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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 2 1993

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March 2, 1993 Volume 1148 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.0
USPTO was neither ISA nor IPEA	475.00	950.0
Filing with an EPO or JPO search report	415.00	830.0
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.0
—For each independent claim in excess of 3	37.00	74.0
—For each claim in excess of 20	11.00	22.0
—For each application containing a multiple dependent claim	115.00	230.0
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.0
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.0

Nov. 8, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 27, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,903,345 through 4,905,319
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 25, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,571,741 through 4,573,215
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 20, 1992 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,296	06/737,505	11/25/86
(4,488,644)	(06/582,021)	(12/18/84)
Re. 32,460	06/740,396	7/21/87
(4,488,358)	(06/490,330)	(12/18/84)
Re. 33,119	07/168,525	11/28/89
(4,488,823)	(06/317,333)	(12/18/84)
4,488,313	06/403,568	12/18/84
4,488,314	06/466,061	12/18/84
4,488,315	06/437,496	12/18/84
4,488,316	06/542,739	12/18/84
4,488,319	06/314,798	12/18/84
4,488,320	06/456,617	12/18/84
4,488,321	06/470,388	12/18/84
4,488,322	06/238,526	12/18/84
4,488,331	06/543,779	12/18/84
4,488,336	06/467,405	12/18/84
4,488,352	06/485,854	12/18/84
4,488,360	06/592,386	12/18/84
4,488,362	06/410,065	12/18/84
4,488,363	06/482,522	12/18/84
4,488,365	06/446,982	12/18/84
4,488,369	06/498,067	12/18/84
4,488,370	06/352,712	12/18/84
4,448,371	06/425,221	12/18/84
4,488,372	06/430,723	12/18/84
4,488,373	06/567,733	12/18/84
4,488,374	06/546,756	12/18/84
4,488,375	06/423,044	12/18/84
4,488,377	06/494,142	12/18/84
4,488,379	06/490,348	12/18/84
4,488,380	06/447,938	12/18/84
4,488,382	06/489,704	12/18/84
4,488,383	06/510,820	12/18/84
4,488,385	06/383,347	12/18/84
4,488,386	06/437,898	12/18/84
4,488,387	06/470,056	12/18/84
4,488,389	06/451,416	12/18/84
4,488,391	06/217,473	12/18/84
4,488,394	06/254,769	12/18/84
4,488,395	06/489,527	12/18/84
4,488,400	06/481,609	12/18/84
4,488,401	06/382,934	12/18/84
4,488,402	06/375,172	12/18/84
4,488,403	06/470,578	12/18/84
4,488,405	06/306,401	12/18/84
4,488,409	06/527,735	12/18/84
4,488,413	06/458,617	12/18/84
4,488,414	06/538,384	12/18/84
4,488,422	06/467,442	12/18/84
4,488,424	06/496,601	12/18/84
4,488,425	06/395,052	12/18/84
4,488,428	06/396,173	12/18/84
4,488,430	06/393,342	12/18/84
4,488,431	06/384,341	12/18/84
4,488,435	06/431,637	12/18/84
4,488,436	06/582,162	12/18/84
4,488,437	06/496,641	12/18/84
4,488,439	06/405,725	12/18/84
4,488,440	06/472,531	12/18/84
4,488,442	06/500,060	12/18/84
4,488,448	06/472,746	12/18/84
4,488,450	06/467,854	12/18/84
4,488,453	06/348,164	12/18/84
4,488,455	06/298,509	12/18/84
4,488,459	06/424,093	12/18/84
4,488,461	06/323,658	12/18/84
4,488,462	06/319,194	12/18/84
4,488,463	06/475,333	12/18/84
4,488,465	06/395,924	12/18/84
4,488,466	06/414,977	12/18/84
4,488,469	06/349,985	12/18/84
4,488,471	06/496,204	12/18/84
4,488,473	06/348,202	12/18/84
4,488,482	06/447,429	12/18/84
4,448,483	06/499,556	12/18/84
4,488,484	06/499,809	12/18/84
4,488,486	06/450,495	12/18/84
4,488,488	06/452,487	12/18/84
4,488,489	06/330,850	12/18/84
4,488,490	06/527,714	12/18/84
4,488,491	06/480,442	12/18/84
4,488,492	06/352,371	12/18/84
4,488,496	06/344,664	12/18/84
4,488,497	06/375,087	12/18/84
4,488,501	06/432,982	12/18/84
4,488,503	06/449,004	12/18/84

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4,488,504	06/461,089	12/18/84
4,488,505	06/494,284	12/18/84
4,488,506	06/388,774	12/18/84
4,488,508	06/503,011	12/18/84
4,488,510	06/535,267	12/18/84
4,488,511	06/473,045	12/18/84
4,488,512	06/545,911	12/18/84
4,488,513	06/527,458	12/18/84
4,488,514	06/493,852	12/18/84
4,488,515	06/510,815	12/18/84
4,488,516	06/553,015	12/18/84
4,488,518	06/465,253	12/18/84
4,488,520	06/518,226	12/18/84
4,488,521	06/215,636	12/18/84
4,488,526	06/423,445	12/18/84
4,488,528	06/587,739	12/18/84
4,488,530	06/604,177	12/18/84
4,488,536	06/436,795	12/18/84
4,488,538	06/343,369	12/18/84
4,488,539	06/539,354	12/18/84
4,488,540	06/500,076	12/18/84
4,488,541	06/448,249	12/18/84
4,488,544	06/450,073	12/18/84
4,488,547	06/415,748	12/18/84
4,488,550	06/399,329	12/18/84
4,488,551	06/399,500	12/18/84
4,488,557	06/585,774	12/18/84
4,488,558	06/388,740	12/18/84
4,488,559	06/279,102	12/18/84
4,488,560	06/416,709	12/18/84
4,488,561	06/507,653	12/18/84
4,488,565	06/464,424	12/18/84
4,488,567	06/510,756	12/18/84
4,488,568	06/387,783	12/18/84
4,488,570	06/504,433	12/18/84
4,488,571	06/477,825	12/18/84
4,488,573	06/513,445	12/18/84
4,488,574	06/405,101	12/18/84
4,488,575	06/438,777	12/18/84
4,488,576	06/281,014	12/18/84
4,488,578	06/380,936	12/18/84
4,488,579	06/482,208	12/18/84
4,488,583	06/469,961	12/18/84
4,488,585	06/499,558	12/18/84
4,488,593	06/416,471	12/18/84
4,488,596	06/545,354	12/18/84
4,488,599	06/516,074	12/18/84
4,488,600	06/381,236	12/18/84
4,488,601	06/426,303	12/18/84
4,488,602	06/495,204	12/18/84
4,488,605	06/312,963	12/18/84
4,488,608	06/413,233	12/18/84
4,488,610	06/378,653	12/18/84
4,488,612	06/446,654	12/18/84
4,488,613	06/436,933	12/18/84
4,488,614	06/407,264	12/18/84
4,488,615	06/422,857	12/18/84
4,488,616	06/458,256	12/18/84
4,488,617	06/491,584	12/18/84
4,488,618	06/446,615	12/18/84
4,488,621	06/331,735	12/18/84
4,488,623	06/539,541	12/18/84
4,488,624	06/506,048	12/18/84
4,488,626	06/290,416	12/18/84
4,488,627	06/299,108	12/18/84
4,488,631	06/399,408	12/18/84
4,488,635	06/460,946	12/18/84
4,488,636	06/294,861	12/18/84
4,488,638	06/382,594	12/18/84
4,488,643	06/546,324	12/18/84
4,488,651	06/345,347	12/18/84
4,488,652	06/475,048	12/18/84
4,488,653	06/588,238	12/18/84
4,488,656	06/500,570	12/18/84
4,488,657	06/480,107	12/18/84
4,488,662	06/442,822	12/18/84
4,488,663	06/425,205	12/18/84
4,488,667	06/471,622	12/18/84
4,488,671	06/484,349	12/18/84
4,488,673	06/403,219	12/18/84
4,488,675	06/481,294	12/18/84
4,488,677	06/493,508	12/18/84
4,488,679	06/437,928	12/18/84
4,488,681	06/505,850	12/18/84
4,488,683	06/300,209	12/18/84
4,488,684	06/454,304	12/18/84
4,488,689	06/406,539	12/18/84
4,488,690	06/474,073	12/18/84
4,488,691	06/453,444	12/18/84
4,488,692	06/330,751	12/18/84
4,488,693	06/299,923	12/18/84
4,488,694	06/471,679	12/18/84
4,488,698	06/289,321	12/18/84
4,488,704	06/445,891	12/18/84
4,488,705	06/306,366	12/18/84
4,488,707	06/466,013	12/18/84
4,488,709	06/395,112	12/18/84
4,488,711	06/478,393	12/18/84
4,488,713	06/475,664	12/18/84
4,488,715	06/431,684	12/18/84
4,488,719	06/475,188	12/18/84
4,488,721	06/380,533	12/18/84
4,488,722	06/315,895	12/18/84
4,488,723	06/421,997	12/18/84
4,488,724	06/338,314	12/18/84
4,488,725	06/521,588	12/18/84
4,488,726	06/491,174	12/18/84
4,488,727	06/439,179	12/18/84
4,488,728	06/507,055	12/18/84
4,488,729	06/530,376	12/18/84
4,488,730	06/499,272	12/18/84
4,488,731	06/415,925	12/18/84
4,488,732	06/459,196	12/18/84
4,488,733	06/527,476	12/18/84
4,488,736	06/486,794	12/18/84
4,488,738	06/262,986	12/18/84
4,488,739	06/348,207	12/18/84
4,488,743	06/401,920	12/18/84
4,488,744	06/328,352	12/18/84
4,488,745	06/481,620	12/18/84
4,488,747	06/407,446	12/18/84
4,488,748	06/376,531	12/18/84
4,488,749	06/414,610	12/18/84
4,488,751	06/451,813	12/18/84
4,488,753	06/335,335	12/18/84
4,488,756	06/462,685	12/18/84
4,488,759	06/469,742	12/18/84
4,488,761	06/376,533	12/18/84
4,488,763	06/256,574	12/18/84
4,488,766	06/429,360	12/18/84
4,488,769	06/483,880	12/18/84
4,488,770	06/489,073	12/18/84
4,488,771	06/355,819	12/18/84
4,488,776	06/429,041	12/18/84
4,488,777	06/299,104	12/18/84
4,488,779	06/443,028	12/18/84
4,488,782	06/377,763	12/18/84
4,488,786	06/258,985	12/18/84
4,488,787	06/440,613	12/18/84
4,488,788	06/475,066	12/18/84
4,488,789	06/332,897	12/18/84
4,488,791	06/357,162	12/18/84
4,488,792	06/480,472	12/18/84
4,488,796	06/488,270	12/18/84
4,488,797	06/375,654	12/18/84
4,488,798	06/503,564	12/18/84
4,488,807	06/401,199	12/18/84
4,488,809	06/369,800	12/18/84
4,488,813	06/373,112	12/18/84
4,488,815	06/463,741	12/18/84
4,488,822	06/336,834	12/18/84
4,488,823	06/317,333	12/18/84
4,488,824	06/378,418	12/18/84
4,488,826	06/429,878	12/18/84
4,488,827	06/491,933	12/18/84
4,488,829	06/384,333	12/18/84

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4,488,830	06/472,148	12/18/84
4,488,831	06/530,550	12/18/84
4,488,832	06/388,190	12/18/84
4,488,835	06/553,882	12/18/84
4,488,836	06/430,758	12/18/84
4,488,838	06/381,409	12/18/84
4,488,839	06/372,714	12/18/84
4,488,841	06/384,182	12/18/84
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4,792,551	06/514,112	12/20/88
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4,792,602	06/562,045	12/20/88
4,792,606	07/074,384	12/20/88
4,792,609	06/866,039	12/20/88
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4,792,619	07/158,974	12/20/88
4,792,620	07/021,384	12/20/88
4,792,624	07/019,168	12/20/88
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Patent Number	Serial Number	Issue Date	4,792,961	06/755,421	12/20/88
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4,792,883	07/075,649	12/20/88	4,792,987	06/689,935	12/20/88
4,792,896	06/556,130	12/20/88	4,792,988	07/031,949	12/20/88
4,792,906	06/902,417	12/20/88	4,792,995	07/087,048	12/20/88
4,792,908	06/843,534	12/20/88	4,792,997	07/062,518	12/20/88
4,792,959	07/008,752	12/20/88			

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,383,161	06/261,055	5/10/83	5/06/81	1/13/93
4,630,397	06/738,559	12/23/86	6/09/86	1/13/93
4,654,897	06/803,071	4/07/87	11/29/85	1/13/93
4,671,303	06/797,761	6/09/87	11/13/85	1/13/93
4,703,859	06/924,561	11/03/87	10/29/86	1/13/93
4,757,980	07/107,567	7/19/88	10/06/87	1/13/93

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,701,240, Re. S.N. 07/918,144, Filed July 24, 1992, Cl. 156/555, DEVICE FOR JOINING BY CALENDERING AT LEAST ONE SHEET OF GLASS AND AT LEAST ONE FILM OF PLASTIC MATERIAL, Johannes Kraemer, et. al., Owner of Record: *Saint-Gobian Vitrage, Cedex, France,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 1304

4,873,719, Re. S.N. 07/994,163, Filed Dec. 21, 1992, Cl. 379, ENHANCED CALLING NUMBER DELIVERY SERVICE SYSTEM, Morris Reese, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 2601

4,876,308, Re. S.N. 08/002,013, Filed Jan. 8, 1993, Cl. 524/780, POLYURETHANE ADHESIVE FOR A SURFACE TREATMENT-FREE FIBER REINFORCED PLASTIC, Earl G. Melby, et. al., Owner of Record: *Gencorp Inc., Akron, Ohio,* Attorney or Agent: Louis Gubinsky, Ex. Gp.: 1511

4,983,071, Re. S.N. 08/001,050, Filed Jan. 6, 1993, Cl. 405/154, PIPE BURSTING AND REPLACEMENT APPARATUS AND METHOD, Allan T. Fisk, et. al., Owner of Record: *Consolidated Edison Co. of New York, Inc., New York, N.Y.,* Attorney or Agent: Alfred L. Haffner, Jr., Ex. Gp.: 3501

5,021,771, Re. S.N. 07/997,070, Filed Dec. 24, 1992, Cl. 340/709, COMPUTER INPUT DEVICE WITH TWO CURSOR POSITIONING SPHERES, Ronald D. Lachman, Owner of Record: *Darby & Darby P. C., New York, N.Y.,* Attorney or Agent: Joseph A. Robinson, Ex. Gp.: 2609

5,085,358, Re. S.N. 08/001,804, Filed Jan. 8, 1993, Cl. 223/94, ADJUSTABLE CLOTHES HANGER, Peter-Ar Fu Lam, Owner of Record: *Inventor,* Attorney or Agent: Arthur Freilich, Ex. Gp.: 2407

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,016,750, Reexam. No. 90/002,936, Requested Jan. 26, 1993, Cl. 073/629, ULTRASONIC IMAGING METHOD AND APPARATUS, Philip S. Green, Owner of Record: *SRI International, Menlo Park, Calif.,* Attorney or Agent: Morrison & Foerster, Palo Alto, Calif., Ex. Gp.: 2605, Requester: Owner

4,109,960, Reexam. No. 90/002,930, Requested Jan. 8, 1993, Cl. 297/258, LEGLESS ROCKER-RECLINER CHAIR, Lawrence M. Stinchfield, Owner of Record: *Inventor, Paso Robles, Calif.,* Attorney or Agent: Thomas Scheneck, Jr., Schneck & McHugh, San Jose, Calif., Ex. Gp.: 3507, Requester: Owner

4,820,859, Reexam. No. 90/002,910, Requested Dec. 17, 1992, Cl. 558/483, PROCESS FOR THE PRODUCTION OF HIGH ENERGY MATERIAL, Ross W. Millar, et. al., Owner of Record: *Secretary of State of U.K. Great Britain, London, England,* Attorney or Agent: Cushman, Darby & Cushman, Washington, D.C., Ex. Gp.: 2203, Requester: Owner

4,977,137, Reexam. No. 90/002,908, Requested Dec. 22, 1992, Cl. 514/006, ACTOFERRIN AS A DIETARY INGREDIENT PROMOTING THE GROWTH OF THE GASTROINTESTINAL TRACT, Buford L. Nichols, et. al., Owner of Record: *Baylor College of Medicine, Houston, Tex.,* Attorney or Agent: William A. Stout, Houston, Tex., Ex. Gp.: 1808, Requester: Paul Lempel, Kenyon & Kenyon, New York, N.Y.

5,091,171, Reexam. No. 90/002,911, Requested Dec. 17, 1992, Cl. 424/642, AMPHOTERIC COMPOSITIONS AND POLYMERIC FORMS OF ALPHA HYDROXYACIDS AND THEIR THERAPEUTIC USE, Reuy J. Yu, et. al., Owner of Record: Ruey J. Yu, Ambler, Pa., Eugene J. Van Scott, Abington, Pa., Attorney or Agent: Foley & Lardner, Alexandria, Va., Ex. Gp.: 1202, Requester: Richard R. Mybeck, Scottsdale, Ariz.

5,098,662, Reexam. No. 90/002,909, Requested Dec. 8, 1992, Cl. 422/102.00, MODULAR SOLVENT EXTRACTOR/CONCENTRATOR APPARATUS, Bruce A. Killough, Owner of Record: *Corning, Inc., Corning, N.Y.,* Attorney or Agent: Brian R. Lealie, Ex. Gp.: 1801, Requester: Owner

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED JANUARY 18, 1993 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
293,093	71/321,180	4/12/1932
293,104	71/321,511	4/12/1932
293,109	71/321,588	4/12/1932
293,113	71/317,589	4/12/1932
293,129	71/320,944	4/12/1932
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293,182	71/321,700	4/12/1932
551,771	71/607,374	12/04/1951
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557,459	71/558,597	4/15/1952
557,462	71/561,737	4/15/1952
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557,481	71/577,124	4/15/1952
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557,517	71/589,718	4/15/1952
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557,615	71/607,312	4/15/1952
557,618	71/607,502	4/15/1952
557,619	71/607,503	4/15/1952
557,620	71/607,818	4/15/1952
557,624	71/607,936	4/15/1952
557,633	71/608,277	4/15/1952
557,637	71/608,614	4/15/1952
557,652	71/609,840	4/15/1952
557,655	71/609,891	4/15/1952
557,657	71/609,997	4/15/1952
557,660	71/610,282	4/15/1952
557,662	71/610,351	4/15/1952
557,666	71/610,609	4/15/1952
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557,674	71/611,163	4/15/1952
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557,681	71/611,540	4/15/1952
557,682	71/611,542	4/15/1952
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557,701	71/612,665	4/15/1952
557,703	71/612,737	4/15/1952
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557,731	71/615,375	4/15/1952
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932,059	72/334,271	4/11/1972
932,061	72/368,453	4/11/1972
932,069	72/386,781	4/11/1972
932,071	72/394,278	4/11/1972
932,073	72/373,831	4/11/1972
932,074	72/341,785	4/11/1972
932,075	72/368,927	4/11/1972
932,080	72/383,161	4/11/1972
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932,100	72/373,116	4/11/1972
932,102	72/336,269	4/11/1972
932,104	72/376,494	4/11/1972
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932,106	72/388,641	4/11/1972
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932,145	72/377,605	4/11/1972
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932,170	72/363,529	4/11/1972
932,172	72/365,951	4/11/1972
932,173	72/366,495	4/11/1972
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932,190	72/398,464	4/11/1972
932,192	72/327,575	4/11/1972
932,195	72/341,746	4/11/1972
932,199	72/354,137	4/11/1972
932,203	72/363,669	4/11/1972
932,220	72/388,372	4/11/1972
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932,246	72/379,699	4/11/1972
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932,264	72/365,635	4/11/1972
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932,269	72/386,198	4/11/1972
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932,273	72/391,678	4/11/1972
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932,297	72/398,265	4/11/1972
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932,309	72/376,989	4/11/1972
932,313	72/380,494	4/11/1972
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932,321	72/384,534	4/11/1972
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932,348	72/349,772	4/11/1972
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935,082	72/326,090	5/30/1972
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Patent Available for Licensing

Roche has entered into a Consent Order with the Federal Trade Commission with respect to the merger of a subsidiary of Roche Holdings, Inc. and Genentech, Inc. (FTC Docket No. C*3315*). As part of such Consent Order, Roche has agreed to grant non-exclusive licenses upon written applications made until Dec. 31, 2000 under its United States CD4-Based Therapeutic Patent Portfolio, which includes U.S. Patent Application Serial No. 07/510,773 - "Chimeric CD4-Immunoglobulin Polypeptides," by Klaus Karjalainen and Andre Traunecker, filed April 18, 1990. Roche is willing to grant such non-exclusive licenses to all qualified applicants at a royalty not in excess of one percent (1%) of net sales if only Process Patents are licensed, or three (3%) of net sales if Product Patents are licensed. The license agreement will contain other reasonable and customary terms and conditions. Copies of the FTC Consent Order and all relevant patents (as defined in the Order) are available from Roche upon written request. Any interested party should respond to:

Hoffmann-La Roche Inc.
Attn: George M. Gould, Esq.
Vice President & Chief Patent Counsel
340 Kingsland Street
Nutley, N.J. 07110

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,500,659, Loretta A. Kroupa, Elton H. Relyea, EXTRUDABLE, CURABLE POLYORGANOSILOXANE COMPOSITIONS, Interference No. 101,713, decided Aug. 19, 1992, claims 1-14.

Patent No. 4,572,865, David G. Gluck, Alberto Deleon, John P. Oliver, FACED FOAM INSULATION BOARD AND FROTH-FOAMING METHOD FOR MAKING SAME, Interference No. 102,068, decided June 26, 1992, claims 1-6, 8-11, 13-42, 44, 50 and 51.

Patent No. 4,607,293, Yoshinori Okada, Kuniaki Miura, Isao Fukushima, MAGNETIC RECORDING AND REPRODUCTION SYSTEM, Interference No. 102,109, decided June 6, 1991, claims 1-3.

Patent No. 4,696,028, Sanform J. Morganstein, Edward F. Tuck, Bakulesh A. Mehta, Herbert B. Krakau, PBX INTERCEPT AND CALLER INTERACTIVE ATTENDANT BYPASS SYSTEM, Interference No. 102,823, decided Dec. 8, 1992, claim 47.

Patent No. 4,736,020, Heinz Hillen, Peter Moesta, Stefan Marcinowski, PURIFICATION OF HTNF, Interference No. 102,288, decided July 1, 1992, claims 1 and 2.

Patent No. 4,781,439, Hisao Yokokura, Tadao Nakata, Susumu Era, Yasuo Hanawa, Kishiro Iwasaki, Teruo Kitamura, Akio Mukoh, Toshikazu Narahara, Yasuhiko Kando, Shunichi Numata, Kooji Fujisaki, LIQUID CRYSTAL POLYIMIDE ALIGNMENT FREE OF SCATTERING DOMAINS, Interference No. 102,771, decided Oct. 20, 1992, claims 1-3.

Patent No. 4,786,648, Stephen C. Bergmeier, David A. Downs, Walter H. Moos, David W. Moreland, Haile Tecle, O-SUBSTITUTED TETRAHYDROPYRIDINE OXIME CHOLINERGIC AGENTS, Interference No. 102,337, decided Aug. 24, 1992, claims 1-23, 25 and 27.

Patent No. 4,810,583, Theresa S. Brown, Connie J. Parvin, Patricia B. Walters, Wolfram F. Rothe, Radford French, AIRCRAFT WINDSHIELD, Interference No. 102,791, decided Aug. 18, 1992, claims 1-11.

Patent No. 4,863,630, Ellen L. Swan, Rajat S. Basu, AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE AND ETHANOL, Interference No. 102,974, decided Dec. 11, 1992, claims 1-18.

Patent No. 4,872,857, Neil A. Newman, Herbert A. Bankstahl, John M. Griffiths, Lyle M. Forsgren, Wayne T. Beck, OPERATION OPTIMIZING SYSTEM FOR A MARINE DRIVE UNIT, Interference No. 102,703, decided Dec. 8, 1992, claims 1-8, 10-12, 14 and 15.

Patent No. 4,876,423, Laurence E. Tighe, Tim Parker, LOCALIZED MICROWAVE RADIATION HEATING, Interference No. 102,857, decided Dec. 8, 1992, claims 1-20.

Patent No. 4,879,272, Naoto Shimoda, Tsutomu Kawaguchi, METHOD AND COMPOSITION FOR PREVENTING THE ABSORPTION OF A MEDICINE, Interference No. 102,978, decided Dec. 14, 1992, claims 3 and 4.

Patent No. 4,900,549, Petra DeVries, Antonius Ludovicus Van Wezel, deceased; by Cornelia M. Van Wezel-Berendse, Administratrix; Eduard C. Beuvery, PROCESS FOR PREPARING IMMUNOGENIC COMPLEXES AND PHARMACEUTICAL COMPOSITION CONTAINING THESE COMPLEXES, Interference No. 102,864, decided Nov. 12, 1992, claims 2, 3/2, 7/2, 9/2, 13/2 and 15/2

Patent No. 4,928,771, Joseph E. Vandevier, CABLE SUSPENDED PUMPING SYSTEM, Interference No. 102,881, decided Nov. 25, 1992, claims 1, 2 and 4.

Patent No. 4,956,568, Chung-Yi Su, Michael R. Ty Tan, William J. Anklam, MONOLITHIC SAMPLER, Interference No. 102,769, decided Dec. 23, 1992, claims 1, 4 and 5.

Patent No. 4,993,737, Albert Torcomian, LOAD-BEARING MULTI-POSITION DRAWBAR ARRANGEMENT AND SUSPENSION SYSTEM, Interference No. 102,758, decided Dec. 9, 1992, claims 14-17, 22-24.

Patent No. 5,000,952, Lawrence Steinman, Jorge R. Oukenberg, Gary K. Schoolnik, Amrit K. Judd, POLYPEPTIDE PERTUSSIS TOXIN VACCINE, Interference No. 102,906, decided Nov. 5, 1992, claims 1, 6, 7, 9 and 10.

Patent No. 5,080,566, Hirotsugu Sakata, Toshinobu Inoue, Satoru Oikawa, FLUID SCROLL MACHINE WITH PROJECTION ON ONE SIDE OF OLDHAM RING, Interference No. 102,943, decided Nov. 5, 1992, claims 1-6.

NANNIE B. HENRY
Deputy Clerk, Board of Patent Appeals and Interferences
(703) 557-4005

Errata

The following registration numbers listed in the Trademark Registration Issued" and "Index of Registrants"section of the Trademark Official Gazette was listed inadvertently.

TM 322, TMI 14	1,745,995	1/12/93
TM 323, TMI 2	1,746,044	1/12/93
TM 518, TMI 16	1,695,213	6/16/92
TM 293, TMI 41	1,734,782	11/24/92
TM 309, TMI 5	1,735,473	11/24/92
TM 297, 308 TMI 26	1,734,927	11/24/92
TM 280, TMI 40	1,727,150	10/27/92
TM 273, TMI 15	1,724,011	10/13/92
TM 430, TMI 14	1,689,385	5/26/92
TM 116, TMI 5	1,674,153	2/04/92
TM 307, TMI 8	1,683,709	4/21/92
TM 297, TMI 37	1,682,247	4/07/92
TM 391, TMI 76	1,740,672	12/15/92

Consequently, the certificate of registration bearing the above identified registration number was not issued on the date indicated, and the registration number has been vacated

Jan. 27, 1993 DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration number was inadvertently listed as cancelled in the "Trademark Registration Cancelled, Section 8" and "Index of Registrants" sections of the *Official Gazette* of Mar. 18, 1992:

TM 395, TMI 27 1,386,428

Consequently, the above-identified registration is still active.

Jan. 27, 1993 DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration number was erroneously listed in the Notices of Expiration of Trademark Registrations" section of the*Official Gazette* of Dec. 1, 1992:

TMOG 111 550,132

Consequently, the above-identified registration is still active.

Jan. 27, 1993 DAVID E. BUCHER
Director of Trademark Examining Groups

Availability of Patent In Computer Program Training

1. Training In Washington, D.C.
Friday, April 16, 1993

The Patent and Trademark Office (PTO) has developed a computer program, called PatentIn, that will facilitate compliance with the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures (sequence rules: 37 CFR 1.821 through 1.825). (Final rules were published in the Federal Register, 55 Fed. Reg. 18230 (May 1, 1990), and in the *Official Gazette*, 1114 O.G. 29 (May 15, 1990).)

A one-day training sessions will be held on the use of the PatentIn Computer Program on Friday, Apr. 16, 1993 from 10:00 am to 4:00 pm. The training will be held at the Department of Agriculture Graduate School Training Facility. The School is located at 600 Maryland Ave., S.W., Washington, D.C. at the L'Enfant Plaza Metro stop.

The training will be hands on, using personal computer equipment and will include (1) the use of PatentIn to prepare the sequence listing file of information, and (2) the use of word processing software to prepare the PatentIn sequence listing file for inclusion as part of the application papers. The class will also include training on the basic file editing and manipulation skills that may be necessary for preparing sequence information for importing into PatentIn.

Because of the limited number of computers available, the class will be limited to no more than 17 participants.

Requests to attend the class should be made in writing, addressed to the Commissioner of Patents and Trademarks; Washington D.C. 20231; Attention: Arthur F. Purcell, Office of the Administrator for Search and Information Resources; Crystal Park Building 3, Suite 702. Requests should include a check for $100, made payable to the Commissioner of Patents and Trade-

marks, or an authorization to charge a PTO Deposit Account. Requests authorizing charges to Deposit Accounts may also be sent via facsimile to 703-557-0668.

2. Training On Request

On request from sponsoring organization, PatentIn training, as well as training on the sequence Rules, can also be provided by qualified PTO instructors at remote locations under the following conditions:

— A request for such training should be directed to the Commissioner of Patents and Trademarks, Patent and Trademark Office, Washington, D.C. 20231, by the sponsoring organization. The request should reference this Notice.

— Because the number of qualified instructors is very limited, sponsoring organizations normally should submit requests at least three months in advance of the desired training session date and should be flexible as regards scheduling of training sessions.

— If the sponsoring organization is other than a non-profit entity or membership association, e.g., the sponsoring organization is private company or firm, that organization must specify that the training opportunity will also be made available to individuals not employed by the company or firm.

— The sponsoring organization must agree to pay for all travel related expenses of the instructor(s) plus a fixed fee of $500 per instructor per instruction day to cover salary, overhead and training materials costs.

— The sponsoring organization must provide the physical facilities and any equipment necessary to conduct the training. Since these will vary according to the circumstances and number of trainees, such arrangements should be made in consultation with the instructor.

Any questions about the sequence rules or this notice should be directed to Arthur F. Purcell, by telephone at (703) 557-1687, or by FAX at (703) 557-0668.

WILLIAM S. LAWSON
Administrator
Search and Information Resources

PATENT NOTICES

Certificates of Correction For Week of March 2, 1993

Des. 316,208	4,975,794	5,026,637	5,043,075
Des. 316,290	4,979,120	5,026,834	5,043,101
Des. 317,204	4,979,150	5,027,942	5,043,222
Des. 317,275	4,981,008	5,028,136	5,043,314
Des. 319,517	4,981,123	5,028,406	5,043,386
Des. 319,721	4,981,532	5,028,543	5,043,692
Des. 319,725	4,984,687	5,028,627	5,044,472
Des. 320,566	4,985,475	5,028,744	5,044,542
Des. 321,241	4,985,976	5,029,183	5,044,904
Des. 324,351	4,986,540	5,029,306	5,044,916
Des. 325,298	4,988,445	5,029,438	5,044,955
Des. 329,133	4,988,570	5,029,889	5,044,962
PP. 7,730	4,988,990	5,030,365	5,045,027
Re. 33,631	4,989,489	5,030,450	5,045,074
4,558,125	4,990,044	5,030,866	5,045,479
4,609,464	4,990,640	5,031,221	5,045,576
4,709,892	4,990,959	5,031,578	5,045,775
4,713,454	4,991,383	5,031,671	5,046,001
4,747,127	4,991,566	5,031,686	5,046,192
4,812,255	4,991,616	5,031,728	5,046,784
4,812,447	4,992,399	5,032,108	5,047,228
4,820,504	4,992,466	5,032,132	5,047,366
4,829,131	4,992,927	5,032,159	5,047,439
4,834,324	4,994,022	5,032,820	5,047,491
4,843,420	4,995,620	5,033,192	5,047,583
4,847,983	4,995,713	5,033,301	5,047,635
4,862,252	4,997,289	5,033,722	5,047,988
4,863,177	4,998,340	5,034,171	5,048,129
4,866,654	4,999,159	5,034,333	5,048,337
4,868,161	4,999,170	5,034,477	5,048,448
4,871,706	4,999,739	5,034,908	5,048,677
4,881,089	5,001,158	5,034,916	5,048,911
4,881,551	5,002,043	5,034,993	5,048,968
4,887,774	5,003,557	5,035,897	5,049,155
4,889,472	5,004,645	5,036,067	5,049,453
4,890,639	5,004,651	5,036,158	5,049,687
4,894,386	5,004,864	5,036,372	5,049,801
4,896,747	5,005,815	5,036,470	5,050,006
4,896,950	5,006,395	5,036,637	5,050,218
4,904,816	5,006,791	5,036,696	5,050,328
4,905,133	5,006,937	5,036,793	5,050,525
4,906,779	5,007,979	5,036,857	5,050,666
4,907,201	5,008,001	5,036,863	5,050,686
4,910,225	5,008,172	5,036,864	5,051,190
4,912,033	5,008,853	5,036,868	5,051,272
4,912,776	5,008,870	5,037,514	5,051,352
4,927,461	5,009,988	5,037,902	5,051,410
4,931,554	5,013,033	5,038,166	5,051,786
4,934,544	5,013,037	5,038,238	5,052,391
4,935,631	5,013,834	5,038,531	5,052,575
4,936,671	5,014,094	5,038,639	5,053,596
4,939,533	5,014,505	5,039,034	5,053,643
4,939,922	5,014,804	5,039,413	5,053,733
4,940,685	5,015,070	5,039,471	5,054,163
4,940,716	5,017,784	5,039,478	5,054,655
4,945,838	5,017,943	5,039,625	5,054,743
4,947,007	5,018,620	5,039,702	5,055,168
4,947,925	5,020,161	5,039,741	5,055,226
4,948,243	5,020,382	5,039,803	5,055,232
5,049,692	5,021,114	5,039,951	5,055,583
4,950,541	5,021,248	5,040,104	5,055,628
4,950,682	5,021,603	5,040,236	5,055,678
4,951,402	5,021,947	5,040,261	5,055,683
4,952,076	5,021,967	5,040,503	5,055,840
4,955,857	5,022,256	5,040,617	5,055,912
4,957,120	5,022,406	5,041,011	5,055,946
4,957,605	5,023,077	5,041,389	5,055,977
4,961,225	5,023,626	5,041,961	5,056,137
4,962,155	5,023,740	5,042,123	5,056,202
4,963,686	5,023,977	5,042,145	5,056,375
4,963,720	5,024,442	5,042,220	5,056,413
4,965,382	5,024,491	5,042,457	5,056,414
4,965,926	5,025,196	5,042,509	5,056,445
4,969,927	5,025,350	5,042,553	5,056,653
4,970,406	5,025,860	5,042,673	5,056,733
4,973,290	5,026,432	5,043,008	5,056,781
5,056,903	5,060,357	5,062,976	5,066,411
5,057,085	5,060,392	5,063,011	5,066,422
5,057,172	5,060,565	5,063,038	5,066,453
5,057,178	5,060,574	5,063,256	5,066,849
5,057,185	5,060,776	5,063,353	5,066,974
5,057,242	5,060,893	5,063,376	5,067,068
5,057,698	5,060,953	5,063,445	5,067,078
5,057,972	5,061,308	5,063,661	5,067,100
5,057,977	5,061,382	5,063,992	5,067,271
5,057,979	5,061,634	5,064,123	5,067,981
5,058,292	5,061,843	5,064,173	5,068,075
5,058,437	5,061,900	5,064,294	5,070,056
5,058,572	5,061,996	5,064,304	5,073,974
5,058,717	5,062,025	5,064,443	5,101,031
5,058,805	5,062,096	5,064,479	5,112,341
5,058,871	5,062,109	5,064,747	5,119,712
5,058,918	5,062,177	5,064,839	5,112,203
5,059,217	5,062,198	5,065,094	5,126,071
5,059,320	5,062,344	5,065,198	5,148,075
5,059,496	5,062,429	5,065,407	5,160,308
5,059,891	5,062,598	5,065,482	5,163,288
5,059,915	5,062,702	5,065,974	
5,060,193	5,062,808	5,066,084	
5,060,274	5,062,902	5,066,160	

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PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

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GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	3/05/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	5/28/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	5/08/92
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PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	2/07/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	7/13/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	10/07/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	1/04/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	4/28/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	4/21/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	5/01/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/04/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during February 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,935,596 to 3,946,800 inclusive
Plant Patents ..... 3,828 to 3,830

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REEXAMINATIONS

MARCH 2, 1993

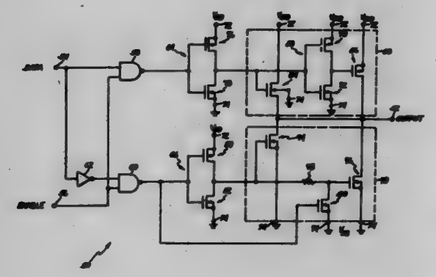
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,638,187 (1936th)

CMOS OUTPUT BUFFER PROVIDING HIGH DRIVE CURRENT WITH MINIMUM OUTPUT SIGNAL DISTORTION

Clifford H. Boler, Bloomington; William W. Leake, St. Paul; Surinder S. Rai, Plymouth, and Gene B. Zemske, Minneapolis, all of Minn., assignors to Cypress Semiconductor (Minnesota) Inc.

Reexamination Request No. 90/002,667, Mar. 12, 1992.
Reexamination Certificate for Patent No. 4,638,187, issued Jan. 20, 1987, Ser. No. 782,639, Oct. 1, 1985.
Int. Cl.[5] H03K *21/10*
U.S. Cl. 307—451



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–19 and 21–32 is confirmed.

Claim 20 is cancelled.

1. An output buffer for producing an output at an output terminal comprising:

a pull-up circuit responsive to a first signal for pulling the output toward a first supply potential when turned on, the pull-up circuit including first and second FETs, each having a gate, a source and a drain, the first and second FETs each having a current path formed by their source and drain connected in parallel between the output terminal and a first supply potential terminal, and first delay means connected to the gate of the second FET for delaying turn-on of the second FET with respect to turn-on of the first FET; and

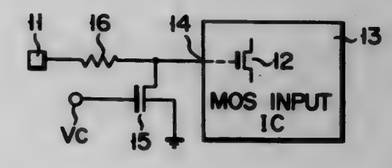
a pull-down circuit responsive to a second signal for pulling the output at the output terminal toward a second supply potential when turned on, the pull-down circuit including third and fourth FETs each having a gate, a source and a drain, the third and fourth FETs each having a current path formed by their source and drain connected in parallel between the output terminal and a second supply potential terminal, and a second delay means connected to the gate of the fourth FET for delaying turn-on of the fourth FET with respect to turn-on of the third FET.

B1 4,692,834 (1937th)

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT WITH VARIABLE LIMITING THRESHOLD FOR MOS DEVICE

Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo, and Akira Narita, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshack Computer System Co., Ltd., Tokyo, both of Japan.

Reexamination Request No. 90/002,809, Aug. 11, 1992.
Reexamination Certificate for Patent No. 4,692,834, issued Sep. 8, 1987, Ser. No. 761,707, Aug. 2, 1985.
Claims priority, application Japan, Aug. 20, 1984, 59-172559
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—91



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 6, 11 and 12 are cancelled.

Claims 1, 2 and 7 are determined to be patentable as amended.

Claims 3–5 and 8–10, dependent on an amended claim, are determined to be patentable.

1. A variable-threshold electrostatic discharge protection circuit in combination with an associated semiconductor device containing an input MOS transistor having an input gate, said input MOS transistor being operative from a power source potential and a reference potential and being responsive to a reference level input signal and to high and low level input signals, said protection circuit comprising:

an input terminal receiving said reference level input signal and said high and low level input signals, said input terminal being coupled to said input gate of said input MOS transistor of said associated semiconductor device; [and]

a gate-controlled MOS diode connected between said input gate of said input MOS transistor of said associated semiconductor device and said reference potential of said input MOS transistor for limiting at a variable threshold the voltage applied to said input gate of said MOS input transistor, said diode having a control gate and being responsive to a given threshold control potential applied to said control gate to increase said variable threshold to limit the voltage at said input terminal to a value above said high level input signal when said high level input signal is applied to said input terminal; *and*

means, coupled to the control gate of gate-controlled MOS diode, for changing the value of said given threshold potential in accordance with whether said high voltage input signal or said low voltage input signal is applied to said input terminal.

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B1 4,751,087 (1938th)

TRANSDERMAL NITROGLYCERIN DELIVERY SYSTEM

Steven M. Wick, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Reexamination Request No. 90/002,398, Aug. 9, 1991.
Reexamination Certificate for Patent No. 4,751,087, issued Jun. 14, 1988, Ser. No. 725,215, Apr. 19, 1985.
Int. Cl.[5] A61F *13/00*; A61K *9/70, 31/21*
U.S. Cl. 424—449

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

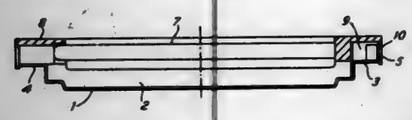
The patentability of claims 1–30 is confirmed.

1. An adhesive-coated sheet material comprising:
(a) a flexible backing; and
(b) a pressure-sensitive adhesive-coating comprising a homogeneous mixture of:
(i) an acrylic polymer comprising, as a major constituent, a hydrophobic monomeric acrylic or methacrylic acid ester of an alkyl alcohol, the alkyl alcohol containing 4 to 10 carbon atoms; and
(ii) nitroglycerin in an amount by weight of about 25 to 45 percent of the total weight of said adhesive coating;
said sheet material being suitable for substantially continuous transdermal delivery of nitroglycerin to a subject over a prolonged period in an amount which is therapeutically effective for prophylactically treating angina pectoris and/or controlling hypertension and/or treating congestive heart failure.

B1 4,864,104 (1939th)

HEATING ASSEMBLY USING TUNGSTEN-HALOGEN LAMPS

Peter W. Crossley, Hampshire; Bernard F. Fellerman, Hayling Island, and Graham H. Goodchild, Hampshire, all of England, assignors to Thorn EMI Patents Limited, Hayes, England

Reexamination Request No. 90/002,742, Jun. 3, 1992.
Reexamination Certificate for Patent No. 4,864,104, issued Sep. 5, 1989, Ser. No. 143,063, Jan. 12, 1988.
Continuation of Ser. No. 49,049, May 11, 1987, Pat. No. 4,751,370, which is a continuation-in-part of Ser. No. 563,930, Dec. 21, 1983, abandoned.
Foreign Application Priority, United Kindom, Dec. 24, 1982, 8236797; Mar. 24, 1983, 8308105; Aug. 1, 1983, 8320717
Int. Cl.[5] H05B *3/74*
U.S. Cl. 219—464

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-7 is confirmed.

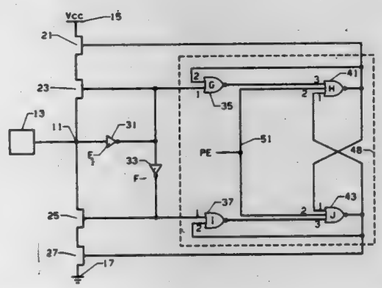
1. A heating assembly comprising:
at least one tungsten halogen lamp capable when energized of generating infra-red radiation having a predetermined wavelength spectrum, a cooktop of glass ceramic material usefully transparent to infra-red radiation in part at least of said spectrum, means supporting said at least one lamp beneath said cooktop, thermally insulative and infra-red reflective means disposed beneath said at least one lamp and said cooktop and capable of inhibiting transmission of heat away from said cooktop and also of reflecting towards said cooktop without significant spectral change infra-red radiation generated by said at least one lamp and initially directed away from said cooktop, said thermally insulative and infra-red reflective means consisting at least of a non-metallic material, the cooktop, said at least one lamp and said thermally insulative and infra-red reflective means being juxtaposed and in closely proximate relationship with one another, whereby said assembly is of shallow construction and exhibits relatively rapid thermal response to energization and deenergization of said at least one lamp, the assembly further including limiting means responsive to the temperature of said cooktop to de-energize said at least one lamp when said temperature reaches a predetermined maximum value.

B1 5,051,619 (1940th)

PREDRIVE CIRCUIT HAVING LEVEL SENSING CONTROL

Ben Campione, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Reexamination Request No. 90/002,598, Feb. 10, 1992.
Reexamination Certificate for Patent No. 5,051,619, issued Sep. 24, 1991, Ser. No. 403,865, Sep. 7, 1989.
Int. Cl.[5] H03K *17/687, 19/003, 19/094, 19/20*
U.S. Cl. 307—443



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–9 and 11 are determined to be patentable as amended.

Claim 10, dependent on an amended claim, is determined to be patentable.

1. A circuit device for predriving a signal conductor, which is *capable of being controllably* switched [between] *to a* first *voltage level* and *to a* second voltage [levels] *level* in the course of operation of a circuit to which said signal conductor is coupled, to a third voltage level lying between said first and second voltage levels, so as to enhance the switching operation of said signal conductor [between] *to* said first *voltage level* and *to said* second voltage [levels] *level* comprising:
a first terminal for receiving a first reference potential, corresponding to said first voltage level;
a second terminal for receiving a second reference potential, corresponding to said second voltage level;
a third terminal to which the signal conductor to be predriven is coupled;
a first [means] *controlled switching circuit*, coupled in circuit between said first and second terminals and said third terminal, [for receiving] *which is operative to receive* a predrive enabling signal and, in response thereto, *to* controllably [providing] *provide* a first current flow path between said third terminal and *either* one of said first and second terminals, while preventing a second current flow path between said third terminal and the other of *either of* said first and second terminals, until the voltage level of said third terminal [reaches said third voltage level, said third voltage level being independent of the level of said enabling signal,] *is brought to a voltage level that is independent of the level of said predrive enabling signal* and thereupon interrupting said first current flow path, while continuing to *maintain the voltage level of said third terminal at a voltage level that is independent of the level of said predrive enabling signal and to* prevent said second current flow path between said third terminal and the other of *either of* said first and second terminals, *so that, in response to said predrive enabling signal, said thirdterminal is brought to neither of said first and second voltages, but, instead, to a voltage level that is independent of the level of said predrive enabling signal and wherein the voltage level to which said third terminal is brought and at which said third terminal is maintained, while said first current flow path is interrupted and said second current flow path is continued to be prevented, corresponds to said third voltage level.*

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STATUTORY INVENTION REGISTRATIONS

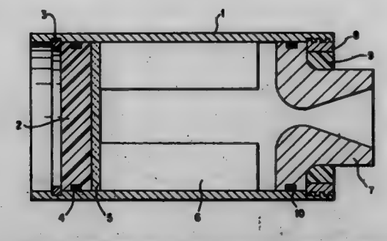
PUBLISHED MARCH 2, 1993

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1144
SOLID PROPELLANT ROCKET MOTOR WITH FUSIBLE END CLOSURE HOLDER

Charles C. Cherry, McGregor, and Raymond E. Wiechering, Waco, both of Tex., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 4, 1990, Ser. No. 593,725
Int. Cl.[5] F02K *1/00*
U.S. Cl. 60—39.1 25 Claims

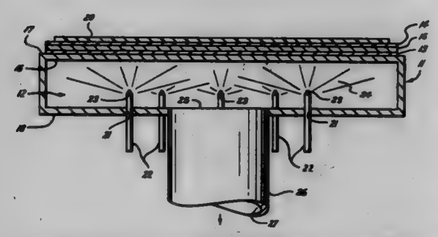


1. A solid propellant rocket motor comprising a motor case, a propellant and at least one end closure, wherein at least one end closure is connected to the casing by at least one fusible connector which melts at temperatures below those that will cause autoignition of the motor but does not melt during normal propulsion of the motor, so that the end closure releases before the autoignition and is retained in place during the normal propulsion, wherein the fusible connector melts at a temperature in the range of 270° F. to 320° F.

H1145
RAPID TEMPERATURE RESPONSE WAFER CHUCK

Richard L. Anderson, Austin, Tex., assignor to Sematech, Inc., Austin, Tex.

Continuation of Ser. No. 587,718, Sep. 25, 1990, abandoned. This application Nov. 6, 1991, Ser. No. 790,098
Int. Cl.[5] F25B *19/02, 29/00*
U.S. Cl. 165—61 12 Claims



1. An apparatus for cooling a semiconductor wafer disposed thereon comprising:

a body for having said semiconductor wafer reside thereon and said body having a hollow cavity therein;

spray means coupled to said body and disposed within said cavity for spraying a liquid to at least a portion of an interior surface of said cavity which is proximal to said semiconductor wafer, but wherein said liquid is prevented from physically contacting said wafer;

said liquid for extracting heat from said wafer by the use of latent heat of vaporization of said liquid when said liquid is sprayed onto said portion of said interior surface of said cavity and is vaporized upon contact with said interior surface of said cavity, such that said wafer is maintained at a predetermined temperature;

exhaust means coupled to said cavity of said body for exhausting vaporized liquid from said cavity.

H1146
PLASMA SPRAYING TUNGSTEN HEAVY ALLOYS

Deepak Kapoor, Saddle Brook, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 542,570, Jun. 22, 1990, abandoned. This application May 30, 1991, Ser. No. 709,909
Int. Cl.[5] B22F *1/00*
U.S. Cl. 148—673 3 Claims

1. A process for producing tungsten heavy alloys of at least 80% by weight of tungsten, said process comprising the steps of:

mixing powder of tungsten and alloying metals in the proportion of at least 80% tungsten by weight and introducing such mixture into a thermal spray plasma gun hot zone;

heating such mixture in the hot zone to form a molten alloy;

spraying such molten alloy in droplet form into a collecting chamber;

cooling such droplets in said chamber to solidify such droplets, which form a tungsten alloy in powdered form.

H1147
METHOD OF INHIBITING CORROSION IN OIL FIELD PRODUCED FLUIDS

Kevin J. Kennelley, 2712 Dunwick, Plano, Tex. 75023; Eugene R. Thomas, 2505 Harvard, Midland, Tex. 79701; Robert J. Voorhees, 1290 Cliffview Dr., Green River, Wyo. 82935; James D. Watson, 1431 Wakefield, Houston, Tex. 77018, and Daniel S. Sullivan, 9114 Tooley Dr., Houston, Tex. 77031

Filed Dec. 28, 1990, Ser. No. 635,258
Int. Cl.[5] E21B *37/00*
U.S. Cl. 252—8.552 7 Claims

1. A method of inhibiting the corrosion in the metal tubulars of a well producing oil or gas which contains corrosive amounts of hydrogen sulfide and free sulfur, said method comprises introducing into the produced oil or gas stream from 200 ppm to 10,000 ppm (vol) of a formulation comprising:

(a) a diaryldisulfide having the following formula:

R—S—S—R′

Where:
R is an alkyl group or an aromatic group; and
R′ is an aromatic group; and

(b) a film forming amine-based corrosion inhibitor having polar groups capable of attaching to the surface of the tubulars; the volume ratio of (a)/(b) being between 2:1 and 10:1.

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H1148
METHOD OF SEPARATING ACTIVATED HUMAN PROTEIN C

Kenji Wakabayashi, 5-18, Tamadaira 3-chome; Yoshihiko Sumi, 18-4, Tamadaira 3-chome, both of Hino-shi, Tokyo; Yataro Ichikawa, 11-7, Kotesashi-cho 2-chome, Tokorozawa-shi, Saitama-ken; Yoichi Sakata, 1-13-39, Hanakoki-cho, Oyama-shi, Tochigi-ken, and Nobuo Aoki, 20-2-304, Honjo 4-chome, Ibaraki-ken, Tokyo, all of Japan

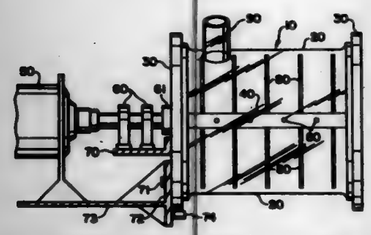
Continuation of Ser. No. 181,424, Apr. 14, 1988. This application Jan. 3, 1992, Ser. No. 815,870
Claims priority, application Japan, Apr. 17, 1987, 62-93377
Int. Cl.[5] C12Q *1/56*
U.S. Cl. 435—13 9 Claims

1. A method of separating activated human protein C, which has a gamma-carboxyglutamic acid (Gla) domain and is biologically active, from a mixture containing activated human protein C, which comprises bringing a mixture containing activated human protein C having a Gla domain in the presence of calcium into contact with a fixed monoclonal antibody comprising an insoluble carrier and fixed thereto a monoclonal antibody specific to a human protein C having a calcium ion bound to the Gla domain, whereby the activated human protein C having a calcium ion bound to the Gla domain is bound to the fixed monoclonal antibody, and then treating the fixed monoclonal antibody binding the activated human protein C having the calcium ion bound to its Gla domain with an aqueous medium substantially free from calcium ions, whereby the activated human protein C is released from the fixed antibody in a form not binding the calcium ion in the Gla domain.

H1149
HIGH SOLIDS FERMENTATION REACTOR

Charles E. Wyman, Lakewood; Karel Grohmann; Michael E. Himmel, both of Littleton, and Christopher J. Richard, Lakewood, all of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 15, 1989, Ser. No. 310,557
Int. Cl.[5] C12M *1/02*
U.S. Cl. 435—316 9 Claims

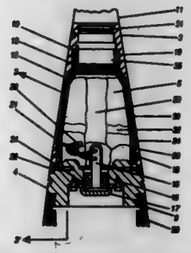


1. A fermentation reactor designed for fermentation of materials comprising greater than about 10% solids, said reactor comprising
(a) a horizontal cylindrical vessel;
(b) a rotatable shaft extending along the central axis of said vessel; wherein said shaft including rigidly attached mixing members capable of stirring said materials; wherein said mixing members comprise rods which are perpendicular to said shaft;
(c) motor means for rotating said shaft in said vessel.

H1150
PARACHUTE RECOVERY SYSTEM FOR PROJECTILES

Paul L. Fritch, Mine Hill, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1992, Ser. No. 871,158
Int. Cl.[5] F42B *8/12*
U.S. Cl. 102—498 5 Claims



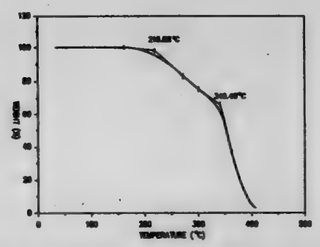
1. An improved parachute recovery system for a gun fired, spin stabilized, artillery projectile having:
a payload at the rear end of said projectile;
a conical nose at the forward end of said projectile;
said nose being a nose-deployed parachute recovery module consisting of;
a base that is threadably attached to the said payload;
a hollow conical windshield that is pinned to the said base with frangible shear pins, said windshield enclosing a hollow conical parachute canister which houses a parachute assembly;
a time fuze threadably mounted to the forward end of said windshield;
wherein the improvement comprises:
a cylindrical piston area formed between close fitting cylindrical sections at the forward end of said windshield and said parachute canister and located below said time fuze; whereby said piston area is pressurized by expulsion gas pressure from a expulsion charge initiated by said time fuze; whereby said windshield is moved forward, shearing the said shear pins and is jettisoned from said projectile; whereby said jettisoned windshield captures the said parachute canister and jettisons it also; whereby said jettison of said parachute canister causes exposure of a parachute deployment bag assembly to the windstream; whereby a parachute is deployed from the said deployment bag; whereby said parachute is decoupled from said spinning projectile payload by a ball bearing swivel that is mounted in said base; whereby said parachute and payload floats down in a projectile nose-up position for a soft landing and recovery.

H1151
FOLDED CAVITY ANTENNA

Edward A. Peterson, Jr., 1022 Kitchener Cir., San Jose, Calif. 95121

Filed Mar. 20, 1991, Ser. No. 672,268
Int. Cl.[5] H01Q *13/10, 13/22*
U.S. Cl. 343—705 3 Claims

1. An antenna for use in the very-high and ultra-high frequency bands, comprising:
a first surface of conductive material,
a second surface of conductive material equally spaced from said first surface and closer to a cylindrical axis of symmetry,

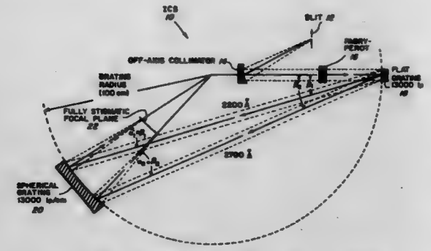


edges of conductive material connecting outer perimeters of said first and second surface, and
a slot means for radiating cut into said first surface.

H1152
IMAGING CHANNELED SPECTROGRAPH

Clarence M. Korendyke, Ft. Washington, Md., assignor to United States of America, Washington, D.C.

Filed Sep. 27, 1990, Ser. No. 588,915
Int. Cl.[5] G01J *3/28*
U.S. Cl. 356—328 6 Claims



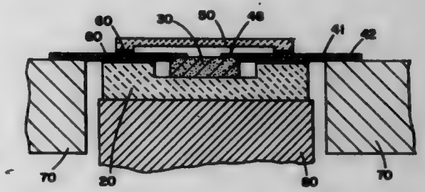
4. An Imaging Channeled Spectrograph comprising:
an entrance slit for receiving light from a source to be analyzed;
a collimator means for collimating said light from said entrance slit;
a Fabry-Perot bandpass filter means for filtering said collimated beam;
a grating means for diffracting said filtered beam; and
a spherical grating for focusing said diffracted spectrum onto a focal plane; and
wherein said collimator means, said filter means, said grating means, and said spherical grating cooperate to produce a plurality of two-dimensional, monochromatic images of said entrance slit.

H1153
NON-METALLIZED CHIP CARRIER

Melvin C. August, 18416 W. Edgewater Dr., Chippewa Falls, Wis. 54729; Diane M. Christie, E. 3215 Bearude La., Eau Claire, Wis. 54701; Arthur J. Hebert, Rte. 5, Box 385, Eagle Rapid Dr., Chippewa Falls, Wis. 54729; Eugene F. Neumann, 19010 E. Edgewater Dr., Chippewa Falls, Wis. 54729, and Richard R. Steitz, P.O. Box 253, Chippewa Falls, Wis. 54729

Filed Jan. 28, 1991, Ser. No. 646,834
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—74 1 Claim

1. A hermetically sealed carrier for an integrated circuit, comprising:
a ceramic carrier substrate having a cavity for holding the integrated circuit and having a periphery; an electrical lead TAB tape having electrical traces formed on a polyamide film for electrically connecting the integrated circuit to a circuit board, said electrical lead TAB tape extending across and over said periphery of said ceramic carrier substrate forming extended portions, said extended portions providing for electrical attachment of the integrated circuit to said circuit board;

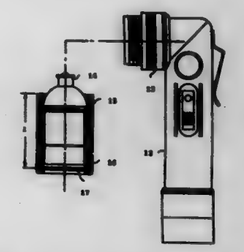


a ceramic carrier lid positioned over said integrated circuit; and
sealing glass between said electrical lead TAB tape and said carrier substrate and between said electrical lead TAB tape and said carrier lid for forming a hermetic seal over the integrated circuit.

H1154
COVERT LIGHTING ADAPTOR

David J. Gibeon, Tuckerton, and Paul F. Rohrbacher, Brick, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1992, Ser. No. 878,190
Int. Cl.[5] F21V *9/14*
U.S. Cl. 359—501 7 Claims



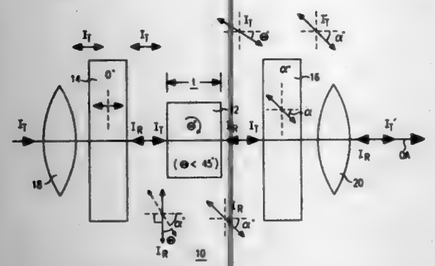
1. A lighting adaptor attached to a light source comprising:
a spectral filter capable of filtering light to a designated frequency spectrum;
a polaroid filter means for adjusting the intensity of light filtered by said spectral filter;
said polaroid filter means comprising a rotating barrel assembly and at least one static polaroid filter and at least one movable polaroid filter, both polaroid filters having a cross-polarization and parallel-alignment state;
an attachment means for securing the barrel assembly onto the light source; and
an assembly sealing means for maintaining environmental protection.

VOL 1148 ISS 1 MR 2 1993 UMI

H1155
OPTICAL ISOLATOR WITH IMPROVED STABIITY

Vincent J. Fratello, New Providence, N.J.; Ralph S. Jameson, Allentown, Pa., and Steven J. Licht, Bridgewater, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Continuation of Ser. No. 698,436, May 10, 1991, abandoned. This application Jun. 8, 1992, Ser. No. 895,211
Int. Cl.[5] G02F *1/09*
U.S. Cl. 359—484 21 Claims

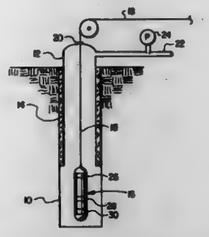


1. An optical isolator comprising
a first polarization selective element;
a second polarization selective element disposed at an angle α with respect to said first polarization selective element;
Faraday rotation means disposed in an optical signal path between said first and second elements
characterized in that
the Faraday rotation means comprises
a magnetic field source for generating a magnetic field B of a predetermined intensity; and
magneto-optic means comprising a predetermined thickness t and coupled to the magnetic field source, wherein either one or both of said predetermined field intensity and said thickness t are chosen such that said Faraday rotation means exhibits a predetermined stability of isolation with respect to changes in temperature or wavelength by providing a rotation θ of less than 45° to an optical signal passing therethrough.

H1156
DOWNHOLE FRACTURE DETECTION AND CHARACTERIZATION

Robert W. Siegfried, II, 6 Creekwood Cir., Richardson, Tex. 75080

Filed Nov. 21, 1991, Ser. No. 796,515
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—31 6 Claims



1. A method for evaluating fractures in an earth formation surrounding a borehole, comprising:
using a sonic logging tool in a borehole to measure a first acoustic property of an earth formation surrounding a borehole at a first pressure, said logging tool having at least one transducer for generating an acoustic signal and at least one transducer for receiving the acoustic signal after it has passed through at least a portion of the formation surrounding the borehole;
changing the pressure in said borehole adjacent said earth formation;
using said sonic logging tool in said borehole to measure a second acoustic property of said earth formation after said pressure change; and,
comparing said first and second measurements to determine the amount of fracturing present in said earth formation.

REISSUES

MARCH 2, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,186
COMBINED HEAD COVERING AND WIGLET

Leanna L. Moen, 2747 17th Avenue Ct., Moline, Ill. 61265

Original No. 4,804,003, dated Feb. 14, 1989, Ser. No. 106,205, Nov. 17, 1987. Continuation of Ser. No. 741,035, Jun. 4, 1985, abandoned, which is a continuation of Ser. No. 493,281, May 16, 1983, abandoned. Application for reissue Oct. 10, 1991, Ser. No. 774,578
Int. Cl.[5] A45D *8/40*; A61G *5/00*
U.S. Cl. 132—53 3 Claims

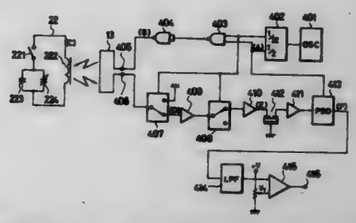
1. A head covering comprising: a body portion formed of a soft, porous stretch fabric, said body portion including a preformed inherent, circular central portion surrounded by a preformed inherent continuous circularly-extended side portion terminating in a circular rim portion integral with and not originally separate from said body portion, the width of said side portion between said central portion and said rim portion being sufficiently large to cause said rim portion to circumscribe the head of the wearer and to be below the normal hairline of the wearer, the circumference of said rim portion being sufficiently small to establish a resilient peripheral grip about the head of the wearer to fully support the residuum of said body portion fitting loosely on and completely over the wearer's head without additional support, and the circumferential line of said rim portion extended substantially parallel the circumferential line formed by the junction of said central portion with said side portion; the formation pf said head covering such that when embracing the head of a wearer, the rim portion normally is disposed from high on the forehead to low on the back of the neck of the wearer, and said side portion is adapted to have a substantially frusto-conical shape in side elevation;
and further wherein at least one gathering means is secured to said side portion for gathering a portion of said side portion, said gathered portion beginnning at said rim portion and extended normal thereto.

Re. 34,187
COORDINATES INPUT SYSTEM

Tsuguya Yamanami; Toshiaki Senda, both of Saitama, and Azuma Murakami, Kanagawa, all of Japan, assignors to Wacom Co. Ltd., Saitama, Japan

Original No. 4,786,765, dated Nov. 22, 1988, Ser. No. 76,962, Jul. 23, 1987. Application for reissue Feb. 27, 1990, Ser. No. 485,669
Claims priority, application Japan, Jul. 26, 1986, 61-171684; Aug. 20, 1986, 61-194492; Aug. 28, 1986, 61-202483
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—19 92 Claims

9. An implement for designating one of plural characteristics thereof and a position thereof to a tablet including means for signalling indications of the implement characteristic and position comprising
a cordless housing adapted to be manually held and manually moved proximate a surface of the tablet, the housing including:
a tuned circuit having no electric power supply connected to it, the tuned circuit including
reactance means including several reactances comprising an inductor and a capacitor, and

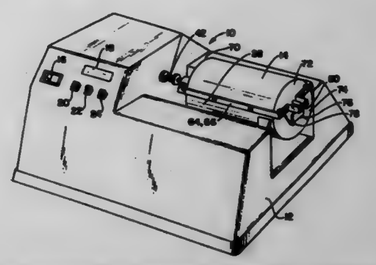


plural manually activated switches for connecting said several reactances together in different combinations to provide plural resonant frequencies for the tuned circuit in response to different ones of the plural manually activated switches being activated to signal a selected characteristic;
the housing being constructed so that waves having a magnetic component can be coupled without wires between a reactance of the tuned circuit and a structure outside of the housing.

Re. 34,188
AUTOMATIC FILM PROCESSORS

Roman Kuzyk, 55 Florister Dr., Trenton, N.J. 08690, and Lewis M. Edwards, Trenton, N.J., assignors to Roman Kuzyk, Trenton, N.J.

Original No. 4,890,131, dated Dec. 26, 1989, Ser. No. 316,772, Feb. 28, 1989. Application for reissue Aug. 9, 1990, Ser. No. 564,836
Int. Cl.[5] G03D *3/06*
U.S. Cl. 354—299 8 Claims



1. An automatic film processor for processing roll, sheet or disc film comprising, in combination:
A. [removable] drum means for storing said [undeveloped] film in a light free chamber, said drum means including;
(a) a [single coupling] connector port means utilized for the ingress and egress of chemical solutions, *and*
(b) removable mounting means for mounting said film [therein, said mounting means including,
(i) an agitating coupling means disposed on one distal end and extending external to said drum means; and
(c) a first reservoir, said first reservoir being adapted to

receive a plurality of chemical solutions and said removable mounting means, a portion of said mounting means being submersible in said liquid chemical solutions] *within said drum means*;

B. housing means *for supporting said drum means*, said housing means including;

(a) a [single mating] coupling connector port means for the ingress and egress of said chemical solutions *to said drum*;

(b) [heater and blower means for providing heated air over said drum means;

(c) first drive motor means, said drive motor means being adapted to be connected to a source of electrical power and including;

(i) a rotary output shaft having a mating agitating coupling means disposed on the distal end of said output shaft, said mating agitating coupling being adapted to be coupled to said drum means agitating coupling for transferring rotary and longitudinal motion to said drum means,

(d) linear valve] *manifold* means disposed in said housing means, having an egress port *communicating with the coupling connector port means* and a plurality of ingress ports, each said ingress port being individually selectable and coupled to *a source of one of* said chemical solutions;

[(e) valve motor means disposed in said housing means, and coupled to said linear valve means for controlling the selection of only one chemical solution at a time, said valve motor means being adapted to be coupled to said source of electrical power,

(f)] *(c)* [a second] reservoir *means* disposed in said housing for storing one of said *chemical solutions* [liquid chemicals] at a time *and having an outlet communicating with said drum means*, said [second] reservoir *means* having;

(i) means for heating said chemical solutions to a prescribed temperature, when said solutions are disposed within said reservoir [, and

(ii) stirring means coupled to said chemical solution for stirring said solution to provide a uniform temperature throughout said solution]; [(g)]

[(g)] *(d)* first [pump] *fluid transfer* means [coupled between said linear valve means and said second reservoir means] for *drawing each of* [pumping] said chemical solutions [from] *by vacuum through* said [linear valve] *manifold* means to said [second] reservoir *means;*

[(h)] *(e)* second [pump] *fluid transfer* means *interposed* [coupled] between said [second] reservoir *means* and said *drum means* [first reservoir] for *transferring* [pumping] said heated chemical solutions from said [second] reservoir *means* to said *drum means* [first reservoir]; and

[(i)] *(f)* drain means[, said drain means being] coupled to said *drum means* [first reservoir] for draining said chemical solutions therefrom when required[; and

C. control means disposed within said housing for controlling the sequence and timing of each step of the automatic process and the flow of said chemical solutions, to and from said linear valve means, and said first and second reservoirs].

Re. 34,189

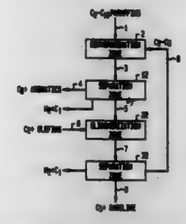
CONVERSION OF PARAFFINS TO GASOLINE

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Original No. 4,788,364, dated Nov. 29, 1988, Ser. No. 137,112, Dec. 22, 1987. Application for reissue Jan. 11, 1991, Ser. No. 645,421

Int. Cl.[5] C07C *1/00, 12/00, 2/02*

U.S. Cl. 585—312 **39 Claims**



1. A continuous process for conversion of C_2–C_4 alkanes to aromatic rich hydrocarbons boiling in the gasoline range comprising:

maintaining a dual vertical column reactor comprising a lower transport riser reaction zone and an upper turbulent fluidized bed reaction zone, both zones containing fluidized catalyst comprising acid medium pore metallosilicate zeolite;

contacting a feedstock comprising at least one C_2–C_4 alkane with fluidized catalyst in the lower transport zone under high temperature dehydrogenation conditions to dehydrogenate the feedstock and substantially prevent cracking reactions to obtain an intermediate product comprising dehydrogenated hydrocarbons and aromatics; and

contacting the intermediate hydrocarbon product with fluidized catalyst in the upper turbulent zone under lower temperature oligomerization conditions to obtain a final product comprising C_5+ gasoline boiling range hydrocarbons.

PLANT PATENTS

GRANTED MARCH 2, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,163

HYBRID TEA ROSE PLANT NAMED JHILMAR

Lowell L. Hoy, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed Jul. 1, 1991, Ser. No. 724,596

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

8,164

P.F. 23 PEACH TREE

Paul J. Friday, P.O. Box 850, Coloma, Mich. 49038

Filed Jul. 5, 1991, Ser. No. 726,251

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—43.2 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described of large size, vigorous and spreading in growth and a regular and productive bearer of large size, yellow flesh freestone fruit with good flavor and eating quality; and being further characterized by a partially showy blossom when in full bloom; and a fruit of substantially spheroidal shape having a firm flesh, and a red skin color cover over 80% of the fruit at maturity which occurs about 26 days after maturity of the Redhaven peach.

8,165

HINSHAW MUTANT WHITE PINE TREE

Joe S. Hinshaw, Lenoir, N.C., assignor to Gailya T. Hinshaw, Lenoir, N.C.

Filed Jun. 25, 1991, Ser. No. 720,733

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—50.1 **1 Claim**

1. A new and distinct variety of white pine tree substantially as described and illustrated, characterized as to novelty by its strongly ascending, whorled branches, forming acute angles with the trunk.

8,166

HIBISCUS PLANT NAMED TANGERINE

Frank C. Moser, Alva, Fla., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 12, 1991, Ser. No. 744,075

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—67.8 **1 Claim**

1. A new and distinct cultivar of hibiscus named Tangerine, as shown and described and illustrated.

8,167

CHRYSANTHEMUM PLANT — SNOW BIJOUX CULTIVAR

Jacques C. M. van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jan. 26, 1991, Ser. No. 721,712

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—82.1 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Snow Bijoux substantially as herein shown and described, which:

(a) exhibits attractive spider anemone flowers having an overall diameter of approximately 60 mm. wherein the tubular ray florets are white and the disc florets are yellow in coloration, said flowers being distinguishable from those of the Bijoux cultivar wherein the tubular ray florets are soft pink,

(b) bears flowers in a generally flat capitulum form when mature,

(c) exhibits a flower response period of approximately nine weeks,

(d) forms attractive dark green foliage, and

(e) has the ability to produce flowers of commercially acceptable quality throughout the year in a cut mum production program.

8,168

MIDFIELD BERMUDAGRASS

Ray A. Keen, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Filed May 28, 1991, Ser. No. 706,272

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—90 **1 Claim**

1. A new and distinct variety of Bermudagrass as shown and described.

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PATENTS

GRANTED Mar. 2, 1993

ERRATA

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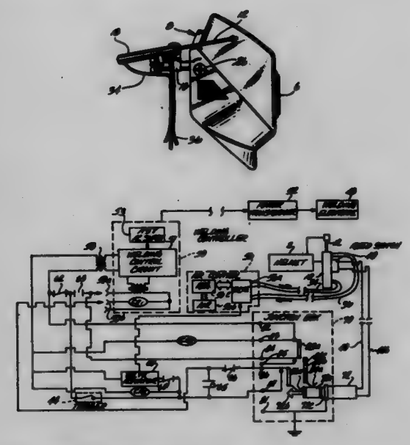
PATENTS

GRANTED MARCH 2, 1993

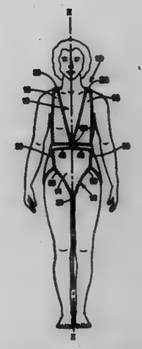
GENERAL AND MECHANICAL

5,189,735
WELDING SYSTEM WITH AUTOMATIC WELDING HELMET AND SAFETY CIRCUIT
Peter J. Corona, 1130 W. Marine, Apt. 21, Gardena, Calif. 90247
Filed Mar. 19, 1991, Ser. No. 671,303
Int. Cl.[5] A42B *1/00*; A61F *9/00*
U.S. Cl. 2—8 7 Claims



1. A welding system comprising:
a helmet comprising a headband harness, a hood having an arc welding face mask attached thereto, and means for pivotably attaching the hood to the headband;
actuating means mounted to the harness and hood for movement between a first and second position to pivot the hood between upper and lower positions, respectively;
means for controlling the actuating means;
means for detecting whether the actuating means is in the first or second position;
an arc welding electrode;
a welding controller for turning on and off the electrode;
a trigger actuable for actuating the welding controller; and
a safety circuit for connecting the trigger, detecting means, means for controlling the actuating means and the welding controller such that the actuating means moves the hood to the lower position prior to the actuation of the welding controller, wherein the welding controller comprises a first transformer and the safety circuit comprises a second transformer connected to the welding controller, the first and second transformers being connected in series to the trigger along partly overlapping first and second electrically conductive paths, respectively, the safety circuit further comprising a normally open switch disposed along the first path and responsive to the actuating means for closing when the actuating means is in the second position to thereby enable welding when the hood is in the lower position and for opening when the actuating means is not in the second position to thereby disable welding when the hood is not in the lower position, and wherein the safety circuit further comprises means for rendering the second path conductive in response to pressing the trigger, the means for controlling the actuating means being responsive to current flow along the second path.

5,189,736
EXERCISE GARMENT
Lisa N. Price, 223 Brightwood Pl., San Antonio, Tex. 78209
Filed Jun. 5, 1991, Ser. No. 711,171
Int. Cl.[5] A41D *1/22*, *7/00*
U.S. Cl. 2—69 20 Claims

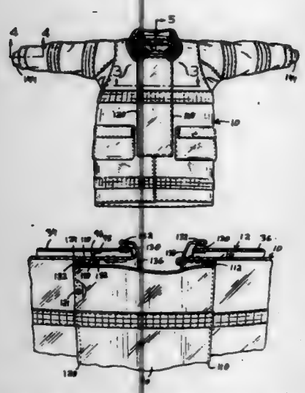


1. A garment for use by a person during exercise or physical activity, comprising:
a left rear panel having a left rear panel strap and a right rear panel having a right rear panel strap, said left rear panel and right rear panel being connected and being generally full cut for positioning about a rear gluteal region of said person;
a front panel connected to said rear panels at a crotch area and at a left and right side, said left and right side connections being forward of a coronal plane of said person during usage of said garment, said front panel having a left front panel strap and a right front panel strap adapted to be connected to said left rear panel strap and said right rear panel strap, respectively, for lifting said gluteal region and supporting the lower back and gluteal/pelvic region of said person; and
a generally V-shaped belt connected at approximately the position of said connection of said rear panels and having a left end and a right end adapted to be fastened, said ends being pulled forward and upward and fastened at approximately the waist of said person for supporting said gluteal region during usage of said garment.

5,189,737
FIREMAN'S TURNOUT COAT
Theresa Ribicic, Mentor-on-the-Lake, Ohio, assignor to Ramwear, Inc., Mentor, Ohio
Continuation of Ser. No. 392,262, Aug. 10, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,511
Int. Cl.[5] A41D *1/02*, *13/00*
U.S. Cl. 2—93 3 Claims

1. A coat suitable for use by firefighters in firefighting, the coat, when worn as designed, comprising:
an outer shell, the outer shell having right and left sleeves and a body, the body having a right-front section, a left-front section, and a back section;
a slit in one of the front sections, the slit extending generally from a first endpoint near but below a top of the one front section to a second endpoint near but above a bottom of the one front section;
an opening in the outer shell extending from a top edge of the front sections to a bottom edge of the front sections,

the opening selectively separating the right-front section from the left-front section;
a liner; and,
a storm flap, the storm flap having a first and second longitudinal edge, the storm flap being fixedly attached to the liner via an attaching means, the storm flap selectively extending outwardly through the slit and covering the opening thereby indicating the liner is being properly worn under the outer shell.

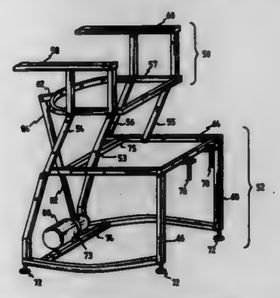


5,189,738
GARMENT SHOULDER PAD WITH POCKET
Jenna Mitchell, 719 Sunset Ave., Venice, Calif. 90291
Filed Aug. 6, 1991, Ser. No. 740,804
Int. Cl.[5] A41D *27/26*
U.S. Cl. 2—268 13 Claims

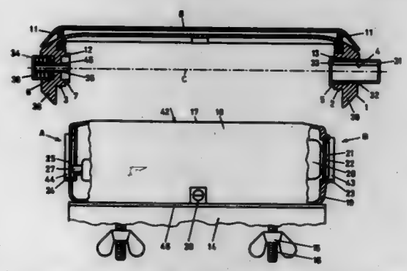
1. A shoulder pad for use with a garment, comprising
a pad of generally triangular or semi-circular shape having a top fabric layer an intermediate fabric layer a bottom fabric layer and a layer of padding between said bottom and intermediate fabric layers which are attached along of their respective outer edges so as to enclose the layer of padding;, the top and bottom fabric layers being attached to one another along respective outer edges so as to form an enclosed internal compartment into which the articles may be placed and concealed, the pad including a closeable opening for providing access into the enclosed internal compartment and for providing for entry and removal removal of the articles therefrom.

5,189,739
TOILET SEAT FOR AN INVALID
Timothy J. Thierry, 23357 Bassett St., West Hills, Calif. 91307
Filed Sep. 20, 1991, Ser. No. 763,285
Int. Cl.[5] A47K *13/00*
U.S. Cl. 4—254 9 Claims

6. A movable toilet seat comprising:
a lower frame;
an upper frame to which a toilet seat may be attached and upon which a person may stably be seated, said upper frame moving relatively forward of said lower frame when said upper frame is raised;
a plurality of struts of equal length connecting said upper frame to said lower frame, said plurality of struts each pivotally connected to said upper and lower frames so as to define a parallelogram so that said upper frame is kept horizontal when said upper frame moves relative to said lower frame and said plurality of struts not passing through an angle defined with respect to said lower frame of greater than ninety degrees; and
means for moving said upper frame relative to said lower frame, said moving means pivotally coupled to said upper frame.

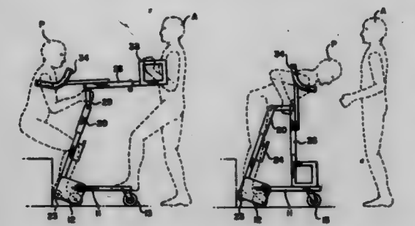


5,189,740
TOILET SEAT ASSEMBLY WITH A BIDET
Alois Diethelm, Tuggen, Switzerland, assignor to Geberit AG, Jona, Switzerland
Filed Apr. 2, 1991, Ser. No. 679,643
Claims priority, application Switzerland, Apr. 3, 1990, 1110/90
Int. Cl.[5] A47K *3/20*
U.S. Cl. 4—420.4 10 Claims



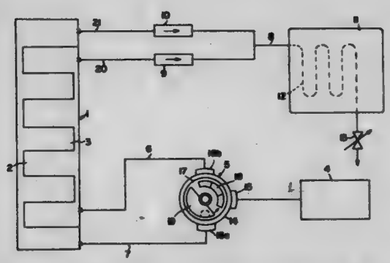
1. A toilet seat assembly, comprising: a toilet seat with a hollow projection, a bidet arranged in said hollow projection of said toilet seat, said bidet having means to affix it to a toilet bowl said bidet including a tubular housing with ends for pivotably supporting said toilet seat such that said toilet seat may be lifted up, said tubular housing having a shower arm and being substantially closed on all sides to prevent exposure of the housing interior to the ambient when said toilet seat is lifted up, flank parts defining opposite sides of said hollow projection and at lest one of said flank parts arranged to house at least one of a push-button and a knob at least one of a switch and, a valve arranged in said tubular housing, said at least one push button and said knob being respectively engageable with said at least one of said switch and said valve.

5,189,741
PATIENT LIFT AND TRANSPORTATION DEVICE
Robert L. Beardmore, 311 Linares Ave., Long Beach, Calif. 90803, assignor to Robert L. Beardmore, Long Beach, Calif.
Filed Nov. 15, 1991, Ser. No. 793,022
Int. Cl.[5] A61G *7/14, 7/12*
U.S. Cl. 5—86.1 14 Claims



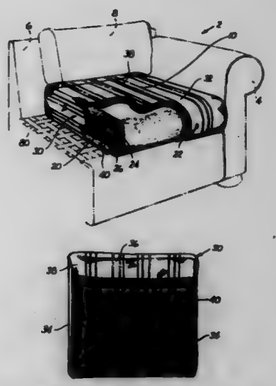
1. A device for transporting a patient in a standing/leaning position comprising a base having front and rear wheels, a front frame extending upwardly from said base and having a top end, means on said base for supporting the feet of a patient to be transported, means on said front frame for supporting the knees of a patient positioned with his feet on said feet supporting means, and means comprising a rear frame extending upwardly from said base rearwardly of said front frame and pivotally connected to said top end of said front frame for supporting the upper body of a patient standing on said feet supporting means and having his knee supported on said knee supporting means, said rear frame having an upper end comprising means for engaging under the arms of a patient, whereby the underarm portion of a sitting patient can be engaged and upon pivoting of the rear frame from a beyond horizontal position to a generally vertical position, the patient is moved from a sitting position to a standing/leaning position on the transporting device.

5,189,742
PRESSURE CONTROLLED INFLATABLE PAD APPARATUS
Rolf Schild, London, United Kingdom, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 20, 1992, Ser. No. 854,833
Claims priority, application United Kingdom, Mar. 9, 1992, 9205075
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—453 22 Claims



1. A pressure controlled inflatable pad apparatus for supporting a body comprising an inflatable pad, a source of inflating fluid to provide a flow of said fluid to the pad for inflating the pad, a sensor, a fluid supply line for fluid flowing through the supply line to the pad and then through the sensor to an exhaust, the sensor being located beneath the pad, said sensor serving to reduce fluid flow to said exhaust if the pad is insufficiently inflated to support the body.

5,189,743
DRAINABLE CUSHION AND FURNITURE SEATING
Donna M. Difloe, 1225 Lake Charles Dr., Roswell, Ga. 30075
Continuation-in-part of Ser. No. 648,024, Jan. 30, 1991, Pat. No. 5,093,946, which is a continuation-in-part of Ser. No. 466,760, Jan. 18, 1990, Pat. No. 5,005,241, which is a continuation of Ser. No. 258,736, Oct. 17, 1988, Pat. No. 4,914,772. This application Dec. 5, 1991, Ser. No. 802,506
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] A47C *27/12;* A47G *9/00*
U.S. Cl. 5—461 27 Claims



1. A cushion which drains liquid comprising:
a) an inner core of drainable filling material having a bonded fiber structure; and
b) an outer covering surrounding said inner core, said outer covering comprising:
i) an upper portion comprising air and water permeable fabric material, and
ii) a lower portion of a material having a plurality of openings larger in size than any opening of said upper portion for draining of liquid from said cushion and for promoting air circulation through said cushion.

5,189,744
SHEET OR BLANKET CONSTRUCTION WITH EXPANDABLE POCKET FOR END FITTING ON MATTRESS
Donna D. Roberts, 2231 Hartford Ave., Fullerton, Calif. 92631
Filed Nov. 12, 1991, Ser. No. 790,455
Int. Cl.[5] A47G *9/04, 9/02*
U.S. Cl. 5—497 2 Claims

1. A sheet, blanket or the like for and fitting around a mattress having corner and upper and lower surface areas, comprising:
a) an expandable pocket formed integrally of the sheet and defining an open seam line horizontally of the sheet and overlying an end portion of the mattress along its lower surface area, and two spaced, generally parallel closed seam lines at each end of the pocket, generally perpendicular to said open seam line, said pocket adapted for fitting around the mattress corners;
b) an elastic element incorporated into the open seam line, and an elastic element incorporated into closed seam lines; and,

c) a plurality of gathers formed by the sheet along at least the open seam line, whereby

i. the elastic elements and the gathers are expandable, thereby enabling the positioning of the expandable pocket onto mattress ends of various sizes;

ii. upon positioning of the expandable pocket onto a mattress, the elastic elements contract, thereby securing the end pocket onto an end of the mattress and enabling the user to lie either on top of, or under the sheet, blanket or

the like, and in the latter instance, the user's feet are comfortably secured within the expandable pocket, and without dislodging the end pocket from the mattress;

iii. the said sheet, blanket or the like defining sides which are edge trimmed to about the width of the mattress, the said sides extending from the said open seam line at each end thereof; and,

iv. the sheet, blanket or the like is secured to the mattress as a single thickness, without any auxiliary attachments thereto.

5,189,745

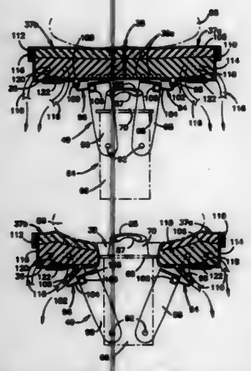
MATTRESS CONSTRUCTION FOR SUPPORT STRUCTURE CONTAINING HUMAN WASTE COLLECTION SYSTEM

James P. Workman, Spring Hill, Kans.; Thomas S. Hargest, Charleston, S.C., and Myles D. Nolte, Ottawa, Kans., assignors to Burke Mobility Products, Inc., Kans.

Continuation-in-part of Ser. No. 314,716, Feb. 23, 1989, Pat. No. 5,058,222. This application Mar. 27, 1991, Ser. No. 675,656

Int. Cl.[5] A61G *7/02*

U.S. Cl. 5—604 **16 Claims**



1. A patient support and waste collection system comprising:

a bed presenting a support surface which may be adjusted for moving a patient supported thereon to a sitting position;

a selectively inflatable mattress forming at least a portion of said support surface, said mattress comprising a foam core having an air permeable matrix structure and an exterior surface and a substantially impermeable outer covering bonded to at least a majority of the exterior surface of the core to permit inflation of the mattress;

said mattress comprising at least two abutting segments adapted to be temporarily spread apart laterally with respect to each other to define a selectively openable aperture in said mattress, for providing for collection of wastes excreted by the patient; and

means for varying the inflation of said mattress.

5,189,746

EMERGENCY PATIENT EVACUATION SYSTEM

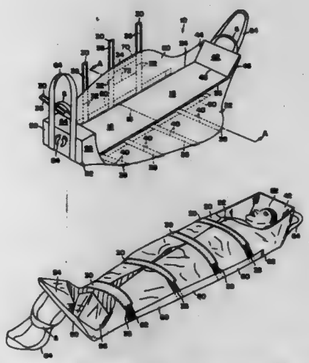
John P. Horie, Port Moody, Canada, assignor to British Columbia Mental Health Society, Vancouver, Canada

Filed Feb. 18, 1992, Ser. No. 836,521

Claims priority, application Canada, Mar. 6, 1991, 2037652

Int. Cl.[5] A61G *1/013*

U.S. Cl. 5—627 **12 Claims**



1. A device for evacuating a non-ambulatory patient by lifting or sliding, without the use of a mattress, comprising:

a) an elongated, planar, rigid base portion having a length and width greater than the length and width of said patient when supine, said base portion having an upper surface on which said patient lies and a lower surface adapted for sliding on a surface;

b) a cushioning layer secured to the upper surface of said base portion of sufficient thickness to cushion said patient during evacuation;

c) means for releasably securing said person on said base portion;

d) handle means attached to one end of said base portion whereby said device may be pulled from said one end;

e) handle means attached to both sides of said base portion whereby said device may be lifted from said both sides;

f) a rigid head piece hingedly secured to said base portion at one end thereof and adapted to shield the top of said patient's head when said patient is secured to said base portion; and

g) a rigid foot piece hingedly secured to said base portion at the opposite end thereof to said head piece, and adapted to shield the bottom of said patient's feet when said patient is secured to said base portion;

whereby when in use said patient is secured to said base portion, and said lower surface of said base portion forms a rigid planar sliding surface larger in dimension than the length and width of said supine patient.

5,189,747

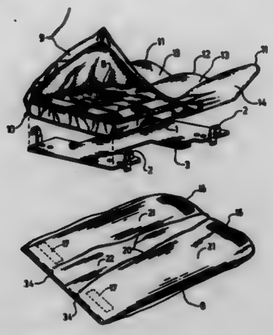
SEAT CUSHION

Philip C. Mundy, and Jim E. Bender, both of Kitchener, Canada, assignors to Canadian Posture and Seating Centre (1988) Inc., Ontario, Canada

Filed Oct. 4, 1991, Ser. No. 770,903

Int. Cl.[5] A47C *27/18, 7/02*

U.S. Cl. 5—654 **8 Claims**



1. A seat cushion comprising:

a base having lower and upper surfaces and front, rear and side edges;

a shaped foam cushioning element secured across the upper surface of said base, having a generally rectangular recess in the upper surface thereof defining an insert area, said insert area being near the rear of the cushioning element and being generally centered from side to side; and

a generally rectangular pad positionable in said insert area, substantially filling said insert area, said pad containing a viscous gel between at least two layers of plastic defining an envelope for said gel, said pad being sealed around front, rear and two side edges thereof and being divided by two seams into three separate and distinct compartments each of comparable volume, namely a central compartment adapted to support the sacral area of a user, and two side compartments adapted to support the ischial tuberosities of a user, each seam having a small gap at some point therealong to permit minimal flow of said gel between said compartments.

5,189,748

INFANT SIDE SUPPORT SLEEPER

Tina A. Garrison, and Susan A. Reichert, both of 2525 Octavia La., Marietta, Ga. 30062

Filed Jul. 17, 1992, Ser. No. 915,901

Int. Cl.[5] A47D *7/00, 13/00*

U.S. Cl. 5—655 **1 Claim**

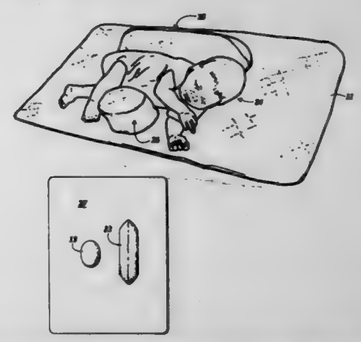
1. A restraining device adapted to support an infant lying on its side comprising

a planar fabric sheet of a sufficient size to support the full length of the infant;

a larger elongated pillow casing member and a smaller laterally spaced post casing member attached to the upper side of said sheet,

closeable opening means located on the lower side of said sheet, permitting the positioning and removal of pillow insert in the pillow casing and a post insert in the post casing;

pillow and post inserts positioned in the pillow and post casings respectively, said pillow insert adapted to support substantially the whole back portion of an infant lying on its side, and the post insert adapted to support the abdominal area of the infant while permitting substantial movement of the hands and feet of the infant,



whereby an infant positioned on its side on said sheet will be restrained on its side with its back contacting the pillow casing and its front contacting the post casing.

5,189,749

MULTIPURPOSE BROADHEAD AND ARROW MAINTENANCE TOOL

Bruce A. Thomas, Swartz Creek; Mark A. Smith; Mark T. Birchmeier, both of Owosso, and Lawrence D. Reiber, Oakley, all of Mich., assignors to Thomas Design & Engineering Services, Inc., Swartz Creek, Mich.

Filed Mar. 3, 1992, Ser. No. 845,201

Int. Cl.[5] B25B *13/00*

U.S. Cl. 7—138 **20 Claims**

1. A tool, for use with an archery arrow having a broadhead attached on one end and being formed into a cone at the other end, comprising:

an elongated body having a top, a bottom, and a central axis;

sharpener means embedded in said bottom for sharpening the broadhead;

wrench means formed in said bottom for receiving the broadhead; and

dresser means formed in said top for dressing the cone.

5,189,750

COMBINATION BOTTLE OPENER AND CAN OPENER

Sean M. Brennan, 1750 Croner Ave., Menlo Park, Calif. 94025

Filed Jul. 8, 1991, Ser. No. 727,029

Int. Cl.[5] B67B *7/44;* B25F *1/04*

U.S. Cl. 7—152 **20 Claims**

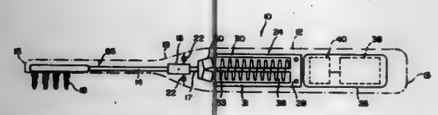
1. A combination bottle opener and can opener comprising:

a bottle opening element exhibiting a body portion, an an-

gled surface and a protrusion, said angled surface and protrusion defining a bottle cap receiving portion; and

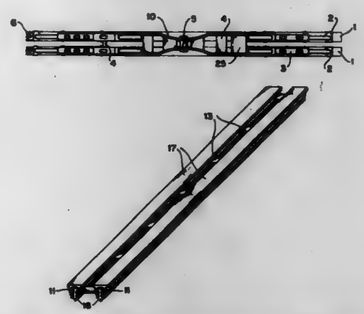
a can opening element including a body part and a cutting blade articulably connected to said body part; said can opening element being movably connected to said bottle opening element.

5,189,751
VIBRATING TOOTHBRUSH USING A MAGNETIC DRIVER
David Giuliani, Mercer Island; Roy W. Martin, Redmond, and Rodger H. Rosenbaum, Seattle, all of Wash., assignors to Gentech, Inc., Mercer Island, Wash.
Filed Mar. 21, 1991, Ser. No. 672,844
Int. Cl.[5] A61C *17/34*; B08B *13/02*
U.S. Cl. 15—22.1 **51 Claims**



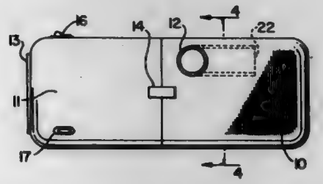
1. A vibrating toothbrush having a magnetic driver, comprising:
a toothbrush body;
a lever arm having toothbrush bristles at one end thereof;
means for mounting the lever arm to the body for vibrating action of the lever arm about a single fixed pivot point, said lever arm and said mounting means defining a combination having a known natural mechanical resonant frequency; and
means positioned within the body for driving the lever arm about said mounting means at an operating frequency, wherein there is no direct mechanical connection between the driving means and the lever arm, and wherein the operating frequency is approximately equal to the natural mechanical resonant frequency of the combination of the lever arm and the mounting means, wherein the driving means includes permanent magnet means located at the other end of the lever arm and an electromagnet spaced away from the permanent magnet means, the electromagnet including an electromagnet coil to receive an alternating current driving signal, wherein current through the electromagnet during one-half cycle results in movement of the lever arm about the pivot point in one direction, while current through the electromagnet during the other half cycle results in movement of the lever arm about the pivot point in the opposing direction.

5,189,752
TRIPLE/TWIN WIPER REPLACEMENT CARRIER AND BLADE UNIT
James R. Longacre, 3621 Littledale Rd., Kensington, Md. 20895, and John M. White, 15774 Widewater Dr., Dumfries, Va. 22026
Continuation of Ser. No. 647,249, Jan. 29, 1991, abandoned. This application Mar. 3, 1992, Ser. No. 844,871
Int. Cl.[5] B60S *1/28, 1/38*
U.S. Cl. 15—250.41 **20 Claims**



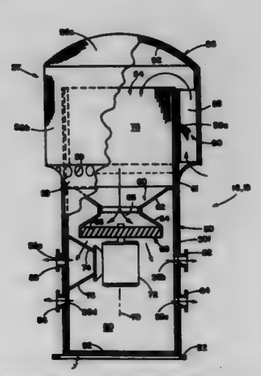
10. A single twin wiper replacement carrier for a twin blade windshield wiper holder, said holder including a plurality of lever systems adapted to bias separate wiper blades against a windshield of a vehicle, the lever systems defining two groups of a plurality of spaced parallel grippers adapted to slidably receive and retain said separate wiper blades, said replacement carrier comprising:
a plurality of elongated struts;
bridge structure means for coupling said struts together substantially parallel to each other; and
mounting means for connecting said carrier to said wiper holder including a pair of oppositely extending tangs protruding from two of said elongated struts, each of said pairs of oppositely extending tangs adapted to be slidably received by one of said groups of grippers.

5,189,753
AUTOMOBILE VACUUM CLEANER
Lawrence Sousa, Ancaster, and Duncan Hill, Ottawa, both of Canada, assignors to Central Auto-Vacc Ltd., Ancaster, Canada and Zee Investments Limited, Grand Cayman, Cayman Islands
Filed May 15, 1991, Ser. No. 700,417
Int. Cl.[5] A47L *5/38*; B60S *1/54, 1/64*
U.S. Cl. 15—313 **4 Claims**



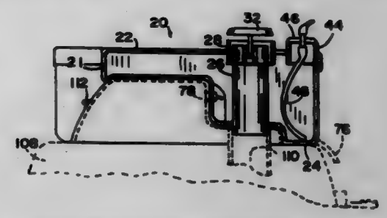
1. A central vacuum cleaning assembly adapted for use in a vehicle comprising a waste collection chamber and an air withdrawal chamber;
said air withdrawal chamber including an electric motor driving a vacuum generating fan impeller;
said waste collection chamber being outside of and contiguous to said air withdrawal chamber and including an intake opening and an outlet opening, said outlet opening communicating directly with said air withdrawal chamber;
said intake opening adapted to cooperate with a tube leading to a vacuum cleaner nozzle,
a baffle means cooperating directly with the intake opening to divert all incoming air flow and transported solids and liquids away from the outlet opening and permit particulate and liquid waste material to fall towards a waste retaining section of the waste collection chamber,
said waste retaining section being located in a lower part of the waste collection chamber in normal use,
said outlet opening leading from a higher part of the waste collection chamber to the air withdrawal chamber,
said outlet opening cooperating with a waste retaining means comprising a partition, said partition being adapted to retain particulate and liquid waste in the waste retaining section of the waste collection chamber,
said outlet opening cooperating directly with an air filter for removal of fine dust, said outlet opening and said filter permitting free exit of filtered air from the waste collection chamber and entry of said filtered air into the air withdrawal chamber,
said air withdrawal chamber and said fan impeller being constructed and arranged to draw said filtered air into the air withdrawal chamber and to expel said air through an outlet in said air withdrawal chamber to the atmosphere, wherein the waste collection chamber and the air withdrawal chamber are releasably held together by a latching means, such that the exterior of the vacuum cleaner assembly is partially formed by the exterior of said waste collection chamber, and partially formed by the exterior of the air withdrawal chamber, which allows for separation of said waste collection chamber and said air withdrawal chamber to allow for emptying of the waste collection chamber.

5,189,754
CAR WASH AIR BLOWER SYSTEM
Jerry R. Sauter, 1905 Birdseye Creek Road, Gold Hill, Oreg. 97525
Filed Dec. 4, 1990, Ser. No. 621,993
Int. Cl.[5] B60S *3/04*
U.S. Cl. 15—316.1 **3 Claims**



1. An air producer usable in a car wash air blower system for producing flowing air comprising:
housing means having walls defining an inlet, an outlet spaced from the inlet, and an air travel path between the inlet and the outlet, the housing means further comprising cap means having walls covering the inlet, having an opening spaced for the inlet, and defining an initial air travel path with a bend greater than ninety degrees between the opening and the inlet; and
fan means mounted in the air travel path between the inlet and the outlet, with the housing means and fan means being structured so that substantially all of the air flowing through the inlet and along the air travel path also flows through the fan means.

5,189,755
WET VACUUM/EXTRACTOR AND CLEANING SOLUTION TANK THEREFOR
Robert A. Yonkers, 3565 Apache Ct., Grandville, Mich. 49418, and David E. McDowell, 7425 Lime Hollow Dr., S.E., Grand Rapids, Mich. 49506
Continuation of Ser. No. 580,809, Sep. 11, 1990, abandoned. This application Apr. 3, 1992, Ser. No. 866,893
Int. Cl.[5] A47L *7/00*
U.S. Cl. 15—321 **22 Claims**

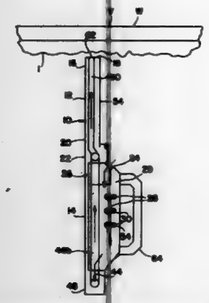


1. A wet vacuum/extractor for simultaneously and for independently dispensing cleaning solution to and vacuuming/extracting debris from a surface to be cleaned, comprising:
a recovery tank for receiving debris;
a vacuum fan in fluid communication with said recovery tank for generating a vacuum;
exhaust means in fluid communication with said vacuum fan for exhausting air from said vacuum fan;
a cleaning solution tank having a bottom, for holding cleaning solution;
a cleaning tool for dispensing cleaning solution to a surface to be cleaned, operably connected with said vacuum/extractor;
fluid flow means operably connected between said cleaning solution tank, near said bottom of said cleaning solution tank so that it is below the level of cleaning solution when said tank is filled with same, and said cleaning tool, for delivering cleaning solution from said tank to said cleaning tool, said fluid flow means including a non-self priming pump; and
diverting means in fluid communication with said exhaust means and said cleaning solution tank for switchably diverting said exhaust air from said exhaust means to said cleaning solution tank to thereby temporarily pressurize said cleaning solution tank and force cleaning solution through said fluid flow means to prime said fluid flow means with cleaning solution, said diverting means being operatively connected with and diverting said exhaust air into said cleaning solution tank.

5,189,756
SNOW AND ICE REMOVER
Tamae Sprunger, 20 Woodview La., Algonquin, Ill. 60102
Filed Dec. 17, 1990, Ser. No. 628,630
Int. Cl.[5] B60S *1/54*
U.S. Cl. 15—322 **18 Claims**

1. A snow and ice remover for a surface, comprising:
a scraper having a blade for contacting the ice on the surface;
means for passing a fluid along the blade and onto the ice,

electrical means for heating the fluid in the remover, in which the passing the means passes the heated fluid



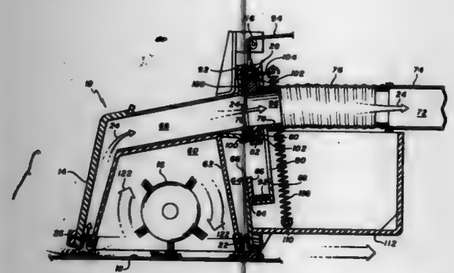
through the scraper onto the ice to melt the ice and facilitate removal of the ice.

5,189,757

HEAD ASSEMBLY FOR A VACUUM CLEANING APPARATUS

William H. Williams, 4938 Golden Arrow, Palos Verdes, Calif. 90274, and Paul G. Jacobs, 9958 Amestoy Ave., Northridge, Calif. 91324

Filed Oct. 31, 1991, Ser. No. 784,306
Int. Cl.[5] A47L *5/30*
U.S. Cl. 15—332 **20 Claims**



1. A cleaning head assembly for a vacuum cleaning apparatus, comprising:
- a rotatably driven brush carried within and laterally spanning the head assembly, the brush being adapted to loosen and agitate dirt on a surface to be cleaned;
- a first vacuum pathway having a first inlet opening adjacent to the surface to be cleaned and laterally spanning the head assembly on one side of the brush, the first vacuum pathway extending from the first inlet opening to a dirt collection zone within the vacuum cleaning apparatus;
- a second vacuum pathway having a second inlet opening adjacent to the surface to be cleaned and laterally spanning the head assembly on a second, opposite, side of the brush relative to the first inlet opening, the second vacuum pathway extending from the second inlet opening to the dirt collection zone within the vacuum cleaning apparatus; and
- means for selectively drawing a vacuum through the first or the second vacuum pathways, and for controlling and changing, if needed, the direction of brush rotation in accordance with the vacuum pathway selected.

5,189,758

SUPPORT SYSTEM FOR A FLEXIBLE CLOSURE

James F. Levy, 434 Barnwell St., Columbia, S.C. 29202

Continuation-in-part of Ser. No. 588,365, Sep. 26, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 787,315
Int. Cl.[5] A47H *15/00*; E05D *15/06*
U.S. Cl. 16—87.4 R **7 Claims**

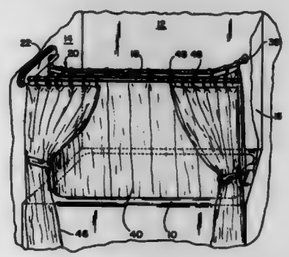
1. A system for supporting a flexible closure, said system comprising:
- a pair of brackets;
- a rail having a channel formed therein, said rail supported by said brackets, said brackets preventing rotational movement of said rail;
- a plurality of carriers carried by said rail;
- means for fastening said flexible closure to said plurality of carriers,
- said carrier having a roller assembly and a shank, said shank having a first end and a second end, said first end having a first shaped hole for receiving said roller assembly, said roller assembly supported within and rolling freely in said channel and in said first end of said shank,
- said first shaped hole having a first portion with a larger diameter and a second portion with a smaller diameter, said second portion communicating with said first portion so that said roller assembly can be inserted through said first portion of said first shaped hole of said shank but not through said second portion of said first shaped hole of said shank so that said roller assembly can be inserted through said first portion and moved to said second portion to secure said roller assembly in said first end of said shank.

5,189,759

SHOWER CURTAIN ROD UNIT

Frank A. Poore, 23 Sand Land Dr., Attica, Mich. 48412

Filed Oct. 21, 1991, Ser. No. 779,893
Int. Cl.[5] A47H *13/00, 15/00*; A47K *3/22*
U.S. Cl. 16—87.40 R **7 Claims**



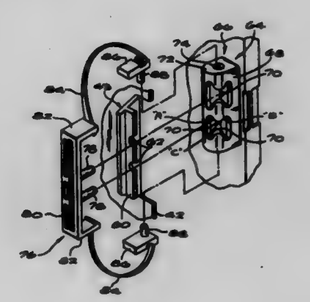
1. A dual curtain rod unit for installation between opposite walls of a shower stall, said unit comprising an outer rod, a substantially bow-shaped inner rod of uninterrupted, substantially smooth outer surface construction over its entire functional length, keying shaft means on each end portion of said inner rod, a pair of end plate means adapted for attachment to opposite walls of a shower stall, first socket means in a forward portion of each of said end plate means for receiving and supporting the ends of said outer rod, and keying socket means in a rearward portion of each of said end plate means for receiving and supporting the keying shaft means of said inner rod in a mating, sliding-fit, non-rotative manner with the bow of said inner rod facing toward said outer rod, said keying socket means being the only points of attachment of said inner rod, thus allowing for said uninterrupted surface thereof along its entire functional length for permitting slide hangers mounted thereon to slide without significant resistance.

5,189,760

MEDICINE CABINET

William J. Aisley, Malibu, Calif., assignor to Zaca, Inc., Westlake Village, Calif.

Division of Ser. No. 576,069, Aug. 31, 1990, Pat. No. 5,139,322. This application Apr. 6, 1992, Ser. No. 864,328
Int. Cl.[5] E05D *3/06*
U.S. Cl. 16—317 **9 Claims**



1. A medicine cabinet assembly, comprising;
- a housing adapted for mounting into a building wall and defining a forwardly open interior chamber;
- a mirror door; and
- hinge means for swingably mounting said mirror door onto said housing, said hinge means including a hinge mounting seat formed along one side edge of said housing, said hinge mounting seat including an open pocket lined on one side by a support wall having a cam pin port formed therein;
- said hinge means further including a cam unit formed along one side edge of said mirror door, said cam unit including a cam wall having an open contoured cam track formed therein and further including a retainer plate having a pivot pin aperture formed therein;
- said hinge means further including a hinge pin unit having a pivot member adapted for connection onto said hinge mounting seat and including a pivot pin receivable into said pivot pin aperture of said cam unit to retain said cam unit within said pocket, and a cam pin receivable through said cam pin port into engagement with said cam track when said cam unit is received within said pocket to guide opening and closing movement of said mirror door relative to said housing in accordance with the shape of said cam track.

5,189,761

STRAP FOR COLLECTING AND TRANSPORTING RECYCLABLE MILK CONTAINERS AND METHOD OF USING SAME

Bruce Chisholm, P.O. Box 25094, Portland, Oreg. 97225

Filed Apr. 3, 1992, Ser. No. 863,212
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—16 PB **3 Claims**

1. A method for collecting and transporting recyclable milk containers having handles comprising:
- (a) providing an elongate flexible strap including:
  - (i) a first end having a width and defining one or more shoulders,
  - (ii) a second end defining an opening having a length longer than said width, a portion of said opening including a notch,
  - (iii) a medial section located between said first end and said second end defining a slot that will slidably receive said strap;
- (b) inserting said first end of said strap through said handle of a first milk container;
- (c) inserting said first end of said strap through said slot of said medial section of said strap to form a loop that encircles said handle and thereby attaching said first milk container immovably to said strap;
- (d) inserting said first end of said strap through the handles of additional milk containers; and
- (e) inserting said first end of said strap through said opening in said second end and engaging said shoulder in said notch thereby attaching all of said milk containers to said strap.

5,189,762

REMOVABLE THREADLESS BUTTON APPARATUS

Joseph C. Giancaspro, 3136 E. Irwin, Mesa, Maricopa County, Ariz. 85204

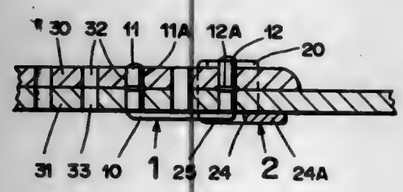
Filed Oct. 9, 1991, Ser. No. 774,702
Int. Cl.[5] A44B *1/34*
U.S. Cl. 24—108 **5 Claims**

1. Threadless button apparatus, comprising, in combination:
- button means to be secured to cloth, including
  - a disk,
  - a fastener needle means secured to and extending from the disk, including
    - a neck,
    - a bulbous portion, and
    - a flexible needle bottom having a tip for penetrating the cloth; and
- lock means for securing the button means to the cloth, including
  - an outer cylinder,
  - a bottom wall secured to the outer cylinder and against which the tip contacts, and

an inner cylinder secured to the bottom wall and disposed within the outer cylinder for receiving the fastener

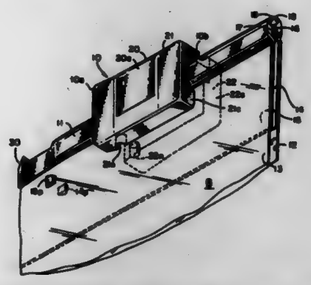
needle and in which the flexible needle bottom curls when the tip contacts the bottom wall to secure the button means to the cloth.

5,189,763
STRAP CLASP
Bertrand P. Voumard, Chexbres, Switzerland, assignor to Isa-france, Villers-de-Lac, France
Filed Jul. 10, 1991, Ser. No. 728,144
Claims priority, application Switzerland, Jul. 13, 1990, 2347/90
Int. Cl.[5] A44B *11/22*
U.S. Cl. 24—175 **13 Claims**



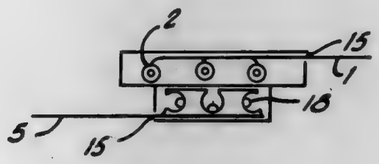
1. A clasp for a strap, comprising:
a first part having a flat base plate and at least one cylindrical stud fixed perpendicular to said base plate,
two superimposed upper and lower lengths of said strap having one or more aligned holes therein for receiving said at least one stud, said base plate resting against the underside of the lower length of said strap, and
a second part surrounding said two superimposed lengths of strap transversely and having
a top portion resting upon the upper length of said strap, said at least one stud extending beyond said top portion,
a bottom portion, and
a first longitudinal slot in said top portion and extending to at least one edge of said top portion and including a notch for slidably receiving said at least one stud.

5,189,764
PLASTIC RECLOSABLE FASTENER WITH STRUCTURE FOR RETAINING SLIDER IN CLOSED POSITION
Fox J. Herrington, Holcomb, and Eric A. St. Philips, Fairport, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.
Continuation of Ser. No. 674,648, Mar. 22, 1991, abandoned. This application Apr. 22, 1992, Ser. No. 873,537
Int. Cl.[5] A44B *19/16*
U.S. Cl. 24—387 **3 Claims**



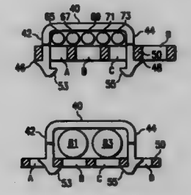
1. A plastic reclosable fastener with a slider particularly suited for thermoplastic bags and the like comprising a pair of flexible plastic strips having separable fastener means extending along the length thereof comprising reclosable interlocking male and female profile elements on the respective strips, said male and female elements having complementary cross sectional shapes such that they are closed by pressing the elements together, a straddling plastic slider on said strips for closing the reclosable male and female elements, and latching means for retaining said slider in closed position when said slider reaches the closed end of its travel along said plastic strips comprising cooperating detent structure on said slider and at least one of said plastic strips, said detent structure on said at least one plastic strip being located on the outer surface thereof and below said interlocking male and female profile elements intermediate the ends of said profile elements and engageable with said detent structure on said slider when said slider is at the closed end of its travel on said plastic strips.

5,189,765
ZIPPER JOINT BETWEEN TWO SURFACES
Tara C. Singhal, P.O. Box 5075, Torrance, Calif. 90510
Filed Jul. 16, 1991, Ser. No. 730,478
Int. Cl.[5] A44B *19/16*
U.S. Cl. 24—400 **6 Claims**



1. A fastener comprising:
(a) two edges to be joined together made of plastic/nylon type material,
(b) one edge being a male edge consisting of three continuous ridges in the form of cylindrical rods defining a central rod and two outer rods one on each side of the central rod,
(c) the other edge being a female edge consisting of continuous hollow cylindrical channels wherein the number of channels equals the number of rods and the channels define a central channel and two outer channels one on each side of the central channel,
(d) the channels have longitudinal openings that are at different angles from each other's channel openings,
(e) the central rod and channel of the said three rods and the channels in said male and female edges can fit into and snap into each other when compression force is applied from above and below said edges and when overlaid on top of each other,
(f) the two outer of the said rods and channels can fit into each other and snap into each other when compression force is applied sideways and when the outer rods and channels are laid side by side,
(g) a joining aid in the form of a tube which when pulled over said male and female edges in one direction applies force to join the edges, and
(h) the joining aid which when pulled over said male and female edges in the reverse direction assist in separating the edges.

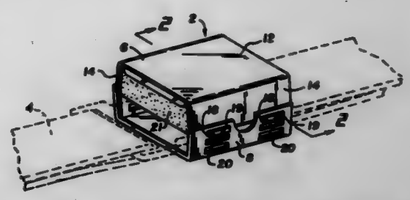
5,189,766
MULTIPLE BIT HEIGHT SNAP FIT CABLE HOLDER APPARATUS
William F. Weber, Allen, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.
Filed Jan. 31, 1992, Ser. No. 829,121
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—459 **5 Claims**



1. Cable holder apparatus comprising, in combination:
U-shaped flexible material having a main bit portion with first and second side portions extending from said main bit portion for, as a first alternative, enclosing a cable oriented in a first direction with respect to the apparatus, the side portions each having surface projections for coaction with an opening in a base and said side portions having extremities extending a distance X from said main portion as viewed from an end of said U-shaped flexible material; and
said side portions each having an opening therein, for, as a second alternative, enclosing a cable oriented in a direction orthogonal said first direction thereby defining two legs extending to the extremity of said portion which legs are shorter than the distance X as viewed from a side of said U-shaped flexible material.

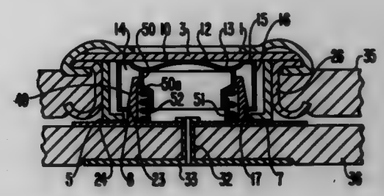
5,189,767
CLOSURE DEVICE SECURITY COVER
Klaus Reitsma, #20 - 18812 - 96th Avenue, Surrey, B.C., Canada V3T 4W2
Filed Nov. 19, 1991, Ser. No. 794,419
Int. Cl.[5] A44B *11/26*
U.S. Cl. 24—633 **7 Claims**

1. A cover for securing about an engaged closure device comprising:
a body having an upper portion and a lower portion that define a cavity therebetween to accept and enclose the closure device, said upper and lower portions having depending sidewalls that are positionable in opposed relationship such that the depending sidewalls of one portion are deformable to interfit between the depending sidewalls of the other portion; and
interlocking means comprising slots formed in the depending sidewalls of one portion of the body and projecting flanges formed in the depending sidewalls of the other portion dimensioned to be insertable through the slots, and biasing means tending to bias apart the upper and



lower portions to ensure that release of the flanges from the slots must be accomplished by a compressive force to overcome the force of the biasing means in combination with the force necessary to remove the flanges from the slots, whereby the interlocking means act to releasably secure the upper and lower portions together to prevent access to the closure device thereby preventing accidental or unauthorized opening of the engaged closure device.

5,189,768
SNAP FASTENER WITH SEPARATOR SPRING
Robert G. Riceman, West Caldwell, and Mitchell A. Medina, Essex Fells, both of N.J., assignors to Randolph-Rand Corporation, New York, N.Y.
Filed Oct. 29, 1991, Ser. No. 783,873
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—634 **35 Claims**



1. A snap fastener, comprising:
a female snap member including a snap type resilient clamp having a dished resilient actuator plate and a plurality of legs depending from the periphery thereof having inwardly extending hooks on the free ends thereof and defining a male member receiving recess therewithin, said dished resilient actuator plate being able to be resiliently snapped between a closed position in which said dished resilient actuator plate is convexly dished, and said legs are in an inward position with said hooks in a radially inward engaging position, and an open position in which said dished resilient actuator plate is concavely dished and said legs are in an outwardly inclined position with said hooks in a radially outward disengaging position, and casing means in which said snap type resilient clamp is positioned for movement between said closed position and said open position;
a male member having a hook receiving recess therearound and insertable into said male member receiving recess to position said hook receiving recess in opposed relation to said hooks for causing said male member to be gripped by said hooks when said snap type resilient clamp is in the closed position and for freeing said male member for movement into and out of said male member receiving

recess when said snap type resilient clamp is in the open position;

resilient means between said female snap member and said male member for being compressed when said female snap member and said male member are brought together and said hooks are in said engaging position and for urging said female snap member and said male member apart when said dished resilient actuator plate is moved to the concave position for releasing said hooks, said resilient means being positioned on one of the members and having a shape for being protected against accidental snagging or deformation when the members are separated,

whereby when said dished resilient actuator plate is depressed to move from the convex to the concave condition, said hooks are moved out of said recess in said male member to free said female snap member from said male member and said resilient means expands to urge said female snap member away from said male member; and

actuating means movable in a direction other than the direction of movement of said dished resilient actuator plate between the closed position and the open position and engagable with said dished resilient actuator plate for moving said dished resilient actuator plate from the convex to the concave condition, whereby said hooks are moved out of said recess in said male member to free said female snap member from said male member and to allow said female snap member to move away from said male member.

5,189,769

MANUFACTURE OF A MULTIPLE BIASED FABRIC BY FOLDING

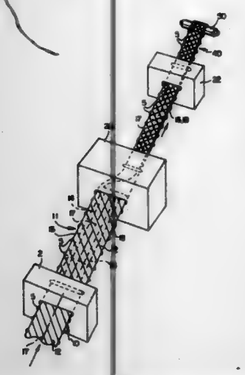
Roy Shoesmith, Ontario, Canada, assignor to Bay Mills Limited, Ontario, Canada

Continuation-in-part of Ser. No. 377,171, Jul. 10, 1989, Pat. No. 4,989,529. This application Jun. 1, 1990, Ser. No. 531,643

The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.

Int. Cl.[5] D03D *1/00*; D05B *1/00*; B32B *5/00*

U.S. Cl. 28—158 **22 Claims**



1. A method of making a multi-layer non-woven multiple biased fabric comprising the steps of:

directing a layer of single biased structural fabric in a longitudinal direction of travel, wherein the layer of fabric is comprised of a plurality of structural fibers oriented substantially parallel to each other at an acute angle to the longitudinal centerline of the fabric;

leading the single biased fabric layer into a folding stage for folding the biased layer longitudinally from one edge toward another to form a multiple biased fabric;

leading the multiple biased fabric into an affixing stage for affixing the multiple biased fabric together to provide a single structural fabric being multiple biased.

5,189,770

METHOD OF MAKING SOLID ELECTROLYTE CAPACITOR

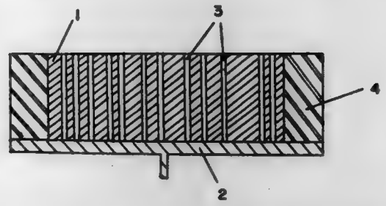
Manfred Waidhas, Nuremberg; Kurt Pantel, Heroldsberg, and Gerhard Richter, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 8, 1991, Ser. No. 742,843

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1990, 4025617

Int. Cl.[5] B21F *41/00*; H01G *9/00, 9/02*

U.S. Cl. 29—25.03 **18 Claims**



1. A method for the production of a solid electrolyte capacitor, comprising the steps of: arranging a formed metallic anode body, which has pores passing through it, on a working electrode; depositing a conductive polymer in the pores of the anode body by electrochemical polymerization of a monomer in the liquid phase, in the presence of a conducting salt; removing the anode body from the working electrode; and providing the polymer with a contact.

5,189,771

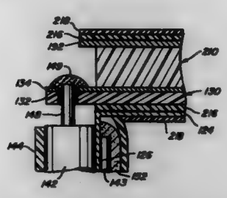
METHOD OF MAKING A MUSICAL INSTRUMENT TRANSDUCER

Lawrence Fishman, 5 Green St., Woburn, Mass. 01801

Division of Ser. No. 642,398, Jan. 17, 1991, which is a continuation of Ser. No. 552,984, Jul. 16, 1990, Pat. No. 5,029,375; which is a continuation-in-part of Ser. No. 251,570, Sep. 30, 1988, Pat. No. 4,944,209, which is a continuation-in-part of Ser. No. 876,238, Jun. 19, 1986, Pat. No. 4,774,867, which is a continuation-in-part of Ser. No. 856,189, Apr. 28, 1986, abandoned. This application May 21, 1992, Ser. No. 887,180

Int. Cl.[5] H01L *41/22*

U.S. Cl. 29—25.35 **22 Claims**



1. A method of fabricating a stringed instrument transducer that is adapted to be positioned adjacent the instrument strings to receive acoustic vibratory signals therefrom, said method comprising the steps of;

providing a module having a first elongated electrically conductive member, a conductive shield means integral with the first conductive member, said conductive member having a conductive tailpiece, the tailpiece adapted to receive a second elongated electrically conductive member and a piezoelectric transducer, said tailpiece having a junction adapted for rotational movement of the tailpiece from a first position where the tailpiece is disposed outside the shield means to a second position where the tailpiece is disposed inside the shield means,

providing to the tailpiece a second elongated electrically conductive member and a piezoelectric transducer comprising a polyvinylidene fluoride co-polymer,

positioning said second elongated electrically conductive member and piezoelectric transducer on the tailpiece to form an elongated unitary structure that includes the piezoelectric transducer disposed between the conductive tailpiece and the second electrically conductive member,

disposing around the unitary structure a means for electrically shielding said unitary structure,

rotating the tailpiece to its second position that the unitary structure is disposed inside the shield means.

5,189,772

METHOD OF UPHOLSTERING

John W. Appelt, Sooke, Canada, assignor to Key Plastics Sales, Inc., Upper Sandusky, Ohio

Filed Jan. 14, 1991, Ser. No. 640,874

Int. Cl.[5] B68G *7/00*

U.S. Cl. 29—91.1 **7 Claims**

1. A method of covering a surface with fabric comprising:

laying an upholstering piping means along a surface to be covered, said upholstering piping means being a single piece of resilient material including first and second elongated elevating means joined by a joining means,

laying fabric over said surface such that said fabric also covers said upholstering piping means, and

attaching said fabric to said surface with a fastener, such that said fastener passes through said joining means, thereby drawing said joining means toward said surface and drawing said first and second elevating means together to form piping.

5,189,773

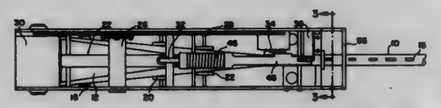
MAST FORMING AND DEPLOYMENT SYSTEM

T. Jeffrey Harvey, and P. Alan Jones, both of Goleta, Calif., assignors to AEC-Able Engineering Co., Inc., Goleta, Calif.

Filed Jul. 15, 1991, Ser. No. 730,238

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—33 D **8 Claims**



1. A mast forming and deployment system comprising for forming a self-supporting mast:

storage means for storing a strip of sheet metal as a coil;

tube forming means for guiding said sheet metal to form a tube with overlapping edges;

feed means for feeding said sheet metal to said tube forming means and for driving said sheet metal through it;

stapling means for stapling said tube at its overlapping edges as it exits from said tube forming means by driving rigid staples through said tube and against anvil means on said tube forming means.

5,189,774

AUTOMATIC PALLET SWITCHING MECHANISM

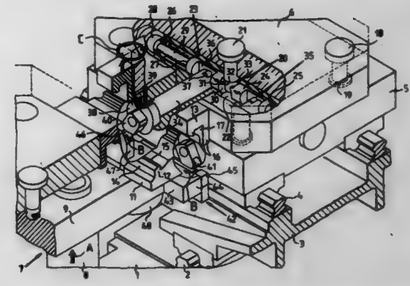
Dietmar Hofmann, Seebach, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 6, 1992, Ser. No. 909,587

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1991, 4122215

Int. Cl.[5] B23Q *7/14*; B65G *17/48*

U.S. Cl. 29—33 P **16 Claims**



1. An automatic pallet switching mechanism for machine tools, said mechanism comprising:

a pallet support for holding a work pallet in a fixed position;

a pallet changer having a vertically movable support structure and a driver rotatably mounted thereon for elevating and pivoting the work pallet; and

a pallet fixing device having clamping means disposed inside the pallet support for securing a locking bolt mounted on the work pallet, said clamping means comprising:

two clamping slides which are biased against each other by compression springs, the mutually facing ends of said clamping slides being formed with keys;

lateral keyways in the locking bolt configured for locking engagement therein of said keys of said clamping slides;

a lateral recess in at least one of said clamping slides for engagement therein of a control element; and

at least one shaft mounted in said pallet support for carrying said control element at one end thereof and having its other end adapted to be coupled by means of an operating member to said vertically movable support structure of said pallet changer.

5,189,775

ZONE CONTROLLED DEFLECTION COMPENSATED ROLL

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Filed Feb. 25, 1992, Ser. No. 840,460

Int. Cl.[5] B21B *31/32*; B60B *9/22*

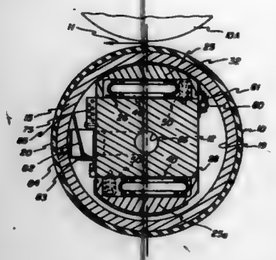
U.S. Cl. 492—5 **16 Claims**

1. A deflection controlled self-loading roll in which a rotatable roll shell is supported on a non-rotating central beam by a plurality of individual movable shoes positioned along said beam transversely of the roll between said beam and said shell, and is movable by said shoes between an unloaded position for servicing or threading a web thereon and a loaded position, and in which said shoes have surface means thereon for bearing against an inside surface of said shell in sliding relation thereto for compensating for shell bending under nip loading against a

second roll, and in which said shoe surface means and said inside shell surface are separated, during use, by a lubricating film, the improvement comprising:

a plurality of inflatable bellows type actuators comprising upper and lower rigid plates, which form mounting surfaces, separated by a collapsible enclosing wall;

means mounting said actuators along said beam such that said bellows are adopted to apply to said shoes a generally radial force along a "Z" axis upon the application of fluid pressure thereto to urge said shoes into engagement with said shell inside surface;

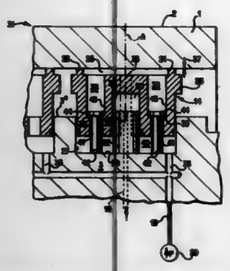


means mounting said shoes on said beam providing for translational movement of said shoes along said "Z" axis while providing for rotational movement of said shoes at least about orthogonal "X" and "Y" axes, in which the "X" axis is generally parallel to the direction of movement of material through said nip, and the "Y" axis is generally parallel to said beam, and in which said lubricating film between said shoes and said shell inside surface is generated exclusively by hydrodynamic plain bearing action therebetween.

5,189,776
ROLLER

Karl-Heinz Küsters, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

PCT No. PCT/DE90/00432, § 371 Date Feb. 6, 1992, § 102(e) Date Feb. 6, 1992, PCT Pub. No. WO90/15263, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 6, 1990, Ser. No. 778,941
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3918989
Int. Cl.[5] B21B *13/02*
U.S. Cl. 492—7 4 Claims



1. A roller for compressing webs of material comprising:

a rotatable hollow cylinder having an inner circumference, an outer working circumference, and a stationary crosshead extending lengthwise through the hollow cylinder to form a surrounding clearance space with the inner circumference of the hollow cylinder;

hydraulic support means disposed on the crosshead and acting against the inner circumference of the hollow cylinder for supporting the hollow roller in an active plane, said hydraulic support means comprising a piston-like sealing member radially moveable relative to the crosshead;

a radial cylinder bore disposed in the crosshead in which said sealing member is moveable which forms a cylinder space near the bottom of the bore, said sealing member having a contact surface conforming to the shape of the inner circumference of the hollow cylinder and having a hydrostatic bearing pocket that has an open end facing the inner circumference of the hollow cylinder, said bearing pocket having a closed edge at its periphery that forms said contact surface;

A feed line for conveying hydraulic fluid to the cylinder space;

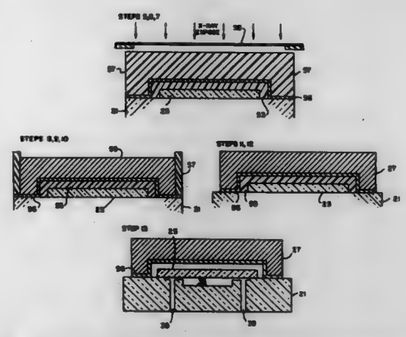
a passage channel in the sealing member fluidically coupling said cylinder space to the bearing pocket for conveying hydraulic fluid in a throttle-free manner; and

means for pressing said sealing member against the inner circumference of the hollow cylinder, said sealing member including a stop for limiting the radial extent said sealing member can travel, said stop having a head bolt that includes a projecting head and a step bore through which said head bolt passes, said step bore having two portions of differing diameter to form an axial step, said head bolt being coupled to a radially inner-most base of the cylinder space, said projecting head being supportable on the step.

5,189,777
METHOD OF PRODUCING MICROMACHINED DIFFERENTIAL PRESSURE TRANSDUCERS

Henry Guckel, and Todd R. Christenson, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 7, 1990, Ser. No. 626,581
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—424 19 Claims



11. A method of making a micromachined structure comprising the steps of:

(a) forming a sacrificial release layer of material on the surface of a substrate, the material of the sacrificial release layer being dissolvable in a liquid which does not affect the substrate;

(b) applying a plating base at least over the sacrificial release layer, the plating base being formed of a metal;

(c) forming a layer of casting material over the plating base to at least the desired thickness of a structure to be formed, the deposited casting material being susceptible to X-rays such that the casting material exposed to X-rays can be dissolved in a selected developer solvent;

(d) exposing the casting material to X-rays in a desired pattern;

(e) removing the casting material with the developer solvent in those areas which have been exposed to X-rays while leaving the remaining casting material to define a mold area over the plating base;

(f) depositing a solid metal into the mold area onto the plating base by electroplating;

(g) removing the remaining casting material;

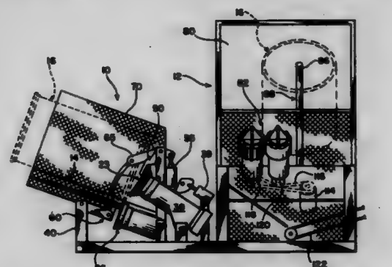
(h) removing the plating base in regions where solid metal has not been deposited to allow access to the sacrificial release layer;

(i) removing the sacrificial release layer material to leave the deposited metal on the plating base free of the substrate where the sacrificial release layer has been removed.

5,189,778
DRUM RECYCLING SYSTEM

John K. Shepard, Bolingbrook; Thomas P. Vander Sanden, Tinley Park; Arthur R. Tomczak, Chicago, all of Ill., and Lawrence E. Reack, Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Dec. 6, 1991, Ser. No. 802,925
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—426.4 28 Claims



21. A method of recycling a drum having a paperboard sidewall with first and second metal chimes crimped to and about opposed first and second end portions of said sidewall; the method comprising severing said sidewall from said first chime, removing said first chime from said sidewall, severing said sidewall from said second chime, removing said second chime, helically cutting said sidewall into a continuous strip of predetermined width, and cutting said strip, immediately sequential to and during the formation thereof, into predetermined length segments.

5,189,779
METHOD OF INSTALLATION OF A GROMMET ASSEMBLY TO A WALL PANEL

Duane D. Fishel, Oswego, and Nancy K. Rogers, Naperville, both of Ill., assignors to Allsteel Inc., Aurora, Ill.

Division of Ser. No. 682,687, Apr. 9, 1991, Pat. No. 5,144,777.
This application Nov. 20, 1991, Ser. No. 795,120
Int. Cl.[5] B23P *11/02*; B21D *39/00*; B65D *55/00*; F16L *5/00*
U.S. Cl. 29—453 6 Claims

5. A method for field installing a grommet assembly to and through an aperture formed in a wall panel, said method comprising the steps of:

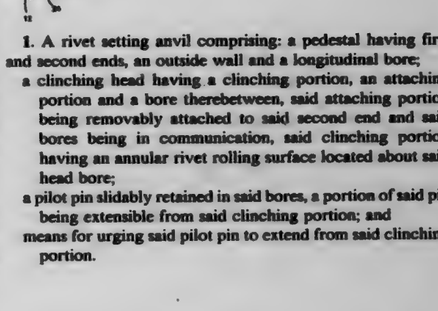
guiding a tubular cutting means against an outer face of a wall panel;

spinning and pressing the tubular cutting means to cut through the wall panel;

removing and excised portion of said wall panel cut by said cutting means and forming thereby a circular aperture therethrough;

non-resiliently inserting a grommet means through said aperture and disposing pivotal locking means adjacent a back surface of said wall panel;

inserting insert sleeve means having a terminal leading edge through said grommet means;



pressing said terminal leading edge of said insert sleeve means against said locking means;

pivoting said locking means to lock at the back surface of said wall panel;

snap engaging said sleeve means to said grommet means; and,

arranging face plate means at the front face of said wall panel thereby masking over said grommet means.

5,189,780
RIVET SETTING ANVIL

Hugh D. Landes, Huron, Ohio, assignor to Heavy Duty Marketing Corporation, Huron, Ohio

Filed Jul. 9, 1992, Ser. No. 911,147
Int. Cl.[5] B23P *11/00*; B21J *15/04*
U.S. Cl. 29—243.53 7 Claims

1. A rivet setting anvil comprising: a pedestal having first and second ends, an outside wall and a longitudinal bore;

a clinching head having a clinching portion, an attaching portion and a bore therebetween, said attaching portion being removably attached to said second end and said bores being in communication, said clinching portion having an annular rivet rolling surface located about said head bore;

a pilot pin slidably retained in said bores, a portion of said pin being extensible from said clinching portion; and

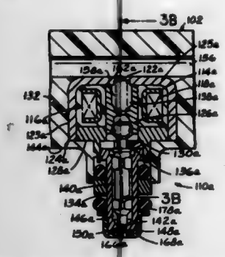
means for urging said pilot pin to extend from said clinching portion.

5,189,781
RAPID TOOL MANUFACTURING
Lee E. Weiss; Friedrich B. Prinz, and E. L. Gursoz, all of Pittsburgh, Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.
Continuation of Ser. No. 562,385, Aug. 3, 1990. This application Jan. 10, 1992, Ser. No. 821,265
Int. Cl.[5] B21B *13/22*
U.S. Cl. 29—527.2 27 Claims

1. A method for rapid tool manufacturing comprising the steps of:
building an SFF pattern made of plastic to be used to make a first die half;
spraying metal onto the pattern without any solid layer between the pattern and the metal to form a first metal substrate;
separating the substrate from the SFF pattern to form the first die half;
building a second SFF pattern to be used to make a second die half;
spraying metal onto the second SFF pattern to form a second metal substrate; and
separating the second metal substrate from the second SFF pattern to form the second die half.

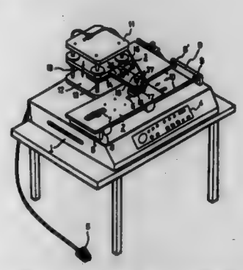
26. A method for rapid tool manufacturing comprising the steps of:
building an SFF pattern from a computer-based geometric model; and
robotically spraying metal onto the SFF pattern in correspondence with the computer based geometric model.

5,189,782
METHOD OF MAKING INTEGRALLY FORMED AND TUNED FUEL RAIL/INJECTORS
John C. Hickey, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 630,913, Dec. 20, 1990, Pat. No. 5,086,743. This application Nov. 19, 1991, Ser. No. 793,885
Int. Cl.[5] F01F *41/02*
U.S. Cl. 29—602.1 10 Claims



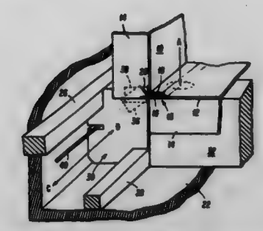
1. A method for integrally forming a fuel rail assembly having a plurality of core fuel injector assemblies each coupled to a source of fuel, comprising the steps of:
positioning each of a plurality of electric coil assemblies within a corresponding magnetic core to form a plurality of said core fuel injector assemblies and positioning each of said core fuel injector assemblies within a separable mold;
inserting each of a plurality of first removable pins into an opening concentrically formed in each of said core fuel injector assemblies;
inserting a second removable pin into said mold which communicates with each of said core fuel injector assemblies;
injecting plastic into said mold for forming said fuel rail assembly with said plurality of core fuel injector assemblies hermetically sealed therein and hermetically sealing each of said coil assemblies within said corresponding magnetic core for each of said core fuel injector assemblies;
removing said first pins to define a fuel passageway in each of said core fuel injector assemblies and removing said second pin to define a fuel path communicating with each of said fuel passageways;
removing said separable mold;
inserting each of a plurality of armatures into each of said fuel passageways of said core fuel injector assemblies;
coupling each of a plurality of valve assemblies to each of said fuel passageways of said core fuel injector assemblies; and
connecting one of a plurality of resistors in series between each one of said coil assemblies and one of an equal plurality of electronic drivers, said resistors being selected with a resistance value to provide substantially equivalent fuel flow through each of said core fuel injector assemblies.

5,189,783
PARTS MOUNTING APPARATUS FOR MEMORY BOARD
Jung C. Hoon, 7-1107 Shindonga Apt., 988-1, Pnagbae Dong, Socho Ku, Seoul, Rep. of Korea
Filed Feb. 14, 1991, Ser. No. 655,660
Claims priority, application Rep. of Korea, Nov. 7, 1990, 90-17997
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—741 7 Claims



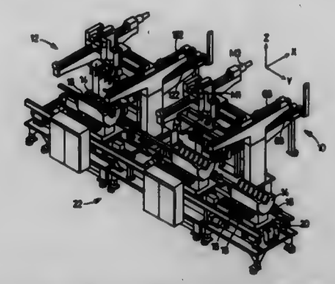
1. A parts mounting apparatus for mounting parts on a circuit board, comprising:
a main body with an upper surface,
support members spaced apart and disposed on said upper surface,
guide bars extending between said support members,
a work table adapted for sliding movement on said guide bars,
a parts jig and a board jig spaced apart and disposed on said work table, and
a parts carrier located on said upper surface, comprising
a vertically movable plate, and
a bracket adjustably attached to said movable plate.

5,189,784
APPARATUS FOR FORMING SEAMS IN BOX-SHAPED MEMBERS
Robert E. Welty, Cedar Rapids, Iowa, assignor to Iowa Precision Industries, Inc., Cedar Rapids, Iowa
Filed Nov. 13, 1989, Ser. No. 434,362
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—796 6 Claims



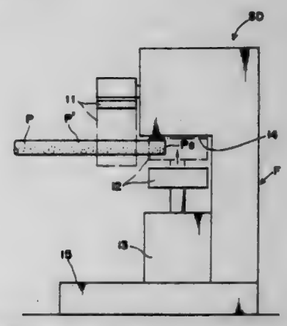
1. An apparatus for completing the formation of a Pittsburgh-type seam partially formed along one corner formed by a first side and a second side of a box-shaped rectangular duct of deformable sheet material which sides are being locked together at the corner by said seam, the completion of the seam being accomplished by bending an outwardly extending edge of the first side of the duct over and against the second side at the corner, said apparatus comprising a carrier moveable along a defined straight path, forming means combined with said carrier and movable with said carrier along said path, a supporting table having guides for guiding the carrier's movement along its defined path, holding means to securely hold the two sides of the duct in a predetermined fixed position with the outwardly extending edge of the first side positioned along the path of the forming means, and power means to advance the carrier along its defined path so that the forming means will engage the edge and bend it at approximately a right angle over and against the second side as the forming means moves along its path, thereby completing the seam.

5,189,785
APPARATUS FOR INSERTING THRUST METAL INSERTS BETWEEN CYLINDER BLOCK AND CRANKSHAFT, BY ROTATING CRANKSHAFT
Mitsumoto Inoguchi; Kenji Manabe, and Hitomi Itoh, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Oct. 24, 1991, Ser. No. 781,905
Claims priority, application Japan, Oct. 25, 1990, 2-289754
Int. Cl.[5] B23Q *7/00*
U.S. Cl. 29—809 5 Claims



1. A thrust metal inserting apparatus operable when a crankshaft having a journal and a crank arm at one end of said journal is positioned on a cylinder block having a bearing portion such that said journal is fitted on an arcuate concave bearing surface of said bearing portion, said bearing portion having an arcuate groove formed on an end face thereof along said arcuate bearing surface, so as to cooperate with a surface of said crank arm to define an arcuate gap, said apparatus operating to insert an arcuate thrust metal insert into said arcuate gap, said apparatus comprising:
positioning means for holding said thrust metal insert and positioning said insert at a circumferential position of said journal which is opposite to said arcuate bearing surface of said bearing portion in a diametric direction of said journal, such that said insert is substantially concentric with said arcuate groove;
pressing means for forcing said insert at said circumferential position against said surface of said crank arm, said pressing means comprising a thrust metal inserter in the form of a plate which has an arcuate end face corresponding to the outer circumferential surface of said journal, an arcuate recess formed on a side surface thereof along said arcuate end face, and an air passage communicating with said arcuate recess;
said pressing means further comprising a pressurizing circuit for supplying compressed air to said arcuate recess through said air passage, to thereby force said insert against the surface of said crank arm; and
rotating means for rotating said crankshaft about an axis thereof, while said insert is forced against the surface of said crank arm by said pressing means, whereby said insert is rotated with said crankshaft and at least partially inserted into said arcuate gap.

5,189,786
ELECTRICAL CABLE STRIPPING METHOD AND ELECTRICAL CABLE LOOSENING DEVICE
Suminori Ishikawa, and Norihiko Hashimoto, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan
Filed Nov. 8, 1991, Ser. No. 789,607
Claims priority, application Japan, Nov. 13, 1990, 2-308241
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—825 2 Claims



1. A stripping method for stripping an electrical cable having a conductor wire wound around a core member and a coating member tightly mounted on said conductor wire, said method comprising the steps of:
clamping said electrical cable at a clamping position which is adjacent an end portion of said electrical cable;
pounding and bending said end portion to separate said coating member from said conductor wire; and
stripping said electrical cable of said coating member at the pounded end portion.

2. An electrical cable loosening device in combination with an electrical cable and for loosening said electrical cable, said electrical cable having a conductor wire wound around a core

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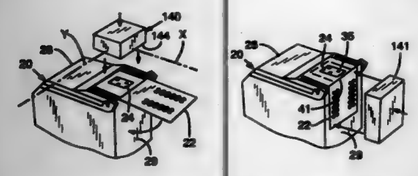
member and a coating member tightly mounted on said conductor wire, said electrical cable loosening device comprising:
- a frame structure;
- a stop surface formed on said frame structure;
- a clamping means for clamping said electrical cable at a clamping position which is adjacent an end portion of said electrical cable; and
- a pounding means provided on said frame structure and in association with said stop surface, for repeatedly pounding and bending said end portion of said electrical cable including said coating member against said stop surface to attendantly loosen and separate said coating member form said conductor wire.

5,189,787
ATTACHMENT OF A FLEXIBLE CIRCUIT TO AN INK-JET PEN

Douglas J. Reed, Corvallis, Oreg.; Kenneth J. Courian, San Diego, Calif.; Gary G. Lutnesky, Corvallis, Oreg.; Milo A. Undlin, Corvallis, Oreg., and Terry M. Lambright, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 30, 1991, Ser. No. 737,623
Int. Cl.[5] H05B *3/00*
U.S. Cl. 29—831 **12 Claims**

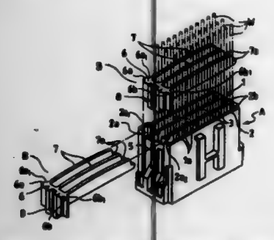


1. A method of attaching a conductor-carrying plastic strip to the plastic body of a pen, comprising the step of staking the strip to the pen body.

5,189,788
METAL TERMINAL LOCKING METHOD AND DEVICE

Hitoshi Sakai, and Toshihiko Masuda, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 752,797
Claims priority, application Japan, Sep. 3, 1990, 2-230654
Int. Cl.[5] H01R *9/00*
U.S. Cl. 29—842 **10 Claims**

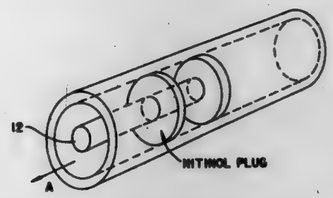


1. A method of locking metal terminals in a connector including a connector housing having a terminal locking member accommodating chamber disposed adjacent a plurality of terminal accommodating chambers in which said metal terminals are respectively disposed, said connector further including a terminal locking member for locking each of said metal terminals in said terminal accommodating chambers when said terminals are moved in an insertion direction to a predetermined position, comprising the steps of:
providing a terminal locking jig including at least one engaging prong extending therefrom;
inserting said terminal locking jig into said terminal-locking-member accommodating chamber;
moving said locking jig in said insertion direction so as to attendantly move said metal terminals, which are not in said predetermined position, to said predetermined position such that said terminals are locked by said locking members;
removing said locking jig; and
inserting a terminal locking element into said locking member accommodating chamber so as to secondarily lock said terminals in said terminal accommodating chambers.

5,189,789
METHOD FOR SEALING TUBES

Charles E. Hall, West Chester, Ohio, assignor to Hall United Technologies, Inc., Int'l, West Chester, Ohio

Filed Nov. 6, 1991, Ser. No. 788,624
Int. Cl.[5] B23D *15/26*
U.S. Cl. 29—890.031 **4 Claims**



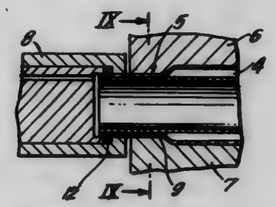
1. A method for sealing the internal peripheral surface of a tube, comprising the steps of:
providing a plug which includes a plug body and means for sealing the internal peripheral surface of the tube in response to temperature elevation above an insertion level, with said means comprising at least one annular wing formed on an outer periphery of the plug body;
chilling said plug to a temperature below a transition temperature of said plug;
bending said at least one annular wing of said chilled plug backward such that said at least one wing has an outer diameter which is less than an inner diameter of a tube to be sealed;
inserting said chilled plug with said at least one bent wing into an open end of a tube, such that a back portion of said plug is flush with the open end of said tube; and
heating said plug by exposure to ambient temperature,
wherein said plug is formed of a material which will return to an un-deformed state after being heated past said transition temperature, such that said annular wings return to a state of increased diameter, thereby sealing the tube.

5,189,790
METHOD OF FABRICATING A DOUBLE WALLED PIPE ELBOW

Wolfgang Streubel, Baratrup, and Rainer Hansen, Paderborn-Elsen, both of Fed. Rep. of Germany, assignors to Benteler Aktiengesellschaft, Paderborn, Fed. Rep. of Germany

Filed Jun. 12, 1991, Ser. No. 714,253
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1990, 4019899
Int. Cl.[5] B21D *39/00*
U.S. Cl. 29—890.149 **3 Claims**

1. Method of fabricating a double walled pipe elbow comprising sliding an inner pipe having an inside surface and an outside surface and opposite ends into an outer pipe having an inside surface and outside surface and opposite ends, connecting the inner and outer pipes together at least at the ends of one of the pipes, inserting a bending mandril into the inner pipe and bending the inner and outer pipes into a bent configuration, wherein the improvement comprises placing the inner and outer pipes into a hollow interior space of a shaping tool with the interior space corresponding to the final shape of the outside surface of the outer pipe, sealing the ends of the outer pipe in a pressure tight manner, introducing a pressure medium

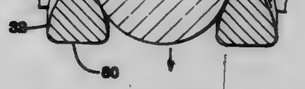


between the outside surface of the inner pipe and the inside surface of the outer pipe and also into the inner pipe and expanding the outer pipe so that the outside surface thereof is in full surface contact with the hollow interior space of the shaping tool and thereby forming an open intermediate space between the outside surface of the inner pipe and the inside surface of the outer pipe.

5,189,791
METHOD FOR MAKING A RETAINER HAVING ENHANCED ROLLER RETENTION

Richard L. Alling, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Division of Ser. No. 585,466, Sep. 20, 1990, abandoned. This application Jun. 3, 1991, Ser. No. 711,502
Int. Cl.[5] F16C *33/00*
U.S. Cl. 29—898.067 **3 Claims**

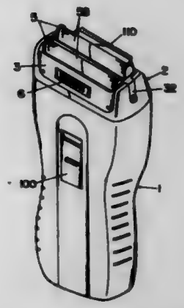


1. A method of forming a roller bearing retainer from a thin strip of metal, said strip having a first surface and a second surface, comprising the steps of:
piercing with a piercing tool a plurality of slots in said strip, forming a plurality of crossbars, said crossbars having side surfaces adjacent said slots, said piercing tool entering said strip first surface and exiting said strip second surface;
removing said piercing tool from said strip;
reforming the side surfaces of said crossbars with a wedge shaped tool directed through the second surface toward the first surface such that said side surfaces are altered and burrs formed by the piercing the step are moved away from bearing members;
cutting off a section of said strip; and
forming said cutoff section into a circular shaped strip whereby the second surface of said strip forms an outer radial surface of said circular shaped strip.

5,189,792
RECIPROCATORY ELECTRIC SHAVER

Kiyotaka Otsuka; Kenzo Shirakawa; Masakazu Kita; Masao Tanahashi, all of Hikone, and Jyuzaemon Iwasaki, Nagahama, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 16, 1991, Ser. No. 807,591
Claims priority, application Japan, Dec. 28, 1990, 2-404527; Dec. 20, 1990, 2-404528; Mar. 1, 1991, 3-36103
Int. Cl.[5] B26B *19/02, 19/44, 19/12*
U.S. Cl. 30—43.92 **10 Claims**



1. In a reciprocatory electric shaver comprising:
a head frame mounting more than one elongated cutter head extending horizontally to define a longitudinal axis and having opposed longitudinal ends spaced along said longitudinal axis, each cutter head including an elongated outer shearing foil which comes into hair shearing engagement with an inner cutter driven to reciprocate along said longitudinal axis;
said cutter heads being floatingly supported to said head frame in such a manner than said cutter heads are vertically movable relative to said head frame independently from each other as well as that each of said cutter heads is vertically movable at one of said longitudinal ends substantially independently of the other longitudinal end;
said head frame having opposed end walls spaced along said longitudinal axis, said opposed end walls being formed respectively with spring support members molded integrally therein and which are vertically movable relative to said head frame independently from each other and are coupled to said longitudinal ends of the cutter head in a floatingly supporting relation thereto;
a shaver housing mounting said head frame, a reciprocating element projecting from said housing to driving connect said inner cutter, and a spring means carried by said reciprocating element to floatingly support said cutter heads.

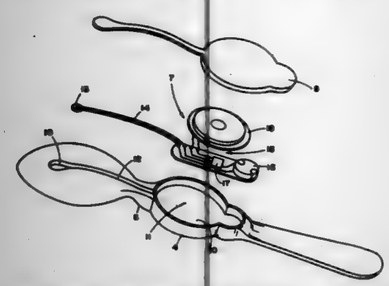
5,189,793
CUTLERY PIECE

Eli Ratzon, 11 Ha'gadna St., Petach-Tikva 49231, and Itzhak Hadad, 13 David Raziel St., Petach-Tikva 49246, both of Israel

Filed Feb. 24, 1992, Ser. No. 840,265
Claims priority, application Israel, Mar. 6, 1991, 97456
Int. Cl.[5] A47J *43/28*
U.S. Cl. 30—123 **7 Claims**

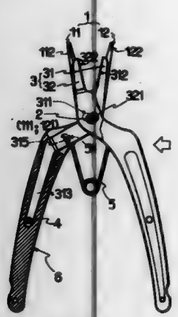
1. A cutlery piece which comprises:
a food holding portion having upper and lower faces;
a handle; and
electronic means comprising a light sensor in said food holding portion and means to provide one of a light and a

sound signal, said electronic means being adapted to transiently activate said means to provide said signal when at



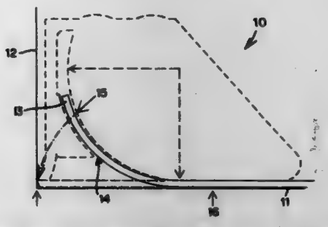
least one of the faces of the food holding portion is exposed to light after a period of darkness.

5,189,794
PAIR OF SHEARS WITH TONGS
Long-Fur Kuo, Taipei, Taiwan, assignor to Young-Life International Co., Ltd., Taipei, Taiwan
Filed Dec. 16, 1991, Ser. No. 807,994
Int. Cl.[5] B26B *13/00, 13/16*
U.S. Cl. 30—135 6 Claims



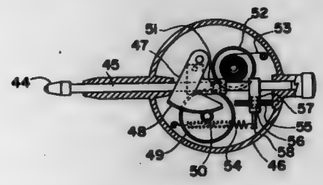
1. A pair of shears comprising:
a pair of shear plates in overlapping relationship mounted together so as to pivot with respect to each other, one end of each of said shear plates defining a cutting edge, another end of each of said shear plates defining a handle, said shears plates having a hole therein for the receipt of a pivot member, said handle having a first rivet hole formed therein;
a pair of tong plates arranged in overlapping relationship so as to generally pivot with respect to each other, one end of each of said tong plates defining a tong member, another end of each of said tong plates defining a tong handle, said tong handle affixed to said handle of said shear plate, said tong plates having an elongated hole therein aligned with said hole of said shear plates, said pivot member extending through said hole of said shear plates and said elongated hole of said tong plates, said tong handle having a second rivet hole formed therethrough, each of said tong plates having a peg attached on said tong handle;
a rivet extending through said first rivet hole of said handle of said shear plates and through said second rivet hole of said tong handle;
a tension spring to said peg on each of said tong plates, said tension spring for urging said tong handle of one of said tong plates away from a tong handle of another of said tong plates.

5,189,795
PRECISION LINOLEUM EDGE TRIMMING TOOL
Conrad Fortin, 534 Main St., Van Buren, Me. 04785
Filed Feb. 2, 1992, Ser. No. 844,560
Int. Cl.[5] B26B *29/00, 29/02, 27/00*
U.S. Cl. 30—294 10 Claims



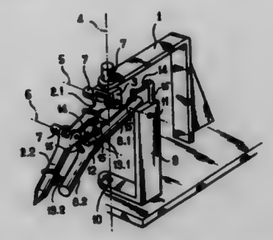
1. A tool for use in trimming an edge portion of a length of a floor covering such as linoleum to fit against a wall of a building, said tool including leading and trailing ends having portions for sliding contact with the floor or an existing covering thereon and front edges for sliding contact with the wall at the junction therewith of the floor or a floor covering thereon when the tool is in an operative position, a downwardly and rearwardly opening throat also opening through the ends of the tool and having front and rear walls connected to the ends, the throat walls spaced to enable an edge portion of the covering of predetermined maximum thickness to enter and pass transversely through the throat as the tool is slid forwardly while in said position, said throat walls so shaped that such edge portions within and passing through the throat are maintained curved upwardly against the front wall, said throat walls provided with lengthwise slots where edge portions of the material are held against the front wall within a line of severance, a holder having a seat, a connection between the holder and the ends of the tool, a blade having an elongated cutting edge, a releaseable connection between the blade and the seat holding the blade in the slots with its cutting edge in a position to sever the edge portion of the covering against the front wall as the tool is advanced in said operative position and with the shortest distance between the blade and any line, parallel to the cutting line of severance, on the undersurface of said portions, as measured thereto along the front wall of the throat, equal to the shortest distance between the building wall and said line, a wanted fit of the trimmed edge is ensured.

5,189,796
SHOCK-RESISTANT DEVICE FOR A MEASURING MACHINE
Serge Ginggen, Chavannes, and Jean-Marc Frauenknecht, Bussigny-près-Lausanne, both of Switzerland, assignors to Tesa S.A., Switzerland
Filed Apr. 23, 1991, Ser. No. 690,008
Claims priority, application Switzerland, May 18, 1990, 01692/90
Int. Cl.[5] G01B *3/22*
U.S. Cl. 33—556 6 Claims



1. A shock-resistant device for a measuring machine comprising a body, a measurement rod movable within the body and at least one measurement probe connected to the measurement rod and intended to contact an element of a part to be measured under the pressure of a return spring, characterized by the fact that it is composed of two members in engagement, in the form of a bolt and a nut with reversible relative rotation and axial displacement, one of which (21, 40, 55) is fastened to the body (1, 25, 46) of the instrument and is immoveable at least axially with respect to it, while the other (20, 39, 56) is connected to the measurement rod (4, 27, 45) of the instrument so as to be displaced and driven axially by the latter, a single one of these two elements being moveable in rotation with respect to the body to which it is attached and the frictional force developed by the relative rotation of these two elements in engagement, upon displacement of the measurement rod within the body, being so determined as to yield at least to the pressure of the return spring (7, 34, 54) of the measurement machine.

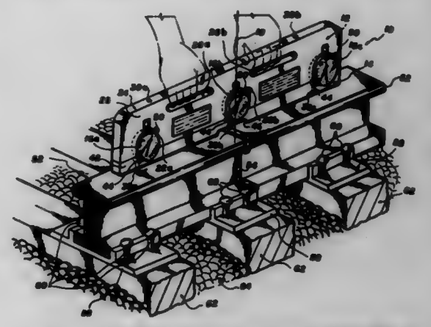
5,189,797
APPARATUS FOR MEASURING THE SHAPE OR POSITION OF AN OBJECT
Romain Granger, Montoire, France, assignor to Romer, Montoire, France
Filed Mar. 4, 1992, Ser. No. 845,702
Claims priority, application France, Mar. 12, 1991, 91 02976
Int. Cl.[5] G01B *5/14*
U.S. Cl. 33—1 MP 3 Claims



1. Apparatus for measuring the shape or position of an object, the apparatus comprising a stand supporting a series of measurement segments hinged to one another and having angular position sensors for sensing the angular positions of the measurement segments, wherein the apparatus further includes a bracket supporting a series of hinged support segments adjacent to the measurement segments, link members fixed to the support segments and engaged at least partially around the measurement segments to support them in a direction opposing the force of gravity, and assistance members acting on the support members to counter the force of gravity.

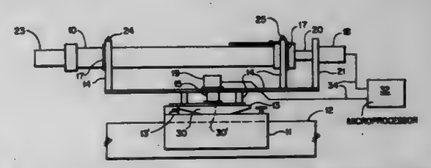
5,189,798
ALIGNMENT GAUGE
Jeffrey La Force, P.O. Box 3636, Napa, Calif. 94558
Filed Nov. 6, 1991, Ser. No. 788,504
Int. Cl.[5] G01D *21/00*; G01B *5/25*
U.S. Cl. 33—1 Q 4 Claims

1. An alignment gauge to facilitate the measurement of welded joints and the alignment of elongated structures, said alignment gauge comprising:
a base having a top surface, a bottom surface, a center, a right side of said center, a left side of said center, a channel positioned within said bottom surface of said base at said center of said base, and a plurality of vertical holes through the base,
at least three dial indicators, each including actuating plungers, each actuating plunger to be received by one of said vertical holes such that said actuating plungers each protrude through said bottom surface of said base, one of said dial indicators being positioned at said center of said base, one of said dial indicators being positioned at said left side of said center of said base, and one of said dial indicators being positioned at said right side of said center of said base,
an upright member having a face and bottom surface, including an aperture for each said dial indicator, whereby said apertures are located on said face adjacent said bottom surface of said upright member, each said aperture location corresponds to each said dial indicator location on



said base, said dial indicators are recessed in said apertures,
fastening means to attach said upright member to said base, said bottom surface of said upright member fastened to said top surface of said base having the center of said upright member in common with said center of said base, and
fastening means to secure said dial indicators to said top surface of said base.

5,189,799
LASER GONIOMETER
George M. Fairer, Boulder; James M. Boerngr; David W. Harris, both of Lakewood; DeWayne A. Campbell, Littleton; Gene E. Tuttle, Littleton; Mark H. McKeown, Golden, and Steven C. Benson, Lakewood, all of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Continuation of Ser. No. 340,119, Apr. 11, 1989, abandoned.
This application Jan. 30, 1991, Ser. No. 748,015
Int. Cl.[5] E01C *1/00*
U.S. Cl. 33—281 5 Claims



1. Apparatus for providing a measure of azimuth and dip angles for geologic mapping, particularly where magnetic compasses are not appropriate, the apparatus comprising:
a base,
carriage means rotatably mounted on said base so as to enable rotation of said carriage means through azimuth angles,
laser means, having a long axis and rotatably mounted on said carriage means so as to enable rotation of said laser means about said long axis through a dip angle, for producing a laser beam,
a diverging lens means for receiving said laser beam and for

causing said beam to diverge into a diverging substantially planar beam,

first encoder means connected to said carriage means for generating a first output signal indicating the azimuth angle of the laser means, and

second encoder means connected to said laser means for generating a second output signal indicating the dip angle of the laser means based on said laser means rotating about said long axis.

5,189,800

DEVICE FOR DRAWING ELLIPTICAL CURVES

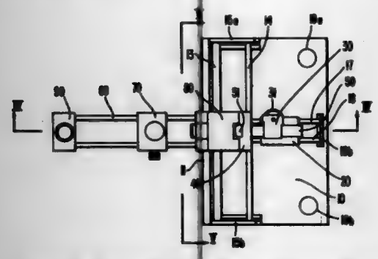
Shiro Morita, 17-10, Sennari 2-chome, Sakura-shi, Chiba 285, and Kazuo Yoshitake, 32-21, Minamihanahata 3-chome, Adachi-ku, Tokyo 121, both of Japan

Continuation of Ser. No. 520,617, May 8, 1990, abandoned. This application Feb. 19, 1992, Ser. No. 837,700

Claims priority, application Japan, May 8, 1989, 1-114768

Int. Cl.[5] B43L *11/04, 11/055*

U.S. Cl. 33—30.1 **4 Claims**



1. A device for drawing an elliptical curve having a major x-axis 2(A+B) and a minor y-axis 2A, said axes being perpendicular to one another, said device comprising:

a generally planar base plate having a straight side;

an elongated x-axis guide track structure mounted on said base plate, said x-axis guide track structure extending along said straight edge, said x-axis guide track structure comprising a pair of elongated, longitudinally extending, laterally spaced, x-axis guide rod elements having circular transverse cross-sectional configurations;

an elongated y-axis guide track structure mounted on said base plate, said y-axis guide track structure extending perpendicularly to said straight edge and having a first center line extending therealong, said y-axis guide track structure comprising a pair of elongated, longitudinally extending, laterally spaced y-axis guide rod elements having circular transverse cross-sectional configurations, said y-axis guide rod elements being disposed on opposite sides of said first center line, said guide member track structures being fixed relative to one another;

a y-axis movable member mounted on said y-axis guide track structure, said y-axis movable member having a pair of spaced first openings therein, said y-axis guide rod elements each being received in a respective one of said first openings, said first openings permitting movement of said y-axis movable member along said y-axis guide rod elements with the y-axis guide rod elements disposed therein;

pivot structure carried by said y-axis movable member for movement therewith along said y-axis guide track structure, said pivot structure being pivotally mounted on said y-axis movable member for rotation about a first axis extending through said first center line and perpendicularly to the plane of said base plate;

an x-axis movable member mounted on said x-axis guide track structure, said x-axis movable member having a pair of spaced second openings therein, said x-axis guide rod elements each being received in a respective one of said second openings, said second openings permitting movement of said x-axis movable members along said x-axis guide rod elements with the x-axis guide rod elements disposed therein;

an elongated first arm having a pair of spaced ends and a second center line extending between said ends, said pivot structure including a releasable clamp gripping one end of the first arm, the other end of said first arm being pivotally mounted on said x-axis movable member for movement therewith along said x-axis guide track structure and for rotation relative thereto about a second axis extending perpendicularly of the plane of said base plate, said first and second axes being disposed to extend through said second center line, said clamp being selectively releasable to permit movement of the arm relative to the pivot structure in a direction longitudinally of the arm to thereby change the magnitude of the distance B between said first and second axes;

an elongated extension arm detachably mounted on said outer end of the first arm for movement with said first arm as it pivots about said first and second axes, said extension arm extending outwardly away from said x-axis movable member on the opposite side thereof from said one end of the first arm, said elongated extension arm having a third center line extending therealong, said third center line being disposed in end-to-end alignment with said second center line; and

a drawing instrument adjustably mounted on said extension arm at a position spaced from said second axis by the distance A, said instrument being movable along said extension arm to selectively change the magnitude of said distance A, said drawing instrument being mounted for making its mark at a point disposed beneath said third center line.

5,189,801

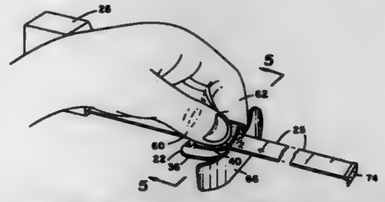
SPEED GUIDE

Gary E. Nicely, General Delivery, Sharps Chapel, Tenn. 37866

Filed Jan. 17, 1992, Ser. No. 822,435

Int. Cl.[5] B43L *13/02*

U.S. Cl. 33—42 **19 Claims**



1. A guide facilitating the movement of a tool along the edge of an article wherein the tool has a preselected section having two opposite sides which extend toward and terminate along a linear edge and the preselected section is arcuate in shape as a path is traced across the preselected section in a direction which is substantially normal to the linear edge, the guide comprising:

an attachment portion being U-shaped in cross section so as to provide a U having two opposite side members positionable on opposite sides of the preselected section of the tool with which the guide is to be used, at least one of the side members of the U having an arcuate portion which is shaped generally complimentary to that of the preselected section of the tool when the U of the attachment portion is positioned thereabout, the side members being compressible with the fingers of a user against the opposite sides of the preselected tool section so that an appreciable amount of the surface area of said one side member contacts a surface of the preselected tool section to maintain the attachment portion in a fixed position upon the tool section during use of the guide, and

a fence portion joined to the attachment portion including means defining a plane adapted to be slidably moved along the edge of the article so that as the attachment portion is compressed about the tool section with the fingers as aforesaid and the plane-defining means is slidably moved along the edge of the article, the fence portion is disposed generally between the edge of the article and the fingers of the user;

the attachment portion being constructed of a resiliently flexible material and the side members of the U of the attachment portion being joined by a bend which is devoid of sharp corners to accommodate a flexing of the side members between a flexed condition at which the space provided between the side members accepts a tool section having a thickness, as measured between the two opposite sides thereof, within a broad range of thicknesses and a compressed condition at which the side members are firmly compressed against the opposite sides of the tool section.

5,189,802

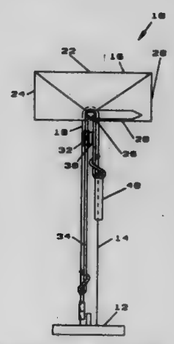
VEHICLE PARKING GUIDE

Willis E. Bergfield, 7505 Walnut Canyon Dr., Moorpark, Calif. 93021

Filed May 11, 1992, Ser. No. 881,077

Int. Cl.[5] B60Q *9/00*

U.S. Cl. 33—264 **15 Claims**



1. A vehicle parking quidel comprising:

a base,

a support member projecting vertically upward from said base,

a position display board mounted on said support member in a position clearly visible by the driver of a vehicle to be parked and carrying indicating means positionable to advise the driver when the vehicle is in a desired parking range, and

means engageable by a vehicle approaching said parking guide to move said indicating means in an manner proportional to the distance of said vehicle from the desired parking position.

5,189,803

DEVICE FOR MEASURING THE FIRST DOWN IN FOOTBALL

Alvin J. Caywood, Garland, Tex., assignor to Dalco Athletic Lettering, Inc., Garland, Tex.

Filed Jul. 22, 1991, Ser. No. 733,700

Int. Cl.[5] G01C *15/00*

U.S. Cl. 33—289 **11 Claims**

1. A device for measuring the position of a football on a football playing field comprising: a base adapted to be placed in juxtaposition on a yard line on the football playing field; a first elongated member to determine the distance the football is positioned relative to said base; a second elongated member to visually indicate the location of said base; first means for pivotally connecting said first elongated member to said base to permit said first elongated member to be selectively rotated into engagement with said second elongated member and into

a measuring position; and second means for pivotally connecting said second elongated member to said base so that said base remains substantially in juxtaposition with the line on the field when said first and second members are moved relative to said base when marking the position of the football on the field.

5,189,804

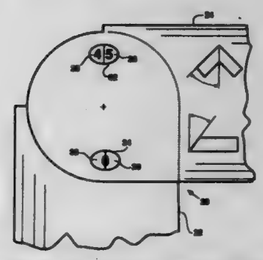
ANGLE INDICATING INSTRUMENT

Edward Ostachowski, 1316 Canford Crescent, Mississauga, Ontario, Canada L5J 3N1

Filed Feb. 1, 1991, Ser. No. 649,904

Int. Cl.[5] B43L *7/10*; G01B *3/56*

U.S. Cl. 33—471 **4 Claims**



1. An angle indicating instrument, wherein said instrument is adapted for engagement over a range of angles of from slightly greater than 0° up to 180°, any such angle being referred to as the engaged angle when engaged by said instrument, wherein said engaged angle relates to a piece of material to be cut, and wherein said instrument is used to directly indicate and specifically refer to a cutting angle of a beveled cut to be made in said piece of material; said angle indicating instrument comprising:

a first arm;

a second arm;

said first and second arms being joined together in angularly variable relation to one another, with the angle between said first arm and said second arm being said engaged angle; wherein said first arm has an angle indicating means for indicating angles that are the complement of one half of said engaged angle, and that are to be used for forming

a beveled cut to be made in said piece of material to be cut in order to adapt said piece of material for beveled adjoinment to another piece of material, wherein said angle indicating means comprises a first scale on a first surface of said first arm, and wherein said first scale is a scale that has angle readings of from 0° to 90° that are evenly displayed over a range of 180°;

and wherein said angle indicating means comprises a second scale on said first surface opposite said first scale, and wherein said second scale indicates an angle that is complementary to said engaged angle for acute values of said engaged angle, and indicates an angle that is 90° less than said engaged angle for obtuse values of said engaged angle over a range of 180°; and

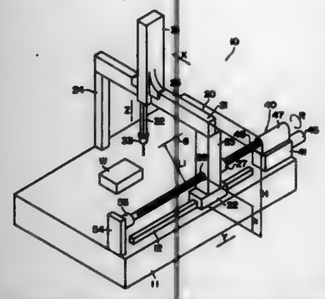
a reference means on said second arm for simultaneously reading an angle on said first and second scales.

5,189,805

COORDINATE MEASURING MACHINE

Masakazu Matsumoto, and Keizo Takahashi, both of Utsunomiya, Japan, assignors to Mitutoyo Corporation, Tokyo, Japan

Filed Sep. 24, 1991, Ser. No. 764,710
Claims priority, application Japan, Sep. 28, 1990, 2-102138[U]
Int. Cl.[5] G01B 5/03
U.S. Cl. 33—503 **6 Claims**



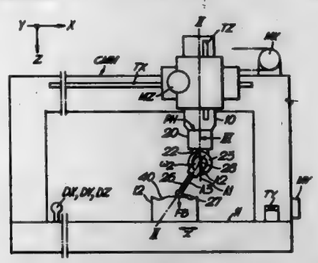
1. A coordinate measuring machine having a table, a gate-type slider device, movable on said table, including a pair of columns in a parallel state to each other and a beam crossing from one column to another, a measuring element movable on said gate-type slider device and driving means for moving the slider device with reference to the table, so that the coordinate measuring machine is capable of the measurement of dimensions and configurations of an object to be measured by using the measuring element, wherein said driving means includes a ball screw in a state which is parallel to the surface of the table and is rotatably and directly connected by a nut member mounted on at least one of said columns and is oriented in accordance with a dimensional range defined by a formula of $1/6H \leq h \leq 5/6H$, wherein "H" is a distance from the surface of the table to the top of the gate-type slider device, and "h" is a distance from the surface of the table to the center axis of the ball screw.

5,189,806

METHOD OF AND APPARATUS FOR SCANNING THE SURFACE OF A WORKPIECE

David R. McMurtry, Wotton-Under-Edge, and Brian C. R. Henning, Thornbury, both of United Kingdom, assignors to Renishaw plc, Gloucestershire, England

Continuation of Ser. No. 555,464, Filed a Pct/GB89/01504, Dec. 16, 1989, abandoned.
This application Aug. 17, 1992, Ser. No. 928,667
Claims priority, application PCT Int'l Appl., Dec. 19, 1988, PCT/GB88/01135; United Kingdom, Apr. 19, 1989, 8908854
Int. Cl.[5] G01B 5/03, 7/03
U.S. Cl. 33—503 **36 Claims**



1. Apparatus for gathering data relating to a surface of a workpiece, the apparatus including a part of a coordinate positioning machine, and comprising:

a surface detecting device;

support means for mounting the surface detecting device for movement within a three-dimensional reference framework, the support means being supported on the part of the coordinate positioning machine;

means for producing relative movement between the surface detecting device and the surface to bring the surface detecting device into a predetermined spatial relationship with the surface;

means for producing relative movement between the surface detecting device and the surface along a path at constant speed within the reference framework, whereby the surface detecting device passes over the surface;

means for simultaneously producing relative oscillatory movement between the surface detecting device and the surface in a direction transverse to said path such that said surface detecting device moves through a plurality of locations; and

means for determining at said plurality of locations relative to a datum position;

(a) an instantaneous position of the surface detecting device relative to the support means; and

(b) an instantaneous position of the part of the coordinate positioning machine, whereby data in respect to the positions of a plurality of points of the work surface relative to said reference framework may be gathered.

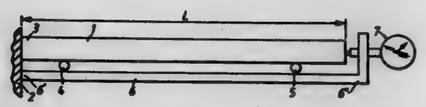
5,189,807

METHOD AND ARRANGEMENT FOR DETERMINING THE LINEAR (HEAT) EXPANSION OF ELONGATED BODIES

Carl-Erik Gustafsson, Eskilstuna, Sweden, assignor to C. E. Johansson AB, Eskilstuna, Sweden

Filed Feb. 3, 1992, Ser. No. 829,296
Claims priority, application Sweden, Feb. 8, 1991, 9100393
Int. Cl.[5] G01B 11/04
U.S. Cl. 33—702 **26 Claims**

1. An arrangement for determining and enabling for compensating for linear, heat, expansion of at least one elongated body means, at least a portion of which constitutes a physical length scale means wherein measurement errors occur because of length deviations caused by deviations from a reference temperature at which the length of said body means was calibrated, and wherein at least one elongate reference element is provided, and devices (7, 12) are included for measuring the linear expansion of the elongated body means (1, 8, 22, 24, 28) relative to said at least one reference element (6, 9), said reference element being made from a material having a known



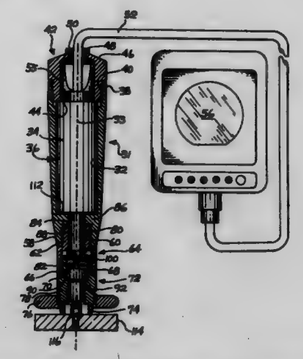
thermal coefficient of linear, heat, expansion (α) which deviates from the coefficient of linear, heat, expansion of the elongated body means material, thereby enabling a compensation factor, for correcting the length of the elongated body means, to be determined.

5,189,808

MEASUREMENT GAUGE

Michael D. Evans, Kent; Curtis L. Gnagy, Renton; William F. Herold, Kirkland; Christopher W. Lagerberg, Seattle, and Bruce W. Nelson, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 3, 1991, Ser. No. 709,927
Int. Cl.[5] G01B 3/56
U.S. Cl. 33—836 **20 Claims**



1. A gauge for measuring the depth of a countersink in a workpiece or the protrusion of a fastener head above said workpiece, comprising:

a tubular foot having an axial bore and an annular ring for contacting the surface of said workpiece around said countersink or said fastener head;

a probe mounted in said axial bore of said tubular foot for axial guided sliding movement therein, said probe having a top surface at one end and a tip at the other end thereof;

a transducer having a body and a stud, said stud having a tip which is axially movable along a longitudinal axis relative to said body, said tip having a distal end remote from said body;

said transducer having a sensor for measuring the displacement of said tip relative to said body;

a device for attachment to said transducer to establish a fixed reference location thereon for fixing the position of said transducer relative to said tubular foot;

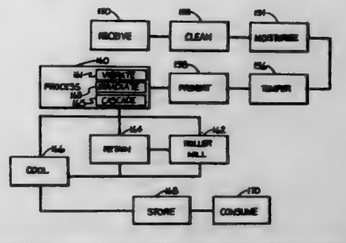
a connector for removably connecting said tubular foot to said attachment device in such a position that said transducer tip contacts said probe top surface when said probe tip is centered in and contacting said countersink or said fastener head, so that said transducer accurately measures the position of said probe tip relative to said workpiece surface into said countersink or on said fastener head.

5,189,809

VIBRATORY BULK MATERIAL PROCESSING METHOD

Richard G. Bailey, Overland Park, Kans., and Merton R. Leggott, Lincoln, Nebr., assignors to Flakee Mills, Inc., Lincoln, Nebr.

Division of Ser. No. 420,030, Oct. 11, 1989, Pat. No. 5,023,429.
This application Jun. 18, 1991, Ser. No. 716,858
Int. Cl.[5] F26B 7/00
U.S. Cl. 34—1 W **6 Claims**



1. A bulk material processing method, which includes the steps of:

(a) providing a frameword assembly;

(b) providing a tray assembly with a pair of transversely-spaced sidewalls, an upper plate extending transversely between said sidewalls and including a material-receiving upper surface and longitudinally-spaced upstream and downstream ends, a lower plate extending transversely between said sidewalls and including a material-receiving upper surface and longitudinally-spaced upstream and downstream ends, longitudinally-spaced upstream and downstream tray assembly ends;

(c) mounting said tray assembly on said framework assembly;

(d) depositing the bulk material on the upper plate material-receiving upper surface in proximity to the upstream end thereof and between said tray assembly sidewalls;

(e) vibrating said tray assembly with a vibrator;

(f) moving said bulk material flow path from said tray assembly upstream end to said tray assembly downstream end;

(g) moving said bulk material along said material flow path over said plate material-receiving upper surfaces and between said tray assembly sidewalls;

(h) subjecting said bulk material to energy in the infrared range as said bulk material is moved along said material flow path; and

(i) dampening vibration from said vibrator with respect to said frame assembly and said tray assembly.

5,189,810

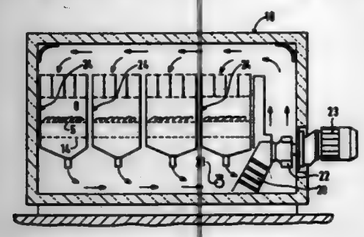
METHODS AND APPARATUS FOR THE CONTINUOUS HEAT TREATING OF YARN

Gerhard Vetter, Sinzen, Fed. Rep. of Germany, assignor to Michael Horauf Maschinenfabrik GmbH & Co. KG, Dourdorf, Fed. Rep. of Germany

Filed Oct. 24, 1990, Ser. No. 603,303
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1989, 3938183
Int. Cl.[5] F26B 7/00
U.S. Cl. 34—1.8 **9 Claims**

9. A method of heat treating previously mechanically compressed yarn comprising the steps of depositing the yarn in loop form onto an upper support surface of a perforated non-metallic net conveyor belt means, passing said conveyor belt means through an inlet of an open heating chamber and into said heating chamber which is operating at atmospheric pres-

sure passing said conveyor belt means lengthwise through said heating chamber such that said support surface extends substantially horizontally across a lateral width of said heating chamber, circulating superheated steam within said heating chamber, guiding said steam downwardly toward said upper surface of said conveyor belt means and toward the yarn disposed thereon, and passing said conveyor belt means and the yarn through an outlet of said heating chamber, said guiding step including guiding superheated steam through a plurality



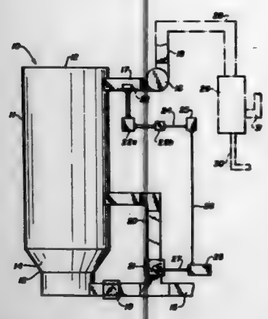
of laterally adjacent lengthwise extending channels of a flow rectifier, then passing the superheated steam through a perforated plate disposed downstream of said channels with reference to the flow of superheated steam and extending across said lateral width, and then passing the superheated steam past a pair of downwardly converging guide surfaces disposed downstream of said perforated plate and upstream of said conveyor belt means so that superheated steam received from the perforations of said perforated plate is accelerated as it approaches said conveyor belt means.

5,189,811

METHOD AND ASSEMBLAGE FOR CONTROLLING AND MANAGING LOWER EXPLOSION LEVELS

James C. Rose, Fremont, and Thomas P. DiNardo, Raleigh, both of N.C., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 18, 1992, Ser. No. 853,378
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—29 **6 Claims**



1. An assemblage for controlling and managing the lower explosive level in an oven or furnace used to dry or process products containing a volatile or combustible material, said assemblage comprising:

(a) an oven or furnace having a closed upper end, a lower end having a receptacle adapted to receive a charge of product containing a volatile or combustible material therein and side walls interconnecting said upper and lower ends defining an oven or furnace body therebetween;

(b) a primary air conduit equipped with a valve means and communicating with said lower end through which a primary supply of air is conveyed through a product charge contained in said receptacle;

(c) conduit means communicating at one end with said body adjacent said closed upper end and connected to an air pump or blower at its other end;

(d) an exhaust conduit secured to said air pump or blower for exhausting air removed from said body into the atmosphere;

(e) a supplemental air conduit equipped with a valve means and communicating at one end with said body intermediate said upper end and said receptacle and communicating at its other end with said primary air conduit and through which a supplemental supply of air is delivered into said body;

(f) sensing means within said communicating conduit for monitoring the concentration of said volatile or combustible material present in the air conveyed through said communicating conduit; and,

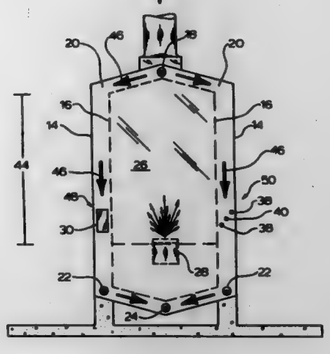
(g) regulating and control means interconnected with said sensing means and said supplemental air conduit to control and regulate the rate at which air is conveyed through said primary and supplemental air conduits such that the lower explosive limit of said volatile or combustible material within said body is maintained at or below a predetermined level.

5,189,812

MOISTURE SENSOR FOR A CONTINUOUS FLOW DRYER

Randall J. Ediger, Hampton, Nebr., assignor to Optek, Inc., Galena, Ohio

Filed Sep. 24, 1990, Ser. No. 588,077
Int. Cl.[5] F26B *21/00, 17/12, 25/22, 3/14*
U.S. Cl. 34—54 **8 Claims**



1. A grain moisture sensor adapted for controlling the flow of grain in a continuous flow grain dryer having spaced apart exterior and interior walls, a generally continuous flow of grain between said exterior and interior walls, which flow is fed by an input means at the dryer top and flows down the length of the dryer walls to a variable discharge means, said interior walls partially defining a heat plenum, a source of hot air in communication with said plenum, said exterior and interior walls each having numerous small holes through which heated air from said heat plenum may flow, the general vertical extent of the space between said exterior and interior walls through which said hot air flows being referred to as a heat zone, said heated air flow being operative to reduce the moisture content of said grain flowing through said heat zone, said grain moisture sensor comprising:

a plurality of conductors for communicating a variable voltage between two points;

support means adapted for supporting said conductors in the heat zone of the dryer, and oriented in such a way as to allow the grain to substantially fill the space between said conductors and to flow between said conductors in response to the operation of said variable discharge means;

an electrical circuit including measuring means for determining the capacitance and temperature of said conductors, control logic means electrically connected to said measuring means and operative to calculate the percentage moisture content of the grain between said conductors as a function of said capacitance and temperature, said control logic means also electrically connected to said variable discharge means and operative to control the speed of said variable discharge means;

said plurality of conductors comprising at least one capacitor including at least a pair of substantially flat capacitor plates, mounted in a spaced relation from the walls, substantially parallel to each other and substantially vertically;

said measuring means including an oscillator electrically connected to said capacitor so as to produce a variable voltage of a frequency indicative of the capacitance of said capacitor with grain between plates whose moisture/-dielectric properties change the overall capacitance of the sensor system and a conversion means for communicating said frequency level to said control logic means;

said conversion means including a frequency-to-voltage converter an analog-to-digital converter operative to convert said frequency to a voltage level and to communicate said voltage level to said control logic means;

a control panel mounted exteriorly of said dryer and electrically connected to said control logic means, said control panel including means for communicating to said control logic means desired grain moisture content, grain type, and fine calibration;

said control panel further including means for displaying moisture content information calculated by said control logic means; and

said electrical circuit further including a communication means operative to effect communication between the sensor and external devices.

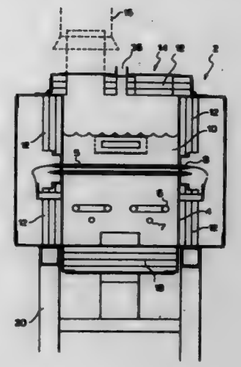
5,189,813

FLUIDIZED BED AND METHOD OF PROCESSING MATERIAL

James E. Heath, Burlington, Canada, and Scott L. Angell, Blaine, Minn., assignors to Samuel Strapping Systems Ltd., Mississauga, Canada

Filed Feb. 22, 1991, Ser. No. 658,650
Int. Cl.[5] F26B *17/00*
U.S. Cl. 34—57 A **3 Claims**

1. In a fluid bed having a retort and a plurality of lamps which emit energy for heating of the particles of the fluid and means for fluidizing said bed, wherein said lamps are in direct contact with the particles of the fluid bed and said lamps extend through said bed and are submerged within said bed, said fluidizing means effectively fluidizing the particles in said bed to achieve effective fluidizing along at least the portion of each



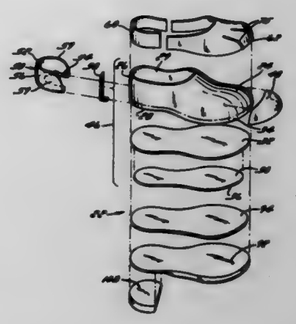
lamp which effectively emits the radiation and avoiding localized overheating or contamination of the lamps.

5,189,814

REINFORCED RUBBER FOOTWEAR PRODUCT

Tarachand S. Barma, La Crosse, Wis., assignor to La Crosse Footwear, Inc., La Crosse, Wis.

Filed Mar. 16, 1990, Ser. No. 495,021
Int. Cl.[5] A43B *13/42, 1/10*
U.S. Cl. 36—4 **14 Claims**



1. A vulcanized rubber footwear product, comprising:

an upper portion; and

a lower, generally shoe-shaped portion secured to said upper portion, said lower portion comprising an inner layer of vulcanized rubber, an outer layer of vulcanized rubber, a rigid heel counter in a heel portion thereof interposed between and enclosed by said inner and outer rubber layers, and means for securing said heel counter to at least one of said rubber layers.

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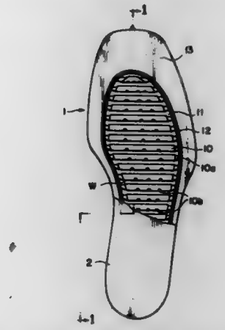
5,189,815
SKI BOOT WITH FLEXIBLE METATARSAL, TIBIAL AND CALF PORTIONS
Alessandro Pozzebon, Paderno Di Ponzano Veneto; Giancarlo Foscaro, Treviso, and Adolfo Pozzebon, Sala D'Istrana, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy
Filed Oct. 28, 1991, Ser. No. 783,758
Claims priority, application Italy, Nov. 7, 1990, 40144 A/90
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **11 Claims**

1. A ski boot comprising a rigid shell having a rigid sole and rigid toe and heel portions, said shell further having a pair of opposite rigid lateral malleoli portions extending upwardly from said sole and past a user's ankle region, and a rigid rear portion extending upwardly from said heel portion, a longitudinal opening being provided in said rigid shell, said longitudinal opening extending from said toe portion past a user's upper metatarsal region and tibial region, a rear recess also being provided in said rigid shell above said rigid rear portion and at a user's calf region, the ski boot further comprising a flexible band member being connected to said shell and covering said longitudinal opening at said metatarsal region, said flexible band member comprising at least one first flexible flap element arranged at said longitudinal opening and being releasably closable for closing said longitudinal opening at said metatarsal region, the ski boot further comprising a quarter which is connected to said shell and which extends around and overlies said lateral malleoli portions, said rear portion, and said longitudinal opening at said tibial region, said quarter comprising at least one second flexible flap element arranged at said longitudinal opening and being releasably closable for closing said longitudinal opening at said tibial region, said quarter being provided with an opening overlying said rear recess of said shell, said quarter further comprising a flexible insert being connected to said quarter and covering said opening thereof, the ski boot further comprising means for releasably closing said at least one first flap element at said metatarsal region, and means for releasably closing said at least one second flap element at said tibial region.

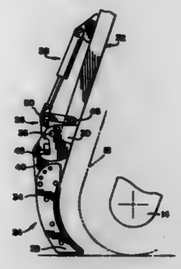
5,189,816
MID-SOLE OR SOLE OF SHOES
Osamu Shibata, Tokyo, Japan, assignor to Kabushiki Kaisha Himiko, Tokyo, Japan
Filed Oct. 24, 1991, Ser. No. 820,381
Claims priority, application Japan, Nov. 22, 1990, 2-316195; Apr. 25, 1991, 3-121943
Int. Cl.[5] A43B *13/18, 13/20, 13/38*
U.S. Cl. 36—28 **10 Claims**

1. A sole of shoes comprising:
an elongated bottom plate having a longitudinal axis, said bottom plate having a wall portion defining a recess in said bottom plate, said bottom plate having a peripheral edge portion;
a plurality of elongated blades disposed in said recess and having longitudinal axes extending generally perpendicular to said longitudinal axis of said bottom plate, said blades being slanted relative to said bottom plate, said blades having longitudinal ends;
a cover sealed to said peripheral edge portion of said bottom plate to thereby define a sealed enclosure between said bottom plate and said cover;
said blades having an initial unflexed height greater that the depth of said recess such that said blades have upper edge portions which extend beyond said wall portion which define said recess when said blades are in said initial unflexed state;
webs connecting said longitudinal ends of said blades to said wall portion of said bottom plate, said webs having a height less than said height of said blades;



said blades having notches opening up onto said upper edge portions of said blades and extending partially into said blades so as to have a height less than the height of said blades; and
liquid means in said sealed enclosure and operable to provide a massaging effect to a person who walks with said shoes as said liquid means passes back and forth through said notches and past the free ends of said blades and said webs.

5,189,817
CRUMBER MECHANISM FOR A TRENCHER MACHINE
Philip W. Schroeder, Derby, Kans., assignor to Case Corporation, Racine, Wis.
Filed Jul. 24, 1992, Ser. No. 919,290
Int. Cl.[5] E02F *5/06*
U.S. Cl. 37—86 **7 Claims**

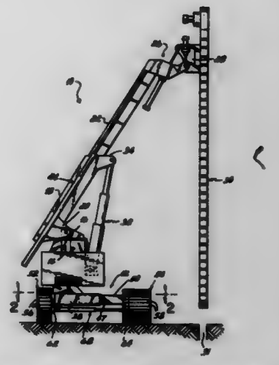


1. A crumber mechanism for a trencher machine having a digging chain assembly mounted for orbital movement about an elongated boom, said crumber mechanism comprising:
a support boom attached to said elongated boom;
a crumber shoe pivotally mounted on said support boom for swinging movement in a generally vertical plane of travel between working and non-working positions;
a fluid powered motor operatively coupled to said support boom and said shoe;
a linkage mechanism mounted on said support boom and coacting with said motor to move said shoe between positions in response to operation of said motor, said linkage mechanism connecting said motor and said shoe; and
means for releasably locking said crumber shoe in a working position relative to said support boom, said locking means including a lock carried by said linkage mechanism and a slotted groove defined by said support boom, an elongated slot defined by said shoe and in response to operation of said motor, said lock being movable into locking coaction with said slotted groove when said shoe is moved into its working position thereby relieving the motor of hydraulic stresses during a trenching operation and which is automatically released from said groove upon movement of said shoe toward said non-working position.

5,189,818
FOOTWEAR LACE LOCKING ASSEMBLY
Joseph J. Skaja, San Antonio, Tex., assignor to Kaepa, Inc., San Antonio, Tex.
Continuation of Ser. No. 477,598, Feb. 9, 1990, abandoned, which is a continuation of Ser. No. 74,953, Jul. 17, 1987, Pat. No. 4,899,466, which is a continuation-in-part of Ser. No. 916,531, Oct. 8, 1986, abandoned. This application Feb. 28, 1991, Ser. No. 663,287
Int. Cl.[5] A43B *11/00*; A43C *5/00*
U.S. Cl. 36—50.1 **12 Claims**

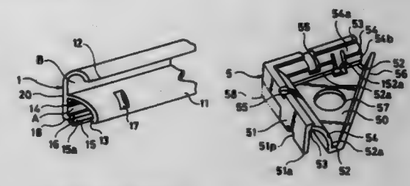
12. In a lacing assembly for an article of footwear:
(a) a first vamp section including opposed vamp portions and a second vamp section, disposed upwardly adjacent of the first vamp section and including opposed vamp portions,
(b) the first vamp portions having an upper end and a lower end and a plurality of lace-receiving eyelets including a pair of opposed eyelets disposed at said upper end,
(c) the second vamp portions having an upper end and a lower end and a plurality of lace-receiving eyelets including a pair of opposed eyelets disposed at said lower end, adjacent said first vamp portion upper end eyelets,
(d) at least one pair of adjacent end eyelets including locking means for each of said pair of end eyelets, said locking means including an individual plate portion providing an eyelet opening and an elongate relatively narrow communicating slit, and
(e) a single continuous lace having opposed side lengths, said side lengths being received by opposed lace-receiving eyelets in said first vamp portions, and said side lengths extending between said first and second vamp sections and being received by opposed lace-receiving eyelets in said second vamp portions, said lace being received by the slit of said lace-receiving locking eyelets in selectively lockable friction relation to permit the first vamp section to be adjusted and maintained in adjustment substantially independently of the second vamp section, the lacing assembly having a longitudinal axis the slits having parallel sides and a width less than the thickness of the lace to provide said friction relation said slits having a length substantially greater than the size of the communicating opening.

5,189,819
TRENCHING APPARATUS
Randy J. Holloway; Bruce E. Moore, and Ronald R. Shinn, all of Lubbock, Tex., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio
Filed May 8, 1991, Ser. No. 696,873
Int. Cl.[5] E02F *5/06*
U.S. Cl. 37—87 **9 Claims**



2. Apparatus for digging a trench, comprising:
a base support having opposed sides;
a digger arm for digging a trench along a trench line;
means for mounting said digger arm to said base support;
a first track assembly mounted on a side of said base support closest to the trench line, and a second track assembly mounted to the opposite side of said base support, said first track assembly having a greater width than said second track assembly to provide an expanded load bearing surface closest to the trench formed by said digger arm.

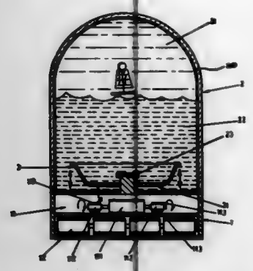
5,189,820
FRAME
Takeo Komamura, Nakakasasugi, Matsudo-shi, Chiba, Japan
Filed Sep. 10, 1990, Ser. No. 580,222
Claims priority, application Japan, May 23, 1990, 131157
Int. Cl.[5] G09F *1/12*
U.S. Cl. 40—156 **12 Claims**



1. A frame, comprising:
a plurality of elongate frame elements each of a respective predetermined length; and
at least one connecting corner element, having intersecting sides formed to be shorter than said frame elements, to which sides said frame elements are respectively mounted angularly with respect to each other, said sides defining with said frame elements means for engaging therewith in a manner permitting relative angular movement therebetween,
wherein at least one of said frame elements is mounted to a corresponding side of said at least one connecting corner element for said angular movement relative thereto about a direction parallel to said corresponding side, and

each side of said at least one connecting corner element comprises a side plate having a lower end formed with a convex shaft section.

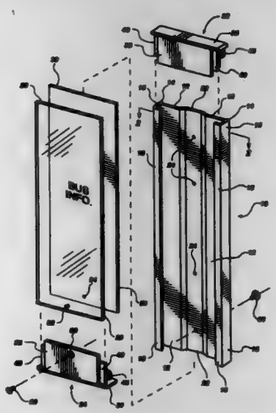
5,189,821
LIQUID WAVE DISPLAY ORNAMENT
Vincent K. W. Lee, No. 44, Lane 458, Sheh Chung Street, Taipei, Taiwan
Filed Nov. 12, 1991, Ser. No. 790,454
Int. Cl.[5] G09F *19/02*
U.S. Cl. 40—406 **5 Claims**



1. A liquid wave display ornament comprising:
a) a base;
b) a transparent liquid container supported on the base and filled with two liquids of different specific gravities;
c) a guide rod extending from the bottom of the liquid container;
d) a diaphragm supported for movement on the guide rod and including at least one magnet secured to a bottom portion thereof; and
e) a variable magnetic device supported by the base and positioned below the magnet of the diaphragm, which magnetic device includes means for alternatively exposing magnetic forces of opposite polarities to the magnet for alternatively repulsing and attracting the magnet, thereby imparting a corresponding movement to the diaphragm for creating waves in the liquids.

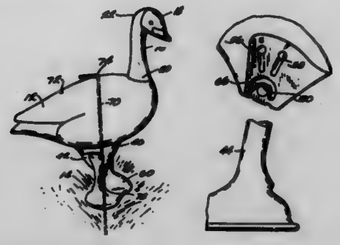
5,189,822
TAMPER RESISTANT SIGN
Donald W. Schmanski, and Andrew J. Huntington, both of Carson City, Nev., assignors to Carsonite International, Carson City, Nev.
Filed Aug. 24, 1990, Ser. No. 571,982
Int. Cl.[5] G09F *7/02*
U.S. Cl. 40—611 **8 Claims**

1. An elongate, tamper resistant sign for flush mounting to a support wall, said sign comprising:
an elongate, sturdy back wall having a central elongate axis, and including top and bottom ends and respective lateral side edges;
a pair of ribs extending backwardly from the respective lateral side edges of said back wall;
opposite side walls including forward side edges and extending forwardly from the respective side edges of said back wall, with said side walls being contiguous with the respective ribs at the respective side edges of said back wall;
a pair of flanges including lateral edges and extending toward each other from the forward side edges of said side walls so that the respective flanges, side walls, and side edge portions of said back wall form respective channels along the side edges of said back wall, with said channels facing each other and including upper and lower ends;
means for mounting the back wall to said support wall such that the ribs at the respective lateral side edges of said back wall are held tight and flush against said support wall, with each rib and associated sidewall forming a combined structure that inhibits insertion of a prying element between the rib and the support wall;
an elongate depression formed along the central elongate axis of said back wall, with the depression protruding backwardly from said back wall to a depth substantially the same as the distance that said pair of ribs extend from the lateral side edges of said back wall;
wherein said means for mounting the back wall to said support wall comprises openings in said depression and fastener elements extending through said openings to engage said support wall;
an insert panel received within the channels and lying adjacent to the back wall;
display graphics formed on the surface of said insert panel which faces away from said back wall;
a clear protective panel received within the channels to overlie the insert panel;
an upper end cap, a portion of which fits within the channels to close the upper ends of the channels and thus prevent withdrawal of said insert panel and said clear protective panel from the upper ends of said channels; and
a lower end cap which fits within the channels to close the lower ends of the channels and thus prevent withdrawal



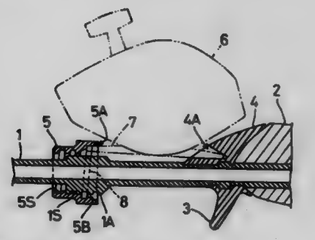
of said insert panel and said clear protective panel from the lower ends of said channels;
wherein the upper end cap comprises
a cap plate including front and back side edges and having dimensions to completely cover the top end of the back wall, the ends of the channels and ends of the ribs;
a front plate having front and back faces and opposite lateral sides and extending downwardly from the front side edge of said cap plate, said front plate sliding downwardly to its operative position between the lateral edges of the pair of flanges which form said channels;
a pair of fins connected to the back face of the front plate and extending from the opposite lateral sides of said front plate toward the respective side walls, with the fins engaging said pair of flanges when the front plate slides downwardly to its operative position;
at least one projection extending from the back face of the front plate to engage said back wall when the front plate slides downwardly to its operative position; and
a pair of back plates extending downwardly from the back side edge of said cap plate, said back plates sliding downwardly along said back wall between the respective ribs at the lateral edges of said back wall and the depression protruding backwardly from said back wall.

5,189,823
DECOY INCLUDING BODY POSITIONABLE IN ALTERNATIVE POSITIONS
Charles A. Lanius, Prairie du Sac, Wis., assignor to Flambeau Products Corporation, Middlefield, Ohio
Filed Apr. 26, 1991, Ser. No. 692,117
Int. Cl.[5] A01M *31/06*
U.S. Cl. 43—3 **13 Claims**



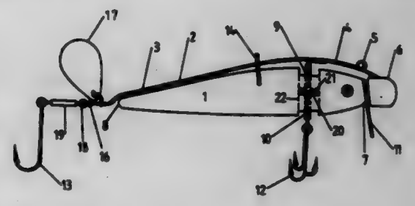
1. A decoy comprising:
a decoy body having opposite sides and one of a projection and a pair of spaced apart apertures on one of the opposite sides, and
a leg assembly supporting the decoy body above the ground and for selective shiftable movement between a first decoy position and a second decoy position, the leg assembly including a pair of legs releaseably engaging the opposite sides of the decoy body, one of the legs including the other of the projection and the pair of spaced apart apertures, the projection being housed in one of the apertures when the decoy body is in the first decoy position and the projection being housed in the other of the apertures when the decoy body is in the second decoy position, and means for attaching at least one of the legs to the decoy body such that the decoy body is releaseably selectively shiftable with respect to the leg assembly between the first decoy position and the second decoy position.

5,189,824
FISHING ROD
Yoshiro Yamato, Shimonoseki, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Dec. 2, 1991, Ser. No. 801,391
Claims priority, application Japan, Dec. 1, 1990, 2-400011[U]
Int. Cl.[5] A01K *87/06*
U.S. Cl. 43—22 **5 Claims**



1. A fishing rod comprising:
a fixed hood formed on a rod body;
a movable hood having an inner threaded portion engageable with a threaded portion of the rod body;
a reel seat including said fixed hood and said movable hood for supporting opposed ends of a foot of a reel;
a threaded guide groove defined at an inner peripheral face of said movable hood, said guide groove having a pitch corresponding to a pitch of said inner threaded portion and having a minimum inner diameter greater than an inner diameter of said inner threaded portion; and
a contact face defined in an inner peripheral face of said movable hood facing said fixed hood, said contact face contacting a terminal face of said reel foot in a direction substantially normal to an axis of said inner threaded portion, said contact faced fixedly supporting said reel foot to a rod by urging said terminal face of the reel foot along said axis toward said fixed hood.

5,189,825
WEIGHTED WOBBLING LURE
John E. Stewart, 46 Crowder Circuit, Stirling Canberra 2611, Australia
Filed Oct. 7, 1991, Ser. No. 768,924
Claims priority, application Australia, May 11, 1989, PJ4154; Nov. 23, 1989, PJ7537; Apr. 18, 1990, 53283/90
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.03 **12 Claims**

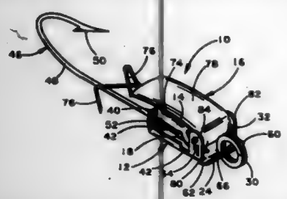


1. A fishing lure comprising:
a lure body having a front end, a rear end, and a longitudinal axis;
a framework member generally parallel to said longitudinal axis of said lure body, said framework member including a line connection means;
pivot means attaching said framework member to said lure body rearward of said lure body font end;
a weight member having a rear end and a front end, said weight member attached to said framework member, wherein said weight member is suspended forward of said lure body front end, and said line connection means located rearward and spaced from said weight member front end, and forward of said pivot means;
an action producing means comprising a bib attached to said lure body forward of said pivot means, and
a fish hooking means connected to said fishing lure; whereby said lure wobbles in an oscillating action when drawn through a body of water, said wobble action caused by a reaction force of the water on said action producing means which causes the lure body to pivot about said pivot means, and said water reaction force alternately acting on said lure body rearward of said pivot means causing said body to realign with the direction in which the lure is being drawn through the water, and said weight member stabilizing said framework member form longitudinal rotation and lateral movement when said lure is drawn through the water.

5,189,826
FISHING DEVICE
Gene A. Schlaegel, 1810 Winston Dr., Iowa City, Iowa 52245
Filed Mar. 9, 1992, Ser. No. 849,623
Int. Cl.[5] A01K *83/06*
U.S. Cl. 43—42.29 **15 Claims**

1. A fishing device, comprising:
a fixed jaw adapted for attachment to a fishing line,
a movable jaw disposed in juxtaposition to said fixed jaw and movable towards and away from the same,
a lead head jig secured to said fixed jaw,

a locking lever defining an elongated handle terminating at one end in an integral angularly disposed arm,
means pivotally securing said arm to one end of said fixed jaw above said movable jaw whereby, in locked position, said handle is in juxtaposition with said movable jaw and said arm is oriented towards and in engagement with said movable jaw,
in unlocked position, said handle and arm being movable out

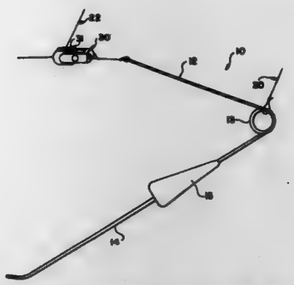


of engagement with said movable jaw whereby said movable jaw is movable away from said fixed jaw sufficiently to permit the selective insertion and removal of a bait fish therebetween, and
said handle being movable to juxtaposition with said movable jaw to effect the pivotal movement of said arm in forcible pressing engagement with said movable jaw for urging and holding said jaws in locking engagement on any bait fish therebetween.

5,189,827
FISHING SPREADER
Melvin E. Mrozek, 1835 Winslow, Attica, Mich. 48412
Filed Jan. 13, 1992, Ser. No. 819,837
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—42.74 **13 Claims**

1. A combination of a fishing device connected in a knotless connection to a continuous fishing line, comprising:
an elongated, relatively stiff spreader wire means having a first arm and a second arm, each of the arms having an inner end and an outer end, said arms each being adapted for connection to a fishing lure in a position spaced from their respective inner ends;
a generally elongated, flat body attached to the inner ends of the arms such that the outer end of the first arm is spaced with respect to the outer end of the second arm;
the body having first and second opposed sides and a pair of longitudinally spaced openings extending through the body from the first side to the second side so as to face in a common direction;
retainer structure mounted on the first side of the body substantially aligned with the pair of spaced openings;
a fishing line having a plurality of loops, each loop being received in a corresponding one of the spaced openings and at least two of the loops being wrapped around the retainer structure remote from the opening through which the loops have been inserted;
whereby the body is connected to the fishing line at a selected position along the line when the line is pulled taut.

5,189,828
DOWNRIGGER FISHING SYSTEM
Jerald C. Summers, 204 S. County Rd. 3, Fort Collins, Colo. 80524
Filed Dec. 31, 1991, Ser. No. 816,605
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—43.12 **1 Claim**



1. A method for positioning a lure below the surface of water, wherein said lure is secured to a fishing line, wherein the method comprises the steps of:
(a) providing a downrigger system comprising:
(1) a generally V-shaped body member having an upwardly extending arm member and a downwardly and rearwardly extending leg member, wherein said arm member further includes attachment means for detachably securing said line thereto; wherein said body member comprises an elongated rod member;
(2) a weight member secured to said leg member; wherein said weight member weights 5 to 12 pounds; and
(b) connecting a towing line to said body member;
(c) detachably connecting said fishing line to said arm member; and
(d) towing said downrigger system below the water surface in a manner such that said arm member and said leg member are in a vertical plane.

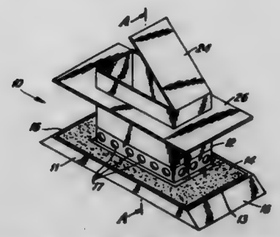
5,189,829
INSECT TRAP
Nils-Vide I. Johansson, Rinkabyholmsvägen 63, Kalmar, Sweden S-39477
Continuation of Ser. No. 671,680, Mar. 19, 1991, abandoned, which is a continuation of Ser. No. 439,597, Nov. 20, 1989, abandoned. This application Nov. 22, 1991, Ser. No. 801,614
Claims priority, application Sweden, Nov. 11, 1988, 8804173
Int. Cl.[5] A01M *1/14*
U.S. Cl. 43—114 **12 Claims**

12. A process for preparing an insect trap comprising the steps of:
(a) selecting a suitable cord having sufficient mechanical strength;
(b) selecting a suitable adhesive for coating the cord;
(c) coating the cord with the adhesive so that the diameter of the coated cord does not exceed about 5.0 mm; and
(d) arranging the cord in a substantially horizontal position in an enclosed space where insects are to be caught.

5,189,830
TICK TRAP
Donald Montemarro, Freehold, N.J., assignor to Janette Zackerman, North Bergen, N.J.
Filed Aug. 26, 1991, Ser. No. 749,962
Int. Cl.[5] A01M *1/14, 1/00*
U.S. Cl. 43—121 **5 Claims**

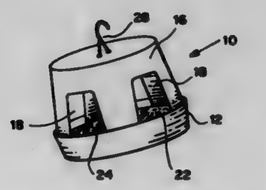
1. A tick trap comprising:
a base having an upper surface with a sticky layer thereon;

a hollow member mounted on the base and extending upwardly therefrom, said member having a plurality of portholes located at spaced intervals about the lower portion of the hollow member adjacent the upper surface of the base and comprising a box like structure having a floor extending thereacross at a distance above the base, and,



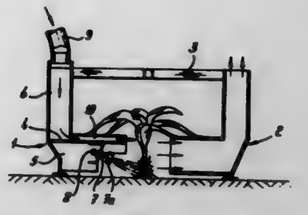
a pressurized gas tank and means to actuate said tank mounted on said floor comprising a timing circuit, a battery power supply coupled thereto and actuating means connected to said tank and to the power supply and periodically activated by the timing circuit,
wherein the gas tank releases a gas through the portholes when actuated which attracts ticks, said ticks becoming embedded in the sticky layer.

5,189,831
METHOD AND DEVICE FOR THE BIOLOGICAL CONTROL OF FLYING INSECTS
David W. Miller, Amherst, Mass.; Fernando Agudelo-Silva, San Francisco, Calif.; Haim B. Gunner, Amherst; Vanessa F. LeFevre, Northampton, both of Mass., and Meir Broza, Haifa, Israel, assignors to EcoScience Corporation, Worcester, Mass.
Continuation-in-part of Ser. No. 324,461, Mar. 15, 1989, Pat. No. 5,057,315. This application Aug. 23, 1990, Ser. No. 572,486
The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.
Int. Cl.[5] A01N *63/04*; A01M *1/10*
U.S. Cl. 43—121 **13 Claims**



1. An apparatus for control of flying insects comprising
a chamber attractive for flying insects, having at least one entrance therein for the flying insects, and containing an effective amount to lethally infect the flying insects of a live culture of a fungus that can be pathogenic for the flying insects selected from the group consisting of Metarhizium, Beauveria, Verticillium, Paecilomyces species and combinations thereof, on a nutrient medium, wherein the geometry of the chamber causes the entering insects to contact a lethal amount of the fungus.

5,189,832
DEVICE FOR THERMALLY KILLING WEEDS
Hendrik J. Hoek, Soest, and Hendrikus G. Hoogenboom, Utrecht, both of Netherlands, assignors to HOAF Apparatenfabriek B.V., Nijkerk, Netherlands
Filed Jan. 14, 1991, Ser. No. 641,060
Claims priority, application Netherlands, Jan. 15, 1990, 9000092
Int. Cl.[5] A01M *15/00*
U.S. Cl. 47—1.44 **7 Claims**

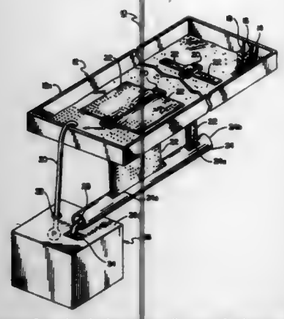


1. Device for thermally killing weeds near plants of a valuable crop arranged in rows, comprising: a frame which is intended to be moved in the direction of the rows of plants, at least one burner fixed to the frame, the nozzles of which are directed at or just above the ground, discharge means for combustion gases fitted at some distance opposite the burner nozzles, and feed means for feeding in cooling medium essentially at right angles to the direction of movement of the frame to form a cooling curtain at some distance above the place where the combustion gases of the burners will touch the ground, wherein the outflow direction of the burners runs essentially at right angles relative to the direction of movement of the frame.

5,189,833
TURF-GROWING PROCESS
Edward H. Clark, La Mesa, Calif., assignor to Conjetta M. Butt, La Mesa, Calif., a part interest
Filed Mar. 9, 1992, Ser. No. 848,676
Int. Cl.[5] A01C *1/04*
U.S. Cl. 47—56 **12 Claims**

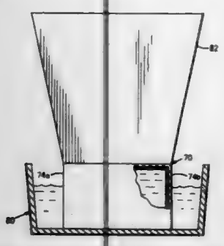
1. A turf-growing process which comprises:
covering a flat surface with an impermeable membrane;
placing a porous mat over said membrane;
spreading a growing medium to a thickness of at least 3 millimeters over said mat;
inseminating said medium with grass seeds;
keeping said medium moist through germination of said seeds;
preparing a lawn bed;
lifting said mat from said membrane; and
wherein said step of placing a porous mat comprises selecting a sheet of non-woven spun bonded polymer fiber matting.

5,189,834
IMPROVED APPARATUS FOR IRRIGATING CONTAINER GROWN PLANTS IN A CLOSED SYSTEM
Evert S. Green, 2740 Yacht Club Blvd., Ft. Lauderdale, Fla. 33304
Filed Apr. 30, 1991, Ser. No. 693,655
Int. Cl.[5] A01G *31/00*
U.S. Cl. 47—62 2 Claims



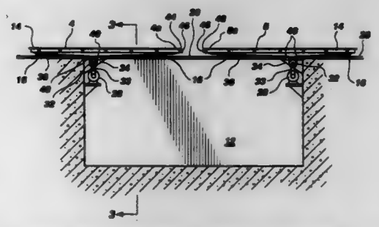
1. A system for the irrigation of potted plants each of the plant containers having a hole through its base for receiving water, said system comprising:
elongated flat planar surface defining a bench for receiving and supporting potted plants, said bench including a surrounding wall and an inner bottom surface;
first layer of horticultural capillary matting disposed on top of said bench bottom, said bench bottom being constructed of a wettable water impervious material such as plastic;
first and second capillary sheets disposed above and below, respectively, said sheet of horticultural matting, throughout said bench bottom, said bench bottom having at least one aperture disposed therethrough;
wick means disposed through said bench bottom aperture, said wick disposed about a portion of said bench bottom in contact with said first capillary sheet;
closed conduit means disposed beneath said bench, said conduit including an aperture for receiving said wick means;
reservoir means connected to said outlet of said conduit means for receiving excess water received through said wick means.

5,189,835
DEVICE FOR CONTINUOUSLY IRRIGATING SOIL OF PLANTS GROWING IN INDIVIDUAL POTS
Evert Green, 2740 Yacht Club Blvd., Ft. Lauderdale, Fla. 33304
Continuation-in-part of Ser. No. 387,528, Jul. 31, 1989, abandoned. This application Jan. 17, 1992, Ser. No. 822,351
Int. Cl.[5] E03B *13/00*
U.S. Cl. 47—80 13 Claims



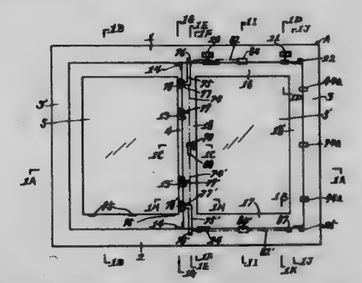
11. A device for continuously irrigating the soil in an individual flower pot and for supporting an individual flower pot within a water-bearing container, said flower pot having a bottom wall and a drain hole therethrough, said device comprising:
a porous, open-celled, rectangular block having substantially parallel opposed planar major block surfaces adapted in size to support a single flower pot thereon;
a plastic sheet wrapped around and covering the top surface of said block and the four side surfaces of said block;
a thin, single-particle-thick layer of cord sand attached to said plastic cover only along one inside block surface contacting said one block surface, whereby said device is placed within a water-bearing container and a potted plant is placed upon support such that water is placed in the water-bearing container to a predetermined level on said block.

5,189,836
AUTOMATED INSPECTION PIT COVER SYSTEM
Matt L. Alder, 3302 E. Splendor Way, Salt Lake City, Utah 84124, and L. Cliff Payzant, 7276 S. 2870 East, Salt Lake City, Utah 84121
Continuation of Ser. No. 610,358, Nov. 7, 1990, abandoned. This application Oct. 18, 1991, Ser. No. 780,411
Int. Cl.[5] E06B *11/00*
U.S. Cl. 49—33 3 Claims



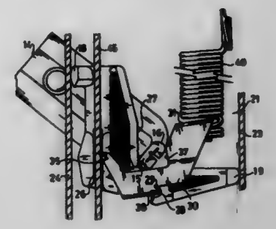
1. A movable inspection pit cover adapted for use with an inspection pit having an elongated inspection opening over which a vehicle can be driven so that the vehicle straddles the inspection pit opening so that the underside of said vehicle can be inspected or serviced, the inspection pit cover comprising:
a first rigid, substantially planar cover positioned over at least a portion of the inspection pit, the first cover having dimensions such that the vehicle can straddle the first cover as the first rigid, substantially planar cover is moved over the inspection pit, the first rigid, substantially planar cover being configured such that a worker above or in the pit cannot lift the cover out of its horizontal orientation over the inspection pit;
a second rigid, substantially planar cover positioned over at least a portion of the inspection pit, the second cover having dimensions such that the vehicle can straddle the second cover as the second rigid, substantially planar cover is moved over the inspection pit, the second rigid, substantially planar cover being configured such that a worker above or in the pit cannot lift the cover out of its horizontal orientation over the inspection pit;
a first base support element disposed along a first elongated side of the inspection pit and not substantially extending beyond the side of the inspection pit;
a second base support element disposed along a second elongated side of the inspection pit and not substantially extending beyond the side of the inspection pit;
a plurality of rollers disposed on the first cover and on the second cover such that the rollers engage the first and the second base support elements allowing the first and the second covers to move along the length of the inspection pit such that the neither the first cover nor the second cover extend substantially beyond the width of the inspection pit and such that the first cover and the second cover simultaneously move apart during opening of the covers to expose at least a portion of the inspection pit and simultaneously move together during closing of the covers to substantially cover the inspection pit, the plurality of rollers comprising means for guiding the first and the second covers linearly along the first and second base support elements;
driving means for selectively applying force to both the first cover and the second cover in opposing directions in order to simultaneously move the first and the second covers apart from each other to expose at least a portion of the inspection pit such that the driving means engages the first and second covers so that the motion of the first and covers apart from each other can be stopped at any time and such that the first and second covers do not move in an opening direction unless the driving means is engaged and for applying force to both the first cover and the second cover in converging directions in order to simultaneously move the first and second covers toward each other when closing the covers such that the driving means engages the first and second covers so that motion of the first and second covers toward each other can be stopped at any time and such that the first and second covers do not move in a closing direction unless the driving means is engaged; and
a control box connected to the driving means and including means for manually directing the driving means and causing the opening, the closing, and the stopping at any time of the first and the second covers, the control box located outside of the inspection pit and being operable by a person positioned outside of the inspection pit such that when the vehicle is driven over the elongated inspection pit to straddle the same the first and the second covers can be opened to allow access to the underside of the vehicle and the first and second covers can be substantially closed any time regardless of whether a vehicle is straddling the inspection pit.

5,189,837
SINGLE SLIDING SASH
Tatsuhiko Ienaga, Kawasaki, Japan, assignor to Fujisash Co., Kanagawa, Japan
Continuation of Ser. No. 589,774, Sep. 28, 1990, abandoned. This application Feb. 28, 1992, Ser. No. 845,501
Claims priority, application Japan, Dec. 21, 1989, 1-332236
Int. Cl.[5] E05D *15/20*
U.S. Cl. 49—130 6 Claims



1. A sash assembly for a window frame including a horizontally sliding door which is positioned on an internal side of a fixed section of said sash assembly when open and which closes an open section of said sash assembly when closed, said sash assembly comprising:
a frame having a top and a bottom edge element and a first and a second side edge element, said fixed section of said frame being delimited by said first side element, said top element, said bottom element and a central element; the open section of said frame being delimited by said central element, said top element, said bottom element and said second side element;
said central element defining the rear of said open section and the second side element defining the front of said open section;
an upper guide track coupled to said top element of said frame; a bottom guide track coupled to said bottom element of said frame; said upper and lower guide tracks each having a straight portion and a curved portion, said straight portion lying in a plane parallel to and in spaced relation from said fixed section on the internal side thereof;
said curved portion extending from said straight portion toward said second side element and terminating adjacent to the front of said open section;
a sliding door for closing said open section and having a top and a bottom edge and a front and a rear end; means in spaced relation to said second side element engageable with the front end of said door as said door is moved to the closed position for forcing said door into sealing engagement with said second element; and a plurality of sliding guide members pivotally coupled to respective ones of said top and bottom edges of said door adjacent the front end thereof and lying within the perimeter of said door, said guide members positioned in said upper and lower guide tracks for guiding said door along said upper and lower guide tracks to permit movement of said door along said straight and curved portions, whereby said curved portion causes movement of the front end of said door toward said front of said open section to position said door in co-planar relationship with said closed section when closing said open section, and a lower support member pivotally connected to the bottom edge of said door adjacent the rear end and lying within the perimeter of said door, said lower support member comprising lower roller means pivotally connected with said bottom guide track, said bottom guide track having an opening therein to permit movement of said lower roller means therethrough when said door is pivoted about the lower roller means connection to the closed position.

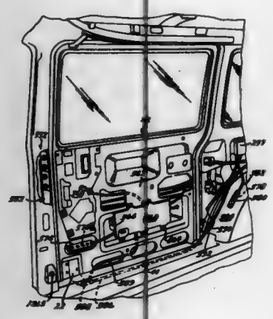
5,189,838
TILT SASH LOCK SHOE SYSTEM
Norman R. Westfall, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.
Filed Jun. 10, 1992, Ser. No. 896,427
Int. Cl.[5] E05D *15/22, 13/12*
U.S. Cl. 49—181 40 Claims



1. A tilt sash lock shoe system using a counterbalanced shoe running in a shoe channel of a resin jamb liner, said system comprising:

a. a locking rib extending into said shoe channel;
b. said shoe being configured to run against walls of said channel and to have a backing surface disposed adjacent a back side of said locking rib;
c. a locking element carried by said shoe and biased by a counterbalance into a locked position in which a biting edge of said lock element bites into a front side of said rib;
d. a non-circular sash pin carried by a sash and supported by said shoe at the bottom of an open topped slot in said shoe where said pin engages and separates confronting surfaces of said shoe and said locking element; and
e. said sash pin being configured for separating said confronting surfaces by enough to hold said locking element out of said locked position when said sash is untilted and for reducing the separation of said confronting surfaces to move said locking element into said locked position when said sash tilts.

5,189,839
CONTROL APPARATUS FOR POWERED VEHICLE DOOR SYSTEMS
Daniel L. DeLand, Davison; Paul Heimnick, Owosso; Curtis T. Moy, Grand Blanc, all of Mich.; Lawrence H. Zuckerman, Easton, Pa.; David G. Grossman, Green Lane, Pa., and Kurt P. Schuler, Allentown, Pa., assignors to Masco Industries, Inc., Taylor, Mich.
Division of Ser. No. 497,603, Mar. 22, 1990, Pat. No. 5,140,316. This application May 15, 1992, Ser. No. 885,021
Int. Cl.[5] E05F *11/00, 15/00*
U.S. Cl. 49—360 **12 Claims**

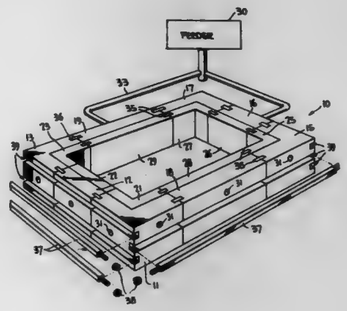


1. In a control system for operating a sliding power-operated door movable along a predetermined path of travel between a closed position and fully open position relative to a body opening within a body portion of a self-propelled motor vehicle, control circuitry within the sliding door for operating electrically powered equipment within the sliding door, the control circuitry comprising:
control logic means for locally controlling the operation of the electrically powered equipment within the sliding door; and
battery means for storing electrical power required to run the control logic means and the electrically powered equipment within the door when the door is not in its closed position.

5,189,840
DEVICE FOR HOLDING SLIDABLE MEMBER
Hirofumi Yanagizawa; Katsuhiko Oikawa, both of Moriyama; Shigeru Nakamura, Kanagawa, and Yoshisori Kamiya, Sagamihara, all of Japan, assignors to Ganze Limited, Ayabe and Nissan Motor Co., Ltd., Kanagawa, both of, Japan
Filed Aug. 12, 1991, Ser. No. 744,037
Claims priority, application Japan, Aug. 13, 1990, 2-214787; Sep. 25, 1990, 2-256414
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—493 **14 Claims**

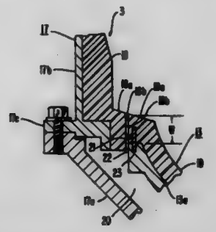
1. A slidable member holding device having a flock portion for contact with a member slidable relative to the device, the flock portion comprising a yarn including as its components at least two kinds of filaments having different thicknesses.

5,189,841
UNITARY WINDOW FRAMES AND SASHES
Michael Arbetter, Greensburg, Pa., assignor to Francine Arbetter, Yardley, Pa.
Filed May 18, 1988, Ser. No. 195,307
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—504 **12 Claims**



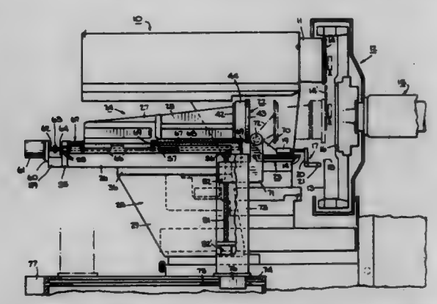
1. A window assembly comprising a window frame and at least one window sash movably mounted in said frame, wherein said frame and sash are each molded as a respective single piece of plastic material, said single piece having an interior completely filled up with said plastic material without cavities and without any structural support members embedded therein.

5,189,842
BARREL FINISHING MACHINE
Hisamine Kobayashi, and Katsuhiro Izuhara, both of Nagoya, Japan, assignors to Tipton Manufacturing Corporation, Nagoya, Japan
Filed Apr. 8, 1991, Ser. No. 682,108
Claims priority, application Japan, Apr. 6, 1990, 2-37628
Int. Cl.[5] B24B *31/00*
U.S. Cl. 51—163.1 **8 Claims**



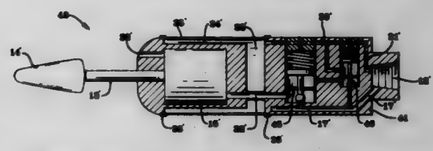
1. A barrel finishing machine comprising:
a) a dual barrel structure including a cylindrical stationary container and a rotary container concentrically mounted in the stationary container for rotation relative thereof, a small gap being defined between the stationary and rotary containers;
b) a pair of linings formed from an elastic material and provided to cover inner surfaces of the stationary and rotary containers, respectively; and
c) a stopper member provided in the lining of the rotary container at position in the vicinity of an outer circumferential edge of the rotary container for restraining expansive deformation of the lining of the rotary container due to thermal expansion thereof, the stopper member extending upwardly from a base of the rotary container and extending circumferentially around the base of the rotary container, the stopper member being detachable attached to the base of the rotary container.

5,189,843
WAFER SLICING AND GRINDING MACHINE AND A METHOD OF SLICING AND GRINDING WAFERS
Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.
Filed Aug. 30, 1990, Ser. No. 575,281
Int. Cl.[5] B24B *49/00*
U.S. Cl. 51—165.76 **36 Claims**



1. In a wafer slicing and grinding machine, the combination of
a first chuck for holding a wafer stationary on a longitudinal axis and in a grinding position;
means for moving said chuck rectilinearly in a direction parallel to said axis between said grinding position and a retracted position;
a transfer chuck movable between a transfer position adjacent said first chuck to receive a wafer therefrom and an unloading position for unloading of a wafer therefrom; and
a pick-off means for moving a wafer sliced from an ingot onto said transfer chuck at a holding station thereof for subsequent transfer to said first chuck in said retracted position.

5,189,844
FLUID DRIVEN TOOL CONTROL DEVICE
Michael C. Swarden, Cambridge, and Walter L. Brassert, Belmont, both of Mass., assignors to Northern Research & Engineering Corp., Woburn, Mass.
Filed Dec. 26, 1991, Ser. No. 813,467
Int. Cl.[5] B24B *49/00*
U.S. Cl. 51—165.9 **12 Claims**

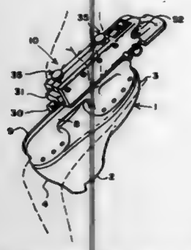


1. A fluid driven tool having a control device comprising;
a tool body including an inlet for driving fluid;
a throttle valve in said tool body for controlling the flow of driving fluid to a tool motor and having a normally closed position;
means responsive to an increase of fluid pressure for opening said valve to cause driving fluid to flow to said tool motor;
a control chamber in said body;
an opening in said body for venting said control chamber to the atmosphere and located where it is closed by the hand of an operator normally grasping the tool body during operation;
means for connecting said chamber to said valve opening means for the pressure in said chamber to cause said valve opening means to open said valve; and
means for applying fluid pressure to said chamber at a low pressure wherein the pressure in said chamber can remain at substantially atmospheric pressure when said opening is uncovered and will rise to a pressure above atmospheric when said opening is covered by the hand of an operator thereby causing said valve opening means to open the valve in said body for allowing driving fluid to flow to said tool motor.

5,189,845
BLADE SHARPENING DEVICE AND METHOD
Richard L. Courcheane, 3931 Sherwood Blvd., Delray Beach, Fla. 33445
Continuation-in-part of Ser. No. 538,542, Jun. 14, 1990, Pat. No. 5,103,597. This application Mar. 24, 1992, Ser. No. 856,516
Int. Cl.[5] B21K *17/00*
U.S. Cl. 51—205 R **5 Claims**

1. A skate sharpener comprising, in combination,
a hand-held body member,
said hand-held body member housing an adjustable pivot member,
a blade slot in said hand-held body member,
a cradle beneath said blade slot for removably securing an abrading member beneath the blade slot of the hand-held member,
a blade slot in the adjustable pivot member,
and means for adjusting the pivot member pivotally within

the hand-held body member to thereby vary the angular setting of the relationship between the blade slot of the



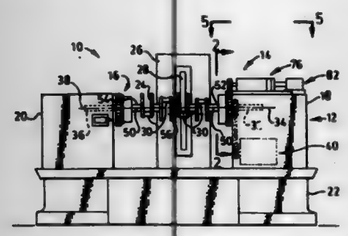
pivot member and the blade slot of the hand-held body member.

5,189,846

CHUCK INDEXING ARRANGEMENT AND METHOD

Roger D. Griswold, Sparland, Ill., assignor to Caterpillar Inc., Peoria, Iowa

Filed Feb. 24, 1992, Ser. No. 840,377
Int. Cl.[5] B24B 41/06, 5/00, 5/16
U.S. Cl. 51—216 ND **29 Claims**



25. A grinder for machining a plurality of rod bearing journals located between first and second axially aligned main bearing shafts of a crankshaft, comprising:

a frame having spaced head and tail stocks;

an abrasive grinding wheel;

means for rotatively connecting the abrasive grinding wheel to the frame for movement between the head and tail stocks;

a drive shaft having a longitudinal axis and being rotatively connected to the head stock;

drive motor means for rotating the drive shaft;

a tail shaft having a longitudinal axis and being rotatively mounted on the tail stock, said longitudinal axes of the drive and tail shafts being axially aligned;

a first indexing device, including:

a chuck spindle having a longitudinal axis and being connected to the drive shaft, said chuck spindle axis being substantially parallel to the drive shaft axis and radially offset from the drive shaft axis a pre-determined normal distance substantially equal in magnitude to a normal distance extending from an axis of one of the first and second main bearing shafts to an axis of one of the rod bearing journals;

a pot chuck having a housing, a pair of jaws pivotally connected to the housing, and a main bearing supporting cradle connected to the housing, said housing being rotatively connected to the chuck spindle, said cradle supporting the first main bearing shaft relative to said chuck spindle axis and said jaws clampingly maintaining the first main bearing shaft in the cradle and from movement relative to said housing;

a gear connected to said housing and rotatable about the chuck spindle axis;

an indexing motor having a rotatable output shaft and a pinion gear connected to the output shaft, said pinion gear being rotatable with the output shaft;

guide means for movably connecting the indexing motor to the head stock and guiding movement of said motor between a first position at which said pinion gear is engaged with said gear and a second position at which said pinion gear is spaced from being engaged with said gear, said indexing motor being adapted to rotate the gear at the first position;

power means for moving the indexing motor between said first and second motor positions;

a first latch connected to said drive shaft and selectively movable between a first position at which said housing is maintained from rotation about said chuck spindle axis and a second position at which said housing is free to rotate about said chuck spindle axis;

a second latch connected to said head stock and selectively movable between a first position at which said chuck spindle is maintained from orbiting rotation about the drive shaft axis and a second position at which said chuck spindle is free to orbit about said about said drive shaft axis, said indexing motor being adapted to rotate said housing and index a preselected one of said rod bearing journals to a preselected position at which said one rod bearing journal is axially aligned with the axis of said first drive shaft at the second position of the first latch, at the first position of the second latch, and at the first position of the indexing motor; and

a second indexing device including:

a chuck spindle having a longitudinal axis and being connected to the tail shaft, said second indexing device chuck spindle axis being substantially parallel to the tail shaft axis and radially offset from the tail shaft axis a pre-determined normal distance substantially equal in magnitude to a normal distance extending from an axis of one of the first and second main bearing shafts to a longitudinal axis of one of the rod bearing journals;

a pot chuck having a housing, a pair of jaws pivotally connected to the housing, and main bearing supporting cradle connected to the housing, said housing being rotatively connected to the chuck spindle, said cradle of the second indexing device supporting the second main bearing shaft relative to the chuck spindle axis of the second indexing device and said jaws clampingly maintaining the second main bearing shaft in the cradle of said second indexing device and from movement relative to the housing of said second indexing device;

a first latch connected to said tail shaft and selectively movable between a first position at which said housing of the second indexing device is maintained from rotation about the chuck spindle axis of said second indexing device and a second position at which said housing of the second indexing device is free to rotate about the chuck spindle axis of said second indexing device;

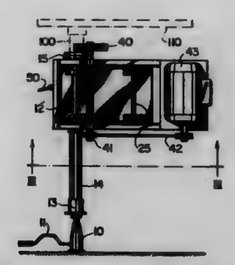
a second latch connected to said tail stock and selectively movable between a first position at which said chuck spindle of said second indexing device is maintained from orbiting rotation about the tail shaft axis and a second position at which said chuck spindle of the second indexing device is free to orbit about said tail shaft axis, said indexing motor of the first indexing device being adapted to rotate the housing of said second indexing device through the crankshaft at the second position of the first latch and the first position of the second latch of the second indexing device.

5,189,847

RESURFACING DEVICE

Roger Billingsley, R.R. #2, Goulais River, Ontario P0S 1E0, Canada

Filed Jul. 24, 1991, Ser. No. 735,235
Int. Cl.[5] B24B 19/00
U.S. Cl. 51—241 R **12 Claims**



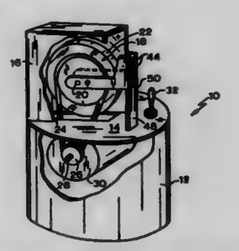
1. A device for resurfacing in situ a fifth wheel king pin, said device comprising an elongate member, which during use extends from said pin to a surface below said pin, means adjacent the upper end of said elongate member for engaging said pin, a first arm pivotably mounted on and extending horizontally from said elongate member, a second arm movably mounted on said first arm, means mounted on said second arm for resurfacing said pin as said first arm is pivoted about said elongate member, and means for adjustably positioning said second arm relative to said first arm.

5,189,848

BLADE SHARPENING APPARATUS, BLADE GUIDE AND SHARPENING METHOD

Frank Flaherty, 12 Falmouth Landing Rd., East Falmouth, Mass. 02536

Filed Jun. 27, 1991, Ser. No. 721,982
Int. Cl.[5] B24B 1/00, 7/00
U.S. Cl. 51—285 **14 Claims**



1. A sharpening apparatus for sharpening blades comprising;

a) grinding means for grinding a blade having an inner side and an outer side to produce a sharpened cutting edge, said grinding means comprising a rotary grinding wheel mounted on an axle;

b) a grinding surface on the circumferential, peripheral edge of the rotary grinding wheel;

c) blade guide means for positioning the blade at a plurality of selected positions relative to the grinding surface for grinding a plurality of blade facets;

d) a guide surface adapted for supporting the outer side of the blade to position said blade between the grinding means and the blade guide means said guide surface having a constant angled relationship with said grinding surface;

e) base means for mounting a drive means for driving the grinding means, said base means including a horizontally extending table member;

f) a housing attached to the base means for mounting the axle of the rotary grinding wheel to position the grinding means in spaced apart relationship with the drive means;

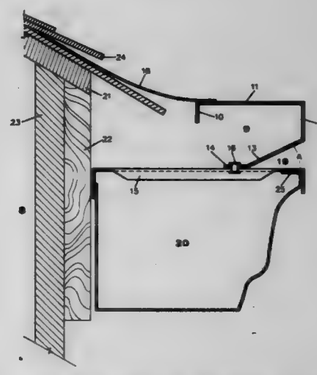
g) support means for selectively positioning the blade guide means relative to the grinding means, said support means extending vertically between the table member and the bottom of said blade guide means, and having adjustment means for selective extension and retraction of said support means wherein the blade is oriented in a generally vertical plane with a cutting edge extending downwardly to provide a horizontal sharpening path across the grinding surface in a controlled relationship defined by the blade guide means by supporting the blade between the grinding surface on one side of the blade and the guide surface on the opposite side of the blade such that the leading edge of the blade is kept in spaced apart relationship with the grinding surface.

5,189,849

ROOF RAIN GUTTER DEBRIS SHIELD/RUN-OFF WATER CONTROL

James A. Collins, 109 Wayland Rd., Wilmington, Del. 19807

Filed Feb. 10, 1992, Ser. No. 833,143
Int. Cl.[5] E04D 13/00
U.S. Cl. 52—12 **4 Claims**



1. A roof rain gutter shield for installation in proximity to both the eaves and the lower shingle extremities of a residential building above and onto a conventional rain gutter trough comprising:

a horizontal capillary cap portion having $\frac{1}{8}$" vertical strengthening flange integrally connected and coextensive along its rearmost extremity,

a vertical deflector portion extending in a vertical plane downwardly essentially $\frac{1}{4}$"–1" from said horizontal capillary cap portion at a 90° angle,

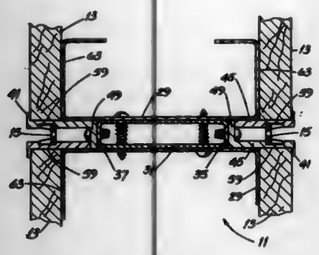
a re-entry extension portion extending inwardly toward the building and downwardly toward the gutter trough at a sharply defined essentially 60° angle from a lower extremity of said vertical deflector portion, and

a $\frac{1}{4}$" horizontal support flange extending from said re-entry extension portion toward said building,

horizontal support stabilizer means provided as attachment means for attaching said roof rain gutter shield to said conventional rain gutter trough, and

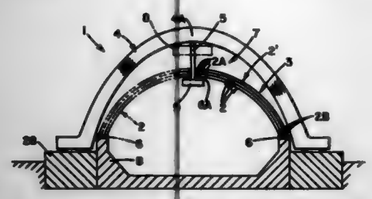
a roof slope adaptor provided between the lower shingle extremities and said horizontal capillary cap portion so that said roof rain gutter shield can accommodate various gutter and eave displacements.

5,189,850
SYSTEM FOR MOUNTING A WALL STANDARD
J. Reed Felton, Milwaukee, Wis., assignor to T. J. Hale Company, Menomonee Falls, Wis.
Filed Feb. 3, 1992, Ser. No. 830,059
Int. Cl.[5] A47G 29/02
U.S. Cl. 52—36.4 19 Claims



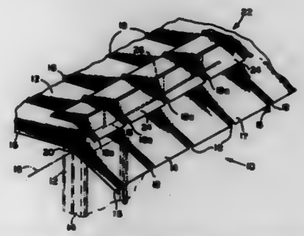
1. In a wall-like display structure of the type supporting wall panels having exterior surfaces, the structure having plural support studs mounted in pairs, wherein each stud has a face and a pair of flange surfaces, the studs of a pair are mounted in face-opposed relationship at a distance from one another and each stud of a pair has a flange surface coplanar with a flange surface of the other stud of the pair, an improved system for mounting a wall standard including:
a spacer mounted between the faces of a pair of studs and having a first attachment edge;
a first retention assembly separate from the spacer and including a pair of commonly-shaped upright members mounted in inverted relationship one to the other and attached to the first attachment edge for panel support;
the retention assembly retaining a slotted standard at a position intermediate the exterior surfaces and the flange surfaces.

5,189,851
MOVABLE DOME-TYPE ROOF FOR STRUCTURE
Yukihiro Omika; Kuniaki Sato; Eiji Matsushita; Kazuo Kojima; Tsutomu Kumazawa, and Yasuo Ogawa, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 468,701, Jan. 23, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 759,744
Claims priority, application Japan, Jan. 24, 1989, 1-14517
Int. Cl.[5] E04B 1/346
U.S. Cl. 52—66 41 Claims



1. A structure with a movable dome-type roof comprising: a circular base; an arched superstructure having an apex and diametrically opposed pedestals supported on opposite sides of said circular base and an apex concentric with the center of said circular base; arched superstructure base means; a plurality of shell sections having upper apex means and lower base means adapted to be supported between the apex of said arched superstructure and said circular base; said shell sections being adapted to rotate about a vertical axis defined by said apex of said arched superstructure and the center of said circular base, and to nest one beneath another; means to shift said shell sections about said vertical axis; and means to shift said arched superstructure on said arched superstructure base means relative to said circular base.

5,189,852
MODULAR ROOF PANEL ASSEMBLY AND LOCKING APPARATUS FOR A MODULAR PANEL SYSTEM USED IN CONSTRUCTING RELOCATABLE BUILDINGS
Michael Baldino, Omaha, and Daniel L. Kelsay, Fremont, both of Nebr., assignors to Kelly Industries, Fremont, Nebr.
Division of Ser. No. 688,028, Apr. 19, 1991, Pat. No. 5,090,838, which is a division of Ser. No. 415,007, Sep. 29, 1991. This application Dec. 16, 1991, Ser. No. 808,114
Int. Cl.[5] E04B 7/02
U.S. Cl. 52—90.1 7 Claims

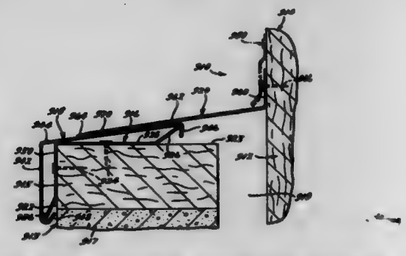


1. A modular roof panel assembly for a modular panel system used in constructing relocatable buildings, said roof panel assembly comprising:
a first panel hingedly connected to a second panel for allowing said first and second panels to pivot towards and away from each other about a common axis, said first panel being hingedly connected to said second panel such that an aperture exists between said first and second panels proximate said common axis;
a ridge cap including a top panel sized to cover said aperture and positioned above said first and second panels proximate said aperture;
securing means integral with said top panel and engaged with one of said first or second panels for securing said top panel to said first and second panels, said securing means comprises a securing tab integral with said top panel and extending therefrom said aperture for securing said top panel to said first and second panels, said securing tab being constructed of a flexible material and being bent into engagement with one of said first and second panels to thereby secure said top panel to said first and second panels, whereby said ridge cap is securely positioned on said first and second panels over said aperture therebetween to prevent water from passing therethrough.

5,189,853
EDGE SEALING DEVICES FOR BUILDING STRUCTURES
Mark D. Braine; Ralph Kirby; Donald W. Schultz, all of Asheville; Richard G. Tuttle, Hendersonville, and John B. Hickman, Asheville, all of N.C., assignors to W. P. Hickman Company, Asheville, N.C.
Continuation-in-part of Ser. No. 532,657, Jun. 4, 1990, abandoned. This application Nov. 8, 1991, Ser. No. 789,823
Int. Cl.[5] E04B 7/00
U.S. Cl. 52—96 23 Claims

1. An edge sealing assembly for sealingly capping a portion of a building construction having a back wall with a vertical outer surface thereon and a facing structure with a horizontal upper surface and a vertical outer surface thereon, the facing structure being disposed adjacent to the back wall in a generally face-to-face relationship therewith, said edge sealing assembly comprising:

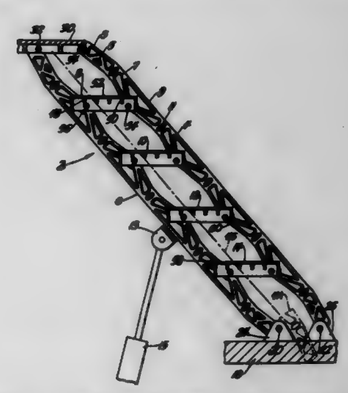
an elongated clip member having a generally L-shaped lateral cross-sectional configuration defined by a generally horizontal leg portion and a generally vertical leg portion, said horizontal leg portion being adapted to engage the horizontal upper surface of the facing structure and said vertical leg portion being adapted to engage the vertical surface of the facing structure, said horizontal leg portion including an upper edge portion thereon configured to be spaced generally away from the horizontal upper surface of the facing structure, said vertical leg portion including a lower edge portion thereon configured to be spaced generally away from the vertical surface of the facing structure;
fastening means for securing said clip member to the facing structure;
an elongated fascia member having a generally angulated lateral cross-sectional configuration, a lower portion of said fascia member being adapted for extending generally along said vertical leg portion of said clip member and having a generally hook-shaped lower fascia edge portion adapted for interlockingly engaging said lower edge portion of said clip member, an upper portion of said fascia



member sloping downwardly and outwardly toward said lower fascia portion and being adapted for extending over said horizontal leg portion of said clip member and having a generally hook-shaped upper fascia edge portion adapted for interlockingly engaging said upper edge portion of said clip member, said fascia member being resiliently snapped onto said clip member after one of said hooked fascia edge portions is interlockingly engaged with the corresponding respective edge portion of said clip member in order to secure said fascia member thereto;
an elongated coping member having a generally angulated lateral cross-sectional configuration, an upper portion of said coping member being adapted for engaging the vertical outer surface of the back wall, and a lower portion of said coping member sloping downwardly and outwardly from said upper coping portion and being adapted to overlap said downwardly and outwardly sloping upper fascia portion in order to accommodate a variety of lateral dimensions between the vertical outer back wall surface and the vertical outer facing surface; and
fastening means for securing said upper coping portion to the vertical outer surface of the back wall.

5,189,854
ADJUSTABLE HEIGHT STAIRWAY
Kyle J. Nebel, Macomb, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 14, 1992, Ser. No. 944,600
Int. Cl.[5] E04F 11/00
U.S. Cl. 52—183 15 Claims

1. An adjustable height stairway comprising:
a base;
two parallel lower frame members having first base engagement ends;
first connection means for pivotally mounting the first base engagement ends to the base, the lower frame members swingable about the first connection means;
two parallel upper frame members having second base engagement ends;
second connection means for pivotally mounting the second base engagement ends to the base, the second connection means being remote from the first means, the upper frame members swingable about the second connection means;
a plurality of steps parallel to the base disposed at intervals along the lower frame members, each of the steps having one end and an opposed other end;
the one ends pivotally connected between one of the upper frame members and one of the lower frame members;
the other ends pivotally connected between another of the upper frame members and another of the lower frame members;

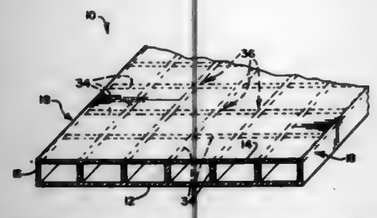


the frame members each including an elongate edge having a wave-like configuration comprised of alternating peaks and valleys, the elongate edges on the upper frame members faced toward the elongate edges on the lower frame members;
connection locations on the peaks where the steps are pivotally connected to the frame members;
means for swinging the stairway upon the first and second connection means;
the stairway having a collapsed configuration in which peaks of elongate edges of the lower frame members project into valleys on the upper frame members such that all the connection locations are coplanar and tops of the steps are in a common plane;
the stairway having a expanded configuration where the elongate edges of the upper frame members are spaced from the elongate edges of the lower frame members.

5,189,855
FOUNDATION RAFT FOR SUPPORTING A STRUCTURE
Antony A. B. Williams; Jean P. Pellinier, and Brian G. Lant, all of Pretoria, South Africa, assignors to CSIR, Pretoria, South Africa
Continuation of Ser. No. 733,363, Jul. 19, 1991, abandoned, which is a continuation of Ser. No. 412,404, Sep. 26, 1989, abandoned. This application Mar. 12, 1992, Ser. No. 849,964
Claims priority, application South Africa, Sep. 30, 1988, 88/7366
Int. Cl.[5] E04B 1/86
U.S. Cl. 52—252 12 Claims

1. A foundation raft comprising a pair of vertically spaced substantially horizontal foundation slabs of set cementitious material, namely an upper slab and a lower slab having a space therebetween, the slabs being spaced apart by a plurality of upwardly extending webs, for supporting a low-rise walled

building of at most three floors in height on underlying material which is prone to heaving or differential settling which subjects the raft to slowly varying vertical forces on its lower source, with the walls of the building, at least in part, resting on parts of the upper slab which have no web thereunder, the lower slab having a lower surface for resting directly on said underlying material, each said slab being continuous and integral and having a periphery which has an outline in plan view which is the same as that of the raft as a whole, and being horizontally reinforced in different directions by substantially horizontally extending reinforcement which is embedded therein, which reinforcement extends substantially continuously across the full area of said slab, a plurality of said webs



being substantially evenly distributed relative to one another in the space between the slabs and extending, at least in part, in different horizontal directions, those webs spaced inwardly from the periphery of the raft all being substantially the same thickness and being integrally bonded to each of the slabs, a plurality of said webs being arranged along the periphery of the raft so that they surround at least a portion of the space between the slabs located inwardly of said periphery, the raft having a construction whereby:

each slab has a thickness in the range of 50–200 mm;

the spacing between the slabs is in the range 100–1500 mm; and

each web has a thickness in the range 0.2–400 mm; and

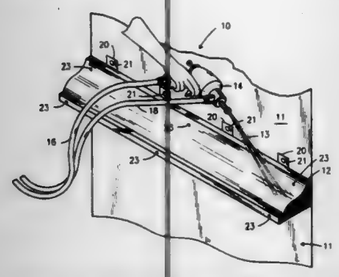
adjacent webs are spaced apart by 300–3500 mm.

5,189,856

DURABLE BUILDING MATERIALS HAVING EXPANDED POLYSTYRENE BASE

Edmund P. Windstrup, 275 Maple Ave., Palm Harbor, Fla. 34684

Filed Jan. 4, 1991, Ser. No. 837,440
Int. Cl.[5] E04C *1/00*
U.S. Cl. 52—309.9 **3 Claims**



1. An article of manufacture having utility in the construction industry as a non-weight bearing, ornamental construction material that is attached to a building, comprising:

a block of high density expanded polystyrene having a density of about 3.0 pounds per cubic foot;

said block having an ornamental shape including details of construction that would be obliterated by a coating of cementitious material having a thickness of more than about 0.030 inch;

a first coating of a cementitious material disposed in overlying relation to said block;

said first coating being about 0.015 inch in thickness so that said details are not obliterated by said first coating;

whereby said expandable polystyrene is nailable or otherwise attachable to a building structure for ornamental purpose; and

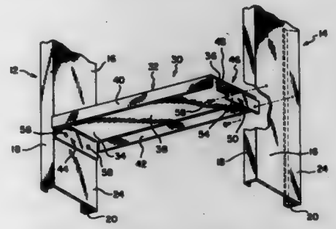
whereby said density of said block, coupled with said first coating of said cementitious material, provides a durable article of manufacture.

5,189,857

FLUSH MOUNT BRIDGING AND BACKING

Thomas R. Herren, 128 Cerritos, Long Beach, Calif. 90802, and Gene Carpenter, 6221 E. Onyx La., Anaheim Hills, Calif. 92807

Filed Jul. 17, 1991, Ser. No. 731,549
Int. Cl.[5] E04C *2/42*
U.S. Cl. 52—317 **18 Claims**



1. In combination a plurality of uniform metal upright studs mounted at laterally spaced intervals, each stud being of a uniform width and formed with a stud base having front and back surfaces and parallel stud sides extending from said front surface of said stud base to a predetermined height, and cross connecting devices between said studs, each said device comprising a U-shaped channel having opposite ends and having a uniform width throughout the same as the width of said studs and formed with a channel base and parallel channel sides extending outwardly from said channel base, said device having a length that spans the distance from the back surface of the stud base of one of said studs to the stud sides of an adjacent stud, an end tab disposed transversely across one of said ends of said channel normal to the alignment thereof and extending outwardly from said channel base in the same direction as said channel sides, and a tongue located at the other end of said channel and projecting away from said end tab beyond said channel sides and formed in a width so as to fit between said stud sides and having a tip that extends parallel to said end tab and in the same direction from said channel base as said channel sides, whereby the length of said device between said tip of said tongue and said end tab spans the distance between said back surface of said stud base of one of said studs and said front surface of said stud base of an adjacent stud, and said tongue spans the height of said stud sides.

5,189,858

DECORATIVE PANEL, IN PARTICULAR FOR CEILINGS

Daniel Jouanet, 44 rue de Lagny, 75020 Paris, France

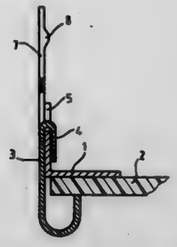
Filed Apr. 29, 1991, Ser. No. 692,533
Claims priority, application France, Apr. 30, 1990, 90 05467
Int. Cl.[5] E04B *9/00*
U.S. Cl. 52—488 **8 Claims**

1. A modular panel for covering surfaces on a fixed support, comprising:

a rigid frame formed by four L-shaped angle irons, each having an outer surface and a flange;

a decorative panel having an edged perimeter held by said rigid frame; and

a shaped section fitted against the outer surface of each of said four L-shaped angle irons, each shaped section having a longitudinal end bent inwardly of the frame, wherein the edges of the decorative panel are clamped, substantially over the entire perimeter, between the flange of each of said L-shaped angle irons and the bent longitudinal edges of each of said shaped sections.

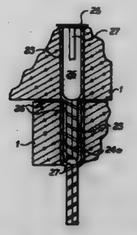


5,189,859

MODULIZED SPACE TRUSS ASSEMBLY

William J. Payer, 4860 Parkview Mine Dr., Sugar Hill, Ga. 30518

Continuation-in-part of Ser. No. 548,021, Jul. 5, 1990, abandoned. This application Sep. 4, 1991, Ser. No. 754,948
Int. Cl.[5] E04C *3/20*
U.S. Cl. 52—585 **19 Claims**



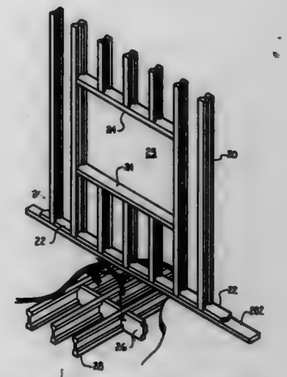
1. In a modular space truss component, the improvement comprising at least one pipe embedded therein with a prong protruding from one end of said pipe outwardly from the component, said pipe having a bore width larger than the width of said prong and an open end adjacent a surface of the component; a supply of bonding agent disposed within said pipe bore; a seal sealing said pipe open end; and a bonding agent accelerator disposed within said pipe bore and separated from said bonding agent by separator means, whereby upon mounting another modular space truss component of like construction thereto by inserting the other component prong into the tube, the seal and separator means may be ruptured and the bonding agent and bonding agent accelerator intermixed to bond the other component prong to the tube.

5,189,860

CONSTRUCTION SYSTEMS AND ELEMENTS THEREOF

Christopher R. Scott, 6518 Avenida Wilfredo, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 458,779, Dec. 22, 1989, which is a continuation-in-part of Ser. No. 333,705, Apr. 3, 1989, which is a division of Ser. No. 16,364, Feb. 19, 1987, Pat. No. 4,817,356, which is a division of Ser. No. 578,285, Feb. 8, 1984, abandoned. This application Jan. 22, 1991, Ser. No. 643,281
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] E04C *3/30*
U.S. Cl. 52—729 **8 Claims**



1. A construction element, which comprises:

a first end portion and a second end portion, said first and second end portions having substantially equal rectangular cross sections, said end portions being parallel to one another, said rectangular cross sections of said end portions defining respective midpoints, said midpoints defining an end portion midplane, said end portion midplane being parallel to said end portions and axially bisecting said end portions;

a central web portion having a rectangular cross section, said cross section of said web portion having a width about equal to that of each of said first and second end portions, said web portion further defining a web portion midplane which axially bisects said web portion, said web midplane being parallel to and spaced apart a predetermined distance from said end portion midplane;

a first transition section having a parallelogram-shaped, non-rectangular cross section, said cross section having a width about equal to the width of said first end portion for connecting said first end portion to said web portion; and

a second transition section having a parallelogram-shaped non-rectangular cross section, said cross section having a width about equal to the width of said second end portion for connecting said second end portion to said web portion, said first and second transition portions each forming an angle of about 45° with said web portion midplane to offset said first and second end portions from said central web plane by said predetermined distance.

5,189,861

SEWER CHIMNEY COUPLING AND METHOD OF BUILDING A SEWER CHIMNEY

Peter J. Segda, 68 Sunrico Dr., Manchester, Conn. 06040

Filed Nov. 12, 1991, Ser. No. 789,922
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—745.03 **4 Claims**

1. A method of building a sewer chimney for connecting a surface branch sewer line to a deeply buried main sewer line

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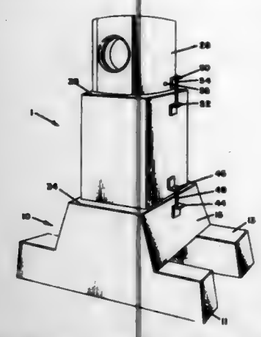
having a fixture with an upwardly facing opening, and a first seal within said fixture, said method comprising the steps of:

(a) inserting one end of an elongated pipe through said opening and into said fixture so that said first seal forms a seal between said first pipe and said fixture and said first pipe extends vertically so that the opposite end of said pipe extends above said fixture and represents an upper end,

(b) setting a base which has first and second leg portions which are spaced from each other and a bridge portion which extends from one of said leg portions to the other of said leg portions so that said leg portions are on opposite sides of said fixture and said bridge portion is above said fixture, said bridge portion having a first vertical bore, said base being positioned relative to said elongated pipe so that said first bore is vertically aligned with said upwardly facing opening and said pipe extends through said



first bore and the upper end of said first pipe is above said bridge portion,

(c) placing a transitional section on said bridge portion, said transitional section having a second vertical bore which is vertically aligned with said first vertical bore so that when said transitional section is placed on said bridge portion said elongated pipe extends through said second vertical bore,

(d) positioning a cap block on said transitional section, said cap block having a third vertical bore and a horizontal bore with an outwardly facing opening which is adapted to receive a lateral service pipe, so that when said cap block is positioned on said transitional block, said third vertical bore is aligned with said first and second vertical bores, and the upper end of said elongated pipe extends into said third bore and is below said horizontal bore, and

(e) securing said transitional section to said bridge portion and said cap block.

5,189,862

WINDOW AND FRAME STRUCTURE THEREFOR

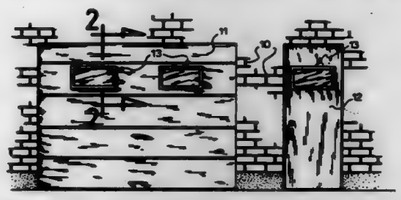
Jean-Claude Lafleur, 3409 Marlcourt St. - Apt. 6, Sainte-Foy, Canada G1W 2M4

Continuation-in-part of Ser. No. 528,195, May 14, 1990, abandoned. This application May 28, 1991, Ser. No. 705,926

Int. Cl.[5] E04B *1/61*

U.S. Cl. 52—771 **9 Claims**

1. A window structure comprising a window frame and a glazing unit held by said window frame in an opening of a panel such as a door having two exposed opposite face portions surrounding said opening, said window frame comprising two frame sections engaging on the opposite sides respectively of said glazing unit and on the opposite face portions respectively of said panel, said frame sections being of identical cross-sectional shape and each one including an inner portion overlapping said glazing unit, a peripheral portion, and a rim portion outwardly projecting from said peripheral portion and overlapping said face portions of said panel, the peripheral portion of both frame sections having transversely-projecting pawl teeth, H-shaped clips interconnecting said frame sections, each clip including two oppositely extending pairs of legs, the legs of each pair receiving therebetween said peripheral portion of one frame section, one leg of each pair having ratchet teeth selectively engageable by said pawl teeth, said clips



positioned outward of said glazing unit and adjustably engaging said pawl teeth of both frame sections and disposed transversely of the window frame, so that the rim portions of the two frame sections can be pressed against said face portions of said panel despite variations in the thickness of said panel and such that said glazing unit can be centrally positioned relatively to the thickness of said panel.

5,189,863

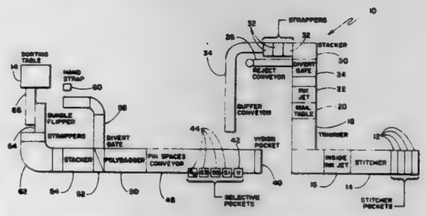
VIDEO IMAGING TECHNIQUE USED IN BAGGING ASSEMBLY

John R. Pozzi, Allentown, Pa., assignor to Brown Printing Company, A Division of Gruner & Jahr Printing and Publishing Co., Waseca, Minn.

Filed Mar. 20, 1992, Ser. No. 855,514

Int. Cl.[5] B65B *61/02, 61/26;* **G06K** *9/00*

U.S. Cl. 53—411 **15 Claims**



1. A method of selectively adding onserts contained in a plurality of storage bins to a continuous stream of printed magazines, comprising:

(a) sequentially generating address label information including a dot code pattern and applying the address able to each of the magazines in said stream, wherein the dot code pattern define which of the onserts in said plurality of storage bins are to be added to each magazine;

(b) transferring said magazines sequentially to an identification station;

(c) sensing at the identification station the dot code pattern of the label on said magazines using a computering means including a video camera, said computing means generating a plurality of video windows for decoding the dot code pattern to determine which ones of the onserts are to be added to each magazine;

(d) sequentially transferring said magazines past each of the plurality of storage bins, wherein the bins corresponding to the dot code pattern on a given magazine are sequentially actuated to dispense an onsert onto said given magazine as it passes by; and

(e) inserting said magazines with its added onserts into a polybag at a polybag station for ultimate mailing.

UMI

5,189,864

METHOD OF WRAPPING REAMS OF PAPER, AND EQUIPMENT FOR THE IMPLEMENTATION OF SUCH A METHOD

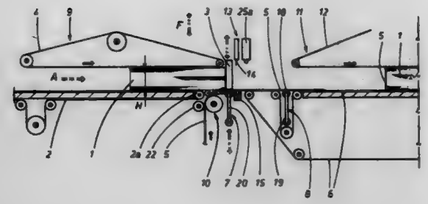
Andrea Cinotti, Bologna; Gilberto Forni, San Giovanni in Persiceto, and Davide Dall'omo, Bologna, all of Italy, assignors to Wrapmatic S.p.A., Bologna, Italy

Filed May 8, 1992, Ser. No. 880,884

Claims priority, application Italy, May 24, 1991, 000177 A/91

Int. Cl.[5] B65B *11/10, 13/20*

U.S. Cl. 53—439 **7 Claims**



1. A method of wrapping reams of paper, in particular large size reams, comprising the steps of:

aligning and compacting the sheets of a ream advancing in a horizontal conveying direction on a first power driven belt, by interaction with at least one transverse vertical barrier and by the descent of a movable second belt facing and running at the same surface speed as the first belt;

drawing out and extending a predetermined length of wrapping paper from below the level of the first belt through a feed station, positioned preceding the vertical barrier in relation to the conveying direction, and onto a third belt positioned beyond the vertical barrier in relation to the conveying direction;

raising the vertical barrier, and raising and interposing a first wrapping gate affording an opening of height equal at least to the height of the ream, in such a way as to draw the extended wrapping paper upright in the manner of a wall occupying the path of the advancing ream;

simultaneously advancing the ream through the opening of the gate in such a way as to impinge on the upright wrapping paper and supplying further paper from the feed station at the same rate as that of the advance, until a part of the ream including the leading face is enveloped by a first portion of the wrapping paper and the ream is carried at least onto the third belt and beyond the feed station;

bringing the ream to a standstill on the third belt, then cutting through the extended wrapping paper at a point adjacent to the first gate and simultaneously applying gum to the edge of the paper severed by the cut;

raising a second wrapping gate, positioned at the entry end of the third belt and identical to the first gate, in such a way as to draw upright the remaining portion of the wrapping paper not yet enveloping the ream;

reversing the conveying direction of the third belt in such a way that the ream is caused to pass backwards, through the second gate, impinging on the remaining portion of the wrapping paper and becoming completely enveloped with the cut edges of the paper overlapped and secured by the gum.

5,189,865

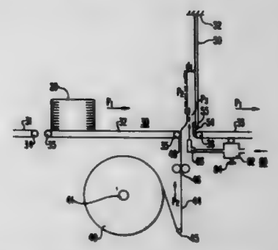
METHOD AND APPARATUS FOR WRAPPING AN ARTICLE

Jose A. Andrade, Sunrise, and Leonard A. Watts, Hallandale, both of Fla., assignors to IDAB Incorporated, Hialeah, Fla.

Filed Jun. 3, 1992, Ser. No. 892,954

Int. Cl.[5] B65B *11/08*

U.S. Cl. 53—466 **16 Claims**



1. An article wrapping device, comprising:

conveyor means for conveying articles to be wrapped along a first path in a generally horizontal direction;

feeding means beneath the first path for feeding a sheet of wrapping material upwards along a second path in a generally vertical direction, the second path intersecting the first path;

displaceable wall means disposed in a generally vertical orientation across the first path alongside the second path above the feeding means and displaceable by the article in the direction of said first path; and

air flow means for providing a flow of air along and between the second path and the displaceable wall means to maintain a general orientation of the sheet of wrapping material in the second path.

5,189,866

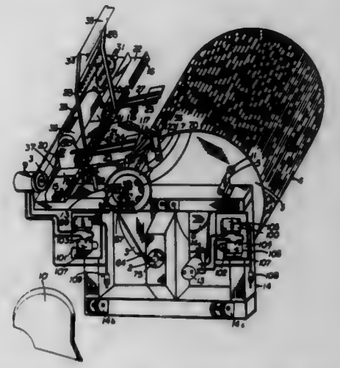
ELEMENT PROTECTION COVER APPLICATOR FOR ROUND HAY BALES

Lloyd J. Krutza, 9692 Cty. K, Amherst, Wis. 54406

Filed Apr. 8, 1991, Ser. No. 681,721

Int. Cl.[5] B05B *11/04*

U.S. Cl. 53—587 **1 Claim**



1. A plastic film wrap cover applicator machine for round hay bales with an automatic wrap cycle, defined as the period of time after electrical activation is made until wrap is finished with no manual assistance required, said machine comprising a

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frame, means for mounting said frame on rear hydraulic lift arms of an agricultural tractor which supplies the lift remote hydraulic and electrical power to attached machine, which make the wrapper operational to perform a wrap cycle of automatic wrap operation after bale has been lifted to wrap position by tractor lift linkage with wrap machine components being mechanically and hydraulically activated by an electric remote switch mounted on tractor, disk means rotatably mounted on said frame, means on said disk means for axially penetrating and supporting said bale, bale start clamp jaws mounted on said disk means, means for opening and closing said clamp jaws for holding the leading end of said film, a plastic timing wheel for controlling the wrapping cycle of said machine, hydraulic motor for rotating said disk means and said timing wheel controlled by a hydraulic control valve that is electrically controled, for turning at a ratio of one revolution to four of the bale, to give a maximum of four wraps of twenty inch wide plastic cover film to each cycle, a carriage assembly for supporting a roll of plastic film, hydraulic means for moving said carriage assembly parallel to the bale axis, a series of three electrical switches mounted in position to be activated by pre-determined position of a first set of cams on said timing wheel relative to step by step operation required to complete wrap cycle that will entail the timed movement of said hydraulic powered traveling mechanical carriage assembly that travels in proper-timed sequence to advance the plastic film wrap with control of application to bale as overlap on each of four wrap revolutions, the first which is of parallel to vertical end of bale, the second and third of spital nature with overlap, and the fourth is again straight and parallel to vertical edge of bale, a cut-off blade mounted on a pivoting arm for cutting said film, electrical pull solenoid for pivoting said arm and cutting said film, a plastic smooth down flap freely mounted for swinging movement on said cut-off arm for smoothing the cut edge of said plastic film one half turn before bale turn stops and carriage returns to start-stop position, rubber faced carriage clamp jaws mounted on said carriage assembly for cooperating with said bale start clamp jaws, means for opening and closing said carriage clamp jaws for clamping raw cut edge of plastic film at time cut was made and carriage was in return position enabling film to be grasped by said bale start clamp jaws, thus completing wrap cycle and machine is in start-stop position and reset to accept and wrap next bale of common size, sixty inches diameter and sixty inches in length, a second set of cams for said timing wheel for controlling the wrapping of bales with a variation of diameters and additional lengths of thirty-six, forty-eight inches, making it compatible to most round bales produced with current balers.

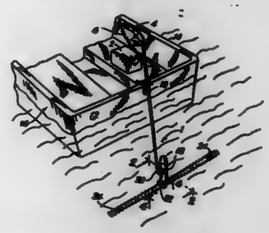
5,189,867

AQUATIC VEGETATION CUTTER

Michael Schmidt, 51 Tamarack Rd., Mahopac, N.Y. 10541

PCT No. PCT/US89/01505, § 371 Date Oct. 23, 1990, § 102(e) Date Oct. 23, 1990
Continuation-in-part of Ser. No. 181,323, Apr. 13, 1988, Pat. No. 4,885,902. This PCT application Oct. 15, 1989, Ser. No. 598,673
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] A01D *45/08*
U.S. Cl. 56—8 **36 Claims**

1. A light weight, portable, aquatic vegetation cutter which comprises a direct current electrical motor for generating a driving force, two reciprocating type elongated cutting blade assemblies disposed in a substantially end-to-end opposed relationship relative to each other, each of said cutting blade assemblies comprising a toothed stationary cutting blade and a toothed reciprocating cutting blade, means for transmitting the driving force of said motor to said blade assemblies, means for preventing the intrusion of water to preselected parts of the aquatic vegetation cutter, and means for momentarily reversing the polarity of the direct current to said motor for bringing



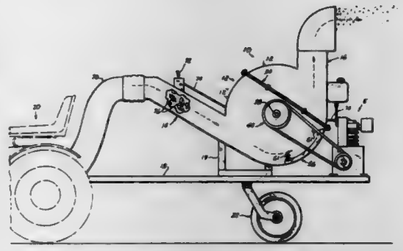
the teeth of said stationary and said reciprocating blades in a substantially overlapping relationship.

5,189,868

LEAF MULCHER

Jerry Hill, P.O. Box 1089, Nicoma Park, Okla. 73066

Filed Mar. 23, 1992, Ser. No. 856,310
Int. Cl.[5] A01D *34/70*; B02C *13/08, 13/28*
U.S. Cl. 56—13.3 **2 Claims**



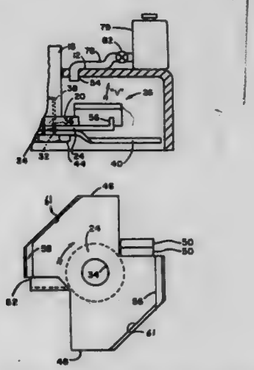
1. In a mobile propelled rotary mower having a downwardly open tractor housing having an outlet port and having a power driven vegetation cutting and impelling blade rotatable in a horizontal plane within the tractor housing and operative to generate an air blast for propelling cut and other vegetation lying on the surface of the earth outwardly of the tractor housing through the outlet port, the improvement comprising:
- platform means connected in trailer fashion with said tractor housing;
- a fan housing having opposite end walls and a part-circular perimeter wall and having perimeter wall inlet and outlet openings;
- inlet and outlet conduits connected, respectively, with the fan housing wall around the inlet and outlet openings;
- other conduit means connecting the inlet conduit with the tractor housing outlet port for transferring vegetation from the tractor housing to said fan housing;
- power driven fans means including a plurality of radially disposed cupped fan blades journalled by the end walls of said fan housing for increasing the velocity of the forced air blast through the fan housing; and,
- friction bar means including a plurality of channel members each having bight portions cooperatively secured, respectively by their bight portions, to the radially outward end of each fan blade and in the arcuate inner plane of an arc of the fan housing perimeter wall for shredding vegetation air blast forced between the friction bar means by the centrifugal force of the fan blades.

5,189,869

POWER WASHER FOR ROTARY MOWERS

Roby C. McBride, Rte. 2, and Roger A. McBride, Rte. 1, Box 396 B, both of Limestone, Tenn. 37681

Continuation-in-part of Ser. No. 564,775, Aug. 9, 1990, Pat. No. 5,094,066. This application Oct. 29, 1991, Ser. No. 784,555
Int. Cl.[5] A01D *34/64, 34/66, 34/82, 55/00*
U.S. Cl. 56—17.5 **9 Claims**



5. A wash-fluid slinger device adapted for association with and rotation by a drive shaft of a rotary blade mowing machine for washing the inner wall of the blade shroud thereof, wherein the shroud has a top deck and surrounding skirt depending therefrom providing a blade cavity, wherein one or more drive shafts are provided within the cavity and at least one of which carries a rotary blade, said slinger device having body means, diverter means associated with said body means and located generally radially outwardly thereon, said diverter means having at least one upper surface portion contoured to provide at least one vector surface means adapted for generally vertical orientation with respect to the general plane of the cavity side of the deck, said diverter means also being provided with at least one chute surface means adapted for orientation within the blade cavity such that its fluid throw axis is directed generally radially outwardly toward the skirt, said vector surface means and said chute surface means being adapted to direct, respectively, contacting wash fluid generally toward the deck and generally toward the skirt upon rotation of the drive shaft with which said device is associated.

5,189,870

MOWER DISCHARGE DUCT GUARD

Gary D. Hohnl, Slinger, Wis., assignor to Deere & Company, Moline, Ill.

Filed May 7, 1992, Ser. No. 880,124
Int. Cl.[5] A01D *34/70, 75/20*
U.S. Cl. 56—320.2 **11 Claims**

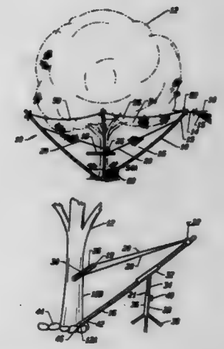
1. Guard means usable with a vegetation mower adapted to be supported by a vehicle and a vegetation collection means carried by the vehicle, a discharge duct means extending between the mower and collection means, the duct means including first and second material conveying sections with mating portions and means for releasably joining the two sections together, and blower means carried within one section near its mating portion, the guard means including:
- cover means swingably connected to the one section and movable between a first position substantially blocking said section when the two sections are uncoupled, and
- a second position adjacent said sections so as to permit the mating portions of the first and second sections to be joined, and
- means yieldably urging the cover means toward its first position.

5,189,871

COLLECTION NETTING FOR FRUIT AND NUT TREES

Wilfred C. Frederiksen, 16881 Bolero La., Huntington Beach, Calif. 92649, and Sun Y. Kim, 2384 Lancaster Ct., Hayward, Calif. 94542

Continuation-in-part of Ser. No. 835,514, Feb. 14, 1992. This application Sep. 11, 1992, Ser. No. 944,116
Int. Cl.[5] A01D *46/00*
U.S. Cl. 56—329 **19 Claims**



1. A netting system for fruit or nut collection from orchard trees having a central trunk with a base at the ground, comprising;
- a netting unit around each orchard tree, each netting unit having:
- at least three or more elongated support struts uniformly spaced around each tree having first ends anchored at the base of the tree and distal second ends displaced a distance from the trunk of the tree and elevated from the ground, wherein the struts are angularly disposed around the tree;
- a perimeter tie line interconnecting the distal second ends of the struts;
- a cross brace structure having cross brace members horizontally fastened to the trunk of the tree with the brace members having ends displaced from the trunk of the tree with means for interconnecting the ends of each brace member with at least one strut at a location between the ends of the strut;
- a plurality of wedge-shaped net panels, each net panel being disposed between adjacent struts with the net panels having a top edge connected to the perimeter tie line and opposite side edges, connected spaced struts, wherein a funnel-like net structure is formed.

12. A netting system for fruit or nut collection from orchard trees having a central trunk with a base at the ground comprising:

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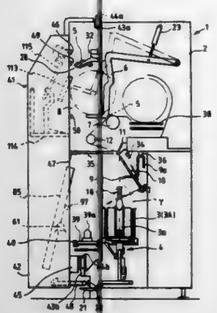
a netting unit around each orchard tree, each unit having:
four net support struts spaced uniformly around the tree extending upwardly and outwardly from the trunk, the struts having first ends anchored at the base of the tree and distal second ends displaced a distance from the trunk of the tree and elevated from the ground;
a plurality of horizontal, elevated guy cables with cable pairs crossing at a high point adjacent to the trunk with the cables having connection means for connecting the cables to the trunk at an elevated position on the trunk, the cables extending to adjacent trees in the orchard forming a matrix;
connection means at the distal ends of the struts for connecting the ends of the struts to the guy cables wherein diagonally opposite struts connect to the same cable spatially apart; and
four wedge-shaped net panels, each net panel being disposed between adjacent struts with the panels having opposed edges connected to the struts to form a funnel of inverted pyramid shape to direct nuts to the base of the tree.

5,189,872

PROCESSING ROBOT FOR A TWO-FOR-ONE TWISTER

Hiroshi Mima, Joyo; Tadashi Suzuki, Uji, and Yasuhiko Kubota, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 494,145, Mar. 14, 1990, abandoned. This application May 27, 1992, Ser. No. 890,295
Claims priority, application Japan, Mar. 17, 1989, 1-63857; Mar. 20, 1989, 1-66379; Mar. 28, 1989, 1-73863; Mar. 28, 1989, 1-73865
Int. Cl.[5] D01H *9/10, 7/86*
U.S. Cl. 57—264 **2 Claims**



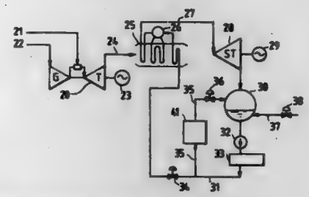
1. A yarn exchange and doffing device for use with a two-for-one twister having a plurality of twisting units for producing winding packages, the twisting units having a yarn tube carried by a cradle arm, the twisting units additionally including indicator means for indicating the completion of a yarn end finding operation, the exchange and doffing device comprising:
yarn changing means for exchanging a new yarn feed package for an old yarn feed package;
yarn end finding means for finding a yarn end on the new yarn feed package, wherein the yarn end finding means comprises suction means for applying a suction force to the yarn end and sensor means for sensing the presence of the yarn end;
sensor means for sensing the indicator means;
air flow means for producing an air flow;
threading means for using the air flow to insert the yarn end into an axial hole of the new yarn feed package;
doffing means for removing a full winding package and supplying a new yarn tube to the cradle arm; and
yarn engaging means for engaging the yarn end with the yarn tube;
wherein the device will bypass a twisting unit unless the sensor means senses the indicator means.

5,189,873

COMBINED CYCLE POWER PLANT WITH WATER TREATMENT

Nobuyoshi Mishima, and Yoshiki Noguchi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1991, Ser. No. 758,009
Claims priority, application Japan, Sep. 12, 1990, 2-240011
Int. Cl.[5] F02C *6/00*
U.S. Cl. 60—39.182 **9 Claims**



1. A combined cycle power plant comprising:
a gas turbine;
a generator connected to said gas turbine to generate electric power;
an exhaust heat recovery boiler for heating a condensate with exhaust combustion gas from said gas turbine to generate steam;
a steam turbine driven by the steam generated by said exhaust heat recovery boiler;
a generator connected to said steam turbine to generate electric power;
a condenser for condensing steam exhausted from said steam turbine to form a condensate in said condenser at a predetermined time;
a condensate feed line having a condensate pump for feeding the condensate from said condense to said exhaust heat recovery boiler, and a stop valve disposed at a downstream side of said condensate pump;
deaerating means for deaerating the condensate in said condensate feed line, said deaerating means comprising said condenser, heating means connected to said condenser for heating the condensate in said condenser at a predetermined time, and a condensate recirculation line having a valve and connected to said condenser and to said condensate feed line at an upstream side of said stop valve and at a downstream side of said condensate pump for recirculating the condensate from and to said condenser via a part of said condensate feed line; and
a water treatment apparatus provided in said condensate recirculation line for removing iron oxides from the condensate.

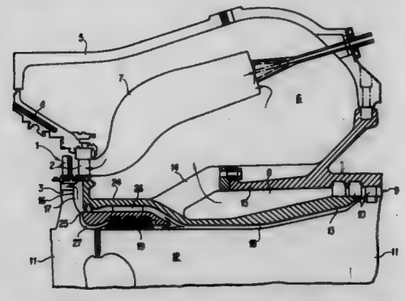
5,189,874

AXIAL-FLOW GAS TURBINE COOLING ARRANGEMENT

Franz Kreitmeier, Baden, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Apr. 2, 1991, Ser. No. 679,274
Int. Cl.[5] F02C *3/00*; F01D *5/14*
U.S. Cl. 60—39.75 **4 Claims**

1. An axial flow gas turbine, comprising:
a compressor section having at least one row of rotating blades for creating a spinning flow of compressed air having a tangential flow velocity component;
a turbine section having at least one row of rotating blades;
a rotating drum connected between said compressor section with said turbine section;
a drum cover surrounding said drum between said compressor section and said turbine section, said drum cover and drum defining an annular passage having an inlet adjacent a downstream most one of the compressor blades for permitting the spinning flow of compressed air to flow through the annular passage;
a spin cascade positioned adjacent a radially innermost portion of a downstream end of said annular passage for tangentially accelerating the spinning flow and directing the spinning flow towards the blades of the turbine section for cooling the blades of the turbine sections; and
a labyrinth seal in the downstream end of said annular passage and positioned in parallel flow with said spin cascade,
wherein said annular passage comprises means for permitting the spinning flow from said compressor section to reach said spin cascade without impediment to the tangential component of the spin flow velocity.

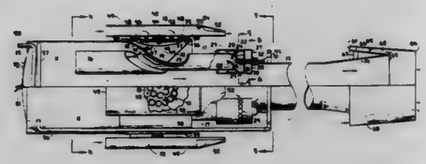


5,189,875

SELF STARTING VALVED PULSE JET

John A. Melenric, 8417 Cedarbrake, Houston, Tex. 77055-4825

Filed Sep. 10, 1990, Ser. No. 580,184
Int. Cl.[5] F02K *7/067*
U.S. Cl. 60—249 **11 Claims**



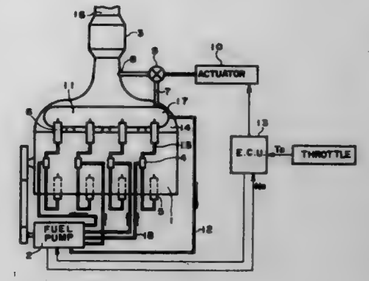
1. A self starting valve type pulse jet engine comprising:
a. a substantially cylindrical combustion chamber of circular cross section,
b. an elongated substantially cylindrical exhaust tube of circular cross section projecting aft from said combustion chamber constructed and arranged on a common axis with the axis of said combustion chamber,
c. a reduction cone intermediate said combustion chamber and said exhaust tube,
d. a multiplicity of straight air and fuel inlets constructed in a single axis configuration, each air and fuel inlet utilizing two tubes including a forward tube and an aft tube axially aligned with each other, the forward tube of larger cross section and mounted in said reduction cone projecting into said combustion chamber, an opening between said axially aligned tubes,
e. an annular plenum chamber surrounding the openings between the tubes, a number of shrouded valve assemblies equal to the number of openings and housed in the outer wall of said annular plenum chamber, the forward edge of said outer wall mounting the aft end of the combustion chamber outer wall, a plenum chamber aft cone shaped wall mounting the forward edge of said exhaust tube,
f. said aft tube of each air and fuel inlet mounted to and penetrating through said plenum chamber aft cone shaped wall and projecting forward toward the aft end of said forward tube of each air and fuel inlet,
g. a one way air valve mounted to the aft end of said aft tube of each air and fuel inlet guided to move fore and aft without rotation and permitting air flow into the combustion chamber only for engine starting,
h. a fuel supply means operably associated with said combustion chamber and
i. ignition means operably associated with said combustion chamber.

5,189,876

EXHAUST GAS PURIFICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

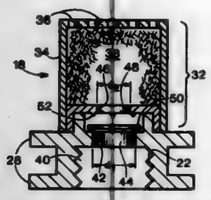
Shinya Hirota, Susono, and Tokuta Inoue, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 7, 1991, Ser. No. 652,193
Claims priority, application Japan, Feb. 9, 1990, 2-11563[U]
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—286 **12 Claims**



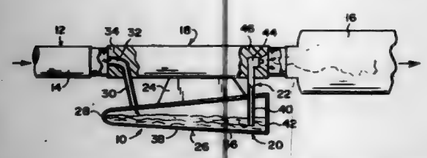
1. An exhaust gas purification system for an internal combustion engine comprising:
the internal combustion engine being capable of fuel combustion at lean air-fuel ratios, the engine having an exhaust manifold and an exhaust conduit connected to the manifold;
a catalyst installed in the exhaust conduit of the engine and constructed of zeolite carrying at least one kind of metal selected from transition metals and noble metals, said catalyst being employed to reduce nitrogen oxides included in exhaust gas from the engine under oxidizing conditions and in the presence of hydrocarbons;
an HC producing means for producing hydrocarbons of low boiling points from fuel for combustion in the engine by subjecting at least a portion of the fuel for combustion to a process selected from the group including cracking and fractional distillation; and
an HC supply means for supplying the hydrocarbons of low boiling points produced by the HC producing means to the exhaust conduit upstream of the catalyst.

5,189,877
EXHAUST MANIFOLD AIR INJECTOR
Carter Wells, Colorado Springs, Colo., and Joseph M. Youngblood, Jr., Grapevine, Tex., assignors to Oxy Adder, Inc., Grapevine, Tex.
Filed Jan. 18, 1991, Ser. No. 642,843
Int. Cl.[5] F01N *3/30*
U.S. Cl. 60—293 19 Claims



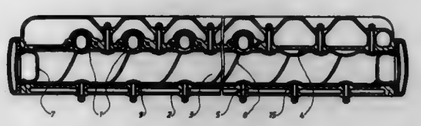
1. An air injector for a vehicle engine exhaust manifold comprising:
a tubular main body adapted to be attached to said vehicle engine exhaust manifold having
an exterior surface;
an interior bore;
a valve chamber in communication with the interior bore of the tubular main body; the valve chamber having
a first circumference edge defining a first opening, the first opening directed toward the tubular main body;
a second circumference edge defining a second opening, the second opening directed away from the tubular main body;
a valve means for permitting air to travel into the tubular main body, the valve means being free to move between the first circumference edge and the second circumference edge, such that when the valve means is against the second circumference edge a seal is formed that substantially blocks exhaust, and when the valve means is against the first circumference edge air is permitted to flow around the valve means; and
means for preventing the valve means from sticking on at least the second circumference edge.

5,189,878
VEHICULAR EXHAUST POLLUTION REDUCER
Antonio Robinson, 3850 Hudson Manor Ter. #2B, Riverdale, N.Y. 10463, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007
Filed May 28, 1991, Ser. No. 706,179
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—309 4 Claims



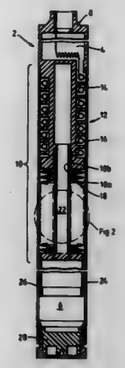
1. An exhaust trap for an exhaust system of a motor vehicle the exhaust system having an engine exhaust pipe and a muffler, said trap comprising:
a) a support and connecting pipe affixed between the engine exhaust pipe and the muffler of the exhaust system of the motor vehicle;
b) trapping and condensing means carried by said support, for trapping some exhaust and condensing water vapor and solids coming through the engine exhaust pipe; and
c) means for spraying condensed water into the exhaust entering the muffler through said connecting pipe.

5,189,879
EXHAUST GAS LINE FOR AN INTERNAL-COMBUSTION ENGINE AND ITS METHOD OF MANUFACTURE
Hans Sudmanns, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Friedrichshafen GmbH, Fed. Rep. of Germany
Filed Jun. 20, 1991, Ser. No. 718,258
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1990, 4021326
Int. Cl.[5] F21N *3/02, 7/10*
U.S. Cl. 60—321 2 Claims



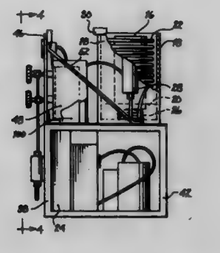
1. An exhaust gas line for an internal-combustion engine, wherein the exhaust gas line is enclosed by a gastight water-cooled housing to which it is fastened at several points in such a manner that in a cold state the exhaust gas line is subjected to a radial prestress which is just eliminated at engine operating temperature; wherein the improvement comprises that the exhaust gas line is a metal strip which is helically wound into a tube in such a manner that, in the cold state of the exhaust gas line side edges of the metal strip are aligned to produce a gap therebetween; said gap having a width
wherein upon heating of the wound metal strip to normal engine operating temperatures, the gap is just closed by thermal expansion of the metal strip.

5,189,880
DILUTION REFRIGERATORS
Giorgio Frossati, Galgewater 21, 2311 VZ Leiden, Netherlands, and Nei F. Oliveira, Jr., Rua José Yázigi 424, CEP 05658 S. Paulo, S.P., Brazil
Filed Aug. 2, 1991, Ser. No. 739,988
Claims priority, application United Kingdom, Aug. 2, 1990, 9017011
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.3 10 Claims



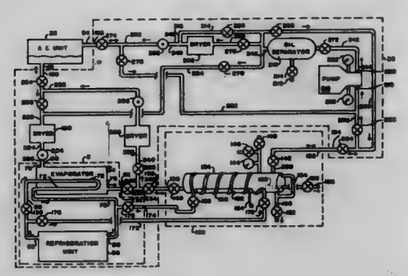
1. A dilution refrigerator comprising:
a plastic still having a film breaker at an upper end thereof;
a plastic heat exchanger structure in fluidic communication with said still at an upper end of said heat exchanger; and
a mixing chamber defined by plastic walls, said mixing chamber in fluidic communication with said heat exchanger structure at a lower end of said heat exchanger, said heat exchanger providing a relatively low impedance path for fluid flow between said still and said mixing chamber.

5,189,881
REFRIGERANT RECOVERY APPARATUS AND METHOD
Lee A. Miles, 300 S. Val Vista Dr., Sp. 161, Mesa, Ariz. 85204
Filed Oct. 21, 1991, Ser. No. 780,031
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—77 8 Claims



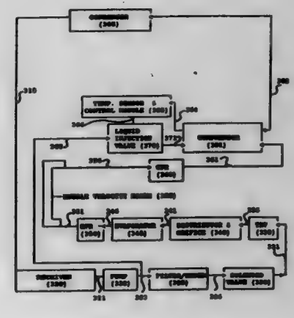
8. A method for draining refrigerant liquid from a refrigeration system comprising, in combination:
providing a chiller, said chiller unit comprising a drum having a fluid therein and a chiller coil disposed in said drum;
connecting piping circuit means to the refrigeration system; and
connecting storage cylinder means connected to the piping circuit means and disposed within the chiller unit for collecting the refrigerant liquid when cooled.

5,189,882
REFRIGERANT RECOVERY METHOD
Edward C. Morgan, Sr., Memphis, Tenn., assignor to B M, Inc., Memphis, Tenn.
Division of Ser. No. 629,262, Dec. 17, 1990, Pat. No. 5,123,259.
This application Jan. 27, 1992, Ser. No. 827,696
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—77 10 Claims



1. A method for removing liquid CFC refrigerant from an air conditioning unit into a storage tank, which comprises:
a. creating a temperature gradient between liquid refrigerant in the air conditioning unit and liquid refrigerant within the storage tank by cooling liquid refrigerant emerging from the air conditioning unit, before the emerging refrigerant enters the storage tank, using a liquid coolant other than water and non-commingling with said refrigerant;
b. storing the cooled refrigerant in the storage tank; and,
c. pumping refrigerant vapor within the storage tank back into the air conditioning unit.

5,189,883
ECONOMICAL REFRIGERATION RETROFIT SYSTEMS
Gene H. Bradford, Houston, Tex., assignor to Natkin & Company, Englewood, Colo.
Filed Apr. 13, 1992, Ser. No. 867,510
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—83 17 Claims



1. A method for converting a compression type refrigeration system designed for the use of R-12 refrigerant which systems comprises an evaporator, a compressor rated for R-12 use, a condenser and a receiver and conduit means interconnecting these devices to circulate the refrigerant through these devices in a continuous loop in the sequence named, to the use of R-22 refrigerant comprising:
installing a pressure regulator in the suction line to the compressor and balancing such regulator to the operating limitations of the compressor motor;
installing a line into the body of the compressor sufficient to inject liquid refrigerant into the compressor for cooling purposes; and
attaching a desuperheating control to the refrigerant injection line to control the amount of refrigerant injected based upon the temperature inside the compressor.

5,189,884
PASSIVE HEAT PUMP WITH NON-AZEOTROPIC REFRIGERANT
Samuel M. Sami, University of Moncton, R.C.E.C., Moncton, N.B., E1A 3E9, Canada
Filed May 2, 1991, Ser. No. 694,948
Int. Cl.[5] F25B *47/00*; C09K *5/04*
U.S. Cl. 62—114 8 Claims

7. In a passive heat pump means comprising one or more aligned closed pipes which are partially filled with refrigerant,

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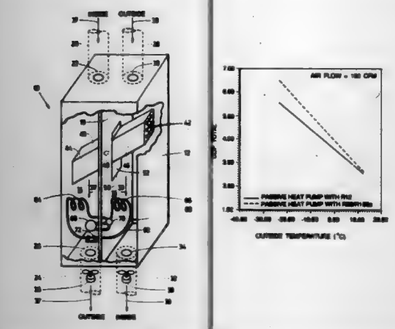
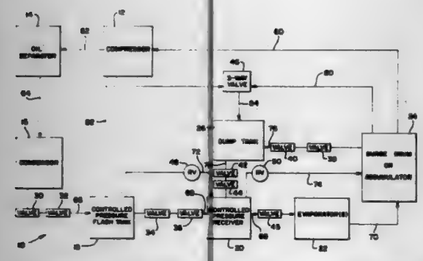
the improvement wherein the refrigerant comprises a non-azeotropic mixture of R22 and R152a mixed in the ratio of



from 60 parts R22 to 40 parts R152a to 80 parts R22 to 20 parts R152a.

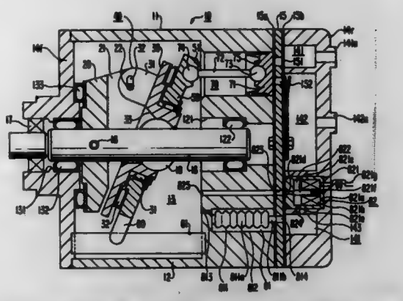
5,189,885
RECIRCULATING REFRIGERATION SYSTEM
Shimao Ni, Westmont, Ill., assignor to H. A. Phillips & Co., St. Charles, Ill.
Filed Nov. 8, 1991, Ser. No. 789,164
Int. Cl.[5] F25B *43/00*
U.S. Cl. 62—117 **9 Claims**



6. A method for recirculating liquid refrigerant in a refrigeration system comprising the steps of

a) compressing refrigerant gas in a compressor;
b) condensing said refrigerant gas to a liquid;
c) storing said liquid in a flash tank;
d) transferring said liquid to a receiver tank;
e) transferring said liquid from said receiver tank to an evaporator, which transfers heat from the surrounding environment to said liquid, thereby flashing part of said liquid and creating a liquid/gas mixture;
f) separating the liquid from said liquid/gas mixture and transferring said liquid to a dump tank;
introducing flash gas from said flash tank into said dump tank for pumping liquid from said dump tank into said receiver; and
h) attaching a pressure regulator valve to said flash tank for regulating the pressure of the flash gas introduced into said dump tank.

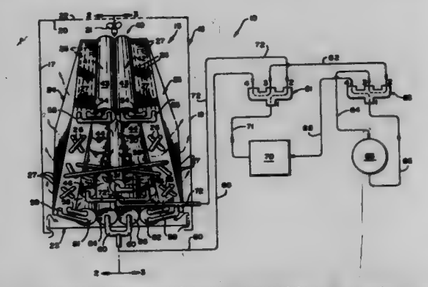
5,189,886
REFRIGERATING SYSTEM HAVING A COMPRESSOR WITH AN INTERNALLY AND EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT MECHANISM
Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan
Division of Ser. No. 404,594, Sep. 8, 1989, Pat. No. 5,027,612, which is a continuation of Ser. No. 247,605, Sep. 22, 1988, Pat. No. 4,882,909. This application Apr. 29, 1991, Ser. No. 692,902
Claims priority, application Japan, Sep. 22, 1987, 62-236315
Int. Cl.[5] F04B *1/26*
U.S. Cl. 62—228.5 **1 Claim**



1. In a refrigerating system including a refrigerant circuit, comprising a condenser, evaporator and compressor, the compressor including a compressor housing having a central portion, a front end plate at one end and a rear end plate at its other end, said housing having a cylinder block, a piston slidably fitted within each of said cylinders, a drive mechanism coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported in said housing, a rotor coupled to said drive shaft and rotatable therewith, and coupling means for drivingly coupling said rotor to said pistons such that the rotary motion of said rotor is converted into reciprocating motion of said pistons, said coupling means including a member having a surface disposed at an incline angle relative to said drive shaft, said incline angle of said member being adjustable to vary the stroke length of said pistons and the capacity of said compressor, said rear end plate having a suction chamber and a discharge chamber, variable displacement control means for controlling angular displacement of said adjustable member, said variable displacement control means comprising first valve control means for controlling fluid communication between said crank chamber and said suction chamber in response to changes in refrigerant pressure in said compressor, said first valve control means comprising a first passageway providing fluid communication between said crank chamber and said suction chamber and first valve means for controlling the opening and closing of said first passageway to vary the capacity of the compressor by adjusting the incline angle, said first valve means comprising a first valve to directly open and close said first passageway, said variable displacement control means further comprising second valve control means for controlling fluid communication between said crank chamber and said suction chamber in response to a control signal generated outside of the compressor, said second valve control means comprising a second passageway providing fluid communication between said crank chamber and said suction chamber and second valve means for controlling the opening and closing of said second passageway in response to the control signal, to vary the capacity of said compressor by adjusting the incline angle, said second valve means comprising a second valve to directly open and close said second passageway and override the operation of said first valve, the improvement comprising:

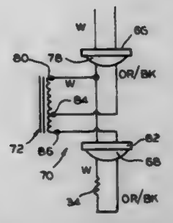
means for controlling the generation of said signal in response to the temperature of air leaving the evaporator such that an "on" signal is generated when the temperature of air leaving the evaporator indicates a value between a predetermined range of values and an "off" signal is generated when the temperature of air leaving the evaporator indicates a value beyond said predetermined range of values.

5,189,887
HEAT CONDENSING FURNACE WITH DE-INTENSIFIER TUBES
Gerry Vandervaart, Niagara Falls, Ontario, Canada, assignor to Kool-Fire Research & Development, Canada
Continuation of Ser. No. 459,227, Dec. 29, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 825,760
Int. Cl.[5] F25B *29/00*
U.S. Cl. 62—238.7 **27 Claims**



1. A gas condensing furnace comprising an outdoor coil burner assembly, said outer coil burner assembly including first and second outdoor heat exchanger means for conducting a refrigerant therethrough; said first outdoor heat exchanger means including a first outdoor coil defining a first refrigerant series flow path having a refrigerant inlet and a refrigerant outlet; said first refrigerant series flow path establishes refrigerant flow in a first general direction, said second outdoor heat exchanger means including a second outdoor coil defining a second refrigerant series flow path having a refrigerant inlet and a refrigerant outlet; said second refrigerant series flow path establishes refrigerant flow in a second general direction generally opposite to said first refrigerant series flow path first general direction, means for generating relatively intense heat relative to ambient temperature which is adapted to be absorbed by said first outdoor coil, said second outdoor coil being positioned generally between said first outdoor coil and said intense heat generating means for de-intensifying the relatively intense heat of the intense heat generating means whereby less intense heat is absorbed by said first outdoor coil and the refrigerant flowing therethrough, said first and second outdoor coils and the refrigerant inlets and outlets thereof being in series communication with each other, a compressor and an indoor coil, refrigerant conduit means for placing an outlet of said compressor in refrigerant communication with an inlet of said indoor coil, and further refrigerant conduit means for placing an outlet of said indoor coil in refrigerant communication with said second outdoor coil inlet and for placing said first outdoor coil outlet in refrigerant communication with an inlet of said compressor.

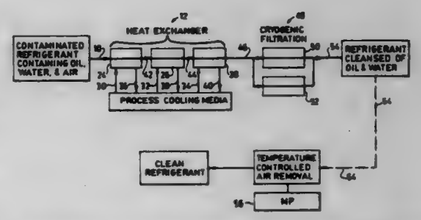
5,189,888
STILE HEATER FOR REFRIGERATOR
Vincent P. Anderson, Center Township, Vanderburgh County, and Christopher G. Schmidt, Knight Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Mar. 26, 1990, Ser. No. 498,998
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—248 **15 Claims**



1. In a refrigeration apparatus including a cabinet provided with an inner liner to define an interior storage space and an electrical anti-condensation heater mounted at a select portion of said cabinet and connected to a source of electrical power to prevent external cabinet condensation, the improvement comprising:

means connected between said source of power and said heater for stepping up voltage applied to said heater to increase heat produced thereby.

5,189,889
REFRIGERANT RECLAIMING DEVICE
Bernard E. Daily, Brockport, N.Y., assignor to CFC Solutions Corporation, Rochester, N.Y.
Filed Oct. 24, 1991, Ser. No. 782,168
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—292 **18 Claims**



1. An apparatus for reclaiming contaminated refrigerant, comprising:

(a) first heat exchanger means for cooling said contaminated refrigerant to a temperature of less than about 32 degrees Fahrenheit;
(b) second heat exchanger means for cooling said contaminated refrigerant to a temperature of less than about −40 degrees Fahrenheit;
(c) third heat exchanger means for cooling said contaminated refrigerant to a temperature of less than about −100 degrees Fahrenheit, wherein each of said first heat exchanger means, said second heat exchanger means, and said third heat exchanger means is a tube-in-tube heat exchanger which is comprised of a liquid nitrogen input port and a liquid nitrogen output port;
(d) filtering means for removing from said contaminated refrigerant at a temperature of less than about −100 de-

grees Fahrenheit substantially all of the particles in said refrigerant with a maximum dimension in excess of about 0.1 microns, wherein said filtering means is adapted to produce a filtered refrigerant; and

(e) gas removing means for removing noncondensable gas from said filtered refrigerant, wherein said gas removing means is adapted to produce a filtered and degassed refrigerant.

5,189,890

PORTABLE CHILLER

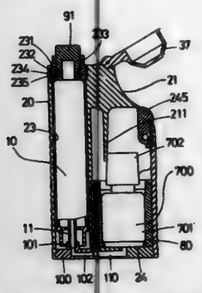
Daisuke Kitayama, Osaka, Japan, assignor to Senju Seiyaku Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 705,672, May 24, 1991, abandoned. This application Jul. 17, 1992, Ser. No. 914,656

Claims priority, application Japan, Jun. 1, 1990, 2-145046; Jun. 14, 1990, 2-156714

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—293 **10 Claims**



1. A portable chiller comprising a cylinder means having a cylinder body containing a liquefied gas refrigerant and a nozzle for ejecting said refrigerant from said cylinder body only when it is forced into said body and a chiller case, said chiller case including:

a cylinder compartment for accommodating said cylinder,

a cooling compartment which is loaded with a replaceable article to be chilled and in which said article is chilled,

a refrigerant ejection means for ejecting the refrigerant from said cylinder in said cylinder compartment into said cooling compartment, and

a refrigerant gasification control means for allowing the refrigerant ejected into said cooling compartment to first circulate in liquid form around the article to be chilled in said cooling compartment and, then, be gasified, wherein said refrigerant gasification control means is resilient and substantially surrounds and directly contacts the peripheral surface of said replaceable article, wherein a portion of said replaceable article and a portion of said cooling compartment has a clearance therebetween for receiving therein said refrigerant gasification control means, and wherein another portion of said replaceable article and another portion of said cooling compartment has another clearance therebetween for receiving therein said refrigerant and for transferring said refrigerant into said refrigerant gasification control means.

5,189,891

AUGER TYPE ICE MAKING MACHINE

Shigetoshi Sakamoto, Nagoya, Japan, assignor to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

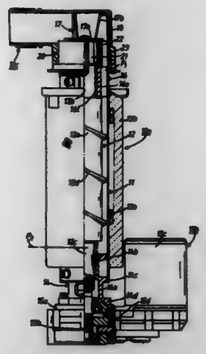
Filed Oct. 1, 1991, Ser. No. 769,591

Claims priority, application Japan, Oct. 1, 1990, 2-264618

Int. Cl.[5] F25C *1/14*

U.S. Cl. 62—354 **4 Claims**

1. An auger type ice making machine having an upright evaporator housing, the internal wall of which is formed with a cylindrical freezing surface, and an auger mounted for rotary movement within said evaporator housing to scrape ice crystals off said freezing surface and to advance the scraped ice crystals toward an upper end of said housing, wherein an extruding head assembly mounted on the upper end of said evaporator housing comprises a cylindrical head member coaxially coupled with the upper end of said evaporator housing, said head member having an internal cylindrical wall formed with a plurality of circumferentially equally spaced



radial projections forming a plurality of circumferentially equally spaced compression chambers to which the scraped ice crystals are successively introduced under the action of said auger, and a thrust mechanism mounted on an upper end of said auger to compress radially outwardly the ice crystals introduced into said compression chambers in accordance with rotation of said auger, said thrust mechanism comprising a plurality of thrust elements radially slidably disposed within said compression chambers to compress said ice crystals.

5,189,892

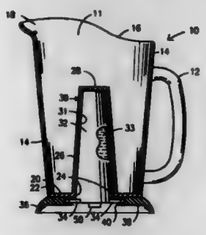
CONTAINER THAT COOLS LIQUIDS

Steven K. Roberts, 9311 Forrester Dr., Bradenton, Fla. 34202

Filed Feb. 7, 1992, Ser. No. 832,245

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—372 **14 Claims**



1. A container, comprising:

a bottom wall of predetermined geometrical configuration;

an opening of predetermined geometrical configuration being formed in said bottom wall;

said bottom wall having an outer peripheral edge and an inner peripheral edge that borders said opening;

imperforate outer sidewalls being mounted about the outer peripheral edge of said bottom wall and projecting upwardly therefrom;

imperforate inner sidewalls being mounted about the inner peripheral edge of said opening formed in said bottom wall and projecting upwardly therefrom;

an imperforate closure wall member for closing an uppermost end of said inner sidewalls;

said inner sidewalls and closure wall member collectively defining a post member, said post member being formed integrally with said bottom wall;

a cavity having an uppermost end defined by said closure wall member, a lowermost end defined by said opening formed in said bottom wall, and an outer periphery defined by said inner sidewalls;

a plug member having a main body part specifically configured and dimensioned, such that the outer surfaces of said main body part are in close conformity to and contact with said inner sidewalls and said closure wall member, to slideably fit within said cavity;

said plug member being hollow;

a freezable substance being permanently disposed within said hollow plug member, said freezable substance and said plug member being coolable prior to insertion of said plug member into said cavity;

said inner sidewalls and said closure wall member being formed of a substantially noninsulating material so that efficient heat transfer is obtained between said plug member and the liquid within said container; and

engagement means formed integrally with said plug member for releasably positioning said plug member within said cavity;

said plug member and freezeable substance contained therein being frozen prior to insertion of said plug member into said post member;

whereby a potable is protected from contact with said plug member by said post member.

5,189,893

SHACKLE LOCK WITH A PIVOTABLE LOCKING ARRANGEMENT

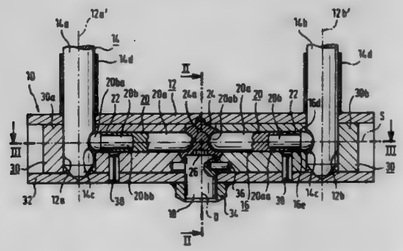
Ludger Kortenbrede, Telgte, Fed. Rep. of Germany, assignor to Aug. Winkhaus GmbH & Co. KG, Telgte, Fed. Rep. of Germany

Filed Jun. 24, 1991, Ser. No. 719,801

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1990, 9013187.8; European Pat. Off., May 8, 1991, 911075505

Int. Cl.[5] E05B *67/24*

U.S. Cl. 70—38 A **15 Claims**



1. A lock unit comprising a lock body (12), said lock body (12) having a main plane (S) and at least one channel (12*a*, 12*b*) within said lock body (12), said at least one channel (12*a*, 12*b*) intersecting said main plane (S) and being adapted for accommodating a channel engagement member (14*a*, 14*b*), said channel engagement member (14*a*, 14*b*) having a locking depression (14*c*) substantially located in said main plane (S), when said channel engagement member (14*a*, 14*b*) is introduced into said channel (12*a*, 12*b*) to a predetermined depth, a rotatable body (24, 124) being rotatably mounted within said lock body (12) about an axis of rotation (D) substantially perpendicular to said main plane (S), said axis of rotation (D) being spaced from said channel (12*a*, 12*b*) along said main plane (S), a cavity (16) being provided within said lock body (12) substantially along said main plane (S) and extending from said rotatable body (24) to said channel (12*a*, 12*b*), an elongate locking bar unit (20, 120) within said cavity (16) extending from said rotatable body (24) to said channel (12*a*, 12*b*), said locking bar unit (20) having a locking end portion (20*ba*) adjacent to said channel (12*a*, 12*b*) and a control end portion (20*ab*) adjacent to said rotatable body (24), said locking end portion (20*ba*) being engageable with said locking depression (14*c*) of said channel engagement member (14*a*, 14*b*) when said channel engagement member (14*a*, 14*b*) is introduced into said channel (12*a*, 12*b*) to said predetermined depth, said control end portion (20*ab*) having a convex pivot end face pivotally engaged with a concave pivot entraining face (24*a*, 124*a*) of said rotatable body (24), said elongate locking bar unit (20) being, in response to rotation of said rotatable body (24) about said axis of rotation (D), tiltable within said cavity (16) in parallel with said main plane (S) about a tilting center (C) adjacent said channel (12*a*, 12*b*) between a locking tilt position substantially parallel to a connection line extending in said main plane (S) from said tilting center (C) to said axis of rotation (D) and an unlocking tilt position tilted with respect to said connection line, the distance between said locking depression (14*c*) and said concave pivot entraining face (24*a*) being shorter in said locking tilt position than in said unlocking tilt position, said locking bar unit (20) having an effective length variable against the action of internal prestress means (22), said locking bar unit (20) extending both in said locking tilt position and in said unlocking tilt position in a straight direction from a location of contact of said locking end portion (20*ba*) with said locking depression (14*c*) to a location of contact of said control end portion (20*ab*) with said concave pivot entraining face (24*a*), said rotatable body (24) being lockable against rotation in a locking position corresponding to said locking tilt position of said locking bar unit (20), said locking end portion (20*ba*) being prevented from completely falling into said channel (12*a*, 12*b*) under the action of the prestress means (22) by a restricted outlet portion (16*a*) of said cavity (16) towards said channel (12*a*, 12*b*), said restricted outlet portion (16*a*) permitting, however, engagement of said locking end portion (20*ba*) with said locking depression (14*c*).

5,189,894

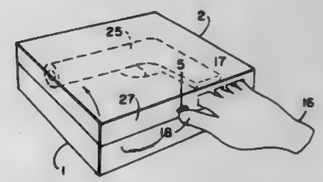
QUICK OPENING, CHILD-SAFE CONTAINER WITH DIGITAL COMBINATION LOCK

William M. Buck, 4091 Cypress Reach Ct., Apt. 401, Bldg. 152, Pompano Beach, Fla. 33069

Filed Feb. 10, 1992, Ser. No. 833,004

Int. Cl.[5] E05B *65/42, 37/16*

U.S. Cl. 70—63 **6 Claims**



5. A quick opening container with a locking mechanism that is rapidly opened only by a hand to which the locking mechanism has been preset, said hand having a thumb and four parallel fingers with finger tips, said fingers separated from one another by interdigital troughs, in which the length of each finger is defined by the distance from the finger tip to the interdigital troughs adjacent thereto, said container comprising:

A) an enclosure;

B) a closure movably connected to said enclosure, said closure having an open position for access to said container and a closed position for preventing access to said container;

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C) a lock mechanism having an unlocked condition for opening said closure and a locked condition to maintain said closure in closed position; said lock mechanism including;

a) a plurality of elongate tumblers each having a long axis, said tumblers slidably mounted parallel to one another on a first member of a pair consisting of said enclosure and said closure for reciprocating, spring biased motion along said long axis, each said tumbler having a finger tip contact element afixed thereto for engagement by a finger tip to provide said motion;

b) a plurality of interdigital stop elements, each stop element affixed to said first member of said pair between adjacent tumblers, said stop elements arranged for engaging said interdigital troughs while the finger tip contact elements are engaged by the finger tips to thereby define the motion of the tumblers by the length of each finger;

c) a locking bar means slidably mounted on one member of said pair and arranged transverse to said long axes for preventing opening of said closure when said lock mechanism is in locked condition;

d) pass means and stop means mounted on each said tumbler and distributed along said long axis in a mutually exclusive manner so that locations along said long axis are provided with one or the other of stop means or pass means, said stop means arranged for operatively interacting with said locking bar means to maintain said locked condition and said pass means not interacting with said locking bar means; and

e) adjustment means on each said tumbler for preset adjustment of said lock mechanism for quick opening by a particular hand, said adjustment means providing for adjusting distance between said finger tip contact and said pass means and said stop means so that when the finger tips of said particular hand push the tumblers along said spring biased motion to the extent permitted by said interdigital stop elements, said pass means of all said tumblers will be aligned with said locking bar means to achieve said unlocked condition to permit said closure to be opened, and at least one of said stop means will be aligned with said locking bar means at all other times to achieve said locked condition, whereby said closure is openable only by said particular hand.

5,189,895

LOCKING MECHANISM FOR MOTOR VEHICLES

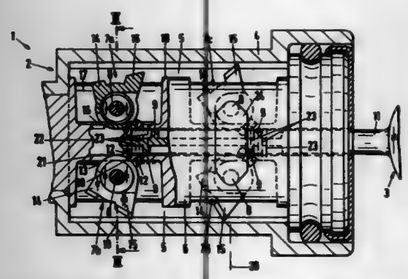
Dittmar Schwab, Rodgau, and Dieter Kaaser, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Yoma Aktiengesellschaft Industrieprodukte, Obertshausen, Fed. Rep. of Germany

Filed Nov. 2, 1990, Ser. No. 608,305

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1989, 3937611; Jan. 22, 1990, 4019943

Int. Cl.[5] E05B *25/08*

U.S. Cl. 70—366 **23 Claims**



1. A lock and key combination, comprising a locking cylinder and a key, said locking cylinder comprising a cylinder housing, at least one blocking channel, and a cylinder core in said cylinder housing, a key channel in said cylinder core, a plurality of tumblers mounted in said cylinder core, a tumbler axis provided for each of said tumblers so that each tumbler is tiltable about its own tumbler axis, at least one protruding cam or a recess on said key or on said tumblers for transforming a linear key motion in said key channel into a rotation of said tumblers about their axes, said key comprising a depression, said cylinder core comprising a recess including a through-hole opening toward said depression, a catch element mounted in said recess, said catch element comprising a spring web and a catch nose in said spring web, said catch nose projecting through said through-hole for cooperation with said depression in said key, whereby said spring web normally urges said catch nose into said depression, said key further comprising a metal key shaft having cut-outs and plastic key control elements recessed in said cut-outs for protecting said plastic key control elements.

5,189,896

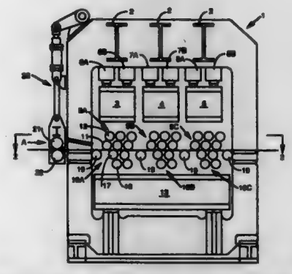
SINGLE STAND ROLLER LEVELLER FOR HEAVY PLATE

Andrew E. Melzer, Bethel Park, and Leonard P. Blough, Irwin, both of Pa., assignors to Mesta International, Pittsburgh, Pa.

Filed Mar. 2, 1992, Ser. No. 844,120

Int. Cl.[5] B21D *1/02*

U.S. Cl. 72—13 **9 Claims**



1. A roller leveller for one-pass levelling of high strength steel plate having a yield strength up to about 250,000 psi and a thickness from about 3/16 to about ½ inch, comprising:

a main leveller frame;

top beams mounted on the main frame;

at least three generally rectangular upper roll frames mounted on the top beams;

a lower roll frame mounted on the main frame;

at least three sets of separately driven upper work rolls and lower work rolls, each upper work roll mounted in an upper roll frame and moveable therewith and each lower work roll mounted in the lower roll frame, wherein one set of opposed upper and lower rolls comprises an entry roll set, another set of opposed upper and lower rolls comprises an intermediate roll set and another set of opposed upper and lower rolls comprises an exit roll set, each roll set comprising at least three upper work rolls opposed to at least two lower work rolls of the same diameter, said upper and lower work rolls of each set being offset relative to one another so as to level said plate as the plate is fed through the work rolls along a horizontal path;

back-up rolls backing up each work roll;

at least twelve screwdown assemblies, each said assembly having a pusher element thereof bearing on a corner portion of an upper roll frame whereby, by selective operation of said assemblies, the corresponding upper roll frame and its associated rolls are moveable vertically and are tiltable in the direction of a pass line of plate passed through the leveller to vary the gap between the upper and lower work rolls, all of said upper roll frames being tiltable and vertically movable;

retraction actuation means to actuate selective ones of said assemblies to vertically move the corresponding upper roll frame and associated upper rolls as a single group into and out of an operative position;

driven carrier rolls upstream of the entry roll set, downstream of the exit roll set, and between each roll set, said carrier rolls acting as non-shaping rolls;

means separately to drive each work roll and the carrier rolls;

a pair of opposed and vertically spaced apart pinch rolls disposed upstream of the entry roll set in the pass line of plate passed through the leveller;

control means separately to control the gap between upper work rolls and lower work rolls in each set of work rolls in a vertical direction and in the direction of the pass line, and

means to remove the rolls from the respective roll frames.

5,189,897

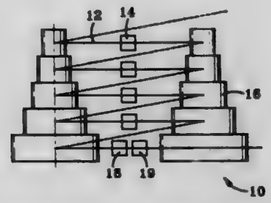
METHOD AND APPARATUS FOR WIRE DRAWING

Robert E. Lionetti, Wadsworth; Patrick E. Joseph, Akron; Dong K. Kim, Akron, and Farrel B. Helfer, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 15, 1991, Ser. No. 776,948

Int. Cl.[5] B21C *1/04*

U.S. Cl. 72—278 **16 Claims**



1. A method of drawing steel wire to produce high tensile strength, steel wire with increased torsional ductility, comprising the steps of:

a. drawing wire through a plurality of standard dies followed by a next to last die and a final die arranged in a wire drawing device;

b. reducing the cross section of the wire by a constant reduction of about 15% to about 18% at each of the plurality of standard dies; and

c. reducing the wire at said final die and said next to last die of said wire drawing device by a total amount to equal said constant reduction wherein the reduction at the next to last die is between about 10% to about 90% of the constant reduction and the remainder of the reduction is at the final die.

5,189,898

HEAVY DUTY AUXILIARY TOWER FOR A REPAIR RACK

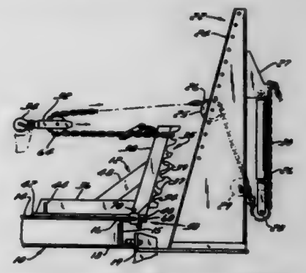
Harold F. Hamilton, West Allis, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Oct. 1, 1991, Ser. No. 769,864

Int. Cl.[5] B21D *1/12*

U.S. Cl. 72—457 **8 Claims**

1. In an apparatus for repairing and straightening vehicles including a rack having upper and lower tracks, a plurality of pull towers mounted on said lower track for movement around the rack, each pull tower including a tension member having a free end for attachment to the damaged area of the vehicle, the improvement comprising an auxiliary tower mounted on said upper track in close proximity to one of the pull towers whereby said tension member can be attached to said vehicle with said free end of said tension member attached to said



auxiliary tower whereby a tensile force applied to the chain will be doubled at the point of connection of the chain to the damaged vehicle.

5,189,899

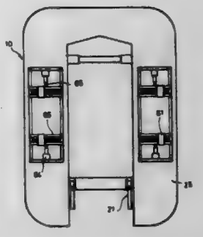
APPARATUS FOR VEHICLE STRAIGHTENING AND REPAIR

Chin H. Hsu, Suite 1, 11F, 95-8 Chang Ping Road, Sec. 1, Taichung, Taiwan

Filed Jan. 22, 1992, Ser. No. 823,848

Int. Cl.[5] B21D *12/00*

U.S. Cl. 72—457 **2 Claims**



1. An improvement on apparatus for straightening and repairing vehicles of the type comprising a frame member having a pair of parallel elongate track members for supporting a vehicle, and at least one vertical pull tower adjustable in position along the outer side of each said track member and being adjustable in angular orientation with respect therewith for exerting pulling forces on selected vehicle parts connected therewith, wherein in the improvement thereof:

at least two vertical bolster cylinders are disposed over each said track member, each said bolster cylinder being carried by a support block slidingly mounted on a laterally aligned carriage with each said support block being displaceable by a threaded shaft engaged therewith, said threaded shaft being rotated by a remotely controlled motor;

each said carriage is slidingly engaged within a corresponding said track member, each said carriage being displaceable in a longitudinal direction by a threaded shaft engaged therewith, said threaded shaft of a said carriage being rotated by a corresponding remotely controlled motor;

each said bolster cylinder has a sleeve member with a telescoping extension therein displaceable in a vertical direction by a remotely controlled fluid lifting means disposed within said sleeve;

a clamp member is provided on the upper terminal end of

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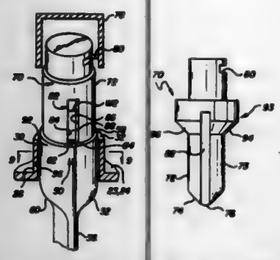
said extension of each said bolster cylinder for securing with a selected vehicle part.

5,189,900
APPARATUS FOR CONNECTING A COOLANT TUBE AND HEADER OF A HEAT EXCHANGER

James L. Colvin, Mt. Pleasant; Shawn T. Jennings, N. Charleston, both of S.C., and Gary L. Tarzwell, Warren, Mich., assignors to McCord Heat Transfer Corporation, Walled Lake, Mich.

Division of Ser. No. 665,351, Mar. 6, 1991, Pat. No. 5,099,575. This application Nov. 1, 1991, Ser. No. 786,258
Int. Cl.[5] B21D *19/00*
U.S. Cl. 72—479 **9 Claims**

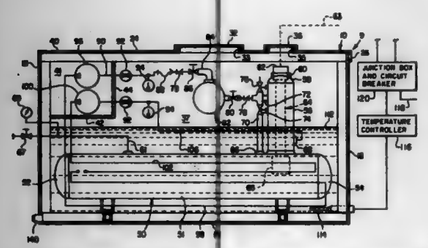


1. A flaring tool (70) for expanding ends (52) of a coolant tube (20) of a heat exchanger (10) against a manifold opening (28) in the heat exchanger (10) comprising:
a rigid non-deformable, longitudinally extending body portion (72) extending through the manifold opening (28) and into the end (52) of the coolant tube (20) for forcibly expanding the coolant tube (20) into frictional force-fit engagement with the manifold opening (28) to establish a force-fit frictional seal therebetween;
and characterized by a groove (82) extending longitudinally parallel and axially along said body portion (72) of said flaring tool (70) for straddling and receiving a mechanical tube seam (50) extending longitudinally along the tube (20) to force the portions (62,64) of the tube (20) adjacent the seam (50) outwardly and into force-fit sealing contact with the manifold opening (28).

5,189,901
DENSITOMETER CALIBRATION APPARATUS AND METHOD

Edward T. Draus, Walsenburg, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 13, 1990, Ser. No. 566,937
Int. Cl.[5] G01D *18/00*
U.S. Cl. 73—1 R **13 Claims**

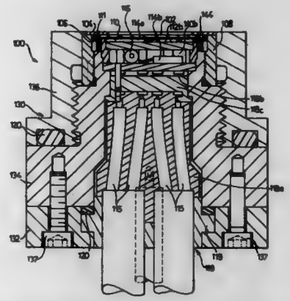


1. An apparatus for calibrating a densitometer and the like comprising:
means forming an enclosure defining a space for at least partially filling said space with a temperature controlled liquid bath;
a pressure vessel disposed in said space including means for receiving a densitometer to be disclosed in said pressure vessel, for measuring the density of a fluid in said pressure vessel;
first pump means for circulating a fluid through said pressure vessel whose density is to be measured;
a flow circuit connected to said pressure vessel including a pycnometer removably connected to said flow circuit for receiving a quantity of said fluid at the controlled temperature condition and for removal from said flow circuit to be weighed to determine the density of said fluid at said temperature controlled condition; and
second pump means for circulating said fluid through said pycnometer.

5,189,902
HUMIDITY SENSOR, AND A MEASUREMENT INSTALLATION INCLUDING A PLURALITY OF SUCH SENSORS

Kurd G. Groeninger, Le Col Des Roches/Suisse, Switzerland, assignor to E. G. & G., Maurepas, France

Filed Jan. 8, 1991, Ser. No. 638,838
Claims priority, application France, Jan. 8, 1990, 90 00128
Int. Cl.[5] G01W *1/00*
U.S. Cl. 73—24.06 **14 Claims**

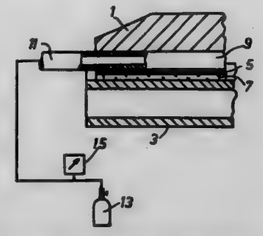


1. A relative humidity or water activity sensor comprising, in combination:
a body defining a cavity;
at least one membrane suitable for passing water vapor while constituting a barrier to liquids, the membrane being situated between the cavity and the medium whose relative humidity and/or water activity is to be measured;
at least two humidity sensing elements disposed at substantially equal distances from the membrane, each of said at least two humidity sensing elements being a resonant humidity sensing element comprising a crystal plate coated at least in part with an adsorbent material and disposed inside the cavity;
at least one resonant temperature sensing element also disposed inside the cavity, and
means for determining the resonant frequencies of the sensing elements and for deducing the value of the relative humidity or of the water activity of the medium, and also for deducing temperature.

5,189,903
SLIDING STRIP FOR COLLECTOR WITH RUPTURE DETECTION DEVICE

Peter Hoffmann, Steeg; Johann Hoell, Hallstatt; Herbert Grabner, and Klaus Reiser, both of Bad Ischl, all of Austria, assignors to Hoffmann & Co. Elektrokohle Gesellschaft mbH, Steeg, Austria

PCT No. PCT/EP89/00563, § 371 Date Dec. 17, 1990, § 102(e) Date Dec. 17, 1990, PCT Pub. No. WO89/11408, PCT Pub. Date Nov. 30, 1989
PCT Filed May 23, 1989, Ser. No. 623,384
Claims priority, application Fed. Rep. of Germany, May 25, 1988, 3817743
Int. Cl.[5] G01M *3/26*; B60L *5/20*
U.S. Cl. 73—40 **14 Claims**

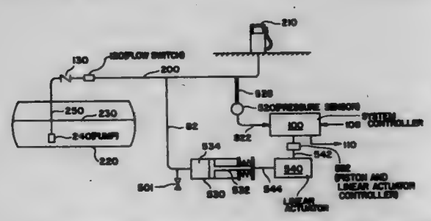


1. A sliding strip for a collector comprising:
a carrier;
a carbon strip supported on said carrier; and
a monitoring device for detecting rupture or wear of said carbon strip, said monitoring device comprising:
an elongated gas-tight channel formed in said carbon strip along the length thereof, the channel being defined over at least part of its circumference by walls formed by said carbon strip and a layer of gas-tight material secured to the carbon strip and forming a remaining part of the circumference of the channel;
means for maintaining an elevated air or gas pressure in said channel; and
a detector for signalling a drop of said pressure.

5,189,904
TEMPERATURE COMPENSATED METHODS FOR DETECTION OF LEAKS IN PRESSURIZED PIPELINE SYSTEMS USING PISTON DISPLACEMENT APPARATUS

Joseph W. Mareaca, Jr., Sunnyvale, Calif.; James W. Starr, Bound Brook, N.J., and Christopher P. Wilson, La Honda, Calif., assignors to Vista Research, Inc., Mountain View, Calif.

Continuation of Ser. No. 575,210, Aug. 30, 1990, abandoned. This application Jan. 3, 1992, Ser. No. 816,800
The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—40.5 R **16 Claims**

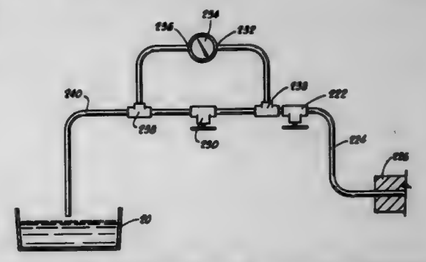


1. A method for measuring the change in the temperature-compensated flow rate produced by a leak while compensating for thermally induced volume changes in a pressurized pipeline system containing a liquid product, comprising:
(a) pressurizing said pipeline system to a first pressure and measuring with displacement means those changes in the volume of product in said pipeline that are required to maintain approximately constant pressure over a first measurement period, wherein said displacement means comprises a solid object adjustably inserted in said pipeline system, which object may be inserted or withdrawn from said pipeline system to displace known volumes of product in said pipeline system;
(b) changing the pressure in said pipeline to a second pressure and measuring with said displacement means those changes in the volume of product in said pipeline that are required to maintain approximately constant pressure over a second measurement period;
(c) computing the temperature-compensated change of volume from the changes of volume during said measurement periods; and
(d) computing the rate of change of temperature-compensated volume.

5,189,905
INTEGRAL GAS COMPRESSOR AND INTERNAL COMBUSTION ENGINE

James L. Waldrop, Woodward, Okla., assignor to Gas Jack, Inc., Oklahoma City, Okla.

Division of Ser. No. 541,777, Jun. 21, 1990, which is a division of Ser. No. 427,576, Oct. 27, 1989, Pat. No. 4,961,691. This application Jul. 3, 1991, Ser. No. 725,637
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—54.09 **4 Claims**



1. A method of sensing oil viscosity in a pressure lubricated compressor crankcase, said method comprising the steps of:
connecting a valve between an oil pressure source in said crankcase nd a low pressure portion of said crankcase;
flowing oil from said oil pressure source through said valve and discharging oil from said valve to said low pressure portion of said crankcase;
adjusting said valve such that a pressure drop across said valve is set at an initial level; and
measuring said pressure drop across said valve over time and thereby monitoring changes in the viscosity of said oil.

5,189,906
COMPACT ATOMIC FORCE MICROSCOPE

Virgil B. Elings; John A. Gurley, both of Santa Barbara, Calif., and Dror Sarid, Tucson, Ariz., assignors to Digital Instruments, Inc., Santa Barbara, Calif.

Continuation of Ser. No. 442,256, Nov. 28, 1989, Pat. No. 5,025,658. This application Apr. 19, 1991, Ser. No. 687,684
Int. Cl.[5] G01B *5/28*
U.S. Cl. 73—105 **4 Claims**

1. In an atomic force microscope having a sensing tip mounted on a lever arm and in contact with a surface of a

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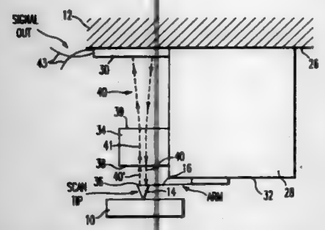
sample, wherein said tip is scanned across said sample surface, the method of operation comprising:

disposing a reflecting surface to move vertically in relation to the surface of the sample in combination with the sensing tip;

reflecting a light beam off the reflecting surface so that the phase of a reflected light beam is a function of a vertical position of the sensing tip;



detecting the reflected light beam and outputting an output signal which is a function of the phase of the reflected light beam;

adjusting a force forcing the tip onto the surface of the sample to bend the lever arm until the output signal is near a point of maximum sensitivity; and

adjusting the vertical position of the reflecting surface during scanning of said tip to maintain the output signal from said light detector at said point of maximum sensitivity.

5,189,907

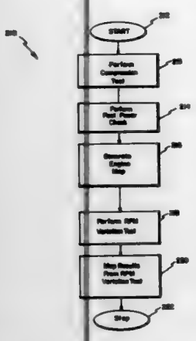
INTERNAL COMBUSTION ENGINE MAPPING APPARATUS AND METHOD

Joseph A. Marino, Waukesha; Surender Makhija; John P. Sutton, both of Brookfield, and Steve A. Trottier, Oconomowoc, all of Wis., assignors to Bear Automotive Service Equipment Company, New Berlin, Wis.

Filed Feb. 27, 1991, Ser. No. 661,662

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—116 **23 Claims**



1. An apparatus for performing an engine performance test on an internal combustion engine, the internal combustion engine having a plurality of cylinders and an ignition system for controlling firing of the cylinders, comprising:

means coupled to the ignition system of the internal combustion engine for sensing cylinder firing pulses;

means for coupling to a primary winding of an ignition coil of the internal combustion engine;

shorting means coupled to the means for coupling to a primary winding for electrically shorting the primary winding to ground whereby a cylinder misfire is induced in the internal combustion engine;

means coupled to the means for sensing cylinder firing pulses for detecting changes in instantaneous RPM of the internal combustion engine;

means connected to the shorting means and the means for detecting changes in instantaneous RPM for correlating an induced misfire with changes in instantaneous RPM of the internal combustion engine and generating an engine map;

means for storing the engine map; and

engine performance test means for measuring a function of the internal combustion engine which relates to individual cylinders of the internal combustion engine and mapping the function of the internal combustion engine to individual cylinders in the internal combustion engine using the engine map stored in the means for storing.

5,189,908

TESTING APPARATUS FOR ENGINE DRIVEN AUTOMOTIVE COMPONENT WITH FEATURE OF PRECISE SIMULATION OF ENGINE TRANSITION STATE

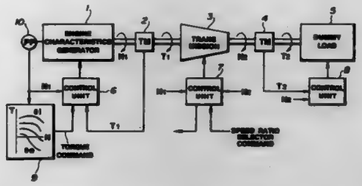
Kaoru Sano; Fumio Mizushina; Toshimitsu Maruki, all of Shizuoka; Yukio Naganuma, Tokyo, and Takashi Goto, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Nov. 28, 1990, Ser. No. 618,950

Claims priority, application Japan, Nov. 30, 1989, 1-310881; Nov. 30, 1989, 1-310884; Nov. 30, 1989, 1-310885; Nov. 30, 1989, 1-310890

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.1 **19 Claims**



1. A simulation system for a specimen associated with an automotive internal combustion engine, comprising:

a power plant which incorporates relatively a high inertia and means for compensating a high inertia for achieving a low inertia equivalent to the automotive internal combustion engine, said power plant being connected to an input axle of the specimen;

an engine characteristics generator receiving predetermined engine operation parameter simulated data for deriving a control signal to be output to the input axle of the specimen according to a predetermined engine output torque variation characteristic which is set in terms of said engine operation parameter simulated data; and

means, cooperative with said engine characteristics generator and responsive to a torque variation command demanding said output torque from a first value to a second value, for determining a transient characteristic of the specimen according to the output torque value from said power plant and a torque derived at an output axle of the specimen.

5,189,909

DEVICE FOR MEASURING PROPERTIES OF UNDERGROUND WATER AND METHOD THEREFOR

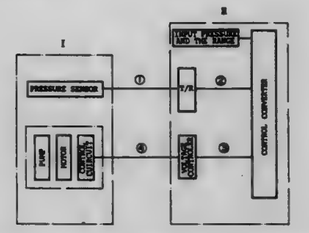
Takayasu Oike; Kazuhiko Endoh; Takashi Suzuki; Kazuhiro Watanabe; Hirochika Suzuki, all of Yokohama; Jun Shimada, Tsukuba; Takashi Ishii, Tokyo; Tateo Adachi, Tokyo, and Yoshihiro Horie, Tokyo, all of Japan, assignors to The Tsurumi-Seiki Co., Ltd., Kanagawa and Shimizu Construction Co., Ltd., Tokyo, both of, Japan

Filed Aug. 6, 1990, Ser. No. 563,244

Claims priority, application Japan, Aug. 7, 1989, 1-204284; Aug. 7, 1989, 1-204285

Int. Cl.[5] E21B *49/08, 47/00*

U.S. Cl. 73—155 **8 Claims**



1. A device inserted into a bored hole to measure properties of underground water therein, comprising:

measuring means with a measuring sensor for measuring the properties of said underground water;

a pair of expandable and contractible packers arranged above and below said measuring means respectively;

a water pump for pumping up to the ground surface the underground water flowing into the area partitioned by said packers;

a pressure sensor to detect water pressure around said water pump;

control means to control the pumping rate in accordance with a signal detected by said pressure sensor;

transmitting means for sending measurement signals from said measuring means; and

receiving means arranged on the ground for receiving said measurement signals from said transmitting means.

5,189,910

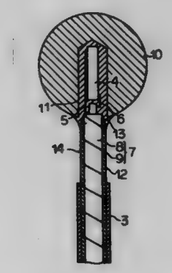
FLUID SPEED MEASURING PROBE

Yoshio Onda, Tokyo, Japan, assignor to Honda Engineering Co., Ltd., Osaka, Japan

Filed Apr. 19, 1991, Ser. No. 687,664

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.25 **12 Claims**



1. A fluid speed measuring probe comprising:

a hollow base with a terminal provided at the longitudinal base end thereof;

a hollow supporting member which is attached to the forward end of said base;

a sensor composed of a piece of a single crystal of germanium disposed at the forward end of said supporting member;

lead wires led from both longitudinal ends of the sensor;

a wiring member connected to said lead wires and disposed at the hollow portion of said supporting member and said base;

a spherical metal covering member provided with a sensor receiving hole into which said sensor is inserted; and

an electrically insulating and thermally conducting member made of a synthetic resin for fixing said sensor in the state of being suspended in said resin and spaced from said supporting member, said wiring member and the inner surface of said covering member, respectively.

5,189,911

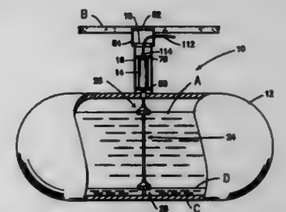
LIQUID LEVEL AND TEMPERATURE SENSING DEVICE

John T. Ray, Brandon; Roland P. Piccone, Sarasota, and Peter W. Mansfield, Holmes Beach, all of Fla., assignors to Sarasota Measurements & Controls, Inc., Sarasota, Fla.

Filed Jan. 10, 1992, Ser. No. 819,058

Int. Cl.[5] G01F *23/00*; G01R *33/18*

U.S. Cl. 73—292 **25 Claims**



1. A liquid level sensing device for monitoring and measuring the level of liquid stored within a tank or reservoir comprising an upper control canister to house control circuitry to generate and transmit digital level interrogation pulses, a lower sensing probe including an outer tube to operatively house a solid inner conductor coupled to said control circuitry to receive said digital level interrogation pulses and a first level sensing means movable disposed relative to said outer tube to interact with the electromagnetic field generated in said solid inner conductor by said digital level interrogation pulses to generate a corresponding series of sonic pulses and a transducer disposed in operative relationship relative to said solid inner conductor including means to sense said series of sonic pulses and generate a corresponding series of electrical signals, said control circuitry coupled to said transducer to receive said corresponding series of electrical signals and including means to measure the time lapse between said digital level interrogation pulses and said corresponding electrical signals to indicate the relative position of said first level sensing means relative to the longitudinal axis of said inner conductor corresponding to the level of an upper liquid within the tank or reservoir and means to generate a liquid level output signal corresponding to the level of the upper liquid for transmission to a display monitor and a second level sensing means disposed beneath said first level sensing means, said second level sensing means movable disposed relative to said outer tube to interact with the electromagnetic field generated in said solid inner conductor by said digital level interrogation pulses to generate a corresponding second series of sonic pulses and said transducer is disposed in operative relationship relative to said solid inner conductor including means to sense said second series of sonic pulses and generate a corresponding second series of electrical signals, said control circuitry coupled to said transducer to receive said corresponding second series of electrical signals and including

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means to measure the time lapse between said digital level interrogation pulses and said corresponding second series of electrical signals to indicate the relative position of said second level sensing means relative to the longitudinal axis of said inner conductor corresponding to the level of a lower liquid within the tank or reservoir and means to generate a second liquid level output signal corresponding to the level of a lower liquid for transmission to the display monitor.

5,189,912

ULTRASONIC WHEEL MEASURING APPARATUS AND WHEEL BALANCER INCORPORATING SAME

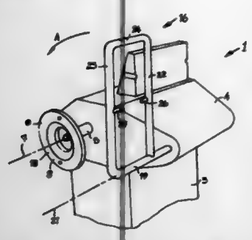
Michael M. Quinlan, Mount Laurence, Ireland; Bernard Jackson, Los Gatos, Calif.; Gordon C. Pacey, Watsonville, Calif.; Willy Borner, Cupertino, Calif.; Brendan O'Sullivan, Castletroy, Ireland, and Keith A. Kreft, Cupertino, Calif., assignors to Interbalco AG, Switzerland

Continuation of Ser. No. 801,582, Dec. 5, 1991, abandoned, which is a continuation of Ser. No. 403,970, Sep. 7, 1989, abandoned. This application Jul. 9, 1992, Ser. No. 911,355

Claims priority, application Ireland, Sep. 7, 1988, 2694/88; Sep. 9, 1988, 2734/88

Int. Cl.[5] G01M *1/02*

U.S. Cl. 73—462 **20 Claims**



2. Apparatus for locating a characteristic on a radial side face of a vehicle wheel, the vehicle wheel defining a rotational axis, and for determining the radial distance of the characteristic from the rotational axis of the wheel, and the distance of the characteristic from a reference plane which extends transversely of the rotational axis of the wheel, the apparatus comprising:

a housing;

receiving means mounted on the housing for receiving the wheel, the receiving means defining the rotational axis of the wheel;

a mounting means movable relative to the housing, and constrained to move in a predetermined path relative to the housing;

sensing means for transmitting and receiving a measuring signal for detecting the wheel and the characteristic, the sensing means being mounted on the mounting means at a predetermined position relative to the predetermined path, and being arranged so that on movement of the mounting means relative to the housing, the measuring signal of the sensing means is directed towards and moves over a portion of the radial side face of the wheel;

detecting means for detecting the position of the mounting means relative to the housing; and

computing means for computing the radial distance of the characteristic from the rotational axis, and the distance of the characteristic from the reference plane based upon output signals received from the sensing means and the detecting means.

5,189,913

APPARATUS AND METHOD FOR DETERMINING THE RATE OF ROTATION OF A MOVING BODY

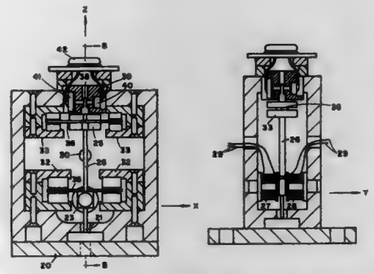
Ehud Netzer, Migdal-Haemek, and Itzhak Porat, Haifa, both of Israel, assignors to The State of Israel, Ministry of Defence, Rafael Armament Development Authority, Tel Aviv, Israel

Continuation-in-part of Ser. No. 479,972, Feb. 14, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 778,255

Claims priority, application Israel, Mar. 14, 1989, 89605

Int. Cl.[5] G01P *9/04*

U.S. Cl. 73—505 **4 Claims**



1. An apparatus for determining the rate of rotation of a body rotating with an angular velocity ω about a first axis, the apparatus comprising:

a housing adapted to be fixed to said body so as to rotate with said angular velocity ω about the first axis;

a mechanical system within the housing having more than two degrees of freedom;

forcing means for applying a forced vibration to the mechanical system about a second axis substantially perpendicular to said first axis, thereby producing a Coriolis response along a third axis mutually perpendicular to said first and second axes, said forced vibration having a predetermined magnitude and a frequency which is constrained to lie within a predetermined range such that there is produced a coupling between said degrees of freedom whereby the magnitude of the Coriolis response is substantially insensitive to frequency;

measuring means for measuring the magnitude of the Coriolis response; and

computing means responsive to the magnitude of the forced vibration and to the magnitude of the Coriolis response for calculating the rate of rotation ω.

5,189,914

PLATE-MODE ULTRASONIC SENSOR

Richard M. White, Berkeley, and Stuart W. Wenzel, Kensington, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 467,412, Jan. 18, 1990, Pat. No. 5,129,262, which is a continuation of Ser. No. 162,193, Feb. 29, 1988, abandoned. This application Nov. 15, 1991, Ser. No. 792,457

Int. Cl.[5] G01N *9/24*

U.S. Cl. 73—599 **25 Claims**

1. An ultrasonic sensor comprising:

a propagation medium comprising a thin planar sheet of material capable of supporting Lamb waves, said sheet having a thickness which is not greater than about twenty micrometers, and having some physical characteristic determined by a measurand acting thereon, said physical characteristic determining the propagation characteristics of Lamb waves to be propagated along the medium, said propagation medium including a layer of silicon nitride and a layer of piezoelectric material,

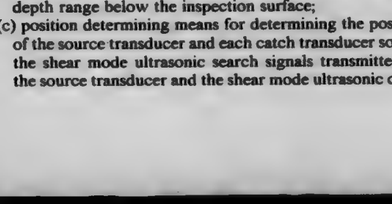
electrical means coupled to the propagation medium for producing Lamb waves in the propagation medium, said electrical means including means for producing both symmetrical and antisymmetrical Lamb waves in the propagation medium,

output means for producing an electrical signal representative of the determined propagation characteristic of the Lamb waves propagating along the propagation medium,

measuring means for measuring a selected characteristic of said electrical signal, said output means including a receiving transducer, coupled to the propagation medium, for producing an electrical signal representative of the Lamb waves propagating along said propagation medium,

the electrical means including a launching transducer, coupled to the propagation medium, for generating Lamb waves in the propagation medium,

a feedback path between the receiving and launching transducers for providing feedback from the receiving transducer to the launching transducer,



a feedback amplifier in the feedback path for amplifying said electrical signal produced by the receiving transducer and fed back to the launching transducer, the sensor forming an oscillator in which Lamb waves are continuously propagated along the propagation medium,

the measuring means including frequency measuring means for measuring the oscillation frequency, and

frequency blocking means for preventing signal frequencies outside a certain range from reaching the feedback amplifier, said frequency blocking means being adjustable so that the frequencies which are blocked may be varied,

whereby the sensor may be operated successively at several different frequencies to indicate different measurands.

5,189,915

SINGLE MODE ULTRASONIC INSPECTION METHOD AND APPARATUS

Eugene R. Reinhart, Austin; Ronald E. Larsen, Del Valle; Michael C. Monaco, and Teodoro Leon-Salamanca, both of Austin, all of Tex., assignors to Reinhart & Associates, Inc., Austin, Tex.

Filed Nov. 21, 1990, Ser. No. 616,849

Int. Cl.[5] G01N *29/10*

U.S. Cl. 73—623 **12 Claims**

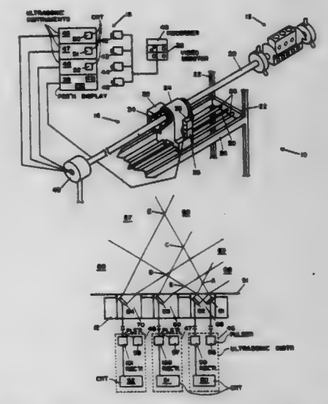
6. An ultrasonic inspection apparatus comprising:

(a) transmitting means, including a source transducer, for transmitting shear mode ultrasonic search signals from the source transducer into the mass of an object from an inspection surface thereof so that the search signals propagate along a plane extending normal to the inspection surface;

(b) signal receiving means, including a plurality of catch transducers aligned along the normal plane along which the search signals propagate, for receiving shear mode ultrasonic catch signals that are produced as the ultrasonic search signals encounter acoustic discontinuities in the mass of the object to be inspected and a portion of their energy is directed back toward the inspection surface, each catch transducer receiving shear mode ultrasonic catch signals produced within a substantially different depth range below the inspection surface;

(c) position determining means for determining the position of the source transducer and each catch transducer so that the shear mode ultrasonic search signals transmitted by the source transducer and the shear mode ultrasonic catch signals detected by each catch transducer may be correlated; and

(d) recording means for recording the shear mode catch signals received by the signal receiving means, along with



the time interval between the receipt of each catch signal and the transmission of the shear mode ultrasonic search signal from which each said catch signal is produced, and the position of the source transducer and each catch transducer.

5,189,916

PRESSURE SENSOR

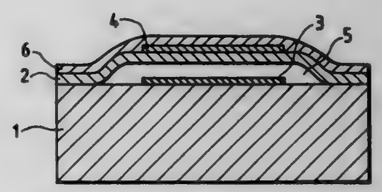
Katsuyoshi Mizumoto; Kanehisa Kitsukawa; Toshikatsu Yasuda, and Takao Kojima, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Aug. 12, 1991, Ser. No. 743,781

Claims priority, application Japan, Aug. 24, 1990, 2-221370; Oct. 31, 1990, 2-292093

Int. Cl.[5] G01L *7/08, 9/12*

U.S. Cl. 73—724 **25 Claims**



2. A pressure sensor, comprising:

a ceramic substrate formed from a first unsintered ceramic material;

a diaphragm capable of deformation under pressure, and formed of a second unsintered ceramic material having a factor of shrinkage upon sintering smaller than that of the first material, wherein said diaphragm is fixed to the periphery of a surface of said ceramic substrate to form an integral assembly having a hollow space formed therebetween upon sintering due to the difference in the factor of shrinkage of the first and second materials;

a first electrode formed on a surface of said ceramic substrate which faces said diaphragm; and

a second electrode formed on said diaphragm in opposition to said first electrode.

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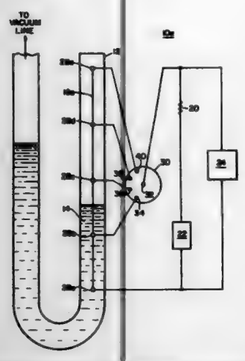
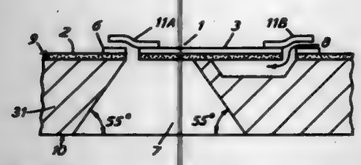
5,189,917
ELECTRICAL MERCURY MANOMETER
Kallambella M. Vijayakumar, and Junchang Dong, both of Brookline, Mass., assignors to Trustees of Boston University, Boston, Mass.
Filed Jul. 22, 1991, Ser. No. 734,241
Int. Cl.[5] G01L *9/02*
U.S. Cl. 73—750 **3 Claims**



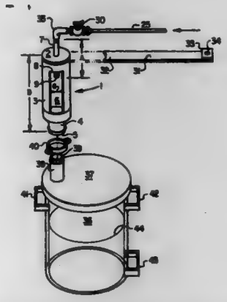
1. An electrical mercury manometer, a mercury barometer or a vacuum gauge comprising:
- a manometer tube with a column of mercury;
- at least three electrical taps in said manometer tube disposed at least one in the mercury column and at least one above the mercury column;
- a switch means for selecting one of the taps disposed above said column of mercury;
- a power supply interconnected between the deepest tap disposed in the mercury column and said selected tap;
- a resistance element extending between said deepest tap in said mercury column and the highest tap above the mercury surface, the remaining taps connected to said resistance element at different locations; and
- sensing means for sensing the output voltage across said deepest tap and said selected tap representative of the variations in shunting effect on said resistance element of the mercury as it rises and falls with pressure.

5,189,918
"NULL" FLOW SENSOR
Stephen D. Etienne, Hayes, and Donald C. Young, Pangbourne, both of England, assignors to Thorn EMI plc, London, England
Filed Jun. 1, 1990, Ser. No. 530,590
Claims priority, application United Kingdom, Jun. 2, 1989, 8912755
Int. Cl.[5] G01F *1/28*
U.S. Cl. 73—861.75 **4 Claims**



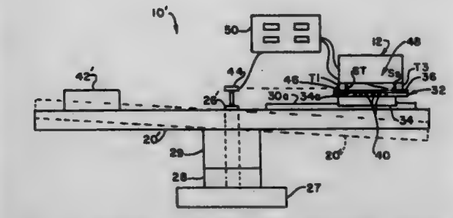
1. A fluid flow rate measurement device comprising:
- a substrate of semiconductor material from which is micromachined a beam having first and second free ends and a pivot structure midway between the first and second free ends about which the beam is capable of pivoting, said first and second free ends overlying first portions of the substrate defining a channel and a cavity respectively;
- further portions of the substrate adjacent said first portions, which further portions carry electrically conductive deposits thereby forming first electrode structures, and the first and second free ends of the beam having at least partially deposited thereon electrically conductive material defining further electrode structures to cooperate with said first electrode structures to form a plurality of capacitor electrode structures adapted to carry a variable electrical charge in order to exert an electrostatic force to counteract pivoting of the beam caused by a differential force exerted across the beam by fluid flowing into the cavity and through the channel.

5,189,919
WELLHEAD FLUID SAMPLER
Raymond Hernandez, Andrews, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Apr. 29, 1991, Ser. No. 693,125
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.43 **2 Claims**



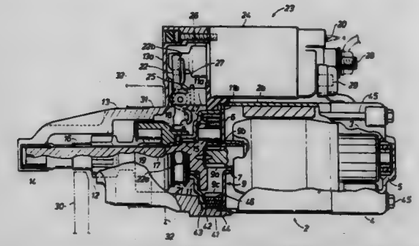
1. In wellhead fluid sampling apparatus wherein a wellhead is employed for controlling the production of fluid from a subterranean reservoir to the earth's surface, and valved first conduit means is in fluid communication with the interior of said wellhead for removing a fluid sample from said wellhead as said produced fluid passes therethrough, the improvement comprising a housing means with closed top, side, and bottom means, said bottom means having a first aperture for the removal of fluid from the interior of said housing, second conduit means in fluid communication with the interior of said first conduit means and with the upper interior of said housing means, said second conduit means being of a length which is at least one-half of the length of said housing means and sufficient to provide essentially linear flow for said fluid as it leaves said second conduit means and enters the upper interior of said housing means, a second aperture extending through said housing side means, said second aperture extending a finite distance from near the vicinity where said second conduit means terminates in the interior of said housing means toward said bottom means, said second aperture being of a width just sufficient to allow passage of a sample receptacle through said second aperture and into the interior of said housing means below said second conduit means so that fluid leaving said second conduit means flows into said receptacle when held in the interior of said housing means, said second aperture width being a minor portion of the circumference of said side means and no more than about two-thirds of the inside diameter of said housing means so that said receptacle is essentially enclosed by said side means when in the interior thereof, and closed container means removably connected to said housing means in fluid communication with said first aperture to receive and hold any fluid not retained in said receptacle.

5,189,920
CORNER STABILITY TESTING APPARATUS
Rosendo Martinez, St. Louis, Mo., assignor to Electronics & Space Corp., St. Louis, Mo.
Filed Mar. 21, 1991, Ser. No. 672,833
Int. Cl.[5] G01M *17/00*; G01N *19/02*
U.S. Cl. 73—865.3 **19 Claims**



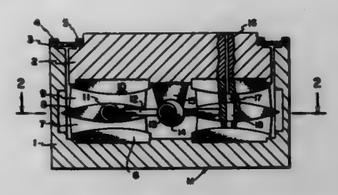
1. Apparatus for testing the cornering stability of a vehicle to determine when the vehicle begins to slide or tip over comprising:
- a movable platform capable of supporting the weight of a vehicle, the vehicle being positioned on one end of the platform with a longitudinal centerline of the vehicle being orthogonal to the longitudinal axis of the platform;
- a counterweight positioned at an opposite end of the platform from the vehicle;
- means for rotating the platform through a range of speeds to simulate vehicle movement in a circular path such as when the vehicle is rounding a corner; and,
- sensor means attached to the vehicle for detecting movement of the vehicle relative to the platform.

5,189,921
STARTER SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Shinichi Nagashima; Hitoshi Ono, both of Tochigi, and Kazuhiro Yamamoto, Gunma, all of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Japan
Filed May 22, 1991, Ser. No. 703,961
Claims priority, application Japan, Jun. 5, 1990, 2-146924
Int. Cl.[5] F02N *15/06*
U.S. Cl. 74—7 A **6 Claims**



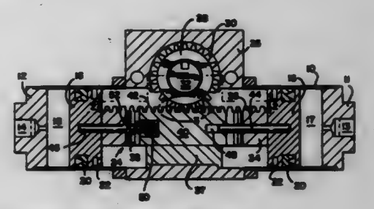
1. A starter system for an internal combustion engine, comprising:
- an electric motor accommodated in a motor casing;
- a center bracket coaxially attached to an end portion of said motor casing defining a cylindrical chamber for accommodating a planetary reduction gear unit therein between said center bracket and an end plate of said motor casing; and
- a pinion cover secured to a same longitudinal end of said electric motor as said center bracket defining a chamber for accommodating an overrunning clutch having an input member connected to an output end of said planetary reduction gear unit and an output member carrying a pinion thereon;
- one of an internal gear of said planetary reduction gear unit and said pinion cover being provided with a projection which passes through an opening provided in said center bracket and engages with a recess provided in the other of said internal gear of said planetary reduction gear unit and said pinion cover.

5,189,922
FORCE IMPULSE GENERATOR
Peter H. Parashikov, 11, V. Vodenicharski Street, Sofia, Bulgaria
Filed May 7, 1990, Ser. No. 519,848
Claims priority, application Bulgaria, May 9, 1989, 88 391
Int. Cl.[5] F16H *21/26*
U.S. Cl. 74—38 **4 Claims**



1. Force impulse generator having a stationary base to which there is movably connected an impulse body, and in a cavity between them there is disposed a force impulse converter, wherein the force impulse converter comprises
- two identical crank mechanisms, each of which comprises a middle hinge segment with necks disposed on both sides in its axis, a top and bottom segment arm and a top and bottom hinge segment;
- each middle hinge segment being connected by means of a connecting rod and eccentric neck to a common crankshaft;
- each middle hinge segment having double-convex, identical round cylindrical surfaces which are in contact sliding with respective surfaces mating of one side of said bottom segment arm and one side of said top segment arm;
- said top and bottom segment arms each having identical, concave round cylindrical surfaces mating at their other side in contact sliding with respective surfaces mating of said bottom and top hinge segments;
- said bottom hinge segment being attached to said impulse body and said top hinge segment being attached to said stationary base.

5,189,923
ANTIBACKLASH RACK ASSEMBLY
Paul H. Lashbrook, Valparaiso, Ind., assignor to Bimba Manufacturing Company, Monee, Ill.
Filed Jan. 24, 1992, Ser. No. 825,056
Int. Cl.[5] F16H *55/18, 1/04*
U.S. Cl. 74—409 **31 Claims**



1. An antibacklash rack comprising:

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a first longitudinally extending rack member having gear teeth extending transversely thereof which are adapted to receive and engage at least one tooth of a gear to mesh therewith, said first rack member being movable in a longitudinal direction;

a second longitudinally extending rack member also having gear teeth extending transversely thereof and in substantially the same direction as the teeth of said firs rack member, the teeth of said second rack member also being adapted to receive and simultaneously engage the same tooth of the gear as that which meshes with the teeth of the first rack member, said second rack member also being longitudinally movable with said first rack member; and

a spring means exerting a force on said second rack member in said longitudinal direction to urge at lest one of the teeth on the second rack member in said longitudinal direction and in offset relationship to the teeth on said first rack member to engage the tooth of the gear which meshes with the teeth of said fist rack member and force the tooth of the gear into engagement with a tooth of the first rack member and hold it in engagement therewith, whereby opposite sides of the tooth on the gear which meshes with the teeth of said rack members are simultaneously positioned between and held in engagement with at least one tooth on each of said first and second rack members to prevent backlash upon movement of any of the teeth.

5,189,924

CONTROL BOX MOUNTED INSIDE A HOUSING TO ACTUATE CABLES, RODS AND THE LIKE

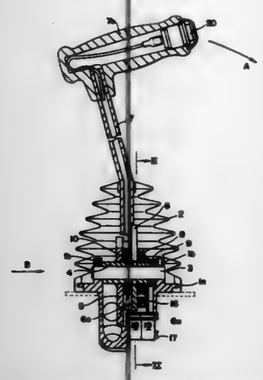
Klaus Altenheiner, Ehringshausen-Katzenfurt, and Werner Lasse, Ehringshausen-Kölschhausen, both of Fed. Rep. of Germany, assignors to Mefex Telecontrol GmbH & Co., Ehringshausen, Fed. Rep. of Germany

Filed May 22, 1991, Ser. No. 710,034

Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016977

Int. Cl.[5] B60K *20/00*

U.S. Cl. 74—473 R **14 Claims**



1. A control box adapted to control at least one function of a mechanical device, comprising:

a housing;

an arbor fixed to said housing;

a shaft rotatably mounted on said arbor;

a control disk mounted for rotation with said shaft;

a lever rigidly connected to the control disk;

a fixed disk integral with said shaft and adapted to be connected to mechanical means for controlling an operation of the mechanical device;

wherein said lever is pivotable about an axis of rotation of said shaft in a first direction which effects an adjustment of said mechanical device, and wherein said control box further comprises means for permitting said lever to be tipped relative to said shaft in a second direction perpendicular to the first direction to effect an electrical control of at least one function of the mechanical device; and

further comprising adjustable clamping means for adjustably frictionally clamping said fixed disk against free rotation.

5,189,925

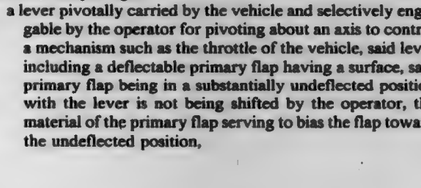
GEAR SHIFT LEVER

Leonard Neal, Windsor, and Robert Elliott, Tecumseh, both of Canada, assignors to Tamco Limited, Ontario, Canada

Filed Dec. 17, 1991, Ser. No. 808,734

Int. Cl.[5] B60K *20/00*

U.S. Cl. 74—473 R **2 Claims**



1. A vehicle gearshift lever assembly comprising:

a) an upper lever member for manipulation by a vehicle operator, said upper lever having a top end and a lower, operative end;

b) an isolator member located in the lower end of said upper lever member, and

c) an insert shaft for operative engagement with a vehicle gearbox mechanism;

said isolator member being formed of an integrally formed piece of resilient material so that vibration from said gearbox and insert shaft is absorbed by said isolator to inhibit transfer of said vibration to said upper lever member; and comprising a cylindrical configuration with a frusto-conical upper end and engaging juxtaposed surfaces of the interior of said operative end of said upper lever member, and a central, coaxial bore in said isolator for receiving an upper portion of the insert shaft therein;

d) said isolator member having its lower end projecting outwardly of the upper lever member and having a peripheral groove therein;

e) said insert shaft having a lower end with means for connection to a vehicle gearbox and an upper end located in the coaxial bore of said isolator member, and knurling on at least a part of the surface of said upper end located in the isolator member; said upper end of said insert shaft having a constant diameter throughout its length.

5,189,926

THROTTLE CONTROL

Jon M. Patterson, Wauwatosa, Wis., and James H. Weitz, Ridgewood, N.J., assignors to Deere & Company, Moline, Ill.

Filed Jun. 14, 1991, Ser. No. 715,532

Int. Cl.[5] G05G *5/06*

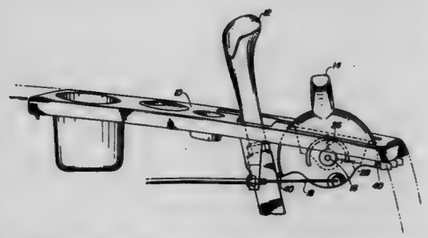
U.S. Cl. 74—527 **28 Claims**

1. A control usable with a vehicle such as a lawn and garden tractor, comprising:

a lever pivotally carried by the vehicle and selectively engagable by the operator for pivoting about an axis to control a mechanism such as the throttle of the vehicle, said lever including a deflectable primary flap having a surface, said primary flap being in a substantially undeflected position with the lever is not being shifted by the operator, the material of the primary flap serving to bias the flap toward the undeflected position,

a plurality of teeth radially spaced about the lever's pivot axis and each having a projecting height from the surface of the primary flap,

a rib member rigidly carried by the vehicle and abuttable with the teeth of the primary flap for blocking the lever from pivoting when not being shifted by the operator, said



rib member being abuttable with the teeth of the primary flap to deflect the primary flap in a direction generally parallel to said axis of the lever for allowing the teeth to shift past the rib when the operator pivots the lever, said rib member being positioned a distance from the surface of the primary flap for allowing the primary flap to remain undeflected when the lever is not being pivoted.

5,189,927

VARIABLE RATIO DRIVE TRANSMISSION

Michael J. Egan, 28 Fords Road, Wollongong, NSW 2515, Australia

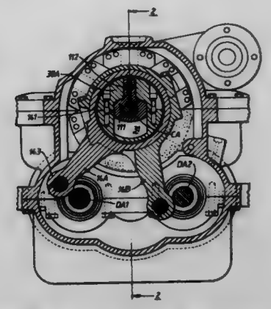
PCT No. PCT/GB89/00473, § 371 Date Jun. 17, 1991, § 102(e) Date Jun. 17, 1991, PCT Pub. No. WO90/05252, PCT Pub. Date May 17, 1990

PCT Filed May 4, 1989, Ser. No. 679,012

Claims priority, application United Kingdom, Nov. 8, 1988, 8826112

Int. Cl.[5] F16C *3/04*

U.S. Cl. 74—602 **6 Claims**



1. A variable throw crank drive, comprising a crankshaft having a plurality of axially spaced big-end journals, each having at least one connecting-rod, (con-rod) mounted thereon through the intermediate of eccentric mounting means, said means all being adjustable in unison to permit the eccentricity of each con-rod big-end to be adjusted from a minimum value to a maximum value, and a rotatable operating shaft extending axially through the crankshaft and operable, while the crankshaft is running, to vary the eccentricities of said eccentric mounting means in unison, wherein the eccentric mounting means for each con-rod big-end comprises a journal mounted for radial displacement relative to the crankshaft, and wherein a corresponding counterweight is also mounted for radial displacement relative to the crankshaft, the journal and its counterweight being radially displaceable in opposite directions by cam means fast with the operating shaft and operatively coupled to said journal and its counterweight.

5,189,928

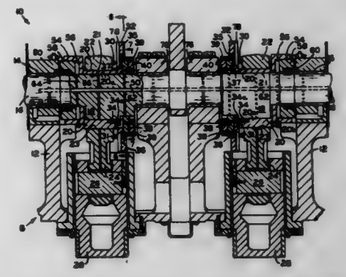
ADJUSTABLE STROKE PUNCH PRESS

Patrick H. Ontrop; Robert L. Schockman, both of St. Henry, and Frederick C. Bergman, Coldwater, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Division of Ser. No. 606,489, Oct. 31, 1990, Pat. No. 5,109,766. This application Jan. 28, 1992, Ser. No. 826,792

Int. Cl.[5] B30B *5/00, 1/06*

U.S. Cl. 74—603 **4 Claims**



1. A process for adjusting the stroke length of a punch press, the punch press including a crankshaft with an eccentric portion, an eccentric sleeve radially disposed on the eccentric portion and selectively rotatable relative to the eccentric portion, a connection arm radially and rotatably disposed on the eccentric sleeve, a locking plate axially moveable on the crankshaft, a clamping plate fixed to the crankshaft, and a piston for receiving pressurized hydraulic fluid and thereby axially urging the locking plate into frictional engagement with the clamping plate during normal press operation, said process comprising the steps of:

relieving the hydraulic pressure in the piston and thereby disengaging the locking and clamping plates;

locking the eccentric sleeve to the connection arm;

then rotating the crankshaft through a desired angle;

then unlocking the eccentric sleeve from the connection arm; and

then supplying pressurized hydraulic fluid to the piston to create frictional engagement between the locking and clamping plates for normal operation of the punch press.

5,189,929

SYSTEM AND METHOD FOR TRANSMISSION GEARBOX NOISE CONTROL UTILIZING LOCALIZED OIL COOLING/HEATING

Anthony G. Chory, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 9, 1992, Ser. No. 848,515

Int. Cl.[5] F16H *57/02, 37/06*; F01M *1/00*

U.S. Cl. 74—606 A **7 Claims**

1. In combination with a transmission system including a gearbox housing having rotatably mounted therein a gearing reduction stage that includes a central bull gear and at least one bull pinion intermeshing therewith, and wherein the gearbox housing and the gearing reduction stage are formed from disparate metals having dissimilar coefficients of thermal expansion, a transmission gearbox noise control system for abating noise emanating from the gearing reduction state due to spatial misalignment between the central bull gear and the at least one bull pinion, comprising:

means for providing a working fluid;

means for discharging said working fluid as a jet to impinge

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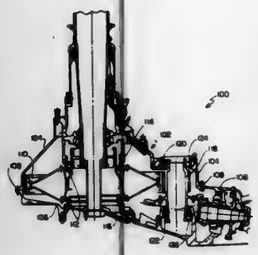
upon selected internal localized areas of the gearbox housing; and

means for regulating operation of said discharging means wherein said discharged working fluid effectively nulls



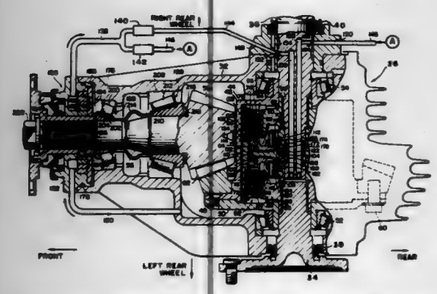
temperature variations among said selected internal localized areas of the gearbox housing to effectively minimize temperature-induced spatial misalignment in the gearing reduction stage such that noise emanating from the gearing reduction stage is abated.

5,189,930

VEHICLE POWER TRANSMITTING MECHANISM

Osamu Kameda, Hiroshima, Japan, assignor to Mazda Motor Corp., Hiroshima, Japan

Filed Feb. 19, 1991, Ser. No. 656,519
Claims priority, application Japan, Feb. 19, 1990, 2-37782
Int. Cl.[5] F16H *35/04*
U.S. Cl. 74—650 **14 Claims**



1. A power transmitting system for a vehicle comprising:

an input shaft,

left and right output shafts,

a speed reduction mechanism for transmitting a driving force from the input shaft to the output shafts,

a left hydraulic clutch disposed between the speed reduction mechanism and the left output shaft and for transmitting the driving force,

a right hydraulic clutch disposed between the speed reduction mechanism and the right output shaft,

an oil pump for supplying a hydraulic pressure for the left and right clutches,

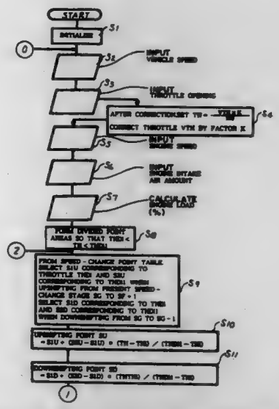
the left and right hydraulic clutches being disposed in the speed reduction mechanism, and the input shaft constituting a primary element of the oil pump.

5,189,931

ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

Kenji Suzuki, Okazaki, Japan, assignor to Aisin AW Co., Ltd., Japan

Filed Aug. 12, 1991, Ser. No. 743,525
Claims priority, application Japan, Sep. 4, 1990, 2-232488
Int. Cl.[5] B60K *41/18*
U.S. Cl. 74—866 **14 Claims**



1. An electronically controlled automatic transmission having a plurality of hydraulic servos to be selectively actuated by oil pressure to produce a plurality of gear ratios, said transmission comprising:

an engine intake air amount sensor for detecting the amount of engine intake air (AF);

an engine speed sensor for detecting engine speed (NE);

memory means for storing an initial value (EL_I) for (AF/NE);

computing means for determining a current value of (AF/NE)=(EL) based on the detected amount of the engine intake air (AF) and the detected engine speed (NE) and for determining a current correction coefficient based on said initial value (EL_I) and said current value of (AF/NE)=(EL); and

regulating means for regulating the oil pressure supplied to the hydraulic servos in accordance with said current correction coefficient.

5,189,932

ROCK BIT MANUFACTURING METHOD

Daura Palmo, Harris County, and James H. Snider, Galveston County, both of Tex., assignors to Cummins Tool Co., Tex.

Filed Dec. 24, 1991, Ser. No. 812,748
Int. Cl.[5] E21B *10/08*
U.S. Cl. 76—108.2 **10 Claims**

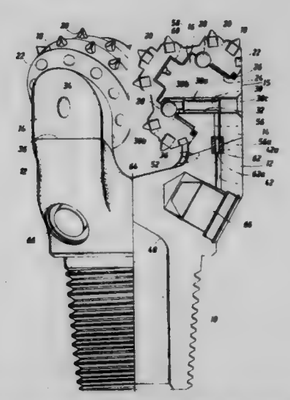
1. A method of making a roller cone-type rock bit comprising the steps of:

on a main body member having a tool joint portion adjacent one end and a plurality of leg portions adjacent the other end, radially offset from the centerline of the main body member and circumferentially spaced from one another, providing said leg portions with respective outer surfaces inclined longitudinally inwardly from the radially outer extremity to the radially inner extremity and lying on a common locus defining a surface of revolution;

forming a plurality of bases corresponding to the number of leg portions, each base comprising a leg extension defining an end surface and a trunnion extending angularly from the leg extension distal its end surface;

providing a fixture having a plurality of recesses corresponding to the number of trunnions, adapted to matingly receive respective ones of the trunnions, and oriented with respect to one another in a manner corresponding to a desired relative orientation of the trunnions on the rock bit;

then mounting each trunnion in a respective one of the recesses of the fixture whereby the end surfaces of the respective leg extensions all face generally outwardly from the fixture;



then simultaneously machining the end surfaces to lie on a common surface of revolution corresponding to that of the outer surfaces of the leg portions of the main body member;

then removing the trunnions from the fixture;

then mating each end surface of a leg extension with a respective outer surface of a leg portion of the main body member;

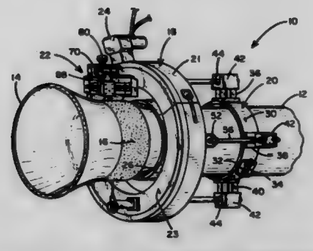
then connecting the mated leg extensions and leg portions.

5,189,933

CLAMSHELL MOUNTED PIPE NOZZLE WELD MILLING MACHINE WITH CENTERING APPARATUS

Donato L. Ricci, Rte. 1, Box 1067, Hager City, Wis. 54014

Filed Apr. 8, 1991, Ser. No. 681,961
Int. Cl.[5] B23B *3/26*
U.S. Cl. 82—113 **17 Claims**



1. Apparatus for removing the overlay weld material from an arcuate flared surface of a pipe nozzle, comprising:

(a) clamshell means adapted to be concentrically mounted on a pipe whose nozzle overlay weld is to be removed, said clamshell means including an annular stationary member and an annular rotatable member encircling said pipe and means for driving said rotatable member relative to said stationary member around said pipe as a center;

(b) a tool block for clamping a weld cutting tool, said tool block affixed to said rotatable member and being movable in the radial direction relative to said pipe in accordance with an axially extending arcuate profile; and

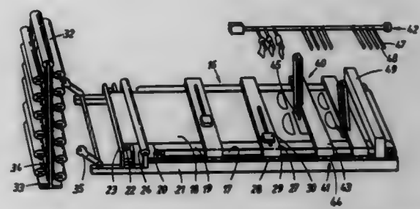
(c) tool block translating means affixed to said rotatable member for imparting incremental movement of said tool block in the axial direction upon each rotation of said rotatable member, said tool block being simultaneously moved in the radial direction as determined by said axially extending arcuate profile.

5,189,934

APPARATUS FOR CUTTING AND REMOVING PORTIONS FROM A MATERIAL WEB

Mats Ingvar Davidson, and Dan Davidson, both of Ganghester, Sweden, assignors to Eton Construction AB, Sweden

PCT No. PCT/SE88/00701, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990, PCT Pub. No. WO89/11806, PCT Pub. Date Dec. 14, 1989
PCT Filed Dec. 27, 1988, Ser. No. 623,427
Claims priority, application Sweden, Jun. 2, 1988, 8802081; Jun. 2, 1988, 8802082
Int. Cl.[5] B26D *1/08, 7/18*
U.S. Cl. 83—153 **13 Claims**



1. An apparatus for cutting portions from a longitudinally extending web comprising:

a longitudinally extending support surface having at least a portion thereof made of a resiliently compressible composition, and including a first end and a second end remote from said first end, said web disposed in a predetermined plane on said support surface during cutting of said web;

means for moving said support surface in at least said longitudinally extending direction; and

cutting means for selectively cutting said web at predetermined locations therealong, said cutting means comprising an upper member and a lower member cooperatively associated with said upper member for cutting said web therebetween, said lower member being postionable between said web and said support surface, whereby said lower member is moveable towards said support surface to engage and forcibly depress the resiliently compressible composition of said support surface to enable the web to remain in the predetermined plane during cutting of said web.

5,189,935

ROTARY CUTTING DIE ASSEMBLY

Richard Rosemann, 456 S. Clay, Kirkwood, Mo. 63122

Continuation-in-part of Ser. No. 611,075, Nov. 9, 1990, abandoned. This application Jan. 9, 1992, Ser. No. 820,309
Int. Cl.[5] B26D *7/26*
U.S. Cl. 83—343 **15 Claims**

1. A rotary cutting die assembly for performing cutting operations of a rotary die cutting press, the assembly comprising:

a mandrel having an exterior surface and means for mounting the mandrel on a rotary die cutting press;
a hollow cylindrical sleeve having an exterior surface and in interior surface, the sleeve having at least one cutting edge on the exterior surface, the sleeve being received on the mandrel for movement of the sleeve relative to the mandrel;
a drive gear received on the mandrel for movement of the drive gear relative to the mandrel, the drive gear being connected in a driving engagement with the cylindrical sleeve to cause the sleeve to move relative to the mandrel

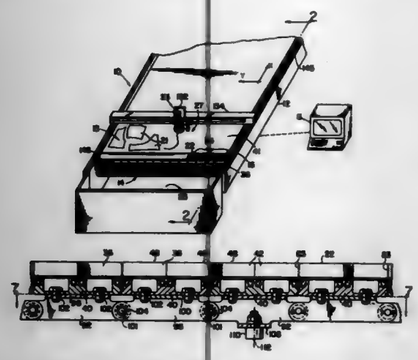
in response to the drive gear moving relative to the mandrel;
the sleeve has opposite first and second ends, and the drive gear is received on the mandrel adjacent to the sleeve and engaging in driving engagement with one of the first and second ends of the sleeve;
a radial slot is provided on a side of the drive gear adjacent to the sleeve; and
an axial pin is provided on said one of the first and second ends of the sleeve, the pin extends into the slot on the drive gear thereby connecting the drive gear in driving engagement with the sleeve.

5,189,936

CONVEYOR FOR SUPPORTING AND ADVANCING SHEET MATERIAL AND CUTTING MACHINE INCLUDING SUCH CONVEYOR

Heinz J. Gerber, and Lawrence S. Wolfson, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Apr. 5, 1991, Ser. No. 681,862
Int. Cl.[5] B26D 7/20; B65G 17/06
U.S. Cl. 83—409 **20 Claims**



1. A machine for cutting sheet material, said machine comprising:
a stationary frame having a cutting station fixed relative thereto,
a cutter supported by said frame at said cutting station and movable in X and Y coordinate directions relative to said frame to cut sheet material at said cutting station,
an endless conveyor belt, and
two rotatable end units supported by said frame and spaced apart from one another in said X coordinate direction on opposite sides of said cutting station about which end units said belt is trained to define a path of movement for said belt with an upper run and a lower run each extending between said end units,
said belt comprising a plurality of elongated support members each having a length dimension and a width dimension with said length dimension extending horizontally and transversely of said path of movement and being many times longer than said width dimension which extends parallel to said path of movement, said support members being arranged in succession along said path, and means connecting said support members to one another in succession to form said support members into said belt,
each of said support members when positioned in said upper run having a flat upwardly facing horizontal sheet material support surface,
said means connecting said support members to one another in succession being means whereby adjacent ones of said support members are pivotally connected to each other and restrained against movement relative to one another in the direction of said path of movement of said belt at at least two connecting points spaced from one another along the lengths of the support members for pivotal movement only relative to one another about a horizontal pivot axis extending transversely to said path of movement which axis when said adjacent ones of said support members are located in said upper run is located below said support surfaces of said adjacent ones of said support members so that as said adjacent ones of said support members move over either one of said end units they are spaced apart from one another in the region between the support surfaces and said axis and as said adjacent ones of said support members move along said upper run they are spaced in said region between their support surfaces and said axis more closely to one another than they are during movement over either one of said end units,
said adjacent ones of said support members said region between said axis and their support surfaces including coengagable parts which move arcuately relative to one another to become disengaged from one another as said adjacent support members move onto either one of said end units and away from said upper run, which move arcuately relative to one another to become engaged with one another as said adjacent support members move from either one of said end units and toward said upper run, and which remain in engagement with one another as said adjacent support members move along said upper run and restrain said adjacent support members from moving vertically relative to one another.
said coengagable parts being located along at least those portions of said adjacent support members extending between said two connecting points, and
said coengagable parts having complementary wedge shapes whereby as said adjacent ones of said support members move onto said upper run from either one of said end units a wedging action occurs, if necessary, between said coengagable parts to move said adjacent ones of said support members, or portions thereof, vertically relative to one another to bring them into a desired vertical relationship.

9. An apparatus for supporting and advancing sheet material, said apparatus comprising:
an endless conveyor belt, and
two horizontally spaced apart rotatable end units about which said belt is trained to define a path of movement for said belt with an upper run and a lower run each extending between said end units,
said belt comprising a plurality of elongated support members each having a length dimension and a width dimension with said length dimension extending horizontally and transversely of said path of movement and being many times longer than said width dimension which extends parallel to said path of movement, said support members being arranged in succession along said path, and means connecting said support members to one another in succession to form said support members into said belt,
each of said support members when positioned in said upper run having a flat upwardly facing horizontal sheet material support surface,
said means connecting said support members to one another in succession being means whereby adjacent ones of said support members are pivotally connected to each other and restrained against movement relative to one another in the direction of said path of movement of said belt at at least two connecting points spaced from one another along the lengths of the support members for pivotal movement only relative to one another about a horizontal pivot axis extending transversely of said path of movement which axis when said adjacent ones of said support members are located in said upper run is located below said support surfaces of said adjacent ones of said support members so that as said adjacent ones of said support members move over either one of said end units they are spaced apart from one another in the region between their support surfaces and said axis and as said adjacent ones of said support members move along said upper run they are spaced more closely to one another than they are during movement over either one of said end units,
said adjacent ones of said support members in the region between said axis and their support surfaces including coengagable parts which move arcuately relative to one another to become disengaged from one another as said adjacent support members move onto either one of said end units and away from said upper run, which move arcuately relative to one another to become engaged with one another as said adjacent support members move from either one of said end units and toward said upper run, and which remain in engagement with one another as said adjacent support members move along said upper run and restrain said adjacent support members from moving vertically relative to one another,
said coengagable parts being located along at least those portions of said adjacent support members extending between said two connecting points, and
said coengagable parts having complementary wedge shapes whereby as said adjacent ones of said support members move onto said upper run from either one of said end units a wedging action occurs, if necessary, between said coengagable parts to move said adjacent ones of said support members, or portions thereof, vertically relative to one another to bring them into a desired vertical relationship.

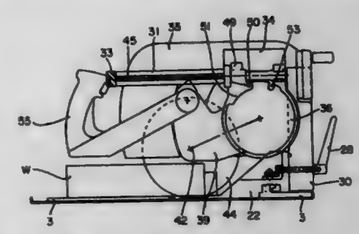
5,189,937

CIRCULAR SAW ARRANGEMENT

Andrea Garuglieri, Colle Brianza, Italy, assignor to Black & Decker, Inc., Newark, Del.

Filed Feb. 24, 1992, Ser. No. 840,791
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1991, 4106635
Int. Cl.[5] B26D 1/16, 1/18
U.S. Cl. 83—471.3 **7 Claims**

1. A circular saw arrangement, comprising:
a frame;
a table plate mounted on the frame, the table plate having a first side and a second side;
the table plate being pivotable between a first position in which said first side faces upwardly and a second position in which said second side faces upwardly;
restraining means for non-movably connecting the table plate and the frame in said first and second positions of the table plate;
a support element rotatably mounted to said first side of the table plate and extending across a part of said first side, said support element being rotatable about an axis of rotation;
said support element having a through slot extending radially with respect to said axis of rotation;
mounting means for connecting a saw unit containing a powered saw blade to the support element wherein in said first position of the table plate the saw blade can be moved downwardly from an elevated position for cutting of a workpiece;
guide means connected to said mounting means, said guide means in said first position of the table plate permitting movement of the saw blade in a longitudinal direction of the through slot;
stop means for limiting the downward movement of the saw blade from the elevated position to a lowered cutting position in which cutting position the saw blade extends into the through slot with a lowermost peripheral point of



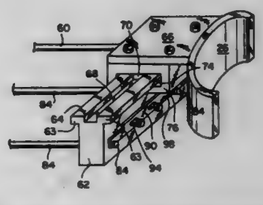
the saw blade above the area of the table plate covered by the support element;
an opening in the table plate, said opening being overlaid by at least a part of the through slot of the support element in a center position of the saw blade;
locking means for locking, when the table plate is in the second position, the saw blade in said center position in a sawing position in which a section of the saw blade extends through the through slot of the support element and through the opening of the table plate; and
a stop adjustable in the direction of the movement of the saw blade in the longitudinal direction of the through slot which stop cooperates with a stop face which upon lowering of the saw blade is moved correspondingly and which limits the lowering movement of the saw blade by engagement with the stop.

5,189,938

SHEAR MECHANISM HAVING QUICK CHANGE DROP GUIDE

William C. Tintle, Waterford, Conn., assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.

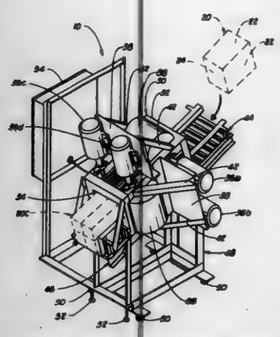
Filed Dec. 24, 1991, Ser. No. 814,744
Int. Cl.[5] C03B 7/10
U.S. Cl. 83—623 **3 Claims**



1. A shear mechanism for shearing discrete gobs from runners of molten glass comprising a longitudinally displaceable shear assembly housing including
at least one shear,
a corresponding number of gob drop guide assemblies each including

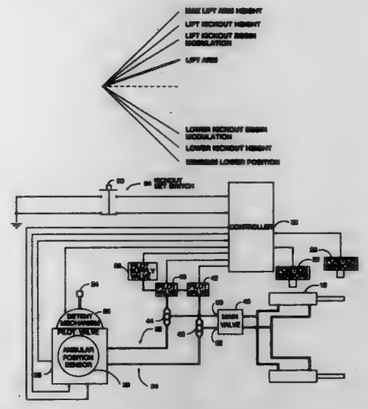
a base portion having a front surface facing forwardly towards a sheared gob, and
a top portion including a drop guide facing forwardly toward a sheared gob,
said base portion including means for supporting said top portion for selected movement relative thereto,
means for supporting each of said base portion for longitudinal displacement relative to said associated shear,
said supporting means including a plurality of parallel rods extending forwardly through said base portion and each having a free end extending forwardly beyond the front surface of said base portion,
catch means defined on the free end of said rods, and
a latching plate,
means for fastening said latching plate on said front surface of said base portion for movement between a securing position whereat said latching plate will become operatively associated with said catch means to secure said rods to said base portion and a release position whereat said base portion can be displaced forwardly and removed from said rods.

5,189,939
APPARATUS FOR CUTTING BLOCKS OF ICE
Russel G. Allen, Jr., San Antonio, Tex., assignor to Carbonic Reserves, Inc., San Antonio, Tex.
Filed Dec. 23, 1991, Ser. No. 814,979
Int. Cl.[5] B26D *3/06*
U.S. Cl. 83—878 **26 Claims**



1. An apparatus for cutting a block of ice, the apparatus comprising:
a frame having four sides, an open input end and an open output end, the input end communicating with the output end to define a straight feed chute for feeding a block of ice through the frame from the input end to the output end of the frame, each side of the frame having a plurality of slots therethrough communicating with the feed chute;
a first saw mounted to the frame and having a first radial saw blade extending through a corresponding one of the slots into the feed chute;
a second saw mounted to the frame and having a second radial saw blade extending through a corresponding one of the slots into the feed chute in coplanar opposition to the first radial saw blade;
a third saw mounted to the frame and having a third radial saw blade extending through a corresponding one of the slots into the feed chute; and
a fourth saw mounted to the frame and having a fourth radial saw blade extending through a corresponding one of the slots into the feed chute in coplanar opposition to the third saw blade;
wherein the first and second radial saw blades are substantially perpendicular to the third and fourth radial saw blades.

5,189,940
METHOD AND APPARATUS FOR CONTROLLING AN IMPLEMENT
Javad Hosseini; Eric A. Hutchison, both of Peoria; Randall M. Mitchell, Washington; Weldon L. Phelps, Dunlap, and James E. Schimpf, Plainfield, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Sep. 13, 1991, Ser. No. 759,390
Int. Cl.[5] F15B *13/16*
U.S. Cl. 91—361 **25 Claims**

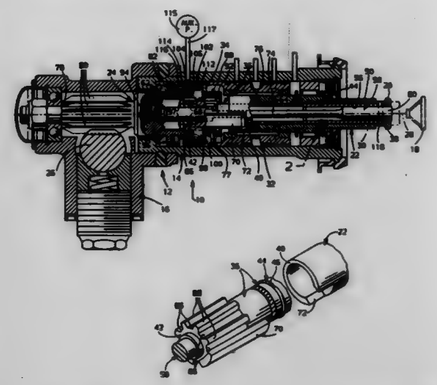


9. An apparatus for controllably raising and lowering an implement relative to a work vehicle, said implement being pivotally connected to said work vehicle and movable to and between maximum raised and lowered positions in response to the extension and retraction of a hydraulic cylinder, comprising:
a control lever movably connected to the work vehicle;
means for producing a lever pilot signal in response to the position of said control lever, said lever pilot signal having a first pilot pressure;
means for producing an electrohydraulic pilot signal in response to movement of said control lever, said electrohydraulic pilot signal having a second pilot pressure;
means for selecting the greater of said first and second pilot pressures; and
means for controlling the position of the implement in response to the selected pressure.

5,189,941
POWER STEERING GEAR PERMITTING SEPARATE MECHANICAL AND HYDRAULIC BALANCING
Jeffrey J. Roethlisberger, St. Charles, and Stanley R. Goodrich, Jr., Reese, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 2, 1991, Ser. No. 801,200
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—375 A **9 Claims**

1. A detent mechanism in a hydraulically assisted power steering gear for an automotive vehicle, the power steering gear being of the type having
an input member with a first end and a second end, rotatable about a steering gear axis and connected to a steering wheel,
an output member rotatable about the steering gear axis,

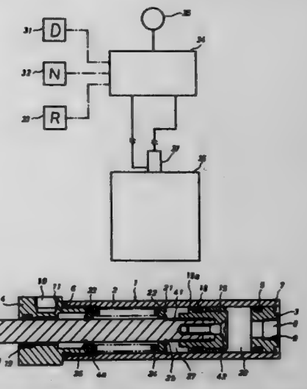
connected to a pair of steerable road wheels, and proximate to the second end of the input member,
a rotary valve including a valve sleeve rotatable as a unit with the output member and a valve spool portion rotatable as a unit with the input member, having a hydraulically balanced position between the valve sleeve and the valve spool portion, and
a torsion rod aligned on the steering gear axis with a first end of the torsion rod disposed within the first end of the input member and a second end of the torsion rod attached to the output member,
the detent mechanism comprising:
a tubular stub shaft having a first end and a second end, aligned with the steering gear axis, having a detent recess on the second end, having the first end of the tubular stub shaft radially interposed between the first end of the input member and the first end of the torsion rod, and with the



second end of the tubular stub shaft extending beyond the second end of the input member;
a detent engaging element rotating with the output member, accommodated in the output member by a socket alignable with the detent recess;
a spring urging the detent engagement element into the detent recess, thereby rotatively aligning the tubular stub shaft with the output member to a mechanically balanced position; and
a pin passing through and thereby rotatively linking the input member, the first end of the tubular stub shaft, and the first end of the torsion rod such that the tubular stub shaft is rotatively aligned with the output member in the mechanically balanced position, simultaneous with the rotary valve being in the hydraulically balanced position, simultaneous with the torsion rod being in a neutral position.

5,189,942
3-POSITION ACTUATOR
Masahiro Ohkubo, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan
PCT No. PCT/JP90/01453, § 371 Date Aug. 21, 1991, § 102(e) Date Aug. 21, 1991, PCT Pub. No. WO91/09069, PCT Pub. Date Jun. 27, 1991
PCT Filed Nov. 8, 1990, Ser. No. 721,655
Claims priority, application Japan, Dec. 22, 1989, 1-334087
Int. Cl.[5] F01B *31/14*
U.S. Cl. 92—13.6 **3 Claims**

1. A 3-position actuator having a moving body comprising a piston slidingly reciprocating for a specified distance in an axial direction within a casing having an inner surface of substantially constant diameter, and a piston rod which moves integrally with the piston and a part of which protrudes out of said casing, said moving body being moved to one end side when fluid flows into a first fluid chamber through a first port formed on said casing, and said moving body being moved to the other end side when fluid flows into a second fluid chamber through a second port formed on said casing; characterized by that a pair of stoppers are installed in said casing with a specified clearance left between them in the axial direction, one stopper of said pair of stoppers comprising a snap ring disposed on an axially central portion of said inner surface of substantially constant diameter of said casing, a pair of spring seats and a spring are installed between the pair of stoppers, said spring is located between the pair of spring seats to press one-side spring seat against said one-side stopper and to press the other-side spring seat against said other-side stopper, a pair of stopping portions are provided on said moving body in a projecting manner with a specified clearance left between them in the axial direction, said one-side stopping portion mates with said one-side spring seat from a side opposite to the spring under a state where said one-side spring seat contacts with said one-side stopper, and said other-side stopping portion mates with said other-side spring seat from the side opposite to the spring under a state where said other-side spring seat contacts with said other-side,

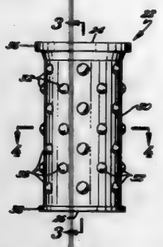


wherein said piston rod comprises male threads formed on an outer periphery at one end of said piston rod for screwing into said piston, and wherein the moving distance of the moving body to one end side is made adjustable by rotating said piston rod within said piston.

5,189,943
DEVICE FOR REDUCING ICING
Frederick A. Powers, Maple Grove, Minn., assignor to Graco Inc., Minneapolis, Minn.
Filed Jul. 31, 1992, Ser. No. 923,234
Int. Cl.[5] F01B *11/02*
U.S. Cl. 92—169.1 **5 Claims**

1. In an air-generated motor having an exhaust passage which is susceptible to icing, said exhaust passage having cross-sectional dimensions, the improvement comprising a generally tubular liner being located in said passage, said liner comprising:
an outer surface having dimensions less than said passage cross-sectional dimensions;
a generally smooth inner surface; and
a plurality of spacer elements extending outwardly from said outer surface to space said outer surface from said passage and to locate said liner relative to said passage, said liner

being formed of a flexible material such that when compressed air is exhausted through said passage and said



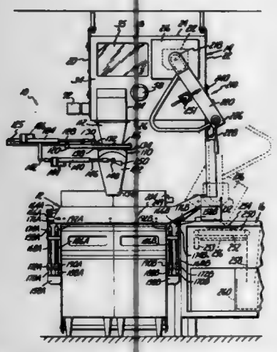
liner, portions of said liner intermediate said spacer elements will flex sufficiently to prevent ice buildup.

5,189,944

AUTOMATED FRENCH FRY COOKING APPARATUS

Glenn O. Rasmussen, Champlin; James W. Finkowski, Andover; Robert F. Meyer, Minneapolis; Richard L. Keller, Plymouth; Thomas P. Kempf, Brooklyn Park, and Ronald N. Phillips, Moundsview, all of Minn., assignors to Burger King Corporation, Miami, Fla.

Filed Feb. 19, 1991, Ser. No. 657,537
Int. Cl.[5] A47J *37/12*
U.S. Cl. 99—334 **16 Claims**



1. A cooking apparatus for deep frying foodstuff in a cooking medium comprising:

a refrigeration system, including:

a refrigeration unit;

means within the refrigeration unit for supporting a supply of frozen foodstuff;

receiving means positioned within the refrigeration unit and adjacent to the supporting means, the receiving means being configured to receive frozen foodstuff from the supporting means; and

a metering mechanism positioned within the refrigeration unit, the metering mechanism being configured to monitor the weight of frozen foodstuff on the receiving means and thereby measure a metered quantity of frozen foodstuff;

a cooking unit positioned adjacent to the refrigeration unit, including:

a frying tank for containing a supply of a hot cooking medium; and

a plurality of frying baskets associated with the cooking unit, each frying basket being movable between a loading position wherein the frying basket is oriented to receive frozen foodstuff from the refrigeration unit, a cooking position wherein the frying basket is immersed in the hot cooking medium within the frying tank for the deep frying of foodstuff, a draining position wherein excess cooking medium is allow to drain from the deep fried foodstuff and a dump position wherein deep fried foodstuff is discharged from the frying basket; and

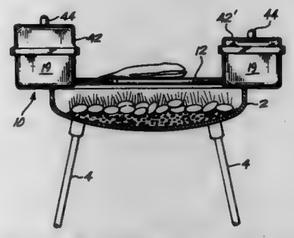
a delivery mechanism coupled to the refrigeration unit and alignable with any of the plurality of frying baskets for transferring a metered quantity of frozen foodstuff from the receiving means to any one of the plurality of frying baskets which is oriented in the loading position.

5,189,945

WATER COOLED BARBECUE GRILL

Donald C. Hennick, 625 Western Ave., Seattle, Wash. 98104

Filed Nov. 18, 1991, Ser. No. 793,591
Int. Cl.[5] A47J *37/00*
U.S. Cl. 99—339 **11 Claims**



1. A barbecue grill comprising a first metal sheet having opposite upper and lower surfaces; a second metal sheet having opposite upper and lower surfaces and being positioned above said first sheet, with at least a portion of said upper surface of said first sheet being spaced from said lower surface of said second sheet, to form a circulation passageway between said sheets for circulating cooling liquid; a plurality of spaced heat passageways extending perpendicular to, and closed from communication with, said circulation passageway; each said heat passageway extending through said first and second sheets and opening onto said lower surface of said first sheet and said upper surface of said second sheet, and each of said sheets extending continuously between and around said heat passageways; and a reservoir in communication with said circulation passageway.

5,189,946

SELF-DRAINING COOKING POT

John F. Leon, P.O. Box 160, Tryon, N.C. 28782

Filed Sep. 16, 1992, Ser. No. 946,408
Int. Cl.[5] A47J *27/00*
U.S. Cl. 99—403 **20 Claims**

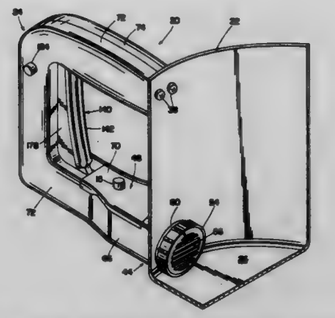
1. A self-draining cooking pot comprising:

a vessel having an aperture in a lower portion of said vessel;

a handle assembly affixed to said vessel;

said handle assembly including a valve housing portion sealingly engaging portions of said vessel peripheral to said aperture, said valve housing portion having a drain opening; and

a valve module receivable within said valve housing portion, said valve module including valve elements serving to selectively open and close a fluid flow path between said aperture and said drain opening, and said valve module



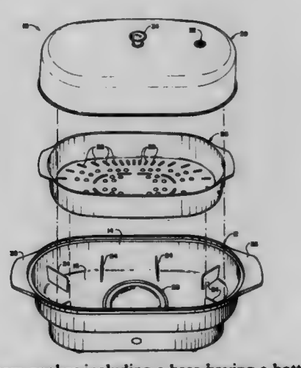
being readily removable from said valve housing portion to facilitate cleaning.

5,189,947

RICE AND VEGETABLE STEAMER

Yung S. Yim, Shatin, Hong Kong, assignor to Chiaphua Industries Limited, Hong Kong

Filed Jun. 29, 1992, Ser. No. 905,436
Int. Cl.[5] A47J *27/04*; F27D *11/00*
U.S. Cl. 99—415 **4 Claims**



1. In a steam cooker including a base having a bottom wall and sidewalls integrally formed with the bottom wall, the bottom wall having a central opening therethrough, and a water heater mounted in the central opening and forming a fluidtight seal with the bottom wall, the bottom wall, sidewalls and heater cooperating to define a water reservoir, the improvement wherein said water heater comprises

a heat conducting metal body having an upwardly directed surface defining a portion of the water reservoir surface and a bottom surface,

an elongated generally U-shaped heater channel formed in said bottom surface and extending in a generally circular path,

an elongated metal sheathed heating element mounted within said heater channel and having its terminal end portions disposed in generally radially overlapping relation,

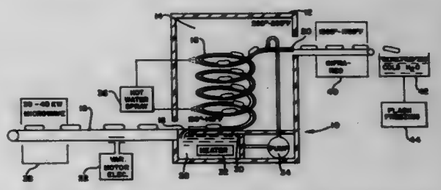
an annular recess formed in the top surface portion of said metal wall, said annular recess having a first portion of uniform depth defined by a first substantially planar bottom wall portion and a second portion of varying depth defined by a second substantially planar bottom wall portion inclined with respect to the first wall portion, whereby water in said water reservoir will have a greater depth above said first bottom wall portion than above said second bottom wall portion, said inclined wall portion overlaying said overlapped end portions of said heating element.

5,189,948

LOW TEMPERATURE SPIRAL CONDUCTION VAPOR COOKER AND PROCESS

Benno E. Liebermann, Louisville, Ky., assignor to Beltec International, Louisville, Ky.

Filed Feb. 5, 1991, Ser. No. 650,809
Int. Cl.[5] A47J *27/00*
U.S. Cl. 99—443 C **9 Claims**



1. A low temperature water conduction and vapor cooker for fish, meat and poultry products, comprising:

a cooking chamber;

a conveyor belt within the cooking chamber, the belt having a path rising circuitously within the cooking chamber such that generally each tier of the conveyor belt passes over another tier of the conveyor belt, a lowermost portion of the belt path being adapted for receiving uncooked food product in the cooking chamber, an uppermost portion of the belt path being adapted for discharging cooked food product form the cooking chamber;

means for channeling heated water underneath the belt path, the channeling means also having a circuitous path following the belt path and located directly beneath each tier of the conveyor belt; and,

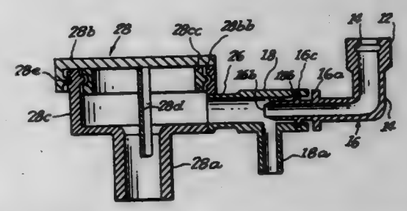
a source of water heated to a temperature of no more than 205 degrees Fahrenheit; the source supplying heated water to the means for channeling near the uppermost portion of the belt path, the means for channeling being of sufficient length such that the heated water cools to about no less than 130 degrees Fahrenheit near the lowermost portion of the belt path.

5,189,949

CAPPUCCINO DISPENSER

Vincenzo Apa, 3733 Lancewood Dr., Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 554,792, Jul. 20, 1991. This application Jun. 14, 1991, Ser. No. 715,760
Int. Cl.[5] A23C *3/02*; A23F *5/00*
U.S. Cl. 99—453 **3 Claims**



1. An aerating, mixing and dispensing device for providing a

steam, milk and air mixture of a desired uniform consistency for cappucino comprising:

a mixing chamber for mixing steam, milk and air, having an annular sidewall, a bottom surface connected to said annular sidewall, and a top annular edge, defining said chamber opening;

a mixing chamber cover, mountable over said chamber;

main inlet conduit, having distal and proximal ends connected in fluid communication at said proximal end into said mixing chamber;

second inlet conduit, having distal and proximal ends, connected at said proximal end into the main inlet conduit substantially perpendicular, said second inlet conduit connectable at said distal end to a source of milk;

third conduit having a steam nozzle portion disposed at a proximal end and a connection at a distal end for connection to a steam source, said steam nozzle end including a tapered end wall portion and an elongated external air inlet channel disposed longitudinally on a peripheral exterior portion of said third conduit, said nozzle air inlet channel having a predetermined depth and width forming a predetermined crossectional area, said third conduit steam nozzle portion having a diameter to permit slidable insertion within the free end of said main inlet conduit, whereby the main inlet conduit is sized in conjunction with the steam nozzle air inlet channel to provide a predetermined volume of air and steam flow into said main inlet conduit, said third conduit having a raised portion for stopping the insertion of said steam nozzle into said main inlet conduit at a predetermined position, said second inlet conduit connection inlet into the main inlet and the proximal end of said steam nozzle on said third conduit relative to said stop being sized so that when said steam nozzle is engaged within said main inlet conduit at said stop wall, the end portion of the nozzle will be disposed at a predetermined location relative to the second inlet conduit connection into the main inlet, whereby a proper mixture of air from the steam nozzle air inlet channel, milk from said second inlet conduit, and steam, is provided to achieve a uniform desired consistency; and

outlet means connected to the bottom surface of said mixing chamber for dispensing the mixture of steam, milk and air received in said mixing chamber.

5,189,950

SCREEN PRINTING MACHINE AND PRINT HEAD CARRIAGE THEREFOR

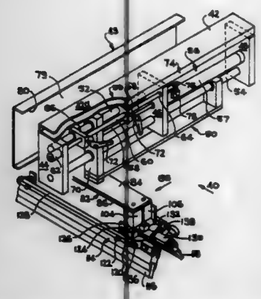
Otto R. Eppinger, Parkdale, Australia, assignor to Reefdale Pty. Ltd., Braeside, Australia

Filed Oct. 1, 1991, Ser. No. 769,427

Claims priority, application Australia, Oct. 1, 1990, PK2581/90; Mar. 7, 1991, PK4949/91

Int. Cl.[5] B41F *15/10*

U.S. Cl. 101—115 **15 Claims**



1. A print head assembly for use with a screen printing machine of the type including a fixed frame having a plurality of arms and a movable frame carrying a plurality of platens, the movable frame being mounted for rotation relative to the fixed frame, the print head assembly comprising:

a) a mounting frame which in use is operatively connected to an arm of the fixed frame;

b) a carriage operatively connected to the mounting frame and arranged for reciprocating movement relative thereto;

c) a piston/cylinder assembly for causing the reciprocating movement of the carriage, the assembly including a cylinder having opposed ends with a piston therein;

d) first, second and third support members extending from the mounting frame and in spaced relation relative to one another, said third support member being disposed between said first and second support members;

e) guide means operatively connected to said support members in spaced relation from the mounting frame such that together they form a rigid structure;

f) said carriage including at least two bearing sections slidably received on said guide means, said bearing section being spaced apart with one being disposed between the first and third support members and the other between the second and third support members, and said carriage further including a coupling section connecting the piston to the carriage;

g) said cylinder being supported between one of said first or second support members and said third support member.

5,189,951

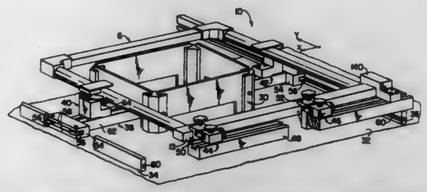
PLANAR SUPPORT FOR MATERIAL MOUNTED TO A FRAME AND METHOD OF USE

Ronald B. Webster, Ellington; David P. Boisvert, Bristol; Thomas A. Gordon, Hebron; Michael Baron, Vernon; Michael L. Raczkowski, Tolland; Raymond J. MacQueen, Jr., Canton; Robert Evans, Middletown, all of Conn., and K. Scott Smith, Sturbridge, Mass., assignors to Gerber Scientific Products, Manchester, Conn.

Filed Dec. 4, 1991, Ser. No. 803,126

Int. Cl.[5] B41C *1/14*

U.S. Cl. 101—128.1 **22 Claims**



1. A system for supporting in a given plane fixed relative to a base a thin layer of material mounted to a frame, said system comprising:

a base;

said base having an upwardly facing surface defining the plane to which a material is to assume, said base having disposed thereon a first coordinate axis and a second coordinate axis, each of which axes is orthogonally oriented relative to the other;

support means for referencing the planar dimension of said base and for supporting a layer of material above said base and in a spatial relationship relative to said base upwardly facing surface so as to dispose the layer of material in a given plane parallel to that defined by said upper surface of said base;

first clamp means for holding a portion of said frame to said base with reference to one of the first and second coordinate axes; and

second clamp means for holding the frame and drawing it below said given plane and for causing said layer of material overlaid on said support means to conform to said generally planar dimension provided by said support means; and

locating means fixed relative to said base and associated with the other of said first and second coordinate axes for locating said frame in registration with reference to the other of said first and second coordinate axes.

5,189,952

PROCESS FOR PRODUCING WINDOW GLASS WITH THIN FILM THEREON

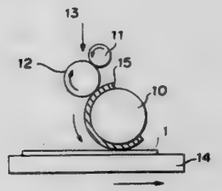
Shinya Ohmura, Tokyo; Hisakazu Tsuchiya, Yokohama, and Masahiro Miwa, Tokyo, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 8, 1991, Ser. No. 666,885

Claims priority, application Japan, Mar. 9, 1990, 2-56746; Mar. 9, 1990, 2-56747; Oct. 30, 1990, 2-290667; Oct. 30, 1990, 2-290670

Int. Cl.[5] B41M *1/04, 7/00*

U.S. Cl. 101—211 **19 Claims**



1. A process for producing a window glass with a thin film thereon, which comprises coating a coating solution which can be gelled by light on a glass substrate by flexographic printing, then exposing the coated glass substrate to light, and then baking the coated glass substrate to form a thin film.

5,189,953

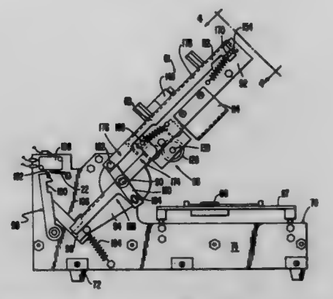
ELECTRIC MOTOR DRIVEN IMPRINTER

Randall J. Kennedy, and David A. Moritz, both of Kitchner, Canada, assignors to Consolidated NBS, Inc., Mississauga, Canada

Filed May 21, 1992, Ser. No. 886,154

Int. Cl.[5] B41F *3/04*

U.S. Cl. 101—269 **38 Claims**



1. An electric motor driven imprinter comprising:

an electric motor having first and second motor windings each having a first terminal for coupling to a source of electric power and a second terminal connected together and for coupling to the source of electric power;

a base for receiving a print bearing element having printing to be imprinted and a print receiving element to be imprinted with the electric motor being attached to the base;

a head pivotally connected to the base which is pivoted between an open position providing access to the base and a closed position positioning the heat for imprinting;

a movable carriage mounted in the head having mounted therein a rolling platen with the carriage being driven by a transmission coupling the electric motor to the carriage to move the carriage in a first and a second opposite direction with movement in each direction to one of a pair of ends of travel imprinting print from the print bearing element on the print receiving element;

a first switch having a first terminal for connection to the source of electrical power and alternatively to one of second and third switch terminals respectively electrically connected to the first terminal of the first and second motor windings and connected to a capacitor with the alternative connection to the second and third switch terminals being controlled by a first control mechanism which is activated when the carriage moves to the end of travel in either the first or second direction; and

a second switch coupled to the motor windings with the second switch being controlled by a second control mechanism to close the second switch in response to pivoting the head to the closed position so that current flows through the closed second switch through the electric motor and the electric motor is activated when current flows through the switches and the motor windings from the source of electrical power with the direction of rotation being controlled by the end of travel at which the carriage is positioned at the time of closing the head.

5,189,954

INK SUPPLYING DEVICE FOR A PRINTING PRESS

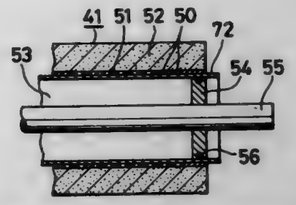
Yoshiaki Ono, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1992, Ser. No. 834,192

Claims priority, application Japan, Feb. 15, 1991, 3-44208

Int. Cl.[5] B41F *7/00, 31/02*

U.S. Cl. 101—329 **3 Claims**



1. An ink supply roller for a printing press comprising:

a cylindrical core member defining an ink chamber therein, said cylindrical core member having a plurality of holes to allow ink to pass from the ink chamber and through said cylindrical core member;

an ink absorbing cylindrical member disposed about said cylindrical core member; and

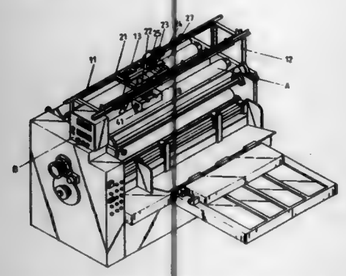
a removable cylindrical sealing tube disposed interiorly of said cylindrical core member and removably mounted such that when said cylindrical sealing tube is disposed interiorly of said cylindrical core member, ink is prevented from passing through said holes to the ink absorbing member while allowing ink to pass to said ink absorbing cylindrical member when said removable cylindrical sealing tube is removed.

5,189,955

AUTOMATIC INKING MECHANISM FOR PAPERBOARD PRINTING MACHINES

Shun-Fa Su, No. 10, Alley 28, Lane 917, Kang Shan South St., Chien Chen District, Kaohsiung, and Ching C. Lin, No. 22-3, Lane 80, Wu Ching 2nd Rd., Feng Shan City, Kaohsiung County, both of Taiwan

Filed Jul. 23, 1992, Ser. No. 917,401
Int. Cl.[5] B41F *31/06, 31/14, 31/36*
U.S. Cl. 101—351 2 Claims



1. An automatic inking mechanism installed on top of a common paperboard printing machine comprising:
- a pair of supporting frames fixed on top of a paperboard printing machine at proper positions near two ends of said machine;
- two rack rails parallelly and transversely extending between said pair of supporting frames at a position generally above an uppermost roller of said printing machine;
- a plurality of inducers being disposed along one of said rack rails at proper positions;
- a framework having four gears disposed at four corners thereof for engaging with said rack rails so that said framework is reciprocatively movable on said rack rails when said framework is driven by a transmission motor provided on said framework, and a downward extended panel to which a cylinder is vertically attached;
- an induction member being attached to said framework at an adequate position so as to induce said inducers disposed on said one rack rail;
- an ink reservoir being connected to said cylinder below said framework through an L-shaped plate connected to a pushrod of said cylinder and having a generally V-shaped bottom with a slit formed thereof; and
- an embossed roller being disposed in said ink reservoir with two ends extending out of two ends of said ink reservoir and being adjustably fixed thereto by bolts so that a variable gap is allowed between said embossed roller and a bottom of said ink reservoir; said embossed roller being allowed to adequately contact said uppermost roller of the printing machine when said cylinder actuates said pushrod thereof to move to a lower position, and the rotation of said uppermost roller permitting ink in said ink reservoir to be evenly passed to it through said embossed roller for printing.

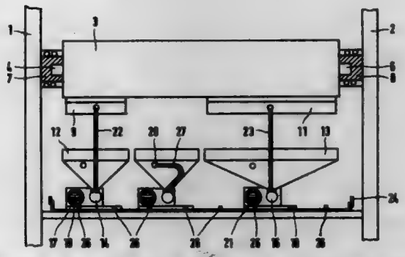
5,189,956

PRINTING INK FEEDING ASSEMBLY

Wolfgang O. Reder, Veitshöchheim, and Georg Schneider, Würzburg, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed May 27, 1992, Ser. No. 888,624
Claims priority, application Fed. Rep. of Germany, May 28, 1991, 4117389
Int. Cl.[5] B41F *31/02*
U.S. Cl. 101—364 6 Claims

1. A printing ink feeding assembly on a printing press for feeding printing ink to an anilox roller, said printing ink feeding assembly comprising:
- a first ink trough having an ink outlet opening;
- a first ink pumping unit removably secured to said ink outlet opening;
- a first chambered doctor blade engageable with the anilox roller and having a length less than an axial length of the anilox roller;



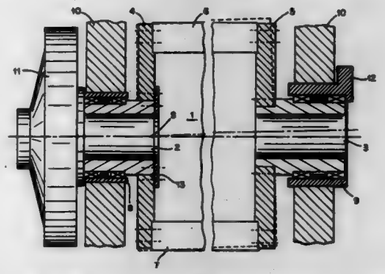
- first ink feeding means for feeding ink to said chambered doctor blade from said first ink trough through said first ink pumping unit; and
- a first base plate removably securable to a support trough of the printing press, said first base plate carrying said first ink trough, said first ink pumping unit, and said first ink feeding means, and forming a first anilox inking unit, said first anilox inking unit being shiftably positionable with respect to said anilox roller.

5,189,957

SHEET-CONVEYING DRUM FOR SKEW REGISTER CORRECTION

Ingo Kobler, Anhausen; Roland Holl, Weiterstadt, and Dietrich Dettinger, Heusenstamm, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Apr. 24, 1991, Ser. No. 690,855
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1990, 4012928
Int. Cl.[5] B41F *21/10*
U.S. Cl. 101—409 14 Claims



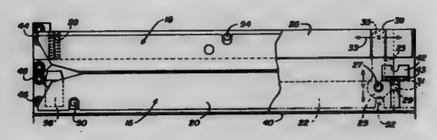
1. A skewable sheet-conveying drum mounted for rotation in bearings supported by frame elements, one of said bearings being a drive-side bearing defining a primary axis, comprising, in combination,
- a drum body including first and second end webs,
- shaft means including first and second shaft ends for journalling said drum body in said bearings, said first shaft end having a shaft axis and being non-displaceably mounted in the drive-side bearing such that the first shaft end axis and the primary axis are coaxial,
- means for coupling said first and second drum end webs to the first and second shaft ends such that rotational input applied to the first shaft end imparts rotational movement through the first end web to the drum body,
- and means for causing translational movement of the second drum end web radially with respect to the primary axis to pivot the drum body relative to the first shaft end and skew the drum body relative to the first shaft end axis and the primary axis.

5,189,958

PLATE CLAMPING SYSTEM FOR A DUPLICATING MACHINE

Leonard I. Tafel, Mount Prospect; Joseph S. Nowik, Skokie, and Siegfried H. Lebherz, Chicago, all of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Apr. 5, 1991, Ser. No. 681,045
Int. Cl.[5] B41F *1/28*
U.S. Cl. 101—415.1 21 Claims



1. In a duplicating machine having a plate cylinder rotatably mounted on a frame with plate clamp assemblies having clamps to hold the leading and trailing edges of a plate therein, an improved plate clamping system comprising:
- means for attaching the leading edge plate clamping assembly only at one end to the plate cylinder such that the leading edge plate clamping assembly has no axial movement; means for adjusting only the other end of the leading edge plate clamping assembly in a direction laterally with respect to its longitudinal axis to enable skewing of the leading edge plate as required; and
- means coupling the leading edge plate clamp assembly to the trailing edge plate clamp assembly such that laterally adjusting only the other end of the leading edge plate clamp assembly to skew the leading edge plate automatically moves the trailing edge clamp assembly only axially to cause it to be in proper alignment with the trailing edge of the skewed plate.

5,189,959

Patent Not Issued For This Number

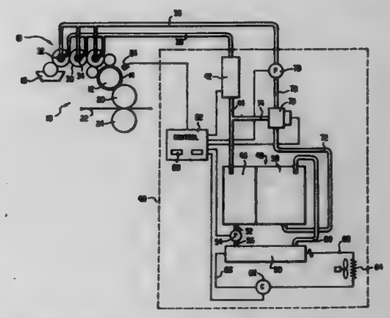
5,189,960

APPARATUS AND METHOD FOR CONTROLLING TEMPERATURE OF PRINTING PLATE ON CYLINDER IN ROTARY PRESS

Fredric Valentini, 718 N. Lombard, Oak Park, Ill. 60302, and David W. Moore, 1543 Walnut, Western Springs, Ill. 60558

Filed Nov. 18, 1991, Ser. No. 795,945
Int. Cl.[5] B41F *23/04*
U.S. Cl. 101—487 8 Claims

1. A temperature control system for a printing plate of a rotary press of a type having a cylinder, said printing plate being carried on the cylinder, and an ink train including a plurality of ink rollers, at least one of which rollers is hollow and equipped with connections for circulating water in a heat exchange relationship therethrough, said system comprising:
- a water circulating unit including a two-chambered water reservoir, two circulating pumps, a water chiller, a water heater and a controllable mixing valve, said circulating unit being connected to the hollow roller to provide a closed loop water circulating path;



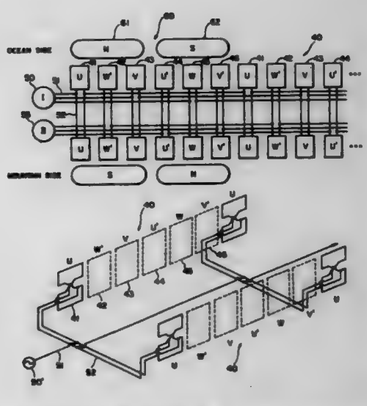
- temperature sensing means for detecting a temperature of the printing plate and also for generating a signal corresponding to a detected plate temperature; and
- means, responsive to the signal, for controlling the circulating unit so as to regulate a temperature of the water circulating through the closed loop path in accordance with the detected plate temperature.

5,189,961

SUPERCONDUCTIVE MAGNETICALLY LEVITATED RAILWAY, AND POWER-FEED SYSTEM THEREFOR

Junji Fujie, Hino, Japan, assignor to Railway Technical Research Institute, Japan

Filed Jun. 22, 1992, Ser. No. 901,954
Claims priority, application Japan, Jul. 8, 1991, 3-166609
Int. Cl.[5] B60L *13/10*
U.S. Cl. 104—281 5 Claims



1. A superconductive magnetically levitated railway having a vehicle and a track, which has two side walls, along which the vehicle runs, comprising:

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(a) six phases of propulsion-levitation-guidance ground coils provided on both side walls of the track; and
(b) a pair of superconducting magnets, which are mounted on the vehicle, corresponding to the six phases of said propulsion-levitation-guidance ground coils.

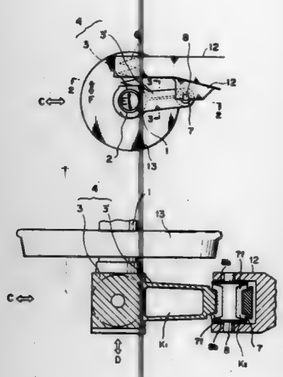
5,189,962

AXLE BOX SUSPENSION WITH RESILIENT ELEMENTS ADHERED TO THE MOVABLE COMPONENTS SUCH THAT ALL RELATIVE MOVEMENT BETWEEN THE COMPONENTS OCCURS BY DEFORMATION OF THE RESILIENT ELEMENTS

Akira Iwamura, and Shuji Akachi, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 400,425, Aug. 30, 1989, abandoned.
This application May 29, 1992, Ser. No. 892,713
Claims priority, application Japan, Sep. 1, 1988, 63-216220
Int. Cl.[5] B61F *5/30*
U.S. Cl. 105—218.2 **18 Claims**

1. An axle box suspension for mounting axles of a railway vehicle upon a truck frame thereof, comprising:
an axle box body including an axle box and an axle anchor rod, said axle box supporting said axle with a bearing disposed about said axle, and said axle anchor rod being integrally formed with said axle box and extending outwardly from one side thereof;
an axle spring interposed between said axle box body and said truck frame; and



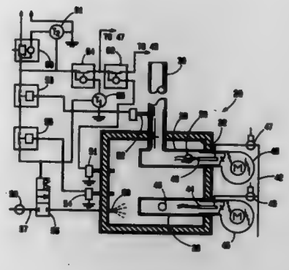
means for coupling said axle anchor rod to said truck frame, through means of a shaft, which is separate and distinct from said truck frame, and a resilient element disposed about said shaft, wherein said axle anchor rod has a first predetermined twisting rigidity and said resilient element has a second predetermined twisting rigidity, and wherein further said shaft has opposite axial end portions thereof fixedly mounted within said truck frame, said resilient element is fixedly mounted upon said shaft, and said axle anchor rod is fixedly mounted upon said resilient element such that no slidable movement is permitted to occur between said axle anchor rod and said resilient element, between said resilient element and said shaft, and between said shaft and said truck frame, in a running direction of said vehicle which is parallel to a longitudinal axis of said axle anchor rod, and in a direction transverse to said longitudinal axis of said anchor rod as a result of said shaft being formed with bobbin means located axially inwardly of both of said axial end portions, and said resilient element including an axially central bush section and a pair of flange sections disposed at opposite axial ends of said bush section for complementarily engaging said bobbin means of said shaft, whereby a resulting composite twisting rigidity of said vehicle with respect to said running direction thereof is less than said first predetermined twisting rigidity of said axle anchor rod or said second predetermined twisting rigidity of said resilient element.

5,189,963

COMBUSTIBLE ATMOSPHERE FURNACE CONTROL SYSTEM

Carlton B. Mann, 1203 S. Chilton, Tyler, Tex. 75701

Filed Sep. 30, 1991, Ser. No. 769,934
Int. Cl.[5] F23N *5/02*
U.S. Cl. 110—190 **10 Claims**



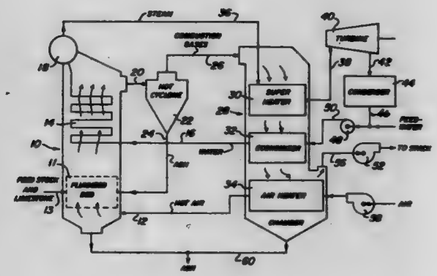
1. A method for temperature control of a combustible atmosphere processing furnace independent of elapsed time without internal ignition or explosion comprising:
establishing a safe upper limit for the rate-of-change of combustible atmosphere temperature with respect to the temperature thereof for said furnace;
charging said furnace with volatile materials;
firing said furnace;
continuously measuring the temperature of the combustible atmosphere of said furnace;
continuously determining the rate-of-change of said combustible atmosphere temperature with respect to the temperature thereof;
cooling said furnace whenever said combustible atmosphere temperature rate-of-change with respect to the temperature thereof exceeds said established safe limit; and
discontinuing said cooling when said combustible atmosphere temperature rate-of-change with respect to the temperature thereof is less than said established safe limit.

5,189,964

PROCESS FOR BURNING HIGH ASH PARTICULATE FUEL

John W. Rich, Jr., R.D. #1, Box 211, Auburn, Pa. 17922

Division of Ser. No. 278,676, Dec. 1, 1988, Pat. No. 4,961,756.
This application Apr. 30, 1990, Ser. No. 516,155
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—347 **20 Claims**



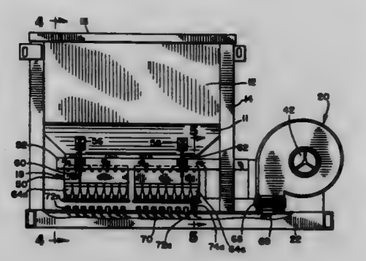
1. A process for generating power, comprising the steps of:
preparing a particulate fuel comprising combustible and non-combustible fractions, the non-combustible fraction constituting in a range from about 30 percent to about 50 percent, by weight, of the dry weight of the fuel;
admitting the fuel into a fluidized bed combustion chamber and therein burning the fuel to produce heat; and
extracting power from the heat thus produced.

5,189,965

GRANULAR MATERIALS APPLICATOR

Kent M. Hobbs, and Johnathan I. Macy, both of Holdrege, Nebr., assignors to Holdrege Seed and Farm Supply Company, Holdrege, Nebr.

Filed May 2, 1990, Ser. No. 517,940
Int. Cl.[5] A01C *15/04, 7/00*
U.S. Cl. 111—178 **7 Claims**



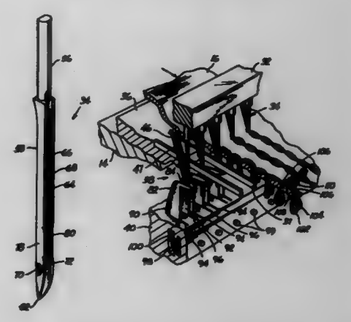
1. Apparatus for dispensing a predetermined quantity of granular material at a predetermined rate of application comprising:
support means;
a hopper attached to said support means for holding said granular material, said hopper having a base including an orifice for allowing the granular material to pass therethrough;
pneumatic delivery means spaced from and subtending said hopper for directing said granular material in a uniform distribution toward a dispensing location;
a metering system including a plurality of metering roll means rotatably mounted about a common axis of rotation and positioned between said hopper orifice and said pneumatic delivery means, each of said metering roll means having a plurality of spaced pockets about its circumference, said pockets being intermediate and spaced from each of the sides of the metering roll means, each of said pockets having a substantially cylindrical internal shape with a convex end defining a volume of preselected size relative to the concentration of the material to be dispensed, each of said pockets receiving said material and directing said material toward said pneumatic delivery means upon rotation of said metering roll means;
a plurality of segregated metering channels, each of said metering channels having an enclosed metering roll feed chute in communication with said hopper orifice and having a portion thereof defined by a cantilevered leveling knife, said leveling knife adjacent the circumference of a respective one of said metering rolls for removing excess material from said spaced pockets when said metering roll rotates about its axis of rotation;
metering drive means for rotating said metering roll means at a preselected angular velocity; and
control means for determining said predetermined rate of application and driving said metering drive means at said preselected angular velocity.

5,189,966

TUFTING APPARATUS AND METHOD FOR FORMING LOOP PILE

William H. Satterfield, Dalton, Ga., assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Apr. 24, 1992, Ser. No. 874,065
Int. Cl.[5] D05C *15/22;* D05B *85/00*
U.S. Cl. 112—80.53 **19 Claims**



1. A needle for tufting including a shank having a longitudinal axis, a blade extending from said shank to a point portion terminating in a tip, said blade having an elongated groove formed along one surface and defining a pair of spaced apart flanks on opposite sides of said groove, an eye extending transversely through each flank opening into said groove above said tip, whereby at least a first and a second yarn strand may be guided along said groove for guiding said first yarn strand

through one eye and said second yarn strand through the other eye.

17. A method of tufting loop pile fabric comprising reciprocating a needle having two eyes along a path from one side through another side of a backing material fed in one direction, supplying separate yarn strands to each eye, oscillating a pair of loopers at said other side of said backing material toward and away from said path, seizing a loop of yarn by one of said loopers presented by said needle from one of said eyes, and seizing another loop of yarn by the other of said loopers presented by said needle from the other of said eyes.

5,189,967

APPARATUS FOR FEEDING LABELS TO A SEWING SITE OF AN INDUSTRIAL SEWING MACHINE

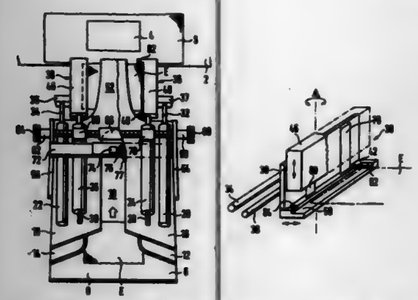
Helmut Schips, Klosterweidlistr. 1, CH-9000 St. Gallen, and Jakob Wirth, Sulzbergstr. 28A, CH-9400 Rorschacherberg, both of Switzerland

Filed Mar. 14, 1991, Ser. No. 669,514

Claims priority, application European Pat. Off., Mar. 15, 1990, 90104932

Int. Cl.[5] D05B *3/22*

U.S. Cl. 112—113 **13 Claims**



1. An apparatus, for feeding labels to a sewing site of an industrial sewing machine, comprising:

a carrier positioned adjacent the sewing site; and

receiving means movable with respect to said carrier in a horizontal, rectilinear manner and which takes up a label at a take-over station remote from the sewing site, then is moved to the sewing site where a pressing punch presses the label against a fabric located therebeneath, and thereafter said receiving means is moved back to the take-over station in an empty condition;

the receiving means including two grippers having an adjustable distance therebetween, and disposed transversely of the path of movement between the sewing site and the take-over station;

each gripper having clamping means engaging an edge portion of the label;

wherein the two grippers are coupled to a threaded spindle assembly having a righthand thread and a lefthand thread, so that they can be adjusted in synchronism and in opposite directions.

5,189,968

DIGITAL CONTROLLER WITH A.C. INDUCTION DRIVE FOR SEWING MACHINES

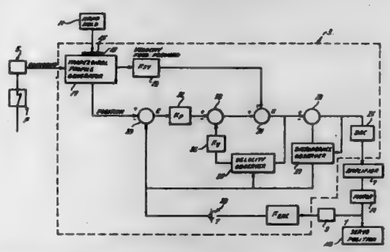
Terry I. Eichenseer, Webster Groves, Mo., assignor to Brown Group, Inc., St. Louis, Mo.

Filed Sep. 17, 1990, Ser. No. 583,150

Int. Cl.[5] D05B *19/00*

U.S. Cl. 112—121.11 **8 Claims**

8. In a motor driven sewing machine the improvement of a programmable closed-loop feed back controller having means to effect changes in sewing speed commands by a velocity observer comprising a sewing machine shaft and a shaft position encoder for determining sewing needle position, a velocity observer, a shaft speed encoder operatively connected to said sewing machine shaft for continuously monitoring said sewing machine shaft positions, an AC drive motor responsive to said



speed encoder and programmable closed-loop feedback controller to maintain a linear rate of speed change whereby a deceleration rate of said AC drive motor is dynamically lowered to increase needle position accuracy.

5,189,969

DEVICE FOR PROCESSING SHEET MATERIAL WITH COLORED PATTERN

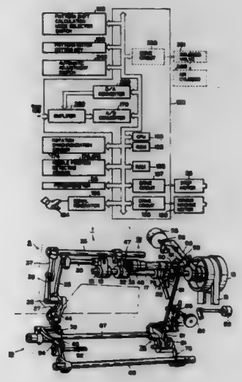
Hirosumi Ito, Nagoya; Etsuzo Nomura, Kasugai; Kohichi Akahane, Komaki, and Hirokazu Takeuchi, Chita, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 7, 1992, Ser. No. 832,397

Claims priority, application Japan, Feb. 12, 1991, 3-19053

Int. Cl.[5] D05B *19/00, 27/06, 27/08*

U.S. Cl. 112—121.11 **22 Claims**



15. A sewing machine for sewing two sheet materials having patterns, comprising;

detecting means for detecting color states of the patterns of the sheet materials and producing color state signals indicative of the color states;

adjusting means for adjusting said detecting means to allow said detecting means to produce a desired color state signal with respect to a reference color state, said adjusting means including detection control means for controlling said detecting means to detect the reference color state to produce a color state signal indicative of the detected reference color state, said adjusting means adjusting said detecting means, in response to the produced color state signal, to thereby allow said detecting means to produce the desired color state signal with respect to the reference color state; and

sewing means for feeding the sheet materials on the basis of the color state signals produced by said detecting means and joining the sheet materials.

5,189,970

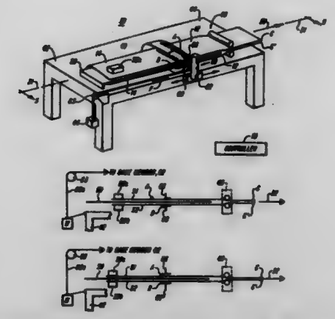
CROSS-SEAM ALIGNMENT APPARATUS

Edward A. VanDuyne, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 23, 1991, Ser. No. 763,925

Int. Cl.[5] D05B *35/04*

U.S. Cl. 112—121.26 **3 Claims**



1. Apparatus for aligning a lateral edge of a first stretchable composite limp material segment with a similar lateral edge of a second stretchable composite limp material segment, each of said first and second segments including two panels joined at a cross-seam extending transversely from corresponding points on said lateral edge, whereby said corresponding points are in substantially overlapping alignment, and for feeding said segments from said apparatus with said corresponding points overlappingly aligned in a feed direction extending from upstream points to downstream points along a feed axis, comprising:

A. a selectively operable feed assembly near said downstream points, said feed assembly including means for driving therefrom limp material segments adjacent thereto in said feed direction;

B. a ply separator including a planar rigid plate, said plate having its principal plane substantially parallel to said feed axis, said plate extending from points near said upstream points to points near said downstream points and upstream from said feed assembly;

C. selectively operative receiving means for initially receiving said first and second limp material segments adjacent to opposite sides of said plate whereby said lateral edges of said first and second segments are in nominal overlapping alignment and the ends of said lateral edges closest to said downstream points are in overlapping alignment and held adjacent to said feed assembly; and

D. a selectively operable cross-seam aligner including:

i. a body member adjacent to said plate and associated means for enabling motion of said body member with respect to said plate in said feed direction;

ii. bias means for applying a bias force F to said body member, said force F being directed opposite to said feed direction;

iii. a first elongated finger element extending from said body member and being selectively positionable to extend transverse to said feed axis and opposite from a first side of said plate of said ply separator and means for selectively separating said first finger element from said ply separator by a gap G, where G is greater than the thickness of each of said panels of said first composite limp material segment and is less than the thickness of said cross-seam thereof; and

iv. a second elongated finger element extending from said body member and being selectively positionable to extend substantially parallel to said first finger element and transverse to said feed axis and opposite a second side of said plate of said ply separator and means for selectively separating said second finger element from said ply separator by a gap G', where G' is greater than the thickness of each of said panels of said second composite limp material segment and is less than the thickness of said cross-seam thereof.

5,189,971

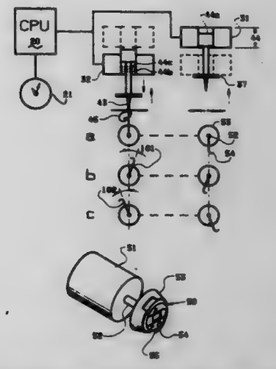
ELECTRONIC SEWING MACHINE

Samuel R. Frankel, 211 Maple St., Shillington, Pa. 19607, and Meghanad D. Wagh, 3131 Clifton Ave., Bethlehem, Pa. 18017

Filed Oct. 29, 1990, Ser. No. 605,030

Int. Cl.[5] D05B *69/10*

U.S. Cl. 112—220 **35 Claims**



1. An electronic sewing machine with a base, a bobbin assembly mounted under the base, a cantilevered frame mounted on the base within the frame, a needle bar assembly comprising a needle bar with a top portion and a lower holder portion in which is held a needle for sewing, a presser foot mounted on the frame adjacent to the needle, an external supply of thread under tension, a treadle and a first central processing unit for operating the machine comprising:

(a) means for storing in the first CPU a multiplicity of sets of operating instructions to operate the machine;

(b) a first and a second solenoid each with an air core and cooperatively and axially mounted vertically within the frame such that the cores form a vertical, linear passage of a defined within length with an up terminus and a down terminus and containing within the passage an iron alloy reciprocator bar attached to the head portion of the needle bar which reciprocates up and down along the defined length of the passage by magnetic action of the solenoids responsive to a first set of instructions from the first CPU so as to make one stitch for each reciprocation up and down;

(c) a stepper motor with a shaft mounted under the base adjacent to the bobbin assembly, the motor being enabled to rotate the shaft a first step which is a defined angle of rotation less than 1 revolution to a first reference position by means of a second set of instructions from the first CPU;

(d) the bobbin assembly being attached to the stepper motor shaft for rotation, said assembly having a bobbin case, a spool of thread contained within the case and, disposed outwardly from the case, a hook such that from the first

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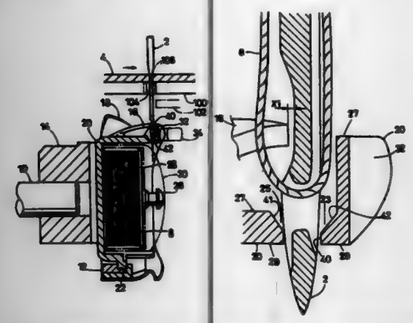
reference position the bobbin assembly will cooperatively form a stitch of a defined tightness with a loop formed by the needle when the bobbin case makes one revolution.

5,189,972

HORIZONTAL AXIS FULL ROTARY HOOK WITH A BOBBIN CASE HOLDER HAVING A NEEDLE GUIDING MEANS

Hiroyuki Mitsui, Kasugai; Satoshi Morii, Nagoya; Toshiaki Iwasaki, Nagoya, and Minoru Yamaguchi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 27, 1992, Ser. No. 858,646
Claims priority, application Japan, Mar. 31, 1991, 3-92755
Int. Cl.[5] D05B *55/06, 57/14*
U.S. Cl. 112—227 7 Claims



1. A horizontal axis full rotary hook for a sewing machine, comprising:

a generally cylindrical hook base having a point of hook, an inner circumferential surface, and a guide groove formed in said inner circumferential surface; and

a generally cylindrical bobbin-case holder having an inner circumferential surface, an outer circumferential surface, and a part-circumferential rail provided on said outer circumferential surface, said bobbin-case holder being supported by said hook base such that the bobbin-case holder is freely rotatable relative to the hook base while said rail is guided in said guide groove,

said bobbin-case holder having a needle aperture which allows a sewing needle with an upper thread to be moved down to a bottom position thereof, said needle aperture having a first inclined inner surface which is opposite to said point of hook with respect to said needle at said bottom position, a distance between said needle at said bottom position and said first inclined inner surface as measured in a direction parallel to a rotation axis of said bobbin-case holder being decreased in a direction from said outer circumferential surface of the bobbin-case holder toward said inner circumferential surface of the bobbin-case holder.

5,189,973

LOOPER WHICH ROTATES IN A HORIZONTAL PLANE FOR A DOUBLE LOCK-STITCH SEWING MACHINE

Thomas Krumme; Robert Strohl, and Dieter Wachter, all of Bielefeld, Fed. Rep. of Germany, assignors to Dürkopp Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1991, Ser. No. 674,532
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1990, 4009203
Int. Cl.[5] D05B *57/14, 65/02*
U.S. Cl. 112—231 25 Claims

1. In combination, a sewing machine looper which rotates in a horizontal plane;

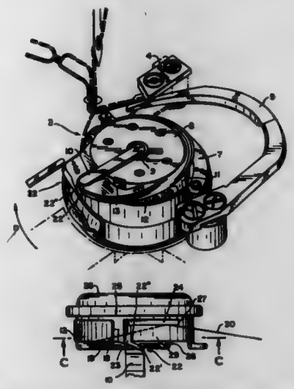
a unitary bobbin case which is secured against rotation with respect to said looper and has means for receiving a bobbin with thread thereon, said bobbin case having a top surface; and

a thread-cutting device including a thread-catcher;

said bobbin case having an upstanding generally cylindrical wall with at least first, second and third apertures therein, numbered according to the direction of rotation of said looper, said apertures being open at the top surface of the bobbin case and providing a thread path from inside to outside said bobbin case, wherein a thread from said bobbin may exit through said first aperture, reenter through said second aperture, and then exit through said third aperture;

said first and second apertures being defined by an upstanding finger which forms part of said wall;

a leaf spring being provided on said wall for bearing on said finger and thereby tensioning such thread as it passes from



said first aperture to said second aperture along the radially outside surface of said wall; and

guide means on said wall for guiding the thread, which extends from said bobbin case through said first aperture, into said second and third apertures to complete the threading of said bobbin case, and out of the third aperture and into position for being caught by said thread catcher and cut by said cutting device;

wherein said third aperture includes a generally vertical slot and a generally horizontal slot extending circumferentially of said wall in said looper rotation direction, which permits the thread to be pulled in said rotation direction by a needle-thread loop carried by said looper, to a downstream end of said slot, and thereby into position for being caught by said thread catcher and cut by said cutting device substantially simultaneously with said needle-thread.

5,189,974

KAYAK CATAMARAN

William E. Masters, 100 Bentcreek Ct., Easley, S.C. 29642

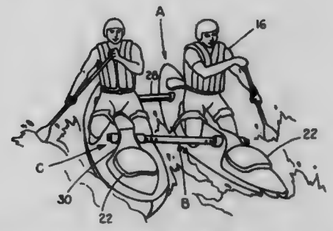
Filed Jul. 2, 1991, Ser. No. 724,741
Int. Cl.[5] B63B *1/14*
U.S. Cl. 114—61 31 Claims

1. A kayak catamaran comprising:

a plurality of laterally spaced longitudinally extending hulls;

cockpit means carried by each of said hulls for accommodating at least one boater on each of said hulls from which said catamaran is paddled;

a plurality of rigid elongated connector means spaced from one another along the length of said hulls extending laterally between said hulls, and said elongated connector means having opposing free ends connected to said hulls; and



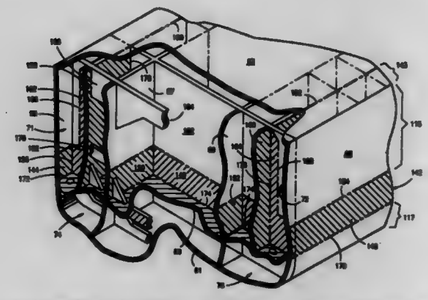
flexible coupling means for coupling said ends of said elongated connector means to said hulls so that said hulls and elongated connector means move relative to each other generally in three-degrees of freedom.

5,189,975

METHOD FOR RECONFIGURATION TANKERS

Jay J. Zednik, Oakton, Va., and Paul C. Dahan, Pittstown, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 1, 1992, Ser. No. 877,501
Int. Cl.[5] B23K *31/00*
U.S. Cl. 114—74 A 14 Claims



1. A method of reconstructing a tanker having a bow section, a stern section, and a midship cargo section, said midship cargo section including hull bottom plating, deck plating, port and starboard outer plating, continuous port and starboard longitudinal bulkheads, and a plurality of continuous transverse bulkheads, whereby a plurality of center cargo tanks are formed between said port and starboard longitudinal bulkheads, said transverse bulkheads, and said bottom and deck plating, a plurality of port wing cargo tanks are formed between said port outer plating, said port longitudinal bulkhead, said transverse bulkheads, and said bottom and deck plating, and a plurality of starboard wing cargo tanks are formed between said starboard outer plating, said starboard longitudinal bulkhead, said transverse bulkhead, and said bottom deck plating, said method comprising the steps of:

(1) separating a lower portion of the midship cargo section from an upper portion thereof by:

(a) cutting said port and starboard outer plating apart along horizontal cutting lines extending the length of said midship cargo section;

(b) cutting said continuous port and starboard longitudinal bulkheads apart along horizontal cutting lines extending the length of said midship cargo section; and

(c) cutting each of said continuous transverse bulkheads apart along horizontal cutting lines extending transversely across said midship cargo section;

(2) cutting said bow and stern sections free from said upper portion of the midship cargo section, and elevating said upper portion of said midship cargo section with respect to said lower portion thereof;

(3) inserting a spacer member between said separated upper and lower portions of said midship cargo section, said spacer member including new insert sections of said port and starboard outer hull plating, of said port and starboard longitudinal bulkheads, and of said transverse bulkheads, said spacer member further including a new horizontal mid-deck;

(4) welding said separated lower portion of the midship cargo section to a lower longitudinal edge of said spacer member, and said separated upper portion of the midship cargo section to an upper longitudinal edge of said spacer member; and

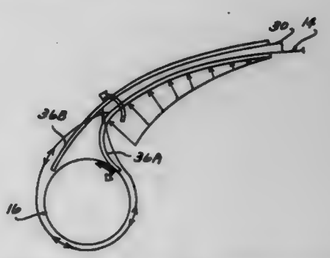
(5) welding said upper portion of said midship cargo section to said bow and stern.

5,189,976

SAIL SHAPING ARRANGEMENT FOR SAILBOARDS

Steven M. Cochran, 2350 N. Woodward Ave., No. 5, Bloomfield, Mich. 48013, and Mark J. Murphy, 1228 Oakwood Ct., Rochester, Mich. 48063

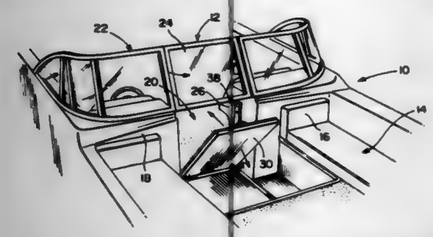
Filed Feb. 19, 1991, Ser. No. 656,732
Int. Cl.[5] A63H *9/08*
U.S. Cl. 114—102 10 Claims



1. A sail shaping arrangement for a sailing craft of the type including a hull, a mast mounted to said hull, a sail of flexible sheet material mounted to said mast by means of a mast sleeve extending along the luff of said sail and a plurality of battens mounted to said sail to extend from the leech to the luff of said sail, said sail shaping arrangement comprising:

a pair of separate, flexible fingers which are normally straight and means mounting said fingers to said sail opposite each other and aligned with one of said battens, each of said fingers having one end extending past the forward tip of said batten to be coextensive with opposite sections of said mast sleeve so as to straddle said mast, the length of each of said fingers being sufficient so as to cause said one end of a respective inside one of said pair of flexible fingers to bend to form a knee therein upon shifting of said mast sleeve to a fully filled out condition on a respective side of said mast, said bent finger one end angled by said knee so that one side of said one end pushes directly against said mast so as to be restrained thereby from moving past said mast, said flexible fingers terminating before the midpoint of the mast said respective bent finger latches said mast sleeve in said either respective shifted position corresponding to said respective filled out condition of said sail, with said bent finger assuming a relatively stable locked condition pushed against said mast in either shifted position.

5,189,977
TILT-UP CURTAIN FOR SMALL BOATS
Samuel L. Davidson, Monroe, La., assignor to Mastercrafters Corporation, Winnsboro, La.
Filed Feb. 21, 1992, Ser. No. 838,863
Int. Cl.[5] B63B *19/12*
U.S. Cl. 114—201 R 6 Claims

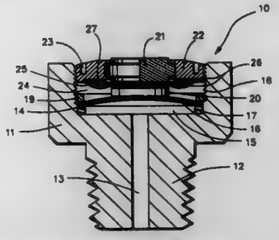


1. A boat having a cockpit, a forward compartment separated from the cockpit by port and starboard consoles with a communication space therebetween, and a panel for closing off the cockpit from the forward compartment, said panel being transversely hinged to a floor of the boat, the panel having a lowered inoperative position extending along the floor of the boat and an elevated operative position engaging against the respective consoles or against stops connected to the respective consoles to at least partially close off said space, wherein the boat includes a windshield with outer sections on the respective consoles and a hinged central section having a bottom edge which engages an upper edge of the panel to secure the panel in the operative position.

5,189,978
OPERATING AT SEA ISLAND STATION
Keith R. McAllister, Davidsonville, Md., assignor to The United States of America as represented by the Secretary of The Navy, Washington, D.C.
Filed Nov. 1, 1991, Ser. No. 788,625
Int. Cl.[5] B63B *35/44*
U.S. Cl. 114—258 7 Claims

1. An Operating At Sea Island Station (OASIS) for deployment in an area of water a preselected distance from a body of land, comprising:
- a plurality of discrete, self-sufficient operating units positioned in spaced apart relationship within said area of water, each unit being operable to perform a specialized function and being operable in combination with other units to perform an overall task;
- means for maintaining said plurality of operating units in spaced apart relationship within said area of water so that any activity taking place relative to one of said operating units may progress without interference from any of the remaining operating units;
- means for connecting a selected operating unit with other selected operating units to permit the specialized function performed by said selected operating unit to be shared with said other selected operating units;
- wherein said plurality of operating units include;
- an administration unit formed from a semi-submersible drilling rig and configured for office and quarters spaces;
- an air field made from modular components and having a length sufficient to receive designated aircraft;
- a supply center for on and off-loading supplies to be used by said plurality of operating units;
- a fuel storage facility for providing bulk fuel and refueling capability to shipping and aircraft utilizing said Operating At Sea Island Station;
- an ammunition center for handling ammunition and hazardous cargo utilized by shipping and aircraft utilizing said Operating At Sea Island Station;
- a heliport/aircraft repair unit formed from a semi-submersible platform and operable to perform emergency aircraft repair and maintenance;
- a ship repair unit for performing emergency repairs to ships utilizing said Operating At Sea Island Station;
- self-defense units positioned within said area of water to encircle the remainder of said plurality of operating units and operable to provide air and sea defense and;
- said fuel storage facility is connected with said supply center, said airfield and said ammunition center via flexible hosing to permit fuel stored in said storage facility to be transferred to said supply center, airfield and ammunition center.

5,189,979
FLUID PRESSURE INDICATOR
Charles H. Popenoe, 6307 Wiscasset Rd., Bethesda, Md. 20816-2111
Filed Apr. 1, 1992, Ser. No. 861,539
Int. Cl.[5] G01F *7/08, 19/14*
U.S. Cl. 116—273 3 Claims

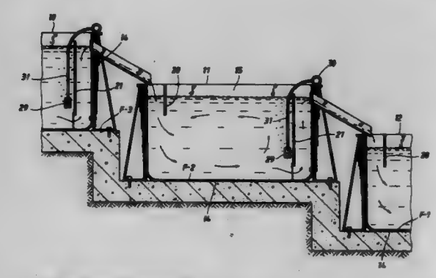


1. A fluid pressure indicator comprising:
- a main body having an internal hollow portion communicating with fluid pressure from a fluid pressure source;
- a flexible diaphragm separating said hollow portion into two chambers, wherein one side of the diaphragm is subjected to said fluid pressure and the other side to a reference pressure;
- a light reflecting indicator portion on said diaphragm;
- a light transmitting window;
- means for mounting said window in axial relationship with said indicator portion;
- a displacement indicator comprising a sealed light-transmitting flexible envelope containing light absorbing fluid, said indicator being interposed between said window and said indicator portion; and
- whereby a change in fluid pressure on said diaphragm causes a flexing of the said diaphragm and a change in thickness in said displacement indicator thereby altering the amount of light reflected from said indicator portion through said light-absorbing fluid and said window.

5,189,980
ROUNDED TOP HEADER EXTRUSION FOR BOAT WINDSHIELDS
Albert W. Zirkelbach; Alan P. Zirkelbach, and Donald A. Zirkelbach, all of Sarasota, Fla., assignors to Aldon Industries Inc., Bradenton, Fla.
Division of Ser. No. 409,655, Sep. 19, 1989, Pat. No. 4,993,351.
This application Jan. 10, 1991, Ser. No. 639,347
The portion of the term of this patent subsequent to Feb. 16, 2008, has been disclaimed.
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—361 8 Claims

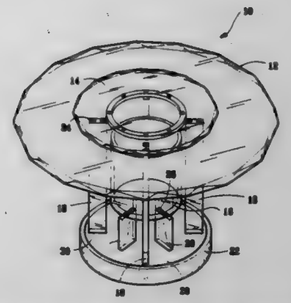
1. A unitary member for rigidly engaging a boat windshield having an extremity, providing a curved upper surface and providing means for supporting a boat canopy, the member comprising an elongated extrusion having a generally uniform cross-section along its length, the extrusion being defined in cross-section by:
- first and second generally parallel arms having a windshield-engaging channel between them for receiving the boat windshield and the extremity, each arm having means along the channel for gripping the windshield;
- a generally semi-circular rail portion extending across the channel between the arms; and
- means for permitting engagement of a boat canopy to the extrusion comprising:
  - (a) a lateral channel extending inward into the extrusion and being formed by the first arm; and
  - (b) a fastener extending generally from said windshield-engaging channel and terminating adjacent the lateral channel, said fastener being adapted to mate with the canopy.

5,189,981
FISH FARM
Herbert J. Ewald, Jr., 615 Avenue A, Karnes City, Tex. 78118
Filed Aug. 16, 1991, Ser. No. 746,786
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—3 1 Claim



1. A fish farm comprising:
- first and second laterally extending, open tanks arranged in side by side relation;
- a first vertical wall extending laterally across each tank near its upstream side and with the lower edge of the wall a substantial distance above the bottom of the tank;
- a second vertical wall extending laterally across each tank near its downstream side and with the lower edge of the wall close to the bottom of the tank;
- means for supplying water to the first tank on the upstream side of the first wall therein;
- means for transferring water from the first tank to the second tank including:
- an outlet opening in the downstream side of the first tank; and
- a spillway extending from the first to the second tank to permit water to flow by gravity from the outlet opening into the second tank on the upstream side of the first wall of the second tank; and
- means for transferring water from the second tank including an outlet opening in the downstream side thereof,
- the lower edges of the outlet opening in each tank being intermediate the upper and lower edges of the first and second walls thereof so that water must pass beneath the lower edges of the first walls of each tank in order to induce flow along the bottom thereof, as it enters the tank, as well as beneath the lower edges of the second walls of each tank so as to deter fish from leaving the tank with the water; and
- means for injecting air into the water of each tank near the upstream side of the second wall thereof.

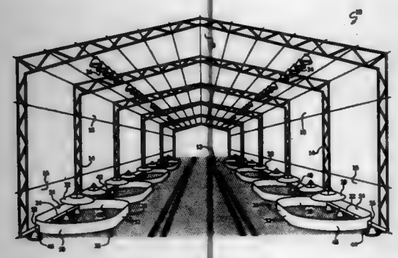
5,189,982
TABLE WITH DECORATIVE AQUARIUM AND LIGHT REFRACTIVE EFFECT
Chin S. Liu, No. 8, Lane 244, Swc. 5, Yen-Ping N. Rd., Taipei, Taiwan
Filed May 18, 1992, Ser. No. 884,764
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 2 Claims



1. A table with decorative aquarium and light refraction effect comprising:
- a top made of transparent material;
- a plurality of equidistant transparent legs arranged annularly to support the top;
- a transparent decorative aquarium below the top, located within a cylindrical zone formed by the said transparent legs;
- a plurality of equidistant transparent supports arranged annularly to support the aquarium; and
- a nontransparent base to support the said legs and supports, having a top cover and a bottom board arranged to provide a space between them, a plurality of slots at the top cover for insertion of the respective legs and supports, a hollow supporter beneath each slot to fit a leg or support, and a lighting fixture installed at the bottom of each hollow supporter whereby light from each light fixture is projected through the hollow supporter to a leg or sup-

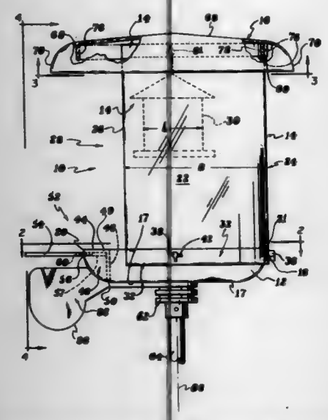
port, where the light is refracted and then projected to the top and the aquarium.

5,189,983
POULTRY HOUSE CONFINEMENT RING SYSTEM AND METHOD
David Aitchison, HCR 63, Box 263, Ozark, Ark. 72949
Filed Apr. 30, 1992, Ser. No. 876,571
Int. Cl.[5] A01K *31/18*
U.S. Cl. 119—31 27 Claims



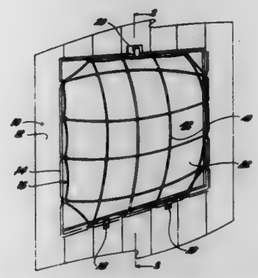
1. A brooder confinement system for use in a poultry house having a plurality of feeders, brood heaters, and waterers comprising:
at least one reusable confinement ring each positioned to surround at least one brood heater, at least one feeder, and at least one waterer, and to rest on the poultry house floor so as to form a brooding shelter for raising young poultry.

5,189,984
BIRD FEEDER ENCLOSURE
Robert F. Smith, 1913 Brockway, Saginaw, Mich. 48602
Filed Jan. 16, 1992, Ser. No. 821,626
Int. Cl.[5] A01K *39/01*
U.S. Cl. 119—52.2 15 Claims



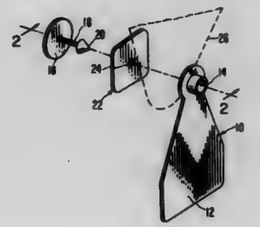
1. A bird feeder enclosure for detachably mounting a bird feeder on which birds can perch and feed, said bird feeder having a predetermined breadth, said enclosure including
an upstanding shroud including a back wall and side walls spaced apart a breadth greater than said predetermined breadth; said side walls having
rear edge portions joined to said back wall and
front wall portions spaced apart a distance greater than said predetermined breadth and defining a front opening through which said bird feeder can pass;
means for detachably mounting said feeder on said enclosure to allow said bird feeder to be moved from a position within said enclosure through said opening to a remote position without said enclosure;
upwardly opening tray means detachably mounted on the lower end of said shroud for collecting any bird feed which might spill from said bird feeder;
a roof member detachably mounted on the upper end of said shroud;
means for mounting one of said tray means and said roof member for rotation about a vertical axis; and
a weather vane mounted on said enclosure and operable in response to wind for rotating the enclosure about said axis to a position in which said front opening is away from the force of the wind to protect the bird feeder from the wind elements while providing access to the bird feeder enclosed therein.

5,189,985
EXPANDABLE HAY FEEDER
James L. Brady, Rte. 1 Box 132, Coward, S.C. 29530, and Carl T. Stokes, Rte. 4 Box 189, Darlington, S.C. 29532
Filed Mar. 19, 1992, Ser. No. 853,903
Int. Cl.[5] A01K *1/10*
U.S. Cl. 119—60 15 Claims



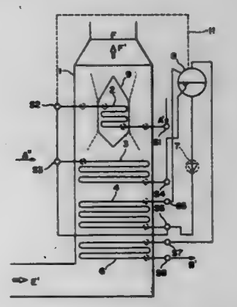
1. A device for use in feeding hay to an animal and for use with a wall with a hole therethrough, said wall having a first side and an opposing second side, said device comprising:
a surface;
a frame in spaced relation to said surface, said frame having a first side and a second side;
means for holding said frame in spaced relation to said surface, said holding means further comprising a latch to hold said first side of said frame to said first side of said wall and a means for attaching said surface to said second side of said wall so that said surface and said frame have said hole therebetween, said latch having a latched position and an unlatched position, and at least one hinge holding said second side of said frame to said first side of said wall; and
a grid attached to said frame, said grid formed of a resilient and stretchable material, said grid having an unstretched shape but stretching when said hay is placed between said surface and said grid, said grid holding said hay against said surface and returning to said unstretched shape as said hay is removed..

5,189,986
VETERINARY TRANSDERMAL ACTIVE AGENT DELIVERY DEVICE
Terry L. Burkoth, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.
Filed Sep. 23, 1991, Ser. No. 764,436
Int. Cl.[5] A01K *13/00*
U.S. Cl. 119—156 7 Claims



1. An active agent dispensing system attachable to the ear of an animal for the transdermal delivery of an active agent to the animal, the dispensing system comprising:
(a) an ear tag component comprising:
(i) a front plate,
(ii) a rear plate, and
(iii) a pin or rivet adapted to interconnect the front and rear plates upon penetrating the animal's ear; and
(b) a transdermal device component located between the front plate and the ear or between the rear plate and the ear comprising:
(i) a backing layer,
(ii) a matrix comprising the active agent to be delivered, and
(iii) an opening extending through the transdermal device for receiving the rivet of the ear tag component;
wherein, the transdermal device component is held in active agent-transmitting relation with the skin of the ear of the animal by the ear tag component.

5,189,988
PROCESS FOR STARTING UP A HEAT EXCHANGER SYSTEM FOR STEAM GENERATION AND HEAT EXCHANGER SYSTEM FOR STEAM GENERATION
Kurt Budin, and Georg Gasteiger, both of Vienna, Austria, assignors to SGP-VA Energie- und Umwelttechnik Gesellschaft m.b.H., Vienna, Austria
Filed Aug. 13, 1991, Ser. No. 744,929
Claims priority, application Austria, Aug. 27, 1990, 1755/90
Int. Cl.[5] F22D *5/26*
U.S. Cl. 122—6 A 26 Claims



1. A process for the starting up of a steam generator heat exchanger system which system includes a start-up heat exchanger and a second heat exchanger positioned, with respect to feed medium flow, in line and downstream from said start-up heat exchanger, and said start-up heat exchanger and said second heat exchanger being positioned for contact with hot gas passing in a hot gas line, comprising:
inputting feed medium at temperature T_1 to said start-up heat exchanger;
heating said start-up heat exchanger and feed medium contained therein by subjecting said start-up heat exchanger to a hot gas at a temperature greater than T_1 such that feed medium exiting said start-up heat exchanger is at temperature T_2 which is higher than T_1;
inputting the feed medium exiting said start-up heat exchanger at temperature T_2 to said second heat-exchanger; and
varying the temperature of the feed medium exiting said start-up heat exchanger and being inputted to said second heat exchanger such that the temperature of the feed medium is lowered gradually from temperature T_2 to an operating temperature T_3 so as to avoid thermal shock in said heat exchanger system.

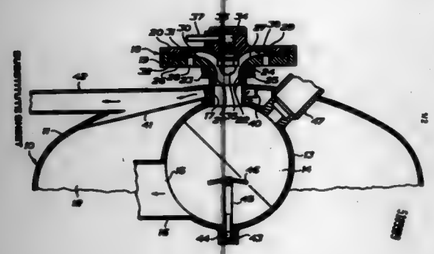
5,189,987
ODOR CONTROLLING ANIMAL LITTER WITH PINE OIL
Anna G. Stanislowski, Walnut Creek, and J. Bruce England, Pleasanton, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Continuation of Ser. No. 570,986, Aug. 22, 1990, Pat. No. 5,016,568, which is a continuation of Ser. No. 370,472, Jun. 23, 1989, abandoned. This application May 20, 1991, Ser. No. 703,227
Int. Cl.[5] A01K *1/015;* A61K *7/04*
U.S. Cl. 119—171 4 Claims

1. A liquid composition for deodorizing animal wastes by contract therewith, said composition comprising:
an aqueous dispersion which comprises an ammonia-controlling-effective amount of pine oil and a dispersion aid therefor, said dispersion aid being selected from the group consisting of anionic, nonionic, cationic, amphoteric surfactants, and mixtures thereof.

5,189,989
PULSATORY BURNER
Jan Nilsson, Falkenberg, and Stefan Lundberg, Hammenhög, both of Sweden, assignors to Pulsonex AB, Halmstad, Sweden
PCT No. PCT/SE90/00541, § 371 Date Jan. 17, 1992, § 102(e) Date Jan. 17, 1992, PCT Pub. No. WO91/02924, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 21, 1990, Ser. No. 809,523
Claims priority, application Sweden, Aug. 24, 1989, 8902811
Int. Cl.[5] F22B *31/00*
U.S. Cl. 122—24 5 Claims

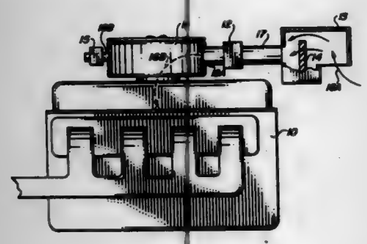
1. Boiler containing a pulsatory burner which is mounted in the water space (12) of the boiler, comprising a combustion chamber (14) with a neck (17) provided as an air inlet, a non-return valve (18) controlling the air flow through the air inlet to the combustion chamber, said non-return valve having a seat (26) concentric with the air inlet, at least one air inlet opening (28), a plane, relatively thin circular valve ring (29) which is elastically flexible and, in the closed position of the valve,

engages the seat and keeps the air inlet opening closed but can be operated to an open position by depression in the combus-



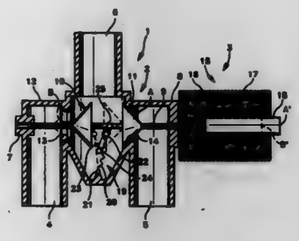
tion chamber, and an outlet (40, 41) for hot water from the water space (12) said outlet being provided around the neck (17) for the cooling thereof.

5,189,990
COMBUSTION APPARATUS
Robert Powell, P.O. Box 894, Patagonia, Ariz. 85624
Continuation-in-part of Ser. No. 614,858, Nov. 16, 1990, Pat. No. 5,065,704. This application Nov. 6, 1991, Ser. No. 788,492
Int. Cl.[5] F02M *25/04*
U.S. Cl. 123—25 J **20 Claims**



1. An engine assembly comprising:
a) an internal combustion engine in which fuel is burned in air;
b) an air filter having a primary port for directing a supply of air to said internal combustion engine; and,
c) an adjustable humidifier having,
1) a housing having a portion thereof compsoed of oxygen-attractive metal,
2) an evaporative pad located in said housing, a portion of the surface of said evaporative pad located in an air stream to said air filter,
3) adjustment means for selectively increasing or decreasing the surface area of said evaporative pad exposed to said air stream,
4) a reservoir for storage of liquid water and chlorine, and,
5) a water pump for recirculating said liquid water and chlorine from said reservoir over said evaporative pad.

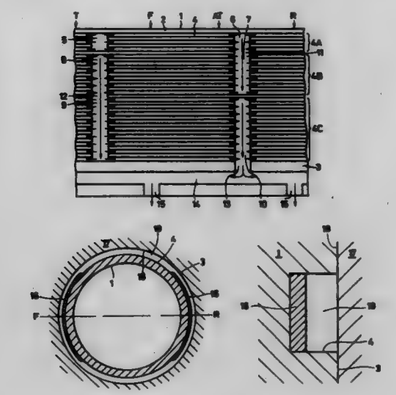
5,189,991
SOLENOID DISTRIBUTING VALVE FOR VOLUME FLOW CONTROL
Michael Hunsberg, Göppingen, Fed. Rep. of Germany, assignor to J. Ebers Plicher, Esslingen, Fed. Rep. of Germany
Filed Dec. 12, 1991, Ser. No. 806,736
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1990, 4042084
Int. Cl.[5] F16K *31/06, 11/044;* F01P *7/14*
U.S. Cl. 123—41.1 **12 Claims**



1. An electric switching solenoid valve, comprising:
a valve piston guided in a valve housing; a magnet armature connected to said piston and an electric coil for moving said valve piston from one switching position to another switching position by means of said magnet armature, said coil including coil areas which are assigned switching positions of the solenoid valve and being selectively acted on by current only during a switching operation; and holding means arranged in said valve housing for mechanically holding said valve piston in one of said switching positions, said holding means being formed by a mechanical holding device including a spring element connected between said valve housing and said valve piston, said spring being coupled at coupling points selected such that as the valve piston proceeds from one switching position to another switching position, said spring element is moved from one stable position, located at one switching position over an unstable central position, to another stable position located at another switching position, said spring element comprising two leaf springs, each of said leaf springs having a common coupling point at said valve housing and having a common coupling point at said valve piston, said leaf springs being compressed and extending outwardly in opposite directions.

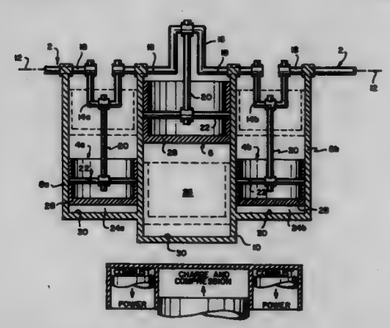
5,189,992
CYLINDER LINER
Fujio Hama, and Kenichi Harashina, both of Okaya, Japan, assignors to Teikoku Piston Ring Co., Ltd., Tokyo, Japan
Filed Jun. 5, 1992, Ser. No. 894,474
Claims priority, application Japan, Jun. 6, 1991, 3-51056
Int. Cl.[5] F02F *1/10*
U.S. Cl. 123—41.84 **10 Claims**

1. A cylinder liner fitted in a cylinder bore of a cylinder block of a multiple-cylinder engine and having an outer circumferential surface having a plurality of annular grooves and a plurality of longitudinal grooves connected thereto, wherein a part in an axial direction of a crankshaft of a bottom of at least one of said annular grooves is coated with a sprayed coating of metal, a sectional area of said annular groove



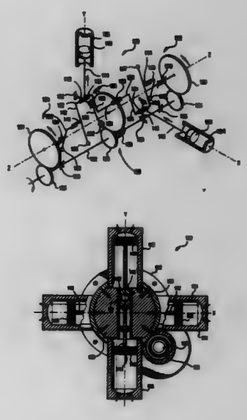
provided with the sprayed coating varies in a circumferential direction, and
a cooling liquid is flowed in said grooves.

5,189,993
IN-LINE THREE CYLINDER COMBUSTION ENGINE
Wallace Schneider, 41 W. 72nd St., New York, N.Y. 10023
Filed Jun. 25, 1991, Ser. No. 720,950
Int. Cl.[5] F02B *75/06*
U.S. Cl. 123—53 A **16 Claims**



1. An internal combustion engine of the in-line type, comprising:
a set of cylinders in which is contained a full-sized chamber and a pair of half-sized chambers so that said full-sized chamber is aligned between said pair of half-sized chambers, each of said half-sized chambers having a volumetric displacement which is substantially one-half that of said full-size chamber;
two outer pistons movable in corresponding ones of said cylinders for defining said half-sized chambers;
a central piston movable in another of said cylinders for defining said full-sized chamber; and
a rotatable crankshaft to which is connected each of said pistons so that said outer pistons move together in unison in a direction which is opposite to that which said central piston moves at the same time, all of said pistons and cylinders extending from the same side of said crankshaft, whereby inertial forces and vibrations induced from simultaneous power strokes by said outer pistons are lessened by inertial forces and vibrations induced by said central piston moving opposite that of said outer pistons in response to the simultaneous power strokes and whereby inertial forces and vibrations induced from a power stroke by said central piston are lessened by inertial forces and vibrations induced by said outer pistons moving opposite that of said central piston simultaneously in response thereto.

5,189,994
INTERNAL COMBUSTION ENGINE
Ilya Gindentaller, 407 Avenue G, Apt. 32, Redondo Beach, Calif.
Filed Aug. 20, 1991, Ser. No. 747,615
Int. Cl.[5] F02B *75/22*
U.S. Cl. 123—55 R **18 Claims**



1. In an engine or like apparatus, the combination comprising:
at least one cylinder disposed along a first axis;
a piston reciprocable in the at least one cylinder;
a first linear guideway in alignment with the at least one cylinder;
a first guide in the first guideway, the first guide being coupled to the piston for reciprocation therewith;
a second linear guideway disposed along a second axis, the second axis being orthogonal to the first axis and offset therefrom along a third axis mutually orthogonal to the first and second axes;
a second guide reciprocable in the second guideway;
an orbital crankshaft including crank means having first and second crank pins journaled in the first and second guides, respectively; and
means rotatable about the third axis and coupled to the crankshaft at a point midway between the crank pins for providing output power from the engine.

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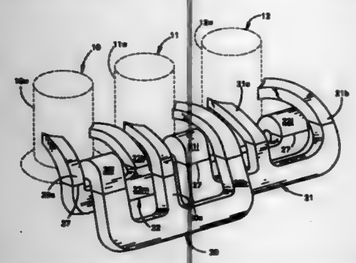
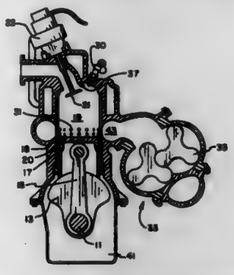
5,189,995
STEPPED PISTON ENGINE
Bernard Hooper, High Woodland, Littlegain, Hilton, Nr. Bridgnorth Shropshire, Great Britain WV15 5PA
PCT No. PCT/GB90/00410, § 371 Date Oct. 16, 1991, § 102(e) Date Oct. 16, 1991, PCT Pub. No. WO90/11436, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 19, 1990, Ser. No. 768,401
Claims priority, application United Kingdom, Mar. 18, 1990, 8906278
Int. Cl.[5] F02B *75/20*
U.S. Cl. 123—59 BS 20 Claims



1. A stepped piston engine comprising first, second and third stepped cylinders, each cylinder being stepped and having a larger diameter pumping part, and a smaller diameter working part, and a piston slidable in the cylinder, means coupling each piston to an output shaft of the engine, first transfer passage means to transfer pre-compressed charge from the larger diameter pumping part of the first cylinder to the smaller diameter working part of the second cylinder, second transfer passage means to transfer pre-compressed charge from the larger diameter pumping part of the second cylinder to the smaller diameter working part of the third cylinder, and third transfer passage means to transfer pre-compressed charge from the larger diameter pumping part of the third cylinder to the smaller diameter working part of the first cylinder, the first, second and third transfer passage means each having volumes within a variation of 25% of each other, wherein each of said transfer passage means comprises an inlet passage part, a main passage part, and at least two branches extending from the main passage part, the combined lengths of the main passage part, the branches and the inlet passage part for each of the transfer passage means being generally equal.

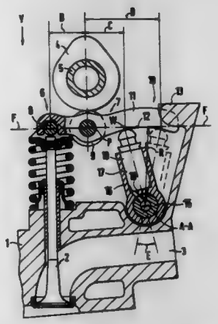
5,189,996
TWO-STROKE-CYCLE ENGINE WITH VARIABLE VALVE TIMING
William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to North American Philips Corporation, New York, N.Y.
Division of Ser. No. 435,232, Nov. 9, 1989, Pat. No. 5,083,533. This application Oct. 3, 1991, Ser. No. 774,005
Int. Cl.[5] F02B *25/04*
U.S. Cl. 123—65 VC 3 Claims

1. A spark-ignited tow-stroke-cycle internal combustion engine having an exhaust poppet valve for each cylinder of the engine and including means operable on a first command to open an exhaust poppet valve and operable on a second command to close an exhaust poppet valve, means for selectively determining the time of occurrence of the first and second commands in accordance with a desired engine output characteristic, intake port means in each cylinder sidewall selectively opened and closed by piston motion, a source of reassured combustion air coupled to the intake port means for supplying air to the cylinder while the piston is in position to open the



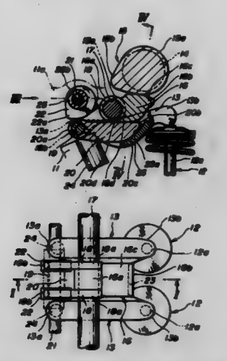
intake port means, and a fuel injector for introducing fuel into the cylinder.

5,189,997
INTERNAL-COMBUSTION ENGINE COMPRISING A ROCKER LEVER VALVE GEAR
Klaus Schneider, Tiefenbroan-Mühlhausen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Jul. 2, 1992, Ser. No. 906,874
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1991, 4122142
Int. Cl.[5] F01L *1/34, 1/12, 1/24*
U.S. Cl. 123—90.16 8 Claims



1. An internal-combustion engine comprising:
at least one charge cycle valve;
a rocker lever valve gear in a cylinder head and which is actuated by a camshaft, a rocker lever of the rocker lever valve gear having an end that controls the at least one charge cycle valve, the rocker lever having a changeable abutment point and an arc shaped longitudinal part;
a pivotable control shaft;
abutment receiving devices coupled to the control shaft so as to be pivotable together with the control shaft, wherein the longitudinal part of the rocker lever is in contact with the abutment receiving devices at the abutment point, the abutment point of the rocker lever being changed by pivoting of the control shaft;
a transmitting member coupled to the camshaft and which applies the camshaft to a first point of the rocker lever which is between a bearing arm applied to the charge cycle vale and the longitudinal part; and
the bearing arm is rotatably disposed on a shaft disposed in parallel to the camshaft and arranged on an upper end of the charge cycle valve.

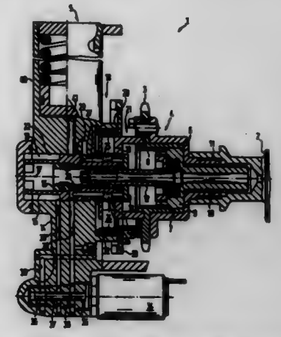
5,189,998
VALVE MECHANISM OF INTERNAL COMBUSTION ENGINE
Seinosuke Hara, Kanagawa Prefecture, Japan, assignor to Atsugi Unisia Corporation, Atsugi, Japan
Filed Jul. 20, 1992, Ser. No. 914,576
Claims priority, application Japan, Jul. 23, 1991, 3-182179
Int. Cl.[5] F01L *1/34, 1/18*
U.S. Cl. 123—90.16 11 Claims



1. A valve mechanism for an internal combustion engine having a plurality of intake or exhaust valves for each cylinder, comprising:
a cam shaft rotated in synchronization with operation of the engine;
a valve driving cam integrally mounted on said cam shaft to rotate therewith;
a swing structure positioned below said valve driving cam, said swing structure being pivotally supported on a fixed portion of the engine and having leading ends which are respectively put on stems of said valves;
a supporting shaft extending in parallel with said cam shaft;
a cam follower having one end pivotally connected to said supporting shaft and the other end slidably engaged with said valve driving cam;
a link structure pivotally connected to said supporting shaft and extending in a direction away from said cam follower, said link structure having a pivot shaft connected to the extending end thereof;
a lever member having one end pivotally connected to said pivot shaft and the other end movably interposed between said swing structure and said cam follower; and
a control means for pivoting said link structure about said supporting shaft in accordance with an operation condition of the engine.

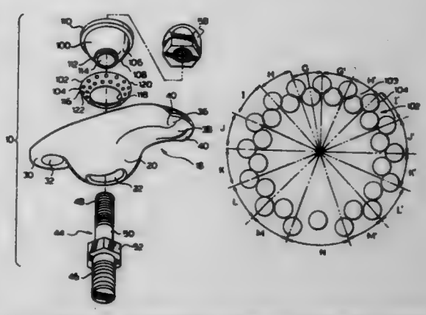
5,189,999
DEVICE FOR ADJUSTING THE RELATIVE ANGLE OF ROTATION OF A SHAFT TO A DRIVE WHEEL, ESPECIALLY THE CAMSHAFT OF AN INTERNAL COMBUSTION ENGINE
Josef Thoma, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
PCT No. PCT/EP90/01442, § 371 Date Mar. 6, 1992, § 102(e) Date Mar. 6, 1992, PCT Pub. No. WO91/03628, PCT Pub. Date Mar. 21, 1991
PCT Filed Aug. 30, 1990, Ser. No. 838,196
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929621
Int. Cl.[5] F01L *1/34;* F16D *3/10;* F16H *35/08;* F15B *15/17*
U.S. Cl. 123—90.17 18 Claims

1. A device for adjusting a relative angle of rotation of a shaft with respect to a drive wheel, particularly the camshaft of an internal combustion engine,
compriaing a hydraulic linear motor constituting an actuating arrangement which



acts upon an adjusting mechanism acting between the drive wheel and the shaft, wherein
a hydraulic pump with a pump rotor is operatively arranged coaxially with respect to one of a longitudinal and adjustment axis of the linear motor.

5,190,000
ROCKER ARM ASSEMBLY
Peter J. van Schaik, and Marko Valcic, both of Toronto, Canada, assignors to Van-Rob Stampings Inc., Scarborough, Canada
Filed Mar. 16, 1992, Ser. No. 851,837
Claims priority, application Canada, Mar. 5, 1992, 2062321
Int. Cl.[5] F01L *1/18*
U.S. Cl. 123—90.39 21 Claims



1. A rocker arm assembly for an internal combustion engine comprising:
an elongate rocker arm having a pushrod engaging portion proximate one end, a valve stem engaging portion proximate its other end, and a socket-forming recess inbetween the ends with an aperture therethrough;
first inwardly directed spherically disposed bearing surfaces in the recess about the aperture,
retaining stud means extending through the aperture,
part-ball-means retained on the stud means within the socket-forming recess and having second outwardly directed spherically disposed bearing surfaces in the recess about the stud means,
ring bearing means disposed about the stud means sand-

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wiched between the part-ball-means and the socket-forming recess,

the ring bearing means comprising a raceway having an outwardly directed side surface and an opposite inwardly directed side surface,

the raceway securing a plurality of ball bearings therein with ball bearings extending from at least one of the outwardly and inwardly directed side surfaces of the raceway into complementary engagement with at least one of the first and second bearing surfaces to guide the rocker arm in pivotal motion relative to the retaining stud means.

5,190,001

FUEL SUPPLY SYSTEM FOR AN ENGINE OPERATING AN ALCOHOL-CONTAINING FUEL

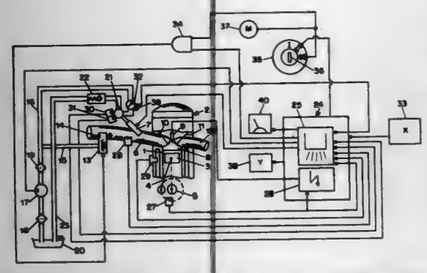
Steinke Dieter, Wolfsburg, and Uwe Kammann, Warberg, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Aug. 20, 1991, Ser. No. 747,681

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1990, 4026513

Int. Cl.[5] F02N *17/08*

U.S. Cl. 123—179.15 **14 Claims**



1. A fuel supply system for an internal combustion engine operating on alcohol-containing fuel comprising an engine start switch, a fuel pump, an air intake line, cold-start means for injecting auxiliary fuel into the air intake line, control means for controlling the actuation time of the cold-start means as a function of temperature when the engine temperature is below a predetermined lower temperature limit, fuel ignition means and fuel injection means for injecting fuel during normal engine operation actuated by the control means, wherein the cold-start means is switched on automatically upon actuation of the engine start switch, the control means controls the actuation time of the cold-start means additionally as a function of the alcohol content of the fuel supplied to the engine and the control means controls the engine operation when the cold-start means is actuated so that the fuel ignition means is actuated without the fuel injection means being actuated for a predetermined time period preceding actuation of the fuel injection means or the cold-start means.

5,190,002

ENGINE VALVE

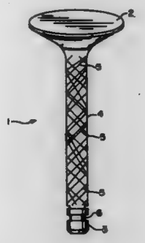
Frederick G. Wietig, West Falls, N.Y., assignor to Val-Kro, Inc., Tonawanda, N.Y.

Filed Aug. 31, 1992, Ser. No. 937,181

Int. Cl.[5] F01L *3/00*

U.S. Cl. 123—188.3 **17 Claims**

1. A metallic valve for use in internal combustion engines comprising on one terminal end a tip portion, on an opposite terminal end a head portion and between said tip and said head portions is located a stem portion, said stem portion connecting said head portion and said tip portion, providing thereby the entire metallic valve structure, said stem portion having on its exterior portion a surface roughness having an Rp value of from about 4.0 to about 15.0, said exterior portion of said stem also having throughout substantially its entire length a cross hatching channel pattern, said cross hatching channel pattern having a depth of an Rvk value of up to about 30 micro-inches



which is sufficient to hold a lubricant to provide proper lubrication for said valve and adjacent surfaces while at the same time minimizing any emission problems.

5,190,003

CYLINDER BLOCK FOR AN INTERNAL COMBUSTION ENGINE

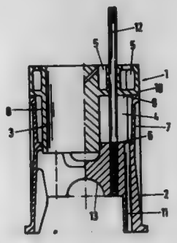
Dieter Voigt, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 5, 1992, Ser. No. 846,607

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1991, 4108050

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 R **4 Claims**



1. A cylinder block for an internal combustion engine comprising a first section containing cylinders and cooling chambers adjacent to the combustion chamber portion of the cylinders and having a downwardly projecting portion, and a second section having an upwardly facing opening receiving the downwardly projecting portion of the first section in sealed relation and forming an annular space therebetween providing an oil compartment which is isolated from the cooling chambers, the second section providing the outer wall of the annular space.

5,190,004

INTERNAL COMBUSTION ENGINE

Mitsunori Iwata, Osaka, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Sep. 11, 1991, Ser. No. 757,534

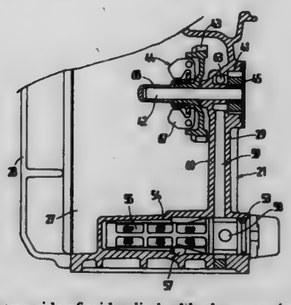
Claims priority, application Japan, Sep. 12, 1990, 2-243015; Sep. 12, 1990, 2-243016

Int. Cl.[5] F01M *1/00*

U.S. Cl. 123—196 R **5 Claims**

1. An internal combustion engine of the type in which a cylinder block, having a crankshaft mounted therein, is equipped therein with a gear mechanism for driving an intermediate shaft which is mounted in a crankshaft direction,

wherein a gear for driving a lubricating oil pump is interlocked with said intermediate shaft within said cylinder



block on a side of said cylinder block opposed to said gear mechanism in the crankshaft direction.

5,190,005

ATTACHING STRUCTURE FOR OIL PUMP OF ENGINE

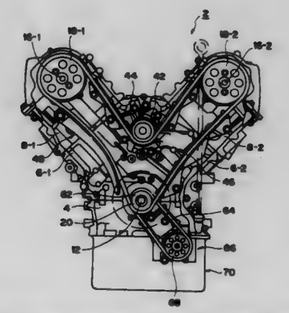
Hiroshi Saito, and Hideo Fujiwara, both of Shizuoka, Japan, assignors to Suzuki Motor Corporation, Shizuoka, Japan

Filed Oct. 11, 1991, Ser. No. 775,820

Claims priority, application Japan, Oct. 31, 1990, 2-294468; Feb. 22, 1991, 3-50758

Int. Cl.[5] F01M *1/00*

U.S. Cl. 123—196 R **4 Claims**



1. A V-shaped internal combustion engine, comprising a V-shaped cylinder block having a rotatable crank shaft therein, said cylinder block having first and second cylinder banks, first and second cylinder heads mounted on said first and second cylinder banks, said first and second cylinder heads having first and second front end surfaces, respectively, said first front end surface of said first cylinder head being offset axially forwardly relative to said second front end surface of said second cylinder head in the direction of the axis of rotation of said crank shaft, first and second rotatable cam shafts mounted on said first and second cylinder heads, respectively, first and second cam sprockets mounted on first and second cam shaft end portions of said first and second cam shafts on the front side of the V-shaped internal combustion engine, said first and second cam sprockets lying in the same vertical plane, a single timing chain, a single timing chain drive sprocket for driving said timing chain and mounted on an end portion of said crank shaft on the front side of the V-shaped internal combustion engine and in the same vertical plane as said first and second cam sprockets, an oil pump having an oil pump drive sprocket, means mounting said oil pump below and laterally offset from said crank shaft, said oil pump being located rearwardly of said second front end surface of said second cylinder head, an auxiliary, drive sprocket mounted on said crank shaft end portion at a position forwardly of said second front end surface of said second cylinder head and between a crank journal portion of said crank shaft supported by said cylinder block and said timing chain drive sprocket, a chain wound around said auxiliary sprocket and said oil pump drive sprocket for driving said oil pump when said auxiliary drive sprocket is rotated, said oil pump drive sprocket being arranged in the same vertical plane as said auxiliary drive sprocket.

5,190,006

INJECTION ARRANGEMENT FOR IMPROVING FUEL CONSUMPTION

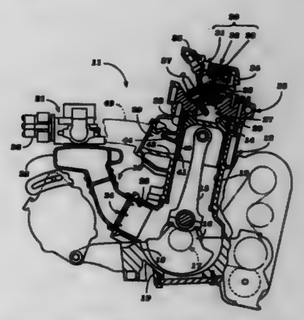
Yu Motoyama, and Ryusuke Kato, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 22, 1991, Ser. No. 673,642

Claims priority, application Japan, Mar. 23, 1990, 2-75308

Int. Cl.[5] F02D *43/00*

U.S. Cl. 123—305 **33 Claims**



1. An internal combustion engine having a combustion chamber, an exhaust port for exhausting gases from said combustion chamber, exhaust port timing means including a valve which progressively opens as the speed and load of the engine increase for effecting a change in the timing when said exhaust port is open, fuel injection means for injecting fuel directly into said combustion chamber, and means for interrelating said exhaust port timing means and said fuel injection means for substantially precluding the exit of fuel injected into the said combustion chamber from said exhaust throughout the entire range of speed and load of the engine to produce the desired torque characteristics.

5,190,007

AIR INDUCTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Martin J. Joyce, Derbyshire, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Filed Jan. 29, 1992, Ser. No. 827,643

Claims priority, application United Kingdom, Jan. 31, 1991, 9102121

Int. Cl.[5] F02B *29/00*

U.S. Cl. 123—336 **8 Claims**

1. An air induction system for an internal combustion engine

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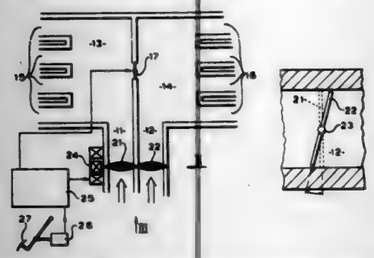
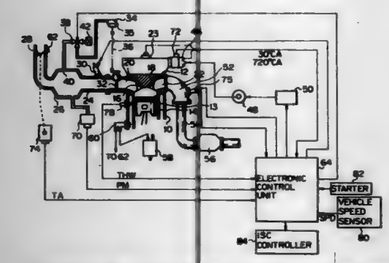
comprising a dual choke inlet with a pivotal throttle blade in each choke, the throttle blades being mounted for rotation



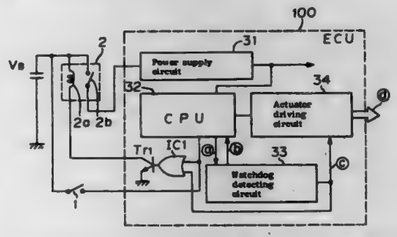
together on a common spindle, the throttle blades being angularly offset from each other.

5,190,008
LEAN BURN INTERNAL COMBUSTION ENGINE
Hirofumi Yamasaki, Kakogawa; Kiyoshi Yagi, Kobe; Keisuke Tsukamoto, Toyota; Toshio Taksoka, Toyota, and Takao Fukuma, Toyota, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Continuation of Ser. No. 654,970, Dec. 14, 1991, abandoned. This application Aug. 4, 1992, Ser. No. 921,961
Claims priority, application Japan, Feb. 15, 1990, 2-34987; Feb. 15, 1990, 2-34989
Int. Cl.[5] F02D *43/04*
U.S. Cl. 123—306 **6 Claims**



1. A lean burn internal combustion engine, comprising:
an engine body;
an intake line for introducing intake air into the engine body;
a throttle vale in the intake line for controlling an amount of intake air introduced into the engine body;
fuel supply means supplying an amount of fuel into the intake line for producing a combustible mixture;
ignition means for causing an ignition of the combustible mixture in the engine body;
an exhaust line for removing resultant exhaust gas from the engine body;
means for detecting a degree of opening of the throttle valve;
means for calculating a basic amount of fuel to be supplied by the fuel supply means which corresponds to a stoichiometric air-fuel ratio of the combustible mixture;
first map calculating means for determining a correcting fuel amount based on the detected degree of opening of the throttle valve;
correcting means for correcting the basic fuel amount by the correcting fuel amount to obtain a calculated leans air-fuel mixture;
means for operating the fuel supply means to supply the calculated lean air-fuel mixture as the combustible mixture;
second map calculating means for determining an ignition timing based on the detected degree of opening of the throttle valve when the basic fuel amount is corrected by the correcting means; and
means for operating the ignition means at the ignition timing.

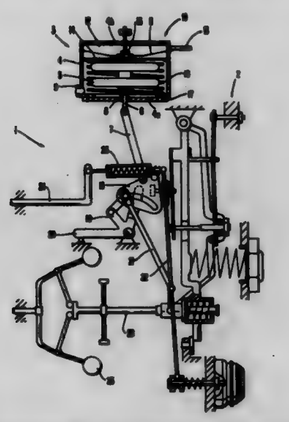
5,190,009
CONTROL DEVICE FOR AN ENGINE OF AN AUTOMOBILE
Yoichi Kadota, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 16, 1992, Ser. No. 899,245
Claims priority, application Japan, Jul. 11, 1991, 3-170880
Int. Cl.[5] F02M *3/00*
U.S. Cl. 123—339 **1 Claim**



1. A control device for an engine of an automobile comprising:
a power supply switch which is switched to ON or OFF by a driver;
an OR circuit which calculates a logical sum of an ON/OFF signal of the power supply switch and a signal corresponding to a pulse signal outputted from a central processing unit;
a power supply relay which is activated to supply power to the control device for an engine of an automobile by the OR circuit when the power supply switch is switched to ON, and which is deactivated to cut power to the control device for an engine of an automobile when the power supply switch is switched to OFF and the signal corresponding to the pulse signal outputted from the central processing unit goes off; and
a detecting means for detecting that outputting of the pulse signal is stopped when an initializing operation of an actuator by the central processing unit is finished and for outputting an output of the signal corresponding to the pulse signal to the OR circuit and to an actuator driving circuit for driving the actuator.

5,190,010
ARRANGEMENT FOR REGENERATING A SOOT BURN-OFF FILTER IN THE EXHAUST DUCT OF AN AIR-COMPRESSING FUEL-INJECTED INTERNAL-COMBUSTION ENGINE
Wendelin Klügl, Kernen, and Walter Pütz, Burgstetten, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Dec. 2, 1991, Ser. No. 801,467
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041627
Int. Cl.[5] F02D *7/00, 31/00*
U.S. Cl. 123—380 **3 Claims**

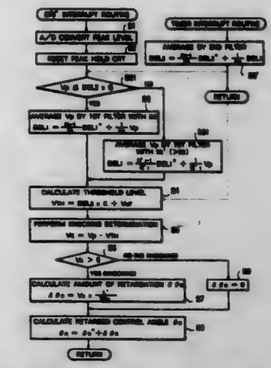
1. Arrangement for regenerating a soot burn-off filter in the exhaust duct of an air-compressing fuel-injected internal combustion engine, comprising:
a servomechanism which acts on a mechanical speed governor of a fuel injection pump of said engine to reduce a quantity of fuel injected to said engine as exhaust-gas backpressure increases, wherein the servomechanism is integrated into an altitude-matching device of said speed governor, the altitude matching device being adapted to adjust the quantity of fuel injected to said engine in response to changes in atmospheric pressure;
said servomechanism comprising a diaphragm chamber connected via an exhaust-gas beckpressure line to the exhaust duct, and a spring-loaded diaphragm which can be subjected t the exhaust-gas backpressure; and



said altitude-matching device comprising a barometer capsule guided in a housing, acting against a spring and having an adjusting part articulated on a transmission rod as part of the governor linkage in the speed governor, said barometer capsule being surrounded by the diaphragm spring, which is supported, on the one hand, against the bottom of the housing and, on the other hand, via the diaphragm, against an adjustable stop.

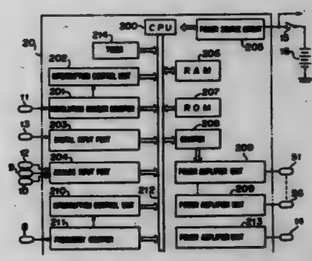
5,190,011
KNOCKING CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINE
Atsuko Hashimoto, and Toshio Iwata, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 1, 1991, Ser. No. 769,415
Claims priority, application Japan, Oct. 2, 1990, 2-263042; Oct. 2, 1990, 2-263043
Int. Cl.[5] F02P *5/14*
U.S. Cl. 123—425 **22 Claims**

1. A method of controlling knocking in an internal combustion engine, comprising the steps of:
generating a vibration level periodically at a predetermined time interval on the basis of an output signal of a knocking sensor installed for detecting vibrations of said engine;
making a decision as to whether or not said vibration level exceeds a predetermined value;
averaging said vibration level in accordance with a first predetermined constant defining a first vibration level significance ratio to provide a first mean value unless said vibration level exceeds said predetermined value;
averaging said vibration level in accordance with a second predetermined constant defining a second vibration level significance ratio which is less than said first predetermined significance ratio to provide a second mean value if said vibration level exceeds said predetermined value;
generating a threshold level, which is referred to upon making a decision as to the occurrence of knocking, on the basis of either one of said first and second mean values;
comparing said vibration level with said threshold level to determine whether there is knocking in the engine; and



controlling an engine control parameter so as to suppress engine knocking when said vibration level exceeds said threshold level.

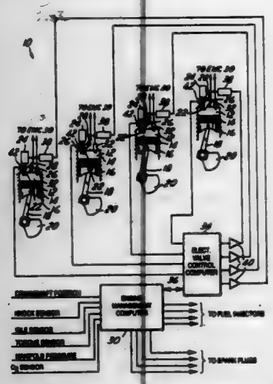
5,190,012
FUEL CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Toshihiro Takahashi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 15, 1992, Ser. No. 820,738
Claims priority, application Japan, Jan. 22, 1991, 3-005641
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—479 **2 Claims**



1. A fuel control device for an internal combustion engine, comprising;
a) an air flow quantity sensor for detecting an intake air flow quantity of the internal combustion engine;
b) a crank angle sensor for detecting a rotation angle of a crankshaft of the internal combustion engine;
c) a pressure sensor for detecting a pressure in an intake pipe of the internal combustion engine;
d) means for continuously and repeatedly determining a predicted intake air quantity for the internal combustion engine based on an engine revolution number obtained from an output of the crank angle sensor and the pressure in the intake pipe;
e) means for detecting a failure of the air flow quantity sensor by comparing the predicted intake air quantity with the intake air flow quantity obtained from the air flow quantity sensor; and
f) fuel injection quantity controlling means for controlling a fuel injection quantity to the internal combustion engine based on an output of the air flow quantity sensor when

the air flow quantity sensor is normal, and on the predicted intake air quantity when the air flow quantity sensor has failed.

5,190,013
ENGINE INTAKE VALVE SELECTIVE DEACTIVATION SYSTEM AND METHOD
Henry C. Dozier, Rochester Hills, Mich., assignor to Siemens Automotive L.P., Auburn Hills, Mich.
Filed Jan. 10, 1992, Ser. No. 819,044
Int. Cl.[5] F02D *13/06*, *41/04*; F01L *25/08*
U.S. Cl. 123—481 **19 Claims**

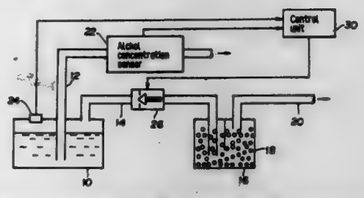


1. An internal combustion engine comprising multiple combustion chambers each of which is repeatedly charged with a fresh combustible fluid mixture charge that is combusted therein to power the engine and subsequently exhausted therefrom, multiple valve means each associated with a corresponding combustion chamber for controlling the ingress and egress of combustible and combusted mixture to and from the corresponding combustion chamber, and multiple electromechanical actuator means each associated with a corresponding one of said valve means for controlling operation of same, electronic computing means for controlling certain components of the engine, including said multiple electromechanical actuator means, in accordance with multiple variables associated with engine operation, characterized by means for detecting when certain one or more of said multiple variables indicates deviation in the operation of any one of said combustion chambers from desired operation, and means responsive to such indication of such deviation for controlling the electromechanical actuator means associated with the corresponding valve means associated with said any one of said combustion chambers such that the corresponding valve means prevents the ingress of combustible mixture into said any one of said combustion chambers.

5,190,014
VAPORIZED FUEL CONTROL SYSTEM FOR VEHICULAR INTERNAL COMBUSTION ENGINE
Toshiyuki Suga; Shinichi Kitajima, both of Wako, and Yoshihiko Kobayashi, Haga, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1991, Ser. No. 801,285
Claims priority, application Japan, Nov. 30, 1990, 2-336802
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—519 **3 Claims**

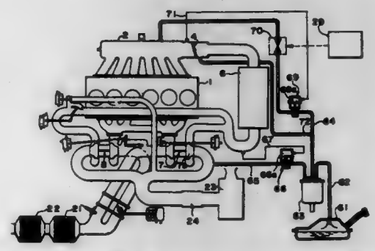
1. A system for controlling an amount of vapor fuel evaporating from a blended fuel composed of gasoline and an alcohol contained in a fuel tank mounted at a vehicular internal combustion engine, to be fed to a canister connected to the tank, comprising:

first means for detecting a pressure in the tank; and



control means for adjusting the amount of vapor fuel fed to the canister in response to the detected alcohol concentration and the pressure in the tank such that the in-tank pressure is kept at a predetermined pressure.

5,190,015
EVAPORATED FUEL DISCHARGE SUPPRESSING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Kunihiko Nakata; Mamoru Yoshioka, both of Susono; Toshihisa Sugiyama, Gotemba, and Yuji Kanto, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Feb. 4, 1992, Ser. No. 830,910
Claims priority, application Japan, Feb. 5, 1991, 3-35322; Feb. 5, 1991, 3-35323
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 **20 Claims**



1. An evaporated fuel discharge suppressing apparatus for an internal combustion engine comprising:

an internal combustion engine having an intake conduit in which a butterfly-type intake throttle valve is installed;

a fuel tank;

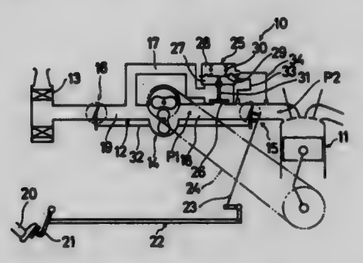
a canister, connected to the fuel tank through an evaporated fuel conduit, for adsorbing evaporated fuel generated in the fuel tank and flowing to the canister;

a main purge conduit connecting the canister and a portion of the intake conduit downstream of the butterfly type intake throttle valve;

a purge control solenoid valve, installed in the main purge conduit, for controlling a purge amount of evaporated fuel by duty control in response to an engine operating condition; and

a bypass purge conduit which is independent of the main purge conduit, having an upstream end and a downstream end and bypassing the purge control solenoid valve, the upstream end of the bypass purge conduit being connected to either one of the canister and a portion of the main purge conduit upstream of the purge control solenoid valve, and the downstream end of the bypass purge conduit being connected to a portion of the intake conduit of the engine which is located upstream of a trailing, outermost edge of said butterfly-type intake throttle valve when the butterfly-type intake throttle valve is fully closed and is downstream of said trailing outermost edge when the butterfly-type intake throttle valve is fully opened.

5,190,016
SUPERCHARGED ENGINE
Toshio Takeda, Mizuho, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Sep. 27, 1991, Ser. No. 766,262
Claims priority, application Japan, Sep. 27, 1990, 2-257963
Int. Cl.[5] F02B *33/38*
U.S. Cl. 123—564 **9 Claims**



1. A supercharged engine comprising:

an intake passage;

an engine located at one end of the intake passage;

an air cleaner at another end of the intake passage, whereby air flows through the intake passage in an upstream to downstream direction from the air cleaner to the engine;

a mechanical supercharger located in the intake passage;

a main throttle valve located at a downstream side of the intake passage;

a sub throttle valve located at an upstream side of the intake passage, the sub throttle valve having an opening ratio which is larger than an opening ratio of the main throttle valve, wherein the sub throttle valve is linked with the main throttle valve;

a relief passage, in parallel to the intake passage, located between a downstream space between the mechanical supercharger and the main throttle valve and an upstream space between the mechanical supercharger and the sub throttle valve; and

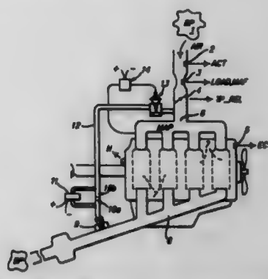
a relief valve located in the relief passage and having means responsive to a pressure-difference across the main throttle valve.

5,190,017
EXHAUST GAS RECIRCULATION SYSTEM FAULT DETECTOR
Michael J. Callen, Dearborn; Rogelio G. Samson, Bloomfield Hills; Alistair S. Teasdale, Redford, and Richard L. Wanat, Troy, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed May 28, 1992, Ser. No. 889,659
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—571 **10 Claims**

1. A method of determining a fault in an EGR system includes the steps of:

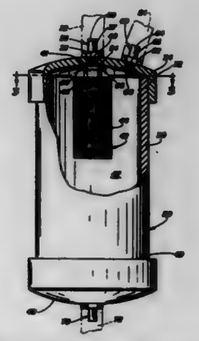
comparing the measured exhaust gas flow through the EGR system to an expected EGR flow;

determining the period of time that the expected flow of EGR deviates from the measured EGR flow by a calibrated EGR flow amount; and



indicating a fault condition in the EGR system if the duration of the deviation exceeds a predetermined amount of time.

5,190,018
INTERNAL-COMBUSTION ENGINE HYDROCARBON SEPARATOR
John W. Costello, Newhall; Dino J. DeFilippi, Calabasas, and Jonathan D. Kraut, Huntington Beach, all of Calif., assignors to Performa Tech Incorporated, Calabasas, Calif.
Filed Jul. 13, 1992, Ser. No. 912,698
Int. Cl.[5] F02B *25/06*
U.S. Cl. 123—573 **14 Claims**



1. A hydrocarbon and volatile gas separator for an internal combustion engine, comprising:

a canister formed having an enclosed reservoir chamber in which crankcase emissions of hydrocarbons and volatile gases are separated, and wherein the volatile gases are vaporized and returned to the internal-combustion engine so as to reburn therein;

an inlet fitting mounted in said canister and connected by a first hose to the engine to receive crankcase emissions therefrom;

a separator means for separating the hydrocarbons and volatile gases, wherein the volatile gases are vaporized as said gases pass through said separator means being attached to said inlet fitting and positioned within said canister;

a permanent magnet mounted to said inlet fitting and interposed between said canister and said separator means, and arranged to allow the hydrocarbons and volatile gases to pass through the magnetic field provided by said permanent magnet;

an outlet fitting mounted to said canister and connected by a second hose to the engine so as to return vaporized gases to the engine to be reburned therein; and

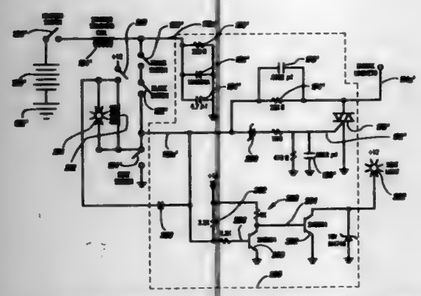
VOL 1148 ISS 1 MR 2 1993 UMI

a discharge fitting mounted to said canister, whereby the hydrocarbons are drained from said canister.

5,190,019
INTERLOCK CIRCUIT FOR DE-ACTIVATING AN ENGINE

Arthur J. Harvey, Streetsboro, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Filed Sep. 10, 1991, Ser. No. 757,178
Int. Cl.[5] F02P *11/00*
U.S. Cl. 123—630 11 Claims

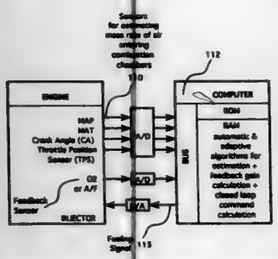


1. A safety circuit for inhibiting operation of an engine having a spark plug energized by a magneto coil comprising:
a) a triac coupled to a magneto coil for diverting magneto generated pulses applied to said magneto coil away from said magneto coil and thereby inhibiting engine operation; and
b) disabling circuitry for coupling a triac activation voltage to a gate electrode of the triac in response to a sensed condition; said disabling circuitry including a first circuit portion for coupling the magneto generated pulses to the triac gate electrode and rendering said triac conductive to prevent the magneto coil from energizing the spark plug and a second circuit portion for routing magneto generated pulses away from the triac gate electrode to ground, thereby inhibiting triac conduction when a safe operating condition is sensed.

5,190,020
AUTOMATIC CONTROL SYSTEM FOR IC ENGINE FUEL INJECTION

Dong-Il D. Cho, 3 Rosewood Ct., Princeton Junction, N.J. 08550

Filed Jun. 26, 1991, Ser. No. 722,546
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—684 4 Claims

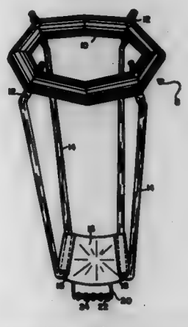


1. A fuel injection system for an internal combustion engine comprising:
at least one intake manifold sensor for sensing at least one ambient condition at the intake of an internal combustion engine which is indicative of the mass flow rate through the intake manifold;
an exhaust sensor for sensing the oxygen content of the exhaust gases exiting the engine;
at least one fuel injector which provides fuel to the engine;
a controller coupled to said sensors and said fuel injector, said controller being responsive to sensing signals from said sensors in order to calculate and control the amount of fuel to be delivered to the engine at specific time intervals, the amount of fuel delivered calculated for each time interval being based substantially on the immediately preceding time interval calculation and the signals from said sensors.

5,190,021
QUICK RELEASE FOOT STRAP

Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434, and Willard S. Haynes, P.O. Box 241, Doyle, Calif. 96109

Filed Aug. 5, 1991, Ser. No. 740,147
Int. Cl.[5] F41B *3/02*
U.S. Cl. 124—20.1 1 Claim



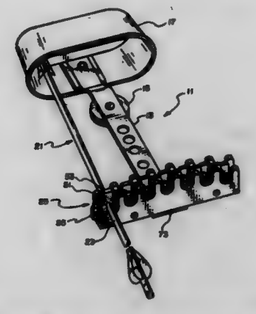
1. A device for launching objects, comprising:
a base adapted to be held by a user;
a plurality of elongate elastic thrust bands fixed to the base and extending downwardly therefrom;
a pouch supported by a lower end of the thrust bands and adapted to receive objects for launching; and
a foot strap affixed to the pouch;
characterized in that the foot strap includes a substantially elongated flexible support member, at least one annular member, said annular member being freely rotatable on said support member, and retaining means to hold said annular member in position on said support member.

5,190,022
ARROW QUIVER WITH ADJUSTABLE ARROW SHAFT CLAMP

Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah

Filed Nov. 1, 1991, Ser. No. 786,301
Int. Cl.[5] F41B *5/06*
U.S. Cl. 124—25.7 11 Claims

1. An archery quiver comprising:
a support member structured and arranged for attachment to the handle riser of an archery bow and having a first end and a second end;
a hood member carried by said first end of said support member, being structured and arranged to receive the pointed ends of a plurality of arrows, each said arrow having a shaft, a nock end and a point end; and
an arrow shaft clamp member carried by said second end of said support member, said clamp member including at least one set of first and second gripper elements, an arrow shaft retaining notch in each of said gripper elements, a resilient arrow engaging surface in each retaining notch, and resilient means being structurally different from said gripper elements and biasing each of said gripper elements and said retaining notches to an arrow shaft gripping position.



5,190,023
GRIP REST

Edward Sacco, 2178 County Rte. 4, Central Square, N.Y. 13036

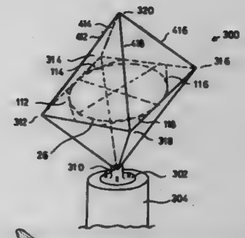
Filed Jul. 22, 1991, Ser. No. 733,692
Int. Cl.[5] F41A *9/00*
U.S. Cl. 124—44.5 8 Claims

1. An arrow grip rest comprising:
a) an elongated support plate having a central, longitudinal axis and including front and rear edges with first and second, opposite side edges, all defining top and bottom surfaces extending therebetween;
b) means mounting said plate to the arrow ledge of a bow handle;
c) first and second rigid legs pivotally attached at first ends thereof to said support plate adjacent said rear edge about an axis perpendicular to said longitudinal axis of said support plate, said first and second legs extending upwardly from said plate top surface substantially parallel to each other and terminating at second ends thereof, said legs being movable about said pivotal attachment between fully raised and fully lowered positions;
d) first and second, elongated gripping members fixedly mounted to said second ends of said first and second legs and extending substantially parallel to said longitudinal axis, said gripping members having concave surfaces facing each other and positioned a predetermined distance from each other whereby the shaft of an arrow may be placed therebetween with said concave surfaces frictionally engaging opposite side surfaces of said shaft and positioning said shaft along an axis substantially parallel to said longitudinal axis of said plate; and
e) spring means resiliently biasing said first and second legs in said fully raised position.

5,190,024
DIAMOND SAWING PROCESS

Daya R. Senanayake, 9 Ecrin Place, Colombo 8,

PCT No. PCT/LK89/00002, § 371 Date Jul. 8, 1991, § 102(e) Date Jul. 8, 1991, PCT Pub. No. WO90/05624, PCT Pub. Date May 31, 1990
PCT Filed Nov. 14, 1989, Ser. No. 689,793
Claims priority, application Sri Lanka, Nov. 16, 1988, 9954
Int. Cl.[5] B28D *5/00*
U.S. Cl. 125—30.01 1 Claim



1. A diamond sawing process for a diamond (300) having an apex portion (310, 320) which defines a girdle and a plurality of girdle apices (312, 314, 316, 318), which includes the step of removing an apex portion (320) of the diamond, the said apex portion being removed as a unitary fragment characterized by starting a cut to one side of the girdle, and continuing the cut through the girdle to the other side of the girdle, whereby to remove a girdle apex (312, 314, 316, 318, 340), also as a unitary fragment,
characterized by a diamond having at least two adjacent ridges (412, 414, 416, 418), and by marking means adapted to mark the ridges at positions spaced from the associated girdle apices (312, 314, 316, 318), said mark being made on the diamond external surface and without removal of diamond material, and
characterized by means to rotate the diamond relative to said marking means, the marker means having a marker point (330), the marker means being mounted with a vertical travel facility so that the marker point (330) can remain in contact with the diamond external surface.

5,190,025
MOTOR VEHICLE DRINKING WATER WARMING AND HEATING DEVICE

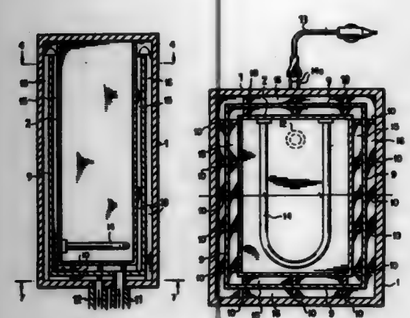
Ning S. Chen, 44 Fu-Ching 4th Street, Wu-Chieh Hsian, Ilan-Hsien, Taiwan

Filed Apr. 1, 1991, Ser. No. 678,243
Int. Cl.[5] F24H *1/20*; B60H *1/06*
U.S. Cl. 126—19.5 6 Claims

1. A drinking water warming and heating device comprising:
a housing having walls defining an interior space therein;
a storage chamber having walls located inside said space in spaced relationship to said housing walls to define a water circulating space between said chamber and said housing;
a partition set in said housing in said water circulating space to divide said water circulating space into an inner water circulating space and an outer water circulating space, wherein said partition extends vertically in said water circulating space;
a mounting means connected to said partition and located in said water circulating space for mounting said partition spaced between said housing walls and said chamber

walls, and wherein and mounting means comprises vertically extending plates located in said outer circulating space and connected between said partition and said housing walls;

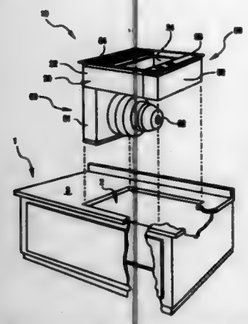
an engine cooling water intake port in communication with said inner space and connectable to an engine of a motor vehicle having a water tank, and said intake port directing hot engine cooling water into said inner water circulating space; and



an engine cooling water outlet port in communication with said outer water circulating space and connectable to the water tank of the motor vehicle to guide the hot engine cooling water from said outer water circulating space to the water tank;

said inner water circulating space and said outer water circulating space being in communication with each other at a location remote from said inlet and outlet ports such that the cooling water circulates from said inlet port through said inner space, into said outer space, and thence out said outlet port.

5,190,026
MODULAR COUNTERTOP COOKING SYSTEM
Roger F. Doty, Connersville, Ind., assignor to Maytag Corporation, Newton, Iowa
Filed Nov. 19, 1991, Ser. No. 794,461
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—39 R **14 Claims**



1. A countertop cooking appliance system including modular components, comprising:

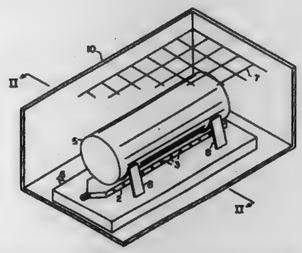
at least one cooking module including a box-like, open-top housing and at least one heating apparatus,

said cooking module being free of controls for energizing or controlling said heating apparatus and

a control module for carrying controls for controlling said heating apparatus, including a box-like, open-top control housing separate from said cooking module, a side of said control housing providing a connection for said control module to one side of said box-like, open-top housing of said cooking module,

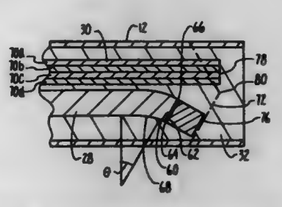
said control module and cooking module providing means for interconnection to provide substantially coplanar open-tops when connected and operation of said heating apparatus with substantially coplanar controls.

5,190,027
HEAT RADIANT DEVICE FOR GAS GRILLS
Joseph J. Miceli, 7902 Limoges Dr., Jacksonville, Fla. 32210
Filed Apr. 14, 1992, Ser. No. 868,308
Int. Cl.[5] A47J *37/00*
U.S. Cl. 126—41 R **12 Claims**



1. In a gas cooking grill having one or more burner elements producing open flames through apertures on opposite sides of said burner elements, the improvement comprising a radiant member composed of a material having high heat reflective properties mounted directly above each said burner element in contact with said flames, said radiant member having a configuration corresponding to the configuration of each said burner element, and said radiant member extending beyond each of said opposite sides of each said burner element, and further comprising a planar radiant member composed of a material having high heat reflective properties positioned beneath each of said burner elements, said planar radiant member being wider than said radiant member.

5,190,028
METHOD FOR MANUFACTURING A DISPOSABLE ARTHROSCOPIC PROBE
W. Michael Lafferty, Leucadia; George H. Middle, Canyon Lake, both of Calif.; Algis R. Banys, Reno, Nev., and Daniel S. Kline, Carlsbad, Calif., assignors to Citation Medical Corporation, Reno, Nev.
Continuation-in-part of Ser. No. 650,066, Feb. 4, 1991. This application Mar. 3, 1992, Ser. No. 845,070
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—6 **24 Claims**



1. A method for assembling an arthroscopic probe comprising:

bending a substantially linear image-transmitting optical fiber having a proximal end and a distal end about a pivot point to render said distal end oblique relative to said proximal end;

attaching a lens to said oblique distal end of said image-transmitting optical fiber to form an image path; and

positioning said image path in a hollow needle having an open proximal end and an open distal end wherein said lens is at said open distal end and said image-transmitting optical fiber is at said open proximal end of said needle to form said arthroscopic probe.

5,190,029
FORMULATION FOR DELIVERY OF DRUGS BY METERED DOSE INHALERS WITH REDUCED OR NO CHLOROFLUOROCARBON CONTENT
Peter R. Byron, and Richard N. Dalby, both of Richmond, Va., assignors to Virginia Commonwealth University, Richmond, Va.
Division of Ser. No. 655,668, Feb. 14, 1991. This application Jun. 26, 1991, Ser. No. 721,698
Int. Cl.[5] A61K *9/12*; A61M *11/00*; C09K *3/30*
U.S. Cl. 128—200.14 **3 Claims**

Propellant	% of initial Weight after 24h immersion in Propellant[b]						
	LDP[a]	White	Black Buna	White Buna	Chloro-butyl	Butyl	Neoprene
CFC-11	127	141	142	137	227	288	170
CFC-12	110	105	105	105	125	135	111
CFC-114	103	100	101	101	107	103	102
Propane	107	102	102	102	103	117	104
iso-Butane	107	101	101	101	120	139	108
n-Butane	107	102	102	102	123	141	107
HFC-134a	101	117	112	114	108	101	101
HCFC-123	100	414	457	398	145	136	136
DME	105	135	133	133	110	120	120
Perfluoro-propane	103	100	100	100	100	100	103

[a] LDP = low density polyethylene.
[b] 100 represents no weight gain.

1. A metered dose inhaler, comprising:

a container capable of holding fluids under pressure;

a valve connected to said container;

gaskets associated with said valve selected from the group consisting of low density polyethylene, butyl elastomer, and neoprene; and

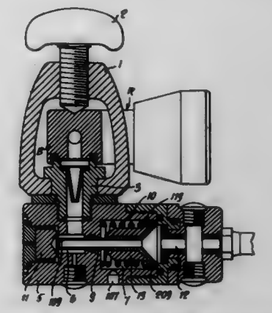
an aerosol formulation positioned within said container, said aerosol formulation including a drug dissolved or dispersed in 1,1,1,2-tetrafluoroethane, said 1,1,1,2-tetrafluoroethane being the sold propellant of said aerosol formulation.

5,190,030
VALVE FOR REGULATORS IN SELF-CONTAINED UNDERWATER BREATHING APPARATUS
Roberto Semeia, San Salvatore di Cogorno, Italy, assignor to Scubapro Europe S.r.l., Casarza Ligure, Italy
Filed Feb. 21, 1992, Ser. No. 838,868
Claims priority, application Italy, Mar. 8, 1991, GE91 U 000007
Int. Cl.[5] A62B *7/04*
U.S. Cl. 128—204.26 **8 Claims**

1. A valve for a regulator in a self-contained underwater breathing apparatus, which comprises two sealingly separated adjacent chambers, a pressure chamber and a compensation chamber, a partition dividing the two chambers, a tubular plug which is at least partially within each of the chambers, a heat insulating member and an outlet,

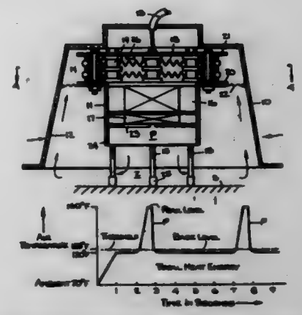
the pressure chamber having means to connect it with a pressurized gas source and having a seat adapted to cooperate with a matching edge of the tubular plug,

the compensation chamber having at least one hole which connects it to ambient medium, having one end of the tubular plug which is in the form of a flaring-out expansion head, which is connected with the valve outlet, and having a helical spring sealingly guided therein between the expansion head and the partition,



the heat insulating member being fitted between the helical spring and said flaring-out expansion head and constituting means to prevent heat exchange between the helical spring and the expansion head.

5,190,031
UNIVERSAL THERMOTHERAPY APPLICATOR
Raul Guibert, and Bettina Guibert, both of 2800 Plaza del Amo #418, Torrance, Calif. 90503
Continuation of Ser. No. 667,186, Mar. 11, 1991, Pat. No. 5,107,832. This application Feb. 3, 1992, Ser. No. 829,232
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—399 **4 Claims**



1. A thermotherapy technique for treating a patient having a temperature sensitivity threshold which is that temperature value above ambient at which the patient experiences undue discomfort, said technique comprising the steps of:

(a) heating a flow zone to a temperature that is elevated well above ambient;

(b) flowing a stream of air through said zone at a velocity which cyclically alternates between a low and a high velocity whereby heat is transferred to the air stream and the stream emerging from the zone has in each cycle a high temperature interval and a low temperature interval; and

(c) exposing a skin surface of the patient to the stream emerging from the zone, the temperatures of the intervals being such that the low temperature has a base value above ambient and below the threshold, and the high

temperature has a peak value much higher than the threshold, the duty cycle being such as to allow for internal heat transfer to take place in the region between the skin surface in the intervals between successive high temperature peaks to an extent preventing a significant rise in surface temperature above the threshold.

5,190,032

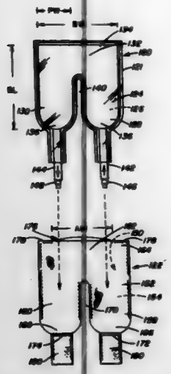
APPARATUS FOR CONTROLLING THE TEMPERATURE OF AN AREA OF THE BODY

Thomas N. Zacoi, Pittsburgh, Pa., assignor to Federal Leasing Rehab Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 443,931, Mar. 15, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,438

Int. Cl.[5] A61F 7/00

U.S. Cl. 128—400 18 Claims



1. An apparatus for use with a temperature controlled fluid circulating device, said apparatus for controlling a temperature of an area of a body, said apparatus comprising:

a fluid circulating blanket;

said fluid circulating blanket having a first side and a second side;

said fluid circulating blanket having two parallel elongated blanket portions and a connecting blanket portion therebetween;

said parallel elongated blanket portions having first ends and second ends with said connecting blanket portion being at said first ends to form an elongated opening between said parallel elongated blanket portions;

said fluid circulating blanket having fluid connection hose means extending from an edge of said second end of each of said parallel elongated blanket portions;

said fluid connection hose means including an extended end adapted to be connected to the fluid circulating device;

a support envelope surrounding said fluid circulating blanket to enclose at least said first side and said second side within an interior of said support envelope;

said support envelope including an inside surface adjacent said first side and an outside surface adjacent said second side;

said support envelope having two parallel elongated envelope portions and a connecting envelope portion therebetween;

said parallel elongated envelope portions having envelope first ends and envelope second ends with said connecting envelope portion being at said envelope first ends to form an elongated envelope opening between said parallel elongated envelope portions;

said elongated envelope opening being in alignment with said elongated opening of said fluid circulating blanket;

said inside surface and said outside surface being joined at least at an edge of said elongated envelope opening;

means for securely positioning said support envelope, with said fluid circulating blanket therein, with said inside surface of said support envelope against the area of the body;

said inside surface of said support envelope including cloth material; and

said outside surface of said support envelope including insulation material.

5,190,033

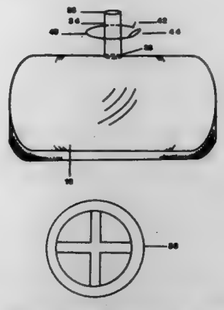
ICE PEAS COLD/HOT THERAPEUTIC PACK

Linda J. Johnson, 1415 Eleventh Ave., San Francisco, Calif. 94122

Filed Jun. 10, 1991, Ser. No. 712,962

Int. Cl.[5] A61F 7/00

U.S. Cl. 128—403 3 Claims



1. A method of providing heat or cold therapy to a selected body part of a patient comprising:

(a) providing a therapeutic pack at a desired temperature, said pack comprising:

(i) a pouch readily deformable over a therapeutic range of temperatures,

(ii) a plurality of hollow capsules disposed within said pouch, said capsules encapsulating means stable over a therapeutic range of temperatures for retarding temperature change of said capsules once said capsules are at a desired temperature,

(iii) plug means for controlled movement of air into and out of said pouch;

(b) positioning said pack in conformable relation over a contour of the body part;

(c) removing air from said pack through said plug means to immobilize said pack in its contact configuration with the body part.

5,190,034

IMPLANTABLE ARRHYTHMIA SYSTEM WITH PROTECTION AGAINST RELEASE OF UNNEEDED PULSES

Jason A. Sholder, Northridge, Calif., assignor to Siemens Pacesetter, Inc., Sylmar, Calif.

Filed Jan. 10, 1991, Ser. No. 639,642

Int. Cl.[5] A61N 1/362

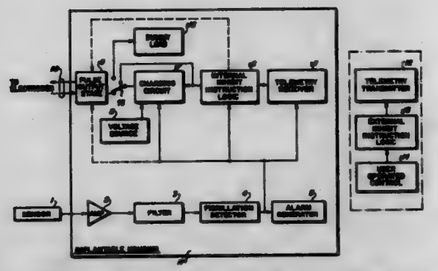
U.S. Cl. 128—419 PG 34 Claims

1. An arrhythmia treatment system comprising: sensor means adapted for implantation in a patient for sensing a physiological characteristic which exhibits a change upon the onset of cardiac arrhythmia and for generating an electrical signal corresponding to said physical characteristic;

treatment means contained in a housing adapted for implantation in a patient, said treatment means adapted to be connected in vivo to said sensor means to receive said

electrical signal therefrom for initiating an arrhythmia treatment sequence, including releasing a treatment pulse in vivo to said patient via electrodes adapted for implantation in said patient, in response to said change in said physical characteristic;

means in communication with said treatment means for



informing said patient, substantially simultaneously with the initiation of said arrhythmia treatment sequence, that said arrhythmia treatment sequence has been initiated; and

means in communication with said treatment means and operable by said patient for optionally stopping said arrhythmia treatment sequence before releasing said treatment pulse.

5,190,035

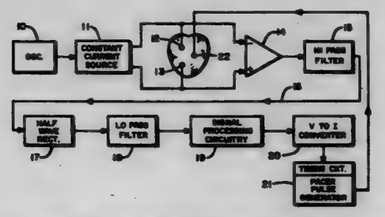
BIOMEDICAL METHOD AND APPARATUS FOR CONTROLLING THE ADMINISTRATION OF THERAPY TO A PATIENT IN RESPONSE TO CHANGES IN PHYSIOLOGICAL DEMAND

Rodney W. Salo, Columbia Heights, and Brian D. Pederson, St. Paul, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of Ser. No. 362,903, Mar. 29, 1982, Pat. No. 4,686,987, which is a continuation-in-part of Ser. No. 274,875, Jun. 18, 1981, abandoned. This application Apr. 17, 1986, Ser. No. 853,059

Int. Cl.[5] A61N 1/365

U.S. Cl. 128—419 PG 2 Claims



1. A cardiac pacer for the therapeutic-stimulation of a heart comprising:

lead system means for coupling said pacer to the patient's heart;

measuring means coupled to said lead for inferring the stroke volume of said heart from the measurement of a physiologic parameter and for producing measurement indicative of stroke volume;

computation and control means coupled to said measuring means for determining a heart rate value in response to said stroke volume measurements wherein said heart rate is defined as the V—V interval;

means for comparing the value of said stroke volume measurement with the value of a stroke volume set point for producing a stroke volume difference value;

means for determining a heart rate difference value, wherein said heart rate value is defined as the V—V interval, from said stroke volume difference value;

means for adding said heart rate different value to the previous heart rate value yielding a current, heart rate value; and

pulse generator means coupled to said lead system and said computational and control means for providing stimulation pulses to said heart at a frequency which is a function of said heart rate value.

5,190,036

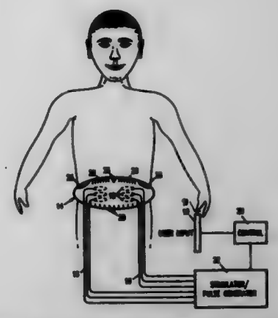
ABDOMINAL BINDER FOR EFFECTUATING COUGH STIMULATION

Steven H. Linder, 5093 Woodbrae Ct., Saratoga, Calif. 95070

Filed Feb. 28, 1991, Ser. No. 662,027

Int. Cl.[5] A61N 1/22

U.S. Cl. 128—421 13 Claims



1. An apparatus for inducing coughing by electrical stimulation resulting from increasing intrathoracic pressures in a human with a physical disability comprising:

an electrode belt having at least one electrode for attachment to the abdominal area of a person;

means coupled to said at least one electrode for providing at least one pulse train of a predetermined duration with pulses having a given amplitude for stimulating the abdominal muscles of the person, wherein said pulse train providing means includes a pulse generator for generating said pulse train and a stimulator circuit means for converting said pulses to stimulus pulses of a specified amplitude and duration; and control means coupled to said pulse generator and stimulator circuit means for controlling the amplitude and width of said pulses.

5,190,037

HIGH-POWER CORONA DISCHARGE BEAM THERMOTHERAPY SYSTEM

Alfonso Di Mino, and Andre Di Mino, both of Woodcliff Lake, N.J., assignors to ADM Tronics Unlimited, Inc., Northvale, N.J.

Continuation-in-part of Ser. No. 779,841, Oct. 21, 1991. This application Jan. 27, 1992, Ser. No. 826,105

Int. Cl.[5] A61N 1/02

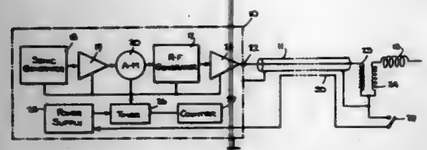
U.S. Cl. 128—422 11 Claims

1. A corona discharge beam thermotherapy system for veterinary applications adapted to project the beam onto the skin surface of an animal overlying a problem region, the beam serving to relieve pain, said system comprising:

(a) an energy-generating unit having a power exceeding 25 watts in which a radio-frequency carrier having a predetermined radio frequency is modulated by an audio-frequency signal having a predetermined audio frequency to

produce at an output terminal periodic bursts of radio-frequency energy whose repetition rate corresponds to the frequency of the signal; and

(b) a portable applicator gun having a relatively short barrel provided with an open mouth, in which barrel are housed both a tank circuit connected by a cable extending from the gun to the output terminal of the unit and a long



discharge electrode, one end of which is coupled to the tank circuit, the other end of which terminates in a tip adjacent the mouth of the barrel, from which tip the energy is radiated to project said beam toward said skin surface which is spaced from the tip, said electrode having a helical coil form whereby it can be housed within said relatively short barrel.

5,190,038

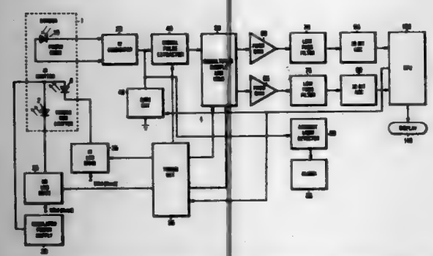
PULSE OXIMETER WITH IMPROVED ACCURACY AND RESPONSE TIME

Michael J. R. Polson, Chesire, Conn., and Gregory L. Morris, South Wales, United Kingdom, assignors to Novametrix Medical Systems, Inc., Wallingsford, Conn.

Filed Nov. 1, 1989, Ser. No. 430,612

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—633 **14 Claims**



1. A pulse oximeter for measuring oxygen saturation in the blood of a living person, comprising:

reference signal generation means for generating a reference signal having a fixed level;

light generation means for generating light having a first wavelength and light having a second wavelength, said light of said first and second wavelengths each having a fixed output level proportional to said fixed level of said reference signal, and said light generation means being capable of directing said light towards a blood carrying tissue sample;

light detection means for detecting the light of said first and second wavelengths, after passage through said tissue sample, and for generating, in response to said light detection, a first electrical signal related to said first wavelength, and a second electrical signal related to said second wavelength, said first and second electrical signals each having a signal magnitude related to the degree of oxygen saturation in said blood, and being less than an expected maximum signal magnitude and more than an expected minimum signal magnitude;

signal conversion means having a dynamic range extending from at least said expected minimum signal magnitude to at least said expected maximum signal magnitude so that said signal conversion means can accommodate said first and second electrical signals and convert said first electrical signal into a first digital signal and said second electrical signal into a second digital signal; and

computer processing means for processing said first and second digital signals so as to compute the oxygen saturation level of said blood.

5,190,039

APPARATUS AND METHOD FOR MONITORING BODY ORGANS

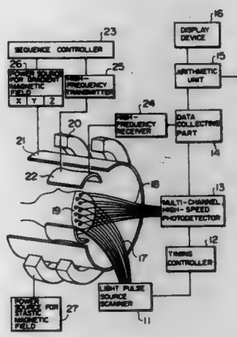
Hiroshi Takeuchi, Matsudo; Fumio Kawaguchi, Tokyo; Yuichi Yamashita, Hachioji; Kazuo Takeda, Kokubunji; Yoshitoshi Ito, Ome; Yasuhiro Mitsui, Fuchu, and Keiichi Nagai, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,607

Claims priority, application Japan, Dec. 8, 1989, 1-317781

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **17 Claims**



1. A living-body measuring apparatus for measuring the oxygen partial pressure in a living body non-invasively, comprising:

means for throwing light on a living body;

means for detecting light having passed through the living body;

means for obtaining the oxygen saturation of an oxygen content indicator substance at a predetermined portion of the living body, from the detected light;

means for generating nuclear magnetic resonance in the living body, to obtain the temperature of the predetermined portion from a first resonance characteristic of the nuclear magnetic resonance;

means for generating nuclear magnetic resonance in the living body, to obtain the acidity of the predetermined portion from a second resonance characteristic of the nuclear magnetic resonance;

means for determining an oxygen partial pressure from the oxygen saturation in accordance with an oxygen dissociation curve of the oxygen content indicator which is compensated with the temperature and the acidity; and

means for displaying the oxygen partial pressure.

5,190,040

APPARATUS FOR MEASURING THE CHANGE IN THE CONCENTRATION OF A PIGMENT IN BLOOD

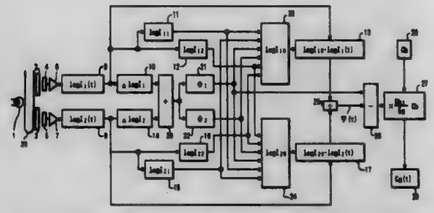
Takao Aoyagi, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 515,527, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 138,111, Dec. 28, 1987, abandoned. This application Aug. 12, 1991, Ser. No. 743,618

Claims priority, application Japan, Dec. 26, 1986, 61-314784

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—633 **12 Claims**



1. An apparatus for measuring a change in the concentration of a pigment injected into a blood vessel, an absorptivity coefficient of the blood being changed with respect to a first wavelength of light, the apparatus comprising:

light quantity detecting means for continuously detecting quantities of radiation of light which have been transmitted/reflected by a living tissue containing pulsating blood, one of the detected radiations of light transmitted/reflected by the living tissue having the first wavelength of light;

first computing means for converting outputs from said light quantity detecting means to logarithmic values and for determining constant and pulsating components of the logarithmic values of each wavelength both before and after the change in the absorptivity coefficient of the blood, and for computing estimated transmitted/reflected light level of a supposed ischemic tissue, from the determined constant and pulsating components; and

second computing means for continuously computing the concentration of pigment injected into the blood vessel according to the estimated transmitted/reflected light level of the supposed ischemic tissue computed by said first computing means and according to the quantities of radiation of light detected by said light quantity detecting means.

5,190,041

SYSTEM FOR MONITORING AND CONTROLLING BLOOD GLUCOSE

Yoram Palti, 51 Ruth Street, Haifa 34404, Israel

Division of Ser. No. 392,828, Aug. 11, 1989, Pat. No. 5,101,814. This application Dec. 27, 1991, Ser. No. 816,303

Int. Cl.[5] A61F *2/02, 2/48, 2/70*; A61B *5/05*

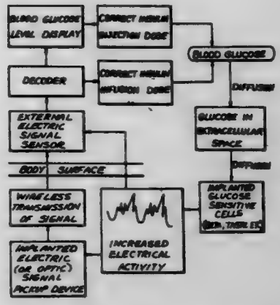
U.S. Cl. 128—635 **16 Claims**

1. A capsule implantable in a patient's body, said capsule comprising a thin walled tube or a pellet and being constituted of:

(a) glucose-sensitive living animal cells capable of producing an electrical signal in response to the glucose concentration in the medium surrounding the capsule in the patient;

(b) a membrane enclosing the cells, the membrane being impermeable to the cells and any antibodies and large molecules to prevent immunological reactions, and being permeable to nutrients for and waste products form the cells to maintain viability of the cells; and

(c) electrodes within the membrane for measuring the potential difference corresponding to the electrical activity of the cells;



the dimensions of the capsule being sufficient to permit implantation in the patient's body and diffusion between the cells and the medium surrounding the capsule in the body.

5,190,042

APPARATUS FOR DETERMINING INTRAOCULAR PRESSURE

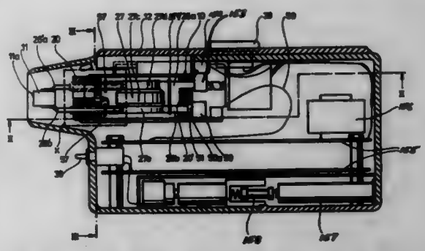
Bertram Hock, Haibach, Fed. Rep. of Germany, assignor to Datron-Electronic GmbH, Muhltal-Traisa, Fed. Rep. of Germany

Filed Sep. 14, 1990, Ser. No. 583,730

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1989, 3931630

Int. Cl.[5] A61B *3/16*

U.S. Cl. 128—652 **18 Claims**



1. An apparatus for determining the inter-relationship between an aplanated area of a human eye and a force required for producing said aplanation, to permit determination of intraocular pressure, comprising:

a housing;

a slide;

a measurement member for placement against the human eye to produce said aplanation in response to the force of said member against the eye, a connection between said slide and said measurement member permitting relative displacement therebetween whereby said relative displacement has a magnitude proportional to the magnitude of said force;

measurement means connected to said slide for detecting the displacement between said measurement member and said slide and for converting said detected relative displacement into a corresponding force-value signal;

identification means connected to said slide for detecting the size of the aplanation area produced on the eye by said force of said measurement member, and producing area signals corresponding thereto;

calculating means for receiving said force-value signals and

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said area signals and for correlating said signals to determine said intraocular pressure;
means for moving said slide relative to said housing selectably in a first measuring direction and in a second withdrawal direction, said slide being moveable in a range of linear distances, in use, the size of said aplanated area and said force changing, and said intraocular pressure being determined continuously by said calculating means as said slide moves through said distance range.

5,190,043

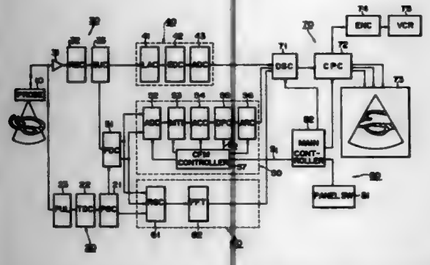
Patent Not Issued For This Number

5,190,044

ULTRASONIC BLOOD FLOW IMAGING APPARATUS

Schuichi Kawasaki; Toshio Shirasaka, both of Tochigi; Takanobu Uchibori, Ootawara; and Yasuo Miyajima, Utsunomiya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1991, Ser. No. 677,092
Claims priority, application Japan, Mar. 30, 1990, 2-83907
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—661.09 **18 Claims**



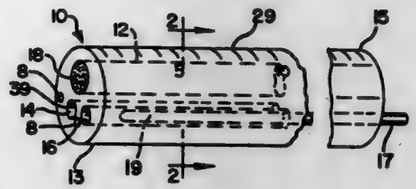
1. An ultrasonic blood flow imaging apparatus comprising:
first means for displaying a tomographic image of an object to be examined on the basis of reflected components of ultrasonic waves transmitted to the object; and
second means having at least auto-correlation means and arithmetic means, for color-display processing blood flow Doppler signals for display as a two-dimensional blood flow image superimposed on the tomographic image, said auto-correlation means obtaining blood flow Doppler signals detected from the object using an auto-correlation method, and said arithmetic means obtaining said blood flow Doppler signals from said auto-correlation means,
wherein said second means includes
comparing means, provided between said auto-correlation means and said arithmetic means, for comparing a power information value of each blood flow Doppler signal obtained by said auto-correlation means and a predetermined value,
discriminating means, provided between said auto-correlation means and said arithmetic means, for discriminating the blood flow Doppler signals into blood flow Doppler signals having power information values lower than a predetermined value and signals other than the blood flow Doppler signals based on the result of the comparison made by said comparing means, and
display means for displaying the blood flow Doppler signals discriminated by said discriminating means as a two-dimensional blood flow image together with the tomographic image.

5,190,045

METHOD AND DEVICE FOR DOPPLER-GUIDED AND IMAGED RETROGRADE CATHETERIZATION

Leon J. Frazin, 2106 North Daytou, Chicago, Ill. 60614

Continuation-in-part of Ser. No. 413,953, Sep. 28, 1989, Pat. No. 5,038,789. This application Mar. 14, 1991, Ser. No. 669,052
Int. Cl.[5] A61B *8/06*
U.S. Cl. 128—662.06 **18 Claims**



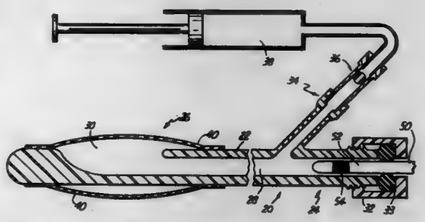
1. A method for the Doppler-guided, imaged intravascular catheterization of a higher mammal, comprising:
inserting into a peripheral blood vessel a catheter having a tip having an ultrasound transceiver operationally disposed therewith;
generating from signals produced by the ultrasound transceiver a continuous indication of the direction of blood flow relative to the catheter;
displaying said indication of blood flow direction;
advancing the catheter towards the heart in accordance with the indication of blood flow direction;
locating the catheter at the coronary ostium using a transponder and an external ultrasonic transducer; and
providing an ultrasonic imaging transducer to generate an image of the location of the vessel surrounding said transducer.

5,190,046

ULTRASOUND IMAGING BALLOON CATHETER

Leonid Shturman, Minneapolis, Minn., assignor to Shturman Cardiology Systems, Inc., Minneapolis, Minn.

Filed May 1, 1992, Ser. No. 877,469
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **13 Claims**



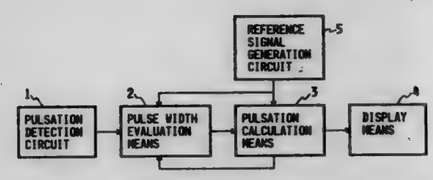
1. An ultrasound imaging balloon catheter apparatus for use in positioning an ultrasound transducer near a wall of a cavity or passageway, comprising:
an elongated catheter having proximal and distal end portions and a tubular wall defining an inner lumen, the tubular wall including an opening in the distal end portion;
an inflatable balloon secured to the catheter and covering the opening in the distal end portion; and
an ultrasound catheter having proximal and distal end segments and ultrasound transducer means carried in its distal end segment;
the distal opening in the tubular wall and the distal end segment of the ultrasound catheter being shaped and sized so that, when the balloon is inflated, the distal end segment of the ultrasound catheter including the ultrasound transducer means can be advanced through the distal opening into the balloon to locate the transducer means radially outwardly of the lumen of the elongated catheter.

5,190,047

PHOTOELECTRIC PULSATION TYPE PULSIMETER

Hiroshi Odagiri; Hiroyuki Masaki, and Yuichi Inoue, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Jul. 23, 1990, Ser. No. 557,303
Claims priority, application Japan, Jul. 25, 1989, 1-193499; Jul. 25, 1989, 1-193501
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—687 **12 Claims**



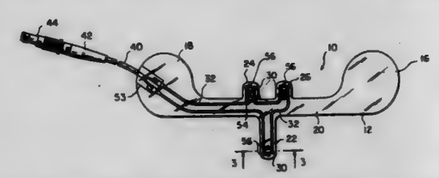
1. A photoelectric pulsation type pulsimeter comprising:
a pulsation detection circuit for detecting a pulsation pulse of a heartbeat and outputting a pulsation signal to pulse width evaluation means;
pulse width evaluation means for evaluating said pulsation signal and a pulse rate;
pulsation calculation means for calculating said pulse rate;
a reference signal generation circuit for generating a reference signal and outputting said reference signal to said pulsation calculation means and said pulse width evaluation means; and
display means for displaying said pulse rate calculated by said pulsation calculation means.

5,190,048

THERMISTOR AIRFLOW SENSOR ASSEMBLY

Mark A. Wilkinson, Marietta, Ga., assignor to Healthdyne, Inc., Marietta, Ga.

Filed Sep. 17, 1991, Ser. No. 761,293
Int. Cl.[5] A61B *5/087*
U.S. Cl. 128—724 **10 Claims**



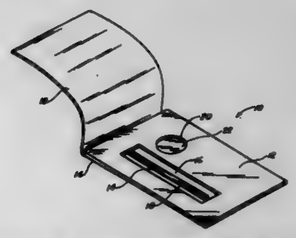
1. A thermistor airflow sensor assembly adapted to be mounted adjacent the mouth and nose of a patient for monitoring the breathing of such patient, comprising:
a) upper and lower layers of thin, flexible, resilient plastic film readily conformable to the facial curvatures of the patient, said layers being essentially identical in shape and configured to include an elongated main body strip, longitudinal end portions serving as primary mounting pads for the assembly, a first leg extending laterally form said main body strip and having an outer end adapted to be generally aligned with the mouth of the patient when the assembly is mounted, and a pair of longitudinally spaced legs having outer ends and extending laterally form said main body strip in a direction opposed to said first leg, the outer end of each of said pair of legs being aligned with the nostrils of the patient when the assembly is mounted;
b) said layers being laminated to each other over substantially their entire surfaces,
c) circuit conductors between said layers, said conductors extending to said outer ends of each of said legs and to a periphery of one of said end portions, and being adapted to be electrically connected to a monitor;
d) the outer ends of said legs of said upper layer being formed with openings below which said circuit conductors extend and are exposed;
e) thermistor means for sensing air temperature mounted in each of said openings and electrically connected to said circuit conductors, said thermistor means projecting outwardly from a surface of the upper film layer to provide exposed surfaces over which exposed air form the patient's mouth and nose can pass;
f) an electrically insulative coating over the exposed surfaces of said thermistor means for electrically isolating said thermistor means and said circuit conductors from said patient, whereby
said thermistor means detects the temperature of ambient and expired air and transmits signals through said circuit conductors indicative of such temperatures.

5,190,049

SYSTEM FOR OBTAINING BLOOD SAMPLES AND SUBMITTING FOR TESTING OF AIDS

David Briggs; Brenda Briggs; David J. Bourgeois, all of 4400 Trenton, Suite "G" , Metairie, La. 70006; Kent Leger, 1221 Amelia St., New Orleans, La. 70115, and James W. Briggs, 4400 Trenton, Suite "G" , Metairie, La. 70006

Continuation of Ser. No. 258,780, Oct. 18, 1988, Pat. No. 4,979,515, which is a continuation of Ser. No. 51,947, May 20, 1987, Pat. No. 4,777,964, which is a continuation of Ser. No. 815,535, Jan. 2, 1986, abandoned. This application Jun. 21, 1990, Ser. No. 524,847
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—760 **3 Claims**



1. A method for having a person collect his own blood specimen and submit the specimen for subsequent analysis for bacterial, viral or chemical components in the blood specimen, the method comprising the following steps:
a) providing a blood collection kit, the kit including at least means for pricking one's skin for drawing blood, blood-receiving means for receiving blood drawn therefrom, and sealing means contained in the collection kit to seal the blood-receiving means containing one's blood, at least the blood-receiving means being removable from the rest of the kit;
b) pricking one's finger to draw blood;
c) introducing a quantity of one's blood into the blood-receiving means in an amount sufficient to conduct blood tests on the quantity of blood;

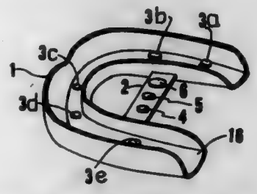
d) sealing the blood-receiving means containing the quantity of blood;
e) returning the sealed blood-receiving means containing one blood to the rest of the blood collection kit; and
f) sealing the blood collection kit and forwarding the blood collection kit containing the blood specimen to a laboratory for analysis.

5,190,050
TIP DEFLECTABLE STEERABLE CATHETER
Ray Nitzsche, Edison, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.
Filed Nov. 8, 1991, Ser. No. 790,225
Int. Cl.[5] A61M *25/00*
U.S. Cl. 128—772 21 Claims

1. A tip-deflectable, steerable catheter comprising:
a catheter handle having a body and a collar sleeve, said collar sleeve being slidably mounted onto and for selective longitudinal sliding movement relative to said body;
an elongated catheter tube having longitudinally spaced apart proximate and distal ends, said proximal end of said catheter tube being fixedly attached to said collar sleeve of said catheter handle;
a catheter tip portion carried at said distal end of the catheter tube and having a distal end most remote from said handle;
an elongated, substantially flat planar first shim having longitudinally spaced apart proximal and distal ends and disposed within said catheter tip portion, said first shim distal end being attached to said catheter tip portion proximate said tip portion distal end, and said first shim proximal end being attached and anchored to said catheter handle body; and
an elongated, substantially flat planar second shim having longitudinally spaced apart proximal and distal ends and disposed within said catheter tip portion in face-to-face overlying abutment with said first shim, said second shim distal end being attached to said first shim distal end and said second shim proximal end abutting said distal end of the catheter tube so that longitudinal movement of said catheter tube distal end as said collar sleeve is selectively moved longitudinally toward said catheter tip portion relative to said handle body causes said proximal end of said second shim to move correspondingly longitudinally and said attachment of said first shim to said catheter handle body causes tip-deflecting curvature of said catheter tip portion in accordance with said selective longitudinal movement of said collar sleeve.

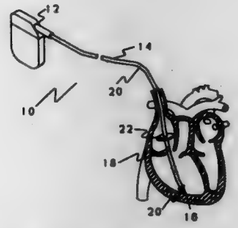
5,190,051
BRUXISM-RELAXING TRAINER
Mark J. Wilson, 23701 Mariner #212, Laiguel, Calif. 92677
Filed Apr. 12, 1990, Ser. No. 508,801
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—777 2 Claims

1. A dental appliance to be worn over the upper teeth to signal when clenching occurs comprising:
a. a flexible, tooth-conforming, U-shaped structure provided with a shelf bridging the arms of the U;
b. pressure sensitive switches arranged in said structure so as to be actuated whenever extended contact occurs between the upper and lower teeth;
c. a battery contained in said structure and fixed on said shelf;
d. a delay circuit and oscillator mounted on the shelf of said structure;
e. a sound producing means mounted on the shelf;
f. wiring interconnecting the switches and battery with the



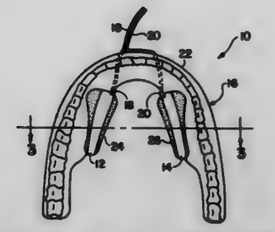
delay circuit, the oscillator and the sound producing means;
whereby, with said appliance in place in the upper mouth, clenching of the teeth will close at least one of the switches and result, after a desired delay, in an audible signal in the mouth, said signal serving to call the attention of the user to the clenching and thus help eliminate habitual clenching.

5,190,052
PACER LEAD WITH BIPOLAR ELECTRODE
Edward A. Schroeppel, Lake Jackson, Tex., assignor to Intermedics, Inc., Angleton, Tex.
Filed Nov. 21, 1990, Ser. No. 616,794
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 15 Claims



1. A lead for a therapeutic device comprising
a lead body having a proximal end, a distal end and an outside surface, said proximal end being adapted to be connected to said therapeutic device;
at least one stimulating electrode for conducting electrical pulses to a ventricle of a human heart to be stimulated, said stimulating electrode being connected electrically to said proximal end through said lead body,
a first sensing electrode located substantially on said outer surface of said lead body in an atrium of said human heart and connected electrically to said proximal end of said lead body;
a second sensing electrode displaced proximally from said first sensing electrode along said lead body in said atrium and connected electrically to said proximal end of said lead body; and
a flexible elastomeric sheet perforated with at least one hole attached to said lead body for supporting said second electrode outwardly from said lead body and capable of collapsing against the outer surface of the lead body.

5,190,053
METHOD AND APPARATUS FOR ELECTRICAL SUBLINGUAL STIMULATION
Jeffrey A. Meer, 7380 St. Auburn Dr., Birmingham, Mich. 48010, assignor to Jeffrey A. Meer, revocable living trust, West Bloomfield, Mich.
Filed Feb. 28, 1991, Ser. No. 662,565
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—787 20 Claims

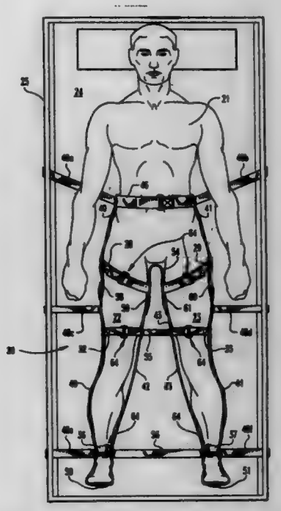


1. A sublingual electrode device for applying stimulating electrical pulses from a source thereof to a patient's genioglossus muscle to maintain upper airway patency in the treatment of sleep apnea syndrome, the device comprising:
a plurality of electrodes;
a plurality of electrical conductors, each conductor being electrically connected to a different one of the electrodes to conduct electrical pulses form the source thereof to the electrode to which each conductor is connected; and
support means for sublingually supporting the electrodes to maintain an optimally effective intra-oral, sublingual disposition of the electrodes.

5,190,054
MICROWAVE HYPERTHERMIA PROBE
Richard W. Fetter, Colgate; Peter D. Gadsby, Cedarburg, both of Wis., and Jeffrey L. Kabachinski, Boynton Beach, Fla., assignors to Labthermics Technologies, Inc., Champaign, Ill.
Division of Ser. No. 547,535, Jun. 29, 1990, Pat. No. 5,097,845, which is a division of Ser. No. 371,202, Jun. 26, 1989, abandoned, which is a division of Ser. No. 108,923, Oct. 15, 1987, Pat. No. 4,841,988. This application Jul. 26, 1991, Ser. No. 736,538
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[5] A61N *5/02*
U.S. Cl. 128—804 8 Claims

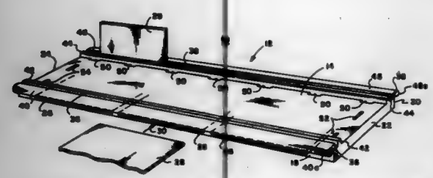
1. In a coaxial microwave probe for performing benign prostatic hyperplasia treatment by inserting said probe into a normal body opening and having a conductive inner member extending axially along the length of the probe, a dielectric material disposed about the inner member and an outer conductive member disposed about the dielectric material, said outer conductive member at least in part defining an effective heating length of the probe to provide a desired heating pattern, the improvement comprising said outer conductive member formed from a conductor wound in a helical pattern of axially varying pitch.

5,190,055
DEVICE FOR RESTRAINING A PERSON
Wayne O'Connor, 1810 E. 109th St., Indianapolis, Ind. 46280
Filed Mar. 27, 1992, Ser. No. 859,040
Int. Cl.[5] A61B *19/00*; A61F *5/37*
U.S. Cl. 128—869 17 Claims



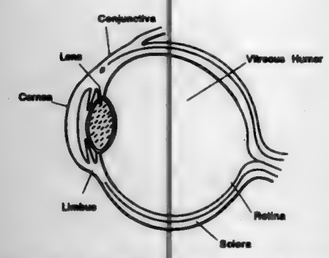
1. A soft restraint device for restraining a person to a frame, such as a bed frame or the like, comprising:
a set of at least four leg straps, comprising
(a) a left upper leg strap disposable around a left upper leg of the person;
(b) a right upper leg strap disposable around a right upper leg of the person;
(c) a left lower leg strap disposable around a left lower leg portion below a left knee of the person; and,
(d) a right lower leg strap disposable around a right lower leg portion below a right knee of the person;
a first left side longitudinal flexible strap running along the length of the person's left leg, wherein said first left side longitudinal strap is secured to said left upper leg strap and to said left lower leg strap;
a second left side longitudinal flexible strap disposable along an elongated length of the inside of the person's left leg, wherein said second left side longitudinal strap is secured to said left side upper leg strap and to said left lower leg strap, wherein said first left side longitudinal strap is disposable along the outside of the person's left leg;
a first right side longitudinal flexible strap running along the length of the person's right leg, wherein said first right side longitudinal strap is secured to said right upper leg strap and to said right lower leg strap;
a second right side longitudinal flexible strap disposable along an elongated length of the inside of the person's right leg, wherein said second right side longitudinal strap is secured to said right side upper leg strap and to said right lower leg strap, wherein said first right side longitudinal strap is disposable along the outside of the person's right leg,
wherein said left and right longitudinal straps are interconnected to form a unitary restraint device; and,
a plurality of means for securing said set of leg straps to the bed frame.

5,190,056
PORTABLE DEVICE FOR SUPPORTING AN INJURED PERSON
Michael C. Hull, 4142 Crossing Ln., Dallas, Tex. 75220
Filed Feb. 12, 1992, Ser. No. 834,488
Int. Cl.[5] A61F 5/37
U.S. Cl. 128—870 20 Claims



1. A portable device for supporting an injured person, said device comprising:
- a radiolucent board having a length sufficient to support the injured person's entire body in a supine position, said board being relatively rigid and having relatively flat, opposed top and bottom surfaces;
- at least one slot intermediate said top and bottom surfaces, said at least one slot being adapted to receive a radio-imaging plate with the plate oriented substantially parallel to said top and bottom surfaces, said at least one slot having sufficient length along said board to permit anterior/posterior radio-imaging of the injured person's entire body without having to move either the person or said board; and
- at least one groove on a top portion of said board, said at least one groove being adapted to receive a radio-imaging plate with the plate oriented substantially perpendicular to said top and bottom surfaces and having sufficient length along said board to permit lateral radio-imaging of the person's entire body without having to move either the person or said board.

5,190,057
SARFARAZI METHOD OF CLOSING A CORNEAL INCISION
Faezeh Sarfarazi, 25 Wiswall Rd., Newton Center, Mass. 02159
Filed Dec. 13, 1991, Ser. No. 807,437
Int. Cl.[5] A61F 9/00
U.S. Cl. 128—898 20 Claims

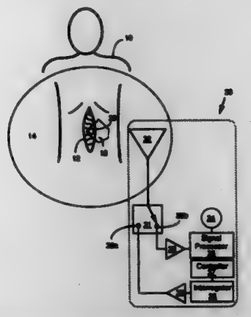


1. A method of sealing a corneal incision having edges, which comprises the steps of:
- measuring the curvature of the corneal surface;
- grasping said edges of said incision;
- aligning said edges while remeasuring, such that an undistorted surface is measured;
- applying a glue to said aligned incision; and
- immobilizing said aligned incision for a period of time sufficient to set said glue.

5,190,058
METHOD OF USING A TEMPORARY STENT CATHETER
Lee A. Jones, Minneapolis; Leanne Dittmer, Fridley; Rodney G. Wolff, Maple Grove, and Vincent Hull, Fridley, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed May 22, 1991, Ser. No. 703,975
Int. Cl.[5] A61M 29/02
U.S. Cl. 128—898 6 Claims

1. A method for providing temporary support for a blood vessel comprising the steps of:
- (a) inserting into the blood vessel a catheter having at a distal end a balloon and a stent;
- (b) inflating the balloon in the blood vessel to cause the stent to expand radially and press against the blood vessel;
- (c) locking a restriction device onto the catheter, thereby immobilizing the expanded stent in the radially expanded position;
- (d) deflating the balloon to allow blood to flow through the locked stent;
- (e) unlocking the restriction device and radially contracting the stent to disengage the stent from the blood vessel;
- (f) removing the catheter and stent from the blood vessel.

5,190,059
SURGICAL IMPLEMENT DETECTOR UTILIZING A POWERED MARKER
Carl E. Fabian, 577 NE. 96th St., Miami Shores, Fla. 33138, and Philip M. Anderson, Madison, N.J. 07940
Continuation of Ser. No. 698,199, May 6, 1991, Pat. No. 5,107,862, which is a continuation of Ser. No. 437,184, Nov. 16, 1989, abandoned. This application Mar. 25, 1992, Ser. No. 857,221
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] A61B 19/00
U.S. Cl. 128—899 5 Claims

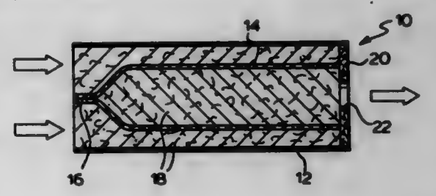


1. An apparatus for detecting a surgical implement in human or animal tissue, comprising:
- (a) a marker secured to a surgical implement adapted to be positioned within a surgical wound, said marker being battery powered and including a starting means having a receiver means for receiving a first signal and a switch connected to said battery for activating said marker;
- (b) field generating means for transmitting an electromagnetic field having a predetermined frequency band;
- (c) signal generating means activated by said starting means in response to receipt of a first signal to cause said field generating means to transmit said electromagnetic field, said electromagnetic field being a second signal that provides said marker with signal identity, and said starting means operating in response to said first signal to close said switch, connecting said signal generating means with said battery;
- (d) detection means having (i) an interrogator means for generating and transmitting said first signal to said starting means, (ii) a signal processor means for receiving said second signal and (iii) an antenna, said antenna being alternately connected to said interrogator means and said signal processor means for generating said first signal and receiving said second signal to detect said marker;
- (e) said field generating means consisting of a coil when said second signal has a frequency below 3 megahertz and comprising a single end lead when said second signal has a frequency above 3 megahertz; and
- (f) said antenna being a coil when said second signal has a frequency below 3 megahertz and comprising a single end lead when said second signal has a frequency above 3 megahertz.

5,190,060
SMOKABLE ARTICLE
Guillermo Gerding, Hamburg; Bernhard Hauser, Schenefeld; Knut Möller, Hamburg; Bernd-Henrik Müller, Hamburg; Gert Rudolph, Hamburg, and Wolfgang Wiethaup, Hamburg, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany
Filed Mar. 21, 1990, Ser. No. 496,840
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 3910899
Int. Cl.[5] A24D 1/18
U.S. Cl. 131—194 15 Claims

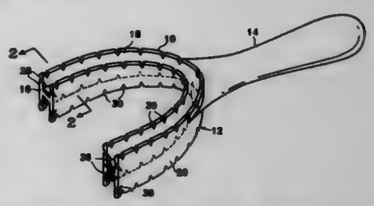
1. A smokable article having an aerosol generating zone at one end, an intermediate zone, and a mouthpiece at an end opposite the aerosol generating zone, said article comprising:
- an annular combustion element at said aerosol generating zone, and a cylindrical carrier for an aerosol precursor disposed centrally coaxially in said combustion element with a space therebetween, and connected thereto for heat transfer, said combustion element being externally surrounded coaxially by an insulating layer;
- an outer sheath surrounding said insulating layer and connecting said aerosol generating zone with said mouthpiece to form a cavity therebetween at said intermediate zone;
- wherein air flow passages are formed in said aerosol generating zone in said space between said cylindrical carrier and said combustion element extending to said cavity, said cylindrical carrier being impregnated with said aerosol precursor, such that aerosols generated by heat of said combustion element when ignited may be drawn to said mouthpiece by air passing through said air flow passages and said cavity.

5,190,061
CIGARETTE SMOKE FILTER
Warren A. Brackmann, Mississauga, Canada, and Tow P. Liew, Oux, United Kingdom, assignors to Rothmans, Benson & Hedges Inc., North York, Canada and Rothmans International Services Limited, Buckinghshire, England
Filed Apr. 19, 1991, Ser. No. 687,742
Claims priority, application United Kingdom, Apr. 20, 1990, 9008887
Int. Cl.[5] A24F 7/04
U.S. Cl. 131—332 9 Claims



1. A cigarette smoke filter element, comprising:
- an elongate cylinder of non-absorbent microfine fibers which is closed at the upstream end of the filter element in the intended direction of flow of tobacco smoke through the filter element,
- tobacco smoke filter material located both externally of said cylinder of microfine fibers, in the form of an elongate cylinder located between and in engagement with an outer filter element wrapping and the external surface of said elongate cylinder of microfine fibers, and internally of said cylinder of microfine fibers, in the form of an elongate plug in engagement with the inner surface of said elongate cylinder of microfine fibers, and
- tobacco smoke flow path blocking means located at the downstream end of said filter element in the intended direction of flow of tobacco smoke through the filter element to permit filtered tobacco smoke having an enhanced flavor-to-tar ratio to pass out of the filter element from radially internally of said elongate cylinder of microfine fibers while inhibiting filtered tobacco smoke from passing out of the filter element from radially externally of said elongate cylinder of microfine fibers.

5,190,062
PERSONAL DENTAL FLOSS HOLDER AND METHOD
David Rafaeli, 22632 Blue Fin Trail, Boca Raton, Fla. 33428
Filed Dec. 4, 1991, Ser. No. 802,317
Int. Cl.[5] A61C 15/00
U.S. Cl. 132—323 15 Claims



1. A customized dental floss holder for holding dental floss for personal dental use comprising:
- a body portion crafted for a particular individual;
- adapted to be fitted to a portion of at least one jaw of the individual;
- including floss guides positioned to place dental floss at the proper relative position between teeth selected for flossing; and

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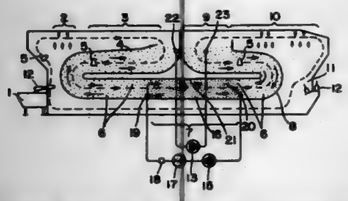
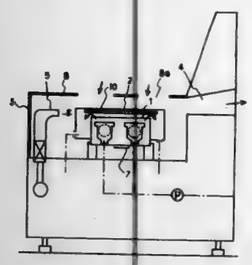
including at least one mold portion of an end of at least one of the mentioned individual's teeth.

5,190,063
MACHINES FOR WASHING BOTTLES OR THE LIKE
Antonio M. Urcola, Independencia N° 2240, Buenos Aires, Argentina
Filed Jul. 18, 1991, Ser. No. 732,048
Claims priority, application Argentina, Aug. 8, 1990, 317.564
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—60 8 Claims



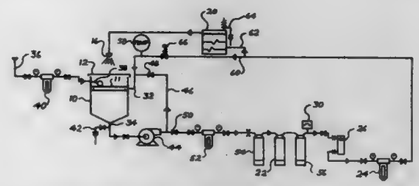
1. Washing machine for bottles which comprises: independent containers housing said bottles; a conveyor for transporting said containers with bottles in a single direction; washing means having an inlet and an outlet and including at least one bottle immersion tank containing a washing solution traversed by said conveyor; said washing means including a middle zone having washing solution heating elements, and zones before and after said heated zone constituting a single pump displacement hydraulic circuit from the outlet to the inlet; and wherein (1) countercurrent thermal exchange is established from the inlet to said heated zone between the washing solution and the conveyor for the progressive heating of the bottles, and (2) a second thermal exchange is established from the heated zone to the outlet between the conveyor and washing solution for thermal recovery of the solution and progressive cooling of the bottles.

5,190,064
APPARATUS FOR WASHING SEMICONDUCTOR MATERIALS
Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan
Filed Apr. 24, 1991, Ser. No. 690,309
Claims priority, application Japan, Apr. 30, 1990, 2-112629
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—84 5 Claims



1. Apparatus for washing semiconductor materials comprising:
- a plurality of washing tanks for semiconductor materials,
- air duct means defining blowing ports for discharging a flow of air over the plurality of washing tanks,
- suction port means disposed opposite the blowing ports to remove the air after passing over the plurality of washing tanks, and
- ionizer means mounted on at least one side of an overflow tank formed integrally with and surrounding the plurality of washing tanks to ionize air flowing over the plurality of washing tanks, wherein build-up of static charge and resultant staining of the semiconductor materials in inhibited.

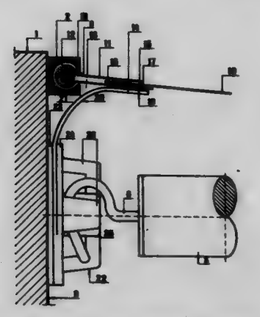
5,190,065
SELF-CONTAINED WASHING UNIT FOR PRINTED CIRCUIT BOARDS
Jimmy L. Kovac, Charlotte, and Jeffrey T. LeVie, Mt. Holly, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 29, 1991, Ser. No. 799,815
Int. Cl.[5] B08B *3/02, 13/00*
U.S. Cl. 134—107 14 Claims



1. A washing system suitable for use as a self-contained unit for cleaning flux from soldered printed circuit boards, said washing system comprising:
- a supporting platform suitable for movement from one location to another location;
- sump means located on said supporting platform for catching a fluid after it is used to wash a printed circuit board;
- a recirculating filter system, attached to said supporting platform, which removes the fluid from the sump means, removed foreign matter from the fluid, and directs the cleansed fluid back into the sump means;
- means for heating fluid; and
- means for diverting at least a portion of the recirculating fluid into said heating means, onto a printed circuit board, and into the sump means.

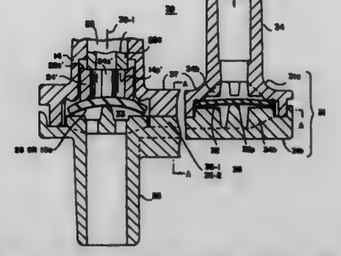
5,190,066
DEVICE FOR ATTACHMENT ONTO A TENT, AND A TENT
Knud E. Joergensen, Odense, Denmark, assignor to Trio Sport A/S, Odense, Denmark
Filed Aug. 28, 1990, Ser. No. 573,974
Claims priority, application Denmark, Aug. 31, 1989, 4304/89
Int. Cl.[5] E04H *15/08*
U.S. Cl. 135—89 11 Claims

1. An awning adapted for removable attachment onto a caravan or a similar vehicle,
- said caravan comprising an outside wall surface and a hollow profile with a longitudinal slit, said hollow profile extending along at least a portion of said wall surface,
- said awning comprising: a canvas, an edge of said canvas, at least one anchoring bracket attached to said canvas adjacent said edge, and a beading extending along said edge and adapted for insertion into said hollow profile with said canvas extending through said longitudinal slit and away from said beading, in order to removably attach said awning to said caravan, whereby said canvas when stretched in a direction generally away from said beading retained in said hollow profile may be suspended so as to extend generally away from said wall surface and along said stretching direction,
- said beading being formed by folding back and stitching together a band of fabric to define two layers, said band of fabric attached to said edge of said awning canvas to form a casing, said casing containing an elongate body constituting a core of said beading, and wherein said anchoring bracket is mounted by attachment through both layers of said band forming said casing within a narrow, essentially linear zone, said zone extending for a predetermined length and essentially parallel to said beading,



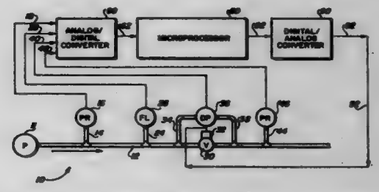
said anchoring bracket comprising: at least one anchoring eyelet, and a contact surface adapted for supporting a portion of said anchoring bracket adjacent said anchoring eyelet against said wall surface, said anchoring bracket being attached to said canvas in such a way that said contact surface may extend away from said stretching direction.

5,190,067
DIRECTIONAL FLOW CONTROL
Joseph R. Paradis, 17 Hickory Forest Dr., Hilton Head Island, S.C. 29926, and Peter N. Kotsifas, Fiskdale, Mass., assignors to Nypro, Inc., Clinton, Mass., by Peter N. Kotsifas
Continuation-in-part of Ser. No. 530,097, May 29, 1990, Pat. No. 5,070,905. This application Dec. 9, 1991, Ser. No. 804,811
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—1 19 Claims



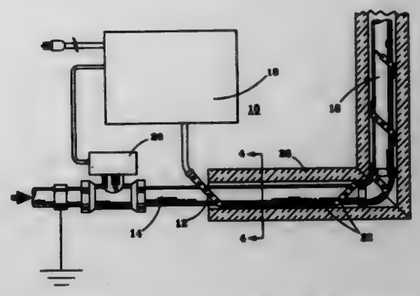
1. The method of controlling fluid flow in a device which includes the steps of:
- (1) introducing fluid into an input channel;
- (2) diverting said fluid into an output channel; and
- (3) controlling the flow of said fluid from said input channel into said output channel by applying peripheral mechanical pressure to a diaphragm which is bowed under pressure into said input channel, wherein said peripheral pressure is applied by further engaging an internal member in contact with said diaphragm by an external member after absorbing the initial engagement to compensate for tolerance variations between.

5,190,068
CONTROL APPARATUS AND METHOD FOR CONTROLLING FLUID FLOWS AND PRESSURES
Brian Phillbin, 150 E. Wagon Wheel Dr., Phoenix, Ariz. 85020
Filed Jul. 2, 1992, Ser. No. 907,797
Int. Cl.[5] G05D *7/06*
U.S. Cl. 137—8 4 Claims



3. A method of controlling a flow of fluid in a conduit comprising the steps of
- providing an adjustable valve in the conduit;
- sensing the differential pressure of the fluid flow across the valve;
- sensing the pressure of the fluid flow upstream from the valve;
- sensing the flow rate of the fluid upstream from the valve;
- comparing the flow rate of the fluid upstream from the valve to a predetermined desired flow rate;
- sensing the pressure of the fluid flow downstream from the valve;
- calculating the change in flow across the valve in response to the sensed differential pressure, the sensed upstream and downstream pressures, and the sensed flow rate;
- comparing the change in flow to the predetermined desired flow rate;
- calculating an adjustment in the valve in response to the compared flows; and
- adjusting the valve in response to the calculated adjustment.

5,190,069
APPARATUS AND METHOD FOR DETECTING LEAKS
Raymond C. Richards, R.D. 1, Box 369, Potsdam, N.Y. 13676
Filed Apr. 27, 1992, Ser. No. 874,501
Int. Cl.[5] F17D *5/06*; F16L *55/00*; G08B *21/00*
U.S. Cl. 137—312 14 Claims



1. A leak detector for use in monitoring fluid containing structures, comprising:
- a pair of spaced apart electrical conductors, electrically insulated from one another by an electrical insulating material; and
- at least one detector cell, enclosing a portion of said conductors, said detector cell having a raised cup-shaped body portion that includes a top surface spaced apart from a bottom chamber by a side wall having at least one aper-

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ture defined therein through which leaking fluid can circulate, said top surface being adapted to contact with a surface of the structure being monitored, a bottom wall of said bottom chamber being spaced a predetermined distance below said enclosed portion of said conductors, and said enclosed portion of said conductors being noninsulated to expose said enclosed portion of said conductors to leaking fluid entering said cell and accumulating in said bottom chamber;

whereby when a predetermined volume of fluid has accumulated in said chamber, said conductors are in contact with the fluid for allowing detection thereof.

5,190,070

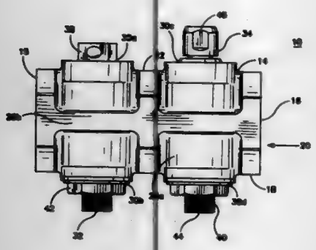
LOCKABLE GAS VALVE

Larry Robinson, 605 E. Grove St., Pomona, Calif. 91767

Filed Nov. 4, 1991, Ser. No. 787,513

Int. Cl.[5] F16K *35/00*

U.S. Cl. 137—385 **4 Claims**



1. A gas shut off valve comprising:

a housing, of essentially cylindrical shape, having a central, longitudinal bore and an outside;

a valve stem having an essentially solid cylindrical shape and a medial opening; said valve stem being pivotally mounted perpendicularly within said central, longitudinal bore so that said medial opening can be rotated from a position parallel to said central, longitudinal bore to a position transverse to said central, longitudinal bore and so that when said medial opening is parallel to said central longitudinal bore, gas flow is permitted and when said medial opening is transverse to said central, longitudinal bore gas flow is prevented;

a handle, coaxial and integral with said valve stem and projecting to said outside of said housing; said handle having an essentially cylindrical shape and wrenching flats; said handle being adapted to receive a locking collar and a key-actuated, removable lock; said locking collar having a hollow cylindrical shape; said handle being designed so that said locking collar can be slipped over said handle and so that said key-actuated, removable lock can retain said locking collar in place on said handle; said handle being designed so that, when said locking collar is locked in place over said handle by said key-actuated, removable lock, said wrenching flats are inaccessible; and

means for attachment to gas pipes.

5,190,071

PINCH VALVE ASSEMBLY

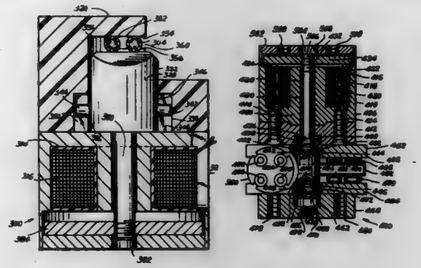
Akos Sule, 4 Gates Ave., Roseland, N.J. 07068

Division of Ser. No. 381,043, Jul. 17, 1989, Pat. No. 4,993,456, which is a continuation-in-part of Ser. No. 695,395, Jan. 28, 1985, abandoned, which is a division of Ser. No. 354,053, Mar. 2, 1982, Pat. No. 4,496,133. This application Feb. 14, 1991, Ser. No. 656,241

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] F16K *11/00*

U.S. Cl. 137—595 **9 Claims**



1. A pinch valve assembly comprising a valve body,

a solenoid housing mounted on said valve body,

a solenoid coil mounted in said solenoid housing with said solenoid coil having a central bore,

armature means disposed in said valve body,

a plunger member supported by said armature means,

guide means disposed on said valve body and disposed to guide said plunger relative to said valve body, with said guide means comprising a pin member projecting from a surface of said plunger and slideably disposed with respect to a slot formed in said valve body,

resilient tubing means disposed between said plunger and said valve body and with said armature means disposed to force said plunger against said tubing means and said tubing means against said valve body causing said tubing means to collapse and preventing flow through said tubing means when said solenoid coil is electrically energized thereby drawing said armature means toward said solenoid, said tubing means comprising a plurality of individual resilient tubes.

5,190,072

RELIEF VALVE ASSEMBLY FOR RECYCLABLE PRESSURE VESSELS

Milton B. McAnally, Charlotte, N.C., assignor to Schrader Automotive Inc., Charlotte, N.C.

Filed May 28, 1992, Ser. No. 889,191

Int. Cl.[5] F16K *17/196*

U.S. Cl. 137—454.5 **9 Claims**

1. For a recycleable pressure vessel a relief valve assembly comprising:

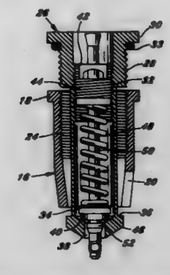
a. a tubular insert adapted to be secured in an opening in the vessel, the lower end of the insert being formed with stop means, and an internally threaded section intermediate the ends of the insert,

b. a closure subassembly including

1. a tubular valve core housing having an externally threaded section threadedly engaging the threaded section of the insert, an internally threaded section and an internal relief valve seat at the lower end of the housing,

2. retaining means associated with the outside of the housing and spaced from the threaded section of the housing at least the distance from the stop means to the upper end of the threads on the insert,

3. a valve core disposed in the housing and including a threaded tubular body engaging the internally threaded section in the housing at a position to establish relief pressure, a valve element in the lower end of the housing engaging the seat, and a spring compressively disposed between the body and the valve element,



whereby after depressurizing the vessel, the closure subassembly may be unscrewed from the insert and the subassembly will be retained loosely in the insert as the stop means engages the retaining means, the insert and housing providing a vent path therebetween, all without disturbing the position of the valve core body in the housing and the relief pressure of the valve element against its seat.

5,190,073

PRESSURE REGULATING INLET-AND-OUTLET VALVE

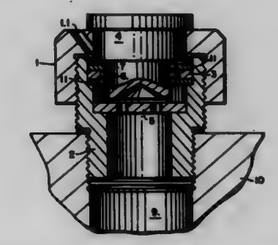
Rolf Vogt, Ofterswim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 781,782

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1991, 4100166

Int. Cl.[5] F16K *31/12*

U.S. Cl. 137—493 **7 Claims**



1. In a pressure regulating, inlet-and-outlet valve for controlling the pressure of a first fluid medium within a sealed space enclosed by a housing wall, the improvement wherein the wall is penetrated by at least one annular gap that is spanned by a magnetic field produced by magnetic field generating means and completely occupied by a second ferrofluidic liquid medium confined inside the gap by the field.

5,190,074

CHECK VALVE APPARATUS

Gilman O. Christopher, 924 W. 11th Pl., Mesa, Ariz. 85201

Filed Apr. 20, 1992, Ser. No. 871,106

Int. Cl.[5] F16K *17/168*

U.S. Cl. 137—495 **11 Claims**

1. Check valve apparatus comprising, in combination:

housing means for receiving a flow of fluid;

a primary bore in the housing means;

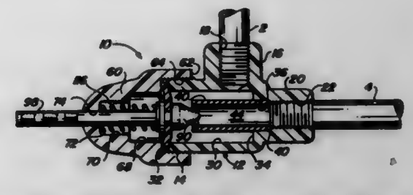
a sleeve disposed in the housing means, including

a bore communicating with the primary bore and through which fluid flows from the primary bore out of the housing means,

an outer end,

a groove in the bore adjacent to the outer end, and

an o-ring in the groove defining a valve seat; and



valve means securable to the housing means, including

a valve housing,

a valve disposed against the valve seat and movable in response to fluid pressure to move away from the valve seat to allow fluid to flow in the primary bore, and

stem means secured to the valve and extending outwardly from the valve housing for manually moving the valve away from the valve seat.

5,190,075

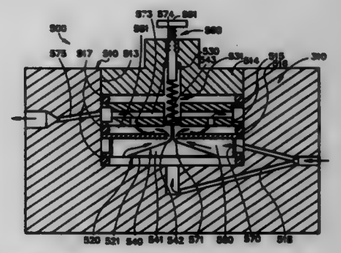
VISCOSITY-INSENSITIVE MECHANICAL FLUID FLOW REGULATOR

Michael L. Teutler, 11420 Luz Rd., San Diego, Calif. 92127, and Gerald L. Wheeler, 10390-D E. Briar Oaks, Stanton, Calif. 90680

Continuation-in-part of Ser. No. 329,433, Mar. 28, 1989, Pat. No. 5,024,105. This application Mar. 27, 1990, Ser. No. 500,007

Int. Cl.[5] G05D *7/00*

U.S. Cl. 137—501 **23 Claims**



1. A fluid flow regulator comprising:

a housing defining a channel for transporting a flowing fluid from an inlet where the fluid is at an inlet fluid pressure to an outlet where the fluid is at an outlet fluid pressure that is less than the inlet fluid pressure;

the housing's channel having a first constricted region restricting fluid flow between its inlet and its outlet, across which fluid-flow-restricting constricted region the fluid pressure incurs a first pressure drop;

the housing's channel having a second constricted region restricting fluid flow between its inlet and its outlet, across which fluid-flow-restricting constricted region the fluid pressure incurs a second pressure drop;

the sum of the first pressure drop and the second pressure drop substantially totaling a pressure drop between the inlet fluid pressure and the outlet fluid pressure;

a differential pressure sensor, located within the housing's

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channel so as to experience the first pressure drop across the channel's first constricted region, the differential pressure sensor moving in response to the first pressure drop;

wherein the differential pressure sensor is, because of its movement relative to the flowing fluid, at least slightly sensitive in such movement to fluid friction and thus to changes in fluid friction caused by changes in fluid viscosity;

a flow obstructor mechanically connected to the differential pressure sensor for moving therewith in order to variably occlude the housing's channel at its second constricted region;

wherein the flow obstructor is, because of its movement to obstruct the fluid flow at the channel's second constricted region, sensitive in such movement to fluid friction and thus to changes in fluid friction caused by changes in fluid viscosity;

a force basing means, operating between the housing and both of the mechanically-connected pressure sensor and flow obstructor, for biasing with a constant force (i) the differential pressure sensor against its movement in response to the first pressure drop, and (ii) the flow obstructor in a direction so as to less substantially obstruct the channel's second constricted region, therein to more substantially flow fluid therethrough this second constricted region at a lower second pressure drop;

wherein because the total fluid pressure drop from inlet to outlet is the sum of the first and the second pressure drops, then the movement of the flow obstructor under force of the force biasing means in the direction so as to lower the second pressure drop correspondingly raises the fist pressure drop, therein serving to move the differential pressure sensor against the biasing force in response to this raised first pressure drop until an equilibrium is reached;

wherein at equilibrium a force on the differential pressure sensor resultant from the first pressure drop will be constant, and equal to the constant force of the force biasing means minus a frictional force of the flowing fluid against the flow obstructor;

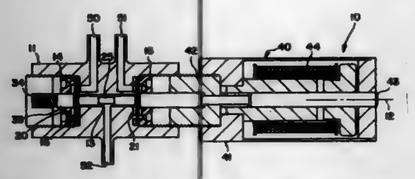
the mechanical connection of the flow obstructor to the differential pressure sensor being so that an increased fluid frictional drag force on the flow obstructor where it moves to variably occlude the housing's channel at its second constricted region acts mechanically oppositely to a change in static differential pressure on the pressure sensor due to the same increase in fluid frictional drag force, the mechanically oppositely-acting forces tending to cancel each other.

5,190,076

LOW ENERGY THREE WAY VALVE

Michael F. Klocke, 20805 Chateau Ave., Yorbalinda, Calif. 92686

Filed Nov. 7, 1991, Ser. No. 787,916
Int. Cl.[5] F16K *11/02*
U.S. Cl. 137—625.5 **9 Claims**



1. A valve having a central axis, said valve comprising a body having a first face and a second face, an axially extending passage extending from face to face, a first seat on said first face surrounding one end of said passage, a second seat on said second face surrounding the other end of said passage, said seats being axially spaced apart by a reference spacing:

a first port through said body opening on said first face outside of said first seat, a second port through said body opening on said second face outside of said second seat, and a third port through said body opening into said passage;

a first nominally planar flexible and elastic diaphragm supported by said body adjacent said first seat, and a second nominally planar flexible and elastic diaphragm supported by said body adjacent to said second seat, said diaphragms each having a sealing surface which when the diaphragm is relaxed is spaced from its respective seat, said sealing surfaces being axially spaced apart at that time by an axial control spacing, said control spacing being larger than said reference spacing;

said diaphragms and said body forming flow channels from said first and second faces to said first and second ports when the respective diaphragm is displaced from its respective seat;

a push rod in said central passage, said push rod having an axial length at least equal to said control spacing so as to remain in abutting non-adherent contact with both of said diaphragms, not secured in any way to either of said diaphragms, and having a lesser cross section configuration than said passage so as to permit fluid flow past the push rod between the ports;

force bias means mounted to said body adapted to maintain a continuing force on said first diaphragm tending to move said diaphragm against said pushrod; and

an axial plunger means so disposed and arranged so as to apply an axial force to move said second diaphragm against the push rod, and through the push rod against the first diaphragm to move said diaphragms and said push rod in opposition to said bias means, when pressed toward said second diaphragm;

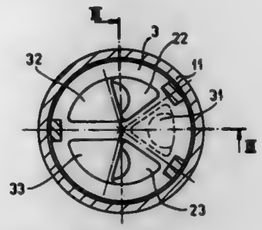
whereby the flow condition of the valve is changed as a function of pressing on or not pressing on said plunger.

5,190,077

SWITCHOVER VALVE

Manfred Paweizik, Soest, and Kerstin Polhaus, Hagen, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Oct. 25, 1991, Ser. No. 783,630
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1990, 4035838
Int. Cl.[5] F16K *11/074*
U.S. Cl. 137—625.46 **7 Claims**



1. A switchover valve comprising:

a housing having an axis;

a generally circular valve plate fixed in the housing centered on the axis, having an inner face, and formed offset from the axis with a pair of outlet ports opening at the face and an inlet port lying angularly between the outlet ports and also opening at the face, the ports being radially offset from the axis; and

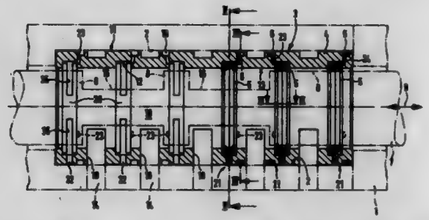
a generally circular control plate rotatable about the axis in the housing, having an inner face flatly sealingly engaging the valve-plate face, and formed offset from the axis with a pair of angularly spaced crossflow pockets opening at the face and formed between the crossflow pockets with a flat blocking part of an area greater than that of the outlet port, the control plate being movable angularly about the axis between a pair of angularly offset crossflow positions with the respective pockets overlying and forming a fluid-flow connection between the inlet port and the respective outlet ports and a blocking position with the blocking part wholly overlying the inlet port and preventing flow between the inlet and outlet ports.

5,190,078

SEALING DEVICE FOR A MULTIWAY VALVE AND A METHOD FOR THE PRODUCTION THEREOF

Kurt Stoll, Esslingen, and Siegfried Kettner, Korntal-Münchingen, both of Fed. Rep. of Germany, assignors to Festo KG, Esslingen, German Democratic Rep.

Filed Dec. 3, 1991, Ser. No. 802,057
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1991, 4101059
Int. Cl.[5] F15B *13/04*
U.S. Cl. 137—625.69 **21 Claims**



1. A sealing device for use in a multiway valve, comprising:

an elongated, hollow sleeve-like holding member having a radially outwardly facing surface and a radially inwardly facing surface, said radially inwardly facing surface having a plurality of axially spaced, circumferentially extending, radially inwardly facing holding recesses each with means defining a radially inwardly facing bottom wall therein;

a radially inwardly facing sealing element received in each radially inwardly facing recess and having, at locations whereat said sealing element contacts wall surfaces of the holding recess, a shape conforming to a shape of the wall surfaces of the holding recess, said inwardly facing sealing element having a radial part projecting radially inwardly beyond the confines of said radially inwardly facing surface; and

means defining at least one circumferentially extending empty space between said radially inwardly facing bottom wall of each said radially inwardly facing holding recess and a radially outwardly facing part of said radially inwardly facing sealing element for allowing a radial deformation of said radial part of said sealing element into each respective said holding recess.

5,190,079

FLOW CONTROL DEVICE

Tsuneo Nakada, Yamanashi, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 657,337, Feb. 15, 1991, abandoned, which is a continuation of Ser. No. 339,190, Apr. 14, 1989, abandoned. This application Aug. 20, 1991, Ser. No. 750,728
Claims priority, application Japan, Apr. 15, 1988, 63-92854; May 23, 1988, 63-126846
Int. Cl.[5] F15D *1/02*
U.S. Cl. 138—45 **8 Claims**

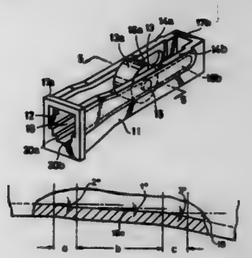
1. A flow control device with a flexible liquid supply tube mounted therein such that said flexible liquid supply tube can be squeezed by virtue of its flexibility to vary the size of a liquid flow path in said liquid supply tube, to thereby control a rate of flow of liquid through said liquid supply tube,

said flow control device comprising:

a housing having a liquid supply tube insertion channel, through which said liquid supply tube is inserted, said housing having opposite side walls which have bearing grooves therein which extend in the longitudinal direction of said liquid supply tube insertion channel, said liquid supply tube insertion channel having a bottom; and

a roller having a shaft supported in said bearing grooves such that said roller is movable along said bearing grooves and along said liquid supply tube insertion channel from one end to the other end, said liquid supply tube in said liquid supply tube insertion channel being squeezed by the periphery of said roller;

said bottom of said liquid supply tube insertion channel including at least first, second and third inclined surface portions all which are inclined with respect to said bearing grooves and which are selectively cooperative with said roller to squeeze said liquid supply tube therebetween for control of the rate of flow of liquid through said liquid supply tube,



said first inclined surface portion being inclined at a given angle and being adapted for fine adjustment of rate of flow of liquid through said liquid supply tub;

said second inclined surface portion being inclined in the same direction as said first inclined surface portion but by a greater angle than said first inclined surface portion and being adapted for a coarser adjustment of the rate of liquid flow through said liquid supply tube said second inclined surface portion terminating at one end portion thereof at one end portion of said first inclined surface portion;

said third inclined surface portion being inclined in the same direction as said first inclined surface portion but by a greater angle than said first inclined surface portion and being adapted for a coarser adjustment of the rate of liquid flow through said liquid supply tube, said third inclined surface portion terminating at one end portion thereof at another end portion of said first inclined surface portion such that said first inclined surface portion for said fine adjustment is located between said second and third inclined surface portions for said coarser adjustment; and

the length of said first inclined surface portion being grater than the lengths of said second and third inclined surface portions.

5,190,080

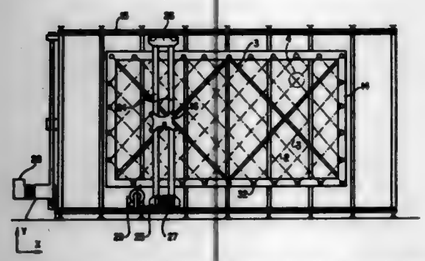
PROTECTIVE NETTING AND PROCESSES AND APPARATUS FOR THE PRODUCTION THEREOF

Fabio Peder, Laives, Italy, assignor to Esrock S.P.A., Milan, Italy

Filed Oct. 31, 1990, Ser. No. 606,839
Int. Cl.[5] B21F *27/08*
U.S. Cl. 140—92.1 **1 Claim**

1. The apparatus for the production of a protective netting comprising crossed-over cables which are connected together at their intersections, comprising:

a frame for arranging the cables in the form of netting, and an XY co-ordinate guide means, a carriage adapted to move on said guide means in mutually normal directions, and on said carriage a cable guide means for automatically laying



out at least one cable in netting form on the frame, wherein the carriage is adapted for removal of the cable guide means and fitting with a cable connecting means in place of the cable guide means.

5,190,081

DEVICE FOR TRANSFERRING FLUID FROM A BAG INTO A FLUID RESERVOIR

D. H. Winder, 25 Wendell Ave., Weston, Ontario, Canada M9W 3K6

Filed Jun. 3, 1991, Ser. No. 709,260
Int. Cl.[5] B65B *47/36*
U.S. Cl. 141—1 11 Claims

1. A method for transferring fluid from a fluid filled sealed bag having a passage therethrough to a fluid reservoir, comprising the steps of:

(a) placing said bag within a generally upstanding container having an open top and at least one side wall with a cutter therein having at a lower portion a blade which closely faces said at least one side wall and at an upper portion a guide which is free of sharp edges, said container also having fluid communication means below said blade for directing said fluid to said reservoir;

(b) lowering said bag with said guide passing through said bag passage and directing said bag to a position adjacent said blade of said cutter;

(c) pulling said bag upon said blade to cut open said bag and thereby allow said fluid to flow out of said bag;

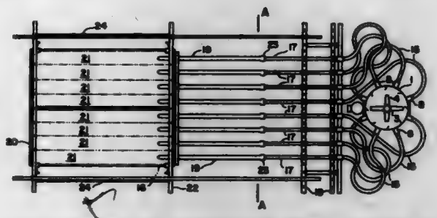
(d) draining said fluid out of said bag, through said fluid communication means to said reservoir.

5,190,082

METHOD AND APPARATUS FOR FILLING DUVETS AND THE LIKE

Julian M. Watson, Leeston, and Ian D. McFarlane, Twin Creeks, both of New Zealand, assignors to Wool Research Organization of New Zealand, Inc., Lincoln, New Zealand

Continuation-in-part of Ser. No. 423,229, Oct. 18, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 656,964
Claims priority, application New Zealand, Oct. 18, 1988, 226613
Int. Cl.[5] B65B *1/16*
U.S. Cl. 141—1 8 Claims



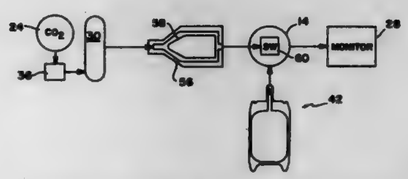
2. An apparatus for simultaneously filling a plurality of separate compartments in a duvet or the like, the apparatus including a means for holding a compartmented case of a duvet or the like in a generally horizontal plane, a main hopper drum for a supply of particulate fill material, a secondary hopper, a material handling fan for sucking the particulate fill on demand from the main hopper into said secondary hopper, means to optionally spray water onto the particulate fill material as it passes through said material handling fan, a fluidizing drum which receives said fill material from said secondary hopper and includes a plurality of outlets, a plurality of elongated hollow members, means connected to said plurality of outlets of the drum to connect a respective outlet to a respective elongated hollow member and deliver a pulsed supply of fill material thereto, the elongate hollow members and the means for holding the compartmented case being movable relative to each other so that when a fill material in the drum is fluidized and pulsed from the outlets to the hollow individual members it fills closed ends of the compartments, the hollow individual members which are initially within the compartments are gradually withdrawn as the compartments are simultaneously filled by the fill material from the elongated hollow members.

5,190,083

MULTIPLE FLUID SPACE DISPENSER AND MONITOR

Ashis S. Gupta, Marietta, and Leonard F. Antao, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 485,506, Feb. 27, 1990, abandoned. This application Oct. 3, 1991, Ser. No. 770,349
Int. Cl.[5] B65B *3/10*
U.S. Cl. 141—18 4 Claims



1. A dispensing system for use in the microgravity conditions of outer space comprising:

a plurality of fluid supply containers, at least one of said plurality of fluid supply containers being filled with a carbonated pre-mix beverage, at least one being filled with water, and at least one being filled with blood plasma;

means for cooling said plurality of fluid supply containers;

means for maintaining the carbon dioxide in said carbonated pre-mix beverage in solution;

a plurality of fluid dispensing ports, connected to respective ones of said plurality of fluid supply containers, for dispensing fluids from said microgravity dispensing system;

a plurality of portable containers selectively connectable to said plurality of fluid dispensing ports for receiving the dispensed fluids, each said container including indicia thereon for identifying the user of the container;

means, associated with said container of carbonated pre-mix beverage, for controlling a dispensing flow rate therefrom thereby preventing carbon dioxide breakout from said carbonated pre-mix beverage, said means for controlling a dispensing flow rate includes an inverted conical valve member in-line with said carbonated beverage container, whereby an increasing annular cross-section of the valve enables a cross-sectional area of product flow to increase, thereby decreasing an atmospheric pressure of the fluid and maintaining a laminar flow;

scanning means associated with each dispensing port for reading said indicia on a container connected thereto and generating an identification signal;

means for monitoring dispensed fluids according to predetermined criteria, said means for monitoring including a computerized tabulation device for determining and storing a plurality of variable including type and quantity of dispensed fluids and processing the identification signal to determine the identity of users of said dispensed fluids, and a viewing screen in close proximity to the dispensing ports for displaying said variables and identity of users; and

means for initiating a dispensing operation, said means for initiating including a switch positioned in each of said plurality of fluid dispensing ports, said switch being actuated in response to insertion of said drinking container or other types of containers into any one of said fluid dispensing ports to initiate the dispensing operation, and the actuation of said switch further initiating a tabulation routine of said means for monitoring whereby consumption history is determined for the user identified by the identification signal and displayed on said viewing screen.

5,190,084

FILLING ELEMENT FOR FILLING MACHINES FOR DISPENSING LIQUID

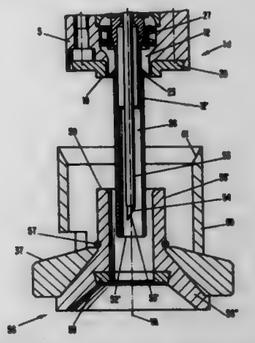
Egbert Diehl, Hackenheim; Karl Lorenz, Niederhausen; Helmut Griff, Feilbingert; Bernd Link, Dörrebach; Ludwig Clüserath, Bad Kreuznach, and Klaus Kaiser, Neu-Bamberg, all of Fed. Rep. of Germany, assignors to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft, Bad Kreuznach, Fed. Rep. of Germany

Filed May 3, 1991, Ser. No. 695,620
Claims priority, application Fed. Rep. of Germany, May 5, 1990, 4014449; Jan. 30, 1991, 4102633
Int. Cl.[5] B65B *3/26*
U.S. Cl. 141—39 16 Claims

1. A filling element for filling machines for dispensing a liquid material into containers, including: a valve seat, a liquid flow valve that is disposed in liquid passage means of said filling element and has a valve body that cooperates with said valve seat of said filling element and can be moved back and forth between a position that closes said liquid flow valve off and a position that opens said liquid flow valve; and a discharge opening that is provided on an underside of said filling element a via which, when said liquid flow valve is opened, said liquid material flows to a respective container that is to be filled; said filling element further comprising:

a gas channel that at said underside of said filling element is open to form a return gas opening for a return gas stream, whereby in this region said gas channel is concentric to a filling element axis and is surrounded by said discharge opening of said filling element; and

an electrical probe for determining filling heights of said liquid material in said containers, said probe including: a first probe element, which projects beyond said underside of said filling element and has at least one portion that is provided with at least one electrode that forms a probe contact, and a second probe element that is provided on



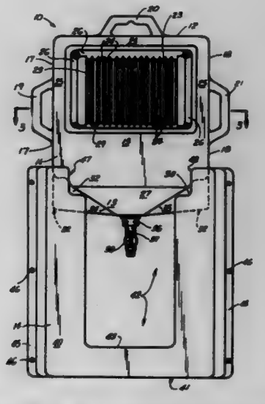
said filling element, extends in the direction of said filling element axis, and at least partially surrounds said at least one portion of said first probe element, with a lower end of said second probe element being spaced further from said underside of said filling element than is said at least one portion of said first probe element, and with said second probe element not only being axially open at said lower end thereof but also having a radially open portion in at least one side portion thereof.

5,190,085

APPARATUS FOR CHANGING AND RECYCLING VEHICLE FLUIDS

Gary Dietzen, 110 Stonewood Cir., Lafayette, La. 70508

Filed Feb. 6, 1992, Ser. No. 832,114
Int. Cl.[5] F16N *31/00*
U.S. Cl. 141—98 18 Claims

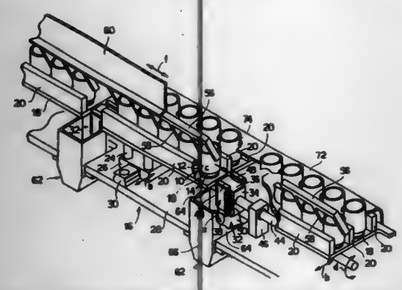


1. An engine oil change and recycle apparatus, comprising:

(a) a vessel body having an interior reservoir for containing oil drained from an engine, the body having parallel front

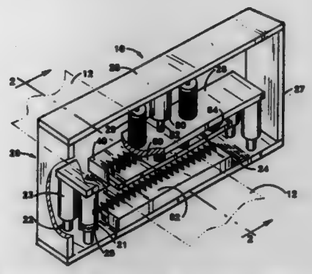
and rear surfaces on opposite sides of the interior reservoir;
(b) the vessel body having an inlet for enabling draining oil to enter the reservoir at the front surface of the vessel body when the vessel body is in a first, horizontal position such that the front surface is substantially horizontal;
(c) a base for enabling the vessel body to be supported in an upright position wherein the front and rear surfaces are generally vertical, the base having a lower portion which contacts a surface on which the base is placed and a recess means shaped to conform to the outer surface of the vessel when the vessel body is in the upright position and is placed in the recess means;
(d) an outlet member that defines a drain for emptying the reservoir when the vessel body is in the upright position;
(e) the vessel body having a closed wall portion that contains drained oil below the inlet when the vessel body is in the upright position;
(f) a valve at the outlet member for controlling flow from the reservoir;
(g) the valve being spaced a sufficient distance above the lower portion of the base when the vessel body is in the upright position and is in the recess means to enable a container to be placed under the valve when the vessel body is in the upright position and in the recess means so that the drained engine oil can be recycled into such container.

5,190,086
MEDICAMENT SUPPLY APPARATUS FOR USE IN ELUTION TESTING DEVICE
Yasunori Shimizu, Nagaokakyo, Japan, assignor to Dainippon Seiki Co., Ltd., Kyoto, Japan
Filed Aug. 12, 1991, Ser. No. 743,620
Claims priority, application Japan, Aug. 20, 1990, 2-87276[U]
Int. Cl.[5] B65B *31/00*; B67C *3/00*
U.S. Cl. 141—174 4 Claims



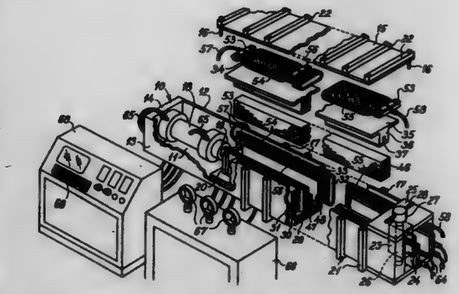
1. An apparatus for automatically supplying medicament comprising,
a base;
a plurality of medicament cups, each cup adapted to containing a measured quantity of medicament therein and having an open upper end and a lower portion to be engaged;
horizontal tables mounted on said base and having upper surfaces in alignment with each other, each table having opposing ends, one end of one table positioned adjacent an opposing end of another table in parallel relationship said plurality of medicament cups being placed in a row on each of said surfaces and slidable thereon;
guide members respectively disposed along each row of the plurality of medicament cups the end portion of a guide member on one surface being aligned with the end portion of a guide member on an adjacent surface placed on said horizontal tables, said guide members having end portions;
rotating members disposed between said ends of said horizontal tables adjacent said guide member end portions, each rotating member having a holding face in alignment with said upper surfaces and said end portions of said guide members of each respective horizontal table and having engaging means for engaging with said portion to be engaged of each medicament cup;
a horizontal support shaft which is fixed to said rotating members and supported rotatably on said base so as to turn the rotating members simultaneously within a vertical plane perpendicular to direction of the row of said medicament cups;
a turning mechanism mounted to said shaft for turning said horizontal supporting shaft;
and a direct acting means for engaging each row of said plurality of cups placed on respective horizontal tables, for sliding the medicament cups in one direction along said guide members on said upper surface of the horizontal table, whereby the plurality of medicament cups on the horizontal tables are transferred one by one from the upper surface of one table onto the holding face of each rotating member and then onto the upper surface of an adjacent table.

5,190,087
WOOD CUTTING AND SPLICING APPARATUS
Fred Mike, 12210 Hillside La., Louisville, Ky. 40299
Filed Jan. 22, 1992, Ser. No. 901,861
Int. Cl.[5] B27F *1/06*
U.S. Cl. 144—91 11 Claims



1. An apparatus for cutting and splicing sheets of wood veneer, comprising:
a support assembly for two pairs of dies and means to move the dies in a cutting and splicing relationship with each other;
a first pair of elongated dies in opposed cooperating relation, a first die being a holding die and being transversely moveable within a second die, said second die being a cutting die and being stationary in relationship with said first die;
a second pair of elongated dies in opposed cooperating relation, a third die being a holding die and being transversely moveable within a fourth die, said fourth die being a cutting die and being stationary in relationship with said third die;
said first and second pairs of dies being mounted in spaced parallel relationship, said first pair of dies being transversely moveable toward said second pair of dies;
a spacing between said first and second pairs of dies of sufficient thickness to receive at least two sheets of wood veneer material disposed in overlapping relationship therebetween; and
means to move the dies in a cutting and splicing relationship with each other.

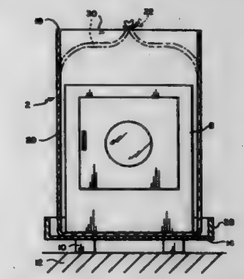
5,190,088
METHOD AND APPARATUS FOR COMPRESSING A WOOD SAMPLE
Thomas Thomassen, Jaegerspris; Jens Ljørring, Viran; and Ove Hansen, Køge, all of Denmark, assignors to Dansk Teknologisk Institut, Taastrup, Denmark
PCT No. PCT/DK90/00219, § 371 Date Oct. 15, 1991, § 102(e) Date Oct. 15, 1991, PCT Pub. No. WO91/02637, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 23, 1990, Ser. No. 768,248
Claims priority, application Denmark, Aug. 24, 1989, 4183/89
Int. Cl.[5] B27M *1/02*; B30B *1/32*
U.S. Cl. 144—361 10 Claims



1. A method of compressing an elongate wood sample substantially in the direction of the grain or the fibres of the sample, said sample comprising side surfaces and end surfaces, said method comprising
inserting the wood sample into a chamber substantially defined by side wall parts adapted for engaging and supporting the side surfaces of the sample for preventing deflection, and by a first and a second end wall part adapted for engaging respective end surfaces of the sample,
moving said first end wall part in a direction along said side wall parts and towards said second end wall part while controlling or restricting the motion of said second end wall part in order to compress the wood sample between said end wall parts, and
moving a portion of said side wall parts extending substantially in the total length of the sample together with said first end wall part in a fixed relationship, while controlling or restricting the motion of said remaining portion of the side wall parts also extending substantially in the total length of the sample so as to maintain a fixed relationship between said remaining portion of said side wall parts and said second end wall part.

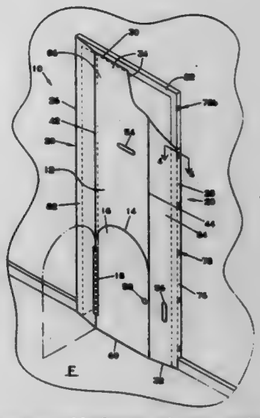
5,190,089
PROTECTIVE COLLAPSIBLE BAG ASSEMBLY FOR APPLIANCE ITEMS
Gary R. Jackson, 1656 Waterford Rd., Walworth, N.Y. 14568
Filed Dec. 9, 1991, Ser. No. 804,045
Int. Cl.[5] B65D *81/18, 65/02*
U.S. Cl. 150—165 5 Claims

1. A collapsible bag assembly for extension about an appliance item to protect it from water damage, said collapsible bag assembly comprising:
(a) a water impermeable, flexible tube of plastic sheeting having disposed at opposite ends thereof an open tube top and a closed tube bottom, and having a side wall disposed between the tube top and the tube bottom; and



(b) a water impermeable, inflexible base comprising a platform attached to the closed tube bottom, said platform being structurally capable of supporting the appliance.

5,190,090
TOY DOOR ASSEMBLY
Denise Mraz-Wasch, 9241 Highland Dr., Brecksville, Ohio 44144
Filed Jun. 18, 1991, Ser. No. 717,088
Int. Cl.[5] E06B *7/28*
U.S. Cl. 160—180 20 Claims



1. A toy door assembly for covering a portal comprising:
a. a panel member comprising opposite sides extending generally upwardly when said assembly is in use, a top side and a bottom side which extend generally horizontally when said assembly is in use and said panel member defining a doorway therein;
b. a door member;
c. a hinge connecting said door member to said panel member for opening and closing the doorway;
d. support structure integral with said panel member for supporting said door assembly and for detachably securing the assembly to a peripheral portal region when in use;
wherein said panel member comprises a first panel portion defining said doorway and said support structure further comprises a second panel portion between said first panel portion and one of said upwardly extending sides, said second panel portion disposed at an angle with respect to said first panel portion to stiffen said assembly when in use; and

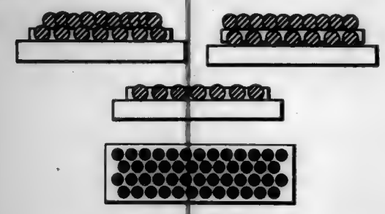
wherein said first panel portion comprises a first fold line extending parallel to said top and bottom sides, said panel member foldable along said first fold line into a storage configuration, said second panel portion foldable along a second fold line extending transversely with respect to said first fold line into the storage configuration.

5,190,091

METHOD OF IMPREGNATION OF ALUMINUM ALLOY WITH A WEAR-RESISTANT MATERIAL

Gopal S. Revankar, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Aug. 8, 1990, Ser. No. 564,185
Int. Cl.[5] B22D *19/00*
U.S. Cl. 164—97 **16 Claims**



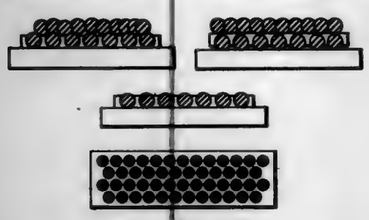
1. A method for impregnating an iron product with a hard wear-resistant material surface layer comprising:
(a) providing a pattern of particles arranged in a mesh plate;
(b) providing a sand core having a desired shape which has a first layer of adhesive on at least a portion thereof;
(c) placing a tape having a second adhesive layer onto the mesh plate so as to transfer the pattern of particles from the mesh plate onto the second adhesive layer and then placing the tape upon the first adhesive layer in a manner so as to minimize contact with the first adhesive layer;
(d) curing the first adhesive layer so as to anchor the particles to the sand core and then removing the tape; and
(e) casting an aluminum melt around the particles so as to produce an aluminum product having a wear-resistant material surface layer.

5,190,092

METHOD OF IMPREGNATION OF IRON WITH A WEAR-RESISTANT MATERIAL

Gopal S. Revankar, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Aug. 8, 1990, Ser. No. 564,184
Int. Cl.[5] B22D *19/00*
U.S. Cl. 164—97 **16 Claims**



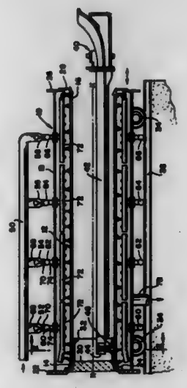
1. A method for impregnating an iron product with a hard wear-resistant material surface layer comprising:
(a) providing a pattern of particles arranged in a mesh plate;
(b) providing a sand core having a desired shape which has a first layer of adhesive on at least a portion thereof;
(c) placing a tape having a second adhesive layer onto the mesh plate so as to transfer the pattern of particles from the mesh plate onto the second adhesive layer and then placing the tape upon the first adhesive layer in a manner so as to minimize contact with the first adhesive layer;
(d) curing the first adhesive layer so as to anchor the particles to the sand core and then removing the tape; and
(e) casting an iron melt around the particles so as to produce an iron product having a wear-resistant material surface layer.

5,190,093

METHOD FOR CASTING IRON PIPE

Gene L. Oliver, Birmingham, Ala., assignor to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Dec. 13, 1991, Ser. No. 806,322
Int. Cl.[5] B22D *13/02, 13/10*
U.S. Cl. 164—118 **10 Claims**



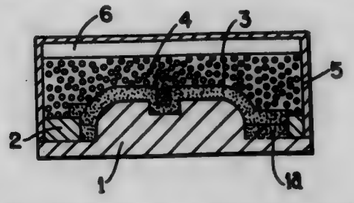
1. In a centrifugal pipe casting process in which individual metal pipes are cast in successive casting cycles in an elongated generally tubular metal mold by simultaneously rotating the mold about its longitudinal axis and moving the mold along said axis relative to a molten metal pouring trough while pouring metal from the trough into the mold progressively from one end of the mold to the other end thereof, applying cooling water onto the external surface of the mold to cool the mold and extract heat of fusion from the molten metal to solidify the pipe, extracting the solidified pipe from the mold and returning the mold to position for the next pipe casting cycle while continuing to apply cooling water to remove heat therefrom, the improvement comprising the step of discontinuing the application of cooling water to the external surface of the mold just prior to commencing pouring of molten metal into the mold, and delaying the application of cooling water to the external surface of the mold while pouring molten metal into the mold for a time to permit limited dilation of the pipe mold by heat absorbed from the molten metal to thereby reduce the tensile stress at the outer surface of the mold, and then commencing the application of cooling water to the external surface of the mold and continuing the application of cooling water until just prior to commencing the next pouring cycle.

5,190,094

HETEROPOROUS FORM TOOL FOR MANUFACTURING CASTING MOULDS AND PROCESS FOR ITS MANUFACTURE

Walter Knoess, Weissensee, Fed. Rep. of Germany, assignor to Sinterstahl GmbH, Fussen, Fed. Rep. of Germany

PCT No. PCT/EP88/00942 § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO 89/03736, PCT Pub. Date May 5, 1989
PCT Filed Oct. 20, 1988, Ser. No. 381,658
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735751
Int. Cl.[5] B22C *7/00, 23/00*
U.S. Cl. 164—159 **11 Claims**



1. A gas-permeable form tool for manufacturing casting and core moulds from hardenable moulding sand, the form tool comprising heteroporous, open-pore material, said form tool having a heteroporous wall including a first fine-pore layer region adjacent to a moulding sand to be conveyed to said form tool and hardened, by blowing reaction gas towards said moulding sand through said heteroporous wall, said first fine-pore layer being about 0.2–2 mm thick and having a material density between about 75 to 95 percent of theoretical specific density and a pore diameter of less than about 50 μm, said first fine-pore layer being in contact with a second large-pore supporting skeleton having a theoretical material density of less than 80 percent of theoretical specific density and a median pore diameter of more than about 100 μm, the boundary between said first fine-pore layer and said second large-pore layer providing a differential pressure when said form tool is charged externally with said reaction gas.

9. A process for manufacturing a form tool to be used for manufacturing a casting mould, said form tool having a heteroporous wall, comprising the following steps:
applying a first layer of a fine-grain powdered first material to a gauge mould of said casting mould said first layer being about 0.2–2 mm thick and having a material density between about 75 to 95 percent of theoretical specific density and a pore diameter of less than about 50 um;
applying by compression a coarse-grain powdered second layer as supporting skeleton having a theoretical material density of less than 80 percent of theoretical specific density and a median pore diameter of more than about 100 um, said first layer being in contact with said second layer; and
setting the wall of the form tool.

5,190,095

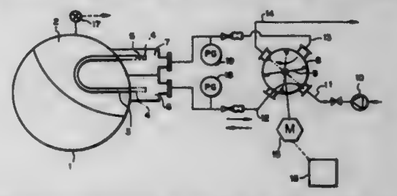
CONDENSER FOR REFRIGERATOR AND METHOD OF OPERATING THE SAME

Masakazu Fujimoto, and Toshio Osuna, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed May 21, 1992, Ser. No. 886,147
Claims priority, application Japan, May 23, 1991, 3-146614
Int. Cl.[5] F28G *1/02*
U.S. Cl. 165—1 **7 Claims**

1. A condenser for a refrigerator, having heat exchanger tubes for cooling said condenser each of which has brush receivers and cooling water inlet/outlet ports at both ends thereof, one of said brush receivers accommodating a brush for washing said tube, cooling water supply and discharge pipes which are connected to said cooling water inlet/outlet ports, respectively, through a four-way valve, and a motor for driving said four-way valve through a plurality of positions, wherein the position of said four-way valve is switchable to control the valve opening of said four-way valve for controlling the flow rate of cooling water supplied to said heat exchanger tubes, and to change the direction of flow in said heat exchanger tubes.

5. A method of operating a condenser for a refrigerator, having heat exchanger tubes for cooling said condenser each of which has brush receivers and cooling water inlet/outlet ports at both ends thereof, one of said brush receivers accommodating a brush for washing said tube, and cooling water supply



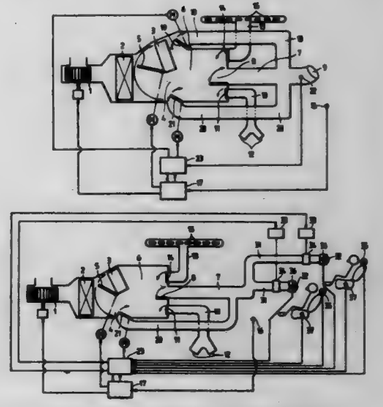
and discharge pipes which are connected to said cooling water inlet/outlet ports, respectively, through a four-way valve, wherein, when said condenser is to be cooled, the valve opening of said four-way valve is controlled on the basis of the pressure in said condenser to thereby control the flow rate of cooling water supplied to said heat exchanger tubes, whereas, when said heat exchanger tubes are to be washed, said four-way valve is switched so as to change the direction of flow in said heat exchanger tubes, thereby allowing said washing brushes to travel through said tubes automatically, and thus automatically washing the inside of said tubes.

5,190,096

CAR AIR CONDITIONING EQUIPMENT WITH TEMPERATURE VARIATION SYSTEM TO AVOID OCCUPANT BOREDOM WITH CONSTANT TEMPERATURE AIR

Yousuke Taniguchi, and Hiroshi Aoki, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

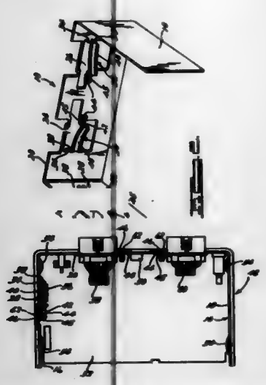
Continuation of Ser. No. 269,718, Nov. 10, 1988, abandoned. This application Dec. 3, 1990, Ser. No. 620,468
Claims priority, application Japan, Nov. 11, 1987, 62-284478
Int. Cl.[5] F25B *29/00*
U.S. Cl. 165—12 **1 Claim**



1. Car air conditioning equipment, which comprises:

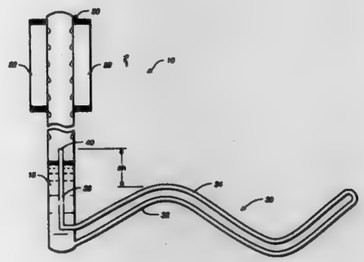
an air feeding device having means for feeding air to an interior of a car;
air outlet means for blowing air into said car interior;
a room-temperature detector means for detecting the temperature in said car interior;
a temperature detector means located in said air outlet means for detecting a temperature of air blown out from said air outlet means;
means for cooling air flow fed from said air feeding device to form a flow of cooling-air;
means for heating air flow fed from said air feeding device to form a flow of heating-air;
first air mixing means for mixing the heating-air flow and the cooling-air flow from said heating means and cooling means, respectively, in a chamber and first air path means for supplying the mixed air flow from said chamber to said air outlet means via a first air path;
temperature control means for controlling the first air mixing means based upon at least the detected car interior-temperature and a set point temperature;
at least one second air path means interconnecting said chamber from a location both downstream of said means for heating the air and downstream of said means for cooling the air to said first air path at a location adjacent to said air outlet means;
at least one second air mixing means for controlling the flow of air through said at least one second air path means;
temperature variation control means, operative when the difference between the car interior-temperature and said set point temperature becomes smaller than a predetermined value, for controlling said air feeding device to feed a substantially constant amount of air and for varying the position of said second air mixing means responsive to the detected interior-temperature and the detected blown-air temperature to produce variations of flow through said at least one second air path which, when combined with the flow through the first air path, produce the variation in discharge temperature within an upper limit and lower limit of said set temperature without substantial variation of flow through said air outlet means.

5,190,097
INTEGRATED CLAMPING DEVICE FOR COMPONENT HEATSINKING
Steven F. Selby, 10315 Temperance; Frank H. Klein, 10020 Westleigh Dr., both of Huntsville, Ala. 35803, and Dewayne E. Green, 322 Wildwood Trace, Winchester, Tenn. 37398
Filed Jun. 8, 1992, Ser. No. 894,972
Int. Cl.[5] F28F *7/00*; H02B *1/56*
U.S. Cl. 165—80.2 9 Claims



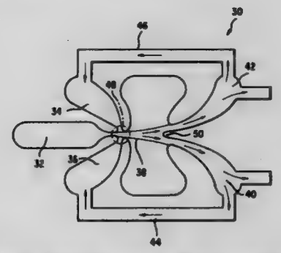
1. A heatsinking arrangement for a heat-generating component of an instrument such as a radio having a chassis, comprising a heatsink connected to said chassis, and mounting means for said component comprising an elongated clamp having one end integrally joined to said chassis and the opposite end free of said chassis, said clamp being adapted to clamp said component against said heatsink in direct surface-to-surface contact therewith, and means for securing said opposite end of said clamp to said heatsink.

5,190,098
THERMOSYPHON WITH EVAPORATOR HAVING RISING AND FALLING SECTIONS
Erwin L. Long, 5741 College Dr., Anchorage, Ak. 99504
Filed Apr. 3, 1992, Ser. No. 863,193
Int. Cl.[5] F28D *15/02*
U.S. Cl. 165—104.22 7 Claims



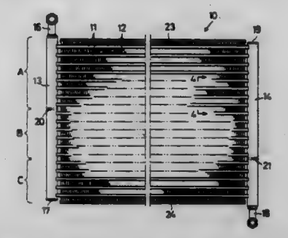
1. A thermosyphon comprising:
a sealed container having a condenser part and an evaporator part; and an easily vaporizable liquid inside said sealed container;
said evaporator part including a supply tube and a return tube, said tubes having a vertically extending section and a laterally extending section, said laterally extending section being of thermally conductive material and extending laterally from said vertically extending section to a distal point and being allowed to include both positively and negatively sloped flexible tubular sections, said tubes being in mutually liquid-communicating relationship at said distal point, said vertically extending section of said return tube having an upwardly facing opening, being inside said supply tube and having a substantially smaller cross-sectional area than said supply tube at said vertically extending section, said opening being sufficiently higher than said laterally extending part of said tubes such that the hydrostatic pressure inside said tubes causes said liquid to flow from said return tube through said distal point into said supply tube when said liquid boils inside said evaporator part.

5,190,099
PULSATILE IMPINGING COOLING SYSTEM FOR ELECTRONIC IC MODULES AND SYSTEMS USING FLUIDIC OSCILLATORS
George Mon, Potomac, Md., assignor to The United States of the America as represented by the Secretary of the Army, Washington, D.C.
Filed May 1, 1991, Ser. No. 695,145
Int. Cl.[5] H01L *23/467*
U.S. Cl. 165—104.33 5 Claims



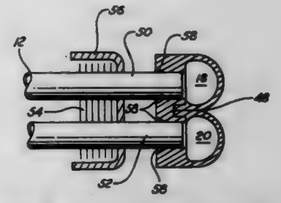
1. A pulsatile impinging cooling system comprising
a fluidic feedback oscillator to produce a pulsating flow of fluid to enhance the heat transfer process; and
at least one integrated circuit module.

5,190,100
CONDENSER FOR USE IN A CAR COOLING SYSTEM
Ryoichi Hoshino; Hironaka Sasaki, and Takayuki Yasutake, Oyamashi, Japan, assignors to Showa Aluminum Corporation, Japan
Continuation of Ser. No. 509,901, Apr. 16, 1990, Pat. No. 5,025,855, which is a division of Ser. No. 77,815, Jul. 27, 1987, Pat. No. 4,825,941. This application Mar. 19, 1991, Ser. No. 671,365
Claims priority, application Japan, Jul. 29, 1986, 61-179763; Nov. 2, 1986, 61-263138
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] F28F *13/00*
U.S. Cl. 165—146 14 Claims



1. A condenser for liquefying gaseous coolant in an air conditioning system of an automobile after the system has compressed the coolant, said condenser comprising:
(i) a plurality of flat tubular elements defining flow paths and disposed in a spaced, substantially parallel relation, each element including at least one inside wall;
(ii) a plurality of fin members, each fin member disposed between adjacent tubular elements;
(iii) a pair of headers disposed in a spaced, substantially parallel relation at opposite ends of the tubular elements, the one and/or the other header defining a coolant inlet and a coolant outlet for the condenser, each header being a substantially round, elongate member and defining, for each tubular element, an opening through which it receives the tubular element and establishes fluid communication with the element;
(iv) at least one partitioning plate mounted in one of the headers transversely of the header to divide the inside opening of the header, said plate including a first portion which extends into a slit in the header and a second portion which is generally co-extensive with the inside opening of the header;
the coolant flowing from the inlet into one header and making a first pass through a plurality of the tubes to the other header, the coolant also making a final pass through a plurality of tubes to the outlet, the tubular elements and headers forming a first zone which receives gaseous coolant from the inlet and a final zone through which the coolant flows before discharging through the outlet, the effective cross sectional area of the flow paths defined by the tubular elements through which the coolant makes the final pass being smaller than the effective cross sectional area of the flow paths of those through which the coolant makes the first pass; said condenser being able to resist internal pressures greater than 10 atmospheres.

5,190,101
HEAT EXCHANGER MANIFOLD
Ali Jalilevand, Plymouth, and Eugene E. Rhodes, Belleville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 16, 1991, Ser. No. 807,356
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—176 13 Claims



9. A manifold for a heat exchanger assembly, comprising:
a pair of hollow longitudinal fluid conduits disposed adjacent one another, each of said conduits defining a fluid conducting pathway therein, said pair of fluid conduits being formed from an extruded U-shaped channel member having a generally planar base member and a pair of vertically depending walls projecting generally perpendicularly to the plane of said base member and wherein said pair of walls have been rolled into mating contact with said base member to form said pair of fluid conduits;
a plurality of fluid conducting passageways defined in said base member, said passageways being in fluid communication with said pair of fluid conduits;
a plurality of crimped baffles formed in said pair of fluid conduits at predetermined locations; and
at least one inlet port and at least one outlet port formed in each of said fluid conduits.

5,190,102
SINTERED METAL SUBSTITUTE FOR PREPACK SCREEN AGGREGATE
Bryant A. Arterbury; James E. Spangler, both of Houston, and Thomas V. Malorzo, Dallas, all of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.
Continuation-in-part of Ser. No. 601,271, Oct. 22, 1990, Pat. No. 5,088,554. This application Dec. 16, 1991, Ser. No. 807,720
Int. Cl.[5] B01D *39/10*; E21B *43/08*
U.S. Cl. 166—228 22 Claims

9. A well screen for separating unconsolidated material out of inflowing well fluid in water, oil, gas and recovery wells, characterized by a tubular, porous body of sintered powdered

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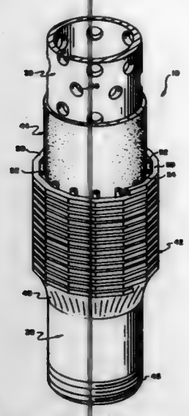
metal, the porous body of sintered powdered metal comprising compressed metal slivers having an uncompressed length in the range of from about 50 microns to about 1,400 microns.

20. A method for making a prepack sleeve for a well screen comprising the steps:

(a) producing metal slivers in average lengths in the range of from about 50 microns to about 1,400 microns;



(b) compressing the slivers to approximately 60,000 to 65,000 pounds per square inch within a mold; and,

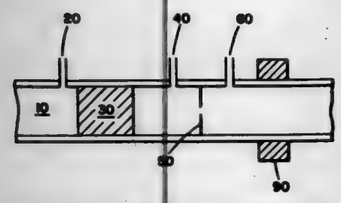
(c) sintering the compressed slivers in an oven at a temperature in the range of from about 1,600 to about 2,100 degrees Fahrenheit until the slivers become tacky and bond to each other.

5,190,103

METERING OF TWO-PHASE FLUIDS USING FLOW HOMOGENIZING DEVICES AND CHEMICALS

Suzanne Gristen, San Dimas, and Ki C. Hong, Orange, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Dec. 20, 1991, Ser. No. 811,104
Int. Cl.[5] E21B *43/24, 47/00*
U.S. Cl. 166—250 12 Claims



1. A method of metering a two-phase fluid comprising:

a) injecting a surfactant into the fluid to form a pseudo-single phase fluid, and

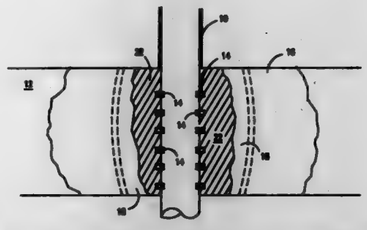
(b) metering the pseudo-single phase fluid.

5,190,104

CONSOLIDATION AGENT AND METHOD

Paul Sinn, Cranbury, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 19, 1991, Ser. No. 810,464
Int. Cl.[5] E21B *33/138*
U.S. Cl. 166—294 24 Claims



1. A sand consolidating method for an unconsolidated or loosely consolidated formation comprising:

a) perforating a cased borehole at an interval expected to produce fines or sand when producing hydrocarbonaceous fluids from said interval;

b) injecting an aqueous solution of a silicate into said interval through perforations contained in the borehole which solution is of a strength sufficient to react with an organic solvent solution of alkylpolysilicate to form a permeability retention cement where said silicate is selected from a member of the group consisting of alkali metal silicate, organoammonium silicate, or ammonium silicate;

c) injecting thereafter a spacer volume of a water-immiscible hydrocarbonaceous liquid into said zone;

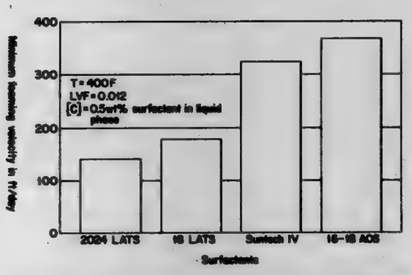
d) injecting thereafter a water-miscible organic solvent containing an alkylpolysilicate into said interval in an amount sufficient to react with the aqueous silicate so as to form a silica cement with permeability retention characteristics whereupon the interval is consolidated in a manner sufficient to prevent formation sand from being produced from the formation during the production of hydrocarbonaceous fluids.

5,190,105

METHOD FOR IMPROVING THE STEAM SPLITS IN A MULTIPLE STEAM INJECTION PROCESS

Adrian D'Souza, Richmond, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Filed Sep. 26, 1991, Ser. No. 765,821
Int. Cl.[5] E21B *36/00, 43/24*
U.S. Cl. 166—303 13 Claims



1. A method for enhancing the uniformity of steam distribution in a multiple steam injection system comprising a steam generator, a steam header, a primary steam line connecting the generator to the header, and a plurality of secondary steam lines connecting the header to at least one tertiary headers and/or steam injection wells, the method comprising:

(a) injecting the surfactant into at least one steam line, and

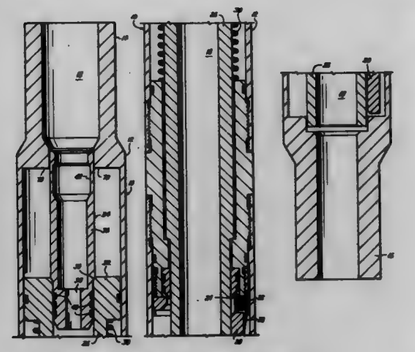
(b) mixing the surfactant and steam sufficiently so as to form a foam, wherein the surfactant is an alkyl aromatic sulfonate having at least one alkyl group having a chain length of 12 to 30 carbon atoms, wherein the at least one sulfonate which is selected has a minimum foam generation velocity for the steam temperature employed which is less than that associated with alkyl aromatic sulfonates having other chain lengths in the range and further wherein the concentration of the surfactant is about 50 to about 5000 ppm based on the total cold water equivalent of the steam flow.

5,190,106

WELL INJECTION VALVE RETRIEVABLE CHOKE

Russell A. Johnston, Alvin, Tex., assignor to Camco International Inc., Houston, Tex.

Filed Oct. 7, 1991, Ser. No. 772,515
Int. Cl.[5] E21B *43/12*
U.S. Cl. 166—322 3 Claims



1. A well fluid injection valve comprising,

a housing with a bore therethrough,

a downwardly facing valve seat in the bore,

a valve closure element positioned below the valve seat moving between an open position to a closed position on the valve seat for blocking off upward flow through the bore but allowing downward flow,

a tubular flow tube telescopically movable in the housing, and movable downwardly through the valve seat for opening the valve and movable upwardly for allowing the valve to close,

biasing means in the housing for biasing the flow tube upwardly for closing the valve,

a piston movable in the housing and connected to the flow tube and exposed to fluid in the bore,

an upwardly facing shoulder on the flow tube in the bore, and

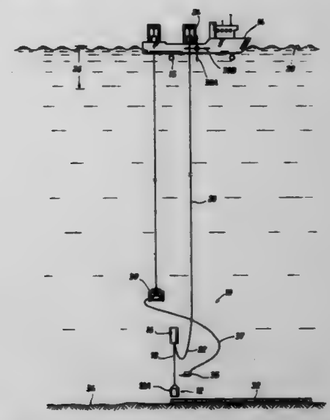
a retrievable orifice member retrievably positioned on the shoulder for providing a force for opening the valve when fluid is injected downwardly through the bore.

5,190,107

HEAVE COMPENSATED SUPPORT SYSTEM FOR POSITIONING SUBSEA WORK PACKAGES

Carl G. Langner, Spring, and Franz Kopp, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 690,208, Apr. 23, 1991. This application Mar. 13, 1992, Ser. No. 853,332
Int. Cl.[5] E21B *7/12*
U.S. Cl. 166—355 18 Claims



1. A heave compensating support system for positioning a subsea work package from a surface vessel, said system comprising:

a subsurface buoy;

a lift line connecting the subsea work package to the subsurface buoy; and

a compensating lift line having a catenary loop below the subsurface buoy, the compensating lift line being supported by the subsurface buoy on one end and connected to the surface vessel on the other end, the subsea work package, subsurface buoy, lift line and compensating lift line cooperating to establish a natural frequency for the suspended subsea work package which is materially different from the average wave frequency acting on the surface vessel.

5,190,108

METHOD AND APPARATUS FOR INHIBITING BIOLOGICAL FOULING OF WATER WELLS

Neil Mansuy, Kansas City, Mo., assignor to Layne-Western Company, Inc., Shawnee Mission, Kans.

Filed Aug. 19, 1991, Ser. No. 746,695
Int. Cl.[5] E21B *43/12*
U.S. Cl. 166—371 15 Claims

1. A method of controlling biological fouling of a water well bored down to a water table, said method comprising the steps of:

sealing the well at a preselected location therein; providing a source of anoxic gas at a location out of the well and above the surface; extending a gas supply conduit from said source down into the well to a location below said preselected location near the water table with said conduit having a single outlet located near the water table; and conveying the gas from the source and through the supply conduit at a positive pressure to displace air from the well and replace the air with said anoxic gas to inhibit aerobic bacteria growth.

10. Apparatus for controlling biological fouling of a water well having a well casing extending in the well and a submers-

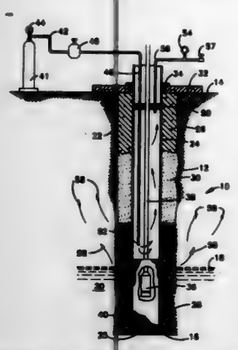
UMI

ible pump in the well immersed in water for pumping water to the surface through a water pipe, said apparatus comprising:

a source of anoxic gas located outside the well at the surface;

means for sealing the well casing at a selected location near the surface; and

a gas supply conduit communicating with said gas source to receive the gas therefrom and extending through said seal



means down into the well casing, said supply conduit having a single outlet at a discharge end thereof located in the well near the water for applying the gas to the well casing to displace air from the well casing and thereby impede aerobic bacteria development while making use of the well casing to provide access to the well for said pump, water pipe and gas supply conduit.

5,190,109

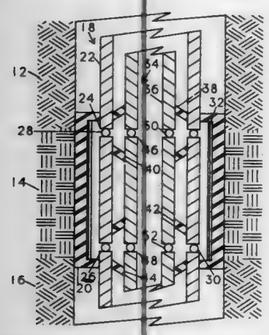
METHOD AND APPARATUS FOR ISOLATING WELL BORES USING EXTERNAL PACKERS

Carlos W. Pardo, Missouri City, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 4, 1991, Ser. No. 770,815

Int. Cl.[5] E21B *33/127*

U.S. Cl. 166—387 **8 Claims**



1. An improved external packer for well bores comprising:

a pipe member having at least one annular expandable packing member externally mounted thereon;

aperture means communicating between the interior of said pipe and the interior of each said at least one packing member;

isolation tool means to deliver a resin to each said respective at least one packing member; and

activator means prepositioned within each said at least one packing member whereby introduction of said resin to each said respective at least one packing member causes said packing member to expand and consolidate with the packing member inflated tightly against the walls of said well bore.

6. A method for inflating an expandable sealing member of an external well bore packer comprising:

providing a pipe member with at least one annular external expandable packing member;

providing aperture means between said pipe member and each said at least one expandable packing member;

providing prepositioned within each said at least one expandable member a material which will activate a resin;

providing means to deliver resin to each said at least one expandable member; and

delivering said resin to each said at least one expandable member whereby said resin will be expanded to inflate said member into sealing engagement with the well bore.

5,190,110

USE OF AN AQUEOUS SWOLLEN MACROMOLECULE-CONTAINING SYSTEM AS WATER FOR FIRE FIGHTING

Hubert von Blücher, Freytagstrasse 45, D-4000 Duesseldorf; Hasso von Blücher, Columbusstrasse 58, D-4000 Duesseldorf 1, and Ernest de Ruiter, Hoebenstrasse 57a, D-5090 Leverkusen 3, all of Fed. Rep. of Germany

Continuation of Ser. No. 708,082, May 24, 1991, abandoned, which is a continuation of Ser. No. 541,162, Jun. 20, 1990, abandoned, which is a continuation of Ser. No. 855,196, Apr. 23, 1986, abandoned. This application Nov. 18, 1991, Ser. No. 794,786

Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515865

Int. Cl.[5] A62C *2/00*; **A62D** *1/00*; **B27N** *9/00*

U.S. Cl. 169—46 **12 Claims**

1. In the fighting of fires for protection of objects from fire by applying thereto water, the improvement which comprises dispersing in the water particles of a cross-linked water-insoluble but highly water-swellable acrylic acid derivative polymer in an amount insufficient to bring the viscosity above 100 mPa's, the particles being present in an amount such that after swelling the swollen particles hold 50 to 80% by weight of the total water.

5,190,111

HITCH POSITIONING WITH SLIP OVERRIDE CONTROL AND CALIBRATED WHEEL SPEED FOR DETERMINING SLIP

Steven C. Young, Lancaster; Bradley A. Nielsen, New Holland, both of Pa.; James W. Macqueene, Willowbrook, and Garrett E. Swierenga, Westmont, both of Ill., assignors to Ford New Holland, Inc., New Holland, Pa.

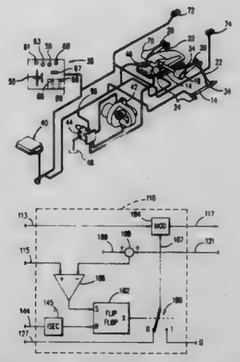
Filed Jun. 3, 1991, Ser. No. 709,237

Int. Cl.[5] A01B *63/112*

U.S. Cl. 172—7 **20 Claims**

1. In a system having a hitch mounted on a tractor, means responsive to a position command for generating a position signal for positioning the hitch, modifier means for modifying the position signal in accordance with a degree of slip of the tractor wheels, slip signal generating means for generating a slip signal corresponding to the degree of wheel slip, the slip signal generating means including a sensor for sensing the rate of rotation of the tractor wheels, and a radar unit mounted at a side of the tractor for sensing true ground speed, the improvement comprising:

slip signal control means for selectively applying said slip signal to said modifier means, said slip signal control means including means for preventing application of the slip signal to the modifier means when the position command commands positioning of the hitch higher than a threshold height.



5,190,112

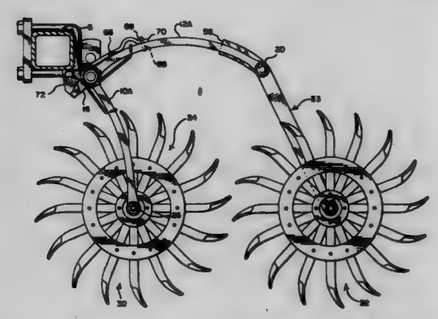
ROTARY HOE EXTENSION

Mark Johnston, McComb, and Patrick T. Whalen, Colchester, both of Ill., assignors to Yetter Manufacturing Company, Colchester, Ill.

Filed Oct. 4, 1991, Ser. No. 771,232

Int. Cl.[5] A01B *35/28*

U.S. Cl. 172—245 **19 Claims**



11. A rotary hoe arrangement including a tool bar; a plurality of support arms, each support arm connected to and supported by said tool bar with a first set of support arms, each arm in said first set having an axis at a lower end thereof, each of said axes of said first set being aligned with other axes of said first set; a second set of support arms, each arm of said second set disposed between a pair of arms in said first set, each of said arms in said second set having a length greater than the length of the arms of said first set, the arms of said second set each having an axis at a lower end thereof, each of said axes of said second set being aligned with each other and spaced from the axes of said first set; and a plurality of rotary hoe wheels, each wheel rotatable about the axis of a first or second support arm, wherein the effective length of said support arms of the second set exceed the length of said support arms of the first set a sufficient distance such that the axes of mounting of adjacent hoe wheels are offset in the direction of hoe travel an amount greater than the diameter of the hoe wheels thereby assuring no overlap of the rotary path of adjacent hoe wheels.

5,190,113

REAMER

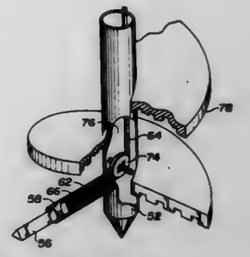
Mike Hawrylak, General Delivery, Corey, Alberta, Canada T0A 2E0

Filed Aug. 19, 1991, Ser. No. 746,898

Claims priority, application Canada, Nov. 13, 1990, 2029733

Int. Cl.[5] E21B *10/32, 17/07*

U.S. Cl. 175—18 **2 Claims**



1. An ice reamer, comprising:

a. an elongate tubular body having a first end, a second end, and a spiral cutting edge which extends between the first end and the second end such that the elongate body functions as an auger;

b. a tubular sleeve secured to the first end of the elongate body and extending outwardly at an angle from the elongate body for a distance which is less than the width of the spiral cutting edge;

c. a single blade disposed within the tubular sleeve, the blade being movable between an extended position wherein the blade extends radially at an angle from the tubular sleeve and a retracted position wherein the blade is drawn within the tubular sleeve;

d. means at the second end of the elongate body, whereby the elongate body may be inserted through a hole with the blade in the retracted position and then rotated to ream a remote end of the hole with the blade in the extended position;

e. biasing means biasing the blade toward an extended position; and

f. a cable extending through the elongate tubular body and secured between the blade and a lever at the second end of the elongate body such that by manipulation of the lever a force is exerted upon the blade to overcome the biasing of the biasing means thereby moving the blade from the extended position to the retracted position.

5,190,114

FLOW PULSING APPARATUS FOR DRILL STRING

Bruno H. Walter, Edmonton, Canada, assignor to Intech International Inc., Edmonton, Canada

Continuation of Ser. No. 645,146, Jan. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 436,603, Nov. 15, 1989, Pat. No. 5,009,272. This application Oct. 23, 1991, Ser. No. 781,760

Claims priority, application Canada, Nov. 25, 1988, 584145; Jun. 22, 1989, 603594

Int. Cl.[5] E21B *7/18, 7/24, 4/14, 31/113*

U.S. Cl. 175—56 **21 Claims**

1. A liquid flow pulsing apparatus including a housing having means providing a passage for a flow of liquid and means for periodically restricting the flow through said passage to create pulsations in the flow and a cyclical water-hammer effect to vibrate the housing during use, said means for periodically restricting the flow including a constriction means in the passage to accelerate the flow to a higher velocity and a first passage region through which the accelerated higher velocity liquid flows followed by a downstream passage region adapted to provide for a reduced liquid velocity, and a movably

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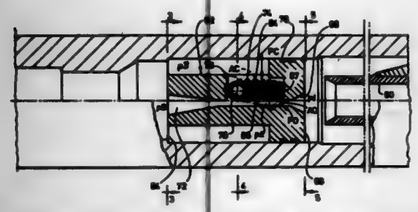
mounted control means exposed in use to the liquid pressures associated with said first passage region and to the liquid pressures associated with said downstream passage region and adapted to move between a first generally full-flow position and a second flow restricting position in said first passage region by virtue of alternating differential liquid pressure forces associated with said first passage region and said downstream passage region and acting on said control means during use, and wherein said housing is arranged such that said mov-



ably mounted control means has one surface portion exposed to the liquid flow in said first passage region and a generally opposing surface position in communication with the liquid pressure existing in said downstream passage region, such that said control means tends to be moved rapidly in a cyclical fashion between the first and second positions by virtue of said alternating differential pressure forces which arise from liquid flow induced pressure effects and water hammer effects acting on said control means during use.

5,190,115

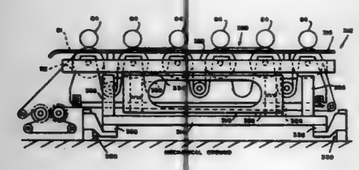
MODULAR MAILING MACHINE WITH LOAD CELL SCALE

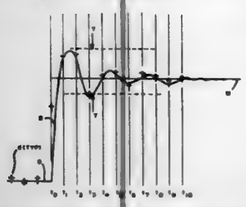
Donald T. Dolan, Ridgefield; Robert T. Durst, Jr., Fairfield; Seymour Feinland, Stamford; Gerald C. Freeman, Norwalk, and Morton Silverberg, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 575,021, Aug. 30, 1990, Pat. No. 5,082,072. This application Sep. 27, 1991, Ser. No. 768,143

Int. Cl.[5] G01G *19/40, 23/10*

U.S. Cl. 177—25.15 **20 Claims**





1. A mailing machine having a plurality of modules, each of said modules to form a single process station having a single registration area for receiving an envelope, wherein said modules include:

a) a scale module including support means for supporting said envelope, said support means forming a part of said registration area, for weighing said envelope on said support means;

b) a transport module for positioning said envelope in said registration area of said process station and for ejecting said envelope from said process station;

c) a meter module including printing means for imprinting an indicia representative of a postage amount on said envelope while said envelope is in said registration area; and

d) a platen module having means for causing said envelope to contact said printing means while said envelope is in said registration area; wherein

e) said modules each operate in a manner generally functionally independent of any other module and does not interfere with the operation of any other module, and said modules perform their respective function with respect to said envelope while said envelope is at said process station; and wherein further,

f) said scale module further comprises:

f1) transducer means for generating a series of signals representative of the instantaneous response of said support means; and,

f2) processing means responsive to said transducer signals for:

f2.1) detecting the presence of said envelope on said support means;

f2.2) examining all subsequent sequences of said transducer signals having a first length to determine the difference between the maximum and minimum values for each of said first length sequences; and

f2.3) for the first of said first length sequences of which said difference is less than a predetermined threshold, determining a first estimate for said weight as the average of said values, except for the first value, comprising said first length sequence; then

f2.4) if said first estimate is not within a predetermined distance of a breakpoint of a selected postal rate chart using said first estimate to determine said postage amount in accordance with said postal rate chart; and

f2.5) if said first estimate is within said predetermined distance, examining additional sequences of said transducer signals to make a second, more accurate estimate, and using said second estimate to determine said postage amount in accordance with said postal rate chart.

5,190,116

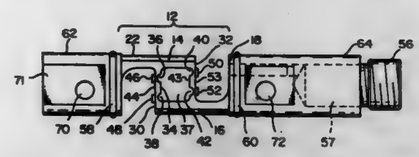
DEFLECTION TRANSDUCER FOR MEASURING VEHICLE LOADS AND A SYSTEM FOR MOUNTING SAME

Keith W. Reichow, Renton, Wash., assignor to Stress-Tek, Inc., Renton, Wash.

Division of Ser. No. 479,842, Feb. 13, 1990, abandoned. This application Oct. 18, 1991, Ser. No. 778,707

Int. Cl.[5] G01G *3/14;* **G01L** *1/22;* **G01B** *7/16*

U.S. Cl. 177—211 **12 Claims**



1. A transducer for measuring vehicle loads, comprising:

two rigid, substantially parallel, spaced-apart beam members, extending toward and overlapping each other from opposing end element portions thereof in a longitudinal direction of the transducer;

at least two flexure members, having flexure portions, said flexure members extending between and attached to said rigid beam members, spaced apart in the longitudinal direction of the transducer, said flexure members being sensitive to axial tension and compression forces but relatively insensitive to twisting forces; and

strain sensing means secured to said flexure members in the vicinity of the flexure portions thereof, providing an electrical signal output corresponding to the axial deflection of the flexure members and hence an indication of the load on the vehicle.

5,190,117

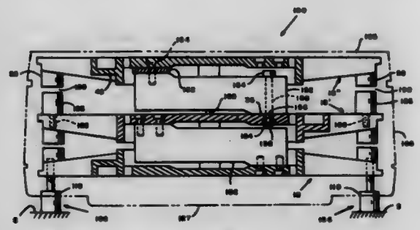
LOAD CELL SUPPORTING MEMBER AND WEIGHING SCALE INCORPORATING THE SAME

Gerald C. Freeman, Norwalk, and Norman Lilly, Stratford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 551,374, Jul. 11, 1990, Pat. No. 5,072,799. This application Aug. 15, 1991, Ser. No. 774,004

Int. Cl.[5] G01G *21/28, 3/14*

U.S. Cl. 177—244 **5 Claims**



1. A weighing scale comprising:

(a) a first load cell supporting member;

(b) a first load cell supported by said first load cell supporting member;

(c) a second load cell supporting member supported by said first load cell;

(d) a second load cell supported by said second load cell supporting member;

(e) a platform supporting member supported by said second load cell;

(f) said first load cell supporting member, said second load cell supporting member and said platform supporting member all being substantially identical; and wherein

(g) each of said supporting members comprises:

(i) a central portion having means for protecting one of said load cells from excessive loading; and

(ii) a plurality of arms extending radially from said central portion.

5,190,118

AUXILIARY POWER TRAIN AND STEERING SYSTEM FOR A VEHICLE

James E. Yelton, P.O. Box 5613, Eugene, Oreg. 97405

Filed Nov. 1, 1991, Ser. No. 786,587

Int. Cl.[5] B60K *25/06, 26/00*

U.S. Cl. 180—53.2 **3 Claims**

1. An auxiliary power train and an auxiliary steering system for a truck to enable positioning of the truck by an operator located adjacent the truck, said auxiliary power train and auxiliary steering system comprising,

an engine,

a transmission driven by said engine, said transmission including a power take off,

a differential including an auxiliary drive shaft,

a hydraulic pump coupled to said power take off,

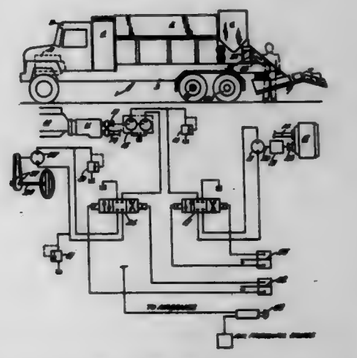
a first hydraulic motor,

gear reduction means coupling said first hydraulic motor to the auxiliary drive shaft of the differential,

a second hydraulic motor,

means coupling said second hydraulic motor to a steering component of the truck,

first and second solenoid actuated valve means for controlling fluid flows from said hydraulic pump to said first and second hydraulic motors for powering the truck differential and said steering component of the truck,



electrical controls in circuit with said first and second solenoid valves, said electrical controls located at a rearward location on the vehicle and accessible to an operator stationed adjacent the vehicle, and

truck brake control means located at said rearward location.

5,190,119

HYDRAULIC POWER STEERING DEVICE RESPONSIVE TO SPEED OF VEHICLE

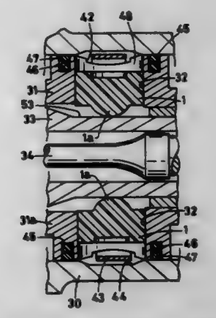
Keiji Nomura, Nara; Katsutoshi Nishimura, Osaka; Kazunori Okamoto, Osaka; Tomoharu Horiuchi, Osaka; Masayuki Watanabe, Kyoto; Hirohisa Nakao, Osaka, and Masahiko Noguchi, Osaka, all of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Mar. 25, 1991, Ser. No. 674,115

Claims priority, application Japan, Apr. 16, 1990, 2-40450[U]; Nov. 7, 1990, 2-117582[U]; Nov. 9, 1990, 2-117788[U]

Int. Cl.[5] B62D *5/06*

U.S. Cl. 180—132 **8 Claims**



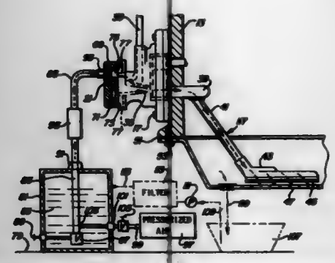
1. A hydraulic power steering device responsive to the speed of a vehicle comprising:

a housing;

an output shaft disposed in the housing, the output shaft having an inner peripheral surface defining a hole in the output shaft;

an input shaft disposed in the housing band being coaxial with the output shaft;
a torsion bar provided between the output shaft and the input shaft;
a control valve provided around the input shaft for controlling the amount of pressure oil to be supplied from a hydraulic pump to a power cylinder in accordance with the torsion of the torsion bar; and
plungers made entirely of a synthetic resin, each plunger being slidably fitted in said hole-defining inner peripheral surface of the output shaft so that at least a portion of each plunger is slidably in contact with the inner hole-defining peripheral surface of the output shaft and each plunger has a forward end adapted to be pressed against the input shaft by oil pressure in accordance with the vehicle speed to obtain a reaction.

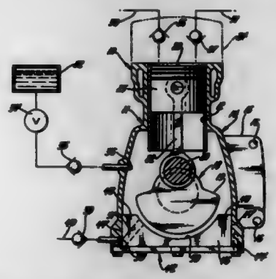
5,190,120
FLUSHING APPARATUS FOR VEHICLE OIL PUMP PICKUP TUBE AND SCREEN
Dion M. Watts, 11649 Faust, Detroit, Mich. 48228
Filed Jun. 3, 1991, Ser. No. 709,325
Int. Cl.[5] F16N *33/00*
U.S. Cl. 184—1.5 **8 Claims**



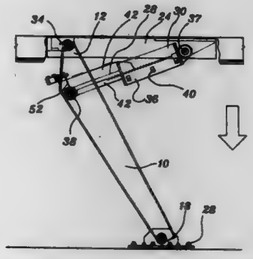
1. In combination a vehicle engine having a crankcase and a pan with a drain plug at its bottom;
an oil pump mounted on said crankcase having an inlet and an outlet;
a filter mount boss on said oil pump;
a pickup tube in said crankcase at one end connected to said oil pump inlet and at its other end having an intake adjacent the bottom of said pan;
a screen retained within said intake;
a reservoir containing a flushing fluid;
an outlet pipe extending from said reservoir and communicating with said fluid;
an air pressure source connected to said outlet pipe for pressurizing said flushing fluid; and
an adapter means on said outlet pipe supported upon said mount boss connecting said outlet pipe to said pump outlet;
whereby flushing fluid under pressure passes through said adapter means and successively through said pump outlet and inlet, through said pickup tube and through said intake screen to flush out impurities therein.

5,190,121
TWO PHASE COMPRESSOR LUBRICATION
Gregory L. Muzyk, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 31, 1991, Ser. No. 786,312
Int. Cl.[5] F01M *1/04*
U.S. Cl. 184—6.5 **6 Claims**

1. Two phase oil lubrication means for a reciprocating piston machine having a crankcase, a cylinder and associated mechanism rotatable within a closely surrounding imaginary envelope within the crankcase, said lubrication means comprising a mist system arranged to supply oil mist to the crankcase for lubricating the mechanism when in operation,
a splash pocket formed by a recess in a bottom wall of the crankcase for collecting oil between operating periods, the pocket having a surface below and conforming approximately with a lower portion of such envelope of the rotatable mechanism such that the mechanism splashes collected oil from the splash pocket during operation, and
a drain system communicating with an upper portion of the splash pocket for draining excess oil from the bottom of the crankcase.

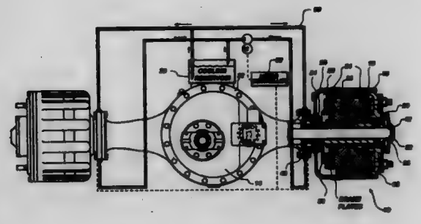


5,190,122
SAFETY INTERLOCK SYSTEM
Robert H. Fletcher, Glenwood, N.J., and James Myers, Oakridge, Tenn., assignors to Advantage Lift Systems, Inc., San Diego, Calif.
Filed Sep. 12, 1991, Ser. No. 758,118
Int. Cl.[5] B66F *7/00*
U.S. Cl. 187—8.5 **8 Claims**



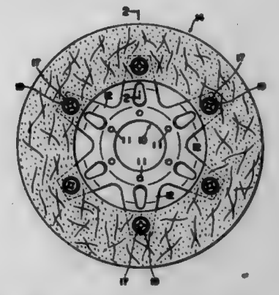
1. A safety system for use with an expansible hydraulic power element comprising a piston and cylinder, the piston pivotally connected to a support leg, of a vehicle lift system and such cylinder, pivotally connected to a lifting platform, the safety system comprising:
(a) lower locking means secured to a housing of said piston, said lower locking means having a continuous negative rake sinusoidal locking surface (NRSLS); and
(b) upper locking means securable within the path of travel of said NRSLS of said lower locking means, said upper locking means having a continuous negative rake sinusoidal surface proportioned for selectable interlock with said NRSLS surface of said lower locking means.

5,190,123
DIRECT DRIVE AXLE BRAKE AND COOLING SYSTEM
Dusan J. Hvolka, Salt Lake City, Utah, assignor to Cannon Engineering Technologies, Inc., Utah
Filed Jul. 1, 1991, Ser. No. 724,188
Int. Cl.[5] F16D *55/02*
U.S. Cl. 188—71.6 **16 Claims**



1. A direct drive self cooling hydraulic brake system for an axle system having an axle shaft with a splined end operably associated with an hydraulic drive unit and another end operably associated with a wheel end and wheel hub, comprising:
i. a coolant reservoir filled with hydraulic fluid,
ii. at least one hydraulically activated axle wheel brake component having
a. a brake housing with exterior walls journal mounted to the axle shaft proximate the wheel end, said brake housing having hydraulic drive passages, and coolant circulation passages,
b. a corresponding wheel hub brake casing with interior walls attached to the axle shaft and structured to surround and encase the brake housing such that the interior walls of the wheel hub brake casing rotate in passing registration with the exterior walls of said brake housing, said casing interior walls defining a hub reservoir surrounding and encasing the brake components, and in communication with the circulation passages to deliver and withdraw hydraulic fluids,
c. a plurality of stator brake discs radially spaced around the exterior walls of the brake housing,
d. a plurality of corresponding rotor brake discs attached to the interior walls of the brake casing and operably associated with the hydraulic drive passages to be axially displaced by increased pressure in the drive passages, and structured to engage the stator brake discs, when displaced;
iii. pressure control activation means operably associated with the hydraulic drive passages associated with the rotor brake discs to selectively axially displace said rotor brake discs to engage the stator brake discs and stop the wheel hub from turning in one mode, and to retract said rotor brake to disengage the stator brake discs to free the wheel hub in another mode, and
iv. a coolant circuit in communication with the circulation passages and coolant reservoir to deliver and withdraw coolant from the wheel hub reservoir, and
v. circulation means to circulate the hydraulic fluids within the wheel hub reservoir about the axle wheel brake components to absorb heat generated during braking and transport the same to the cooling reservoir to dissipate said heat by cooling the coolant before recirculation through the wheel hub reservoir to cool the brake components.

5,190,124
BRAKE DISCS
Ichiro Hasoda, Nagano, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan
PCT No. PCT/JP91/00389, § 371 Date Nov. 18, 1991, § 102(e) Date Nov. 18, 1991, PCT Pub. No. WO91/14880, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 26, 1991, Ser. No. 773,968
Claims priority, application Japan, Mar. 26, 1990, 2-30684[U]
Int. Cl.[5] F16D *65/12*
U.S. Cl. 188—218 XL **3 Claims**



1. A brake disc comprising:
a disc hub which rotates as a wheel on which said hub is mounted rotates;
a friction disc mounted on said disc hub;
a collar inserted through connecting holes formed through said disc hub and said friction disc, respectively; and
a connecting means for fixing said friction disc to said disc hub and consisting of a connecting bolt penetrating through said collar, said bolt having a head at one of its ends and a nut at its opposite end; wherein said collar has an annular ridge on a circumference of said collar at substantially a middle of said collar and defining a clearance between said disc hub and said friction disc; one of said friction disc and said disc hub being supported between one lateral side of said annular ridge and one of said head of said connecting bolt and said nut, the length of said collar between the other lateral side of said annular ridge and the remaining one of said friction disc and said disc hub and the other of said head of said connecting bolt and said nut being greater than the thickness of said remaining one of said friction disc and said disc hub.

5,190,125
VACUUM BRAKE BOOSTER
Kazuhiko Suzuki; Akihiko Miwa; Yuzuru Sagiura, and Satoshi Kawasumi, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Continuation of Ser. No. 470,350, Jan. 25, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 841,779
Claims priority, application Japan, Jan. 25, 1989, 1-007342; Nov. 16, 1989, 1-133412
Int. Cl.[5] F16B *9/10*
U.S. Cl. 188—357 **14 Claims**

1. A vacuum brake booster comprising:
a push rod movable in an axial direction in response to movement of a brake pedal;
a housing including a front shell and a rear shell connected with each other;
power piston means and a diaphragm located in the housing and dividing an interior of the housing into a constant pressure chamber and a variable pressure chamber, the power piston means being responsive to a pressure differential between the constant pressure chamber and the variable pressure chamber, a valve plunger operatively

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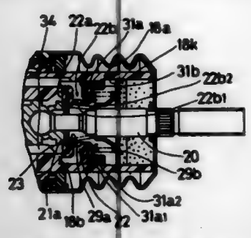
connected to a front end portion of the push rod and disposed within the power piston means;

a control valve element disposed in the power piston means and having a seal surface normally in contact with a seat surface of the valve plunger by an urging force provided by a first urging means, the control valve element having a rolling portion under influence of atmospheric pressure at its radially outer surface and a negative pressure directed to its inner surface, respectively, and which includes a flange portion and a barrel-shaped portion flexible in an axial direction to respond to axial movement of the push rod, the control valve element being secured to a cylindrical portion of the power piston means by a securing means for engaging a second urging means for urging the push rod toward the brake pedal, said flange portion of said rolling portion being secured by said securing means



in an air-tight manner, said flange portion of said rolling portion being spaced from the cylindrical portion of the power piston means by said securing means;

the power piston means having a valve seat contactable with the control valve element so that a fluid communication between the constant pressure chamber and the variable pressure chamber is interrupted upon contact between said control valve element and said valve seat;

the seat surface of the valve plunger being separable from the control valve element so as to produce the pressure differential between the constant pressure chamber and the variable pressure chamber; and

said securing means securing the flange portion of the control valve element to the cylindrical portion of the power piston means to prevent relative movement between the flange portion of the control valve element and the power piston means.

5,190,126

SHOCK ABSORBER WITH AIR CAVITY CONTROLLED ORIFICES

Charles Carnutt, 75992 Baseline, Twenty Nine Palms, Calif. 92277

Filed Sep. 16, 1991, Ser. No. 760,884
Int. Cl.[5] F16F *9/06, 9/34*
U.S. Cl. 188—269 **17 Claims**

1. A shock absorber comprising:

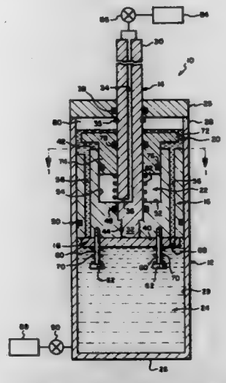
a tubular cylinder having a blind end and an opposite end,

a piston rod disposed coaxially within said cylinder so that a portion thereof occupies space within said cylinder and a portion thereon protrudes axially from said opposite end of said cylinder,

a first piston secured to said piston rod within said cylinder and movable in longitudinal reciprocation in sliding, fluid tight sealed engagement against said cylinder, said first piston defining separate dampening passageway means and return passageway means extending longitudinally therethrough, said first piston and said piston rod defining therebetween an annular well facing said opposite end of said cylinder,

return passage closure means mounted on said first piston to alternatively block and unblock said return passageway means,

a second piston having an annular configuration mounted for longitudinally reciprocation in said well in sliding, fluid tight sealed engagement with both said piston rod and said first piston to positions alternatively blocking said dampening passageway means as said first piston approaches said blind end of said cylinder and unblocking said dampening passageway means as said first piston withdraws from said blind end of said cylinder, said first and second pistons together defining at least one cavity of variable volume including a cavity therebetween that varies in volume inversely with the volume of said portion of said piston rod occupying space within said cylinder,



an annular end closure means disposed across said opposite end of said cylinder and having a central opening with a seal to receive said piston rod in sliding, fluid tight sealed engagement therewith,

a compressible fluid located in said space elsewhere in said cylinder of variable volume and which is compressed therewithin when said first piston moves toward said blind end of said cylinder and which expands as said first piston moves toward said opposite end of said cylinder, and

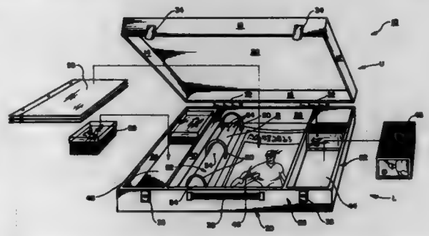
an incompressible fluid occupying space elsewhere in said cylinder.

5,190,127

CARD COLLECTION CARRYING CASE WITH THREE-RING BINDER

Don E. Cummings, 767 W. Alru St., Rialto, Calif. 92376

Filed Dec. 31, 1991, Ser. No. 814,816
Int. Cl.[5] A45C *13/00*; G09F *19/00*; B42F *13/00*
U.S. Cl. 190—102 **2 Claims**



1. A case for organization, storage, transport and display of collector items, said case comprising:

a rectangular cover having a flat top and four upright side walls;

a rectangular receptacle having a flat bottom and four upright side walls, said receptacle being divided into a first cavity dimensioned to receive a plurality of separate collector cards, a second cavity containing a three-ring binder and a third cavity dimensioned to receive a plurality of boxed collector cards, said three-ring binder being mounted to said flat bottom of the receptacle end removably holding a plurality of protective transparent plastic sheets within the second cavity;

carrying means for transporting said case;

hinge means for connecting the cover to the receptacle; and

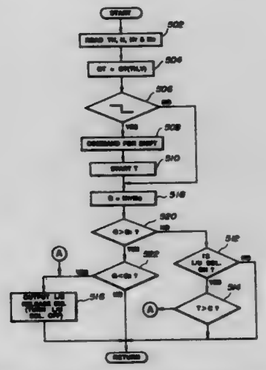
latching means for securing said cover to said receptacle.

5,190,128

LOCK-UP CONTROL DURING SHIFTING

Naonori Iizuka, Shizuoka, Japan, assignor to Jatco Corporation, Tokyo, Japan

Filed Jun. 26, 1991, Ser. No. 721,239
Claims priority, application Japan, Jun. 28, 1990, 2-171044
Int. Cl.[5] F16H *45/02, 61/14*
U.S. Cl. 192—3.31 **2 Claims**



1. A method of a lock-up clutch control during a gear shifting of an automatic transmission which has an input shaft and an output shaft, the method comprising the steps of:

detecting a revolution speed of the input shaft and generating an input revolution speed signal indicative of said detected revolution speed of the input shaft;

detecting a revolution speed of the output shaft and generating an output revolution speed signal indicative of said detected revolution speed of the output shaft; detecting a command for gear shifting;

measuring a period of time elapsed from occurrence of said command for the gear shifting; calculating a ratio of said input speed to said output speed; releasing said lock-up clutch when said ratio is within a predetermined range; and

releasing the lock-up clutch if said ratio is not within said predetermined range upon said period of time exceeding a predetermined value.

5,190,129

PRESS DRIVE WITH OIL SHEAR CLUTCH/BRAKE DRIVES

Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to Midwest Brake Bond Co., Warren, Mich.

Filed Jan. 24, 1992, Ser. No. 825,043
Int. Cl.[5] F16D *67/04*
U.S. Cl. 192—18 A **4 Claims**

1. An apparatus in combination with an oil shear clutch brake unit, said oil clutch brake unit comprising:

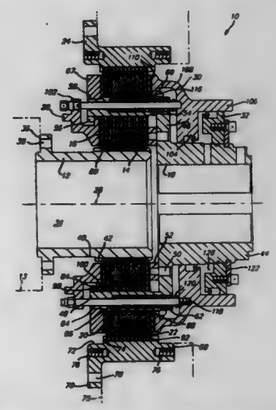
support means for anchoring said clutch brake unit to a non-rotatable member of said apparatus;

input means for receiving rotary motion from said apparatus, said input means rotatable with respect to said support means and disposed in coaxially spaced relation thereabout;

output means for transmitting rotary motion from said clutch brake unit, said output means rotatable with respect to said support means and disposed between said support means and said input means in coaxially spaced relation thereabout, said output means including a drive ring and an annular collar extending from said drive ring for rotation therewith and disposed in coaxially spaced relation thereabout;

selectively operable brake means for prohibiting rotation to said output means from said input means, said brake means including a plurality of interleaved first friction disks alternately splined, respectively, to said support means and said collar, said first friction disks extending axially between first and second ends of said brake means;

selectively operable clutch means for transmitting rotational motion from travelling of said output means with respect to said support means, said clutch means including a plurality of interleaved second friction disks alternately splined, respectively, to said input means and said collar,



said second friction disks extending axially between first and second ends of said clutch means;

said collar including first and second axially spaced stops, respectively, proximate said first and second ends, said collar mounting said brake means radially inward of and in coaxial nested relation to said clutch means;

first piston means for engaging said brake means, said first piston means slidably disposed in said collar adjacent said first end of said first disk members and axially movable towards said second stop adjacent to said second end of said first disk members;

spring means for urging said first piston means into contact with said first friction disks and said first friction disks into compressed engagement with said second stop whereby to engage said brake means and prohibit rotation of said output means;

second piston means for engaging said clutch means, said second piston means slidably disposed on said collar adjacent to said second end of said second disk members and axially movable towards said first stop adjacent to said first end of said second disk members;

actuating means for connecting said first and second piston means together;

pressure chamber means adjacent said second piston means for selectively moving said first piston means against said

spring means to disengage said brake means when said chamber means is pressurized and substantially simultaneously moving said second friction disks into compressed engagement with said first stop whereby to engage said clutch means and transmit rotation from said input means to said output means.

5,190,130

PROCESS FOR REGULATING A CLUTCH

Christian Thomas, Zoetermeer, Netherlands; Gerald Rowe, Lindau, Fed. Rep. of Germany; Wolf-Dieter Gruhle, Tettnang, Fed. Rep. of Germany, and Wolfgang Maier, Markdorf, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

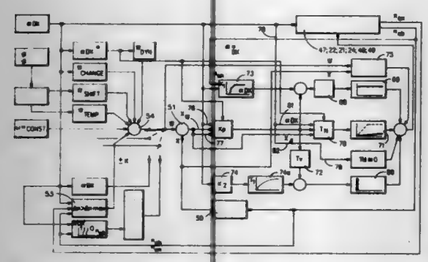
PCT No. PCT/EP89/01369, § 371 Date May 15, 1991, § 102(e) Date May 15, 1991, PCT Pub. No. WO90/05866, PCT Pub. Date May 31, 1990

PCT Filed Nov. 15, 1989, Ser. No. 690,967

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838908

Int. Cl.[5] F16D *41/02*

U.S. Cl. 192—0.032 **24 Claims**



1. A process for regulating a clutch situated in a power train between an input and an output shaft to reduce unwanted noise occurring therein, in which a sensor device (**55, 56**) is provided for detecting a rotation-rate difference $\Delta\omega$ in the power train and regulating equipment (**52**), depending upon a control variable detected by the sensor device, controls a correcting variable y to be fed to the clutch to control a speed difference Δn to reduce unwanted power train noise, the process comprising the steps of:

providing the regulating equipment (**52**) with a comparator unit (**51**), and comparing with said comparator unit (**51**) an actual value x of the rotation-rate difference $\Delta\omega$ detected for the output shaft of the power train with a limit value w_{const}, and

limiting the rotation-rate difference $\Delta\omega$ to the limit value w_{const}, upon the equal value x at least of reaching and exceeding the limit value w_{const}, by changing the correcting variable y of the clutch (**21**).

5,190,131

FLUID COUPLING HAVING A PUMP SEAL

Mitsutoshi Hagiwara, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 1, 1991, Ser. No. 786,895

Claims priority, application Japan, Nov. 9, 1990, 2-117763[U]

Int. Cl.[5] F16D *35/00*

U.S. Cl. 192—58 B **4 Claims**

1. A fluid coupling comprising:

an input shaft;

a housing having a space therein and supported by the input shaft via a bearing;

a dividing plate dividing the space into a storing chamber and an acting chamber;

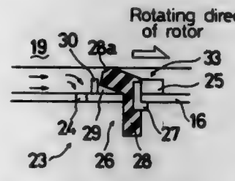
through holes made in the dividing plate;

a valve means for opening and closing the through holes;

a rotor fixed to the input shaft and located in the acting chamber;

pumping holes made in the dividing plate;

pumping projections made on the dividing plate at a downstream side of the pumping holes and corresponding thereto; and



sealing means located between each of the pumping holes and each of the pumping projections for sealing a space between said dividing plate and said rotor, wherein the sealing means comprises an elastic member having one end fixed to the dividing plate and the other end in sliding contact with the rotor.

5,190,132

SYSTEM FOR LOADING A SILO VEHICLE OR SIMILAR WITH POURABLE BULK MATERIAL

Ambros Stanelle, and Andric Stanelle, both of Guglingen, Fed. Rep. of Germany, assignors to Karl-Heinz Stanelle, Guglingen, Fed. Rep. of Germany

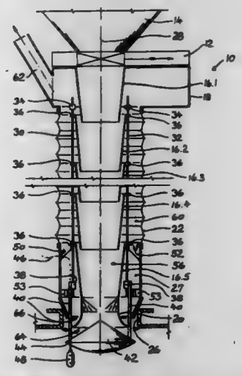
PCT No. PCT/EP88/00731, § 371 Date Mar. 15, 1990, § 102(e) Date Mar. 15, 1990, PCT Pub. No. WO89/01453, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 17, 1988, Ser. No. 458,723

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727561

Int. Cl.[5] B65G *11/14*

U.S. Cl. 193—30 **11 Claims**



1. A device for loading a silo vehicle having a circular filling opening with pourable bulk material comprising:

a chute for the bulk material, which chute has several funnels which are distributed over the height of fall and in each case taper downwards in the longitudinal direction of the chute;

an offtake channel provided outside the chute for the offtake of the bulk material/air mixture which escapes upon filling;

a set-down cone for the dustproof setting down of the device on the circular filling opening of the silo vehicle, which forms the outer lower covering of the offtake channel;

a closing part at the lower end of the set-down cone for closing the lower end of the chute;

a device which comprises at least one first pull member for holding the closing part at varying distances from the lower edge of the chute;

at least the lowest funnel is approximately rectangular in its cross-sectional planes which are normal to the longitudinal direction of the chute;

at least one side of the funnel intersects in outline in the manner of a chord the circular arc of the set-down cone which arc delimits the opening of the loading device; and

the first pull member is provided along a straight line in the offtake channel and is fastened to the closing part in such a manner that it can be guided in the free space delimited between this chord and the circular arc of the set-down cone.

5,190,133

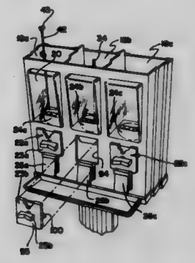
BULK VENDING MACHINE APPARATUS

Richard K. Bolen, Champaign, Ill., assignor to The Northwestern Corporation, Morris, Ill.

Filed Mar. 21, 1991, Ser. No. 673,204

Int. Cl.[5] G07F *11/44*

U.S. Cl. 194—350 **35 Claims**



15. A vending apparatus for bulk product comprising:

a housing unit having a hopper located therein for containing and storing bulk product,

and further in which said housing unit has a front side and a rear side,

said rear side having a rectangular opening therein communicating with said hopper, the sides of the opening defined by vertically extending slotted edges and the bottom of the opening defined by a horizontally extending shoulder comprising an upwardly extending inner portion, a downwardly extending outer portion, and a generally flat middle portion forming a transition between the inner and the outer portions; and

a removable hopper panel retained by and slidably installable in said slotted edges so that a lower edge thereof abuts said horizontally extending shoulder.

5,190,134

FLEXIBLE MOBILE BRIDGE CONVEYOR

Dennis Z. Mraz, Saskatoon, Canada, assignor to Westfalia DME, Inc., Saskatoon, Canada

Filed Dec. 20, 1991, Ser. No. 809,920

Int. Cl.[5] B65G *41/00*

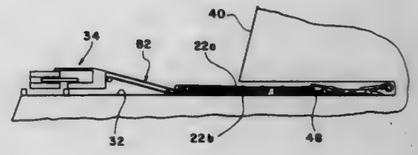
U.S. Cl. 198—303 **12 Claims**

1. A flexible mobile bridge conveyor having a plurality of carriages connected to each other to form a train, each carriage comprising:

an axle having wheels mounted on opposite ends thereof and being encased in a housing;

a first frame section fixedly connected to the axle housing;

a second frame section having a proximal end pivotally connected to the first frame section so as to be pivotal about both a horizontal, longitudinal pivot axis and a horizontal, transverse axis; and



a linkage means, coupled to the first frame section, for coupling an adjacent carriage.

5,190,135

TRAY FOR USE IN A SORTING MACHINE

Jørgen Sølund, Tappernoje, Denmark, assignor to ITS-Intern Transport Systems A/S, Tappernoje, Denmark

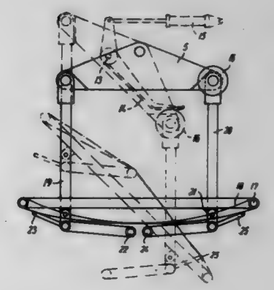
PCT No. PCT/DK90/00226, § 371 Date Mar. 2, 1992, § 102(e) Date Mar. 2, 1992, PCT Pub. No. WO91/03324, PCT Pub. Date Mar. 21, 1991

PCT Filed Aug. 31, 1990, Ser. No. 836,341

Claims priority, application Denmark, Sep. 1, 1989, 4335/89

Int. Cl.[5] B65G *47/46*

U.S. Cl. 198—365 **2 Claims**



1. A tray (**1**), e.g. for use in a sorting machine of the type wherein articles or parcels are transported on a plurality of such trays (**1**), which are moved along in an endless path and are pivotable from a horizontal position of equilibrium to an inclined discharge position by a selectively controllable activation means (**14**) for discharging the contents of each tray (**1**) on to a desired unloading means (**12**), said tray (**1**) consisting of a retangular frame (**17**) which is covered by a fabric (**18**) or a similar material, which is suspended at both sides from a support in pivots (**2, 3**) in the centre of two-armed levers (**4, 5**), characterized in that the support consists of two U-shaped rods (**19, 20**) to which discharge means (**22, 23** and **24, 25**) are secured, said discharge means hitting and stretching the fabric (**18**) on the rectangular frame (**17**) when the tray is pivoted from the horizontal position of equilibrium to the inclined discharge position to one or the other side.

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5,190,136

MAGNETIC GUIDING ASSEMBLY FOR YARN PACKAGES TRANSPORTED ON A TEXTILE MACHINE

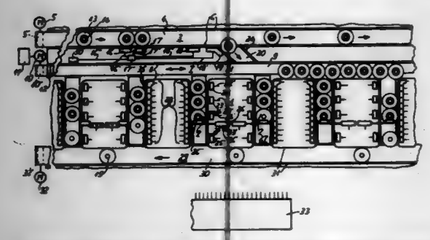
Hans Grechsch; Rolf Mayer, both of Moenchen-Gladbach; Michael Lys, Neuss; Helmut Koblen, Erkelenz, and Gerhard Radziejewski, Moenchen-Gladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 11, 1990, Ser. No. 535,884

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3919106; Dec. 4, 1989, 4011797

Int. Cl.[5] B65G 47/46

U.S. Cl. 198—372 23 Claims



1. An assembly for transporting tubes in association with a textile machine, the tubes being of the type on which yarn is wound, comprising:

a plurality of tube support members for supporting tubes for transport along a predetermined travel path, said tube support members individually including a common selected one of a magnetic means and a ferromagnetic component; and

means for selectively diverting tube support members from said predetermined travel path, said selectively diverting means including the other of said magnetic means and said ferromagnetic component, said magnetic means and said ferromagnetic component magnetically interacting with one another, sensing means for sensing a characteristic of a tube support member or a tube supported on a tube support member and means for selectively varying the magnetic interaction between said magnetic means and said ferromagnetic component to selectively divert tube support members from said predetermined travel path in response to the sensing by said sensing means of the presence or absence of said characteristic of the respective tube support members to be diverted.

5,190,137

APPARATUS FOR ORIENTING SPHERICAL PRODUCTS HAVING AT LEAST ONE SUBSTANTIALLY FLATTENED SURFACE

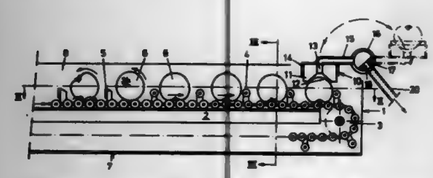
Adrianus W. Tas, Burg. Winkelaan 3, 2631 HG Nootdorp, Netherlands

Filed Apr. 26, 1991, Ser. No. 690,784

Claims priority, application Netherlands, Apr. 26, 1990, 9001004

Int. Cl.[5] B65G 47/24

U.S. Cl. 198—387 14 Claims



1. In an apparatus for orienting substantially spherical products having at least one substantially flattened surface, such as tomatoes and the like, said apparatus comprising a roller conveyor having spaced apart rollers which are rotatable about their axis and a free space is provided between each of successive rollers which is smaller than a greatest diameter of the product to be oriented, said roller conveyor further comprising projecting members extending above a top surface of the rollers so as to form conveyor compartments between the projecting members for receiving therein one product to be oriented, the improvement wherein a product-supporting part of each roller has a substantially cylindrical shape and the center-to-center distance between each of successive rollers of the conveyor is at most equal to half the diameter of the flattened surface of the product to be oriented and the number of rollers in each compartment is greater than two.

5,190,138

APPARATUS FOR FILLING A TRANSPORT CONTAINER

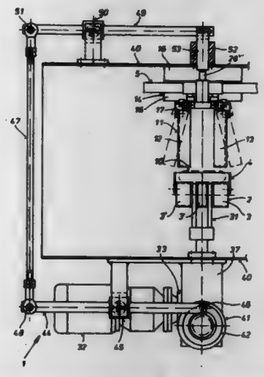
Karl-Heinz Strasser, Berg b. Ravensburg, and Martin Röck, Tettnang, both of Fed. Rep. of Germany, assignors to Handtmann A-Punkt Automation GmbH, Baienfurt, Fed. Rep. of Germany

Filed Mar. 8, 1991, Ser. No. 667,105

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1990, 4007801

Int. Cl.[5] B65G 47/04

U.S. Cl. 198—468.8 16 Claims



1. An apparatus for controlled filling of a transport container with piece goods, comprising:

a conveying means for conveying said piece goods toward said transport container, with said transport container being arranged vertically above said conveying means and being formed of two halves that are adjustable relative to one another in a controllable manner;

a lifting device arranged under said conveying means and movable in a direction toward said transport container, thereby penetrating said conveying means, and further being insertable into said transport container;

a control member cooperating with said halves of said transport container and driveably connected to said lifting device, with said control member adjusting in a forced manner said halves of said transport container with respect to lifting movements of said lifting device; and

said halves of said transport container having U-shaped cross-section and are disposed, spaced at a distance from one another, at a carrier that engages a transport device.

5,190,139

MULTIPLE-CHANNEL VIBRATING FEEDING TABLE

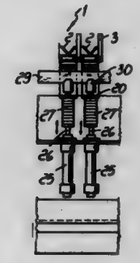
Roberto Maggioni, Gorgonzola, Italy, assignor to Promart S.r.l., Segrate, Italy

Filed Jul. 10, 1992, Ser. No. 911,573

Claims priority, application Italy, Jul. 23, 1991, 002302 A/91

Int. Cl.[5] B65G 43/10

U.S. Cl. 198—570 8 Claims



1. Multiple-channel vibrating feeding table comprising: a table provided with a plurality of mutually adjacent troughs which define channels for conveying loose parts in general, motor means for vibrating said table, and means for connecting each of said troughs to said motor means which can be activated individually for the vibratory actuation of only selected trough or troughs.

5,190,140

MATERIAL HANDLING APPARATUS

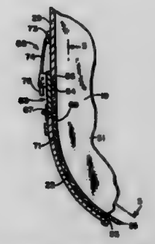
Floyd E. Buschbom, Long Lake, Minn., assignor to J-Star Industries, Fort Atkinson, Wis.

Division of Ser. No. 735,634, Jul. 25, 1991, Pat. No. 5,147,030, which is a continuation-in-part of Ser. No. 542,538, Jun. 25, 1990, Pat. No. 5,035,317, which is a division of Ser. No. 388,140, Aug. 1, 1989, Pat. No. 4,964,502. This application Feb. 27, 1992, Ser. No. 842,535

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] B65G 31/04

U.S. Cl. 198—642 17 Claims



1. A material handling apparatus comprising: a housing having wall means surrounding a chamber having an inlet opening and an outlet opening spaced from the inlet opening, knife means mounted on the wall means adjacent the inlet opening, said knife means having an inwardly directed stop section and a knife portion that projects downwardly and inwardly, said knife portion having a cutting edge facing the inlet opening, a liner of low friction and abrasion resistant plastic means engageable with the stop section covering a portion of the inside of the housing to minimize collection of material within said housing, impeller means located within said chamber of the housing operable to move material through the outlet opening, said impeller means having paddle means to cut material on rotation of the impeller means, each paddle means has an outer generally transverse end having a generally transverse edge movable on rotation of the impeller means in close relation to the cutting edge of the knife means to cut material thereby reducing the amount of material that is collected on the wall means adjacent the inlet opening, and means rotatably mounting he impeller means on said housing, said knife portion located generally concentric with the axis of rotation of the impeller means whereby upon rotation of the impeller means material is cut by the cutting edge and moves from the inlet opening toward the outlet opening and is discharged through said outlet opening.

5,190,141

STABILIZING OUTPUT CONVEYOR FOR A CIGARETTE PACKING MACHINE

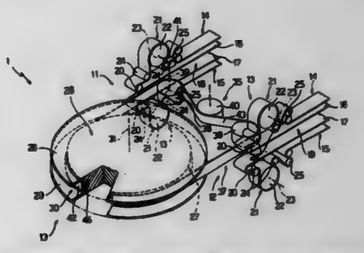
Fulvio Boldrini, Ferrara; Alessandro Minarelli, and Antonio Gamberini, both of Bologna, all of Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Jan. 15, 1992, Ser. No. 821,029

Claims priority, application Italy, Jan. 25, 1991, BO91A000020

Int. Cl.[5] B65G 47/91

U.S. Cl. 198—689.1 7 Claims



1. A conveyor (1) for stabilizing packs of cigarettes (2) coming off a packing machine (3); said packs (2) being shaped in the form of a rectangular parallelepipedon, and being fed on to and along said stabilizing conveyor (1) in a direction (10) crosswise to the larger lateral surface (4); said conveyor (1) being substantially U-shaped and defined by two substantially straight end portions (11, 12) connected by a curved intermediate portion (13); characterized by the fact that, for each said end portion (11, 12), it comprises two conveyors (14, 15) having facing parallel branches (16, 17) traveling in said direction (10) and defining, in between, a straight channel (18, 19) the width of which, measured between said facing branches (16, 17), substantially equals that of said packs (2); and by the fact that, for said intermediate portion (13), it comprises a drum (26) having a peripheral annular channel (30) of substantially the same width as said straight channels (18, 19), and a bottom annular surface (27) tangent to an inner surface (32) of each said straight channel (18, 19); drive means (35) being provided for rotating said drum (26) about an axis (31) perpendicular to said channels (18, 19, 30), and at a given surface speed substantially equal to the speed of at least one portion of said conveyors (14, 15) relative to at least one said end portion (11, 12); said drive means (35) comprising a suction belt (36) defining part of the inner surface of said straight channels (18, 19), and wound on to said drum (26) along a portion of said annular channel (30).

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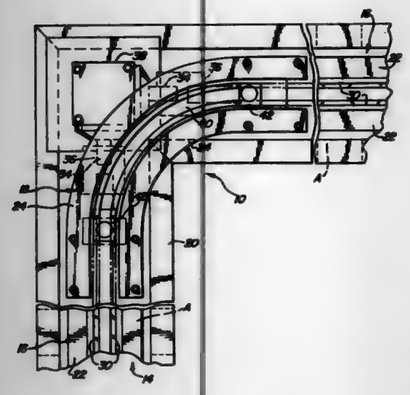
5,190,142

LIFT AND CARRY ACCUMULATING CONVEYOR

Jeffery A. Stadler, Fenton, Mich., assignor to Excel Corporation, Fenton, Mich.

Filed Mar. 4, 1991, Ser. No. 664,086
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—774.3 3 Claims



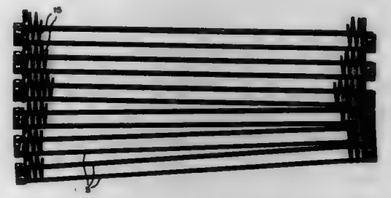
1. A conveyor comprising:
a frame having a pair of elongated, spaced apart and parallel stationary rails including a curved section and first and second contiguous straight sections at each end of said curved section;
a first pair of elongated, spaced apart movable rails extending parallel to said stationary rails in said first straight section;
a second pair of elongated, spaced apart movable rails extending parallel to said stationary rails in said second straight section;
first means for moving said first pair of movable rails between a forward and a retracted position and between an upper and a lower position;
second means for moving said second pair of movable rails between a forward and a retracted position and between an upper and a lower position in synchronization with the movement of said first pair of movable rails by said first means;
said first and second means including a rotating cam disk with an eccentric channel and a cam follower disposed within said channel and connected through a lifting rod to one of said first and second pair of movable rails for moving said rails between an upper and lower position;
a pair of curved spaced apart movable rails extending parallel to said stationary rails in said curved section and having pivotally connected along vertical axes to said first and second pair of movable rails; and
wherein said pair of curved movable rails are constrained at said vertical axes to move between said upper and lower position and between said forward and retracted position in synchronization with said first and second pair of movable rails,
whereby parts being conveyed along said conveyor are conveyed from the first straight section of said stationary rails to the second straight section of said stationary rails on the curved section of said stationary rails by the movement of said curved movable rails induced by the synchronous movement of said first and second pair of movable rails.

5,190,143

CONVEYOR BELT

Ingemar Fröderberg, Höganäs, and Jaan Raner, Helsingborg, both of Sweden, assignors to Frigoscandia Food Process Systems Aktiebolag, Helsingborg, Sweden

PCT No. PCT/SE90/00455, § 371 Date Feb. 26, 1992, § 102(e) Date Feb. 26, 1992, PCT Pub. No. WO91/00233, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 26, 1990, Ser. No. 836,018
Claims priority, application Sweden, Jun. 27, 1989, 8902310
Int. Cl.[5] B65G *17/06*
U.S. Cl. 198—778 20 Claims



1. An endless conveyor belt for an air treatment plant in which the conveyor belt (1), over a part of its length, travels in a helical path and comprises a bottom (2) consisting of transverse rods (5) and a wire netting, and side plates (3) fixedly connected in pairs with two rods (5) so as to form, together with these rods, a link which is movable relative to adjoining links to about two axes perpendicular to the longitudinal direction of the belt and situated one in the plane of the bottom (2) and the other perpendicular thereto, characterised in that the wire netting consists of zig-zag wires (15) each of which encloses not only the two rods (5) of one link but also one adjacent rod (5) of the adjoining link.

5,190,144

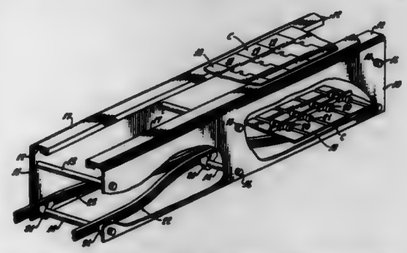
Patent Not Issued For This Number

5,190,145

APPARATUS FOR SUPPORTING CONVEYOR BELTS

Stuart J. Ledgingham, Coto de Caza, and Dale I. Goldberg, Irvine, both of Calif., assignors to Valu Engineering, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 768,354, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 611,163, Nov. 9, 1990, abandoned. This application Nov. 8, 1991, Ser. No. 790,672
Int. Cl.[5] B05G *15/60*
U.S. Cl. 198—841 48 Claims



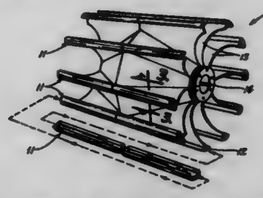
1. A way or rail system for conveyors, which comprises:
a support element adapted to be mounted adjacent a conveyor belt or chain;
an elongate synthetic resin way or rail; and
a mounting clip means to associate said way or rail with said support element;
said mounting clip means including a portion which snaps onto said support element;
said mounting clip means further including a portion which snaps onto said way or rail;
said portion of said mounting clip means which snaps onto said support element being generally U-shaped.

5,190,146

REPLACEABLE PULLEY LAGGING DEVICE

Karl C. Valster, and Allen V. Reicks, both of Pella, Iowa, assignors to Precision Pulley, Inc., Pella, Iowa

Filed Apr. 22, 1991, Ser. No. 688,449
Int. Cl.[5] B65G *39/10*
U.S. Cl. 198—843 8 Claims



1. A replaceable pulley lagging device for attachment to a wing pulley of a type including a hub adapted for rotation about an axis, a plurality of radially extending wings having an inward end, an outward end and two side edges, said wings being attached at said inward ends thereof to said hub, said outward and of each of said wings having an exterior portion having a substantially continuous cross-sectional shape along a major portion of its length and being thicker at said outward end than the portion of the wing radially inwardly therefrom for permitting a replaceable lagging device to be selectively retained on or to be slid off of and onto said outward end, said replaceable pulley lagging device comprising:
a backing member having an interior portion with a substantially continuous interior cross-sectional shape which generally conforms to said exterior portion of said outward end of said wings and wherein said backing member is selectively movable between a removed position and an installed position wherein said backing member is disposed around at least a portion of said outward end of said wings wherein said interior portion of said backing member is an abutment with at least a portion of the exterior portion of the outward end of said wings to prevent flexing of said backing member as pressure is applied thereto; and
an elastomeric means attached along the length of an exterior portion of said backing member for contacting an endless conveyor belt disposed around said wing pulley, said elastomeric means, in a cross-section taken perpendicular to the longitudinal centerline of said elastomeric means, is thicker at the center thereof than it is at the sides thereof.

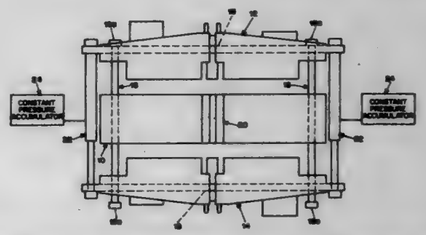
5,190,147

TENSIONING CAR FOR FLEXIBLE CONTINUOUS TRAM

John H. Pennington, Green River, Wyo., assignor to General Chemical Corporation, Parsippany, N.J.

Filed May 15, 1991, Ser. No. 700,627
Int. Cl.[5] B65G *21/00*
U.S. Cl. 198—861.2 3 Claims

1. A tensioning car for a flexible continuous tram having a multiplicity of cars coupled together for limited articulation relative to each other and supporting an endless transport belt, and an endless crawler chain having transverse crawler pads affixed to it, guided through chain guides on the cars, and adapted to be driven periodically to move the tram along a mine tunnel, comprising a center beam structure adapted to support a segment of the transport belt, a pair of side beam structures, one on each side of the center beam structure and each having coupling means for coupling it to an adjacent car of the tram, guide means joining the side beam structures for limited movement relative to each other lengthwise of the tram and also supporting the center beam structure, chain guides on each of the beam structures adapted to guide the crawler chain, a pair of hydraulic piston/cylinders, one adjacent each end of the tensioning car, coupled between the side beam structures,



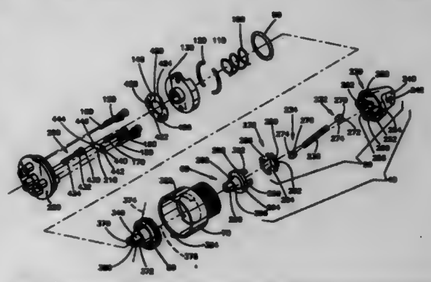
and a constant pressure accumulator connected to each cylinder and supplying a hydraulic fluid under a substantially constant pressure to the respective cylinder so that the cylinders urge the side beam structures away from each other and thereby maintain a generally constant tension in the crawler chain.

5,190,148

MARINE KEY SWITCH

Thomas D. Williams, Mentor, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Filed Feb. 1, 1991, Ser. No. 649,584
Int. Cl.[5] H01H *27/10*
U.S. Cl. 200—43.08 24 Claims



24. A switch for controlling the operation of a motor consisting of:
a) a lanyard;
b) a knob including a grippable portion coupled to the lanyard and a body portion mounting a pair of oppositely directed, outwardly-biased detents and having a socket opening oppositely to the grippable portion;
c) a key actuator having a keyed portion, an oppositely directed prong for frictional engagement with the socket in the knob and a laterally directed tooth;
d) a housing having an opening at one end for removably receiving the key actuator and a back plate at an opposite end, the opening being defined by a lip having a pair of recesses for cooperating with the detents to define first and second stable angular orientations of the key actuator, the lip being constructed and arranged to engage the tooth on the key actuator to restrict the movement of the key actuator out of receipt in the opening in the housing when the key actuator is in the second stable angular orientation;
e) a key-receiving member having a shaft portion and a keyed recess communicating outside the housing through

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the opening for receiving the key actuator, the shaft portion having a non-circular profile;

f) a rotor rotatably supported by the housing having a central hole with a non-circular profile matching the non-circular profile of the shaft portion for slidable engagement with the shaft portion, the rotor including a pocket defined by a radial back wall portion and a pair of annular side wall portions;

g) shaft biasing means for biasing the key-receiving member away from the rotor;

h) the housing including a stop extending into the pocket on the rotor;

i) a compression spring trapped in the pocket between the back wall and the stop for biasing the rotor toward the first stable angular orientation and for returning the rotor to the first stable angular orientation when the knob is disengaged from the key actuator while the rotor and key actuator are in the second stable angular orientation;

j) the rotor and back plate each including a stop surface for abutment to limit angular movement of the rotor past the second stable angular orientation against the bias of the compression spring;

k) a contact plate keyed to the rotor having at least two raised surfaces;

l) a plurality of terminals penetrating the back plate for communication outside the housing, including a central terminal aligned with a central axis of the shaft portion and at least two terminals spaced from the central terminal for electrical connection with the raised portions to the contact plate when the rotor is in the second angular orientation; and

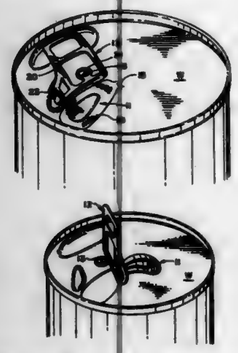
m) a cantilevered contact electrically engaged at one end with one of the angularly deployed terminals and aligned at another end between the central terminal and an end of the shaft portion to electrically connect the one of the annularly deployed terminals and the central terminal when a force is applied to the shaft portion against the bias of the shaft biasing means to slide the end of the shaft portion toward the central terminal.

5,190,149

SIDE-PIVOTING FRANGIBLE OPENING FOR CONTAINER END WALL

Arthur A. Krause, 20642 Skouras Dr., Canoga Park, Calif. 91306

Filed Mar. 27, 1992, Ser. No. 858,651
Int. Cl.[5] B65D *17/34*
U.S. Cl. 220—269 **10 Claims**



1. In a container closure of the type having a tear tab formed integrally in a container end wall and joined to the container end wall along a frangible score line for separation from the end wall to form an opening, and an actuating tab attached to the end wall at a point of attachment adjacent to the tear tab, said actuating tab being in a position to engage and remove the tear tab to form the opening, the improvement comprising:

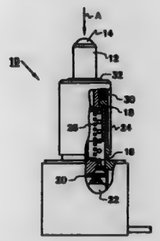
said actuating tab being attached to the container end wall in a position adjacent to and separate from the tear tab, and including a nose portion that engages the end wall adjacent the score line to initiate fracture of the score line and move the end wall relative to the tear tab so that an edge portion of the tear tab is exposed above the plane of the adjacent end wall, and a heel portion that engages beneath the edge of the tear tab to progressively fracture the score line and fold the tear tab back away from the end wall as the actuating tab is pivoted about its point of attachment with the container end wall and pivoted into overlying relationship with the tear tab against the end wall when the tear tab is fully opened.

5,190,150

BALL BEARING PLUNGER ACTUATOR FOR A SWITCH

Gregory L. Lane; William J. Kipp, and James P. Miller, all of Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 11, 1991, Ser. No. 728,407
Int. Cl.[5] H01H *3/16*
U.S. Cl. 200—341 **20 Claims**



1. A switch, comprising:

a housing;

an actuator, said actuator having an operative end disposed in said housing of said switch and a distal end extending from said housing;

a sphere, said distal end having an opening shaped to receive said sphere in revolving association therein; and

an insert disposed in said opening between said actuator and said sphere.

5,190,151

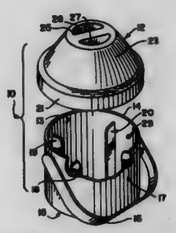
STORAGE CONTAINER WITH INTERNAL BARRIER MEANS

Charles W. Dietterich, Brodheadsville, Pa., assignor to Binney & Smith Inc., Easton, Pa.

Filed Jan. 31, 1992, Ser. No. 830,197
Int. Cl.[5] A45C *11/34*; B65D *1/40*
U.S. Cl. 206—214 **16 Claims**

1. A portable storage container for use in the storage and transportation of children's possessions, said portable storage container comprising a body portion and internally disposed barrier means to prevent the substantial insertion of a child's head into said storage container, said body portion comprising an inner surface and an outer surface, said inner surface defining an inner materials storage area, said barrier means each being substantially planar in shape and disposed within and only partially across said inner materials storage area to define an open area between the inner edge of each barrier means and an opposing portion of the inner surface, each plane defined by the barrier means extending from said inner surface, said barrier means thereby permitting insertion of a child's hand into said inner materials storage area while prohibiting the substantial insertion of a child's head into said inner materials storage area.

15. A portable storage container for use in the storage and transportation of children's possessions, said portable container comprising a body portion and internally disposed barrier means to prevent the substantial insertion of a child's head into said storage container, said body portion including a substantially cylindrical wall portion and a substantially round base portion, said internally disposed barrier means comprising axially longitudinal planar rib members extending radially



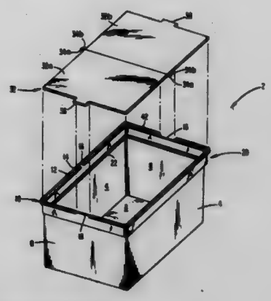
perpendicular to the cylindrical wall portion comprising a horizontal upper portion and a vertical exterior edge connected by a curved intermediate corner portion, said rib members being disposed substantially perpendicular to the inner surface of said body portion by means of connection to said wall portion and said base portion of said body portion, said rib members each extending only partially across said body portion and not engaging each other, the disposition of said barrier means within said body portion thereby permitting insertion of a child's hand into said body portion while prohibiting the substantial insertion of a child's head into said body portion.

5,190,152

PORTABLE FILE BOX

Scott D. Smith, Memphis, and Howard T. Rudd, Collierville, both of Tenn., assignors to Trav-L-File, Inc., Olive Branch, Mich.

Filed Jun. 17, 1992, Ser. No. 899,704
Int. Cl.[5] B65D *5/50*
U.S. Cl. 206—425 **14 Claims**



1. A file box, comprising:

a pair of opposing sidewalls;

a pair of opposing endwalls;

a bottom wall;

said sidewalls, endwalls and bottom wall defining a box interior;

said sidewalls and endwalls having rim portions on the upper ends thereof, said sidewall rim portions being flanged outwardly defining cover side support ledges thereon;

said sidewall rim portions each having an aperture therein adjacent said side support ledge;

said endwall rim portions each having a downwardly extending cut-out portion therein;

first and second pivotable cover members having side portions and end portions, said cover members each having a pair of opposed laterally extending pivot members adjacent one end thereof, and a handle member extending outwardly from the other end thereof;

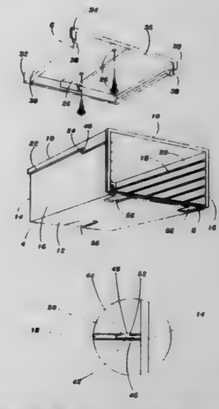
said cover members arranged in end-to-end relation wherein each covers a portion of said box interior, and further wherein said cover member side portions are supported on said side support ledges, said pivot members are rotatably received in said apertures, and said handle members extend through said cut-out portions when in a closed position, respectively, thereby enabling said cover members to be selectively pivoted about said pivot members to an open or closed position relative to said box interior.

5,190,153

COMPACT DISC HOLDER

Gregory A. Schultz, 229 Ritten House Road, Kitchener, Ontario, Canada N2E 2V3 , and Mark E. Weber, 224 Ritten House Road, Kitchener, Ontario, Canada N2E 2V5

Filed Jan. 21, 1992, Ser. No. 822,693
Int. Cl.[5] B65D *85/30*
U.S. Cl. 206—309 **4 Claims**



1. A holder for storing one or more compact discs, each disc being contained within a disc container, each container having a tiny groove extending parallel to one edge thereof, said holder comprising a housing and anchoring means for said housing, said housing having a front, a top wall, a bottom wall, a rear wall and two side walls, said top, bottom and two said walls all extending rearward from said front, said housing containing partial partitions that are sufficiently large to hold at least two containers in a spaced apart parallel relationship from one another extending from front to rear of said housing when said disc containers are inserted into the housing through said front, said housing being sized relative to said disc containers so that said containers fit easily within said housing through said front, said housing having a retention means for each disc container to hold the containers within said housing when the containers are oriented with said grooves towards said rear wall and towards said retention means when inserted into said housing, said retention means contacting said groove and becoming released from said groove when a disc container is pulled out of said housing, said anchoring means being a bracket containing a channel along each side, each channel being set back from a front of the bracket, said bracket being sized to receive said housing, said housing having a ridge extending partially along each side, each ridge being sized and

located to fit within the channel, with releasable locking means to hold each ridge in each channel when the ridges have been fully inserted.

5,190,154

BOX FOR RECEIVING SCREWDRIVER BITS

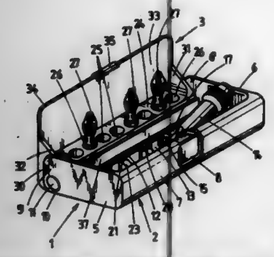
Andreas Reusch, Remscheid, Fed. Rep. of Germany, assignor to Wera Werk Hermann Werner GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,414

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1990, 9013289[U]

Int. Cl.[5] B65D *85/20*

U.S. Cl. 206—375 **7 Claims**



1. A box for receiving screwdriver bits and a chuck operative with the bits, the box comprising:
- a compartment which extends in a longitudinal direction of the box and is configured to receive the chuck;
- a row of insertion openings arranged parallel to the compartment and configured for receiving the bits;
- a bottom part having said compartment, and a closure lid hinged via a hinge to the bottom part along a back side of the box, there being a closure side of the bottom part opposite said back side of the box;
- wherein said compartment extends along the closure side of said bottom part of the box;
- said lid includes a ledge facing said bottom part of the box and extending parallel to and adjacent said hinge; and
- said insertion openings are developed as holes in said ledge and direct tips of the screwdriver bits away from said hinge to provide for a tilting of the box, upon a pivoting of the hinged lid during an opening of the box, from a position parallel to a bottom of the box into an upright position, the tips being secured in the insertion openings in positions parallel to the bottom of the box by an inner wall of said compartment against falling out of their insertion openings.

5,190,155

TAMPER PROOF FOLDING BOX

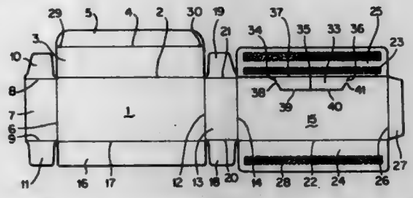
Herbert Grunwald, Gutach, Fed. Rep. of Germany, assignor to August Faller KG, Waldkirch, Fed. Rep. of Germany

Continuation of Ser. No. 434,401, Nov. 9, 1989, abandoned, which is a continuation of Ser. No. 159,544, Feb. 23, 1988, abandoned. This application Jan. 16, 1991, Ser. No. 642,229

Int. Cl.[5] B65D *77/30*

U.S. Cl. 206—459.1 **5 Claims**

1. A reclosable folding box having a seal,
- said box comprising encircling side panels defining an encircling upper edge forming a reclosable opening to said box,
- one of said side panels having a seal identifying segment portion enclosed therein by perforated lines weakening said one side panel and having a segment portion width and extending from said upper edge,
- a reclosable end flap covering said reclosable opening having a bent over flap extension having a width greater than said segment width, and underlying said segment portion,
- said one panel having a second flap extending from said one panel and overlying said first mentioned flap and secured thereto,
- said flap extension being unweakened in an area underlying said panel weakening lines so as to present a continuous closure at said one panel if said segment portion is removed,
- said bent over flap extension being unattached to said one side panel adjacent to said segment,



- said weakening lines acting as separation lines permitting hand separation of said segment portion from said one side panel whereby said end flap acts as a complete closure for said bod and means permitting hand separation allows an observer to identify separation or integrity of said segment portion with said side panel means.

5,190,156

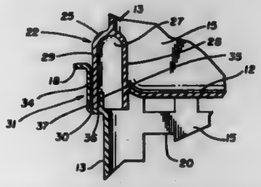
STORAGE BIN SYSTEM

Brian J. Conaway, Wooster, and Tyrone M. Keyes, Cincinnati, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jan. 6, 1992, Ser. No. 817,285

Int. Cl.[5] B65D *21/00*

U.S. Cl. 206—509 **21 Claims**



1. A storage bin comprising a bottom surface, opposed side walls and a rear wall extending upwardly from said bottom surface and forming an open top defined by an upper rim, foot members formed in said side walls and said rear wall and extending below said bottom surface, sockets formed in said side walls and said rear wall near said upper rim, an aperture formed in each said socket, and means formed on said foot members so that said foot members and the sockets of a like bin may engaged each other to stack the bin on the like bin, said means including lock tabs which automatically engage each said aperture as said foot members are received in said sockets.

5,190,157

WIDE-NECKED DRUM

Dietmar Przytulla, Kerpen, Fed. Rep. of Germany, assignor to Mauser Werke GmbH, Bruhl, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 698,640

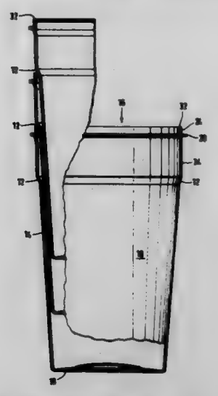
Claims priority, application Fed. Rep. of Germany, May 31, 1990, 9006150

Int. Cl.[5] B65D *21/02*

U.S. Cl. 206—519 **13 Claims**

1. A bulk wide-necked open ended drum for the transport of particularly dangerous liquid or solid charges, having a barrel

body flange portion at the upper open end for accommodating a cover and tension ring to provide gas and liquid-proof fastening of the cover to the drum characterized in that the drum includes a barrel body (10) of a lesser diameter adjacent the base portion of the barrel than adjacent the upper open end (16) and the change in diameter is defined in the upper third of the barrel body of an abrupt step-like expansion (12) of diameter, said expansion (12) of the diameter from the lesser to the larger diameter of the said barrel body (10) is being approximately four times the strength (thickness) of the side (14) of the barrel body; and the barrel body side (14) being continuously substantially perpendicular relative to the plane of the top and bottom of the drum from the diameter expansion (12) upwards to the upper open end (16) of the drum.



5,190,158

GOLD PAN WITH CLASSIFIER

Robert E. Remias, P.O. Box 1325, Ashland, Oreg. 97520

Filed Nov. 12, 1991, Ser. No. 790,553

Int. Cl.[5] B03B *5/00*; B07B *1/00*

U.S. Cl. 209—44 **20 Claims**

12. A gold pan for separating particulate matter of disparate specific gravities from a carrier fluid comprising; an elliptically-shaped pan having two inclined end walls, a first and second pan inclined side wall, and a horizontally, centrally located bottom wall, said first and second inclined walls extending upwardly and outwardly from said bottom wall to a first height, said end walls extending upwardly and outwardly from said bottom wall to a second height, each said wall having an interior and exterior surface, a plurality of transversely extending ridges projecting from the interior surface of a first portion of said first side wall and encompassing said second side wall and both ends to a second portion of said first wall.

5,190,159

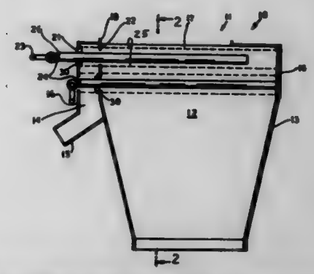
SELF-CLEANING GRATE MAGNET AND BUSHING

Anthony J. Barker, Lake City, Pa., assignor to Eriez Manufacturing Company, Erie, Pa.

Filed Mar. 23, 1992, Ser. No. 856,305

Int. Cl.[5] B03C *1/00*

U.S. Cl. 209—223.2 **15 Claims**



1. A self-cleaning grate magnet comprising a first end and an intermediate partition disposed in spaced relation to one another defining a discharge area;
- a product area adjacent said discharge area;
- a first hole in said first end aligned with a second hole in said intermediate partition;
- a magnetic tube attached to a tube support frame and extending through said first hole and through said second hole into said product area to attract ferrous material from a product flowing through said product area;
- said second hole being substantially larger than said magnetic tube thereby allowing said ferrous material to be drawn into said discharge area;
- an annular wiper bushing;
- said annular wiper bushing being disposed on said magnetic tube between said first end and said intermediate partition
- said magnetic tube being adapted to be pulled through said first hole and through said second hole in said intermediate partition pulling said annular wiper bushing against said first end thereby stopping said annular wiper bushing;
- said magnetic tube being adapted to be further pulled through said first holes, through said second holes and through said annular wiper bushing whereby said ferrous material is wiped from said magnetic tube in said discharge area;
- said magnetic tube being adapted to be pushed back through said first hole and through said second hole carrying said annular wiper bushing into engagement with said intermediate partition whereby said annular wiper bushing is stopped and said magnetic tube is further pushed through said annular wiper bushing into said product area.

11. An annular wiper bushing for wiping a magnetic tube comprising a hollow cylindrical body;
- said cylindrical body having a cylindrical bore;
- said cylindrical bore having countersinks;
- two spaced internal annular grooves in said cylindrical body;
- one said internal annular groove being adjacent a first bushing end of said cylindrical bore and one said internal annular groove adjacent a second bushing end of a cylindrical bore;
- an annular wiper ring in said each said spaced internal groove;
- said annular wiper ring being generally rectangular in cross section;
- said annular wiper ring having a lip integrally attached thereto;
- said annular wiper ring having an inner side, an outer periphery, an outer side with an intermediate part and an inner periphery;

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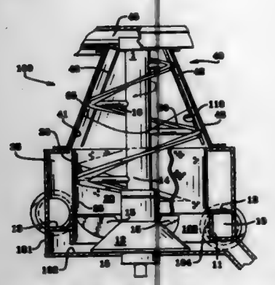
said lip having an inner periphery and an outer periphery;
said inner periphery of said lip substantially forming a continuation of said inner periphery of said annular wiper ring;
said outer periphery of said lip adapted to be clear of said countersinks and joining said outer side of said annular wiper ring at said intermediate part.

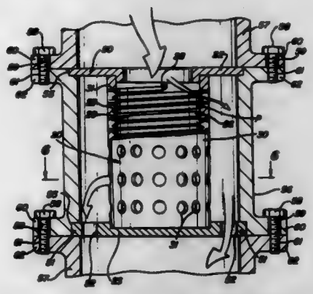
5,190,160
METHOD AND APPARATUS FOR ENHANCING TRANSPORT OF KNOTS IN A KNOT DRAINER
Patrick D. Murphy; Ian J. H. Clarke-Pounder, both of Nashua, N.H., and Brian J. Gallagher, Beaconsfield, Canada, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Aug. 2, 1991, Ser. No. 739,398
Int. Cl.[5] B07B *1/22*
U.S. Cl. 209—270 24 Claims



1. In a device for separating coarse particles from a liquid borne slurry, said device having a helical conveyor flight, an inlet chamber, a feed chamber, a screening chamber, a wash and liquid separation chamber, and a liquid free coarse particle discharge chamber, the improvement in combination with said device, comprising:
means for altering dynamic balances of forces which act upon the coarse particles during their transport through said device from the inlet chamber, through the feed chamber, through said screening chamber, and through said wash and liquid separation chamber.

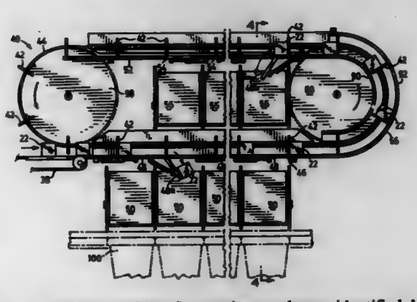
5,190,161
CYLINDRICAL ELEMENT FOR FILTERING AND SEPARATION
Koichi Arai, Kanagawa, Japan, assignor to Arai Machinery Corporation, Kanagawa, Japan
Continuation-in-part of Ser. No. 449,123, Dec. 8, 1989, abandoned, which is a continuation of Ser. No. 184,081, Apr. 20, 1988, abandoned. This application Feb. 27, 1991, Ser. No. 661,796
Claims priority, application Japan, Apr. 22, 1987, 62-097284
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] B07B *1/49*
U.S. Cl. 209—400 21 Claims

1. A cylindrical filtering element comprising:
(a) a cylindrical frame plate, said cylindrical frame plate including, in combination:
(i) a plurality of discrete locking grooves having a helical pitch disposed along the inner surface between a first and a second coaxial ends of said cylindrical frame plate, and
(ii) a wire of uniform cross-section formed into a helix and received in said locking grooves,
(iii) a plurality of openings; and
(b) a locking device securing both ends of said wire in said cylindrical frame plate, said pitch and the dimensions of said wire being selected in conjunction with the spacing of



said grooves to create a gap between adjacent strands of said wire with said gap acting as a filtration flow path.

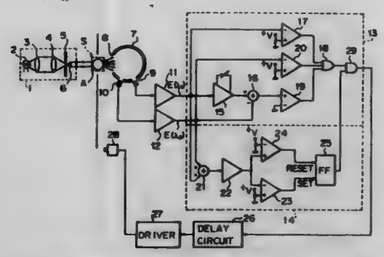
5,190,162
SORTING MACHINE
Karl Hartlepp, 487, Highway 53 West, R.R. #1, Ancaster, Ontario, Canada L9G 3K9
Filed Jul. 30, 1991, Ser. No. 737,869
Claims priority, application Canada, Jul. 30, 1990, 2022289
Int. Cl.[5] B07C *5/00*
U.S. Cl. 209—583 9 Claims



1. A sorting machine for storing packages identified by individual bar codes carried on the packages the machine comprising:
an induction station for receiving packages and including a gate and a bar code reader;
gate actuation means operable to open and to close the gate for allowing individual packages to pass through the gate at predetermined intervals;
an induction conveyor passing through the induction station and passing under the gate to carry the packages from the induction station are permitted by the gate actuation means, the packages being spaced on the induction conveyor by said predetermined intervals;
a slider bed having trap doors moveable between an elevated position in alignment with the slider bed and a lowered position providing openings in the slider bed for the packages to fall from the slider bed;
a transport mechanism operable to receive the packages individually from the induction conveyor and to move the packages along the slider bed, the transport mechanism including individual pushers to move over the slider bed spaced from one another by said predetermined interval so that each pusher receives a respective one of the packages from the induction conveyor and pushes that package along the slider bed;

receiving stations positioned under the trap doors;
control means operable in response to the bar codes on the packages to move the trap doors between the elevated to lowered position so that the packages drop from the slider bed into the receiving stations according to an address list stored in the control means and in response to the identifying bar codes.

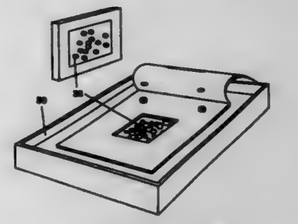
5,190,163
SORTING APPARATUS UTILIZING TRANSMITTED LIGHT
Kazuyoshi Anzai; Akira Shibayama, both of Chiba; Susumu Hirano, and Hajime Sasaki, both of Kanagawa, all of Japan, assignors to Anzai Sogo Kenkyusho Co., Ltd. and Morinaga & Co., Ltd., both of, Japan
Continuation of Ser. No. 545,435, Jun. 28, 1990, abandoned.
This application Apr. 22, 1992, Ser. No. 873,875
Claims priority, application Japan, Oct. 3, 1989, 1-258240
Int. Cl.[5] B07C *5/342*
U.S. Cl. 209—588 12 Claims



1. A sorting apparatus utilizing transmitted light to determine whether an article under inspection is defective or not and thus eliminating the article when determined to be defective, comprising:
a light irradiator irradiating said article with a light beam having a smaller diameter than that of said article;
a light condenser condensing the rays of light transmitted through said article while being diffused, said light condenser being positioned diametrically opposite said light irradiator;
two light detecting means for respectively detecting two specific kinds of light having different wavelengths among the condensed rays of transmitted light; and
a judging means for judging whether said article is defective or non-defective by obtaining a ratio between the intensities of the two specific kinds of light detected by said light detecting means and judging whether or not the obtained ratio is higher than a predetermined value.

5,190,164
BEAD SORTING TOOL
Allen Graves, 5333 SE. Henderson, Portland, Oreg. 97206-8228
Filed Dec. 3, 1991, Ser. No. 802,132
Int. Cl.[5] B07B *13/05;* B07C *7/04*
U.S. Cl. 209—614 6 Claims

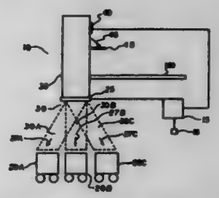
1. A sorting tool for sorting objects based on size comprising:
(a) a flat, rigid support means of sufficient size to allow placement of objects to be sorted thereon;
(b) a plurality of sheets of material of predetermined size and thickness, said sheets being removably stacked on each other and having a portion of material removed from their centers thereby forming a chamber to contain the objects to be sorted, said stacked sheets being placed on said support means;
(c) a hand held, manually manipulable means having an adhesive surface for engaging and removing selected ones of said objects; whereby the thickness of said stack of sheets defines the size of the objects engaged and removed by said adhesive surface with those objects of a size greater than the stack thickness being removed from the



Perspective View of Sorter With Frame

chamber by said adhesive surface and those objects of a size less than the stack thickness remaining in said chamber.

5,190,165
METHOD AND APPARATUS FOR FACILITATING THE COLLECTION OF SEPARATED WASTE IN MULTI-STORY BUILDINGS
Robert J. Garfield, Jr., 931 Washington St., Hollywood, Fla. 33019
Filed Nov. 5, 1991, Ser. No. 788,190
Int. Cl.[5] B01D *61/00*
U.S. Cl. 209—655 13 Claims



1. A method of facilitating waste collection so as to enable a plurality of users to simultaneously deposit separated waste according to a predetermined schedule in multi-story buildings having at least one trash chute with access doors located on a plurality of said stories, comprising the steps of:
scheduling a type of waste to be collected during an interval of time by selecting a type of waste to be collected and selecting a corresponding interval of time during which said type of waste is to be collected, said interval of time comprising a beginning time and an ending time;
generating a waste signal representing said type of waste and an interval signal representing said interval of time;
positioning a corresponding waste collection container so as to receive said type of waste during said interval;
displaying said waste signal; and
displaying said ending time.

5,190,166
STAND OR SEPARATION, ESPECIALLY A BOOK-END
Niels Vilsbøll, Bakken 9, Ydby, DK–7760 Hurup Thy, Denmark
PCT No. PCT/DK90/00094, § 371 Date Oct. 11, 1991, § 102(e) Date Oct. 11, 1991, PCT Pub. No. WO90/11706, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 11, 1990, Ser. No. 768,657
Claims priority, application Denmark, Apr. 12, 1989, 1751/89
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—43 10 Claims

1. Stand adapted to be used on a construction including at least one horizontally disposed plate element, the stand includ-

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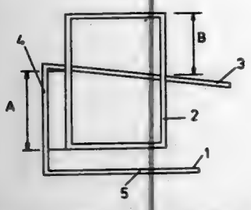
ing a support element and a resilient element cooperable with the support element such that the stand is fixed on the at least one horizontal plate element by sliding the support element with respect to the resilient element, wherein the support element rests against the at least one horizontal plate element with a support area and is adapted to be locked thereto by the



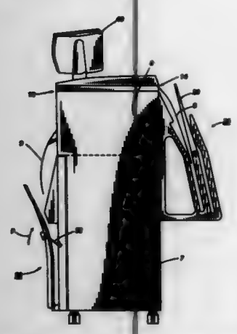
resilient element, the resilient element including a first branch disposed substantially parallel to the support area of the support element and a second branch resiliently connected to said first branch, said second branch is inclined with respect to the first branch such that the first and second branches form a wedge, and wherein said resilient element is slidably connected to the support element.

5,190,167

ENGINEERING SIZE DOCUMENT STACKER

Albert E. Andrews, Rochester, and Eugene J. Maano, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1992, Ser. No. 889,024
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—50 **9 Claims**



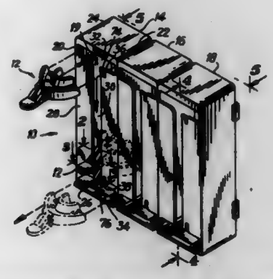
1. A document stacking catch tray for stacking documents exiting a wide format machine, comprising:
at least two bins configured to hold documents therein; and
a diverter which when placed in a first position deflects incoming documents into a first of said at least two bins and when placed in a second position serves as a document support and means for directing incoming documents into a second of said at least two bins.

5,190,168

RACK FOR STORING AND DISPENSING DENTAL TRAYS, AND DENTAL TRAYS FOR USE THEREWITH

Leonard French, and Marc Gottlieb, both of Commack, N.Y., assignors to Affordable Dental Products, East Farmingdale, N.Y.

Filed Dec. 11, 1990, Ser. No. 625,819
Int. Cl.[5] A61C 19/00
U.S. Cl. 211—59.2 **17 Claims**



13. In an item for use with a storage and dispensing rack, the rack comprising a first compartment defining a space for receiving the item, said compartment including a front wall having a vertically extending slot of predetermined width therein in communication with said space, and a first member constricting the width of said slot at the bottom thereof to less than said predetermined width, the item being of the type having a first, operative portion, a second portion for gripping the item, and an intermediate section joining said first and second portions, the improvement comprising:
said intermediate section having a pair of grooves therein separated by a predetermined distance which is less than said predetermined width of said slot but greater than the width of said slot when constricted by said first member, each groove having a predetermined width which is greater than the thickness of said front wall defining said slot and the width of said first and second positions being greater than the width of said slot, whereby the item may be slidably received in said slot when the defining walls of said slot are received in said grooves for securing the item in said compartment with said first portion thereof in said space and said second portion thereof outside said space, said first member restricting downward sliding movement of the item in said slot.

5,190,169

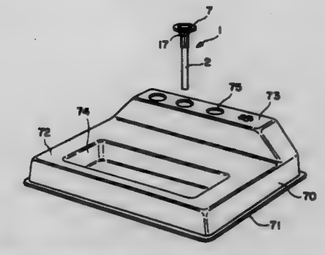
DEVICE AND METHOD FOR THE SAFE SECURING AND DISPOSAL OF SHARPS FROM MEDICAL TOOLS

Brian F. Sincock, Adelaide, Australia, assignor to Ausmedics Pty Ltd., Port Lincoln, Australia

Continuation-in-part of Ser. No. 528,963, May 22, 1990, Pat. No. 5,047,019, which is a continuation-in-part of Ser. No. 265,707, Nov. 1, 1988, Pat. No. 4,973,315, and a continuation-in-part of Ser. No. 497,638, Mar. 23, 1990, and a continuation-in-part of Ser. No. 523,426, May 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 265,707, Nov. 1, 1988, Pat. No. 4,973,315, and a continuation-in-part of Ser. No. 545,587, Jun. 29, 1990, Pat. No. 5,129,886, which is a division of Ser. No. 265,707, Nov. 1, 1988, Pat. No. 4,973,315.
This application Jun. 3, 1991, Ser. No. 710,041
Claims priority, application Australia, Nov. 4, 1987, PI5348; Oct. 26, 1989, PJ7069
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—60.1 **46 Claims**

1. An apparatus for supporting a plurality of sheaths for receiving and holding medical sharps, each sheath comprising a tubular portion closed at a lower end and open at an upper end, said apparatus comprising:

holding means comprising a planar surface with a plurality of apertures therein, each aperture for receiving and supporting one of said sheaths toward an upper end of the sheath, wherein at least one of said apertures comprises means for preventing the rotation of a sheath;
said sheaths comprising radial ribs extending longitudinally along the outer surface of the sheath from a point near the



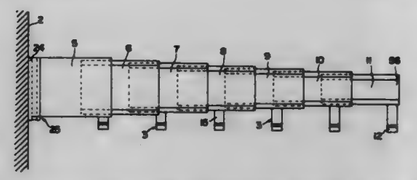
open upper end for engagement with said means for preventing the rotation; and
an upper inner surface of said sheaths comprises means for grippingly engaging a boss portion of a medical sharp, said means for grippingly engaging comprising a plurality of ridges extending radially inward form the inner surface of the tubular portion.

5,190,170

CLOTHES ARM FOR HANGING UP ARTICLES OF CLOTHING

Walter Steiner, Brittten, Switzerland, assignor to Stewi AG, Winterthur, Switzerland

Filed Nov. 12, 1991, Ser. No. 789,978
Claims priority, application Switzerland, Nov. 16, 1990, 3646/90
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—104 **21 Claims**



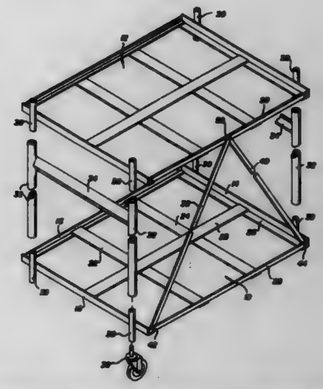
1. A clothes arm for hanging articles of clothing, the clothes arm comprising:
a plurality of telescopically arranged, coupled, hollow arm elements having an axis, the arm elements having a fixing end with a fixing means whereby the arm elements can be fixed to a wall;
one or more clothes hooks distributed over the length of the arm elements and projecting at substantially right angles to the axis of the arm elements, each of the clothes hooks having a shank, the clothes hooks being arranged in a substantially straight line along the axis of the arm elements;
a recess on at least one of the arm elements for receiving the shank of the clothes hook projecting from an adjacent arm element to permit a telescoping of the clothes arm;
each of the arm elements having a closed hollow cross-section with planar boundary faces.

5,190,171

MULTI-TIERED COLLAPSIBLE TRANSPORTER AND STORAGE RACK

George W. Christman, Jr., 8 Highland Ave., Sea Cliff, N.Y. 11579

Filed Jul. 8, 1991, Ser. No. 726,743
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—188 **3 Claims**



1. A transporter and storage rack comprising: At least two rectangular tiered horizontal shelves mounted in spaced parallel relationship one over the other; four vertical tubular members mounted at the respective corners of each shelf; four elongated vertical tubular members forming sockets for removable receiving the upper ends of respective ones of said vertical tubular members of the lowermost shelf and extending upwardly from the plane of the lowermost shelf to receive the lower ends of respective ones of said vertical tubular members of the uppermost shelf, each of said shelves being formed of strips of angle-iron extending around the periphery thereof, and longitudinal and transverse rigid straps attached to said angle-iron strips and extending therebetween in co-planar relationship, and which includes two diagonal rigid strips having their lower ends pivotally mounted the ends of the strip of the angle-iron extending along one side of the lower shelf, said diagonal strips extending upwardly to the strip of angle-iron extending along the corresponding side of the upper shelf, and fastener means mounted on the last-named strip of angle-iron for releasably securing the upper ends of the diagonal strips thereto.

5,190,172

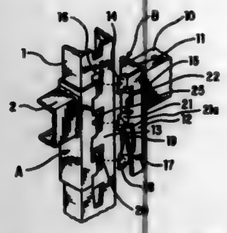
CONNECTION ASSEMBLY AND METHOD FOR A STRUCTURAL RACK

Paul R. Tyson, Hatfield, Pa., assignor to Artco Corporation, Hatfield, Pa.

Filed Jan. 30, 1992, Ser. No. 828,185
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—191 **10 Claims**

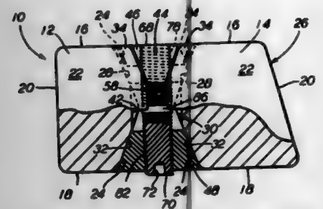
1. A connection assembly for a structural rack comprising
(a) a support member having a planar surface on which at least one slot is defined thereon;
(b) a stringer which has two definable ends; and
(c) means for connecting the support member and the stringer wherein the connection means is attached to as least one end of the stringer and wherein the means comprises
(i) a plate extending from the end of the stringer; and
(ii) at least one tab extending perpendicularly from the plate wherein the tab comprises a hook member and a locking and abutment member wherein the hook mem-

ber extends from the tab in one direction, and the locking and abutment member extends in a direction opposite to that direction in which the hook member extends, the locking and abutment member off set from the hook member so that the hook member is engageable with a lower edge of the slot on the support member and the locking and abutment member is lockable within the



boundaries of the slot and is in suitable proximity to a top edge of the slot to abut the top edge, the locking and abutment member having a first edge suitable for parallel contact with the planar surface of the support member prior to locking the locking and abutment member into the slot and a second edge which is rounded and suitable for abutment to the top edge of the slot.

5,190,173
ADJUSTABLE BLOCKOUT APPARATUS
Peter S. Mautino, Verona, and Douglas Hanes, Pittsburgh, both of Pa., assignors to McConway & Torley Corporation, Pittsburgh, Pa.
Filed Jan. 28, 1992, Ser. No. 826,627
Int. Cl.[5] B61G *9/00*
U.S. Cl. 213—62 R **19 Claims**



1. A yoke draft gear pocket axially adjustable blockout apparatus positionable within such yoke draft gear pocket which is disposed within a center sill member mounted on a railway freight car body, to enable equipping of such railway car with a slackless drawbar coupling arrangement, said axially adjustable blockout apparatus comprising:

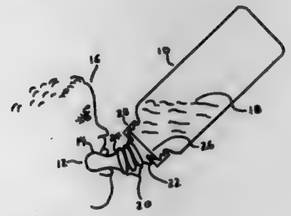
(a) a pair of spaced end blocks, each of said pair of spaced end blocks having a top wall portion, a bottom wall portion, a pair of end wall portions, a pair of side wall portions, and confronting end faces, each said confronting end face having a pair of inclined surfaces along at least a portion thereof converging from a respective said top wall portion and from said bottom wall portion towards an intermediate section of said end face;

(b) a pair of spaced wedge shaped members disposed between said pair of said spaced end blocks, each of said pair of said spaced wedge shaped members having a pair of side wall portions, an outer wall portion and an inner wall portion, with each said inner wall portion confronting each other, and a pair of end wall portions converging from said outer wall portion towards said inner wall portion;

(c) a threaded means engagable with each of said pair of said spaced wedge shaped members for adjustably securing said confronting pair of said spaced wedge shaped members together; and

(d) means for slidably connecting said pair of said spaced wedge shaped members with said pair of said spaced end blocks, with each of said converging end wall portions of said spaced wedge shaped members contacting a said inclined surface of a confronting end face of a said spaced end block.

5,190,174
SWIVEL TEAT FOR BABY BOTTLE
Robert W. Klag, 7 Azalea Dr., Mill Valley, Calif. 94941
Continuation of Ser. No. 144,746, Jan. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 11,191, Feb. 5, 1987, abandoned. This application Jan. 31, 1991, Ser. No. 707,381
Int. Cl.[5] A61J *11/04*
U.S. Cl. 215—11.1 **16 Claims**



1. In combination:

a beverage container having an artificial teat through which liquid can be discharged from said container into an orifice of a drinker,

said teat having a body having an interior and exterior profile and first and second opposite ends, said teat comprising at least one expandable corrugation extending from said interior to said exterior profile of said teat and intermediate said ends thereof,

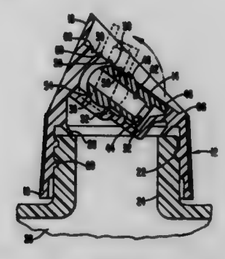
said at least one corrugation allowing said teat to bend freely without inhibiting a flow of liquid therethrough and without limiting the depth of insertion into said drinker's orifice,

said body of said teat containing, when said teat is positioned with one end upward and said second end downward, a downwardly and inwardly tapered portion below said at least one corrugation, said portion being sufficiently rigid to define where said teat may bend during use without blocking the flow of beverage therethrough and without tilting said teat in conjunction with said beverage container when drinking.

5,190,175
TAMPER EVIDENT CLOSURE
Frank J. Schmidt, Lisle, Ill., assignor to Continental White Cap, Inc., Downers Grove, Ill.
Filed Jun. 10, 1992, Ser. No. 896,401
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—230 **11 Claims**

1. A tamper evident closure comprising a closure including a flexible end panel portion having formed therein a sealing state indicating area which can flex from a seal indicating position to a non-seal indicating position, a cover in overlying relationship to said sealing state indicating area, a liquid crystal indicator housed between the external surface of said sealing state indicating area and the interior surface of said cover, said liquid crystal indicator having distinct optical properties viewable through said cover when said flexible end panel is in a seal indicating position, means for irreversibly disrupting said liquid crystal indicator, said means positioned to irreversible disrupt said liquid crystal indicator when said flexible end panel flexes to its non-seal indicating position whereby when said flexible end panel flexes to its non-seal indicating position said distinct optical properties irreversibly change.

5,190,176
CHILD RESISTANT CLOSURE WITH PROTECTIVE FLANGE AND CANTED UPPER WALL
Donald H. Lavange, Cumberland, R.I., assignor to Polytop Corporation, Slatersville, R.I.
Filed Dec. 30, 1991, Ser. No. 814,696
Int. Cl.[5] B65D *47/06, 55/02*
U.S. Cl. 215—235 **3 Claims**



1. A child resistant closure comprising:

a) a cap and a spout,

b) said cap comprising an upper wall and a depending skirt, said skirt being adapted for securement to a container,

c) said upper wall having a cavity defined therein to receive said spout,

d) an opening formed in the upper wall of said cap for communication with said spout,

e) a passage extending axially through said spout, and terminating in a discharge opening,

f) said spout being mounted within said cavity in said cap for pivotal movement about a horizontal axis between a closed position wherein said spout closes off said opening in said upper wall of said cap and an open position wherein said opening and said axial passage in said spout are aligned,

g) at least one rib formed on the upper surface of said spout so that manual pressure applied thereto can rotate said spout out of its closed position within said cavity in said upper wall of said cap,

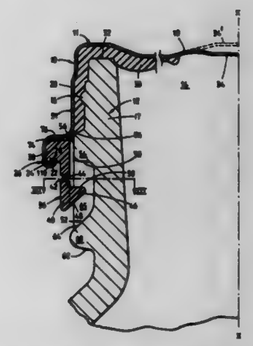
h) the invention being characterized by

1) said cap further including a frusto-conical section that extends upwardly above said upper wall, and said spout received in said cavity in said upper wall,

2) an upper end of said frusto-conical section terminating in a protective flange that extends around the perimeter of said frusto-conical section,

3) said protective flange being integrally formed with said cap and possessing sufficient height and structural rigidity to resist bending and thereby deter unauthorized access to said rib on said spout.

5,190,177
METAL SCREW CLOSURES FOR PACKAGING CONTAINERS
Malcolm G. Collins, Wantage, United Kingdom, assignor to CMB Foodcan plc, United Kingdom
Filed Apr. 5, 1991, Ser. No. 681,241
Claims priority, application United Kingdom, Apr. 6, 1990, 9007868; Jun. 7, 1990, 9012688
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 **16 Claims**



1. A screw closure for a container having a mouth comprising a metal closure body having a closure panel adapted to overlie a mouth of a container and a skirt which is peripherally attached to the closure panel and extends to a free edge, said skirt having a generally cylindrical region interiorly provided with means for conforming to a screw thread of an associated container, an inward curl adjacent said cylindrical region which terminates at said free edge, the closure further including a plastic security ring having a top portion held captive by the curl and an integral bottom portion which has locking means projecting interiorly of the curl for preventing rotation of the closure by engagement with an associated container, the security ring having at least one line of weakening between said top and bottom portions along which said security ring is rupturable to enable the closure to be unscrewed from an associated container while leaving visible evidence of the rupture, said security ring being adapted to rupture by relative angular movement between said top and bottom portions, said closure skirt having a substantially radially directed annular shoulder disposed in axially spaced opposition to the inward curl for holding the top portion captive in a non-rotary manner, the top portion of the security ring being compressively engaged between the annular shoulder of the skirt and said curl, said security ring top portion having a radially exterior annular lower shoulder portion which is received within the curl, a recess which defines an inner periphery of the security ring annular shoulder portion, and said free edge being disposed within said recess and making deforming engagement with the top portion of the security ring at a base of said recess.

5,190,178
SNAP-ON, SCREW-OFF CAP AND CONTAINER NECK
Daniel Luch, Los Gatos, Calif., assignor to Cap Snap Co, San Jose, Calif.
Filed Aug. 9, 1990, Ser. No. 565,638
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—256 **43 Claims**

1. In combination, a container neck and a container closure, said neck having an upper opening, a first downward extending neck stretch portion below said opening, said first neck stretch portion having an exterior, at least one first helical engagement means around said exterior of said first

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neck stretch portion, a locking wall portion below said first neck stretch portion, at least one external tooth on said locking wall portion,

said closure having a top, a downward extending upper skirt portion depending from said top, said upper skirt portion having an interior, at least one second helical engagement means around said interior of said upper skirt portion shaped to make with said at least one first helical engagement means, a lower skirt portion below said upper skirt portion, frangible means joining said upper and lower skirt portions together, at least one internal tooth on said lower skirt portion shaped to engage said at least one external tooth to prevent unscrewing of said closure relative to said neck without breaking said frangible means,

said at least one first and second helical engagement means being shaped so that when said closure is moved directly axially downward on said neck without rotation of said closure relative to said neck, said at least one first and second helical engagement means slip past each other, said upper skirt portion being flexible to permit said at least one first and second helical engagement means to slip past each other and then to interengage,

orientation means on said closure to orient said closure relative to said neck whereby direct axial downward movement of said closure on said neck without rotation of said closure relative to said neck causes said internal tooth to be substantially in side-by-side contact with said external tooth to restrain unscrewing of said closure relative to said neck so long as said frangible means is intact.

5,190,179

COLLAPSIBLE SHIPPING CONTAINER

Geoffrey R. Richter, 17 Bianca Street, Coolum Beach, Queensland, 4573, and Frank M. Fisk, P.O. Box 115, Albany Creek, Queensland, 4035, both of Australia

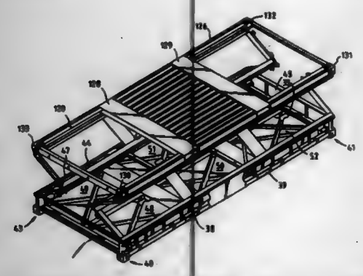
PCT No. PCT/AU89/00354, § 371 Date Jan. 31, 1991, § 102(e) Date Jan. 31, 1991, PCT Pub. No. WO90/02084, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 18, 1989, Ser. No. 646,753

Claims priority, application Australia, Aug. 23, 1988, PI9983

Int. Cl.[5] B65D *7/26*

U.S. Cl. 220—6 **20 Claims**



1. A collapsible box container having a base, two end walls, a top wall and two side walls; said base comprising a rigid reinforced rectangular structure with two opposing skirting walls and internal plinths at each corner terminating below the upper edges of the skirting walls, said base including forklift tyne pockets extending through the opposing skirting walls; said end walls each comprising a rigid reinforced structure including integral side posts which form the load transmitting features of the erected container and which are supported by said plinths and locked thereto by keying elements located within the plinths, said side posts having an inner facing pivoting arrangement to permit pivoting of the end walls inwardly of the container; said top wall comprising a rectangular reinforced structure and a fixing block at each corner; said side walls each comprising two rigid reinforced rectangular sidewall structures longitudinally hingedly connected to one another and also hingedly connected to the inner edge of an adjacent skirting wall and a reinforced longitudinal edge of the top wall; whereby the container is collapsible by fractionally raising the top wall, unlocking the side posts from the plinths, pivoting each end wall inwardly of the container so that it assumes a horizontal position between the skirting walls, lowering the top wall while simultaneously collapsing the side walls inwardly of the container so that the rigid reinforced rectangular sidewall structures of each side wall fold into two face-to-face sections lying between the skirting walls, said opposing skirting walls and said top wall having interior surfaces defining an interior space therebetween, said collapsed side walls lying entirely within said interior space, and the perimeter of the top wall being substantially coplanar with the outer sides of the skirting walls and in sealed relationship thereto when the container is collapsed.

5,190,180

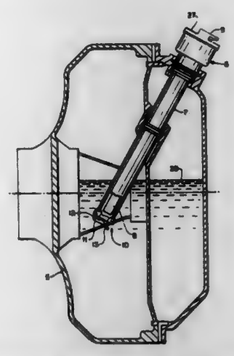
RESERVOIR FILL TUBE WITH ANTI-LEAK VALVE

James Crone, La Salle, Canada, assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 9, 1990, Ser. No. 594,779

Int. Cl.[5] B65D *90/00*

U.S. Cl. 220—86.2 **6 Claims**



1. A reservoir fill tube assembly having a tube extending into a fluid reservoir such that one end of the assembly extends into the interior side of the reservoir and the other end extends outside of the reservoir, wherein the assembly further comprises:

a flapper valve, comprising a vale cap and a valve cap seat secured to one end of the tube, wherein said valve cap seat includes an orifice between the interior of said tube and the reservoir, and wherein said valve cap and valve cap seat are hingedly attached such that said valve cap closes under reservoir pressure greater than ambient, creating a seal between said valve cap and valve cap sat and wherein said flapper valve is oriented such that said valve cap hangs open in response to gravitational force when the reservoir pressure is equivalent to ambient;

means, disposed within the tube, for measuring the fluid level within the reservoir; and

means, disposed between said valve cap and said valve cap seat for preventing said valve cap from opening more than 90° relative to said valve cap seat.

5,190,181

CONTAINER WITH CAP-TYPE CLOSURE

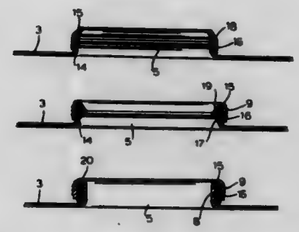
Bernd Büdenbender, Schubertweg 5, 2160, Stade, Fed. Rep. of Germany

Division of Ser. No. 393,703, Aug. 14, 1989, Pat. No. 5,052,576. This application Oct. 1, 1991, Ser. No. 769,295

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1988, 3827551; Aug. 29, 1988, 3829230; Aug. 29, 1988, 3829240

Int. Cl.[5] B65D *41/04*

U.S. Cl. 220—288 **8 Claims**



1. A cap-type closure container, comprising:

a container body;

a container bottom closing one end of said container body;

a container cover of sheet metal closing an opposite end of said container body, said container cover being formed with at least one filling opening and, bounding said opening and formed in one piece with said cover, a tube stub having an external screw thread and defining an annular sealing surface surrounding said opening and located on a side of said cover turned away from said container body; and

an internally threaded cap threadedly received removably on said tube stub, forming a closure for said opening and having a sealing ring pressed against said surface, said tube stub being double-walled and having an inner wall joined to said cover and an outer wall joined to said inner wall at a transition portion forming said annular sealing surface, said transition portion having a minimum radius of curvature and said outer wall lying directly against said inner wall.

5,190,182

SLIDE GATE

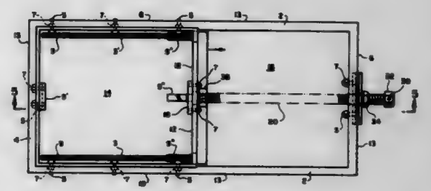
Jimmy W. Copas, Clover, S.C.; Roderick G. MacLennan, III, Matthews, N.C.; Thomas L. Overcash; Michael D. Sawyer, both of Charlotte, N.C., and Thomas D. Willingham, Rock Hill, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Mar. 13, 1992, Ser. No. 850,756

Int. Cl.[5] B65D *43/20*

U.S. Cl. 220—345 **3 Claims**

1. In a container for storage and transporting bulk material having an open bottom discharge passage member and slide gate attached below said passage member wherein a seal is provided between the discharge passage member and slide gate said seal being disposed around a periphery of the discharge passage member, the improvement of acme screw means attached to said slide gate for horizontal movement of the slide gate between an open and closed position, said slide gate having a plurality of spaced wedges located on an underside of the slide gate near a rear end thereof; a wedge attached to each of a front portion of two spaced parallel side wall risers said rises being attached to left and right side walls of a housing frame; and a wedge attached to a forward front section inside the gate housing frame whereby in the closed position said slide gate is



tightly sandwiched between the seal disposed around the periphery of he discharge passage member and the slide gate.

5,190,183

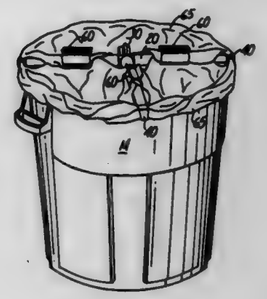
TRASH CAN DIVIDER

Patrick McNaughton, Minneapolis, and Jamie McNaughton, Brooklyn Park, both of Minn., assignors to McNaughton Incorporated, Minneapolis, Minn.

Filed Jan. 8, 1992, Ser. No. 818,055

Int. Cl.[5] B65D *90/04*

U.S. Cl. 220—551 **11 Claims**



1. Apparatus for dividing a trash receptacle of the type having an upwardly open rim into a plurality of sections, comprising:

a plurality of elongated telescopic arms, each having first and second ends and being independently telescopically adjustable to vary its length from the first end to the second end;

securing means carried by the first ends of the arms for securing the arms to the rim of the receptacle;

connector means for attaching and supporting the second ends of the arms with respect to one another, the connector means being generally centrally located so that the arms emanate radially outward from their second ends at the connector means to their first ends at the rim of the receptacle; and

means for positioning trash receptacle liners with respect to the arms to provide a plurality of sections.

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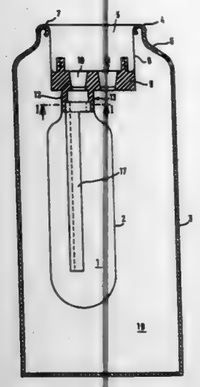
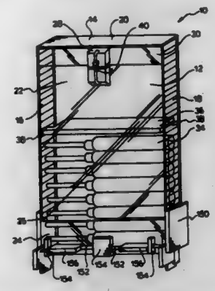
5,190,184
PRESSURE CONTAINER FOR GASES, LIQUIDS, PASTE-LIKE MATERIAL OR SIMILAR PRODUCTS
Rudolf Lechner, Singen, Fed. Rep. of Germany, assignor to Ladoco AG, Zug, Switzerland
Filed Jul. 1, 1992, Ser. No. 907,375
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1991, 4121857
Int. Cl.[5] B65D *35/28*
U.S. Cl. 220—581 **8 Claims**



1. Pressure container for gases, liquids, paste-like materials or similar products, particularly aerosol can, comprising:
a plurality of chambers, each chamber being sealed with regard to each other chamber;
a plurality of outlet valves, each one of said outlet valves being assigned to one of said chambers;
a valve plate means adapted to receive and support said outlet valves;
means for simultaneously operating said outlet valves;
at least one of said chambers being constituted by a flexible bag connected to said valve plate means;
said valve plate means being provided with at least a first extension tube means extending into the interior of said pressure container and said at least one flexible bag comprising a neck portion gas-tightly connected to said first extension tube means.

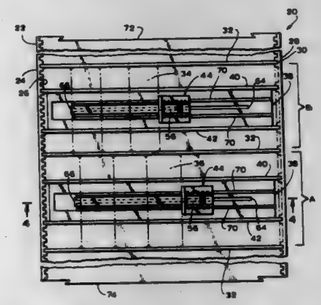
5,190,185
MEDICATION TRANSPORT AND DISPENSING MAGAZINE
Joseph Blechl, Ingleside, Ill., assignor to Baxter International Inc., Deerfield, Ill.
Filed May 18, 1990, Ser. No. 525,793
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—1 **10 Claims**

8. A method for stocking unit dose medication containers comprising:
placing a plurality of medication containers in a magazine having a storage area for holding the medication containers, an access door for accessing the storage area, and a locking mechanism for containing the medication containers in the storage area; storing the medication containers in the magazine; transporting the magazine to the site of actual use; and loading the medication dispensers into an automatic dispensing apparatus by releasing the locking mechanism to allow a cam member to actuate a release door to allow the medication dispensers to fall by gravity



into a cartridge contained in the automatic dispensing apparatus.

5,190,186
MULTI-PACKAGE ADJUSTABLE SHELF DISPLAY DISPENSER
Gerald Yablans, Port Washington, N.Y., and David C. Miller, New Canaan, Conn., assignors to P.O.P. Displays, Inc., Long Island City, N.Y.
Continuation-in-part of Ser. No. 571,566, Apr. 6, 1990, abandoned. This application Apr. 5, 1991, Ser. No. 682,856
Int. Cl.[5] G07F *11/02*
U.S. Cl. 221—124 **36 Claims**

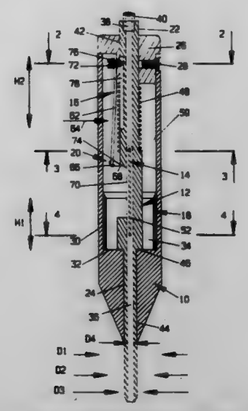


1. A multi-package shelf display comprising a bottom portion and an upstanding wall, a plurality of positively engaged members on said upstanding wall to arrest movement along said wall, at least one slide instrumentality having at least one means lockingly engaging a selected member of said plurality of members to prevent transverse movement of said instrumentability and pusher means constructed and arranged to move along said slide instrumentality in one direction and adapted to push a column of packages along said slide instrumentality in said one direction.

5,190,187
DEVICE FOR THE DISPENSING OF SPRINGS
Jean-Marie Michelena, Limoges, France, assignor to Societe Technique d'Automatismes et d'Ensembles A Ressorts - S.T.A.E.R., Limoges, France
Filed Nov. 12, 1991, Ser. No. 789,840
Claims priority, application France, Nov. 13, 1990, 90 14077
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—186 **10 Claims**

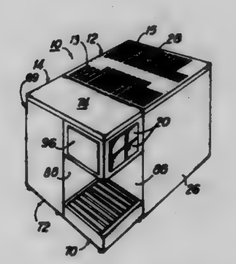
1. Device for the dispensing of springs in at least one unit,

comprising spring-feed means of the type with a flexible tube, within which the springs are arranged behind one another, in contact and coaxially with the flexible tube, and a tubular dispensing body, characterized in that the tubular body comprises two coaxial tubes (10, 12), the inner tube (12) being mounted telescopically relative to the outer tube (10), a connection (38) between the feed means (40) and the inner tube (12), first and second blocking means (14 and 16) for blocking



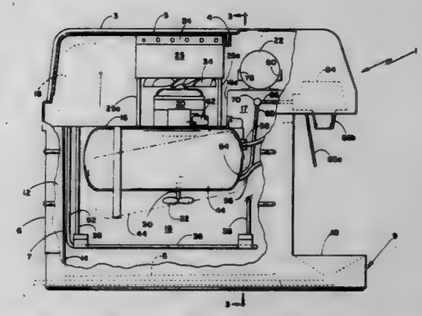
a first and a second spring (R1, R2) contained in the inner tube (12), and first and second unblocking means (18 and 20) for unblocking said first and second blocking means (14, 16) in order to release the first and second springs, said blocking and unblocking means (14, 16, 18, 20) being controlled by a relative displacement of the outer tube (10) in relation to the inner tube (12), in such a way that the first spring (R1) is compressed by the displacement of the first blocking means (14), before being released by the first unblocking means (18).

5,190,188
CONVERTIBLE BEVERAGE DISPENSER
William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 527,229, May 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 129,032, Dec. 4, 1987, abandoned. This application Jun. 3, 1991, Ser. No. 709,529
Int. Cl.[5] B67B *7/00*
U.S. Cl. 222—1 **43 Claims**



1. A convertible multiflavor postmix beverage dispenser comprising:
(a) a refrigeration module and a separate dispense module, said refrigeration module having a refrigeration module housing and said dispense module having a dispense module housing;
(b) removable connecting means for connecting said housings together to operate as a one-piece unit and for separating said housings from each other to operate as a two-piece unit;
(c) means for connecting a water line in said refrigeration module to a water line in said dispense module;
(d) means for connecting a plurality of syrup lines in said refrigeration module to a plurality of syrup lines in said dispense module;
(e) said refrigeration module including a refrigeration unit and a carbonation unit inside of said refrigeration module housing;
(f) said dispense module including a plurality of selector buttons and a multiflavor dispensing valve with a dispensing nozzle for dispensing a beverage into a cup;
(g) said refrigeration module being larger than said dispense module and said refrigeration module housing having a width equal to the length of said dispense module housing and when said housings are connected together, one end of said refrigeration module housing being connected to one side of said dispense module housing;
(h) means on said one end of said refrigeration module housing for mounting a plurality of syrup pumps to the external surface thereof; and
(i) said one side of said dispense module housing having a syrup pump opening therein and said dispense module housing including a hollow section adjacent said opening of a size sufficient to receive therein any syrup pumps mounted on said refrigeration module.
34. The apparatus as recited in claim 22 wherein said refrigeration module includes a carbonation unit.

5,190,189
LOW HEIGHT BEVERAGE DISPENSING APPARATUS
Elvis S. Zimmer, Princeton, and Douglas Goulet, Big Lake, both of Minn., assignors to IMI Cornelius Inc., Anoka, Minn.
Filed Oct. 30, 1990, Ser. No. 605,709
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—67 **23 Claims**



21. A carbonated beverage dispenser, comprising:
a cooling tank having a substantially horizontal bottom end surface and perimeter walls extending upwardly therefrom to a top end defining a tank having an interior volume for holding a volume of water therein, and a rigid support cover extending over the top end the support cover having a top surface, and a bottom surface facing the tank interior volume,
refrigeration means including a condenser and an evaporator, the condenser extending substantially horizontally and secured adjacent the support cover top surface and the evaporator held in the tank and extending substantially

horizontally and adjacent to the bottom end for cooling the water therein,

an elongate carbonator pivotally secured within the tank on one end thereof and extending lengthwise between the cover and the evaporator, the carbonator having a gas inlet for connecting to a pressurized source of carbon dioxide, a water inlet connected to the pump means for permitting filling of the carbonator with water by operating of the pump means and a carbonated water outlet connected to a dispensing valve, control means responsive to movement of the carbonator and connected to the pump means for controlling the operating thereof wherein the control means initiates the operating of the pump means for filling the carbonator with water when the carbonator moves to a water filling position and stops the operating of the pump means when the carbonator moves to a carbonator full position, and the control means including switch means secured to the support cover and the carbonator pivotally secured to the cover, and the switch responsive to movement of the carbonator towards a first position adjacent the support cover for turning on the pump means for filling the carbonator and the switch responsive to movement of the carbonator towards a second position below the support cover for turning off the pump means.

5,190,190

MOLDABLE TWO-PART VALVE BODY

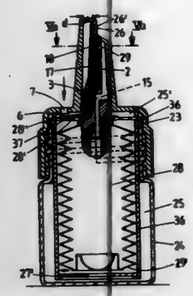
Manfred Fudalla, Leer, Fed. Rep. of Germany, assignor to Weener-Plastik GmbH & Co. KG, Weener/Ems, Fed. Rep. of Germany

Filed Feb. 14, 1991, Ser. No. 656,229

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1990, 4005881; Jun. 6, 1990, 4018147

Int. Cl.[5] B65D *35/56*

U.S. Cl. 222—105 **23 Claims**



1. A valve body for a dispenser, including a dispenser having a collapsible and elastically restorable container of a filling material to be dispensed, the valve body comprising:

a self-closing filling-material outlet valve and a self closing air inlet valve;

two valve-body parts which form a parting plane extending in a longitudinal direction of the valve body;

means for connecting a first of said valve-body parts to a second of said valve-body parts, said first valve-body part being a closure part and said second valve-body part being a dispensing opening part;

wherein the filling-material outlet valve comprises a valve seat formed within the dispensing opening part, and a closure member which swings resiliently on the closure part in the longitudinal direction of the valve body at the parting plane for closing against the valve seat;

the closure part and the dispensing opening part being formed as a unitary structure; and

said air inlet valve comprises a valve seat and a closure member for contacting the valve seat of the inlet valve, the valve seat of the inlet valve being formed within one of said valve body parts, and the closure member of the inlet valve being formed as a portion of the other of said valve body parts.

5,190,191

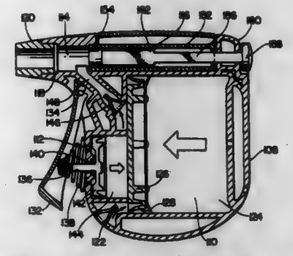
APPARATUS FOR MEASURED AND UNMEASURED DISPENSING OF VISCOUS FLUIDS

Mark E. Reyman, 246 Centre Ave., Apt. 5N, New Rochelle, N.Y. 10805

Filed Mar. 13, 1991, Ser. No. 668,959

Int. Cl.[5] G01F *11/00*

U.S. Cl. 222—256 **14 Claims**



1. A viscous fluid dispenser for dispensing both measured and unmeasured quantities of viscous fluid comprising:

a housing having a dispensing conduit with an open proximal and distal end and a viscous fluid reservoir in communication with said conduit;

self contained means for applying pressure to said fluid reservoir;

a distinct collapsible measuring chamber for receiving and retaining a predetermined quantity of fluid, said chamber being retainable in said housing means and having a distal end thereof in communication with said dispensing conduit;

valve means interposed between said reservoir and said measuring chamber; and

closure means attached adjacent said conduit for selectively sealing said distal end of said conduit such that when said conduit is sealed and said self contained means for applying pressure is activated, a predetermined quantity of fluid fills said measuring chamber and when said conduit is open fluid is permitted to flow from the reservoir out to the distal end of said conduit.

5,190,192

INTRINSICALLY SAFE METERING PUMP FOR A PRESSURIZED SPRAY HEAD

Jean-Pierre Lina, Le Neubourg, and Hervé Pacaud, Auvers-Sur-Oise, both of France, assignors to Valois, Le Neubourg, France

Filed Jul. 9, 1991, Ser. No. 727,163

Claims priority, application France, Jul. 9, 1990, 90 08667

Int. Cl.[5] B05B *11/00*; **G01F** *11/00*

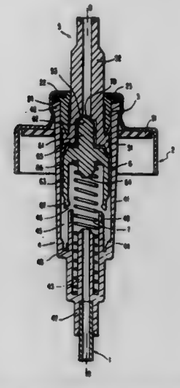
U.S. Cl. 222—321 **3 Claims**

1. An intrinsically safe metering pump for a pressurized spray head, said metering pump being mounted in gastight manner on a receptacle containing both a liquid to be sprayed and a gas, said metering pump comprising, disposed around a common axis of revolution:

a pump body communicating with said receptacle via an open cylinder extending inside said pump body and having at least one outside projection at at least one of its ends;

a first hollow piston slidably mounted inside said pump body to slide along a stroke that is delimited by abutment means, said first piston having a base at its end adjacent to said receptacle in gastight contact with said pump body for isolating a pump chamber inside said pump body from the atmosphere, and having a hollow rod including an internal section narrowing at its end opposite from said receptacle;

a differential second piston slidably mounted inside said pump body with a skirt at its receptacle end, said skirt having a free end adapted to fit in gastight manner over said open cylinder of said pump body to form an admission non-return valve for admitting said liquid from said receptacle to said pump chamber, and having a punch at its end opposite to said receptacle, with the tip of the



punch being truncated to serve as a bearing surface for a needle engaged inside said hollow rod of said first piston, said tip coming into abutment against a narrowing to constitute together therewith an outlet non-return valve for passing said liquid from said pump chamber to the atmosphere; and

a return spring disposed between said second piston and said pump body;

wherein after said liquid contained in said pump chamber has been sprayed, said spring exerts a return force capable of opening said admission non-return valve only if the pressure within said receptacle is greater than a predetermined pressure.

5,190,193

CONTAINER CLOSURE

James D. Scudday, 2798 S. Syene Rd., Madison, Wis. 53711

Filed Nov. 29, 1991, Ser. No. 800,081

Int. Cl.[5] B65D *5/72, 25/38*

U.S. Cl. 222—500 **3 Claims**

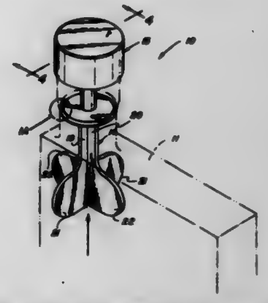
1. A container closure, comprising,

a container, the container including a container spout defined by a predetermined diameter, wherein the spout includes a spout upper end defining an upper distal end of the container spout, and

a torroidal seat formed within the spout spaced below the spout upper end and spaced above the container, wherein the spout is defined about a spout axis, and

a closure member, the closure member mounted within the spout, including a cylindrical head defined by a cylindrical head diameter less than the predetermined diameter of the spout, wherein the cylindrical head includes plural pairs of lobes fixedly mounted to the cylindrical head positioned below the cylindrical head and oriented within the container below the spout, wherein the cylindrical head is mounted on the torroidal seat in a first position and displaced from the torroidal seat in a second position, and the plural pairs of lobes are spaced from the cylindrical head a predetermined spacing, and wherein the torroidal seat is spaced from the container a predetermined length, wherein the predetermined length is less than the predetermined spacing, and

the cylindrical head includes a planar bottom surface, and further includes a planar top surface, the planar top surface further including a beveled peripheral surface extending from the planar top surface to the peripheral edge of the cylindrical head, and further including a first vane coaxially and orthogonally mounted to the planar bottom surface, and a second vane orthogonally oriented relative to the first vane integrally and coaxially mounted to the planar bottom surface, wherein the plurality of lobes includes a first pair of lobes coplanar relative to one another and coplanar with the first vane, and the second vane including a plurality of second lobes orthogonally oriented relative to the first lobes, wherein the second lobes are coplanar relative to one another and to the second vane extending on diametrically opposed sides of the second vane within the container, and



a spout cap, the spout cap including a cylindrical head, and including a planar top wall, and the top wall including a positioning leg fixedly mounted to the top wall extending within the cylindrical cap head, wherein the planar top surface of the cylindrical head is spaced from the spout upper end a predetermined distance and wherein the positioning leg is spaced from the bottom surface of the cap top wall a distance equal to the predetermined distance, and

the cylindrical head of the closure member includes a matrix of through-extending bores directed therethrough defined by a predetermined number, wherein a cylindrical head cap plate is selectively securable to the cylindrical head of the closure member, wherein the cylindrical head cap plate includes a plurality of plate plugs extending orthogonally and downwardly relative to the cap plate, wherein the plate plugs are defined by the predetermined number and are arranged for reception within the through-extending bores to effect selective cessation of fluid flow through the through-extending bores.

5,190,194

RECREATIONAL INNER-TUBE ACCESSORY

Paul Rosner, and Barry Canter, both of 322 S. Laurel St., Richmond, Va. 23220

Filed Feb. 18, 1992, Ser. No. 836,696

Int. Cl.[5] A45C *11/00*

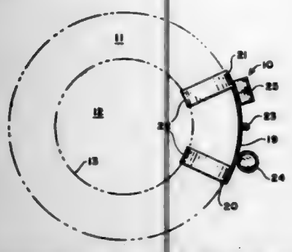
U.S. Cl. 224—0.5 **5 Claims**

1. An accessory holder device adapted to embracingly engage an inflated torus-shaped inner tube having a circular outer perimeter with a contour and an interior circular perimeter which defines a central region, said device comprised of:

a) a horizontal elongated mounting panel having a pair of spaced extremities, said panel being arcuately shaped and

adapted to match the contour of the outer perimeter of the tube,

b) a pair of vertically disposed resilient holding arms extending from said pair of extremities as continuous integral extensions of said mounting panel, wherein one of said pair of holding arms extends from one of said pair of extremities and another of said pair of holding arms extends from another of said pair of extremities, said holding arms being shaped such that said holding arms are adapted to encircle a substantial portion of said tube in tight-fitting engagement therewith,

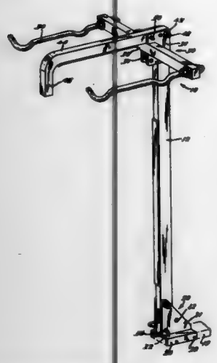


c) a cylindrical umbrella-holding receptacle vertically affixed to said mounting panel and adapted to accept an umbrella handle in close conformity therewith,

d) a cylindrical beverage-holding receptacle tangentially affixed to said mounting panel in vertical disposition and having upper and lower extremities and a closure panel fixedly associated with said lower extremity, said receptacle being adapted to receive a beverage container in close conformity therewith, and

e) a utility container affixed to said mounting panel and having a hingedly associated lid connected thereto, said lid having fastening means adapted to secure said lid in a closed position.

5,190,195
HITCH MOUNTED BICYCLE RACK
Richard L. Fullhart, Goshen; Steven L. Garatoni, Osceola; David J. Troyer, Elkhart, all of Ind., and Philip K. Hoopes, Jr., Union, Mich., assignors to Reese Products, Elkhart, Ind.
Filed Mar. 15, 1991, Ser. No. 670,314
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—42.03 B **15 Claims**



1. A bicycle rack comprising:

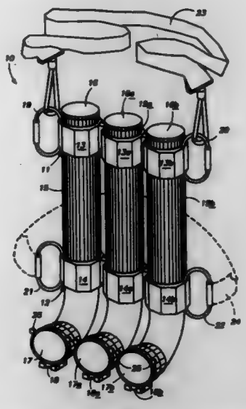
a lower base member adapted to be removably mounted onto a trailer hitch affixed to a vehicle;

an upper assembly disposed in generally a horizontal position and having a crossbar member, a pair of spaced apart bicycle support hooks extending outwardly from said crossbar member, a pivotally operated clamp arm for clamping at least one bicycle onto said support hooks, bracket means for mounting said crossbar member, said bracket means provided with vertically spaced apart clamp arm mounting means for removably and pivotally mounting said clamp arm for pivotable operation at either of two vertically spaced apart first and second pivot locations on said bracket means such that said clamp arm is pivotally mounted a first predetermined distance above said support hooks with said clamp arm pivotally mounted at one of said pivot locations and said clamp arm pivotally mounted above said support hooks a distance different from said first predetermined distance with said clamp arm pivotally mounted at the other of said pivot locations;

a vertical support member having a lower end secured to said lower base member and extending upwardly therefrom; and

means for mounting said bracket means on the upper end of said vertical support member, said clamp arm pivotally mounted at the first pivot location of said vertically spaced apart pivot locations for clamping bicycle frames having a first predetermined diameter and said clamp arm pivotally mounted at the second pivot location of said vertically spaced apart first locations for clamping bicycle frames having a second predetermined diameter smaller than said first predetermined diameter.

5,190,196
PAINT BALL MAGAZINE APPARATUS
Harry H. Hamer, III, 418 S. Frederick St., Mechanicsburg, Pa. 17055
Filed Oct. 7, 1991, Ser. No. 772,109
Int. Cl.[5] F42B *39/02*
U.S. Cl. 224—208 **4 Claims**



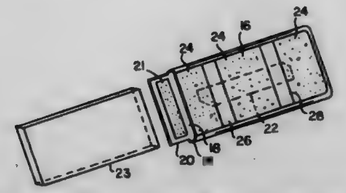
1. A paint ball magazine apparatus for recharging of a paint gun support, wherein the apparatus includes

an upper collar spaced from and parallel a lower collar, and at least one magazine tube orthogonally mounted to the upper collar and lower collar projecting below the lower collar, with the magazine tube of a generally "L" shaped configuration to define an upper magazine tube leg and a lower magazine tube leg, wherein the upper magazine tube leg and lower magazine tube leg are joined together at an arcuate communicating intersection, the upper leg

including a transparent lid mounted to an upper terminal end overlying the upper leg, and

a lid plate removably mounted relative to the lower distal end of the lower leg.

5,190,197
DISPOSABLE GLOVE DISPENSER FOR A VEHICLE
Ronald J. Novak, 413 W. Houstonia, Royal Oak, Mich. 48073
Filed Aug. 30, 1991, Ser. No. 753,319
Int. Cl.[5] B60R *7/05*
U.S. Cl. 224—312 **2 Claims**



1. In a vehicle having a rigid sun visor and other interior structures: the improvement comprising a dispenser for protective disposable gloves contained within a rectangular box (23); said dispenser comprising a case formed of a flexible material; said case comprising a flexible front panel (14) and a flexible rear panel (16); each panel having a relatively long upper edge, a relatively long lower edge, and first and second relatively short side edges; said front panel being longer than said rear panel in a direction taken parallel to the upper and lower panel edges, whereby the edge area of the front panel at its first side edge forms a flexible flap; said front and rear panels being connected together along their respective upper edges, lower edges, and second side edges; said flap being disconnected from the first side edge of the rear panel, whereby a slot-like opening is formed for slidable insertion of a box of disposable gloves into said case; said rear panel having an exterior surface comprised at least partly of hook and loop fastener material; said flap having an interior surface formed of hook and loop fastener material; said flap having an interior surface formed of hook and loop fastener material, whereby said flap can be folded to extend across the box insertion opening, with its hook and loop interior surface attached to the hook and loop surface of said rear panel; two resilient straps extending along the exterior surface of said rear panel in spaced apart relation, each resilient strap having one end thereof attached to the upper edge of the rear panel and the other end thereof attached to the lower edge of the rear panel; each resilient strap lying flat against the exterior surface of said rear panel in its unstressed condition; each strap being stretchable in the direction of its length, whereby the straps can be manipulated so that the vehicle sun visor is sandwiched between the straps and the case rear panel; said front panel having a dispenser opening (22) for manual withdrawal of gloves from the aforementioned box; said rear panel having exposed hook and loop surface areas located in the spaced defined between the rear panel side edges and the straps; and a patch means (32) mountable on an interior structure of the vehicle remote from the sun visor; said patch means having an exterior surface formed of hook and loop fastener material; said patch means being of sufficient size so that its hook and loop fastener surface can mate with the exposed hook and surface areas of said rear panel, whereby the dispenser case can be detachably mounted on the aforementioned vehicle interior surface.

5,190,198
VEHICLE ARTICLE CARRIER
John S. Cacheran, Lake Orion, Mich., assignor to John A. Bott, Grosse Pointe Shores, Mich.
Filed Mar. 27, 1991, Ser. No. 676,085
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—321 **11 Claims**

1. An article carrier for a vehicle comprising:

a plurality of slats fixedly secured on a generally horizontally extending exterior vehicle body surface, said slats extending generally longitudinally of the vehicle;

a pair of brackets disposed upon certain of said slats and a restraining bar extending laterally between and secured adjacent its opposite ends to said bracket; and

selected slats of said slats including means for defining a channel member for permitting sliding movement of at least one of said brackets along the length thereof, and means for defining one or more notches located along said channel member;

said brackets each including a locking member cooperable with said one or more notches and moveable between engaged and disengaged positions for locking and unlocking said brackets at a position along said certain of said slats;

cable means operatively associated with at least one of said locking members for urging said one locking member into and out of said engaged and disengaged positions;

actuating means positioned on at least one of said brackets and operatively associated with said cable means and at least one of said locking members for causing said locking members of each of said brackets to be moved generally simultaneously to releasably secure and allow longitudinal adjustment of said restraining bar and said brackets at predetermined positions along said certain of said slats; and

said actuating means being manually movable generally linearly within a plane extending through said restrainging bar.

5,190,199
DISPENSING CARTON WITH CUTTING MEANS PROTECTOR
Wayne Bulger, Tinley Park, and Chih-Hung Chen, Naperville, both of Ill., assignors to First Brands Corporation, Danbury, Conn.
Filed May 28, 1991, Ser. No. 706,143
Int. Cl.[5] 225 *20, 43, 50*; B26F *3/02*
U.S. Cl. 225—1 **16 Claims**

16. A method for dispensing a sheet material from a dispensing carton contsining a roll of sheet material, said dispensing carton comprises a bottom, front, rear and end walls, a lid hingedly connected to the rear wall forming an elongated

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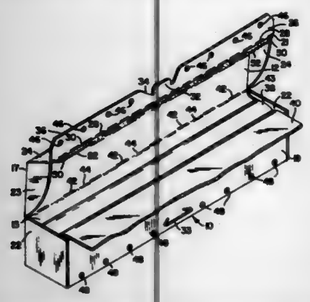
aperture between the lid and the front wall for withdrawing a sheet material from a roll of sheet material positioned within the dispensing carton, said lid comprising a first panel and a second panel, said first panel extending from said rear wall to said front wall and said second panel overlapping the front wall and having a cutting means with a cutting edge affixed thereto, said second panel having an inner surface, a top edge and a bottom edge with a hinge line placed between said top



edge and bottom edge whereby said second panel may be bent at said hinge line to form a cutting means support means and a cutting edge protector means along said hinge line and adjacent said cutting edge of said cutting means with said hinge line being located behind said cutting edge wherein said method comprises opening said dispensing carton and dispensing said sheet material therefrom with said cutting edge protector means overlaying said cutting edge of said cutting means during said dispensing of said sheet material.

5,190,200

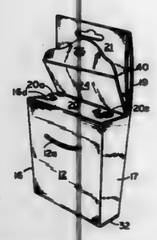
BIODEGRADABLE DENTAL FLOSS CONTAINER

Gary M. Hammerlund, Grand Rapids, Mich., assignor to Ranir/DCP Corporation, Grand Rapids, Mich.

Filed Dec. 23, 1991, Ser. No. 813,199

Int. Cl.[5] B26F 3/00; B65D 5/00

U.S. Cl. 225—42 **17 Claims**



5. An integral, one-piece, cellulosic, recyclable, dental floss package/container/dispenser, comprising:

a one-piece paperboard element defining a rear wall, a front wall, a pair of side walls, a top inner panel having a floss exit orifice and a floss cutter, a top closure and a bottom closure; and

an integral hang tab extending upwardly above said top closure for suspending said dental floss package and dental floss therein from a display hanger.

5,190,201

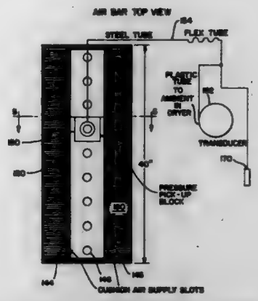
METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A WEB WITHIN A WEB DRYER

Gerald D. Briggs, Butler, Wis., assignor to Quad/Tech, Inc., Sussex, Wis.

Continuation of Ser. No. 642,066, Jan. 16, 1991, abandoned. This application Feb. 18, 1992, Ser. No. 837,564

Int. Cl.[5] B41F 23/04; F26B 13/20; B65H 26/00

U.S. Cl. 26—1 **9 Claims**



1. An apparatus for detecting a break in a web in a web offset printing system, the apparatus comprising:

an enclosure, said enclosure having an interior, an entrance aperture and an exit aperture, said interior being intermediate said entrance aperture and said exit aperture, said web traversing said interior from said entrance aperture to said exit aperture;

a fluid pressure means within said interior for providing a fluid flow within said interior, said fluid pressure means providing at least one inlet to said interior and providing at least one outlet from said interior for establishing said fluid flow, said at least one outlet meeting said interior at an outlet boundary, said fluid flow generally flowing from said at least one inlet, through a cushion pressure zone at a surface of said web within said interior, and through said at least one outlet past said outlet boundary and creating a cushion pressure in said cushion pressure zone; and

a sensing means for sensing pressure, said sensing means being disposed to sense said cushion pressure substantially at said outlet boundary.

5,190,202

APPARATUS AND METHOD FOR DRAWING YARN FROM A CONVEYOR

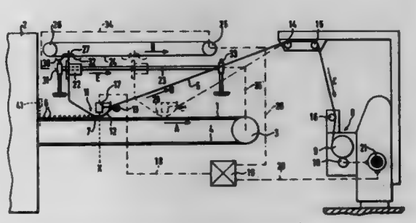
Rolf Mischker, and Eugen Hommel, both of Charlotte, N.C., assignors to American Suessen Corporation, Charlotte, N.C.

Filed Nov. 21, 1990, Ser. No. 616,929

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1989, 3939823

Int. Cl.[5] B65H 51/20

U.S. Cl. 226—118 **17 Claims**



1. Apparatus for handling yarns, comprising:

conveying means for conveying looped yarn in a downstream direction,

drawing-off means for drawing the yarn off said conveying means,

sensing means for sensing the location of a terminal end of the looped yarn on said conveying means,

control means operably connected to said drawing-off means and said sensing means for regulating the rate of drawing-off as a function of deviations in the location of the terminal end of the looped yarn,

holding means disposed adjacent the terminal end of the looped yarn for holding the looped yarn against said conveying means prior to the looped yarn being drawn off, said holding means disposed in an operating position when said drawing off means is activated,

displacing means for displacing said holding means in a downstream direction in response to said drawing-off means being deactivated and said conveying means remaining activated, whereby said holding means will be positioned in the vicinity of the terminal end of the looped yarn when said drawing-off means is reactivated, and for thereafter causing said holding means to be displaced upstream with the terminal end of the looped yarn as the yarn is drawn-off, and

said sensing means being situated adjacent said holding means when said holding means is in said operating position.

5,190,203

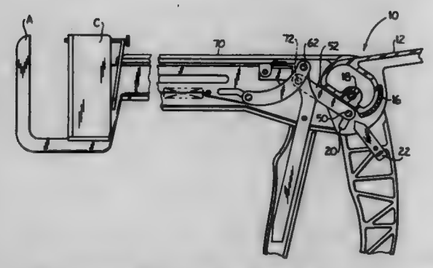
CONTROLLED CLOSURE MECHANISM

Daniel Rodak, Milford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 593,697, Oct. 5, 1990, abandoned. This application Jun. 4, 1992, Ser. No. 893,899

Int. Cl.[5] A61B 17/72

U.S. Cl. 227—175 **28 Claims**



1. An apparatus for surgically applying closure means to body tissue, which comprises:

a) first and second means for gripping the body tissue therebetween and for applying the tissue closure means,

b) a longitudinally extending member cooperating with at least one of said first and second gripping means:

c) actuation means for driving said tissue closure means,

d) means for displacing said longitudinally extending member to advance at least one of said first and second gripping means toward the other to grip the body tissue therebetween in preparation for applying the tissue closure means, said displacing means being independent of said actuation means; and

e) means for engaging and disengaging said displacing means so as to retain said first and second gripping means in selective spaced relation to provide predetermined gripping force independent of thickness of the body tissue therebetween.

5,190,204

LASER BUTT-WELDING DEVICE AND METHOD

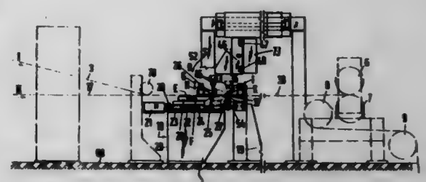
Kurt Jäck, Aalendorf; Wilfried Prange, Dinslaken, and Gerhard Alber, Ravensburg, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG Maschinenbau, Fed. Rep. of Germany

Filed Jan. 10, 1991, Ser. No. 640,479

Claims priority, application European Pat. Off., Jan. 20, 1990, 90101135.3

Int. Cl.[5] B23K 26/00, 37/04

U.S. Cl. 228—5.7 **24 Claims**



1. A method for preparing the ends of first and second metal strips for butt-welding and for butt-welding the strips together, said preparing and butt-welding being performed by a single laser, said method comprising:

clamping said first strip;

cutting off an end of said first strip with a laser, leaving a straight edge for welding;

clamping said second strip;

cutting off an end of said second strip with said laser, leaving a straight edge for welding;

moving said edges of said first and second strips into butt-welding relationship; and

welding said first and second strips together with said laser.

5,190,205

BONDING HEAD ASSEMBLY

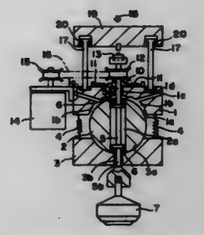
Kanji Ozawa, and Yukitaka Sonoda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Oct. 31, 1991, Ser. No. 785,494

Claims priority, application Japan, Oct. 31, 1990, 2-295089

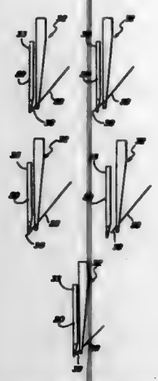
Int. Cl.[5] B23K 3/00, 20/02

U.S. Cl. 228—44.7 **5 Claims**



1. A bonding head which is equipped with: a central shaft to which a bonding tool is mounted, an oscillating element which is attached to said central shaft, an oscillating element retaining block which retains aid oscillating element in a manner that said oscillating element is free to oscillate, and a retaining means which retains said oscillating element in said oscillating element retaining block, said retaining means being a vacuum suction retaining means.

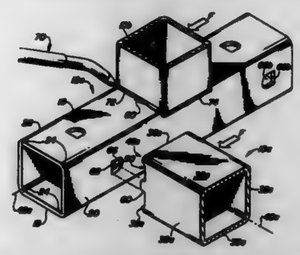
5,190,206
ULTRASONIC WIRE BONDING TOOL AND METHOD FOR SELF-THREADING SAME
Charles F. Miller, Anaheim Hills, and Kenneth L. Biggs, Orange, both of Calif., assignors to West Bond Inc., Anaheim, Calif.
Filed Jul. 9, 1992, Ser. No. 911,190
Int. Cl.[5] H01L *21/60, 21/607*
U.S. Cl. 228—102 18 Claims



1. An improved tool for ultrasonic wire bonding comprising;
a. an elongated shaft adapted at a first end thereof to receive and transmit vibrational energy from an acoustic power source,
b. a tapered tip section joined to the second end of said shaft, said tip section having a front wall, a flat lower front toe section, a lower oblique wall which slopes upward and rearward from said toe section, a rear wall which intersects said lower oblique wall, a guide hole adapted to receive a wire extending obliquely through said rear wall and said lower oblique wall, said guide hole having an enlarged rear entrance opening in said rear wall and an exit opening in said lower oblique wall, and right and left side walls, one of said side walls having formed therein a shallow groove, said groove intersecting said rear wall and forming an intersecting ledge with said front wall, said ledge being adapted to severe a bonding wire laid in said groove and pulled taut against said ledge.

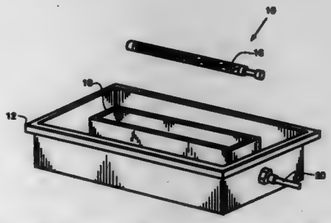
5,190,207
METHOD FOR WELDING RECTANGULAR TUBES
Donald R. Peck, Clive; Arman P. Mortale, and Leo W. Riegel, both of Ankeny, all of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Jun. 2, 1992, Ser. No. 892,097
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—170 19 Claims

1. A method of welding a first elongated tube of rectangular cross section to a second elongated tube of rectangular cross section, wherein the tubes have upper and lower walls joined by opposite sides with rounded corners having radii of curvature joining the sides and the upper and lower walls, the method comprising:
notching the opposite sides of one end of the first tube with a shape complimentary to the side of the second tube;
supporting the notched end of the first tube against the side of the second tube so that the upper and lower walls of the first tube touch or are in close proximity to the rounded corners of the second tube;
welding the upper and lower walls of the first tube to the rounded corners of the second tube; and
precisely locating the first tube relative to the second tube, the step of precisely locating including:



providing a tab in one the notched sides of the first tube and providing a mating hole in the side of the second tube; and inserting the tab into the hole.

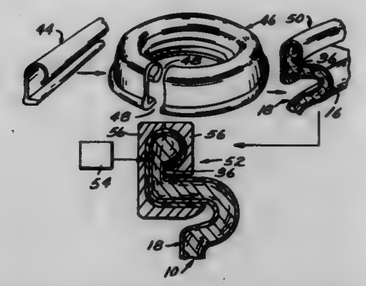
5,190,208
FOAMING FLUX FOR AUTOMATIC SOLDERING PROCESS
Raymond L. Turner, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Continuation-in-part of Ser. No. 705,858, May 28, 1991, abandoned, which is a division of Ser. No. 607,200, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,765, May 15, 1990, Pat. No. 5,085,365. This application Oct. 21, 1991, Ser. No. 780,170
Int. Cl.[5] B23K *1/20*
U.S. Cl. 228—207 40 Claims



1. A method for soldering a metal comprising applying to a surface a foaming soldering flux, heating said metal to a desired soldering temperature, and applying solder to said surface, said soldering flux comprising (a) a water-soluble organic acid having at least two carboxylic acid groups, (b) water, and (c) at least one foaming agent, the concentration of which is sufficient to generate a foam head height of at least about 0.5 inch for automated wave soldering processes and to collapse rapidly to avoid accumulation of foam.

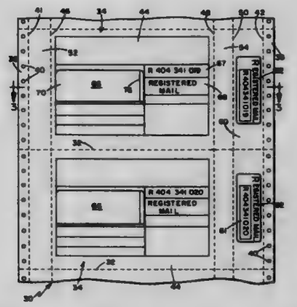
5,190,209
PLASTIC CHIME OVERLAY FOR FIBRE DRUM
Gerald A. Gordon, Wheeling; John K. Shepard, Bolingbrook, and William L. Swihart, deceased, late of Westmont, all of Ill. by Nancy L. Muller, executrix , assignors to Sonoco Products Company, Hartsville, S.C.
Filed May 18, 1990, Ser. No. 525,010
Int. Cl.[5] B65D *7/44*
U.S. Cl. 229—5.7 13 Claims

1. In a storage drum adapted to contain aggressive materials, said drum including a peripheral side wall with an upper edge portion defining an open upper end adapted to selectively receive an overlying cover, and a closed bottom, an inner lining within said drum, said lining being generally inert to aggressive materials to be contained within said drum, a chime overlying, intimately engaging and defining a bead about the upper edge portion of the side wall peripherally thereabout, said chime conforming to the upper edge portion both interiorly and exteriorly of said drum; the improvement comprising a plastic overlay generally inert to aggressive materials to be contained in said drum, said overlay overlying said chime peripherally about said open upper end and depending for at least a portion of the height of said chime exteriorly of said drum, said overlay depending below said chime interiorly of



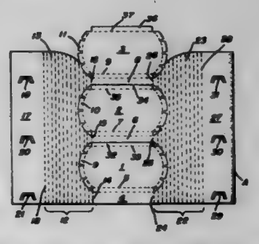
said drum and terminating in an inner edge portion engaging said lining below said chime, a continuous bond between said overlay inner edge portion and said lining sealing said overlay to said lining peripherally about said open upper end of said drum, said overlay having a continuous inner surface, and an uninterrupted bond between said chime and said inner surface of said overlay for substantially the full extent of said inner surface, said uninterrupted bond providing a continuous seal between said overlay and said chime for the extent of the uninterrupted bond between said overlay inner surface and said chime.

5,190,210
CONTINUOUS MAILING FORMS AND MAILING PREPARATION SYSTEM
Gerard F. Walz, Fallbrook, Calif., assignor to Walz Postal Solutions, Inc., Fallbrook, Calif.
Filed Sep. 13, 1989, Ser. No. 406,732
Int. Cl.[5] B65D *27/06*
U.S. Cl. 229—69 7 Claims



1. A continuous mailing form assembly, comprising:
at least one sheet of individual form parts secured together along spaced transverse tear lines, the sheet having opposite outer marginal side edges;
the sheet having lines of pin feed perforations along said opposite outer marginal side edges;
each individual form part having spaced longitudinal tear lines for separating a predetermined detachable area of the form part from the remainder of the form part for attachment to an item to be mailed, the predetermined detachable area comprising a return postcard having printed indicia on both of its faces including marked areas for receiving predetermined information concerning a mailed item, one of said areas on a first face of said postcard comprising a designated addressee area for receiving the address to which the item is to be mailed;
a blown-on label assembly secured to the designated addressee area on each form part, the assembly comprising a detachable address label for attachment to an item to e mailed and means for duplicating the address printed on the address label on the return postcard;
each form part further including an identifying number label having means for securing it to an item to be mailed, the label being detachably secured to the remainder of the form.

5,190,211
SNACK DISPLAY
David C. F. Stoddard, Atlanta, and Ladd M. Orr, Clarkston, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Apr. 27, 1992, Ser. No. 874,375
Int. Cl.[5] A47B *3/00*
U.S. Cl. 229—120.21 11 Claims



1. A snack display comprising a plurality of parallel spaced part cross pieces, a pair of side pieces foldably joined to opposite ends of said cross pieces respectively and which are of arcuate cross sectional configuration, planar panels foldably joined to edges of said side pieces which are remote from said cross pieces, means securing together edges of said planar panels which are remote from said side pieces and a plurality of shelves each having ends and a rear edge foldably joined respectively to said cross pieces and disposed in horizontal parallel relation to each other.

5,190,212
COLLAPSIBLE DIVIDER FOR A SHIPPING BOX
Jerry F. Morris, Harrisonburg, Va., assignor to Packaging Services Inc., Weyers Cave, Va.
Filed Mar. 20, 1992, Ser. No. 855,714
Int. Cl.[5] B65D *5/48*
U.S. Cl. 229—120.29 11 Claims

1. A collapsible divider for insertion in a rectangular box that has a first set of opposed parallel walls of a first length and a second set of opposed parallel walls of a second length, said divider comprising:
a unitary, elongated, rectangular sheet of a foldable material having a front surface and a back surface; a long dimension with long edges and a short dimension with short edges, as well as a right half and a left half,
at least six score lines situated transversely to the long dimension of said sheet, three of said score lines situated in said left half and three in said right half, said score lines forming seven sections, a central one of said sections being

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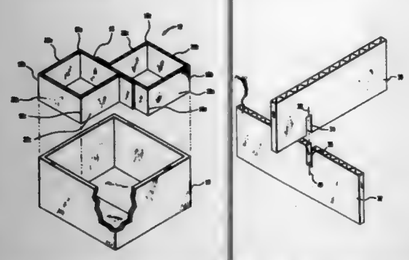
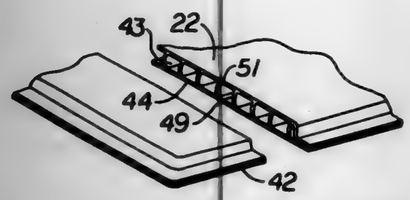
substantially equal in length to said first length, a first pair of said sections connected along a first pair of said score lines to said central section on either side of said central section, each of the two sections forming said first pair being substantially equal in length to one half of said second length; a second pair of sections connected along a second pair of said score lines respectively to each of said first sections; a third pair of said sections connected along a third pair of score lines respectively to each of said second sections, each of said sections forming said third pair being substantially equal in length to one half of said second length;



said sheet being folded at the three score lines situated in the right half towards the front surface and at the three score liens situated in the left half towards the back surface, so said first, second and third sections form a rectangle on the front surface and the back surface, respectively; and

means to secure the smaller edges of the sheet to said central section in a way that said first sections and said third sections are parallel to each other to form a collapsible divider that when erected in a box divides the box into four compartments.

5,190,213
REUSABLE THERMALLY INSULATED FOOD DELIVERY BOX
Lawrence H. Horwitz, 1881 Keys Crescent, Cincinnati, Ohio 45206
Filed Jan. 30, 1992, Ser. No. 828,109
Int. Cl.[5] B65D *5/00*
U.S. Cl. 229—152 **5 Claims**



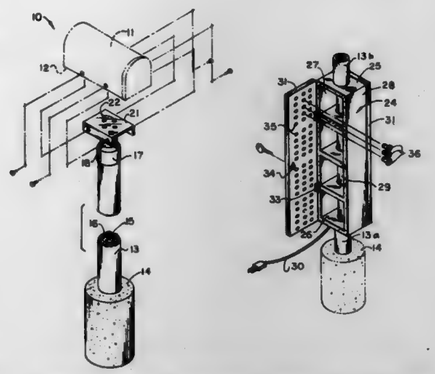
1. A reusable box for delivering thermally insulating food, said box comprising:

top, bottom, and side wall panels appropriately interconnected to form a closable container,

said wall panels constructed from a corrugated plastic material having plastic corrugations and capable of being sanitized for the delivery of food, and

said panels having sealed fluted edges such that the resusable box is capable of being sanitized.

5,190,214
MAILBOX MESSAGE INDICATION SUPPORT APPARATUS
Richard J. Dewailly, 310 Marcia Dr., Luling, La. 70070
Filed Mar. 26, 1992, Ser. No. 858,041
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—39 **5 Claims**



1. A mailbox support apparatus arranged for receiving a mailbox housing thereon, wherein the apparatus comprises,

a polymeric support post, the polymeric support post including an outer first diameter and having a lower distal end and an upper distal end, a cement anchor, the lower distal end received within the cement anchor, and the upper distal end including a post cap mounted thereon, with the post cap including an inner diameter equal to the first diameter, and

an internally threaded extension formed to the post cap coaxially aligned therewith extending upwardly thereof, and

an externally threaded plug received within the internally threaded extension, and

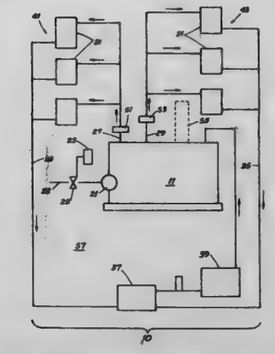
a plug flange mounted to an upper distal end of the plug, and

a mounting plate arranged for securement to the flange, and

a plurality of plate fasteners securing the mounting plate to the plug flange, with the mounting plate arranged for securement to the mailbox housing, and

the support post includes a post lower portion and a support post upper portion, the lower portion coaxially aligned relative to the upper portion in a spaced relationship, and an indicator housing, the indicator housing including a housing bottom wall and a housing top wall, the housing bottom wall fixedly mounted to the support post lower portion fixedly and orthogonally relative to the housing bottom wall, and the housing top wall including the support post upper portion extending upwardly thereof in an orthogonal relationship medially intersecting the housing top wall, and the indicator housing including an illumination bulb extending from the housing top wall to the housing bottom wall coaxially aligned relative to the support post upper portion and the support post lower portion, and the indicator housing including a housing first side wall spaced from a housing second side wall, and a transparent door mounted hingedly to the housing extending from the housing top wall to the housing bottom wall between the housing first side wall and the housing second side wall, and the transparent door including a door latch arranged for securement of the transparent door to the housing, and alpha numeric designation means mounted selectively to the transparent door.

5,190,215
METHOD FOR CONTROLLING A BOILER
Robert Habermehl, Jr., Franklin; Norman M. Knauer, and Alan L. Kwasneske, both of Milwaukee, all of Wis., assignors to Habermehl-Knauer Controls, Inc., Franklin, Wis.
Filed Oct. 30, 1991, Ser. No. 785,281
Int. Cl.[5] G05D *23/00*
U.S. Cl. 236—91 F **27 Claims**



23. In a building heating system having a boiler and wherein:

the building includes two heating zones, each having at least one temperature sensor and a flow loop including a zone valve and a water return line; and,

the temperature of each zone is controlled at a set point and a zone is calling for heat;

an improved method for controlling the boiler including the steps of:

monitoring control parameters including ambient temperature exterior the building and the temperature of water in the return line;

controlling boiler firing and quiescence as a function of a combination of water and ambient temperatures;

and wherein the method includes a zone control routine comprising the steps of:

initiating boiler firing in response to the call for heat;

opening both zone valves;

monitoring the temperature of water in each return line; and,

closing the zone valve in that loop having the higher return line water temperature if the difference in water temperatures exceeds a predetermined value,

thereby prioritizing transfer of heat to that zone having the lower return line water temperature.

5,190,216
FUEL-INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES
Carl F. Deneke, 116 Cool Way Dr., San Antonio, Tex. 78232
Filed Apr. 19, 1991, Ser. No. 687,840
Int. Cl.[5] F02M *67/00*
U.S. Cl. 239—5 **9 Claims**

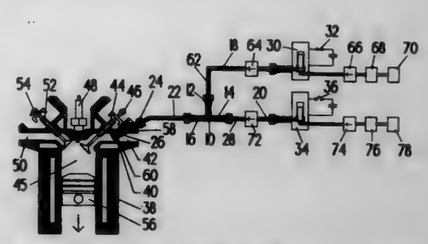
7. The method of producing and delivering consecutive charges of a consistent volume mixture of air and an atomized liquid fuel to the combustion chamber of an internal combustion engine through a fuel inlet valve, comprising the steps of:

(1) supplying pressured liquid fuel to an input end of a delivery conduit extending to said fuel inlet valve of said combustion chamber at a preselected pressure to form a column of liquid fuel only in said input end when said fuel inlet valve is closed;

(2) supplying a pulse of pressurized air transversely into said input end of the delivery conduit, the pressure of said air substantially exceeding the pressure of said liquid fuel, thereby severing a slug of liquid fuel from said liquid fuel column;

(3) opening said fuel inlet valve;

(4) propelling said slug of liquid fuel by said air pressure along said delivery conduit with an increasing velocity; and



(5) passing said accelerated slug of liquid fuel and said pulse of air through an atomizing nozzle to produce a charge of air and atomized fuel for entry into said combustion chamber through said opened fuel inlet valve.

5,190,217
APPLICATOR GUN FOR APPLYING SURFACE COATINGS
Andrew W. Black, Lake Barrington, and Richard M. Kleinke, Crystal Lake, both of Ill., assignors to Air Pressure Damp-Proofing Service, Inc., Rolling Meadows, Ill.
Filed Aug. 26, 1991, Ser. No. 749,914
Int. Cl.[5] B05B *7/14, 17/00*
U.S. Cl. 239—154 **30 Claims**

1. A hand held spray gun for directing a mixture of viscous liquid and glass particles onto a substrate surface comprising an elongated barrel, a spray nozzle supported by said barrel, means for connecting said spray nozzle to a pressurized liquid supply, said spray nozzle being operable for creating a discharging spray pattern of liquid particles from liquid directed to said nozzle from said supply, a glass cutter assembly mounted in fixed relation to said barrel, said cutter assembly including a rotatable cutter blade and means for directing a continuous glass roving to said cutter blade, said cutter blade being rotatable for cutting said continuous glass roving into glass particles for direction into said barrel, a fan mounted in fixed relation to said barrel and being operable for directing an air flow through said barrel in a downstream direction, and a motor mounted in fixed relation to said barrel for simultaneously operating said fan and cutter whereby an air flow directed through said barrel by said fan forcefully directs cut glass fibers through the barrel and into intermixing relation with the liquid particles discharging from said spray nozzle for application onto said substrate surface as an integrated coating.

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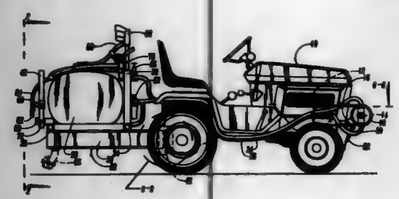
5,190,218
SPRAYING LIQUIDS WITH A SMALL TRACTOR
Howard H. Kayser, R.R. 2, Box 8, and Steven A. Claude, 1310 Front St., both of Garner, Iowa 50438
Filed Apr. 15, 1991, Ser. No. 685,036
Int. Cl.[5] B05B *1/20*; A01C *23/00*
U.S. Cl. 239—172 8 Claims



1. A spraying system for attachment to a lawn and garden size tractor having a rotating auxiliary drive means near the front of the tractor, a front connection means at the front of the tractor, and a rear connection means at the rear of the tractor, comprising:

mounting means connectable to the front connection means for holding a mechanically-powered fluid pump means to allow operative connection of the fluid pump means to the auxiliary drive means, the front connection means including aperture in the front of the tractor, the mounting means including a bar insertable into said apertures and being releasably securable by locking means;

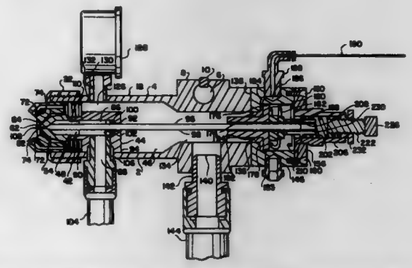
frame means for supporting a spraying tank and spraying boom;

attachment means for attaching the frame means to the rear connection means at the rear of the tractor, the rear connection means including pins extending from positions generally at the rear of the tractor, the attachment means comprising a quick attach means including bracket means having generally vertical slots which can be inserted over said pins, and having quick release means to lock the frame means to the rear of the tractor and in a generally horizontal position, said quick release means being spaced from said pins, the vertical slots and the pins allowing the frame means to be pivoted on the pins so that one end of the frame means which includes the quick attach means can be lifted and connected to the pins, and the opposite end then pivoted up to horizontal and the frame means locked into position with the quick release means; and

fluid connection means for fluidly communicating between the mounting means at the front of the tractor and the frame means at the rear of the tractor to allow pumping action with respect to the contents of the spraying track and the spraying boom, the fluid pump means being mechanically driven by the auxiliary drive means at the front of the tractor, but delivering pumping action to the boom and tank at the rear of the tractor.

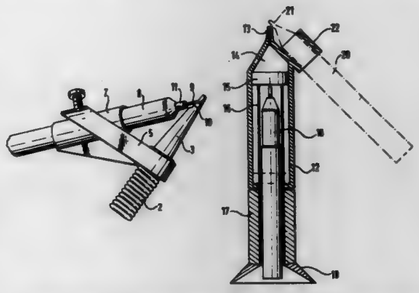
5,190,219
AUTOMATIC SPRAY GUN
William H. Copp, Jr., 5 Solomon Pierce Rd., Lexington, Mass. 02173
Filed Oct. 3, 1991, Ser. No. 770,251
Int. Cl.[5] B05B *1/26*
U.S. Cl. 239—296 21 Claims

1. A spray gun for use in an automatic spray gun system, comprising a plurality of individual modular components and connecting means to assemble into an operational spray gun and to disassemble for cleaning, repair and replacement, including a pressurized air chamber module to receive pressurized air for atomization of liquid to be sprayed from said spray gun, a pressurized liquid housing module for connection to said pressurized air chamber module to receive pressurized liquid to be atomized and sprayed from said spray gun, first connecting means to connect said pressurized liquid housing module to said pressurized air chamber module, a nozzle module having a nozzle orifice for connection to said pressurized liquid housing module to receive pressurized liquid therefrom and flow through said nozzle orifice, second connecting means to connect said nozzle module to said pressurized liquid housing module, an elongated needle valve member module having a forwardly extending needle end tapering to a point for seating in said nozzle orifice for closure thereof when fully seated, an operating means module for connection to said pressurized air chamber module and to said needle valve member module to move said needle valve member module into and out of fully



seated engagement with said nozzle orifice of said nozzle module, third connecting means to connect said operating means module to said pressurized air chamber module, fourth connecting means to connect said operating means module to said needle valve member module for movement thereof into and out of said fully seated engagement with said nozzle orifice, an atomization means module for connection to said pressurized air chamber module to receive pressurized air therefrom and direct it on said pressurized liquid as it flows through said nozzle orifice, and fifth connecting means to connect said atomization means module to said pressurized air chamber module.

5,190,220
AIR BRUSH APPARATUS HAVING AN IMPROVED NOZZLE AND CONNECTION MECHANISM
Terence W. Bolton, c/o Bolton Research Limited, Unit 6, City Business Centre, Basin Road, Chichester, West Sussex PO19 2DU, England
Filed Jun. 19, 1991, Ser. No. 717,427
Claims priority, application United Kingdom, Jun. 20, 1990, 9013745
Int. Cl.[5] B05B *7/24*
U.S. Cl. 239—305 11 Claims



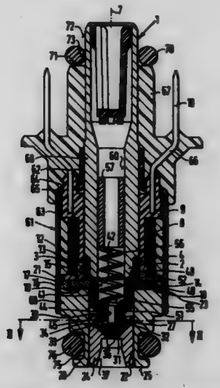
1. Apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet;

a manually operated pump connected to supply air under pressure directly to the nozzle; and

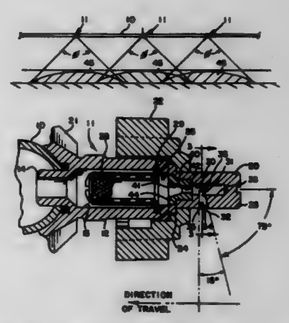
a pen-like container having a nib and a shoulder adjacent the nib and being supported within a holder so that the nib is in close proximity to the nozzle outlet and so positioned that air leaving the nozzle outlet is directed onto and over the nib to cause liquid from the pen-like container to be dispensed as a fine particulate spray in air, the nozzle outlet being formed with a step to define an abutment surface against which cuts the shoulder of the pen-like container to correctly locate the nib with respect to the nozzle outlet.

5,190,221
ELECTROMAGNETICALLY ACTUATABLE FUEL INJECTION VALVE
Ferdinand Reiter, Markgroeningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE91/00342, § 371 Date Jan. 31, 1992, § 102(e) Date Jan. 31, 1992, PCT Pub. No. WO91/19090, PCT Pub. Date Dec. 12, 1991
PCT Filed Apr. 25, 1991, Ser. No. 828,897
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1990, 4018256
Int. Cl.[5] B05B *1/34*; F02U *51/08*
U.S. Cl. 239—463 20 Claims



1. An electromagnetically actuatable fuel injection valve for fuel injection systems of mixture-compressing internal combustion engines with externally supplied ignition, having an inner pole surrounded by a magnet coil, an armature toward the inner pole that is joined to a ball acting as a valve closing body, said valve closing body is slidably supported in a guide bore in a nozzle holder (20) and cooperates with a fixed valve seat (31), in which the armature (41) has a through bore (42), extending concentrically with a longitudinal valve axis (7), and the ball (30) has a blind bore (44) that communicates with the through bore (42), from said blind bore at least one transverse conduit (45) leads to the circumference of the ball.

5,190,222
SPRAY NOZZLE WITH RECESSED DEFLECTOR SURFACE
James Harsch, Naperville, Ill., assignor to Spraying Systems Co., Wheaton, Ill.
Filed Jun. 14, 1991, Ser. No. 715,438
Int. Cl.[5] B05B *1/26*
U.S. Cl. 239—523 31 Claims



1. A spray nozzle assembly for mounting on a spray boom through which a supply liquid is directed comprising,

a stem mounted on said boom and having a liquid passage for receiving supply liquid from said boom,

a spray tip,

means for mounting said spray tip on said stem for receiving supply liquid from said stem passage and for directing the liquid in a pre-determined spray pattern,

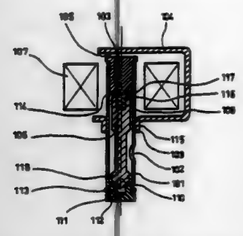
said spray tip being formed with an elongated, axially extending cylindrical chamber communicating with said stem passage, and

said spray tip being formed with a cross slot which intersects said chamber at a location intermediate opposite ends thereof for defining a discharge orifice, a deflection surface on a downstream side of said discharge orifice for directing liquid discharging from said orifice in a direction transverse to the axis of said chamber, and a pocket extending downstream of said deflection surface a distance at least twice the diameter of said chamber.

5,190,223
ELECTROMAGNETIC FUEL INJECTOR WITH CARTRIDGE EMBODIMENT
Gerhard Mezusich, Bochum, Fed. Rep. of Germany, assignor to Siemens Automotive L.P., Auburn Hills, Mich.
Continuation of Ser. No. 419,392, Oct. 10, 1989, abandoned.
This application Mar. 20, 1991, Ser. No. 673,251
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1988, 3834446
Int. Cl.[5] B05B *1/30*
U.S. Cl. 239—585.5 11 Claims

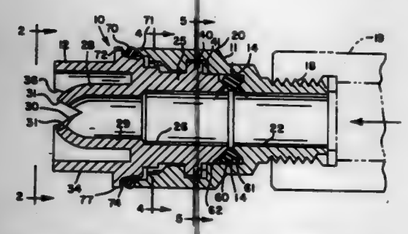
1. In an electromagnetic fuel injector for an internal combustion engine and comprising an electromagnet, an armature, a magnetic pole, and a valve housing, the improvement comprising a cartridge for supporting said electromagnet having a nonmagnetizable portion and a valve seat wherein said cartridge is surrounded by at least one magnetic coil, said coil

being connected to two contact pins and enveloped by at least one magnetic return flow element, and wherein the magnetic



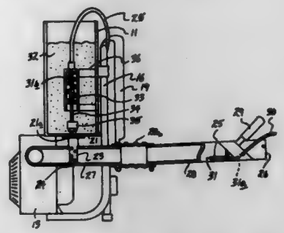
return flow element is at least partly formed by a cap which is open on one side.

5,190,224
QUICK DISCONNECT NOZZLE ASSEMBLY
Richard J. Hamilton, West Chicago, Ill., assignor to Spraying Systems Co., Wheaton, Ill.
Continuation of Ser. No. 505,068, Apr. 5, 1990, abandoned. This application Feb. 11, 1992, Ser. No. 835,045
Int. Cl.[5] B05B *1/00*; F16L *37/18, 19/00*
U.S. Cl. 239—600 39 Claims



1. A quick disconnect nozzle assembly comprising
a nozzle body,
a removable and replaceable spray nozzle tip,
said tip and body each having an internal bore for the passage of liquid therethrough,
said nozzle tip having a discharge orifice for imparting a predetermined spray pattern to liquid passing through said liquid passage bores and discharging from said tip;
an annular sealing member interposed between said tip and body,
said nozzle tip and body having cooperating camming means for causing said tip and body to be axially drawn together in response to rotation of said tip relative to said body for pressing said tip and body into predetermined sealing engagement with said annular sealing member,
said nozzle tip and body having radially cooperating detent means, said detent means being axially separated from said camming means and being actuatable in response to rotation of said tip relative to said body in one direction for retaining said tip in predetermined sealing engagement with said annular sealing member without affecting the force of engagement of said spray tip and body on said annular sealing member and for locating and retaining said nozzle tip and the discharge orifice thereof in predetermined angular orientation relative to said body, and said detent means being deactuatable in response to rotation of said tip relative to said body in an opposite direction for removing said tip from said body without increasing the force of engagement of said spray tip and body on said annular sealing member.

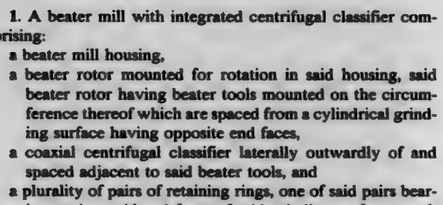
5,190,225
BROADCAST SPREADER APPARATUS
Bruce M. Williams, 1568 Gridley, Grand Rapids, Mich. 49504
Filed Jul. 18, 1991, Ser. No. 731,898
Int. Cl.[5] A01C *15/04*; B05B *7/30*
U.S. Cl. 239—653 5 Claims



1. A broadcast spreader apparatus, comprising,
a vertically aligned hopper, the hopper including a hopper forward wall, a hopper bottom wall, and a plurality of side walls, the side walls including a left side wall, and
the hopper bottom wall defining an acute included angle between the left side wall and the bottom wall, and
the hopper including a bottom wall opening directed through the bottom wall at a junction defined by an intersection of the left side wall and the bottom wall, and
a blower motor, the blower motor mounted within a blower housing, and the blower housing including feed conduit to direct pneumatic pressure through the feed conduit from the blower housing, and
valve means positioned within the hopper for directing selective flow of granular material through the bottom wall opening, and
the feed conduit includes a rigid tubular first leg in pneumatic communication with the blower housing, with the rigid tubular first leg positioned below the hopper and below the junction, and the feed conduit including a tubular second leg, with the tubular second leg in pneumatic communication with the tubular first leg to include a flexible tubular junction to permit pivotment of the tubular second leg relative to the tubular first leg, and
a material metering conduit, the metering conduit mounted in communication interiorly of the hopper through the bottom wall opening and projecting diametrically through the tubular first leg, the metering conduit including a matrix of apertures directed therethrough to direct granular material from the hopper through the metering conduit and the apertures.

5,190,226
APPARATUS AND METHOD FOR SEPARATION, RECOVERY, AND RECYCLING MUNICIPAL SOLID WASTE AND THE LIKE
Clifford C. Holloway, 39368 Camp Dr., Prairieville, La. 70769
Filed Apr. 29, 1991, Ser. No. 692,550
Int. Cl.[5] B02C *23/24*
U.S. Cl. 241—23 21 Claims

11. Apparatus for separation and recovery of recyclable materials from solid waste materials comprising:
a rotatable pressure vessel having a chamber including inlet and outlet means;
means for introducing said solid waste materials into said inlet means;
means for pressurization and heating said solid waste materials in said chamber;
extruder means carried in said vessel for applying an extruding action to said solid waste materials while said vessel is in a heated and pressurized state, said extruder means being further disposed for expelling the processed solid waste from said vessel responsive to exposing said solid

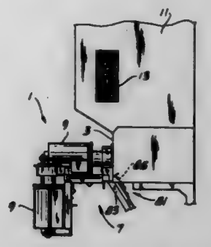


waste materials to heat and pressurization for a predetermined time period.

5,190,227
BEATER MILL WITH INTEGRATED CENTRIFUGAL CLASSIFIER
Wilhelm Pallmann, Zweibrücken, Fed. Rep. of Germany, assignor to Pallmann Maschinenfabrik GmbH & Co. KG, Zweibruecken, Fed. Rep. of Germany
Filed Jan. 17, 1992, Ser. No. 822,143
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1991, 4101343
Int. Cl.[5] B02C *13/10, 23/08*
U.S. Cl. 241—79.1 5 Claims

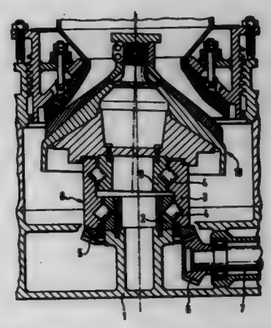
1. A beater mill with integrated centrifugal classifier comprising:
a beater mill housing,
a beater rotor mounted for rotation in said housing, said beater rotor having beater tools mounted on the circumference thereof which are spaced from a cylindrical grinding surface having opposite end faces,
a coaxial centrifugal classifier laterally outwardly of and spaced adjacent to said beater tools, and
a plurality of pairs of retaining rings, one of said pairs bearing against said end faces of said grinding surfaces, each pair of retaining rings having different retaining rim heights, and means adjustably and selectively setting each of said pairs of rings adjacent said end faces, whereby said rings are adapted to be selectively positioned one after another on said end faces of the grinding surface so as to vary the classifying effect on material impinging on said grinding surface.

5,190,228
COFFEE GRINDER MOUNT ASSEMBLY
Leonard A. Ficken, Manchester; Robert J. Reese, St. Charles, and Andrew F. Pong, St. Louis, all of Mo., assignors to Unidynamics Corporation, New York, N.Y.
Filed Oct. 1, 1991, Ser. No. 769,868
Int. Cl.[5] A47J *42/56*
U.S. Cl. 241—100 20 Claims



1. A coffee grinder mount assembly for mounting a coffee grinder to a housing by means of a support member adjacent a coffee bean storage bin for receiving coffee beans therefrom for grinding, said assembly comprising a mounting bracket for supporting said coffee grinder and fixedly attaching it to said housing, said mounting bracket including a sliding means for moving said coffee grinder between an operating position wherein said coffee grinder may be operated to grind coffee or like food product suitable for brewing, and a servicing position wherein said coffee grinder is disposed remote from said storage bin, said coffee grinder being movable with said sliding means in a linear direction away from said operating position and then pivotable with said sliding means to said servicing position.

5,190,229
ROLLING BEARING ARRANGEMENT FOR A CONICAL CRUSHER
Theodor Kaiser, Höchstadt/Aisch, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany
Filed Aug. 5, 1991, Ser. No. 740,104
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1990, 4034220
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—207 1 Claim



1. A conical crusher, comprising a vertically arranged driving element (8) is rotatably mounted on a base (1) as to be freely rotatable with first and second inner races (2, 9), the second inner race (9) adjacent to the crusher cone (10) is in-

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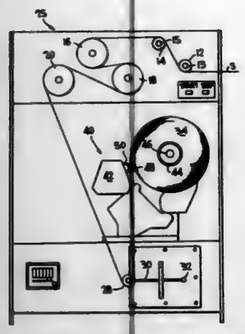
clined with respect to the first inner race (2) and offset eccentrically with respect to the first inner race (2), a rolling bearing arrangement consisting of a single common hollow cylindrical outer part (3) in which the two inner races (2,9) are supported on rolling elements (4), the outer part being part of the driving element (8) and the first inner race (2) being connected with the base (1) whereas the second inner race (9) carries a crushing cone (10).

5,190,230

NON-CATENARY TOW WINDER

Larry C. Cowan, Burlington, N.C., assignor to John Brown Inc., West Warwick, R.I.

Filed Sep. 23, 1991, Ser. No. 764,223
Int. Cl.[5] B65H *54/00*
U.S. Cl. 242—42 **4 Claims**



1. A tow winder for winding a plurality of yarn strands simultaneously onto a package comprising in combination a plurality of guide wheels equal in number to the number of yarn strands to be wound for receiving and guiding said plurality of strands; at least first, second and third godets for receiving the plurality of strands from said guide wheels; a regenerative DC motor for driving said godets; drive means constructed and arranged with said motor for driving said first godet at a first speed and said second and third godet at a greater speed whereby said plurality of strands will be stabilized and tensioned and fed to said second and third godets at a constant speed and at uniform tension; means constructed and arranged with one of said second and third godets for measuring and metering equally the length of each strand; and take-up means for uniformly taking up said plurality of strands on a common package.

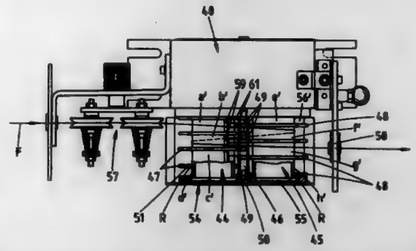
5,190,231

FEED DEVICE FOR TRAVELLING THREADS

Alberto G. Sarfati, Como, Italy, assignor to Société de brevets industriels-Etablissement, Vaduz, Liechtenstein

Filed Jun. 7, 1991, Ser. No. 712,067
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1990, 4021461
Int. Cl.[5] B65H *51/22*
U.S. Cl. 242—47.08 **9 Claims**

1. In a feed device for a travelling thread, particularly for bringing thread to thread-processing machines, in which device the thread is fed tangentially to a drum, said drum being connected with a rotary drive, and wherein the thread is removed from said drum by means of draw-off force acting on a side of the drum tangential to the drum, the thread wrapping partially the circumference of the drum, the drum rotating with higher circumferential speed than speed forwarding-off of the thread, the thread being adapted to be brought to the outer surface of the drum in slip entrainment via the draw-off force, wherein aid drum and at least one other like drum, constituting at least two said drums which are adjacent with parallel axes to one other and are divided by stationary partition walls such that each of aid drums forms a plurality of regions one behind the other in axial direction of the respective drums, the thread partial wrapping said regions in a manner wherein the thread



passes from said regions of one drum to respective adjacent of said regions of the other drum, the improvement wherein

each of said partition walls defines a plane, and wherein

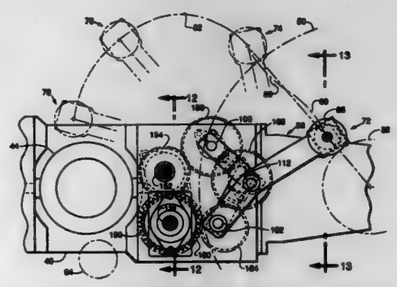
each said outer surface of a corresponding said drum has a radially outwardly directed annular collar aligned with aid plane o the corresponding partition wall.

5,190,232

WIND-UP LAY-ON-ROLL APPARATUS

Noel C. Brandon, Manalapan, and Leonard N. Jenkins, New Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 13, 1990, Ser. No. 610,440
Int. Cl.[5] B65H *18/08, 23/10*
U.S. Cl. 242—56 A **10 Claims**



1. An apparatus for supporting ends of a wind-up lay-on roll while the roll applies a substantially uniform contact force across a width of web material being wound into a roll having an axis, the apparatus comprising:

a first four bar linkage assembly and a second four bar linkage assembly, one of the linkage assemblies for connecting each end of the wind-up lay-on roll to a support and adapted to move such that movement of the ends of the wind-up lay-on roll is confined in a substantially radial direction from the web roll axis when the wind-up lay-on roll is in contact with the width of an outer surface of the web roll;

a force sensor for sensing and forming a signal representative of the force being applied to each end of the wind-up lay-on roll;

a position sensor for sensing and forming a signal representative of an angular position of a link or crank in one of the linkage assemblies;

a position sensor for sensing and forming a signal representative of a position of the outer surface of the web roll; and

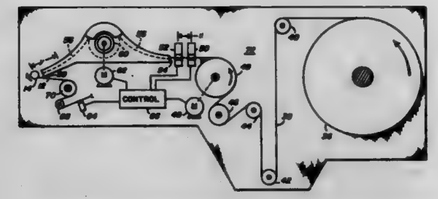
means responsive to the force signals and the position signals for moving the linkage assemblies such that the wind-up lay-on roll applies a substantially uniform force across the width of the web material being wound into the roll.

5,190,233

APPARATUS FOR CUTTING AND FEEDING STRIPS OF WEB MATERIAL

Jayson J. Nelson, Webster; William E. Paymeat, Rochester; Thomas A. Sisson, Hilton, and Joseph A. Watkins, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1991, Ser. No. 684,417
Int. Cl.[5] B65H *19/26, 20/12*
U.S. Cl. 242—56 R **17 Claims**



1. Apparatus for cutting and feeding strips of web material, comprising:

a source of an indeterminate length of web material;

means for withdrawing a predetermined portion of said web material from said source, said portion having a lead end and longitudinally extending edges;

guide track means for receiving said lead end and guiding said edges along a curved path to minimize curl of said portion transverse to said edges, said curved path having entrance and exit ends;

rotatable vacuum drum means, positioned intermediate said entrance and exit ends and provided with a peripheral portion substantially congruent with at least a part of said curved path, for gripping said portion along said part of said curved path;

cutter means, positioned between said means for withdrawing and said guide track means, for severing said portion from said indeterminate length to form such a strip of web material; and

means for rotating said vacuum drum means to feed such a strip along said guide track means following said severing.

5,190,234

WEB HANDLING METHOD AND APPARATUS WITH PRE-ACCELERATION OF WEB FEED ROLLS

Frederick D. Ezekiel, Lexington, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Continuation of Ser. No. 573,283, Aug. 24, 1990, abandoned, which is a continuation of Ser. No. 280,335, Dec. 6, 1988, abandoned. This application Jan. 27, 1992, Ser. No. 826,124
Int. Cl.[5] B65H *19/14*
U.S. Cl. 242—58.1 **14 Claims**

1. A web handling apparatus for continuously supplying a running web to a web-consuming machine at a first speed, and for splicing said running web to a ready web at a lower, second speed while continuing to supply said running web to said web-consuming machine at said first speed, said apparatus comprising:

A) first means for rotatably supporting a roll of running web for supplying web therefrom at said first speed;

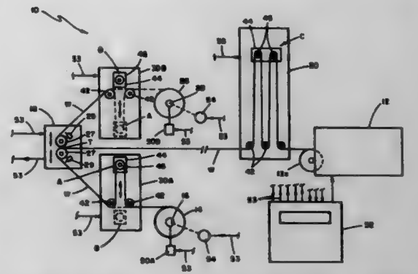
B) second means for rotatably supporting a roll of ready web;

C) means for pulling said running web from said roll of running web with a substantially constant force sufficient to move said running web at said first speed;

D) means for braking the rotation of said roll of running web so as to slow a trailing end segment thereof to a selected minimum speed including zero;

E) means disposed along a web path between said first supporting means and said pulling means for splicing said slowed trailing end segment with a leading end of said ready web;

F) first storage means disposed along said web path between said splicing means and said pulling means for storing a length of said running web and for supplying said stored length at said first speed to a web-consuming machine while said braking means is slowing said roll of running



web and said webs are being spliced at said minimum speed;

G) driver means coupled with said roll of ready web for accelerating said roll of ready web prior to completion of said splice during a pre-acceleration phase and for continuing said acceleration thereafter to said first speed, so as to be able to attain said first speed earlier than said first speed would be attained if said acceleration did not begin until said splice were completed; and

H) second storage means disposed along a second web path between said roll of ready web and said splicing means for storing a length of said ready web while said roll of ready web is being accelerated before completion of said splice and attainment of said first speed by said ready web.

5,190,235

DRUM-TYPE WINDER FOR WINDING WEBS OF MATERIAL

Herbert Schönmeier, and Luzian Kies, both of Düsseldorf, Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 530,365, May 30, 1990, abandoned. This application Jun. 5, 1992, Ser. No. 895,175
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1989, 3924612
Int. Cl.[5] B65H *18/20*
U.S. Cl. 242—66 **18 Claims**

10. In a drum-type winder for winding webs of material, such as paper, comprising two drums against which a reel rests while being wound with the webs, the improvement which comprises a freely rotating attenuating roller (12) that extends across the operating width of the drums, means for applying the attenuating roller approximately horizontally to the reel (4.1), a braking strip (14) secured to pivoting arms (10) which

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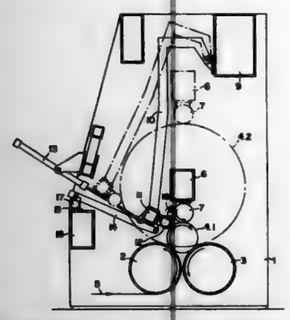
secures the attenuating roller for pivoting motion and a braking mechanism (17) for braking the strip with an adjustable



force, the braking strip serving to brake the pivoting motion of the attenuating roller.

5,190,236

WIRE COILER WITH ROTATING WINDING DRUM

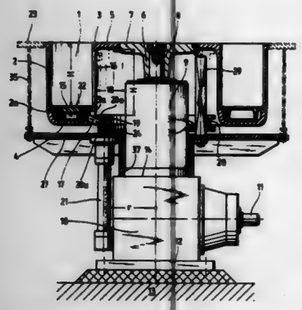
Horst Groos, Mettmann, and Bernhard Zesch, Ratingen, both of Fed. Rep. of Germany, assignors to SMS Hasenclever GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 29, 1991, Ser. No. 751,537

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1990, 4029494

Int. Cl.[5] B21C *47/02*

U.S. Cl. 242—81 **9 Claims**



1. In a wire collar including:

a rotatable annular winding drum having an inner wall, an outer wall radially spaced from said inner wall, an open top between said walls, and a base interconnecting said walls, all having a common vertical axis, a vertical drive shaft coaxial with and rotationally coupled to said winding drum at an upper region of said inner wall, a plurality of axially elongate apertures provided in said inner wall, an annular coil support member disposed in said drum between said inner and outer walls and vertically movable relative to said walls, and a plurality of coupling members each coupled to said coil support member and extending through respective ones of said apertures and movable vertically along said apertures, the improvement comprising:

a vertically movable annular lifting member coaxial with and movable between said inner wall and said shaft, said lifting member being coupled to said coupling members for lifting said coupling members and therewith said coil support member;

static lifting drive means for lifting said annular lifting member; and

means for coupling said annular lifting member to said lifting drive means so that a freely rotatable coupling is provided between said lifting drive means and said annular coil support member.

5,190,237

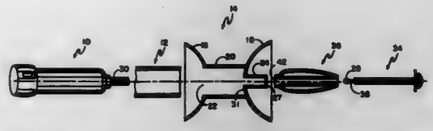
KITE REEL HAVING CLUTCH AXIALLY ENGAGEABLE TO AN ELECTRIC SCREWDRIVER

William E. Fagan, 9 Longfellow Rd., Arlington, Mass. 02174

Filed Apr. 3, 1992, Ser. No. 863,034

Int. Cl.[5] B65H *75/40;* **F41J** *9/08*

U.S. Cl. 242—96 **1 Claim**



1. In a kite reel for use on a kite of the type having a string attached thereto, the combination comprising:

an electric screwdriver having first and second ends having a handle at its first end, said screwdriver being of the cylindrical type having a drive shaft extending from its second end, said drive shaft having a hex aperture defined in the end thereof;

a spool member having a hollow core and first and second ends;

first and second open, bowl-like, flared hollowed flanges, one positioned at each end of said spool member, each flange having its opening aimed outward, said string adapted to be wrapped around the core of said spool member between said flanges;

a wall disposed at the first end of said spool member;

a cylindrical collar member adapted to fit over the second end of said screwdriver, said collar member being of a size to fit in the second end of said spool member, the second end of said spool member being open to allow the free rotation of said spool member on said electric screwdriver;

a hollow receipt member positioned at the center of said wall adapted to receive the drive shaft of said electric screwdriver;

a hex receipt aperture defined at the end of said hollow receipt member alignable with said hex aperture defined in the drive shaft of said screwdriver;

a handle having an aperture defined therein; and

a handle shaft, having a first and second end, said shaft rotatably disposed within said handle aperture, said handle shaft having at its first end means to prevent its further insertion into said handle member and having at its second end a hex member adapted to be positioned into said hex receipt aperture of said hollow receipt member and said hex aperture of said drive shaft of said electric screwdriver, said handle shaft further including a groove defined therein immediately adjacent to said hex member, said handle shaft provided such that when said hex member is engaged through said hex receipt aperture into said hex aperture of said handle shaft, said spool member is driven in the direction of the rotation of said electric screwdriver; and when said handle shaft is manually pulled by the operator such that said hex receipt aperture of said hollow receipt member is aligned with said groove in said handle shaft, said spool member is allowed to freely rotate on said collar member such that the electric screwdriver's rotating drive shaft does not drive or engage said spool member, allowing the free playing out of string from said spool member.

5,190,238

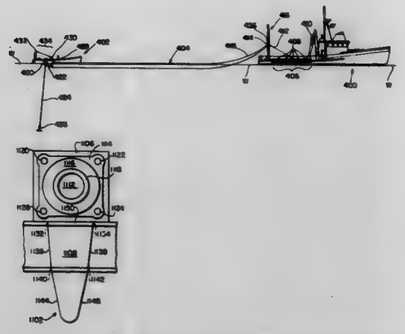
REEL ASSEMBLY ESPECIALLY SUITABLE FOR HOLDING A SECTION OF AN OIL BOOM

Malcolm B. Whidden, Jr., P.O. Box 280, South Harpswell, Me. 04079

Division of Ser. No. 571,148, Aug. 23, 1990, Pat. No. 5,087,152. This application Dec. 10, 1991, Ser. No. 804,409

Int. Cl.[5] E02B *15/04;* **B63B** *35/32*

U.S. Cl. 242—106 **15 Claims**



1. A reel assembly especially suitable for holding a section of an oil boom, comprising:

a) a substantially cylindrical drum having a slot allowing access with an at least partially hollow interior of the drum, the drum adapted to have wound on it the section of oil boom, the boom section having first and second ends, the first end adapted to be inserted into the interior of the drum and having one or more apertures adapted to receive one or more corresponding valve assemblies but having no such valve assemblies inserted therein, a substantial length of the boom section being wound substantially tightly about the drum, the second end of the boom section having one or more valve assemblies inserted therein;

b) an axis which is concentric with the drum and around which the drum may rotate; and

c) reel mounts including:

1) bearings adapted to receive opposite ends of the axis and support the axis as it rotates; and

2) downwardly projecting tongues adapted to fit in respective apertures on a carrier or tender vessel for holding and stabilizing the position of the reel assembly, the tongues being generally flat and having opposite broad faces which are generally "V"-shaped and a narrower edge which joins the opposite broad faces so as to form the tongue, the vertex of the "V" being pointed downward in use, thus allowing the reel assembly as a whole to be easily inserted or removed from the hold of the vessels and permitting rapid deployment and retrieval of the boom section.

5,190,239

RETRACTOR SHAFT-ROTATING TYPE PRETENSIONER

Ryoichi Yoshida, and Muneo Nishizawa, both of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

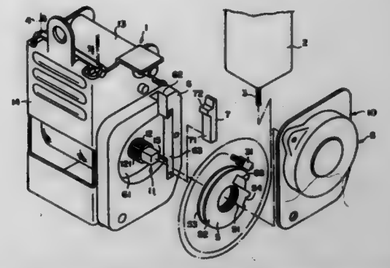
Filed Mar. 2, 1992, Ser. No. 844,797

Claims priority, application Japan, Mar. 6, 1991, 3-63716

Int. Cl.[5] B60R *22/46*

U.S. Cl. 242—107 **3 Claims**

1. A retractor shaft-rotating type pretensioner for a vehicle seat belt having a pulley that is normally not engaged with the belt reel shaft of a retractor but is movable into driving engagement with the belt reel shaft upon operation of a power source such as to rotate the reel shaft in the belt-winding direction and thereby apply a pretension to the belt, characterized in that a movable spacer is detachably coupled to the pulley such that it is moved by the pulley upon rotation of the pulley by the



power source from a retracted position to an engaging position in which it is engaged between the pulley and a portion of a fixed member and maintains the pulley in driving engagement with the reel shaft and in the engaging position is uncoupled from the pulley so that the pulley can rotate.

5,190,240

BELT RETRACTOR SHAFT-ROTATING PRETENSIONER

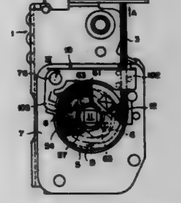
Tetsuya Hamane, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Mar. 11, 1992, Ser. No. 849,516

Claims priority, application Japan, Mar. 12, 1991, 3-70297

Int. Cl.[5] B60R *22/46*

U.S. Cl. 242—107 **1 Claim**



1. A belt retractor shaft-rotating pretensioner for a vehicle seat belt comprising a cable, power source means coupled to a pulling portion of the cable for pulling the cable, means for coupling a pulled portion of the cable to a reel shaft of the belt retractor when the cable is pulled to transmit rotation to the reel shaft, and braking means for ensuring that the coupling means remains engaged with the reel shaft when the cable is pulled including means frictionally engaging the pulling portion of the cable for generating a braking input force when the cable is pulled and means for transmitting the braking input force to the pulled portion of the cable.

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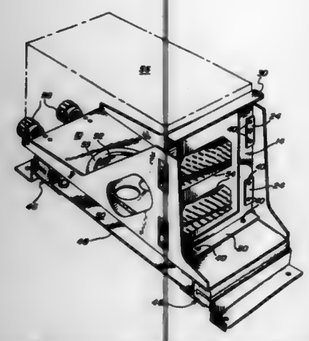
5,190,241

AVIONIC TRAY AND METHOD OF MAKING SAME

Raymond J. Pease, Sherborne, England, assignor to Hollingsead International, Inc., Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 780,280, Oct. 18, 1991, Pat. No. 5,129,594. This application Apr. 6, 1992, Ser. No. 863,842
The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.
Int. Cl.[5] G12B *9/00*
U.S. Cl. 244—1 R **17 Claims**



1. A generally elongated avionic tray having a front and rear end for supporting an avionic black box above a plenum chamber and for holding one half of an electrical connector arranged to mate with a complementary other half connector carried at the back of the box comprising:
- a substantially flat bottom section of unitary construction of metal sheet and defining an opening intermediate the front and rear ends of the tray adapted to communicate with the plenum chamber;
- a pair of side rails of unitary construction with the bottom section and extending upwardly at lateral edges of the bottom section and at right angles thereto;
- at least one inwardly projecting back plate support and alignment tab formed in each side rail, the tabs defining substantially flat surfaces lying in a plane perpendicular to the bottom section and the side rails, said flat tab surfaces being positioned at the rear end of the side rails for accommodating the black box between the tabs and the front end of the tray; and
- a back plate having an opening for receiving the said half connector, the back plate being secured to the alignment tabs so that the connector half is positioned precisely at right angles with respect to the bottom surface and the side rails to insure proper mating between both halves of the connector when the black box is mounted on the tray.

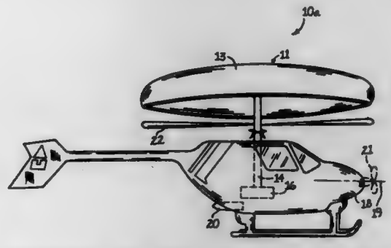
5,190,242

MODEL JET HELICOPTER WITH SOLID-CIRCULAR ROTOR BLADE

Edward H. Nichols, 166 Canonchet Dr., Portsmouth, R.I. 02871

Filed Dec. 18, 1989, Ser. No. 451,645
Int. Cl.[5] B64C *27/22*
U.S. Cl. 244—12.2 **1 Claim**

1. A model aircraft arranged for vertical, horizontal, and hovering flight, comprising in combination,
- an elongate fuselage symmetrically arranged about a longitudinal axis, and
- a forward thrust means mounted parallel to the longitudinal axis on the fuselage for providing forward thrust to the fuselage, and
- a unitary solid blade member fixedly mounted to a rotor shaft, the rotor shaft mounted for rotation interiorly of the fuselage and orthogonally arranged relative to the longitudinal axis, and
- the rotor shaft extending exteriorly above an upper surface of the fuselage, and
- wherein the solid blade is defined with an annular peripheral edge, the annular peripheral edge arranged orthogonally relative to the rotor shaft, and the solid blade member defined as a convex parabolic unitary surface arranged exteriorly of the fuselage including a convex interior surface complementary to that define by the exterior surface, and
- wherein the rotor shaft includes pivot means to enable pivotment of the rotor shaft relative to the fuselage to effect



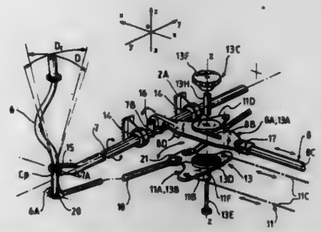
maneuvering of the fuselage, as well as providing gyroscopic stability to the aircraft, and
- wherein the forward thrust means comprises at least one jet propulsion device, and
- wherein the forward thrust means further includes a propeller assembly aligned with the longitudinal axis, wherein the propeller assembly is arranged orthogonally relative to the longitudinal axis and mounted to a forward end of the fuselage, and
- further including a lift propeller assembly mounted orthogonally to the rotor shaft underlying the blade member, wherein the lift propeller assembly is defined by a diameter substantially equal to that defined by the blade member.

5,190,243

DEVICE FOR THE ADJUSTMENT OF THE MANEUVER FORCES OF MOVABLE MEMBERS OF AN AIRCRAFT

Bruno Guimbal, Les Milles, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jun. 29, 1992, Ser. No. 905,458
Claims priority, application France, Jul. 3, 1991, 91 08313
Int. Cl.[5] B64C *27/52*
U.S. Cl. 244—17.25 **11 Claims**



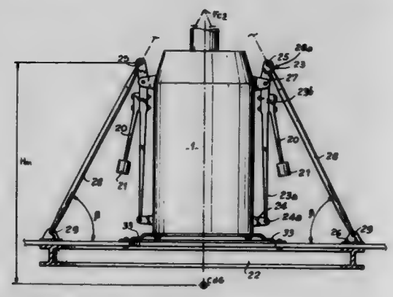
1. A device for the adjustment of the maneuver forces of movable members of an aircraft comprising:
- at least one pivoting control column;
- a shaft articulated to said column and able to pivot around its axis under the action of an angular displacement of the column in a first plane;
- a first link provided between said shaft and at least one first movable member, and giving rise to the displacement of said first movable member;
- a connecting rod articulated to said column and able to be displaced in translation parallel to its longitudinal axis under the action of an angular displacement of the column in a second plane;
- a second link provided between said connecting rod and at least one second movable member, and giving rise to the displacement of said second movable member; and
- friction means in order to apply the correct angular displacements to the column int he two planes and provide adjustable braking of the angular displacements of the column under the forces coming from the first and second movable members, wherein said friction means are arranged between said first and second links and comprise at least two friction elements, associated respectively with the first and second links, and adjustable clamping means applying the two friction elements against one another.

5,190,244

ANTIRESONANT SUSPENSION DEVICE FOR A HELICOPTER

Victor Y. Yana, Marseilles, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Nov. 19, 1991, Ser. No. 794,066
Claims priority, application France, Nov. 30, 1990, 90 15036
Int. Cl.[5] B64C *27/51*; F01D *5/26*; F04D *29/66*
U.S. Cl. 244—17.27 **6 Claims**



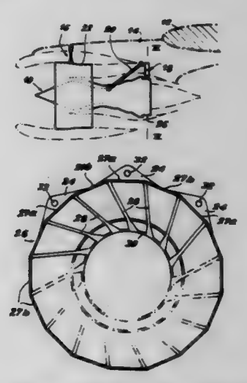
1. In a helicopter comprising:
- a fuselage having an upper structure,
- at least one engine,
- a lifting rotor,
- a transmission box constituting a speed reducer connected to said at least one engine and to said rotor through a gear train for transmitting the power of said at least one engine to said rotor, said speed reducer having a housing and a vertical output shaft and being located between said fuselage and said rotor which has an axis of rotation coaxial with the axis of rotation of said vertical output shaft,
- an assembly connecting said speed reducer to said fuselage and comprising a pylon including a set of at least three rigid oblique bars arranged around said speed reducer in directions which are concurrent on said axis of rotation of said rotor at a point located between the centre of said rotor and an upper part of said speed reducer, means connecting upper ends of said oblique bars to said housing of said speed reducer, said oblique bars being connected by their lower ends to said upper structure of said fuselage, a flexible plate disposed between a bottom of said speed reducer and said upper structure of said fuselage and allowing the bottom of said speed reducer limited alternating movements of vertical translation and limited alternating movements of oscillation about axes which are contained in the plane of said plate and intersect at the centre of said plate, but allowing no rotation of the bottom of said speed reducer about the axis of said rotor relative to said upper structure of said fuselage:
- an antiresonant suspension device for said speed reducer which is relative to said fuselage and comprising monodirectional antiresonant means constituting said means connecting said upper ends of said oblique bars to said housing of said speed reducer, said antiresonant means including beating weights which are disposed about said housing of said speed reducer in substantially vertical positions in a number equal to the number of said rigid oblique bars.

5,190,245

TURBOJET ENGINE EXHAUST CASING WITH INTEGRAL SUSPENSION LUGS

Pierre Debeneix, St Sauveur Sur Ecole, France, assignor to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jun. 17, 1992, Ser. No. 899,913
Claims priority, application France, Jun. 19, 1991, 91 07515
Int. Cl.[5] B64D *27/00*
U.S. Cl. 244—54 **3 Claims**



1. An exhaust casing for a turbojet engine, said casing having a cross-sectional shape in the form of a regular polygon providing said casing with a plurality of sides, and at least three hanging lugs carried externally by said casing to form part of a rear suspension structure for said engine, wherein each of said hanging lugs is carried by one of said sides of said casing and is situated in the extension of the two sides of said casing adjacent said one side.

5,190,246

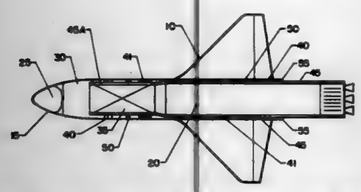
SHUTTLE ORBITER WITH TELESCOPING MAIN PROPULSION UNIT AND PAYLOAD

Ian O. Mac Conochie, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 7, 1991, Ser. No. 743,469
Int. Cl.[5] B64D *27/02*
U.S. Cl. 244—54 **11 Claims**

1. An improvement for a space shuttle comprising:
- means for propelling the space shuttle;
- a cargo space; and
- means for positioning said means for propelling at various locations within said cargo space such that said means for

propelling propels the space shuttle while positioned at one of the various locations, wherein the volume of said cargo space is varied by the positioning of said means for propelling.

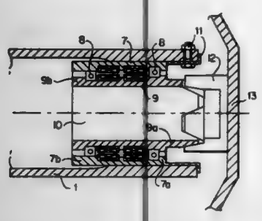


5,190,247

ARRANGEMENT OF A ROTARY APPARATUS FOR LANDING GEARS

Robert Le Chatelier, Reuil Malmaison, France, assignor to Labinal, société anonyme, France

Filed Jul. 26, 1991, Ser. No. 736,501
Claims priority, application France, Aug. 2, 1990, 90 05892
Int. Cl.[5] B64D *43/00*
U.S. Cl. 244—103 R **20 Claims**



1. Arrangement of a rotary apparatus for an aircraft landing gear, said arrangement comprising an aircraft wheel, an axle for said wheel, an assembly in a single unit disposed in said axle and comprising, axially in succession from an end of said axle, an outermost stator part and an innermost stator part having substantially the same diameter and two inner rotor parts which correspond to said stator parts and are interconnected in rotation, one of said rotor parts being an axially outermost rotor part and the other of said rotor parts being an axially innermost rotor part, said outermost rotor part in being associated with means for driving said outermost rotor part synchronism by a part associated with said wheel, said outermost stator part being constituted by a genetachometric stator part in which said outermost rotor part is rotatable, and said innermost stator part being constituted by a stator of a coupling rotating transformer.

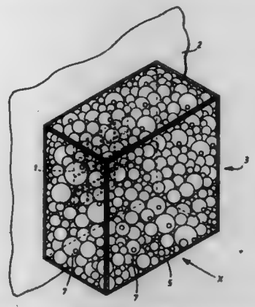
5,190,248

PROTECTION OF AIRCRAFT STRUCTURES

Peter R. Lee, Tunbridge Wells, England, assignor to Royal Ordnance plc, London, England

Filed Nov. 7, 1990, Ser. No. 610,237
Claims priority, application United Kingdom, Nov. 8, 1989, 8925191; Nov. 8, 1989, 8925195
Int. Cl.[5] B64D *45/00*
U.S. Cl. 244—121 **12 Claims**

1. An aircraft structure which includes at least one of a luggage compartment and cargo compartment, a passenger cabin and at least one air channel communicating between said at least one of a luggage compartment and cargo compartment and cabin, each of said at least one air channel includes a blast attenuation valve for attenuating a blast transmitted at least partially through the channel from an explosion in said at least one of a luggage compartment and cargo compartment wherein said valve comprises a collection of compressible bodies through which air can normally permeate, but when said bodies are compressed together by a substantial increase in pressure, form a barrier to the passage of air.

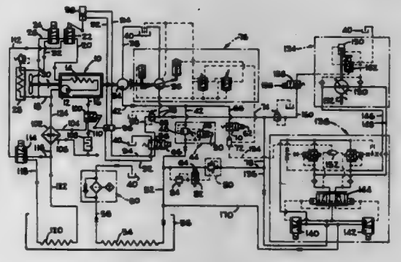


5,190,249

AIRCRAFT DEICER FLUID HEATING AND PROPULSION SYSTEM

Thomas W. Whitmire, Winter Park, and Edwin C. Hightower, Orlando, both of Fla., assignors to Zwick Energy Research Organization, Inc., Huntington Beach, Calif.

Filed Sep. 25, 1989, Ser. No. 414,628
Int. Cl.[5] B64D *15/00*
U.S. Cl. 244—134 R **16 Claims**



14. A system for heating aircraft deicing fluid on a deicer having an engine, said system comprising:

a tank for holding deicing fluid;

first pump means capable of being driven by the engine connected to draw deicing fluid from said tank; and

back pressure valve means positioned in the outlet from said first pump means to continuously, substantially and directly heat the deicing fluid to a temperature to deice said aircraft.

5,190,250

AUTONOMOUS, HELIBORNE-MOBILE CONSTRUCTION/EMERGENCY POD SYSTEM

Denton DeLong, Trumbull, and Richard Enders, Jr., Milford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 4, 1991, Ser. No. 754,787
Int. Cl.[5] B64C *1/22*
U.S. Cl. 244—137.1 **15 Claims**

1. An autonomous, heliborne-mobile pod system configured for use on a helicopter having an external stores support station, comprising:

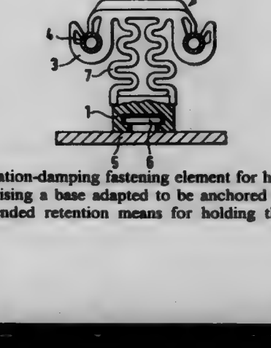
equipment pod means for provisioning ground personnel with mission equipment, said equipment pod means being configured for internal storage of the mission equipment; and

dual cable winch and rack assembly means for integrating said equipment pod means in combination with the external stores support station of the helicopter wherein the helicopter may fly a normal flight envelope, said dual cable winch and rack assembly means including

a winch subassembly operative for up winching said equipment pod means for up-loading thereof, for down winching said equipment pod means for deployment thereof, and for up winching deployed equipment pod means for recovery thereof,

means for rigidly securing said winch subassembly in combination with the external stores support station of the helicopter, and

a suspension rack secured in combination with said winch subassembly, said suspension rack including means for locking said equipment pod means in combination with said suspension rack to up-load and recover said equipment pod means by operation of said winch assembly, said locking means being further operative for releasing said equipment pod means from said suspension rack after deployment thereof by operation of said winch assembly.



5,190,251

VIBRATION-DAMPING FASTENING ELEMENT

Giuseppe Bodo, I-Vercelli, Italy, assignor to A. Raymond et Cie., Grenoble, France

Filed Aug. 16, 1991, Ser. No. 745,853
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 9011879[U]
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—73 **2 Claims**

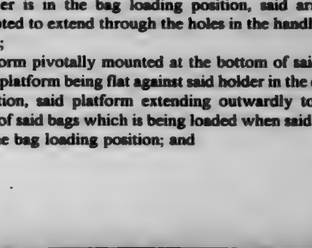
1. A vibration-damping fastening element for holding pipelines comprising a base adapted to be anchored to a carrier plate, suspended retention means for holding the pipelines spaced from said base, said retention means comprising a pair of U-shaped retention shells for holding the pipelines spaced from and connected to each other by a yoke, each shell having a width in the longitudinal direction of the pipelines, and a pair of flexible connecting webs connected between said yoke and said base between the pair of shells, said webs being of meander-shape, symmetrical to one another between the yoke and the base and of the same width as said shells.

5,190,252

REFUSE BAG SUPPORT SYSTEM

Lawrence A. Schrager, 32 Lincoln Ave., Highland Park, N.J. 08904

Filed Mar. 23, 1990, Ser. No. 497,881
Int. Cl.[5] A63B *55/04*
U.S. Cl. 248—97 **12 Claims**



1. A refuse bag support system for sorting and storing refuse of varying types and volumes comprising

a) a plurality of side-by-side bags,

b) a plurality of arms each with means for releasably supporting an edge portion of an opening of one of said bags,

c) bag-holding means comprising an open top container having side walls and containing said plurality of bags and having a total volume which is substantially less than the total volume of said plurality of bags if all were filled to capacity,

d) said arms being mounted in pairs of the bag-holding means with one bag gripped by each pair of arms,

e) underlying means supporting and carrying the weight of the contents of each bag and relieving the arms of that weight, and

f) displacement means for selectively moving the arms of each pair thereof apart for widening the opening of the associated bag and toward one another for narrowing that opening.

5,190,253

COLLAPSIBLE HOLDER FOR THERMOPLASTIC BAGS

Lewis E. Sable, Rochester, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

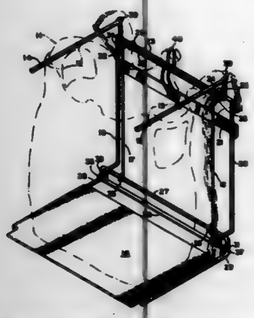
Filed Jan. 29, 1992, Ser. No. 827,313
Int. Cl.[5] A63B *55/04*
U.S. Cl. 248—97 **12 Claims**

1. A collapsible holder for thermoplastic bags having support holes in the handles thereof comprising:

two arms pivotally mounted at the top of said holder, said arms extending downwardly when said holder is in the collapsed position and extending outwardly when said holder is in the bag loading position, said arms being adapted to extend through the holes in the handles of said bags;

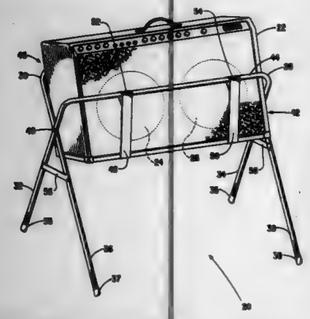
a platform pivotally mounted at the bottom of said holder, said platform being flat against said holder in the collapsed position, said platform extending outwardly to support one of said bags which is being loaded when said holder is in the bag loading position; and

two linkage bars each being connected at the top thereof to said two arms and at the bottom thereof to said platform



so that when said platform is moved outwardly said arms move upwardly and outwardly.

5,190,254
AMPLIFIER STAND
Michael D. Maguire, 39 Theresa Ct., Stamford, Conn. 06907
Filed Jan. 13, 1992, Ser. No. 820,294
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—164 21 Claims



1. An amplifier stand comprising:

A. a pair of U-shaped frame members each having a pair of legs and a bight portion therebetween;

B. a pair of axially aligned axle means joining said legs for relative rotation of said frame members around said axis, the length of said legs above said axle means being less than below said axle means;

C. means for limiting the maximum distance permitted between said bight portions yet permitting said bight portions to otherwise freely move toward and away from each other; and,

D. sling means fastened to each of said bight portions, said sling means being of greater length than the maximum distance permitted between said bight portions,

whereby when an amplifier is placed in said sling means, said bight portions move against the amplifier and the lower ends of said legs are all located outside the vertical projection of said bight portions.

5,190,255
DEVICE FOR MECHANICALLY SECURING A FURNITURE COMPONENT, OR THE LIKE, TO A FRAME
Pier L. Gianfranchi, Via G. Lucci 5, 20131 Milano, Italy
Filed Dec. 13, 1991, Ser. No. 806,649
Claims priority, application Italy, Dec. 19, 1990, 22431 A/90
Int. Cl.[5] F16M *11/24*
U.S. Cl. 248—188.4 4 Claims

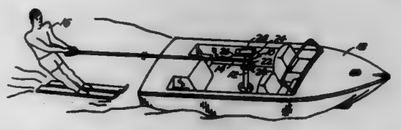
1. A device for securing a component to the frame of an object, comprising:

a first block having a first face, a second opposite face, a central hole passing through the center of said first block, and an impression in said first face to receive and engage at least a portion of said frame;

a second block having a third face, a fourth opposite face, a central hole passing through the center of said second block aligned with the hole passing through said first block, and an impression in said third face, complementary to the impression in said first face, to receive and engage at least a portion of said frame, said third face of said second block lying in opposition to the first face of said first block; and

a pin, attachable at one end to said component, passing through said central holes of both said blocks, and connectable at its other end to said object.

5,190,256
CAMERA SUPPORT FOR TRACKING TOWED OBJECT
John T. Macchiarella, 146 Vega Rd., Watsonville, Calif. 95076
Filed Jan. 14, 1991, Ser. No. 640,637
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—229 7 Claims



1. A camera support fastenable to a boat mounted pylon holding a tow rope to a towed object and operable to automatically track movement of the towed object, said support comprising:

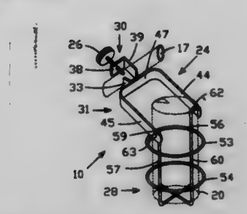
stationary means for attachment to the pylon and for positioning the support,

a turning stand mounted for panning rotation above the stationary means,

a platform pivotally mounted for tilting on the turning stand and rotatable therewith, and

a guidance arm extending rigidly from the platform over the tow rope in an axial direction for attachment thereto at a location spaced from the pylon so that the arm and the tow rope move together laterally at the point of attachment.

5,190,257
BEVERAGE CONTAINER HOLDER
Alan Gradei, Mt. Prospect, and John Allen, Palatine, both of Ill., assignors to Alan & Alan Inc., Mt. Prospect, Ill.
Filed Oct. 7, 1991, Ser. No. 772,226
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—231.7 2 Claims



1. A holder adapted to be mounted on a support and carry a container comprising:

a mounting bracket including a generally C-shaped clamp portion and a separate generally U-shaped swing portion attached to said clamp portion;

said clamp portion defining an open center adapted to receive a support and having a support receiving portion at one end and a threaded bore defined in the opposing end, said clamp portion defining a gap between said one end and said opposing end of sufficient size permitting the support to be inserted therethrough into said open center, said receiving portion including a flat center segment and a pair of slanted side segments narrowing to said center segment to define a tapered anvil for receiving the support;

a screw extending through said bore and adapted to be adjustably moved toward said receiving portion to clamp onto the support positioned within said open center between said receiving portion and said screw;

said swing portion having a flat center section joining a pair of spaced downwardly extending arms, the lower outer surface of the clamp portion center segment being fixed to the outer surface of the swing portion center section;

a carrier including means for carrying a container therein; and,

cooperating means associated with said swing portion and said carrier for pivotally mounting said carrier on said swing portion so that said carrier swings under the support.

5,190,258
ARTICULATED SUPPORT ASSEMBLY
Chung C. Yu, 87 Townsend St., Walton, N.Y. 13856
Filed May 26, 1992, Ser. No. 887,881
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—279 11 Claims

1. An articulated support assembly comprising

a) a frame,

b) a post on said frame having a longitudinal axis,

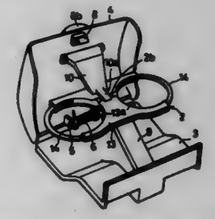
c) a first arm pivotable about said post in a first plane between a retracted position on said frame and a first angularly extended position,

d) slide means for translating said first arm longitudinally with respect to said post when said first arm is in its angularly extended position, and

e) a second arm pivotable on said first arm about an axis perpendicular to said post axis in a second plane different from said first plane between a retracted position coplanar

with said first arm and a second angularly extended position.

5,190,259
CUP HOLDING APPARATUS
Hidetsugu Okazaki, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 3, 1992, Ser. No. 829,301
Claims priority, application Japan, Mar. 1, 1991, 3-010616[U]
Int. Cl.[5] B60R *7/00*
U.S. Cl. 248—311.2 4 Claims



1. A cup holding apparatus having a cup holder for holding a cup, a containing portion for containing therein said cup holder, and a hinged lid provided on a base portion which constitutes said containing portion such that said cup holder can be contained in such a manner as to be held between said lid and said base portion when said lid is closed, wherein said apparatus is provided with

a first link which is rotatably connected at one end thereof to said base portion and is rotatably connected at the other end thereof to a first pivot portion provided on said cup holder, and

a second link which is rotatably connected at one end thereof to said lid and is rotatably connected at the other end thereof to a second pivot portion provided on said cup holder away from said first pivot portion,

such that a link mechanism having said cup holder as an intermediate link is constituted to take said cup holder into or out of said containing portion by the closing or opening operation of said lid.

5,190,260
WATER HEATER TANK SUPPORT
Richard P. Daubenspeck, 23275 Caminito Marcial, Laguna Hills, Calif. 92653
Continuation of Ser. No. 581,039, Sep. 12, 1990, abandoned. This application Aug. 28, 1991, Ser. No. 758,335
Int. Cl.[5] A47K *17/00*
U.S. Cl. 248—313 15 Claims

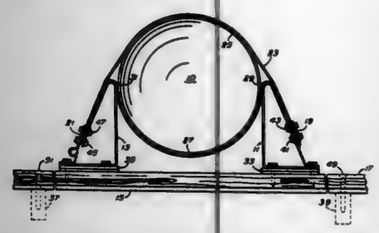
1. A water heater tank and lateral support system for securing a water heater tank to an adjacent vertical wall comprising:

an elongated vertically oriented, tank;

a first and second separate mounting brackets connected to

the wall and disposed on opposite sides of the tank, each of said brackets having a first end portion disposed proximate a peripheral portion of the tank and spaced from each other a distance about equal to the diameter of the tank, thereby enabling the brackets to be mounted after the tank is in position adjacent a wall; and

a strap for securing the water heater tank to said mounting



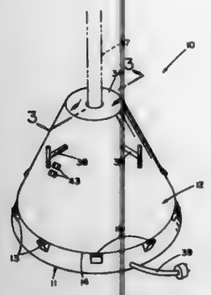
brackets, said strap having a first end portion connected to said first bracket and extending about said first bracket end portion and a portion of the water tank facing said wall, said strap being secured to said second bracket and extending about said second bracket first end portion and a portion of the water tank facing away from said wall, said strap having a second end portion secured to said first bracket.

5,190,261

ROTATABLE TREE SUPPORT APPARATUS

Michael J. Tetting, 105 Wilson Ave. SE., St. Cloud, Minn. 56304

Filed Feb. 14, 1992, Ser. No. 837,643
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—522 **1 Claim**



1. A rotatable tree support apparatus, comprising,

a truncated conical base, the truncated conical base including a truncated conical rotary head mounted over the truncated conical base coaxially aligned with the truncated conical base about a common axis, and

the rotary head including a rotary head top wall fixedly mounted to an upper end of the rotary head orthogonally oriented relative to the common axis, and

the rotary head top wall including a tubular support shaft fixedly and orthogonally mounted relative to the rotary head top wall extending below the rotary head top wall, including a support shaft socket directed through the rotary head top wall for receiving a tree trunk therewithin, and

the support shaft socket includes an intermediate web mounted medially of the support shaft and orthogonally oriented relative to the common axis, with the support shaft coaxially aligned relative to the common axis and coincident therewith, and the support shaft including a support shaft bottom end wall, the bottom end wall including a bottom end socket, and a drive motor positioned below the bottom end, the drive motor including an output shaft, the output shaft including an output shaft bar fixedly mounted to an upper distal end of the output shaft, and the output shaft bar received within the bottom end socket, and an electrical conductive first cable directed through the conical base in electrical communication with the drive motor, and

the truncated conical base includes a cavity therewithin, the base cavity including a base cavity floor, and the base cavity floor orthogonally oriented relative to the common axis, and an array of bearing support heads fixedly mounted to an exterior wall of the conical base, with the bearing support heads spaced above the cavity floor, and each of the support heads including a bearing socket therewithin, and each bearing socket including a cylindrical roller bearing rotatably mounted therewithin, and

each bearing socket includes a first axle bore coaxially aligned with the second axle bore, the first axle bore and the second axle bore are radially oriented relative to the common axis, and each cylindrical roller bearing includes the rigid axle received within the first axle bore and a second telescoping axle telesolpingly mounted within the roller bearing, wherein the second telescoping axle includes a biasing spring positioned within the roller bearing to bias the second telscoping axle exteriorly of said roller bearing, and

the conical base includes a base upper annular end and annular flange mounted within the conical base projecting into the base cavity concentric relative to the common axis and parallel and spaced above the cavity floor, with the annular flange mounting an electrical transmission plate between the annular flange and the base upper annular end, the transmission plate including a transmission plate central bore coaxially aligned relative to the common axis and rotatably receiving the support shaft therethrough, and at least one electrical outlet directed through the rotary head, and the electrical transmission plate including a first circular electrical track and a second circular electrical track concentric relative to the first circular electrical track and positioned interiorly of the first circular electrical track, wherein the first circular electrical track and the second circular electrical track are concentric relative to the common axis and mounted within the electrical transmission plate, and an electrically conductive second cable in electrical communication with the electrically conductive first cable directed to the electrical transmission plate, and the electrical conductive second cable includes a first electrical wire in electrical communication with the first circular electrical track and a second electrical wire in electrical communication with the second circular electrical track, and said electrical outlet including a rigid first contact arm and a rigid second contact arm in electrical communication with the electrical outlet directed downwardly relative to the electrical outlet, with the first contact arm in electrical communication with the first circular electrical track and the second contact arm in electrical communication with the second circular electrical track, and

the first circular electrical track, and the second circular electrical track are discontinuous to effect a discontinuous current of electrical energy directed from the first circular electrical track and the second circular electrical track to said electrical outlet, and

the first contact arm includes a first shoe mounted at a lower end thereof, and the second contact arm includes a second shoe at a lower distal end of the second contact arm, the first shoe and the second shoe each include a respective first shoe floor opening and a second floor shoe opening aligned with the respective first circular electrical track and the second circular electrical track, and a first contact lug directed through the first shoe floor opening and the second shoe floor opening including a second contact lug,

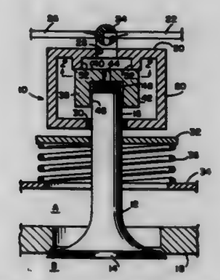
wherein the first contact lug and the second contact lug are electrically conductive and are in electrical communication with the respective first circular electrical track and the second circular electrical track, and a first shoe spring mounted between the first contact lug and the first contact arm, and a second shoe spring mounted between the second contact lug and the second contact arm to bias the first contact lug and the second contact lug in electrical communication with the respective first circular electrical track and the second circular electrical track.

5,190,262

HYDRAULICALLY-OPERATED VALVE ASSEMBLY

Derek Woollatt, Campbell, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Dec. 9, 1991, Ser. No. 803,871
Int. Cl.[5] F16K *31/163*; F01L *9/02*
U.S. Cl. 251—48 **9 Claims**



1. A hydraulically-operated valve assembly, comprising:

a valve seat;

a chamber for receiving hydraulic fluid therewithin;

a valve having a head for seating against, and removal from said seat, and having a shank for reciprocation within said chamber;

first means for admitting and discharging hydraulic fluid into and from said chamber; and

second means interposed between said shank and said first means for hydraulically controlling movement of said shank within said chamber in at least one reciprocal direction; wherein

said second means comprises a cap having a cylindrical bore; and

said shank defines a substantially sealing interface with said bore.

5,190,263

LOCKING MECHANISM FOR AN ACTUATOR

William F. Roberts, West Boylston, Mass., assignor to Neles-Jamesbury, Inc., Worcester, Mass.

Filed Apr. 8, 1992, Ser. No. 865,266
Int. Cl.[5] F16K *31/12, 35/00*; F01B *19/00, 31/14*
U.S. Cl. 251—60 **9 Claims**

1. A locking mechanism for a valve actuator comprising:

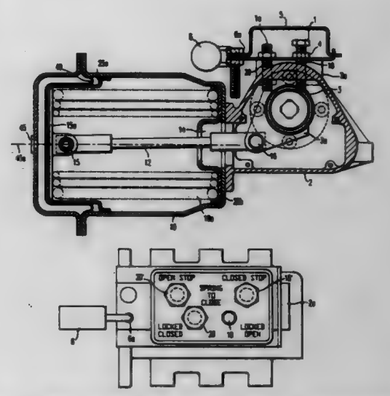
actuator body means connected to a housing; and

locking cam means mounted within said actuator body means, said locking cam means comprising at least two flat portions and being integral with a driver arm means which is rotatably mounted in the actuator body means, said driver arm means being pivotally connected to an actuator rod, said actuator rod extending from said driver arm means to said housing;

said actuator body means comprising:

a first bore means for receiving a first bolt means, said first bolt means being insertable in said first bore means for abutting against one of said at least two flat portions of said locking cam means and locking said locking cam means and driver arm means in a valve open position; and

a second bore means for receiving said first bolt means, said first bolt means being insertable in said second bore means



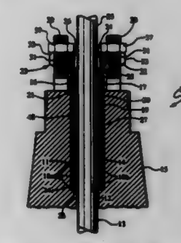
for abutting against the other of said at least two flat portions of said locking cam means and locking said locking cam means and driver arm means in a valve closed position.

5,190,264

ADJUSTABLE VALVE PACKING ARRANGEMENT

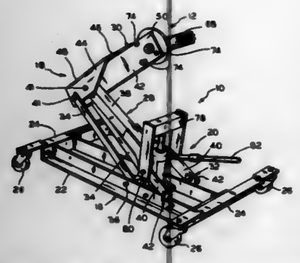
Henry W. Boger, Walpole, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 3, 1992, Ser. No. 845,306
Int. Cl.[5] F16K *41/02*; F16J *15/54*
U.S. Cl. 251—214 **21 Claims**



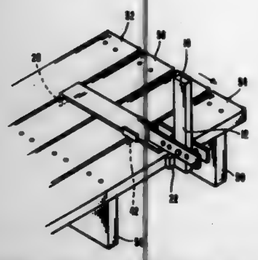
1. In a fluid valve including a packing element for sealing an annular space between a valve stem and the wall of a bore in a valve body through which said stem extends, the improvement comprising a follower with upper and lower generally cylindrical telescoping parts, said lower part being telescoped into said annular space and having a cavity telescopingly receiving a portion of the upper part, said cavity defining an enclosed spring chamber between the upper and lower parts isolated from said wall and the environment surrounding said valve when telescoped together, a disc spring mounted within said spring chamber, and an adjustable support extending across said bore and being connected between said valve body and said upper part of said follower, said disc spring acting between said upper and lower parts of said follower to yieldably compress said packing element.

5,190,265
VEHICLE SERVICE TOOL
Gerald E. Burry, Owatonna; Larry W. Botcher, Northfield, and C. P. Emerson, Lanesoi, all of Minn., assignors to OTC Division of SPX Corporation, Owatonna, Minn.
Filed Jan. 21, 1992, Ser. No. 822,923
Int. Cl.[5] B60P *1/04*
U.S. Cl. 254—8 B 21 Claims



1. A service tool for removal and replacement of vehicle parts, comprising:
a base;
a lift arm mechanism including a base end and a distal end, and means for pivotally mounting the base end to the base;
a jack mounted to the base and the lift arm mechanism for pivotally moving the lift arm mechanism base end to adjust height of the distal end;
a vehicle part adapter for receiving a vehicle part to be removed or replaced; and
mounting means for mounting the vehicle part adapter to the lift arm mechanism distal end, comprising joint means for allowing rotary motion of the vehicle part adapter relative to the distal end in every direction about a horizontal axis and attitude adjustment means for adjustably limiting movement of the vehicle part adapter to control attitude of the same.

5,190,266
DECKING CLAMP AND SPACER
John Barrera, 1701 Tackerton Ave., Whiting, N.J. 08759
Filed Apr. 23, 1992, Ser. No. 872,040
Int. Cl.[5] B65F *3/00*
U.S. Cl. 254—17 2 Claims



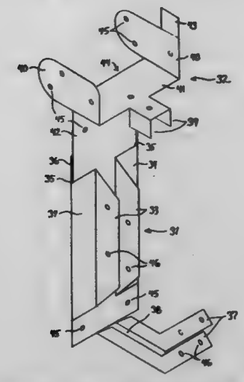
1. An articulating lever assembly for straightening, installation and securing of warped or bowed deck boards to the underlying joists, the assembly comprising:
a first arm member having a board-engaging lipformed on the first end thereof for engagement between secured deck boards, a second arm member having a first handle end and a second end having a board-engaging cross member for engagement with he edge of a deck board to be secured, said first arm member pivotally secured to said second arm member above said cross member, said first arm member comprising a generally planar portion having said board-engaging lip formed thereon and a pair of support arms perpendicularly secured to said planar portion opposite said first end, si support arms having a plurality of apertures aligned therethrough, said apertures alignable with an aperture in said second arm member for receipt of a securing means for pivotal engagement of said first member to said second arm member, said plurality of apertures in said support arm providing for adjustment of distance between said cross member of said second arm member and said board-engaging lip of said first arm member to accommodate deck boards of different widths, said cross member of said a second arm member cooperative with said lip of said first arm member straightening and position said deck boards to be installed.

5,190,267
HAND RAILING AND METHOD OF MANUFACTURE
Gervase G. Schmitt; Ronald T. Schmitt, and Gervase A. Schmitt, all of Lancaster, Pa., assignors to G. G. Schmitt & Sons, Inc., Lancaster, Pa.
Filed Nov. 22, 1991, Ser. No. 796,382
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—59 14 Claims

1. A hand railing comprising a rigid, elongated body portion terminating in first and second spaced apart ends defining a longitudinal length of said body portion, each said end being adapted for attachment to a mounting connector, said body portion further having a first surface and a circumferentially opposed second surface, said second surface having a plurality of longitudinally spaced indentations to facilitate gripping thereof, said indentations being generally uniformly formed and spaced along the major portion of said longitudinal length and terminating along a line generally parallel to said first surface.

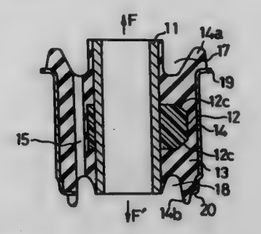
5,190,268
FENCE CONSTRUCTION SYSTEM FOR SLOPING TERRAIN
Belarmino G. Espinueva, 2710 Glen Evans Ct., San Jose, Calif. 95148
Continuation-in-part of Ser. No. 782,826, Oct. 25, 1991. This application Jan. 17, 1992, Ser. No. 822,362
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—67 8 Claims

1. A fence construction system comprising:
an adjustable lower bracket adapted for attachment to a fence post comprising:
a body having a lower channel for receiving the kickboard of a fence, said lower channel being adjustable in angle,
and an upper channel for receiving the lower rail of a fence, said upper channel being adjustable in angle, and said upper channel being slidably attached to said body such



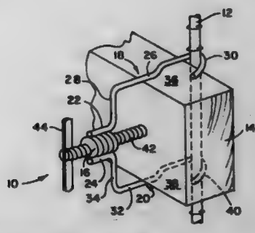
that the distance between said upper channel and said lower channel is adjustable.

5,190,269
RUBBER BUSHING
Katsuhisa Ikeda, Kasugai, and Akihiko Sakuragi, Komaki, both of Japan, assignors to Tokai Rubber Industries, Ltd., Komaki, Japan
Filed Jul. 30, 1991, Ser. No. 738,208
Claims priority, application Japan, Aug. 9, 1990, 2-84776[U]
Int. Cl.[5] F16M *13/00*; F16F *13/00*
U.S. Cl. 267—140.12 12 Claims



1. A rubber bushing, comprising:
an inner cylindrical member having roughened portions formed on a part of an outer peripheral surface thereof;
a ring comprising resin, said ring disposed integrally on said part of said outer peripheral surface on which said roughened portions are formed, said ring having a non-circular shape comprising a non-circular cross-section taken in a radial direction with respect to a cylindrical axis of said inner member;
an elastic member comprising rubber, said elastic member formed outside said inner cylindrical member;
an outer cylindrical member connected to said inner cylindrical member by means of said elastic member; and
said non-circular shape of said ring including at least two projections which project in an axially symmetrical manner in directions perpendicular to said cylindrical axis of said inner cylindrical member.

5,190,270
APPARATUS FOR ERECTING FOUNDATION REINFORCING BARS AND THE LIKE
Jerry D. Huston, 3248 Cascade Blvd., Redding, Calif. 96003
Filed Jul. 16, 1991, Ser. No. 730,494
Int. Cl.[5] B25B *1/20*
U.S. Cl. 269—41 1 Claims

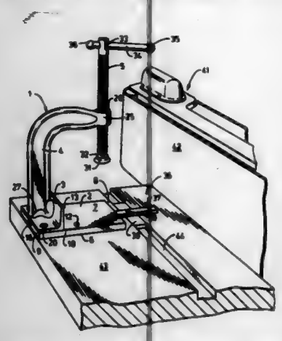


1. The combination comprising:
stake means driven into the ground and thereby maintained in substantially vertical orientation;
beam means attached to said stake means and thereby maintained in substantially horizontal orientation; and
concrete reinforcing bars clamped to said beam means by clamping means;
each of said clamping means comprising:
a body member defining an internally threaded passage;
first arm means having an inner portion and an outer portion, said outer portion terminating in a hook adapted to embrace a reinforcing bar and said inner portion being affixed to said body member and maintaining said outer portion substantially parallel to the axis of said passage;
second arm means having an inner portion and an outer portion, said outer portion terminating in a hook adapted to embrace a reinforcing bar and said inner portion being affixed to said body member and maintaining said outer portion substantially parallel to the axis of said passage; and
screw means threadedly engaged in said internally threaded passage;
said outer arm portions being spaced apart by more than a transverse dimension of said supporting means and being of such length that when they transversely embrace said supporting means and said screw means is fully withdrawn into said passage said hooks can be engaged with a reinforcing bar which is in contact with the face of said supporting means opposite said body member.

5,190,271
MULTI-PURPOSE HOLD-DOWN CLAMP
Henry C. Otterbein, II, 653 Hidden Point La., Cincinnati, Ohio 45230
Continuation of Ser. No. 590,887, Oct. 1, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,782
Int. Cl.[5] B23Q *3/02*
U.S. Cl. 269—91 19 Claims

1. In combination with a table of a power tool, a multi-purpose hold down clamp comprising a plate-like base having substantially planar top and bottom surfaces, a forward edge, a rearward edge and side edges, a clamping screw support having a vertical portion and a horizontal portion, said vertical portion having a lower end affixed to said base near said rearward base edge and centered between said base sides, said vertical portion having an upper end from which said horizontal portion extends forwardly toward said forward base edge and spaced upwardly from said base upper surface, said horizontal portion having an enlarged free end, said enlarged end having a vertical internally threaded bore therethrough, a

vertical clamping screw engaged in said support bore and having at its lower end a clamping head having a clamping surface adapted to cooperate with said base top surface to clamp a workpiece therebetween, said table having at least one rectilinear guide slot formed therein, said bottom surface of said clamp base having a rectilinear slot formed therein and extending centrally thereof from said base forward edge through said base rearward edge, a T-guide comprising upper



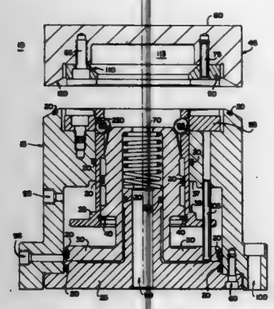
and lower rectilinear bars, said upper bar overlying said lower bar and being joined at its longitudinal center to said lower bar near one end thereof, said lower bar being slidably receivable in said table guide slot, said upper bar being slidably receivable in said slot in said clamp base, said clamp being shiftable along said table in a first guided rectilinear path of travel determined by said lower bar in said table guide slot, said clamp being simultaneously shiftable along said table in a second guided path of travel determined by said upper bar in said base slot.

5,190,272

ACTUATOR AND PALLETIZING SYSTEM

Frank J. Zika, LaGrange, and Henry J. Flair, Franklin Park, both of Ill., assignors to Snow/Taft-Peirce Company, Bellwood, Ill.

Filed Dec. 20, 1990, Ser. No. 631,370
Int. Cl.[5] B23Q *3/10*
U.S. Cl. 269—309 **34 Claims**



1. An actuator device for energizing a pallet bas coupling for selectively coupling a complementary pallet, comprising:

coupling means for coupling said pallet base with said complementary pallet, said coupling means comprising complementary multitoothed rings;

piston means and cam means for activating the pallet base coupling, said piston means coaxial with said cam means; and

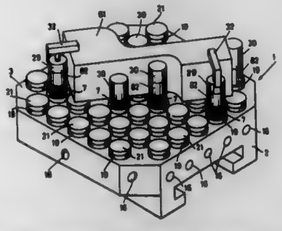
force driving means for selectively activating said piston and cam means.

5,190,273

PALLET WITH ADJUSTABLE ANCHORAGE SYSTEM FOR EQUIPPING THE CLAMPING FIXTURE OF A ROUGH PIECE TO BE MACHINED WITH MACHINE TOOLS

Guido Salvagnini, Sarego, Italy, assignor to SZ s.r.l., Sarego, Italy

Continuation of Ser. No. 278,717, Dec. 2, 1988, abandoned. This application Apr. 15, 1991, Ser. No. 684,507
Claims priority, application Italy, Dec. 10, 1987, 22932 A/87
Int. Cl.[5] B23Q *3/10*
U.S. Cl. 269—309 **21 Claims**



1. A pallet for mounting a clamping fixture for clamping a rough piece to be machined between said pallet and said clamping fixture, comprising:

a supporting face provided with a plurality of holes which include threaded portions; and

at least one anchorage means for adjustably engaging said threaded portions of the holes as to height and angular orientation about axes of the holes, the anchorage means provided with means for engaging said clamping fixture, wherein each anchorage means comprises:

a substantially cylindrical body having an externally threaded body portion for adjustable engagement in a respective supporting face hole;

a locking ring nut threadably engaged with the externally threaded body portion for locking the anchorage means in a desired adjusted position;

a coaxial hole passing through said body and communicating with a fluid supply, said fluid supply for operation of a hydraulic cylinder of the clamping fixture;

a further body portion; and

fluid sealing means disposed between said further body portion and a portion of said supporting face hole.

5,190,274

SHEET TREATMENT DEVICE WITH A VARIABLE TIME PERIOD FOR JAMMING INDICATION

Koji Kamamoto, Osaka; Yasuji Yamauchi, and Kazutoshi Yamamoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1991, Ser. No. 798,231
Claims priority, application Japan, Nov. 28, 1990, 2-331467
Int. Cl.[5] B42B *2/00*; B65H *39/02*
U.S. Cl. 270—53 **19 Claims**

1. A sheet treatment device for sheets conveyed from an image forming device, comprising:

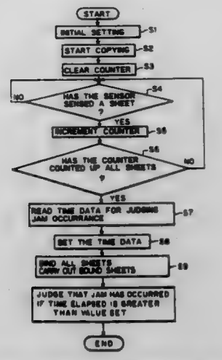
means for counting the number of sheets conveyed piece by piece from said image forming device;

means for binding a plurality of sheets counted by said counting means;

means for conveying a set of sheets bound by said binding means;

means for setting a time period which is variable as a function of the number of sheet counted by said counting means;

means disposed at a specified position, for detecting passage of the set of sheets conveyed by said conveying means; and



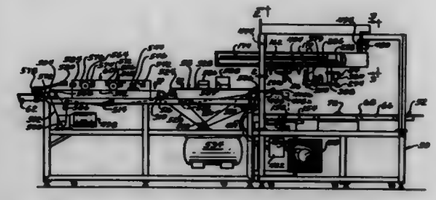
means for judging that sheet jamming has occurred in the event that the passage of the bound sheets is not detected by said detecting means within said time period from the time when the set of sheets begins to be conveyed by said conveying means.

5,190,275

SLEEVE LOADER

Maximilian Adamski, Jr., Palatine; Paul A. Berg, Crystal Lake, and Robert L. Kosrow, Hoffman Estates, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Sep. 11, 1989, Ser. No. 405,704
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—9 **37 Claims**



1. An apparatus for processing a stack of garments for sewing, comprising:

means for retaining the stack of garments;

means for picking up at least one garment from atop the stack, the pick up means having at least two spaced generally aligned pick up fingers for grasping;

means for moving the picking up means towards the retaining means;

means for sensing an edge of the garment stack;

means responsive to the sensing means for stopping the picking up means adjacent an edge of the garment stack to permit operation of the picking up means; and

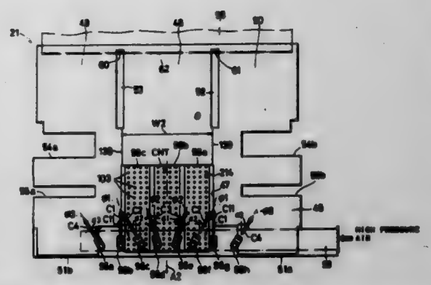
means for maneuvering the removed garment from a first operative position above the retaining means, toward a second service position spaced from the retaining means while aligning the garment in a desired configuration.

5,190,276

SHEET FEEDING APPARATUS

Toyoaki Nambe, Nara; Kazuaki Karasuda, Yamatokoriyama; Osamu Wakuda, Yamatotakada, and Hirasaga Yamamoto, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1991, Ser. No. 668,259
Claims priority, application Japan, Mar. 13, 1990, 2-62205; Mar. 20, 1990, 2-70915
Int. Cl.[5] B65H *5/08*
U.S. Cl. 271—13 **10 Claims**



1. A sheet feeding apparatus comprising:

(a) a laying plate having a centerline running in a feeding direction, for receiving a stack of sheets

(b) a feeding means for feeding a sheet to be fed from the stack, the feeding means located adjacent to the position of the sheet to be fed and

(c) an air stream forming means for injecting air from plural positions in directions directed outwardly from the centerline of the laying plate and in directions toward the feeding means and in directions toward the position of sheets in the laying plate, the air forming means being disposed downstream from the laying plate in the feeding direction, and

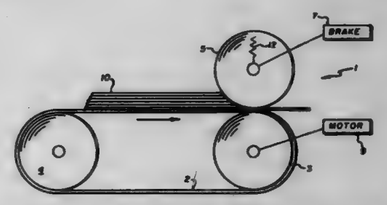
(d) an air stream flow rate control means for controlling the air flow based on the sheet size to provide a separating action between the sheet to be fed and the remainder of the sheets.

5,190,277

SHEET SEPARATION DEVICE

Mukhles U. Rahman, Penfield, and Charles Dolcimascolo, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1992, Ser. No. 878,075
Int. Cl.[5] B65H *3/02*
U.S. Cl. 271—35 **10 Claims**



1. In a sheet separation device including a sheet separation member for contacting an outside surface of an outside sheet in a stack of sheets, and means for moving the sheet separation member in a direction generally tending to separate the outside sheet from the stack, the improvement wherein the sheet separation member is a relatively hard member covered by a thin

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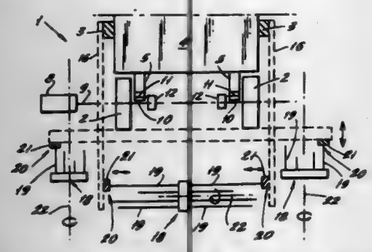
layer of a silicone elastomer having a Shore Å durometer less than 35.

5,190,278

MAGAZINE FOR CONTAINER FORMING SHEETS OR THE LIKE ADJUSTABLE FOR PREDETERMINED SHEETSIZES

Kay Wallin, and Ingmar Nilsson, both of Halmstad, Sweden, assignors to Sprinter System AB, Sweden

PCT No. PCT/SE89/00703, § 371 Date Jan. 21, 1991, § 102(e) Date Jan. 21, 1991, PCT Pub. No. WO90/06275, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 30, 1989, Ser. No. 689,803
Claims priority, application Sweden, Nov. 30, 1988, 8804329
Int. Cl.[5] B65H *1/00*
U.S. Cl. 271—147 **3 Claims**



1. An apparatus for automatically adjusting the dimensions of a carton blank magazine in a machine for forming carton blanks to select a plurality of predetermined sized carton blank formats, and for delivering the carton blanks to an exit of the machine, the apparatus comprising:
a selectively movable bottom tool portion;
a pair of selectively movable side tool portions;
bottom guide means disposed on said bottom tool portion for vertically guiding a carton blank;
at least one side guide means disposed on each of said side tool portions for horizontally guiding the carton blank;
a step disposed on each of said bottom and side tool portions;
a format setting wheel associated with each of said bottom and side tool portions, each format setting wheel including a plurality of pins extending perpendicularly therethrough, each of said pins having a different length corresponding to one of the dimensions of a particular predetermined carton blank format;
each of said pins including a free end which engages the stop of a respective bottom or side tool portion, whereby when said free end engages a stop, the respective bottom or side portion is fixed in a position determined by the selected blank format; and
advancing means disposed on said bottom guide means for delivering the carton blanks to the end of the machine.

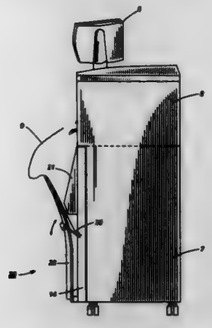
5,190,279

COPY OUTPUT STACKER FOR ENGINEERING SIZE COPIES

Daniel L. Morris; David A. Bartman, both of Webster, and Albert E. Andrews, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1992, Ser. No. 888,582
Int. Cl.[5] B65H *31/20*
U.S. Cl. 271—223 **9 Claims**

1. A copy output stacking tray for a wide format machine which includes an upstanding front portion with a pair of vertically positioned door panels therein that are openable for the replenishment of copy sheet supplies and having top and bottom portions, comprising:
a first portion of the stacking tray being attached to the top portion of each of the panel doors and including a portion extending down and away from the top of the door panels;
a second portion of the stacking tray being attached to the bottom portion of each of the door panels and extending coextensively with but spaced from the panel doors in order to form a pocket to catch copy sheets; and



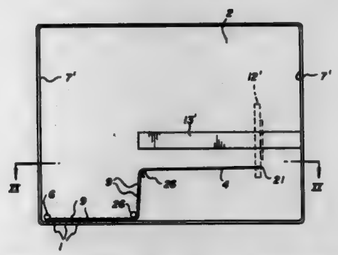
at least one hinged plate which when in a first position allows copy sheets to travel to the point where said second portion is attached to the door panels and when in a second position is pivoted into the path of the copy sheets and serves as a stop in order to facilitate the stacking of varied lengths of copy sheets.

5,190,280

SHEET SIZE INDICATION MEANS FOR A UNIVERSAL SHEET FEED CASSETTE

Thomas W. Gray, and Christopher S. Garcia, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1991, Ser. No. 740,228
Int. Cl.[5] B65H *1/00*
U.S. Cl. 271—171 **7 Claims**



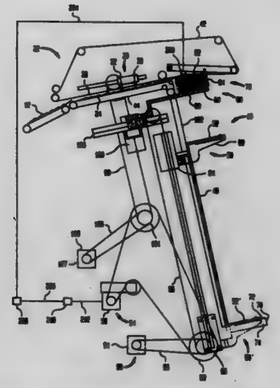
1. A universal sheet feeding cassette with at least one movable guide member adapted to contact a trailing edge of a recording sheet loaded in the cassette, the cassette comprising:
a cassette wall having a series of holes for indicating the recording sheet size loaded in the cassette;
a supply and take up spool within the cassette;
a sheet disclosure means, having as a first portion a self-recoiling ribbon having a series of holes and as a second portion the series of holes in the cassette wall, for disclosing a recording sheet size loaded in the cassette;
a first section of the self-recoiling ribbon is attached directly to the movable guide member and a second section of the self-recoiling ribbon is attached directly to the supply and take up spool.

5,190,281

VERTICAL SIGNATURE STACKING SYSTEM HAVING A NON-CONTACT SENSOR TO CONTROL STACK FORMATION

John Cardenas, 5 Church St., High Bridge, N.J. 08829

Filed Jun. 21, 1991, Ser. No. 719,174
Int. Cl.[5] B65H *31/12*
U.S. Cl. 271—198 **20 Claims**



1. A vertical stacking system comprising:
a frame;
a vertical support wall supported by the frame;
a sliding support defining a support surface which intersects the vertical support wall;
a feed means to feed signatures to the support surface of the sliding support and form a stack of signatures thereon, the feed means comprising an upper conveyor, having a upper feed extension located above the support surface with the stack formed between the support surface and the upper feed extension, the stack having a stack top adjacent to the upper feed extension, whereby the location of the feed extension section is determined by the location of the top of the stack top.
a non-contact sensing means to sense the location of the upper feed extension and generate a location signal; and
a slide drive control means to control the slide drive means in response to the location signal.

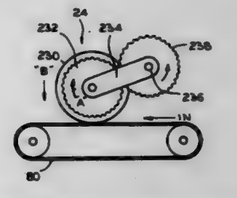
5,190,282

MULTI-PASS SORTING MACHINE

K. George Rabindran, Morton Grove; Thomas Faber, Skokie; David Filicicchia, Schaumburg; Kenneth L. Guenther, Park Ridge; Joseph Kalika, Niles; Melvin T. Kerstein, Lincolnwood; Girish B. Shah, Schaumburg, and David Wiley, Palatine, all of Ill., assignors to Bell & Howell Company, Skokie, Ill.

Division of Ser. No. 500,408, Mar. 27, 1990, Pat. No. 5,143,225. This application Jul. 17, 1991, Ser. No. 731,513
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—272 **16 Claims**

1. A singulation device, suitable for use in a multi-pass bar code sorter apparatus for sorting documents, which comprises a powered belt means, a singulation roller assembly including a singulation roller overlying and adapted to contact said belt means, said roller assembly being mounted on one end of a pivotable arm means, said arm means being pivotable about a pivot axis spaced from the axis of rotation of said singulation roller, and positive powered drive means mounted on said pivot axis and engaging said singulation roller assembly for power transmission thereto without interfering with the interaction of said singulation roller with said belt means, said positive powered drive means when delivering power from said positive powered drive means to said singulation roller producing a downwardly directed force applied by said singulation roller to a document on the belt means to increase the



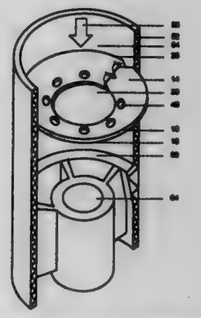
normal force against the document moving on said belt means to insure positive engagement between said roller and the document.

5,190,283

REVERSIBLE GOLF CUP HOLE PROTECTOR AND METHOD OF MANUFACTURE

Gerard M. Hanson, 1746 NW. 84th Dr., Coral Springs, Fla. 33071

Filed Jan. 14, 1992, Ser. No. 822,040
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—34 R **20 Claims**



1. A golf putting cup including a protective device for the bottom of said golf cup, said protective device comprising: a sheet of flexible material having at least two side surfaces, first and second coupling edges, a center opening and an outer periphery; and, means for locking said first and second coupling edges together so that said first and second coupling edges are juxtaposed and said sheet is a conical shape for ease of insertion into the golf cup.

5,190,284

SHOULDER ALIGNMENT TRAINING DEVICE FOR GOLFERS

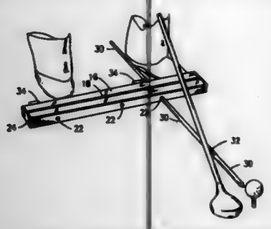
Arthur Diaz, 3217 N. "B" St., Tampa, Fla. 33609

Filed May 19, 1992, Ser. No. 885,181
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—35 A **7 Claims**

1. A training aid for golfers, comprising:
an elongate base member having a longitudinal axis of symmetry;
said base member including an elongated flat top wall;
an elongated mirror fixedly secured to said flat top wall;
an elongate marking means applied to said mirror, said marking means substantially longitudinally bisecting said mirror;
at least one transversely disposed throughbore formed in said base member and below said mirror; and

an elongate dowel pin for slidable insertion within said at least one throughbore;

whereby said dowel pin is positioned in a preselected throughbore of said at least one throughbore, said base member is positioned between a golfer and a golf ball with



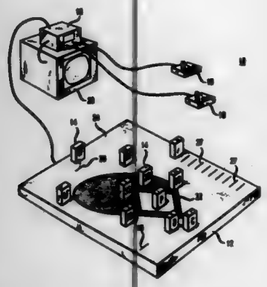
said base member aligned with a target, the golfer's feet are positioned in a predetermined relationship relative to said base member and said dowel pin, and the golfer's shoulders, head, and hands are aligned with said marking means during the set-up.

5,190,285

ELECTRONIC GAME HAVING INTELLIGENT GAME PIECES

Robert B. Levy, Morrisville, Pa., and Fred W. Verdi, Lawrenceville, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1991, Ser. No. 767,585
Int. Cl.[5] A63F *9/24*
U.S. Cl. 273—85 G **22 Claims**



1. An electronic game comprising:

at least one intelligent game piece providing a three-dimensional representation of at least one participant of an activity to be simulated and containing a re-programmable electronic memory for storing activity characteristics associated with the activity to be simulated;

a game board for physically supporting each of a plurality of the game pieces and for coupling electrical signals thereto;

an electronic control unit coupled to the game board for reading the electronic memory in each game piece supported by the game board to obtain the activity characteristics stored in each said game piece and for simulating an activity to be performed by at least one participant, the characteristics of the activity to be simulated being determined, at least in part, in accordance with the activity characteristics electronically stored in the electronic memory for each game piece; and

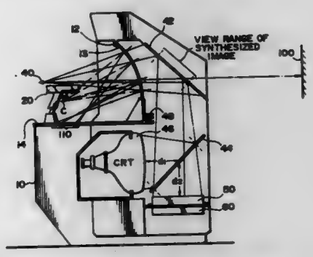
at least one operator controller coupled to the control unit for enabling an operator to provide input to the control unit to allow the operator to perform the simulated activity.

5,190,286

IMAGE SYNTHESIZING SYSTEM AND SHOOTING GAME MACHINE USING THE SAME

Naoki Watanabe, Komae; Toshiaki Shinbo, Kawasaki, and Mitsuru Ogata, Ohmiya, all of Japan, assignors to Namco, Ltd., Tokyo, Japan

Filed Sep. 23, 1991, Ser. No. 764,171
Claims priority, application Japan, Sep. 27, 1990, 2-257970
Int. Cl.[5] A63F *9/22*
U.S. Cl. 273—85 G **18 Claims**



1. An image synthesizing system comprising:

a half mirror located in an optical path extending toward a display section;

a diorama disposed in one of transmissive- and reflective-side optical paths and having at least one movable part;

a video display disposed in the other of said transmissive- and reflective-side optical paths such that a video scene of said video display will be superimposed over an image of said diorama through said half mirror;

control means for controlling said video scene in a predetermined combination with the motion of the at least one movable parts in said diorama; and

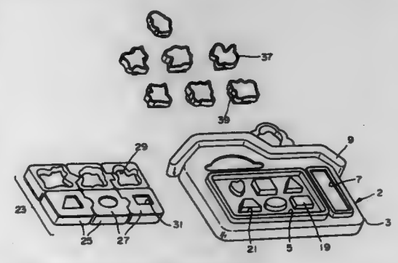
a transparent curved window having a center of curvature located one of below and above a visual point of an observer, whereby the image of said diorama can be superimposed over said video scene to form a synthesized image which is variable in connection with motion of the at least one movable part of said diorama.

5,190,287

JIGSAW PUZZLE TOY USING BLOCKS

Shozo Ishiyama, Tokyo, Japan, assignor to Kabushiki Kaisha Gakushu Kenkyusha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,337
Claims priority, application Japan, Nov. 27, 1990, 2-327191
Int. Cl.[5] A63F *9/12*
U.S. Cl. 273—156 **11 Claims**



1. A jigsaw puzzle toy comprising:

a board;

a plurality of first projections projecting on an upper surface of said board and having first shapes, when viewed in plan;

a plurality of first blocks having first holes defined in surfaces thereof and having shapes complementary to said first shapes of said first projections for fitting engagement therewith, and second holes defined in other surfaces thereof different from said first holes when viewed in plan; and

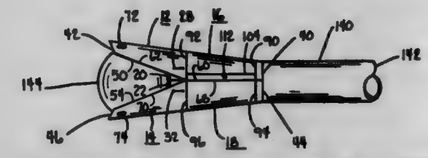
a plurality of second blocks having shapes complementary to said second shapes, when viewed in plan, for fitting engagement in said cavities, of said first blocks.

5,190,288

GOLF CLUB AND ATTACHABLE BALL RETRIEVER

Gordon Rogers, 23. Winwood, School Lane, Woolton, Liverpool 25, L25 7XJ, Merseyside, England

Filed Dec. 19, 1991, Ser. No. 811,256
Int. Cl.[5] A63B *53/00*
U.S. Cl. 273—162 E **19 Claims**



1. An attachment for temporarily attaching to the end of an extension member, the attachment when so attached being used for retrieving a ball, the attachment comprising:

opposite plates of flexible sheet material having generally coextensive laterally spaced side borders extending between longitudinally spaced end edges;

joining means for joining said plates such that the side borders of one plate cooperate with the respectively adjacent side borders of the other plate in hinge-like fashion;

said plates lying generally flat when both pairs of adjacent side borders are spread apart, and said plates both bowing between their side borders when the side borders are pressed toward one another to define a longitudinal tube while the end edges define opposite open tube ends;

one of said open tube ends being sized to permit the insertion therethrough of the end of the extension member, and the other open tube end being sized for grasping the ball; and

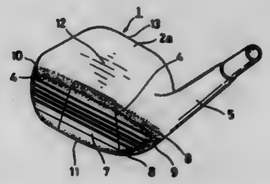
resiliency mean united with said plates normally biasing said plates to lie generally flat and for yielding to pressure, applied to squeeze said sides toward one another thereby providing for the resiliently biased gripping of said extension member therebetween, while further providing for the resiliently biased releasable grasping of the ball to be retrieved.

5,190,289

GOLF CLUB

Masao Nagai, Osaka, Japan, and Paolo Pinlafarina, Cambiano, Italy, assignors to Mizuno Corporation, Osaka, Japan

Filed Mar. 14, 1991, Ser. No. 669,721
Claims priority, application Japan, Mar. 15, 1990, 2-65768
Int. Cl.[5] A63B *53/00, 53/04*
U.S. Cl. 273—167 E **13 Claims**



1. A golf club comprising a head including a sole portion, a crown portion, a heel portion, a toe portion, a face portion and a back portion, a shaft and a grip,

the ratio of the width from the heel portion to the toe portion, the thickness of the sole portion to the crown portion and the depth from the face portion to the back portion being substantially 2:1:1.6;

said head having a substantially rectangular shape; and

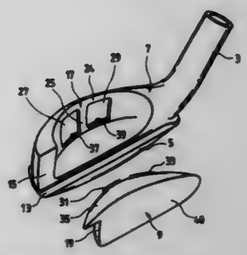
a roughened surface portion having a predetermined width and a surface roughness and being capable of reducing the value of air resistance by forming a turbulent boundary layer around said head when said golf club is swung and being is annularly formed on a peripheral portion of said face portion of said head, wherein the width of said annular roughened surface portion on said peripheral portion of said face portion of said head is between 10 mm and 30 mm with the remainder of said head being substantially void of any surface roughness.

5,190,290

HEAD FOR GOLF CLUB

Shigeki Take, Tokyo, Japan, assignor to Daiwa Golf Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1991, Ser. No. 788,927
Claims priority, application Japan, Nov. 13, 1990, 2-118675[U]
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 **9 Claims**



1. A head for a golf club, comprising:

a metal body including a hosel and a sole which are formed integrally with each other, said sole having a proximate end and a distal end with respect to said hosel;

a filling member provided on said sole, said filling member having a front surface and a rear surface opposite said front surface and an upper and lower extent; and

a fiber-reinforced resin coating a portion of said metal body and said filling member,

wherein said metal body is integrally formed with a support portion and wherein an opening is defined between said sole and said support portion generally above said lower extent for supporting said filling member along said rear surface, said support portion extending from said hosel toward said distal end of said sole being shaped to extend along a portion of said rear surface generally above said sole.

5,190,291

GOLF CLUB WHICH PROVIDES SENSORY INFORMATION DURING A SWING

John N. Melvin, 10545 Lennox La., Dallas, Tex. 75229

Filed Mar. 20, 1992, Ser. No. 855,196
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.2 **20 Claims**

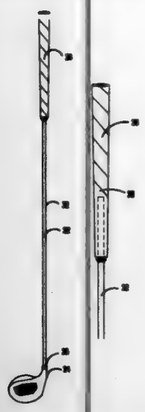
1. A training golf club, comprising:

a highly flexible shaft having a first and second end;

a head for striking a golf ball connected to said first end of said highly flexible shaft; and

a flexible handle connected to said second end of said highly

flexible shaft, said highly flexible shaft having a uniform diameter throughout its length, a capability of being bent to a point where the head is less than one foot from the handle without breaking, and providing said golf club with a first flex point located on said highly flexible shaft closer to said flexible handle than said head, said highly



flexible shaft being constructed of a material that is easily twisted, said flexible handle providing said golf club with a second flex point located on said flexible handle, whereby flexing of said golf club at said first and second flex points and twisting of said highly flexible shaft each provide a golfer with sensory information.

5,190,292

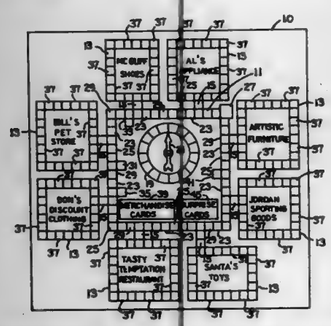
SHOPPING BOARD GAME APPARATUS

Melody J. Perry, 18516 79th Pl. West, Edmonds, Wash. 98026

Filed Feb. 13, 1992, Ser. No. 836,783

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—256 **8 Claims**



1. A board game comprising a board marked to define an endless main path simulating the main corridor of a shopping mall, and a plurality of endless branch paths simulating individual stores in the shopping mall; each branch path having its own store entrance connection to the endless main path; each path having subdivider markings thereon defining discrete spaces for accommodating player tokens advanceable along the respective path; a first group of spaces in the main path being marked to direct the player to a cash machine spinner means; a second group of spaces in the main path being marked to direct the player landing thereon to receive a card entitling the player to purchase an item of merchandise by moving a token to a specified space in one of the branch paths; some of the spaces in each branch path being marked to indicate a specific merchandise item available for purchase when a player's token lands thereon; and a cash spinner means having a spinner and a series of markings denoting different dollar amounts receivable by the player operating the spinner.

5,190,293

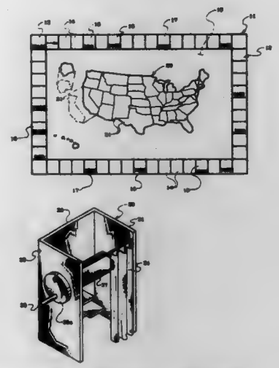
ELECTION GAME APPARATUS

Flavio M. Cabrera, Calle 119 A No. 53 A 85, Bogotá (Niza), Colombia

Filed Mar. 26, 1992, Ser. No. 858,044

Int. Cl.[5] A63F *3/04, 9/04*

U.S. Cl. 273—257 **2 Claims**



1. An election game apparatus, comprising,

a game board, the game board including a perimeter path of continuous spaces, the perimeter path includes a start space, a plurality of first spaces that are blank, a plurality of second spaces that are indicating voting of players, a plurality of third penalty spaces, a plurality of fourth reward spaces, and a plurality of fifth special award spaces within the game path,

and

a central area on the game board within the central area,

and

a puzzle map representing a country, said puzzle map located in the central area,

and

a predetermined number of contrastingly colored tokens to include a first, second, third, fourth, and fifth coloration,

and

a plurality of sets of state puzzle components, each set of state puzzle components comprising a plurality of state puzzle components representing all the states of the country wherein each state puzzle component is configured to represent an individual state and to be placed within the puzzle map, the state puzzle components in any one set all having the same uniform color and the sets of state puzzle components are contrastingly colored from one another wherein each state is represented by contrastingly colored state puzzle components to include a first, second, third, fourth, and fifth coloration of state puzzle components associated with the respective first, second, third, fourth, and fifth tokens,

and

a predetermined number of vote cards, each vote card having indicia representing a city within a state and each state having a plurality of cities wherein each city is individually represented by a vote card and

a bag member, for the predetermined number of vote cards to be placed therein,

and

a plurality of mayoral cards, wherein the mayoral cards are equal to the predetermined the plurality of mayoral cards divided into contrastingly colored sets to include a first, second, third, forth and fifth coloration of sets of mayoral cards associated with the respective first, second, third, forth and fifth token number,

and

dice members for directing players about the perimeter path of spaces, wherein each player is afforded one of said tokens, and upon a player and a token landing upon a second space, the player is directed to withdraw a further predetermined number of vote cards from said bag member,

and

a player landing upon one of said third spaces is directed to loose at least one turn, said player landing upon a fourth space is directed to advance a plurality of spaces, and said player landing upon one of said fifth spaces is directed to draw a yet further predetermined number of vote cards from said bag member.

5,190,294

GOLF BALL

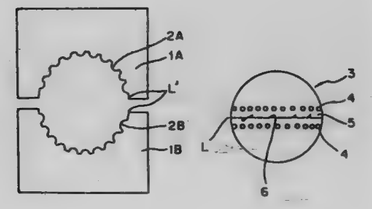
Kengo Oka, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Apr. 18, 1991, Ser. No. 687,010

Claims priority, application Japan, Nov. 30, 1990, 2-337564

Int. Cl.[5] A63B *37/14*

U.S. Cl. 273—232 **20 Claims**



1. A method of manufacturing a golf ball comprising the steps of:

molding the golf ball with a pair of semispherical molds having many dimple patterns formed on the inner surface thereof except on the connecting portion between the upper and lower molds so as to form first dimples arranged on the surface of the golf ball, a seam being formed at the connection portion and the seam failing to have dimples thereon, a great circle being formed on the golf ball only at the seam;

removing a burr formed on said seam corresponding to said connecting portion between upper and lower molds; and

forming second dimples on said seam after the step of removing the burr.

5,190,295

TABLE GAME BOARD FORMING A BOOK-SHAPED BOX

Louis Togni, Clos Mariane Chemin du Pére-Eternel, Hyeres 83400, France

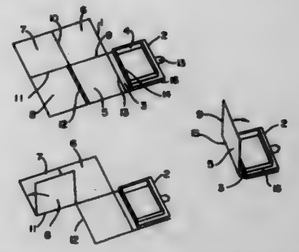
PCT No. PCT/FR90/00413, § 371 Date Dec. 12, 1991, § 102(e) Date Dec. 12, 1991, PCT Pub. No. WO90/15649, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 12, 1990, Ser. No. 778,085

Claims priority, application France, Jun. 13, 1989, 89 08077

Int. Cl.[5] A63F *3/00*; B65D *79/00*

U.S. Cl. 273—285 **20 Claims**



1. A table game board forming a book-shaped box comprising:

a game board;

a panel having dimensions and forming a base of the book-shaped box;

a receptacle positioned adjacent to said game board, said receptacle comprising four sides cooperating with said panel to form a container capable of storing game pieces;

said game board comprising a plurality of folds and at least one cut, said plurality of folds and said at least one cut divide said game board into a plurality of elements to permit said game board, when said plurality of elements are folded one upon the other, to have substantially the same dimensions of said panel;

a band connecting one of said plurality of elements to said panel;

said panel, said band and said folded plurality of elements forming the book-shaped box, said panel forming one cover of the book-shaped box, said band forming a back panel of the book-shaped box, and said folded plurality of elements forming another cover of the book-shaped box; and

said panel having a thickness which is substantially equal to that of the folded plurality of elements.

5,190,296

MEMORY GAME

J. Douglas Sainsbury, P.O. Box 988, Thornhill, Toronto, Ontario, Canada L3T 4A5

Filed Nov. 25, 1991, Ser. No. 796,787

Int. Cl.[5] A63F *1/00*

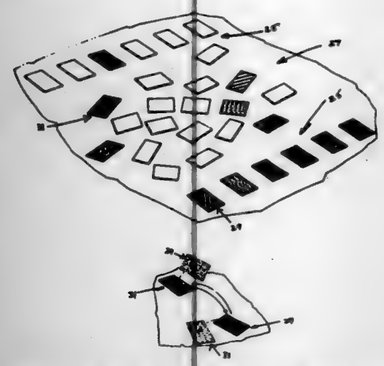
U.S. Cl. 273—296 **11 Claims**

1. Playing pieces of a game comprising a plurality of playing pieces, each playing piece having two faces each of which can act as a support surface for said playing piece and which includes on each face a visually distinct indicia which is hidden when the respective playing piece is supported on the respective face;

said faces of said playing pieces being configured to have a set of first faces and a set of second faces, said set of first faces being grouped into at least 6 subgroups with each subgroup having a common visually distinct indicia and having at least 6 playing pieces;

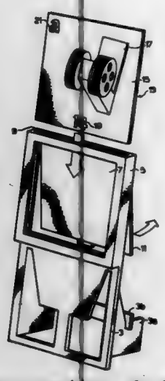
said set of second faces being grouped into at least 6 visually distinct subgroups with each subgroup having a common

visually distinct indicia and having at least 6 playing pieces;
said set of first faces and said set of second faces being coordinated such that said visually distinct indicia of each



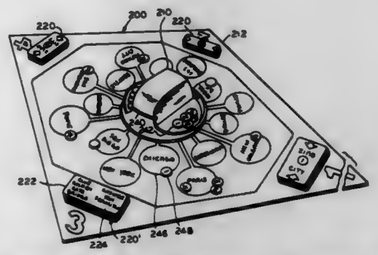
subgroup of said set of second faces is paired to form single playing pieces with each visually distinct indicia of the subgroups of said set of first faces and wherein said indicia are different colour fields.

5,190,297
GAME APPARATUS
Lewis Jessen, Scarborough, and Sam Sgro, Thornhill, both of Canada, assignors to Bluffers Beware Limited, Scarborough, Canada
Continuation-in-part of Ser. No. 550,551, Jul. 10, 1990, abandoned. This application Mar. 30, 1992, Ser. No. 860,061
Int. Cl.[5] A63F *1/00, 1/10*
U.S. Cl. 273—296 **5 Claims**



1. Game apparatus comprising a plurality of game cards, each card having a front face and a rear face, the front face of each card having a pictorial representation thereon and the rear face having an accurate worded description of said pictorial representation, said game apparatus including card support means for supporting the cards individually in at least a generally upright position with the pictorial representation on the front face of each card in an exposed position and the worded description being viewable from the rear of said support means without having to remove the card from said support means and player identification means which identifies a specific player to provide a true statement of the accurate worded description on the card and which further identifies other players to provide untrue statements as to the accurate worded description on the card.

5,190,298
AMUSEMENT DEVICES
James S. W. Lee, Long Island, N.Y., and Chiu K. Kwan, Kowloon, Hong Kong, assignors to C. J. Associates, Ltd., Monrovia, Liberia
Continuation-in-part of Ser. No. 504,542, Apr. 4, 1990, Pat. No. 5,028,047. This application Jan. 23, 1991, Ser. No. 644,841
The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.
Int. Cl.[5] A63F *9/00, 9/18, 9/06*
U.S. Cl. 273—430 **8 Claims**

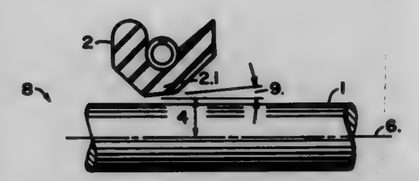


1. A game apparatus comprising means for producing an activating event; first and second group of game pieces; at least one of said groups of game pieces being marked with an indicating medium, said indicating medium being excited responsive to said activating event, said excitement continuing during only a predetermined time period following said activating event; said first and second groups being distinguished during said period while said medium is excited and being indistinguishable from each other except during the period while said indicating medium is excited; a container for displaying a random arrangement of individual ones of said first and second groups of game pieces; a cover for containing said means for producing said activating event; and means for selectably removing individual ones of said first and second groups of game pieces from said container.

5. A game apparatus comprising means for producing an activating event; a plurality of game pieces; said game pieces each having first indicium and second indicium thereon; said first game piece indicium being a clue or question; said second game piece indicium being an answer to said clue or question of said first game piece indicium; said second game piece indicium being printed by using an excitable indicating medium, which is excited responsive to said activating event for becoming visible during only an approximately predetermined time following said activating event after which said excitement of said medium subsides and said visibility disappears; a game board having a plurality of indicia corresponding to said excitable second game piece indicia; said first game piece indicium is printed by using an indicating medium which is excited to become visible only during said predetermined time period; said activating event being a brief flash of bright light; said indicating medium being excitable photochromic ink which responds to said bright flash by emitting light of a distinctive color when excited; and said means for producing said activating event comprises means for exposing only an excitable one of said first and second game piece indicia to said flash of bright light while preventing a simultaneous exposure of the other of said first and second game piece indicia to said flash of bright light.

6. A game apparatus comprising means for producing an activating event; a game piece for displaying a pattern for completion by a player in response to said event; said pattern being printed in an excitable indicating medium which is excited in response to said activating event for becoming visible only during an approximately predetermined time period following said activating event; said pattern being invisible except when said indicating medium is excited; a base unit for holding said game piece; a protective sheet for receiving markings made by a player; and a cover for containing said means for producing an activating event.

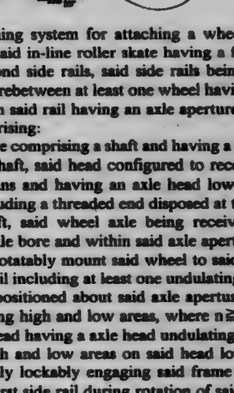
5,190,299
RADIALLY UNDULATING SHAFT SEAL
David E. Johnston, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany
Filed Oct. 23, 1991, Ser. No. 781,787
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1991, 4101835
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—152 **11 Claims**



1. In a shaft seal having a central seal axis and a lip of resilient material that surrounds a shaft to be sealed, the shaft seal defining a sealed space when mounted on a shaft, wherein the lip is demarcated by a radially inner sealing surface that tapers in the form of a hollow cone from a surface of minimum diameter adjacent the side facing the sealed space toward a surface of larger diameter adjacent the side facing away from the sealed space, and wherein the lip has ribs that project radially inward, distributed uniformly around it, the improvement wherein the ribs consist of undulations propagated along the inner sealing surface in the circumferential direction of the seal, and wherein the difference between the circumferentially adjacent maximal and minimal distances between the inner sealing surface and the seal axis is less than 0.3 mm.

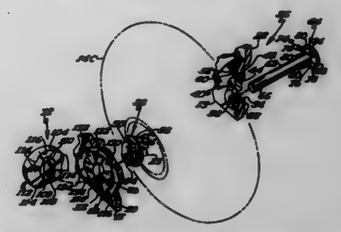
5,190,300
TOP JAW AND WEDGE CONNECTOR
James R. Jaggers, Fort Lauderdale, Fla., assignor to DL&J, Inc., Fort Lauderdale, Fla.
Continuation-in-part of Ser. No. 774,826, Oct. 11, 1991, which is a continuation-in-part of Ser. No. 681,714, Apr. 8, 1991, Pat. No. 5,076,596. This application Apr. 6, 1992, Ser. No. 863,862
Int. Cl.[5] B23B *31/10*
U.S. Cl. 279—124 **9 Claims**

1. A top jaw system for securing a top jaw in position above a chuck comprising:
a base jaw member having a lower portion and a wedge portion, said lower portion having a top surface and a bottom surface, said wedge portion integrally formed with and depending upward from the top surface of said lower portion, said wedge portion having an aperture defining a pair of flat angled contact faces and a bottom contact face, said pair of flat angled contact faces directed along radials extending outward from the center of the chuck, each of said angled contact faces forming an acute angle with the bottom contact face of said wedge portion;
means for attaching said base jaw to the chuck;
a top jaw having a face disposed toward the chuck, said top jaw having a slot sized to receive said wedge portion of



said base jaw, the slot extending from the face of said top jaw into said top jaw; and
means for attaching said top jaw to said base jaw.

5,190,301
FASTENING SYSTEM FOR THE WHEELS OF AN IN-LINE ROLLER SKATE
Andrzej M. Malewicz, Minnetonka, Minn., assignor to Rollerblade, Inc., Minneapolis, Minn.
Filed Mar. 13, 1991, Ser. No. 668,612
Int. Cl.[5] A63C *17/06*
U.S. Cl. 280—11.22 **44 Claims**



1. A fastening system for attaching a wheel to an in-line roller skate, said in-line roller skate having a frame including first and second side rails, said side rails being provided for mounting therebetween at least one wheel having a wheel axle bore and each said rail having an axle aperture, said fastening system comprising:
a wheel axle comprising a shaft and having a head at one end of said shaft, said head configured to receive a fastening tool means and having an axle head lower surface, said axle including a threaded end disposed at the other end of said shaft, said wheel axle being received within said wheel axle bore and within said axle aperture of said side rails to rotatably mount said wheel to said frame;
said first rail including at least one undulating, frame surface pattern positioned about said axle aperture and having n alternating high and low areas, where $n \geq 2$;
said axle head having a axle head undulating surface pattern with high and low areas on said head lower surface for selectively lockably engaging said frame surface pattern of said first side rail during rotation of said axle, said axle head surface pattern and said frame surface pattern mutu-

ally configured for a high area of one of said frame and axle head surface patterns sized to be received within an opposing low area of the other of said patterns; and

a threaded fastener adjacent said second side rail for threadably engaging and retaining said threaded end of said axle as said axle is rotated relative to said fastener;

said axle head surface pattern and said frame surface pattern are characterized by said high and low areas defining a substantially smoothly contoured surface, have a shape selected for opposing surfaces of said frame surface pattern and said axle head surface pattern to slip relative to one another during turning of said axle head until said axle is secured to said threaded fastener with a desired degree of tightness;

said frame surface pattern surrounding said axle aperture and extending radially therefrom with said frame surface pattern generally symmetrical about said axle aperture;

said frame surface pattern and said axial surface pattern resiliently biased toward one another with a biasing force sufficient for a high area of said axle surface pattern to override an opposing high area of said frame surface pattern against an urging of said biasing force until said axle is secured to said fastener with a desired tightness;

said opposing surface patterns resiliently biased toward one another with a biasing force sufficient for opposing high areas to override one another against an urging of said biasing force until said axle member is secured to said fastener member with a desired tightness;

whereby engagement of said axle head surface pattern with said first side rail undulating surface pattern substantially prevents said axle from inadvertently rotating and being loosened by skating generated forces.

5,190,302

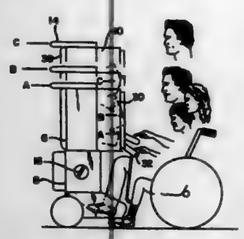
TRANSPORTABLE COMPONENT STAND

Frank Trotta, Maplewood, N.J., assignor to Electronic Voting Systems, Inc., New York, N.Y.

Continuation of Ser. No. 518,164, May 30, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 782,744

Int. Cl.[5] B62B *3/02*

U.S. Cl. 280—35 **14 Claims**



1. A transportable stand for use and storage of components for user interaction comprising an upper frame member interacting with a lower frame member, the upper and lower frame members each having two vertical side members being essentially parallel to each other at opposite sides of the stand, the side members having top portions and bottom portions, wherein the bottom portions of the side members of the upper frame member engage the top portions of the side members of the lower frame member and the bottom portion of the side members of the lower frame member further comprise substantially parallel base members which extend from front to back, the two side members of the lower frame member being attached by a cross-member having a compartment thereon wherein a recess in the front of the lower frame member is defined by the cross member in the back and the parallel said members in the front of the lower frame member to allow a user's legs when seated to rest under components on said stand, and further wherein the upper frame member includes handle means and has a component module with removable covers and components for user interaction located therein mounted on said upper frame member, said upper frame member being capable of being raised and lowered on the lower frame member by means for selectively varying component height relative to a floor on which the stand is located for use int he sitting or standing position and means for enabling movement of the stand comprising wheels attached to the base members of the lower frame member.

5,190,303

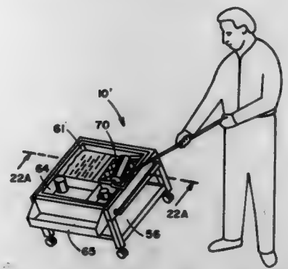
MOBILE WORK STATION FOR PAINTER

Kevin H. Schumacher, Baltimore; Robert J. Martin, and Edward L. Martin, both of Hampstead, all of Md., assignors to Leonard Bloom, Towson, Md.

Continuation of Ser. No. 532,388, Jun. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 371,032, Jun. 26, 1989, Pat. No. 4,993,726. This application Apr. 22, 1992, Ser. No. 873,700

Int. Cl.[5] B62B *3/00*

U.S. Cl. 280—38 **20 Claims**



1. A mobile work station for a painter, wherein the mobile work station is relatively lightweight and collapsible to facilitate transport and storage, comprising a frame having side walls to form an open well substantially in the center thereof; a tray having side walls and a bottom; means to mount the tray in the open well in the frame, whereby a paint roller, paint pan, brushes and the like may be disposed in the tray and moved about by the painter on the job; a plurality of legs, each leg having a first end and a second end, the first end of each leg being mounted on the frame and being capable of being pivoted, such that each leg has a first position in which the leg is adjacent to the frame, and such that each leg has a second position in which the leg depends downwardly to support the frame; means for securing each leg in both the first and second positions, respectively; and a cover removably attached to the frame; wherein when the cover is attached to the frame, the cover encloses the open well in the frame such that the tray and the contents of the tray are contained therein, and such that the mobile work station may be conveniently transported and stored; wherein when the legs are in the second downwardly-depending position to support the frame, the cover may be detached from the frame and may be disposed between the legs, and wherein means are provided for removably attaching the cover to the legs, such that the cover further supports the legs in the downwardly-depending position, providing additional structural integrity for the mobile work station, and further serving as a shelf thereon.

5,190,304

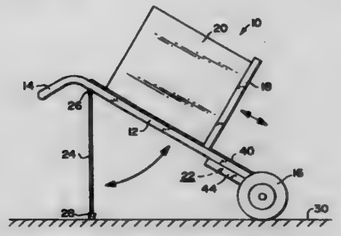
BACK SAVER HAND TRUCK

Dee Preatiss, 29 River St., Bristol, Conn. 06010, and George Spector, 233 Broadway Rm. 3815,, New York, N.Y. 10007

Filed Dec. 13, 1991, Ser. No. 806,313

Int. Cl.[5] B62B *1/20*

U.S. Cl. 280—47.29 **2 Claims**



1. A back saver hand truck which comprises:

a) an elongated upstanding frame having a handle portion;

b) a pair of ground engaging wheels attached to the bottom of said frame;

c) a platform for supporting a load thereon, said platform transversely extending outwardly at one end from said frame;

d) means for lifting said platform upwardly and lowering said platform downwardly in a longitudinal direction along said frame so that a person does not have to bend down to remove the load from said platform, when said platform is lifted upwardly; further including a pair of rest legs, each pivotally mounted to the back of said frame near said handle portion and having a rubber foot, so that when said hand truck is tipped backward in an inclined position, said rest legs will swing out with said feet engaging the ground to support said hand truck in its inclined position; wherein said means for lifting said platform upwardly and lowering said platform downwardly is mounted to said frame and includes:

e) a battery for supplying a power source;

f) a normally opened mercury switch electrically connected to said battery;

g) a motor electrically connected to said mercury switch;

h) a pump electrically connected to said motor and mechanically connected to said platform;

i) a track on the front of said frame for said platform to ride within; and

j) a normally opened reversing switch electrically connected between said battery and said motor, so that when said hand truck is placed in its inclined position, said mercury switch will close causing said motor to activate said pump and lift said platform upwardly, said reversing switch can then be manually closed for reversing said motor, changing the direction of said pump and lowering said platform downwardly to its original position.

5,190,305

LUGGAGE HANDLING HAND CART

William A. Putman, Louisville, Ky., assignor to Magline, Inc., Pinconning, Mich.

Filed Dec. 23, 1991, Ser. No. 812,650

Int. Cl.[5] B62B *3/04, 3/10*

U.S. Cl. 280—79.3 **7 Claims**

1. In a luggage handling hand cart,

a. a luggage supporting rectilinear platform supported on wheels and having sides and ends with opposite corners;

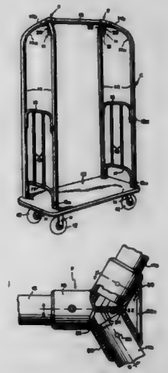
b. a pair of upright extending upwardly from the platform at each end thereof from the corners thereof and having upper ends;

c. the upper ends of said upright being compoundly configured to extend inwardly relative to the ends of the platform and inwardly relative to the sides thereof;

d. a pair of opposed, molded, generally Y-shaped synthetic plastic fittings, each having a base with a pair of projecting leg parts extending at a compound angle from said base outwardly relative to the ends of the platform and outwardly relative to the sides thereof for telescopically receiving the upper ends of the uprights above each end of said platform;

e. and a top longitudinally extending cross rail, for supporting clothing hung on hangers, having ends telescopically received by said bases of the fittings;

f. each of said fittings having a tubular base and leg parts for the reception of said top rail and the upper ends of the



uprights, respectively, and also having internal wall structure with interior wall portions extending radially internally of each fitting leg part and integrated with said fitting leg parts internally, and further having a head portion extending radially internally of each fitting integrated with the base of the fitting internally;

g. the top rail ends being in rigidly abutting relation with the internal head portions of the fittings and the upper ends of said uprights being in rigidly abutting relation with the interior wall portions of said fittings; and

h. securing fastener means maintaining both said top rail ends and fitting internal head portions in rigidly abutting relation and said upright upper ends and interior wall portions of the fittings in rigidly abutting relation.

5,190,306

PASSENGER TRANSPORTATION SYSTEM FOR BICYCLES

Leonard G. Nauman, 1020 Quebec Ave. North, Golden Valley, Minn. 55427, and Dale E. Stenberg, 10336 Wentworth Ave. South, Bloomington, Minn. 55420

Continuation of Ser. No. 587,801, Sep. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 457,371, Dec. 27, 1989, Pat. No. 5,052,704. This application Jan. 31, 1992, Ser. No. 830,183

Int. Cl.[5] B62J *1/00*

U.S. Cl. 280—202 **35 Claims**

1. A footrest usable by a person riding a bicycle having a frame, said frame including a horizontal tube, a handle bar post and a diagonal tube extending rearwardly and downwardly from said handle bar post, said footrest being supported at least by the diagonal tube of the bicycle, wherein said footrest comprises:

first and second sides, each said side having a substantially planar side surface with a longitudinal direction of extent coextensive with that of the diagonal tube, said sides

adjoining each other along adjacent ends thereof to form a longitudinally extending vertex and so as to define an included angle θ between said substantially planar side surfaces; and

wherein each of said sides includes at least one foot land for resting a foot thereon, each said land comprising a sub-

stantially planar surface extending outwardly form and longitudinally rearwardly along each said respective planar side surface; and

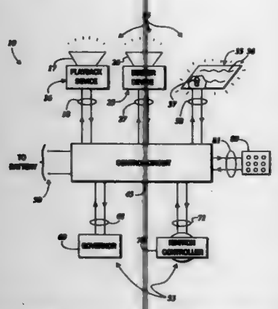
wherein said footrest is mounted to the diagonal bar such that the bar is nested within said longitudinally extending vertex and such that said sides depend downwardly from said vertex.

5,190,307

SMOKELESS AUTOMOBILE

Randy M. Brown, 4262 Doublegate Dr., Douglasville, Ga. 30135, and Robert E. Rivers, Valley Run Rd., Bremen, Ga. 30110

Filed Aug. 20, 1991, Ser. No. 747,517
Int. Cl.[5] B60D *1/28*
U.S. Cl. 280—271 **13 Claims**



1. Anti-smoking apparatus for use in an automobile to deter passengers from smoking within a passenger compartment of the automobile, said anti-smoking apparatus comprising:

at least one sensor means for detecting the presence of smoke within an automobile passenger compartment;

an engine governor means for connection to an automobile engine for controlling the speed of the automobile; and

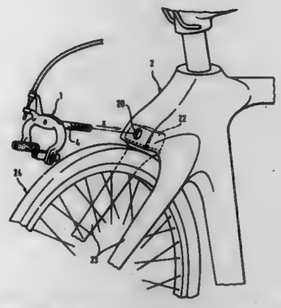
a control means connected to said at least one sensor means and said engine governor means for activating said engine governor means in response to detection of smoke by said at least one sensor means.

5,190,308

APPARATUS FOR SECURING ACTIVE AND/OR PASSIVE ELEMENT TO THE WALL OF COMPOSITE COMPONENTS

Jean-Pierre Couturet; Jean-Claude Chretien, both of Nevers, France, and Joris van Raemdonck, Bazel, Belgium, assignors to Look S.A., Nevers cedex, France

Filed Jun. 11, 1991, Ser. No. 714,163
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018957
Int. Cl.[5] B62K *19/38*
U.S. Cl. 280—281.1 **12 Claims**



1. Apparatus for the securing of an element to a wall of a composite component comprising a holder (3, 5) on the composite component (2) engaging through an aperture (20) in the wall (21) of the composite component (2) and having a coupling part (3) disposed at a first side of the composite component (2) to which access is difficult, and an actuation part (5) which is disposed at a second side of the composite component (2) which can be brought into engagement with the coupling part (3) for applying a turning movement to the coupling part (3); the coupling part (3) being adapted to be coupled with a coupling counterpiece (4) of the element (1) which passes through the actuating part (5), with mutual rotation and axial clamping of the coupling part (3), the wall (21), the actuating part (5) and the element (1).

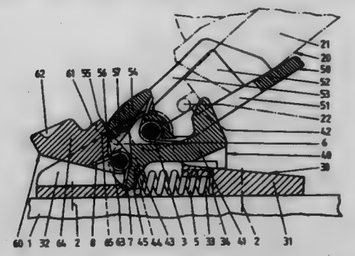
5,190,309

SKI BINDING FOR A CROSS COUNTRY SKI OR TOURING SKI

Engelbert Spitaler, Wr.Neudorf; Heinz Wittmann, Vienna, and Roland Erdei, Weigelsdorf, all of Austria, assignors to HTM Sport-und Freizeitgeraete Gesellschaft m.b. H., Schwechat, Austria

PCT No. PCT/EP91/00484, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO91/15275, PCT Pub. Date Oct. 17, 1991
PCT Filed Mar. 14, 1991, Ser. No. 777,279
Claims priority, application Austria, Mar. 30, 1990, 745/90
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—615 **4 Claims**

1. A ski binding for a cross country ski or touring ski comprising a bearing block adapted to be secured to a ski, said bearing block having a base plate with an elongated recess therein and a horizontally transversely extending first axle thereon, a holding cup and a two-arm swivel part pivotally supported for movement about said horizontally transversely extending first axle in unison as well as with respect to one another for the purpose of transitioning between a closed and an open position of the ski binding, a first lever arm of said swivel part carrying at least one locking pin, said holding cup having means defining an opening for receiving therein said at least one locking pin in the closed position of the ski binding, said locking pin being fixed by a yieldable lock, and said holding cup being further adapted to grip over a front sole extension of a ski boot while said locking pin also extends through an opening in an extension of the front sole of the ski boot, whereas in the open position of the ski binding, said locking pin is removed from said opening on said holding cup, an elastic element for resisting said pivoting of said holding cup and said swivel part about said transversely extending first axle, a second lever arm of said swivel part having a second axle thereon extending parallel to said horizontally transversely extending



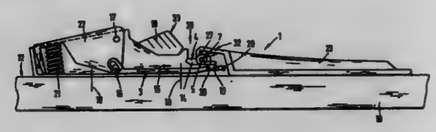
first axle, said yieldable lock including a lock part pivotally mounted on said second axle for engaging said holding cup in the closed position of the ski binding, and a first spring for urging said holding cup and said swivel part apart, wherein said second lever arm of said swivel part, extends downwardly and forwardly, wherein said elastic element is a second spring arranged in said elongated recess in said base plate of said bearing block, and wherein said second lever arm of said swivel part is stressed directly by said second spring.

5,190,310

CROSS-COUNTRY SKI BINDING HAVING A RELEASABLE RETAINING HOOK ASSEMBLY

Bernt-Otto Hauglin, Khokkarjtua, Norway, and Eugen Popp, Munich, Fed. Rep. of Germany, assignors to Witco A.S, Norway

PCT No. PCT/EP90/00084, § 371 Date Dec. 12, 1990, § 102(e) Date Dec. 12, 1990, PCT Pub. No. WO90/11806, PCT Pub. Date Oct. 18, 1990
PCT Filed Feb. 19, 1990, Ser. No. 634,160
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, P3912019.8
Int. Cl.[5] A63C *9/00*
U.S. Cl. 280—615 **19 Claims**



1. A cross-country or touring ski binding having a binding body and an engaging member, said body adapted to be secured to a ski for use with a cross-country ski shoe (2) including a sole having a front end (9) and an engaging element which complements and engages an engaging member of the binding body (1) and forms an articulated pivotal coupling, said engaged element forming a sole-integrated pivot axis (8) which extends transversely to the longitudinal direction of the shoe and approximately parallel with the bottom surface of said shoe, said engaging member includes a retaining hook (3) which at least partially encompasses said pivot axis (8) and defines a hinge therewith and permits moving the ski shoe between a raised pivoted position and a lowered position approximately parallel with the ski, said retaining hook being movable between a closed position and a release position, said binding having an elastically deformable element for elastically restoring the shoe (2) from said raised pivoted position to said lowered position, said deformable element operating with the front end (9) of the sole, the improvement comprising a locking member (4) secured to said binding body in a location of the shoe in said lowered position in said binding body, said locking member being movable between a locking position holding said retaining hook in said release position and an unlocking position permitting said retaining hook to move to said closed position and being movable by said engaged element whereby step-in of the shoe into the binding actuates said locking member to release said retaining hook and holds said locking member in said unlocking position in which the retaining hook (3) is freely movable to said sole integrated pivot axis (8).

5,190,311

SNOWBOARD BINDING SYSTEM

Jake Carpenter, East Dorset, and David J. Dodge, Charlott, both of Vt., assignors to Burton Snowboards U.S.A

Continuation of Ser. No. 478,586, Feb. 9, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 758,530
Int. Cl.[5] A63C *9/086*
U.S. Cl. 280—618 **22 Claims**

1. A snowboard binding system comprising:

a first boot attachment means, and

a second boot attachment means, each boot attachment means disposed for movement on a snowboard in response to forces applied by the snowboard rider;

a first cable attached to each of said first and second boot attachment means;

and a first tensioning means acting on said first cable, said first tensioning means normally biasing the first cable into a first retracted condition providing a retaining force holding the first and second boot attachment means in a stable condition on the snowboard, said first tensioning means responding to loads applied by the rider above a first predetermined level to overcome the normal biasing of said first cable to extend the cable length to a more lengthened condition and reducing the retaining force for at least one of said boot attachment means to permit movement thereof relative to but without detachment from the snowboard.

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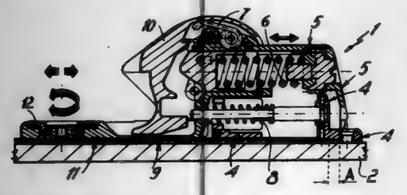
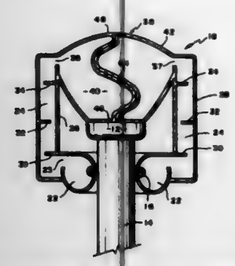
5,190,312
ANTIFRICTION DEVICE, PARTICULARLY FOR SKI BINDINGS
Giorgio Baggio, San Martino Di Lupari; Roberto Gorza, Feltre, and Mirco Battistella, Breda Di Piave, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy
Filed Sep. 3, 1991, Ser. No. 753,469
Claims priority, application Italy, Sep. 10, 1990, 59380/90[U]
Int. Cl.[5] A63C *9/082, 9/084*
U.S. Cl. 280—628 3 Claims



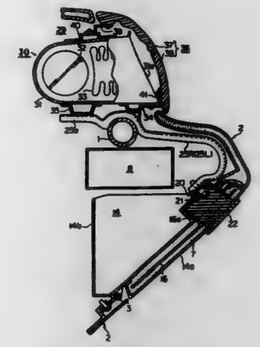
1. A ski binding:
a first body which is connectable to a ski in a fixed position;
a second body which is slidably supported by said first body, said second body being slidable with respect to said first body in a direction parallel to a longitudinal axis of the ski;
means for biasing said second body into a forward position thereof with respect to said first body;
means for releasably holding down a ski boot sole portion, said means for releasably holding down being connected to said second body;
a tab element which is rigidly connected to said second body and which extends forwardly therefrom and above which a ski boot sole lower surface is arrangeable, thereby said tab element being slidable rigidly with said second body in said direction parallel to the longitudinal axis of the ski; and
a plate element for engaging the ski boot sole lower surface which is pivotally mounted to said tab element about a vertical axis which is substantially perpendicular to the longitudinal axis of the ski.

5,190,313
IMPACT CUSHIONING DEVICE
Robert Hickling, 323 Country Club Rd., Oxford, Miss. 38655
Filed Aug. 7, 1991, Ser. No. 741,348
Int. Cl.[5] B60R *21/22, 21/24*
U.S. Cl. 280—731 26 Claims



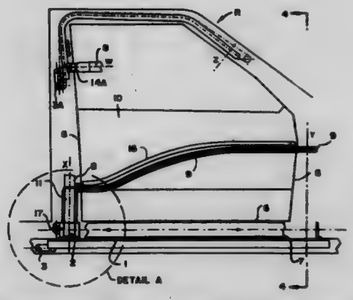
1. An impact cushioning device for preventing direct impact with a terminal end of an elongated object comprising a gas pressure source and an inflatable safety bag, said safety bag including a reservoir portion containing said gas pressure source, an inflatable cushion portion and at least one inflatable duct portion providing fluid communication between the gas pressure source and the cushion portion, said reservoir, duct and cushion portions being mounted on said elongated object in a normally deflated and stowed condition at a point remote from said terminal end, and being dimensioned relative to the point of attachment of the cushion device on said elongated object such that upon inflation of said reservoir, duct and cushion portions with gas pressure from the gas pressure source, said cushion portion axially protrudes beyond and extends radially inward to substantially, entirely cover the said terminal end of said elongated object and is restrained at least in part relative to said terminal end in such position by said duct portion, said duct portion including baffle means for restricting free pressurized gas flow between said reservoir portion and said duct portion and between said duct portion and said cushion portion such that, upon inflation, said reservoir is substantially fully inflated prior to inflation of said duct portion which is substantially fully inflated prior to said cushion portion and a pressure gradient exists from said cushion portion to said reservoir portion through a period in which impact can occur due to the restriction provided by said baffle means.

5,190,314
GLOVE BOX STRUCTURE OF VEHICLE
Seiji Takasugi, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 5, 1991, Ser. No. 724,400
Claims priority, application Japan, Jul. 4, 1990, 2-175379
Int. Cl.[5] B60R *21/045, 21/16*
U.S. Cl. 280—752 12 Claims



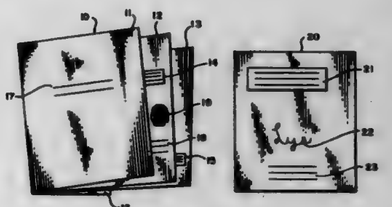
1. A glove box and knee protecting structure, installed in an instrument panel structure in a front passenger compartment of an automotive vehicle, said instrument panel structure including an opening formed therein, at least one frame member, extending in a transverse direction of a body of said automotive vehicle, and an instrument panel, supported by said frame member, comprising:
a box structure having at least a front box wall and a rear box wall for providing a glove box with a substantially rectangular top-opening, said glove box being supported for swinging movement by said instrument panel structure so as to move between a closed position, in which said front box wall is located within said opening, and an open position, in which said rear box wall is located close to said opening;
knee protecting means, located outside and above a path traversed by said glove box as it swings between said closed position and said open position, inside said instrument panel structure for protecting knees of a passenger in said front passenger compartment upon a collision of said automotive vehicle, said knee protecting means including a resiliently bendable member, cantilevered at a first end by being connected to said frame member and extending towards said opening so as to place a second end thereof within said opening; and
lock means, attached to said second end of said resiliently bendable member, for holding said glove box in said closed position, said resiliently bendable member comprising a pair of resiliently bendable arms disposed separately and at a distance coinciding approximately with a distance between knees of a passenger in said transverse direction.

5,190,315
PASSIVE SAFETY BELT SYSTEM
Ennio Curto, Via E. di Velo, 84, 36100 Vicenza, Italy
Filed Jun. 6, 1991, Ser. No. 710,184
Claims priority, application Italy, Nov. 15, 1990, 64261
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 9 Claims



1. A passive safety seat belt system for an occupant on a seat of a motor vehicle having a frame and a least a door, comprising:
a) first guide disposed on an outboard side of the seat secured to the frame below the door;
b) retractor adapted to move along said first guide between a first position behind the door and a second position in front of the door;
c) second guide disposed above the door;
d) a first anchor adapted to move along said second guide between a third position behind the door and a fourth position toward the front of the door;
e) a second anchor disposed inboard of the seat;
f) a belt having a first end secured to said first anchor, a second end secured to said retractor, and an intermediate portion secured to said second anchor;
g) first drive operably engaged with said retractor for positioning said retractor at said first and second positions;
h) second drive operably engaged with said first anchor for positioning said first anchor at said third and fourth;
i) a third guide having a first portion disposed on the frame behind the door, a second portion disposed across the door and a third portion disposed in front of the door;
j) said first portion is lower than said third portion;
k) a telescoping assembly operably secured to said retractor, said belt and said third guide such that a belt portion adjacent the door is lifted upwardly when said retractor moves to said second position;
l) whereby said belt secures the occupant to the seat when said retractor and said first anchor are disposed at said first and third positions, respectively, and said belt is released from the occupant when said retractor and said first anchor are disposed at said second and third positions, respectively.

5,190,316
METHOD OF MAKING PERSONALIZED CHILDREN'S STORYBOOK UTILIZING STICKERS
John B. Hefty, 976 Grand Canal St., Gulf Breeze, Fla. 32561
Filed Aug. 29, 1991, Ser. No. 751,995
Int. Cl.[5] B42D *15/00, 1/00*
U.S. Cl. 281—15.1 5 Claims



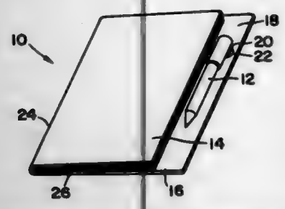
1. A method of making a to-be-completed personalized children's storybook containing a children's story and optionally illustrations, said method comprising the steps of:
(a) preprinting a storybook containing a story set forth in non-variable text and optionally illustrations, and providing a plurality of sections at selected locations in said storybook to be matched up with personalized stickers that are compatible with and complete the storyline of said storybook;
(b) obtaining personal data about an intended recipient of said storybook to match up with said plurality of sections at selected locations in said storybook;
(c) providing an adhesive sticker for each of said selected locations, with said stickers being adapted to be matched up with and applied onto said storybook in said selected locations so as to be compatible with said non-variable text in said selected locations;
(d) printing said personal data on said adhesive stickers in such a manner that the thus imprinted stickers can complete the text of said storyline thereby enabling one to read said personalized storybook from start to finish, wherein said adhesive stickers are adapted to change said story to a story about said intended recipient, wherein said adhesive stickers are adapted to replace sections of said non-variable text which sections are identical to the text on said adhesive stickers except for said personalized data, wherein each of said stickers is adapted to blend in with the specific background of the specific location in said storybook to which they are to be applied so as to have the appearance of being printed directly on the page of said storybook to which they are intended to be applied, and wherein said stickers, after said printing, contain personal data and non-variable text identical to said non-variable text in the sections said stickers are intended to replace, whereby the thus imprinted stickers can be applied onto the storybook to complete the personalized storybook.

5,190,317
ONE HOLE FOLDER
Martin Zoland, 7 Mandeville Crescent, Toorak, Victoria 3142, Australia
Filed Nov. 18, 1991, Ser. No. 793,866
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—30 12 Claims

1. A folder and writing instrument combination, said writing instrument including a longitudinal body and a clip, said clip having proximal and distal ends with said proximal end affixed to said writing instrument, said folder including a front cover with an inside portion and an outside portion and a back cover with an inside portion and an outside portion, said front cover and said back cover being joined at one side thereof so as to form a spine, said front and back covers having first and second

edges adjacent said spine and a third edge opposite said spine, said combination comprising:

a through-hole located in said back cover adjacent said third edge, said through-hole adapted to receive said clip by a



substantially perpendicular insertion of said distal end of said clip through said through-hole, said clip holding said writing instrument in place by clipping against said outside portion of said back cover to clamp said back cover against said longitudinal body of said writing instrument.

5,190,318
DOCUMENT WITH FORGERY-PREVENTION MEANS
Antonio Mantegazza, Noverasco di Opera, Italy, assignor to Enginpex Ltd., Dublin, Ireland
Filed Jun. 17, 1991, Ser. No. 717,309
Claims priority, application Italy, Jun. 22, 1990, 20727 A/90
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—82 **10 Claims**

1. Document, particularly of the check type, with forgery-prevention means, comprising a sheet-like element, said sheet-like element having at least one surface, said at least one surface of said sheet-like element having at least one portion for writing indications, wherein said document further comprises regions made of magnetic material so as to define a code which can be detected by a magnetic reading head, said magnetic material being an erasable magnetic material, said regions made of erasable magnetic material being provided at said at least one indication-writing portion on said at least one surface of said sheet-like element.

5,190,319
TICKET FOR DESIGNATING VEHICLE PARKING LOCATION
Ronald A. Sandler, 1320 N. State Pkwy., Chicago, Ill. 60610
Filed Oct. 1, 1991, Ser. No. 769,444
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—102 **2 Claims**

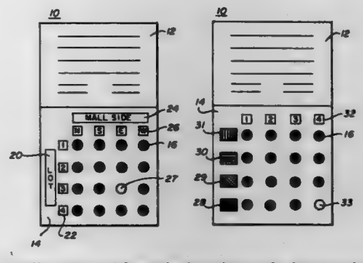
1. A device for easily recording a vehicle parking location in a parking facility comprising:

a printed card having indicia in a plurality of rows and columns for identifying a parking location;

a first unique pictorial representation for each row of indicia to represent one of a first plurality of unique parking features identifying where the vehicle is parked such as a parking lot on one of the sides of a building;

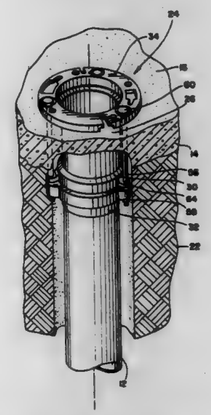
a second unique pictorial representation for each column of indicia to represent one of a second plurality of unique parking features identifying where the vehicle is parked such as a particular area in the parking lot on one of the sides of a building designated by one of the first row indicia; and

a friable removable mask covering associated with each indicia in the rows and columns such that the friable mask



is easily removed from the location at the intersection of a row wherein one of the first unique parking features is represented by one of the first unique pictorial representations and a column wherein one of the second unique parking features is represented by one of the second unique pictorial representations to specifically identify the vehicle parking location.

5,190,320
TELESCOPING CLOSET FLANGE
B. Eugene Hodges, 761 Palmer Dr., Greenville, Mich. 48838
Filed Jan. 13, 1992, Ser. No. 819,795
Int. Cl.[5] F16L *23/00*
U.S. Cl. 285—56 **7 Claims**



1. A telescoping closet flange assembly for extending a drain pipe to floor level, said flange assembly characterized by:

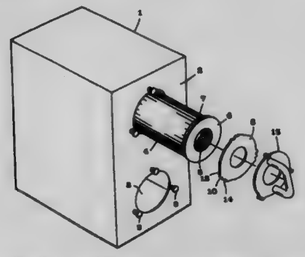
a cylindrical body sized to slide over the drain pipe and having a radially outwardly extending rim at one end and a beveled edge at the opposite end, said rim having a plurality of spaced apertures circumferentially disposed for receiving fastening means,

a cylindrical seal sized to fit snugly over said drain pipe and having a beveled edge in water tight communication with said body beveled edge,

a cylindrical slide adjacent to the outer surfaces of said body and said seal where said body and said seal are in water tight communication, and having at about its mid-section a plurality of radially outwardly extending tabs, each of said tabs having an aperture for receiving fastening means, and

a cylindrical seal cap having a large diameter portion adjacent to the outer surface of said slide and a small diameter portion adjacent to the outer surface of said drain pipe, said large diameter portion having a plurality of radially outwardly extending tabs, each of said tabs having an aperture for receiving fastening means.

5,190,321
ARRANGEMENT FOR MOUNTING A TUBE OR MEMBER PROVIDED WITH A FLANGE
Anders Krantz, Söderala, Sweden, assignor to Airchitect I Soderhamn AB, Söderhamn, Sweden
PCT No. PCT/SE90/00342, § 371 Date Dec. 12, 1991, § 102(e) Date Dec. 12, 1991, PCT Pub. No. WO90/14542, PCT Pub. Date Nov. 29, 1990
PCT Filed May 22, 1990, Ser. No. 781,202
Claims priority, application Sweden, May 25, 1989, 8901871
Int. Cl.[5] F16L *5/02*
U.S. Cl. 285—192 **6 Claims**



1. A mounting arrangement for mounting a member provided with a flange within an opening formed in a wall, said arrangement comprising a member with a flange thereon, a wall with an opening therein for receiving said member and means mounting at least three abutment members to said wall in spaced relationship around said opening and a locking element having a periphery having at least three spaced apart seats on said periphery adapted to cooperate with a corresponding number of said abutment members, each of said abutment members having an oblique surface against which at least a portion of said locking element can be applied whereby when said locking element is turned said locking element engages said abutment members and said locking element and said flange are urged inwardly toward said wall for fixed mounting therewith, said locking element further including a cam surface adjacent to each of said seats, each of said abutment members comprising a pin having a conical portion forming said oblique surface and tapering towards said wall against which said cam surface is applied until said pin engages said seat.

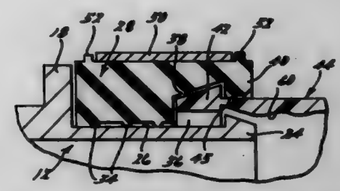
5,190,322
SEALING CUFF FOR BLOW MOLDED PLASTIC COMPONENTS
William E. Hughes, 40034 Fraser Dr., Sterling Heights, Mich. 48310
Filed Sep. 6, 1991, Ser. No. 756,095
Int. Cl.[5] F16L *33/20*
U.S. Cl. 285—236 **2 Claims**

1. A clamping device for clamping fluid sealing first and second cylindrical parts having truncated conical head portions which are adapted to telescope over one another with clearance therebetween.

an annular cuff of resilient rubber-like material,

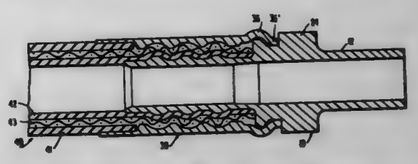
said annular cuff having a first internal diameter portion for sealing engagement with the outside diameter of the first part and a second internal diameter portion for sealing engagement with the outer diameter of the second part,

said cuff having a retainer pocket formed therein which receives the head portion of the second part and having an outer wall forming one end of said cuff to entrap said head



portion of said second part therein when said cuff is inserted on said first part and said head portions are telescoped clamping means positioned around said cuff for exerting a constricting force to effect a fluid tight seal on the outer surfaces of said parts while clearance remains between said telescoped head portions.

5,190,323
HIGH PRESSURE COUPLING
Hans Oetiker, Oberdorfstrasse 21, CH-8812 Horgen, Switzerland
Division of Ser. No. 472,280, Nov. 1, 1990, Pat. No. 5,031,301.
This application Mar. 28, 1991, Ser. No. 676,349
Int. Cl.[5] F16L *33/20*
U.S. Cl. 285—39 **20 Claims**



1. A high-pressure coupling for a hose-like object to be securely fastened thereby, comprising:

a nipple structure including a main portion, a connecting nipple portion extending from said main portion in one axial direction of the nipple structure and terminating in a free end, a nipple portion extending from said main portion in the other axial direction of the nipple structure, said nipple portion having spaced, circumferentially extending protuberances whose external surfaces are rounded-off, said main portion including a collar portion, sharp-edged step means between said collar portion and a circumferential groove which is adjoined by a head portion, as viewed in the direction from the nipple portion in the one axial direction, said nipple portion being connected with said collar portion by way of a tapering portion, said main portion and at least a part of said connecting portion being provided with an axial bore of a substantially constant first diameter, said nipple portion being provided with an axial bore of a substantially constant second diameter smaller than said first diameter which passes over into the axial bore of said first diameter by way of a tapering bore in said tapering portion, said tapering portion being of substantially constant thickness over a major part of its length and having a thickness approximately the same as the normal thickness of the nipple portion within the area between circumferentially extending protuberances, the tapering bore of said tapering portion extending at most only a slight distance underneath the collar portion, said collar

portion having an external dimension smaller than the external dimension of the head portion, and

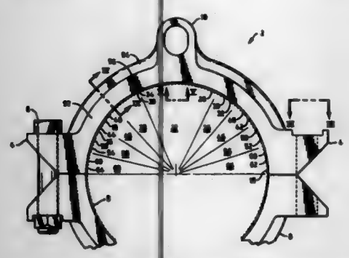
a sleeve-like member for cooperation with said nipple structure to define a space accommodating the hose-like object when assembled over said nipple structure, said sleeve-like member having a substantially cylindrical external surface and including a main portion provided with rounded-off internal circumferential grooves, the main portion of said sleeve-like member having a normal internal diametric dimension smaller than the external dimensions of the collar portion and being adjoined in said one axial direction by a connecting portion and in the other axial direction by an end portion, the connecting portion of said sleeve-like member having an internal diametric dimension larger than the normal internal diametric dimension of its main portion and at least slightly larger than the external dimensions of the collar portion so as to slidably fit over the same, and the end portion of said sleeve-like member having an internal diametric dimension at least as large as the internal diametric dimensions of the connecting portion of the sleeve-like member and increasing in its internal diametric dimension toward its free end without sharp edge to minimize damage to a hose-like object during bending thereof.

5,190,324

PIPE RESTRAINING MEMBER

Edwin A. Bird, Ashdown, Ark., and Kirby L. Shaddix, Texarkana, Tex., assignors to M&FC Holding Company, Inc., Wilmington, Del.

Filed Nov. 6, 1991, Ser. No. 788,425
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—328 **32 Claims**



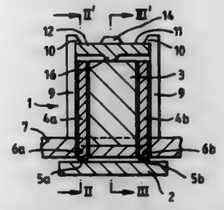
1. A pipe restraining member comprising a collar member, flange means disposed on each end of said collar member and adapted to receive first connecting means for connecting said collar member to a support means, said collar member and said support means being adapted cooperatively to encircle a first pipe member, lug means disposed on said collar member and adapted to receive second connecting means for connecting said collar member to a collar assembly encircling a second pipe member, and groups of protrusions extending inwardly from an inside surface of said collar member and adapted to engage an external surface of said first pipe, said groups including a first group of protrusions of greater height than a second group of protrusions, said first group of protrusions being disposed centrally of said collar member as viewed axially of said first pipe member, said first group of protrusions being disposed on said inside surface axially of said collar member and remote from said flange means.

5,190,325

MAGNETIC CATCH

Argus Dom-Desouza, Sanningdale, England, assignor to Technophone Limited, Surrey, England

Filed Apr. 6, 1992, Ser. No. 863,809
Claims priority, application United Kingdom, Apr. 12, 1991, 9107822
Int. Cl.[5] E05C *17/56*
U.S. Cl. 292—251.5 **14 Claims**



1. A magnetic assembly for a magnetic catch, comprising:

a magnet having front, rear, and side faces,

a pair of pole members disposed respectively adjacent to opposite side faces of said magnet, each pole member comprising a portion which is proud of the front face of the magnet,

a casing having at least one aperture for receiving the proud portions of the pole members,

a unitary plate-like support member comprising abutment means disposed adjacent the rear face of the magnet, the abutment means being in the form of a localized protuberance extending proud of the support member, the support member being disposed to overlie the magnet and both pole members so as to limit their movement, and

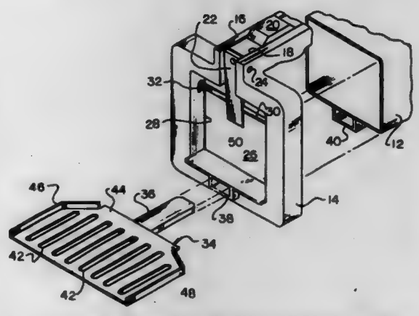
means for holding the support member such that the abutment means biases the magnet towards the aperture in the casing, the support member being adapted to allow movement of the pole members relative to the magnet in the fore and aft direction.

5,190,326

CAT LITTER BOX CLEANER

Gary L. Nunn, Rt. 1 Box 190A, Prospect, Tenn. 38477

Filed Sep. 9, 1991, Ser. No. 756,592
Int. Cl.[5] A01K *29/00*
U.S. Cl. 294—1.3 **6 Claims**



1. A new and improved cat litter box cleaner comprising:

container means,

shovel means for collecting litter and sifting said litter through at least open slot formed in said shovel means, thereby to remove fecal matter from said litter;

guide means for directing said fecal matter to a movable closure pivotally mounted on said container means; and

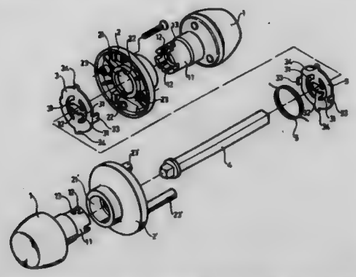
opening means for pivotally opening said movable closure, whereby said fecal matter may be collected within said container means, said opening means comprising a slidably movable button abuttable against an arm, said arm being pivotally attached to a retention ring means mounted on said container means, said arm being abuttable against said closure so as to selectively force an opening of said closure to facilitate a collecting of fecal matter.

5,190,327

TUBULAR DOOR LOCK

Jui C. Lin, No. 55-10 Been Chou Rd., Kangshan, Kaohsiung Hsien, Taiwan

Filed Jul. 8, 1992, Ser. No. 910,431
Int. Cl.[5] E05B *3/00*
U.S. Cl. 292—348 **5 Claims**



1. A tubular door.lock comprising two knobs, the inner and the outer one, which respectively have a tubular shaft, each said tubular shaft passing through a shaft hole in a bearing plate and having a projecting hook and a projection on a circumferential surface thereof, each said bearing plate having two opposite notches in the circumference of the shaft hole for the projections of the each tubular shaft to pass through so as to combine the knob with an actuating plate, said two actuating plates respectively having two opposite crescent slots for the tubular shaft of the knob to fit therein, a straight slot communicating with said two crescent slots for the hook of the tubular shaft to pass through to let the actuating plate laterally fit in a space between the hook and the projection of the tubular shaft, and a square shaft having both ends fitting in the straight slot in both the actuating plates so that the square shaft and said two actuating plates can move each other.

5,190,328

CARPET STRETCHING TOOL

Martin L. Anderson, Rte. 3, Box 60, Maple Lake, Minn. 55368

Filed Jul. 23, 1991, Ser. No. 734,622
Int. Cl.[5] A47G *27/04*
U.S. Cl. 294—8.6 **26 Claims**

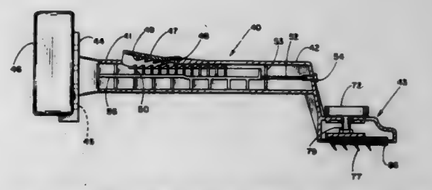
1. A hand operated carpet stretching tool comprising:

a carpet holding or gripping head system;

a padded knee plate;

outer and inner overlapping, slidably adjustable shank members connecting and spacing the carpet gripping head system and the knee plate;

adjustable locking means for fixing the relative positions of the outer and inner shank members thereby fixing the distance between the head system and the knee plate, the locking means including a plurality of serially spaced tooth members integral with the outer shank member adapted to mesh against a plurality of serial mating surfaces integral with the inner shank member which cooperate in a manner to rigidly withstand repeated impacts on the knee plate; and



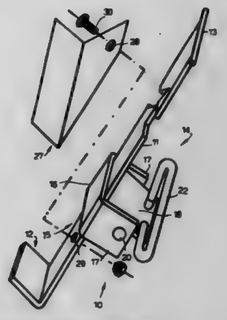
resilient means urging the teeth against the mating surfaces in a manner that urges the gripping head system and the knee plate toward each other.

5,190,329

HAND ACTUATED LOAD LIFTING DEVICE

Carol V. Steer, and Peter R. Steer, both of 6 Nancy Yaun Court, Woongary, Queensland 4213, Australia

Filed Feb. 10, 1992, Ser. No. 833,115
Claims priority, application Australia, Feb. 13, 1991, 71018/91
Int. Cl.[5] B65G *7/12*; B66F *11/00*
U.S. Cl. 294—15 **10 Claims**



1. A manual lifting aid comprising:

an elongated member;

load engagement means at one end of said member;

a handle assembly including a guide having a pair of opposite side arms and a base, said elongated member being slidingly disposed between said side arms and being adjacent said base;

locking means mounted between said arms for pivotal movement towards and away from said elongated member; and

a lifting handle fixed for movement with said locking means whereby a lifting force applied to said handle for lifting said load causes pivotal movement of said handle and thus pivotal movement of said locking means into engagement with said elongated member to lock said handle assembly relative to said member against movement in at least one direction along said elongated member to permit lifting of said load.

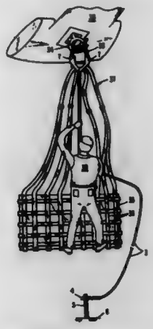
VOL 1148 ISS 1 MR 2 1993 UMI

5,190,330
TOOL FOR CONNECTING A SNAP-HOOK TO A REMOTE EYE
Bill Dunham, 8067 NE. Juanita Dr., Kirkland, Wash. 98034
Filed Apr. 3, 1992, Ser. No. 863,407
Int. Cl.[5] B25J *1/00*; B63B *21/54*
U.S. Cl. 294—19.1 **4 Claims**

1. A tool for connecting a snap-hook to a remote eye, said snap-hook including a hook eye, a curved hook tine extending from said hook eye to a free end, a hook throat defined by and between said hook eye and said free end, and a snap finger which normally spans across and closes said hook throat and which is springable inwardly of the hook throat into an open position, said tool comprising:
a hook holder including a channel in which the snap-hook is received, said channel including a bottom wall, a sidewall and side barriers, together forming a channel space, said snap-hook being received in the channel space with the snap finger and the hook throat being positioned above the channel bottom wall, and with the general plane of the snap-hook being substantially parallel with the sidewall of the hook holder;
and a holding arm having a first end portion that is pivotally attached to the hook holder and an opposite end portion which includes a snap finger engaging hook, including a hook recess.
wherein a snap-hook can be placed within the channel of the hook holder and the holding arm can be pivotally moved to place the snap finger of the snap-hook into the hook recess of the snap finger engaging hook of the holding arm, to secure the snap-hook to the hook holder, and
wherein the hook holder and snap-hook can be moved to the remote eye, and further move the hook holder and snap-hook to place the snap finger into contact with the remote eye, and further move the hook holder and snap-hook towards the remote eye, to move the snap finger out of engagement with the hook recess of the holding arm, allowing the remote eye to enter into the hook throat, and freeing the snap-hook from the holding arm, and allowing the hook holder to be moved away from the snap-hook following engagement of the snap-hook and the remote eye.

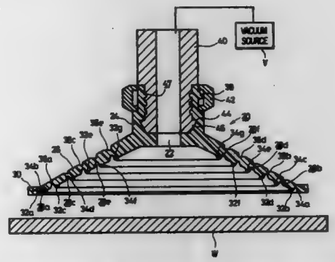
5,190,331
HELICOPTER HOOK-UP AND STATIC ELECTRIC DISCHARGE DEVICE
Joseph G. Corbin, Castle Hayne, N.C., assignor to Sky-Hook, Inc., Sanford, Me.
Filed Jan. 30, 1991, Ser. No. 647,962
Int. Cl.[5] B25J *1/04*; H05F *3/02*
U.S. Cl. 294—24 **21 Claims**

1. A device for attaching a one of different hook-up assemblies to an elevated hook which comprises:
a pole member; and
a hook-up head attached to one end of said pole member,
said hook-up head comprising a main body portion having a pair of spaced apart upper grip members, each including an outer, central, and inner grip plate extending from a common side of the associated upper grip member, and a



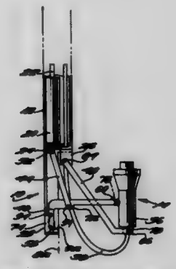
lifting arm support member extending from said main body portion.

5,190,332
SUCTION PAD FOR ATTRACTING AND HOLDING A WORKPIECE
Shigekazu Nagai; Shuuzou Sakurai, and Tadasu Kawamoto, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 6, 1991, Ser. No. 755,748
Claims priority, application Japan, Sep. 6, 1990, 2-93899[U]; Dec. 25, 1990, 2-401615[U]
Int. Cl.[5] B66C *1/02*
U.S. Cl. 294—64.1 **9 Claims**



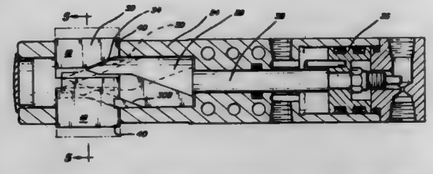
1. A suction pad for attracting and holding a workpiece, comprising:
a suction base coupled to a vacuum suction source;
a suction skirt connected with said base and projecting radially outwardly from said base, said skirt having a peripheral edge; said peripheral edge being brought into contact with the workpiece for attracting and holding the workpiece;
a rib provided proximate to said peripheral edge of said suction skirt for preventing deformation of said peripheral edge when said edge is brought into contact with the workpiece;
a plurality of grooves concentrically defined on an inside surface of said suction skirt, each of said grooves having a different diameter; and
a plurality of steps concentrically defined on an outside surface of said suction skirt substantially opposite from said grooves.

5,190,333
GRIPPER DEPLOYING AND INVERTING LINKAGE
Richard L. Minichan, 23 Pineview Dr., Warrenville, S.C. 29851, and Mark A. Killian, 102 Foxhunt Dr., North Augusta, S.C. 29841
Filed Apr. 8, 1991, Ser. No. 681,294
Int. Cl.[5] G21C *19/26*
U.S. Cl. 294—86.41 **13 Claims**



1. A mechanical linkage for use with an end effector, said linkage comprising:
a frame having a first axis;
a rod;
actuating means attached to said frame for moving said rod between a first and a second position, said end effector in line with said frame when said rod is in said first position and inverted when said rod is in said second position;
a stationary bracket slidably mounted to said frame;
a first link having a first end and a second end, said first end pivotally attached to said rod;
a second link having a first end and a second end, said second end of said second link pivotally attached to said end effector, said second end of said first link attached to said second link so that said first link can rotate said second link when said rod moves between said first position and said second position;
a third link having a first end and a second end, said first end of said third link pivotally attached to said stationary bracket and said second end of said third link pivotally attached to said end effector; and
means for stopping said second link when said rod is at said first or said second positions.

5,190,334
POWERED CLAMP WITH PARALLEL JAWS
Edwin G. Sawdon, St. Clair, Mich., assignor to BTM Corporation, Marysville, Mich.
Filed Mar. 11, 1991, Ser. No. 667,445
Int. Cl.[5] B25J *15/08*
U.S. Cl. 294—88 **15 Claims**



14. An improved gripping means for removably gripping an object having at least two jaws that engage surfaces upon said object, said improvement comprising:
(a) a housing having at least one wall that defines a chamber disposed within said housing and said housing further having surfaces defining a plurality of passages that lead radially outwardly from said chamber through said at least one wall;
(b) camming means disposed within said chamber for displacing said jaws radially inwardly and outwardly with respect to said chamber;
(c) a plurality of follower members, each of said follower members depending inwardly from each of said jaws and passing through one of said passages to engage said camming means, said follower members having a shape that corresponds to said passages such that each of said follower members slidingly engage one of said surfaces defining said passages thereby providing the only means for preventing movement of said follower members in any direction other than the direction of said radial displacement; and
(d) actuating means for actuating said camming means.

5,190,335
CONTROL ENHANCING TWEEZERS
Eric Rommerdale, Brandon, Miss., assignor to The W. E. Bassett Company, Shelton, Conn.
Division of Ser. No. 413,224, Sep. 27, 1989, Pat. No. 5,052,416.
This application Jul. 29, 1991, Ser. No. 737,458
Int. Cl.[5] A61B *17/30*; B25B *9/02*; B25J *1/02*
U.S. Cl. 294—99.2 **5 Claims**

1. Control enhancing tweezers constructed for substantially improving the handling characteristics and manipulation ease of the tweezers by individuals with reduced or impaired manual dexterity, said tweezers comprising
A. a pair of tweezers comprising first and second elongated arms fixedly mounted to each other at their respective first ends and extended from said first ends in juxtaposed, spaced, aligned, relationship, said arms being spring biased to normally maintain the second ends thereof spaced apart;
B. A first tweezer-arm engaging member mounted to the first arm of said tweezers, and incorporating
a. a support base,
b. mounting means
1. extending from a first surface of the support base, and
2. constructed for lockingly engaging said first arm of the tweezers and securely affixing the support base to the first tweezer arm,
c. an enlarged, readily accessible finger/thumb receiving and supporting zone
1. formed on a second surface of the support base, and
2. constructed for comfortably and conveniently receiving the finger or thumb of the user and for securely positioning the finger or thumb in operational control over the first arm of the tweezers; and
d. a pair of wall members
1. extending from opposed sides of the support base in juxtaposed, spaced facing relationship, and
2. being spaced apart a distance substantially equal to the width of the first tweezer arm, thereby providing a surrounding and embracing engaged relationship of the arm-engaging member with the first tweezer arm; and
C. a second tweezer-arm engaging member mounted to the second tweezer arm and incorporating
a. a support base,
b. mounting means
1. extending from a first surface of the support base, and
2. constructed for lockingly engaging the second arm of

the tweezers and securely affixing the support base to the second tweezer arm, and

c. an enlarged, readily accessible finger/thumb receiving and supporting zone

1. formed on a second surface of the support base, and
2. constructed for comfortably and conveniently receiving the finger or thumb of the user and for securely positioning the finger or thumb in operational control over the second arm of the tweezers, and

d. a pair of wall members

1. extending from opposed sides of the support base in juxtaposed, spaced facing relationship, and
2. being spaced apart a distance substantially equal to the width of the second tweezer arm, thereby providing a surrounding and embracing engaged relationship of the second arm-engaging member with the second tweezer arm

whereby individuals with impaired or reduced manual dexterity, or with varying stages of joint diseases, are capable of controllably manipulating the first and second tweezer arms by readily accessing the finger/thumb receiving and supporting zones and controllably activating the first and second tweezer arms connected thereto.

5,190,336

POCKET CARRIER FOR SKIS AND POLES

George R. Palz, 46 Wells Ave., Cheektowaga, N.Y. 14227

Filed Dec. 10, 1991, Ser. No. 805,854
Int. Cl.[5] A63C *11/02*
U.S. Cl. 294—147 **6 Claims**

1. A carrier assembly for hand carrying a pair of skis and poles substantially horizontally or vertically, which may be used as a hanger for storing the skis and poles, said carrier assembly comprising:

a) a pair of assemblies each comprising a flexible cord material formed into a continuous elongated large loop and having opposite ends; and

b) each assembly including two cord locks which are placed between the ends of the assembly by inserting the large loop through each cord lock to form two smaller loops on either side of the locks;

c) each of said cord locks comprises a housing carrying a manually operated member which co-operate in a manner such that when the member is pressed, the cord lock moves freely along the large loop from end-to-end and when the member is released, the cord lock tightens against the large loop in a manner preventing relative movement between the cord lock and the large loop;

d) so that one of the smaller loops can be tightened with a lock against the pair of skis and the other smaller loop can be tightened with a lock against the pair of poles.

5,190,337

COLLAPSIBLE PIPE RACK FOR PICKUP TRUCKS

Patrick K. McDaniel, Pasco, Wash., assignor to Columbia Mfg., Inc., Richland, Wash.

Filed Sep. 24, 1991, Ser. No. 765,153
Int. Cl.[5] B60P *3/00*
U.S. Cl. 296—3 **6 Claims**

1. A collapsible rack for a pickup truck having a horizontal cargo bed and a cab, comprising:

a rack frame extending from a forward end to a rearward end and wherein the rack frame includes a pair of elongated rigid side rails, each having a cross sectional configuration in the approximate shape of the letter "H" with a top channel and a bottom channel;

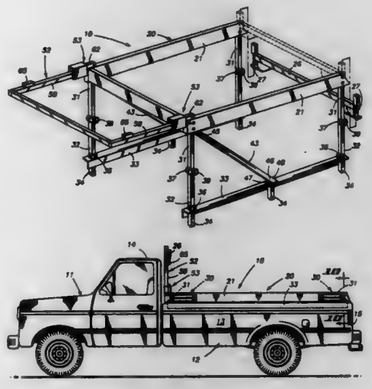
folding legs, each having a first end and a second end, with the first end including means for attachment to the rack frame within the bottom channel of one of said side rails and the second end with means for attachment to the pickup truck;

knuckle means on the legs for enabling selective folding of the legs between storage conditions wherein the rack frame is located in a horizontal, lowered inoperative position adjacent the pickup bed, with the legs being received within and covered by the bottom channels of the side rails, and raised conditions wherein the frame is supported in an elevated, operative position with respect to the pickup bed; and

a rack extension mounted to the top channels of the side rails; and

wherein the rack extension is slidably received within the top channels of the side rails at the forward ends thereof for selective sliding adjustment therein between a first, storage position substantially retracted within the top channels, and a second, operative position, wherein the rack extension projects substantially horizontally and forwardly from the forward ends of the side rails.

5. A collapsible rack for a pickup truck having a horizontal cargo bed and a cab, comprising:



a rack frame including a pair of rigid elongated side rails each including a downwardly open elongated channel extending between forward and rearward ends;

folding legs, each having a first end and a second end, with the first end pivotally attached to one of the side rails within the channel thereof and the second end having means for attachment to the pickup truck;

knuckle joints on the legs for permitting folding thereof between storage conditions wherein each leg is received within and covered by one of said channels, with the rack frame located in a horizontal, lowered inoperative position adjacent the pickup bed, and raised conditions wherein the frame is supported in an elevated, operative position with respect to the pickup bed; and

a rack extension pivotably mounted to the rigid elongated side rails adjacent the forward ends thereof for selective movement between an upright storage position projecting upwardly from the side rails and a substantially horizontal extended position, to to selectively extend from the rack frame over the pickup cab; and

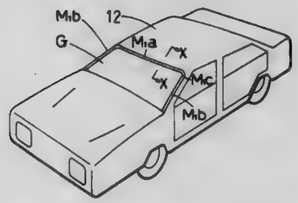
locking means on the rigid elongated side rails and rack extension for selectively locking the rack extension in either the upright storage position or the horizontal extended position.

5,190,338

AUTOMOBILE WINDSHIELD MOLDING AND METHOD OF PRODUCING THE SAME

Yukihiko Yada, Nagoya, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Ohbe, Japan

Filed Sep. 6, 1991, Ser. No. 755,847
Claims priority, application Japan, Sep. 6, 1990, 2-236396
Int. Cl.[5] B60J *1/00*
U.S. Cl. 296—93 **8 Claims**



1. An automobile windshield molding for sealing the space between a windshield and a periphery of a window opening of a vehicle body panel, said molding comprising a pair of extruded side molding parts, a pair of extruded corner molding parts and an extruded upper molding part integral with and extending between said side and corner molding parts, each of said side, corner and upper molding parts including:

(a) an exterior wing adapted to cover a space, on the exterior side of the vehicle, between the window-opening periphery of the vehicle body panel and each of side, corner and upper edges of the windshield, said exterior wing including an inward wing portion for covering the peripheral surface of the windshield and an outward wing portion for covering the periphery of the vehicle body panel, said interior wing portion having an eaves which protrudes out over said windshield; and

(b) a connecting portion extending from an interior side of each said exterior wing through the space between the window-opening periphery of the vehicle body panel and each said edge of the windshield and terminating in a foot on the interior side of the vehicle body panel and a lip on the exterior side of the vehicle body panel;

wherein said eaves has a bottom surface in direct contact with said windshield at said upper molding part which gradually becomes spaced further and further from said windshield along said side molding parts, so as to form a first water drain channel extending along each of said side molding parts between said bottom surface of said eaves and said windshield.

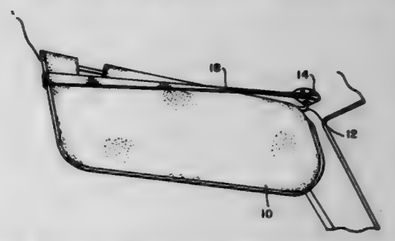
5,190,339

MOTOR VEHICLE SUN VISOR POSITIONER

John W. Ceideberg, P.O. Box 1296, Gardnerville, Nev. 89410

Continuation-in-part of Ser. No. 796,660, Nov. 25, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 901,964
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.9 **5 Claims**

1. An attachment for the sun visor assembly of a vehicle, the sun visor assembly including a bracket attached to the ceiling of the vehicle, an elongated bar having a right-angled vertical end portion extending into the bracket for rotation about a vertical axis, and a sun visor mounted on said elongated bar for rotation about a horizontal axis, said attachment comprising: a flexible band mounted on said visor and having its ends clamped under said bracket at first and second points displaced from said vertical axis and from one another, said band being looped around the end of said visor remote from said bracket so that when the visor is rotated about said vertical axis the remote end of said visor moves along the inner surface of said band, and said band being mounted on said visor with means providing sufficient tension to resist movement of said remote end of said visor along the inner surface of said band, thereby



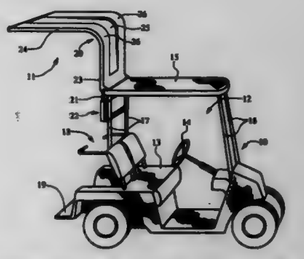
causing the visor to be held in the angular position to which it is set about said vertical axis by the occupant of the vehicle.

5,190,340

GOLF CART REAR ROOF UNIT

Edwin H. Nuscher, 514 Barberry Rd., Savannah, Ga. 31419

Filed May 26, 1992, Ser. No. 887,893
Int. Cl.[5] B62D *25/06*
U.S. Cl. 296—99.1 **10 Claims**



1. A canopy assembly for attaching a rearwardly extending rooftop to a golf cart having a golf bag compartment located rearwardly of a seating compartment over which a protective cover is supported by laterally spaced apart front and rear vertically extending stanchions, said canopy assembly comprising:

an L-shaped roof having a front face disposed substantially normal of a backswept top section,

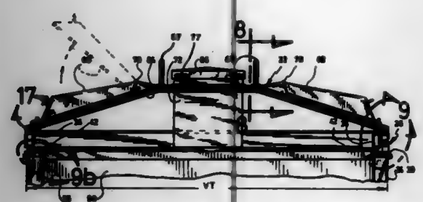
a pair of L-shaped roof support bars configured to conform to a lengthwise configuration of said roof,

means connecting said roof support bars to said roof to extend lengthwise of said roof in a spaced apart relationship with a lower end portion of said support bars extending below a lower edge of said roof front face,

roof attaching means including a pair of support bar holders each configured for secure retention of said roof support bar lower end portion and

means affixing said roof attaching means to said cart top rear support stanchions disposing said support bar holders in a spaced apart array with each said holder in registration with a lower end portion of a roof support bar attached to said roof and said roof front face adjoining said cart protective cover, whereby said roof and cart are positioned in an attaching relationship with said roof backswept top section overlying the cart golf bag compartment.

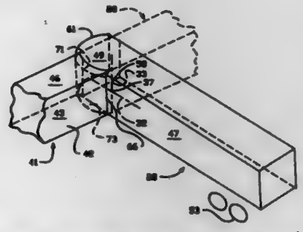
5,190,341
RIGID COVER ASSEMBLY FOR OPEN TOP BOX BODY
Claude J. M. Simard, 43, Bossé , Chicoutimi, Quebec, Canada G7J 1K9
Filed Dec. 17, 1991, Ser. No. 808,572
Int. Cl.[5] B60P 7/02
U.S. Cl. 296—100 10 Claims



1. A rigid cover assembly for use on an open top box body adapted to carry loose goods, and having a surrounding wall including two upstanding end walls and two upstanding lateral walls each provided with an upper edge, said cover assembly comprising,
an elongated bracket adapted to sit on and be fixed to said upper edges of said surrounding wall, said bracket having a substantially upside down U-shape for straddling said upper edges,
a peripheral frame mounted above said surrounding wall and substantially in line with said bracket,
a hinge member secured to a portion of said elongated bracket located over one of said lateral walls and to at least a portion of said frame disposed above said bracket above said one of said lateral walls,
an elongated dome-shape lid mounted over and secured to said frame, said lid extending above said frame for closing said top box body,
at least one tilted piston device connected at one end to an inner portion of said lid and at the other end to a portion of said bracket above one of said end walls of the box body, said piston device disposed inside said lid across a corner of said lid and above said box body for pivoting said lid about said hinge member and for raising and lowering said lid,
whereby the lid is adapted to open and close the box body upon actuation of said piston device, said piston device being located in said lid when the latter is closed over said box body.

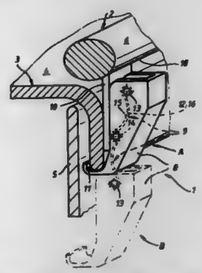
5,190,342
TRACTOR-TRAILER AERODYNAMIC DRAG REDUCTION APPARATUS AND METHOD
Huston Marlowe, Orinda, and John C. Lindsley, Felton, both of Calif., assignors to Paccar Inc., Bellevue, Wash.
Filed Sep. 24, 1991, Ser. No. 764,529
Int. Cl.[5] B62D 35/00
U.S. Cl. 296—180.2 49 Claims

1. A truck tractor-trailer assembly having reduced aerodynamic drag comprising:
a trailer having a trailer body with a trailer top skin and oppositely facing trailer side skins, said trailer top skin and said trailer side skins extending longitudinally and terminating in leading trailer skin edges, said trailer body further having a front wall extending transversely between said trailer side skins and having a bottom wall;
a tractor having a frame with a cab assembly mounted to said frame, said cab assembly having a cab top skin and oppositely facing cab side skins extending longitudinally toward said trailer body and terminating in trailing cab skin edges spaced apart from said leading trailer skin edges, said cab assembly having a rear wall extending transversely between said cab side skins;
a fifth wheel assembly coupling said bottom wall of said trailer to said frame of said tractor for pivotal movement about a substantially vertical yaw axis and a substantially horizontal pitch axis; and



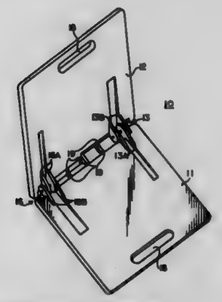
at least one of said trailing can skin edges and said rear wall being positioned substantially as close to a respective one of said leading trailer skin edges and said front wall as is permitting by the full range of relative required yaw of said tractor and said trailer, plus the full range of relative required upward pitch of said tractor and said trailer, plus a minimum clearance distance.

5,190,343
RELEASABLE FASTENING DEVICE, ESPECIALLY FOR ATTACHMENTS ON CONVERTIBLES
Ernst Fischer, and Hans Götz, both of Böblingen, Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Aug. 16, 1991, Ser. No. 748,750
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025861
Int. Cl.[5] B60J 7/20
U.S. Cl. 296—180.5 8 Claims



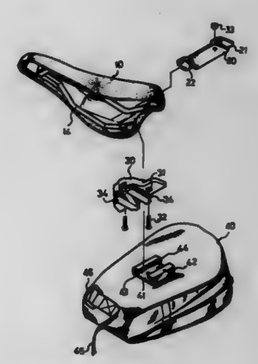
1. Releasable fastening system for releasably fastening an automobile convertible wind guard to a vehicle body part, said wind guard including upper and lower frame bodies which are pivotable with respect to one another, said lower frame body being fastenable to a convertible body by a fastening device with the lower frame body extending along a space closing edge of the convertible body, said fastening system including a fastening device comprising:
a hook part which is attached to one of the lower frame body and a convertible body part, and is releasably engageable with the other of the lower frame body and the convertible body part to lock the lower frame body and convertible body part to one another,
and a tensioning device formed by a flexural spring which has one end pivotally mounted on the hook part and the other end pivotally mounted on the one of the lower frame body and the convertible body part to which the hook part is attached,
said flexural spring being configured and dimensioned to move beyond a dead center position during movement of the hook part between a released position with the hook part out of engagement with the other of the lower frame body and the convertible body part and a locked position with the hook part in engagement with the other of the lower frame body and the convertible body part, said flexural spring serving to elastically hold the hook part in its locked position while accommodating distance tolerances between the hook part and the other of the lower frame body and the convertible body part,
wherein the convertible body part is a cover of a folding-top box.

5,190,344
SINGLE MOLD STADIUM SEAT
Richard Anderson, and Arthur B. Cox, both of P.O. Box 623, Meridian, Id. 83642
Continuation of Ser. No. 561,179, Aug. 1, 1990, abandoned. This application Aug. 13, 1992, Ser. No. 928,636
Int. Cl.[5] A47C 4/04
U.S. Cl. 297—17 2 Claims



1. A stadium seat which consists of:
a pair of identical generally planar seat members, hereinafter referred to as first and second seat members, each having a rear edge formed along substantially the entire length of the end of the seat;
a hinge being attached to and between the rear edges of said seat members and configured to pivot said seat members with respect to each other between an open position having said seat members disposed generally 100° apart, one to the other, and a closed position having said seat members generally parallel with each other;
said hinge having a first half and a second half where the first half is identical to the second half;
said first seat member having the first half of said hinge attached at a point on its rear edge;
said second seat member having the second half of the hinge attached at a point on its rear edge such that when said first and second seat members are aligned with their rear edges side by side, the first and second halves of said hinge will engage each other; and
wherein radial stops formed along the entire length of said rear edges act to prevent said seat members from rotating past said open position.

5,190,345
SEAT OF A BICYCLE HAVING A DEVICE FOR FASTENING A BAG
Mike Lin, Taichung, Taiwan, assignor to Topeak Inc., Taiwan, Taiwan
Filed Dec. 6, 1991, Ser. No. 802,750
Int. Cl.[5] A47C 7/62
U.S. Cl. 297—192 2 Claims



1. A seat of a bicycle comprising:
a pair of rods provided on a bottom portion thereof;
a plate disposed above said rods and having two end portions each having a shoulder formed thereon for engagement with said rods respectively so that said plate is stably engaged with said rods;
a bracket disposed below said rods and fixed to said plate so that said rods are fixed between said plate and said bracket, said bracket having two first flanges formed on a bottom portion thereof and laterally extended outward therefrom;
an object having a member disposed on an upper portion thereof, said member having a pair of second flanges extended inward therefrom so as to form a pair of channels for engagement with said first flanges of said bracket in order to couple said member to said bracket and in order to couple said object to said seat, and each of said channels having an end wall formed integral on a first end thereof for limiting relative movement between said bracket and said member.

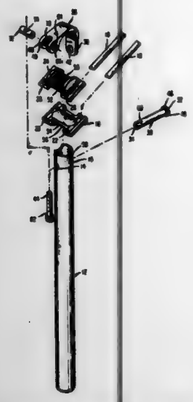
5,190,346
ADJUSTABLE WRAPAROUND BICYCLE SEAT POST CLAMPING APPARATUS WITH A SINGLE FASTENER
Geoffrey F. Ringle, 203 Afton Ave., Trenton, N.J. 08618
Filed Jul. 13, 1992, Ser. No. 912,560
Int. Cl.[5] B62J 1/00
U.S. Cl. 297—195 23 Claims

1. An adjustable wraparound bicycle seat post clamping apparatus with a single fastener, for use with a bicycle seat having longitudinally extending mounting rails, which comprises:
A. a seat post means defining a hole means extending laterally therethrough, said seat post means defining an upper post end thereon;
B. a lower rail clamping means positioned adjacent said upper post end of said seat post means and being adjustable with respect thereto, said lower rail clamping means defining a first lower rail clamping slot means and a second lower rail clamping slot means therein adapted to receive longitudinally extending mounting rails of a bicycle seat therein;
C. an upper rail clamping means positioned adjacent said lower rail clamping means and defining a first upper rail

clamping slot means immediately adjacent said first lower rail clamping slot means for retaining a longitudinally extending mounting rail of a bicycle seat therein, said upper rail clamping means further defining a second upper rail clamping slot means immediately adjacent said second lower rail clamping slot means for retaining another longitudinally extending mounting rail therein;

D. a rod means extending through said hole means defined in said seat post means, said rod means including a first rod end and a second rod end;

E. a wraparound member including a first wraparound end and a second wraparound end, said wraparound member defining a rod aperture means adjacent said first wraparound end thereof, said rod aperture means being adapted to receive said rod means extending therethrough to movably secure said first wraparound end of said wraparound member with respect to said first rod end of said



rod means, said wraparound member being generally arcuate and extending from said first rod end of said rod means over and around said upper rail clamping means and said lower rail clamping means to the opposite side thereof with said second wraparound end being positioned adjacent the opposite side of said seat post means adjacent said second rod end of said rod means; and

F. a detachable securement means adapted to attach said second rod end of said rod means with respect to said second wraparound end of said wraparound member, said detachable securement means being adapted to urge said wraparound member toward said second rod end to bias together said upper rail clamping means and said lower rail clamping means between said wraparound member and said upper post end of said seat post means to detachably retain longitudinally extending mounting rails therebetween.

5,190,347

ADJUSTABLE FLEXIBLE BACK CUSHION WITH ADJUSTING BELTS AND ATTACHMENT BELT

Lieu Shiow-Lan, 12F-3, No. 368, Sec. 1, Wen Hsuh 2Rd, Lin Kou Hsiang, Taipei, Taiwan

Filed Nov. 5, 1991, Ser. No. 788,280
Int. Cl.[5] A47C 7/02
U.S. Cl. 297—284.5 **4 Claims**

1. An adjustable flexible back cushion comprising:

a) a flexible protecting frame having upper, lower and opposite side portions;

b) a ventilation mesh attached to the frame;

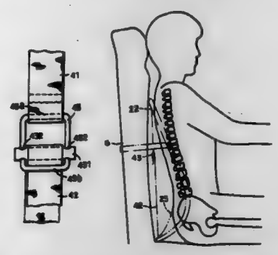
c) at least one elastic belt attached to opposite side portions of the frame adapted to fasten the back cushion to a back of a seat;

d) at least two curvature adjusting pull belt assemblies, each belt assembly comprising:

i) an upper belt having a first end attached to the upper portion of the frame and a second end;

ii) a lower belt having a first end attached to the lower portion of the frame and a second end;

iii) adjustable fastening means attaching the second ends of the upper and lower belts together comprising:



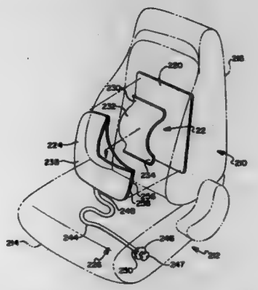
a ring member attached to the second end of one of the upper and lower belts; and a rod member slidably attached to the ring member and adapted to engage the second end of the other of the upper and lower belts, the rod movable between a clamping position wherein the second ends are affixed to each other and a released position wherein the second ends are adjustable relative to each other.

5,190,348

SELF-INFLATING SUPPORT DEVICE INCLUDING CURVED MEMORY PLATE

Arduino Colasanti, East Detroit, Mich., assignor to Findlay Industries, Troy, Mich.

Filed Oct. 25, 1991, Ser. No. 782,820
Int. Cl.[5] A47C 3/00
U.S. Cl. 297—284.6 **15 Claims**



1. A self-inflating support device comprising:

(a) a mounting plate;

(b) a curved memory plate mounted upon the mounting plate, being formed of a flexible material and having an upper end, a middle portion and a lower end, the middle portion upwardly curved relative to the upper end and the lower end;

(c) a bladder sealed onto the mounting plate, the bladder having an interior and encompassing the memory plate within the interior thereof; and

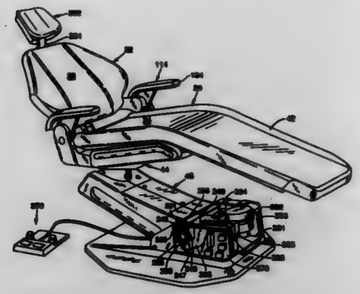
(d) means for regulating air flow, the means for regulating being connected to the bladder.

5,190,349

DENTAL CHAIR

George K. Austin, Jr.; El Don L. Hoven; Tony J. Tewell; Shawn R. Irwin; Paul B. Kreba, all of Newberg, and Bradley A. Rice, Salem, all of Oreg., assignors to A-Dec, Inc., Newberg, Oreg.

Filed Mar. 29, 1990, Ser. No. 501,674
Int. Cl.[5] A47C 1/02
U.S. Cl. 297—316 **9 Claims**



1. A chair comprising:

a seat having a seating surface upon which a person sits when using the chair;

a back having a resting surface for supporting the back of the person that sits in the chair; and

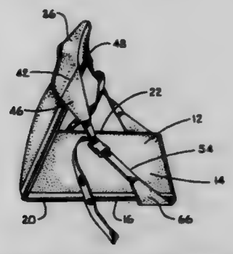
connection means for connecting the seat and the back and for guiding movement of the seat and back between a first chair position for supporting a sitting person and a second chair position for supporting a recumbent person, and for increasing relative to horizontal the slope of the seating surface as the seat and back move toward the second chair position, the connection means defining a pivot axis about which the back pivots in moving between the first and the second chair position, the pivot axis being located so that whenever the back is in the second chair position the portion of the resting surface nearest the seating surface is raised relative to the portion of the seating surface nearest the resting surface.

5,190,350

SEATING ARRANGEMENT

Phillip Hwang, and Lisa Hwang, both of Taipei, Taiwan, assignors to Goodway Corporation, Taipei, Taiwan

Continuation-in-part of Ser. No. 406,745, Sep. 13, 1989, Pat. No. Des. 329,148. This application Aug. 14, 1990, Ser. No. 567,369
Int. Cl.[5] B60N 2/02
U.S. Cl. 297—380 **16 Claims**



1. An improved portable seating arrangement comprising, in combination:

a flexible, air tight body means defining an air-tight pad means receiving cavity and having spaced remote end edges and spaced apart lateral edges extending between said spaced apart end edges, and said body means having a fold line extending between said lateral edges and intermediate said remote end edges to define a seat portion extending from said fold line to one of said remote end edges and a back portion extending from said fold line to the other of said remote end edges and said back portion and said seat portion movable towards and away from each other along said fold line;

a flexible pad means in said pad means receiving cavity;

a pair of substantially flexible flap means coupled to said body means, and one of said flexible flap means at each of and extending from said remote end edges of said body means, and said flexible flap means extending between said lateral edges and each of said flexible flap means positionable to overly and to be in contact with a portion of said body means in regions adjacent said remote end edges thereof and said flexible flap means extending from said end edges a preselected distance toward said fold line and extending between said lateral edges, for said seating arrangement in the seating position thereof whereby said flexible flap means resists forces imposed on said body means to distribute such resistance to forces across the width of said body means;

strap means coupled to said pair of flexible flap means for detachable coupling together to restrain said body means in said seating position thereof; and

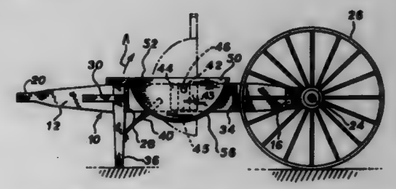
means for providing said fold line between said back portion and said seat portion.

5,190,351

WHEELBARROW FOR TRANSPORTING ROCKS AND STONES

Joe Klumpjan, 1334 Sunset Dr. Rte. 3, Campbellsport, Wis. 53010

Filed Jan. 27, 1992, Ser. No. 825,881
Int. Cl.[5] B62B 1/24
U.S. Cl. 298—3 **3 Claims**



1. A wheelbarrow for transporting rocks and stones, comprising:

a. a frame having two elongated, spaced side rails, each with opposite ends, one end of each rail defining a handle and the other end of each rail defining a forward axle support, and at least one cross brace spanning the spaced side rails and securing them in rigid assembly;

b. an axle mounted in the axle supports;

c. a wheel mounted on said axle for rotation relative to said frame, wherein the wheel is of a minimum diameter of 30 inches;

d. a pair of mounting brackets, one each mounted on each side rail intermediately of the opposite ends;

e. a box having a semicylindrical closed bottom, upstanding side walls having a C-shaped bottom edge and an open top, said box including a pair of axially aligned pivot posts extending from said side walls forwardly of the axis of said semicylindrical bottom to position the center of gravity of said box rearwardly of the axis of said pivot posts, each post adapted to be removably received in one of said brackets for tiltably supporting the box relative to said frame, whereby the box is movable between an upwardly opening filling position with the forward edge of the open

top positioned rearwardly of the wheel and a dump position in which the contents of the box are discharged to the rear of the wheel, and wherein said cross brace defines a support for holding the box in the filling position; and

f. a support secured to and extending downwardly from said frame between the handles and the box for supporting the frame and the box above the ground.

5,190,352

MINING MACHINE WITH CASCADING CONVEYOR SYSTEM AND METHOD OF CONVEYING

Maurice K. LeBegue, and Clarence H. Woodford, II, both of Fairmont, W. Va., assignors to Tamrock World Corporation, N.V., Curacao, Netherlands Antilles

Filed Oct. 16, 1991, Ser. No. 776,992

Int. Cl.[5] B65G *21/14*, E21C *35/20*

U.S. Cl. 299—18 **24 Claims**

17. A method for conveying dislodged material from a mine face comprising the steps of,

dislodging material from a mine face by a mining machine,

extending a main conveyor longitudinally on a frame of the mining machine,

transporting the dislodged material on the main conveyor rearwardly of the mine face,

stabilizing the mining machine frame by ground engaging means connected to the rear of the machine frame as material is dislodged from the mine face and transported rearwardly on the main conveyor,

connecting a discharge conveyor to the ground engaging means in underlying relation with the main conveyor to receive dislodged material therefrom, and

supporting the discharge conveyor on the ground engaging means for lateral swinging movement of the discharge conveyor relative to the main conveyor for diverting the direction the dislodged material is transported from the mine face to the end of the discharge conveyor.

5,190,353

ROCK CUTTING TOOL HAVING ECCENTRIC DRIVE

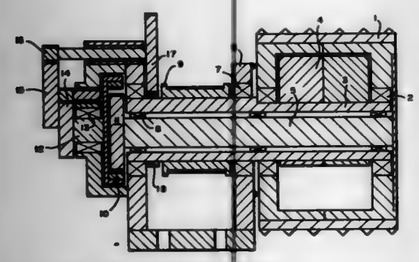
Ulrich Bechem, Tiefendorferstr. 87, D-5800 Hagen 1, Switzerland

Filed Apr. 8, 1991, Ser. No. 681,681

Claims priority, application Switzerland, Apr. 9, 1990, 1205/90

Int. Cl.[5] E21B *10/08*

U.S. Cl. 299—86 **14 Claims**



1. A rock cutting tool which includes:

a sleeve equipped with cutting elements and supported on a rotatable shaft having an axis, the sleeve being separately rotatable with respect to the shaft and eccentrically arranged in relation to the shaft whereby, in use, rotation of the shaft imparts a radially oscillating motion on the sleeve; and

at least one adjustable counterweight connected to the shaft and located within the sleeve, said counterweight being rotatable with respect to said sleeve for the purpose of dynamic balancing of the shaft and sleeve assembly.

5,190,354

VEHICLE WHEEL COVER

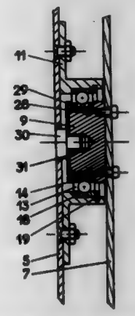
Serge Levy, 4B, route du Saléve, 74240 Gaillard, France, and Mustapha Alaoui Mrani, 33, boulevard de la Forêt, 1009 Pully, Switzerland

Filed Nov. 14, 1991, Ser. No. 791,315

Claims priority, application European Pat. Off., May 13, 1991, 91440037

Int. Cl.[5] B60B *7/00*

U.S. Cl. 301—37.25 **9 Claims**



1. Wheel cover for the wheel of a vehicle, said wheel having a hub and a rim, the cover comprising a securement and support device (1) secured to the hub (2) or to the rim (3) of the wheel (4) and a substantially flat shield element (5), mounted on said device (1) for rotation and having an asymetric spacing of its mass relative to its axis of rotation (6), permitting said shield element (5) to maintain a fixed angular position relative to the horizontal, even during rotation of said wheel (4), the securement and support device (1) comprising a base plate (7) fixed to the hub (2) or to the rim (3) of the wheel (4) and a support shaft (9), of cylindrical shape, removably mounted on said base plate (7) and provided with an external circular abutment (17), there being a rotative connection between the securement and support device (1) and the shield element (5) comprised by a roller bearing (13), the mounting of the roller bearing (13) on the support shaft (9) being effected by means of an annular intermediate member (26) disposed adjustably between an internal ring (14) of the roller bearing (13) and the support shaft (9), and delimited by a perforated disk (27), whose diameter corresponds substantially to that of the internal ring (14).

5,190,355

SEAL FOR DRIVE-WHEEL-HUB ASSEMBLY

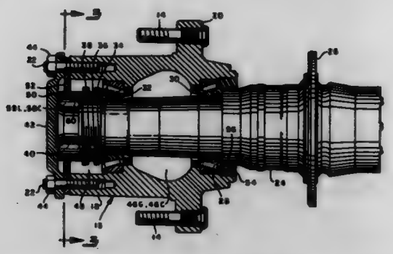
James R. Hobbie, Galesburg, Mich., and Ronald L. Hughes, Lexington, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 5, 1991, Ser. No. 726,088

Int. Cl.[5] B60B *27/00*

U.S. Cl. 301—105.1 **9 Claims**

1. A seal for a drive-wheel-hub assembly that has an axle shaft (40) extending outwardly from a differential; a generally cylindrical non-rotatable axle housing (12) and spindle (24) enclosing said axle shaft, that define a first cavity between said axle shaft and the interior surface of said spindle; an end cap (42) on the outer end of said axle shaft; a rotatable inwardly extending hub (16) affixed to said end cap, forming a second cavity (46C, 48) between the inside-diameter surface of said hub and the outside-diameter surface (33) of said spindle; and wheel bearings (30, 32) in said second cavity, engaging said outside-diameter surface of said spindle and said inside-diameter surface of said hub for rotatably supporting said hub relative to said spindle; comprising:



outer seal means (50, 52, 62) fixedly supported between said first (58C) and second (46C, 48) cavities for sealing off said first cavity from said second cavity for lubricants, wherein said outer seal means comprises:

first outer seal means (50) fixedly supported with respect to said spindle (24) and located outward of said bearing (32) for lubricant sealing; and,

second outer seal means (52, 62) fixedly supported with respect to said hub (16) and slidably engaging said first outer seal means (50) for forming a rotational seal with said first outer seal means.

5,190,356

AND-TYPE CONTROL VALVE FOR A TRACTOR-TRAILER BRAKING SYSTEM

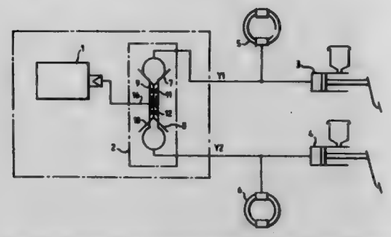
James G. Knowles, Welton, United Kingdom, assignor to Wabco Automotive U.K. Limited, Rugby, England

Continuation of Ser. No. 371,952, Jun. 27, 1989, abandoned. This application Nov. 14, 1991, Ser. No. 791,686

Claims priority, application United Kingdom, Jul. 1, 1988, 8815703

Int. Cl.[5] B60T *11/20*

U.S. Cl. 303—7 **22 Claims**



1. An AND-type control valve for a tractor-trailer braking system, comprising a housing having an outlet port formed therein, said housing including a first input flowpath coupled for fluid communication with said outlet port, a second input flowpath coupled for fluid communication with said outlet port, said outlet port being in fluid communication with at least one of said first and second input flowpaths only when both of said first and second input flowpaths are pressurized, a first non-return valve having a portion displaceable in said first input flowpath between open and closed positions, said first non-return valve defining a first open area therethrough and including first flow sensitive means for assisting in displacing said portion of said first non-return valve to said closed position thereof, a second non-return valve having a portion displaceable in said second input flowpath between open and closed positions, said second non-return valve defining a second open area therethrough and including second flow sensitive means for assisting in displacing said portion of said second non-return valve to said closed position thereof, said first flow sensitive means and said second flow sensitive means respectively including first and second piston means defining first and second orifices, respectively, said first orifice having an area less than said first open area and said second orifice having an area less than said second open area, said first non-return valve and said second non-return valve being operatively arranged such that both respective portions thereof cannot be displaced to their respective closed positions substantially simultaneously.

5,190,357

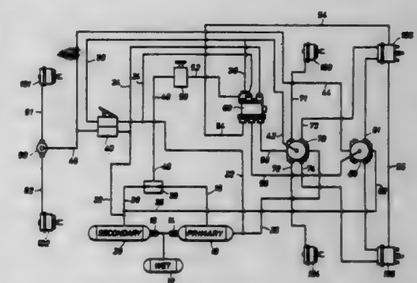
AIR-ACTUATED BRAKE SYSTEM FOR VEHICLES

Nathan Goldfein, Houston, Tex., assignor to International Transquip Industries, Inc., Houston, Tex.

Filed May 24, 1991, Ser. No. 705,082

Int. Cl.[5] B60T *13/00*

U.S. Cl. 303—7 **16 Claims**



1. An air actuated brake system for a vehicle, comprising:

a brake assembly for at least one axle thereof including a service brake which is applied upon delivery of air thereto and a park brake which is applied upon the venting of air therefrom,

a primary source of air under pressure,

a secondary source of air under pressure separate from the first source,

a primary relay for receiving air from said primary source and delivering it to the service brake in response to at least one of a service signal and a parking brake,

a secondary relay for receiving air from said secondary source and delivering it to the service brake in response to at least one of a service signal and a parking signal,

control means adapted for receiving air from at least one of said primary and secondary sources and adapted, in response to a park signal to vent air from the park brake and to transmit a service signal to primary and secondary relays, respectively,

means actuable, upon the receipt of air from at least one of said primary and secondary sources, to transmit a service signal to said primary and secondary relays, respectively, and to said control means,

means actuable, upon the receipt of air from at least one of said primary and secondary sources, to transmit a park signal to the control means, and

means for preventing loss of air delivered to the service brake or the control means in the event of loss of air from either source.

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5,190,358

ANTILOCK BRAKE SYSTEM FOR PROVIDING DIFFERENT BRAKE PRESSURES TO FRONT AND REAR WHEEL CIRCUITS

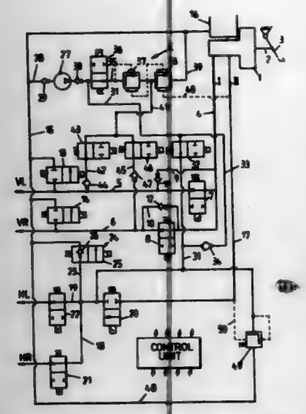
Roland Holzmann, Stuttgart; Karl-Heinz Willmann, Frieberg/-Neckar, and Michael Friedow, Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,264

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1990, 4004270

Int. Cl.[5] B60T *8/26, 13/16, 13/66*

U.S. Cl. 303—9.71 **25 Claims**



1. A brake system for feeding brake fluid at different pressures to first and second brake circuits for braking front and rear wheels including a master brake cylinder for producing a brake pressure on the brake fluid controllable by means of a brake pedal and transmitting the brake fluid under pressure to said first and second brake circuits via first and second main lines (4, 17), said first main line (4) connects the master brake cylinder to first and second front wheel brake cylinders via a first branch line (5) and a second branch line (6), and said second main line (17) connects the master brake cylinder to first and second rear wheel brake cylinders via a third branch line (18) and a fourth branch line (19), at least one first shutoff valve (7) is incorporated in said first branch line and at least one second shutoff valve (8) is incorporated in said second branch line (6) of the first brake circuit, and at least one third shutoff valve (20) is incorporated in said second main line of said second brake circuit, at least one pump that communicates downstream of the at least one first and second shutoff valves (7, 8) in said first and second branch lines (5, 6) and downstream of the at least one third shutoff valve (20) in said second brake circuit, a first shutoff and selection valve (21) in said third branch line and a second shutoff and selection valve 22 in said fourth branch line, and a return and check valve (24) connected with said third and fourth branch lines and to a return line (15) for returning brake fluid to a supply container (16), said at least one pump having an outlet connected with a feed system (E, E1), which has first and second pressure limiting valves (37, 38) of different pressure levels for feeding brake fluid at different pressures to the first and second brake circuits, and also to said supply container (16) whereby a brake pressure made available by means of the feed system (E, E1) to the second brake circuit that brakes the rear wheels is higher than a pressure simultaneously made available to the first brake circuit braking the front wheels.

5,190,359

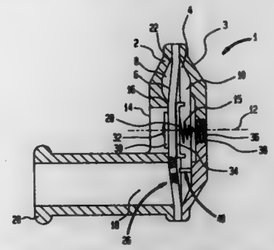
PRESSURE RELIEF VALVE FOR RAILWAY BRAKE EMERGENCY SYSTEMS

Gary W. Egerton, Silver Spring, Md., assignor to Pulse Electronics, Incorporated, Frederick, Md.

Filed Feb. 25, 1992, Ser. No. 841,382

Int. Cl.[5] B60T *15/02*

U.S. Cl. 303—86 **10 Claims**



1. A railroad emergency-brake, pressure relief, valve mounted on a railroad end-of-train unit, comprising in combination:

a valve body having a first wall and a second wall defining a hollow space;

a flexible diaphragm extending across said hollow space dividing said hollow space into a first chamber and a second chamber;

said diaphragm having an axis perpendicular to the plane of said diaphragm;

a first chamber having an exhaust port in said first wall, said exhaust port surrounded by a flange forming a valve seat in said first chamber;

said flexible diaphragm movable between a first position in which said diaphragm engages said valve seat with a middle portion of said diaphragm covering said exhaust port and a second position in which said diaphragm is disposed away from said valve seat, uncovering said exhaust port;

said first chamber further having a brake pressure port;

an orifice in said diaphragm providing a fluid pressure coupling between said first chamber and said second chamber so that brake pipe pressure is communicated to said second chamber and deflects said diaphragm to its first position, whereby said exhaust port remains closed so long as brake pipe pressure in said second chamber is exerted on said diaphragm;

a pilot valve port in said second wall for connecting the second chamber to a pilot valve, whereby opening said pilot valve reduces pressure in said second chamber so that said diaphragm lifts off said valve seat and moves to said second position; and

said valve secured in an end-of-train unit so that said diaphragm axis is in a vertical orientation when said end-of-train unit is in its operating position, whereby in operation condensation in said second chamber can drain through said orifice.

5,190,360

CONTROL METHOD FOR AN ANTISKID BRAKING SYSTEM

Yoshiaki Sano, Okazaki, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 713,864

Claims priority, application Japan, Jun. 15, 1990, 2-158508

Int. Cl.[5] B60T *8/88*

U.S. Cl. 303—92 **12 Claims**

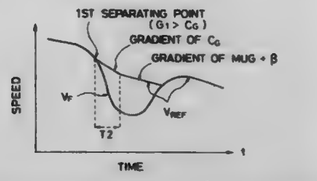
1. A control method for an antiskid braking system of an automobile, the system comprising wheel speed sensors attached individually to several wheels of the automobile to

detect the respective speeds of the wheels, a deceleration sensor attached to a body of the automobile to detect the deceleration of the body, and brake units attached individually to the wheels to control braking forces on the wheels, said control method comprising:

a first step for calcualting a criterion wheel speed, said first step including a first process for selecting one of the wheel speeds, obtained by means of the wheel speed sensors, as a selected wheel speed, and a second process for calculating the criterion wheel speed on the basis of the selected wheel speed;

a second step for obtaining a detected deceleration of the body on the basis of an output from the deceleration sensor, said second step being executed in parallel with said first step;

a third step for differentiating the criterion wheel speed to obtain a calculated deceleration of the body;



a fourth step for calculating a reference body speed in accordance with the value of the calculated deceleration, said fourth step including a third process for adjusting the reference body speed to the criterion wheel speed when the value of the calculated deceleration is not greater than a first predetermined deceleration value, a fourth process for lowering the reference body speed with a fixed first gradient during a predetermined transition time after a point of time when the first predetermined deceleration value is exceeded by the calculated deceleration, and a fifth process for lowering the reference body speed with a second gradient, which is determined in accordance with the detected deceleration of the body, after the passage of the transition time; and

a fifth step for controlling the operation of the brake unit of a corresponding one of the wheels when at least one of the wheel speeds develops a tendency to skid so that the wheel speed follows the reference body speed,

said steps being executed repeatedly.

5,190,361

ANTI-SKID BRAKE SYSTEM FOR AN AUTOMOTIVE VEHICLE

Toru Onaka; Toshiaki Tsuyama, and Kazutoshi Nobumoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 30, 1991, Ser. No. 814,601

Claims priority, application Japan, Dec. 28, 1990, 2-417433

Int. Cl.[5] B60T *8/32*

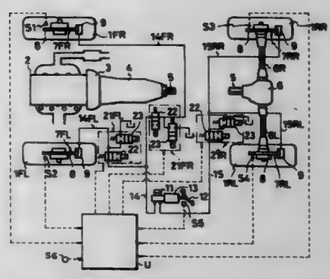
U.S. Cl. 303—100 **13 Claims**

1. An anti-skid brake system for an automotive vehicle capable of starting the control of braking force for preventing the wheel from being locked when a predetermined condition for starting the control thereof is met, comprising:

vehicle speed detecting means for detecting a vehicle speed;

wheel speed detecting means for detecting a speed of rotation of the wheel;

difference determining means for determining a difference between the vehicle speed detected by the vehicle speed detecting means and the wheel speed detected by the wheel speed detecting means; and



inhibition means for inhibiting the start of the control of the braking force when the difference is smaller than a predetermined value.

5,190,362

PRESSURE LIMITING VALVE WITH UNCOUPLED VALVE CLOSING BODY AND TAPPET

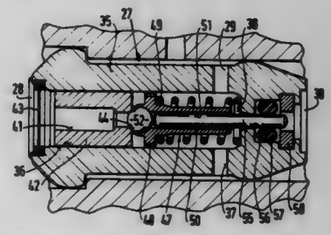
Ernst-Dieter Schaefer, Gerlingen, and Klaus Mueller, Tamm, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 8, 1991, Ser. No. 726,675

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1990, 4030424

Int. Cl.[5] F15B *13/042*; B60T *7/32, 8/46*

U.S. Cl. 303—113.2 **1 Claim**



1. A pressure limiting valve (27) for hydraulic motor vehicle brake systems (10),

having a housing (35) having an axial bore (36) with a first connection (28) for a pressure fluid subject to operating pressure, a second connection (29) for diverted pressure fluid, and a third connection (30) exposed to control pressure;

a valve seat (44) disposed on a valve seat body (42) within said axial bore of said housing (35), said valve seat body includes a longitudinal bore that communicates with the first connection (28);

a valve closing body (47) guided longitudinally displaceably in said bore of the housing (35) counter to the force of a compression spring (49) which engages said valve closing body to force said valve closing body toward said valve seat (44), said valve closing body (47) including a second longitudinal bore;

a valve seat closing member embodied as a ball (52) secured to one end of said valve closing body for seating on said valve seat (44), and;

a tappet (55) movable in said second longitudinal bore and extending away from the valve seat closing member in a direction of motion of the valve closing body (47), said tappet includes one end that engages said valve seat closing member and one end that ends juxtaposed the third

connection (30), and passes through a fixed sealing ring (57),

the tappet (55) is embodied as a cylindrical pin received in said second longitudinal bore (51) of the valve closing body (47) in a manner relatively movable with respect to said valve closing body, the tappet engages the valve seat closing member solely under the influence of the control pressure and subsequent to an opening stroke of the pressure limiting valve (27), said tappet (55) in absence of control pressure in the third connection (30) is retained by said sealing ring in a position in which the tappet does not engage the valve seat closing member.

5,190,363
DRIVE WHEEL FOR A BELTED TRACK CRAWLER
Robert W. Brittain, and Charles D. Olson, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Continuation of Ser. No. 696,680, May 7, 1991, abandoned. This application Aug. 5, 1992, Ser. No. 925,548
Int. Cl.[5] B62D *55/084*
U.S. Cl. 305—57 **15 Claims**

1. A crawler vehicle comprising:

a frame;

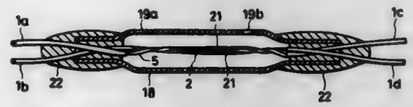
a pair of main drive wheels connected to opposite sides of the frame, each of the drive wheels is provided with a hub having a circumference, the hub having a central guide groove in the circumference of the hub, extending laterally outward from the guide groove are a plurality of frictional engagement elements, the engagement elements are detachably mounted to the hub and define the engagement surface of the main drive wheel, circumferential gaps are formed by adjacent engagement elements;

a pair of idlers connected to opposite sides of the frame, each of the idlers are longitudinally aligned with a corresponding main drive wheel;

a pair of endless belted tracks, one endless belted track engaging a longitudinally aligned idler and main drive wheel and the other endless belted track engaging the other longitudinally aligned idler and main drive wheel, each endless track is provided with a centering guide lug for engaging the guide groove of the main drive wheel and a flat drive portion extending outwardly from the lug for engaging the frictional engagement elements, whereby the circumferential gaps permit material trapped between the tracks and the main drive wheels to fall through the circumferential gaps and out of the main drive wheels.

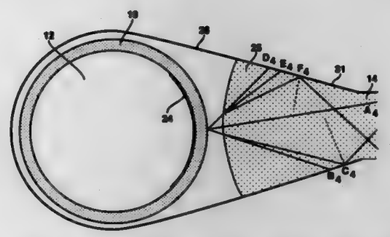
5,190,364
OPTICAL STAR COUPLER AND METHOD FOR MANUFACTURING THE SAME
Katsuyuki Imoto, Sayama, and Hiroyuki Kunugiyama, Hitachi, both of Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan
Filed Dec. 14, 1987, Ser. No. 132,888
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 **15 Claims**

1. An optical star coupler comprising: an optical fiber bundle formed of a plurality of optical fibers, the central portion of said optical fiber bundle being twisted, fused and pulled under heating so as to form a tapered region, and the outer peripheral



portion of said tapered region being coated with a dielectric substance.

5,190,365
BACKLIGHTING FOR LIQUID CRYSTAL DISPLAYS
Clifford B. Cordy, Jr., Central Point, Oreg., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Oct. 16, 1991, Ser. No. 778,437
Int. Cl.[5] G01D *11/28*
U.S. Cl. 362—26 **8 Claims**



1. A lamp for illuminating a display, the lamp being adjacent to a light guide, the light guide underlying the display, the lamp comprising:

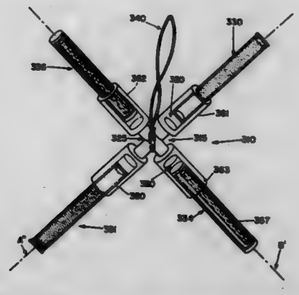
a plasma region for generating short wavelengths of light;

a plasma container surrounding the plasma region and having an inside and outside surface, for restricting the plasma to a specific region; and

phosphorescent region deposited on the inside surface of the plasma container, the phosphorescent region converting the short wavelengths of light to visible light, the phosphorescent region being adjacent to the light guide.

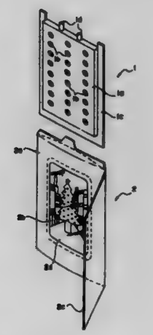
5,190,366
MULTI-COLORED LUMINESCENT FISHING LURE
Victor B. World, Cincinnati, Ohio, assignor to World Plastics Corporation, Cincinnati, Ohio
Filed Oct. 17, 1991, Ser. No. 778,727
Int. Cl.[5] F21K *2/00*
U.S. Cl. 362—34 **25 Claims**

1. A multi-colored luminescent fishing lure comprising a unitary connector body, said connector body having a plurality of spaced recesses for receiving individual luminescent color tubes of different colors, said recesses disposed in said body in an outward angular orientation from one another to maintain said color tubes in a spaced and non-aligned relation-



ship with one another, and means for attaching said lure to a fishing line.

5,190,367
LUMINOUS DISPLAY BOARD
Norio Aoki, Tokyo, Japan, assignor to High Performance Chemical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 628,518, Dec. 17, 1990, abandoned. This application Oct. 30, 1991, Ser. No. 784,080
Int. Cl.[5] F21K *2/06*
U.S. Cl. 362—34 **5 Claims**



1. A luminous member, comprising:

a flexible flat shaped light-transmitting container having a hollow flat internal space with a peripheral sealed edge forming a support framing said hollow flat internal space and a plurality of nonrupturing connecting portion which are formed so as to connect a front side to a back side of the hollow flat internal space within said sealed edge support frame to maintain said flat shape of said container,

a glass ampule within the container,

the glass ampule and the container each being filled with respective solutions, for causing chemical luminescence when the respective solutions are mixed.

5,190,368
FOUR LAMP TYPE HEADLAMP
Tsuneo Sekiguchi, Tokyo, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan
Filed Mar. 6, 1992, Ser. No. 846,818
Claims priority, application Japan, Mar. 22, 1991, 3-83551
Int. Cl.[5] B60Q *1/04*
U.S. Cl. 362—61 **10 Claims**

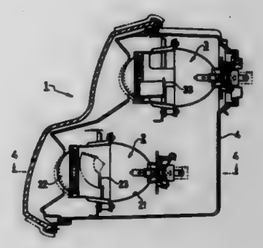
1. A four lamp type headlamp arrangement in which two lighting fixtures are respectively arranged in first and second

headlamp units, respectively positioned on a left and right front side of a vehicle, and wherein a distribution light of a plurality of running beams and a distribution light of a plurality of pass-each-other beams provided by said first and second headlamp units, are switchable with each other, comprising:

one of said tow lighting fixtures in each of said first and second headlamp units being a projector type fixture that is switchable between the distribution light of a pass-each-other beam and the distribution light of a running beam;

the other one of said two lighting fixtures in said first and second headlamp unit providing at all times a pass-each-other beam; and wherein:

when a plurality of running beams are in an "ON" state,



said one of said two lighting fixtures in both said first and second headlamp units are switched to provide the distribution light for said plurality of running beams; and

when the plurality of pass-each-other beams are in an "ON" state, said one of said two lighting fixtures in both said first and second headlamp units are switched to provide the distribution light for said plurality of said pass-each-other beams while the other one of said two lighting fixtures in both said first and second headlamp units are also in an "ON" state to provide respective pass-each-other beams, whereby said pass-each-other beams are provided by lighting all four lighting fixtures in both of said first and second headlamp units.

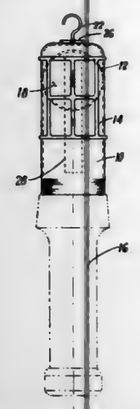
5,190,369
TROUBLELIGHT ATTACHMENT FOR FLASHLIGHT
Stan D. Pace, 826 N. Union, Loudonville, Ohio 44842
Filed Jan. 24, 1992, Ser. No. 825,060
Int. Cl.[5] F21L *15/02*
U.S. Cl. 362—186 **10 Claims**

1. A device that is releasably attachable to a flashlight top lamp end comprising:

a. a shell with a closed top and open bottom said open bottom is adapted to be releasably attachable to and to re-

ceive light from the top lamp end of the flashlight, and said shell having a front and a back; and,

b. a clear window in the front of said shell; and,



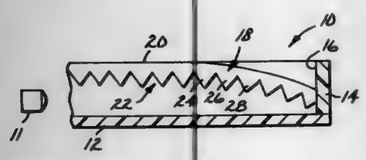
c. a flat mirror reflector attached to the shell which directs light from the open bottom of the shell to said window.

5,190,370

HIGH ASPECT RATIO LIGHTING ELEMENT

Richard A. Miller, Stillwater; Kenneth A. Aho, Chisago City, and Sanford Cobb, Jr., St. Mary's, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 21, 1991, Ser. No. 748,030
Int. Cl.[5] F21V 5/02
U.S. Cl. 362—340 6 Claims



1. A lighting element comprising:

a housing defining an optical cavity having an optical window;

a light extractor for directing light out of said optical cavity through said optical window, said light extractor having a first side and a second side, said second side having a plurality of linear triangular prisms thereon, each of said prisms having first and second facets, said prisms defining a smooth arcuate curve; and

a light source positioned so as to provide a beam of light traveling at a grazing angle to said second surface of said extractor and approaching said extractor from a first end thereof such that said light will enter each of said prisms through said prism's first facet, be totally internally reflected by said prism's second facet and emerge from said extractor through said first side;

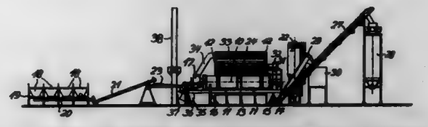
wherein said curve is designed to provide collimated output from said lighting element.

5,190,371

METHOD AND PLANT PRODUCING A BITUMINOUS PAVING MIXTURE

Jorgen Gjerulff, Brondersiev, Denmark, assignor to Pedershaab Maskinfabrik A/S, Denmark

PCT No. PCT/DK89/00183, § 371 Date Mar. 15, 1991, § 102(e) Date Mar. 15, 1991, PCT Pub. No. WO90/01086, PCT Pub. Date Feb. 8, 1990
PCT Filed Jul. 26, 1989, Ser. No. 640,307
Claims priority, application Denmark, Jul. 27, 1988, 4208/88
Int. Cl.[5] B28C 1/22
U.S. Cl. 366—25 7 Claims



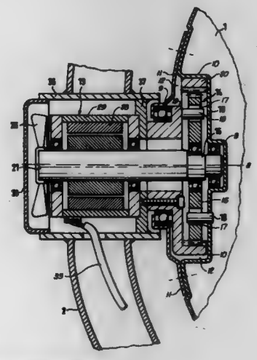
1. A drying and mixing plant for the production of a bituminous paving mixture, said plant comprising a drying and mixing drum (10) having inlet and outlet ends, driving means (11, 12) for rotating the drum about its longitudinal axis, means (21–23) for feeding aggregate material into the drum at its inlet end, and means (24–26) for supplying a further component material, such as a binder, into the drum at locations intermediate of the inlet and outlet ends, characterized by inclination adjustment means (16) for lifting and lowering the drum (10) so as to change the inclination of the drum axis, closure means (50, FIG. 3) for selectively at least partly closing and opening the outlet end of the drum (10), said drum (10) being divided into sections by at least one annular partition wall (47) extending radially inward from the inner wall of the drum, said partition wall being selectively movable between a position in which flow of material between adjacent drum sections is obstructed and a position in which material may flow freely from one section to another.

5,190,372

MIXER

Peter Kasberger, Aystetten, Fed. Rep. of Germany, assignor to Lescha Maschinenfabrik GmbH & Co. KG, Augsburg, Fed. Rep. of Germany

Filed Feb. 8, 1991, Ser. No. 653,344
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1990, 4006434
Int. Cl.[5] B28C 7/00, 7/16
U.S. Cl. 366—45 2 Claims



1. A mixer comprising:

a drum having a bottom mounted on a pivotting arm in a cantilever fashion, said pivotting arm having a bushing affixed therein, said bushing having a cover fastened on one side so as to seal said bushing from an exterior environment, said bushing coaxial with an axis of said drum, said bottom having a first wall and a second wall defining a space therebetween, said first wall receiving a first drum bearing, said second wall receiving a second drum bearing;

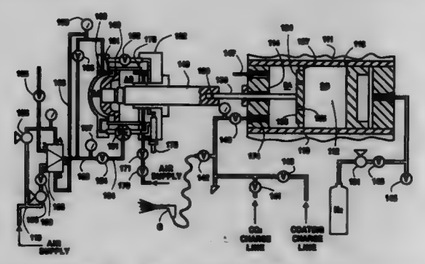
a motor having a drive shaft extending through one of said first and second drum bearings, said motor having an internal rotor positioned within said bushing, said motor having a stator secured to a flange within said bushing, said flange being affixed to said bushing, said drive shaft interactive with a step-down transmission contained in said space between said first and second walls, said shaft having an eccentric engaging said step-down transmission, said transmission drivingly interconnected between said motor and said drum so as to cause said drum to rotate relative to a speed of said motor, said pivotting arm having a cable channel formed therein, said cable channel for enabling an electrical connection to said motor, said electrical connection extending through a hole in said bushing, said hole communicating with said cable channel, said electrical connection extending to a switchplug of a pivot axis of said pivotting arm.

5,190,373

METHOD, APPARATUS, AND ARTICLE FOR FORMING A HEATED, PRESSURIZED MIXTURE OF FLUIDS

Donald J. Dickson, Charleston, and Marcelo J. Marchetti, Kanawha, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 24, 1991, Ser. No. 813,023
Int. Cl.[5] B01F 15/05, 5/18
U.S. Cl. 366—146 11 Claims



1. Apparatus for mixing, heating and pressurizing at least two fluids comprising:

a vessel having a chamber sealed at one end;

pressurizing means located in said chamber and capable of reciprocal movement in said chamber;

first inlet means for introducing fluids into said chamber on one side of said pressurizing means;

means on said first inlet means side of said pressurizing means for continuously mixing said fluids in said chamber to form a mixture;

means attached to said mixing means for continuously reciprocally moving said mixing means along the length of said chamber;

means for heating said mixture in said chamber;.

outlet means for discharging the continuously mixed mixture from said chamber; and

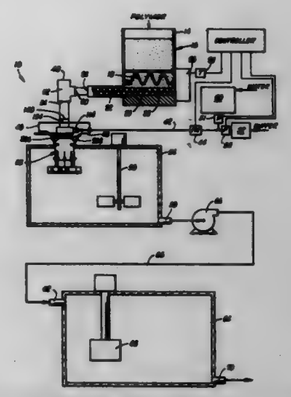
second inlet means located on the other side of pressurizing means for introducing pressurizing force means for moving said pressurizing means in said chamber in order to maintain substantially constant pressure as said mixture is discharged therefrom.

5,190,374

METHOD AND APPARATUS FOR CONTINUOUSLY MIXING WELL TREATMENT FLUIDS

Weldon M. Harms, Duncan; Thomas E. Allen, Comanche; Lewis R. Norman, Duncan, all of Okla., and Syed Hamid, Rijnsburg, Netherlands, assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 29, 1991, Ser. No. 693,995
Int. Cl.[5] B01F 15/02
U.S. Cl. 366—165 12 Claims



1. A method of hydrating a polymer to produce a well treatment gel, said method comprising the steps of:

providing a predetermined quantity of a hydratable polymer in a substantially particulate form, said polymer having a hydration-delaying coating, to a solids inlet of a water spraying mixer;

supplying a stream of water to a water inlet of said mixer;

adding a buffering compound to said stream of water for breaking down said coating on said polymer; and

mixing said polymer and water in said mixer, said mixer comprising means for directing said water in a substantially spiralling flow within said mixer, thereby wetting substantially all of the polymer particles to form a water-polymer mix prior to discharge from said mixer.

5,190,375

AGITATOR WITH A ROTARY SHAFT AND HOLLOW SHAFT FOR STIRRING AND MIXING MATERIALS

Katsumi Shiobara, Yono, Japan, assignor to Satake Chemical Equipment Mfg., Ltd., Moriguchi, Japan

Filed Aug. 17, 1990, Ser. No. 568,721
Claims priority, application Japan, Aug. 21, 1989, 1-96753; Apr. 17, 1990, 2-40274
Int. Cl.[5] B01F 7/16
U.S. Cl. 366—294 3 Claims

1. An agitator, which comprises:

a first and second hollow shaft which are coaxial, said second shaft extending from a distal end of said first shaft;

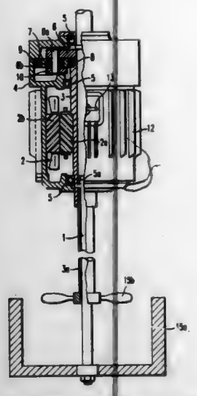
a rotary shaft positioned within said first and second hollow shafts;

a first and a second stirring rotor which are coaxial and are positioned at a distal end of said rotary shaft and said second hollow shaft, respectively;

an electric motor disposed at an end portion of the rotary shaft, said motor having a casing, a rotor and a stator wherein said motor drives the first hollow shaft;

a gear reduction mechanism which includes a rotary member, said gear reduction mechanism being driven by said first hollow shaft and being positioned in said casing for engaging said rotary shaft, wherein a portion of the rotary

shaft extends within the casing and is rotatably received in said first hollow shaft and wherein said gear reduction mechanism includes means for rotating said rotary member at a speed which is lower than that of the first hollow shaft; and



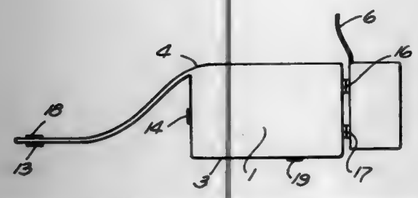
bearing members for journaling the rotary shaft at upper and lower ends of the casing, wherein the rotor of the electric motor is fixed to a middle portion of the first hollow shaft, and the rotary shaft and the first hollow shaft are interlocked with each other by said gear reduction mechanism.

5,190,376

COLLAPSIBLE, PORTABLE, MULTIPLE USE, INSULATED BAG WITH COMPANION ATTACHABLE MULTIPLE USE BAG

Steven C. Book, North Hollywood, Calif., assignor to Auto-Shade, Inc., North Hollywood, Calif.

Filed Sep. 10, 1991, Ser. No. 757,077
Int. Cl.[5] B05D *30/08*
U.S. Cl. 383—4 **13 Claims**



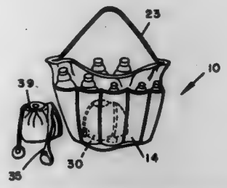
1. A storage bag that can be attached to an external mounting surface, comprising:
- a flexible bag having a first wall, a second wall, a third wall, a fourth wall and a bottom wall, said walls defining a cavity;
- a top cover pivotally attached to said first wall such that said top cover can be placed over said cavity;
- first cover attachment means operatively connected to said flexible bag and said top cover for attaching said top cover to said second, third and fourth walls such that said cavity is enclosed;
- first attachment strip means attached to said bottom wall for attaching said flexible bag to the external mounting surface; and,
- second attachment strip means attached to said top cover for attaching said top cover to said first attachment strip means and said bottom wall when said flexible bag is in a collapsed position.

5,190,377

BINGO PURSE

Mary T. Kelly, 9282 Burnt Store Rd., Punta Gorda, Fla. 33950

Filed May 4, 1992, Ser. No. 877,764
Int. Cl.[5] B65D *33/02*
U.S. Cl. 383—29 **7 Claims**



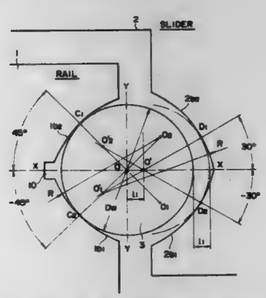
1. A Bingo carrying case adapted for carrying of the various items required for use in the play of the game of Bingo, the carrying case comprising:
- first and second sides secured together to form a circular tube, said first and second sides each having a top end and a bottom end,
- first and second panels secured to said first and second sides and to said bottom ends of said first and second sides, said first and second panels having a series of pockets formed between the surfaces of said sides and panels,
- a circular bottom member secured to said bottom ends of said first and second sides and said first and second panels, thereby forming a container,
- a zipper secured to said top ends of said first and second sides, for closing said top ends, and
- a handle secured to said top end of said first and second sides and to opposite ends of said zipper, thereby forming a carrying handle and a stopper for each end of said zipper.

5,190,378

LINEAR MOTION ROLLING CONTACT GUIDE UNIT HAVING AN ASYMMETRICAL GUIDE CHANNEL

Kazuhiko Tanaka, Fuchu, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1991, Ser. No. 764,025
Claims priority, application Japan, Sep. 27, 1990, 2-255410
Int. Cl.[5] F16C *29/06*
U.S. Cl. 384—49 **6 Claims**



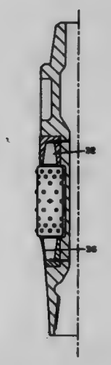
1. A linear motion rolling contact guide unit, comprising:
- a rail extending over a predetermined distance, said rail having at lest one side surface formed with an inner guide groove extending in parallel with a longitudinal axis of said rail, said inner guide groove having a first arc surface;
- a slider saidably mounted on said rail, said slider having at lest one side surface formed with an outer guide groove located opposite to and in parallel with said inner guide groove to thereby define a guide channel between said inner and outer guide grooves, said outer guide groove having a second arc surface asymmetrically arranged with respect to the art surface of said inner guide groove; and
- a plurality of balls provided in said guide channel to thereby provide a rolling contact between said rail and said slider;
- whereby a first distance between two contact points on eh firs arc surface formed between said inner guide groove and each of said balls when each of said balls are brought into contact with said inner guide groove is longer than a second distance between two contact points on the second arc surface formed between said outer guide groove and each of said balls when each of said balls are brought into contact with said outer guide groove.

5,190,379

BEARINGS FOR ROLLER CUTTER ASSEMBLY

Kenneth M. White, Calgary, Canada, assignor to Western Rock Bit Company, Ltd., Calgary, Canada

Filed Jun. 1, 1992, Ser. No. 891,209
Claims priority, application Canada, Jun. 3, 1991, 2043781
Int. Cl.[5] E21B *10/24*; F16C *17/04*
U.S. Cl. 384—246 **12 Claims**



1. For use in a roller reamer adapted for releasable attachment to a drill string, a roller cutter assembly comprising: a cylindrical body having an integral tapered bearing pin at each end of the body and a journal bearing block for each of the bearing pins, a tapered bearing surface in each bearing block of a diameter slightly larger than that of the associated bearing pin, the angle of taper of the bearing pins and bearing surfaces being greater than the arc tangent of the coefficient of static friction between the coacting bearing surfaces on the roller and bearing block such that the bearing pins do not self-lock in the bearing blocks.

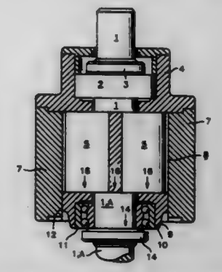
5,190,380

DEVICE FOR COMPENSATING EXPANSION IN ROTATORY EQUIPMENT

Vicente Comerci, San Juan 4284, Buenos Aires, Argentina 1233

Filed Dec. 13, 1991, Ser. No. 806,375
Claims priority, application Argentina, Nov. 4, 1991, 321088
Int. Cl.[5] F16C *23/06, 19/52*
U.S. Cl. 384—493 **3 Claims**

1. In rotary equipment comprising a stator, a rotor mounted within said stator, and a driving shaft driven by said rotor, a device for compensating expansion of the rotary equipment, wherein said device comprises a sliding plate with a seat on which a bearing is housed, said sliding plate being mounted on the driving shaft and fixed thereto by an adjustment nut, said sliding plate having an outer configuration equal to the cross section selected for the stator, said sliding plate being further provided with an expansion groove.

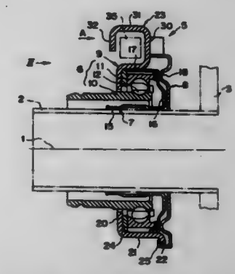


5,190,381

RELEASE BEARING ASSEMBLY

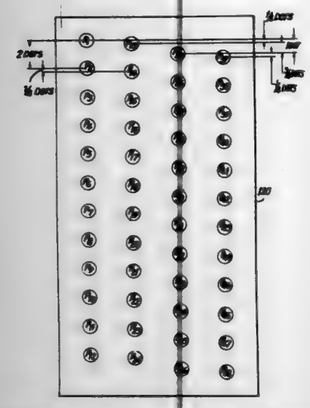
Tooru Hamada; Masahiko Iwase, and Syogo Ohga, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jan. 14, 1992, Ser. No. 793,344
Claims priority, application Japan, May 18, 1990, 2-51985[U]
Int. Cl.[5] F16C *19/10*
U.S. Cl. 384—617 **1 Claim**



1. A release bearing assembly, in which a release bearing including an inner race, an outer race and balls installed between them is disposed around a cylindrical guide extending in a clutch axial direction, a cylindrical part of a cylindrical sleeve guided by an outer peripheral surface of the guide is disposed between the inner race and the guide, a radial outward extension is provided at one end of the sleeve, the extension is made contact with one end face of the outer race, a cover facing on the one end face is installed with the extension sandwiched between them, an annular body of the side plate is made engage with the other end face of the outer race, the side plate includes a cylindrical outer peripheral part and an engageing part and a clamping part, the cylindrical outer peripheral part extending from an outer peripheral end of the annular body along and over a radial outside of an outer peripheral surface of the outer race, the cylindrical outer peripheral part and the engageing part extending from an opposite-to-the-body end of the outer peripheral part to a radial outside, a portion engaging with a release fork is formed on the engaging part, an outer peripheral edge of the cover is secured to an outer peripheral edge of the clamping part, and a contacting part contacting with the extension of the sleeve so as to make the extension contact with the one end face of the outer race.

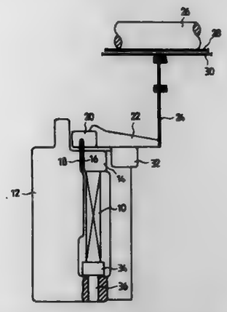
5,190,382
PRINT ELEMENT ARRANGEMENT IN SERIAL MATRIX PRINTER
Osamu Koshiishi; Takashi Asada; Kiyofumi Koike, and Masaki Shimomura, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan
Filed Oct. 24, 1990, Ser. No. 602,527
Claims priority, application Japan, Oct. 26, 1989, 1-280464
Int. Cl.[5] B41J *2/255*
U.S. Cl. 400—121 9 Claims



1. A serial printer having a dot type printing head for printing on a paper, including only 2N columns of dot forming elements where N is a positive integer equal to 2 or more, said printer further including a carriage supported on said printer for reciprocal movement across said paper in a carriage direction, said columns of dot forming elements being supported on said carriage for selectively printing dots on said paper, each column of said dot forming elements being spaced a predetermined distance from adjacent columns of said dot forming elements in the carriage direction, each said dot forming element column including a plurality of dot forming elements arranged in a line, drive means for selectively driving selected dot forming elements in each column of dot forming elements by one of an even numbered timing and an odd numbered timing, each column of dot forming elements driven by an even numbered timing being shifted in the column direction by one dot with respect to each other column of dot forming elements driven by an even numbered timing, each said column of dot forming elements driven by an odd numbered timing being shifted in the column direction by one dot with respect to each other column of dot forming elements driven by an odd numbered timing, each said column of dot forming elements driven by an even numbered timing corresponding to a column of dot forming elements driven by an odd numbered timing and being shifted in the column direction by less than about ½ dot pitch with respect to its corresponding column of dot forming elements driven by an odd numbered timing.

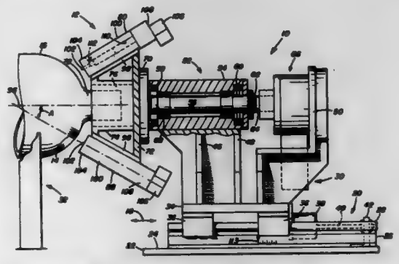
5,190,383
DOT PRINTING APPARATUS
Yoshifumi Suzuki, Ena; Yoshiyuki Ikezaki, and Akira Iriguchi, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jun. 23, 1992, Ser. No. 902,989
Claims priority, application Japan, Jun. 26, 1991, 3-181740
Int. Cl.[5] B41J *3/02*
U.S. Cl. 400—124 16 Claims

1. A dot printing apparatus including a print head performing dot printing on a print sheet by a printing wire and an actuator having a piezoelectric member connected to the printing wire for driving the printing wire, the dot printing apparatus comprising:
- a supplying means for supplying electric energy to the piezoelectric member to charge thereof,
- a removing means for removing the electric energy from the charged piezoelectric member to discharge thereof,
- a judging means for judging whether dot printing data to be



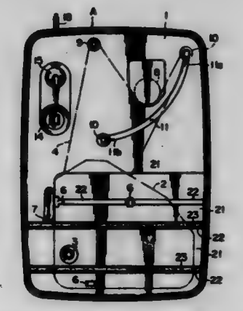
printed exists within a first predetermined number of printing pitches on the print sheet next to a present printing pitch,
- a control means for controlling the removing means based on judgement by the judging means, so that the removing means removes a part of the electric energy from the charged piezoelectric member and thereafter completely removes remainder of the electric energy therefrom.

5,190,384
DOME AND ROUND PARTS ROTARY MARKER
Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.
Continuation-in-part of Ser. No. 792,438, Nov. 15, 1991, which is a continuation of Ser. No. 562,737, Aug. 3, 1990, abandoned.
This application Feb. 11, 1992, Ser. No. 834,170
Int. Cl.[5] B41J *1/30*
U.S. Cl. 400—128 20 Claims



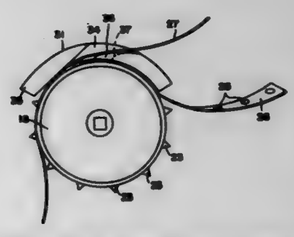
1. Apparatus for marking a selected array of characters in an arcuate path on the surface of an object comprising,
- a support member positioned adjacent to the object to be marked, said support member having a reference plane parallel to an axis of the object,
- a carriage mounted on said support member for movement parallel to said reference plane with the object to be marked remaining fixed relative to said carriage,
- first drive means drivingly connected to said carriage for linearly moving said carriage to a preselected position on said support member relative to the surface of the object,
- a rotor supported by said carriage in coaxial alignment with the surface of the object to be marked for rotation relative to the object in a preselected direction,
- marking means for imprinting a selected array of characters on the surface of the object,
- means for supporting said marking means radially on said rotor for movement into and out of contact with the surface of the object,
- second drive means connected to said rotor for rotating said rotor through a preselected angle in a first direction about the axis of the object,
- actuating means for selectively actuating said marking means to mark the surface of the object with portions of the selected array of characters on a first line radiating in an arcuate path about the axis of the object as the rotor rotates in a first direction through a preselected angle about the object,
- said first drive means linearly moving said carriage a preselected distance on said support member for rotation of said rotor by said second drive means in a second direction opposite to said first direction through a preselected angle, and
- said actuating means actuating said marking means to mark the surface of the object on a second line spaced from and radiating in an arcuate path parallel to said first line with the other portions of said selected array of characters.

5,190,385
INK RIBBON REGENERATING DEVICE
Tetuo Taguchi, Kawaguchi; Hiroshi Wada, Mieato; Keiichi Emura, Koshigaya; Yutaka Shinohara, Kounosu; Yoshihiro Wada, Yashio; Isao Osuki, Mieato; Kazunori Suzuki, Kasukabe, and Kazuo Sakai, Satte, all of Japan, assignors to Pentel Kabushiki Kaisha, Japan
Filed Jan. 22, 1991, Ser. No. 734,273
Claims priority, application Japan, Jul. 30, 1990, 2-81003[U]; Aug. 30, 1990, 2-90810[U]; Sep. 29, 1990, 2-103083[U]; Jan. 30, 1991, 3-8650[U]
Int. Cl.[5] B41J *31/14*
U.S. Cl. 400—200 19 Claims



1. A device for regenerating an ink ribbon of an ink ribbon cassette, comprising:
- a housing having an upper surface for mounting thereon an ink ribbon cassette having an ink ribbon and an ink ribbon moving mechanism operative when driven for moving the ink ribbon;
- a motor disposed in the housing for producing a rotary output;
- power transmitting means disposed in the housing and connected to the motor and releasably engaged with the ink ribbon moving mechanism in the ink ribbon cassette for transmitting the power of rotation of the motor to the ink ribbon moving mechanism to thereby move the ink ribbon when the cassette is mounted in position on the housing, said power transmitting means comprising a vertical rotator disposed on a lower inside surface of said housing, a hollow cylinder projecting upwards from the lower inside surface and coaxially slidably receiving the rotator, a flange coaxially horizontally fixed with the top end of the rotator, said flange having an outer periphery meshed with a gear connected to be rotationally driven by said motor, and a vertical shaft the lower end of which is coaxially releasably engaged with a central portion of the flange and the upper end of which is projected above said upper surface of said housing through a hole formed in said upper surface, said shaft being shaped to releasably engage with the ink ribbon moving mechanism to thereby move the ink ribbon;
- holding means provided on the upper surface of the housing for removably holding one of the opposite edge portions of the upper surface of the ink ribbon cassette to thereby lock the cassette in position on the upper surface of the housing;
- a guide pin fixedly provided on the upper surface of the housing for slidably guiding the ink ribbon drawn out of the ink ribbon cassette;
- a guide roller inserted into and movable along an elongated slot formed in the upper surface of the housing for guiding the ink ribbon drawn out of the ink ribbon cassette while applying a tension to the ink ribbon in cooperation with the guide pin;
- a rotatable ink pad provided on the upper surface of the housing to forcedly contact with the ink ribbon which is drawn out of the ink ribbon cassette, the ink ribbon being urged into contact with the ink pad by both the guide pin and the guide roller for distributing ink contained in the ink pad onto the ink ribbon; and
- a solenoid having a plunger actuated thereby and provided in the housing for releasably locking a shaft of the guide roller with the plunger at one of the opposite ends of the elongated slot.

5,190,386
PRINTER WITH EDGE STRIP TRIMMER
James R. Eudy, 4316 Whitetail La., Midland, N.C. 28107
Filed Jan. 28, 1992, Ser. No. 826,820
Int. Cl.[5] B41J *11/26*
U.S. Cl. 400—621.1 14 Claims



1. In a printer having first and second opposed sprocket means positioned on opposed sides of a printer platen for feeding from an upstream to a downstream direction continuous-feed paper sheets having continuous-feed edge strips formed along the opposing sides of the paper sheets, the combination of a edge strip trimming apparatus, said edge strip trimming apparatus comprising first and second edge strip trimmers, each of said edge strip trimmers including means for separating said edge strip from said paper sheets before the edge strip leaves the sprocket means, said means for separating including:
- (a) edge strip hold-down means positioned in spaced-apart relation to one of the first and second sprocket means for receiving a sheet of paper to be separated from the edge strip and for holding the edge strip against the sprocket means as the paper is fed through the printer;
- (b) separating means for separating the edge strip from the paper sheet, said separating means comprising an inclined

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paper support bed extending inwardly from the edge strip hold down means to a point underneath the horizontal plane of the paper sheet for progressively divergent the plane of the edge strip from the plane of the paper sheet as the paper sheets are successively fed through the printer;

(c) said support bed defining an edge surface, said edge surface having a gradual compound curve which tapers both outwardly towards the edge strip hold down means and forwardly in the direction from which the paper sheets are fed through the printer to separate the edge strip from the paper sheet by moving the paper sheet simultaneously away from the edge strip in both a vertical and a lateral plane thereby causing progressive simultaneous separation in two planes.

5,190,387
KEYBOARD ACCOUTERMENT TRAY
Marc A. Anth, 549 Ridgeway Dr., Twin Falls, Id. 83301
Filed Mar. 13, 1992, Ser. No. 851,079
Int. Cl.[5] B41J *29/00*
U.S. Cl. 400—717 **11 Claims**

1. A keyboard accouterment tray for attachment to a computer keyboard, said keyboard having a top surface supporting the keyboard keys, side edges and a bottom side opposite the top surface, said tray comprising means providing a keyboard and accounterment tray combination as a rigid and portable unit, said means including:

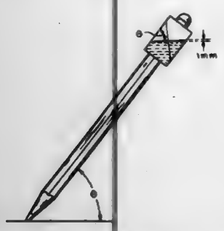
a support member, for placement below the bottom side of a keyboard, said support member being in a plane parallel to said bottom side of the keyboard;

a clamping means attached to the support member at a location below the bottom side of the keyboard, said clamping means engaging opposite side edges of the keyboard, and

a tray-wing, with a firm and flat upper planar surface, rigidly extending beyond the edge of the keyboard, a removably-mounted accessory,

whereby the keyboard and accouterment tray become a rigid and portable unit.

5,190,388
WRITING INSTRUMENT WITH WATER LEVEL INDICATOR
Suk H. Lee, 7145 N. Hamlin, Lincolnwood, Ill. 60645
Filed Nov. 5, 1990, Ser. No. 608,824
Int. Cl.[5] B43K *29/00, 29/08*
U.S. Cl. 401—52 **9 Claims**



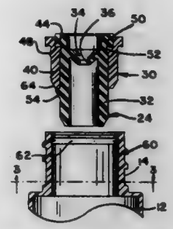
1. In a writing instrument for teaching a pupil good penmanship by training the pupil to hold the writing instrument at an optimum angle, the improvement comprising:

a transparent vessel associated therewith and having a liquid therein with a liquid level that varies with different positions that said writing instrument is held,

said transparent vessel including a marking thereon that is inclined at the optimum writing angle at which said pupil should hold the writing instrument when writing,

whereby said liquid level and said marking are visually coincident with one another when the pupil is writing with the writing instrument held at said optimum writing angle.

5,190,389
WIPER MOUNTING RING
Martin M. Vasas, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Co., Bridgeport, Conn.
Filed Dec. 23, 1991, Ser. No. 812,416
Int. Cl.[5] A46B *11/00*; A45D *40/00, 40/26*
U.S. Cl. 401—122 **15 Claims**



1. A cosmetics container comprising:

a) a bottle for receiving cosmetics, the bottle including a neck, said neck defining a generally cylindrical opening into the cavity of the bottle;

b) a cap having a rod and cosmetics applicator extending therefrom, the rod and applicator extending centrally through the neck opening of the bottle when the cap is secured to the bottle neck;

c) wiper having a tubular sleeve and an apertured wiper diaphragm extending across the opening defined by the tubular sleeve, the wiper being fabricated of a resilient flexible material;

d) a wiper mounting ring including a cylindrical sidewall adapted to mount the wiper on the inside surface thereof, the wiper mounting ring being adapted to be mounted and retained in the neck opening of the bottle, thereby positioning the wiper centrally within the neck opening for receiving the rod and applicator through the apertured wiper diaphragm;

e) the upper end of the wiper mounting ring defining an annular notch adjacent to the inside surface and the wiper including a radially projecting rim matingly received in said notch; and

f) the wiper including radially outwardly projecting lugs which engage the lower end of the wiper mounting ring, said rim and lugs together longitudinally positioning the wiper with respect to the wiper mounting ring.

5,190,390
JOINT FOR CONNECTING A CANOPY SUPPORT TO A STROLLER
Huang Ming-Tai, 4th Fl., No. 302, Pailing Wu Rd., Taipei, Taiwan
Filed Jan. 8, 1992, Ser. No. 818,144
Int. Cl.[5] F16B *1/00*
U.S. Cl. 403—24 **2 Claims**

1. A joint comprising:

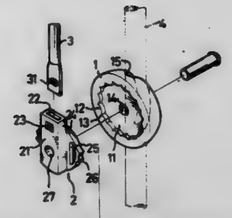
(a) a first element having a first side attachable to a segment of an associated stroller structure and a second side formed with a generally circular cavity defined by a bottom wall and a side wall with a multiplicity of indents

spaced thereabout, said element having a passage extending therethrough coaxially of said cavity;

(b) a second element comprising:

(i) a receptacle portion having a cavity extending thereinto from one edge thereof and an aperture in one side thereof communicating with said cavity;

(ii) a disk-shaped portion on the side of said receptacle portion opposite that having said aperture and provides generally arcuate projections extending outwardly of said receptacle portion, each projection having a multiplicity of teeth formed on the periphery thereof and rotatably engageable with said indents of said first element; and

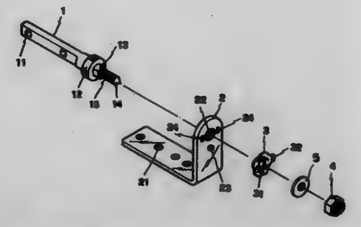


(iii) passage extending from said one side of said receptacle portion and coaxially through said disk-shaped portion;

(c) a pivot fastener extending through said passage of said first element and said passage of said second element to secure said first element and said second element in rotatable assembly; and

(d) a canopy support having one end portion dimensioned and configured to seat in said cavity of said second element and having a resiliently deflectable tab on said end portion so that, when the canopy support is inserted into said cavity, said tab projects into and is hooked in said aperture, said flexible tab being deflectable to allow said end portion of said canopy support to be disengaged from said second element.

5,190,391
VARIABLE TORSIONAL FORCE PIVOT SHAFT CONNECTOR
Chin-fu Huong, Taipei Hsien, China, assignor to Yen Yang Basestrong Co., Ltd., Taipei Hsien, Taiwan
Filed May 4, 1992, Ser. No. 877,761
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—96 **5 Claims**



1. A pivot shaft connector for the two pivotal halves of a notebook personal computer comprising:

a) a shaft for attachment to one half of the personal computer, the shaft including a front axle, a circular collar adjacent the front axle, and a rectangular flange disposed between the circular coolar and the front axle;

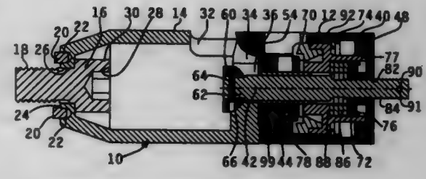
b) a base plate for attachment to the other half of the personal computer, the base plate including a plurality of raised portions, and an axle hole for receiving the front axle and the rectangular flange therethrough;

c) a spring plate having a corrugated configuration defined by alternating peaks and furrows, the spring plate including a rectangular hole for receiving the rectangular flange therethrough;

d) means carried by the front axle for securing the front axle to the base plate and disposing the spring plate against the base plate and adjacent the raised portions; and

e) wherein when one half of the personal computer is pivoted relative to the other half, rotation of the front axle causes the peaks and furrows of the spring plate to alternately engage the raised portions of the base plate, thereby varying the torsional force required to rotate the shaft.

5,190,392
ROBOT-FRIENDLY CONNECTOR
George F. Parma, Houston; Mark H. Vandeberghe, Friendswood, and Steve C. Ruiz, Houston, all of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Nov. 26, 1991, Ser. No. 799,460
Int. Cl.[5] F16B *1/04*
U.S. Cl. 403—171 **13 Claims**



1. A connector comprising

a receptacle member having a receptacle recess therein defined by recess walls for receiving a joint member, and a receptacle slot in one of the recess walls communicating with the receptacle recess,

a joint member having a head secured to a movable rod, part of the rod within the joint member and part of it with the head thereon extending outside the joint member,

the head and a portion of the rod insertable into the receptacle recess so that a portion of the rod is receivable in the receptacle slot,

tightening means in the joint member for moving the movable rod further into the joint member to secure the head against a wall of the recess,

the receptacle slot has a chamfered top entry into which and through which the portion of the rod is inserted, and

the joint member has a curved protruding tongue for contacting the chamfered top entry to accommodate initial misalignment between the receptacle member and the joint member.

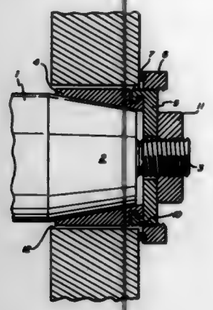
5,190,393
DEVICE AT EXPANDABLE MOUNTING SLEEVE
Roger Svensson, Box 271, S-997 00 Atvidsberg, Sweden
PCT No. PCT/SE89/00296, § 371 Date Jan. 7, 1991, § 102(e) Date Jan. 7, 1991, PCT Pub. No. WO89/11598, PCT Pub. Date Nov. 30, 1989
PCT Filed May 25, 1989, Ser. No. 613,555
Int. Cl.[5] F16B *7/04*
U.S. Cl. 403—370 **12 Claims**

1. An expandable device for attaching a shaft to a hub comprising:

a shaft having a truncated conical end;

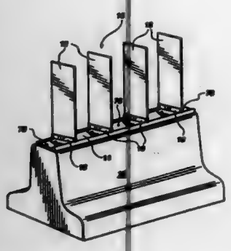
an expandable sleeve having an inner conical surface mating

with the truncated conical end and an exterior surface mating with a mounting hole in the hub;
a threaded washer having a threaded outer surface and adapted to rotatably interconnect with one end of said expandable sleeve;
a threaded part extending axially from said truncated conical end of said shaft and through said treaded washer;



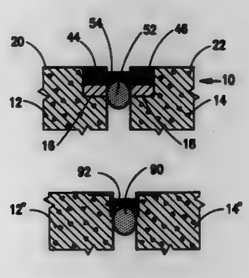
a nut mounted on said threaded part and threaded to engage said threaded washer, said nut having an outer diameter smaller than said outer surface of said threaded washer; and
an internally threaded ring adapted to be threaded onto said outer surface of said threaded washer and engageing said hub.

5,190,394
ADJUSTABLE GLAREFOIL ASSEMBLY
Richard D. Mallon, and Michael M. Leigh, both of Carson City, Nev., assignors to Carsonite International Corp., Carson City, Nev.
Filed Jun. 10, 1991, Ser. No. 712,594
Int. Cl.[5] E01F *9/00*
U.S. Cl. 404—6 **10 Claims**



1. An adjustable glarefoil assembly for mounting to a median barrier along a divided highway comprising:
an elongate base runner section having a bottom face for attachment to the median barrier and a top face opposing the bottom face,
a plurality of elongate glarefoil blades having two opposing faces and being adapted to reduce headlight glare from oncoming traffic along the divided highway, and
adjustable coupling means attached at both of the opposing faces and at one end of each of the glarefoil blades and to the top face of the base runner section at forward and rearward positions with respect to the glarefoil blades such that each glarefoil blade can be angularly adjusted selectively into a plurality of upright, light blocking orientations with respect to a variety of different projected median barrier locations without removal of the blade from the base runner section or removal of the base runner section from the median barrier.

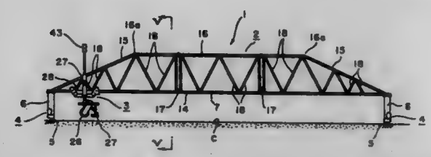
5,190,395
EXPANSION JOINT METHOD AND SYSTEM
Joe R. Cathey, Claremore, and Dale W. Baker, Owasso, both of Okla., assignors to Silicone Specialties, Inc., Tulsa, Okla.
Filed Feb. 12, 1992, Ser. No. 835,239
Int. Cl.[5] E01C *11/06, 11/10*
U.S. Cl. 404—74 **10 Claims**



1. A method to produce an expansion joint for adjacent roadway slabs having a gap therebetween, which comprises:
a. cutting or forming a recess into the surface of each of said adjacent roadway slabs to form a pair of recesses parallel to and adjacent said gap;
b. cleaning said recesses to a sound and rust-free surface;
c. coating each recess with a slightly resilient polymer primer to inhibit rust and corrosion and to form a bonding surface;
d. installing a mortar mixture of said slightly resilient polymer and aggregate into each recess to form a pair of parallel nosings adjacent to said gap, said nosings bonded to said roadway slabs;
e. sandblasting and then priming opposed surfaces of said nosings with a silicone primer;
f. inserting a temporary backing between said nosings in said gap;
g. installing an initially liquid silicone sealant between said nosings and on top of said temporary backing which will cure to form a flexible seal.

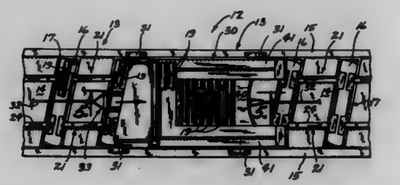
6. A roadway expansion joint system for adjacent roadway slabs having a gap therebetween, which system comprises:
a. epoxy primer to coat and adhere to a recess cut or formed into the surface of each of said adjacent roadway slabs forming a pair of recesses parallel to and adjacent said gap;
b. a nosing to fill each of said recesses, said nosings formed of a mortar mixture of epoxy and aggregate which will bond with and adhere to said epoxy primer;
c. silicone primer to coat opposed surfaces of said nosings;
d. a temporary backing inserted between said nosings in said gap; and
e. an initially flowable silicone sealant between said nosings and on top of said temporary backing which will cure to form a flexible seal.

5,190,396
CONCRETE LEVELING APPARATUS
Hayao Aoyagi; Tatso Kawamura; Minoru Ochiai; Kenji Okuda, all of Tokyo; Toru Shimano, and Kazuo Yamazaki, both of Chiba, all of Japan, assignors to Takenaka Corporation, Osaka and Sanwa Kizai Co., Ltd., Tokyo, both of, Japan
PCT No. PCT/JP90/00832, § 371 Date Sep. 20, 1991, § 102(e) Date Sep. 20, 1991, PCT Pub. No. WO91/11574, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 27, 1990, Ser. No. 768,576
Claims priority, application Japan, Jan. 26, 1990, 2-6879[U]; Jan. 26, 1990, 2-6880[U]; Jun. 7, 1990, 2-148950[U]; Jun. 19, 1990, 2-64753
Int. Cl.[5] E01C *19/22, 19/00*
U.S. Cl. 404—84.5 **7 Claims**



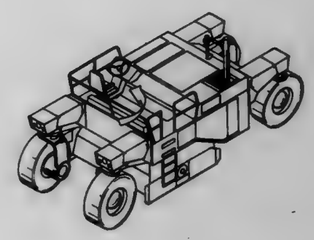
1. A concrete leveling apparatus, comprising rails positioned on opposite sides of a poured concrete surface, a traveling beam that spans said rails and is adapted for travel in a direction of travel along said rails, a traveling unit that is movably mounted on said traveling beam and is adapted for travel along said traveling beam in a direction of travel perpendicular to the direction of travel of said traveling beam, and a concrete leveler portion supported by said traveling unit, an adjustment mechanism for adjusting and leveling said concrete leveler portion, said concrete leveler portion including a slope angle detector and a laser light receiver that receives laser light emitted at a planned height, and a control apparatus that compares a value of a slope angle and height of said concrete leveler portion detected by said laser light receiver and slope angle detector with predetermined values and said control apparatus including means for controlling said adjustment mechanism based on the comparison such that said adjustment mechanism adjusts said concrete leveler portion with respect to the poured concrete surface.

5,190,397
DOWEL BAR INSERTION METHOD AND APPARATUS FOR CONCRETE PAVING MACHINE
Steven C. Bengford, Arthur, and Ronald D. Small, Cherokee, both of Iowa, assignors to Gomaco Corporation, Ida Grove, Iowa
Filed Mar. 18, 1991, Ser. No. 670,880
Int. Cl.[5] E01C *23/02, 11/24*
U.S. Cl. 404—88 **16 Claims**



1. A dowel bar inserting apparatus for the insertion of dowel bars at locations for transverse joints in a newly formed concrete road surface for attachment to a slip forming machine having a frame with means for propelling said frame in a forward direction, a dowel bar placement pan subframe operably connected to said frame, said placement pan subframe having a subframe longitudinal axis and extending generally transversely to the direction of forward movement of said frame, said subframe having a plurality of slots disposed therein along the length thereof, each of said slots also having a slot longitudinal axis which is generally parallel to said forward direction, the slot longitudinal axis of each slot being generally parallel to the slot longitudinal axis of each other respective slot, a trolley means for traveling back and forth across said subframe along said subframe longitudinal axis, means for storing a plurality of dowel bars in said trolley means, means for permitting said stored dowel bars to roll downwardly one behind another, dowel bar stopping means for stopping the lowermost one of said dowel bars in a predetermined position with respect to said trolley means, retainer means operably attached to said subframe and disposed in each of said slots for holding a respective dowel bar in each slot thereof prior to insertion of said dowel bars into said newly formed concrete road surface, the improvement comprising:
dowel bar extractor means operably attached to said subframe between each of said slots for moving said lowermost one of said dowel bars in primarily a horizontal direction from said predetermined position with respect to said trolley means whereby it can drop into one of said dowel bar holding means; and
means for guiding said lowermost dowel bar from said predetermined position to said respective dowel bar holding means after said lowermost dowel bar contacts said dowel bar extractor means.

5,190,398
APPARATUS FOR PREPARING A ROAD BED
George W. Swisher, Jr., 1500 Dorchester Dr., Oklahoma City, Okla. 73120
Filed Mar. 12, 1991, Ser. No. 667,914
Int. Cl.[5] E01C *23/12*
U.S. Cl. 404—90 **18 Claims**



1. An apparatus for preparing a road surface comprising:
a frame having a first end and a second end;
a plurality of independently steerable wheels retractable along an arced path, secured to the frame for supporting and moving the frame in a first direction with the first end leading, a second direction with the second end leading or in a direction oblique to the first or second direction; and
a rotatable drum having a plurality of teeth secured thereto carried by the frame, for pulverizing the surface while the frame is moving in either the first or second direction.

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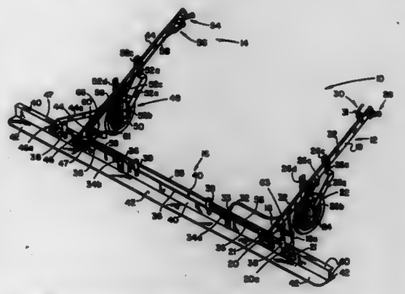
5,190,399
ROAD VEHICLE FOR THE SPREADING OF MATERIALS FOR REPAIR OF THE HIGHWAY, WITH INTEGRATED COMPACTOR
Michel Chappet, Maurepas, and Jean-Pierre Reymonet, Le Chesnay, both of France, assignors to Colas S.A., Boulogne-Billancourt Cedex, France
Filed Sep. 6, 1991, Ser. No. 755,769
Claims priority, application France, Oct. 30, 1990, 90 13475
Int. Cl.[5] E01C *23/12*
U.S. Cl. 404—102 **22 Claims**

1. A road vehicle for spreading of materials for repair of a highway, comprising:
a carrier chassis mounted on rolling elements having associated therewith;
a device for receiving material;
a device for transferring the material towards a component for spreading the material over the highway;
a component for spreading the material over the highway;
a tank for product for binding the material onto the highway;
a binding-product distribution bar positioned in front of the spreading component;
a motorization assembly;
a unit for driving the vehicle;
a front portion of said chassis being mounted on rolling elements;
hydraulic control and transmission means connecting said motorization assembly to said rolling elements and to said unit for driving the vehicle; and
a rear portion of said chassis being positioned in back of said component for spreading the material, said rear portion of said chassis being mounted on rollers or balls that are rotatable independently of said rolling elements connected to said motorization assembly and mounted on said front portion of the chassis, and said rear portion of said chassis having positioned thereon at least one of said motorization assembly, said tank, and said hydraulic control and transmission means, whereby weight of said at least one of said motorization assembly, said tank and said hydraulic control and transmission means is exerted on said rear portion of said chassis to form a compactor of materials spread over the highway.

5,190,400
SCREED SPREADER BOX AND COMPACTION ROLLER
Carl L. Sterner, 3860 Nord Rd., Bakersfield, Calif. 93312-9215
Continuation-in-part of Ser. No. 446,558, Dec. 5, 1989, Pat. No. 5,046,889. This application Sep. 9, 1991, Ser. No. 756,236
Int. Cl.[5] E01C *19/28*
U.S. Cl. 404—103 **16 Claims**

1. A spreading device for towing behind a traveling material mixer vehicle for applying a cold mixed paving material to a surface to be paved comprising:
(a) a frame of a width substantially equal to the width of said surface to be paved and having left and right sides:
(b) an auger rotationally attached to said frame spaced above and substantially parallel to said surface to be paved for distribution of said cold mix paving material in a layer across and along said surface to be paved;
(c) a rolling screed rotationally attached to said frame adjacent and substantially parallel to said auger means and spaced above said surface to be paved for spreading said cold mix paving material in a substantially flat layer across and along said surface to be paved;
(d) a compression roller attached for rotation to said frame adjacent to said rolling screed and substantially parallel thereto; and
(e) a pressure cylinder attached between said towing vehicle and said spreader box for applying pressure downwardly on said compaction roller while lifting upwardly on said towing vehicle.

5,190,401
WHEELED CONCRETE SCREED
Louis A. Wilson, R.R. 4, North Vernon, Ind. 47265
Filed Apr. 23, 1991, Ser. No. 690,117
Int. Cl.[5] E01C *19/22*
U.S. Cl. 404—118 **5 Claims**

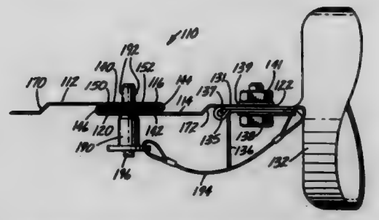


1. A wheeled concrete screed, comprising:
a strike board and blade assembly;
a pair of corresponding main handle members pivotally mounted to said strike board and blade assembly;
a pair of corresponding wheel assemblies affixed to and extending downwardly from said main handle members;
means to adjust the pitch of said strike board and blade assembly independent of changes in elevation of said strike board and blade assembly; and
means interposed between said strike board and blade assembly and each of said wheel assemblies that fill in wheel ruts created by said wheel assemblies as said wheel assemblies traverse wet concrete.

5,190,402
FIRE RESISTANT CONNECTOR FOR OIL CONTAINMENT BOOMS
Robert L. Vick, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 26, 1991, Ser. No. 798,653
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—70 **18 Claims**

1. A boom connector for connecting an end of a first buoyant oil containment boom to an end of a second buoyant oil containment boom and for providing an effective oil barrier to impede the leakage of oil between a first side of the booms and a second side of the booms, said boom connector comprising:

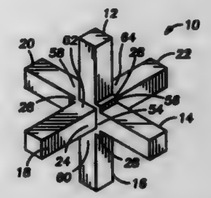
a) a first upright sheet metal connector portion adapted to withstand temperatures in excess of 600° C., and having
a base portion securable to the end of the first oil containment boom and projecting from the end;
an elbow portion extending from said base portion;
an engaging portion having a length extending from said elbow portion generally parallel to and adjacent said base portion; and
a slot bounded by said base portion, said elbow portion, and said engaging portion, said slot having a width, said length of said engaging portion substantially greater than said width of said slot;
b) a second upright sheet metal connector portion adapted to withstand temperatures in excess of 600° C., and having:
a base portion securable to the end of the second oil containment boom and projecting from the end;
an elbow portion extending from said base portion;



an engaging portion having a length extending from said elbow portion generally parallel to and adjacent said base portion; and
a slot bounded by said base portion, said elbow portion, and said engaging portion, said slot having a width, said length of said engaging portion substantially greater than said width of said slot;
so that said first connector portion may be interengaged with said second connector portion by positioning said engaging portion of said first connector portion within said slot of said second connector portion, and said engaging portion of said second connector portion within said slot of said first connector portion to connect the first oil containment boom to the second oil containment boom and to create a tortuous path to impede the passage of oil between said first and second connector portions; and
c) releasable means for preventing unintentional disengagement of said first connector member from said second connector member.

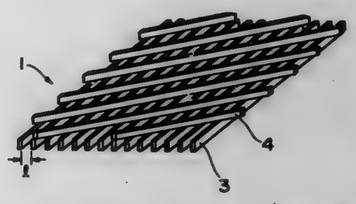
5,190,403
EROSION PROTECTION DEVICE
Francis S. Atkinson, Johns Island, S.C., assignor to Atkinson-McDougal Corporation, Philomath, Oreg.
Filed Jun. 7, 1991, Ser. No. 712,215
Int. Cl.[5] F02B *3/12*
U.S. Cl. 405—29 **10 Claims**

1. An interchangeable member for placement into a grid for protection of a water land interface, comprising:
a central core;
a plurality of legs radiating outward from said core, the intersection of said legs at said core forming an interstice;
a spacing means for spacing the member adjacent other members in the grid disposed at at least one interstice and



being formed of a raised portion of said legs at said interstice.

5,190,404
VERTICAL DRAINAGE DEVICE
Nobuo Kiyokawa, Bunkyo, and Jun Nishimura, Kuga, both of Japan, assignors to Mitsui Petrochemical Industrial Products Ltd. and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan
Filed Jun. 6, 1991, Ser. No. 711,319
Claims priority, application Japan, Jun. 6, 1990, 2-59807[U]; May 20, 1991, 3-35569[U]
Int. Cl.[5] E02B *11/00*
U.S. Cl. 405—45 **19 Claims**

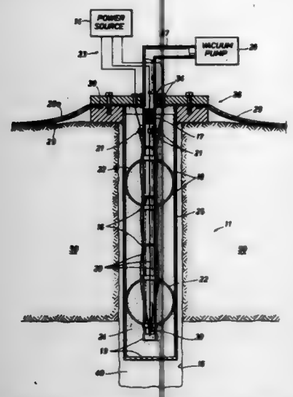


1. A vertical drainage device including a generally plate-like elongated conduit member formed of a synthetic resin and a non-woven fabric attached to said conduit member, said vertical drainage device being adapted to be embedded into soil in a vertical direction coincident with a longitudinal direction of said conduit member and adapted to suck up water existing in the soil;
said conduit member comprising a plurality of parallel vertical ribs extending in the longitudinal direction of said conduit member and a plurality of transverse ribs extending in a transverse direction of said conduit member for connecting said vertical ribs together;
wherein a spacing 1 between the adjacent ones of said vertical ribs is set to 0.5 mm–5 mm, so as to define a conduit space between the adjacent vertical ribs.

5,190,405
VACUUM METHOD FOR REMOVING SOIL CONTAMINANTS UTILIZING THERMAL CONDUCTION HEATING
Harold J. Vinegar; George L. Stegemeier; Eric P. de Rouffignac, and Charles C. Chou, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Dec. 14, 1990, Ser. No. 627,479
Int. Cl.[5] E02D *3/11*
U.S. Cl. 405—128 **11 Claims**

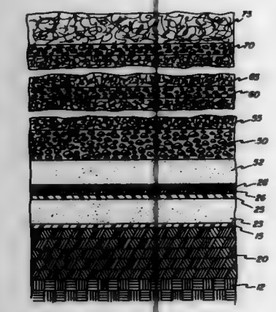
1. A method of remediating soil comprising the steps of:
emplacing a pattern of heater wells in the soil;
installing electrical heating elements in said heater wells;

pulling a vacuum through said heater wells;
applying electrical power to said electrical heating elements;



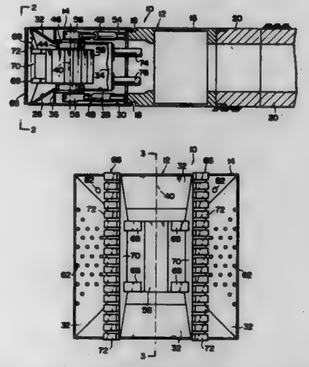
heating the soil by thermal conduction from said heater wells; and
decreasing the amount of contaminants in the soil.

5,190,406
CATIONIC TREATMENT LANDFILL
Hugh P. Shannonhouse, and Robert W. Styron, both of Marietta, Ga., assignors to Municipal Services Corp., Kennesaw, Ga.
Filed Dec. 13, 1991, Ser. No. 806,640
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—129 16 Claims



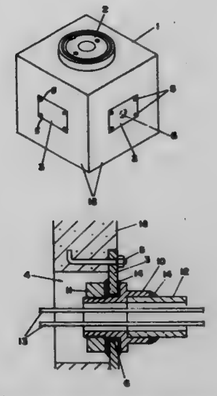
1. In a landfill cell for the containment of waste material defined at least in part by a depression in the ground, which depression is bounded by a leachate impervious means defining the bottom and the side walls of the cell, the improvement in the immobilization of heavy metals present in leachate from such waste material for the continuous long-term protection of underlying and contiguous ground aquifers, comprising:
a first leachate permeable layer of a natural cationic active material have a CEC value of at least 50 meq/100 g, said material extending in overlying relation to said liner means over said bottom and to said side walls and forming a base layer, a first overburden of such waste material positioned immediately above said base layer, the thickness of said base layer being sufficient to absorb and immobilize a major portion of the lead, cadmium, and mercury metal ion leachates from said overburden,
at least one additional said leachate permeable layer of said cationic active material positioned immediately above said first overburden, and
at least one additional said waste material overburden material positioned above said additional layer of cationic active material.
14. The method of long term storing of ash from the incineration of municipal solid waste in a landfill cell, comprising the steps of forming a water impervious liner at a bottom of such cell, covering said liner with a layer of cationic active material in the form of crushed lignite and applying to such material an overburden of said ash in a quantity which is related to the quantity of lignite such that the total cationic capacity of said lignite layer is sufficient to immobilize at least 100% of the heavy metal ions which are capable of being leached in said cell from said overburden.

5,190,407
RECTANGULAR SHIELD EXCAVATING MACHINE
Toshio Akesaka, Kanagawa, and Kazuto Hamada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Iseki Kaihatsu Koki and Penta-Ocean Construction Co. Ltd., both of Tokyo, Japan
Filed Jan. 6, 1992, Ser. No. 817,286
Claims priority, application Japan, Jan. 14, 1991, 3-069534
Int. Cl.[5] E21D *9/08*
U.S. Cl. 405—141 13 Claims



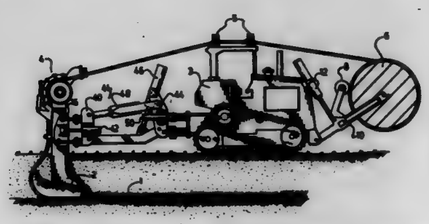
1. A rectangular shield excavating machine, comprising:
a quadrangularly tubular shield body having a front end, a rear end and a pair of facing exterior members, said body defining a space in said front end for receiving cuttings;
a rotor disposed in said space having an onward and backward angular rotation around an axis extending a direction parallel to said facing exterior members;
excavating means disposed in the front end of said body; and
drive means for rotating onward and backward said rotor angularly around said axis;
wherein said space includes a muck chamber for receiving said cuttings, said muck chamber shaped so that its dimension in a direction orthogonal to said axis is gradually decreased from the front end toward the rear end;
wherein at least one of said facing exterior members and said rotor include means for crushing large gravels contained in the cuttings and for feeding the cuttings further into said muck chamber toward the rear end of the body.

5,190,408
METHOD OF LAYING UNDERGROUND CABLES
Shotaro Ozeki, and Masakazu Kawanabe, both of Fukuoka, Japan, assignors to Saito Denki Sangyo Co., Ltd., Fukuoka, Japan
Filed Sep. 25, 1991, Ser. No. 765,578
Claims priority, application Japan, Sep. 27, 1990, 2-101990[U]
Int. Cl.[5] H02G *3/18*
U.S. Cl. 405—154 10 Claims



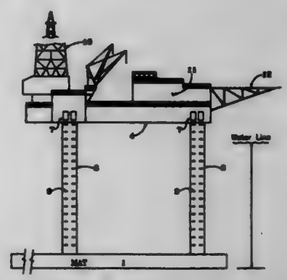
1. A method of laying underground cables in a distributing box comprising:
casting said distributing box out of concrete;
forming an opening in a wall of said distributing box;
recessing said opening thus forming a recessed area;
embedding fastening means in said wall within said recessed area;
forming a hole in a distributing adapter;
passing a bushing through said hole;
fixing said bushing with a nut so as to be supported on said adapter by a flange of said bushing;
said bushing having an un-threaded hole for fitting a cable duct into said bushing; and
attaching said distributing adapter with said fastening means over said opening and within said recessed area, wherein said underground cables are inserted in said cable duct.

5,190,409
BURIED CABLE REMOVAL APPARATUS
Ronald H. Hall, 161 Argyle Street, Embro, Ontario, Canada N0J 1J0
Filed Mar. 6, 1992, Ser. No. 846,715
Int. Cl.[5] F16L *1/00*
U.S. Cl. 405—154 4 Claims



1. Apparatus for the removal of cable buried in the ground, comprising a trenching plow blade suspended from a blade support assembly and means for pulling said blade support assembly to pull said blade through the ground above the cable, and mounted to said blade support assembly generally above the area of the blade, a cable-pulling assembly, said cable-pulling assembly comprising:
a pulling wheel rotatably mounted to said blade support assembly, and means for driving said wheel;
a plurality of rollers mounted between roller support arms, said roller support arms being connected to each other and pivotally mounted at one end to the blade support assembly;
a hydraulic cylinder mounted between said blade support assembly and said roller support arms, operable to move said roller support arms between an open position in which the cable may be inserted or removed between said rollers and said pulling wheel, and a closed position in which said rollers force the cable against said pulling wheel; whereby cable may be pulled from the ground behind said blade by said cable-pulling assembly as said blade is advanced through the ground.

5,190,410
CONVERSION OF MAT JACK-UP DRILLING PLATFORMS TO FLOATING DRILLING PLATFORMS
Dwight S. Nunley, 500 Oakwood Dr., Gretna, La. 70056
Continuation-in-part of Ser. No. 606,143, Oct. 31, 1990, abandoned. This application Oct. 11, 1991, Ser. No. 775,212
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—196 11 Claims

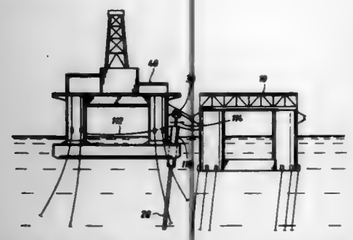


1. A floating drilling rig which is comprised of a platform which supports surface equipment comprising a derrick, living quarters, a helipad, and the like, which platform is welded to a floatable mat by a plurality of metal plates which are welded around the periphery of the lower outside side plating of said platform and to the top of said mat, which platform and mat were component parts of a bottom supported jack-up rig.

5,190,411
TENSION LEG WELL JACKET
David A. Haste, Spring; Lee K. Brasted, Kingwood, and George Rodenbush, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.
Continuation of Ser. No. 624,842, Dec. 10, 1990, abandoned. This application Jul. 24, 1992, Ser. No. 919,631
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—223.1 25 Claims

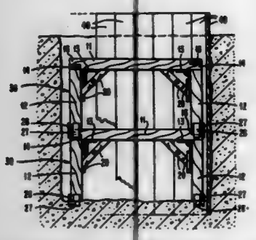
1. A tension leg well jacket for installation secured to an ocean floor, projecting above an ocean surface, and supporting a riser in communication with a well; said tension leg well jacket being adapted to receive support for well operations from an offshore drilling vessel, comprising:
a foundation secured to the ocean floor;
at least one elongated tendon attached at one end to the foundation;
a superstructure comprising a buoyant hull;
means for attaching the top of the tendon to the superstruc-

ture which is restrained thereby to float below its free-floating draft; and



a laterally accessible riser support mounted on the superstructure which is separate from the means for attaching the top of the tendon to the superstructure.

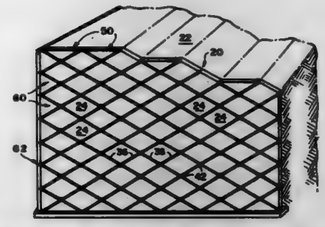
5,190,412
QUICK ASSEMBLY MODULAR FRAME
Philip A. Salvatore, Leonia, N.J., assignor to The Brooklyn Union Gas Company, Brooklyn, N.Y.
Filed Apr. 7, 1992, Ser. No. 864,642
Int. Cl.[5] E02D *17/08*
U.S. Cl. 405—272 14 Claims



1. A framing module for assembling the frame of a rectangular tower which comprises a horizontal wale having at one end a first tenon extending along the top of said wale and a first set-back along the bottom of said wale and having at the other end a second tenon extending along the bottom of said wale and a second set-back along the top of said wale, a vertical leg, a hinge connected to said wale with the hinge pin positioned along the edge of said first set-back and connected to said leg with said hinge pin positioned along the top end of said leg, and a locking brace extending diagonally from said wale to said leg to hold said wale at right angle to said leg and form a mortise between said first tenon and the top end of said leg.

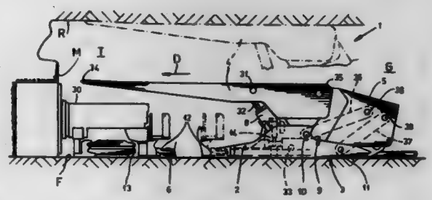
5,190,413
EARTHWORK SYSTEM
John M. Carey, Ashburn, Va., assignor to The Neel Company, Springfield, Va.
Filed Sep. 11, 1991, Ser. No. 757,901
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—286 14 Claims

1. An earthwork system comprising an earth retaining wall formed of modular panels, said modular panels including an apex angle with upper panel edges extending downwardly therefrom at an approximate angle of 120° to each other, and a base angle with lower panel edges extending upwardly therefrom at an approximate angle of 120°, said upper edges and said lower edges meeting at a pair of opposed side angles of approximately 60°, said panels being generally isometric grid with continuous joint lines between the stacked panels extending at approximately 30° to the horizontal in crossing relation to each other to define said isometric grid and to define lines of free movement generally corresponding to the natural shear planes of consolidating soil retained by said wall, said panel edges extending along corresponding edges of adjacent panels to



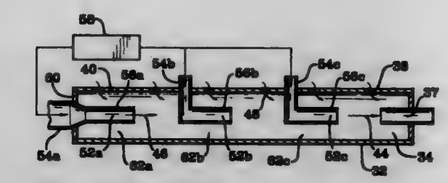
define said joint lines and for accommodating longitudinal relative movement between adjacent panels along said lines of free movement in response to soil consolidating whereby shear stress within the individual panels is minimized.

5,190,414
WALKING PROP FOR MINE TUNNELS
Hans-Ferdinand Bemmerl, Herne; Alois Scheunert, Recklinghausen; Peter Kröninger, Gelsenkirchen; Peter Rose, and Alfred Bollmann, both of Bochum, all of Fed. Rep. of Germany, assignors to Strebtechnik Bochum GmbH & Co., Bochum, Fed. Rep. of Germany
Filed Apr. 3, 1992, Ser. No. 863,562
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1991, 4110681
Int. Cl.[5] E21D *23/10*
U.S. Cl. 405—296 10 Claims



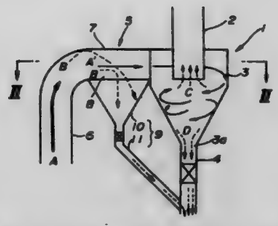
1. A walking prop for a mine, comprising:
a substantially horizontal skid having a horizontal surface adapted to ride along a floor of a mine tunnel;
at least one hydraulic ram on said skid;
a roof cap operatively connected to said ram and extending in a forward direction of advance of said walking prop from said ram and adapted to be braced against a roof of said tunnel;
a goaf-side shield rearwardly of said roof cap and articulated thereto;
a lever linkage connecting said shield to said skid and provided with forwardly disposed and goaf-side links;
a stepping mechanism for advancing said skid along said floor and including:
a guide-rod assembly having a pair of generally horizontal guide rods along which said skid is guided, and
a stepping piston-and-cylinder assembly braced between said guide-rod assembly and said skid for shifting said skid relative to said guide-rod assembly; and
a lifting piston-and-cylinder assembly acting upon said skid in a region of said ram and including:
a lifting bridge secured to laterally opposite sides of said yoke,
a pair of lifting cylinders having respective cylinder members and respective piston members, one of the members of each lifting cylinder being pivotally connected to and suspended from said lifting bridge, and
a pressure plate pivotally connected to another member of each of said lifting cylinders and formfittingly engaging around said guide rods to enable at least a forward end of said skid to be lifted from said floor by operation or said lifting cylinders for advance of said skid along said floor.

5,190,415
FLOW INDUCED FEED COLLECTOR AND TRANSPORTER APPARATUS
Girten O. Allerton, Mocksville, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Sep. 3, 1991, Ser. No. 754,509
Int. Cl.[5] B65G *53/58*
U.S. Cl. 406—118 9 Claims



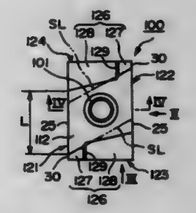
1. An apparatus comprising:
a tube having an inlet, an outlet, and an internal area;
suction means being in fluid communication with said outlet for inducing a flow through said tube;
a plurality of aperture means spaced along a wall of the tube for introducing a particulate material to the internal area; and
a plurality of flow boosting means, applied along the length of said tube between the inlet and the outlet, for maintaining the velocity of said flow throughout the length of said tube whereby said particulate material is conveyed a greater distance through said pipe than is possible without the flow boosting means.

5,190,416
METHOD FOR REDUCING PRESSURE LOSSES IN CYCLONE SEPARATOR AND DUCTING SYSTEM FOR CYCLONE SEPARATOR
Yasuhiro Nakagawa, Apple Valley, Calif., assignor to Mitsubishi Materials Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 613,316, Nov. 8, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 758,737
Int. Cl.[5] B65G *53/40, 53/60*
U.S. Cl. 406—155 2 Claims



1. A method for reducing pressure losses in a cyclone separator comprising introducing a gas entraining a particulate material into an entry duct connected to the cyclone separator, separating at least a portion of said particulate material through an entry opening formed in a bottom surface of a horizontally extending section of said entry duct in proximity to a junction point of said entry duct to the cyclone separator, and introducing the gas entraining said particulate material into the cyclone separator, a hopper being connected to said entry opening and said portion of said particulate matering being discharged by way of a discharge opening of said hopper, said discharge opening of said hopper being connected to a discharge duct of the cyclone separator for introducing said portion of said particulate material into said discharge duct, said horizontally extending section comprising a first horizontal portion having a width of said entry duct and a second horizontal portion extending narrowly from the first portion and connecting with said separator in a tangential direction thereof, said method further comprising separating at least said portion of said material through said entry opening having an area about equal to an area of a bottom surface of the first portion plus an area of a bottom surface of the second portion having at least one-third width of said width of the entry duct whereby the particulate material is prevented from being deposited and heaped in proximity to said junction point.

5,190,417
THROWAWAY INSERT
Tatsuo Arai, and Takayoshi Saito, both of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Nov. 26, 1991, Ser. No. 798,644
Claims priority, application Japan, Nov. 26, 1990, 2-124002[U]
Int. Cl.[5] B26D *1/12*
U.S. Cl. 407—40 5 Claims



1. A throwaway insert having a generally quadrilateral-shaped flat plate configuration, said insert comprising:
first and second generally quadrilateral-shaped major faces disposed parallel and opposite to each other;
a first pair of oppositely facing first and second side faces respectively extending between two opposite side margins of said first major face and two opposite side margins of said second major face;
a remaining second pair of oppositely facing third and fourth side faces respectively extending between remaining two side margins of said first major face and remaining two sided margins of said second major face;
major cutting edges, one each constituted along each of said respective intersections of each of said first and second major faces with each of said first and second side faces;
minor flanks, one each respectively constituted along each of said respective intersections of each of said first and second major faces with each of said third and fourth side faces, said minor flanks respectively extending between a pair of oppositely formed intersections of said first major face with said first and second side faces, and between a pair of said oppositely formed intersections of said second major face with the first and second side faces, where said intersection constitutes said major cutting edge;
minor cutting edges, one each respectively constituted along each of the intersections of one end of each of said minor flanks with either of said first and second side faces;
each of said minor flanks including a transition portion so as to form a multi-stage face of concave cross section includ-

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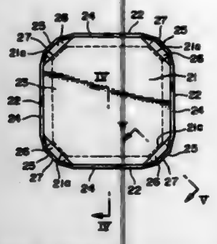
ing at least first and second face elements which adjacently follow on another and collectively extend from said one end to the other end of said minor flank so that an insert relief angle of said second face element is less than an insert relief angle of said first face element.

5,190,418
ROTARY CUTTER

Masaaki Nakayama; Masayuki Ozawa, and Junichi Saito, all of Iharaki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Mar. 25, 1992, Ser. No. 857,443
Claims priority, application Japan, Mar. 28, 1991, 3-27342
Int. Cl.[5] B23C *5/20*
U.S. Cl. 407—42 4 Claims



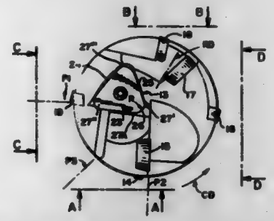
1. A rotary cutter comprising:
a cutter body having an axis of rotation therethrough; and
a cutting insert releasably secured to a forward end of said cutter body, said cutting insert having marginal ridges defining a main cutting edge and an auxiliary cutting edge, said main cutting edge being directed radially outwardly of said cutter body while said auxiliary cutting edge is directed axially forwardly of said cutter body;
said cutting insert having faces defining a first rake surface and a second rake surface, said first rake surface being disposed adjacent to said main and auxiliary cutting edges such that an axial rake angle is no less than +30°, said second rake surface being disposed between said first rake surface and said auxiliary cutting edge such that an angle, defined between said second rake surface and said axis of rotation of said body as viewed in a cross-section perpendicular to said auxiliary cutting edge, is no larger than +20°, said second rake surface being formed such that a distance, measured in a direction parallel to said first rake surface and defined between said auxiliary cutting edge and the intersection of said first rake surface with said second rake surface, is set so as to range from 0.5 mm to 1.5 mm.

5,190,419
BALL END MILL AND THROW AWAY INSERT FOR SUCH END MILL

Hans Lindberg, and Lars-Gunnar Wallström, both of Sandviken, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Jun. 19, 1991, Ser. No. 717,644
Claims priority, application Sweden, Jun. 19, 1990, 9002171
Int. Cl.[5] B23C *5/20*
U.S. Cl. 407—42 15 Claims

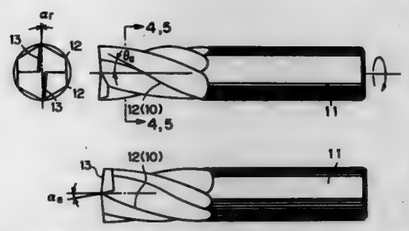
1. A ball nose end mill for metalworking, comprising a rotary body rotatable about a longitudinal axis thereof, a forward end surface of said body being of generally hemispherical shape and including a plurality of cavities; and a plurality of indexable cutting inserts mounted in respective ones of said cavities; a central one of said inserts being of substantially triangular shape and mounted closely adjacent said longitudinal axis; said central insert including a forwardly facing, substantially triangular top face and a plurality of edge faces intersecting one another to form three corner regions, and intersecting said top face to form therewith a plurality of main cutting edges; each of said main cutting edges being disposed between two of said corner regions and being convexly curved when viewed in a direction toward the respective edge face; said central insert being mounted such that one of said main cutting edges constitutes an active cutting edge positioned in a cutting orientation; one corner region of said central insert being situated at an end of said active cutting edge and is located immediately adjacent said axis; said plurality of cutting inserts including additional inserts of generally rectangular shape; each of said additional cutting inserts including a circumferentially facing, generally rectangular top face and a plurality of edge faces intersecting said last-named top face to form therewith a plurality of cutting edges; each of said additional inserts being arranged such that one cutting edge thereof constitutes an active cutting edge positioned in a cutting orientation; said plurality of additional inserts including first and second additional inserts whose cutting edges are convexly curved when viewed in a direction toward their respective top faces; said first and second additional inserts having their active cutting edges disposed on opposite sides of said axis and lying generally in a first plane which contains said axis.



5,190,420
SOLID END MILL FOR FINISHING THE FACE OR SIDE OF HARD WORK

Kiyoshi Kishimoto, and Shigeyasu Yodoshi, both of Osaka, Japan, assignors to Hitachi Tool Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 501,670, Mar. 29, 1990, abandoned.
This application Jan. 31, 1992, Ser. No. 830,505
Claims priority, application Japan, Jun. 20, 1989, 1-157499
Int. Cl.[5] B26D *1/12*
U.S. Cl. 407—54 7 Claims

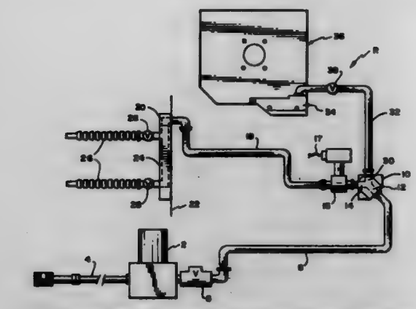


1. A solid end mill for finishing the face or side of hard work comprising a shank, a plurality of helix cutting edges on the periphery of said end mill, and a cross-section of the end mill which is perpendicular to a longitudinal axis of said end mill is of a polygonal like shape in cross-section with three or more angles, said polygonal like shape having adjacent sides of said polygonal like shape forming vertexes, said polygonal like shape selected from the group consisting of a regular hexagonal and a regular octagonal shape, said cutting edges being formed at each vertex of said polygonal like shape along the longitudinal axis of said end mill and being circumscribed by an imaginary cylinder, and said end mill further being characterized in that a direction of the helix of said cutting edges about said longitudinal axis of said end mill is identical to the rotational direction of said end mill.

5,190,421
COOLANT SUPPLY SYSTEM FOR A MACHINE TOOL

Jiaxuan Wen, Horseheads; Jack F. Sheehan; Terrence M. Sheehan, both of Elmira, all of N.Y., and Gary L. Comstock, Gillett, Pa., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Nov. 20, 1991, Ser. No. 794,918
Int. Cl.[5] B23Q *11/10*
U.S. Cl. 408—56 26 Claims

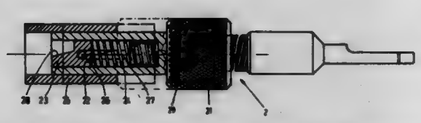


1. A coolant supply system for a machine tool, comprising:
a) a coolant source;
b) first means for directing coolant to the inside of a workpiece from said coolant source;
c) second means for directing coolant to outside of the workpiece from said coolant source; and
d) an electrically actuated valve for automatically selectively directing coolant only to the inside of the workpiece, thereby increasing coolant flow to the inside of the workpiece when needed.

5,190,422
DEVICE FOR THE QUICK FASTENING OF A TOOL INTENDED TO BE DRIVEN IN ROTATION

André Léchot, Orvin, Switzerland, assignor to Precifar S.A., La Chaux-de-Fonds, Switzerland

Filed May 28, 1991, Ser. No. 706,231
Claims priority, application Switzerland, Jun. 18, 1990, 2016/90
Int. Cl.[5] B23B *31/107*
U.S. Cl. 408—239 R 6 Claims

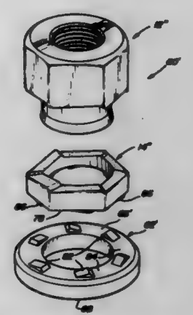


1. A device for quick fastening of a tool to drive means, comprising
a first part having a cylindrical base for connecting to the tool, said base having an external thread; and
a second part securable to the drive means, said second part including:
a first hollow cylindrical component having an internal thread for cooperating with the external thread of said base of said first part for receiving said base in said first component,
a second component slidable within said first component and engageable with said base to prevent base rotation relative to said second component, and
hand-actuatable means including a ring member slidable over said first component for translationally moving said second component within said first component and for preventing rotation of said second component relative to said first component.

5,190,423
LOCKING FASTENER

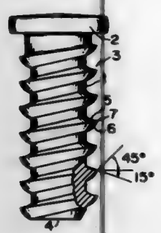
Paul E. Ewing, 32005 Alameda, Farmington Hills, Mich. 48336

Filed Feb. 15, 1991, Ser. No. 656,569
Int. Cl.[5] F16B *39/00*
U.S. Cl. 411—134 8 Claims



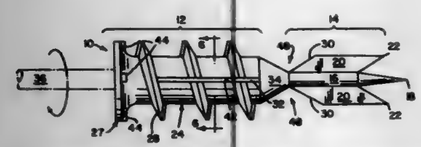
1. In a locking threaded fastener of the type comprising a threaded shank with threads advancing axially of the shank in a tightening direction from an outer end to an inner end, and a nut assemblage including a first nut member having a through-hole for a clearance fit with the threaded shank and including a second nut member with a threaded hole for threaded engagement with the threaded shank, the second nut member being disposed nearer the outer end of the threaded shank than the first nut member whereby a workpiece surface may be disposed between the first nut member and the inner end of the threaded shank, said nut assemblage also including means for coupling the first and second nut members together for rotation together when the second nut member is rotated in the tightening direction and wedge means for wedging the first and second nut member axially apart in response to rotation of the second nut member relative to the shank in the loosening direction, the wedge means having a wedge angle which is greater than the angle of the threads whereby such rotation causes the threads to jam and inhibit loosening of the second nut member, the improvement in said nut assemblage including:
a third nut member having a through-hole for a clearance fit with said threaded shank and being disposed with the first nut member between it and the second nut member,
a flat inner surface on the third nut member for engaging the workpiece,
a flat outer surface on the third nut member and a flat inner surface on the first nut member for engagement with the flat outer surface on the third nut member,
said wedge means having engaging surfaces with a coefficient of friction less than the coefficient of friction between the flat outer surface on the third nut member and the flat inner surface on the first nut member, the last mentioned coefficient being less than that between the flat inner surface of the third nut and workpiece.

5,190,424
BOLT FOR USE WITH RESIN CLIPS
Hiroshi Kozino, Komaki, and Muneyuki Onogi, Kakamigahara, both of Japan, assignors to K.K. Aoyama Seisakusho, Nagoya, Japan
Filed Dec. 4, 1991, Ser. No. 802,298
Claims priority, application Japan, Jun. 7, 1989, 1-66329[U]
Int. Cl.[5] F16B *37/06, 35/00*
U.S. Cl. 411—171 3 Claims



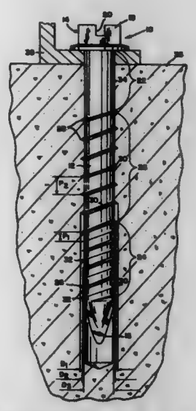
1. A stud bolt, comprising:
a stud welding portion;
a shank portion, attached to the stud welding portion; and
screw threads formed on the shank,
wherein the screw threads have a convex, curved surface facing away from the stud welding portion, and a concave, curved surface facing toward the stud welding portion, such that the convex and concave surfaces converge and meet to form a single common thread crest.

5,190,425
ANCHOR
Alicia Wieder, Willowbrook, and Ralph D. Tenuta, Mt. Prospect, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Oct. 21, 1991, Ser. No. 780,011
Int. Cl.[5] F16B *25/00*
U.S. Cl. 411—387 20 Claims



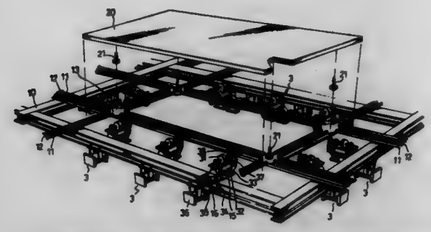
1. A self-drilling anchor for insertion into a workpiece so as to secure an element to said workpiece, comprising:
a drilling portion comprising a pair of oppositely disposed blade means having a substantially parallelogram configuration including forwardly extending inclined drill point means for drilling a bore of a predetermined diameter within a workpiece;
a threaded portion including a generally cylindrical body having a diameter which is substantially the same as said diameter of said bore, and thread means formed upon said body for tapping said bore so as to secure said anchor within said workpiece; and
a section, having portions of substantially less diameter than said diameter of said bore and joining said drilling and threaded portions together, and comprising a tapered portion formed upon a forward portion of said cylindrical body and rearwardly extending inclined portions of said parallelogram configured blade means, for receiving particulate matter dislodged from said workpiece as a result of said drilling of said bore and for discharging said particulate matter from said bore, thereby preventing accumulation of said particulate matter within said bore so as not to impede insertion of said anchor within said workpiece.

5,190,426
CONCRETE FASTENER
Alicia Wieder, Willowbrook; Ralph D. Tenuta, Mt. Prospect, and Martin J. Nilsen, Hampshire, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Mar. 2, 1992, Ser. No. 844,201
Int. Cl.[5] F16B *35/04*
U.S. Cl. 411—412 18 Claims



1. A fastener for threadedly tapping a bore, defined within a substrate and having a predetermined diameter, so as to secure a member to said substrate, comprising:
a cylindrical shank having a constant diameter, with a head portion defined upon one end of said cylindrical shank and a tapered point defined upon an opposite end of said cylindrical shank;
a first thread of uniform pitch extending along the length of said cylindrical shank from said tapered point toward said head portion for a predetermined axial length; and
a second thread of uniform pitch extending along said cylindrical shank from said tapered point to a point which is substantially midway of said predetermined axial length of said first thread so as to define with said first thread a first threaded stage;
said second thread having a diameter which is slightly greater than said predetermined diameter of said bore of said substrate so as to engage sidewall portions of said bore of said substrate and thereby center and stabilize said cylindrical shank of said fastener as said second thread also begins to tap said bore of said substrate, and said first thread has a diameter which is greater than said diameter of said second thread so as to finalize said tapping of said bore of said substrate, the portion of said first thread extending beyond the termination of said second thread at said midway point of said first thread defining a second threaded stage serving to accommodate particulate matter dislodged from said sidewall portions of said bore of said substrate during said tapping process so as to permit said fastener to be fully driven into tapped engagement within said bore of said substrate without jamming of said fastener due to said dislodged particulate matter.

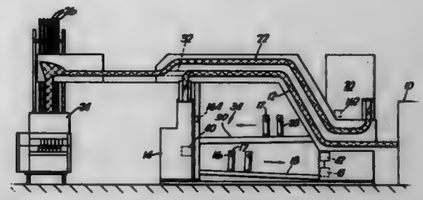
5,190,427
COMPUTER-CONTROLLED BLOCK TO BLOCK SHIFTING TYPE MULTI-FLOOR MULTI-BLOCK EQUIPMENT CONVEYING AND STORAGE SYSTEM
Nelson Lai, Taipei, Taiwan, assignor to Necer International Co., Ltd., Taipei, Taiwan
Filed Oct. 2, 1991, Ser. No. 769,646
Int. Cl.[5] E04H *6/24*
U.S. Cl. 414—278 3 Claims



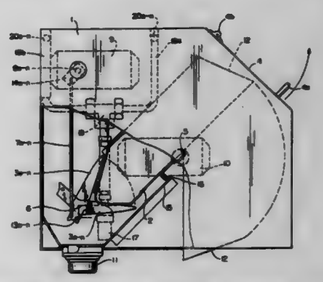
1. A multi-floor, multi-block equipment conveying and storage system, said system comprising:
a multi-floor steel framework made of H-beam steel, each floor of said framework being divided into a plurality of equal blocks longitudinally and latitudinally aligned, said equal blocks being formed into a plurality of equal storage units for storing storage items,
a lifting gear access unit located centrally with respect to each floor for the passing therethrough of a lifting gear through a center of each floor, said lifting gear being controlled to move from floor to floor,
said storage units and said lifting gear each having a plurality of driving mechanisms mounted on the steel H-beams therein and separately controlled to move separate carrier plates from block to block in a straight direction and permitting a designated carrier plate in any floor to be moved to the lifting gear access unit of a same floor for delivery to any other floor by said lifting gear,
said driving mechanisms being respectively mounted on the steel H-beams around each storage unit, and a bottom framework of a driving mechanism including a rubber wheel coupled to a gear on an output shaft of a motor by a chain and driven by said motor to carry a carrier plate, two adjusting levers and two cranks respectively connected between said motor and two bearing blocks on each steel H-beam, and a cylinder connected to said two cranks by a link to move said link alternatively back and forth causing said rubber wheels to be moved upwards for supporting the carrier plate thereon and to be moved downwards and disconnected from the carrier plate thereon.

5,190,428
CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES
Leonard J. Bryant; Peter A. Clarke, both of High Wycombe; Wilfred B. Heginbotham, Beeston; Keith K. Martin, and James McLeod, both of High Wycombe, all of England, assignors to Molins Machine Company, Inc., Richmond, Va.
Continuation of Ser. No. 19,211, Feb. 25, 1987, abandoned. This application Feb. 6, 1990, Ser. No. 475,987
Claims priority, application United Kingdom, Feb. 25, 1986, 8604663; Apr. 10, 1986, 8608739; Sep. 3, 1986, 8621267
Int. Cl.[5] B65G *47/00*
U.S. Cl. 414—403 37 Claims

1. In a system for conveying rod-like articles of the tobacco industry between a delivery device and a receiving device which processes said articles, a container conveying system comprising means for unloading rod-like articles from containers for delivery of said articles to said receiving device, at least one container conveyor for conveying containers loaded with rod-like articles towards said unloading means, at least one device positioned in proximity to said container conveyor for receiving from at least one of a container carried by said container conveyor and the articles therein coded information relating to a physical characteristic other than a generic name of the articles carried in the container, means responsive to said one device for determining whether said coded information agrees with predetermined information relating to a physical characteristic which identifies predetermined articles, and control means responsive to said determining means for controlling said container conveyor so that only containers carrying said predetermined articles identified by coded information agreeing with said predetermined information are passed to said unloading means for delivery of articles to said receiving device, whereby said receiving device receives only said predetermined articles to be processed by that receiving device.



5,190,429
ARRANGEMENT FOR THE OPENING OF RIGID, COLLAPSIBLE CASINGS OR OF FLEXIBLE BAGS
Jan Harlegard, Therwil, Switzerland, assignor to S I C AG, Basel, Switzerland
Filed Jul. 11, 1991, Ser. No. 728,614
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1990, 4022276
Int. Cl.[5] B65B *69/00;* B65F *7/00;* A61G *9/00*
U.S. Cl. 414—412 8 Claims



1. An arrangement for the opening, emptying and disposing of liquid containing rigid collapsible enclosures or flexible bags comprising:
(a) a housing (1) having a rotary basket (2) for receiving enclosures or bags, said rotary basket being located in a center of the housing, said housing being accessible through an opening flap (4) which is movably supported by a hinge (46) said flap being openable and closeable by a grip (4*a*);
(b) a plurality of parallel, horizontally fixed knives (3*a–n*) and a plurality of parallel at an angle upwardly and inwardly located movable knives (3*a–n*) disposed in a lower portion of said housing on a first rotary axle (6) such that the movable and the fixed knives cooperate to open and close in a scissors-like manner;
(c) a plurality of pull rods (7*a–n*) which are engaged below

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with levers (13*a*–*n*) of the parallel at an angle upwardly and inwardly located movable knives and above with levers (14*a*–*n*) which are fastened to a second rotary axle (8*a*–*n*) which is guided by a first outer support (8*a*) and a first motor bearing (8*b*), said second rotary axle being pivoted by a first motor (9) such that through this movement, the movable knives and the fixed knives open and close in a scissors-like manner which causes the movable knives to penetrate through parallel slits in the rotary basket and cut the collapsible enclosure or the flexible bag located inside the rotary basket which in turn allows a liquid contained in the collapsible enclosure or the flexible bag to flow off into a discharge (11);

(d) a second motor (10) having a third rotary axle (5) guided by a second outer support (5*a*) and a second motor bearing (5*b*), said rotary basket being attached to the third rotary axle and through the second motor rotated forwardly to such an extent that an opening (12) in the rotary basket is pivoted over a receiving through (15) having a lip seal (16) such that the substantially empty enclosure or bag located within the rotary basket, without any external contact, can slide out of the rotary basket and the housing and thereafter said rotary basket can be rotated in a reverse direction by the second motor into its initial position for a renewed insertion of a liquid-filled enclosure or bag.

5,190,430

APPARATUS FOR FEEDING PACKAGING MACHINES WITH STACKS OF SHEET MATERIAL

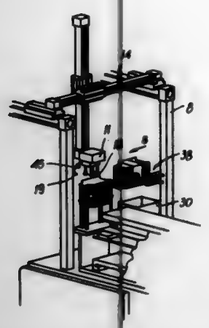
Armando Neri, Bologna, and Mario Turra, Casalecchio Di Reno, both of Italy, assignors to G. D. S.p.A., Bologna, Italy

Filed Jul. 27, 1990, Ser. No. 558,550

Claims priority, application Italy, Aug. 1, 1989, 3575 A/89; May 8, 1990, 3484 A/90

Int. Cl.[5] **B72D** *7/02*; **B65B** *69/00*

U.S. Cl. 414—412 **12 Claims**



1. Apparatus for feeding stacks of sheet material to packaging machines, comprising:

means for supporting the stacks arranged side by side, said stacks being individually wrapped by respective wrapping bands;

a fixed framework;

a unit for removing and transferring said stacks, said unit being mounted on said framework for movement relative thereto;

a head mounted on said unit for gripping said stacks, said head being movable along three orthogonal axes, said head being transferable along a path, said stacks being thereby transferable along said path;

a cutting station comprising means for cutting said wrapping bands; and

a feeding station for guiding and feeding said stacks to said packaging machines, said path along which said head is transferable extending from said means for supporting said stacks to said cutting station and then to said feeding station, said means for supporting said stacks, said cutting station, and said feeding station being located within an area defined by said fixed framework; wherein said cutting station is arranged in said path along which said stacks are transferable, so that said wrapping bands are cuttable by said means for cutting when said stacks are transferred along said path.

5,190,431

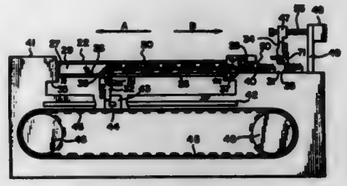
SEPARATION AND TRANSFER APPARATUS

Mark W. King; Thomas E. Toth; Stephen R. Lamb; Steven D. Swendrowski, all of San Diego, Calif.; Kazuyuki Tsurishima, and Mitsuaki Tani, both of Saitama, Japan, assignors to Sym-Tek Systems, Inc. and Advantest Corp.

Filed Jul. 3, 1991, Ser. No. 725,354

Int. Cl.[5] **B65G** *65/02*

U.S. Cl. 414—417 **12 Claims**



1. A separation and transfer apparatus for use in connection with an electronic device test system for removing electronic devices from a device magazine and transferring said electronic devices in horizontal direction, comprising:

a housing which holds said device magazine in a predetermined position, said housing includes a plate having a same plane as that of an inner floor of said device magazine;

an air blower which blows compressed air at said electronic devices through a slit of said device magazine so that said electronic devices move in one direction on a horizontal plane, said air blower continuously moves from one end of said device magazine to the other end of said device magazine while blowing said compressed air;

a piston pin which ejects a pin and inserts said pin into a space made between a last electronic device in said device magazine and said other end of said device magazine, said piston pin pushes an end of said last electronic device so that said electronic devices are taken out from said device magazine; and

a driver which is connected with said air blower and said piston pin so as to change a horizontal position of said air blower and said piston pin.

5,190,432

DUMP TRUCK STONE SLINGER

Leonard Gerow, 36 Jackson Dr., N. Sydney, Cape Breton, N.S. B2A 3M6, Canada

Filed Sep. 24, 1991, Ser. No. 764,522

Int. Cl.[5] **B60P** *1/36*

U.S. Cl. 414—489 **12 Claims**

1. A material delivery attachment for a vehicle having a wheeled, elongated chassis, a dump body pivotally connected to said chassis, means for pivotally moving said dump body between a lowered travelled position and an elevated dump position, and movable gate means in said dump body, said attachment means comprising:

swing arm means for pivotal connection at a first end thereof to said chassis;

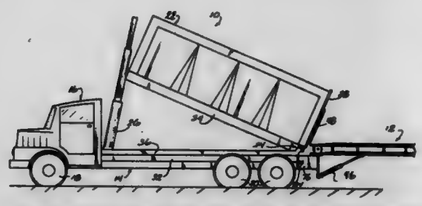
elongated frame means pivotally connected at one end thereof to a second end of said swing arm means;

means for independently moving said swing arm means and said frame means about a respective pivot axis to move said frame means from or to a stowed position adjacent said chassis to or from a working position extending away from said vehicle, said frame means carrying independently operable conveyor means and drive means therefor for moving material discharged from said dump body through said gate means to a desired location remote from said vehicle adjacent the other end of said frame means;

a generally vertically extending bushing at said second end of said swing arm means;

a shaft receivable in said bushing;

a large diameter first sprocket and a yoke member connected to an upper end of said shaft with said frame means being pivotally mounted within said yoke member;



a small diameter second sprocket connected below a lower edge of said swing arm means to a shaft of a first motor means mounted on said swing arm means;

an intermediate diameter third sprocket connected to a lower end a vertically extending idler shaft bearingly mounted on said swing arm means;

a first chain member drivingly interconnecting said second and third sprockets;

a small diameter fourth sprocket connected to an upper end of said idler shaft; and

a second chain member drivingly interconnecting said fourth and first sprockets.

5,190,433

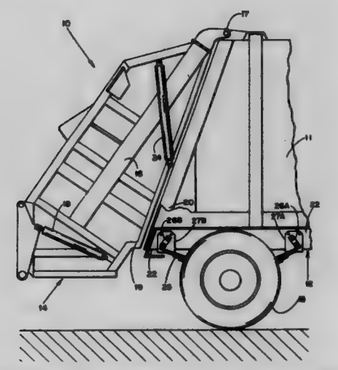
STRUCTURE FOR CENTER OF GRAVITY ENHANCEMENT FOR REAR LOADING COMPACTOR

Robert A. Boda, Ooltewah, Tenn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Filed Sep. 5, 1991, Ser. No. 755,313

Int. Cl.[5] **B65F** *3/00*

U.S. Cl. 414—525.1 **3 Claims**



1. In a rear loading, compactor type refuse truck body having a tailgate and a continuous lower rear transfer brace member having spaced upper and lower horizontal flanges spaced by front and rear spaced webs, the webs disposed to form an acute angle with the vertical thereby forming a composite crossection generally in a shape of a tubular parallelogram having a height and width sufficient to support the tailgate, the truck body further being designed to be accommodated on a truck chassis having a pair of spaced, substantially parallel horizontal longitudinal main chassis members having a height greater than that of the continuous transfer brace and having rearward directed ends which abut the front web of the continuous transfer brace and thereby space the frame for an opening closed by the tailgate from rear wheels, the improvement comprising a central recess in the lower transfer brace member which accommodates rearward directed ends of the spaced longitudinal main chassis members and allows them to abut the rear web of the lower rear transfer brace member without loss of continuity of support to thereby allow the frame for the opening closed by the tailgate to be moved forward and mounted closer to the rearward directed ends of the main chassis members.

5,190,434

ARTICLE SUPPLIER

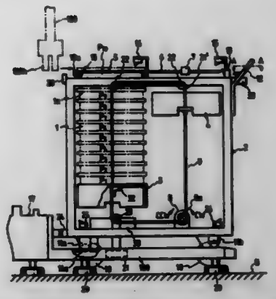
Toshihiko Miura, and Sachio Umetsu, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 493,437, Mar. 14, 1990, abandoned. This application Feb. 6, 1992, Ser. No. 830,488

Claims priority, application Japan, Mar. 14, 1989, 1-059607; Mar. 15, 1989, 1-061028; Feb. 16, 1990, 2-35277; Feb. 17, 1990, 2-36721

Int. Cl.[5] **B65G** *60/00*

U.S. Cl. 414—609 **2 Claims**



1. An apparatus for supplying articles, comprising:

first elevator means for raising and lowering at least one pallet loaded with articles;

second elevator means for raising and lowering at least one empty pallet;

driving means for driving said first and second elevator means, said driving means including a reversible motor for simultaneously driving said first and second elevator means in opposite directions;

first holding means for supporting a pallet raised by said first elevator means at a supply position;

second holding means for supporting an empty pallet to be lowered by said second elevator means;

first detecting means for detecting the presence of a pallet supported on said first holding means and outputting a signal;

second detecting means for detecting the presence of an empty pallet on said second holding means and outputting a signal;

third detector means for detecting if said second elevator can be lowered and outputting a signal;

transferring means for transferring an empty pallet on said first holding means to said second holding means; and

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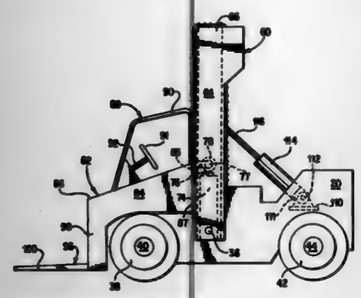
supplying means for supplying the pallet on said first elevator to said first holding means, said supplying means driving said first elevator means upwardly toward said first holding means on the basis of output signals from said second and third detecting means in a first operation, and driving said first elevator means downwardly on the basis of an output signal from said first detecting means in a second operation.

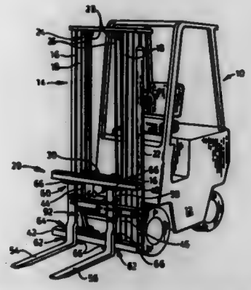
5,190,435
FORK LIFT TRUCK
Irving Epstein, Mercer Island, Wash., assignor to Washington Chain and Supply, Inc., Seattle, Wash.
Filed Nov. 29, 1988, Ser. No. 277,252
Int. Cl.[5] B66F *9/14*
U.S. Cl. 414—635 21 Claims



1. A fork lift truck comprising:
a. a frame;
b. an upright pedestal operatively connecting with said frame;
c. an operator's station operatively connecting with said pedestal:
d. forks operatively connecting with said pedestal:
e. said operator's station being positioned between said forks and said pedestal to give an operator visibility unobstructed by said pedestal:
f. a first means operatively connecting with said operator's station and said forks to change the elevation of said operator's station and said forks;
g. a second means operatively connecting with said fork lift truck and said pedestal to rotate said pedestal away from a vertical position; and,
h. a third means operatively connecting with said fork lift truck for movement of said fork lift truck in any direction on the ground.

5,190,436
CARRIAGE ASSEMBLY HAVING SIDE SHIFTABLE AND ADJUSTABLE FORKS
Kjell Sorlie, Tonsberg, Norway, assignor to Caterpillar Industrial Inc., Mentor, Ohio
Filed Jan. 6, 1991, Ser. No. 710,850
Int. Cl.[5] B66F *9/14*
U.S. Cl. 414—667 8 Claims

1. A carriage assembly for a lift mast, comprising:
a carriage frame having a first elongated guide and a flange defining a front surface;
first and second load engaging forks each having a rear surface and being connected to the first elongated guide, said forks each being movable along the first elongated guide in directions transversely of the lift mast;
a carrier disposed in an area between the rear surface of the forks and the surface of the carriage frame and being movably connected to the carriage frame;
means for movably connecting said carrier to said carriage frame and guiding said carrier for movement in said transverse directions, said connecting means including first and second rails connected to the carriage frame at elevationally spaced apart locations, said first and second rails being substantially parallel to each other and to the first elongated guide, and first and second slide members connected to the carrier and slidably engaged with the first and second rails, said first rail including a cylindrical rod having first and second spaced apart end portions and first and second brackets connected to said cylindrical rod at said first and second rod end portions and to said flange, said second rail including an elongated rectangular shaped rod connected to the flange, said first slide member including a tubular sleeve disposed about the cylindrical rod, and said second slide member including a block having a notch disposed therein, said second-rail being disposed in the notch;
a first jack being positioned in the area between the rear surface of the forks and the surface of the carriage frame

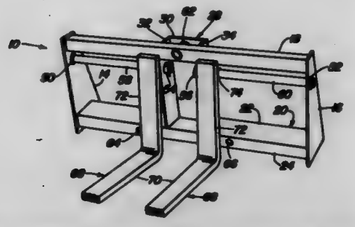


and being connected to and between the first fork and the carrier, said first jack being extensibly movable and said first fork being movable along said first elongated guide in response to extensible movement of said first jack;
a second jack being positioned in the area between the rear surface of the forks and the surface of the carriage frame and being connected to and between the second fork and the carrier, said second jack being extensibly movable and said second fork being movable along said first elongated guide in response to extensible movement of said second jack;
a third jack being positioned in the area between the rear surface of the forks and the surface of the carriage frame and being connected to and between the carrier and the carriage frame, said third jack being extensibly movable and said first and second forks being shiftable in unison along said first elongated guide in response to extensible movement of said third jack.

5,190,437
MULTIPURPOSE LOADER ATTACHMENT FRAME AND COMPONENTS THEREFOR
Robert N. Perry, Welland, Canada, assignor to Deere & Company, Moline, Ill.
Filed Jan. 9, 1992, Ser. No. 819,165
Int. Cl.[5] B66C *1/00*
U.S. Cl. 414—722 13 Claims

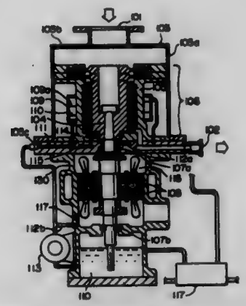
1. A tractor-mounted loader attachment frame adapted for having first and second sets of different types of tines optionally mounted thereto comprising: a one-piece welded frame including upper and lower horizontal cross members extending between and joined to opposite parallel end plates making right angles with the cross members; an upright member located centrally between said end plates and extending between and being joined to said cross members; a first set of tine attaching bushings being integrally embodied in the opposite end plates and the upright member at respective locations adjacent to and

below said upper cross member and being aligned with each other along an axis extending parallel to the upper cross member; and a second set of tine attaching bushings including a horizontal upper bushing extending perpendicular to and being carried by said upper cross member at a location midway between opposite ends thereof and first and second lower bushings oriented in parallel relationship to the upper bushing and being carried by the lower cross member at respective



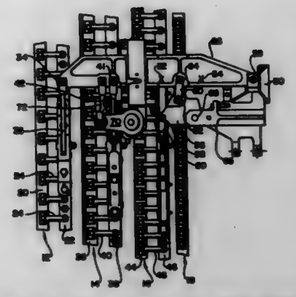
locations at opposite sides of said upright member and equidistant from said upper bushing, whereby said first set of tine attaching bushings are adapted for optionally receiving a tine support rod means on which is received a set of fork lift tines to thus form a fork lift attachment, and said second set of tine attaching bushings are adapted for optionally receiving the rear ends of spear-like tines to thus form a bale fork attachment.

5,190,438
VACUUM PUMP
Minoru Tsuiyama, Ibaraki; Masahiro Mase, Tochigi; Kazuaki Nakamori, Ibaraki, and Takashi Nagaoka, Tsukuba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 8, 1991, Ser. No. 682,265
Claims priority, application Japan, Apr. 6, 1990, 2-090344; Apr. 25, 1990, 2-107596
Int. Cl.[5] F04D *29/58*
U.S. Cl. 415—90 8 Claims



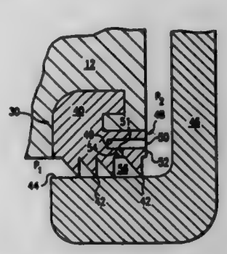
1. In a vacuum pump for suctioning gas containing aluminum chloride ($AlCl_3$), compressing the gas to have a pressure substantially equal to or close to atmospheric pressure, and therafter exhausting the compressed gas,
the improvement wherein a cooling jacket is provided for cooling a conduit, and a cooling liquid having a thermal conductivity less than a thermal conductivity of water flows through said cooling jacket to cool the conduit while maintaining a temperature inside the conduit higher than a sublimation temperature of the aluminum chloride.

5,190,439
VARIABLE VANE NON-LINEAR SCHEDULE FOR A GAS TURBINE ENGINE
Ranjan Das, Hobe Sound, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jul. 15, 1991, Ser. No. 731,213
Int. Cl.[5] F01D *17/16*
U.S. Cl. 415—149.4 3 Claims



1. In a method for operating a gas turbine engine having a compressor section with a plurality of rows of variable angle stator vanes, including a variable angle IGV vane row, wherein the angle of said IGV vane row is changed as a function of engine speed, and the angle of at least one other vane row is changed as a linear function of the angle of said IGV vane row, the improvement wherein the angle of a third vance row is varied as a non-linear function of the angle of said IGV vane row, said non-linear function being approximately linear at higher engine speeds and having greater than said linear variation at engine start and idle speeds and wherein said engine has a fourth row of stator vanes following said third vane row, and wherein the angle of said forth row is maintained constant for all engine speeds.

5,190,440
SWIRL CONTROL LABYRINTH SEAL
Martin D. Maier, Olean, N.Y., and Colin Osborne, Norwich, Vt., assignors to Dresser-Rand Company, Corning, N.Y.
Filed Mar. 11, 1991, Ser. No. 667,768
Int. Cl.[5] F01D *11/02*
U.S. Cl. 415—174.5 53 Claims



1. An apparatus comprising a housing, a rotatable shaft positioned in said housing, a low pressure chamber in said housing for containing a fluid at a low pressure, a high pressure chamber in said housing for containing said fluid at a high pressure, said rotatable shaft constituting a rotatable element, an annular labyrinth seal element positioned coaxially with said rotatable shaft and between a rotatable element and said housing, said annular labyrinth seal element having a plurality of annular teeth facing a radially adjacent surface, said annular labyrinth seal element having a first annular end exposed to

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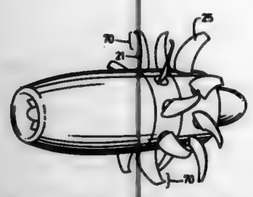
said high pressure chamber and a second annular end exposed to said low pressure chamber, said annular teeth being spaced along the longitudinal length of the annular labyrinth seal element between said first and second annular ends, said annular teeth extending radially into sealing relationship with said radially adjacent surface such that a portion of said fluid passes from said high pressure chamber at said first annular end through the annular space between said annular teeth and said radially adjacent surface to said low pressure chamber at said second annular end with the rotation of said rotatable shaft tending to cause a circumferential flow of said portion of said fluid as said portion of said fluid passes through said annular space, a first plurality of flow bypass passageways, each of said first plurality of flow bypass passageways being stationary and extending from a predetermined opening in said high pressure chamber to a respective one of a first plurality of openings located in an annular chamber formed between a predetermined adjacent pair of said annular teeth, said first plurality of openings being spaced at least substantially uniformly about the circumference of said annular chamber, wherein the flow resistance from said high pressure chamber through said first plurality of flow bypass passageways to said annular chamber is substantially less than the flow resistance through the portion of said annular space from said first annular end to said annular chamber, thereby reducing the circumferential flow of said portion of said fluid passing from said high pressure chamber through said annular space to said low pressure chamber.

5,190,441

NOISE REDUCTION IN AIRCRAFT PROPELLERS

Guy C. Murphy, Fairfield, Ohio; Bruce J. Gordon, N. Reading, Mass.; Leroy H. Smith, Jr., Cincinnati, Ohio; Jan C. Schilling, Middletown, Ohio, and Alan R. Stuart, Cincinnati, Ohio, assignors to General Electric Company

Filed Aug. 13, 1990, Ser. No. 566,203
Int. Cl.[5] B64C *11/48*
U.S. Cl. 416—129 9 Claims



1. An aircraft propeller system, comprising:

a) forward and aft counterrotating propellers, each including a plurality of blades having curved leading edges, wherein said forward propeller blade leading edges are approximately mirror images of said aft propeller blade leading edges, except in the tip regions;

b) a tip region on each of said forward propeller blades which has cahedral.

5,190,442

ELECTRONIC PUMPCONTROL SYSTEM

Johannes N. Jorritsma, 37 Yonge Street N., Aurora, Ontario, Canada L4G 1N6

Filed Sep. 6, 1991, Ser. No. 755,646
Int. Cl.[5] F04B *41/06*
U.S. Cl. 417—7 22 Claims

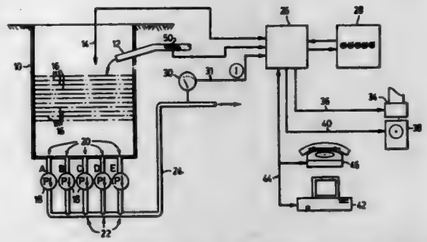
1. In a pumping system which includes a container for liquid, an inlet for the inflow of liquid entering the container, means for ascertaining the liquid level in said container and for generating a first signal corresponding to the current level, a plurality of pumps each having an inlet communicating with the interior of the container and an outlet communicating with a common conduit for liquid being pumped out of the container, and a pump controller for receiving said first signal and for starting and stopping individual pumps,

the improvement comprising:

pressure sensing means in said conduit for sensing the backpressure against which pumps in operation are pumping and for generating a second signal corresponding to said sensed backpressure, the pump controller receiving said second signal,

the provision, operatively connected to the pump controller, of an addressable memory for storing values corresponding to pumping rates vs. backpressure for each of said pumps, along with high and low backpressure values for each pump, and

processor means operatively connected to the pump controller, the processor means being programmed such that:



(a) on high backpressure, the pump controller avoids pumpstarts which will not result in a net increase in the total pumping rate;

(b) on a decrease in backpressure, the pump controller allows more pumps to start when called for, and allows for the starting of more pumps than the minimum necessary, in order to decrease the duration of pumping;

(c) the pump controller avoids a pumpstart under conditions which, given the stored high and low backpressure values for the respective pump, would result in the pump undergoing rapid on/off cycling;

(d) the pump controller avoids the starting and stopping of pumps on pressure surges, by delaying any action for a given time period longer than the duration of a typical pressure surge.

5,190,443

HYDROPNEUMATIC CONSTANT PRESSURE DEVICE

Osvaldo Valdes, Las Lavandulas 10168, Las Condes, Santiago, Chile

Filed May 30, 1991, Ser. No. 706,599
Claims priority, application Argentina, Jun. 1, 1990, 317005
Int. Cl.[5] F04B *49/02, 49/06, 49/08*
U.S. Cl. 417—38 11 Claims

1. A constant pressure hydropneumatic arrangement for automatically controlling the starting and stopping an electrical pump that supplies the demand for a fluid with various consumption, said hydropneumatic arrangement comprising:

a flow sensor device for detecting variation in demand for consumption including a sensor piston disposed facing an outlet of the pump;

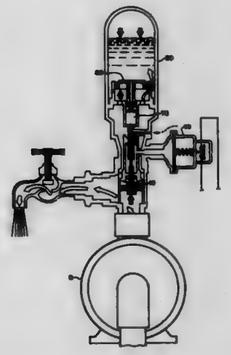
a driving cylinder cooperating with said sensor piston, said driving piston communicating with fluid pressure;

a pressure transfer chamber, said driving cylinder disposed within said pressure transfer chamber, said pressure transfer chamber communicating to the fluid pressure by means of said driving piston and communicating from the fluid pressure only when said driving piston is at a point of maximum displacement;

a pressure control switch being coupled to said pressure transfer chamber and being electrically connected to the pump; and

a hydropneumatic tank including:

an air-injection pump having an actuating piston being coupled to said hydropneumatic tank and connected to outside air;



a fluid flow regulator for regulating the flow of fluid from said hydropneumatic tank; and

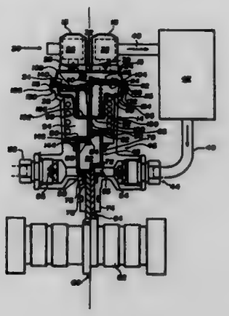
a fluid transfer device for transferring fluid towards said hydropneumatic tank.

5,190,444

TANDEM FUEL PUMP ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

James J. Grinsteiner, Union, and David B. Meisner, Carol Stream, both of Ill., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Aug. 21, 1991, Ser. No. 748,121
Int. Cl.[5] F04B *23/08*
U.S. Cl. 417—199.1 19 Claims



1. A tandem fuel pump assembly for an internal combustion engine comprising:

a housing having a cavity which accommodates two pumping elements therein, said housing including a first fuel pathway therethrough including a first chamber having an inlet thereto from a source of fuel and a pumping outlet therefrom, and a second fuel pathway therethrough including a second chamber having an inlet thereto and an outlet therefrom adapted to feed an engine injection system, said pumping outlet from said first chamber feeding pressurized fuel to said inlet to said second chamber;

a first movable pumping element disposed in said housing and partially defining said first chamber for filling and evacuating said first chamber;

a second movable pumping element disposed in said housing and partially defining said second chamber for filling and evacuating said second chamber, said first and second pumping elements being biased by first and second springs disposed within said housing respectively between each pumping element and said housing, said first and second pumping elements being mechanically connected to one another through a lost motion connection permitting said first pumping element to have a shorter stroke than the stroke of said second pumping element; and

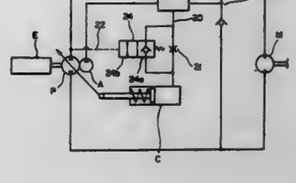
actuating means for operating said second pumping element to cause operation of both pumping elements against the action of said biasing springs.

5,190,445

VARIABLE CAPACITY PUMP CONTROLLER OF HYDRAULICALLY DRIVEN WHEEL

Masanori Ikuri, Kawagoe, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho and Komatsu Mec Kabushiki Kaisha, both of Tokyo, Japan

PCT No. PCT/JP90/00499, § 371 Date Oct. 17, 1991, § 102(e) Date Oct. 17, 1991, PCT Pub. No. WO90/13762, PCT Pub. Date Nov. 15, 1990
PCT Filed Apr. 17, 1990, Ser. No. 773,661
Claims priority, application Japan, Apr. 28, 1989, 1-107403
Int. Cl.[5] F04B *49/08*
U.S. Cl. 417—218 4 Claims



1. A control system for a variable capacity pump in a hydrostatic drive for a vehicle, comprising:

a main hydraulic circuit having said variable capacity hydraulic pump therein;

a pilot hydraulic circuit having a variable capacity control cylinder connected to said variable capacity hydraulic pump for controlling the pumping capacity of said variable capacity hydraulic pump, said pilot hydraulic circuit having a throttle valve and a pilot-operated check valve connected in parallel with said throttle valve, said throttle valve and said pilot-operated check valve being connected to said variable capacity control cylinder for controlling the operation speed of said variable capacity control cylinder, and means for operating said pilot-operated check valve in response to the pressure of the hydraulic fluid in said main hydraulic circuit so as to discharge hydraulic fluid from said variable capacity control cylinder when the pressure of the hydraulic fluid in said main hydraulic circuit is high.

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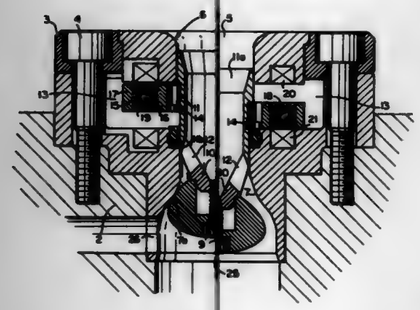
5,190,446

PUMP CONTROL METHOD AND POPPET VALVE THEREFOR

Stephen H. Salter, East Lothian, and William H. S. Rampen, Edinburgh, both of Scotland, assignors to The University Court of the University of Edinburgh, Edinburgh, Scotland

PCT No. PCT/GB89/01146, § 371 Date Mar. 25, 1991, § 102(e) Date Mar. 25, 1991, PCT Pub. No. WO90/03519, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 28, 1989, Ser. No. 671,827
Claims priority, application United Kingdom, Sep. 29, 1988, 8822901
Int. Cl.[5] F04B *49/04, 49/06*
U.S. Cl. 417—297 16 Claims



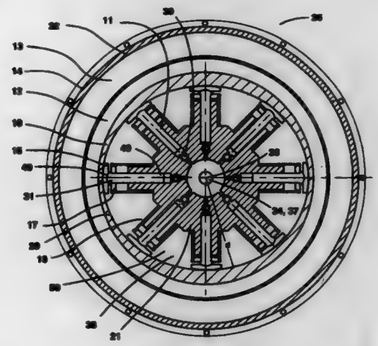
1. A method of controlling the displacement of a reciprocating fluid pump connected to a high pressure duct and having a plurality of pumping chambers each of which has an inlet valve with a valve member movable to an open limit condition to admit low pressure fluid to the chamber on an inlet stroke of the pump, and movable to a closed limit condition to prevent fluid again flowing past the valve member and for a displacement volume of fluid to be ejected at high output pressure from the chamber into the high pressure duct on a discharge stroke of the pump, and electromagnetic means to control the movement of the valve members between limit conditions, characterised in that each valve member is a poppet valve and in that the electromagnetic means comprises a solenoid coil fixedly mounted in a casing of the valve and a magnet on the poppet valve coacting with the coil to move the valve into at least one of its limit conditions on electrical energisation of the coil, and in that electrical energisation of the solenoid coil is controlled by a microprocessor unit in response to output displacement volume of fluid ejected from the pump, which energisation of the solenoid coil is used to move the valve member to its closed limit condition, de-energisation allowing the valve member to move under the influence of fluid flow-induced forces into its open limit condition, which method further includes the step of programming the microprocessor unit to enable or disable the next chamber to pump on the basis of the difference between a running account of the displacement volume demanded and the actual previous displacement volume of the pump, the decisions being projected forward in time so as to move the inlet valve of the next chamber to pump to its closed condition at the at the commencement of a discharge stroke in that chamber if the actual previous displacement volume requires the volume contribution of that chamber to meet the displacement volume demanded.

5,190,447

HYDRAULIC PUMP WITH INTEGRAL ELECTRIC MOTOR

William E. Schneider, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1992, Ser. No. 855,827
Int. Cl.[5] F04B *27/08, 35/04*
U.S. Cl. 417—356 5 Claims



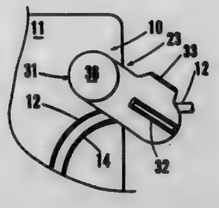
1. An integrated pumping mechanism, comprising:
an electric motor having an external stator and an internal rotor; and
Said rotor having a geometric axis of rotation, an aperature defining a radially inwardly facing cam surface which surrounds said axis, an inlet cam plate having an axially inwardly facing inlet cam surface, and an outlet cam plate having an axially inwardly facing outlet cam surface which is opposed said axially inwardly facing inlet cam surface;
A pump having a fixed central member, a plurality of coplanar pistons which are coupled with said fixed central member, and a plurality of parallel spool valves which are coupled with said fixed central member and are perpendicular to said pistons and parallel to said axis;
said fixed central member being concentric with said axis and having an inlet port and an outlet port;
each said piston having a radially inner end and a radially outer end, radially outwardly extending from said fixed member, and slidably and reciprocatingly engaging said radially inwardly facing cam surface of said aperture of said rotor at said radially outer end of said piston;
each said spool valve having an inlet end and an outlet end, being located adjacent to said radially inner end of one said piston, communicating with said inlet port and said outlet port, and slidably and reciprocatingly engaging said axially inwardly facing inlet cam surface at said inlet end of said spool valve and said axially inwardly facing outlet cam surface at said outlet end of said spool valve;
said axially inwardly facing inlet cam surface having sinuosity with respect to the geometric plane defined by said pistons;
said axially inwardly facing outlet cam surface having sinuosity with respect to the geometric plane defined by said pistons which is complementary with respect to said sinuosity of said axially inwardly facing inlet cam surface;
whereby said engagements of said pistons with said radially inwardly facing cam surface of said aperture of said rotor coordinate with said engagements of said spool valves with said axially inwardly facing inlet cam surface and said axially inwardly facing outlet cam surface.

5,190,448

TUBE PLACEMENT AND RETENTION MEMBER

John A. Lane, Watertown; Frederick C. Deno, Brownville, and Frederick F. Schweitzer, Jr., Watertown, all of N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jul. 12, 1991, Ser. No. 730,184
Int. Cl.[5] F04B *43/08*
U.S. Cl. 417—474 14 Claims



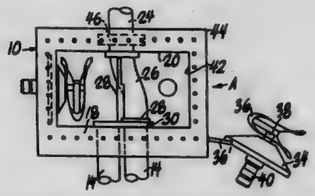
1. A retention means for assisting in placing and locking a medical tube within a retention slot formed in an assembly, said retention means comprising:
means for retaining the tube in the slot, said means for retaining including an elongate arm being movable relative to the retention slot from a first position wherein the tube is positionable with the retention slot, to a second position wherein at least a portion of said means for retaining the tube covers at least a portion of the slot;
means for moving the tube within the slot in response to movement of said means for retaining the tube between said first position and said second position; and
means for mounting said retention means adjacent the retention slot said means for moving the tube including a tab member extending from said elongate arm for contacting the tube within the slot.

5,190,449

MATERIAL FEED TANK FOR SLUDGE PUMPS

Rolf Dose, Filderstadt; Hellmut Hurr, Reutlingen, and Hartmut Benckert, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Fed. Rep. of Germany

PCT No. PCT/EP89/00274, § 371 Date Oct. 17, 1990, § 102(e) Date Oct. 17, 1990, PCT Pub. No. WO89/10486, PCT Pub. Date Nov. 2, 1989
PCT Filed Mar. 15, 1989, Ser. No. 598,602
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813758
Int. Cl.[5] F04B *15/02*
U.S. Cl. 417—517 25 Claims



10. A feed tank as defined in claim 1, wherein
the feed tank has a substantially rectangular configuration, such that the front and rear walls are oriented substantially parallel relative to each other, and the first and second side walls are each oriented substantially perpendicular relative to the front and rear walls.

5,190,450

GEAR PUMP FOR HIGH VISCOSITY MATERIALS

Syamal K. Ghosh, Rochester; William A. Cox, Scottsville; Larry H. Bowerman, Canandaigua, and David P. Stokloss, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 6, 1992, Ser. No. 847,257
Int. Cl.[5] F01C *21/02*
U.S. Cl. 418—189 10 Claims

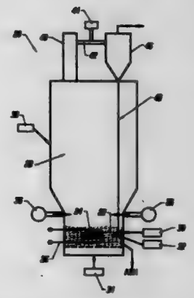
1. A pump for materials having a viscosity up to about 3.0×10^5 centipoise (cps), said pump comprising:
a) a pump body formed with a gear receiving means, said pump body having an inlet end and a discharge end;
b) a pair of intermeshing gears arranged in said gear receiving means between said inlet end and said discharge end;
c) a pair of side plates having bearing receiving means, said side plates being mounted to said pump body to close said gear receiving means;
d) plain bearing means press fitted in the bearing receiving means;
e) a pair of shafts rotatably supported in said bearing means, said gears being mounted on said shafts and said shafts and said bearing means forming a bearing/shaft assembly; and,
f) means formed in said side plates for relieving into the discharge end only the pressure build-up in the intermesh of said gears as said material is pumped towards the discharge end of said pump body to reduce the load on said bearing/shaft assembly.

5,190,451

EMISSION CONTROL FLUID BED REACTOR

Gerhardt O. Goldbach, San Jose, Calif., assignor to Combustion Power Company, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 672,067, Mar. 18, 1991. This application Feb. 6, 1992, Ser. No. 831,884
Int. Cl.[5] F23D *14/00*
U.S. Cl. 431—5 14 Claims



1. A fluidized bed reactor comprising:
a central chamber;
means for receiving an externally fed gas from a discrete

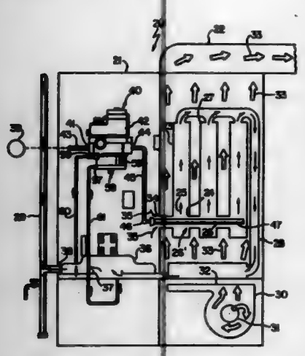
industrial process, said receiving means being coupled to said central chamber to convey said gas to said chamber, said gas containing contaminants;
means for circulating particulate matter within said central chamber;
means for producing an operating temperature of at least 1,500° F. within said central chamber; and
means for maintaining a freeboard oxygen level of not more than 4% in said central chamber, said producing means and said maintaining means facilitating chemical reactions between said gas and said circulating particulate matter to reduce said contaminants in said gas.

5,190,452

HEAT EXCHANGER CONTROL SYSTEM, CONTROL VALVE DEVICE THEREFOR AND METHODS OF MAKING THE SAME

Jay R. Ketchka, Cypress, and Habil M. Haddad, Santa Ana, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 27, 1992, Ser. No. 874,722
Int. Cl.[5] F23N *1/00*
U.S. Cl. 431—12 20 Claims



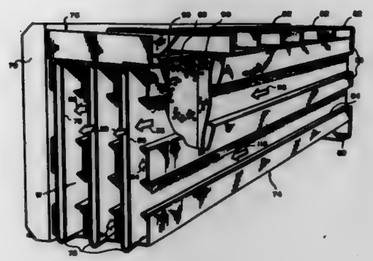
1. In a heat exchanger control system comprising a source of fuel, a burner means for being interconnected to said source of fuel for issuing said fuel therein for burning at said burner means, means for supplying combustion air to said burner means to aid in said burning of said fuel that issues therefrom, electrically operated control valve means operatively interconnected to said burner means and said source of fuel for interconnecting said source of fuel to said burner means when said electrically operated control valve means is in a first operating condition thereof and for disconnecting said source of fuel from said burner means when said electrically operated control valve means is in a second operating condition thereof, and a differential pressure operated electrical switch means operatively interconnected to said electrically operated control valve means to tend to cause said electrically operated control valve means to be in said first condition thereof when said differential pressure operated electrical switch means is in a first condition thereof and to tend to cause said electrically operated control valve means to be in said second condition thereof when said differential pressure operated electrical switch means is in a second condition thereof, said differential pressure operated electrical switch means being operatively interconnected to said means for supplying combustion air and being adapted to be operated thereby from said second condition thereof to said first condition thereof only when the pressure value of said air being supplied to said burner means is at or above a predetermined value whereby sufficient combustion air will be supplied to said burner means before said electrically operated control valve means causes fuel to issue from said burner means, said electrically operated control valve means comprising a housing means, the improvement wherein said differential pressure operated switches means is carried by said housing means so as to be self-contained with said electrically operated control valve means.

5,190,453

STAGED COMBUSTOR

John O. Le, Yorba Linda; Charles L. Stone, Corona, and Myron L. Tapper, Placentia, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Mar. 1, 1991, Ser. No. 663,215
Int. Cl.[5] F23D *21/00*
U.S. Cl. 431—170 9 Claims



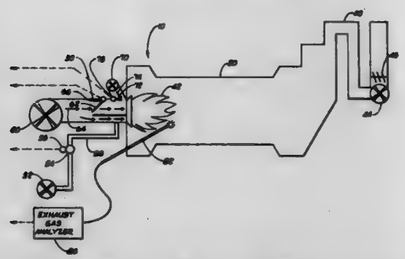
1. A staged combustor, comprising:
a housing;
a first combustion stage contained within said housing for combusting a fuel rich mixture of a fuel and an oxidizer;
a plurality of serially positioned secondary combustion stages contained within said housing and located downstream said first stage each of said plurality of secondary combustion stages includes means for receiving secondary flows of said oxidizer to the mass of combustion efflux produced from the first combustion stage, the gradual increase of oxidizer/fuel ratios providing a resultant substantially stiochiometric combustion, said combustion stages being compriaed of a plurality of combustor cartridges, each cartridge having said plurality of serially disposed catalyst bed compartments for promoting combustion in a controlled manner, a first of said catalyst bed compartments providing said first combustion stage, said fuel being H_2 and said oxidizer being O_2; and,
means for cooling said combustion stages comprising coolant passageways formed by spaces between said cartridges,
said housing including:
steam inlet means at a forward end thereof for the introduction of a flow of coolant steam to said coolant passageways;
oxidizer inlet means for introducing oxidizer to said plurality of combustor cartridges;
fuel inlet means for introducing fuel to said plurality of first catalyst bed compartments; and,
an outlet at an aft end for discharging a combined flow of combustion products and coolant steam.

5,190,454

ELECTRONIC COMBUSTION CONTROL SYSTEM

Stuart W. Murray, Edmond, and Kenneth D. Corby, Del City, both of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Jul. 15, 1991, Ser. No. 731,080
Int. Cl.[5] F27B *7/00*
U.S. Cl. 432—103 9 Claims
MICROFICHE APPENDIX INCLUDED
(15 Microfiche, 1 Pages)



1. A method of achieving improved combustion in a hot mix asphalt plant having a drum, a burner and adjustable air flow to combustion of the burner, the steps of the method comprising:
(a) calibrating the burner, the steps of calibrating the burner comprising:
(1) selecting a plurality of fuel positions for the burner;
(2) inserting an exhaust gas analyzer probe into the drum proximate to combustion of the burner, the exhaust gas analyzer probe being connected to an exhaust gas analyzer to provide an analysis of the constituents of the combustion products of the burner;
(3) varying the air flow to the combustion of the burner for a plurality of air settings at each fuel position of the burner; and
(4) determining an optimal air setting for each fuel position of the burner by comparing the analysis of the constituents of the combustion products for each air setting for each fuel position; and
(b) controlling the air flow to the combustion of the burner during operation of the plant to produce asphalt, the steps of controlling air flow comprising:
(1) monitoring the fuel position of the burner for changes in the selected fuel position; and
(2) adjusting the air flow to the combustion of the burner to the optimal air setting for the selected fuel position of the burner in response to the changes in the selected fuel position.

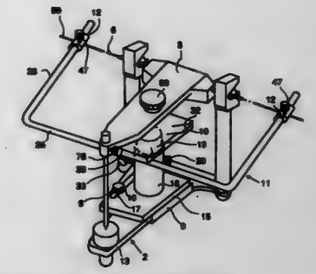
5,190,455

ARTICULATOR APPARATUS

Hans Schreiber, Mierendorffstrasse 2, 6940 Weinheim, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,152
Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816820; May 26, 1988, 3817867
Int. Cl.[5] A61C *11/00*
U.S. Cl. 433—54 35 Claims

1. A method for synchronizing a hinge axis and centric relation-block of unequally constructed articulators, to facilitate the exchange of jaw models, comprising the steps of:
(a) loosenably fixing identical first split cast plates in each of the unequally constructed articulators for synchronization of an articulator upper jaw arm to a specific mounting plate via a connecting medium in each of the unequally constructed articulators;
(b) forming a concurring relation with respect to the hinge axis starting from a starting articulator having a position of each of the first split cast plates 1 which are optimally related to the hinge axis;
(c) horizontally and vertically adjusting the hinge axis of the unequally constructed articulators to be synchronized; and



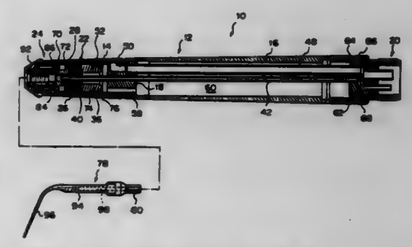
(d) synchronizing the unequally constructed articulators by providing an identical spatial relation of second split cast plates using a centric relation block to form a correct connection with a lower jaw mounting plate of each of the unequally constructed articulators via the connecting medium.

5,190,456

AIR-DRIVEN DENTAL SCALER

Akiro Hasegawa, Tokyo, Japan, assignor to Micron Co., Ltd., Japan

Continuation of Ser. No. 370,120, Jun. 23, 1989, abandoned, which is a continuation of Ser. No. 99,385, Sep. 18, 1987, abandoned. This application May 26, 1992, Ser. No. 887,660
Claims priority, application European Pat. Off., Sep. 26, 1986, 86113258.7
Int. Cl.[5] A61C *1/07*
U.S. Cl. 433—120 26 Claims



1. An air-driven dental scaler comprising:
a tubular casing adapted to be held by an operator and having a proximal end and a distal end, a scaling tool disposed adjacent said distal end of the casing, an air-driven vibrator received in said casing and resilient support means for supporting said vibrator within said casing and for isolating the casing from the vibration induced by said vibrators,
said air-driven vibrator comprising a housing defining a cylindrical chamber having a pair of opposite end faces, a vibration generating element loosely held within said chamber, and means for passing fluid through said chamber to cause said element to alternately strike said end faces to thereby generate vibration, said chamber being axially aligned with the longitudinal axis of said casing, the axial length of said chamber being less than its diameter; and
said vibrator being positioned immediately adjacent said

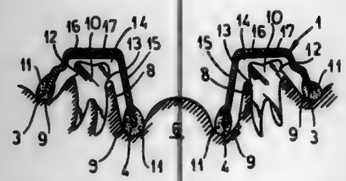
distal end and vibrationally coupled to said scaling tool in a vibration transmitting relationship thereto, said vibrator and said scaling tool as coupled together being vibrationally isolated from said casing so that the vibration generated in said vibrator by the striking action of said element is transmitted to the scaling tool more in an acoustic vibration mode than in a flexural vibration mode.

5,190,457

METHOD FOR MAKING AN IMPRESSION OF A DENTATE HUMAN JAW

Josephus Schreinemakers, Oranje Nassaulaan 12, NL-60 26 BX Maarheeze, Netherlands

Filed May 15, 1992, Ser. No. 884,750
Claims priority, application Fed. Rep. of Germany, May 17, 1991, 4116109; Jan. 31, 1992, 4202676
Int. Cl.[5] A61C *9/00*
U.S. Cl. 433—214 14 Claims



1. A method of taking an impression of a human patient's jaw having
a hard U-shaped dental arch,
a mobile mucosa and a stationary mucosa to each side of the arch,
a linear action boundary between the mucosae, and
at least one tooth projecting from the arch, with an imperforate tray forming a U-shaped recess and having an endless edge extending all around the recess, the method comprising the steps of sequentially:
a) applying substantially only along the entire edge of the tray a bead of a high-viscosity impression material;
b) fitting the tray with the bead of high-viscosity impression material to the jaw with the U-shaped recess engaging over the arch and the bead on the edge engaging and being deformed by the mobile mucosa outward of the linear action boundary
c) curing the deformed bead of high-viscosity material and thereby forming the tray and the cured bead of high-viscosity material into a custom tray;
d) filling the custom tray with a body of a low-viscosity impression material;
e) pressing the filled custom tray over the patient's dental arch to press the cured bead on the tray edge into tight engagement against the mobile mucosa outward of the linear action boundary to form between the tray and the dental arch a substantially closed and generally constant-section chamber hydraulically confining the low-viscosity impression material;
f) compressing the confined low-viscosity material in the chamber against the dental arch by pressing the tray toward the arch while mobilizing the mobile mucosa to hydraulically press the confined material into form-fit engagement with the stationary mucosa and tooth and without substantial leakage of the impression material from the chamber;
g) curing the low-viscosity impression material; and
h) stripping the custom tray with the low-viscosity material from the jaw.

5,190,458

CHARACTER ASSESSMENT METHOD

Valma R. Driessner, 13 Augusta Street, Maylands, Australia 5069

Filed Apr. 17, 1991, Ser. No. 686,475
Claims priority, application Australia, Apr. 17, 1990, PJ9621
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—236 9 Claims

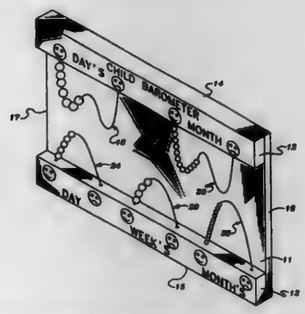
1. A method of psychological testing of a person, comprising:
(a) instructing the person to produce a drawing which includes at least one pictorial representation of each of at least a majority of the following items: a hand, an eye, a tree, a fish, a star, a spiral; a half-circle, and a zig-zag; and
(b) subjecting to psychological interpretation the drawing produced in response to step (a).

5,190,459

CHILD'S BEHAVIORAL CALENDAR APPARATUS

Jeffery B. Determan, 17290 County Rd. #291, Nathrop, Colo. 81236

Filed Jan. 13, 1992, Ser. No. 819,979
Int. Cl.[5] G09B *19/00*; G06C *1/00*
U.S. Cl. 434—238 1 Claim



1. A child's behavioral calendar apparatus, comprising in combination,
a support plate, the support plate including a top edge spaced from and parallel a bottom edge, and a right side spaced from and parallel a left side,
and
an upper housing in contiguous communication with the top edge extending coextensively between the right side and the left side,
and

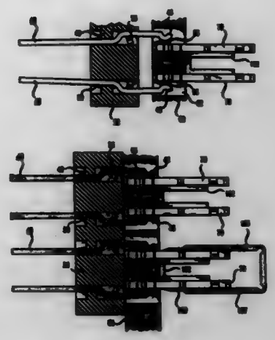
a lower housing in contiguous communication with the bottom edge extending coextensively between the right side and the left side, wherein the upper housing is spaced from and parallel the lower housing,
and
a first inverted "U" shaped loop mounted to the lower housing between the lower housing and the upper housing adjacent the support plate, wherein the first loop includes a first end and second end mounted to the lower housing, and includes a plurality of first loop spheres slidably receiving the first loop therethrough, wherein the first loop spheres are displaceable from the first loop to indicate a number of a child's misbehavioral activities per day,
and
a second "W" shaped support loop mounted to the upper housing extending below the upper housing adjacent the support plate, wherein the second "W" shaped support loop includes a first trough and a second trough, and includes a plurality of second loop spheres displaceable from the first trough slidably along the second loop to the second trough for indication of improper behavior in the second trough relative to acceptable behavior relative to the first trough,
and
a third inverted "U" shaped loop mounted to the second housing adjacent the first loop, wherein the third loop includes at least four third loop spheres for indication of a number of weeks of misbehavior per monthly time frame,
and
a fourth loop of a generally "U" shaped configuration mounted to the lower housing adjacent the third loop, wherein the fourth loop includes twelve fourth loop spheres, wherein each fourth loop sphere is arranged for indication of a month of twelve months of a calendar year, whereupon displacement of a fourth loop sphere from a first end of the fourth loop to a second end of the fourth loop is arranged for counting a number of months traversed in the calendar year,
and
a fifth loop, the fifth loop of a generally "W" shaped configuration mounted to the upper housing adjacent the second loop, wherein the fifth loop includes a fifth loop first trough and a fifth loop second trough, wherein twelve fifth loop spheres are slidably mounted to the fifth loop and initially positioned within the first trough and are displaceable to the second trough for indication of a predetermined number of months of unacceptable social behavior upon dispacement of one said fifth loop spheres from the first trough to the second trough,
and
the first housing includes a first housing cavity therewithin, and wherein the first loop includes a first loop pictorial plate adjacent a first loop first end and a translucent first loop second pictorial plate adjacent a first loop second pictorial end, and an illumination bulb contained within the upper housing, and a first switch means in operative communication with the illumination bulb to effect illumination therewithin for effecting illumination through the first pictorial plate and the second pictorial plate, and the first loop is formed of a hollow translucent tubular material and the first loop first end is positioned adjacent the illumination bulb to direct illumination through the first loop.

5,190,460

CENTRAL OFFICE CONNECTOR FOR A DISTRIBUTING FRAME SYSTEM

Sastry V. Emani, Omaha, Nebr., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 27, 1991, Ser. No. 799,519
Int. Cl.[5] H01R *13/26*
U.S. Cl. 439—51 16 Claims



1. A connector, which comprises:
a housing;
a first panel which is supported by said housing and which includes a plurality of first contact elements each having one portion which extends from said first panel and another portion which is adapted to be connected to an electrical conductor;
a second panel which includes a plurality of cavities and a plurality of second contact elements which are mounted in said cavities of said second panel such that one portion of each said second contact element is secured within a cavity of said second panel and another portion extends from said second panel and is adapted to be connected to an electrical conductor, said second panel being mounted on said housing such that said one portion of each said first contact element extends into juxtaposition with and overlaps but is spaced from the one portion of an aligned, associated second contact element; and
means for mounting said first and second panels to facilitate relative linear motion between said first and second panels in a single direction to cause a portion of said one portion of each said first contact element to become engaged electrically with said one portion of the aligned, associated second contact element.

5,190,461

CONNECTOR ASSEMBLY WITH BOTH FUNCTIONS OF COAXIAL CONNECTOR AND MULTIPLE CONTACT CONNECTOR

Kazuya Oorui, and Hisamitsu Takagi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

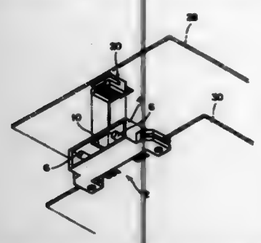
Filed Jun. 15, 1992, Ser. No. 898,336
Claims priority, application Japan, Jun. 17, 1991, 3-144575
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—63 4 Claims

1. A connector assembly having both functions of a coaxial connector and a multiple contact connector, comprising:
a first printed wiring board having conductive patterns provided thereon;
a coaxial connector secured to one end of said first printed wiring board, said coaxial connector including a housing having an opening with a predetermined configuration, and a plurality of terminals connected by means of solder

to said conductive patterns of said first printed wiring board;

a second printed wiring board having conductive patterns provided thereon;

a multiple contact connector having a plurality of contacts fixed to one end of said second printed wiring board and having a configuration to be received through said opening of said coaxial connector, said plurality of contacts of



said multiple contact connector being connected by means of solder to said conductive patterns of said second printed wiring board; and

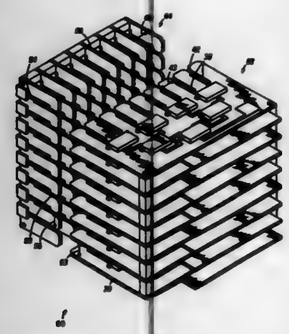
means for supporting said first printed wiring board and said second printed wiring board in a parallel relationship with each other in such a manner that said multiple contact connector is positioned within said housing through said opening of said housing of said coaxial connector.

5,190,462

MULTILEAD MICROWAVE CONNECTOR

John K. Lauchner; Andrew J. Schlaim, both of Tempe, and Robert S. Ames, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1991, Ser. No. 754,484
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—65 9 Claims



1. An electrical connector comprising;

at least first and second insulating substrates adapted to intersect so that at least one principal face of the first substrate is not parallel with at least one principal face of the second substrate;

electrical leads located on the at least one principal face of each substrate which make contact when the substrates intersect; and

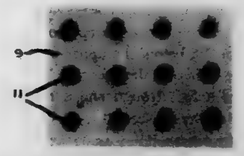
wherein the substrates have signal leads on front faces thereof and ground planes on opposed back faces thereof and the intersection of the substrates provides four quadrants therebetween, designated sequentially as quadrants one through four, and wherein signal leads on the substrates are coupled in the first quadrant and ground planes on the substrates are coupled in the third quadrant.

5,190,463

HIGH PERFORMANCE METAL CONE CONTACT

Madhav Datta, Peekskill; David E. King, Endicott; Alan D. Knight, Newark Valley, and Carlos J. Sambucetti, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 596,432, Oct. 12, 1990, Pat. No. 5,105,537.
This application Nov. 25, 1991, Ser. No. 797,575
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—74 9 Claims



1. An electrical connection assembly for use in high density circuitry applications, said electrical connection assembly comprising first and second electrical connection structures adapted for engaging each other in an interdigitated, freely detachable and wiping manner to provide electrical connection therebetween, each of said electrical connection structures being of electrochemically machined, monolithic construction of a singular conductive metallic material and including a solid substrate portion having a plurality of solid cones projecting substantially perpendicularly from said substrate, each of said solid cones being of sharply domed configuration having rounded side walls the interconnecting surfaces between adjacent ones of said solid cones on each of said electrical connection structures being substantially rounded, said solid cones of said first electrical connection structure intermeshing with said solid cones of said second electrical structure to form said freely detachable and wiping connection during said engagement between said first and second electrical connection structures.

5,190,464

SHIELDED ELECTRICAL CONNECTOR WITH CONTACT SHUNTING ARRANGEMENT

Hsiu-Shen Chow, Pan-Chiao, Taiwan, and Leonard Ellentuch, Wallkill, N.Y., assignors to Chian Chyun Enterprise Co. Ltd., Taipei Hsien, Taiwan and Resco, Inc., Newburgh, N.Y.

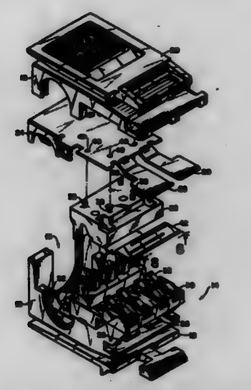
Continuation of Ser. No. 677,218, Mar. 29, 1991, abandoned.
This application Jun. 5, 1992, Ser. No. 895,185
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—188 15 Claims

1. A shielded electrical connector for mating with a complementary electrical connector, said shielded connector comprising:

(a) an insulating terminal housing formed of a base member and a cover member, said housing having a front mating face, a rear wire-connecting face and a terminal supporting platform extending between the faces;

(b) a plurality of electrical terminals mounted on the terminal supporting platform with contact portions disposed in the area of the mating face and wire-connecting portions disposed in the area of the wire-connecting face, each contact portion comprising a resilient contact tongue spaced from said platform and having a free end extending away from said mating face, each contact tongue being matable against a corresponding contact tongue of the complementary connector to urge the contact tongues toward the respective platforms from which they are supported;

(c) electrical shunt means fixedly mounted in said housing and disposed adjacent to said contact tongues in the area of the free ends thereof, said shunt means engaging preselected contact tongues when said connector is in an unmated condition and being spaced from said preselected contact tongues when said connector is in a mated condition, said shunt means comprising an insulative, substantially planar surface having a plurality of conductive contact pads arranged thereon on a common straight line and facing said terminals, with each contact pad oriented



adjacent a respective one of said contact tongues such that the area of contact between each pad and its respective, adjacent contact tongue is made in substantially the same relative position on all contact tongues, with the contact areas arranged on a common line; and

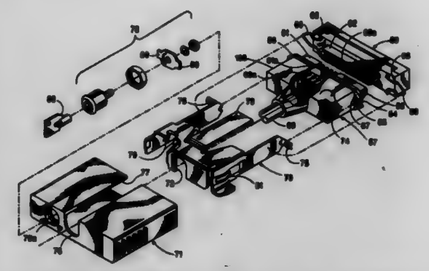
(d) conductive electrical shield means attached to said base member and said cover member of said housing, said shield means having contact portions which are matable with complementary contact portions of the electrical shield means of a complementary connector.

5,190,465

CABLE LOCKING COVERS

Ronald V. Davidge, Coral Springs; John R. Dewitt, Boca Raton; Paul J. Galiais, Boynton Beach; Francis A. Kuchar, Jr., Delray Beach; Jay H. Neer, and Thomas H. Newsom, both of Boca Raton, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 19, 1991, Ser. No. 762,141
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—304 11 Claims



1. Apparatus for locking a cable connector in engagement with an external port of a device, wherein said cable connector comprises a plurality of electrical contacts at a contact end configured for contact with port contacts within said external port and a plurality of insulated wires attached to various of said electrical contacts extending from said cable connector at an end opposite said contact end, wherein said cable connector and said port include first attachment means for holding said cable in engagement with said port, said first attachment means being operable to prevent said cable connector from being pulled away from said port and to release said cable connector for disengagement with said port, and wherein said apparatus comprises:

a bracket configured for engagement with said connector, including a bracket aperture through which said insulated wires extend when said bracket and said connector are so engaged;

second attachment means for holding said bracket and said connector in engagement;

a cover configured for engagement with said bracket, including a cover aperture through which said insulated wires extend when said cover is engaged with said bracket and said bracket is engaged with said connector; and

lockable attachment means for holding said cover and said bracket in engagement;

wherein said cover, engaged with said bracket, surrounds said second attachment means when said bracket is engaged with said cable connector, to block access thereto; and

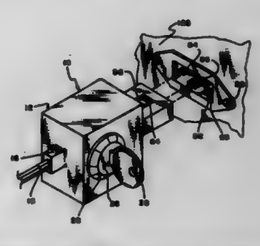
wherein said cover and said bracket, when engaged with each other and with said connector, block operation of said first attachment means, thereby preventing release of said cable connector from said port.

5,190,466

LOCKING CONNECTOR FOR DETACHABLE POWER CORDS

Jack L. McVey, P.O. Box 48726, Wichita, Kans. 67201-8726

Filed Jul. 9, 1991, Ser. No. 727,461
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—304 6 Claims

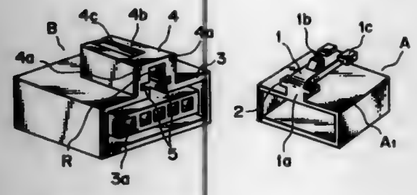


1. A connecting device for an electrical power cord that is controllably detachable from a mating standard appliance power socket which is operatively associated with an electrically powered appliance or apparatus, said device comprising a housing bearing at least one electrical contact and associated circuitry means to facilitate continuity of electrical current flow between at least one conductor in a power cord attached to said housing and a conductor in said mating appliance power socket, wherein the improvement comprises:

an obstructing means mounted in said housing by way of a mounting means to facilitate the extension of a portion of said obstructing means, through an opening, beyond the body of said housing and into contact with said appliance power socket, whereby disengagement of said connecting device from said socket is prevented; and

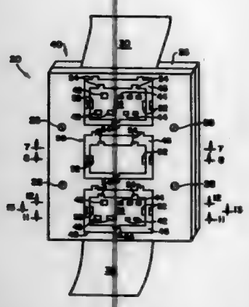
a controlled-access operating means to facilitate retracting said obstructing means into a position essentially within the bounds of said housing, whereby said connecting device may be freely disengaged from said socket.

5,190,467
CONNECTOR
Yukio Ohta, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Nov. 5, 1991, Ser. No. 788,016
Claims priority, application Japan, Nov. 27, 1990, 2-123598[U]
Int. Cl.[5] H01R 13/627
U.S. Cl. 439—354 2 Claims



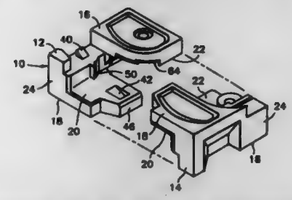
1. A connector comprising:
a male connector housing;
a female connector housing;
a locking arm formed on an outside portion of said female connector housing, said locking arm having a base formed integrally with said female connector housing at a forward portion thereof, said locking arm extending axially rearwardly from the base;
guide means provided at the base of said locking arm and extending laterally relative to said locking arm, for guiding insertion of said locking arm into an engagement sleeve;
an engagement sleeve housing integrally formed on an outside portion of said male connector housing, said engagement sleeve housing including an engagement sleeve therein formed so as to receive said locking arm; and
engagement groove means extending along a length of the engagement sleeve for, receiving said guide means thereinto.

5,190,468
RIBBON CABLE CONNECTOR
Edward L. Nichols, III, Annapolis, Md., and David A. Jakopin, Washington, D.C., assignors to Smart House, L.P., Upper Marlboro, Md.
Filed Jun. 10, 1991, Ser. No. 712,535
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—404 23 Claims



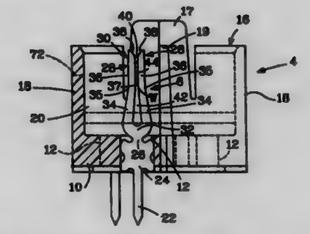
1. An apparatus for providing electrical interconnection between a ribbon cable having a plurality of conductors and electrical projections of an electrical device comprising:
a cable holder made of insulating material for holding a portion of said ribbon cable substantially flat, said cable holder comprising:
a recessed portion extending from a first opening on one end to a second opening on an opposite end of said cable holder for insertion of said ribbon cable;
a front face; and
a cut-out portion formed in said front face and extending to said recessed portion;
a cable alignment piece insertable in said cut-out portion for precisely aligning said ribbon cable, said cable alignment piece comprising an alignment housing having a hollow center area;
at least one receptacle module insertable into said cut out portion, said receptacle module comprising:
a housing made of insulating material insertable into said hollow center area of said inserted cable alignment piece, said housing including a front face;
a plurality of electrically conductive receptacle sites disposed on said front face and adaptable for insertion of said electrical projections of said electrical device to establish electrical connection with said electrical projections;
a plurality of electrically conductive insulator displacement pins partially projecting out of said housing and adaptable for establishing electrical contact with said ribbon cable conductors when said module is inserted into said cut-out portion; and
a plurality of electrical conductors disposed within said housing for electrically connecting said insulator displacement pins with said receptacle sites.

5,190,469
ELECTRICAL CORD END CONNECTOR
Cheuk Y. Mui, 41-43 39th Pl., Apt. 3C, Long Island, N.Y. 11104
Filed Jun. 3, 1992, Ser. No. 893,037
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—410 10 Claims



1. An electrical cord end connector for providing a pair of terminals electrically connected to the conductors of a two conductor electrical cord, said connector including a pair of substantially identical panel members having corresponding stepped first and second outwardly facing opposite side faces and corresponding edges extending about said faces, pivot means pivotally securing said panel members together with said first stepped faces opposing and interfitted with each other and with said panel members being relatively angularly displaceable about a predetermined axis between first and second positions, said panel members each including a elongated electrically conductive terminal supported therefrom, said panel members, when in said second positions, being positioned with said elongated electrically conductive terminals disposed in generally the same diametric plane of said axis and convergent in a direction extending outwardly of a first corresponding pair of said edges and defining a socket having opposing outwardly divergent sides opening outwardly of a second corresponding pair of said edges opposite said first pair of edges and, when in said first positions, being relatively rotated to positions with said elongated conductive members being generally parallel and disposed generally normal to said first corresponding edges and with said socket sides swung toward each other and disposed in closely spaced generally parallel relation, said terminals each including an insulation piercing element projecting inwardly of a corresponding socket side toward the other socket side with said elements being disposed in axially spaced diametric planes of said axis, said elements, when said panel are swung from said second positions to said first positions, being swingable to positions at least closely adjacent the opposing socket sides for piercing the insulation of a conductor disposed between said elements and the opposing socket sides.

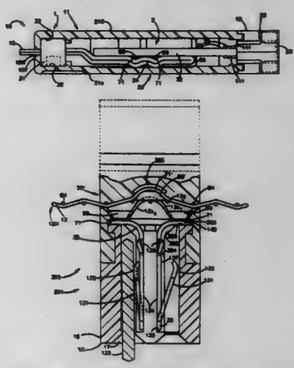
5,190,470
ELECTRICAL WIRE CONNECTOR AND AN ELECTRICAL TERMINAL THEREFOR
Lucas Soes, Roosmalen, and Hermanus P. J. Gilissen, Esch, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 22, 1991, Ser. No. 797,494
Claims priority, application United Kingdom, Dec. 6, 1990, 9026529
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—417 13 Claims



1. An electrical connector, comprising:
a first insulating housing having a base through which extends a plurality of terminal receiving openings;
plurality of electrical terminals each having an anchoring portion received in a respective one of said openings, a connecting portion for connection to an external electrical conductor, and a pair of wire connecting arms upstanding from the base, the wire connecting arms of each terminal each having a lower part connected to the anchoring part of the terminal and a wire receiving upper part remote from the base and being substantially shorter than said lower part, the lower parts of the arms converging toward the upper part of the arms in a direction away from the anchoring portion of the terminal, and the upper parts of the arms being parallel to each other and having opposed parallel, wire contacting surfaces; and
a second insulating housing for mating with the first insulating housing in a mating direction, the second insulating housing having means for supporting a plurality of wires extending transversely of the mating direction, for the engagement of each wire, between the wire contacting surfaces of the wire receiving upper part of a respective one of the terminals when the second insulating housing has been mated with the first insulating housing.

5,190,471
CABLE TERMINATION ASSEMBLY FOR HIGH SPEED SIGNAL TRANSMISSION
Dawn Barile, Euclid; John T. Vesaleck, Madison; Randy G. Cloud, Painesville, and Michael McCoy, Euclid, all of Ohio, assignors to Ohio Associated Enterprises, Inc., Painesville, Ohio
Filed Feb. 13, 1991, Ser. No. 654,794
Int. Cl.[5] H01R 9/07
U.S. Cl. 439—455 11 Claims

1. A cable termination assembly comprising:
a) a planar ribbon cable having plural electrical conductors arranged in a generally parallel, elongate, spaced apart relation;
b) a plurality of said electrical conductors having connection portions located along the length of the cable, in spaced-apart relation, at least some of said connection portions protruding to one side of said cable;
c) insert means for insertion between the major planar extent of said ribbon cable and at least some of said connection portions on said one side of said cable, to rigidify said at least some of said connection portions and hold apices of said at least some of said connection portions in substantially coplanar relation;
d) electrical conducting means for conducting electrical signals with respect to such connection portions;
e) electrically non-conductive means for holding said cable and electrical conducting means in positional relationship for such electrical conducting function;



f) wherein said cable comprises woven cable, said conductors include plural signal conductors and plural ground conductors and said conductors undulate in a weave pattern forming respective loop-like portions extending away from the central generally planar axis of said cable;
g) said insert means comprising a plurality of relatively rigid rod-like inserts positioned between respective loop-like portions of conductors and such generally planar axis of said cable to rigidify such respective loop-like portions;
h) said inserts being located axially along the length of said cable; and
i) wherein said loop-like portions form such respective connection portions of said cable.

5,190,472
MINIATURIZED HIGH-DENSITY COAXIAL CONNECTOR SYSTEM WITH STAGGERED GROUPER MODULES
John A. Voltz, Hockessin, and George A. Hansell, III, Newark, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Mar. 24, 1992, Ser. No. 856,780
Int. Cl.[5] H01R 11/00
U.S. Cl. 439—579 37 Claims

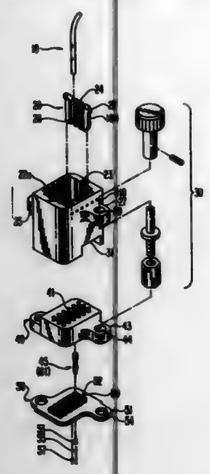
1. A high-density coaxial interconnect system comprising the components:
(a) a plurality of coaxial cable connectors, each connector further comprising:
(i) a coaxial cable having a signal carrying center conductor surrounded by a dielectric material, further surrounded by an outer conductor and a polymeric jacket;
(ii) a signal contact attached to the center conductor of the coaxial cable;
(iii) a thermoplastic insulator surrounding the signal contact; and
(iv) a ground shell surrounding the thermoplastic insula-

tor, said shell having a retention groove surrounding its exterior face.

(b) at least one grouper module with interlocking means, said grouper module having rows with a plurality of receptacle grooves, wherein each groove is provided with a retention ridge on its interior surface and wherein the receptacle grooves are positioned within the grouper module in a staggered array so that the grooves are at a diagonal to each other with respect to the rows and wherein each retention ridge interacts with the retention groove of the ground shell so as to lock a coaxial cable connector within the receptacle groove of the grouper module;

(c) a grouper frame having four sides and interlocking means which houses the grouper module and secures the grouper module in place by engagement of the interlocking means of the grouper module and the grouper frame;

(d) a header frame comprising four side walls and a top face, said top face of the header frame having a plurality of receptacle holes that match the staggered array of receptacle grooves of the grouper module housed within the grouper frame and a plurality of alignment cones on the underside of the top face between receptacle holes;



(e) a plurality of step-down ground contacts, each having a diameter in the upper region of the contact greater than the diameter in the lower region, and beams that project inward, wherein each ground contact is positioned in a receptacle hole and stabilized by the alignment cones of the header frame, said ground contacts mate with the ground shells of the coaxial cable connector;

(f) a header plate having a plurality of receptacle holes in a staggered array matching the array of the receptacle holes of the header frame and also having a plurality of ground pin holes uniformly interspersed among the receptacle holes, said header plate positioned adjacent the plurality of step-down ground contacts opposite and parallel to the top face of the header frame;

(g) a plurality of alternating ground and signal pins, said ground pins positioned within the ground pin holes of the header plate and said signal pins, each surrounded by an insulator, positioned within the receptacle holes so as to mate with the signal contact; and

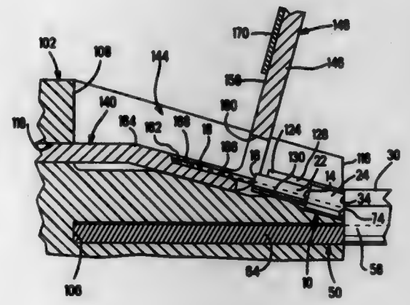
(h) holding means for aligning and securing components of the assembly together.

5,190,473

MICROCOAXIAL CABLE CONNECTOR

Robert S. Mroczkowski, Lititz, and Richard E. Rothenberger, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 18, 1992, Ser. No. 884,790
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—580 22 Claims



1. An electrical connector for use with a plurality of coaxial wires, comprising:

a housing member having a plurality of passageways extending therethrough from a rearward face to a mating face;

a plurality of signal terminals associated with inner conductors of said coaxial wires and insertable into respective said passageways of said housing from said rearward face thereof for contact sections at forward ends thereof to become at least exposed along said housing mating face for electrical connection to another electrical article, said signal terminals arranged in rows and the signal terminals of each said row being initially joined to a carrier strip at rear ends thereof; and

a ground plate including contact sections extending forwardly from a body section thereof for insertion into respective passageways of said housing member to become at least exposed along said housing mating face for electrical connection to said another electrical article, said ground plate including a rear section extending rearwardly from said body section and including ground termination regions along upper and lower surfaces thereof to which outer conductors of said coaxial wires are electrically joined;

each said signal terminal including a rear section extending outwardly from a medial plane of said housing to a said carrier strip from a substantial bend adjacent said housing for termination to a respective said inner conductor just forwardly of said bend; and

said housing having a rearward section including a plurality of channels along opposed surfaces thereof adapted to receive intermediate sections of said signal terminals therealong, and concluding in narrowed channel portions extending to respective wire-receiving entrances at a rearward end of said housing adapted to receive thereinto respective said inner conductors of said coaxial wires being moved axially forwardly of said substantial bends and into termination sites for solder termination to respective said signal terminals,

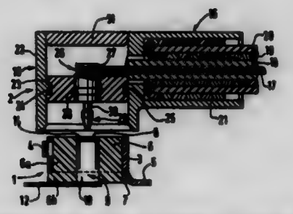
whereafter said carrier strips are removable to define discrete circuits of said signal terminals to respective said inner conductors of said coaxial wires.

5,190,474

COAXIAL CONNECTOR FOR CONNECTING A COAXIAL CABLE TO A PRINTED ELECTRONIC-CIRCUIT BOARD

Guy A. Ginet, Voiron, France, assignor to Radiall, Rosny-sous-Bois, France

Filed Jun. 15, 1992, Ser. No. 898,460
Claims priority, application France, Jun. 17, 1991, 91 07370
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—581 12 Claims



1. A coaxial connector for connecting a coaxial cable to a printed electronic-circuit board, comprising two connector elements each comprising a central contact, respectively a male and female contact, an external ground contact and an insulation between the central contact and the ground contact, said connector elements comprising means for connecting them electrically and attaching them, respectively, to the end of a coaxial cable and to a printed board, wherein the connector element intended to be attached to the printed board is arranged as a cylindrical socket (1) comprising an external bush (3) which forms a ground contact, is radially elastic over a portion at least of its height and is provided integrally at its rear portion with means (5) for attaching it to a printed board, and a central contact (9) disposed in a central hole (8) of a tubular insulation (6) which is retained in said external bush (3) and is provided, also integrally, at its rear portion, with means (12) for attaching it to said printed board, and wherein the connector element intended to be attached to the coaxial cable is arranged as a plug (2) comprising a tubular portion (16), for connection to the end of a coaxial cable, and a tubular coupling portion (15) comprising a cylindrical external bush forming a ground contact (22), capable of engaging around the external bush of the connector element arranged as a socket, and a central contact (26) which comprises at its rear portion connection means (27) for the central conductor (17) of the coaxial cable and which is immobilized in a tubular insulation (23) retained in said external bush (22), said central contacts of the two connector elements comprising interacting means (14, 30) for locking by snap-fastening.

5,190,475

ELECTRICALLY INSULATIVE CONNECTOR BOOTS

James A. Dickens, Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 5, 1992, Ser. No. 831,723
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—588 10 Claims

1. An electrically insulative boot for covering a first conductive housing including a plug skirt and a receptacle skirt of a first stackable connector assembly, comprising:

a first electrically insulative shield for substantially covering a first half of the conductive housing, the first shield including:

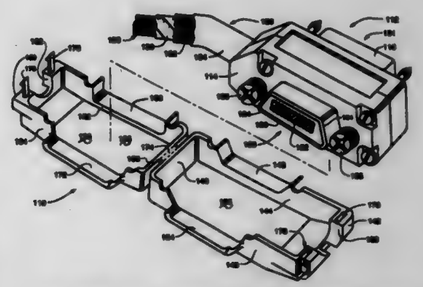
a first plug flap for covering a first exterior side of the plug skirt, the first plug flap having at least one reinforcing rib with a first camming surface; and

a first receptacle flap for covering a first exterior side of the receptacle skirt, an interior surface of the first receptacle flap adapted to ride along at least one of the first camming surfaces of one of the first plug flaps on a mating second stackable connector assembly thereby bending the first receptacle flap away from the receptacle skirt allowing the plug skirt of the mating second stackable connector assembly to be adjacent the receptacle skirt of the first stackable connector assembly when connected together; and

a second electrically insulative shield connected to the first shield, the second shield for substantially covering a second half of the conductive housing, the second shield having a plug side and a receptacle side, the second shield including:

a second plug flap for covering a second exterior side of the plug skirt, the second plug flap having at least one reinforcing rib with a second camming surface; and

a second receptacle flap for covering a second exterior side of the receptacle skirt, an interior surface of the second receptacle flap adapted to ride along at least one of the second camming surfaces of one of the second plug flaps on the mating second stackable connector assembly thereby bending the second receptacle flap away from the receptacle skirt allowing the plug skirt of the mating second stackable connector assembly to be adjacent the receptacle skirt of the first stackable connector assembly when connected together.

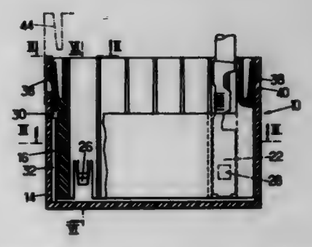


5,190,476

PLUGGABLE ELECTRICAL CONNECTION BLOCK AND CONNECTOR INCORPORATING SUCH A BLOCK

Georges Chaillet, Lormaye, France, assignor to Francelco, Serenes, France

Filed Feb. 14, 1992, Ser. No. 835,399
Claims priority, application France, Feb. 15, 1991, 91 01820
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—595 10 Claims



1. A pluggable electrical connection block comprising:

a rectangular housing having two opposite faces formed with internal longitudinal projections that define parallel slideways; and

a plurality of flat slabs of elongated cross-section made of

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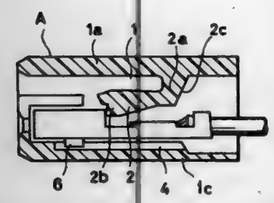
insulating material, each of said slabs in one of said slideways, formed with a single row of parallel passages for receiving respective contact terminals and having a major face cut out in a front portion thereof to constitute individual resilient retaining detents for engaging holes in the terminals,

said housing and each said slab including mutually cooperating keying means that allow a slab to be fully inserted in one angular position only,

wherein: said longitudinal projections are formed throughout the entire depth of the housing so as to guide each said slab from the moment it is inserted in the housing; said detents are placed short of the front end of the respective slab; and said housing has a step formed internally on one of the major sides, sized and located to come into abutment against any one of the detents that is lifted because a terminal in an adjacent one of said slabs is not fully pushed home, thereby limiting bending deformation of the detent.

5,190,477
WIRE HARNESS CONNECTION STRUCTURE
Nobuyuki Akeda, Shizuoka, Japan, assignor to Yazaki Corporation, Japan
Filed Sep. 25, 1991, Ser. No. 765,089
Claims priority, application Japan, Sep. 26, 1990, 2-99725[U]
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—595 8 Claims



1. A wire harness connection structure comprising:

a connector housing having a plurality of terminal cavities, each of which provides a space defined by side walls;

a metallic wire terminal which is to be inserted into one of said terminal cavities and which is equipped with a stopper for preventing said terminal from moving if said terminal is reversely inserted into one of said terminal cavities;

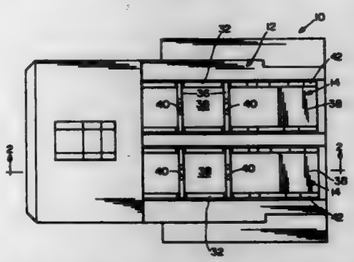
locking means provided in each of said terminal cavities and which is adapted to engage and support said terminal when said terminal is inserted into one of said terminal cavities;

normal insertion guide means provided in each of said terminal cavities and which is adapted to guide said stopper when said terminal is inserted into one of said terminal cavities in a normal fashion; and

reverse insertion guide means provided in each of said terminal cavities and which is adapted to guide said stopper in a direction perpendicular to the longitudinal axis of said terminal cavities if said terminal is reversely inserted into one of said terminal cavities;

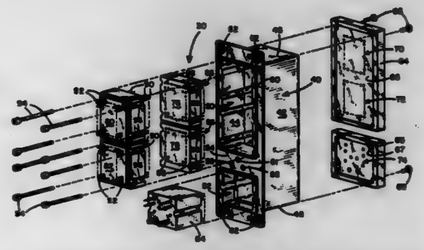
wherein said locking means is provided with an engagement section, which lodges said stopper when said terminal is inserted deep into one of said terminal cavities, and a stop section which, if said terminal is reversely inserted into one of said terminal cavities, abuts against said stopper guided by said reverse insertion guide means.

5,190,478
TERMINAL LOCKING MEANS FOR ELECTRICAL CONNECTORS
Stephen A. Colleran, Lisle, and Richard R. Edgley, Elmhurst, both of Ill., assignors to Molex Incorporated, Lisle, Ill.
Filed Dec. 30, 1991, Ser. No. 814,128
Int. Cl.[5] H01R *13/422*
U.S. Cl. 439—595 6 Claims



1. In an electrical connector which includes a dielectric housing having a through passage for receiving a female terminal including a terminating end for engaging a conductor and a mating end for receiving a male terminal, wherein the improvement comprises a resilient locking arm on the housing and adapted to engage a recess in the female terminal for locking the female terminal in the passage, the locking arm being located for engagement by the male terminal upon entering the mating end of the female terminal to prevent the locking arm from disengagement with the recess.

5,190,479
ELECTRICAL CONNECTOR INCORPORATING EMI/RFI/EMP ISOLATION
Albert E. Jordi, Anoka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 30, 1991, Ser. No. 768,180
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 13 Claims



1. An electrical connector receptacle for allowing connection of electronic apparatus contained with a shielding enclosure to a multi-conductor wiring harness terminating in an industry standard plug of the type having a plurality of male pins arranged in a grid of rows and columns, the connector receptacle comprising:

(a) a generally rectangular, box-like conductive shell mounted in a wall of said shielding enclosure, said shell having four mutually perpendicular side walls defining a housing cavity having open front and rear faces, said housing cavity dimensioned to receive said plug when inserted through said open front face;

(b) a frame member removably attached to said shell proximate said open rear face and supporting a flat substrate containing a plurality of socket contacts, the socket

contacts being arranged in a grid pattern of rows and columns and being spaced the same as the spacing of the contact pins of said plug;

(c) a plurality of terminal pins joined to said socket contacts and projecting outwardly with respect to said shell to which said electronic apparatus may be connected;

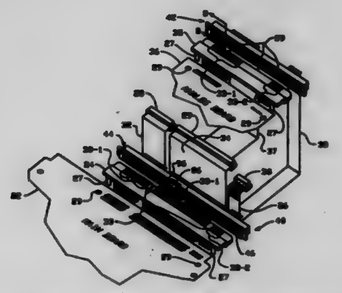
(d) at least one EMI/RFI module, said module comprising a generally rectangular block dimensioned to fit within said housing cavity through said open front face and having first and second opposed major surfaces, said block including a plurality of contact pins extending between said first and second opposed major surfaces and spaced in accordance with said grid pattern, said plurality of contact pins having a first end insertable into said socket contacts on said substrate and a second end defining a female socket;

(e) filter circuit means in said EMI/RFI module and operatively coupled between selected ones of said contact pins and said conductive shell for attenuating high frequency noise signals;

(f) at least one EMP module, said module comprising a generally rectangular block having first and second opposed major surfaces, being insertable into said housing cavity through said open front face and including a plurality of contact pins extending between said first and second opposed surfaces of said EMP module and spaced in accordance with said grid pattern, said plurality of contact/pins in said EMP module having a first end insertable into said female socket of said contact pins of said EMI/RFI module and a second end defining a female socket for receiving one of said male pins; and

(g) transient voltage suppression means in said EMP module and operatively coupled between selected ones of said contact pins and said conductive shell for creating an active barrier between transient spikes induced in said wiring harness and said electronic apparatus in said shielding enclosure.

5,190,480
ALL-IN-ONE INTERCONNECTION ASSEMBLY
Danny K. Chan, San Francisco; Lee-Ming Cheng, Cupertino; Jeng-Yih Hwang, San Jose, and Conrad Y. Choy, San Francisco, all of Calif., assignors to Foxconn International, Inc., Sunnyvale, Calif.
Filed Jul. 17, 1991, Ser. No. 731,507
Int. Cl.[5] H01R *23/70*
U.S. Cl. 439—637 9 Claims



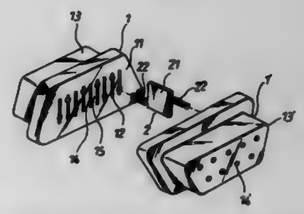
1. An electrical connector assembly for releasable mounting of a Main Printed Circuit Board (PCB) to a computer chassis, said PCB including a plurality of power conductive pads and a plurality of signal conductive pads with all of said power conductive pads and said signal conductive pads on the PCB being disposed together in a side-by-side array along an edge of the PCB, the connector assembly comprising:

an insulative unitary housing including a front side and a rear side, said unitary housing being formed with a slot in the front side dimensioned to a slidably receive the PCB edge, said unitary housing further defining a first set of passages disposed at a first portion of said housing and a second set of passages disposed at a separate second portion of said housing, each passage of said first and second set of passages extending between the front side and the rear side of said housing and each including an opening into said slot, and each adjacent passage of said second set of passages being spaced apart by a distance greater than each adjacent passage of said first set of passages;

a plurality of signal conductive members each including a signal contact portion, said signal conductive members being positioned in said first passages and extending through each respective opening to protrude into said slot to contact respective signal conductive pads when the PCB edge is received in said slot, said signal conductive members each including a signal Insulation Displacement Contact (IDS) extending outwardly of said unitary housing, and said signal IDCs being grouped for connection to peripheral apparatus through ribbon cables; and

a plurality of power conductive members each being of substantially similar shape but larger in transverse cross-sectional area than each said signal conductive members and each including a power contact portion, said power conductive members being positioned in said second passages and extending through each respective opening to protrude into said slot to contact respective power conductive pads when the PCB edge is received in said slot, said power conductive members each including a power Insulation Displacement Contact (IDC) extending outwardly of said unitary housing, and said power IDCs being grouped for connection to a plurality of power sources through ribbon cables.

5,190,481
STRUCTURE OF THE SWITCHING DEVICE FOR ELECTRICAL CONNECTOR
Ted Ju, 18, Lane 30, Syh Wei Rd., Wu Gu Hsiang, Taipei Hsien, Taiwan
Filed Mar. 7, 1990, Ser. No. 490,707
Int. Cl.[5] H01R *27/02*
U.S. Cl. 439—654 8 Claims



1. A connector comprising:

a plurality of terminals, each of said plurality of terminals comprising a substantially flat connecting plate defining a first plane and first and second connecting heads extending from opposing edges of the substantially flat connecting plate, said first and second connecting heads having respective axes extending parallel to the first plane and parallel to each other; and,

first and second insulating bodies respectively having confronting first and second generally flat surfaces defining a second plane therebetween which is substantially perpendicular to the first plane, said first insulating body having a first plurality of grooves, formed in said first generally flat surface, each for receiving said first connecting head and a first portion of said substantially flat connecting plate one of said plurality of terminals, said second insulating body having a second plurality of grooves, confronting said first plurality of grooves and formed in said sec-

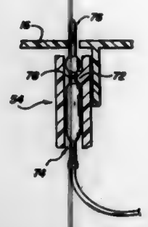
ond generally flat surface, each for receiving said second connecting head and a remaining second portion of said substantially flat connecting plate of one of said plurality of terminals;

said first insulating body having a third generally flat surface opposing said first generally flat surface and a first plurality of through-holes extending respectively from said first plurality of grooves to said third generally flat surface, each of said first plurality of through-holes for receiving one of said first connecting heads, said second insulating body having a fourth generally flat surface opposing said second generally flat surface and a second plurality of through-holes extending respectively from said second plurality of grooves to said fourth generally flat surface, each of said second plurality of through-holes for receiving one of said second connecting heads.

5,190,482
BULKHEAD CONNECTOR ASSEMBLY

Allen F. VanDerStuyf, Novi; Ravindra Patil, Canton; James P. Burgess, Troy, and Daniel P. Marshall, Southgate, all of Mich., assignors to Electro-Wire Products, Inc., Dearborn, Mich.

Continuation-in-part of Ser. No. 611,514, Nov. 13, 1990, Pat. No. 5,100,336. This application Nov. 8, 1991, Ser. No. 789,274
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—686 **3 Claims**



1. An electrical terminal comprising a base member fabricated from a dielectric material and defining a terminal retaining socket therein, said socket having associated therewith a locking finger, said socket and finger being operative in combination to receive and retain a female electrical terminal therein, said base member further including a wedge receiving groove defined therein proximate said locking finger; and

a locking wedge comprising a top face portion which has a side wall portion projecting perpendicularly therefrom, said side wall portion configured to fit into the wedge receiving groove of the base member and including a locking finger actuating ramp associated therewith, said ramp operative, when the side wall portion is fit into the groove, to bias the locking finger into engagement with a terminal disposed in the socket; the top face portion including an opening defined therein at a location which corresponds to said socket when the side wall portion is fit into the groove, said opening being configured so that the top face covers a first portion of an edge of the terminal but exposes a second portion of the edge of the terminal so that the terminal may be contacted by a test probe.

5,190,483
CONTACT RETENTION

Michael A. Viselli, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 14, 1992, Ser. No. 835,789
Int. Cl.[5] H01R *13/41, 13/436*
U.S. Cl. 439—751 **21 Claims**

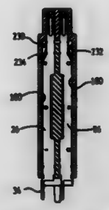
1. An electrical connector, comprising:

a dielectric housing having a plurality of uniformly spaced channels in opposed major surfaces thereof, each of said channels defined by opposed first and second sidewalls;

a contact received in each channel, each contact having a mating end, a mounting end and a body section extending therebetween;

said body section defining an axis between said mating end and said mounting end, said body section defining opposed first and second major surfaces;

a first protrusion extending from the first major surface proximate said mating end to engage said first sidewall,



and a second protrusion extending from one of said major surfaces to engage one of said sidewalls at a location axially spaced from said mating end farther than said first protrusion, whereby each contact is resiliently bent by the protrusions to provide an interference fit with sidewalls of the channel in which it is received;

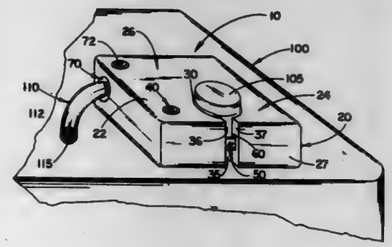
a cover member defining a cavity therein, the dielectric housing receive din the cavity;

and an inner surface of the cover member engages said contacts to prevent said contacts from being displaced from said channels.

5,190,484
CLAMP FOR A BATTERY CABLE

Juan Kennedy, 2245 SW. 31 Ave., Miami, Fla. 33145

Filed Aug. 14, 1992, Ser. No. 929,531
Int. Cl.[5] H01R *4/28*
U.S. Cl. 439—761 **11 Claims**



1. A clamp for a battery cable comprising:

a main clamp body, said clamp body including a top face, a bottom face, a distal clamping portion, and a proximal cable connection portion,

said distal clamp portion including a vertical bore extending therethrough between said top face and said bottom face, said vertical bore being adapted to receive a battery terminal stud therein,

a vertical channel extending from said vertical bore to a distal face of said clamp body, and from said top face to said bottom face of said clamp body,

said vertical channel including a first inner face and a second inner face disposed in spaced, confronting relation to one another,

tightening means structured and disposed to pull said second inner face of said vertical channel towards said first inner face of said vertical channel so as to reduce a gap between said confronting faces and effectively tighten said bore about the terminal stud,

said tightening means including a rotatable tightening member mounted within said clamp body,

said tightening member including an upper, exteriorly engageable head portion accessible through said clamp body and adapted to facilitate the clockwise or counter-clockwise rotation thereof,

an axial channel extending from at least said tightening means through said first inner face and second inner face of said vertical channel,

a strong, yet flexible track extending through said axial channel, said track including a proximal end, a distal end, and a plurality of engagement apertures disposed along a length thereof,

said distal end of said track being secured to said clamp body near said second inner face of said vertical channel,

said tightening member including engagement means structured and disposed to engage said apertures in said track, upon rotation of said tightening member, resulting in the movement of said track and the pulling to tighten or releasing to loosen of said second inner face of said vertical channel,

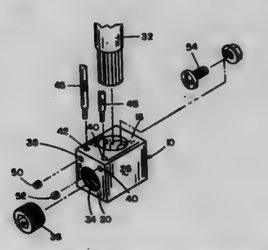
a longitudinal bore in said proximal portion of said clamp body, said longitudinal bore being structured and disposed to receive the battery cable therein, and

fastening means structured and disposed to maintain the battery cable securely attached to said clamp body.

5,190,485
ELECTRICAL TERMINATION LUG

Jimmy D. Ransdell, P.O. Box 1691, North Platte, Nebr. 69103

Filed Feb. 3, 1992, Ser. No. 829,696
Int. Cl.[5] H01R *11/09*
U.S. Cl. 439—798 **4 Claims**



1. An electrical termination lug for connecting a large conductor and at least one smaller conductor to electrical equipment comprising,

a block member having an upper end portion, a lower end portion, a front portion, a back portion, and opposite side portions,

said block member having a first opening extending therethrough for receiving a large conductor,

said first opening extending completely through said block member between its upper and lower end portions,

first means for securing the large conductor in said first opening,

means for securing said block member to said electrical equipment whereby the large conductor may extend upwardly into said first opening or extend downwardly into said first opening,

at least a second opening formed in said block member spaced from said first opening and extending into one of said upper end portion, said lower end portion, said front portion, said back portion or one of said side portions for receiving a small conductor therein, and means for securing the small conductor in said second opening.

5,190,486
SELECTIVELY PLATING ELECTRICALLY CONDUCTIVE PIN

Peter Tsuk, Westmount, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 23, 1991, Ser. No. 734,714
Int. Cl.[5] B05D *3/06*
U.S. Cl. 439—886 **26 Claims**

10. An electrically conductive pin comprising:

an integral body having a center portion between two end portions, and the end portions only being selectively plated with a gold to provide gold plated contact regions thereon, and

the center portion of the pin being selectively plated overall with a uniform thickness of an other conductive material,

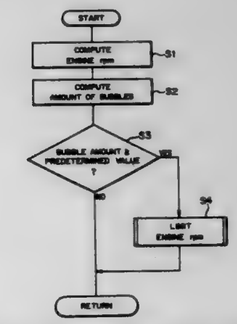
the other conductive material contacting the center portion only of the body and extending between gold plated contact regions of the two end portions without underlying said gold plated contact regions, with inwardly facing surfaces of gold contacting only the body of the pin,

whereby an overlayer of gold on said other conductive material is avoided.

5,190,487
CONTROL APPARATUS FOR AN OUTBOARD MARINE ENGINE

Wataru Fukui, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1992, Ser. No. 871,751
Claims priority, application Japan, Apr. 24, 1991, 3-092533
Int. Cl.[5] B63H *1/18*
U.S. Cl. 440—1 **7 Claims**



1. A control apparatus for an outboard marine engine having a propulsion screw, said apparatus comprising:

a rotational speed sensor for sensing the number of revolutions per minute of the engine and generating a rotational speed signal;

a bubble sensor for sensing the amount of bubbles generated around the propulsion screw and generating a corresponding bubble signal;

a controller operatively connected to receive the output signals of said sensors for generating, based on these sig-

nals, a drive signal which controls engine operating parameters, said controller including a speed limiting means for determining, based on the bubble signal from said bubble sensor, whether the amount of bubbles generated around the screw is equal to or greater than a predetermined value;

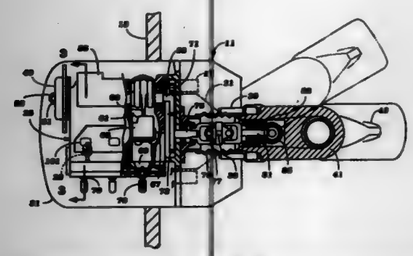
actuator means operatively connected to receive the drive signal from said controller so that it is thereby driven to control the engine operating parameters in a manner to limit the number of revolutions per minute of the engine when said speed limiting means determines that the amount of bubbles is equal to or greater than the predetermined value.

5,190,488

OUTBOARD MOTOR

Hiroaki Fujimoto, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 25, 1991, Ser. No. 661,432
Claims priority, application Japan, Feb. 26, 1990, 2-42565
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—53 **17 Claims**



1. An outboard motor for attachment as a unit to the transom of a watercraft comprising means for affixing said outboard motor to the transom, an internal combustion engine having a plurality of cylinders all extending transversely to the watercraft and horizontally disposed and a horizontally disposed engine output shaft at one side of said cylinders, a driveshaft housing journaling a driveshaft for rotation about a generally vertically extending axis, propulsion means at the lower end of said driveshaft housing and driven by said driveshaft for propelling the watercraft, a generally vertically extending steering axis about which at least said driveshaft housing is pivoted for steering of said watercraft, said engine output shaft being laterally offset from a longitudinally extending plane containing said steering axis with said plane intersecting said cylinders, and, transmission means for driving said driveshaft from said engine output shaft.

5,190,489

INFLATABLE SWIMMING SUPPORTS

Tung S. Yeung, North Point, Hong Kong, assignor to Sunco Products, Inc., Industry, Calif.

Filed Jan. 27, 1992, Ser. No. 826,045
Int. Cl.[5] B63C *9/12*
U.S. Cl. 441—122 **4 Claims**

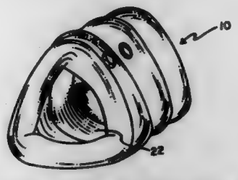
1. An inflatable swimming support adapted to be worn upon the limb of a user, the support comprising:

a larger, continuous and closed, doughnut-shaped air chamber formed of fluid-impervious, flexible material, the larger air chamber forming a central arm opening therethrough;

a smaller, substantially doughnut-shaped air chamber formed of fluid-impervious, flexible material, the smaller air chamber being circumferentially secured to the larger air chamber around the central arm opening along spaced lines with the smaller chamber located totally between said lines;

a first valve means in direct fluid communication with the larger air chamber for the selective inflation and deflation thereof; and

a second valve mean in direct fluid communication with the smaller air chamber independent of the larger air chamber



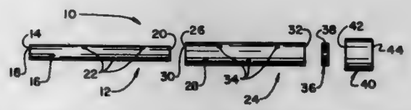
for the selective inflation and deflation of the smaller air chamber, the first and second valve means being located in spaced relationship on the exterior surface of the support and chambers along the length of the central arm opening whereby the support, with both chambers inflated, may be rolled up and down the limb of a user to any extent.

5,190,490

ADJUSTABLE PIPE WAND FOR BUBBLES

Jack S. Wachtel, 1640 Lands End Rd., Pt. Manalapan, Fla. 33462

Filed Jan. 16, 1992, Ser. No. 822,177
Int. Cl.[5] A63H *33/28*
U.S. Cl. 446—15 **10 Claims**



1. A bubble pipe comprising: a first elongated hollow tubular member defined by a sidewall having an inner and outer surface and first and second open ends, said first member sidewall having a plurality of orifices disposed therethrough; a second elongated hollow tubular member defined by a sidewall having an inner and outer surface and first and second open ends, said second member sidewall having a plurality of orifices disposed therethrough; and, a plurality of ridges disposed along the open end of one of said members for support of an aqueous bubble solution placed across said ridges, one of said members slidably insertable and rotatable into the other member wherein said member sidewall orifices are juxtaposition for expulsion of air delivered through one said member lessening the velocity and volume directed through said first and second member and against said solution; whereby the placement of an aqueous bubble solution across said ridges of said open end followed by a direction of air through said members whose air velocity is controlled by slidably rotation thereof, forms a bubble by placement of the air within the solution.

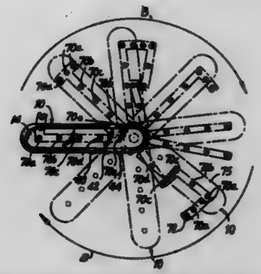
5,190,491

ANIMATED PADDLE

Keith Connelly, Ithaca, N.Y., assignor to I & K Trading Corporation, Vienna, Va.

Filed Nov. 27, 1991, Ser. No. 800,801
Int. Cl.[5] A63H *33/26*
U.S. Cl. 446—242 **12 Claims**

1. An animated paddle comprising a handle oriented in an axial direction and a body rotationally mounted about said handle, a light source means disposed on said paddle body for emitting light in at least a direction substantially parallel to said axial direction and light source energizing means for selectively lighting said light source means for producing a variable



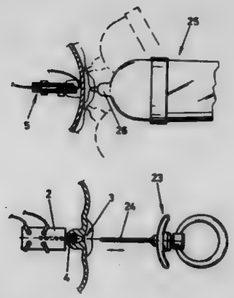
sequence of first predetermined light patterns, so that rotation of said body about said handle produces a lighted image comprised of an aggregate of the lighting sequences of said first predetermined light patterns being displayed at least in a plane substantially perpendicular to said axial direction.

5,190,492

MECHANISM FOR DOLLS ALLOWING SUCKING MOVEMENT

Juan J. Berenguer, c/o Sucesores de Jose Berenguer, S.A. Berjusa, Cervantes No. 18, Onil, Alicante, Spain

Continuation of Ser. No. 584,748, Sep. 19, 1990, Pat. No. 5,092,811. This application Aug. 27, 1991, Ser. No. 750,394
Claims priority, application Spain, Apr. 18, 1990, 9001104
The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.
Int. Cl.[5] A63H *3/28, 3/24, 33/26*
U.S. Cl. 446—301 **2 Claims**



1. In combination

(a) a doll having a face with lips defining a mouth, and having crying and sucking mechanisms which produce movement of the lips of the doll, and also having a voice device which produces a crying sound, the doll being characterized by a timing/control circuit which includes the voice device and a motor which moves the lips by operation of said sucking mechanism, said circuit also including:

i) a switch place din said mouth so as to be opened by a shaft inserted into the mouth, this switch being connected to the circuit to operate the voice device to produce the crying sound after the switch has been closed;

ii) a magnetic field detector separate from said switch and located adjacent the mouth, and connected to the circuit to activate the motor and thereby the sucking mechanism;

said timing/control circuit being arranged to activate said motor when the magnetic field detector indicates that a magnetic nipple has been placed in the vicinity of the mouth and to activate the voice device to produce a crying sound at a predetermined time interval after removal of the nipple from the mouth, said switch being operable by said shaft to terminate the crying sound and to de-activate the circuits when the shaft is inserted into the mouth;

(b) a simulated pacifier having a shaft suitable for operating said switch; and

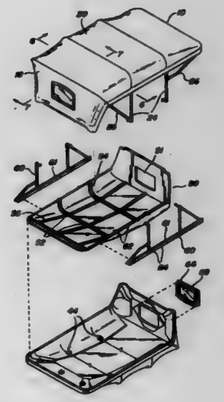
(c) a bottle with a magnetic nipple suitable for operating the magnetic field detector.

5,190,493

FABRIC ROOF FOR SCALE MODEL VEHICLE AND METHOD OF ASSEMBLY

William Li, Hong Kong, Hong Kong, assignor to Franklin Mint Company, Franklin Center, Pa.

Filed Jan. 3, 1992, Ser. No. 816,995
Int. Cl.[5] A63H *17/26*
U.S. Cl. 446—470 **10 Claims**



1. A fabric covered roof for model vehicles which simulates a vehicle roof of the type in which a fabric cover is attached to bows, comprising:

(a) an upper frame having front, back and lateral sides which is spanned on a top face thereof by a plurality of spaced transverse ribs extending between the lateral sides, wherein said ribs are shaped to simulate the upper portion of said bows;

(b) a plurality of pegs depending from a bottom face of said frame, said pegs being arranged in a pattern:

(c) a fabric cover stretched over said transverse ribs, said cover being folded around the frame sides and clamped to at least one of said pegs;

(d) a bottom plate adapted to fit inside said upper frame and having a shape generally matching the contour defined by

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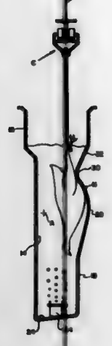
the bottom face of the frame, and further having bores arranged in a matching pattern thereon adapted to receive said pegs in a closely conforming fit to hold said frame and plate together.

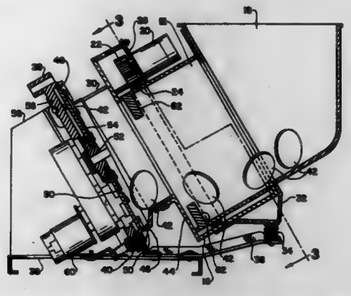
5,190,494
POULTRY SCALDER
Eugene E. Martin, Denver, Pa., and Edward H. Covell, III, 919 Riverside Dr., Salisbury, Md. 21801, assignors to Edward H. Covell, III, Salisbury, Md.
Filed Jan. 21, 1992, Ser. No. 822,961
Int. Cl.[5] A22B *5/08*
U.S. Cl. 452—80 7 Claims



1. An apparatus for scalding poultry, comprising
a shackle conveyor for moving a series of slaughtered birds along a predetermined path,
an elongate tank for containing scalding water, disposed below said conveyor and configured to follow said path, said tank having an unobstructed, open top and two side walls, at least one of said walls having an inwardly and upwardly inclined portion even with the breasts of the birds, and
said conveyor being situated sufficiently close to said inwardly inclined wall portion, laterally, to keep the breasts in contact therewith, whereby a normal force developed between said inwardly inclined wall portion and the breast has a downward component sufficient to overcome any buoyancy forces that would otherwise raise portions of the birds out of the water.

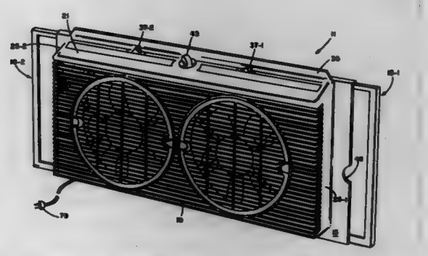
5,190,495
HIGH CAPACITY COIN HOPPER FOR A GAMING MACHINE
Thomas N. Taxon, Henderson, Nev., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Feb. 14, 1991, Ser. No. 655,871
Int. Cl.[5] G07D *9/04*
U.S. Cl. 453—32 27 Claims

1. A coin storage and dispensing apparatus for a gaming machine comprising:
a frame;
an inclined hollow cylinder for holding coins rotatably mounted on said frame;
rotating means for rotating said cylinder; and



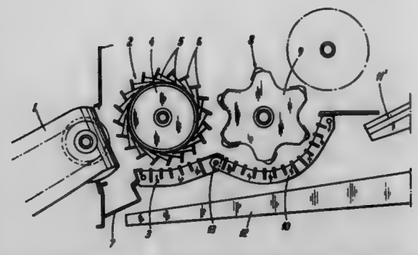
rotating dispensing means for dispensing coins from said cylinder.

5,190,496
WINDOW FAN
Shao Shih-Chin, Framingham, Mass., assignor to Holmes Products Corp., Milford, Mass.
Filed May 1, 1991, Ser. No. 693,303
Int. Cl.[5] F24F *7/013*
U.S. Cl. 454—210 6 Claims



1. A window fan comprising:
a) a housing having at least one air flow opening adapted to communicate with the space inside of a window, at least one air flow opening adapted to communicate with the space outside of a window, a pair of adjustably extendable side extensions, each of said pair of adjustably extendable side extensions comprising a pair of outer guides, each of said outer guides having formed on its inner surface at least one row of projections, and a plurality of telescoping panels, said telescoping panels being disposed on opposite sides of said at least one row of projections, the outermost telescoping panel having an outer edge sized and shaped to fit within the side railing of either a double hung window frame or within the top and bottom railings of a vertical slider window frame;
b) four locking assemblies mounted on said housing, each of said four locking assemblies having means for engaging the projections on a corresponding outer guide and being movable between a first position in which said engaging means engages the projections in a ratchet-type fashion, permitting movement of the outer guide upon the application thereto of a substantial force, and a second position in which said engaging means engages the projections in a locking fashion, preventing movement of the outer guide; and
c) at least one fan unit mounted inside said housing.

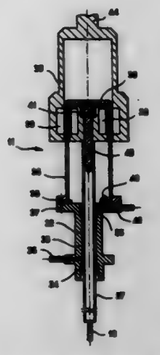
5,190,497
SELF-PROPELLING HARVESTER THRESHER
Franz Heldjans, Harsewinkel, Fed. Rep. of Germany, assignor to Claas Ohg, Harsewinkel, Fed. Rep. of Germany
Filed Jul. 11, 1991, Ser. No. 728,599
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1990, 4023720
Int. Cl.[5] A01F *12/20*
U.S. Cl. 460—76 15 Claims



1. A self-propelling harvester thresher, comprising two threshing mechanisms located one after the other in a direction which is transverse to a transporting direction and each having a threshing drum and a threshing basket, said threshing mechanisms operating in accordance with the principle of a tangential flow and both drums of the threshing mechanisms rotating in the same direction, said threshing basket and said threshing drum of said first threshing mechanism and said threshing basket and said threshing drum of said second threshing mechanism being arranged with a gap relative to one another which gap is adjustable, said threshing drum of one of said threshing mechanisms which is the first threshing mechanism as considered in a working direction having a circumferential speed which is smaller than a circumferential speed of said threshing drum of the other of said threshing mechanisms which in a second threshing mechanism as considered in the working direction.

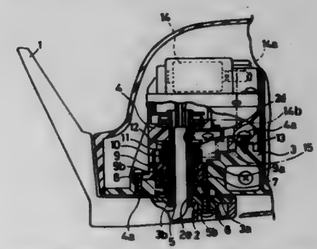
5,190,498
MAGNETIC DRIVE SYSTEM FOR REACTOR USED IN THE SYNTHESIS OF ZIEGLER-TYPE CATALYTIC SOLIDS OR SOLID CONSTITUENTS OF THE SAME
Claude Brun, Idron, France, assignor to Elf Atochem S.A., Courbevoie, France
Division of Ser. No. 629,849, Dec. 19, 1990. This application Jan. 15, 1992, Ser. No. 820,930
Claims priority, application France, Dec. 22, 1989, 89 17071
Int. Cl.[5] F16D *27/01*
U.S. Cl. 464—29 7 Claims

1. In a reactor having a reactor body and an agitator, a magnetic drive system for generating rotational and translational motion of the agitator, comprising:
a tubular shaft having one end attached to the agitator and another end;
a magnetic annular weight fitted to said another end;
a guide column having an end supported by the reactor body and a free end, the guide column further having a cylindrical bore and just means for slidably mounting an intermediate part of said tubular shaft in a fluid tight manner;
a cylindrical guide cap fluid tightly mounted to the free end of the guide column, the guide cap covering the magnetic annular weight and incorporating a cylindrical guide shaft integral with a bottom of the cap, and second means for slidably mounting said tubular shaft coaxially and fluid tightly on said guide shaft;
a drive rotor covering the guide cap and positioned annular magnetic weight enclosing the guide cap and positioned with respect to the annular weight fitted to the tubular shaft such that a rotational or translational movement of the drive rotor generates a corresponding movement of the tubular shaft and the agitator; and



means connected to the drive rotor for rotationally and translationally moving the drive rotor.

5,190,499
TORQUE LIMITER ARRANGEMENT FOR ROTATING DEVICE
Keiji Mori, Kariya, and Hidekazu Kogita, Toyota, both of Japan, assignors to Aisin Seiki K.K., Kariya, Japan
Filed Oct. 2, 1990, Ser. No. 591,640
Claims priority, application Japan, Oct. 2, 1989, 1-257549
Int. Cl.[5] G02B *7/18*; F16D *7/06*
U.S. Cl. 464—36 7 Claims



1. A torque limiter arrangement, for a rotating device, adapted to control relative rotation between a fixed element and a rotational element operatively connected to a drive unit, comprising:
a first clutch disposed between said fixed element and said rotational element and releasable upon application of a relative torque not less than a predetermined first torque between the fixed element and the rotational element;
a second clutch disposed between said fixed element and said rotational element and releasable upon application of a relative torque not less than a predetermined second torque between the fixed element and the rotational element;
a first biasing means operatively connected with the first clutch to determine the first torque; and
a second biasing means operatively connected with the second clutch to determine the second torque;
wherein the second biasing means provides a biasing force greater than a biasing force provided by the first biasing

means to such a degree that the second torque is always larger than the first torque,

wherein said first and second biasing means include at least one first spring operatively connected between and acting on the first and second clutches, and at least one second spring operatively connected with and acting only on the second clutch, and

wherein said first biasing means is comprised solely of said at least one first spring acting on said first clutch and said second biasing means is comprised of said at least one first spring and said at least one second spring acting together on said second clutch.

5,190,500

CHAIN THROWER MECHANISM FOR BICYCLE GEAR CHANGE

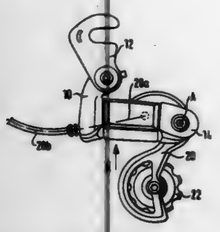
Hans J. Schwerdhoefer, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 8, 1991, Ser. No. 773,108

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1990, 4031983

Int. Cl.[5] F16H *59/00*

U.S. Cl. 474—80 **36 Claims**



1. A chain thrower mechanism for gear change in a bicycle, said chain thrower mechanism comprising two terminal members (10,14), namely a frame side terminal member (10) adapted to be fastened on a bicycle frame and a thrower side terminal member (14) adapted to be assembled with a chain thrower unit (20) and further comprising at least one connecting member (16,18) hingedly connected with both said terminal members (10,14) for guiding said thrower side terminal member (14) along a predetermined path (24) with respect to said frame side terminal member (10), said chain thrower unit (20) being adapted for engagement with a bicycle chain and for dislocating said bicycle chain between at least two chain sprockets in response to movement of said thrower side terminal member (14) along said predetermined path (24), at least one articulated component assembly (10,16) of said chain thrower mechanism comprising at least two components (10,16), one of said at least two components (10,16) being at least a part of one (10) of said terminal members (10,14) and another one (16) of said at least two components (10,16) being at least a part (16) of a connecting member (16), said at least two components (10,16) being articulated with respect to each other by a joint having a joint axis (B—B), said at least two components (10,16) being moulded from a plastics material,

said at least two components (10,16) being integrally moulded from said plastics material, said joint (34) being formed as a weakened portion of plastics material interconnecting said two components (10,16).

5,190,501

METHOD OF MANUFACTURING BICYCLE CHAIN THROWER MECHANISM

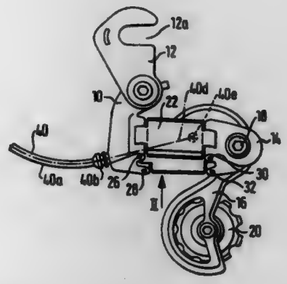
Hans J. Schwerdhoefer, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 8, 1991, Ser. No. 773,104

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1990, 4031982

Int. Cl.[5] F16H *61/00*

U.S. Cl. 474—80 **23 Claims**



1. A method of manufacturing a chain thrower mechanism for gear change operations in a bicycle,

said chain thrower mechanism comprising two terminal members (10, 14), namely a frame side terminal member (10) adapted to be fastened on a bicycle frame, and a thrower side terminal member (14) adapted to be assembled with a chain thrower unit (16), and further comprising at least one connecting member (22, 24) hingedly connected with both said terminal members (10, 14) for guiding said thrower side terminal member (14) along a predetermined path (34) with respect to said frame side terminal member (10), said chain thrower unit (16) being adapted for engagement with a bicycle chain and for dislocating said bicycle chain between at least two chain sprockets in response to movement of said thrower side terminal member (14) along said predetermined path (34),

at least one articulated component assembly (10, 22) of said chain thrower mechanism comprising at least two components (10, 22), one (10) of said at least two components (10, 22) being at least a part of one (10) of said terminal members (10, 14) and another one (22) of said at least two components (10, 22) being at least a part of a connecting member (22), said at least two components (10, 22) being articulated with respect to each other by a joint (26) having a joint axis, said joint (26) being established by respective complementary and mutually engaged hinge portions (10*b*, 22*a*) of said components (10, 22),

said method comprising manufacturing said at least one component assembly (10, 22) by

a) prefabricating a first one (10) of said at least two components (10, 22) with a respective hinge portion (10*a*, 10*b*);

b) providing a mould cavity (44*c*) for moulding a second one (22) of said at least two components (10, 22), said mould cavity (44*c*) being partially confined by said first component (10) such that the hinge portion (10*a*, 10*b*) of said first component (10) is inside of and in fluid flow communication with said mould cavity (44*c*);

c) filling said mould cavity (44*c*) with a liquid moulding material such as to obtain said second component (22) with the respective hinge portion (22*a*) of said second component (22) being shaped by the complementary hinge portion (10*a*, 10*b*) of said first component (10).

5,190,502

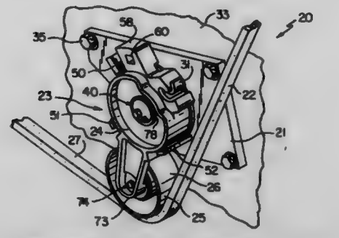
BELT TENSIONING SYSTEM, BELT TENSIONER THEREFOR AND METHODS OF MAKING THE SAME

David E. Gardner, Royal Oak, and David B. Novak, Bloomfield Hills, both of Mich., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Feb. 7, 1992, Ser. No. 832,297

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—135 **20 Claims**



1. In a belt tensioning system comprising a support means having an abutment means, an endless transmission belt construction carried by said support means and arranged to move in a certain path relative to said support means, an arm pivotally mounted to said support means, a pulley rotatably carried by said arm and being in engagement with said belt construction, and a wound coiled spring having opposed ends one of which is operatively interconnected to said abutment means of said support means and the other of which is operatively interconnected to said arm whereby the force of said wound coiled spring tends to pivot said arm in a direction that urges said pulley against said belt construction with a force that tensions said belt construction, the improvement wherein said arm has a shoulder means for being engaged by said one of said opposed ends of said wound coiled spring by the force of said wound coiled spring so as to permit removal of said arm and said wound coiled spring as a self-contained unit from said support means when said arm is pivoted to a certain position where said shoulder means of said arm engages said one end of wound coiled spring and effectively moves said one end of said wound coiled spring out of contact with said abutment means of said support means.

5,190,503

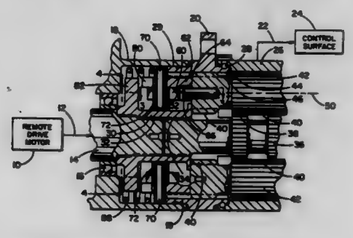
GEARED ROTARY ACTUATOR WITH INTERNAL STOP MECHANISM

David E. Russ, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 16, 1991, Ser. No. 808,447

Int. Cl.[5] F16D *11/08, 11/12, 43/26*; F16H *35/10*

U.S. Cl. 475—269 **11 Claims**



7. A geared rotary actuator comprising:

a housing adapted to be fixed to another structure;

a rotatable input shaft journalled by said housing;

a sun gear within said housing and coaxial with said input shaft;

means drivingly connecting said sun gear to said input shaft;

a rotatable output shaft journalled by said housing and including a rotatable ring gear coaxial with said input shaft;

a fixed ring gear in said housing;

at least one planet gear in said housing between said sun gear and said ring gears and meshed with said sun gear and both said ring gears and undergoing epicyclic motion upon rotation of said input shaft toward or away from an overtravel position;

a position indicating formation movable in said housing with said planet gear to provide a mechanical indication of the position of said planet gear in relation to said overtravel position;

a mechanical sensor including a first ring-like element rotatable within said housing about said input shaft and having a sensing formation complimentary to said position indicating formation and arranged such that movement of said planet gear close to said overtravel position will cause rotation of said first ring-like element within said housing;

a first cam surface on said first ring-like element;

a second ring-like element in said housing about said input shaft and mounted thereon to be fixed against rotation while being axially movable along said shaft;

a cam follower on said second ring-like element and engageable with said first cam surface;

a radially directed stop tab carried by said input shaft to be rotatable therewith in a path in proximity to said second ring-like element;

an axially directed stop tab carried by said second ring-like element and movable therewith into said path and;

a spring in said housing biasing said second ring-like element away from said path.

5,190,504

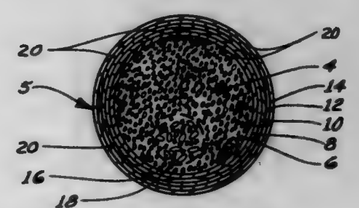
DEFORMABLE GRIP

Mark A. Scatterday, 4001 N. 54th Pl., Phoenix, Ariz. 85018

Filed Jan. 9, 1992, Ser. No. 895,791

Int. Cl.[5] A63B *23/16*

U.S. Cl. 482—49 **8 Claims**

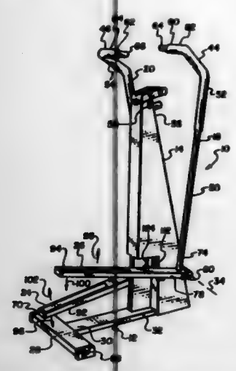


1. A semi-resilient exercise grip comprising:

a non-resilient core containing a deformable mixture of individual particles identical in size and shape to millet and a talc lubricant; and

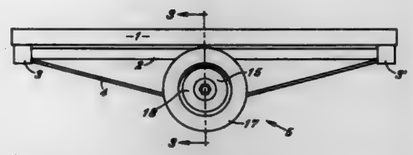
a resilient covering surrounding said core wherein when the grip is held in a user's hand in a non-deformed round shape and then compressed by a user's hand, it is deformed into a first shape and upon the release of compressive force, the grip partially resumes the shape it had prior to the deformation and assumes a second shape.

5,190,505
STEPPER EXERCISER
William T. Dalebout, Logan, and Scott R. Watterson, River Heights, both of Utah, assignors to Proform Fitness Products, Inc., Logan, Utah
Division of Ser. No. 482,224, Feb. 20, 1990, Pat. No. 5,058,882, which is a continuation-in-part of Ser. No. 432,145, Nov. 6, 1989, Pat. No. Des. 321,388. This application Sep. 24, 1991, Ser. No. 764,812
Int. Cl.[5] A63B *23/04*
U.S. Cl. 482—52 9 Claims



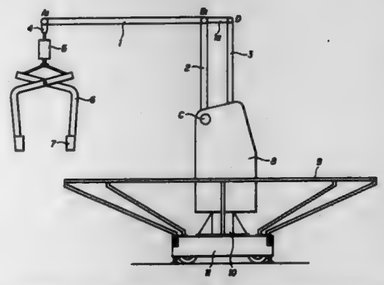
1. An exercising device for the performance of stepping exercises by an upright user, said exercising device comprising:
frame means for positioning on a support surface;
a first lever having an upper surface and opposite first and second ends, said lever being pivotably mounted proximate said first end thereof to said frame means with said second end being free and moveable in an arc between a first position and a second position which is above and spaced from said first position;
a second lever having an upper surface and opposite first and second ends, said second lever being pivotably mounted proximate said first end thereof to said frame means with said second end being free and moveable in an arc between a first position and a second position which is above and spaced from said first position;
resistance means connected to the frame means and to said first lever and said second lever to resist movement of each of said second end of said first and second levers from said second positions to said first positions;
a first handle removably attached to said first lever proximate said first end thereof, to extend rigidly freely upwardly therefrom, said first handle being sized for grasping and moving by the hand of a user positioned on said first and said second lever and moveable in an arc between a first position and a second position which is forward and spaced from said first position, wherein movement of said first handle from said first position to said second position urges said second end of said first lever from said first position to said second position; and
a second handle removably attached to said second lever proximate said first end thereof to extend freely upwardly therefrom, said second handle being sized for grasping and moving by the hand of a user positioned on said first and said second lever and movable in an arc between a first position and a second position which is forward and spaced from said first position wherein movement of said second handle from said first position to said second position urges said second end of said second lever from said first position to said second position.

5,190,506
ADVANCED BALANCING BOARD
Daniel M. Zublk, 181 Porter St., Watertown, Conn. 06795, and Dean W. Kennedy, 237 Island Trail, Harris, Conn. 06763
Filed Dec. 17, 1991, Ser. No. 808,654
Int. Cl.[5] A63B *22/20*
U.S. Cl. 482—68 6 Claims



1. A balancing board comprising:
a. an elongate deck having longitudinally disposed centrally on its undersurface a stepped rail, the rail defined by a central raised rib and side ledges of lesser height than the raised rib;
b. a roller assembly comprising a spaced pair of like wheels linked together for independent rotation by a central axle, each wheel comprising a rigid hub, the hubs engaging the respective ledges and closely straddling the raised rib, each wheel further comprising a resilient tire, said tire surrounding the hub such that said tire does not engage the ledges and raised rib, said roller assembly being capable of maintaining a neutral position wherein neither tire engages the elongated deck,
whereby the user in riding the deck may exert force downward to one side of the deck and cause the deck to tip laterally so that the undersurface engages only the tire on one of the wheels, and the ledge of the opposing side of the stepped rail disengages its corresponding hub, to cause rotation of the engaged wheel while the other wheel idles to achieve a desired result.

5,190,507
APPARATUS FOR PRACTICE OF AMBULATION
Kenji Iijima, Hamamatsu, Japan, assignor to Japan EM Co. Ltd., Shizuoka, Japan
Filed Jan. 30, 1991, Ser. No. 647,830
Int. Cl.[5] A61H *1/02*
U.S. Cl. 482—69 4 Claims

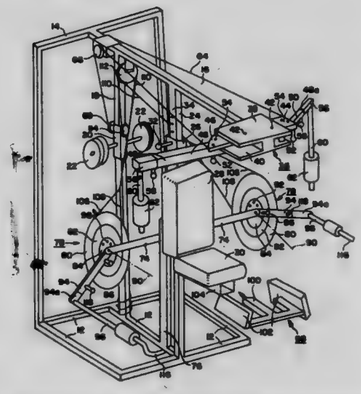


1. An apparatus for practice of ambulation, comprising:
means for suspending a person making practice of ambulation by a predetermined suspension force;
means for generating said predetermined suspension force; and
means for generating a restoring force to restore said person to a predetermined path when said person is outside of said predetermined path, said suspension force generating means being pivoted on a fixed point to be allowed to perform clockwise and counter clockwise rotations;
said means for generating said suspension force becoming inclined by said clockwise and counter clockwise rotations on said fixed point when the person is outside of said predetermined path, said restoring force being generated in accordance with inclination of said means for generating said suspension force.

5,190,508
RETRACTABLE JUMP ROPE
Paul E. Kliewer, and Barbara A. Kliewer, both of 405 Brooks Lake Rd., Cokato, Minn. 55321
Filed Mar. 3, 1992, Ser. No. 845,015
Int. Cl.[5] A63B *5/20*
U.S. Cl. 482—82 15 Claims

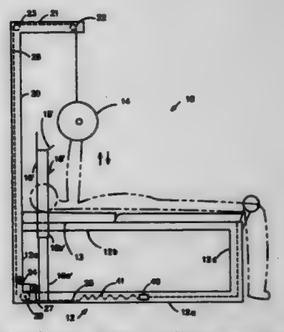
1. A jump rope comprising:
a) a pair of elongated handles; and
b) a spirally coiled cord having open coils and extending between the handles and being extendable in length by centrifugal force being exerted on the cord when the handles are manipulated to swing the cord for jumping rope, the centrifugal force extending the cord to a longer length sufficient for jumping rope, the cord being resiliently retractable to a shorter length insufficient for jumping rope when the cord is at rest, wherein the handles are tubular and engageable to each other, the cord being retractable into the handles whereby the jump rope may be stored in one piece.

5,190,509
UPPER BODY ISOLATING EXERCISER
Fredric O. Davison, Jr., 1719 Grant St., Santa Clara, Calif. 95050
Filed Sep. 12, 1991, Ser. No. 758,791
Int. Cl.[5] A63B *21/062*
U.S. Cl. 482—100 15 Claims



1. An exerciser for exercising the upper body of a user which comprises:
a frame including a vertical track member and vertical seat support member;
a weight assembly means slidably mounted on said vertical track;
a seat means slidably mounted on said vertical seat support member;
means for securing said seat means at any one of a plurality of preset locations on said vertical support member;
a right and left lower lever means rotatably secured to said frame for exercising by a user sitting on said seat with said right lower means located on his right side and said left lower means located on his left side;
a first cable means having a first end coupled to said right lower lever means and a second end coupled to said left lower lever means;
a first pulley means for coupling said weight means to said first cable means; and
wherein said right and left lever means each includes:
a first lower cam and second lower cam, each with a periphery;
an arm;
said first and second cams and an end of said arm concentrically mounted rotatably together on said frame;
means for securing said arm to a preset orientation with respect to said cams; and
said first cable means includes a first branch cable and a second branch cable each having one end joined to said periphery of said first and second cams respectively at locations on opposite ends of a diameter of said cams and each said branch cable having another end joined to said another branch cable end and to an end of a main cable coupled to said weight assembly means providing that when said lower lever is turned in one said direction, said first cam will pull on said first branch cable and when said lever is turned in said opposite direction, said second cam will pull on said second branch thereby lifting said weight means and providing resistance to turning said lever in both said directions to a user seated at a preset elevation on said seat and forcibly contacting said right or left lower lever means with his respective right or left hand or forearm to rotate said respective lower lever means.

5,190,510
BENCH PRESS APPARATUS
John Goodger, 7 Minti Rd., Coram, N.Y. 11727
Filed Sep. 5, 1991, Ser. No. 755,482
Int. Cl.[5] A63B *21/078*
U.S. Cl. 482—104 8 Claims



1. An apparatus for training weight lifters in performing weight lifting exercise comprising:
a substantially horizontal bench plateform, said platform having at one end a head portion and at the other end a leg portion, said platform having an axis extending longitudinally from said head portion to said leg portion, and said platform supporting the head and torso of the weight lifter

thereon in a generally horizontal position, such that the weight lifter's thighs may extend horizontally beyond said leg portion, the weight lifter's feet may rest on a floor, the weight lifter's legs may bend at the knees, and the weight lifter's knees may alternately move inward and outward from each other while the weight lifter's feet rest uninterrupted on the floor without the need to lift the feet up from the floor;

a support for a barbell weight;

a cord member attachable at one end to the barbell weight;

one or more pulleys mounted on the apparatus, said cord member rotatable about said one or more pulleys and connected at an other end to a base of said apparatus;

a motor for rotating said cord about said one or more pulleys; and,

a weight support actuating means to permit the weight lifter to actuate a lifting of the barbell weight away from the weight lifter while the feet of the weight lifter rest uninterrupted on the floor and while the barbell weights are closely proximate to the chest area of the weight lifter, said weight support actuating means having one or more switches located in a position adjacent to said leg portion of said platform, said one or more switches horizontally and laterally oriented so as to be actuated by generally horizontal, lateral movement of the weight lifter's knees while the weight lifter's feet rest uninterrupted on the floor.

5,190,511

EXERCISE EQUIPMENT EMPLOYING FLUID RESISTANCE SUITABLE FOR USE IN SPACECRAFT AND OTHER LOW GRAVITY ENVIRONMENTS

Larry G. Petree, P.O. Box 3457, Lubbock, Tex. 79452

Filed Sep. 3, 1991, Ser. No. 754,442
Int. Cl.[5] A63B *21/008*
U.S. Cl. 482—112 **12 Claims**

1. A fluid resistance device, comprising:

housing means defining a chamber having two variable volume chamber portions for containing fluid;

fluid moving means in said housing means for moving fluid in said housing means from one chamber portion to the other chamber portion;

baffle means in said housing means;

at least two bores passing through said baffle means;

valve means in said baffle means, wherein said valve means and said baffle means cooperate to resist fluid flow between said chamber portions in said housing means;

adjustment means external to said housing means in operative relationship with at least one of said valve means; and

lever means external to said housing means in operative relationship with said fluid moving means; wherein:

said valve means comprises at least two one way valves each respectively located in one of said bores, at least one of said valves having a valve element capable of allowing fluid flow through one of said bores in only one direction from a second chamber portion to a first chamber portion, and at least one other of said one way valve means having a valve element being oriented in said other bore to only permit fluid flow in an opposite direction from said first chamber portion to said second chamber portion;

said adjustment means regulates at least one of said valve means to adjust the minimum force required to move said lever in at least one direction so as to cause fluid to flow through at least one of said bores; and

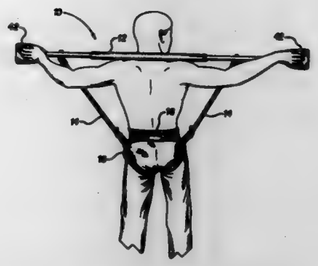
said one way valves which will not allow fluid flow in one direction will also not allow fluid flow in the opposite direction unless a predetermined minimum force is applied via said lever means.

5,190,512

EXERCISER

Daniel J. Curran, 2369 Kingston Creek Rd., California, Md. 20619

Filed Nov. 7, 1991, Ser. No. 788,925
Int. Cl.[5] A63B *21/02*
U.S. Cl. 482—124 **3 Claims**



1. Exercising apparatus comprising:

an extensible pole having a central segment and first and second outer segments, each having an outer end, said first and second outer segments being concentric and axially slidably adjustable relative to said central segment;

a body harness for engaging the midsection of a user including a belt and a plurality of flexible straps for encircling the crotch of a user; and

a plurality of elastic, substantially linear flexible members, each of said elastic, substantially linear flexible members being attached to one end to said extensible pole segment outer ends and being attached at the other end to said body harness, at least one of said ends of said elastic, substantially linear flexible members being adjustable as to length, each of said elastic, substantially linear flexible members being anchored at one end to a respective one of said flexible straps, whereby movement of said extensible pole during exercising is yieldably resisted by said elastic, substantially linear flexible members, muscles of the body thereby being forced to exert increased effort.

5,190,513

DUAL STATION EXERCISE BENCH

Theodore G. Habing, Long Beach, and Ronald S. Gibson, Valencia, both of Calif., assignors to Pacific Fitness Corporation, Santa Fe Springs, Calif.

Filed Aug. 21, 1991, Ser. No. 748,025
Int. Cl.[5] A63B *23/02*
U.S. Cl. 482—145 **7 Claims**

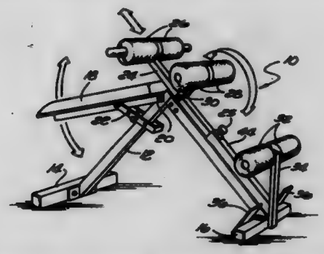
1. An exercise apparatus comprising:

a frame having front and rear base members and front and rear inclined portions extending downwardly from an apex toward said front and rear base members respectively;

a back pad coupled to said rear inclined portion of the frame;

a lower transverse support pad coupled to said frame proximate to said front base member;

an upper transverse support pad coupled to said front inclined portion of the frame proximate to said apex; and



an intermediate transverse support pad coupled to said front inclined portion of the frame between said upper and lower support pads;

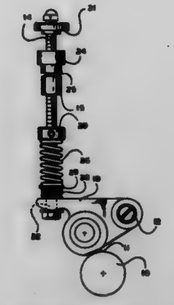
wherein said forward inclined portion of the frame includes a slideable member to which said upper support pad is coupled and said intermediate support pad is pivotally coupled to said slideable member.

5,190,514

GAP CONTROL APPARATUS FOR FOLD ROLLER

Tom Galvanauskas, Palm Bay, Fla., assignor to Profold, Inc., Sebastian, Fla.

Filed Oct. 11, 1991, Ser. No. 776,087
Int. Cl.[5] B65H *45/14*
U.S. Cl. 493—420 **4 Claims**



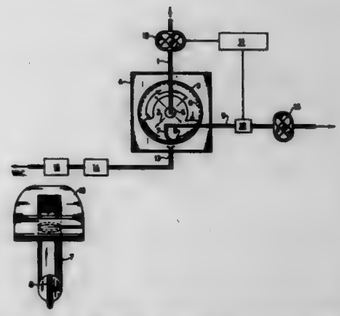
1. Paper folding apparatus including a plurality of fold rollers and a plurality of complementary rollers, each fold roller of said plurality of fold rollers being adjacent to one complementary roller of said plurality of complementary rollers for forming a nip therebetween, each fold roller of said plurality of fold rollers further including a pivot, an arm mounted on said pivot and carrying said fold roller, and a screw received through an opening in said arm so that said arm is movable relative to said screw, characterized by a plurality of springs for normally urging said arm in a first direction to cause said fold roller to engage said complementary roller at said nip, said plurality of springs including a first spring surrounding said screw, and a second spring surrounding said screw and adjacent to said first spring so that said first spring and said second spring are in series with each other, said springs normally urging said fold roller against said complementary roller, said first spring being easily compressible to allow said fold roller to move and open said nip sufficiently for a piece of paper being folded to pass through said nip between said fold roller and said complementary roller.

5,190,515

VACUUM DEGASSING APPARATUS

Donald E. Eaton, Walworth; Errol S. Francis, Rochester; Eric L. Dillenbeck, Rochester; Lawrence D. Meston, Rochester, and Walter Johannes, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 13, 1992, Ser. No. 820,449
Int. Cl.[5] B04B *11/02, 11/08, 15/08*
U.S. Cl. 494—5 **8 Claims**



1. An apparatus for degassing a continuously flowing liquid feed stream which comprises:

an air-tight housing;

means for removing gas from within said housing and for maintaining therein a sub-atmospheric pressure;

said housing containing a centrifuge bowl having a circular cross-section, said bowl being mounted for rotation about an axis extending through the center of and perpendicular to said circular cross-section;

said bowl having an inner surface for the spreading of centrifugally impelled liquid in a thin layer and an annular peripheral trough for retaining centrifugally impelled liquid as the bowl rotates;

means for feeding said liquid feed stream into said bowl;

means for withdrawing a degassed liquid stream from said bowl which includes a tube extending from an exit line outside of said housing to an open end of said tube that is positioned within the annular trough of said bowl and is immersible in the liquid therein;

means for measuring the pressure of the degassed liquid stream withdrawn from said bowl through said tube;

means responsive to said pressure measuring means for regulating the flow of the liquid feed stream into said bowl to maintain a substantially constant level of liquid in the annular trough of said bowl; and

means for regulating the flow of the degassed liquid stream withdrawn from said bowl.

5,190,516

METHOD INTRAOPERATIVE ELECTRON BEAM RADIOTHERAPY USING REMOTELY LOCATED BEAM GENERATOR

Donald G. Brosa, 4901 Sussex Way, Bloomfield Hills, Mich. 48013

Continuation of Ser. No. 267,573, Nov. 8, 1988, abandoned, which is a division of Ser. No. 911,138, Sep. 24, 1986, abandoned. This application Jan. 19, 1990, Ser. No. 540,453
Int. Cl.[5] A61N *5/10*
U.S. Cl. 600—1 **3 Claims**

1. A method for alternatively utilizing a single microtron for time shared intraoperative and conventional radiotherapy at

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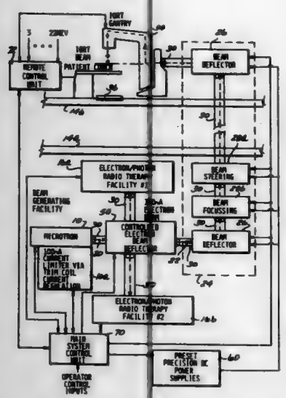
alternate sites in a multilevel building having an operating suite level and a radiation therapy level, comprising the steps of:

generating an electron beam with said microtron of selectively variable current and energy levels;

generating an electron beam at a current level high enough to enable a full range of radiotherapy, including effective photon irradiation, to a treatment site located on said radio-therapy level in said building, and transporting said high current electron beam over a transport system adapted to provide adequate shielding for said high current level electron beam;

alternatively generating an electron beam having a current level high enough at a maximum for effective electron beam treatment, but substantially below the current level



required for effective photon radiotherapy, and transporting said low current level beam over a relatively lightly shielded transport system to a treatment head located within an laternate site comprising a conventional operating suite on said operating suite level in said building, isolated and remote from said conventional treatment site and said microtron, whereby said microtron can be utilized for a complete range of conventional treatment at said conventional treatment site on said radiotheraphy level in said building and alternatively exclusively for intraoperative therapy at an alternate site comprised of an operating suite on said operating suite level in said building whereat said intraoperative therapy can be performed without moving patient out of said operating suite.

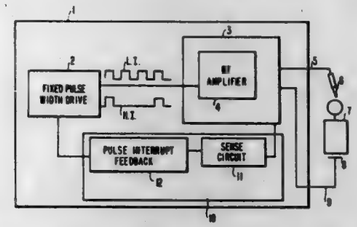
5,190,517

ELECTROSURGICAL AND ULTRASONIC SURGICAL SYSTEM

David A. Zieve, Lafayette, and Michael S. Klicek, Boulder, both of Colo., assignors to Valleylab Inc., Boulder, Colo.

Filed Jan. 6, 1991, Ser. No. 711,484
Int. Cl.[5] A61B *17/32, 17/39*
U.S. Cl. 604—22 5 Claims

1. In an electrical circuit system which provides electrical energy to a surgical apparatus for performing one or more surgical procedures at a surgical site on a patient, which apparatus comprises a handpiece, a tool supported by said handpiece, said tool having a vibrating tool tip with a tool passageway therethrough terminating in a tip opening, vibrating means for ultrasonically vibrating said tool tip and suction means for applying aspiration to aspirate tissue particles and fluid away from the surgical site and through said tip opening and tool passageway; which system comprises RF current means selectively operable for providing an RF current to said tool tip for allowing performance of an electrosurgical procedure at the surgical site; said RF current means including a generator having a pulse drive and RF amplifier section, and switching means for switching the RF current provided to said tool tip to at least an RF coagulating current during ultrasonic vibration, the improvement wherein said system includes



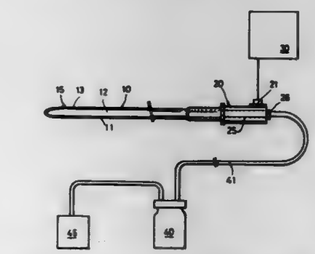
means for providing feedback control of the output energy provided by said drive comprising an impedance sensing network which automatically acts to reduce the RF output energy as load impedance increases, whereby RF leakage current is restrained to a safe low level.

5,190,518

SURGICAL DEVICE FOR THE TREATMENT OF HYPER HIDROSIS

Katsuya Takasu, 124-1, Aza-kamigochu, Oaza-akabane, Ishiki-cho, Haza-gun, Aichi-ken, Japan

Filed Apr. 8, 1991, Ser. No. 681,267
Claims priority, application Japan, Oct. 12, 1990, 2-275014
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 4 Claims



1. A surgical device for the treatment of hyper hidrosis, comprising:

a pipe portion having an enclosed tip on one end thereof, said pipe portion having at least one flattened surface along an entire length thereof, and having a suction opening on an upper surface thereof;

a convex scraping portion protruding outward from a front edge of the suction opening;

a handle detachably connected to said pipe portion, and having a passage therethrough;

vibration generator means for propagating ultrasonic vibrations to said pipe portion, said vibration generator means mounted on said handle;

suction pipe means, connected to the passage of said handle;

ultrasonic generator means for generating electrical energy to said vibration generator means;

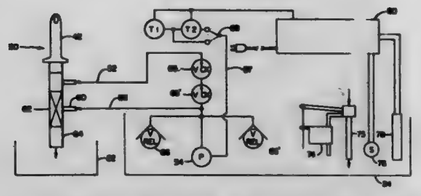
a suction means for providing suction, connected to said suction pipe means; wherein said vibration generator means propagates ultrasonic vibrations to said pipe portion by converting electrical energy provided by said ultrasonic generator means, a suction is provided to said suction opening by said suction means, through said suction pipe means, said handle, and said pipe portion.

5,190,519

METHOD AND APPARATUS FOR PULSING WATER INTO THE COLON AREA

David P. Mead, Castle Rock; Thomas Shilling, Englewood, and Ray Atchley, Golden, all of Colo., assignors to Aegis Medical, Inc., Littleton, Colo.

Continuation-in-part of Ser. No. 247,734, Sep. 22, 1988, Pat. No. 5,019,056. This application May 23, 1991, Ser. No. 704,330
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—27 10 Claims



1. In colonic lavage apparatus wherein a speculum is insertable into the rectum of a patient, a liquid fill line is provided for delivering liquid under pressure through said speculum into the patient's colon from a liquid supply source, the improvement comprising:

pump means for pumping liquid under pressure from said source through said speculum into the colon;

first timer means for sequentially activating and deactivating said pump means over first and second predetermined time intervals, respectively, whereby to deliver liquid under pressure over said first predetermined time interval; and

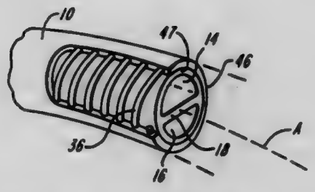
pulse means associated with said pump means including second timer means for delivering pulses of liquid through said speculum at closely spaced time intervals within each said first predetermined time interval.

5,190,520

REINFORCED MULTIPLE LUMEN CATHETER

Paul V. Fenton, Jr., Marblehead; William J. Gorman, Newburyport, and Thomas M. Young, North Andover, all of Mass., assignors to Strato Medical Corporation, Beverly, Mass.

Filed Oct. 10, 1990, Ser. No. 595,028
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—43 12 Claims



1. A multiple lumen catheter comprising:

(a) an elongated, flexible, tubular element extending about a central axis and including embedded therein at least one filament extending in a helical path about said central axis, wherein the inner surface of said tubular element defines an interior region; and

(b) an elongated divider element having elongated lateral edges, said lateral edges being integral with, and extending from portions of said inner surface of said tubular element, whereby at least two lumens are defined in said interior region on opposing sides of said divider element;

wherein said tubular element comprises:

(a) an elongated, flexible, tubular sheath having a substantially circular cross-section and an inner diameter substantially equal to D;

(b) an elongated, flexible, tubular interior element having an outer surface, an interior surface, and a substantially circular cross-section, said outer surface having a diameter equal to D1 and said interior surface having a diameter equal to d, where D1 is less than D and d is less than D1, and wherein the interior surface of said interior element forms said inner surface of said tubular element;

(c) said filament, said filament being wound about said outer surface of said tubular interior element; and

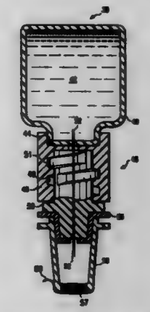
(d) a flexible bonding material dispose dint he region between the outer surface of said interior element and the inner surface of said sheath.

5,190,521

APPARATUS AND METHOD FOR RAISING A SKIN WHEAL AND ANESTHETIZING SKIN

Vance M. Hubbard; Welton K. Brunson, both of Bedford, and V. C. Saied, Wichita Falls, all of Tex., assignors to Tecnol Medical Products, Inc., N. Richland Hills, Tex.

Filed Aug. 22, 1990, Ser. No. 572,508
Int. Cl.[5] A61M *31/00, 5/24*
U.S. Cl. 604—51 12 Claims



1. A method for anesthetizing skin, comprising the steps of:

pinching a section of skin to be anesthetized;

pricking said section of skin with an injector containing an anesthetizing agent;

limiting the depth of penetration of said injector; and

forming a skin wheal so that it is readily accessible for intravenous injections or the like.

5,190,522

DEVICE FOR MONITORING THE OPERATION OF A DELIVERY SYSTEM AND THE METHOD OF USE THEREOF

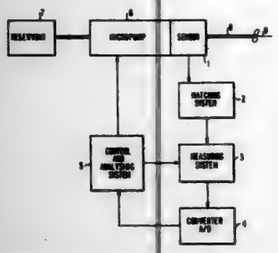
Jan Wojcicki, Warsaw; Bogusław Lilpop, Prazskow; Marek Ziembicki, and Stanislaw Bielawski, both of Warsaw, all of Poland, assignors to Institute of Biocybernetics and Biomedical Engineering P.A.S., Warsaw, Poland and Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 639,657, Jan. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 467,613, Jan. 19, 1990, abandoned. This application Apr. 11, 1991, Ser. No. 745,988
Claims priority, application Poland, Jan. 20, 1989, 277308
Int. Cl.[5] A61M *5/20*
U.S. Cl. 604—65 8 Claims

1. A device for monitoring the operation of a drug delivery system comprising:

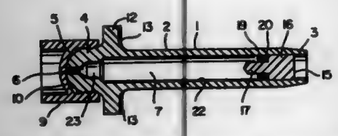
(a) a volumetric micropump which delivers in the form of a single stroke a preset amount of a drug from a drug reservoir through a catheter to a patient body;

(b) a measuring element or sensor located in the infusion line which generates an analog signal based on the actual pressure or the single stroke volume of the micropump;
(c) a matching system which conditions the signal produced by the measuring element or sensor and transmits the signal to a measuring system which measures the peak value and zero level of the signal and transmits the measured parameters to an analog-to-digital converter; and



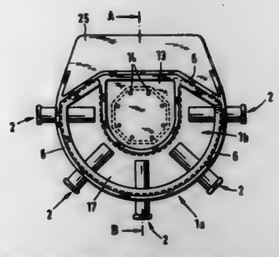
(d) an analyzing and control system which compares the measured parameters and the calculated amplitude with preset values recorded in the memory of the analyzing and control system and which (i) signals an alarm state or automatically corrects the operation of the micropump if a quantitative deviation in the volume of a single stroke of the pump is detected and (ii) signals an alarm state if another alarm state of the drug delivery system is detected.

5,190,523
DISPOSABLE SYRINGE AND INJECTOR
Istvan Lindmayer, Pierrefonds, Canada, assignor to Idee International R & D Inc., Montreal, Canada
Filed Aug. 16, 1991, Ser. No. 746,340
Int. Cl.[5] A61M *5/30*
U.S. Cl. 604—72 **7 Claims**



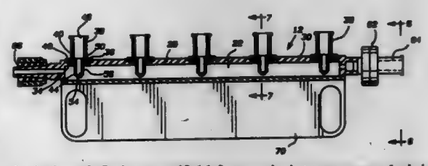
1. A syringe for a needleless injector comprising tubular body means defining a medicine chamber, said body means having one closed end and an open end; orifice means in said closed end for discharging medicine from said chamber; plug means slidable in said chamber between said open and closed ends for pushing medicine through said orifice means; prong means extending inwardly from said plug means into said means chamber; O-ring means on said prong means for creating a fluid-tight seal between said plug means and said body means; and annular sealing ring means on said prong means for preventing entry of said O-ring means between said plug means and said body means during movement of said plug means towards said orifice means, said sealing ring means including a slot extending through one side thereof facilitating expansion of said ring means against the interior of said body means for preventing movement of said O-ring between said body means and said plug means.

5,190,524
DEVICE FOR BRINGING TOGETHER SEVERAL INFUSIONS AND/OR INJECTIONS
Roland Wex, Am Haag 28, D-3508, Meisungen, Fed. Rep. of Germany
Filed Feb. 8, 1991, Ser. No. 652,937
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1990, 4004134
Int. Cl.[5] A61M *5/14, 37/00*
U.S. Cl. 604—80 **18 Claims**



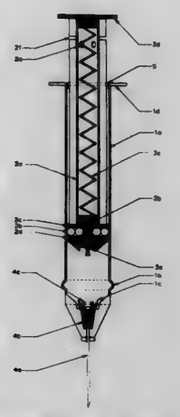
1. In a device for combining a plurality of liquid infusions to form a mixture comprising a chamber having a circumference and a plurality of separately closable inlets for various infusion liquids and an outlet for the mixture wherein the improvement comprises a chamber comprising a first chamber portion having inlets, a second chamber portion and an elastic sealing element held in an outer region of said circumference and interposed between the first and second portions, said sealing element extending over and covering the inlets, and segments of said sealing element being prestressed against such inlets to close same, each of said inlets communicating with the chamber and the outlet when the elastic sealing element is removed from covering each such inlet, wherein the separately closable inlets are disposed radially about an axis and said outlet is disposed longitudinally along said axis, wherein the inlets are located proximate the circumference of the chamber and each inlet ends in a sealing element opening space connected with the outlet, and wherein the sealing element has an inner circumference, and is disposed concentrically with the outlet, wherein the inner circumference terminates at a distance from an inner boundary of the opening space.

5,190,525
DRUG INFUSION MANIFOLD
Timothy J. Oswald, Lincolnshire; Lois L. Caron, McHenry; Mark E. Larkin, Lindenhurst; William L. Rudzena, McHenry, and Edward S. Tripp, Park City, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Continuation-in-part of Ser. No. 632,254, Dec. 21, 1990, abandoned. This application Dec. 31, 1991, Ser. No. 816,435
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—83 **13 Claims**



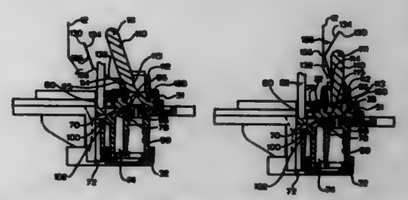
1. A drug infusion manifold for use in intravenous administration of drugs and/or solutions to a patient, said drug infusion manifold comprising:
(a) a housing defining an elongated in-line flow channel, said flow channel having a first open end portion for receipt of carrier fluid thereinto and a second open end portion for directing patient feed fluid therefrom;
(b) a plurality of spaced apart inlet openings formed in said housing in fluid communication with said flow channel; and
(c) check valve means extending through each of said inlet openings and into said flow channel for directing drugs and/or solutions into said flow channel and precluding fluid flow from said flow channel, said check valve means including a valve member defining an inlet portion for receipt of a drug and/or solution thereinto under pressure and a valve stem portion that extends into said flow channel, said valve stem portion having a side wall that defines an inlet passage that is open at one end in communication with said inlet portion and is closed at the other end, said side wall having at least one lateral inlet port extending therethrough communicating said inlet passage with said flow channel, said valve stem portion having an elastomeric sleeve member received in covering relationship with said inlet port such that when the pressure of the drug and/or solution in said inlet passage exceeds a predetermined level said sleeve member deflects outwardly directing fluid flow from said inlet passage into said flow channel to be transferred to the patient by flow of the carrier fluid.

5,190,526
HYPODERMIC SAFETY SYRINGE WITH RETRACTING NEEDLE SYSTEM
Kenneth W. Murray, 8185 S. Logan Ct., Littleton, Colo. 80122; Charles C. Gabbard, and Nola M. H. Gabbard, both of P.O. Box 244, Mount Juliet, Tenn. 37122-0244
Filed Sep. 18, 1992, Ser. No. 946,662
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **9 Claims**



1. A hypodermic safety syringe with a retracting needle system comprising;
a transparent cylindrical body element for containing a liquid; having appurtenances interacting with;
a hollow needle temporarily interconnected with said body element for communicating liquid between said body element and a patient, area or process, said needle having a carriage and a hollow tine, said needle repositionable between an operable extreme wherein said needle projects axially outward from said body element and an inoperable extreme whereby said needle is retracted and contained completely within said body element by interacting with;
a plunger reciprocally received into said body element whereby vacuum and pressurization forces are generated by adjustment of said plunger within said body element wherein liquid is drawn into said body element communicating through said needle by vacuum caused by adjusting said plunger outward from said body element and wherein liquid is expelled from said body element communicating through said needle by pressurization force caused by adjusting said plunger into said body element;
a retraction mechanism whereby a retraction guide is permanently connected to a spring and is locking contact with spherical bearings thus held motionless within a cylindrical cavity within the plunger structure,
a safing means associated with said hypodermic safety syringe with retracting needle whereby the needle is automatically retracted into a cavity within said plunger substantially at the end of the injection stroke whereby mating members extending from the retraction guide and needle carriage engage and become captured as an angled surface on the plunger deflects catches restraining the needle and carriage assembly; spherical bearings within shafts in the plunger align with a radial concave interior surface of the barrel thereby releasing the retraction guide, captured needle and carriage assembly thereby retracting within the cavity in the plunger structure and rendering the syringe safe for handling and transport to disposal.

5,190,527
INTRAVENOUS METERING DEVICE
Dannie E. Hamilton, Hoffman Estates, and Roberta Scola, Roselle, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Continuation-in-part of Ser. No. 411,789, Sep. 25, 1989, Pat. No. 5,108,373. This application Dec. 3, 1991, Ser. No. 802,069
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—153 **3 Claims**



1. A device which meters fluid for delivery from a source of fluid to a patient, comprising:
an air retention chamber having upper and lower portions, the upper portion having an inlet in fluid communication with the source of fluid, the lower portion having an outlet in fluid communication with a fluid passageway;
a pumping chamber having an inlet and an outlet, the inlet being in fluid communication with the fluid passageway, the pumping chamber inlet including a first valve to control the entry of fluid into the pumping chamber, the pumping chamber outlet including a second valve having an outlet pressure chamber in fluid communication with the pumping chamber and having a diaphragm as an upper wall;
a standpipe prestressed against the diaphragm;
means for varying the volume of the pumping chamber to pressurize the pumping chamber, the diaphragm being capable of opening in response to an increase in the pumping chamber pressure; and
safety means for preventing accidental free flow of fluid through the metering device.

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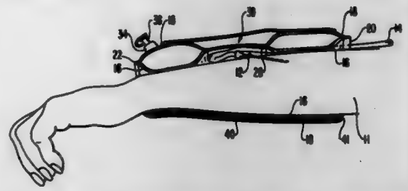
5,190,528
PERCUTANEOUS TRANSSEPTAL LEFT ATRIAL CANNULATION SYSTEM
James D. Fonger, Wayland, Mass.; Kenneth R. Jonkman, Grand Rapids, Mich.; James H. Anderson, Columbia, and Sally E. Mitchell, Baltimore, both of Md., assignors to Boston University, Boston, Mass.
Filed Oct. 19, 1990, Ser. No. 600,483
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—171 **42 Claims**

1. A cannulation system for draining blood from the left atrium of the heart through a blood vessel comprising, as an assembly to be inserted through the blood vessel:
- a catheter having a distal end and a proximal end, said distal end including an orifice and the catheter width being reduced near the orifice;
- a guide wire;
- a needle;
- said guide wire and said needle located axially in the catheter such that either the guide wire or the needle can alternately be extended through the orifice at the catheter distal end; and
- a cannula, having a distal end and a proximal end, surrounding the catheter, said cannula having a hole located at the extreme distal end of the cannula such that the hole of the cannula slides over the exterior of the catheter, the needle having a stiffness sufficient to serve as an obturator such that the catheter and cannula can be passed over the needle and through the atrial septum, but flexible enough to pass through a blood vessel.

5,190,529
ADVANCEMENT SLEEVE AND ADAPTER FOR A CATHETER
Jennifer J. McCrory, Lincoln, R.I., and James P. Cianci, Walpole, Mass., assignors to The Kendall Company
Filed May 20, 1991, Ser. No. 703,321
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—175 **22 Claims**

1. An article adapted for use as a component part of a catheter system wherein a proximal section is exteriorized above the skin for connection to a liquid drug source for administration to a patient through the catheter, comprising, in combination:
- a flexible sleeve having opposed proximal and distal ends defining a chamber within a sleeve having a diameter sufficiently great to permit passage of the catheter through the opposed ends of the sleeve,
- the sleeve having an advancement tip at its distal end adapted to facilitate advancement of the sleeve into a passage beneath the skin created by tunneling the catheter subcutaneously from the entry point where the distal end of the catheter is introduced into the body to an exit site where the proximal end is exteriorized for connection to an adapter,
- the advancement tip having a base section and a generally bullet-shaped leading end to which the top tapers from the base section to optimize ease of penetration, the base section having an outer diameter greater than the outer diameter of the sleeve, whereby to minimize frictional resistance to entry of the sleeve beneath the skin,
- the advancement tip having a channel extending therethrough for receiving the catheter for passage through the sleeve;
- an adapter for placing the proximal end of the catheter in liquid communication with the drug source, the adapter having
- opposed proximal and distal ends;
- a channel extending longitudinally between the adapter ends,
- an opening at the distal end of the adapter communicating with the adapter channel and through which the proximal end of the catheter can be inserted;
- means for releasably securing the proximal end of the catheter within the opening and in liquid communication with the adapter channel;
- and means for permanently attaching the proximal end of the sleeve to the distal end of the adapter with the sleeve chamber surrounding the opening in the adapter, whereby a catheter extending through the sleeve may be introduced into the adapter opening to receive liquid drug passing through the adapter channel for administration to the patient.

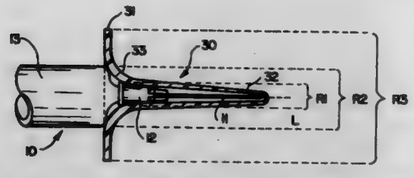
5,190,530
INFLATABLE CANNULA RETAINING DEVICE
Susan M. J. A. Greeff, and Janice A. Guastella, both of Cape Province, South Africa, assignors to OP-CO Medical Products Limited, New York, N.Y.
Filed Oct. 19, 1990, Ser. No. 599,871
Claims priority, application South Africa, Oct. 20, 1989, 89/7969
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—179 **5 Claims**



1. A protective medical retaining device for use with cannula means having connected intravenous line means, said cannula means being inserted in a patient, with said retaining device providing immobilization and protection for said cannula means with connected intravenous line means, said retaining device comprising:
- an inflatable pad means for covering skin of said patient adjacent said cannula means, said inflatable pad means including at least one observation opening that can be positioned over said cannula means so said cannula means is positioned within said observation opening, said inflatable pad means including strap means for retaining said inflatable pad means adjacent said skin of said patient, said cannula means being immobilized with respect to said skin of said patient when said inflatable paid means is inflated wherein said strap means is transparent and said strap means is positioned over said observation opening to provide an observation window means over said cannula means.

5,190,531
Patent Not Issued For This Number

5,190,532
CANNULA CAP
Wing-Kwong S. Yu, 2966 Crystal Creek Dr., San Jose, Calif. 95133
Filed May 8, 1992, Ser. No. 880,696
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **4 Claims**

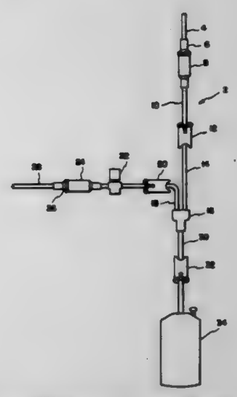


1. In combination with a conventional syringe having a barrel and a needle attached to said barrel by a hub, a cannula cap comprising:
- a conically shaped housing with an inner cavity extending from an open end to a closed end, said housing having circular cross-sections which progressively decrease in diameter relative to a longitudinal axis from said open end to said closed end;
- said open end of said housing mating with said hub to provide an airtight cover for said needle;
- a funnel integral with said conically shaped housing at said open end, said funnel having a smoothly rounded inner surface to slidably guide said needle into said housing, said inner surface extending along said longitudinal axis with a progressively increasing circular cross-section ending at an opening having a diameter sufficient to enclose and contact an outside surface of said barrel;
- said inner surface at said opening being integral with a front planar surface of a peripheral flange, said front planar surface extending normal to said longitudinal axis a distance beyond said opening sufficient to cover and protect the fingers of a handler;
- said funnel having an outer surface forming a smooth concave surface between a back planar surface of said peripheral flange and an outer surface of said housing, said back planar surface extending normal to said longitudinal axis beyond said opening a distance sufficient to cover and protect the fingers of said handler, said back planar surface forming a stop surface for the fingers of said handler when said handler grasps said cap by said funnel outer surface; whereby
- said funnel inner surface will guide said needle into said housing when said needle and said funnel are properly aligned, and said flange will receive needle jabs on said front planer surface of said flange when said needle and said funnel are not properly aligned, thereby protecting the fingers of said handler from said needle jabs.

5,190,533
BIODEGRADABLE FLUID-ABSORBING STRUCTURES
William A. Blackburn, 102 Biscayne Cir., Cary, N.C. 27513
Filed Jan. 6, 1992, Ser. No. 817,159
Int. Cl.[5] A61F *13/15, 13/20*; B32B *5/16*
U.S. Cl. 604—367 **33 Claims**

1. A biodegradable fluid-absorbing structure, comprising:
- (a) a biodegradable porous inner liner;
- (b) a biodegradable absorbent material forming a central section secured to the inner liner; and
- (c) a biodegradable outer cover secured to the absorbent material comprising:
  - (i) a biodegradable back sheet;
  - (ii) a biodegradable intermediate substrate located between the back sheet and the absorbent material; and
  - (iii) at least one inorganic mineral layer applied between the back sheet and the intermediate substrate and formed of a material which is capable of rapidly forming a fluid barrier when contacted by a fluid exuded by the absorbent material.

5,190,534
PREFILLED STERILANT FLUID RELEASABLE COUPLING CONNECTOR APPARATUS FOR CATHETER APPLICATIONS
Lamar C. Kendell, Ogden, Utah, assignor to DelMed, Inc., Ogden, Utah
Filed Dec. 7, 1990, Ser. No. 624,142
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—905 **17 Claims**



1. A luer lock connection device comprising:
- a male luer connector member having a central tubular portion outwardly circumscribed by a generally tubular sheath portion and having an open end facing in a first axial direction;
- a female luer connector member operatively interconnectable with said male luer connector and having a hollow tubular portion coaxially insertable into said sheath portion to coaxially receive said central tubular portion of said male luer connector member;
- cooperating thread means on said male and female luer connector members for releasably holding them in their operatively interconnected orientation; and
- means associated with said male and female luer connector members and responsive to their operative interconnection for forming within said sheath portion a sterilant fluid-receiving chamber having:
- an inner annular portion coaxially disposed between the outer side surface of said central tubular portion and the inner side surface of said central tubular portion and the inner side surface of said hollow tubular portion of said female luer connector member, said inner annular portion having an annular first end and an annular second end spaced apart therefrom in said first axial direction, and

an outer annular portion coaxially disposed between the outer side surface of said hollow tubular portion of said female luer connector member and the inner side surface of said sheath portion, said outer annular portion having an annular first end, and an annular second end spaced apart therefrom in said first axial direction, said first ends of said inner and outer annular portions communicating with one another; and

seal means, responsive to the operative interconnection of said male and female luer connector members, for forming annular resilient seals around said second ends of said inner and outer annular portions of said sterilant fluid-receiving chamber.

5,190,535

LASER LIGHT TRANSMITTING PROBE

Norio Daikuzono, Chiba, Japan, assignor to S.L.T. Japan Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,313
Claims priority, application Japan, Jun. 30, 1989, 1-169029
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—13 **7 Claims**

1. A laser light transmitting probe comprising:

a base onto which laser light impinges;

a body through which said laser light penetrates; and

a semi-circular conical fore end portion which emits said laser light, wherein:

(i) said semi-circular conical fore end portion tapers to a tip,

(ii) said fore end portion has a pair of arcuate side surfaces joined by at least one flat surface formed between said pair of arcuate side surfaces, said at least one flat surface extending to said tip to define an edge between said pair of arcuate side surfaces along said tip, said at least one flat surface narrowing toward the tip, and

(iii) said tip is rounded at least along portions of said edge adjacent to said pair of arcuate side surfaces such that at least opposite ends of said edge are rounded.

5,190,536

SUBMERSIBLE LENS FIBEROPTIC ASSEMBLY FOR USE IN PDT TREATMENT

Leroy Wood, Buffalo; Donn Boyle, No. Tonawanda, and William R. Potter, Grand Island, all of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Continuation of Ser. No. 461,636, Jan. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 268,723, Nov. 8, 1988, Pat. No. 5,111,821. This application Feb. 19, 1992, Ser. No. 839,724
Int. Cl.[5] A61N *5/06*
U.S. Cl. 606—16 **5 Claims**

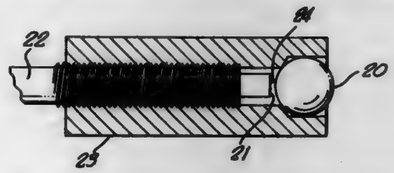
1. A submersible lens fiberoptic assembly for producing a rapidly divergent light output for treating a relatively large tissue area at a short distance, comprising:

an optical fiber with an end face for emitting light energy,

a fiber jacket means for protecting said optical fiber,

a ball lens having a uniform index of refraction greater than 2 for light in a wavelength of 630 nm and positioned to allow said fiber end face to be substantially located at the back focal point of said ball lens, for focusing the light beam from said optical fiber inside itself and producing a rapidly divergent beam of light with substantially uniform light distribution, and

a housing means fixed to said fiber jacket means surrounding



said ball lens and said end face of said optical fiber, and providing an opening for exposing the output surface of said lens to the outside.

5,190,537

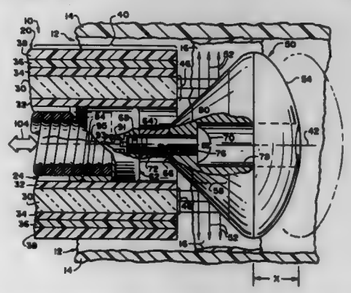
Patent Not Issued For This Number

5,190,538

METHOD AND APPARATUS FOR SUBJECTING A BODY SITE TO A MOVABLE BEAM OF LATERALLY DIRECTED LASER RADIATION

Hany M. G. Hussein, Costa Mesa; Vahid Sandatmanesh, Irvine, and Stanislaw Sulek, Huntington Beach, all of Calif., assignors to Trimedyne, Inc., Irvine, Calif.

Filed Apr. 22, 1991, Ser. No. 689,455
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—17 **4 Claims**



1. A catheter suitable for coupling to a laser source to direct radiant energy laterally to a selected body cavity site, said catheter comprising:

(a) a hollow, elongate, flexible, optical fiber adapted for coupling to said laser source, said fiber defining a central opening having a circular transverse cross section and having a distal end region that extends along a longitudinal axis and that terminates in a transverse, substantially flat, annular, energy delivery surface for emitting laser radiation transmitted by the fiber;

(b) reflector means positioned axially adjacent said energy delivery surface for intercepting and reflecting said emitted radiation in a beam with at least a portion of said beam radiating substantially transversely of, and substantially around, said axis;

(c) a cylindrical sleeve slidably disposed in said central opening of said fiber and connected to said reflector means; and

(d) a flexible drive cable disposed in said central opening of said fiber and connected to said sleeve whereby linear displacement of said drive cable relative to said fiber can be effected to locate said reflector means at selected axial positions along said axis relative to said energy delivery surface whereby said beam irradiates a selected body site along said axis.

5,190,539

MICRO-HEAT-PIPE CATHETER

Leroy S. Fletcher, and George P. Peterson, both of College Station, Tex., assignors to Texas A & M University System, College Station, Tex.

Filed Jul. 10, 1990, Ser. No. 550,519
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—25 **23 Claims**

1. A micro-heat-pipe catheter comprising:

a. a shaft having a first end and a second end, said first end having a needle-like shape for penetrating soft tissue.

b. a channel disposed within the shaft, the channel chargeable with a quantity of a working fluid,

c. an insulating layer disposed along the shaft between the first end and the second end, and

d. a thermal transfer element thermally coupled to the second end of the shaft.

5,190,540

THERMAL BALLOON ANGIOPLASTY

Benjamin I. Lee, Washington, D.C., assignor to Cardiovascular & Interventional Research Consultants, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 535,022, Jun. 8, 1990, abandoned. This application Sep. 25, 1991, Ser. No. 765,326
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—28 **20 Claims**

1. A method for carrying out balloon catheter angioplasty within a coronary artery having a stenosis comprising the steps of:

positioning the balloon or the catheter within the stenosis of the artery,

increasing the temperature of the stenosis and artery surrounding the balloon prior to the inflation of the balloon to an inflation extent sufficient to cause outward expansion for a clinically appropriate time period and to a temperature level sufficient to cause a change in the stenosis and surrounding artery from a relatively solid state into a softer and more moldable state and thereafter increasing the inflation of the balloon so that outward expansion occurs within the stenosis and artery in said softer and more moldable state to thus reduce the tendency to fracture during expansion,

reducing the temperature of the stenosis and surrounding artery while maintaining the expansion by balloon inflation for a clinically appropriate time period and to a temperature level sufficient to re-establish the relatively solid state thereof so as to increase the tendency to maintain the stenosis and artery in the expanded condition; and

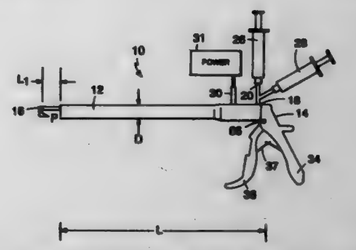
then deflating the balloon and thereafter withdrawing the catheter.

5,190,541

SURGICAL INSTRUMENT AND METHOD

John E. Abele, Concord; Douglas J. Daniels, Meadow; Donald E. Robinson, Hopkinton, and Stephen R. Thistle, Scituate, all of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Filed Oct. 17, 1990, Ser. No. 599,144
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—46 **29 Claims**



1. A surgical instrument useful for laparoscopic surgery comprising an insulated shaft extending between proximal and distal ends,

said proximal end having a control means for controlling clamping or cutting by the instrument and a connection to an electrosurgical radiofrequency power source;

said insulated shaft having conductor means serving to conduct radiofrequency power from said connection to the distal end of the instrument;

said distal end being of general J-hook form defining a tissue-receiving pocket, the J-hook having a bottom with a proximal side which defines a tissue-engaging ledge;

said insulated shaft supporting tissue-engaging clamping or cutting members, said members movable axially, distally of the instrument toward said ledge in response to said control means for successively engaging said tissue by a first of said members at a first point along said ledge and subsequently by a second of said members at another point spaced along said ledge from the first engaged point, whereby tissue such as an artery or other tissue hooked in the pocket of said J-hook can be engaged on opposite surfaces for clamping or cutting while appropriate radiofrequency current from said power source is applied to said tissue.

5,190,542

SURGICAL RETRIEVAL ASSEMBLY AND RELATED METHOD

Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022; Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023, and John V. Mizzi, 30 Cramer Rd., R.F.D. #3, Poughkeepsie, N.Y. 12603

Continuation-in-part of Ser. No. 788,035, Nov. 5, 1991. This application Jun. 2, 1992, Ser. No. 892,214
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—47 **21 Claims**

1. A surgical instrument assembly for use in snare cauterization operations, comprising:

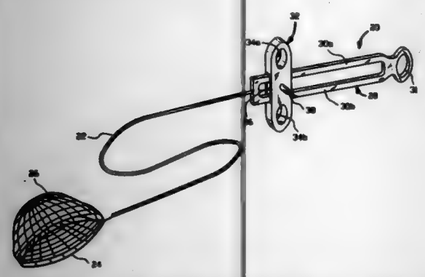
a flexible cauterization loop;

electrical conductor means operatively connected to said cauterization loop for feeding an electrical current thereto;

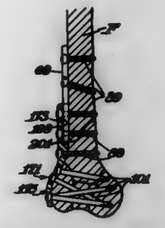
a flexible auxiliary loop connected to said cauterization loop at most at three points;

actuator means operatively connected to said cauterization loop and said auxiliary loop for alternately expanding and contracting said cauterization loop and said auxiliary loop; and

a flexible web member connected to said auxiliary loop essentially around a circumference thereof to form a capture pocket, said auxiliary loop defining a mouth opening of said pocket.



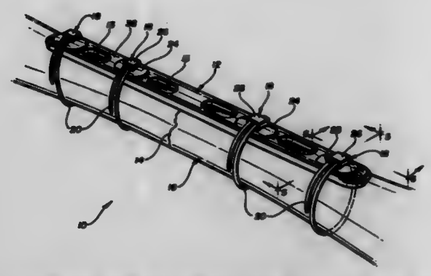
5,190,544
MODULAR FEMORAL FIXATION SYSTEM
Michael W. Chapman, Sacramento, Calif.; Charles C. Edwards, Baltimore, Md., and Dana C. Mears, Oakmont, Pa., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.
Division of Ser. No. 232,188, Aug. 15, 1988, Pat. No. 5,041,114, which is a division of Ser. No. 877,626, Jun. 23, 1986, Pat. No. 4,776,330. This application Mar. 18, 1991, Ser. No. 670,839
Int. Cl.[5] A61B 17/58
U.S. Cl. 606—69 6 Claims



1. A bone implant assembly comprising:
an elongated bone plate adapted to be secured to a patient's bone having an upper surface, a lower surface intended to be adjacent the patient's bone in use and two side surfaces connecting the upper and lower surfaces, with the thickness of the plate being substantially constant between the two side surfaces, the width of the upper surface being greater than the width of the lower surface, said side surfaces being tapered inwardly toward one another from said upper surface to said lower surface, with said bone plate being adapted to be secured to the patient's bone by means of bone fasteners received in apertures in the bone plate, and
a surgical implant having an elongated plate portion, having an upper surface and a lower surface, adapted to be secured to the patient's bone by means of bone fasteners received in apertures in said elongated plate portion, with a cavity being formed in the lower surface of the elongated plate portion at a free end of said plate portion, said cavity extending longitudinally from said free end to a shoulder defining an end of the cavity and said cavity having a transverse cross-section complementary to that of said elongated bone plate so that said elongated bone plate can enter and be removed from said cavity only by relative axial movement between said elongated bone plate and said elongated plate portion, and with at least one of said bone fastener-receiving apertures in said elongated plate portion, which at least one aperture is in communication with said cavity, overlying a bone fastener-receiving aperture in said elongated bone plate when said bone plate is inserted into said cavity and an end of said bone plate abuts said shoulder.

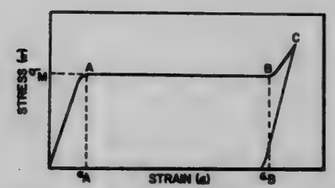
5,190,545
CERCLAGE WIRE POSITIONING INSERT
George M. Corsi, Aberdeen; Richard M. Brooks, West Milford, and Paul J. Viola, Bogota, all of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.
Filed Aug. 27, 1991, Ser. No. 750,666
Int. Cl.[5] A61B 17/58
U.S. Cl. 606—74 13 Claims

1. A bone fracture stabilization apparatus comprising:
at elongated bone plate having a plurality of apertures in the form of an elongated slot with rounded ends extending through said bone plate;
at least one insert having a body shaped for insertion into at least one of said plurality of apertures in said bone plate, said body having a flange extending from said body for engaging an outer surface of said bone plate and a boss extending from said body in a direction away from the fractured bone, said boss having at least one opening therein;
a cable extending through said opening in said boss and around the fractured bone; and



a means for fixing the length of cable after said cable has been tensioned around the bone to hold the bone plate in engagement with the fractured bone.

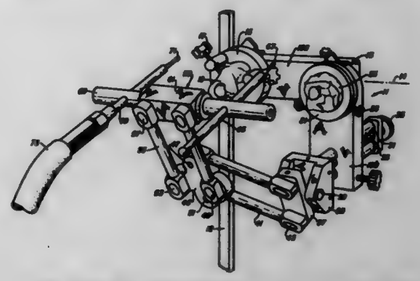
5,190,546
MEDICAL DEVICES INCORPORATING SIM ALLOY ELEMENTS
James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Division of Ser. No. 252,019, Sep. 27, 1988, Pat. No. 5,067,957, which is a continuation of Ser. No. 177,817, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 47,824, May 8, 1987, abandoned, which is a continuation of Ser. No. 865,703, May 21, 1986, Pat. No. 4,665,906, which is a continuation of Ser. No. 541,852, Oct. 14, 1983, abandoned. This application Apr. 9, 1991, Ser. No. 682,243
Int. Cl.[5] A61B 17/58
U.S. Cl. 606—78 40 Claims



1. A method of forming an attachment to a bone, which comprises positioning in an aperture in the bone an element formed at least partially from a shape memory alloy which displays stress induced martensite behavior at body temperature, the element being so positioned that it is deformed by the walls of the aperture by the formation of stress-induced martensite, and thereby exerts a force outwardly on the walls of the aperture.

5,190,547
REPLICATOR FOR RESECTING BONE TO MATCH A PATTERN
Forest C. Barber, Jr., Bedford, and Darrell G. Tidwell, Crowley, both of Tex., assignors to Midas Rex Pneumatic Tools, Inc., Ft. Worth, Tex.
Filed May 15, 1992, Ser. No. 883,685
Int. Cl.[5] A61B 17/00; A61F 5/00
U.S. Cl. 606—79 16 Claims

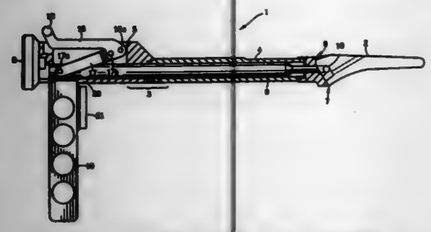
1. An apparatus for resecting a bone into a desired shape, comprising in combination:
a frame having an x-axis, a y-axis, and a z-axis;
pattern holder means on the frame for holding a pattern representing the desired shape of the bone;
bone holder means on the frame for holding the bone to be resected on the frame, the bone holder means being spaced apart from the pattern holder means along the x-axis;
a tool holder having a tool holder axis;
probe means mounted rigidly to the tool holder and having a tip for tracing over the contour of the pattern;
cutting tool means mounted rigidly to the tool holder and having a tip for resecting the bone in a contour that is the same as the pattern while the probe means is traced over the pattern;
the tips of the probe means and the cutting tool means being located on a line parallel to the tool holder axis;
rotation means for rotating the probe means and the cutting tool means about the tool holder axis; and
linkage means mounting the tool holder to the frame for allowing an operator to freely move the tool holder in three dimensions while maintaining the tool holder axis parallel to the x-axis.



5,190,548
SURGICAL REAMER
Robert Davis, Safety Harbor, Fla., assignor to Linvatec Corporation, Largo, Fla.
Filed Apr. 10, 1991, Ser. No. 683,064
Int. Cl.[5] A61F 5/04
U.S. Cl. 606—80 32 Claims

1. A surgical bone reamer comprising
a rotatable body having a proximal end, a distal end, a longitudinal axis and a longitudinal bore extending from said distal end to said proximal end;
a drill tip at said distal end including tip edges positioned around said axis and disposed angularly with a plane normal to said axis for penetrating bone;
reaming edges joined to said tip edges and extending longitudinally from said tip edges to said proximal end parallel with said axis for forming a tunnel when said body is rotated in bone, said drill tip being tapered in a distal direction from said reaming edges to said bore;
flute surfaces disposed between said tip edges for evacuating bone along said flute surfaces when said body is rotated in bone; and
an elongate shank for mounting said body to rotate said body in bone.

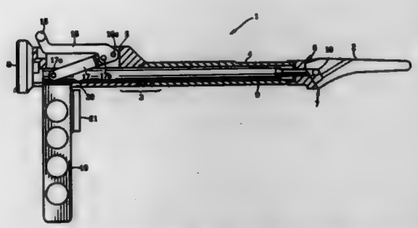
5,190,549
LOCKING SURGICAL TOOL HANDLE SYSTEM
Gary J. Miller, and Matthew Lyons, both of Gainesville, Fla., assignors to Exactech, Inc., Gainesville, Fla.
Filed Aug. 2, 1990, Ser. No. 561,801
Int. Cl.[5] A61F 5/00
U.S. Cl. 606—85 **13 Claims**



1. A locking surgical tool handle system, comprising:
a. a tool for at least one of cutting, shaping, and forming biologic tissues, the tool having a flanged recess for receiving at least one engagement projection;
b. a tool handle, including:
(1) a body having an engagement end and a hollow shaft disposed within the body;
(2) a tension element disposed within the shaft of the body, the tension element extending out from the engagement end of the body and having at least one engagement projection for engaging the flanges of the recess of the tool;
(3) a hand grip attached to the tension element;
(4) locking means, coupled to the tension element, for pulling the tension element into a locked position within the body when at least one engagement projection is disposed within the recess of the tool, the locking means including:
(a) a first link coupled to the tension element by a tension element pivot;
(b) a second link coupled to the first link by a link pivot, and coupled to the tool handle body by a body pivot;
(c) the locking means having (1) an over-center locked position in which the link pivot is in-line with the body pivot and the tension element pivot, and the distance between the body pivot and the tension element pivot has a first length, and (2) an unlocked position in which the link pivot is not in-line with the body pivot and the tension element pivot, and the distance between the body pivot and the tension element pivot has a second length shorter than the first length;
whereby the tool is held to the engagement end of the tool handle by the application of tension to the tool by the tension element when the locking means is in its locked position, thus permitting the tool to perform at least one of cutting, shaping, and forming biologic tissues.

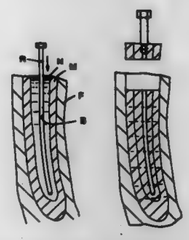
5,190,550
LOCKING SURGICAL TOOL HANDLE SYSTEM
Gary J. Miller, and Matthew Lyons, both of Gainesville, Fla., assignors to Exactech, Inc., Gainesville, Fla.
Continuation-in-part of Ser. No. 561,801, Aug. 2, 1990. This application May 12, 1992, Ser. No. 881,688
Int. Cl.[5] A61B 17/00; A61F 2/32
U.S. Cl. 606—85 **8 Claims**

1. A locking surgical tool handle system, comprising:
a. a tool having a flanged recess for receiving at least one engagement projection;
b. a tool handle, including:
(1) a body having an engagement end and a hollow shaft disposed within the body;
(2) a tension element disposed within the shaft of the body, the tension element extending out from the engagement end of the body and having at least one engagement projection for engaging the recess of a tool;
(3) locking means, coupled to the tension element, for pulling the tension element into a locked position within the body when at least one engagement projection is disposed within the recess of a tool the locking means



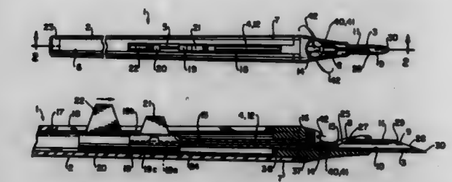
comprising (a) a first link centrally coupled to the tension element by a tension element pivot, and (b) a second link coupled to the first link by a link pivot, and to the body by a body pivot, and having a handle end;
whereby the tool is held to the engagement end of the tool handle by the application of tension to the tool by the tension element when the locking means is in its locked position.

5,190,551
CONTROLLED APPARATUS AND METHOD FOR EXTRACTING CEMENT MANTLES FROM BONE RECESSES
Albert K. Chin, Palo Alto; Milton B. McColl, Los Altos; Kathryn J. Hoffman, Redwood City, and Diane E. Caramore, San Francisco, all of Calif., assignors to Zimmer, Inc., Warsaw, Ind.
Filed Dec. 14, 1990, Ser. No. 628,390
Int. Cl.[5] A61B 17/56
U.S. Cl. 606—99 **2 Claims**



1. A method for removing a mantle of cement having an elongate curvilinear cavity formed therein from adhered condition with a bone recess, said method comprising:
(a) filling the curvilinear cavity with fluid cement;
(b) inserting an elongate curvilinear rod in the fluid cement;
(c) permitting the cement to cure and form a unitary mass with the mantle;
(d) withdrawing the curvilinear rod from the mass to form an elongate curvilinear bore therein;
(e) tapping the bore to form a screw-threaded section therein;
(f) engaging the screw-threaded section of the bore with a pulling tool; and,
(g) imparting pulling force to the pulling tool to remove that portion of the mass within which the tool is threadably engaged from the recess.

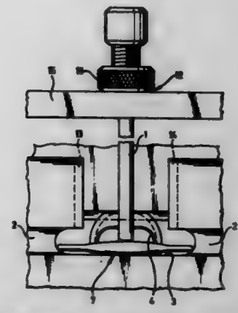
5,190,552
SLOTTED TUBE INJECTOR FOR AN INTRAOCULAR LENS
Charles D. Kelman, 721 Fifth Ave., New York, N.Y. 10022
Filed Feb. 4, 1992, Ser. No. 830,693
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—107 **13 Claims**



1. Slotted tube injector for partial insertion in a minimum size eye incision to inject into the eye a temporarily folded intraocular lens having generally opposed seating haptics extending from the lens periphery, comprising
a longitudinal support forwardly terminating in a tube having a rearwardly facing loading end and a forwardly facing insertion end interconnected by a through bore to contain the folded lens, and a slot extending from the loading end to the insertion end and communicating the bore with the exterior of the tube to permit the haptics to protrude to the exterior from the folded lens in the bore, the insertion end being insertable in the incision, and
holding and locking means arranged on the support for movement relative to the tube for loading and locking the lens in unfolded state thereon at the loading end, for moving the lens into the loading end for controlled folding of the lens into the bore and locating of the haptics in the slot so as to protrude to the exterior, and upon inserting the insertion end in the incision with the haptics passing through the incision protruding from the tube, for moving the lens out of the insertion end for controlled unfolding of the lens out of the bore and return of the lens and haptics to unfolded state thereon, and for unlocking the unfolded lens for controlled release therefrom in the eye.

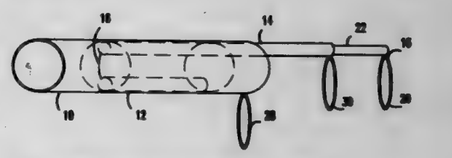
5,190,553
METHOD AND APPARATUS FOR FOLDING A RESILIENT INTRAOCULAR LENS
Otmar Kanert; Jochen Kaumann, and Ulrich Dretzler, all of Dortmund, Fed. Rep. of Germany, assignors to adatomed Pharmazeutische und medizintechnische Gesellschaft mbH, Munich, Fed. Rep. of Germany
Filed Feb. 6, 1992, Ser. No. 831,841
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1991, 4108303
Int. Cl.[5] A61B 17/00; A61F 9/00, 2/16
U.S. Cl. 606—107 **5 Claims**

1. Apparatus for folding a resilient intraocular lens comprising a support surface for supporting the lens to be folded, a hold-down member movable towards said support surface to hold the lens thereon, first and second feed pressing members which have faces facing towards each other from opposite sides of the support surface and which are synchronously movable in mutually opposite relationship to a position of being brought together at which said faces thereof which are in contact with the lens on the support surface fold the lens to reproduce in a slightly reduced fashion the internal contour of a tube member of an implantation instrument for subsequent implantation of the lens, and an insertion press member mov-



able to insert the folded lens into the interior of said implantation instrument tube member.

5,190,554
APPENDIX EXTRACTOR
Charles C. Coddington, III, and David L. Sarrett, both of Virginia Beach, Va., assignors to Eastern Virginia Medical School, Norfolk and Center for Innovative Technology, Herndon, both of, Va.
Filed Apr. 8, 1992, Ser. No. 865,068
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—113 **6 Claims**



1. An appendix extraction tool, comprising:
a cannula sized to fit in a laparoscopic hole in a patient's abdomen having first and second ends, a first end of said cannula being insertable within a human abdomen and having an opening large enough to accommodate a human appendix;
two spaced apart guide members positioned within said cannula;
a first slidable member connecting said two spaced apart guide members, said first slidable member being positioned within said cannula; a means for moving said first slidable member between a first position within said cannula to a second position which may be inside or outside said first end of said cannula;
an appendix grasping line which passes through said two spaced apart guide members, said appendix grasping line forming an appendix grasping loop between said two spaced apart guide members, said appendix grasping line being separate from said means for moving; and
means for enlarging and contracting said appendix grasping loop which is separately operable from said means for moving including
(i) means for securing said appendix grasping line to a first of said two spaced apart guide members, and
(ii) a means for sliding a sufficient amount of said appendix grasping line out a first end of a second of said two spaced apart guide members for said appendix grasping loop to fit around a distal tip of said human appendix, said means for sliding including a second slidable member which can slide within said second guide member of

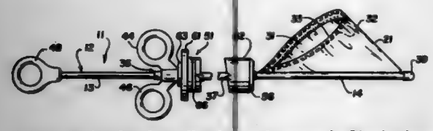
said two spaced apart guide members relatively toward and away from said second of said two spaced apart guide members.

5,190,555

DEVICE FOR COLLECTION AND REMOVAL OF BODY PARTS DURING LAPAROSCOPIC SURGERY

Lowell A. Wetter, San Francisco; Jeffrey E. Holmes, San Jose; Michael Hogendijk, Sunnyvale, and Jeffrey J. Christian, San Jose, all of Calif., assignors to Unisurge, Inc., Cupertino, Calif.

Filed Dec. 13, 1991, Ser. No. 807,098
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—114 **8 Claims**



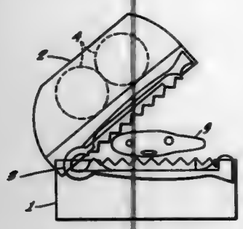
1. In a device for the collection and removal of body tissue and/or parts in laparoscopic surgery on a patient, an elongate tubular member having proximal and distal extremities and having a bore extending therethrough, a sack formed of a flexible material and having an opening therein, means carried by said tubular member securing at least a side portion of said sack within at least a portion of the length of the distal extremity of said elongate tubular member, drawstring means secured to said sack and circumscribing said opening in said sack for opening and closing said opening in said sack, said drawstring means extending into said bore, slide means slidably mounted on said elongate tubular member and secured to said drawstring means in said bore and handle means secured to the proximal extremity of said tubular member and to said slide means for introducing said sack into the patient and for causing relative movement between the tubular member and the slide means to open said opening in said sack for the collection of body tissue and/or body parts in the patient and to close said opening in said sack after collection of the body tissue and/or parts.

5,190,556

CORD CUTTER SAMPLER

Stephen R. Hessel, Fountain Valley, Calif., assignor to O.B. Tech, Inc., Costa Mesa, Calif.

Filed Mar. 19, 1991, Ser. No. 672,535
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—120 **11 Claims**



1. Apparatus for cutting an umbilical cord and collecting a blood sample therefrom comprising

housing means for receiving and entrapping a section of umbilical cord,

cutting means for cutting an entrapped section of the cord and sealing at least one cut end of said cord, and

said housing means comprising means for holding and connecting vial means to provide fluid communication between the vial means and the end of the cord sealed by the cutting means thereby enabling the vial means to receive blood from the umbilical cord.

5,190,557

VIBRATORY METHOD AND INSTRUMENT FOR EXTRACTING STONES FROM URINARY TRACT

German Borodulin; Maxim Persidsky, both of San Francisco; Alexander Shkolnik, San Mateo, and Marshall Stoller, San Francisco, all of Calif., assignors to Urological Instrument Research, Inc., San Francisco, Calif.

Filed Oct. 3, 1991, Ser. No. 771,396
Int. Cl.[5] A61B *8/00*
U.S. Cl. 606—127 **15 Claims**

1. A method for extracting a foreign solid body from a duct, comprising the steps of:

providing an instrument for extracting stones from the urinary tract with a stone catcher of a flexible nature having windows and capable of performing low-frequency vibrations, said stone catcher being confined in a catheter in a contracted state and being expanded radially, increasing said windows, when it protrudes from said tube to such an extent that a calculus can pass into said catcher through one of said windows, said instrument having drive means for imparting said low-frequency vibrations to said stone catcher;

wherein said drive means for said stone catcher comprises a motor with an output element which performs rotary motions combined with axial vibrations, and a rod-like element which is inserted into said catheter and passes through said catheter connecting said stone basket to said output element of said motor, said rod-like element having a twisted portion, which during the rotation of said rod-like element generates radial vibrations transmitted to said stone basket; wherein said stone catcher is connected to said rod-like element through a coupling member, said coupling member having means to provide free rotation of said rod-like element with respect to said stone catcher and to restrict said rod-like element and said stone catcher against axial movement with respect to each other;

inserting said instrument into the urinary tract of a patient having a calculus in said urinary tract;

aligning the position of said stone catcher with said calculus;

expanding said stone catcher by protruding it from said catheter;

catching said calculus into said stone catcher in its expanded state;

contracting said stone catcher by pulling it in the direction of said catheter to reduce the size of said stone catcher enough to grasp said calculus;

energizing said drive means of said instrument for imparting said low-frequency vibrations to said stone catcher;

extracting said instrument from the urinary tract and from the body of said patient while maintaining the stone catcher under the action of said low-frequency axial vibrations; and

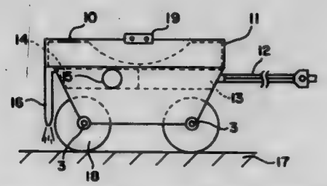
deenergizing said driving means after extraction of said instrument from the body of said patient.

5,190,558

METHOD OF ELIMINATING STRATUM CORNEUM FROM THE SKIN AND AN INSTRUMENT TO BE USED THEREFOR

Narushi Ito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 7, 1990, Ser. No. 610,057
Claims priority, application Japan, Nov. 8, 1989, 1-288820; Mar. 19, 1990, 2-28311[U]
Int. Cl.[5] A61B *19/00*
U.S. Cl. 606—131 **4 Claims**



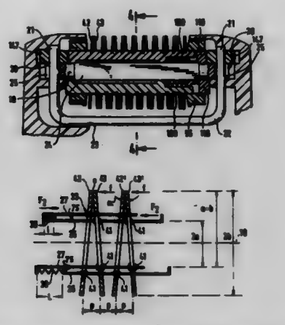
1. An instrument for eliminating stratum corneum from the skin comprising a roller on which an adhesive tape is wound, means for spraying steam and a body which supports said steam-spraying means and forms a grip for holding the roller, whereby the steam spraying means applies steam to the skin to swell keratinized cells prior to their removal by said adhesive tape.

5,190,559

EPILATING APPLIANCE

Georges Gabion, Rillieux; Aimé Cleyet, and Robert Roger, both of Lyons, France, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 30, 1991, Ser. No. 785,024
Claims priority, application France, Apr. 25, 1991, 91 05135
Int. Cl.[5] A45D *26/00*
U.S. Cl. 606—133 **20 Claims**



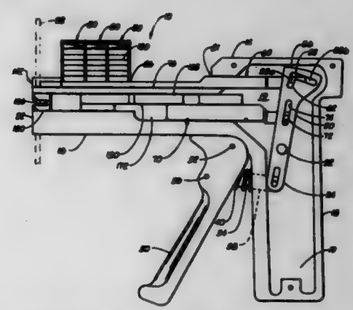
1. An epilating appliance comprising a casing which is suitable for being held by a user's hand, axle structure in said casing, a motor in said casing, rotary cylinder structure in said casing mounted on said axle structure and adapted to be driven in rotation by said motor about a central axis that extends along said axle structure and extends generally parallel to the surface of the skin to be epilated, a plurality of pinching members mounted in series relation on said rotary cylinder structure for rotation therewith, spring structure, and actuating member mounted in series relation on said rotary cylinder structure for rotation therewith, spring structure, and actuating member structure comprising a plurality of actuating members displaceable against the action of said spring structure for pivoting said pinching members in pairs about pinching member pivot axes that are disposed at a distance from said central axis and extend generally perpendicular to said central axis of said rotary cylinder structure to move tips of adjacent pinching members of said pairs into engagement with each other at engagement points.

5,190,560

INSTRUMENT FOR LIGATION AND CASTRATION

John B. Woods, 10919 S. Sandusky, Tulsa, Okla. 74137, and Wayne Porter, Rte. 1, Bowie, Tex. 76230

Filed Jun. 20, 1991, Ser. No. 718,508
Int. Cl.[5] A61B *17/12*
U.S. Cl. 606—137 **17 Claims**



1. An instrument for placing a ligature on a tubular vessel and for severing the tubular vessel and associated structures, the instrument comprising:

a pistol-shaped body forming a barrel and a grip, wherein the barrel has a muzzle with a muzzle opening therethrough for receiving tubular vessels and the body is formed with a cavity extending from the muzzle opening through the barrel and into the grip;

a trigger operatively connected to the body, wherein the trigger includes a trigger rod extending from the trigger through the grip and into the cavity;

a yoke mounted at a medial pivot point thereof within the cavity and having a trigger end and a ligating end, wherein the trigger end is pivotally connected tot he end of the trigger rod extending into the cavity;

a ligature driver connected to the ligating end of the yoke and slidingly disposed along the upper length of the barrel, the ligature driver adapted to move toward the muzzle and back in response to the pivoting movement of the yoke;

a pair of ligature compressors attached to the barrel on opposing sides of the muzzle opening with a space between the ligature compressors, the space between the ligature compressors narrowing toward the muzzle of the barrel to compress a ligature around a tubular vessel positioned in the muzzle opening as the ligature driver pushes the ligature toward the muzzle between the ligature compressors;

a blade driver pivotally attached to the yoke at a point

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between the ligating end and the pivot point of the yoke, the blade driver having a muzzle end extending into the barrel and moving lengthwise within the barrel toward the muzzle and back in response to the pivoting movement of the yoke; and

a blade attached to the muzzle end of the blade driver and adapted to move into the muzzle opening to sever a tubular vessel positioned within the muzzle opening when the blade driver moves toward the muzzle.

5,190,561

TISSUE AND ORGAN EXTRACTOR

John N. Graber, Minneapolis, Minn., assignor to Surgical Innovations, Inc., Minneapolis, Minn.

Filed Jan. 23, 1991, Ser. No. 644,987
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—127 **5 Claims**

1. A tissue and organ extractor for use in laparoscopy along with auxiliary surgical instruments, said extractor for encompassing and extracting tissues, organs or the like from a body cavity during a laparoscopic surgical procedure and comprising:

a generally tubular, elongated rod-shaped shank having a handle end and a working end, said shank having a longitudinal bore extending the length of said shank, said bore for receiving said auxiliary instruments;

a flexible collapsible generally cone-shaped encompassing means for substantially entirely encompassing and compressing said tissue, organ or the like during the extraction thereof from said body cavity, said encompassing means operably coupled to said working end of said shank end and including an open end; and

handle means for holding said extractor, said handle means being at said handle end of said shank and including a

locking means for engaging and securing one of said auxiliary surgical instruments in fixed relationship to said encompassing means while said one of said auxiliary surgical instrument is in said bore.

5,190,562

METHOD FOR BLEACHING TEXTILES

Glen A. Dickson, and Donnie R. Gray, both of Dilley, Tex., assignors to Ocean Wash, Inc., Dilley, Tex.

Continuation of Ser. No. 117,664, Nov. 5, 1987, Pat. No. 4,900,323. This application Oct. 6, 1989, Ser. No. 418,394
Int. Cl.[5] D06L *3/00*
U.S. Cl. 8—111 **12 Claims**

1. A non-aqueous method for fading a previously dyed denim fabric comprising the steps of:

(a) placing the previously dyed denim fabric in a tumbler;

(b) adding a potassium permanganate impregnated nonabrasive powder carrier selected from the group consisting of feldspar, soda ash, sodium silicate, synthetic silica dioxides, calcium carbonate, sodium bicarbonate, sodium sequicarbonate, borax and sodium sulfate, therewith;

(c) tumbling the denim fabric in the tumbler for an interval sufficient to obtain a desired color fading;

(d) rinsing after tumbling to obtain the faded denim fabric after having a desired color fade; and

(e) drying the color faded denim fabric.

5,190,563

PROCESS FOR PREPARING INDIVIDUALIZED, POLYCARBOXYLIC ACID CROSSLINKED FIBERS

Carlisle M. Herron; David J. Cooper; Thomas R. Hauser, all of Memphis, Tenn., and Bart S. Hersko, Cincinnati, Ohio, assignors to The Proctor & Gamble Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 432,709, Nov. 7, 1989, abandoned. This application Oct. 17, 1990, Ser. No. 596,606
Int. Cl.[5] D21H *11/20*; D06M *13/00*
U.S. Cl. 8—120 **27 Claims**

1. A process for making individualized, twisted and curled, crosslinked wood pulp cellulosic fibers, said process comprising the steps of:

a. providing wood pulp cellulosic fibers;

b. contacting said fibers with a solution containing a C_2–C_9 polycarboxylic acid crosslinking agent, wherein said C_2–C_9 polycarboxylic acid crosslinking agent is selected from the group consisting of:

(i) aliphatic and alicyclic C_2–C_9 polycarboxylic acids having at least three carboxyl groups per molecule; and

(ii) aliphatic and alicyclic C_2–C_9 polycarboxylic acids having two carboxyl groups per molecule and having a carbon-carbon double bond located alpha, beta to one or both of the carboxyl groups,

wherein one carboxyl group in said C_2–C_9 polycarboxylic acid crosslinking agent is separated from a second carboxyl group by either two or three carbon atoms;

c. mechanically separating said fibers into substantially individual form; and

d. drying said fibers and heating said fibers to cause said crosslinking agent to react with said fibers to form crosslink bonds while said fibers are in substantially individual form, to from intrafiber ester crosslink bonds; said fibers being contacted with a sufficient amount of crosslinking agent such that from about 0.5 mole % to about 10.0 mole % of the crosslinking agent, calculated on a cellulose anhydroglucose molar basis, reacts with said fibers to form said intrafiber ester crosslink bonds, said crosslinked fibers having a water retention value of from about 28 to about 60.

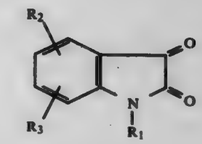
5,190,564

PROCESS FOR DYEING KERATINOUS FIBRES COMBINING ISATIN OR ITS DERIVATIVES WITH AN AMINOINDOLE OR AN AMINOINDOLINE, AND COMPOSITIONS USED

Gérard Lang, Saint-Gratien, and Jean Cotteret, Verneuil-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Filed Jan. 30, 1992, Ser. No. 828,299
Claims priority, application France, Feb. 1, 1991, 91 01186
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—423 **17 Claims**

1. Process for dyeing keratinous fibers, in particular human hair, characterised in that there is applied to the said fibers a component (A) consisting of a composition containing, in a medium suitable for dyeing, at least one compound of formula (I):



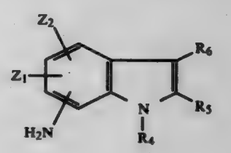
(I)

in which:

R_1 denotes a hydrogen atom, a C_1–C_6 alkyl radical, acetyl, benzoyl, phenyl or C_1–C_4 carboxyalkyl;

R_2 and R_3, independently of each other, denote a hydrogen atom, a C_1–C_5 alkyl, C_1–C_4 alkoxy, a hydroxyl, an amino, a halogen atom, a nitro, an alkyl(C_1–C_6)phenyl, phenyl, alkyl(C_1–C_6)amino, hydroxyalkyl(C_1–C_6)amino, polyhydroxyalkyl(C_2–C_6)amino group;

and a component (B) consisting of a composition containing, in a medium suitable for dyeing, at least one aminoindole compound of the following formula (II):



(II)

in which:

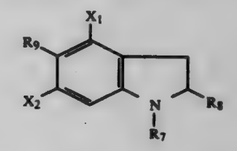
R_4 and R_6, independently of each other, represent a hydrogen atom or a C_1–C_4 alkyl group;

R_5 denotes a hydrogen atom or a C_1–C_4 alkyl group or a COOR′ group, R′ being a hydrogen atom or a C_1–C_4 alkyl group;

Z_1 represents a hydrogen or a halogen atom, a C_1–C_4-alkyl, C_1–C_4 alkoxy or hydroxyl radical;

Z_2 represents a hydrogen atom or a C_1–C_4 alkyl radical;

as well as its cosmetically acceptable salts, or alternatively an aminoindoline of formula (III):



(III)

in which:

R_7 and R_8, independently of each other, represent a hydrogen atom or a C_1–C_4 alkyl radical;

X_1 and X_2 represent a hydrogen atom or an NH_2 radical, at least one, and only one, representing NH_2;

R_9 denotes a hydrogen atom, a C_1–C_4 alkyl or C_1–C_4-

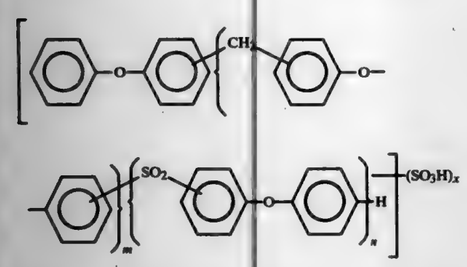
alkoxy radical; R_9 denoting hydrogen when X_2 denotes NH_2;
as well as its cosmetically acceptable salts.

5,190,565
SULFONATED 2-(2'-HYDROXYARYL)-2H-BENZOTRIAZOLES AND/OR SULFONATED AROMATIC FORMALDEHYDE CONDENSATES AND THEIR USE TO IMPROVE STAIN RESISTANCE AND DYE LIGHTFASTENESS

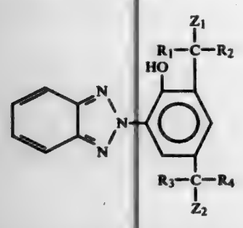
Morris B. Berenbaum, Summit; John H. Bonfield, Basking Ridge, both of N.J.; Charles J. Cole; Paul W. Harris, both of Chester, Va.; Thomas P. J. Izod, Basking Ridge, N.J.; Harry E. Ulmer, Cameron, S.C.; Frederick R. Hopf, Parsippany, N.J.; James T. Yardley, Morristown, N.J., and Karen M. Bland, Hamburg, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 384,234, Jul. 24, 1989, Pat. No. 4,990,623, which is a continuation-in-part of Ser. No. 111,873, Oct. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 889,705, Jul. 28, 1986, abandoned, and Ser. No. 74,487, Jul. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 904,433, Sep. 8, 1986, abandoned. This application Feb. 1, 1991, Ser. No. 650,400
Int. Cl.[5] D06P 5/00; C07D 249/20
U.S. Cl. 8—490 10 Claims

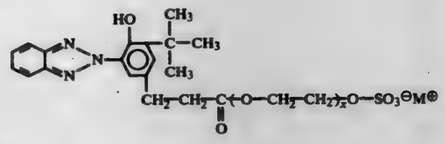
1. A process for improving the stain resistance and lightfastness of polyamide fibers which comprises treating the fibers with a sulfonated aromatic-formaldehyde condensation product and a sulfonated 2-(2'-hydroxyaryl)--2H-benzotriazole wherein said condensation product is a compound or mixture of compounds selected from the compounds having the following structure:



wherein m is 0 to 4, n is 0 to 3, x is 1 to 5 and m and n are selected so that $m+n>1$, and said sulfonated benzotriazole is selected from the group consisting of



wherein R_1, R_2, R_3 and R_4 are independently the same or different C_1–C_{30} alkyl groups and Z_1 and Z_2 are each a C_1–C_{30} alkyl or sulfonated phenyl, naphthyl, phenanthryl or anthryl group, provided at least Z_1 or Z_2 is a sulfonated phenyl, naphthyl, phenanthryl or anthryl group, and

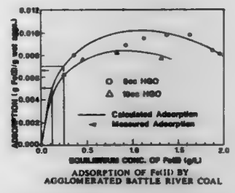


wherein x is from 6 to 30 and M is selected from the group consisting of hydrogen, ammonium, aluminum, magnesium, lithium, sodium, and zinc.

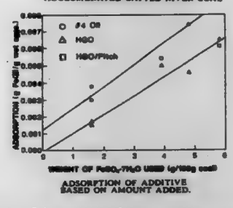
5,190,566
INCORPORATION OF A COPROCESSING ADDITIVE INTO COAL/OIL AGGLOMERATES

Bryan D. Sparks, Gloucester; Richard D. Coleman, Orleans; Floyd N. Toll, Russell; F. Weldon Meadus, Ottawa, and Michio Ikura, Kanata, all of Canada, assignors to Energy, Mines and Resources Canada, Ottawa, Canada

Filed Jan. 8, 1992, Ser. No. 818,100
Int. Cl.[5] C10L 9/10, 9/00
U.S. Cl. 44—627 7 Claims



ADSORPTION OF Pe(II) BY AGGLOMERATED BATTLE RIVER COAL



ADSORPTION OF ADDITIVE BASED ON AMOUNT ADDED.

1. A method of incorporating a coprocessing additive in coal/oil agglomerates, comprising:
a) forming an aqueous slurry of particulate sub-bituminous coal, the particulate coal comprising carbonaceous particles and particulate inorganic material,
b) agitating the slurry while admixing agglomerating oil therewith, to form carbonaceous particle/oil agglomerates with particulate inorganic material, and water, separated therefrom,
c) separating, in an undried condition, the carbonaceous particle/oil agglomerates from the particulate inorganic material and water, and
d) intimately contacting the separated, undried, agglomerates with an aqueous solution of coprocessing additive comprising at least one water soluble salt of a metal from Groups 5 to 12 of the Periodic Table of Elements (International Union of Pure and Applied Chemistry, 1983) for specific adsorption of additive in molecularly disseminated form by the separated, undried agglomerates.

5,190,567
SINTERED ALUMINOUS ABRASIVE GRAINS AND METHOD OF PRODUCING THE SAME

Masahiro Tanemoki; Yoshihiro Onoda; Masaru Nozaki, and Naruo Suzuki, all of Osaka, Japan, assignors to Japan Abrasive Co., Ltd., Osaka, Japan

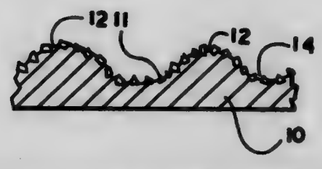
Filed Feb. 11, 1991, Ser. No. 653,313
Claims priority, application Japan, Feb. 9, 1990, 2-30427
Int. Cl.[5] C09C 1/68
U.S. Cl. 51—293 12 Claims

1. Sintered aluminous abrasive grains consisting essentially of aluminum oxide in an amount higher than 98.0 wt % and lithium oxide in an amount of 0.01–1.5 wt %, which aluminous abrasive grains, have a density of at least 95% of the theoretical density and an alpha alumina crystal size of less than one micron.

5,190,568
ABRASIVE TOOL WITH CONTOURED SURFACE

Nasm N. Tselesin, 2900 Lookout Pl., Atlanta, Ga. 30305

Continuation-in-part of Ser. No. 712,989, Jun. 10, 1991, and a continuation-in-part of Ser. No. 467,958, Jan. 22, 1990, Pat. No. 5,049,165, which is a continuation-in-part of Ser. No. 303,924, Jan. 30, 1989, Pat. No. 4,925,457. This application Aug. 7, 1991, Ser. No. 741,678
Int. Cl.[5] B24D 3/00
U.S. Cl. 51—293 18 Claims



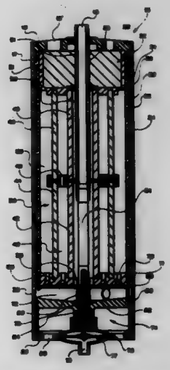
1. An abrasive material for grinding or polishing, said abrasive material comprising a carrier for receiving a plurality of hard particles, and means for holding said hard particles to said carrier, said carrier being contoured for defining a plurality of peaks which are in contact with a surface being ground, and a plurality of valleys which are spaced from said surface being ground, said plurality of hard particles substantially uniformly covering at least a portion of said carrier, said portion including both some of said peaks and contiguous ones of said valleys, the arrangement being such that said hard particles are adjacent to one another so that said particles laterally support one another.

5,190,569
PURIFICATION APPARATUS FOR PNEUMATIC SYSTEMS

Wayne D. McGrath, 4943 Park Rd., #703, Charlotte, N.C. 28209

Filed Jun. 13, 1991, Ser. No. 714,668
Int. Cl.[5] B01D 46/00
U.S. Cl. 55—218 17 Claims

1. An apparatus for purification of air within pneumatic systems such as truck air brake systems, having a compressor and a supply reservoir, said purification apparatus being positioned downstream of the compressor and upstream of the supply reservoir, for reducing the quantity of moisture and airborne particulate matter within the airstream of the pneumatic system, said purification apparatus comprising:
(a) an air dryer including a casing having at least one air inlet, an air flow path therethrough, at least one air outlet, at least one drainage outlet, and having within said casing:
(i) a first stage for filtration of incoming air, including a first stage filtration chamber located within said casing adjacent said air inlet and within said air flow path, said filtration chamber being in communication with said air inlet and containing filtration means for filtering out said particulate matter within the airstream entering said casing, and said filtration chamber having an outlet;
(ii) a second stage for cooling the airstream, including an inlet receiving said airstream from said first stage outlet, chamber means for cooling said airstream to a sufficient degree to induce condensation and agglomeration of moisture contained in the airstream, and an outlet contained within said casing;
(iii) a third stage for removing moisture from said airstream, including an inlet receiving said airstream from said second cooling stage outlet, a moisture reduction chamber within said casing, said moisture reduction chamber including moisture reduction means for acquiring moisture from the airstream passing therethrough, a collection chamber within said moisture reduction chamber for collecting said moisture acquired by said moisture reduction means, and channel means communicating with said casing air outlet to permit said airstream to be returned to said pneumatic system through said casing outlet; and
(b) moisture evacuation means contained within said casing for evacuation of said collected moisture from said purification apparatus, whereby said purification apparatus can receive impurities and moisture from the pneumatic system when the compressor is operating thereby generating an airstream within said purification apparatus, and wherein said evacuation means expels collected moisture from said air dryer when the compressor ceases operation.



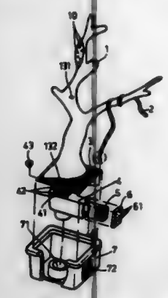
5,190,570
COMBINED DECORATIVE FLOWER POT AND AIR FILTER

Chin C. He, P.O. Box 82-144, Taipei, Taiwan

Filed May 18, 1992, Ser. No. 885,025
Int. Cl.[5] B01D 46/10
U.S. Cl. 55—279 1 Claim

1. A combined decorative flower pot and air filter comprising:
a flexible trunk having a plurality of branches with perforations for receiving twigs, each of said twigs being provided with a metallic wire in the interior so that said twigs may be twisted and kept in place as desired;
a base;
a motor arranged in said base and having an outlet and an inlet;
an air filter mounted on the outlet of said motor;
a net mounted on a bottom of said flexible trunk and disposed on said base;
a tubular member arranged within said flexible trunk and

extending upwardly out of said flexible trunk and downwardly to connect with the inlet of said motor;



a plurality of canes twisted on said branches and extending down into holes near the outlet of said motor; and

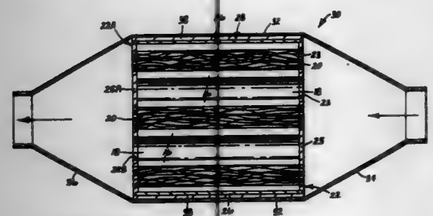
a fragrant agent fitted on an outer side of said air filter.

5,190,571

DIESEL PARTICULATE TRAP BASED ON A MASS OF FIBROUS FILTER MATERIAL FORMED WITH LONGITUDINAL TUNNELS FILLED WITH FLEXIBLE STRANDS

William T. Fay, St. Paul; Edward M. Fischer, White Bear Lake, and Stephen M. Sanocki, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 29, 1991, Ser. No. 891,642
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—523 **14 Claims**



1. A diesel particulate trap comprising

a tubular casing having an inlet and an outlet;

means for connecting the inlet and outlet of the casing into an exhaust system;

a filtering element in the form of a mass of fibrous filter material that radially fills the casing and comprises lofty yarn extending in straight lines in a repeating pattern, which lines of lofty yarn form a plurality of coextensive, compact, porous fibrous walls, each extending substantially parallel to the axis of the casing and intersecting others of the walls to define a plurality of uniform tunnels that extend through said mass in the direction of the axis of the casing;

inlet and outlet endplates that cover the ends of the filtering element, each endplate being formed with openings, at least some of which are axially aligned with imperforate areas of the other endplate,

a plug filling each of a plurality of the tunnels and preventing exhaust gases from flowing through its tunnel without being filtered; and

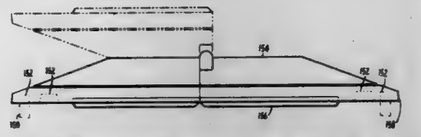
a plurality of the tunnels being open, each open tunnel being axially aligned with an opening in one endplate and with an imperforate area of the other endplate, so that exhaust gases entering the open tunnels are filtered by passing through compact fibrous walls before reaching the outlet.

5,190,572

COMPOSTING METHOD AND DEVICE

Richard Long, San Francisco, Calif., assignor to Smith & Hawken, Mill Valley, Calif.

Filed Mar. 5, 1991, Ser. No. 664,874
Int. Cl.[5] C05F *9/06, 17/00, 17/02*
U.S. Cl. 71—9 **2 Claims**



1. A method for mixing compost, comprising the steps of:

providing a composter comprising a plurality of stackable rectangular sub-units, each sub-unit being comprised of four interlocking double walled plastic panels, wherein each stackable sub-unit has a top edge from which a plurality of protrusions extend, and a bottom edge having protrusion-receiving recesses so that any number of sub-units can be stacked and the stacking order of the sub-units can be readily changed;

stacking the composter sub-units between an original bottom sub-unit and an original top sub-unit over a first piece of earth to form a first stack;

placing biodegradable matter into the first stack;

allowing said biodegradable matter in said first stack to begin decomposing;

removing the original top sub-unit from said first stack and placing it on a second piece of earth to act as the new bottom sub-unit for a second sub-unit stack;

transferring the upper compost layer from said first stack into the new bottom sub-unit of said second stack;

sequentially repeating the two preceding removing and transferring steps for each of the sub-units and corresponding compost layers until the original bottom sub-unit of the first stack becomes the new top sub-unit, so that in the process of reversing the sub-unit stacking order the compost has been substantially mixed.

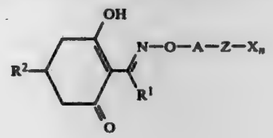
5,190,573

CYCLOHEXENONE OXIME ETHERS, THEIR PREPARATION AND THEIR USE AS HERBICIDES

Ulf Misslitz, Neustadt; Norbert Meyer, Ladenburg; Juergen Kast, Boehl-Iggelheim; Norbert Goetz, Worms; Albrecht Harreus, Ludwigshafen; Bruno Wuerzer, Otterstadt; Helmut Walter, Obrigheim; Karl-Otto Westphalen, Speyer, and Matthias Gerber, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 8, 1991, Ser. No. 697,050
Claims priority, application Fed. Rep. of Germany, May 9, 1990, 4014986; Oct. 20, 1990, 4033423
Int. Cl.[5] A01N *43/16*; C07D *309/06*
U.S. Cl. 504—292 **7 Claims**

1. A cyclohexenone oxime ether of the formula I



(I)

where

R^1 is C_1–C_6-alkyl;

A is an unsubstituted or C_1–C_3-alkyl-substituted C_2–C_4-alkylene or C_1–C_4-alkenylene chain in which a methylene group is replaced by an oxygen atom, a sulfur atom, a sulfoxyl group, a sulfonyl group or —N(R^a)—, where

R^a is hydrogen, C_1–C_6-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkynyl,

Z is phenyl,

a 5-membered heteroaromatic structure having from one to three heteroatoms selected from the group consisting of three nitrogen atoms and an oxygen or a sulfur atom, or

a 6-membered heteroaromatic structure having from one to four nitrogen atoms,

X is an amino group —N$R^a R^b$, where

R^a is hydrogen, C_1–C_4-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkynyl and

R^b is hydrogen, C_1–C_4-alkyl, C_3–C_6-alkenyl, C_3–C_6-alkynyl, C_1–C_6-acyl or benzoyl, where the aromatic ring may carry from one to three substituents selected from the group consisting of nitro, cyano, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio and C_1–C_4-haloalkyl;

nitro, cyano, halogen, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or completely halogenated C_1–C_4-alkoxy, carboxyl, C_1–C_4-alkoxycarbonyl, benzyloxycarbonyl or phenyl, where the aromatic radicals may additionally carry from one to three of the followsubstituents: nitro, cyano, halogen, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or completely halogenated C_1–C_4-alkoxy, carboxyl, C_1–C_4-alkoxycarbonyl or benzyloxycarbonyl;

n is from 0 to 3 or 1 to 5 where Z is halogen;

R^2 is C_1–C_4-alkoxy-C_1–C_6-alkyl- or C_1–C_4-alkylthio-C_1–C_6-alkyl;

C_3–C_7-cycloalkyl or C_5–C_7-cycloalkenyl, where these groups may carry from one to three substituents selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or completely halogenated C_1–C_4-alkyl, hydroxyl and halogen;

a 5-membered saturated heterocyclic structure containing one or two heteroatoms selected from the group consisting of oxygen and sulfur, where the heterocyclic structure may additionally carry from one to three radicals selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio and partially or completely halogenated C_1–C_4-alkyl;

a 6- or 7-membered saturated or mono- or diunsaturated heterocyclic structure containing one or two heteroatoms selected from the group consisting of oxygen and sulfur, where the heterocyclic structure may additionally carry from one to three radicals selected from the group consisting of hydroxy, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio and partially or completely halogenated C_1–C_4-alkyl;

a 5-membered heteroaromatic structure containing one to three heteroatoms selected from the group consisting of two nitrogen atoms and an oxygen or a sulfur atom, where this ring may additionally contain from one to three radicals selected from the group consisting of halogen, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or completely halogenated C_1–C_4-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkenyloxy, partially or completely halogenated C_2–C_6-alkenyl and C_1–C_4-alkoxy-C_1–C_4-alkyl;

phenyl or pyridyl, where these groups may additionally carry from one to three radicals selected from the group consisting of halogen, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, partially or completely halogenated C_1–C_4-Alkyl, C_3–C_6-alkenyloxy, C_3–C_6-alkynyloxy and —N$R^a R^b$, where R^a and R^b have the above meanings, and their agriculturally useful salts and esters of C_1–C_{10}-carboxylic acids and inorganic acids.

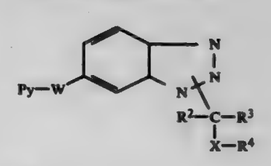
5,190,574

HERBICIDAL PYRAZOLYLOXY AND PYRAZOLYLAMINO-BENZOTRIAZOLES

David P. J. Pearson, Maidenhead; John E. D. Barton, Reading; Christopher J. Mathews, Maidenhead; David Cartwright, Reading, and Susan P. Barnett, Bracknell, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Feb. 7, 1991, Ser. No. 653,206
Claims priority, application United Kingdom, Feb. 16, 1990, 9003556; Sep. 5, 1990, 9019345
Int. Cl.[5] A01N *43/647*; C07D *401/12, 401/14*
U.S. Cl. 504—225 **11 Claims**

1. A compound of formula (I):



in which

the dotted line indicates the presence of two double bonds arranged so as to form a fused hetero aromatic ring system;

Py is an optionally substituted pyrazole ring;

W is O or NR^1; where R^1 is hydrogen or C_1–C_3 alkyl;

X is $(CH_2)_n$, CH=CH, $CH(OR^5)CH_2$, or $COCH_2$;

where n is 0, 1 or 2;

R^2 and R^3 are independently selected from H, optionally substituted C_1–C_{10} alkyl, C_2–C_{10} alkenyl or C_3–C_{10} alkynyl, halogen, or NR^6R, and R^2 and R^3 together with the carbon to which they are attached form an optionally substituted C_2–C_{10} alkenyl group or a C_3–C_9 cycloalkyl group;

R^4 is CO_2R^8, CN, COR^8, CH_2OR^8, $CH(OH)R^8$, $CH(OR^8)R^9$, $CSNH_2$, $COSR^8$, $CSOR^8$, $CONHSO_2R^8$, $CONR^{10}R^{11}$, $CONHNR^{10}R^{11}$, $CONHN^+R^{10}R^{11}R^{12}R^{14}$, $CO_2{}^-R^{15+}$ or $COON{=}CR^{10}R^{11}$;

R^{15+} is an agriculturally acceptable cation and R^{14-} is an agriculturally acceptable anion;

R^5, R^8 and R^9 are independently selected from H or an optionally substituted C_1–C_{10} alkyl, phenyl, C_2–C_{10} alkenyl or C_2–C_{10} alkynyl group;

R^6, R^7, R^{10}, R^{11} and R^{12} are independently selected from H or an optionally substituted C_1–C_{10} alkyl, C_2–C_{10} alkenyl, phenyl or C_2–C_{10} alkynyl group; or any two of R^6, R^7, R^{10}, R^{11} and R^{12} together with the atom to which they are attached form a C_3–C_9 cycloalkyl, pyrrolidine, piperidine or morpholine ring;

and wherein:

(i) optional substituents for the pyrazole ring comprise up to 3 members selected from halogen; a group R^x where R^x is a group as defined hereinbefore for R^8; nitro, C_1–C_{10} haloalkoxy; a group $S(O)_mR^y$ where m is 0, 1 or 2 and R^y is a group as hereinbefore defined for R^8; or R^z where R^z is a group as hereinbefore defined for R^4;

(ii) optional substituents for phenyl groups R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} comprise up to 5 members selected from halogen, C_1–C_3 alkyl, C_1–C_{10} haloalkyl, C_1–C_{10} haloalkoxy, nitro, cyano, C_1–C_3 alkoxy or $S(O)_qR^w$ where q is 0, 1 or 2 and R^w is C_1–C_{10} alkyl; and

(iii) optional substituents for alkyl, alkenyl and alkynyl groups R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11} and R^{12} comprise one or more members selected from halogen; nitro; cyano; phenyl; CO_2R^{19}, $NHCOR^{19}$ or $NHCH_2CO_2R^{19}$ where R^{19} is hydrogen, C_1–C_6 alkyl or

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an agriculturally acceptable cation; C_1–C_6 alkoxy; oxo; $S(O)_qR^w$ where q is 0, 1 or 2 and R^w is C_1–C_{10} alkyl; amino; mono- or di- (C_1–C_6 alkyl)amino; $CONR^{20}R^{21}$ where R^{20} and R^{21} are independently selected from hydrogen; C_1–C_6 alkyl, C_2–C_6 alkenyl or C_2–C_6 alkynyl, or R^{20} and R^{21} together form a tetrahydrofuranyl ring.

5,190,575

5-SUBSTITUTED-2,4-DIPHENYLPYRIMIDINE DERIVATIVES AND THEIR USE

Junichi Sato, Osaka; Yuzuru Sanemitsu, Hyogo; Shinichi Kawamura, Osaka; Nobuaki Mito, Hyogo, all of Japan; Tatsuhiro Hamada, Genlis, France, and Ryo Yoshida, Hyogo, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

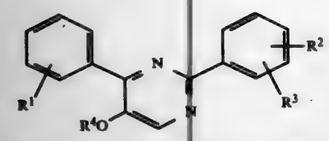
Continuation of Ser. No. 602,833, Oct. 23, 1990, which is a continuation-in-part of Ser. No. 544,089, Jun. 22, 1990, abandoned, which is a continuation of Ser. No. 391,016, Aug. 9, 1989, abandoned, and a continuation-in-part of Ser. No. 508,446, Apr. 13, 1990, which is a division of Ser. No. 391,016, Aug. 9, 1989, abandoned. This application Dec. 17, 1991, Ser. No. 809,649

Claims priority, application Japan, Aug. 9, 1988, 63-199155; Sep. 27, 1988, 63-243539; Oct. 23, 1989, 1-276593; Oct. 23, 1989, 1-276594; Oct. 23, 1989, 1-276595; Oct. 23, 1989, 1-276596; Jan. 31, 1990, 2-23430

Int. Cl.[5] A01N *43/54*; C07D *239/34*

U.S. Cl. 504—242 **13 Claims**

1. A compound of the formula (I):



(I)

wherein R^1 represents a halo-(C_1 to C_6)-alkoxy group at the ortho or meta position; R^2 and R^3, which may be either the same or different, each represents a hydrogen atom, a halogen atom, a (C_1 to C_2)-alkyl group, a halo-(C_1 to C_2)-alkyl group, a (C_1 to C_2)-alkoxy group, a nitro group, a (C_1 to C_2)-alkylthio group, a halo-(C_1 to C_2)-alkylthio group or a halo-(C_1 to C_2)-alkoxy group; and R^4 represents a (C_1 to C_2)-alkyl group; provided that both of R^2 and R^3, if each representing a substituent other than a hydrogen atom, are not at the ortho position for the pyrimidine ring at the same time.

5,190,576

HERBICIDAL COMBINATION BASED ON BROMOXYNIL OR ONE OF ITS DERIVATIVES

Thierry Bernard, Dardilly, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

Division of Ser. No. 646,646, Feb. 7, 1991, Pat. No. 5,149,358. This application Mar. 9, 1992, Ser. No. 848,527

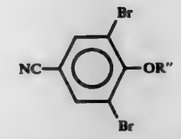
Claims priority, application France, Jun. 13, 1989, 89 08154

Int. Cl.[5] A01N *37/34*, *43/40*, *43/54*, *47/30*

U.S. Cl. 504—136 **19 Claims**

1. A herbicidal composition comprising a synergistic herbicidally effective amount of:

(a) at least one compound of the formula



where R'' is hydrogen, potassium or sodium; and

(b) 2-[[(4,6-dimethoxypyrimidin-2-yl)aminocarbonyl]aminsulphonyl]-N,N-dimethyl-3-pyridinecarboxamide).

5,190,577

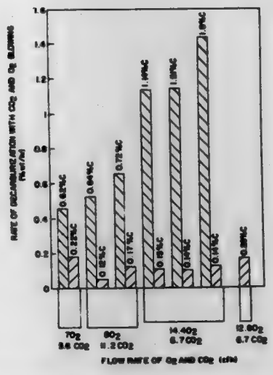
REPLACEMENT OF ARGON WITH CARBON DIOXIDE IN A REACTOR CONTAINING MOLTEN METAL FOR THE PURPOSE OF REFINING MOLTEN METAL

Curtis L. Bermel, Chicago; Sara H. Anderson, and Daniel R. Urban, both of Westmont, all of Ill., assignors to Liquid Air Corporation, Walnut Creek, Calif.

Filed Dec. 11, 1990, Ser. No. 625,955

Int. Cl.[5] C21C *5/35*

U.S. Cl. 75—552 **8 Claims**



1. A process for decarburizing molten metal or ferro-alloys, comprising:

in a first phase, adjusting the temperature of a molten metal or ferro-alloys bath to a desired operating range,

in a second phase, reducing the carbon content of the molten bath to a value correspond approximately to the carbon content of the bath in equilibrium with CO at a partial pressure of 1 atm and at a temperature within said desired operating range, and

in a third phase, further reducing the carbon content of the bath from said value to substantially the desired carbon content,

wherein during the first phase, a gas mixture comprising oxygen and carbon dioxide is introduced by subsurface injection into said molten bath, and during the second and third phases, a mixture comprising oxygen and an inert gas selected from the group consisting of argon, xenon, neon, helium and nitrogen is introduced in said molten bath, and wherein the carbon dioxide is preheated before introduction by subsurface injection.

5,190,578

METHOD FOR HYDROMETALLURGICAL PROCESSING OF FRIABLE CONCENTRATION PRODUCTS

Alexander V. Feldman, McLean, Va., assignor to F & T Technology Corporation, McLean, Va.

Filed Dec. 6, 1991, Ser. No. 802,826

Int. Cl.[5] C22B *11/08*

U.S. Cl. 75—747 **6 Claims**

1. A method for hydrometallurgical processing of friable secondary metallic products containing nonferrous and precious metals and comprising the following operations:

a. Treatment of said products with an alkali solution in the autoclave at 80°–190° C. and delivery of oxygen into said autoclave at a pressure of 0.1–0.8 MPa as a result of which aluminum and lead pass from said products into said alkali solution while other said products form a solid sediment; and,

b. Treatment of said solid sediment with a sulfuric acid solution in another autoclave under surplus oxygen pressure as a result of which said nonferrous metals pass from said solid sediment into said solution of sulfuric acid and form enriched concentrate of precious metals in the form of another solid sediment.

5,190,579

AQUEOUS ADDITIVE SYSTEMS, METHODS AND POLYMERIC PARTICLES

William C. Gose, and Kenneth W. Hyche, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 240,903, Sep. 6, 1988, Pat. No. 5,007,961, which is a continuation-in-part of Ser. No. 197,946, May 24, 1988, Pat. No. 4,975,120, which is a continuation-in-part of Ser. No. 827,042, Feb. 7, 1986, Pat. No. 4,898,616, which is a continuation-in-part of Ser. No. 701,888, Feb. 15, 1985, abandoned. This application Feb. 7, 1990, Ser. No. 476,071

Int. Cl.[5] C08L *91/06*; C08D *191/06*, *191/08*

U.S. Cl. 106—18 **4 Claims**

1. Method of preparing aqueous emulsions which include an emulsifiable wax and at least one processing, stabilizing or other functional polymer additive component, said method comprising

(1) agitating a mixture which contains by weight, about 20 to about 80 percent water, about 5 to about 35 percent of an emulsifiable wax, about 0.2 to about 1.0 percent of a base, and about 2 to about 30 percent of a surfactant; at a temperature sufficient to melt all solids; and under a pressure sufficient to prevent boiling for a period of time to ensure homogeneity;

(2) cooling said emulsion to ambient temperature; and

(3) milling in the range of 20 up to 70 wt. % of the cooled emulsion with in the range of about 30 up to 80 wt. % of said additive(s) optionally with 0–35 wt. % water, and optionally with 0–1 wt. % antifoam for a period of time to ensure substantial homogeneity.

5,190,580

PROCESS OF USING BIOCIDAL COMPOSITIONS

Rainer Gruening, Basking Ridge, N.J., assignor to Troy Chemical Corporation, Newark, N.J.

Division of Ser. No. 467,404, Jan. 22, 1990, Pat. No. 5,071,479. This application Oct. 25, 1991, Ser. No. 782,624

Int. Cl.[5] C09D *5/16*

U.S. Cl. 106—18.32 **3 Claims**

1. A method for retarding fouling of an underwater surface of a marine structure by marine pests which comprises applying a coating of a paint to said surface, said paint containing a biocidally effective amount of 3-iodo-2-propynyl propyl carbamate, 4-iodo-3-butynyl propyl carbamate and mixtures thereof in admixture with a solvent and a binder.

5,190,581

INK, INK-JET RECORDING METHOD, AND INSTRUMENT EMPLOYING THE INK

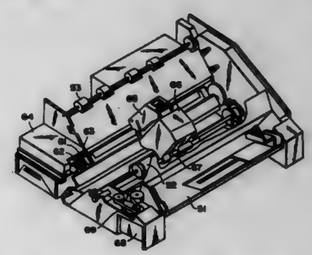
Kyoko Fukushima, Yokohama; Kerome Shirota, Kawasaki, and Shoji Koike, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 664,111, Mar. 4, 1991, abandoned. This application Jun. 10, 1992, Ser. No. 896,883

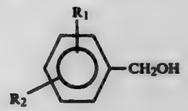
Claims priority, application Japan, Mar. 6, 1990, 2-53951; Mar. 6, 1990, 2-53952; Feb. 6, 1991, 3-035010; Feb. 6, 1991, 3-035011

Int. Cl.[5] C09D *11/02*

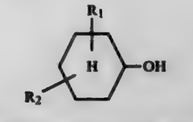
U.S. Cl. 106—20 D **4 Claims**



1. An ink comprising a recording agent and an aqueous liquid medium for dissolving or dispersing the recording agent, the ink comprising a compound represented by the general formula (I) or (II):



(I)



(II)

where R_1 and R_2 are independently selected from the group consisting of radicals of hydrogen, alkyl or alkoxy having not more than 10 carbons, sulfonic acid or salts thereof, nitro, hydroxyl, carboxyl, and amino or derivatives thereof, and R_1 and R_2 are not simultaneously a hydrogen radical, and wherein said compound is contained in an amount in the range of from 0.01% to 30% by weight of the total weight of the ink.

5,190,582

INK FOR INK-JET PRINTING

Masakazu Shinozuka; Hiroto Nakamura; Kenichi Kanbayashi; Yaeko Maruyama; Noriko Oyama, and Hiroyuki Oxishi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP90/01516, § 371 Date Jul. 18, 1991, § 102(e) Date Jul. 18, 1991, PCT Pub. No. WO91/07470, PCT Pub. Date May 30, 1991

PCT Filed Nov. 21, 1990, Ser. No. 721,630

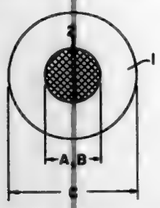
Claims priority, application Japan, Nov. 21, 1989, 1-302855; Nov. 21, 1989, 1-302856; Feb. 8, 1990, 2-29213; Feb. 8, 1990, 2-29214; Feb. 8, 1990, 2-29215; Feb. 8, 1990, 2-29216; May 17, 1990, 2-127431; May 17, 1990, 2-127435; May 18, 1990, 2-128774; May 21, 1990, 2-130789

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—20 D **13 Claims**

1. An ink composition for ink-jet printing, comprising a

coloring component and a dispersion medium in which said coloring component is homogeneously dispersed and retained,
said coloring component being insoluble in said dispersion medium, and dispersed therein in the state of finely divided particles of an average particle size of 0.01 μm or more in an amount of 1-20% by weight, said coloring component comprising a metal oxide,



said dispersion medium comprising a liquid having a maximum surface tension at 25° C. of 50 dyn/cm, and
said ink composition having the property that said dispersion medium separates immediately from said coloring component when said ink composition is deposited on an image-recording material.

5,190,583

AQUEOUS COATING COMPOSITION AND THE USE THEREOF FOR COATING TO BE PROTECTED FROM LIGHT, ESPECIALLY ULTRAVIOLET RADIATION

Taskred Menzel, Bad Essen, and Hermann Nickel, Bohmte, both of Fed. Rep. of Germany, assignors to Transfer-Electric Gesellschaft Fur, Lemforde, Fed. Rep. of Germany

Continuation of Ser. No. 444,877, Dec. 4, 1989, abandoned. This application Jun. 24, 1992, Ser. No. 902,793
Int. Cl.[5] C08K *3/16*
U.S. Cl. 106—241 7 Claims

1. An aqueous coating composition consisting essentially of a film-forming aqueous dispersion of synthetic resin particles and inorganic pigment particles, except carbon black, wherein
(a) said pigment particles have an average particle size of 7 to 70 nm,
(b) said synthetic resin particles have a greater particle size than the inorganic pigment particles and are completely coated with the inorganic pigment particles,
(c) the proportions of synthetic resin particles to pigment particles being one part by weight of said synthetic resin particles to at least one part by weight of said pigment particles and said pigment particles being present in an amount sufficient to provide UV protection upon coating, and
(d) said coating composition after applying to a surface and drying provides a coating with the inorganic pigment particles in the form of a coherent homogeneous surface that reflects UV radiation.

5,190,584

KETENE DIMER PAPER SIZING AGENTS MODIFIED BY NONREACTIVE HYDROPHOBES

Guglielmo Ruffini, Bergamo, Italy, assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 13, 1990, Ser. No. 627,944
Claims priority, application Italy, Dec. 14, 1989, 89/22701A
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Int. Cl.[5] C09D *7/12*
U.S. Cl. 106—243 12 Claims

1. A composition comprising
(a) a ketene dimer having the general formula $[RCH{=}C{=}O]_2$ wherein R is an alkyl radical having from 6 to 22 carbon atoms, a cycloalkyl radical having at least 6 carbon atoms, an aryl, aralkyl or alkaryl radical, and
(b) a nonreactive hydrophobe compound, which is a fatty acid ester derived from fatty acids having from 10 to 24 carbon atoms and alcohols having from 1 to 5 carbon atoms selected from the group consisting of mono-, di- and polyhydric alcohols, the melting point of said fatty acid ester is at least about 10° C. higher than the melting point of said ketene dimer, and the ketene dimer to fatty acid ester ratio is from about 11:100 to about 75:100 by weight.

5,190,585

PRODUCTION OF PIGMENT COMPOSITIONS

James M. McCrae, Kilmarnock, and Neil C. W. Forsythe, Glasgow, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 415,018, Sep. 29, 1989, abandoned. This application Nov. 13, 1991, Ser. No. 793,266
Claims priority, application United Kingdom, Oct. 6, 1988, 8823483; Jul. 21, 1989, 8916752
Int. Cl.[5] C09B *27/00*; C08K *5/00*
U.S. Cl. 106—493 13 Claims

1. In an aqueous process for the production of an azo pigment composition which comprises contacting an azo pigment precursor selected from the group consisting of a diazo or tetrazo component or an azo coupling component with a water immiscible carrier medium, the azo pigment being produced by reacting one or more azo pigment precursors selected from the group consisting of a diazo or tetrazo component or an azo coupling component in a synthesis vat, the improvement comprising contacting, before or during the synthesis of the azo pigment, said one or more azo pigment precursors selected from the group consisting of a diazo or tetrazo component or an azo coupling component with the water immiscible carrier medium and then completing the azo pigment synthesis to produce the azo pigment and the water immiscible carrier medium.

5,190,586

PIGMENT COMPOSITE PARTICLES PREPARED BY SUSPENSION POLYMORIZATION

Katsumi Mizuguchi, Ibaraki; Masanori Ohiwa, Toyonaka; Keizou Ishii, Ashiya, and Shinichi Ishikura, Tsuzuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Nov. 28, 1990, Ser. No. 618,370
Claims priority, application Japan, Nov. 28, 1989, 1-308229
Int. Cl.[5] C08L *101/02*
U.S. Cl. 106—499 11 Claims

1. Pigment composite particles having an average particle size of 3 to 300 micrometers prepared by suspension-polymerizing an aqueous suspension comprising:
(a) a pigment paste comprising a pigment and a pigment grinding resin having a hydrophilic group therein of at least 0.2 mmol/g,
(b) a polymerizable monomer and
(c) a polymerization initiator; wherein said pigment is located on the outside of the composite pigment particles.

5,190,587

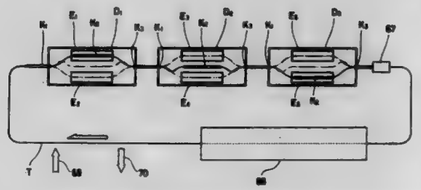
SINGLE-LINE PARTS COATING SYSTEM

Hideyuki Sakai, Okazaki, Japan, assignor to Nichidai Industrial Co. Ltd., Aichi and Daiwa Paint Trading Co. Ltd., Nagoya, both of, Japan

Division of Ser. No. 689,327, Apr. 23, 1991, Pat. No. 5,150,655.
This application May 18, 1992, Ser. No. 884,419
Claims priority, application Japan, Apr. 24, 1990, 2-108220
Int. Cl.[5] B61B *7/00*
U.S. Cl. 118—324 9 Claims

1. A single-line system for coating parts, such as automobile parts or electrical parts with paint, which comprises
plural coating sections (D_1 to D_3) each housing plural coating booths (E_1 and E_2, E_3 and E_4, E_5 and E_6),

horizontally-movable nonflexible rails (K_2) located in the respective coating sections portions thereof,
a first fixed nonflexible rail for introducing parts to be coated into a first coating section (D_1),
intermediate fixed nonflexible rails located between the coating sections,
a last fixed nonflexible rail for discharging the parts from a last coating section (D_3),
all said nonflexible rails being arranged in series,
horizontally-flexible rails located between the non-flexible rails to connect the nonflexible rails,
means for suspending the movable nonflexible rail (K_2),
means for suspending the horizontally-flexible rail, trolleys which run suspended from the nonflexible and flexible rails, and
plural operating means each provided in conjunction with one of the coating sections (D_1 to D_3) for moving the movable nonflexible rail (K_2) transversely in a horizontal plane to selectively locate the nonflexible rail (K_2) in one of the coating booths,
each of the flexible rails comprising
(i) rail pieces (R_0 to R_n) which are in contact with each other,
intermediate ones (R_1 to R_{n-1}) of the rail pieces each having a concave front end face and a convex rear end face and being in contact with adjacent rail pieces at its concave front end face and its convex rear end face, respectively,
a foremost one (R_0) of the rail pieces having a straight or flat front end face and a convex rear end face and being



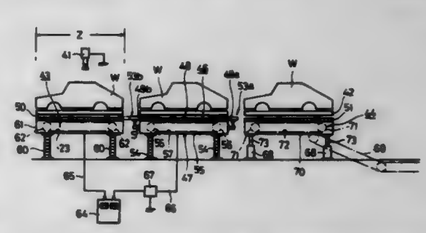
in contact with the adjacent rail piece (R_1) at its convex rear end face, and
a rearmost one (R_n) of the rail pieces having a concave front end face and a straight or flat rear end face and being in contact with the adjacent rail piece (R_{n-1}) at its concave front end face,
(ii) connecting plates (S_0 to S_n) for connecting the rail pieces (R_0 to R_n) together,
each of the connecting plates (S_1 to S_n) except a foremost one (S_0) bridging adjacent rail pieces,
(iii) means for fixing each of the connecting plates (S_1 to S_n) except the foremost connecting plate (S_0) on a top of one of adjacent rail pieces,
(iv) pivotal connecting means (P_1 to P_n) located along a longitudinal centerline of the flexible rail for connecting each of the connecting plates (S_1 to S_n) to the other one of the adjacent rail pieces such that the connecting plate, together with the rail piece to which the connecting plate is fixed, can move in an arc, in a horizontal plane, relative to the other one of the adjacent rail pieces, and
the pivotal connecting means thus connecting the adjacent rail pieces together for relative arcing motion,
(v) means for fixing the foremost connecting plate (S_0) on a top of the foremost rail piece (R_0),
(vi) arcing-motion limiting means for limiting the arcing motion of the connecting plate to a relatively small range,
(vii) the convex rear end face of each of the intermediate rail pieces (R_1 to R_n) and the concave front end face of the adjacent rail piece which is in contact therewith, coinciding with a curved line produced by drawing a circle with a predetermined radius round a center of an opening of the rail piece into which the pivotal connecting means connecting the adjacent rail pieces together is inserted,
(viii) the convex rear end face of the foremost rail piece (R_0) and the concave front end face of the rail piece (R_1) located immediately behind the foremost rail piece (R_0), coinciding with a curved line produced by drawing a circle with a first given radius round a center of an opening of the foremost rail piece into which the pivotal connecting means connecting the foremost rail piece and the rail piece (R_1) together is inserted, and
said first given radius being equal to said predetermined radius, and
(ix) the concave front end face of the rearmost rail piece (R_n) and the convex rear end face of the rail piece (R_{n-1}) located immediately in front of the rearmost rail piece, coinciding with a curved line produced by drawing a circle with a second given radius round a center of an opening of the rail piece (R_{n-1}) into which the pivotal connecting means connecting the rearmost rail piece and the rail piece (R_{n-1}) together is inserted, and
said second given radius being equal to said predetermined radius.

5,190,588

ELECTROSTATIC COATING FACILITY FOR ELECTROCONDUCTIVE COATING MATERIAL

Masaharu Matsuhita, Nagoya; Tomoyasu Ito, Seto; Touichi Watanabe, Yokohama; Akira Shoji, Nagoya; Michitaka Moritani, and Takatoshi Okuta, both of Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo, Japan

Filed Aug. 29, 1991, Ser. No. 752,051
Claims priority, application Japan, Aug. 30, 1990, 2-226656; Aug. 30, 1990, 2-226657; Nov. 30, 1990, 2-330213; Dec. 28, 1990, 2-408643
Int. Cl.[5] B05B *5/025*
U.S. Cl. 118—635 7 Claims



1. An electrostatic coating facility for applying an electroconductive coating material comprising,
a coating machine disposed in a coating zone while being grounded to the earth,
an insulated conveyer 1 disposed in said coating zone for conveying an object (W) to be coated in an electrically insulated state and applying a high voltage to the object (W) to be coated,
an entering conveyer 10 disposed for carrying the object (W) to be coated into said coating zone,
a delivery conveyer 11 for carrying the coated object (W) after coating out of said coating zone, and
a relay transfer device 12 interposed between said insulated conveyer 1 and said entering conveyor 10, and between said insulated conveyer 1 and said delivery conveyer 11 for transferring the object (W) in an electrically insulated state while keeping a required insulation distance between each of them.

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5,190,589

COMPOUNDS AND PROCESS PREPARING A SUBSTITUTED OR AN UNSUBSTITUTED 4(5)-(ω-AMINOALKYL)IMIDAZOLE

John C. Eriks, Driebuis; Henderikus van der Goot, Hoofddorp; Hendrik Timmerman, Veorschoten, and Jan G. Koper, Weesp, all of Netherlands, assignors to Cedona Pharmaceuticals B.V., Haarlem, Netherlands

PCT No. PCT/NL89/00019, § 371 Date Dec. 3, 1990, § 102(e) Date Dec. 3, 1990, PCT Pub. No. WO89/10360, PCT Pub. Date Nov. 2, 1989

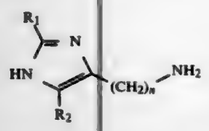
PCT Filed Apr. 5, 1989, Ser. No. 573,015

Claims priority, application Netherlands, Apr. 18, 1988, 88 00998

Int. Cl.[5] C07D *233/64, 405/10*

U.S. Cl. 548—311.7 **2 Claims**

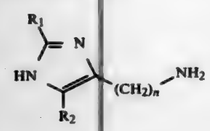
1. A process for preparing a substituted or an unsubstituted 4(5)-ω-aminoalkyl)imidazole of the formula:



wherein n has a value of from 2 to 6; R_1 is hydrogen or a linear, branched or cyclic, saturated or unsaturated non-aromatic hydrocarbon group having 1–6 C-atoms or a substituted or unsubstituted phenyl group wherein any substituents are mono- or di-substituents selected from the group consisting of lower alkyl, halogen, alkoxy and methylenedioxy or a combination thereof, and R_2 is hydrogen or methyl;

said process comprising brominating an ω-phthalimidoalkan-2-one to form a 1- or 3-bromo-ω-phthalimido-alkan-2-one derivative, subjecting said derivative to ring closure with an amidine, followed by hydrolytic separation of the phthalic residue, and wherein the bromination is carried out in an anhydrous methanol and the ring closure is carried out in N.N-dimethylformamide with potassium carbonate under mold conditions.

2. A compound of the formula



wherein n has a value of from 2 to 6; R_1 is a branched or cyclic, saturated non-aromatic hydrocarbon group having 3–6 C-atoms, a linear, branched or cyclic unsaturated non-aromatic hydrocarbon group having 2–6 carbon atoms or a substituted or unsubstituted phenyl group wherein any substituents are mono- or di-substituents selected from the group consisting of lower alkyl, halogen, lower alkoxy and methylenedioxy or a combination thereof, and R_2 is hydrogen or methyl.

5,190,590

VACUUM COATING APPARATUS

Masaki Suzuki, Hirakata; Hidetoshi Kawa, Ibaragi; Shigeyuki Yamamoto, Nara, and Nobuhisa Maeda, Yamatotakada, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 8, 1991, Ser. No. 682,110

Claims priority, application Japan, Apr. 10, 1990, 2-95723

Int. Cl.[5] C23C *14/24*

U.S. Cl. 118—664 **2 Claims**

1. A vacuum coating apparatus comprising:

a vacuum deposition chamber from which air can be evacuated;

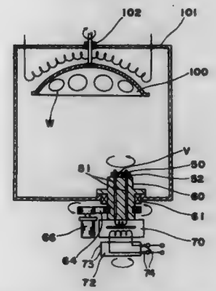
a carrier accommodated in said vacuum deposition chamber and configured to carry objects to be coated;

a rotary mechanism extending through a chamber wall of said vacuum deposition chamber and being rotatable with respect to said carrier;

a heating element mounted on said rotary mechanism and accommodated in said vacuum deposition chamber, said heating element being configured to accommodate material to be evaporated and deposited on surfaces of objects carried by said carrier;

a monitoring member mounted on said carrier;

film thickness measuring means, disposed outside of said vacuum deposition chamber, for measuring a thickness of films formed on surfaces of objects carried by said carrier



by monitoring a thickness of a film formed on said monitoring member; and

a conveyor supporting said carrier and automatically operable to convey said carrier between an atmosphere outside of said vacuum deposition chamber and the interior of said vacuum deposition chamber such that said carrier and objects carried thereby can be automatically conveyed from the atmosphere outside of said vacuum deposition chamber to the interior of said chamber and from the interior of said vacuum deposition chamber to the atmosphere outside of said chamber,

and said conveyor being stoppable to position said carrier within said vacuum deposition chamber such that said heating element is rotatably by said rotary mechanism during a deposition operation while objects carried by said carrier are maintained stationary.

5,190,591

LANGMUIR-BLODGETT FILM FORMING APPARATUS

Makoto Okano; Toshiyuki Miyadera, and Fumio Matsui, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,083

Claims priority, application Japan, Jan. 17, 1991, 3-3766

Int. Cl.[5] B05C *3/09*

U.S. Cl. 118—667 **7 Claims**

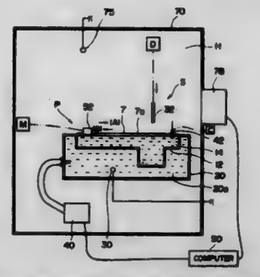
1. A Langmuir-Blodgett (LB) film forming apparatus comprising:

a first tank having a subphase contained therein;

a packing unit positioned on said first tank so as to orient and pack a sample which is a composition for forming a monomolecular film developed on said subphase;

a sampling unit positioned so as to sample the oriented and packed monomolecular film on a substrate;

said packing unit comprising a second tank in which a solution is stored, said first tank being disposed in said solution of said second tank; an outer casing enclosing said packing unit, said sampling unit, and said first and second tank; a first controller for controlling a temperature of the solution in said second tank; and said outer casing being provided with a second controller for controlling an ambient



temperature in said outer casing, said first and second controllers being operatively coupled to one another so as to maintain a temperature of the solution substantially the same as said ambient temperature in said outer casing.

5,190,592

AEROSOL INJECTION SYSTEM FOR PRODUCING COMPOSITE LAYERS BY PYROLYSIS

Jean-Jacques Chanze, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 12, 1991, Ser. No. 684,371

Claims priority, application France, May 2, 1990, 90 05525

Int. Cl.[5] C23C *16/46*

U.S. Cl. 118—719 **6 Claims**

1. System for the injection of droplet aerosols travelling in a gaseous phase and containing a solute for the production of composite layers by the pyrolysis of the solute on heated substrates (6) travelling in the muffle (2) of a furnace, which has a generally parallelepipedic, vertical case (8), fitted by its base to the said muffle and supplied with aerosol and additional air at its top, said case being used for channelling the aerosol from its arrival at the top down to its base, where it reaches the various heated substrates, characterized in that said case has three parts, namely from top to bottom and on the common path of the aerosol and the gaseous phase: an injection chamber (36) provided in its upper part with at least one opening for the aerosol and additional air supply and, in its lower part, with a plate (54) having holes, each of which is provided with a short tubular element (56) in the manner of a vertical chimney stack issuing into the injection chamber, the different stacks (56) ensuring the free passage of the aerosol and the additional air in the direction of the base of the case;

a chamber (38) for vaporizing the aerosol droplets and provided with a double side wall containing heating resistors (62, 64, 66) distributed over the entire height in several groups, each regulatable in an autonomous manner;

a vapour phase discharge injector (40) continuous with the lower wall of the case and provided with at least one slot (68) extending along a straight segment (70) in a general direction perpendicular to the travel speed of the substrate (6) to be coated, but whose opening is oriented in such a way as to ensure the passing onto the same of the vapour phase as parallel as possible to their surface.

5,190,593

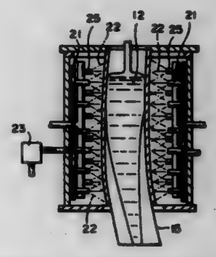
APPARATUS AND METHOD FOR CLEANING THE OUTSIDE OF THE MOLD TUBE IN A CONTINUOUS CASTING MACHINE

Cass R. Kurzinski, 120 Julian Plz., Syracuse, N.Y. 13210

Filed Feb. 21, 1991, Ser. No. 658,731

Int. Cl.[5] B22D *11/124*; C23G *1/02*

U.S. Cl. 134—3 **15 Claims**



1. In a mold having a mold tube for casting molten metal, and means for directing a coolant fluid against the mold tube for cooling it and the metal being cast therein, the improvement comprising:

means for applying a chemical solution against the outside surface of the mold tube, in situ, for dissolving precipitates therefrom while the mold tube remains in place in the mold.

13. A method of removing precipitate from the outer surface of a mold tube in a metal casting machine, comprising the steps of:

applying a chemical solution, in situ, to the precipitate on the mold tube to dissolve and remove the precipitate while leaving the mold tube in place in the metal casting machine.

5,190,594

CONTACT LENS CLEANING MATERIAL AND METHOD

Maylee H. Chou, Lexington, and Edward J. Ellis, Lynnfield, both of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation of Ser. No. 434,412, Nov. 9, 1989, Pat. No. 5,089,053. This application Oct. 7, 1991, Ser. No. 772,110

The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.

Int. Cl.[5] B08B *3/08*

U.S. Cl. 134—6 **7 Claims**

1. A contact lens cleaning material designed for cleaning hard contact lenses formed of silicon and fluorine containing polymers, after said lenses have been used in the eye.

said cleaning material comprising,

(a) an anionic surface active agent selected to have good cleaning action with respect to protein and mucous like material deposits;

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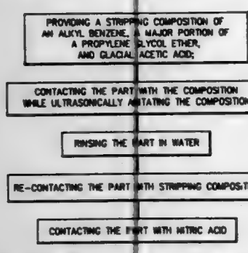
(b) an alkylphenyl polyether alcohol surfactant;
(c) an aqueous suspending vehicle; and
(d) a quatenary phosphate ester surfactant.

5,190,595
OZONE SAFE STRIPPING SOLUTION FOR THERMAL GREASE
Joseph G. Ameen, Apalachin; Joseph Funari, Vestal, both of N.Y.; Joseph D. Poole, Charlotte, N.C., and David W. Siscenstein, Jr., Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 3, 1991, Ser. No. 753,471
Int. Cl.[5] B08B *3/12*; C11D *7/50*
U.S. Cl. 134—40 8 Claims



1. A method for stripping a silicone oil base grease from a part, comprising the steps of:
a. providing a stripping composition comprising:
i. about 83 to about 87 weight percent of an alkylbenzene,
ii. about 8 to about 12 weight percent of a solution comprising a major portion of a propylene glycol ether, and
iii. about 4 to about 6 weight percent of glacial acetic acid;
b. contacting the part with the composition while ultrasonically agitating the composition;
c. thereafter rinsing the part in water;
d. thereafter re-contacting the part with the stripping composition; and
e. thereafter contacting the part with an oxidizing acid.

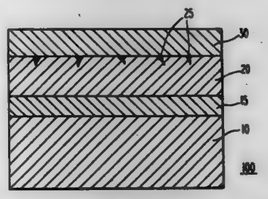
5,190,596
METHOD OF BRAZING METAL SURFACES
Roland S. Timsit, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada
Continuation-in-part of Ser. No. 646,151, Jan. 25, 1991, Pat. No. 5,100,048. This application Jan. 21, 1992, Ser. No. 823,291
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 35 Claims

1. A method of joining an aluminum surface to a metal surface selected from aluminum, copper, brass and steel surfaces with a brazing alloy having a melting point lower than that of the metal(s) of the surfaces to be joined, comprising:
(a) applying as a coating to at least one of the metal surfaces to be joined a mixture of a metal and a brazing flux capable of removing an oxide layer formed on said surfaces and which melts below 600° C., said metal of said mixture being adapted to form a brazable eutectic alloy with at least one of the surface metals;
(b) heating said surfaces and said coating, in juxtaposed relation, to a temperature above the melting point of both the brazing flux and the brazable eutectic alloy to thereby remove oxide film from said surfaces to be joined, cause said metal of said mixture to dissolve into the oxidefree metal surface and form therewith a brazing alloy layer and form a brazed assembly; and
(c) cooling the brazed assembly to form a solidified brazed joint between the surfaces.

5,190,597
PROCESS FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING IMPROVED MAGNETIC AND SURFACE FILM PROPERTIES
Hisashi Kobayashi; Osamu Tanaka, and Hiroyasu Fujii, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Nov. 5, 1991, Ser. No. 788,212
Claims priority, application Japan, Nov. 7, 1990, 2-301919
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—111 5 Claims

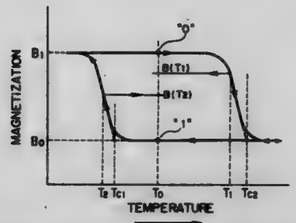
1. A process for producing a grain-oriented electrical steel sheet having improved magnetic and surface film properties, said process comprising the steps of:
heating to a temperature of 1200° C. or less an electrical steel slab consisting, in wt %, of 0.025 to 0.075 carbon, 2.5 to 4.5 silicon, 0.012 or less sulfur, 0.010 to 0.060 acid-soluble aluminum, 0.010 or less nitrogen, 0.08 to 0.45 manganese, and the balance consisting of iron and unavoidable impurities;
hot rolling said slab to form a hot-rolled strip;
cold rolling said hot-rolled strip to form a cold-rolled strip having a thickness of a final product through a single cold rolling stage or two or more stages of cold rolling, between which stages an intermediate annealing is conducted;
decarburization-annealing said cold-rolled strip;
nitriding said decarburization-annealed strip while it is travelling;
applying an annealing separator to said nitrided strip; and
final texture-annealing said strip by heating the strip to a first temperature of from 800° to 850° C. in an atmosphere having a composition of 30 vol % or more (N_2+Ar) with 25 vol % or more N_2 and the remainder H_2, subsequently heating the slab from said first temperature to a second temperature of about 1200° C. in an atmosphere having a composition of 25 to 35 vol % N_2 and 75 to 65 vol % H_2, and subsequently heating the slab from and to above said second temperature in an atmosphere having a composition of 100 vol % H_2.

5,190,598
STEAM TURBINE COMPONENTS HAVING DUPLEX COATINGS FOR IMPROVED EROSION RESISTANCE
Javaid I. Qureshi, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 484,317, Feb. 26, 1990. This application Apr. 13, 1992, Ser. No. 867,996
Int. Cl.[5] B05D *3/10*; C23C *8/70*
U.S. Cl. 148—217 17 Claims



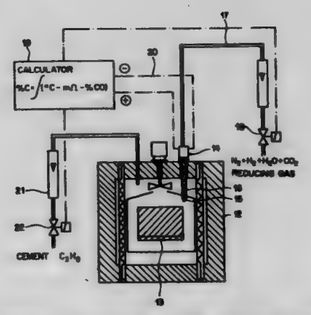
9. A method of coating a turbine component to improve its surface erosion resistance, comprising:
(a) providing a turbine component having a ferrous substrate comprising a first surface thereon;
(b) depositing, by means of a pack diffusion process, a boride layer integral with said first surface;
(c) austentizing said boride layer; and
(d) disposing a sealing layer onto said boride layer, said sealing layer being disposed by a low temperature bonding process.

5,190,599
MAGNETIC MEMORY AND MAGNETIC ALLOY THEREOF
Masashi Sahashi, Yokohama; Yoichi Tokai, Urayasu, and Tomomi Funayama, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Sep. 24, 1990, Ser. No. 586,983
Claims priority, application Japan, Sep. 26, 1989, 1-247940
Int. Cl.[5] C22C *30/04*; H01F *1/047*
U.S. Cl. 148—315 6 Claims



1. A magnetic memory, comprising a magnetic alloy having as a main phase an iso-molar compound phase, said iso-molar compound phase being represented with general expression $Pt(Fe_{1-x}Mnx)Sn$ where a relationship of $0<x<1$ is satisfied, wherein said magnetic memory is capable of recording information by changing a magnetic property of said magnetic alloy, whereby said alloy possesses a degree of magnetization at a temperature T_1 such that said degree of magnetization is reobtained in said alloy when said alloy is both heated to a temperature T_2 so as to lose said magnetization and is then cooled to a temperature below T_1.

5,190,600
METHOD OF MONITORING A HEAT TREATMENT WITH CARBON PENETRATION
Pierre Beuret, Route de Bure 21, 2900 Porrentruy, Switzerland
Division of Ser. No. 527,319, May 23, 1990, Pat. No. 5,064,620. This application Aug. 16, 1991, Ser. No. 745,710
Claims priority, application Switzerland, Jan. 1, 1989, 2059/89
Int. Cl.[5] C21B *7/24*; C21D *11/00*
U.S. Cl. 148—509 7 Claims

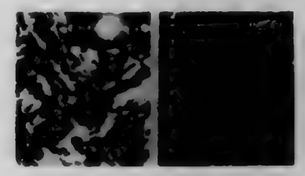


1. A method of monitoring a heat treatment with carbon penetration, carried out on workpieces placed in a furnace, comprising the use of a probe for measuring the electrical resistance of a conductor placed in the presence of the atmosphere of the furnace, and the processing of the resistance values successively obtained by such measurements, wherein the improvement comprises the steps of:
using a tubular conductor,
placing one of the faces of a segment of the conductor in contact with the atmosphere of the furnace, and
connecting the space adjoining the other face of the segment to a supply of reducing gas.

5,190,601
SURFACE STRUCTURE OF CERAMICS SUBSTRATE AND METHOD OF MANUFACTURING THE SAME
Akira Yamakawa, and Akira Sasame, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Division of Ser. No. 623,204, Dec. 6, 1990, Pat. No. 5,134,461. This application Dec. 13, 1991, Ser. No. 808,154
Claims priority, application Japan, Dec. 7, 1989, 1-318250
Int. Cl.[5] C23C *10/60*, *14/14*
U.S. Cl. 148—518 6 Claims

6. A method of manufacturing a surface structure of a ceramic substrate, comprising the steps of
forming a metallized layer of a refractory metal on a surface of an AlN substrate,
forming an Ni layer on said metallized layer,
forming on said Ni layer an Au layer having a thickness not larger than a half of a thickness of said Ni layer,
heating said substrate in a non-oxidizing atmosphere and at a temperature not less than 500° C. to cause alloying reaction between said Ni layer and said Au layer thus forming a NiAu alloy layer, and
forming an Au plating layer having a thickness not larger than 1.0 μm on said NiAu alloy layer.

5,190,602
HETEROPHASE TITANIUM ALUMINIDES HAVING ORTHORHOMBIC AND OMEGA-TYPE MICROSTRUCTURES
Leonid Bendersky, Gaithersburg; William J. Boettinger, Mouravia, and Francis S. Biancaniello, Gaithersburg, all of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.
Filed Dec. 17, 1991, Ser. No. 808,819
Int. Cl.[5] C22C *14/00*
U.S. Cl. 148—669 11 Claims



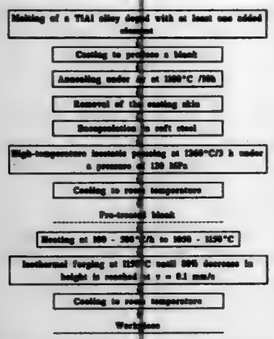
1. An alloy comprised of titanium, aluminum and niobium having a heterophase microstructure, in equilibrium, comprised of an orthorhombic, Ti_2AlNb, phase and an omega-type, $B8_2$, phase.

5,190,603

PROCESS FOR PRODUCING A WORKPIECE FROM AN ALLOY CONTAINING DOPANT AND BASED ON TITANIUM ALUMINIDE

Mohamed Nazmy, Fislisbach, and Markus Staubli, Dottikon, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Jun. 26, 1991, Ser. No. 721,407
Claims priority, application European Pat. Off., Jul. 4, 1990, 90112734.0
Int. Cl.[5] C22C *14/00*
U.S. Cl. 148—671 7 Claims



1. A process for producing a workpiece from an alloy containing dopant and based on titanium aluminide, comprising the following process steps:
melting the alloy into a melt;
casting the metal into a cast body;
cooling the cast body to room temperature and removing casting skin and scale layer on the cast body;
subjecting the descaled cast body to high-temperature isostatic pressing at a temperature between 1,200° and 1,300° C. and a pressure between 100 and 150 MPa;
cooling the isostatically pressed cast body;
heating the cooled cast body to 1,050° to 1,200° C.;
deforming the cast body one or more times for the purpose of molding and structure improvement the high-temperature deformation being carried out by isothermal deformation of the cast body in the temperature range between 1,050° and 1,150° C. at a deformation rate of $\dot{\epsilon}=5\cdot10^{-5}s^{-1}$ to $10^{-2}s^{-1}$ until a deformation of $\epsilon=1.6$ is reached where

$$\epsilon=1n\ h_o/h$$

h_o=original height of the workpiece, and h=height of the workpiece after deformation;
cooling the deformed cast body to room temperature; and
machining the deformed cast body to produce a workpiece by material removal.

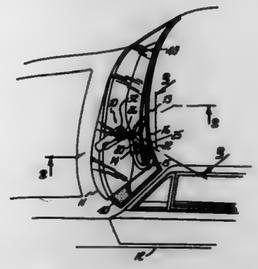
5,190,604

WINDSHIELD INSTALLATION TOOL

Craig A. Shaver, 37888 Riviera Rd., St. Cloud, Minn. 56303

Division of Ser. No. 510,106, Apr. 17, 1990, Pat. No. 5,085,415.
This application Jan. 16, 1992, Ser. No. 819,270
Int. Cl.[5] B60J *1/00*
U.S. Cl. 156—108 6 Claims

1. A method for manually installing a relatively large cover in a vehicle over an opening therein, said method comprising:
mounting an extendable positioning means temporarily in said vehicle, said extendable positioning means having an extension portion therein which can be selectively positioned between being substantially entirely within said vehicle and extending partially through said opening therein;
extending said extension portion partially through said opening in said vehicle;
positioning a portion of said cover in approximately its



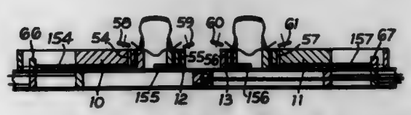
desired location on said vehicle adjacent said opening with a second portion of said cover on said extension means; and
retracting said extension means to being within said vehicle to permit said cover to be positioned on said vehicle across said opening as desired.

5,190,605

APPARATUS AND METHOD FOR MANUFACTURING TWO PNEUMATIC TIRES

Eric Holroyd, Knutsford, and Anthony R. Wright, Southport, both of United Kingdom, assignors to Bridgestone/Firestone Inc., Akron, Ohio

Continuation of Ser. No. 474,125, May 1, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 762,810
Claims priority, application United Kingdom, Nov. 13, 1987, 8726624
Int. Cl.[5] B29D *30/24*
U.S. Cl. 156—128.1 15 Claims



1. A method of manufacturing two pneumatic tires comprising providing a cylindrical former including a coaxial arrangement of two center discs, two end discs, and two drums each disposed between a center disc and a respective end disc, assembling on said former two pairs of bead toe strips in side-by-side relationship; one of the toe strips in each pair being located radially outwards of the respective center disc and the other toe strip in each pair being located radially outwards of the respective drum, two inner liners each liner being associated with a respective pair of toe strips so as to extend between the strips in each pair, a single carcass ply extending around the two inner liners and the two pairs of toe strips, and two pairs of bead assemblies extending around the carcass ply, each assembly being located radially outwards of a respective toe strip, locating radially outward from the carcass ply two tread packages each package being associated with a respective pair of bead assemblies, cutting the single carcass ply between the two toroids, then shaping the carcass ply and two inner liners from a generally cylindrical form to the shape of two toroids by means of movement of the drums and their respective center discs towards one another, the carcass ply contacting and adhering to the two tread packages, turning the four edges of the two parts of the carcass ply so formed around the four bead assemblies, one edge per assembly, and removing the two toroidal green covers so formed from the former.

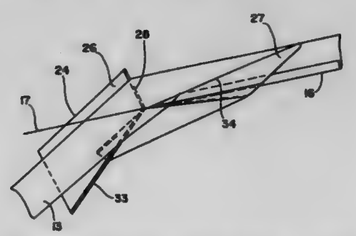
6. A former for the manufacture of two pneumatic tires comprising two spaced-apart end discs, a center shaft passing through the centers of and slideable within the end discs, two center discs slidably mounted on the center shaft and controllably movable toward or away from a center plane mid-way between said two end discs, the center discs being in contact with each other when adjacent the center plane, one disc on each side thereof, two cylindrical drums slidably mounted on the center shaft, one drum being positioned between one of the center discs and one of the end discs so that said one drum, end disc and center disc are on the same one side of the said center plane, and the other drum being positioned between the other center disc and other end disc so that said other drum, end disc and center disc are on the other side of said center plane, and two flexible cylindrical sleeves each mounted at each of their ends and extending between the end discs and center discs on respective sides of the center plane, each sleeve passing around the drums between the end discs and the center discs, a portion of each cylindrical sleeve which is around a respective drum when the latter is in contact with its respective adjacent center disc being flexible but substantially inextensible and the remaining portion of each cylindrical sleeve being flexible and extensible.

5,190,606

METHOD FOR PRODUCING RAISED LEG CUFF FOR DIAPERS INCLUDING TWO FOLDING BOARDS

John R. Merkatoris, Green Bay, and William Van Ryzin, De Pere, both of Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed Jun. 14, 1991, Ser. No. 715,905
Int. Cl.[5] B31D *5/04*
U.S. Cl. 156—164 9 Claims



1. A method of forming a raised leg cuff for a diaper comprising:
advancing first and second webs along a longitudinal path extending from unwind means toward first and second folding boards, respectively,
applying a longitudinally extending strip of adhesive to each of said webs,
applying a tensioned continuous elastic web to each of said webs in contact with said adhesive strip thereof,
introducing the first and second webs equipped with said adhesive strips and elastic bands respectively into said first and second boards to roll a longitudinally extending fold in each web having confronting fold portions for encapsulating said elastic band within said adhesive strip, and to provide a longitudinally extending portion transversely spaced from said fold,
advancing a third web along said path and adhering said portions of said first and second folded webs to said third web in transversely spaced relation to provide a diaper web having a pair of raised leg cuffs without additional folding or unfolding of any of said webs.

5,190,607

MOISTURE-CURING, NCO-REACTIVE POLYURETHANE HOTMELT ADHESIVE COMPOSITION

Joachim Werner, Dormagen; Walter Meckel, Neuss; Horst Stepanski, Leverkusen, and José Collazo-Martinez, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 872,275, Apr. 22, 1992. This application Aug. 10, 1992, Ser. No. 927,444
Claims priority, application Fed. Rep. of Germany, May 1, 1991, 4114220
Int. Cl.[5] C08G *18/70, 77/04;* C08J *4/00*
U.S. Cl. 156—331.1 6 Claims

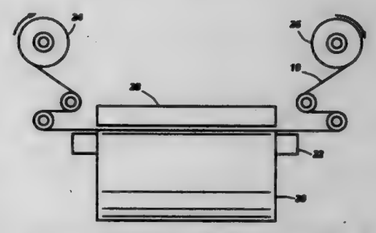
1. A process for bonding substrates in the presence of moisture with a moisture-curing, NCO-reactive polyurethane hotmelt adhesive composition, comprising applying the adhesive composition to a surface of one of the substrates and contacting it with a surface of another substrate to which is optionally applied the adhesive composition which is a reaction product of:
A) a mixture of:
i) polyfunctional polyol component which is liquid or highly viscous (paste-like) at room temperature (25° C.) and which has a molecular weight of 500 to 5,000 and
ii) a polyfunctional polyol component which is crystalline at room temperature (25° C.) and which has a molecular weight of 500 to 10,000 and with
B)
(i) a mixture of a polyisocyanate component containing two differently reactive NCO groups and
(ii) a diisocyanate component having an NCO functionality to hydroxyl groups which is greater than that of the less reactive NCO groups of the polyisocyanate component containing two differently reactive NCO groups,
the overall ratio of NCO:OH groups being greater than 1, and the ratio of the NCO groups of the polyisocyanate component containing two differently reactive NCO groups to the OH groups of the polyol component being between 1.25 and 2.5, and the ratio by weight formed from the quantity of polyol component i) plus the quantity of the polyisocyanate component containing two differently reactive NCO groups and the quantity of the crystalline polyol component ii) plus the quantity of diisocyanate component containing isocyanate groups which are more reactive to OH groups than the less reactive NCO groups of the isocyanate containing two differently reactive NCO groups being between 10 and 0.1.

5,190,608

LAMINATED BELT

John J. Darcy, Webster; Karl V. Thomsen, Ontario, and Eugene A. Swain, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,833
Int. Cl.[5] B29C *65/08*
U.S. Cl. 156—73.4 5 Claims



1. A process comprising providing a rectangular flexible sheet comprising thermoplastic substrate, a charge generating

layer and a charge transport layer, said charge transport layer comprising a thermoplastic material, overlapping the opposite ends of said sheet to form a belt with said charge transport layer facing outwardly away from the center of said belt, the overlapped ends being between about 0.9 millimeter and about 1.4 millimeters from each other, ultrasonically welding said overlapped ends together to form a welded seam having irregular protrusions on the outwardly facing surface of said seam, laminating a thin flexible strip to said welded seam by providing a tape comprising a flexible backing, a thin flexible metal foil, a weakly adhering adhesive layer between said backing and said foil and an activatable adhesive layer on the side of said foil facing away from said backing, the distance from each edge of said flexible strip to a centerline between said overlapped ends being between about 4 mm and about 10 mm, applying said tape to said seam, activating said activatable adhesive layer and removing said backing whereby said foil permanently adheres to said seam and separates from said backing.

5,190,609

STABLE PRESSURE SENSITIVE SHRINK LABEL TECHNIQUE

Kenneth S. C. Lin, San Marino, Calif.; Roderick T. Coward, Mississauga, Canada, and Douglas W. Wilson, Covina, Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Apr. 2, 1991, Ser. No. 679,222
Int. Cl.[5] B32B *31/26*
U.S. Cl. 156—85 **11 Claims**

1. A method relating to shrinkable labels, comprising the steps of:
(a) forming a shrinkable film consisting essentially of polypropylene, said film being heat shrinkable in one direction by at least 20 percent at elevated temperatures;
(b) mounting the polypropylene film on a strip of flexible backing tape with a release coating thereon, utilizing a layer of permanent pressure sensitive film between the film and the backing tape;
(c) applying graphics to said polypropylene film;
(d) forming said adhesive coated film into individual labels mounted on said backing tape;
(e) applying said labels to products;
(f) heating said labels to a temperature in the order of 240 degrees F to 250 degrees F to shrink said labels by about 20 percent or more; and
(g) storing said products with the shrinkable labels applied thereto for prolonged periods at relatively high ambient temperatures, with the shrink back of said labels following such storage being less than three percent.

5,190,510

METHOD FOR PRODUCING A CERAMIC FIBER-METAL LAMINATE

Roger B. Ek, 2711-226th Ave. SE., Issaquah, Wash. 98027

Continuation of Ser. No. 433,130, Nov. 8, 1989, abandoned. This application Oct. 29, 1991, Ser. No. 784,131
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—89 **32 Claims**

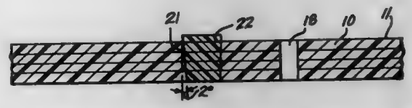
1. A method for producing a laminate comprising a metal substrate, said metal substrate having a first side and a second side, an inorganic fiber matrix, said inorganic fiber matrix having a first side and a second side, and an inorganic binder binding said first side of said metal substrate to said first side of said inorganic fiber matrix, said method comprising:
preconditioning said first side of said metal substrate by contacting said first side with a preconditioning sol containing said inorganic binder dispersed in a liquid dispersant for a period of time of at least five minutes sufficient to activate said first side of said metal substrate;
saturating at least said first side of said inorganic fiber matrix with a binder sol containing said inorganic binder in a quantity and concentration such that said inorganic binder constitutes less than 10 percent of the total weight of said inorganic binder plus said inorganic fiber matrix after drying;
applying said first side of said inorganic fiber matrix to said first side of said metal substrate to form a laminate;
gelling said binder sol; and
drying said laminate to remove said liquid dispersant from said gelled binder sol thereby binding said fiber matrix to said first side of said metal substrate.

5,190,611

BEARING LOAD RESTORATION METHOD FOR COMPOSITE STRUCTURES

Rudy L. Cologna, Bellevue, and Everett A. Westerman, Jr., Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 13, 1991, Ser. No. 654,938
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—98 **16 Claims**



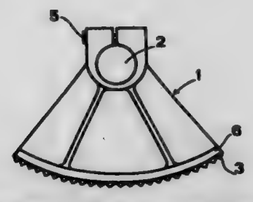
1. A method of restoring bearing load capability to a fiber reinforced/resin matrix composite material panel having an undesired opening therein, said method comprising the steps of:
removing material from said panel in a region surrounding said undesired opening to form a prepared opening having a predetermined size and shape; said prepared opening being sized to encompass said undesired opening and being defined by a sidewall that presents an interior bearing load transmitting surface; said prepared opening having an outer end that opens onto an outer surface of said panel, an opposite inner end that opens onto an inner surface of said panel, a maximum width at said outer end, and a minimum width at said inner end; and said load transmitting surface being substantially perpendicular to said outer surface of aid panel, having an angle of taper in an inward direction relative to said outer surface, and tapering inwardly from said outer end to said inner end;
providing a prefabricated insert of composite material sized and shaped to at least substantially fill said prepared opening; said insert having sufficiently high compression strength, and fitting sufficiently snugly in said prepared opening, and said angle of taper being sufficiently small, to allow bearing loads to be transmitted directly from said insert to said panel and from said panel to said insert; and
positioning said insert in said prepared opening and bonding it to said load transmitting surface.

5,190,612

LABELING MACHINE FOR SELF-ADHESIVE LABELS

Ireneo Orlandi, San Giorgio di Mantova, Italy, assignor to Alfa Costruzioni Meccaniche S.p.A., Mantova, Italy

Filed Jan. 7, 1991, Ser. No. 638,089
Claims priority, application Italy, Mar. 6, 1990, 40038 A/90; Fed. Rep. of Germany, Dec. 28, 1990, 4042100; Spain, Dec. 29, 1990, 9100156
Int. Cl.[5] B65C *9/00*
U.S. Cl. 156—567 **8 Claims**



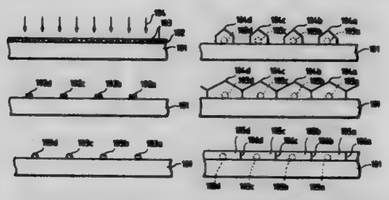
1. A labeling machine for transporting an applying in sequence respective labels having an adhesive coating onto a container moving in a continuous string of containers, comprising:
a platform rotatable about a first axis;
at least one segment rotatable about a respective shaft, said shaft being supported by said platform and having a second axis parallel with said first platform axis, said at least one segment having a working outer surface for engagement during use of said machine, with the adhesive surface of a respective label, said outer working surface including a plurality of projections extending away from said second axis, the outer end surfaces of said projections contacting said adhesive surface during use of said machine, the area of said contacting end surfaces being a minor portion of the outer working surface area of said at least one segment;
at least one gripping means positioned adjacent said platform for collecting, during rotation of said platform about said first axis during use of said machine, a respective label from said at least one segment, and for transporting said collected label to a position for contacting a container in said string, the motions of said platform and said at least one segment about said axes, and motion of said at least one gripping means being synchronized with container motion so as to attach a respective label to each said container in said string.

5,190,613

METHOD FOR FORMING CRYSTALS

Kenji Yamagata, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 415,960, Oct. 2, 1989, abandoned. This application Oct. 18, 1991, Ser. No. 778,756
Claims priority, application Japan, Oct. 2, 1988, 63-247815; Sep. 29, 1989, 1-255524
Int. Cl.[5] C30B *17/00*
U.S. Cl. 156—600 **10 Claims**



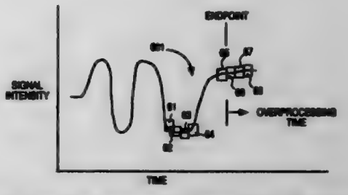
1. A method for forming a crystal comprising the steps of:
(i) providing a substrate patterned to have thereon (a) at least one primary seed of non-single crystalline material doped with an impurity and (b) a non-nucleation surface having a smaller nucleation density than the primary seed, wherein said impurity is at least one selected from the group of P, B, As, and Sn; said at least one primary seed having a sufficiently fine surface for agglomeration into a single crystalline seed;
(ii) heat treating said at least one primary seed doped with said impurity in an atmosphere containing hydrogen gas at a temperature lower than the melting point temperature of said at least one primary seed, thereby causing each said primary seed to agglomerate to form a single crystalline seed; and
(iii) growing a crystal from each said single crystalline seed.

5,190,614

METHOD OF ENDPOINT DETECTION AND STRUCTURE THEREFOR

Steven C. Leach, Santa Clara; Jewett W. Fowler, Mountain View; Herbert E. Litvak, Palo Alto, and Mariste A. Thomson, Santa Clara, all of Calif., assignors to Luxtron Corporation, Santa Clara, Calif.

Filed Sep. 5, 1990, Ser. No. 578,056
Int. Cl.[5] H01L *21/00*; G01B *9/02*
U.S. Cl. 156—626 **5 Claims**
MICROFICHE APPENDIX INCLUDED
(94 Microfiche, 1 Pages)



1. The method for detecting an endpoint for the processing of a material and calculating an over-processing time for said processing comprising:
generating electromagnetic radiation and using said radiation to indicate the state of said processing:
generating from said electromagnetic radiation a waveform representing a measure of said processing;
providing a first window having four sides, said sides being a first side, a second side, a third side and a fourth side, the first side and third side being opposite each other and the second side and the fourth side being opposite each other, said first, second, third and fourth sides being connected so as to form a closed boundary around said first window;
placing said first window over said waveform such that said waveform enters said first window through said first side;
detecting the one of said four sides from which said waveform exits said first window;
placing a plurality of successive windows, each successive window being substantially identical to said first window, over said waveform such that said waveform enters each of said successive windows through the first side of each of said successive windows as said waveform exits a previous window;
detecting the one of the four sides of each successive window from which said waveform exits;
designating the first of said successive windows from which said waveform exits thorough the third side as an endpoint window;
measuring the time beginning immediately following the exit of said waveform from the third side of said endpoint window; and
continuing to place said successive windows over said waveform and detecting the one of said four sides from which

said waveform exits from each of said successive windows while measuring said over-processing time until a predetermined number of consecutive windows have said waveform exiting through said third side.

5,190,615

LOW BRIGHTNESS FUNCTIONAL PIGMENT FROM PROCESS BY-PRODUCT

Albert C. Kunkle; Robert E. Hardy, both of Macon, and Bobby Ray Skipper, Cochran, all of Ga., assignors to J. M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 07/643,885, Jan. 18, 1991. This application Apr. 27, 1992, Ser. No. 875,894

Int. Cl.[5] D21H *17/68*

U.S. Cl. 162—135 **3 Claims**

1. A paper product which includes a low brightness, high yellow index kaolin pigment from a kaolin clay containing iron-stained TiO_2, the pigment produced by the method comprising:

dispersing the kaolin clay in water to form a kaolin dispersion;

separating the kaolin dispersion into an aqueous high brightness fraction and an aqueous lower brightness fraction, the lower brightness fraction having a TiO_2 content substantially between 5–12% by weight dry clay and an Fe_2O_3 content substantially between 0.5–2.5% by weight dry clay;

concentrating the lower brightness fraction to form a kaolin suspension containing kaolin particles and iron-stained TiO_2 particles;

dispersing the concentrated kaolin suspension with a dispersion agent;

diluting the dispersed kaolin suspension;

flocculating the diluted suspension and filtering the flocculated suspension to form a filter cake thereby removing excess salts.

5,190,616

SELF-EMULSIFYING SIZING AGENTS

Shin-ichi Akimoto, 1326-28, Zushimachi, Machida-shi, Tokyo 194-02; Susumu Honda, 7-9, Minamiyukigaya 4-chome, Ohta-ku, Tokyo 145; Toru Yasukohchi, 3-10-404, Fujisaki 2-chome, Kawasaki-ku, Kawasaki-shi, Kanagawa-ken 210; Hideki Takahashi, 2-49, Kominotani 4-chome, Suma-ku, Kobbe-shi, Hyogo-ken 654-01, and Fujio Takahashi, 1-13-207, Higashinaruocho 1-chome, Nishinomiya-shi, Hyogo-ken 663, all of Japan

PCT No. PCT/JP89/01305, § 371 Date Oct. 16, 1990, § 102(e) Date Oct. 16, 1990, PCT Pub. No. WO90/07609, PCT Pub. Date Jul. 12, 1990

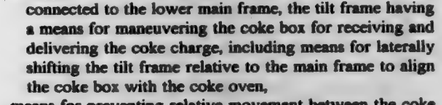
PCT Filed Dec. 26, 1989, Ser. No. 566,462

Claims priority, application Japan, Dec. 27, 1988, 63-327821

Int. Cl.[5] D21H *17/15*

U.S. Cl. 162—158 **5 Claims**

1. A method for sizing paper by using a copolymer of polyoxyalkylene alkenyl ether and maleic anhydride, the polyoxyalkylene alkenyl ether being represented by the general formula (1):



(1)

wherein Z is a residue of compounds having 2–8 hydroxy groups, AO is one or more oxyalkylene groups of 2–18 carbon atoms, with the proviso that the bond of the oxyalkylene groups may be under a random or blocking condition when AO is two oxyalkylene groups or more, R is an alkenyl group of 2–5 carbon atoms, R^1 is a hydrocarbon or an acyl group of 1–24 carbon atoms, $a \geqq 0$, $b \geqq 0$, $c \geqq 0$, $l = 1–2$, $m = 0.7$, $0 \leqq n/l(l+m+n) \leqq \frac{1}{4}$, $al+bm+cn = 1–500$ and $l+m+m+n = 2.8$.

5,190,617

COKE HANDLING APPARATUS INCLUDING COKE BOX AND CARRIER VEHICLE

Edward S. Kress, Brimfield, and Gene C. Carpenter, Galesburg, both of Ill., assignors to Kress Corporation, Brimfield, Ill.

Division of Ser. No. 331,519, Mar. 30, 1989, Pat. No. 4,997,527, which is a continuation-in-part of Ser. No. 185,089, Apr. 22, 1988, Pat. No. 4,886,580, which is a continuation-in-part of Ser. No. 41,876, Apr. 22, 1987, abandoned. This application Mar. 4, 1991, Ser. No. 664,555

Int. Cl.[5] C10B *39/02, 39/12*

U.S. Cl. 202—227 **53 Claims**

1. A coke handling and quenching apparatus comprising, in combination,

a coke box including a plurality of metal panels having an exterior surface defining a door opening and a receiving chamber having an interior shape and a volume substantially equal to that of a charge of coke for receiving and carrying a coke charge from a discharge end of a coke oven in a pollution-free manner,

door means for selectively closing the door opening to enclose the coke within the receiving chamber to substantially isolate the coke from the atmosphere and external cooling media,

means for cooling the exterior surface of the receiving chamber to indirectly cool the charge of coke by passing an external cooling media over the exterior surfaces of the coke box receiving chamber panels,

means for circulating gas present within the receiving chamber to enhance the transfer of heat from the coke to the panels of the receiving chamber,

a carrier vehicle for transporting and maneuvering the coke box, comprising, in combination, a lower main frame,

an upper tilt frame for supporting the coke box pivotally connected to the lower main frame, the tilt frame having a means for maneuvering the coke box for receiving and delivering the coke charge, including means for laterally shifting the tilt frame relative to the main frame to align the coke box with the coke oven,

means for preventing relative movement between the coke box and the discharge end of the coke oven during loading of a coke charge, and

means for inclining the tilt frame for unloading the coke charge from the coke box.

5,190,618

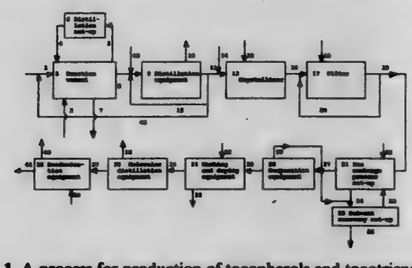
PRODUCTION OF HIGH CONCENTRATION TOCOPHEROLS AND TOCOTRIENOLS FROM PALM-OIL BY-PRODUCTS

Abdul G. Md. Top, Kuala Lumpur; Leong W. Leong, Shah Alam; Augustine S. H. Ong, Kuala Lumpur, all of Malaysia; Tsukasa Kawada, Tokyo, Japan; Hitoshi Watanabe, Tokyo, Japan, and Nozomu Tsuchiya, Tokyo, Japan, assignors to Bioindustry Development Centre (BIDEC), Tokyo, Japan and Palm Oil Research & Development Board, Selangor, Malaysia

Filed Mar. 31, 1989, Ser. No. 332,238

Int. Cl.[5] B01D *1/24, 3/12, 3/34*; C07D *311/72*

U.S. Cl. 203—34 **14 Claims**



1. A process for production of tocopherols and tocotrienols from palm fatty acid distillates, which comprises:

(a) treating the palm fatty acid distillates with an alkyl alcohol and catalysts to convert free fatty acids and glycerides into alkyl esters by esterification and transesterification, respectively;

(b) distilling the product of step (a) under reduced pressure to remove alkyl esters and leave the tocopherols and tocotrienols in the residue;

(c) cooling the residue of step (b) to crystallize substances with melting temperatures higher than tocopherols and tocotrienols and filtering off the crystalline material to leave the tocopherols and tocotrienols in the filtrate;

(d) treating the filtrate from step (c) by an ion-exchange procedure with an anionic exchange resin to produce a concentrated tocopherol and tocotrienol fraction in a solvent;

(e) removing the solvent from the tocopherol and tocotrienol fraction from step (d) by evaporation;

(f) washing and drying the product of step (e);

(g) subjecting the washed and dried product of step (f) to molecular distillation to produce a further concentrated tocopherol and tocotrienol product which as a content of at least 95 percent tocopherols and tocotrienols, and a cumulative yield of at least 70 percent; and

(h) deodorizing the tocopherol and tocotrienol product of step (g).

12. A process for production of tocopherols and tocotrienols from palm fatty acid distillates, which comprises:

(a) distilling the palm fatty acid distillates to remove free fatty acids therein, using a high heat-transfer rate falling film distillation column at temperature between 150° and 250° C., and a vacuum below 10 torr (1333 N/m^2);

(b) treating the distillate of step (a) with an alkyl alcohol and a catalyst selected from the group consisting of p-toluenesulfonic acid, hydrochloric acid and sulphuric acid to convert free fatty acids into alkyl esters by esterification at a temperature between 65° and 110° C., and a reaction time of less than 3 hours;

(c) treating the reaction mixture of step (b) with a catalyst selected from the group consisting of potassium hydroxide, sodium hydroxide and sodium methoxide to convert glycerides into alkyl esters by transesterification, at a temperature between 30° and 70° C., and a reaction time of 10 minutes or more;

(d) treating the reaction mixture of step (c) with a chelating agent selected from the group consisting of ascorbic acid, phosphoric acid, maleic acid, citric acid and tartaric acid;

(e) distilling the product of step (d) with a high heat-transfer rate falling film vacuum distillation column, operating at less than 10 torr (1333 N/m^2) and at a temperature between 100° and 200° C. to remove a major part of the alkyl esters and leave the tocopherols and tocotrienols in the residue;

(f) cooling the residue of step (e) to crystallize substances with melting temperatures higher than tocopherols and tocotrienols and filtering off the crystalline material to leave the tooopherols and tocotrienols in the filtrate;

(g) treating the filtrate from step (f) by an ion-exchange procedure with an anionic exchange resin, using an eluting solvent selected from the group consisting of methanol, ethanol and hexane and using an acidic solution for desorbing tocopherols and tocotrienols from the resin;

(h) removing the solvent from the tocopherol and tocotrienol fraction from step (g) by evaporation using a falling film evaporator and a rotary short path evaporator in series, operating at temperatures of 50° and 130° C. respectively, and under reduced pressure;

(i) washing and drying the product of step (h);

(j) subjecting the product from step (i) to molecular distillation carried out at a temperature between 140° and 220° C., and under a vacuum below 0.05 torr (6.7 N/m^2), to produce a further concentrated tocopherol and tocotrienol product which has a content of at least 95 tocopherols and tocotrienols, ad a cumulative yield of at least 70 percent; and

(k) deodorizing the tocopherol and tocotrienol product of step (j).

5,190,619

SEPARATION OF 3-METHYL-2-BUTANONE FROM FORMIC ACID BY EXTRACTIVE DISTILLATION WITH DMSO

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715, and George Beatu, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Mar. 30, 1992, Ser. No. 860,418

Int. Cl.[5] B01D *3/40*; C07C *45/83, 53/02*

U.S. Cl. 203—51 **1 Claim**

1. A method for recovering 3-methyl-2-butanone from a mixture of 3-methyl-2-butanone and formic acid which comprises distilling a mixture of 3-methyl-2-butanone and formic acid in a rectification column in the presence of about one part of an extractive agent per part of 3-methyl-2-butanone—formic acid mixture, recovering 3-methyl-2-butanone as overhead product and obtaining the formic acid and the extractive agent from the stillpot, wherein said extractive agent consists of dimethyl sulfoxide and at least one material selected from the group consisting of hexahydrophthalic acid, myristic acid, p-nitrophenyl acetic acid, phenyl acetic acid, 2-methoxyethyl ether, diisobutyl ketone, ethyl phenyl acetate and diethyl malate.

5,190,620

METHOD OF USING A ROTATABLE DISC TO REMOVE HEAT SOFTENABLE SURFACE COVERINGS

Philip M. Winter, Birchwood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 558,302, Jul. 26, 1990, abandoned. This application Jun. 26, 1991, Ser. No. 721,139

Int. Cl.[5] B32B *35/00*

U.S. Cl. 156—344 **26 Claims**

1. A method of removing adhered heat softenable surface coverings from a surface of a heat stable substrate substantially without damage to said substrate, and method comprising the steps of:

(a) providing a rotatable body having a peripheral surface and being rotatable about its axis, said body comprising a disc of foamed elastomer, said elastomer being selected so that said body is capable of (1) increasing a temperature of

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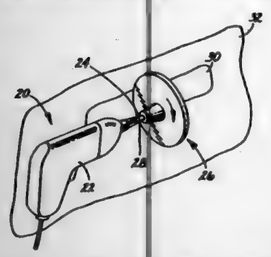
said heat softenable surface covering when said body is rotated in frictional contact therein to a temperature which diminishes the integrity of said surface covering (2) forcibly removing said surface covering from said substrate after said increase in temperature, and (3) attriting a portion of said peripheral surface which contacted said surface covering to provide a renewed peripheral surface of said foamed elastomer;

(b) attaching said rotatable body to means for rotating said body and rotating said rotatable body to provide a rotating body which rotates about its axis at a surface speed which will cause said surface covering to increase in temperature when contacted by peripheral surface of said rotating body to a temperature which results in diminished integrity of said surface covering;

(c) contacting a portion of said peripheral surface of said rotating body with said heat softenable surface covering to be removed, causing said surface covering to increase in temperature and thereafter forcibly removing said surface covering by said portion of said peripheral surface from said heat stable substrate; and

(d) continue rotating said rotating body to cause attrition of said peripheral surface of said rotating body.

13. A method of removing adhered heat softenable surface coverings from a surface of a heat stable substrate substantially without damage to said substrate, said method comprising the steps of:



(a) providing a rotatable body having a peripheral surface and being rotatable about its axis, said body comprising at least two discs comprising an elastomer, said elastomer being selected so that the body is capable of (1) increasing a temperature of said heat softenable surface covering when said body is rotated in frictional contact therewith to a temperature which diminishes the integrity of said surface covering, (2) forcibly removing said surface covering from said substrate after said increase in temperature, and (3) attriting a portion of said peripheral surface which contacted said surface covering to provide a renewed peripheral surface of said elastomer;

(b) attaching said rotatable body to means for rotating said rotatable body;

(c) rotating said rotatable body to provide a rotating body which rotates about its axis at a surface speed which will cause said surface covering to increase in temperature when contacted by a peripheral surface of said rotating body to a temperature which results in diminished integrity of said surface covering;

(d) contacting a portion of said peripheral surface of said rotating body with said heat softenable surface covering to be removed, causing said surface to increase in temperature and thereafter forcibly removing said portion of said surface covering by said rotating body peripheral surface from said heat stable substrate; and

(e) continue rotating said rotating body to cause attrition of said rotating body peripheral surface.

5,190,621

Patent Not Issued For This Number

5,190,622

RECOVERY OF GLYCERINE FROM SORBITOL BY AZEOTROPIC DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 14, 1991, Ser. No. 792,155

Int. Cl.[5] B01D *3/36*; C07C *29/82*

U.S. Cl. 203—60 **1 Claim**

1. A method for recovering glycerine from a mixture of glycerine and sorbitol which comprises distilling a mixture of glycerine and sorbitol in a distilling column in the presence of an azeotrope forming agent, recovering the glycerine and the azeotrope forming agent as overhead product, separating the glycerine from the azeotrope forming agent and obtaining the sorbitol from the stillpot, wherein said azeotrope forming agent comprises one material selected from group consisting of 1-methyl naphthalene, biphenyl, isobornyl acetate, benzyl benzoate, dimethyl phthalate and ethyl salicylate.

5,190,623

NUCLEAR FUEL REPROCESSING PLANT

Yuko Sasaki, Mito; Takashi Honda, Katsuta; Saburo Shoji; Shiro Kobayashi, both of Hitachi, and Yasumasa Furutani, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

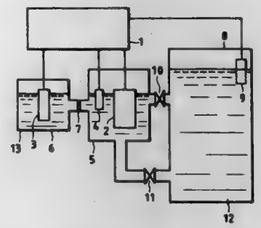
PCT No. PCT/JP88/00694, § 371 Date Mar. 29, 1989, § 102(e) Date Mar. 29, 1989, PCT Pub. No. WO89/01224, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 13, 1988, Ser. No. 335,661

Claims priority, application Japan, Jul. 29, 1987, 62-187560

Int. Cl.[5] C25C *1/24*

U.S. Cl. 204—1.5 **5 Claims**



1. In a method for operating a nuclear fuel reprocessing plant comprising processing a used nuclear fuel by vacuum boiling of a nitric acid solution, the improvement comprising a corrosion-proofing method including reducing the valence of oxidizing metal ions selected form the group consisting of Ru (VIII), Ce (IV), Cr(VI) and Fe (III), dissolved in said vacuum boiling nitric acid solution, by electrolytic reduction while said metal ions are kept in the ionic state and generating NOx gas.

5,190,624

ELECTRORHEOLOGICAL FLUID CHEMICAL PROCESSING

Ronald P. Reitz, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 219,522, Jul. 15, 1988, and a continuation-in-part of Ser. No. 219,523, Jul. 15, 1988, abandoned, and a continuation-in-part of Ser. No. 405,178, Sep. 11, 1989, and a continuation-in-part of Ser. No. 584,836, Nov. 5, 1990, abandoned. This application Nov. 23, 1990, Ser. No. 617,317

Int. Cl.[5] C25B *3/00*

U.S. Cl. 204—59 R **6 Claims**

1. A process for electrically controlling chemical reactions within an electrorheological fluid comprising:

providing an electrorheological fluid composition having chemical reactants dispersed therein, said reactants being responsive to an electric field such that said reactants will chemically react upon exposure of said composition to an electric field and chemically alter said composition;

applying an electric field to said composition from an electrical source such that said composition is chemically altered.

5,190,625

ELECTROLYTIC PRODUCTION OF RARE EARTH METALS/ALLOYS THEREOF

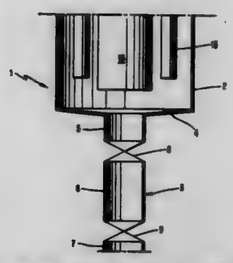
Francoise Seon, Montreuil, and Ghislaine Barthole, Saint-Mande, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 631,479, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 497,828, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 806,289, Dec. 9, 1985, abandoned. This application May 4, 1992, Ser. No. 879,114

Claims priority, application France, Dec. 7, 1984, 84 18700

Int. Cl.[5] C25C *3/00, 3/34*

U.S. Cl. 204—64 R **13 Claims**



1. A process for the preparation of neodymium, or alloy thereof with another rare earth metal, or with a transition metal, comprising electrolyzing with solid electrodes a melt which comprises (i) neodymium chloride, (ii) lithium chloride, and (iii) lithium fluorides.

5,190,626

PROCESS FOR REMOVING VINYLIDENE CHLORIDE AND OTHER UNSATURATED COMPOUNDS FROM 1,1-DICHLORO-1-FLUOROETHANE

Stephen F. Yates, Arlington Hts., Ill.; Addison M. Smith, Amherst, N.Y., and Arthur F. Murphy, Mt. Arlington, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 13, 1990, Ser. No. 627,070

Int. Cl.[5] C07C *17/00*

U.S. Cl. 204—157.95 **6 Claims**

1. A process for selectively removing vinylidene chloride and other unsaturated compounds from 1,1-dichloro-1-fluoroethane with minimal loss of said 1,1-dichloro-1-fluoroethane comprising

(a) contacting a gaseous mixture consisting substantially of 1,1-dichloro-1-fluoroethane and up to about 2000 wt. ppm vinylidene chloride with about 1–6 mols of chlorine for each mol of vinylidene chloride in the presence of ultraviolet light having wavelength between about 300 and 400 nm providing an exposure grater than zero and up to about 50 watts-hour/kg of said mixture, thereby reducing the concentration of vinylidene chloride to less than 200 wt. ppm by converting said vinylidene chloride to 1,1,1,2-tetrachloroethane; and

(b) separating the 1,1,1,2-tetrachloroethane formed in (a) from 1,1-dichloro-1-fluoroethane.

5,190,627

PROCESS FOR REMOVING DISSOLVED OXYGEN FROM WATER AND SYSTEM THEREFOR

Takayuki Saito, Hiratsuka; Hidenobu Arimitsu, Atsugi; Ken Nakajima, Kamakura; Yoko Iwase, and Hiroyuki Shima, both of Fujisawa, all of Japan, assignors to Ebara Corporation, Tokyo and Ebara Research Co., Ltd., Fujisawa, both of, Japan

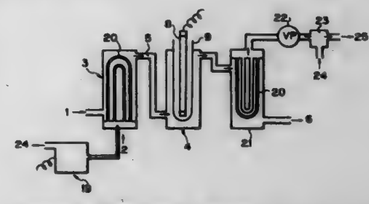
Continuation of Ser. No. 605,278, Oct. 30, 1990, abandoned.

This application Apr. 24, 1992, Ser. No. 873,680

Claims priority, application Japan, Nov. 7, 1989, 1-287860; Mar. 15, 1990, 2-62496; Mar. 15, 1990, 2-62497; Oct. 12, 1990, 2-274766

Int. Cl.[5] C01B *13/16*; C02F *1/46*

U.S. Cl. 204—158.2 **5 Claims**



1. A process for removing dissolved oxygen from water, comprising irradiating with a total dose of ultraviolet radiation of more than about 10 mW.sec/cm^2, a solution consisting essentially of water, dissolved oxygen, and added hydrogen in an amount of about 1–5 mole of hydrogen per mole of dissolved oxygen.

5,190,628

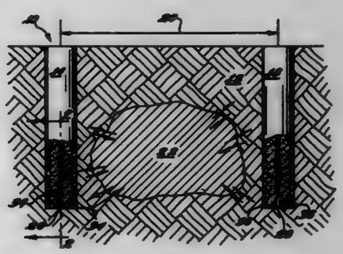
METHOD AND APPARATUS FOR REMOVING IONS FROM SOIL

Jane P. Bibler, 813 E. Rollingwood Rd., Aiken, S.C. 29801

Filed Feb. 25, 1992, Ser. No. 841,108

Int. Cl.[5] B01D *61/44*

U.S. Cl. 204—182.4 **12 Claims**



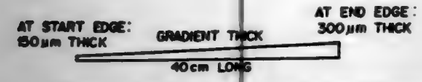
1. A method for removing at least one species of ions from an area of soil having groundwater, said method comprising the steps of:

placing at least two electrodes in spaced relation with respect to each other and to said area of soil;

placing a permeable barrier adjacent each of said at least two electrodes and said area of soil, said barrier adapted to pass said groundwater, said barrier carrying an ion exchange resin, said resin being selective for said at least one species of ions; and

applying a potential across said electrodes, said potential causing said at least one species of ions to migrate with respect to said electrodes, thereby allowing said ion exchange resin carried in said permeable barrier to capture said species.

5,190,629
ELECTROPHORESIS MEDIUM MEMBRANE
Mitsuru Sugihara, and Masashi Ogawa, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 219,938, Jul. 15, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 604,358
Claims priority, application Japan, Jul. 16, 1987, 62-177978
Int. Cl.[5] C25B *7/00*
U.S. Cl. 204—182.8 12 Claims

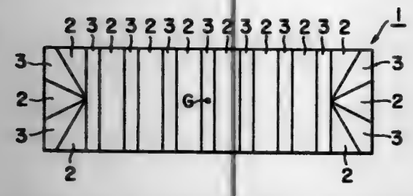


1. An electrophoresis medium membrane for use in separating fragments of nucleic acid comprising a planar support, a planar cover sheet, and a layer of an electrophoresis gel medium provided between said support and said cover sheet, said electrophoresis gel medium containing an aqueous polyacrylamide gel, which is prepared by crosslinking polymerization of an acrylamide compound and a crosslinking agent in water and a compound having at least one carbamoyl group as a denaturing agent,

wherein said layer of said electrophoresis gel medium has both a predetermined gradual change in layer thickness within the range from 50 μm to 5 mm and a predetermined gradual change in concentrations of said acrylamide compound and said cross-linking agent in the range from 3 to 30 weight percent.

12. In a method for the separation of DNA fragments from a mixture thereof wherein portions of the mixture are introduced to a gel medium membrane in an electrophoresis apparatus and subjected to an electric potential, the improvement which comprises the membrane being the membrane of claim 1.

5,190,630
SPUTTERING TARGET
Makoto Kikuchi; Yoshiharu Fukasawa, and Hideo Ishihara, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 486,205, Feb. 28, 1990, abandoned.
This application Apr. 7, 1992, Ser. No. 866,116
Claims priority, application Japan, Mar. 1, 1989, 1-49065
Int. Cl.[5] C23C *14/34, 14/35*
U.S. Cl. 204—192.12 16 Claims



15. A method of forming a metal thin film on a substrate by use of a sputtering target, comprising the steps of:

providing a sputtering target comprising target pieces of different materials compositely arrayed therein, said sputtering target having at least one irregular erosion region which is defined as a region enclosed within a circle having an erosion width as its diameter, at a part farthest from the center of gravity of said sputtering target within a region to be eroded in a curvilinear shape, said target pieces each having a wedge shape or a quadrangular shape and 4 to 21 of said target pieces being arrayed within each said irregular erosion region; and

subjecting said sputtering target to sputtering, thereby to form a deposited film on said substrate, said deposited film having a maximum resistance error rate of at least 10% as expressed by the following formula in a deposited film obtained by subjecting said sputtering target to sputtering:

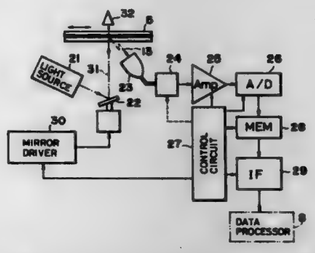
$$\text{Maximum resistance error rate (\%)} = \frac{(\bar{x} - X)}{\bar{x}} \times 100$$

wherein, $\bar{x}$ signifies an average value of resistances of respective points of said deposited film formed into a shape and an area corresponding to those of said sputtering target, said points dividing into 20 equal parts on the center line of said deposited film which extends in the longitudinal direction thereof, and X signifies a resistance value which has the greatest difference from the average value $\bar{x}$.

5,190,631
PROCESS FOR FORMING TRANSPARENT SILICON CARBIDE FILMS
Henry Windischmann, Solon, and George Fischer, Shaker Heights, both of Ohio, assignors to The Carborundum Company, Niagara Falls, N.Y.
Continuation of Ser. No. 638,939, Jan. 9, 1991, abandoned. This application Jun. 12, 1992, Ser. No. 898,171
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.15 9 Claims

1. A process for forming a silicon carbide coating comprising DC-magnetron sputtering an electrically conductive substantially silicon carbide target in a reduced pressure consisting essentially atmosphere having greater than 5 percents partial pressure of hydrogen and an inert gas to form a substantially transparent film on a substrate.

5,190,632
MULTI-COLORED ELECTROPHORESIS PATTERN READING SYSTEM
Hitoshi Fujimiya, and Hisanori Nasu, both of Yokohama, Japan, assignors to Hitachi Software Engineering Co., Ltd., Yokohama, Japan
Filed Mar. 20, 1992, Ser. No. 854,872
Claims priority, application Japan, Mar. 22, 1991, 3-059175
Int. Cl.[5] G01N *21/84, 27/26, 27/447;* B01D *57/02*
U.S. Cl. 204—299 R 7 Claims



1. A multi-colored electrophoresis pattern reading system capable of labelling each of plural samples separately with each of plural fluorescent substances having a different fluorescence wavelength, subjecting the plural samples to electrophoresis to develop a pattern of electrophoresis, exciting the fluorescent substances labelled on the respective plural samples to emit fluorescence, and reading a fluorescent pattern emitting the fluorescence, comprising:

a light source means for irradiating the pattern of electrophoresis with irradiating light for exciting the fluorescent substance labelled on the sample to produce fluorescence;

a light scanning means for scanning the irradiating light while irradiating a gel in the direction of thickness of the gel with the irradiating light from the light source means;

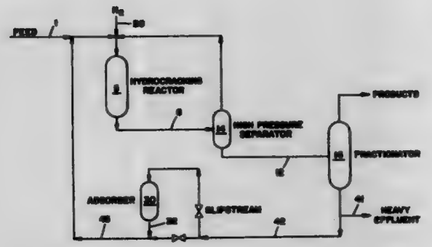
a light receiving means for receiving the fluorescence separated from scattered light resulting form a reading surface on the basis of a position relationship of a light receiving path by setting a light receiving surface so as to be located in a direction different from an optical axis of the irradiating light;

a fluorescent-wavelength separating means for separating fluorescence having a predetermined wavelength from an optical signal received by the light receiving means, and having a separator and means capable of controlling an angle of incidence relative to an optical axis of the separator;

an optoelectric conversion means for generating electric signals by subjecting the optic signals passed through the fluorescent-wavelength separating means to optoelectrical conversion; and

a signal processing means for subjecting the electric signals generated by the optoelectric conversion means to signal processing and converting the electric signals into a predetermined form of data representation.

5,190,633
HYDROCRACKING PROCESS WITH POLYNUCLEAR AROMATIC DIMER FOULANT ADSORPTION
John C. Fetzer, Hercules, and David G. Lammel, San Rafael, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.
Filed Mar. 19, 1992, Ser. No. 853,680
Int. Cl.[5] C10G *67/06*
U.S. Cl. 208—99 11 Claims



1. A process for removing stable polycyclic aromatic dimers present in hydrocracker effluents comprising the steps of:

(a) recovering a heavy effluent stream from a hydrocracker which heavy effluent stream comprises stable polycyclic aromatic dimer compounds and smaller-ringed aromatic compounds;

(b) contacting at least a portion of the heavy effluent stream with an adsorbent contained in an absorbent zone whereby a major portion of stable polycyclic aromatic dimer compounds contained in the heavy effluent stream are retained and a majority of the smaller-ringed aromatics elute from the adsorption zone to produce an adsorber effluent stream having a reduced concentration of stable polycyclic aromatic dimer compounds;

(c) monitoring the adsorber effluent stream using Synchronous Scanning Fluoresence and regenerating the adsorbent when the concentration of polycyclic aromatic dimer compounds in the adsorber effluent stream reach a predetermined concentration; and

(d) recycling at least a portion of adsorber effluent stream to the hydrocracking reactor.

5,190,634
INHIBITION OF COKE FORMATION DURING VAPORIZATION OF HEAVY HYDROCARBONS
Jorge M. Fernandez-Baujin, North Bergen; Kandasamy M. Sundaram, West Paterson, and Jo-Lang Chien, Cedar Grove, all of N.J., assignors to Lummus Crest Inc., Bloomfield, N.J.
Filed Dec. 2, 1988, Ser. No. 278,999
Int. Cl.[5] C10G *47/22;* C07C *4/04*
U.S. Cl. 208—107 3 Claims

1. In a process for cracking a crude petroleum feedstock including preheating and vaporizing said feedstock and then cracking said feedstock at a temperature in excess of 560° C. inside the tubes of the radiant section of a pyrolysis heater to produce olefins wherein said feedstock is partially heated to a temperature of 100° C. to 500° C. and then further heated and mixed with steam to produce a mixture of feedstock and a steam at a temperature of 450° C. to 700° C. and wherein said mixture is fed to said cracking step wherein the improvement comprises the further step of mixing from 0.01 to 0.15 wt % hydrogen based on the weight of feedstock with said mixture of feedstock and steam prior to raising the temperature above about 500° C. whereby the formation of coke is reduced when said temperature is raised above about 500° C.

5,190,635
SUPERPARAMAGNETIC FORMATION OF FCC CATALYST PROVIDES MEANS OF SEPARATION OF OLD EQUILIBRIUM FLUID CRACKING CATALYST
William P. Hettinger, Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.
Continuation of Ser. No. 601,965, Oct. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 332,079, Apr. 3, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 777,473
Int. Cl.[5] C10G *11/18*
U.S. Cl. 208—113 16 Claims

1. In a hydrocarbon conversion process for contacting hydrocarbons containing varying amounts of iron, nickel and/or vanadium with particles in a reaction zone wherein coke and metals are deposited on said particles, and wherein at least a portion of said coke is removed in a regeneration zone, the improvement comprising:

(a) operating said reaction zone at a temperature of from about 900° to about 1100° F. with a particulate contact time of from about 0.1 to 5 seconds, and operating said regeneration zone at a temperature of from about 1100° to 1450° F.;

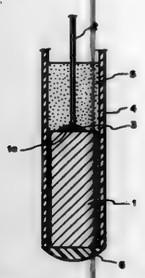
(b) accumulating on said particles at least 4500 ppm iron compounds from said feedstock or iron compounds intentionally added to the circulating reaction-regenerator system;

(c) adjusting operating conditions so as to render at least a portion of said iron compound on said particles a superparamagnetic or ferromagnetic specie of iron compound having a Curie Point of at least about 500° F. (260° C.);

(d) magnetically separating more highly magnetic particles from less magnetic particles; and

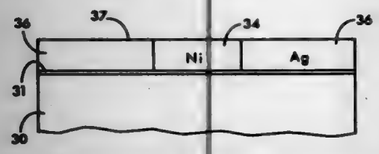
(e) recycling at least a portion of said less magnetic particles.

5,190,636
ION-SENSITIVE FILM, METHOD OF PRODUCING THE SAME AND ION SENSOR
Norihiko Ushizawa; Shuichiro Yamaguchi; Naoto Uchida, and Takeshi Shimomura, all of Nakai, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP89/00434, § 371 Date Oct. 24, 1990, § 102(e) Date Oct. 24, 1990, PCT Pub. No. WO89/10554, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 25, 1989, Ser. No. 602,230
Claims priority, application Japan, Apr. 25, 1988, 63-100161
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—416 11 Claims



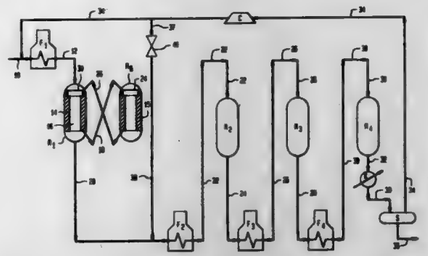
4. An ion sensitive film consisting essentially of an admixture of a redox substance having a redox function and a polymeric compound containing an ion carrier substance.

5,190,637
FORMATION OF MICROSTRUCTURES BY MULTIPLE LEVEL DEEP X-RAY LITHOGRAPHY WITH SACRIFICIAL METAL LAYERS
Henry Guckel, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed Apr. 24, 1992, Ser. No. 874,116
Int. Cl.[5] C25D *5/02*
U.S. Cl. 205—118 21 Claims



1. A method of forming micromechanical structures comprising the steps of:
(a) providing a plating base on a surface of a substrate;
(b) applying a photoresist in a layer onto the plating base;
(c) exposing the photoresist in a pattern to radiation to render the photoresist dissolvable in a pattern;
(d) removing the dissolvable photoresist;
(e) electroplating a first layer of a primary metal onto the plating base in the area from which the photoresist has been removed;
(f) removing the remainder of the photoresist;
(g) electroplating a first layer of a secondary metal onto the plating base to cover and surround the first layer of the primary metal, the secondary metal chosen so that it can be differentially etched without substantially etching the primary metal;
(h) machining the exposed surface of the secondary metal down to a flat surface to a selected height which exposes the first layer of the primary metal.

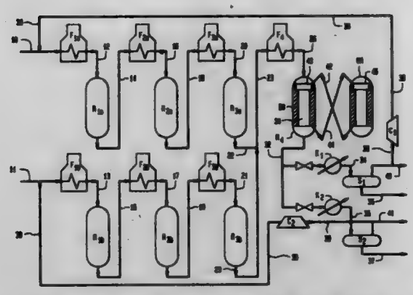
5,190,638
MOVING BED/FIXED BED TWO STAGE CATALYTIC REFORMING
George A. Swan, III, and Eduardo Mon, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Dec. 9, 1991, Ser. No. 805,348
Int. Cl.[5] C10G *59/02*
U.S. Cl. 208—65 7 Claims



1. A process for catalytically reforming a gasoline boiling range hydrocarbon reactant stream in the presence of hydrogen in a reforming process unit comprised of a plurality of serially connected reforming zones wherein each of the reforming zones contains a reforming catalyst comprised of one or more Group VIII noble metals on a refractory support, which process comprises:
(a) reforming the reactant stream in a first reforming stage which is comprised of one or more reforming zones which are operated in a moving-bed continuous catalyst regeneration mode wherein the catalyst is comprised of one or more Group VIII noble metals on substantially spherical support particles, which catalyst descends through the reforming zone, exits, and is passed to a regeneration zone where at least a portion of the accumulated carbon is burned-off, and wherein the regenerated catalyst is recycled back to the one or more reforming zones;
(b) passing the partially reformed reactant stream into a second reforming stage comprised of one or more serially connected reforming zones containing a fixed-bed of catalyst comprised of one or more Group VIII noble metals, which one or more reforming zones is operated at reforming conditions which includes a pressure of about 100 to 500 psig, thereby producing an effluent stream of at least 96 RON clear.

5,190,639
MULTIPLE FIXED-BED REFORMING UNITS SHARING COMMON MOVING BED REACTOR
Gerrit S. Swart, Westfield; Paul W. Kamienski, Basking Ridge, both of N.J., and Stuart S. Goldstein, Ewell, Surrey, England, assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Dec. 9, 1991, Ser. No. 805,332
Int. Cl.[5] C10G *59/02*
U.S. Cl. 208—65 7 Claims

1. A process for catalytically reforming a gasoline boiling range hydrocarbon reactant stream in the presence of hydrogen in a reforming process unit comprised of a plurality of serially connected reforming zones wherein each of the reforming zones contains at least one reforming catalyst containing a Group VIII noble metal on a refractory support, which process comprises:
(a) reforming two reactant streams in a first reforming stage which is comprised of two separate fixed-bed reforming process units each unit comprised of one or more serially connected reforming zones containing a fixed-bed of a catalyst comprised of at least one Group VIII noble metal on a refractory support, which one or more reforming zones are operated at reforming conditions which includes a pressure of about 100 to 500 psig;
(b) passing the resulting effluent streams from both of the two fixed-bed reforming units to a second reforming stage comprised of one or more serially connected reforming zones which are operated in a moving-bed continual catalyst regeneration mode which is operated at pressures from about 30 to 100 psig, wherein the catalyst descends through the reforming zone, exits, and is passed to a regeneration zone where at least a portion of any accumulated carbon is burned-off, and wherein the regenerated catalyst is recycled to the one or more second stage reforming zones;



(c) passing a first portion of the effluent stream from said second stage reforming to a first separation zone wherein a hydrogen-rich gaseous stream and a predominantly C_5+ liquid stream are produced, wherein a portion of the hydrogen-rich gaseous stream is recycled to one of the fixed-bed reforming process units, and the remaining portion is collected as product gas, and
(d) passing a second portion of said effluent stream from said second stage reforming to a second separation zones wherein a hydrogen-rich gaseous stream and a predominantly C_5+ liquid stream are produced, and wherein a portion of the hydrogen-rich gaseous stream is recycled to the other fixed-bed reforming process unit, and the remaining portion is collected as product gas.

5,190,640
TREATMENT OF OILS USING AMINOCARBINOLS
Glenn L. Roof, Sugar Land; Lawrence N. Kremer, and Robert V. Market, Friendswood, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Filed Sep. 18, 1991, Ser. No. 761,467
Int. Cl.[5] C10G *29/20*
U.S. Cl. 208—236 19 Claims

1. A method of sweetening sour hydrocarbons, which comprises treating said hydrocarbons with an effective sweetening amount of a compound of an aminocarbinol of the formula

$$R_2N—CH(—R^1)OH$$

wherein R^1 is hydrogen or a hydrocarbyl or inertly substituted hydrocarbyl and each R is independently hydrocarbyl or inertly substituted hydrocarbyl or both R groups are collectively a divalent hydrocarbon or ether radical combined with the nitrogen of the aminocarbinol to form a heterocyclic ring represented by the formula

$$(—R—R—)>N—CH(—R^1)OH.$$

5,190,641
HYDROCONVERSION CATALYST
Charles R. Wilson, San Francisco, and Kirk R. Gibson, El Cerrito, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.
Division of Ser. No. 543,257, Jun. 25, 1990, Pat. No. 5,089,462.
This application Nov. 13, 1991, Ser. No. 791,217
Int. Cl.[5] C10G *45/04, 45/06, 45/08*
U.S. Cl. 208—254 R 13 Claims

1. A method of hydrodenitrogenation of a hydrocarbon feed containing nitrogen compounds, which method comprises contacting said feed in a reaction zone under hydrodenitrogenation conditions comprising a temperature within the range of about 500° F. to about 850° F., a total pressure within the range of about 450 to about 3500 pounds per square inch gauge, its space velocity ranging from 0.05 to about 5.0 ($hr.^{-1}$), and a hydrogen partial pressure ranging from about 350 to about 3200 pounds per square inch gauge in the presence of hydrogen and with a catalyst prepared by the method comprising:
a. precipitating a hydrolyzable Group IVB compound to form a hydrated Group IVB oxide gel;
b. washing the hydrated Group IVB oxide gel with water;
c. adding aqueous acidic compounds and a soluble Group VIII metal compound to the hydrated Group IVB oxide gel, forming a slurry;
d. mixing and peptizing a hydrated supporting oxide with the slurry;
e. adding a partially or totally soluble Group VIB metal compound; and
f. shaping, drying and calcining catalyst particles; and collecting an effluent with reduced nitrogen levels.

5,190,642
HYDROCONVERSION CATALYST
Charles R. Wilson, San Francisco; Kirk R. Gibson, El Cerrito, and Cal-Wen Hung, San Rafael, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.
Division of Ser. No. 543,005, Jun. 25, 1990, Pat. No. 5,089,453.
This application Nov. 13, 1991, Ser. No. 791,216
Int. Cl.[5] C10G *45/04, 45/06, 45/08*
U.S. Cl. 208—254 R 15 Claims

1. A method for the hydrodenitrogenation of a hydrocarbon feed containing a substantial amount of nitrogen compounds, which method comprises contacting said feed in a reaction zone under hydrodenitrogenation conditions comprising a temperature within the range of about 500° F. to about 850° F., a total pressure within the range of about 450 to about 3500 pounds per square inch gauge, a liquid hourly space velocity ranging from about 0.05 to about 5.0 (hr^{-1}), and a hydrogen partial pressure ranging from about 350 to about 3200 pounds per square inch gauge, in the presence of hydrogen and with a catalyst prepared by the method comprising:
(a) peptizing alumina with an aqueous acidic solution containing a soluble Group IVB metal compound, and a soluble Group VIII metal compound;
(b) neutralizing said aqueous acidic solution containing the peptized alumina with an aqueous solution containing a basic compound and a soluble Group VIB metal compound while mulling; and
(c) shaping, drying and calcining the catalyst particles; and collecting an effluent with reduced nitrogen levels.

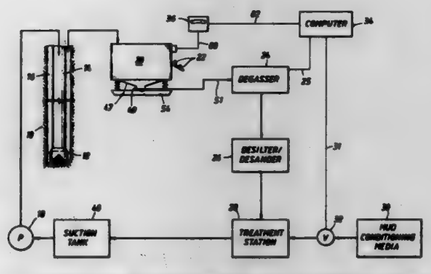
5,190,643
WATER TREATMENT DEVICE HAVING MEANS TO COUNT TIMES USED AND LIMIT USEAGE
J. Kenneth Duncan, Solon, and Wesley A. Schroeder, Uniontown, both of Ohio, assignors to Mr. Coffee, Inc., Bedford Heights, Ohio
Filed Jan. 10, 1992, Ser. No. 818,620
Int. Cl.[5] B01D *35/14*
U.S. Cl. 210—85 16 Claims

1. A portable water treatment device comprised of:
a vessel having a pouring spout at the upper end thereof,
a replaceable filter cartridge containing a filter media, and
a lid assembly for enclosing the upper end of said vessel, said lid assembly including a counting mechanism for monitoring uses of water treatment device and comprising:
housing means having an aperture therethrough communicating with said filter cartridge,
a movable gate member for opening and closing said aperture in said housing, said gate member movable between a position closing said aperture and a position opening said aperture,
counting means incrementally movable along a predetermined path, said counting means operably engaging said gate member wherein said counting means moves one increment each time each said gate member is opened and closed, and
means for preventing movement of said counting means and said gate member after said gate member has moved a predetermined number of increments.

5,190,644
MOTION CONTROLLER FOR WASTEWATER TREATMENT TRICKLING FILTER
Robert S. Wisniewski, Walker, Mich., assignor to City of Wyoming, Wyoming, Mich.
Filed Feb. 28, 1992, Ser. No. 843,531
Int. Cl.[5] C02F *3/04*
U.S. Cl. 210—97 19 Claims

1. An apparatus for controlling the rotation rate of a wastewater distribution assembly for a sewage treatment trickling filter contained by a vessel, the distribution assembly being of the type including a support and at least one distribution arm terminating adjacent the wall of said vessel, said apparatus comprising in combination:
a carriage having at least one wheel mounted to an end of the distribution arm, said wheel engaging a wall of the vessel; and
hydraulic feed back means responsive to the rotation of said wheel for controlling the free wheeling of said wheel about said vessel, thereby retarding motion of said distribution arm in response to increasing rotation rate of said wheel.

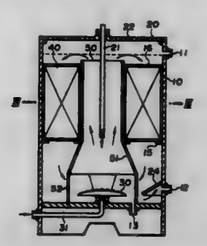
5,190,645
AUTOMATICALLY ADJUSTING SHALE SHAKER OR THE LIKE
Harry L. Burgess, 5400 Memorial #511, Houston, Tex. 77007
Filed May 3, 1991, Ser. No. 695,540
Int. Cl.[5] B01D *33/00*
U.S. Cl. 210—144 24 Claims



1. A shaker for separating cuttings from a drilling or mining operation from a carrier liquid, said shaker comprising:
a hollow body having a mud inlet and a mud outlet;
a screen mounted generally horizontally in said hollow body between said mud inlet and said mud outlet;
a motive assembly operatively connected to said screen for repetitively moving said screen;
a plurality of generally horizontal, generally parallel elongate members connected to said screen for movement therewith; and
a respective solid weight laterally constrained by each of said elongate members, but freely longitudinally movable therealong.

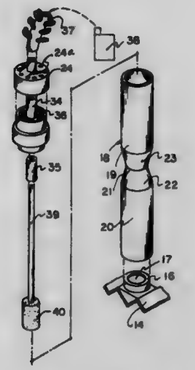
5,190,646
WASTEWATER TREATING BIOLOGICAL FILM TANK
Takashi Hattori, 5-34-104, Soshigaya 2-chome, Setagaya-ku, Tokyo, and Kazuo Nakano, Yokohama, both of Japan, assignors to Nikki Hanbai Co., Ltd., Yokohama and Takashi Hattori, Tokyo, both of Japan
Filed Mar. 11, 1991, Ser. No. 667,775
Int. Cl.[5] C02F *3/06*
U.S. Cl. 210—151 20 Claims

1. A biological film apparatus for treating raw water and waste water, comprising:
tank means having a top, a bottom and a peripheral side wall interconnecting said top and bottom to define an upper tank portion connected to a lower tank portion;
hollow vertical column means arranged centrally in said tank means;
water supply means connected to said upper tank portion for introducing water to be treated into said vertical column means in a downward flow direction;
continuous-pore ceramic element means arranged in said tank means circumferentially around said vertical column means for biological treatment of said water, said ceramic element means including a plurality of biological film elements each comprising 65 to 93 weight % SiO_2, 5.2 to 15.2 weight % Al_2O_3 and 0.1 to 0.7 weight % Fe_2O_3 and having a continuous-pore structure where all pores communicate with each other, said pores having an average diameter of 20 to 120 μm to provide said film element with an apparatus porosity of 60 to 80%.
air bubble supply means connected said lower tank portion for introducing air bubbles into said vertical column means to contact said water to be treated in an upward flow direction opposite said downward flow direction, said air bubbles dissolving in said water and circulating said water upwardly and out of said vertical column



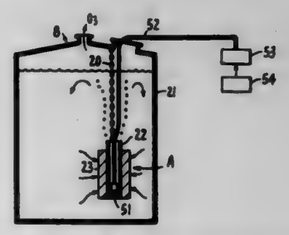
means onto said continuous-pore ceramic element means for treatment therein;
overflow outlet means connected to said upper tank portion for removing from said tank means matter floating on said water;
sludge drain outlet means connected to said lower tank portion for removing from said tank means biological solids and untreated sludge setting on said tank means bottom; and
treated water outlet means connected to said peripheral side wall of said tank means at said lower tank portion for removing treated water from said tank means.

5,190,647
AQUARIUM VENTURI TUBE
Jason R. Balestrieri, Rte. 11 Box 7, Sante Fe, N. Mex. 87501
Filed Aug. 13, 1992, Ser. No. 929,017
Int. Cl.[5] A01K *63/04*
U.S. Cl. 210—169 8 Claims



1. An aquarium venturi tube, comprising,
a filter plate, the filter plate arranged for positioning in an aquarium, wherein the filter plate includes a matrix of apertures directed therethrough, and
the filter plate further including a cylindrical and tubular boss mounted to the filter plate extending upwardly thereof, the boss including a central bore directed therethrough, and
a flow tube having a lower tube coaxially aligned and positioned below an upper tube, wherein the lower tube includes a lower tube lower distal end receiving the boss therewithin, and the lower tube includes a lower tube upper distal end having a lower tube upper conical tubular portion formed thereon, and
the upper tube including an upper tube lower distal end, wherein the upper tube lower distal end includes an upper tube lower conical tube portion formed thereon, and
a central venturi tube positioned between the lower tube upper conical tube portion and the upper tube lower conical tube portion, and
aeration means coaxially directed through the flow tube positioned within the lower tube below the central venturi tube.

5,190,648
WATER PURIFYING METHOD AND APPARATUS
Larry R. Ramsauer, 642 Gignere Ct., San Jose, Calif. 95133
Continuation-in-part of Ser. No. 269,869, Nov. 10, 1988, abandoned. This application Apr. 3, 1990, Ser. No. 504,126
Int. Cl.[5] C02F *1/48, 1/78*
U.S. Cl. 210—172 13 Claims



1. A purifying system for a reservoir of water comprising, in combination:
means for generating ozone,
a lift tube for containing water,
means for suspending said lift tube in a water tank with the upper end of said lift tube below the surface of the water,
means for introducing water into said lift tube, a filter located in the path of water flow into said lift tube;
means for injecting ozone into the water introduced into said lift tube for causing upward movement of water in said lift tube and purifying the water, said means for introducing water into said lift tube including openings at the bottom of said lift tube, said filter surrounding and spaced outwardly from the lift tube and when the ends substantially sealed thereto permitting water to flow through said filter into the bottom of said lift tube,
magnets on opposite sides of the opening at the bottom of said lift tube, and
said magnets having their north poles facing one another across the water introduced into the lift tube.

5,190,649
APPARATUS FOR WORKING UP METAL-CHARGED WASTE SLUDGES
Antonio M. Celi, D-5466, Neustadt, Im Engelsgarten 2, Fed. Rep. of Germany
Filed Jun. 14, 1989, Ser. No. 366,808
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821242
Int. Cl.[5] B01D *36/00*
U.S. Cl. 210—178 7 Claims

1. An apparatus for removing metals from metal charged

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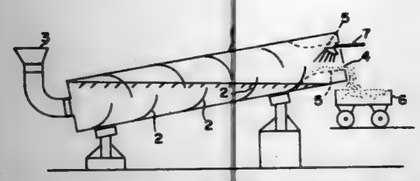
waste sludges with an aqueous solution of ammonium chloride and sodium sulfate comprising:

(a) a mixing apparatus for mixing the aqueous solution of ammonium chloride and sodium sulfate together with the waste sludges, said mixing apparatus including a rotating container having an elongated rotating drum with lifter blades on the inside wall thereof mounted for movement towards a discharge opening in one end thereof;

(b) a residence zone in the rotating drum for holding the sludge during treatment;



(c) an inlet opening on one end of the mixing apparatus for the introduction of sludges into the mixing apparatus on the end opposing the discharge opening for removing separated undissolved solids from the mixing apparatus upon completion of the metal removal;

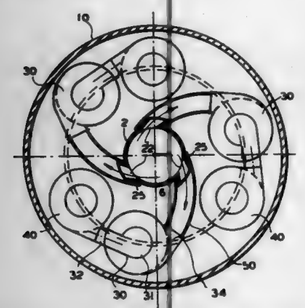
(d) a separating apparatus for separating the metal charge solution from the undissolved solids and comprising a filter tray positioned in said mixing apparatus in the region of the discharge opening for carrying the separated solids to the discharge opening; and

(e) a drying apparatus for drying the separated undissolved solids.

5,190,650
TANGENTIAL SOLIDS SEPARATION TRANSFER TUNNEL

Robert F. Tammera, West Orange; Donald F. Shaw, Denville; Kenneth J. Reinman, Long Valley, and George Melfi, Whippany, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 24, 1991, Ser. No. 720,056
Int. Cl.[5] B01J 8/18; B01D 21/26
U.S. Cl. 210—256 **4 Claims**



1. An apparatus for separation of fluidized solids suspended in a gaseous phase comprising:

(a) a vessel having a disengaging zone;

(b) a vertical tubular riser positioned in the vessel, the riser having a discharge end located in the disengaging zone, the riser having at its discharge end a plurality of openings in the periphery;

(c) a pair of vertical projections for each peripheral opening in the riser, the projections extending outwardly and substantially tangential to the tubular riser, the vertical projections being connected by top and bottom projections which with the vertical projections define a conduit;

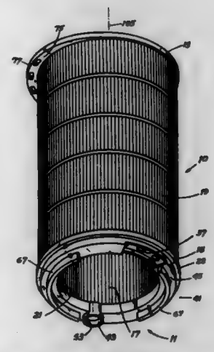
(d) a cyclone for each opening in the riser, the cyclone having an inlet for receiving entrained solids discharged from an opening in the riser, the cyclone inlet having an area less than the area of the opening of the riser;

(e) arcuately shaped tunnel means communicating with the riser opening and the cyclone inlet, the tunnel means having an inlet end which fits around, but is spaced apart from the conduit defining projections extending from the riser whereby entrained solids discharged from the riser are guided through an arcuate path for tangential introduction into the cyclone inlet.

5,190,651
FILTER CARTRIDGE

Terrel F. Spencer, and Gary L. Brooks, both of Lake Geneva, Wis., assignors to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed Jun. 24, 1991, Ser. No. 720,263
Int. Cl.[5] B01D 27/14
U.S. Cl. 210—305 **14 Claims**



1. In a fluid filter cartridge of the type having spaced filter elements supported by first and second end caps, the elements defining an effluent path therebetween, at least the first end cap having an interior element-supporting surface, an exterior surface and a plurality of annularly-arranged exit passages communicating with the path, the improvement comprising:

an annular fluid exhaust manifold coupled to the exterior surface of the first end cap and defining a ring-like conduit in communication with the exit passages; and,

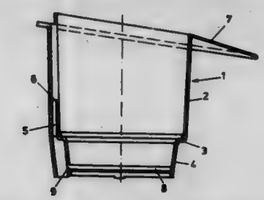
a discharge port coupled to the conduit and configurated and arranged for low-friction detachment from an outlet vent.

5,190,652
FILTER HOLDER FOR COFFEE CARTRIDGES

Bernardus M. van Thoor, Maarssen, and Jan C. van Hattem, Amerongen, both of Netherlands, assignors to Sara Lee/DE N.V., Utrecht, Netherlands

Filed Sep. 17, 1991, Ser. No. 761,291
Claims priority, application Netherlands, Sep. 21, 1990, 9002072
Int. Cl.[5] B01D 29/085
U.S. Cl. 210—474 **4 Claims**

1. A filter holder for coffee cartridges, comprising a cartridge-receiving portion (4) with a closed bottom and a lateral extract passage (9), a by-pass (5) which has its inlet (6) spaced above the cartridge-receiving portion (4) and terminates adjacent the extract passage (9), as well as an upper supporting rim (7) which is so inclined relative to the axis of the closed bottom, that when the filter pan is arranged by the supporting rim (7) thereof on the upper edge of a receptacle for brewed coffee,

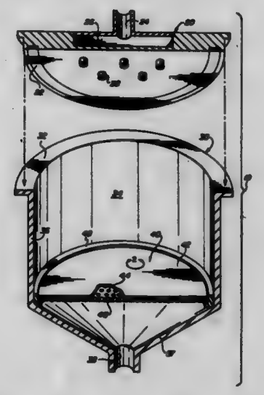


outlets of the by-pass (5) and the extract passage (9) are disposed substantially at the lower point.

5,190,653
COFFEE BREWER FILTRATION DEVICE

James P. Herrick, Brookfield, Conn.; Robert F. Smith, Ridgefield Park, N.J., and Mete Brancaj, Yonkers, N.Y., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed Oct. 30, 1990, Ser. No. 606,040
Int. Cl.[5] B01D 29/085
U.S. Cl. 210—477 **20 Claims**



1. A reusable filtration device adapted for use in a coffee brewer, comprising:

a filter element having a first surface intended for contact with an aqueous coffee brewing mixture containing suspended coffee particulates, a second surface on the side of the filter element opposite the first surface, and holes extending through the filter element from the first surface to the second, wherein individual holes have an open area in the first surface of from 100 to 3,000 square microns and together provide an open area of from 5 to 30%, and the center-to-center spacing of the holes is within the range of from 10 to 150 microns.

5,190,654
PROCESS FOR PRODUCING AN ULTRA-THIN AND ASYMMETRIC MINERAL MEMBRANE

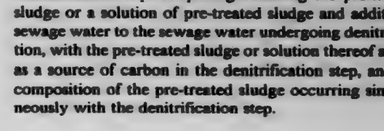
Jean-Michel Bauer, Pagny S/Moselle, France, assignor to Le Carbone Lorraine, Courbevoie, France

Filed Jul. 17, 1991, Ser. No. 731,340
Claims priority, application France, Jul. 24, 1990, 90 09999
Int. Cl.[5] B01D 71/04
U.S. Cl. 210—490 **11 Claims**

1. A process for producing an asymmetric thin membrane on a support, aid asymmetric membrane comprising outer and inner layers disposed on the support, the outer layer being an active, porous layer of thickness less than about 0.1 μm, and the inner layer having a greater thickness and pore size than the outer layer, comprising the steps of:

(a) preparing a fluid dispersion of a finely divided inorganic material, a water-soluble organic solvent, and a resin capable of being coked to a coke content greater than 20% by weight, and which resin is insoluble in water and soluble in the organic solvent;

(b) depositing the fluid dispersion as a layer on a mineral support;



(c) contacting the layer of fluid dispersion on the mineral support with water so as to displace at least some of the organic solvent from the layer and to precipitate the resin; and,

(d) thermally treating the contacted layer-mineral support to convert at least the resin to coke and form an asymmetric, thin, coke-containing membrane.

11. Asymmetric filtration membranes with an active layer of small thickness which are obtained by the process of claim 1.

5,190,655
WATER PURIFICATION PROCESS 2

Johan Lars I. Karlsson, Barkstigen 4, Lidingö, Sweden

Continuation of Ser. No. 462,226, Jan. 9, 1990, abandoned. This application Sep. 26, 1991, Ser. No. 769,321
Claims priority, application Sweden, Jan. 11, 1989, 8900071
Int. Cl.[5] C02F 3/30
U.S. Cl. 210—607 **7 Claims**

1. A process for the purification of sewage water comprising:

(a) carrying out a chemical precipitation of the sewage water using aluminum salts, calcium salts, iron salts or combinations thereof to obtain a sludge, and thereafter pre-treating the sludge mechanically, enzymatically, thermally, biologically, chemically or combinations thereof to increase the availability of the pre-treated sludge to bacterial oxidation; and

(b) subjecting the sewage water treated in step (a) to a nitrification step wherein ammonium nitrogen contained therein is oxidized to nitrate, and a denitrification step wherein nitrates contained therein are reduced to nitrogen gas, the denitrification step comprising admixing the pre-treated sludge or a solution of pre-treated sludge and additional sewage water to the sewage water undergoing denitrification, with the pre-treated sludge or solution thereof acting as a source of carbon in the denitrification step, and decomposition of the pre-treated sludge occurring simultaneously with the denitrification step.

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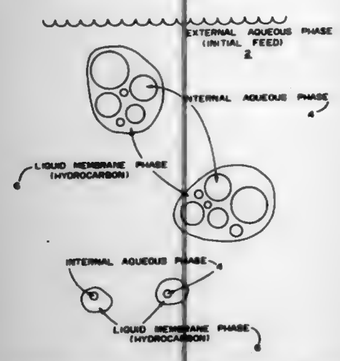
5,190,656

METHOD FOR REMOVING SCALE VIA A LIQUID MEMBRANE IN COMBINATION WITH AN AMINO CARBOXYLIC ACID AND A CATALYST

James M. Paul, DeSoto, and Richard L. Morris, Duncanville, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 459,120, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 332,147, Apr. 3, 1989, abandoned. This application Aug. 7, 1991, Ser. No. 742,565
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] B01D *17/00*, C02F *1/26, 5/10*
U.S. Cl. 210—643 20 Claims



1. A liquid membrane method for removing barium sulfate scale from equipment containing same via an emulsion comprising:

a) contacting said scale-containing equipment with an external aqueous phase which causes said scale to solubilize into scale-forming ions in said external aqueous phase which consists essentially of:

i) an aqueous solution having a pH of from about 8 to about 14;

ii) a first complexing agent selected from a member of the group consisting of aminocarboxylic acid or polyamines, salts and mixtures thereof in an amount of at least about 0.1 to about 1.0M; and

iii) a catalyst in an amount of at least from about 0.01 to about 0.5M selected from a member of the group consisting of fluoride, persulfite, persulfate, dithionate, hypochlorite, formate, salicylate, aminoacetate, glycolate, or thioglycolate anions and mixtures thereof, having an ionization constant of less than about $10^{-2}K_a<10^{-2}$ which acts with said first complexing agent to substantially enhance said agents ability to solubilize scale;

b) mixing an emulsion into said external aqueous phase which emulsion contains an immiscible liquid hydrocarbonaceous membrane phase having a second complexing agent for said scale-forming ions therein stronger than said first complexing agent enveloped around droplets of an internal aqueous phase having a stronger third complexing agent for scale-forming ions than said second complexing agent; and

c) transferring said scale-forming ions from said external aqueous phase into said hydrocarbonaceous membrane phase which ions are then transferred from said hydrocarbonaceous membrane phase into said internal aqueous phase where said ions are accumulated and concentrated which causes scale to be removed from said equipment within a substantially reduced time period than is possible with said first and third complexing agents alone.

5,190,657

BLOOD FILTER AND METHOD OF FILTRATION

David G. Heagle, Toutman, and John J. Hiers, Elkin, both of N.C., assignors to Lydall, Inc., Manchester, Conn.

Filed Jul. 22, 1991, Ser. No. 733,613
Int. Cl.[5] B01D *37/00, 39/04, 39/06, 39/08*
U.S. Cl. 210—645 44 Claims

1. A filter material for filtering leucocytes from a fraction of or whole blood, comprising:

(A) a shape-sustaining laid textile web having a thickness of at least about 1 millimeter and a bulk density of between about 0.05 and 0.4 g/cm^3, said web having:

(i) a plurality of interlocked, textile fibers with average deniers between about 0.05 and 0.75 and average lengths between about 3 millimeters and 15 millimeters, said textile fibers being substantially uniformly distributed in said web so as to form a matrix of the textile fibers with spaces between adjacent interstices of interlocked fibers;

(ii) a plurality of fibrillated particles of polymeric material having a surface area of between about 5 and 60 square meters per gram substantially disposed within said spaces of the matrix, said fibrillated particles having a plurality of fine fibrils which are interlocked with adjacent textile fibers of said spaces such that the fibrillated particles are not substantially displaceable from said web during filtration of said blood; and

wherein the weight ratio of the fibrillated particles to the textile fibers is between about 1:99 and 40:60.

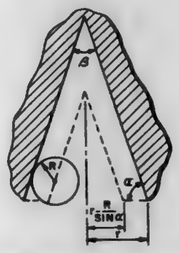
44. A method for filtering leucocytes from a fraction of or whole human blood, comprising passing said blood through the filter material of claim 1 and recovering the filtered blood.

5,190,658

METHOD FOR SIZE EXCLUSION CHROMATOGRAPHY

Lev Z. Vilenchik, Longmeadow; Roger C. Ayotte, Springfield, both of Mass.; Jawed Asrar, Chesterfield, and Christopher J. Hardiman, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 3, 1992, Ser. No. 830,093
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—656 3 Claims



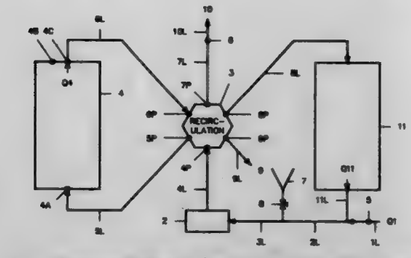
1. A method for separating macromolecules of different molecular weight by size exclusion chromatography comprising passing a solution of said macromolecules through a column packed with spherical particles comprising aluminum oxide, aluminum hydroxide, or a mixture thereof having wedge-shaped macropores at a flow rate whereby said macromolecules are eluted from said column in descending order of molecular weight.

5,190,659

CONTAMINATION REMOVAL SYSTEM EMPLOYING FILTRATION AND PLURAL ULTRAVIOLET AND CHEMICAL TREATMENT STEPS AND TREATMENT MODE CONTROLLER

Lawrence K. Wang, Latham; Lubomyr Karyiko, New Providence, N.J., and Mu Hao S. Wang, Latham, N.Y., assignors to International Environmental Systems Inc., Pittsfield, Mass.

Filed Jul. 6, 1990, Ser. No. 549,596
Int. Cl.[5] B01D *24/46, 41/02, 36/00, 37/04*
U.S. Cl. 210—663 20 Claims



1. An improved filtration process for removing contaminants from a contaminated liquid comprising the following steps:

(a) operating an apparatus comprising a piping system including an influent liquid pipe, effluent discharge pipes, a waste drain, and process pipes, an ultraviolet pretreatment means, a chemical feed system, a pump means, a process tank, a pressure filter means including reactive granular filter media and a filter septum, an ultraviolet post-treatment means, and a central flow control means in a filtration mode,

(b) pumping the contaminated liquid to said influent liquid pipe of said apparatus,

(c) disinfecting the contaminated liquid by said ultraviolet pretreatment means, as needed, and producing an ultraviolet pretreated liquid,

feeding a chemical selected from the group consisting of oxine, hypochlorite, peroxide and permanganate, or combinations thereof, as needed, to the ultraviolet pretreated liquid for chemical pretreatment and producing an ultraviolet and/or chemical pretreated liquid,

(e) pumping the ultraviolet and/or chemical pretreated liquid to said central flow control means to said pressure filter means which comprises reactive granular filter media and a filter septum,

(f) filtering the ultraviolet and/or chemical pretreated liquid by said reactive granular filter media supported by said filter septum inside said pressure filter means for removal of suspended, dissolved, living and non-living contaminants, and producing a filter effluent and a concentrate,

(g) periodically discharging a portion of said concentrate from said pressure filter means though an on/off valve during a prolonged filtration operation,

(h) discharging the filter effluent from said pressure filter means through said central flow control means to said effluent discharge pipe where the filter effluent is treated by the ultraviolet post-treatment means, and producing a post-treated effluent or a product liquid,

(i) periodically turning said central flow control means manually or automatically from said filtration mode to a backwash mode for backwashing said pressure filter means at a liquid flow direction opposite to that of the filtration mode using the ultraviolet and/or chemical pretreated liquid and producing, then discharging a backwash wastewater from said pressure filter and said central flow control means to said waste drain for disposal,

(j) turning said central flow control means manually or automatically from any previous operational mode to a rinse mode for rinsing said pressure filter means at a liquid flow direction identical to that of the filtration mode with said ultraviolet and/or chemical pretreated liquid and producing, then discharging a rinse wastewater from said pressure filter means and said central flow control means to said waste drain for disposal,

(k) turning said central flow control means manually or automatically from said rinse mode to the filtration mode again for the filtration operation, for producing another filter effluent and another concentrate, and repeating steps (a) through (h),

(l) turning said central flow control means manually or automatically from any previous operational mode to a bypass mode, allowing the ultraviolet pretreated liquid to bypass said pressure filter means and to be post-treated by said ultraviolet post-treatment means for producing a non-filtered but disinfected product liquid,

(m) periodically turning said central flow control means manually or automatically from any previous operational mode to a flushing mode for flushing the influent liquid pipe and the ports of said central flow control means and producing, then discharging a flushing wastewater to said waste drain for disposal,

(n) manually or automatically turning said central flow control means from any previous operational mode to a preparation mode for preparing a chemical solution in said process tank, using said contaminated liquid and chemical from said chemical feed system,

(o) turning said central flow control means manually or automatically from any previous operational mode to a recirculation mode for recycling said chemical solution the entire apparatus to regenerate said reactive granular filter media without discharging said product liquid or said wastewater,

(p) turning said central flow control means manually or automatically from any previous operational mode to a first precoat mode for precoating said septum with said reactive granular filter media inside said pressure filter means by recirculation of the effluent of said process tank and said reactive granular filter media from said chemical feed system,

(q) turning aid central flow control means manually or automatically from any previous operational mode to a second precoat mode for continuously precoating said septum with said reactive granular filter media inside said pressure filter means with said contaminated liquid and said reactive granular filter media from said chemical feed system, and continuously discharging a wastewater to said waste drain, and

(r) turning said central flow control means manually or automatically from either said first precoat mode or said second precoat mode to the rinse mode for rinsing and then to the filtration mode for normal filtration operation and producing the product liquid.

5,190,660

ION COMPLEXATION BY SILICA-IMMOBILIZED POLYETHYLENEIMINES

Leonard F. Lindoy, 3 Jarrah Court, Cranbrook, Queensland, Australia 4811, and Peter Eaglen, 22 Harvey Street, Gulliven Townsville, 4812, Queensland, Australia

Filed Jun. 4, 1992, Ser. No. 893,925
Int. Cl.[5] B01D *15/04, 15/08*
U.S. Cl. 210—670 16 Claims

1. A method of removing preselected metal ions from solution, comprising:

selecting a substrate from the class consisting of silica and silicate materials, having an average size of +200 mesh particles;
attaching a silane linking compound to said substrate; selecting a polyethyleneimine having a complexing capacity for the preselected metal ions;
after said step of attaching the silane linking compound, chemically bonding said selected polyethyleneimine to the substrate via the silane linking compound, thereby creating an immobilized polyethyleneimine;
exposing said immobilized polyethyleneimine to a first solution containing the preselected metal ions; and
continuous exposure to said first solution until the immobilized polyethyleneimine complexes at least some of the metal ions.

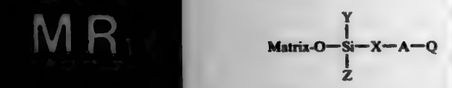
5,190,661

PROCESS OF REMOVING IONS FROM SOLUTIONS USING A COMPLEX WITH SULFUR-CONTAINING HYDROCARBONS

Ronald L. Bruening, Sandy; Bryce J. Tarbet, Highland; Reed M. Izatt, and Jerald S. Bradshaw, both of Provo, all of Utah, assignors to Brigham Young University, Provo, Utah

Filed Jun. 8, 1992, Ser. No. 895,341
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—670 **17 Claims**

1. A method of removing desired ions from a mixture thereof in solution with other ions said method comprising:
(a) bringing said solution having a first volume into contact with a compound comprising a sulfur and electron withdrawing group containing ligand-covalently bonded via a silane spacer grouping to a solid support matrix having the formula:



wherein
(i) Matrix is a member selected from the group consisting of sand, silica gel, glass, glass fibers, alumina, zirconia, titania and nickel oxide and mixtures thereof,
(ii) y and Z are members independently selected from the group consisting of (a) O-Matrix, (b) X—A—Q, or (c) Cl, Br, I, alkyl, alkoxy, substituted alkyl or substituted alkoxy;
(iii) X can be any spacer member selected from the group consisting of (1) groups having the formula:

$$(CH_2)_a(OCH_2CHR^1CH_2)_b$$

wherein R^1 is a member selected from the group consisting of H, SH, OH, lower alkyl, and aryl; a is an integer from 2 to about 10 and b is an integer of 0 or 1, (2) phenyl and (3) methacryl;
(iv) A is a member selected from the group consisting of S, 0, NR^2, and CH_2, wherein R^2 is a member selected from the group consisting of H and lower alkyl with the proviso that A must be S when Q does not contain an S atom;
(v) Q is a member selected from the group consisting of Ar and lower alkyl with the provisos that (1) Q must be electron withdrawing when X is other than phenyl (2) must contain an S atom when A does not and (3) wherein Ar is an aryl group selected from the group consisting of phenyl, thiophenyl, naphthyl, biphenyl, pyridyl, pyrimidinyl, pyrazyl, pyridazinyl, furyl, thienyl, pyrryl, quinolinyl and bipyridyl; and
(vi) with the further proviso that A must be CH_2 when Q is Ar selected from the group consisting of 2-furyl, 2-thienyl and 2-pyrryl;
(b) removing said solution from contact with said compound to which said desired ions have been complexed; and
(c) contacting said compound having desired ions complexed thereto with a volume, smaller than said first volume, of a receiving solution having either a greater affinity for said desired ions than said compound or a greater affinity for said compound than said desired ions thereby breaking said complex between said compound and said desired ions and recovering the desired ions in concentrated form in said smaller volume of said receiving solution.

5,190,662

REMOVAL OF IRON SULFIDE PARTICLES FROM ALKANOLAMINE SOLUTIONS

Alfred E. Keller, Ponca City; Fred C. Veatch, Newkirk; Arthur L. Cummings; James C. Thompson, both of Ponca City, all of Okla., and Regina A. Severson, Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed Jul. 29, 1991, Ser. No. 737,946
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—673 **9 Claims**

1. A process for removing ion sulfide particles from an aqueous alkanolamine solution which comprises passing the alkanolamine solution through a contact material to which iron sulfide particles in an alkanolamine solution adhere, said contact material having openings greater than the size of the iron sulfide particles, whereby flow of alkanolamine solution through the contact material remains unimpeded with no significant increase in pressure drop across the contact material during the process and whereby the iron sulfide particles in the alkanolamine solution adhere to the contact material which does not require periodic removal for cleaning or replacement.

5,190,663

PROCESS FOR PURIFYING WASTE WATER STREAMS BY INCLUSION COMPLEXATION OF POLYNUCLEAR AROMATIC HYDROCARBONS

John C. Fetzer, Hercules, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Filed Apr. 16, 1992, Ser. No. 869,669
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—674 **16 Claims**

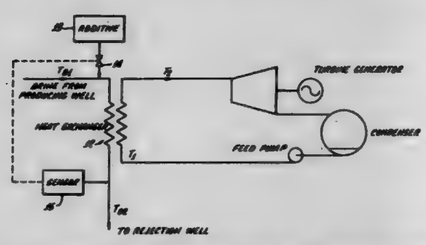
1. A process for removing dissolved polynuclear aromatic hydrocarbons from an aqueous composition which comprises the step of:
contacting said composition with a water insoluble inclusion agent comprising an anchored cyclodextrin, said cyclodextrin having an inclusion cavity diameter of at least about 10 angstroms; and
wherein the concentration of dissolved organics in said aqueous composition is no greater than about fifteen percent by weight.

5,190,664

BRINE HEAT EXCHANGER TREATMENT METHOD

Darrell L. Gallup, Chino Hills, Calif.; Michael L. Barnes, Pasay, Philippines; Douglas Cope, Pasay, Philippines; Quirino S. Kolimlim, Pasay, Philippines, and John K. Leong, Bakersfield, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 322,681, Mar. 13, 1989, Pat. No. 5,073,270, which is a continuation of Ser. No. 590,016, Mar. 15, 1984, abandoned, which is a continuation of Ser. No. 566,714, Dec. 27, 1983, Pat. No. 4,756,888. This application Oct. 31, 1990, Ser. No. 607,263
Int. Cl.[5] C02F *5/08*
U.S. Cl. 210—696 **20 Claims**



1. A method for virtually eliminating a silicon-containing precipitate from a high-enthalpy geothermal brine having an initial temperature and containing one or more cations capable of forming a sulfate salt and containing less than a saturated amount of said sulfate salt to produce a sulfate precipitate at a final temperature lower than said initial temperature, which brine tends to form said precipitate when thermal energy is removed from said brine and said initial temperature is reduced to said final temperature in a process in which thermal energy is transferred across a solid surface in contact with said brine, which method comprises:
adding an amount of sulfate-producing acid to said brine to form a brine-acid mixture and substantially eliminate said silicon-containing precipitate;
controlling the amount of said added acid based upon said less than saturated amount of sulfate salt;
flowing said brine-acid mixture in contact with said solid surface after said controlling step; and
wherein said brine-acid mixture does not produce a substantial amount of said silicon-containing precipitate and said sulfate precipitate after said flowing.

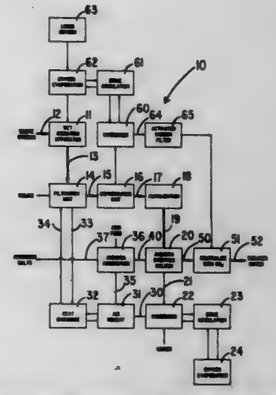
5,190,665

PROCESS AND APPARATUS FOR REMOVING CARBON DIOXIDE AND STRIPPING ANOTHER COMPONENT FROM A LIQUID STREAM

James A. Titmas, 347 Crain Ave., Kent, Ohio 44240, and Phillip J. Flauto, 2205 E. Streetsboro Rd., Hudson, Ohio 44326

Filed Aug. 12, 1991, Ser. No. 743,918
Int. Cl.[5] B01D *19/00*
U.S. Cl. 210—743 **10 Claims**

1. A process for continuously treating a liquid stream and for removing a selected component therefrom, the process for treating comprising the steps of depressurizing the liquid stream to remove carbon dioxide and forming a carbon dioxide stream and a component-laden stream; raising the pH of said component-laden stream; gas-stripping said component-laden stream with a stripping gas to remove the component therefrom thereby forming a relatively component-free liquid stream and a gaseous component stream; neutralizing said relatively component-free liquid stream with said carbon dioxide stream; dehumidifying said gaseous component stream; dissolving said gaseous component stream in an acidic solution by re-absorption forming a reduced component gas stream and a liquid salt complex of the component; and utilizing said reduced component gas stream to remove the component in said gas-stripping step.



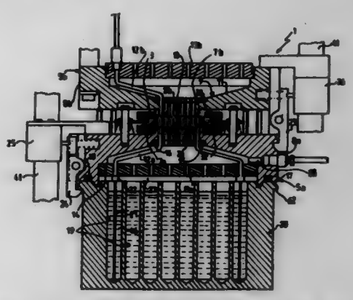
8. A process as in claim 1, including the further step of monitoring the pH of said component-laden stream and adjusting as necessary to a pH of about 9.

5,190,666

METHOD AND APPARATUS FOR FILTERING A PLURALITY OF SAMPLES THROUGH A FILTER WITH INDEXING OF THE FILTER

Jean-Claude Bisconte, Brie-sous-Forges, France, assignor to Biocom S.A., Les Ulis, France

PCT No. PCT/FR89/00544, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO90/04445, PCT Pub. Date May 3, 1990
PCT Filed Oct. 20, 1989, Ser. No. 678,261
Claims priority, application France, Oct. 21, 1988, 88 13804
Int. Cl.[5] B01D *46/44, 17/12*
U.S. Cl. 210—744 **17 Claims**

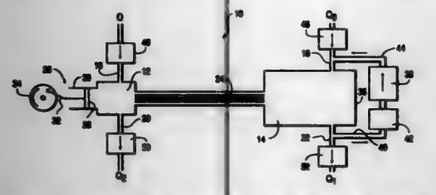


1. Filter apparatus for filtering a plurality of liquid or gas fluid samples containing particles to be filtered, said apparatus comprising:
a filter;
means for simultaneously and independently filtering fluid samples on said filter; and
means for force filtering the samples through said filter;
and wherein said means for simultaneously and independently filtering fluid samples comprises:

at least one gasket including a plurality of through perforations;
first and second sealed clamping means cooperating with said gasket and said filter, said clamping means having perforations located for being brought into alignment with the perforations through said gasket and for cooperating therewith to put an upstream face of said gasket into communication, via said filter, with a plurality of independent inlets for samples of fluid to be filtered, and to put a downstream face of said gasket into communication with a plurality of likewise independent outlets for the fluid samples, said perforated clamping means and said gasket defining on said filter a plurality of independent and mutually sealed filter zones corresponding to said perforations and adapted to have the fluid samples passing in parallel therethrough under drive from said force filtering means; and
means for indexing said filter.

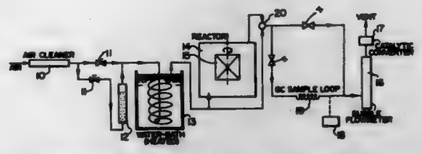
15. A method of filtering making use of the apparatus according to claim 1, comprising:
i) monitoring the tendency during filtering of the filter zones to become clogged with particles contained in the samples; and
ii) measuring the filtered volume for each sample.

5,190,667
SEPARATION OF GASES AND SOLUTES BY AUGMENTED DIFFUSION IN COUNTERFLOW
Marc J. Jaeger, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.
Filed Jan. 19, 1991, Ser. No. 717,654
Int. Cl.[5] B01D *17/06, 15/04*
U.S. Cl. 210—748 **46 Claims**



1. A method for separating gases or liquids of differing masses from a gas or liquid mixture, respectively, by enhanced diffusion comprising conducting at least one cycle of:
feeding said mixture of gases or liquids of differing masses into a first reservoir which is connected by at least one duct to a second reservoir;
feeding a carrier fluid into said second reservoir;
establishing oscillatory axial movement of fluid within said at least one duct;
withdrawing from said second reservoir a mixture of carrier fluid and a mixture of gases or liquids of differing masses enriched in the component thereof having the higher effective diffusion coefficient; and
withdrawing from said first reservoir a mixture of carrier fluid and a mixture of gases or liquids of differing masses enriched in the component thereof having the lower effective diffusion coefficient;
wherein a positive flow of said carrier fluid is maintained from said second reservoir through said at least one duct into said first reservoir by (1) maintaining the rate of flow of said carrier fluid into said second reservoir above the rate of withdrawal from said second reservoir of said mixture of carrier fluid and gas or liquid mixture of differing masses enriched in the component having the higher effective coefficient of diffusion or (2) maintaining the rate of withdrawal from said first reservoir of said mixture of carrier fluid and mixture of gases or liquids of differing masses enriched in said component having the lower effective coefficient of diffusion above the rate of flow of said mixture of gases or liquids of differing masses into said first reservoir.

5,190,668
METHOD FOR THE REMOVAL OF VOLATILE ORGANIC COMPOUNDS FROM WATER
Karl T. Chuang, 14717 - 45 Ave., Edmonton, Alberta, Canada T6H 5R4
Filed Sep. 30, 1991, Ser. No. 767,818
Int. Cl.[5] C02F *1/72*
U.S. Cl. 210—750 **17 Claims**



1. A process for removing a volatile organic compound (VOC) from water contaminated with such VOC, comprising
(a) providing a reactor containing a packed bed, said packed bed including an inert packing material and a noble metal oxidation catalyst deposited on a hydrophobic support;
(b) flowing a liquid feed containing water and VOC, through the reactor,
(c) flowing a gaseous feed containing oxidizing agent through the reactor; and
(d) stripping from the water the VOC in vapour form and then catalytically oxidizing the VOC vapour at a temperature of 20° to 180° C. to form CO_2 and water.

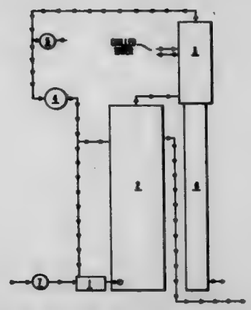
5,190,669
PURIFICATION OF WASTE STREAMS
A. Thomas Weibel, Cranbury, N.J., assignor to FMC Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 666,751, Mar. 8, 1991, abandoned. This application Nov. 25, 1991, Ser. No. 797,606
Int. Cl.[5] C02F *1/78*
U.S. Cl. 210—759 **4 Claims**

1. A process for decreasing the color of an aqueous lignin-containing solution comprising the steps of:
a. adjusting the pH of the solution to between pH 5 and 10,
b. incorporating sufficient hydrogen peroxide into the solution to maintain a concentration of about 0.5 millimoles per liter for at least 20 minutes, and
c. incorporating sufficient ozone into the solution to provide from 1 to 3 moles of ozone per mole of hydrogen peroxide incorporated in step b.

5,190,670
PROCESS AND SYSTEM FOR SEPARATING AND CONDENSING CONTAMINANTS FROM A LIQUID
Donald M. Stearns, Cocoa, Fla., assignor to PEC Research, Inc., Titusville, Fla.
Continuation-in-part of Ser. No. 494,457, Mar. 16, 1990, Pat. No. 5,125,167, and a continuation-in-part of Ser. No. 588,268, Sep. 26, 1990, Pat. No. 5,133,882, and a continuation-in-part of Ser. No. 700,610, May 15, 1991. This application May 14, 1992, Ser. No. 882,968
Int. Cl.[5] B01D *37/00*
U.S. Cl. 210—767 **4 Claims**

1. A method for removing contaminates from a liquid comprising the following series of steps:
providing a source of pressurized gas;
dissolving and entraining a gas in said liquid uader pressure such that said liquid becomes super-saturated with said gas;

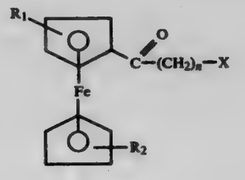
reducing pressure on said liquid thereby allowing said gas dissolved in said liquid to be released in the form of microbubbles thereby removing contaminates attached to said microbubbles;



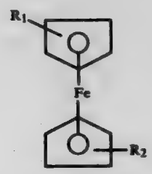
circulating said gas with said contaminates to a condenser and condensing said contaminates and any of said liquid present in said gas in vapor form;
recirculating said gas to said source of pressurized gas.

5,190,671
PROCESS FOR THE SYNTHESIS OF MONOHALOALKANOYLFERROCENES
Paul Caubere, Nancy; Yves Fort, Vandoeuvre Les Nancy; Jean-Claude Gautier, Ablon Sur Seine, and Jean-Claude Mondet, Vert Le Petit, all of France, assignors to Societe Nationale Des Poudres Et Explosifs, Paris, France
Filed Oct. 2, 1991, Ser. No. 769,776
Claims priority, application France, Oct. 3, 1990, 90 12157
Int. Cl.[5] C07F *17/02*
U.S. Cl. 210—767 **10 Claims**

1. Process for the synthesis of monohaloalkanoylferrocenes of general formula (I)

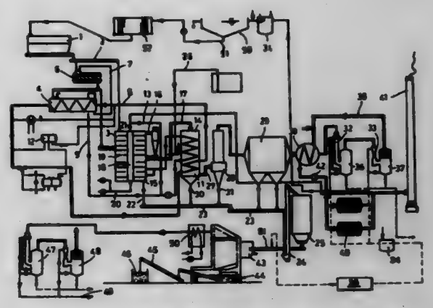


in which
X denotes chlorine or bromine,
n is an integer such that $2 \leqq n \leqq 7$,
R_1 and R_2, which are identical or different, denote hydrogen or an alkyl chain containing 1 to 8 carbon atoms, characterised in that a ferrocene derivative of general formula (II)



in which
R_1 and R_2 have the abovementioned meaning, is reacted at a temperature θ_r of between −5° C. and +15° C., in the presence of aluminum chloride as catalyst, with a halide or the anhydride of an acid of general formula (III) HOO-C—$(CH_2)_n$—X, X and n having the abovementioned meaning,
an acylating solution obtained by mixing $AlCl_3$ and the halide or the anhydride of acid (III) in methylene chloride and whose temperature θ_a, lower than θ_r, is such that 5° C.$\theta_r - \theta_a \leqq 15$° C., being progressively added to a solution of the ferrocene derivative (II) in methylene chloride, the molar ratio of the acid halide or anhydride to the ferrocene derivative being between 0.99 and 1.01 and the molar ratio of aluminum chloride to the ferrocene derivative being between 1.05 and 1.11,
in that the reaction mixture is then hydrolysed to recover an organic phase,
and in that the required product of formula (I) is recovered by filtering this organic phase and then evaporating off methylene chloride.

5,190,672
METHOD FOR THERMAL DISPOSAL OF SEWAGE SLUDGE
Hubert Coenen, Aarbergen; Helmut Hubert, Wiesbaden; Friedhelm Bultmann, Aarbergen, and Matthias Brunner, Hohenstein-Unterdorf, all of Fed. Rep. of Germany, assignors to Passavant-Werke AG, Fed. Rep. of Germany
Filed May 22, 1991, Ser. No. 703,096
Claims priority, application Fed. Rep. of Germany, May 22, 1990, 4016468
Int. Cl.[5] F23G *5/00*; B01D *53/00*; F23J *15/00*
U.S. Cl. 210—770 **12 Claims**

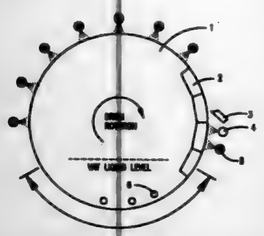


1. A method of thermal disposal of sewage sludge, comprising the steps of; drying the sludge, incinerating the sludge, dedusting the flue gas resulting from incineration, and washing the flue gas, wherein the ashes and flue gas dust resulting from incineration and the sludge resulting from flue gas washing are treated together with high temperature combustion which includes melting of solids.

5,190,673
FILTRATION IN SOLVENT DEWAXING WITH CONTINUOUS SPRAYING OF FILTER WITH BOTH HOT AND COLD SOLVENTS
Lyle A. Leach, Morphett Vale Sth, Australia, assignor to Mobil Oil Corp., Fairfax, Va.
Filed Jan. 12, 1991, Ser. No. 714,430
Int. Cl.[5] C10G *73/06, 73/10*
U.S. Cl. 210—772 **10 Claims**

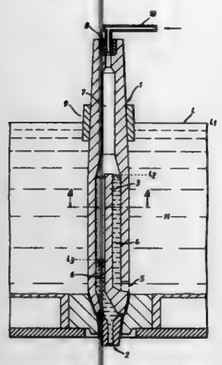
1. A process for continuously applying hot wash solvent to a rotary drum filter used for solvent dewaxing and operated at a filtration temperature in the range of from about −30 ° to about −5° C., said rotary drum filter having a doctor blade and a filter cloth, the improvement which comprises:

discharging wax at said doctor blade;
continuously directing a spray of hot solvent below said doctor blade of said rotary drum filter, said hot solvent having a temperature in the range of from about 75° to about 85° C.;



continuously directing a cold solvent spray below said hot solvent spray to cool said filter cloth back to the filtration temperature, wherein said cold solvent spray is at about the filtration temperature.
2. The process of claim 1 wherein both said hot solvent and said cold solvent comprises MEK.

5,190,674
METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF MOLTEN METALS
James H. Monks, 1 Guisborough Road, Nunthorpe, Middlesborough, Cleveland TS7 0LE, England
PCT No. PCT/GB91/00524, § 371 Date Oct. 3, 1991, § 102(e) Date Oct. 3, 1991, PCT Pub. No. WO91/15320, PCT Pub. Date Dec. 17, 1991
PCT Filed Apr. 4, 1991, Ser. No. 777,403
Claims priority, application United Kingdom, Apr. 4, 1990, 9007618; Dec. 20, 1990, 9027661
Int. Cl.[5] B22D *41/58, 39/06*
U.S. Cl. 222—590 **21 Claims**



1. A method of controlling the rate of flow of molten metal from a holding vessel through a discharge orifice into a receptacle the method comprising
(i) disposing within the holding vessel a flow control chamber comprising a down-flow chamber separate from but in fluid communication with the interior of the holding vessel, the down-flow chamber having an outlet at its lower end, said outlet leading to or forming part of the discharge orifice, and an opening towards or at its upper end;
(ii) applying a gas pressure within the flow control chamber sufficient to allow molten metal from the holding vessel interior to pass through the opening to establish in the lower end of the down-flow chamber a column of the molten metal with a volume of gas occupying the upper end of the flow control chamber and serving to separate the column of molten metal from the opening, whereby an equilibrium is established between molten metal passing through the opening and molten metal passing out through the discharge orifice such that the height of the column of molten metal in the down-flow chamber remains substantially constant; and
(iii) one of reducing said column of gas, thereby increasing the height of the column of molten metal and the flow rate through the discharge orifice or increasing said volume of gas, thereby reducing the height of said column and said flow rate.

5,190,675
GELLING ORGANIC LIQUIDS
J. Mark Gross, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Continuation of Ser. No. 808,133, Dec. 12, 1985, abandoned. This application Jan. 5, 1990, Ser. No. 464,640
Int. Cl.[5] E21B *43/26*; B01J *13/00*
U.S. Cl. 252—8.551 **27 Claims**

22. A method of fracturing a subterranean formation comprising:
(a) preparing a gel, which gel is substantially free of water and pH affecting substances, and which is stable at temperatures of at least 250° F., by mixing by contacting a gellable hydrocarbon liquid with:
(i) a phosphate diester gelling agent prepared by:
(1) reacting a phosphate triester with P_2O_5 so as to produce a corresponding anhydrous polyphosphate;
(2) reacting the anhydrous polyphosphate of step (1) with an alcohol so as to produce the corresponding phosphate diester having one radical from the triester and another from the alcohol; and
(ii) an aluminum alkoxide as an activator having an non-pH-affecting residue;
wherein all of the reagents are substantially free of water and pH-affecting substances;
(b) entraining a hard particulate proppant within the gel; and
(c) pumping the gel down the wellbore into contact with the subterranean formation at sufficient pressure so as to create and/or extend a fracture into the formation.

5,190,676
HIGH-SPEED SPINNING OIL COMPOSITION CONTAINING AN ORGANOPHOSHURIC ESTER SALT AND AN OXYALKYLENE POLYMER
Koichi Yanase, and Masayuki Abe, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Nov. 30, 1990, Ser. No. 620,110
Claims priority, application Japan, Nov. 30, 1989, 1-312531
Int. Cl.[5] D06M *10/08*
U.S. Cl. 252—8.9 **1 Claim**

1. A method for spinning a polyester fiber or acrylic fiber, which comprises applying a high-speed spinning composition to the fiber, wherein the composition consists essentially of components (A), (B) and (C):
(A) an organophosphoric ester salt represented by formula (1):

$$M^+X^- \quad (1)$$

wherein M^+ represents an alkali metal ion, ammonium ion or an amine ion; and X^- represents an anion of an organophosphoric ester represented by formula (2):

$$(R_1—O—(AO)_a)_b—P—(OH)_{3-b} \quad (2)$$

wherein R_1 represents an alkyl or alkenyl group having 8 to 22 carbon atoms; A represents an alkylene group having 2 to 4 carbon atoms; a represents an integer of from 0 to 22; and b is a number equal to 1 or 2;
(B) an oxyalkylene polymer represented by formula (3):

$$B_{11}—O—(AO)_nH \quad (3)$$

wherein R_{11} is a hydrogen atom, an alkyl or alkenyl group having 1 to 20 carbon atoms, an acyl group having 2 to 22 carbon atoms, an aryl group, a polyhydric alcohol group or a silyl group; A represents an alkylene group having 2 to 4 carbon atoms; said oxyalkylene polymer has a molecular weight of 2,000 to 40,000; and
(C) a nonionic surfactant;
wherein said components (A) and (B) are contained in proportions of about 5 to 80% by weight and about 5 to 70% by weight, respectively, based on the solid content of the composition.

5,190,677
METHODS FOR PRODUCING STABILIZED SOLID THIOCARBONATE COMPOSITIONS
Richard L. Pilling, and Donald C. Young, both of Fullerton, Calif., assignors to Union Oil Comany of California, Los Angeles, Calif.
Division of Ser. No. 290,992, Dec. 28, 1988, Pat. No. 5,039,327, which is a continuation-in-part of Ser. No. 253,139, Oct. 4, 1988, Pat. No. 4,908,143, and a continuation-in-part of Ser. No. 260,912, Oct. 21, 1988, Pat. No. 4,908,142. This application Aug. 1, 1991, Ser. No. 738,870
Int. Cl.[5] C10M *135/14*
U.S. Cl. 252—17 **31 Claims**

1. A method for making stabilized solid particles of a thiocarbonate selected from the group consisting of alkali and alkaline earth metal tri- and tetrathiocarbonates, and combinations thereof, said method comprising the steps of:
(1) forming particles of a thiocarbonate selected from alkali and alkaline earth metal tri- and tetrathiocarbonates generally unstable in soil in a water-free medium in which said thiocarbonate is stable and substantially insoluble;
(2) separating said particles from said medium so that said particles are substantially water-free and in an environment which is substantially free of water, CO_2 and O_2; and
(3) dispersing said particles in a matrix selected from the group consisting of water-resistant wax, oil, grease, and combinations thereof in an amount sufficient to increase the stability of said thiocarbonate in soil.

5,190,678
PROCESS FOR THE PREPARATION OF OVER-BASED GROUP 2A METAL SULFONATE GREASES AND THICKENED COMPOSITIONS
Charles J. Swartz, and Bryant J. Hardy, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.
Filed Nov. 2, 1990, Ser. No. 609,324
Int. Cl.[5] C10M *115/10*
U.S. Cl. 252—18 **6 Claims**

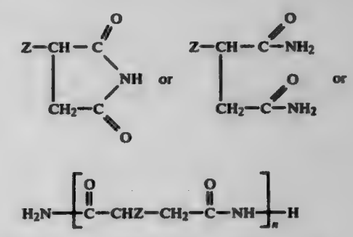
1. A method for the production of overbased metal sulfonate thickened grease with a dropping point of at least 650° F. comprising:
(a) mixing base oil, thickener, catalyst and water containing ingredients in a reaction vessel;
(b) reacting the mixture at a temperature below 210° F. for a time sufficient to reduce the half-scale penetration to a value below 45 mm while venting the vessel to prevent condensation of water within the vessel;
(c) raising the reactor contents to at least 260° F. with constant stirring and dehydrating the reaction mass by removing the catalyst and water without allowing either to condense and re-enter the vessel; then
(d) adding finish oil as necessary to meet penetration and composition targets.

5,190,679
AQUEOUS BASED LOOSENER COMPOSITION ADAPTED FOR REMOVING CABLE FROM A CONDUIT
William P. McDonald, Viroqua, Wis., assignor to American Polywater Corporation, Stillwater, Minn.
Filed Mar. 14, 1991, Ser. No. 669,483
Int. Cl.[5] C10M *3/04*
U.S. Cl. 252—41 **14 Claims**

1. An aqueous based composition for removing cable from a conduit comprising:
(a) about 0.5 to 10 wt % of a lubricating agent selected from the group consisting of a C_8–C_{25} fatty acid salt compound, a polyacrylamide compound having a molecular weight of about 1×10^5 to 20×10^6, and mixtures thereof;
(b) about 5 to 30 wt % of a solvating agent comprising a nonpolar hydrocarbon compound selected from the group consisting of a liquid terpene, a petrochemical hydrocarbon, a liquid halogenated hydrocarbon, and mixtures thereof, wherein said solvating agent softens or dissolves a binding agent present in said conduit which binds said cable to said conduit;
(c) about 0.2 to 5 wt % of a nonionic surfactant;
(d) about 0.1 to 5 wt % of sequestrant; and
(e) a major proportion of water;
wherein the aqueous composition has a pH of about 3 to 12.

5,190,680
FRICTION MODIFIER COMPRISING A LONG CHAIN SUCCINIMIDE DERIVATIVE AND LONG CHAIN ACID AMIDE
John V. Bullen, Feltham, and David K. Walters, Camberley, both of England, assignors to Ethyl Petroleum Additives Ltd., Bracknell, England
Continuation of Ser. No. 487,779, Mar. 5, 1990, Pat. No. 5,021,176. This application Mar. 4, 1991, Ser. No. 664,538
Claims priority, application United Kingdom, Mar. 20, 1989, 8906345
The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.
Int. Cl.[5] C10M *133/16*
U.S. Cl. 252—51.5 A **13 Claims**

1. An oil-soluble friction reducing additive composition which comprises (a) at least one succinimide derivative having the structure



wherein n is an integer from 2 to 4 and wherein Z has the structure $R_1R_2CH—$ wherein R_1 and R_2 are each independently straight or branched chain hydrocarbon groups containing from 1 to 34 carbon atoms and the total number of carbon atoms in the groups R_1 and R_2 is from 11 to 35, and wherein the said succinimide derivative is made by reacting maleic anhydride, maleic acid or maleic ester with a mixture of internal

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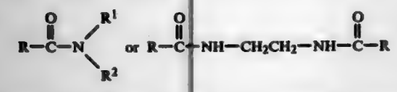
olefins formed by isomerizing linear α-olefins containing from 12 to 36 carbon atoms; and (b) at least one oil-soluble acid amide of the general formula

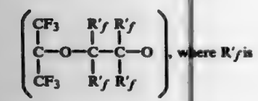


in which each R, which may be the same or different, is hydrogen or alkyl or alkenyl of 1 to 35 carbon atoms, R^1 and R^2 are each hydrogen or alkyl or alkenyl of 1 to 23 carbon atoms or one of R^1 and R^2 is hydrogen and the other is a group RCO— in which R is as defined above.

5,190,681
ANTIRUST ADDITIVES FOR LUBRICANTS OR GREASES BASED ON PERFLUOROPOLYETHERS
Ezio Strepparola, Treviglio; Piero Gavezotti, and Costante Corti, both of Milan, all of Italy, assignors to Ausimont S.r.l., Milan, Italy
Continuation of Ser. No. 335,227, Apr. 10, 1989, abandoned. This application Jan. 17, 1991, Ser. No. 715,692
Claims priority, application Italy, Apr. 13, 1988, 20183 A/88
Int. Cl.[5] C10M *147/04*
U.S. Cl. 252—51.5 R **5 Claims**

1. Antirust additives for greases and lubricating oils based on perfluoropolyethers, consisting of fluoropolyether compounds having at least one of the following repeating units:

(C_3F_6O), $(CH_2CF_2CF_2O)$, and



, where R'_f is

a fluoroalkylene radical, and having at least one end group of formula:

—CFX—CN;

where X is F or CH_3; and the other radical may be a perfluoroalkyl radical having 1 to 3 carbon atoms.

5,190,682
LUBRICANT MIXTURES AND GREASE COMPOSITIONS BASED THEREON
John W. Harris, Oakville, Canada, assignor to Shell Oil Company, Houston, Tex.
Filed Mar. 26, 1992, Ser. No. 857,906
Claims priority, application United Kingdom, May 20, 1991, 9110838
Int. Cl.[5] C10M *107/08, 111/04*
U.S. Cl. 252—56 S **7 Claims**

1. A lubricant mixture for use as a base fluid in open-gear grease consisting essentially of from about 55% w to about 65% w of a liquid polybutene having a viscosity at 38° C. in the range of 1,000 mm^2/s to 20,000 mm^2/s and a viscosity at 100° C. in the range of 40 mm^2/s to 500 mm^2/s, and from about 30% w to about 50% w of a liquid polyalphaolefin having a viscosity at 38° C. in the range of 10 mm^2/s to 75 mm^2/s and a viscosity at 100° C. in the range of 2 mm^2/s to 15 mm^2/s.

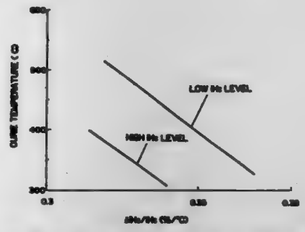
5,190,683
WATER CLARIFICATION COMPOSITION CONTAINING A WATER CLARIFIER COMPONENT AND A FLOC MODIFIER COMPONENT
Eric J. Evain, Mobile, Ala.; Hartley H. Downs, Kingwood, Tex., and Daniel K. Durham, Spring, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Filed Jun. 19, 1990, Ser. No. 540,048
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—60 **9 Claims**

1. A water clarifier composition for aqueous systems having improved floc characteristics comprising:

an effective amount of a water clarifier component selected from the group consisting of dithiocarbamates; and

an effective amount of a floc modifier component selected from the group consisting of amines, alcohols, aminoalcohols, ethers and mixtures thereof, and halogenated adducts thereof.

5,190,684
RARE EARTH CONTAINING RESIN-BONDED MAGNET AND ITS PRODUCTION
Fumitoshi Yamashita, Ikoma, and Masami Wada, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 380,598, Jul. 17, 1989, abandoned. This application Jan. 7, 1991, Ser. No. 638,437
Claims priority, application Japan, Jul. 15, 1988, 63-177809
Int. Cl.[5] C04B *35/04*; H01F *1/053*
U.S. Cl. 252—62.54 **4 Claims**



1. A resin-bonded magnet for use in a permanent motor which comprises a resinous binder and melt quenched magnetically isotropic ferromagnetic alloy particles having a coercive force of 8 to 12 kOe of the formula:

$$Fe_{100-x-y-z}Co_xR_yB_z$$

wherein R is at least one of Nd and Pr, x is an atomic % of not less than 15 and not more than 30, y is an atomic % of not less than 10 and not more than 13 and z is an atomic % of not less than 5 and not more than 8; said ferromagnetic alloy particles uniformly dispersed in said binder.

5,190,685
AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE, ETHANOL AND CYCLOPENTANE
Peter B. Logsdon, North Tonawanda; Leonard M. Stachura, Hamburg; Ellen L. Swan, Ransomville, and Rajat S. Basu, Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Aug. 15, 1990, Ser. No. 567,846
Int. Cl.[5] C11D *7/30, 7/50*; C23G *5/028*; B08B *3/00*
U.S. Cl. 252—171 **28 Claims**

1. Azeotrope-like compositions consisting essentially of from about 51 to about 98.8 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 40 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2-dichloro-1,2,2-trifluoroethane and a mixture of 1,1-dichloro-2,2,2-trifluoroethane and 1,2-dichloro-1,2,2-trifluoroethane, from about 0.1 to about 5 weight percent cyclopentane and from about 0.1 to about 4 weight percent ethanol which boil at about 31.5° C. at 760 mm Hg.

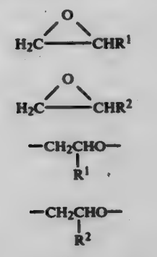
5,190,686
LIQUID-CRYSTALLINE COPOLYMER
Shunji Uchida; Satoshi Hachiya, and Kenji Hashimoto, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan
Filed Aug. 17, 1989, Ser. No. 395,058
Claims priority, application Japan, Aug. 26, 1988, 63-210659; Sep. 5, 1988, 63-220411
Int. Cl.[5] C09K *19/52*; C08G *59/00, 65/08*
U.S. Cl. 252—299.01 **14 Claims**

1. A liquid-crystalline copolymer comprising the copolymerization product of;

(a) at least one liquid-crystalline epoxy compound which has a helical structure and is represented by the following general formula (1) and

(b) at least one liquid-crystalline epoxy compound which has a helical structure opposite in twining direction of helix to the helical structure of the liquid-crystalline epoxy compound (a) and is represented by the following general formula (2),

the copolymerization product comprising at least one repeating unit represented by the following general formula (3) and at least one repeating unit represented by the following general formula (4), wherein the molar ratio of the repeating unit (3) to the repeating unit (4) is from 99:1 to 1:99;



wherein R^1 and R^2 are different from each other and each independently are a group represented by $—(CH_2)_k—OR^3$, wherein

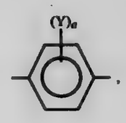
k is an integer having a value of from 1 to 30,

R^3 is a group represented by $—A_p—X—B_q—R^4$, wherein

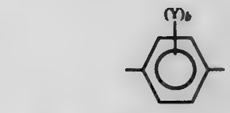
X is a single bond, —COO— or —OCO—,

p and q each independently are an integer having a value of 1 or 2,

A is



B is

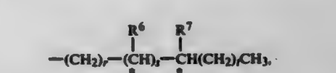


a and b each independently being an integer having a value of from 0 to 4 and being identical with or different from each other, each Y being a halogen atom and being identical with or different from the others,

A and B are identical with or different from each other, and

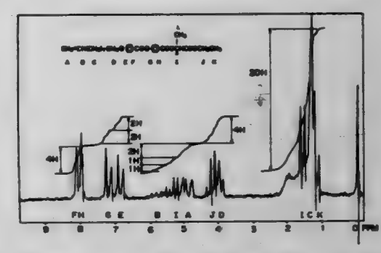
R^4 is —$COOR^5$, —$OCOR^5$ or —OR^5, wherein

R^5 is

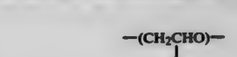


R^6 and R^7 each independently being —CH_3, a halogen atom, —CN or —CF_3, r and t each independently being an integer having a value of from 0 to 10, with the proviso that t is not 0 when R^7 is —CH_3, s being an integer of 0 or 1 and C marked with * is an asymmetric carbon atom.

5,190,687
LIQUID-CRYSTALLINE POLYMERS AND COPOLYMERS
Satoshi Hachiya; Hiroyuki Endo, both of Chiba, and Shunji Uchida, Tokyo, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan
Filed Sep. 28, 1989, Ser. No. 413,625
Claims priority, application Japan, Oct. 5, 1988, 63-249966
Int. Cl.[5] C09K *19/52, 19/10*
U.S. Cl. 252—299.01 **10 Claims**



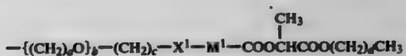
1. A liquid-crystalline polymer having the repeating units represented by the following general formula (II):



(II)

wherein

R^1 is



wherein

a is an integer having a value of 1 to 10,

b is an integer having a value of 0 or 1,

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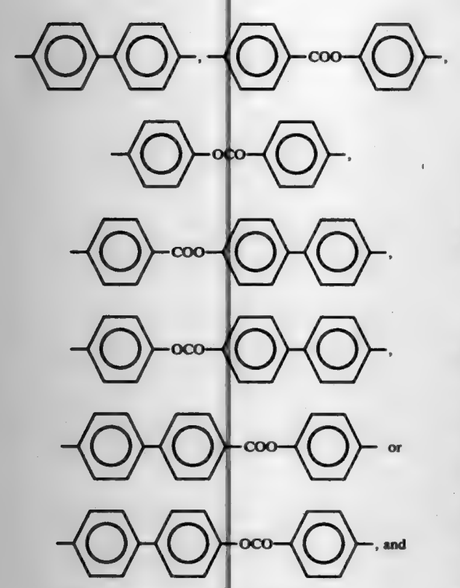
c is an integer having a value of 1 to 30,
X^1 is —COO, —O— or a single bond,
M^1 is



d is an integer having a value of 1 to 5.

5,190,688

LIQUID CRYSTALLINE MIXTURE

Ian C. Sage, Broadstone; Stephen J. Lewis, Bournemouth, and Dominic Chaplin, Bromley, all of Great Britain, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP88/00048, § 371 Date Sep. 30, 1988, § 102(e) Date Sep. 30, 1988, PCT Pub. No. WO88/05803, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 25, 1988, Ser. No. 255,165

Claims priority, application United Kingdom, Jan. 30, 1987, 8702126

Int. Cl.[5] C09K *19/52, 19/34, 19/06, 19/30*

U.S. Cl. 252—299.01 **16 Claims**

1. A liquid crystalline mixture comprising at least two liquid-crystalline compounds which are free of perfluoroalkylene groups and not more than 40% by weight of at least one partially fluorinated additive of formula I

$$R^1—(CH_2)_m—(CF_2)_n—R^2 \qquad I$$

wherein m is 0 to 12, n is 2 to 12 and R^1 and R^2 each signify a group of formula

$$R—(A^1—Z^1)_p—(A^2)_q—Z^2$$

in which

R is F or straight chain alkyl with 1–15 C atoms, it also being possible for one or two non-adjacent CH_2 groups to be replaced by —O—, —CO—, —O—CO—, —CO—O, —O—CO—O—, —C≡C— and/or —CH=CH—,

A^1 and A^2 are in each case (1) an unsubstituted or mono- or polysubstituted 1,4-cyclohexylene group, it also being possible for one or two non-adjacent CH_2 groups to be replaced by —O— and/or —S—, (2) a 1,4-bicyclo[2,2,-2]octylene group, or (3) a 1,4-phenylene group which is unsubstituted or substituted by one or two F and/or Cl atoms and/or CH_3 groups and/or CN groups, it also being possible for one or two CH groups to be replaced by N,

Z^1 is —CO—O—, —O—CO—, —CH_2CH_2—, —CH-CN—CH_2—, —CH_2—CHCN—, —CH=CH—, —C≡C—, —OCH_2—, —CH_2O—, —CH=N—, —N=CH—, —N=N—, —NO=N—, N=NO— or a single bond, is —CO—O—, —O—CO—, —CH_2CH_2—, —CH-CN—CH_2—, —CH_2—CHCN—, —CH=CH, —C≡C—, —OCH_2—, —CH_2O—, —CH=N—, —N=CH=, —N=N—, —NO=N—, —N=NO—, —$(CH_2)_k$—CO—O— or a single bond,

k is 1 to 6,

p is 0, 1 or 2, and

q is 0 or 1,

or one of the groups R^1 and R^2 may also be H, with the proviso that the sum of m+p+q equals 1 to 15.

5,190,689

POLYMER MATERIALS HAVING LIQUID-CRYSTALLINE PHASES

Heino Finkelmann; Friedrich Hessel, both of Freiburg; Rudolf Eidenschink, Münster, and Joachim Krause, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 566,794, Aug. 13, 1990, abandoned, which is a continuation of Ser. No. 912,461, Sep. 29, 1986, abandoned. This application Aug. 16, 1991, Ser. No. 746,219

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534646

Int. Cl.[5] C09K *19/52, 19/34, 19/12, 19/30*

U.S. Cl. 252—299.01 **24 Claims**

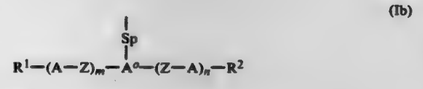
1. A polymer having a liquid crystalline phase and comprising a polymeric backbone to which is bonded mesogenic groups,

said mesogenic groups having the structure (a) a central portion comprising ring groups and optional bridging groups between these ring groups and (b) terminal groups,

said mesogenic groups being bonded to the polymer backbone via a lateral position on one of said rings or via one of said bridging groups and being of the formula

(Ia)

(Ib)



wherein

R^1 and R^2 are each independently C_{3-15}-alkyl or C_{3-15}-alkyl wherein one or two non-adjacent CH_2 groups are replaced with —O—, —CO—, —O—CO—, —CO—O—, —CH=CH— or a combination thereof, or one of the radicals R^1 and R^2 is F, Cl, Br, NCS, NO_2, CN or R^3—A—Z,

R^3 is C_{1-15}-alkyl or C_{1-15}-alkyl wherein one or two non-adjacent CH_2 groups are replaced with —O—, —CO—, —O—CO—, —CO—O—, —CH=CH—, or a combination thereof, or R^3 is F, Cl, Br, NCS or CN,

Sp is a bond or a radical of the formula —Q^1—W^1—Q^2—W^2,

Q^1 and Q^2 independently of one another are each a bond, C_{1-25}-alkylene or C_{1-25}-alkylene wherein one or more non-adjacent CH_2 groups are replaced with —O—, —S— or —N(C_1–C_6-alkyl)—,

W^1 and W^2 independently of one another are each a bond, —O—, —S—, —SO—, —SO_2—, —N(C_1–C_6-alkyl)—, —CO—, —CO—O—, —O—CO—, —O—CO—O—, —CO—S—, —S—CO—, —CO—NH(C_1–C_6-alkyl)—, —NH(C_1–C_6-alkyl)—CO, —O—CO—NH(C_1–C_6-alkyl)—, NH(C_1–C_6-alkyl)—CO—O or C_1–C_6-alkylene,

A in each case is 1,4-cyclohexylene, 1,4-cyclohexylene wherein one or two non-adjacent CH_2 groups are replaced with —O— or —S—, 1,4-cyclohexylene substituted in the 1-position by C_1–C_4-alkyl, F, Cl, Br, CF_3 or CN, 1,4-cyclohexylene 1-substituted by C_{1-4}-alkyl, F, Cl, Br, CF_3 or CN wherein 1 or 2 non-adjacent CH_2 groups on the ring are replaced with —O— or —S—, piperidine-1,4-diyl, 1,4-bicyclo-[2.2.2]octylene, 1,4-phenylene, 1,4-phenylene substituted by one or two of F, Cl, CH_3 or CN, 1,4-phenylene in which one or more CH groups are replaced with N, or 1,4-phenylene substituted by one or two of F, Cl, CH_3 or CN and in which one or more CH groups are replaced with N,

A^0—Sp— is a radical of the formula

(1)

or a radical (1) wherein one or two non-adjacent CH_2 groups are replaced with —O— or —S— (radical A), or one of said radicals (1) or A wherein a —CH_2CH_2— group is replaced with —N=C— or —CH=CH— (radical B)

or one of said radicals (1), A or B which is substituted in the 1-position by C_1–C_4-alkyl, F, Cl, Br, CF_3 or CN,

or A^0—Sp— is a radical (3) of the formula

wherein q is 0 to 2, or a radical (3) wherein one or more CH groups is replaced with N (radical D), or a radical (3) or D which is substituted by one or two of F, Cl, CH_3 or CN,

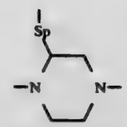
or A^0—Sp— is a radical of the formula

(4)

(5)

-continued

(6)



n and m are each 0 to 3,

Z in each case is independently —CO—O—, —O—CO—, —CH_2CH_2—, —CHCN—CH_2—, —CH_2—CHCN—, —CH=CH—, —OCH_2—, —CH_2O—, —CH=N—, —N=CH, —NO=N, —N=NO— or a single bond, and

Z^0—Sp is —CH_2CHSp—, —CSpCN—CH_2—, —CH-CN—CHSp—, —CSp=CH—, —CHSp—O— or —CSp=N,

with the provisos that m+n is 0 to 3, said mesogenic groups have at least two rings, and m and n are at least one in formula Ib.

5,190,690

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING SAME AND LIQUID CRYSTAL DEVICE USING SAME

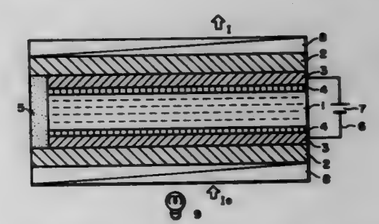
Takao Takiguchi, Tokyo; Takashi Iwaki, Inchara; Takeshi Togano, Yokohama; Yoko Yamada, and Shozo Mori, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,314

Claims priority, application Japan, Apr. 20, 1989, 1-102238

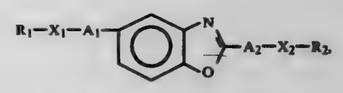
Int. Cl.[5] C09K *19/34;* **G02F** *1/13*

U.S. Cl. 252—299.61 **306 Claims**

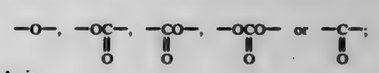


1. A liquid crystal composition comprising at least two mesomorphic compounds, at least one of which is a mesomorphic compound having the following formula (I):

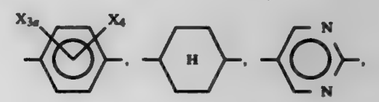
(1)



wherein R_1 and R_2 each is an alkyl group having 1–16 carbon atoms optionally substituted with fluoro or alkoxy group having 2–6 carbon atoms; X_1 and X_2 each is a single bond,



and A_1 is



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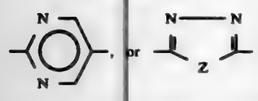
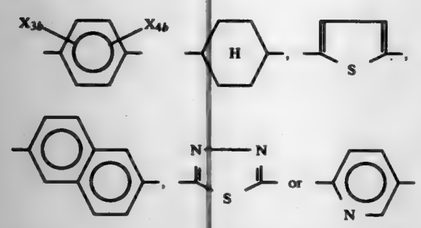


wherein X_3 a and X_4a each is hydrogen or fluorine and Z is —O— or —S—; and A_2 is



wherein X_{3b} and X_{4b} each is hydrogen, fluorine, chlorine, bromine, —CH_3, —CN or —CF_3.

5,190,691

FERROELECTRIC LIQUID CRYSTAL COMPOSITION

Makoto Kikuchi, Kisarazu; Fusayuki Takeshita, Ichihara; Mitsuyoshi Ichihashi, Fukuoka; Kanetsugu Terashima, Ichihara, and Kenji Furukawa, Yokosuka, all of Japan, assignors to Chisso Corporation, Tokyo, Japan

Filed Aug. 2, 1989, Ser. No. 388,500

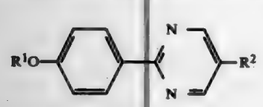
Claims priority, application Japan, Aug. 3, 1988, 63-192663

Int. Cl.[5] C09K *19/34, 19/12, 19/20;* **G02F** *1/13*

U.S. Cl. 252—299.61 **12 Claims**

1. A ferroelectric liquid crystal composition having quick response property comprising at least each of:

a component A of one or more compounds selected from the group consisting of compounds of the formula (I):



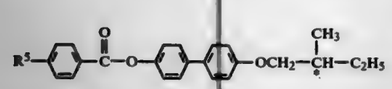
(I)

wherein R^1 and R^2, which may be the same or different, each represents an alkyl group having 1 to 18 carbon atoms; and compounds of the formula (II):

(II)

wherein R^3 and R^4, which may be the same or different, each represents an alkyl group or an alkoxy group having 1 to 18 carbon atoms;

component B being a compound expressed by formula (III):



(III)

wherein R^5 represents an alkyl group or alkoxy group each having 1 to 18 carbon atoms, and * indicates an asymmetric carbon atom;

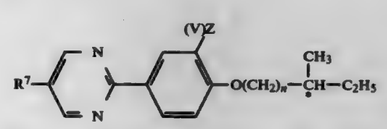
component C being a compound expressed by the formula (IV):

(IV)

wherein R^6 represents an alkyl group or alkoxy group each having 1 to 18 carbon atoms, X represents

Y represents a hydrogen atom or a halogen atom, and * indicates an asymmetric carbon atom; and

component D being a compound expressed by the formula (V):



(V)

wherein R^7 represents an alkyl group or alkoxy group each having 1 to 18 carbon atoms, n is an integer of 0 to 10, Z represents a hydrogen atom or a halogen atom, and * indicates an asymmetric carbon atom and the proportion of said component A being 20 to 80 wt. %, that of said component B being 5 to 30 wt. %, that of said component C being 3 to 10 wt. %, that of said component D being 3 to 20 wt. %, based on the total amount of said four components A, B, C and D, and the phase transition series of said composition assumes an order of isotropic liquid→cholesteric phase→chiral smectic C phase, starting from the high temperature side.

5,190,692

FOUR RING ESTERS AND ETHERS

David Coates, Dorset, and Simon Greenfield, Poole, both of Great Britain, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

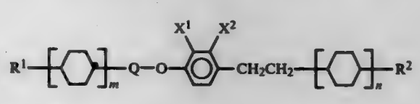
Filed Mar. 13, 1990, Ser. No. 492,144

Claims priority, application United Kingdom, Mar. 14, 1989, 8905840

Int. Cl.[5] C09K *19/30;* **C07C** *69/76, 41/00*

U.S. Cl. 252—299.63 **15 Claims**

1. A four ring ester or ether of the formula I



(I)

wherein

R^1 and R^2 each independently are (i) C_{1-9}-alkyl, (ii) C_{1-9}-alkyl wherein one CH_2 group is replaced by oxygen, or (iii) C_{2-9}-alkenyl, when one CH_2 group is replaced by oxygen,

m and n are each 1 or 2, the sum of m and n being 3, X^1 and X^2 are each hydrogen or fluorine, and

Q is —CH_2— or —CO—, with the proviso that if m=2, then (a) Q is CH_2, (b) at least one of X^1 and X^2 is F, or (c) both Q is CH_2 and at least one of X^1 and X^2 is F.

5,190,693

STABLE AQUEOUS SUSPENSIONS OF INORGANIC SILICA-BASED MATERIALS INSOLUBLE IN WATER

Pier D. Mattioli, Saronno; Angelo Testorio, Novara, and Claudio Troglia, Milan, all of Italy, assignors to Ausidet S.p.A., Milan, Italy

Continuation of Ser. No. 227,781, Aug. 3, 1988, abandoned. This application Feb. 21, 1991, Ser. No. 660,156

Int. Cl.[5] B01J *13/00;* **C11D** *17/08, 17/00*

U.S. Cl. 252—313.1 **10 Claims**

1. Aqueous suspensions of silica-based inorganic materials, insoluble in water and in a finely subdivided form, wherein the silica-based inorganic material corresponds to the formula:

$$(Cat_{2/n}O)_x Me_2O_3(SiO_2)_y(H_2O)_w \quad \text{(III)}$$

and the amount of inorganic material, based on silica, is from 30% to 70% by weight and wherein:

Cat represents a cation of valency n, exchangeable with Ca;

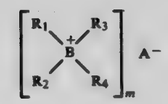
x is a number between 0.7 and 1.5;

Me represents boron or aluminum;

y is a number between 1.3 and 4; and

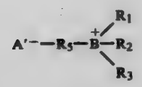
w is a number from 0 to 10,

stabilized with from 0.01% to 5% by weight, with respect to the suspension, of at least one polymeric macromolecular organic compound, having a molecular weight greater than 1500 and containing hydroxylic groups selected from the group consisting of GUAR gum, XANTHANE gum and mixtures thereof, and with from 0.001% to 0.5% by weight, with respect to the suspension, of surfactant consisting of an ammonium quaternary compound selected from the group consisting of:



(I)

or



(II)

B is nitrogen;

A^- is an anion of halogens, organic acids, inorganic acids, or a hydroxyl anion;

A' is —SO_3^- or —COO^-;

m is an integer equal to the valency of anion A^-;

R_1, R_2, R_3 and R_4, equal to or different from each other, are selected from the group consisting of an alkyl radical containing from 1 to 20 C atoms; an aryl radical; an aryl radical substituted with from 1 to 6 alkyl radicals containing from 1 to 4 C atoms; an aryl-alkylene radical; a polyoxyalkylene radical H(O—R_6)p, R_6 being a linear or a branched alkylene radical containing from 1 to 6 C atoms, 'p' being an integer between 2 and 50; a phenylpolyoxyalkylene radical or an alkylenepolyoxyalkylene radical, containing from 1 to 4 C atoms in the alkylene chain and from 1 to 6 C atoms in the oxyalkylene chain; with the proviso that R_1, R_2, R_3 and R_4 may combine with each other and a N atom to form a heterocyclic ring, provided at least one of the R_1, R_2, R_3 and R_4 radicals contain a polyoxyalkylene radical and R_5 is a linear or branched alkylene radical containing from 1 to 20 C atoms.

5,190,694

ARTICLE FOR SUPPRESSING FOAM AND METHOD FOR SUPPRESSING FOAM

Rainer Osberghaus, Duesseldorf; Franz Krause, Hilden, and Bernfrid Scheller, Pulheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

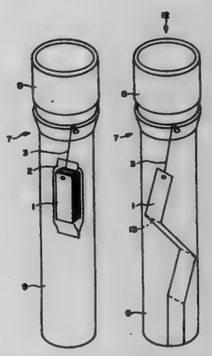
PCT No. PCT/EP89/00433, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO89/10178, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 21, 1989, Ser. No. 613,488

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3814707

Int. Cl.[5] D21H *21/12*

U.S. Cl. 252—321 **18 Claims**



13. An article of claim 1 wherein the fabric is a fabric selected from the group consisting of knitted, woven or non-woven fabric.

5,190,695

METHODS TO PRODUCE SOLID ELECTROLYTE AND SOLID ELECTRODE COMPOSITES

Tadashi Sotomura, Kashiwara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 28, 1991, Ser. No. 706,234

Claims priority, application Japan, May 28, 1990, 2-137807; May 28, 1990, 2-137808; May 28, 1990, 2-137809; May 28, 1990, 2-137810; May 28, 1990, 2-137811; May 28, 1990, 2-137812; May 28, 1990, 2-137813; May 28, 1990, 2-137814; May 28, 1990, 2-137815; May 28, 1990, 2-137816

Int. Cl.[5] H01B *1/22*

U.S. Cl. 252—500 **4 Claims**

1. A method for making a solid electrolyte composite comprising: dispersing solid electrolyte powders in a solvent in which plastic resin is dissolved to form a slurry; and, removing said solvent from said slurry, wherein from 0.1 to 20 percent based upon the total weight of the resultant slurry of a compound selected from the group consisting of (a) to (e) is included in said slurry:

(a) a cationic surfactant having both or either of ethylene-oxide chains or propylene-oxide chains containing 1 to 50 ethylene-oxide or propylene-oxide units per one mol of said cationic surfactant;

(b) a cationic surfactant having ethylene-oxide chains and butylene-oxide chains containing 1 to 50 ethylene oxide or butylene-oxide unit per one mol of said cationic surfactant;

(c) a polyether compound produced by adding both or either of ethylene-oxide and propylene-oxide to a polyamine compound in an amount of 2 to 150 moles per one active hydrogen atom of said polyamine compound;

(d) a polyether compound produced by adding both ethy-

VOL 1148 ISS 1 MR 2 1993 UMI

lene-oxide and butylene-oxide to a polyamine compound in an amount of 2 to 150 moles per one active hydrogen atom of the polyamine compound;

(e) an amide compound produced by dehydration and condensation reaction between polyalkylene-imine and fatty acid which contains 8 to 160 nitrogen atoms per one molecule, wherein the polyalkyleneimine to fatty acid mol ratio is 1/1 to 1/80.

5,190,696

PROCESS FOR PREPARATION OF CARBONACEOUS MOLDED BODY HAVING EXCELLENT COMPRESSIVE ELASTICITY

Masaki Fujii, Sakai, and Masanori Minohata, Izumi, both of Japan, assignors to Kao Oil Company, Limited, Tokyo, Japan

PCT No. PCT/JP90/00143, § 371 Date Oct. 5, 1990, § 102(e) Date Oct. 5, 1990, PCT Pub. No. WO90/09346, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 6, 1990, Ser. No. 582,837

Claims priority, application Japan, Feb. 7, 1989, 1-27874; Feb. 7, 1989, 1-27875

Int. Cl.[5] H01B *1/04*; C01B *31/00*

U.S. Cl. 252—502 **10 Claims**

1. A process for preparing a carbonaceous molded body, comprising the steps of:

mixing elastic graphite particles with a powdery binder selected from the group consisting of pitches, thermoplastic resins and thermosetting resins; wherein said powdery binder is contained in an amount of 0.1 to 5 parts by weight per part by weight of said elastic graphite particles;

molding the thus obtained mixture to form a first molded body;

pulverizing the first molded body to obtain pulverized graphite; and

molding the thus obtained pulverized graphite to form a second molded body to thereby obtain a carbonaceous molded body having a light weight and an excellent elasticity, which has a bulk density lower than 1.0 g/cm^3 and a recovery ratio of 50% or more at a compressibility of 5 to 50%.

5,190,697

PROCESS OF MAKING A PTC COMPOSITION BY GRAFTING METHOD USING TWO DIFFERENT CRYSTALLINE POLYMERS AND CARBON PARTICLES

Kunakazu Ohkita, Chiba; Akira Ueno, Yokohama; Toshiaki Abe, and Shoichi Sugaya, both of Tokyo, all of Japan, assignors to Daito Communication Apparatus Co., Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,249

Claims priority, application Japan, Dec. 27, 1989, 1-339560

Int. Cl.[5] H01B *1/24*, *1/06*

U.S. Cl. 252—511 **13 Claims**

1. A method of producing a PTC (positive temperature coefficient) composition comprising:

mixing at least a first and a second crystalline polymer together with conductive carbon particles to produce a first mixture of polymers having a number of tertiary hydrogen atoms greater than 1.5 per 1000° C. on the average;

said first crystalline polymer being a highly crystallized crystalline polymer selected from the group consisting of high density polyethylene, polyesters, fluorine-containing polymers, and mixtures thereof, the amount of said first crystalline polymer being sufficient to impart PTC properties of self-resetting and overcurrent protection to said composition;

said second crystalline polymer being selected from the group consisting of low density polyethylene and medium density polyethylene, said second crystalline polymer being present in an amount to provide sufficient tertiary hydrogen atoms so that the composition can graft to said carbon particles and thus disperse said carbon particles throughout said composition;

heating said first mixture;

mixing an organic peroxide into the heated first mixture to form a second mixture;

said organic peroxide being present in sufficient amount and being effective to convert a part of said polymer in said first mixture to a polymer having unpaired electrons;

disintegrating an aggregate of said carbon particles by means of grafting said polymer having unpaired electrons to said carbon particles; and

said grafting being effective for dispersing said disintegrated carbon particles throughout said second mixture.

5,190,698

POLY(ALKYLENE OXIDE)VINYL CARBOXYLIC ESTER CONTAINING POLYMER/INORGANIC OXIDE COMPOSITES AND METHODS OF MAKING

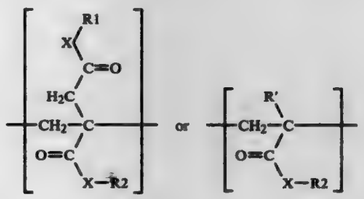
Bradley K. Coltrain; Neil T. Ferrar, both of Fairport; Christine J. T. Landry, Honeoye Falls, and S. R. Turner, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1991, Ser. No. 685,319

Int. Cl.[5] W01B *1/06*

U.S. Cl. 252—518 **4 Claims**

1. A process of forming a composite having between about one to about 60 weight percent of metal oxide of 1) a polymer containing repeating units derived from a vinyl carboxylic ester having at least one organo terminated poly(alkylene oxide) side chain with the proviso that the poly(alkylene oxide) is present in an amount greater than 35 mole percent of the total of all backbone monomer units and alkylene oxide units in the polymer wherein said polymer can be represented by repeating units having the formula:



wherein at least one of R^1 and R^2 represents -(R3-O)$_n$-R4 wherein n is an integer from 0 to about 50 and the other of R^1 and R^2, as well as R′ is independently selected from the group consisting of hydrogen, methyl and ethyl; X is oxygen, nitrogen or sulfur;

wherein in the units -(R3-O)n-R4, each R^3 is randomly selected from straight or branched chain alkylene having from 2 to 4 carbon atoms, and R^4 is selected from the group consisting of hydrogen, alkyl, alkyenyl, haloalkyl, phenyl and substituted aromatic wherein said substituents are selected from the group consisting of halogen; amino groups; thio containing groups; nitro or nitroaromatic group; and terminally halogen substituted alkyl groups;

and 2) a metal oxide, said method comprising the steps of:

combining said polymer and a metal oxide precursor in a solvent solution;

casting or coating said solution into a substrate;

curing the resulting sample to form a composite of said polymer having organo terminated poly(alkylene oxide) side chains and said metal oxide.

5,190,699

CITRIC ACID FATTY ALCOHOL ESTER POLYGLYCOL ETHER SULFOSUCCINATES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Elke Hohn; Hans-Jürgen Kohle, both of Schlüchern; Georg-Friedrich Urban, Bensheim; Joachim Weigand, Freigericht, and Christl Möller, Steinau a.d. Str., all of Fed. Rep. of Germany, assignors to REWO Chemische Werke GmbH, Steinau an der Strasse, Fed. Rep. of Germany

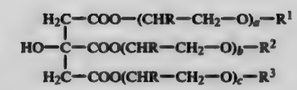
Filed Apr. 6, 1992, Ser. No. 863,832

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1991, 4111811

Int. Cl.[5] A61K *7/075*, *7/50*; C11D *1/06*, *1/26*

U.S. Cl. 252—557 **14 Claims**

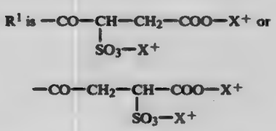
1. A citric acid fatty alcohol ester polyglycol ether sulfosuccinate of the general formula (1)



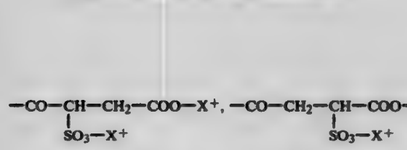
(1)

in which

each R is the same or different and is H or —CH$_3$;



R^2 is selected from the group consisting of



—H, and alkyl and acyl radicals having 8–22 carbon atoms, which radicals are optionally substituted and optionally contain one or more multiple bonds;

R^3 is an alkyl or acyl radical having 8–22 carbon atoms, which is optionally substituted and optionally contains multiple bonds;

a and b, which are identical or different, are each 0–5, provided that the sum of (a+b) is at least 1;

c is 0–15; and

X^+ is in each occurrence H^+ or a cation.

12. An aqueous washing-up liquid, comprising

a) 1–10 parts by weight of at least one compound of the general formula (1) of claim 1;

b) 1–30 parts by weight of at least one surfactant selected from the group consisting of nonionic, amphoteric, zwitterionic and anionic surfactants; and

c) optionally 0.1–10 parts by weight of one or more components selected from the following thickeners, fragrances, preservatives, colorants, vegetable extracts and other additives and auxiliaries and optionally

d) water to 100.

5,190,700

FLAME RETARDANT FOR HALOGEN-CONTAINING VINYL RESINS

Yoshitane Watanabe, Funabashi; Keitaro Suzuki, Toyama; Kouji Shishido, Kazukabe, and Masayuki Teramishi, Ichihara, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 311,524, Feb. 16, 1989, abandoned. This application Aug. 29, 1990, Ser. No. 574,606

Claims priority, application Japan, Feb. 25, 1988, 63-42640

Int. Cl.[5] C09K *21/02*

U.S. Cl. 252—609 **31 Claims**

1. A powder flame retardant for a halogen-containing Vinyl resin, comprising 100 parts by weight of antimony pentoxide and

(A) 5 to 30 parts by weight of at least one of an alkali metal in the form of a compound, wherein said alkali metal is selected from the group consisting of lithium, sodium and potassium, said parts of said compound being calculated as M_2O where M is said alkali metal;

(B) 0.2 to 10 parts by weight of perchloric acid radical in the form of an acid, salt or amine thereof, calculated as perchloric acid radical; and

(C) 1 to 50 parts by weight of a hydrophobic dispersing agent having a boiling point or a decomposition temperature of 200° C. or higher; all of said parts by weight being based on 100 parts by weight of antimony pentoxide.

5,190,701

METHOD AND EQUIPMENT FOR MICROATOMIZING LIQUIDS, PREFERABLY MELTS

Hans-Gunnar Larsson, Västerås, Sweden, assignor to H.G. Tech AB, Västerås, Sweden

Continuation of Ser. No. 488,032, May 23, 1990, abandoned. This application Jan. 6, 1992, Ser. No. 818,462

Claims priority, application Sweden, Dec. 9, 1987, 8704905

Int. Cl.[5] B29B *9/08*

U.S. Cl. 264—8 **13 Claims**

1. A method for atomizing a liquid to form a fine powder, comprising the steps of:

mixing said liquid with a first fluid medium jet, causing said liquid to be disintegrated into fine particles;

projecting, at a high rate of speed, said first fluid medium jet containing disintegrated liquid into a barrier means comprising a solid body, such that said first fluid medium jet and fine particles diverge away from and around said barrier means, thus increasing contact surface between said first fluid medium jet and said liquid and increasing intermixing therebetween;

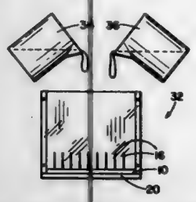
after diverging, solidifying said disintegrated liquid into a fine powder downstream of said barrier means; and

subjecting said solid body to cooling so as to deposit a solidified layer of atomized melt thereon and protect the body from attack by the liquid being atomized, said body being stationary or rotating.

5. Apparatus for atomizing a liquid to form a fine powder, comprising:

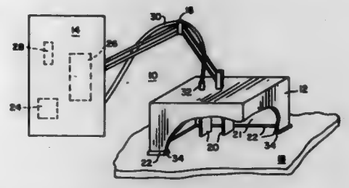
a casting box for a liquid to be atomized comprising a metal melt, said casting box including means for tapping a liquid stream or pool to be atomized;
first nozzle means connected with a source of fluid for providing a first fluid medium jet adapted, in conjunction with said tapping means, for tapping and mixing with the liquid stream or pool to be atomized;
a barrier means oriented with respect to said first nozzle means so that it is in the path of the first fluid medium jet, said barrier means adapted for causing divergence of said first fluid medium jet away from and around said barrier means, and comprising a solid body, a second nozzle means connected to a source of fluid and oriented for directing a second fluid medium jet in a direction substantially 180° to the first fluid medium jet, or both said solid body and said second nozzle means, and
means for solidifying atomized metal melt downstream of said barrier means,
wherein said barrier means is provided with at least one auxiliary nozzle connected to a source of fluid for preventing liquid from coming into contact with particular parts of the nozzle or solid body.

5,190,702
METHOD OF MAKING A MOLD FOR MANUFACTURING DENTAL APPLIANCES
William B. Johnson, 5010 E. 68th St., Ste. 104, Tulsa, Okla. 74136
Division of Ser. No. 640,045, Jan. 1, 1991, Pat. No. 5,089,183. This application Sep. 9, 1991, Ser. No. 756,788
Int. Cl.[5] A61C *13/00*; B29C *41/00, 33/40*
U.S. Cl. 264—16 4 Claims



1. A method of making a mold for use in the manufacture of appliances for use in filling endodontically prepared root canals comprising:
(a) drilling into a flat base member a plurality of spaced apart holes:
(b) inserting into each of said holes in said base member elongated metal patterns each having substantially the desired configuration of a filler covered carrier shaft portion of an endodontic appliance;
(c) forming a vessel with said base member as the bottom thereof and with said patterns extending upwardly therefrom;
(d) pouring liquid plastic and catalyst into said vessel to fill said vessel to a depth at least to fully cover said patterns extending upwardly therein;
(e) allowing said plastic having said catalyst mixed therewith to solidify to form a mold; and
(f) removing said mold from said vessel and from said base, the mold having a cavity therein for each of said patterns, each cavity being useful for forming an appliance therein.

5,190,703
PLASMA REACTOR CHAMBER
Peter W. Rose, and Stephen L. Kaplan, both of San Carlos, Calif., assignors to Himont, Incorporated, Foster City, Calif.
Filed Dec. 24, 1990, Ser. No. 633,547
Int. Cl.[5] C23C *16/50*
U.S. Cl. 264—22 21 Claims

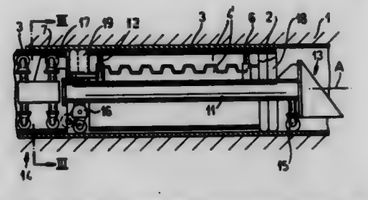


1. A plasma reactor comprising:
a reactor chamber being formed by at least one chamber wall, said chamber wall having a treatment opening formed therein, said opening being identified by edges of said chamber wall;
a vacuum seal being disposed upon said edges of said chamber wall to surround said opening;
a plasma generation means having first portions thereof that are disposed within said chamber and functioning to create a plasma within said chamber;
whereby said chamber wall with said seal disposed thereon may be placed upon a treatment surface to form an enclosed plasma reactor vessel wherein a plasma may be struck to treat said treatment surface.
11. A method for treating a portion of a surface with a plasma, comprising:
placing a portion of a surface to be treated proximate an opening in a wall of a plasma reactor chamber, said chamber having a seal engaged to said wall and surrounding said opening, said seal being disposed to surround and sealingly engage said portion of said surface;
creating a plasma within said reactor chamber, whereby said portion of said surface will be exposed to said plasma for treatment.

5,190,704
SURFACE TREATING METHOD FOR THERMOPLASTIC RESIN MOLDED ARTICLES
Kohichiroh Katoh, Abiko; Motomi Nogiwa, Zushi, and Yoshiharu Iwasaki, Yokohama, all of Japan, assignors to Agency of Industrial Science and Technology and Nippon Petrochemical Company, Limited, both of Tokyo, Japan
PCT No. PCT/JP91/00068, § 371 Date Nov. 22, 1991, § 102(e) Date Nov. 22, 1991, PCT Pub. No. WO91/11483, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 23, 1991, Ser. No. 768,517
Claims priority, application Japan, Jan. 23, 1990, 2-11810
Int. Cl.[5] B29C *71/04*
U.S. Cl. 264—22 3 Claims

1. A method for surface treating a thermoplastic resin molded article comprising radiating a molded article with ultraviolet light having a wavelength no longer than 300 nm, said molded article formed from a composition which includes:
(A) 50% to 95% by weight of a thermoplastic resin; and
(B) 5% to 50% by weight of a functionalized polyolefin resin, said resin functionalized by at least one member selected from the group consisting of a monomer containing a carboxylic acid group, a monomer containing a carboxylic ester group, a monomer containing an acid anhydride group, epoxy group-containing monomers, hydroxyl group-containing monomers, amino group-containing monomers, alkenyl cyclic iminoether derivatives and polyfunctional monomers.

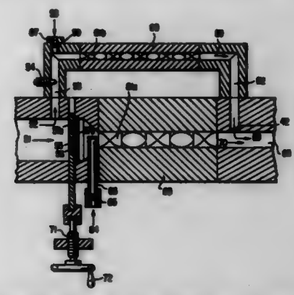
5,190,705
METHOD FOR LINING LARGE-DIAMETER PIPES
Leo Corazza, Sonnenbergstrasse 52, CH-9030 Abtwil, Switzerland
Filed Sep. 13, 1991, Ser. No. 759,218
Claims priority, application Switzerland, Sep. 14, 1990, 02975/90
Int. Cl.[5] B28B *1/16*; B32B *31/06, 35/00*; F16L *55/18*
U.S. Cl. 264—36 3 Claims



1. A method of repairing an underground large-diameter pipe having an inner surface and a horizontal center axis the method comprising the steps of sequentially:
a) cleaning and smoothing the inner surface of the pipe;
b) supporting with props carried on a movable carriage, inside the pipe and spaced inward from the inner surface of the pipe, a lining having a shape conforming to a shape of the inner surface and formed of a plurality of lining sections of a durable synthetic resin, the lining being tubular and forming with the inner surface an annular space having open ends;
c) temporarily blocking both open ends of the space;
c) injecting into an upper region of the space a hardenable mass, so that the mass flows down in the space and displaces air therein, and substantially completely filing the space with the mass while venting the displaced air through holes in the lining to prevent formation of voids in the mass;
e) curing the mass into a first composite lining in which the lining sections are imbedded in the mass;
f) unblocking the ends of the space and removing the props by moving the movable carriage located inside the pipe;
g) moving the carriage to a second location adjacent the first composite lining and repeating step b), but with one end of the space being blocked by the first composite lining and only the other end of the space being open;
h) temporarily blocking the other open end of the space and then repeating steps d) and e) in the space at the second location to form a second composite lining adjacent and contiguous with the first composite lining; and
i) unblocking the other end of the space and removing the props by moving the movable carriage located inside the pipe.

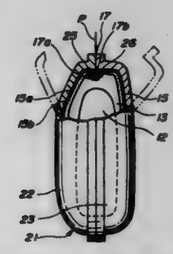
5,190,706
METHOD FOR MAKING MULTICOLORED FOAM AND PRODUCT THEREOF
Dennis A. Kaase, West Barnstaple, Mass., assignor to Sealed Air Corporation, Saddle Brook, N.J.
Continuation of Ser. No. 162,792, Feb. 26, 1988, Pat. No. 4,919,864. This application Apr. 24, 1990, Ser. No. 513,974
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—45.9 10 Claims

1. A process for making a multicolored foam product comprising selected portions possessing different properties, said process comprising:
passing thermoplastic material into a means for extruding plastic material;
separating a first portion of said material from a second portion of said material by passing a first portion of said material through plate means comprising at least one adjustably sized aperture for creating a pressure drop across said plate means, said first portion of material passing into a passage for conveying said material to an exit orifice, whereby adjustment of the size of said at least one aperture diverts a required amount of said thermoplastic material into a second means for conveying material to said exit orifice, said material passing through said second means comprising said second portion of said material;
adding a coloring material to at least one of said first portion of material and said second portion of material while said first portion of material and said second portion of material are separated;
passing said second portion of material into said passage from at least one position at the perimeter of the passage



closely adjacent said exit orifice, said second material passing onto a selected portion of said first material flowing longitudinally through the exit orifice, concurrently with said first material;
continuously extruding said first and second portions of said material through the exit orifice concurrently without substantial mixing; and
foaming the material, said second material covering only said selected portion of the surface of the first material, leaving substantial portions of the surface of the first material uncovered and thereby forming a multicolored foam product.

5,190,707
METHOD OF MOLDING SKIN-COVERED FOAMED ARTICLE
Norio Yanagishita, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan
Filed Oct. 29, 1991, Ser. No. 783,774
Claims priority, application Japan, Oct. 30, 1990, 2-293191
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.6 8 Claims



1. A method of molding a skin-covered article, comprising by steps:
(a) putting an outer skin member having an opening to a mold;
(b) putting a frame in said outer skin member;

(c) setting a pair of wires at an end portion of said outer skin member, said wires having elastic properties and end portions of said wires being secured to said mold such that said elastic properties act to tightly close the opening;
(d) pouring a liquid foamable material in said outer skin member upon opening the opening;
(e) closing the opening and said mold and curing said liquid foamable material; and
(f) removing said wires from said outer skin member.

5,190,708
METHOD FOR THE REALIZATION OF A CERAMIC TILE, GLAZED OR ENAMELLED
Sillingardi Vitaliano, Bologna, and Ranuzzi Paolo, Spezzano Di Fiorano (MO), both of Italy, assignors to Azienda S.R.L., R. P. Color S.R.L., Bologna, Italy
Filed Aug. 25, 1987, Ser. No. 89,327
Claims priority, application Italy, Sep. 24, 1986, 3517 A/86; Mar. 5, 1987, 3373 A/87
Int. Cl.[5] C04B *33/34*
U.S. Cl. 264—62 8 Claims

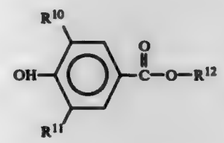
1. Method for producing a glazed or enamelled ceramic tile from a crude ceramic tile made of a clay material, said method comprising: applying a layer of frit, consisting essentially of monolithic granules of a spheroidal form, on the facing of the crude tile, placing the frit containing tile in a kiln for essiccation, raising the temperature of the frit containing tile to a level where said clay material is essiccated while said frit is melted, surface tension maintaining the spherical shape of said frit, further firing the tile to convert the frit to a glaze or enamel coating, producing a glazed or enameled tile, and cooling said tile.

5,190,709
REACTION INJECTION MOLDING OF CERAMICS USING A CERAMIC PRECURSOR AS A BINDER
Alexander Lukacs, III, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Continuation of Ser. No. 843,776, Feb. 28, 1992, abandoned, which is a continuation of Ser. No. 675,010, Mar. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 373,305, Jun. 29, 1989, abandoned. This application Jun. 26, 1992, Ser. No. 905,484
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—63 13 Claims

1. A process for preparing a sintered ceramic article comprising:
(a) injecting into a heated mold a fluid, solvent-free, non-dilatant mixture comprising at least 40% by volume of a ceramic powder, a metal powder or mixtures thereof, and a curable poly(thio)ureasilazane binder that is a liquid below its curing temperature, to cure the binder and produce a hardened molded article,
(b) heating the hardened molded article under a suitable atmosphere to a temperature sufficient to convert the cured binder to a ceramic and
(c) sintering the article to the desired density.

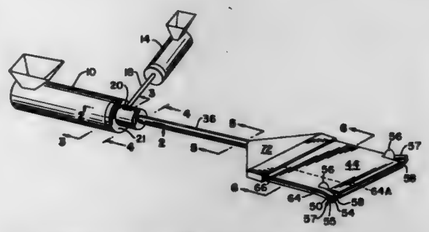
5,190,710
METHOD FOR IMPARTING IMPROVED DISCOLORATION RESISTANCE TO ARTICLES
George Kletecka, Fairview Park, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Feb. 22, 1991, Ser. No. 659,213
Int. Cl.[5] D01F *1/04, 1/06*
U.S. Cl. 264—78 9 Claims

1. A method for imparting improved discoloration resistance to an article made from thin film or monofilament of a polyolefin, comprising,
(i) incorporating into a melt from which said film or fiber is formed, an effective amount, sufficient to color the article but not more than 2 phr, of a blue or green phthalocyanine pigment, or a red azo or disazo pigment, in combination with two primary stabilizers substantially free of secondary stabilizers, so as to produce a pigmented article for outdoor use, said combination of primary stabilizers consisting essentially of
(a) a piperidyl-based (PDYL) hindered amine light stabilizer (HALS) having a molecular structure containing at least two polysubstituted piperidyl groups; and,
(b) a 3,5-di-substituted-4-hydroxybenzoate having the structure



wherein
R^{10} and R^{11} each represent a substituent selected from the group consisting of C_1–C_{12} alkyl, phenyl, naphthyl, C_4–C_{12} cycloalkyl, and C_1–C_8 alkyl-substituted cycloalkyl, each alkyl substituent being C_1–C_8; and,
R^{12} represents a hydrocarbyl group selected from the group consisting of C_{10}–C_{24} alkyl, C_4–C_{12} cycloalkyl, C_1–C_8 alkyl-substituted independently represent C_1–C_{24} alkyl, C_4–C_8 cycloalkyl, and C_1–C_8 alkyl-substituted cycloalkyl; and,
(ii) extruding said melt to form said monofilament having a diameter less than 50 microns, or said thin film having a thickness less than 50 microns; whereby said monofilament and said thin film fail to exhibit objectionable change of visible color over a period of at least ten years in normal use.

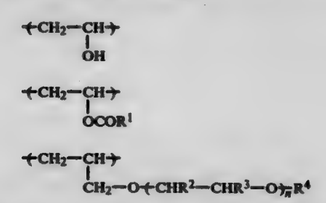
5,190,711
METHODS FOR PROCESSING POLYMERS
Robert J. Blemberg, Appleton, Wis., assignor to American National Can Company
Continuation of Ser. No. 204,485, Jun. 9, 1988, abandoned. This application Apr. 18, 1991, Ser. No. 687,765
Int. Cl.[5] B29C *47/06, 47/92*
U.S. Cl. 264—171 23 Claims



1. A method of processing polymers comprising:
(a) plasticating a first polymeric composition and thereby forming a first polymeric melt stream having first viscosity;
(b) encapsulating said first polymeric melt stream in a second melt stream having a second viscosity lower than said first viscosity by at least about 20 percent, to thereby form a composite melt stream, with said second melt stream forming a continuous layer about the circumference of, and positioned outwardly of, said first melt stream, said first melt stream being completely enclosed by said second melt stream; and
(c) passing said composite melt stream into and through a transfer means of sufficient length and symmetry to reduce any thickness variations of at least 10% in said second melt stream about the circumference of said composite melt stream by at least about 50% of the variation
(d) feeding said composite melt stream through an extrusion die.

5,190,712
METHOD FOR MELT-MOLDING WATER-SOLUBLE VINYL ALCOHOL POLYMERS
Tsukasa Oishi, Mukou; Toru Seki, Ibaraki, and Takuya Honda, Hirakata, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Continuation-in-part of Ser. No. 635,447, Dec. 28, 1990, abandoned. This application Aug. 30, 1991, Ser. No. 753,165
Claims priority, application Japan, Dec. 29, 1989, 1-340839
Int. Cl.[5] B29C *45/72, 47/38;* C08F *16/06*
U.S. Cl. 264—211.230 5 Claims

1. . A method for melt-molding a water-soluble vinyl alcohol copolymer which comprises melt-molding a water-soluble, oxyalkylene group-containing vinyl alcohol copolymer under substantially anhydrous conditions, and substantially in the absence of plasticizers, said copolymer comprising a vinyl alcohol unit (A), a vinyl ester unit (B) and an oxyalkylene allyl ether unit (C) of the formulas:



(A)

(B)

(C)

wherein R^1 in (B) is an alkyl group; R^2 and R_3 in (C) each is a hydrogen atom or an alkyl group; R^4 in (C) is a hydrogen atom, an alkyl group, a phenyl group or a substituted phenyl group; n is equal to 1 through 50; in proportions of a mol %, b mol % and c mol %, respectively, where

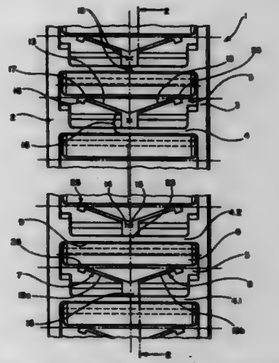
$0.1 \leq c \leq 20$,

$50 \leq 100a/(a+b) \leq 100$,

and the oxyalkylene moiety $(CHR^2—CHR^3—O—)_n$ of unit (C) accounts for 3 to 40 percent by weight of the total resin, and having a melt index of not less than 5 grams/10 minutes under a load of 2,160 g at a temperature of 210° C.

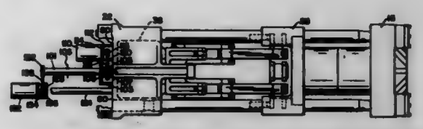
5,190,713
PROCESS FOR THE PRODUCTION OF A ROLLER BEARING CAGE WITH MOLDED-ON SPRING ELEMENTS
Juergen Rabe, Sterperedorfer Muehle, D-8522 Hoechstadt, Fed. Rep. of Germany
PCT No. PCT/DE90/00805, § 371 Date Jun. 20, 1991, § 102(e) Date Jun. 20, 1991, PCT Pub. No. WO91/06784, PCT Pub. Date May 16, 1991
PCT Filed Oct. 23, 1990, Ser. No. 690,932
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935295
Int. Cl.[5] B29C *45/00*
U.S. Cl. 264—328.1 5 Claims

1. Process for the production of a one-piece roller bearing cage having a pair of annular shoulders that are connected together by webs that run parallel to a central longitudinal axis of the bearing cage, a first side of each web having a molded-on ramp for holding a respective roller bearing and an opposite side of each web carrying at least one molded-on spring element for pressing a respective roller bearing toward a facing first side of an adjacent web, the spring element being connected to the web via a spring base; comprising the steps supplying a flow of an elastic polymer material, selected from the group consisting of self- or internally reinforcing plastics, a polymer blend, and a compound of several plastics with liquid crystal portions, through a gate directly into a respective flow



channel that defines the spring base area of a respective spring element, the spring base flow channel having a large volume in comparison to that of a flow channel that defines the spring element; and polymerizing the polymer material with the molecules thereof being oriented in a direction of flow of the material into the spring element flow channel from the spring base flow channel.

5,190,714
MOLD CLAMPING SYSTEM
William A. Reinhart, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Division of Ser. No. 600,850, Oct. 22, 1990, Pat. No. 5,102,327, and a continuation-in-part of Ser. No. 432,462, Nov. 6, 1989, Pat. No. 4,990,084. This application Nov. 13, 1991, Ser. No. 791,205
Int. Cl.[5] B29C *45/66*
U.S. Cl. 264—328.1 5 Claims



1. A method for relatively moving a pair of mold members toward and away from each other in a molding machine for molding articles from a flowable material that is injected into a mold cavity defined by the mold members when they are in contact with each other, said method comprising:
a. providing a first motor for rotating a rotatable ball screw and a second motor for rotation a rotatable ball nut carried by the ball screw to provide a mold drive arrangement for moving one of the pair of mold members toward and away from the other mold member;
b. energizing the first motor to rotate the ball screw at a first rotational speed to rapidly move the movable mold member at a first linear speed relative to the other mold member; and
c. when the mold members are in proximity to each other, energizing the second motor to rotate the ball nut a: a second rotational speed to drive the ball screw axially at a

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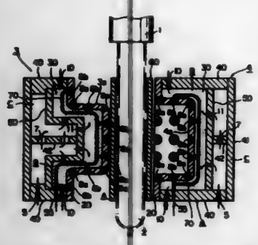
second linear speed to clamp the mold members tightly together and to permit the injection into the mold cavity of pressurized material without separation of the mold members.

5,190,715
BLOW MOLDING PROCESS FOR PRODUCTION OF HOLLOW TYPE ARTICLES

Akiyoshi Yamada, and Yoshiaki Kanoh, both of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Division of Ser. No. 412,998, Sep. 26, 1989, Pat. No. 5,017,126. This application May 20, 1991, Ser. No. 702,296
Claims priority, application Japan, Sep. 27, 1988, 63-239841
Int. Cl.[5] B29C *49/04, 49/64, 49/66*
U.S. Cl. 264—526 13 Claims



1. A blow molding process of producing hollow molded articles using an apparatus comprising an extruder with a die and a mold having heat medium passages formed therein to communicate with a heat medium source to be connected with the mold, said mold including two mold halves each comprising: a shell housing including an inner shell part, the inner shell part being made of a metallic material having a high thermal conductivity and being contoured so that the mold halves define a mold cavity at the inner shell parts thereof; and a heat insulating area defined within the shell housing, said heat insulating area including means for reinforcing said shell housing against a blow molding pressure and a mold clamping pressure and said heat insulating area providing substantial thermal insulation against a transmission of heat from the inner shell contoured part thereto, said process comprising the steps of:

extruding a parison of a plasticized material from a die into a gap between the mold halves while the mold is open;

blowing gas into said parison while the mold is closed, to have the parison form the molded hollow article within the mold cavity;

disposing an instantaneous radiation heater in the mold half gap so it partially encompasses the parison while the mold is open;

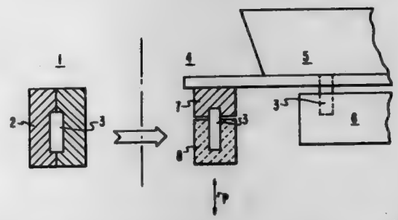
heating the surfaces of the inner contoured parts of the mold and the outer surface of the parison by using the instantaneous radiation heater disposed in the mold half gap and additionally heating the inner shell contoured parts using a heating medium passed through the heat medium passages;

cooling the molded article by cooling the mold at the inner shell contoured parts thereof by flowing a cooling medium through the heat medium passages of the mold while the mold is closed, the cooling of the mold occurring alternatively with the heating of the mold by the heating medium.

5,190,716
PROCESS FOR MANUFACTURING AND PREHEATING A SHAPED CERAMIC PART

Raimund Brückner, Engenhahn; Hans Rothfuss, Taunusstein; Albert Ott, Waldems-Würtems, and Ernst Lährsen, Bad Schwalbach, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 19, 1991, Ser. No. 794,056
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1990, 4038061
Int. Cl.[5] B22D *41/60*
U.S. Cl. 266—44 16 Claims



1. A process for manufacturing a ceramic part comprising an immersion nozzle or shroud which is to be subjected to a heat treatment operation, is to be mounted on a metallurgical vessel for use in a high temperature environment while contacted by molten metal, and is to be preheated prior to such use, said process comprising:

shaping said part at a shaping location;

providing at a position of use a heating device integrated into an insertion device for inserting said part to an operating position on said metallurgical vessel;

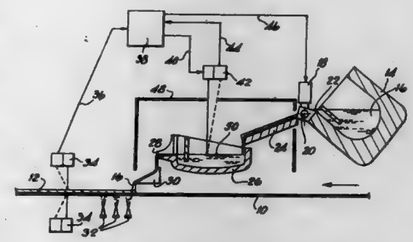
transferring said part from said shaping location to said heating device; and

operating said heating device and thereby at least partially performing said heat treatment operation and thereby also forming said preheating.

5,190,717
METAL POURING SYSTEM

Colin R. Bayliss, Rugby, England, assignor to T&N Technology Limited, Rugby, England

Division of Ser. No. 527,309, May 23, 1990. This application Sep. 25, 1991, Ser. No. 765,319
Claims priority, application United Kingdom, May 25, 1990, 8912081
Int. Cl.[5] B22D *41/00*
U.S. Cl. 266—80 4 Claims



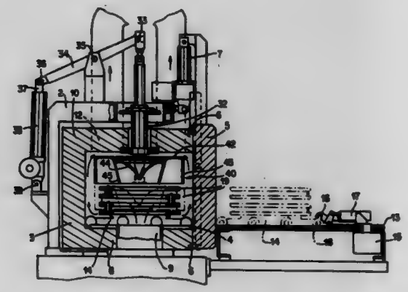
1. Apparatus for the control of the rate of flow of molten metal onto a moving strip, the apparatus comprising first sensor means for measuring the thickness of metal poured onto the strip, the first sensor means being linked to computer memory and control means for comparing the actual thickness of metal

on the strip with a desired thickness stored in the computer memory to be achieved, second sensor means linked to the computer memory and control means to measure the level of molten metal in intermediate holding dish means having pouring means, furnace melting means having servo control means to vary the rate of pour from the furnace to the intermediate holding dish means, the rate of pour from the furnace melting means being responsive to signals to said servo control means from the computer control means in order to minimize the difference between the actual measured thickness of the strip and the desired thickness by adjustment of the metal level in the intermediate holding dish means relative to said pouring means in the holding dish.

5,190,718
MACHINE FOR THERMO-MECHANICAL TREATMENT OF PARTS MADE OF MEMORY ALLOYS

Laurent Buffard, Saint Cyr Sur Mer; Michel Raymond, Lacicotat; Léo Vincent, Saint Germain Au Mont d'Or; Renee-Paule Girones, Cadenet, and Andre Barrier, Lozanne, all of France, assignors to Imago, Ajaccio, France

Filed Jul. 18, 1991, Ser. No. 732,108
Claims priority, application France, Jul. 20, 1990, 90 09715
Int. Cl.[5] B21K *29/00*
U.S. Cl. 266—96 21 Claims



1. A machine for thermo-mechanical treatment of parts made of memory alloys, comprising:

a thermally insulated chamber connected to a source of heat-conducting fluid;

a support, capable of being introduced into said chamber, supporting several crowns superimposed on one another and containing said parts, the crowns being arranged to permit passage of the gaseous fluid, wherein each of said crowns has a central opening and regularly angularly distributed axial holes for engaging a slidable rod, said slidable rod serving to guide said parts; and

a tension applicator for applying tension to the crowns.

5,190,719
PLANT FOR THE PRODUCTION OF MOLTEN METALS

Wilfried Pirklbauer, Niederneukirchen; Alfred Weber, Luftenberg, and Johann Auer, Florian, all of Austria, assignors to Voest-Alpine Industrianlagenbau GmbH, Linz, Austria

Filed Nov. 6, 1991, Ser. No. 788,362
Claims priority, application Austria, Nov. 19, 1990, 2334/90
Int. Cl.[5] C21C *5/38*
U.S. Cl. 266—144 11 Claims

1. In a melting vessel comprising an upstanding shaft furnace including a wall defining said furnace disposed about a longitudinal axis of this shaft furnace,

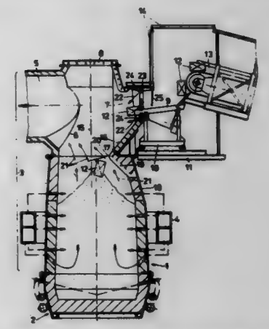
said shaft furnace characterized by a lower portion and a co-axially extending upper portion,

said lower portion accommodating burners disposed peripherally about the wall of said shaft furnace and optionally including ducts for feeding oxygen-gas to the interior of said furnace,

said upper furnace portion including a charging opening through which material to be melted is fed by charging means disposed in the upper portion of said furnace,

a gas evacuation duct being provided in said upper portion of said furnace for receiving offgases formed during operation of said melting vessel, the improvement:

wherein both said gas evacuating duct and said charging means in said upper portion of said shaft furnace are disposed laterally and approximately diametrically opposite to each other such as to define a chamber therebetween, said duct characterized by a mouth entering said chamber, said charging means extending into said charging opening,



said charging opening having means for providing a gas curtain substantially across said opening,

wherein an inclined intake chute is disposed adjacent to and below said charging opening for feeding material to be melted into said shaft furnace,

said inclined chute extending downwardly towards the axis of said shaft furnace and terminating against a wall section of said furnace to provide a protruding nose-like projection projecting inwardly toward said axis from said furnace wall,

said wall section extending below said nose-like projection and being inclined relative to said lower furnace portion and merging with said furnace wall.

5,190,720
LIQUID METAL COOLED NUCLEAR REACTOR PLANT SYSTEM

Anstein Hunsbedt, Los Gatos, and Charles E. Boardman, Saratoga, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 16, 1991, Ser. No. 745,809
Int. Cl.[5] G21C *11/08*
U.S. Cl. 376—287 19 Claims

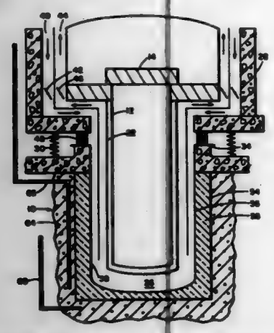
1. An improved liquid metal cooled nuclear reactor plant system, comprising the combination of:

a fixed structure comprising an open top silo vessel;

a seismically isolated structure comprising a reactor vessel containing a pool of liquid metal coolant with a core of heat producing fissionable fuel immersed therein and a containment vessel substantially surrounding the reactor vessel in spaced apart relation with the reactor vessel thereby providing an intermediate closed space between the reactor and containment vessels for retaining a gas;

said reactor and containment vessels of the seismically isolated structure extending concentrically downward into the open top silo vessel fixed structure in spaced apart

relation whereby the silo vessel substantially surrounds the reactor and containment vessels; and

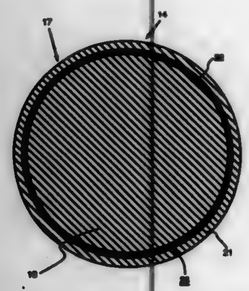


an annular flexible seal member positioned between an upper annular edge of the fixed structure and the seismically isolated structure.

5,190,721
ZIRCONIUM-BISMUTH-NIOBIUM ALLOY FOR NUCLEAR FUEL CLADDING BARRIER

Bo C. Cheng, Cupertino, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1991, Ser. No. 812,465
Int. Cl.[5] G21C *3/00*
U.S. Cl. 376—417 8 Claims



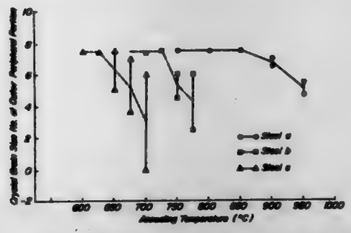
1. A corrosion resistant alloy for the inner barrier liner in nuclear fuel cladding consisting essentially of; in weight percent, about 0.1 to less than 0.5 percent bismuth, about 0.1 to less than 0.5 percent niobium, and the balance substantially zirconium, the alloy having ductility and hardness comparable to sponge zirconium.

5,190,722
HIGH COLD-FORGING ELECTROMAGNETIC STAINLESS STEEL

Yoshinobu Saito; Makoto Tabei; Yasuhide Ouchi, all of Sendai; Jun Takizawa, Wako; Hitoshi Itami, Wako, and Yoshiaki Takagi, Wako, all of Japan, assignors to Tohoku Special Steel Works Limited, Sendai and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Dec. 30, 1991, Ser. No. 814,621
Claims priority, application Japan, Dec. 28, 1990, 2-418092
Int. Cl.[5] C22C *38/28, 38/32*
U.S. Cl. 420—40 9 Claims

1. A high cold-forging electromagnetic stainless steel consisting essentially of not more than 0.02 wt % of C, not more than 0.50 wt % of Si, not more than 0.50 wt % of Mn, 10.0–18.0 wt % of Cr, 0.30–1.50 wt % of Mo, 0.05–0.50 wt % of Ti, 0.30–2.00 wt % of Al, 0.0005–0.05 wt % of B, not more than 0.05 wt % of N and the balance being substantially Fe, wherein the simultaneous presence of Ti and B widens the



temperature range showing good magnetic properties and produces fine and uniform crystal grain structure to improve the soft magnetic properties and improves cold forging properties.

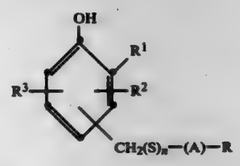
5,190,723
PROCESS FOR INHIBITING CORROSION

Emyr Phillips, Wakefield, and Robert C. Wasson, Warrington, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 314,678, Feb. 23, 1989, abandoned.
This application Dec. 3, 1990, Ser. No. 622,133
Claims priority, application United Kingdom, Feb. 25, 1988, 8804457
Int. Cl.[5] C23F *11/10*
U.S. Cl. 422—15 13 Claims

1. A process for inhibiting corrosion of a metallic surface in contact with an organic material which comprises

providing a corrosion-inhibiting effective amount of a compound of formula I



I

wherein

R^1 and R^2 are the same or different and each is hydrogen, C_1–C_{15}alkyl, C_3–C_{15}alkenyl, C_7–C_{10}phenylalkyl, C_6–C_{18}aryl having 6 to 10 aromatic ring carbon atoms or C_5–C_{12}cycloalkyl;

R^3 is hydrogen, C_1–C_{15}alkyl or C_2–C_{15}alkenyl;

n is 1;

A is a residue of a pyridine ring; and

R is one or more of hydrogen, C_1–C_{15}alkyl, C_1–C_4-halogenoalkyl, C_1–C_{12}alkoxy, C_1–C_{12}alkylthio, phenylthio, benzylthio, C_1–C_{12}alkylsulphonyl, phenyl, C_7–C_{15}alkylphenyl, C_7–C_{10}phenylalkyl, C_5–C_8cycloalkyl, halogen, NO_2, CN, COOH, COO(C_1–C_{12}alkyl), OH, NH_2, $CONH_2$, NHR^4, $N(R^4)_2$, $CONH(R^4)$ or $—CON(R^4)_2$ wherein R^4 is C_1–C_{12}alkyl, C_3–C_{12}alkyl which is interrupted by one or more O-atoms, C_5–C_8cycloalkyl, benzyl, phenyl or phenyl which is substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy or NO_2, or $N(R^4)_2$ is a pyrrolidino, piperidino or morpholine group;

adding said compound to an organic material to be in contact with a metallic surface wherein said organic material is a coating material; and

thereby inhibiting corrosion of the metallic surface.

5,190,724
PROCESS FOR DISINFECTING MEDICAL MOLDING MATERIALS

Klaus Hachmann, Hilden; Klaus Benecnir, Langenfeld, and Karlheinz Disch, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf and ESPE Stiftung & Co. Produktions-und Vertriebs KG, Seefeld, both of, Fed. Rep. of Germany

PCT No. PCT/EP89/01052, § 371 Date May 17, 1991, § 102(e) Date May 17, 1991, PCT Pub. No. WO90/03191, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 11, 1989, Ser. No. 663,818
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1988, 3831779; Dec. 27, 1988, 3844024
Int. Cl.[5] A61L *2/18*
U.S. Cl. 422—28 20 Claims

1. In a process for the disinfection of medical molding materials in which, after hardening and removal from the original, the molding materials are contacted with an aqueous solution, said aqueous solution contains a disinfectant selected from the group consisting of aldehydes, phenols, quaternary ammonium compounds, biguanides, active halogen compounds, and peroxidic compounds, wherein the improvement comprises the presence in the aqueous solution of 0.1 to 15% by weight of material selected from the group consisting of soluble alcohols and mixtures thereof.

5,190,725
CHEMICAL TREATMENT OF AN INFECTIOUS WASTE

Robert S. Meijer, San Diego, and John P. Frain, Oceanside, both of Calif., assignors to Winfield Industries, San Diego, Calif.

Continuation-in-part of Ser. No. 510,700, Apr. 19, 1990, abandoned. This application Apr. 26, 1991, Ser. No. 692,195
Int. Cl.[5] A01N *59/00*
U.S. Cl. 422—37 14 Claims

1. A method for treating an infectious waste comprising:

collecting infectious waste in a container having separate compartments containing a predetermined quantity of a chlorite salt and a predetermined quantity of an acid;

selecting a target kill level for said infectious waste in a treatment solution, said target kill level defined by a curve having the equation:

$$[ClO_2]=a_n e^{-kn}T,$$

wherein

n=said selected target kill level,

$[ClO_2]$=chlorine dioxide concentration of said treatment solution,

T=temperature of said treatment solution, and

a, k=empirically determined constants for a given kill level;

preheating an aqueous solvent to a preheat temperature in an auxiliary container;

mechanically breaking the container and infectious waste therein said auxiliary container into a smaller particle size for releasing and mixing said predetermined quantity of chlorite salt and said predetermined quantity of an acid with infectious waste particles in preheated aqueous solvent;

reacting said predetermined quantity of said chlorite salt and said predetermined quantity of said acid in said preheated aqueous solvent to generate said treatment solution comprising chlorine dioxide;

measuring an initial temperature and an initial chlorine dioxide concentration of said treatment solution;

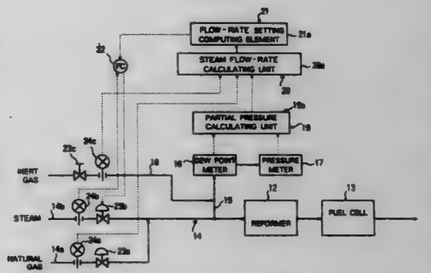
comparing said initial temperature and said initial chlorine dioxide concentration to said curve;

adjusting the temperature of said treatment solution until said treatment solution achieves a temperature and a chlorine dioxide concentration on or above said curve to substantially disinfect said waste.

5,190,726
APPARATUS FOR MEASURING THE FLOW RATE OF WATER VAPOR IN A PROCESS GAS INCLUDING STEAM

Toshio Shinoki; Akira Sasaki, and Shuichi Matsumoto, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 666,907
Claims priority, application Japan, Mar. 13, 1990, 2-63055
Int. Cl.[5] G01N *25/66*
U.S. Cl. 422—62 6 Claims



1. An apparatus for measuring the flow rate of water vapor in a process gas including steam comprising:

first supply means for supplying and measuring the flow rate of a first gas;

second supply means for supplying steam;

first mixing means in communication with the first and second supply means for mixing the first gas and the steam to form a process gas;

third supply means for supplying and measuring the flow rate of an inert gas;

second mixing means in communication with the first mixing means and the third supply means for mixing the inert gas with the process gas to obtain a gas mixture;

dew point sensing means in communication with the second mixing means for sensing the dew point of the gas mixture;

pressure sensing means in communication with the second mixing means for sensing the pressure of the gas mixture at which the dew point was sensed by the dew point sensing means;

partial pressure calculating means operatively connected to the dew point sensing means and the pressure sensing means for calculating the partial pressure of water vapor in the gas mixture based on the dew point sensed by the dew point sensing means and the pressure sensed by the pressure sensing means; and

flow rate calculating means operatively connected to the partial pressure calculating means and the first and third supply means for calculating the flow rate of water vapor in the process gas based on the calculated partial pressure, the flow rate of the first gas, and the flow rate of the inert gas.

5,190,727
DEVICE FOR MOVING AND POSITIONING PIPETTE TRAYS IN AN ANALYZER

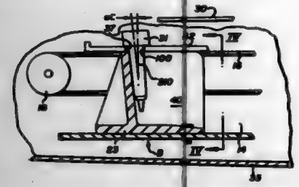
Alexander Hirsch, Stuttgart, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1991, Ser. No. 732,250
Int. Cl.[5] G01N *21/01, 35/02, 1/14*
U.S. Cl. 422—67 15 Claims

1. In an apparatus for aligning a tray of pipette tips in proper

position at a pickup station, said apparatus comprising, said tray pipette tips and said pickup station, said tips each having a longitudinal axis and said pickup station including an aspirator probe mounted to descend to pick up a tip, the improvement comprising:

means for moving tips to said station while being carried in said tray, said tray having means for holding said tips with said longitudinal axis in a substantially stable vertical position, said holding means having a degree of horizontal



sliding freedom for said tips that is greater than a horizontal margin of error in mating said probe with a tip,

means for stopping at least one of said tips at said station while still in said tray, said stopping means including means for locating said one tip at a known location in said tray but at a discrete angle off of vertical,

means for sensing that the tray has stopped moving,

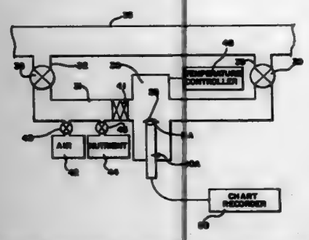
and control means for reorienting said located one tip so as to be substantially aligned with the vertical and with said probe.

5,190,728

APPARATUS FOR MONITORING FOULING IN COMMERCIAL WATERS

Linda R. Robertson, St. Charles, and Jeffrey R. Cantrall, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 21, 1991, Ser. No. 781,078
Int. Cl.[5] G01N *31/12*
U.S. Cl. 422—68.1 14 Claims



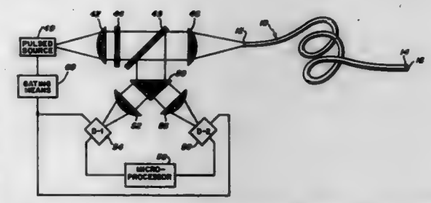
4. A fouling monitor for continuously measuring chemical and biological fouling in a commercial water system having a main stream of the water, wherein the biological and chemical fouling is due to the process of fouling deposits, said monitor comprising means for taking a slip stream of water from the main stream of the water, a dissolved oxygen probe for measuring dissolved oxygen levels, said probe having a sensing head, said sensing head having a roughened surface for enhancing the attachment of fouling deposits, means for continuously supplying air to the slip stream, means for selectively supplying nutrient to the slip stream, means for mixing the air and nutrient in the slip stream, a chamber in which the sensing head of the dissolved oxygen probe is received to expose the head to the slip stream mixture, and means for recording the output of the probe, whereby the probe continuously measures fouling, and the addition of nutrient differentiates between chemical and biological fouling.

5,190,729

LUMINESCENT OXYGEN SENSOR BASED ON A LANTHANIDE COMPLEX

Bennett L. Hanenstein, Andover; Rayma Picerno, Acton, both of Mass.; Harry G. Brittain, Maplewood, N.J., and James R. Nestor, Nashua, N.H., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 326,729, Mar. 21, 1989, abandoned, which is a division of Ser. No. 904,963, Sep. 8, 1986, Pat. No. 4,861,727.
This application Feb. 14, 1991, Ser. No. 655,648
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[5] G01N *21/64*
U.S. Cl. 422—91 16 Claims



1. An oxygen gas sensor comprising an oxygen-quenchable luminescent lanthanide complex and detector means operatively connected to said complex for detecting oxygen-quenching of said complex, said complex being of at least one lanthanide ion which emits a narrow-line luminescence when excited to a predetermined energy state and at least one ligand having an excited ligand energy state from which it transfers energy to said lanthanide ion to cause said ion to luminesce, said excited ligand energy state being substantially equal to said predetermined energy state so that said lanthanide ion and ligand form a resonant pair between which energy is rapidly transferred back and forth such that the presence of oxygen substantially interferes with the transfer of energy between the resonant pair of quenches said excited ligand energy state.

5,190,730

REACTOR FOR EXOTHERMIC REACTIONS

Lawrence A. Smith, Jr., Bellaire; Dennis Hearn, Houston, and Edward M. Jones, Jr., Friendswood, all of Tex., assignors to Chemical Research & Licensing Company, Pasadena, Tex.

Continuation of Ser. No. 451,583, Dec. 18, 1989, abandoned, which is a division of Ser. No. 268,074, Oct. 31, 1988, Pat. No. 5,003,124, which is a division of Ser. No. 58,698, Jun. 1, 1987, Pat. No. 4,950,803, which is a continuation of Ser. No. 442,359, Nov. 17, 1982, abandoned. This application Jul. 8, 1991, Ser. No. 728,041
Int. Cl.[5] B01J *3/00*
U.S. Cl. 422—109 7 Claims

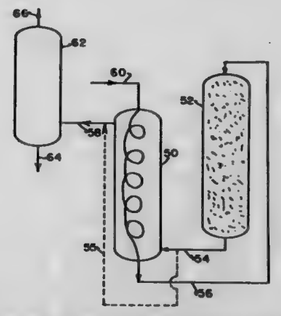
1. A reaction system for conducting exothermic reactions, comprising in combination:

(a) a preheater means for heating the reactants in a liquid feed stream to a temperature sufficient to initiate the exothermic reaction in a catalyst bed;

(b) a pressure vessel having an upper inlet in fluid communication with said preheater and a lower outlet for removing the effluent from said vessel;

(c) a fixed bed of catalyst suitable for catalyzing an exothermic reaction between said reactants positioned between said inlet and said outlet to provide a generally downward flow path for a reaction mixture; and

(d) control means acting in response to the temperature in said fixed bed for controlling the pressure on the fixed



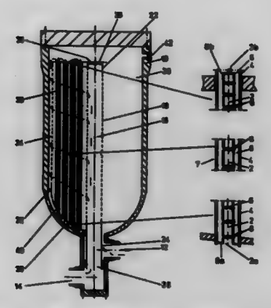
catalyst bed such that a portion of the reaction mixture is vaporized by the positive heat of reaction.

5,190,731

PROCESS AND APPARATUS FOR EXOTHERMIC REACTIONS

Henrik O. Stahl, Rungsted Kyst, Denmark, assignor to Haldor Topsoe A/S, Denmark

PCT No. PCT/DK90/00034, § 371 Date Aug. 15, 1991, § 102(e) Date Aug. 15, 1991, PCT Pub. No. WO90/09234, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 12, 1990, Ser. No. 743,393
Claims priority, application Denmark, Feb. 16, 1989, 713/89
Int. Cl.[5] F28D *7/10*
U.S. Cl. 422—148 4 Claims



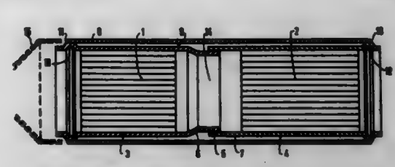
3. A process for the exothermic reaction of gaseous raw materials in a catalytic reactor having at least one catalyst bed, comprising the steps of providing a catalytic reactor having at least one catalyst bed and cooling tube assembly, passing gaseous raw materials in a substantially radial direction through at least one catalyst bed containing a cooling tube assembly and passing a cooling gas through a perforated inner tube of each cooling tube assembly to an annular space located within each cooling tube assembly and along a heat exchanging outer wall of an outer tube of each cooling tube assembly, to remove excessive heat of reaction from the at least one catalyst bed by indirect heat exchange with the cooling gas.

5,190,732

CATALYST WITH A DOUBLE CASING SYSTEM

Wolfgang Maus, Bergisch Gladbach; Ludwig Wieres, Overath, and Rainer Sahler, Köln, all of Fed. Rep. of Germany, assignors to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Division of Ser. No. 684,689, Apr. 11, 1991. This application Dec. 10, 1991, Ser. No. 805,097
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 8812762[U]
Int. Cl.[5] F01N *3/28*
U.S. Cl. 422—179 5 Claims



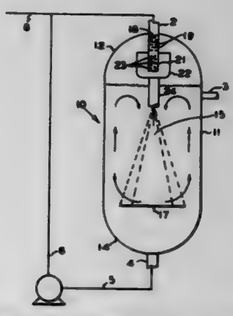
1. A metal-made carrier body for carrying thereon an exhaust gas cleaning catalyst, said carrier body having been formed by superposing a sheet-like metal band made of a thin metal sheet and a corrugated band made from another thin metal sheet one over the other in a contiguous relation into a multi-layered composite body defining many network-patterned gas flow passages along a central axis thereof, and then enclosing the multi-layered composite body within a cylindrical metal casing, characterized in that the cylindrical metal casing has a double-layer structure composed of an inner portion made of a metal material having a coefficient of thermal expansion similar to that of the constituent members of the multi-layered composite body and an outer portion made of another metal material having greater heat- and corrosion-resistance than the metal material of the inner portion.

5,190,733

HIGH INTERFACIAL AREA MULTIPHASE REACTOR

Milind B. Ajinkya, Mendham; Robert M. Koros, Westfield, and Barry L. Tarmy, Berkeley Heights, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 310,182, Feb. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 235,572, Aug. 24, 1988, abandoned. This application Feb. 14, 1991, Ser. No. 665,637
Int. Cl.[5] B01F *5/10, 5/20*
U.S. Cl. 422—231 4 Claims

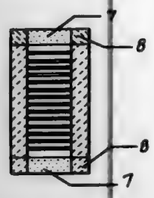


1. An apparatus for contacting of at least two distinct fluid phases, the apparatus consisting essentially of:

a vertically disposed vessel for containment of at least two distinct fluid phases, the vessel being defined by a cylindri-

cal wall of a given diameter and defining a cylindrical space, the vessel including a top fluid inlet and a bottom fluid outlet;
baffle means positioned within the vessel and above the bottom fluid outlet at a distance of about 0.2 to about 0.5 times the diameter of the vessel;
nozzle means positioned to extend downwardly from the top fluid inlet into the vessel;
a conduit providing communication between the top fluid inlet and the nozzle means, the conduit including means for generating bubbles of one of the distinct fluid phases in the other and
for feeding the bubble of one phase in the other through the nozzle means at a velocity sufficient to eject the bubbles of one phase in the other from the nozzle means into the fluid contained in the vessel and to force the fluid phases to flow downwardly through a central region of the vessel and upwardly through an annular region surrounding the central region.

5,190,734
MODIFIED END ASSEMBLY FOR HIGH PRESSURE, HIGH TEMPERATURE REACTION VESSELS
Robert H. Frushour, P.O. Box 818, Plymouth, Mich. 48170
Filed Feb. 22, 1991, Ser. No. 660,332
Int. Cl.[5] B01J *3/00*; B28B *3/00*
U.S. Cl. 422—242 **10 Claims**



1. An end assembly for use in a belt or cubic high pressure, high temperature reaction vessel having a reaction chamber containing a reaction charge and anvils mounted on opposite ends of the reaction chamber, the end assembly comprising:
a one piece member disposed between and in contact with a reaction charge in a reaction chamber of a reaction vessel and one of the anvils and composed of a mixture of two or more materials, at least one of which is electrically conductive, and at least one of which is non-conductive to heat and electricity.

5,190,735
RECOVERY OF GERMANIUM-68 FROM IRRADIATED TARGETS
Dennis R. Phillips; David J. Jamriska, Sr., and Virginia T. Hamilton, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Mar. 30, 1992, Ser. No. 860,617
Int. Cl.[5] C01G *17/00*
U.S. Cl. 423—2 **14 Claims**

1. A process for selective separation of germanium-68 from proton irradiated molybdenum targets comprising:
dissolving a proton irradiated molybdenum target in a hydrogen peroxide solution to form a first ion-containing solution;
contacting the first ion-containing solution with a cationic exchange resin whereby ions selected from the group consisting of molybdenum, technetium, selenium, vanadium, a portion of zirconium, a portion of rubidium, niobium, arsenic and germanium are contained within a second ion-containing solution while ions selected from the group consisting of a portion of rubidium, zinc, beryllium, cobalt, iron, manganese, chromium, strontium, yttrium and a portion of zirconium are selectively adsorbed by the cationic exchange resin;
adjusting the pH of the second ion-containing solution to within the range of from about 0.7 to about 3.0;
adding sufficient soluble metal halide to the second ion-containing solution to adjust concentration of the soluble metal halide in the second ion-containing solution to a level adapted for subsequent separation of germanium;
contacting the pH-adjusted, soluble metal halide-containing second ion-containing solution with a dextran-based material for sufficient time whereby germanium, niobium, zirconium and arsenic are separated by the dextran-based material; and,
recovering the germanium from the dextran-based material.

5,190,736
SYNTHESIS OF CRYSTALLINE ZSM-35
Stuart D. Hellring, Yardley, Pa.; Clarence D. Chang, Princeton, and John D. Lutner, Hamilton Square, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Oct. 18, 1991, Ser. No. 779,550
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—706 **18 Claims**

1. A method for synthesizing crystalline material exhibiting a characteristic X-ray diffraction pattern including d-spacing maxima values as shown in Table 1, which comprises (i) preparing a mixture capable of forming said material, said mixture comprising sources of alkali or alkaline earth metal (M), an oxide of trivalent element (X), an oxide of tetravalent element (Y), water and directing agent (R) of 1,4-diaminocyclohexane, and having a composition, in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	1 to 100
H_2O/YO_2	10 to 100
OH^-/YO_2	0.001 to 0.25
M/YO_2	0 to 2.0
R/YO_2	0.1 to 2.0

(ii) maintaining said mixture under sufficient conditions including a temperature of from about 100° C. to about 200° C. until crystals of said material are formed; and (iii) recovering said crystalline material from step (ii), said recovered crystalline material containing said R.

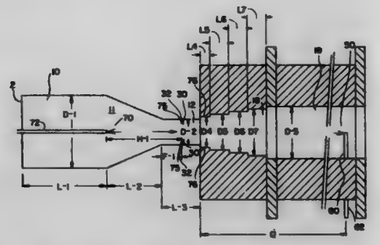
5,190,737
HIGH YIELD MANUFACTURING PROCESS FOR SILICON CARBIDE
Alan W. Weimer; Raymond P. Roach, and John P. Henley, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of PCT/US90/00276, Jan. 11, 1990, which is a continuation-in-part of PCT/US89/00114, Jan. 11, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,507
Int. Cl.[5] C01B *31/36*
U.S. Cl. 423—345 **26 Claims**

1. A process for preparing silicon carbide by carbothermal reduction, comprising transporting, in a gaseous medium, a particulate reactive mixture of a silica source and a carbon source through a reaction zone while adding carbon monoxide gas to the reaction zone at a rate such that carbon monoxide gas constitutes at least about 30 mole % of the gases exiting the reaction zone, the heating rate of the atmosphere within the reaction zone being such that substantially all of the reactive mixture is heated at a heating rate of at least about 100° C./second until an elevated temperature of at least 1800° C. is reached.

5,190,738
PROCESS FOR PRODUCING UNAGGLOMERATED SINGLE CRYSTALS OF ALUMINUM NITRIDE
Luc Parent, Quebec, Canada, assignor to Alcan International Limited, Montreal, Canada
Filed Jun. 17, 1991, Ser. No. 716,648
Int. Cl.[5] C01B *21/072*
U.S. Cl. 423—412 **18 Claims**

1. A process for producing substantially unagglomerated generally spherical single crystals of aluminum nitride having an oxygen content below about 4% by weight, which comprises subjecting alumina and carbon in the presence of nitrogen to a preheating step at a temperature in the range of 1600–1700° C. for a period of about 1 to 4 hours and then to a heating step at a temperature in the range of 1800–1950° C. for a second period of about 1 to 4 hours, in the presence of an alkali metal oxide in an amount sufficient to produce single crystals of AlN having diameters in the range of about 10 microns to about 100 microns.

5,190,739
PRODUCTION OF CARBON BLACKS
Bruce E. MacKay, Framingham; Mark A. Wilkinson, and Barrie J. Yates, both of Lexington, all of Mass., assignors to Cabot Corporation, Boston, Mass.
Continuation-in-part of Ser. No. 661,741, Feb. 27, 1991, abandoned. This application Jan. 10, 1992, Ser. No. 818,943
Int. Cl.[5] C09C *1/50*
U.S. Cl. 423—450 **18 Claims**



1. In a multi-staged process for producing furnace carbon blacks which exhibit both lower-than-normal structure at a given surface area, and lower-than-normal surface area at a given overall combustion level wherein in a first stage there is produced a stream of hot gases possessing sufficient energy to convert a carbon black-yielding hydrocarbonaceous feedstock to carbon black which stream is propelled into a second stage where feedstock is injected into said gaseous stream, and in a subsequent stage the feedstock is converted into carbon black prior to the termination of carbon forming reactions by quenching, and the cooling, separating, and recovering the resultant carbon black, the improvement which comprises separately introducing essentially unreacted auxiliary hydrocarbon into a reaction zone wherein the feedstock is at the moment undergoing the carbon forming reactions to form the carbon particles which reaction zone is located from about the point of feedstock injection to about the point of quenching, and adjusting the primary combustion level and overall combustion level, so that the structure sensitivity index (SSI) of the process is less than zero, said SSI being defined by the formula:

$$SSI = \frac{SAS_{mf} - SAS_{ah}}{|SAS_{mf}|}$$

where

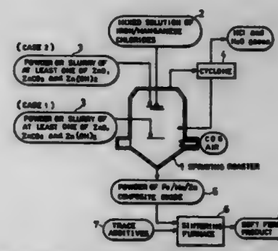
-continued

$$SAS_{mf} = \frac{\Delta(DBP)_{mf}}{\Delta(\text{Iodine Number})_{mf}};$$

$$SAS_{ah} = \frac{\Delta(DBP)_{ah}}{\Delta(\text{Iodine Number})_{ah}};$$

$|SAS_{mf}|$ = Absolution value of SAS $_{mf}$;
$\Delta(DBP)_{mf}$ = the change in DBPA of the carbon black due to a change in feedstock flow rate while all other process operating conditions are held constant;
$\Delta(\text{Iodine Number})_{mf}$ = the change in iodine adsorption number of the carbon black due to a change in feedstock flow rate while all other process operating conditions are held constant;
$\Delta(DBP)_{ah}$ = the change in DBPA of the carbon black due to a change in auxiliary hydrocarbon flow rate while all other process operating conditions are held constant; and
$\Delta(\text{Iodine Number})_{ah}$ = the change in iodine adsorption number of the carbon black due to a change in auxiliary hydrocarbon flow rate while all other process operating conditions are held constant.

5,190,740
METHOD PRODUCING COMPOSITE OXIDES FOR USE AS STARTING MATERIALS FOR PRODUCING FERRITES
Tetsu Narutani; Hidekazu Yoshimatsu; Masakatsu Yamazaki, all of Chiba; Masao Tsuzaki; Fumiaki Yoshikawa, both of Tokyo, and Katashi Takaki, Okayama, all of Japan, assignors to Kawasaki Steel Corporation, Japan
Filed Dec. 7, 1990, Ser. No. 624,054
Claims priority, application Japan, Jun. 21, 1990, 2-161218; Jun. 26, 1990, 2-165620; Jun. 26, 1990, 2-165621
Int. Cl.[5] C01G *49/02*
U.S. Cl. 423—594 **17 Claims**



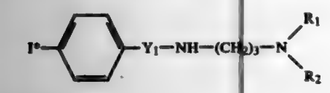
1. In a method for producing a starting oxide for making soft ferrites, which oxide comprises iron, zinc and at least one metal selected from the group consisting of manganese, magnesium, nickel and copper, the steps comprising
feeding a mixed chloride aqueous solution of iron chloride and at least one chloride selected from the group consisting of chlorides of manganese, magnesium, nickel and copper to a furnace and roasting the aqueous solution for oxidation at high temperatures to obtain a composite oxide consisting of iron and at least one metal selected from the group consisting of manganese, magnesium, nickel and copper; and
at a position within the furnace where the composite oxide is being formed or the produced composite oxide has heat of roasting and which has a temperature of not lower than 400° C., adding zinc oxide and/or a compound capable of ready conversion into zinc oxide at the existing temperature, thereby producing an oxide by the action of the heat of roasting.

5,190,741
AGENTS FOR DIAGNOSING AND TREATING MELANOMAS, AROMATIC HALOGENATED DERIVATIVES USABLE AS SUCH AGENTS AND THEIR PREPARATION

Marie-France Moreau, Romagnat; Josette Michelot, La Cendre; Annie J. Veyre, Clermont-Ferrand; Jean-Claude Madelmont, Romagnat; Denise Godemeche, Chamalieres; Pierre Leberre, Clermont-Ferrand; Daniel Parry, Beaumont, and Gaston Meyniel, Clermont-Ferrand, all of France, assignors to Institut National De La Sante Et De La Recherche Medicale (Inserm), Paris, France and Cis Bio International, Saclay, France

PCT No. PCT/FR90/00107, § 371 Date Aug. 6, 1991, § 102(e) Date Aug. 6, 1991, PCT Pub. No. WO90/09170, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 14, 1990, Ser. No. 741,481
Claims priority, application France, Feb. 14, 1989, 89 01898
Int. Cl.[5] A61K *31/00, 43/00*
U.S. Cl. 424—1.1 2 Claims

1. A compound of formula



wherein
Y_1 represents a CO group,
I^* represents ^{125}I, ^{123}I, ^{131}I
R_1 is selected from the group consisting of hydrogen, methyl, ethyl, propyl and isopropyl, and
R_2 is selected from the group consisting of hydrogen, methyl, ethyl, propyl and isopropyl.

5,190,742
DEVICE AND METHOD FOR CARRYING OUT A PLURALITY OF SEQUENTIAL TRANSFORMATIONS OF A SUBSTRATE

Edward Deutsch; Karen Libson, both of St. Louis, Mo., and Fabio Langhi, Turin, Italy, assignors to Sorin Biomedica S.p.A., Italy

Filed Jun. 26, 1990, Ser. No. 543,695
Claims priority, application Italy, Jun. 28, 1989, 67529 A/89
Int. Cl.[5] A61K *43/00*; B01J *19/90, 69/00*
U.S. Cl. 424—1.1 11 Claims

1. A device for carrying out a plurality of sequential transformations of a pharmaceutical by means of a single step procedure comprising:
a volume containing a substrate, said volume provided with inlet means for introducing within said volume a first substance adapted to contact said substrate in order to cause a first transformation thereof, and
within said volume a given amount of at least a second substance, said second substance encapsulated in sterile pyrogen free biocompatible microcapsules adapted to release said second substance with a given release profile after having been contacted by said first substance in order to cause a second transformation to thereby form an injectable pharmaceutical.

5,190,743
COMPOSITION FOR DISCLOSING DENTAL PLAQUE

Alexander J. Simone, and Thomas G. Polefka, both of Somerset, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 696,404, May 6, 1991, Pat. No. 5,098,691.
This application Oct. 10, 1991, Ser. No. 774,494
Int. Cl.[5] A61K *7/16, 7/22, 49/00*
U.S. Cl. 424—7.1 4 Claims

1. A plaque disclosing aqueous rinse composition containing an effective staining amount of a cobalamine compound which is absorbable by plaque deposits to identify areas of plaque formation on teeth which are clearly visible to the naked eye as color stained plaque immediately upon contact and easily removable therefrom by rinsing.

5,190,744
METHODS FOR DETECTING BLOOD PERFUSION VARIATIONS BY MAGNETIC RESONANCE IMAGING

Scott M. Rocklage, Los Gatos; John Kucherczyk, Mill Valley, and Michael E. Moseley, San Francisco, all of Calif., assignors to Salutar, Sunnyvale and The Regents of the University of Ca., Oakland, both of, Calif.

Filed Mar. 9, 1990, Ser. No. 490,859
Int. Cl.[5] G01N *24/08;* A61K *31/555;* G01V *3/00*
U.S. Cl. 424—9 36 Claims

1. A method of detecting regions of blood flow abnormality or variation in a human or non-human body, said method comprising the steps of (1) administering into the cardiovascular system of said body a contrast enhancing amount of a paramagnetic metal containing magnetic resonance imaging contrast agent, (2) subjecting said body to a magnetic resonance imaging procedure and obtaining a series of temporally spaced magnetic resonance signals or images from regions in at least a part of said body into which said agent passes, (3) detecting temporal variations in said signals or images, and (4) identifying from said temporal variations in said signals or images regions of abnormal or modified blood flow in said body and providing a quantitative indication of the degree of blood flow abnormality or modification therein.

5,190,745
INSECTICIDAL COMPOSITIONS

Kazunobu Dohara, Hirakata; Mitsuyasu Makita, Nishinomiya, and Yasuo Abe, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 689,472, Apr. 23, 1991, abandoned. This application Mar. 24, 1992, Ser. No. 856,557
Claims priority, application Japan, Apr. 24, 1990, 2-109840; Oct. 15, 1991, 3-266044
Int. Cl.[5] A61L *9/04;* A01N *43/50*
U.S. Cl. 424—45 6 Claims

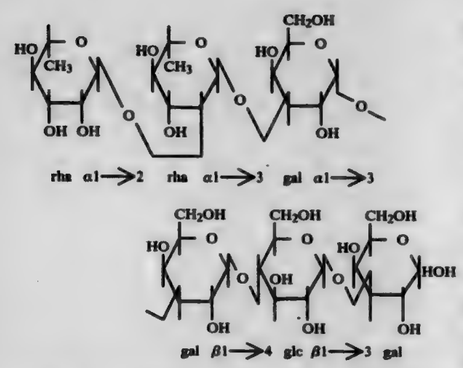
1. An insecticidal aerosol composition which comprises:
(a) 2,4-dioxo-1-(2-propynyl)imidazolidin-3-ylmethyl chrysanthemate,
(b) at least one carboxylic acid ester selected from the group consisting of monocarboxylic acid esters having 16–19 carbon atoms and dicarboxylic acid esters having 16–19 carbon atoms,
(c) kerosene, and
(d) a propellant selected from the group consisting of dimethyl ether and a mixture of dimethyl ether and liquefied petroleum gas,
the weight ratio of (a) to (b) being from 3:1 to 1:100.

5,190,746
PLAQUE INHIBITING OLIGOSACCHARIDE

Frederick J. Cassels, Gaithersburg, and Jack London, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 349,772, May 10, 1989, Pat. No. 5,071,977.
This application Sep. 12, 1991, Ser. No. 757,989
Int. Cl.[5] A61K *31/70, 6/00*
U.S. Cl. 424—49 6 Claims

1. A method of inhibiting the build up of human dental plaque deposits in the human oral cavity by administering a composition comprising the hexasaccharide of the formula I



wherein "rha" designates rhamnose, "gal" designates galactose, and "glc" designates glucose, to the human oral cavity.

5,190,747
ORAL OR DETERGENT COMPOSITION COMPRISING A NONIONIC SURFACE ACTIVE AGENT

Shizuo Sekiguchi; Tomoko Yasumasu, both of Funabashi; Hiroshi Miyake, Narashino, and Yoshihisa Endo, Sakura, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Division of Ser. No. 608,738, Nov. 5, 1990, Pat. No. 5,109,127.
This application Jan. 29, 1992, Ser. No. 827,463
Claims priority, application Japan, Nov. 6, 1989, 1-288154
Int. Cl.[5] A61K *7/16;* C11D *1/66*
U.S. Cl. 424—56 17 Claims

1. A detergent composition comprising at least one surface active agent selected from the group consisting of amphoteric surface active agents and anionic surface active agents; and a fatty acid ester of a hexose or an alkyl glycoside thereof, wherein the content of monoester is from 94 to 99.8% by weight, the content of diester is from 0.2 to 5% by weight and the content of tri- and higher polyesters is from 0 to 1% by weight in said fatty acid ester.

5,190,748
ABSORPTION ENHANCEMENT OF ANTIBIOTICS

Maria O. Bachynsky, Nutley; Martin H. Infeld, Upper Montclair; Navait Shah, Clifton, and Joel Unowsky, Livingston, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 527,669, May 21, 1990, abandoned, which is a continuation of Ser. No. 274,590, Nov. 22, 1988, abandoned. This application Dec. 18, 1991, Ser. No. 809,244
Int. Cl.[5] A61K *31/74*
U.S. Cl. 424—78.08 21 Claims

1. A method for treating a bacterial infection in a mammal, comprising orally administering to the mammal a therapeutic amount of a pharmaceutical composition comprising:
(a) a cephalosporin; and
(b) an absorption enhancing amount of a two-component absorption enhancing system including:
(1) a compound of the formula:

$$CH_3(CH_2)_{10}CH_2(OCH_2CH_2)_nOH$$

wherein n has an average value of 12; and
(2) a pharmaceutically acceptable salt of caprylic acid, wherein the weight ratio of component (b)(1) to component (b)(2) is from about 1:10 to about 10:1;
said composition being coated with a pharmaceutically acceptable enteric coating material.

5,190,749
COPOLYMERS OF VINYL PYRROLIDONE AND A QUATERNARY AMMONIUM MONOMER COMPLEXED WITH H_2O_2 IN THE FORM OF FREE-FLOWING POWDERS

Robert B. Login, Oakland, and John J. Merianos, Middletown, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Jan. 13, 1992, Ser. No. 820,178
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.
Int. Cl.[5] A61K *31/79, 31/785*
U.S. Cl. 424—78.24 11 Claims

1. A process for the production of free-flowing powders of a copolymer of vinyl pyrrolidone and a quaternary ammonium monomer complexed with H_2O_2 comprising reacting a fluidized bed of said copolymer maintained at a reaction temperature of from ambient temperature of about 60° C. with finely divided droplets of a 30 to 85% by weight aqueous solution of H_2O_2, which is introduced at a rate of about 2–5 g of solution/min/kg copolymer, and drying the product.

5,190,750
METHODS FOR THE TREATMENT OF DEMYELINATING DISEASE, UVEITIS, OR GRAFT-VERSUS-HOST DISEASE USING TNF

Yoshiki Otsuka; Kazuyoshi Hori, and Hiroshi Hayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1991, Ser. No. 665,876
Claims priority, application Japan, Mar. 9, 1990, 2-56734; Mar. 9, 1990, 2-56735; Mar. 9, 1990, 2-56736
Int. Cl.[5] A61K *37/02*
U.S. Cl. 424—85.1 8 Claims

1. A method for treating demyelinating disease, comprising administering a pharmaceutical composition, consisting essentially of an effective anti-demyelinating disease amount of tumor necrosis factor and at least one pharmaceutically acceptable carrier, diluent or excipient, to a patient having demyelinating disease.

5,190,751
TREATMENT OF CERTAIN LEUKEMIAS WITH A COMBINATION OF GAMMA INTERFERON AND ALPHA INTERFERON

Paul P. Trotta, Rutherford, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 4,731, Jan. 20, 1987, abandoned. This application Sep. 26, 1991, Ser. No. 766,911
Int. Cl.[5] A61K *37/66*
U.S. Cl. 424—85.4 4 Claims

1. A method of inhibiting the proliferation of susceptible human lymphoma derived B cell leukemia cells which comprises treating such cells with an effective amount of a synergistic combination of recombinant human alpha interferon and recombinant human gamma interferon.

5,190,752
INTRAVENOUSLY ADMINISTERABLE POLYCLONAL IMMUNOGLOBULIN PREPARATION CONTAINING IGM AND METHOD OF MANUFACTURE

Wolfgang Möller, Oberursel; Hebert Dichtelmüller, Sulzbach/Ts.; Norbert Kothe, Kronberg; Dieter Rudnick, Rödermark, and Detlef Piechaczek, Münster, all of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Dreieich, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 380,180
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825429
Int. Cl.[5] A61K *39/395;* C07K *3/12, 3/24, 3/28*
U.S. Cl. 424—85.8 13 Claims

1. The method which comprises intravenously administering

to a patient in need of treatment and prophylaxis relative to bacterial infections an intravenously administrable polyclonal immunoglobulin solution for the treatment and prophylaxis of bacterial infections,

a) comprising at least 50% by weight of IgM in terms of the total content of immunoglobulins,

b) exhibiting an anticomplementary activity of at most about 25 μl complement (1:30)/mg protein,

c) in aqueous solution, at 57° C. for 4 hours losing a maximum of about 2 titer steps,

d) being free of viruses, and

e) having a protein concentration of 1 to 20 g/100 ml.

5,190,753

3-PHENYL-5,6-DIHYDROBENZICIACRIDINE-7-CARBOXYLIC ACIDS AND RELATED COMPOUNDS AS IMMUNOSUPPRESSIVE AGENTS

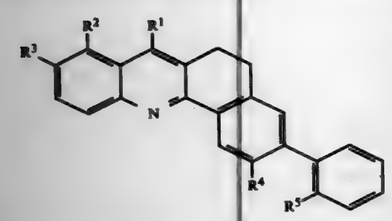
Carl H. Behrens, and Bruce D. Jaffee, both of Wilmington, Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Division of Ser. No. 548,825, Jul. 5, 1990, Pat. No. 5,135,934. This application Jun. 5, 1992, Ser. No. 892,165

Int. Cl.[5] A61K *39/00, 31/00, 31/70, 31/56*

U.S. Cl. 424—85.8 6 Claims

1. A method of treating graft versus host disease, organ transplantation rejection, or a chronic inflammatory disease in a mammal comprising administering to the mammal in an amount effective for the treatment of a desired aforesaid disease a compound having the formula:



(I)

or a pharmaceutically acceptable salt thereof, wherein:

R^1 is CO_2H, CO_2Na, CO_2K, or CO_2R^6;

R_2 and R^3 independently are H, F, Cl, Br, I, CH_3,CH_2CH_3, CF_3, or $S(O)_mR^7$;

R^4 and R^5 independently are H, or taken together are S with the proviso that when R^1 is CO_2Na then R^3 is not F;

R^6 is $(CH_2)_nNR^8R^9$;

R^7 is alkyl of 1 to 5 carbon atoms optionally substituted with 1 or 2 of F, Cl and Br;

R^8 and R^9 independently are H or alkyl of 1 to 3 carbon atoms;

m is 0 to 2; and

n is 2 to 4;

said compound of formula (I) being administered in combination with at least one immunosuppressive agent selected from the group consisting of:

cyclosporin A, azathioprine, a corticosteroid, OKT3, FK506, mycophenolic acid or the morpholineethylester thereof, 15-deoxyspergualin, rapamycin, mizoribine, misoprostol, or an anti-interleukin-2 receptor antibody.

5,190,754

***AMPELOMYCES QUISQUALIS* AQ10, CNCM I-807, FOR BIOLOGICAL CONTROL OF POWDERY MILDEW**

Abraham Satejaberg, Rehovot, Israel, assignor to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Continuation of Ser. No. 385,470, Jul. 27, 1989, abandoned. This application Oct. 31, 1991, Ser. No. 785,157

Claims priority, application Israel, Aug. 2, 1988, 87323

Int. Cl.[5] A61K *37/00*; C12N *1/12, 1/06, 1/14*

U.S. Cl. 424—93 Q 7 Claims

1. A biologically pure culture of *Ampelomyces quisqualis* AQ10, Accession Number I-807.

5,190,755

NUTRIENT COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

Nils Molin, Lund; Carl-Erik Albertsson, Saltsjö-Duvnäs; Stig Bengmark, Lund, and Kåre Larsson, Bjärred, all of Sweden, assignors to Probi AB, Lund, Sweden

PCT No. PCT/SE89/00114, § 371 Date Nov. 9, 1990, § 102(e) Date Nov. 9, 1990, PCT Pub. No. WO89/08405, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 9, 1989, Ser. No. 571,635

Claims priority, application Sweden, Mar. 9, 1988, 880022-2

Int. Cl.[5] A01K *63/00*; A61K *37/00*; C12N *9/42*; A21D *2/00*

U.S. Cl. 424—93 J 10 Claims

1. A method for preparing a nutrient composition for enteral nutrition, comprising:

admixing an oat-flour, water and α-amylase to form a first admixture;

heating said first admixture to a temperature not higher than 95° C., under agitation to form a stable suspension;

cooling said first admixture to about 50° C.;

adding a β-glucanase to said cooled first admixture to form the second admixture;

holding said second admixture at about 50° C. until the viscosity of said second admixture is less than 0.020 Pas;

adding lactobacilli, having the ability to spontaneously adhere to the intestine, to said second admixture of reduced viscosity to form the third admixture; and

fermenting said third admixture at between 30° C. and 40° C. to form the nutritional composition.

5,190,756

METHODS AND MATERIALS FOR EXPRESSION OF HUMAN PLASMINOGEN VARIANT

Francis J. Castellino, Granger, Ind., and Deborah L. Higgins, San Carlos, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 444,584, Dec. 1, 1989, Pat. No. 5,087,572. This application Aug. 29, 1991, Ser. No. 752,125

Int. Cl.[5] C12N *15/58, 9/68*; A61K *37/547, 37/62*

U.S. Cl. 424—94.64 13 Claims

1. A human plasminogen (HPg) variant in which the arginine residue at position 561 of native-sequence plasminogen is replaced with another amino acid, which variant is incapable of proteolytic cleavage to its two-chain form and, when in a binary complex with streptokinase, is capable of activating native plasminogen.

5,190,757

PHARMACEUTICAL LIQUID COMPOSITION CONTAINING BEZOAR BOVIS AND PREPARATION FOR ITS MANUFACTURE

Young S. Kim, Cosmos Mansion #1002, 302-62 Ichon-Dong, Yongsan-Ku, Seoul, Rep. of Korea

Continuation of Ser. No. 275,725, Nov. 23, 1988, abandoned. This application Oct. 11, 1990, Ser. No. 595,673

Claims priority, application Rep. of Korea, May 16, 1988, 88-5668

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.1 4 Claims

1. A process for preparing a pharmaceutical liquid composition, which comprises the steps of:

(a) extracting a first microparticle mixture of Dioscoreae Rhizoma, Glycyrrhizae Radix, Ginseng Radix, Typhae Pollen, Massa Medicata Fermentata, Sojae germinatum Semen, Cinnamomi Cortex, Paeoniae Radix, Liriope Tuber, Scutellariae Radix, Angelicae Gigantis Radix, Ledebouriellae Radix, Atractylodis Rhizome Alba, Bupleuri Radix, Platycodi Radix, Armeniacae Semen, Hoelen, Cnidii Rhizoma, Antellopis Cornu, Ampelopsis Radix, and Zingiberis Rhizoma and extracting said first microparticle mixture with water to provide a first extract and filtering said first extract to provide a first filtrate,

(b) combining Bezoar Bovis, Moschus and Rhinocerotis with water to produce a Bezoar Bovis-water mixture,

(c) combining Borneol with ethanol to produce a Borneol-ethanol mixture,

(d) combining gelatin and water to produce a gelatin solution, and

(e) combining said first filtrate, said Bezoar Bovis-water mixture, said Borneol-ethanol mixture and said gelating solution to produce said pharmaceutical composition.

5,190,758

SEBACEOUS EXCITOSECRETORY AGENT

Yasunobu Kobayashi, and Motonobu Matsumoto, both of Osaka, Japan, assignors to Sunstar K.K., Osaka, Japan

Filed Sep. 23, 1991, Ser. No. 763,707

Claims priority, application Japan, Sep. 26, 1990, 2-258189

Int. Cl.[5] A61K *7/48, 31/19, 47/44*; A01N *25/02*

U.S. Cl. 424—401 5 Claims

1. A process for exciting secretion of sebum comprising the step of applying onto a skin surface a sebaceous excitosecretory agent comprising at least one of undecylenic acid, its salts, its esters, and its amide derivatives as an active ingredient, wherein the concentration of said at least one of undecylenic acid, its salts, its esters, and its amide derivatives is from 0.01 to 10% by weight based on the total amount of said agent.

5,190,759

COMPOSITION AND METHOD FOR PREVENTION OF ADHESIONS BETWEEN BODY TISSUES

Gert Lindblad, Ystad, and Peter Buckley, Uppsala, both of Sweden, assignors to Kabi Pharmacia AB, Uppsala, Sweden

PCT No. PCT/SE90/00117, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO90/10031, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 21, 1990, Ser. No. 585,064

Claims priority, application Sweden, Feb. 21, 1989, 8900586

Int. Cl.[5] A61F *2/02*; A01N *43/04*; A61K *31/715*; C07H *5/06*

U.S. Cl. 424—423 2 Claims

1. Method for preventing adhesion between tissue surfaces, which comprises implanting into the space in which adhesions are to be prevented a composition comprising an admixture of dextran in an amount 1 to 35% and hyaluronic acid in an amount of 0.5 to 6%, the dextran having a weight average molecular weight within the range of 30,000 to 75,000 and the hyaluronic acid having a weight average molecular weight within the range of 500,000 to 6,000,000.

5,190,760

SOLID PHARMACEUTICAL COMPOSITION

Rodney C. Baker, Hertsfordshire, England, assignor to Coopers Animal Health Limited, Hertfordshire, England

Continuation of Ser. No. 548,712, Jul. 6, 1990, abandoned. This application May 21, 1992, Ser. No. 887,393

Claims priority, application United Kingdom, Jul. 8, 1989, 8915716

Int. Cl.[5] A23K *1/18*

U.S. Cl. 424—438 14 Claims

1. A solid pharmaceutical composition for release of a biologically active substance into a desired aqueous environment, containing a core and an outer layer coated thereon,

said core consisting essentially of between 17 and 93% by weight of the biologically active substance, between 0.01 and 7% by weight of a water swellable polymer material and between 0 and 83% of one or more accessory ingredients, relative to the total weight of the core; and

the outer layer consisting essentially of between 25 and 75% by weight of the biologically active substance, between 25 and 75% by weight of a material for enabling rapid dispersion of the outer layer into the aqueous environment and 0 to 50% by weight of one or more accessory ingredients, relative to the total weight of the outer layer.

5,190,761

ELECTROMAGNETIC FIELD TRIGGERED DRUG AND CHEMICAL DELIVERY VIA LIPOSOMES

Robert P. Liburdy, 1820 Mountain View Rd., Tiburon, Calif. 94920

Continuation-in-part of Ser. No. 367,013, Jun. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 302,803, Jan. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 893,436, Aug. 5, 1986, Pat. No. 4,801,459. This application Jun. 12, 1990, Ser. No. 537,191

Int. Cl.[5] A61K *9/127, 9/133*

U.S. Cl. 424—450 25 Claims

1. A method of delivering a drug to a preselected target body site of a patient at a temperature within a specific temperature range between about 10° C. and 65° C. comprising the steps of:

(a) administering the drug to the target body site said drug being within a liposome composition, the liposome composition having drug release characteristics that are essentially temperature insensitive within the specific temperature range and not having a phase transition temperature within the specific temperature range at which the liposome composition spontaneously releases drug and

(b) subjecting the preselected target body site and liposome composition thereupon to a nonionizing electromagnetic field to release drug from the liposome composition at a temperature within the specific temperature range.

5,190,762

METHOD OF ADMINISTERING PROTEINS TO LIVING SKIN CELLS

Daniel B. Yarosh, Merrick, N.Y., assignor to Applied Genetics, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 623,888, Dec. 26, 1990, which is a continuation-in-part of Ser. No. 215,566, Jul. 6, 1988, Pat. No. 5,077,211. This application Jan. 23, 1991, Ser. No. 644,920

Int. Cl.[5] A61K *37/22, 37/52*

U.S. Cl. 424—450 5 Claims

1. A method for administering a protein having intracellular biological activity into the interior of living skin cells which lie below the skin's stratum corneum, comprising the steps of:

(a) encapsulating the protein in liposomes; and

(b) applying the liposomes to the outer surface of living skin so that the protein encapsulated in the liposomes traverses

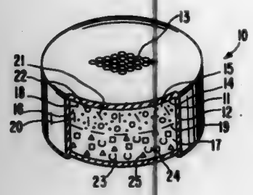
the skin's stratum corneum and the outer membranes of said cells and is thereby delivered by the liposomes into the interior of said cells.

5,190,763

DOSAGE FORM INDICATED FOR THE MANAGEMENT OF ABNORMAL POSTURE, TREMOR AND INVOLUNTARY MOVEMENT

David E. Edgren, El Granada; Howard A. Carpenter, Palo Alto; Gurdish K. Bhatti, Fremont, and Atul D. Ayer, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 7, 1990, Ser. No. 520,295
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—473 3 Claims



3. An improvement in a dosage form for administering a first and a second anti-Parkinson drug to a patient, wherein the dosage form comprises:

(a) a wall;

(b) a compartment formed by the wall

(c) a therapeutic composition in the compartment, said composition comprising 1 mg to 750 mg of a first anti-Parkinson drug selected from the group consisting of bromocriptine, ergot, lisuride, pergolide, mesulergine, levodopa, carbidopa, levodopa-carbidopa, amantadine, deprenyl, trihexyphenidyl, benztropine, biperiden, ethopropazine, procyclidine, dopamine agonist, monoamine oxidase inhibition, anticholinergic, anti-Parkinson salt and anti-Parkinson derivative; and 1 mg to 750 mg of a different second anti-Parkinson drug selected from said group, and wherein the composition in the presence of fluid that enters the compartment forms in administrable composition;

(d) an osmotic composition comprising 100 weight percent in the compartment, said composition comprising a member selected from the group consisting of an omsagent and an osmopolymer, which composition in the presence of fluid that enters the compartment develops properties that aid in administering the anti-Parkinson drug from the dosage form;

(e) a passageway in the wall that connects the exterior with the interior of the dosage form for delivering the anti-Parkinson drug to the patient; and wherein the improvement comprises:

(f) providing the anti-Parkinson drug substantially-free of adverse effects for administration in a rate-controlled dose per unit time.

5,190,764

AGENT FOR IMPARTING A SUSTAINED RELEASE PROPERTY TO A PESTICIDE, A PESTICIDE HAVING A SUSTAINED RELEASE PROPERTY AND A PROCESS FOR THE PRODUCTION THEREOF

Kaoru Chiba, Fujisawa; Shinji Yonemura; Tatsuo Noguchi, both of Atsugi; Takuo Wada, Hatano, and Satoru Moriyama, Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00231, § 371 Date Nov. 3, 1989, § 102(e) Date Nov. 3, 1989, PCT Pub. No. WO89/07889, PCT Pub. Date Sep. 8, 1989
Continuation of Ser. No. 439,352, Nov. 3, 1989, abandoned. This PCT application Mar. 3, 1989, Ser. No. 920,525
Claims priority, application Japan, Mar. 3, 1988, 63-48635
Int. Cl.[5] A01N *25/34*
U.S. Cl. 424—408 20 Claims

1. A process for the production of a pesticide in the form of composite particles, each composite particle comprising a solid central core of a solid, pesticidally active ingredient and either an outer layer consisting of fine particles of a hydrophobic substance surrounding said core or a continuous coat-film made of said hydrophobic substance, said process comprising

providing fine particles of the hydrophobic substance having an average particle diameter of not greater than one-fifth of the average diameter of said solid core of the pesticidally active ingredient in such a proportion that the total amount of the hydrophobic substance employed is in a range of 0.05 parts to 1 part by weight per part by weight of said pesticidally active ingredient, and

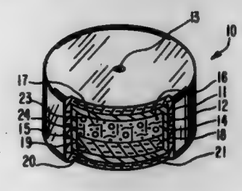
adhering said fine particles of the hydrophobic substance to the surfaces of said solid core of the pesticidally active ingredient or partially embedding individual particles of the fine particles of the hydrophobic substance into the surfaces of said solid core of the pesticidally active ingredient such that the hydrophobic substance wholly coats the surfaces of the core of the solid pesticidally active ingredient.

5,190,765

THERAPY DELAYED

Frank Jao, San Jose; Patrick S. L. Wong, Palo Alto; Hoa T. Huynh, Fremont; Kathy McChesney, Cupertino, and Pamela K. Wat, Santa Clara, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 722,622, Jun. 27, 1991, Pat. No. 5,160,744. This application Nov. 26, 1991, Ser. No. 799,451
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—473 6 Claims



1. A dosage form for the delayed-delivery of a drug to a fluid environment of use, wherein the dosage form comprises:

(a) drug composition comprising a dose of 0.05 ng to 1.5 g of a calcium channel blocker drug, and a polymer comprising a molecular weight up to 1,000,000 and a rate of hydration in the presence of fluid that enters the dosage form to change from a non-dispensable phase to a dispensable phase;

(b) a push composition that imbibes fluid and expands, whereby the push composition pushes the calcium channel blocker drug composition from the dosage form;

(c) a wall that surrounds the drug and push compositions, said wall comprising a semipermeable cellulose polymer composition permeable to the passage of fluid present in the environment of use, and 15 wt % to 85 wt % of a different cellulose polymer comprising a 8,500 to 4,000,000 molecular weight for slowing the rate of fluid passage through the semipermeable cellulose polymer composition of the wall;

(d) at least one exit means in the wall for delivering the drug from the dosage form; and wherein the dosage form is characterized by:

(e) a subcoat for the delayed-delivery of drug, which subcoat comprises a hydroxyalkylcellulose polymer possessing a 8,500 to 4,000,000 molecular weight that surrounds the drug and push composition and is positioned between the inside surface of the wall and the drug and push composition; and characterized further by:

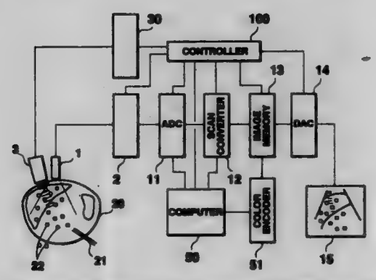
(f) a delayed-delivery of 30 minutes to 7 hours is provided by (1) the polymer in the drug composition, (2) the polymer in the wall composition and (3) the polymer in the subcoat operating in conjunction, whereby through the combined operations of (1), (2) and (3) a delayed-delivery of the calcium channel blocker drug is provided by the dosage form.

5,190,766

METHOD OF CONTROLLING DRUG RELEASE BY RESONANT SOUND WAVE

Ken Ishihara, 1-1-15, Chigasa, Takarazuka-shi, Hyogo, Japan

Filed Apr. 12, 1991, Ser. No. 684,386
Claims priority, application Japan, Apr. 16, 1990, 2-100090
Int. Cl.[5] A61K *9/52*
U.S. Cl. 424—489 6 Claims



1. A method of controlling a release of a drug from a drug carrier or drug holding structure comprising the steps of: measuring the acoustic characteristics of a drug carrier or drug holding structure in the region in which a drug is to be released in order to calculate the resonance frequency of said drug carrier or drug holding structure and irradiating said drug carrier or drug holding structure having a sharp acoustic resonance with a sound wave having a frequency including the resonance frequency of said drug carrier or drug holding structure in said region thereby controlling the release of said drug from said drug carrier or drug holding structure.

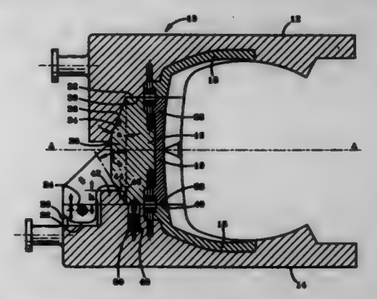
5,190,767

TIRE MOLD

Arthur W. Beres, Akron; Helmut Dernbach, Cuyahoga Falls, and Richard A. Raymond, Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 10, 1991, Ser. No. 727,867
Int. Cl.[5] B29C *33/26, 35/00*
U.S. Cl. 425—28.1 5 Claims

1. A tire mold comprising an upper mold half and a lower mold half, each including a sidewall molding portion and a tread molding portion, each tread molding portion terminating at an upper split plane surface and a lower split plane surface spaced from the mid circumferential plane of the mold, said lower mold half having a plurality of hinge members spaced angularly about the mold axis and mounted on the periphery of said lower mold half, a center ring having a tread molding portion and an upper plane surface in coplanar contact with said upper mold split plane surface and a lower plane surface in coplanar contact with said lower split plane surface, said center ring comprising a plurality of arcuate segments each swingably connected respectively to said hinge members for swinging movement about a hinge axis, said center ring having an



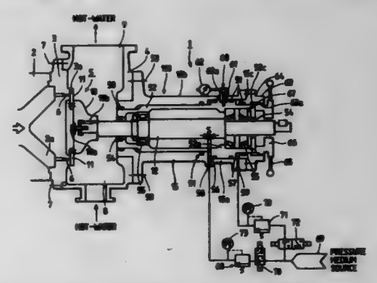
upper surface for engagement with an upper register surface on said upper mold half to provide an upper register and a lower register surface for engagement with the surface of an upstanding ring flange on said lower mold half to provide a lower register, said upstanding ring flange being positioned between each said hinge axis and said lower surface of each of said arcuate segments, said lower register surface being inclined upwardly and radially outward relative to the axis of said mold with each said hinge axis being spaced below said lower split plane surface a distance equal to from about 2 to 3½ the height of said ring flange to provide for a swinging movement of each said arcuate segment upon opening of said mold.

5,190,768

APPARATUS FOR GRANULATING PLASTICS

Yasuhiko Ishida; Minoru Yoshida; Hideki Mizuguchi; Sakaaki Okita, and Tetsuo Makida, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,148
Claims priority, application Japan, May 22, 1990, 2-130240
Int. Cl.[5] B29C *47/00, 71/00*
U.S. Cl. 425—67 3 Claims



1. A plastics granulating apparatus comprising:

a die having a die surface;

a cutter drive shaft coupled to a driver;

a cutter holder, mounted on said drive shaft, having cutter knives driven to rotate along said die surface;

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a housing having said cutter drive shaft rotatably mounted therein by virtue of a sleeve, said driver being capable of rotating said cutter drive shaft so as to cause said cutter holder to rotate in a manner that plastics particles are obtained by cutting resin extruded from said die by means of said cutter knives, said sleeve being axially movably provided in said housing so as to coaxially rotatably hold said cutter drive shaft; and

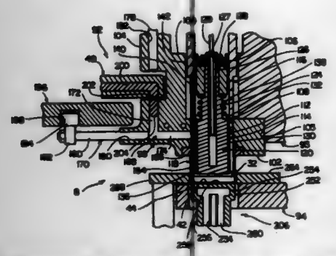
space chambers defined by said sleeve and said housing, wherein a pressure medium is supplied into said space chambers so that said cutter drive shaft moves axially with axial movement of said sleeve.

5,190,769

APPARATUS FOR FORMING ANNULAR LINER

Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork Co., Ltd., Japan

Filed Jan. 28, 1992, Ser. No. 826,826
Claims priority, application Japan, Feb. 13, 1991, 3-40450
Int. Cl.[5] B29C *63/00*
U.S. Cl. 425—113 **5 Claims**



1. An apparatus for forming an annular liner on an inside surface of a container closure shell comprising;

a molding means which is conveyed through a container closure shell receiving zone, a resin material receiving zone a molding zone and a container closure discharge zone

a container closure shell feeding means which feeds a container closure shell having a circular top panel to said molding means in said container closure shell receiving zone;

a resin material feeding means which feeds a synthetic resin material to said molding means in said resin material receiving zone; and

a container closure discharge means which discharges the container closure consisting of a container closure shell and an annular liner formed on the inside surface of the top panel from said molding means in said container closure discharge zone; wherein

said molding means includes an anvil on which the container closure shell is placed in an inverted state, and a press tool assembly which is disposed over said anvil being faced thereto and moveable in a direction to approach or separate away from said anvil;

said press tool assembly includes a punch member, a cylindrical bushing member arranged on the outside of said punch member and a cylindrical sleeve member arranged on the outside of said bushing member, said bushing member being allowed to ascend or descend relative to said punch member and said sleeve member;

said press tool assembly further includes a resin flow path that extends from an open upstream end up to a space where said bushing member ascends and descends between said punch member and said sleeve member, and a means for forcibly flowing the resin, and the upstream end of said resin flow path has a notch formed at a position on the downstream side in a direction in which said molding means moves;

said resin material feeding means includes a feeding nozzle with a discharge port positioned to pace said stream end of said resin flow path in said resin material receiving zone;

when said molding means moves through said resin material receiving zone, a molten synthetic resin material discharged from said discharge port of said feeding nozzle enters into said resin flow path through said notch and is cut away from said discharge port of said feeding nozzle and then, the synthetic resin material in the resin flow path flows through the resin flow path by the action of said means for forcibly flowing the resin; and

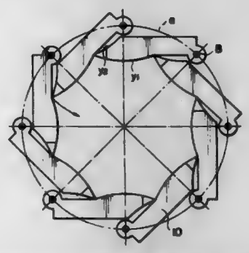
in said molding zone, said bushing member is lowered with respect to said punch member and said sleeve member, and the synthetic resin material is pressed onto the inside surface of the top panel of the container closure shell and is molded into an annular liner.

5,190,770

APPARATUS FOR CUTTING AND SHAPING A SPHERICAL BODY

Yasunori Tashiro, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Continuation of Ser. No. 546,498, Jun. 29, 1990, abandoned. This application Jul. 18, 1991, Ser. No. 732,722
Claims priority, application Japan, Jan. 12, 1989, 1-313654
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] B29C *47/06*
U.S. Cl. 425—132 **1 Claim**



1. An apparatus for cutting and shaping a spherical material from a continuous bar of material consisting of dough with a filling therein, comprising an assembly consisting of a plurality of identically-shaped cutting and shaping members, one end of each of the members being pivotally fitted to each of a plurality of fulcrums that are equidistantly disposed on an imaginary circumference formed by connecting the fulcrums, and the opposite end of each of the members being formed into a tip so that the members collectively and radially form and close an opening concentric to the circumference surrounded by the members when each member pivots away from and towards the center of the circumference, respectively, thereby to cut and shape material passing through the opening,

wherein each of the cutting and shaping members has on both sides thereof adjacent the tip first and second curved side surfaces and respectively, such that when the members make a pivotal movement, the tip of one member slides over the first curved side surface of an adjacent member so that the opening is confined by an exposed part of the first curved side surface of the members to cut and shape the material,

wherein each of the first and second curved side surfaces forms an arc whose radius is equal to the distance between the fulcrums of two adjacent cutting and shaping members, and when the opening is closed, the center of the arc of the first curved side surface of a cutting and shaping member is at the same time located at a distance from the fulcrum of a member that is equal to the radius of the imaginary circumference and at a distance from the center of the opening that is equal to the distance between two adjacent fulcrums, and the center of the arc of the second curved side surface is at the same time located at a distance from the fulcrum of the next member, in the direction going from the first curved side surface to the second curved side surface, that is equal to the radius of the imaginary circumference and at a distance from the center of the opening that is equal to the distance between two adjacent fulcrums, and

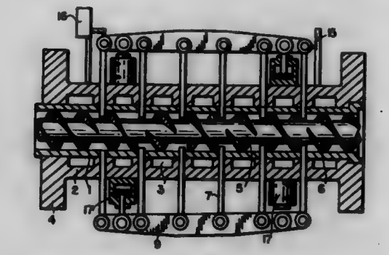
wherein the first curved side surface of each of the cutting and shaping members has a uniform thickness, except for an area near the tip thereof, where the thickness decreases toward the tip.

5,190,771

SCREW EXTRUDER

Wilfried Baumgarten, Pattensen, Fed. Rep. of Germany, assignor to Kraftanlagen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 22, 1991, Ser. No. 689,447
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1990, 4012612
Int. Cl.[5] B29C *47/00*
U.S. Cl. 425—171 **8 Claims**



1. A screw extruder for working plastic compositions, said extruder comprising:

a cylinder having radially directed bore holes extending therethrough, said bore holes being disposed in at least two planes perpendicular to the cylinder axis and said bore holes of adjacent planes being aligned parallel to the axis of said cylinder;

a rotating spiral screw disposed in said cylinder, said screw having at least two adjacent circumferential grooves forming gaps in the spiral, said gaps corresponding in position to said adjacent bore hole planes;

pins corresponding to said bore holes, said pins being radially disposed about said cylinder and having an inner end extendible through said bore holes and into said spiral screw gaps;

a beam fastened to an outer end of at least two pins, said at least two pins being aligned in a row parallel to said cylinder axis;

stud means for jointly connecting said pins to said beam, said stud means being guidingly engaged in corresponding slots in said beam so as to allow angling of said beam with respect to a normally parallel adjustment of the beam and the cylinder axis; and

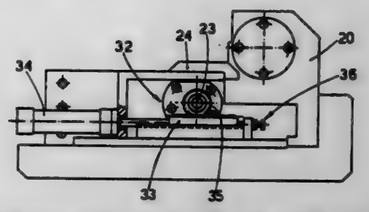
two drive means disposed at opposing ends of said beam for displacing said beam, whereby said opposing beam ends are independently displaceable by said drive means, thereby controlling the depth to which said at least two pins extend into said screw gaps relative to one another.

5,190,772

DEVICE TO CHANGE DIES

Pierluigi Conselvan, Selvazzano, and Attilio Cecchin, S. Martino di Lupari, both of Italy, assignors to Pavan Mapimpianti S.p.A., Galliera Veneta, Italy

Filed Mar. 11, 1992, Ser. No. 849,356
Claims priority, application Italy, Mar. 20, 1991, UD91A000042
Int. Cl.[5] A01J *21/00*
U.S. Cl. 425—184 **8 Claims**



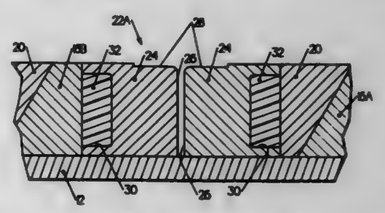
1. Device to change dies which is suitable for dies employed for the extrusion of dough as alimentary paste, generally called "pasta", whether long pasta in strings, pasta in strips or sheets, bird's nest-type pasta, etc., the device including a fresh die (12) and a used die (11) and being characterized in that it has a central lengthwise axis (23) defining in a plane orthogonal to that axis (23) the first and third quarters of a circle, in which quarters the dies (11–12) are positioned within specific spaces (14–15), such spaces (14–15) being defined by an outer frame (19) and an inner frame (21), at least one of these frames (19–21) being able to move laterally so as to clamp or free the dies (11–12), the device being able to rotate about the central axis (23).

5,190,773

MOLD FOR FABRICATING COMPOSITE ARTICLES HAVING INTEGRALLY BONDED STIFFENING MEMBERS

Christopher J. Damon, Cheshire, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 18, 1991, Ser. No. 793,901
Int. Cl.[5] B29C *35/02, 43/36*
U.S. Cl. 425—186 **7 Claims**



1. A composite mold for simultaneously co-curing at least one stiffening member formed of prepreg plies in combination with a main structural panel formed of prepreg laminates in a single cure process to form a composite article having the at least one stiffening member integrally bonded thereto, each at least one stiffening member having a leg and opposed flanges, comprising:

a mold base;

a stiffening member mold assembly mounted on said mold base, said stiffening member mold assembly including

at least first and second complementary pressure blocks each having a forming face and a stepped shoulder for forming one stiffening member, said first and second complementary pressure blocks being mounted on said

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mold base with said forming faces and stepped shoulders thereof in opposed relation wherein prepreg plies layed up therebetween define the leg and opposed flanges of the one stiffening member, at least one of said first and second complementary pressure blocks having a pressure cavity formed therein, and

a pressure pad formed from a thermally expansible material encapsulated in each said pressure cavity, each said pressure pad, pressure cavity combination being configured wherein each said pressure pad is operative to expand in volume to generate a predetermined pressure in response to elevated temperatures of the single cure process; and

a rigid mold assembly disposed in combination with said mold base and said stiffening member mold assembly to define said composite mold, said rigid mold assembly including

first and second members rigidly secured in combination with said mold base, said first member being disposed in abutting engagement with said first complementary pressure block and operative to act as a reactive surface therefor,

a removable wedge member mounted on said mold base and disposed intermediate said second member and said second complementary pressure block in abutting engagement therewith, and

end member means mounted on said mold base for facilitating assemblage of said stiffening member mold assembly in combination with said first member and said removable wedge member;

exposed faces of aid stiffening member mold assembly and said rigid mold assembly distal said mold base providing a rigid lay-up surface for the prepreg laminates forming the main structural panel, the prepreg laminates contacting the prepreg plies forming the opposed flanges of the one stiffening member.

5,190,776

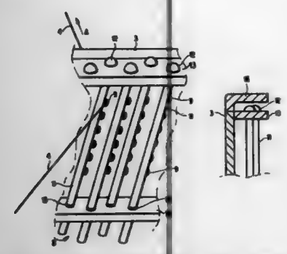
APPARATUS FOR CALENDERING CORDS WITH ELASTOMERIC MATERIAL

Sasada Koichi, Kodaira, Japan, and Takashi Matsumura, Wilson, N.C., assignors to Bridgestone/Firestone Inc., Akron, Ohio

Continuation of Ser. No. 648,941, Feb. 1, 1991, abandoned. This application Jun. 9, 1992, Ser. No. 896,787

Int. Cl.[5] B29C *31/00, 67/00*

U.S. Cl. 425—363 **8 Claims**



1. An apparatus for calendering cords with elastomeric material comprising:

at least two creel stands having means for holding multiple spools of cords;

a main guide board having an array of holes for said cords to pass through, said holes arranged in two dimensions on said guide board;

freely rotatable guide rolls located at an entrance side of said main guide in such a manner that center lines of said holes are consonant with a tangent line of said guide rolls, said guide rolls extending along columns of said array of holes in approximately a vertical direction and decreasing cord angles to said holes so that chafing between said cords and holes is reduced, said guide rolls having head portions and further comprising an upper frame located at the upper portion of said main guide board and having a plurality of holes for supporting said guide rolls in cooperation with said guide roll head portions; a lower frame having a plurality of holes through which said guide rolls extend; and a cover located above said head portions and spaced to prevent said guide rolls from exiting from the holes in said lower frame;

a guide tool for arranging said cords to be calendered;

a set of calender rolls for coating said cords with elastomeric material; and

at least one of said creel stands being located at an offset position relative to said guide board.

5,190,775

ENCAPSULATED BIOACTIVE SUBSTANCES

Robert E. Klose, West Nyack, N.Y., assignor to Balchem Corporation, Slate Hill, N.Y.

Filed May 29, 1991, Ser. No. 706,859

Int. Cl.[5] A23K *1/18*

U.S. Cl. 426—2 **12 Claims**

1. A method for administering a bioactive substance to the post-rumen portion of the digestive system of a ruminant substantially without introducing the substance to the rumen portion of the digestive system, said method comprising orally administering a composition of matter containing particles having a specific gravity between about 0.3 and 2.0 and said particles consisting essentially of:

(a) a core comprising bioactive substance;

(b) a hydrophobic coating encapsulating said core in a quantity sufficient to essentially preclude introduction of bioactive substance into the rumen; and

(c) a surfactant applied to the surface of the hydrophobic coating in a quantity sufficient to ensure that said particles do not float on the rumen.

5,190,776

LOW/NO FAT BAKERY INGREDIENT

Vitus W. Baumann, Smithtown, N.Y., assignor to Kraft General Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 639,636, Jan. 10, 1991, abandoned. This application May 18, 1992, Ser. No. 884,352

Int. Cl.[5] A21D *13/08*

U.S. Cl. 426—94 **10 Claims**

1. A low-fat or no-fat, laminated baked good containing a roll-in ingredient which, as formulated, is comprised of from 50 to 70% fat-free, chemically-leavened cake crumbs, from 5 to 15% sugar syrup and from 10 to 25% of a starch-based creme filling.

5,190,777

PACKAGE FOR MICROWAVING POPCORN

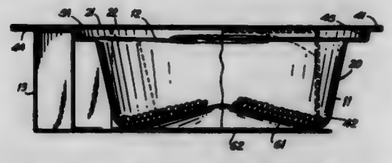
Gary D. Anderson; George B. Bourns, both of Asheboro, N.C.; Earl E. Hoyt, Franklin Lakes, N.J., and Howard P. Siegel, Yonkers, N.Y., assignors to American Home Food Products, Inc., New York, N.Y.

Continuation of Ser. No. 888,300, Jul. 18, 1986, abandoned. This application May 31, 1988, Ser. No. 519,353

Int. Cl.[5] B65D *21/08, 25/36, 81/34*

U.S. Cl. 426—107 **6 Claims**

1. A shelf stable package for shipping and popping corn in a microwave oven comprising, a bowl formed of microwaveable plastic, transparent to microwave energy, and having sidewalls and an upwardly directed conical bottom that is conical substantially across the bottom between said sidewalls, a charge comprising corn kernels and a shortening, which is solid at room temperature, said kernels having a moisture content of at least about 11.5 percent by weight and being concentrated substantially around the circumference of the bowl on the conical bottom with the apex of the conical bottom having few or no kernels, and a plastic swirl cover layer secured to said bowl, said plastic swirl being in the form of a plurality of folds disposed in a spiral arrangement being transparent to microwave energy, and being expansible in response to internal steam pressure generated by popping of said corn kernels, a



microwave transparent paperboard shell covering at least a portion of said bowl, said paperboard shell having a portion extending across and exteriorly covering said upwardly directed conical bottom, and a microwave susceptor layer attached to said portion of said paperboard shell and underlying and being spaced from said conical bottom of said bowl.

5,190,778

FOAM-STABILIZED MALT BEVERAGE

Kenneth Clare, deceased, late of Vista Jean Clare, surviving spouse , and Margaret A. Lawson, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 23, 1990, Ser. No. 527,452

Int. Cl.[5] C12C *5/02*

U.S. Cl. 426—329 **6 Claims**

1. A process for improving the foam properties of a fermented malt beverage comprising adding to said beverage gellan gum in an amount of about 5–400 ppm by weight of said beverage.

5,190,779

COUNTERCURRENT EXTRACTION OF COFFEE

Klaus Schlecht, Orbe, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Jun. 26, 1991, Ser. No. 721,154

Claims priority, application European Pat. Off., Jul. 18, 1990, 90113716.6

Int. Cl.[5] A23F *5/26*

U.S. Cl. 426—434 **8 Claims**

1. In a countercurrent coffee extraction process, wherein coffee material to be extracted is contained in extraction cells connected in series and wherein a cell containing the least extracted coffee material to be extracted is positioned downstream, with respect to a flow of extraction liquid, from a cell containing coffee material which is most extracted, the improvement comprising reducing a percolation rate of extraction liquid passing through at least one extraction cell intermediately positioned in the extraction cell series between the extraction cells containing the least extracted coffee material and the most extracted coffee material and then increasing the flow rate of extraction liquid through a cell positioned downstream from the at least one cell in which the percolation rate is reduced.

5,190,780

METHOD FOR THE PRODUCTION OF FOOD AND NOVEL FOOD PRODUCT

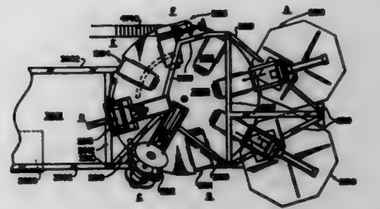
Amos Fehr, and Joseph Cheng, both of c/o 4572 Erie Avenue, Niagara Falls, Ontario, L2E 3N3, Canada

Continuation of Ser. No. 337,638, Apr. 13, 1989. This application Apr. 25, 1991, Ser. No. 691,690

Claims priority, application Canada, Jun. 30, 1988, 571001; Feb. 21, 1989, 591682

Int. Cl.[5] A21C *3/02*; A23L *1/322*; A23P *1/08*

U.S. Cl. 426—502 **17 Claims**



1. A method for production of a generally-cylindrical, overlapped-folded, loaded, rolled dough food product comprising:

(a) providing first and second stacks of substantially square-shaped sheets of dough upon a stacking surface, said stacks being spaced apart by a predetermined distance;

(b) reciprocating a pair of lifting members so that one lifting member is above one of said stacks and the other lifting member is above a movable conveying surface;

(c) drawing a sheet of dough from a stack beneath said one lifting member against said one lifting member and simultaneously releasing a sheet of dough drawn against said other lifting member;

(d) repeating steps (b) and (c) to deliver sheets of dough alternately from the pair of lifting members to the movable conveying surface to arrange the sheet of dough in a diamond orientation at a first discrete stationary zone;

(e) moving said surface to advance said sheet of dough in its diamond orientation from said first discrete stationary zone to at least one foodstuff dispensing second discrete zone downstream thereof;

(f) stopping said surface to place the dough sheet at said foodstuff dispensing second discrete zone;

(g) loading at least one foodstuff onto a discrete region of said upper surface of said sheet of dough while said sheet of dough is stationary, said foodstuff forming a pile atop said upper surface of said sheet of dough while said lower surface of said sheet of dough remains on said surface;

(h) advancing said surface to move said sheet of dough loaded with at least one foodstuff to a loaded dough sheet third discrete folding zone;

(i) stopping said surface at said third discrete folding zone;

(j) folding opposed transverse corners of said diamond-shaped loaded sheet of dough inwardly to cover said pile of foodstuff and to meet and overlap one another slightly near the central portion of the dough sheet, thereby providing a substantially-hexagonally-shaped, overlapped-folded, loaded sheet of dough, while said sheet of dough is stationary, whereby said foodstuff appears covered while said lower surface of said sheet of dough rests upon said movable surface;

(k) advancing the movable surface to move said substantially-hexagonally-shaped, overlapped-folded, loaded sheet of dough to a fourth discrete rolling zone;

(l) stopping said movable surface to bring the folded dough sheet to said fourth discrete rolling zone;

(m) rolling said overlapped-folded, loaded sheet of dough, by gripping and raising one angular point of said substantially-hexagonally-shaped sheet of dough and rolling said gripped and raised angular point over said top of said covered pile of foodstuff so that said gripped and raised

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angular point is rolled at least two and one-half revolutions, thereby providing a generally-cylindrical, overlapped-folded, loaded, rolled dough product, while said sheet of dough is stationary; and

(n) discharging said generally-cylindrical, overlapped-folded, loaded, rolled dough product to a discharge zone.

5,190,781

SPOONABLE NON-DAIRY CREAMS

Jan Van Heteren, Hinchley Wood; David M. King, Willaston, and Evelyn M. Moriarty, Horsechurch, all of England, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Oct. 28, 1991, Ser. No. 783,283

Claims priority, application European Pat. Off., Oct. 29, 1990, 90202863.8

Int. Cl.[5] A23L *1/19*

U.S. Cl. 426—521 2 Claims

1. A process for the preparation of a spoonable stable non-dairy cream comprising the steps of:

(a) admixing a fat, an emulsifier, a thickener, 0.1 to 10 wt. % of a buttermilk powder and water to form a premix;

(b) heating the premix to a temperature of 70° to 90° C. to form a heated premix;

(c) sterilizing the heated premix by injection of steam having a temperature of 130° to 160° C. for 1 to 30 seconds to form a sterilized premix;

(d) cooling the sterilized premix to 40° to 60° C. to form a cooled premix;

(e) homogenizing the cooled premix under pressure to form a homogenized mixture;

(f) cooling the homogenized mixture to 25° to 40° to form a cooled homogenized mixture; and

(g) filling a container with the cooled homogenized mixture at 25°to 40° C. to form a spoonable non-dairy cream, wherein the non-dairy cream is storable for at least 14 days at a temperature of 1° to 15° C. without noticeable chemical or physical changes.

5,190,782

ACYLATED AMINO ACID ESTER DERIVATIVES AS LOW CALORIE FAT MIMETICS

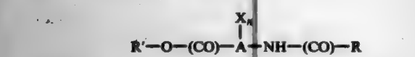
Ronald G. Yarger, Convent Station; Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 409,254, Sep. 19, 1989, abandoned. This application Apr. 24, 1991, Ser. No. 690,732

Int. Cl.[5] A23L *1/29*

U.S. Cl. 426—531 23 Claims

1. An edible composition having a fat ingredient, wherein at least 5% of said fat ingredient comprises an amino acid fat mimetic derivative of the formula



where

A=a hydrocarbyl group having 1 to 6 carbons,

X=a free or acylated amino acid side chain having 1 to 25 carbons,

n=0 or 1,

each R is, independently, a C_1 to C_{29} aliphatic group, a C_2 to C_{29} ester group of the formula R″—O—R‴—, or a C_2 to C_{29} ester group of the formula R‴—O—(CO)— R″— or R″—(CO)—O—R‴—, where R″— and R‴— are, independently, aliphatic groups, and

each R′ is, independently, a C_1 to C_{30} aliphatic group, a C_2 to C_{30} ester group of the formula R″—O—R‴—, or a C_2 to C_{30} ester group of the formula R‴—O—(CO)— R″— or R″—(CO)—O—R‴—, where R″— and R‴— are, independently, aliphatic groups.

5,190,783

PRIMARY AMIDE ESTERS AS LOW CALORIE FAT MIMETICS

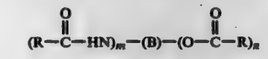
Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Ronald G. Yarger, Convent Station, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Division of Ser. No. 490,237, Sep. 19, 1989, Pat. No. 5,043,233. This application Aug. 12, 1991, Ser. No. 743,612

Int. Cl.[5] A23L *1/29*

U.S. Cl. 426—531 18 Claims

1. A food composition comprising fat ingredients and nonfat ingredients and having said fat ingredients at least partially replaced by a fat mimetic compound of the formula



where:

B is a sugar having from 3 to 6 carbons,

m=1 to 3,

n=1 to 3, and

each R is independently, a C_1 to C_{29} aliphatic group, a C_2 to C_{29} ether group of the formula R′—O—R″—, or a C_2 to C_{29} ester group of the formula R″—O—(CO)—R′— or R′—(CO)—O—R″—,

where R′- and R″- are, independently, aliphatic groups.

5,190,784

METHOD FOR MAKING SALMON AND CRAWFISH FLAVORING COMPOSITIONS

Alfredo Cirello, Via Arona, 16, 20145 - Milano, Italy

Filed Dec. 11, 1991, Ser. No. 805,527

Int. Cl.[5] A23L *1/325*

U.S. Cl. 426—533 8 Claims

1. A method for making a food composition having a remarkable and long duration salmon or crawfish flavour, comprising the steps of:

a) providing a low value dry groud fish meat as a precursor meat material;

b) reacting said dry ground fish meat with 37% HCl for 24 hours at a temperature of 100°–103° C. to provide a reaction mixture, while refluxing reaction vapors from said mixture;

c) neutralizing said mixture by contacting with sodium carbonate having a pH of 6–7;

d) filtering said mixture to provide a clear liquid;

e) concentrating said clear liquid under a reduced pressure at 40° C. to 26–30 Bé; and

f) filtering said clear liquid to remove undesired salts therefrom thereby obtaining said food composition.

5,190,785

METHOD FOR THE MANUFACTURE OF PECTINOUS AND SACCHARIFEROUS PREPARATIONS, SUCH AS JAM, MARMALADE OR THE LIKE

Manfred Oelsner, Windmühlenweg 39, D-2000 Hamburg 52, Fed. Rep. of Germany

Filed Jun. 4, 1991, Ser. No. 710,064

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018915; European Pat. Off., Jun. 19, 1990, 90111590.7

Int. Cl.[5] A23L *1/064*

U.S. Cl. 426—577 16 Claims

1. A method for the manufacture of pectinous and saccharierous preparations such as jam and marmalade, particularly from fresh fruit or fruit that has been kept fresh and which is stoned, deseeded or cored, fruit flesh, fruit pulps, fruit purees and pastes, comprising:

providing a first charge of products of fruit, glucose syrup and crystallized sugar in a total quantity A,

removing a component of fruit and glucose syrup from the first charge in a minor quantity compared to the total quantity A to provide a second charge B containing the removed component of fruit and glucose syrup and component C containing the remainder of the first charge,

separately boiling down the second charge B containing fruit and glucose syrup removed from the first charge, then

mixing powdered pectin with component C,

mixing second charge B and component C containing the remainder of the first charge,

heating the mixture of second charge B, component C and pectin under pressure at a temperature of from 95° C. to 110° C. in dependence of the solubility of the pectin,

adding acid at gelatinization temperature of the mixture to obtain a product and then

placing the resulting product into receptacles.

5,190,786

FOOD MODIFIER AND PROCESS FOR MAKING SAME LOW FAT CHOCOLATY CHIP WITH HYDRATED MICRO PARTICLES OF COCOA

Wendy A. Anderson, New York; Dreesa Dulin, Tarrytown; Jimbay Loh, Peekskill, and Mark D. Fitch, Stonybrook, all of N.Y., assignors to Kraft General Foods, Inc., Northfield, Ill.

Filed Feb. 20, 1992, Ser. No. 839,527

Int. Cl.[5] A23G *1/00, 1/04*

U.S. Cl. 426—631 29 Claims

1. A low-fat chocolaty chip containing less than about 10% cocoa butter comprising about 30% to about 55% of an aqueous sugar paste of micromilled cocoa and about 45% to about 70% additional sugar; a total sugar to cocoa ratio of between about 2:1 and about 7:1, and a total moisture content of between about 10 and about 20%; said paste comprising about 10 to about 30% cocoa, about 15% to about 75% sugar and about 20% to about 55% aqueous liquid; and said micromilled cocoa having a particle size of about 0.1 to about 20 microns.

5,190,787

PROCESS FOR PRODUCING CONTAINERIZED BEAN CURD

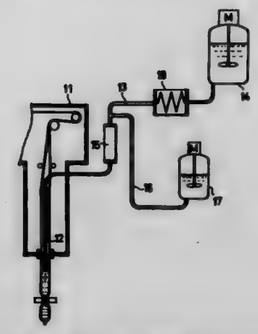
Shoichi Takeoka, and Isao Kasai, both of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed May 6, 1991, Ser. No. 696,427

Claims priority, application Japan, May 9, 1990, 2-120578

Int. Cl.[5] A23L *1/20*

U.S. Cl. 426—634 6 Claims



1. A process for producing containerized bean curd comprising the steps of:

heat-sterilizing an amount of bean milk sufficient to prepare one lot of bean curd;

storing the sterilized milk in a heat-insulating tank while cooling the milk to a temperature of at most 10° C.;

delivering the milk from the heat-insulating tank to a mixer;

pre-heating the milk to a temperature of between 18° C. and 30 ° C. while the milk is being delivered from the heat-insulating tank to the mixer for mixing with the coagulant;

admixing a coagulant with the milk as delivered from the tank, the coagulant being mixed with the milk in the mixer;

filling the mixture into containers, sealing off the containers, and heating the sealed containers to coagulate the mixture within the containers.

5,190,788

ANTI-STATIC ANTI-BACTERIAL FIBERS

Paul M. Liang, and Frank Tsai, both of Taipei, Taiwan, assignors to RCS Technology Corporation, Taipei, Taiwan

Filed Aug. 16, 1990, Ser. No. 568,228

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—2 7 Claims

1. A method of treating fibers to render the fibers both electrically conductive and anti-bacterial, said method comprising the steps of:

a) preparing a first bath of an aqueous solution containing copper ions;

b) preparing a second bath of an aqueous solution containing iodide ions in the absence of elemental iodine;

c) immersing said fibers in said first bath wherein said copper ions are adsorbed onto said fibers;

d) removing said fibers from said first bath and immersing said fibers in said second bath wherein said iodide ions combine with said copper ions to form copper iodide which is adsorbed onto said fibers to increase the electrical conductivity and anti-bacterial properties of said fibers; and

e) removing said fibers from said second bath.

5,190,789

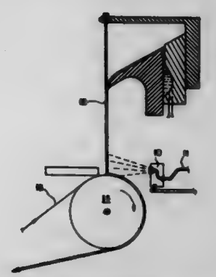
ULTRASONIC MONITORING OF A FREELY FLOWING CURTAIN OF COATING MATERIAL

Douglas S. Finnicum, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1991, Ser. No. 751,468

Int. Cl.[5] B05D *1/30*; B05C *11/00, 5/00*

U.S. Cl. 427—8 34 Claims



1. A method of coating a surface of a continuously moving substrate with a continuously flowing curtain of coating composition comprising the steps of:

(a) transmitting successive waves toward the curtain at a distance from the curtain;

(b) receiving the successive waves at a same or different distance from the curtain after step (a); and

(c) interpreting the successive waves to determine the presence and position of the curtain,

whereby a signal is generated when either the presence of the curtain is not confirmed or the position of the curtain is outside a range of curtain positions in order to initiate corrective action.

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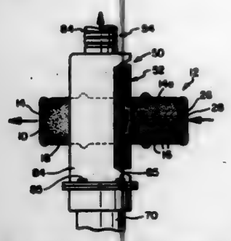
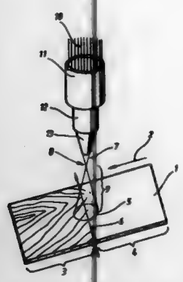
5,190,790
POWDER COATING REMOVAL METHOD
Daniel E. Blankemeyer, Columbus Grove, Ohio, assignor to Metokote Corporation, Lima, Ohio
Filed May 2, 1991, Ser. No. 694,667
Int. Cl.[5] B05D *1/06*
U.S. Cl. 427—466 18 Claims



1. A method of applying powder coating material to a recessed region of a surface of a workpiece, said method comprising the steps of:
electrostatically bonding powder coating material onto an area of the surface of said workpiece, said area including said recessed region and a non-recessed region;
frictionally wiping said non-recessed region of said area to agitate to powder coating material thereon, thereby overcoming the electrostatic bond between the non-recessed region and the powder coating material thereon; and
removing the agitated powder coating material on said non-recessed region without removing the powder coating material in said recessed region.

5,190,791
INFRARED RADIATION PROCESS FOR A HIGH CONTRAST IN THE NATURAL GRAIN OF A NATURALLY PALE WOOD
Jürgen Günter, Sindelfingen; Siegfried Köhler, Ostfildern; Siegfried Lang, Gärtringen-Rohrau; Luise Scheilhorn, Sindelfingen, and Erwin Lutz, Schönaich, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed Oct. 18, 1991, Ser. No. 779,253
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1990, 4033255
Int. Cl.[5] B05D *3/06, 3/02*
U.S. Cl. 427—554 23 Claims



1. A process for bringing out a contrast in a grain pattern of a wood component having portions of different age which have insufficient original contrast relative to each other and consisting essentially of one of a solid piece of wood, a veneered component and a veneer sheet, comprising the step of applying heat to a visible face of the component near the surface thereof for a period of time sufficient only to cover the entire surface of the compound with uniform heat intensity for bringing out the contrast, in a contact-free manner, through infrared radiation in a stagnant ambient atmosphere.

5,190,792
HIGH-THROUGHPUT, LOW-TEMPERATURE PROCESS FOR DEPOSITING OXIDES
Joseph M. Blum, Yorktown Heights; Kevin K. Chan, Staten Island; Robert C. McIntosh, Bronx, and Zeev A. Weinberg, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 27, 1989, Ser. No. 413,357
Int. Cl.[5] B05D *3/12;* C23C *16/00*
U.S. Cl. 427—560 17 Claims
1. A process for the deposition of silicon dioxide material on a substrate comprising the steps of:
washing said substrate;
exposing said substrate in a dilute hydrofluoric acid solution;
rinsing said substrate in a rinse solution;
said steps of exposing and rinsing performed immediately prior to inserting said substrate into a deposition chamber within approximately five minutes; and
depositing said silicon dioxide material in a hot-wall furnace in said deposition chamber using a low-pressure chemical vapor deposition process at a temperature between 200° C. and 300° C.;
said step of washing includes the steps of:
a first de-ionized water rinse;
a dip in a dilute hydrofluoric acid solution;
a second de-ionized water rinse;
a first ultrasonic agitation in a solution of ammonia (NH_4OH), hydrogen peroxide (H_2O_2) and de-ionized water at a temperature of approximately 60° C.;
a third de-ionized water rinse;
a second ultrasonic agitation in a solution of hydrochloric acid HCL, hydrogen peroxide (H_2O_2) and de-ionized water at a temperature of approximately 60° C.;
a fourth de-ionized water rinse;
a final rinse; and
a spin dry;
said rinse solution comprises de-ionized water.

5,190,793
REFRACTORY COVERCOAT FOR SEMICONDUTOR DEVICES AND METHODS OF MAKING AND USING THE SAME
Carl W. Berlin, Bringhurst, and John K. Isenberg, Roosville, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.
Division of Ser. No. 793,896, Nov. 18, 1991. This application Jan. 10, 1992, Ser. No. 818,946
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—96 1 Claim
1. A method of making a two-sided circuitry device comprising;
printing a conductive ink on the top face of a substrate to provide a first circuitry;
placing the substrate onto a conveyor belt of a furnace with the top face exposed and transporting the substrate on the conveyor belt through the furnace operated at a temperature sufficient to consolidate the conductive ink into a cohesive electrical lead and removing the substrate from the oven;
applying a refractory covercoat onto the top surface of the substrate covering said first circuitry, wherein said refractory covercoat comprises a glass frit, an organic binder and an inorganic filler comprising at least one selected from the group consisting of ZrO_2, Al_2O_3, SiO_2, BsO, CaO, MgO and La_2O_3; said glass frit and inorganic filler being present in a weight ratio with respect to each other ranging from about 60/40 to about 70/30, and said glass frit and inorganic filler comprising about 65 to about 75 weight percent of said composition;

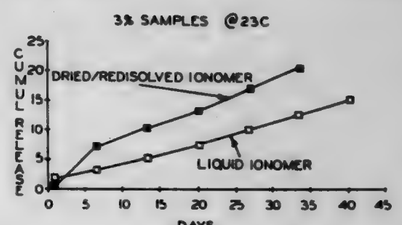
firing said refractory covercoat;
printing a second conductive ink on a back face of the substrate to form a second circuitry;
placing said substrate on a conveyor belt of an oven with the top face downward the refractory covercoat contacting the conveyor belt and transporting said substrate through said oven operated at a temperature sufficient to consolidate said second ink into a cohesive electrical conductor, so that said refractory covercoat protects the electrical conductor on the top face from damage by the furnace belt.

5,190,794
LIQUID CRYSTAL DISPLAY DEVICE AND COLOR FILTER FOR USE WITH THE LIQUID CRYSTAL DISPLAY DEVICE AND METHOD OF MAKING THE COLOR FILTER
Thunekazu Yoshino, Kamakura, and Tomiya Sonoda, Machida, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 434,004, Nov. 9, 1989, Pat. No. 5,042,920. This application May 31, 1991, Ser. No. 708,726
Claims priority, application Japan, Nov. 10, 1988, 63-282441; Jan. 10, 1989, 1-1978; Jan. 10, 1989, 1-2923
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—162 15 Claims
1. A method of manufacturing a color filter for liquid crystal devices, comprising the steps of:
providing a transparent substrate;
forming a transparent color layer on said transparent substrate by printing, said color layer having an undulating surface;
forming a plurality of resin layers on said color layer; and
flattening an upper surface of said color filter by polishing an upper surface of at least one of said resin layers.

5,190,795
METHOD FOR IMPROVING ADHESION TO METAL
Scott R. Culler, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 407,365, Sep. 14, 1989, Pat. No. 5,011,410. This application Feb. 11, 1991, Ser. No. 653,616
The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.
Int. Cl.[5] B05D *1/38, 3/02*
U.S. Cl. 427—226 2 Claims
2. A method for adhering a metal article to a substrate by /way of an intermediate layer of adhesive, which method comprises the steps of:
(a) coating at least a portion of the surface of the article with a coupling agent that is capable on heating of forming exogenous inorganic oxide;
(b) heating the coated surface at a temperature and for a time sufficient to convert the coating to a layer of exogenous inorganic oxide;
(c) adhering the article at said layer of exogenous inorganic oxide to an intermediate layer of adhesive composite; and
(d) adhering the substrate to the metal article by way of the intermediate layer,
wherein the adhesive comprises a resin comprising a mixture of Bisphenol A diglycidyl-methacrylate and triethyleneglycol dimethacrylate.

5,190,796
IMPROVED METHOD OF APPLYING METAL COATINGS ON DIAMOND AND ARTICLES MADE THEREFROM
Charles D. Iacovangelo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jun. 27, 1991, Ser. No. 722,575
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—304 16 Claims
1. A method of improving adhesion of a nickel alloy coat to a surface of a diamond article comprising the steps of:
contacting said article for an effective time with an electroless plating bath for plating said surface of said article to a desired thickness, said bath comprising a compound of nickel and a compound of a transitional metal selected from the group consisting of molybdenum, titanium, niobium and chromium;
gradually heating said electrolessly plated article in a non-oxidizing atmosphere from a first temperature to a desired heat treatment temperature at a predetermined rate; and
maintaining said electrolessly plated article at said desired heat treatment until a desired degree of adhesion between said surface and said metal alloy coat is attained.

5,190,797
COATING A SUBSTRATE WITH AN IONOMER
Warren A. Thaler, Flemington; Cruise K. Jones, Glen Gardner; Evelyn N. Drake, Bernardsville; Pacifico V. Manalastas, Edison, and Edward N. Kresge, Watchung, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Jun. 24, 1991, Ser. No. 720,042
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—385.5 12 Claims



1. A process for the encapsulation of a solid substrate which comprises the steps of:
(a) forming a solution of an olefin or styrene polymer in a hydrocarbon solvent selected from the group consisting of aliphatic and aromatic hydrocarbons and mixtures thereof;
(b) contacting the solution of the polymer with a sulfonating agent at a sufficient temperature and for a sufficient period of time to form a solution of a sulfonated polymer containing carboxylic acid;
(c) forming a solution of a base selected from the group consisting of alkali metal hydroxides and mixtures thereof in a solvent selected from the group consisting of aliphatic alcohols and mixtures of an aliphatic alcohol and a hydrocarbon, the hydrocarbon being selected from the group consisting of aliphatic and aromatic hydrocarbons and mixtures thereof;
(d) adding the solution of the base to the solution of sulfonated polymer in an amount sufficient to neutralize the sulfonated polymer and carboxylic acid, thereby forming a coating solution; and
(e) contacting the solid substrate with the coating solution while removing the solvent therefrom, thereby forming an encapsulated substrate.

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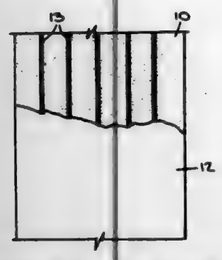
5,190,798
PAPER-PLASTIC FILM, FIBERGLASS-REINFORCED SEALING TAPE
Gilbert Bloch, 3149 S. Malo Ct., Palm Beach Gardens, Fla. 33410
Filed Jan. 9, 1992, Ser. No. 818,543
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—40 8 Claims

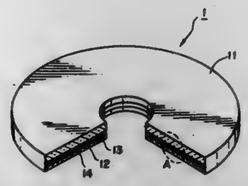


1. A strippable laminated sealing tape for sealing a carton or other article fabricated of recyclable paper material, said tape comprising:
(a) a paper inner ply having a relatively low fiber bond strength, said paper inner ply having an exposed outer surface which is pre-gummed so that it is adherable to an article to be sealed, and having an inner surface;
(b) a non-recyclable synthetic plastic film outer ply of high strength laminated to the inner surface of the inner ply by a water-based polyacrylate polymer adhesive, said outer ply rendering the tape water-resistant; and
(c) a longitudinal array of fiberglass strands extending along the length of the tape and sandwiched between the plies and bonded thereto by said adhesive to reinforce the tape, said outer ply having an axial orientation that is normal to said longitudinal array, said strands having a greater affinity for the outer plastic film ply than for the inner paper ply to which the strands are bonded, whereby the plastic outer ply is strippable from the inner paper ply and when so stripped retains the strands bonded thereto to render the article, which retains substantially all of the inner paper ply, recyclable.

5,190,799
FLOOR COVERING WITH INTEGRAL WALKING SURFACE
Chester W. Ellingson, III, Rosemount, Minn., assignor to Reese Enterprises, Inc., Rosemount, Minn.
Filed May 9, 1991, Ser. No. 697,807
Int. Cl.[5] B32B 3/06
U.S. Cl. 428—53 4 Claims

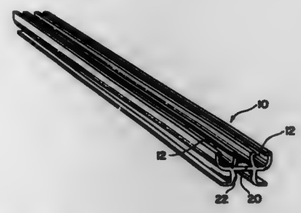
1. A longitudinal rail capable of being interconnected with other longitudinal rails to form a pedestrian walking surface, the rail comprising:
(a) a rigid rail core having an upwardly facing surface, a downwardly facing surface with a plurality of vertical members extending therefrom, a front edge and a rear edge; and
(b) at least one plastic cushion layer extending at least partially across the upwardly facing surface of said rail core, and at least partially around the front and rear edges of said rail core, said plastic cushion being softer than said rail core.

5,190,800
OPTICAL RECORDING MEDIUM
Takashi Yamada, and Fumio Matsui, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 18, 1991, Ser. No. 716,875
Claims priority, application Japan, Jan. 17, 1991, 3-003765
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—64 15 Claims



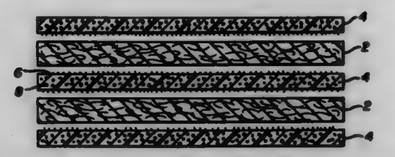
1. An optical recording medium having a recording layer formed on a light transmissive substrate, said substrate transmitting at least 80% of light for recording and reproducing on the recording layer, wherein said substrate contains a light absorbent material so as to allow only the light for recording and reproducing to pass through the substrate, and wherein said recording layer contains material capable of optical recording.

5,190,801
DUAL WIPER EXTRUSION
Pierre Charet; Govelio R. Gonzalez, both of Miami, Fla., and John M. White, Dumfries, Va., assignors to Rally Accessories, Inc., Miami, Fla.
Filed Dec. 21, 1990, Ser. No. 631,939
Int. Cl.[5] B32B 3/06; B60S 1/40
U.S. Cl. 428—99 1 Claim



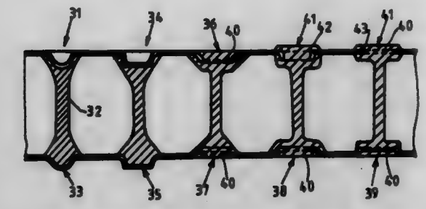
1. A dual wiper extrusion comprising:
a pair of smoothly arcuate U-shaped channel members positioned parallel one to the other and opening in the same direction and defining a plurality of bottom end caps, each U-shaped member including a smoothly arcuate L-shaped extension from a back side of said U-shaped member opposite said end caps, said respective L-shaped extension from each U-shaped member forming opposed channels for connecting said extrusion to a wiper assembly, said U-shaped channel members and said L-shaped extensions being formed in said smoothly arcuate form so as to eliminate stress concentrations at all physical locations along said members and extensions, said U-shaped channel members connected one to the other by a single, continuous bridging member joined to each respective U-shaped member at a location on said U-shaped members located between said end caps and said back side extension of said L-shaped extensions whereby bending stress induced in said bridging member from the twisting action of said extrusion in use and during installation of said extrusion is minimized to substantially eliminate splitting of said extrusion in or along said bridging member.

5,190,802
BALLISTIC RESISTANT LAMINATE
Louis A. Pilato, 598 Watchung Rd., Bound Brook, N.J. 08805
Filed Jan. 6, 1989, Ser. No. 293,995
Int. Cl.[5] B32B 5/12
U.S. Cl. 428—111 22 Claims



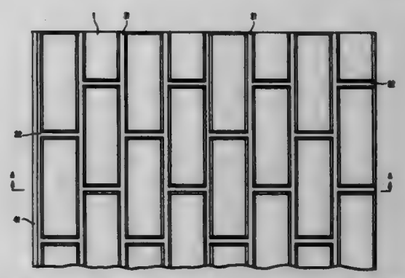
1. A ballistic resistant laminate comprising alternating plies of woven fabric bonded to alternating plies of non-woven scrim prepreg through a heat curable resin in said prepreg wherein said fabric is woven from filaments of glass or at least one normally solid organic polymer having:
(a) a tensile modulus of at least about 20 g/denier;
(b) a tensile strength of at least about 400,000 psig; and
(c) an areal density at least about 0.5 lb/ft^2 and said scrim comprises filaments of natural or synthetic fibers impregnated with a heat curable resin.

5,190,803
STRUCTURAL SHELL WITH REINFORCING RIBS CONNECTED VIA PERFORATIONS
Hubert Goldbach, Ratingen, and Boris Koch, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 434,433, Nov. 13, 1989, abandoned.
This application Feb. 5, 1991, Ser. No. 650,746
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1988, 3839855
Int. Cl.[5] B32B 3/24
U.S. Cl. 428—138 4 Claims



1. A lightweight structural component having high strength and rigidity properties comprising a shell having a hollow interior, and an inner surface reinforcing ribs of thermoplastic material injected onto the inner surface and contained within the hollow interior adhering to the shell where the ribs engage the inner surface of shell and also at a plurality of connecting points, a plurality of perforations in the shell at the connecting points through which thermoplastic material of the reinforcing ribs passes and extends beyond the perforation to anchor the reinforcing ribs to the shell, and each of the perforations having deformed edge portions embedded in the thermoplastic material of the reinforcing ribs to assist in anchoring the reinforcing ribs to the shell.

5,190,804
COATED INORGANIC HARDENED PRODUCT
Kazuo Seto; Minoru Inoue; Motoaki Haruna, all of Osaka; Hiroshi Kimura, Tokyo; Yasutoshi Nagano, Tokyo, and Yasuhiro Kashida, Tokyo, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo and Matsushita Electric Works, Ltd., Osaka, both of, Japan
Division of Ser. No. 618,551, Nov. 27, 1990, Pat. No. 5,091,460.
This application Oct. 3, 1991, Ser. No. 770,492
Claims priority, application Japan, Nov. 27, 1989, 1-308781; Jul. 25, 1990, 2-200735; Sep. 29, 1990, 2-263509
Int. Cl.[5] B32B 3/02
U.S. Cl. 428—192 8 Claims



1. A coated inorganic hardened product comprising an inorganic hardened product, a primer layer formed on the surface thereof as a first layer and a second layer formed on the primer layer, wherein the first layer is formed by curing a primer composition comprising the following components (a) to (d);
(a) 100 parts by weight o an isocyanate prepolymer containing at least two isocyanate groups per molecule but containing no urethane bond,
(b) from 1 to 100 parts by weight of an organosilicon compound containing at least one mercapto group and at least two alkoxy groups per molecule,
(c) 100 parts by weight or less, on a dry basis, of an epoxy resin-modified silicone resin, and
(d) from 0.01 to 30 parts by weight of an organotin compound and/or a tin salt of an organic acid; and the second layer is formed by curing a coating composition comprising the following components (A) to (C)
(A) an organosilane oligomer solution containing silica particles dispersed therein, said solution being obtained by partially hydrolyzing a hydrolyzable organosilane represented by the formula

$$R^1_nSiX_{4-n} \quad (I)$$

wherein R^1 which may be the same or different each represents a substituted or unsubstituted monovalent hydrocarbon group having 1 to 8 carbon atoms, n is an integer of from 0 to 3, and X represents a hydrolyzable group, said partial hydrolyzing of said organosilane being in the presence of colloidal silica dispersed in an organic solvent or water,
(B) a polyorganosiloxane having a silanol group in the molecule thereof, represented by the average composition formula

$$R^2_aSi(OH)_bO_{\frac{(4-a-b)}{2}} \quad (II)$$

wherein R^2 which may be the same or different each represents a substituted or unsubstituted monovalent hydrocarbon group having 1 to 8 carbon atoms, and a and b are numbers satisfying the following equations:

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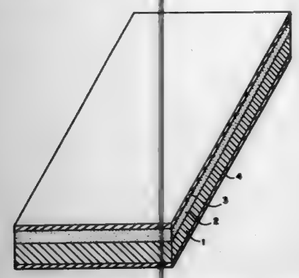
$0.2 \leq a \leq 2$

$0.0001 \leq b \leq 3$

$a+b<4$, and

(C) a catalyst.

5,190,805
ANNOTATABLE INK JET RECORDING MEDIA
David Atherton, North Kingstown, and Sen Yang, Warwick, both of R.I., assignors to Arkwright Incorporated, Fiskeville, R.I.
Filed Sep. 20, 1991, Ser. No. 762,978
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 24 Claims

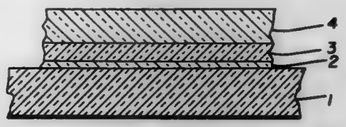


1. A matte film composite which comprises a transparent or opaque substrate, having an at least one side thereof, a water-insoluble, water-absorptive and ink-receptive annotatable matrix layer, the matrix layer comprising a hydrogen complex and a pigment, wherein the mass ratio of the pigment to the hydrogel is 0.2:1 to 3.5:1, the pigment having a MOH hardness of from about 2.2 to 7.0 and an average particle size of from about 0.5 to 10 microns, said matrix having a Critical Integrity Value of not less than 20 g.

5,190,806
LIQUID-PENETRATION-RESISTANT SORBENT LAMINATE
Haruo Nomi, Okayama, Japan, assignor to W. L. Gore & Associates, Inc., Newark, Del.
Filed Jan. 19, 1992, Ser. No. 901,316
Claims priority, application Japan, Jul. 4, 1991, 3-190738
Int. Cl.[5] B32B *7/12, 3/26*
U.S. Cl. 428—198 5 Claims

1. A liquid-penetration-resistant water-vapor-permeable composite material comprising
(a) at least two layers of porous fluoropolymer film, each having on the surfaces facing each other
(b) a non-porous coating of water-vapor-permeable adhesive; said porous fluoropolymer films separated by a layer of sorbent particles bonded to said water-vapor-permeable adhesive coating.

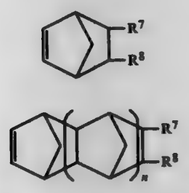
5,190,807
ABRASION WEAR RESISTANT POLYMERIC SUBSTRATE PRODUCT
Fred M. Kimock, Macungie; Bradley J. Knapp, Allentown, and Steven J. Fiske, Kutztown, all of Pa., assignors to Diamonex, Incorporated, Allentown, Pa.
Filed Oct. 18, 1990, Ser. No. 600,210
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.[5] B32B *17/06, 17/10*
U.S. Cl. 428—216 56 Claims



1. A coated substrate product comprised of a substantially optically transparent polymeric substrate and a first composite layer, said first composite layer comprising a substantially optically transparent adhesion-mediating layer at least 3 microns thick bonded to and disposed towards said substrate of a polysiloxane polymer having a high elasticity and capable of forming a strong chemical bond to said polymeric substrate, a chemically vapor deposit first interlayer bonded to and disposed immediately adjacent to said adhesion-mediating layer of a substantially optically transparent material devoid of alkali metal atoms and fluorine, and a chemically vapor deposited first layer of substantially optically transparent diamond-like carbon bonded to and disposed immediately adjacent to said first interlayer and away from said substrate, said first interlayer being capable of forming a strong chemical bond to said adhesion-mediating layer and diamond-like carbon.

5,190,808
PREPREG COMPRISING SATURATED OR UNSATURATED SILANE SUBSTITUTED CYCLIC GROUP
Linwood P. Tenney, Birmingham, Ala.; Timothy J. Kettering, Middleburg Hgts., Ohio; Robert J. Minchak, Parma Hgts., Ohio; George M. Benedikt, Macedonia, Ohio, and David J. Smith, Sheffield Lake, Ohio, assignors to B. F. Goodrich Company, Akron, Ohio
Division of Ser. No. 440,146, Nov. 22, 1989, Pat. No. 5,071,701.
This application Aug. 26, 1991, Ser. No. 751,640
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—224 10 Claims

1. A laminate comprising at least one layer of a non-cellulic cloth impregnated with a copolymer having repeating units derived from silane-substituted and non-silane-substituted monomers of the formulas



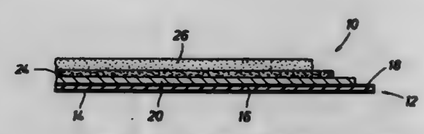
wherein n=1–4 and R^7 and R^8 are independently selected from hydrogen, halogen, C^1–C_{12} alkyl groups, C_2–C_{12} alkylene groups, C_6–C_{12} cycloalkyl groups, C_6–C_{12} cycloalkylene groups and C_6–C_{12} aryl groups, silane or R^7 and R^8 together form a saturated or unsaturated silane substituted cyclic group of from 4 to 12 carbon atoms with the two ring carbon atoms

connected thereto, said ring carbon atoms forming part of and contributing to the 4 to 12 carbon atoms in the cyclic group with the proviso that, when R^7 and R^8 do not together form said cyclic group, at least one of R^7 and R^8 is a silane group.

5,190,809
FABRIC OF THERMOPLASTIC FIBER AND CONTINUOUS REINFORCING FIBER
Roelof Marissen, Born, and Hans H. H. Horsmans, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands
Filed Aug. 31, 1990, Ser. No. 575,475
Claims priority, application Netherlands, Aug. 31, 1989, 8902194
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—225 7 Claims

1. Fabric suitable for being processed as a thermoplastic composite prepreg, comprising thermoplastic fibers and continuous reinforcing fibers, said thermoplastic fibers having a melting point lower than that of said reinforcing fibers, with said thermoplastic fibers heated before being processed to form said fabric to a temperature of from 50° to 15° C. below the melting point of said thermoplastic material.

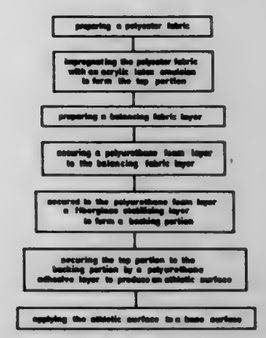
5,190,810
COMPOSITE FOR USE IN MAKING PROTECTIVE ARTICLES FOR USE IN LASER SURGERY
Warren Kirschbaum, 77 Harbor La., Kemah, Tex. 77565, and Steven L. Weinberg, 916 Davis Rd., League City, Tex. 77573
Division of Ser. No. 491,177, Mar. 9, 1990, Pat. No. 5,103,816, which is a continuation-in-part of Ser. No. 405,519, Sep. 11, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,768
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—246 5 Claims



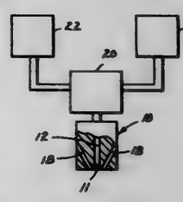
1. A laser resistant composite for application to an object to be protected from damage from an incident laser beam comprising:
an adhesive-backed foil;
a layer of fire retardant fabric bonded to said foil on the side opposite the adhesive; and
an insulative layer laminated to said fire retardant fabric.

5,190,811
ATHLETIC COURT SURFACE
Dennis Rossi, 4051 N. Point Rd., Baltimore, Md. 21222
Filed Jan. 22, 1992, Ser. No. 901,813
Int. Cl.[5] B32B *27/40*; A63G *1/00*; A63H *13/20*
U.S. Cl. 428—246 9 Claims

1. A cushioned athletic surface with improved shrinkage and resistance to moisture absorbency for placement on a base material comprising a top surface and a backing portion wherein the top surface is comprised of a polyester fabric impregnated with an acrylic latex emulsion and wherein the backing portion is comprised of a balancing fabric layer secured to a stabilizing layer containing fiberglass by a polyurethane foam layer wherein said backing portion is secured to the top surface by an adhesive layer.



5,190,812
FILM MATERIALS BASED ON MULTI-LAYER BLOWN MICROFIBERS
Eugene G. Joseph, Arden Hills, and James A. Rustad, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 30, 1991, Ser. No. 768,174
Int. Cl.[5] A61F *13/02*; B32B *3/10, 23/02, 5/22*
U.S. Cl. 428—297 17 Claims



1. A transparent film formed from a nonwoven web of microfibers having a substantially continuous phase of a thermoplastic low modulus material having a Young's modulus of less than about $10^7 N/m^2$ and within said continuous phase of thermoplastic low modulus material a discontinuous array of entangled microfibers of an extensible thermoplastic material.

5,190,813
POROUS FLUORORES IN MATERIAL PLATED WITH A METAL
Kazuhiko Ohashi; Hiroshi Kato, and Takayuki Wani, all of Okayama, Japan, assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Jul. 20, 1992, Ser. No. 916,924
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—319.3 3 Claims

1. A porous polytetrafluoroethylene material comprising:
a porous polytetrafluoroethylene substrate,
a cation-exchange resin coated on the inside pore surface of the substrate,
at least one layer of platinum metal or platinum alloy bonded to the cation-exchange resin.

VOL 1148 ISS 1 MR 2 1993 U.M.I.

5,190,814
NON-DUSTING WINDOW ENVELOPE FILM UTILIZING A PARTICULATE ANTI-FLECKING AGENT
Stephen I. Foster, Bexley; Jeffrey J. Stimler, Newark, and Gail S. Nonnemacher, Reynoldsburg, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 422,846, Oct. 17, 1989, Pat. No. 5,089,953, which is a continuation-in-part of Ser. No. 220,296, Jul. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 393,057, Aug. 10, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 597,605
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.
Int. Cl.[5] B32B *5/16*; B24C *51/02*
U.S. Cl. 428—327 21 Claims

1. A window envelope having a non-opaque plastic window patch formed of a film comprising polystyrene and a quantity of one or more particulate anti-flecking agents protruding from the surface of the film sufficient to make the film non-dusting, the one or more particulate anti-flecking agents each having a melting point greater than the polystyrene of the film and being substantially non-compatibilized and chemically inert with and substantially insoluble in the polystyrene of the film.

5,190,815
WATERPROOFING TAPE COMPRISING ETHYLENIC SULFONATE POLYMERS
Hiroya Kobayashi; Tadao Shimomura; Kazuhiro Okamura, all of Osaka, and Yoshinori Sano, Hyogo, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
Division of Ser. No. 318,067, Jan. 17, 1989, abandoned. This application Jun. 17, 1991, Ser. No. 716,628
Claims priority, application Japan, Jun. 9, 1987, 62-142186; Jul. 7, 1987, 62-167692; Nov. 15, 1987, 62-287366
Int. Cl.[5] B32B *00/00*
U.S. Cl. 428—335 6 Claims

1. A waterproofing tape for an optical or electric cable, which comprises
a film or sheet,
a cross-linked macromolecular compound containing a sulfonic acid group or a salt thereof in an amount of not less than 0.5 mg. equivalent/g and a dissociating group in an amount of not less than 1.0 mg. equivalent/g. and having the ability to absorb deionized water in the range of 50 to 1000 times its own weight, said cross-linked macromolecular compound being produced by polymerizing a monomer mixture consisting essentially of (A) 5 to 100 mol % of at least one sulfonic acid group unsaturated monomer selected from the group consisting of sulfoethyl(meth)acrylate, sulfopropyl(meth)acrylate, and 2-acrylamide-2-methyl propanesulfonic acid or salt thereof and (B) 95 to 0 mol % of at least one other unsaturated monomer selected from the group consisting of methacrylic acid, sodium methacrylate, acrylamide, acrylic acid, calcium acrylate, methacrylamide, methoxy polyethylene glycol monomethacrylate and sodium acrylate in the presence of a cross-linking agent in the range of 0.00001 to about 0.3 in molar ratio, based on said monomer mixture, and
an organic macromolecular binder comprising 5 to 300 parts by weight of an organic macromolecular binder and 0.05 to 3 parts by weight of an inorganic powder possessing an average particle diameter not more than 20 microns on the basis of 100 parts by weight of the cross-linked macromolecular compound,
wherein the cross-linked macromolecular compound is immobilized on the surface of the film or sheet with the organic macromolecular binder, said immobilized cross-linked macromolecular compound and said organic macromolecular binder together forming a layer of from 30 to 150 microns in thickness.

5,190,816
POLYOLEFIN ADHESIVE TAPE
Eric S. Gardiner, Westtown, and Dale L. Haner, Pomona, both of N.Y., assignors to Arizona Chemical Company, Panama City, Fla.
Continuation of Ser. No. 583,184, Sep. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 415,626, Oct. 2, 1989, abandoned. This application Feb. 24, 1992, Ser. No. 840,294
Int. Cl.[5] B32B *7/112*
U.S. Cl. 428—343 7 Claims

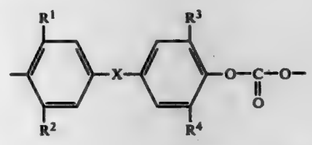
1. An adhesive tape comprising:
a polyolefinic film comprising:
from about 99.5% to about 90.0% by weight of a low surface energy polyolefin; and
from about 0.5% to about 10.0% by weight of an amphiphile having the formula

$$RA(CHR^2[CH_2]_aA^1)_mR^1$$

where R and R^1 are selected from the group consisting of the alkyl, aryl, alkylaryl, acyl and arylacyl derivatives of an aliphatic or aliphatic/aromatic mono-acid with a molecular weight of from about 200 to about 500 daltons, A and A^1 are O, R^2 is selected from the group consisting of H, CH_3 and C_2H_5, n is from 0 to 3 and m is from 2 to 20 whereby the amphiphile is intimately mixed with the polyolefin and the amphiphile is substantially non-leachable from the polyolefin film into aqueous liquids and whereby the surface energy of the polyolefinic film is enhanced with respect tot he surface energy of the polyolefin without the amphiphile; and
a coating of a water-dispersed adhesive disposed on at least one surface of said film.

5,190,817
PHOTOCONDUCTIVE RECORDING ELEMENT
David R. Terrell, Lint; Stefaan K. De Meutter, Zandhoven, both of Belgium; Ulrich Grigo, Kempen, and Volker Serini, Krefeld, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium
Filed Nov. 13, 1990, Ser. No. 611,526
Claims priority, application European Pat. Off., Nov. 13, 1989, 89202864.8
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—343 12 Claims

1. A photoconductive recording material having a conducting electrode coated with at least one binder layer incorporating at least one polyester carbonate copolymer containing aromatic polyester and aromatic carbonate units and wherein the aromatic carbonate units are present in the range of 10 to 48 mole % of said copolymer and correspond to the following general formula (I):

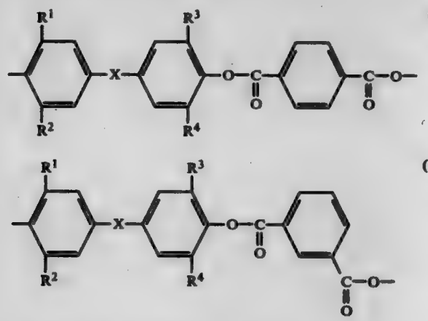


(I)

in which: X represents S, SO_2, $-\overset{R^5}{\underset{R^6}{C}}-$ or $R^7-\overset{R^5}{\underset{R^6}{C}}-R^8$,

each of R^1, R^2, R^3, R^4, R^7 and R^8 (same or different) represents hydrogen, halogen, an alkyl group or an aryl group, and each of R^5 and R^6 (same or different) represents hydrogen, an alkyl group, an aryl group or together represent the necessary atoms to close a cycloaliphatic ring, and wherein the aromatic ester units are present in the range of 52 to 90 mole % of said copoly-

mer and have at least one of the compositions represented by the general formulae (II and III):



(II)

(III)

in which: X, R^1, R^2, R^3 and R^4 have the same meaning as described above, said polyester carbonate having a weight averaged molecular weight in the range of 120,000 to 1,000,000.

5,190,818
ADHESIVE COMPOSITION FOR TEMPORARY ADHESIVE BONDING OF PAPER SHEETS
Tsutomu Sakai, Tokyo, Japan, assignor to Toppan Moore Co., Ltd., Tokyo, Japan
Filed Mar. 21, 1991, Ser. No. 672,838
Claims priority, application Japan, Apr. 20, 1990, 2-103140; Jun. 29, 1990, 2-170100
Int. Cl.[5] B32B *7/12*; C08L *3/00*
U.S. Cl. 428—355 9 Claims

1. A peelable adhesive composition which comprises, as a mixture:
(a) an aqueous emulsion or latex of a rubber containing 100 parts by weight solids:
(b) from 30 to 150 parts by weight of particles of silica gel having an average particle diameter in the range from 10 nm to 30 μm and an oil absorption of at least 100 ml/100 g.; and
(c) from 70 to 250 parts by weight of starch having a particle diameter larger than the average particle diameter of the silica gel particles as the component (b), the total amount of the comPonents (b) and (c) being in the range from 100to 400 parts by weight.

5,190,819
FIBERS FORMED OF BLENDS OF ETHERIC PHOSPHAZENE POLYMERS AND METAL OXIDES AND THE METHOD OF THEIR FORMATION
Christine J. T. Landry, Honeoye Falls; Wayne T. Ferrar, and Bradley K. Coltrain, both of Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 450,964, Dec. 15, 1989, Pat. No. 5,104,602. This application Sep. 26, 1991, Ser. No. 765,786
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—357 10 Claims

1. Composite fiber comprising a multicomponent blend of etheric phosphazene and metal oxide wherein said metal oxide comprises between about 1 and about 80 percent by weight of said composite.

5,190,820
COATED REINFORCING FIBER AND METHOD FOR APPLYING AN OXIDE BARRIER COATING
Michael L. Millard, Sharonville; Michael G. Harrison, West Chester, and Andrew Szweda, Middletown, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Division of Ser. No. 440,575, Nov. 20, 1989, Pat. No. 5,024,859. This application Mar. 1, 1991, Ser. No. 665,638
Int. Cl.[5] B32B *18/00, 33/00*; C04B *35/02, 35/10, 35/48*
U.S. Cl. 428—378 2 Claims

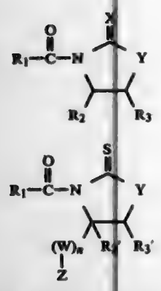
1. An improved reinforced fiber comprising in combination:
a reinforcing fiber having a predetermined fiber diameter and of a fiber material capable of exposure to an oxidizing environment at greater than 1000° C. without substantial adverse change in fiber mechanical properties; and
a metal oxide barrier coating being at least about 50% fine microcrystalline oxide on the fiber, the coating being of oxide selected from the group consisting of zirconium oxide, hafnium oxide and their mixtures, the coating applied to the fiber by first wetting the fiber with a solution containing the metal in the form of a salt and then decomposing the salt to the metal oxide by heating, the coating being such that it will not chemically react with the fiber in an oxidizing environment greater than 1000° C.;
the coating having a thickness in the range of about 0.005% to less than 7% of the fiber diameter.

5,190,821
HOLLOW FILAMENT CROSS-SECTIONS CONTAINING FOUR CONTINUOUS VOIDS
Michael T. Goodall, Landenberg, Pa.; Craig A. Jackson, and Perry H. Lin, both of Seaford, Del., assignors to D. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 24, 1991, Ser. No. 735,241
Int. Cl.[5] B05D *3/00*
U.S. Cl. 428—398 8 Claims

1. A continuous filament, comprising a thermoplastic synthetic polymer and having a solid axial core and four substantially equispaced continuous nonround voids, a void content of about 6% to 25%, and a four sided cross-sectional contour which is free of substantial convex or concave curves, wherein each void is substantially centered on a side of the contour.

5,190,822
SURFACE-MODIFIABLE LIPOSOME AND PROCESS FOR PRODUCING SURFACE-MODIFIED LIPOSOME
Naoyuki Nishikawa, and Mitsunori Ono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 19, 1991, Ser. No. 687,799
Claims priority, application Japan, Apr. 20, 1990, 2-104670; Aug. 17, 1990, 2-216750
Int. Cl.[5] A61K *9/127*; B01J *13/20*
U.S. Cl. 428—402.2 11 Claims

1. A surface-modifiable liposome comprising a compound represented by formula (I) or (II):



(I)

(II)

and a lipid capable of forming a liposome; wherein

R_1 represents a hydrophobic group; R_2 and R_3 each represents an organic group or a hydrogen atom; R_2 and R_3 optionally combine with each other to form a double bond or a ring; X and Y each represents an oxygen atom or a sulfur atom; R_2' and R_3' each represents a hydrogen atom or an organic group; W represents a linking group; n represents 0 or 1; and Z represents a hydrophilic group.

5,190,823

METHOD FOR IMPROVING ADHESION OF SYNTHETIC DIAMOND COATINGS TO SUBSTRATES

Thomas R. Anthony, Schenectady, and James F. Fleischer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 386,737, Jul. 31, 1989, abandoned. This application Feb. 11, 1991, Ser. No. 653,556

Int. Cl.[5] B32B 7/00; B05D 3/06

U.S. Cl. 428—408 **6 Claims**

1. A method for improving adhesion of a diamond coating produced by chemical vapor deposition on at least one substrate which comprises thermally activating a mixture of hydrogen and a hydrocarbon gas in the presence of said substrate and an auxiliary substrate comprising silicon in elemental or combined form.

5,190,824

ELECTROSTATIC-ERASING ABRASION-PROOF COATING

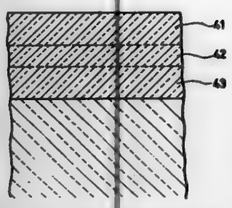
Kenji Itoh, Zama, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Continuation-in-part of Ser. No. 318,541, Mar. 3, 1989, abandoned. This application Feb. 26, 1991, Ser. No. 660,949

Claims priority, application Japan, Mar. 7, 1988, 63-54467

Int. Cl.[5] B32B 9/04

U.S. Cl. 428—408 **11 Claims**



1. An abrasion-proof amorphous carbon coating formed on a substrate comprising:

a first carbon layer formed on said substrate by glow discharge CVD method where said substrate is located on an electrode which functions as a cathode:

a second carbon layer formed on said first carbon layer, said second layer having low resistivity and having a lower degree of hardness than said first layer; and

a third diamond-like carbon layer formed on said second layer having a high degree of hardness and resistivity of 10^{10}–10^{15} ohm centimeter,

wherein said first layer functions as an impurity blocking layer and to improve the adhesion of said coating to the substrate, said second layer functions to erase static electricity formed on the coating and to reduce stress caused by said first layer, and said third layer functions as a surface protective layer.

5,190,825

ADHESIVE LAYER USED IN THE MANUFACTURE OF LAMINATED GLAZINGS, METHOD OF MANUFACTURING AND LAMINATED GLAZINGS COMPRISING SUCH LAYER

Herve Arribart, Soisy Sous Montmorency, and Pascal Chartier, Paris, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 207,550, Jun. 16, 1988, abandoned. This application Oct. 25, 1991, Ser. No. 781,642

Claims priority, application France, Jun. 16, 1987, 87 08345

Int. Cl.[5] B33B 17/10, 27/40

U.S. Cl. 428—412 **7 Claims**

1. A transparent laminate, comprising a layer of plastic selected from the group consisting of polyurethane, polyvinylbutyral and polyvinylchloride having at least two major surfaces, wherein at least one of monomers or oligomers of an unsaturated monomer or salts of said monomer are radiochemically grafted on at least one of the major surfaces, which is in contact with a sheet selected from the group consisting of glass, polycarbonate and polymethylmethacrylate, to improve the adhesion between the layer of plastic with said sheet.

5,190,826

INTERLAYERS FOR USE IN SOUND-INSULATING LAMINATED GLASSES

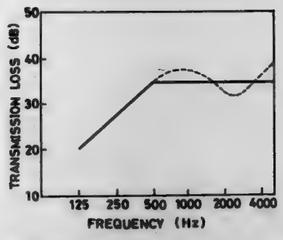
Kenichi Asahina, Shiga; Naoki Ueda, Osaka, and Hirofumi Omura, Shiga, all of Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

Filed May 13, 1991, Ser. No. 699,073

Claims priority, application Japan, May 14, 1990, 2-123600; Dec. 27, 1990, 2-408395

Int. Cl.[5] B32B 17/10

U.S. Cl. 428—437 **13 Claims**



1. An interlayer for use in laminating two or more plates of glass together, the interlayer in the form of a laminated film and comprising at least one resin film (A) and at least one resin film (B), the resin film (A) comprising a resin (a) and a plasticizer, the resin film (B) comprising a resin (b) and a plasticizer, the resin (a) being a polyvinyl acetal having a degree of acetalization of at least 50% and prepared by acetalizing a polyvinyl alcohol with an aldehyde having 6 to 10 carbon atoms, the resin (b) being a polyvinyl acetal having a degree of acetalization of at least 50% and prepared by acetalizing a polyvinyl alcohol with an aldehyde having 1 to 4 carbon atoms.

5,190,827

SILICONE PRESSURE SENSITIVE ADHESIVE COMPOSITIONS HAVING HIGH SOLIDS CONTENT

Shaow B. Lin, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Mar. 26, 1991, Ser. No. 675,396

Int. Cl.[5] B32B 9/04

U.S. Cl. 428—447 **42 Claims**

1. An organopolysiloxane composition curable to produce a pressure sensitive adhesive having high tack and high peel adhesion, comprising by weight:

(A) from about 50 to about 75 parts by weight of a toluene soluble, resinous copolymer comprising $R_3SiO_{\frac{1}{2}}$ units and $SiO_{4/2}$ units wherein R is selected from the group consisting of alkyl groups and alkenyl groups, wherein the resinous copolymer comprises from about 0.2% to about 5.0% by weight, based on the total weight of the copolymer, of hydroxyl radicals, at least 95% of all R groups being an alkyl group, the total number of R radicals that are alkenyl radicals being 0–0.5% of all R radicals, the molar ratio of $R_3SiO_{\frac{1}{2}}$ units to $SiO_{4/2}$ units being from about 0.6 to about 0.9 inclusive;

(B) an alkenyl-terminated polydiorganosiloxane having a viscosity of from about 20 to about 400 centipoise at 25° C. and having the general formula

$$R^2R^1{}_2SiO(R^3{}_2SiO)_mSiR^1{}_2R^2 \quad (I)$$

wherein each R^1 is independently an alkyl group having from 1 to about 10 carbon atoms or an aryl group, R^2 is an alkenyl group having from 1 to about 10 carbon atoms, each R^3 is independently R^1 or R^2, with the proviso that at least 99.5% of all R^3 radicals are R^1, "m" is a number in the range of from about 1 to about 300;

(C) a hydride-terminated organohydrogenpolysiloxane in an amount sufficient to provide a silicon-bonded hydrogen content of from 0 to about 90 mole % based on the total silicon-bonded hydrogen content of (C) and (D), wherein (C) is compatible with the mixture of (A) and (B), has a viscosity of from about 10 to about 1000 centipoise at 25° C., and has the general formula

$$R^4{}_2HSiO(R^5{}_2SiO)_xSiHR^4{}_2 \quad (II)$$

wherein each R^4 is independently an alkyl group having from 1 to about 10 carbon atoms or an aryl group, and each R^5 is hydrogen or R^4, with the proviso that at least 99.5% of all R^5 radicals are R^4, "a" is a number in the range of from 1 to about 500, there being at least two silicon bonded hydrogen atoms per molecule of (C), no silicon atom bearing more than one silicon bonded hydrogen atom;

(D) a hydrogen-containing polydiorganosiloxane containing more than 2 silicon-bonded hydrogen atoms per chain and present in an amount sufficient to provide a silicon-bonded hydrogen content of from 10 to about 100 mole % based on the total silicon-bonded hydrogen content of (C) and (D), wherein (D) is selected from the group consisting essentially of

(1) linear hydrogen-containing polydiorganosiloxane fluids having a viscosity of from about 5 to about 12,000 centipoise at 25° C., a hydride equivalent weight of from about 60 to about 10,000 grams/silicon-bonded hydrogen atom, and the general formula

$$(R^6)_3SiO[(R^6)_2SiO]_x[HR^6SiO]_ySi(R^6)_3$$

wherein R^6 is an alkyl radical having from about 1 to about 10 carbon atoms or an aryl radical, "x" is a number in the range of from about 0 to about 800, and "y" is a number in the range of from about 3 to about 100; and

(2) resinous hydrogen-containing siloxane copolymers selected from the group consisting essentially of:

(a) resinous hydrogen-containing siloxane copolymers comprising by weight:

(i) from about 60% to about 100% of $SiO_{4/2}$ units and $(R^7)_2HSiO_{\frac{1}{2}}$ units; wherein the ratio of $(R^7)_2HSiO_{\frac{1}{2}}$ units to $SiO_{4/2}$ units is from about 0.6:1 to about 2:1; and

(ii) from 0 to about 40% of $(R^7)_3SiO_{\frac{1}{2}}$ units and $(R^7)_2SiO_{2/2}$ units; and

(b) resinous hydrogen-containing siloxane copolymers comprising by weight:

(i) from about 30% to about 100% of $R^7SiO_{3/2}$ units and $(R^7)_2HSiO_{\frac{1}{2}}$ units; wherein the ratio of $(R^7)_2HSiO_{\frac{1}{2}}$ units to $R^7SiO_{3/2}$ units is from about 0.6:1 to about 2:1; and

(ii) from 0 to about 70% of $(R^7)_3SiO_{\frac{1}{2}}$ units and $(R^7)_2SiO_{2/2}$ units;

wherein R^7 is a monovalent hydrocarbon radical having from 1 to about 6 carbon atoms at least 95% of all R^7 groups being an alkyl group, the resinous siloxane copolymers having a hydride content of from about 0.05% to about 1.2% by weight and a hydride equivalent weight of from about 80 to about 2000 grams/silicon-bonded hydrogen atom; and the total of (B), (C) and (D) being from about 25 to about 50 parts by weight; the total of (A), (B), (C) and (D) being 100 parts by weight; the ratio of silicon-bonded hydrogen atoms in (C) and (D) to olefinically unsaturated radicals in the total of (A) and (B) being in the range of from about 1.1:1 to about 15.0:1; (C) and (D) having an average hydride equivalent weight of at least 1500 grams/silicon-bonded hydrogen atom based on the total of silicon-bonded hydrogen atoms in (C) and (D);

(E) a catalytic amount of a hydrosilation catalyst; and

(F) from 0 to about 40% by weight of an organic solvent.

5,190,828

LOW-GLOSS POLYACETAL RESIN COMPOSITIONS AND MOLDED ARTICLES

Tohru Katsumata, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Jul. 9, 1991, Ser. No. 725,797

Claims priority, application Japan, Jul. 9, 1990, 2-18117

Int. Cl.[5] B32B 9/06; C08F 283/06

U.S. Cl. 428—447 **5 Claims**

1. A low surface gloss polyacetal resin composition comprising

(A) 100 parts by weight of a polyacetal resin; and

(B) a surface gloss reducing effective amount between about 0.1 to 40 parts by weight of a silicone graft copolymer which is the radical copolymerization product of, and has units constituting its main backbone chain derived from, comonomers (a) and (b), wherein comonomer (a) is an acrylic-modified silicone which is the condensation reaction product of α,ω-dihydroxypolydimethylsiloxane with γ-methacryloxypropyldimethylchlorosilane or γ-methacryloxypropyltrichlorosilane, and wherein comonomer (b) is acrylic or methacrylic acid or an ester thereof.

5,190,829

ORNAMENTAL BASEBALL BAT AND METHOD OF MANUFACTURE

Lance Nybye, 13275 Blueberry Hill Ln., Valley Center, Calif. 92082

Filed Nov. 25, 1991, Ser. No. 796,782

Int. Cl.[5] B32B 21/00

U.S. Cl. 428—542.4 **11 Claims**

1. A method of ornamenting a wooded baseball bat having a large diameter end portion and an opposite end portion of a smaller diameter forming a handle, comprising the steps of:

removing a unitary piece of wood from the bat leaving a cavity;

configuring one side of the unitary piece of wood; and

securing another side of configured piece of wood within the bat cavity.

5,190,830

METHOD OF FORMING A UNIFORM COATING BY ELECTRODEPOSITION ON INTEGRATED FERROUS AND NON-FERROUS MATERIALS AND PRODUCT THEREOF

Katsuhiko Matsuo, Ibaraki, and Takeshi Kunisori, Sakai, both of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Jun. 27, 1991, Ser. No. 722,145
Claims priority, application Japan, Jun. 29, 1990, 2-172955
Int. Cl.[5] C25D *13/12*
U.S. Cl. 428—626 **10 Claims**

1. A method of forming a uniform coating on integrated ferrous and non-ferrous metal articles by electrodeposition, which comprises the steps of:

precoating the non-ferrous metal article with an organic surface coating film containing fine particles of molybdenum disulfide, the non-ferrous metal article being comprised of aluminum or aluminum alloy,

attaching the ferrous metal article to the non-ferrous metal article, and

coating the attached non-ferrous and ferrous metal articles simultaneously by electrodeposition,

wherein the organic surface coating film containing fine particles of molybdenum disulfide on the non-ferrous metal article enables a uniform coating to be formed simultaneously on the integrated non-ferrous and ferrous metal articles by electrodeposition despite the dissimilar electrical conductivities of the metal articles.

6. An integrated article comprising integrated ferrous and non-ferrous metal articles having a uniform outer coating formed simultaneously on the integrated ferrous and non-ferrous metal articles by electrodeposition, said coated integrated article being produced by:

precoating the non-ferrous metal article with an organic surface coating film containing fine particles of molybdenum disulfide, the non-ferrous metal article being comprised of aluminum or aluminum alloy,

attaching the ferrous metal article to the non-ferrous metal article, and

coating the attached non-ferrous and ferrous metal articles simultaneously by electrodeposition,

wherein the organic surface coating film containing fine particles of molybdenum disulfide on the non-ferrous metal article enables a uniform coating to be formed simultaneously on the integrated non-ferrous and ferrous metal articles by electrodeposition despite the dissimilar electrical conductivities of the metal articles.

5,190,831

BONDED TITANIUM/STEEL COMPONENTS

John G. Banker, Boulder, Colo., assignor to Explosive Fabricators, Inc., Colo.

Filed Nov. 5, 1991, Ser. No. 788,088
The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.
Int. Cl.[5] B32B *15/00*
U.S. Cl. 428—660 **4 Claims**

1. An explosion bonded three-layered metal product comprising:

a first layer of steel,

a second layer of copper-nickel adjacent said steel layer, said layer of copper-nickel comprising copper in a range from 65% to 75% and nickel in a range from 35% to 25%, and

a layer of titanium adjacent said layer of copper-nickel,

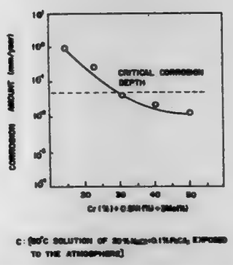
a layer of titanium adjacent said layer of copper-nickel, wherein said bonded three-layered product exhibits superior bond toughness.

5,190,832

ALLOY AND COMPOSITE STEEL TUBE WITH CORROSION RESISTANCE IN COMBUSTION ENVIRONMENT WHERE V, NA, S AND CL ARE PRESENT

Hiroyuki Ogawa; Tetsuo Ishitsuka; Kozo Denpo; Akihiro Miyasaka; Koichi Takeda, all of Kanagawaken, and Satoshi Araki, Yamaguchiken, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,066
Claims priority, application Japan, Dec. 21, 1990, 2-405285
Int. Cl.[5] C22C *3/00*; B32B *15/00*
U.S. Cl. 428—678 **2 Claims**



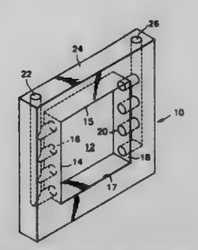
1. An alloy exhibiting corrosion resistance in a combustion environment where V, Na, S and Cl are present consisting essentially of, in weight percent, not more than 0.05% C, 0.02–0.5% Si, 0.02–0.5% Mn, 15–35% Cr, 0.5–4% Mo, more than 40% but not more than 60% Co, 5–15% Fe, 0.5–5% W, 0.0003–0.005% Ca and the remainder of Ni at a content of not less than 4% and unavoidable impurities, provided that Cr (%) + 0.5Ni (%) + 3Mo (%) > 30 (%).

5,190,833

ELECTRODES FOR METAL/AIR BATTERIES AND FUEL CELLS AND BIPOLAR METAL/AIR BATTERIES INCORPORATING THE SAME

Jonathan Goldstein; Neal Naimer, both of Jerusalem; Erik Khasin, Rishon Le-Zion, and Avner Brokman, Jerusalem, all of Israel, assignors to Luz Electric Fuel Israel Ltd., Jerusalem, Israel

Filed Dec. 31, 1990, Ser. No. 633,518
Int. Cl.[5] H01M *8/06*
U.S. Cl. 429—27 **20 Claims**



1. A bipolar primary metal/air battery of the type having a plurality of electrically series-connected cells, each cell comprising:

a) a metallic slurry anode, containing oxidizable metal particles and an alkaline electrolyte;

b) a current-collecting electrolyte-impervious metallic structure having a first surface in contact therewith for collecting current from said metallic slurry anode;

c) a metallic foamed or fiber mat having a first surface attached to a second surface of said structure, a second surface of said mat being impregnated with an inner hydrophobic waterproof barrier layer coated with an outer active catalytic layer, said mat constituting an air cathode;

d) means for introducing oxygen into said mat, and

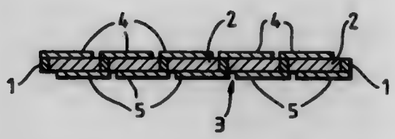
e) a porous separator positioned adjacent to said second surface of said mat and which allows the migration of said alkaline electrolyte therethrough.

5,190,834

COMPOSITE MEMBRARNES AND ELECTROCHEMICAL CELLS CONTAINING THEM

Kevin Kendall, Runcorn, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 22, 1991, Ser. No. 780,204
Claims priority, application United Kingdom, Oct. 24, 1990, 9023091
Int. Cl.[5] H01M *6/18*
U.S. Cl. 429—31 **15 Claims**



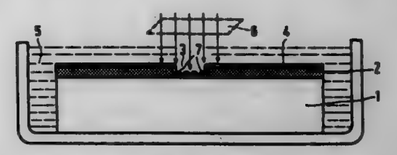
1. A composite membrane comprising at least one domain of an electrolyte material and at least one domain of an electronically conducting interconnect material, said electrolyte domain and said interconnect domain traversing the thickness of the membrane so that the membrane comprises contact surfaces for the electrolyte domain and the interconnect domain on both major faces thereof.

5,190,835

METHOD OF REPAIRING A DEFECT IN A LITHOGRAPHIC MASK COMPRISING METAL DEPOSITION FROM SOLUTION VIA U.V. STIMULATED ELECTRON EMISSION

Johannes W. M. Jacobs; Christiaan J. C. M. Nillesen, and Johannes M. G. Rikken, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1991, Ser. No. 663,502
Claims priority, application Netherlands, Mar. 5, 1990, 9000502
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 **21 Claims**



1. A method of repairing a defect in a mask pattern of a lithographic mask comprising the steps of

(a) providing a mask with a photosensitive layer,

(b) introducing said mask and photosensitive layer into a solution of a metal ion,

(c) exposing said mask and photosensitive layer through a radiation diaphragm corresponding to interruptions in said mask to radiation having a wavelength to be absorbed by said photosensitive layer,

(d) forming free electrons from exposed portions of said photosensitive layer, said free electrons converting said metal ion of said solution into metal at said interruptions, and

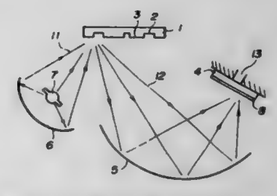
(e) automatically ending said conversion upon reaching a thickness of said metal at said interruptions that substantially prevents said radiation from penetrating to said photosensitive layer.

5,190,836

REFLECTION TYPE PHOTOMASK WITH PHASE SHIFTER

Kenji Nakagawa, Isehara, and Kenichi Kawashima, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 12, 1991, Ser. No. 667,934
Claims priority, application Japan, Mar. 16, 1990, 2-67601
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 **12 Claims**



1. A reflection type photomask comprising:

a substrate having a concavo-convex substrate surface; and

a reflecting surface formed on at least part of said concavo-convex substrate surface and having a concavo-convex reflecting surface including a first region and a second region which have a relative height difference, so that a light reflected from the first region and a light reflected from the second region have a predetermined phase difference caused by a difference in lengths of optical paths of the lights which reflect at the first and second regions.

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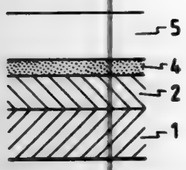
5,190,837
IMAGE HOLDER MEMBER HAVING RESIN LAYER OF METAL-COATED FINE RESIN PARTICLES AND BINDER RESIN
Kiyoshi Sakai, Chofu; Hisami Tanaka; Naoto Fujinuma, both of Yokohama; Teigo Sakakibara, Tokyo, and Takashi Koyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 17, 1990, Ser. No. 598,966
Claims priority, application Japan, Oct. 17, 1989, 1-271061
Int. Cl.[5] G03G 5/14
U.S. Cl. 430—58 15 Claims

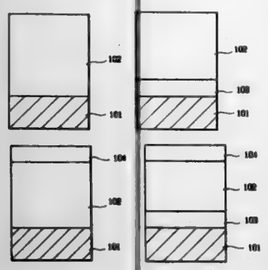


1. An image holding member which carries an electrostatic image or a toner image comprising an electroconductive substrate, a resin layer, and an image holding layer, said resin layer being placed between the electroconductive substrate and the image holding layer, and said resin layer comprising metal-coated fine resin particles and a binder resin.

7. An image holding member according to claim 1, wherein the image holding layer is a photosensitive layer.

9. An image holding member according to claim 7, wherein the photosensitive layer comprises a charge-generating layer and a charge-transporting layer.

5,190,838
ELECTROPHOTOGRAPHIC IMAGE-FORMING MEMBER WITH PHOTOCONDUCTIVE LAYER COMPRISING NON-SINGLE-CRYSTAL SILICON CARBIDE
Keishi Saitoh; Masafumi Sano, and Koichi Matsuda, all of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 393,961, Aug. 15, 1989, abandoned.
This application Aug. 27, 1990, Ser. No. 572,354
Claims priority, application Japan, Aug. 18, 1988, 63-203831; Aug. 18, 1988, 63-203832; Aug. 18, 1988, 63-203833
Int. Cl.[5] G03G 5/14, 5/082
U.S. Cl. 430—65 23 Claims

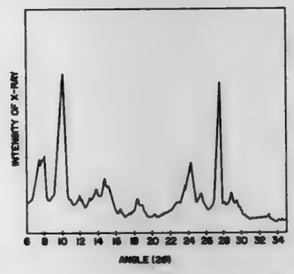


1. An electrophotographic image-forming member which comprises a substrate for electrophotography and a light receiving layer being disposed on said substrate, said light receiving layer comprising a photoconductive layer formed of a non-single-crystal carbide film containing silicon atoms as a matrix, carbon atoms in an amount of 5 to 15 atomic % and hydrogen atoms in an amount in a proportion of 1% or less per unit volume and having an intensity ratio of 0.01 to 0.05 between the C—H bond stretching mode and the Si—H bond stretching mode in an infrared absorption spectrum.

2. An electrophotographic image-forming member according to claim 1, wherein said light receiving layer further comprises a charge injection inhibition layer being disposed between said substrate and said photoconductive layer.

3. An electrophotographic image-forming member according to claim 2, wherein said charge injection inhibition layer is formed of a doped non-single-crystal silicon-containing film selected from the group consisting of a doped non-single-crystal hydrogenated silicon film, a doped non-single-crystal silicon oxide film, a doped non-single-crystal silicon nitride film and a doped non-single-crystal silicon carbide film.

5,190,839
ELECTROPHOTOGRAPHIC PHOTORECEPTOR
Yoshihide Fujimaki; Hajime Tadokoro; Yasuhiro Oda, and Hiroshi Yoshioka, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Jun. 29, 1990, Ser. No. 546,379
Claims priority, application Japan, Jul. 4, 1988, 1-73388; Jul. 4, 1989, 1-73382
Int. Cl.[5] G03G 5/14, 5/06
U.S. Cl. 430—78 6 Claims

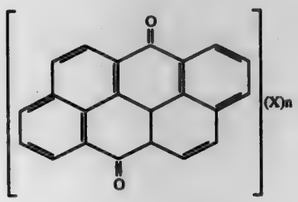


1. An electrophotographic photoreceptor comprises a light-sensitive layer provided on a substrate, wherein the light-sensitive layer contains;

a crystalline titanylphthalocyanine providing, in an X-ray diffraction spectrum with a CuK α ray (1.541Å), characteristic peaks of Bragg angles (2θ) of 9.6°±0.2°) and 27.2°±0.2°, and a peak intensity at 9.6°±0.2° is not less than 40% of that at 27.2°±0.2°, and

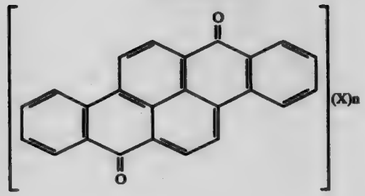
a polycyclic quinone pigment represented by a formula of Q_1, Q_2 or Q_3, or an azo pigment represented by a formula BA.

Q_1

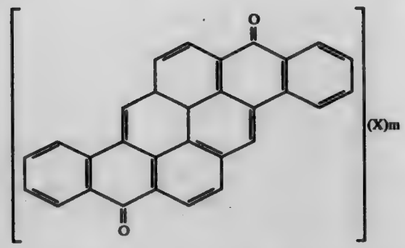


-continued

Q_2

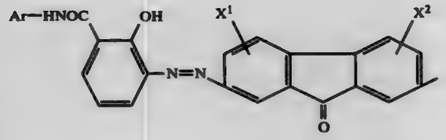


Q_3

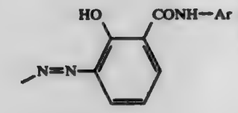


wherein X is a halogen atom, a nitro, cyano, acyl or carboxyl group, n is an integer of 0 to 4, and m is an integer of 0 to 6,

BA



Z

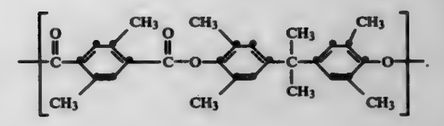


Z

wherein X_1 and X_2 independently are a hydrogen atom or a halogen atom, provided that X_1 and X_2 are not simultaneously a hydrogen atom; Ar is an aromatic hydrocarbon ring having a fluorinated hydrocarbon group or an aromatic heterocyclic group having a fluorinated hydrocarbon group; Z is a group of non-metal atoms necessary to complete a substituted or unsubstituted aromatic heterocyclic group.

5,190,840
MULTIACTIVE ELECTROPHOTOGRAPHIC ELEMENT COMPRISING A POLYESTER OF A TETRAMETHYL BISPHENOL A DERIVATIVE
David S. Weiss; Paul D. Yacobucci, both of Rochester, and Hsinjin Yang, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 22, 1991, Ser. No. 748,365
Int. Cl.[5] G03G 5/047
U.S. Cl. 430—96 2 Claims

1. In an electrophotographic element comprising:
an electrically conductive support;
a charge-generation layer sensitive to visible or infrared radiation; and
a charge-transport layer containing a triarylamine charge-transport material,
the improvement wherein the charge-transport layer comprises a polyester containing recurring units having the structure



5,190,841
TWO-PHASE FERROELECTRIC-FERROMAGNETIC COMPOSITE AND CARRIER THEREFROM
Bijay S. Saha; Alec N. Mutz, both of Rochester, and Robert E. Zeman, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 19, 1991, Ser. No. 810,633
Int. Cl.[5] G03G 9/107; C04B 35/40
U.S. Cl. 430—106.6 30 Claims

16. Carrier particles for use in the development of electrostatic images which comprise a hard magnetic interdispersed two-phase ferrite composite comprising, as a ferromagnetic phase, a magnetically hard ferrite material having a hexagonal crystalline structure of the general formula $R_xP(1-x)Fe_{12}O_{19}$, wherein R is selected from rare earth elements, P is selected from the group consisting of strontium, barium, lead, or calcium and mixtures thereof, and x has a value of from about 0.1 to about 0.4, exhibiting a coercivity of at least 300 Oersteds when magnetically saturated and an induced magnetic moment of at least 20 EMU/g when in an applied field of 1000 Oersteds and, as a ferroelectric phase, a ferroelectric material comprised of at least one of the double oxides of titanium, hafnium, zirconium, tin and germanium and either an alkaline earth, or cadmium or lead, wherein the mole ratio of the ferromagnetic phase to the ferroelectric phase is from about 1:1 to about 1:4.

5,190,842
TWO PHASE FERROELECTRIC-FERROMAGNETIC COMPOSITE CARRIER
Bijy S. Saha; Alec N. Mutz, both of Rochester, and Robert E. Zeman, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 19, 1991, Ser. No. 810,628
Int. Cl.[5] G03G 9/107; C04B 35/26
U.S. Cl. 430—106.6 27 Claims

14. Carrier particles for use in the development of electrostatic images which comprise a hard magnetic interdispersed two-phase ferrite composite comprising, as a ferromagnetic phase, a magnetically hard ferrite material having a hexagonal crystalline structure of the general formula $MO.6Fe_2O_3$, wherein M is selected from the group consisting of strontium, barium, lead and mixtures thereof, exhibiting a coercivity of at least 300 Oersteds when magnetically saturated and an induced magnetic moment of at least 20 EMU/g when in an applied field of 1000 Oersteds and, as a ferroelectric phase, a ferroelectric material compriaed of at least one of the double oxides of titanium, zirconium, tin, hafnium or germanium and either an alkaline earth or lead or cadmium, wherein the mole ratio of the ferromagnetic phaseto the ferroelectric phase is from about 1:1 to about 1:4.

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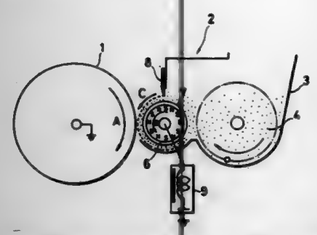
5,190,843

METHOD AND APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Nobutaka Noda; Kazuo Hamamura, both of Yokohama, and Tetsuo Murase, Kawasaki, all of Japan, assignors to Katsuragawa Electric Co., Ltd., Japan

Filed Jul. 6, 1990, Ser. No. 548,864
Claims priority, application Japan, Jul. 10, 1989, 1-177550
Int. Cl.[5] G03G *13/24, 13/01*
U.S. Cl. 430—122 **2 Claims**



1. A method for developing electrostatic latent images comprising the steps of:

(a) forming a developer brush by attracting a developer comprised of a high electrical resistance magnetic toner and a magnetic carrier onto the outer peripheral surface of a sleeve having a magnet roll disposed in the interior thereof, said magnet roll having magnetic poles of different polarities arranged alternately along the inner circumference of said sleeve;

(b) rotating said magnet roll and said sleeve in a direction opposite to the direction of rotation of an image carrier so that said developer on said sleeve moves in the same direction as said sleeve at a speed substantially equal to the peripheral speed of said image carrier; and

(c) supplying said developer onto the surface of said image carrier under the influence of an alternating electrical field applied between said image carrier and said sleeve and an alternating magnetic field created by said magnet roll as said magnet roll rotates, said alternating electrical field and alternating magnetic field causing an oscillation of said developer between said image carrier and said sleeve;

wherein said magnet roll is rotated at such a speed that the alternating magnetic field created thereby has a frequency which allows said alternating magnetic field to be applied to said developer brush at least once while the same portion of said developer brush is kept in contact with said image carrier; and

wherein said alternating electrical field is applied between said image carrier and said sleeve with a frequency which does not cause a beating phenomenon with said alternating magnetic field.

5,190,844

PRODUCTION OF SURFACE-MODIFIED ORGANIC PARTICLES

Naoya Yabuuchi, Saitu; Akihiro Kanakura, Hirakata; Takahito Kishida, Yao; Masayuki Maruta, Hannan; Koichi Nagata, Neyagawa, and Makoto Shimizu, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 6, 1991, Ser. No. 803,418
Claims priority, application Japan, Dec. 7, 1990, 2-409779; Dec. 14, 1990, 2-410831
Int. Cl.[5] G03G *9/097*
U.S. Cl. 430—137 **16 Claims**

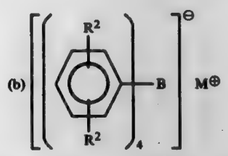
1. A process for producing organic particles which are covered with insoluble substances, characterized by, into a dispersion comprising;

(A) organic particles,

(B) a compound selected from the group consisting of

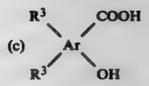
(I)

wherein R^1, the same or different, is a hydrogen atom, an alkyl group having 1 to 22 carbon atoms or an aryl group having 6 to 22 carbon atoms which may be substituted, and X represents an halogen atom,



(II)

wherein R^2, the same or different, is a hydrogen atom or an alkyl group having 1 to 22 carbon atoms, and M represents an alkali metal,



(III)

wherein Ar is a benzene ring or a naphthalene ring, R^3, the same or different, is a hydrogen atom or an alkyl group having 1 to 22 carbon atoms, and the groups —COOH and —OH are present on two carbon atoms which are adjacent to each other in the Ar ring, and

(d) a polymer with weight average molecular weight 2,000 to 200,000 having a quaternary salt group

(C) a dispersing medium in which the organic particles are insoluble and in which compound (B) is soluble;

adding an insolubilizer (D) which is reacted with the compound (B) to form an insoluble substance.

5,190,845

PHOTOSENSITIVE RESIN COMPOSITION AND COLOR FILTER COMPRISING A POLYMER DYEABLE WITH AN ANIONIC DYE, AN AZIDE COMPOUND AND A COMPOUND WITH AT LEAST TWO ACRYLOL GROUPS

Matsuo Hashimoto, Tano; Nobuyuki Futamura, Maebashi; Sumio Yoda, Takasaki, and Yoshifumi Saiki, Maebashi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00700, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO89/01186, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 14, 1988, Ser. No. 345,543
Claims priority, application Japan, Jul. 28, 1987, 62-186561; Oct. 1, 1987, 62-245900; Apr. 13, 1988, 63-88993
Int. Cl.[5] G03F *7/021;* G03C *1/695*
U.S. Cl. 430—196 **9 Claims**

1. A photosensitive resin composition comprising

(a) a polymer dyeable with an anionic dye,

(b) an azide photosensitive compound, and

(c) a compound having at least two acryloyl groups in the same molecule thereof, selected from the group consisting of spiroglycol diacrylate and cyclohexanedimethylol diacrylate.

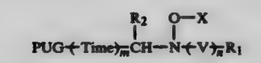
5,190,846

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morio Yagihara; Hisashi Okamura, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

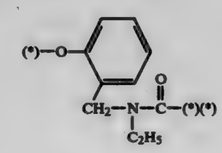
Filed Nov. 13, 1990, Ser. No. 614,181
Claims priority, application Japan, Nov. 16, 1989, 1-298140
Int. Cl.[5] G03C *5/54, 1/42, 1/06, 1/34*
U.S. Cl. 450—264 **25 Claims**

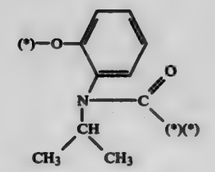
1. A silver halide photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, wherein the silver halide photographic material contains at least one photographic agent represented by the following formula (I):

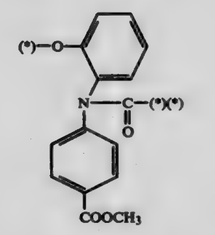


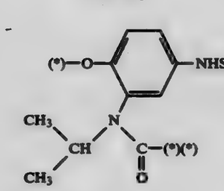
(I)

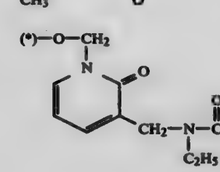
wherein X represents a hydrogen atom or a group capsule of forming a hydrogen atom upon hydrolysis; Time is selected from the group consisting of











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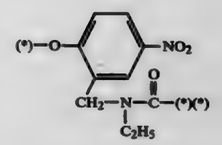

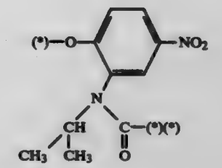

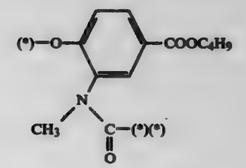

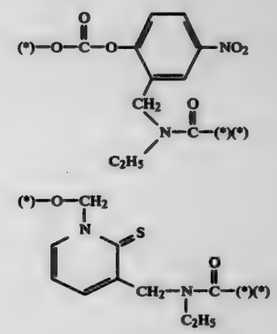

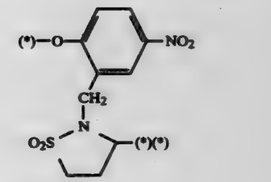

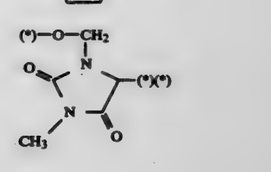

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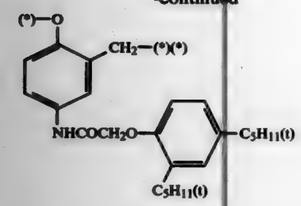

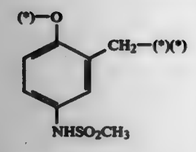

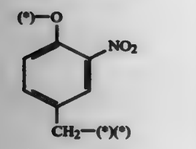

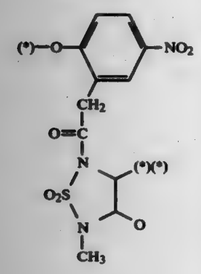

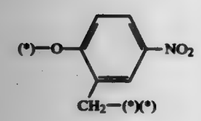

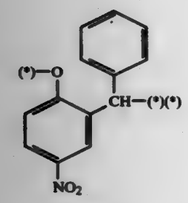

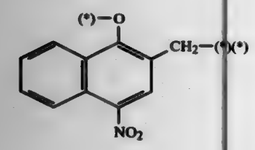

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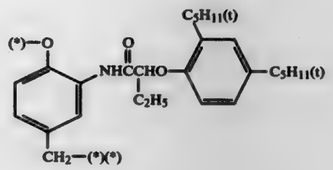

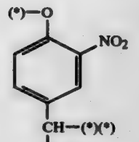

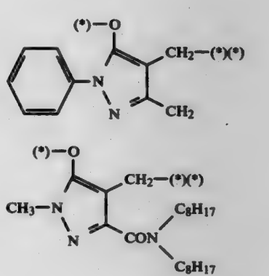

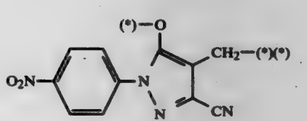

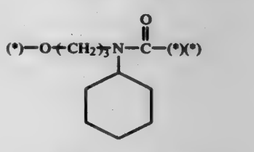

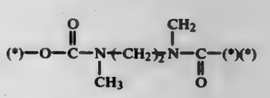

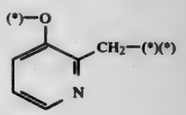

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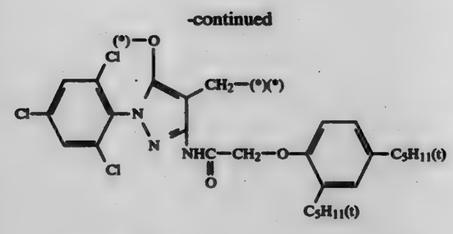

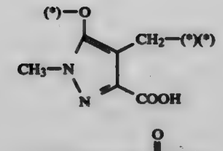

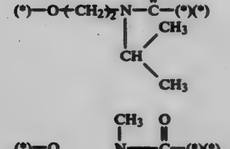

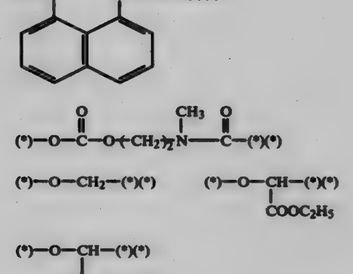

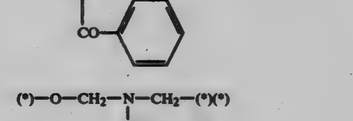

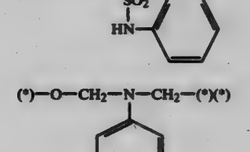

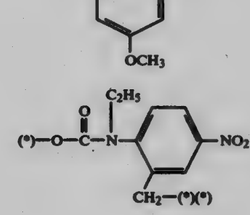

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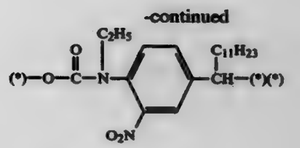
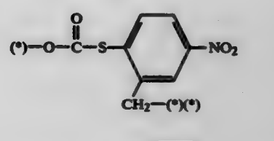
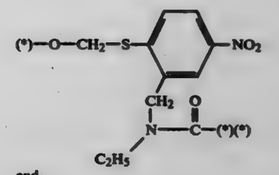
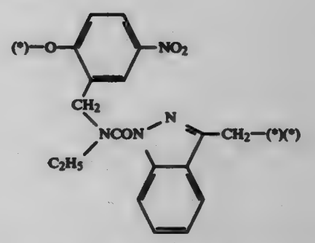


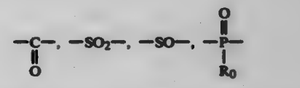




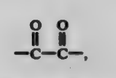
and



PUG represents a photographically useful group capable of being cleaved upon development; V represents



wherein R_0 represents an alkoxy group or an aryloxy group,



an iminomethylene group or

R_1 represents a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an alkoxy group, an aryloxy group, an amino group or $—CHR_2—Time)_mPUG$; R_2 represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group; m represents 0 or 1; and n represents 0 or 1.

5,190,847
PHOTOGRAPHIC SILVER HALIDE MATERIALS CONTAINING ARYL HYDRAZIDES
Dominic M. Chen, Wilmington, Del., and Reinhold Rüger, Rodermark, Fed. Rep. of Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 20, 1991, Ser. No. 661,596
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1990, 4006032
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—264 3 Claims

1. A photographic material containing an aryl hydrazide for the production of images with ultrahigh contrast comprising a support having thereon at least one silver halide emulsion layer, the emulsion, or at least one another auxiliary layer in contact with the silver halide emulsion layer on said support contains a compound of Formula (I)

$$Ar—NR—NR_1—G—X^+A^- \quad (I)$$

wherein Ar is a substituted phenyl group or another substituted or unsubstituted aryl group,
G is the group CO, SO, SO_2, phosphonyl, phosphoryl or $C{=}NR_2$,
X^+ is a radical containing a cationic group with a quaternary nitrogen atom,
R, R_1, and R_2, which can be the same or different, are hydrogen, alkyl or alkyl sulfinyl groups with one to six carbon atoms, and
A^- is an anion,
the improvement wherein the quaternary nitrogen atom is included in a substituted or unsubstituted imidazolium, imidazolinium, isoquinolinium, or quinolinium group.

5,190,848
PHOTOGRAPHIC BETA-KETOAMIDE AND PHOTOGRAPHIC ELEMENTS CONTAINING THEM
Michael W. Crawley, Kingswood-Watford, Great Britain, assignor to Eastman Kodak Company, Rochester, N.Y.
PCT No. PCT/GB90/00712, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990, PCT Pub. No. WO90/13852, PCT Pub. Date Nov. 15, 1990
PCT Filed May 8, 1990, Ser. No. 623,731
Claims priority, application United Kingdom, May 9, 1989, 8910636
Int. Cl.[5] G03C *7/36*
U.S. Cl. 430—389 7 Claims

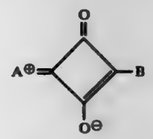
1. A multicolor photographic element comprising a support bearing a yellow dye image-forming unit comprised of at least one blue-sensitive silver halide emulsion layer having associated therewith at least one yellow dye-forming coupler of the general formula (I):

$$R^1COCHCONHR^2 \quad (I)$$
$$\quad\quad\quad SO_2R^3$$

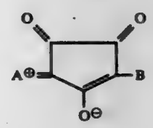
wherein R^1 and R^2 are substituted or unsubstituted aryl groups, and R^3 is a substituted or unsubstituted alkyl or aryl group.

5,190,849
OPTICAL RECORDING MEDIUM CONTAINING CARBOXYLIC ACID-BASE METALLIC COMPLEX AND SQUARYLIUM-BASE OR CROCONIUM-BASE DYE
Tsuyoshi Sasaki, Yokohama; Chieko Mihara, Kawasaki, and Hiroyuki Sugita, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 11, 1990, Ser. No. 596,034
Claims priority, application Japan, Oct. 12, 1989, 1-266966
Int. Cl.[5] G11B *7/24*
U.S. Cl. 430—495 8 Claims

1. An optical recording medium comprising (a) a squarylium- or croconium-base dye of formulae (I) or (II):

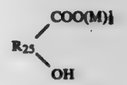


(I)

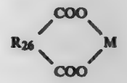


(II)

wherein $A^{\oplus}$ is a cationic bivalent organic residue and B is a monovalent organic residue; and
(b) a carboxylic acid-base metallic complex of the formulae (XI) or (XII):



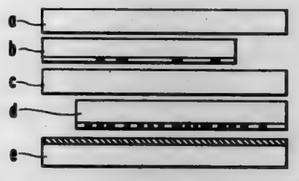
(XI)



(XII)

wherein M is a metal atom, and each of R_{25} and R_{26} is a substituted or unsubstituted alkylene group, a substituted or unsubstituted aromatic ring, a substituted or unsubstituted aliphatic ring, a substituted or unsubstituted heterocyclic ring, or a substituted or unsubstituted aliphatic hydrocarbon residue with an unsaturated bond.

5,190,850
SILVER HALIDE PHOTOGRAPHIC MATERIAL
Minoru Sakai, and Kazunobu Katoh, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 14, 1991, Ser. No. 699,835
Claims priority, application Japan, May 14, 1990, 2-123683
Int. Cl.[5] G03C *1/46*
U.S. Cl. 430—503 11 Claims



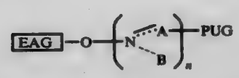
1. A silver halide photographic material having on a support a first light-sensitive layer containing a light-sensitive silver halide emulsion and, separate from the first-sensitive layer, a second light-sensitive layer containing a light-sensitive silver halide emulsion, wherein a hydrazine compound is contained in the first light-sensitive layer and/or a hydrophilic colloid layer containing no light-sensitive silver halide emulsion provided on the support, a redox compound which is not the same compound as the hydrazine compound capable of releasing a development inhibitor by oxidation is contained in the second light-sensitive layer, and the sensitivity of the first light-sensitive layer is higher by 0.2 to 1.0 than that of the second light-sensitive layer.

5,190,851
COLOR PHOTOGRAPHIC ELEMENT
Krishnan Chari, Rochester; John T. Keech, Penfield; John F. Sawyer, Fairport; Jeffrey W. Schmoeger, and Paul L. Zengerle, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 21, 1990, Ser. No. 631,607
Int. Cl.[5] G03C *1/46*
U.S. Cl. 430—505 8 Claims

1. A color photographic silver halide negative working duplicating element comprising a support having thereon at least one red-sensitive photographic silver halide emulsion layer comprising at least one cyan image-dye forming coupler; at least one green-sensitive photographic silver halide emulsion layer comprising at least one magenta image-dye forming coupler and at least one blue-sensitive photographic silver halide emulsion layer comprising at least one yellow image-dye forming coupler, wherein
(a) at least one of the red-sensitive, green-sensitive or blue sensitive photographic silver halide emulsion layers comprises a unit of at least two layers including a first layer and a second layer, the first layer of each unit having a higher sensitivity than the second layer and being farther from the support than the second layer;
(b) the first layer contains an amount of image-dye forming coupler or couplers insufficient to react with all the oxidized developer formed during development after maximum exposure;
(c) the image-dye forming couplers of the first layer being in a dispersion having a mean particle size of less than 0.14 micron, and;
(d) the silver halide grains of the first layer having a mean grain volume less than 0.015 cubic micron.

5,190,852
SILVER HALIDE PHOTOGRAPHIC MATERIAL
Naoto Matsuda, and Michio Ono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 12, 1992, Ser. No. 833,799
Claims priority, application Japan, Feb. 13, 1991, 3-40498
Int. Cl.[5] G03C *5/54, 7/26, 1/84*
U.S. Cl. 430—517 12 Claims

1. A silver halide photographic material which comprises a support having thereon at least one layer containing a compound represented by general formula (I):



(I)

wherein EAG represents an electron-accepting group; A represents a group which undergoes a reaction triggered by the cleavage of the oxygen-nitrogen single bond in the general formula to release PUG; B represents a hydrogen atom or an alkyl group, an aralkyl group, an aryl group, a heterocylic group, an acyl group, a sulfonyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkoxysulfonyl group or an aryloxysulfonyl group which may contain substituents; the solid lines indicate a single bond; the broken lines indicate that either of these lines is a bond, with the proviso that when the broken line between N and A represents a bond, B is not present; EAG and B, and A and B may be connected to each other to form a ring; EAG may be connected to a polymer residue to fix the compound of general formula (I) to a high molecular chain; n represents an integer 0 or 1; and PUG represents a photographically useful group, with the proviso that when n is 0, PUG represents a photographically useful group represented by general formula (II):

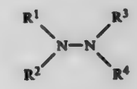
(II)

wherein X and Y each represents an atom or atomic group required to render the group represented by general formula (II) photographically useful; the solid lines indicate a single bond; and the broken lines indicate that either of these lines is a bond, with the proviso that X and Y may be connected to each other to form a heterocyclic group containing N and when the broken line between N and X represents a bond, Y is not present.

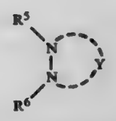
11. A silver halide photographic material as claimed in claim 1, wherein PUG is a filter dye.

5,190,853
SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL
Nobuo Seto, and Masakazu Morigaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Nov. 22, 1989, Ser. No. 440,296
Claims priority, application Japan, Nov. 22, 1988, 63-295812; Nov. 30, 1988, 63-302587
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—551 11 Claims

1. A silver halide color photosensitive material comprising at least one silver halide emulsion layer on a support wherein the silver halide color photosensitive material comprises a hydrophilic colloidal layer containing a yellow coupler,
wherein the layer further contains a color image stabilizer in an amount of 10 to 200 mole % based on the amount of the yellow coupler, said color image stabilizer and said yellow coupler being together contained in droplets of a medium which are dispersed in the layer, and said color image stabilizer being an organic compound containing at least two nitrogen atoms represented by the following formula (I) or (II):



[I]



[II]

in which each of R^1, R^2, R^3 and R^4 independently is a member group selected from the group consisting of hydrogen, an alkyl group, an alkenyl group, an aryl group, a heterocyclic group, an alkoxycarbonyl group, an aryloxycarbonyl group, an acyl group, a sulfonyl group, a sulfinyl, a phosphoryl group, a carbamoyl group and a sulfamoyl group; R^1 and R^2, or R^3 and R^4 may form, together with the nitrogen atom, a 5- to 8-membered heterocyclic ring; two or more compounds having the formula (I) may be combined with each other at the position of R^1, R^2, R^3 or R^4 to form a polymer; the number of the total carbon atoms contained in R^1, R^2, R^3 and R^4 is not less than 6; neither R^1 and R^2 nor R^3 and R^4 form a heterocyclic ring which consists of

where R is an alkylene group and Z^1 is a sulfonyl or sulfinyl; when one of R^1 and R^2 is a hydrogen, the other one of R^1 and R^2 is not an arylsulfonyl group; and one of R^3 and R^4 is a hydrogen, the other one of R^3 and R^4 is not an arylsulfonoyl group; each of R^1, R^2, R^3 and R^4 is neither a residue of a coupler nor a residue of a reducing agent; each of one of R^1 and R^2 and one of R^3 and R^4 independently is an alkoxycarbonyl group, an aryloxycarbonyl group, an acyl group, an alkylsulfonyl group, a sulfinyl group, a phosphoryl group, a carbamoyl group or a sulfamoyl group; each of R^5 and R^6 independently is a member group selected from the group consisted of hydrogen, methyl, butyl, tert-butyl hexadecyl, phenoxyethyl, methoxyethyl, dodecyl, ethyl, octyl, a cycloalkyl group, an alkenyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, an acyl group, a sulfonyl group, a phosphoryl group, a sulfinyl group, an alkylcarbamoyl group, an arylcarbamoyl group, an alkylsulfamoyl group, an arylsulfamoyl group, an alkoxycarbonyl group and an aryloxycarbonyl group, Y is a non-metallic atomic group which forms, together with the two nitrogen atoms, a 5- to 8-membered heterocyclic ring; Y does not form a heterocyclic ring which consists of

where R is an alkylene group and Z^2 is a heteroatom; Y does not form a perhydro-1,2,4,5-tetrazine ring; when Y forms 1-phenyl-3-pyrazolidone, neither hydrogen, acetyl nor an acyl group, which acyl group is substituted with carboxyl, is placed at the 2-position of 1-phenyl-3-pyrazolidone.

5,190,854

PHOTOGRAPHIC INFRA-RED SENSITIZED MATERIAL CONTAINING A SPEED ENHANCING AGENT

Rudi A. Geudewoeck, Herent, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

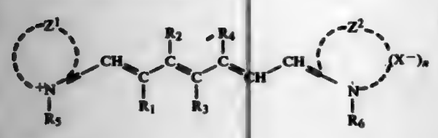
Filed Jul. 9, 1991, Ser. No. 727,818

Claims priority, application European Pat. Off., Jul. 10, 1990, 90201899.7

Int. Cl.[5] G03C *1/20, 1/28*

U.S. Cl. 430—576 **9 Claims**

1. Photographic laser recording material comprising a transparent base and at least one emulsion layer containing a silver halide emulsion which is sensitized to the near infra-red by the combination of a heptamethine chain containing dye according to general formula (I) and a supersensitizer characterized in that said emulsion layer further contains a compound according to general formula (II):



(I)

wherein,

Z^1 and Z^2 represent a non metallic atomic group necessary to complete a benzothiazole, benzoxazole, naphtothiazole or naphtoxazole nucleus; R_5 and R_6 each represent an alkyl;

R_1, R_2, R_3, and R_4 each represent a hydrogen atom, a substituted or unsubstituted alkyl, alkoxy, amino, phenyl or benzyl group; R_1 and R_3, or R_2 and R_4 respectively may combine with each other to form a 5- or 6-membered ring;

X^- is an anion n is 0 in case of an intramolecular salt via an anionic group in R or otherwise 1,

wherein R_{11}, R_{13}, and R_{14} each represent a hydrogen atom or a lower alkyl group and R_{12} represents an alkyl or aryl group.

5,190,855

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR PROCESSING THE SAME

Ichizo Toya; Rikio Inoue, and Tadashi Ito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1991, Ser. No. 660,834

Claims priority, application Japan, Feb. 26, 1990, 2-45232; Apr. 4, 1990, 2-89379

Int. Cl.[5] G03C *1/09*

U.S. Cl. 430—599 **6 Claims**

1. A silver halide light-sensitive material comprising a support having on one side thereof at least one negative silver halide emulsion layer containing a binder, in which a coating weight of the total binder on said one side of the support is not more than 4.2 g/m^2 and in which silver halide grains in said emulsion layer have been subjected to reduction sensitization and to chemical sensitization in the presence of a nitrogen-containing heterocyclic compound capable of forming a complex with silver wherein said nitrogen-containing heterocyclic compound is a member selected from the group consisting of hydroxytriazaindrene, hydroxytetraazaindene, and hydroxypentaazaindene.

5,190,856

METHOD AND APPARATUS FOR DETECTING SINGLE BASE MUTATIONS IN DNA WITH DENATURING GRADIENT ELECTROPHORESIS

Anne-Lise Borresen, Tollef Grava v. 38, N-1342 Jar, Norway

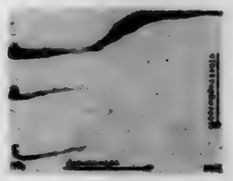
PCT No. PCT/NO88/00074, § 371 Date May 31, 1989, § 102(e) Date May 31, 1989, PCT Pub. No. WO89/02930, PCT Pub. Date Apr. 6, 1989

PCT Filed Oct. 3, 1988, Ser. No. 381,405

Claims priority, application Norway, Oct. 2, 1987, 874164

Int. Cl.[5] C12Q *1/68*

U.S. Cl. 435—6 **9 Claims**



1. A method for detection and screening of genomic DNA for single base mutations in multiple loci, said method comprising subjecting genomic DNA fragments, said genomic DNA having sufficient size to include multiple loci that can each exhibit single base pair mutations, to denaturing gradient gel electrophoresis (DGGE) in a reversibly crosslinked gel medium, said medium comprising a polyacrylamide, a low gelling temperature agarose and a denaturant in a gradient perpendicular to the direction of electrophoresis followed by a transfer to a support membrane and hybridization to various selected probes.

5,190,857

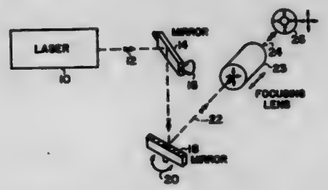
OPTICAL METHOD FOR MEASURING AN ANALYTE USING AREA-MODULATED LUMINESCENCE

Fritz S. Allen, Corrales; Carlos Bustamante; Thomas M. Niemczyk, both of Albuquerque, all of N. Mex., and Burton P. Dornan, Berkeley, Calif., assignors to Acrogen, Inc., Oakland, Calif.

Division of Ser. No. 354,137, May 19, 1989, Pat. No. 5,026,159. This application Jun. 5, 1991, Ser. No. 710,669

Int. Cl.[5] G01N *21/64, 33/542*

U.S. Cl. 435—7.21 **13 Claims**



1. A method for determining the presence of an analyte in a sample employing a luminescence label, wherein at least two different regions of different volumes of an assay medium are irradiated and the number of luminescent moieties related to the amount of analyte are inhomogeneously distributed in said regions, said method comprising:

irradiating sequentially said at least two different volumes of said assay medium comprising luminescent moieties present in an amount related to the amount of analyte in said sample, said irradiating being, for a given wavelength distribution, at a constant radiant power or at a constant photon flux at each of said volumes and under the same conditions except for said difference in volume;

detecting the light emitted from said volumes and determining the difference in light emission from each of said volumes,

wherein said difference is related to the presence of analyte in said sample.

5,190,858

MONOCLONAL ANTIBODIES DIRECTED TO EPITOPES OF HUMAN TRANSFORMING GROWTH FACTOR—α AND USES THEREOF

John M. Sorvillo, Merrick; David M. Valenzuela, Franklin Square, and Frederick H. Reynolds, Jr., Syosset, all of N.Y., assignors to Oncogene Science, Inc., Uniondale, N.Y.

Filed Feb. 1, 1989, Ser. No. 304,947

Int. Cl.[5] C12Q *1/00*; G01N *33/53*

U.S. Cl. 435—7.23 **14 Claims**

1. A method of detecting TGFα in formalin-fixed, paraffin-embedded human tissue sections which comprises:

(1) contacting the tissue sections with a monoclonal antibody, which

(a) specifically forms a complex with TGFα in formalin-fixed, paraffin-embedded tissue sections,

(b) has an affinity of at least 10^7, and

(c) is directed to the epitope to which monoclonal antibody 213-4.4 (ATCC No. HB9992) is directed,

under conditions such that the antibody binds to the tissue sections, and

(2) detecting the bound antibody and thereby detecting TGFα in the tissue sections.

5,190,859

PURIFICATION OF LFA-3

Michael Dustin, Boston, and Timothy Springer, Chestnut Hill, both of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Continuation of Ser. No. 19,010, Feb. 26, 1987, abandoned. This application Oct. 3, 1989, Ser. No. 421,292

Int. Cl.[5] C07K *3/18, 15/14*; G01V *33/566*

U.S. Cl. 435—7.24 **12 Claims**

1. A method for purifying LFA-3comprising contacting a liquid comprising LFA-3 with an affinity column comprising anti-LFA-3 antibody to bind LFA-3 to said anti-LFA-3 antibody, washing said column with a first alkaline buffer, and then eluting said LFA-3 from said affinity column using a second acidic buffer, to provide purified LFA-3 capable of binding to CD2 antigen on T-lymphocytes.

5,190,860

DIFFERENTIAL DIAGNOSTIC ASSAY FOR BRUCELLOSIS

Leslie G. Adams; Roger Smith, III; Joe W. Templeton, all of College Station, Tex., and Kathleen A. Overholt, Silver Spring, Md., assignors to The Texas A & M University System, College Station, Tex.

Filed Oct. 30, 1989, Ser. No. 428,825

Int. Cl.[5] G01N *33/569, 33/577*; C07K *15/28*; C12N *5/00*

U.S. Cl. 435—7.32 **10 Claims**

1. A competitive immunoassay for differentiating a sample containing antibodies stimulated by a *B. abortus* field strain infection form a sample containing antibodies estimated by *B. abortus* Strain 19 vaccination comprising the following steps:

a) providing a quantity of a biotin-conjugated monoclonal antibody produced by a hybridoma cell line having ATCC deposit number HB10286;

b) obtaining a test sample from an animal, wherein said test sample is milk or serum;

c) admixing said biotin-conjugated monoclonal antibody with said test sample in a container which contains a quantity of immobilized *B. abortus* lipopolysaccharide antigen;

d) incubating said admixture from Step (c) to allow competition between biotin-conjugated monoclonal antibody and antibodies in said test sample for specific binding to said immobilized lipopolysaccharide antigen;

e) washing said container so as to remove any unbound monoclonal antibody;

f) adding avidin-enzyme conjugate and substrate to measure the quantity of the biotin-conjugated monoclonal antibody bound to said lipopolysaccharide antigen;

g) calculating the percent competitive inhibition wherein greater than about 65% and less than or equal to about 85% inhibition is suspect for *B. abortus* field strain infection and greater than about 85% inhibition is positive for *B. abortus* field strain infection.

5,190,861

METHOD FOR THE DIAGNOSIS OF RHEUMATOID ARTHRITIS

Taro Hayakawa, Nagoya; Shuji Kodama; Kazushi Iwata, both of Takaoka; Junichi Kishi, Nagoya; Kyoko Yamashita, Nagoya, and Hisashi Iwata, Nagoya, all of Japan, assignors to Fuji Yakuhin Kogyo Kabushiki Kaisha, Toyama, Japan

PCT No. PCT/JP88/00846, § 371 Date Apr. 25, 1989, § 102(e) Date Apr. 25, 1989, PCT Pub. No. WO89/02078, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 25, 1988, Ser. No. 348,701

Claims priority, application Japan, Aug. 25, 1987, 62-209306

Int. Cl.[5] G01N *33/543*

U.S. Cl. 435—7.94 **1 Claim**

1. A method for diagnosing rheumatoid arthritis which comprises enzyme-immunologically measuring the amount of collagenase inhibitor present in sera, plasma or synovial fluid

by means of a sandwich assay wherein two different monoclonal antibodies which specifically bind to different antigenic determinants of the collagenase inhibitor are used, wherein the first of said monoclonal antibodies is used for attachment of antigen to the solid phase and is an IgG-type antibody which is produced by a hybridoma having all of the identifying characteristics of the hybridoma deposited as BP-3469 and wherein the second of said monoclonal antibodies is enzyme conjugated and used to detect antigen bound by said first monoclonal antibody, said second antibody being produced by a hybridoma having all of the indentifying characteristics of the hybridoma deposited as BP-3468, and comparing the measured amount of collagenase inhibitor with that found in normal subjects.

5,190,862

CHROMOGENIC COMPOUNDS AND THE USE THEREOF AS ENZYME SUBSTRATES

Hans Wielinger, Weinheim, and Gerd Zimmermann, Mannheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

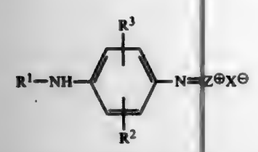
Division of Ser. No. 175,838, May 31, 1988, Pat. No. 5,108,890. This application Oct. 11, 1991, Ser. No. 776,590

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710937

Int. Cl.[5] C12Q *1/37, 1/44, 1/56*

U.S. Cl. 435—23 **40 Claims**

1. Method for determining a peptide bond cleaving enzyme comprising contacting a sample with a compound of the formula:



wherein R^1 is an amino acid residue or a residue of an oligopeptide in which amino groups are optionally substituted by protective groups, R^2 and R^3, which are the same or different, are hydrogen atoms, lower alkyl, lower alkoxy, carboxyl or lower alkoxycarbonyl or carboxamido groups having from 1–6 carbon atoms optionally substituted by lower alkyl or, if R_2 and R_3 are adjacent, can represent a —CH=CH—CH=CH— radical, and wherein Z is a radical of the general formula:

in which A, M, D and E are carbon or nitrogen atoms, whereby, insofar as they are not bridgehead atoms, said carbon atoms can optionally be substituted by oxygen, lower alkyl, lower alkoxy, aryl, aralkyl, or aryloxy, and said nitrogen atoms optionally substituted by lower alkyl, aralkyl or aryl, and Q is an unsaturated hydrocarbon chain with 3–5 carbon atoms which is optionally interrupted by nitrogen or sulphur atoms or contains such heteroatoms at the beginning or end of the chain, said carbon atoms optionally being substituted by lower alkyl, lower alkoxy, aralkyl, aryloxy or aryl and/or said nitrogen atoms optionally substituted by lower alkyl, aralkyl or aryl, and the total number of heteroatoms in the bicyclic radical is at most 3, and X is an anion of an organic or inorganic acid, and detecting one or more reactions products.

5,190,863

COMPOSITION FOR DETERMINING THE PRESENCE OR CONCENTRATION OF D-β-HYDROXYBUTYRATE

Thomas A. Magers, South Bend, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Jun. 29, 1990, Ser. No. 545,634

Int. Cl.[5] C12Q *1/32*

U.S. Cl. 435—25 **23 Claims**

1. A composition capable of exhibiting a sufficient color transition upon contacting a test sample to demonstrate the presence or concentration of D-β-hydroxybutyrate in the test sample said composition comprising:

a) Dβ-hydroxybutyrate dehydrogenase;

b) nicotinamide adenine dinucleotide;

c) a disulfide reductase system comprising a disulfide substrate and a disulfide reductase; and

d) a thiol-responsive indicator dye.

5,190,864

ENZYME AMPLIFICATION BY USING FREE ENZYME TO RELEASE ENZYME FROM AN IMMOBILIZED ENZYME MATERIAL

Roger W. Giese, Quincy, Mass.; Markus Ehrat, Suhr, Switzerland, and Douglas J. Cecchini, Somerville, Mass., assignors to Northeastern University, Boston, Mass.

Continuation of Ser. No. 852,237, Apr. 15, 1986, Pat. No. 4,937,188. This application Apr. 30, 1990, Ser. No. 516,321

The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.

Int. Cl.[5] C12P *1/00*; C12N *11/00, 11/06, 9/00*

U.S. Cl. 435—41 **24 Claims**

1. A method for amplifying enzymatic activity, comprising:

providing a support-leash-enzyme conjugate wherein the support is a solid, the leash comprises molecular chain which is cleavable by the enzyme in the free state, the leash is attached to the support and to the enzyme by covalent bonds, and the conjugate has a plurality of -leash-enzyme units connected to the support; said conjugate being structured such that the bound enzyme of a given -leash-enzyme unit is unable to cleave the leash portion of that unit;

adding to said conjugate a first amount of said enzyme in the free state, to produce a mixture of free enzyme and support-leash-enzyme conjugate;

incubating said mixture a predetermined period of time, to cause enzyme from said conjugate to be released into the free state; and

recovering said enzyme in the free state from said conjugate in a second amount greater than said first amount of enzyme.

5,190,865

ANTIBODY-ENHANCED STEREOSPECIFIC HYDROLYSES

Peter G. Schultz, Oakland, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 383,465, Jul. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 273,455, Nov. 18, 1988, abandoned. This application Aug. 29, 1990, Ser. No. 574,674

Int. Cl.[5] C12N *9/00*; C12P *13/20*

U.S. Cl. 435—108 **1 Claim**

1. A method for the production of an optically active D-isomer of 2-aminobenzoyl phenylalanine by stereospecific hydrolysis of an ester of 2-aminobenzoyl phenylalanine at a preselected —CO_2— group thereof, said ester having a chiral center at a carbon atom adjacent to the carbon of said preselected —CO_2— group and said ester being present in a mixture of enantiomers of D- and L-isomers of said ester, said method comprising:

(a) contacting said ester enantiomer mixture with antibody elicited by a mixture of antigen enantiomers which are stable analogs of unstable transition states of said ester enantiomers tending to decompose by cleaving at said preselected —CO_2— group to form hydrolysis products thereof, said antibody being one which promotes said hydrolysis; and

(b) recovering said optically active D-isomer of 2-aminobenzoyl phenylalanine from said hydrolysis products.

5,190,866

PROCESS FOR PRODUCING ANTIBIOTIC STREPTOVARICIN

Kaname Inoue, Kawasaki; Motohide Yamazaki, Joetsu, both of Japan, and Richard W. Armentrout, La Jolla, Calif., assignors to Shin-Etsu Bio, Inc., San Diego, Calif.

Division of Ser. No. 601,877, Oct. 23, 1990. This application Jan. 27, 1992, Ser. No. 826,371

Int. Cl.[5] C12R *1/465*; C12P *17/18, 17/08*; C07E *17/00*

U.S. Cl. 435—119 **1 Claim**

1. In a process for the production of Streptovaricin wherein a microorganism is cultured in a broth to produce a mold of *Streptomyces spectabilis* and generate Streptovaricin in the presence of absorbent polymer beads, and the beads with Streptovaricin adhered thereto are recovered from the broth, the improvement which comprises separating the beads from the broth and treating the beads with an aqueous solution having a specific gravity effective to cause the beads to separate in a layer separate from the mold at the surface of the solution and removing the beads from the solution.

5,190,867

PROCESS FOR THE PREPARATION OF R-2,2-R_1,R_2-1,3-DIOXOLANE-4-METHANOL

Mauro A. Bertola; Arthur F. Marx, both of Delft; Hein S. Koger, Spaarndam; Volkert P. Claassen, Amsterdam, all of Netherlands, and Gareth T. Phillips, Sittingbourne, United Kingdom, assignors to Shell International Petroleum Company, Ltd., London, England

Continuation of Ser. No. 47,908, May 7, 1987, abandoned. This application Jan. 21, 1992, Ser. No. 822,653

Claims priority, application United Kingdom, May 8, 1986, 8611238

Int. Cl.[5] C12P *17/04, 41/00*

U.S. Cl. 435—126 **29 Claims**

1. Process for the preparation of 2,2-R_1,R_2-1,3-dioxolane-4methanol enriched in R-isomer wherein R_1 and R_2 are H or alkyl groups, optionally branched, or wherein R_1 and R_2 together with the carbon atom to which they are attached form a carbocyclic ring which comprises subjecting a mixture of R- and S-2,2-R_1,R_2-1,3-dioxolane-4-methanol to the action of a bacteria selected from the group consisting of the genus Nocardia, the genus Rhodococcus, the genus Corynabacterium and the genus Mycobacterium having the ability for stereoselective consumption of S-2,2-R_1,R_2-1,3dioxolane-4-methanol for a period of time such that S-2,2-R_1,R_2-1,3-dioxolane-4-methanol in the mixture is altered to give a 2,2-R_1,R_2-1,3-dioxolane-4-methanol enriched in R-isomer.

5,190,868

CONTINUOUS PROCESS FOR THE INTERESTERIFICATION OF FATS OR OILS

Yoshitaka Kokusho, Kusatachi; Akio Oshima, Hino; Akira Tsunoda, Hino, and Shinjiro Iwasaki, Hino, all of Japan, assignors to Meito Sangyo Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 238,072, Aug. 30, 1988, abandoned. This application Jan. 22, 1991, Ser. No. 644,425

Claims priority, application Japan, Aug. 31, 1987, 62-215508; Jun. 30, 1988, 63-162930

Int. Cl.[5] C12P *7/64, 7/62*; C12N *11/14, 9/20*

U.S. Cl. 435—134 **13 Claims**

1. A continuous process for the interesterification of oils or fats comprising treating said oils or fats in the presence of a fatty acid wherein a reactor column packed with a lipase having a molecular weight of about 100 kD or greater as determined by fractionation on a Sephadex G200 column and an optimum pH of about 8.0 or greater, isolated from a species of microorganism selected from the group consisting of *Alcaligenes* and *Achromobacter* and containing 0 to 5% moisture, is fed with a substrate solution composed of said oils or fats and said fatty acid in such manner that said substrate solution which has a moisture content in the range of 100 to 1800 ppm is fed to said reactor column and the reaction solution output from said reactor column has a moisture content in the range of 50 to 800 ppm, the moisture content being adjusted to said ranges by passing said substrate solution across a precolumn packed with a hygroscopic solid that is moistened beforehand, before being fed to said reactor column.

5,190,869

PROCESS FOR OBTAINING SORBITOL AND GLUCONIC ACID OR GLUCONATE USING *ZYMOMONAS MOBILIS*

Bert Rehr, Kelkheim, and Hermann Sahm, Juelich, both of Fed. Rep. of Germany, assignors to Forschungszentrum Juelich GmbH, Juelich, Fed. Rep. of Germany

Filed May 28, 1991, Ser. No. 706,333

Claims priority, application Fed. Rep. of Germany, May 28, 1990, 4017103

Int. Cl.[5] C12P *7/58, 7/18*; C12N *11/04, 1/38*

U.S. Cl. 435—137 **18 Claims**

1. A process for obtaining at least one of sorbitol, gluconic acid and gluconate starting from an aqueous solution of at least one of fructose and glucose, comprising the steps of:

permeabilizing cells of *Zymomonas mobilis*;

immobilizing the permeabilized cells in a gel with κ-carrageenan;

stabilizing the cells with K^+ ions;

rigidifying the stabilized cells with either an aldehyde or a combination of an amine and an aldehyde, said aldehyde or amine/aldehyde combination being selected from the group consisting of glutaraldehyde, a combination of glutaraldehyde and hexamethylenediamine and a combination of glutaraldehyde and polyethyleneimine; and

converting an aqueous solution of at least one of fructose and glucose into at least one of sorbitol, gluconic acid and gluconate with the stabilized, immobilized cells.

5,190,870

METHOD FOR OXIDIZING HYDROCARBONS WITH A HYDROXYLASE FROM A METHANE MONOOXYGENASE

John D. Lipscomb, Wayzata, Minn., and Brian G. Fox, Pittsburgh, Pa., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 352,721, May 16, 1989, abandoned. This application Oct. 8, 1990, Ser. No. 600,575

Int. Cl.[5] C12P *17/12, 17/02*; C12N *1/26, 1/28*

U.S. Cl. 435—155 **46 Claims**

1. A method for oxidizing hydrocarbons with purified hydroxylase component from a soluble methane monooxygenase comprising contacting said purified hydroxylase with said hydrocarbons in the presence of a source of electrons and one or more electron transport-mediating compounds under essentially aerobic conditions and absent reductase and B components from the same or other soluble methane monooxygenase, until at least a portion of the corresponding oxidized product is produced in an isolable amount, wherein said source of electrons and said electron transport-mediating compounds are able to reduce said hydroxylase.

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5,190,871
USE OF THE SITE-SPECIFIC INTEGRATING FUNCTION OF PHAGE φC31

Karen L. Cox, Martinsville; Stuart A. Kuhstoss, Indianapolis; R. Nagaraja Rao, Indianapolis; Mark A. Richardson, Indianapolis; Brigitte E. Schoner, Monrovia, and Eugene T. Seno, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 12, 1989, Ser. No. 364,959
Int. Cl.[5] C12N *15/74, 1/21, 15/09, 15/63*
U.S. Cl. 435—172.3 28 Claims

1. A method for directing integration of a plasmid into a streptomycete genome which comprise the step of introducing into said streptomycete a plasmid comprising a DNA sequence, such DNA sequence containing site-specific integrating functions of phage φC31 subject to the limitation that the plasmid not be capable of directing plaque formation.

5,190,872
IMMOBILIZED ALCOHOL UTIDASE FOR USE IN AN ALCOHOL MEASURING APPARATUS

Yoshio Hashizume, Kakogawa; Akio Kariyone, Kyoto; Ryuzo Hayashi, Higashiosaka, and Minako Oka, Sapporo, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1990, Ser. No. 573,066
Claims priority, application Japan, Aug. 25, 1989, 1-219104; Mar. 12, 1990, 2-61703
Int. Cl.[5] C12M *11/14, 1/40;* C12Q *1/54, 1/26*
U.S. Cl. 435—176 8 Claims

1. An immobilized alcohol oxidase produced by at least the following steps of:
a) bonding an aminosilane coupling agent to the surface of a carrier,
b) bonding a multifunctional aldehyde to an amino group of said aminosilane coupling agent which is bonded to the surface of said carrier by contacting said carrier with a solution containing the multifunctional aldehyde,
c) washing said carrier to remove essentially all free multifunctional aldehyde from the carrier, and
d) bonding an alcohol oxidase to said multifunctional aldehyde which is bonded to said amino group to immobilize a one-molecule thickness of alcohol oxidase on the carrier.

5,190,873
HYBRID TRYPTOPHAN APOREPRESSOR CONTAINING LIGAND BINDING SITES

Waldemar Lernhardt, Solana Beach; Mario Bourdon, San Diego, and Phil Youderian, Ramona, all of Calif., assignors to California Institute of Biological Research, La Jolla, Calif.

Filed Jun. 21, 1991, Ser. No. 720,222
Int. Cl.[5] C07K *13/00, 17/00, 17/02;* C12P *21/00*
U.S. Cl. 435—177 19 Claims

1. A tryptophan aporepressor containing within its amino acid residue sequence a peptide segment heterologous to said aporepressor, said segment being located on an aqueous solvent-accessible surface of said aporepressor and containing about 3–20 amino acid residues, wherein said peptide segment comprises a ligand binding site.

5,190,874
METHOD FOR PRODUCING PENICILLINASE AND XYLANASE

Koki Horikoshi, Tokyo, Japan, assignor to Rikagaku Kenkyusho, Wako, Japan

Continuation of Ser. No. 265,221, Oct. 25, 1988, abandoned, which is a continuation of Ser. No. 814,793, Dec. 30, 1985, abandoned. This application Aug. 30, 1989, Ser. No. 401,507
Claims priority, application Japan, Dec. 28, 1984, 59-278681
Int. Cl.[5] C12N *9/24, 1/21, 15/70*
U.S. Cl. 435—200 12 Claims

9. A method for producing penicillinase and xylanase, which comprises cultivating a transformed strain of the genus Escherichia in a suitable nutrient broth, thereby accumulating said penicillinase and xylanase, and separating the thus-produced penicillinase and xylanase from the broth, wherein said transformed strain is capable of expressing and secreting heterologous penicillinase and xylanase, and which strain comprises a plasmid consisting of:
a) a first chromosomal DNA fragment from the genus Bacillus coding for penicillinase; and
b) a second DNA fragment, operably linked for autonomous expression to said first DNA fragment, and for expressing said xylanase, said second DNA fragment consisting of a chromosomal DNA fragment from a strain of the genus Aeromonas coding for xylanase.

5,190,875
PEPTIDE AMIDASE AND THE USE THEREOF

Doerte Steinke, Aachen, and Maria-Regina Kula, Niederzier-Hambach, both of Fed. Rep. of Germany, assignors to Forschungszentrum Juelich GmbH, Juelich and Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 6, 1991, Ser. No. 694,981
Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014564
Int. Cl.[5] C12N *9/78, 9/80, 9/82, 9/84*
U.S. Cl. 435—227 2 Claims

1. A peptide amidase which can be isolated from the flavedo of citrus fruits and that catalyzes the selective hydrolytic elimination of the free amino group at the C-terminal location of peptide amides, and wherein said amidase, in substantially pure form,
(A) is further capable of catalyzing the elimination of the C-terminal amino group of N-terminal protected amino acid amides;
(B) does not cleave peptide bonds;
(C) has an optimum pH of 7.5+/−1.5;
(D) is stable at pH 6.0–9.0;
(E) has an optimum temperature of 30° C. at pH 7.5;
(F) exhibits weak inhibition by serine protease inhibitors;
(G) has a molecular weight of 23,000+/−3000 daltons as measured by electrophoresis;
(H) has an isoelectric point of pH 9.5; and
(I) is liable to aggregation.

5,190,876
METHOD OF MODIFYING CELLULAR DIFFERENTIATION AND FUNCTION AND COMPOSITIONS THEREFOR

Alfred H. Merrill, Jr., Stone Mountain; Joseph M. Kinkade, Jr., Decatur, both of Ga., and Victoria L. Stevens, Rahway, N.J., assignors to Emory University, Atlanta, Ga.

Filed Dec. 27, 1988, Ser. No. 292,564
Int. Cl.[5] C12N *5/06;* C07C *215/10, 35/18;* A61K *31/07*
U.S. Cl. 435—240.2 6 Claims

4. A method of promoting cellular differentiation and maturity of myelocytic or promyelocytic cells capable of differentiation, comprising the step of treating said cells with vitamin A or an analog thereof and sphingosine or an analog thereof in amounts which promote differentiation of myelocytic or promyelocytic cells.

5,190,877
SACCHAROMYCES STRAINS FOR MALTOSE FERMENTATION

Klaas A. Osinga, Voorschoten; Robert F. Beudeker, Delft; Johannes B. Van der Platt, Leiderdorp, and Johannes A. de Hollander, Oegstgeest, all of Netherlands, assignors to Gistbrocades N.V., Delft, Netherlands

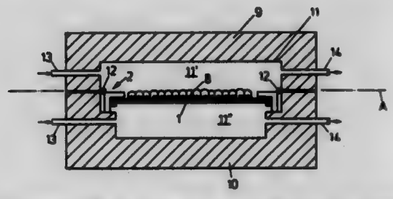
Continuation of Ser. No. 140,031, Dec. 31, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 611,319
Claims priority, application European Pat. Off., Sep. 3, 1987, 87201670; Mar. 9, 1988, 88200453
Int. Cl.[5] C12N *1/19;* A21D *2/00*
U.S. Cl. 435—256 20 Claims

1. A transformed yeast capable of enhanced production of carbon dioxide as compared to an untransformed parent of said yeast upon fermentation in a medium comprising maltose, wherein said maltose is fermentable by both said parent and said transformed yeast, and wherein said transformed yeast comprises a DNA construct comprising at least one gene capable of expression in said transformed yeast encoding a maltose permease, maltase or a maltose regulatory protein.

5,190,878
APPARATUS FOR CULTIVATING CELLS

Minuth Wilhelm, Neue Welt 1, 8401 Hohengebraching, Fed. Rep. of Germany

Filed Dec. 14, 1990, Ser. No. 627,729
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1989, 3923279
Int. Cl.[5] C12M *3/00, 3/04, 1/14*
U.S. Cl. 435—285 15 Claims

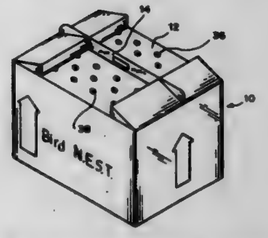


1. An apparatus for cultivation of biological cells, comprising:
a culture vessel defining an internal space (11, 19, 22, 26);
at least one inflow opening (13) communicating with said internal space for introducing a cell treatment medium;
at least one outflow opening (14) communicating with said internal space (11, 19, 22, 26) for removing said cell treatment medium;
at least one holding device (2) arranged to support a penetrable flat cell substrate (1) with a cell culture thereon and being removably installed in said internal space such that the holding device rests on a surface inside the internal space and the cell treatment medium can come into contact with said cell substrate (1) from both the apical and basal sides;
said holding device (2) comprising a supporting ring (3) and a fixing ring (4), said supporting and fixing rings being concentric, and with the cell substrate being fixed between these rings (3, 4);
the supporting ring (3) having a supporting ring section (3') encircling said fixing ring (4) and said supporting ring section having an axial height (h);
the fixing ring (4) having an axial thickness, the axial thickness of the fixing ring being sufficiently smaller than the axial height (h) of said supporting ring section (3') such that the fixing ring (4), when positioned in said supporting ring, is incapable of abutting the said surface of the internal space of the holding device (2).

5,190,879
CONTROLLED ENVIRONMENT ANIMAL ISOLATION SYSTEMS

N. Lee Wolfe, and Franklin W. Range, both of Athens, Ga., assignors to Bowolfe, Inc., Watkinsville, Ga.

Continuation of Ser. No. 519,837, May 8, 1990, abandoned. This application Aug. 1, 1991, Ser. No. 742,884
Int. Cl.[5] C12M *1/00, 1/22;* A01K *1/00, 31/00*
U.S. Cl. 435—287 26 Claims

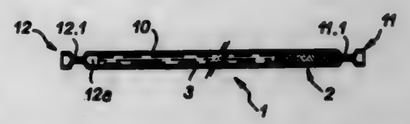


1. A controlled environment container comprising:
a container of an appropriate size and shape for animals, plants, or cells having an opening for air and heat exchange in combination with an ultra-thin dense skin, gas permeable composite polydimethylsiloxane membrane including a porous support substrate, permeable to gases and heat and impermeable to microorganisms, having a thickness between approximately 0.2 microns and 25 microns and an O_2 permeability of at least 2.19×10^{-4} ml/(sec×cm^2), wherein the membrane covers the opening and is sealably attached at all edges of the opening and the combination of the membrane and support withstands sterilization and handling, having the same permeability to gases and heat and mechanical strength after sterilization as before.

5,190,880
TUBE KNOWN AS STRAW, FOR CRYOGENICALLY PRESERVING BIOLOGICAL SAMPLES

Robert Cassou, "Les Cassou" Sainte Montaine, 18700 Aubigny-sur-Nere; Maurice Cassou, and Bertrand Cassou, both of 10 rue Georges Clémenceau, 61300 L'Aigle, all of France

Filed Nov. 1, 1990, Ser. No. 607,684
Int. Cl.[5] C12M *1/24, 3/00*
U.S. Cl. 435—296 9 Claims



1. A tube for cryogenic preservation of biological specimens, in particular viral cultures, comprising a tubular envelope of predetermined length having opposed ends, said tubular envelope being made of a biologically neutral, substantially transparent polymer material, a seal being defined at each end of said tubular envelope, a sliding stopper being located axially inwardly of and proximate to one of said ends and comprising aqueous gel disposed between two pads of porous elastic, said polymer material being an ionomer resin having an embrittlement temperature less than or equal to 77 K, and the end seals comprising autogenic welds.

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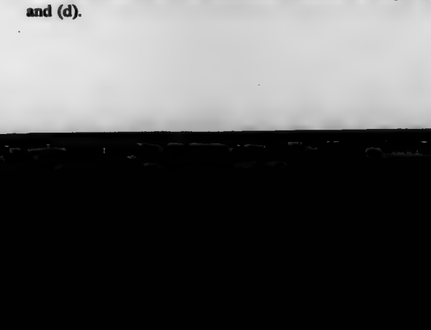
5,190,881
DETERMINATION OF ACTINIDES IN URINE AND FECAL SAMPLES
Terry T. McKibbin, Larimer County, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Feb. 4, 1992, Ser. No. 831,017
Int. Cl.[5] G01N *33/20*
U.S. Cl. 436—82 **10 Claims**

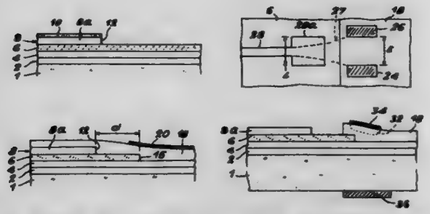
1. A method for analyzing human urine or feces for trace amounts of actinides, consisting of uranium (U), plutonium (Pu), and americium (Am) in a single sample of urine or feces, said sample having been dried, reduced, and carried on a first precipitate, comprising the steps of:
(a.) dissolving the first precipitate in a solution of hydrochloric acid (HCl) and hydrofluoric acid (HF);
(b.) reducing the dissolved precipitate of step (a.) by the addition of titanium trichloride ($TiCl_3$);
(c.) adding a neodymium (Nd) carrier, thereby forming a neodymium fluoride (NdF) precipitate;
(d.) dissolving the NdF precipitate in a mixture of nitric acid (HNO_3) and boric acid (H_3BO_3), adding ammonium hydroxide and reprecipitating as neodymium hydroxide ($Nd(OH)_3$);
(e.) dissolving the $Nd(OH)_3$ precipitate in a dilute nitric acid (HNO_3);
(f.) treating the dissolved $Nd(OH)_3$ with sodium nitrite ($NaNO_2$), thereby adjusting the oxidation state of the plutonium (Pu) to a valence of four (IV);
(g.) reprecipitating the dissolved $Nd(OH)_3$ of step (f.) by the addition of ammonium hydroxide (NH_4OH);
(h.) dissolving the reprecipitated $Nd(OH)_3$ of step (g.) by the addition of hydrochloric acid (HCl);
(i.) passing the dissolved $Nd(OH)_3$ of step (h.) through an anion exchange resin;
(j.) washing the resin of step (i.) in hydrochloric acid, thereby removing americium (Am) and salts from the resin;
(k.) eluting the uranium (U) and plutonium (Pu) with a 1M hydrochloric acid;
(l.) adding hydrofluoric acid (HF) to the eluant of step (k.), thereby forming a neodymium fluoride (NdF) precipitate carrying tetravalent plutonium (Pu);
(m.) filtering the NdF precipitate of step (l.) thereby forming a filtered precipitate and a filtrate;
(n.) counting a plutonium activity of the filtered precipitate of step (m.) on an alpha spectrometer;
(o.) treating the filtrate of step (m.) with titanium trichloride ($TiCl_3$), thereby reducing the uranium;
(p.) adding a neodymium carrier to the filtrate of step (o.), thereby forming a NdF precipitate carrying uranium;
(q.) filtering the NdF precipitate of step (p.);
(r.) counting a uranium activity of the filtered precipitate of step (q.) on the alpha spectrometer;
(s.) adding ammonium hydroxide to the eluant portion from step (j.), thereby forming a precipitate carrying americium;
(t.) dissolving the precipitate of step (s.);
(u.) complexing the dissolved precipitate of step (t.) with ethylene diamine-tetraacetic acid (EDTA) thereby forming a solution;
(v.) neutralizing the solution of step (u.) with ammonium hydroxide and discarding the precipitate formed;
(w.) coprecipitating the americium on a neodymium hydroxide precipitate by the addition of potassium hydroxide;
(x.) oxidizing the americium to a valence of six (VI) thereby redissolving the precipitates of step (w.)
(y.) selectively reducing any cerium (Ce) present;
(z.) precipitating the neodymium as neodymium fluoride (NdF);
(aa.) centrifuging the NdF precipitate of step (z.) and discarding the NdF precipitate;
(bb.) reducing the Am (VI) to Am (III);
(cc.) adding an Nd carrier;
(dd.) letting a solution of step (cc.) stand for 15 minutes;
(ee.) filtering a precipitate on a 0.1 μm filter; and then
(ff.) counting an americium activity of the filtered precipitate of step (ee.) on the alpha spectrometer.

5,190,882
METHOD FOR QUANTITATIVELY DETERMINING THE AMOUNT OF SATURATES, OLEFINS, AND AROMATICS IN A MIXTURE THEREOF
Wolfgang W. Schulz, Lebanon, and Mark W. Genowitz, Phillipsburg, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Continuation-in-part of Ser. No. 487,579, Mar. 2, 1990, abandoned. This application Jan. 6, 1992, Ser. No. 817,217
Int. Cl.[5] G01N *21/33*
U.S. Cl. 436—139 **9 Claims**



1. A method for determining the concentration of saturates, olefins and aromatics in a composition comprising:
(a) contacting a chromatographic stationary phase with a sample of the composition for a time sufficient to load said saturates, olefins and aromatics onto said stationary phase;
(b) separating said saturates, olefins and aromatics, loaded on said stationary phase, by passing a mobile phase, under super critical conditions, through said stationary phase in a sufficient concentration and for a time sufficient to obtain an eluent wherein the concentration of saturates, olefins and aromatics in said eluent varies over time such that the concentration of saturates and olefins in said eluent obtained over a first time interval is substantially higher than over a second time interval, said second time interval being a time interval at least after said first time interval and the concentration of aromatics in said eluent obtained over said second time interval is substantially higher than over said first time interval;
(c) passing said eluent through an ultraviolet absorption detector and irradiating said eluent with ultraviolet light at a wavelength capable of producing a uniform ultraviolet absorbance response for said olefins that is independent of the specific olefins present and measuring said ultraviolet absorbance response over said first time interval;
(d) passing said eluent through a mass detector capable of producing a mass response to saturates and olefins in said eluent obtained over said first time interval and capable of producing a mass response to said aromatics in said eluent obtained over said second time interval and measuring said mass response over said first time interval and said second time interval;
(e) determining the concentration of saturates, olefins and aromatics from said measurements obtained in steps (c) and (d).

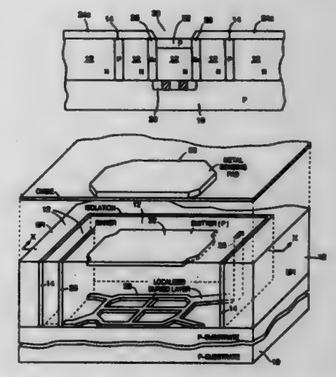
5,190,883
METHOD FOR MAKING AN INTEGRATED LIGHT GUIDE DETECTOR STRUCTURE MADE OF A SEMICONDUCTIVE MATERIAL
Louis Menigaux, Bures sur Yvett; Alain Carenco, Bourg La Reine, and André Scavennec, Paris, all of France, assignors to France Telecom-Establissement autonome de droit Public (Centre National d'Etudes), France
Filed May 16, 1991, Ser. No. 700,718
Claims priority, application France, May 21, 1990, 90 06317
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—3 **11 Claims**



1. Method for making an integrated monolithic detector guide structure consisting of the stages:
a) epitaxially growing on a semiconductive material a lower semiconductive confinement film followed by a semiconductive guide film and finally an upper semiconductive confinement film, the guide film being inserted between the confinement films having a prohibited band of energy smaller than those of said confinement films, all said films having a first conductivity type,
b) etching the upper confinement film so as to form a strip guide with one extremity defining a first step,
c) etching the guide film to form a second step adjacent to the first step so as to constitute a stair with two steps
d) epitaxially growing a semiconductive detector film with the first conductivity type on the films obtained at the stage c), a prohibited band of energy of this detector film being smaller than those of the confinement and guide films,
e) eliminating that portion of the detector film covering the strip guide, and
f) forming a detector in said detector film opposite said second step so as to embody a butt coupling between the guide film and the detector.

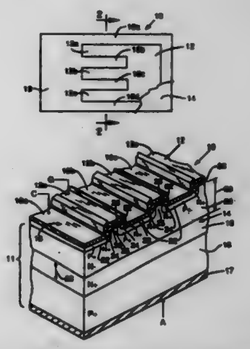
5,190,884
METHOD OF MAKING VERTICAL PNP TRANSISTOR
Giovanni P. Giannella, Saratoga, Calif., assignor to Exar Corporation, San Jose, Calif.
Division of Ser. No. 644,019, Jan. 18, 1991, Pat. No. 5,097,309. This application Mar. 17, 1992, Ser. No. 852,775
Int. Cl.[5] H01L *21/265, 29/70*
U.S. Cl. 437—31 **6 Claims**

1. A method for fabricating a vertical PNP transistor having a base, a collector, and an emitter on a substrate of a first conductivity-type material, wherein the substrate serves as the collector, comprising:
a. forming a localized buried layer of an increased concentration of a second conductivity-type material on the substrate;
b. forming an epitaxial layer of the second conductivity-type material on the substrate to serve as the base;
c. forming an isolation region of the first conductivity-type material in the epitaxial layer which extends to the substrate to create a tub;
d. forming a deep region of an increased concentration of the second conductivity-type material in the epitaxial layer which extends and connects to the localized buried layer and serves as a connection for the base of the vertical PNP transistor; and



e. forming an emitter region of the first conductivity-type material on the epitaxial layer directly above the localized buried layer.

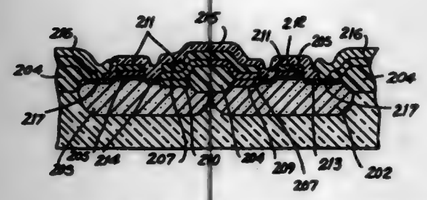
5,190,885
IGBT PROCESS TO PRODUCE PLATINUM LIFETIME CONTROL
Douglas A. Pike, Jr.; Dah W. Tsang, and James M. Katana, all of Bend, Oreg., assignors to Advanced Power Technology, Inc., Bend, Oreg.
Continuation of Ser. No. 751,441, Aug. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 737,560, Jul. 26, 1991, which is a continuation of Ser. No. 467,636, Jan. 19, 1990, abandoned, and a continuation of Ser. No. 439,101, Nov. 16, 1989, Pat. No. 5,045,903, which is a division of Ser. No. 194,874, May 17, 1988, Pat. No. 4,895,810, which is a continuation-in-part of Ser. No. 842,771, Mar. 21, 1986, Pat. No. 4,748,103. This application Mar. 13, 1992, Ser. No. 852,932
Int. Cl.[5] H01L *21/00, 21/02, 21/467*
U.S. Cl. 437—31 **86 Claims**



1. An improved fabrication process for making a MOS-type insulated gate controlled four-layer power switching device, the process comprising:
forming a semiconductor substrate having a first layer of a first dopant type defining a device anode and second layer of a second, opposite-polarity dopant type defining a drain region extending from an upper surface of the substrate toward the first layer;

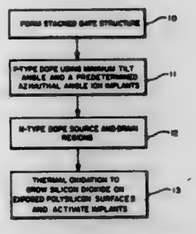
forming an insulative layer on the upper surface of the second layer of the substrate and an insulated gate contact layer on the insulative layer;
forming double diffused regions including a body region of the first dopant type and a source region of the second dopant type within the body region, the body region forming two PN junctions with the drain and source regions, respectively spaced apart so as to define a channel region in the body region subjacent the insulated gate contact;
forming a source contact alongside the gate contact but spaced insulatively therefrom, the source contact forming an electrical connection to the source region and the body region and a short therebetween and defining a cathode contact for the device;
forming a anode contact on the opposite side of the substrate in electrical connection to the first layer;
the step of forming the second layer including:
forming a first portion contacting the first layer and having a first thickness and a first doping concentration;
forming a second portion contacting the second layer and extending to said upper surface to receive said double diffused regions;
sizing and doping the second portion to a second thickness and a second doping concentration sufficient to block a predetermined maximum reverse bias voltage; and
sizing and doping the first portion to produce a predetermined output impedance (R_o) sufficient to resist current flow during forward conduction when a high voltage (V_{ce}) is across the cathode and anode contacts.

5,190,886
SEMICONDUCTOR DEVICE AND METHOD OF PRODUCTION
Michio Asahina, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 844,347, Mar. 2, 1992, abandoned, which is a continuation of Ser. No. 702,134, May 13, 1991, Pat. No. 5,093,276, which is a continuation of Ser. No. 553,281, Jul. 17, 1990, abandoned, which is a division of Ser. No. 75,245, Jul. 16, 1987, Pat. No. 4,985,746, which is a continuation of Ser. No. 807,408, Dec. 10, 1985, abandoned. This application Jul. 17, 1992, Ser. No. 916,800
Claims priority, application Japan, Dec. 11, 1984, 59-261251
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—41 **2 Claims**



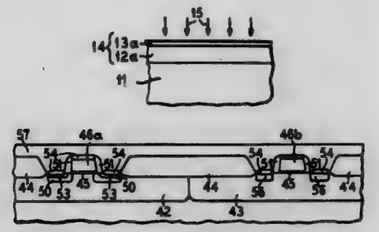
1. A method for making a semiconductor device comprising:
forming a non-doped polysilicon gate on a gate insulating film on a substrate having a P well region and an N well region;
injecting low concentration ions into the P and N well regions using the non-doped polysilicon gate as a mask;
forming silicon dioxide sidewalls on both sides of the polysilicon gate;
injecting high concentration ions into the P and N well regions and annealing;
depositing a refractory metal film on the surface
thermally activating the refractory metal film to form a silicide film;
etching the unactivated refractory metal film to form polysilicon gates and source-drain regions;
depositing a phosphoric silicate glass on the surface and lamp annealing the structure;
etching the phosphoric silicate glass to form a contact hole; and
forming a conductive connector in the contact hole.

5,190,887
METHOD OF MAKING ELECTRICALLY ERASABLE AND ELECTRICALLY PROGRAMMABLE MEMORY CELL WITH EXTENDED CYCLING ENDURANCE
Daniel N. Tang, and Gregory E. Atwood, both of San Jose, Calif., assignors to Intel Corporation, Santa Clara, Calif.
Filed Dec. 30, 1991, Ser. No. 815,946
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—43 **15 Claims**



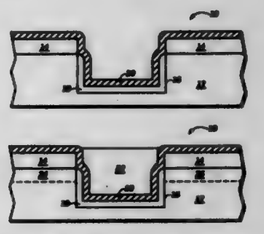
1. A method of forming an electrically erasable nonvolatile memory device including a field-effect memory cell on a semiconductor substrate comprising the steps of:
forming a tunnel dielectric layer over a second region within a doped monocrystalline silicon layer of the substrate, wherein the monocrystalline silicon layer includes a first region, the second region, and a third region, the first region and the third region lying on opposite sides and immediately adjacent to the second region;
depositing a floating gate layer over the tunnel dielectric layer;
forming a first patterned photoresist layer over the floating gate layer;
patterning the floating gate layer;
forming an intergate insulating layer over the floating gate layer;
forming a control gate layer over the intergate insulating layer;
forming a second patterned photoresist layer over the control gate layer;
patterning the control gate layer;
after forming the first patterned photoresist layer, doping the substrate with a first dopant, the first dopant being the same dopant type as the monocrystalline silicon layer dopant, the doping being done by ion implantation at a tilt angle no less than a minimum tilt angle and at about a predetermined azimuthal angle, such that a significant number of ions enter the first region and the second region near the first region and substantially no ions enter the third region, whereas if either the tilt angle is less than the minimum tilt angle or the azimuthal angle is not at about the predetermined azimuthal angle, a significant number of ions would enter the third region;
masking the first region;
doping the third region with a second dopant, the second dopant being an opposite dopant type as the monocrystalline silicon layer dopant; and
doping the first region and the third region with a third dopant, the third dopant being the same dopant type as the second dopant, the third dopant dose being heavier than the first dopant dose, the second dopant diffusion coefficient being greater than the third dopant diffusion coefficient.

5,190,888
METHOD FOR PRODUCING A DOPED POLYCIDE LAYER ON A SEMICONDUCTOR SUBSTRATE
Udo Schwalke, Williston, Vt., and Ralf Burmaster, Ratingen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Oct. 17, 1991, Ser. No. 779,408
Claims priority, application Hague, Oct. 23, 1990, 90120324.0
Int. Cl.[5] H01L *21/335*
U.S. Cl. 437—57 **20 Claims**



1. A method for producing a doped polycide layer on a semiconductor substrate, comprising the steps of:
producing a silicon layer that is not single-crystal on the semiconductor substrate;
producing the silicon layer with a pre-doping;
producing a metal silicide layer on the silicon layer so as to form the polycide layer composed of silicon and metal silicide; and
after the formation thereof, doping the polycide layer to an ultimate value of dopant concentration using an implantation;
wherein the step of producing a metal silicide layer comprises the steps of:
depositing a metal layer onto the silicon layer; and
converting a part of the silicon layer into the metal silicide layer by reaction with the metal layer arranged thereon using a thermal treatment;
wherein the method further comprises the steps of:
using a substrate of silicon as the semiconductor substrate at whose surface are arranged masking structures of a material that does not react with the metal layer to form metal silicide during the thermal treatment;
structuring the silicon layer before the deposition of the metal layer; and
depositing the metal layer surface-wide onto a surface of the silicon layer, a surface of the masking structures and a surface of the exposed regions of the substrate, so that metal silicide forms at the surface of the silicon layer and the surface of the exposed regions of the substrate during the thermal treatment, whereas unreacted metal is preserved on the masking structures;
wherein the method further has the steps of:
producing an insulating layer between the substrate and the silicon layer at least in one region of the silicon layer, said insulating layer being structured such that the insulating layer has common side walls with the silicon layer in this region; and
producing side wall coverings of an insulating material, that does not react with the metal layer to form metal silicide during the thermal treatment, at the side walls before the deposition of the metal layer;
wherein at least a part of the structured silicon layer arranged on the insulating layer forms a gate electrode and the insulating layer arranged therebelow forms a gate dielectric for a MOS transistor and wherein source and drain regions for the MOS transistor are formed in the substrate during the implantation for doping the polycide layer; and wherein the method further comprises the steps of:
a) producing in the substrate a first well having a first conductivity type and a second well having a second conductivity type opposite that of the first conductivity type;
b) defining a first region in the first well for the acceptance of a first MOS transistor and a second region in the second well for the acceptance of a second MOS transistor complementary vis-a-vis said first MOS transistor by field oxide regions;
c) first producing a gate oxide layer at a surface of the first region and a surface of the second region, then producing a doped polysilicon layer of the first conductivity type surface-wide and producing a cover layer thereon, said cover layer containing at least one of silicon oxide and silicon nitride;
d) producing a first photoresist mask that leaves only the first region uncovered after formation of a first gate electrode for the first MOS transistor and of a second gate electrode for the second MOS transistor by structuring the polysilicon layer and after formation of side wall coverings at side walls of the first gate electrode and of the second gate electrode;
e) removing the first photoresist mask after the formation of first source region and first drain region for the first MOS transistor by implantation of doping ions of the second conductivity type upon employment of the first gate electrode and of the first photoresist mask as an implantation mask;
f) after removing of the cover layer, applying the metal layer surface-wide and implementing the thermal treatment for forming metal silicide;
g) using a second photoresist mask as an implementation mask that leaves only the second region uncovered, implementing an implantation with doping ions of the first conductivity type being implemented for setting an ultimate value of dopant concentration in the second gate electrode and for the formation of a second source region and a second drain region for the second MOS transistor; and
h) producing an intermediate oxide layer surface-wide after removing of the second photoresist mask.

5,190,889
METHOD OF FORMING TRENCH ISOLATION STRUCTURE WITH GERMANIUM SILICATE FILLING
Stephen S. Poon, and Papu D. Maniar, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 9, 1991, Ser. No. 803,930
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—67 **19 Claims**



15. A process for forming a trench structure comprising the steps of:
providing a substrate material and a hard mask material that overlies the substrate material, the hard mask material having at least one opening which exposes at least one surface portion of the substrate material;
removing portions of the substrate material exposed by the

at least one opening in the hard mask material, the removal of the portions of the substrate material forming at least one trench in the substrate material having a sidewall portion and a bottom portion;
forming a dielectric barrier, the dielectric barrier overlying the bottom portion of the trench and being adjacent the sidewall portion of the trench; and
forming a substantially planar region of germanium silicate material which overlies the barrier and is adjacent the barrier, the region of germanium silicate material being formed only within a portion of the at least one trench.

5,190,890
WAFER BASE FOR SILICON CARBIDE SEMICONDUCTOR DEVICES, INCORPORATING ALLOY SUBSTRATES, AND METHOD OF MAKING THE SAME

Walter Precht, Towson, Md.; Richard Koba, Burlington, Mass.; Donald Kupp, State College, Pa., and Delwyn Cummings, Meriden, Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Division of Ser. No. 532,906, Jun. 4, 1990, Pat. No. 5,043,773. This application Aug. 8, 1991, Ser. No. 742,597
Int. Cl.[5] H02L *21/20*
U.S. Cl. 437—100 17 Claims

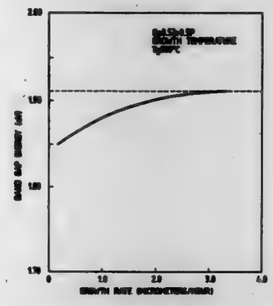
1. A process for preparing a semiconductor wafer base comprising:
providing a single crystal metal carbide alloy substrate, wherein the substrate comprises a metal carbide alloy selected from the group consisting of alloys of two or more of TiC, VC, NbC, TaC, ZrC, HfC, WC, and MoC;
depositing an unpolytyped, single crystal overlayer of 3C-SiC onto the substrate, so that the 3C-SiC overlayer is epitaxially related to said substrate.

5,190,891
METHOD FOR FABRICATING A SEMICONDUCTOR LASER DEVICE IN WHICH THE P-TYPE CLAD LAYER AND THE ACTIVE LAYER ARE GROWN AT DIFFERENT RATES

Tatsuo Yokotsuka, London, England; Akira Takamori, Atsugi; Masato Nakajima, and Tomoko Suzaki, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1991, Ser. No. 710,483
Claims priority, application Japan, Jun. 5, 1990, 2-148299; Jun. 5, 1990, 2-148300
Int. Cl.[5] H01S *3/19*; H01L *21/203*
U.S. Cl. 437—129 7 Claims

1. A method for fabricating a semiconductor laser device which comprises:
providing a GaAs monocrystal substrate of one conductivity type;
epitaxially growing a first clad layer of a compound semiconductor of one conductivity type represented by the formula, $(Al_xGa_{1-x})_{0.5}In_{0.5}P$, wherein $0.4 \leqq x \leqq 1$, on a plane (001) of the substrate;
epitaxially growing, on the first clad layer, an active layer of a compound semiconductor of the formula, $(Al_yGa_{1-y})_{0.5}In_{0.5}P$, wherein $0 \leqq y \leqq 0.35$ provided that x and y are so selected that the value of (x−y) is not less than 0.4, said active layer being grown at a rate of not less than 2.0 μm/hour; and
epitaxially growing, on the active layer, a second clad layer of a compound semiconductor of the other conductivity

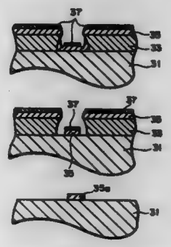


type represented by the formula defined with respect to the first clad layer, at least one of the first and second clad layers, which is of a p-type conductivity, being grown at a rate of not larger than 0.5 μm/hour sufficient to form a monolayer superlattice structure therein.

5,190,892
METHOD FOR FORMING PATTERN USING LIFT-OFF

Yoshiaki Sano, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 387,963, Aug. 1, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 800,728
Claims priority, application Japan, Aug. 11, 1988, 63-200358
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—180 1 Claim

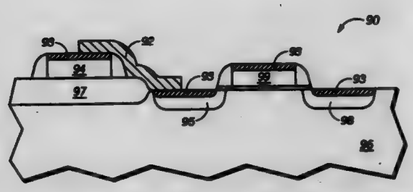


1. A method of forming a pattern which comprises the steps of:
forming a resist pattern on a substrate to obtain a first structure, said resist pattern having a window opening and having portions overhanging said window opening;
forming a first film on said first structure using a deposition process of a low directivity to obtain a second structure, said first film consisting of a refractory metal;
forming a second film on said second structure using a deposition process of a high directivity;
etching said first film selectively using said second film as an etching mask; and,
dissolving said resist pattern after said etching step;
wherein said process of a low directivity is a sputtering process or a chemical vapor deposition process and wherein said process of a high directivity is a resistive heating evaporation process or an electron beam evaporation process.

5,190,893
PROCESS FOR FABRICATING A LOCAL INTERCONNECT STRUCTURE IN A SEMICONDUCTOR DEVICE

Robert E. Jones, Jr., and Hisao Kawasaki, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 1, 1991, Ser. No. 677,945
Int. Cl.[5] H01L *21/44*, *21/48*
U.S. Cl. 437—192 14 Claims

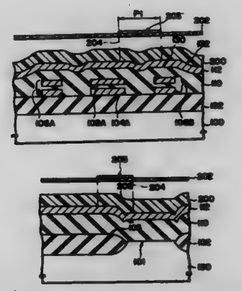


1. A process for fabricating a local interconnect structure in a semiconductor device, comprising the steps of:
providing two silicon elements in the semiconductor device which are to be electrically connected;
forming cobalt silicide regions over each of the two silicon elements;
depositing a layer of metal onto the device;
patterning the layer of metal to form a strap to connect the two cobalt silicide regions; and
after patterning the layer of metal to form a strap, thermally nitriding the strap to form a conductive nitride interconnect.

5,190,894
METHOD OF FORMING A WIRING LAYER OF A SEMICONDUCTOR DEVICE

Hirohito Tanoda, and Masataka Takebuchi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1991, Ser. No. 689,706
Claims priority, application Japan, Apr. 20, 1990, 2-104566
Int. Cl.[5] H01L *21/31*
U.S. Cl. 437—195 10 Claims



1. A method of manufacturing a semiconductor device in which a metal wiring layer is formed by a positive photoresist on an interlevel insulator having a step portion on its surface, said metal wiring layer extending along said step portion in a longitudinal direction thereof and being formed across said step portion in a direction perpendicular to said longitudinal direction, and said method comprising the steps of:
arranging a metal layer on a region on said interlevel insulator including said step portion;
arranging said resist on said metal layer;
exposing said resist to a light beam using mask means having a light-shielding portion corresponding to said wiring layer to pattern said resist; and
etching said metal layer using said patterned resist as a mask;
wherein said light-shielding portion of said mask means is sized such that both sides of said metal wiring layer are located at locations where an upper surface of said interlevel insulator is perpendicular to the radiation direction of the light beam.

5,190,895
CERAMICS COMPOSITE MATERIAL

Kiyoshi Uchida; Yukio Shimokawa; Hiroshi Nomura, all of Aichi; Hirohiko Nakata, and Masaya Miyake, both of Hyogo, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Japan Fine Ceramics Center, Nagoya, both of, Japan

PCT No. PCT/JP89/00735, § 371 Date Mar. 2, 1990, § 102(e) Date Mar. 2, 1990, PCT Pub. No. WO90/01020, PCT Pub. Date Aug. 2, 1990
Continuation-in-part of Ser. No. 465,206, Mar. 2, 1990, abandoned. This PCT application Jul. 21, 1989, Ser. No. 879,158
Claims priority, application Japan, Jul. 21, 1988, 63-182715; Aug. 1, 1988, 63-192421; Aug. 29, 1988, 63-214619; Oct. 28, 1988, 63-272375
Int. Cl.[5] C03C *14/00*, *10/00*
U.S. Cl. 501—32 4 Claims

1. A ceramics composite material consisting essentially of: a matrix of crystallized glass having a first material fracture strength, said crystallized glass being selected from the group consisting of Li_2O—SiO_2—Al_2O_3, Na_2O—Al_2O_3—SiO_2, MgO—Al_2O_3—SiO_2, PbO—ZnO—B_2O_3, ZnO—B_2O_3—SiO_2, and SiO_2—B_2O_3—Al_2O_3—MgO—K_2O—F; and a reinforcement material of fibers or whiskers of oxide ceramics excluding CaO, contained in said matrix of crystallized glass, said reinforcement material having a second material fracture strength, said reinforcement material being present as a substantial volume proportion of the total composite material, said composite material having a bond strength at interfaces between said crystallized glass and said reinforcement fibers or whiskers, said bond strength being less than said first material fracture-strength of said crystallized glass and less than said second material fracture strength of said reinforcement material.

5,190,896
CONTRAST ENHANCEMENT IN GLASS

Sally Pacilowski, Laserse; David G. Krashkevich, Dallas, and Ronald A. Klimek, Shavertown, all of Pa., assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Continuation-in-part of Ser. No. 785,570, Oct. 30, 1991, abandoned, which is a continuation of Ser. No. 735,027, Jul. 22, 1991, abandoned. This application Jun. 25, 1992, Ser. No. 904,098
Int. Cl.[5] C03C *3/095*
U.S. Cl. 501—64 20 Claims

1. A glass composition consisting essentially of

Oxide	Wt. %
SiO_2	40–72
B_2O_3	0–13
Al_2O_3	0.5–3
Li_2O	0–3
Na_2O	8–13
K_2O	1–10
TiO_2	8.0–9.5
CeO_2	2.6–3.5
Nd_2O_3	5–17
Fe_2O_3	1.40–2.10
CoO	0–0.07
NiO	0–0.4
CuO	0–0.5
Er_2O_3	0–2

-continued

Oxide	Wt. %
V_2O_5	0–0.5
Cr_2O_3	0–0.25

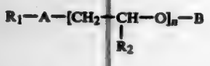
and having the following properties
% T (2.0 mm) 400 nm: ≦2.2%
% T (2.0 mm) 380 nm: 0.0%, and
a: −1.0 to −7.5
b: +1.0 to +10.0.

5,190,897
CERAMIC FOAM FILTERS
Shingo Azumi, Toyokawa, Japan, assignor to Foseco International Limited, Birmingham, England
Continuation of Ser. No. 558,154, Jul. 26, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 762,256
Claims priority, application United Kingdom, Aug. 8, 1989, 8918048
Int. Cl.[5] C04B *38/06*
U.S. Cl. 501—81 10 Claims

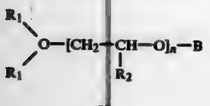
1. A ceramic foam filter formed by impregnating an organic foam with an aqueous slurry, said slurry composition comprising 20% to less than 50% by weight silicon carbide, 20–50% by weight alumina, 1.5–5.0% by weight silica derived from colloidal silica sol, and 1–3% by weight alumino-silicate fibers, and having been fired at a temperature of at least 1150° C., so that the filter has a ceramic matrix in which substantially all the alumino-silicate fibers are dissolved.

5,190,898
POURABLE MOLDING COMPOUND CONTAINING SINTERABLE POWDERS
Johan H. H. Ter Maat, Mannheim; Knut Oppenlaender, Ludwigshafen, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Aug. 20, 1991, Ser. No. 747,572
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1990, 4026965
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—127 10 Claims

1. A pourable molding compound containing sinterable powders, which comprises, based on the total compound,
a) from 60 to 97% by weight of sinterable powders selected from the group consisting of an oxidic ceramic powder, a nonoxidic ceramic powder and a metal powder,
b) from 0.1 to 10% by weight of surfactants, obtained by alkoxylation of aliphatic alcohols, fatty acids, fatty acid amides or aliphatic amines, of the formula



or Ter Maat et al. Ser. No. 07/747/572



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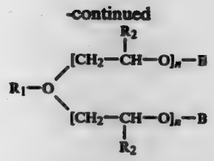
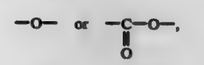
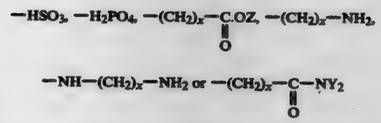


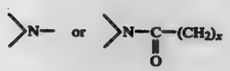
where R_1 is an aliphatic hydrocarbon radical having from 10 to 40 carbon atoms, A is



R_2 is —H, —CH_3 and/or —CH_2-CH_3,
B is hydrogen,



where Z is hydrogen, an alkali metal or ammonium, x is an integer from 1 to 3, and Y is H or —CH_3, D is



where x is also as defined above, and n is an integer from 1 to 40, and
c) from 2 to 35% by weight of an organic solvent having a melting point < 10° C. and a boiling point of from 40° to 180° C., selected from the group comprising the alkanes, ethers, esters and ketones.

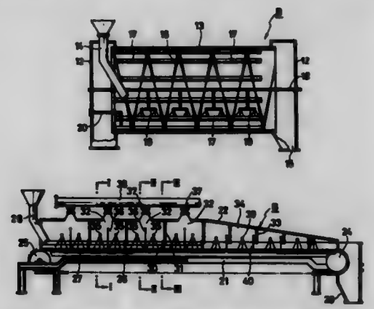
5,190,899
HIGH ALUMINA REFRACTORY SHAPES
Peter T. Sutor, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 281,885, Dec. 7, 1988, abandoned, which is a continuation of Ser. No. 84,308, Aug. 11, 1987, abandoned. This application Feb. 28, 1992, Ser. No. 844,962
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—127 9 Claims

1. A mix for forming a high alumina refractory shape with high resistance to aluminum penetration and high hot strength consisting essentially of at least 60% by weight aluminum oxide and 1% to 5% by weight boron phosphate and, for each 100 parts by weight of aluminum oxide and boron phosphate, P_2O_5 as phosphoric acid or monoaluminum phosphate in an amount sufficient to bind the mix.

5,190,900
PROCESS FOR REMOVING IRON FROM KAOLIN, QUARTZ AND OTHER MINERAL CONCENTRATES OF INDUSTRIAL INTEREST
Luigi Toro, Rome; Anna Maria Marabini, Frascati; Bruno Paponetti, Coppito, and Bruno Passariello, Tivoli, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy
Filed Oct. 3, 1991, Ser. No. 770,389
Claims priority, application Italy, Oct. 11, 1990, 21707 A/90
Int. Cl.[5] C04B *33/02, 33/04, 33/10, 14/04*
U.S. Cl. 501—148 13 Claims

1. A process for bleaching kaolin, quartz, titanium minerals and ceramic minerals, comprising suspending at least one ground material selected from the group consisting of kaolin, quartz, titanium minerals and ceramic minerals in a 0.1–5M solution of acid containing a sugar, stirring said suspension, and collecting the deferrized residue by filtration.

5,190,901
METHOD FOR PRODUCING ACTIVE CARBON USING CARBON-CONTAINING MATERIAL
Yoji Hirai, Omiya, Japan, assignor to Heiyo Shoji Kabushiki Kaisha, Omiya City, Japan
Filed Aug. 15, 1991, Ser. No. 746,114
Claims priority, application Japan, Aug. 15, 1990, 2-215493
Int. Cl.[5] B01J *37/34*; C01B *31/10*; H05B *3/00*; F27D *3/00*
U.S. Cl. 502—5 2 Claims



1. A method of producing an active carbon during a carbon-containing material as a raw material, comprising:
a step of carbonizing said carbon-containing material in a carbonizing unit at a temperature of about 600° C. for one to two hours without any intake of an environmental air under the influence of radiant heat from an outer wall of the carbonizing unit heated by combustion gas to produce carbonized material having an electric resistance value of 1.5 ohms or less, wherein said carbonizing unit is constructed in the form of a thermal radiation type batch furnace including an outer wall molded of a refractory material and a vessel mounted on a firing lattice in said outer wall with a heating chamber formed between said outer wall and said vessel while said raw material is air-tightly received in said vessel; and
a step of activating said carbonized material in an activating treatment unit for about one hour while the temperature in a drum is maintained at a temperature of about 850° C. in an atmosphere composed of steam and with the application of power of electricity to induce electric discharge whereby said carbonized material is self heated and said self heating is a function of the electrical resistance of said carbonized material, wherein said activating treatment unit is installed downstream of said carbonizing unit and includes a spirally extending screw conveyor, a plurality of discharge electrodes arranged around said screw conveyor in substantially equally spaced relationship in a circumferential direction for inducing electric discharge between adjacent discharge electrodes, and a rotary steam supply pipe having a plurality of steam spray nozzles attached thereto so as to allow steam to be sprayed therethrough toward the carbonized material to generate an atmosphere of steam.

5,190,902
METHOD FOR PRODUCING ATTRITION-RESISTANT CATALYST BINDERS
Edward J. Demmel, 1931 Port Claridge, Newport Beach, Calif. 92660
Filed Jun. 4, 1992, Ser. No. 893,921
Int. Cl.[5] B01J *20/12, 21/16, 37/28*
U.S. Cl. 502—63 112 Claims

106. Attrition-resistant clay/phosphate/catalyst particles, made by a process comprising:
(1) preparing a clay slurry having from about 20 to about 50 weight percent clay;
(2) adjusting the pH of the clay slurry to a level which places an aluminum component of the clay in an oxidation state which is conducive to formation of an ammonium aluminum phosphate complex;
(3) providing the clay slurry with ammonium ions and with phosphate ions by introducing therein an ammonium phosphate compound selected from the group consisting of monoammonium acid orthophosphate, diammonium acid ortho phosphate and triammonium orthophosphate and thereby producing a clay slurry having ammonium aluminum phosphate complex units in a quantity such that the attrition-resistant binder particles ultimately made from the slurry will be comprised of from about 1 to about 20 weight percent phosphate and from about 80 to about 99 weight percent clay;
(4) mixing catalyst particles into the clay/phosphate-containing compound slurry to form a clay/phosphate-containing compound/catalyst particle slurry having a quantity of catalyst particles which is such that the attrition-resistant clay/phosphate/catalyst particles made from said slurry will comprise from about 3 to about 60 weight percent of said particles;
(5) drying the slurry to produce solid particles; and
(6) calcining said solid particles in order to produce attrition-resistant clay/phosphate/catalyst particles.

5,190,903
LOW ACIDITY Y ZEOLITE
Karl Z. Steigleder, Glen Ellyn, Ill., assignor to UOP, Des Plaines, Ill.
Filed Mar. 31, 1991, Ser. No. 672,974
Int. Cl.[5] B01J *29/08*
U.S. Cl. 502—79 8 Claims

1. A modified Y-zeolite characterized by:
(a) a framework silica to alumina ratio of from 4.5 to 9;
(b) an ammonia programmed desorption (NH_3-TPD) acidity strength value of less than about 1.50;
(c) a unit cell size of about 24.35 to about 24.37 Angstroms;
(d) an ion exchange capacity greater than 0.07;
(e) and having been prepared by:
(i) cation exchanging a sodium Y-zeolite and producing an ammonium Y-zeolite having a sodium content, calculated as Na_2O; less than about 3.0 wt. percent;
(ii) calcining said ammonium Y-zeolite in the presence of added steam at a water vapor partial pressure greater than 2.0 p.s.i.a. and reducing the unit cell size of the zeolite to less than about 24.59 Angstroms;
(iii) cation exchanging the zeolite and producing a low sodium Y-zeolite having a sodium content, calculated as Na_2O, of from about 0.3 to 0.1 percent;
(iv) calcining said low sodium Y zeolite in the presence of added steam at a water vapor pressure greater than about 2.0 p.s.i.a. under conditions that the unit cell size of said zeolite is reduced to a value between about 24.35

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and 24.37 Angstroms and the sorptive capacity of said zeolite for water vapor is reduced to a value less than 15 weight percent at 25 degrees C and a p/p° value of 0.10; and,

(v) dehydroxylating said Y-zeolite by dry calcining at a temperature of at least 426 degrees C. for a period of at least one hour.

4. The zeolite of claim 1 wherein the zeolite subjected to the dehydroxylating step has a water sorption capacity of 25 degrees C. and 10 percent relative humidity between 6 and 12 wt. percent.

5,190,904

PARAFFIN ALKYLATION CATALYST

Clifford S. Crossland, Houston, Tex.; Alan Johnson, Ontario, Canada; John Woods, Ontario, Canada, and Elliot G. Pitt, Ontario, Canada, assignors to Chemical Research & Licensing Company, Pasadena, Tex.

Division of Ser. No. 632,478, Dec. 24, 1990, Pat. No. 5,157,196. This application Nov. 12, 1991, Ser. No. 791,106

Int. Cl.[5] B01J *29/04, 21/08, 27/06*

U.S. Cl. 502—85 21 Claims

12. A solid, particulate catalyst for paraffin alkylation comprising antimony pentafluoride supported on a silica base and manufactured by the steps comprising:

(a) washing particulate silica with a strong acid

(b) separating said particulate silica and acid

(c) washing said particulate silica with water

(d) heating said particulate silica

(e) contacting said particulate silica with antimony pentafluoride to produce an antimony pentafluoride containing silica and

(f) contacting said antimony pentafluoride containing silica with C_3 to C_7 alkane at a temperature in the range of −30° C. to −160° C.

5,190,905

ASYMMETRIC HYDROGENATION OF AROMATIC-SUBSTITUTED OLEFINS USING METAL OR METAL ALLOY CATALYSTS

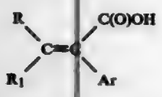
Charles H. Kolich; Thanikavelu Manimaran, and W. Dirk Klobucar, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 17, 1991, Ser. No. 716,014

Int. Cl.[5] B01J *31/00*; C07F *00/00, 15/00*; C07C *63/04*

U.S. Cl. 502—162 17 Claims

1. A process for preparing optically active α-aryl aliphatic carboxylic acids which comprises catalytically, asymmetrically hydrogenating a carboxylic acid of the formula



or the amine salt thereof, where R and R_1 are the same or different and are hydrogen, alkyl, cycloalkyl, or haloalkyl; and Ar is aryl or substituted aryl; by utilizing a catalytically effective amount of a mixture of (i) metal or metal alloy activated with hydrogen and (ii) a chiral phosphine compound.

5,190,906

ALKYL AROMATIC HYDROCARBON DEHYDROGENATION CATALYST AND METHOD FOR PRODUCING THE CATALYST

Akira Murakami, Toyama; Hidemi Unel, Tokyo; Masayuki Terauichi, Saitama, and Masaki Ohta, Toyama, all of Japan, assignors to Nissan Girdler Catalyst Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1992, Ser. No. 843,919

Claims priority, application Japan, Mar. 5, 1991, 3-123185

Int. Cl.[5] B01J *21/06, 23/10, 23/78, 23/86, 23/88*

U.S. Cl. 502—304 7 Claims

1. An alkyl aromatic hydrocarbon dehydrogenation catalyst containing iron oxide, potassium oxide and titanium oxide as essential components wherein an iron oxide content is 40.0 to 90.0 wt. %, a potassium oxide content is 5.0 to 30.0 wt. % and a titanium oxide content is 0.005 to 0.95 wt. % provided that all catalyst components are calculated as oxides.

5,190,907

GRANULATED INORGANIC SORBENT AND METHOD OF ITS MANUFACTURE

Leonid M. Sharygin, Beloyarsky raion, pos.Zarechny, ul.Aleschenkova, d.5, kv.20; Vladimir I. Barybin, Beloyarsky raion, pos. Zarechny, ul.Lenina, d. 36, kv.36; Valery F. Goncher, Beloyarsky raion, pos.Zarechny ul.Takhovskaya, d.22, kv.44; Olga J. Smyshlyaeva, Beloyarsky raion, pos.Zarechny, ul.-Kurchatova, d.2a, kv.9; Anatoly P. Shtin, Beloyarsky raion, pos.Zarechny, ul.Aleschenkova, d.5. kv.24; Sergei Y. Tretyakov, Beloyarsky raion, pos.Zarechny, ul.Aleschenkova, d.7b, kv.87; Valery E. Moissev, Beloyarsky raion, pos.Zarechny ul.Takhovskaya, d.24, kv.71; Tatyana N. Perekhozhiva, Beloyarsky raion, pos.Zarechny ul. Aleschenkova, d.5, kv. 31; Vladimir M. Galkin, Beloyarsky raion, pos.Zarechny ul. Aleschenkova, d.7b, kv.69; Alina V. Korenkova, Beloyarsky raion, pos.Zarechny ul. Leningradskaya, d.16, kv.9; Elena I. Zlokazova, Beloyarsky raion, pos.Zarechny ul.Takhovskaya, d.18, kv.39; Sergei M. Vovk, Beloyarsky raion, pos.Zarechny ul.Klary Tsetkin, d.11, kv.27, and Valery G. Ponomarev, Beloyarsky raion, pos.Zarechny ul.Leningradskaya, d.16, kv.140, all of Sverdlovskaya obl., U.S.S.R. 624051

Filed Mar. 29, 1991, Ser. No. 676,705

Claims priority, application U.S.S.R., May 29, 1989, 4691307

Int. Cl.[5] B01J *20/06*; C01G *19/02*; B01D *53/02*

U.S. Cl. 502—400 17 Claims

1. A granulated inorganic sorbent on the basis of oxides of metals belonging to group IV of the Periodic System, characterized in that it has the following formula

$$Ti_xZr_ySn_{1-x-y}O_2.nH_2O$$

where $0<x+y<1$, x=0–0.95, y=0–0.15, n=0.05–1.8, a specific surface of 30 to 250 m^2/g and is a solid solution with a rutile structure, and with diffractogram, as measured using Cu-$K\alpha$-radiation, characterized by principal peaks at the angle 2θ equal to 26.8±0.7, 34.5±1.5, 52.8±1.5 degrees.

5,190,908

A RACKED BED FOR REMOVAL OF RESIDUAL MERCURY FROM GASEOUS HYDROCARBONS

Costandi A. Audeh, Princeton, N.J., and Barry E. Hoffman, Duncanville, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 24, 1991, Ser. No. 719,408

Int. Cl.[5] B01J *20/08, 20/28*; B01D *53/02, 53/04*

U.S. Cl. 502—415 11 Claims

1. A packed bed for removing moisture and mercury from a gas at a temperature range from about 50° F.–120° F., the packed bed comprising:

(a) a layer of desiccant particles;

(b) a porous layer containing an element selected from the group consisting of silver, gold and mixtures thereof; and

(c) at least one protective layer of pellets or spheres for maintaining the integrity of the packed bed, said pellets or spheres being larger than the desiccant particles and comprising an inert substrate onto which an active compound selected from the group consisting of copper oxide, copper hydroxide and copper sulfide is impregnated.

5,190,909

RECORD MATERIAL UTILIZING A VINYL CARBINOL OR DERIVATIVE THEREOF AS A CHROMOGENIC COMPOUND

Kenneth J. Shanton, Neenah, Wis., and Farid Azizian, Oxon, England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

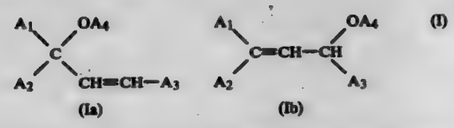
Filed Nov. 15, 1990, Ser. No. 613,018

Claims priority, application United Kingdom, Nov. 15, 1989, 8925850

Int. Cl.[5] B41M *5/136, 5/30*

U.S. Cl. 503—218 20 Claims

1. Record material comprising a support and at least one chromogenic material and at last one colour developer therefore, wherein said chromogenic material includes at least one compound selected from the compounds represented by the formula (I) (Ia or (Ib):



(Ia) (Ib) (I)

wherein one of A_1 and A_3 is an optionally-substituted carbocyclic aryl group and the other of A_1 and A_3 is either an optionally-substituted aryl group which is the same or different from A_1, or an optionally-substituted nitrogen-containing aromatic heterocyclic group, with the proviso that if both A_1 and A_3 are aryl groups, then at least one of A_1 and A_3 has a substituted amino or -N-heterocyclic substituent in the 4-position, relative to the bond joining A_1 or A_1 respectively to the remainder of the molecule; A_2 is hydrogen or an optionally-substituted aryl, alkyl or aralkyl group; and A_4 is hydrogen or an optionally-substituted alkyl, aryl or aralkyl group.

5,190,910

THERMAL TRANSFER IMAGE-RECEIVING MATERIAL

Toshiaki Aono, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

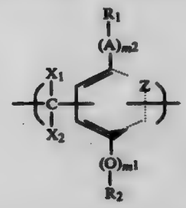
Filed Feb. 12, 1992, Ser. No. 834,400

Claims priority, application Japan, Feb. 13, 1991, 3-40619

Int. Cl.[5] B41M *5/035, 5/38*

U.S. Cl. 503—227 19 Claims

1. A thermal transfer image-receiving material comprising a support having provided thereon at least one image-receiving layer for accepting a dye transferred from a thermal transfer dye-providing material to form an image, wherein the image-receiving layer contains a dispersion prepared by dispersing a dye-accepting substance in a hydrophilic binder with an emulsifier comprising at least one surfactant selected from the polymers containing a repetitive unit represented by Formula (I):



(I)

wherein R_1 and R_2 may be the same or different and each represent a hydrogen atom, a halogen atom, a substituted or unsubstituted aliphatic hydrocarbon group, or an $-SO_3M$ group, in which M represents a cation capable of forming a salt with sulfonic acid; A represents —O— or —NH—; Z represents a group of carbon atoms necessary for forming a benzene ring or a naphthalene ring; m^1 and m^2 each represent 0 or 1; and X_1 and X_2 may be the same or different and each represent a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, provided that X_1 and X_2 may be combined with each other to form a 3- to 8-membered ring.

5,190,911

SUPERCONDUCTING FREE ELECTRON LASER

Yasuhiko Takemura, Atsugi, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

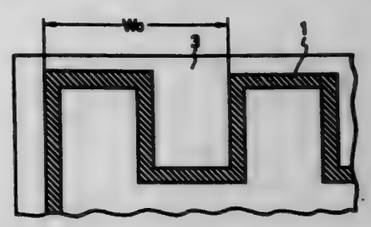
Division of Ser. No. 470,733, Jan. 26, 1990, which is a continuation-in-part of Ser. No. 287,069, Dec. 21, 1988, Pat. No. 4,971,945. This application Jun. 11, 1991, Ser. No. 713,096

Claims priority, application Japan, Dec. 21, 1987, 62-321391

The portion of the term of this patent subsequent to Nov. 28, 2007, has been disclaimed.

Int. Cl.[5] H01S *3/00*

U.S. Cl. 505—1 8 Claims



1. A free electron laser comprising:

a means for emitting an electron beam along a laser emission line; and

a wiggler for inducing periodic magnetic fields along said electron beam,

wherein said wiggler is composed of superconducting coils arranged, on a substrate to form said periodic magnetic fields where said superconducting coil is made of a superconducting type II oxide ceramic.

5,190,912

SINTERED OXIDE SUPERCONDUCTING WIRES

Susumu Yamamoto; Nozomu Kawabe, and Teruyuki Murai, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 438,986, Nov. 20, 1989, Pat. No. 5,100,865. This application Dec. 13, 1991, Ser. No. 806,986

Claims priority, application Japan, Apr. 17, 1987, 62-96044

The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.

Int. Cl.[5] H01B *12/00*

U.S. Cl. 505—1 9 Claims

1. A sintered oxide superconducting wire produced by the process comprising the steps of:

packing powders of metal oxides or a mixture of metal oxides and metal carbonates, which, when sintered, form the desired ceramic copper oxide superconductive material, said oxides each having oxidation potential (ΔG°) higher than or equal to that of copper, in a cylinder formed from a material selected from the group consisting of high-temperature oxidation-resistant stainless steel and high temperature oxidation-resistant nickel alloy;

drawing said packed cylinder to a desired size; and

sintering said drawn packed cylinder in air to form said wire;

wherein said cylinder is removed subsequent to the final step of sintering.

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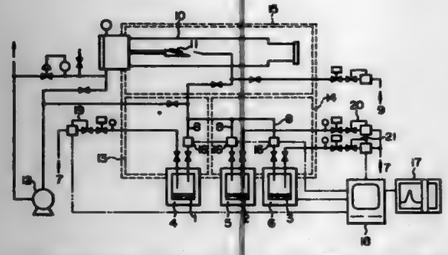
5,190,917

VOL 1148 ISS 1 MR 2 1993 UMI

5,190,913
APPARATUS FOR PRODUCING SUPERCONDUCTING OXIDE FILM

Kazutoshi Higashiyama, Hitachi; Takahisa Ushida; Izumi Hirabayashi, both of Nagoya, and Shoji Tanaka, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo; NGK Spark Plug Co., Ltd., Aichi and International Superconductivity Technology Center, Tokyo, all of, Japan

Filed Mar. 25, 1992, Ser. No. 857,272
Claims priority, application Japan, Mar. 26, 1991, 3-061454
Int. Cl.[5] C23C *16/00*
U.S. Cl. 505—1 3 Claims



1. An apparatus for producing a superconducting oxide film by metal organic chemical vapor deposition, which comprises a raw material gas generator provided with a heater and for holding a raw material organic metal, a film formation chamber provided with a heated substrate therein, a raw material gas transfer line provided between the raw material gas generator and the film formation chamber and kept at a given temperature, a vacuum pump for evacuating the film formation chamber to reduced pressure, and a raw material gas analyzer comprising a raw material collector tube provided in the raw material gas transfer line, a carrier line provided as a bypass to the raw material gas collector tube, a differential pressure meter provided between the raw material gas collector tube and the carrier line, a dilution gas line interlocked with the differential pressure meter and for leading a dilution gas to the raw material gas collector tube, a vacuum pump for evacuating the raw material gas collector tube, a gas separation column branched from the carrier line, a gas detector connected to the gas separation column, a flow rate controller for supplying a carrier gas to the carrier line and flow path switch valves provided at branches of all the lines, and heating means for heating all the lines.

5,190,914
SUPERCONDUCTING MATERIAL OF METAL OXIDES

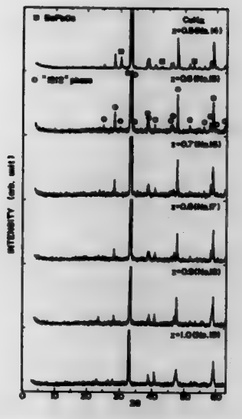
Shin-ichi Koriyama, Urayasu; Kazuhiro Sakuyama, Ichikawa; Toshihiko Maeda, Tokyo; Hisao Yamauchi, Urayasu, and Shoji Tanaka, Tokyo, all of Japan, assignors to International Superconductivity Technology Center; Kyocera Corporation; Tohoku Electric Power Company, Inc. and Furukawa Electric Co., Ltd., all of, Japan

Filed Feb. 28, 1991, Ser. No. 662,457
Claims priority, application Japan, Mar. 2, 1990, 2-51483
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 2 Claims

1. A superconducting material comprising metal oxides wherein the metals in said metal oxides are defined by the following formula:

$$(Pb_{1-z}Cu_z)\,((Sr_{1-y}Ba_y)_{1-x}Ca_x)_2(A_{1-x}Ca_x)Cu_2$$

wherein A is at least one element selected from the group consisting of Y, La, Nd, Sm, Eu, Gd, Ho, Er, Yb and mixtures of at least one of Y, La, Nd, Sm, Eu, Gd, Ho, Er and Yb with a least one of Tb, Tm and Lu, x is a number not smaller than 0 but not greater than 0.4, v is a number not smaller than 0 but not greater than 0.2x, y is a number not smaller than 0.1 but is less than or equal to 0.6 and z is a number not smaller than (2y−0.4) but not greater than (2y+0.2) with the proviso that



when x is smaller than 0.2, z is not smaller than (0.6−x) but smaller than 1.0 and when x is between 0.2 and 0.4, z is not smaller than 0.4 but is smaller than 1.0.

5,190,915
PERFUMED STRUCTURED EMULSION IN PERSONAL PRODUCTS

John M. Behan, Kensington; Jeremy N. Ness, Canterbury; Keith D. Perring, Ashford, and William M. Smith, Folkstone, all of Great Britain, assignors to Unilever Patent Holdings B.V., Rotterdam

Filed Jul. 10, 1991, Ser. No. 726,407
Claims priority, application European Pat. Off., Jul. 11, 1990, 90307588.5
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—2 16 Claims

1. A process for incorporating a perfume into a personal product, which comprises first combining the perfume with one or more non-ionic emulsifiers and an aqueous phase to form a structured emulsion containing liquid crystal structures, which surround the dispersed perfume, and thereafter dispersing this structured emulsion into a personal product base, wherein the structured emulsion comprises 1–30% by weight of one or more non-ionic emulsifiers, 1–50% by weight of a perfume and 20–98% by weight of an aqueous phase, and the non-ionic emulsifiers are chosen from the group consisting of:

i.a. (Polyethoxylated) fatty alcohols of the formula:

R3—(O—CH2)x—(CH═CH)y—(CH2-)z—(O—CH2—CH2)w—OH

wherein: w ranges from 0–20; y is 0 or 1; $x+z+2y=1$-1–23;

i.b. Branched (polyethoxylated) fatty alcohols of the formula:

R—(O—CH2—CH2)w—OH

wherein: R is a branched alkyl group of 12–18 carbon atoms w is as specified above;

ii. Glycerol mono-fatty acid esters;

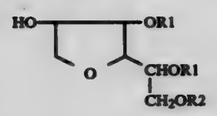
iii. Fatty acid esters of polyethylene glycols of the formula:

R1—(O—CH2—CH2)w—OH or

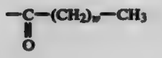
R1—(O—CH2—CH2)w—O—R1

wherein R1 is a stearoyl, lauroyl, oleoyl or palmitoyl residue; w ranges from 2–20;

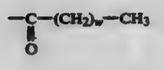
iv. Sorbitan fatty acid mono- and tri-esters of the formula:



wherein: R1 is H or

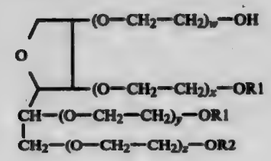


and R2 is

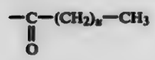


and w ranges from 10–16;

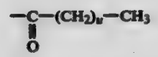
v. Polyethoxylated sorbitan fatty acid esters, particularly those of the formula:



wherein: R1 is H or



and R2 is



u ranges from 10–16 and (w+x+y+z) is 2–20.

5,190,916
USE OF OVOMACROGLOBULIN AS AN AGENT FOR TREATING WOUND AND INFLAMMATION

Masakazu Adachi, Takasaki, Japan, assignor to Japan Immuno Research Laboratories Co., Ltd., Takasaki and Otsuka Pharmaceutical Co., Ltd., Tokyo, both of, Japan

PCT No. PCT/JP87/00364, § 371 Date Feb. 8, 1988, § 102(e) Date Feb. 8, 1988, PCT Pub. No. WO87/07505, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 9, 1987, Ser. No. 157,508
Claims priority, application Japan, Jun. 13, 1986, 61-138670; May 29, 1987, 62-136516
Int. Cl.[5] A61K *37/02, 37/10*
U.S. Cl. 514—8 6 Claims

1. A method of treating a wound in a patient, comprising administering an effective amount of ovomacroglobulin, to said patient in need of the treatment.

5,190,917
TREATMENT OF PSORIASIS

John Lezdey, 976 Kingston Dr., Cherry Hill, N.J. 08034, and Allan J. Wachter, 9822 S. Grandview, Tempe, Ariz. 85284

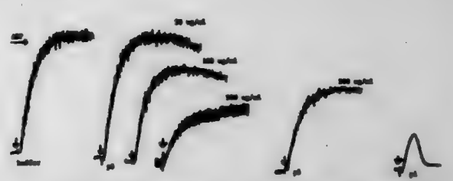
Continuation-in-part of Ser. No. 598,241, Oct. 16, 1990, abandoned, and a continuation-in-part of Ser. No. 591,630, Oct. 2, 1990, Pat. No. 5,114,917, which is a continuation-in-part of Ser. No. 445,005, Dec. 4, 1989, Pat. No. 5,008,242, which is a continuation-in-part of Ser. No. 242,735, Sep. 9, 1988, abandoned, and a continuation-in-part of Ser. No. 181,707, Sep. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 946,445, Dec. 24, 1986, abandoned. This application Apr. 11, 1991, Ser. No. 683,620
Int. Cl.[5] A61K *37/64, 31/57*
U.S. Cl. 514—12 14 Claims

1. A method for the treatment of dermatitis or psoriasis which comprises topically administering to the site of the psoriasis or dermatitis an effective amount of the combination of at least one compound having an affinity to bind and/or inhibit the mediators of mast cells and T-cells and of about 0.1 to 10% by weight of a corticosteroid.

5,190,918
PEPTIDE FRAGMENTS AND ANALOGS OF THROMBOSPONDIN AND METHODS OF USE

Alan H. Deutch, Columbia, Md., and George Tuszynski, Mays Landing, N.J., assignors to W. R. Grace & Co.-Conn., New York, N.Y. and The Medical College of Pennsylvania, Philadelphia, Pa.

Filed Feb. 22, 1990, Ser. No. 483,527
Int. Cl.[5] A61K *37/00, 37/02;* C07K *5/00, 7/00*
U.S. Cl. 514—15 7 Claims



1. A method for inhibiting tumor metastatic activity comprising administering an effective amount of a polypeptide compound having the formula:

$$Z_1\text{-}AA_1\text{-}AA_2\text{-}AA_3\text{-}AA_4\text{-}AA_5\text{-}AA_6\text{-}AA_7\text{-}AA_8\text{-}AA_9\text{-}Z_2$$

wherein

Z_1 is hydrogen, amino, acetyl or up to twelve amino acid residues;

AA_1 is tryptophan or n-formyl-tryptophan;

AA_2 is serine, threonine or aspartic acid;

AA_3 is proline, glutaminc acid, serine or isoleucine;

AA_4 is cysteine;

AA_5 is serine or asparagine;

AA_6 is valine or threonine;

AA_7 is threonine or serine;

AA_8 is cysteine;

AA_9 is glycine or serine; and

Z_2 is hydroxyl, carboxyl, non-amino acid such as agmatine or up to forty-two amino acid resides, including carboxyamide or alkylamide forms thereof.

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5,190,919
ANTIHEMOSTATIC FACTOR VII PEPTIDES
Daryl S. Fair, and Anuradha Kumar, both of Tyler, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.
Filed Nov. 13, 1989, Ser. No. 435,657
Int. Cl.[5] A61K *37/00, 37/02;* C07K *5/00, 7/00*
U.S. Cl. 514—15 8 Claims

1. A pharmaceutical formulation for the treatment of clotting disorders comprising a peptide consisting essentially of from about 10 to about 36 amino acids in length characterized in that said peptide inhibits the rate of extrinsic pathway mediated activation of Factor X by at least about 40%, and said peptide includes an amino acid sequence that is at least 90% homologous to the sequence G-E-H-D-L-S-E-H-D-G, together with a pharmaceutically acceptable excipient.

5,190,920
METHOD FOR USING SYNTHETIC ANALOGS OF THROMBOSPONDIN FOR INHIBITING METASTASIS ACTIVITY
Jacob Eyal, Baltimore; Bruce E. Hamilton, Silver Spring, both of Md., and George P. Tuszynski, Williamstown, N.J., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Sep. 24, 1990, Ser. No. 587,197
Int. Cl.[5] G61K *37/02;* G01K *1/04*
U.S. Cl. 514—17 8 Claims

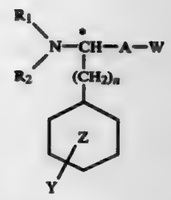
1. A method for inhibiting metastasis comprising administering to an animal an effective amount of a polypeptide compound of the formula:

$$R_1—CYS—X_2—X_3—X_4—CYS—R_2$$

wherein:
X_2 X_3, and X_4 are the same or different amino acid residues selected from the group consisting of valine, threonine, serine, and arginine;
R_1 is a protected or unprotected terminal amino group, consisting of hydrogen, amino, acetyl or one amino acid residue or the desamino form thereof; and
R_2 is a protected or unprotected terminal carboxyl group consisting of hydroxyl, carboxyl, or one amino acid residue selected from the group consisting of lysine, glycine, and arginine, including carboxyamide or alkylamide forms thereof;
the structure of the polypeptide is optionally cyclized through a bond between the cysteines, preferably a disulfide bond, or a bond between R_1 and R_2.

5,190,921
AMINO ACIDS AND PEPTIDES HAVING A MODIFIED TYROSINE RESIDUE, THEIR PREPARATION AND THEIR APPLICATION AS MEDICAMENTS
Bernard P. Roques, St. Maurice; Isabelle Marseigne, Lyons, and Bruno Charpentier, Valbonne, all of France, assignors to Institut National de La Sante et de La Recherche Medicale (INSERM), Paris Cedex, France
Continuation of Ser. No. 383,008, Jul. 21, 1989, abandoned. This application Jan. 24, 1992, Ser. No. 825,294
Claims priority, application Japan, Aug. 1, 1988, 63-10391
Int. Cl.[5] A61K *37/02;* C07K *5/08, 5/10, 7/06*
U.S. Cl. 514—17 16 Claims

1. A chemical compound represented by the formula:



(I)

in which:
each of R_1 and R_2 independently represents a hydrogen atom; a straight- or branched-chain C_1–C_8 alkyl radical, optionally substituted; a C_3–C_7 cycloalkyl radical or a mono- or polycyclic aromatic residue, optionally substituted;
in the case in which R_1 represents a hydrogen atom, R_2 being also capable of representing a radical which protects the amine function, of the acyl type or the urethane type, or even an amino acid residue or a peptide fragment;
R_1 and R_2 being also capable of forming, with the nitrogen atom to which they are attached, a 5- to 7-component ring capable of containing another heteroatom, and capable of being substituted by a straight- or branched-chain C_1–C_8 alkyl radical;
A represents —CO
Y represents a residue chosen from those of formula:

$$—OSO_2OR_3 \quad \text{(II)};$$

$$—OPO(OR_3)_2 \quad \text{(III)};$$

$$—(CH_2)_m—SO_2OR_3 \quad \text{(IV)};$$

and

$$—CH_2)_m—PO(OR_3)_2 \quad \text{(V)},$$

where
R_3 represents a hydrogen atom, a sodium atom or a straight- or branched-chain C_1–C_8 alkyl radical, optionally substituted; and
m is from 1 to 4;
Z represents a 6-component ring chosen from the cyclohexane, pyridyl or phenyl rings, optionally substituted; and
n is from 0 to 4;
W represents:

-B-D-Trp-E-Asp-PheNHQ,

where:
B and E, which may be identical or different, represent a residue chosen from methionine, norleucine, leucine, serine, threonine, allothreonine, cysteine, homocysteine and the corresponding N-methylated derivatives, the OH or SH functions of serine, threonine, allothreonine, cysteine and homocysteine residues or their corresponding N-methylated derivatives being capable of being free or protected,
D represents a glycine residue;
Q represents hydrogen or a straight- or branched chain C_1–C_8 alkyl group, optionally substituted, or even phenyl or phenylalkyl, the alkyl fraction of which has a straight or branched chain and contains 1 to 8 carbon atoms, the phenyl fraction of which can be substituted;
B being capable also of representing a 1,1-diaminoalkyl, 1,1-diaminomethylthioalkyl, 1,1-diaminomercaptoalkyl or 1,1-diaminohydroxyalkyl residue, the alkyl fractions being C_1–C_8, with a straight or branched chain, optionally substituted by a cycloalkyl residue or aromatic residue, and, in all cases, D necessarily representing a malonic residue;
on the condition that when Y represents a (II) or (III) residue, the sequence-AW is other than a sequence composed of natural amino acids, the compound being in the D, L or DL form; a mixture thereof as a pharmaceutically acceptable salt thereof.

5,190,922
TERMINALLY MODIFIED TRI-, TETRA- AND PENTAPEPTIDE ANAPHYLATOXIN RECEPTOR LIGANDS
Jay R. Luly; Meguni Kawai, and Paul E. Wiedeman, all of Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jun. 4, 1991, Ser. No. 710,209
Int. Cl.[5] A61K *37/00;* C07K *5/00*
U.S. Cl. 514—18 13 Claims

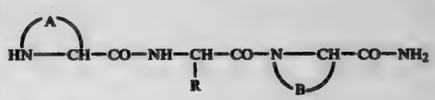
1. A compound of the formula

A-Lys-Pro-(D-Cha)-G-J-L

wherein
D-Cha is D-cyclohexylalanyl;
A is R_1-R_2-R_3;
G, is absent or is R_{13}-R_{14}-R_{15};
J is R_{16}-R_{17}-R_{18}; and
L is R_{19};
where
(a) R_1 is selected from the group consisting of lower alkyl, alkoxy, aryl, aryloxy, arylalkenyl, arylalkoxy, carboxyalkyl, cyano, cyanoalkyl, amino, aminoalkyl, alkylamino, arylalkyl, aroyl, haloalkyl, hydroxyalkyl, and hydrogen;
(b) R_2 is selected from the group consisting of $CR_{99}R_{100}$ and oxygen, with the proviso that when R_2 is oxygen, R_1 is aryl, lower alkyl or arylalkyl;
(c) R_3 is selected from C═O, CH_2, and —$CH_2C(O)$— with the proviso that when R_3 is CH_2, the R_2 cannot be oxygen;
(d) R_{13} is CH_2 or NR_{50} where R_{50} is hydrogen, lower alkyl or arylalkyl;
(e) R_{14} is $CR_{230}R_{231}$;
(f) R_{15} and R_{18} are independently selected from C═O, CH_2, and —$CH_2C(O)$—;
(g) R_{16} is selected from the group consisting of oxygen, NR_{50}, and CH_2 where R_{50} is as defined above, with the proviso that when R_{15} is C═O and R_{16} is oxygen, then R_{17}, R_{18}, and R_{19} taken together represent hydrogen, lower alkyl, aryl, or arylalkyl;
(h) R_{17} is $CR_{301}R_{302}$;
(i) R_{19} is selected from OH and CN, with the proviso that when R_{18} is C═O then R_{19} is OH;
(j) R_{99} is selected from the group consisting of hydrogen, arylalkyl, aryl, arylalkenyl, lower alkyl, carboxyl, alkoxy, hydroxyalkyl, and hydroxy;
(k) R_{100} is selected from the group consisting of hydrogen, arylalkyl, and lower alkyl;
(l) R_{230} is selected from the group consisting of lower alkyl, arylalkyl, guanidinoalkyl, and (cycloalkyl)alkyl, with the proviso that when J–L represent an L-arginyl residue, the arylalkyl value of R_{230} is limited to benzyl;
(m) R_{231} and R_{302} are independently selected from the group consisting of hydrogen, arylalkyl, alkenyl, and lower alkyl, with the proviso that when J–L represent an L-arginyl residue, the arylalkyl value of R_{231} is limited to benzyl; and
(n) R_{301} is selected from the group consisting of hydrogen, lower alkyl, aminoalkyl, arylalkyl, (cycloalkyl)alkyl, and guanidinoalkyl;
all of the foregoing with the provisos that when A is an α-amino acid residue, then R_{18}–R_{19} cannot be —COOH and when R_{18}–R_{19} is COOH, then A cannot be an α-amino acid residue.

5,190,923
PEPTIDE COMPOUNDS CONTAINING A CYCLIC AMIDE STRUCTURE
Michel Vincent, Bagneux; Georges Remond, Versailles; Bernard Portevin, Elancourt; Yolande Herve, Puteaux, and Jean Lepagnol, Chatou, all of France, assignors to Adir Et Compagnie, Courbevoie, France
Filed Jan. 4, 1991, Ser. No. 710,283
Claims priority, application France, Jan. 18, 1990, 90 07559
Int. Cl.[5] C07K *5/04, 5/06;* A61K *37/02*
U.S. Cl. 514—19 7 Claims

1. A compound selected from these of formula (I):



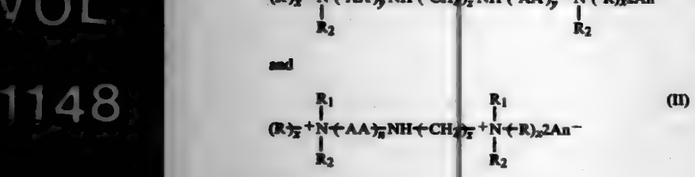
(I)

in which:
A represents, with the nitrogen and carbon atoms to which it is linked:
a 2-oxoperhydro-7-azepinyl group
a 2-oxoperhydro-8-azocinyl group
a 2-oxoperhydro-9-azoninyl group
a 2-oxoperhydro-10-azecinyl group
a 2-oxo-2,3,4,7-tetrahydrobenz[e]azepin-7-yl group
a 2-oxo-2,3,6,7-tetrahydrobenz[d]azepin-7-yl group
a 2-oxo-2,5,6,7-tetrahydrobenz[c]azepin-7-yl group
B represents, with the nitrogen and carbon atoms to which it is linked, a polycyclic structure selected from the following structures:
2-azabicyclo[2.2.1]heptane,
2-azabicyclo[2.2.2]octane, optionally substituted at positions 1 and 4 with a linear or branched (C_1–C_4) alkyl group,
perhydroindole,
perhydroisoindole,
indoline,
isoindoline,
perhydroquinoline,
perhydroisoquinoline,
1,2,3,4-tetrahydroquinoline,
1,2,3,4-tetrahydroisoquinoline,
cyclopenta[b]pyrrolidine,
pyrrolidine, optionally substituted with one or two linear or branched (C_1–C_4) alkyl group,
piperidine,
thiazolidine,
R represents:
hydrogen,
linear or branched (C_1–C_6) alkyl optionally substituted with amino or guanidino,
(4-imidazolyl)methyl optionally substituted on one of the nitrogen atoms with linear Or branched (C_1–C_4) alkyl,
(3-pyrazolyl)methyl,
(2-pyridyl)methyl optionally substituted with amino,
its enantiomers, diastereoisomers and epimers, as well as its addition salts with a pharmaceutically-acceptable acid.

5,190,924
PEPTIDE AMIDES AND AMIDE DIMERS USEFUL AS MUSCLE RELAXANTS
Zenon D. Konteatis, Maplewood, N.J., and David C. Palmer, Bethlehem, Pa., assignors to BOC Health Care, Inc., Murray Hill, N.J.
Filed Feb. 13, 1991, Ser. No. 654,736
Int. Cl.[5] A61K *37/00, 37/02*
U.S. Cl. 514—19 13 Claims

1. A peptide amide or amide dimer compound selected from those represented by the formulae:

5,190,927
continued



and

wherein

R is methyl or ethyl;

R_1 and R_2 are independently selected from the group consisting of methyl, ethyl and allyl, or R and one or both of R_1 and R_2, together with the nitrogen to which they are attached, form a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, piperazine and hexamethyleneimine;

AA are independently selected from the group consisting of Ala, Val, Leu, Ile, Phe and Pro;

n is 2 to 4;

x is independently 0 or 1;

y is independently 1 or 2;

z is 2 to 12; and

An^- is a pharmaceutically acceptable anion.

8. A method of producing muscle relaxation in a mammal comprising administering to said mammal an effective amount of peptide amide or an amide dimer in accordance with claim 1.

5,190,925

USE OF GANGLIOSIDES IN THE TREATMENT OF AUTONOMIC DYSFUNCTION IN CHAGAS' DISEASE

Francesco della Valle, Padova, Italy, and Daniel J. Iose, Cordoba, Argentina, assignors to Fidia, S.p.A., Abano Terme, Italy

Continuation of Ser. No. 446,108, Dec. 5, 1989, abandoned. This application Feb. 3, 1992, Ser. No. 829,598

Claims priority, application Italy, Jun. 8, 1989, 48063 A/89

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—25 10 Claims

1. A method for the treatment of autonomic nervous system abnormalities caused by Chagas' disease or American trypanosomiasis which comprises administering to a patient in need thereof a therapeutically effective amount of a pharmaceutical composition which comprises a mixture of ganglioside GM_1, GM_{1a}, GD_{1b} and GT_{1b}.

8. A method for the treatment of autonomic nervous system abnormalities caused by Chagas' disease or American trypanosomiasis which comprises administering to a patient in need of such treatment between 10 to 100 mg per day of a pharmaceutical composition which comprises about 17 to 25% by weight of ganglioside GM_1, about 36 to 46% by weight of ganglioside GD_{1a}, about 12 to 18% by weight of ganglioside GD_{1b}, and about 14 to 22% by weight of GT_{1b}.

5,190,926

3'-AZIDO-2',3'-DIDEOXYPYRIMIDINES AND RELATED COMPOUNDS AS ANTIVIRAL AGENTS

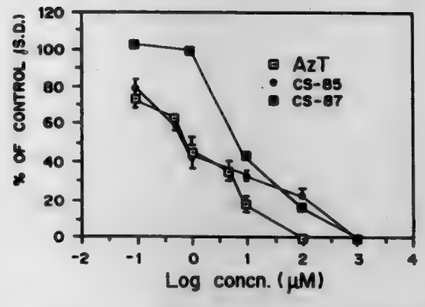
Chung K. Chu, Athens, and Raymond F. Schinazi, Tucker, both of Ga., assignors to University of Georgia Research Foundation, Inc., Athens and Emory University, Atlanta, both of, Ga.

Continuation of Ser. No. 104,438, Oct. 2, 1987, Pat. No. 4,916,122, which is a continuation-in-part of Ser. No. 7,473, Jan. 28, 1987, abandoned. This application Nov. 6, 1989, Ser. No. 434,521

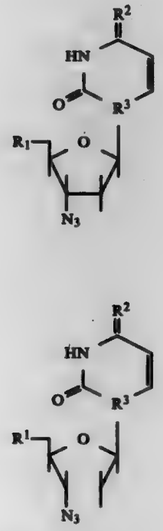
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—49 3 Claims



1. A method of inhibiting HIV comprising administering to a human infected with HIV an amount of a composition containing an active ingredient having the formula:



wherein R_1 is selected from the group consisting of C_1–C_4 acyl, sulfate, or amino, R_2 is O, and R_3 is N, or a pharmacologically acceptable acid addition salt thereof, in association with a pharmaceutical carrier in an amount inhibiting intracellular HIV replication.

5,190,927

HIGH-GLYCERYL, LOW-ACETYL GELLAN GUM FOR NON-BRITTLE GELS

Helena C. Chang, Solano Beach, and Joseph M. Kobseff, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 9, 1991, Ser. No. 727,507

Int. Cl.[5] C12P *19/04*

U.S. Cl. 514—54 4 Claims

1. Partially deacylated gellan gum which comprises between 0% and less than about 1% acetyl groups, and about 3–12% glyceryl groups, derived from *Pseudomonas elodea* ATCC 31461 grown in a suitable fermentation medium.

5,190,928

PROCESS AND A COMPOSITION FOR IMMUNIZING PLANTS AGAINST DISEASES

Rolf Schurter, Binningen; Walter Kunz, Oberwil, and Robert Nyfeler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

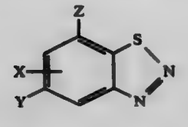
Continuation of Ser. No. 494,190, Mar. 15, 1990, abandoned, which is a division of Ser. No. 234,241, Aug. 18, 1988, Pat. No. 4,931,581. This application Apr. 10, 1991, Ser. No. 683,582

Claims priority, application Switzerland, Aug. 21, 1987, 3229/87

Int. Cl.[5] A01N *43/82*

U.S. Cl. 514—63 18 Claims

9. A process for immunising plants against attack by phytopathogenic microorganisms which comprises applying as active ingredient to said plants and/or to the locus thereof a compound of formula I'



(I')

in which:

X is hydrogen, halogen, hydroxy, methyl, methoxy, HOOC or MOOC;

Y is hydrogen, halogen, SO_3H, SO_3M, nitro, hydroxy or amino;

Z is cyano or COA;

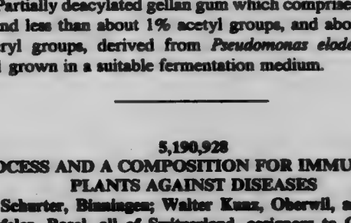
A is UR, $N(R_1)R_2$ or $U^1N(=C)_n(R_3)R_4$;

M is the molar equivalent of an alkali metal or alkaline earth metal ion that has been formed from a corresponding base or basic compound;

U is oxygen or sulfur;

U^1 is oxygen or $—N(R_5)—$;

R is hydrogen, C_1–C_8alkyl, C_1–C_8alkyl substituted by halogen, cyano, nitro, hydroxy or by U-C_1–C_3alkyl, (T)—COOH or (T)—COOC_1–C_4alkyl, C_3–C_6alkenyl, halo-substituted C_3–C_6alkenyl, C_3–C_6alkynyl, halo-substituted C_3–C_6alkynyl, $(T)_n$-C_3–C_6cycloalkyl, or a group selected from the following:



-continued

each of X^a, X^b and X^c, independently of the others, is hydrogen, halogen, hydroxy, cyano, HOOC, MOOC, C_1–C_3alkyl-OOC, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_2haloalkyl having up to 5 halogen atoms; or X^a is C_1–C_2haloalkoxy having up to 5 halogen atoms, nitro, dimethylamino, phenyl, phenoxy, benzyloxy or sulfamoyloxy and X^b and X^c are both hydrogen; or

X^a is phenyl, phenoxy or benzyloxy and X^b is halogen or methyl and X^c is hydrogen; or

X^a, X^b and X^c together are 4 or 5 fluorine atoms;

naphth is a naphthyl radical that is unsubstituted or is substituted by halogen, methyl, methoxy, or by nitro;

W is a 5- to 7-membered saturated or unsaturated heterocycle having from 1 to 3 hetero atoms from the group O, N and S that is unsubstituted or is substituted by halogen, trifluoromethyl, cyano, C_1–C_2alkyl or by a C_1–C_2alkoxycarbonyl-C_2–C_4alkyleneimino radical, or is a monosaccharide radical;

T is a bridge member $—CH_2—$, $—CH_2CH_2—$, $—CH(CH_3)—$, $—CH_2CH_2CH_2—$ or $—CH_2CH_2O—$;

R_1 is hydrogen, C_1–C_5alkyl, C_1–C_5alkyl interrupted by an oxygen or sulfur atom, C_1–C_5alkyl substituted by halogen, cyano, HOOC or by C_1–C_2alkyl-OOC, C_1–C_5alkyl interrupted by an oxygen or sulfur atom and substituted by halogen, cyano, HOOC or by C_1–C_2alkyl-OOC, C_3–C_5alkenyl, C_3–C_5alkenyl substituted by C_1–C_3alkyl-OOC, C_3–C_5alkynyl, C_3–C_5alkynyl substituted by C_1–C_3alkyl-OOC, $(T)_n$-C_3–C_6cycloalkyl, $(T)_n$-C_3–C_6cycloalkyl substituted by C_1–C_3alkyl-OOC, $(T)_n$-phenyl or $(T)_n$-phenyl substituted in the phenyl moiety by halogen, hydroxy, methyl, CF_3, cyano, methoxy, HOOC or by MOOC;

R_2 is hydrogen, hydroxy, C_1–C_3alkyl, C_1–C_3alkyl substituted by cyano or by C_1–C_3alkoxy, C_1–C_4alkoxy, or a 3- to 6-membered saturated or unsaturated heterocycle having O, N or S as hetero atoms;

R_1 and R_2 together are a heterocycle W;

R_3 is hydrogen, cyano, C_1–C_5alkyl, phenyl, phenyl substituted by halogen, hydroxy, methyl, methoxy, HOOC or by MOOC, or a heterocycle W;

R_4 is hydrogen, C_1–C_5alkyl, $CONH_2$, CONH—CONH-C_1–C_3alkyl, C_1–C_5alkanoyl, C_1–C_3alkanoyl substituted by halogen or by C_1–C_3alkoxy, C_3–C_5alkenoyl, or C_3–C_5alkenoyl substituted by halogen or by C_1–C_3alkoxy;

R_3 and R_4 together are a heterocycle W or a carbocyclic ring W';

W' is a carbocyclic radical having from 3 to 7 ring carbon atoms;

R_5 is hydrogen or methyl;

R_6 is hydrogen or C_1–C_4alkyl; and

n is 0 or 1;

with the exception of the compounds:

7-cyanobenzo-1,2,3-thiadiazole;

4-chloro-7-cyanobenzo-1,2,3-thiadiazole;

4,6-dibromo-7-cyanobenzo-1,2,3-thiadiazole;

benzo-1,2,3-thiadiazole-7-carboxylic acid;

benzo-1,2,3-thiadiazole-7-carboxylic acid methyl ester.

5,190,929

CYCLOPHOSPHAMIDE ANALOGS USEFUL AS ANTI-TUMOR AGENTS

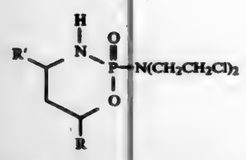
Richard F. Borch, Pittsford, N.Y., and Gregory W. Cassio, Ann Arbor, Mich., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed May 25, 1988, Ser. No. 198,406

Int. Cl.[5] C07F *9/6584*; A61K *31/675*

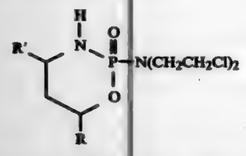
U.S. Cl. 514—80 27 Claims

1. A compound having the formula:



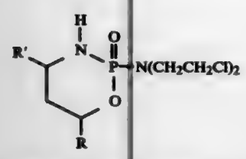
and pharmaceutically acceptable salts thereof wherein
R' is hydrogen, hydroxy or hydroperoxy, with the proviso that when R' is hydrogen, R is not phenyl;
R is unsubstituted or mono- or di-substituted aryl, wherein the substitutents are lower alkyl, halo, lower alkoxy, nitro, nitrilo, formyl, carboxy, lower alkanoyl, carboamido, amino, lower aminoalkyl, lower alkylamino, lower dialkylamino, hydroxy, lower alkylthio or mercapto.

2. A compound having the formula:



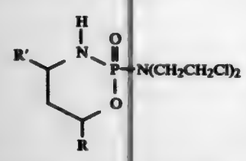
and pharmaceutically acceptable salts thereof wherein
R' is hydrogen, hydroxy or OOH,
R is aryl-lower alkyl which is unsubstituted or monosubstituted or disubstituted with lower alkyl, halo, lower alkoxy, nitro, nitrilo, formyl, carboxy, lower alkanoyl, carboamido, amino, lower aminoalkyl, lower alkylamino, lower dialkylamino, hydroxy, lower alkylthio or mercapto.

3. A compound having the formula:



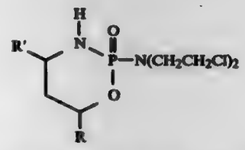
and pharmaceutically acceptable salts thereof wherein
R is an unsubstituted or mono- or di-substituted nitrogen, sulfur or oxygen containing heterocyclic wherein the substitutents are lower alkyl, halo, lower alkoxy, nitro, nitrilo, formyl, carboxy, lower alkanoyl, carboamido, amino, lower aminoalkyl, lower alkylamino, lower dialkylamino, hydroxy, lower alkythlthio or mercapto and
R' is hydrogen, hydroxy or OOH,
wherein heterocyclic is furyl, thienyl, pyrrolyl, pyridyl, pyrazolyl, pyrimidinyl, pyridazinyl, oxazolyl, quinolinyl, isoquinolinyl, indolyl, benzothienyl, benzofuryl, imidazoyl, benzoxazolyl, piperazinyl, or tetrahydrofuryl.

4. A compound having the formula:

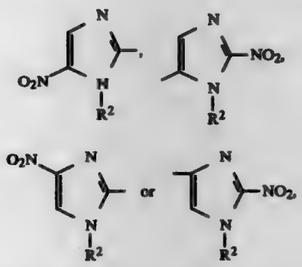


and pharmaceutically acceptable salts thereof wherein
R is nitrogen, sulfur or oxygen containing heterocyclic lower alkyl which is unsubstituted or monosubstituted or disubstituted, wherein the substitutents are lower alkyl, halo, lower alkoxy, nitro, nitrilo, formyl, carboxy, lower alkanoyl, carboamido, amino, lower amino alkyl, lower alkylamino, lower dialkylamino, hydroxy, lower alkylthio or mercapto, and
R' is hydrogen, hydroxy or OOH,
wherein heterocyclic is furyl, thienyl, pyrrolyl, pyridyl, pyrazolyl, pyrimidinyl, pyridazinyl, oxazolyl, quinolinyl, isoquinolinyl, indolyl, benzothienyl, benzofuryl, imidazoyl, benzoxazolyl, piperazinyl or tetrahydrofuryl.

9. A compound having the formula:



and pharmaceutically acceptable salts thereof wherein R is



wherein R^2 is lower alkyl which is unsubstituted or monosubstituted with hydroxy or amino and wherein R' is hydrogen, hydroxy, or OOH.

5,190,930

ARALIPHATYLAMINOALKANEDIPHOSPHONIC ACIDS

Knut A. Jaeggi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

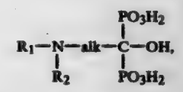
Division of Ser. No. 500,441, Mar. 28, 1990, Pat. No. 5,110,807, which is a continuation-in-part of Ser. No. 278,394, Dec. 1, 1988, abandoned. This application Dec. 20, 1991, Ser. No. 811,590

Claims priority, application Switzerland, Dec. 11, 1987, 4847/87

Int. Cl.[5] A61K *31/66, 31/67, 31/665, 31/675;* **C07F** *9/06, 9/02, 9/28*

U.S. Cl. 514—89 **14 Claims**

1. An aromatically substituted alkylaminoalkanediphosphonic acid of the formula



(I)

wherein

R_1 is a lower alkyl or lower alkenyl radical that is mono- or di-substituted by at least one heteroaryl radical selected from the group consisting of pyrrolyl, thienyl, furyl, pyridyl, imidazolyl, pyrimidinyl, and quinolyl, wherein each of said heteroaryl radicals is unsubstituted or substituted by at least one substituent selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, and halogen;

R_2 is selected from the group consisting of hydrogen, lower alkyl and lower alkenyl; and
alk is lower alkylene;
or a pharmaceutically acceptable salt thereof.

13. A method of treating a disease associated with a calcium metabolism disorder in a warm-blooded animal in need thereof comprising administering to said warm-blooded animal an effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

5,190,931

REGULATION OF GENE EXPRESSION BY EMPLOYING TRANSLATIONAL INHIBITION OF MRNA UTILIZING INTERFERING COMPLEMENTARY MRNA

Masayori Inouye, Bridgewater, NJ, assignor to The Research Foundation of State University of New York, Albany, NY.

Continuation-in-part of 300,741, Jan. 23, 1989, abandoned, which is a continuation of 585,282, Mar. 1, 1984, abandoned, which is a continuation-in-part of 543,528, Oct. 20, 1983, abandoned, and a continuation-in-part of 228,852, Aug. 3, 1988, abandoned, which is a continuation of 543,528, Oct. 20, 1983, abandoned. This application Nov. 15, 1989, Ser. No. 436,598

Int. Cl.[5] C12N *5/10, 5/11, 15/09, 15/12*

U.S. Cl. 435–240.2 **86 Claims**

1. A prokaryotic or eukaryotic cell containing a non-native DNA construct, which construct produces an RNA which regulates the function of a gene, said DNA construct containing the following operably linked DNA segments:
a. a transcriptional promoter segment;
b. a transcription termination segment; and
therebetween
c. a DNA segment;
whereby transcription of the DNA segment produces a ribonucleotide sequence which does not naturally occur in the cell, is complementary to a ribonucleotide sequence transcribed from said gene, and said non-naturally occurring ribonucleotide sequence regulates the function of said gene.

3. A method of regulating the function of a gene in a prokaryotic or eukaryotic cell which comprises introducing into said cell the DNA construct of claim 1.

5,190,932

MICROBICIDAL FORMULATIONS COMPRISING WATER DISPERSIBLE POLYMERS WITH CHEMICALLY BONDED AMMONIUM GROUPS AND FATTY ACID RADICALS

Rolf Dhein, Krefeld; Lothar Bücker, Dormagen; Otto Exner, Monheim; Walter Radt, Krefeld; Ingrid Radt, Krefeld; Christian Radt, Krefeld, and Hans G. Schmitt, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 551,591

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 3924527

Int. Cl.[5] A01N *31/08, 43/52, 55/04, 57/14*

U.S. Cl. 514—112 **8 Claims**

1. A water-containing an water-dilutable microbicidal formulation comprising water, an effective amount of a microbicide, and a water-dispersible polymer having a content of 70–500 meqs of chemically bonded tertiary, quaternary or tertiary and quaternary ammonium groups per 100 g of polymer, the polymer containing chemically bonded radicals of mono- or polyunsaturated fatty acids.

5,190,933

SUBSTITUTED PROPANE-PHOSPHINIC ACID COMPOUNDS

Eric K. Baylis, Stockport, England; Ludwig Maier, Arlesheim, Switzerland; Stuart J. Mickel, Lausen, Switzerland; Hans-Rudolf Olpe, Bottmingen, Switzerland; Helmut Bittiger, Freiburg, Fed. Rep. of Germany; Wolfgang Fritzl, Basel, Switzerland, and Roger G. Hall, Flixton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

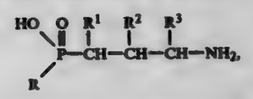
Continuation of Ser. No. 722,634, Jun. 27, 1991, abandoned, which is a division of Ser. No. 502,399, Mar. 30, 1990, Pat. No. 5,064,819, which is a continuation-in-part of Ser. No. 484,716, Feb. 26, 1990, Pat. No. 5,051,524, which is a continuation-in-part of Ser. No. 378,887, Jul. 12, 1989, Pat. No. 5,013,863, which is a continuation-in-part of Ser. No. 275,882, Nov. 25, 1988, abandoned. This application Mar. 3, 1992, Ser. No. 845,871

Claims priority, application United Kingdom, Dec. 4, 1987, 8728483

Int. Cl.[5] A61K *31/185, 31/045, 31/095, 31/13*

U.S. Cl. 514—114 **1 Claim**

1. Method for the treatment of cognitive and memory disorders, anxieties and/or depressive states of mind, characterised in that a compound of the formula I



(I)

wherein R denotes an aliphatic, cycloaliphatic, cycloaliphatic-aliphatic or araliphatic radical having 2 or more carbon atoms, and wherein one of the groups R^1, R^2 and R^3 represents hydrogen or an aliphatic, cycloaliphatic, araliphatic or aromatic radical, another one of R^1, R^2 R^3 is hydrogen or, in the case of R^1 and R^2, is hydroxy, and the remaining one of R^1, R^2 and R^3 is hydrogen, or wherein R denotes methyl, R_1 denotes hydrogen or hydroxy, R_2 denotes an aromatic radical and R_3 represents hydrogen, or of a pharmaceutically acceptable salt thereof is administered to a warm-blooded organism in need of such treatment.

5,190,934

P-SUBSTITUTED PROPANE-PHOSPHINIC ACID COMPOUNDS

Stuart J. Mickel, Lausen, and Georg von Sprecher, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, New York, N.Y.

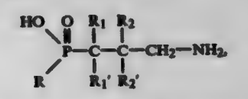
Continuation of Ser. No. 759,210, Sep. 13, 1991, abandoned, which is a continuation of Ser. No. 528,673, May 24, 1990, abandoned. This application Mar. 3, 1992, Ser. No. 845,869

Claims priority, application United Kingdom, Jun. 3, 1989, 8912814

Int. Cl.[5] C07F *9/30;* **A61K** *31/44, 31/66, 31/185*

U.S. Cl. 514—114 **22 Claims**

1. A compound of the formula I



(I)

wherein either: R_1 is halogen, R_1' is halogen or hydrogen and R_2 and R_2' denote hydrogen or; R_1 and R_1' represent hydrogen, R_2 is an aliphatic or aromatic radical and R_2' is hydroxy or; R_2 and R_2' together represent oxo, and wherein R denotes an aliphatic, cycloaliphatic, cycloaliphatic-aliphatic or araliphatic radical having 2 or more carbon atoms or; if R_1 and R_1' denote hydrogen, R_2 represents an aromatic radical and R_2' is hydroxy, R represents methyl, or a salt thereof.

22. A method for the treatment of cerebral insufficiencies, depressions and/or anxieties, characterized in that a therapeutically effective amount of a compound claimed in claim 1 is administered to a warm-blooded organism in need of such treatment.

from the group consisting of —OH, C_{1-6} alkyl, C_{1-6} alkoxy

(I)

VOL 1148 ISS 1 MR 2 1993 UMI

5,190,935

VITAMIN D ANALOGUES

Ernst T. Binderup, Tåstrup, and Martin J. Calverley, Herlev, both of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

PCT No. PCT/DK90/00168, § 371 Date Nov. 19, 1991, § 102(e) Date Nov. 19, 1991, PCT Pub. No. WO91/00855, PCT Pub. Date Jan. 24, 1991

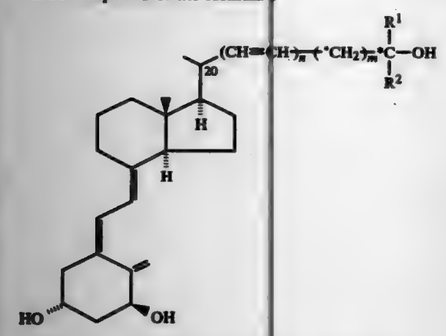
PCT Filed Jul. 4, 1990, Ser. No. 773,950

Claims priority, application United Kingdom, Jul. 10, 1989, 8915770

Int. Cl.[5] A61K *31/59*; C07J *175/00*

U.S. Cl. 514—167 **7 Claims**

1. A compound of the formula I



I

in which formula, n is 2 or 3, m is 0 or an integer from 1–4; R^1 and R^2 (which may be the same or different) stand for hydrogen or C_1–C_8, hydrocarbyl indicating the residue after removal of a hydrogen atom from a straight, branched or cyclic saturated or unsaturated hydrocarbon, or taken together with the carbon bearing the hydroxyl group (starred in formula I), R^1 and R^2 can form a saturated or unsaturated C_3–C_8 carbocyclic ring; in addition, R^1 and/or R^2 and/or one of the m carbons designated by the "." may be optionally substituted with one or more chlorine or fluorine atom(s); and finally one of the carbons designated "." may optionally be substituted by one or two C_1–C_2 alkyl group(s); and derivatives of the compounds pounds of formula I in which one or more hydroxy have been transformed into -O-acyl or -O-glycosyl or phosphate ester groups; such masked groups being hydrolyzable in vivo; and other prodrugs thereof.

5,190,936

PROCESS FOR IMPROVING THE THERAPEUTIC EFFICACY OF FAT-SOLUBLE CORTICOSTEROIDS AND COMPOSITION FOR CARRYING OUT THIS PROCESS

Jean-Pierre Langier, Antony; Evelyne Segot, Nogent-sur-Marne; Francois Ringenbach, Bourg-la-Reine; Jean-Thierry Simonnet, Paris, and Philippe M. Touzan, Vanves, all of France, assignors to L'Oreal, Paris, France

Filed Jun. 13, 1990, Ser. No. 536,891

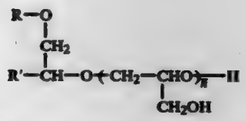
Claims priority, application France, Jun. 15, 1989, 89 07947

Int. Cl.[5] A61K *31/56*, *37/22*

U.S. Cl. 514—169 **21 Claims**

1. A process for improving the therapeutic efficacy of a corticosteroid by incorporating said corticosteroid in the lamellae of vesicles formed from a nonionic amphiphilic lipid, said corticosteroid being selected from the group consisting of hydrocortisone 21-acetate 17-propionate, said process comprising

(a) introducing said corticosteroid into a nonionic amphiphilic lipid constituting the lamellae of vesicles formed on dispersing said nonionic amphiphilic lipid in an aqueous phase so as to form a nonionic amphiphilic lipid phase, said nonionic amphiphilic lipid having the formula



(I)

wherein

$\bar{n}$ has an average statistical value between 2 and 6;

R represents R_1 or R_2CO, wherein R_1 is a linear or branched C_{12}–C_{14} aliphatic radical and R_2 is a linear or branched C_{11}–C_{17} aliphatic radical, and

R′ represents R_1 as defined as above, and

dispersing the resulting nonionic amphiphilic lipid phase in an aqueous phase so as to form said vesicles, said coritcosteroid representing 0.5 to 2.5 by weight relative to the total weight of the lipids constituting the lamellae of said vesicles.

5,190,937

LACTAM DERIVATIVES

Roger E. Markwell, and Ian Hughes, both of Harlow, England, assignors to Beecham Group p.l.c., Brentford, England

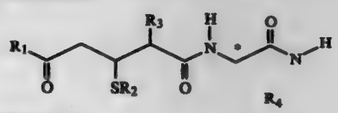
Filed Jan. 11, 1991, Ser. No. 640,069

Claims priority, application United Kingdom, Jan. 15, 1990, 9000846

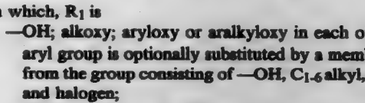
Int. Cl.[5] C07D *225/02*, *223/10*; A61K *31/55*, *31/395*

U.S. Cl. 514—183 **10 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)



R_4

in which, R_1 is

—OH; alkoxy; aryloxy or aralkyloxy in each of which the aryl group is optionally substituted by a member selected from the group consisting of —OH, C_{1-6} alkyl, C_{1-6} alkoxy and halogen;

—NR_6R_7, where each of R_6 and R_7 is independently hydrogen or alkyl, or R_6 and R_7 together with the nitrogen atom to which they are bonded form a 5-, 6-, or 7-membered ring with an optional oxygen or sulphur atom or a second nitrogen atom in the ring, said optional second nitrogen atom optionally substituted by C_{1-6} alkyl;

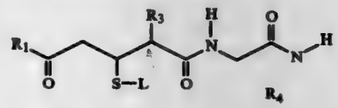
or a group —NH—CH(R_8)—C(O)—R_9 where R_8 is hydrogen; alkyl optionally substituted by —OH, alkoxy, —NR_6R_7 as defined for R_1, quanidine, —CO_2H, —$CONH_2$, —SH, or —S—alkyl; or —CH_2—Ar where Ar is optionally substituted aryl or heteroaryl, wherein heteroaryl is selected from aromatic heterocyclic compounds having a 5- or 6-membered monocyclic ring or a 9-membered fused bicyclic aromatic heterocyclic group containing one or two nitrogen atoms, the optional substituents being selected from the group consisting of —OH, C_{1-6} alkyl, C_{1-6} alkoxy and halogen; and R_9 is alkoxy; —OH; or —NR_6R_7 as defined for R_1;

R_2 is hydrogen; C_{2-8} alkanoyl; or arcyl optionally substituted by —OH, C_{1-6} alkyl, C_{1-6} alkoxy or halogen;

R_3 is C_{3-6} alkyl; and

R_4 is —$(CH_2)_m$— where m is an integer from 4 to 12.

10. A compound of formula (IV):



(IV)

in which R_1 is

—OH; alkoxy; aryloxy or aralkyloxy in each of which the aryl group is optionally substituted by a member selected

from the group consisting of —OH, C_{1-6} alkyl, C_{1-6} alkoxy and halogen;

—NR_6R_7, where each of R_6 and R_7 is independently hydrogen or alkyl, or R_6 and R_7 together with the nitrogen atom to which they are bonded form a 5-, 6-, or 7-membered ring with an optional oxygen or sulphur atom or a second nitrogen atom in the ring, said optionally second nitrogen atom optionally substituted by C_{1-6} alkyl;

or a group —NH—CH(R_8)—C(O)—R_9 where R_8 is hydrogen; alkyl optionally substituted by —OH, alkoxy, —NR_6R_7 as defined for R_1, quanidine, —CO_2H, —$CONH_2$, —SH, or —S—alkyl; or —CH_2—AR where Ar is optionally substituted aryl or heteroaryl, wherein heteroaryl is selected from aromatic heterocyclic compounds having a 5- or 6-membered monocyclic ring or a 9-membered fused bicyclic aromatic heterocyclic group containing one or two nitrogen atoms, the optional substituents being selected from the group consisting of —OH, C_{1-6} alkyl, C_{1-6} alkoxy and halogen; and R_9 is alkoxy; —OH; or —NR_6R_7 as defined for R_1;

R_3 is C_{3-6} alkyl;

R_4 is —$(CH_2)_m$— where m is an integer from 4 to 12; and

L is a conventional sulfur protecting group, provided that L is not C_{2-8} alkanoyl or optionally substituted aroyl.

5,190,938

DERIVATIVES OF 2-HYDROXYTHIOPHENE AND -FURAN FUSED WITH A NITROGEN-CONTAINING RING AND THEIR APPLICATION IN THERAPY

Alain Badore, Roquettes; Marie-Françoise Bordas, Labarthe sur Sese; Daniel Frehel, Toulouse, and Jean-Marc Herbert, Plaisance du Touch, all of France, assignors to Sanofi, Paris, France

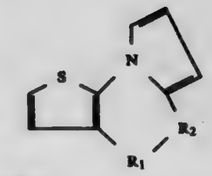
Filed Oct. 2, 1990, Ser. No. 591,828

Claims priority, application France, Oct. 2, 1989, 89 12854

Int. Cl.[5] A61K *31/435*; C07D *495/04*

U.S. Cl. 514—215 **10 Claims**

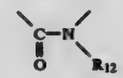
1. A compound of formula



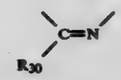
(I)

in which formulae:

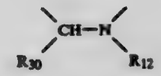
R_1 represents a radical of general formula (Z_0), (Z_1), (Z_2), (Z_3) or (Z_4)



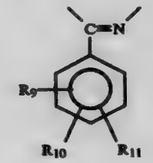
(Z_0)



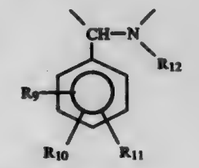
(Z_1)



(Z_2)



(Z_3)

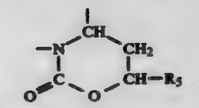


(Z_4)

R_3 represents a hydrogen atom or a linear or branched alkyl or alkenyl radical having 1 to 6 carbon atoms,

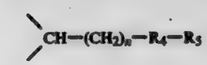
R_9, R_{10} and R_{11}, which may be identical or different, each represent a hydrogen atom, a halogen atom or an alkyl radical having 1 to 6 carbon atoms,

R_{12} represents a hydrogen atom or, with R_2 and the nitrogen atom to which they are attached, forms a radical of general formula (W):

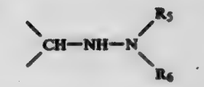


(W)

R_2 represents a methylene radical, a hydroxymethylene radical, a carbonyl radical or a radical of general formula (Y_1), (Y_2), (Y_3) or (Y_4):



(Y_1)



(Y_2)

5,190,939

PYRROLO (1,2-A) THIENO (3,2-F) (1,4) DIAZEPINES

Sylvain Raslt, Moult; Michel Boulouard; Patrick Dallemagne, both of Caen; Max Robba, Paris; Béatrice Guardiola, and Michelle Devissaguet, both of Neuilly Sur Seine, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Mar. 7, 1991, Ser. No. 665,812

Claims priority, application France, Mar. 8, 1990, 90 02933

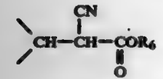
The portion of the term of this patent subsequent to Jul. 8, 2009, has been disclaimed.

Int. Cl.[5] A61K *31/55*; C07D *475/14*

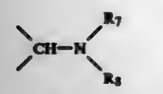
U.S. Cl. 514—220 **18 Claims**

1. A compound of general formula (I):

-continued

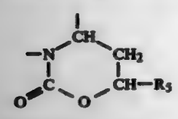


(Y3)



(Y4)

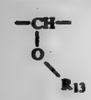
or, with R_{12} and the nitrogen atom to which they are attached, forms a radical of general formula (W):



(W)

in which formulae:

R_4 represents an oxygen or sulfur atom, a carbonyl radical or a radical of general formula (X_1), (X_2), (X_3) or (X_4):



(X_1)

(X_2)

(X_3)

(X_4)

n is between 0 and 4 inclusive,

R_5 represents a hydrogen atom, a linear or branched alkyl chain having 1 to 10 carbon atoms, optionally interrupted by one or more oxygen or sulfur atoms, a phenyl or benzoyl radical or an phenylalkyl or naphthylalkyl radical having 7 to 11 carbon atoms (optionally substituted on the aromatic ring with one or more halogen atoms, linear or branched alkyl radicals having 1 to 6 carbon atoms, nitro radicals or linear or branched alkoxy radicals having 1 to 6 carbon atoms), a linear or branched carboxyalkyl radical having 2 to 7 carbon atoms, a linear or branched alkoxycarbonylalkyl radical having 3 to 10 carbon atoms, a linear or branched alkoxycarbonyl radical having 2 to 7 carbon atoms, a linear or branched carbamoylalkyl radical having 2 to 7 carbon atoms, a cycloalkyl radical having 3 to 7 carbon atoms, an unsaturated ring-system selected from thienyl, furyl, pyrrolyl, pyridinyl, and pyrimidinyl, pyridylcarbonyl or pyrimidinylcarbonyl radical, a clofibroyl radical or a 6-hydroxy-2,5,7,8-tetramethylchroman-2-carbonyl radical,

R_6 represents a hydrogen atom or a linear or branched alkyl radical having 1 to 6 carbon atoms,

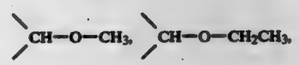
R_7 and R_8, which may be identical or different, each represent a hydrogen atom, a linear or branched alkyl radical having 1 to 6 carbon atoms, a phenyl radical or a phenylalkyl radical having 7 to 9 carbon atoms (optionally substituted on the aromatic ring with one or more halogen atoms or alkyl or alkoxy groups having 1 to 6 carbon atoms), or, together with the nitrogen atom to which they are attached form a saturated or unsaturated 5- to 7-membered ring-system comprising 1 to 2 hetero atoms selected from nitrogen, oxygen and sulfur, optionally substituted with an alkylcarbonyl of 2–5 carbon atoms or alkoxycarbonyl group having 2 to 5 carbon atoms,

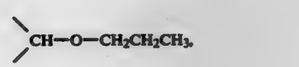
R_{13} represents a hydrogen atom, a linear or branched alkylcarbonyl radical having 2 to 6 carbon atoms or a benzoyl radical,

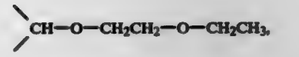
with the provisos that:

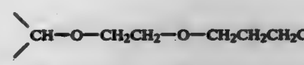
when R_1 represents a radical of general formula (Z_3), then R_2 cannot represent a methylene radical,

when R_1 represents a radical of general formula (Z_0) and R_{12} represents a hydrogen atom, then R_2 cannot represent the following radicals:









when R_1 represents a radical of general formula (Z_0), R_{12} represents a hydrogen atom and R_2 represents a radical of general formula (Y_1) with n=1 and R_4 representing a carbonyl radical, then R_5 cannot represent a methyl, isopropyl or phenyl radical,

when R_1 represents a radical of general formula (Z_0) and R_{12} represents a hydrogen atom, then R_2 cannot represent a carbonyl radical,

its isomers, diastereoisomers and enantiomers,

its addition salts with a pharmaceutically acceptable inorganic or organic acid.

18. A method for treating a living animal body afflicted with stroke, cerebral aging or metabolic diseases including hyperlipidemia, hypertriglyhyperglycemia comprising the step of administering to the said living animal an amount of a compound of claim 1 which is suitable for the alleviation of the said condition.

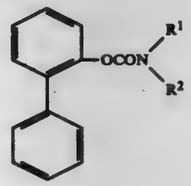
5,190,940

CHOLESTEROL ESTER HYDROLASE INHIBITORS

Thomas J. Commons, Wayne; Richard E. Mewshaw, Norristown, and Donald P. Strike, St. Davids, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 582,687, Sep. 14, 1990, Pat. No. 5,112,859.
This application Nov. 22, 1991, Ser. No. 796,500
Int. Cl.[5] A61K *31/54, 31/535, 31/445, 31/495*
U.S. Cl. 514—227.5 6 Claims

1. A compound of the formula:



in which

R^1 and R^2 taken together with the nitrogen atom to which they are attached complete a heterocyclic moiety of the formula:

in which

X is NR^5, —O— or —S—;

where

R^5 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or substituted phenyl in which the substituent is alkyl of 1 to 6 carbon atoms, halogeno, alkoxy of 1 to 6 carbon atoms or trifluoromethyl; and

R^6 is hydrogen, alkyl of 1 to 6 carbon atoms or gem-dialkyl of 2 to 12 carbon atoms.

5,190,941

USE OF NAPHTHOXAZINES FOR THE TREATMENT OF CONDITIONS ASSOCIATED WITH CEREBRAL ISCHAEMIA

Joachim Nozulak, Heitersheim, Fed. Rep. of Germany; André Sauter, Bottmingen, Switzerland, and Jean-Marie Vigouret, Alle, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Dec. 12, 1990, Ser. No. 626,352
Claims priority, application United Kingdom, Dec. 14, 1989, 8928316; Fed. Rep. of Germany, Feb. 3, 1990, 4003262
Int. Cl.[5] A61K *31/535*; C07D *265/34*
U.S. Cl. 514—229.8 8 Claims

1. The (−)-(4aR,10aR)-3,4,4a,5,10,10a-hexahydro-6-methoxy-4-methyl-9-methylthio-2H-naphth[2,3-b]-1,4-oxazine hydrogen malonate.

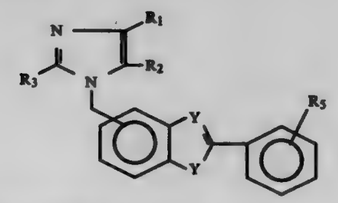
5,190,942

BENZOXAZOLE AND RELATED HETEROCYCLIC SUBSTITUTED IMIDAZOLE AND BENZIMIDAZOLE DERIVATIVES

Michael A. Poss, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 22, 1991, Ser. No. 688,768
Int. Cl.[5] A61K *31/535, 31/415*; C07D *263/57, 277/62, 403/02, 233/91, 233/54*
U.S. Cl. 514—235.8 13 Claims

1. A compound of the formula



and pharmaceutically acceptable salts thereof;

where X is

or N;

Y is O, S, NR_6, or CR_6R_6';

R_1 is hydrogen, halogen, $—NO_2$, $—CF_3$ or —CN;

R_2 is H, CN, alkyl of 1 to 10 carbon atoms, alkenyl of 3 to 10 carbon atoms, or the same groups substituted with F; phenylalkenyl wherein the aliphatic portion is 2 to 6 carbon atoms; $—(CH_2)_m$-imidazol-1-yl; $—(CH_2)_m$-1,2,3-triazolyl optionally substituted with one or two groups selected from CO_2R_7 or alkyl of 1 to 4 carbon atoms;

$—(CH_2)_m$-tetrazolyl; $—(CH_2)_nOR_6$; $—(CH_2)_nOCR_7$;

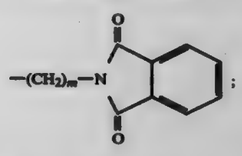
$—(CH_2)_nSR_8$; $—CH=CH(CH_2)_xCHOR_8$; $—CH=CH(CH_2)_xCR_8$;

$—CR_9$; $—CH=CH(CH_2)_xOCR_6$; $—(CH_2)_x—CH(CH_3)—COR_9$;

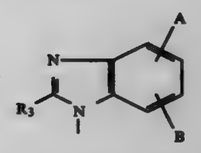
$—(CH_2)_nCR_9$; $—(CH_2)_nOCNHR_{10}$; $—(CH_2)_nNR_6COR_{10}$;

$—(CH_2)_nNR_6CNHR_{10}$; $—(CH_2)_nNR_6SO_2R_{10}$; $—(CH_2)_nNR_6CR_{10}$;

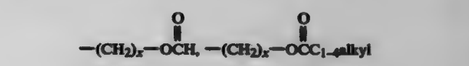
$—(CH_2)_mF$; $—(CH_2)_mONO_2$; $—(CH_2)_mN_3$; $—(CH_2)_mNO_2$;



or R_1 and R_2 taken together with the carbon atoms of the imidazole nucleus to which they are attached can form a benzimidazole shown as



wherein A can be hydrogen, alkyl, C_xF_{2x+1}, C_6F_5, halogen, C_{1-6}alkoxy, $—(CH_2)_xOH$, $—(CH_2)_x—OC_{1-4}$alkyl,

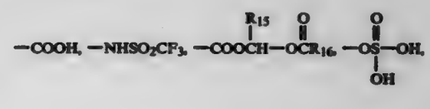


or $—COR_9$ and B can be hydrogen, alkyl, C_xF_{2x+1}, C_6F_5, halogen or C_{1-6}alkoxy;

R_3 is alkyl of 2 to 10 carbon atoms, alkenyl or alkynyl of 3 to 10 carbon atoms or the same groups substituted with F or CO_2R_7; cycloalkyl of 3 to 8 carbon atoms, cycloalkylalkyl of 4 to 10 carbon atoms; cycloalkylalkenyl or cycloalkylalkynyl of 5 to 10 carbon atoms; $(CH_2)_xZ(CH_2)_mR'$ (wherein R' is H, C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{2-4}alkenyl or C_{2-4}alkynyl) optionally substituted with F or CO_2R_7; benzyl or benzyl substituted on the phenyl ring with 1 or 2 halogens, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms or nitro;

R_4 is hydrogen, alkyl, aryl, cycloalkyl, aralkyl, $—COOR_7$ or $—CONR_{14}R_{15}$;

R_5 is hydrogen,



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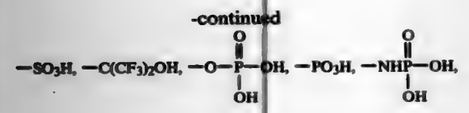
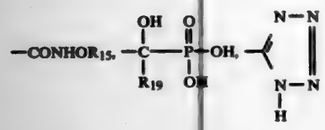
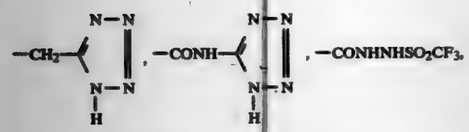
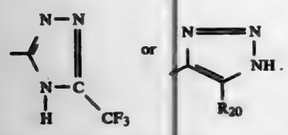








R_6 and R_6' are independently selected from H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

R_7 is H, alkyl or perfluoroalkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

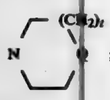
R_8 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, benzyl, acyl of 1 to 4 carbon atoms, phenacyl;

R_9 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, $(CH_2)_pC_6H_5$, OR_{11} or $NR_{12}R_{12}$;

R_{10} is alkyl of 1 to 6 carbon atoms or perfluoroalkyl of 1 to 6 carbon atoms, 1-adamantyl, 1-naphthyl, 1-(1-naphthyl-)ethyl, or $(CH_2)_pC_6H_5$;

R_{11} is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

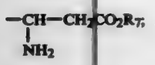
R_{12} and R_{13} independently are H, alkyl of 1 to 4 carbon atoms, phenyl, benzyl, α-methylbenzyl, or taken together form a ring of the formula



Q is NR_{14}, O or CH_2;

R_{14} and R_{15} are independently H, alkyl, aryl, aralkyl or cycloalkyl;

R_{16} is C_{1-6}alkyl, $-NR_{17}R_{18}$ or



R_{17} and R_{18} are independently H, C_{1-6}alkyl, benzyl or taken together are 3 to 6 carbon atoms forming a 4- to 7-membered ring with the nitrogen atom to which they are attached;

R_{19} is H, C_{1-5}alkyl, phenyl;

R_{20} is —CN, $—NO_2$ or $—CO_2R_7$;

Y=O or S;

Z=O, NR_6 or S;

m is 1–5;

n is 1–10;

p is 0–3;

q is 2–3;

r is 0–2;

s is 0–5;

t is 0 or 1; and

x is 1–6.

5,190,943

FUNGICIDAL MIXTURE

Rainer Seele, Fussgoenheim; Friedrich Loecher, Limburgerhof; Reinhold Saur, Boehl-Iggelheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BAS Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 599,886, Oct. 19, 1990, Pat. No. 5,106,848. This application Oct. 17, 1991, Ser. No. 778,243

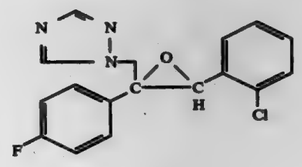
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1989, 3935113

Int. Cl.[5] A01N *43/64, 43/84*

U.S. Cl. 514—231.2 4 Claims

1. A fungicidal composition containing a synergistically fungicidally effective amount of a mixture consisting of

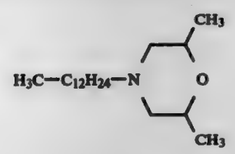
a) 2-(1,2,4-triazol-1-ylmethyl)-2-(4-fluorophenyl)-3-(2-chlorophenyl)-oxirane of the formula I



I

and

b) N-tridecyl-cis-2,6-dimethylmorpholine of the formula



in a ratio of a:b of about 1:3.

5,190,944

SYNERGISTIC MICROBICIDAL COMBINATIONS CONTAINING 3-ISOTHIAZOLINE AND COMMERCIAL BIOCIDES

Jemin C. Hsu, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 567,201, Aug. 14, 1990, Pat. No. 5,132,306, which is a division of Ser. No. 444,571, Dec. 1, 1989, Pat. No. 4,990,525, which is a division of Ser. No. 289,066, Dec. 22, 1988, Pat. No. 4,906,651. This application Jan. 26, 1992, Ser. No. 841,953

Int. Cl.[5] A01N *43/66, 43/80, 47/10*

U.S. Cl. 514—244 8 Claims

1. A microbicidal composition comprising a synergistic mixture the first component of which is a 3:1 ratio of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one and the second component of which is selected from the group consisting of p-tolyldiiodomethylsulfone; 3-iodo-2-propynylbutylcarbamate; and 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride where the ratio of first component to second component is in the range of from about 8:1 to about 1:200.

5,190,945

AZINYLIMINODITHIETANES AND THEIR FUNGICIDAL AND NEMATOCIDAL METHODS OF USE

Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Urs Müller, Münchenstein, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

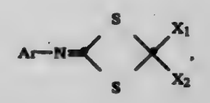
Division of Ser. No. 641,832, Jan. 14, 1991, abandoned. This application Nov. 19, 1991, Ser. No. 794,537

Claims priority, application Switzerland, Jan. 18, 1990, 163/90

Int. Cl.[5] A61K *31/445, 31/505;* C07D *239/02, 415/00*

U.S. Cl. 514—255 14 Claims

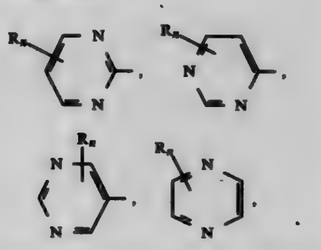
1. A 2-(Pyrimidyl or pyrazinyl)-imino-1,3-dithietane of formula I



(I)

wherein

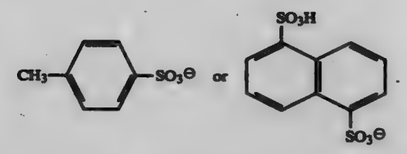
Ar is one of the radicals



R is unsubstituted C_1–C_3alkyl or C_1–C_3alkyl which is substituted by halogen, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3alkylthio or cyano, independently of one another, or is unsubstituted or halo-substituted C_3–C_7alkenyl, unsubstituted or halo-substituted C_3–C_7alkynyl, or C_3–C_5cycloalkyl, C_1–C_3alkoxy, C_1–C_3alkylthio, di-C_1–C_3alkylamino, nitro or halogen,

n is a number from 0 to 3,

X_1 and X_2 independently of each other are hydrogen or halogen, including the addition salts formed with acids of the formula $H^{\oplus}X^{\ominus}$ in which the anion $X^{\ominus}$ is $Cl^{\ominus}$, $Br^{\ominus}$, $I^{\ominus}$, HSO_4^-, $H_2PO_4^-$, $H_2PO_3^-$, NO_3^-, $CH_3COO^{\ominus}$, CH_2ClCOO^-, CF_3COO^-, $HOCH_2COO^-$, $CH_3CH(OH)COO^{\ominus}$, $HOOCCOO^{\ominus}$, $HOOCCH_2COO^{\ominus}$, $HOOCCH{=}CHCOO^{\ominus}$,



5,190,946

METHODS AND COMPOUNDS

Avner Rama, Jerusalem, Israel, and Karel Valter, Geneva, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

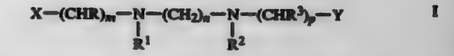
Filed Feb. 12, 1991, Ser. No. 654,154

Claims priority, application United Kingdom, Feb. 23, 1990, 9004099; Feb. 23, 1990, 9004100; Mar. 30, 1990, 9007144

Int. Cl.[5] A61K *31/495;* C07D *295/10*

U.S. Cl. 514—255 5 Claims

1. A method of restoring drug-sensitivity to cancer cells that have become multi drug-resistant in a host requiring such treatment which comprises administering to the host an effective amount of a compound of formula I



I

wherein R and R^3, which may be the same or different, each is hydrogen, an alkyl group containing 1 to 5 carbon atoms, or unsubstituted or substituted aryl or aralkyl, wherein the substituents are selected from the group consisting of halogen, alkoxy and alkyl in turn being unsubstituted or halo-substituted; R^1 and R^2 taken together are alkylene containing 2 carbon atoms; m and p, which may be the same or different, each is a number from 0 to 3; n is the number 2; and X is a group of the formula R_x^4—CO—, R_x^4—COO—, R_x^4—CONH—, R_x^4—NHCO—, or R_x^4—O— and Y is a group of formula R_y^4—CO—, R_y^4—COO—, R_y^4—CONH—, R_y^4—NHCO—, or R_y^4—O— in which R_x^4 and R_y^4, which may be same or different, each is unsubstituted or substituted aryl, aralkyl, diarylalkyl or aryloxyalkyl, wherein the substituents are as indicated above, and the alkyl moiety in the aralkyl, diarylalkyl and aryloxyalkyl groups contains 1 to 5 carbon atoms and can be unsubstituted or substituted by a cycloalkyl group containing 3 to 8 carbon atoms; or a physiologically acceptable acid addition salt thereof.

5,190,947

CODEINE SALT OF A SUBSTITUTED CARBOXYLIC ACID, ITS USE AND PHARMACEUTICAL COMPOSITIONS THEREOF

Walter Riess, Basel, and Alfred Sallmann, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

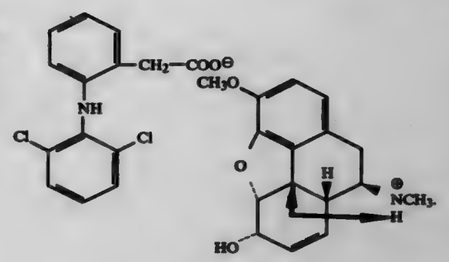
Filed Aug. 16, 1991, Ser. No. 746,676

Claims priority, application Switzerland, Aug. 23, 1990, 2735/90

Int. Cl.[5] A61K *31/485;* C07D *489/04*

U.S. Cl. 514—282 3 Claims

1. The codeine salt of [2-[(2,6-dichlorophenyl)-amino]-phenyl]-acetic acid of formula



(I)

5,190,948

USE OF URIDINE IN THE PHARMACOLOGICAL TREATMENT OF THE PERIPHERAL COMPLICATIONS OF DIABETES

Mario Materazzi; Vincenzo Pelliti; Giovanni Di Stazio, and Giovanna De Luca, all of Rome, Italy, assignors to Polifarma S.p.A., Rome, Italy

Filed May 22, 1991, Ser. No. 704,230

Claims priority, application Italy, Jun. 13, 1990, 48057A/90

Int. Cl.[5] A61K *31/505*

U.S. Cl. 514—274 1 Claim

1. A method for the pharmaceutical treatment of patients suffering from peripheral neuropathy, retinopathy or peripheral vasculopathy produced in said patients by diabetes melli-

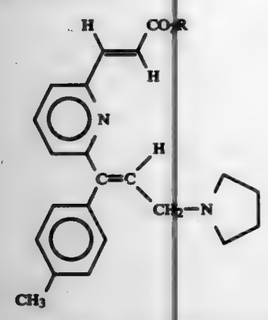
tus as a peripheral complication, comprising administering orally to said paticats a pharmaceutical effective amount of uridine to reduce said peripheral complications, with the proviso that cytidine is not administered.

5,190,949
AGENTS FOR POTENTIATING THE EFFECTS OF ANTITUMOR AGENTS AND COMBATING MULTIPLE DRUG RESISTANCE

Ann C. King, Chapel Hill, N.C., assignor to Burroughs Wellcome Company, Research Triangle Park, N.C.

Division of Ser. No. 539,836, Jun. 18, 1990, Pat. No. 5,124,330. This application Jun. 10, 1992, Ser. No. 899,711
Int. Cl.[5] A01N *43/42*; A61K *31/44*
U.S. Cl. 514—290 8 Claims

1. A method of increasing the sensitivity of a tumor to an antineoplastic agent, which tumor is harbored in a subject and which tumor is resistant to said antineoplastic agent, comprising concurrently administering to said subject an antineoplastic agent and a potentiating agent, said potentiating agent selected from the class consisting of



I

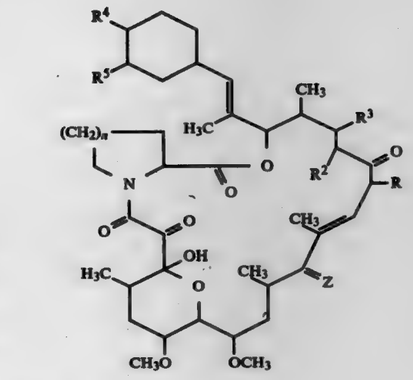
wherein R is C_{1-4} alkyl, and the pharmaceutically acceptable salts thereof, said potentiating agent being administered in an amount effective to increase the sensitivity of said tumor to said antineoplastic agent.

5,190,950
ANTAGONISTS OF IMMUNOSUPPRESSIVE MACROLIDES

Thomas R. Beattie, Scotch Plains; Matthew J. Wyvratt, Mountainside, and Francis J. Dumont, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 551,811, Jun. 25, 1990, abandoned. This application Sep. 26, 1991, Ser. No. 766,908
Int. Cl.[5] A61K *31/40, 31/44*; C07D *267/00*
U.S. Cl. 514—291 2 Claims

1. A method for the modification of treatment of an immunoregulatory disorder or disease with an FK-506-type immunosuppressive macrolide comprising the administration to a mammalian species in need of such modification of an effective amount of a compound of the formula:



I

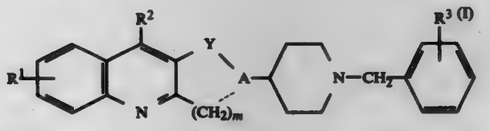
wherein:
Z is (OR[1], H) or oxo;
R is methyl, ethyl, propyl or allyl;
R^1 is hydrogen, C_1–C_6 alkanoyl, aryl C_1–C_6 alkanoyl or aroyl;
R^2 is hydrogen, or R^2 and R^3 taken together form a double bond;
R^3 is hydrogen, hydroxy, C_1–C_6 alkoxyl, C_1–C_6 alkanoyloxy, aryl C_1–C_6 alkanoyloxy or aroyloxy;
R^4 is hydroxy, C_1–C_6 alkanoyloxy, aryl C_1–C_6 alkanoyloxy or aroyloxy;
R^5 is hydroxy, methoxy, C_1–C_6 alkanoyloxy, aryl C_1–C_6 alkanoyloxy or aroyloxy; and
n is 1 or 2.

5,190,951
QUINOLINE DERIVATIVES

Hiroshi Hasegawa, Sakura; Kazuo Isomae; Takeshi Kotsugai, both of Narita; Noriaki Shioiri, Chiba; Kumiko Sekine, Narita; Naokata Taido, Funabashi; Susumu Sato, Higashi-shirai, and Tadayuki Kuraishi, Chiba, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1991, Ser. No. 773,432
Claims priority, application Japan, Oct. 19, 1990, 2-281093; Oct. 19, 1990, 2-281094
Int. Cl.[5] A61K *31/44*; C07D *471/04*
U.S. Cl. 514—292 3 Claims

1. A quinoline compound represented by the following formula (I):



(I)

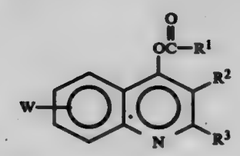
wherein >A- represents a group >N-$(CH_2)_n$-, wherein n is an integer of 0–7; Y represents a group >C=O or >CHOH, R^1 is a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, or an alkylthio group, R^2 is a hydrogen atom, a halogen atom, an alkyl group, a hydroxy group, an alkoxy group, a phenyl group which may have a substrtuent, a phenoxy group, an alkanoyloxy group, or an amino group which may have a substituent, R^3 is a hydrogen atom, a halogen atom, an alkyl group, or an alkoxy group, and m is an integer of 1–2; or a salt thereof.

5,190,952
4-ACYLOXYQUINOLINE DERIVATIVES AND INSECTICIDAL OR ACARICIDAL COMPOSITIONS CONTAINING SAME

Nobuto Minowa; Tomoya Machinami; Seiji Shibahara; Keiichi Imamura; Michiaki Iwata; Masaru Shimura, and Shigeharu Inouye, all of Yokohama, Japan, assignors to Meiji Seika Kabushiki Kaisha, Tokyo, Japan

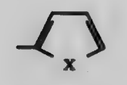
Filed Jul. 5, 1990, Ser. No. 549,136
Claims priority, application Japan, Jul. 7, 1989, 1-176187
Int. Cl.[5] C07D *215/233*; A01N *43/42, 43/44*
U.S. Cl. 514—297 7 Claims

1. A 4-acyloxyquinoline derivative represented by the formula (I):

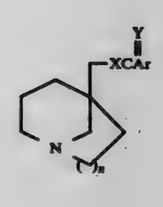


(I)

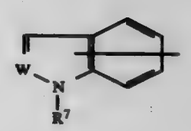
wherein
R^1 represents (1) hydrogen, (2) C_1–C_{18} alkyl, (3) C_3–C_{10} cycloalkyl which is unsubstituted or is substituted by halogen, lower alkyl, or lower alkenyl, (4) phenylloweralkyl, (5) phenoxyloweralkyl, (6) phenyl which is unsubstituted or is substituted by at least one of lower alkyl and halogen, (7) naphthyl which is unsubstituted or is substituted by at least one of lower alkyl and halogen, (8) OR^4 where R^4 represents (a) lower alkyl, (b) phenyl which is unsubstituted or is substituted by at least one of lower alkyl and halogen or (c) naphthyl which is unsubstituted or is substituted by at least one of lower alkyl and halogen, or (9) a group



where X is is oxygen or sulphur,
R^2 represents (1) hydrogen, (2) lower alkyl or (3) —$COOR^5$ where R^5 is hydrogen or lower alkyl,
R^3 represents (1) hydrogen or (2) C_1–C_{10} alkyl, provided that R^1 does not represent OR^4 when R^2 is hydrogen and R^3 is methyl, and
W represents one to four groups selected from (1) hydrogen, (2) halogen, (3) lower alkyl and (4) lower alkoxy, said substituent groups being the same or different, provided that the compound wherein R^1 is methyl and R^2, R^3 and W each are hydrogen is excluded.



wherein
n is 1 or 2,
X is NH or O
Y is O or S and
Ar is



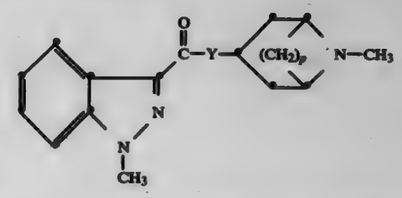
wherein
W is CH or N, and
R^7 is H or C_1–C_4 allyl, the stereoisomers; the N-oxide,
or a pharmaceutically acceptable salt thereof.

5,190,953
HETEROCYCLIC CARBOXYLIC ACID AMIDES AND ESTERS OF AZABICYCLIC COMPOUNDS AS GASTRIC PROKINETIC, ANTIEMETIC, ANXIOLYTIC AND ANTIARRHYTHMIC AGENTS

Harry R. Munson, Jr., Leawood, Kans., and Gunnar E. Jagdmann, Apex, N.C., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Mar. 26, 1992, Ser. No. 858,259
Int. Cl.[5] A61K *31/435*; C07D *471/08*
U.S. Cl. 514—299 8 Claims

1. A compound of the formula:



(III)

wherein Y is NH or O; and p is 2 or 3; which compound acts as a 5-HT antagonist at 5-HT_3 receptors.

5,190,954
METHODS FOR THE TREATMENT OF COGNITIVE DISORDERS

Michael B. Tyers, Ware, England, assignor to Glaxo Group Limited, London, England

Division of Ser. No. 133,885, Dec. 16, 1987, Pat. No. 4,985,437. This application Oct. 20, 1989, Ser. No. 424,736
Claims priority, application United Kingdom, Dec. 17, 1986, 8630074; Dec. 17, 1986, 8630076; Dec. 17, 1986, 8630077; Mar. 25, 1987, 8707175
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—299 4 Claims

1. A method of improving cognition in a patient suffering from dementia or other cognitive disorder which comprises administering to the patient an effective amount for the treatment of said dementia or other cognitive disorder of a compound of formula III:

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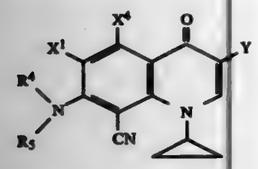
5,190,955
ANTIBACTERIAL 8-CYANO-1-CYCLOPROPYL-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS

Michael Schriewer; Klaus Grohe, both of Odenthal; Uwe Petersen, Leverkusen; Ingo Haller, Wuppertal; Karl G. Metzger, Wuppertal; Rainer Endermann, Wuppertal, and Hans-Joachim Zeller, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 434,666, Nov. 13, 1989, Pat. No. 5,051,418, which is a division of Ser. No. 144,394, Jan. 14, 1988, Pat. No. 4,908,366. This application Jan. 25, 1991, Ser. No. 645,751
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702393
Int. Cl.[5] A61K *31/47*, C07D *401/04*
U.S. Cl. 514—312 8 Claims

1. An 8-cyano-1-cyclopropyl-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid of the formula



(I)

in which

Y represents carboxyl, nitrile, —$COOR^1$ or —$CONR^2R^3$, wherein

R^1 represents alkyl, and

R^2 and R^3 each independently represents hydrogen or alkyl, and

R^3 may also represent phenyl

X^1 represents hydrogen, nitro, alkyl, or halogen,

X^4 represents hydrogen or halogen or alkyl,

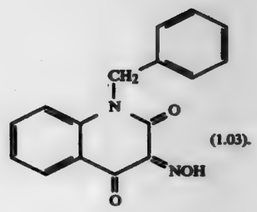
R^4 and R^5, together with the nitrogen atom to which they are bonded, form a 5- or 6-membered heterocyclic ring containing no additional hetero atoms therein and which is unsubstituted or mono-, di- or trisubstituted on the carbon atoms by identical or different substitutents, said substituents being (A) 2-thienyl, hydroxyl, alkoxy with one to three carbon atoms, amino, methylamino, ethylamino, aminomethyl, methylaminomethyl or ethylaminomethyl, or (B) C_1–C_4-alkyl, phenyl or cyclohexyl, said substituents (B) being unsubstituted or mono-di- or trisubstituted by chlorine, fluorine, bromine, methyl, phenyl, hydroxyl, methoxy, benzyloxy, nitro or piperidino.

5,190,957
TREATMENT OF MULTI-DRUG RESISTANT TUMORS WITH QUINOLYL-AND ISOQUINOLYLOXAZOLE-2-ONES

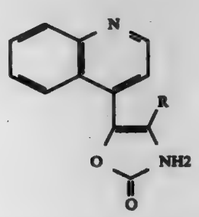
Sai P. Sunkara, and Winton D. Jones, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 590,521, Oct. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 436,262, Nov. 3, 1989, abandoned. This application Mar. 13, 1992, Ser. No. 852,922
Int. Cl.[5] A61K *31/47*
U.S. Cl. 514—314 2 Claims

1. A method of reversing vinblastine resistance in a vinblastine resistant tumor by administering to a patient, in need thereof, an effective amount of a compound according to the formula:



(1.03).



wherein R is selected from the group consisting of hydrogen and C_1–C_6 alkyl.

5,190,956
CERTAIN N-SUBSTITUTED 3-OXIMINO-2,4-DIOXOQUINOLIN-2,4-(1H)DIONES USEFUL FOR TREATING VIRAL INFECTIONS

Adriano Afonso, West Caldwell; Jay Weinstein, Upper Montclair, and Margaret J. Gentles, Bloomfield, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 7, 1990, Ser. No. 579,919
Int. Cl.[5] C07D *215/20*, *215/22*; A61K *31/47*
U.S. Cl. 514—312 6 Claims

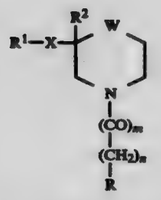
1. The compound of the formula

5,190,958
PIPERIDINE DERIVATIVES

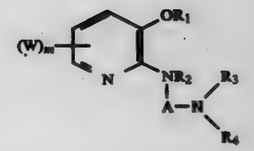
Paul A. Carter, Sittingbourne, and Surinder Singh, Chatham, both of England, assignors to Shell Research Limited, United Kingdom

Filed Dec. 24, 1990, Ser. No. 631,681
Claims priority, application United Kingdom, Dec. 29, 1989, 8929331
Int. Cl.[5] A61K *31/445*, *31/435*; C07D *401/04*, *211/06*
U.S. Cl. 514—317 7 Claims

1. A method of combating fungus at a locus which comprises treating the locus with a fungicidally effective amount of a compound of the formula



(I)



(I)

in which:

R_1 and R_2 each represent a hydrogen,

W represents a halogen atom or a lower alkyl or alkoxy group optionally substituted with o-ne or more halogen atoms, and m being between 0 and 3,

A is a linear or branched alkyl radical having 1 to 6 carbon atoms, inclusive,

R_3 and R_4, which may be identical or different, represent:

a linear or branched lower alkenyl group,

a cycloalkyl group having 6 to 10 carbon atoms, inclusive an aryl or (lower alkyl)aryl group,

each of these groups being optionally substituted with one or more halogen atoms or trifluoromethyl, hydroxyl or lower alkoxy groups, or alternatively:

R_3 and R_4, with the nitrogen atom to which they are linked, constitute a saturated or unsaturated, moncor bicyclic nitrogenous heterocyclic system having at most 12 atoms—not counting the hydrogen atoms—among which may be included one to three hetero atoms selected from nitrogen, oxygen and sulfur, unsubstituted or substituted with lower alkyl, phenyl, phenyl(lower alkyl), or diphenyl(lower alkyl) group, it being possible for the phenyl, phenyl(lower alkyl) or diphenyl(lower alkyl) groups to be substituted with one or more halogen atoms or a hydroxyl, lower alkyl, lower alkoxy, or trifluoromethyl group, on condition that R_3 and R_4, with the nitrogen atom to which they are linked, do not constitute a 4-arylpiperazine system,

lower alkyl, lower alkenyl and lower alkyloxy being understood to mean a linear or branched group having 1 to 6 carbon atoms inclusive and aryl groups being unsaturated mono- or bicyclic groups having 5 to 12 carbon atoms inclusive—incorporating or otherwise in their carbon skeleton 1, 2 or 3 hetero atoms selected from nitrogen, oxygen and sulfur, its isomers, epimers and diastereoisomers, as well as its addition salts with a pharmaceutically acceptable acid

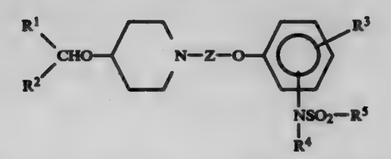
or an acid-addition salt or metal salt complex thereof, in which R represents a hydrogen atom or an optionally substituted alkyl, alkenyl, alkynyl, alkoxy, cycloalkyl, phenyl, naphthyl, phenylcarbonyl, naphthylcarbonyl, and thienyl; R^1 represents an optionally substituted alkyl, phenyl, benzyl or cycloalkyl group; R^2 represents a hydrogen atom or an optionally substituted alkyl group; W represents —CH_2—; X represents —CH_2—; —CH_2CH_2—, —O— or a single chemical bond; m is 0 or 1 and n represents an integer from 0 to 3.

5,190,959
PIPERIDINE COMPOUNDS WHICH HAVE USEFUL PHARMACEUTICAL ACTIVITY

Satoshi Murai; Masanao Shimano; Hiroshi Yamamoto; Toshihiro Koyama; Tsutomu Nakamura; Masaru Ogawa; Mitsuru Watanuki; Taira Okamoto, and Toshimitsu Hori, all of Kyoto, Japan, assignors to Kaken Pharmaceutical Co. Ltd., Tokyo, Japan

Filed Aug. 5, 1992, Ser. No. 925,017
Claims priority, application Japan, Aug. 8, 1991, 3-199649; Apr. 16, 1992, 4-96418
Int. Cl.[5] A61K *31/445*
U.S. Cl. 514—318 10 Claims

1. A piperidine compound having the formula (I):



(I)

wherein R^1 and R^2, which may be the same or different from each other, are (i) a phenyl group or a phenyl group substituted by a halogen atom, trifluoromethyl group, a C_{1-5} alkyl group or a C_{1-5} alkoxyl group, (ii) a C_{3-7} cycloalkyl group, (iii) pyridyl group or (iv) thienyl group, R^3 is (i) hydrogen atom, (ii) a halogen atom, (iii) a C_{1-4} alkyl group or (iv) a C_{1-4} alkoxyl group, R^4 is (i) hydrogen atom or (ii) a C_{1-4} alkyl group. R^5 is (i) a C_{1-5} alkyl group or a C_{1-5} alkyl group substituted by a halogen atom, (ii) phenyl group or (iii) thienyl group and Z is (i) a C_{1-6} alkylene group, (ii) a C_{2-6} alkenylene group or (iii) a C_{3-6} alkynylene group or a pharmacologically acceptable salt thereof.

5,190,960
MEDICINAL OXAZOLOPYRIDINE COMPOUNDS

Gérald Guillaumet, Orleans; Christine Flouzat, Clermont Ferrand; Daniel H. Caignard, Paris; Pierre Renard, Versailles; Michelle Devissaguet, and Béatrice Guardiola, both of Neuilly Sur Seine, all of France, assignors to Adir Et Compagnie, Courbevoie, France

Division of Ser. No. 711,297, Jun. 6, 1991, Pat. No. 5,155,116. This application Nov. 12, 1991, Ser. No. 791,261
Claims priority, application France, Jun. 29, 1990, 90 08202
Int. Cl.[5] A61K *31/445*, *31/44*; C07D *213/74*, *211/28*
U.S. Cl. 514—318 11 Claims

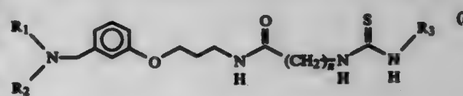
1. A compound selected from those of formula (I)

5,190,961
THIOUREA DERIVATIVES AND ANTIMICROBIAL AGENT AND ANTIULCER AGENT CONTAINING THE SAME

Hirokazu Hasegawa; Isamu Endo; Shingo Koyama; Masashi Isozaki; Yukari Yoshiyama; Shigenori Nozawa, and Norio Arakawa, all of Kanagawa, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,437
Claims priority, application Japan, Aug. 3, 1990, 2-204999; Jul. 9, 1991, 3-193631
Int. Cl.[5] A61K *31/445*, *31/40*, *31/17*, *31/34*; C07L *335/12*; C07D *403/10*, *405/10*, *409/10*
U.S. Cl. 514—331 15 Claims

1. A thiourea compound represented by the formula (I)



(I)

wherein R_1 and R_2 are the same or different and each represents a lower alkyl group, or R_1 and R_2 taken together represent a group having the formula —$(CH_2)_m$— in which m is 4 or

5, R_3 represents a lower alkyl group or a cycloalkyl group or a group having the formula $-(CH_2)_l-R_4$ in which R_4 is a phenyl, naphthyl, pyridyl, furyl or thienyl group optionally having 1-3 substituents selected from the group consisting of lower alkyl, lower alkoxy, phenoxy, lower alkylthio, hydroxy, halogen, nitro, cyano and trifluoromethyl, and l represents an integer of 0 to 2 and n represents an integer of 1 to 5 or a physiologically acceptable salt thereof.

5,190,962

TREATING HYPERTENSION

Timothy J. Barberich, Concord, and James W. Young, Still River, both of Mass., assignors to Sepracor, Inc., Marlborough, Mass.

Filed Mar. 13, 1990, Ser. No. 492,647
Int. Cl.[5] A61K *31/44, 31/215*
U.S. Cl. 514—356 1 Claim

1. A method of treating hypertension in an individual with nitrendipine and reducing undesirable side effects associated with administration of nitrendipine, comprising administering to the individual a therapeutically effective amount of optically pure nitrendipine which has anti-hypertensive activity and at least one additional drug selected from the group consisting of a thiazole diuretic and a beta blocker.

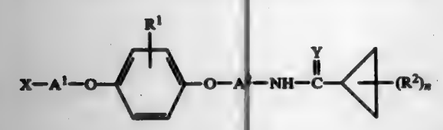
5,190,963

CYCLOPROPANE(THIO)CARBOXAMIDES, THE PREPARATION THEREOF AND INTERMEDIATES THEREFOR, AND THE USE THEREOF FOR CONTROLLING PESTS

Christoph Nuebling, Hassloch; Hans Theobald, Limburgerhof; Uwe Kardorff, Mannheim; Wolfgang Krieg, Weingarten, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 3, 1992, Ser. No. 830,154
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1991, 4103382
Int. Cl.[5] C07D *261/06, 285/12, 271/10;* A01N *43/80, 43/82*
U.S. Cl. 514—363 6 Claims

1. A cyclopropane(thio)carboxamide of the formula I



where
n is 0, 1 or 2, it being possible for the R^1 radicals to be different when n is 2;
A^1 is methylene, ethylene or propylene, it being possible for these groups to carry one or two C_1–C_3-alkyl groups;
A^2 is ethylene or propylene, it being possible for these groups to carry one or two C_1–C_3-alkyl groups;
R^1 is hydrogen, halogen or C_1–C_6-alkyl;
R^2 is halogen or C_1–C_3-alkyl;
X is a 5-membered heteroaromatic radical selected from the group consisting of isoxazole, thiadiazole and oxadiazole, it being possible for these 5-membered heteroaromatic rings to carry on their carbon atoms from one to three of the following: nitro, cyano, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_6-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, C_1–C_4-alkoxy-C_1–C_4-alkyl, C_3–C_8-cycloalkyl, C_2–C_8-alkenyl, C_2–C_8-alkynyl, aryl or aryl-C_1–C_{10}-alkyl, it being possible for the aromatic radicals in turn to carry from one to five halogens and/or from one to three of the following: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio or C_1–C_4-haloalkylthio;
Y is oxygen or sulfur.

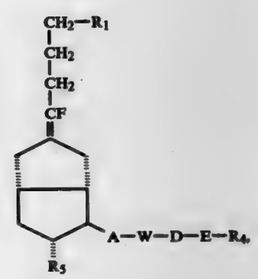
5,190,964

5-FLUOROCARBACYCLINS, THEIR PREPARATION AND PHARMACEUTICAL USE

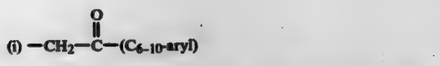
Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Martin Haberey; Claus-Steffen Stürzebecher, and Michael-Harold Town, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 334,795, Apr. 3, 1978, abandoned, which is a continuation of Ser. No. 188,877, May 2, 1988, abandoned, which is a continuation of Ser. No. 77,278, Jul. 24, 1987, abandoned, which is a continuation of Ser. No. 804,225, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 539,218, Oct. 5, 1983, abandoned. This application Feb. 15, 1990, Ser. No. 480,448
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3237200
Int. Cl.[5] C07C *177/00;* A61K *31/557*
U.S. Cl. 514—374 34 Claims

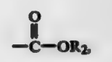
1. A 5-fluorocarbacyclin of the formula



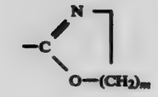
wherein
R_1 is $-CH_2OH$ or



wherein R_2 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; hydroxy; C_{1-4} alkoxy; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4}-alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms, or



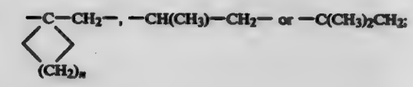
wherein the aryl group is unsubstituted or substituted by (a) 1–3 phenyl groups, each of which is unsubstituted or substituted by 1–3 halogen atoms; (B) 1–3 C_{1-4}-alkoxy groups; or (C) 1–3 halogen atoms;
R_1 is



wherein m is 1 or 2,
or R_1 is

wherein R_3 is R_2 or the acyl group of a C_{1-10}-hydrocarbon carboxylic or sulfonic acid;
W is —CHOR—, or

wherein the OR-group is in the α- or β-position;
R is tetrahydropyranyl, tetrahydrofuanyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-10}-hydrocarbon carboxylic or sulfonic acid;
A is $-CH_2-CH_2-$, trans—CH=CH—, or —C≡C—,
D is



n is 1, 2 or 3;
E is —C≡C— in the 18, 19-position (prostacyclin nomenclature),
R_5 is OR;
R_4 is (a) a C_{1-10} hydrocarbon aliphatic radical, (b) a C_{1-10} hydrocarbon aliphatic radical substituted by C_{6-10} aryl or by C_{6-10} aryl substituted by 1–3 halogen atoms; a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; (c) C_{3-10} cycloalkyl, (d) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-10} aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy groups, (g) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N and S, the remainder being carbon atoms;
or when R_2 is H, a physiologically compatible salt thereof with a base.

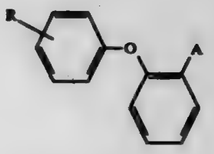
5,190,965

PHENOXYPHENYL DERIVATIVES, COMPOSITIONS AND METHODS OF USE THEREOF

Gerardus S. F. Ruigt, Eb Oss, Netherlands; Dirk Leysen, Lommel, Belgium, and Johannes H. Wieringa, Heesch, Netherlands, assignors to AKZO N.V., Velperweg, Netherlands

Filed May 29, 1992, Ser. No. 891,545
Claims priority, application European Pat. Off., May 29, 1991, 91201288.7
Int. Cl.[5] A61K *31/415;* C07D *233/22*
U.S. Cl. 514—401 5 Claims

1. A phenoxyphenyl derivative having the formula



(I)

wherein
R is one or two halogen atoms; and
A is 4,5-dihydro-1H-imidazole; or
a pharmaceutically acceptable salt thereof.

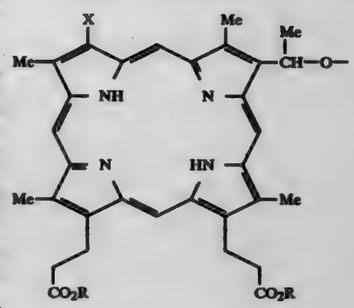
5,190,966

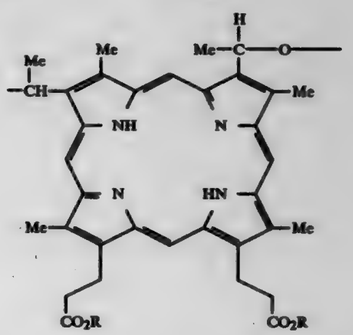
PURIFIED HEMATOPORPHYRIN DIMERS AND TRIMERS USEFUL IN PHOTODYNAMIC THERAPY

Thomas J. Dougherty, Grand Island, and Ravindra K. Pandey, Buffalo, both of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Division of Ser. No. 343,865, Apr. 26, 1989, Pat. No. 4,968,715, which is a continuation-in-part of Ser. No. 215,592, Jul. 6, 1988, abandoned. This application Sep. 18, 1990, Ser. No. 584,204
Int. Cl.[5] A61K *31/40;* C07D *487/22*
U.S. Cl. 514—410 5 Claims

1. A compound of the formula





VOL 1148 ISS 1 MR 2 1993 UMI

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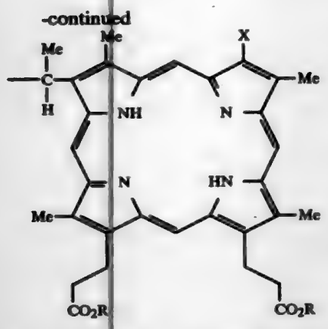


wherein each X is independently CH_3CHOH— or CH_2=CH— and wherein R is H or lower alkyl, in isolated form.

5. A pharmaceutical composition which consists essentially of the compound of claim 1 as active ingredient along with a pharmaceutically acceptable excipient.

5,190,967

MEDICAMENTS FOR TREATING ERECTILE DISORDERS

Alan J. Riley, Dunmore, England, assignor to Glaxo Group Limited, London, England

Filed Jun. 4, 1991, Ser. No. 711,068

Claims priority, application United Kingdom, Jun. 5, 1990, 9012469

Int. Cl.[5] A61K *31/40*

U.S. Cl. 514—411 **4 Claims**

1. A method of treatment of a mammal, including man, suffering from or susceptible to the effects of male erectile disorder which comprises administering to a mammal in need of such treatment an effective amount of a compound of formula (I):

(I)

or a physiologically acceptable salt or hydrate thereof.

5,190,968

(POLYCYCLIC-ARYLMETHOXY) INDOLES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

John W. Gillard, Baie d'Urfe, and John H. Hutchinson, Montreal, both of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

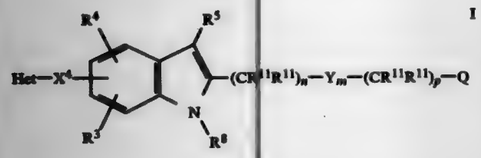
Filed Sep. 30, 1991, Ser. No. 768,124

Int. Cl.[5] C07D *209/18*; A61K *31/405*

U.S. Cl. 514—419 **14 Claims**

1. A compund of the formula I:

I



wherein:

Het is ArR^1R^2;

Ar is a bicyclic or tricyclic aromatic hydrocarbon;

R^1, R^2, R^3, R^4 and R^{10} are independently hydrogen, halogen, perhalo lower alkenyl, lower alkyl, lower alkenyl, lower alkynyl, $-CF_3$, —CN, $-NO_2$, $-N_3$, $-C(OH)R^{11}R^{11}$, $-CO_2R^{12}$, $-SR^{14}$, $-S(O)R^{14}$, $-S(O)_2R^{14}$, $-S(O)_2NR^{15}R^{15}$, $-OR^{15}$, $-NR^{15}R^{15}$, $-NR^{1-2}CONR^{15}R^{15}$, $-COR^{16}$, $CONR^{15}R^{15}$, or $-(CH_2)_rR^{21}$;

R^5 is hydrogen, $-CH_3$, CF_3, —C(O)H, X^1—R^6 or X^2—R^7;

R^6 and R^9 are independently alkyl, alkenyl, $-(CH_2)_nPh(R^{10})_2$ or $-(CH_2)_nTh(R^{10})_2$, wherein Ph is phenyl and Th is 2- or 3-thienyl;

R^7 is $-CF_3$ or R^6;

R^8 is hydrogen or X^3—R^9;

each R^{11} is independently hydrogen or lower alkyl, or two R^{11}'s on same carbon atom are joined to form a cycloalkyl ring of 3 to 6 carbon atoms;

R^{12} is hydrogen, lower alkyl or $-CH_2R^{21}$;

R^{13} is lower alkyl or $-(CH_2)_rR^{21}$;

R^{14} is $-CF_3$ or R^{13};

R^{15} is hydrogen, $-COR^{16}$, R^{13}, or two R^{15}'s on the same nitrogen may be joined to form a monocyclic heterocyclic ring of 4 to 6 atoms containing up to 2 heteroatoms chosen from O, S, or N;

R^{16} is hydrogen, $-CF_3$, lower alkyl, lower alkenyl, lower alkynyl or $-(CH_2)_rR^{21}$;

R^{17} is $-(CH_2)_s-C(R^{18}R^{18})-(CH_2)_s-R^{19}$ or $-CH_2CONR^{15}R^{15}$;

R^{18} is hydrogen or lower alkyl;

R^{19} is

a) 2,5-dioxy-1-pyrrolidinyl, (3-pyridinylcarbonyl) amino, 1,3-dihydro-1,3-dioxo-2H-isoindol-2-yl, 1,3-dihydro-2H-isoindol-2-yl, 2,4-imidazolinedion-1-yl, 2,6-piperidinedion-1-yl, 2-imidazolyl, 2-oxo-1,3-dioxolen-4-yl, piperidin-1-yl, morpholin-1-yl, or piperazin-1-yl, or

b) the radical W—R^{20};

R^{20} is alkyl or $-COR^{23}$;

R^{21} is phenyl substituted with 1 or 2 R^{22} groups;

R^{22} is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, lower alkylcarbonyl, $-CF_3$, —CN, $-NO_2$ or $-N_3$;

R^{23} is alkyl, cycloalkyl, or monocyclic monoheterocyclic ring of 5 to 7 members containing only 1 heteratom selected from N, S, or O;

R^{24} is the residual structure of a standard amino acid, or R^{18} and R^{24} attached to the same N can cyclize to form a proline residue;

m is 0 or 1;

n is 0 to 3;

p is 1 to 3 when m is 1;

p is 0 to 3 when m is 0;

r is 0 to 2;

s is 0 to 3;

t is 0 to 2;

u is 0 to 3;

W is 0, S or NR^{15};

X^1 is O or NR^{15};

X^2 is CO, $CR^{11}R^{11}$, S, S(O), or $S(0)_2$;

X^3 is CO, $CR^{11}R^{11}$, $S(0)_2$, or a bond;

X^4 is CH=CH, CH_2—Y^1, or Y^1—CH_2;

Y is X^1 or X^2;

Y^1 is O, S, $S(0)_2$, or CH_2;

Q is $-CO_2R^{12}$, $-CONHS(O)_2R^{14}$, $-NHS(O)_2R^{14}$, $-S(O)_2NHR^{15}$, $-CONR^{15}R^{15}$, $-CO_2R^{17}$, $-CONR^{18}R^{24}$, $-CR^{11}R^{11}OH$, or 1H- or 2H-tetrazol-5-yl;

or a pharmaceutically acceptable salt thereof.

5,190,969

2,3-EPOXY DERIVATIVES AS ANTI RETROVITAL CHEMOTHERAPEUTIC AGENTS

Jeffrey J. Blumenstein, Germantown; Christopher J. Michejda; Stephen Oroszlan, both of Potomac, and Terry Copeland, Frederick, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Filed Dec. 20, 1988, Ser. No. 286,977

Int. Cl.[5] A61K *31/40, 31/335*

U.S. Cl. 514—422 **9 Claims**

1. An antiviral compound having the formula:

wherein R is COR^5; R^5 is a naturally occurring or synthetic amino acid bound via a terminal nitrogen on said naturally occurring or synthetic amino acid; and R^1 is aralkyl, aralkyl(lower alkyl)ether, C_5–C_{13} alkyl(lower alkyl)ether, or C_{5-13}alkyl.

5,190,970

METHOD FOR PREVENTING ONSET OF OR TREATING TYPE II DIABETES EMPLOYING A CHOLESTEROL LOWERING DRUG ALONE OR IN COMBINATION WITH AN ACE INHIBITOR

Henry Y. Pan, Princeton Junction, and Michael Bergman, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 599,957, Oct. 19, 1990, Pat. No. 5,130,333. This application Dec. 20, 1991, Ser. No. 811,122

Int. Cl.[5] A61K *31/35, 31/40*

U.S. Cl. 514—423 **8 Claims**

1. A method for reducing the risk of Type II diabetes, which comprises administering to a mammalian specie in need of treatment a therapeutically effective amount of a combination of a cholesterol lowering drug which is mevastatin, lovastatin, pravastatin or velostatin, and an angiotensin converting enzyme inhibitor which is captopril, zofenopril, enalapril, ceranapril, fosinopril, lisinopril, fentiapril, pivopril, ramipril, cilazapril, BRL-36,378, MC-838, alacepril, quinapril, indolapril, delapril, spirapril, CGS14,824, CGS16,617, perindopril CI925, and WY-44221.

5,190,971

SUBSTITUTED DIBENZ-OXA-THIOCINONES, -12-OXIDES AND -12,12-DIOXIDES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN MEDICAMENTS

Peter Fey; Klaus Frobel; Jan-Bernd Lourfos, all of Wuppertal; Andreas Knorr, Erkrath; Johannes-Peter Stasch, Wuppertal; Erwin Bischoff, Wuppertal; Hans-Georg Dellweg, Wuppertal, and Martin Beuck, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 798,386

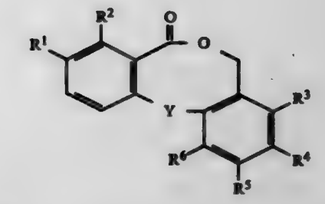
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1990, 4039860

Int. Cl.[5] A61K *31/39*; C07D *327/00*

U.S. Cl. 514—431 **5 Claims**

1. A dibenz-oxa-thiazinone of the formula I

(I)



in which

R^1 and R^6 are identical or different and each represent hydrogen; or represent straight-chain or branched alkyl or alkenyl each having up to 10 carbon atoms which are optionally monosubstituted to trisubstituted by halogen, azido or imino or by cycloalkyl having 3 to 8 carbon atoms or aryl having 6 to 10 carbon atoms, which in turn are optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of halogen, nitro, cyano, hydroxyl and straight-chain or branched alkyl, alkoxy or alkoxycarbonyl each having up to 6 carbon atoms; or represent alkyl or alkenyl which are optionally additionally substituted by a group of the formula $-OR^7$, —CO—R^8 or $-CONR^9R^{10}$, in which

R^7 denotes hydrogen, cycloalkyl having 3 to 7 carbon atoms or straight-chain or branched alkyl, alkenyl or acyl each having up to 8 carbon atoms, which are optionally monosubstituted to trisubstituted by halogen-substituted phenyl, cycloalkyl having 3 to 7 carbon atoms, hydroxyl, halogen or straight-chain or branched alkoxy having up to 6 carbon atoms or by carboxyl, acyl having up to 6 carbon atoms or alkoxycarbonyl having up to 6 carbon atoms,

R^8 denotes hydrogen, hydroxyl, phenoxy or straight-chain or branched alkoxy having up to 8 carbon atoms, or denotes aryl having 6 to 10 carbon atoms or cycloalkyl having 3 to 8 carbon atoms, which are optionally substituted by hydroxyl or halogen or by straight-chain or branched alkyl, alkoxy or alkoxycarbonyl each having up to 8 carbon atoms, or denotes straight-chain or branched alkyl or alkenyl each having up to 8 carbon atoms, which are optionally substituted by halogen, carboxyl, hydroxyl or alkoxy, alkoxycarbonyl or acyl each having up to 6 carbon atoms,

R^9 and R^{10} are identical or different and denote hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or denote phenyl, or

R^1 and/or R^6 directly represent a group of the formula $-OR^7$ or —CO—R^8,

in which

R^7 and R^8 have the abovementioned meaning,

R^2 represents hydrogen, or represents the group $-OR^7$,

in which

R^7 has the abovementioned meaning, or represents straight-chain or branched alkyl or alkenyl each having up to 8 carbon atoms, which are optionally substituted by the group $-OR^7$,

in which

R^7 has the abovementioned meaning, or represents phenyl which is optionally monosubstituted to trisubstituted by halogen, nitro or hydroxyl or by straight-chain or branched alkoxy having up to 6 carbon atoms,

R^3, R^4 and R^5 are identical or different and represent hydrogen, nitro, halogen or straight-chain or branched alkyl having up to 8 carbon atoms,

Y represents a sulphur atom or a group of the formula >SO or $>SO_2$,

and their physiologically acceptable salts, with the proviso that if Y represents the >SO— or $>SO_2$-group, at least one of the substituents R^1–R^6 must be different from hydrogen.

R^{64}, R^{74}, R^{84} and R^{94} are individually selected from the

VOL 1148 ISS 1 MR 2 1993

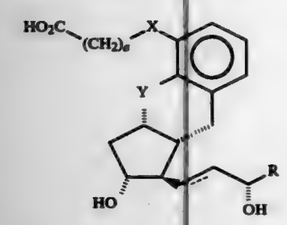
5,190,972

METHOD OF COMBATTING CYCLOSPORINE ORGAN TOXICITY WITH PROSTAGLANDIN ANALOGS

Lynette J. Dumble, Victoria, Australia, assignor to The University of Melbourne, Melbourne, Australia

Filed Jan. 27, 1992, Ser. No. 825,669
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—454 7 Claims

1. A method of combatting cyclosporine nephrotoxicity in a subject in need of such treatment, comprising administering to said subject an effective cyclosporine nephrotoxicity-combatting amount of a compound of formula (I):



(I)

wherein:
a is an integer of from 1 to 3;
X and Y, which may be the same or different, are selected from —O— and —CH_2—;
R is —$(CH_2)_5R^1$ wherein R^1 is hydrogen or methyl, or R is cyclohexyl, or R is —$CH(CH_3)CH_2C{\equiv}CCH_3$; and
the dotted line represents an optional double bond;
or of a physiologically acceptable salt or acid derivative thereof.

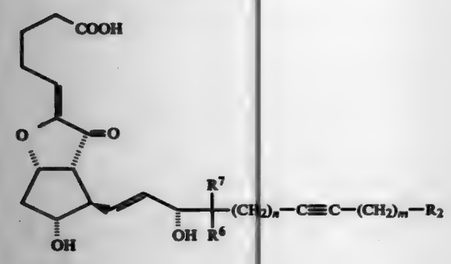
5,190,973

20-ALKYL-7-OXOPROSTACYCLIN DERIVATIVES USEFUL AS PHARMACEUTICALS

Robert Nicholson, Berlin; Helmut Vorbruegger; Claus S. Stuerzebecher, and Martin Haberey, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 277,825, Nov. 30, 1988, abandoned, which is a continuation of Ser. No. 144,139, Jan. 15, 1988, abandoned, which is a continuation of Ser. No. 37,892, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 917,444, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 759,039, Jul. 10, 1985, abandoned. This application Oct. 19, 1990, Ser. No. 599,916
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340988
Int. Cl.[5] A61K *31/34, 31/557;* C07D *307/937*
U.S. Cl. 514—470 5 Claims

1. A 20-alkyl-7-oxoprostacyclin derivative of formula I



I

wherein
n is 1;
R_2 is a straight-chain or branched-chain C_{1-4}-alkyl group;
m is 1; and
R_6 and R_7 each independently are H or a straight-chain or branched-chain C_{1-4}-alkyl group;
or a salt thereof with a physiologically compatible base.

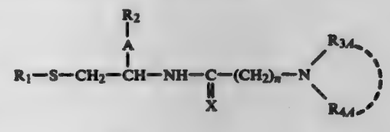
5,190,974

N-SUBSTITUTED DERIVATIVES OF α-MERCAPTO ALKYLAMINES, THEIR PREPARATION PROCESS AND THE INTERMEDIATES OBTAINED, THEIR USE AS MEDICAMENTS AND THE COMPOSITIONS CONTAINING THEM

Francoise Clemeance; Odile Le Martret, both of Paris, and Francis Petit, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 5, 1991, Ser. No. 725,985
Claims priority, application France, Jul. 5, 1990, 90 08539
Int. Cl.[5] A61K *31/21, 31/17;* C07C *273/00, 327/00*
U.S. Cl. 514—513 12 Claims

1. A compound selected from the group consisting of mercapto-alkylamines in all possible racemic, enantiomeric and diastereoisomeric forms of the formula

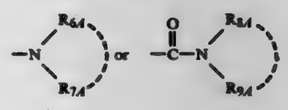


I,

wherein n is an integer from 0 to 4, R_1 is hydrogen or

R_5 is selected from the group consisting of optionally substituted alkyl of 1 to 6 carbon atoms, optionally substituted alkenyl and alkynyl of 2 to 6 carbon atoms, optionally substituted and optionally unsaturated monocyclic ring of 5 to 7 links and condensed rings of 8 to 10 links and

R_{10} and R_{11} are individually selected from the group consisting of hydrogen, optionally substituted alkyl or 1 to 6 carbon atoms, optionally substituted alkenyl and alkynyl of 2 to 6 carbon atoms and optionally substituted monocyclic aryl of 5 to 7 links or condensed aryl of 8 to 10 links, A is selected from the group consisting of alkylene of 1 to 6 carbon atoms and alkenylene of 2 to 6 carbon atoms, both optionally substituted with —OH or alkoxy of 1 to 6 carbon atoms and a single bond, R_2 is optionally substituted monocyclic ring of 5 to 7 links or condensed rings of 8 to 10 links, X is oxygen or sulfur, R_{3A} and R_{4A} are individually selected from the group consisting of hydrogen, —OH, alkoxy of 1 to 6 carbon atoms, acyl and acyloxy of up to 6 carbon atoms, salified or esterified carboxy, —CN, optionally substituted alkyl of 1 to 6 carbon atoms, optionally substituted alkenyl and alkynyl of 2 to 6 carbon atoms, R_c and R_c—O—, R_c is selected from the group consisting of optionally substituted aliphatic or aryl monocyclic ring of 5 to 7 links or condensed rings of 8 to 10 links,



R_{6A}, R_{7A}, R_{8A} and R_{9A} are individually selected from the group consisting of hydrogen, —OH, alkyl, alkoxy, acyl and acyloxy of up to 6 carbon atoms, free, salified or esterified carboxy, phenoxy, phenyl, benzyl, phenethyl, and their non-toxic, pharmaceutically acceptable acid addition salts.

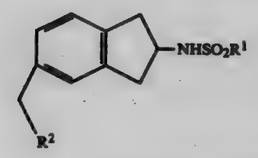
5,190,975

INDAN DERIVATIVES USED FOR TREATING THROMBOSES OR ASTHMA

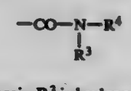
Takeo Iwakuma, Agao; Harumichi Kohno, Koganei; Yasuhiko Sasaki; Katsuo Ikezawa, both of Urawa, and Akio Odawara, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 688,246, Apr. 22, 1991, which is a division of Ser. No. 271,324, Nov. 15, 1988, Pat. No. 5,030,652. This application Jun. 12, 1992, Ser. No. 897,412
Claims priority, application Japan, Nov. 18, 1987, 62-290957; Jun. 21, 1988, 63-152642; Jun. 21, 1988, 63-152643
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—562 4 Claims

1. A method for the treatment or prophylaxis of thromboses in a warm-blooded animal which comprises administering an effective amount of a compound having the formula:



wherein R^1 is a phenyl group or a phenyl group substituted by a member selected from the group consisting of a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a halogen atom, trifluoromethyl, and nitro, or a naphthyl group, and R^2 is a hydroxymethyl group or a group of the formula:



wherein R^3 is hydrogen atom or a C_1–C_5 alkyl group and R^4 is a C_3–C_6 cycloalkyl group, a C_2–C_6 alkoxycarbonyl-phenyl group, carboxy-phenyl group, a C_1–C_5 alkyl group, or a C_1–C_5 alkyl group having a substituent selected from a C_1–C_5 alkoxycarbonyl group, carboxy group, a C_2–C_6 alkoxycarbonylphenyl group, a carboxy-phenyl group, a C_2–C_6 alkoxycarbonyl-(C_3–C_6)cycloalkyl group and a carboxy-(C_3–C_6)cycloalkyl group, or a pharmaceutically acceptable salt thereof to said warm blooded animal.

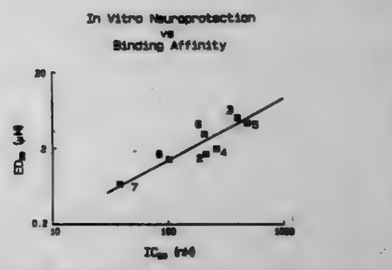
5,190,976

N,N'-DISUBSTITUTED GUANIDINES AND THEIR USE AS EXCITATORY AMINO ACID ANTAGONISTS

Eckard Weber, Laguna Beach, Calif., and John F. W. Keana, Eugene, Oreg., assignors to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University and University of Oregon, Eugene, Oreg.

Continuation-in-part of Ser. No. 487,033, Mar. 2, 1990, Pat. No. 5,093,525, which is a continuation-in-part of Ser. No. 237,367, Aug. 29, 1988, Pat. No. 4,906,779, which is a continuation-in-part of Ser. No. 884,150, Jul. 10, 1986, Pat. No. 4,709,094. This application Mar. 2, 1992, Ser. No. 844,498
Int. Cl.[5] A61K *31/535;* A01N *37/52*
U.S. Cl. 514—634 12 Claims

1. A neuroprotecting symmetrical N,N'-disubstituted guanidine which exhibits a high binding activity with respect to the PCP receptor in the NMDA receptor-channel complex and is selected from the group consisting of N,N'-Bis(3-trifluoromethylphenyl)guanidine, N,N'-Bis(4-fluoro-3-ethylphenyl)guanidine; N,N'-Bis(3,5-diethylphenyl)guanidine; N,N'-Bis(3-nitrophenyl)guanidine; N,N'-Bis(4-fluoro-3-nitrophenyl)guanidine; N,N'-Bis(3-nitro-5-ethylphenyl)guanidine; N,N'-Bis(3-azidophenyl)guanidine; N,N'-Bis(quinolin-8-yl)guanidine and N,N'-Bis(coumarin-8-yl)guanidine, or a physiologically acceptable salt thereof.



5,190,977

ANTIVIRAL COMPOSITIONS

Stephen Herman, 9341 Hazel Cir., Villa Park, Calif. 92667

Continuation of Ser. No. 600,316, Oct. 19, 1990, Pat. No. 5,006,076, which is a division of Ser. No. 363,628, Jun. 8, 1989, Pat. No. 4,983,637, which is a continuation-in-part of Ser. No. 211,378, Jun. 24, 1988, abandoned, and a continuation-in-part of Ser. No. 456,216, Dec. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 211,378, Jun. 24, 1988, abandoned. This application Nov. 21, 1991, Ser. No. 795,513
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.
Int. Cl.[5] A01N *27/00;* A61K *31/01*
U.S. Cl. 514—724 3 Claims

1. An antiviral pharmaceutical composition comprising a pharmaceutically acceptable non-aqueous systemic carrier and a pharmacologically antiviral amount of an ozonide of a terpene, wherein said composition is suitable for systemic injection.

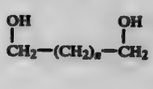
5,190,978

CARCINOSTATIC COMPOSITIONS AND METHODS

Shingo Nakamura, Joyo; Yoshichika Nishimura, Kyoto; Sensuke Naruse, Tsu, and Nobuhiko Miwa, 20-17 Mikkaichimachi, Shobara-shi, Hiroshima-ken, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co. Ltd., Kyoto and Nobuhiko Miwa, Hiroshima, both of, Japan

Filed Sep. 28, 1990, Ser. No. 589,580
Claims priority, application Japan, Sep. 29, 1989, 1-255674; Sep. 29, 1989, 1-255675
Int. Cl.[5] A61K *31/045*
U.S. Cl. 514—738 15 Claims

1. A method of treatment for suppressing the growth of a tumor in an animal having a tumor which is susceptible to such treatment which comprises administering thereto orally or parenterally a pharmacologically effective amount of a diol represented by the formula (I):

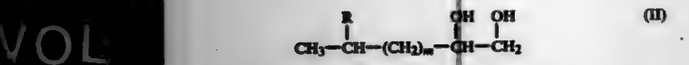


(I)

wherein
n is an integer of 6 to 33;
or by the formula (II):

$(CH_2)_m$—O—C(O)—R^1 or $(CH_2)^m$—O—C(O)—OR^1, of expandable polymer bead which is impregnated with a

1993 UMI



(II)

wherein R is a hydrogen of C_1 to C_5 alkyl and m is an integer of 3 to 21.

5,190,979

OZONIDES OF TERPENES AND THEIR MEDICAL USES

Stephen Herman, 9341 Hazel Cir., Villa Park, Calif. 92667

Continuation of Ser. No. 823,087, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 456,216, Dec. 20, 1989, abandoned, which is a division of Ser. No. 211,378, Jun. 24, 1988, abandoned. This application Jun. 9, 1992, Ser. No. 896,735

Int. Cl.[5] A01N *31/00, 31/04;* A61K *31/045;* C07C *45/00*

U.S. Cl. 514—762 16 Claims

1. A method of medical treatment for a medical condition in a mammal, said condition being selected from the group consisting of viral infections, bacterial infections, fungal infections, dermatoses, indolent neoplasms, sunburn, burns and swollen joints, said method comprising the parenteral application to said mammal of a pharmacologically effective amount for treatment of said condition of an ozonide of a termpene in a pharmacologically acceptable carrier or excipient.

5,190,980

PYROGLUTAMIC ACID ESTERS, THEIR SYNTHESIS AND USE IN TOPICAL PRODUCTS

John G. Black, Bedford, and Ian R. Scott, Northamptonshire, both of England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 430,074, Nov. 1, 1989, abandoned, which is a continuation of Ser. No. 17,104, Feb. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 764,170, Aug. 9, 1985, Pat. No. 4,774,225. This application Apr. 26, 1991, Ser. No. 696,286

Claims priority, application United Kingdom, Aug. 20, 1984, 8421112

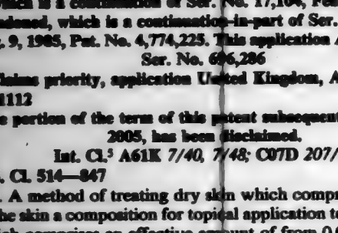
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[5] A61K *7/40, 7/48;* C07D *207/12*

U.S. Cl. 514—847 10 Claims

9. A method of treating dry skin which comprises applying to the skin a composition for topical application to human skin, which comprises an effective amount of from 0.01 to 99% by weight of:

(a) an ester of pyroglutamic acid having the structure:



wherein n is 1 or 2; and wherein R″ is hydrogen, a straight or branched chain alkyl group having up to 22 carbon atoms; a straight or branched chain group selected from the group consisting of:
hydroxymethyl
2-hydroxyethyl
2-hydroxy-n-propyl
3-hydroxy-n-propyl
2-hydroxy-n-butyl
3-hydroxy-n-butyl
5-hydroxy-n-valeryl
2,3-dihydroxy-n-propyl
2,3-dihydroxy-n-butyl, and
12-hydroxylstearyl,
or an alkenyl group, selected from the group consisting of:
linoleyl
linolenyl
arachidonyl and
columbinyl;
and R′ is defined as R″ and is the same or different from R″ except that it cannot be hydrogen and except that, when R″ is an alkenyl group as defined above, the R′ must have 10 to 22 carbons; and

(b) a physiologically and cosmetically acceptable diluent.

5,190,981

FORMULATION CONTAINING S(+) ENANTIOMER OF FLURBIPROFEN OR KETOPROFEN AND METHOD OF USE FOR ORAL ADMINISTRATION FOR PREVENTION AND TREATMENT OF BONE LOSS ASSOCIATED WITH PERIODONTAL DISEASE

William J. Wechter, Redlands, Calif., assignor to Sepracor Inc., Marlborough, Mass.

Continuation-in-part of Ser. No. 568,220, Aug. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,331, Aug. 17, 1989, abandoned. This application May 28, 1991, Ser. No. 705,941

Int. Cl.[5] A01N *37/10;* A61K *31/19*

U.S. Cl. 514—900 7 Claims

1. A composition for application to buccal membranes to achieve enhanced bioavailability to promote bone regrowth and to reduce inflammation and bone resorption associated with periodontal disease, said composition comprising a highly purified S(+) enantiomer of at least one nonsteroidal anti-inflammatory drug selected from the group consisting of S(+) flurbiprofen and S(+) ketoprofen in a pharmaceutically acceptable formulation for application to buccal membranes.

5,190,982

ULTRASONIC CONTRAST AGENTS, PROCESSES FOR THEIR PREPARATION AND THE USE THEREOF AS DIAGNOSTIC AND THERAPEUTIC AGENTS

Raimund Erbel; Rainer Zotz, both of Mainz; Volker Krone, Flörsheim; Michael Magerstädt, Hofheim am Taunus, and Axel Walch, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 690,761, Apr. 24, 1991, Pat. No. 5,137,928. This application May 26, 1992, Ser. No. 859,257

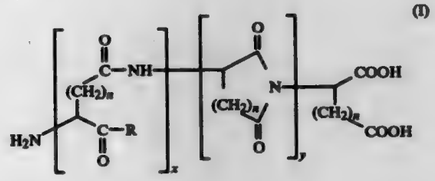
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013321

Int. Cl.[5] C08J *9/16*

U.S. Cl. 521—56 1 Claim

1. A process for the preparation of an ultrasonic contrast agent composed of microparticles which contain a gas and a polyamino-dicarboxylic acid-co-imide derivative of the formula I

(I)



in which
n is 1 or 2
x is 1 to 500
y is 1 to 500, where
x+y is 2 to 1000, and
R is O—R^1 or NH—R^2, in which R^2 is H, (CH_2)m—OR^1, $(CH_2)^m$—O—C(O)—R^1 or $(CH_2)^m$—O—C(O)—OR^1, and
m is 2 to 6, and
R^1 is H, aryl, aralkyl, arylalkenyl, alkyl or C_3–C_8-cycloalkyl or a biologically inactive steroid alcohol or an amino acid, where aryl is unsubstituted or is substituted by C_1–C_4-alkyl, C_2–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkylcarbonyloxy, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy or hydroxyl,
where the alkyl radicals specified for R^1 have 1–22 carbon atoms and the alkenyl radicals have 2–22 carbon atoms, which are not interrupted or are interrupted by a carbonyloxy or oxycarbonyl group, where the repeating units placed in square brackets are distributed randomly and/or in blocks in the polymer, and where both the repeating units labeled with x and those labeled with y are identical or different and where the amino acids are α- and/or β-linked, which process comprises:

(a) a solution of one or more polyamino-dicarboxylic acid-co-imide derivatives of the formula I or a solution of this or these derivatives which additionally contains one or more other polymers and/or physiologically acceptable auxiliaries being spray-dried, or

(b) one or more polyamino-dicarboxylic acid-co-imide derivatives of the formula I being dissolved in a solvent or solvent mixture with high melting point, or these derivatives being mixed with one or more other polymers and/or physiologically acceptable auxiliaries and dissolved in a solvent mixture with high melting point and then added dropwise to a condensed cold gas and subsequently the solvent being removed, or

(c) one or more polyamino-dicarboxylic acid-co-imide derivatives of the formula I being dissolved in a solvent or solvent mixture and subsequently, where appropriate after addition of another solvent and/or of one or more other polymers, being precipitated or dispersed in water, and the resulting suspension being freed of solvents.

5,190,983

HOLLOW PARTICLES OF CROSSLINKED MELAMINE RESIN HAVING A UNIFORM PARTICLES DIAMETER AND A PROCESS FOR PRODUCING THE SAME

Masami Ito, Chigasaki; Satoshi Kouishi, and Fuminosu Fukunawa, both of Fujisawa, all of Japan, assignors to Honen Corporation, Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 651,936

Claims priority, application Japan, Feb. 19, 1990, 2-37745

Int. Cl.[5] C08J *9/32;* B01J *13/02*

U.S. Cl. 521—56 6 Claims

1. A process for producing hollow particles of crosslinked melamine formaldehyde resin having a uniform particle diameter, said process comprising subjecting a water-soluble melamine-formaldehyde-methanol precondensate to condensation reaction in the presence of a curing catalyst, said curing catalyst comprised of an organic acid, in an aqueous solution containing a water-soluble polymer with carboxyl groups or a water-soluble copolymer of ethylenically unsaturated carboxylic acid monomer until the reaction liquid becomes turbid due to the formation of particles; adding to the reaction mixture a solvent or substance which dissolves or swells the melamine resin condensate forming the particles; optionally diluting the mixture with a reactive solvent after the addition of the solvent or substance; and allowing the reaction to go to completion.

5,190,984

PHOTODEGRADABLE EXPANDED POLYMERIC FOAM

Ervin R. Dan, Lexington, and John Kwok, Holden, both of Mass., assignors to Novacor Chemicals (International) S.A., Fribourg, Switzerland

Filed Sep. 23, 1991, Ser. No. 763,694

Int. Cl.[5] C08J *9/18*

U.S. Cl. 521—59 13 Claims

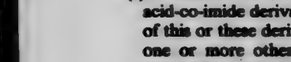
1. In a suspension polymerization process for the production of expandable polymer bead which is impregnated with a blowing agent wherein said polymer comprises:

(i) from 50 to 100 weight % of one or more C_{8-12} vinylaromatic monomers which are unsubstituted or substituted by a C_{1-4} alkyl radical; and

(ii) from 0 to 50 weight % of one or more monomers selected from the group consisting of:
C_{1-4} alkyl acrylates, C_{1-4} alkyl methacrylates, anhydrides of C_{4-6} dicarborylic acids and C_{3-8} alkyl nitriles;
the improvement comprising dissolving is in said vinyl aromatic monomer at least 1 weight % of a copolymer comprising:

(i) from 0 to 99 weight % of one or more C_{8-12} vinyl aromatic monomers which are unsubstituted or substituted by a C_{1-4} alkyl radical; and

(ii) from 1 to 100 weight % of one or more monomers of the formula:



1

wherein R_1, and R_2, are independently selected from the group consisting of a hydrogen atom and C_{1-4} alkyl radical; and R_3 is selected from the group consisting of a C_{1-4} alkyl radical and a C_{6-10} aromatic radical.

5,190,985

STABLE AMINOPLAST CELLULAR FOAMS AND THE PROCESS FOR THEIR MANUFACTURE

Karl J. Milder, Pfäffikon, Switzerland, assignor to IDC System AG, Freienbach, Switzerland

PCT No. PCT/CH91/00061, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO91/14731, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 18, 1991, Ser. No. 768,990

Claims priority, application Switzerland, Mar. 22, 1990, 954/90

Int. Cl.[5] C08J *9/00, 9/02*

U.S. Cl. 521—116 16 Claims

1. A stable aminoplastic cellular foam comprising a reaction product of an amine formaldehyde precondensate constituent (A) with a foaming agent hardener constituent (B) wherein constituent (A) contains a halogenated alkene polyalcohol and/or constituent (B) contains dodecylbenzolsulphonic acid, optionally partially esterified with a fatty alcohol, and contains a long-chain polyalcohol.

5,190,986

ELASTOMERIC LOW DENSITY FOAMABLE COMPOSITIONS AND PROCESS OF MAKING THE SAME AND ARTICLES MADE THEREFROM

Richard B. Allen, Troy, N.Y., and Peplin Shanlan, Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 530,549, Jul. 9, 1990, Pat. No. 5,130,340. This application Dec. 6, 1991, Ser. No. 802,941

Int. Cl.[5] C08J *9/16*

U.S. Cl. 521—139 24 Claims

1. An elastomeric, low density foamable composition in the form of particles or beads, comprised of:

(a) a major amount, based on the total amount of (a) and (b), of a block copolymer comprised of an alkenyl aromatic compound and a diene monomer;

(b) a minor amount, based on the total amount of (a) and (b), of one or more other thermoplastic resins selected from alkenyl aromatic resins, polyphenylene ether resins, and mixtures thereof; and

(c) an easily volatile blowing agent present in an amount sufficient to foam the resin combination to a density of less than about 20 lbs./ft.[3].

5,190,597

METHOD FOR DRYING FOAMS

Martin Parkinson, 6 North Delaware Dr., Nyack, N.Y. 10960

Filed Aug. 10, 1992, Ser. No. 927,852
Int. Cl.[5] C08J 9/40, 9/42
U.S. Cl. 521—146 **8 Claims**

1. A method for maintaining the internal structure of a liquid filled organic polymer foam during the removal of said liquid from said foam, which comprises the steps of:
(a) replacing said liquid within said foam by immersing said foam in a melted fluorocarbon solvent selected from the group consisting of
1,1-difluorotetrachloroethane and
1,2-difluorotetrachloroethane;
(b) solidifying said melted fluorocarbon solvent; and
(c) vacuum sublimating said solidified fluorocarbon solvent from said foam.

5,190,988

ULTRAVIOLET-CURABLE ORGANOPOLYSILOXANE COMPOSITION CONTAINING A BENZOINSULPHONATE INITIATOR AND METAL CATALYST

Shunji Aoki; Toshio Ohba, and Yasuaki Hara, all of Gunma, Japan, assignors to Shin-Etsu Chemical Company, Limited, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,706
Claims priority, application Japan, May 30, 1990, 2-138608
Int. Cl.[5] C08F 2/50, 4/00; C08G 77/06, 77/04
U.S. Cl. 522—18 **11 Claims**

1. An ultraviolet-curable organopolysiloxane composition which comprises, as a mixture:
(a) 100 parts by weight of an organopolysiloxane having a viscosity in the range of from 50 to 3000 centipoise at 25° C. and containing, in a molecule, at least one (meth)acryloxy-substituted monovalent hydrocarbon group or at least one epoxy- or glycidyloxy-substituted monovalent hydrocarbon group;
(b) from 0.1 to 20 parts by weight of a sulfonate compound represented by the general formula

$$R^1—CO—CR^2(OR^3)—CR_2^4—O—SO_2—R^5,$$

in which R^1 and R^2 are each an unsubstituted or substituted aryl group having 6 to 30 carbon atoms, R^3 is a hydrogen atom or a monovalent hydrocarbon group having 1 to 7 carbon atoms, R^4 is a hydrogen atom or a monovalent hydrocarbon group having 1 to 5 carbon atoms, R^5 is an unsubstituted or substituted monovalent hydrocarbon group having 1 to 20 carbon atoms; and
(c) from 0.1 to 20 parts by weight of a salt represented by the general formula

$$MA_q$$

in which M is a cation of an alkali metal or alkaline earth metal element. A is a non-nucleophilic and non-basic anion selected from the group consisting of SbF_6^-, $SbCl_6^-$, PF_6^-, BF_4^-, HSO_4^-, and ClO_4^- and the subscript q is 1 or 2.

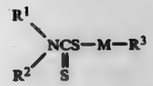
5,190,989

HYDROPHILIC GROUP-CONTAINING AB-TYPE BLOCK COPOLYMER

Shunichi Himori, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

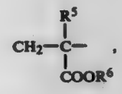
Continuation of Ser. No. 209,597, Jun. 22, 1988, abandoned.
This application Nov. 30, 1990, Ser. No. 620,389
Claims priority, application Japan, Jun. 23, 1987, 62-154458
Int. Cl.[5] C08F 2/50, 4/00, 293/00
U.S. Cl. 522—57 **6 Claims**

1. An AB-type block copolymer represented by formula (I):

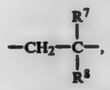


(I)

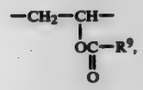
wherein R^1 represents a hydrocarbon group having 1 to 10 carbon atoms; R^2 represents a hydrogen atom or a hydrocarbon group having 1 to 10 carbon atoms; R^3 represents a benzyl group, T,0461
wherein R^4 represents an alkyl group having 1 to 10 carbon atoms, or an alkyl group having 1 to 18 carbon atoms; M represents a group represented by the formula $(M^2)_m$-$(M^1)_n$ or $(M^1)_m$-$(M^2)_n$, each of m and n being a natural number of 20 to 5,000; M^1 represents a (meth)acrylate residue represented by the formula:



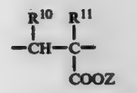
wherein R^5 represents a hydrogen atom or a methyl group, and R^6 represents a hydrocarbon group having 1 to 18 carbon atoms, or an aromatic vinyl residue represented by the formula:



wherein R^7 represents a hydrogen atom or a methyl group, R^8 represents a phenyl group, a halogenated phenyl group or an alkylphenyl group or a fatty acid vinyl ester residue represented by the formula:

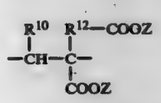


wherein R^9 represents a hydrocarbon group having 1 to 18 carbon atoms, M^2 represents a hydrophilic group-containing vinyl residue represented by any one of the formulae (II) to (XII):



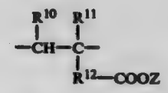
(II)

wherein R^{10}, R^{11} each represent a hydrogen atom, a methyl or a hydroxyl group, and Z represents a hydrogen atom, an alkali metal atom, ammonium or an organic amine;



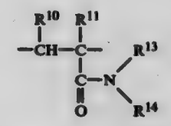
(III)

wherein R^{10} and Z have the same meanings as in the formula (II), and R^{12} represents an alkylene group having 1 to 10 carbon atoms;



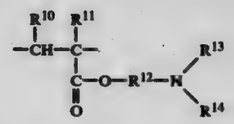
(IV)

wherein R^{10}, R^{11} and Z have the same meanings as in the formula (II), and R^{12} has the same meaning as in the formula (III):



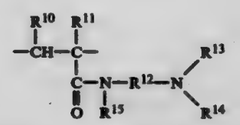
(V)

wherein R^{10} and R^{11} have the same meanings as in the formula (II), R^{13} and R^{14} each represent a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or a sulfonated alkyl group represented by the formula $—R^{12}SO_3Z$, wherein R^{12} and Z have the same meanings as in the formula (III):



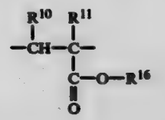
(VI)

wherein R^{10}, R^{11} and R^{12} have the same meanings as in the formula (IV), and R^{13} and R^{14} have the same meanings as in the formula (V):



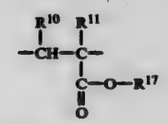
(VII)

wherein R^{10}, R^{11}, R^{12}, R^{13} and R^{14} have the same meanings as in the formula (VI), and R^{15} represent a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or a sulfonated alkyl group represented by the formula $—R^{12}SO_3Z$, wherein R^{12} and Z have the same meanings as in the formula (III):



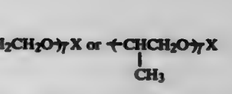
(VIII)

wherein R^{16} represents a hydroxylated alkyl group having 1 to 18 carbon atoms and having at least one hydroxyl group, and R^{10} and R^{11} have the same meanings as in the formula (II):

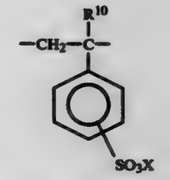


(IX)

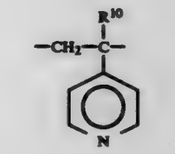
wherein R^{10} and R^{11} have the same meanings as in the formula (II), and R^{17} represents a polyethylene glycol group or a polypropylene glycol group represented by the formula:



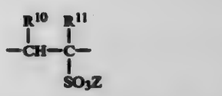
wherein l represents a natural number of 1 to 10 and X represents an alkyl group having 1 to 10 carbon atoms or Z, $—PO_3H_2$, $—PO_3HZ$ or $—PO_3Z_2$, wherein Z has the same meaning as in the formula (II)



wherein R^{10} and Z have the same meanings as in formula (II):



wherein R^{10} has the same meaning as in formula (II); or



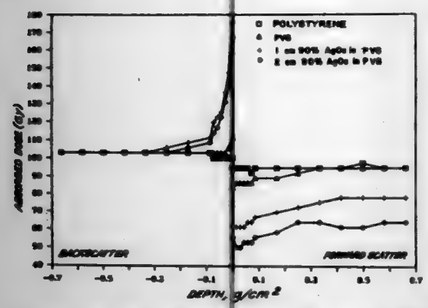
(XII)

wherein R^{10}, R^{11} and Z have the same meanings as in formula (II); and M^2 further represents a vinylpyrrolidone residue or an ammonium salt of the formula (V), (VI) or (VII), prepared by a process, comprising:
a first step of polymerizing either a monomer for forming the M^1 block or a monomer for forming the M^2 block in the presence of a sulfur-containing compound having formula (XIII):

(XIII)

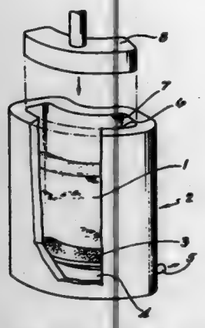
wherein R^1, R^2 and R^3 are as defined above so as to synthesize a polymer initiator having a dithiocarbamate group as indicated in formula (XIII) at the polymer terminal end; and
a second step of polymerizing the other monomer in the presence of the polymer initiator obtained in the first step; wherein the polymerization reactions in the first step and in the second step are carried out upon exposure to ultraviolet radiation.

5,190,990
DEVICE AND METHOD FOR SHIELDING HEALTHY TISSUE DURING RADIATION THERAPY
Frederick Eichmiller, Ijamsville, Md., assignor to American Dental Association Health Foundation, Gaithersburg, Md.
Filed Apr. 27, 1990, Ser. No. 515,827
Int. Cl.[5] G21K *1/10*
U.S. Cl. 523—137 **9 Claims**



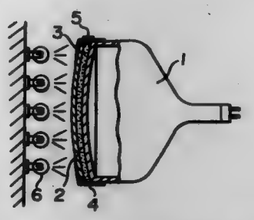
1. A method for shielding healthy tissues during radiation therapy which comprises covering those tissues during therapy with a radiation shield for use during high energy radiation therapy which is custom fitted to the conformation of tissue at the site of intended use, comprising the polymerized form of a composite of a manually moldable elastomeric material and a filler powder of spherical particles of non-toxic, non-radioactive high atomic density metal or metal alloys.

5,190,991
BRAKE LININGS
Enan Parker, and Bruno Grele, both of Smithville, Tenn., assignors to Nutura Corporation, Nashville, Tenn.
Filed Nov. 1, 1990, Ser. No. 607,728
Int. Cl.[5] C08J *5/14*; C08K *7/02*
U.S. Cl. 523—149 **1 Claim**

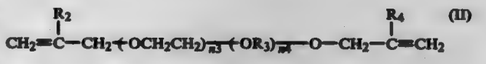


1. A method for the manufacture of a curved brake lining which comprises the following successive steps:
(a) mixing the ingredients of a composition for the brake lining into a slurry in water, the slurry composition consisting essentially of fibers, binder polymer and particulate materials in which the amount of fiber is in the range of 17% to 60% by volume of the composition of the lining and the fibers include web-forming fibers in the range 8% to 40% by volume of the composition,
(b) supplying said slurry to a mold, at least the base of which is permeable to water, the mold cavity having sides which are curved so as to give the cavity the shape of a thick brake lining on its side,
(c) dewatering the slurry,
(d) applying pressure to the mixture in the mold by means of a curved punch acting in a direction perpendicular to the mold base and parallel to said curved walls to form a preform having two substantially parallel upper and lower faces, a curved surface which is to become the curved braking surface of the lining in use, and a curved back surface,
(e) extracting the preform from said mold and drying off excess water,
(f) placing the preform into a further mold with a curved base and applying pressure to the preform with a curved punch, to cold form and compress the preform in a direction perpendicular to the direction of the pressure applied during preforming and produce a curved brake lining of a desired thickness.
(g) removing the curved brake lining from the mold, and
(h) heating the molded product to cure the brake lining composition.

5,190,992
PHOTOCURABLE RESIN COMPOSITION FOR GLASS LAMINATION
Toshiyuki Kato; Syunzi Ito, and Tsunehiko Shimizui, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 190,169, May 4, 1988, abandoned. This application Oct. 1, 1991, Ser. No. 769,480
Claims priority, application Japan, May 13, 1987, 62-116455; May 13, 1987, 62-116456; Aug. 6, 1987, 62-195364
Int. Cl.[5] C08F *2/50*, *16/32*; C08G *75/12*
U.S. Cl. 522—180 **2 Claims**



1. A photocurable resin composition for glass lamination, consisting essentially of a radical polymerizable monomer and a photopolymerization initiator, a cured product of which has a volume resistivity of less than 5×10^9 Ω-cm, said radical polymerizable monomer comprising a polythiol and a polyene of the formula II



(II)

wherein each of R_2 and R_4 is a hydrogen atom or a methyl group, R_3 is an aliphatic bivalent hydrocarbon group having at least three carbon atoms, n3 is an integer of at least 2, n4 is an integer of at least 1, and the average molecular weight of said polyene of formula II is from 500 to 5000.

5,190,993
PROCESS TO ENHANCE THE TENSILE STRENGTH OF RECLAIMED SAND BONDED WITH ESTER CURED ALKALINE PHENOLIC RESIN USING AN AMINOSILANE SOLUTION
S. Raja Iyer, Naperville, Ill., assignor to Borden, Inc., Columbus, Ohio
Continuation of Ser. No. 179,392, Apr. 8, 1988, abandoned. This application Jan. 15, 1990, Ser. No. 538,588
Int. Cl.[5] B22C *1/22*; C08K *9/06*; C08J *3/03*; C04B *14/04*
U.S. Cl. 523—145 **34 Claims**

1. A method for treating free-flowing granular sand that comprises
at least some free-flowing granular foundry sand that has been previously used by forming it into a resin-bonded shape with a binder of an alkaline phenolic resin cured by an ester-functional curing agent, then separated from said shape into free-flowing granules,
to improve the tensile strength of a cured resin-bonded shape made from said sand, as compared to the tensile strength that would be achieved in the absence of said treatment, said method comprising
placing said sand in contact with a solution of an aminosilane, wherein
(a) the solvent in said solution is selected from the group consisting of water-compatible organic solvents, aqueous-liquids, and mixtures thereof,
(b) said aminosilane consisting of either:
(1) a silane conforming to the formula $R'Si(OR)_3$, wherein R' is a C_2–C_6 alkylene group bonded to an amino, hydroxy-C_1–C_6 alkylamino, or amino-C_1–C_6 alkylamino group, and the groups R may be the same or different and are selected from C_1–C_6 alkyl and C_1–C_6 alkoxy-substituted C_1–C_6 alkyl groups; or
(2) an aminoalkyl alkoxysilane of the formula

$$R_2N(CH_2)_nSi(OR^1)_{3-x}(R^2)_x$$

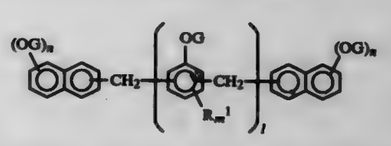
where
each R may be H or lower alkyl, independently of the other;
n equals a whole number of from 2 to 5;
R^1 is an alkyl group of from 1 to 4 carbon atoms;
R_2 is an alkyl group of from 1 to 4 carbon atoms or phenyl, and
x is 0 or 1; or
(3) $R_2N-(CH_2)_m-NH-(CH_2)_nSi(OR^1)_{3-x}(R^2)_x$
where
each R may be H or lower alkyl, independently of the other;
m is a whole number of from 2 to 3;
n is a whole number of from 2 to 4;
R^1 is an alkyl group of from 1 to 4 carbon atoms;
R^2 is an alkyl group of from 1 to 4 carbon atoms, and
x is 0 or 1; and
(c) the amount of said aminosilane solution used is sufficient to increase the tensile strength of shaped resin-bonded articles made from such silane-treated sand.

5,190,994
AQUEOUS DISPERSIONS OF HYBRID POLYMERS AND COATING COMPOSITIONS CONTAINING SAME
Roelof Buter, Dieren; Andreas H. J. Roelofs, and Aletta Wesenhove, both of Arnhem, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands
Filed Feb. 27, 1991, Ser. No. 661,712
Claims priority, application European Pat. Off., Mar. 6, 1990, 90200518.0
Int. Cl.[5] C08L *51/08*
U.S. Cl. 523—407 **23 Claims**

1. A hybrid polymer which comprises
(A) a polymer (core) comprising a mercapto-functionalized poly(epoxyester), which is the reaction product of
(1) an epoxy-terminated poly(epoxyester) and
(2) a compound containing
(a) a primary mercapto group and
(b) a group more reactive with an epoxy group than is a primary mercapto group;
onto which has been grafted, via the addition polymerization of free-radically polymerizable monomers in the presence of the mercapto-functionalized poly(epoxyester),
(B) at least one addition polymer-based chain (shell), the addition polymer-based chain having an acid number of from about 20 to about 100.

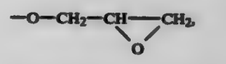
5,190,995
NAPHTHALENE RING CONTAINING EPOXY RESIN COMPOSITION AND SEMICONDUCTOR DEVICE ENCAPSULATED THEREWITH
Toshio Shiobara, Annaka, and Kazutoshi Tomiyoshi, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jan. 24, 1991, Ser. No. 645,496
Claims priority, application Japan, Jan. 25, 1990, 2-15596
Int. Cl.[5] C08L *63/04*
U.S. Cl. 523—443 **16 Claims**

1. An epoxy resin composition comprising
(A) an epoxy resin of the general formula:

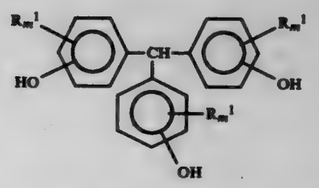


(I)

wherein R^1 is a hydrogen atom or an alkyl group having 1 to 10 carbon atoms,
OG is



letter m is an integer of 0 to 2, n is equal to 1 or 2, and l is an integer of 0 to 3,
(B) a curing agent based on a novolak phenol resin and/or a triphenolalkane compound of the general formula:



(2)

wherein R^1 and m are as defined above, and
(C) an inorganic filler, wherein 350 to 700 parts by weight of component (C) are present per 100 parts by weight of the total of components (A) and (B).

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5,190,999

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5,190,996

WATER RESISTANT FORMALDEHYDE-FREE CORRUGATING ADHESIVE COMPOSITIONS

Michael Foran, Somerville; Jules Schoenberg, Scotch Plains, and Dilip Ray-Chaudhuri, Bridgewater, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Jan. 19, 1990, Ser. No. 467,601
Int. Cl.[5] C08L *1/08, 3/08;* B32B *3/00*
U.S. Cl. 524—28 21 Claims

1. A formaldehyde-free, water-resistant starch, alkaline curing corrugating adhesive composition comprising:

(i) from about 0.1 to 7%, by weight of resin solids based on starch of a crosslinking agent, prepared by reacting an amine, a polyamine, or ammonia with an epihalohydrin to form an epihalohydrin/polyamine condensate;

(ii) from about 10–50%, based on total weight of the adhesive, of a starch component comprising an ungelatinized starch, a partially swollen starch or a mixture of ungelatinized and gelatinized starch;

(iii) from about 50–90%, based on total weight of the adhesive, of water;

(iv) sufficient alkali to provide the adhesive with pH of about 7.5 to 13; and

(v) a tackifying amount of a boron-containing salt.

5,190,997

ADHESIVE COMPOSITION

Martin K. Lindemann, Greenville, and Kim Deacon, Rockhill, both of S.C., assignors to Sequa Chemicals, Inc., Chester, S.C.

Continuation of Ser. No. 12,366, Feb. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 902,696, Sep. 2, 1986, Pat. No. 4,683,165, which is a continuation-in-part of Ser. No. 753,685, Jul. 10, 1985, Pat. No. 4,616,057. This application Feb. 2, 1989, Ser. No. 305,174
The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.
Int. Cl.[5] C08L *1/26*
U.S. Cl. 524—44 31 Claims

1. An adhesive composition comprising a protective colloid and an aqueous polymer emulsion containing a first polymer network which is crosslinked and which is mixed and intertwined on a molecular scale with a second polymer network, wherein the second polymer differs from the first polymer and the first polymer comprises 5 to 95% on a solids by weight basis of the emulsion and the monomers of the first polymer and second polymer are not readily copolymerizable.

5,190,998

BITUMEN BLENDS

Robert G. Fisher, Kent, England, assignor to The British Petroleum Company p.l.c., London, United Kingdom

Filed Jun. 19, 1991, Ser. No. 717,554
Claims priority, application United Kingdom, Jun. 22, 1990, 9013951
Int. Cl.[5] C08L *95/00*
U.S. Cl. 524—59 12 Claims

1. A paving composition which comprises a blend of:

(a) bitumen having the following characteristics, namely a penetration in the range 15–450 mm/10, a softening point in the range 30° to 80° C., and a penetration index of −2 to +2 and

(b) A high vinyl polybutadiene polymer with a content of 1,2-polybutadiene of at least ten 10% by weight, said polymer containing not more than 50% by weight of units derived from a comonomer, and having a weight average molecular weight of at least 100,000, the quantity of polymer being in the range 0.5 to 20% by weight of the total blend, said blend being substantially free from added sulphur or peroxide cross-linking agents, and having an elastic recovery of over 50%.

5,190,999

α-CARBONYLPHENYLACETONITRILE DERIVATIVES AS STABILIZERS FOR ORGANIC MATERIALS

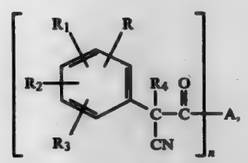
Peter Nesvadba, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 24, 1991, Ser. No. 719,860
Claims priority, application Switzerland, Jun. 28, 1990, 2160/90
Int. Cl.[5] C08K *5/5353, 5/26, 5/16;* C07C *309/06, 213/57, 243/28, 255/40, 255/44, 255/41*
U.S. Cl. 524—96 20 Claims

1. A stabilized composition which comprises

(a) a polymer, functional fluid or lubricant, subject to thermal, oxidative or actinic degradation, and

(b) an effective stabilizing amount of at least one compound of formula I

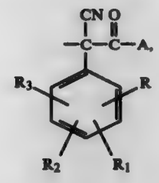


(I)

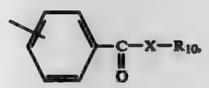
in which R is hydrogen, —OH, halogen, C_1–C_{20}alkyl, C_2–C_{20}alkenyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-C_5–C_{12}cycloalkyl, phenyl, naphthyl, C_1–C_{20}alkoxy, phenyloxy, naphthyloxy, —S—C_1–C_{20}alkyl, —S—phenyl, —S—naphthyl, —O—CO—C_1–C_{20}alkyl, —O—CO—phenyl, —O—CO—naphthyl, —COOH, —COO—C_1–C_{20}alkyl, —COO—C_2–C_{20}alkenyl, —COO—phenyl, —COO—naphthyl, —CONR′R″, —CO—C_1–C_{20}alkyl, —CO—phenyl, —CO—naphthyl, —NHCO—C_1–C_{20}alkyl, —NHCO—C_2–C_{20}alkenyl, —NHCO—phenyl or —NHCO—naphthyl, R_1 can have the same meaning as R, R_2 is hydrogen, halogen or C_1–C_4alkyl and R_3 is hydrogen or halogen, or two radicals R, R_1, R_2 or R_3 bonded to one another in the ortho-position together form tetramethylene or —CH=CH—CH=CH—, where the remaining two radicals of R, R_1, R_2 and R_3 are hydrogen,

R′ and R″ independently of one another are hydrogen, C_1–C_{20}alkyl, C_2–C_{20}alkenyl, phenyl or naphthyl or, together with the bonding N atom, form a 5- or 6-membered heterocyclic ring, a is zero to 10, n is 1 to 6, X is —O— or —NH—,

R_4 is hydrogen, or, when n=1, R_4 is also a group



A, when n=1, is —OH, —OR_5, —NR_6R_7, —NH—NR_8R_9, C_1–C_{30}alkyl, C_2–C_{30}alkenyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-C_5–C_{12}cycloalkyl



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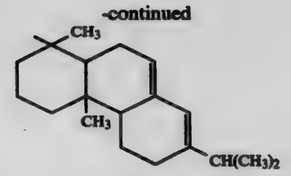
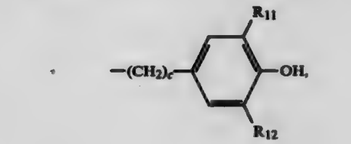
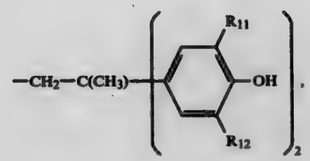
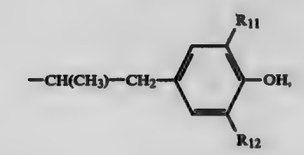


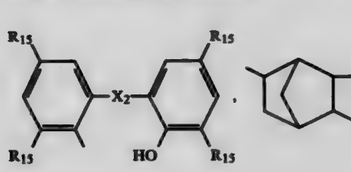
or the corresponding dihydro or tetrahydro derivative, —C_aH_{2a}—CO—X—R_{10}, —C_bH_{2b}—OCO—R_{10}, —C_bH_{2b}—OH,





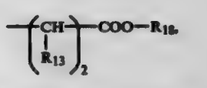


where R_5 is C_1–C_{30}alkyl, C_2–C_{30}alkenyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-C_5–C_{12}cycloalkyl, phenyl-C_1–C_4alkyl, phenyl, naphthyl, biphenyl, the radical of a terpene alcohol or a radical of the formulae

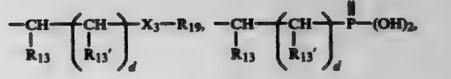


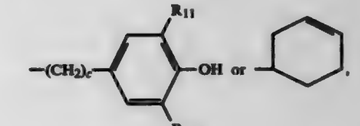
R_6 and R_7 independently of one another are hydrogen, C_1–C_{20}alkyl, C_2–C_{20}alkenyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-C_5–C_{12}cycloalkyl, phenyl-C_1–C_4alkyl, phenyl, naphthyl,

or —$CH_2C(CH_2$—O—$R_{16})_3$ or R_6, if R_7=H, can also be —$(CH_2)_f$—X—R_{16} or R_6 and R_7, together with the N bonding atom, form a 5- or 6-membered heterocyclic ring, R_8 and R_9 independently of one another are hydrogen, C_1–C_{20}alkyl, phenyl, —CO—C_1–C_{20}alkyl, —CO—C_2–C_{18}alkenyl, —CO-phenyl or —CO-naphthyl or together are =CH—R_{17}, R_{10} is hydrogen, C_1–C_{20}alkyl, C_2–C_{20}alkenyl, C_5–C_{12}cycloalkyl, phenyl-C_1–C_4alkyl, phenyl, naphthyl, —CO—C_1–C_{20}alkyl, —CO-phenyl, —CO-naphthyl or



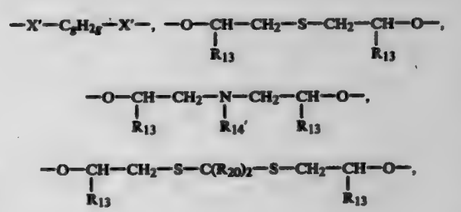
R_{11} and R_{12} independently of one another are hydrogen, C_1–C_4alkyl, cyclohexyl or phenyl, R_{13} is hydrogen or methyl and R_{13}' is hydrogen, methyl or phenyl, R_{14} is C_1–C_{20}alkyl, C_2–C_{20}alkenyl, C_5–C_{12}cycloalkyl, phenyl-C_1–C_4alkyl, phenyl or naphthyl, the R_{15} independently of one another are C_1–C_4alkyl, R_{16} is hydrogen, —CO—C_1–C_{20}alkyl, —CO—C_2–C_{20}alkenyl, —CO-phenyl or —CO-naphthyl, R_{17} is C_1–C_{20}alkyl, C_2–C_{20}alkenyl, C_5–C_{12}cycloalkyl, phenyl, naphthyl, 2-furyl,





R_{18} is hydrogen, C_1–C_{20}alkyl or C_2–C_{20}alkenyl, R_{19} is C_1–C_{20}alkyl, C_5–C_{12}cycloalkyl, phenyl or —CH_2—COO—C_{12}–C_{20}alkyl, X and a are as defined above, X_1 is —O—, —S—, —NH— or —NR_{14}—, X_2 is a direct bond, —CH_2—, >CH—CH_3 or —S— and X_3 is —O—, —S—, —NH— or —NR_{19}—, b is 3 to 5, c is 0 to 2, d is 0 or 1, e is 2 to 10 and f is 2 to 6;

or A, when n=2, is



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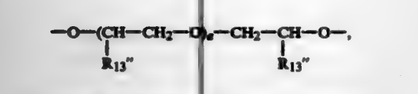
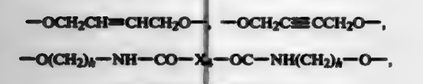
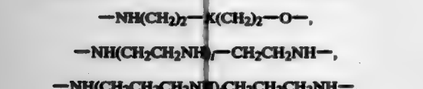
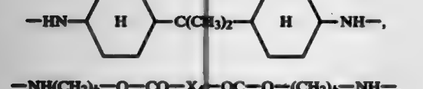
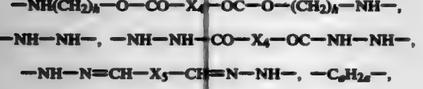
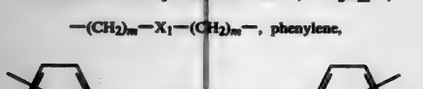


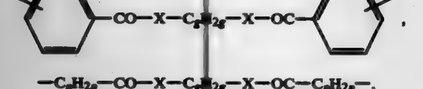


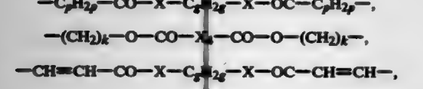


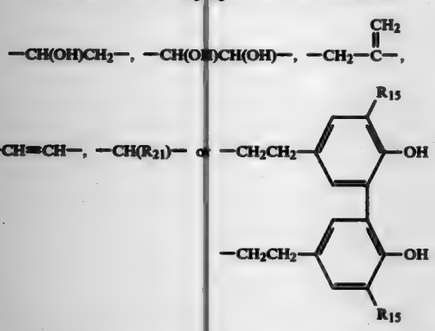






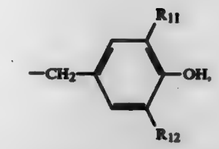






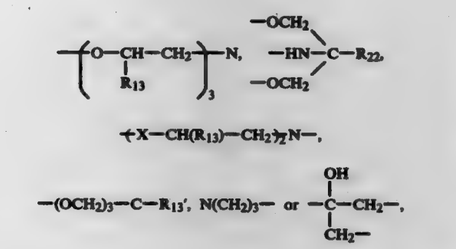
where X, R_{13}, R_{15}, a and f are as defined above, the X' independently of one another are —O— or —NH—, R_{13}'' is hydrogen or methyl and, if a=zero, can also be C_2–C_1-alkyl or phenyl, R_{14}' can have the same definition as R_{14} or is hydrogen, the R_{20} independently of one another are hydrogen, C_1–C_{20}alkyl, phenyl or together are a 5–12-membered cycloaliphatic ring,

R_{21} is C_5–C_{12}cycloalkyl, phenyl-C_1–C_4alkyl, phenyl or



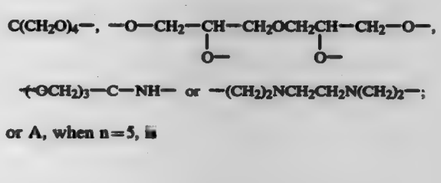
g is 2 to 12, h is 2 to 6, i is 1 to 5, k is 3 to 5, m is 1 or 2 and p is 1 to 10, X_4 is $-C_aH_{2a}-$, phenylene or —CH=CH— and X_5 is a direct bond, $-(CH_2)_3-$ or $-C(CH_3)_2-S-S-C(CH_3)_2-$;

or A, when n=3, is

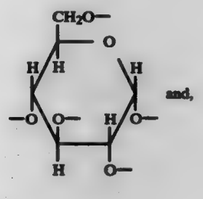


where R_{13} and R_{13}' are as defined above and R_{22} is methyl or ethyl;

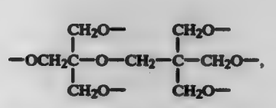
or A, when n=4, is



or A, when n=5, is



A, when n=6, is



and with the proviso that, when component (a) is an unsaturated polyester and when n is 1 in formula I of component (b), then R_4 is hydrogen.

5,191,000

FLAMEPROOFED, NON-DRIPPING POLYALKYLENE TEREPHTHALATE MOLDING COMPOUNDS

Karl Fuhr, Krefeld; Friedemann Müller, Neuss, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 697,908

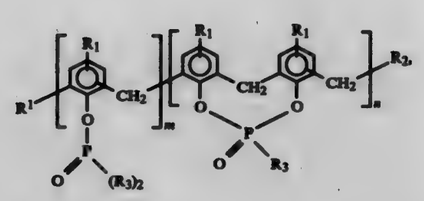
Claims priority, application Fed. Rep. of Germany, May 22, 1990, 4016416

Int. Cl.[5] C08K 5/5357

U.S. Cl. 524—117 4 Claims

1. Flameproofed, non-dripping polyalkylene terephthalate molding compounds which, in addition to polyalkylene terephthalate, contain

A. 5 to 30 parts by weight esters of acids of phosphorus corresponding to formula (I)

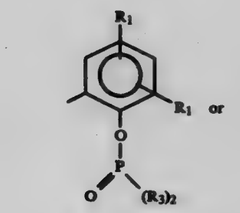


(I)

in which

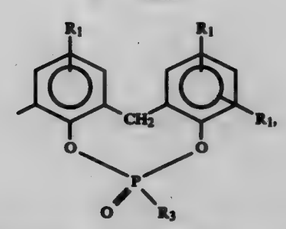
R_1 is hydrogen, C_{1-8} alkyl, C_{7-12} aralkyl and/or optionally C_{1-4}-alkyl-substituted phenyl,

R_2 represents



(II)

or



(III)

R_3 represents optionally C_{1-4}-alkyl-, C_{8-10}-aryl- or C_{7-12}-aralkyl-substituted phenoxy, C_{1-4} alkyl, C_{7-12} aralkyl and/or optionally C_{1-4}-alkyl-substituted phenyl,

m is 0 or an integer of 1 to 12,

n is 0 or an integer of 1 to 5,

with the proviso that, when

m is 0, n is at least 1 and R_2 represents (III),

n is 0, m is at least 1 and R_2 represents (II), and in which the number of phenyl nuclei of the novolak of formula (I) is no higher than 12,

and

B) 0.01 to 2.0 parts by weight of an anti-dripping agent.

5,191,001

PROCESS FOR THE PRODUCTION OF SOLVENTLESS POLYCARBONATE

Steffen Kühlig, Krefeld; Ralf Pakull, Cologne; Ulrich Grigo, Kempen; Peter Tacke, Krefeld; Dieter Freitag, Krefeld, and Wolfgang Alewelt, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Oct. 10, 1991, Ser. No. 774,443

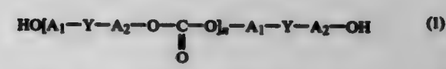
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1990, 4032924

Int. Cl.[5] C08G 63/64, 63/80, 63/82

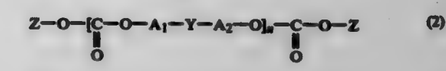
U.S. Cl. 524—125 11 Claims

1. A process for the production of aromatic solventless aromatic polycarbonate having a weight average molecular weight of 15,000 to 200,000 and terminal OH group content of <250 ppm comprising

(i) preparing by the interfacial method oligocarbonates corresponding to formulae 1 and formula 2 :



(1)



(2)

in which

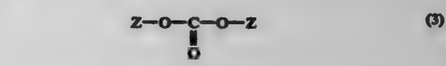
A_1 and A_2 independently denote difunctional carbocyclic or heterocyclic aromatic groups,

Y is a divalent group or a single bond,

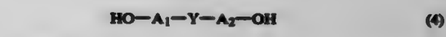
Z is an alkyl or an aryl group and

n is an integer of 1 to 75,

(ii) preparing a mixture of said oligocarbonates or a mixture of said (1) with a monomer corresponding to formula (3) or of said (2) with a monomer corresponding to formula (4)



(3)



(4)

in which

A_1, A_2, Y and Z are as defined above, and crystallizing said mixture, and

(iii) polycondensing said crystallized mixture in the solid phase.

5,191,002

METHOD AND COMPOSITIONS FOR A FLOOR CARE MAINTENANCE SYSTEM

John B. Davis, Carrollton-Carroll, Ga., assignor to Purina/-Churchill Chemical Company, Atlanta, Ga.

Filed Oct. 18, 1991, Ser. No. 779,831

Int. Cl.[5] C08L 31/02

U.S. Cl. 524—157 19 Claims

1. A kit for a low zinc, low phosphate, acrylic-based, integrated floor care maintenance system comprising:

A) a low zinc acrylic floor finish having a zinc content of less than 100 ppm and a phosphate content measured as percent phosphorus of less than 0.4% by weight; and

B) a floor finish stripper having no added zinc, no added phosphate and comprising from about 0.01 to 5% by weight of an ammonium perfluoroalkylsulfonate.

weight of 185,000 to 225,000 and 40% to 60% of said resin

cent unsaturated carbonyl compounds to produce a latex;

5,191,003
RUBBER COMPOSITION
Naoki Inui, Yamatokoriyama; Chikahito Ebina, Misao; Miyuki Oikawa, Ibaraki; Hideo Nagaoki, Osaka; Shinichi Yachigo, Toyonaka, and Manji Sasaki, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Aug. 7, 1991, Ser. No. 741,617
Claims priority, application Japan, Aug. 8, 1990, 2-210603; Mar. 7, 1991, 3-41652
Int. Cl.[5] C08K 5/20
U.S. Cl. 524—206 18 Claims

1. A rubber compositon comprising a rubber selected from the group consisting of natural rubbers and synthetic rubbers containing at least one diene monomer, and per 100 parts by weight of the rubber, from about 20 to about 200 parts by weight of carbon black and from about 0.1 to about 20 parts by weight of a diamide compound represented by the formula:

wherein X is hydrogen, alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 18 carbon atoms, alkanoyl of 2 to 19 total carbon atoms, amino, nitro, cyano, carboxy or halogen, and n is an integer of 2 to 12.

5,191,004
FLAME RETARDANT CROSSLINKABLE POLYMERIC COMPOSITIONS HAVING IMPROVED PROCESSABILITY
Melvin F. Maringer, Cincinnati, and James W. Biggs, Lebanon, both of Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.
Filed Mar. 22, 1991, Ser. No. 674,824
Int. Cl.[5] C08K 5/54
U.S. Cl. 524—265 24 Claims

1. A flame retardant crosslinkable polymeric composition comprising:
(a) a polymer selected from the group consisting of copolymers of ethylene and vinyl esters of C_{2-6} aliphatic carboxylic acids, copolymers of ethylene and C_{1-6} alkyl acrylates, copolymers of ethylene and C_{1-6} alkyl methacrylates, or mixtures thereof;
(b) 80 to 400 phr hydrated inorganic filler;
(c) 0.5 to 5 phr of a lower alkyl-, alkenyl-, alkynyl- or arylalkoxysilane having from 1 to 3 C_{1-6} alkoxy substituents;
(d) 0.5 to 8 phr antioxidant;
(e) 0.25 to 6 phr naphthenic or paraffinic processing oil having a 100° F. viscosity from 100 SUS to 2500 SUS and saturates content from 50 to 90 percent with total aromatics content not exceeding 50 percent; and
(f) 0.25 to 5 phr of a processing additive selected from the group consisting of a fatty acid, a calcium soap of a fatty acid, an aluminum soap of a fatty acid, a fatty acid amide, a mixture of a fatty acid and a fatty acid amide, a natural or synthetic wax and low molecular weight polyethylene.

5,191,005
PROCESS FOR PREPARING THERMOPLASTIC ELASTOMER COMPOSITIONS AND THERMOPLASTIC ELASTOMER COMPOSITIONS
Kazuhiko Murata; Norishige Murakami, and Shizuo Shimizu, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
PCT No. PCT/JP90/00885, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO91/00890, PCT Pub. Date Jan. 24, 1991
PCT Filed Jul. 10, 1990, Ser. No. 613,749
Claims priority, application Japan, Jul. 10, 1989, 1-177342; Jun. 18, 1990, 2-159185
Int. Cl.[5] C08K 5/54
U.S. Cl. 524—269 20 Claims

1. A process for preparing partially crosslinked thermoplastic elastomer compositions, which comprises;
feeding a mixture comprising
(a) 90–40 parts by weight of peroxide crosslinking olefin copolymer rubber,
(b) 10–60 parts by weight of peroxide decomposition olefin plastics (wherein (a) and (b) are selected so that (a)+(b) becomes 100 parts by weight), and
(c) 0–100 parts by weight of peroxide non-crosslinking hydrocarbon rubbery substance through a hopper into a cylinder of an extrusion machine,
feeding simultaneously (d) 10–80 parts by weight (based on 100 parts by weight of total sum of (a) and (b)) of a mineral oil softener, or (d) 10–80 parts by weight (based on 100 parts by weight of total sum of (a) and (b)) of a mineral oil softener and (e) 1–40 parts by weight (based on 100 parts by weight of total sum of (a) and (b)) of silicon oil through an inlet provided on the cylinder separately from the hopper into the cylinder, and
dynamically heat treating the resulting mixture in the presence of organic peroxide in the cylinder,
wherein the total amount of a mineral oil softener in the composition is increased by the feeding of (d) or of (d) and (e) through the inlet to such an amount to make the composition have a hardness of not more than 50 in terms of JIS A type spring hardness.

5,191,006
OXYMETHYLENE COPOLYMER COMPOSITION
Isamu Matsumoto; Zenpei Mizutani; Hiroshi Yada, and Yoshihito Hara, all of Yokkaichi, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Filed Jan. 24, 1991, Ser. No. 719,491
Claims priority, application Japan, Feb. 7, 1990, 2-172597
Int. Cl.[5] C08K 5/11
U.S. Cl. 524—310 6 Claims

1. An oxymethylene copolymer composition which is an intimate mixture consisting essentially of:
(A) 100 parts by weight of an oxymethylene copolymer,
(B) 0.01 to 2 parts by weight of an ester composed of a polyhydric alcohol having 2 to 10 carbon atoms and a higher fatty acid having 22 to 32 carbon atoms, and
(C) 0.01 to 3 parts by weight of an alkaline earth metal salt of a fatty acid having 12 to 35 carbon atoms.

5,191,007
PVC MEMBRANE FOR SWIMMING POOL LINER
Julian Zelazny, Allenstown, and David R. Morse, Sandown, both of N.H., assignors to Borden, Inc., Columbus, Ohio
Filed Sep. 5, 1991, Ser. No. 755,086
Int. Cl.[5] C08K 5/524, 5/09
U.S. Cl. 524—336 29 Claims

1. A polyvinyl chloride resin composition comprising a mixture of:
A. 100 parts by weight of polyvinyl chloride resin wherein 40% to 60% by weight of said resin is an ultra high molecular weight polyvinyl chloride resin having a molecular weight of 185,000 to 225,000 and 40% to 60% of said resin is a high molecular weight polyvinyl chloride resin having a molecular weight of 115,000 to 150,000;
B. from about 1 to 6 parts by weight of a mixed barium-zinc-alkyl phosphite heat stabilizer;
C. an ultra violet absorber; and
D. from about 30 to 100 parts by weight of a plasticizer.

5,191,008
PROCESS FOR THE PRODUCTION OF LATEXES BY THE SELECTIVE MONOMER ADDITION
Howard H. Frost, Calhoun, Ga.; Pamela S. Graham, Stow, Ohio; Ronald D. Fiedler, Atwater, Ohio, and Ramesh N. Gujarathi, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 21, 1991, Ser. No. 779,666
Int. Cl.[5] C08F 2/16
U.S. Cl. 524—460 19 Claims

1. A free radical emulsion polymerization process for the production f a latex comprising polymerizing (a) at least one conjugated diene, (b) at least one non-carboxylic vinyl aromatic or non-carboxylic vinyl aliphatic comonomer selected from the group consisting of styrene, α-methyl styrene, vinyl toluene, acrylonitrile, methacrylonitrile, vinylidene chloride, ethyl acrylae, butyl acrylate, vinyl pyridine, methylmethacrylate, hexylacrylate, 2-ethyl hexyl acrylate or mixtures thereof, and (c) at least one ehtylenically unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid mixtures thereof, comprising (1) polymerizing a first portion of non-carboxylic vinyl aromatic or non-carboxylic vinyl aliphatic comonomer in the absence of any conjugated diene to a conversion of 60 to 90 percent to form a partially polymerized latex; (2) introducing to the partially polymrized latex the total amount of conjugated diene to be polymerized; (3)copolymerizing the conjugated diene with the unreacted non-carboxylic vinyl aromatic or non-carboxylic vinyl aliphatic comonomer in the partially polymerized latex to a conversion of 75 to 90 percent of unreacted conjugated diene and noncarboxylic vinyl aromatic or non-carboxylic vinyl aliphatic comonomer; (4) introducing the remaining portion of non-carboxylic vinyl aromatic or non-carboxylic vinyl alipahtic comonomer to be polymerized to the latex having a conversion of 75 to 90 percent; and (5) copolymerizing the remaining portion of non-carboxylic vinyl aromatic or non-carboxylic vinyl aliphatic comonomer in the latex with the unreacted conjugated diene latex.

5,191,009
PROCESS FOR PRODUCING STABLE LATEX
Sun-Lin Chen; Ramesh N. Gujarathi, and Susan M. Prentice, all of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sep. 20, 1990, Ser. No. 584,985
Int. Cl.[5] C08F 2/16
U.S. Cl. 524—460 17 Claims

1. A process for producing a neutralized latex that is useful in the manufacture of water reducible coatings which comprises:
(1) free radical aqueous emulsion polymerizing at a pH of less than about 3.5 a monomer mixture which comprises, based on 100 weight percent monomers: (a) at least about 45 weight percent vinyl aromatic monomers, (b) from about 15 to about 50 weight percent of at least one alkyl acrylate monomer, and (c) from about 1 to about 6 weight percent of at least one unsaturated carbonyl compound; in the presence of about 0.5 to 4.0 phm of at least one phosphate ester surfactant in the presence of about 0.5 to 4.0 phm of at least one water insoluble nonionic surface active agent and in the presence of at least one seed polymer which is comprised of repeat units which are derived from at least about 45 weight percent vinyl aromatic monomers, from about 15 to abut 50 weight percent alkyl acrylate monomers, and from about 1 to about 6 weight percent unsaturated carbonyl compounds to produce a latex; and
(2) neutralizing the latex with ammonia to a pH which is within the range of about 7 to about 10.5 to produce the neutralized latex.

5,191,010
EMULSION HAVING DYE DEVELOPING PROPERTY
Katsumi Inagaki; Kenzo Miyamoto, both of Yokohama, and Masayoshi Sekiya, Tokyo, all of Japan, assignors to Nippon Zeon Co., Ltd., Toyko, Japan
Continuation of Ser. No. 264,133, Oct. 28, 1988, abandoned.
This application Oct. 23, 1990, Ser. No. 601,048
Claims priority, application Japan, Oct. 30, 1987, 62-275351
Int. Cl.[5] C08L 61/04, 33/12, 33/20; C08K 5/13
U.S. Cl. 524—510 6 Claims

1. An aqueous emulsion having a due developing property, comprising emulsified polymer particles obtained by emulsion or suspension polymerization in the presence of an organic dye developer selected from the group consisting of p-phenylphenol, p-t-butylphenol, bisphenol A, tetrabromobisphenol A, benzoic acid, chlorobenzoic acid (o-, m- & p-), nitrobenzoic acid (o-, m- & p-), toluic acid (o-, m- & p-), 4-methyl-3-nitrobenzoic acid, 2-chloro-4-nitrobenzoic acid, 2,3-dichlorobenzoic acid, 2,4-dichlorobenzoic acid, p-isopropylbenzoic acid, 2,5-dinitrobenzoic acid, p-t-butylbenzoic acid, N-phenylanthranilic acid, 4-methyl-3-nitrobenzoic acid, salicylic acid, m-hydroxybenzoic acid, p-hydroxybenzoic acid, 3,5-dinitrosalicylic acid, 5-t-butylsalicylic acid, 3-phenyl-salicylic acid, 3-methyl-5-t-butylsalicylic acid, 3,5-di-t-butylsalicylic acid, 3,5-di-t-amylsalicylic acid, 3-cyclohexylsalicylic acid, 5-cyclohexylsalicylic acid, 3-methyl-5-isoamylsalicylic acid, 5-isoamylsalicylic acid, 3,5-di-sec-butylsalicylic acid, 5-nonylsalicylic acid, 2-hydroxy-3-methylbenzoic acid, 2-hydroxy-5-t-butylbenzoic acid, 2,4-cresotinic acid, 5,5-methylenedisalicylic acid, acetaminobenzoic acid (o-, m- & p-), 2,4-dihydroxybenzoic acid, 2,5-dihydroxybenzoic acid, anacardic acid, 1-naphthoic acid, 3,5-di-alpha,-alpha-dimethylbenzylsalicylic acid, 3,5-di-alpha-methylbenzylsalicylic acid, 2-naphthoic acid, 1-hydroxy-2-naphthoic acid, 2-hydroxy-3-naphthoic acid, 2-hydroxy-1-naphthoic acid, thiosalicylic acid, 2-carboxybenzaldehyde, and polyvalent metal salts of said acids.

5,191,011
FILLED POLYACETAL RESIN COMPOSITIONS AND PROCESSES FOR MAKING THE SAME
Yoshihisa Tajima; Mitsuru Yokouchi, and Masaru Miura, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan
Continuation of Ser. No. 661,347, Feb. 28, 1991, abandoned.
This application Jun. 15, 1992, Ser. No. 899,167
Claims priority, application Japan, Mar. 1, 1990, 2-50258
Int. Cl.[5] C08L 7/00
U.S. Cl. 524—512 8 Claims

1. A method of making a polyacetal resin composition comprising melt-blending at a melt-blending temperature a polyacetal base resin A, a filler material B, and a thermoplastic acrylic resin C in weight ratios which satisfy the following formulas (1) and (2):

$$(B+C)/(A+B+C)=[0.03 \text{ to } 0.6]0.05 \text{ to } 0.4 \quad (1)$$

$$C/(B+C)=[0.05\ ]0.25 \text{ to } 0.95 \quad (2),$$

wherein
said method includes selecting the filler material B and the thermoplastic acrylic resin C such that the filler material B has a surface tension which is at least 2.0 dyn/cm greater than the surface tension of the acrylic resin C at the melt-blending temperature, and wherein
said polyacetal resin A, said filler material B, and said thermoplastic acrylic resin C are simultaneously melt-blended to thereby cause, during the melt-blending step,

sen, an aromatic moiety, an alkyl moiety or an alkenyl moiety, polycyclic vinyl monomer represented by the following for-

the thermoplastic acrylic resin C to form a continuous interconnected network within the polyacetal resin with the filler material B encapsulated within the interconnected network of the acrylic resin C, wherein

said filler material B is selected from the group consisting of acrylic and melamine resins; and wherein

said thermoplastic acrylic resin C is a homopolymer of methyl methacrylate or a copolymer which is mainly comprised of units derived from methyl methacrylate.

5,191,012

AQUEOUS DISPERSIONS OF ENCAPSULATED POLYISOCYANATES

Peter H. Markusch, McMurray, Pa.; Ashok M. Sarpeshkar, New Martinsville, and Robin E. Tirpak, Wheeling, both of W. Va., assignors to Miles Inc., Pittsburgh, Pa.

Filed Mar. 28, 1991, Ser. No. 677,010

Int. Cl.[5] C08J 3/02; C08K 3/20; C08L 75/00; C08G 18/00

U.S. Cl. 524—591 8 Claims

1. An aqueous dispersion of an encapsulated polyisocyanate which contains unreacted isocyanate groups and is prepared by a process which comprises

a) dispersing in water a polyisocyanate which has an isocyanate content of at least 12% by weight and

b) reacting the dispersed polyisocyanate with a polyamine having primary and/or secondary amino groups and having a molecular weight of 400 or less in an amount sufficient to provide an equivalent ratio of amino groups to isocyanate groups of at least 0.05:1.0.

5,191,013

MACROCYCLIC FILLED COMPOSITIONS CONVERTIBLE TO POLYESTER COMPOSITES

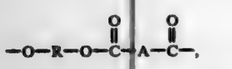
Todd D. Cook; Andrew J. Salem, both of Schenectady; Thomas L. Evans, Clifton Park; Eric J. Pearce, Clifton Park, and Kevin P. McAlea, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 16, 1991, Ser. No. 700,839

Int. Cl.[5] C08J 5/04; C08K 3/10; C08L 67/00

U.S. Cl. 524—601 22 Claims

1. A composition comprising a filler; at least one macrocyclic polyester oligomer comprising structural units of the formula



(I)

wherein R is an alkylene or mono- or polyoxyalkylene radical containing a straight chain of about 2–8 atoms and A is an m- or p-linked monocyclic aromatic or alicyclic radical; and a catalytically effective amount of a macrocyclic polyester oligomer polymerization catalyst.

5,191,014

TEMPORARY PROTECTIVE AQUEOUS COATING COMPOSITIONS

John S. Roberts, Wokingham, and John A. Cook, Slough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 419,604, Oct. 10, 1989, abandoned. This application Feb. 10, 1992, Ser. No. 831,096

Claims priority, application United Kingdom, Oct. 12, 1988, 8823883; May 16, 1989, 8911188

Int. Cl.[5] C08L 33/10

U.S. Cl. 524—831 19 Claims

1. An aqueous coating composition suitable for use in the application of temporary coatings which composition comprises water and a dispersion of particulate water-insoluble copolymer which has a weight average molecular weight of 10 000 to 200 000 and which is a copolymer of

(i) methacrylamide;

(ii) acrylic or methacrylic acid or a mixture of the two; and

(iii) a staple monomer other than those recited in (i) and (ii) which is copolymerisable with acrylic or methacrylic acid by free radical initiated copolymerization but which does not confer water solubility on the copolymer; and an oligomer chemically bonded to said copolymer, said oligomer comprising a long chain hydrophilic moiety which moiety has a molecular weight of from 500 to 4000 and a hydrophobic moiety through which the oligomer is chemically bonded to the particulate copolymer and wherein

a) based on the combined weights of the monomers (i), (ii) and (iii), the particulate copolymer comprises 7 to 14 wt. % of acrylic acid or methacrylic acid or the mixture of the two, 0.1 to 10 wt. % of methyacrylamide and the balance is staple monomer,

b) from 1 to 10 wt. % of the total weight of the particulate copolymer is oligomer and

c) the coating composition comprises not more than 5 wt. % of organic solvent based on the combined weight of water, organic solvent and particulate copolymer in the composition.

5,191,015

POLYMERS AND POLYMER-PEPTIDE CONJUGATES

Robert C. Sheppard, Cambridge, and Peter Goddard, West Sussex, both of England, assignors to Medical Research Council, London, United Kingdom

PCT No. PCT/GB88/01090, § 371 Date Jun. 4, 1990, § 102(e) Date Jun. 4, 1990, PCT Pub. No. WO89/05305, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 9, 1988, Ser. No. 476,393

Claims priority, application United Kingdom, Dec. 9, 1987, 8728752; Jun. 25, 1988, 8815170

Int. Cl.[5] C07K 1/04, 17/08

U.S. Cl. 525—54.1 26 Claims

1. A polymer-peptide conjugate comprising an insoluble polymer support having at least one peptide chain covalently linked thereto, said insoluble polymer support consisting of a soluble polymer or copolymer cross-linked by residues of a cross-linking agent which contains a linkage capable of selective chemical cleavage, under selected cleavage conditions which do not cause significant cleavage of peptide bonds or of the covalent peptide-polymer support linkages by means of which said at least one peptide chain is convalently linked to said insoluble polymer support, whereby upon submission of said polymer-peptide conjugate to said selected cleavage conditions said polymer-peptide conjugate can yield soluble peptide-polymer or peptide-copolymer fragments.

5,191,016

FUNCTIONALIZED POLY(HYDROXYALKANOATES) AND METHOD OF MANUFACTURING SAME

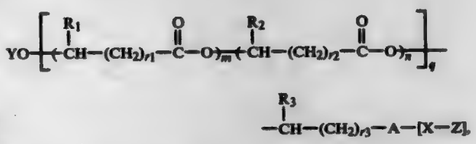
Manasur Yalpani, 560 Lepare, Buffalo Grove, Ill. 60089

Filed Jul. 19, 1990, Ser. No. 554,338

Int. Cl.[5] C08G 63/08, 63/48, 69/26, 69/36

U.S. Cl. 525—54.2 8 Claims

1. A functionalized poly(hydroxyalkanoate) compound having the formula:



wherein Y is hydrogen, a saccharide moiety or an alkenyl moiety having a molecular weight in the range of from about 25 to about 100,000; R_1, R_2 and R_3 are, independently, hydrogen, an aromatic moiety, an alkyl moiety or an alkenyl moiety, said alkyl moiety or said alkenyl moiety including from one to about nine carbon atoms; A is carbonyl or methylene; X is oxygen or NH; Z is selected from the group consisting of hydrogen, a saccharide moiety, an alkyl moiety, an alkenyl moiety, said alkenyl moiety having a molecular weight in the range of from about 25 to about 100,000, with the provision that if Y is hydrogen, Z is not hydrogen; r_1, r_2 and r_3 are, independently, a numeral 1, 2 or 3; m and n are, independently, a numeral in the range of from one to about 5; and q is a numeral in the range of from about 5 to about 10,000.

5,191,017

HIGH-IMPACT THERMOPLASTIC POLYETHER SULFONE MOLDING COMPOSITIONS

Thomas Eckel, Dormagen; Dieter Wittmann, Cologne; Karl-Heinz Ott, Leverkusen, and Christian Lindner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 446,753, Dec. 6, 1989, abandoned. This application May 20, 1991, Ser. No. 702,984

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841670

Int. Cl.[5] C08G 63/48, 63/91

U.S. Cl. 525—68 11 Claims

1. A thermoplastic molding composition comprising

(A) 75 to 97% by weight, based on the total amount of components (A) and (B), of a linear aromatic polyether sulfone, and

(B) 3 to 25% by weight, based on the total amount of components (A) and (B), of a diene graft polymer comprising

(B.1) 5 to 90 parts by weight of a mixture which is grafted on

(B.2) 10 to 95 parts by weight of a diene rubber, and optionally,

(C) a thermoplastic resin selected from the group consisting of vinyl copolymer, polyalkylene terephthalate, aromatic polycarbonate and aromatic polyester carbonate,

wherein said mixture (B.1) contains

(B.1.1) 50 to 95 parts by weight of at least one member selected from the group consisting of methyl methacrylate, styrene, α-methyl styrene, nucleus substituted styrene wherein substitution is any of C_{1-4} alkyl and halogen, and

(B.1.2) 5 to 50 parts by weight of at least one member selected from the group consisting of acrylonitrile, methacrylonitrile, methyl methacrylate, maleic anhydride, maleic imide N-substituted by C_{1-4} alkyl or by phenyl, and

wherein said rubber (B.2) has a mean particle diameter of 0.09 to 1 μm and a gel content of more than 50% relative to the weight of said rubber, and wherein said diene graft polymer (B) is characterized in that an initiator system containing an organic hydroperoxide and ascorbic acid is used in its preparation, and

wherein at most half of the weight of said aromatic polyether sulfone (A) is replaced by said thermoplastic resin (C).

5,191,018

IMPACT-RESISTANT GRAFT COPOLYMER AND THERMOPLASTIC RESIN COMPOSITION CONTAINING SAME

Hiroshi Hagiwara; Toshio Hosokawa, and Katsumi Suzuki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

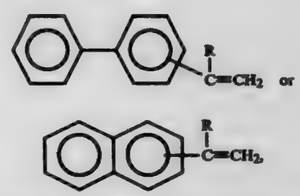
Filed Nov. 21, 1991, Ser. No. 795,770

Claims priority, application Japan, Nov. 30, 1990, 2-329796

Int. Cl.[5] C08L 9/00

U.S. Cl. 525—86 16 Claims

1. A graft copolymer, comprising: 5–90 wt. parts of a rubber polymer and 10–95 wt. Parts of a vinyl monomer graft-polymerized onto the rubber polymer; said rubber polymer comprising 40–99 wt. % of butadiene and 1–60 wt. % of an aromatic polycyclic vinyl monomer represented by the following formula (I) or (II):



Formula (I)

Formula (II)

wherein R denotes a hydrogen atom or a methyl group.

5,191,019

CROSSLINKED HALOGEN-CONTAINING POLYMER

Roger Dahl, Stenungsund, Sweden; Steinar Pedersen, Porsgrunn, Norway; Jaan Roots, Oslo, Norway, and Keith Redford, Hagan, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

PCT No. PCT/NO90/00033, § 371 Date Oct. 8, 1991, § 102(e) Date Oct. 8, 1991, PCT Pub. No. WO90/09407, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 8, 1990, Ser. No. 768,975

Claims priority, application Norway, Feb. 8, 1989, 890543

Int. Cl.[5] C08F 8/00

U.S. Cl. 525—103 14 Claims

1. A method for production of a thermostable crosslinked halogen-containing copolymer, where an organic silane is used as crosslinking agent and where the crosslinking is carried out in the presence of humidity, characterized in that a halogen-containing monomer is copolymerized with a glycidyl (epoxy)-containing acrylate and where 0.05–15 parts by weight of a silane

where

RF=a mercapto group, a primary or secondary amine, a carboxylic acid or an anhydride,

R′=a non-functional group,

R″=a non-hydrolyzed group,

Y=one or more groups which could be hydrolyzed,

n=0, 1 or 2 is added and where the crosslinking is carried out after processing of the polymer.

5,191,020

POLYPHENYLENE SULFIDE RESIN COMPOSITION

Junzo Masamoto, Kurashiki; Tetsuo Nakamoto, Yokohama, and Kimihiro Kubo, Kurashiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1990, Ser. No. 524,613

Claims priority, application Japan, Jul. 5, 1989, 1-171913; Jul. 21, 1989, 1-187457; Jul. 21, 1989, 1-187458; Oct. 25, 1989, 1-276134

Int. Cl.[5] C08R 81/02; C08G 75/14

U.S. Cl. 525—189 5 Claims

1. A polyphenylene sulfide resin composition possessing improved impact properties consisting essentially of

(A) a polyphenylene sulfide resin containing a non-blocked type polyfunctional isocyanate compound melt-kneaded therewith, and

(B) an ethylene copolymer elastomer comprising 50 to 90% by weight of ethylene units, 5 to 49% by weight of α,β-unsaturated carboxylic acid alkyl ester units and 0.5 to 10% by weight of maleic anhydride units.

(I) the weight proportion of the alkenyl aromatic com-

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5,191,021

TIRE WITH TREAD CONTAINING STYRENE, ISOPRENE, BUTADIENE TERPOLYMER RUBBER

Adel F. Halasa, Bath, Ohio; Jean Bergh, Vlaanderen, Luxembourg, and Fernand A. J. Fourgon, Blaetsgoe, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 213,919, Jun. 29, 1988, Pat. No. 5,047,483. This application Aug. 26, 1991, Ser. No. 750,126
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] C08L 9/06
U.S. Cl. 525—237 10 Claims

1. A pneumatic tire having an outer circumferential tread where said tread is a sulfur cured rubber composition comprised of, based on 100 parts by weight rubber (phr), (A) about 30 to about 70 parts by weight of a styrene, isoprene, butadiene terpolymer rubber (SIBR), and (B) about 70 to about 30 parts by weight of at least one of cis 1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber wherein said SIBR rubber is comprised of (i) about 10 to about 35 weight percent bound styrene, (ii) about 20 to about 60 weight percent bound isoprene, and (iii) about 10 to about 50 weight percent bound butadiene and is characterized by having a single glass transition temperature (Tg) which is in the range of about −70° C. to about −5° C. and, further, the said bound butadiene structure contains about 10 to about 50 weight percent 1,2-vinyl units, the said bound isoprene structure contains about 10 to about 40 weight percent 3,4 units, and the sum of the weight percent 1,2-vinyl units of the bound butadiene and the weight percent 3,4 units of the bound isoprene is in the range of about 20 to about 90 percent.

5,191,022

COVULCANIZABLE POLYMER BLENDS AND PROCESS FOR PRODUCING THE SAME

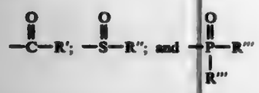
Donald A. White, Edison; Stanley J. Brois, Westfield, both of N.J., and Bruce D. Allison, Terre Haute, Ind., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Mar. 9, 1990, Ser. No. 491,140
Int. Cl.[5] C08L 23/36, 7/00, 9/00, 23/32
U.S. Cl. 525—237 18 Claims

1. A vulcanizable composition comprising: (a) at least on sulfur diimide-modified terpolymer of ethylene, a higher alpha olefin, and an non-conjugated diene, (b) at least one highly unsaturated rubbery polymer and a vulcanizing agent, said sulfur diimide represented by the formula:

Y'—N=S=N—Y

wherein Y and Y' are independently selected from the group consisting of



wherein R' is selected from the group consisting of hydrocarbyl and hydrocaryloxy, R'' comprises a hydrocarbyl substituent, and R''' and R'''' are independently selected from hydrocarboyloxy and where each R', R'', R''' and R'''' comprise from 1 to 20 carbon atoms.

5,191,023

BLOCK-COPOLYMERIZED-RUBBER-MODIFIED STYRENE COPOLYMERS

Mune Iwamoto, Osaka; Norifumi Ito, Kanagawa; Tetsuyuki Matsubara, Kanagawa; Kazuo Sugazaki, Kanagawa, and Toshihiko Ando, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 392,896, Aug. 14, 1989, abandoned.
This application Jul. 8, 1991, Ser. No. 726,951
Claims priority, application Japan, Aug. 26, 1988, 210597/1988
Int. Cl.[5] C08F 297/04; C08L 53/02
U.S. Cl. 525—314 31 Claims

1. A rubber-modified styrene copolymer prepared by polymerizing a monomer of styrene or its derivatives and a monomer of acrylonitrile or its derivatives in the presence of a rubbery polymer comprising:

a block copolymer comprising a first polymer block comprising at least one monomer of butadiene or its derivatives and a second polymer block comprising at least one monomer of styrene or its derivatives, said block copolymer constituting at least about 50 wt % of said rubbery polymer and having a monomer of styrene or its derivatives content of from about 3 to about 20 wt % and a starlike radial structure represented by the formula (BDB—STB$_m$P) wherein BDB denotes a polymer block comprising at least one monomer of butadiene or its derivatives, STB denotes a polymer block comprising at least one monomer of styrene or its derivatives, m is an integer of from 3 to 6 and P is a moiety of a multi-functional coupling agent, said rubbery polymer containing no greater than about 0.5 wt % styrene-insoluble components at 25° C. and having a viscosity of from about 5 to about 50 centistokes as measured at 25° C. in the form of a 5 wt % styrene solution; and

said rubber-modified styrene copolymer comprising dispersed particles of said rubbery polymer and a continuous phase of a copolymer of said monomer of styrene or its derivatives and said monomer of acrylonitrile or its derivatives, wherein said dispersed particles contain a copolymer of said monomer of styrene or its derivatives and said monomer of acrylonitrile or its derivatives grafted or occluded and have a copolymer occlusion and graft index from about 25 to about 150%; and wherein

the molecular weight distribution index of said copolymer of the monomer of styrene or its derivatives and said monomer of acrylonitrile or its derivatives is from about 1.9 to about 3.0.

5,191,024

HYDROGENATED DIENE BLOCK COPOLYMER AND COMPOSITION COMPRISING THE SAME

Tooru Shibata; Toshio Teramoto; Yoshiharu Hashiguchi, and Kunio Goshima, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 18, 1990, Ser. No. 524,809
Claims priority, application Japan, May 19, 1989, 1-124429; May 19, 1989, 1-124430
Int. Cl.[5] C08F 297/04; C08L 53/02
U.S. Cl. 525—314 4 Claims

1. A hydrogenated diene block copolymer having a polystyrene-reduced number-average molecular weight of 50,000–600,000 which is a hydrogenation product of an (A)—(B) block copolymer in which (A) means an alkenyl aromatic compound polymer block and (B) means a conjugated diene homopolymer block wherein the vinyl content of the conjugated diene portion is more than 60%, or an (A)—(B-)—(C) block copolymer in which (A) and (B) are as defined above and (C) means an alkenyl aromatic compound-conjugated diene copolymer tapered block wherein the proportion of the alkenyl aromatic compound increases gradually, or an (A)—(B)—(A) block copolymer in which (A) and (B) are as defined above, in which block copolymer

(1) the weight proportion of the alkenyl aromatic compound/the conjugated diene is 5/95 to 60/40, and

(2) the content of the bound alkenyl aromatic compound in at least one block (A) is at least 3% by weight and the total of the bound alkenyl aromatic compound contents in the two block (A)'s or the block (A) and the block (C) is 5–25% by weight based on the total monomers, and in which hydrogenation product at least 80% of the double bond unsaturations of the conjugated diene portion is saturated by the hydrogenation.

5,191,025

POLYMERIZATION OF CIS-5,6-BIS(TRIMETHYLSILOXY)-1,3-CYCLOHEXADIENE AND OTHER SUBSTITUTED CYCLOHEXADIENES

Robert H. Grubbs, South Pasadena; Douglas L. Gin, and Vincent P. Conticello, both of Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 697,220, May 7, 1991, Pat. No. 5,122,574, which is a continuation-in-part of Ser. No. 647,576, Jan. 29, 1991, Pat. No. 5,128,418. This application Feb. 5, 1992, Ser. No. 831,788
Int. Cl.[5] C08F 130/08
U.S. Cl. 525—326.5 7 Claims

1. A process by which 1,4-poly(cis-5,6-bis(trimethylsiloxy)-1,3-cyclohexadiene) is converted to 1,4-poly(cis-5,6-dihydroxy-1,3-cyclohexadiene) using a source of fluoride and an alcohol having 1 to 4 carbon atoms.

5. A process by which 1,4-poly(cis-5,6-bis(trimethylsiloxy)-1,3-cyclohexadiene) is converted to 1,4-poly(cis-5,6-dihydroxy-1,3-cyclohexadiene) using an anhydrous strong acid.

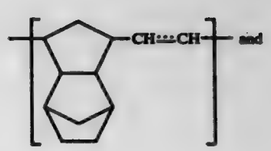
5,191,026

RING-OPENING HYDROGENATED COPOLYMER AND PROCESS FOR PRODUCING THE SAME

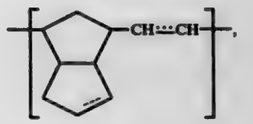
Yoshikatsu Nishi, Yokohama; Masayoshi Oshima, Niiza; Teiji Kohara, Kawasaki, and Tadao Natsume, Yokosuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/01327, § 371 Date Jun. 7, 1990, § 102(e) Date Jun. 7, 1990, PCT Pub. No. WO89/06253, PCT Pub. Date Jul. 13, 1989
PCT Filed Dec. 24, 1988, Ser. No. 476,492
Claims priority, application Japan, Dec. 25, 1987, 62-326688; Dec. 25, 1987, 62-326689
Int. Cl.[5] F08F 8/00; C08F 4/64, 232/00; C08G 61/08
U.S. Cl. 525—332.1 35 Claims

1. A polycyclic norbornene or its derivative ring-opening hydrogenated copolymer which contains 90–10% by mole of a repeating unit represented by the following formula [I] or the alkyl-substituted derivative thereof and at least a repeating unit represented by the following formula [II] or the alkyl-substituted derivative thereof, has an intrinsic viscosity [η] of 0.01–20 dl/g as determined in toluene at 25° C. and in which at least 50% of the (C C) linkages constituting the main chain are single bonds



[I]



[II]

wherein represents either a single bond or a double bond.

5,191,027

COMPOSITION COMPRISING AN EPOXY COMPOUND

Takaaki Fujiwa, Hiroshima; Ikuo Takahashi, Himeji, and Hiroyuki Oshima, Hiroshima, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed May 11, 1990, Ser. No. 522,025
Claims priority, application Japan, May 12, 1989, 1-119672
Int. Cl.[5] C08F 8/08
U.S. Cl. 525—332.1 4 Claims

1. A composition consisting essentially of a homopolymer or copolymer consisting of one or more members selected from a group consisting of formulae (I), (II), and (III):

(I)

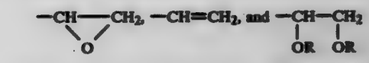
(II)

(III)

wherein

n is an integer of 2 to 1000,

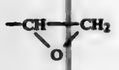
X represents a mixture of



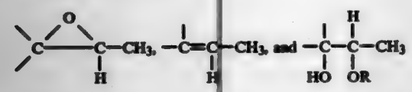
groups, in which R is either H, an alkyl group, an alkyl carbonyl group, or an aryl carbonyl group, provided that at least one

more aqueous emulsion polymer(s) containing pendant and/or

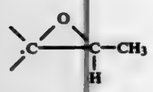
5,191,031



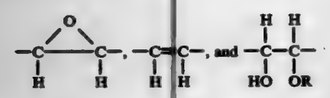
group is contained therein,
Y represents a mixture of



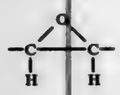
groups in which R is either H, an alkyl group, an alkyl carbonyl group or an aryl carbonyl group, provided that at least one



group is contained therein, and
Z represents a mixture of



groups in which R is either H, an alkyl group a carboalkyl group, or a carboaryl group, provided that at least one



group is contained therein.

5,191,028

RUBBER COMPOSITION COMPRISING DIENE RUBBER MATERIAL AND VULCANIZATION ACCELERATORS

Yutaka Ishioka, Nagoya, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Continuation of Ser. No. 459,656, Jan. 2, 1990, abandoned. This application Aug. 26, 1991, Ser. No. 752,897
Claims priority, application Japan, Jan. 12, 1989, 1-5790
Int. Cl.[5] C08C *19/20*
U.S. Cl. 525—332.7 **6 Claims**

1. A rubber composition comprising 100 parts by weight of a diene rubber material, 1.5 to 2.5 parts by weight of N-cyclohexyl-2-benzothiazyl sulfenamide, 0.02 to 1.0 part by weight of a condensation product of n-butylaldehyde and aniline, and 0.3 to 1.5 part by weight of tetrabutylthiuram disulfide.

5,191,029

PHOSPHORUS-CONTAINING POLYMER COMPOSITIONS CONTAINING WATER-SOLUBLE POLYVALENT METAL COMPOUNDS

Theodore A. DelDonne, 3142 Taft Rd., Norristown, Pa. 19403

Continuation of Ser. No. 569,263, Aug. 17, 1990, abandoned, which is a continuation of Ser. No. 291,816, Dec. 28, 1988, abandoned. This application Aug. 19, 1991, Ser. No. 749,627
Int. Cl.[5] C08F *8/42*
U.S. Cl. 525—366 **11 Claims**

1. A polymer compostion which dries to an aqueous salt spray resistant coating comprising in combination a) one or more aqueous emulsion polymer(s) containing pendant and/or terminal phosphorus group(s) and b) one or more water-soluble polyvalent metal compound(s) functioning as a crosslinking agent.

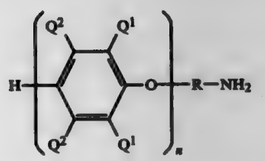
5,191,030

PROCESS FOR PRODUCING AMINO GROUP TERMINATED POLYPHENYLENE ETHER

Haruo Ohmura; Mitsutoshi Aritomi; Michiharu Kihira, and Hiroshi Nakano, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

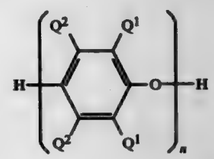
Filed Sep. 19, 1991, Ser. No. 762,112
Claims priority, application Japan, Sep. 19, 1990, 2-247378; Apr. 10, 1991, 3-103518; Apr. 10, 1991, 3-103533
Int. Cl.[5] C08L *71/12*
U.S. Cl. 525—390 **2 Claims**

1. A process for producing an amino group terminated polyphenylene ether represented by the following general formula (I)



(I)

wherein Q^1s each represent a halogen atom, a primary or secondary alkyl group having 1 to 12 carbon atoms, an aryl group having 6 to 12 carbon atoms, an aminoalkyl group having 1 to 12 carbon atoms, a hydrocarbon oxy group having 1 to 12 carbon atoms or a halohydrocarbon oxy group having 1 to 12 carbon atoms; Q^2s each represents a hydrogen atom, a halogen atom, a primary or secondary alkyl group having 1 to 12 carbon atoms, an aryl group having 6 to 12 carbon atoms, a haloalkyl group having 1 to 12 carbon atoms, a hydrocarbon oxy group having 1 to 12 carbon atoms, or halohydrocarbon oxy group having 1 to 12 carbon atoms; R represents an aliphatic hydrocarbon group having 1 to 32 carbon atoms, an aromatic hydrocarbon group having 6 to 32 carbon atoms or an araliphatic hydrocarbon group having 7 to 12 carbon atoms; and n is a number of 10 to 500, which process comprises reacting a polyphenylene ether represented by the following general formula (II)



(II)

wherein Q_1, Q_2 and n are as defined above, with a primary amine halide represented by the following general formula (III)

(III)

wherein R is as defined above, and X represents a halogen atom.

5,191,031

THERMOPLASTIC RESIN POLYMER HAVING IMPROVED MOLDABILITY AND HEAT RESISTANCE AND COMPOSITION

Sumio Ueda, Kimitsu, and Sadao Ibe, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 205,904, Jun. 13, 1988, abandoned. This application Nov. 20, 1991, Ser. No. 798,038
Claims priority, application Japan, Dec. 2, 1987, 62-303365; Dec. 28, 1987, 62-329440
Int. Cl.[5] C08F *283/08*
U.S. Cl. 525—392 **4 Claims**

1. A thermoplastic resin polymer having improved moldability and heat resistance, comprising a polyphenylene ether and a low molecular weight styrene polymer bonded to said polyphenylene ether, said low molecular weight styrene polymer having a number average polymerization degree of from 5.5 to 8.0 and being present in an amount of from 0.5 to 3.0% by weight, based on the weight of said polyphenylene ether.

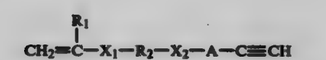
5,191,032

HETEROFUNCTIONAL MACROMER COMPOUND, ITS PREPARATION AND POLYMER DERIVED THEREFROM

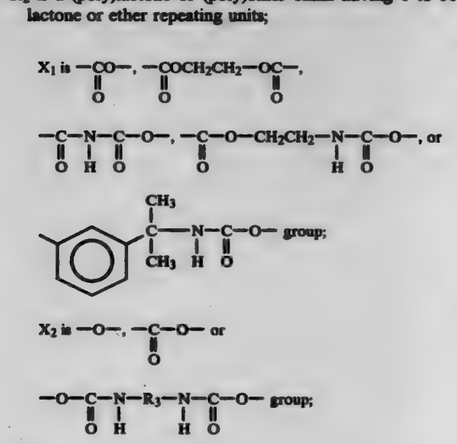
Mitsuo Yamada, Osaka, and Kei Aoki, Nara, both of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Nov. 22, 1991, Ser. No. 796,384
Claims priority, application Japan, Nov. 30, 1990, 338960
Int. Cl.[5] C08G *63/91, 65/48*
U.S. Cl. 525—404 **1 Claim**

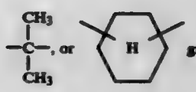
1. A heterofunctional macromer compound represented by the formula:



in which
R_1 is hydrogen atom or an alkyl group having 1 to 4 carbon atoms;
R_2 is a (poly)lactone or (poly)ether chain having 1 to 50 lactone or ether repeating units;



in which
R_3 is an alkylene having 1 to 6 carbon atoms, aromatic or alicyclic group;
A is $-CH_2-$,



group.

5,191,033

EPOXY RESIN COMPOSITION CONTAINING AMINATED EPOXY RESIN-ALKYLENE OXIDE POLYOLS

Michael Cuscurida; George P. Speranza, both of Austin, and Kathy B. Sellstrom, Pflugerville, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed May 11, 1992, Ser. No. 880,855
Int. Cl.[5] C08G *59/40, 59/62, 65/00*
U.S. Cl. 525—407 **20 Claims**

1. An epoxy resin composition comprising the cured reaction product of a curable admixture which comprises a vicinal polyepoxide having an epoxide equivalence of 1.8 or greater and a curing amount of a curative comprising a polyamine produced by the process of:
a. reacting
i. a diol initiator,
ii. one or more alkylene oxides, and
iii. an intermediate epoxy resin in proportion such that the ratio of hydroxyl functionality to equivalents of intermediate epoxy resin is at least 2 to 1, and in such a manner that the intermediate epoxy resin is added internally along the length of the polyol chain to give a modified polyol having a molecular weight of 2000 to 5000, and
b. aminating said modified polyol to yield said polyamine.

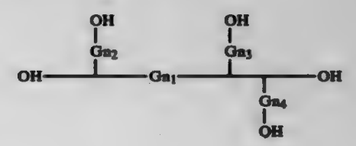
5,191,034

BRANCHED ENERGETIC POLYETHER ELASTOMERS

Elie Abed, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ontario, Canada

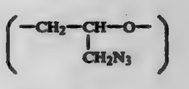
Continuation-in-part of Ser. No. 680,927, Apr. 5, 1991, Pat. No. 5,130,381. This application Jun. 19, 1992, Ser. No. 901,478
Int. Cl.[5] C08G *65/24, 65/32*
U.S. Cl. 525—407 **41 Claims**

1. A process for the preparation of branched chain hydroxy-terminated aliphatic azido ether polymers and copolymers, of structural formulas I and II,



I

wherein
G=GAP unit



n=total number of GAP units;

$$n = n_1 + n_2 + n_3 + n_4 + \ldots + n_x = \sum_{i=1}^{x} n_i$$

n_1=number of GAP units in segment 1;

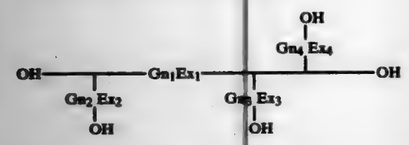
5,191,039

FLUORINE CONTAINING EPOXY(METH)ACRYLATE

5,191,041

CATALYST FOR OLEFIN HYDROCARBON

n_1=number of GAP units in segment 1;
n_2=number of GAP units in segment 2;
n_s=number of GAP units in segment s;
s=total number of segments in the molecule;
$400 \leqq n \leqq 2000$, of a functionality of about 10, and a molecular weight of 40,000 to 200,000; and



II

wherein
E is a (—O—R) unit, where R is C1 to C4 lower-alkyl;
n=total number of GAP units in the copolymer;
x=total number of E units in the copolymer;
n_1 and x_1 are respectively the number of GAP and E units in segment 1;
n_2 and x_2 are respectively the number of GAP and E units in segment 2;
n_s and x_s are respectively the number of GAP and E units in segment s;
s=total number of segments in the copolymer;

$$n = n_1 + n_2 + \ldots + n_s = \sum_{i=1}^{s} n_i$$

$$x = x_1 + x_2 + \ldots + x_s = \sum_{i=1}^{s} x_i$$

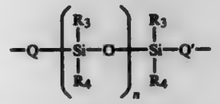
$280 \leqq x \leqq 1400$
$280 \leqq n \leqq 1400$, of a functionality of about 10, and a molecular weight of 40,000 to 200,000
comprising the single step of respectively reacting a solid rubbery epichlorohydrin polymer (PECH) and/or epichlorohydrin-alkylene oxide (PEEC) copolymer, of a molecular weight of 0.50 to 5.0×10^6, with an alkali metal azide selected from the group consisting of sodium azide, potassium azide and lithium azide, in a suitable organic solvent, in the presence of a suitable initiator at a temperature of of greater than 70° C. while agitating.

5,191,035
BLENDS OF POLYETHER SULFONES AND POLYIMIDES
M. Jamal El-Hibri, Roswell; James E. Harris, Buford, both of Ga., and John L. Melquist, Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Sep. 30, 1991, Ser. No. 768,009
Int. Cl.[5] C08L 77/00, 77/06
U.S. Cl. 525—434 8 Claims

1. A composition comprising a blend of polyether sulfone and the polyimide of sulfonyl bis(phthalic anhydride) and 1,4-bis(p-aminocymyl)benzene, wherein said polyether sulfone does not contain a biphenyl unit.

5,191,036
THERMOPLASTIC RESIN COMPOSITION
Naoki Yamamoto; Hiroshi Mori; Akira Nakata, and Misayo Suehiro, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Division of Ser. No. 475,793, Feb. 6, 1990, Pat. No. 5,084,527.
This application May 31, 1991, Ser. No. 708,301
Claims priority, application Japan, Feb. 23, 1989, 64-41735; Feb. 23, 1989, 64-41736
Int. Cl.[5] C08L 67/03, 69/00
U.S. Cl. 525—439 4 Claims

1. A thermoplastic resin composition comprising:
(A) a polycarbonate resin,
(B) an aromatic polyester-polyorganosiloxane block copolymer formed from an aromatic polyester segment which is an aromatic polyester selected from the group consisting of (a) a copolycondensation product of p-hydroxybenzoic acid, 2,6-naphthalene-dicarboxylic acid, and hydroquinone, (b) a copolycondensation product of p-hydroxybenzoic acid, 2,6-naphthalene-dicarboxylic acid, and 2,6-naphthalenediol, and (c) a copolycondensation product of p-hydroxybenzoic acid, 2,6-naphthalenedicarboxylic acid, hydroquinone, and isophthalic acid;
and a polyorganosiloxane segment represented by a formula



wherein R_3 and R_4 individually indicate methyl or phenyl; Q and Q' individually indicate a divalent group; and n is an integral number of 10 or greater;
and the weight of ratio of A to B (A/B) being 10/90 to 90/10.

5,191,037
BIODEGRADABLE POLYMERIC COMPOSITION
Yoshiharu Doi, 2617-39 Imajuku-cho, Asahi-ku, Yokohama-shi, Kanagawa-ken, and Yoshiharu Kunugi, Yokohama, both of Japan, assignors to Doi, Yoshiharu, Yokohama and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan
Filed Oct. 17, 1991, Ser. No. 778,276
Claims priority, application Japan, Apr. 11, 1991, 3-79118
Int. Cl.[5] C08L 67/04; C08G 63/06
U.S. Cl. 525—450 13 Claims

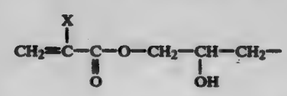
1. A biodegradable polymeric composition comprising 100 parts by weight of a first polymer which is a microbiologically-produced homopolymer or copolymer of R(−)-3-hydroxybutyric acid, and from 3 to 4,000 parts by weight of a second polymer which is a chemically-synthesized random copolymer of R(−)-3-hydroxybutyric acid and S(+)-3-hydroxybutyric acid.

5,191,038
PREPARATION OF BRANCHED POLYCARBONATE COMPOSITION FROM CYCLIC AROMATIC POLYCARBONATE OLIGOMER, POLYHYDRIC PHENOL AND POLYCARBONATE
Herman O. Krabbenhoft, Schenectady, and Eugene P. Boden, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 521,495, May 10, 1990, Pat. No. 5,097,008, which is a division of Ser. No. 359,594, Jun. 1, 1989, abandoned.
This application Jul. 26, 1991, Ser. No. 736,165
Int. Cl.[5] C08L 69/00
U.S. Cl. 525—462 9 Claims

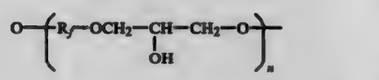
1. A method for preparing a branched polycarbonate composition which comprises contacting a mixture of aromatic cyclic polycarbonate oligomers with a non-branched linear aromatic polycarbonate and a polyhydric phenol having more than two hydroxy groups per molecule in the presence of a catalytic amount of a carbonate equilibration catalyst at a temperature in the range of about 200° C. to about 350° C. in a melt equilibration process.

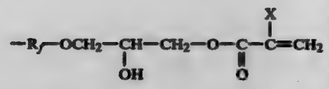
5,191,039
FLUORINE-CONTAINING EPOXY(METH)ACRYLATE RESIN
Tohru Maruno; Shigeki Ishibashi, both of Tokorozawa, and Kouzaburou Nakamura, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan
Division of Ser. No. 332,381, Apr. 3, 1989, Pat. No. 5,068,261, which is a continuation of Ser. No. 29,644, Mar. 24, 1987, abandoned. This application May 2, 1991, Ser. No. 694,542
Claims priority, application Japan, Mar. 24, 1986, 61-64000; May 13, 1986, 61-107675; Oct. 7, 1986, 61-237004; Oct. 17, 1986, 61-246849
Int. Cl.[5] C08G 59/16
U.S. Cl. 525—531 4 Claims

1. A fluorine-containing epoxy(meth)acrylate resin represented by the following formula (I):



(I)

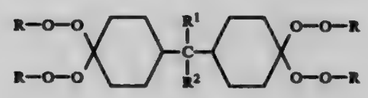




wherein R_f is selected from the group consisting of —ϕ—$C(CF_3)_2$—ϕ— (where ϕ stands for — —) and —$CH_2(CF_2)_6CH_2$—; n is zero or a positive integer such than adhesive composition formulated with the fluorine-containing epoxy(meth)acrylate resin is functionally effective as an adhesive and such that the adhesive composition containing the fluorine-containing epoxy(meth)acrylate resin has a refractive index ranging from 1.434 to 1.532; and X is hydrogen or a methyl group.

5,191,040
PROCESS FOR PRODUCING STYRENIC POLYMER
Ryoso Okumura, and Kiichi Izumida, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan
Filed Feb. 11, 1992, Ser. No. 833,506
Claims priority, application Japan, Feb. 27, 1991, 3-053750
Int. Cl.[5] C08F 4/36, 2/02
U.S. Cl. 526—65 14 Claims

1. A process for producing a styrenic polymer which comprises feeding a compound consisting essentially of a styrenic monomer to 2 to 6 units of reactors connected in series and carrying out a bulk polymerization at a reaction temperature of 90° to 200° C. and a difference of reaction temperatures among the units of reactors of not more than 40° C. and in the presence of 10 to 450 ppm by weight of an organic peroxide represented by the following formula (I):



(I)

wherein R represents a tertiary alkyl group or a tertiary aralkyl group, and R^1 and R^2 each represent an alkyl group having 1 to 2 carbon atoms, said styrenic polymer having a weight average molecular weight of 30×10^4 to 70×10^4 and a ratio of weight average molecular weight (Mw) to number average molecular weight (Mn) of not more than 3.0.

5,191,041
CATALYST FOR OLEFINIC HYDROCARBON POLYMERIZATION AND PROCESS AND PRODUCING OLEFINIC HYDROCARBON POLYMER
Hayato Sabe; Keisaku Yamamoto, both of Chiba; Akio Imai, Osaka; Kiyoyaki Sugimori, and Kizaku Wakatsuki, both of Chiba, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan
Division of Ser. No. 675,823, Mar. 27, 1991, Pat. No. 5,122,493.
This application Jan. 16, 1992, Ser. No. 821,037
Claims priority, application Japan, Mar. 29, 1990, 2-084526; Jan. 25, 1991, 3-7627
Int. Cl.[5] C08F 4/631, 210/16
U.S. Cl. 526—142 4 Claims

1. A process for producing an olefinic hydrocarbon polymer comprising copolymerizing an α-olefin containing from 3 to 12 carbon atoms and ethylene, or an α-olefin containing from 3 to 12 carbon atoms, ethylene, and a polyene compound, in an inert solvent in the presence of an inert hydrocarbon solvent-soluble catalyst consisting of (A) a reaction product obtained by reacting (a) at least one vanadium compound represented by formula:

$$VO(OR)_mX_{3-m}$$

wherein R represents a hydrocarbon group; X represents a halogen atom; and m represents a real number of from 0 to 3, and (b) a dihydroxy hydrocarbon compound constituted of a straight chain hydrocarbon skeleton containing from 2 to 12 carbon atoms and having a hydroxyl group at each of both terminals thereof and at least one hydrocarbon branch bonded to said hydrocarbon skeleton in an inert hydrocarbon solvent at an (a) to (b) molar ratio of from 1:0.5 to 1:1.4 and (B) at least one organoaluminum compound represented by formula:

$$R_n'AlX_{3-n}'$$

wherein R' represents a hydrocarbon group; X' represents a halogen atom; and n represents a real number more than 0 and less than 2.

5,191,042
PROCESS FOR PREPARING ALPHA-OLEFIN COPOLYMERS HAVING A NARROW MWD AND BROAD COMPOSITIONAL DISTRIBUTION
Charles Cozewith, Watchung, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.
Continuation of Ser. No. 403,953, Sep. 6, 1989, abandoned. This application Sep. 25, 1991, Ser. No. 767,523
Int. Cl.[5] C08F 2/04, 236/20
U.S. Cl. 526—144 26 Claims

1. A process for preparing an elastomeric copolymer of ethylene, at least one other alpha-monoolefin having from 3 to 18 carbon atoms, and from 0 to 20% by weight of a non-conjugated diene, said copolymer containing from about 30 to about 85 weight percent of ethylene and from about 15 to 70 weight percent of said other alpha-monoolefin, said copolymer further characterized by a broad intermolecular compositional distribution such that at least about 25% by weight of the copolymer differs from the mean ethylene content of the copolymer by greater than plus or minus 5%, and said copolymer having a molecular weight distribution such that the weight average molecular weight divided by the number average molecular weight as determined by GPC is from about 2 to 5,
said process comprising polymerizing a mixture of ethylene and at least one other alpha-monoolefin and, optionally, said non-conjugated diene in solution in the presence of a catalyst and promoter system comprising:
a) A vanadium compound having the formula:

wherein X is halogen, Y is an organic alcoholate, carboxylate, ketonate or diketonate having up to 10 carbon atoms, a may range from 1 to 3 with the sum of a and b being 2 or 3, c may range from 1 to 4 with the sum of c and d being 3 or 4,

b) an aluminum compound having the formula AlR_3, wherein R is a hydrocarbon radical having from 1 to 10 carbon atoms, and

c) a halogenated organic polymerization promoter having a Cooper reactivity index in the range of about 0.01 to 30, the Cooper reactivity index of carbon tetrachloride being 1.0,

said vanadium compound, aluminum compound and promoter being separately introduced into the solution to form the catalyst and promoter system in the presence of said ethylene, higher alpha-monoolefin and optional non-conjugated diene.

5,191,043

PRECIPITATION POLMERIZATION OF COPOLYMERS OF A VINYL LACTAM AND A POLYMERIZABLE CARBOXYLIC ACID HAVING A MOLECULAR WEIGHT OF LESS THAN 20,000 IN A COSOLVENT MIXTURE OF AN ALIPHATIC HYDROCARBON SOLVENT AND ISOPROPANOL

Jean S. Shih, Paramus, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Filed Mar. 16, 1992, Ser. No. 851,707
Int. Cl.[5] C08F 2/14
U.S. Cl. 526—212 15 Claims

1. A precipitation polymerization process for making fine, white, powdered copolymers of a vinyl lactam and a polymerizable carboxylic acid, optionally with a polymerizable comonomer, having a weight average molecular weight of about 20,000 or less, which comprises:

(a) charging a reactor with a cosolvent mixture of a C_3–C_{10} saturated hydrocarbon, branched of unbranched, cyclic or acylic, and about 2 to 30% by weight of a secondary alcohol in which the copolymer product is substantially insoluble over the entire compositional range of the copolymers, and a polymerization initiator, which is heated to 50° to 150° C., and agitated; and

(b) simultaneously feeding selected amounts of a vinyl lactam and a polymerizable carboxylic acid, optionally with a polymerizable comonomer, and, if desired, additional polymerization initiator, into said reactor while continuing to agitate the reaction mixture to precipitate the copolymer as a fine, white powder from solution.

5,191,044

PREPARATION OF POLYISOBUTENE

Hans P. Rath, Grunstadt; Herwig Hoffmann, Frankenthal; Peter Reuter, Mannheim, and Helmut Mach, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 8, 1991, Ser. No. 772,804
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1990, 4033196
Int. Cl.[5] C08F 2/00
U.S. Cl. 526—212 4 Claims

1. In a process for producing polyisobutene by polymerizing isobutene and/or hydrocarbons containing isobutene in the presence of a complex of BF_3 and an alcohol in which the molar ratio of BF_3 to the alcohol and any additional complexing agent in the complex is from 0.5:1 to 0.95:1, the improvement which comprises substantially removing free BF_3 from the complex, its solution and/or from the reaction chamber prior to the polymerization.

5,191,045

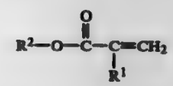
COATING COMPOSITION AND RESIN MOLDED ARTICLE COATED THEREBY

Masaaki Funaki, Ichihara, and Fujio Sawaragi, Kanagawa, both of Japan, assignors to Nippon ARC Co., Ltd., Chiba, Japan

Filed Aug. 26, 1991, Ser. No. 749,749
Claims priority, application Japan, Sep. 10, 1990, 2-239419
Int. Cl.[5] C08F 26/06
U.S. Cl. 526—259 4 Claims

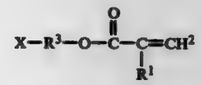
1. A coating composition for forming an undercoat layer, which contains a copolymer obtained from the following monomer compounds (i), (ii) and (iii),

(i) an acrylic or methacrylic compound containing at least one of the compounds of the formulae (I) and (II),



(I)

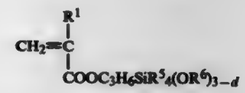
wherein R^1 is hydrogen or a methyl group and R^2 is an alkyl group,



(II)

wherein R^1 is hydrogen or a methyl group, R^3 is an alkylene group, and X is a hydroxyl group, a carboxyl group, an amine group, an epoxy group, an amido group or $Si(OR^4)_3$ in which R^4 is an alkyl group,

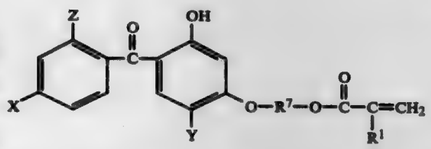
(ii) an alkoxysilyl group-containing acrylic or methacrylic compound of the formula (III),



(III)

wherein R^1 is hydrogen or a methyl group, R^5 is a hydrocarbon group having 1 to 6 carbon atoms, R^6 is a hydrocarbon group having 1 to 5 carbon atoms, an alkoxyalkyl group or an acyl group having 1 to 4 carbon atoms, and d is 0, 1 or 2, and

(iii) an acrylic or methacrylic compound having ultraviolet light absorbability selected from the group consisting of a benzophenone-substituted acrylic monomer of the formula (IV)

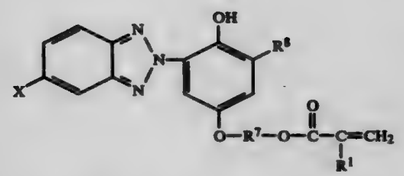


(IV)

wherein R^1 is hydrogen or a methyl group, R^7 is an alkylene group $(CH_2)_n$– in which n is 1 to 5 or a hydroxyalkylene group, Z is hydrogen, a hydroxyl group or a carboxyl group, X is hydrogen or an alkoxy group OR^8 in which R^8 is an alkyl group of C_nH_{2n+1} in which n is 1 to 20, and Y is hydrogen, chlorine or a sulfonic acid group,

and a triazole-substituted acrylic monomer of the formula (V),

Amine—R^2—Amine



(V)

where the Amine is a member selected from the group of primary and secondary amines, and where R^2 is a member selected from the group consisting of alkylene, cycloalkylene, alkylene ether, and mixtures thereof, said diamine compounds including a butyl nitrile rubber, and

thereafter reacting said prepolymer cotnpound with an additional amount of said liquid diamine compound wherein the relative molar equivalent amounts of said prepolymer and said liquid diamine compound are substantially equal, and the polymeric product produced is a thermoplastic material.

5,191,046

TRANSPARENT HEAT-RESISTANT STYRENE-BASE COPOLYMER

Mune Iwamoto, Yokohama; Norifumi Ito, Kamakura; Tetsuyaki Matsubara, and Toshihiko Ando, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 524,695, May 18, 1990, abandoned, which is a continuation of Ser. No. 867,098, May 17, 1986, abandoned. This application Mar. 1, 1991, Ser. No. 663,083
Claims priority, application Japan, Jun. 3, 1985, 60-118717
Int. Cl.[5] C08F 22/40
U.S. Cl. 526—262 11 Claims

1. In a transparent heat-resistant styrene-base copolymer comprising (a) 30 to 80 parts by weight of a unit derived from a styrene-base monomer, (b) 5 to 70 parts by weight of a unit derived from a monomer selected from the group consisting of a (meth)acrylonitrile monomer and a (meth)-acrylic ester monomer, and (c) 2 to 25 parts by weight of a unit derived from a phenylmaleimide monomer selected from the group consisting of an N-phenylmaleimide substituted by a substituted phenyl group at the N-position and an N-phenylmaleimide substituted by an unsubstituted phenyl group at the N-position, all based on 100 parts by weight of the copolymer, the improvement wherein:

(1) the ratio (b)/(c) is at least 0.3;

(2) the ratio of the weight average molecular weight Mw of the copolymer to the number average molecular weight Mn of the copolymer in the copolymer, Mw/Mn, is 1.8 to 3.0;

(3) the amount of the phenylmaleimide monomer still remaining in the copolymer is not more than 0.2 weight percent; and

(4) the copolymer containing methanol-soluble matter in an amount below 5 weight percent.

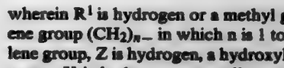
5,191,047

ENAMINE KETONE AND ENONESULFIDE POLYMER SYSTEMS

Frank W. Harris, Akron, Ohio, assignor to Edison Polymer Innovation Corporation, Brecksville, Ohio

Division of Ser. No. 534,449, Jun. 6, 1990, Pat. No. 5,059,666.
This application Oct. 21, 1991, Ser. No. 780,254
Int. Cl.[5] C08F 238/00, 228/04, 226/06
U.S. Cl. 526—263 10 Claims

10. An enamine ketone polymer formed by initially preparing a liquid propynone-terminated prepolymer compound by reacting a bispropynone having the formula:



where R′ is a member selected from alkylene, cycloalkylene, alkylene ether, and mixtures thereof, with a liquid diamine compound of the formula:

5,191,048

BIODEGRADABLE FREE-RADICAL ADDITION POLYMERS

Graham Swift, Blue Bell, and Barry Weinstein, Dresher, both of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Filed Feb. 1, 1991, Ser. No. 649,631
Int. Cl.[5] C08F 34/02
U.S. Cl. 526—271 11 Claims

1. A terpolymer comprising as polymerized units from about 15 to 55 mole percent of at least one first monomer selected from the group consisting of vinyl acetate, vinyl ethers and vinyl carbonates, from about 10 to 70 mole percent of at least one second monomer of an ethylenically unsaturated monocarboxylic acid, and from about 15 to 55 mole percent of at least one third monomer of an anhydride of a dicarboxylic acid and wherein said terpolymer is formed in a non-aqueous system such that less than about one mole percent of the monomers are hydrolyzed during said polymerization.

5,191,049

COPOLYMER OF POLYMERIZABLE COMPONENTS IN NAPHTHA OIL AND MALEIC ANHYDRIDE, PROCESS FOR PRODUCING SAID COPOLYMER, AND DERIVATIVES THEREOF

Norihide Enomoto; Yoshihiro Naruse; Keiji Sugiura; Kimiyo Ohtsu, and Masato Takagi, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Tokyo, Japan

Continuation of Ser. No. 372,306, Jun. 27, 1989, abandoned. This application Dec. 23, 1991, Ser. No. 813,888
Claims priority, application Japan, Jun. 30, 1988, 63-163625; Jul. 19, 1988, 63-179460; Apr. 14, 1989, 1-96154; Apr. 14, 1989, 1-96155; Apr. 14, 1989, 1-96156
Int. Cl.[5] C08F 222/04
U.S. Cl. 526—272 7 Claims

1. A copolymer of about one part by mole maleic anhydride and about one part by mole polymerizable component of naphtha oil containing at least 5 wt % of a polymerizable component that comprises essentially of the following components (a), (b) and (c) whose contents are indicate by eight percentages:

(a) 70–90 wt % of indene;

(b) 0.5–29.5 wt % of styrene; and

(c) 0.5–29.5 wt % in total of one or more compounds selected from among alpha-methylstyrene, methylstyrene, methylindene, dimethylstyrene, trimethylstyrene, coumarone and dicyclopentadiene, wherein a total content of styrene and a styrene derivative of the copolymer is 25 mol % or less.

5,191,050
FUNCTIONALIZED ETHYLENE POLYMERS USEFUL FOR METAL COATING, AND PROCESS FOR THEIR PREPARATION
Marius Hert, Vernouil en Halatte; Brigitte Labatut, and Jean Leben, both of Lens, all of France, assignors to Norsolor, France
Continuation of Ser. No. 601,005, Oct. 22, 1990, abandoned, which is a continuation of Ser. No. 257,591, Oct. 14, 1988, abandoned. This application Jul. 10, 1991, Ser. No. 729,789
Claims priority, application France, Oct. 14, 1987, 87-14183
Int. Cl.[5] C08F 222/04
U.S. Cl. 526—272 6 Claims

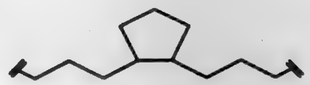
1. Polymers of melt index between 1 and 20 dg/min, which comprise:
83 to 98.7 moles of units (A) derived from ethylene,
0.29 to 3 moles of units (B) derived from an ethylenically unsaturated α,β-dicarboxylic acid anhydride,
1 to 13.6 moles of units (C) derived from an alkyl acrylate or methacrylate in which the alkyl group contains from 1 to 12 carbon atoms, and
0.01 to 0.4 moles of units (D) derived from at least one polyol polyacrylate or polymethacrylate, the moles of units (A) to (D) being per 100 moles.

5,191,051
PROPOXYLATED ALKALI-SOLUBLE THICKENERS
Gregory D. Shay, and Fran K. Kravitz, both of Des Plaines, Ill., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Continuation of Ser. No. 294,405, Jan. 9, 1989, abandoned. This application Sep. 28, 1990, Ser. No. 590,531
Int. Cl.[5] C08F 226/02
U.S. Cl. 526—301 17 Claims

1. A copolymer which provides an aqueous alkali-soluble anionic copolymer providing anti-settling and thickening characteristics, comprising an aqueous emulsion copolymer of:
(A) about 10–60 weight percent of an alpha, beta-monoethylenically unsaturated carboxylic acid;
(B) about 20–80 weight percent of a non-reactive monoethylenically unsaturated monomer which provides a water-insoluble copolymer;
(C) about 0.5–40 weight percent of a monoethylenically unsaturated, hydrophobic nonionic monomer which is the reaction product of a monohydric or monoamine-terminated polypropoxylated or polybutoxylated hydrophobe with a monoethylenically unsaturated monomer having a single group which is reactive under the conditions employed, and provided said monoethylenically unsaturated, hydrophobic nonionic monomer is not the reaction product of a monohydric or monoamine-terminated polyethoxylated hydrophobe with a monoethylenically unsaturated monomer having a single group which is reactive under the conditions employed; and
(D) from 0 up to about 2 weight percent of a polyethylenically unsaturated monomer.

5,191,052
COPOLYMERS OF ETHYLENE AND 1,3-BUTADIENE
Howard C. Welborn, Jr., Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.
Continuation-in-part of Ser. No. 944,385, Dec. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 747,615, Jun. 21, 1985, abandoned. This application Nov. 2, 1990, Ser. No. 609,325
Int. Cl.[5] C08F 236/06, 4/602
U.S. Cl. 526—339 8 Claims

1. Unsaturated copolymers the polymer chain molecules of which comprise copolymerized units of ethylene and 1,3 butadiene, a portion of the 1,3 butadiene being incorporated into the molecular backbone as trans 1,2 cyclopentane having the structure (I)



the remainder of the butadiene units being present in the copolymer backbone as units of 1,2 non-cyclic butadiene comonomer and units of 1,4 cis and trans noncyclic butadiene comonomer.

5,191,053
PREPARATION OF POLYORGANOSILOXANES WITH CONTROLLED LOW-LEVELS OF HYDROXY SUBSTITUTION
Sidney A. Hansen, Beaverton, and Charles E. Neal, Jr., Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Nov. 14, 1990, Ser. No. 612,655
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—12 14 Claims

1. A process for preparing polyorganosiloxanes containing a controlled low-level of chloride and hydroxy substitution, the process comprising:
(A) contacting a mixture comprising polyorganosiloxanes of formula

and a source of triorganosilyl endblocker of formula

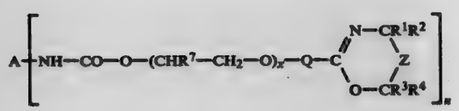
$R^1{}_3Si—$,

with an aqueous hydrogen chloride solution; where each X is independently selected from a group consisting of chloride atoms and hydroxyl radicals; each R is independently selected from a group consisting of hydrogen, monovalent hydrocarbon radicals of 1 to 6 carbon atoms, and 1,1,1-trifluoropropyl radical; each R^1 is independently selected from a group consisting of hydrocarbon radicals of 1 to 6 carbon atoms and 1,1,1-trifluoropropyl radical; and a is an average value within a range of one to 2000;
(B) controlling concentration of hydrogen chloride in the aqueous hydrogen chloride solution at a value within a range of 10 to 30 weight percent;
(C) controlling temperature of the contacted mixture and aqueous hydrogen chloride solution at a value within a range of −40° C. to 100° C.; and
(D) recovering product polyorganosiloxanes of formula

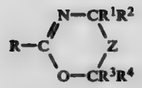
where the product polyorganosiloxanes have a potential value for hydroxy substitution within a range of 10 to 1,000 ppm; R is as previously described, R^2 is selected from a group consisting of R^1, hydroxyl, and chloride; and b is an average value within a range defined by the specific value for a of the polyorganosiloxanes of Step (A) to about 2,000.

5,191,054
NEW CROSSLINKED POLYMERS AND PROCESS FOR THEIR PRODUCTION
Brigitte Hase, Erkrath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
PCT No. PCT/EP90/01141, § 371 Date Jan. 21, 1992, § 102(e) Date Jan. 21, 1992, PCT Pub. No. WO91/01344, PCT Pub. Date Feb. 7, 1991
PCT Filed Jul. 12, 1990, Ser. No. 820,586
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1989, 3924164
Int. Cl.[5] C08G 18/08
U.S. Cl. 528—48 20 Claims

1. A process for the production of crosslinked polymers from cyclic polyiminoethers, wherein a mixture of
a) a cyclic polyiminoether corresponding to formula I



in which A is an aliphatic, aromatic or araliphatic group containing 4 to 40 carbon atoms and n free valencies at various carbon atoms, x may assume a value of 0 to 40, n has a value of 2, 3 or 4, Z is either a direct bond or the group CR^5R^6, the substituents R^1 to R^6 independently of one another represent H, alkyl or aryl containing up to 8 carbon atoms, the substituent R^7 is hydrogen, methyl or ethyl and Q is a phenylene group, which may be substituted by one or two methyl groups, or the group —CHR— M—, in which R is selected from the group consisting of H, alkyl and alkenyl and M is selected from the group consisting of alkylene, alkenylene, arylene and alkarylene and the parts R and M of the molecule independently of one another contain 0 to 12 carbon atoms and may additionally be substituted by an alkoxy group containing 1 to 3 carbon atoms, and, optionally,
b) a component selected from the group consisting of cyclic monoiminoethers corresponding to formula IV

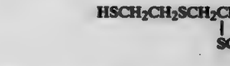


IV

in which R is a C_{1-21} aliphatic, aromatic or araliphatic radical attached by carbon which may contain ether groups and may bear further substituents and Z and also R^1 to R^6 are as defined above, lactones containing 4, 5, 6 or 7 ring members, and mixtures thereof, and, necessarily,
c) a catalyst for the cationic polymerization and, optionally,
d) fillers, additives, or both,
is polymerized with heating.

5,191,055
MERCAPTO COMPOUND, A HIGH REFRACTIVE INDEX RESIN AND LENS AND A PROCESS FOR PREPARING THEM
Yoshinobu Kanemura; Katsuyoshi Sasagawa; Masao Imai, all of Yokohama, and Toshiyuki Suzuki, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Continuation of Ser. No. 794,897, Nov. 20, 1991, abandoned, which is a division of Ser. No. 399,990, Aug. 29, 1989, Pat. No. 5,087,758. This application May 20, 1992, Ser. No. 885,251
Claims priority, application Japan, Dec. 22, 1988, 63-321928
Int. Cl.[5] C08G 18/32, 18/48
U.S. Cl. 528—77 9 Claims

1. A polythiourethane base resin comprising reacting a mercapto compound of the formula (I)

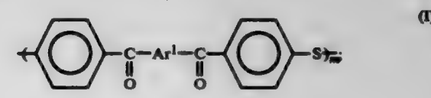


(I)

with at least one ester compound selected from the group consisting of polyisocyanate compounds, polyisothiocyanate compounds and isothiocyanate compounds having a isocyanato groups.

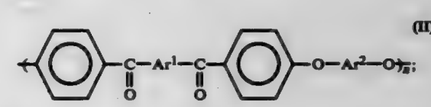
5,191,056
ARYLENE SULFIDE KETONE COPOLYMER AND PREPARATION PROCESS THEREOF
Kiyoshi Sugie; Hiroo Inata, and Shunichi Matsumura, all of Yamaguchi, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Aug. 16, 1991, Ser. No. 745,664
Claims priority, application Japan, Aug. 17, 1990, 2-215717; Mar. 28, 1991, 3-87257
Int. Cl.[5] C08G 8/02, 75/00
U.S. Cl. 528—125 10 Claims

1. An arylene sulfide ketone copolymer comprising recurring units represented by the formulas (I) and (II):



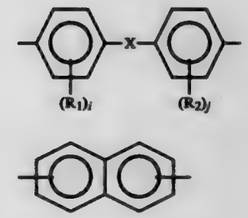
(I)

and



(II)

wherein
Ar^1 is a 1,5-, 2,6- or 2,7-naphthalene ring;
Ar^2 is selected from aromatic residues represented by the following formulas (1), (2) or (3),

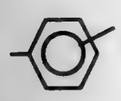


(1)

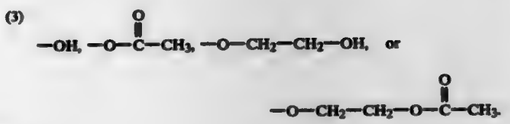
(2)

5,191,060
PREPARATION OF DODECANE TERMETHYLAMIDE

-continued



(3)



wherein

x in formula (1) is a direct bond, —O—, —CO— or —CR_3R_4—;

R_3 and R_4 are identical or different and represent individually a hydrogen atom, methyl, ethyl or propyl group;

R_3 and R_4 may form a cyclohexane ring including the carbon atom to which they are bonded;

R_1 and R_2 are identical or different and each represents methyl, ethyl or propyl group;

i and j are identical or different and each represents zero or an integer of from 1 to 4; and

the bonding positions in the formula (2) are 1,5-, 2,6- or 2,7-;

the m:n ratio is from 95:5 to 5:95 in molecular ratio;

and has an inherent viscosity of at least 0.3 when measured in concentrated sulfuric acid at 30° C.

5,191,057

POLYESTER AND AN ARTICLE MADE OF THE SAME COMPRISING A P-QUATERPHENYL DERIVATIVE

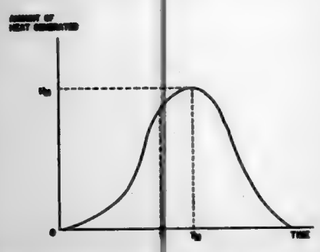
Akihiro Niki, Takatsuki; Makoto Okuno, Sakai; Toshio Uenaka, Tokuyama; Terumichi Saito; Hiroki Tsunomachi, both of Ibaraki; Kazuo Doyama, Suita; Makoto Yamaguchi, Takatsuki, and Daishiro Kishimoto, Ibaraki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha and Kabushiki Kaisha Sanko Kaihatsu Kagaku Kenkyusho, both of Osaka, Japan

Continuation of Ser. No. 438,142, Nov. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 356,726, May 25, 1989, abandoned. This application Dec. 11, 1991, Ser. No. 804,940

Claims priority, application Japan, May 26, 1988, 63-129181; May 26, 1988, 63-129182; Aug. 31, 1988, 63-216874; Aug. 31, 1988, 63-216876; Jan. 24, 1989, 1-15748; Jan. 24, 1989, 1-15845

Int. Cl.[5] C08G *63/00, 77/00, 77/04, 8/02*

U.S. Cl. 528—190 23 Claims



1. A polyester produced from main acid moiety contributing monomer components comprising at least one dicarboxylic acid, or at least one lower alkyl ester of a dicarboxylic acid, or at least one halogenated dicarboxylic acid; and as its main alcoholic moiety contributing monomer components at least a p-quater-phenyl derivative of the formula:

(I)

wherein the R groups, independently, are

5,191,058

PREPARATION OF PEROXIDE TERMINATED POLYCARBONATE

Edward J. Fewkes, Jr., Galway, N.Y., assignor to General Electric Company, Schenectady, N.Y.

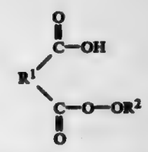
Division of Ser. No. 615,192, Nov. 19, 1990, abandoned, which is a division of Ser. No. 404,287, Sep. 7, 1989, abandoned. This application Nov. 27, 1991, Ser. No. 799,219

Int. Cl.[5] C08G *64/20*

U.S. Cl. 528—198 7 Claims

1. A method for preparing a peroxide-terminated polycarbonate which comprises reacting an organic dihydroxy compound with phosgene in the presence of a peroxy ester of the formula

(IV)



as a chain termination agent, wherein R^1 is a divalent aliphatic or alicyclic radical and R^2 is a tertiary aliphatic or alicyclic radical.

5,191,059

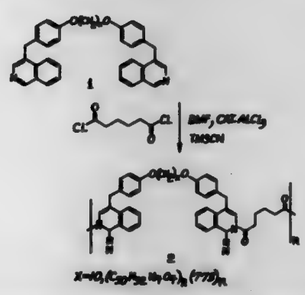
ISOQUINOLINE-CONTAINING POLY(REISSERT COMPOUNDS)

Harry W. Gibson, and Yajnanarayana H. R. Jois, both of Blacksburg, assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Apr. 15, 1991, Ser. No. 685,378

Int. Cl.[5] C08G *12/26*

U.S. Cl. 528—220 16 Claims



1. A poly(Reissert compound) formed by reaction of a coupled bis(isoquinoline), a diacid chloride, and a source of cyanide.

5,191,060

PREPARATION OF DODECANE TEREPHTHALAMIDE POLYMERS

Murali K. Akkapeddi, Morristown; Michael F. Cummings, Madison, and Gerald J. Dega, Flanders, all of N.J., assignors to Allied Signal

Filed Jan. 8, 1992, Ser. No. 818,192

Int. Cl.[5] C08G *69/28*

U.S. Cl. 528—347 14 Claims

1. A process for producing a dodecane terephthalamide polymer having a high melting temperature and dimensional stability, comprising the steps of:

a) reacting an aqueous suspension comprising substantially equimolar diacid/diamine admixture of 1,12-dodecanediamine, and terephthalic acid in a reactor to form an aqueous suspension of polyamide prepolymer at a reaction temperature of from about 200° C. to about 270° C., wherein said prepolymer has a reduced viscosity of from about 0.1 to about 0.4, measured in a 0.5 g/dl solution in 96% sulfuric acid at 25° C.;

b) drying said prepolymer; and

c) polycondensating said dried prepolymer in an extruder to form said polyamide polymer, whereby said polyamide polymer absorbs less than 3 weight percent of moisture, measured according to the ASTM D570-81 testing procedure, and has a reduced viscosity of at least about 0.5, measured in a 0.5 g/dl solution in 96% sulfuric acid at 25° C.

5,191,061

RESIN FOR HIGH-REFRACTION LENS CONTAINING A SULFUR-CONTAINING AROMATIC(METH)ACRYLATE AND A MERCAPTO COMPOUND

Yukihito Zauka; Seiichiro Hayakawa; Tsutomu Iizuka, and Fumio Watari, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1991, Ser. No. 779,051

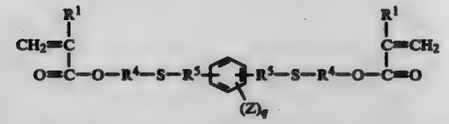
Claims priority, application Japan, Oct. 24, 1990, 2-284466; Oct. 24, 1990, 2-284467

Int. Cl.[5] C08G *75/00;* C08F *228/00*

U.S. Cl. 528—376 9 Claims

1. A cured resin for high-refraction lenses which is obtained by polymerizing a composition comprising

(A) from 70 to 99 parts by weight of a sulfur-containing aromatic (meth)acrylate represented by formula (I'):



wherein R^1 represents a hydrogen atom or a methyl group; R^4 and R^5 each represents a divalent hydrocarbon group having from 1 to 4 carbon atoms; Z represents a halogen atom exclusive of a fluorine atom; and q represents 0 or an integer of from 1 to 4,

(B) from 1 to 30 parts by weight of al least one mercapto compound selected from

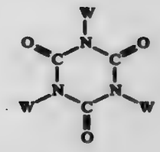
(B-1) a compound represented by formula (II):

(II)

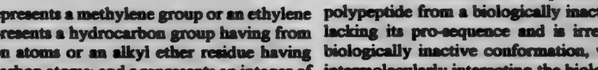
wherein R^6 represents a methylene group or an ethylene group; R^7 represents a hydrocarbon group having from 2 to 15 carbon atoms or an alkyl ether residue having from 2 to 15 carbon atoms; and r represents an integer of from 2 to 6; or

(B-2) a compound represented by formula (III):

(III)



wherein W represents



wherein s and u each represents an integer of from 1 to 8, and t represents 0 or an integer of 1 or 2; and

(C) up to 50 parts by weight of an ethylenically unsaturated monomer copolymerizable with the compound represented by formula (I').

5,191,062

STEAM PURGING OF GRANULAR EPDM RESINS

Robert J. Bernier, Flemington, and Duan-Fan Wang, Somerville, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 27, 1991, Ser. No. 766,405

Int. Cl.[5] C08F *6/28, 6/26*

U.S. Cl. 528—483 18 Claims

1. A process for substantially removing and recovering unreacted diene monomer from ethylene propylene diene monomer (EPDM) resin produced in a fluidized bed reactor which comprises:

(a) directing said resin into a purging zone in contacting relationship with steam in an amount and at a velocity sufficient to remove substantially all unreacted diene monomer from said EPDM resin, said resin being introduced at a temperature above the temperature of the steam in said purging zone;

(b) discharging said EPDM resin, having substantially all the diene monomer removed, from said purging zone;

(c) discharging a stream including steam and diene monomer from said purging zone and thereafter introducing said stream into a first steam and diene monomer separation zone to condense said steam into water and to separate diene monomer from said water leaving trace amounts of diene monomer in said water;

(d) discharging and recovering said diene monomer removed from said water from said separation zone; and

(e) discharging said water containing trace amounts of diene monomer from said separation zone.

5,191,063

PRODUCTION OF BIOLOGICALLY ACTIVE POLYPEPTIDES BY TREATMENT WITH AN EXOGENOUS PEPTIDE SEQUENCE

Masayori Inouye, Bridgewater; Yoshiji Ohta, Highland Park; Xueli Zhu, Iselin, and Frank Jordan, Chatham, all of N.J., assignors to University of Medicine and Dentistry of New Jersey, N.J.

Filed May 2, 1989, Ser. No. 346,552

Int. Cl.[5] C07K *3/00, 13/00;* C12N *9/00*

U.S. Cl. 530—324 4 Claims

1. An in vitro method for producing a biologically active polypeptide from a biologically inactive polypeptide which is lacking its pro-sequence and is irreversibly unfolded into a biologically inactive conformation, which method comprises intermolecularly interacting the biologically inactive polypeptide with an effective amount of the pro-sequence of the naturally occurring polypeptide and promoting the folding of the

moiety of the reacted immunoglobulin of step (b) with an

5,191,069

VOL 1148 ISS 1 MR 2 1993 UMI

biologically inactive polypeptide into its corresponding mature biologically active polypeptide.

5,191,064

NON-A, NON-B HEPATITIS VIRUS ANTIGEN PEPTIDE

Terukatsu Arima, Okayama, and Konosuke Fukai, Toyonaka, both of Japan, assignors to The Research Foundation for Microbial Diseases (Osaka University), Osaka, Japan

Filed Aug. 31, 1989, Ser. No. 401,271

Claims priority, application Japan, Sep. 30, 1988, 63-247175; Mar. 4, 1989, 1-52642; Jun. 14, 1989, 1-153257; Jul. 25, 1989, 1-193233

Int. Cl.[5] C07K 7/00

U.S. Cl. 530—324 2 Claims

1. A substantially pure non-A, non-B hepatitis virus antigen peptide essentially free of other virus proteins, consisting essentially of at least a part of an amino acid sequence coded for by at least one nucleotide sequence selected from the group consisting of formulae (I) to (VI):

GAATTCCAAAAAGAGCAAAACAAACCGCCG (I);
AAGAAAAAACTAATAAGAGAAG
AAAAGGCGAAGAGACACAGGAAAAAAAAAA
CAGAGACGAAGGTCAGATAGAA
AAAAAGCAAGGAATTC

GAATTCCGAGAACAAGACCAGATAAAAACC (II);
AAAGACAGAACACAACAGAGAA
AGACGAAAAGAAGCACCAATCGCAGGCGAAGC
AAAAACGAAAAAAAAAAAAAA
AAAGGAATTC

GAATTCCAAGAAAAAAAGGGAGAAGCCAGC (III);
AATGGAGAAGCCGAAAACGACA
CACACAAGAAACAAAGGAGGTACAAAGAAAAA
GAAAAAACGGCAACAAATAA
CCCAGGAAAGAACAAAAAGCCAAGAGTGGGCA
GAATAAAAAACTGGAACCGG
GAGGGAAGGAAGGACGCATATCAGATTAGAAA
AAGGAGGGAATTC

GAATTCCTAAGAAATGGCTAGCCCTAGGAG (IV);
AGCCAGTCTTTCCCCAGTCAGT
TAGCCCGCAAATGCCAGAGCATCAAGAATTCAG
AAAAGGAGAAAATATAGTT
AATATCAAAGTGGTCGAAGCCTAAGATAGAGAG
GTAGAGAGTATGAAGAGTA
AGACGAATACAAACCAAAATTCTGGAATGATCA
TTAAAAACATTATTGATAG
GTACTTAGAAGGGCAAGAGAGGAAGAAGAAAGT
AATGAGAAATGCTTATGGA
AGCCAAAGGAGCTTTCCAGGAGAAGAAAGGGAATTC

GAATTCCCAACGCGTCGGCTTGGCCC (V);
GCGCCTTGGCCGCCGACCCGCGCTGA
TGGCCGTGGAATTC

GAATTCCGGGGTATTTGCCTCGATCTG (VI);
CCTGCTCAGCGCTTCGGCCCTCGGC
TTGGGCGCCCTGCTGCTGGCTTCCGAGCAG
CTATTCAGCGCCTTGAAAGTGG
TTGGCGCGGCGTACGTGTCCGGGAATTC

wherein the left and right ends of each nucleotide sequence represents the 5'-terminus and 3'-terminus, respectively; and nucleotide sequences individually obtained by substituting at least one nucleotide of each of said nucleotide sequences of formulae (I) to (VI) in accordance with the degeneracy of the genetic code;

said part of an amino acid sequence containing at least one epitope which is reactive to a non-A, non-B hepatitis virus antibody.

5,191,065

PROCESS FOR THE PREPARATION OF TRIPEPTIDES

Hans-Wolfram Flemming, Usingen; Manfred Rukwied, Kelkheim, and Manfred Schmidt, Wehrheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 7,438,073, Nov. 20, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 728,028

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839379

Int. Cl.[5] A61K 37/02; C07K 5/00

U.S. Cl. 530—331 10 Claims

1. A process for the preparation of tripeptides of the general formula I

U-A-B-C-OH I

in which

OH denotes a hydroxy substituent,

U denotes hydrogen or a urethane protective group,

A denotes a natural α-amino acid,

B denotes a natural α-amino acid, and

C denotes an aromatic α-amino acid,

comprising the steps of

(1) reacting a compound of the formula II

U'-B-OH II

in which U' is a urethane protective group which can be eliminated by hydrogenolysis, and B and OH have the above-mentioned meanings, with a compound of the formula III

H-C-OR III

in which R represents alkyl having 1 to 4 carbon atoms, H represents a hydrogen, and C has the above-mentioned meaning, in the presence of propylphosphonic anhydride,

(2) eliminating the protective group U' by hydrogenolysis,

(3) reacting the resulting compound of the formula IV

H-B-C-OR IV

with a compound of the formula V

U-A-OH V

whereby the reaction is carried out in a solvent system consisting essentially of water and one or more compounds selected from the group consisting of chloroform, methylene chloride, butyl acetate, and ethyl acetate, in the presence of propylphosphonic anhydride, and finally

(4) eliminating R enzymatically.

5,191,066

SITE-SPECIFIC CONJUGATION OF IMMUNOGLOBULINS AND DETECTABLE LABELS

Christopher Bieniarz, Highland Park; Mazhar Husain, Libertyville, and Howard E. Bond, Lake Forest, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 7, 1990, Ser. No. 624,169

Int. Cl.[5] C07K 15/12, 15/28

U.S. Cl. 530—391.1 19 Claims

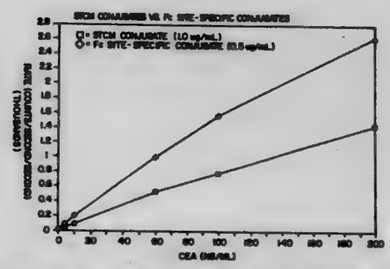
1. A process for producing a derivatized immunoglobulin, said process comprising the steps of:

(a) site-specifically oxidizing the glycosylated zone of the Fc region of an immunoglobulin with an oxidant to convert at least two hydroxyl groups in said zone of said immunoglobulin to an aldehyde group;

(b) reacting the oxidized immunoglobulin of step (a) with a disulfide compound wherein at least one of said aldehyde groups is reductively aminated to introduce a disulfide moiety onto the Fc region of said immunoglobulin; and

(c) selectively reducing the disulfide bonds of the disulfide

moiety of the reacted immunoglobulin of step (b) with an amount of a reductant sufficient to convert at least one of said disulfide moieties of said immunoglobulin into two sulfhydryl groups but insufficient to reduce the disulfide



bonds in the complementarity defined region and the hinge region of said immunoglobulin thereby leaving the disulfide bonds in said complementarity defined region and said hinge region essentially unaffected.

5,191,067

FIBROBLAST GROWTH FACTOR CONJUGATES

Douglas A. Leppi, Del Mar, and Andrew Baird, San Diego, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 27, 1989, Ser. No. 344,109

Int. Cl.[5] C07K 7/00, 13/00; A61K 37/36

U.S. Cl. 530—399 2 Claims

1. A conjugate compriaing saporin and basic FGF which is reactive with an FGF receptor.

2. A pharmaceutical composition comprising a conjugate of basic FGF with saporin, and a physiologically acceptable excipient.

5,191,068

REMOVAL OF CELLS FROM AN AQUEOUS SUSPENSION

Alan R. Thomson, Beaconsfield; Frances L. Stickley, Kings Langley; Stephen E. Clark, Aylesbury, all of England, and John L. Daiss, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/GB90/00012, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO90/07715, PCT Pub. Date Jul. 12, 1990

PCT Filed Jan. 4, 1990, Ser. No. 571,619

Claims priority, application United Kingdom, Jan. 6, 1989, 8900252

Int. Cl.[5] C07K 3/20, 17/00; C12N 11/00

U.S. Cl. 530—413 3 Claims

1. A method of removing cells from an aqueous suspension of cells which method comprises

(1) forming a ternary complex by the interaction of

(a) the cells,

(b) a first antibody which contains a kappa chain and which binds to an antigenic surface component on the cells, and

(c) a second antibody which binds to the kappa chain of the first antibody, said second antibody being covalently bound to a solid phase carrier, and

(2) separating the aqueous phase from the solid phase carrier.

5,191,069

POLYFUNCTIONAL COMPOUNDS CONTAINING α-DIAZO-β-KETO ESTER UNITS AND SULFONATE UNITS

Horst Roeschert, Ober-Hilbersheim; Georg Pawlowski, Wiesbaden; Hans-Joachim Merrem, Basking Ridge, and Ralph Dammel, Klein-Winternheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

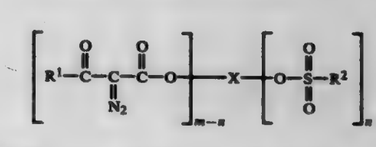
Filed May 1, 1991, Ser. No. 694,386

Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014649

Int. Cl.[5] C07C 245/18, 245/14; C07F 5/02, 7/18

U.S. Cl. 534—556 42 Claims

1. A compound according to the formula I



in which

R^1 and R^2 independently of one another are alkyl, cycloalkyl, aralkyl, aryl; or alkyl, cycloalkyl, aralkyl or aryl substituted by (C_1–C_3)-alkoxy, halogen, nitrile, amino, amido or nitro having 4 to 20 carbon atoms, or such groups wherein individual CH_2 groups are replaced by —O—, —S—, NR_3, —NH— or

groups,

X is an alkylene, cycloalkylene, arylene, heteroarylene, aralkylene; or alkylene, cycloalkylene, arylene, heteroarylene, or aralkylene substituted by (C_1–C_3) alkyl, (C_1–C_3) alkoxy, halogen, nitrile, amino or nitro having 2 to 22 carbon atoms, or such groups wherein individual —CH$_2$—groups are replaced by —O—, —S—, —NR_3—, —C(O)—O; —C(O)—NR_3—, —C(O)—NH—, —NR_3—C(O)—NR_4—, —O—C(O)NR_3—, —O—C(O)—N— or —O— CO—O— groups, or such groups wherein CH groups are replaced by —N—, in which

R^3 and R^4 independently of one another, are hydrogen or alkyl, aryl, aralkyl; or alkyl, aryl or aralkyl substituted by (C_1–C_3) alkyl, (C_1–C_3) alkoxy, halogen or amino,

m is an integer from 3 to 8,

n is an integer from 1 to 3, and m>n.

5,191,070

CONTINUOUS PROCESS FOR THE PREPARATION OF BISAZO PIGMENT MIXTURES

Werner Guthauser, Füllinsdorf, Switzerland, and Philippe Rohner, Scotland, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 564,915, Aug. 8, 1990, abandoned. This application Jan. 19, 1992, Ser. No. 901,490

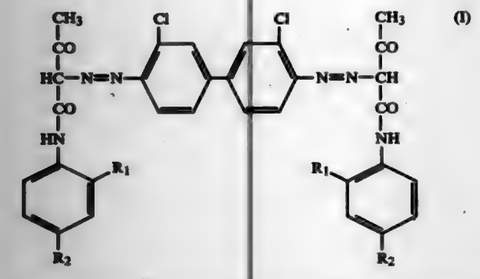
Claims priority, application Switzerland, Aug. 10, 1989, 2939/89

Int. Cl.[5] C09B 35/037; C09C 7/12

U.S. Cl. 534—582 7 Claims

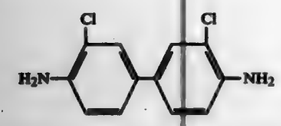
1. A continuous process for the preparation of a bisazo pigment mixture of at least two different bisazo pigments of the general formula

R1 represents alkyl with 2-6 carbon atoms or one of the



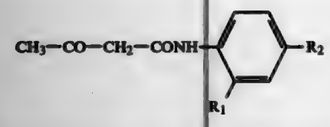
(I)

wherein R_1 and R_2 each may be independent of themselves and are each independently of one another hydrogen, chloro, methyl or methoxy, which bisazo pigments differ from each other in at least one of the substituents R_1 or R_2, by simultaneously coupling a bisdiazotised diaminodiphenyl (A) of formula



(II)

and a mixture (B) of two coupling components of formula



(III)

wherein R_1 and R_2 are each independently of the other hydrogen, chloro, methyl or methoxy which coupling components differ from each other in at least one of the substituents R_1 or R_2, which process comprises mixing continuously the aqueous acidic solution of at most pH 4 of the bisdiazotised diaminodiphenyl (A) with an aqueous alkaline solution of not lower than pH 12 of the mixture (B) of at least two coupling components of formula III which differ from each other as described above in a molar ratio A:B of 1:2.1 to 2.3, keeping the pH in the range from 5.5 to 6.5 by regulating the educt feed, reacting the educts for an average residence time of 1 to 5 minutes, and isolating the resultant pigment mixture by filtration.

5,191,071

MONOESTERS OF GLYCOSIDES AND A PROCESS FOR ENZYMATIC PREPARATION THEREOF

Ole Kirk, Copenhagen N, Denmark; Frederik Björkling, Helsingborg, Sweden, and Sven E. Godtfredsen, Vaerlose, Denmark, assignors to Novo Nordisk A/S, Denmark

Continuation of Ser. No. 465,130, Feb. 20, 1990, abandoned. This application Jun. 28, 1991, Ser. No. 725,881

Claims priority, application Denmark, Aug. 21, 1987, 4388/87

Int. Cl.[5] C07H *15/04, 15/203;* C12P *7/62*

U.S. Cl. 536—4.1 **38 Claims**

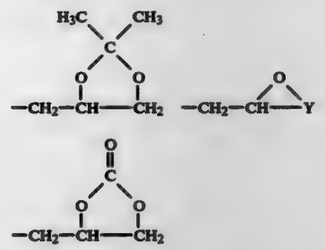
1. A compound of the formula

R—COO—X—OR[1]

wherein

X represents a monosaccharide containing one hexose or pentose unit which carries (a) the group OR^1 at the anomeric carbon atom and (b) the group RCOO— at a primary hydroxy group;

R^1 represents alkyl with 2–6 carbon atoms or one of the following groups



wherein

Y represents methylene or ethylene; and

R represents alkyl with 4–24 carbon atoms.

5,191,072

LIPID A MONOSACCHARIDE ANALOGUES

Akira Hasegawa; Makoto Kiso, both of Gifu; Shinichi Uesato, Yokohama; Masanobu Suzuki, Yokohama; Tomio Ishida, Yokohama, and Yutaka Saito, Yokohama, all of Japan, assignors to Japan Tobacco Inc., Tokyo and Akira Hasegawa, Gifu, both of, Japan

PCT No. PCT/JP90/01288, § 371 Date Jul. 17, 1991, § 102(e) Date Jul. 17, 1991, PCT Pub. No. WO91/04259, PCT Pub. Date Apr. 4, 1991

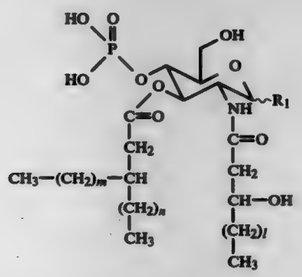
PCT Filed Sep. 20, 1990, Ser. No. 689,770

Claims priority, application Japan, Sep. 20, 1989, 1-241866

Int. Cl.[5] C07H *11/00, 13/00, 13/02;* A61K *31/70*

U.S. Cl. 536—117 **6 Claims**

1. Lipid A monosaccharide analogues of the following formula:



wherein R_1 is a hydrogen atom or a hydroxyl group, 1 is an integer of 8–14, m is an integer of 11–17, and n is an integer of 8–14.

5,191,073

CHROMOGENIC MEROCYANINE ENZYME SUBSTRATES

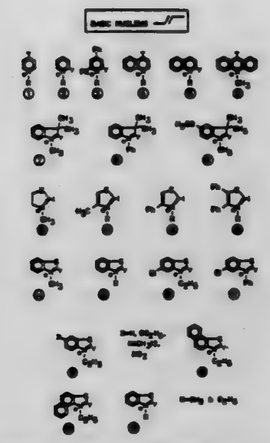
Paul F. Corey, and M. Teresa Yip, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Division of Ser. No. 310,060, Feb. 13, 1989, Pat. No. 5,122,602. This application Feb. 26, 1992, Ser. No. 841,791

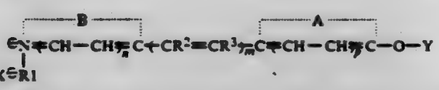
Int. Cl.[5] C07H *17/04, 5/06;* C12Q *1/54;* G01N *33/58*

U.S. Cl. 536—17.2 **15 Claims**

1. A method for determining a particular enzyme in a liquid test sample, comprising the steps of:



(a) contacting the test sample with a compound of the formula



wherein Y is an enzymatically-cleavable group that is (i) capable of being cleaved from such compound by said enzyme or (ii) capable of being modified by said enzyme to produce a secondary substrate compound in which the modified enzymatically-cleavable group is cleavable from the compound by a secondary enzyme, in which case the secondary substrate compound is contacted with said secondary enzyme; A represents a nonmetallic atomic group or residue which completes a 5- or 6-membered carbocyclic or heterocyclic ring or a fused ring system consisting of 5- and/or 6-membered heterocyclic or carbocyclic rings; B represents a nonmetallic atomic group or residue which completes a 5- or 6-membered N-containing heterocyclic ring or a fused ring system consisting of 5- and/or 6-membered heterocyclic or carbocyclic rings; R^1 is alkyl or aryl; R^2 and R^3, which may be the same or different, are hydrogen or lower alkyl; m, n, and p, which may be the same or different, are integers from 0 through 3 provided that m+n+p is at least 2; and X is a counterion (anion); and

(b) measuring the resulting color generated by the cleaved merocyanine indicator group.

5,191,074

β-LACTAM COMPOUNDS AND PRODUCTION PROCESS THEREOF

Yasumitsu Tamura, 9-24, Sakasegawa 2-chome, Takarazuka, Hyogo 665; Junichi Haruta, Hirakata, and Nishi Koichi, Osaka, all of Japan, assignors to Yasumitsu Tamura and Shionogi & Co., Ltd., both of Tokyo, Japan

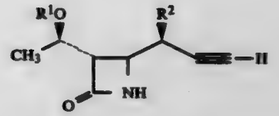
Continuation of Ser. No. 478,469, Feb. 9, 1990, abandoned, which is a division of Ser. No. 164,062, Mar. 3, 1988, abandoned. This application Aug. 12, 1991, Ser. No. 746,083

Claims priority, application Japan, Mar. 6, 1987, 62-52816

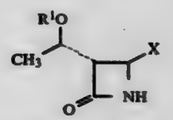
Int. Cl.[5] C07B *55/00, 37/04;* C07D *205/08;* C07F *7/10*

U.S. Cl. 540—200 **4 Claims**

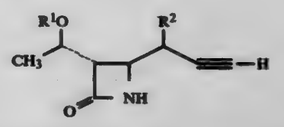
1. A process for producing a β-lactam compound of the following formula:



wherein OR^1 is a protected or unprotected hydroxyl group and R^2 is a C_1 to C_7 alkyl or aryl group in the β-form, which comprises reacting an azetidinone compound of the following formula:

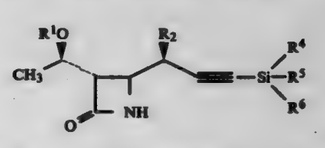


wherein OR^1 is the same as defined above and X is an electrogenative group removable through the reaction, with a stannylallene group of the formula $R^2—CH=C=CH—SnR^7_3$ wherein R^2 is the same as defined above and R_7 is a C_1 to C_4 alkyl group or a phenyl group, to give a β-lactam compound of the following formula:

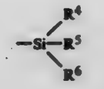


wherein OR^1 and R^2 are the same as defined above and R^2 is in α- and β-forms, and reacting said β-lactam compound with a lithium alkylamide or alkyllithium and an organosilyl halide of the formula:

wherein OR^1 and R^2 are the same as defined above, and R^4, R^5 and R^6 are the same or different and each represents a C_1 to C_4 alkyl group or an aryl group, and Y is a halogen atom, successively, whereby the α-form of R^2 is isomerized to the β-form to produce a β-lactam compound of the following formula:



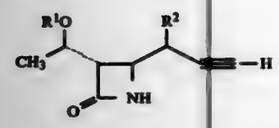
wherein OR^1 is a protected hydroxy group, and R^2, R^4, R^5 and R^6 are the same as defined above; and subjecting said β-lactam compound to a removal reaction of the group



2. A method for isomerizing the α-form of a R^2 in a β-lactam compound of the formula:

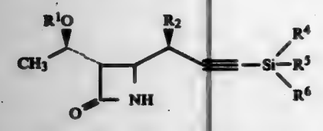
iodine atom, with the proviso that when Y represents a hydro-

5,191,079



wherein OR^1 is a protected or unprotected hydroxyl group and R^2 is a C_1 to C_7 alkyl or aryl group, which comprises reacting said β-lactam compound with a lithium alkylamide or alkyllithium and an organosilyl halide of the formula:

wherein R^4, R^5 and R^6 are the same or different and each represents a C_1 to C_4 alkyl group or an aryl group, and Y is a halogen atom, successively, whereby the α-form of R^2 is isomerized to form the β-form, producing selectively a β-lactam compound of the formula:



wherein OR^1, R^2, R^4, R^5 and R^6 are the same as defined above, and R^2 is in the β-form.

5,191,075

PROCESS FOR THE PREPARATION OF PENEMS

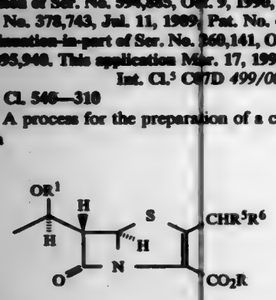
Brian T. O'Neill, Westbrook, and Douglas Phillips, Ledyard, both of Conn., assignors to Pfizer Inc, New York, N.Y.

Division of Ser. No. 594,885, Oct. 9, 1990, which is a division of Ser. No. 378,743, Jul. 11, 1989, Pat. No. 4,992,543, which is a continuation-in-part of Ser. No. 260,141, Oct. 19, 1988, Pat. No. 4,895,940. This application Mar. 17, 1992, Ser. No. 852,598

Int. Cl.[5] C07D *499/00*

U.S. Cl. 546—310 **19 Claims**

1. A process for the preparation of a compound of the formula



(6')

wherein

R is $—CH_2CX=CH_2$, $—CH_2CH_2Si(CH_3)_3$, p-nitrobenzyl, or a conventional radical forming an ester which is hydrolyzed under physiological conditions;

X is H or Cl;

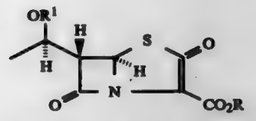
R^1 is a conventional silyl protecting group; and

R^5 and R^6 are taken separately, R^5 is hydrogen or (C_1–C_8)alkyl; R^6 is hydrogen, methyl, (C_1–C_8)alkoxy or OR^7; and R^7 is a conventional hydroxy protecting group; or

R^5 and R^6 are taken together and are $—(CH_2)_mO(CH_2)_p—$ where m and p are each zero or an integer of value 1 to 5, with the proviso that the sum of m and p is at least 3;

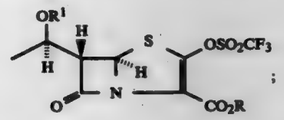
which comprises:

(a) reacting a compound of the formula



(4)

with substantially one molar equivalent of triflic anhydride in the presence of a substantial molar excess of diisopropylethylamine, in a reaction inert solvent at a temperature in the range of about −40° to −90° C. to form a solution of a compound of the formula



(5)

and

(b) reacting said solution of the compound of the formula (5) with at least one molar equivalent of

$$R^5R^6CH)_2Cu(CN_nLi_{n+1}$$

wherein R^5 and R^6 are as defined above and n is zero or 1 at a temperature in the range of about −60° to −100° C. to form said compound of the formula (6').

5,191,076

ACETYLOXYLATION PROCESS FOR PRODUCING 4-ACETOXYAZETIDINONES WITH OSMIUM CATALYST

Takao Saito; Hidenori Kumobayashi, and Shunichi Murahashi, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

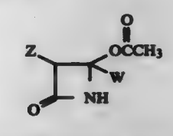
Filed Nov. 26, 1991, Ser. No. 798,150

Claims priority, application Japan, Nov. 30, 1990, 2-335727

Int. Cl.[5] C07D *205/08*; C07B *41/12*

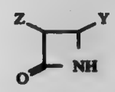
U.S. Cl. 540—357 **8 Claims**

1. A process for producing a 4-acetoxyazetidinone represented by formula (I):



(I)

wherein Z represents a hydrogen atom, a lower alkyl group, or a protected or unprotected hydroxyethyl group; and W represents a hydrogen atom, a lower alkyl group, or a group of the formula —COOR[1], wherein R^1 represents a lower alkyl group, which comprises reacting an azetidinone represented by the formula (II):



(II)

wherein Z is as defined above; and Y represents a hydrogen atom, a carboxyl group, a lower alkyl group, or a group of the formula —COOR[1], wherein R^1 represents a lower alkyl group, with acetic acid and an oxidizing agent in the presence of, as a catalyst, an anhydrous or hydrous osmium compound represented by the formula OsX_3 or hydrated versions thereof, wherein X represents a chlorine atom, a bromine atom, or an

iodine atom, with the proviso that when Y represents a hydrogen atom, a lower alkyl group, or —COOR[1], then W represents Y, and when Y represents —COOH, then W represents a hydrogen atom.

5,191,077

DIASTEREOMERIC 5R,6S-6-(1R-HYDROXYETHYL)-2-(CIS-1-OXO-3-THIOLANYLTHIO)-2-PENEM-3-CARBOXYLIC ACIDS

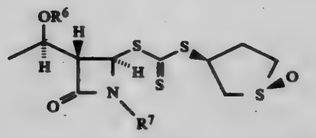
Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 460,118, Oct. 18, 1989, Pat. No. 5,013,729. This application Jan. 28, 1991, Ser. No. 647,400

Int. Cl.[5] C07D *205/09, 333/48, 301/26, 333/32*

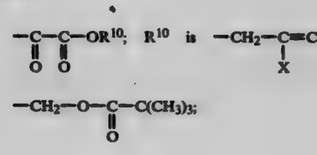
U.S. Cl. 540—357 **5 Claims**

1. A compound having the absolute stereochemical formula



(VI)

wherein R^6 is a conventional silyl protecting group; R^7 is hydrogen or



and

X is hydrogen or chloro.

5,191,078

PROCESS FOR THE DIRECT AND REGIOSELECTIVE FUNCTIONALIZATION IN POSITION 2 OF PHENOTHIAZINE

Mariano Meneghin, Revine-Lago, Italy, assignor to Zambon Group S.p.A., Milan, Italy

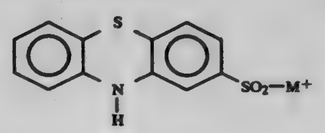
Division of Ser. No. 626,763, Dec. 13, 1990, Pat. No. 5,109,134. This application Mar. 2, 1992, Ser. No. 844,434

Claims priority, application Italy, Dec. 21, 1989, 22769 A/89

Int. Cl.[5] C07D *279/20*; C07B *45/04*

U.S. Cl. 544—35 **1 Claim**

1. A compound of formula



(III-A)

wherein M^+ is the cation of an alkali metal.

5,191,079

QUINOLINECARBOXYLIC ACID DERIVATIVES

Hirosato Kondo, Suita; Masahiro Taguchi, Hirakata; Yoshikazu Jitabe; Yoshimasa Inoue, both of Osaka; Yasuo Kotera, Osaka, and Fumio Sakamoto, Daito, all of Japan, assignors to Kaneko, Ltd., Tokyo, Japan

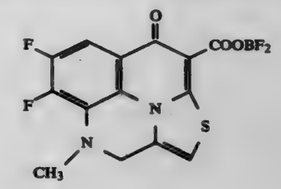
Division of Ser. No. 703,739, May 21, 1991. This application Jan. 30, 1992, Ser. No. 907,184

Claims priority, application Japan, Aug. 30, 1990, 2-229651

Int. Cl.[5] C07D *513/16*; C07F *5/04*

U.S. Cl. 544—229 **2 Claims**

1. A quinolinecarboxylic acid derivative of the formula:



5,191,080

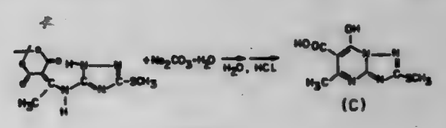
METHOD FOR PREPARING TETRAAZAINDENES

David G. Lincoln, Webster, and Mark J. Robbins, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 678,776, Apr. 1, 1991, Pat. No. 5,103,016, which is a division of Ser. No. 542,621, Jun. 25, 1990, Pat. No. 5,061,799. This application Jan. 21, 1992, Ser. No. 823,279

Int. Cl.[5] C07D *471/02*

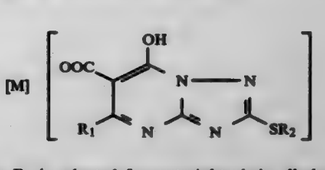
U.S. Cl. 544—263 **9 Claims**



(C)

STEP 3

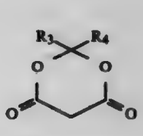
1. A method for the preparation of a tetraazaindene salt represented by the structural formula



I

wherein R_1 is selected from straight chain alkyl groups and aryl groups having up to about 8 carbon atoms, R_2 is an alkyl or aryl group having up to about 8 carbon atoms, and M is a metal cation selected from Na, K, and mixtures thereof, comprising the steps of:

(i) reacting a compound represented by the structural formula



IV

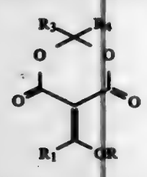
wherein R_3 and R_4 are independently selected from alkyl groups having up to about 4 carbon atoms with an ortho-

ester represented by the structural formula R_1—C(OR)$_3$

pionylbenzyl]carbamate, 3,5-di-t-butyl-4-hydroxyphenyl-N-[1-

VOL 1148 ISS 1 MR 2 1993 UMI

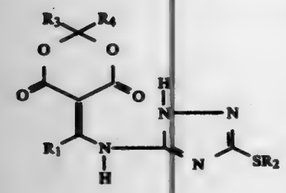
ester represented by the structural formula R_1—$C(OR)_3$ wherein R_1 is as defined hereinabove and R is an alkyl group having up to about 3 carbon atoms in the presence of (a) a catalytic amount of a tertiary amine having a pKa sufficient to catalyze the reaction and (b) a substantially anhydrous organic solvent to form a first intermediate represented by the structural formula



(II)

wherein R, R_1, R_3, and R_4 are as described hereinabove;
(ii) reacting said first intermediate with a triazole represented by the structural formula

wherein R_2 is as defined hereinabove to form a second intermediate represented by the structural formula



(III)

wherein R_1, R_2, R_3, and R_4 are as described hereinabove; and
(iii) reacting said second intermediate with a base selected from the group consisting of NaOH, KOH, Na_2CO_3, and K_2CO_3, and mixtures thereof, at a reaction temperature in the range of from about 0° C. to about 50° C., to form said tetraazaindene salt having Formula I.

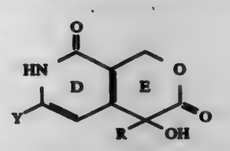
5,191,081
1-CYANOMETHYL-4-CARBOXYMETHYL-3-KETOPIPERAZINE, SALTS THEREOF AND PROCESS FOR THEIR PREPARATION
Brian A. Parker, Nashua, N.H., assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Dec. 12, 1991, Ser. No. 805,765
Int. Cl.[5] C07D *241/08*
U.S. Cl. 544—384 1 Claim

1. A compound represented by the following formula:

wherein R represents hydrogen or an alkali metal or alkaline earth metal.

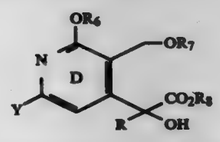
5,191,082
CAMPTOTHECIN INTERMEDIATE AND METHOD OF MAKING CAMPTOTHECIN INTERMEDIATES
Daniel L. Comins, and Matthew F. Beavsky, both of Cary, N.C., assignors to North Carolina State University, Raleigh, N.C.
Division of Ser. No. 632,970, Dec. 20, 1990, Pat. No. 5,162,532. This application Aug. 10, 1992, Ser. No. 927,217
Int. Cl.[5] C07D *491/052*
U.S. Cl. 546—116 5 Claims

1. A method of making a compound of Formula III:



(III)

wherein R is loweralkyl and Y is H or Cl, comprising reacting a compound of Formula XII

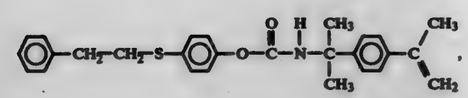


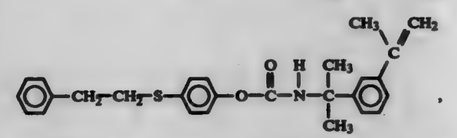
(XII)

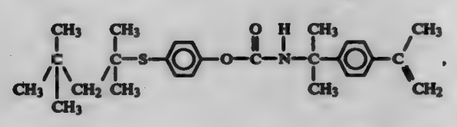
wherein R_6, R_7 and R_8 are loweralkyl with a compound selected from the group consisting of bromotrimethylsilane and iodotrimethylsilane to produce a reaction product, and then contacting the reaction product with an acid solution to yield the compound of Formula III.

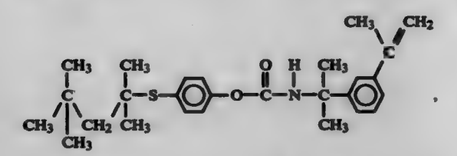
5,191,083
FUNCTIONALIZED MONOMERS FROM 1-(1-ISOCYANATO-1-METHLETHYL)-3 OR 4-(1-METHYLETHENYL) BENZENE
Howard A. Colvin; Kirkwood S. Cottman, both of Akron, and Dane K. Parker, Massillon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 016,148, Feb. 18, 1987, Pat. No. 4,853,478, which is a division of Ser. No. 806,688, Dec. 16, 1985, Pat. No. 4,714,772, which is a division of Ser. No. 737,742, May 28, 1985, Pat. No. 4,604,439. This application Feb. 28, 1989, Ser. No. 317,259
Int. Cl.[5] C07D *211/46*; C07C *271/44*
U.S. Cl. 546—222 1 Claim

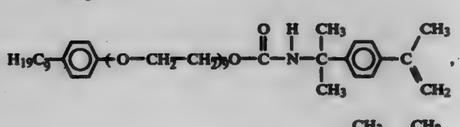
1. A polymerizable monomer selected from the group consisting of 2-[3-(butylthio)-2-methyl-propionyloxy] α-ethyl N[α,α'-dimethyl-3-isopropionylbenzyl]carbamate, 2-[3-(butylthio)-2-methyl-propionyloxy]ethyl N[α,α'-dimethyl-4-isopropionylbenzyl]carbamate, 3,5-di-t-butyl-4-hydroxyphenyl-N-[1-(3-isopropenylphenyl)-1-methyl]ethyl carbamate, 3,5-di-t-butyl-4-hydroxyphenyl-N-[1-(4-isopropenylphenyl)-1-methyl]ethyl carbamate, and monomers having the formula:

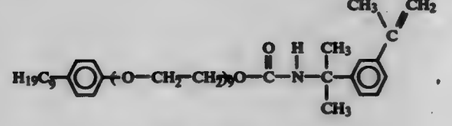


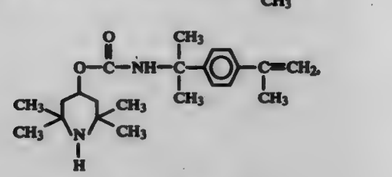


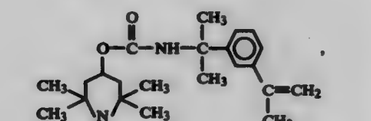


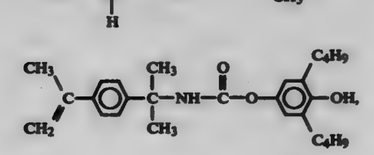


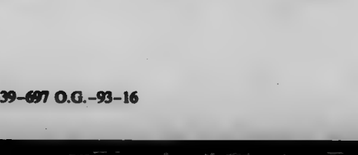












339-697 O.G.-93-16

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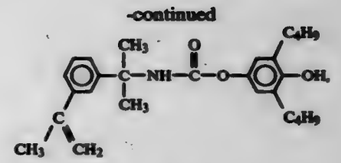
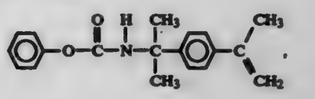
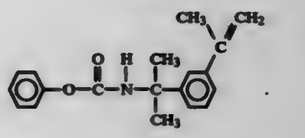


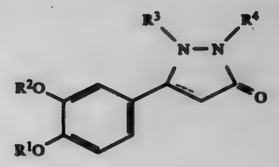


and

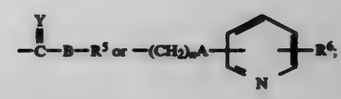


5,191,084
PHENYL PYRAZOLIDINONES AS BRONCHODILATORS AND ANTI-INFLAMMATORY AGENTS
Johan F. Bagli, Princeton, and Louis J. Lombardo, Belle Mead, both of N.J., assignors to American Home Products Corporation, New York, N.Y.
Filed May 1, 1991, Ser. No. 694,197
Int. Cl.[5] C07D *401/12*
U.S. Cl. 546—279 12 Claims

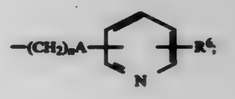
1. A compound having the formula



wherein
R^1 is hydrogen or lower alkyl;
R^2 is C_{3-7} alkyl or C_{3-7} cycloalkyl;
R^3 is hydrogen, lower alkyl, carboxyloweralkyl, lower alkoxycarbonyl, lower alkoxycarbonyl loweralkyl, C_{6-10} aryl or C_{12-16} aralkyl;
R^4 is



B is a bond, NH or O;
Y is O or S;
A is a bond or —C≡C—;
n is 0–5;
R^5 is



1993 UMI

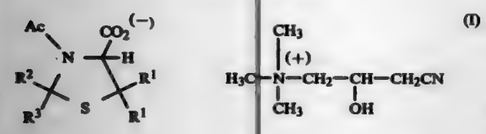
R^6 is hydrogen or halo;
the dotted line represents an optional double bond; or a pharmacologically acceptable salt thereof.

5,191,085
OPTICALLY ACTIVE SALTS OF A SUBSTITUTED THIAZOLIDINE-4-CARBOXYLATE AND 3-CYANO-HYDROXYPROPYL TRIMETHYL-AMMONIUM, THEIR PRODUCTION AND USES

Harald Jakob, Hanselroth; Klaus Huthmacher, Gelnhausen, and Herbert Klenk, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 27, 1991, Ser. No. 675,623
Claims priority, application Fed. Rep. of Germany, May 15, 1990, 4015573
Int. Cl.[5] C07D *277/06*
U.S. Cl. 548—201 **7 Claims**

1. An optical active of the formula (I):



(I)

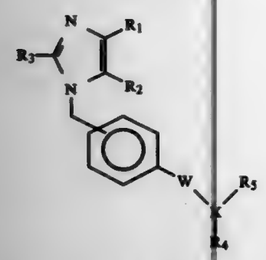
where
R^1 represents hydrogen or methyl;
R^2 and R^3, which may be identical of different, represent hydrogen, alkyl with 1 to 8 C-atoms, alkenyl with 2 to 8 C-atoms, C_5 or C_6 cycloalkyl, or R^2 and R^3 taken together are alkylene with 4 to 11 C-atoms; and Ac represents an acyl group selected from the group consisting of benzoyl, tosyl, nitrophenyl, sulfonyl, acetyl and formyl.

5,191,086
IMIDAZOLE AND BENZIMIDAZOLE DERIVATIVES

Michael A. Poss, Lawrenceville, N.J., assignor to E.R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 19, 1991, Ser. No. 671,328
Int. Cl.[5] C07D *403/10, 233/60, 233/54*
U.S. Cl. 548—252 **3 Claims**

1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof, where
R_1 is H, halogen, NO_2, CF_3, CN;
R_2 is H, —CN, $C_{1\text{-}10}$alkyl, $C_{2\text{-}10}$alkenyl or the same groups optionally substituted with fluoro, and phenyl $C_{1\text{-}6}$alkenyl;
R_3 is alkyl of 2 to 10 carbon atoms, alkenyl or alkynyl of 3 to 10 carbon atoms or the same groups substituted with F or CO_2R_7; cycloalkyl of 3 to 8 carbon atoms, cycloalkylalkyl of 4 to 10 carbon atoms; cycloalkylalkenyl or cycloalkylalkynyl or 5 to 10 carbon atoms; $(CH_2)_nZ(CH_2)_mR'$ (wherein R' is H, $C_{1\text{-}6}$alkyl, $C_{3\text{-}6}$cycloalkyl, $C_{2\text{-}4}$alkenyl or $C_{2\text{-}4}$alkynyl) optionally substituted with F or CO_2R_7; benzyl or benzyl substituted on the phenyl ring with 1 or 2 halogens, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms or nitro;
W is —O—;
X is $—CR_4'$;
R_4 and R_4' are each independently hydrogen, alkyl of 1 to 10 carbon atoms, alkenyl or alkynyl of 3 to 10 carbon atoms, cycloakyl of 3 to 8 carbon atoms, cycloalkylalkyl of 4 to 10 carbon atoms, cycloalkylalkenyl or cycloalkylalkynyl of 5 to 10 carbon atoms, aryl of aryl substituted with any R_5 group, benzyl or benzyl substituted on the phenyl ring with 1 or 2 halogens, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, nitro; and,
R_5 is —COOH or tetrazolyl.

5,191,087
PROCESS FOR THE SYNTHESIS OF 1,4-DISUBSTITUTED PYRAZOLES

Jean-Marie Alcaraz, Saint Germain Les Corbeil; Maryse Lecacheur, Bergerac, and Yves Robin, Vert Le Petit, all of France, assignors to Societe Nationale Des Poudres Et Explosifs, Paris, France

Filed Jul. 20, 1992, Ser. No. 914,574
Claims priority, application France, Jul. 24, 1991, 91 09331
Int. Cl.[5] C07D *231/12*
U.S. Cl. 548—373.1 **14 Claims**

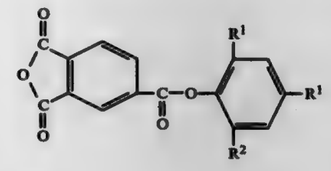
1. Process for the synthesis of 1,4-disubstituted pyrazoles, characterised in that a monosubstituted hydrazine is reacted with the product of reaction of an acetal with an N-substituted halomethyliminium salt.

5,191,088
AROMATIC MONOANHYDRIDE-ESTERS

Yefim Blyakhman, Bronx, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

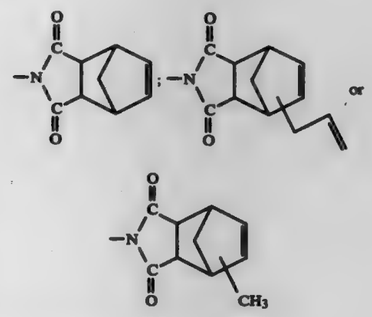
Continuation-in-part of Ser. No. 667,728, Mar. 11, 1991, abandoned. This application Nov. 13, 1991, Ser. No. 791,863.
Int. Cl.[5] C07D *405/12*
U.S. Cl. 548—435 **2 Claims**

1. An aromatic monoanhydride-ester of the formula I



(I)

wherein R^1 is



or

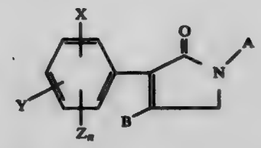
and R^2 is hydrogen, C_1–C_4alkyl or —OCH_3.

5,191,089
HERBICIDAL 4-ALKOXY- AND 4-(SUBSTITUTED)AMINO-ARYLPYRROLINONE DERIVATIVES

Bernd Baasner, Bergisch Gladbach; Reiner Fischer, Monheim; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

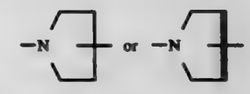
Filed Aug. 9, 1990, Ser. No. 565,536
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1989, 3928504
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] C07D *207/38*
U.S. Cl. 548—550 **10 Claims**

1. A 4-alkoxy- or 4-(substituted) amino-3-aryl-pyrrolinone of the formula



in which
X and Y independently of one another represent hydrogen, fluorine, chlorine, bromine, iodine, C_1–C_6-alkyl, C_1–C_6-alkoxy, halogeno-C_1–C_4-alkyl or phenoxy or phenylthio which are in each case unsubstituted or substituted by one to five identical or different substituents, the substituents on the phenyl being fluorine, chlorine, bromine, iodine, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen-C_1–C_4-alkyl,
Z represents fluorine, chlorine, bromine, iodine, C_1–C_6-alkyl or C_1–C_6-alkoxy,
n represents the number 0, 1, 2 or 3,
A represents in each case unsubstituted or in each case halogen-substituted C_1–C_{12}-alkyl, C_3–C_8-alkenyl, C_3–C_8-alkynyl, C_1–C_{10}-alkoxy-C_2–C_8-alkyl, C_1–C_8-polyalkoxy-C_1–C_8-alkyl or C_1–C_{10}alkylthio-C_1–C_8-alkyl, or represents cycloalkyl which has 3 to 8 ring atoms and can be interrupted by one nitrogen atom to form a four or five membered ring or by oxygen and/or sulphur, or A represents phenyl-C_1–C_6-alkyl, phenyl or naphthyl, in each case unsubstituted or substituted in the phenyl part by one to five identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, iodine, C_1–C_6-alkyl, C_1–C_6-alkoxy, halogeno-C_1–C_6-alkyl, halogeno-C_1–C_6-alkoxy and phenoxy or phenylthio which are in each case unsubstituted or substituted by one to five identical or different substituents from the group consisting of fluorine, chlorine, bromine, iodine, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogeno-C_1–C_4-alkyl and halogeno-C_1–C_4-alkoxy, represents hydroxyl, C_1–C_{10}-alkoxy, halogeno-C_1–C_{10}-alkoxy or cycloalkoxy having 3 to 7 ring atoms, the cycloalkyl radical being unsubstituted or substituted by one to five identical or different substituents from the group consisting of fluorine, chlorine, bromine and C_1–C_4-alkyl, or
represents the group

wherein
C and D independently of one another represent hydrogen, C_1–C_{10}-alkyl, C_3–C_{10}-alkenyl, C_1–C_8-alkoxy-C_1–C_8-alkyl, C_1–C_8-alkylthio-C_1–C_8-alkyl, C_1–C_8-polyalkoxy-C_1–C_8-alkyl, cycloalkyl having 3 to 8 ring atoms, which can be interrupted by one nitrogen atom to form a four or five membered ring or by one, two or three oxygen or sulphur atoms, or phenyl, phenyl-C_1–C_6-alkyl, phenoxy-C_1–C_6-alkyl, hetaryl or hetaryl-C_1–C_6-alkyl, having in each case 5 or 6 ring atoms and containing one nitrogen atom to form a pyrrolidinyl ring or 1 or 2 oxygen or sulphur atoms in the ring, which are in each case unsubstituted or substituted by one to five identical or different substituents, or
C and D, together with the nitrogen atom to which they are bonded, represents a heterocyclic radical of the formula:



which is optionally substituted by one to five identical or different substituents from the group consisting of C_1–C_6-alkyl and C_1–C_4-alkylcarbonyl,
with the proviso that at least one radical X, Y or Z does not represent chlorine or methyl if B represents hydroxyl and A has a meaning other than optionally substituted phenyl or naphthyl excluding the compound wherein B=hydroxy; X, Y and Z=hydrogen and A=2,6-diethyl phenyl.

5,191,090
PREPARATION OF 2-(2'-THIENYL)ETHYLAMINE DERIVATIVES AND SYNTHESIS OF THIENO(3,2-C)PYRIDINE DERIVATIVES THEREFROM

Bradley S. DeHoff, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 470,299, Jan. 25, 1990, Pat. No. 5,068,360. This application Jul. 31, 1991, Ser. No. 738,697
Int. Cl.[5] C07D *333/26, 495/01*
U.S. Cl. 549—74 **12 Claims**

1. A process for making 2-(2'-thienyl)ethylamine comprising contacting a compound of the formula

where
X is a leaving group;
with liquid ammonia; and
an alkyl ketone or aryl ketone.

5,191,091
HYDROGENATION WITH CU-AL CATALYSTS

Richard W. Wegman, and David R. Bryant, both of South Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 719,932, Jun. 24, 1991, abandoned, which is a division of Ser. No. 454,457, Dec. 21, 1989, Pat. No. 5,053,380. This application Jan. 27, 1992, Ser. No. 825,339
Int. Cl.[5] C07D *307/08, 307/60*; C07C *29/149, 31/20*
U.S. Cl. 549—326 **8 Claims**

1. A process for hydrogenating a bound oxygen-containing organic compound, said process comprising:
contacting said organic compound as a vapor with hydrogen in the presence of an activated catalyst composition consisting of copper and aluminum under hydrogenation conditions, said catalyst having been made by a process comprising:
reducing a homogeneous mixture of copper and aluminum oxides by heating in the presence of a reducing gas under activation conditions which comprise a gradually increasing temperature at a rate of about 3°–18° C./hr

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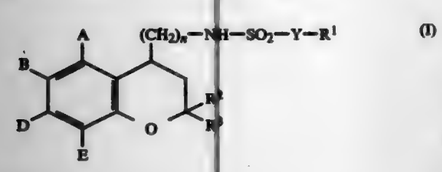
from a starting temperature of about 40° to 75° C. to a final reduction temperature of about 150° C. to 250° C.

5,191,092
ANTITHROMBOTIC ISO- AND HETEROCYCLIC PHENYLSULPHONAMIDES

Ulrich Niewöhner, Wermelskirchen; Franz-Peter Hoever, Cologne; Elizabeth Perzborn, Wuppertal; Volker-Bernd Fiedler, Leverkusen, all of Fed. Rep. of Germany; Peter Norma, Berks, United Kingdom; Hilary P. Francis, Berks, United Kingdom, and Marie G. McKeniff, Berks, United Kingdom, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1990, Ser. No. 588,793
Claims priority, application United Kingdom, Nov. 2, 1989, 8924755
Int. Cl.[5] C07D *311/92, 311/78*
U.S. Cl. 549—385 7 Claims

1. A phenylsulphonamide of the formula



(I)

in which

A, B, D and E are identical or different and

represent hydrogen, hydroxyl, halogen, trifluoromethyl, trifluoromethoxy, straight-chain or branched alkyl or alkoxy in each case having up to 8 carbon atoms, or

represent aryl having 6 to 10 carbon atoms, which is optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, trifluoromethyl, trifluoromethoxy, carboxyl, nitro, cyano and straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms, or

represent a group of the formula $-(CH_2)_m-CO-Z$ or $-O-(CH_2)_p-CO-Z$, wherein

m—denotes a number 0, 1, 2, 3 or 4,

p—denotes a number 1, 2, 3 or 4, and

Z—denotes hydroxyl, straight-chain or branched alkoxy having up to 8 carbon atoms, aryloxy having 6 to 10 carbon atoms or a group of the formula $-NR^4R^5$, wherein R^4 and R^5 are identical or different and denote hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or aryl having 6 to 10 carbon atoms,

with the proviso that either A and B or B and D or D and E together must form a 5- to 7-membered saturated or unsaturated carbocycle fused to the basic structure and which in turn may be substituted by a group of the formula $-(CH_2)_m-CO-Z$ or $-O-(CH_2)_p-CO-Z$,

Y—represents the group $-(CH_2)_s-$, wherein s—denotes a number 0, 1, 2, 3 or 4,

R^1—represents aryl having 6 to 10 carbon atoms, which is optionally monosubstituted to pentasubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, trifluoromethyl, difluoromethyl, difluoromethoxy, trifluoromethoxy, carboxyl, aryloxy having 6 to 10 carbon atoms, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl in each case having up to 8 carbon atoms and $-NR^4R^5$,

n—represents a number 0, 1 or 2, and R^2 and R^3 are identical or different and represent hydrogen of straight-chain or branched alkyl having up to 8 carbon atoms,

or a salt thereof.

5,191,093
PROCESS FOR PREPARING CRYSTALLINE CALCIUM PSEUDOMONATE

Geoffrey H. Baker, Banstead, and Merle Beal, Horley, both of England, assignors to Beecham Group p.l.c., Epsom, England

Division of Ser. No. 338,446, Apr. 13, 1989, Pat. No. 4,916,155, which is a continuation-in-part of Ser. No. 72,683, Jul. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 745,213, Jun. 17, 1985, abandoned. This application Mar. 12, 1990, Ser. No. 468,584
Int. Cl.[5] C07D *309/10*
U.S. Cl. 549—414 2 Claims

1. A process for preparing crystalline calcium pseudomonate or a hydrate thereof which process comprises reacting pseudomonate ions with calcium ions in solution in an aqueous solvent, recovering a crystalline calcium pseudomonate hydrate from the solution and thereafter optionally removing water of crystallisation.

5,191,094
MONO (2-AMMONIUM-2-HYDROXYMETHYL-1,3-PROPANEDIOL) (2R,CIS)-1,2-EPOXYPROPYL-PHOSPHONATE WITH IMPROVED CHARACTERISTICS OF STABILITY AND PROCESSING

Dario Tentorio, Vigano'3; Graziano Castaldi, Briosa; Claudio Girodano, Monza, and Franco Pozzi, Como, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Division of Ser. No. 557,030, Jul. 25, 1990, Pat. No. 5,162,309. This application Jun. 11, 1992, Ser. No. 897,067
Claims priority, application Italy, Jul. 27, 1989, 21340 A/89
Int. Cl.[5] C07D *303/02*
U.S. Cl. 549—513 1 Claim

1. A method for preparing mono-(2-ammonium-2-hydroxymethyl-1,3,-propanediol)(2R,cis)-1,2-epoxypropylphosphonate consisting of:

preparing in a reactor at a temperature between 15°–50° C., a methanolic solution of bis-(2-ammonium-2-hydroxymethyl-1,3-propanediol)(2R,cis)-1,2-epoxypropyl-phosphonate, equimolecular amounts of methanesulphonic acid, equimolecular amounts of mono (+)-alpha-phenethylammonium (2R,cis)-1,2-epoxypropyl-phosphonate and amounts of tri-hydroxymethyl-aminomethane (THAM) equal to 2–3% in moles with respect to the amount of THAM contained in the bis-salt of THAM with Fosfomycin;

diluting the solution with ethanol in amounts comprised of between 4:1 and 10:1 with respect to the volume of the solution; and

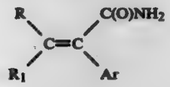
cooling the solution under slow stirring, wherein the ratio of a length of an anchor stirrer:diameter of the reactor is greater than 0.7 and the power is less than 0.25 kw/m^3.

5,191,095
ASYMMETRIC HYDROGENATION OF OLEFINIC AMIDES USING ORGANORUTHENIUM CATALYST

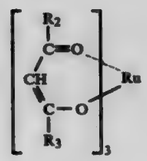
Thanikavelu Manimaran; W. Dirk Klobucar, and Charles H. Kolich, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 17, 1991, Ser. No. 716,015
Int. Cl.[5] C07C *102/00, 63/04, 53/134, 57/30*
U.S. Cl. 554—35 16 Claims

1. A process for preparing optically active α-aryl aliphatic amides which comprises catalytically, asymmetrically hydrogenating an olefinic amide of the formula



where R and R_1 are the same or different and are hydrogen, alkyl, cycloalkyl, or haloalkyl; and Ar is aryl or substituted aryl; by utilizing a mixture of (i) a ruthenium compound of the formula



where R_2 and R_3 are the same or different and are alkyl, haloalkyl, aryl, substituted aryl, phenylalkyl or substituted phenylalkyl; and (ii) a chiral phosphine compound.

5,191,096
PROCESS FOR PRODUCING OMEGA-HYDROXY FATTY ACIDS

Tadafumi Yokota, and Akio Watanabe, both of Toda, Japan, assignors to Nippon Mining Co., Ltd., Japan

Continuation of Ser. No. 319,155, Mar. 6, 1989, abandoned. This application Jan. 23, 1992, Ser. No. 826,638
Claims priority, application Japan, Dec. 7, 1987, 62-307417; Jul. 18, 1988, 63-177222; Aug. 3, 1988, 63-192692
Int. Cl.[5] C07C *51/10, 51/15, 59/00*
U.S. Cl. 554—129 5 Claims

1. A process for producing an ω-hydroxy fatty acid, which comprises subjecting an alkali metal or alkaline earth metal salt of a long-chain dicarboxylic acid monoester having a carbon number of about 9–18 to a reduction with a borohydride compound.

5,191,097
PRODUCTION OF FATTY ACID SALTS

James W. Dynes; Gerard J. Gutowski, both of Tiffin, Ohio, and M. Stephen Lajoie, Basking Ridge, N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Sep. 17, 1991, Ser. No. 761,234
Int. Cl.[5] G07C *51/00*
U.S. Cl. 554—156 4 Claims

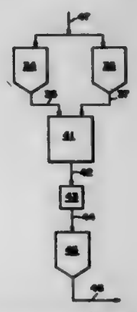
1. A process for the preparation of a fatty acid salt product which comprises (1) forming an admixture of reactive ingredients comprising (a) at least one C_{14}–C_{22} fatty acid, (b) calcium oxide in at least an equivalent weight quantity for salt formation with the fatty acid, and (c) between about 10–50 weight percent, based on the weight of fatty acid, of an aqueous solution of sodium carbonate-bicarbonate, wherein the aqueous solution is a residual effluent from a sodium bicarbonate-producing process, and the solution contains between about 0.2–5 weight percent of sodium in the form of sodium carbonate-bicarbonate; and (2) recovering the salt product after completion of the exothermic salt-forming reaction.

5,191,098
CONTINUOUS PROCESS FOR PREPARATION OF AQUEOUS DISPERSIONS OF METAL SOAPS

H. Steve Koenig, North Wales, Pa., and Gary L. Spoonburgh, Parsippany, N.J., assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 385,754, Jul. 26, 1989, abandoned. This application Dec. 5, 1991, Ser. No. 803,771
Int. Cl.[5] C07C *51/00*
U.S. Cl. 554—156 16 Claims

1. A continuous process for preparing an aqueous dispersion of a metal soap which comprises: forming a mixture by continuously introducing at least one carboxylic acid having from about 6 to about 30 carbon atoms, at least one oxide or hydroxide of a metal, which forms a metal soap with the at least one carboxylic acid, water and a dispersive amount of at lease one dispersing agent into a media mill, wherein water comprises from about 25% to about 65% by weight of the mixture and



reacting the mixture in the media mill for from about 1 to about 55 minutes to form an aqueous dispersion of the metal soap.

5,191,099
CHEMICAL VAPOR DEPOSITION OF ALUMINUM FILMS USING DIMETHYLETHYLAMINE ALANE

Wayne L. Gladfelter, St. Paul, and Everett C. Phillips, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Sep. 5, 1991, Ser. No. 755,317
Int. Cl.[5] C07F *5/06*
U.S. Cl. 556—27 1 Claim

1. Essentially pure $[(CH_3)_2(CH_3CH_2)N]AlH_3$.

5,191,100
CHROME HUMATES AS DRILLING MUD ADDITIVES

William C. Firth, Jr., Robbinsville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Feb. 8, 1985, Ser. No. 699,642
Int. Cl.[5] C07F *11/00, 5/06*
U.S. Cl. 556—27 1 Claim

1. A chrome humate composition useful for reducing the viscosity of and preventing fluid loss in water-based drilling fluids, said compositions comprising the reaction or complexation product of a humate which has been obtained from association with a titanium mineral deposit and which has a compositional make-up of carbon to hydrogen (weight to weight) ratio of 9.5–17.5:1.0, carbon to oxygen (weight to weight) ratio of 1.0–2.3:1.0; an aluminum content of 2.8–8.4 percent by weight; a titanium content of 0.5–3.5 percent by weight and a calcium content of less than 0.5 percent by weight; and an inorganic chromium compound.

5,191,101
ENERGY POLYMERIZABLE COMPOSITIONS CONTAINING ORGANOMETALLIC INITIATORS

Michael C. Palazzotto, and William A. Hendrickson, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 443,660, Nov. 22, 1982, Pat. No. 5,089,536. This application Nov. 26, 1991, Ser. No. 799,046
Int. Cl.[5] C07F *17/02, 13/00*
U.S. Cl. 556—47 18 Claims

1. A compound having the formula:

$$[(L^9)(L^{10})M^p]^{+q}Y_n$$

wherein

M^p represents a metal selected from Cr, Mo, W, Mn, Re, Fe, and Co;

L^9 represents 1 or 2 ligands contributing π-electrons that can

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be the same or different ligand selected from substituted and unsubstituted (η^3-allyl, η^5-cyclopentadienyl, and η^7-cycloheptatrienyl and substituted η^6-aromatic compounds selected from η^6-benzene and substituted η^6-benzene compounds and compounds having 2 to 4 fused rings each capable of contributing 3 to 12 π-electrons to the valence shell of *M*P;

L^{10} represents none or 1 to 3-ligands contributing an even number of σ-electrons that can be the same or different ligand selected from carbon monoxide or nitrosonium;

with the proviso that the total electronic charge contributed to *M*P by L^9 and L^{10} plus the ionic charge on metal *M*P results in a net residual positive charge of q to the complex; and

q is an integer having a value of 1 or 2, the residual electrical charge of the complex cation;

Y is a halogen-containing complex anion selected from AsF_6^-, SbF_6^- and SbF_5OH^-; and

n is an integer having a value of 1 or 2, the number of complex anions required to neutralize the charge q on the complex cation.

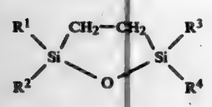
5,191,102

PROCESS OF PRODUCING SILETHYLENE OXIDE

Masayuki Oyama, Takaaki; Keiichi Fukuda, Asaaka; YAsushi Yamamoto, Takaaki, and Noriyuki Koike, Gunma, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 913,345
Claims priority, application Japan, Jul. 16, 1991, 3-201322
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—464 **3 Claims**

1. In a process of producing a silethylene oxide represented by the following general formula (1):



(1)

wherein R^1, R^2, R^3, and R^4, which may be the same or different, each represent an unsubstituted or substituted hydrocarbon group having 1 to 8 carbon atoms, which comprises hydrolyzing 1,4-dichloro-1,1,4,4-tetrahydrocarbyl-1,4-disilabutane and then thermally decomposing the resulting reaction mixture in the presence of an alkali, the improvement comprising the steps of bringing the reaction mixture obtained in the thermal decomposition in contact with carbon dioxide and distilling the obtained reaction mixture.

5,191,103

PROCESS AND COMPOSITION FOR PROMOTING HYDROSILYLATION REACTIONS USING STERICALLY HINDERED NITROGEN-CONTAINING AND PHOSPHORUS-CONTAINING COMPOUNDS

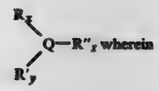
Kunj R. Mehta, Parkersburg, W. Va., and James D. Reedy, Marietta, Ohio, assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 30, 1991, Ser. No. 815,821
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—479 **10 Claims**

1. A process for carrying out a platinum catalyzed hydrosilylation reaction between an SiH-containing material and a terminal olefin, comprising:

heating said SiH-containing material and said olefin in the presence of a platinum catalyst and a promoter, said promoter comprising:

a hindered amine or phosphine, or acid salt thereof, containing at least 6 carbon atoms and having the formula



wherein

Q is N or P;

when Q is N, R is H, alkyl of 1–18 carbon atoms, nonterminal alkenyl of 4–18 carbon atoms, arylalkyl of 7–25 carbon atoms, or a derivative thereof;

when Q is P, R is alkyl of 1–18 carbon atoms, non-terminal alkenyl of 4–18 carbon atoms, arylalkyl of 7–25 carbon atoms, or a derivative thereof;

x is 0 or 1;

R′ is alkyl of 1–18 carbon atoms, nonterminal alkenyl of 4–18 carbon atoms, arylalkyl of 7–25 carbon atoms, or a derivative thereof;

y is 0, 1, or 2;

R″ is a branched group having a 2° or 3° carbon atom bonded directly to Q, and is alkyl of 3–18 carbon atoms, nonterminal alkenyl of 4–18 carbon atoms, arylalkyl of 7–25 carbon atoms, or a derivative thereof;

z is 1, 2, or 3 and z=3-x-y; and

two R′ groups, two R″ groups, or one R′ and one R″ may be taken together to constitute a divalent moiety forming a 5–7 membered ring containing a Q atom.

5,191,104

ALKOXYLATION OF CARBOXYLATED COMPOUNDS

Stephen W. King, Scott Depot, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 20, 1990, Ser. No. 585,459
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—260 **27 Claims**

1. A process for the alkoxylation of a carboxylated compound comprising contacting the carboxylated compound with an alkylene oxide in the presence of a mixed metal oxide catalyst under conditions effective to alkoxylate the carboxylated compound, wherein the mixed metal oxide catalyst comprises:

(a) a material having the formula

$$M_x^{2+}Q_y^{3+}(OH)_{2x+3y-nz}A_z^{n-} \cdot a\ H_2O \quad (I)$$

wherein M is at least one divalent metal cation; Q is at least one trivalent metal cation; and A is at least one anion providing a valence (n−), wherein n is 1 to 4 and wherein a is a positive number, M, Q and A are provided in a proportion such that x/y is a number equal to or greater than 1, z has a value greater than zero and 2x+3y−nz is a positive number, or

(b) a material prepared by calcining the material of formula (I) having the formula

$$M_x^{2+}Q_y^{3+}(OH)_{(2x+3y-nz)/2}D_z^{n-} \quad (II)$$

wherein M, Q, x, y, z and n have the same meanings defined above in connection with formula (I), and D is at least one nonvolatile anion.

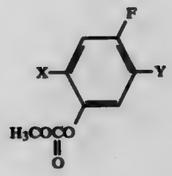
5,191,105

TETRAHYDROPHTHALIMIDES, AND THEIR PRODUCTION AND USE AS HERBICIDES

Eiki Nagano, Hyogo; Shunichi Hashimoto, Osaka; Ryo Yoshida, Hyogo; Hiroshi Matsumoto, and Katsuzo Kamoshita, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 651,877, Sep. 18, 1984, Pat. No. 5,030,760, which is a division of Ser. No. 360,997, Mar. 23, 1982, Pat. No. 4,484,940. This application Feb. 5, 1991, Ser. No. 650,943
Claims priority, application Japan, Sep. 1, 1981, 56-138044; Oct. 28, 1981, 56-173364; Nov. 5, 1981, 56-180046; Nov. 5, 1981, 56-180047; Nov. 10, 1981, 56-180547; Nov. 12, 1981, 56-182024; Nov. 12, 1981, 56-182025; Feb. 2, 1982, 57-15899
Int. Cl.[5] C07C 203/00, 25/13
U.S. Cl. 558—270 **7 Claims**

1. A compound of the formula



wherein X is a chlorine atom or a bromine atom and Y is H or NO_2.

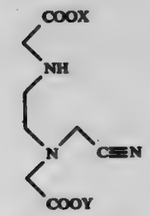
5,191,106

N,N′-DIACETIC ACID-N′-CYANOMETHYL, SALTS THEREOF, AND THEIR PREPARATION

Brian A. Parker, Nashua, N.H., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 806,032, Dec. 12, 1991. This application Jul. 30, 1992, Ser. No. 922,264
Int. Cl.[5] C07C 253/30
U.S. Cl. 558—346 **8 Claims**

1. A process for the preparation of a compound represented by the following formula:



wherein X and Y each represent hydrogen or an alkali metal or alkaline earth metal, comprising:

a. reacting formaldehyde with an alkali metal or alkaline earth metal salt of ethylenediaminediacetic acid to form 1,3-bis(carboxymethyl)imidazolidine, and

b. reacting the product of step a with a cyanide source wherein said process is carried out at a temperature of about 0° to 110° C.

5,191,107

Patent Not Issued For This Number

5,191,108

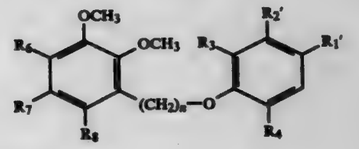
CATECHOL CARBOXYLIC ACIDS

Matthew Carson, Nutley; Ru-Jen L. Han, Princeton Junction, and Ronald A. Lumsden, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

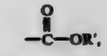
Division of Ser. No. 347,109, May 3, 1989, Pat. No. 5,025,036, which is a continuation-in-part of Ser. No. 234,239, Aug. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 223,470, Jul. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 103,789, Oct. 1, 1987, abandoned. This application Apr. 3, 1991, Ser. No. 679,962
Int. Cl.[5] C07C 69/76, 49/76
U.S. Cl. 560—64 **12 Claims**

1. A compound of the formula

XXXIV



wherein R_1' is



acetyl, hydrogen or hydroxy, R_2' is

hydrogen, or hydroxy, R′ is hydrogen, lower alkyl, R_3 is hydrogen or lower alkyl, R_4 is hydrogen, lower alkyl or halogen, R_6 is hydrogen, lower alkyl, aryl or cycloalkyl, R_7 and R_8 are hydrogen, lower alkyl or halogen, and n is an integer from 2 to 10, provided that no more than one of R_1' or R_2' is

or hydroxy.

5,191,109

PROCESS FOR PREPARING OPTICALLY ACTIVE CYCLOPENTENONES

Masayoshi Minai, Moriyama; Sachiko Imaoa, Mieoe; Seiichi Kai, Nara; Takaharu Ikeda, Ibaraki, and Hideyuki Ikehira, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

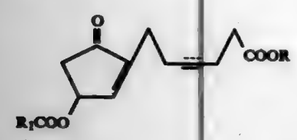
Filed Jan. 31, 1991, Ser. No. 648,893
Claims priority, application Japan, Feb. 2, 1990, 2-24738; Feb. 2, 1990, 2-24739; Feb. 2, 1990, 2-24740; Jul. 13, 1990, 2-185930; Jul. 18, 1990, 2-191347
Int. Cl.[5] C07C 69/74
U.S. Cl. 560—121 **11 Claims**

1. A process for preparing optically active 4-hydroxycyclopentenones of the formula:

[I]

wherein R is a C_1–C_6 alkyl, the symbol χ means a double bond

or a triple bond, and the * marked carbon is an asymmetric carbon, which comprises treating a cyclopentenone ester of the formula:



[XI]

wherein R, and the symbol χ are as defined above and R_1 is a C_1–C_5 alkyl optionally having a halogen substituent, with an esterase which can be preferentially hydrolyze either one of the optical forms of said ester [XI];

wherein the cyclopentenone ester [XI] is prepared by the steps of

(a) reacting a diester of the formula:

[II]

wherein R and the symbol χ are as defined above, with an alkaline earth metal hydroxide, followed by decomposing the product with an acid to give a half ester of the formula:

[VI]

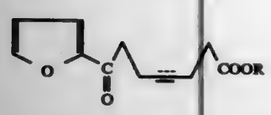
wherein R and the symbol χ are as defined above,

(b) reacting the half ester [VI] with furan in the presence of an acid anhydride of the formula:

$$(XYCHCO)_2O \qquad [XIII]$$

wherein X and Y are the same or different and are each a hydrogen atom, a chlorine atom or a bromine atom, provided that both X and Y are not simultaneously a hydrogen atom, in the presence of a boron trifluoride or a boron trifluoride complex catalyst, or

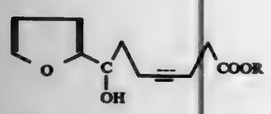
reacting the half ester [VI] with furan in the presence of trifluoroacetic acid anhydride to give a furfuryl ketone of the formula:



[VII]

wherein R and the symbol χ are as defined above,

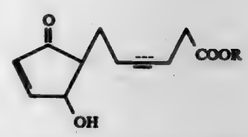
(c) treating the furfuryl ketone [VII] with a reducing agent to give a furancarbinol of the formula:



[VIII]

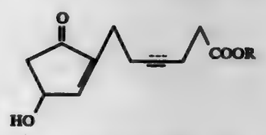
wherein R and the symbol χ are as defined above,

(d) treating the furancarbinol [VIII] in an aqueous solvent at pH 3.5–6 in the presence or absence of a catalyst to give a 3-hydroxycyclopentenone [IX]



[IX]

or a racemic 4-hydroxycyclopentenone of the formula:



wherein R and the symbol χ are as defined above, and

(e) subjecting the 3-hydroxycyclopentenone [IX] or the racemic 4-hydroxycyclopentenone to

1-i) treatment in an aqueous solvent at pH 6–9, or treatment with chloral and an organic amine to convert into racemic 4-hydroxycyclopentenone, and then

1-ii) reacting the racemic 4-hydroxycyclopentenone with a carboxylic acid of the formula:

$$R_1COOH \qquad [X]$$

wherein R_1 is as defined above, or a derivative thereof in the presence of a basic substance or acid substance, or

2) treatment with an aliphatic carboxylic acid of the formula:

$$R_1'COOH \qquad [X']$$

wherein R_1' is a C_1–C_5 alkyl optionally having a halogen substituent, an anhydride of the aliphatic carboxylic acid [X'] and a metal salt of the aliphatic carboxylic acid [X'].

5,191,110

PROCESS FOR THE SYNTHESIS OF VITAMIN A AND CERTAIN ONES OF DERIVATIVES

Guy Solladie, Strasbourg; Serge Forestier, Claye-Souilly, and Gérard Lang, Saint-Gratien, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 197,820, May 23, 1988, abandoned. This application Apr. 21, 1992, Ser. No. 871,710
Int. Cl.[5] C07C *67/02*
U.S. Cl. 560—260 5 Claims

1. A process for the synthesis of an all-trans compound selected from the group consisting of vitamin A and its ethers, retinol and retinoic acid, and their 13-cis isomers comprising effecting stereospecific reduction of the two hydroxyl groups of an ether-diol, precursor of vitamin A with a mixture of 2 equivalents of titanium chloride and 1 equivalent of lithium aluminum hydride in an anhydrous solvent medium at a temperature between 5° C. and about 40° C. and optionally converting the resulting ether into vitamin A, retinol or retinoic acid.

5,191,111

MANUFACTURE OF ISOCYANATE-SUBSTITUTED ISOPHTHOLAYL CHLORIDE

Samuel D. Arthur, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 720,164, Jun. 27, 1991, which is a division of Ser. No. 695,899, May 6, 1991, Pat. No. 5,084,182, which is a division of Ser. No. 560,512, Jul. 31, 1990, Pat. No. 5,019,264. This application Mar. 16, 1992, Ser. No. 851,886
Int. Cl.[5] C07C *263/10*
U.S. Cl. 560—347 6 Claims

1. A method of manufacture of isocyanate-substituted isophthaloyl chloride comprising, forming a mixture of amino-substituted isophthalic acid, catalyst, phosgene and halogenated solvent,

heating said mixture in a pressure vessel under autogenous pressure,

treating said mixture to remove said solvent, and

distilling said mixture to yield said isocyanate-substituted isophthaloyl chloride.

5,191,112

PROCESS FOR OPTICAL RESOLUTION OF (±)-2-(3-BENZOYL)-PHENYLPROPIONIC ACID

Hiroyuki Nohira, Urawa, and Kazutaka Arai, Funabashi, both of Japan, assignors to Nissan Chemical Industries, Ltd., Toyko, Japan

Filed Aug. 24, 1990, Ser. No. 571,871
Claims priority, application Japan, Oct. 17, 1989, 1-269466
Int. Cl.[5] C07B *57/00*
U.S. Cl. 562—401 5 Claims

1. A method for the optical resolution of (±)-2-(3-benzoyl)-phenylpropionic acid comprising dissolving (±)-2-(3-benzoyl)-phenylpropionic acid into a solvent;

adding an optically active phenylpropylamine;

inducing crystallization; and

filtering the resulting crystals to obtain a diastereomer salt, treating said diastereomer salt with a base, and subsequently acidifying said diastereomer salt to obtain a residue, and drying said residue to obtain a (−)-2-(3-benzoyl)-phenylpropionic acid.

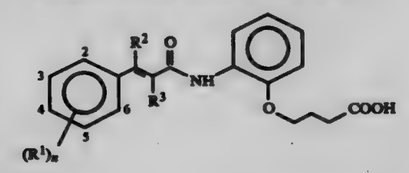
5,191,113

CINNAMOYLAMIDE DERIVATIVES

Hisao Nakai; Hiroshi Terashima, both of Takatsuki, and Yoshinobu Arai, Osaka, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 691,509, Apr. 25, 1991, Pat. No. 5,093,366, which is a division of Ser. No. 572,341, Aug. 24, 1990, Pat. No. 5,037,852, which is a continuation of Ser. No. 191,194, May 6, 1988, abandoned. This application Dec. 5, 1991, Ser. No. 802,605
Claims priority, application Japan, May 7, 1987, 62-109722
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] C07C *229/34, 229/40, 229/42*
U.S. Cl. 562—455 3 Claims

1. A cinnamoylamide derivative of the formula



(I)

wherein,

R^2 represents a methyl group and R^3 represents a hydrogen atom, and $(R^1)_n$ represents a member selected from the group consisting of

2-fluoro-4-pentyloxy group,

4-butylthio group and

4-phenoxy group,

or a non-toxic salt thereof.

5,191,114

PROCESS FOR ENHANCING THE FLOW CHARACTERISTICS OF IBUPROFEN

Jiyn-Ren Chen, Shreveport, La., assignor to Sage Pharmaceuticals, Inc., Shreveport, La.

Filed Oct. 9, 1991, Ser. No. 773,258
Int. Cl.[5] C07C *53/134*
U.S. Cl. 562—496 27 Claims

1. A process for enhancing the flow characteristics of ibuprofen, comprising the steps of granulating the ibuprofen with a hydrophilic solvent and a hydrophobic organic solvent which is miscible with said hydrophilic solvent to dissolve and modify and crystal surface of the ibuprofen and drying the ibuprofen.

5,191,115

METHOD FOR OBTAINING CARBOXYLIC ACIDS BY REACTION OF ALKANES AND FORMIATES

Véronique Lazzeri, Marseille; Roger Gallo, Beau Bel Air, and Rachid Jalal, Marseille, all of France, assignors to Atochem, Paris, France

PCT No. PCT/FR90/00243, § 371 Date Feb. 5, 1991, § 102(e) Date Feb. 5, 1991, PCT Pub. No. WO90/12779, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 5, 1990, Ser. No. 623,715
Claims priority, application France, Apr. 18, 1989, 89 05153
Int. Cl.[5] C07C *61/12*
U.S. Cl. 562—499 13 Claims

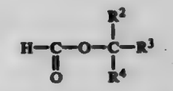
1. A process for the preparation of a carboxylic acid represented by the Formula (I):

$$R^1—COOH \qquad (I)$$

wherein R^1 represents a tertiary branched alkyl radical or a cycloalkyl radical with at least one ring, and which is optionally substituted by at least one alkyl radical, and further where the carbon in alpha of the carbonyl group is a tertiary carbon atom, comprising reacting a branched or cyclic alkane of Formula (II):

$$R^1H \qquad (II)$$

in which R^1 is a branched alkyl radical or cycloalkyl radical with at least one ring and which is optionally substituted by at least one alkyl radical, and where the carbon atom in alpha of the hydrogen atom is a tertiary atom or a secondary atom which is capable of being rearranged during the course of the reaction into a tertiary atom, with a formiate of Formula (III):



(III)

wherein R^2, R^3 and R^4 each independently represent a hydrogen atom or an alkyl radical, with the following three provisos: (i) R^2, R^3 and R^4 do not simultaneously represent a hydrogen atom, (ii) the compound (III) leads in the reaction medium, directly, or after rearrangement, to a stable cation, $R^2R^3R^4C^+$, and (iii) the alkane formed from the cation may be readily eliminated from the reaction medium, in the presence of an acid catalyst.

5,191,116

PROCESS FOR THE PREPARATION OF METHACRYLIC ACID AND METHACROLEIN

Setsuo Yamamatsu, and Tatsuo Yamaguchi, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP89/00510, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989
PCT Filed May 22, 1989, Ser. No. 488,117
Int. Cl.[5] C07C *47/22, 57/05;* B01J *23/28*
U.S. Cl. 562—549 22 Claims

1. A process for the preparation of methacrylic acid and methacrolein, which comprises contacting at a temperature of 240° to 350° C. in a reactor a mixed gas comprising isobutane and molecular oxygen in the vapor phase with a catalyst comprising a composition containing a heteropoly acid having P

and/or As as a central element or central elements and Mo as a coordinating element, said composition being represented by the formula:

$$A_aMo_{12}B_bC_cD_dO_e \quad (I)$$

wherein A represents P and/or As; Mo represents molybdenum; B represents V and/or Cu; C represents at least one member selected from the group consisting of an alkali metal, an alkaline earth metal and Tl; D represents at least one member selected from the group consisting of Ag, Zn, Cd, Ti, Zr, Nb, Ta, Cr, W, Mn, Fe, Co, Ni, B, Al, Ge, Rh, Sn, Sb, Bi, Se, Te, Y, La, Ce, Pr and Nd; O represents oxygen; and a, b, c, d and e are numbers, respectively, representing relative atomic proportions of A, B, C, D and O, wherein a, b, c and d are, respectively, in the ranges of from 0.5 to 3, from 0.01 to 3, from 0 to 3 and from 0 to 3, and e is the number of oxygens required to satisfy the valence and relative atomic proportion requirements of the elements present, thereby obtaining a gaseous reaction mixture comprising methacrylic acid and methacrolein.

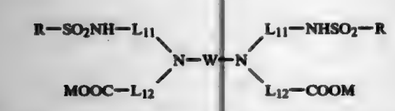
5,191,117

SULFONAMIDE DERIVATIVE

Hisashi Okada, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 24, 1991, Ser. No. 812,938
Claims priority, application Japan, Dec. 25, 1990, 2-405649
Int. Cl.[5] C07C *315/00, 303/00*
U.S. Cl. 562—556 **12 Claims**

1. A sulfonamide derivative expressed by the general formula (D):



where R represents an unsubstituted alkyl group, or an alkyl group substituted by a member selected from the group consisting an alkoxy group, an amino group, an acylamino group, a sulfonyl amino group, an alkylthio group, a sulfonyl group, a sulfinyl group, a hydroxy group, a halogen atom, a sulfo group, a carboxyl group, and an acyloxy group, L_{11} and L_{12} represent an alkylene group respectively, W represents an alkylene group having 2 or more carbon atoms, and M represents a hydrogen atom or a cation.

5,191,118

CATALYTIC DEHALOGENATION OF ALPHA-HALOGENATED CARBOXYLIC ACIDS/ESTERS

Yves Correia, Chateau-Arnoux, and Michel Bertucci, Lyons, both of France, assignors to Atochem, Puteaux, France

Filed Apr. 6, 1990, Ser. No. 505,985
Claims priority, application France, Apr. 7, 1989, 89 04607
Int. Cl.[5] C07C *51/00*
U.S. Cl. 562—604 **14 Claims**

1. A process for the dehalogenation of an alpha-halogenated carboxylic acid, or ester thereof, comprising reacting such acid or ester with hydrogen in the presence of a catalytically effective amount of (i) a Group VIII precious metal catalyst, and (ii) either sulfur or a sulfur compound.

5,191,119

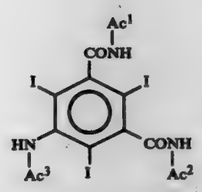
PROCESS FOR PRODUCING NON-IONIC RADIOGRAPHIC CONTRAST MEDIA UTILIZING N-ALLYLATION

Milos Sovak, Rancho Santa Fe, and Ramachandran Ranganathan, San Diego, both of Calif., assignors to Cook Imaging Corp., Bloomington, Ind.

Continuation of Ser. No. 356,268, May 23, 1989, abandoned, which is a continuation of Ser. No. 258,389, Oct. 7, 1988, abandoned, which is a continuation of Ser. No. 676,391, Nov. 15, 1984, abandoned, which is a continuation of Ser. No. 554,308, Oct. 20, 1983, abandoned. This application Jul. 5, 1990, Ser. No. 549,256
Int. Cl.[5] C07C *233/65*
U.S. Cl. 564—153 **7 Claims**

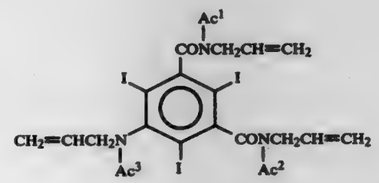
1. A method for preparing Iohexol, comprising:

acylating 5-amino-2,4,6-triiodoisophthaldiamide with acetic anhydride and removing any second acetyl group on a single nitrogen to provide a N, N'N''-triacetyl derivative having the formula;

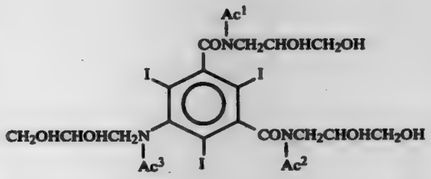


wherein Ac^1, Ac^2 and Ac^3 are each an acetyl group;

allylating said triacetyl derivative with allyl chloride or allylamine in the presence of base to provide a N, N'N''-triallyl derivative having the formula;



oxidizing olefinic groups of said triallyl derivative introduced by said allylating step to glycols to provide a tris-glycol derivative having the formula;



and, removing Ac^1 and Ac^2 by hydrolysis to produce Iohexol.

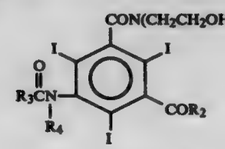
5,191,120

PROCESS FOR PREPARING NONIONIC X-RAY CONTRAST AGENTS

Mills T. Kneller, University City; Youlin Lin, Chesterfield, and James R. Wheatley, Hazelwood, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 450,693, Dec. 13, 1989, Pat. No. 5,075,502. This application Sep. 24, 1991, Ser. No. 764,644
Int. Cl.[5] C07C *233/12, 233/16*
U.S. Cl. 564—153 **2 Claims**

1. A method for preparing a compound of the general formula



wherein R_2 is selected from the group consisting of $NHCH_3$, $NHCH_2CH_2OH$, and $NCH_2CHOHCH_2OH$, R_3 is selected from the group consisting of CH_3, CH_2OH, $CH(CH_3)OH$, $CHOHCH_2OH$, CH_2OCH_3, and $CH_2OCH_2CH_3$, and R_4 is selected from a group consisting of CH_3, CH_2CH_2OH, $CH_2CH_2OCH_3$, $CH_2CHOHCH_2OH$, and $CH_2CHOHCH_2OCH_3$, comprising the steps of

a. reacting a compound selected from the group consisting of 5-amino-2,4,6-triiodo-3-(N-methylaminocarbonyl)benzoyl chloride, 3-[N-(2-acetoxyethyl)aminocarbonyl]-5-amino-2,4,6-triiodobenzoyl chloride, and 5-amino-3-[N-(2,3-diacetoxypropyl)aminocarbonyl]-2,4,6-triiodobenzoyl chloride; with a compound selected from the group consisting of acetyl chloride, methoxyacetyl chloride, ethoxyacetyl chloride, acetoxyacetyl chloride, 2-acetoxypropionyl chloride, and 2,3-diacetoxypropionyl chloride; under amide-forming conditions;

b. reacting the product of step a with 3-(N-2-hydroxyethyl-)amino-1,2-propanediol under amide-producing conditions;

c. reacting the product of step b with a compound selected from the group consisting of methyl halides, 2-haloethyl methyl ethers, haloethyl acetates, halo-2,3-propanediol, and 2,3-diacetoxyhalopropane under alkylating conditions; and

d. if acetate protecting groups are present, thereafter hydrolyzing the product of step c under hydrolyzing conditions to remove said acetate groups.

5,191,121

AROYL KETONE DERIVATIVE, UV RAY ABSORBER COMPRISING THE SAME, AND COSMETIC COMPOSITION CONTAINING THE SAME

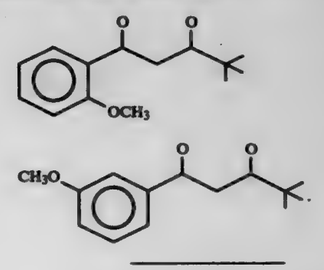
Shinji Yamada, Ichikai; Akira Kawamata, Utsunomiya; Genji Imokawa, Utsunomiya; Shinichi Masuda, Utsunomiya; Masakazu Yamaguchi; Kouichi Niinaka, both of Ichikai, and Hiroko Joukura, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 577,567, Sep. 5, 1990, abandoned. This application Apr. 15, 1991, Ser. No. 684,872
Claims priority, application Japan, Sep. 5, 1989, 1-229708; Jan. 22, 1990, 2-12196
Int. Cl.[5] C07C *223/06*
U.S. Cl. 564—305 **2 Claims**

1. An aroyl ketone derivative represented by the formula (I):

$$Ar(COCH_2COR^1)_n$$

where R^1 represents t-butyl or heptyl, Ar represents a benzene or naphthalene ring which is substituted with one or more alkoxy groups having 1–24 carbon atoms, alkenyloxy groups having 1–24 carbon atoms, mono- or di-alkylamino-groups having 1–24 carbon atoms, or α-methylenedioxy groups and n is an integer of 1–3; excluding the compounds where Ar is a di- or tri-methoxy substituted benzene ring and compounds represented by the following formulae:



5,191,122

Patent Not Issued For This Number

5,191,123

PROCESSES FOR THE PREPARATION OF HYDROXYL-CONTAINING COMPOUNDS

Stephen W. King, Scott Depot, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 20, 1990, Ser. No. 585,559
The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.
Int. Cl.[5] C07C *213/06*
U.S. Cl. 564—507 **43 Claims**

1. A process for preparing hydroxyl-containing compounds which consists essentially of contacting a carboxylated hydroxyl-containing compound with a metal oxide catalyst under decarboxylation conditions effective to produce the corresponding hydroxyl-containing compound, wherein said carboxylated hydroxyl-containing compound is selected from the group consisting of carboxylated diethylene glycol, carboxylated triethylene glycol, carboxylated tetraethylene glycol, carboxylated pentaethylene glycol, carboxylated hexaethylene glycol, a carboxylated poly(oxyalkylene)glycol, a carboxylated poly(oxyethylene)(oxypropylene)glycol, carboxylated diethanolamine, carboxylated triethanolamine, a carboxylated diethylene glycol monoalkyl or monoallyl ether, a carboxylated triethylene glycol monoalkyl or monoallyl ether, a carboxylated tetraethylene glycol monoalkyl or monoallyl ether, a carboxylated pentaethylene glycol monoalkyl or monoallyl ether, a carboxylated hexaethylene glycol monoalkyl or monoallyl ether, a carboxylated poly(oxyalkylene)glycol monoalkyl or monoallyl ether, a carboxylated fatty alcohol ethoxylate, a carboxylated nonyl phenol ethoxylate, a carboxylated poly(oxyethylene)(oxypropylene)glycol monoalkyl or monoallyl ether, a carboxylated alkoxy diethanolamine and a carboxylated alkoxy or dialkoxy triethanolamine.

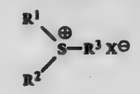
5,191,124

SULFONIUM SALTS HAVING ACID-LABILE GROUPS

Reinhold Schwalm, Wachenheim, and Andreas Beuttcher, Neustadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 30, 1988, Ser. No. 214,011
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721740
Int. Cl.[5] C07C *69/96*
U.S. Cl. 568—18 **11 Claims**

1. A sulfonium salt of the formula (I)



(I)

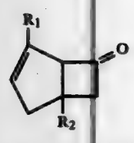
where R^1, R^2 and R^3 are identical or different and are each an aliphatic or aromatic radical or an aliphatic and aromatic radical which contain heteroatoms, or two of the radicals R^1 to R^3 are bonded to one another to form a ring, with the proviso that at least one of the radicals R^1 to R^3 contain one or more acid-cleavable groups bonded to oxyphenyl or oxynaphthyl, and one of the radicals R^1 to R^3 can be bonded to one or more further sulfonium salt radicals and $X^{\ominus}$ is a non-nucleophilic counter-ion.

5,191,125
PROCEDURE FOR THE PREPARATION OF BICYCLO [3.2.0]HEPT-2-EN-7-ONES

Goffredo Rosini, Bologna; Rodella Serra, Modena; Franco Rama, Varese, and Giovanni Confalonieri, Milan, all of Italy, assignors to Enichem S.p.A., Milan and Istituto Guido Donegani S.p.A., Novara, both of, Italy

Filed Jun. 30, 1992, Ser. No. 906,823
Claims priority, application Italy, Jul. 4, 1991, 001855 A/91
Int. Cl.[5] C07C 45/45
U.S. Cl. 568—356 5 Claims

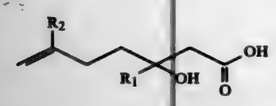
1. Procedure for the preparation of bicyclo[3.2.0]hept-2-en-7ones having the formula:



(I)

wherein R_1 and R_2, the same or different, are H or a C_1–C_4 alkyl group, including:

(a) the reaction of a 3-hydroxy-6-alkenoic acid having the formula:



(III)

wherein R_1 and R_2 have the above meaning, with sodium or potassium acetate and acetic anhydride, carried out at room temperature for a period of at least two hours,

(b) treatment at a temperature ranging from 100° to 140° C., under reflux conditions, for a period which is sufficient to complete the reaction, and

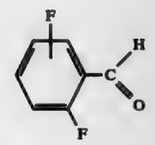
(c) separation of the product (I) from the reaction mixture.

5,191,126
PROCESS FOR THE PREPARATION OF DIFLUOROBENZALDEHYDES

Theodor Papenfuhs, Frankfurt am Main, and Andreas Kanschik-Conradeen, Germersheim/Rhein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

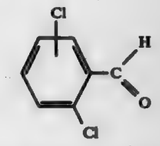
Filed Jul. 14, 1992, Ser. No. 913,150
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1991, 4123461
Int. Cl.[5] C07C 45/63, 47/55
U.S. Cl. 568—437 8 Claims

1. A process for the preparation, in high yield, of a difluorobenzaldehyde of the formula (1)



(1)

in which the second fluorine atom is, in the 4 or 6 position, which comprises reacting a dichlorobenzaldehyde of the formula (2)



(2)

in which the second chlorine atom is int eh 4 or 6 position, with an alkali metal fluoride in a dipolar aprotic solvent in the presence of an ethylene glycol dialkyl ether as catalyst of the formula (3)

$$RO-(CH_2-CH_2-O)_n-R \quad (3)$$

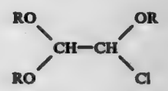
in which R is a methyl, ethyl or propyl or isopropyl group and n is a number from 1 to about 50, at temperatures of about 160° C. to about 250° C.

5,191,127
GLYOXAL DERIVATIVES AND METHOD FOR MAKING THE SAME

James H. Babler, Chicago, Ill., assignor to Loyola University of Chicago, Chicago, Ill.

Filed Aug. 13, 1991, Ser. No. 743,074
Int. Cl.[5] C07C 43/30, 43/32
U.S. Cl. 568—591 7 Claims

1. A method for making a monochloro-glyoxal derivative of the formula



comprising the steps of:

(a) forming a first reaction mixture in the presence of a catalytic amount of acid of

(i) glyoxal; and

(ii) ROH wherein R is selected from the group consisting of C_1–C_{10} alkyl, C_5–C_6 cycloalkyl, and allyl;

(b) isolating $(RO)_2CH-CH-(OR)_2$ from the first reaction mixture;

(c) forming a second reaction mixture of

(iii) $(RO)_2CHCH(OR)_2$ and

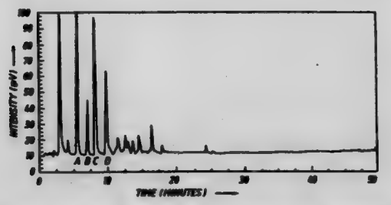
(iv) a chloride reagent in the presence of a catalytic amount of acid; and

(d) isolating $(RO)_2CH-CHCl(OR)$ from the second reaction mixture.

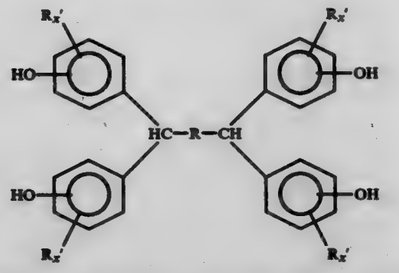
5,191,128
PROCESS FOR PREPARING TETRAPHENOLIC COMPOUNDS

Simon M. Li, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

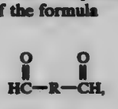
Filed Mar. 12, 1992, Ser. No. 851,376
Int. Cl.[5] C07C 39/12, 37/20
U.S. Cl. 568—720 16 Claims



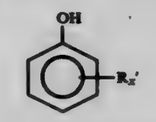
1. A process for preparing a tetraphenol of the formula



in which R is a direct bond or a hydrocarbyl linking moiety, R' is selected from the group consisting of C_{1-6} alkyl and halide, and x is an integer from 0 to 5, the process comprising contacting, at a temperature within the range of about 40° to about 110° C. in a solvent medium comprising a ketone and a C_{1-8} alkanol, a dialdehyde of the formula



in which R is a direct bond or hydrocarbyl linking moiety, and a stoichiometric excess of a phenolic compound which can be represented by the formula



in the presence of a catalytic amount of an acid-functional cation exchange resin.

5,191,129
METHOD OF PREPARING AN ISOPROPANOL AND DIISOPROPYL ETHER OXYGENATE MOTOR FUEL ADDITIVE

Robert L. Irvine, Overland Park, Kans., assignor to The Pritchard Corporation, Overland Park, Kans.

Filed May 1, 1992, Ser. No. 877,642
Int. Cl.[5] C07C 29/04, 41/00
U.S. Cl. 568—895 22 Claims

1. A method of preparing an oxygenate which contains isopropanol, diisopropyl ether and water, and that is useful as an additive for motor fuels, said method comprising the steps of:

providing a C_3 hydrocarbon feed stock containing a major proportion of propene;

providing a feed stream containing water;

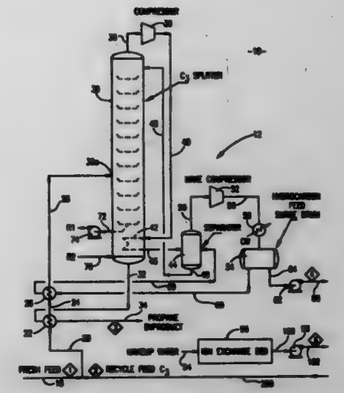
providing a catalytic reactor zone made up of a number of serially interconnected catalytic stages each having a lower inlet and an upper outlet, and presenting in said serial order thereof, an initial catalytic stage and a final catalytic stage,

said stages being located in disposition and interconnected in a manner such that the outlet of each stage is connected to and communicates with the inlet of the next adjacent stage in the serial order thereof.

each stage being provided with a quantity of a particulate strongly acidic ion exchange catalyst characterized by the property of catalyzing the hydrolysis of said feed stock by the water;

introducing a quantity of said feed stock and the water into the inlet of said initial catalytic stage, and into respective inlets of a plurality of catalytic stages serially connected therewith for exothermic reaction of the C_3 feed stock with the water;

maintaining the molar ratio of the water to propene delivered to each stage within the range of from about 2:1 to about 6:1;



causing the feed stock and water after introduction thereof into a respective catalytic stage, and the resultant isopropanol and diisopropyl ether formed therefrom, to flow upwardly in serial order through corresponding stages from the outlet of a respective stage to the inlet of the stage next adjacent thereto, with the reactants exiting through the outlet of the final stage of said number thereof;

maintaining the temperature of the reactants in each of the catalytic stages receiving feed stock and water within a range of from about 250° F. to about 300° F., with the pressure in each of the stages receiving feed stock and water being at a level of from about 1200 psia to about 3000 psia;

separating a substantial proportion of the isopropanol, the diisopropyl ether, any unreacted feed stock, and any residual organic components that may have formed in the reactor zone, from at least a proportion of the unreacted water in the outflow from the outlet of the uppermost of said catalytic stages receiving feed stock and water;

removing said proportion of separated water from said uppermost catalytic stage as a stream apart from said isopropanol, the diisopropyl ether, water, unreacted feed stock, and any residual organic components that may have formed in the reactor zone; and

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5,191,137

separating from said unreacted feed stock an oxygenate motor fuel additive fraction,

said oxygenate fuel additive fraction including isopropanol, diisopropyl ether, and water together with any residual organic components that may have formed in the reactor zone.

5,191,130

PROCESS FOR OLIGOMERIZING OLEFINS USING HALOGENATED PHOSPHOROUS-CONTAINING ACID ON MONTMORILLONITE CLAY

John R. Sanderson, and John F. Knifton, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Dec. 16, 1991, Ser. No. 807,342

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] C07C *2/74, 2/02*

U.S. Cl. 585—255 20 Claims

1. A process for the preparation of oligomers, comprising the following steps: (1) depositing a halogenated, phosphorous-containing acid on a substrate comprising montmorillonite clay; and (2) contacting under effective oligomerization conditions (a) linear olefins containing from 10 to 24 carbon atoms with (b) a catalytically effective amount of the montmorillonite clay having said acid deposited thereon.

5,191,131

PROCESS FOR PREPARATION OF LOWER ALIPHATIC HYDROCARBONS

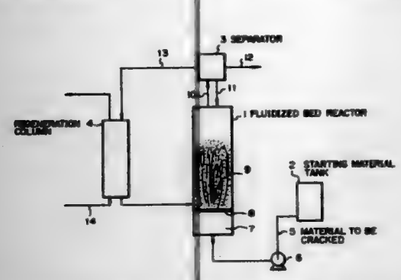
Kazunori Takahata; Toshihiro Murashige, both of Waki; Yukimasa Shigemura, Ichihara; Hiroshi Takaki, Ichihara, and Akihiko Okano, Ichihara, all of Japan, assignors to Research Association for Utilization of Light Oil, Tokyo, Japan

Filed Dec. 4, 1991, Ser. No. 444,980

Claims priority, application Japan, Dec. 5, 1988, 63-307270; Dec. 5, 1988, 63-307271; Mar. 9, 1989, 1-51546; May 29, 1989, 1-135364

Int. Cl.[5] C07C *4/06, 5/333*

U.S. Cl. 585—324 15 Claims



1. A process for the preparation of a lower aliphatic hydrocarbon comprising at least 30% by weight of an olefin having 3 to 4 carbon atoms from a first paraffin having 5 to 10 carbon atoms or a first hydrocarbon comprising at least 30% by weight of said first paraffin, which comprises:

carrying out a first reaction of catalytically cracking said first paraffin having 5 to 10 carbon atoms or said first hydrocarbon comprising at least 30% by weight of said first paraffin in the presence of a catalytic cracking catalyst having a strong acidity selected from the group consisting of

a mordenite catalyst dealuminized by an acid treatment to produce a silica/alumina molar ratio of from 12 to 70, and a solid super-strong acid catalyst formed by supporting a sulfuric acid ion on a carrier composed of $Zr(OH)_4$, ZrO_2, H_4TiO_4, TiO_2 or Fe_2O_3,

to convert said first paraffin or said first hydrocarbon to a second hydrocarbon comprising at least 30% by weight of a second paraffin having 3 to 3 carbon atoms; and

carrying out a second reaction of dehydrogenating said second hydrocarbon comprising at least 30% by weight of said second paraffin having 3 to 4 carbon atoms obtained in said first reaction with a dehydrogenation catalyst to convert said second hydrocarbon to a lower aliphatic hydrocarbon comprising at least 30% by weight of an olefin having 3 to 4 carbon atoms.

5,191,132

CYCLOPENTADIENE TYPE COMPOUNDS AND METHOD FOR MAKING

Konstantinos Patsidis; Syriac J. Palackal, and Helmut G. Alt, all of Bayreuth, Fed. Rep. of Germany, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 9, 1991, Ser. No. 697,363

Int. Cl.[5] C07C *13/00, 13/28*

U.S. Cl. 585—375 41 Claims

1. A process comprising reacting (1) a fluorenyl halide of the formula Z—R—X, wherein Z is a substituted or unsubstituted fluorenyl; X is Cl, Br, or I; and R is a divalent organic Ge, Si, B, Al, P, or Sn radical or alkylene radical with (2) and alkali metal salt of Z', wherein Z' is selected from the group consisting of unsubstituted fluorenyl, substituted fluorenyl, unsubstituted cyclopentadienyl, substituted cyclopentadienyl, unsubstituted indenyl, substituted indenyl and tetrahydroindenyl to produce a compound of the formula Z—R—Z', wherein Z and Z' are different.

15. A method for preparing compounds of the formula Z—CH_2—Z' wherein Z and Z' are different and Z is unsubstituted fluorenyl or substituted fluorenyl and Z' is unsubstituted cyclopentadienyl, substituted cyclopentadienyl, unsubstituted indenyl, substituted indenyl, tetrahydro indenyl, unsubstituted fluorenyl, or substituted fluorenyl comprising reacting a compound of the formula Z-Si$(CH_3)_3$ with alkali metal to form the alkali metal salt of Z-Si$(CH_3)_3$, reacting said alkali metal alkyl salt with a dihalomethane, to produce 9-methyl halide-9-trimethyl silyl Z, and reacting said 9-methyl halide-9-trimethyl silyl Z with the alkali metal salt of Z' to yield Z—CH_2—Z', wherein the halogens of the dihalomethane are each individually selected from Cl, Br, and I.

24. A process comprising reacting (1) a solution of a dihalo compound selected from the group consisting of dihalo organic compounds of Ge, Si, B, Al, P, Sn, wherein the two halogens are directly bonded to the respective Ge, Si, B, Al, P, or Sn atom, and dihalo alkylenes of the formula X—R—X wherein R is an alkylene radical having 1 to 20 carbon atoms in which the halogens of said dihalo compounds are selected from Cl, Br, and I with (2) a substituted or unsubstituted fluorenyl lithium salt wherein said solvent for the dihalo compound consists essentially of a non-polar organic liquid to produce a fluorenyl compound of the formula Fl—R—X wherein Fl corresponds to the substituted or unsubstituted fluorenyl of the lithium salt, X is selected from Cl, Br, or I, and R is the remnant of the dihalo compound.

5,191,133

PROCESS FOR PREPARATION OF 2-VINYLNAPHTHALENE

Henry C. Linstid, III, Clinton, N.J., assignor to Hoescht Celanese Corporation, Somerville, N.J.

Filed May 22, 1991, Ser. No. 704,574

Int. Cl.[5] C07C *1/24*

U.S. Cl. 585—437 15 Claims

1. A process for synthesizing 2-vinylnaphthalene comprising selectively hydrogenating a first mixture of 2-acetonaphthalene and 1-acetonaphthalene to form a second mixture including 2-methylnaphthyl carbinol and unreacted 1-acetonaphthalene followed by dehydrating said second mixture to yield 2-vinyl naphthalene, wherein the dehydration product consists substantially exclusively of 2-vinyl naphthalene.

5,191,134

AROMATICS ALKYLATION PROCESS

Quang N. Le, Cherry Hill, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 18, 1991, Ser. No. 732,264

The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.

Int. Cl.[5] C07C *2/64*

U.S. Cl. 585—446 30 Claims

1. A process for preparing long chain alkyl-substituted aromatic compounds which comprises reacting an aromatic compound with an alkylating agent under alkylation reaction conditions in the presence of an alkylation catalyst comprising an inorganic, non-layered, porous, crystalline phase material having pores with diameters of at least about 13 Å and exhibiting, after calcination, an X-ray diffraction pattern with at least one d-spacing greater than about 18 Å with a relative intensity of 100, and having a benzene adsorption capacity of greater than about 15 grams benzene per 100 grams at 50 torr and 25° C., to form an alkylated aromatic compound possessing at least one alkyl group derived from the alkylating agent.

5,191,135

AROMATICS ALKYLATION PROCESS

Francis G. Dwyer, West Chester, Pa., and Quang N. Le, Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Mar. 25, 1991, Ser. No. 673,925

Int. Cl.[5] C07C *2/66*

U.S. Cl. 585—455 24 Claims

1. A process for preparing long chain alkyl-substituted naphthalenes with improved selectivity for the mono-alkylated product, which comprises reacting a naphthalene or alkyl naphthalene compound with an alkylating agent possessing an alkylating aliphatic group having at least six carbon atoms under alkylation reaction conditions in the presence of water and a alkylation catalyst consisting essentially of a porous crystalline zeolite, to form a long chain alkylated naphthalene compound possessing at least one alkyl group derived from the alkylating agent, the selectivity for the mono-alkylated product being greater than in the absence of the added water.

5,191,136

PROCESS FOR PRODUCTION OF SEC-BUTYLBENZENE

Kazutera Takahashi, Chiba, and Yasuhiko Higashio, Osaka, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Sep. 9, 1991, Ser. No. 756,692

Claims priority, application Japan, Sep. 10, 1990, 2-240670; Jun. 3, 1991, 3-131092

The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.

Int. Cl.[5] C07C *2/70*

U.S. Cl. 585—461 6 Claims

1. A process for production of sec-butylbenzene comprising reacting benzene and n-butene in the presence of a liquid aluminum chloride complex catalyst, wherein the reaction is carried out under conditions satisfying formulae (1) to (4):

$$40 > C \times T \times 2^{(K-20)/10} > 20 \quad (1)$$

$$C \leq 0.9 \quad (2)$$

$$T \leq 0.7 \quad (3)$$

$$K \geq 80 \quad (4)$$

wherein C is a concentration (% by weight) of a complex catalyst in the reaction mixture; T is a reaction time (hr); and K is a reaction temperature (°C.).

5,191,137

MOLECULAR SIEVES COATED WITH NON-OXIDE CERAMICS FOR TOLUENE DISPROPORTIONATION

Jeffrey S. Beck, Lawrenceville, N.J., assignor to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 650,109, Feb. 4, 1991, Pat. No. 5,120,692. This application Apr. 27, 1992, Ser. No. 873,843

Int. Cl.[5] C07C *5/52*; B01J *29/04*

U.S. Cl. 585—475 10 Claims

1. A process for converting an organic, said process comprising contacting said organic with a catalyst comprising a molecular sieve coated with a non-oxide ceramic.

2. A process according to claim 1, wherein said molecular sieve coated with a non-oxide ceramic is ZSM-5 coated with BN.

3. A process according to claim 2, wherein toluene is contacted with said ZSM-5 coated with BN under conditions sufficient to disproportionate said toluene.

5,191,138

PROCESS FOR OXIDATIVE CONVERSION OF METHANE TO HIGHER HYDROCARBONS USING METAL SULFIDE OXIDIZING AGENT

Scott Han, Lawrenceville; James N. Michaels, Neshanic Station; Robert E. Palermo, Bloomfield, all of N.J.; David L. Stern, Yardley, and Dennis E. Walsh, Richboro, both of Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 597,217, Oct. 15, 1990, abandoned. This application Nov. 19, 1991, Ser. No. 794,560

Int. Cl.[5] C07C *1/00*

U.S. Cl. 585—900 8 Claims

1. A process for converting methane to at least one hydrocarbon having at least two carbon atoms, said process comprising contacting methane in the absence of O_2 with a reducible metal sulfide oxidizing agent under conditions sufficient to (i) produce said hydrocarbon and (ii) produce hydrogen sulfide.

5,191,139

PROCESS FOR OLIGOMERIZING OLEFINS USING SULFATE-ACTIVATED GROUP IV OXIDES

John R. Sanderson, Leander; John F. Knifton, and John M. Larkin, both of Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Nov. 4, 1991, Ser. No. 787,164

Int. Cl.[5] C07C *2/10*

U.S. Cl. 585—520 15 Claims

1. In a process for the preparation of oligomers from linear olefins containing from 10 to 24 carbon atoms, the improvement comprising oligomerizing said olefins in the presence of an oligomerization catalyst consisting essentially of sulfate-activated zirconium dioxide.

5,191,140

PROCESS FOR PRODUCING OLEFIN OLIGOMER

Makoto Akatsu; Satoru Miyaji, and Tatsuya Kawamura, all of Tokuyama, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1991, Ser. No. 756,508

Claims priority, application Japan, Sep. 20, 1990, 2-251446

Int. Cl.[5] C07C *2/02*

U.S. Cl. 585—525 17 Claims

1. A process for producing an olefin oligomer, which comprises polymerizing an α-olefin having 6 to 16 carbon atoms in the presence of boron trifluoride as a catalyst and further in the co-presence of a co-catalyst selected from the group consisting of at least two of water, an alcohol and a carboxylic acid anhydride.

5,191,141
PROCESS FOR CONVERTING METHANOL TO OLEFINS USING AN IMPROVED METAL ALUMINOPHOSPHATE CATALYST
Paul T. Barger, Arlington Heights, Ill.; Stephen T. Wilson, Shrub Oak, N.Y., and Jennifer S. Holmgren, Bloomingdale, Ill., assignors to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 790,908, Nov. 13, 1991, Pat. No. 5,126,308. This application Apr. 1, 1992, Ser. No. 862,018
Int. Cl.[5] C07C 1/24
U.S. Cl. 585—640 10 Claims

1. A process for converting methanol to light olefins comprising contacting the methanol with a catalyst comprising a crystalline metal aluminophosphate at conversion conditions, the metal aluminophosphate characterized in that it has an empirical composition on an anhydrous basis expressed by the formula

$$(EL_xAl_yP_z)O_2$$

where EL is a metal selected from the group consisting of silicon, magnesium, zinc, iron, cobalt, nickel, manganese, chromium and mixtures thereof, x is the mole fraction of EL and is at least 0.005, y is the mole fraction of Al and is at least 0.01, z is the mole fraction of P and is at least 0.01 and $x+y+z=1$, the metal aluminophosphate characterized in that it is composed of particles at least 50% of which have a particle size less than 1.0 μm and no more than 10% of the particles have a particle size greater than 2.0 μm.

5,191,142
PROCESS FOR CONVERTING METHANOL TO OLEFINS OR GASOLINE
Christopher L. Marshall, and Jeffery T. Miller, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Dec. 23, 1991, Ser. No. 812,640
Int. Cl.[5] C07C 1/00
U.S. Cl. 585—640 29 Claims

1. A process for converting a methanol feedstream comprising at least one mole of methanol per mole of any olefins present in said feedstream to a hydrocarbon product selected from C_3–C_{12} olefins and paraffinic gasoline components, said method comprising the step of:

contacting, in a backmixed reaction zone having a recycle to feed ratio of greater than about 3:1 and under methanol conversion conditions, a solid acid methanol conversion catalyst and a gaseous reaction mixture comprising said feedstream and conversion products thereof to form said hydrocarbon product selected from C_3–C_{12} olefins and paraffinic gasoline components.

5,191,143
PREPARATION OF ISOBUTYLENE
Wei-Yang Su, Austin; William A. Smith, and Roya Toolotan, both of Houston, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.
Filed Jan. 10, 1992, Ser. No. 818,931
Int. Cl.[5] C07C 1/00, 7/00, 7/17
U.S. Cl. 585—640 4 Claims

1. A method for the continuous preparation of isobutylene substantially free from tertiary butyl formate from a tertiary butyl alcohol feedstock contaminated with methyl formate which comprises the steps of:

continuously charging a tertiary butyl alcohol feedstock contaminated with tertiary butyl formate to a reactor and contacting it therein with a bed of a catalyst consisting essentially of sulfuric acid impregnated alumina under reaction conditions including a temperature of about 150° to about 400° C. and a pressure of about 0 to about 3000 psig. at the rate of about 0.5 to about 10 g of feedstock per hour per cc of catalyst, to form a reaction product substantially completely free from tertiary butyl formate,

withdrawing the reaction product from said reactor, and

recovering a tertiary butyl formate-free isobutylene product from the said reaction product.

5,191,144
OLEFIN UPGRADING BY SELECTIVE CONVERSION WITH SYNTHETIC MESOPOROUS CRYSTALLINE MATERIAL
Quang N. Le, Cherry Hill, and Robert T. Thomson, Voorhees, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Oct. 7, 1991, Ser. No. 772,184
Int. Cl.[5] C07C 6/04
U.S. Cl. 585—643 17 Claims

1. A process for disproportionation of olefinic feedstock by contacting the feedstock with acid porous solid catalyst at elevated temperature under acid cracking conditions; said catalyst comprising an inorganic, porous crystalline phase material having, after calcination, a hexagonal arrangement of uniformly-sized pores having diameters of at least about 13 Angstrom Units and exhibiting a hexagonal electron diffraction pattern that can be indexed with a d_{100} value greater than about 18 Angstrom Units.

5,191,145
CONTINUOUS PROCESS FOR PREPARING ALUMINUM ALKYLS AND LINEAR 1-OLEFINS FROM INTERNAL OLEFINS
Robert H. Allen; John N. Hu; Ronny W. Lin, and Andrew D. Overstreet, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 674,104, Mar. 25, 1991, Pat. No. 5,124,465. This application Aug. 2, 1991, Ser. No. 739,654
The portion of the term of this patent subsequent to Jun. 23, 2009, has been disclaimed.
Int. Cl.[5] C07C 5/25, 5/23; C07F 5/06
U.S. Cl. 585—665 16 Claims

1. A continuous process for making a 1-olefin compound from an internal olefin, said process comprising:

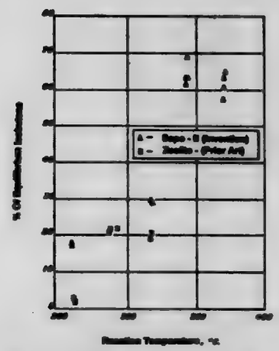
(a) continuously introducing a linear internal olefin containing 4 to about 30 carbon atoms, or a mixture of such internal olefins, and a trialkyl aluminum, in a mole ratio of linear internal olefin to trialkyl aluminum of about 1-50/1, into a reaction zone in the presence of a catalytic amount of an isomerization catalyst so as to (i) cause isomerization of the internal olefinic double bond to form at least some linear 1-olefin and (ii) cause the linear 1-olefin so formed to displace alkyl groups from said trialkyl aluminum and form an alkyl aluminum compound, wherein at least one of the alkyl groups bound to aluminum is a linear alkyl group derived from said linear 1-olefin, and displaced olefin corresponding to said displaced alkyl groups,

(b) continuously removing said displaced olefin and reaction mixture containing said alkyl aluminum compound from said reaction zone, and

(c) reacting said alkyl aluminum compound with a 1-olefin in a displacement zone so as to displace said linear alkyl from said alkyl aluminum compound and form a free linear 1-olefin compound.

5,191,146
OLEFIN ISOMERIZATION PROCESS
Gregory J. Gajda, Mt. Prospect, and Paul T. Barger, Arlington Hts., both of Ill., assignors to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 670,139, Mar. 15, 1991, Pat. No. 5,132,484, which is a continuation-in-part of Ser. No. 442,879, Nov. 29, 1989, abandoned. This application Dec. 30, 1991, Ser. No. 814,167
Int. Cl.[5] C07C 5/23
U.S. Cl. 585—667 15 Claims

1. A process for the isomerization of pentenes which comprises contacting a pentene-containing feedstock at isomerization conditions with a catalyst containing at least one NZMS to



provide a product containing one or more of the isopentanes in greater concentration than in the feedstock.

5,191,147
ISOPARAFFIN/OLEFIN ALKYLATION
Thomas F. Degnan, Moorestown; Kenneth J. Del Rossi, Woodbury; Altaf Husain, Marlton, all of N.J., and Albin Huss, Jr., Chadds Ford, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Continuation-in-part of Ser. No. 736,275, Jul. 25, 1991, abandoned. This application Oct. 30, 1991, Ser. No. 785,398
Int. Cl.[5] C07C 2/58, 2/62
U.S. Cl. 585—722 48 Claims

1. A process for alkylating an isoparaffin with an olefin comprising contacting an isoparaffin having from 4 to 8 carbon atoms with an olefin having from 2 to 12 carbon atoms in an alkylation reaction zone at temperature from about −20° C. to about 200° C. in the presence of a Bronsted acid and an inorganic, porous crystalline phase material having, after calcination, a hexagonal arrangement of uniformly-sized pores having diameters of at least about 13 Angstrom Units and exhibiting a hexagonal electron diffraction pattern that can be indexed with a d_{100} value greater than about 18 Angstrom Units, wherein the molar ratio of said isoparaffin to said olefin is from about 1:1 to about 250:1 to evolve a product stream containing C_5+ alkylate.

5,191,148
ISOPARAFFIN/OLEFIN ALKYLATION
Thomas F. Degnan, Moorestown; Kenneth J. Del Rossi, Woodbury, both of N.J., and Albin Huss, Jr., Chadds Ford, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed May 6, 1991, Ser. No. 696,484
Int. Cl.[5] C07C 2/58
U.S. Cl. 585—724 55 Claims

1. A process for alkylating an isoparaffin with an olefin comprising contacting an isoparaffin having from 4 to 8 carbon atoms with an olefin having from 2 to 12 carbon atoms in an alkylation reaction zone at temperature from about −20° C. to about 150° C. with an alkylation catalyst complex comprising a Lewis acid and an inorganic, porous crystalline phase material having, after calcination, a hexagonal arrangement of uniformly-sized pores having diameters of at least about 13 Angstrom Units and exhibiting a hexagonal electron diffraction pattern that can be indexed with a d_{100} value greater than about 18 Angstrom Units, wherein the molar ratio of said isoparaffin to said olefin is from about 1 to about 250 to evolve a product stream containing C_5+alkylate.

5,191,149
METHOD OF REFINING LIQUIFIED PETROLEUM GASES INTO AEROSOL PROPELLANTS
Rajendra D. Kulkarni, 1127 Juniper Canyon Ln., Houston, Tex. 77062
Filed Jul. 12, 1991, Ser. No. 729,285
Int. Cl.[5] C07C 7/00, 7/12, 7/17; C01B 17/16
U.S. Cl. 585—802 7 Claims

7. A process of refining liquified petroleum gas containing isobutane, butane and propane for use as an aerosol propellant by removing odorous components including water soluble and non-water soluble components comprising,

contacting the liquified petroleum gas with an electrolyte solution thereby dissolving the water soluble components into said electrolyte solution,

hydrogenating the solution and converting the non-water soluble components to water soluble components which are then dissolved into said electrolyte solution,

treating the solution with an acid,

separating the solution into an electrolyte liquid stream and a hydrocarbon liquid stream,

thereafter treating the hydrocarbon stream with a caustic solution,

thereafter treating the hydrocarbon stream with sodium thiosulfate,

separating the hydrocarbon stream from the sodium thiosulfate, and

then drying the hydrocarbon stream.

5,191,150
METHOD FOR SEPARATING CONJUNCT POLYMERIC BYPRODUCTS FROM MIXTURE CONTAINING HYDROFLUORIC ACID AND A SULFONE
Jonathan E. Child; Tomas R. Melli, both of Sewell, N.J., and Sergei Yurchak, Media, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Feb. 11, 1992, Ser. No. 833,684
Int. Cl.[5] C07C 7/00, 2/58, 2/00; B01J 20/34
U.S. Cl. 585—809 8 Claims

1. A method for separating conjunct polymers and sulfolane from a mixture containing conjunct polymers, sulfolane, and hydrofluoric acid comprising the sequential steps of separating hydrofluoric acid from said mixture to provide an intermediate stream containing less than about 30 percent hydrofluoric acid by weight and gravitationally separating said intermediate stream into a sulfolane-enriched stream and a conjunct polymer-enriched stream.

5,191,151
USE OF SILVER-EXCHANGED IONOMER MEMBRANES FOR GAS SEPARATION
Odd I. Eriksen; Elin Aksnes; Ivar M. Dahl, all of Oslo, Norway, and Fu-Ming Lee, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 18, 1991, Ser. No. 809,828
Int. Cl.[5] C07C 7/144, 7/10
U.S. Cl. 585—818 51 Claims

1. In a process for separating at least one alkene containing 2 to 4 carbon atoms per molecule from at least one alkane containing 1 to 6 carbon atoms per molecule contained in a gaseous feed by means of an ionomer membrane, the improvements which comprise:

having water vapor present in said gaseous feed, and

using a silver-exchanged ionomer membrane having been prepared by the preparation method comprising the steps of

(a) contacting (i) an ionomer membrane of a copolymer of tetrafluoroethylene and at least one perfluorovinyl ether containing a terminal sulfonic acid group with (ii) a solution of at least one alkali metal compound, under such conditions as to obtain an alkali-metal-exchanged ionomer membrane;

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(b) contacting the thus-obtained alkali-metal-exchanged ionomer membrane with a liquid comprising at least one alcohol containing from 2 to 20 carbon atoms and from 1 to 5 hydroxyl groups per molecule, under such conditions as to obtain a swollen alkali-metal-exchanged ionomer membrane; and

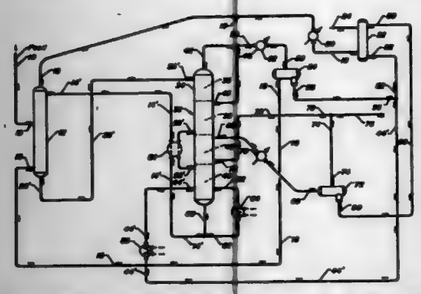
(c) treating the thus-obtained swollen alkali-metal-exchanged ionomer membrane with a solution containing at least one silver compound, under such conditions as to replace alkali metal ions with silver ions in said ionomer membrane.

5,191,152

PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS WITH ENERGY REDISTRIBUTION

Paulino Forte, Yonkers, N.Y., assignor to UOP, Des Plaines, Ill.

Filed Feb. 20, 1991, Ser. No. 657,923
Int. Cl.[5] C07C 7/10
U.S. Cl. 585—833 26 Claims



1. A continuous solvent extraction process for the separation of aromatic hydrocarbons from a feedstock comprising aromatic and non-aromatic hydrocarbons, said process comprising:

(a) contacting said feedstock with a first lean solvent stream and a recycle stream in an extraction zone and at extraction conditions and separating said feedstock into a raffinate stream comprising non-aromatic hydrocarbons and a first rich solvent stream comprising solvent, aromatic hydrocarbons and non-aromatic hydrocarbons;

(b) passing said rich solvent stream to a stripping zone, contacting said solvent stream with a stripping steam stream at stripping conditions in a first section of said stripping zone, recovering a first vapor stream from said first stripping zone section and discharging a second rich solvent stream from said first stripping zone section;

(c) separating a mixed hydrocarbon phase comprising non-aromatic hydrocarbons and aromatic hydrocarbons from said first vapor stream and passing said mixed hydrocarbon phase to said extraction zone as said recycle stream;

(d) passing said second rich solvent stream to a second section of said stripping zone, contacting said second rich solvent stream with a stripping steam stream in said second stripping zone section, discharging a second vapor stream from said second stripping zone section, and withdrawing a second lean solvent stream from said second stripping zone section;

(e) recovering an aromatic product stream from said second vapor stream;

(f) reboiling at least a portion of said second lean solvent stream and returning said reboiled portion to said second stripping zone section; and,

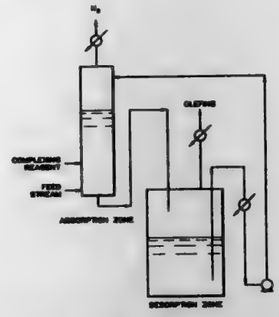
(g) cooling a second portion of said second lean solvent stream and producing said first lean solvent stream by transferring heat from said portion of said second lean solvent stream to said second rich solvent stream as it passes from said first section to said second section of said stripping zone.

5,191,153

METHOD FOR PREPARING OLEFIN COMPLEXING REAGENTS AND USE THEREOF

Ted H. Cymbaluk, Bartlesville, Okla.; Donald C. Tabler, Fort Collins, Colo.; Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 457,122, Dec. 26, 1989, Pat. No. 5,104,570.
This application Nov. 4, 1991, Ser. No. 787,151
Int. Cl.[5] C07C 7/10
U.S. Cl. 585—833 9 Claims



1. A process for separating an olefin from a mixture of an olefin and a paraffin comprising the steps of:

a) contacting said mixture of said olefin and said paraffin in an inert atmosphere with a complexing reagent consisting essentially of a copper(I) carboxylate/BF_3 adduct in an aromatic solvent, whereby said olefin reacts with said complexing reagent to form an olefin/reagent complex in said aromatic solvent while said paraffin remains uncomplexed, wherein the molar ratio of said carboxylate to said BF_3 in said reagent is about 1:2;

b) separating said olefin/reagent complex from said uncomplexed paraffin; and

c) recovering said olefin from said olefin/reagent complex.

5,191,154

METHOD AND SYSTEM FOR CONTROLLING CHEMICAL REACTION IN A MOLTEN BATH

Christopher J. Nagel, Boston, Mass., assignor to Molten Metal Technology, Inc., Waltham, Mass.

Filed Jul. 29, 1991, Ser. No. 737,048
Int. Cl.[5] C02F 1/72; A62D 3/00
U.S. Cl. 588—201 12 Claims

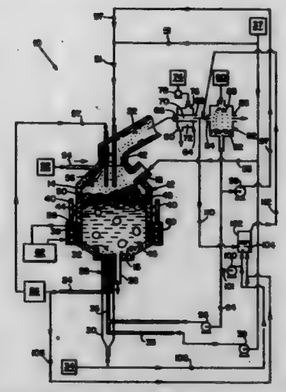
1. A method for controlling chemical reaction of a feed, comprising the steps of:

a) directing the feed into a reactor within which a molten bath is disposed, the molten bath having a temperature sufficient to chemically react at least a portion of the feed, whereby an intermediate component, which includes a carbon chain of greater than three carbons, and atomic constituents are formed, a portion of the intermediate component combining with an off-gas formed in the reactor and being emitted with the off-gas from the reactor;

b) separating at least a portion of the intermediate component from the off-gas to form an intermediate stream;

c) directing said intermediate stream into the reactor for chemical reaction of the intermediate component which is returned to the reactor to form atomic constituents and subsequent exothermic reaction of at least a portion of the atomic constituents with an oxidant in the molten bath; and

d) directing an oxidant into the molten bath which exothermally reacts with said atomic constituents, whereby heat generated by the exothermic reaction initiates additional chemical reaction of the feed and of the intermediate component, thereby controlling chemical reaction of the feed.



5,191,155

PROCESS FOR NONPOLLUTING DESTRUCTION OF POLYCHLORINATED WASTE MATERIALS

Klaus Driemel; Joachim Wolf, and Wolfgang Schwarz, all of Duisburg, Fed. Rep. of Germany, assignors to Grillo-Werke AG, Duisburg, Fed. Rep. of Germany

Continuation of Ser. No. 162,139, Feb. 29, 1988, abandoned.
This application Oct. 7, 1991, Ser. No. 771,570
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708310
Int. Cl.[5] A62D 3/00; C01B 17/50; C01G 17/00; F23G 7/04
U.S. Cl. 588—209 7 Claims

1. A process for nonpolluting removal of polychlorinated waste materials and the recovery of sulfur dioxide characterized in that polychlorinated waste materials or combustible residual materials contaminated with said polychlorinated waste materials are subjected to combustion together with waste sulfuric acid, acid tars or similar sulfur- and carbon-containing waste products in a multi-stage combustion furnace, the combustion comprising a four stage process wherein:

(a) in a first stage, the waste sulfuric acid, acid tars or sulfur- or carbon-containing waste products and the polychlorinated waste materials are fed into a rotary furnace containing a coke bed at a temperature of at least 400° C. together with an amount of air equal to about 25 to 55% of the total amount of air required for the four stage process, so that the resultant reducing gas mixture is heated to about 800° C. to 1100° C., wherein said polychlorinated waste materials fed into said rotary furnace include at least one of polychlorinated dibenzodioxines, polychlorinated dibenzofuranes or polychlorinated biphenyls;

(b) in a second stage, the reducing gas mixture is fed from the rotary furnace to an intermediate combustion chamber and admixed with about 10 to 15% of the amount of air required for the four stage process, while a volume velocity per hour of about 200 to 400 Nm^3 of gas/m^3 of combustion space is maintained and the temperature of the gas mixture increases to about 1150° C. to 1350° C.;

(c) in a third stage, the gas from the intermediate combustion chamber is fed into the forward combustion space of a secondary combustion chamber and mixed with about 20 to 45% of the amount of air required for the four stage process, while a volume velocity per hour of about 50 to 180 Nm^3 of gas/m^3 of combustion space is maintained and the separation gas cools to about 1000° C. to 1200° C.; and

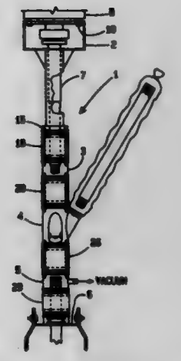
(d) in a fourth stage, the remaining portion of the total air required in the fourth stage process is fed into the center portion of the secondary combustion chamber and mixed with the separation gas so that in the rear part of the secondary combustion chamber a temperature of about 1000° C. to 1200° C. is obtained, a volume velocity per hour of about 150 to 400 Nm^3 of gas per m^3 of combustion space is maintained, and an oxygen excess of 1 to 2% for the four stage process is provided; and the process gases cooled, sulfur dioxide removed from the process gases, and then the gases purified by washing.

5,191,156

DRILL STRING ENCLOSURE

Douglas K. Jorgensen; Douglas J. Kuhns; Otto Wiersholm, and Timothy A. Miller, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1992, Ser. No. 868,143
Int. Cl.[5] B09B 1/00
U.S. Cl. 588—249 11 Claims



1. A drill string enclosure comprising:

a top bracket having an upper and lower end;

a first flexible cylinder member connected at one end to said lower end of said top bracket;

means for guiding drill casings attached to said other end of said first flexible cylinder member;

a second flexible cylinder member connected at one end to said means for guiding drill casings;

a lower cylinder member attached to the other end of said second flexible cylinder member;

a third flexible cylinder member connected at one end to said lower cylinder member; and

a bottom bracket attached to the other end of said third flexible cylinder member.

5,191,157

METHOD FOR DISPOSAL OF HAZARDOUS WASTE IN A GEOPRESSURE ZONE

Clinton P. Crocker, P.O. Box 4440128, Houston, Tex. 77244

Filed Apr. 5, 1991, Ser. No. 680,949
Int. Cl.[5] G21F 9/34; B09B 1/00
U.S. Cl. 588—250 9 Claims

1. A method of safely disposing of hazardous waste, including the steps of: forming a borehole in the earth's crust extending from the surface to the interior of a geopressure cell by penetrating the geopressure barrier seal; placing the hazardous

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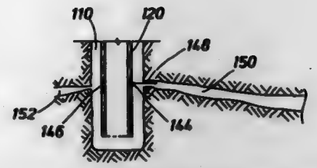
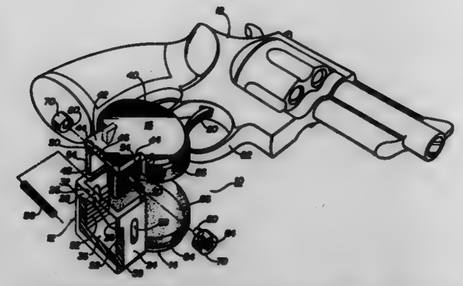
waste material in the geopressure cell by moving the hazardous waste through the borehole; and reestablishing the geopressure seal of the geopressure cell to prevent migration of the hazardous waste from the geopressure seal.



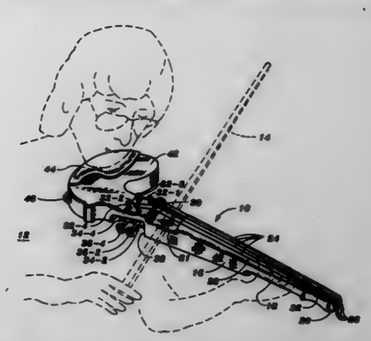
5,191,158
TRIGGER GUARD FOR A FIREARM
Ann D. Fuller, and Robert M. Fuller, both of Rte. 1, Duncan Bridge Rd., Santee, Ga. 30571
Filed Mar. 5, 1992, Ser. No. 848,704
Int. Cl.[5] F41A *17/54*
U.S. Cl. 42—70.07 6 Claims



1. A safety device for a firearm having a trigger, comprising:
(a) a frame having side walls with opposed inner surfaces;
(b) a first element on the frame, the first element having a forward portion and a rear;
(c) a second element moveable on the frame; and
(d) means for securing the second element on the frame at a selected distance from the first element so as to engage therebetween, and prevent access to, at least the trigger of the firearm, the second element having a forward portion which is complementary in shape, and in opposed relationship to, the forward portion of the first element, a second portion laterally extending from a rear of the forward portion of the second element and a pair of opposed, parallel legs depending from the second portion and having outer surfaces; the securing means comprising first serrations vertically extending along the inner surfaces of the side walls of the frame and second serrations which are complementary in shape to the first serrations and which are extending on the outer surfaces of the legs and means for releasably positioning the second serrations in or out of engagement with the first serrations in order to maintain the second element at the selected distance from the first element, wherein the releasably positioning means comprises the legs being flexibly connected to the second element to move about a horizontal axis, an opening being defined through each of the side walls of the frame and finger engaging means laterally extending from the outer surfaces of the legs through a respective opening so that when the finger engaging means are pressed inwardly, the second serrations on the legs are moved out of engagement with the first serrations to allow the legs to either be moved downwardly between the side walls to secure the first and second elements in engagement with the trigger or moved inwardly along the side walls to release the second element from its overlying relationship with the first element so that the device can be removed from the firearm.

5,191,159
ELECTRICAL STRINGED MUSICAL INSTRUMENT
John C. Jordan, 1173 Linden Dr., Concord, Calif. 94520
Filed Nov. 28, 1990, Ser. No. 620,532
Int. Cl.[5] G10D *1/02*
U.S. Cl. 84—274 6 Claims

1. An electrical stringed musical instrument of the violin type, comprising:
an elongated body having a first end, a second end, a first major face extending from said first end to said second end, a second major face extending from said first end to said second end, a first side extending between said first major face and said second major face, and a second side extending between said first major face and said second major face;
a neck projecting from said first end of said body;
a fingerboard overlying a part of said first major face and a part of said neck;
a bridge projecting from said first major face;
a plurality of machine heads located between said bridge and said second end of said body, each of said machine heads having a string receiving portion projecting from said first major face of said body and an associated tuning key located on one side of said body, said tuning keys being closer to said bridge than to said second end of said body; and
a plurality of strings, each of said strings passing over said bridge and being attached to one of said string receiving portions;
said body including a projection extending beyond the outer ends of the tuning keys located on the same side thereof and being capable of supporting a chin rest.



5,191,160
GUITAR POSITIONING DEVICE
Mark C. Barnett, 350 Anderson La., Hendersonville, Tenn. 37075
Filed Jan. 9, 1992, Ser. No. 791,775
Int. Cl.[5] G10D *3/00*
U.S. Cl. 84—327 1 Claim

1. A guitar positioning apparatus comprising:
an adjustable waist band;
a telescopic bracket rod having a screw;
a ball attached atop the screw;
a nut having a wing cap; the wind cap having a hole therein;
said nut being affixed to said waist band;
said ball being housed within the hole in said wing cap.

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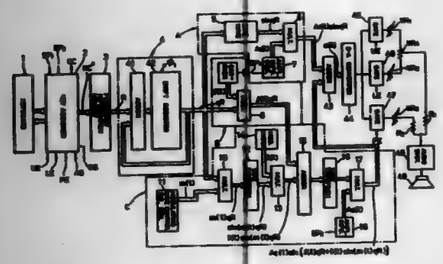
5,191,161
ELECTRONIC MUSICAL INSTRUMENT INCLUDING WAVESHAPE MEMORY AND MODIFIABLE ADDRESS CONTROL

Akiyoshi Oya, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Division of Ser. No. 748,732, Jun. 25, 1985, Pat. No. 4,748,888, which is a division of Ser. No. 921,883, Jul. 7, 1978, Pat. No. 4,643,066, which is a continuation of Ser. No. 700,941, Jun. 29, 1976, abandoned. This application Oct. 15, 1987, Ser. No. 109,270
Claims priority, application Japan, Jul. 3, 1975, 50-82208; Jul. 3, 1975, 50-82209
Int. Cl.[5] G10H *1/06, 7/02*
U.S. Cl. 84—604 6 Claims



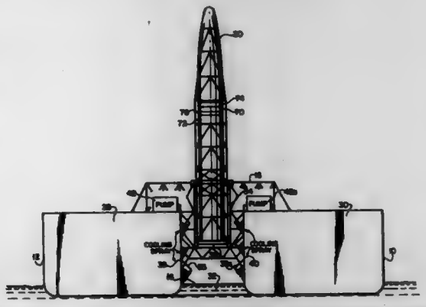
1. An electronic musical instrument, comprising:
storage means for storing waveform information;
address signal production means for producing a single address signal which changes at a uniform rate corresponding to a frequency of the waveform to be produced over one cycle of a waveform, to read out the waveform information stored in said storage means;
modulating signal production means for producing a modulating signal;
modification means coupled to said address signal production means and to said modulating signal production means for modifying the single address signal produced from said address signal producing means, into a modified address signal according to the modulating signal supplied from said modulating signal production means without using a feedback loop from said storage means, the changing rate of said modified address signal varying in one cycle of the waveform; and
accessing means coupled to said modification means for accessing said storage means by the use of the modified address signal delivered from said modification means to generate a waveform signal which has a distorted waveform according to the modulating signal produced by the modulating signal production means, and has the frequency determined by the single address signal generated by the address signal production means.

5,191,162
METHOD AND APPARATUS FOR A SHIP-BASED ROCKET LAUNCHING STRUCTURE

Dieter W. Csimmek, Yorktown, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Sep. 5, 1991, Ser. No. 755,338
Int. Cl.[5] B63B *35/00*; F41F *3/042*
U.S. Cl. 89—1.802 20 Claims

11. A method for launching a rocket at sea comprising the steps of:
positioning two ships at a staging point;
interconnecting said two ships by means of trusses at the respective bows and sterns of said two ships, and with a connecting truss comprising a rocket cradle;
positioning a rocket in said rocket cradle;
tilting said rocket cradle to a desired launch position; and

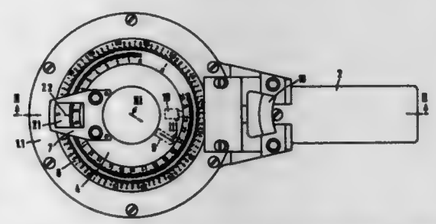


launching said rocket wherein exhaust gases from the rocket impinge substantially directly on the surface of the sea, and concurrent with said launching.

5,191,163
DEVICE FOR SETTING FUZES IN LARGE-CALIBER SHELLS

Erich Wallwey, Vellmar, and Siegfried Sinn, Niestetal, both of Fed. Rep. of Germany, assignors to Firma Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Apr. 3, 1992, Ser. No. 864,912
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1991, 4111002
Int. Cl.[5] F42C *17/02*
U.S. Cl. 89—6 9 Claims

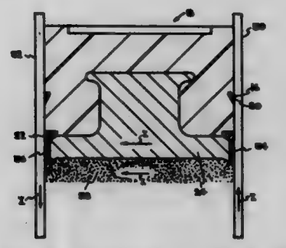


1. A device for setting a fuze in a large-caliber shell, wherein the fuze is coaxial with the point of the shell and has one section secured stationary to the shell and a second section rotatable around the axis of the shell and a groove in the surface of each section extending along a plane through the axis of the shell, the device comprising: an essentially round housing; a handle extending radially out of the housing; first and second concentric rings, means mounting the first ring for rotation in the housing, means mounting the second ring for rotation independently of the first ring, means for securing the second ring to the first ring for rotation therewith, wherein both rings have an inner surface configured to match the outer surface of a fuze, a motor for rotating the first ring including a torque limiter, and wherein the inner surface of the first ring has a pin mounted for sliding movement radially inwardly against the force of a spring and radially outwardly, the inner surface of the second ring has a stationary radial pin, and the pins are positioned such that, when the device is applied to a fuze, the first pin will point toward the stationary section and the second pin toward the rotating section of the fuze.

5,191,164
HYBRID ARMATURE PROJECTILE

Ronald S. Hawke, Livermore, Calif.; James R. Asay, Los Lunas, N. Mex.; Clint A. Hall; Carl H. Konrad, both of Albuquerque, N. Mex.; Gerald L. Seuve, Berthoud, Colo.; Mohsen Shahinpoor, Albuquerque, N. Mex., and Allan R. Susoeff, Pleasanton, Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 1, 1991, Ser. No. 678,430
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 35 Claims



1. A projectile for accelerating in a forward direction in a bore of a railgun, said projectile including a transitioning armature and comprising:
a body with an outer surface and a front end and a back end;
an electrically conductive material forming a transitioning armature at the back end of the body; and
means for providing a seeding material between the conductive material forming said transitioning armature and the bore of the railgun for establishing a plasma when said armature transitions from a solid armature of a first diameter to a hybrid armature of a lesser diameter and wherein said means is attached to the outer surface of the body and located forward of said transitioning armature.

5,191,165
ORDNANCE BARRELS

Leif Oskarsson; Sigge Andersson, and Bengt Pettersson, all Ljungby, Sweden, assignors to Statoil Europarts AB, Ljungby, Sweden

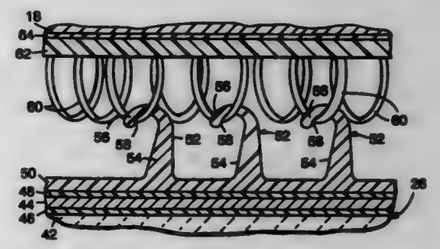
Filed Oct. 1, 1991, Ser. No. 769,258
Claims priority, application Sweden, Oct. 1, 1990, 9003119
Int. Cl.[5] F41A *21/02*
U.S. Cl. 89—15 6 Claims

1. A method of producing for use as a rocket launcher or grenade launcher ordnance a rifled, non-metallic barrel, having, in cross section, lands alternating with grooves with smooth transitions therebetween, said barrel being made from a composite material comprising a thermosetting matrix material and reinforcing fibers, said method comprising:
providing a rifled mandrel having a length at least as great as the length of the desired barrel, and an outer diameter which corresponds to the inner diameter of the desired barrel, said rifled mandrel having a substantially circular cross section, with longitudinal rifling grooves alternating with longitudinal rifling lands with smooth transitions therebetween, said lands and grooves corresponding to the grooves and lands respectively for the rifling of the desired barrel;
surrounding said rifled mandrel with a continuous, porous, fluffy mat formed of a fibrous material, said mat being capable of absorbing said matrix material in its uncured or prepolymer state, and being drenched with said matrix material;
thereafter surrounding the mat with a plurality of fiber layers drenched with matrix material, so as to dispose said layers peripherally about the mandrel;
applying said fiber layers against said fluffy mat with the matrix material absorbed therein to compress said mat and to fill the rifling grooves of the mandrel, the mat and its content of matrix material being thereby compressed to a smaller thickness above the lands than above the grooves of the mandrel, with the thicker parts thereof penetrating into said rifling grooves, at the same time forcing out surplus matrix material and entrapped air;
continuing the application of additional drenched fiber layers until the barrel wall has reached a desired thickness;
curing the matrix material; and
removing the resulting barrel from the mandrel.

5,191,166
SURVIVABILITY ENHANCEMENT

Martin E. Smirlock, Concord; Robert C. Sykes, Burlington; Anthony L. Alesi, Wayland, and Joseph J. Prifti, Arlington, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Filed Jun. 10, 1991, Ser. No. 712,935
Int. Cl.[5] F41H *5/013, 5/04*
U.S. Cl. 89—36.02 19 Claims



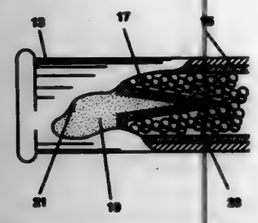
1. An applique armor system comprising
a plurality of armor tiles, each said armor tile including a ceramic component of relatively low tensile strength and an impedance match enhancing sheet component of greater tensile strength then said ceramic component secured to the face of said ceramic component remote from the anticipated attack direction, said ceramic component having a thickness of at least ten times the thickness of said sheet component,
a separable fastener component of a first type secured to one face of said composite armor tile for cooperative engagement with a separable fastener component of a second type secured to a surface of structure whose survivability is to be enhanced,
one of said separable fastener components having a multiplicity of hooking elements and the other separable fastener component having complementary structure for releasable interengagement with said hooking elements of said one separable fastener component,
said armor system having energy absorbing characteristics and providing progressive energy dissipation of energy resulting of impact of a ballistic missile on an armor tile of said plurality of armor tiles.

5,191,167
MULTI-POINT FIBER OPTIC IGNITER
Richard A. Beyer, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 29, 1992, Ser. No. 890,429
Int. Cl.[5] F42C *19/08*
U.S. Cl. 102—201 9 Claims

1. A method for the multi-point ignition of a sensitive energetic material, comprising the steps of:
a) selecting an elongated single non-branching optic fiber,
b) selecting a sensitive energetic material,
c) adding an epoxy glue to the side of the optic fiber at several sites in an amount sufficient to attach the sensitive energetic material so as to form an exit for light energy.
d) attaching the sensitive energetic material to the optic fiber, and
e) irradiating the optic fiber so as to transmit light energy along the fiber optic to the exit formed by the attached sensitive energetic material, and
f) igniting the sensitive energetic material.

6. An system for the multi-point ignition of a sensitive energetic material comprising:
a) an elongated single non-branching optic fiber,
b) a sensitive energetic material attached by an epoxy glue to the optic fiber at several points along its length.
b) irradiation means positioned at one end of the optic fiber,
c) lens means positioned between the irradiation means and one end of the optic fiber,
so that on the irradiation of an end of the optic fiber, light energy is transmitted along the optic fiber and exits at the point of the attached sensitive energetic material.

5,191,168
SABOT FOR HIGH DISPERSION SHOT SHELL
Lawrence J. Puckett, Churchville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 29, 1992, Ser. No. 828,321
Int. Cl.[5] F42B *7/02*
U.S. Cl. 102—457 13 Claims



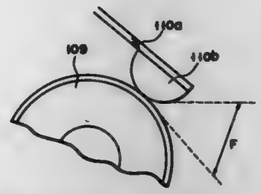
11

1. A sabot for a shotgun shell, said sabot comprising a tubular portion and a base, wherein said tubular portion attaches to said base forming a cup-like member for launching a load of shot, said base being provided with a centrally disposed recess which protrudes into said load of shot said base, including said recess, having a substantially uniform thickness, whereby a distance approximately equal to the length of said tubular portion, said recess expands readily under the influence of propellant gases and imparts to a substantial portion of said shot a transverse velocity component, thereby enhancing shot dispersion.

5,191,169
MULTIPLE EFP CLUSTER MODULE WARHEAD
John B. Hu, Yorbalinda, Calif., assignor to Olin Corporation, Cheshire, Conn.
Filed Dec. 23, 1991, Ser. No. 812,340
Int. Cl.[5] F42B *12/10, 12/18*
U.S. Cl. 102—476 18 Claims

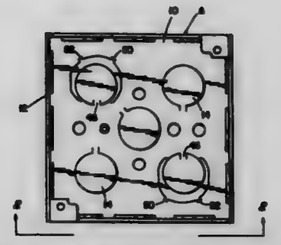
1. A warhead comprising:
a tubular body having a central axis and having a plurality of explosively formed penetrator modules all of said modules having substantially identical outer diameters and arranged tandemly within said body along said axis, each of said modules including a support disk having a set of circumferentially spaced bores therethrough, each of said bores having a central bore axis intersecting said central axis at an included acute angle, each bore having mounted therein a separate ductile metal disk, a separate explosive charge totally contained within said bore behind and against said metal disk, and an ignition means for said explosive charge, each of said bore axes being uniquely offset from each other so that each EFP travels along a unique forward path.

5,191,170
DEVELOPING APPARATUS HAVING DEVELOPING AGENT LAYER FORMING BLADE
Minoru Yoshida, Tokyo, and Kouji Hirano, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 21, 1991, Ser. No. 795,532
Claims priority, application Japan, Nov. 30, 1990, 2-340514
Int. Cl.[5] G03G *15/06*
U.S. Cl. 118—644 14 Claims



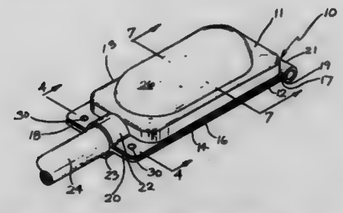
1. A developing apparatus comprising:
developing means for supplying developing agent to an image bearing member to develop a latent image, said developing means having a conductive layer on a surface thereof and arranged opposite to the image bearing member; and
means for forming a developing agent layer on the conductive layer of said developing means, said forming means having a charging layer having wear-resistance equal to or lower than that of the conductive layer of said developing means, wherein said conductive layer is made from conductive polyurethane resin.

5,191,171
ECCENTRIC KNOCKOUTS
Mark A. Bordwell, Memphis, Tenn., assignor to Thomas & Betts Corporation, Bridgewater, N.J.
Filed Jan. 23, 1991, Ser. No. 645,478
Int. Cl.[5] B65D *41/32*
U.S. Cl. 174—65 R 31 Claims



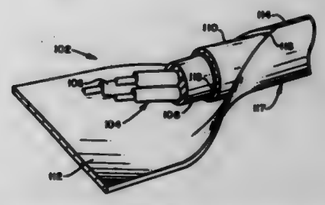
25. A metal wall having inner and outer knockouts eccentrically located with respect to each other, said outer knockout being non-circular, said inner and outer knockouts sharing a common outer periphery over an arc substantially less than 180° and greater than 40°, and at least one frangible connection between said inner knockout and said wall along said common outer periphery.

5,191,172
CABLE TERMINAL PROTECTOR
Richard S. Gargaseee, P.O. Box 323, East Greenwich, R.I. 02818
Filed Nov. 7, 1991, Ser. No. 788,807
Int. Cl.[5] H02G *15/02*
U.S. Cl. 174—74 A 9 Claims



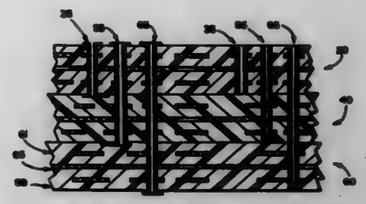
1. Cable terminal protector, comprising
(a) two rectangular main members, each having spaced, parallel side edges and spaced, parallel end edges,
(b) a hinge joining one end edge of one of the main members to one of the end edges of the other main member, so that the main members may be moved from an open position to a closed position,
(c) semi-cylindrical sheaths located at mating edges of the main members to embrace and seal on a cable extending through them in closed position of the main members,
(d) a pocket extending from the central position of each main member forming an enclosure for a cable terminal,
(e) apertures formed in one of the main members at the said other end adjacent the intersections of the end edges with the side edges,
(f) tapered pegs formed on the other of the main members for engagement with the said apertures, and
(g) inter-engaging seals formed on the main members surrounding the pockets to prevent foreign matter from entering the enclosure.

5,191,173
ELECTRICAL CABLE IN REELED TUBING
Phillip S. Starr, Dallas; Malcolm N. Council, Richardson, both of Tex.; Willard J. Deese, Sandersville, Miss.; E. G. Hoffman, Middlefield, Conn.; Robert F. Bailey, Spring, Tex., and David H. Neuroth, Hamden, Conn., assignors to Otis Engineering Corporation, Dallas, Tex.
Filed Apr. 22, 1991, Ser. No. 689,465
Int. Cl.[5] H01B *7/20*
U.S. Cl. 174—105 R 4 Claims



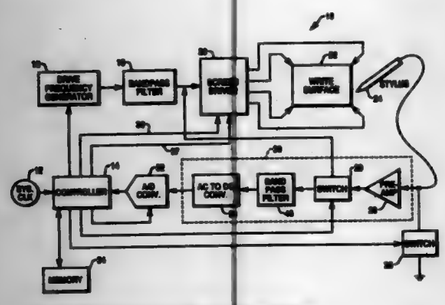
1. An electrical cable assembly for use in subterranean wells, said assembly comprising:
a cable core further comprising a plurality of electrical conductors;
longitudinally seamed, steel tubing disposed around said cable core; and
means disposed between said cable core and said steel tubing for restricting relative axial and rotational movement between said cable core and said tubing, wherein said restricting means comprises a plurality of axially spaced metal cylinders, said metal cylinders surrounding said cable core and being bonded to said cable core and to said steel tubing.

5,191,174
HIGH DENSITY CIRCUIT BOARD AND METHOD OF MAKING SAME
Chi S. Chang, Endicott; Joseph G. Hoffarth, Binghamton; Voya R. Markovich, Endwell; Keith A. Snyder, and John P. Wiley, both of Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 1, 1990, Ser. No. 561,401
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—266 21 Claims



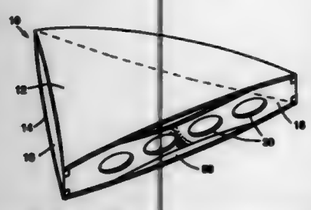
1. In a multilayered circuit board assembly including first, second and third layered subassemblies arranged in a serially contiguous manner, each of said subassemblies having at least one dielectric layer, electrically conducting wiring in the form of at least one conductive layer and at least one through hole therein, each of said subassemblies further including a predetermined wiring density and an electrical current resistance, the improvement wherein said wiring densities and said electrical current resistances of said subassemblies progressively decrease from said first subassembly to said third subassembly.

5,191,175
SELF-TUNING DIGITIZER CONTROL CIRCUIT AND METHOD
Robert L. Protheroe; Kazem Mesteranzadeh, and John F. Crooks, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 29, 1991, Ser. No. 737,129
Int. Cl.[5] G09C 21/00
U.S. Cl. 178—18 31 Claims



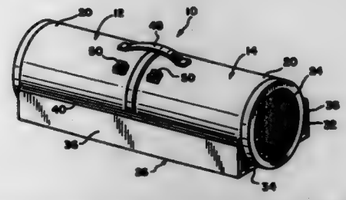
1. A digitizer control circuit comprising:
means for exciting the digitizer;
means for sensing the excitation of the digitizer and for producing a signal having information about the position of the sensing means; and
means, coupled to the sensing means, for processing the information signal having a frequency characteristic which changes;
said exciting means being tunable to the processing means as the frequency characteristic changes.

5,191,176
AUDIO LOUDSPEAKER ENCLOSURE
Junius B. Wright, 2034½ San Antonio, Alameda, Calif. 94501
Filed Feb. 21, 1991, Ser. No. 659,007
Int. Cl.[5] H05K 5/00
U.S. Cl. 181—148 8 Claims



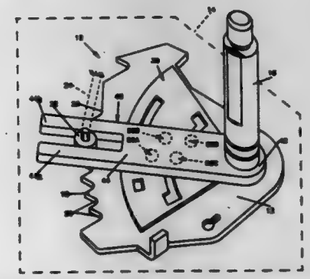
1. An enclosure for a system of audio loudspeakers, comprising:
a. a first panel having a surface that is generally flat and flexible and an equilateral right triangle shape, said first panel having at least one dimension that corresponds to a resonant quarter wavelength of less than 100 hertz;
b. a second panel substantially parallel to the first panel and having a surface that is generally flat and flexible and an equilateral right triangle shape that is symmetrical, said second panel having at least one dimension that corresponds to a resonant quarter wavelength of less than 100 hertz;
c. means for coupling the first panel to the second panel; and
d. means for supporting at least one loudspeaker between the first and second panels
wherein the first and second panels have corresponding equilateral sides which define a pair of side edges of the enclosure, and wherein a first point of intersection of the equilateral sides of the first panel is connected to a second point of intersection of the equilateral sides of the second panel, wherein the hypotenuses of each of the first and second panels define a front edge of the enclosure, and wherein the means for supporting at least one loudspeaker is positioned so that the loudspeaker is facing outwardly from the front edge.

5,191,177
TUBE SPEAKER
Yang H. Cai, 14162 S. Orange Ave., Paramount, Calif. 90723
Filed Jun. 27, 1991, Ser. No. 721,948
Int. Cl.[5] H05K 5/00
U.S. Cl. 181—153 12 Claims



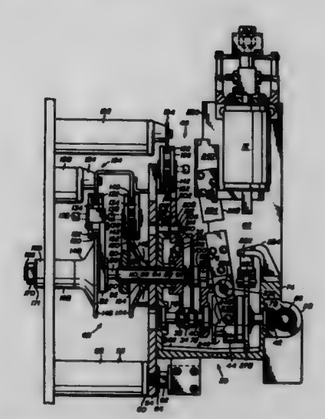
1. A tube speaker system comprising a pair of tubular cylinders, each having opposite blind and speaker ends and a cylindrical wall with a radially outwardly facing opening therethrough proximate said blind end thereof, said cylinders being disposed horizontally in mutually coaxial alignment with said blind ends of said cylinders in mutual abutment, a separate speaker mounted in each of said speaker ends of said cylinders, supporting means secured beneath said coaxially aligned cylinders to prevent said cylinders from rolling on their cylindrical walls, and a laterally enclosing structure open at both ends and extending the lengths of said coaxially aligned tubular cylinders to laterally enclose at least portions of said cylindrical walls thereof to thereby define a laterally enclosed sound tunnel between said laterally enclosing structure and said cylindrical walls, wherein said sound tunnel is in communication with said radially outwardly facing openings in said cylindrical walls of both of said tubular cylinders.

5,191,178
VEHICULAR TRANSMISSION SENSOR APPARATUS RESPONSIVE TO GEAR SELECTION
Gary A. Baker, North Scituate, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 10, 1992, Ser. No. 819,439
Int. Cl.[5] H01H 9/06
U.S. Cl. 200—61.88 14 Claims



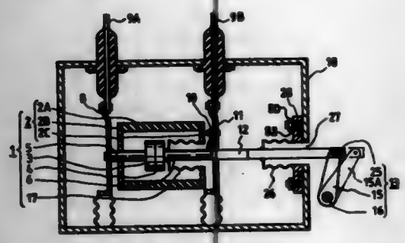
9. A switch system for use with motor vehicle transmission apparatus having a detent lever with a plurality of detents on an outer edge surface thereof, each detent corresponding to a specific transmission gear selection, the detent lever being pivotable about an axis, a cam plate mounted on the detent lever and movable therewith, a switch housing fixedly mounted adjacent the detent lever, switch means mounted on the switch housing and having first and second electrical contacts movable relative to one another between contacts engaged and contacts disengaged positions, follower means extending between the cam plate and the electrical contacts, the cam plate having a selected profile causing the follower means to move toward the electrical contacts at a selected angular position of the detent lever to cause the contacts to move into a contacts engaged position and the follower means moving away from the electrical contacts at other angular positions of the detent lever to cause the contacts to move into the contacts disengaged position, and means for electrically energizing the switch and for outputting a signal therefrom corresponding to the respective contacts engaged and disengaged position.

5,191,179
TAP SELECTOR ANTI-ARCING SYSTEM
Joseph W. Yatchum, McMurray, and Clarence K. Hess, Jr., Beallsville, both of Pa., assignors to Cooper Power Systems, Inc., Coraopolis, Pa.
Continuation-in-part of Ser. No. 434,917, Nov. 9, 1989, Pat. No. 5,056,377. This application Nov. 28, 1990, Ser. No. 619,367
Int. Cl.[5] H01H 19/58, 21/78, 3/00
U.S. Cl. 200—11 TC 1 Claim



1. A rotary load tap selector for selectively engaging winding taps with a secondary circuit to vary the voltage therethrough with respect to a rated voltage, comprising:
a housing having a partition therein forming a gearing compartment and a selector compartment;
an insulator panel disposed in said selector compartment;
first and second slip rings electrically connected to the secondary circuit and disposed in said selector compartment, said first slip ring being mounted on said panel and said second slip ring being mounted on said partition;
a plurality of taps mounted on said panel in a circle around said first slip ring, each of said taps electrically connected to one of the winding taps, one of said taps being a neutral tap;
high and low voltage reversing taps mounted on said panel adjacent said neutral tap to selectively engage said plurality of taps to the secondary circuit above or below the rated voltage;
first and second gears mounted on coaxial shafts rotatably disposed on said partition, said gears being disposed within said gearing compartment and including a travel limit pin thereon;
gear limit means disposed adjacent said first and second gears to limit the ultimate rotational movement of said first and second gears;
first and second contact arms mounted on said coaxial shafts within said selector compartment whereby rotation of said gears causes the rotation of said contact arms;
said contact arms having first and second contacts, said first contacts engaging at least one of said taps, said second contacts of said first contact arms continuously engaging said first slip ring and said second contacts of said second contact arm continuously engaging said second slip ring whereby said contact arms form an electrical connection between said taps and said slip rings;
a lever arm rotatably mounted in said gearing compartment having third and fourth contacts, said lever arm having a high voltage position with said third contacts engaging said high voltage reversing tap and said fourth contacts engaging said neutral tap and a low voltage position with said third contacts engaging said low voltage reversing tap and said fourth contacts engaging said neutral tap;
a pin mounted on said first gear engageable with said lever arm as said first contact arm passes said neutral tap rotating said lever arm from one of said high and low voltage positions to the other;
a drive shaft extending through said gearing compartment;
means for selectively rotating said drive shaft to vary the voltage a predetermined amount;
a pinion arm mounted on said drive shaft having first and second pins, said first pin adapted for engaging and rotating said first gear 40° and said second pin adapted for engaging and rotating said second gear 40° upon selected rotation of said drive shaft;
a bypass switch blade electrically connected to the secondary circuit and mounted on said panel;
a bypass switch arm rotatably mounted in said gearing compartment for engaging said bypass switch blade to open the secondary circuit and bypass said taps, said bypass switch arm having a follower pin on one end;
a cam mounted on said drive shaft and engaging said follower pin, said cam upon rotation of said drive shaft engaging said follower pin to move said bypass switch arm in and out of electrical engagement with said bypass switch blade whereby said secondary circuit bypasses said taps upon engagement of said bypass switch arm blade as said first contacts on said contact arms move from one said tap to another said tap;
an interrupter for interrupting the secondary circuit, said interrupt having a switch;
a cam member mounted on said drive shaft;
a cam follower disposed on linkage connected to said switch, said cam member reciprocating said linkage by means of said cam follower to actuate said switch and open the secondary circuit as said first contacts on said contact arms move from one said tap to another said tap;
a lockout member rotatably mounted in said gearing compartment between said gears;
first and second stops for engaging said lockout member and limiting rotation thereof;
biasing means for biasing said lockout member against one of said stops; and
a lock pin projecting from each of said gears engageable with said lockout member whereby upon one lock pin engaging said lockout member, said lockout member engages one of said stops to prevent further rotation of the lock pin of the other gear.

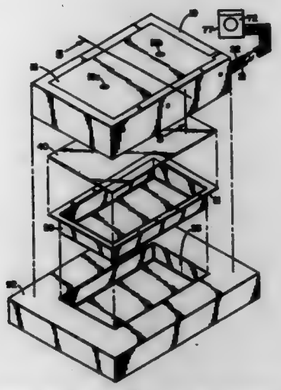
5,191,180
GAS-INSULATED SWITCHGEAR INCLUDING A VACUUM SWITCH, OPERATING MECHANISM AND PLURAL BELLOWS
Tadao Kitamura; Toshio Kobayashi, and Yoshiaki Matsumura, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Jul. 11, 1991, Ser. No. 728,368
Claims priority, application Japan, Jul. 19, 1990, 2-191056
Int. Cl.[5] H01H 33/66; H02B 7/01
U.S. Cl. 200—144 B 6 Claims



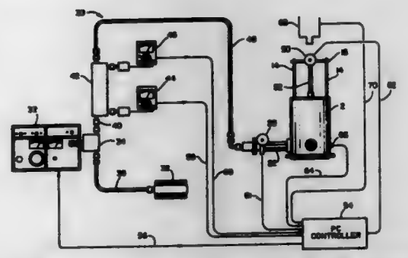
1. A gas-insulated switchgear comprising:
a gas tank filled with an insulating gas having a gas pressure at least equal to atmospheric pressure, said gas tank including a first bellows;
a vacuum switch housed in said gas tank and including a vacuum tank having a second bellows, said vacuum switch having a movable terminal and a contact means enclosed in said vacuum tank, said contact means including a fixed contact element and a movable contact element, one end of said movable terminal being fixed to said movable contact element and extending from said vacuum tank through said second bellows, said movable and contact element of said contact means being movable to perform electrical connection and disconnection functions by driving means located outside of said gas tank; and
a transmission mechanism including a driving rod for transmitting an operation force from said driving means to said movable terminal of said vacuum switch, said driving rod extending from said gas tank through said first bellows.

5,191,181
SEALING THERMOPLASTIC MEMBER DEVOID OF CONDUCTIVE MATERIAL
Duane M. Regenscheid, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.
Filed Aug. 1, 1990, Ser. No. 561,059
Int. Cl.[5] H05B 6/00
U.S. Cl. 219—10.41 19 Claims

5. An apparatus for sealing a first all plastic member devoid of electrical conductive material either in the first member or connected thereto to a second all plastic member devoid of electrical conductive material either in the second member or connected thereto, comprising:
(a) a frame;
(b) a support member, operatively connected to said frame, designed to support the second plastic member;
(c) clamping means for clamping a contacting portion of the first plastic member to a contacting portion of the second plastic member;
(d) a platen, including an induction member and a conductive element, operatively connected to said frame and moveable to a location proximate to one of said contacting portions;
(e) power supply means for passing an electrical current through said induction member, wherein an electromagnetic current is induced in said conductive element, and said current generates heat to seal said contacting portions to each other; and
(f) means for cooling said induction member and platen, said cooling means positioned proximate said induction member and both said cooling means and induction member positioned in and carried by said platen.

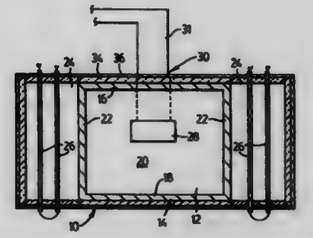


5,191,182
TUNEABLE APPARATUS FOR MICROWAVE PROCESSING
Jeffrey D. Gelorme, Plainville, Conn.; David A. Lewis, Carmel NY, and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 551,716, Jul. 11, 1990. This application Nov. 27, 1991, Ser. No. 799,376
Int. Cl.[5] H05B 6/68
U.S. Cl. 219—10.55 B 3 Claims



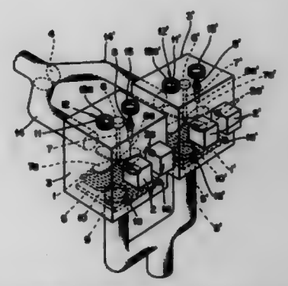
1. A microwave processing apparatus comprising in combination, microwave apparatus having a tuneable cavity and further comprising means operatively associated with said apparatus for removing vapor from said cavity, wherein said cavity comprises in combination, sidewall, top wall and bottom wall forming said cavity,
movable short means positioned in said cavity for defining a chamber of variable volume above said short means and a chamber of variable volume below said short means;
said short means having aperture means therein to allow any vapor generated in one of said chambers to pass into the other of said chambers and away from any product being exposed to microwave radiation in said apparatus,
microwave supply means for supplying an adjustable amount of microwave power to said cavity, power meter and sensor means for measuring microwave power reflected from said cavity and relaying said measurement to a programmed computer controller, means for moving said short means within said cavity in response to a signal from a computer controller to vary the volume of the chambers above and below said short means, temperature sensing means for sensing the temperature in said cavity and relaying said temperature to a programmed computer controller; and
programmed computer controller means operatively associated with said microwave supply means, said power meter and sensor means, said means for moving said short means within said cavity and said temperature sensing means, for varying (1) the power supply to said microwave supply means and (2) the size of said chambers above and below said short means in response to measurements relayed thereto of the microwave power reflected from said cavity and of the temperature in said cavity to attain the Q factor of said apparatus.

5,191,183
APPARATUS FOR PROCESSING CERAMICS USING MICROWAVE OVEN WITH RESISTANCE HEATING UNIT
Ibrahim S. Balbaa, Mississauga, and Steven J. Oda, Etobicoke, both of Canada, assignors to Ontario Hydro, Toronto, Canada
Filed Feb. 21, 1991, Ser. No. 658,694
Int. Cl.[5] H05B 6/80
U.S. Cl. 219—10.55 M 6 Claims



1. An apparatus for processing ceramic materials, comprising
an insulated housing providing a heating chamber defining a workspace and a secondary chamber disposed adjacent to the heating chamber,
the heating chamber having an interior microwave-impermeable lining enclosing the workspace and access means permitting the materials to be placed in and removed from the workspace,
convectional heating means in said secondary chamber,
a microwave energy source,
waveguide means coupled to the heating chamber for propagating microwave energy into the heating chamber,
a perforated wall separating the heating chamber and the secondary chamber to permit convectional and radiative heat transfer from the secondary chamber to the heating chamber, and
temperature measuring means for measuring the temperature of the workspace and control means for selectively activating said convectional heating means for preheating the workspace to approximately 500°–600° C. and means for selectively activating the microwave energy source when the ambient temperature in the workspace has reached a selected temperature approximately corresponding to threshold temperature at which microwave absorption of a ceramic material being processed increases significantly.

5,191,184
MICROWAVE WASTE PURIFYING AND INCINERATING APPARATUS
Dong-Lyoul Shin, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Oct. 22, 1991, Ser. No. 780,467
Claims priority, application Rep. of Korea, Oct. 23, 1990, 90-16990
Int. Cl.[5] H05B 6/80; F23G 5/00
U.S. Cl. 219—10.55 R 5 Claims



1. A waste purifying and incinerating apparatus comprising:
a pair of purifying and incinerating chambers, arranged parallel to each other and having a heater and a pair of magnetrons provided thereon, for storing the waste matters introduced and for drying and incinerating the introduced waste matters by using a radiating heat from said heater and a very high frequency generated by said magnetrons, respectively;
a passage exchangeable means switched in accordance with a control signal supplied from a control means for selectively controlling a pair of introducing passages for the waste matters introduced into said purifying and incinerating chambers;
a filtering means for generating heat by absorbing the very high frequency generated by said magnetron to further dry and incinerate the waste matters and for passing a liquid content and ashes produced by incinerating the waste matters;
a stirring means rotated by a driving means for grinding the waste matters and for dispersing the very high frequency evenly in said chambers;
a sensor means for sensing an amount of the waste matters introduced into said purifying and incinerating chambers and transferring the sensed signal to said control means;
a water draining means having a filtering and disinfecting member for filtering and disinfecting said liquid content when a water content and ashes retained in the waste matters are drained;
a gas discharging means having a gas filtering member for filtering and removing poisonous gas.

5,191,185
GIRTH AND SEAL WELDING APPARATUS
Clarence D. John, Jr., Penn Hills Township, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 30, 1990, Ser. No. 605,882
Int. Cl.[5] B23K 9/12
U.S. Cl. 219—60 R 29 Claims

24. An apparatus for girth welding a sealing plug to the end of a hollow tube and for seal welding a sealing plug axial bore which is in communication with the tube, said welding apparatus comprising
a housing defining a closed welding chamber and an access opening at one end of said chamber to allow passage of a tube therethrough which is fitted with a sealing plug having an axial bore in communication with the tube,
a girth welding assembly supported by said housing and

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having a girth welding electrode with a leading arc discharge tip disposed in said chamber,

means supporting said girth welding assembly and girth welding electrode for movement of said electrode arc discharge tip toward and away from the hollow tube and sealing plug,

drive rotation means for operatively connecting to a tube for rotating a tube when positioned for welding, and

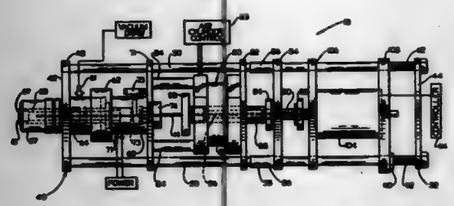
a seal welding assembly for seal welding the bore of the sealing plug after girth welding of the plug to the tube, said seal welding assembly including

(a) a frame defining forward and rear ends, and including a pair of substantially parallel guide rails extending longitudinally from the forward to the rear end of said frame,

(b) means mounting said frame to the said welding chamber housing,

(c) a head fixed to the front end of said frame between said guide rails, said head having front and rear portions and an axial opening extending through said head,

(d) end stop means having a front sealing plug engaging end and a rear end, and an axial passage extending through said end stop means and forming a front opening, said end stop means being rotatably mounted in said head opening and being movable there within between an extended position where said front sealing plug engaging end extends outward beyond said opening for engaging and supporting a sealing plug during girth welding and a



retracted position where said sealing plug engaging end is retracted within said opening,

a drive cylinder mounted to said guide rails for longitudinal movement there along and connected to said end stop means, said drive cylinder having an output shaft with front and rear ends, and wherein said output shaft extends through said air cylinder in substantially coaxial alignment with said end stop means passage,

a seal welding electrode having a forward arc discharge tip and a rear end connected to the front end of said air cylinder output shaft, said seal welding electrode extending coaxially in said end stop means passageway and being movable therein upon actuation of said cylinder output shaft between a retracted non-welding position where said tip is positioned within the axial passageway and an extended welding position where said tip extends outward beyond said front opening of said end stop means for permitting the seal welding closure of the axial opening of a fuel rod sealing plug, and

stop means for limiting movement of said output shaft in both a forward and reverse direction while generating movement of said drive cylinder in a reverse direction from the direction of movement of said output shaft whereby as said welding electrode means is extended, said end stop member is retracted, and as said welding electrode means is retracted, said end stop member is extended.

5,191,186

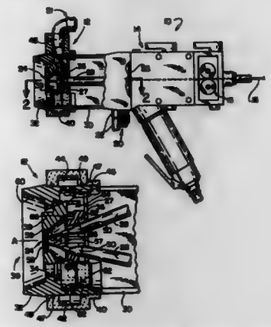
NARROW BEAM ARC SPRAY DEVICE AND METHOD

Harold B. Crapo, III, Pembroke; Brian J. Blades, Concord, and William R. Kratochvil, Laconia, all of N.H., assignors to Tafa, Incorporated, Concord, N.H.

Continuation-in-part of Ser. No. 542,330, Jun. 22, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 731,813

Int. Cl.[5] B23K *9/04*

U.S. Cl. 219—76.16 13 Claims



1. A narrow beam arc spray head device, comprising:

convergent-divergent nozzle means;

a plurality of wires the paths of which intersect at a point in said nozzle means;

means for supplying electrical current to said wires such that an arc is formed between said wires causing a portion of at least one of said wires to melt;

a primary axial gas stream impinging upon such wire path intersection to cause such molten wire to be carried axially away from the area of such intersection; and

a secondary gas stream forming a generally conical sheath around said axial gas stream in such convergent portion of said nozzle means;

whereby said primary gas stream and said secondary gas stream emerge from said nozzle means as substantially coaxial gas streams thus tending to concentrate the flow of such molten wire carried by such substantially coaxial streams.

5,191,187

LASER MACHINING DEVICE WHEREIN A POSITION REFERENCE LASER BEAM IS USED BESIDES A MACHINING LASER BEAM

Toshikazu Kajikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1991, Ser. No. 718,514

Claims priority, application Japan, Jun. 21, 1990, 2-163717

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.76 5 Claims

1. A laser machining device for machining an object by a machining laser beam, comprising:

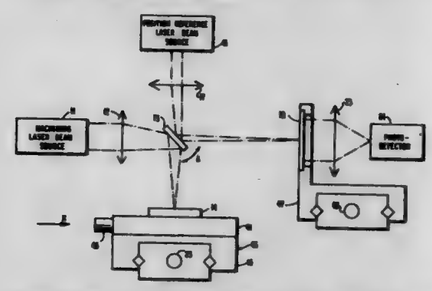
a machining laser beam source for controllably generating said machining laser beam;

a position reference laser beam source for generating a position reference laser beam;

displaying means for displaying a position reference pattern for allowing passage of said position reference laser beam with a variable beam intensity;

scanning means for scanning said object by said machining laser beam and said position reference pattern by said position reference laser beam so that said object is scanned at a machining position corresponding to a reference position at which said position reference laser beam is incident on said position reference pattern and through which said position reference laser beam passes to become an intensity variable laser beam having said variable beam intensity:

a photodetector for detecting said intensity variable laser beam to produce a detection signal representative of said variable beam intensity; and



control means supplied with said detection signal for controlling said machining laser beam source to make said machining laser beam source generate said machining laser beam when said variable beam intensity is greater than a threshold beam intensity.

5,191,188

METHOD OF PREVENTING INTERFERENCE BY A MACHINING HEAD

Kelichiro Miyajima, Minamitsuru, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

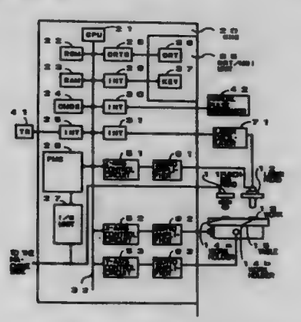
PCT No. PCT/JP91/00499, § 371 Date Dec. 2, 1991, § 102(e) Date Dec. 2, 1991, PCT Pub. No. WO91/16172, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 10, 1991, Ser. No. 778,069

Claims priority, application Japan, Apr. 26, 1990, 2-111553

Int. Cl.[5] B23K *26/02*

U.S. Cl. 219—121.83 2 Claims



1. A method of preventing an interference between a punching head and work holders, or between a laser head and said work holders of compound equipment designed for punch-pressing and laser machining, comprising:

horizontal interference areas wherein said punching head or said laser head will horizontally interfere with said work holders,

a vertical interference area wherein said laser head will vertically interfere with said work holders,

means for preventing punch-pressing and sounding an alarm, when said punching head attempts to enter said horizontal interference area, and

means for sounding an alarm if said laser head descends into said vertical interference area and further enters said horizontal interference area.

5,191,189

Patent Not Issued For This Number

5,191,190

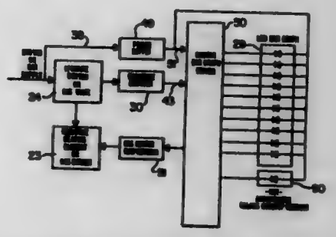
CONTROL SYSTEM FOR AN APPLIANCE OR THE LIKE, CONTROL DEVICE THEREFOR AND METHODS OF MAKING THE SAME

David M. Dodson, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 481,889, Feb. 20, 1990, abandoned. This application Jun. 25, 1991, Ser. No. 720,914

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—483 6 Claims



1. In a control system comprising a source of electrical energy, an output producing heating unit that uses said energy to produce said output thereof, a control device having control means that comprises an infinitely variable cyclable electrical switch means for interconnecting said source of energy to said unit, said control device having a rotatable shaft provided with opposed ends of which one of said opposed ends is mechanically interconnected to said switch means and of which the other of said opposed ends is interconnected to a control knob that sets said switch means in different positions thereof in relation to the rotational set position of said shaft from an "off" position thereof by rotation of said control knob, said switch means having the amount of said energy passing therethrough from said source to said unit being different for each set position thereof, and indicating means operatively associated with said shaft for visually indicating the set position of said shaft and, thus, the amount of energy being fed by said switch means to said unit, the improvement comprising sensing means operatively associated with said shaft that senses the set position of said shaft and electronically displays that sensed position of said shaft whereby said sensing means comprises said indicating means, said sensing means comprising a potentiometer having a housing means and a movable actuator carried thereby, said actuator having an opening passing therethrough, said shaft having an intermediate part thereof telescopically disposed in said opening of said actuator and being splined thereto whereby said shaft carries said potentiometer and said switch means in coaxially aligned relation so that rotation of said shaft by said control knob mechanically rotates said actuator therewith at the same time said shaft is mechanically setting said switch means.

5,191,191

LOGIC CIRCUIT AND METHOD FOR CONTROLLING THE POWER SUPPLY OF AN IRONING SYSTEM

Nicholas F. St. Aubyn, Truro, United Kingdom, assignor to Gemini Clothescare Limited, Cornwall, United Kingdom

Filed Feb. 28, 1991, Ser. No. 665,941

Claims priority, application United Kingdom, Mar. 1, 1990, 9004614; Feb. 19, 1991, 9103461

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—485 4 Claims

1. An electrical logic circuit for incorporation in the common power supply system of an ironing system including a plurality of electrical components which have intermittent power requirements, which components include an electrically heatable iron and an electrically heatable ironing board, the circuit comprising

means for designating at least one of the components as a

and wherein this system further includes means designed at

(5) if second data field information is older than said informa-

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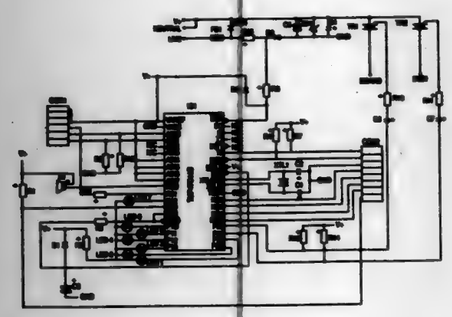
dominant component and at least one of the components as a subsidiary component; and



means to direct power to the dominant component preferentially and to the subsidiary component only in dependence on the instantaneous power requirement of the dominant component.

5,191,192

NON-CONTACT TYPE INFORMATION CARD AND COMMUNICATION SYSTEM

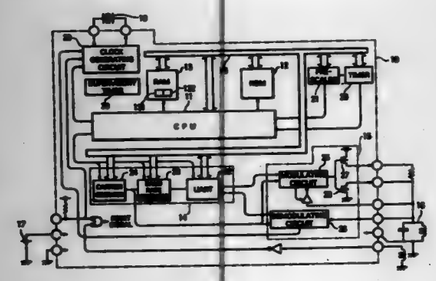
Kunichi Takahira, and Kazuo Asanui, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1991, Ser. No. 756,428

Claims priority, application Japan, Sep. 10, 1990, 2-239396; Mar. 6, 1991, 3-39785

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—375 **12 Claims**



1. A non-contact type information card comprising:

data transmitting and receiving means for transmitting data to and receiving data from a plurality of external units without direct contact;

data processing means for processing data based on command signals sequentially received by said data transmitting and receiving means, each command signal including first identification information identifying one of the external units and second identification information identifying time;

storing means for storing the first and second identification information of a first command signal;

determining means for determining, when said data transmitting and receiving means receives a second command signal, whether the first and second identification information of the second command signal agree with the first and second identification information of the first command signal stored in said storing means;

stopping means for stopping, when said determining means determines that the first and second identification information of the second command signal agree with the first and second identification information of the first command signal, said data processing means until said data transmitting and receiving means receives another command signal; and

updating means for updating, when said determining means determines that the first and second identification information of the second command signal does not agree with the first and second identification information of the first command signal, said storing means by storing the first and second identification information of the second command signal.

5,191,193

SYSTEM OF PAYMENT OR INFORMATION TRANSFER BY MONEY CARD WITH ELECTRONIC MEMORY

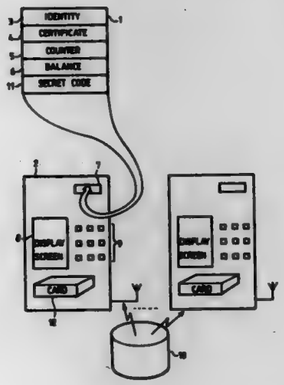
Jean-Yves Le Roux, Bouc Bel Air, France, assignor to Gemplus Card International, Gemenos, France

Filed Oct. 9, 1990, Ser. No. 594,862

Claims priority, application France, Oct. 13, 1989, 89 13449

Int. Cl.[5] G06K *5/00*; G06F *15/30*

U.S. Cl. 235—379 **6 Claims**



1. A system of payment by electronic memory money cards comprising memory money cards and one or more interaction terminals to interact on financial balances recorded in these cards, wherein:

these memory cards include at least four different memorizing zones: an identity zone, a balance zone, an interaction counter zone and a certificate zone,

and wherein the terminals include means designed, before each interaction, to:

prepare a signature from the balance, the content of the counter, and the identity,

ascertain that this signature corresponds to a certificate recorded in the certificate zone,

and wherein this system further includes means designed, at each interaction, to:

modify the balance,

increment the content of the interaction counter,

prepare a new signature as a function of the new balance, the new content of the interaction counter and the identity,

and record the new signature as a new certificate in the certificate zone.

5,191,194

Patent Not Issued For This Number

5,191,195

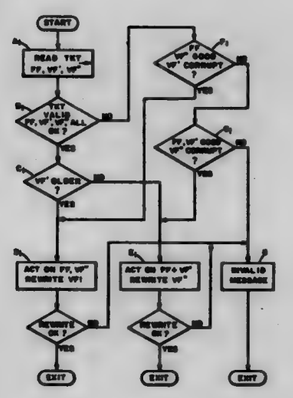
FARE CARD READ-WRITER WHICH OVERWRITES OLDEST OR INVALID DATA

Kenneth R. Aubrey, San Diego, Calif., assignor to Cubic Automatic Revenue Collection Group, San Diego, Calif.

Continuation of Ser. No. 274,335, Nov. 21, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 607,305

Int. Cl.[5] G07B *15/02*

U.S. Cl. 235—384 **1 Claim**



1. A computer-implemented data processing method for coding and decoding first use and subsequent information related to access to a controlled access facility on a codable three section ticket, comprising the steps of:

(1) coding first use information on a first data field of a codable three section ticket and subsequent use information on at least one of a second data field and a third data field of said codable three section ticket, the coded subsequent use information including the date and time of the use;

(2) decoding the information on said first data field, said second data field, and said third data field;

(3) upon subsequent use, first testing of each of said data fields for validity of decoded information;

(4) if valid information is detected by said first testing in all three data fields, second testing to determine whether said information in said second data field is older than said information in said third data field;

(5) if second data field information is older than said information on said third data field by said second testing, coding said subsequent use information onto said second data field, allowing access and exiting process;

(6) if second data field information is not older than said information on said third data field by means of said second testing, coding said subsequent use information on said third data field, allowing access and exiting process;

(7) if said first testing does not determine that valid information is found in all of the three data fields, third testing to determine whether said information on said first and third data field is valid;

(8) if said information by said third test means is valid, coding said subsequent use information onto said second data field, allowing access and exiting process;

(9) if said information by said third test means is not valid, fourth testing of validity of said information on said first and second data fields;

(10) if said information by said fourth test means is valid, coding said subsequent use information onto said third data field, allowing access and exiting process; and

(11) if said information by said fourth test means is not valid, indicate invalid ticket and exit process.

5,191,196

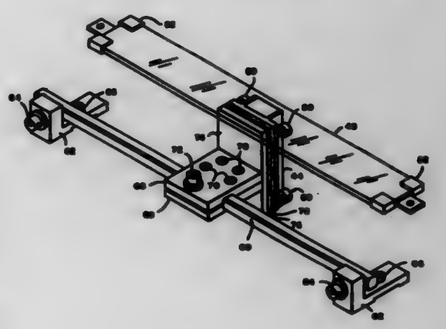
APPARATUS FOR ADJUSTABLY SECURING A BAR CODE SCANNER DEVICE USING NYLON HOOK AND LOOP TYPE FASTENERS

John J. Marcodo, Easton, and Edward M. Iffrovits, New Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 2, 1989, Ser. No. 430,753

Int. Cl.[5] G06K *13/06, 13/24, 13/00, 13/107*

U.S. Cl. 235—494 **3 Claims**



1. In an inserter system, an apparatus for positioning a bar code scanner across a paper path travelled by sheets having bar code symbols printed thereon, comprising:

a frame;

a bar code scanner;

a travel bar attached to the frame under a paper path, said travel bar extending in a direction transverse to the paper path;

bracket means for slidably engaging said travel bar said bracket means including a channel through which said

travel bar is placed and means for securing said bracket means to said travel bar;

first and second means for fastening said bar code scanner to said bracket means, wherein said first fastening means comprises nylon hooks and said second fastening means comprises nylon loops, and wherein one of said first and second means is secured to said bar code scanner and the other of said first and second means is secured to said bracket means and wherein said first and second means for fastening is adjusted by tension increasing means wherein the tension increasing means provide substantially uniform tension between the hooks and loops in said first and second means;

a transparent medium deck situated between said bar code scanner and the paper path, said transparent medium deck extending approximately the width of the paper path, wherein said bar code scanner is transversely positioned at any location along said travel bar at which said bar code scanner reads bar code symbols printed at a corresponding location on sheets conveyed along the paper path;

gasket means fastened to said scanner for positioning said scanner at an optimum distance from said paper path, said gasket means also sealing a space between said scanner and said transparent medium deck wherein dust is prevented from accumulating on said scanner; and

wherein loosening and tightening of the tension means allows adjustment of the bar code scanner permitting consistent reading of bar codes.

5,191,197

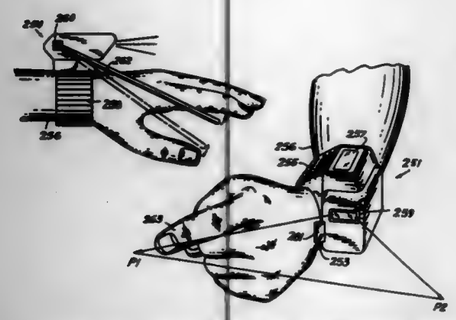
ARM MOUNTED SCANNER ACTUATABLE BY HAND MOVEMENT

Boris Metlitsky, Stony Brook; Mark Krichever, Hauppauge; Ed Barkan, S. Setauket; Howard M. Shepard, Great Neck; Jerome Swartz, Old Field, all of N.Y., and Joseph Sandor, Bolton Island, Calif., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 193,265, May 11, 1988. This application May 13, 1991, Ser. No. 699,417

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—472 **39 Claims**



1. A hands-free scanning system for reading indicia having parts of different light reflectivity, comprising:

(a) a housing having a window;

(b) actuatable electro-optical scanner means in the housing, for projecting a light beam through the window to indicia to be read, for scanning the indicia, and for detecting light of variable intensity that is reflected off the indicia to generate an electrical signal representative of the indicia;

(c) means for mounting the housing on an arm of an operator; and

(d) actuating means for actuating the scanner means to initiate reading of the indicia upon movement of the operator's hand relative to the arm.

5,191,198

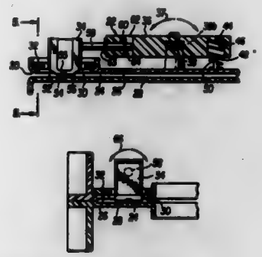
GIMBAL CARD READER

Cuong D. Do, Los Angeles, Calif., assignor to Transaction Technology, Inc., Santa Monica, Calif.

Filed Mar. 22, 1991, Ser. No. 673,360

Int. Cl.[5] G06K *13/00, 13/06*

U.S. Cl. 235—483 **21 Claims**



10. Transducing apparatus, comprising:

a transducer arm,

means mounting said transducer arm for pivoting about an axis transverse to said arm;

means mounting a transducer head on said arm for free rotation about an axis extending longitudinally of said arm;

guide means positioned to be engaged by a face of said head when said arm pivots about said transverse axis;

biasing means biasing said arm to pivot about said transverse axis to bring said head into engagement with said guide means; and

wherein said means mounting said head on said arm comprises a mounting shaft, said head mounted on one end of said shaft, the other end of said shaft being journaled in a bearing hole extending longitudinally into said arm from an end of said arm.

5,191,199

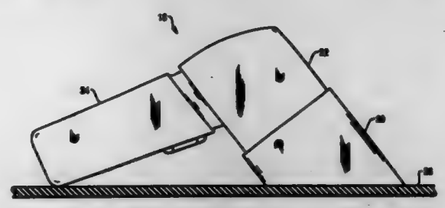
BAR CODE SCANNER SUPPORT MEMBER

Michael J. Elko, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 12, 1990, Ser. No. 628,180

Int. Cl.[5] G06K *13/06, 7/10*

U.S. Cl. 235—483 **5 Claims**



1. In combination with a portable optical bar code scanner having a scanning head portion and a handle portion, an elongated hollow cover member having one end secured to the head portion and its other end having an edge configuration oriented at an angle to the axis of the cover member for supporting, together with the handle portion, the scanner at an acute angle when in a rest position on a supporting surface, said edge configured such that when supporting the scanner all of the periphery of the angled edge is flush with said supporting surface.

5,191,200

IMAGING APPARATUS HAVING A FOCUS-ERROR AND/OR TILT DETECTION DEVICE

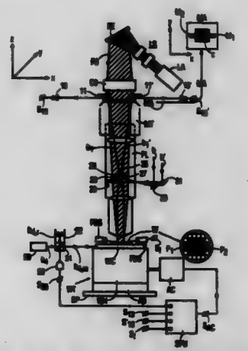
Jan E. van der Werf; Marinus A. van den Brink, both of Eindhoven; Henk F. D. Linders, Dommelen, and Johannes M. M. Beltman, Veldhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 16, 1991, Ser. No. 808,340

Claims priority, application Netherlands, Mar. 7, 1991, 9100410

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.4 **52 Claims**



1. An imaging apparatus comprising an imaging system and an opto-electronic focus detection system for determining a deviation between the image plane of the imaging system and a second plane on which imaging is to take place, said focus detection system comprising a radiation source for supplying a focus detection beam, a radiation-sensitive detector arranged at the same side of the second plane as the radiation source, and optical elements for directing the focus detection beam onto the second plane at a small angle to said plane for changing the vergency of said beam and of that of the beam reflected by the second plane and for directing the last-mentioned beam onto the detector, characterized in that the focus detection beam has a wide wavelength band and in that a first and a second grating are provided, the first grating being arranged in the radiation path between the radiation source and the second plane and the second grating being arranged between said second plane and the detector.

5,191,201

CAMERA WITH FOCUS DETECTING DEVICE FOR REMOVING VIGNETTING EFFECTS

Yosuke Kusaka, and Ken Utagawa, both of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 540,324, Jun. 19, 1990, abandoned, which is a division of Ser. No. 506,553, Apr. 9, 1990, Pat. No. 4,977,311, which is a continuation of Ser. No. 418,899, Oct. 6, 1989, abandoned, which is a continuation of Ser. No. 262,151, Oct. 12, 1988, abandoned, which is a continuation of Ser. No. 77,290, Jul. 24, 1987, abandoned, which is a division of Ser. No. 661,456, Oct. 16, 1984, Pat. No. 4,687,917. This application Nov. 19, 1991, Ser. No. 795,262

Claims priority, application Japan, Oct. 19, 1983, 58-195434; Jan. 31, 1984, 59-15509; Jul. 4, 1984, 59-138809

Int. Cl.[5] G01J *1/20*

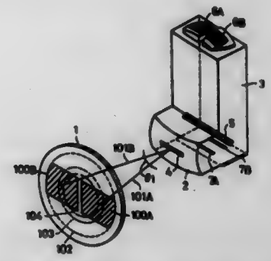
U.S. Cl. 250—201.8 **23 Claims**

1. A camera having a photo-taking lens and comprising:

image sensor means having a first light-receiving area and a second light-receiving area;

optical means for directing two light beams from an object to be photographed to said first light-receiving area and said second light-receiving area, respectively, said image sensor means generating outputs according to intensity distributions of light incident on said light-receiving areas;

displacement amount calculating means for calculating a displacement amount of the intensity distributions of light incident on said first and second light-receiving areas in response to outputs of said image sensor means;



main area detection means for detecting a position of a main area in light from the object incident upon at least one of said light-receiving areas and for generating a corresponding detection signal; and

focus detection means for adjusting the calculated displacement amount in response to said detection signal and detecting focus of the photo-taking lens.

5,191,202

PHOTOELECTRIC CONVERSION DEVICE

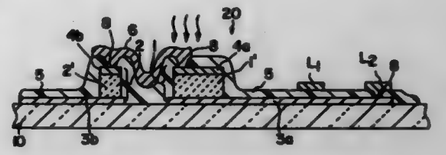
Koichi Kitamura; Atsushi Kawasaki; Hidenori Mimura; Yasuhiro Ohta, and Takashi Sawafuji, all of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 13, 1991, Ser. No. 668,630

Claims priority, application Japan, Mar. 14, 1990, 2-64925

Int. Cl.[5] H01L *27/146*

U.S. Cl. 250—208.1 **36 Claims**



1. A photoelectric transducer device, comprising:

an insulating substrate;

n sensor elements equally divided in N sensor blocks each containing k sensor elements, each sensor element including

a first lower electrode mounted on said substrate,

a second lower electrode mounted on said substrate, said second electrode being electrically separated from said first electrode, said first and second electrodes being formed of a material having a first resistivity,

a photoelectric conversion means for converting optical radiation impinging thereon to electrical energy, said photoelectric conversion means being formed on said first electrode,

a diode means, formed on said second electrode, for preventing crosstalk, and

an upper electrode formed on said diode means and said photoelectric conversion means so as to electrically connected said diode means and said photoelectric conversion means;

N first connection lines respectively corresponding to said N sensor blocks on a one-to-one basis, each first line being connected to all of the k second electrodes of the corresponding sensor block; and

k second connection lines, the k sensor elements in each

5,191,207

means being at least equal to the optical thickness of said

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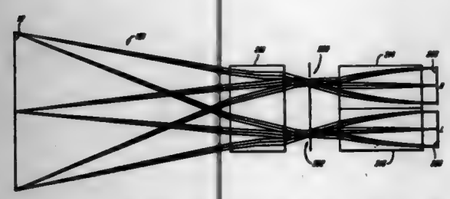
sensor block corresponding to said k second connection lines on a one-to-one basis, each second line being connected to the first electrodes of the sensor elements corresponding thereto, the second lines being formed of a material having a second resistivity which is lower than the first resistivity.

5,191,203

STEREO VIDEO ENDOSCOPE OBJECTIVE LENS SYSTEM

Harry P. McKinley, Southampton, Mass., assignor to McKinley Optics, Inc., Southampton, Mass.

Continuation-in-part of Ser. No. 687,330, Apr. 18, 1991, Pat. No. 5,122,650. This application Apr. 15, 1992, Ser. No. 868,706
Int. Cl.[5] H01J 40/14
U.S. Cl. 250—208.1 17 Claims



1. A stereoscopic objective lens system for a stereo video endoscope, the objective lens system converting optical images of an object generated at an objective end of the objective system to pixel-mapped left and right optical images at an image plane end of the objective system, the objective lens system comprising,

A. a gradient index collimator lens element proximate the objective end for collecting light from points on the object,

said gradient index lens having a first optical axis, a selected diameter and a selected optical power,

wherein said gradient index lens images the object points substantially to infinity so that light transmitted by the gradient index lens from the object points is substantially collimated,

B. a right/left pair of stereo gradient index lenses situated adjacent said gradient index collimator lens for collecting light from said gradient index collimator lens,

said first right/left pair of stereo gradient index lenses including,

a right gradient lens and

a left gradient lens,

the optical axis of said right stereo lens and the optical axis of said left stereo lens being substantially parallel to the optical axis of collimator lens,

wherein said collimator lens and said right/left pair of stereo lenses cooperate so that the collimator lens presents equal-angle light ray pairs from symmetrically disposed object points to the right/left pair of stereo lenses, and

said right stereo lens collects light from said collimator lens to generate a right image at the image plane,

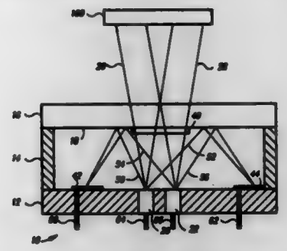
said left stereo lens collects light from said collimator lens to generate a left image at the image plane, such that corresponding portions of each left/right image are mapped to within a selected distance of each other.

5,191,204

MULTI-BEAM OPTICAL SYSTEM AND METHOD WITH POWER DETECTION OF OVERLAPPING BEAMS

LeRoy D. Dickson, Morgan Hill, Calif., and Robert S. Fortenberry, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1991, Ser. No. 784,205
Int. Cl.[5] H01J 40/14
U.S. Cl. 250—208.2 27 Claims



1. A multi-beam optical system comprising:

a radiation source for providing a plurality of N overlapping radiation beams, where N is an integer greater than one;

a plurality of N radiation detectors;

a means for directing a different portion of each of the N beams to each of the N detectors; and

power detection means connected to the detectors for generating a separate power signal representative of the individual power of each of the N beams.

5,191,205

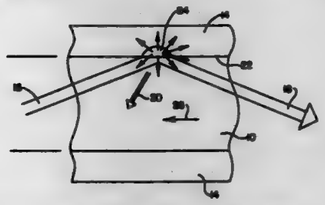
Patent Not Issued For This Number

5,191,206

DISTRIBUTED FIBER OPTIC SENSOR USING CLAD MATERIAL LIGHT BACKSCATTERING

Anthony A. Bolarski, Columbus, and Vincent D. McGinniss, Sunbury, both of Ohio, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 16, 1991, Ser. No. 685,858
Int. Cl.[5] H01J 5/16; G01K 11/00; G02B 6/00
U.S. Cl. 250—227.14 32 Claims



1. A distributed fiber-optic sensor comprising:

a. an optical fiber core having a cladding that produces a change in light scattering in said cladding in response to a change in the environment of said cladding wherein said change in light scattering in said cladding is coupled into said optical fiber core to produce a change in intensity of backscattered light in said optical fiber core and

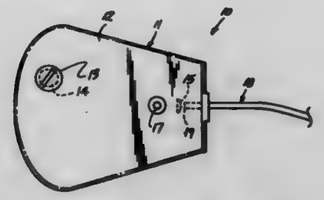
b. a means for sensing said change in intensity of said backscattered light.

5,191,207

OPTICAL DETECTOR APPARATUS WITH RIGID POSITIONING FIXTURE

Harry C. Leon-Guerrero, 349 West 232nd Pl., Carson, Calif. 90745

Filed Aug. 28, 1991, Ser. No. 751,131
Int. Cl.[5] H01J 5/16, 40/14
U.S. Cl. 250—227.11 4 Claims



1. An optical detector apparatus, comprising,

a housing, the housing including a top wall, with the top wall including a battery cover removably mounted through the top wall, with a battery positioned within the housing, and

the housing including an optical detector lens positioned within the housing, and

the optical detector lens in electrical communication with a light sensitive switch, the light sensitive switch in electrical communication with an indicator illumination member directed through a top wall of the housing to effect illumination of the illumination member upon detection of a predetermined light wave length by the optical detector lens, and

a flexible fiber optic cable directed through the housing adjacent the optical detector lens, with a rear end portion of the flexible fiber optic cable directed in adjacency to the optical detector lens, and a forward end portion of the fiber optic cable oriented in a remote position relative to the housing, and

a positioning fixture slidably receiving the forward end portion of the fiber optic cable, and

the positioning fixture includes a rigid tube, the rigid tube complementarily receiving the forward end portion of the fiber optic cable therethrough, and the rigid end tube including a tube forward end, the tube forward end mounted coaxially relative to a torroidal rigid positioning wheel, the rigid tube coaxially aligned with the torroidal rigid positioning wheel, and the tube forward end including a plurality of equally spaced elastomeric spokes mounting the tube forward end coaxially of the rigid tube.

5,191,208

FIBER OPTIC SENSOR SYSTEM WITH A REDUNDANCY MEANS AND OPTIMIZED THROUGHOUT

Charles S. Siemon, 1130 Island View La., Encinitas; William M. Lafferty, 571 D Hygeia Ave., Leucadia, both of Calif. 92024, and Clark C. Guest, 11524 Alkaid Dr., San Diego, Calif. 92126

Division of Ser. No. 436,765, Nov. 15, 1989, Pat. No. 5,051,578. This application Sep. 23, 1991, Ser. No. 764,215
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.21 3 Claims

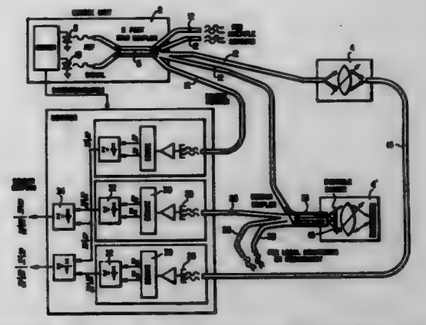
1. A fiber optic detection system comprising:

source means for producing a light beam,

coupling means for coupling said light beam into a transducer for measuring a physical parameter, and

redundancy means connected to said transducer for directing light from said transducer to a plurality of optical fibers, and

detector means for receiving light from said plurality of optical fibers, the optical throughput of said detector means being at least equal to the optical throughput of said plurality of optical fibers,



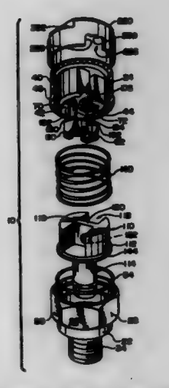
wherein at least one of said plurality of optical fibers traverses a physical path substantially different from that of other of said plurality of optical fibers.

5,191,209

PHOTOELECTRIC SWITCH SEALED AGAINST INFILTRATION OF CONTAMINANTS

William G. Rodseth, Elgin, and James W. Robinson, Mundelein, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jan. 17, 1991, Ser. No. 716,215
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—229 20 Claims



1. A photoelectric switch sealed against infiltration of contaminants, comprising:

a housing structure defining an axis of movement within said housing structure, and having a hollow interior defined within said housing structure;

photoelectric switching means mounted said hollow interior of said housing structure to define a light path between a phototransmitter and a photoreceiver of said photoelectric switching means;

a plunger having a shutter portion movably disposed within said hollow interior of said housing structure along said axis of movement between an inoperative position at which said shutter portion blocks said light path defined between said phototransmitter and said photoreceiver of said photoelectric switching means, and an operative position at which said shutter portion does not block said light path defined between said phototransmitter and said

ponents to atomized components thereby forming an

tion as said electron beam scans said metallisation layer;

photoreceiver of said photoelectric switching means, and an actuating portion fixedly connected to said shutter portion for axial movement along with said shutter portion along said axis of movement of said housing structure and extending outwardly through a wall portion of said housing structure to be acted upon by means of a force eternal to said housing structure in order to move said shutter portion from said inoperative position to said operative position; and

means defined between said axially movable actuating portion of said plunger and said wall portion of said housing structure through which said axially movable actuating portion of said plunger extends for sealing said housing structure against the infiltration of contaminants regardless of said axial movement of said actuating portion of said plunger through, and relative to, said wall portion of said housing structure.

5,191,210

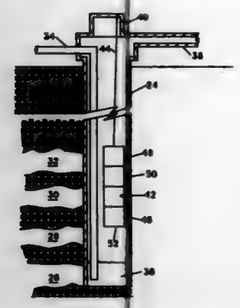
PRODUCED STEAM SURVEY DEVICE AND METHOD

James C. Pauley, Bakersfield, Calif.; Irwin R. Supernaw, and Thomas M. Williams, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 679,482, Apr. 2, 1991, abandoned. This application Jan. 13, 1992, Ser. No. 819,732

Int. Cl.[5] G01V *5/04*

U.S. Cl. 250—260 10 Claims



1. A method for determining the flow rate of steam entering a production well from a steam flooded formation comprising the steps of:

providing a sonde having therein a pair of spaced gamma detectors and a source of radioactive gas and means to release measured amounts of said gas into said well;

determining the effective cross-sectional area of the production well;

lowering said sonde into said production well;

releasing a measured amount of radioactive gas into the well in a short rapid burst so as to create a pulse at the detectors; and

measuring said radioactive gas as it flows past said gamma detectors whereby the velocity and volume of steam can be determined.

5,191,211

THERMAL DESORPTION METHOD FOR SEPARATING VOLATILE ADDITIVES FROM VULCANIZABLE RUBBER

William B. Gorman, Jr., Mooresville, Ind., assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Mar. 23, 1992, Ser. No. 856,263

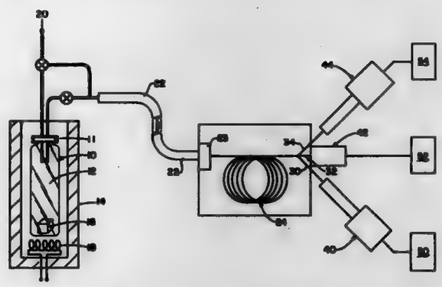
Int. Cl.[5] E01D *59/44*

U.S. Cl. 250—282 11 Claims

1. A process for separating and identifying volatile components from a test sample of vulcanized or unvulcanized rubber compound, comprising the steps of:

a) heating the test sample in a sealed vial having an overhead collecting headspace at temperature sufficiently high to volatilize the volatile components in the test sample but below a pyrolysis temperature of the polymer to avoid pyrolysis of the test sample;

b) allowing the volatile components to collect in the headspace;



c) transferring the volatile components at a temperature sufficient to maintain the gaseous state of the volatile components, to a chromatograph column to separate the volatile components; and

d) transferring each component to an analyzer detector for identification.

5,191,212

ANALYTICAL SYSTEM WITH ELECTROTHERMAL ATOMIZER AND MASS SPECTROMETER FOR ATOMIC AND MOLECULAR ANALYSIS

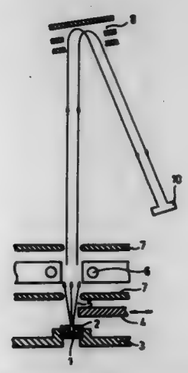
Heinz Falk, Kleve, and Hermann Wollnik, Fernwald, both of Fed. Rep. of Germany, assignors to Spectro GmbH, Kleve, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 719,127

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1990, 4022061

Int. Cl.[5] G01N *21/73, 21/74*

U.S. Cl. 250—288 17 Claims



1. A method of measuring the concentration of elemental and molecular constituents of a sample including nonselected components and other components to be determined, said method comprising the steps of:

(a) thermally pretreating a sample in an electrothermal atomizer at a first temperature to vaporize and to drive off nonselected components of the sample;

(b) thereafter heating the sample to a vaporization temperature of other components, thereby turning the other components to atomized components thereby forming an atomic beam;

(c) ionizing the atomized components downstream of the atomic beam while conveying the atomized components along the path;

(e) thereafter collecting ions of the atomized components in an ion trap for a first period of time; and

(f) thereafter emitting simultaneously the ions from the trap over a second period of time shorter than the first period of time, and supplying the ions to a mass spectrometer for measuring abundance of respective masses of the ions by the mass spectrometer thereby measuring the concentration of constituents of the sample.

5,191,213

INTEGRATED CIRCUIT STRUCTURE ANALYSIS

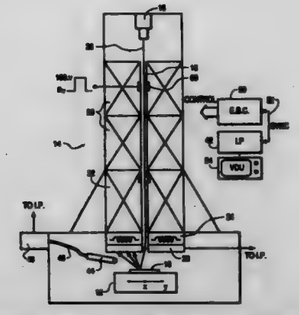
Haroon Ahmed; Simon Blythe, both of Cambridge, United Kingdom, and Beatrice Fraboni, Bologna, Italy, assignors to Olivetti Systems & Networks S.r.l., Ivrea, Italy

Filed Jul. 5, 1991, Ser. No. 725,303

Claims priority, application United Kingdom, Jul. 5, 1990, 9014923

Int. Cl.[5] H01J *37/28, 37/30*

U.S. Cl. 250—310 64 Claims



1. Apparatus for determining the structure of an integrated circuit of the type comprising different layers, including metallic and non-metallic features, and a body including at least one region with a higher type-p or type-n dopant concentration with respect to adjacent regions, said apparatus comprising:

an electron beam source;

means for focussing an electron beam from said source and for controllably scanning said electron beam over a surface of said integrated circuit;

a first detector responsive to backscattered electrons from the surface of said integrated circuit to represent said metallic features;

a second detector responsive to secondary electrons emitted by said surface to represent said non-metallic features; and

processing means coupled to each of said first and second detectors and operable to derive a representation of said metallic and non-metallic features of said layers from signals from said first and second detectors;

the improvement comprising means for representing said one region with the higher type-p or type-n dopant concentration as induced at a Schottky barrier junction in said one region, said means comprising:

a third detector connected with a metallisation layer of one of a first type of metal or a second type of metal to define the Schottky barrier junction with said region with respecitve ones of the higher type-p dopant concentration or type-n dopant concentration, and

current sensing means connected with said third detector for sensing a current arising from said Schottky barrier junction as said electron beam scans said metallisation layer; and

wherein said processing means are also coupled to said third detector and are operable to derive a representation of said at least one region with the higher type-p doped or type-n doped concentration from signals from said third detector.

5,191,214

METHOD OF MANUFACTURING DESIGN CARRIER

Kotaro Hiramani, 4-4-3 Nihonbashi Nanbwa-ku, Osaka-shi, Osaka-fu, Japan

Filed Dec. 4, 1990, Ser. No. 621,892

Claims priority, application Japan, Oct. 17, 1990, 2-276466

Int. Cl.[5] G03G *5/16*

U.S. Cl. 250—316.1 11 Claims

11. A design carrier which is composed of a plurality of superposed polarizing plates including a polarizing plate whereon a desired pattern is drawn by heating.

5,191,215

APPARATUS AND METHOD FOR TRANSIENT THERMAL INFRARED SPECTROMETRY OF FLOWABLE ENCLOSED MATERIALS

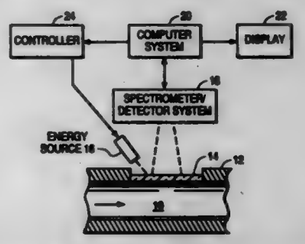
John F. McClelland, and Roger W. Jones, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 546,738, Jul. 2, 1990, Pat. No. 5,070,242, which is a continuation-in-part of Ser. No. 576,448, Sep. 12, 1990, Pat. No. 5,075,552, which is a continuation-in-part of Ser. No. 415,714, Oct. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 297,297, Jan. 13, 1989, abandoned. This application Aug. 23, 1991, Ser. No. 749,186

The portion of the term of this patent subsequent to Dec. 2, 2008, has been disclaimed.

Int. Cl.[5] G01N *21/71*

U.S. Cl. 250—341 26 Claims



1. A method for enabling analysis of a flowable material enclosed in a transport system, comprising the steps of:

transiently generating a temperature differential between a thin surface layer portion of the material and a lower portion of the material sufficient to alter the thermal infrared emission spectrum of the material from the black-body thermal infrared emission spectrum of the material; and

detecting through an infrared transparent portion of the transport system the altered thermal infrared emission spectrum of the material while the altered thermal infra-

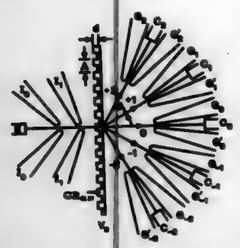
red emission spectrum is sufficiently free of self-absorption by the material of emitted infrared radiation, prior to the temperature differential propagating into the lower portion of the material to an extent such that the altered thermal infrared emission spectrum is no longer sufficiently free of self-absorption by the material of emitted infrared radiation, so that the detected altered thermal infrared emission spectrum is indicative of characteristics relating to molecular composition of the material.

5,191,216

QUANTUM MECHANICAL SEMICONDUCTOR DEVICE WITH ELECTRON/HOLE DIFFRACTIVE GRATING

Gregory N. Henderson; Thomas K. Gaylord, and Elias N. Glytsis, all of Atlanta, Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jul. 18, 1991, Ser. No. 734,300
Int. Cl.[5] H01L *29/80*
U.S. Cl. 257—28 58 Claims



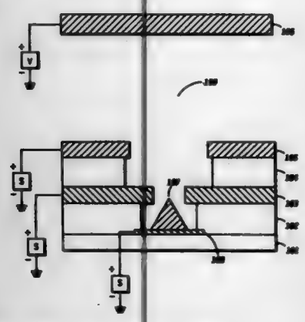
1. A solid state, quantum mechanical, electron/hole wave switching device comprising:
a layer of semiconductor material which supports substantially ballistic electron/hole transport; and
a diffraction grating structure formed in said layer of semiconductor material comprising a modulation in electron/-hole potential energy and/or effective mass for diffracting at least one input electron/hole beam into at least two separate output electron/hole beams.

5,191,217

METHOD AND APPARATUS FOR FIELD EMISSION DEVICE ELECTROSTATIC ELECTRON BEAM FOCUSSING

Robert C. Kane, Woodstock, and Norman W. Parker, Wheaton, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 25, 1991, Ser. No. 796,980
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—423 F 15 Claims



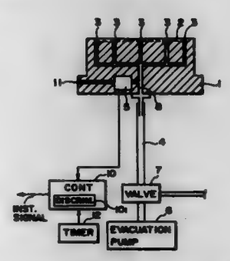
1. A field emission device comprising;
an electron emitter for emitting electrons, by field emission, into a region proximal to the electron emitter;
an extraction electrode disposed substantially peripherally symmetrically about at least a part of the electron emitter;
an anode distally disposed with respect to the electron emitter such that some electrons emitted into the region are collected by the anode;
one of the electron emitter and extraction electrode being designed to have an electrical source coupled thereto so as to effect modulation of electron emission into the region; and
a deflection electrode disposed in the region substantially symmetrically peripherally about at least a part of and axially displaced with respect to the electron emitter and electrically coupled to the electron emitter, such that the deflection electrode remains at the same potential as the electron emitter.

5,191,218

VACUUM CHUCK

Tetsuzo Mori, Atsugi; Mitsuji Maruno, Sagamihara; Kazunori Iwamoto, Yokohama; Yuji Chiba, Isehara, and Kazuyuki Kasumi, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,336
Claims priority, application Japan, Jun. 29, 1990, 2-169938; Jul. 12, 1990, 2-182656
Int. Cl.[5] H01L *21/00*
U.S. Cl. 250—453.11 16 Claims



1. A vacuum-attraction holding device, comprising:
a holding base having an attracting surface, for holding a substrate thereon;
a suction passageway formed in said base, for supplying a vacuum to said holding base to attract the substrate to said attracting surface; and
a pressure sensor provided in said base and being communicated with said suction passageway.

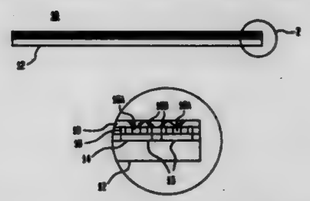
5,191,219

INFORMATION PROCESSING APPARATUS INCLUDING A PLANAR OPTICAL WAVEGUIDE

Richard A. Linke, Princeton, N.J., assignor to NEC Research Institute, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 419,380, Oct. 10, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 688,160
Int. Cl.[5] G02B *27/00, 6/00*
U.S. Cl. 250—551 15 Claims

1. Information processing apparatus comprising
means for forming a planar optical waveguide which extends in two dimensions and serves as a shared medium,
a plurality of light-emitting means and a plurality of light-detecting means extending in a two dimensional arrangement along said planar optical waveguide for broadcasting omnidirectional light signals and abstracting light signals, respectively, into and from said planar optical waveguide, one surface of each light emitting means and one surface of each light detecting means being substantially aligned with one surface of the two-dimensional planar optical waveguide to form a substantially smooth surface, and
a plurality of subsystems comprising at least several hundred semiconductive integrated circuit chips that are to be



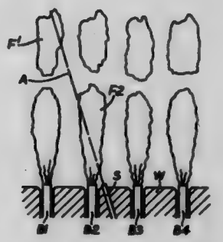
interconnected optically by way of the shared medium, both including input and output ports for processing the light signals in the shared medium, the light-detecting means being coupled to input ports and the light emitting means being coupled to output ports of the subsystems.

5,191,220

FLAME MONITORING APPARATUS AND METHOD HAVING A SECOND SIGNAL PROCESSING MEANS FOR DETECTING A FREQUENCY HIGHER IN RANGE THAN THE PREVIOUSLY DETECTED FREQUENCIES

David C. K. G. Innes, Shepperton, England, assignor to Hamworthy Combustion Equipment Limited, Maidstone, England

Filed Aug. 28, 1991, Ser. No. 751,180
Claims priority, application United Kingdom, Sep. 6, 1990, 9019457
Int. Cl.[5] G01J *31/14*
U.S. Cl. 250—554 7 Claims



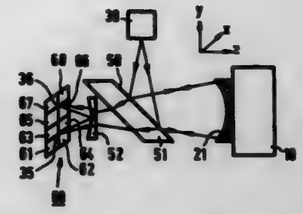
1. Flame monitoring apparatus comprising, in combination:
means for sensing radiation from a flame to be monitored and for producing a detection signal related to the sensed fluctuations of said radiation over a range of frequencies;
first signal processing means for producing a measure of the detection signal strength at least at two different frequencies in said range;
means for providing an output signal depending upon the relative strength of said detection signal at said two frequencies;
second signal processing means for producing a further measure of the detection signal strength at a higher frequency than said two frequencies; and,
means interacting an output signal from said higher frequency measure with said output signal derived from the relative signal strength at said two lower frequencies for providing a resultant output signal exhibiting a change of relative signal strength between flame-on and flame-off conditions in order to indicate the presence of the flame being monitored.

5,191,221

OPTICAL DEVICE DETERMINING THE POSITION AND ORIENTATION OF AN OBJECT, AND OPTICAL RECORDING AND/OR REPRODUCING APPARATUS INCLUDING THE DEVICE

Gerard E. van Rosmalen, and Willem G. Opheij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1990, Ser. No. 581,828
Claims priority, application Netherlands, Jun. 1, 1990, 9001253
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 31 Claims



1. A device for optically determining the position and orientation of an object, comprising a radiation source unit for generating a radiation beam along a radiation path, a radiation-sensitive detection system, and an optical imaging system arranged in the radiation path of said beam for forming a radiation spot on the detection system, said optical imaging system being coupled at least partly to said object in such a way that the position of the radiation spot on the detection system is a measure of the position of the object in a direction transverse to the radiation path,
characterized in that the device further comprises a curved-surface optical element fixed to said object, and an astigmatic element for introducing astigmatism into the radiation beam in the radiation path between said optical imaging system and said detection system, and
said detection system comprises means for detecting the shape of the radiation spot, said shape being a measure of the position of the object in the direction of the radiation path.

5,191,222

APPARATUS FOR SYNCHRONIZING DATA READING CAPABILITIES OF AN OPTICAL READER

Robert J. Edwards, Ridgefield, and Kenneth W. Lovell, Farmington, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 23, 1991, Ser. No. 781,432
Int. Cl.[5] G06K *7/015, 7/10*
U.S. Cl. 250—561 9 Claims

6. An apparatus for adjustably mounting an optical reader to at least one support shaft extending in a first direction, comprising:
a support member having a slotted section defined by first and second arms projecting from each end of said support member, said slotted section extending in a second direction perpendicular to the first direction;
a plate member adjacent and operatively coupled to said support member for clamping said support member to the support shaft, whereby said support member can be adjustably positioned in said first direction;
a travelling nut slidably positioned in said slotted section, and having an aperture in which the optical reader is held, said travelling nut including a threaded hole; and
means extending through apertures in said first and second

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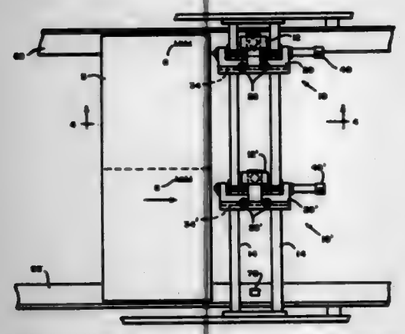
arms and into said slotted section for adjusting the position of said travelling nut in said second direction, said adjustment means including a threaded section for engaging said threaded hole in said travelling nut.

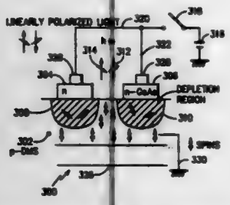


5,191,223

DEVICE FOR SELECTIVE MAGNETIZATION AND METHOD

Hiroo Munekata, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1991, Ser. No. 725,850
Int. Cl.[5] H01L 27/22, 29/82, 29/96, 43/00
U.S. Cl. 257—421 42 Claims



1. An apparatus for controlling the magnetic properties of a semiconductor material in a selected region comprising:

(a) a diluted magnetic semiconductor material;

(b) first means including a non-ferromagnetic electrode for generating an electric field in said selected region for generating carriers in said selected region of said material;

(c) second means for controlling said carrier concentrations in said selected region of said material above and below or across a critical value to achieve a carrier-induced magnetism such that a magnetic state of said selected region can be changed from a first magnetic state to a second magnetic state; and

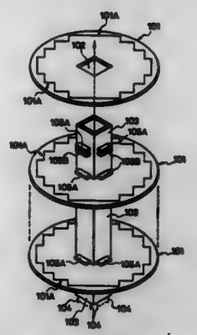
(d) magnetic means for applying a magnetic field in at least a portion of said electrode to substantially magnetize said portion of said selected region in said first or second magnetic state.

5,191,224

WAFER SCALE OF FULL WAFER MEMORY SYSTEM, PACKAGING METHOD THEREOF, AND WAFER PROCESSING METHOD EMPLOYED THEREIN

Masanori Tazmoki, Nishitama; Hiromitsu Mishimagi, Akishima; Makoto Homma; Toshiyuki Sakuta, both of Nishitama; Hisaki Nakamura, Ohme; Keiji Sasaki, Musashino; Minoru Enomoto, Tokorozawa; Toshihiko Satoh, Sayama; Kunio Sakara, Nishitama; Shigeo Kuroda, Ohme; Kanji Otsuka, Higashiyamato; Masao Kawamura, Fuchu; Hisako Kurosawa, Hino, and Kazuya Ito, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 184,871, Apr. 22, 1988, abandoned.
This application Dec. 13, 1990, Ser. No. 627,881
Claims priority, application Japan, Apr. 22, 1987, 62-97326; Apr. 22, 1987, 62-97329; Apr. 22, 1987, 62-97330; Apr. 22, 1987, 62-97331; Apr. 24, 1987, 62-99779
Int. Cl.[5] H01L 23/02, 23/12
U.S. Cl. 257—724 32 Claims



1. A packaging device for a semiconductor integrated circuit, the semiconductor integrated circuit being provided on a main surface of at least one large-sized semiconductor substrate, the at least one large-sized semiconductor substrate having an opening at a center portion of said semiconductor substrate, comprising:

a pillar having a predetermined shape such that said pillar can penetrate through said opening in the at least one semiconductor substrate; and

at least one supporting member for supporting the at least one semiconductor substrate at the center portion of the at least one semiconductor substrate, the supporting member being mounted on said pillar and including electrical connection means for providing electrical connections to said at least one semiconductor substrate.

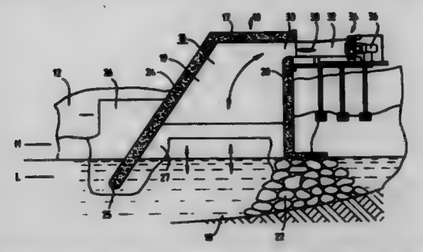
5,191,225

WAVE POWER APPARATUS

Alan A. Wells, Ely, United Kingdom, assignor to Secretary of State for Energy in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 18, 1991, Ser. No. 784,465
Claims priority, application United Kingdom, Oct. 18, 1990, 9022713
Int. Cl.[5] F03B 13/12
U.S. Cl. 290—53 10 Claims

1. An apparatus for extracting power from waves on the sea, comprising means defining a chamber communicating at its lower part with the sea so that waves on the sea cause the water level within the chamber to go up and down, a duct communicating with an upper part of the chamber so that the said movement of the water level causes air to flow to and fro through the duct, and turbine means arranged to be exposed to the said flow of air, the turbine means comprising two turbines on the same shaft, the said air flow passing through the two turbines in series, each turbine comprising a hub portion, a plurality of straight, aerofoil-section blades extending in a substantially radial lane from the hub portion,



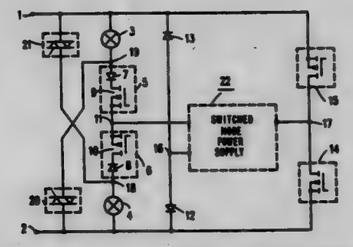
and a circumferential ring fixed to the outer ends of the blades concentric with the hub portion, the ring being sufficiently massive to act as a flywheel and having a greater moment of inertia than that of the hub portion and the blades.

5,191,226

CIRCUIT FOR SUPPLYING PLURAL LOADS VIA A SMPS AND/OR DIRECTLY FROM AN AC VOLTAGE SOURCE

Manfred Albach, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1990, Ser. No. 582,297
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1989, 3933202
Int. Cl.[5] H02J 3/06, 3/14
U.S. Cl. 307—31 21 Claims



1. A circuit arrangement for supplying at least first and second loads with electric energy from an AC-voltage source comprising: a switch-mode power supply unit, first and second input terminals for supplying the AC-voltage to the circuit arrangement, first switching means for coupling said switch-mode power supply unit to said first and second loads so as to supply the electric energy to the first and second loads during first and second time periods, respectively, and second switching means for coupling the second and first loads to said first and second input terminals, respectively, whereby said loads can be selectively directly coupled to the AC-voltage source via the second switching means and the input terminals.

5,191,227

APPARATUS FOR TRANSFERRING CONTROL OF A PLURALITY OF ELECTRICAL DEVICES UPON INTERCONNECTION

Alfred E. Deluca, Harvard, and George M. Kauffman, Hudson, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 545,554
Int. Cl.[5] H01H 35/00
U.S. Cl. 307—38 22 Claims

22. An apparatus for controlling first and second series of electrical devices, each of said electrical devices including switching circuitry for switching each of said electrical devices to a standby mode or an operational mode, comprising:

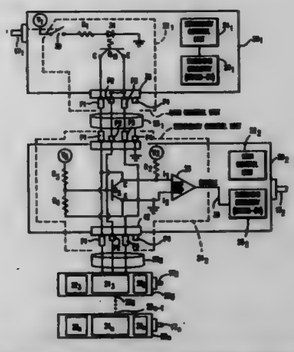
a main control unit provided in each of said electrical devices;

a secondary control unit provided in each of said electrical devices;

means for connecting a main control unit of a first one of said electrical devices in said first series of electrical devices to a secondary control unit of a second one of said electrical devices in said first series of electrical devices;

means for connecting the secondary control units of each remaining electrical device in said first series of electrical devices to each other;

means, responsive to said means for connecting the secondary control units of each remaining electrical device in said first series, for transferring control of an operational state of each electrical device in said first series to said main control unit of said first one of said electrical devices



in said first series of electrical devices when said secondary control units of each remaining electrical device in said first series are connected;

means for connecting the main control unit of a predetermined one of said electrical devices other than said first one of said electrical devices in said first series of electrical devices to a secondary control unit of one of said electrical devices in said second series of electrical devices;

means for connecting the secondary control units of each remaining electrical device in said second series of electrical devices to each other; and

means, responsive to said means for connecting the secondary control units of each remaining electrical device in said second series, for transferring control of an operational state of each electrical device in said second series of electrical devices to said predetermined one of said electrical devices in said first series of electrical devices when said secondary control units of each remaining electrical device in said second series are connected.

5,191,228

VEHICLE BATTERY DISCONNECT ANTITHEFT DEVICE

Jeffrey M. Sloan, 312 George St., Birmingham, Mich. 48009

Continuation of Ser. No. 542,118, Jun. 22, 1990, abandoned.
This application Oct. 16, 1991, Ser. No. 776,879
Int. Cl.[5] B60R 25/04
U.S. Cl. 307—10.3 6 Claims

1. For use in conjunction with a vehicle having an engine and a battery, an electrical system with an electrical starter, an antitheft device comprising:

means for detecting an unauthorized attempt to use the vehicle and for generating an output signal representative thereof;

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an electrically conductive plate and a pair of electrical contacts connected in series, between said battery and said vehicle electrical system;
means for mechanically connecting said plate to a threaded shaft,
a motor for rotatably driving said shaft so as to move said

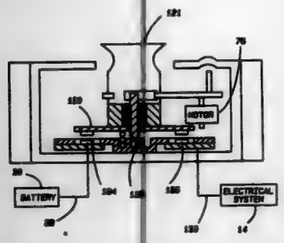
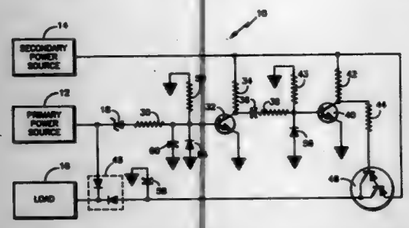


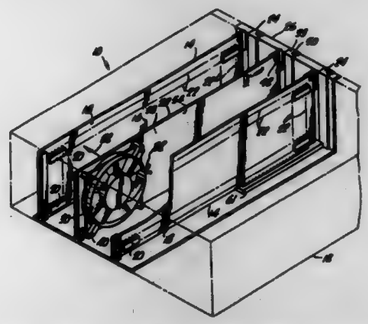
plate from a closed position in which said plate mechanically contacts and electrically completes an electrical circuit between said contacts to an open position in which said plate is spaced from said contacts thereby electrically disconnecting said battery from said electrical system; and
means responsive to said output signal for actuating said motor.

5,191,229
POWER SOURCE TRANSFERRING
Eric W. Davis, Prettymarsh, Me., and John C. Stader, Bridgeport, Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 19, 1990, Ser. No. 629,935
Int. Cl.[5] H02J 9/06
U.S. Cl. 307—66 **4 Claims**



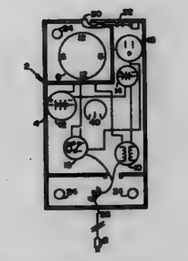
1. Apparatus powered only from one or both of a primary power signal and a secondary power signal, for coupling the secondary power signal to a load in response to loss of the primary power signal, comprising:
a threshold means responsive to loss of the primary power signal below a certain voltage level for asserting a particular signal indicative of the loss of the primary power signal;
a first switching means, for asserting a first voltage signal only in response to assertion of said particular signal indicative of the loss of the primary power signal, said first switching means being a bipolar NPN transistor;
signal attenuation means, for asserting a second voltage signal only in response to assertion of said first voltage signal, said second signal being attenuated after a predetermined amount of time such that it is not being asserted, said signal attenuation means comprising a capacitor;
a second switching means, for asserting a third voltage signal only in response to said second voltage signal not being asserted, said second switching means being a bipolar NPN transistor;
a third switching means, for coupling the secondary power signal to the load only in response to said third voltage signal not being asserted, said third switching means being a bipolar PNP Darlington transistor;
means for directing power signals to prevent the primary power signal from flowing into the source of the secondary power signal and to prevent the secondary power signal from flowing into the source of the primary power signal; and
means, disposed between the primary power signal and said first switch, for delaying termination of the assertion of said first voltage signal.

5,191,230
CIRCUIT MODULE FAN ASSEMBLY
Lap-Yan Heung, 12565 Crenshaw Blvd., Hawthorne, Calif. 90250
Continuation of Ser. No. 303,642, Jan. 30, 1989, Pat. No. 5,079,438. This application Oct. 3, 1991, Ser. No. 771,154
The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.
Int. Cl.[5] H05K 7/20
U.S. Cl. 307—141 **20 Claims**



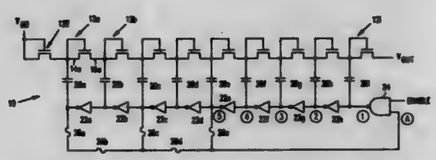
1. A fan module for cooling a circuit module in an electronic system,
wherein the circuit module includes:
(i) a circuit module base board;
(ii) circuitry mounted to the circuit module base board; and
(iii) a circuit module board connector integral with the circuit module base board;
and wherein the electronic system includes an electrical circuit and a plurality of receiving connectors each for receiving the circuit board connector to electrically connect the circuitry to the electrical circuit in the electronic system and to mechanically connect the circuit module base board within the electronic system;
the fan module comprising:
(a) a fan module base board having first and second planar surfaces and first and second edges;
(b) an electrical fan unit mounted to the first planar surface of the fan module base board for cooling the circuitry mounted to the circuit module base board;
(c) a driving circuit electrically connected to the fan unit for activating the fan unit when the fan module is mounted to the electronic system and the electronic system is powered on; and
(d) a fan module base board connector integral with the fan module base board adjacent the first edge for mechanically mounting the fan module base board to each of the receiving connectors interchangeably with the circuit module base board and for electrically connecting the driving circuit to the electrical circuit through one of the receiving connectors,
the fan unit having a depth such that the fan unit is spaced apart from the circuitry on the circuit module when the circuit module and the fan module are mounted to different ones of the receiving connectors.

5,191,231
TIMER FOR ELECTRICAL APPLIANCES
Woodrow Berry, 1678 Givan Ave., Bronx, N.Y. 10469
Filed Apr. 30, 1991, Ser. No. 693,813
Int. Cl.[5] H01H 43/01
U.S. Cl. 307—142 **14 Claims**



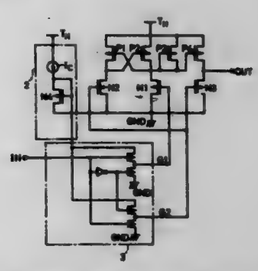
1. An apparatus for providing continuous electrical power to a timer device for controlling operational use time of an electrical appliance, said apparatus comprising:
a housing,
a timer element within said housing,
means within said housing for electrically connecting an electrical appliance to a source of electrical line current through said timer element,
a back-up electrical power supply within said housing, said back-up electrical power supply being selectively electrically connected to said timer element, and
electrical switch means coupled to said timer element and responsive to said source of electrical line current for electrically connecting said back-up power supply to said timer element in response to at least a predetermined decrease in line current such that said timer element is continuously energized to control the operation of said electrical appliance.

5,191,232
HIGH FREQUENCY VOLTAGE MULTIPLIER FOR AN ELECTRICALLY ERASABLE AND PROGRAMMABLE MEMORY DEVICE
Ping Wang, Saratoga, Calif., assignor to Silicon Storage Technology, Inc., Sunnyvale, Calif.
Filed Mar. 17, 1992, Ser. No. 852,529
Int. Cl.[5] H03L 5/00; H03K 17/687
U.S. Cl. 307—264 **5 Claims**



1. A charge pump for use with an electrically erasable and programmable memory device for receiving an enable signal, a first voltage and for generating a second voltage, higher than said first voltage in response thereto, said pump comprising:
a plurality of diode means connected in series, forming a chain having a first diode means and a last diode means, with each diode means having an anode and a cathode with the anode connected to the cathode of an immediately adjacent diode means, and with the cathode of the last diode means supplying said second voltage;
means for supplying said first voltage to said anode of the first diode means;
a plurality of capacitor means, each capacitor means having two ends, a first end connected to an anode of a different one of the diode means;
a plurality of inverter means connected in series, forming a chain having a first inverter means and a last inverter means to produce a plurality of oscillating signals, with each inverter means having an input and an output, with said input connected to the output of an immediately adjacent inverter means, each of said inverter means has its input and output connected to the second end of immediately adjacent capacitor means; and
gate means for receiving said enable signal and an output of one of said inverter means and for generating a first oscillating signal in response thereto and for supplying said first oscillating signal to the input of the first inverter means.

5,191,233
FLIP-FLOP TYPE LEVEL-SHIFT CIRCUIT
Masaji Nakano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 6, 1992, Ser. No. 847,930
Claims priority, application Japan, Mar. 6, 1991, 3-39707
Int. Cl.[5] H03K 5/00, 3/2885, 19/0175
U.S. Cl. 307—264 **4 Claims**



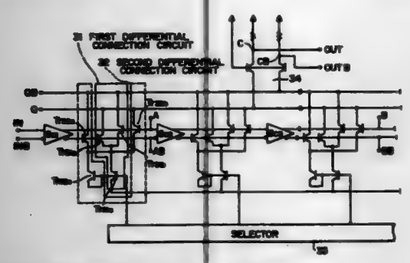
1. A flip-flop type level-shift circuit comprising:
a flip-flop circuit (P1, P2, N1, N2) provided between a first power supply terminal (T_H) and a second power supply terminal (T_L, GND) and having a first output node and a second output node;
an input terminal;
an output terminal;
a control circuit interconnected between said input terminal and said flip-flop circuit, for generating a first gate control signal and a second gate control signal in response to an input signal applied to said input terminal, said flip-flop circuit receiving said first and second gate control signal;
an output stage circuit including a first P-channel MOS transistor (P4) and a first N-channel MOS transistor (N3) connected in series between said first and second power supply terminals, said first P-channel MOS transistor (P4) having a source connected to said first power supply terminal, a gate connected to said first output node of said flip-flop circuit, and a drain connected to said output terminal, and said first N-channel MOS transistor (N3) having a drain connected to said output terminal, a gate connected to said control circuit and receiving said second gate control signal, and a source connected to said second power supply terminal; and
a second P-channel MOS transistor (P3) connected between said first power supply terminal and the gate of said first P-channel MOS transistor (P4) in said output stage circuit, said second P-channel MOS transistor having a source connected to said first power supply terminal, and a gate

junction, and for damping the junction so that reset volt-

tive gate terminals of said FETs to provide proper biasing

and a drain connected in common to the gate of said first P-channel MOS transistor, said second P-channel MOS transistor (P3) constituting a current-mirror circuit with said first P-channel MOS transistor (P4) so as to cause a constant current flow in said first P-channel MOS transistor of said output stage circuit.

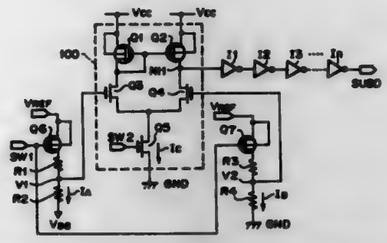
5,191,234
PULSE SIGNAL GENERATOR AND CASCODE DIFFERENTIAL AMPLIFIER
Daisuke Murakami, and Tadao Kawabara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 9, 1991, Ser. No. 803,992
Claims priority, application Japan, Dec. 10, 1990, 2-409770; Jan. 23, 1991, 3-023952; Jan. 23, 1991, 3-023953
Int. Cl.[5] H03K *3/017, 5/153, 5/159*
U.S. Cl. 307—265 **3 Claims**



1. A pulse signal generator comprising:
a cascode amplifier;
a plurality of stages of delay gates connected in series to one another for delaying input signals fed to input terminals thereof;
first differential connection circuits each consisting of a pair of transistors being differentially connected and interposed respectively between the stages of said delay gates so as to transmit, at a predetermined timing, the signals passed through said delay gates;
first and second input lines connected between said first differential connection circuits and said cascode amplifier for supplying output signals from said first differential connection circuits to said cascode amplifier; and
second differential connection circuits each consisting of a pair of transistors being differentially connected which are supplied with the same input signals passed through said delay gates as those fed to said first differential connection circuits, wherein output signals of said second differential connection circuits are inversely connected to said first and second input lines whereby the outputs of the transistors thereof become inverse in polarity to the outputs of the transistors of the corresponding first differential connection circuit.

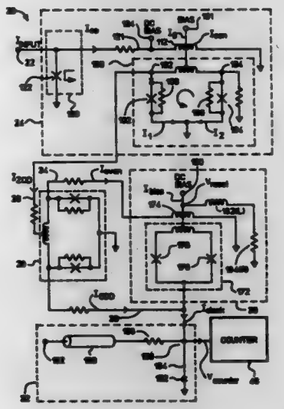
5,191,235
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING SUBSTRATE POTENTIAL DETECTION CIRCUIT
Takahiro Hara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jan. 28, 1992, Ser. No. 827,000
Claims priority, application Japan, Jan. 29, 1991, 3-28077
Int. Cl.[5] H03K *3/01, 5/22*
U.S. Cl. 307—296.2 **5 Claims**

1. A semiconductor integrated circuit device provided with a substrate potential detection circuit which outputs a detection signal at a detection output node when the substrate potential reaches a predetermined detection level, said circuit device comprising:
a current-mirror circuit having a first input transistor and a second input transistor;
a first resistor circuit in which a first and a second resistor are connected in series and which divides a potential difference between an internal reference voltage and the substrate potential and produces an input voltage to be supplied to said first input transistor;
a first switching transistor which is connected between an internal reference voltage source and said first resistor circuit and turns-on and -off in response to a control signal inputted thereto;



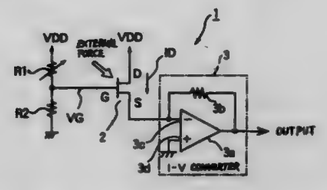
a second resistor circuit in which a third and a fourth resistor are connected in series and which divides a potential difference between said internal reference voltage and a ground potential and produces a reference voltage to be supplied to said second input transistor; and
a second switching transistor which is connected between the internal reference voltage source and said second resistor circuit, and which turns-on and -off in response to the control signal inputted thereto.

5,191,236
SYSTEM AND CIRCUITS USING JOSEPHSON JUNCTIONS
Richard C. Ruby, Menlo Park, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jul. 16, 1990, Ser. No. 554,228
Int. Cl.[5] H03K *3/38;* H03B *15/00*
U.S. Cl. 307—306 **10 Claims**



1. A clock comprising:
a Josephson junction with a plasma voltage and a critical current;
means for applying a triggering pulse to the junction;
means for applying a biasing current to the junction, said biasing current being below the critical current of the junction, and for damping the junction so that reset voltage of the junction is less than its plasma voltage; and
a resonant circuit connected to the junction at an output node, so that the junction causes a voltage pulse to be propagated through the circuit in response to the triggering pulse, said junction being automatically reset thereafter, said circuit including a transmission line and providing a return voltage pulse to the junction after a predetermined delay in response to a voltage pulse from the junction so that, after being reset, the junction is again triggered by the return voltage pulse to cause another voltage pulse to be propagated through the circuit in response to the return voltage pulse, said clock thereby generating clock pulses at the output node in response to said triggering pulse applied to the junction.

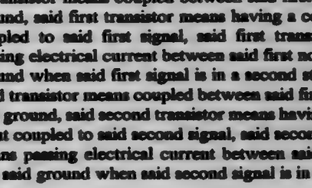
5,191,237
FIELD-EFFECT TRANSISTOR TYPE SEMICONDUCTOR SENSOR
Katuhiko Takebe, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 23, 1991, Ser. No. 749,220
Claims priority, application Japan, Aug. 24, 1990, 2-223322
Int. Cl.[5] H03K *3/00;* H01L *29/66*
U.S. Cl. 257—419 **8 Claims**



1. A field-effect transistor-type semiconductor sensor comprising:
a semiconductor substrate;
a field-effect transistor on said semiconductor substrate, said field-effect transistor having a source, a drain, and a gate;
means for applying a gate voltage between said source and said gate to cause a drain current between said source and said drain, said drain current being changeable with an external force applied to said field-effect transistor in comparison with a drain current, which flows when no external force is applied thereto, said external force being detectable by detecting a change in the drain current; and
said gate voltage applying means being capable of adjustably controlling the drain current, which flows when no external force is applied to said field-effect transistor, to be $\frac{1}{2}$ or less than $\frac{1}{2}$ of a drain current which flows when said gate and said source are shorted.

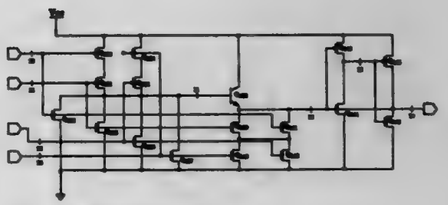
5,191,238
DUAL FET CIRCUITS HAVING FLOATING VOLTAGE BIAS
Carmine F. Vasile, Medford, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Nov. 30, 1990, Ser. No. 620,215
Int. Cl.[5] H03K *17/16, 3/35*
U.S. Cl. 307—443 **6 Claims**

1. A self-biasing switching circuit comprising:
two FETs each having a first, second and gate terminal, respective first terminals of said FETs being connected as a common terminal to form a dual FET, said dual FET having symmetrical source and drain characteristics permitting interchanging said common and respective second terminals of said FETs as a function of the voltages between said common terminal and said gate terminals;
floating voltage means having one end connected to said common terminal and another end connected to respective gate terminals of said FETs to provide proper biasing for said FETs, said floating voltage means including a transformer having a primary section and a secondary section, said secondary section having two legs each connected to one of said gate terminals and a center tap connected to said common terminal;



a diode connecting each leg of said secondary section to said center tap to provide protection for the circuit; and
a plurality of series connected diodes connecting the input of said primary section to ground to provide biasing for the circuit.

5,191,239
RESET GATE FOR A PHASE DETECTOR IN A PHASE-LOCKED LOOP
Alan C. Rogers, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.
Filed Dec. 19, 1991, Ser. No. 810,683
Int. Cl.[5] H03K *19/20, 5/00*
U.S. Cl. 307—445 **16 Claims**



1. A logic gate comprising:
means for receiving a first signal;
means for receiving a second signal;
means for receiving a third signal;
means for receiving a fourth signal;
first switching means coupled between a voltage source and a first node, said first switching means passing electrical current between said voltage source and said first node when said first signal and said second signal are in a first state;
second switching means coupled between said voltage source and said first node, said second switching means passing electrical current between said voltage source and said first node when said third signal and said fourth signal are in said first state;
first transistor means coupled between said first node and a ground, said first transistor means having a control input coupled to said first signal, said first transistor means passing electrical current between said first node and said ground when said first signal is in a second state;
second transistor means coupled between said first node and said ground, said second transistor means having a control input coupled to said second signal, said second transistor means passing electrical current between said first node and said ground when said second signal is in said second state;
third transistor means coupled between said first node and

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said ground, said third transistor means having a control input coupled to said third signal, said third transistor means passing electrical current between said first node and said ground when said third signal is in said second state;

fourth transistor means coupled between said first node and said ground, said fourth transistor means having a control input coupled to said fourth signal, said fourth transistor means passing electrical current between said first node and said ground when said fourth signal is in said second state;

current amplifying means coupled between said voltage source and an output node, said current amplifying means coupled to said first node, said current amplifying means passing electrical current between said voltage source and said output node, said current amplifying means preventing electrical current from passing from said output node to said first node;

third switching means coupled between said output node and said ground, said third switching means passing electrical current between said output node and said ground when said second signal and said fourth signal are in said second state; and

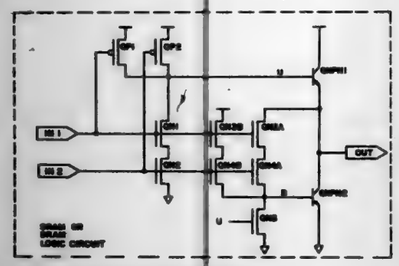
fourth switching means coupled between said output node and said ground, said fourth switching means passing electrical current between said output node and said ground when said first signal and said third signal are in said second state;

whereby said output node changes from said first state to said second state when said first and said second and said third and said fourth signals are all in said first state, said output node changes from said second state to said first state when said first signal and said third or said fourth signals are in said second state or when said second signal and said third or said fourth signals are in said second state.

5,191,240
BICMOS DRIVER CIRCUITS WITH IMPROVED LOW OUTPUT LEVEL

Bruce M. Fleischer, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 5, 1991, Ser. No. 710,592
Int. Cl.[5] H03K *19/02, 19/08*
U.S. Cl. 307—446 5 Claims

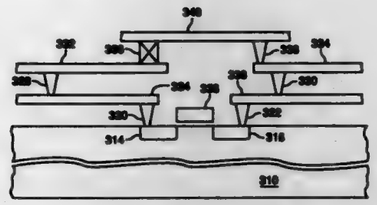


1. A BiCMOS gated diode pull-down NPN transistor circuit with an improved low output level comprising, a pull-down NPN transistor coupled between the output terminal and ground, a first switched current path comprising a first CMOS transistor pair coupled between the output terminal and the base of said pull-down NPN transistor, and a second switched current path comprising a second CMOS transistor pair coupled between the power supply V_{DD} and the base of said pull-down NPN transistor, which circuit improves the low output level and the high-to-low transition of the circuit.

5,191,241
PROGRAMMABLE INTERCONNECT ARCHITECTURE

John L. McCollum, Saratoga; Abbas A. El Gamal, and Jonathan W. Greene, both of Palo Alto, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 561,110, Aug. 1, 1990, Pat. No. 5,132,571. This application Jun. 17, 1992, Ser. No. 899,729
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 20 Claims



1. A user-configurable circuit array architecture, including:

a two dimensional array of functional circuits disposed within a semiconductor substrate, said functional circuits arranged in an array of rows and columns;

a first interconnect layer disposed above and insulated from said semiconductor substrate, said first interconnect layer including a plurality of first conductors running in a first direction, at least some of said plurality of first conductors running directly over adjacent ones of said functional circuits, at least some of said intersections disposed directly over ones of said functional circuits;

a second interconnect layer disposed above and insulated from said first interconnect layer, said second interconnect layer including a plurality of second conductors running in a second direction, at least some of said second conductors forming intersections with ones of said first conductors, at least some of said intersections disposed directly over ones of said functional circuits;

a plurality of user-configurable interconnect elements placed between said first and second interconnect layers at selected ones of said intersections.

5,191,242
PROGRAMMABLE LOGIC DEVICE INCORPORATING DIGITAL-TO-ANALOG CONVERTER

Om P. Agrawal, San Jose, Calif., and Michael J. Wright, Boulder, Colo., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

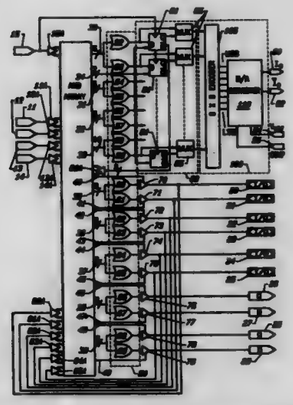
Filed May 17, 1991, Ser. No. 701,790
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 24 Claims

1. A single integrated circuit, comprising:

a programmable logic circuit having at least one logic circuit input and a plurality of logic circuit outputs, each of said plurality of logic circuit outputs providing a digital logic signal;

means for providing a variable amplitude analog signal to an output means, responsive to said plurality of digital output signals provided on said plurality of programmable logic

circuit outputs, said means for providing including input means for receiving said plurality of signals; and

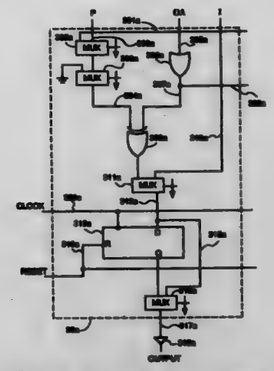


means for coupling said plurality of outputs of said programmable logic circuit to said input means.

5,191,243
OUTPUT LOGIC MACROCELL WITH ENHANCED FUNCTIONAL CAPABILITIES

Ju Shen, San Jose; Albert L. Chan, Palo Alto; Kapil Shankar, San Jose, all of Calif., and Cyrus Tsui, Vancouver, Wash., assignors to Lattice Semiconductor Corporation, Hillsboro, Oreg.

Filed May 6, 1991, Ser. No. 696,907
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 25 Claims

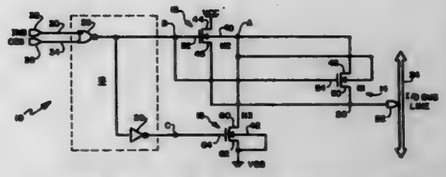


1. An output logic macrocell for use with a logic circuit having a plurality of outputs, said macrocell comprising an exclusive OR gate having first and second inputs, said first input being connected to an output of a first OR gate having a plurality of inputs connected to outputs of said logic circuit, and further comprising means for switching said second input of said exclusive OR gate alternatively to an output of said logic circuit or to ground or to an output of a second OR gate having a plurality of inputs connected to outputs of said logic circuit.

5,191,244
N-CHANNEL PULL-UP TRANSISTOR WITH REDUCED BODY EFFECT

Thomas J. Runaldue, and Qazi R. M. Mahmood, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 16, 1991, Ser. No. 760,313
Int. Cl.[5] H03K *19/0175*
U.S. Cl. 307—475 5 Claims



1. A CMOS output buffer circuit employing an N-channel pull-up transistor with reduced body effect, comprising:

an N-channel pull-up transistor (N2) having its drain connected to an upper power supply potential (VCC), its source connected to an output node (20), its gate connected to a first internal node (B), and its local substrate connected to a second internal node (A);

an N-channel coupling transistor (N1) having its source connected to the second internal node (A), its drain connected to the source of said pull-up transistor (N2), its gate connected to the first internal node (B), and its local substrate connected to the local substrate of said pull-up transistor (N2); and

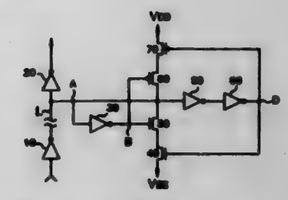
an N-channel discharging transistor (N3) having its drain connected to the second internal node (A), its source connected to a lower power supply potential (VSS), its gate connected to a third internal node (C), and its local substrate connected to the lower power supply potential (VSS),

whereby said coupling transistor and said discharging transistor serves to reduce the body effect on said pull-up transistor and to provide higher immunity from noise on the upper power supply potential (VCC).

5,191,245
DELAY COMPENSATION CIRCUIT

Kyoung-Woo Kang, Taegu-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 2, 1991, Ser. No. 725,768
Claims priority, application Rep. of Korea, May 16, 1991, 1991-7988
Int. Cl.[5] H03K *5/12, 3/29*
U.S. Cl. 307—601 13 Claims



1. A circuit for compensating time delay of a digital signal being transmitted by a signal driver through a transmission line having a delay means for correcting waveform distortion due to resistance and capacitance of said transmission line, comprising:

inverter means coupled to said delay means and said transmission line for receiving said digital signal comprising a

logic high level and a logic low level to generate an in-

a first disk fitted around said drive shaft in said casing for

a termination of said rotor winding including a rotor wind-

5,191,250

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logic high level and a logic low level to generate an inverted signal in dependence upon said digital signal; and

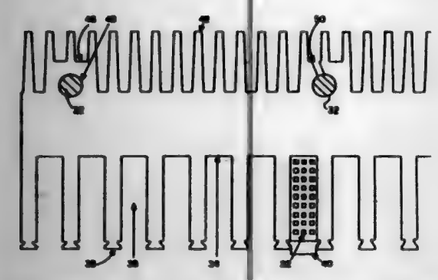
compensator means coupled in parallel to said delay means and said transmission line for compensating for a delay time of said digital signal during a transition from one of said logic high level to said logic low level and said logic low level to said logic high level in response to said inverted signal.

5,191,245

MAGNETICALLY ISOLATED BOLTS FOR LINEAR INDUCTION MOTOR

Andrew Roxborough, Kingston, Canada, assignor to UTDC Inc., Kingston, Canada

Filed Sep. 10, 1991, Ser. No. 757,227
Int. Cl.[5] H02K *41/00*
U.S. Cl. 310—13 **8 Claims**



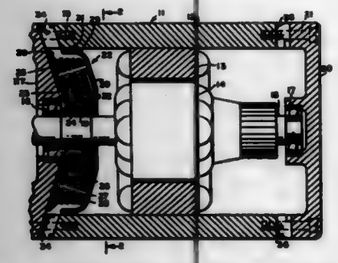
1. A primary for a linear induction motor having a core formed from a plurality of juxtaposed laminae each having a body portion with teeth extending from an edge of the body portion, coils wound in said teeth to induce a magnetic flux path through said core, and fastening means extending through said laminae to clamp said laminae to one another, said body portion including a plurality of protuberances on an edge of said body portion opposite to said teeth and an aperture in each of said protuberances to receive said fastening means, said fastening means thereby being substantially outside said magnetic flux path in said core.

5,191,247

SUBSTANTIALLY NOISELESS FAN FOR INTERNALLY COOLING ELECTRIC MOTORS

Clarence R. Powell, 11618 Placid Ct., Colton, Calif. 92324

Filed Sep. 20, 1991, Ser. No. 763,256
Int. Cl.[5] H02K *9/06, 5/24*; F01D *1/36*; F03B *5/00*
U.S. Cl. 310—62 **4 Claims**



1. In an electric motor assembly including a casing housing a stator and a rotor, a drive shaft interconnected with said rotor to be driven thereby and bearing means rotatably supporting said drive shaft, substantially noiseless cooling means comprising:

a first disk fitted around said drive shaft in said casing for concentric rotation therewith;

a second disk within said casing having a central opening therethrough;

a plurality of other disks, each having a central opening therethrough;

the first, second and plurality of other disks being each of frusto-conical shape and the central openings in the second disk and the plurality of other disks being of progressively larger size in the direction from said first disk towards said rotor;

supporting means supporting said second disk in spaced, parallel relationship with said first disk and between it and said rotor in said casing and the plurality of other disks in spaced parallel relationship with said first and said second disk;

air intake opening means in said casing, said air intake opening means being spaced outwardly from one end of said rotor and the first disk, second disk and plurality of other disks being spaced from the other end thereof; and

air exhaust opening means in said casing;

the spacing between the disks being such that when said disks are rotated at a suitable speed bodies of air in the spaces therebetween are rotated due to boundary layers of air adhering to the disk surfaces and portions of said bodies are sheared from said boundary layers and moved radially outward by centrifugal force thereon created by the rotating disks;

the frusto-conical disk closest to said rotor having a substantially cylindrical skirt encircling the peripheries of at least some of the other disks and spaced outwardly therefrom for directing air expelled outwardly from between said disks toward said air exhaust opening means;

said first disk being positioned farther from said rotor than any other disk and having a peripheral extension beyond the periphery of said any other disk; and

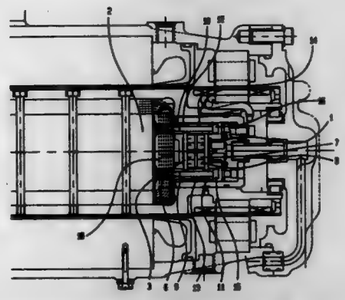
said air exhaust opening means being positioned to receive the air urged radially outward by the disks and exhaust it from said casing.

5,191,248

CONNECTION FOR ROTATING DIODE PACKAGE

John B. Haas, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 9, 1990, Ser. No. 594,330
Int. Cl.[5] H02K *11/00*
U.S. Cl. 310—68 D **17 Claims**



1. A connection arrangement between an electrical device, said electrical device having at least one connection surface capable of bearing a compressional force and mounting means, adjacent said connection surface, for producing said compressional force, and a rotor winding on a rotor of an electrical machine, said connection arrangement between said electrical device and said rotor including:

a termination of said rotor winding including a rotor winding lead and

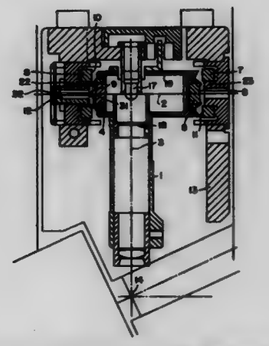
means, included by said rotor, for receiving said mounting means for producing a compressional force, said means for receiving said mounting means further including at least one surface opposable to said at least one connection surface to engage said termination of said rotor winding.

5,191,249

SELF-ALIGNING BEARING FOR A PRECISION MEASUREMENT PENDULUM

Erich Rauscher, Munich; Hans D. Jacoby, Vaterstetten, and Karel Srb, Munich, all of Fed. Rep. of Germany, assignors to Arnold & Richter Cine Technik, GmbH & Co. Betriebs KG, Munich, Fed. Rep. of Germany

Filed Sep. 9, 1991, Ser. No. 756,867
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1990, 4028858
Int. Cl.[5] H02K *7/09*; G01H *1/00*
U.S. Cl. 310—90.5 **20 Claims**



1. Apparatus for precisely measuring deviation from a reference vertical position, said apparatus comprising:

a housing;

a precision pendulum arrangement within said housing for determining deviations from the reference vertical position;

said precision pendulum arrangement comprising:

elongated pendulum means for oscillating in a pendulum oscillation plane;

said pendulum means having a pendulum axis of rotation; and

said pendulum axis of rotation being substantially horizontal;

two self-aligning magnetic bearings to support said elongated pendulum means, each of said two magnetic bearings being located between said elongated pendulum means and said housing;

one of each of said two magnetic bearings being on opposite sides of said pendulum oscillation plane;

each of said two magnetic bearings comprising:

a bearing ring magnet; and

a magnetic component, configured for directing magnetic fields extending in the direction of the pendulum axis of rotation and rotationally symmetrical to the pendulum axis of rotation, and magnetic fields of unlike direction extending radially to the pendulum axis of rotation, radially symmetrically around the pendulum axis of rotation; and

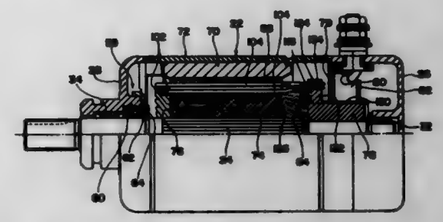
optical sensor means for sensing the position of the pendulum arrangement relative to the housing.

5,191,250

DC MOTOR WITH U-SHAPED ROTOR-COIL WIRE HAVING INCLINED INTERMEDIATE PORTION

Kouji Kobayashi, Nitta, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Filed Sep. 7, 1989, Ser. No. 404,213
Claims priority, application Japan, Sep. 12, 1988, 63-227768; Sep. 12, 1988, 63-227769
Int. Cl.[5] H02K *1/22*
U.S. Cl. 310—261 **24 Claims**

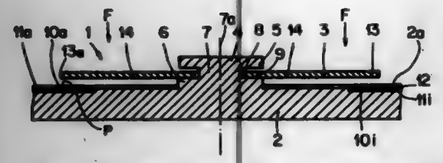


1. In a DC motor which includes: a motor case; a substantially cylindrical rotor core rotatably disposed in the motor case for rotation about a center axis thereof and having a peripheral surface and front and rear end faces; and a rotor coil wound around the rotor core, the rotor core having a plurality of shallower slots and a plurality of deeper slots, the shallower and deeper slots being circumferentially and alternately disposed in the peripheral surface of the rotor core at angular intervals about the center axis of the rotor core, each of the shallower and deeper slots extending axially from the front end face to the rear end face of the rotor core so that axially extending teeth are formed between the shallower and deeper slots, each of the shallower slots including inner and outer sections which are radially aligned with each other, each of the deeper slots including inner and outer sections radially spaced apart and a neck section interposed between the inner and outer sections, a distance between the center axis of the rotor core and the outer section of each shallower slot being generally equal to a distance between the center axis of the rotor core and the outer section of each deeper slot, a distance between the inner and outer sections of each deeper slot being larger than a distance between the inner and outer sections of each shallower slot, the neck section of each deeper slot being of a circumferential length smaller than circumferential lengths of the inner and outer sections of each deeper slot, the rotor coil comprising a plurality of first formed wires and a plurality of second formed wires, each of the first and second formed wires being U-shaped and each including inner and outer leg portions and an intermediate portion, each of said inner and outer leg portions having distal and proximal ends, said intermediate portion interconnecting the proximal ends of the inner and outer leg portions, an angle defined between the inner leg portion and the intermediate portion being larger than 90°, each of the first and second formed wires having said inner leg portion inserted in the inner section of a respective one of a shallower and deeper slot and having said outer leg portion inserted in the outer section of an Nth slot as counted in a circumferential direction from the slot in which a corresponding one of the inner leg portions is inserted so that each of the first and second formed wires straddles (N−1) of said teeth with said intermediate portion projecting from and being inclined to the rear end face of the rotor core, said N being a positive integer greater than two, said intermediate portions of the first and second formed wires occupying a donut-shaped volume on the rear end face of the rotor core, said donut-shaped volume having an inner periphery and having an outer periphery which is both radially outside of the thicker than said inner periphery.

rotor means including shaft means and main field means

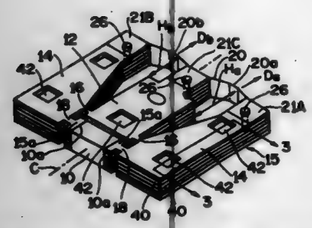
face of said plurality of generally elongate permanent

5,191,251
ELECTROSTATIC MICROMOTOR
Lionel Paratte, Neuchatel, Switzerland, assignor to Asulab, S.A., Switzerland
Filed Feb. 5, 1991, Ser. No. 650,598
Claims priority, application Switzerland, Feb. 9, 1990, 00415/90
Int. Cl.[5] H02N 1/00
U.S. Cl. 310—309 8 Claims



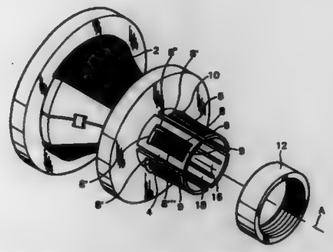
1. An electrostatic micromotor comprising a rotor having a hub and a peripheral region, a stator including electrodes disposed in a plane and facing said peripheral region and adapted to produce an electric field between said stator and said rotor, and means for mounting said hub on said stator for rotation of said rotor relative to said stator, wherein said peripheral region comprises a substantially planar ring substantially parallel to said plane of said electrodes in the absence of said electric field and disposed at least partially in a facing relationship with said electrodes, and wherein said rotor further includes connection means for mechanically connecting said ring to said hub, said connection means being elastically deformable such that said ring is tilted relative to said stator in response to an electrostatic force applied to said ring by said electric field in a direction substantially perpendicular to said plane of said electrodes, and said connection means cooperating with said hub and said peripheral region to define a plurality of openings extending through said rotor to achieve said elastic deformation.

5,191,252
DISPLACEMENT AMPLIFICATION MECHANISM USING PIEZOELECTRIC ELEMENT
Mitsunori Sano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Apr. 24, 1992, Ser. No. 873,094
Claims priority, application Japan, Apr. 25, 1991, 3-94608; May 17, 1991, 3-112087
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—328 10 Claims



1. A displacement amplification device, comprising:
a displacement amplifying member which has a center axis and comprises a central support part having two thin-walled hinge sections protruding symmetrically from two opposite sides with respect to said center axis and a pair of lever arms which are arranged oppositely and symmetrically with respect to said center axis and connected to said support part by said two hinge sections, respectively, such that each of said two hinge sections becomes the fulcrum of lever action of the adjacent lever arm;
a piezoelectric element which changes its length in the direction of a longitudinal axis thereof by application of a voltage thereto and is arranged such that said longitudinal axis is normal to said center axis of said amplifying member and fixed at one end thereof to a root end of one of said lever arms and at the opposite end to a root end of the other lever arm; and
a beam which is made of a resilient metal sheet and is fixed at two opposite end sections thereof to tip ends of the two lever arms, respectively, and at a middle section thereof to a protruding end of said support part of said amplifying member such that each of a first segment of the beam between said middle section and one of said two opposite end sections and a second segment of the beam between said middle section and the other end section makes a buckling motion and consequently changes its distance from a reference end face of said support part of said amplifying member when a displacement of each end of said piezoelectric element is transmitted to the adjacent lever arm and amplified by lever action of the lever arm.

5,191,253
DEFLECTION YOKE HAVING A TIGHT COUPLER
Jacbo Kang, Kyunggi, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea
Filed Jul. 8, 1991, Ser. No. 726,756
Claims priority, application Rep. of Korea, Dec. 6, 1990, 90-19375
Int. Cl.[5] H01J 29/70
U.S. Cl. 313—440 2 Claims

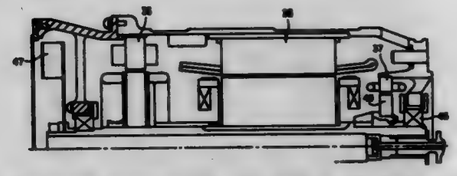


1. A deflection yoke having a coupler for tightly attaching the yoke to the periphery of a cathode ray tube, wherein the coupler comprises:
a neck holder having tapered compressible threaded members formed therein;
perimeter slots formed on three sides of each of the threaded members, thereby enabling compression of the threaded members; and
a locking nut threadable on the threaded members for compressing the threaded members tightly toward the cathode ray tube periphery.

5,191,254
MINIMUM LENGTH, AIR COOLED AC GENERATOR ARRANGEMENT
Bernard A. Raad, Burbank, Calif., and Hong Lee, West Allenhurst, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 19, 1991, Ser. No. 762,192
Int. Cl.[5] H02K 7/20
U.S. Cl. 310—112 6 Claims

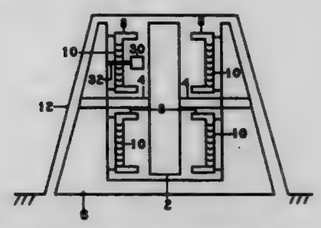
1. A minimum length, air cooled ac generator arrangement, comprising:
stator means including main armature means, exciter field means and permanent magnet generator armature means;

rotor means including shaft means, and main field means, exciter armature means and permanent magnet generator field means, all of which are mounted on said shaft means;
said permanent magnet generator armature means and said permanent magnet generator field means disposed below said main armature means;
rectifier bridge means connecting said exciter armature means to said main field means for rectifying ac power to provide dc power;
shunt resistor means disposed across said main field means for suppressing voltage spikes;



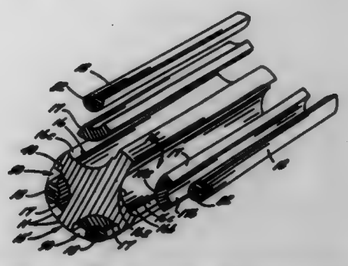
fan means supported on said shaft for circulating air throughout said ac generator arrangement; and
cooling means for cooling components of said ac generator arrangement otherwise blocked by said permanent magnet generator armature means and said permanent magnet generator field means deposed below said main armature means, said cooling means including air impeller means disposed in a space between said permanent magnet generator armature means, said permanent magnet generator field means and said main field means.

5,191,255
ELECTROMAGNETIC MOTOR
George Kloosterhouse, Malaber, Fla., and Gerard Paquette, Isle of Man, United Kingdom, assignors to Magnetospheric Power Corp. Ltd., Turks and Caicos Isls.
Filed Feb. 19, 1991, Ser. No. 656,798
Int. Cl.[5] H02K 21/12
U.S. Cl. 310—156 11 Claims



1. An electromagnetic motor comprising:
a rotor mounted for rotation about an axis;
a plurality of generally elongate permanent magnets mounted on said rotor in a generally end to end arrangement, so as to form a generally polygonal distribution of said permanent magnets about said axis, a first elongated face of each of said permanent magnets having a north magnetic polarity and a second elongated face of each of said permanent magnets having a south magnetic polarity, and wherein, within the generally polygonal distribution of the magnets of said plurality, alternate ones of said permanent magnets have their first faces of said north magnetic polarity facing outwardly from said rotor and alternate others of said permanent magnets, which are located between said alternate ones of said permanent magnets, have their second faces of said south magnetic polarity facing outwardly from said rotor, so that, as one proceeds around said generally polygonal distribution of said plurality of permanent magnets, one successively encounters an alternating distribution of north and south faces of said plurality of generally elongate permanent magnets;
a plurality of electromagnets supported with respect to said rotor such that at least one pole of a respective electromagnet is disposed adjacent to said generally polygonal distribution of said plurality of generally elongated permanent magnets that are mounted on said rotor, and wherein said plurality of electromagnets are arranged such that as said rotor rotates about said axis, whenever a respective one of said permanent magnets becomes juxtaposed with a pole of a respective electromagnet, both a magnetic polarity of said pole of said respective electromagnet is maintained and only said pole of said respective electromagnet is juxtaposed with said respective one of said permanent magnets during the entirety of travel of said respective one of said permanent magnets past said pole of said respective electromagnet, and wherein, upon completion of the travel of said respective one of said permanent magnets past said pole of said respective electromagnet, the magnetic polarity of said respective electromagnet is changed to an opposite magnetic polarity, is association with said one pole of said respective electromagnet becoming juxtaposed with a respective another of said permanent magnets, an outwardly facing elongated face of which has a magnetic polarity opposite to the magnetic polarity of an outwardly facing elongated face of said respective one of said permanent magnets; and
an electromagnet energization circuit coupled to said plurality of electromagnets and being operative to controllably supply energizing current to said plurality of electromagnets such that poles thereof which are juxtaposed to respective ones of said permanent magnets are of the same magnetic polarity of the juxtaposed permanent magnets, so as to cause magnetic repulsion of the juxtaposed permanent magnets and thereby drive said rotor about said axis.

5,191,256
INTERIOR MAGNET ROTARY MACHINE
Frederick B. Reiter, Jr.; Brad C. Koelblinger, both of Fairfield, Iowa; Daniel W. McGee, Ventura, Calif.; Vasaraju S. R. Murthy, St. Louis, Mo., and John S. Draper, Fairfield, Iowa, assignors to American Motion Systems, Fairfield, Iowa
Filed Dec. 15, 1989, Ser. No. 452,301
Int. Cl.[5] H02K 21/12
U.S. Cl. 310—156 44 Claims



1. A rotor structure for a rotary machine comprising:
a rotor frame comprising a monolithic unitary body of magnetically permeable material having an elongate generally cylindrical shape with outer radial surface portions defining an imaginary circular cylindrical surface of said rotor frame, said rotor frame including a series of channels formed in the outer radial surface portions of said rotor frame and opening radially outwardly therefrom, each of said channels extending continuously along an entire length of said rotor frame and opening outwardly from each opposing end of said rotor frame; and
at least one magnet positioned in each of said channels, each

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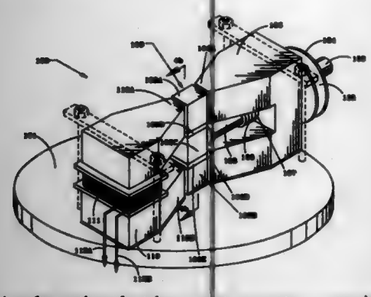
of said magnets having a predetermined shape so as not to protrude radially outwardly beyond the imaginary circular cylindrical surface defined by the outer radial surface portions of said rotor frame.

5,191,257
ARMATURE OF DC MOTOR
Takashi Sugiyama, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Feb. 14, 1992, Ser. No. 835,486
Claims priority, application Japan, Feb. 18, 1991, 3-046166
Int. Cl.[5] H02K 23/26
U.S. Cl. 310—198 4 Claims

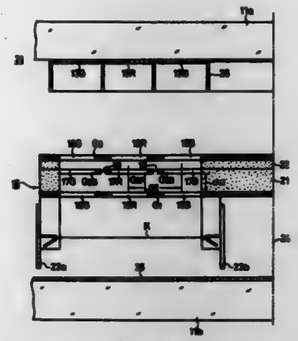
1. An armature for a direct current motor, said armature comprising:
an armature core including a predetermined number of slots formed therein;
half as many commutator bars as said predetermined number of slots;
at least one wave winding type armature coil, said at least one wave winding type armature coil comprising a pair of separate, interconnected coils inserted in said slots, said coils being interconnected at a common front head portion, separated by a distance of two magnetic poles over said armature core, and equal in polarity; and
said at least one wave winding type armature coil further comprising upper and lower connecting leg portions at opposite ends thereof, respectively, for connecting said at least one, wave winding type armature coil to said commutator bars.

5,191,258
ELECTRIC CURRENT GENERATOR INCLUDING TORQUE REDUCING COUNTERMAGNETIC FIELD
James W. Germon, Rte. 2, Box 2091A, Shepherd, Tex. 77371
Filed Sep. 11, 1991, Ser. No. 757,548
Int. Cl.[5] H02K 1/12
U.S. Cl. 310—254 1 Claim



1. An alternating electric current generator, comprising:
(1) a housing;
(2) a motor activated drive shaft rotated by application of torque;
(3) a counter-magnetic field absorbing armature having first and second sides and rotatably carried by said drive shaft, said armature comprising; first and second field transmitting sections at each outboard end on said armature; a central nonmagnetic metal section intermediate said magnetic field transmitting sections; and spacing means positioned between each of said magnetic field transmitting sections and said central nonmagnetic section;
(4) a magnet;
(5) magnetic means on said first side of said armature secured relative to said housing and having a passageway therethrough for receipt of said drive shaft, said magnetic means providing a magnetic path between said magnet and a field coil;
(6) bearing means between said magnetic means and said shaft to permit rotation of said shaft without movement of said magnetic means;
(7) field core means on the second said of said armature and fixedly secured relative to said armature for inducing an electric current energizing said armature; said field core means comprising first and second field core sections; a field coil for generating a counter-magnetic field for absorption by the armature and sandwiched between said first and second field core sections; and
(8) positive and negative electric current conduit means extending from said field core means for transmitting the generated current, whereby, as load is increased on the field coil, the rotation of the drive shaft will increase and the application of torque to said drive shaft may be decreased.

5,191,259
FLUORESCENT DISPLAY APPARATUS WITH FIRST, SECOND AND THIRD GRID PLATES
Masatake Hayashi; Tsuneo Machi, and Minoru Ohzeki, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
PCT No. PCT/JP89/00365, § 371 Date Dec. 5, 1990, § 102(e) Date Dec. 5, 1990
PCT Filed Apr. 5, 1989, Ser. No. 613,731
Int. Cl.[5] H01J 31/15, 29/70
U.S. Cl. 313—497 2 Claims

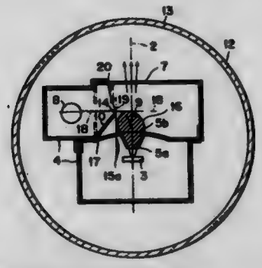


1. A flat type luminescent display, comprising:
a flat type envelope having a face panel, side wall and back plate;
a plurality of segmented luminescent trios on an inner surface of said face panel;
a plurality of cathodes, each cathode disposed in a position in the envelope to uniquely correspond to one luminescent trio in said plurality of luminescent trios;
a first grid plate forming means for pulling out a separate electron beam from each cathode for each segment of the trio uniquely corresponding thereto, said first grid plate being positioned in the envelope adjacent the cathodes and having mesh-like portions corresponding to the segments of each luminescent trio;
a plurality of second grid plates being arranged separate from each other in the envelope by spacing portions, each second grid plate forming means for controlling the electron beam being emitted toward one segment of each luminescent trio, each second grid plate having a mesh-like portion corresponding to said segment;
a third grid plate being disposed in the envelope between said face panel and the second grid plates and forming means to obtain a stable electric field; and
conductor separators surrounding each luminescent trio;
wherein, a relationship of LG2 and d12 is

$$LG2 >> d12$$

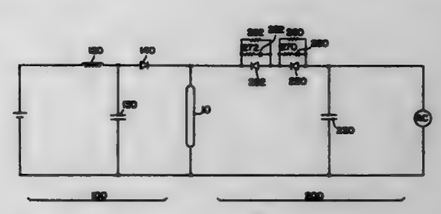
wherein LG2 is a distance between the centers of adjacent segments, and d12 is a spacing between the first grid plate and the second grid plate.

5,191,260
GAS DISCHARGE TUBE PROVIDING IMPROVED FLOW LINE OF ELECTRONS
Koji Kawai, and Yuji Shimazu, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan
Filed Aug. 23, 1991, Ser. No. 749,367
Claims priority, application Japan, Aug. 27, 1990, 2-225918; Jan. 25, 1991, 3-025769
Int. Cl.[5] H01J 17/04, 61/10, 61/12
U.S. Cl. 313—613 10 Claims



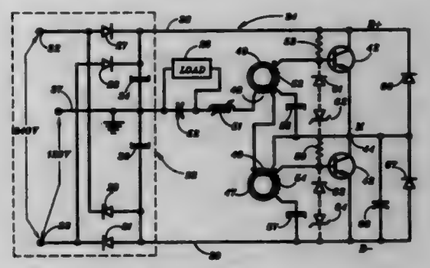
1. A gas discharge tube comprising:
an outer envelope in which a gas is hermetically enclosed;
an anode disposed in the outer envelope;
a cathode disposed in the outer envelope, a flow line of electrons being provided between the cathode and the anode;
a first shield cover for surroundingly covering the anode and the cathode, the first shield cover having a front section formed with an opening which has a center point;
a second shield cover positioned inside the first shield cover at a position immediately adjacent the anode and between the cathode and the anode;
a plasma arc generating portion positioned at the second shield cover for generating a plasma arc, the plasma arc generating portion having one end formed with a bore which provides a center point and confronts the anode and another end formed with an internal conical portion and confronting the front section of the first shield cover, an optical axis extending on a line connecting between the center points of the bore and the opening, and the cathode being positioned offset from the optical axis; and
a shield member positioned between the cathode and the anode and at a position immediately adjacent the another end portion of the plasma arc generating portion for largely bending the flow line of the electrons at a tip end portion of the shield member and for directing the flow line substantially coincident with the optical axis.

5,191,261
SWITCHING POWER SUPPLY FOR HIGH-VOLTAGE FLASH LAMPS
Barton Mass, San Jose, Calif., assignor to Purus, Inc., San Jose, Calif.
Filed Jun. 11, 1991, Ser. No. 714,385
Int. Cl.[5] H05B 37/00
U.S. Cl. 315—171 12 Claims



1. A flash lamp power supply system, comprising:
(a) a simmer power supply circuit, comprising (i) a DC simmer power supply, (ii) means for connecting a flash lamp in series with said DC power supply, and (iii) a capacitor connected in parallel to said power supply and to said flash lamp connecting means, wherein the impedance and capacitance of the simmer power supply are selected so as to provide dV/dT for the simmer power supply circuit equal to or greater than the rate at which the lamp impedance changes during a flash cycle; and
(b) a pulse power supply circuit, comprising (i) a DC pulse source voltage supply, (ii) at least one thyristor, and (iii) means for connecting said lamp in series with said DC pulse source voltage supply and said thyristors, wherein said pulse power supply circuit further comprises a capacitor connected in parallel with said pulse source voltage supply.

5,191,262
EXTRA COST-EFFECTIVE ELECTRONIC BALLAST
Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010
Continuation of Ser. No. 643,023, Jan. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 787,692, Oct. 15, 1985, which is a continuation of Ser. No. 644,155, Aug. 27, 1984, abandoned, which is a continuation of Ser. No. 555,426, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned, said Ser. No. 555,426, is a continuation-in-part of Ser. No. 330,159, Dec. 14, 1981, Pat. No. 4,430,628, which is a division of Ser. No. 973,741, Dec. 28, 1978, abandoned. This application Jan. 13, 1992, Ser. No. 819,655
Int. Cl.[5] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 25 Claims



1. An arrangement comprising:
source means providing a DC voltage at a pair of DC terminals;
inverter means connected with the DC terminals and opera-

desired conditions, the power control circuit including ... gear motor and said spiral drum for rotating said spiral

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tive to provide an inverter output voltage at a pair of inverter terminals; the inverter output voltage; (i) being a periodically alternating voltage, (ii) having a fundamental cycle period with a complete cycle duration, and (iii) having a substantially trapezoidal waveshape; the trapezoidal waveshape having: (i) an up-slope, (ii) a down-slope, (iii) a first segment of substantially constant positive magnitude, and (iv) a second segment of a substantially constant negative magnitude; the duration of the up-slope being approximately equal to that of the down-slope; the duration of the first segment being approximately equal to that of the second segment; the duration of the up-slope being larger than one twentieth of the complete cycle duration but smaller than one third of the complete cycle duration;

gas discharge lamp means having a set of lamp terminals; and

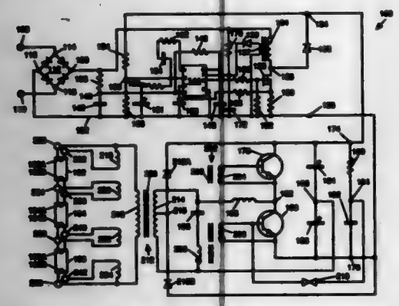
connect and matching means connected in circuit between the inverter terminals and the lamp terminals; the connect and matching means including inductance means operative to cause a manifestly magnitude-limited current to be provided to the gas discharge lamp via its lamp terminals.

5,191,263

BALLAST CIRCUIT UTILIZING A BOOST TO HEAT LAMP FILAMENTS AND TO STRIKE THE LAMPS

John G. Konopka, Barrington, Ill., assignor to Motorola Lighting, Inc., Buffalo Grove, Ill.

Filed Mar. 4, 1992, Ser. No. 845,568
Int. Cl.[5] H05B *41/29*
U.S. Cl. 315—209 R 12 Claims



1. A circuit for driving a gas discharge lamp load, the circuit comprising:

input terminals for connection to a source of AC power;

output terminals for connection to the gas discharge lamp load;

a rectifier coupled to the input terminals for converting the AC power into DC power;

voltage boost means coupled to the rectifier for increasing the voltage of the DC power;

oscillator means coupled to the voltage boost means and to the output terminals for producing AC power at an AC output voltage from the DC power for application to the gas discharge lamp load, the AC output power having a substantially constant high frequency; and

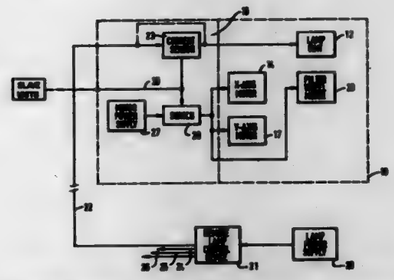
voltage boost temporary excess activation means coupled to the voltage boost means for causing an excessive boosted output voltage to be produced by the voltage boost during a temporary activation period at start-up.

5,191,264

LIGHTING SYSTEM

Colin E. Hammond, Huntsville, Ala., assignor to MHS Inc., Madison, Ala.

Filed Oct. 22, 1991, Ser. No. 780,810
Int. Cl.[5] H05B *37/00*; B60Q *1/02*
U.S. Cl. 315—291 7 Claims



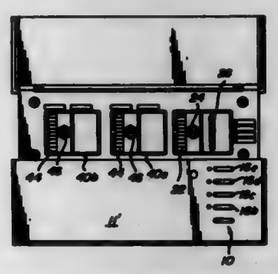
1. A lighting system including a lighting device comprising a lamp unit with a lamp energizable to produce a beam of illumination, and motor means for driving the lamp to change the direction of the beam; control means for association with the lighting device to cause the lamp unit to be moved by the motor means only whilst the lamp is de-energized; and a lamp control device remote from the lighting device and the control means for controlling energization of the lamp.

5,191,265

WALL MOUNTED PROGRAMMABLE MODULAR CONTROL SYSTEM

Michael J. D'Alea, Erwinna; Jonathan H. Fervaco, Riegelsville; Sino P. Hakkarainen, Bethlehem; Joel S. Spira, Coopersburg, and Darryl W. Tucker, Fogelsville, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 9, 1991, Ser. No. 743,244
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—295 28 Claims



1. A wall mountable control system comprising:

a) first switch means having N settings for selecting one of up to N predefined combinations of desired conditions, each setting corresponding to one of the predefined combinations;

b) a modular master control unit (master) coupled to the first switch means and having integral storage means for storing data indicative of each of the predefined combinations and communication means for transmitting control data, including data indicative of the predefined combination selected at the first switch means;

c) a plurality of modular slave control units (slaves) coupled to receive the control data from the master, each slave having an integral power control circuit for controlling power to be delivered to a load associated with one of the desired conditions, the power control circuit including power level selection means for selecting and storing a plurality of different power levels to be delivered to the load, there being a stored power level for each different one of the predefined combinations, each slave being responsive to the control data to select one of the stored power levels;

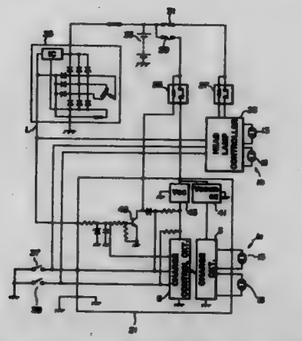
each of the plurality of the slaves thereby controlling a respective load at a power level stored therein as selected by the master to provide the desired combinations in response to the settings of the first switch means.

5,191,266

CIRCUIT AND METHOD FOR CONTROLLING LUMINOUS INTENSITY OF DISCHARGE LAMPS

Tohru Futami; Masao Sakata; Tsuyoshi Todoriki, and Tomio Kasegaya, all of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Feb. 15, 1990, Ser. No. 480,637
Int. Cl.[5] H05B *37/02*; B60Q *1/04*
U.S. Cl. 315—307 28 Claims



1. A control circuit for a discharge lamp comprising:

current control means for controlling a current flowing through a metal vapor discharge lamp;

start detecting means for generating a first input signal in response to detection of starting of an engine; and

discharge control means for switching the current control means in response to the first input signal from an off state in which no current flows through the discharge lamp to a stand-by state in which a stand-by current producing a stand-by warmed-up arc discharge state controllably flows through the discharge lamp, and for switching the current control means between the stand-by state and a full-illumination state in which a full-illumination current producing a full-illumination arc discharge state controllably flows through the discharge lamp.

5,191,267

SYSTEM FOR INDICATING EXTENT OF OVERDRIVE IN FRICTIONAL DRIVE ARRANGEMENTS

David G. Machacek, 513 Union St., Northfield, Minn. 55057

Filed Feb. 20, 1992, Ser. No. 837,899
Int. Cl.[5] H02P *5/46*; B65G *21/18*; F25D *25/04*
U.S. Cl. 318—67 21 Claims

1. Spiral drum freezer apparatus, comprising:

(a) an insulated enclosure;

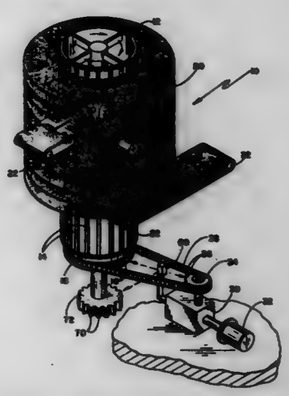
(b) a spiral drum mounted for rotation within said enclosure and including a spiral belt helically disposed around a periphery;

(c) a drum gear motor;

(d) first drive means drivingly engaged between said drum gear motor and said spiral drum for rotating said spiral drum;

(e) second drive means coupled to said spiral belt for driving said spiral belt, including a plurality of rotating guide means guiding said spiral belt;

(f) first speed sensing means coupled to said first drive means



for generating a first output indicative of spiral drum rotational speed;

(g) second speed sensing means coupled to said second drive means for generating a second output indicative of spiral belt speed; and

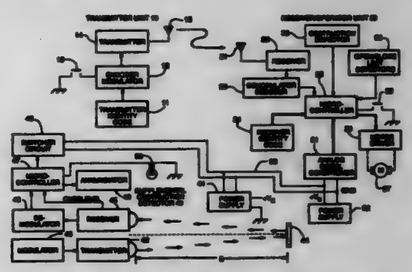
(h) processing means for computing overdrive as a function of said first output and said second output.

5,191,268

CONTINUOUSLY MONITORED SUPPLEMENTAL OBSTRUCTION DETECTOR FOR GARAGE DOOR OPERATOR

Dean C. Duhame, Roseville, Mich., assignor to Stanley Home Automation, Novi, Mich.

Filed Aug. 26, 1991, Ser. No. 750,102
Int. Cl.[5] E05F *15/16*; H02H *7/085*
U.S. Cl. 318—266 25 Claims



1. In an automatic door operator having a motor coupled for moving a door between an open position and a closed position covering an opening, and a controller controlling operation of the motor corresponding to command signals, the improvement comprising:

a supplemental obstruction detector disposed proximate the opening including

obstruction detection means for detecting when the opening is unobstructed,

a safety signal generator connected to said obstruction detection means for generating an active safety signal upon detection that the opening is unobstructed, and

5,191,271

not generating said active safety signal upon failure to detect that the opening is unobstructed, said active safety signal cycling to repetitively cross a predetermined threshold voltage; and

the controller being connected to said supplemental obstruction detector for at least stopping the motor to stop movement of the door upon failure to receive said active safety signal from said supplemental obstruction detector when the motor is closing the door;

wherein the automatic door operator includes a manually operable push button for entry of said command signals, the controller normally initiating door operation upon momentary operation of the push button during receipt of said active safety signal,

the controller being further operative to close the door upon constant operation of the push button during failure to receive said active safety signal from said supplemental obstruction detector.

3. In an automatic door operator having a motor coupled for moving a door between an open position and a closed position covering an opening, and a controller controlling operation of the motor corresponding to command signals, the improvement comprising:

a supplemental obstruction detector disposed proximate the opening;

a two wire cable connecting said supplemental obstruction detector to the controller;

the supplemental obstruction detector including

a power receiving means connected to the two wire cable for receiving electric power for operation of the supplemental obstruction detector via the two wire cable,

obstruction detection means for detecting when the opening is unobstructed,

a safety signal generator connected to said obstruction detection means for generating an active safety signal upon detection that the opening is unobstructed, and not generating said active safety signal upon failure to detect that the opening is unobstructed, said active safety signal cycling to repetitively cross a predetermined threshold voltage, and

a safety signal transmitter connected to the safety signal generator and the two wire cable for transmitting the active safety signal via the two wire cable; and the controller further includes

a power supply means connected to the two wire cable for supplying electric power via the two wire cable, and

a safety signal sensing means connected to the two wire cable for detecting the presence or absence of the active safety signal on the two wire cable by detecting whether the voltage across the two wire cable regularly crosses the threshold voltage; and

the controller being connected to said supplemental obstruction detector for at least stopping the motor to stop movement of the door upon failure to receive said active safety signal from said supplemental obstruction detector when the motor is closing the door.

5,191,269

BRUSHLESS DIRECT CURRENT MOTOR WITH MINIMIZED CURRENT RIPPLE AND METHOD

Francesco Carbolante, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Oct. 10, 1991, Ser. No. 774,793
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 22 Claims

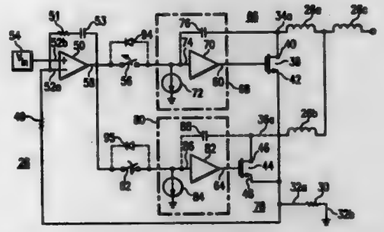
1. A system for use with a brushless, polyphase, direct-current motor having a rotor and stator coils, and a commutation circuit for providing sequencing signals, for maintaining a constant total current in said stator coils during commutation, comprising:

a sense resistor connected at one end to a reference potential;

a feedback amplifier having an inverting input connected to another end of said sense resistor and a non-inverting input connected to a reference voltage;

first and second switches each connected at a first end to an output of said feedback amplifier and connected to be operated by said sequencing signals;

a first transistor connected between a first stator coil and said sense resistor;



a second transistor connected between a second stator coil and said sense resistor; and

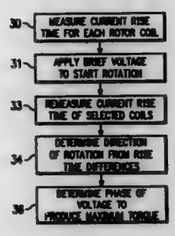
a first current integrator connected to a second end of said first switch to control the turn-off slew rate of current in said first stator coil when said first switch is opened.

5,191,270

METHOD FOR STARTING A MOTOR

Mark J. McCormack, Phoenix, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 7, 1991, Ser. No. 711,919
Int. Cl.[5] H02P *1/18*
U.S. Cl. 318—254 14 Claims



1. A method for determining the direction of starting rotation of a polyphase motor of the type having a plurality of field coils and a rotor, comprising the steps of:

making a first measurement the rise time of current on each of said field coils with the rotor at rest;

applying a voltage to said motor sufficient to produce at least a slight rotation of said rotor;

making a second measurement of the rise time of current on at least two of said field coils with the rotor again at rest;

determining a difference between said first and second rise times measurements,

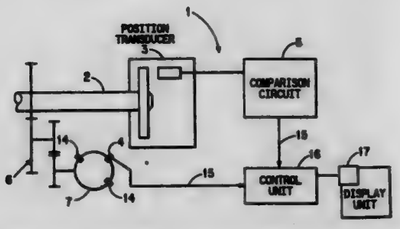
determining from said rise time difference the direction which the rotor rotated.

5,191,271

PROCESS AND DEVICE FOR ADJUSTING AN AXIS

Daniel Hohmeier, Kissing, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

PCT No. PCT/EP89/01497, § 371 Date Sep. 18, 1991, § 102(e) Date Sep. 18, 1991, PCT Pub. No. WO91/08085, PCT Pub. Date Jun. 13, 1991
PCT Filed Dec. 6, 1989, Ser. No. 741,482
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—568.1 13 Claims



1. A process for adjusting an axis, the process comprising the steps of:

providing a mechanical zero point on the axis;

providing a position-measuring system with internal cyclic absolute signaling for measuring movement of the axis away from said mechanical zero point;

providing an adjusting sensor on said axis;

moving the axis to said mechanical zero point;

entering a cyclic absolute actual position value of said position measuring system into an axial control unit when the axis is at said mechanical zero point;

calculating a desired adjustment position of said adjusting sensor in said axis control unit;

moving the axis to said desired adjustment position;

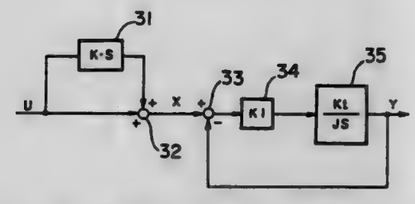
adjusting said adjusting sensor to said desired adjustment position.

5,191,272

METHOD OF ADJUSTING GAIN FOR MOTOR CONTROL

Nobutoshi Torii, Hachioji; Ryo Nihei, and Tetsuaki Kato, both of Minamitsuru, all of Japan, assignors to Fanuc Ltd., Japan

PCT No. PCT/JP91/00434, § 371 Date Nov. 25, 1991, § 102(e) Date Nov. 25, 1991, PCT Pub. No. WO91/15893, PCT Pub. Date Oct. 17, 1991
PCT Filed Apr. 1, 1991, Ser. No. 776,418
Claims priority, application Japan, Apr. 3, 1990, 2-88670
Int. Cl.[5] H02P *5/00*; G05B *11/32, 13/02*
U.S. Cl. 318—609 4 Claims



1. A method of adjusting a feedback gain used in a control system implemented by a computer for controlling a motor driving a load having an inertia in which the inertia of the load is greatly variable, said method comprising the steps of:

determining, using the computer, a first feed-forward gain used in a feed-forward loop of the control system according to a first learning process having a first feedback gain used in a feedback loop of the control system;

calculating, using the computer, a second feedback gain using said first feed-forward gain; and

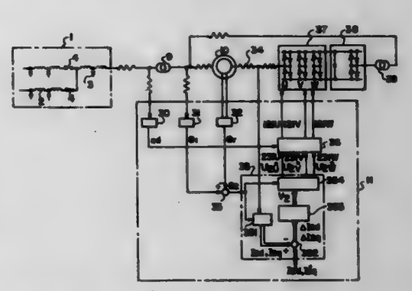
determining, using the computer, a second feed-forward gain using said second feedback gain according to a second learning process, and controlling the motor using the second feedback and feed-forward gains in the control system.

5,191,273

OPERATING CONTROL DEVICE AND METHOD FOR WOUND-ROTOR INDUCTION MACHINE

Takeo Shimamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 798,703, Nov. 29, 1991, abandoned.
This application Jun. 23, 1992, Ser. No. 905,146
Claims priority, application Japan, Nov. 28, 1990, 2-328471
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—828 7 Claims



1. Operating control device for a winding type induction machine wherein control utilizes a PWM controlled inverter for secondary current excitation control of the winding type induction machine connected to a transmission system, comprising:

voltage distortion detection means for detecting a voltage distortion of a primary voltage of said winding type induction machine and producing a voltage distortion signal;

primary voltage phase detection means for detecting a phase of said primary voltage of said winding type induction machine and producing a detected primary voltage phase;

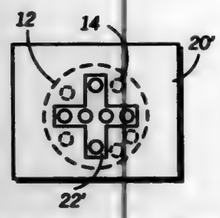
rotor phase detection means for detecting a rotational phase of a rotor of said winding type induction machine and producing a detected rotational phase;

secondary voltage phase calculation means for calculating a phase of a secondary voltage of said winding type induction machine responsive to said detected primary voltage phase and said detected rotational phase and producing a calculated secondary voltage phase;

secondary current control means for calculating voltage command signals for said PWM controlled inverter, responsive to a secondary current of said winding type induction machine, a current command value, and said calculated secondary voltage phase and outputting said voltage command signals; and

gate control means, responsive to said voltage command signals from said secondary current control means and said voltage distortion signal from said voltage distortion detection means, for outputting to said PWM controlled inverter gate control signals for performing PWM control, by modulating said voltage command signals with a triangular wave of modulation frequency responsive to a magnitude of said voltage distortion signal.

5,191,274
METHOD AND APPARATUS FOR CONTROLLING THE SELF-DISCHARGE RATE OF A BATTERY
Robert D. Lloyd, Boca Raton, Fla.; David R. Dworkin, Lawrenceville, Ga., and Tuan Nguyen, Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 426,913, Oct. 26, 1989, abandoned.
This application Jul. 9, 1991, Ser. No. 728,828
Int. Cl.[5] H02J 7/00; H01M 10/46, 4/00, 2/00
U.S. Cl. 320—2 12 Claims

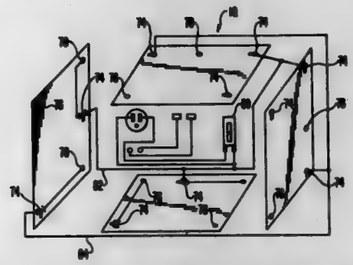


1. A reduced self-discharge energy storage device, comprising:
energy storage means, housed in a casing, for providing energy in response to exposure to an effective amount of at least one activating gas entering through a plurality of supply holes;
interchangeable sealing means having a durometer in a range of durometer ten to fifty being positioned contiguous to said casing on an outer surface for selectively sealing at least one of said plurality of supply holes so as to control or regulate at least one activating gas to contact the energy storage means; and
tension means for maintaining an effective amount of force between said energy storage means and said interchangeable sealing means.

5,191,275
RECHARGEABLE BATTERY PACK DEVICE
Tara C. Singhal, P.O. Box 5075, Torrance, Calif. 90510
Filed Aug. 12, 1991, Ser. No. 743,171
Int. Cl.[5] H01M 10/44
U.S. Cl. 320—2 3 Claims

1. In battery applications, for which an arrangement of plurality of rechargeable nickel cadmium battery cells, in place of an equal number of same size alkaline battery cells is preferable but not used, due to voltage differences in the two cell types and the resulting voltage difference in the arrangement of cells, a battery cassette for use in such applications comprising of:
(a) a battery cassette housing whose external dimension are those of the space occupied by an arrangement of size AA alkaline cells;
(b) said cassette having inside it a plurality of size AAA Nickel cadmium type rechargeable cells;
(c) said plurality of size AAA cells in number being equal to output a voltage nearly equal to that output by said arrangement of size AA alkaline cells;
(d) said plurality of size AAA cells arranged in place holders, inside said battery cassette enabling them to remain secure in their places;
(e) said plurality of size AAA cells electrically connected in series, and resulting overall positive and negative terminals accessible from outside the said cassette;
(f) spatial position of said resulting overall positive and negative terminals being in the same spatial position as of the corresponding terminals of said arrangement of size AA alkaline cells.

5,191,276
VERSATILE BATTERY/CHARGER MODULE AND SYSTEM
Mortaza Zaiaaleain, Cordova, Tenn., assignor to Federal Express Corporation, Memphis, Tenn.
Filed Jul. 10, 1991, Ser. No. 727,980
Int. Cl.[5] H02J 7/00; H01M 10/46
U.S. Cl. 320—2 24 Claims

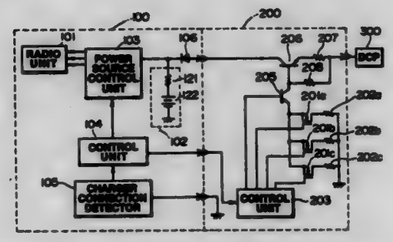


1. A battery/battery charger module for holding a battery pack and a battery charger and for connecting with a power source, the module comprising:
a housing having multiple exterior surfaces;
first electrical connections located in the housing and positioned for connection with the battery pack;
second electrical connections located in the housing and positioned for connection with an input of the battery charger;
third electrical connections located in the housing and positioned for connection with an output of the battery charger;
additional electrical connections for connecting the electrical power source to the second electrical connections and connecting the third electrical connections with the first electrical connections; and
electrical junctions on respective ones of at least two of the exterior surfaces, the junctions connected to the power source and allowing the module to be electrically connected to another battery/battery charger module, said junctions selected from the type of junctions which are retractable and removable.

5,191,277
ELECTRONIC APPARATUS CAPABLE OF CONTROLLING ELECTRIC CURRENT SUPPLY
Akira Ishikura, Tokyo, and Takaaki Ishii, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 19, 1990, Ser. No. 584,828
Claims priority, application Japan, Sep. 20, 1989, 1-245971
Int. Cl.[5] H02J 7/00; H01M 10/46
U.S. Cl. 320—22 3 Claims

1. An electronic apparatus capable of controlling electric current supply, comprising:
a charger; and
an electronic device removably connected to the charger, the electronic device comprising:

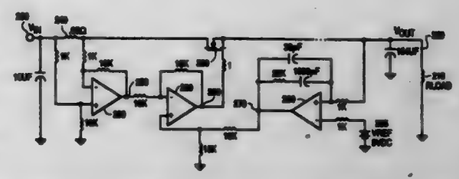
a rechargeable battery unit charged by the charger when the charger is connected to the electronic device;
an electronic unit having a plurality of operational modes in each of which the electronic unit is operated by an operating current of different values, the operating current being supplied from the rechargeable battery unit;
connection detecting means for detecting the connection of the charger to the electronic device; and
first control means for generating a control signal indicative of an appropriate supplying current value to be supplied from the charger on the basis of an appropriate operating current value for each of the operational modes of the electronic unit and a specified charging current value of the battery unit, and supplying the control signal to the charger when the connection detecting means detects that the charger is connected to the electronic device, wherein the first control means comprises
an electric current table for storing the appropriate operating current value corresponding to each of the operational modes of the electronic unit;
means for detecting a present operational mode of the electronic unit;



means for retrieving an appropriate operating current value corresponding to the present operational mode from the electric current table on the basis of the present operational mode;
means for calculating the appropriate operating current value to be supplied by the charger by adding the appropriate operating current value retrieved by the retrieving means and the specified charging current of the rechargeable battery unit; and
means for informing the charger of the appropriate supplying current value calculated by the calculating means when the connection detecting means detects that the charger is connected to the electronic device,
the charger comprising:
current supply means for supplying an electric current to the electronic device; and
second control means for controlling the current supply means such that the electric current to be supplied from the current supply means to the electronic device coincides with the appropriate supplying current value when supplied with the control signal from the first control means.

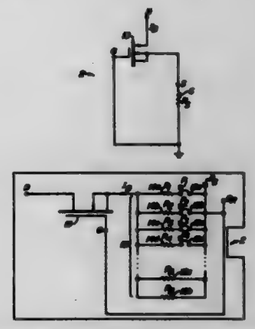
5,191,278
HIGH BANDWIDTH LOW DROPOUT LINEAR REGULATOR
Brian A. Carpenter, Delaplane, Va., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 23, 1991, Ser. No. 780,600
Int. Cl.[5] G05F 1/565
U.S. Cl. 323—275 12 Claims

1. A linear regulator circuit for controlling the voltage applied from a power source to a load comprising:
a single reference voltage;
means, including a circuit element for sensing the current drawn by the load and generating a voltage across the circuit element proportional to the current, said current sensing means having an input connected to the source and, providing a first voltage output;
means for sensing voltage across the load said voltage sensing means having a first input connected to the load and a second input connected to the single reference source and providing a second voltage output;
means for summing the first and second voltage outputs from the current and voltage sensing means and providing a third output signal;



means for switching the first and second outputs as a function of frequency of the voltage sensing and current sensing means; and
means for regulating a power source, said regulating means responsive to the output of said summing means, whereby changes in the current drawn or voltage across a load change the resistance of said regulating means.

5,191,279
CURRENT LIMITING METHOD AND APPARATUS
Nathan Zommer, Los Altos, Calif., assignor to Ixys Corporation, San Jose, Calif.
Filed Mar. 15, 1990, Ser. No. 494,198
Int. Cl.[5] G05F 1/00
U.S. Cl. 323—354 12 Claims



1. Apparatus for providing a substantially constant current from a voltage source comprising:
a) a field effect transistor for controlling a current from a voltage source; and
b) a resistive network attached to a terminal of said transistor, said resistive network comprising at least one resistive element in series with a fusible link, said fusible link providing an open circuit upon application of a voltage across said fusible link, a control element of said transistor connected to an output of said resistive network, said resistive network and said transistor also being fabricated on a single die.

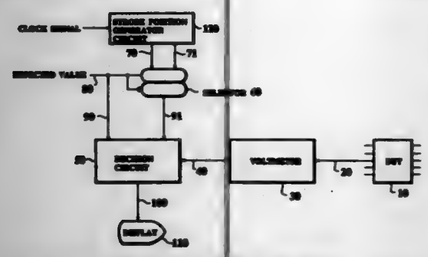
measuring the relative speed of said cylinder and piston from

5,191,285

5,191,280
ELECTRICAL CONTACT TEST PROBE
Sidney Levy, Belle Mead, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.
Filed Jul. 25, 1991, Ser. No. 735,596
Int. Cl.[5] H01R 4/30; G01R 1/06
U.S. Cl. 324—72.5 13 Claims

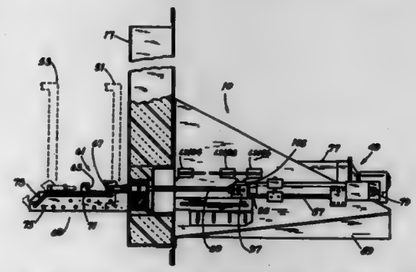
1. An attachable test probe device for establishing electrical engagement between an electrical contact supported within an insulative housing, accessible through an opening therein and an existing alligator clip having a pair of actuatable jaws defining a connection region therebetween, said test probe device comprising:
an elongate probe member insertable into said housing through said opening for electrical engagement with said contact; and
an attachment member electrically coupled to said probe member, said attachment member including means for electrically and mechanically securing said attachment member to said alligator clip at a location remote from said connection region thereof;
wherein said attachment member includes an elongate attachment extent and wherein said securing means includes a pair of traverse deformable tabs extending from said elongate extent of said attachment member, said tabs being crimpably deformable to secure said attachment member to said alligator clip.

5,191,281
IC TESTER CAPABLE OF CHANGING STROBE POSITION IN ACCORDANCE WITH A PREDETERMINED REFERENCE SIGNAL
Kazuhiko Ohashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 20, 1991, Ser. No. 747,627
Claims priority, application Japan, Aug. 21, 1990, 2-218102
Int. Cl.[5] G01R 31/28
U.S. Cl. 324—158 R 7 Claims



7. An apparatus for testing an IC comprising:
a strobe position generator circuit generating a plurality of strobe signals indicating a value of a clock signal at a corresponding plurality of sample times within a clock period;
a selector, receiving said plurality of strobe signals and a predetermined reference signal, and outputting a selected strobe signal; and
a comparison and decision circuit, receiving an output signal of said IC, said predetermined reference signal and said selected strobe signal, comparing said IC output signal with said predetermined reference signal in synchronism with said selected strobe signal, and outputting a signal representative of said comparison.

5,191,282
UNITIZED TEST SYSTEM WITH BI-DIRECTIONAL TRANSPORT FEATURE
Peter A. Liken, West Olive; Robert J. Holmes, Grand Rapids, and George J. Bouwman, Saugatuck, all of Mich., assignors to Venturedyne, Ltd., Milwaukee, Wis.
Filed Oct. 23, 1991, Ser. No. 780,623
Int. Cl.[5] G01R 31/02; H01R 13/631
U.S. Cl. 324—158 F 17 Claims

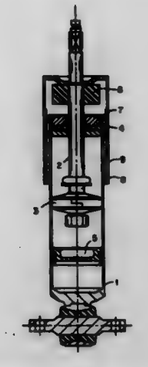


1. An improved system for transporting electrical circuit boards into and out of an environmental chamber including:
a movable carrier supporting plural circuit boards;
an insertion/extraction assembly powering the carrier between a test position and a carrier removal position;
the assembly including a motor exterior the chamber and at least one actuator extending into the chamber for assembly attachment to move the carrier between positions,
whereby the circuit boards are substantially simultaneously transported between the positions.

5,191,283
METHOD OF MEASURING RELATIVE SPEED AND REGULATING THE IN AND OUT STROKES IN A MOTOR-VEHICLE DASHPOT
Ludger Gesenhues, Witten, Fed. Rep. of Germany, assignor to August Bilstein GmbH & Co. KG, Ennepetal, Fed. Rep. of Germany
Filed Sep. 4, 1991, Ser. No. 754,925
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1990, 4036703
Int. Cl.[5] G01P 3/48, 3/54; F16F 9/49, 9/50
U.S. Cl. 324—174 8 Claims

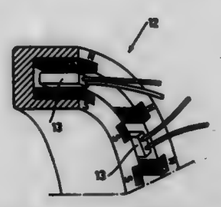
1. A method for measuring relative speed and regulating farthest-in and farthest-out positions of a shock-absorbing cylinder and a shock-absorbing piston movable back and forth within said cylinder and attached to a piston rod in a motor-vehicle dashpot, comprising the steps of: providing said piston with a sensor coil; providing said cylinder with a permanent magnet movable relative to said sensor coil and along said sensor coil; processing by an electric circuit a voltage induced in said sensor coil through relative motion between said sensor coil and said permanent magnet for regulating said farthest-in and farthest-out positions; moving said magnet always past one end of said coil just before said piston enters its farthest-in or farthest-out positions for increasing the voltage induced in said coil; generating a signal from the increased voltage to represent one of the dashpot's farthest-in or farthest-out positions;

measuring the relative speed of said cylinder and piston from said voltage induced in said coil; and regulating said farthest-in



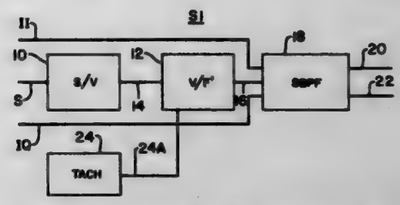
and farthest-out positions in response to a predetermined voltage threshold.

5,191,284
DEVICE FOR DETECTING THE RELATIVE ROTATIONAL SPEED OF TWO ELEMENTS IN A VEHICLE WHEEL
Roberto Moretti, Cambiano, and Angelo Varvello, Turin, both of Italy, assignors to SKF Industrie S.p.A., Turin, Italy
Filed Jul. 1, 1991, Ser. No. 723,746
Claims priority, application Italy, Apr. 7, 1990, 67490 A/90
Int. Cl.[5] G01P 3/487; G01R 33/06
U.S. Cl. 324—174 9 Claims



1. Device for use in a braking system capable of detecting the rotational speed of two relatively rotatable rings of a roller bearing having inner and outer relatively rotatable bearings rings supporting a vehicle wheel, comprising a deflector mounted on one bearing ring having twin magnetized rings with pairs of poles of opposite sign on respective rings confronting each other, magnetic sensors carried by a second deflector mounted on the other bearing ring operatively disposed between the twin magnetized rings, said magnetic sensors being located between confronting poles, the number of which conforms to the pairs of opposite sign poles of said twin magnetized rings, said magnetic sensors being separated by multiples or fractions of half the pitch between paris of adjacent poles such that only one sensor at a time is radially aligned with confronting poles of the magnetized rings to produce signals having a frequency proportional to the relative speed of the inner and outer rings.

5,191,285
SPEED RESPONSIVE FILTERING CONTROL SYSTEM FOR FLAW DETECTION APPARATUS
Said Ghoshtine, and Paul J. Bebick, both of Bronx, N.Y., assignors to Magnetic Analysis Corporation, Mount Vernon, N.Y.
Filed Jul. 19, 1991, Ser. No. 732,826
Int. Cl.[5] G01N 27/82, 27/90; G01R 33/12
U.S. Cl. 324—225 21 Claims



1. A system for processing signals produced by magnetic flaw detection apparatus having facility for examining objects in the course of transport thereof at speeds varying from a prescribed slow speed to a prescribed high speed with transport frequency thereby being within a first frequency range, said system comprising:
(a) first means for detecting the speed of transport of an object under examination and generating output signals having characteristics indicative to said detected speed and extending over a given characteristic range correspondingly with said first frequency range;
(b) second means for receiving said first means output signals and transforming the same into a second frequency range substantially expanded as compared to said first frequency range, said second means storing a plurality of band pass filter center frequency selections in said second frequency range correlated with said transport speed indications in said first means output signals and operable for providing control signals indicative of center frequency selections corresponding with said first means output signals; and
(c) variably settable filter means for receiving said signals produced by said magnetic flaw detection apparatus and said second means control signals and responsive to said second means control signals to establish a band pass filter center frequency for processing said signals received from said magnetic flaw detection apparatus.

5,191,286
METHOD AND PROBE FOR NON-DESTRUCTIVE MEASUREMENT OF THE THICKNESS OF THIN LAYERS AND COATINGS
Helmut Fischer, Industriestr. 21, 7032 Sindelfingen 6, Fed. Rep. of Germany
Filed Jun. 25, 1991, Ser. No. 720,885
Int. Cl.[5] G01R 33/12
U.S. Cl. 324—230 22 Claims

9. Probe for the non-destructive measurement of the thickness t, of thin layers comprising
an inner core having a geometrical center,
at least two active coil devices each generating a different magnetic field for the same layer thickness measurement and having geometrical centers wound nondisplaceable in relation to said inner core,
said geometrical centers of said inner core coinciding with said geometrical centers of said coil devices,
said coil devices being adapted to transmit two different output values corresponding to said different magnetic fields,
each coil device having an output line, and

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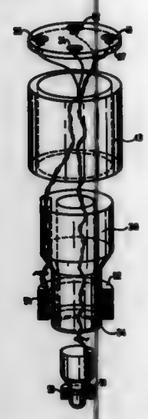
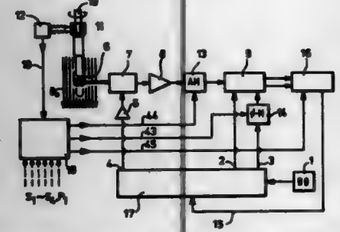
electrode is centrally located with respect to said shoe;

computer means connected to said output lines for computing said layer thickness, t, by resolution of output



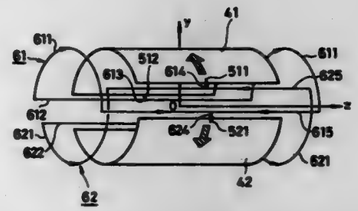
values occurring during the same layer thickness measurement from said coil devices.

5,191,287
METHOD AND DEVICE FOR COMPENSATING UNDESIRABLE SIDE BANDS IN NUCLEAR MAGNETIC RESONANCE SPECTRA
Daniel Marek, Mörlken; Anton Kaster, Greifensee, both of Switzerland; Arno Kasten, Karlsruhe, Fed. Rep. of Germany, and Tschopp Werner, Forch, Switzerland, assignors to Spectrospin AG, Switzerland
Filed May 9, 1991, Ser. No. 697,682
Claims priority, application United Kingdom, May 10, 1990, 4015856; Jun. 13, 1990, 4018836
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—307 15 Claims



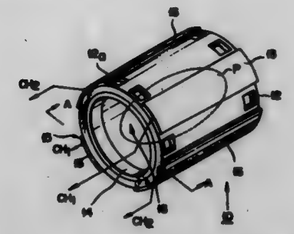
1. Method for compensating at least one type of side band selected from a group of side bands consisting of H_0, H_1, and Q modulation side bands, which are provoked by rotation of a sample in a nuclear magnetic resonance spectrometer, said method comprising:
detecting a frequency of rotation (ω_m) and phase of rotation of the sample; and
modulating an amplitude and phase of a detected nuclear signal with modulation signals, the modulation signals being composed of modulation components having frequencies equal to the frequency of rotation (ω_m) of the sample and integral multiples thereof, the modulation components being synchronized in locked phase relation to the rotation of the sample for Q modulation compensation, and
for H_0 and H_1 side-band compensation, the modulation components are locked in phase with the rotation of the sample and the start of the transmitter pulse, or a pulse sequence for exciting the nuclear signal is locked in phase with the modulation components, and
for H_0 and H_1 side-band compensation, when nuclear magnetic signals are summed up from a plurality of pulse excitations, the phase relation between the modulation components and the rotation of the sample is constant within each recording period, despite differences for different recording periods and starting times of the transmitter pulse, or a pulse sequence for the excitation of the nuclear magnetic signal, and the modulation components exhibit a constant phase relationship over all excitation periods.

5,191,288
COIL FOR GENERATING GRADIENT MAGNETIC FIELD
Michiru Fujita, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Jun. 26, 1991, Ser. No. 721,701
Claims priority, application Japan, Jun. 29, 1990, 2-171863
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—318 7 Claims



1. A gradient magnetic field coil for generating a magnetic field in a determined direction and superpositioning said magnetic field onto a uniform magnetic field comprising:
at least one pair of conductive thin plates, each plate being placed on a surface of a common cylinder and facing to each other on both sides of a plane including a central axis of said cylinder; and
a plurality of rod conductors for supplying an electric current to said at least one pair of conductive thin plates wherein in case of defining a body center of said cylinder to be an origin, defining a central axis of said cylinder to be a z axis, defining an axis included in said plane, intersecting said z axis at said origin and being vertical to said z axis to be an x axis and defining an axis intersecting said z axis at said origin and being vertical to said x axis and z axis to be a y axis;
said at least one pair of conductive thin plates have a symmetrical shape with respect to an x-y plane and a y-z plane;
said conductive thin plates, each facing to each other, are placed in a symmetrical position with respect to an x-z plane;
said at least one pair of conductive thin plates and said rod conductors are connected so that an electric current distribution on said conductive thin plates, each facing to each other, may be symmetrical with respect to the x-z plane and said each electric current in said conductive thin plates may flow in an opposite direction to each other.

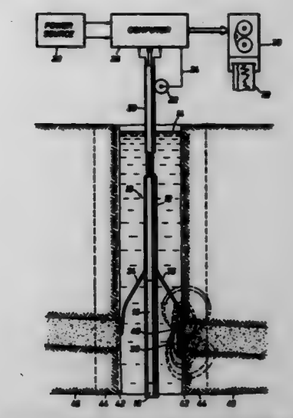
5,191,289
RF-COIL FOR MRI APPARATUS
Hiroshi Hayakawa, Ootawara, and Toru Aratani, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Jan. 4, 1991, Ser. No. 638,162
Claims priority, application Japan, Jan. 10, 1990, 2-1146[U]
Int. Cl.[5] G01V 3/00
U.S. Cl. 324—318 7 Claims



1. An RF coil for magnetic resonance imaging apparatus, comprising:
a dielectric unit having an inner surface and outer peripheral surface;
a plurality of coil conductor means for generating a magnetic field, said coil conductor means arranged on the outer peripheral surface of the dielectric unit in a mutually adjacent relation;
a plurality of frames provided on the inner surface of the hollow dielectric unit, wherein
an accommodation space for locating a living subject therein for examination is defined inside the hollow dielectric unit to allow an RF wave to be transmitted and received to and from the subject located in the space, and
a plurality of openings in said dielectric unit for reducing dielectric loss arranged in a circumferential portion of the dielectric unit between the frames and the coil conductor means.

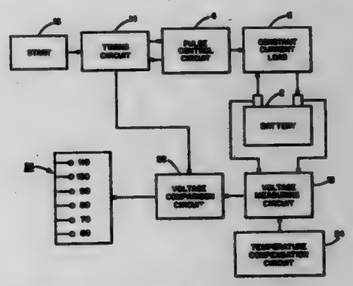
5,191,290
LOGGING APPARATUS FOR MEASUREMENT OF EARTH FORMATION RESISTIVITY
Stanley C. Gianzero, and Roland E. Chemali, both of Austin, Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.
Continuation of Ser. No. 176,085, Apr. 1, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 604,302
Int. Cl.[5] G01V 3/02, 3/06, 3/18
U.S. Cl. 324—374 9 Claims

1. A shoe for obtaining electrical conductivity measurements of formations traversed by a well borehole, the shoe being supported on a logging apparatus, and comprising:
(a) a wall engaging face on said shoe made of a conductive material having a focusing section;
(b) first, second and third aligned electrodes for emitting focused current into formations adjacent to a well borehole, said electrodes aligned and displayed along the length of said face;
(c) an exposed rear face spaced behind said wall engaging face on said shoe opposite said focusing section wherein said rear face is formed of an insulative material;
(d) a return conductive electrode disposed behind said conductive wall engaging face, said rear electrode being surrounded by said insulative rear face wherein said return electrode is centrally located with respect to said shoe; and



(e) current measuring means connected with said electrodes for measuring focused current directed from said focusing section for determining formation related resistivity.

5,191,291
METHOD AND APPARATUS FOR DETERMINING THE PERFORMANCE CAPABILITIES OF SECONDARY BATTERIES
George Taylor, Musket La., Westford, Mass. 01886
Filed Apr. 30, 1991, Ser. No. 693,397
Int. Cl.[5] G01N 27/02
U.S. Cl. 324—429 15 Claims



1. The method of determining the capability of a rechargeable battery to deliver its rated load comprising the steps of
providing a predetermined battery load,
establishing a reference voltage representative of the terminal voltage of a good, fully-charged battery of the type being tested immediately upon being connected to a load equal to said predetermined load,
for a predetermined time period cyclically connecting and disconnecting said predetermined load from said terminals to produce successive on-periods and off-periods, the frequency of said cyclical load being between 10 and 50 Hz,
measuring an ending terminal voltage during an on-period at the end of said time period, and
comparing said ending terminal voltage with said reference voltage as a measure of the capability of said battery to deliver its rated load.

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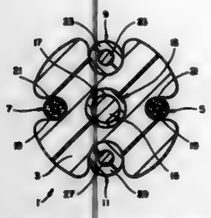
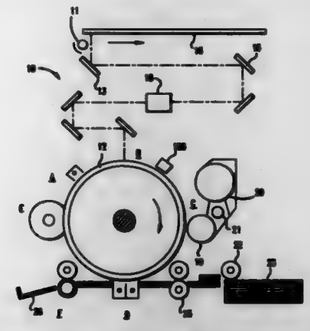
5,191,292
METHOD OF MAKING A SENSOR CABLE
Sheldon M. Klotz, Fremont; Michael Masia, and Cynthia A. Tomlinson, both of Redwood City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 514,500, Apr. 26, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 769,561
Int. Cl.[5] G01N *27/06*
U.S. Cl. 324—446 **16 Claims**



1. A method of making a sensor cable, said method comprising
(1) providing an elongate core member whose outer surface comprises a deformable insulating material;
(2) wrapping a first elongate conductor spirally around the core member so that a first spiral portion of said deformable material is deformed by pressure exerted on it by the first elongate conductor and thus provides (i) a first channel which partially surrounds the first conductor and (ii) at least one first shoulder extending outwardly beyond the first conductor; and
(3) wrapping a second elongate conductor spirally around the core member so that it is spaced apart from the first conductor and so that a second spiral portion of said deformable material is deformed by pressure exerted on it by the second elongate conductor and thus provides (i) a second channel which partially surrounds the second conductor and (ii) at least one second shoulder extending outwardly beyond the second conductor;
the first and second elongate conductors having exposed surfaces which, if the product of step (3) is immersed in an electrically conductive liquid, are contacted by the liquid, the liquid thus providing an electrical connection between the first and second conductors.

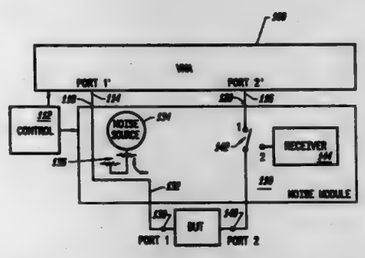
5,191,293
PARK AND RIDE METHOD FOR DETERMINING PHOTORECEPTOR POTENTIALS
Douglas A. Kreckel, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 30, 1991, Ser. No. 752,793
Int. Cl.[5] G01N *27/60*
U.S. Cl. 324—452 **23 Claims**

1. A method of measuring the voltage of the surface of an electrostatic image recording device within a copier or printer, comprising the steps of:
charging a portion of the surface of the recording device with a charging means to create a charged portion;
rotating the recording device;
stopping the rotation of the recording device when said charged portion is adjacent to a charge measuring means;



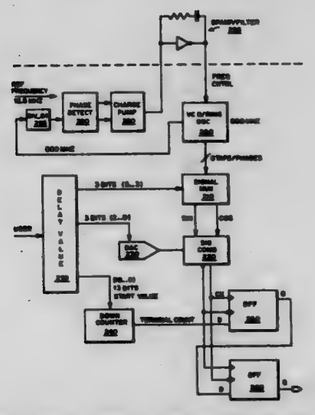
measuring a voltage, v_1, of said charged portion with said charge measuring means at a predetermined time.

5,191,294
MEASURING NOISE FIGURE AND Y-FACTOR
Martin I. Grace, San Jose; Donald A. Bradley, Morgan Hill, and James N. Lin, San Jose, all of Calif., assignors to Wiltron Company, Morgan Hill, Calif.
Continuation of Ser. No. 502,825, Apr. 2, 1990, abandoned. This application Jul. 21, 1992, Ser. No. 917,909
Int. Cl.[5] G01R *27/06*
U.S. Cl. 324—613 **28 Claims**



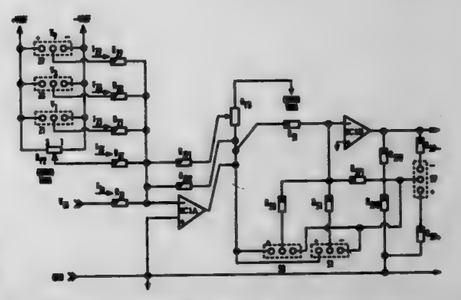
1. A noise measurement system for determining the noise factor of a DUT having first and second ports, comprising:
first and second primary test ports for coupling to respectively said first and second ports of said DUT;
a noise source having a port and operable at selectably a first or a second temperature T_C or T_H;
a power detector having an input port;
termination characterization apparatus having first and second secondary test ports;
means for coupling said first primary test port to said first secondary test port and selectably to said port of said noise source;
means for coupling said second primary test port to said second secondary test port and selectably to said port of said power detector; and
control means for controlling said termination characterization apparatus to:
measure first and second source terminations looking into said port of said noise source operating at respectively T_C and T_H, with said first primary test port coupled to said port of said noise source, said second primary test port coupled to said second secondary test port and said first primary test port coupled to said second primary test port,
measure a first load termination looking into said first port of said DUT, with said first primary test port coupled to said first secondary test port and to said first port of said DUT, said second primary test port coupled to said second port of said DUT and to said port of said power detector, and
measure first and second noise power levels N_1 and N_2 delivered to said power detector, with said first primary test port coupled to said port of said noise source and to said first port of said DUT and said second primary test port coupled to said port of said power detector and to said second port of said DUT, and with said noise source operating at T_C and T_H respectively; and
means for calculating a value for said noise factor of said DUT as a function of N_1, N_2, T_C, T_H, said measured first and second source terminations, and said measured first load termination.

5,191,295
PHASE SHIFT VERNIER FOR AUTOMATIC TEST SYSTEMS
R. Warren Necoechea, Fremont, Calif., assignor to LTX Corporation, Westwood, Mass.
Filed Mar. 11, 1992, Ser. No. 849,521
Int. Cl.[5] H03D *3/24*
U.S. Cl. 328—155 **11 Claims**



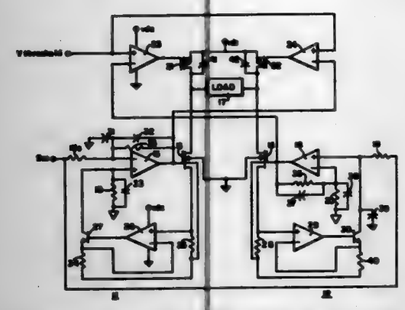
1. A phase shift vernier for an automatic test system for testing integrated circuit devices, said phase shift vernier providing an output signal from an integrated circuit device with continuously variable delay based on an input phase delay value, comprising:
delay value means for receiving said input phase delay value, said input phase delay value indicating an amount of delay for said output signal from said integrated circuit device;
ring oscillator means for circulating an oscillating signal through a plurality of differential stages to generate a plurality of pairs of quadrature signals with a plurality of phase delays, said oscillating signal having a predetermined frequency, each of said differential stages being connected in series, each of said stages phase-shifting its inputs by a predetermined phase delay to generate its differential outputs from each stage;
multiplexor means coupled to said ring oscillator means and to said delay value means for receiving said plurality of pairs of quadrature signals from said ring oscillator means, said multiplexor means selecting first and second signals from said plurality of pairs of quadrature signals from said ring oscillator means in response to said input phase delay value from said delay value means;
DAC means coupled to said multiplexor means and to said delay value means for generating first and second currents, said DAC means generating a current amplitude ("M") based on a predetermined number of least significant bits of said input phase delay value from said delay value means, said first and second currents having an amplitude ratio of (1–0.2*M)/M;
combiner means coupled to said DAC means and to said multiplexor means for generating said output signal whose phase is said first quadrature signal shifted by said input phase delay value, said combiner means multiplying said first and second quadrature signals with said first and second currents to generate third and fourth quadrature signals, respectively, said third and fourth quadrature signals having amplitudes equal to the amplitudes of said first and second currents, respectively, said combiner means further adding said third and fourth quadrature signals to generate said output signal shifted by said input phase delay value.

5,191,296
SIGNAL CONDITIONING CIRCUIT
Giorgio Novelli, Milan, Italy, assignor to Elcon Instruments S.r.l., Italy
Filed Sep. 19, 1991, Ser. No. 762,349
Claims priority, application Italy, Nov. 29, 1990, 22231 A/90
Int. Cl.[5] H03F *1/02*; H03G *9/902*
U.S. Cl. 330—9 **10 Claims**



1. A signal conditioning circuit for amplifying a signal and providing a DC offset to the signal, said signal conditioning circuit comprising:
an amplifier for providing said DC offset;
at least three resistors, one end of each of said three resistors coupled to said amplifier, for biasing said amplifier;
at least three switching means, each of said at least three switching means having at least three terminals, a first terminal of each of said at least three switching means corresponding and coupled to one end of a corresponding one of said at least three resistors; and
at least two predetermined DC voltage sources, each of said at least two predetermined DC voltage sources corresponding to and coupled to a corresponding other of said at least three terminals of said at least three switching means;
wherein each of said three switching means may be selectively closed to connect a corresponding one of said three resistors to one of said two predetermined DC voltage sources so as to bias said amplifier to provided a predetermined DC offset.

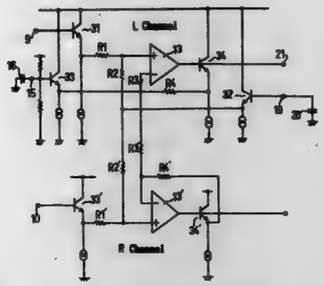
5,191,297
TRANSCONDUCTANCE AMPLIFIER HAVING SENSFETS WHICH DRIVE A LOAD WITH LINEARLY PROPORTIONAL CURRENT
Richard Penman, N. Ogden, and Sean Varley, Salt Lake City, both of Utah, assignors to Iomega Corporation, Roy, Utah
Filed Jul. 25, 1991, Ser. No. 735,646
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—146 8 Claims



1. A transconductance amplifier which drives a load with current which is linearly proportional to an input signal comprising:
two sensfet semiconductor devices, each having a source pin, a drain pin, a gate pin, a mirror pin, and a Kelvin pin, said sensfet devices being of the type in which the current flowing between said source and said drain is controlled by said gate pin, and the current from said mirror pin is a small fraction of the current between said source pin and said drain pin;
a source of power current for each of said sensfet devices, each source of current and said load being connected with said source pins and said drain pins so that said sensfet devices control the flow of current through said load, said sensfet devices being connected as an H bridge amplifier with said load being connected between the drain pins of said sensfet devices;
said input signal being applied to said gate pins;
source means for producing a sense current connected to said mirror pins, said sense current being linearly proportional to said current through said load; and
negative feedback means connected between said source of sense current and said gate pins to apply negative feedback to said gate pins to maintain the current flow through said load linearly proportional to said input voltage.

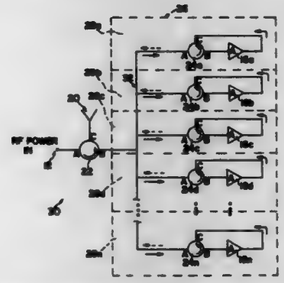
5,191,298
ISOLATION AMPLIFIER CIRCUIT
Hiroyuki Funahashi, and Chung C. Sun, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan
Filed Nov. 21, 1991, Ser. No. 795,432
Claims priority, application Japan, Nov. 24, 1990, 2-319999
Int. Cl.[5] H03F *1/30, 3/68*
U.S. Cl. 330—149 6 Claims

1. An isolation amplifier circuit comprising:
an operational amplifier provided with first and second input terminals, an output terminal, and a feedback resistor for connecting said output terminal and second input terminal;
a first emitter follower, for inputting a signal, connected to said first input terminal, said first emitter follower having a first dynamic resistance;
a second emitter follower connected between said output terminal and said feedback resistor, said second emitter follower having a second dynamic resistance;
a third emitter follower connected between said second input terminal and a first ground impedance, said third emitter follower having a third dynamic resistance;
a fourth emitter follower connected between said first input terminal and a second ground impedance, said fourth emitter follower having a fourth dynamic resistance; and



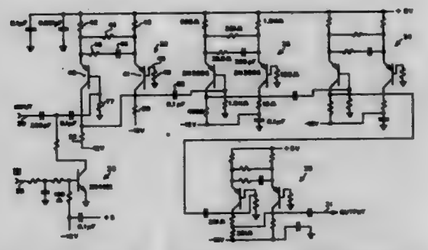
means for making said dynamic resistances of each of said first, second, third, and fourth emitter followers equal, thereby eliminating distortion caused by unequal dynamic resistances.

5,191,299
RADIAL POWER COMBINING OF FIELD-EFFECT TRANSISTOR-BASED AMPLIFIERS
Gerald H. Nesbit, Rollings Hills Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Jul. 15, 1991, Ser. No. 730,131
Int. Cl.[5] H03F *3/68, 3/60*
U.S. Cl. 330—295 16 Claims



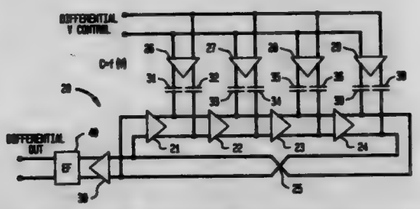
1. An amplifier circuit employing a plurality of amplifiers for amplifying a high frequency signal, said circuit comprising:
input means for receiving a high frequency input signal;
output means for supplying an amplified output signal therefrom;
a network including a plurality of amplifiers, each amplifier having an input path for receiving a portion of said input signal and an output path for providing a portion of said output signal wherein said input path is separate from said output path; and
a radial power combiner/divider means having a plurality of power lines extending therefrom, each line being respectively coupled to one of said amplifiers, said radial power combiner/divider means transmitting portions of the input signal to each of the plurality of amplifiers via respective power lines, and said combiner/divider means also serving to receive said portions of said output signal from the output path of each of said amplifiers via the same respective power lines and combine said portions of said output signals to provide said amplified output signal.

5,191,300
LOCAL AREA NETWORK AMPLIFIER FOR TWISTED PAIR LINES
Martin H. Graham, Berkeley; Anthony J. Ireland, Pleasant Hill; Mark Miller, Oakland, and Matthew Taylor, Pleasant Hill, all of Calif., assignors to Tutankhamon Electronics, Inc., Pleasant Hill, Calif.
Filed May 15, 1992, Ser. No. 883,358
Int. Cl.[5] H03F *3/04*
U.S. Cl. 330—310 10 Claims



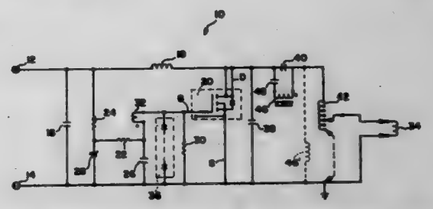
1. An amplifier for amplifying a signal transmitted over a line, where the line attenuates higher frequencies more than lower frequencies:
a plurality of cascaded stages, each stage including predetermined amplification with higher frequency emphasis;
each stage further being able to pass an input signal to the stage's output with substantially no attenuation when the input signal to that stage is of a predetermined level.

5,191,301
INTEGRATED DIFFERENTIAL VOLTAGE CONTROLLED RING OSCILLATOR
Allan L. Mullgrav, Jr., Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 12, 1992, Ser. No. 881,960
Int. Cl.[5] H03B *5/02*
U.S. Cl. 331—57 6 Claims



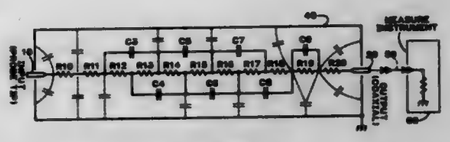
1. A voltage controlled oscillator integrated on a single semiconductor chip comprising:
a plurality of differential inverter logic blocks connected in a ring;
a source of differential control voltage;
a plurality of d.c. differential amplifiers each connected to said source of differential control voltage;
a plurality of pairs of capacitors connecting differential outputs of said d.c. differential amplifiers to at least some of said differential inverter logic blocks, a change in said source of differential control voltage changing a loading effect that said capacitors have on corresponding differential inverter logic blocks and changing the frequency of the ring oscillator; and
output means connected to an output of one of said differential inverter logic blocks and providing a differential output having a center frequency determined by said differential inverter logic blocks connected in said ring.

5,191,302
MOSFET OSCILLATOR FOR SUPPLYING A HIGH-POWER RF INDUCTIVE LOAD
Melvin Rosnick, Riverdale, N.Y., assignor to Lepel Corporation, Edgewood, N.Y.
Filed Nov. 25, 1991, Ser. No. 797,524
Int. Cl.[5] H03B *1/02, 5/12*
U.S. Cl. 331—109 4 Claims



1. A self-excited solid-state oscillator for supplying a high-power RF inductive load, comprising
(a) at least one MOSFET transistor connected in a self-excited oscillator configuration;
(b) an output tuned circuit comprising an inductive load and a tank circuit connected to the load, the tank circuit having a resonant frequency determined at least in part by the inductance of the load;
(c) an RF feedback transformer coupling the tank circuit to the gate of the MOSFET for providing a switching signal to the MOSFET for causing the MOSFET to alternate between the on state and the off state at a frequency equal to the resonant frequency of the tank circuit; and
(d) bias circuit means for superimposing a forward bias voltage on the switching signal.

5,191,303
HIGH SPEED PROBE ATTENUATOR
Matthew A. Porter, Molalla, and Dale A. Ellenwood, Beaverton, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed Sep. 10, 1991, Ser. No. 757,411
Int. Cl.[5] H01P *1/22*
U.S. Cl. 333—81 R 5 Claims



1. A probe attenuator comprising:
a plurality of resistors coupled in series between an input and an output to form a transmission line;
a plurality of capacitors coupled in parallel with different pairs of the resistors such that each capacitor spans a different pair of resistors with at least one individual resistor being spanned by two different capacitors; and
means for coupling an extra capacitor across an output one of the resistors.

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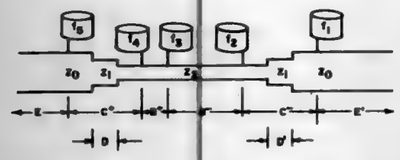
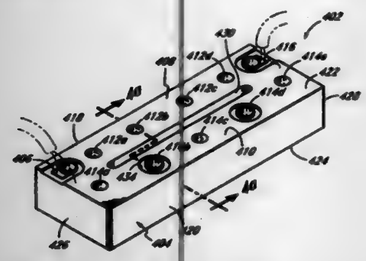
5,191,304
BANDSTOP FILTER HAVING SYMMETRICALLY ALTERED OR COMPENSATED QUARTER WAVELENGTH TRANSMISSION LINE SECTIONS
Douglas R. Jachowski, Redwood City, Calif., assignor to Orion Industries, Inc., Solon, Ohio
Continuation-in-part of Ser. No. 487,628, Mar. 2, 1990, Pat. No. 5,065,119. This application Feb. 27, 1991, Ser. No. 661,874
Int. Cl.[5] H01P 1/20
U.S. Cl. 333—202 44 Claims



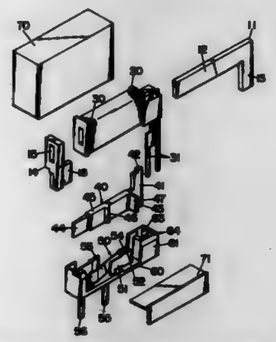
1. A bandstop filter comprising:
a common communication line having a first end and a second end including a plurality of quarter wavelength sections therebetween; and
a plurality of substantially identical, tunable dielectric resonators spaced along and coupled to said line wherein one of said quarter wavelength sections, adjacent to a first resonator from said plurality, is increased in length a predetermined amount thereby forming a first modified section and wherein a second of said quarter wavelength sections, adjacent to a second resonator from said plurality, is decreased in length said predetermined amount thereby forming a second modified section.

5,191,305
MULTIPLE BANDPASS FILTER
R. Jack Frost, San Juan Capistrano, and William G. Erlinger, West Hills, both of Calif., assignors to Interstate Electronics Corporation, Anaheim, Calif.
Filed Jul. 2, 1991, Ser. No. 725,010
Int. Cl.[5] H01P 1/20
U.S. Cl. 333—202 45 Claims



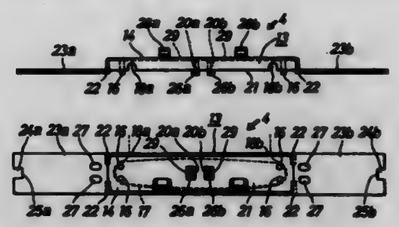
1. A multiple bandpass filter comprising:
a common input for receiving a first composite electromagnetic signal, said common input comprising an input transformer comprising a distributed resonator;
a plurality of single bandpass filters, each having a first and a second end and each having a different frequency passband, each single bandpass filter coupled at its first end to said common input, wherein each of said plurality of single bandpass filters isolates its respective frequency passband from said first composite electromagnetic signal and provides rejection to unwanted frequency bands, each of said plurality of single bandpass filters comprising at least one distributed resonator;
a common output coupled to said second ends of said plurality of signal bandpass filters for providing a second composite electromagnetic signal comprising each of said isolated frequency passbands, said common output comprising an output transformer comprising a distributed resonator; and
a single common structure, having a uniform length, a uniform width and a uniform height, said single common structure containing said common input, said plurality of single bandpass filters, and said common output integral thereto.

5,191,306
MINIATURE ELECTROMAGNETIC ASSEMBLY AND RELAY WITH THE MINIATURE ELECTROMAGNET ASSEMBLY
Norimasa Kaji, Ibaragi; Mitsuo Ichiya, Hirakata; Hiromi Nishimura, Takatsuki; Kazuhiko Inoue, Kadoma; Hideki Fukumoto, Nara, and Yutaka Yamada, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Dec. 17, 1991, Ser. No. 808,770
Claims priority, application Japan, Sep. 14, 1990, 2-96726; Dec. 28, 1990, 2-409255; Apr. 24, 1991, 3-93824
Int. Cl.[5] H01H 51/22
U.S. Cl. 335—78 6 Claims



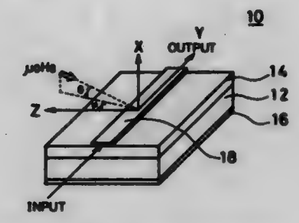
1. In a miniaturized electromagnet comprising:
an L-shaped flat magnetic plate of magnetic material with a horizontally extending core and a first yoke leg integrally depending from one end of said core, said L-shaped magnetic plate and first yoke leg lying in a first plane;
a coil assembly with an excitation coil dispersed around said core to define a coil thickness extending horizontally perpendicular to the length of said core;
a second yoke leg made of magnetic material and depending from the other end of said core in an opposed relation to said first yoke leg; and
an armature bridging between said first and second yoke legs in parallel with the length of said core, said armature having a pivot end and a pole end at opposite ends thereof and pivotally supported at said pivot end adjacent to the first yoke leg with said pivot end in constant magnetic coupling to said first yoke leg such that said armature is pivotable about said pivot end in a horizontal plane parallel to a plane of said core within said coil thickness between a set position and a reset position of having said pole end attracted to and spaced away from said second yoke leg upon energization and deenergization of said excitation coil, respectively;
said second yoke leg being of a flat plate configuration having a general plane extending perpendicular to said first plane and to have its lower end portion bent to define thereat a pole plate which is disposed in a plane parallel to said pole plate being positioned in an overlapping relation to said pole end of said armature for attaching said pole end to said pole plate upon energization of said excitation coil.

5,191,307
DEFLECTION YOKE APPARATUS
Akira Hashimoto, and Shinji Ohtsu, both of Nagaokakyo, Japan, assignors to Murata Mfg. Co., Ltd., Kyoto, Japan
Filed Jan. 30, 1992, Ser. No. 828,463
Claims priority, application Japan, Feb. 4, 1991, 3-010606[U]
Int. Cl.[5] H01H 1/00, 5/00; H04N 5/645
U.S. Cl. 335—214 5 Claims



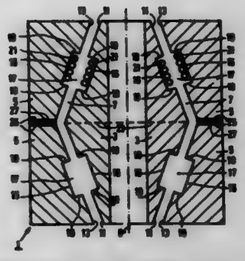
1. A deflection yoke apparatus comprising:
a deflection yoke; and
a leakage magnetic field cancellation coil mounted on a large-diameter portion of the head of the bobbin of said deflection yoke, said leakage magnetic field cancellation coil comprising a coil winding received in a coil receptacle of a coil case, said coil case having a mounting portion by which said coil case is mounted onto said deflection yoke, a cover for closing a coil receptacle opening through which said coil is received, and a hinge by which said cover is swingably joined to one end of said coil receptacle, said cover being formed integrally with said coil case with said hinge positioned between said coil receptacle and said cover.

5,191,308
MAGNETOSTRICTIVE WAVE DEVICE HAVING A HIGHER MAXIMUM CUT-OFF BAND ELIMINATION FILTER
Makoto Tsutsumi, Hirakata, and Toshio Nishikawa, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Jan. 14, 1991, Ser. No. 641,040
Claims priority, application Japan, Jan. 19, 1990, 2-11004
Int. Cl.[5] H01F 7/02
U.S. Cl. 335—304 9 Claims



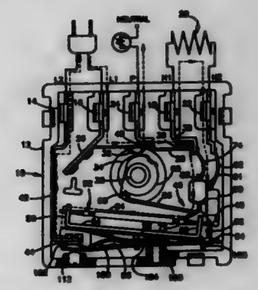
1. A magnetostatic wave device comprising:
a ferrimagnetic substrate;
a strip line formed on said ferrimagnetic substrate, one end of which is connected to an input terminal and the other end of which is connected to an output terminal; and
a magnet for applying a magnetic field to said ferrimagnetic substrate;
said ferrimagnetic substrate being oriented with the direction of lines of force of the magnet being at a non-zero angle to the principal plane of the substrate and at a non-zero angle to the perpendicular to said principal plane.

5,191,309
ROTARY TRANSFORMER
Petrus C. J. Lares, Tilburg, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 26, 1991, Ser. No. 749,801
Claims priority, application Netherlands, Sep. 6, 1990, 9001965
Int. Cl.[5] H01F 19/00
U.S. Cl. 336—120 8 Claims



1. A rotary transformer, comprising an inner core portion and an outer core portion enclosing the inner core portion, the core portions being hollow bodies of revolution of a ferromagnetic material which are rotatable with respect to one another about a common axis, the inner and outer core portions including conical facing surfaces having first recesses which are shaped as a staircase with substantially flat steps, and transformer windings disposed in said first recesses, the windings on the inner core portion and the outer core portion being situated opposite one another and cooperating in a two-by-two fashion, the windings on at least the outer core portion being constructed as self-supporting coils, characterized in that:
the facing surfaces of the core portions are constructed as double conical surfaces having bases which face one another, and
the outer core portion comprises at least two parts.

5,191,310
ADJUSTABLE CYCLING SWITCH FOR ELECTRIC RANGE
George Obermann, Niles; Paul H. Tuma, Lombard, and Ronald S. Joyce, Elk Grove Village, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio
Filed Jul. 9, 1992, Ser. No. 911,234
Int. Cl.[5] H01H 61/02, 71/16
U.S. Cl. 337—105 25 Claims



1. A thermally actuated switch assembly for heater load connection comprising:

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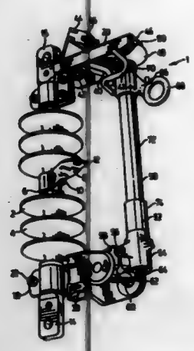
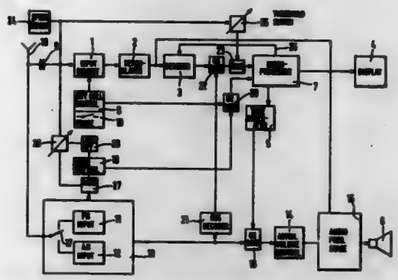
(a) housing structure defining a first and a second power line connector terminal and a third and fourth heater load connector terminal and circuit means connecting said second and third connector terminal;
(b) a stationary contact electrically connected to said first connector terminal;
(c) a thermally responsive cycling mechanism, including a member mounted for pivotal movement on said housing structure, said mechanism including a contact blade having a movable contact thereon disposed upon movement for making and breaking a circuit with said stationary contact, and including a resistance member electrically connected in circuit with at least one of said third and fourth connector terminals, said resistance member operable upon a certain wattage of current flow therethrough to become heated and effect movement of said contact blade to break the circuit with said stationary contact, whereupon said current ceases to flow through said resistance member, which thereupon cools and effects remaking of said circuit with said movable contact thereby cycling current to the load; and,
(d) adjustable means operable upon user actuation to adjust the initial position of said cycling mechanism.

5,191,311
SWITCH FOR USE AS A VERTICALLY MOUNTED CUT OUT OR IN-LINE SWITCH
Thomas H. Webb, Stouffville, and Anthony Cocco, Scarborough, both of Canada, assignors to Firon Metal Industries Ltd., Scarborough, Canada
Filed Jun. 18, 1992, Ser. No. 900,373
Int. Cl.[5] H01H *71/10, 71/20*
U.S. Cl. 337—168 12 Claims



1. A switch, for an electrical transmission line, the switch comprising:
first and second connection bars;
an insulator mechanically connected between the first and second connection bars;
first and second brackets connected to the first and second connection bars respectively, for engaging and retaining a fuse element, which includes pivot lugs at a first end thereof, and a second free end, the second bracket being adapted to engage and retain the second end of the fuse element; and
bracket elements adjustably mounted on the first bracket and defining slots for pivotally receiving the pivot lugs of the fuse element, the bracket elements being adjustable to orient the slot at least partially upwardly, when the switch is in either one of a horizontal position and a vertical position, whereby, if the second end of the fuse element is released, the pivot lugs will be retained by the slots.

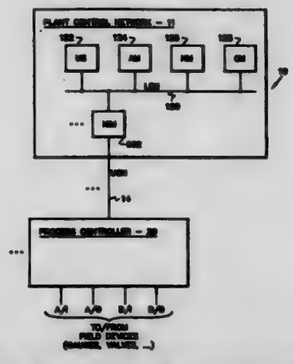
5,191,312
AUTOMOTIVE ACCESSORY CONTROL CENTER
Albrecht Altmann, Sibbesse, and Norbert Ehlers, Hildesheim, both of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany
Filed Mar. 28, 1991, Ser. No. 676,895
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010621
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—441 3 Claims



1. Automotive accessory control center for the operation of an accesory device which demands the visual attention of a driver, comprising
a display (4);
display control means (7) having an input for remotely generated data and an output controlling said display (4) to produce optical indications thereon;
means (1, 2, 3) for receiving remotely generated data;
means (24) for measuring vehicle speed;
a threshold switch (25) having an input connected to an output of said speed measuring means (24); and
a NAND gate (23) having an output connected to said input of said display control means (7) and respective inputs connected to an output of said threshold switch (24) and to an output of said means for receiving remotely generated data.

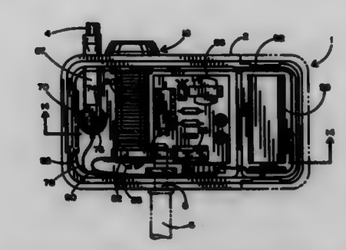
5,191,313
METHOD OF CONTINUOUS MONITORING OF PROCESS VARIABLES OF VARYING GRADES OF A PRODUCT WITHIN A PROCESS CONTROL SYSTEM
Richard R. Galbraith, Maricopa, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 12, 1991, Ser. No. 758,058
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—501 8 Claims

1. In a process control system which is controlling a continuous process, the continuous process producing an output product having a first grade, the process control system performing quality checks at predetermined times on the output product for verifying that predetermined parameters of the output product having the first grade are each within first predetermined limits, a method for dynamically monitoring the continuous process to include a change in the output product from having a first grade to having a second grade, the predetermined parameters having second predetermined limits, the method comprising the steps of:
a) initiating new setpoints for the continuous process such that the output product having the second grade is produced;
b) determining that a transition period is beginning;
c) during the transition period, after determining that the predetermined parameters of the output product fall outside the first predetermined limits,
i) generating at least one temporary alarm, and
ii) diverting the output product to a bypass path thereby avoiding contamination of the output product having the first grade stored in first predetermined storage area;
d) upon determining that the transition period is completed,
i) clearing the temporary alarm(s), and
ii) causing the output product having the second grade to be stored in a second predetermined storage area;



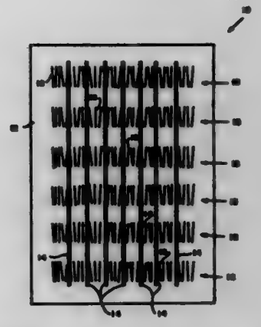
e) verifying that the predetermined parameters of the output product are each within the second predetermined limits of the second grade; and
f) when the predetermined parameters of the output product fall outside the second predetermined limits, indicating an alarm.

5,191,314
COMBINATION ANTI-THEFT LOCK AND ALARM
Roger C. Ackerman, Laguna Niguel; Robert B. Jones, Laguna Hills; Kenneth A. Tarlow, Santa Monica, and Eric Dennison, Laguna Hills, all of Calif., assignors to Pacific West Industries, Beverly Hills, Calif.
Filed Aug. 31, 1990, Ser. No. 575,974
Int. Cl.[5] E05B *45/06, 19/14*; G08B *13/14*
U.S. Cl. 340—542 20 Claims



1. A combination lock and alarm to prevent theft or displacement of property to be protected, said combination comprising:
a housing having a detachable cover;
an alarm located within said housing to generate a warning signal;
an electrically conductive cable having a first end fixedly connected within said housing and an opposite free end to extend around an immovable object and be removably retained within said housing;
an alarm circuit located within said housing and adapted to activate said alarm if said cable is severed;
a source of supply voltage located within said housing beneath said cover to power said alarm circuit;
a first lock assembly to releasably attached said cover to said housing to prevent unauthorized access to said source to supply voltage;
a rotatable second lock assembly to releasably retain the free end of said cable within said housing;
normally open switch means by which to electrically connect said source of supply voltage to said alarm circuit; and
catch means rotated by said second lock assembly at the interior of said housing to engage the free end of said cable and close said switch means such that a rotation of said catch means simultaneously retains the free end of the cable within said housing and connects said source of voltage to said alarm circuit.

5,191,315
DEACTIVATABLE ELECTRONIC ARTICLE SURVEILLANCE MARKERS USING SHORT SEMI-HARD MAGNETIC WIRES
Robert A. Cordery, Danbury, and Charles F. Murphy, III, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Dec. 31, 1990, Ser. No. 636,155
The portion of the term of this patent subsequent to Jan. 9, 2009, has been disclaimed.
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—572 12 Claims



1. An electronic article surveillance marker comprising:
a support member,
a plurality of elongated magnetically soft elements supported by said support member in a generally parallel configuration, and
a plurality of magnetically semi-hard wires supported by said support member adjacent to an intermediate said elongated magnetically soft elements, said magnetically semi-hard wires being individually generally parallel to one another.

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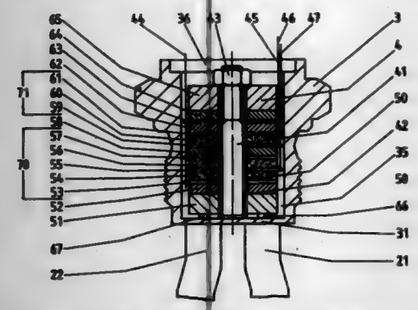
5,191,316
APPARATUS FOR DETERMINING AND/OR MONITORING A PREDETERMINED CONTENTS LEVEL IN A CONTAINER

Volker Dreyer, Lörrach-Haagen, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

PCT No. PCT/DE90/00718, § 371 Date May 20, 1991, § 102(e) Date May 20, 1991, PCT Pub. No. WO91/04467, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 19, 1990, Ser. No. 700,134
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931453
Int. Cl.[5] G06B *21/00*
U.S. Cl. 340—621 14 Claims



1. An apparatus for determining and/or monitoring a predetermined content level in a container, the apparatus comprising:
a mechanical oscillation structure including a diaphragm and at least two oscillation rods which project along a longitudinal axis into the container and which are secured to the diaphragm spaced from each other;
an excitation and receiving transducer formed by a stack of components including at least one piezoelectric element excitable by an AC voltage for stimulating the oscillation rods to opposite oscillations transverse to the longitudinal axis, at least one piezoelectric element for receiving and converting the oscillations of the mechanical oscillation structure to an electrical output signal, and a metal ring disposed on an end of the stack adjacent the diaphragm;
at least two pressure studs disposed between the metal ring and the diaphragm;
a clamping screw fixedly connected to a side of the diaphragm opposite from the oscillating rods, said clamping screw extending through the components of the stack; and
means coupled to an end of the clamping screw for clamping the components of the stack against said diaphragm to provide a concave prestressing of the diaphragm.

5,191,317
LOW AIR WARNING SYSTEM FOR SCUBA DIVERS

Douglas J. Toth, Huntington Beach, Calif.; Steven J. Shankle, Redmond, and Eric R. Brooks, Mukilteo, both of Wash., assignors to Undersea Industries, Inc., Rancho Dominguez, Calif.

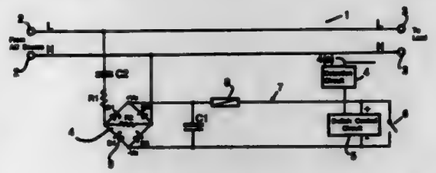
Filed Sep. 9, 1991, Ser. No. 756,526
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—676 16 Claims

1. A low air warning system for use by scuba divers; the system comprising:
an air pressure sensor adapted for connection to an air supply tank and responsive to the reduction of air in said tank below a predetermined threshold to produce an electrical manifestation thereof;
an electromagnetic energy transmitter connected to said sensor for generating a first signal indicative of air supply in said tank above said threshold and a second signal indicative of air supply in said tank below said threshold; and
an electromagnetic energy receiver adapted for being positioned adjacent a diving mask and having a circuit for receiving said first and second signals when said mask is

mounted on a diver's face, said circuit having at least one visual display device within the field of view of said mask, the circuit producing a first visual manifestation in said display device in response to said first signal and a second visual manifestation in said display device in response to said second signal, said first and second visual manifestations being readily distinguishable from one another.

5,191,318
LOSS OF NEUTRAL DETECTING CIRCUIT

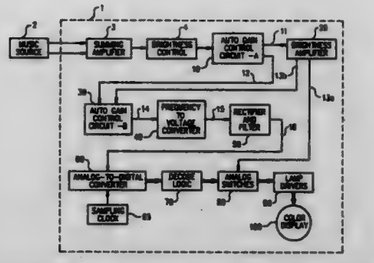
Oliver Glennon, Ballinasloe, Ireland, assignor to Square D Company, Palatine, Ill.

Filed Jul. 8, 1991, Ser. No. 727,017
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—635 7 Claims

1. A loss of neutral detector for use in a system having line and neutral leads, the detector comprising:
a) line and neutral leads for connection in the system between energy source and a load;
b) a loss of neutral detection circuit comprising a pull-up connection between the line and neutral leads and an electro-magnetic field detector for detection of an electromagnetic field generated around the neutral lead on increase of the neutral lead potential via the pull-up connection;
c) a closed loop circuit;
d) a charge storage device connected in the closed loop circuit;
e) an output device connected in the closed loop circuit;
f) a switch connected in the closed loop circuit in a normally open position; and
g) a control circuit for the switch operatively connected to the loss of neutral detection circuit for closing the switch on detection of loss of neutral to activate the output device.

5,191,319
METHOD AND APPARATUS FOR VISUAL PORTRAYAL OF MUSIC

Richard M. Kiltz, 30028 SE. 208th, Maple Valley, Wash. 98038

Filed Oct. 15, 1990, Ser. No. 597,157
Int. Cl.[5] G09G *3/06*
U.S. Cl. 340—701 6 Claims

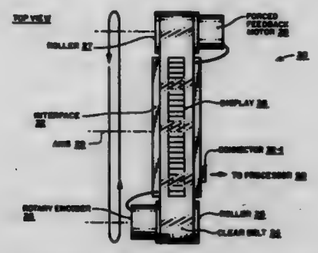


1. Apparatus for translating sound into a visual display, said sound comprising a band of frequencies in the audio spectrum over which appear the rhythmic and melodic characteristics of music, said apparatus comprising:
(a) visual color display means;
(b) means to receive and control the amplitude of audio signals to cause said display brightness to vary in accordance with audio signal amplitude;
(c) gain control means responsive to said sound in the audio spectrum, whereby a frequency dependent signal is produced that is substantially independent of audio amplitude variation;
(d) frequency conversion means responsive to said frequency dependent signal, whereby all frequency components present in said frequency dependent signal are evaluated collectively and a single derivative signal having the same frequency components is produced whose amplitude is caused to vary in direct proportion with the total frequency content of said frequency dependent signal over the entire band of frequencies that include the rhythmic and melodic characteristics of music;
(e) amplitude conversion means responsive to said derivative signal and producing a plurality of discrete signals which denote the amplitude of said derivative signal relative to preselected amplitude threshold values;
(f) switching means responsive to said plurality of discrete signals to cause selection of color in said visual display.

5,191,320
VARIABLE SCALE INPUT DEVICE

Michael T. MacKay, Vallejo, Calif., assignor to Sony Corporation of America, Park Ridge, N.J.

Filed Dec. 15, 1990, Ser. No. 622,727
Int. Cl.[5] G09G *3/20*
U.S. Cl. 340—706 35 Claims

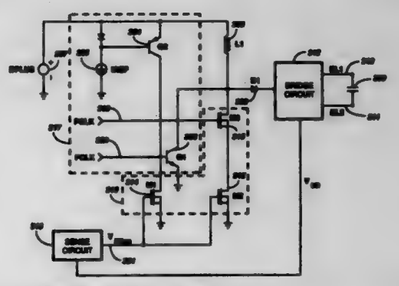


1. A programmable variable scale input device for providing signals indicating selection of an input value from a range of permissible values, comprising:
a transparent belt suspended over a first roller at a first end and a second roller at a second end, said belt rotating in a selected one of a counterclockwise and clockwise direction around said first and second rollers;
rotary encoding means coupled to said first roller for generating signals corresponding to said selected rotation;
tactile feedback means coupled to said belt for applying variable resistance against said rotation of said belt;
visual feedback means located in an area enclosed by said transparent belt for providing visual feedback to a user; and
connector means coupled to said encoding means, said tactile feedback means, said visual feedback means and processing means for providing feedback signals to said generated signals, said connector means including interface means for receiving said generated signals from said rotary encoding means, sending said generated signals to said processing means, receiving said feedback signals from said processing means and sending said feedback signals to said tactile and visual feedback means.

5,191,321
SINGLE CELL BIMOS ELECTROLUMINESCENT DISPLAY DRIVER

Barry W. Herold, Boca Raton, and Kevin Mclaughlin, Lake Worth, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

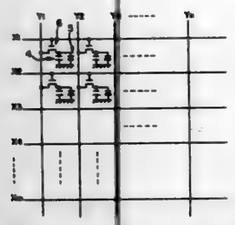
Filed May 9, 1990, Ser. No. 520,894
Int. Cl.[5] G09G *3/30*
U.S. Cl. 340—781 6 Claims



1. A BIMOS circuit comprising:
at least one bipolar transistor operating during a first time period and responsive to a first clock signal having a first frequency, the at least one bipolar transistor controlling a charging current used to generate an output voltage during the first time period:
sensing means for determining a start of a second time period, the start of the second time period corresponding to the output voltage reaching at least a minimum voltage at which a MOA transistor is operational:
at least one MOS transistor operating during the second time period and responsive to a second clock signal having a second frequency, the at least one MOS transistor controlling the charging current used to generate the output voltage during the second time period, the second frequency being substantially less than the first frequency; and
control means responsive to the sensing means, the control means operating in a complementary fashion to disable the first clock signal coupled to the at least one bipolar transistor subsequent to enabling operation of the at least one MOS transistor for controlling the charging current used to generate the output voltage.

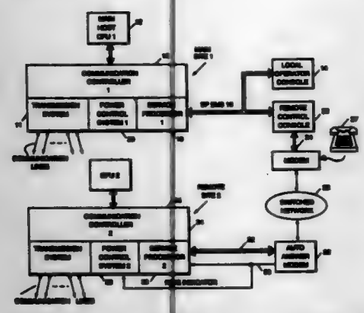
VOL 1148 ISS 1 MR 2 1993 UMI

5,191,322
ACTIVE-MATRIX DISPLAY DEVICE
Mikio Katayama, Ikoma; Masahiro Adachi, Tenri; Hirohisa Tanaka, and Hiroshi Morimoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 7, 1989, Ser. No. 363,184
Claims priority, application Japan, Jun. 13, 1988, 63-145319
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—783 6 Claims



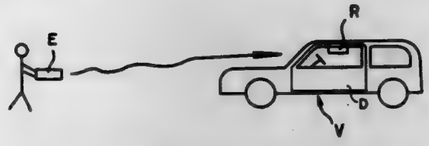
1. An active-matrix display device comprising
a plurality of picture elements that are arranged into a matrix, thin-film transistors that switch said picture elements, and MIS-structured diodes that correspond to the respective picture elements,
wherein each of said MIS-structured diodes is connected in parallel with the associated picture element, and each parallel arrangement of one of said diodes and said associated picture element is connected in series with an associated transistor, said MIS-structured diodes being constructed so that the capacitance of the MIS-diode becomes asymmetric according to the direction of a bias voltage to compensate for a asymmetric voltage to be applied to each picture element.

5,191,323
REMOTE POWER ON CONTROL DEVICE
Gilles Abbes; Eric Lamboley; Thierry Romas, all of Nice, and Pierre Vachee, La Gaude, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 435,105, Nov. 13, 1989, abandoned.
This application Mar. 25, 1991, Ser. No. 681,611
Claims priority, application European Pat. Off., Dec. 13, 1988, 88480097.0
Int. Cl.[5] H04B *1/00*
U.S. Cl. 340—825.37 6 Claims



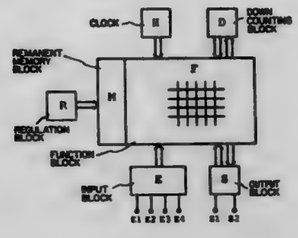
1. A device for powering ON a computer system from a remote console (22) which can be connected to said system through a switched network (28) and an autoanswer modem (30) which provides a ring indicator signal to said system when a connection between said remote console and said autoanswer modem is established, said device being characterized in that it comprises:
a first general computer system power supply activating means (60) controlling the general power ON of said system when activated;
a second validation system power supply means (58), controlling the power ON of a remote power control means (74, 52) when activated by a first power activating signal;
power activating means (64, 66, 38) responsive to said ring indicator signal to set active said first power activating signal which activates said second validation system power supply means; and
said remote power control means (74, 52) being powered ON by said second validation system power supply means when said first power activating signal is active, said power control means sending, when powered ON, a message through said connection to said remote console, said message being displayed at said remote console to prompt an operator to enter a password authorizing said general computer system power ON of said system, said password being received by said remote power control means which generates a second power activating signal when said remote power control means recognizes that said received password is authorized, said second power activating signal being provided to said first general computer system power supply activating means which activates said general power supply means in response thereto; and
function cancelling means (77, 74) providing a function cancelling signal which causes said power activating means to set inactive said first power activating signal when said remote power control means recognizes that said password is not authorized.

5,191,324
REMOTE CONTROL SYSTEM FOR LOCKING/UNLOCKING THE DOORS OF MOTOR VEHICLES WITH ASPHERICAL TOROIDAL LENS CONTAINING MULTIPLE PHOTODETECTORS
Charles Rydel, Paris, France, assignor to Valeo Neiman, Croissy-sur-Seine, France
Filed Feb. 5, 1991, Ser. No. 650,756
Claims priority, application France, Feb. 9, 1990, 90 01541
Int. Cl.[5] G08C *23/00*; G02B *3/06*; B60R *25/00*
U.S. Cl. 340—825.72 10 Claims



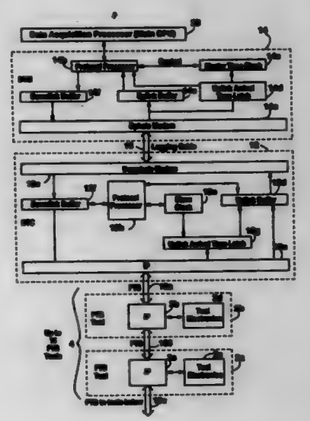
1. A remote control system, in particular for locking and unlocking the doors of a motor vehicle, the system being of the type comprising a portable transmitter including means constituting a light source suitable for generating an encoded light flux, and a fixed receiver including photosensitive means designed to receive the light flux and associated with treatment means designed to decode said light flux, wherein the photosensitive means of the receiver comprise an annular lens having a toroidal aspherical outside surface in the form of a revolution toroidal aspherical surface covering 360° about a vertical axis, and a plurality of photocells provided inside said revolution toroidal aspherical surface of said annular lens and uniformly spaced about said vertical axis.

5,191,325
PROGRAMMABLE RELAY CONTROL DEVICE
André Chovin, Crest; Didier Gary, Valence, and Jacques Taillebois, Bourg les Valence, all of France, assignors to Sextant Avionique, Paris, France
Filed Jun. 19, 1989, Ser. No. 368,029
Claims priority, application France, Jun. 27, 1988, 88 08717
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.83 1 Claim



1. A programmable relay control device comprising device inputs and at least two device outputs, for determining a level of said device outputs as a function of signals present at said device inputs and timing signals from a clock, comprising down-counting decades for counting external events and clock pulses and programming and reprogramming means, said relay control device comprising:
a plurality of reprogrammable remanent memories having memory outputs, and
a plurality of logic networks having a configuration which is controlled by said memory outputs of said remanent memories, said logic networks comprising:
routing grids having routing grid inputs and routing grid outputs and in which at most one of said routing grid outputs corresponds to every one of said routing grid inputs, said routing grids receiving different routing grid input signals and intermediate variable signals and delivering parameter signals and different routing grid output signals,
a combination grid having combination grid inputs and combination grid outputs and in which every output of said combination grid may correspond to a logic combination of the inputs of said combination grid, said inputs of said combination grid receiving said parameter signals delivered by said routing grids and delivering said intermediate variable signals to said routing grids, and
output means receiving at least some of said routing grid output signals and delivering said device outputs, wherein:
said parameter signals are at least four in number and said intermediate variables at least two in number, and
said programmable relay control device further comprises four device inputs, two down-counters, a clock with several ranges and two control outputs, and
said routing grids comprise:
a first grid receiving in particular the device input signals and their complements, the output signals of the down-counters and their complements, the two intermediate variable signals and delivering, on the one hand, four parameters selected from the signals received to the exclusion of the intermediate variables and, on the other hand, the signals for activating and de-activating the down-counters, first grid outputs and resetting,
a second grid receiving substantially the same signals as the first grid and delivering condition signals for inhibiting time down-counting and output signals, and
a third grid receiving the different clock ranges, the device input signals, the intermediate variables and the output signals of the down-counters and delivering one of said signals to the block input of each down-counter; and
wherein the combination grid receives said four parameter signals and delivers said two intermediate variable signals.

5,191,326
COMMUNICATIONS PROTOCOL FOR DIGITAL TELEMETRY SYSTEM
Michael A. Montgomery, Cedar Park, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed Sep. 5, 1991, Ser. No. 755,301
Int. Cl.[5] G01V *1/00*
U.S. Cl. 340—855.5 8 Claims



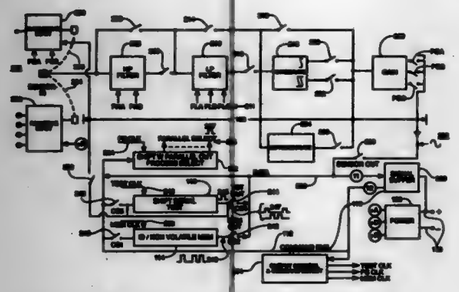
1. A data communication method for transmitting data by uphole and downhole modems from a plurality of well-logging tools along a tool bus, comprising the steps of:
receiving variable length data from a tool by an individual interface package to form an interface package data transmittal.
transmitting said data into an uplink packet provided with a data field and a protocol;
applying said protocol to transform said data field into varying lengths to receive a plurality of said interface package data transmittal of varying lengths;
beginning said variable length data field with a list head word pointing to the beginning of a first word of a first interface package transmittal, said first interface package transmittal having as the first word, a next message pointer, said pointer pointing to the first word in a next interface package transmittal, thereby sequentially packing a plurality of interface package transmittal of varying length into said data field;
stripping said protocol from said uplink packets;
transmitting said uplink package to an uplink superpacket having an address and a plurality of stripped uplink packages; and
transmitting said uplink superpacket from a downhole modem to an uphole modem, wherein data words of varying length are sequentially packed and then transmitted on limited bandwidth communication links.

VOL 1148 ISS 1 MR 2 1993 UMI

5,191,327
PROGRAMMABLE REMOTE TRANSDUCER WITH FILTERING, DIFFERENTIATION, INTEGRATION, AND AMPLIFICATION

Richard D. Talmadge, New Lebanon, Ohio; Kenneth E. Appley, Orange, and Salvatore DeFrancesco, East Haven, both of Conn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 19, 1990, Ser. No. 540,661
Int. Cl.[5] G08C *19/04*
U.S. Cl. 340—870.38 16 Claims



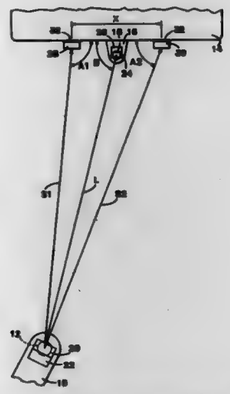
6. A measuring system comprising the combination of:
an analog electrical signal responsive recording apparatus;
an analog electrical signal generating mechanical displacement to electrical signal transducer cell member remotely disposed of said recording apparatus;
and analog signal conditioning means located adjacent said mechanical displacement to electrical signal transducer cell member and electively connected with output terminals thereof for selectably adding transducer signal waveform improving bandpass filtering, waveform differentiation, waveform integration, amplification, digital testing code, and transducer cell digital identification code to said transducer cell member electrical output signal.

5,191,328
TRAILER HITCHING AID AND METHOD USING RECEPTION DELAY OF DIFFERENT VELOCITY SIGNALS

Terry L. Nelson, Camas Valley, Oreg., assignor to Donald L. Gambill, Roseburg, Oreg.

Filed Jan. 13, 1992, Ser. No. 537,172
Int. Cl.[5] B60Q *9/00*; G01S *3/808*; B60D *1/00*
U.S. Cl. 340—870.06 7 Claims

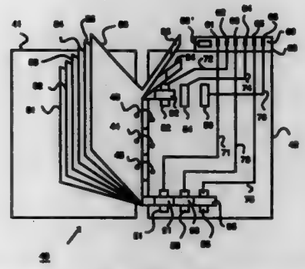
1. The method of moving a hitch component on a towing vehicle into coupling registry with a companion hitch component on a vehicle to be towed comprising:
a) mounting on the vehicle to be towed a transmitter capable of transmitting simultaneously first and second intermittent signals, the first signal of which travels through air at a higher velocity than the second signal,
b) mounting on the towing vehicle a first receiver for receiving said first higher velocity signal and a pair of laterally spaced second receivers for receiving said second lower velocity signal,
c) transmitting said signals as the towing vehicle is moved toward the vehicle to be towed,
d) measuring the time difference between the reception of said first signal of higher velocity and the reception of said second signal of lower velocity, and
e) utilizing said measured time differences to produce for the operator of the towing vehicles a visual display of the distance and angles between the vehicles as the towing vehicle is moved toward the vehicle to be towed, to aid the operator in maneuvering the towing vehicle to move the hitch component on the towing vehicle into coupling registry with the hitch component on the vehicle to be towed.



5,191,329
DATA ENTRY DEVICE WITH AUTOMATIC SHEET IDENTIFICATION

Philip N. Samreus, 1800 16th St., H210, Newport Beach, Calif. 92663

Filed Nov. 13, 1989, Ser. No. 436,080
Int. Cl.[5] H03K *17/955*
U.S. Cl. 341—20 48 Claims

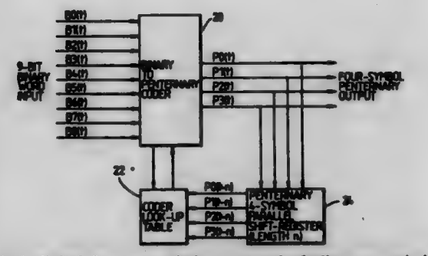


1. For use in a book-like data entry device having a plurality of pageable data entry substrates for storing information in human readable visually observable form and capable of being opened to an open position exposing a selected data entry substrate, a pageable data entry substrate comprising:
a base layer of insulative material having first and second opposed surfaces;
a first electrically conductive element supported upon one of said surfaces of said base layer, said first electrically conductive element including an interactive portion for cooperation with other similar portions of data entry substrates to facilitate identification of the data entry substrate exposed in said open position; and
substrate connection means for making electrical connection between said first electrically conductive element and said data entry device.

5,191,330
BINARY FOR PENTERNARY (FIVE-LEVEL) ENCODING SYSTEM

David A. Fisher, Saffron Walden, and Daniel R. Donovan, Gt Dunmow, both of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 12, 1991, Ser. No. 806,723
Claims priority, application United Kingdom, Dec. 12, 1990, 9026996
Int. Cl.[5] H03M *7/06*
U.S. Cl. 341—56 9 Claims

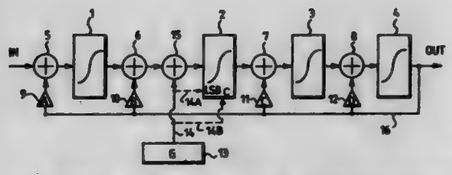


1. A digital data transmission system including transmission equipment comprising means for sampling an input set of binary encoded digital data bits, means for converting the sampled binary encoded set into a selected five-level (penternary or quinternary) line code word for transmission over the system, means for storing each five-level word output from the converting means for a predetermined period of time and means for controlling the selection of a succeeding five-level word conditional on the value of the stored five-level word.

5,191,331
SIGMA-DELTA MODULATOR FOR A D/A CONVERTER WITH PSEUDORANDOM JITTER SIGNAL INSERTION

Teppo Karema; Hannu Tenhunen, and Tapani Ritoniemi, all of Tampere, Finland, assignors to Nokia Mathnpahelimet Oy, Salo and Fineltec Oy, Kemi, both of, Finland

Filed Jan. 9, 1992, Ser. No. 818,522
Int. Cl.[5] H03M *1/20*
U.S. Cl. 341—131 14 Claims

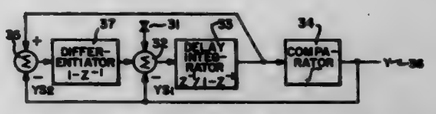


1. A digital sigma-delta modulator for a D/A converter, comprising several cascaded integration stages and feedback means for feedbacking the sign of the output signal of the last integration stage, delayed by one clock cycle and multiplied by predetermined scaling coefficients, to each integration stage, wherein the state of the least significant bit in at least one integration stage subsequent to the first of the integration stages, is variable at random.

5,191,332
DIFFERENTIATOR/INTEGRATOR BASED OVERSAMPLING CONVERTER

Yie-Yuan Shieu, Taipei, Taiwan, assignee to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Feb. 11, 1991, Ser. No. 654,099
Int. Cl.[5] H03M *3/00*
U.S. Cl. 341—143 10 Claims

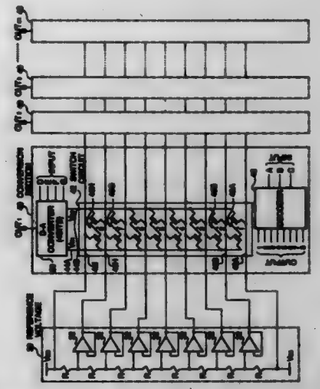


1. An oversampling converter with sampling frequency much higher than the input signal frequency in which the output code contains data and noise after shaping, comprising:
differentiator means for producing a differentiated signal of negative quantization noise;
delay integrator means for integrating the summation of the input signal, negative feedback of a first output and the differentiated negative quantization noise;
quantizer means for receiving and comparing the output of the integrator means to a predetermined reference value, so as to produce the first output as a multi-level output code.

5,191,333
TWO STAGE DIGITAL TO ANALOG CONNECTING CIRCUIT

Masaji Nakano, Tokyo, Japan, assignee to NEC Corporation, Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 766,715
Claims priority, application Japan, Sep. 27, 1990, 2-259440
Int. Cl.[5] H03M *1/68*
U.S. Cl. 341—145 7 Claims



1. An digital-to-analog converting circuit comprising a reference voltage generating means for generating a plurality of different reference voltages, a reference voltage selection means receiving said plurality of reference voltages and controlled by a first input signal composed of at least one bit for supplying two reference voltages selected from said plurality of reference voltages in accordance with said first input signal, and a converting means receiving said two selected reference voltages and controlled by a second input signal composed of a plurality of bits for supplying a voltage which is obtained by dividing a voltage range from one to the other of said two selected reference voltages into a plurality of voltage levels and by selecting one of said plurality of voltage levels in accor-

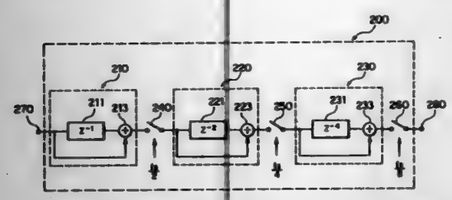
dance with said second input signal, wherein said reference voltage generating means generates three different reference voltages, and said reference voltage selection means includes a decoder receiving said first input signal of one bit as a switching signal for generating two control signals composed of said one bit and an inverted bit of said one bit, and a switching circuit coupled to receive said three reference voltages from said reference voltage generating means and controlled by said two control signals for selecting, in accordance with an active signal of said two control signals, two reference voltages from said three reference voltages, said two selected reference voltages being adjacent to each other in the order of magnitude of said three reference voltages.

5,191,334

SAMPLING FREQUENCY CONVERSION APPARATUS

Akira Yasuda, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 26, 1991, Ser. No. 721,683
Claims priority, application Japan, Jun. 27, 1990, 2-172030
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—61 **10 Claims**



1. A sampling frequency conversion apparatus, comprising:
a first digital filter for receiving an input signal and for outputting a first output signal having a longer bit length than that of the input signal, wherein said first digital filter is an FIR filter for attenuating a band to become aliasing noise due to a first sampling means;
said first sampling means for sampling the first output signal output from said first digital filter at a first sampling frequency, to thereby generate a second output signal;
a second digital filter for receiving said second output signal from said first sampling means and for outputting a third output signal having a longer bit length than that of said second output signal; and
a second sampling means for sampling the third output signal output from said second digital filter at a second sampling frequency, to thereby output a fourth output signal;
wherein said second sampling frequency is less than said first sampling frequency.

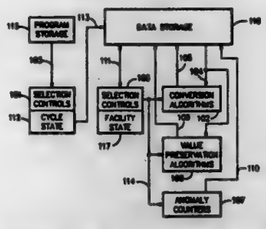
5,191,335

METHOD AND APPARATUS FOR FLOATING-POINT DATA CONVERSION WITH ANOMALY HANDLING FACILITY

Jerald E. Leitherer, Port Ewen, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1990, Ser. No. 612,726
Int. Cl.[5] H03M *7/24*
U.S. Cl. 341—94 **16 Claims**

1. An apparatus for floating-point data conversion with provision for permitting improved accuracy recovery of an initial value without necessarily preserving an original value in original form comprising:
means responsive to first floating-point data of an initial value in a first floating-point format for converting said data to a second floating-point format according to given rules,
means for detecting if in said conversion there is loss of an exact value in said second format due to lack of complete representation in said second format,
means for generating reconstruction data in response to loss of said exact value in said second format, and



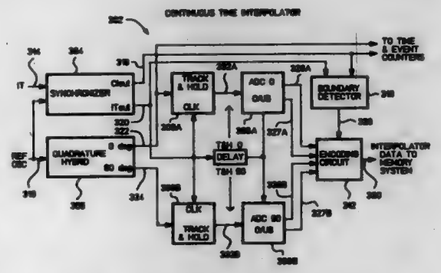
means for storing said reconstruction data wherein said reconstruction data is available for use in correcting for loss of said exact value to thereby provide for recovery of an improved accuracy of the initial value.

5,191,336

DIGITAL TIME INTERPOLATION SYSTEM

Paul Stephenson, Pleasanton, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 29, 1991, Ser. No. 751,488
Int. Cl.[5] H03M *1/64*
U.S. Cl. 341—111 **18 Claims**



1. A system for timing an event signal, comprising:
(1) a reference oscillator;
(2) quadrature hybrid means for dividing said reference oscillator into first and second signals, wherein said second signal is out of phase with said first signal by 90 degrees;
(3) means, coupled to said quadrature hybrid means, for sampling said first and second signals upon receiving the event signal;
(4) means, coupled to said sampling means, for digitizing said sampled first and second signals; and
(5) encoding means, coupled to said digitizing means, for generating a fine time value according to said digitized first and second signals.

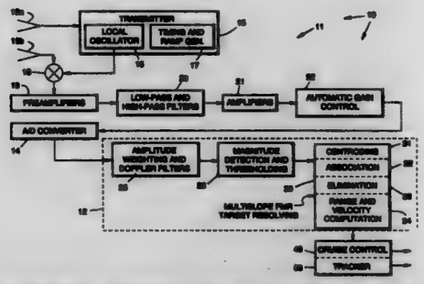
5,191,337

RANGING, DETECTION AND RESOLVING IN A MULTISLOPE FREQUENCY MODULATED WAVEFORM RADAR SYSTEM

Oleg Brovko, Los Angeles, and Trung T. Nguyen, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 25, 1992, Ser. No. 841,133
Int. Cl.[5] G01S *13/53, 13/532*
U.S. Cl. 342—200 **11 Claims**

1. In a multislope linear frequency modulated waveform radar system comprising means for transmitting and receiving radar signals and for processing received frequency modulated waveform radar signals to produce magnitude detected target signals, a method of processing the magnitude detected target signals to resolve targets corresponding to the magnitude detected target signals, said method comprising the steps of:
centroiding magnitude detected target signals to provide centroided target signals, wherein the magnitude detected target signals comprise a set of detections observed for each phase (slope segment) of the frequency modulated waveform;
associating the centroided target signals using a maximum



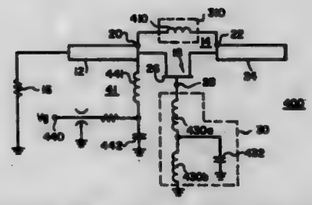
likelihood estimation procedure to predict the filter position for the next phase, and wherein the associating step groups the detection from each phase by expecting hits to be within a gate size of a projected target doppler filter location, and wherein the projected doppler filter location and the gate size depend on all previous phase observations;
eliminating the number of targets to minimize the number of ghosts by reducing the number of candidate targets that correlate in a predetermined number of phases by grouping all paths with a selected number of common hits; and
computing velocity and range for the remaining detected targets.

5,191,338

WIDEBAND TRANSMISSION-MODE FET LINEARIZER

Allen Katz, Trenton, and Shabbir S. Moochalla, Kendall Park, both of N.J., assignors to General Electric Company, East Windsor, N.J.

Filed Nov. 29, 1991, Ser. No. 800,375
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] H04B *7/185;* H03F *3/16*
U.S. Cl. 342—352 **16 Claims**



1. A circuit for, within a particular frequency range, distorting at least one of (a) amplitude and (b) phase of signal to be distorted, in response to the amplitude of said signal to be distorted, said circuit comprising:
a FET including a gate electrode, and also including source and drain electrodes and a controllable path for the flow of signal therebetween;
bias means coupled to said gate electrode and to at least one of said source and drain electrodes, for applying bias voltage to said gate electrode for controlling said FET for distortion of signals traversing said controllable path;
reactance means coupled between said gate electrode and a point of reference potential, said reactance means being selected to have a range of values, within said frequency range, for coacting with said bias for controlling said FET for distortion of said signals traversing said controllable path;
inductance means including first and second ends;
first coupling means coupled to said inductance means and to said FET, for coupling said first end of said inductance means to said source and said second end to said drain, for providing a path for flow of said signal parallel to said controllable path; and
second coupling means for coupling said signal to be distorted to one of said source and drain electrodes, for causing said signal to traverse said controllable path at least once, and for coupling the resulting distorted signal to utilization means.

5,191,339

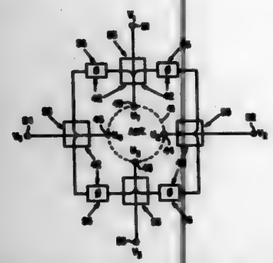
PHASED-ARRAY ANTENNA CONTROLLER

Nabeel A. Riza, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 5, 1992, Ser. No. 847,155
Int. Cl.[5] H01Q *3/22;* G02B *27/10, 27/46*
U.S. Cl. 342—372 **25 Claims**

1. A phased array antenna system comprising:
an antenna array including a plurality of antenna elements, said array being operable in a transmit or receive mode;
an optical signal processing system for generating optical control signals to determine transmit and receive electromagnetic radiation beam patterns of said antenna array, said optical signal processing system comprising:
acousto-optic means for generating optical output signals comprising a plurality of optical output signal pairs, each of said output signal pairs comprising a positive first order doppler-shifted light beam and a negative first order doppler-shifted light beam, and
an optical phase modulating device coupled to said acousto-optic means to selectively control relative phase between said positive and said negative first order doppler shifted light beams;
a transceiver module coupled to said optical signal processing system and to said antenna array and including heterodyne detection means for converting said optical output signal pairs to electrical beamforming signals for controlling the transmit and receive electromagnetic patterns of said antenna array; and
a source of coherent, polarized light optically coupled to said optical signal processing system.

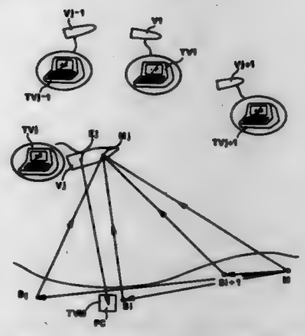
5,191,340
NEUTRALIZATION NETWORK FOR MULTIELEMENT ANTENNA
Ray L. Brandao, Fort Lauderdale; Anthony Parker, and Randall C. Spires, both of Boca Raton, all of Fla., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Aug. 16, 1991, Ser. No. 746,384
Int. Cl.[5] H01Q 3/22, 3/24, 3/26
U.S. Cl. 342—373 6 Claims



1. An improved neutralization network for a multielement antenna of the type including means for compensating for effects of interelement coupling in a closely spaced multielement antenna in order to optimize performance, the improvement comprising:
the means for compensating disposed between output ports of said closely spaced multielement antenna and input ports of a receiver system, and including a plurality f network input ports corresponding in number to a number of elements of said closely spaced multielement antenna and a plurality of network output ports corresponding in number to a number of input ports of the receiver system;
each of said elements and said plurality of network output ports being respectively connected to each of said plurality of network input ports of said receiver system by individual transmission lines; and
network means for coupling a portion of a signal induced in each element of said closely spaced multielement antenna to all other elements of said closely spaced multielement antenna in proper amplitude and phase so as to neutralize said portion of said signal induced in each element by reflections of an incident wave from all other elements of said closely spaced multielement antenna.

5,191,341
SYSTEM FOR SEA NAVIGATION OR TRAFFIC CONTROL/ASSISTANCE
Philippe Genard, Pernichet, and Francois Bocquaert, Catus, both of France, assignors to Federation Francaise De Voile and Compagnie Generale De Geophysique, France
Continuation-in-part of Ser. No. 278,007, Nov. 30, 1988, abandoned. This application Nov. 1, 1991, Ser. No. 786,292
Claims priority, application France, Dec. 1, 1987, 87 16642
Int. Cl.[5] G01S 3/02, 13/00, 1/08
U.S. Cl. 342—456 25 Claims

1. A system to control sea navigation or traffic of a plurality of ships or moving bodies, comprising:
a radio navigation reference system comprising:
at least two reference beacon sources,
a navigation central station M, said central station M, the reference beacon sources and the ships or moving bodies being provided with:
a first intercommunication means from said central station M to each reference beacon source, said first interconnection means being synchronized by said central station M,
a second intercommunication means from said central station and each reference beacon source to each ship or moving body,
means for the real-time display of the geographical position of each ship or moving body,
a third intercommunication means from each ship or moving body to a control station PC, said control station PC having computer means making it possible, through the computation of the distances from each ship or moving body to said central station M and to each reference beacon source, provided by said third intercommunication means, to compute the position of each ship or moving body with respect to the reference radio navigation sys-



tem, said third intercommunication means being turned on the radio navigation carrier wave, said computer means having a tactical program for navigation assistance, of the "Menu" type, comprising at least, after the display, on a display screen, of the map of the navigation zone:
a first data acquisition sub-program called up by validation of an approach mode;
a second starting sub-program called up by validation of a starting mode; and
a third navigation sub-program called up by validation of a navigation mode.

5,191,342
FIX-TRACKING SYSTEM
James M. Alsup, and Edward C. Jelks, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 6, 1981, Ser. No. 292,767
Int. Cl.[5] G01S 3/02
U.S. Cl. 342—465 2 Claims

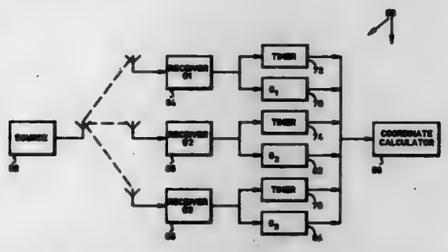
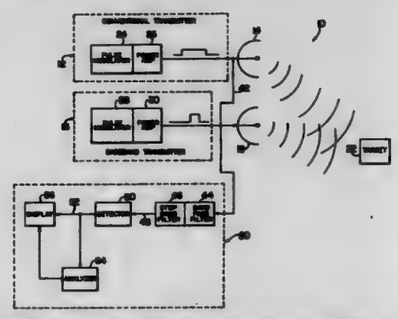


FIG. 6 SYSTEM FOR DETERMINING THE LOCATION OF A SIGNAL SOURCE.

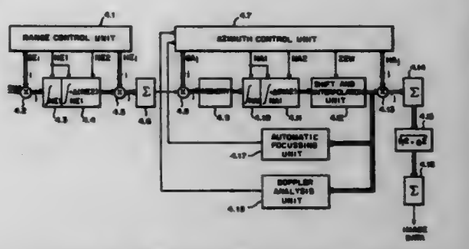
1. System for determining the location of a signal source having coordinates (x,y), which are to be determined, and which may be located as far away as 2000 km, the system not requiring knowledge of ionospheric height or layer structure, comprising:
a plurality of at least three signal receiving means, adapted to receive the signals from the signal source, the receiving means being located in a non-colinear relationship with respect to each other, however, the coordinates (x_1,y_1), (x_2,y_2) and (x_3,y_3) of each of the receivers being very precisely known, each means for receiving being capable of receiving signals from the other two receivers;
a plurality of at least three measuring means, one connected to each receiving means, for measuring precisely the time difference of arrival (TDOA) of the signals from the signal source;
a plurality of at least two means, connected to at least two of the receiving means, for determining the vertical angle θ_i, i=1, 2 or 3, at which the signal from the signal source is received by the receivers; and
means for calculating the coordinates (x,y) of the signal source from the measured vertical angles and the time delays of arrival.

5,191,343
RADAR TARGET SIGNATURE DETECTOR
Paul M. Danzer, Norwalk, and Michael J. Brienza, Easton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Feb. 10, 1992, Ser. No. 836,668
Int. Cl.[5] G01S 13/87
U.S. Cl. 342—21 9 Claims



1. An improved radar target signature detector, comprising:
a baseband radar transmitter which provides a baseband pulse of electromagnetic energy;
a baseband pulse radar antenna for radiating said baseband pulse of electromagnetic energy to illuminate the target;
a wide pulse radar transmitter which provides a wide pulse of electromagnetic energy having a certain carrier frequency;
a wide pulse radar antenna, capable of both radiating and receiving, for radiating said wide pulse of electromagnetic energy to illuminate the target, such that said wide pulse and said baseband pulse mix within one or more nonlinear junctions of the target and generate a target return signal of electromagnetic energy whose frequency spectrum contains cross product frequency components having high resolution target data created by mixing said baseband pulse and said wide pulse, and for receiving said return signal and providing a captured return signal indicative thereof; and
a radar receiver which receives said captured return signal and filters said captured return signal to provide a filtered signal from which the target can be both detected and identified.

5,191,344
METHOD FOR DIGITAL GENERATION OF SAR IMAGES AND APPARATUS FOR CARRYING OUT SAID METHOD
Alberto Moreira, Glicking, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fur Luft- und Raumfahrt, Cologne, Fed. Rep. of Germany
Filed Nov. 27, 1991, Ser. No. 799,214
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1990, 4037725
Int. Cl.[5] G01S 13/90
U.S. Cl. 342—25 3 Claims

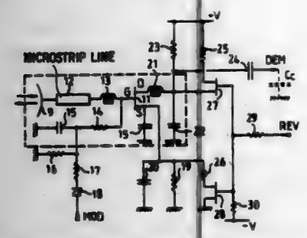


1. A method for digital generation of SAR images obtained by means of a coherent imaging system carried by a carrier, a signal compression being obtained in the azimuth and/or range direction with high resolution by a coherent summation of subapertures, wherein
an overlapped stepwise linear phase approximation is carried out for correction of the quadratic phase characteristic of the SAR signal in the azimuth and/or range direction, whereby the remaining phase error in each subaperture due to the linear phase approximation is limited to 115 degrees and a triangular weighting is used for integration of the subapertures,
for optimizing the phase approximation and suppressing the remaining phase error in each subaperture, a frequency overlapping of the subapertures is effected, whereby a minimum overlap of 21% between the subapertures is used,
the individual subapertures are integrated twice by means of the moving average method for reducing the sidelobes of the low resolution pulse response, this integration corresponding to a triangular amplitude weighting, and
for formation and synthesis of the subapertures, complex multiplications by signals-constant frequency are carried out, so that the signal of each subaperture is shifted in frequency by the required amount that provides the minimum frequency overlap of 21%.

5,191,345
CIRCUIT TO INCREASE THE INFORMATION BIT RATE IN A SYSTEM FOR THE EXCHANGE OF DATA
Marc Camiade, Antony; Pierre Quentin, Paris; Pierre Savary, Les Ulis, and Jean-Philippe Brandeau, Palaiseau, all of France, assignors to Thomson Composants Microondes, Puteaux, France
Filed Nov. 15, 1991, Ser. No. 793,095
Claims priority, application France, Nov. 16, 1990, 90 14291
Int. Cl.[5] G01S 13/74
U.S. Cl. 342—44 4 Claims

1. A system for exchanging data by electromagnetic microwaves between a fixed station and a mobile station, said system including, at said mobile station, an information bit rate increasing circuit which comprises:
a modem and an information processing circuit;
means for maintaining said modem and said information processing circuit at a high impedance and low electrical consumption level when no signal is received at said mobile station from said fixed station;

said processing circuit including a means for sending a signal to activate said modem when said fixed station sends an interrogation signal at a low information bit rate transmitted by said modem to said processing circuit;



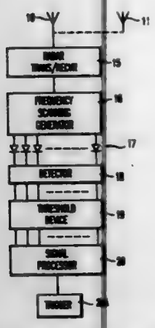
means responsive to said activation signal from said processing circuit, for diminishing the output impedance of said modem whereby the bit rate of information elements exchanged with said fixed station is increased.

5,191,346

DEVICE FOR MEASURING THE DISTANCE TO A RUNWAY FOR AN AERIAL VEHICLE

Bruno Avignon, Palaiseau, and Yves Canal, Le Plessis Robinson, both of France, assignors to Thomson TRT Defense, Paris, France

Filed May 28, 1991, Ser. No. 706,003
Claims priority, application France, Jun. 1, 1990, 90 06878
Int. Cl.[5] G01S *13/42*; F42C *13/04*
U.S. Cl. 342—61 **10 Claims**



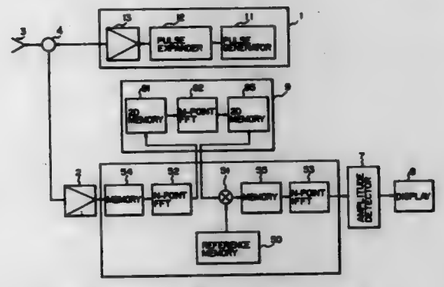
1. A measuring device for measuring distance of an aerial vehicle, equipped with the measuring device, from a runway, comprising:
- a radar transmitter-receiver emitting at a frequency for generating echoes from ground bordering the runway, without generating echoes from the runway;
- means for processing the echoes from a plurality of approximately rectangular zones of the ground; and
- means for determining a distance of the approximately rectangular zones of the ground, which vary in orientation and position relative to the vehicle equipped with the measuring device, from the aerial vehicle.

5,191,347

PULSED DOPPLER RADAR SYSTEM

Sachiko Ishikawa; Takahiko Fujisaka, and Yoshimasa Oh-hashi, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 28, 1991, Ser. No. 751,126
Claims priority, application Japan, Aug. 30, 1990, 2-229234
Int. Cl.[5] G01S *13/53*
U.S. Cl. 342—132 **8 Claims**



1. A pulsed Doppler radar system comprising:
- a transmitting means for generating and transmitting a pulse signal having an expanded frequency bandwidth;
- an antenna means for sending the output of said transmitting means to a target and for receiving a signal which was sent by said transmitting means and reflected by the target;
- a receiver means for processing the received signal to obtain a complex video signal;
- a pulse compressing means including a pulse Doppler processing means responsive to the complex video signal for detecting a speed of the target relative to said radar system and a storage means for storing a reference signal which includes a compensation factor by which an influence of the Doppler effect is compensated in accordance with the speed of the target, said pulse compressing means for combining the output of said pulse Doppler processing means with the reference signal so as to convert the complex video signal to a compressed signal having a narrow pulse width;
- a detecting means for performing envelope detection on the narrow pulse width signal; and
- a display means responsive to the output of said detecting means for displaying a detected target thereon.

5,191,348

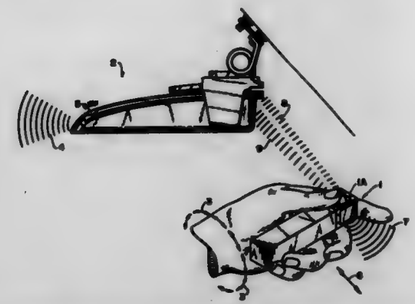
RADAR DETECTOR PERFORMANCE VERIFICATION METHOD AND APPARATUS

Robert W. Brocia, 15 Moore Rd., Bronxville, N.Y. 10708, and Marie Dagata, 406 E. Ninth St., Apt. 12A, New York, N.Y. 10009

Filed Mar. 4, 1992, Ser. No. 845,588
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—173 **16 Claims**

1. An apparatus for testing a radar detector, said apparatus comprising:
- a housing;
- at least one frequency transmitter mounted in said housing;
- means in said housing for receiving energy from an energy source to power said transmitter;
- voltage indicator means for monitoring voltage of the energy source;

- switch means for connecting said voltage indicator means and said transmitter to said receiving means; and



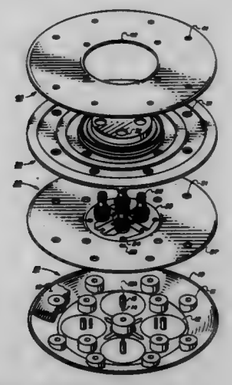
- shielding means being located in said housing to shield said housing from the frequency from the at least one frequency transmitter.

5,191,349

APPARATUS AND METHOD FOR AN AMPLITUDE MONOPULSE DIRECTIONAL ANTENNA

Bruce E. Diamore, Glendale, and Mark D. Smith, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 8, 1990, Ser. No. 564,430
Int. Cl.[5] H01Q *1/40, 3/24, 3/28, 21/06*
U.S. Cl. 343—751 **3 Claims**



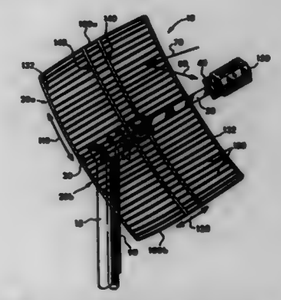
1. A directional antenna comprising:
- a dielectric material radome having an interior surface wherein predetermined first regions of said radome interior surface are shaped to form a multiplicity of folded monopole antenna elements wherein each of said folded monopole antenna elements comprises a feed portion, a grounded portion and a capacitive hat coupling said feed portion to said grounded portion, and wherein each of said folded monopole elements further comprises an electrically conductive coating covering each of said first regions, and wherein a predetermined second region of said radome interior surface is shaped to form a decoupling element wherein said decoupling element comprises an electrically conductive coating covering said second region;
- a first ground plate coupled to said folded monopole antenna element grounded portions;
- a multiplicity of electrical connectors for electrically coupling said antenna to electrical apparatus;
- impedance matching devices coupled to each of said antenna element feed portions; and
- a beam forming network electrically coupling said impedance matching devices to said electrical connectors, such that a predetermined directional radiation pattern is obtained when only one of said electrical connectors is energized in a transmit mode, and the shape of a received energy amplitude pattern for each of said connectors in a receive mode is the same as said predetermined radiation pattern, but displaced at a predetermined physical angle of rotation from those of the remaining connectors such that the direction from which a signal is received by said directional antenna may be uniquely determined by measuring only the relative amplitudes of the signals received at said electrical connectors, wherein said beam forming network includes resistances and capacitors for uniquely defining an electrical connector resistance to a DC input signal.

5,191,350

LOW WIND LOAD PARABOLIC ANTENNA

Dale L. Hemmie, Burlington, Iowa, assignor to Comfer Corporation, Burlington, Iowa

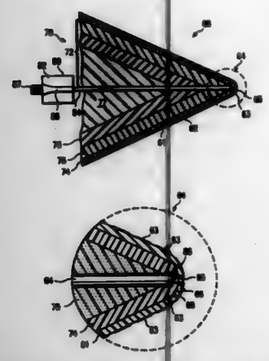
Filed Jul. 19, 1991, Ser. No. 732,651
Int. Cl.[5] H01Q *15/16, 19/12*
U.S. Cl. 343—840 **7 Claims**



7. A parabolic low wind load antenna for receiving incoming signals of predetermined wavelength, said antenna comprising:
- two identical reflective halves connected together to form said parabolic antenna having a perimeter in the shape of a rectangle, said antenna having a parabolic curve in the length dimension of the rectangular shape of said perimeter and a parabolic curve in the width dimension of said rectangular shape of said perimeter, each half of said reflective halves comprising:
  - (a) opposing top and bottom connectors,
  - (b) opposing parabolic outer supports having a circular cross-section of a first diameter and extending in said length dimension, said outer supports terminating in said opposing connectors at the center of said length dimension,
  - (c) a plurality of parabolic reflector elements connected to and perpendicular to two interconnected inner supports having a second diameter, and to said supports, said reflector elements being spaced at bout 10% of said predetermined wavelength, all of said reflector elements having a circular cross-section of said first diameter except the reflector element on said perimeter which has a circular cross-section equaling said first diameter,
- means for firmly attaching said two reflective halves together so that the top connector of one of said identical reflective halves is attached to the bottom connector of the other of said identical reflective halves, and
- said second diameter being greater than said first diameter.

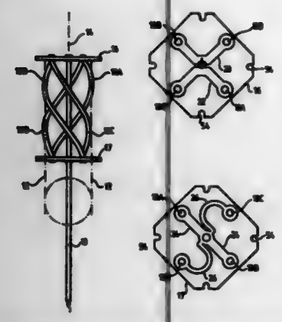
VOL 1148 ISS 1 MR 2 1993

5,191,351
FOLDED BROADBAND ANTENNA WITH A SYMMETRICAL PATTERN
Dean A. Hofer, Richardson, and Matthew L. Pucak, Allen, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 29, 1989, Ser. No. 458,877
Int. Cl.[5] H01Q *1/36*
U.S. Cl. 343—895 55 Claims



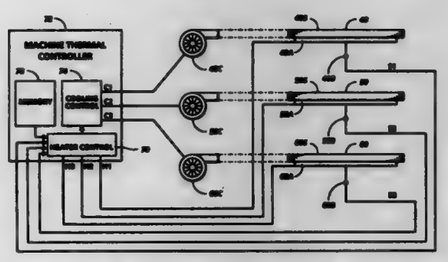
1. A folded broadband antenna, having a substantially symmetrical, broadband radiation pattern, comprising:
(a) a substrate;
(b) a folded antenna aperture including a radiating element that exhibits broadband substantially symmetrical radiation pattern performance disposed on said substrate;
(c) said folded antenna aperture and substrate having a fold along an apex in a wedge shaped geometry with a selected profile, said apex forming a line of symmetry for said folded antenna aperture;
(d) said substrate having a reduced thickness in the region along said fold; and
(e) a feed element shield disposed in said folded antenna and extending to said fold at said region of reduced thickness.

5,191,352
RADIO FREQUENCY APPARATUS
Sidney J. Branson, Peterborough, England, assignor to Navstar Limited, United Kingdom
Filed Jul. 25, 1991, Ser. No. 735,881
Claims priority, application United Kingdom, Aug. 2, 1990, 9016929; Apr. 29, 1991, 9109190
Int. Cl.[5] H01Q *1/36, 21/20*
U.S. Cl. 343—895 18 Claims



1. A radio frequency antenna comprising at least two pairs of helical elements formed as helices having a common central axis, a substantially axially located feeder structured, and at least two coupling structures which are formed separately from the helical elements, the helical elements extending between said coupling structures, wherein each coupling structure includes coupling elements which form radio frequency conducting paths between the helical elements and said axis and which are located in a single respective plane, and wherein the coupling elements of at least one of the structures are of different electrical impedances, those associated with a first of said pairs of helical elements having a difference electrical impedance from those associated with a second of said pairs of helical elements.

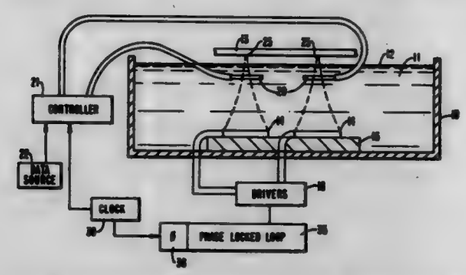
5,191,353
THERMAL CONTROL MECHANISM FOR MULTIPLE PRINT BAR SYSTEM
Stephen C. Corona, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 30, 1991, Ser. No. 814,528
Int. Cl.[5] G01D *9/00, 9/42*; H04N *1/23*
U.S. Cl. 346—1.1 7 Claims



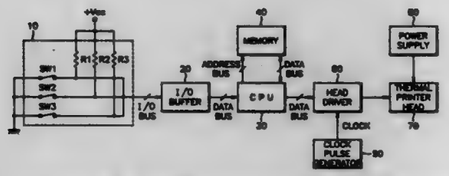
1. A method for controlling overall length of LED print bars including an individual heater attached to each of the print bars, each of the print bars having a characteristic operating temperature, by maintaining the print bars within a preselected temperature range with respect to each other, said method including the steps of:
sensing the operating temperature of each of the print bars and generating signals indicative thereof,
detecting whether two or more of the print bars have operating temperatures which are greater than said preselected temperature range, and
adjusting the temperature of one or more of the two or more print bars to restore the operating temperature to within the preselected temperature range.

5,191,354
METHOD AND APPARATUS FOR SUPPRESSING CAPILLARY WAVES IN AN INK JET PRINTER
Calvin F. Quate, Stanford, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 19, 1992, Ser. No. 838,617
Int. Cl.[5] G01D *9/00, 15/16*
U.S. Cl. 346—1.1 11 Claims

9. In a method for controlling an ink jet printer comprising the steps of applying pressure wave to a pool of liquid ink to excite a capillary wave on a surface of the liquid ink, and destabilizing the ink subject to the pressure wave to effect an ejection of droplets of ink from the surface of the liquid ink, wherein the destabilizing is effected at a rate lower than or equal to a maximum repetition rate, the improvement wherein said step of applying the pressure wave to the pool of the liquid ink comprises applying the pressure wave to said liquid ink at a frequency that is twice said repetition rate, whereby capillary waves resulting from the ejection of said droplets are suppressed.

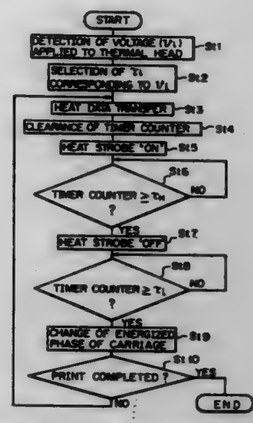


5,191,355
DEVICE FOR ADJUSTING THE HEAT-GENERATING TIME OF A THERMAL PRINTER HEAD
Doo-Shin Kwak, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Dec. 6, 1989, Ser. No. 446,876
Claims priority, application Rep. of Korea, Jun. 29, 1989, 9078/1989
Int. Cl.[5] G01D *9/00*; B41J *2/355*
U.S. Cl. 346—76 PH 10 Claims



1. A circuit for adjusting heat-generation time of a thermal printer head, comprising:
memory means for storing information relating to a plurality of heat-generating resistances for said thermal printer head and relating to a plurality of corresponding strobe pulse widths for said thermal printer head;
switching means for selectively enabling and maintaining variable manual selection of switching signals for selected ones of a plurality of values corresponding to said heat-generating resistances of said thermal printer head;
control means for generating strobe pulse data by determining a selected strobe pulse width suited to said thermal printer head in dependence upon said switching signals and said information;
input/output buffering means interposed between said switching means and said control means, for accumulating said switching signals to provide accumulated signals to said control means; and
driving means for driving the thermal printer head in dependence upon said strobe pulse data.

5,191,356
TOWER CONSERVING RECORDING APPARATUS
Yoshikazu Shibamiya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 344,527, Apr. 26, 1989, abandoned, which is a continuation of Ser. No. 73,177, Jul. 14, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 610,442
Claims priority, application Japan, Jul. 18, 1986, 61-168029
Int. Cl.[5] B41J *2/325*
U.S. Cl. 346—76 PH 25 Claims



1. A recording apparatus for recording an image on a recording medium, comprising:
a recording head adapted for movement relative to said recording medium so as to record the image on said recording medium, said recording head generating heat in a controlled manner thereby to record on said recording medium;
voltage detecting means for detecting a voltage applied to said recording head to cause said recording head to generate heat;
record image density setting means for setting a value of the density of the image to be recorded on said recording medium;
detecting means for detecting the value set by said record image density setting means and providing a corresponding detection signal;
heat-generating period setting means responsive to said detecting means for setting the period of heat generation in said recording head in response to the voltage applied to said recording head;
recording speed setting means responsive to said detecting means for setting the speed of recording by said recording head in accordance with said detection signal from said detecting means;
an electric power source to supply electric power to cause said recording head to generste heat in accordance with said heat-generating period setting means and to move said recording head relative to said recording medium in accordance with said recording speed setting means; and
control means for controlling the heat generating period and the recording speed of said recording head in response to a set value by said record image density setting means, said control means controlling said heat generating period and said recording speed of said recording head in such a manner that an average electric power consumption is substantially constant when said heat generating period and said recording speed of said recording head are controlled.

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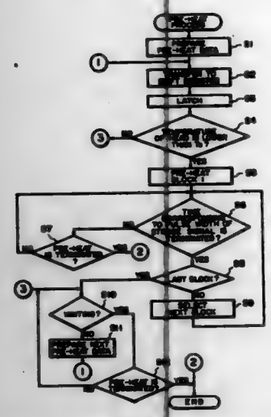
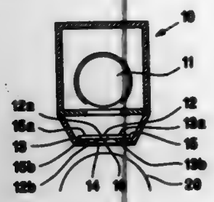
5,191,357
METHOD AND APPARATUS FOR PREHEATING A THERMALLY ACTIVATED PRINTING HEAD
Takashi Ono, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 30, 1989, Ser. No. 374,658
Claims priority, application Japan, Jul. 1, 1988, 63-162605; Jul. 1, 1988, 63-162606; Jun. 28, 1989, 1-163852
Int. Cl.[5] B41J *2/38*
U.S. Cl. 346—76 PH 19 Claims



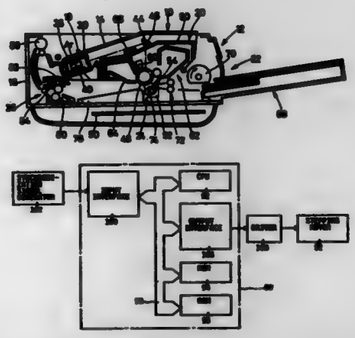
1. A recording apparatus for recording on a recording medium, said apparatus comprising:
a plurality of adjacent heat generating elements; and
control means for controlling so that, when said heat generating elements are preheated during a stand-by period form termination of a first recording to a start of a next recording by providing said heat generating elements with energy which is insufficient to record, so that each of said adjacent heat generating elements is not supplied with energy in a consecutive preheat cycle, and each of said heat generating elements is not continuously provided with energy.

5,191,358
LIGHT SCANNING DEVICE WITH MICROLENSES HAVING A SAME POWER DENSITY DISTRIBUTION AS A POWER DENSITY DISTRIBUTION OF A PHOTOSETTING LIGHT BEAM
Takao Iwasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 14, 1991, Ser. No. 669,058
Claims priority, application Japan, Mar. 16, 1990, 2-67971; Mar. 20, 1990, 2-71348; Mar. 20, 1990, 2-71349; Mar. 20, 1990, 2-71350
Int. Cl.[5] G01D *9/42*; G02F *1/13*
U.S. Cl. 346—107 R 12 Claims



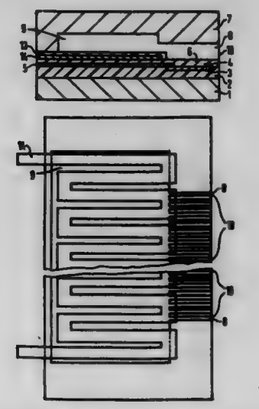
1. A light scanning device, comprising:
a light source for emitting light;
a liquid crystal shutter array having a plurality of liquid crystal shutters arranged in a first direction, said liquid crystal shutter array receiving image signals to selectively open the liquid crystal shutters in response to the image signals, to thereby selectively allow the light emitted from said light source to pass therethrough;
conveying means for conveying a photosensitive member for receiving the light which has passed through said liquid crystal shutter array, said conveying means conveying the photosensitive member in a second direction perpendicular to the first direction to thereby form a latent image thereon corresponding to the image signals; and
focusing means provided on said liquid crystal shutter array for focusing the light having passed through said liquid crystal shutter array onto the photosensitive member conveyed by said conveying means, said focusing means including a plurality of microlenses provided respectively on said plurality of liquid crystal shutters, each of the microlenses being formed of a photosetting material which is provided on a corresponding liquid crystal shutter and having a same power density distribution as a power density distribution of a photosetting light beam used to harden said photosetting material, each of the microlenses having a light transmittance distribution property such that light having passed through each of the microlenses has said power density distribution of said photosetting light beam.

5,191,359
RECORDING APPARATUS HAVING STEPPING MOTOR STEPPED TO FEED RECORDING MEDIUM IN TIMED RELATION WITH RECORDING ACTION FOR EACH LINE
Toshihiro Tsuzuki, Kariya; Kiyoshi Muto, Yokkaichi; Naohisa Kinoshita, Nagoya; Hiroyuki Kashima, Nagoya, and Makoto Hasegawa, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Oct. 15, 1990, Ser. No. 597,342
Claims priority, application Japan, Oct. 25, 1989, 1-277874
Int. Cl.[5] G01D *15/16*
U.S. Cl. 346—108 11 Claims



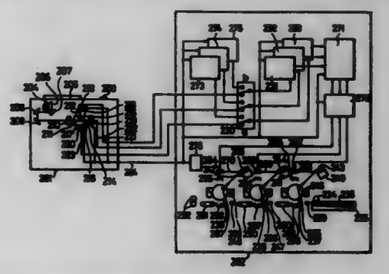
1. A recording apparatus comprising:
recording means for effecting a recording operation along a plurality of recording lines on a recording medium, according to recording data, each of said recording lines being defined by a straight row of picture elements, said recording data for said each recording line including bits corresponding to said picture elements, respectively;
a feeding member for feeding said recording medium in a feeding direction intersecting said recording lines;
a stepping motor operable in steps for continuously producing a rotary motion;
a power transmission mechanism for transmitting the rotary motion of said stepping motor to said feeding member such that each step of operation of said stepping motor from one excitation phase thereof to a next excitation phase thereof produces an incremental feeding distance of said recording medium, said incremental feeding distance being equal to 1/n of a line spacing of said recording lines in said feeding direction, where n represents a positive natural number;
signal generating means for generating a timing pulse at a first point of time which has a predetermined time relation with a second point of time at which said recording means starts recording along said each recording line, such that the recording along said each recording line is effected while the recording medium is continuously fed;
recording control means responsive to said timing pulse, for activating said recording means to start recording along said each recording line; and
stepping control means responsive to said timing pulse, for operating said stepping motor by at least one step, to feed said recording medium from one of said recording lines to the next recording line, such that the operation of said stepping motor in said at least one step is started in a predetermined timed relation with respect to said first point of time.

5,191,360
HEATING DEVICE FOR HEATING THE INK IN THE PRINTING HEAD OF AN INK JET PRINTER
Dietmar Pohlig, München, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Filed Jun. 14, 1991, Ser. No. 715,782
Claims priority, application European Pat. Off., Dec. 14, 1988, 88120856.5
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R 9 Claims



1. A heating device for heating of ink in a print head of an ink print device comprising
a joint ink volume space;
several ink channels ending in exit openings (10), where the ink channels (8) are connected to the joint ink volume space (9);
individually controllable electrothermal converter elements (3) coordinated to each separate ink channel (8), where under the effect of the converter elements (3) a dropletwise ejection of ink occurs from the exit openings (10);
a substrate;
an uppermost cover layer (2,3,4,5,6) disposed on the substrate;
a further cover layer (14), wherein the print head is constructed in a layer structure, wherein the further cover layer (14) is applied onto the uppermost cover layer (2, 3, 4, 5, 6) of a substrate (1), delimiting the ink volume space (9) and the ink channels (8) and containing the electrothermal converter elements (3) wherein the further cover layer (14) serves both as a heating layer for heating the ink and as a temperature sensor layer for determinating the temperature of the ink, wherein the further cover layer (14) is contactable from the outside; and
a further protective layer, wherein the further cover layer is covered by the further protective layer (13), and wherein the further cover layer (14) is extending over a large area of the region of the ink volume space (9).

5,191,361
IMAGE REPRODUCING SYSTEM
Shunichi Abe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 323,162, Mar. 15, 1989, Pat. No. 4,888,636, which is a continuation of Ser. No. 586,774, Mar. 3, 1984, abandoned. This application Aug. 9, 1989, Ser. No. 391,314
Claims priority, application Japan, Mar. 8, 1983, 58-37709; Mar. 8, 1983, 58-37710; Mar. 8, 1983, 58-37711
Int. Cl.[5] G03G *15/01*; G03F *3/08*
U.S. Cl. 346—157 13 Claims



1. An image forming system comprising:
generating means for generating a pattern signal;
recording means movable in relation to a recording medium, comprising a plurality of recording stations sequentially arranged, for each color, in a movement direction of said recording means, each of said recording stations recording a pattern for each color on the basis of the pattern signal generated by said generating means, the size of each recording station being substantially as long as a width the recording medium;
means for detecting a deviation of a pattern recorded by said recording means; and
control means for controlling the registration or alignment of said each recording station on the basis of an output of said detecting means.

5,191,362
ELECTROPHOTOGRAPHIC PRINTING APPARATUS WITH A CONTROL SYSTEM RESPONSIVE TO TEMPERATURE CHANGES
Toshiyuki Ichikawa, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Feb. 19, 1991, Ser. No. 657,851
Claims priority, application Japan, Feb. 21, 1990, 2-38469
Int. Cl.[5] G03B *27/52*; G03G *21/00*
U.S. Cl. 346—160 7 Claims

1. An electrophotographic printing apparatus, comprising:
a photosensitive member;
electrifying means for electrically charging a surface of the photosensitive member;
exposing means for selectively exposing the electrically

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charge surface of said photosensitive member to form an electrostatic latent image;

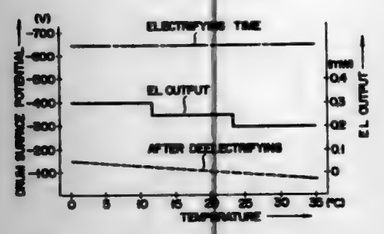
developing means for developing the electrostatic latent image by feeding a developer that adheres to the surface of said photosensitive member in accordance with the electrostatic latent image;

transferring means for electrically charging a sheet of paper to transfer the developed image to the sheet of paper;

deelectrifying means for discharging a plurality of charges remaining on the surface of said photosensitive member after the developed image has been transferred to the sheet of paper, thereby readying the surface of said photosensitive member for recharging;

temperature measuring means for measuring an environmental temperature of said photosensitive member; and

control means including means for detecting a given temperature range among a plurality of continuous temperature ranges within which the measured environmental temperature falls;



said control means further including:

means for controlling said exposing means such that an amount of exposure decreases when the detected environmental temperature moves outside the given temperature range and falls within another temperature range having temperatures that are higher than the temperature within said given temperature range; and

means for controlling the developing means such that an amount of the developer fed to the surface of the photosensitive member is increased and decreased as the measured environmental temperature increases and decreases within the detected temperature range that includes the measured environmental temperature;

whereby the control of the exposure of the surface of the photosensitive member and the control of the amount of developer fed to the surface of said photosensitive member within each temperature range and from temperature range to temperature range provides a substantially uniform print quality.

5,191,363
SPORTS GLASSES WITH WATERTIGHT SEAL
Terry L. Smith, and Diana M. Smith, both of 1706 Barlow La., Sebastopol, Calif. 95472
Filed Dec. 4, 1990, Ser. No. 622,307
Int. Cl.[5] G02C *11/08*
U.S. Cl. 351—62 20 Claims

11. Improved eyewear for protecting the eyes of a wearer during participation in various athletic activities, said eyewear being placed against the face of said wearer, said eyewear comprising

a lens holding frame and a single 'wrap-around' shaped lens, said frame supporting said lens substantially in front of eye portion of said wearer, said frame and said lens defining an interior space,

a single circumferential sealing means affixed to said frame and said lens for sealing said frame and said lens to the face of said wearer, the inner surface of said sealing means being contoured to fit the human face, the outer surface of said sealing means being contoured to fit within said frame and said lens,

retaining means for holding said frame and said lens against the face of the wearer,

air removal means for removing air from the interior portion of said eyewear with connection means for connecting said interioir portion to said air removal means, whereby upon using said air removal means, a slight vacuum is created, promoting a better seal with face of said wearer, wherein said air removal means is a mouthpiece, whereby the wearer can "suck" air from

wherein the improvement comprises the improved seal achieved by creating a slight vacuum in addition to the attachment of said sealing means to common 'wrap-around' eyewear, eliminating the need for a large or bulky frame for attachment purposes, also eliminating the need for an undesirable strap, whereby eyewear is provided that can be worn for a variety of athletic activities, said eyewear having said seal assembly not immediately apparent to the casual observer.

5,191,364
PROTECTIVE EYEWEAR FOR USE IN SPORTS AND THE LIKE
Rudolph J. Kopfer, P.O. Box 2894, Ketchum, Id. 83340
Continuation-in-part of Ser. No. 405,421, Sep. 11, 1989, abandoned. This application Oct. 23, 1990, Ser. No. 601,467
Int. Cl.[5] G02C *5/08*
U.S. Cl. 351—62 25 Claims

1. A protective eyewear device for use in sports and the like comprising:

a semi-rigid frame having

a pair of eye apertures adapted to be aligned with a wearer's eyes,

a sealing area surrounding each aperture adapted to engage the wearer's skin adjacent to the eye,

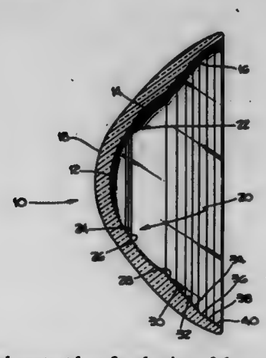
a lens support area surrounding each aperture with the sealing areas and lens support areas positioned to permit at least about 140 degrees peripheral vision with both eyes,

a web diverging from each sealing area to the adjacent lens support area in every direction to enclose the eye without obstructing the peripheral vision, said web including ventilating apertures covered with permeable foam for substantially preventing the passage of wind and foreign material therethrough, said web further having a foam means contoured to partially cover the web so that air is trapped and directed through the ventilation apertures to increase air circulation;

curved lens means covering the apertures in the frame at the lens support areas; and,

a pair of temple bar means attached to the frame and adapted to support the frame on the wearer's head.

5,191,365
CORNEAL CONTACT LENS AND METHOD FOR TREATING MYOPIA
Nick Stoyan, 3841 Diamante Pl., Encino, Calif. 91436
Filed Aug. 23, 1991, Ser. No. 748,845
Int. Cl.[5] G02C *7/04*
U.S. Cl. 351—160 R 20 Claims



1. A corneal contact lens for shaping of the cornea having a posterior surface for contact with the cornea of an eye, said corneal contact lens comprising:

a central zone having a central zone radius of curvature and a central zone diameter;

a tear zone located concentrically around said central zone and having a tear zone radius of curvature and a tear zone radial thickness, wherein said tear zone radius of curvature is smaller than said central zone of radius of curvature;

a transition zone located concentrically between said central zone and said tear zone, said transition zone comprising at least one transition ring having a radius of curvature which is between the radius of curvature of said central zone and said tear zone, and wherein said transition has a radial thickness; and

a peripheral zone located concentrically around said tear zone, said peripheral zone being integral with said tear zone and having a peripheral zone radius of curvature wherein said peripheral zone radius of curvature is greater than or equal to said central zone radius of curvature.

5,191,366
ASPHERICAL LENS, METHOD OF PRODUCING THE LENS AND APPARATUS FOR PRODUCING THE LENS
Toyohiko Kashiwagi, 3-35-23 Mozumahanachi, Sakai-shi Osaka-fu 591, Japan
Filed Mar. 19, 1991, Ser. No. 671,485
Int. Cl.[5] G02C *7/04*; A61F *2/16*
U.S. Cl. 351—177 5 Claims

1. A method of producing an aspherical lens which uses a ray tracing method, comprising the steps of:

performing ray tracing for an incident ray R and finding the position of an intersection PT of said ray R and the refracting curved surface;

setting a desired final passing point PO through which said ray R, passing through the intersection PT, passes after being refracted by a final refracting surface;

arbitrarily determining a slope T of said curved surface at the intersection PT and finding a final passing point P of said ray R corresponding to the surface slope T;

comparing positions of said final passing point P and said preset desired final passing point PO and sequentially changing the surface slope T so that the positions of said final passing point P and said desired final passing point PO coincide with each other;

determining the surface slope T, when the positions of said final passing point P and said desired final passing point PO coincide with each other, as a desired surface slope at the intersection PT;

sequentially changing a height H and/or an angle of said incident ray R with respect to an optical axis L and calculating the shape of said curved surface based on individual positions of intersections PT and surface slopes T at the intersections PT; and

forming a lens in accordance with the calculated shape of said curved surface based on said individual positions of said intersections PT and said surface slopes T at said intersections PT.

5,191,367
INSTRUMENT AND METHOD FOR USE IN OPTOMETRIC EXAMINATIONS
Cosmo Salibello; Jonathan G. Torrey, both of Portland, Oreg.; Steven G. Coffman, Bothell, Wash., and Gerald M. March, Cupertino, Calif., assignors to Applied Vision Concepts, Inc., Portland, Oreg.
Continuation-in-part of Ser. No. 282,596, Dec. 12, 1988, Pat. No. 4,998,820. This application Mar. 7, 1991, Ser. No. 665,903
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—243 15 Claims

1. An optical system for use in conducting optometric examinations on patients who suffer from eye fatigue due to the use of VDT displays, said system comprising:

(a) a light source;

(b) pixel means including a predetermined pattern of small, circular openings through which light is transmitted from the light source toward the patient, for forming alphanumeric characters consisting of pixel-like light elements, each light element formed by one of said openings; and

(c) a generally planar multi-layer screen disposed between

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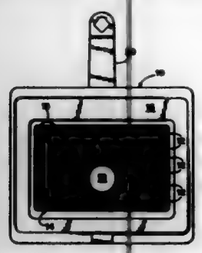
the pixel means and the patient for reducing high-frequency components of the light elements such that the

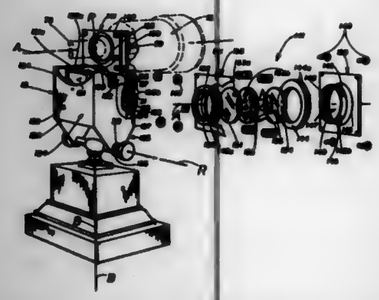


characters exhibit a substantially Gaussian light amplitude curve.

5,191,368
SYSTEM FOR PROJECTING KALEIDOSCOPIC IMAGES FOR GROUP VIEWING

Kevin A. Kalua, 750 Bell Canyon Rd.; Paul A. Nelson, Jr., and Paul A. Nelson, Sr., both of P.O. Box 928, all of Angwin, Calif. 94508

Filed Feb. 18, 1992, Ser. No. 836,260
Int. Cl.[5] G03B *21/00*
U.S. Cl. 353—2 **24 Claims**



1. A kaleidoscopic system for viewing kaleidoscopic images on a screen, comprising:

(i) a Tee-shaped housing defining first and second parallel arms and a transverse arm normal to said first and second parallel arms,

(ii) high intensity lamp mounted within one of said parallel arms,

(iii) a view screen mounted within the other of said parallel arms, said screen permitting viewing external of said first and second parallel arms,

(iv) an object box assembly including fixed mounting means secured to said transverse arm of said Tee-shaped housing and cantilevered into said one or said other of said parallel arms, said object box assembly also including a pair of rotatable female and male hubs threaded together forming a cavity within said one or said other of said parallel arms, transparent wall means positioned at positions of entry and egress of light emitted from said lamp, and pattern producing particles positioned within said cavity between said transparent wall means, said pattern producing particles being axially fixed relative to said transparent wall means at fixed position but movable in two dimensions normal to said axially fixed position,

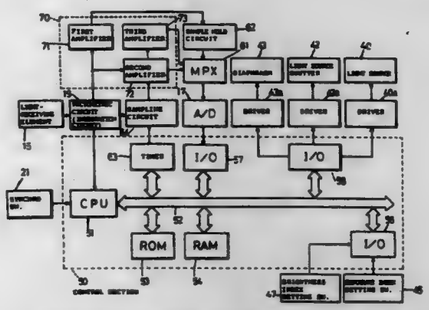
(v) a mirror-lens assembly mounted in said other of said parallel arms for providing enhanced kaleidoscopic images at said screen of said pattern producing particles,

(vi) drive means for driving said pair of rotatable hubs, said transparent wall means and said pattern producing particles in rotation about an axis of rotation coextensive of said first and second parallel arms to change the position of said pattern producing particles in two dimensions at right angles to said axis of rotation.

5,191,369
PHOTOGRAPHING LIGHT QUANTITY CONTROLLER FOR ENDOSCOPE

Katsuhiko Furuya; Masaaki Nakazima; Takayuki Enomoto, and Tadashi Takahashi, all of Tokyo, Japan, assignors to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1991, Ser. No. 748,026
Claims priority, application Japan, Aug. 31, 1990, 2-231361
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—62 **14 Claims**



1. A photographing light quantity controller for an endoscope, which is used to control a quantity of illuminating light when a photograph is to be taken through said endoscope, comprising:

means for supplying light for illuminating an object to said endoscope;

means for detecting a quantity of light that is reflected from said object and for outputting a signal in accordance with the detected quantity of light;

means for amplifying said signal, said amplifying means having a plurality of amplification factors which can be selected as desired;

photographing light quality control means for controlling the quantity of illuminating light that is supplied to said endoscope when a photographing operation is conducted, on a basis of the output signal from said amplifying means; and

means for automatically switching over said amplification factors of said amplifying means from one to another in accordance with a brightness of said object.

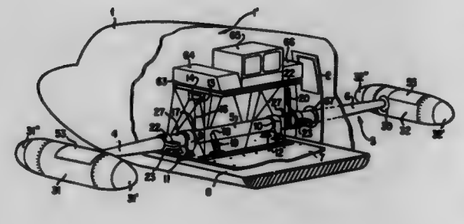
5,191,370
MULTI-SECTION HELICOPTER-BORNE ROTATABLE BEAM, SPECIALLY ADAPTED TO SUPPORT RANGE-FINDER CAMERAS AND TELEVISION FOCUSING CAMERAS FOR STEREOPHOTOGRAMMETRIC SURVEYS

Giovanni Bozzolato, Navacchio, Italy, assignor to Agip S.P.A., Milan, Italy

Filed Sep. 6, 1991, Ser. No. 756,153
Claims priority, application Italy, Sep. 18, 1990, 21504 A/90
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—81 **4 Claims**

1. A multi-section helicopter-borne rotatable beam, in the order of over 6 meters long, for supporting at either of its ends two range-finder cameras and two television focusing cameras for stereophotogrammetric surveys, said beam projecting beyond the two sides of a helicopter at right angles to the helicopter's axis and comprising a multi-section structure of which

the cylindrical central section and side sections are connected together in succession by securing means and in which the central section is supported rotatably by supporting means mounted on a base or bed which in its turn is fixed to the floor of the helicopter cab, and is made to rotate around its longitudinal axis by operating means, said beam supporting at its ends two cylindrical housings or pods with ogival rear and front ends for said range-finder cameras and television focusing cameras which operate through openings in said housings or pods and are supported removably in containers connected to the respective housings or pods by means of a vibration damping system, characterised in that said side sections are truncated-cone tubular structures tapered towards the outer ends of the beam, that said securing means comprise a telescopic connection of the inner ends of said side sections respectively in the ends of said central section of the beam, said connection being secured in position by means of half-ring ties with an internal annular groove co-operating with appropriate flanges on the ends of the central section and on said side sections respectively, as well as by means of pins passing through said sections connected together and safety split pins, that said means of support of the central section consists in two collars mounted rotatably in an axial direction on said base by means

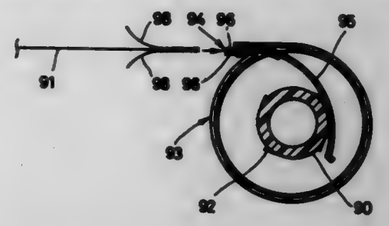


of hinged constraints, that said operating means make said central section of the beam rotate by up to about 105° and consist in an electric actuator supported by a plate which is integral with said base, said actuator vertically moving in both directions a spindle hinged on an arm projecting from one side of said central section, there being hinged on an arm projecting from the opposite side of the latter central section one or more return springs and on one end of said central section there being also a lever for manual emergency rotation of said section, that said openings in each of said housings or pods consist in a ventral rectangular window which can be opened by means of a curved internally-sliding door operated by an electric motor which moves toothed wheels co-operating with curved racks of said door, for the range-finder camera shots, as well as in an aeronautical plexiglass porthole, located behind the above-mentioned window, for the television focusing camera, and that the above-mentioned containers for said cameras each comprise a prismatic box frame whose vibration damping system consists in a set of four springs diverging from the tops of the front part of said frame, in a second set of two pairs of return springs fixed to the rear part of the frame as well as in pairs of double-acting return shock absorbers acting along the longitudinal, transverse and vertical directions of the frame itself.

5,191,371
PHOTOFINISHING AND PRESERVING METHOD FOR PHOTOGRAPHIC FILM AND FILM CASSETTE THEREFOR

Takao Shigaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 622,032, Dec. 4, 1990, Pat. No. 5,093,686.
This application Oct. 16, 1991, Ser. No. 777,140
Claims priority, application Japan, Dec. 5, 1989, 1-315893
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—275 **3 Claims**



1. A cassette for a roll of photographic film, comprising:

a spool having capture members on a peripheral surface thereof, said capture members engaging in perforations formed in said film;

a light-tight housing holding spool therein and having a light-tight film gate through which said film is withdrawn from and inserted into said cassette;

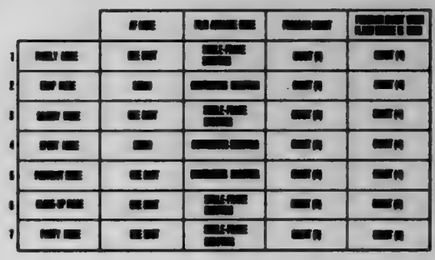
means for guiding said film from said film gate to said spool; and

urging means for pressing a tip of said guiding means onto said capture members on said peripheral surface of said spool.

5,191,372
CAMERA

Yoshihiko Aihara, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 473,825, Feb. 2, 1990, abandoned. This application Dec. 18, 1991, Ser. No. 809,249
Claims priority, application Japan, Feb. 6, 1989, 1-027207; Feb. 6, 1989, 1-027208
Int. Cl.[5] G03B *13/46*
U.S. Cl. 354—400 **6 Claims**



1. A camera comprising:

automatic focusing means for focusing in each of a plurality of different automatic focusing modes including at least first and second automatic focusing modes including at least first and second automatic focusing modes wherein in the first automatic focusing mode, once an in-focus state is attained, a photo-taking optical system is kept in the position of the in-focus state, and in the second automatic focusing mode, even after attainment of an in-focus state, the position of the photo-taking optical system is continu-

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ously shifted in response to a movement of a photographing object to newly bring the photo-taking optical system into an in-focus state;

advancing means for advancing a recording medium in each of a plurality of advance modes, including at least first and second advance modes, wherein in the first advance mode only one frame portion of the recording medium is advanced even when a shutter releasing operation is continuously performed, and in the second advance mode the recording medium is advanced for every photographing shot while the shutter releasing operation continues;

exposure means for executing each of a plurality of exposure programs including at least first and second programs, wherein said exposure means determines an aperture value and a shutter speed according to a change in the luminance of an object to be photographed when operating according to the first program, wherein said exposure means determines an aperture value and a shutter speed also according to a change in the luminance of said object when operating according to the second program, and wherein said exposure means determines different aperture values and different shutter speeds when operating according to the first and second programs even for the same object's luminance;

a memory circuit for storing the automatic focusing modes, the advance modes and the exposure programs in different combinations, each of the combinations consisting of a specific automatic focusing mode, a specific advancing mode and a specific exposure program;

setting means for setting a plurality of photographing modes; and

a control circuit for allowing a photographing operation to be carried out in an applicable combination of the specific automatic focusing mode, the specific advance mode and the specific exposure program stored in said storing means, when a specific photographing mode is set by said setting means.

5,191,373

DISPLAY SYSTEM OF A CAMERA SELECTIVE DISPLAY SYSTEM FOR A CAMERA

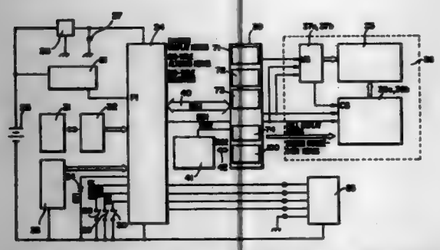
Satoshi Nakano, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 576,073, Aug. 31, 1990, abandoned. This application May 6, 1992, Ser. No. 879,726

Claims priority, application Japan, Aug. 31, 1989, 1-102292[U]

Int. Cl.[5] G03B *17/18*

U.S. Cl. 354—474 20 Claims



1. A display system of a camera for displaying information relating to the camera on a display unit disposed in a main body of the camera, wherein:

the information is divided into sub-title data to be displayed by a plurality of sub-titles and data subordinate to the sub-title data; and which comprises:

information display changeover means comprising means for selecting sub-title data and subordinate data and means for selectively displaying the sub-title data or the subordinate data on the display unit.

5,191,374

EXPOSURE CONTROL APPARATUS

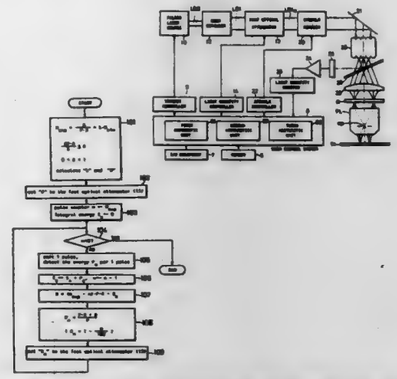
Junji Hazama, Yokohama; Kazuaki Suzaki, and Tsuneaburo Uemura, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 623,176, Dec. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 438,091, Nov. 16, 1989, abandoned. This application Nov. 27, 1991, Ser. No. 799,777

Claims priority, application Japan, Nov. 17, 1988, 63-288977; Dec. 7, 1989, 1-318245

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—43 20 Claims



1. An exposure control apparatus for controlling the amount of exposure of a first body to pulse energy wherein said pulse energy, accompanied by energy variation within a predetermined range per each emission, is applied a plurality of times to said first body through a second body, and a pattern formed on said second body is transcribed onto said first body sensitive to said pulse energy by the plurality of times of the application of said pulse energy to said first body, said exposure control apparatus comprising:

arithmetic means for estimating the number of pulses necessary for the exposure base don the range of energy variation between the emission pulse energies each time said pulses are applied and the allowable accuracy of control of the amount of exposure of said first body to said pulse energy based on the desired total exposure, and for estimating the object value of the integrated light quantity to be supplied to said first body every time a pulse is applied to said first body based on the response to the number of pulses and the desired total exposure;

energy quantity measuring means for measuring the actual integrated light quantity obtained by the pulse energy previously applied to said first body; and

energy quantity adjusting means for adjusting the amount of energy for the next pulse based on the difference between said object value of the integrated light quantity to be attained in response to the application of said next pulse and the previous actual value of integrated light quantity.

5,191,375

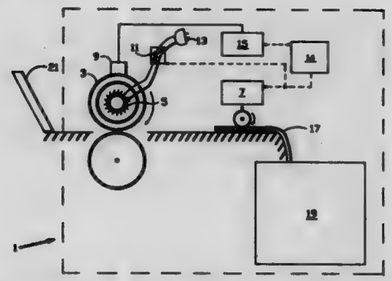
FUSER LOW POWER CONTROL

Douglas C. Hamilton, Lexington, Ky., assignor to Lexmark International, Inc., Greenwich, Conn.

Filed Feb. 14, 1992, Ser. No. 835,873

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—205 4 Claims



1. Imaging apparatus comprising an imaging system creating images in loose toner on a substrate, a heating iron to fix such loose toner by applying heat, a heating element to heat said heating iron, means to measure the temperature of said heating iron, means to activate said heating element and to then measure the time period between when said means to measure represents a first predetermined temperature and when said means to measure represents a second predetermined temperature, and means to extend the period between start after standby and the initial feeding of said substrate after start to said heating iron when said measured time period is greater than a predetermined amount.

5,191,376

OPTICAL UNIT

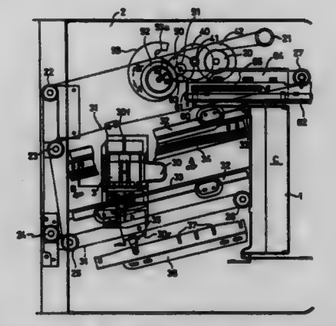
Tatsushi Hayashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1991, Ser. No. 784,579

Claims priority, application Japan, Oct. 29, 1990, 2-293138

Int. Cl.[5] G03G *15/04*; G03B *27/36*

U.S. Cl. 355—233 10 Claims



1. An optical unit comprising a lens and a mirror unit installed within an image forming apparatus, the lens and the mirror unit moving according to a desired power of magnification so as to expose a photo-conductor to the light reflected from the original to form an image corresponding to the desired magnification,

wherein the optical unit comprises,

a cam device for moving the mirror unit, the cam device including a cam which is connected to a driving source and rotates according to the various magnifications, and a cam follower which moves around the cam to reciprocate the mirror unit; and

a lock means on the circumferential surface of the cam, the lock means operative to engage the cam follower to prevent the mirror unit from moving when the optical unit is to be moved.

5,191,377

ORIGINAL SCANNING APPARATUS WITH ELECTRICAL CONNECTING MEMBER

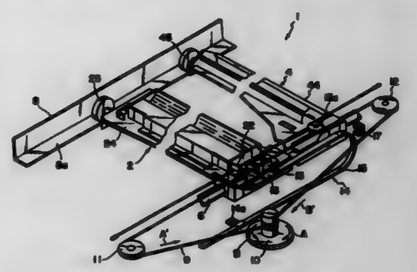
Kazuo Kagiura, Tokyo; Tatsuya Shiratori, Kawasaki; Naomasa Kimura; Eiichi Ando, both of Yokohama; Masanari Shirai, Chigasaki; Yoshikuni Toyama; Hiroyoshi Maruyama, both of Yokohama, and Masashi Ohashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,553, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 311,280, Feb. 16, 1989, abandoned. This application Oct. 1, 1991, Ser. No. 769,482

Claims priority, application Japan, Feb. 19, 1988, 63-037228

Int. Cl.[5] G03G *15/04*

U.S. Cl. 355—235 27 Claims



27. An original scanning apparatus, comprising:

a scanning unit for scanning an original;

a connecting member electrically connected to said scanning unit; and p1 driving means for driving said scanning unit, wherein said driving means comprising a wire connected to said scanning unit and a driving pulley on which said wire is wound, wherein said connecting member is substantially positioned between said wire and driving pulley.

5,191,378

ELECTROSTATIC RECORDING APPARATUS IN WHICH A TRANSFER MATERIAL CONVEYANCE BELT DETACH POINT IS LOCATED DOWNSTREAM FROM THE IMAGE RETAINER

Masahiko Itaya; Hisahiro Saito, and Takayuki Miyamoto, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 557,167

Claims priority, application Japan, Jul. 31, 1989, 1-199088

Int. Cl.[5] G03G *15/16*

U.S. Cl. 355—274 1 Claim

1. An electrostatic recording apparatus comprising:

an image retainer for retaining a toner image;

a movable endless belt for conveying a transfer material to said image retainer, said belt having a separation point at which said belt separates from said image retainer;

a belt drive roller arranged on a downstream side of said belt, said belt drive roller moving said belt in a direction substantially tangent to said image retainer at said separation point; and

an electrode roller for applying an electric voltage to said belt, and for pressing said belt onto said image retainer, thereby forming a nip portion between said electrode roller and said image retainer along a nip plane having a downstream end, said toner image being transferred onto

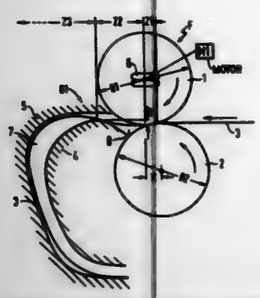
said transfer material while said transfer material passes through said nip portion;

said belt and said roller being arranged whereby said separation point is 2 to 4 mm from said downstream end.

5,191,379
DEVICE FOR FLATTENING SINGLE SHEETS IN NON-MECHANICAL PRINTER AND PRINTER AND COPIER MEANS

Hans Mauser, Seefeld; Rudolf Seeberger, Lochham, and Gerhard Klapetek, Giesen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/DE88/00373, § 371 Date Nov. 26, 1990, § 102(e) Date Nov. 26, 1990, PCT Pub. No. WO89/08872, PCT Pub. Date Sep. 21, 1989
PCT Filed Jun. 22, 1988, Ser. No. 576,391
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808477
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—282 3 Claims

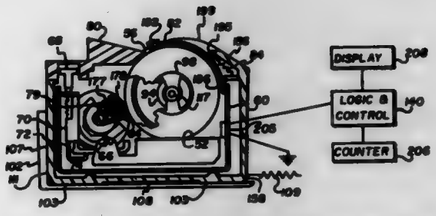


1. A non-mechanical printer or copier, comprising:
an intermediate carrier on which latent images of characters to be printed are generated dependent on print information and are developed into toner images with the assistance of a developer mix;
a transfer printing station in which these toner images are transferred onto a recording medium;
a fixing means for fixing the toner images on the recording medium, said fixing means comprising a motor-driven fixing drum and a pressure roller that together form a fixing nip for the recording medium and further comprising means for heating at least one of the fixing drum and the pressure roller;
a smoothing device for the recording medium that follows the fixing nip as seen in a conveying direction of the recording medium, said smoothing device eliminating the arcings of the recording medium impressed by the fixing means,
the pressure roller being positioned offset by a predetermined horizontal distance relative to the position of the fixing drum in a direction opposite the conveying direction of recording medium;
said smoothing device including paper guide elements being provided following the fixing nip, said paper guide elements forming a paper guide channel composed of a plurality of sections; and
a contour of the paper guide channel is such that, immediately after departing the fixing nip, the recording medium is curved in two following sections of the paper guide channel first in one direction and, subsequently, in an opposite direction, so that a flat and aligned recording medium is present for further conveying after departing the last section.

5,191,380
IMAGE-FORMING APPARATUS AND FUSING ROLLER CARTRIDGE WITH OIL-APPLYING MEANS

Lisa C. Hoover, and Ralph E. Williams, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1992, Ser. No. 829,858
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—284 15 Claims



1. A fuser for fixing a toner image to a receiving sheet, said fuser including:
a pressure roller,
a cartridge including,
a housing having an access opening,
a fusing roller mounted for rotation within said housing and accessible through said access opening,
means for applying offset-preventing liquid to said fusing roller, said applying means being adjustable between a first condition in which a first amount of offset-preventing liquid is applied and a second condition in which less or no such offset-preventing liquid is applied,
actuatable means for adjusting said applying means between its first and second conditions, said means being actuatable from outside said cartridge,
means for actuating said actuatable means in a received cartridge, and
means for receiving said cartridge in a position in which said fusing roller is in engagement with said pressure roller through said access opening and said actuatable means is positioned in operable relation with said actuating means.

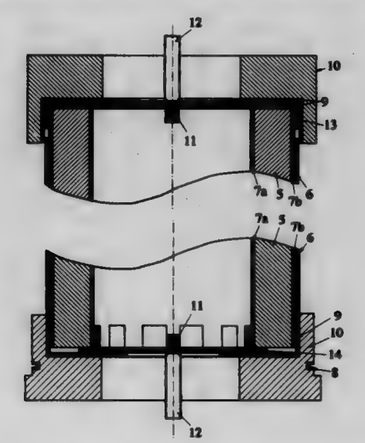
5,191,381
PTC CERAMIC HEAT ROLLER FOR FIXING TONER IMAGE

Jie Yuan, 524 Linden Rd., State College, Pa. 16801

Filed Aug. 12, 1991, Ser. No. 743,675
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 1 Claim

1. A toner image fixing device comprising:
a tubular heat roller having a ceramic body formed of a ceramic resistor material having a positive temperature coefficient of resistance (PTC);
electrically conductive means disposed upon an inner surface and outer surface of said ceramic body, wherein said

electrically conductive means provides for electrical connections;
an insulating layer, formed of an electrically insulative and thermally conductive material, disposed upon said electrically conductive means which is disposed upon the outer surface of said ceramic body in order to insulate a sheet carrying a toner image thereon from electrical contact with said electrically conductive means on said outer surface of said ceramic body;
means for rotating said heat roller;
first and second conductive members located at opposite



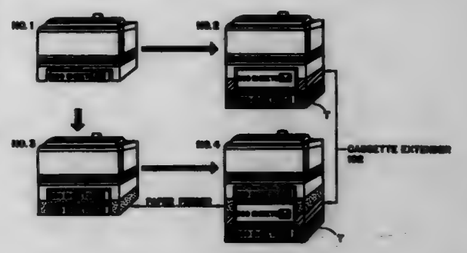
ends of said heat roller which are in electrical contact with said electrically conductive means;
means for applying an electrical voltage to said electrically conductive means by way of electrical connections from an electrical power supply by contacts which press against said first and second conductive members;
said first conductive member electrically contacts said electrically conductive means disposed upon said outer surface of said ceramic body; and
said second conductive member electrically contacts said electrically conductive means disposed upon the inner surface of said ceramic body.

5,191,382
IMAGE FORMING SYSTEM

Shigeru Okamura, Kawasaki; Koichi Miyamoto, Yokohama; Yutaka Kikuchi; Naoki Asano, both of Kawasaki; Hideo Saito, and Hitoshi Ishikawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1992, Ser. No. 871,347
Claims priority, application Japan, Apr. 22, 1991, 3-90743; Apr. 22, 1991, 3-90753
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—309 21 Claims

1. A sheet feeding apparatus comprising:
a containing portion capable of containing a first sheet supporting means for stacking and supporting sheets;
extender means for expanding a containing space of said containing portion in a height direction so that a second sheet supporting means having sheet containing ability greater than that of said first sheet supporting means can be contained in the expanded containing space; and
sheet supply means for feeding out the sheet from said first or second sheet supporting means contained in said containing portion;
wherein said extender means includes a plurality of extender members adapted to be arranged at both lateral sides of said sheet supporting means to increase the height of said

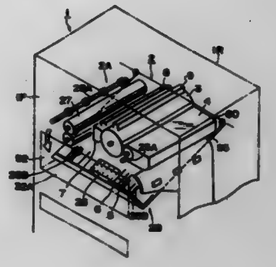


containing portion, and connecting means for connecting said plurality of extender members.

5,191,383
IMAGE FORMING APPARATUS WITH CONVEYING PATH ACCESS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 21, 1991, Ser. No. 780,058
Claims priority, application Japan, Oct. 31, 1990, 2-293882
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—321 19 Claims



1. An image forming apparatus, comprising:
means for forming an image on a recording paper in an image forming position;
means for conveying the recording paper through the image forming position, the conveying means having a conveying path through which the recording paper is conveyed;
means, provided near the conveying means, for defining a predetermined spacing;
a unit for holding the conveying means as one body;
means for movably supporting the unit between a set position where the unit allows the conveying means to convey the recording paper and an opening position where the unit is moved in the spacing to open the conveying path; and
means, provided on the spacing, for storing the recording paper conveyed by the conveying means.

5,191,384

emitting pulses of light from said laser source (14);

frequency signal being used to retrieve said information

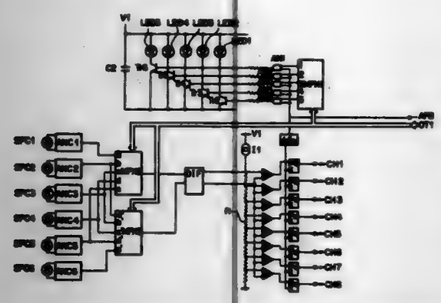
5,191,388

5,191,384

DISTANCE MEASURING SYSTEM

Motohiro Nakanishi, and Hiroshi Ootsuka, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 302,838, Jan. 27, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 631,225
Claims priority, application Japan, Jan. 30, 1988, 63-20338
Int. Cl.[5] G01C *3/00, 5/00*
U.S. Cl. 356—1 23 Claims



1. A distance measuring system for a camera, comprising:
light emitting means for emitting light twice to an object at a same area in an angle of view to be photographed by said camera;
light receiving means including three receiving elements arranged in a line along a base length for receiving reflected light from the object to individually output received light signals;
ratio calculating means including selecting means for selecting received light signals outputted from a first pair of adjacent ones of said three receiving elements when said light emitting means emits light for the first time and for selecting received light signals outputted from a second pair of adjacent ones of said three receiving elements when said light emitting means emits light for the second time, and means responsive to selection of received light signals for taking a ratio between the selected received light signals;
distance calculating means for calculating distances based on the ratios obtained by said ratio calculating means;
distance determining means for determining a distance based on the two distances calculated by said distance calculating means; and
lens driving means for driving a taking lens of said camera based on the distance determined by said distance determining means.

5,191,385

METHOD FOR DETERMINING THE SPATIAL COORDINATES OF POINTS, APPLICATION OF SAID METHOD TO HIGH-PRECISION TOPOGRAPHY, SYSTEM AND OPTICAL DEVICE FOR CARRYING OUT SAID METHOD

Michel Kasser, Saint-Mande, France, assignor to Institut Geographique National, Paris, France

Filed Oct. 7, 1991, Ser. No. 774,038
Claims priority, application France, Oct. 12, 1990, 90 12609
Int. Cl.[5] G01B *11/26*
U.S. Cl. 356—5 34 Claims

1. A method for determining the spatial coordinates of points (A) at which are placed elements of an optical system, the optical system comprising an optical device (13) including a pulsed laser source (14) and a detector (16) which is sensitive to the radiation emanating from said laser source (14), and reflectors (10), the method comprising the steps of:
emitting pulses of light from said laser source (14);
forming a conical divergent beam by causing the pulses of laser radiation emanating from the laser source to diverge;
collecting the radiation reflected from the reflectors (10) in a wide field in order to transmit the same to the detector;
detecting said pulses of light which are reflected from a reflector and collected, by means of said detector (16);

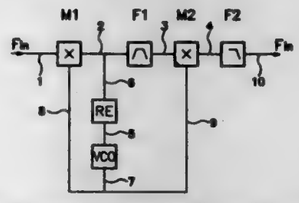
measuring the transit times (Dt_i) of the pulses emitted by the laser source (14), reflected from a reflector (10) and detected by the detector (16); and
determining relationships between said spatial coordinates in response to said transmit times measured in said step of measuring.

5,191,386

OPTICAL INSTRUMENT

Volker Grebe, Bochum, Fed. Rep. of Germany, assignor to Messcon Gesellschaft fur Messtechnik mbH, Dortmund, Fed. Rep. of Germany

Filed Oct. 28, 1991, Ser. No. 783,342
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 9014814
Int. Cl.[5] G01P *3/36;* G01R *23/16*
U.S. Cl. 356—28.5 6 Claims



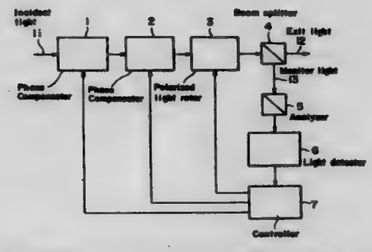
1. A signal frequency processing device for measuring the frequency of an input signal, wherein the frequency of said input signal conveys information relative to a measured phenomenon, said device comprising:
signal input means for receiving said input signal;
frequency generator means for generating an oscillator signal;
mixer means coupled to said signal input means for receiving said input signal and to said frequency generator means for receiving said oscillator signal, said mixer means mixing said input signal with said oscillator signal to provide an intermediate signal having a frequency equal to the difference between the frequency of said input signal and the frequency of said oscillator;
a band pass filter having a predetermined center frequency coupled to said mixer means for receiving said intermediate frequency and passing only said intermediate frequency through to an output of said band pass filter;
control means coupled to the output of said band pass filter and to said frequency generator means for controlling the operation of said frequency generator means to provide an oscillator signal having a frequency which when mixed with said input signal provides said intermediate signal at a frequency substantially equal to the center frequency of said band pass filter, the frequency of said intermediate frequency signal being used to retrieve said information relative to said measure phenomenon;
a second mixer means coupled to said band pass filter for receiving said intermediate frequency signal and to said frequency generator means for receiving said oscillator signal, said second mixer means mixing said intermediate signal with said oscillator signal to provide a second intermediate signal having a frequency equal to the difference between the frequency of said intermediate signal and the frequency of said oscillator signal; and
a second band pass filter coupled to said second mixer means for receiving said second intermediate frequency and passing only said intermediate frequency through to an output of said second band pass filter, the frequency of said second intermediate frequency signal being used to retrieve said information relative to said measured phenomenon.

5,191,387

POLARIZATION CONTROL SYSTEM

Akio Ichikawa; Toshiyuki Takeda, and Satoshi Matsuura, all of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1991, Ser. No. 637,096
Claims priority, application Japan, Jan. 10, 1990, 2-3230; Jan. 10, 1990, 2-3231
Int. Cl.[5] G01B *11/18;* G01J *4/00*
U.S. Cl. 356—34 2 Claims



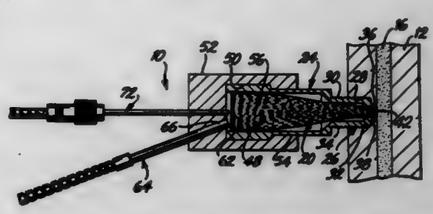
1. A polarization control system which comprises:
a first phase compensator for introducing a phase difference with respect to an incident light;
a second phase compensator for introducing a phase difference by 45 degrees with respect to the light passed through the first phase compensator;
a polarized light rotor for rotating the plane of polarization of the light passed through the second phase compensator;
a beam splitter for dividing the light passed through the rotor into an exit light and a monitor light;
an analyzer so arranged that the direction of the transmission axis of the analyzer does not coincide with the principal axes of the two phase compensators for converting the polarized condition of the light formed by the first phase compensator, second phase compensator and the polarization light rotor into a light volume;
a detector for detecting the light passed through the analyzer; and
a controller for controlling the first and second phase compensators and the polarized light rotor in response to the output of the light detector.

5,191,388

APPARATUS FOR DETECTING AND ANALYZING PARTICULATE MATTER IN A SLURRY FLOW

Lawrence B. Kilham, Secaucus, N.J., assignor to Flow Vision, Inc., Wilmington, Mass.

Filed Dec. 18, 1991, Ser. No. 809,348
Int. Cl.[5] G01N *21/00;* G02B *6/04*
U.S. Cl. 356—335 23 Claims



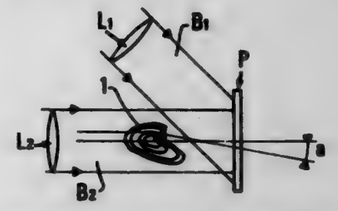
1. Apparatus for detecting particulate matter in a slurry travelling in a flow channel, said apparatus comprising:
optical transmission means for viewing the particulate matter in only a thin layer of said slurry adjacent to said optical transmission means, said thin layer having a maximum depth equal to approximately the largest particle size of said particulate matter, said optical transmission means including a first end and an opposite second end, said first end extending through a port in said flow channel and being adjacent the slurry travelling in the flow channel, and said optical transmission means having a focal length at said first end for permitting focussed viewing by said optical transmission means only in said thin layer which is adjacent to said first end;
securing means for securing said optical transmission means within said port such that said first end of said optical transmission means is adjacent the slurry travelling in the flow channel;
illuminating means for illuminating at least said thin layer of said slurry adjacent said first end of said optical transmission means; and
observation means for viewing an image of said particulate matter in said thin layer from the second end of said optical transmission means.

5,191,389

DEVICE FOR MEASURING BY HOLOGRAPHY THE DEVIATIONS OF LIGHT RAYS IN TRANSPARENT MEDIA

Dean Verhoeven, Rueil-Malmaison, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

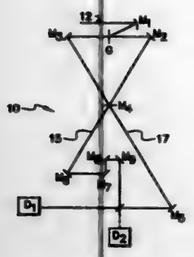
Filed Oct. 31, 1990, Ser. No. 606,612
Claims priority, application France, Nov. 9, 1989, 89 14827
Int. Cl.[5] G01B *9/21*
U.S. Cl. 356—348 20 Claims



1. A holographic deflectometry process for measuring the angular deviations undergone by the light of a laser traversing an object or holograms formed from the object, said process comprising:
(a) directing light from a laser onto an object;

(b) passing light emanating from the object or from a hologram formed from the object through an optical system including at least two lenses, arranged in such a way that part of the reconstructed image of each obtained hologram substantially forms in the object focal plane of said optical system, and a diaphragm, substantially arranged in the image focal plane of said optical system; and
(c) measuring the light, after passage thereof through said optical system, by receiving the light on an angular measuring instrument placed on the side of said diaphragm opposite said optical system.

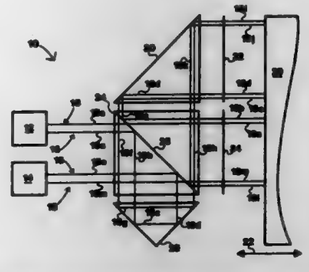
5,191,390
SOLID STATE LASER GYRO WITH INTERFEROMETRICALLY SUBSTRACTED NOISE
Jean-Claude M. Diels, and Ming Lai, both of Albuquerque, N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 28, 1991, Ser. No. 723,367
Int. Cl.[5] G01C *19/66*
U.S. Cl. 356—350 **24 Claims**



1. A ring laser apparatus for spontaneous-emission-free detection comprising:
(a) laser ring means including a means for providing an output from the laser ring means;
(b) means for detecting;
(c) a means for providing gain located within the laser ring; and
(d) a beam splitter wherein the laser ring means and the gain means are structured and arranged such that an energy source stimulates the gain means, further wherein the gain means thereby produces first and second oppositely traveling laser beams along first and second pathways, each of the pathways having equal path lengths, wherein further the first and second oppositely traveling beams include first and second oppositely traveling spontaneous emission components, wherein a portion of each of the first and second oppositely traveling beams are output through the laser ring output means into the beam splitter, so that the oppositely directed first and second spontaneous emission components are highly coherent on the beam splitter such that the beam splitter provides a detection signal free of spontaneous emission noise to the detector means.

5,191,391
HIGH RESOLUTION PLANE MIRROR INTERFEROMETER
John C. Tsai, Saratoga, Calif., assignor to Excel Precision, Santa Clara, Calif.
Filed Jan. 29, 1991, Ser. No. 647,716
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—351 **11 Claims**

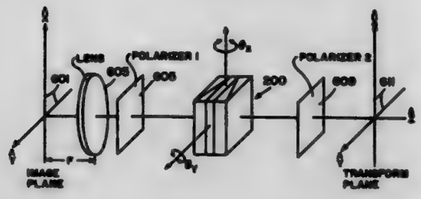
1. An improved interferometer, comprising:
a columnated electromagnetic beam producing means for producing a measurement beam and a reference beam;
a signal analysis apparatus for comparing the measurement beam to the reference beam;
a reference beam redirecting means for directing the reference beam from the beam producing means to the signal analysis apparatus; and
a measurement beam redirecting means for causing the measurement beam to be directed four times toward an objective mirror and then into the signal analysis apparatus such that the measurement beam is Doppler shifted in frequency four times by a movement of said objective mirror, wherein;
the measurement beam redirecting means includes an optical component and a beam polarity rotating means, said optical component comprising a polarizing cube with a polarizing surface therein, a right angle reflector, and a cube corner retroreflector, said beam polarity rotating means being located between said optical component and said objective mirror such that polarity of the measurement beam is rotated by ninety degrees during each completed circuit of the measurement beam between said optical component and said objective mirror, and wherein;



said optical component is configured such that the measurement beam is directed from the beam producing means, through said polarizing cube, through said beam polarity rotating means, to said objective mirror, through said beam polarity rotating means, to said polarizing surface, into the right angle reflector, through said beam polarity rotating means, to said objective mirror, through said beam polarity rotating means, into the right angle reflector, through said polarizing cube, into the cube corner retroreflector, through said polarizing cube, into the right angle reflector, through said beam polarity rotating means, to said objective mirror, through said beam polarity rotating means, into the right angle reflector, to said polarizing surface, through aid beam polarity rotating means; to said objective mirror, through said beam polarity rotating means, through said polarizing cube, and into the signal analysis apparatus.

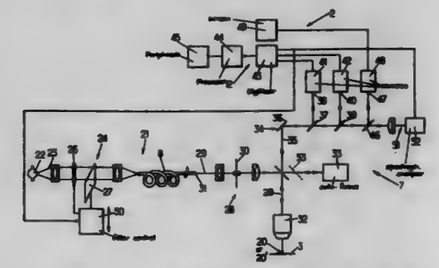
5,191,392
WHITE LIGHT OPTICAL TRANSFORM DEVICE
John L. Johnson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 9, 1991, Ser. No. 757,054
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—353 **3 Claims**

1. An optical Fourier transform device for producing the Fourier transform of an intensity image in both coherent and incoherent lights, said device comprising: a first and a second uniaxial birefringent crystal wedges for passing optical energy therethrough, each wedge having a wedge angle and an optic axis at a predetermined acute angle to the surface of the crystal, said wedges being arranged in parallel such that said second wedge is placed in a mirror image position of said first wedge; a half-wave plate sandwiched between said wedges and fixably attached thereto for interchanging the paths of the extra-ordinary and ordinary rays as the rays pass through said half-wave plate; and a first and a second non-birefringent wedge-shaped crystals for minimizing the prism-angle deviation effect of a beam emanating therefrom, said first non-birefringent crystal being fixably attached to said first birefringent wedge and said second non-birefringent crystal being fixably attached to said second birefringent wedge such that the



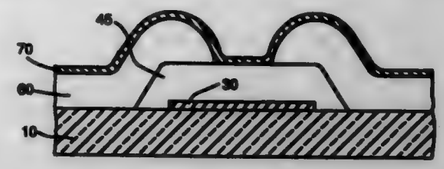
wedge ends of said non-birefringent crystals point in the opposite direction from the wedge ends of said birefringent wedges, thereby rendering a rectangular block shape to said Fourier transform device.

5,191,393
OPTICAL MEASUREMENT DEVICE AND METHOD
Olivier Higuette, St. Germain, and Michel Lacombat, Saclay, both of France, assignors to Micro-Controle, Cedex, France
PCT No. PCT/FR89/00630, § 371 Date Oct. 15, 1990, § 102(e) Date Oct. 15, 1990, PCT Pub. No. WO90/06489, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 5, 1989, Ser. No. 555,510
Claims priority, application France, Dec. 8, 1988, 88 15902
Int. Cl.[5] G01B *11/02*; A61N *5/00*
U.S. Cl. 356—384 **11 Claims**



1. A method for optically measuring submicronic dimensions of a line on an integrated circuit and an amount of overlay between two patterns on said integrated circuit, comprising the steps of:
delivering an incident light beam including energy in the visible and UV ranges from an arc lamp to an optical monofiber having a diameter greater than 500 microns and a length greater than 3 m.,
collecting said light beam originating from the optical monofiber, directing said light beam onto said integrated circuit through a microscope objective lens and substantially orthogonally thereto and focussing said beam on said integrated circuit automatically by an autofocussing system operating in infrared light,
collecting a light beam reflected by said integrated circuit, after it has passed through said microscope objective lens,
directing part of the energy of said reflected beam in the visible range onto a first CCD camera and part of the energy of said reflected beam in the UV range to a second CCD camera, each camera having sensors distributed in a matrix,
digitizing signals delivered by said cameras with a means for delivering pixel-per-pixel digital representations of an optical field of the microscope objective lens, as space representation signals, and
processing said space representation signals to reconstitute, from the signals in the ultraviolet range, the width of said lines and, from the signals in the visible range, the amount of overlay between the two patterns in the field, respectively.

5,191,394
AMORPHOUS SILICON PHOTODIODE WITH SLOPED SIDEWALLS AND METHOD OF FABRICATION
Richard J. Saia; Robert F. Kwasnick, both of Schenectady, and Brian W. Giambattista, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 28, 1991, Ser. No. 783,747
Int. Cl.[5] H01L *45/00, 27/14*; H01J *40/14*
U.S. Cl. 257—52 **4 Claims**



1. A solid state photodetector comprising:
an metallic contact pad disposed on a substrate;
a photodiode body comprising substantially undoped hydrogenated amorphous silicon disposed over and in electrical contact with said contact pad, said photodiode body having an upper surface opposite the surface of said body closest to said contact pad, said photodiode body having sloped sidewalls extending from said upper surface toward said substrate, the slope of said sidewalls being selected to provide a substantially uniformly sloped surface conducive to deposition of a plurality of high integrity conformal layers thereover, said plurality of layers including high integrity layers of dielectric material and relatively thin substantially transparent conducting material;
a photodetector dielectric layer disposed over said photodiode body and patterned to expose at least an electrode contact portion of said upper surface of said photodiode body; and
a relatively thin and substantially transparent common electrode having a thickness between about 50 nm and 300 nm disposed over said photodetector dielectric layer and in electrical contract with said electrode contact portion of said upper surface of said photodiode body
said photodetector being adapted to receive incident light through said common electrode, each of said photodetector dielectric layer and substantially transparent common electrode layers being of high integrity and extending over multiple sidewalls of said photodiode body so as to be adapted for use in a two-dimensional array.

5,191,395
MOS TYPE SEMICONDUCTOR DEVICE WITH MEANS TO PREVENT PARASITIC BIPOLAR TRANSISTOR
Takeyoshi Nishimura, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Apr. 1, 1991, Ser. No. 678,440
Claims priority, application Japan, Apr. 2, 1990, 2-87889; Jul. 9, 1990, 2-181159
Int. Cl.[5] H01L *29/78*
U.S. Cl. 257—328 **8 Claims**

1. A MOS type semiconductor comprising:
a semiconductor layer of first conductivity type;
a plurality of channel regions of second conductivity type having a predetermined impurity density, and being selec-

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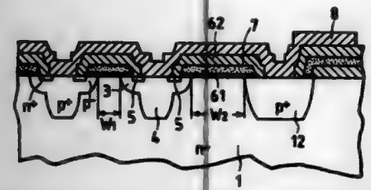
tively formed in a surface of said semiconductor layer to form a plurality of channels in said semiconductor layer between adjacent ones of said channel regions;
source regions of first conductivity type selectively formed in a surface of each one of said channel regions;
a well region of second conductivity type formed with a predetermined depth in a middle portion of each one of said plurality of channel regions, said well region having an impurity density greater than the predetermined impurity density of said plurality of channel regions;
an insulating layer formed on the surface of said semiconductor layer;



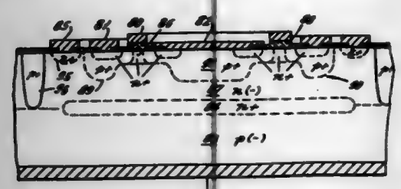
gate electrodes formed on said insulating layer, each gate electrode respectively overlaying one of said plurality of channels;
a main electrode formed in contact with at least one of said source region and said well region;
a diffusion region of second conductivity type formed in the surface of said semiconductor layer and ohmically connected to said main electrode, said diffusion region being laterally separated from said plurality of channel regions by a distance greater than 1.5 times a lateral separation distance between adjacent ones of said plurality of channel regions.

5,191,396

HIGH POWER MOSFET WITH LOW ON-RESISTANCE AND HIGH BREAKDOWN VOLTAGE

Alexander Lidow, Manhattan Beach, and Thomas Herman, Redondo Beach, both of Calif., assignors to International Rectifier Corp., El Segundo, Calif.

Division of Ser. No. 90,664, Aug. 28, 1987, abandoned, which is a division of Ser. No. 456,813, Jan. 10, 1983, Pat. No. 4,705,759, which is a division of Ser. No. 232,713, Feb. 9, 1981, Pat. No. 4,376,286, which is a continuation of Ser. No. 951,310, Oct. 13, 1978, abandoned. This application Jan. 30, 1989, Ser. No. 303,818
Int. Cl.[5] H01L *29/78*
U.S. Cl. 257—339 10 Claims



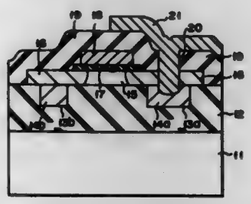
1. A three-terminal power metal oxide silicon field effect transistor device comprising:
a wafer of semiconductor material having first and second opposing semiconductor surfaces; said wafer of semiconductor material having a relatively lightly doped, one conductivity type major body portion for receiving junctions;
at least first and second spaced base regions of the opposite conductivity type to said one conductivity type formed in said wafer and extending from said first surface to a depth beneath said first surface; the space between said at least first and second base regions defining a common conduction region of one conductivity type at a given first surface location;
first and second source regions of said one conductivity type formed in each pair of said at least first and second base regions respectively at first and second first surface locations and extending from said first and second first surface locations to a depth less than said depth of said base regions; said first and second source regions being laterally spaced along said first surface from the facing respective edges of said common conduction region thereby to define first and second channel regions along said first surface between each pair of said first and second source regions, respectively, and said common conduction region;
source electrode means located on said first surface, connected to said source regions and comprising a first terminal;
gate insulation layer means on said first surface and disposed at least on said first and second channel regions;
gate electrode means on said gate insulation layer means, overlying said first and second channel regions and comprising a second terminal;
a drain conductive region remote from said common region and extending from said first surface into said major body portion; and
a drain electrode located on said first surface, coupled to said drain conductive region and comprising a third terminal whereby a current path is defined between said source electrode means and said drain electrode which has a first vertical component from said source electrode means through said common conductive region, a lateral component beneath said at least first and second spaced bases and a second vertical component from beneath said at least first and second spaced bases to said drain electrode;
wherein said wafer of semiconductor material further includes a laterally extending relatively thin buried drain region disposed within said drain conductive region and being of said one conductivity type and having a concentration greater than the concentration of said relatively lightly doped major body portion, and extending beneath and spaced from said common conduction region and said at least first and second bases; said buried drain region portion serving to reduce resistance to lateral current flow between said common conduction region and said drain conductive region.

5,191,397

SOI SEMICONDUCTOR DEVICE WITH A WIRING ELECTRODE CONTACTS A BURIED CONDUCTOR AND AN IMPURITY REGION

Tohru Yoshida, Warabi, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

PCT No. PCT/JP90/01124, § 371 Date Apr. 24, 1991, § 102(e) Date Apr. 24, 1991
PCT Filed Sep. 4, 1990, Ser. No. 684,932
Claims priority, application Japan, Sep. 7, 1989, 1-230534
Int. Cl.[5] H01L *29/78*
U.S. Cl. 257—347 6 Claims



1. A silicon-on-insulator semiconductor device comprising:

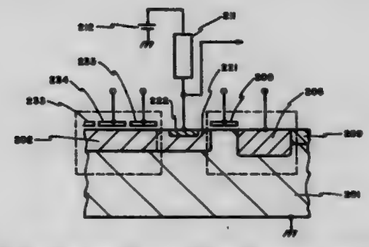
a semiconductor substrate;
a first insulating film, having a recess portion, formed on said semiconductor substrate;
a conductor formed in said recess portion;
a semiconductor film formed on said first insulating film and said conductor;
an impurity region formed in said semiconductor film and on said conductor;
a second insulating film formed on said semiconductor film and said impurity region;
a hole formed above said recess portion, said hole extending through the conductor, the impurity region and the second insulating film and being located away from said first insulating film; and
a wiring film formed in said hole, said wiring film being connected to said conductor and said impurity region.

5,191,398

CHARGE TRANSFER DEVICE PRODUCING A NOISE-FREE OUTPUT

Nobuhiko Mutoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 655,171, Feb. 11, 1991, abandoned, which is a continuation of Ser. No. 464,615, Jan. 3, 1990, abandoned, which is a continuation of Ser. No. 239,536, Sep. 1, 1988, abandoned. This application Nov. 21, 1991, Ser. No. 798,360
Claims priority, application Japan, Sep. 2, 1987, 62-220643; Jan. 8, 1988, 63-1898
Int. Cl.[5] H01L *29/78*; G11C *19/28*
U.S. Cl. 257—216 5 Claims



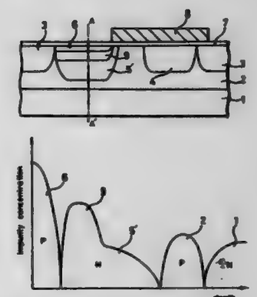
1. A charge transfer device formed on a semiconductor substrate having an impurity concentration of 10^{15}–10^{16} cm^{-3} of a first conductivity type, said charge transfer device comprising:
a charge transfer channel constructed by forming a plurality of transfer electrodes in a line on said semiconductor substrate via an insulator film;
a base region of a second conductivity type formed in said semiconductor substrate to receive charges transferred along said charge transfer channel, said base region having a thickness of 0.2–0.8 μm and an impurity concentration of 10^{16}–10^{17} cm^{-3} and being separated from said transfer electrodes in plan view;
an output region of said first conductivity type formed in said base region, said output region having an impurity concentration of 10^{17}–10^{19} cm^{-3} and being surrounded by said base region at a surface of said semiconductor substrate;
an output terminal connected to said output region in order to derive an electrical output signal in accordance with a quantity of charges received by said base region;
a reset-drain region of said second conductivity type formed in said semiconductor substrate at a first portion which is remote from said base region, said reset-drain region being held at a constant voltage; and
a reset gate electrode formed on said semiconductor substrate at a second portion located between said base region and said reset-drain region, said reset gate electrode being supplied with a reset pulse which produces a potential in said semiconductor substrate thereunder, said potential having a value which is intermediate between the values at said base and reset-drain regions, wherein, in response to said reset pulse, said base region is supplied with a biasing voltage from said reset drain region so as to be completely depleted by a depletion layer extending from said output region throughout said thickness of said base region.

5,191,399

SOLID-STATE IMAGING DEVICE WITH IMPROVED PHOTODETECTOR

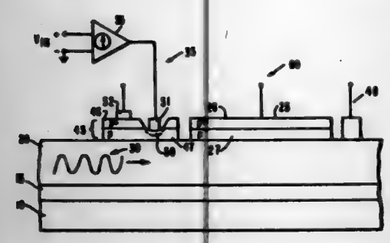
Shigeto Maegawa; Kiyohiko Sakakibara, and Hidekazu Yamamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 811,118
Claims priority, application Japan, Dec. 21, 1990, 2-413391; Sep. 6, 1991, 3-255773
Int. Cl.[5] H01L *29/78, 27/14, 31/00*
U.S. Cl. 257—223 2 Claims



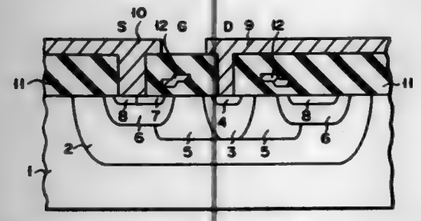
1. A solid-state imaging device comprising:
a photodetector comprising a substrate, a first conductivity type semiconductor layer disposed on said substrate, a second conductivity type semiconductor region disposed in said layer having a dopant impurity concentration varying with position within said region relative to said substrate, a first conductivity type region disposed in said second conductivity type semiconductor region, and a second conductivity type semiconductor subregion disposed between and contacting said first conductivity type region and said second conductivity type region and forming a same conductivity type junction with said second conductivity type region, said second conductivity type subregion having a dopant impurity concentration varying with position within said second conductivity type subregion relative to said substrate and wherein the dopant impurity concentration in said second conductivity type subregion adjacent the same conductivity type junction is higher than the dopant impurity concentration in said second conductivity type region adjacent the same conductivity type junction and a net dopant impurity concentration profile of said second conductivity type subregion and said second conductivity type region includes an inflection point at the same conductivity type junction of said second conductivity type subregion and said second conductivity type region whereby signal charges produced in response to incident light are stored in said second conductivity type subregion of said photodetector for being read out as a light signal.

5,191,400
LINEAR ACOUSTIC CHARGE TRANSPORT CIRCUIT
Robert L. Miller, Bowie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 21, 1991, Ser. No. 747,819
Int. Cl.[5] H01L 29/84, 29/96
U.S. Cl. 377—60 7 Claims



1. A linear acoustic charge transport (ACT) circuit comprising:
an ACT device; and
An R.F. transconductance amplifier for providing an input signal to said ACT device.

5,191,401
MOS TRANSISTOR WITH HIGH BREAKDOWN VOLTAGE
Koji Shirai, Kawasaki, and Ken Kawamura, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 491,084, Mar. 9, 1990, abandoned. This application Nov. 7, 1991, Ser. No. 789,444
Claims priority, application Japan, Mar. 10, 1989, 1-56103
Int. Cl.[5] H01L 27/02
U.S. Cl. 257—328 14 Claims

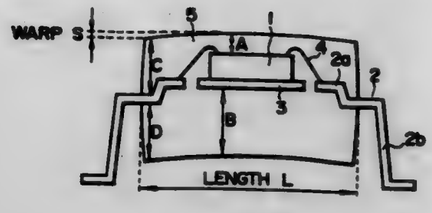


1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a plurality of wells of a second conductivity type formed in said semiconductor substrate;
a plurality of FET structure each having a drain electrode, with each of said structures formed in a different one of said wells; and
a wiring layer extracted from said drain electrode outside said semiconductor substrate;
wherein at least one of said FET structure includes:
a first impurity diffusion layer of the first conductivity type formed in said one of said wells without contacting said semiconductor substrate;
a second impurity diffusion layer of the second conductivity type which surrounds said first impurity diffusion layer and has an impurity concentration higher than that of said well;
a third impurity diffusion layer of the first conductivity type formed within said second impurity diffusion layer without contacting said semiconductor substrate and said first impurity diffusion layer, said third impurity diffusion layer being ring-shaped and having a gap therein through which said wiring layer extends;
a source electrode connected to both said second impurity diffusion layer and said third impurity diffusion layer;
a gate electrode formed between said first impurity diffusion layer and said third impurity diffusion layer and formed on said second impurity diffusion layer so as to interpose an insulation film therebetween; and
a drain electrode connected to said first impurity diffusion layer.

5,191,402
SEMICONDUCTOR DEVICE HAVING AN INTER-LAYER INSULATING FILM DISPOSED BETWEEN TWO WIRING LAYERS
Toshihiko Kondo; Kazuo Tanaka, and Hirofumi Yasuda, all of Suwa, Japan, assignors to Seiko Epson Corporation, Nagano, Japan
Continuation-in-part of Ser. No. 360,611, Jun. 2, 1989, Pat. No. 4,931,996, which is a continuation of Ser. No. 114,311, Oct. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 202,649, Jun. 7, 1988, Pat. No. 5,075,762. This application Jun. 1, 1990, Ser. No. 531,672
Claims priority, application Japan, Oct. 27, 1986, 61-164538; Jun. 9, 1987, 62-143717; Jun. 12, 1987, 62-145297; Jun. 30, 1987, 62-163497; Nov. 4, 1987, 62-278566; Feb. 24, 1988, 63-41253
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] H01L 29/94, 23/54, 29/78
U.S. Cl. 257—288 16 Claims

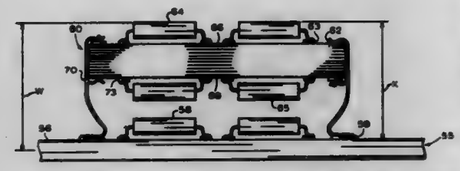
1. A semiconductor device comprising:
a semiconductor substrate;
a first insulating film carried on the semiconductor substrate;
a first wiring layer having sides and carried on the first insulating film;
an interlayer insulating film overlying the first wiring layer and the first insulating film, the interlayer insulating film having:
a top portion which overlies the first wiring layer, and
a pair of sidewall portions which overlie the first insulating film, are adjacent to and in contact with the sides of the first wiring layer, and, as viewed from an elevational perspective, increase in width in advancing from contact with the first wiring layer towards the substrate; and
a second wiring layer which extends from overlying part of the top portion of the interlayer insulating film to and in contact with an exposed portion of the substrate adjacent the first insulating film;
wherein a portion of the second wiring layer is in contact with a portion of at least one of the pair of sidewall portions.

5,191,403
RESIN-SEALED SEMICONDUCTOR DEVICE HAVING A PARTICULAR MOLD RESIN STRUCTURE
Tsutomu Nakazawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 3, 1992, Ser. No. 829,372
Claims priority, application Japan, Feb. 5, 1991, 3-14532
Int. Cl.[5] H01L 23/28, 23/30
U.S. Cl. 257—787 4 Claims



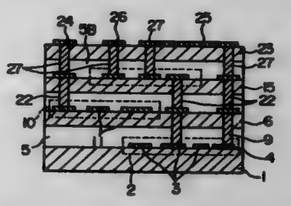
1. A resin-sealed semiconductor device comprising:
a semiconductor chip;
a mold resin structure completely encapsulating and sealing said semiconductor chip with resin upper and lower thicknesses, respectively, above and below said chip; and
an outer lead having a part projecting out of said mold resin structure and electrically connected to said semiconductor chip;
wherein the resin upper thickness is differentiated from the resin lower thickness so that the resulting warp ratio of the molded resin structure is more then 0.0025, and the entire outer surface of said resin-sealed semiconductor device except for the outer lead consists of the mold resin structure.

5,191,404
HIGH DENSITY MEMORY ARRAY PACKAGING
Andrew L. Wu, Shrewsbury; Donald W. Smelser, Bolton; E. William Bruce, II, Lunenburg, all of Mass., and John O'Dea, Galway, Iran, assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 453,518, Dec. 20, 1989, abandoned. This application Sep. 30, 1991, Ser. No. 767,571
Int. Cl.[5] H01L 25/12, 25/16, 23/12
U.S. Cl. 257—724 5 Claims



1. Apparatus for providing a low-profile, high-density package for integrated circuit chips, said apparatus configured for insertion into a computer backplane having a plurality of equally spaced connectors with a predetermined distance between adjacent ones thereof, said connectors being configured for receiving a plurality of adjacent boards, said apparatus comprising:
a circuit board having electrically conductive portions on a first surface and a second surface, said circuit board being further configured for insertion into a connector of said backplane;
at least two generally planar multichip modules, each having a first side and a second side, each of said multichip modules having low-profile, integrated circuit chips mounted to said first and second sides thereof in conductive relation with electrically conductive portions on said first and second sides, said low profile chips being arranged so as to be activated and deactivated in a pattern that avoids undue concentration of thermal dissipation, thereby distributing the thermal loads created by said chips;
edge connection means for mechanically connecting one of said at least two multichip modules to selected points of said conductive portions of said first surface of said circuit board and another of said at least two multichip modules to selected points of said conductive portions of said second surface of said circuit board, with said connection means being configured, dimensioned and arranged for providing electrical connections from said selected points of said conductive portions of said circuit board to selected points of said conductive portions of said first and second sides of said multichip modules, such that said thus-assembled, low-profile package is capable of insertion into said backplane connector without the need of redesign to change said predetermined distance to accommodate adjacent boards in adjacent connectors of said backplane.

5,191,405
THREE-DIMENSIONAL STACKED LSI
Yasuhiro Tomita, Neyagawa; Yoshiyuki Takagi, Osaka; Shigenobu Akiyama, Hirakata, and Kenichi Yamazaki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 19, 1989, Ser. No. 452,337
Claims priority, application Japan, Dec. 23, 1988, 63-326578
Int. Cl.[5] H01L 25/06, 23/52, 23/54
U.S. Cl. 257—777 4 Claims

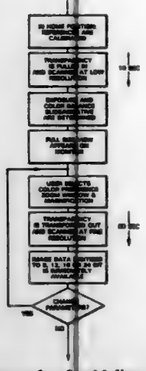


1. A three-dimensional stacked LSI comprising a plurality of integrated-circuit layers stacked together, each of said integrated-circuit layers being equipped with a plurality of circuit elements, said circuit elements being equipped with respective power terminals, which are connected through via-hole wiring between stacked layers to the power wiring of the uppermost integrated-circuit layer, wherein the wiring of the uppermost integrated-circuit layer is formed of aluminum and the wiring of the lower integrated-circuit layers and the via-hole wiring between stacked layers are formed of tungsten.

5,191,406
METHOD AND APPARATUS FOR RAPID SCANNING OF COLOR IMAGES
Marco Brandestini, Kirkland, and Richard F. Ferraro, Seattle, both of Wash., assignors to Nikon Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 511,649, Apr. 20, 1990, abandoned. This application Nov. 20, 1990, Ser. No. 619,663
Int. Cl.[5] H04N 11/00
U.S. Cl. 358—22 24 Claims

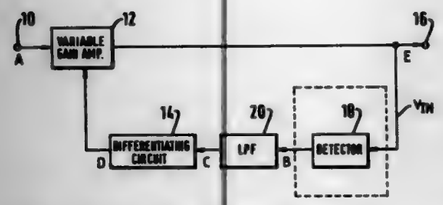
1. A method for rapid digitization of a transparency which uses an illumination system, optical image forming means, and solid-state detection means having a rectilinear detection pattern, and which provides high resolution, color separation and sizing of the image to any desired scale, comprising the steps of:
moving the transparency at selected rate in a first direction thus defining a scale factor in a first dimension;

sampling image data obtained through said solid-state detection means at a selected sample rate along a line in a second dimension while defocusing the image to adjust the spatial bandwidth to said selected sample rate;
acquiring for every line sampled a plurality of line data sets each corresponding to a respective spectral band;



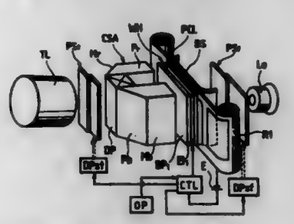
rapidly reducing in each of said line data sets, through a predetermined transformation function, the number of colors in the corresponding spectral band used to faithfully represent the original image; and
compensating data in each of said line data sets, through use of predetermined calibration data, for non-uniformities of said illumination system and said solid-state detection means.

5,191,407
CONTOUR ACCENTUATION CIRCUIT FOR A COLOR SIGNAL
Mitsuno Kawano, Kumagaya, and Tadashi Terada, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 15, 1991, Ser. No. 641,547
Claims priority, application Japan, Jan. 19, 1990, 2-8225
Int. Cl.[5] H04N *9/64, 5/52*
U.S. Cl. 358—37 **17 Claims**



15. A contour accentuating circuit comprising:
a variable gain amplifier having a first input terminal for receiving an input signal, a second input terminal for receiving a gain control signal, and an output terminal for outputting an amplified signal;
gain control means, having an input terminal connected to the output terminal of said variable gain amplifier and an output terminal connected to the second input terminal of said variable gain amplifier, for supplying a gain control signal to said variable gain amplifier, said gain control signal being the differential of a signal having an amplitude which is proportional to the amplitude of the amplified signal when the amplitude of the amplified signal is within a predetermined range and which is substantially constant when the amplitude of the amplified signal exceeds the predetermined range.

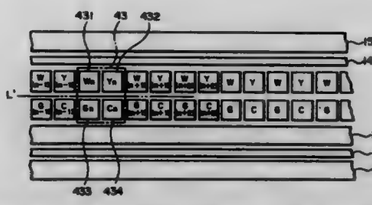
5,191,408
COLOR IMAGING SYSTEM WITH SELECTIVELY OPENABLE OPTICAL SHUTTER
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Miura; Tsutou Asakura; Masato Furuya, both of Yokohama; Yoshihisa Koyama, Yokosuka; Yuji Uchiyama, Chigasaki; Ichiro Negishi; Tetsuji Suzuki, both of Yokosuka; Fujiko Tatsumi, Yokohama; Ryusaku Takahashi, and Keiichi Maeno, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan
Filed Feb. 28, 1991, Ser. No. 662,665
Claims priority, application Japan, Feb. 28, 1990, 2-48112; Mar. 2, 1990, 2-51288; Mar. 9, 1990, 2-58708; Apr. 12, 1990, 2-97260; May 21, 1990, 2-130499; Sep. 17, 1990, 2-246716
Int. Cl.[5] H04N *1/028, 1/46, 3/10, 3/15, 5/30, 9/07*; G02F *1/135*
U.S. Cl. 358—49 **42 Claims**



17. A color imaging system comprising:
a lens for introducing an optical image of a subject;
color separating means for separating said optical image into a plurality of different color images;
an optical shutter selectively openable for transmitting the optical image of the subject to said color separating means;
light-to-light converting means for converting said different color images into respective electric charge images, and for converting said electric charge images into secondary color images, respectively, under an electric field;
a power supply for generating said electric field in said light-to-light converting means; and
control means for individually controlling conversion of said electric charge images into said secondary color images.

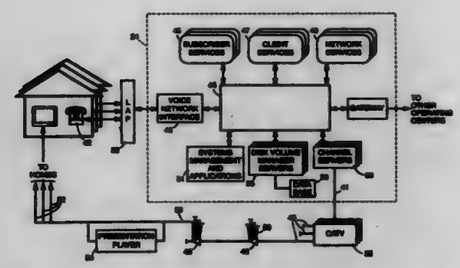
5,191,409
COLOR SCANNING SYSTEM
Tadahiko Hamaguchi; Masatoshi Katoh, and Tsuneo Sato, all of Kanakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 329,280, Mar. 27, 1989, Pat. No. 4,992,860. This application Jun. 4, 1990, Ser. No. 532,791
Claims priority, application Japan, Mar. 29, 1988, 63-75043; May 31, 1988, 63-131382; May 31, 1988, 63-131383; May 31, 1988, 63-131384
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—75 **5 Claims**

5. A color scanning system comprising:
a plurality of contiguous image sensors disposed in a row on an image sensing device which convert a color image into electric signals, each one of said image sensors defined by a plurality of detectors arrayed in a plurality of rows including first and second rows, and the detectors in the plurality of rows accumulate charges generated by incident light for accumulation times starting at different points of time, the first row starting before the second row, and accumulate the charges for predetermined accumulation times, the accumulation time of the first row expiring before the accumulation time of the second row expires;
focusing means for focusing a color image on the detectors;
moving means for moving said image sensors and an original relative to each other in a direction perpendicular to a scanning direction of said image sensors at a predetermined speed;
a storage system including a line shift gate connected to receive and store the accumulated charges of the first row



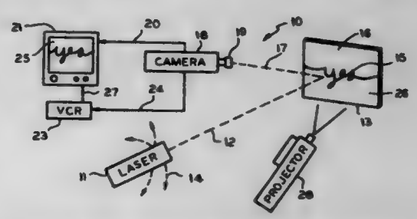
at the end of the accumulation time of the first row, a first channel connected to receive and hold the accumulated charges of the first row from the line shift gate at the end of accumulation time of the second row, and a second channel connected to receive and hold the accumulated charges of the second row at the end of the accumulation time of the second row, the first accumulated charges of the first and second rows being output to the first and second channels, respectively, at a predetermined time.

5,191,410
INTERACTIVE MULTIMEDIA PRESENTATION AND COMMUNICATIONS SYSTEM
Karl W. McCalley, South Barrington; Steven D. Wilson, Chicago, and James L. Fischer, Barrington, all of Ill., assignors to Telaction Corporation, Schaumburg, Ill.
Continuation of Ser. No. 573,262, Aug. 24, 1990, abandoned, which is a continuation of Ser. No. 453,184, Dec. 15, 1989, abandoned, which is a continuation of Ser. No. 271,086, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 81,189, Aug. 4, 1987, Pat. No. 4,792,849. This application Feb. 5, 1991, Ser. No. 652,238
Int. Cl.[5] H04N *7/173, 7/10*
U.S. Cl. 358—86 **53 Claims**



1. An interactive multimedia presentation and communications system concurrently accessible to a plurality of subscribers wherein each of said plurality of subscribers may input his choice of a particular multimedia presentation for viewing on a television set from a plurality of such presentations available on the system, each of said plurality of presentations generally including a sequence of video images, accompanying audio, and a menu of options related to said presentation, and in response to viewing said presentation, may input at least one option to perform transactions related to said presentation or may choose another particular presentation for viewing on said television set comprising:
a) computing means for preparing, storing, processing and transmitting digital data related to said plurality of multimedia presentations and to the performance of said transactions, and which, in response to input from the subscriber performs said transactions or retrieves and processes digital data related to said particular multimedia presentation;
b) input means available to each of said plurality of subscribers for communicating with said computing means;
c) signal processing means for receiving, storing and processing digital data related to said particular multimedia presentations that have been chosen and for converting said digital data into analog TV signals and transmitting said analog TV signals to said television set of each of said plurality of subscribers who have chosen said particular multimedia presentations; and
d) signal transmission means for transmitting digital data from said computing means to said signal processing means.

5,191,411
LASER DRIVEN OPTICAL COMMUNICATION APPARATUS
Myron C. Muckerheide, Port Washington, Wis., assignor to Seton Health Care Foundation, Milwaukee, Wis.
Continuation-in-part of Ser. No. 156,732, Feb. 18, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 467,897
Int. Cl.[5] H04N *7/18, 5/66, 9/31*
U.S. Cl. 358—93 **16 Claims**



1. A laser driven optical communication apparatus for permitting verbally impaired or disabled individuals having limited physical mobility to communicate with others, said laser driven optical communication apparatus comprising:
laser means for generating a coherent beam of light where-in said beam of light may be directed by said individual in a manner so as to form images understandable by others;
interface screen means positioned as a target upon which said individual directs said beam of light towards the formation of said images,
said interface screen means serving to cause a portion of said beam of light directed thereon to be reflected and made visible thereby permitting said individual to follow the path of said beam of light towards facilitating the formation of said images;
optical receiver means associated with said interface means for receiving said reflected portion of said beam of light,
said optical receiver means being capable of enhancing the persistence of said reflected beam of light to, in turn, cause said beam of light to appear as a single continuous image;
display means electrically connected to said optical receiver means for displaying said continuous image thus enabling said directed beam of light to be read and permitting said individual to communicate with others.

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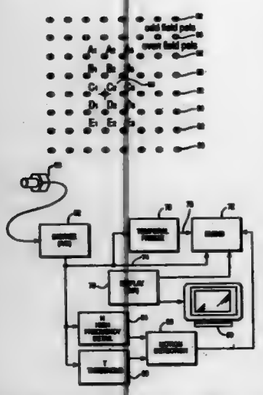
5,191,412
INSPECTION DEVICE FOR AIRCRAFT ENGINE
Richard C. Thomson, Edinburgh, Scotland, assignor to GEC Ferranti Defence Systems Limited, Stanmore, England
Filed Oct. 24, 1991, Ser. No. 782,307
Claims priority, application United Kingdom, Oct. 24, 1990, 9023089
Int. Cl.[5] H04N *7/18*; B64D *47/08*
U.S. Cl. 358—93 11 Claims

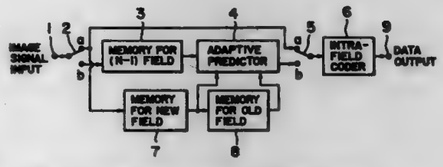
1. An imager which is adapted to be mounted on an aircraft for viewing the front of an aircraft engine in flight, which comprises:
means for forming an image of at least a portion of the front of the aircraft engine;
means for intensifying the formed image; and
means for gating the image intensifying means to enable rotating engine parts to be viewed through the front of the aircraft engine as if stationary or rotating slowly.

5,191,413
SYSTEM AND METHOD FOR ELIMINATING INTERLACE MOTION ARTIFACTS IN CAPTURED DIGITAL VIDEO DATA
Albert D. Edgar, Austin, Tex., assignor to International Business Machines, Armonk, N.Y.
Filed Nov. 1, 1990, Ser. No. 608,107
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—105 4 Claims



1. A method for improving digital video data of a target, comprising
capturing said digital video image data in a plurality of fields;
comparing interfield differences between said plurality of fields to intrafield pixel differences to detect in said digital video image data an area corresponding to motion of said target;
deleting said image area from one of said fields; and
substituting in said area of said one of said fields an image area functionally related to said image area from another of said fields.

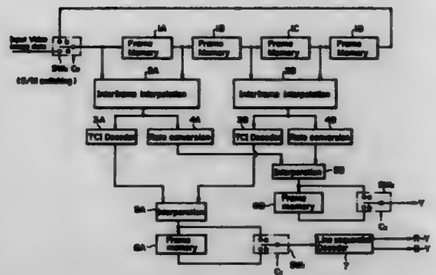
5,191,414
INTERFIELD PREDICTIVE ENCODER AND DECODER FOR REPRODUCING A SIGNAL SUBJECTED TO PREDICTIVE ENCODING BY ENCODER INTO AN IMAGE SIGNAL
Kenji Sugiyama, Noda, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Mar. 26, 1991, Ser. No. 675,182
Claims priority, application Japan, Mar. 27, 1990, 2-77625
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—136 4 Claims



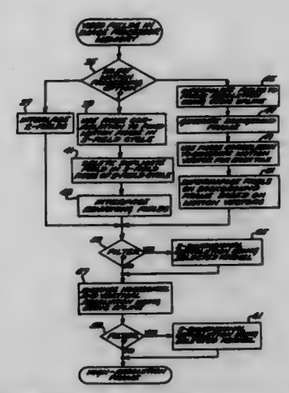
1. An interfield predictive encoder comprising:
first encoder means for setting, from successive fields of image signals inputted in succession, independent fields located at a fixed interval and such that odd and even fields exist one after another to independently encode these independent fields within respective fields;
predictive signal formation means for forming predictive signals of non-independent fields between said independent fields on the basis of signals of respective independent fields before and after those non-independent fields; and
second encoder means for predicting signals of said non-independent fields on the basis of predictive signals corresponding thereto to conduct encoding with respect to predictive errors.

5,191,415
STILL IMAGE TRANSMITTING METHOD
Osamu Matsunaga, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 19, 1991, Ser. No. 687,509
Claims priority, application Japan, Apr. 20, 1990, 2-02802; Jun. 28, 1990, 2-68506
Int. Cl.[5] H04N *7/12*, *7/04*
U.S. Cl. 358—138 1 Claim

1. A still image transmitting method for processing a video image comprising the steps of:
converting said video image into digital image data;
sub-sampling said converted digital image data for a picture area whereby pixel data of said digital image data of a still image is sampled at intervals of a predetermined period; and
transmitting said sub-sampled digital image data of the still image of the picture area at sampling points in first selected positions as video information of a plurality of N fields, in which transmitting step, sub-sampled digital image data obtained in said sub-sampling step at sampling points in second selected positions different than said first selected positions is transmitted in a plurality of N fields that are contiguous to said N fields, so that pixel data at said first and second selected positions of said still image for the picture area is transmitted in a period equal to two times the number of N fields.

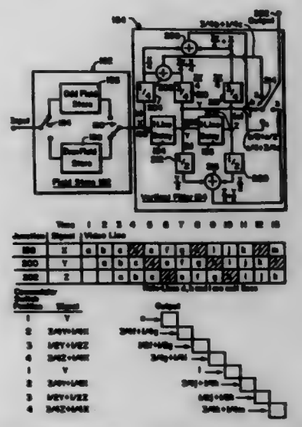


5,191,416
VIDEO SIGNAL PROCESSING SYSTEM
Stewart P. Dickson, Thousand Oaks, and William M. Villarreal, Los Angeles, both of Calif., assignors to The Post Group Inc. and Pacific Title & Art Studio, both of Los Angeles, Calif.
Filed Jan. 4, 1991, Ser. No. 637,486
Int. Cl.[5] H04N *7/01*, *7/18*, *11/20*
U.S. Cl. 358—140 34 Claims



1. An image processing apparatus for converting an input video signal having a succession of interlaced fields, each representing an image at a different time, to an output video signal having a succession of non-interlaced frames, the image processing apparatus comprising:
background means responsive to the interlaced input video signal for generating a succession of non-interlaced background frames, each based on two or more successive associated fields of the input video signal;
motion detection means for detecting areas of motion in the successive associated fields of the input video signal corresponding to each background frame and for generating data indicating the direction and magnitude of motion for each detected area of motion; and
superposition means for incorporating the detected areas of motion into each background frame, to produce a succession of non-interlaced frames constituting an output video signal that preserves the effect of any motion represented in the input video signal.

5,191,417
COMPATIBLE EDTV SYSTEM PROVIDING MULTI-ASPECT RATIO DISPLAY ON EDTV AND CONVENTIONAL TELEVISION RECEIVERS
Kenneth R. Skinner, Jefferson City, Tenn., and Joseph P. Bingham, Indianapolis, Ind., assignors to North American Philips Corporation, New York, N.Y.
Continuation of Ser. No. 598,294, Oct. 16, 1990, which is a division of Ser. No. 239,740, Sep. 2, 1988, Pat. No. 4,984,078.
This application Dec. 11, 1991, Ser. No. 807,966
Int. Cl.[5] H04N *7/01*, *7/00*, *7/04*
U.S. Cl. 358—141 12 Claims



9. Apparatus for decoding a television signal having a first aspect ratio and having border signals defining a border, first picture signals defining a first picture having a second aspect ratio which is wider than said first aspect ratio adjacent said border, enhancement signals combined with said border signals, and a masking signal combined with said border signals, said apparatus comprising:
separating means for separating said enhancement signals from said border signals; and
means for combining said first picture signals with said enhancement signals to provide an enhanced television picture.

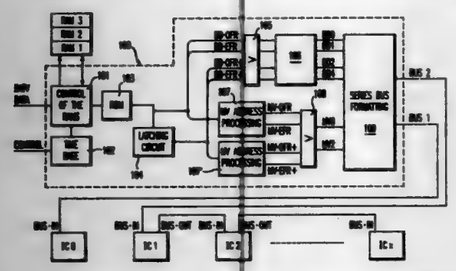
5,191,418
METHOD FOR THE PROCESSING OF DIGITAL CONTROL DATA ASSOCIATED WITH AN HD-MAC TYPE VIDEO SIGNAL AND DEVICE FOR THE IMPLEMENTATION OF THE METHOD
Francis Tran, Illkirch, France, assignor to Laboratoire Europeen de Recherches Electroniques Avancees, Societe En Nom Collectif, Courbevoie, France
Filed Feb. 20, 1991, Ser. No. 658,335
Claims priority, application France, Feb. 23, 1990, 90 02259
Int. Cl.[5] H04N *7/00*, *11/00*, *7/12*
U.S. Cl. 358—142 10 Claims

1. A method for decoding digital control data associated with an HD-MAC type video signal, comprising the steps of:
storing, in a plurality of memories, digital control data corresponding to N (N≧2) successive processing periods, the digital control data comprising motion vector data and branch decision data:
outputting in parallel, through a first processing circuit, motion vector data of an even frame and an odd frame corresponding to a first processing period;
outputting in parallel, through a second processing circuit, motion vector data of an even frame and an odd frame corresponding to a second processing period;

UMI

multiplexing, through a first multiplexer, the output motion vector data of the first and second processing periods and outputting, in parallel, first non-delayed motion vector data and second delayed motion vector data;

multiplexing and outputting, through a second multiplexer,



branch decision data of an even frame and an odd frame of the first and second processing periods; and

delaying the branch decision data and outputting in parallel first non-delayed branch decision data, second delayed branch decision data, third delayed branch decision data and fourth delayed branch decision data.

5,191,419

VIDEO NOISE REDUCER WITH DETECTION OF BOTH TOTAL AND TEMPORAL PICTURE CHANGES

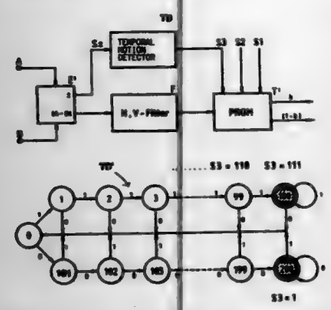
Gerhard Wischermann, Weiterstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 24, 1991, Ser. No. 690,620

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013474

Int. Cl.[5] H04N *5/213*

U.S. Cl. 358—167 **14 Claims**



1. Apparatus including a fader circuit (C) for reducing noise in a first video signal (A) provided to a first input of said fader circuit (C), said fader circuit having an output, said apparatus having a write-read memory (ST) connected in circuit for delaying a second video signal for essentially a full picture period to produce in a read-out of said write-read memory a delayed second video signal (B) said output of said fader circuit (C) providing said second video signal and being connected to an input of said write-read memory and having said first input and a second input connected for fading together said first video signal (A) and said delayed second video signal (B) at a controllable fading factor (k), a total motion detector (E', F) including a comparator (E') connected for comparing corresponding pixels of said delayed second video signal (B) and said first video signal (A) and a control circuit (P), having a preliminary filter (F) for eliminating high frequency noise components, of which an input is connected to an output of said comparator (E'), wherein said filter output produces a signal (M) representative of the absolute value difference between said corresponding pixels, said control circuit also including a read-only memory (T') for modifying said fading factor in response to said filter output signal (M) so that, with increasing total motion in a scene defined by said first video signal, the contribution of said delayed second video signal to the output of said fader circuit is reduced, characterized in that

said comparator (E') has a second output (±) for a signal designating the sign of every said difference between corresponding pixels found in comparison of said first video signal and said delayed second video signal by said comparator, in addition to said output of said comparator connected to said control circuit (P);

said read-only memory (T') of said total motion detector is connected for being addressed jointly by output (M) from said preliminary filter (F) and by at least first and second address signal values, said first address signal value (S1) being a motion-signal-effectiveness threshold value, and

a temporal motion detecting logic circuit (TD, TD' TD'') having an input connected to said output (±) for said sign designating signal of said comparator and an output connected to supply said second address signal value (S3) to an address input of said read-only memory, for at least partially preventing the reduction of the fading factor applied in said fader circuit (C) when designations of the same sign are predominant among sequential sign designations provided by said sign designating signal.

5,191,420

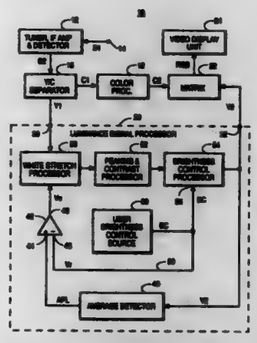
VIDEO SYSTEM WITH FEEDBACK CONTROLLED "WHITE STRETCH" PROCESSING AND BRIGHTNESS COMPENSATION

William A. Lagoni, and Robert L. O'Brien, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 16, 1991, Ser. No. 808,328

Int. Cl.[5] H04N *5/57, 5/52, 9/77*

U.S. Cl. 358—168 **5 Claims**



1. Apparatus, for use in a television system, comprising:

input means for providing a video input signal to be processed;

output means for providing a processed video output signal;

a source for providing a brightness control signal;

a source reaponsive to said processed video output signal for providing an average picture level indicating signal;

amplifier means having a first input to which said average picture level indicating signal is applied, having a second input to which a reference level signal is applied and having an output for providing a control signal representative of a difference between the input signals supplied to said amplifier means;

a non-linear processor and a brightness control processor coupled in cascade between said input means and said output means for applying non-linear processing and brightness control to said processed video output signal;

first means for applying said brightness control signal to a brightness control input of said brightness control processor for controlling the brightness of said processed video output signal;

second means for applying said control signal provided by said amplifier means to a control input of said non-linear processor for controlling a transfer characteristic of said non-linear processor; and

means for deriving at least a portion of said reference signal supplied to said second input of said amplifier means from said brightness control signal supplied to said brightness control processor.

5,191,421

AUTOMATIC SCREEN CONDITION CONTROL CIRCUIT IN TELEVISION SET

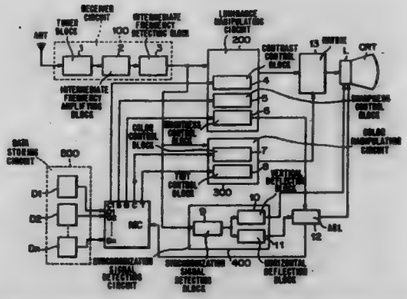
Joo C. Hwang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 17, 1991, Ser. No. 701,825

Claims priority, application Rep. of Korea, Aug. 31, 1990, 90-13690

Int. Cl.[5] H04N *5/235*

U.S. Cl. 358—168 **21 Claims**



20. An automatic screen condition control circuit, comprising:

means for receiving a television signal for enabling a visual display condition by providing an intermediate frequency signal having luminance and chrominance components representative of said television signal;

luminance manipulating meanc coupled to receive said intermediate frequency signal, for performing luminance manipulations on said luminance component of said intermediate frequency signal to provide luminance signals having a plurality of controllable characteristics for a display screen;

synchronous detecting means coupled to receive said intermediate frequency signal, for detecting vertical and horizontal synchronizing signals from said intermediate frequency signal;

deflector means for controlling movements of scanning beams on said display screen in dependence upon said vertical and horizontal synchronizing signals;

auto-brightness limiting means for detecting one determining characteristic from said plurality of controllable characteristics of said luminance signal to provide a detected luminance signal representative of said determining characteristic;

memory means for storing information corresponding to said plurality of controllable characteristics of said image signal for said visual display condition; and

processor means responsive to said detected luminance signal, for applying the information stored by said memory means corresponding to said plurality of controllable characteristics of said image signal, to said luminance manipulating means, for controlling said visual display condition.

5,191,422

CLAMP LEVEL SETTING METHOD FOR TELEVISION SIGNALS

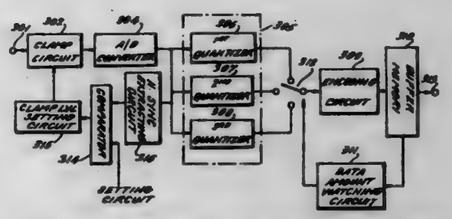
Fujio Cho; Toshiyuki Shimizu, both of Tokyo, and Yasuharu Ashida, Miyagi, all of Japan, assignors to NEC Corporation, Japan

Filed Jul. 25, 1990, Ser. No. 494,170

Claims priority, application Japan, Mar. 16, 1989, 1-62167

Int. Cl.[5] H04N *5/18, 7/13*

U.S. Cl. 358—172 **11 Claims**



1. A method for setting a clamp level of a predetermined portion of a television signal to a predetermined clamp level, wherein the television signal is processed by an analog to digital converter and a plurality of quantizers, the method comprising the steps of: setting said predetermined clamp level to a level such that said television signal is within the dynamic range of said analog to digital converter and such that a quantization error associated with a given quantizer of said quantizers which has the largest quantization step size of said plurality of quantizers is minimized.

5,191,423

TV CHANNEL SELECTING DEVICE WITH A MEMORY

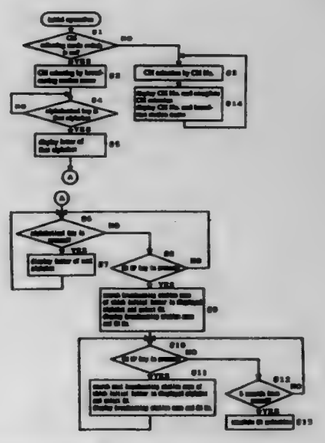
Nobuo Yoshida, Daito, Japan, assignor to Funai Electric Company Limited, Daito, Japan

Filed Apr. 24, 1991, Ser. No. 690,857

Claims priority, application Japan, Nov. 28, 1990, 2-127461[U]

Int. Cl.[5] H04N *5/50*

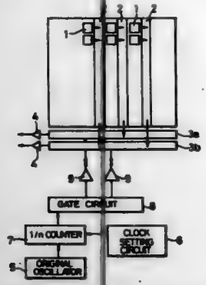
U.S. Cl. 358—191.1 **10 Claims**



1. A channel selecting device comprising:

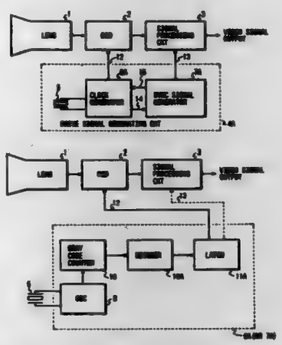
display means for displaying at least a number and an alphabetic character;
means for selecting a television channel;
means for presetting a plurality of names of broadcast stations and respective television channels thereof;
means for storing said plurality of names of broadcast stations and respective television channels thereof;
input means for defining a television channel selection;
said input means including at least one key indicating at least one of a numeral and an alphabetic character, and at least one up or down key;
control means, responsive to said input means, for controlling said display means so as to display a name of one of said broadcast stations and its associated television channel from said means for storing;
said means for selecting being responsive to said control means to select a desired television channel; and
mode setting means for making said means for selecting responsive to one of said name of one of said broadcast stations and said associated television channel.

5,191,424
SOLID-STATE CAMERA DEVICE HAVING A FUNCTION FOR ELIMINATING HIGH FREQUENCY SYNCHRONOUS NOISE
Nabeko Nohmi, and Yukio Endo, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 15, 1990, Ser. No. 538,331
Claims priority, application Japan, Jun. 16, 1989, 1-152109
Int. Cl.[5] H04N *3/335*
U.S. Cl. 358—213.15 17 Claims



1. A solid-state camera device of the horizontal charge-coupled device type, comprising:
signal charge accumulating means forming plural lines in a two-dimensional arrangement to store a signal charge;
a plurality of rows of vertical transfer means for successively reading the signal charges accumulated in the signal charge accumulating means;
horizontal transfer means for reading the signal charges transferred from the vertical transfer means in synchronism with a horizontal transfer clock signal;
output means for outputting a first signal charge as the signal charge for one line transferred from the horizontal transfer means in synchronism with the horizontal transfer clock signal;
selecting means for selecting a second signal charge including noise in a width from about the frequency of the horizontal transfer clock signal to the frequency of the first signal charge;
delaying means for delaying the second signal charge for a required period in synchronism with the horizontal transfer clock signal; and
deduction means for deducting the second signal charge from the first signal charge provided by the output means, to obtain an output signal charge which excludes the second signal charge.

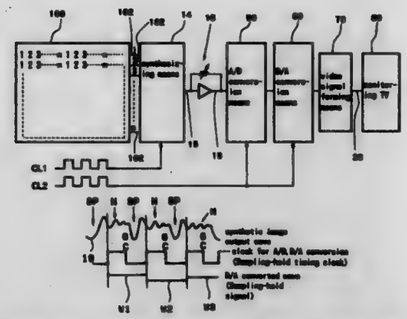
5,191,425
IMAGE PICKUP APPARATUS HAVING A GRAY COUNTER
Hiroki Hachiyama; Takahiro Iwasawa, both of Kamakura; Masanori Ohmae, Nagaokakyo; Masakatsu Yoshida, Otsu; Toshinobu Hatano, Kamakura, and Masakazu Tsuji, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 7, 1991, Ser. No. 695,818
Claims priority, application Japan, May 9, 1990, 2-119431
Int. Cl.[5] H04N *5/335*
U.S. Cl. 358—213.15 12 Claims



1. An image pickup apparatus comprising:
lens means;
a solid-state image sensor for converting light which passes through the lens means into an electric signal;
a signal processing circuit for processing the electric signal outputted from the solid-state image sensor;
a Gray code counter for counting pulses of a first clock signal and generating Gray codes in response to the first clock signal; and
means for feeding a second clock signal and a synchronizing signal to the solid-state image sensor and the signal processing circuit in response to the Gray codes generated by the Gray code counter respectively,
wherein the Gray code counter comprises n-bit counting stages where n denotes a predetermined natural number, and a plurality of logic decoding means for feeding logic outputs to input terminals of the respective counting stages, the logic outputs being equivalent to a produce of a first logic output of a (k−1)-th-bit counting stage and second logic outputs of a (k−2)-th-bit counting stage and lower-bit counting stages where k denotes a natural number between 3 and n, and for feeding a logic output, being equivalent to a product of a first logic output of the (k−1)-th-bit counting stage and second logic outputs of the (k−2)-th-bit and lower bit counting stages, to an input terminal of a k-th-bit counting stage.

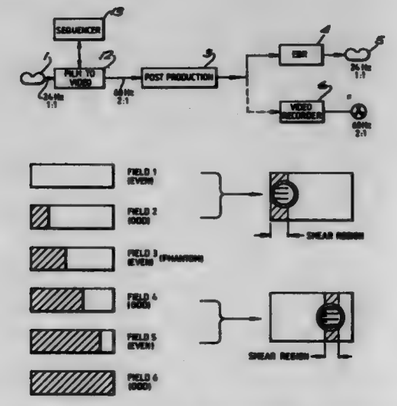
5,191,426
CCD IMAGE PICKUP APPARATUS WITH DIGITAL SYNTHESIZED VIDEO OUTPUT SIGNAL
Nobuo Kochi, Tokyo, Japan, assignor to Kabushiki Kaisha TOPCON, Japan
Filed Jun. 24, 1991, Ser. No. 720,210
Claims priority, application Japan, Jun. 25, 1990, 2-164087
Int. Cl.[5] H04N *3/14, 5/335*
U.S. Cl. 358—213.18 25 Claims

1. A CCD image pickup apparatus comprising:
a CCD having a plurality of scanning lines and a plurality of picture elements arranged along each of the horizontal scanning lines;
a plurality of video output signal lines connected to the CCD in such a manner that a plurality of video output signals are produced by the CCD and introduced into the video output signal lines;
a video signal synthesizing means for synthesizing the video output signals so as to produce a single video signal;
means for producing timing clock pulses;



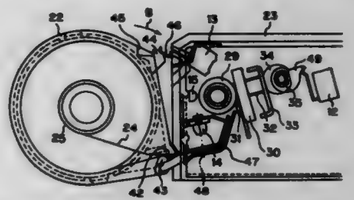
means for delaying a transition point of each of the timing clock pulses so as to move out of each occurring point of synthetic spike noises; and
an A/D conversion means for analog-digital converting according to the timing clock pulses the single video signal produced by the synthesizing means so as to produce a digital signal.

5,191,427
VIDEO POST-PRODUCTION OF MATERIAL ACQUIRED ON FILM
John W. Richards, Chilbolton; Milan Kraljasin, Chineham, both of United Kingdom, and Yoshio Onaki, Tokyo, Japan, assignors to Sony Broadcast & Communications Limited, Basingstoke, England
Filed Aug. 15, 1991, Ser. No. 745,337
Claims priority, application United Kingdom, Aug. 29, 1990, 9018805; Jun. 5, 1991, 9112077
Int. Cl.[5] H04N *3/36, 5/253, 7/01*
U.S. Cl. 358—214 12 Claims



1. A method of processing film material, comprising the steps of:
converting said film material to a video signal comprised of successive fields,
associating a field sequence identifier with each of said fields of the video signal,
motion processing said video signal in dependence on said field sequence identifier, thereby introducing a processing delay in said video signal, and
modifying said field sequence identifier in dependence on said processing delay.

5,191,428
PAPER FEEDING DEVICE CAPABLE OF QUICKLY REPLACING RECORDING PAPER
Katsuyuki Sakai, Nara, and Shigeru Kida, Yamato-Koriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 4, 1991, Ser. No. 771,805
Claims priority, application Japan, Oct. 5, 1990, 2-269161; Oct. 5, 1990, 2-269162
Int. Cl.[5] H04N *1/04*; G01D *15/24*; B41J *15/00, 15/16*
U.S. Cl. 358—296 23 Claims



1. A detachable paper storage cartridge used for a recording device, comprising:
a cartridge main body to be mounted to or de-mounted from said recording device and having a storage space for storing a paper roll as the recording paper;
a holding member for holding said paper roll in said storage space at both width ends of said paper roll in such a manner that a tension of said paper between said paper roll and a platen roller of said recording device increases according to a decrease of the diameter of said paper roll and being rotatable around an axis of said paper roll; and
means for engaging said holding member with a driving motor for driving said platen roller disposed in said recording device to transmit a driving force to said holding member.

5,191,429
ELECTRONIC PRINTING SYSTEM FOR PRINTING MULTIPLE IMAGES WITH DETERMINATION OF THE MAXIMUM NUMBER OF REDUCED SIZE IMAGES TO BE OPTIMALLY PRINTED ON A SHEET OF DETECTED SIZE WITHOUT INTERFERENCE
John L. Rourke, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 28, 1990, Ser. No. 590,628
Int. Cl.[5] H04N *1/23, 1/393*
U.S. Cl. 358—296 10 Claims

1. A process for printing multiples of a reduced size first print image on a sheet of paper stock in an electronic reprographic printer, comprising the steps of:
a) providing an electronic page comprised of image signals representative of said first print image;
b) from said electronic page, determining a size of said first print image;
c) determining a size of the sheet of paper stock on which said first print images are to be printed by said printer;
d) determining the maximum number N of said first print

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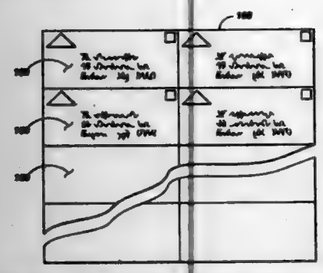
images to be optimally fitted onto said sheet of paper stock without interference; and



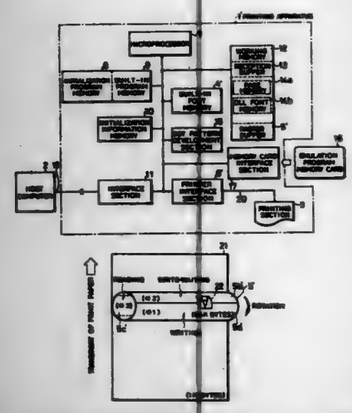
e) in a single pass, using said electronic page to print said first print images N times on each sheet of said paper stock.

5,191,430

PRINTING APPARATUS AND METHOD USING A RASTER BUFFER DIVIDED INTO A WRITING LAYER, A READING LAYER, AND A WRITE-WAITING LAYER FOR HANDLING DATA OVERFLOW

Eisho Sudoh, and Masahiro Suzuki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 10, 1991, Ser. No. 698,384
Claims priority, application Japan, May 22, 1990, 2-130391
Int. Cl.[5] H04N *1/21*
U.S. Cl. 358—296 14 Claims



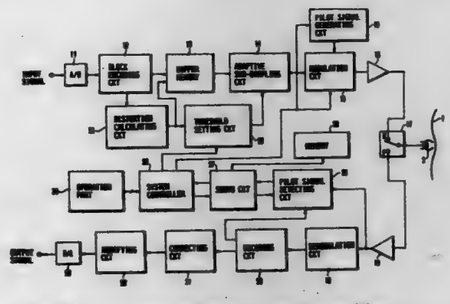
11. In a printing apparatus, an arrangement comprising:
a raster buffer for storing font patterns in a dot image data form;
means for reading font patterns from a font memory and writing the font patterns in the raster buffer; and
address control means for controlling, during writing of the font patterns in the raster buffer, allocation of respective dots of the font patterns to respective memory locations in the raster buffer from a head end to a tail end of the raster buffer, said address controlling means assigning respective dots of a part of a font pattern that has overflowed the tail end of the raster buffer, to a head of the raster buffer such that a part of the font pattern is assigned to the head of the raster buffer and a part of the font pattern is assigned to the tail of the raster buffer, the parts forming a complete font pattern.

5,191,431

RECORDING APPARATUS HAVING PLURAL OPERATING MODES INVOLVING DIVERSE SIGNAL COMPRESSION RATES AND DIFFERENT APPORTIONING OF PILOT SIGNAL RECORDING AREA

Masahide Hasegawa, Kanagawa, and Yasuyuki Tanaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1990, Ser. No. 566,628
Claims priority, application Japan, Aug. 29, 1989, 1-220333; Aug. 31, 1989, 1-225137; Oct. 12, 1989, 1-263837
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—323 15 Claims



1. An information recording apparatus comprising:
(a) compressing means for compressing digital information, said compressing means being responsive to a mode changeover signal for changing over the compression rate of the digital information between at least first and second compression rates, said second compression rate being higher than said first compression rate;
(b) generating means for generating a tracking-control pilot signal;
(c) recording means for recording the digital information compressed by said compressing means and the pilot signal on a recording medium while forming a number of recording tracks; and
(d) mode changeover means for generating said mode changeover signal for changing over an operating mode of said apparatus between a plurality of modes, said plurality of modes including: a first mode in which said compressing means compresses the digital information at said first compression rate and said recording means sets the proportion of a recording area of the pilot signal to the entirety of the recording track to a first ratio; and a second mode in which said compressing means compresses the digital information at said second compression rate and said recording means sets the proportion of a recording area of the pilot signal to the entirety of the recording track to a second ratio, said second ratio being higher than the first ratio.

5,191,432

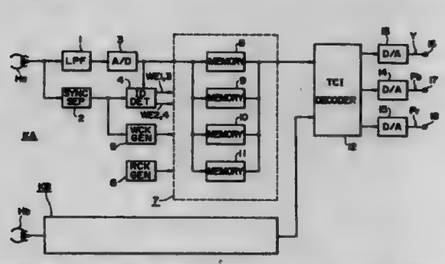
METHOD OF RECORDING AND REPRODUCING COLOR VIDEO SIGNAL WITH TYPE CODES TO INDICATE TYPE OF CHROMINANCE SIGNAL

Hajime Nishimura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 1, 1991, Ser. No. 802,839
Claims priority, application Japan, Dec. 13, 1990, 2-410469
Int. Cl.[5] H04N *9/79*
U.S. Cl. 358—330 1 Claim

1. A method of recording and reproducing a color video signal which includes a brightness signal and first and second chroma signals, the method comprising the steps of:

time base elongating said brightness signal to obtain a time base elongated brightness signal:
time base compressing said first and second chroma signals to obtain first and second time base compressed chroma signals;
alternately combining a first time base compressed chroma signal for one horizontal period and a second time base compressed chroma signal for one horizontal period with a time base elongated brightness signal for one horizontal period to form a time division multiplexed color video signal for one horizontal period;
adding to each time division multiplexed color video signal for one horizontal period a type code signal representative of the type of chroma signal used to form said time division multiplexed color video signal;
dividing the time division multiplexed color video signals into N channels, N being an integer equal to or higher than 2;



shuffling the time division multiplexed color video signal for the N channels for each predetermined video signal unit to obtain recording color video signals;
recording the recording color video signals for the respective channels simultaneouly onto a record medium by means of N heads;
reproducing the recorded color video signals for the N channels from the record medium simultaneouly by N heads to obtain reproduction color video signals for N channels;
separating the type code signals from the reproduction color video signals;
writing and then reading the reproduction color video signals into and from deshuffling memories in accordance with the separated type code signals to obtain deshuffled reproduction color video signals; and
decoding the deshuffled reproduction color video signals to obtain said color video signal consisting of said brightness signal and first and second chroma signals.

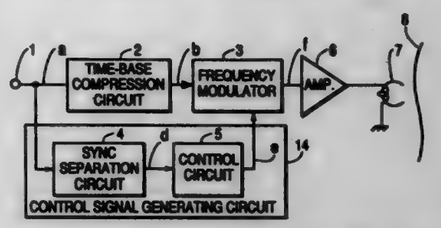
5,191,433

CONTROLLING THE PHASE OF A FREQUENCY-MODULATED WAVE SO AS TO BE IN A PREDETERMINED PHASE RELATIONSHIP WITH A VIDEO SIGNAL

Masahiro Hoajo, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 23, 1990, Ser. No. 497,599
Claims priority, application Japan, Mar. 24, 1989, 1-72416
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 2 Claims

1. A video signal recording apparatus comprising:
a means for time-compressing an input video signal and for time-division multiplexing the time-compressed video signal with a predetermined signal to obtain a multiplexed signal in which the predetermined signal occurs periodically;
a control signal generating means for receiving said input video signal and for generating a control signal which is a pulse signal occurring in a time period in which the predetermined signal occurs in the multiplexed signal;
a frequency-modulating means for frequency-modulating the multiplexed signal to obtain a frequency-modulated signal, including a means responsive to said control signal for resetting said frequency-modulating means in the time period in which the predetermined signal occurs in the



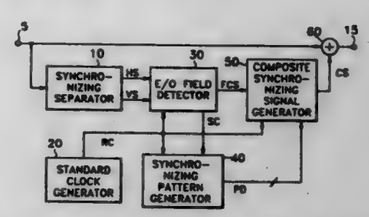
muliplexed signal so that said frequency-modulated signal is in phase with the input video signal; and
a recording means for recording the frequency-modulated signal on a recording medium.

5,191,434

SYNCHRONIZING SIGNAL RESTORATION CIRCUIT

Yong-je Kim, Kyunggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 30, 1991, Ser. No. 737,728
Claims priority, application Rep. of Korea, Oct. 31, 1990, 90-175885; Jul. 20, 1991, 91-12439
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 5 Claims



1. A synchronizing signal restoration circuit, in a video recording/reproducing apparatus for recording and/or reproducing video signals on or from recording media, comprising:
an input terminal for receiving video signals to be reproduced or recorded;
a synchronizing signal separator for separating the synchronizing signals from the video signals supplied through said input terminal;
a standard clock pulse generator for generating a standard clock pulse train with a period much shorter than those of said separated synchronizing signals;
an even/odd field detector for detecting whether said video signal input to the input terminal is of an even or an odd field based on said separated synchronizing signals and said standard clock pulse train;
a synchronizing pattern generator for responding to the detected results of said even/odd field detector to generate synchronizing patterned data corresponding to the respective fields using said standard clock pulse train;
a composite synchronizing signal generator for generating composite synchronizing signals by dividing a frequency of said standard clock pulse train according to a frequency division ratio corresponding to a value of said synchronizing pattern data; and
an adder for adding the composite synchronizing signal generated in said composite synchronizing signal generator to the video signal of the input terminal,
whereby scattered synchronizing signals included in video signals are restored.

a clock generator, responsive to a recording clock, for gen-

rotated in said first direction, to compress the read pixel

5,191,435

IMAGE PICKUP DEVICE

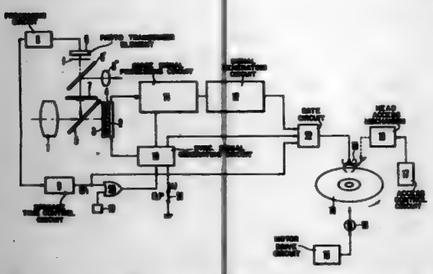
Tokuichi Tsunekawa; Nobuaki Date; Hiroshi Aizawa, all of Kanagawa; Kazuya Hosoe, Machida, and Kazunori Urushibara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 503,148, Mar. 30, 1990, abandoned, which is a division of Ser. No. 309,349, Feb. 10, 1989, Pat. No. 4,928,184, which is a continuation of Ser. No. 4,148, Jan. 16, 1987, Pat. No. 4,823,208, which is a division of Ser. No. 347,966, Feb. 11, 1982, Pat. No. 4,658,304, which is a division of Ser. No. 31,168, Apr. 18, 1979, Pat. No. 4,366,501. This application Jul. 31, 1991, Ser. No. 740,865

Claims priority, application Japan, Apr. 23, 1978, 53-48010; Apr. 23, 1978, 53-48011

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—335 **6 Claims**



1. An image pickup device having a body, comprising, substantially integrally therein:

(a) image pickup means for photoelectrically converting an image light coming from an object into an electric signal;

(b) signal processing means for processing a signal output of said image pickup means;

(c) recording means for recording a signal obtained through said signal processing means onto a recording medium, said recording means having a function of reproducing the signal recorded on the recording medium;

(d) reproduced signal processing means for processing a signal reproduced by said recording means; and

(e) display means for selectively displaying the signal coming from said signal processing means or the signal coming from said reproduced signal processing means, at least said image pickup means, said recording means and said display means are inseparably connected together.

5,191,436

METHOD FOR RECORDING CODED MOTION PICTURE DATA

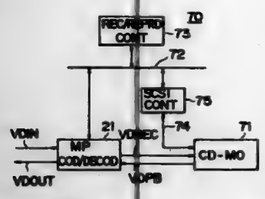
Jun Yonemitsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 30, 1991, Ser. No. 693,707

Claims priority, application Japan, May 9, 1990, 2-119604

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—335 **10 Claims**



1. A method of editing coded moving picture data, in which successive frames of video signals are selectively intraframe coded or interframe coded and quantized to provide coded moving picture data, and said coded moving picture data is arranged in groups of frames with each group including a first number of intraframe coded signals and a second number of intraframe coded signals and each group being recorded on a predetermined recording medium said method comprising editing at least one group of frames and setting an edit flag in the at least one group of edited frames.

5,191,437

DIGITAL IMAGE SIGNAL PLAYBACK CIRCUIT FOR COMBINING TWO CHANNEL PARALLEL PICTURE DATA INTO A SINGLE CHANNEL

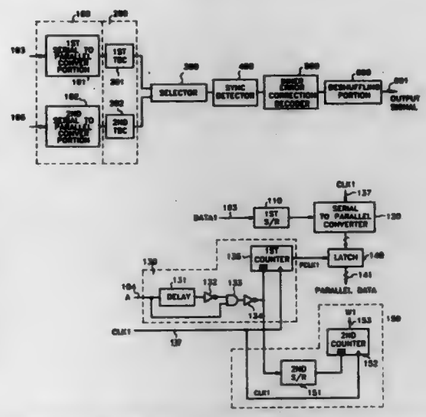
Kye-Jong Kim, Kyunggi, Rep. of Koren, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Jan. 10, 1991, Ser. No. 712,746

Claims priority, application Rep. of Koren, Jan. 27, 1990, 90-9550[U]

Int. Cl.[5] H04N *5/95*

U.S. Cl. 358—337 **7 Claims**



1. A digital image signal playback circuit having information stored thereon and comprising:

first and second serial-to-parallel conversion means, coupled to a first and second channel respectively, for receiving respective first and second serial strings of digital data representative of a portion of said stored information, each string comprising head indicator information and serial data information, said serial data information including image data information and parity data information, said first and second serial-to-parallel conversion means converting said first and second serial strings to first and second parallel data respectively;

first and second time base corrector means for correcting time base errors in the transmitted parallel data by controlling the reading and writing transmission operation of the first and second parallel data from the first and second serial-to-parallel conversion means respectively coupled thereto, and outputting first and second time-corrected output data streams respectively;

selector means for combining said first and second time-corrected output data streams into a single channel data stream;

sync detector means for detecting synchronizing signals recorded in said single channel data stream and outputting symbol string information including parity data; and

inner error correction decoder means for generating original image information in response to the parity data in said symbol string information,

wherein each of of said first and second serial-to-parallel conversion means comprises:

a clock generator, responsive to a recording clock, for generating a clock signal having a frequency related to the period of the head indicator information;

a converter circuit for converting the respectively input serial string to parallel data having a predetermined number of bits, said converter circuit being clocked in response to said recording clock;

means for latching the parallel data from said circuit converter in response to said clock signal; and

means for generating a write address clock signal for writing said parallel data from said latching means into said respective one of said first and second time base corrector means in response to the head indicator information.

5,191,438

FACSIMILE DEVICE WITH SKEW CORRECTION AND TEXT LINE DIRECTION DETECTION

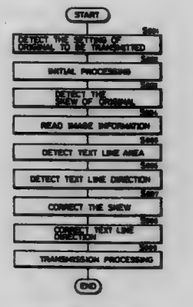
Morihiro Katowada, and Sadaaki Shimonaga, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 10, 1990, Ser. No. 625,055

Claims priority, application Japan, Dec. 12, 1989, 1-322845; Dec. 12, 1989, 1-322846

Int. Cl.[5] H04N *1/413*; G06K *9/32, 9/36*

U.S. Cl. 358—426 **8 Claims**



1. A facsimile device comprising:

pixel signal generating means for reading an image on an original by partitioning said image into a plurality of pixels arranged two-dimensionally, to generate a pixel signal indicating luminance of each of said pixels for each of said pixels;

pixel signal storing means including a plurality of memory cells each for storing said pixel signals logically associated with one of said pixels,

said plurality of memory cells being arranged corresponding to an arrangement of said plurality of pixels and logically two-dimensionally in a predetermined first direction and a second direction crossing said first direction;

text line direction detecting means responsive to said pixel signals stored in said pixel signals stored in said pixel signal storing means for detecting a text line direction indicating an extending direction of text lines included in said image on said original represented by said stored pixel signals in the arrangement of said plurality of memory cells;

text line direction determining means for determining whether said detected text line direction is closer to said first direction or said second direction;

image rotating means responsive to an output of said text line direction determining means for rotating said image on said original represented by said stored pixel signals by a predetermined angle so as to make said text line direction closer to said first direction than to said second direction when said text line direction is closer to said second direction than said first direction;

signals compressing means for reading said stored pixel signals rotated by said image rotating means from said pixel signal storing means which stores the pixel signals rotated in said first direction, to compress the read pixel signal by a compression code; and

transmission means for transmitting said pixel signals compressed by said signal compressing means to another station via a communication line.

5,191,439

IMAGE SIGNAL PROCESSING APPARATUS

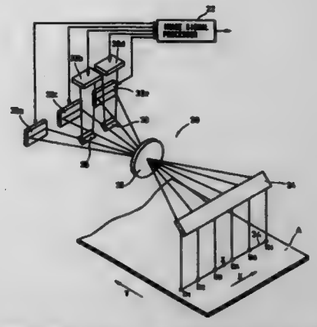
Katsuto Sumi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 25, 1990, Ser. No. 603,062

Claims priority, application Japan, Oct. 27, 1989, 1-281486; Oct. 27, 1989, 1-281487

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—447 **3 Claims**



1. An image signal processing device for processing an image signal produced by a reading optical system, comprising:

unsharp signal generating means for averaging image signals S produced when image information on an original is scanned by the reading optical system, thereby to produce an unsharp signal U; and

image signal generating means for generating an image signal S′ from the image signals S and the unsharp signal U according to the equation:

$$S' = S + K(x)(S - U)$$

where K(x) is a corrective coefficient selected to compensate for variations of MTF characteristics of the image signals, which variations are caused with respect to scanned positions x on the original by the reading optical system.

5,191,440

MULTIPLE PHOTOCOPIER SYSTEM WITH MEMORY AND COMPOSITE PROCESSING

Alfred B. Levine, P.O. Box 34-1738, Bethesda, Md. 20827

Filed Mar. 29, 1990, Ser. No. 500,879

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—450 **12 Claims**

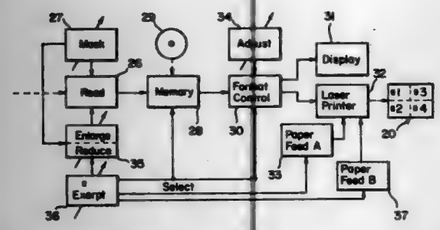
1. An interactive photocopier for electronically combining a manually selected number of separate image segments into a composite image, with the separate image segments being spatially arranged in the composite image under the manual control of a user,

said photocopier having a memory for storing each of the separate image segments, and a visual display for previewing the separate image segments and for viewing said composite image,

and said photocopier having manually controlled manipulating means for spatially adjusting the locations and angular orientations of the separate ones of the image segments in the composite image,

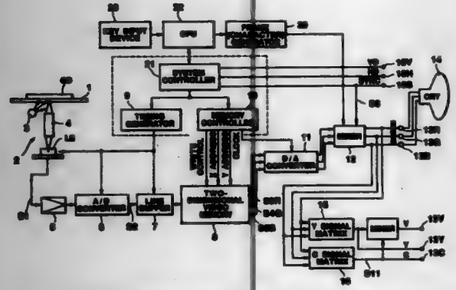
said adjusting of the separate image segments being per-

formed interactively by said user while being viewed on the display screen,
thereby to provide the composite image in a composed arrangement selected and controlled by said user,
said photocopier having printing means for printing said composite image,



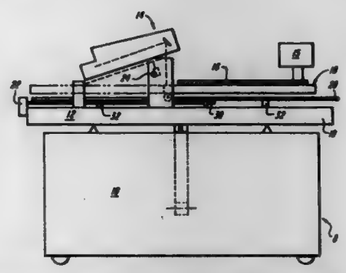
and said memory being detachably connectable to said photocopier and detachably connectable to other photocopiers, thereby to receive and store image segments from other photocopiers.

5,191,441
IMAGE READING DEVICE
Kiyosuke Suzuki; Hideki Wanami, both of Saitama; Atsushi Shirata, Tokyo; Noboru Koyama, Kanagawa, and Tatsuru Sato, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 30, 1990, Ser. No. 502,188
Claims priority, application Japan, Mar. 31, 1989, 1-083696; Mar. 31, 1989, 1-083697; Apr. 1, 1989, 1-083330
Int. Cl.[5] H04N *1/393*
U.S. Cl. 358—451 8 Claims



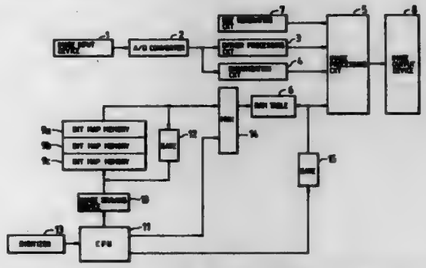
1. A scanning apparatus for reading an image comprising:
a line sensor for reading analog image data corresponding to the image of an original;
an analog-digital converter for converting said image data from analog data into digital image data;
memory means for storing said digital image data;
a memory controller for generating address signals for storing said digital image data into said memory means;
a timing signal generator for controlling said line sensor;
control means connected to said memory controller and to said timing signal generator, for controlling the reading frequency from said memory means so as to be equal to the scanning frequency of a television signal;
a digital-analog converter for converting said digital image data into image data as television signal data corresponding to said original image;
an output terminal for outputting said image data as television signal data; and
said line sensor and said digital-analog converter operating asynchronously.

5,191,442
APPARATUS FOR SCANNING A DOCUMENT
Asaa Bar-Lev, Chestnut Hill; Bryan Corrigan, Framingham, both of Mass.; Daniel A. Ferraro, Jr., Bantam, Conn., and Robert Sengstaken, Hollis, N.H., assignors to ECRM, Tewksbury, Mass.
Filed Apr. 26, 1990, Ser. No. 515,742
Int. Cl.[5] G06K *9/20*
U.S. Cl. 358—453 2 Claims



1. Apparatus for scanning a document comprising
a table base, a table assembly supporting a scanning optics, and a movable document holding platen assembly,
means for translating said platen assembly past said scanning optics,
means integral with said table assembly for recording electrically determined precise two dimensional coordinate positions of documents supported by said assembly, and
means for rotating said table assembly about a pivot axis to an angle relative to said table base and holding said table assembly at said angle for avoiding parallax error in recording electrically determined precise two dimensional coordinate positions of documents supported by said assembly.

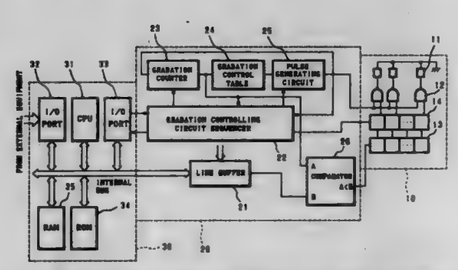
5,191,443
IMAGE PROCESSOR
Daiji Nagaoka, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 293,281, Jan. 4, 1989. This application Mar. 23, 1992, Ser. No. 854,790
Claims priority, application Japan, Jan. 6, 1988, 63-1546
Int. Cl.[5] H04N *1/387*
U.S. Cl. 358—453 10 Claims



1. An image processor for editing an original image to produce an edited output image, comprising:
input means for inputting sets of coordinates, each of said sets of coordinates designating a corresponding portion of a plurality of portions of the original image, said input

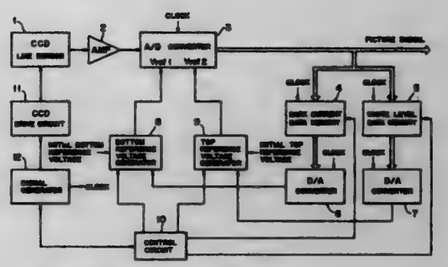
means for designating at least one of a plurality of processing operations to be performed on the portion of the original image corresponding to each of said sets of coordinates to produce a corresponding edited image;
storage means including a plurality of storage locations, each of said plurality of storage locations having a plurality of subsets of storage location, each said subsets corresponding to each portion of said plurality of portions of the original image;
means responsive to said input means for setting a portion of each of said subsets of said plurality of storage locations to selected values according to predetermined combinations of said plurality of storage locations to store data representing said processing operation to be performed on each said portion of said original image, each said portion of said subsets of said plurality of storage locations indicating an interior of the corresponding portions of said original image;
image input means for scanning the original image to produce original image data;
means for accessing said data stored in said subsets of storage locations responsive to said scanning of said original image; and
image processing means for receiving said accessed data and said original image data and for performing said processing operations in the designated portions of said image based on said accessed data to produce output image data representing the edited output image.

5,191,444
METHOD OF CONVERTING GRADATION OF A DIGITAL IMAGE AND A CIRCUIT THEREOF AND A PRINT DENSITY CONTROLLING APPARATUS FOR A PRINTER AND A PRINTER USING THIS METHOD
Masaki Harada, and Hiroshi Kano, both of Hirakata, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Continuation of Ser. No. 365,190, Jun. 12, 1989, abandoned. This application May 28, 1991, Ser. No. 706,103
Claims priority, application Japan, Jun. 20, 1988, 63-151768
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—455 9 Claims



1. A circuit for converting gradation of a digital image, the circuit converting original image data with m gradation into converted image data with n gradation where m is an integer greater in value than that of n, comprising:
a first storing means for storing original image data of the digital image which has m gradation which includes gradation associated with a high-gradation side and other gradation associated with a low-gradation side, said low-gradation side being indicative of a light-colored portion, said high-gradation side being indicative of a deep-colored portion, wherein a human eye is more sensitive to differences in color density for the light-colored portion than for the deep-colored portion;
means for assigning a number of gradation of conversion data based on the sensitivity of the human eye to color density differences, said assigning means including a conversion table for storing groups of gradation of the conversion data, at least one of the groups being assigned to the high-gradation side, at least another one of the groups being assigned to the low-gradation side, each of the groups being set to have assigned a respective manner of gradations, the respective number of gradation of the at least one group assigned to the low-gradation side being less than the respective number of gradations set for at least another one of the groups assigned to the high-gradation side so that each of the numbers of gradations assigned to each group of both the low-gradation and high-gradation sides is based on the sensitivity of the human eye to color density differences;
an operation means for converting gradation of the original image data with m gradation which is stored in said first storing means into converted image data with n gradation in correspondence with said groups of gradation of conversion data in said conversion table; and
a second storing means for storing the converted image data converted by said operation means.

5,191,445
IMAGE READER
Hiromitsu Kurokawa, Yokosuka; Tadayoshi Miyoshi, Yokohama; Takashi Kuriyama, Yokohama, and Ichiro Shishido, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Aug. 7, 1990, Ser. No. 563,923
Claims priority, application Japan, Aug. 8, 1989, 1-205246
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—461 2 Claims



1. An image reader comprising:
photoelectric conversion means having at least one photoelectric conversion element for converting light into an analog signal by means of said element;
analog-to-digital conversion means for quantizing the analog signal in accordance with a quantization-threshold level decided by top and bottom reference voltages having values applied to said analog-to-digital conversion means, thus to produce a digital picture signal to be reproduced as an image, a digital dark current signal which corresponds to a dark current flowing through said element or a digital white level signal which corresponds to a current of a white reference flowing through said element;
bottom reference voltage generation means, on condition that said analog-to-digital conversion means produces said digital dark current signal, for outputting an initial bottom reference voltage which is preliminarily applied to said bottom reference voltage generation means, as said bottom reference voltage, and on condition that said analog-to-digital conversion means produces said digital picture signal, for converting said digital dark current signal into an analog dark current signal by digital-to-analog conversion and outputting said analog current signal as said bottom reference voltage; and
top reference voltage generation means, on condition that said analog-to-digital conversion means produces said digital white level signal, for outputting an initial top

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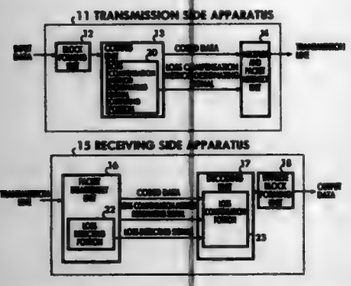
reference voltage which is preliminarily applied to said top reference voltage generation means, as said top reference voltage, and on condition that said analog-to-digital conversion means produces said digital picture signal, for converting said digital white level signal into an analog white level signal by digital-to-analog conversion and outputting said analog white level signal as said top reference voltage.

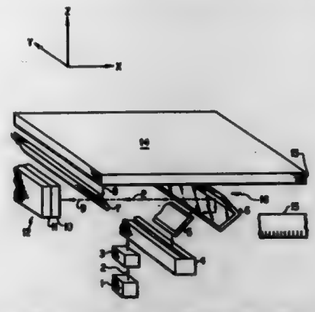
5,191,446
IMAGE DATA TRANSMISSION SYSTEM
Takashi Hamano, Kawasaki; Kiyoshi Sakai, Yokohama, and Kiichi Matsuda, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan
Filed Oct. 9, 1990, Ser. No. 594,090
Claims priority, application Japan, Oct. 9, 1989, 1-262257; Oct. 9, 1989, 1-262259; Oct. 9, 1989, 1-262260
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—463 **38 Claims**



1. An image data transmission system for coding input image data using a plurality of picture elements in blocks and for transmitting said picture elements in units of packets or cells, comprising:
signal outputting means provided on the transmission side of said image data transmission system for outputting a loss compensation method designating signal on the receiving side of said image data transmission system where the data of the block currently being coded is lost during the transmission,
loss detecting means provided on the receiving side of said image data transmission system for detecting the loss of a packet or a cell, and
loss compensating means provided on the receiving side of said image data transmission system for compensating the data of the block which can not be decoded due to the loss, using the loss compensation method designated by the transmission side when the loss is detected.

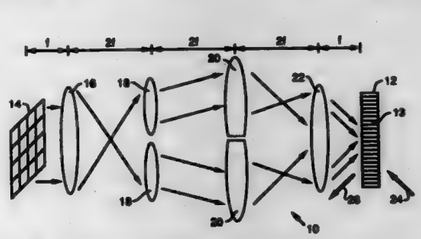
5,191,447
SCANNING BEAM CONTROL SYSTEM WITH TRANSLATED REFERENCE SCALE
Alward I. Pinard, Westford, Mass., assignor to Intergraph Corporation, Huntsville, Ala.
Filed Dec. 7, 1990, Ser. No. 626,582
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—497 **20 Claims**

1. A system for controlling the scanning of a modulated light beam onto an object surface, comprising:
(a) light source means for providing a combined light beam including a modulated light beam and a reference light beam;
(b) optical imaging means, having a fixed position in relation to the object surface, for moving the combined light beam along a scan line;
(c) beam splitter means, in the path of the combined light beam and translatably mounted for translation parallel to the object surface, for splitting the combined light beam such that at least some of the modulated light beam continues in a first direction and at least some of the reference light beam continues in a second direction;
(d) reference scale sensor means, including a reference scale positioned so as to receive at least some of the reference light beam after it leaves the beam splitter means and responsive to reference beam position in two directions,



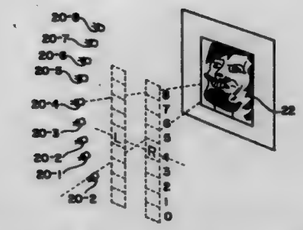
for providing a clocking signal indicative of beam position along the scan line and a vernier position signal indicative of beam position in a direction transverse to the scan line; and
(e) translation means for translating the beam splitter means such as to position precisely each of a series of scans in a direction transverse to the scan lines.

5,191,448
PHOTOREFRACTIVE SQUARE LAW CONVERTER
Frederick R. Vachss, Thousand Oaks, and John H. Hong, Moorpark, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Oct. 23, 1991, Ser. No. 780,595
Int. Cl.[5] G03H *1/02*; G02F *1/00*; G02B *26/00*
U.S. Cl. 359—7 **20 Claims**



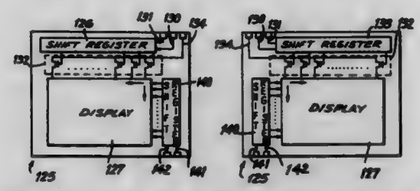
1. A photorefractive spatial light modulator, comprising:
means for receiving an input beam comprising incoherent light bearing an image;
means for separating said input beam into two components, each of said components comprising incoherent light bearing said image;
means for superimposing said two components in a photorefractive medium to generate a holographic grating;
means for receiving a read beam of coherent light directed into said holographic grating; and
said photorefractive medium producing an output beam of coherent light bearing said image, said output beam generated by interaction of said read beam with said grating.

5,191,449
ANIMATED HOLOGRAPHIC STEREOGRAM DISPLAY
Craig Newswanger, Ventura, Calif., assignor to CFC Applied Holographics, Oxnard, Calif.
Filed Feb. 3, 1992, Ser. No. 829,272
Int. Cl.[5] G03H *1/26*; G02B *27/22*
U.S. Cl. 359—22 **2 Claims**



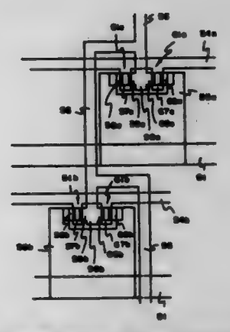
1. A holographic stereogram display comprising:
a holographic unit comprising a plurality of first and second holographic images, each pair of first and second holographic images forming a stereographic image pair, said plurality of first images being overlaid on a first holographic element and said plurality of second images being overlaid on a second holographic element, said first and second elements being spaced apart to form said holographic unit so that said first holographic element will be viewable by one eye of an observer and said second holographic element will be simultaneously viewable by the second eye of the same observer, each image pair having predetermined side-by-side viewing zones when illuminated from a point source located in a predetermined relationship to said holographic unit, the viewing zone of each image pair being spatially separated from the viewing zones of each other image pair, and
a plurality of light sources, each spatially disposed with respect to said holographic unit in a predetermined manner so that turning on any one light source will cause the viewing zones of the respective one image pair to be viewable by an observer.

5,191,450
PROJECTION-TYPE COLOR DISPLAY DEVICE HAVING A DRIVING CIRCUIT FOR PRODUCING A MIRROR-LIKE IMAGE
Akitaka Yajima, and Junichi Nakamura, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 494,365, Mar. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 181,122, Apr. 13, 1988, Pat. No. 4,909,601. This application Apr. 3, 1992, Ser. No. 863,387
Claims priority, application Japan, Apr. 14, 1987, 62-91314; Nov. 16, 1987, 62-288647
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—54 **30 Claims**



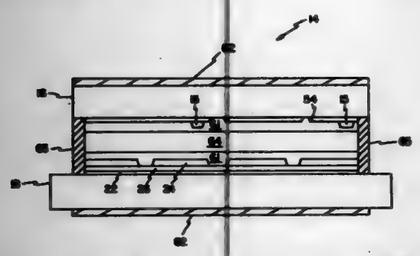
1. A projection-type display device in which light produced by a light source is directed towards a first liquid crystal light valve associated with a first primary color for producing a first image, a second liquid crystal light valve associated with a second primary color for producing a second image and a third liquid crystal light valve associated with a third primary color for producing a third image, the liquid crystal light valves including a plurality of picture element electrodes arranged in an active matrix array, comprising:
integrating means for combining the three images by reflecting at least one of the three images and transmitting at least one of the three images to produce a synthesized image; and
driving means associated with each light valve for driving each of the three light valves, each driving means includes horizontal scanning shift register means for horizontally scanning the image to be produced by the associated light valve;
wherein the horizontal scanning direction of the horizontal scanning shift register means associated with one of the light valves transmits an image opposite to the image transmitted by scanning direction of the horizontal scanning shift register means associated with the other two light valves so that the image produced by the one light valve is synchronized with the images of the other two light valves.

5,191,451
ACTIVE MATRIX DISPLAY DEVICE HAVING DRAIN ELECTRODES OF THE PAIR OF TFTS BEING SYMMETRICALLY FORMED WITH RESPECT TO THE CENTRAL PLANE TO PREVENT THE FLICKER DUE TO THE DIFFERENT PARASITIC CAPACITANCES
Mikio Katayama, Ikoma; Naofumi Kondo, Nara; Yasuru Kanamori, Tenri; Toshiaki Fujihara, Higashiosaka; Hiroshi Fujiki, Tenri, and Kiyoshi Nakazawa, Fujiidera, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Apr. 16, 1991, Ser. No. 685,680
Claims priority, application Japan, Apr. 20, 1990, 2-105982
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—59 **6 Claims**



1. An active matrix display device comprising a pair of insulated substrates, pixel electrodes arranged in matrix on an inner side of one of the pair of insulated substrates, gate buses arranged between the pixel electrodes, at least one pair of thin film transistors disposed for each pixel electrode, each thin film transistors including a gate electrode which is electrically connected to and extends from a corresponding one of the gate buses and a drain electrode electrically connected to a corresponding one of the pixel electrodes, wherein the gate electrodes of each pair of thin film transistors are symmetrically formed with respect to a central plane passing through a center between the pair of thin film transistors, the gate electrodes being perpendicular to the direction of the gate buses, and wherein the drain electrodes of the pair of thin film transistors are symmetrically formed with respect to the central plane.

5,191,402
ACTIVE MATRIX LIQUID CRYSTAL DISPLAY FABRICATION FOR GRAYSCALE
Kalluri R. Sarma, Mesa, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 20, 1989, Ser. No. 410,185
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—59 7 Claims

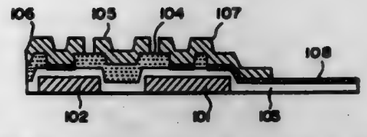


1. A wide viewing angle, active matrix liquid crystal display having halftone grayscale, comprising:
a plurality of pixels on a first substrate;
a plurality of transistors on the first substrate, wherein each transistor of said plurality of transistors is connected to a corresponding pixel of said plurality of pixels; and
a plurality of control capacitor groups on a second substrate wherein:
each control capacitor group has a plurality of control capacitors;
each control capacitor group corresponds to a pixel of said plurality of pixels;
each control capacitor of each control capacitor group defines a subpixel and is connected in series to a capacitance of the subpixel; and
the control capacitors have a common connection.

2. A wide viewing angle, active matrix liquid crystal displaying having halftone grayscale, comprising:
a first glass substrate;
a first layer of indium tin oxide deposited on said first glass substrate and having an etched pattern that defines an area for control capacitors, and serving as a common electrode for the control capacitors;
a first layer of silicon nitride dielectric deposited on said first layer of indium tin oxide, having an etched pattern that defines the dielectric for the control capacitors;
a second layer of indium tin oxide deposited on said first layer of silicon nitride dielectric, having an etched pattern that defines areas for subpixels;
a first alignment layer of polyimide deposited on said second layer of indium tin oxide; and
color filters inserted between said first substrate and said first layer of indium tin oxide, for full color operation.

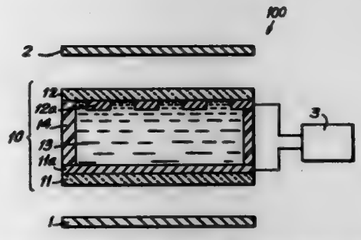
5,191,453
ACTIVE MATRIX SUBSTRATE FOR LIQUID-CRYSTAL DISPLAY AND METHOD OF FABRICATING THE ACTIVE MATRIX SUBSTRATE
Fujio Okumura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Aug. 21, 1990, Ser. No. 570,382
Claims priority, application Japan, Aug. 23, 1989, 1-217913
Int. Cl.[5] G02F 1/13; H01L 27/12
U.S. Cl. 359—59 6 Claims

1. An active matrix substrate for a liquid-crystal display comprising:
a substrate;
a plurality of thin-film transistors formed in an array on said substrate, each of said thin-film transistors having source and drain regions which are formed so that impurities are doped at high concentration; an active layer which is composed of a silicon thin film having a first area and a second area, said first area of said silicon thin film covering said source and drain regions; an insulating film which covers said active layer and which has contact holes over said source and drain regions; and a gate electrode which is formed on said insulating film; and



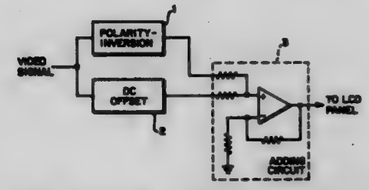
a plurality of transparent electrodes formed on said substrate in a matrix form and connected to said thin-film transistors, respectively, each of said transparent electrodes having said second area continuous to said first area of said silicon thin film and having a metal silicide film formed on said second area of said silicon thin film.

5,191,454
MULTI-COLORED LIQUID CRYSTAL DISPLAY DEVICE
Chiyoaki Iijima; Hiroshi Wada, and Kanemitsu Kubota, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Jun. 30, 1989, Ser. No. 374,209
Claims priority, application Japan, Jul. 6, 1988, 63-169368; Jul. 25, 1988, 63-185093
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—64 19 Claims



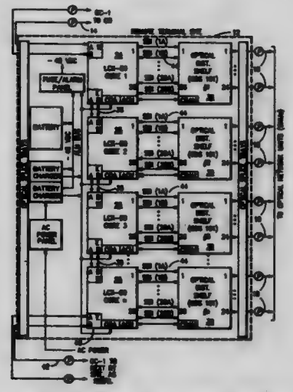
1. An electrooptical display device which displays different colors when driven with different driving voltages, comprising:
a liquid crystal cell including a pair of opposed substrates having electrodes selectively disposed thereon, the substrates spaced apart distance d and a twisted nematic liquid crystal material between the substrates;
each substrate having an orientation direction for aligning liquid crystal molecules adjacent the substrates to be substantially parallel with the orientation direction;
the cell formed so that the value of the product of the optical anisotropy Δn of the liquid crystal material and the thickness d of the liquid crystal layer is in excess of about 1.1 μm;
a pair of polarizers disposed on the exterior sides of the liquid crystal cell; and
circuit means for selectively generating voltage having at least three different values for displaying multiple colors coupled to the electrodes on the substrates.

5,191,455
DRIVING CIRCUIT FOR A LIQUID CRYSTAL DISPLAY APPARATUS
Ryuji Hashimoto, Tenri; Shigeaki Mizushima, Ikoma; Eiichiro Nishimura, Kitakatsuragi; Shigehiro Minezaki, Ikoma, and Toshio Takemoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Dec. 21, 1990, Ser. No. 629,729
Claims priority, application Japan, Dec. 27, 1989, 1-342118
Int. Cl.[5] G02F 1/13; H03K 3/01; H03F 3/45
U.S. Cl. 359—85 12 Claims



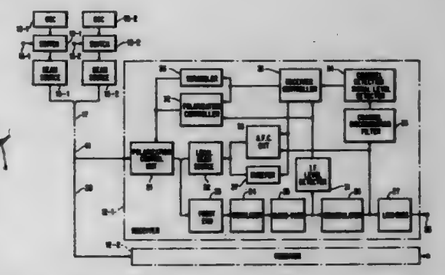
1. A driving circuit for a liquid crystal display apparatus including at least one pixel having a capacitance, comprising:
offset means for generating a DC offset voltage as a function of the capacitance of said at least one pixel; and
adding means for adding said DC offset voltage to an input video signal to generate an output video signal toward said liquid crystal display apparatus.

5,191,456
EFFICIENT FEEDER FIBER LOADING FROM DISTRIBUTION FIBERS
Joseph E. Sutherland, Raleigh, and Paul M. Matsumura, Carrboro, both of N.C., assignors to Alcatel Network Systems, Inc., Richardson, Tex.
Filed Jul. 30, 1991, Ser. No. 737,991
Int. Cl.[5] H04B 10/20; H04J 14/08
U.S. Cl. 359—118 10 Claims



1. A remote terminal (12) for an optical fiber communications system, comprising:
first means (24) for interfacing and cross-connecting a high-rate communication signal on an optical fiber feeder line (14) with a lower-rate communication signal on a first optical fiber distribution line (18);
said first means (24) having a first high speed port for connecting said first means (24) to said optical fiber feeder line (14); and
wherein said remote terminal can have additional interfacing and cross-connecting means (25) each having first and second high speed ports of their own interconnected to a second high speed port of said first means (24) using high-rate communication transmission lines (38), whereby lower-rate communication signals from under-utilized optical fiber distribution lines (18) connected to the interfacing and cross-connecting means (25), can be cross-connected and provided onto the high-rate communication transmission lines (38) for being provided access onto the high-rate optical fiber feeder line (14) whereby unutilized time slots in a lower-rate communication signal on said first optical fiber distribution line are utilized by said additional interfacing and cross-connecting means (25) to achieve efficient use of the feeder line (14).

5,191,457
WDM OPTICAL COMMUNICATION WHEREIN OPTICAL BEAMS ARE MODULATED BY CHANNEL DISCRIMINATION SIGNALS OF DIFFERENT FREQUENCIES BEFORE BY DATA SIGNALS
Shuntaro Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jan. 22, 1991, Ser. No. 643,259
Claims priority, application Japan, Jan. 19, 1990, 2-11475
Int. Cl.[5] H04J 14/02
U.S. Cl. 359—124 7 Claims



4. In a wavelength division multiplexed coherent optical communication system including a transmitter and a receiver, said transmitter for wavelength division multiplexing signal beams of a plurality of channels into a multiplexed signal beam, and for frequency modulating optical beams of a plurality of channels into frequency modulated beams by channel discrimination signals having different frequencies in correspondence to said channels before wavelength division multiplexing said signal beams, said receiver including receiving means for receiving said multiplexed optical beam by using a local optical beam to produce an information carrying intermediate frequency signal and for receiving said multiplexed signal beam by using said local optical beam to produce a data carrying intermediate frequency signal, said receiver comprising detecting means connected to said receiving means for detecting one of said channel discrimination signals in said information carrying intermediate frequency signal in correspondence to one of said channels that should be received said receiver being supplied, as an arriving beam, first with said multiplexed optical beam and subsequently with said multiplexed signal beam, wherein:
said detecting means is for producing a receiver control signal and for making said control signal represent a first control value while said one of the channel discrimination signals is not detected, said detecting means making said control signal represent a second control value instantaneously when said one of the channel discrimination signals is detected;
said receiving means comprising:
a receiver circuit for receiving said arriving beam by using said local optical beam to produce said information carry-

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ing and said data carrying intermediate frequency signals with a substantially common intermediate frequency signal level;

a level detector connected to said receiver circuit for detecting said intermediate frequency signal level to produce a level signal and for making said level signal have a first signal level before and after detection of said intermediate frequency signal level, said level detector making said level signal have a second signal level while said intermediate frequency signal level is detected, said receiver control signal becoming to instantaneously represent said second control value while said level signal has said second signal level;

scrambling means connected to said receiver circuit and said level detector for making a predetermined one of said arriving and said local optical beams have a scrambled and a stabilized polarization while said level signal has said first and said second signal levels; and

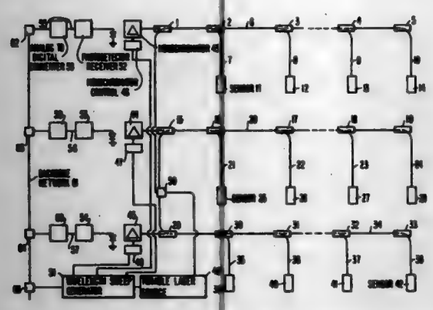
sweeping means connected to said receiver circuit, said level detector, and said detecting means for making said local optical beam have a swept and a stabilized wavelength before and after said receiver control signal instantaneously said second control value, said sweeping means making said local optical beam again have said swept wavelength when said level signal has said first signal level after once having had said second signal level.

5,191,458

OPTICAL ELECTRONIC MULTIPLEXING REFLECTION SENSOR SYSTEM

Donald R. Lyons, Melville, and Stanley M. Reich, Jericho, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 12, 1991, Ser. No. 713,503
Int. Cl.[5] H04B *10/12*; H04J *14/02*
U.S. Cl. 359—127 **5 Claims**



4. An optical electronic multiplexing reflection sensor system comprising

a plurality of single mode fiber optic cable buses;

a plurality of bi-directional couplers coupled in series spaced relation in each of said buses;

a plurality of Bragg sensors, each connected to a corresponding one of said couplers via a single mode secondary fiber optic cable, whereby in each of said buses a unique address is provided each sensor function by wavelength selection;

a plurality of monochromators each coupled to a corresponding one of said buses, each of said monochromators having control means connected thereto for controlling the operation of the monochromator to which it is connected;

a tunable laser source coupled to each of said buses;

a wavelength sweep generator coupled to said laser source and providing outputs to said control means of said monochromators;

a plurality of photodetector receivers each receiving the output of a corresponding one of said monochromators and each having an output providing output signals indicating individual wavelengths of the Bragg sensors coupled thereto;

a plurality of analog to digital converters each connected to the output of a corresponding one of said photodetector receivers; and

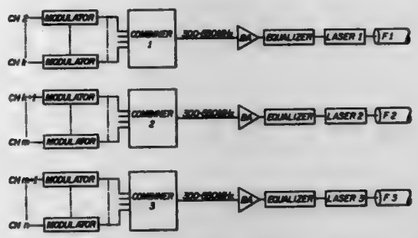
a backbone network connected to said analog to digital converters for distributing and processing digitized data.

5,191,459

METHOD AND APPARATUS FOR TRANSMITTING BROADBAND AMPLITUDE MODULATED RADIO FREQUENCY SIGNALS OVER OPTICAL LINKS

Lee Thompson, Lilburn; Frank Little, Alpharetta; Rezin E. Pidgeon, Jr., Atlanta, all of Ga.

Filed Dec. 4, 1989, Ser. No. 446,461
Int. Cl.[5] H04J *14/02*
U.S. Cl. 359—133 **11 Claims**



5. A system for transmitting a plurality of channels of information from a first location to a second location, said system comprising:

an optical transmitter including means for receiving signals corresponding to each channel of information, means for generating a plurality of radio frequency carrier signals, means for generating a plurality of optical signals, means for modulating each of said information signals onto at least one of said radio carrier frequencies to produce respective modulated radio frequency carrier signals, means for selecting a first group of said modulated radio frequency carrier signals, none of which have the same radio carrier frequency, means for selecting a second group of said modulated radio frequency carrier signals, none of which have the same radio frequency carrier, means for modulating a first optical signal with said first group of modulated radio frequency carrier signals, and means for modulating a second optical signal with said second group of modulated radio frequency carrier signals;

an optical receiver including means for demodulating each said optical signal into its respective modulated radio frequency carrier signals, and means for combining said modulated radio frequency carrier signals into a single signal; and

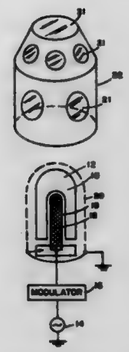
a plurality of optical links connecting each of said optical signal modulating means with a respective one of said optical signal demodulating means.

5,191,460

UV SOURCE FOR HIGH DATA RATE SECURE COMMUNICATION

Walter P. Lapatovich, Marlborough, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 498,258, Mar. 23, 1990, abandoned. This application Dec. 19, 1990, Ser. No. 629,886
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—154 **8 Claims**



1. An ultraviolet communications transmitter operating in the solar blind wavelength region comprising:

an ultraviolet transmissive envelope, said envelope having a outer surface and at least one reentrant cavity and enclosing a fill material containing iodine vapor which forms during discharge a plasma which emits ultraviolet radiation at a wavelength of about 206 nm and has an effective electrical impedance;

an outer conductor positioned around an outer surface of said envelope;

an inner conductor positioned in the reentrant cavity;

a high frequency power source coupled to said inner and outer conductors for inducing an electric field in said envelope and causing discharge therein;

a modulation circuit coupled to said high frequency power source which modulates the power output of said high frequency power source; and

filtering means surrounding said transmissive envelope which filters out noise from a desired wavelength;

said apparatus having a first capacitive impedance associated with coupling of said high frequency power from said inner conductor to said plasma and having a second capacitive impedance associated with coupling of high frequency power from said outer conductor to said plasma, said inner and outer conductors having sufficient surface area to produce first and second capacitive impedances, respectively, which are less than the impedance of said plasma.

5,191,461

INFRARED NETWORK TRANSCEIVER APPARATUS

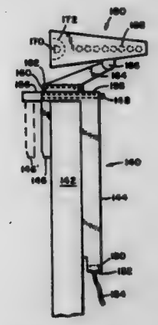
Charles L. Cranshaw, Monte Sereno; John Piccone, San Jose; Richard C. Allen, Los Gatos; James E. Sacherman, and John W. Toor, both of Palo Alto, all of Calif., assignors to Photonics Corporation, San Jose, Calif.

Continuation of Ser. No. 271,570, Nov. 14, 1988, abandoned. This application May 16, 1991, Ser. No. 702,448
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—154 **9 Claims**

9. An apparatus for transmitting information between components in a communication network within an enclosure having at least one diffuse planar reflection surface, comprising:

a. a plurality of illumination sources arranged in a substantially linear arrangement;

b. means for jointly aiming the sources at a location on the reflection surface, wherein the linear arrangement of the sources is maintained in a substantially parallel relationship to the planar surface, and wherein a beam emanating



from the sources forms an acute angle with the reflection surface such that a projection image is formed on the reflection surface which is substantially an isosceles trapezoid; and

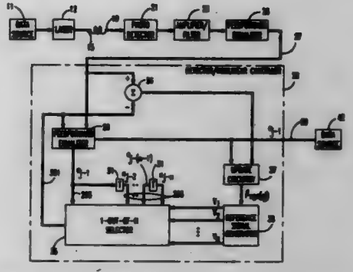
c. at least one illumination receiver aimed at the location on the reflection surface.

5,191,462

FIBER OPTIC TRANSMISSION DISTORTION COMPENSATION

Richard D. Gitlin, Little Silver; Sanjay Kasturia, Red Bank; Robert G. Swartz, Tinton Falls, and Jack H. Winters, Middletown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 11, 1990, Ser. No. 534,623
Int. Cl.[5] H04B *10/06*
U.S. Cl. 359—189 **13 Claims**



1. Apparatus comprising

means for receiving an information-bearing optical signal from an optical fiber to provide a received electrical signal, and

means for forming decisions as to the information as a joint function of the received electrical signal and of a plurality of threshold signals, said means for forming decisions comprising

means for generating the plurality of threshold signals,

means for comparing said received electrical signal with each of the plurality of threshold signals to generate respective tentative decisions, and

means for selecting a particular one of said tentative decisions to be an individual one of the formed decisions as a function of at least one prior decision.

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5,191,463

SCANNING OPTICAL SYSTEM IN WHICH A GHOST IMAGE IS ELMINATED

Kazuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

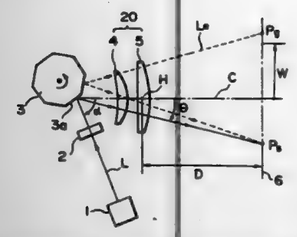
Continuation of Ser. No. 823,988, Jan. 30, 1986, Pat. No. 4,993,792, which is a continuation of Ser. No. 724,044, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 434,331, Oct. 14, 1982, abandoned. This application Sep. 27, 1990, Ser. No. 588,934

Claims priority, application Japan, Oct. 20, 1981, 56-167385

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] G02B *26/08*

U.S. Cl. 359—218 6 Claims



1. A scanning optical system for scanning a surface and for preventing formation of a ghost image on said surface within the effective scanning area that is scanned, said system comprising:

deflector means having a plurality of reflecting surfaces;

a light beam supplying optical system for forming a linear light beam image near one of said reflecting surfaces of said deflector means positioned to deflect a light beam toward the surface; and

imaging means having different powers in orthogonal directions and rendering said one reflecting surface of said deflector means and the surface to be scanned in optically conjugate relation with each other in a plane perpendicular to the deflection plane formed by the light beam image as deflected by said deflector means;

wherein the angle α which the optical axis of said imaging means forms with the optical axis of said light beam supplying optical system satisfies:

$$|\alpha| < (4\pi/N) - (W/D)$$

where N is the number of reflecting surfaces of said deflector means, W is one half of the width of the effective scanning area, and D is the spacing between the principal point of said imaging means, which is adjacent to the surface to be scanned, and the surface to be scanned.

5,191,464

ELECTROOPTIC TIR LIGHT MODULATOR IMAGE BAR HAVING SPATIAL FILTER FOR OPTIMIZING SPATIAL FREQUENCY RESPONSE

David L. Hecht, Palo Alto, Calif., assignor to Xerox Corporation, Rochester, N.Y.

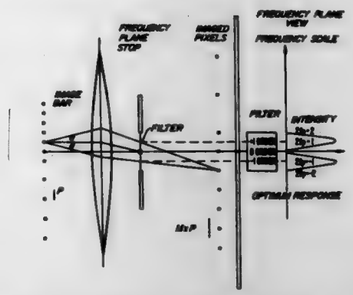
Filed Dec. 31, 1991, Ser. No. 816,432

Int. Cl.[5] G02F *1/03, 1/29*

U.S. Cl. 359—263 5 Claims

1. In a system that includes an electrooptic total internal reflection light modulator having a set of electrodes, an electronic control subsystem for differentially encoding pixel data on the electrodes by applying corresponding voltages thereto in a manner that defines a minimum pixel pitch P, an illumination subsystem for providing an input beam to the modulator, which input beam is converted to a phase front modulated beam by the modulator and the voltages applied thereto, and an imaging subsystem for converting the phase front modulated beam to an imaged beam having an intensity modulated profile corresponding to the pixel data, wherein the diffraction efficiency of the system is in part defined by a set of properties of the modulator and the illumination and imaging subsystems and is characterized by a spatial frequency response, the improvement wherein:

the imaging subsystem includes a compensation filter;



the spatial frequency response of the system, not including the compensation filter, departs significantly from $\sin(\pi Pf)$ for at least some absolute values of f less than about 1/P; and

the compensation filter has a spatial frequency response such that the spatial frequency response of the system, including the compensation filter, approximates $\sin(\pi Pf)$ for absolute values of f less than about 1/P.

5,191,465

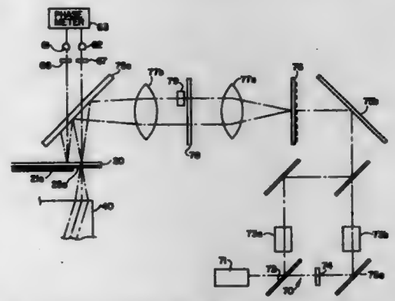
OPTICAL APPARATUS FOR ALIGNMENT OF RETICLE AND WAFER IN EXPOSURE APPARATUS

Kazuhiro Yamashita, Amagasaki, and Nobuo Nomura, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 501,257, Mar. 28, 1990, abandoned. This application Sep. 5, 1991, Ser. No. 759,041

Int. Cl.[5] G01B *9/02;* G02B *5/18;* G02F *1/11*

U.S. Cl. 359—287 6 Claims



6. An optical apparatus for aligning a reticle and a wafer with each other in connection with reduction projection onto the wafer of a circuit pattern formed on the reticle, comprising:

a light source for emitting a light beam of a specified wavelength;

a splitter for splitting the light beam emitted from the light source into two beams;

a pair of accoustooptic elements for modulating the frequency of the split light beams,

an optical system for illuminating the frequency modulated light beams to an alignment grating formed on the reticle and an alignment grating formed on the wafer through windows in the reticle and a reduction projection lens formed on the reticle;

means for adjusting the position of the wafer relative to the reticle based on the phase difference between the respective heterodyne beat signals of the respective ± primary light rays of the fringes generated on the respective alignment gratings;

a reference grating to which the two light beams reflected on the reticle and passing through the optical system are illuminated to produce two light beam interference fringes; and means for picking up the image of Moire interference fringes which are generated by the reference grating and two light beam interference fringes produced by the reference grating, wherein the position of illuminating the two light beams on the reticle is adjusted based on the picked-up image of the Moire fringes.

5,191,466

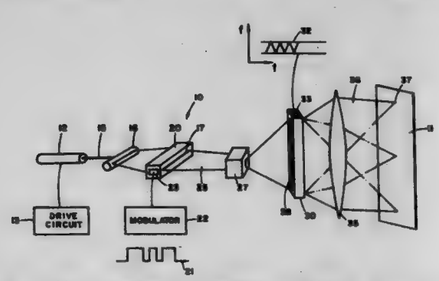
HIGH RESOLUTION TWO-DIRECTIONAL OPTICAL SCANNER

Abraham Gross, Rehovot; Evistar Halevi, Maccabim, and Ran Carmell, Petach-Tikva, all of Israel, assignors to Optrotech Ltd., Nes Ziona, Israel

Filed Aug. 26, 1991, Ser. No. 749,868

Int. Cl.[5] G02F *1/33*

U.S. Cl. 359—305 12 Claims



1. A high resolution two-directional optical scanner for imaging pixel data onto an image plane, the optical scanner comprising:

a source of light,

a first acousto-optic cell for receiving an acoustic signal modulated in accordance with a line of said pixel data so as to form therein a diffraction grating corresponding to the line of pixel data and which diffracts said light towards an image plane so as to form simultaneously on a predetermined area thereof a line of pixels corresponding to said line of pixel data,

a second acousto-optic cell intermediate the first acousto-optic cell and the image plane for intercepting the light diffracted by the first acousto-optic cell and diffracting it towards the image plane in a second direction perpendicular to the line of pixels at an angle dependent on an instantaneous frequency magnitude of a variable frequency scanning signal fed to the second acousto-optic cell,

first optics intermediate the first and second acousto-optic cells for focusing the light diffracted by the first acousto-optic cell onto the second acousto-optic cell, and

second optics intermediate the second acousto-optic cell and the image plane for focusing the light diffracted by the second acousto-optic cell onto the image plane.

5,191,467

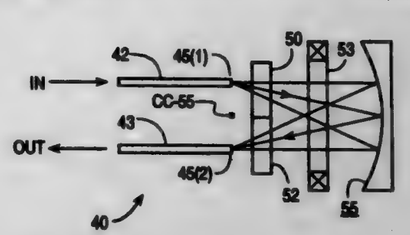
FIBER OPTIC ISOLATER AND AMPLIFIER

Narinder S. Kapany, Woodside; Fred C. Unterleitner, Palo Alto, and Shin-Lo Chia, San Jose, all of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 735,145, Jul. 24, 1991, abandoned. This application Apr. 2, 1992, Ser. No. 862,045

Int. Cl.[5] H01S *3/30;* G02B *6/26;* H04J *11/00*

U.S. Cl. 359—341 25 Claims



1. A fiber optic isolator comprising:

a reflecting imaging device having a reflector;

first and second ports, adapted to register the respective ends of first and second fibers at respective first and second optically conjugate locations;

polarizer means located between said first port and said reflector, said polarizer means including a first birefringent plate;

analyzer means located between said second port and said reflector, said analyzer means including a second birefringent plate;

said first and second birefringent plates having projected optic axes at a relative angle of 45° to each other; and

a 22.5° rotator disposed between said polarizer means and analyzer means on one side and said reflector on the other side;

whereupon light entering said first port and passing through said polarizer means passes through said rotator, reflects from said reflector, passes again through said rotator, passes through said analyzer means, and leaves said second port, while light entering said second port and passing through said analyzer means passes through said rotator, reflects from said reflector, passes again through said rotator, and is prevented by said polarizer means from leaving said second port.

5,191,468

WELDER'S HELMET

Kjell Mases, Gagnef, Sweden, assignor to Hornell Elektrooptik AB, Gagnef, Sweden

PCT No. PCT/SE90/00387, § 371 Date Nov. 21, 1991, § 102(e) Date Nov. 21, 1991, PCT Pub. No. WO90/14809, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 5, 1990, Ser. No. 776,398

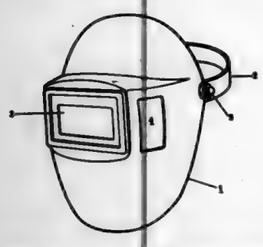
Claims priority, application Sweden, Jun. 5, 1989, 8902039

Int. Cl.[5] G02B *5/22*

U.S. Cl. 359—361 2 Claims

1. A welder's helmet comprising a front surface and opposite side surfaces, and provided on said front surface with at least one so-called fast filter which assumes an increased optical density in response to welding light incident thereon, each of said opposite side surfaces being provided with separate side

windows fitted with filters which will essentially exclude IR-radiation and UV-radiation and have a predetermined con-



stant filter effect for visible light, said front surface being free of transparent regions other than said at least one fast filter.

5,191,469

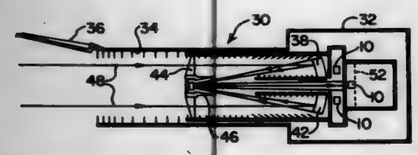
AFOCAL VARIATION FOCUSING SYSTEM FOR MIRRORED OPTICAL SYSTEMS

H. Jay Margolis, 704 Mohawk Dr., #15, Boulder, Colo. 80303

Continuation-in-part of Ser. No. 342,179, Apr. 4, 1989, Pat. No. 5,054,896, which is a continuation-in-part of Ser. No. 286,307, Dec. 19, 1988, Pat. No. 4,988,173, which is a continuation-in-part of Ser. No. 169,271, May 17, 1988, abandoned. This application Oct. 30, 1990, Ser. No. 606,045

Int. Cl.[5] G02B *23/00*

U.S. Cl. 359—366 18 Claims



1. A modular optical system including in combination a front element module which carries an all-mirror reflective optical system and a rear system module which carries a light-reactive material, and wherein said front element module and said rear element module together define an operational optical instrument, and a module which carries a lens system, said lens system module being intermediate said front element module and said rear element module, the actual focal length of said all-mirror reflective element module carried by said front element module varied with respect to said light-reactive material carried by said rear module, without changing the length dimension of the modular optical system, without changing the length dimension of the modules, without changing the mirror or mirrors of the front module, and without changing the position of the rear module, wherein the improvement comprises: said optical system carried by said lens system module includes an afocal variator, and wherein connecting means are carried by said lens system module, whereby said lens system module, said front element module, and said rear element module can be connected in optical series.

5,191,470

MONOCULAR OPTICAL INSPECTION SYSTEM WITH LONG EYE RELIEF AND ENHANCED DEPTH PERCEPTION

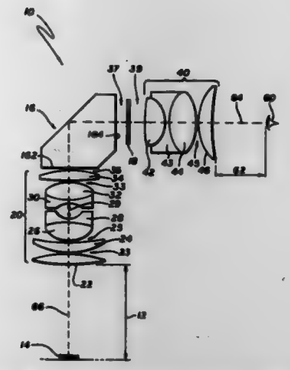
David R. Wickholm, and Donald J. Strittmatter, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 28, 1989, Ser. No. 344,737

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] G02B *21/20, 7/02*

U.S. Cl. 359—375 2 Claims



1. A monocular optical inspection system having an optical path comprising:

objective means having an axis coincident with an optical path and positioned a working distance from an object for forming an image of said object in a focal plane wherein said objective means is disposed to secure a lens means for altering the optical power of said system;

polarizing means having an axis coincident with said optical path;

lamp means for emanating radiant energy which passes through said polarizing means for illuminating said object;

prism means for redirecting said optical path to coincide with a viewing axis;

reticle means intersected by said viewing axis and positioned in said focal plane for providing a visual frame of reference relative to said image; and

monocle means for forming an exit pupil at a distance greater than one inch from said monocle means, wherein said image is visible through said exit pupil and said monocle means is positioned relative to said objective means such that a viewer observing said image through said exit pupil also has an unaided view of said object.

5,191,471

ADJUSTING MECHANISM OF BINOCULARS

Gouzi Funathu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1991, Ser. No. 726,202

Claims priority, application Japan, Jul. 6, 1990, 2-178540; Nov. 30, 1990, 2-336523

Int. Cl.[5] G02B *7/06, 23/18*

U.S. Cl. 359—414 17 Claims

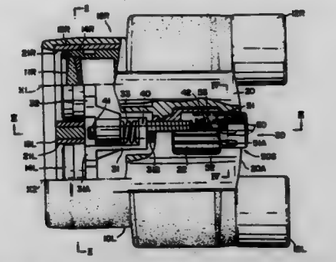
1. A binocular, which comprises:

a retaining member, said retaining member retaining right and left optical elements;

an operable member arranged inside of said retaining member;

an operating member mounted in said retaining member to be externally controllable for operating said operable member, said operating member being arranged to be

shiftable between first and second positions, said second position being substantially within said retaining member, the amount of external projection of said operating mem-



ber from said retaining member at said first position being larger than that at said second position; and

holding means for selectively holding said operating member at one of said first and said second positions.

5,191,472

APPARATUS HAVING A SCREEN WITH LIGHT BLOCKING ELEMENTS

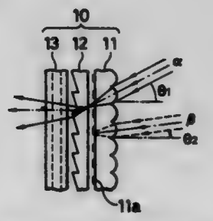
Katsumi Kurematsu, Kawasaki; Nobuo Minoura, Yokohama; Haruyuki Yanagi, Yokohama, and Hideaki Mitsutake, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Nov. 29, 1989, Ser. No. 442,723

Claims priority, application Japan, Nov. 29, 1988, 63-301357; Nov. 24, 1989, 1-305057

Int. Cl.[5] G02B *27/00, 3/08;* G03B *21/60*

U.S. Cl. 359—619 8 Claims



1. An image display apparatus, comprising:

an image projector, having a reflecting mirror, for projecting a light beam with an image; and

a screen for receiving the image, said screen including a first sheet having a first surface facing said reflecting mirror for receiving the light beam reflected by said reflecting mirror and a second surface on a side opposite to said first surface, with a plurality of lens elements arranged on said first surface and light blocking elements arranged on said second surface so as to block a portion of the light beam which is reflected by said first surface back to said reflecting mirror and is re-reflected again to be incident on said second surface through said first surface, wherein

said screen further includes a second sheet on which a Fresnel lens is formed, said second sheet disposed on an opposite side of said first sheet from said reflecting mirror.

5,191,473

OBJECTIVES

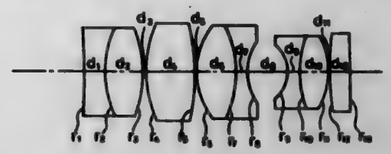
Shingo Kashima, and Chikara Nagase, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1991, Ser. No. 781,846

Claims priority, application Japan, Oct. 24, 1990, 2-286548

Int. Cl.[5] G02B *21/02*

U.S. Cl. 359—659 9 Claims



9. An objective consisting of, in order from the object side, a first lens that is a cemented lens convex on the image side, a positive lens, a pair of cemented meniscus lenses with concave surfaces facing each other, and a positive lens.

5,191,474

ANAMORPHIC ILLUMINATING OPTICAL SYSTEM

Sanae Suzuki, and Nobuo Kanai, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1990, Ser. No. 525,905

Claims priority, application Japan, May 18, 1989, 1-125265; Jan. 12, 1990, 2-5779; Jan. 12, 1990, 2-5780; Jan. 12, 1990, 2-5781

Int. Cl.[5] G02B *13/08*

U.S. Cl. 359—668 6 Claims

1. A projecting apparatus comprising:

a light source;

an illuminating optical system for condensing light from said light source and illuminating a film with the condensed light, said illuminating optical system including an axially symmetric lens system fixedly disposed on an optical axis, and an anamorphic lens system movable between a first position and a second position,

a projecting lens for projecting an image of the film illuminated;

a first mode for causing said projecting lens to project the image of the film onto a first projection plane;

a second mode for causing said projecting lens to project the image of the film onto a second projection plane;

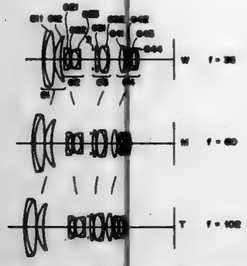
first moving means for moving said anamorphic lens system to said first position in said first mode; and

second moving means for moving said anamorphic lens system to said second position in said second mode.

5,191,475
ZOOM LENS
Chiaki Terauwa, Kanagawa; Jun Hosoya, Tokyo, and Kiyoshi Fukami, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 475,760, Feb. 6, 1990, abandoned. This application Dec. 10, 1991, Ser. No. 804,513
Claims priority, application Japan, Feb. 9, 1989, 1-032389; Feb. 28, 1989, 1-048969
Int. Cl.[5] G02B 15/14
U.S. Cl. 359—684 10 Claims

1. A zoom lens comprising:
a lens group including a lens axially movable for focusing and lenses axially movable for zooming, and
a relay lens group for fulfilling an image forming function, said relay lens group including a relay front lens group and a relay rear lens group with the intervening air spacing being the longest spacing between any two lenses in said relay lens group, and said relay rear lens group including a first movable lens group that is stationary for zooming and axially movable for macro photography and a second movable lens group that is stationary for zooming and axially movable for tracking adjustment.

5,191,476
GREAT RELATIVE APERTURE ZOOM LENS
Haruo Sato, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Dec. 2, 1991, Ser. No. 801,487
Claims priority, application Japan, Dec. 3, 1990, 2-400203; Dec. 3, 1990, 2-400244
Int. Cl.[5] G02B 15/14
U.S. Cl. 359—687 27 Claims



1. A great relative aperture zoom lens including, in succession from the object side, a first lens unit having positive refractive power, a second lens unit having negative refractive power, a third lens unit having a positive refractive power, and a fourth lens unit having positive refractive power, said first lens unit, said third lens unit and said fourth lens unit being designed to be moved toward the object side and displaced relative to said second lens unit during magnification change from the wide angle end to the telephoto end, said second lens unit comprising a forward unit having negative refractive power and positioned on the object side, and a rearward unit having positive refractive power and positioned on the image side, and being designed to satisfy the following condition:

$$-3 \leq f_{G2} \cdot h_{G2R} / f_T \leq -1.76$$

where
f_{G2}: the focal length of the second lens unit;
h_{G2R}: the height of the ray from the on-axis infinity object point from the position at which said ray has passed the outermost marginal edge of that surface of the second lens unit which is most adjacent to the image side at the telephoto end to the optical axis;
f_T: the focal length of the entire system at the telephoto end.

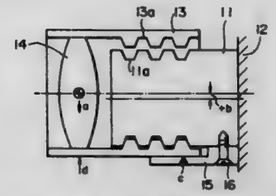
5,191,477
ZOOM FINDER
Tetsuya Abe, and Tahei Moriseawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1991, Ser. No. 658,703
Claims priority, application Japan, Feb. 22, 1990, 2-41461
Int. Cl.[5] G02B 13/02
U.S. Cl. 359—695 22 Claims

1. A zoom finder including an objective optical system of a positive power having a first lens group of negative power, a second lens group of positive power, a third lens group, and an eyepiece optical system of positive power through which an image formed by the objective optical system is observed, said first lens group, said second lens group, said third lens group, and said eyepiece optical system being arranged in this order from an object side, wherein:
said second lens group of the objective optical system is movable in an optical axis direction to vary the power;
said first and second lens groups are movable in association with each other so as to keep a constant diopter; and
said first lens group is provided, on at least one surface thereof, with an aspherical surface having a curvature which decreases toward the peripheral portion thereof.

5,191,478
ZOOM LENS FOR VIDEO CAMERA
Shunichi Horiguchi, Yokohama, and Osamu Uchida, Atsugi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 3, 1992, Ser. No. 829,237
Claims priority, application Japan, Feb. 12, 1991, 3-018604
Int. Cl.[5] G02B 7/02, 15/14
U.S. Cl. 359—703 3 Claims

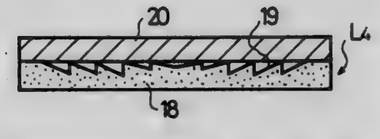
1. A zoom lens for a video camera comprising a focusing mechanism which comprises:
a male helicoid;
a female helicoid threadedly fitted on an inner side of said male helicoid, said female helicoid having a focusing lens; and
a female helicoid holder means supporting said female helicoid from a lower side of said female helicoid in a deadweight direction thereof to thereby support the deadweight of said female helicoid;

said female helicoid, while supported by said female helicoid holder means from the lower side thereof, being angularly



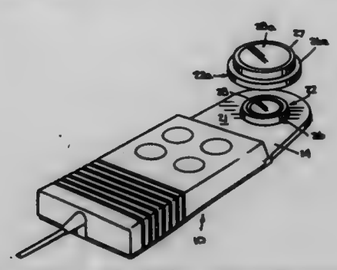
moved relative to said male helicoid so as to effect a focus adjustment.

5,191,479
FRESNEL LENS
Michiro Tsuchida, Yokohama, Japan, assignor to Nipox Kabushiki Kaisha, Yokohama, Japan
Filed Sep. 25, 1991, Ser. No. 765,442
Claims priority, application Japan, Mar. 28, 1991, 3-64122
Int. Cl.[5] G02B 3/08
U.S. Cl. 359—742 10 Claims



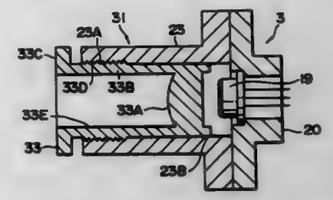
1. A Fresnel lens comprising:
a lens body of a synthetic resin having a flat surface and an annularly grooved surface; and
a glass plate attached to said lens body so as to directly face said annularly grooved surface.

5,191,480
OPTICAL ACCESSORY FOR DIGITIZER CURSORS
Wayne J. Murray, Bridgeport; David Siefer, Orange, and George Hesse, Naugatuck, all of Conn., assignors to Summagraphics Corporation, Seymour, Conn.
Filed Nov. 13, 1989, Ser. No. 436,197
Int. Cl.[5] G02B 7/02, 27/02; G09G 3/02
U.S. Cl. 359—808 3 Claims



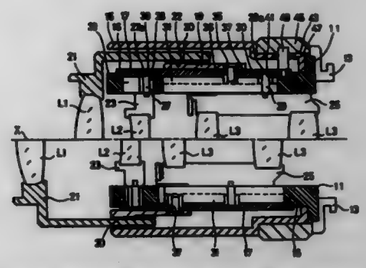
1. The combination of a digitizer cursor and an accessory for use therewith, said digitizer cursor having a recess and a position-sighting aperture in said recess, said accessory comprising an optical element having a peripheral recess adjacent an end thereof and a peripheral shoulder adjacent said peripheral recess, said peripheral recess and said shoulder being sized and configured such that said end of said optical element may be removably inserted into said recess with said shoulder in contact with said cursor adjacent said recess.

5,191,481
LENS INSTALLATION IN AN OPTICAL DEVICE
Yasuo Takizawa, Saitama; Shinya Ikeda, Tokyo; Masataka Nishiyama, Tokyo; Takaaki Yoshinari, Tokyo, and Masakuni Suwashita, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 10, 1991, Ser. No. 757,221
Claims priority, application Japan, Sep. 17, 1990, 2-97888[U]
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—811 8 Claims



1. A lens unit comprising a hollow holder and a lens member coupled in the hollow holder in which the lens member has a lens portion and an outer surrounding wall portion integrally formed with the lens portion, the outer surrounding wall portion extending along the axis of the lens member, and the outer surface of the outer surrounding wall portion being relatively movably coupled with the inner wall surface of the hollow holder, whereby the lens member can be prevented from falling or rolling when it is installed in the hollow holder.

5,191,482
LENS DRIVING APPARATUS
Tetsuo Sekiguchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 18, 1991, Ser. No. 642,788
Claims priority, application Japan, Jan. 19, 1990, 2-3622
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—819 21 Claims



1. A lens dividing apparatus for moving a plurality of lens groups in an optical axis direction to change the spatial distance therebetween, comprising:
a supporting cylinder which is secured to an immovable portion of a lens barrel;
a cam ring which is rotatably fitted on said supporting cylinder;
at least two inner lens moving frames which are provided in said supporting cylinder, so as to move in the optical axis direction;
guide grooves which are formed on said supporting cylinder;
cam grooves which are formed on said cam ring to move said moving frames along therewith when said cam ring is rotated; and
cam followers which are secured to said inner lens moving frames and which extend through corresponding said

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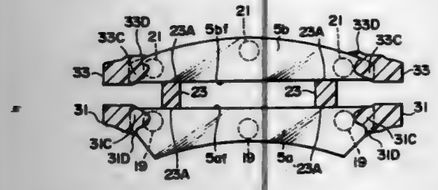
guide grooves to be fitted into corresponding said cam grooves to guide said lens moving frames in the optical axis direction, wherein the number of said guide grooves is smaller than the number of said inner lens moving frames.

5,191,483
INSTALLATION OF OPTICAL COMPONENT IN OPTICAL DEVICE

Yasuo Takizawa, Saitama; Shinya Ikeda, Tokyo; Masataka Nishiyama, Tokyo; Takaaki Yoshinari, Tokyo, and Masakazu Suwashita, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 756,062
Claims priority, application Japan, Sep. 7, 1990, 2-238279
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—819 20 Claims

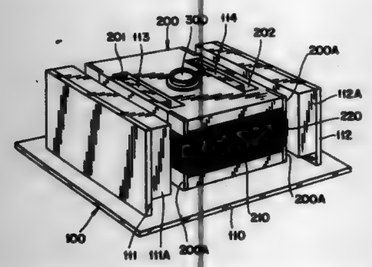


7. A structure for installing at least a pair of optical components on a housing case, comprising:
- a seating surface on said housing case for seating said pair of the optical component;
- at least one spacer member provided on said seating surface for regulating the spacing between said pair of optical components in one direction;
- a pair of fusible members arranged on said housing case adjacent to said seating surface, said fusible members having vertical lengths enough to be beyond the top surfaces of said optical components when said optical components are seated on said seating surface,
- wherein at least a part of respective fusible member is fused onto the corresponding one of said optical components after said corresponding optical component is seated on said seating surface, thereby fixing said optical components onto said seating surface.

5,191,484
OPTICAL PICK-UP OBJECTIVE DRIVING APPARATUS

Jye-Sye Yeon; Jong-Jin Lee, both of Suwon, and Ho-Cheol Lee, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 30, 1992, Ser. No. 828,120
Claims priority, application Rep. of Korea, Jan. 31, 1991, 91-1692
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—824 5 Claims

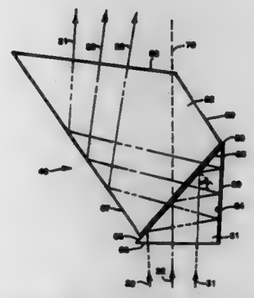


1. An optical pick-up objective driving apparatus comprising an iron core member having magnetic plates, a generally rectangular moving member mounted for movement relative to said iron core member in a rectilinear focusing direction and a rectilinear tracking direction, and a lens mounted on said moving member, said moving member including a focusing drive coil and a tracking drive coil for moving said moving member in said focusing and tracking directions, respectively, and restoring means for biasing said moving member toward a pre-set position, said restoring means comprising magnetic pieces disposed at respective corners of said moving member and facing said magnetic plates.

5,191,485
PRISM FOR IMAGE ROTATION

Todd A. Kahle, Hartford, Wis., assignor to Infographix, Inc., Sussex, Wis.

Filed Sep. 19, 1991, Ser. No. 762,719
Int. Cl.[5] G02B 5/04; G03B 21/11
U.S. Cl. 359—834 20 Claims



1. An apparatus, which rotates a group of light rays when the apparatus is rotated about an axis, comprising:
- a first prism having a transparent first facet through which the light rays enter said prism with an axial light ray of the group entering the first facet along the axis, a transparent second facet at an angle with respect to the first facet such that the light rays strike the second facet at angles of incidence that are equal to or greater than the critical angle, and a third facet reflecting substantially all of the light rays received from the second facet internally toward the second facet so that the light rays strike the second facet at angles of incidence that are less than the critical angle; and
- means for reflecting light rays exiting said first prism through the second facet in which the axial light ray is reflected at a point that is offset from the axis, said means for reflecting being oriented to direct the axial light ray toward the axis.

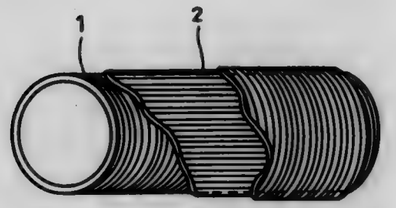
5,191,486
CFRP-MADE OPTICAL CYLINDER

Kunihiko Sato; Kazuo Morohashi, and Hidetoshi Takahashi, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1992, Ser. No. 860,323
Claims priority, application Japan, Mar. 30, 1991, 3-91017
Int. Cl.[5] G02B 5/00
U.S. Cl. 359—894 16 Claims

1. A CFRP-made optical cylinder comprising (a) CFRP layers containing a carbon fiber arranged in a direction substantially parallel to the cylinder axial direction and (b) CFRP layers containing a carbon fiber arranged in a direction nearly orthogonal to the cylinder axial direction, in which cylinder

the carbon fiber arranged in a direction substantially parallel to the cylinder axial direction has a minus thermal expansion

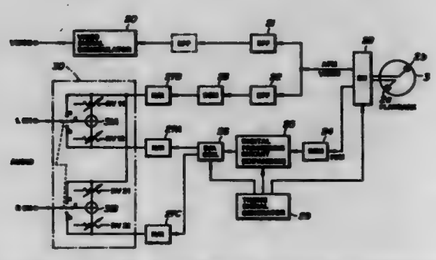


coefficient and the cylinder axial direction has a thermal expansion coefficient of -0.5×10^{-6}/°C. to 0.5×10^{-6}/°C.

5,191,487
HELICAL-SCAN-TYPE VTR WITH ECHO EFFECT PLAYBACK

Shinji Nakamura, Tokyo; Tomohiro Oshima, and Katsuakira Moriwake, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 884,351, Jul. 11, 1986, abandoned. This application Oct. 1, 1990, Ser. No. 593,270
Claims priority, application Japan, Jul. 17, 1985, 60-155946
Int. Cl.[5] H04N 5/93
U.S. Cl. 360—19.1 6 Claims



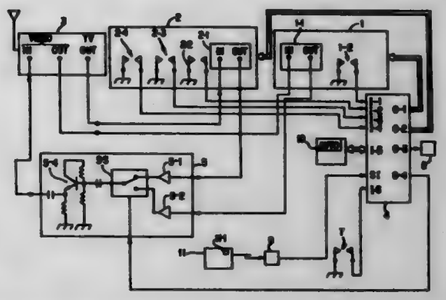
1. An apparatus for recording and reproducing signals on a recording medium, comprising:
- a) a plurality of rotary heads installed on a rotary drum of the apparatus which is capable of recording and reproducing signals on video tracks and on adjacent auxiliary tracks of the recording medium;
- b) first means for recording a video signal and a frequency-modulated audio signal on the video tracks and for recording a time-axis-compressed Pulse-Code-Modulated audio signal on the auxiliary tracks; and
- c) second means for reproducing audio signals by combining the frequency-modulated audio signal and the Pulse-Code-Modulated audio signal, wherein said second means includes means for selectively processing the audio signals to have at least a first and a second degree of phase offset.

5,191,488
AUDIO VISUAL DEVICE USING AN ENDLESS VIDEO TAPE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,984
Claims priority, application Japan, Sep. 29, 1989, 1-254425
Int. Cl.[5] G11B 15/04, 5/86, 27/02
U.S. Cl. 360—60 5 Claims

1. An audio-visual apparatus for a VCR-based video tape, comprising:
- means for recording or reproducing information to or from a T-1 tape and a T-2 tape, wherein T-1 is an endless video tape and T-2 is a standard video tape having tape ends;
- means for detecting whether T-2 has record-prevention tabs installed thereon;
- a remote control unit for sending a control signal each time a switch on said unit is manually operated; and
- means responsive to record-prevention tabs detected on T-2 for

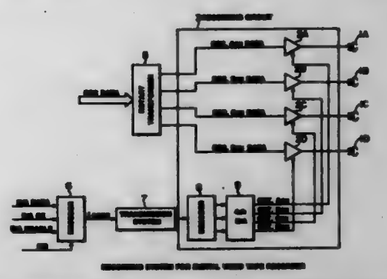


- (a) operating said apparatus in a first mode wherein T-1 and T-2 both are set to recording operation when operating power from a power source is applied to said apparatus,
- (b) operating said apparatus in a second mode wherein T-1 is set to playback operation and T-2 is maintained in recording operation in response to a first receipt of said control signal, and
- (c) operating said apparatus in the first mode in response to a second receipt of said control signal.

5,191,489
METHOD FOR TRANSMITTING RECORD CONTROL SIGNALS AND RECORD CONTROL CIRCUIT

Masaaki Izumaki, Kanagawa, Japan, assignor to Sony Corporation, Japan

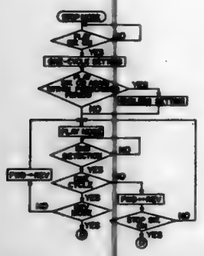
Filed Aug. 23, 1989, Ser. No. 397,401
Claims priority, application Japan, Aug. 30, 1988, 63-216023
Int. Cl.[5] G11B 5/02
U.S. Cl. 360—64 4 Claims



1. In a magnetic recording apparatus in which a recording circuit, provided with an amplifier connected to a magnetic head, is provided on the side of a rotary head drum, a method for transmitting record control signals supplied to said recording circuit, comprising
- indicating said record control signals by serial data and data enable signals indicating data start and data end points of said serial data,
- gating the edge pulses of sync clocks for said serial data with said data enable signals and annexing the gated edge pulses to said serial data, and further annexing transmission mode

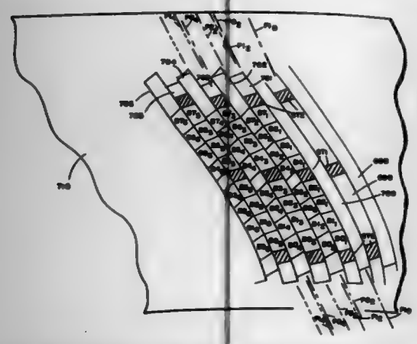
signals indicating the start and the end of transmission to said serial data to form serial control signals, and
serially transmitting the record control signals as the serial control signals from outside said rotary head drum to the side of said rotary head drum.

5,191,490
AUTO REVERSE TYPE TAPE PLAYER CAPABLE OF SELECTIVELY SWITCHING BETWEEN A ONE-CYCLE MODE AND AN ENDLESS MODE
Susumu Tycuno; Norihiro Kurokawa; Masafumi Kurata, and Hideo Yoshida, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 17, 1990, Ser. No. 599,215
Claims priority, application Japan, Oct. 18, 1989, 1-272630; Jan. 16, 1990, 2-7618; Jan. 16, 1990, 2-7619
Int. Cl.[5] G11B *15/18*
U.S. Cl. 360—71 3 Claims



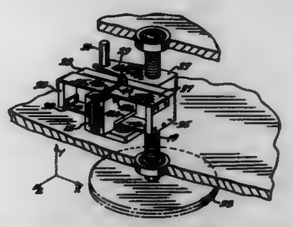
1. A tape player of an auto reverse type having an endless mode for repeating forward play and reverse play, comprising:
means for determining whether a play button is reoperated within a prescribed period after said play button is first operated, and
means for setting the endless mode or canceling the endless mode when said determining means detects that the play button is reoperated.

5,191,491
METHOD AND APPARATUS FOR READING DISTORTED HELICAL STRIPES
James Zweighaft, Boulder, Colo., assignor to Exabyte Corporation, Boulder, Colo.
Filed Nov. 9, 1990, Ser. No. 611,102
Int. Cl.[5] G11B *5/584*
U.S. Cl. 360—77.13 12 Claims



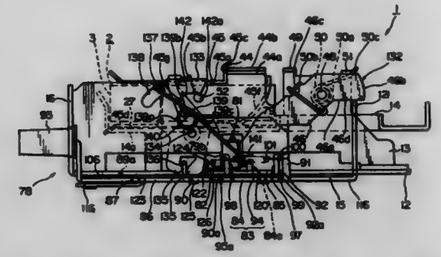
1. Apparatus for reading information recorded on a storage medium in helical tracks, with each track comprising a plurality of blocks of data, with at least some of said tracks having a plurality of servo zones recorded thereon, said apparatus comprising:
means for transporting said storage medium in a direction of medium travel;
a rotatable drum having a portion of a peripheral surface thereof contiguous with said storage medium as said storage medium is transported therepast by said transporting means;
reading means mounted on said drum for traversing an original azimuth path across said storage medium and for reading blocks recorded along at least a portion of the original azimuthal path;
a servo head mounted on said drum for attempting, in a normal mode, to pickup signals recorded in said plurality of servo zones recorded on said tracks;
track distortion detection means for acquiring information indicative of whether a track is distorted;
servo zone selection means for using said information acquired by said track distortion detection means in order to select one of said servo zones as having a specified relationship to a potential track distortion;
control means responsive to said servo zone selection means for causing, in a servo reposition mode, the repositioning of said servo head and for causing said servo head to follow a modified azimuthal path whereon the signal from said selected servo zone is prioritized relative to others of said servo zones, and whereby said reading means accordingly traverses a modified azimuthal path in said servo reposition mode in an attempt to read a portion of said distorted track, said modified azimuthal path being offset with respect to said original azimuthal path relative to said direction of medium travel.

5,191,492
MECHANISMS FOR A CLOSED LOOP HEAD POSITIONER FOR STREAMING TAPE DRIVES
Ashok B. Nayak, La Verne, and Donald Schilling, Anaheim, both of Calif., assignors to Archive Corporation, Costa Mesa, Calif.
Continuation of Ser. No. 502,262, Mar. 30, 1990, abandoned.
This application Aug. 17, 1992, Ser. No. 931,110
Int. Cl.[5] G11B *5/55, 5/584*
U.S. Cl. 360—78.02 2 Claims



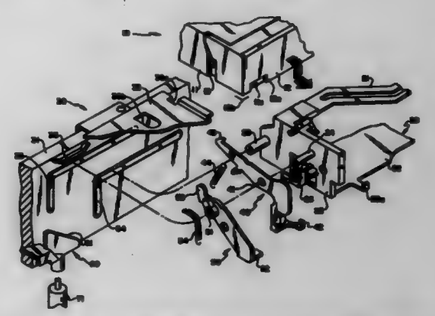
2. In a tape drive having a magnetic head, a head carriage frame, and a coarse positioning mechanism for moving the head carriage frame along a path generally transverse to the direction of tape travel to position the head carriage frame at predetermined coarse positions, a mechanism for fine positioning the magnetic tape head relative to the head carriage frame, comprising:
a resilient support beam for supporting the magnetic tape head generally centrally between its ends which extend beyond the magnetic head and are fixedly and immovably secured to the head carriage frame; and
a piezoelectric bender beam parallel to said support beam for supporting the magnetic tape head generally centrally between its ends which extend beyond the tape head and are fixedly and immovably secured to the head carriage frame, said bender beam deflecting pursuant to a control signal and causing the tape head to move relative to the head carriage frame along a path transverse to the tape travel direction;
whereby the tape head is positionable relative to the head carriage frame along a path transverse to the tape travel direction pursuant to deflection of said piezoelectric bender beam.

5,191,493
CASSETTE EJECTING MECHANISM OF A TAPE PLAYER
Masafumi Tamura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 16, 1991, Ser. No. 641,684
Claims priority, application Japan, Jan. 20, 1990, 2-11505
Int. Cl.[5] G11B *5/008, 15/66*
U.S. Cl. 360—96.5 14 Claims



1. A cassette ejecting mechanism of a tape player comprising:
a chassis;
cassette holder means for holding a tape cassette having a tape, said cassette holder means having a locking portion and a lockable portion;
means for pivotably mounting said cassette holder means on said chassis for movement about a pivotal axis between an ejecting position permitting insertion and removal of the tape cassette and a loading position permitting the tape to be driven;
first biasing means for biasing said cassette holder means toward said ejecting position;
head base means for supporting a magnetic head means for recording or reproducing information signals on or from said tape;
means for mounting said head base means on said chassis for movement between retracted and engaged positions relative to said loading position of said cassette holder means, said magnetic head means being located outside said tape cassette when said head base means is in said retracted position and said cassette holder means is in said loading position, and at least part of said magnetic head means being located inside said tape cassette when said head base means is in said engaged position and said cassette holder means is in said loading position;
driving lever means for moving said head base means between said retracted and engaged positions;
operating lever means movable with respect to said chassis for initiating movement of said cassette holder means toward said ejecting position;
intermediate lever means movable in response to movement of said operating lever means, for causing movement of said driving lever means, said intermediate lever means including a lock member; and
second biasing means for biasing said head base means toward said engaged position;
said lock member of said intermediate lever means being engageable with said lockable portion of said cassette holder means for preventing movement of said cassette holder means toward said ejecting position by said first biasing means when said head base means is in said engaged position; and
said locking portion of said cassette holder means being engageable with said lock member of said intermediate lever means for preventing movement of said head base means toward said engaged position by said second biasing means when said cassette holder means is in said ejecting position.

5,191,494
CASSETTE LOADING APPARATUS IN A VIDEO TAPE RECORDER FOR RECOGNIZING CORRECT TAPE INSERTION USING AN IMPROVED TAPE LID LIFTING APPARATUS
Jung-jae Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea
Filed Dec. 31, 1990, Ser. No. 636,116
Claims priority, application Rep. of Korea, Dec. 31, 1989, 89.20724
Int. Cl.[5] G11B *15/675*
U.S. Cl. 360—96.5 1 Claim



1. A cassette loading apparatus for loading and unloading a cassette having a front lid attachment from a video cassette recorder which includes a driving mechanism for said apparatus, comprising:
a cassette holder for receiving the cassette during an operator loading operation, said cassette holder being mechanically driven by said driving mechanism and including outwardly protruding coupling means;
cassette holder housing means comprising:
first and second side brackets respectively coupled to opposing sides of said cassette holder via the outwardly protruding coupling means, each side bracket including guide means for supporting said outwardly protruding means and for guiding said cassette holder in a horizontal and vertical direction along a fixed axis, said fixed axis being related to an insertion angle of the cassette;
a top plate mounted to said first and second side brackets and including an engaging groove formed thereon; and
a protruding cam formed on a surface of at least one of said side brackets facing said cassette holder;
a cassette recognition lever coupled to said cassette holder and to said at least one side bracket so as to rotate along said fixed axis, and comprising hooking means for latching onto said engaging groove formed on said top plate, wherein said hooking means is disengaged from said engaging groove when a properly inserted cassette causes said cassette recognition lever to rotate in response to the insertion of the cassette in said cassette holder; and
a lid opening lever coupled to said cassette holder and said at least one side bracket so as to rotate along said fixed axis, comprising:
lid supporting means for lifting the front lid attachment of a cassette already inserted into the cassette holder; and
cam contact means coupled to said protruding cam for

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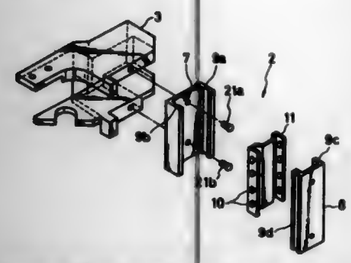
causing said lid opening lever to rotate in response to the cassette holder being guided along said guide means.

5,191,495
MAGNETIC HEAD GUIDING DEVICE

Hiroki Takahara, Atsugi, Japan, assignor to Aaritsu Corporation, Tokyo, Japan

PCT No. PCT/JP90/00261, § 371 Date Oct. 29, 1990, § 102(e) Date Oct. 29, 1990, PCT Pub. No. WO90/10288, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 28, 1990, Ser. No. 601,785
Claims priority, application Japan, Mar. 3, 1989, 1-49882
Int. Cl.[5] G11B *5/55, 21/08*
U.S. Cl. 360—106 15 Claims

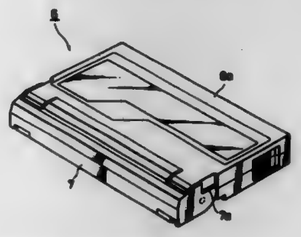


1. A magnetic head guiding device for guiding a magnetic head of a data recording/reproducing apparatus over a multi-track magnetic tape in a widthwise direction of the tape in order to record data on and/or reproduce data from the magentic tape, said magnetic head guiding device comprising:
a base member;
a fixed guide rail member supported by said base member, said fixed guide rail member including:
substantially U-shaped cross-section,
opposite first and second fixed guide rail sides,
a first fixed rail guide groove formed in said first fixed guide rail side, said first fixed rail guide groove having a V-shaped cross-section and extending in the widthwise direction of the tape, and
a second fixed rail guide groove formed in said second fixed guide rail side and separated from said first fixed rail direction of the magnetic tape, said second fixed rail guide groove having a V-shaped cross-section and extending in the widthwise direction of the tape; and
a movable guide rail member movable in the widthwise direction of said tape, said movable guide rail member including:
a substantially U-shaped cross-section,
opposite first and second movable guide rail side,
a first movable rail guide groove formed in said first movable guide rail side in opposition to said first fixed rial guide groove and having a V-shaped cross-section, and
a second movable rail guide groove formed in said second movable guide rail side in opposition to said second fixed rail guide groove and separated from said first movable rail guide groove in a direction perpendicular to the widthwise direction of the magnetic tape, said second movable rail guide groove having a V-shaped cross-section;
a plurality of spherical rolling members arranged in rolling contact with and between said first fixed rail guide groove and said first movable rail guide groove, and between said second fixed rail guide groove and said second movable rail guide groove;
retainer means for holding said rolling members such that said rolling members are rotatable, said retainer means having a substantially U-shaped cross-section and having opposite first and second retainer sides, with said first retainer side being positioned between said first fixed guide rail side and said first movable guide rail side and said second retainer side being positioned between said second fixed guide rail side and said second movable guide rail side, and with dimensions between said first fixed rail guide groove and said first movable rail guide groove and between said second fixed rail guide groove and said second movable rail guide groove are such that said guide grooves apply a pressure to said rolling members therebetween so as to prevent said retainer means from falling out from spaces between said opposite sides of said movable guide rail member; and
head supporting means for supporting the movable guide rail member and the magnetic head such that said magnetic head is movable together with said movable guide rail member.

5,191,496
TAPE CASSETTE HAVING A LID OPENED BY A FORCE IN THE SAME DIRECTION AS A TAPE LOADING FORCE

Yoshio Kondo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 675,166
Claims priority, application Japan, Mar. 30, 1990, 2-84304
Int. Cl.[5] G11B *23/087*
U.S. Cl. 360—132 2 Claims

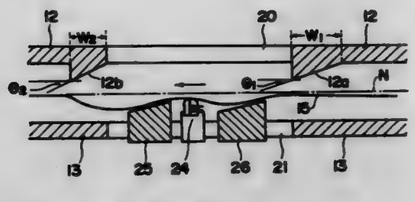


1. A tape cassette comprising:
housing means having a top and a bottom;
a pair of reels;
means mounting said reels for rotation in said housing means;
a recording medium wound on said reels and extending therebetween for transport from one of aid reels to the other;
said housing means being formed with an opening at a front thereof through which transducer means can gain access to said recording medium for recording or reproducing signals on or from said recording medium;
lid means; and
connection means including a pair of pivot shafts for pivotably connecting said lid means to said housing means for selective movement of said lid means between a first position closing said opening and a second position uncovering said opening;
said lid means being formed with an engagement portion displaced from said connection means, whereby said tape cassette is moved by a seating force for playing in a cassette player, said lid means moves from said first position to said second position in response to a force applied to said engagement portion, the force being in substantially the same direction as said seating force, wherein said force is applied downwardly relative to the top of said housing means, said engagement portion is rearward of said pivot means relative to said front of said housing means, and a front portion of said lid means pivots upwardly in moving from said first position to said second position.

5,191,497
MAGNETIC DISK PACK AND MAGNETIC DISK RECORDING/REPRODUCING APPARATUS WITH IMPROVED HEAD TOUCH

Hitoshi Saito, Tokyo; Yasuo Nagashima, Odawara; Toshihiko Matsuo, and Takashi Matsumoto, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 371,857, Jun. 27, 1989, abandoned.
This application Aug. 28, 1992, Ser. No. 935,355
Claims priority, application Japan, Jul. 1, 1988, 63-162667; Jul. 8, 1988, 63-169037; Dec. 22, 1988, 63-322014
Int. Cl.[5] G11B *23/03*
U.S. Cl. 360—133 8 Claims



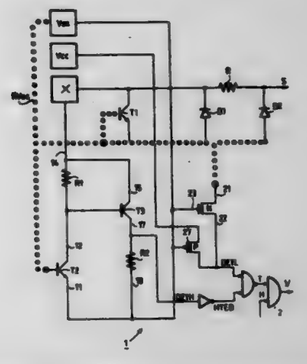
1. A magnetic disk pack, comprising:
a flexible magnetic disk and a protective casing rotatably accommodating said magnetic disk thereinside, said protective casing having a pair of aligned windows formed in at least upper and lower surfaces of said casing, at corresponding positions at a side of said casing, so that a magnetic head can be inserted into one of said windows to be brought into sliding contact with said magnetic disk while said disk is rotating, in a specified direction, thereby recording and reproducing information on and from said magnetic disk, wherein at least one first lug having a substantially flat inclined surface positioned so as to urge said rotating magnetic disk toward and onto said magnetic head by utilization of a positive pressure is formed along and integral with an inner part of a marginal edge of the window opposite that into which said magnetic head is inserted, said inclined surface lying in a plane which intersects a free plane of rotation of said disk at an acute angle.

5,191,498
SAFETY DECIVE FOR INTEGRATED CIRCUIT

Jacek Kowalski, Trets, France, assignor to Gemplus Card International, Gemenos, France

Filed Jan. 22, 1990, Ser. No. 467,903
Claims priority, application France, Jan. 27, 1989, 89 00998
Int. Cl.[5] H01L *27/04*
U.S. Cl. 361—1 5 Claims

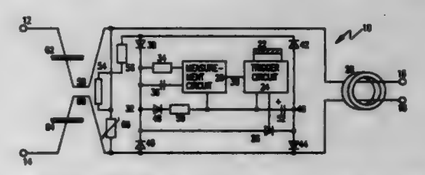
1. A safety device for an integrated circuit on a substrate comprising means for detecting a current flowing in said substrate between a connection terminal on the substrate of this circuit and a position in the substrate, said detecting means having at least one drain region or source region or gate region of a transistor which is connected to said position through said substrate, and means for invalidating an operation of the integrated circuit as a function of a predetermined detection by said detection means.



5,191,499
METHOD AND APPARATUS FOR CURRENT INTERRUPTION IN ELECTRICALLY-POWERED APPARATUS AND EQUIPMENT

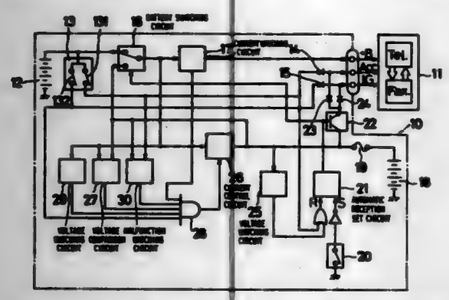
Harry Gans, Dilsberg, and Manfred Grove, Dreieich, both of Fed. Rep. of Germany, assignors to Interruscom A.G., Zarich, Switzerland

Filed May 14, 1991, Ser. No. 699,956
Int. Cl.[5] H02H *3/16*
U.S. Cl. 361—49 30 Claims



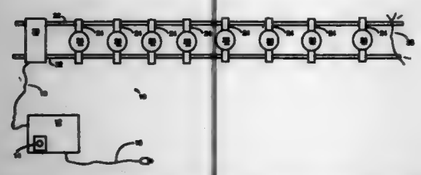
1. A current interruption device for an externally powered electrical apparatus comprising:
a detection means for detecting a selected value of a physical parameter associated with the operation of the externally powered electrical apparatus and generating a detection signal in response to the detection of the selected value of the physical parameter;
a trigger means electrically connected to the detection means that generates a firing signal in reaponse to the detection signal;
a silicon-controlled rectifier electrically connected to the trigger means that fires in response to the firing signal;
a plasma generating means electrically connected to the silicon-controlled rectifier including a resistor responsive to the firing of the silicon-controlled rectifier; and
a plurality of fuse means each electrically connected to one of a plurality of non-ground electrical conductors that carry electrical power to the externally powered electrical apparatus and to one of a plurality of electrical power input conductors, wherein each of the plurality of fuse means comprises a destructible conductor and wherein the firing of the silicon-controlled rectifier will cause the resistor to evaporate, creating a plasma that initiates an electric arcing between the plurality of fuse means, thereby interrupting current flow to the electrically powered apparatus.

5,191,500
POWER SUPPLY CIRCUIT FOR AN AUTOMOBILE
Rikuo Hatano, and Yoshifumi Iwata, both of Aichi, Japan, assignors to Aisin Seiki K.K., Kariya City, Japan
Filed Sep. 11, 1990, Ser. No. 580,453
Claims priority, application Japan, Sep. 12, 1989, 1-236375
Int. Cl.[5] H02J 9/00
U.S. Cl. 361—64 12 Claims



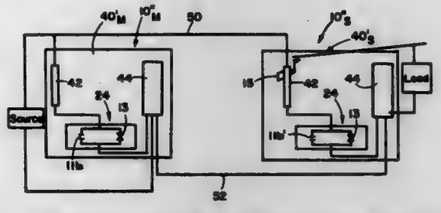
1. A power supply circuit for an automobile comprising:
an electric automotive appliance;
a main battery for supplying power to said electric automotive appliance;
a backup battery for supplying power to said electric automotive appliance;
an ignition key switch connected between said main battery and said electric automotive appliance;
battery switching circuit means for connecting one of said main battery and said backup battery to said electric automotive appliance in accordance with a condition of said ignition key switch;
power detecting means for detecting a charged power in said backup battery;
operation limitation means for limiting an operation of said electric automotive appliance to substantially reduce an amount of power required by said electric automotive appliance; and
control unit means for activating said operation limitation means when said power detecting means detects that a charged power in said backup battery is below a predetermined level.

5,191,501
FAST LAMP CURRENT LIMITING APPARATUS AND METHOD
David A. Blau, Cupertino, Calif., assignor to Translite, Ltd., Redwood City, Calif.
Filed May 4, 1990, Ser. No. 518,922
Int. Cl.[5] H05B 39/02
U.S. Cl. 361—95 20 Claims



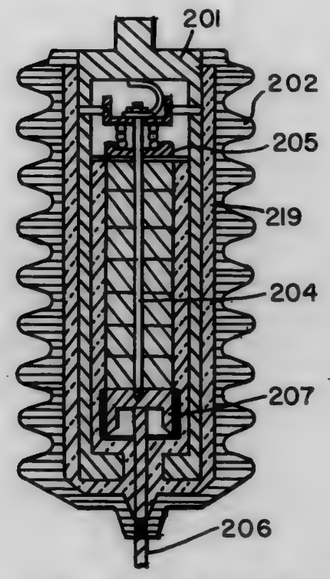
1. A incandescent light system over-current controller, comprising:
a stepdown transformer having a primary winding and a plurality of incandescent lamps connected to a secondary winding;
switching means for turning said incandescent lamps on and off by interrupting power in said primary winding of the stepdown transformer;
monitoring means including a resistor-capacitor integrator network for sensing an average load on said secondary of the stepdown transformer from said primary winding of the stepdown transformer;
means for comparing said average load on the stepdown transformer with an average line voltage and for determining a trip current value from said average load and said average line voltage;
means for compensating said trip current value for an inrush current that occurs during a starting of said incandescent lamps and for limiting the current to said incandescent lamps by pulse width modulating current flowing in said primary of the stepdown transformer;
means for detecting a sudden increase of current in said secondary winding of the stepdown transformer from said primary winding of the stepdown transformer; and
protection means for instantaneously interrupting power supplied to said primary winding of the stepdown transformer responsive to said trip current value, the monitoring means and the sudden current increase detection means.

5,191,502
UNITARY PANEL FOR CONNECTING A LOAD TO A POWER SOURCE IN A MANNER WHICH CONTROLS VOLTAGE SURGES AND TRANSIENTS AND ACCOMMODATES THE NEEDS OF NON-LINEAR LOADS
Barry M. Epstein, 7523 Cliffbrook, Dallas, Tex. 75240; Mark A. Arnspiger, 8605 Westfield, Dallas, Tex. 75243, and Edmond E. Dumas, Jr., 7815 McCallum No. 2202, Dallas, Tex. 75252
Filed Feb. 15, 1991, Ser. No. 655,853
Int. Cl.[5] H02H 9/04
U.S. Cl. 361—111 22 Claims



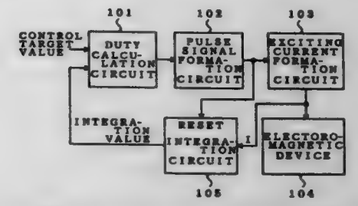
1. A distribution panel for use in connecting a load to a source of power comprising:
A) a base;
B) a phase bus mounted directly on said base;
C) a neutral bus mounted directly on said base, said neutral bus being larger in current carrying capability than said phase bus;
D) a voltage surge and transient protector network mounted directly on said base to be unitary and integral with said base, said voltage surge and transient protector network including a capacitor and a voltage suppressor element; and
E) a plurality of lugs electrically connected to said neutral bus, said lugs being sized in accordance with the larger current carrying capacity of said neutral bus.

5,191,503
LIGHTNING SURGE PROTECTOR
Takeshi Kawamura; Isao Harada, and Tomohisa Matsushita, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Apr. 2, 1991, Ser. No. 679,188
Claims priority, application Japan, Apr. 2, 1990, 2-88823; Oct. 15, 1990, 2-276631
Int. Cl.[5] H02H 1/00
U.S. Cl. 361—127 8 Claims



8. A self arc-extinguishing arrester for protecting equipment from a lightning surge comprising:
a non-linear resistive current limiting element for limiting a current caused by said lightning surge; and
a conductive pressure-proof housing for accommodating said non-linear resistive current limiting element comprising:
an upper electrode member;
a lower electrode member;
a lower end of said housing having a partial opening portion;
an outer insulating element covering an exterior wall surface of said housing; and
an inner insulating element filling an interior space of said housing to insulate said housing from said resistor element;
such that when an internal arc occurs, the energy from said lightning causes said lower electrode member to break said insulator at said opening portion of said conductive pressure-proof housing so as to electrically connect said conductive pressure-proof housing to a part of said lower electrode member,
wherein said lower electrode member has a rod-like portion comprising:
a covered portion covered with said insulator element and being painted to be brightly visible; and
a projecting portion projecting outside said housing, such that it is possible to visually distinguish a displacement of said lower electrode member.

5,191,504
CONTROL APPARATUS FOR ELECTROMAGNETIC DEVICE HAVING PROPORTIONAL SOLENOID
Junichi Narisawa, Tokyo, and Morio Oshima, Ibaragi, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan
PCT No. PCT/JP90/00100, § 371 Date Sep. 28, 1990, § 102(e) Date Sep. 28, 1990, PCT Pub. No. WO90/08914, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 29, 1990, Ser. No. 582,213
Claims priority, application Japan, Jan. 30, 1989, 1-21841; Dec. 7, 1989, 1-319670
Int. Cl.[5] H01H 47/32
U.S. Cl. 361—186 12 Claims

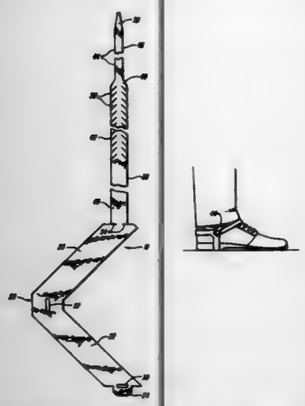


1. A control apparatus for an electromagnetic device having proportional solenoid, said apparatus comprising:
duty factor calculation means for calculating a duty factor on the basis of a control target value;
pulse signal formation means for forming a pulse signal with the calculated duty factor; and
exciting current formation means for forming an exciting current for stimulating a coil of an electromagnetic apparatus in response to the formed pulse signal;
wherein said control apparatus further comprises integration means for integrating the exciting current of said coil in synchronization with said pulse signal and
wherein said duty factor calculation means calculates said duty factor from said control target value and an integration valve output from said integration means.

5,191,505
ELECTRO-STATIC GROUNDING DEVICE
Michael E. Gordon, Boston; Lenard Cohen, Southboro, and Paul Mills, Stow, all of Mass., assignors to Plastic Systems, Inc., Marlboro, Mass.
Filed Jun. 11, 1990, Ser. No. 536,394
Int. Cl.[5] H05F 3/02
U.S. Cl. 361—223 16 Claims

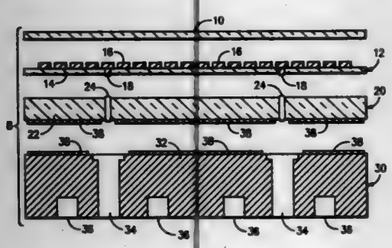
12. An electrostatic discharge control device comprising a unitary piece of conductive sheet material including:
a first leg portion,
a second leg portion integrally connected to and disposed at a substantial angle relative to said first leg portion, and
a connecting portion integrally connected to said second leg portion at a point spaced from the point at which said second leg portion is connected to said first leg portion,
said connecting portion projecting from said second leg portion in a direction extending generally away from said first leg portion and
said device including
first attachment means including an aperture in said device at a point spaced from that at which said first and second leg portions are integrally connected to each other for attaching said first and second leg portions to each other to form said first and second leg portions into a generally cup-shaped configuration adapted to receive the heel or toe of a wearer's foot, and

second attachment means for attaching said connecting portion to at least one of said first and second leg portions



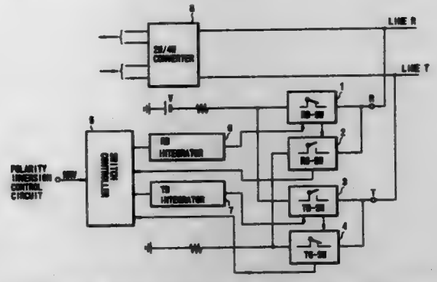
at a point spaced from that at which said connecting portion is integrally attached to said second leg portion.

5,191,506
CERAMIC ELECTROSTATIC CHUCK
Joseph S. Logan, Poughkeepsie; Raymond R. Ruckel, Garrison; Robert E. Tompkins, Pleasant Valley, and Robert P. Westerfield, Jr., Montgomery, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 2, 1991, Ser. No. 694,699
Int. Cl.[5] H02N *13/00*
U.S. Cl. 361—234 20 Claims



1. An electrostatic chuck for clamping a semiconductor wafer comprising, from top to bottom:
- an electrically insulative, thermally conductive isolation layer;
- a multilayer ceramic electrostatic pattern layer having an electrically conductive pattern disposed thereon for generating an electrostatic force and having first electrically conductive vias disposed therethrough for conducting electrical energy to said conductive pattern;
- a multilayer ceramic support having second electrically conductive vias disposed therethrough for conducting electrical energy to said first vias; and,
- a heat sink base having access holes provided therethrough for providing access to said second vias.

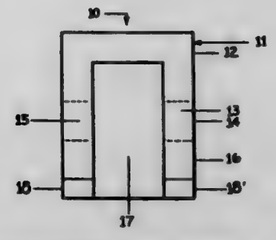
5,191,507
POLARITY INVERTING CIRCUIT
Koichi Saito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 27, 1990, Ser. No. 634,432
Claims priority, application Japan, Dec. 29, 1989, 1-342877
Int. Cl.[5] H03K *17/66*
U.S. Cl. 361—245 5 Claims



1. A polarity inverting circuit for supplying one of first and second potentials to first and second signal lines in accordance with a polarity inversion control signal, the circuit comprising:
- a first potential source and a second potential source;
- first output voltage transmission means (RB-SW1) connected to said first potential source and to said first signal line for linearly changing an output voltage from the first potential to the second potential;
- second output voltage transmission means (TB-SW 3) connected to said second signal line for linearly changing an output voltage from the second potential to the first potential when the output voltage from said first output voltage transmission means reaches the second potential;
- first connection means (RG-SW 2) connected to said first signal line and operated for connecting said first signal line to said second potential source when the output voltage from said first output voltage transmission means substantially reaches the second potential;
- second connection means (TG-SW 4) connected to said second signal line and operated for disconnecting said second signal line from said second potential source when said first connection means is connected to said second potential source;
- first and second polarity switching time changing means, (6,7) connected to said first and second output voltage transmission means, respectively, for changing corresponding rates of changes in the respective output voltages; and
- control means (5) connected to said first and second polarity switching time changing means and to said first and second connection means, said control means receiving a polarity inversion control signal and controlling operations of said first and second output voltage transmission means and of said first and second connection means.

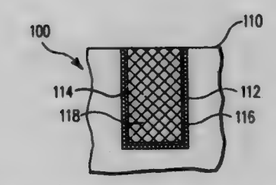
5,191,508
CERAMIC IGNITERS AND PROCESS FOR MAKING SAME
Scott R. Axelson, Milford, N.H., and John T. Vayda, West Brookfield, Mass., assignors to Norton Company, Worcester, Mass.
Filed May 18, 1992, Ser. No. 884,662
Int. Cl.[5] F23Q *3/00, 7/10*
U.S. Cl. 361—257 17 Claims
12. A ceramic igniter comprising a body member composed

of an electrically conductive ceramic material, said body member having at least one slot extending therethrough and an



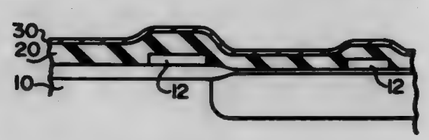
electrically non-conductive material disposed within and substantially filling the slot.

5,191,509
TEXTURED POLYSILICON STACKED TRENCH CAPACITOR
Duen-Shun Wen, Crompond, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 11, 1991, Ser. No. 806,080
Int. Cl.[5] H01G *4/06;* H01L *29/92*
U.S. Cl. 361—311 23 Claims



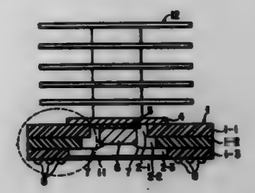
1. A capacitor structure formed in a trench at a surface of a substrate including an electrode having a textured surface, said electrode being formed within an inner surface of said trench wherein said electrode is formed as a layer of doped polysilicon and deposited as hemispherical grain polysilicon.

5,191,510
USE OF PALLADIUM AS AN ADHESION LAYER AND AS AN ELECTRODE IN FERROELECTRIC MEMORY DEVICES
Maria Huffman, Colorado Springs, Colo., assignor to Rasmtron International Corporation, Colorado Springs, Colo.
Filed Apr. 29, 1992, Ser. No. 875,749
Int. Cl.[5] H01G *4/06, 4/10;* H01L *27/02;* G11C *11/22*
U.S. Cl. 361—313 26 Claims



1. A capacitor comprising:
- a substrate;
- a silicon dioxide layer located over said substrate;
- an adhesion layer, comprising palladium, located over said silicon dioxide layer;
- a bottom electrode located over said adhesion layer;
- a layer of ferroelectric material located over said bottom electrode; and
- a top electrode located over said layer of ferroelectric material.

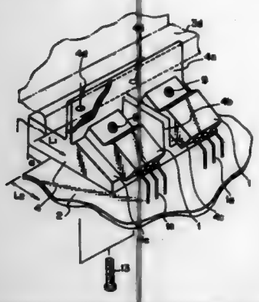
5,191,511
SEMICONDUCTOR DEVICE INCLUDING A PACKAGE HAVING A PLURALITY OF BUMPS ARRANGED IN A GRID FORM AS EXTERNAL TERMINALS
Hiromichi Sawaya, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 4, 1992, Ser. No. 830,892
Claims priority, application Japan, Feb. 8, 1991, 3-18026
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—383 7 Claims



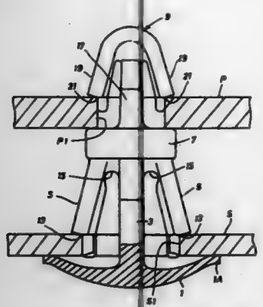
1. A semiconductor device comprising:
- a semiconductor chip having at least one semiconductor element formed thereon;
- a package for receiving said semiconductor chip, said package including
  - a plurality of laminated insulation plates respectively having windows formed therein,
  - metallized patterns formed on the surface of at least one of said insulation plates,
  - through hole passages formed in at least one of said insulation plates,
  - conductive films formed on inner surfaces of said through hole passages to be electrically connected to said metallized patterns, and
  - land patterns formed on one of said insulation plates which has an exposed surface and being electrically connected to said conductive films; and
- bumps formed on the surface of said package and being electrically connected to said semiconductor chip, said bumps being used as external terminals of said package and being formed in said through hole passages whose inner surfaces are covered with said conductive films to project from said through hole passages, and said semiconductor chip being received in a space defined by the windows of said plurality of insulation plates.

5,191,512
HEAT SINK/CIRCUIT BOARD ASSEMBLY
Shinichi Ogura; Hiroo Adachi; Osamu Shishido; Tetsuya Watanabe; Yuuichi Mineo; Tohru Kageyama; Yoichi Nishiyama; Takashi Yamaguchi, and Keiichi Ogawa, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 21, 1991, Ser. No. 794,149
Claims priority, application Japan, Apr. 17, 1991, 3-29987[U]
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 6 Claims
1. A heat sink/circuit board assembly, comprising a circuit board, heat-generating parts, sub-heat sinks, and a main heat sink, said circuit board being generally rectangular and having a generally planer main surface and a lateral mounting end, said sub-heat sinks each having a mounting surface and a heat receiving surface on which is mounted substantially entirely thereon a heat-generating part, said main heat sink having a recessed portion therein the opening of which is larger than an outer diameter of said circuit board, and a protruding portion extending into said recessed portion, each of said sub-heat sinks

serving to connect, at its mounting surface, said circuit board to said main heat sink such that each said sub-heat sink protrudes from said lateral end of said circuit board in a direction parallel to said main surface of said circuit board and is connected to said main heat sink at its protruding portion, and such that said circuit board can be mounted on said main heat sink with said planar main surface facing either toward or away from said recessed portion without compromising heat dissipation.

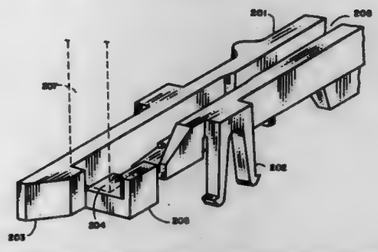


5,191,513
SECURING DEVICE
Haruyuki Sugiura, Kariya, and Katsumasa Takahashi, Nagoya, both of Japan, assignors to Kitagawa Industries Co., Ltd., Japan
Filed Dec. 5, 1991, Ser. No. 803,102
Claims priority, application Japan, Dec. 21, 1990, 2-405162
Int. Cl.[5] H05K 5/00
U.S. Cl. 361—399 20 Claims



1. A device for securing a first board, which defines a relatively large first aperture, to a second board, which defines a relatively small aperture, in a spatial relationship, comprising:
a resilient reverse retention member being dish-shaped and having a concave inner portion which is resilient in the curved direction, said resilient reverse retention member having a diameter larger than the diameter of said first aperture to facilitate engagement adjacent a periphery of said first aperture;
a first linkage member extending from a center of the concave inner portion of said resilient reverse retention member, said linkage member having a diameter smaller than the diameter of said first aperture to facilitate passage through said first aperture;
a first pair of opposed resilient legs extending in diagonal direction from said first linkage member towards said resilient reverse retention member, said legs being resiliently deformable to allow said legs to pass through said first aperture in said first board, and said first pair of resilient legs having first stepped portions for securing said first board by resiliently engaging the periphery of said first aperture in said first board once the resilient legs have passed therethrough; and
a support base connected to the first linkage member opposite of said resilient reverse retention member, said support base having means for securing said support base to said second aperture in a said second board; wherein
recesses are provided in said first linkage member along at lease two opposed sidewalls of said first linkage member, adjacent said resilient reverse retention member, to reduce internal stress in the securing device and prevent stress concentration at a point where the first linkage member extends from said resilient reverse retention member.

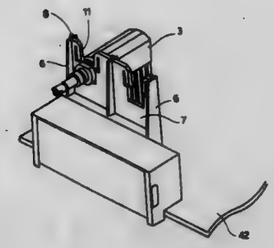
5,191,514
PRINTED CIRCUIT CARD GUIDE WITH LOCKING HOOK
Zbigniew Kabat, and Arcangel N. Capalong, both of Chicago, Ill., assignors to AG Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 9, 1991, Ser. No. 803,848
Int. Cl.[5] H05K 7/14
U.S. Cl. 361—415 5 Claims



1. A card guide for securing a printed circuit board, said card guide comprising:
a first slot arranged to receive said printed circuit board when said printed circuit board is initially inserted into said card guide;
a second slot arranged to receive said printed circuit board after said printed circuit board enters said first slot;
a locking means arranged to prevent said printed circuit board from any longitudinal movement once said printed circuit board is fully inserted into said second slot, lateral movement being required to move said locking means thereby allowing said longitudinal movement of said printed circuit board; and
a tab stop means arranged to limit said lateral movement of said locking means.

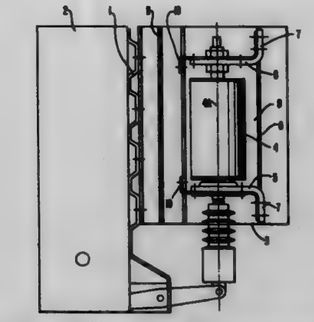
5,191,515
STRUCTURE WHICH FASTENS AN LCD HOLDER AND A VOLUME CONTROL UNIT
Masatoshi Hayamatsu, Saitama, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1991, Ser. No. 719,712
Claims priority, application Japan, Jun. 27, 1990, 2-67271[U]
Int. Cl.[5] H05K 7/02
U.S. Cl. 361—417 4 Claims

1. A structure which fastens an LCD holder and a volume control unit in a device with an LCD, comprising:
a baseplate provided within the device; and
a volume control unit having a terminal;
the LCD holder including a holding unit which accommodates a light emitting element therein for illuminating an LCD panel and which covers the back of the LCD panel, and a volume control unit fastening unit engaged with the volume control unit for fastening the volume control unit to the LCD holder, the holding unit and the volume control unit fastening unit being formed as a unit one above the other;
the LCD holder being fastened at the holding unit to the baseplate; and



the volume control unit being fastened to the volume control unit fastening unit of the LCD holder and, through the terminal, to the baseplate.

5,191,516
SWITCH SUPPORT
Erwin Reichl, Tergernheim, Fed. Rep. of Germany, assignor to Sachsenwerk Aktiengesellschaft, Regensburg, Fed. Rep. of Germany
Filed Mar. 22, 1991, Ser. No. 673,480
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1990, 4010843
Int. Cl.[5] H05K 7/02
U.S. Cl. 361—417 11 Claims

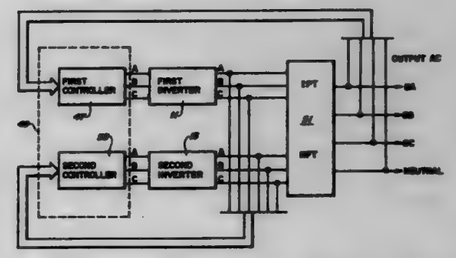


1. An arrangement for supporting a power switch on a wall of a switch drive housing, comprising:
a power switch having an axial direction and including connecting members for connection to external electrical conductors; and
a one-piece profiled strand of insulating material extending in the axial direction of said power switch with a generally unchanging cross section and including:
mounting means for mounting said strand to the wall of the switch drive housing;
a rear wall adjacent and parallel to, and spaced from the wall of the switch drive housing with the strand mounted on the wall of the switch drive housing;
opposing side walls connected to and oriented generally perpendicular to said rear wall;
a front wall parallel to said rear wall and connected to said side walls to define with said side walls and said rear wall a chamber for accommodating said switch, with the connecting members of said switch being brought out of said chamber through said front wall;
rear holding strips emanating from said side walls and including rear holding means for supporting said connecting members in a rear portion of said chamber;
front holding strips emanating from said front wall; and
front holding means disposed on said front holding strips for supporting said connecting members in a frontal portion of said chamber.

5,191,517
ELECTROSTATIC PARTICLE ACCELERATOR HAVING LINEAR AXIAL AND RADIAL FIELDS
Kenneth E. Stephenson, Newtown, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Aug. 17, 1990, Ser. No. 568,924
Int. Cl.[5] H02M 7/25
U.S. Cl. 363—59 7 Claims

1. An apparatus comprising:
a means for supplying a voltage signal; and
a Cockcroft-Walton voltage multiplier that multiplies the voltage signal and includes a bank of radially arranged capacitors, the capacitors having layers which are substantially tubular and comprise an outer capacitor and at least one inner capacitor, such that the inner capacitor is nested within and surrounded by the outer capacitor.

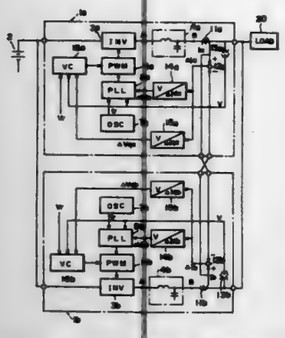
5,191,518
PLURAL INVERTER CONTROL ARRANGEMENT
Bradley J. Recker, 5281 Pepper Dr., Rockford, Ill. 61111, and Derrick Roe, 3385 Quiet Valley La., Rockford, Ill. 61109
Filed Aug. 15, 1991, Ser. No. 745,425
Int. Cl.[5] H02M 1/08, 1/12
U.S. Cl. 363—71 17 Claims



1. An inverter arrangement for converting DC to AC comprising:
first inverter means for inverting DC to AC, said first inverter means having an input for receiving DC and having first inverter output means for providing a first inverter output;
second inverter means for inverting DC to AC, said second inverter means having an input for receiving DC and having second inverter output means for providing a second inverter output;
AC output means for supplying said AC as a function of said first inverter output and said second inverter output, said AC output means having a first input connected to said

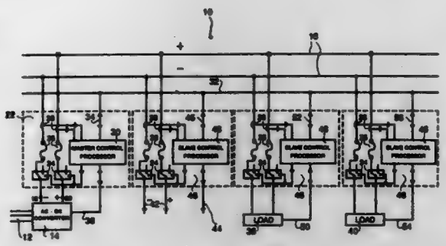
first inverter output means, a second input connected to said second inverter output means, and an AC output; and, controller means connected to said first inverter means and to said second inverter means for controlling said second inverter means so as to minimize DC content between said first inverter output and said second inverter output.

5,191,519
CURRENT SHARING CONTROL IN A PARALLEL INVERTER SYSTEM
Kazuto Kawakami, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 26, 1992, Ser. No. 858,064
Claims priority, application Japan, Mar. 27, 1991, 2-62318
Int. Cl.[5] H02M *7/48*
U.S. Cl. 363—71 **13 Claims**



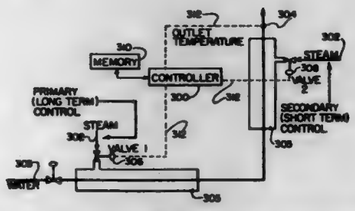
1. An inverter system including a plurality of inverters connected in parallel,
each of said plurality of inverters comprising:
current detection means for detecting an output current of a corresponding inverter;
voltage control means for generating a voltage control signal corresponding to a difference between a voltage reference and an actual voltage of said corresponding inverter;
frequency control means adapted for generating a frequency control signal corresponding to a difference between a frequency reference and an actual frequency of said corresponding inverter;
current difference formation means for forming a current difference signal relating to said corresponding inverter on the basis of a detected result of said current detection means;
d-q axis orthogonal coordinate transform means for transforming a current difference signal formed by said current difference detection means to a signal on the d-q axis orthogonal coordinate system, thus to form a first correction signal relating to the frequency of an output voltage of said corresponding inverter and a second correction signal relating to the amplitude of said output voltage thereof;
first correction means for correcting said frequency control signal by said first correction signal;
second correction means for correcting said voltage control signal by said second correction signal; and
means for controlling said corresponding inverter in accordance with outputs from said first correction means and said second correction means.

5,191,520
POWER SUPPLY SYSTEM
Gregory P. Eckersley, Melbourne, Australia, assignor to Boral Johns Perry Industries Pty. Ltd., Cheltenham, Australia
PCT No. PCT/AU90/00041, § 371 Date Sep. 18, 1991, § 102(e) Date Sep. 18, 1991, PCT Pub. No. WO90/09050, PCT Pub. Date Aug. 9, 1990
PCT Filed Feb. 6, 1990, Ser. No. 730,898
Claims priority, application Australia, Feb. 6, 1989, PJ2582; Apr. 18, 1989, PJ3751
Int. Cl.[5] H02J *13/00*
U.S. Cl. 363—72 **10 Claims**



1. A power supply system comprising:
a controllable converter suitable for connection to an input supply and being adapted to generate an output supply;
a plurality of loads each making a demand for power from the converter;
a plurality of load controllers each interposed between the said output supply and a load; and
a supply controller which can communicate with all of said load controllers and control the generation of the output supply, said supply controller receiving requests from each load controller in response to a demand by a respective load, authorizing the demand as a limit of power to be drawn by that load, and if the actual power drawn by that load as sensed by the respective load controller is greater than the said limit momentarily disconnecting the output supply to all the loads.

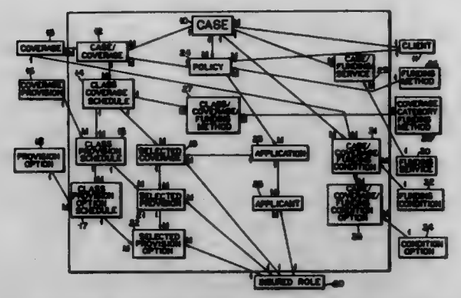
5,191,521
MODULAR MULTIVARIABLE CONTROL APPARATUS AND METHOD
Coleman B. Brosilow, Cleveland Heights, Ohio, assignor to ControlSoft, Inc., South Euclid, Ohio
Filed Jun. 18, 1990, Ser. No. 539,902
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—160 **18 Claims**



1. A method of controlling a process variable through at least two control efforts, comprising the steps of:
a) measuring a disturbance of the process variable from a desired value;
b) determining the dead time interval between the change of a control effort and a change in the process variable for each such control effort;

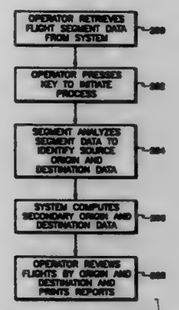
c) changing at least one such control effort to at least partly compensate for such disturbance in the short term;
d) changing at least one such control effort to at least partly compensate for such disturbance in the long term; and
e) returning such control efforts changed to compensate in the short term to their original values after such control efforts changed to compensate in the long term have compensated for such disturbance.

5,191,522
INTEGRATED GROUP INSURANCE INFORMATION PROCESSING AND REPORTING SYSTEM BASED UPON AN ENTERPRISE-WIDE DATA STRUCTURE
James J. Bosco, Newington; David H. Annis, Westogue, both of Conn., and Kathleen M. Prouty, Granville, Mass., assignors to ITT Corporation, New York, N.Y.
Filed Jan. 18, 1990, Ser. No. 467,843
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—401 **7 Claims**



1. An enterprise-wide integrated computer system for storing, processing and reporting information regarding a plurality of group insurance accounts comprising:
a central processing unit;
a memory;
means for storing data concerning each group insurance account in a single relational data base, the relational data base having a structure comprising a plurality of tables in third normal form, each table concerning a specific data subject and wherein the tables are grouped into a plurality of subject categories, each category corresponding to an operating objective of the enterprise on which data is collected;
means for managing the relational data base;
a plurality of applications workstation sub-systems including sales, underwriting administration and actuarial sub-systems;
the sales sub-system comprising means for processing sales data including means for communicating with the central processing unit, memory and data storage means and means for accessing defined subject categories on the single relational database and for capturing, modifying and processing data contained in tables of a defined subject category which are necessary for the sales sub-system functions;
the underwriting sub-system comprising means for processing underwriting data including means for communicating with the central processing unit, memory and data storage means and means for accessing defined subject categories on the single relational database and for capturing, modifying and processing data contained in tables of a defined subject category which are necessary for the underwriting sub-system functions;
the administration sub-system comprising means for processing administration data including means for communicating with the central processing unit, memory and data storage means and means for accessing defined subject categories on the single relational database and for capturing, modifying and processing data contained in tables of a defined subject category which are necessary for the administration sub-system functions;
the actuarial sub-system comprising means for processing actuarial data including means for communicating with the central processing unit, memory and data storage means and means for accessing defined subject categories on the single relational database and for capturing, modifying and processing data contained in tables of a defined subject category which are necessary for the actuarial sub-system functions;
means for controlling the access of an operator to each of the workstation sub-systems;
a plurality of workstations each workstation comprising means for inputting data, means for displaying data, and means for selecting, accessing and interacting with the memory means and each of the applications workstation sub-systems; and
a printing means.

5,191,523
SYSTEM FOR SYNTHESIZING TRAVEL COST INFORMATION
Michael D. Whitenack, Laurel, Md., assignor to Prism Group, Inc., Laurel, Md.
Filed Nov. 6, 1989, Ser. No. 431,780
Int. Cl.[5] G06F *15/00, 15/22*
U.S. Cl. 364—407 **56 Claims**



1. A system for after-ticket purchase determination of true origin-to-destination travel data inferred from travel segment data stored in a computer-based travel reservation database system, comprising:
(a) means for accessing the computer-based travel reservation database after purchase of a ticket;
(b) means for selectively retrieving via said accessing means travel segment data from said computer-based travel reservation database system;
(c) a machine-readable program instruction set;
(d) a programmable computer in communication with said travel reservation database, responsive to an input origin-to-destination inquiry, including:
(i) a processor operating according to said program instruction set;
(iii) means for producing a unique origin-to-destination data block representing a plurality of said data segments including means for processing each identified travel segment data set to produce a true origin-to-destination data block under the control of said program instruction set;
(iii) means for producing a unique name and assigning said unique origin-to-destination data block therewith under the control of said program instruction set, wherein said true origin-to-destination data block includes a group of characters in human readable form;

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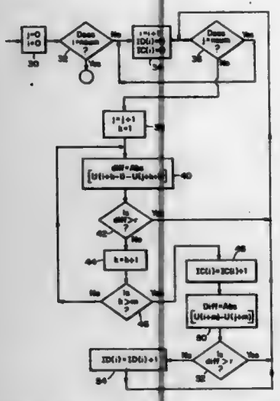
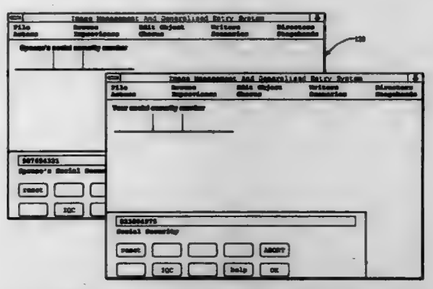
(e) terminal means for inputting selected raw origin-to-destination travel data into said processor; and
(f) means for outputting from said processor a group of characters forming information in human readable form.

5,191,524
APPROXIMATE ENTROPY
Steven M. Pincus, 990 Moose Hill Rd., Guilford, Conn. 06437, and Robert A. Neidorff, 39 Stowell Rd., Bedford, N.H. 03102
Filed Sep. 8, 1989, Ser. No. 404,737
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.05 22 Claims



1. A method for processing a set of medical data with a data processing system to determine a relative amount of patterness of the set of medical data comprising the steps of:
converting measurements of a medical parameter into a set of medical data having values representative of the measured medical parameter;
storing the set of medical data in the memory of a data processing system,
operating on the stored set of medical data with a processor of the data processing system, comprising the operating steps of:
a) defining a class of contiguous runs of prescribed length of the set of medical data;
b) comparing each element of this class to a plurality of elements of this class to determine regularity and stability of similar patterns among the elements of this class, wherein contribution of noise to determination of regularity and stability is minimized;
c) assigning and the stability of similar patterns among the elements of this class of medical data as determined by said comparing step;
d) providing an output signal indicative of a relative amount of patterness of the set of medical data based on an aggregate of the assigned quantitative values;
e) comparing the output signal to a predetermined value of patterness to produce a comparison result; and
performing a corrective medical procedure dependent on the comparison result.

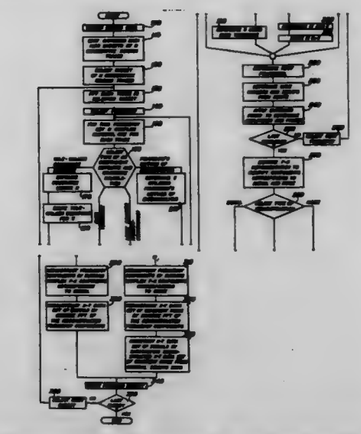
5,191,525
SYSTEM AND METHOD FOR EXTRACTION OF DATA FROM DOCUMENTS FOR SUBSEQUENT PROCESSING
Thomas Q. LeBrun, Dallas; Kerry Cage, and Dennis D. Arnold, both of Carrollton, all of Tex., assignors to Digital Image Systems, Corporation, Carrollton, Tex.
Filed Jan. 16, 1990, Ser. No. 465,411
Int. Cl.[5] G06K *9/00*
U.S. Cl. 364—419 92 Claims



1. A method of electronically processing data from one or more documents to facilitate user interaction with the data, comprising:
a) generating a plurality of first output signals representing electronic images of said documents, said output signals being generated by feeding a series of documents associated together as a transaction sequentially through an optical scanning device whereby transaction integrity is maintained;
b) generating an electric signal at the beginning and end of the transaction for separating the images of one transaction from those of another;
c) identifying at least one of the documents by reference to identification areas or identification words found on the documents, the identification occurring by reference to geographical location or pel pattern techniques;
d) extracting data fields from at least one of the documents by generating a plurality of second output signals representing said data fields;
e) storing said first and second output signals for subsequent processing; and
f) managing the processing of transactions to support adjudication processes and customer inquiries.

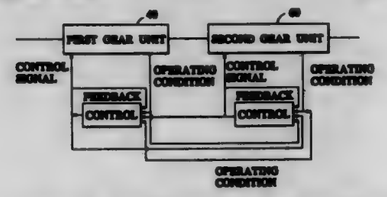
5,191,526
METHOD FOR REMOVING COHERENT NOISE FROM SEISMIC DATA
Stanley J. Laster, Dallas; Robert A. Meek, Sanger, and Thomas E. Shirley, Richardson, all of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.
Continuation-in-part of Ser. No. 220,186, Jul. 18, 1988, abandoned. This application Mar. 12, 1990, Ser. No. 491,885
Int. Cl.[5] G01V *1/00*
U.S. Cl. 364—421 37 Claims

1. A method of seismic exploration comprising the steps of:
a) positioning at least one seismic source and a plurality of geophones at spaced-apart positions along a line of exploration on the surface of the earth,
b) activating said seismic sources to generate seismic waves which travel downwardly in the earth and are reflected upward from subsurface reflecting interfaces as seismic reflection signals,
c) receiving said seismic signals at said geophones on the surface of the earth,
d) recording amplitudes of said seismic signals received by said geophones to produce a first array of seismic traces, said first array of seismic traces being comprised of said seismic signals and coherent noise,
e) selecting a plurality of said seismic traces corresponding to said small group of said geophones;
f) producing an f-k representation of seismic signals for said seismic traces;
g) identifying components of said produced f-k representation;
h) reconstructing frequency components of said seismic signals from said seismic signal components of said produced f-k representation;



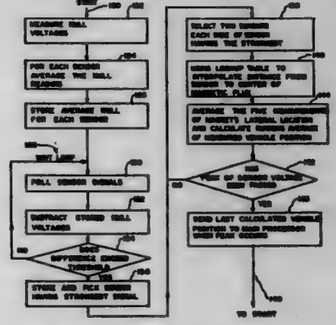
i) reconstructing said seismic signals from said frequency components;
j) reconstructing frequency components of said coherent noise from said coherent noise components of said produced f-k representation;
k) reconstructing said coherent noise from said frequency components,
l) removing said coherent noise by subtracting said reconstructed coherent noise from said series of seismic traces, and
m) producing a second array of seismic traces having said coherent noise removed from said seismic traces.

5,191,527
METHOD OF CONTROLLING AUTOMATIC TRANSMISSION WITH CROSS REFERENCE TO TANDEM GEAR UNITS IN SPEED STAGE SHIFTING
Norimi Asahara, Toyota; Yasuo Hojo, and Hideo Tsumomaru, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Dec. 4, 1990, Ser. No. 621,975
Claims priority, application Japan, Dec. 6, 1989, 1-317004
Int. Cl.[5] B60K *41/06*
U.S. Cl. 364—424.1 19 Claims



1. A method of controlling an automatic transmission in a vehicle having a tandem connection of a first gear unit and a second gear unit, each gear unit including an assembly of gear wheels and friction engaging means so that a specified gear ratio is established in each gear unit by selective engagement and disengagement of the friction engaging means, the method comprising the steps of:
(a) determining a rotational speed of a first friction engaging means in the first gear unit and a rotational speed of a third friction engaging means in the second gear unit;
(b) identifying a predetermined target rotational speed for each of the first and third friction engaging means;
(c) calculating a difference between the target rotational speed and the rotational speed for each of the first and third friction engaging means;
(d) calculating a cycle difference from the differences between the target and rotational speeds at two successive cycles for each of the first and third friction engaging means;
(e) multiplying the difference by a first factor and the cycle difference by a second factor to obtain first and second interim values for the first and third friction engaging means;
(f) subtracting a correction value from the interim values to obtain a control deviation for each first and third friction engaging means, said correction value providing delay compensation for engagement/disengagement of the friction engaging means to include elements wherein engaging/disengagement of the first friction engaging means of the first gear unit is controlled in reference to engagement/disengagement of a second friction engaging means of the first gear unit in setting up a certain gear stage in the first gear unit and also in reference to engagement/disengagement of a fourth friction engaging means in setting up a certain gear stage in the second gear unit;
(g) converting each control deviation to a control amount for controlling a rate of changeover of the second friction engaging means of the first gear unit and the fourth friction engaging means of the second gear unit from a first gear stage to the certain gear stage respectively, wherein the steps are cyclicly repeated at a predetermined time interval.—

5,191,528
UPDATE MARKER SYSTEM FOR NAVIAGTION OF AN AUTOMATIC GUIDED VEHICLE
James V. Yardley, Centerville; Gary L. Whatcott, Holladay, and Bryan A. Bloomfield, Bountiful, all of Utah, assignors to Eaton-Kenway, Inc., Salt Lake City, Utah
Continuation-in-part of Ser. No. 545,174, Jun. 28, 1990, abandoned. This application Oct. 24, 1990, Ser. No. 602,609
Int. Cl.[5] G05D *1/03*; G06F *15/50*
U.S. Cl. 364—424.02 15 Claims



8. Apparatus for ascertaining an estimated lateral position of an automatically guided vehicle at a predetermined area on a route of the vehicle with improved accuracy, said apparatus comprising:
(a) a stationary magnet mounted on the route to provide a sensible unipolar magnetic field that diminishes with increasing distance from the center of said field;
(b) means for pre-storing a predetermined pattern of magnetic field strength as a function of distance from the center of the magnetic field;
(c) sensor means comprising an array of magnetic-field sen-

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sors transversely disposed to direction of vehicle travel and means for calibrating said sensors as the vehicle travels between sensible magnetic fields, each sensor in combination with said calibrating means producing a search variable calibrated to precisely represent magnetic field strength;

(d) correlation means for receiving and for processing said search variables, including means for computing an estimated lateral position of said magnet relative to said vehicle based upon interpolation involving said search variables and said stored predetermined pattern.

5,191,529

TRIP RECORDER OPERATION AND MEMORY RETENTION EXTENSION THROUGH MULTIPLE BATTERY BACKUP AND A LOAD SHEDDING STRATEGY TRIGGERED BY A PRIMARY POWER INTERRUPTION

Rene V. Ramsey, Sterling Heights, and Paul E. Janos, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1990, Ser. No. 591,163
Int. Cl.[5] H02J 9/06
U.S. Cl. 364—424.04 10 Claims

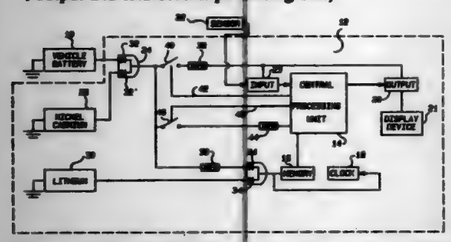
1. A power backup system for providing backup power which provides power to selected portions of a trip recorder having a microcontroller with subsystems capable of independent operation with separate power application including input/output, memory and a central processing unit, said power backup being provided according to a load shedding strategy which seeks to maximize duration of operation and data retention in the event of interruption of primary power supply comprising:

a first power storage device;

a second power storage device;

said primary power supply and said first power storage device are each input to a first OR gate;

said first OR gate having an output connected to said input/output and said central processing unit;



an output of said first OR gate and said second power storage device are each input to a second OR gate;

said second OR gate having an output connected to said memory;

said first OR gate providing power from either said primary power supply or said first power storage device whichever offers the greatest voltage;

said second OR gate providing power from either said first or said second power storage device whichever offers the greatest voltage; and

said first and second OR gate comprising a diode in series with each of said primary power supply, and said first and said second power storage devices.

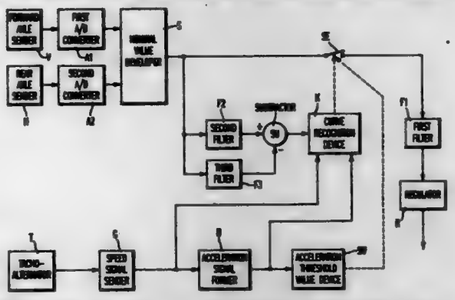
5,191,530

METHOD AND APPARATUS TO REGULATE ILLUMINATION RANGE OF A MOTOR VEHICLE

Micha Hansmann, Lippstadt, and Joachim Hufnagel, Menden, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Jul. 30, 1991, Ser. No. 737,725
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1990, 4024913
Int. Cl.[5] B60Q 1/08
U.S. Cl. 364—424.05 8 Claims

1. In a method of regulating an illumination range of a motor vehicle of a type comprising the steps of developing front-axle and rear-axle signals which respectively depend upon a relative position of a motor-vehicle body to a front axle and a rear axle of the motor vehicle, forming a resulting difference signal indicative of a difference between the front-axle signal and the rear axle signal, filtering and resulting difference signal, as a nominal-value signal, to form a first average value as a function of time, wherein said time for development of the first, average, nominal, value is determined by a first filter time constant, and regulating positions of lamp adjusting elements when the first, filtered average nominal-value deviates from a predetermined value, wherein the improvement: simultaneously with said formation of the first average value, filtering the resulting



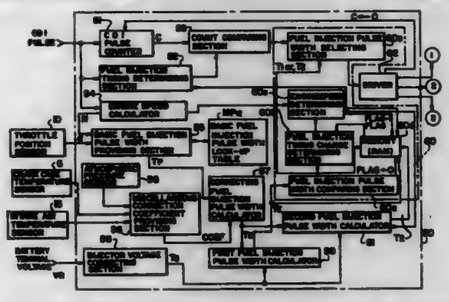
difference signal to form a second average value of the nominal-value signal with a filter having a second filter time constant and filtering the resulting difference signal to form a third average value of the nominal-value signal with a third filter time constant; comparing and thusly produced second nominal average-value signal with the thusly produced third average-value signal, and, upon the presence of a difference between the second average-value signal and the third average-value signal, interrupting use of the first average value formation for regulating positions of said lamp adjusting elements and, upon a termination of said difference, reinstating use thereof for regulating positions of said lamp adjusting elements.

5,191,531

FUEL INJECTION CONTROL SYSTEM FOR A TWO-CYCLE ENGINE

Shiaichi Kurosu, Saitama; Mitsugi Chonan, Iberagi; Fuzuo Tachibana, Saitama; Hideyuki Ishikawa, Saitama; Kazuo Suzuki, Saitama, and Yoshiki Yazuriba, Gunma, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo; Japan Electronic Control Systems, Gunma, both of, Japan and Polaris Industries L.P., Minneapolis, Minn.

Filed Oct. 25, 1990, Ser. No. 602,959
Int. Cl.[5] F02D 41/34
U.S. Cl. 364—431.05 9 Claims



1. A fuel injection control system for a two-cycle engine having a fuel injector and an electronic control unit for controlling operation of the engine, comprising:

detector means for detecting engine operating conditions including speed of the engine;

first pulse width calculating means for calculating a first fuel injection pulse width based on said engine operating conditions detected by said detector means, said first fuel injection pulse width corresponding to amount of fuel necessary for one combustion stroke of the engine;

second pulse width calculating means for calculating a second fuel injection pulse width based on said engine operating conditions detected by said detector means, said second fuel injection pulse width corresponding to an amount of fuel necessary for two combustion strokes of the engine;

comparator means for comparing said first fuel injection pulse width calculated by said first calculating means with a minimum value controllable by said fuel injector;

selecting means for selecting said first fuel injection pulse width when said first fuel injection pulse width is larger than said minimum value, and for selecting said second fuel injection pulse width when said first fuel injection pulse width is smaller than said minimum value; and

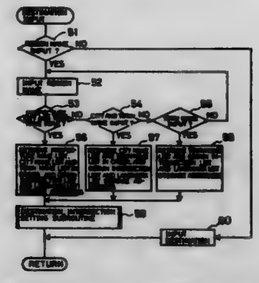
driving means for driving said fuel injector at an injection pulse width selected by said selecting means.

5,191,532

NAVIGATION APPARATUS

Shuzo Moroto, and Takashi Yamada, both of Anjo, Japan, assignors to Aisin AW Co., Ltd. and Kabushiki Kaisha Shinsangyokaihatsu, both of, Japan

Continuation of Ser. No. 630,785, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 392,930, Aug. 1, 1989, abandoned. This application Oct. 9, 1991, Ser. No. 772,121
Claims priority, application Japan, Dec. 5, 1987, 2-307805
Int. Cl.[5] G06F 15/50
U.S. Cl. 364—449 6 Claims



1. A navigation apparatus for providing course guidance for travel to a destination comprising:

memory means for storing geographical data, said geographical data being in a hierarchical structure including region data pertaining to geographical regions and point data indicative of a plurality of geographical points located within said regions;

region input means for selecting one of said regions;

destination setting means for selecting one of said geographical points within the selected region as a set destination;

present position input means for designating one of said geographical points as the present position;

course search means for providing guidance information for travel to the set destination from said present position; and

display means for displaying said guidance information.

5,191,533

FRANKING MACHINE

Werner Haug, Langnau, Switzerland, assignor to Frama AG, Lampertswil, Switzerland

Filed Mar. 7, 1990, Ser. No. 490,040
Claims priority, application Switzerland, Mar. 8, 1989, 00853/89
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] G07B 17/02
U.S. Cl. 364—464.03 3 Claims

1. A franking machine comprising:

a printing head fixed to a machine mainshaft;

a drive for said machine mainshaft in order to rotate said printing head for at least one printing cycle;

typewheels mounted in rotary manner in said printing head for printing a franking value;

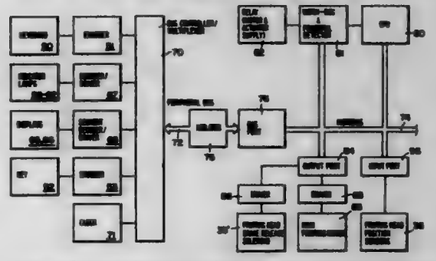
an electromechanical drive including control members for each of said typewheels for setting a desired franking value;

mechanical locking means for securing the set positions of said control members of said electromechanical drive;

a central electronic control unit including a memory in which is stored a postal rate table, and a program memory for automatically controlling said electromechanical drive;

sensors for supplying position signals of said locking means to said central electronic control unit for the control of said electromechanical drive;

a control console comprising a keyboard for the random inputting of instructions to said control unit for setting said typewheels of said printing head, at least one display panel for the display of the inputted instructions, and entry



means for entering the weight of an article to be franked; and

a computer for calculating the franking value on the basis of the weight entry, said program memory automatically controlling the timing and operating functions of said electromechanical drive on the basis of the calculated franking value; and wherein:

said entry means for entering the weight comprises a special key for the choice of a weight entry program, so that said keyboard defines an entry means for the weight; and

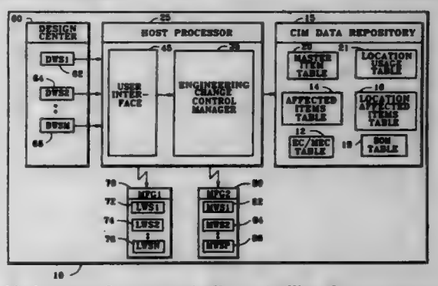
the number of keys necessary for entering the weight corresponds to the number of decimal places of a maximum amount to be entered.

5,191,534

ENGINEERING AND MANUFACTURING CHANGE CONTROL MECHANISM

William M. Orr, Cary, N.C.; Badari N. Panaganti, Mableton, Ga.; James L. Ryan, Smyrna, Ga.; George J. Sambataro, Marietta, Ga., and James R. Wason, Tucker, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1990, Ser. No. 571,394
Int. Cl.[5] G06F 15/46
U.S. Cl. 364—468 14 Claims



14. A system for automatically controlling the management

of engineering changes to a product manufactured by an enterprise having at least one data processor and at least one direct access storage device at a central processing facility, a first plurality of workstations located at a design center, and a second plurality of workstations located at a manufacturing location, said first and second pluralities of workstations connected electrically to said data processor, said system comprising:

interface means operating on the data processor and cooperative with each of said first and second pluralities of workstations for initiating changes in the status of an engineering change and each affected item and each corresponding location affected item that are associated with said engineering change;

a data repository stored on the direct access storage device including at least an engineering change objects table, an affected items table and a location affected items table with said engineering change objects table, affected item table and location affected item table being used to track and update the status of an engineering change and each associated affected item and corresponding location affected item; and

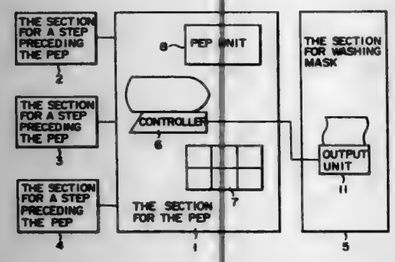
logic means cooperative with said interface means and said data repository for automatically tracking and updating the status of the engineering change and each associated affected item and corresponding location affected item in response to changes in status initiated at said first and second pluralities of workstations.

5,191,535

MASK CONTROL SYSTEM

Haruo Terao, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1990, Ser. No. 621,813
Claims priority, application Japan, Dec. 5, 1989, 1-314191
Int. Cl.[5] G06F *15/46*; G05B *13/02*
U.S. Cl. 364—468 **14 Claims**



1. A mask control system for a semiconductor production photo engraving process (PEP step) comprising:

a controller including lot selecting means for selecting a wafer lot from wafer lots to-be-withdrawn from a step preceding the PEP step, and wafer lots to-be-processed in the PEP step, and a searching means for searching a mask corresponding to the wafer lot selected by said selecting means; and

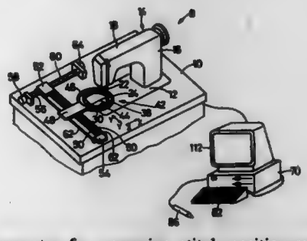
an output unit for causing said controller to detect locations of masks corresponding to selected lots, and for designating a washing order for said masks detected by said controller when said masks are in a washing step.

5,191,536

EMBROIDERY DATA PREPARING APPARATUS

Kyoji Komuro; Masaaki Yokoe, both of Nagoya; Narihiro Matsushita, Kasugai; Kiyokazu Sekine, Mie; Atsuya Hayakawa, Nagoya; Fumiaki Asano, Nagoya, and Hideaki Shimizu, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 23, 1990, Ser. No. 601,469
Claims priority, application Japan, Oct. 26, 1989, 1-279381
Int. Cl.[5] G06F *15/46*; D05B *21/00*
U.S. Cl. 364—470 **20 Claims**



1. An apparatus for preparing stitch position-related data and utilizing the data for controlling an embroidery sewing machine for embroidering a predetermined area by forming stitches at respective stitch positions and thereby filling the area with the formed stitches, comprising:

dividing means for dividing said area into a plurality of sub-areas based on outline data representative of an outline of said area, said outline data including sets of position data each of which is representative of a corresponding one of a plurality of specific positions specified on said outline;

data producing means for producing sets of sub-area data each of which is representative of an outline of a corresponding one of said sub-areas and determining, based on said sets of sub-area data, an order of embroidering of said sub-areas such that, when said embroidery sewing machine forms stitches with a continuous thread and fills each of said sub-areas by the formed stitches, by utilizing said sets of sub-area data and said order of embroidering of said sub-areas, said continuous thread does not pass over the stitches filling said each sub-area, said data producing means using said sets of sub-area data and said order of embroidering of said sub-areas for producing said stitch position-related data; and

data utilization means for using said stitch position-related data to form said stitches.

5,191,537

SYSTEM AND METHOD FOR CONTROLLING CONTINUOUS MIXER WITH MELT PUMP

James M. Edge, Channahon, Ill., assignor to Quantum Chemical Corporation, New York, N.Y.

Filed Mar. 29, 1989, Ser. No. 330,507
Int. Cl.[5] G06F *15/46*; B28C *7/16*
U.S. Cl. 364—473 **5 Claims**

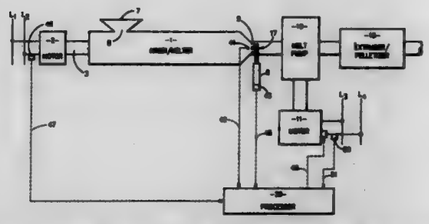
1. In the continuous in-line operation of a mixer/melter having an adjustable size exit opening for feeding a thermoplastic resin melt directly and positively to a melt pump which pumps the melt through an extruder/pelletizer for pelletization, to reduce pressure surges and obtain more uniformly sized pellets, the improvement which comprises:

generating a first input signal representing the amount of energy used by the mixer/melter to feed the thermoplastic resin therethrough;

generating a second input signal representing the amount of energy used to adjust the size of the adjustable exit opening;

generating a third input signal representing the pressure of the resin melt at the interface between the mixer/melter and the melt pump;

transmitting the first, second, and third input signals to a processor;



the processor processing the first, second, and third input signals to determine a desired energy level for the melt pump; and

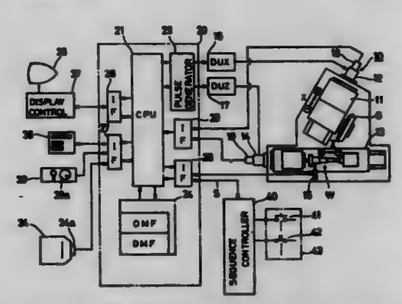
the processor generating an output signal and transmitting the output signal to the melt pump to adjust the energy used by the melt pump to said desired level.

5,191,538

APPARATUS FOR DISPLAYING OPERATION SEQUENCE OF NUMERICALLY CONTROLLED MACHINE TOOL

Takao Yoneda, Nagoya; Naoki Arimoto, Takahama, and Takayuki Hotta, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 3, 1990, Ser. No. 562,630
Claims priority, application Japan, Aug. 31, 1989, 1-226264
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.16 **4 Claims**



1. An apparatus for displaying an operation sequence of a machine tool which is controlled by a numerical controller in accordance with a numerical control program, said apparatus comprising:

operation memory means for memorizing data indicating successive operations;

numerical command memory means for memorizing data indicating successive numerical commands;

first memory control means for storing into said operation memory means data indicating successive operations instructed by an operator through command switches;

second memory control means for storing into said numerical command memory means data indicating successive numerical commands, which are commanded by a manual operation or by the numerical control program during the successive operations;

stopping means for stopping the operations of said first memory control means and said second memory control means when a malfunction occurs, and

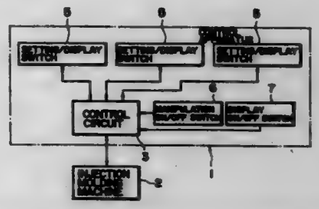
display control means for displaying on a display device information indicating the successive operations together with the executed successive numerical commands based upon the data stored in said operation memory means and said numerical command memory means.

5,191,539

CONTROL APPARATUS FOR AN INJECTION MOLDING MACHINE

Susumu Harada; Hideo Tanaka; Kiyoshi Sasaki, and Tsuginobu Totani, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 548,689
Claims priority, application Japan, Jul. 6, 1989, 1-176354
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—476 **10 Claims**



1. Setting unit in a control apparatus for an injection molding machine having a unit for setting numerical value data corresponding to a molding operation of the injection molding machine and for controlling the molding operation of the machine in accordance with a setting of the setting unit, said setting unit comprising:

a register for storing the numerical value data;

input/output control means for inputting numerical value data to the register and for outputting numerical value data stored in the register, said inputting and outputting being responsive to an external command;

numerical value manipulating means for incrementing the numerical value data stored in said register and for decrementing the numerical value stored in said register, said incrementing and decrementing being responsive to a manual operation;

a numerical value display for displaying the numerical value data stored in said register; and

place position shifting means for automatically shifting set places in said numerical value display and for shifting set places in said numerical value manipulating means responsive to a number of places of an integer part of the numerical value data.

5,191,540

SHEETS PROCESSING APPARATUS INCLUDING MEMORY MEANS REMOVABLY CONNECTED THERETO

James S. Ramsey, Shelton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 5, 1990, Ser. No. 577,728
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—478 **27 Claims**

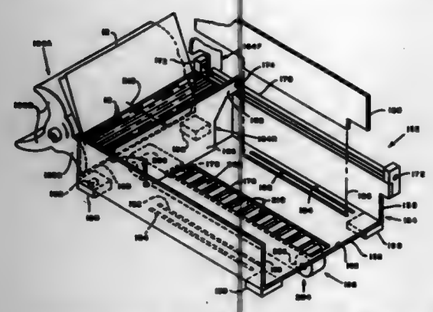
1. Apparatus for processing an elongate web of sheets offline from an inserter for subsequent processing thereby, wherein the web includes a marginal edge portion bordering each sheet, each marginal edge portion includes a code marked thereon, and said code includes data identifying the bordered sheet, the apparatus comprising:

a) means for successively sensing said codes;

b) means for successively separating said sheets from said web; and

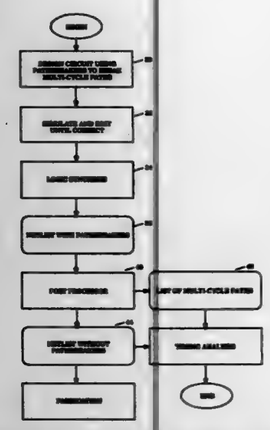
c) means for stacking separated sheets in a predetermined order for subsequent processing by an inserter, the stack-

ing means including memory means removably connectable thereto for storing said successive codes in said pre-



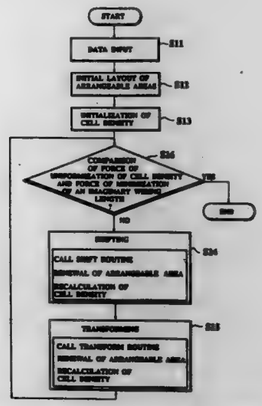
determined order for subsequent downloading to the inserter.

5,191,541
METHOD AND APPARATUS TO IMPROVE STATIC PATH ANALYSIS OF DIGITAL CIRCUITS
Howard Landman, San Jose; Tim Bucher, Newark, and Ser-hou Kuang, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.
Filed May 14, 1990, Ser. No. 523,015
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—489 14 Claims



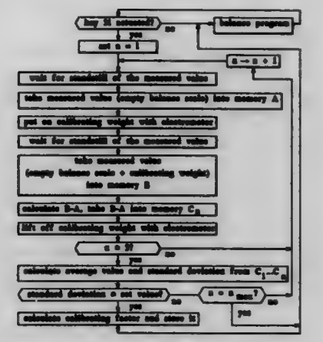
1. An improved method for conducting a static path analysis on an integrated circuit, said circuit including a plurality of circuit elements, comprising the steps of:
detecting multi-cycle paths between said circuit elements, said multi-cycle paths being combinations of said circuit elements in which a signal passing through said combination exceed a predetermined time period;
inserting path breaker circuit means between circuit elements of said circuit comprising said multi-cycle paths to break said multi-cycle paths into single cycle segments;
conducting a static path analysis on said circuit using static path analysis means wherein said path breaker circuit means appear to said static path analysis means as a latch;
wherein said path breaker circuit means comprises:
latch means coupled to an input D for latching a first digital signal applied to said input D upon the receipt of a clock signal;
comparator means coupled to said input D and to an output of said latch means, for comparing the current state of said a signal applied to said input D with the state of said first digital signal stored in said latch means, said comparator means providing a selector signal to a multiplexor if said signal applied to said input D is of the same state as the state of said signal stored in said latch means;
said multiplexor, upon the receipt of said selector signal, coupling the output of said latch means to an output Q of said path breaker circuit means; said multiplexor prior to the receipt of said selector signal coupling an unknown digital value (X) to said output Q.

5,191,542
AUTOMATIC FLOORPLAN OPERATION APPARATUS
Masako Murofushi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 15, 1990, Ser. No. 523,525
Claims priority, application Japan, Jun. 23, 1989, 1-159771
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—491 6 Claims



1. A method of automatic floorplan operation for generating a suitable layout of cells, comprising:
inputting a plurality of cell groups having a logical hierarchy structure, each cell group of said cell groups including a plurality of cells arrangeable on a plurality of cell arrangeable areas permitting overlapped areas and independent areas;
determining estimated distributions of said cell groups in said overlapped areas and said independent areas in said cell arrangeable areas;
operating on cell densities of said cell groups whose estimated distributions in said overlapped areas and said independent areas are determined at said determining step;
evaluating respective degrees of uniformity of cell density in said overlapped areas and said independent areas obtained by said operating step;
repeatedly correcting areas and positions of said cell arrangeable areas when said uniformity of cell density is estimated to be insufficient by said evaluating step; and
outputting a layout of cells when said uniformity of cell density is estimated to be sufficient by said evaluating step.

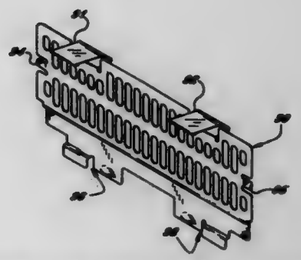
5,191,543
ELECTRONIC BALANCE WITH CALIBRATING DEVICE
Dieter Berthel, Göttingen, and Franz-Josef Melcher, Hardegsen, both of Fed. Rep. of Germany, assignors to Sartorius AG, Göttingen, Fed. Rep. of Germany
Filed Oct. 19, 1990, Ser. No. 599,838
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1989, 3935118
Int. Cl.[5] G01G *19/52*
U.S. Cl. 364—567 4 Claims



1. An electronic balance comprising
a measured value receiver,
a digital signal processing unit,
a display unit and
a calibrating device controlled by the digital signal processing unit for placing on and lifting off a calibrating weight by means of a motor,
the digital signal processing unit that
allows continuously the placing on and lifting off again of the calibrating weight and
calculates a calculated average value and a calculated standard deviation from individual measured values,
compares the calculated standard deviation continuously with a set value stored in the digital signal processing unit and
stops the placing on and lifting off of the calibrating weight and calculates a calibrating factor from the calculated average value and stores the factor when the calculated standard deviation is smaller than the set value and
the digital signal processing unit also stops the placing on and lifting off of the calibrating weight after a set maximum time if the calculated standard deviation is not smaller than the set value and does not store a new calibrating factor in this instance.

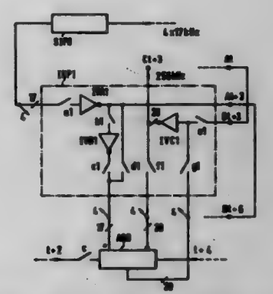
5,191,544
PERSONAL COMPUTER ENCLOSURE WITH SHIELDING
Jeffrey W. Beuck, Delray Beach; James W. Deiso, Boca Raton; Jose E. Richards, Deerfield Beach, and Brian A. Trumbo, Boynton Beach, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Jun. 15, 1990, Ser. No. 538,438
Int. Cl.[5] G06F *1/00*; H05K *9/00*
U.S. Cl. 364—708 16 Claims

1. A microcomputer comprising:
a chassis for mounting a planar board and having a base, a front panel and a rear panel,
a cover for engaging said chassis and forming with said chassis an enclosed, shielded volume for containing components of the microcomputer,
said front panel defining at least one bay for receiving a data storage device, and



a manually removable shield member mounted in said bay for attenuating the emission of electromagnetic radiation therethrough.

5,191,545
INTERPOLATOR INCREASING THE OUTPUT WORD RATE OF A DIGITAL SIGNAL
Jeannes M. J. Sevenhans, Brasschaat, and Lajos Kiss, Wilrijk, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands
Filed Sep. 13, 1991, Ser. No. 759,449
Claims priority, application European Pat. Off., Sep. 18, 1990, 90870153.5
Int. Cl.[5] H04J *3/22*
U.S. Cl. 364—723 13 Claims



1. Interpolator for increasing the output word rate of a digital signal by interleaving words between successive input words . . . , Si, Si+1, . . . the values of the interleaved output words depending on the difference between successive input words, characterized in that the successive input words . . . , Si, Si+1, . . . feed a memory (INP) to store two consecutively applied input words Si (IVB) and Si+1 (IVA) as well as multiplier means producing successively the words . . . , Si, nSi+1, . . . (IVC) where n is the multiplication factor, and the interpolator further includes an adder/subtractor (ADD) repeatedly operated N times during the period of time each pair of words Si and Si+1 is stored to feed the output words into an accumulator (IVC) initially storing nSi provided by the multiplier means, the adder/subtractor inputs being fed by the output word in the acumulator and by words which are such predetermined functions of Si and Si+1 in the memory that after the N repeated operations nSi+1 is fed into the accumulator by the adder/subtractor.

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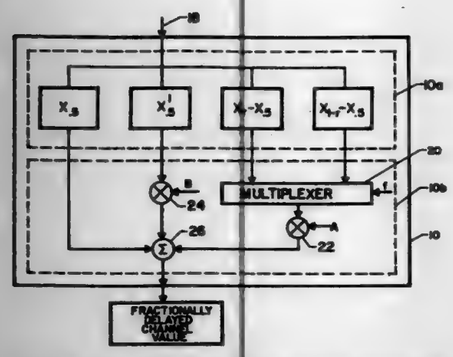
5,191,546
TIME-INTERPOLATION METHOD FOR DIGITAL BEAMFORMERS

John Green, Lisbon, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1991, Ser. No. 643,257
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—723 5 Claims



1. In a time-sampled, acoustic beam forming system including a plurality of spatially separated receiving elements forming a plurality of input channels, each input channel having a known time delay associated with each beam, each time delay consisting of 1) a known integer delay and 2) a known fractional delay, a method of generating an input channel value at the known fractional delay using a two-stage fractional delay beam processor comprising the steps of:

generating, at a first stage of the two-stage processor, a first value of the signal of each of said plurality of input channels at a fractional delay of 0.5, said first value being common to all acoustic beams;

generating, at the first stage, a rate of change based on said first value;

generating, at the first stage, a second value of the signal of each of said plurality of the input channels at a fractional delay of approximately 0.06, said second value being common to all said acoustic beams, and further calculating a difference between said first and second values;

generating, at the first stage, a third value of the signal of each of said plurality of input channels at a fractional delay of approximately 0.94, said third value being common to all said acoustic beams, and further calculating a difference between said first and third values;

comparing, at a multiplexer in a second stage of the two stage processor, said first and second value difference with said first and third value difference for each of said acoustic beams wherein said first and second value difference is selected to pass through the multiplexer when the known fractional delay is less than or equal to 0.5 and wherein said first and third value difference is selected to pass through the multiplexer when the known fraction delay is greater than 0.5;

weighting, at a first multiplier in the second stage said rate of change for each of said acoustic beams based upon the known fractional delay;

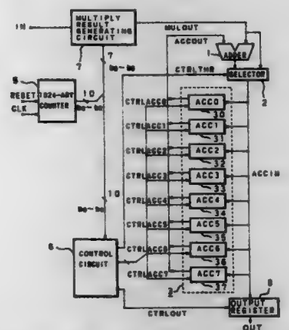
weighting, at a second multiplier in the second stage, said selected value difference for each of said acoustic beams based upon the known fractional delay; and

summing, at a summer in the second stage, said first value, said weighted rate of change and said weighted value difference to form each input channel value.

5,191,547
DECIMATING DIGITAL FINITE IMPULSE RESPONSE FILTER

Koji Kawamoto; Toru Kengaku; Eiichi Teraoka, all of Itami; Tetsuaki Oga, and Hiroichi Ishida, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1990, Ser. No. 564,808
Claims priority, application Japan, Aug. 18, 1989, 1-213599
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.1 6 Claims



1. A decimating filter, wherein input signal samples are received at a rate of N number of samples over a predetermined time period, and M number of filter samples are generated in the predetermined time period, wherein each of the M filter samples is a sum of N number of products, each of the products resulting from a multiplication of one of N number of consecutive input signal samples and a corresponding filter coefficient selected from a sequence of N number of filter coefficients, N being a multiple of M greater than M and M being at least two, the decimating filter comprising:

M number of accumulators;

means for resetting each of said M accumulators;

a memory for holding the N filter coefficients at each of N number of memory locations, wherein said memory outputs a filter coefficient at a memory location corresponding to an index value when said index value is applied to an address input of said memory, said index value being characterized as a whole number from zero to N minus one inclusive;

means for receiving an input sample;

a counter, coupled to said means for receiving an input sample, said counter incrementing a count for each input sample input and said counter resetting said count to zero when said count equals N times M;

multiplying means, coupled to said memory and said counter, for calculating M number of products for each input signal sample, wherein each of said M products is a product of said input signal sample and a filter coefficient, said filter coefficient located at a memory location indicated by an index value determined by said count;

adding means, coupled to said multiplying means and said M accumulators, for adding said M products to contents of said M accumulators, wherein one product is added to each accumulator and each product is added to one accumulator;

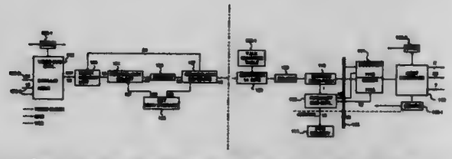
output means, coupled to said adding means, for outputting contents of a selected one sum of said M sums of N products as a filter sample; and

control means, coupled to said means for resetting and coupled to said output means, for triggering said output means to output said selected sum, wherein a sum is selected when said sum is a sum of N products, said sum accumulated in a selected accumulator of said M accumulators, and said control means triggering said resetting means to reset said selected accumulator after said sum is output.

5,191,548
SYSTEM FOR COMPRESSION AND DECOMPRESSION OF VIDEO DATA USING DISCRETE COSINE TRANSFORM AND CODING TECHNIQUES

Alexandre Balkanski, Palo Alto; Steve Purcell, Mountain View, and James Kirkpatrick, San Jose, all of Calif., assignors to C-Cube Microsystems, Milpitas, Calif.

Continuation of Ser. No. 495,583, Mar. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 494,242, Mar. 14, 1990. This application Jan. 3, 1992, Ser. No. 813,403
Int. Cl.[5] G06F *7/38, 15/31*
U.S. Cl. 364—725 7 Claims



1. In an image processing apparatus, a finite impulse response digital filter bank for performing an N-point discrete cosine transform on N pixels of an image, where N is an integer, comprises:

a circuit for receiving signal samples representing said N pixels;

N FIR digital filters coupled to said circuit for performing said discrete cosine transform on said signal samples, each of said N FIR digital filter comprising registers and logic circuits for performing arithmetic operations, wherein the k^{th} filter of said N FIR digital filters has, the Z-transform representation, a system function of the form,

$$H_k(Z) = Z^{-1}e^{j\pi k/2N} \prod_{\substack{l=0,\\ l\neq k}}^{2N-1} (1 - Ze^{-j\pi lk/N})$$

where k=0, 1, 2 . . . , N−1, and wherein k^{th} filter comprises a plurality of cascaded FIR digital filters, each cascaded FIR digital filter implementing at least one zero of said system function.

5,191,549
METHOD AND APPARATUS FOR PERFORMING A MULTIPLE-INPUT OPTICAL ARITHMETIC COMPARISON

Theodore L. Houk, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

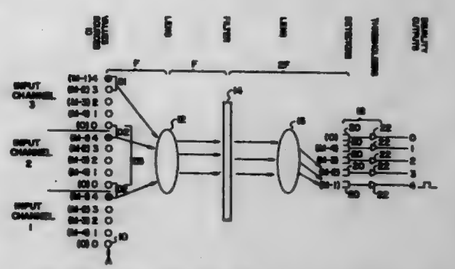
Continuation of Ser. No. 287,275, Dec. 21, 1988, abandoned. This application May 14, 1991, Ser. No. 700,957
Int. Cl.[5] G06G *9/00*
U.S. Cl. 364—822 22 Claims

1. An optical comparator comprising:

a) at least two input channels each having a plurality of light sources arranged in corresponding identical patterns, said light sources being capable of selective activation such that only one light source is activated at a time within each of said channels to form a specific spatial light pattern;

b) a detector array having a plurality of detectors corresponding to positions of said light sources; and

c) a light transfer system disposed between said at least two input channels and said detector array, said plurality of detectors of said detector array and said light transfer system being adapted to detect when a predetermined number of identically positioned light sources corresponding in pattern location in each input channel are activated simultaneously and to generate an output signal indicative thereof, said light transfer system providing one of said

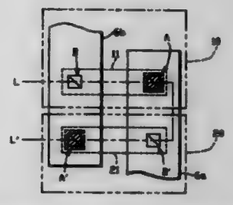


detectors with a light intensity level proportional to the square of the number of identically positioned light sources simultaneously active in each of said input channels.

5,191,550
DUAL ANTIFUSE MEMORY DEVICE

Hideko Kabota, Suwa, Japan, assignor to Seiko Epson Corporation, Japan

Filed Nov. 30, 1990, Ser. No. 621,297
Claims priority, application Japan, Nov. 30, 1989, 1-310904; Dec. 18, 1989, 1-327601; Jan. 11, 1990, 2-4181; Jan. 11, 1990, 2-4182
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—96 11 Claims



1. A semiconductor memory device comprising:

a first antifuse memory element having a first conductive layer;

a second antifuse memory element having a second conductive layer;

said first and second conductive layers each having electrically identical type doping;

said first and second conductive layers each having a surface with a first connection portion and a second connection portion;

first electrodes each separated from a respective one of said first connection portions by a high resistance layer;

second electrodes each formed directly to a respective one of said second connection portions; and

means for applying a voltage between said first and second connection portions of each of said memory elements;

said first connection portion of said first memory element and said second connection portion of said second memory element electrically connected to said first electrode of said first memory element;

said second connection portion of said first memory element and said first connection portion of said second memory element electrically connected to said second electrode of said second memory element.

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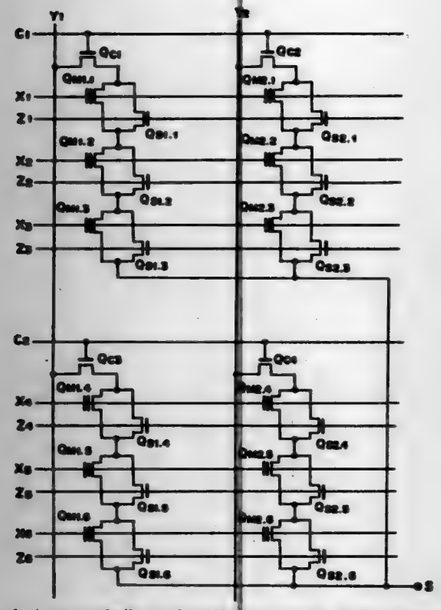
5,191,551

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE WITH TRANSISTOR PARALLELING FLOATING GATE TRANSISTOR

Tatsuro Inoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,165
Claims priority, application Japan, Nov. 30, 1990, 2-340100
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 4 Claims



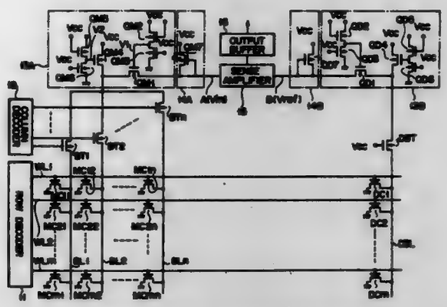
1. A non-volatile semiconductor memory device comprising:
a memory cell array formed by a plurality of memory cell array groups arranged in a matrix form of rows and columns, each of said memory cell array groups including
a transistor group composed of a plurality of transistor pairs connected in series, each transistor pair including a memory field effect transistor having a floating gate electrode and a control gate electrode, and a first selecting field effect transistor having a gate electrode, said memory transistor and said selecting transistor being connected in parallel with each other, and
at least one second selecting field effect transistor having a gate electrode and connected in series with one end of said transistor group;
first word lines each connected with the control gate electrode of said memory transistor for each row;
second word lines each connected with the gate electrode of said first selecting transistor for each row;
select lines each connected with the gate electrode of said second selecting transistor for each row;
bit lines each connected with a drain electrode of said second selecting transistor for each column; and
a source line commonly connected with the source electrodes of one of the transistor pairs in each of said memory cell array groups.

5,191,552

SEMICONDUCTOR MEMORY DEVICE WITH ADDRESS TRANSITION ACTUATED DUMMY CELL

Hiroto Nakai, Kawasaki; Hiroshi Iwahashi, Yokohama; Kazuhiko Kanazawa, Tokyo; Shigeru Kamagai, and Isao Sato, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 370,869, Jun. 23, 1989, Pat. No. 5,040,148. This application May 31, 1991, Ser. No. 684,567
Claims priority, application Japan, Jun. 24, 1988, 63-156539; Jun. 29, 1988, 63-161344
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] G11C *7/00, 11/413, 16/06*
U.S. Cl. 365—189.01 6 Claims



1. A semiconductor memory device comprising:
a plurality of memory cells arranged in rows and columns;
a plurality of row lines corresponding to the rows respectively, each row line connected to memory cells of a corresponding row;
a plurality of column lines corresponding to the rows respectively, each column line connected to memory cells of a corresponding column;
a plurality of first dummy cells, arranged in a column corresponding to the rows respectively, each first dummy cell connected to a corresponding one of the row lines, and one of the first dummy cells being turned on by a selected row line during a data-read mode;
a dummy column line commonly connected to the plurality of first dummy cells;
a second dummy cell having a drain connected to the dummy column line and a gate;
means, coupled to the gate of the second dummy cell, for supplying a predetermined voltage for turning on the second dummy cell during the data-read mode;
a first load circuit connected between the column lines and a power source line;
a second load circuit connected between the dummy column line and the power source line; and
a sense amplifier for sensing the data stored in the memory cell in accordance with a potential differences between the column line and the dummy column line.

5,191,553

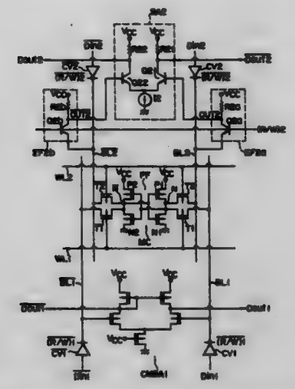
SEMICONDUCTOR MEMORY HAVING A PLURALITY OF PORTS

Satoshi Mizoguchi, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1990, Ser. No. 621,978
Claims priority, application Japan, Dec. 4, 1989, 1-313410
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.06 11 Claims

1. A static random access memory having a plurality of data read/write ports, comprising:

a pair of bit lines of a first port and a pair of bit lines of a second port;
a memory cell for storing write data from one of said pair of bit lines of said first port and said pair of bit lines of said second port and outputting readout data from a selected one of said pair of bit lines of said first port and said pair of bit lines of said second port;
a bit line sense amplifier of said first port for sensing and amplifying readout data from said memory cell;
a bit line sense amplifier of said second port for sensing and amplifying readout data from said memory cell;
a first transfer gate arranged between a first input/output node of said memory cell and the first bit line of said pair of bit lines of said first port, and a second transfer gate arranged between a second input/ output node of said memory cell and the second bit line of said pair of bit lines of said first port; and
a third transfer gate arranged between said input/output node of said memory cell and the first bit line of said pair



of bit lines of said second port, and a fourth transfer gate arranged between the second input/output node of said memory cell and the second bit line of said pair of bit lines of the second port;
wherein first and second bit line potential clamping means are arranged between a first input node of said bit line sense amplifier of the first port and the first bit line of said first pair of bit lines and between a second input node of said bit line sense amplifier of said first port and the second bit line of said first pair of bit lines, said first second bit line potential clamping means clamps a potential of each of said first pair of bit lines to a predetermined level and supplies readout data from said memory cell to said first and second input nodes of said bit line sense amplifier of said first port upon start of a read operation of data, and a value of a drain-source transconductance of said first and second transfer gates is smaller than a value of a drain-source transconductance of said third and fourth transfer gate.

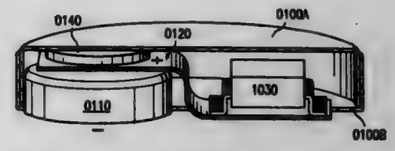
5,191,554

LOW-VOLTAGE LOW-POWER STATIC RAM

Robert D. Lee, Denton, Tex., assignor to Dallas Semiconductor Corp., Dallas, Tex.

Continuation of Ser. No. 569,313, Aug. 16, 1990, which is a continuation of Ser. No. 351,996, May 15, 1989, Pat. No. 4,972,377. This application Aug. 29, 1991, Ser. No. 758,312
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—226 20 Claims

12. A CMOS static random access memory (SRAM) integrated circuit, for connection to a predetermined power supply voltage V_{DD} and to a ground voltage V_{SS}, comprising:
an array of memory cells arranged in rows and columns, with a word line running along each of said rows of said array, and with a bitline pair running along each of said columns of said array;
word line driver circuitry, connected to drive the one of said word lines running along the row of the one of said cells sought to be accessed;
precharge transistors, connected to pull up the potential of said bitline pairs;
wherein each of said cells in said array includes a latch having hysteresis at said predetermined power supply voltage and includes a pair of pass transistors with a first of said pass transistors connecting a first output of said latch to a first bitline of said bitline pair running along the



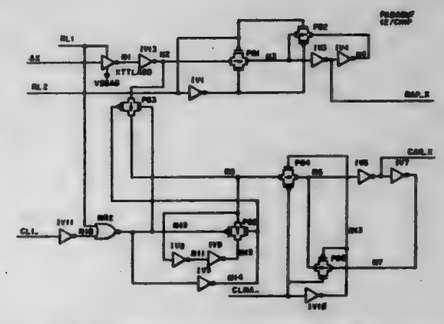
column containing said each of said cells and with a second of said pass transistors connecting a second output of said latch to a second bitline of said bitline pair, and with said pass transistors controlled by said word line running along the row containing said each of said cells;
a sense amplification stage, connected to amplify the output of a selected one of said cells;
column selection circuitry, configured so that only one bitline, of the bitline pair connected to said selected one of said cells is connected to said sense amplification stage.
wherein said word line driver circuitry keeps said pass transistors of said cell turned on for a time interval in which said latch can pull one of said first or second bitlines to ground.

5,191,555

CMOS SINGLE INPUT BUFFER FOR MULTIPLEXED INPUTS

Paolo Tabacco, Dallas; Carol A. Price, and Hugh P. McAdams, both of Houston, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed Jul. 31, 1990, Ser. No. 560,541
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—230.08 6 Claims



1. An input buffer circuit for a semiconductor memory device, comprising:
a single stage circuit portion for receiving a multiplexed row address bit and a multiplexed column address bit;
circuitry connected to the single stage circuit portion for separately holding the received multiplexed row address bit and the received multiplexed column address bit and

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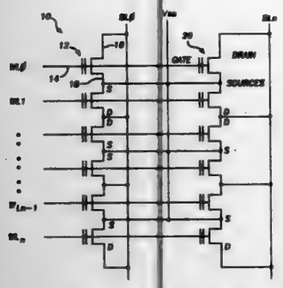
wherein the single stage circuit portion includes:
a tri-state invertor having an input terminal, an output terminal, and a control terminal, the input terminal for receiving the multiplexed row address bit and the multiplexed column address bit, and the control terminal coupled to a tri-state control signal; and
a latch connected to the output of the tri-state invertor to hold the output of the tri-state invertor when the tri-state control signal causes the tri-state invertor to go into tri-state mode.

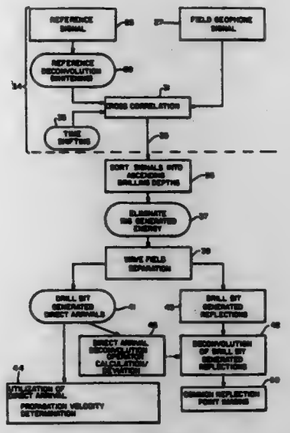
5,191,556
METHOD OF PAGE-MODE PROGRAMMING FLASH EEPROM CELL ARRAYS
Nader Radjy, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Mar. 13, 1991, Ser. No. 668,608
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—235 8 Claims



1. For use in an array including a plurality of flash EEPROM cells, wherein each of said flash EEPROM cells can be programmed and erased, the array including a Vss line common to the sources of the cells, a plurality of respective word lines, each common to respective control/floating gates of a particular respective series of the cells, and a plurality of respective bit lines, each common to drains of cells in a particular respective position in the particular respective series of cells, a method for programming the flash EEPROM cells in said memory array comprising the steps of:
programming cells coupled to the Vss line and to at least one of the word lines of the memory array;
erasing the cells coupled to the Vss line and to at least one of the word lines;
in the course of said step of erasing, inhibiting erase of cells exclusive of the cells coupled to both the Vss line and to the at least one of the word lines; and
selectively programming individual cells coupled to the Vss line and to the at least one of the word lines.

5,191,557
SIGNAL PROCESSING TO ENABLE UTILIZATION OF A RIG REFERENCE SENSOR WITH A DRILL BIT SEISMIC SOURCE
James Rector, Menlo Park; Bruce Marion, Mountain View; Bernard Widrow, Stanford, all of Calif., and Iraj A. Salehi, Naperville, Ill., assignors to Gas Research Institute, Chicago, Ill.
Division of Ser. No. 521,229, May. 9, 1990, Pat. No. 5,050,130, which is a division of Ser. No. 260,784, Oct. 21, 1988, Pat. No. 4,926,391, which is a continuation of Ser. No. 947,755, Dec. 30, 1986, abandoned. This application Sep. 13, 1991, Ser. No. 759,398
Int. Cl.[5] G01V *1/40, 1/28*
U.S. Cl. 367—41 35 Claims

1. An apparatus for providing information on a subterranean geologic formation, which comprises a drill bit for drilling in the earth as a source of energy at a bottom of a borehole, at least one seismic wave sensor spaced from the borehole in the earth for receiving seismic waves imparted into the earth by said drill bit source of energy, a reference sensor for acoustic waves imparted into the borehole by said source of energy, a means connected to receive a reference signal from said reference sensor and a signal from said at least one seismic wave sensor simultaneously, recorded during a period of time when said source of energy is activated at a selected source depth and to generate a cross-correlation function between the reference and seismic wave sensor signals, said apparatus being configured to carry out its signal processing operations repetitively for a series of drill bit depths, generating a series of cross-correlation functions, said reference sensor being located at or proximate to a top of the borehole distant to said source of energy and being located at or proximate to a point where

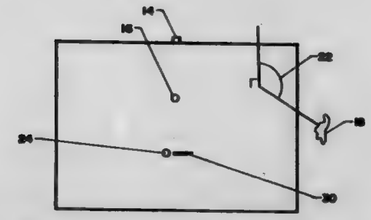


seismic waves generated by said source of energy are secondary radiated into the earth as coherent interference, thus creating cross-correlation functions in which the interference has zero moveout in the series of cross-correlation functions from different source depths, and a means for attenuating the zero-movement interference from the series of cross-correlation functions using a multichannel filter designed to attenuate arrivals by summing a range of adjacent traces from different drill bit depths for each correlation time lag, and subtracting this sum from the original correlations or by transforming the correlation functions to the domain of frequency versus wavenumber using a two-dimensional Fourier transform, designing a rejection filter that removes wavenumbers near the zero value, and then, using a inverse two-dimensional Fourier transform, transforming the filtered data back to the domain of correlation time lag versus depth.

5,191,558
SYSTEM FOR DETERMINING THE ANGLE OF IMPACT OF AN OBJECT ON A STRUCTURE
Michael R. Gorman, Monterey, Calif., and William H. Prosser, Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Jan. 17, 1992, Ser. No. 903,708
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—124 1 Claim

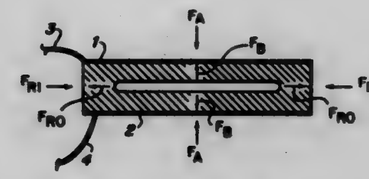
1. A method for determining the angle of impact of an object on a thin-walled structure comprising
mounting at least one broad band transducer on or within the surface of the structure;
detecting an impact which causes at least one symmetric and at least one antisymmetric mode wave;

amplifying and filtering the resulting guided mode waves; and



comparing the symmetric and antisymmetric mode waves to determine the angle of impact.

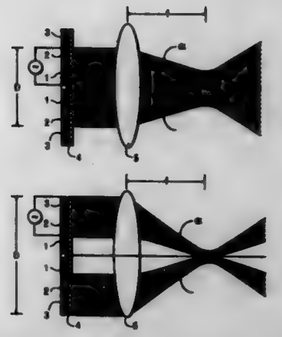
5,191,559
PIEZOELECTRIC CERAMIC HYDROSTATIC SOUND SENSOR
Manfred Kahn, Alexandria, Va., and Mark Chase, Laurel, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 5, 1990, Ser. No. 622,658
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—157 16 Claims



1. A piezoelectric ceramic hydrostatic sound sensor comprising an essentially flat plate-shaped monolithic body of ceramic material defining a plane, said body including upper and lower faces, a single essentially flat void therein essentially parallel to the plane of the body, said void being surrounded by said ceramic material, and electrodes attached to the upper and lower faces of the body.

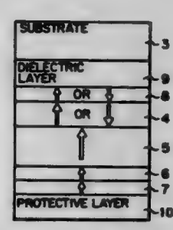
5,191,560
SOUND WAVE GENERATOR FOR THERAPEUTIC PURPOSES
Hans Lobentanzer, and Norbert Wiesheu, both of Munich, Fed. Rep. of Germany, assignors to Dornier Medizintechnik GmbH, Fed. Rep. of Germany
Filed Oct. 15, 1991, Ser. No. 774,968
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1990, 4032357
Int. Cl.[5] A61B *17/22*
U.S. Cl. 362—175 4 Claims

1. A sound wave generator with a variable effective aperture angle according to the electromagnetic principle for therapeutic applications and particularly for the contactless smashing of a concrement situated in the body of a living being, comprising:
a flat coil arrangement,
a metallic diaphragm insulated with respect to the flat coil arrangement, a device for focusing sound waves produced by said diaphragm, and
an electric circuit control apparatus, electrically connected to the flat coil arrangement, for controlling actuation of the flat coil arrangement,
wherein the flat coil arrangement includes an inner coil section, a central coil section concentrically surrounding the inner coil section, and an outer coil section concentrically surrounding the central coil section, each of said sections having a given area,
and wherein the electric circuit control apparatus includes



means operable to selectively actuate respective different pairs of said coil sections to cooperate with said device for focusing to produce respective different effective aperture angles.

5,191,561
MAGNETOOPTICAL RECORDING MEDIUM INCLUDING FIVE MAGNETIC LAYERS FOR DIRECT OVERRIDING BY LIGHT INTENSITY MODULATION WITHOUT AN EXTERNAL BIAS FIELD
Tatsuya Fukami; Kazuhiko Tsutsumi; Takashi Tokunaga, and Yoshiyuki Nakaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Sep. 11, 1991, Ser. No. 757,685
Claims priority, application Japan, Nov. 26, 1990, 2-324271; Nov. 26, 1990, 2-324272; Nov. 26, 1990, 2-324275; Nov. 26, 1990, 2-324276
Int. Cl.[5] G11B *13/04, 11/14, 7/24*
U.S. Cl. 369—13 16 Claims



16. A magnetooptical recording medium that is capable of direct overwriting by light intensity modulation, comprising:
a first magnetic layer disposed on a substrate;
a second magnetic layer disposed on the first layer;
a third magnetic layer disposed on the second layer;
a fourth magnetic layer disposed on the third layer;
each of said magnetic layers having vertical magnetic anisotropy and wherein any two adjacent layers are bound by exchange force between said adjacent layers; and
a fifth magnetic layer having vertical anisotropy and disposed in one of the positions consisting of: on the fourth magnetic layer and said fifth magnetic layer not bound thereto by exchange force, between the first and second magnetic layers and said fifth magnetic layer bound thereto by exchange force, and between the substrate and first magnetic layer and said fifth magnetic layer bound thereto by exchange force.

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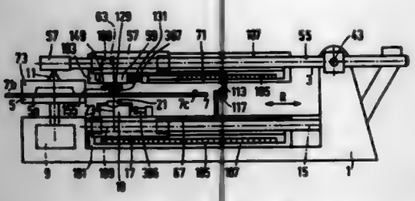
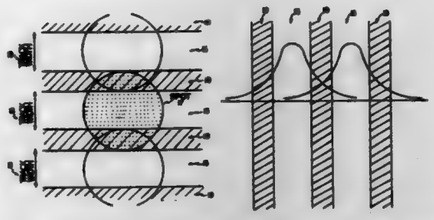
5,191,562
POSITIONING SYSTEM FOR THE HEADS OF A MAGNETO-OPTICAL DATA RECORDER
Johannes M. M. Heusing, and Cornelius A. Heezmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 19, 1990, Ser. No. 585,342
Claims priority, application Netherlands, Jul. 6, 1990, 9001546
Int. Cl.[5] G11B *17/32*
U.S. Cl. 369—13 19 Claims



1. A device for inscribing and/or reading a magneto-optical information carrier, comprising:
a frame, and a turntable mounted to the frame for rotation about an axis of rotation for supporting the carrier,
a first unit arranged to be movable transversely to said axis, comprising focusing means for concentrating a radiation beam to form at least one radiation spot in a focusing plane, and a first actuator for moving the focusing means at least in a direction parallel to said axis,
a displacement body, and means for moving said displacement body with respect to said turntable in a direction transverse to said axis, to a position generally opposite to said first unit, and
a second unit mounted to said displacement body for movement therewith, and arranged, in a direction parallel to said axis, opposite to and spaced from said first unit, comprising first means, for directing a magnetic field which extends into said focusing plane,
characterized in that the device further comprises second means, for moving said first means with respect to said displacement body, at least in a plane oriented transversely to said axis,
said second means comprises a second actuator secured to said displacement body, and a measurement and control system, and
the measurement and control system comprises means for determining, during operation of the device, the position of said first means relative to said focusing means at least in the direction of movement of the displacement body; and third means, controlling at least said second actuator, for controlling the position of said first means relative to said focusing means.

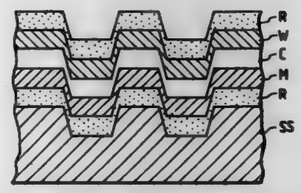
5,191,563
METHOD FOR INCREASING TRACK DENSITY OF MAGNETO-OPTICAL STORAGE MEDIA
Neville K. S. Lee, Sherborn, and Paul H. Schmidt, West Boylston, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 29, 1989, Ser. No. 373,939
Int. Cl.[5] G11B *11/00*
U.S. Cl. 369—13 15 Claims

1. An optical data storage medium comprising:
multiple alternately disposed, or single spiral, recording and non-recording regions forming continuous, nonintersecting tracks in said medium, said recording tracks having a substantially smooth topography and being responsive to a recording signal for recording information by modulation of a physical property of said medium other than reflectivity, said non-recording track having a textured topography, the dimensions of the textured features being substantially smaller than the width of said tracks but of



sufficient size to make said non-recording track relatively unresponsive to said recording signal compared to said recording track.

5,191,564
OVER-WRITE CAPABLE MAGNETOOPTICAL RECORDING MEDIUM HAVING GROOVE DEPTH OF 800 Å OR LESS
Tetsuo Hosokawa, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Mar. 9, 1992, Ser. No. 849,093
Claims priority, application Japan, Apr. 10, 1991, 3-77487
Int. Cl.[5] G11B *11/00, 13/04*
U.S. Cl. 369—13 4 Claims

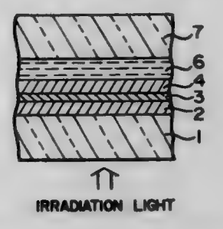


1. An over-write capable magnetooptical recording medium, which includes a substrate having grooves spirally or concentrically formed on a surface thereof; a memory layer consisting of perpendicularly magnetizable magnetic film; and a writing layer consisting of perpendicularly magnetizable magnetic film, these two layers being stacked on said substrate and exchange-coupled, a direction of magnetization of only the writing layer being initially oriented in a predetermined direction, before recording, without changing a direction of magnetization of the memory layer, said medium being capable of over-write recording of different kinds of data by raising the temperature of said medium to different temperature levels, respectively, characterized in that a depth of each of said grooves falls within a range between a minimum depth sufficient for groove tracking and a maximum depth of 800 Å.

5,191,565
OPTICAL INFORMATION RECORDING MEDIUM
Kazuo Isoue, Osaka; Takeo Ohta, Nara; Masumi Uchida, Hirakata; Kazumi Yoshioka, Yawata, and Shigeaki Furukawa, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 537,947, Jun. 14, 1990. This application Jun. 10, 1991, Ser. No. 713,008
Claims priority, application Japan, Jun. 19, 1989, 1-156533; Jul. 6, 1989, 1-174703
Int. Cl.[5] G11B *3/70*
U.S. Cl. 369—284 14 Claims

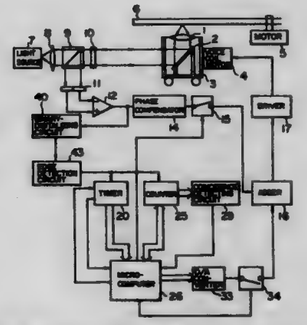
1. An optical information recording medium, comprising an

active layer which undergoes a base change upon irradiation with light; and protective layers which are formed on both sides of the active layer, which have a higher melting point than that of the active layer and which show no absorption at the wavelength of the irradiated light, wherein the thermal



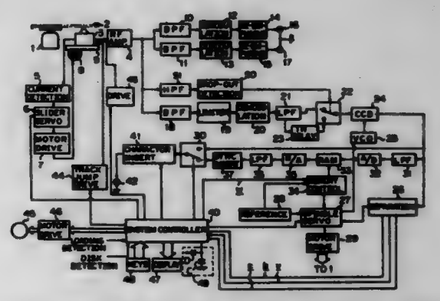
capacity Ma of the active layer and the thermal capacity Md_1 of the protective layer on the side to be irradiated with light have the following relationship: $Ma \leq Md_1/3$, and said active layer has a characteristic such that its minimum cyrstallization time is 90 ns or less.

5,191,566
VELOCITY DETECTION METHOD AND APPARATUS THEREFOR
Hiroyuki Yamaguchi, Hirakata; Mitsuro Moriya, Neyagawa; Shinichi Yamada, Hirakata, and Masayuki Shibano, Izumisano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 1, 1990, Ser. No. 486,845
Claims priority, application Japan, Mar. 7, 1989, 1-54054
Int. Cl.[5] G11B *5/55, 7/00*
U.S. Cl. 369—32 8 Claims



1. A velocity detection method used for a track-seek operation including guiding a conversion means onto a target track of a recording medium including a plurality of tracks which are spaced apart by a given distance, said conversion means for recording and reproducing signals on and from the plurality of tracks of the recording medium, said method comprising the steps of:
(a) setting a position of said target track;
(b) moving said conversion means toward said target track;
(c) measuring a time period for which said conversion means crosses adjacent ones of said tracks;
(d) calculating a relative velocity between said conversion means and said tracks based on a product of a reciprocal of said time period and said distance between said tracks;
(e) determining a relative position of said conversion means with respect to said target track;
(f) establishing a plurality of predetermined velocity limits with respect to relative positions of said conversion means relative to the position of said target track;
(g) comparing said relative velocity with one of said velocity limits;
(h) when said relative velocity is determined in step (g) to be larger than said one of said velocity limits, reiterating steps (c)–(g); and
(i) when said relative velocity is determined in step (g) to be less than or equal to said one of said velocity limits, providing said relative velocity as a detected velocity.

5,191,567
METHOD FOR PLAYBACK OF A PORTION OF A RECORDED DISK PLAYED BEFORE INTERRUPTION OF PLAYBACK
Shigeru Yasuda, and Kenichiro Yasukawa, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Continuation of Ser. No. 184,141, Apr. 21, 1988, abandoned. This application Jun. 5, 1990, Ser. No. 532,242
Claims priority, application Japan, Apr. 24, 1987, 62-102393
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 12 Claims



1. A method of reproducing from a previously played position on a video disk in which information recorded on the video disk is reproduced together with address information indicating a position in a recording area of said recording disk, said method comprising the steps of:
interrupting playback of said video disk by a user;
generating a memorization command for initiating storage of address information of a first recording position during playback of said video disk upon interruption of playback by a user;
storing into a memory device, address data corresponding to the address information of the first recording position of said video disk at which information under reproduction is interrupted for later determining a position at which playback is restarted, in response to the issuance of said memorization command;
generating a second recording position, at a predetermined place, in order of recording, before said first recording position;
storing into said memory device address data corresponding to the address information indicating said second recording position;
generating a reproduction command triggered by a user upon restarting playback from said second recording position so that said video disk is played back starting from said second position; and
restarting the playback operation of said disk playing apparatus from said second recording position of said video disk in response to said last portion reproduction command.

339–697 O.G.–93–21

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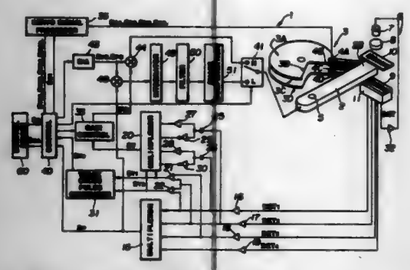
5,191,568

DISC DRIVE APPARATUS WITH TRACKING CONTROL BASED ON MULTIPLE REFERENCE TRACKS AND WITH AUTOMATIC SEEK TIME ADJUSTMENT

Takayasu Muto; Manoru Ooshi; Junkichi Sugita; Masami Kashiwagi; Toru Tanaka, all of Kanagawa, and Hidekazu Sato, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1990, Ser. No. 628,475
Claims priority, application Japan, Dec. 18, 1989, 1-326054; Dec. 27, 1989, 1-336528
Int. Cl.[5] G11B 7/00, 5/596
U.S. Cl. 369—32 4 Claims



1. A disc drive apparatus comprising:
at least one disc medium having data surfaces on which a plurality of concentric data tracks and at least first, second, and third concentric reference regions are formed, wherein there is recorded a servo signal in said reference regions;
transducer means for reading a data signal from and writing a data signal to said data tracks and for reading said servo signal from said reference regions;
actuator means for moving and positioning said transducer means above a desired one of said tracks;
position sensing means for sensing a position of said transducer means relative to said disc medium and for outputting plural phases of position signals dephased at least 90° relative to each other;
there being a single reference track in each of said first and second reference regions, wherein both of said reference tracks correspond to a same one of said plural phases of said position signals;
there being plural reference tracks in said third reference region, wherein each of said plural reference tracks corresponds to each of said plural phases of said position signals; and
means for correcting said position of said transducer means relative to said disc medium based on a position signal corresponding to said single reference tracks in said first and second reference regions and a first one of said plurality of reference tracks in said third reference region, and on others of said plurality of position signals corresponding to others of said plurality of reference tracks in said third reference region.

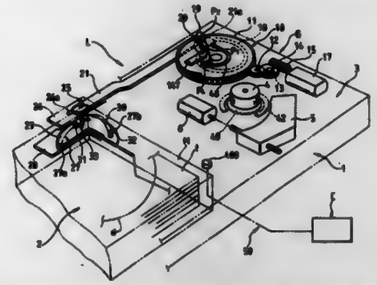
5,191,569

DISK PLAYBACK DEVICE

Atsushi Kurozawa; Toshiyuki Kimoto; Sei Onishi, and Kiyohito Kajihara, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 12, 1990, Ser. No. 492,040
Claims priority, application Japan, May 15, 1989, 1-21165; May 22, 1989, 1-128546; May 24, 1989, 1-131116; May 30, 1989, 1-137209; Jun. 9, 1989, 1-147667
Int. Cl.[5] G11B 17/04
U.S. Cl. 369—38 19 Claims

1. In a disk playback device of the type comprising a magazine for housing a plurality of disks, a data playback section for playing back data recorded on a disk, a plurality of trays for supporting the disks, a tray turning mechanism for transporting a tray supporting a disk between the magazine and the data playback section, the improvement comprising:
disk detecting means for detecting a presence of a disk on a tray, said disk detecting means being disposed adjacent to



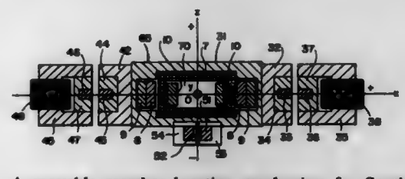
a leading end of the magazine so that said disk detecting means detects the presence of a disk on a tray when the tray turning mechanism transports the tray to a position which is outside of said magazine but not fully in the playback section.

5,191,570

OPTICAL HEAD LOCATING MECHANISM FOR MAGNETICALLY LOCATING AN OPTICAL HEAD

Tomoyuki Shirai, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1990, Ser. No. 610,112
Claims priority, application Japan, Nov. 7, 1989, 1-290893; Nov. 7, 1989, 1-290894
Int. Cl.[5] G11B 7/12
U.S. Cl. 369—44.22 25 Claims



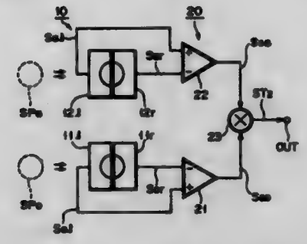
1. A movable member locating mechanism for floating a predetermined movable member along at least one of two axes which are orthogonal to each other and to the axis of a moving direction, said location mechanism floating said predetermined movable member in the air and locating said predetermined movable member at desired positions respectively designated along the direction of at least one of said two axes, said predetermined movable member being arranged to be movable in said moving direction with respect to said locating mechanism and having at least two side surfaces which are parallel to at least one of said two axes, respectively, said movable member locating mechanism comprising:
curbing means for floating said predetermined movable member by magnetically curbing and locating it at a predetermined reference position along each of said two axes; and
means for magnetically locating said predetermined movable member at another position along one of said two axes;
wherein said curbing means comprises at least two permanent magnets respectively fixed to said at least two side surfaces of said predetermined movable member which are in parallel to said one of said two axes, and at least two additional permanent magnets respectively oppositely arranged so as to be attracted to said at least two permanent magnets, said additional permanent magnets being fixed to a device in which said movable member locating mechanism is positioned, whereby said predetermined movable member is floated in the air and located between each of said additional permanent magnets and at a desired position along at least one of said two axes.

5,191,571

TRACKING CONTROL METHOD AND APPARATUS FOR AN OPTICAL DISC SYSTEM

Atsushi Fukumoto, Kanagawa, and Kiyoshi Ohsato, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 24, 1991, Ser. No. 705,492
Claims priority, application Japan, May 31, 1990, 2-142521
Int. Cl.[5] G11B 7/13
U.S. Cl. 369—44.37 10 Claims



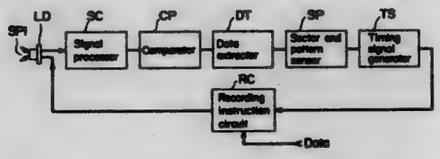
1. A tracking control apparatus for controlling a light beam to follow a track on an optical disc, comprising:
a laser source for generating a plurality of light beams;
means for applying the light beams from said laser source to the optical disc as beam spots which are offset on the optical disc by 1/2n (n is a positive integer of 2 or more) of a track pitch on the optical disc;
photodetector means for detecting light beams reflected by the optical disc from said beam spots;
tracking control signal generating means for generating n signals which are shifted 1/2n of the track pitch in spatial phase, based on a detected output signal from said photodetector means, and for multiplying said n signals together to produce a tracking control signal whose spatial period is 1/n of the track pitch; and
means for controlling the light beam applied from said laser source to the optical disc based on said tracking control signal.

5,191,572

OPTICAL RECORDING AND PLAYBACK SYSTEM OF DUAL LIGHT SOURCE TYPE

Keiichi Tsutsui, Kagaokakyo; Kazuo Tsuboi, and Koji Sogo, both of Takatsuki, all of Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Feb. 6, 1990, Ser. No. 475,851
Claims priority, application Japan, Feb. 20, 1989, 1-41394
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—44.38 8 Claims



1. A dual light source optical recording and playback system comprising:
a first light source including a semiconductor laser for irradiating tracks of a recording medium with a recording light spot to record pits as information units, said semiconductor laser projecting light in at least two directions, light projected by said semiconductor laser in one of said two directions producing said recording light spot,
a second light source for irradiating said tracks with a playback light spot,
an optical system for receiving light from said first and second light sources and causing light from said light sources to irradiate the tracks of said recording medium,
detection means for detecting the light output of said semiconductor laser projected in the other of said two directions and which changes in response to return light of said recording light spot which is projected on the track of recording medium through said optical system and returned through said optical system to said semiconductor laser, and
a timing signal generator for generating a timing signal for the recording a subsequent pit on the track in response to a detection output from said detection means which corresponds to the return light due to reflection by a recorded pit.

5,191,573

METHOD FOR TRANSMITTING A DESIRED DIGITAL VIDEO OR AUDIO SIGNAL

Arthur R. Hair, 301 Oaklawn Dr., Pittsburgh, Pa. 15241

Continuation of Ser. No. 206,497, Jun. 13, 1988, abandoned.
This application Sep. 18, 1990, Ser. No. 586,391
Int. Cl.[5] G11B 5/86, 7/00, 11/00
U.S. Cl. 369—84 6 Claims

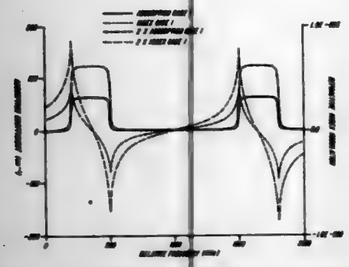
1. A method for transmitting a desired digital audio signal stored on a first memory of a first party to a second memory of a second party comprising the steps of:
transferring money electronically via a telecommunication lien to the first party at a location remote from the second memory and controlling use of the first memory from the second party financially distinct from the first party, said second party controlling use and in possession of the second memory;
connecting electronically via a telecommunications line the first memory with the second memory such that the desired digital audio signal can pass therebetween;
transmitting the desired digital audio signal from the first memory with a transmitter in control and possession of the first party to a receiver having the second memory at a location determined by the second party, said receiver in possession and control of the second party; and
storing the digital signal in the second memory.

receiving the broadcast modulated orthogonal frequency

main switch comprising a plurality of individual data

5,191,574
OPTICAL MEMORY METHOD AND APPARATUS UTILIZING FREQUENCY CHANNELING AND STARK EFFECT

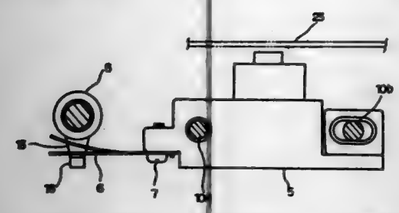
Philip D. Henshaw, Carlisle, and Steven A. Lis, Lexington, both of Mass., assignors to Sparta Systems, Inc., Lexington, Mass.
Continuation-in-part of Ser. No. 236,604, Aug. 25, 1988, Pat. No. 4,998,236. This application Mar. 5, 1991, Ser. No. 664,767
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—100 21 Claims



1. Memory apparatus for read/write storage and retrieval of digital data, the apparatus comprising
optical storage means including a multidimensional holographic storage medium for storing phase holographic images representative of the digital data,
selected regions of said medium containing said holographic images being independently addressable by an interrogating beam of light characterized by selected spatial positions,
said holographic storage medium comprising a spectral hole burning material having absorption regions independently addressable by an interrogating beam of light having a selected frequency,
said spectral hole burning material comprising selectively bleached absorption structures forming addressable frequency channels, and
said phase holograms being stored in index modulation regions near spectral hole absorption edges.

5,191,575
PLATE SPRING AND NUT INTERCONNECTING FOR USE IN AN OPTICAL PICK-UP MOVING APPARATUS

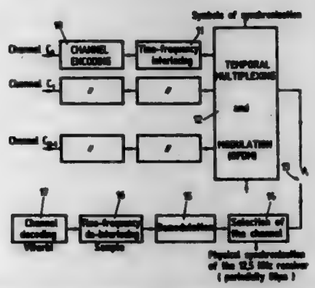
Kunio Kido, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 488,711, Mar. 5, 1990, abandoned. This application Dec. 5, 1991, Ser. No. 803,717
Claims priority, application Japan, Mar. 6, 1989, 1-25397[U]
Int. Cl.[5] G11B 21/02; F16B 7/00
U.S. Cl. 369—223 7 Claims



1. A pick-up moving mechanism for use in optical disk player, which comprises:
(a) a pick-up unit movably supported by at least two linear guide rods;
(b) a pick-up moving screw rotabaly mounted in a direction parallel to the linear guide rods;
(c) a nut threaded upon the pick-up moving screw;
(d) a connecting member integrally coupled with the pick-up unit and engaged with the nut, the connecting member being predominantly composed of a plate spring for providing a resilient force upon the nut in a direction radial to the pick-up moving screw; and
(e) an engaging portion for engaging the nut with the contacting member, the engaging portion comprising a first pressure contact and a second pressure contact, the contacting of the first pressure contact with the second pressure contact being made at a surface that slopes with respect to a line drawn radially through the rotation axis of the pick-up moving screw in the direction of the resilient force.

5,191,576
METHOD FOR BROADCASTING OF DIGITAL DATA, NOTABLY FOR RADIO BROADCASTING AT HIGH THROUGHPUT RATE TOWARDS MOBILE RECEIVERS, WITH TIME FREQUENCY INTERLACING AND ANALOG SYNCHRONIZATION

Daniel Pommier, Breal Sur Montfort, and Bernard Le-Floch, Rennes, both of France, assignors to Etat Francais and Telediffusion de France S.A., France and Etat Francais and Telediffusion de France S.A., France
Filed Oct. 17, 1991, Ser. No. 777,463
Claims priority, application France, Nov. 18, 1988, 88 15216
Int. Cl.[5] H04J 11/00; H04L 27/28
U.S. Cl. 370—18 13 Claims

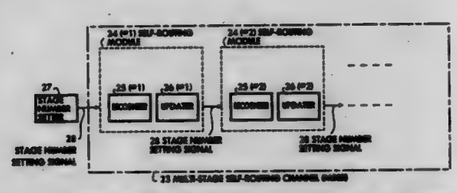


1. A method for the broadcasting and receiving digital data consisting of a source of binary elements comprising the steps of:
providing a plurality of orthogonal frequency carriers;
convolutively coding said source binary elements to form a series of data elements;
temporally interlacing said series of data elements by selectively delaying at least some of said data elements of the series, no two adjacent data elements in said series being delayed by the same amount;
grouping said temporally interlaced series of data elements in data symbols;
grouping said data symbols in frames of symbols, each frame of symbols beginning with a frame header;
inserting in said frame header a first analog synchronization symbol formed by an interval of silence, said interval of silence having the duration of a data symbol;
frequentially interlacing said data elements by selectively modulating said plurality of orthogonal frequency carriers with the data elements of data symbol, each of said data elements being associated with only one of said frequency carriers;
simultaneously broadcasting all of said modulated frequency carriers, the temporal and frequential interlacing effectively preventing any two adjacent data elements in said series of data elements from being broadcast successively in time on a same frequency carrier

receiving the broadcast modulated orthogonal frequency carriers;
detecting an envelope of said first analog synchronization symbol of the header in each of said frames;
setting off a time base for receiver synchronization upon detection of said envelope of said first analog synchronization symbol;
demodulating at least some of said frequency carriers of each of said data symbols to form demodulated data elements;
frequentially de-interlacing said demodulated data elements;
temporally de-interlacing said demodulated data elements; and
decoding said frequentially and temporally de-interlaced data elements.

5,191,577
SWITCH STAGE NUMBER SETTING APPARATUS FOR MSSR CHANNELS

Yoshihiro Uchida; Shunji Yoshimura, both of Kawasaki; Yasuhiro Aso, Tokyo, and Masami Maruyama, Yokohama, all of Japan, assignors to Fujitsu Limited, Japan
Filed Aug. 20, 1991, Ser. No. 748,758
Claims priority, application Japan, Aug. 20, 1990, 2-217101
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—60 12 Claims

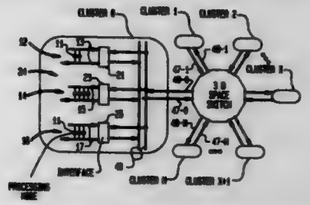


1. A switch stage number setting apparatus for a MSSR channel, being for setting stage numbers, which identify respective stages, to self-routing modules arrayed in respective stages of a channel operating in a multi-stage self-routing system; said switch stage number setting apparatus for an MSSR channel comprising:
recognizing means provided in self-routing modules, each of said recognizing means being for setting a stage number to the switches in the self-routing module of its own stage by recognizing a stage number setting signal supplied from a self-routing module in the preceding stage;
updating means provided in self-routing modules, each of said updating means being for updating a stage number setting signal supplied from a self-routing module in the preceding stage and outputting it to a self-routing module in the succeeding stage; and
a stage number setting means for outputting a predetermined stage number setting signal to a self-routing module in the first stage of said channel.

5,191,578
PACKET PARALLEL INTERCONNECTION NETWORK

Kuo-Chu Lee, Franklin, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.
Filed Jun. 14, 1990, Ser. No. 537,682
Int. Cl.[5] H04R 11/04
U.S. Cl. 370—63 27 Claims

1. An interconnection network for routing data packets comprising:
a plurality of time domain switches for routing data packets in parallel form to and from processing nodes, each of said time domain switches comprising a multiple level bus system with separate data and control paths for transmitting data packets to and from processing nodes and to and from levels in said bus system, and
a space domain switch for routing data packets in parallel form between said time domain switches, said space domain switch comprising a plurality of individual data switching planes for routing slices of said data packets and a control plane for controlling said data switching planes, wherein said control plane comprises a plurality of inputs,



a plurality of outputs, a buffer at each output corresponding to each input, and an arbiter at each output for arbitrating among said slices of data packets buffered at each output for release at said outputs.

5,191,579
RING NETWORK SWITCHING CONTROL DEVICE

Akihiro Matsushita; Shinya Takemura, both of Oyama; Toshio Watanabe, Shimodate; Shigeo Sakai, Oyama, and Nobuo Fukuda, Utsunomiya, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jun. 18, 1990, Ser. No. 539,901
Claims priority, application Japan, Jun. 17, 1989, 1-153593
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—85.15 17 Claims

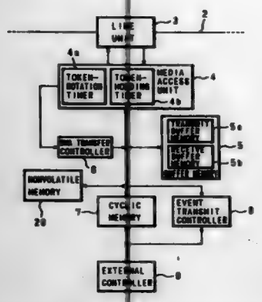
17. A ring network switching control method for use with a ring network in which each of a plurality of communication node is connected in a ring via a duplexed transmission line, the method comprising the steps of:
(a) transmitting control information representing a state of an associated transmission line to another communication node via the transmission line;
(b) supervising the state of the associated transmission line to detect faults and for receiving control information from another communication node via the associated transmission line; and
(c) switching a connection state of the associated transmission line and for transmitting new control information in accordance to predetermined rules based on results of the supervision of the state of the transmission line and the reception of the control information so that each of said communication nodes performs a distributed control in accordance with a change of a state of the network.

5,191,580

COMMUNICATION RESPONSE CONTROL METHOD

Yasushi Nakano, and Yasuhiro Tanaka, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1990, Ser. No. 596,821
Claims priority, application Japan, Oct. 14, 1989, 1-267151
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—85.5 2 Claims



1. A communication response control method for controlling transmission and reception of control data in a plurality of stations, each of said stations being connected to one another by a transmitting line forming a closed loop and each of said stations being connected to an external controller, and for transmitting, when each station obtains a token, a synchronous frame which is being queued in a transmitting buffer memory of each station, and for executing arbitration so that a station in a predetermined state is made under an arbitration mode to set a target-token rotation time of the network when said transmitting line is activated, comprising the steps of:

(a) distributing a set value of said target-token rotation time of the network from a specific station to all the other stations via said transmitting line;

(b) forcibly setting said specific station to the arbitration mode by control of said external controller; and

(c) setting said set value as a target-token rotation time of all said stations in said network.

5,191,581

METHOD AND APPARATUS FOR PROVIDING HIGH PERFORMANCE INTERCONNECTION BETWEEN INTERFACE CIRCUITS COUPLED TO INFORMATION BUSES

Mark P. Woodbury, Amherst; Richard E. Hudnall, Nashua, and Philip G. Hunt, Hampstead, all of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 7, 1990, Ser. No. 623,504
Int. Cl.[5] H04L *12/40*; H04J *3/02*
U.S. Cl. 370—85.9 24 Claims

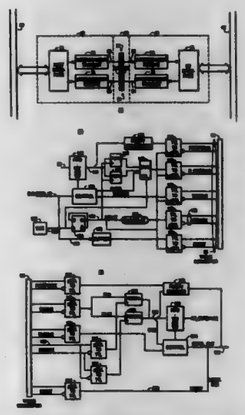
1. Apparatus for interconnecting first and second interface circuits respectively coupled to first and second information buses each having a plurality of data lines, the apparatus comprising:

first and second unidirectional information paths each having conductors for conducting a plurality of data signals, each of the first and second information paths conducting a number of data signals less than the number of data lines in at least one of the information buses;

a first interconnect module for coupling to the first interface circuit, the first interconnect module comprising a first pair of registers each for respectively and simultaneously receiving a set of a first pair of sets of information from the first interface circuit, a first multiplexer for sequentially transferring each set of the first pair of sets of information bits from the first pair of registers over the data lines of the first information path, and a first connector coupled to the first multiplexer;

a second interconnect module for coupling to the second interface circuit, the second interconnect module comprising a second pair of registers each for respectively supplying a set of the first pair of sets of information bits to the second interface circuit, a second connector removably connected to the first connector, and first demultiplexer means coupled to the second connector for receiving the first pair of sets of information bits sequentially transferred by the first multiplexer and for respectively supplying the first pair of sets of information bits to the second pair of registers;

a third interconnect module for coupling to the second interface circuit and comprising a third pair of registers



each for respectively and simultaneously receiving a set of a second pair of sets of information bits from the second interface circuit, a second multiplexer coupled to the second connector for sequentially transferring each set of the second pair of sets of information bits from the third pair of registers over the data lines of the second information path; and

a fourth interconnect module for coupling to the first interface circuit and comprising a fourth pair of registers each for respectively and simultaneously supplying a set of the second pair of sets of information bits to the first interface circuit, and second demultiplexer means coupled to the first connector for receiving the second pair of sets of information bits sequentially transferred by the second multiplexer and for respectively supplying the second pair of sets of information bits to the fourth pair of registers.

5,191,582

METHOD AND APPARATUS FOR THE HIGH SPEED MODIFICATION OF A PACKET ADDRESS FIELD OF A TRANSMITTED PACKET IN A FRAME RELAY SYSTEM

Daniel C. Upp, Southbury, Conn., assignor to TransSwitch Corporation, Shelton, Conn.

Filed Aug. 14, 1991, Ser. No. 744,894
Int. Cl.[5] H04J *3/24*; H04L *12/56*
U.S. Cl. 370—94.1 23 Claims

15. Apparatus in a frame relay system for modifying the address field bytes of an incoming packet containing additional data bytes, comprising:

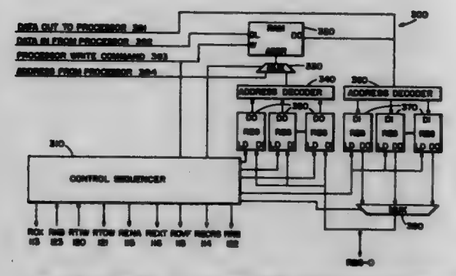
(a) interface means for determining that said incoming packet is being received and for receiving said incoming packet;

(b) address decoder means coupled to said interface means for receiving said address field bytes from said interface means and for determining a DLCI address therefrom;

(c) a first memory means coupled to said address decoder, said first memory means comprising a translation table, wherein addresses of said first memory means relate to incoming DLCI addresses contained in said address field bytes of said incoming packet, and data contained at said addresses of said first memory means comprises outgoing DLCI addresses;

(d) address encoder means coupled to said first memory means for generating from said outgoing DLCI addresses a plurality of address field bytes of an outgoing packet;

(e) second memory means coupled to said address encoder means and said interface means, for receiving said additional data bytes from said interface means, and for receiving said plurality of address field bytes of an outgoing packet; and



(f) at least one data bus over which said address field bytes are transported from said interface means to said address decoder means, said address field bytes of an outgoing packet are transported from said address encoder means to said second memory means, and said additional data bytes are transported from said interface means to said second memory means, wherein

said plurality of address field bytes of said outgoing packet are generated substantially within several byte clocks from the time a last of said address field bytes is received by said address decoder means from said interface means.

5,191,583

METHOD AND APPARATUS FOR EFFECTING EFFICIENT TRANSMISSION OF DATA

Gregory Pearson, Granada Hills, Calif.; Nathan R. Melhorn, Framingham; Michael F. Onorato, Acton, and Craig A. Richards, Wrentham, all of Mass., assignors to Microcom Systems, Inc., Wilmington, Del.

Continuation of Ser. No. 431,595, Nov. 3, 1989, abandoned. This application Jun. 28, 1991, Ser. No. 722,708
Int. Cl.[5] H04J *3/24*; G08C *25/02*
U.S. Cl. 370—94.1 11 Claims

1. A method of transmitting data in packet form over a communications channel in a data telecommunications system, said system comprising an initiating unit of data terminal equipment, a receiving unit of data terminal equipment, a first modem connected between said initiating unit and said communications channel, and a second modem connected between said receiving unit and said communications channel, said method comprising the following steps:

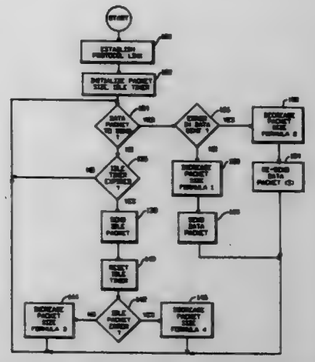
(a) transmitting a stream of data characters from said initiating unit to said first modem;

(b) dividing said data stream received by said first modem into at least one data packet of a first size, with each such packet including identifying data;

(c) transmitting at least one data packet of said first size from said first modem to said second modem over said communications channel;

(d) checking data in said at least one transmitted data packet for any errors and retransmitting said data packet whenever an error is detected;

(e) sending form said first modem to said second modem mover said communications channel at least one idle packet whenever there is not data packet to transmit form said first modem;



(f) checking said at least one sent idle packet for any errors; and

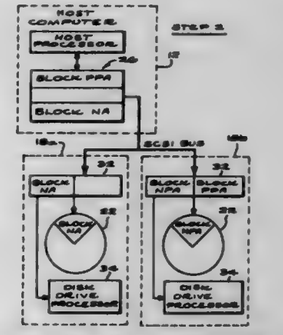
(g) optimizing data transmission efficiency by continually increasing, decreasing, or leaving unchanged said first side of said at least one data packet dependent upon whether any errors are detected by said data packet checking step or said idle packet checking step.

5,191,584

MASS STORAGE ARRAY WITH EFFICIENT PARITY CALCULATION

Michael H. Anderson, Moorpark, Calif., assignor to Micropolis Corporation, Chatsworth, Calif.

Filed Feb. 20, 1991, Ser. No. 658,317
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—51.1 19 Claims



1. A method for writing data to and calculating new parity data for an efficient, redundant array of mass storage devices in a system which includes a host computer connected via a bus to a plurality of diak drives, each with its own controller, comprising the steps of:

calculating the partial parity which is the Exclusive Or function of the old data and the new data which is to be stored in the location which holds the old data;

writing the new data to the location in the peripheral storage device from the old data was obtained;

transferring the partial parity to the controller of a periph-

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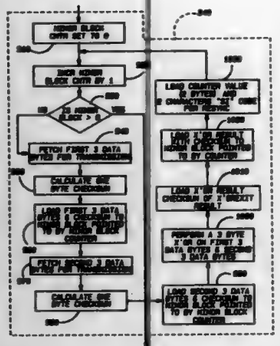
eral storage device which contains the old parity data for the location to which the new data was written;
calculating the new parity which is the Exclusive Or function of the partial parity and the old parity at the controller which receives the partial parity; and
transferring the new parity to the location in the peripheral storage device which formerly held the old parity.

5,191,585
COMPUTER NETWORKING METHOD
Juan F. Velasquez, Saline, Mich., assignor to Secom Information Products Company, Mich.
Filed Mar. 2, 1989, Ser. No. 318,124
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—53 8 Claims



1. A method of building a packet of information for transmission over a data network including the steps of:
(a) setting a minor block counter to zero,
(b) incrementing a minor block counter by one,
(c) determining if said minor block counter is greater than eight, and if said minor block counter is not greater than eight,
(d) fetching the first three data bytes for transmission,
(e) calculating a one byte check sum, and
(f) loading said first three data bytes and said check sum into a minor block pointed to by said minor block counter.

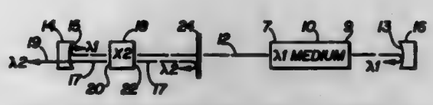
5,191,586
NARROW BAND INCOHERENT OPTICAL CARRIER GENERATOR
David R. Huber, Warrington, Pa., assignor to General Instrument Corporation, Hatboro, Pa.
Filed Jul. 18, 1991, Ser. No. 732,097
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—6 21 Claims

1. A narrow band incoherent optical carrier generator for use in optical communication systems comprising:
a superluminescent source operating below lasing threshold including a gain medium for generating incoherent spontaneous emission and having an input end and an output end;
selective reflector means for reflecting energy within a predetermined narrow band; and
input coupler means for optically coupling the input end of said gain medium to said selective reflector means to cause spontaneous emissions within said predetermined band exiting the input of said gain medium to be reflected back into said gain medium, without reflecting spontaneous emissions outside of said predetermined band back into said medium, thereby producing a narrow band incoherent optical carrier generator.

5,191,587
BLUE GENERATION AT THE H-BETA FRAUNHOFER WAVELENGTH USING NONCRITICALLY PHASE-MATCHED OPTICAL PARAMETRIC GENERATION IN LITHIUM BORATE (LiB_3O_5)
Frank Hanson, San Diego, Calif., and David Dick, Salt Lake City, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 26, 1991, Ser. No. 814,027
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—21 6 Claims

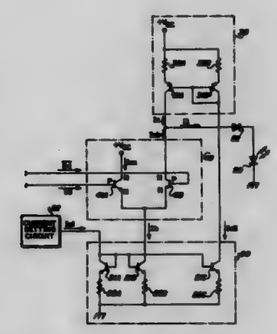
1. An apparatus for optical parametric generation from 470 to 487 nm comprising:
a source of at least a high intensity light pumping wavelength emitted in a vector k;
an optical resonator having a dichroic and an at least partially reflective mirror appropriately separated to define an optical cavity resonating at at least a wavelength from a 470 to 487 nm, said optical resonator further provided with a lithium borate crystal having a z-axis disposed in said optical cavity, said lithium borate crystal being oriented to receive said pumping wavelength at said vector k colinearly with said z-axis of said lithium borate crystal, said lithium borate crystal thereby being oriented with respect to said high intensity light pumping wavelength to achieve a noncritical phase-matching to provide for a phase-matched output generation from said 470 to 487 nm.

5,191,588
HIGH EFFICIENCY, HARMONIC WAVELENGTH LASER SYSTEM
Bruno Decqusy, Aubiere, France, assignor to Alcon Surgical, Inc., Fort Worth, Tex.
Filed Feb. 25, 1992, Ser. No. 842,018
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—22 57 Claims



1. A laser system having a linear cavity, comprising:
a. a lasing medium for producing a fundamental wavelength of radiation having a front face and a longitudinal axis;
b. a first mirror reflective of the fundamental wavelength but transmissive of a desired harmonic wavelength located in front of the laser medium along the longitudinal axis;
c. a second mirror reflective of both the fundamental wavelength and the desired harmonic wavelength located to a rear of the lasing medium along the longitudinal axis;
d. a harmonic wavelength generator responsive to the fundamental wavelength for generating the desired harmonic wavelength of radiation arranged between the front mirror and the lasing medium along the longitudinal axis; and
e. a harmonic wavelength isolator transmissive of the fundamental wavelength but reflective of the harmonic wavelength arranged between the laser medium and the harmonic wavelength generator along the longitudinal axis.

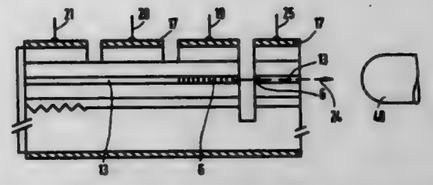
5,191,589
LASER DRIVER AND OPTICAL DISK DRIVE APPARATUS
Yoshiro Amano, Yokohama; Kazuo Hokazono, Fujisawa, and Tatsuo Shimofuse, Yamato, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 28, 1991, Ser. No. 783,793
Claims priority, application Japan, Jan. 17, 1991, 3-44574
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—38 12 Claims



1. A laser driver apparatus comprising:
a laser;
means, coupled to the laser, for supplying a first current signal;
means, coupled to the first current signal supplying means, for supplying a second current signal; and
means, coupled to the first and the second current signal supplying means, for selectively forming a first current path through which the first current signal flows into the laser or a current path through which at least a part of the first current signal flows into the second current signal supplying means.

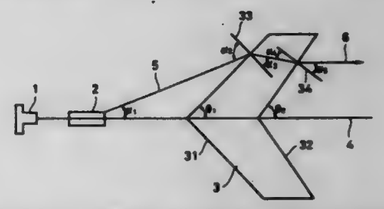
5,191,590
SEMICONDUCTOR DIODE LASER WITH MONITOR DIODE
Pieter I. Kuindersma; Tennis Van Doesgen; Gerardus L. A. H. Van Der Hofstad, all of Eindhoven, and Marcellinus B. M. Kemp, Veldhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jan. 21, 1992, Ser. No. 824,815
Claims priority, application Netherlands, Jan. 23, 1991, 9100103
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 6 Claims

1. A semiconductor diode laser with a monitor diode, comprising a semiconductor body with a substrate region and a superimposed semiconductor layer structure comprising a active layer and a pn junction with which, upon providing a sufficiently strong current in the forward bias direction of the pn junction, coherent electromagnetic radiation is generated in a strip-shaped active region of the active layer situated within a resonance cavity, which resonance cavity is bounded by two end faces which are substantially perpendicular to the active region, the radiation emerging through at least one of the end faces, the monitor diode being formed by a portion of the semiconductor body which is separated from the diode laser



by a groove which extends through the layer structure down to at least the substrate region and of which one of the walls forms an end face of the diode laser, characterized in that the groove and the monitor diode are provided at the side where the main radiation beam emerges and in that the active layer extends over at most only a small portion of the length of the monitor diode.

5,191,591
LASER WAVELENGTH CONVERTER
Sota Okamoto, and Kiyofumi Chikuma, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 12, 1991, Ser. No. 729,349
Claims priority, application Japan, Oct. 29, 1990, 2-291348
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—101 5 Claims



1. In a laser wavelength converting apparatus comprising a laser light source, an optical fiber type wavelength converter for generating a second harmonic from a laser beam emitted from the laser light source and an axicon lens for collimating the second harmonic radiated from the wavelength converter, the improvement which comprises the axicon lens having two conical surfaces, a convex conical surface on a Cerenkov radiation side and a concave conical surface on an opposite side.

5,191,592
D.C. ELECTRIC ARC FURNACE WITH CONSUMABLE AND FIXED ELECTRODE GEOMETRY
Robert A. Jeniak, Saint-Genest-Malifaux, and Nicolas Meyssen, Feurs, both of France, assignors to Clecim, Cergy Pontoise, France
PCT No. PCT/FR91/00215, § 371 Date Nov. 19, 1991, § 102(e) Date Nov. 19, 1991, PCT Pub. No. WO91/14912, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 15, 1991, Ser. No. 776,352
Claims priority, application France, Mar. 19, 1990, 90 03494
Int. Cl.[5] H05B *7/102*
U.S. Cl. 373—107 5 Claims

1. Direct current electric furnace comprising
(a) a vessel constituted by a bottom surrounded by a lateral

output signal means for forming the inverse FFT of said

values of said impedance means by a predetermined

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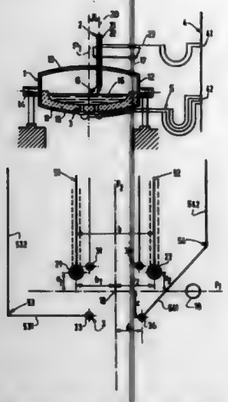
wall and covered with a removable dome-shaped lid, said vessel being symmetrical with respect to a vertical median plane P1;

(b) two consumable electrodes mounted so as to be capable of vertical displacement each at the end of a support arm extending above said dome and passing through said dome in order to enter said vessel, said consumable electrodes being separated from one another and both offset laterally on a side of said vertical median plane P1 turned towards a direct current source;

(c) at least four fixed electrodes passing through said bottom on either side of said median plane and arranged substantially at vertices of a regular polygon symmetrical with respect to said median plane, said fixed electrodes being located between vertical projections of said consumable electrodes;

(d) a direct current source comprising a negative pole and a positive pole respectively connected by conductors to said



consumable electrodes and to said fixed electrodes, the conductors of said fixed electrodes placed towards said direct current source extending directly towards said direct current source, parallel to the conductors of said consumable electrodes, and the conductors of said fixed electrodes placed on a side opposite to said source each comprising a first branch passing around a vertical projection of a corresponding consumable electrode and a second branch extending towards said source parallel to the conductors connected to said consumable electrodes; and

(e) means for loading into said vessel a metal raw material for melting of said metal raw material by production of electric arcs;

(f) said conductors connected to said consumable electrodes passing said support arm and said conductors connected to said fixed electrodes passing along a lower face of said bottom and being directed along paths determined for each fixed electrode in accordance with magnetic effects of various parts of said furnace.

5,191,593

CONFERENCE CALL FEATURE FOR SPREAD SPECTRUM CORDLESS TELEPHONE

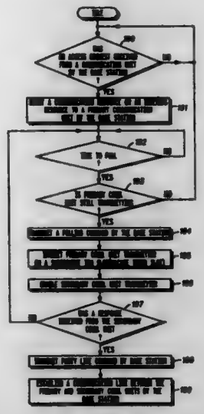
James A. McDonald, Buffalo Grove, and William F. Pickert, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1991, Ser. No. 709,014
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 **21 Claims**

21. A cordless telephone communication unit for use with a spread spectrum cordless telephone communication system allowing conference call communications between two communication units on a single indexing resource through a base site transceiver, such cordless telephone communication unit comprising:

A) means for synchronizing with and exchanging communicated messages between the communication unit and the base site transceiver on an indexing resource upon receiving a request for service from the first communication unit in response to a polling request;

B) means for transmitting a polling message to and receiving a resource request from the second communication unit by



the base site transceiver while the base site transceiver is exchanging communicated messages with the first communication unit;

C) means for synchronizing the first and the second communication units to interleaved alternate indexed resources upon receipt of the resource request from the second communication unit in response to the polling request from the base site transceiver; and

D) mean for exchanging communicating messages between the first and second communication units.

5,191,594

FADING CHANNEL SIMULATOR

Paul E. Argo, and T. Joseph Fitzgerald, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 27, 1991, Ser. No. 798,780
Int. Cl.[5] H04L *1/04*; H04B *1/10, 15/00*
U.S. Cl. 375—1 **8 Claims**

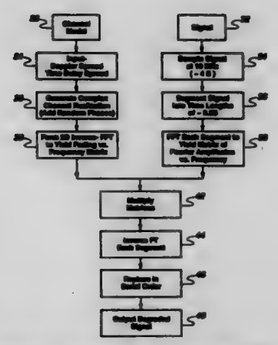
1. A fading channel simulator for affecting a transmitted radio signal with a selected channel scattering function for use in testing fading channel transmission characteristics of a receiver and transmitter in a communications system, comprising:

first transform means for receiving an analog output from said transmitter and outputting a plurality of Fast Fourier Transform (FFT) signal coefficient matrices, each said FFT matrix corresponding to one of a series of segments in a data string representing said analog output;

second transform means for receiving said selected scattering function and outputting a plurality of inverse-FFT channel realization coefficient matrices, each matrix representing successive delay-spread and Doppler-spread characteristics;

multiplication means for multiplying one of said signal coefficient matrices with one of said channel realization coefficient matrices to form an output matrix; and

output signal means for forming the inverse FFT of said output matrix and outputting a faded channel signal string



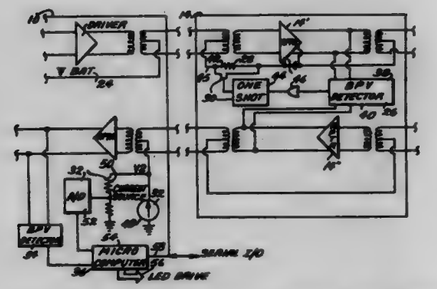
representing said received radio signal for input to said receiver.

5,191,595

T1 DIGITAL COMMUNICATIONS SYSTEM FOR IN-SERVICE DETECTION AND IDENTIFICATION OF MALFUNCTIONING REPEATERS

Jeremy E. Parsons, Emmitsburg, Md., assignor to Telecommunications Techniques Corporation, Germantown, Md.

Filed Apr. 12, 1991, Ser. No. 685,182
Int. Cl.[5] H04B *3/36*
U.S. Cl. 375—3.1 **11 Claims**



1. In a T1 digital communications system using alternate mark inversion encoding and including first terminating equipment having a substantially constant voltage D.C. electrical power source, second terminating equipment, and a plurality of signal repeaters, each repeater comprised of a plurality of signal regenerator circuits each having an input and an output and each repeater connected in duplex electrical circuit relationship between said first and said second terminating equipment and in D.C. circuit relationship with said D.C. power source and said second terminating equipment, the improvement comprising apparatus for in-service detection and identification of malfunctioning or failed said repeaters, said apparatus comprising:

first means in operative relationship with outputs of each of said regenerator circuits for detecting unintentional bipolar violations;

impedance means in series D.C. circuit relationship with said D.C. power source, with said second terminating equipment and with first predetermined of said regenerator circuits;

means in circuit relationship with said first detecting means and with said impedance means for changing impedance values of said impedance means by a predetermined amount in response to detection of unintentional bipolar violations by said first detecting means;

means in circuit relationship with said first predetermined regenerator circuits, with said impedance means and with said D.C. power source for monitoring the voltage drop across said predetermined regenerator circuits and said impedance means;

second means in operative relationship with second predetermined of said regenerator circuits for detecting unintentional bipolar violations from said second predetermined regenerator circuits; and

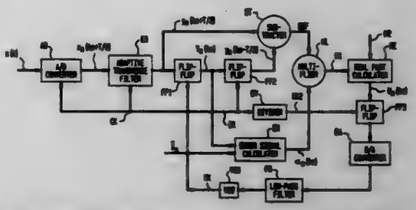
means in operative relationship with said voltage monitoring means and with said second detecting means for determining and indicating the occurrence and location of a malfunctioning said repeater.

5,191,596

APPARATUS AND METHOD FOR TIMING RECOVERY IN THE RECEPTION OF BASE BAND DIGITAL SIGNALS

Roberto Colombo, and Giambattista Di Donna, both of Milan, Italy, assignors to Siemens Telecomunicazioni S.p.A., Milan, Italy

Filed Mar. 5, 1990, Ser. No. 488,183
Claims priority, application Italy, Mar. 24, 1989, 19899 A/89
Int. Cl.[5] H04L *7/033*
U.S. Cl. 375—12 **7 Claims**



1. A method for timing recovery in receiving base band digital signals converted into a sequence of symbols having a symbol interval, said sequence of symbols being sampled by a timing signal to obtain two reconstructed signal samples per symbol interval, wherein said timing signal has a nominal period equal to half said symbol interval and is phase controlled by a control signal, wherein the control signal is derived at each sampling period by the steps of:

deriving a reconstruction error signal;

calculating the difference between the reconstructed signal samples of the preceding and the following sampling period;

obtaining said control signal by the product of said reconstruction error signal and said difference.

5,191,597

METHOD OF COMPENSATING FOR NON-LINEARITIES IN AN END AMPLIFIER INCORPORATED IN A RADIO TRANSMITTER

Björn O. P. Ekelund, and Lars A. Jonsson, both of Lund, Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 22, 1997, Ser. No. 644,442
Claims priority, application Sweden, Jan. 22, 1990, 9000219
Int. Cl.[5] H04L *27/36*
U.S. Cl. 375—60 **4 Claims**

1. In a digital quadrature-modulation radio transmitter comprising a premodulation filter for an incoming binary coded information signal to be transmitted, a modulator and a final amplifier, wherein the modulator includes: register means for storing binary values that form a signal vector whose length corresponds to an impulse response to said premodulation filter, and that represent momentary phase angles and accumu-

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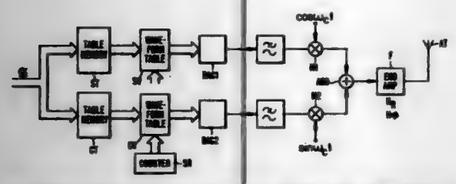
lated phase angles of said information signal; means for addressably storing and retrieving digital values of unmodified quadrature values I(t,α), Q(t,α) addressed by said signal vector; means for converting digital quadrature values to analog quadrature values; means for multiplying the analog quadrature values by sine and cosine carrier wave components; and means for summing the multiplied analog quadrature values and carrier wave components to form a quadrature-modulated radio signal r(t,α), wherein the final amplifier has an amplitude transfer function H_R and a phase transfer function H_ϕ and amplifies the quadrature-modulated radio signal r(t,α), a method of compensating in the modulator for non-linearities in the final amplifier comprising the steps of:

forming digital values R(t,α) which are absolute values of the quadrature modulated radio signal determined by said unmodified quadrature values I(t,α), Q(t,α);



retrieving, for successive values of said digital values R(t,α), first values $H_R(R)$ of the transfer function H_R and second values $H_\phi(R)$ of the transfer function H_ϕ;

storing, at respective addresses corresponding to the digital values R(t,α), said first and second values;

generating successive modified digital quadrature values i(t,α), q(t,α), each value representing a product of an inverse of a respective first value $H_R(R)$, multiplied by a sine and a cosine of a respective second value $H_\phi(R)$; and

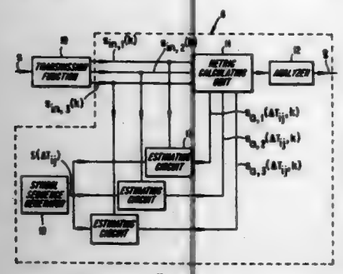
providing the successive modified digital quadrature values i(t,α), q(t,α) to the converting means instead of the unmodified digital quadrature values I(t,α), Q(t,α),

wherein the absolute value of the modified digital quadrature values i(t,α), q(t,α) is I(t,α) divided by $H_R(R)$ and whereby the amplified quadrature-modulated radio signal produced from the modified digital quadrature values is compensated for the non-linearities of the final amplifier.

5,191,598
SYSTEM FOR REDUCING THE AFFECTS OF SIGNAL FADING ON RECEIVED SIGNALS

Tomas O. Bäckström, Kista; Ragnar E. Kahre, Kävlinge, and Jan-Erik Stjernvall, Sollentuna, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 7, 1991, Ser. No. 652,419
Claims priority, application Sweden, Feb. 16, 1990, 9000566
Int. Cl.[5] H04B 7/02; H04L 1/02
U.S. Cl. 375—100 **10 Claims**



6. A system for reducing the affects of signal fading on a receiver, comprising:

plural, mutually spaced apart antennas, for receiving radio signals including a sequence of digital symbols over a communications channel;

means for sampling signals generated by said antennas;

means for generating partial estimates corresponding to and based on said antenna signals and an associated set of assumed symbols; and

means for processing said antenna signals to generate over a number of state transitions a sequence of estimated symbols corresponding to said receiving digital symbols, said processing means including:

means for calculating each state transition a set of postulates based on said antenna signals and said partial estimates;

means for determining partial confidence factors corresponding to each partial estimate and said postulates;

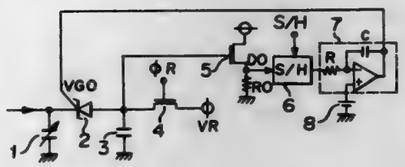
means for calculating each state transition between an old and a new state, a current confidence factor from a preceding confidence factor corresponding to said old state and weighted sum of said partial confidence factors; and

means for analyzing said current confidence factors and for selecting an optimal, current confidence factor at said transition to said new state.

5,191,599
CONTROL DEVICE FOR A CHARGE DETECTION CIRCUIT

Toshiki Seto, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 8, 1991, Ser. No. 790,588
Claims priority, application Japan, Nov. 9, 1990, 2-304396
Int. Cl.[5] H01L 29/78; G11C 19/28
U.S. Cl. 377—60 **3 Claims**



1. A control device for a charge detection circuit comprising:

a CCD final gate electrode formed on a semiconductor substrate,

an electric potential barrier forming gate electrode placed adjacent to said CCD final gate electrode,

a diffusion region formed adjacent to said electric potential barrier forming gate electrode,

a reset transistor connected to said diffusion region,

a source follower circuit which uses as an input an electric potential in said diffusion region,

a sample and hold circuit for receiving the output of said source follower circuit at a specified timing,

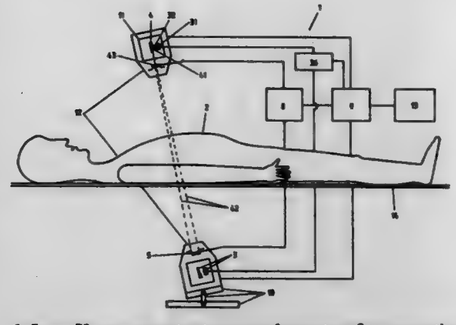
a reference voltage source which has a value determined by the dynamic range of said source follower circuit, and

an integrator which integrates a difference between the output of said sample and hold circuit and the output of said reference voltage source, and applies a value obtained by the integration to said electric potential barrier forming gate electrode.

5,191,600
X-RAY COMPUTER TOMOGRAPHY SYSTEM WITH SPLIT DETECTOR RING

Paul Vincent, Karlsruhe; Günther Laukien, Rheinstetten, and Arne Kasten, Karlsruhe, all of Fed. Rep. of Germany, assignors to Bruker Analytic, Fed. Rep. of Germany

Filed May 3, 1991, Ser. No. 695,597
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015180
Int. Cl.[5] A61B 6/03
U.S. Cl. 378—10 **29 Claims**



1. In an X-ray computer tomography system for generating an image, having a desired slice thickness, of an object, the system having an electron source for generating electrons and a stationary anode, means for applying an electric potential between the electron source and the anode to accelerate the electrons from the electron source to the anode so that the electrons collide with the anode at a focal spot and generate X-ray radiation which passes through the object, a detector responsive to the X-ray radiation for generating image signals, and means responsive to the image signals for generating the image, the improvement being that the detector is comprised of two partial detector rings mutually displaced from one another so that a gap having a width is formed between them and the tomography system comprises means for mounting the partial detector rings on either side of the focal spot so that X-ray radiation emanating from the focal spot passes through the gap, and means responsive to the desired slice thickness for moving the partial detector rings towards and away from each other in order to adjust the gap width so that substantially all of the x-ray radiation corresponding to the desired slice thickness passes through the gap and most of the radiation passing through the object is detected.

5,191,601
VIDEO PHONE UNIT

Takashi Ida, Chiba; Kazuo Ohzeki; Kenshi Dachiku, both of Tokyo; Hideyuki Ueno, Kanagawa; Toshiaki Watanabe, Kanagawa, and Yoshikuni Matsumura, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 4, 1991, Ser. No. 680,355
Claims priority, application Japan, Apr. 4, 1990, 2-88155; Mar. 7, 1991, 3-041965
Int. Cl.[5] H04N 1/42, 7/14
U.S. Cl. 379—53 **16 Claims**

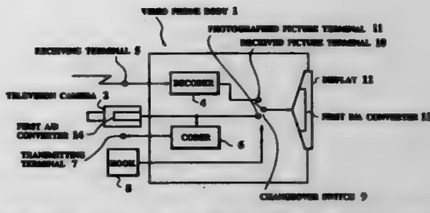
1. A video phone unit for transmitting still or moving pictures between one party and the other party, comprising:

receiving means for receiving a digital picture transmitted from the other party;

photographing means for photographing a subject to produce an analog photographed picture on the one party side, the photographing means being movable;

detecting means for detecting whether the photographing means is immobile or mobile and for generating either a first detecting signal indicating that the photographing means is in a mobile state or a second detecting signal indicating that the photographing means is immobile;

first selecting means for selecting the digital received picture transmitted from the receiving means when the second detecting signal is provided from the detecting means and for selecting the analog photographed picture transmitted from the photographing means when the first detecting signal is provided from the detecting means;



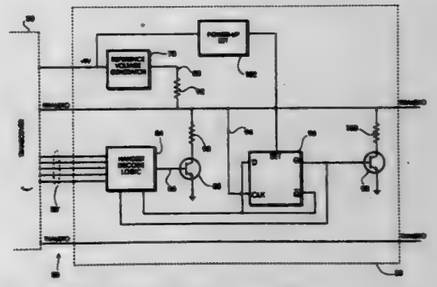
displaying means for displaying either the digital received picture or the analog photographed picture which is selected at the first selecting means; and

transmitting means for transmitting the analog photographed picture provided by the photographing means to the other party.

5,191,602
CELLULAR TELEPHONE HEADSET

Paul L. Regen, Felton, and Marv Tseu, Salinas, both of Calif., assignors to Plantronics, Inc., Santa Cruz, Calif.

Filed Jan. 9, 1991, Ser. No. 639,430
Int. Cl.[5] H04M 11/00, 1/00
U.S. Cl. 379—58 **11 Claims**



6. A cellular telephone system comprising:

a cellular telephone transceiver;

a receive line originating from said transceiver, for carrying AC voice signals from said transceiver;

a transmit line terminating at said transceiver, for carrying AC voice signals to said transceiver;

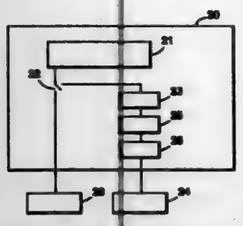
a cellular telephone handset having a handset receiver and a handset microphone;

a headset having a headset receiver and a headset microphone;

a slave unit coupled to said receive line and said transmit line and adapted to apply a coding signal to said receive line;

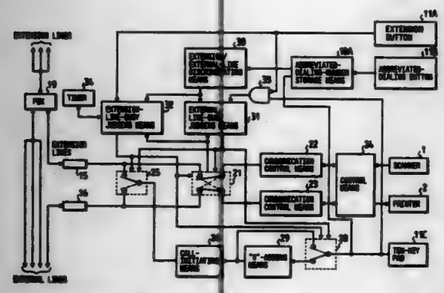
a headset control unit coupled to said receive line and said transmit line and responsive to said coding signal to cause said handset and said headset to be selectively coupled to said receive line and said transmit line.

5,191,603
MESSAGE RECEIVING APPARATUS
Oded Kafri, 3 Ehud St., Beer-Sheva, Israel
Filed Jan. 16, 1991, Ser. No. 642,081
Claims priority, application Israel, Jan. 30, 1990, 93217
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—98 10 Claims



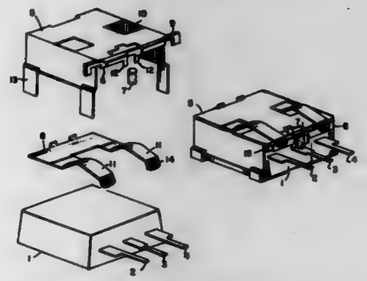
5. A printer incorporating modem means for transforming modulated fax signals received through telephone lines to sequential digital signals, buffer memory means for storing sequential signals corresponding at least to a line of print, dedicated microcircuit means for transforming sequential or linear digital information to two-dimensional or matrix digital information, and means for connecting the same selectively, through said modem, buffer memory and microcircuit means, to a telephone line or to a computer, while by-passing said modem, buffer memory and microcircuit means, so that the operation of the computer is not interrupted when a fax signal is being received.

5,191,604
COMMUNICATION APPARATUS WITH PRIVATE BRANCH EXCHANGE FOR COMMUNICATING WITH EXTENSION OR EXTERNAL STATIONS
Nobuyuki Shigeeda, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Oct. 16, 1991, Ser. No. 777,617
Claims priority, application Japan, Oct. 24, 1990, 2-284378
Int. Cl.[5] H04M *1/00, 11/00, 3/42, 3/00*
U.S. Cl. 379—161 11 Claims



1. A communication apparatus comprising an extension-line connector connected to a private branch exchange, an external-line connector connected to external lines, and a plurality of independently operable communication control units, said communication apparatus further comprising:
means for making a first judgment of whether there exists an attempt to conduct a first communication with a first external station;
means for making a second judgment of whether a second communication is being conducted with a second external station via the external-line connector;
means for providing an instruction for external-line connection to the private branch exchange via the extension-line connector, when both of the first and second judgments are affirmative; and
means for effecting the first communication with the first external station via one of the plurality of communication control units which is not in use, the extension-line connector, and the private branch exchange.

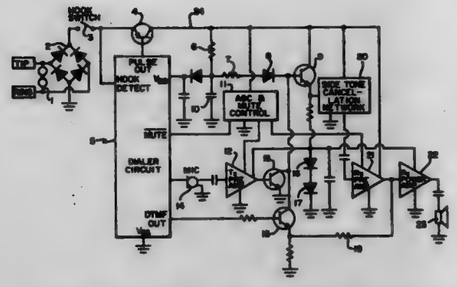
5,191,605
TELEPHONE SURGE PROTECTOR
Boyd G. Brower, Gorham, Me., assignor to GTE Control Devices Incorporated, Standish, Me.
Filed May 24, 1991, Ser. No. 705,215
Int. Cl.[5] H04M *5/00, 1/00;* H02H *9/06, 1/00*
U.S. Cl. 379—332 4 Claims



1. A telephone protector comprising:
an encapsulated bidirectional voltage sensitive switch (BVSS) having three terminals protruding therefrom, one of the terminals being a grounding terminal;
an elongated shorting bar substantially orthogonal to the three terminals;
a metal fusible pellet in direct physical contact with both the grounding terminal and the shorting bar, the metal fusible pellet acting as a spacer to keep the shorting bar spaced from the other two terminals;
spring means to impel the shorting bar into direct physical contact with said other two terminals when the metal fusible pellet has melted.

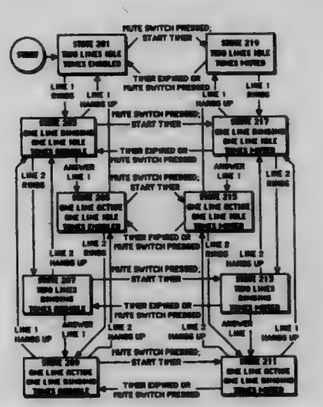
5,191,606
ELECTRICAL TELEPHONE SPEECH NETWORK
Der-Chang Juang, Portz, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed May 8, 1990, Ser. No. 520,212
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—391 2 Claims

1. An apparatus for acquiring DTMF sidetone signals in an electrical speech network, comprising:
mute control circuit means responsive to a mute signal for setting said speech network into DTMF dialing mode;
receiving preamplifier means connected to said mute control circuit means so as to be turned off thereby in a DTMF dialing mode, said receiving preamplifier having an output that becomes a high impedance in said DTMF dialing mode;
DTMF buffer amplifier receiving DTMF signals including a DTMF sidetone; and
a receiving power amplifier having a first terminal driven by said receiving preamplifier means and a second terminal driven by said DTMF buffer amplifier, said receiving power amplifier being responsive to the signals from both said receiving preamplifier means and said DTMF buffer amplifier to receive and amplify receiving signals while in



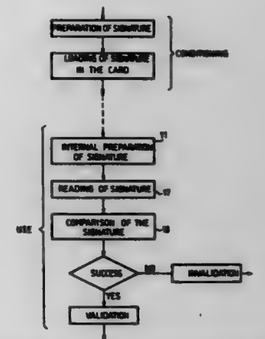
a talking state and to acquire said DTMF sidetone from said DTMF buffer amplifier in said DTMF dialing mode.

5,191,607
RING TONE MUTING WITH DISABLE
Hillel A. Meyers, Chicago, and Jim Tykal, Streamwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 594,463, Oct. 9, 1990, abandoned. This application Jan. 12, 1992, Ser. No. 898,357
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—421 15 Claims



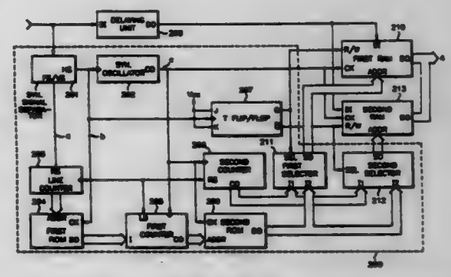
1. A communication control console center, able to receive at least two phone calls, comprising:
means for receiving a first call;
means, responsive to said first call, for generating a first set of ring tones;
means for receiving a second call during said first call;
means for generating a second set of ring tones responsive to said second call;
means for answering one of said first call and said second call;
means for muting said first set of ring tones if said second call is answered, muting said second set of ring tones if said first call is answered, and muting said first set of ring tones and said second set of ring tones if neither said first call nor said second call is answered; and
means for automatically disabling said means for muting.

5,191,608
METHOD FOR THE MANAGEMENT OF AN APPLICATION PROGRAM LOADED IN A MICROCIRCUIT MEDIUM
Francois Geronimi, Aix en Provence, France, assignor to Gemplus Card International, Geneseo, France
Filed Sep. 11, 1991, Ser. No. 757,726
Claims priority, application France, Sep. 12, 1990, 90 11293
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—4 7 Claims



1. A method for the management of an application program in a microcircuit-based medium, comprising the following steps:
preparing a first encrypted signature as a function of a secret code of the microcircuit and predetermined instructions of the program;
loading said signature into a programmable memory of the microcircuit;
loading said program into a program memory of the microcircuit;
preparing a second encrypted signature in the microprocessor of the microcircuit during the execution of said application program;
comparing the first signature to the second signature; and
allowing said program to run if the first signature equals the second signature.

5,191,609
SCRAMBLING AND UNSCRAMBLING CIRCUIT
Heun-Heui Mun, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Mar. 26, 1991, Ser. No. 674,970
Claims priority, application Rep. of Korea, Apr. 14, 1990, 1990-5208
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—14 6 Claims



1. A circuit for scrambling an input video signal, comprising:

address generating means for detecting synchronizing signals from said input video signal, and for generating therefrom a pseudo-random address and a sequential address respectively on a frame-by-frame basis; and

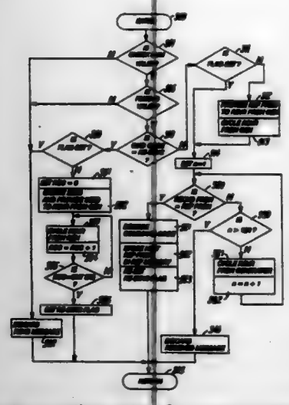
means for pseudo-randomly writing said video signal onto memory means in accordance with said pseudo-random address in a write mode, and for sequentially reading said video signal from said memory means in accordance with said sequential address in a read mode.

5,191,610

REMOTE OPERATING SYSTEM HAVING SECURE COMMUNICATION OF ENCODED MESSAGES AND AUTOMATIC RE-SYNCHRONIZATION

John P. Hill, Westland, Mich., and Alan M. Finn, Ansonia, Conn., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Feb. 28, 1992, Ser. No. 843,402
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—21 23 Claims



1. A remote operating system for remote-controlled operation of a device, comprising:

transmitting means having:

means for transmitting encoded messages, each message comprising an identification number portion and a command code portion,

command means for providing at least one command code signal, each command code signal corresponding to an operating condition of the device, said encoded message command code portion containing a command code signal,

pseudo random binary number (PRBN) generating means comprising a generator polynomial derived from a prime polynomial for generating a sequence of identification numbers, the length of said sequence of identification numbers being dependant upon the order of said prime polynomial, said encoded message identification number portion being selected as the next identification number in said sequence of identification numbers each time said transmitting means is actuated; and

receiving means, connected for communication with the device, having:

means for receiving said encoded messages,

PRBN generating means comprising a generator polynomial derived from a prime polynomial for generating a sequence of reference numbers, said receiving means PRBN generating means generator polynomial being identical to said transmitting means PRBN generating means generator polynomial, said sequence of reference numbers being identical to said sequence of identification numbers,

reference number memory means for storing the current reference number in said sequence of reference numbers,

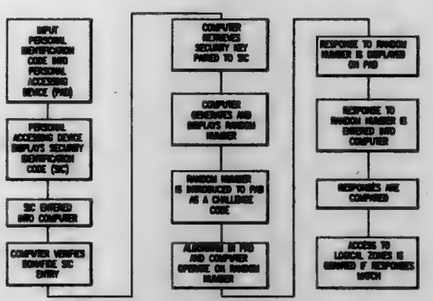
signal processing means responsive to receiving an encoded message for selecting the next reference number from said sequence of reference numbers, and responsive to there being identity between the next reference number and said encoded message identification number portion for replacing the current reference number with the next reference number in said reference number memory means, and for providing said encoded message command code portion to the device.

5,191,611

METHOD AND APPARATUS FOR PROTECTING MATERIAL ON STORAGE MEDIA AND FOR TRANSFERRING MATERIAL ON STORAGE MEDIA TO VARIOUS RECIPIENTS

Gerald S. Lang, 812 Downs Dr., Silver Spring, Md. 20904

Continuation-in-part of Ser. No. 626,409, Dec. 14, 1990, Pat. No. 5,065,429, which is a continuation of Ser. No. 358,263, May 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 331,800, Apr. 3, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 642,889
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—25 26 Claims



1. A security system for granting user entities access, according to their uniquely assigned privileges, to material stored in logical zones on any form of storage medium, and to permit user entities to manage, operate upon and communicate, as enabled by those assigned privileges, both secure and selective materials in said logical zones provided by one or more storage entities, said system comprising:

a wired or wireless communications network provided with two or more nodes, at each of which node an operation or procedure can be performed;

at least two computer processing and storage entities containing storage medium or media, each of said computer processing and storage entities connected to said communications network;

said storage entities containing storage medium or media allowing erasable or non-erasable formatting and recording with stored material into a plurality of information storage and retrieval and management control and user entity material logical zones, each of said logical zones provided with particular material therein, said storage medium or media directly provided thereon with an access management control means for indicating which of said user logical zone or zones on any of said storage medium or media the user entity will be allowed to access and perform the selective privileged operations of reading, writing, replacing, deleting, modifying and communicating based upon access request information provided to the system by the user, said access management control

means provided in each said storage medium or media at a location remote from, and non-contiguous with, said user logical zones;

means in each storage entity for selectively reading material provided in said plurality of logical zones as well as material provided in said access management control means of said storage medium or media or for selectively creating, modifying or deleting logical zones and selectively reading, writing, replacing, deleting and modifying the content of material provided in said plurality of logical zones as well as material provided in said access management control means of said storage medium or media;

a personal accessing device;

a means for providing an interface coupling for exchanging information between said personal accessing device and at least one of said computer processing and storage entities, said personal accessing device containing a security identification code to enable said personal accessing device to be in communication with any of said computer processing and storage entities for transmitting said security identification code to said computer processing and storage entities;

a means for disabling said personal accessing device if an incorrect personal identification code is entered more than a predetermined amount of times;

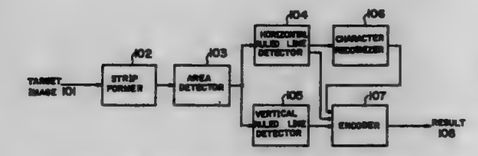
wherein said security identification code is compared or operated upon in any of said computer processing and storage entities to said access management control means provided on said storage medium or media to determine the particular user logical zone or zones to which the user is allowed access and other privileged operations.

5,191,612

CHARACTER RECOGNITION SYSTEM

Yutaka Katsuyama, and Noriyuki Fukuyama, both of Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 13, 1991, Ser. No. 668,541
Claims priority, application Japan, Mar. 13, 1990, 2-61603; Aug. 31, 1990, 2-228422; Oct. 20, 1990, 2-282633
Int. Cl.[5] G06K *9/34*
U.S. Cl. 382—9 5 Claims



1. A character recognition device for recognizing printed characters of images including ruled lines, the device comprising:

a strip forming means for creating a plurality of processing sectors in a strip form extending in a vertical direction for an image to be recognized;

a region detecting means for detecting a region representing a row by determining an upper limit and lower limit of one of a character region and a ruled line region in the respective processing sectors;

a horizontal ruled line detecting means for judging whether or not a region representing a row in the respective processing sectors detected by the region detecting means comprises a horizontal ruled line in a series of characters;

a vertical ruled line detecting means for detecting existence of a vertical ruled line in said respective processing sectors; and

a character recognizing means for recognizing said series of characters in said region representing said row judged as character series by said horizontal ruled line detecting means, wherein

said vertical ruled line detecting means is constructed to detect regions with vertically extending consecutive black picture elements in said respective processing sectors, calculate vertical histograms in the respective regions, and by judging a difference between the vertical histograms identify whether or not the respective regions represent vertical frame lines,

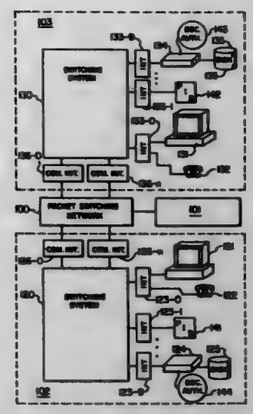
said vertical ruled line detecting means being constructed also to eliminate effects caused by broken frame lines by further vertically searching existence of vertical frame lines from end points of the respective regions in said respective processing sectors.

5,191,613

KNOWLEDGE BASED SYSTEM FOR DOCUMENT AUTHENTICATION

James M. Graziano, 4662 Weld County Rd. 34, Platteville, Colo. 80651, and Halina S. Dziewit, 5260 Centennial Trail, Boulder, Colo. 80302

Division of Ser. No. 615,029, Nov. 16, 1990. This application Nov. 15, 1991, Ser. No. 792,904
Int. Cl.[5] H04L *9/32*
U.S. Cl. 380—25 18 Claims



1. In a data processing system that includes a processor, at least one data terminal and at least one data communication port, a document authentication system comprising:

means for interconnecting said at least one data terminal with said processor;

means, responsive to a first user activating said at least one data terminal to transmit a document origination signal from said at least one data terminal via said interconnecting means to said processor, for transmitting a document, identified by said document origination signal, from said processor to a second user via said data communication port;

means, responsive to receipt of a document authentication signal transmitted to said processor by said second user to acknowledge acceptance of said document by said second user, for comparing said received document authentication signal with said document to determine whether said received document authentication signal contains document acknowledgement data that matches corresponding data in said document, including:

means for identifying differences between said document acknowledgement data contained in said received document authentication signal and said corresponding data in said document,

means for storing data indicative of a set of predetermined thresholds, each threshold in said set of thresholds corresponding to a maximum allowable variation in one of said corresponding data in said document,

means for indicating a match between said received docu-

VOL 1148 ISS 1 MR 2 1993

ment acknowledgement data and said document when said identified differences do not exceed said maximum allowable variation for each of said corresponding data; and

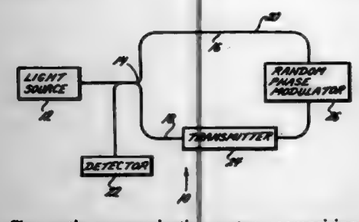
means responsive to said comparing means determining a match between said received document authentication signal and said corresponding data in said document for authenticating said document.

5,191,614

SECURE COMMUNICATION SYSTEM

Phung LeCong, Buena Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 14, 1988, Ser. No. 274,368
Int. Cl.[5] H04L *9/18*
U.S. Cl. 380—49 **5 Claims**



1. A fiber optic communication system, comprising:

a) a light source means for inputting a beam of light into a first optical fiber;

b) a beamsplitting means for splitting the light beam into counterpropagating beams connected to the first optical fiber having one output connected to a detector and second and third outputs for generating clockwise and counterclockwise beams respectively;

c) an optical fiber loop having one end connected to the second output of the beamsplitting means for receiving a light beam propagating in a clockwise direction and the other end of the optical fiber loop connected to the third output of the beamsplitting means for receiving a light beam propagating in a counterclockwise direction;

d) a signaling means connected to the optical fiber loop for modulating an intelligence signal on the counterpropagating light beams;

e) a random phase modulating means connected to the optical fiber loop at its midpoint for modulating a random signal on the counterpropagating light beams; and

e) an electrical circuit means connected to the detector for demodulating the light beams detected to receive the intelligence signal.

5,191,615

INTERRELATIONAL AUDIO KINETIC ENTERTAINMENT SYSTEM

Michael B. Aldava, Tehachapi, and Hazen L. MacIntyre, Woodland Hills, both of Calif., assignors to The Drummer Group, Woodland Hills, Calif.

Filed Jan. 17, 1990, Ser. No. 466,507
Int. Cl.[5] H04H *5/00; 7/04;* A63H *3/28*
U.S. Cl. 381—3 **42 Claims**

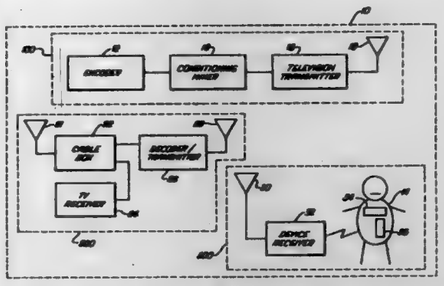
1. An interrelational audio-kinetic entertainment system for providing real time simultaneous program synchronized audio-kinetic movements in a remotely located audible kinetic device, the audible kinetic device of the type moveable in response to kinetic signals and audible in response to an audible signal, comprising:

means for generating a device-driving audio and kinetic signal complex in real time simultaneous synchronization with, yet distinguishable from an audiovisual program signal;

means for transmitting the device-driving audio and kinetic signal complex to a location whereby the device-driving audio and kinetic signal complex as utilized by an audible kinetic device maintains real time simultaneous synchronization with the audiovisual program signal;

means at said location for performing an audiovisual program in response to the audiovisual program signal; and

means independent of the performance of the audiovisual



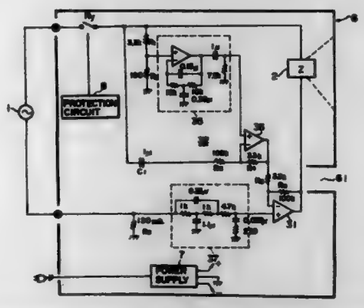
program for receiving the transmitted device-driving audio and kinetic signal complex and applying a decoded device-driving audio and kinetic signal complex responsive to the received device-driving audio and kinetic signal complex to an audible kinetic device for causing real time simultaneous program synchronized sound and motion of an audible kinetic device.

5,191,616

ACOUSTIC APPARATUS

Kenji Yokoyama, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 27, 1990, Ser. No. 634,606
Claims priority, application Japan, Dec. 29, 1989, 1-344500
Int. Cl.[5] H03G *5/00;* H04R *3/00;* H03F *21/00*
U.S. Cl. 381—98 **9 Claims**



1. An acoustic apparatus for supplying a specific frequency band of a driving signal to a loudspeaker unit having a pair of input terminals, to electro-acoustically transducer comprising:

a first driving system for supplying the entire driving signal to one input terminal of said loudspeaker unit; and

a second driving system for removing frequency components corresponding to the specific frequency band from the entire driving signal and producing a modified driving signal, the second driving system supplying the modified driving signal to the other terminal of said loudspeaker unit, wherein said second driving system includes a driving amplifier for driving said loudspeaker unit, a current detection means for detecting a current flowing through said loudspeaker unit, and a feedback means for feeding back the detected current to said driving amplifier;

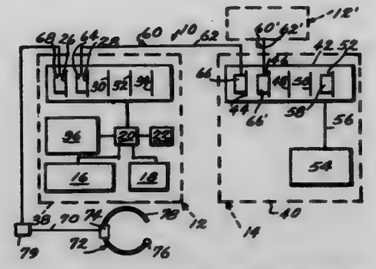
whereby a voltage signal corresponding to the specific frequency band is provided between the pair of input terminals of the loudspeaker.

5,191,617

VOICE INTERACTIVE COMPUTER SYSTEM

P. Stanley Bolin, and Reginald B. Mason, both of Midwest City, Okla., assignors to Intechnics International, Inc., Midwest City, Okla.

Continuation of Ser. No. 423,628, Oct. 18, 1989, abandoned, which is a continuation of Ser. No. 40,512, Apr. 20, 1987, abandoned. This application Jun. 22, 1990, Ser. No. 543,964
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—51 **5 Claims**



1. An interactive instruction apparatus comprising:

video display means for presenting video messages selected to exercise student reading and comprehension skills;

audio output means for presenting audio messages selected to exercise student listening skills;

audio input means for receiving audio responses selected to exercise student speaking skills;

text input means for receiving text responses selected to exercise student writing skills;

student speech reproduction means for receiving, digitizing and reproducing a student speech response;

reference response generation means for generating a reference speech response from a digital recording;

exercising generating means for generating a series of exercises, said exercises comprising: the presentation of video messages through the video display means, the presentation of audio messages through the audio output means, the reception of text responses through the text input means and the reception of audio responses through the audio input means,

at least one of said exercises including a message for prompting a student speech response, an interactive period during which the student speech reproduction means receives and reproduces a student speech response and the reference response generation means generates a reference response in comparative relation with the student response, thereby allowing the student to compare the student speech response with the reference speech response; and

exercise control means responsive to the student for either 1) autonomously signaling the exercise generating means to generate an exercise, or alternatively 2) signaling the exercise generating means to repeat an interactive period.

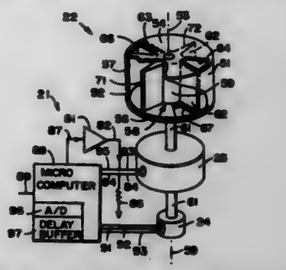
5,191,618

ROTARY LOW-FREQUENCY SOUND REPRODUCING APPARATUS AND METHOD

Bradner L. Hisey, 19325 Athos Pl., Saratoga, Calif. 95070

Filed Dec. 20, 1990, Ser. No. 632,047
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—158 **39 Claims**

1. A rotary acoustic transducer apparatus for producing sound in response to an applied audio signal, comprising a rotary acoustic radiator assembly, a torque motor, a position sensor, and a microcomputer, said rotary acoustic radiator assembly comprising a generally cylindrical means with a cylindrical sidewall and end walls forming a cylindrical chamber having an axis, a shaft, bearings mounting said shaft in said cylindrical means for rotation about said axis, a cylindrical hub secured to said shaft and extending between said end walls, movable vanes secured to said shaft, said shaft, said hub, and said movable vanes forming a rotor assembly, stationary vanes mounted in said chamber between said moving vanes and extending between said cylindrical sidewall and said hub and between said end walls, said cylindrical means having ports



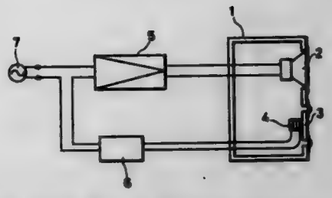
opening through the walls of said cylindrical chamber to direct air flow into and out of the cylinder in response to movement of the movable vanes, a torque motor coupled to the shaft applying rotational reciprocating movement to the rotor assembly, a position sensor for ascertaining the position of said rotor assembly, and means coupling said microcomputer to said torque motor and to said position sensor to control the operations of said torque motor by applying a drive signal in accordance with the applied audio signal and corrections thereto derived by said microcomputer.

5,191,619

BASS ENHANCING DEVICE FOR A SPEAKER SYSTEM

Toru Hayase, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1991, Ser. No. 646,277
Claims priority, application Japan, Feb. 7, 1990, 2-27687
Int. Cl.[5] H04R *3/00*
U.S. Cl. 381—96 **7 Claims**



1. A bass enhancing device for a speaker system, comprising:

amplifying means for amplifying an alternating current that includes a sound signal;

speaker unit means for emitting sound waves, being driven according to a signal current released by the amplifying means;

a bass enhancing member that enhances bass range sound waves by resonating with a bass range resonant frequency differing from a frequency at which the amplitude of vibration speed of the speaker unit means becomes largest, the bass enhancing member being driven by the sound waves emitted by the speaker unit means;

vibration detecting means, included in the bass enhancing member, for detecting vibrations of the bass enhancing member and for releasing a detecting current; and

feedback means for further amplifying the signal current

released by the amplifying means by positive feed back of the detecting current released by the vibration detecting means to the amplifying means.

5,191,620

METHOD FOR CONTROLLING VOLUME LEVEL OF SOUND FOR A DISPLAY

Sang-Su Lee, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 30, 1990, Ser. No. 516,533
Claims priority, application Rep. of Korea, Oct. 5, 1989, 89-14486
Int. Cl.[5] H03G *3/00*
U.S. Cl. 381—105 11 Claims

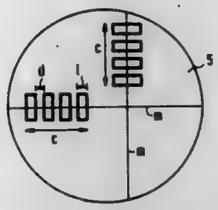
1. A process for controlling and displaying a volume level of an audio sound having a MICOM for receiving a key-input signal transmitted from a transmitter and/or a key-matrix, comprising the steps of:
providing a pulse width modulated signal having six-bits corresponding to a range of 2^n volume levels where n is a positive integer, with said range extending from a minimum volume level through a maximum volume level of sixty-four;
converting said pulse width modulated signal into a DC level to control said level;
providing an On-Screen Display for displaying a plurality of bars indicative of sixty-four volume levels of said audio sound to enable controlling of said volume level of audio sound;
performing an input discrimination routine for discriminating the key-input signal transmitted from the transmitter and/or the key-matrix;
performing an increment routine to increase said volume level and controlling the On-Screen Display when the key-input signal is an up-volume signal;
performing a decrement routine to decrease said volume level and controlling the On-Screen Display when the key-input signal is a down-volume signal; and
performing a state display routine for displaying the plurality of bars on the On-Screen Display controlled by one of the increment routine and the decrement routine, for a predetermined time period to provide a first visual display varying over 2^n levels representing a plurality of levels of volume within said range if said decrement routine does not reduce said volume level to below a minimum value, and to provide a second visual display when said decrement routine reduces said volume level to zero and for subsequent removing the plurality of bars from the On-Screen Display after said predetermined time period.

5,191,621

METHOD AND DEVICE FOR DETERMINING A MODULATION TRANSFER FUNCTION OF A DIGITAL IMAGING SYSTEM

Marius Brok, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 3, 1991, Ser. No. 709,665
Claims priority, application Netherlands, Jun. 5, 1990, 9001265
Int. Cl.[5] G06K *9/00*; G01D *18/00*
U.S. Cl. 382—1 8 Claims



3. A method of determining a modulation-transfer function of an imaging system in which a beam of radiation from a radiation source is incident on an input surface of a detector of signal values of picture elements corresponding to the spatial distribution of the incident radiation, comprising:
positioning a test object in said beam at a location intermediate said source and said input screen to modulate the spatial distribution of radiation incident upon said input surface, said test object comprising a series of equally spaced apart block elements, said series of block elements producing alternate ascending and descending edges in the distribution, along a picture line directed across said series of block elements, of the intensity of radiation incident upon said input surface;
detecting, with said detector, the signal values of consecutive picture elements along said picture line;
differencing the signal values of successive pairs of adjoining picture elements along said picture line to determine derivative values;
Fourier transforming the derivative values of a predetermined same polarity;
determining a sequence of local maxima from the Fourier transformed derivative values of the predetermined same polarity; and
determining a modulation-transfer function from an envelope of said sequence of local maxima.

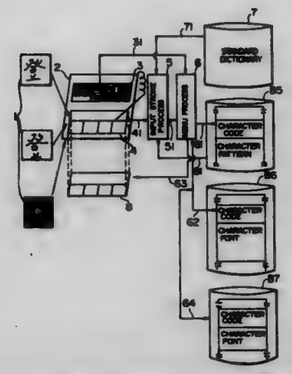
5,191,622

HAND-WRITTEN CHARACTER RECOGNITION APPARATUS WITH A PERSONAL DICTIONARY PREPARATION FUNCTION

Hiroshi Shojima, Hitachi; Soshiro Kuzunuki, Katsuta; Yasushi Fukunaga, Hitachi; Toshikiko Matsuda, Owariasahi; Toshio Takekoshi, Isehara; Masaki Miura, Hitachi; Junko Mori, Hitachi, and Toshimi Mifune, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,265
Claims priority, application Japan, Jul. 17, 1987, 62-176981; Jul. 17, 1987, 62-176982; Aug. 12, 1987, 62-199815; Mar. 18, 1988, 63-63337
Int. Cl.[5] G06K *9/62*
U.S. Cl. 382—13 6 Claims

1. A hand-written character recognition apparatus with a personal dictionary preparation function in which personal character patterns and character codes for characters are registered in pairs, comprising:
input means for time-serially inputting hand-written character data;
character recognition means for comparing the input hand-written character data from said input means with a standard dictionary of character data to recognize a most similar character pattern;
display means for displaying a display font corresponding to the recognized character pattern; and
personal dictionary storage means for registering personal character data and character codes for personal characters in pairs, said character recognition means including



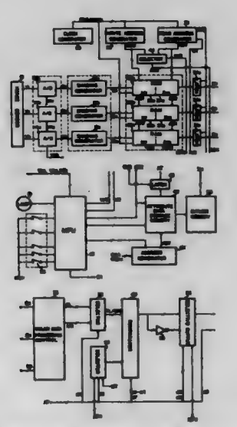
means for comparing inputted hand-written person character data of a character to be registered with said standard dictionary to recognize a similar character pattern, and means for selecting a code of the recognized character pattern as a character code of the personal character to be registered and for storing the personal character data and selected character code as a pair in said personal dictionary storage means.

5,191,623

IMAGE READING AND PROCESSING APPARATUS

Shigeru Moriya, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 296,798, Jan. 12, 1989, Pat. No. 5,048,114.
This application Jun. 19, 1991, Ser. No. 717,795
Claims priority, application Japan, Jan. 14, 1988, 63-7281; Mar. 3, 1988, 63-50946; Mar. 3, 1988, 63-50947
Int. Cl.[5] G06K *9/20*
U.S. Cl. 382—61 18 Claims



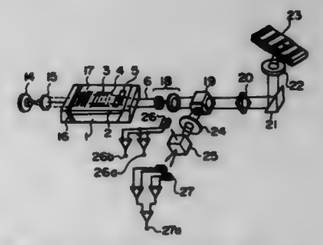
1. In an image editing apparatus used with an image reading apparatus which outputs image data of an original in an editorially modified form, an image editing method comprising the steps of:
electronically reading an original at a first magnification ratio;
establishing edit data corresponding to the image data which is produced when the original is read at the first magnification ratio by the image reading apparatus, wherein said edit data is indicative of the output form of the image data and is electrically stored in a memory;
electronically reading the original at a second magnification ratio by the image reading apparatus, said second magnification ratio being different from the first magnification ratio;
fetching said edit data from the memory in synchronization with the reading of the original at the second magnification ratio, and
modifying the image data of the original read at the second magnification ratio on the basis of said edit data fetched from the memory.

5,191,624

OPTICAL INFORMATION STORING APPARATUS AND METHOD FOR PRODUCTION OF OPTICAL DEFLECTOR

Kenchi Ito; Kazumi Kawamoto, both of Yokohama; Naoya Kanda, Yokosuka; Yasuo Hira, Yokohama; Hideaki Sato, Yokohama; Atsuko Fukushima, Yokohama; Masataka Shiba, Yokohama; Akira Inagaki, Yokohama, and Minoru Yoshida, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1991, Ser. No. 762,935
Claims priority, application Japan, Sep. 19, 1990, 2-247264; Oct. 19, 1990, 2-278983
Int. Cl.[5] G02B *6/00*, *6/36*
U.S. Cl. 385—7 18 Claims



1. A collinear optical deflector comprising:
an optical waveguide including an optical substrate which serves as either an optical substrate having anisotropy of refractive index to exhibit an ordinary refractive index n_{o1} and an extraordinary refractive index n_{e1} or an isotropic optical substrate exhibiting $n_{o1}=n_{e1}$ and an optical thin-film optical waveguide layer formed on said optical substrate and serving as either an optical thin-film optical waveguide layer having anisotropy of refractive index to exhibit an ordinary refractive index n_{o2} and an extraordinary refractive index n_{e2} or an isotropic optical thin-film optical waveguide layer exhibiting $n_{o2}=n_{e2}$, wherein the two ordinary refractive indexes n_{o1} and n_{o2} lie in or are for the same direction and the two extraordinary refractive indexes n_{e1} and n_{e2} lie in or are for the same direction; and
an electrode formed on said optical thin-film optical waveguide layer for generating a surface acoustic wave which propagates in a direction opposite to a propagation direction of a laser beam propagating in said optical thin-film optical waveguide layer and causes the laser beam to be delivered out of said optical thin-film optical waveguide layer in a direction which makes an angle θ to the surface of said optical thin-film optical waveguide layer,

wherein said optical waveguide is formed such that

$$n_{01}\sin\theta < \sqrt{n_{c2}^2 - n_{01}^2} \text{ or}$$

$$n_{e1}\sin\theta < \sqrt{n_{e2}^2 - n_{e1}^2}$$

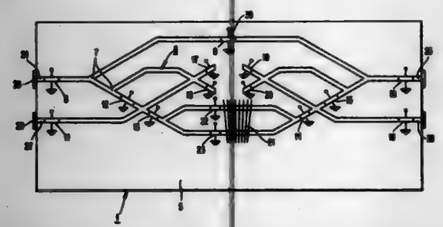
where n_{o1} is the ordinary refractive index that said optical substrate exhibits for an ordinary beam, n_{e1} is the extraordinary refractive index that said optical substrate exhibits for an extraordinary beam, n_{o2} is the ordinary refractive index that said optical thin-film optical waveguide layer exhibits for the ordinary beam and n_{e2} is the extraordinary refractive index that said optical thin-film, optical waveguide layer exhibits for the extraordinary beam.

5,191,625

TERMINAL FOR A FREQUENCY DIVIDED, OPTICAL COMMUNICATION SYSTEM

Mats B. Gustavsson, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 10, 1992, Ser. No. 866,495
Claims priority, application Sweden, Apr. 10, 1991, 9101077
Int. Cl.[5] G02B *6/12*; G02F *1/00*; H01S *3/19*
U.S. Cl. 385—14 4 Claims



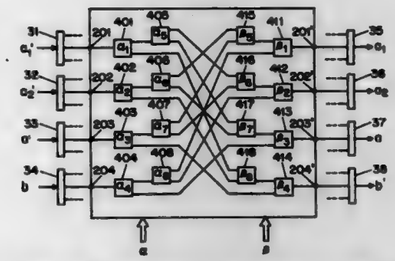
1. A terminal for a frequency-divided, optical communications system on a common semiconductor substrate, the terminal comprising:
- a plurality of connections to the communication system;
- a transmission waveguide extending between said connections and including at least one laser diode;
- an extended optical cavity formed as a waveguide having a plurality of reflecting end surfaces, said cavity having at least one laser diode provided with a wavelength grating, the wavelength of said laser diode being tunable around the grating wavelength, and having at least one connecting waveguide provided with at least one laser diode which connects the cavity with at least one of said connections; and
- a coherent light detector for phase-correct detection of a light signal, said light detector being connected to the cavity and to one of said connections, and said light detector having at least one laser diode for comparing the incoming light signal with a light wave of desired wavelength generated in the cavity, wherein all of said laser diodes can be switched between light-absorbing, light-amplifying and light-transmitting modes with the aid of control signals.

5,191,626

OPTICAL COMMUNICATIONS SYSTEM AND METHOD

Thomas E. Stern, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Apr. 22, 1991, Ser. No. 689,450
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 28 Claims



1. An optical communications system comprising a first plurality of optical communications links, a second plurality of optical communications noes, and a third plurality of optical communications stations,
- each of the plurality of optical communications stations comprising at least one optical receiver and at least one optical transmitter, and being connected to one of the plurality of optical communications nodes by means of one of the plurality of optical communications links,
- each of the plurality of optical communications nodes being connected to at least one other of the plurality of optical communications nodes by means of one of the plurality of optical communications links, and comprising controllable optical-power divider-combiner means comprising optical input ports and optical output ports to which optical communications links are connected,
- said controllable optical-power divider-combiner means being adapted to distribute optical signals arriving at said input ports to said output ports such that optical power is essentially linearly divided and combined from said input ports to said output ports in accordance with a prescribed linear combination rule, and
- said system comprising control means for setting said linear combination to establish desired optical communications paths between communications stations.

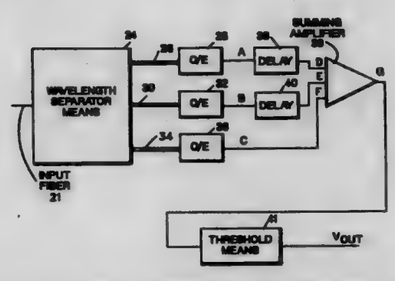
5,191,627

REDUCTION OF INTERSYMBOL INTERFERENCE IN OPTICAL FIBER SYSTEMS BY WAVELENGTH FILTERING

Lee C. Hans, Raleigh; Mitchell L. Loeb, Durham, and George R. Stillwell, Jr., Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1990, Ser. No. 586,644
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 15 Claims

1. An improved fiber optic communication network comprising:
- a transmitter;
- an illumination means, operatively positioned in said transmitter, said illuminating means generating optical pulses representative of data;
- a fiber optic link coupled to the transmitter and operable for transmitting the optical pulses;
- a receiver coupled to the fiber optic link;
- a first means, operatively positioned within said receiver, said first means receiving the optical pulses and separating each pulse into a plurality of optical pulse trains;
- second means responsive to each of the optical pulse trains for converting each optical pulse train into an electrical pulse train;
- third means for delaying selected ones of the electrical pulse train; and



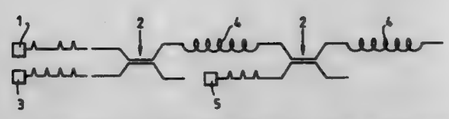
- fourth means for recombining the pulse trains into a single pulse.

5,191,628

OPTICAL AMPLIFIERS

Kevin C. Byron, Bishop's Stortford, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1991, Ser. No. 783,824
Claims priority, application United Kingdom, Nov. 9, 1990, 9024393
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—27 5 Claims



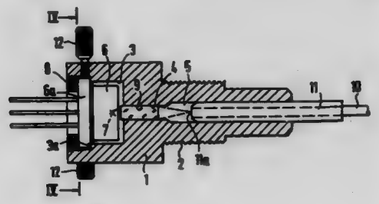
1. A fibre Raman amplifier for soliton systems comprising a length of optical fibre capable of transmitting solitons, means for providing and coupling a soliton stream to one end of the fibre, and means for providing and coupling a pulsed pump signal to said one end of the fibre, the solitons and the pulsed pump signal being such that Raman amplification of the solitons takes place during transmission along the fibre.

5,191,629

LASER MODULE

Manfred Kaiser, Hemmingen, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 21, 1991, Ser. No. 672,891
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009380
Int. Cl.[5] G02B *6/42*
U.S. Cl. 385—90 5 Claims



1. A laser module comprising
- a rotationally symmetric housing defining a central axis, said housing being of one-piece construction and made of metal,
- an axially symmetric recess at one end of the housing and disposed concentrically about said central axis,
- a cylindrical bore at a second end of the housing and also disposed concentrically about said central axis,
- an encased semiconductor laser inside said recess and with a slightly smaller diameter than said recess,
- an optical waveguide extending from the second end of the housing and having a front end fixed inside said cylindrical bore,
- a magnifying lens axially centered in the housing between the semiconductor laser and the optical waveguide, and
- means for positioning the laser in alignment with the central axis of the housing, said means further comprising
- three actuators arranged radially at approximately 120° from each other with each directed toward the central axis and in contact with the encased semiconductor laser, whereby a precise and stable adjustment of the encased semiconductor laser relative to the imaging lens may be achieved without soldering or welding.

5,191,630

NONLINEAR OPTICAL DEVICE FOR CONTROLLING A SIGNAL LIGHT BY A CONTROL LIGHT

Kazuhito Tajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 22, 1991, Ser. No. 688,391
Claims priority, application Japan, Apr. 20, 1990, 2-104943; Feb. 19, 1991, 3-24228
Int. Cl.[5] G02F *1/28, 1/015*; G02B *6/10*
U.S. Cl. 385—122 7 Claims

1. A nonlinear optical device for controlling a signal light by a control light, comprising:
- a waveguide region comprising an optical material having a third order nonlinear optical constant ($X^{(3)}$), said waveguide region being supplied with said signal light having a first predetermined wavelength and said control light having a second predetermined wavelength shorter than said first predetermined wavelength such that electrons and holes are generated in said waveguide region by said control signal; and
- means for applying an electrostatic field to said waveguide region, said electrons and said holes being swept from said waveguide region by said electrostatic field.

5,191,631

HYBRID OPTICAL FIBER AND METHOD OF INCREASING THE EFFECTIVE AREA OF OPTICAL TRANSMISSION USING SAME

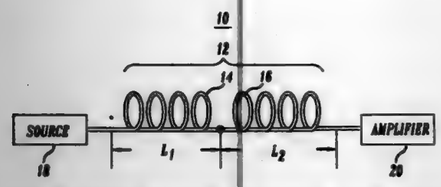
Robert L. Rosenberg, Fair Haven, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1991, Ser. No. 810,625
Int. Cl.[5] G02B *6/10*; G02F *1/00*
U.S. Cl. 385—123 19 Claims

1. A hybrid optical fiber, comprising:
- a first fiber segment having a first effective area and a first fiber dispersion characteristic at a predetermined operating wavelength;

a second fiber segment coupled to the first fiber segment to form the hybrid fiber, the second fiber segment having a second effective area and a second fiber dispersion characteristic at the predetermined operating wavelength, wherein the first effective area is substantially larger than the second effective area and the second fiber dispersion characteristic is substantially lower than the first fiber dispersion characteristic so that the hybrid fiber has a length-weighted fiber dispersion characteristic and a third effective area which is greater than the second effective area.

8. A method for increasing the effective area of optical transmission fiber, comprising the steps of:



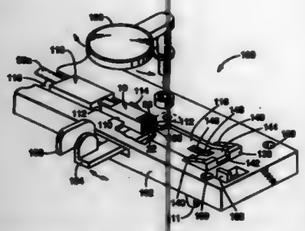
forming a hybrid fiber comprising a first fiber segment having a first predetermined effective area and a first fiber dispersion characteristic at a predetermined operating wavelength, and a second fiber segment with a second predetermined effective area and a second fiber dispersion characteristic at the predetermined operating wavelength, said first predetermined effective area being substantially larger than said second predetermined effective area, so that the hybrid fiber has a length-weighted fiber dispersion characteristic and a third effective area which is greater than the second effective area; and

coupling the hybrid fiber to a light source such that the first fiber segment is adjacent to the source.

5,191,632
SPLICE ACTUATOR TOOL

Charles M. Mansfield; Raymond J. Kasteus, both of Austin, and Donald K. Larson, Cedar Park, all of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 20, 1991, Ser. No. 763,112
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—134 20 Claims



15. A splice actuator tool for actuating an optical fiber splice having an actuation element which moves longitudinally within the splice, the apparatus comprising:

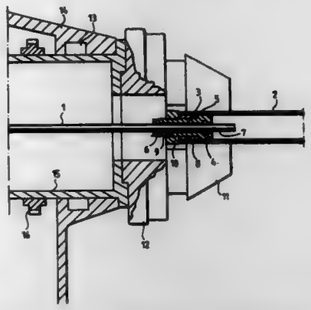
a base having upper and lower surfaces, a central recess in said upper surface, an opening in said recess, and first and second channels in said upper surface, each of said channels being parallel to and aligned with said recess, said first channel being adjacent a first end of said recess, and said second channel being adjacent a second end of said recess;

a lever pivotally attached to said lower surface of said base, having a stud member passing through said opening in said base, said stud member moving essentially parallel to said recess when said lever is pivoted.

5,191,633
CONNECTOR FOR OPTICAL FIBER PREFORMS

Hans-Karl von Bagh, Porvoo, Finland, assignor to Nokia Kaapeli Oy, Helsinki, Finland

PCT No. PCT/FI90/00191, § 371 Date Mar. 20, 1992, § 102(e) Date Mar. 20, 1992, PCT Pub. No. WO91/04950, PCT Pub. Date Apr. 18, 1991
PCT Filed Aug. 9, 1990, Ser. No. 842,111
Claims priority, application Finland, Oct. 5, 1989, 894727
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—147 2 Claims



1. A connector to be used in the production of optical fibre preforms for connecting a process gas and steam supply pipe (1) rotatably to a silica tube (2) to be formed into a preform, comprising a generally cylindrical body part (3) provided with a through-going bore for the supply pipe (1), said bore comprising one or more annular expansions for a ring seal or ring seals (6, 7) sealing the supply pipe (1) with respect to the body part (3), characterized in that one end of the body part (3) is expanded to form an abutment for a ring seal (5) sealing the body part (3) against the inside of the silica tube (2), the connector further comprising a tightening means (8, 10) for pressing the ring seal (5) sealing the body part with respect to the silica tube (2) against its abutment to expand the seal radially.

5,191,634
SCREW PLUG IMMERSION HEATER COMPRISING SEPARATE HEADER AND THREADED SLEEVE SECTIONS

Nicholas Couch, Huddersfield, England, assignor to Wellman Thermal Systems Corporation, Shelbyville, Ind.

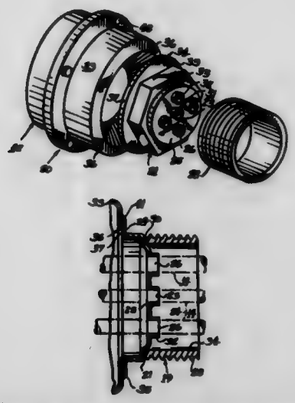
Filed Jan. 11, 1991, Ser. No. 640,186
Int. Cl.[5] H05B *3/78*
U.S. Cl. 392—501 9 Claims

1. An immersion heater for heating fluids, comprising:

a header unit stamped from a metal plate, said header unit comprising a central plate having a plurality of openings therethrough and a head portion projecting from the central plate, the head portion having at least one pair of opposed flattened regions to be gripped by a tool;

at least one heater element projecting through the openings in the central plate and secured to the central plate;

a threaded sleeve formed of a separate piece of metal from the metal plate and having a screw thread on the exterior surface of the sleeve; and

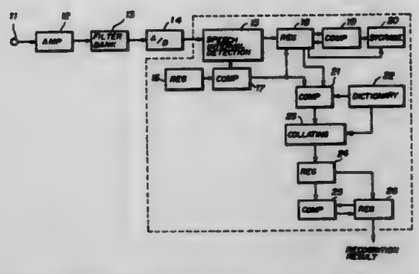


means joining the sleeve to the metal plate surrounding the central plate whereby a fluid-tight chamber is formed from an interior surface of the sleeve and the metal plate.

5,191,635
PATTERN MATCHING SYSTEM FOR SPEECH RECOGNITION SYSTEM, ESPECIALLY USEFUL FOR DISCRIMINATING WORDS HAVING SIMILAR VOWEL SOUNDS

Junichiroh Fujimoto, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 593,798
Claims priority, application Japan, Oct. 5, 1989, 1-261104; Mar. 5, 1990, 2-53017; May 14, 1990, 2-123746
Int. Cl.[5] G10L *5/00*
U.S. Cl. 395—2 17 Claims



1. A pattern matching system especially suitable for a speech recognition apparatus, said pattern matching system comprising:

dictionary means for storing standard speech patterns, each of said standard speech patterns being stored in said dictionary means with two or more different pattern lengths;

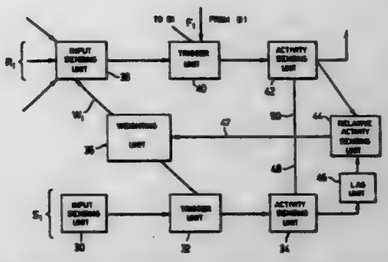
converting means for converting an input speech pattern which has an arbitrary pattern length into at least one converted speech pattern which has one of the pattern lengths with which the standard speech patterns are stored in said dictionary means depending on said arbitrary pattern lengths; and

collating means for collating the converted speech pattern with the standard speech patterns stored in said dictionary means to obtain a standard speech pattern which has a largest degree of similarity to the converted speech pattern.

5,191,636
CONTROL SYSTEM WITH TWO LEVEL SENSOR SYSTEM

Janet R. P. Halperin, 75 Wembly Rd., Toronto, Ontario, Canada M6c 2G3

Filed Sep. 25, 1990, Ser. No. 587,913
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—22 19 Claims



1. A control system for initiating an action in response to a plurality of variably weighted inputs, comprising:

(a) means for receiving a plurality of first input signals;

(b) means for applying a weighting to the first input signals;

(c) trip means for receiving the weighted first input signals, summing the signals and being activated to produce a trip signal when the sum of the weighted first input signals reaches a predetermined threshold level;

(d) means for initiating a first active state on receiving the trip signal;

(e) means for receiving a second input signal on initiation of the first active state;

(f) means for initiating a second active state when the second input signal reaches a predetermined threshold level, initiation of said second active state suppressing the first active state;

(g) means for timing the delay between the production of the trip signal and the suppression of the first active state; and

(h) means for modifying the weighting applied to the first input signals as a function of said delay.

5,191,637
NEURON UNIT AND NEURON UNIT NETWORK

Toshiyuki Furuta; Hiroyuki Horiguchi, and Hirotoshi Eguchi, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 530,404, Jul. 10, 1990. This application Mar. 24, 1992, Ser. No. 856,644
Claims priority, application Japan, Jul. 12, 1989, 1-179629; Mar. 12, 1990, 2-60739; Mar. 16, 1990, 2-67937
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—27 9 Claims

1. A neuron unit for simultaneously processing a plurality of binary input signals and for outputting an output signal which is indicative of a result of the processing, said neuron unit comprising:

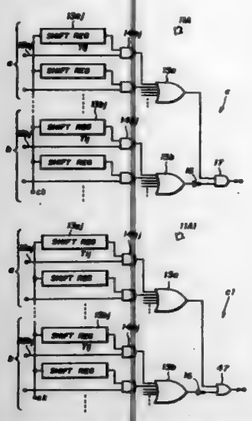
a plurality of input lines for receiving binary input signals which undergo transitions with time;

first and second memory means for storing weighting coefficients;

first gate means for successively obtaining a logical product of one of said binary input signals received from said input lines and a corresponding one of the weighting coefficients read out from said first memory means for each of said binary input signals;

second gate means for successively obtaining a logical prod-

uct of one of said binary input signals received from s id input lines and a corresponding one of the weighting coefficients read out from said second memory means for each of said binary input signals;
third gate means for obtaining a logical sum of logical products output from said first gate means;
fourth gate means for obtaining a logical sum of logical products output from said second gate means; and



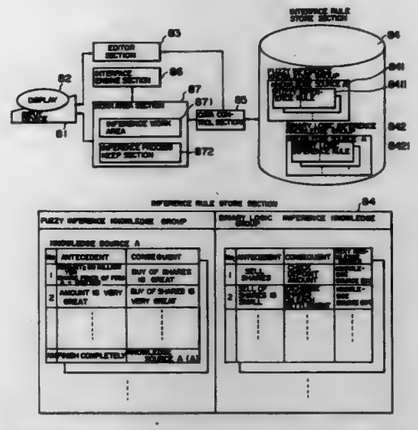
output means including an inverter for inverting the logical sum output from said fourth gate means and a gate for obtaining one of a logical product and a logical sum of the logical sum output from said third gate means and an inverted logical sum output from said inverter, said gate outputting an output signal of said neuron unit.

5,191,638
FUZZY-BOOLEAN MULTI-STAGE INFERENCE APPARATUS

Noboru Wakami, Hirakata; Isao Hayashi, Toyonaka; Hiroyoshi Nomura, Neyagawa, and Eiichi Naito, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 501,037
Claims priority, application Japan, Mar. 31, 1989, 1-083402; Mar. 31, 1989, 1-083404; Mar. 31, 1989, 1-083405; Mar. 31, 1989, 1-083407; Mar. 31, 1989, 1-083408; Mar. 31, 1989, 1-083410
Int. Cl.[5] G06F *9/44;* G05B *13/02*
U.S. Cl. 395—51 29 Claims

1. A fuzzy multi-stage inference apparatus to be employed in information processing systems for diagnosis or recognition purposes, comprising:
an inference rule memory for storing fuzzy inference rules comprising IF parts, THEN parts, and Boolean logic inference rules;
an inference means for deriving control commands for executing multi-step inference processing comprising one of (i) fuzzy logic inferences and (ii) fuzzy logic and Boolean logic inferences in series or in parallel by utilizing said rules stored in said inference rule memory; and
an inference rule selector for determining, by using an evaluation formula, a priority inference rule to be executed by said inference means in a succeeding step in said multi-step inference processing;
wherein:
said inference means outputs a portion of the fuzzy inference rules stored in said inference rule memory to a working region of said memory;
said inference means executes said multi-step inference processing by using only said inference rules outputted to said working region,
said inference rules are divided into plural knowledge sources each of which comprises fuzzy inference rules and Boolean logic inference rules,
said inference means outputs said fuzzy inference rules and said Boolean logic inference rules in one of said knowledge sources to said working region for use in execution of fuzzy logic and Boolean logic inferences, and



said inference rule selector comprises a priority memory in which said priority of inference rules is stored; a compatibility processor for deriving a compatibility of said inference rule to said IF parts; and an inference rule determination means for deriving an inference rule having a priority of more than a predetermined value and a highest priority in said priority memory.

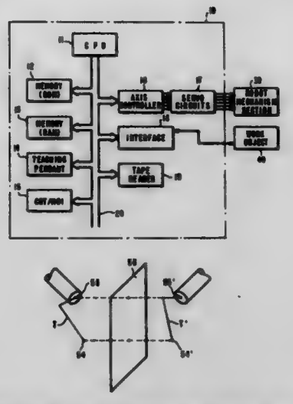
5,191,639
MIRROR IMAGE METHOD FOR USE IN A ROBOT

Ryuichi Hara, Oshino, Japan, assignor to Fanuc Limited, Minamitsuru, Japan

PCT No. PCT/JP89/00409, § 371 Date Aug. 23, 1989, § 102(e) Date Aug. 23, 1989, PCT Pub. No. WO89/10589, PCT Pub. Date Feb. 11, 1989
PCT Filed Apr. 17, 1989, Ser. No. 408,489
Claims priority, application Japan, Apr. 23, 1988, 63-99318
Int. Cl.[5] G05B *13/00, 19/415*
U.S. Cl. 395—99 10 Claims

1. A mirror image method for use in a robot for machining a work object, comprising the steps of:
(a) preparing teaching points represented in a first coordinate system;
(b) defining a second coordinate system having two coordinate axes defining a mirror plane;
(c) calculating a second coordinate system teaching point by transforming a respective one of said teaching points from said first coordinate system to said second coordinate system;
(d) determining, in said second coordinate system, a mirror image point which is symmetrical with said respective one of said teaching points with respect to said mirror plane;
(e) calculating a first coordinate system mirror image point

by transforming said mirror image point from said second coordinate system to said first coordinate system and;

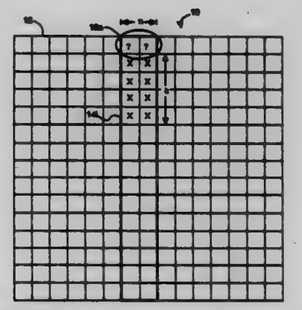


(f) machining the work object by driving the robot based upon said first coordinate system mirror image point.

5,191,640
METHOD FOR OPTIMAL DISCRETE RENDERING OF IMAGES

Michael F. Plass, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1990, Ser. No. 633,930
Int. Cl.[5] G06K *15/00;* G09G *1/06*
U.S. Cl. 395—100 4 Claims



1. A method for converting an original image to a printable bitmap comprising the steps of:
(a) defining a printer model (17*a*);
(b) defining a perception model (17*b*);
(c) defining a comparison model;
(d) sampling said original image to form a sampled image (12);
(e) constructing a plurality of parallel swaths (14) through said sampled image (12), each of said swaths (14) being a linear path of adjacent bits, each path having a width of n bits;
(f) defining a linear array of columns of bits (16*a*, 16*b*, etc.) for each of said swaths (14), each of said columns of bits (16) being n bits wide, each of said columns of bits (16) for each of said swaths (14) being numbered consecutively;
(g) choosing a configuration of values of a first column of bits (16*a*) of an ith swath (14*i*), said ith swath (14*i*) including a number p of said columns of bits (16) and q columns of non-image bits having preset bits (26);
(h) determinig a first set of look-ahead bits (22*a*) adjacent to said first column of bits (16*a*) and within said ith swath (14*i*), said first set of look-ahead bits (22*a*) including a set of k consecutive columns of bits of said ith swath (14*i*), said first set of look-ahead bits having a configuration of values;
(i) applying said printer model (17*a*) to a first neighborhood (20*a*) around said first column of bits (16*a*) to provide a printed image of said first neighborhood (20*a*);
(j) applying said perception model (17*b*) to a second neighborhood (18*a*) within said printed image of said first neighborhood (20*a*) around said first column of bits (16*a*) to provide a perceived image of said second neighborhood (18*a*);
(k) applying said comparison model to compare said perceived image of said second neighborhood (18*a*) with said sampled image (12) of said second neighborhood (18*a*) to arrive at a difference value for each bit of a subset of columns of bits of said ith swath (14*i*) lying within said second neighborhood (18);
(l) calculating a combined difference value from said difference values;
(m) storing said combined difference value along with said configuration of values of said first column of bits (16);
(n) altering said configuration of values of said first column of bits (16) of said ith swath (14*i*);
(o) repeating steps (i) through (n) 2^n times until all of said configurations of values of said first column of bits (16) of said ith swath (14*i*) have been used;
(p) determining which of said configurations of values of said first column of bits (16) provides a least combined difference value for said configuration of values of said first set of look-ahead bits (22), by comparing said stored combined difference values;
(q) altering said configuration of values of said first set of look-ahead bits (22) of said ith swath (14*i*);
(r) repeating steps (i) through (q) up to 2^{n+k} times until all of said configurations of values of said first set of look-ahead bits (22) of said ith swath (14*i*) have been used; and
(s) storing a configuration of values of said first column of bits (16) for each of said configuration of values of said first set of look-ahead bits (22), said stored configuration of values of said first column of bits (16) providing a least combined difference value for a respective configuration of values of said first set of look-ahead bits (22).

5,191,641
CURSOR SHIFT SPEED CONTROL SYSTEM

Yasushi Yamamoto; Shigeru Fujimura; Futoshi Nakase; Toshikazu Nagaya; Shigeaki Harada, and Yasuhiro Takiguchi, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 409,135, Sep. 19, 1989, abandoned. This application Dec. 24, 1991, Ser. No. 814,065
Claims priority, application Japan, Sep. 26, 1988, 63-241294
Int. Cl.[5] G09G *1/00*
U.S. Cl. 395—118 6 Claims

1. A cursor shift speed control system, comprising:
a mouse input means for actuating a cursor on a display so that the cursor moves in response to movement of the mouse input means;
input means for detecting a moving speed of the mouse input means;
correction means connected to the mouse input means, for comparing the moving speed of the mouse input means with a predetermined threshold value set int he correction means, and for calculating corrective values, wherein the greater the moving speed of the mouse input means compared to the predetermined threshold value, the greater the corrective values;
cursor speed calculation means connected to the input means and the correction means, for calculating a corrected cursor speed on the display screen by adding the corrective values one by one to the moving speed of the mouse

examination window setting means for setting an examina-
means for selecting individual ones of the displayed scene

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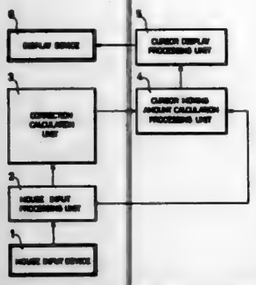
input means, wherein the corrective values are added one by one as the moving speed of the mouse input mans becomes progressively greater than the predetermined threshold value, whereby the corrected cursor speed is increased from a linear relationship between the moving speed of the mouse input means and the corrected cursor speed to a nonlinear relationship between the moving speed of the mouse input means nd the corrected cursor



speed, a rate of change of the corrected cursor speed increasing progressively in accordance with the corrective values added to the moving speed of the mouse input means;

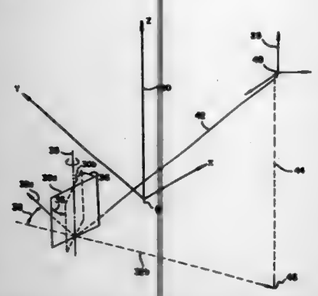
cursor display processing means connected to the cursor speed calculation means, for displaying the cursor on the display screen by successively calculating a displaying position of the cursor based on the corrected cursor speed.

5,191,642

METHOD FOR EFFICIENTLY ALLOCATING COMPUTER RESOURCE FOR REAL TIME IMAGE GENERATION

Lee T. Quick, and William M. Bunker, both of Ormond Beach, Fla., assignors to General Electric Company, Philadelphia, Pa.

Continuation of Ser. No. 36,425, Apr. 9, 1987, abandoned. This application Mar. 22, 1990, Ser. No. 498,475
Int. Cl.[5] G06F *15/72*
U.S. Cl. 395—127 **16 Claims**



1. In a real-time image generation system wherein an entire object is representable by a plurality of polygons, a method for reducing computation time for generating that entire object in an image to be displayed, comprising:

determining the value of a predetermined viewing criterion with respect to a view-point for the entire object;

representing the entire object of the plurality of polygons when the value of the viewing criterion is less than a predetermined threshold value;

representing the entire object by a single polygon when the value of the viewing criterion is not less than the predetermined threshold value, wherein the single polygon is rotatable about a first axis and includes attributes representative of the object as a whole; and

maintaining a predetermined relationship between the object and the view point by rotating the single polygon about the first axis to accommodate relative motion between the view-point and the object;

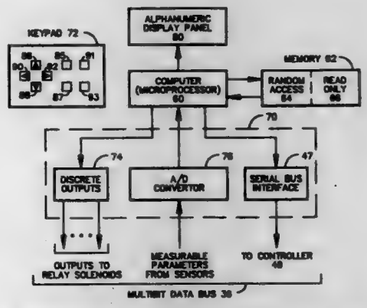
wherein computation time for defining the object is reduced by representing the object by the single polygon with respect to representing the object by a plurality of polygons.

5,191,643

METHOD AND APPARATUS FOR REFRIGERATION CONTROL AND DISPLAY

Richard H. Alsenz, 2402 Creeksmeadows, Missouri City, Tex. 77459

Continuation of Ser. No. 356,634, May 29, 1989, abandoned, which is a continuation of Ser. No. 848,164, Apr. 4, 1986, abandoned. This application Jun. 12, 1990, Ser. No. 537,155
Int. Cl.[5] G09G *1/06*
U.S. Cl. 395—155 **20 Claims**



1. An apparatus for controlling a refrigeration system and for displaying and adjusting, responsive to an operator's input, operating parameters of said system, comprising:

(a) a memory for storing values of said parameters in a plurality of data arrays, each data array comprising a plurality of cells arranged in two dimensions for storing said values;

(b) a moving window display for displaying the contents of a cell of said memory; and

(c) directional control means responsive to said operator input for selecting the cell to be displayed by said moving window display, and for adjusting the parameter values stored in said displayed cell, each of said arrays containing a cell adapted to store an array selector indicative of the array containing the currently displayed cell, said directional control means adapted for adjusting the array selector within the displayed cell for moving said moving window display to an adjacent cell in one of said other arrays.

5,191,644

MULTIWINDOW CONTROL SYSTEM

Masaru Takeda, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 594,963
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—158 **3 Claims**

1. A multiwindow control system for controlling displays on an information processor display screen, comprising:

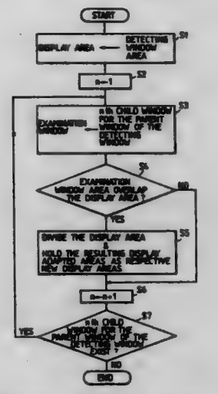
detecting window setting means for setting a detecting window having a selected display area where image information is to be displayed in a first portion of the display screen;

examination window setting means for setting an examination window in a second portion of the display screen;

parentage checking means for checking whether the examination window is a child window having a common parent with the detecting window;

overlap detecting means for detecting whether said examination window overlaps said detecting window at times when said examination window is a child window;

detecting window dividing means for dividing the display area of said detecting window at times when said overlap detecting means detects overlap by said examination window, the divided display areas of the detecting window



forming a plurality of detecting windows, said plurality of detecting windows being checked for parentage by said parentage checking means;

examination window changing means for changing said examination window at times when said examination window is found by the parentage checking means not to be a child window, the changed examination window being checked for parentage by said parentage checking means; and

display-adapted area setting means for setting said plurality of detecting windows into display-adapted areas of the display screen when no windows except said plurality of detecting windows exist on the display screen.

5,191,645

DIGITAL SIGNAL PROCESSING SYSTEM EMPLOYING ICON DISPLAYS

John Carlucci, Sunnyvale, and Kathlynn Uesaka, San Jose, both of Calif., assignors to Sony Corporation of America, Park Ridge, N.J.

Filed Feb. 28, 1991, Ser. No. 660,662
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—159 **34 Claims**

1. A system for processing digital signals representing digitized film images, including:

means for generating a scene signal representing a first sequence of digitized film images;

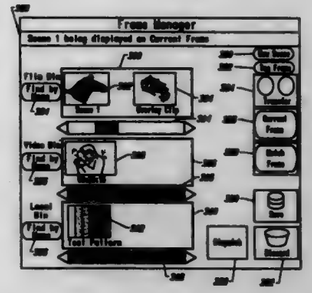
means for storing a frame signal representing a digitized film image selected from the first sequence of digitized film images;

means for compressing the frame signal to generate a scene icon;

means for generating a set of scene processing icons, where each scene processing icon in the set represents a scene processing operation;

means for displaying the set of scene processing icons and means for displaying scene data in response to a user command for information regarding the scene signal, wherein said scene data includes the scene icon;

means for selecting individual ones of the displayed scene processing icons; and



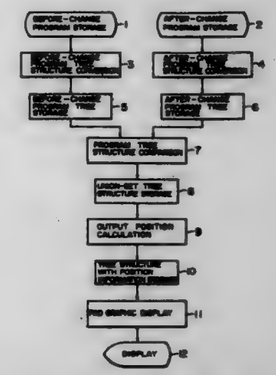
means for processing the scene signal in response to selection of individual ones of the displayed scene processing icons.

5,191,646

DISPLAY METHOD IN SOFTWARE DEVELOPMENT SUPPORT SYSTEM

Ichiro Naito, Tokyo; Hiroyuki Maezawa, Tama; Junko Yamaguchi, Machida; Hidetoei Katsumata, Zama, and Takeshi Ochio, Yamato, all of Japan, assignors to Hitachi, Ltd.; Hitachi Computer Engineering Co., Ltd. and Hitachi Seibu Soft Ware Co., Ltd., all of Tokyo, Japan

Continuation of Ser. No. 122,116, Nov. 18, 1987, abandoned. This application Sep. 25, 1991, Ser. No. 765,462
Claims priority, application Japan, Nov. 20, 1986, 61-275207
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—161 **12 Claims**



12. In a software development support system that converts program text into a graphic display of program structure, a method of displaying changes in program structure comprising:

analyzing a before change version of a single source program and an after change version of the source program to generate before and after change structure information for generating graphic displays of interconnected pictorially depicted program statements of the before and after change source program structure;

comparing the before and after change structure information (i) to generate a union set which includes both before and after change source program statements and (ii) to generate a change identification corresponding to each source program statement that identifies whether and how said each statement has been changed;

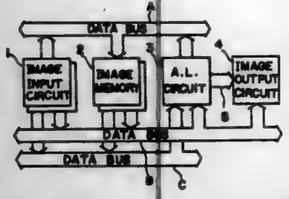
producing a graphic display of at least a portion of the union set including both before and after change source program statements with the corresponding change identification appended to each graphically displayed program statement.

5,191,647

IMAGE DATA PROCESSING SYSTEM

Yasuo Masaki, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 497,827, Mar. 22, 1990, abandoned, which is a continuation of Ser. No. 364,555, Jun. 8, 1989, abandoned, which is a continuation of Ser. No. 901,125, Aug. 28, 1986, abandoned. This application Feb. 7, 1991, Ser. No. 652,318
Claims priority, application Japan, Aug. 30, 1985, 60-192443; Sep. 2, 1985, 60-194090
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—164 29 Claims



11. An image data processing system, comprising:

data bus means including a first data bus and a second data bus provided independently from each other for transferring image data therethrough;

an image input circuit for inputting image data and outputting said image data on said first data bus;

an image memory for storing image data and outputting said image data on said first data bus;

arithmetic logical circuit means for processing image data, for inputting image data from said first data bus and excluding data of said image memory, and outputting data on said second data bus;

an image output circuit commonly provided for outputting image data to peripherals adapted to be connected to said system, said image output circuit being connected to input data from said second data bus and from said first data bus, and to output image data from said image input circuit or image data of said arithmetic logical circuit directly through said commonly provided image output circuit to said peripherals, which output image data does not pass through said image memory.

5,191,648

IMAGE PROCESSING SYSTEM

Yoshikazu Ikenoue; Hirokazu Yamada; Syuzi Maruta; Kazuhiro Araki, all of Osaka, and Kaoru Hashimoto, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1989, Ser. No. 377,943
Claims priority, application Japan, Jul. 11, 1988, 63-172443; Jul. 11, 1988, 63-172444; Jul. 11, 1988, 63-172445
Int. Cl.[5] G06F *15/16, 13/00*
U.S. Cl. 395—200 3 Claims

1. An image processing system having modes of operation including operating and stand-by modes of operation which are to be selectively put into effect, comprising

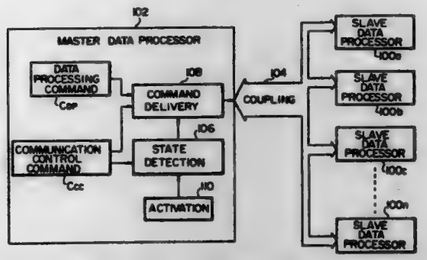
a) a plurality of slave data processor units each of which is operative to execute a set of predetermined functions assigned thereto,

b) a master data processor unit for controlling the operation of each of said slave data processor units, the master data processor unit being operative to output a data processing command requesting each of said slave data processor units to execute said predetermined functions assigned to the slave data processor unit and a communication control command predominant over the communication of data dictating the operation of each of said slave data processor units, and

c) coupling means providing bidirectional connection between said master data processor unit and each of said slave data processor units for allowing transmission therethrough of said data processing command and said communication control command to each of said slave data processor units,

said master data processor unit comprising

b/1) state detecting means for detecting which of the slave



data processor units is currently coupled to the master data processor units through said coupling means by confirming receipt of a reply from the slave data processor unit responsive to the communication control command,

b/2) command delivery means through which, in an operating mode of operation of the image processing system, said data processing command or said communication control command is to be distributed through said coupling means exclusively to the particular slave data processor unit which is detected to the currently coupled to said master data processor unit, and

b/3) activating means operative to activate said state detecting means during a stand-by mode of operation of the image processing system.

5,191,649

MULTIPROCESSOR COMPUTER SYSTEM WITH DATA BUS AND ORDERED AND OUT-OF-ORDER SPLIT DATA TRANSACTIONS

Sudarshan B. Cadambi, Beaverton; Charles B. Guy, Hillsboro, both of Oreg.; David R. Gray, Cupertino, Calif., and Mark A. Gonzales, Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 21, 1990, Ser. No. 631,892
Int. Cl.[5] H04L *12/40*; G06F *13/42*
U.S. Cl. 395—200 5 Claims

1. A method of transferring data in response to a read command in a computer system having an address bus, a command bus, a data bus, and a plurality of processors coupled to the address bus, the command bus, and the data bus, comprising the steps of:

(A) generating from a first processor of the plurality of processors the read command with a first address, wherein the read command requires to read a first data from a second processor of the plurality of processors to the first processor, wherein the first address points to the second processor;

(B) gaining by an arbitration operation an access to the command bus and the address bus from the first processor, wherein the first processor is awarded the access to the command bus and the address bus during the arbitration operation when the first processor has a highest priority among a first number of the plurality of processors that

are currently requesting the access to the command bus and the address bus with the first processor;

(C) issuing the read command to the command bus and the first address to the address bus after the first processor has gained the access to the command bus and the address bus, wherein the first address causes the second processor to receive the read command;

(D) receiving the read command in the second processor;

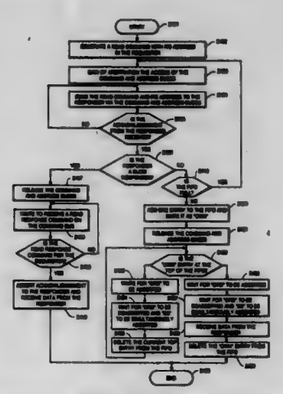
(E) determining with which one of (1) the first data and (2) a read response command and the first data that the second processor desires to respond to the read command;

(F) if the second processor determines to respond to the read command with the first data, then

(i) acknowledging receipt of the read command in the second processor to the first processor by sending a first acknowledgement signal from the second processor to the first processor via the command bus, wherein the first acknowledgement signal indicates to the first processor that the second processor desires to respond to the read command with the first data;

(ii) adding an own marker to a first-in-first-out (FIFO) queue, wherein the own marker contains information that indicates that the second processor will send the first data to the first processor via the data bus in response to the read command;

(iii) releasing the access to the command bus and the address bus by the first processor;



(iv) determining when the first data is available in the second processor;

(v) when the first data is determined to be available in the second processor, then determining when the own marker becomes first in the FIFO queue;

(vi) moving the own marker in the FIFO queue by removing a marker which is currently first in the FIFO queue from the FIFO queue when a data transaction associated with the marker is complete such that the own marker can become first in the FIFO queue, wherein the own marker moves in the FIFO queue in a first-in-first-out order;

(vii) when the own marker is determined to be first in the FIFO queue, then determining if the data bus is free of any data transaction, wherein the step (F) (vii) is repeated if there is a data transaction on the data bus;

(viii) if there is determined to be no data transaction on the data bus, then transferring the first data from the second processor to the first processor by gaining an access to the data bus and issuing the first data to the data bus, wherein the first data is directed to the first processor by the information contained in the marker;

(ix) removing the own marker from the FIFO queue;

(G) if the second processor determines to respond to the read command with the read response command and the first data, then

(i) acknowledging receipt of the read command in the second processor to the first processor by sending a second acknowledgement signal from the second processor to the first processor via the command bus, wherein the second acknowledgement signal indicates to the first processor that the second processor desires to respond to the read command with the read response command and the first data;

(ii) releasing the access to the command bus and the address bus by the first processor;

(iii) determining when the first data is available in the second processor;

(iv) when the first data is determined to be available in the second processor, then gaining by the arbitration operation the access to the command bus and the address bus for the second processor, wherein the second processor is awarded the access to the command bus and the address bus during the arbitration operation when the second processor has the highest priority among a second number of the plurality of processors that are currently requesting the access to the command bus and the address bus with the second processor;

(v) gaining the access to the data bus when the data bus is free of any transaction and a current first marker in the FIFO queue is not demanding the access to the data bus;

(vi) issuing the read response command from the second processor to the command bus and a second address from the second processor to the address bus, wherein the read response command and the second address are both destined for the first processor;

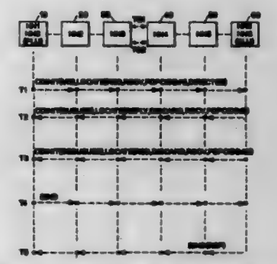
(vii) transmitting the first data from the second processor to the first processor via the data bus, wherein the first processor receives the first data in accordance with the read response command received in the first processor.

5,191,650

VIRTUAL CHAINS FOR SESSION INITIATION IN A DISTRIBUTED COMPUTER NETWORK

Dirk K. Kramer, and Michael A. Lerner, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1989, Ser. No. 393,923
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—200 13 Claims



7. A method for establishing and maintaining a virtual chain between a pair of communicating server nodes in a computer network during the initiation of a communication session between logical units in the corresponding domains of said communicating server nodes, said computer network having a plurality of server nodes, end nodes and network nodes wherein each network node and server node is an information processing system having at least a processor and a memory and maintains a topology database and allocates control blocks to said initiation of a communication session, said method comprising:

selecting a path of intermediate network nodes for session

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initiation by a processor at a first communicating server node that terminates at a second communicating server node;

storing said path for session initiation in control blocks allocated at said first communicating server node;

generating and sending a first session initiation request by the processor at said first communicating server node to said second communicating server node along said selected path of intermediate network nodes for session initiation wherein said first request contains a vector identifying said selected path;

allocating control blocks for session initiation at the intermediate network nodes by a processor at each intermediate network node in response to said first session initiation request, said allocated control blocks at the intermediate network nodes representing a real chain between said pair of communicating server nodes;

receiving said first session initiation request by a processor and storing said selected path in control blocks allocated at said second communicating server node;

queuing said first session initiation request by the processor at said second communicating server node if the processor at said second communicating server node does not have the resources available to complete session initiation;

sending a first response to the first session initiation request from the processor at said second communicating server node to said first communicating server node along said selected path of intermediate network nodes, said first response including an indication that said first session initiation request is being queued;

deallocating the control blocks for session initiation by the processor at each of said intermediate network nodes immediately after said first response is forwarded to the next network node along the selected path for session initiation, with the control blocks remaining allocated at each communicating server node after said first response is received at said first communicating server node representing a virtual chain;

generating and sending additional session initiation requests and replies between said pair of communicating server nodes as required to complete session initiation;

monitoring topology update messages by the processor at each communicating server node path for a plurality of potential disconnect conditions following the deallocation of control blocks at each intermediate network node; and

deallocating the control blocks for session initiation at each communicating server node to discard the virtual chain after session initiation is complete.

5,191,651

APPARATUS AND METHOD FOR MAKING OF INTERCONNECTED PROCESSORS ACT LIKE A SINGLE NODE IN A MULTINODE COMMUNICATION SYSTEM

Nagui Halim, Yorktown Heights; Christos N. Nikolaou, New York, and John A. Pershing, Jr., Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 116,424, Nov. 3, 1987, abandoned. This application Apr. 8, 1991, Ser. No. 682,889

Int. Cl.[5] G06F *13/00, 15/16*

U.S. Cl. 395—200 9 Claims

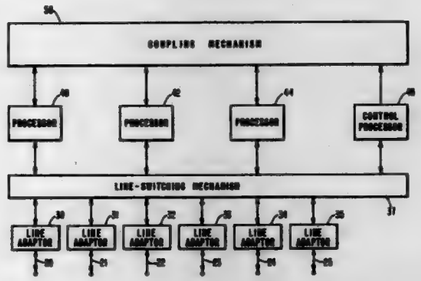
1. Apparatus for interfacing a processor system to a communication network having a multiplicity of nodes and a multiplicity of communication lines connecting said nodes to each other, said processor system having a single node address in said network and acting as one of said multiplicity of nodes in said network, said one node serving a multiplicity of local communication end points and said nodes in said network other than said one node serving a multiplicity of non-local communication end points, said nodes in said network each performing network management and communication session management functions and exchanging network management messages and session requests for establishing communication sessions between individual pairs of said local and non-local communication end points in response to said session requests, said apparatus for interfacing comprising:

a control processor for providing said network management and communication session management functions for said one node;

a plurality of non-control processors interfacing said communication lines that connect said one node to said other nodes of said network with said local communication end points; and

a local communication system interconnecting said non-control and control processors,

said non-control processors transporting data between said communication lines and said local end points via said non-control processors without routing said data through said control processor,



said non-control processors forwarding said session requests and network management messages received from said network to said control processor via said local communication system and forwarding said session requests and network management messages received via said local communication system from said control processor to said network,

said control processor determining data transport paths to be created within said processor system to enable said communication sessions to be established in response to said session requests, said data transport paths not extending through said control processor, said control processor directing said non-control processors to create said determined data transport paths,

said non-control processors creating said determined data transport paths in response to said directing from said control processor.

5,191,652

METHOD AND APPARATUS FOR EXPLOITING COMMUNICATIONS BANDWIDTH AS FOR PROVIDING SHARED MEMORY

Daniel M. Dias, Mahopac, N.Y., and Balakrishna R. Iyer, Fremont, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,969

Int. Cl.[5] G06F *13/38*

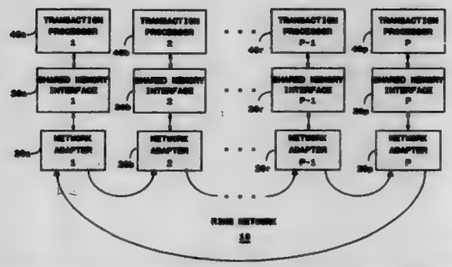
U.S. Cl. 395—200 8 Claims

1. A shared memory facility for a multiprocessor computer system in which multiple processors are interconnected by a logical ring network, and a plurality of data packets are transmitted over the network, comprising:

first packet type specification means, coupled to one of said multiple processors for sending data to another one of said multiple processors by assigning a first value to a data packet of said plurality of data packets;

second packet type specification means, coupled to one of said multiple processors, for allocating a shared memory resource which circulates indefinitely on said ring network by assigning a second value to a data packet of said plurality of data packets;

means responsive to a data packet having said first value for signaling that said data packet having said first value contains the data; and



means responsive to a data packet having said second value for signaling that said data packet having said second value contains the shared memory resource.

5,191,653

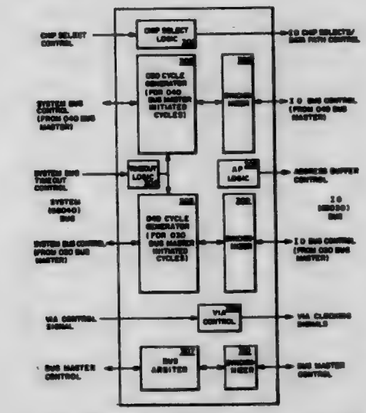
IO ADAPTER FOR SYSTEM AND IO BUSES HAVING DIFFERENT PROTOCOLS AND SPEEDS

John D. (J.) Banks, Palo Alto; Kenneth M. Karakotsios, San Jose, and Albert M. Scalise, Campbell, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 28, 1990, Ser. No. 635,923

Int. Cl.[5] G06F *13/42*

U.S. Cl. 395—275 10 Claims



1. A bi-directional bus adapter coupled between first and second buses, said buses consisting of data, address an control lines, said first and second buses containing a plurality of first and second data transferring devices, each generating a first plurality of data cycles designed to send and receive data according to a predetermined databus size, said first and second buses operating at first and second speeds respectively with first and second bus control protocols respectively, said first and second speeds and first and second bus control protocols being different, said bus adapter provided to allow said devices coupled to either of said buses to transfer data to other devices contained on the other of said buses, said bus adapter comprising:

arbitration means responsive to said plurality of data cycles from said devices, said arbitration means for determining ownership based upon priority of both said first and second buses by only one of said devices at any one time,

wherein said arbitration means supports said first and second bus control protocols;

bus cycle generation means, responsive to said first plurality of data cycles from one of said devices on one of said buses, for generating a second plurality of data cycles necessary to complete said data transfer to one of said other devices on the other of said buses, such that the bus control protocols of each of said buses is supported during said data transfer;

synchronization means coupled to said bus cycle generation means for converting said second plurality of data cycles from either said first speed to said second speed or said second speed to said first speed;

bi-directional data path means coupled between said data bus of said first bus and said databus of said second bus and responsive to said first plurality of data cycles, said data path for performing data path routing between said first and second buses according to said bus control protocols; and

bi-directional address transceiver means coupled between said databus of said first bus and said databus of said second bus and responsive to said first plurality of data cycles, said transceiver means for routing addresses between said first and said second buses,

wherein devices on either of said buses transfer data to devices on the other of said buses according to their bus control protocols, such that said first and second buses operate as one single bus.

5,191,654

MICROPROCESSOR FOR HIGH SPEED DATA PROCESSING

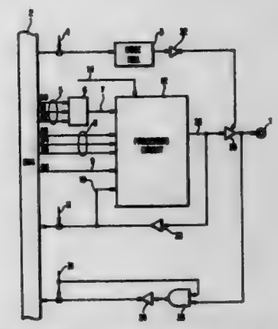
Mitsuji Okada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 16, 1992, Ser. No. 822,049

Claims priority, application Japan, Jan. 16, 1991, 3-3014

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—275 10 Claims



1. A microprocessor having as many input/output ports as the number of bits of data to be processed, for processing output latch data of bits in an output mode, characterized in that each of said input/output ports includes:

a decoder for determining whether or not a bit assigned to the input/output port is selected based on bit information which is supplied from a CPU for designating a bit to be processed; and

a processing circuit comprising

at least one processing element for processing 1-bit data which is supplied from the CPU and/or output latch data which is provided as a feedback to the processing circuit itself,

selecting means for transferring processed data from the processing element in accordance with a particular processing operation determined by the CPU, and

and second synchronous buses via said asynchronous bus

masking means for allowing the processed data transferred from said selecting means to be outputted only when the bit assigned to the input/output port is selected as determined by said decoder.

5,191,655

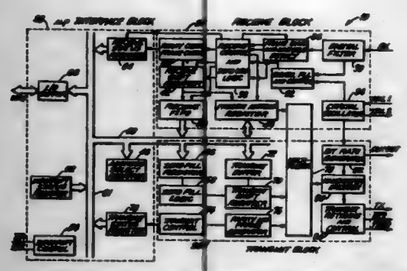
INTERFACE ARRANGEMENT FOR FACILITATING DATA COMMUNICATION BETWEEN A COMPUTER AND PERIPHERALS

Haig Sarkissian, Forest Hills, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Continuation of Ser. No. 582,015, Jul. 20, 1990, abandoned, which is a continuation of Ser. No. 107,159, Oct. 13, 1987, abandoned. This application Oct. 24, 1991, Ser. No. 782,911

Int. Cl.[5] G06F *3/00*

U.S. Cl. 395—275 **1 Claim**



1. An interface arrangement for use in facilitating serial data communication between a computer and a plurality of peripherals located remote from the computer, a plurality of interfaces in respective operative association with each of said peripherals, each of said peripherals being assigned a plurality of unique peripheral addresses, wherein a data message including a plurality of data frames is transmitted from the computer to one of said peripherals, each of said data frames including identification address data uniquely associated with the peripheral to which the data message is directed, at least one of said interfaces including means for receiving and separating the identification address data from each frame of the received serial data message, means for storing said unique peripheral addresses, means coupled to said separating means and to said peripheral address storing means for storing the separated identification address data, means for comparing the separated identification address data and the stored peripheral addresses, means coupled to said separated address data storing means for combining the separated identification address data with each data frame of the data message to be transmitted serially at a later time by the peripheral when said comparing means detects said predetermined relation between the separated identification address data and the stored peripheral identification addresses, and means responsive to said comparison for instructing the peripheral associated with said at least one interface to respond to the received data message at a later time when the separated identification address data bears a predetermined relation to the stored peripheral addresses.

5,191,656

METHOD AND APPARATUS FOR SHARED USE OF A MULTIPLEXED ADDRESS/DATA SIGNAL BUS BY MULTIPLE BUS MASTERS

Stephen J. Forde, III, West Boylston, Mass., and Harold A. Rosenberg, Ann Arbor, Mich., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 29, 1991, Ser. No. 751,766

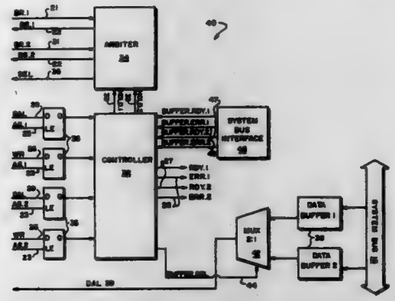
Int. Cl.[5] G06F *13/364*

U.S. Cl. 395—325 **7 Claims**

1. Apparatus for exchanging information via transactions between multiple devices of a computer system including a host memory coupled to a system bus, said transactions including a read transaction between said host memory and a corresponding device requesting data from said host memory, said apparatus comprising:

a signal bus for interconnecting said devices and transporting information between said devices, said signal bus having a plurality of multiplexed address/data signal lines shared by said devices and a plurality of control signal lines including (i) a first group of control lines shared by said devices, (ii) a second group of control lines replicated into sets, each set being accessible by one of said devices, and (iii) a selection control signal line for carrying a selection control signal specifying the use of one of said replicated control line sets by said corresponding device initiating said read transaction on said signal bus;

a host bus interface unit for coupling said signal bus to said system bus, said interface unit including (i) a controller



connected to said signal bus for decoding the information on said address/data signal lines and (ii) a central arbiter coupled to said controller for activating said selection control signal and for providing access to said signal bus by said corresponding device; and

a plurality of bus isolation units, each coupled to an associated one of said devices and capable of isolating said associated device from said shared control lines when activated by said arbiter,

wherein said arbiter activates said associated bus isolation unit of said corresponding device while said corresponding device waits for requested data from said host memory such that another of said devices and host bus interface unit may access said signal bus to initiate another of said transactions, thereby enabling simultaneous occurrences of said transactions on said signal bus.

5,191,657

MICROCOMPUTER ARCHITECTURE UTILIZING AN ASYNCHRONOUS BUS BETWEEN MICROPROCESSOR AND INDUSTRY STANDARD SYNCHRONOUS BUS

Thomas E. Ludwig, Irvine, and Thomas W. Craft, Mission Viejo, both of Calif., assignors to AST Research, Inc., Irvine, Calif.

Filed Nov. 9, 1989, Ser. No. 433,982

Int. Cl.[5] G06F *13/00, 13/42*

U.S. Cl. 395—325 **9 Claims**

1. A computer system operating in accordance with conventional PC protocols, said computer system comprising:

a motherboard that interconnects a plurality of subsystems that provide conventional input/output functions required for PC-compatible computer systems;

a first synchronous bus that operates in synchronism with a first clock signal having a first frequency;

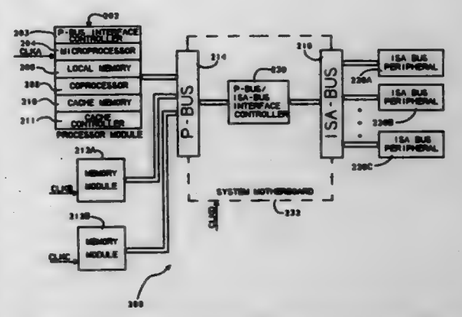
a microprocessor in electrical communication with said first synchronous bus, said microprocessor synchronized by said first clock at said first frequency;

a second synchronous bus synchronized by a second clock signal having a second frequency, said second clock signal operating asynchronously with respect to said first clock signal, said second synchronous bus being on the motherboard, said second synchronous bus configured in accordance with standardized PC bus protocol;

a plurality of bus circuits in electrical communication with said second synchronous bus for transferring data across said synchronous bus in accordance with said standardized PC bus protocol;

an asynchronous bus; and

first and second bus interface circuits, said first bus interface circuit providing electrical communication between said first synchronous bus and said asynchronous bus, said second bus interface circuit providing electrical communication between said second synchronous bus and said asynchronous bus, said first and second bus interface circuits having handshake lines for transmitting and receiving asynchronous handshake signals between said first and second synchronous buses via said asynchronous bus, said first and second bus interface circuits further transferring data between said first and second synchronous buses via said asynchronous bus.



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DESIGN PATENTS

GRANTED Mar. 2, 1993

ERRATA

For CLASS	See PATENT NO.
D03-031	333,599

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DESIGNS

MARCH 2, 1993

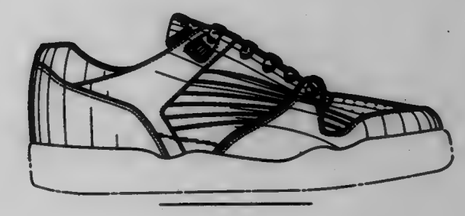
333,546
SANTA SHAPED PASTA
Orestes Rivera, Chicago; Alyssa A. Dudkowski, Des Plaines; Wade W. Thoma, Winnetka, and Bradley D. Barbera, Chicago, all of Ill., assignors to Kraft General Foods, Inc., Northfield, Ill.
Filed Jun. 21, 1991, Ser. No. 718,815
Term of patent 14 years
U.S. Cl. D1—126

333,547
JACKET
Jeffrey D. Schafer, 2191 Woodward Ave., Chippewa Falls, Wis. 54729, and Paul C. Shaurette, Rte. 3 Box 238, Bloomer, Wis. 54724
Filed Oct. 18, 1990, Ser. No. 601,187
Term of patent 14 years
U.S. Cl. D2—187

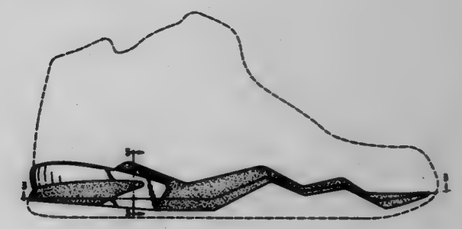
333,548
BRIDAL HAT
Denise Karbaat, 13817 Lorce Ln., Rockville, Md. 20853
Filed Oct. 16, 1990, Ser. No. 598,531
Term of patent 14 years
U.S. Cl. D2—251

333,549
HIGH HEELED SNEAKER
William E. Schoening, Jr., 823 Jackson St., Reynoldsville, Pa. 15851
Filed Mar. 23, 1990, Ser. No. 497,979
Term of patent 14 years
U.S. Cl. D2—285

333,550
SHOE UPPER
Eliseo Marziali, Civitanova Marche, Italy, and Y. K. Shin, Pusan, Rep. of Korea, assignors to Mercury International Trading Corporation, Attleboro, Mass.
Filed Aug. 31, 1990, Ser. No. 575,997
Term of patent 14 years
U.S. Cl. D2—314



333,551
MIDSOLE OF A SHOE
Catherine M. Bailey, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Aug. 5, 1991, Ser. No. 740,469
Term of patent 14 years
U.S. Cl. D2—314



333,558

333,561

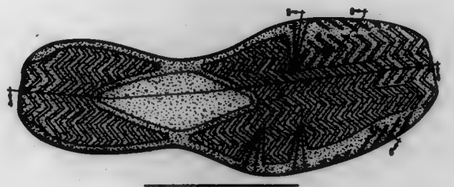
VOL 1148 ISS 1 MR 2 1993 UMI

333,552
SHOE CLOSURE
Christoph Berger, Eglofstein, and Reiner Seiz, Roettenbach, both of Fed. Rep. of Germany, assignors to Tretorn AB, Helsingborg, Sweden
Filed Aug. 26, 1991, Ser. No. 751,250
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1991, M 91 01 510.3
Term of patent 14 years
U.S. Cl. D2—314

333,553
SHOE UPPER
Joseph Bevier, Tigard, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Dec. 4, 1991, Ser. No. 802,424
Term of patent 14 years
U.S. Cl. D2—314

333,554
SHOE UPPER
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 1, 1992, Ser. No. 877,125
Term of patent 14 years
U.S. Cl. D2—314

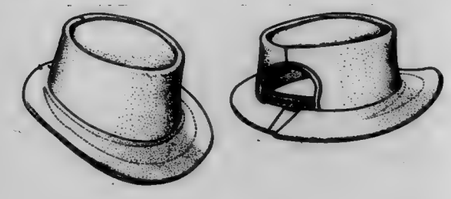
333,555
OUTSOLE BOTTOM
Tinker L. Hatfield, Portland, and Wilson W. Smith, Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed May 8, 1992, Ser. No. 880,012
Term of patent 14 years
U.S. Cl. D2—320



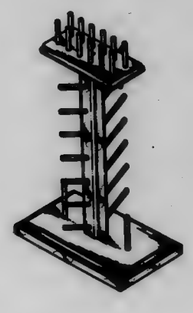
333,556
SHOE OUTSOLE
Erik Purdom, Battleground, Wash., assignor to L. A. Gear, Inc., Los Angeles, Calif.
Filed Jul. 11, 1991, Ser. No. 729,011
Term of patent 14 years
U.S. Cl. D2—320

333,557
SOCK
Joy Wilson, 272 W. Field Ave., Elizabeth, N.J. 07208-3171
Filed Jun. 5, 1990, Ser. No. 533,698
Term of patent 14 years
U.S. Cl. D2—334

333,558
HAT
Roy L. Vossler, 1797-6th Ave. SW., Medicine Hat, Alberta, Canada T1A 8B1
Filed Dec. 10, 1990, Ser. No. 624,681
Claims priority, application Canada, Jun. 12, 1990, 12-06-90-2
Term of patent 14 years
U.S. Cl. D2—509



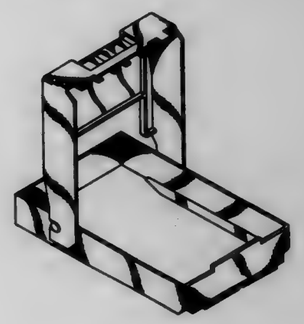
333,559
THREAD DISPENSER
Clare J. Rowley, 8356 Sedan Ave., West Hills, Calif. 91304
Filed Aug. 6, 1991, Ser. No. 741,795
Term of patent 14 years
U.S. Cl. D3—25



333,560
EARPHONE CASE
Ohshi Miyashita, and Katsumi Yamatogi, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Sep. 12, 1989, Ser. No. 406,375
Claims priority, application Japan, Mar. 14, 1989, 1-9266
Term of patent 14 years
U.S. Cl. D3—30.1

333,561
SPECTACLE CASE
Mary Paulence, Mount Royal, Canada, assignor to B. N. Novelties, Canada
Filed Dec. 13, 1990, Ser. No. 627,216
Claims priority, application Canada, Sep. 14, 1990, 14-09-90-2
Term of patent 14 years
U.S. Cl. D3—34

333,562
SECURITY HOLDER FOR A CASSETTE TAPE
James T. Weisburn, Massillon, and John P. Hoerger, Minerva, both of Ohio, assignors to Alpha Enterprises, Inc., East Canton, Ohio
Filed Jun. 26, 1991, Ser. No. 721,664
Term of patent 14 years
U.S. Cl. D3—35



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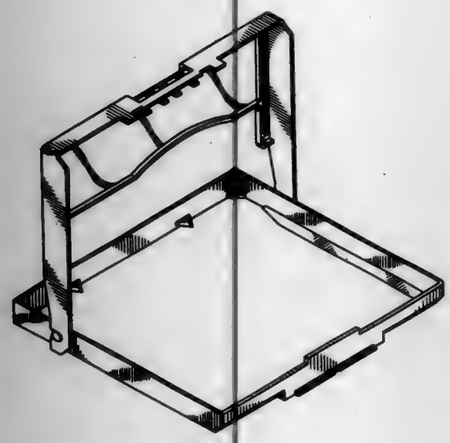
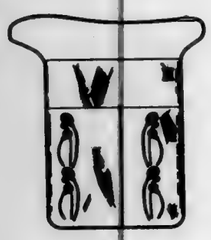
333,553
SECURITY HOLDER FOR A COMPACT DISC
James T. Weisburn, Massillon, and John P. Hoerger, Minerva, both of Ohio, assignors to Alpha Enterprises, Inc., East Canton, Ohio
Filed Jan. 26, 1991, Ser. No. 721,669
Term of patent 14 years
U.S. Cl. D3—35

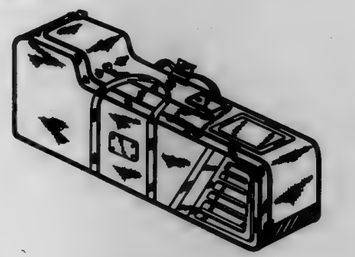


333,554
DIABETIC TOTE/HANDBAG
Kathleen Thompson, 1160 Gordon Ct., and Beverly A. Fearon, 909 Broadacre Rd., both of Clawson, Mich. 48017
Filed Aug. 19, 1991, Ser. No. 746,557
Term of patent 14 years
U.S. Cl. D3—47

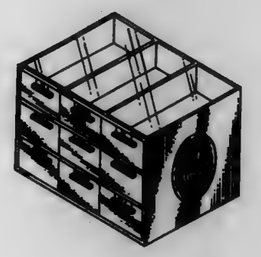


333,565
RUCKSACK
Jocelyne Imbert, Marseille, France, assignor to Louis Vuitton Malletier, Paris, France
Filed Nov. 9, 1989, Ser. No. 434,827
Claims priority, application Int'l Pat. Institute, May 9, 1989, DMA/001007
Term of patent 14 years
U.S. Cl. D3—42

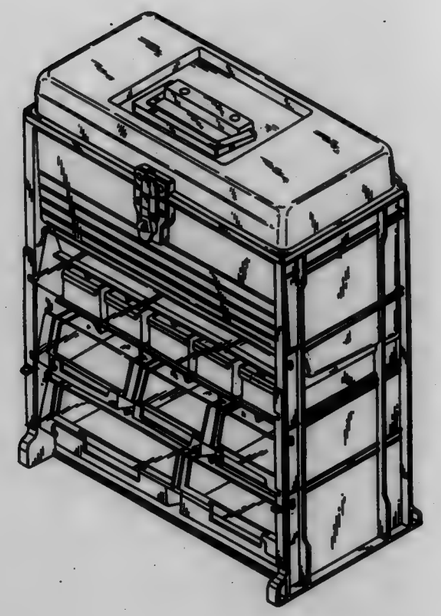
333,566
TRAVEL BAG
Michel Landreau, Annecy, France, assignor to Salomon S.A., Chavanod, France
Filed Jan. 28, 1991, Ser. No. 646,332
Claims priority, application Int'l Pat. Institute, Jul. 27, 1990, DMA 001295
Term of patent 14 years
U.S. Cl. D3—71



333,567
CONTAINER FOR STORING NOTIONS
Ursula Dziewa, 5146 S. Newcastle Ave., Chicago, Ill. 60638
Filed Jun. 26, 1990, Ser. No. 543,572
Term of patent 14 years
U.S. Cl. D3—74

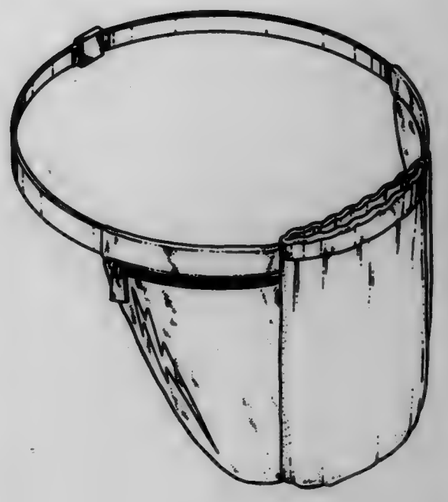


333,568
TOOL BOX AND PARTS ORGANIZER
Thomas Dickinson, St. Louis, Mo., assignor to Contico International, Inc., St. Louis, Mo.
Filed Aug. 31, 1990, Ser. No. 567,617
Term of patent 14 years
U.S. Cl. D3—74



333,569
SPEED SQUARE BELT POUCH
Daniel M. VanOrden, 33 S. Gifford St. Rear, Butler, N.J. 07405
Filed Sep. 9, 1991, Ser. No. 756,769
Term of patent 14 years
U.S. Cl. D3—105

333,570
INSULATED BEVERAGE WAIST PACK
Cynthia Murray, 877 W. 2500 South, P.O. Box 183, Vernal, Utah 84078
Filed Dec. 13, 1991, Ser. No. 806,461
Term of patent 14 years
U.S. Cl. D3—106



333,571
TOOTHBRUSH HANDLE
Daniel K. Harden, Palo Alto, Calif., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed May 28, 1991, Ser. No. 706,528
Term of patent 14 years
U.S. Cl. D4—104

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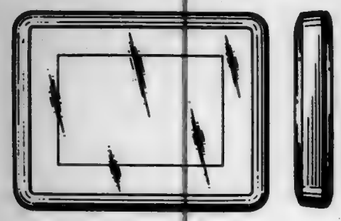
333,572
CHIMNEY CLEANING BRUSH
John A. Jansen, 3445 Laird Court, Westbank, B. C., Canada V0H 2A0 , and Russell M. Sandberg, 1665 Lund Road, Kelowna, B. C., Canada V1X 4K4
Filed Aug. 7, 1991, Ser. No. 741,820
Claims priority, application Canada, Mar. 3, 1991, 803912
Term of patent 14 years
U.S. Cl. D4—136

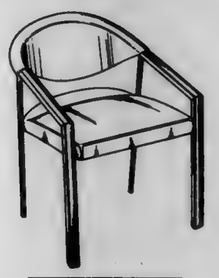
333,573
NAIL ENAMEL BRUSH
Melvin E. Kansen, Highlands, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Continuation of Ser. No. 400,965, Aug. 30, 1989, abandoned.
This application Mar. 6, 1992, Ser. No. 846,425
Term of patent 14 years
U.S. Cl. D4—135

333,574
PHOTO ORGANIZER
Peter Ackeret, Kusnacht, Switzerland, assignor to Showbox-System AG, Landquart, Switzerland
Filed Oct. 17, 1990, Ser. No. 599,346
Term of patent 14 years
U.S. Cl. D6—300

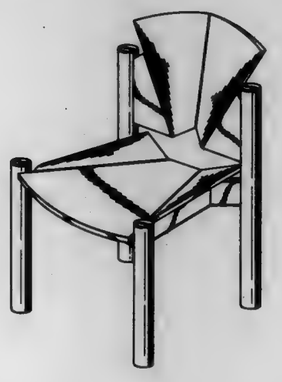


333,575
MINIATURE ROCKING CHAIR
Milo D. Hanson, P.O. Box 634, Gold Beach, Oreg. 97444
Filed Mar. 8, 1990, Ser. No. 490,279
Term of patent 14 years
U.S. Cl. D6—348

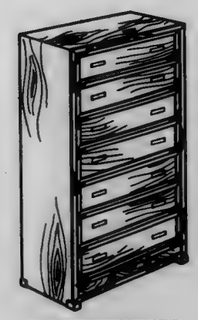
333,576
CHAIR
Bruce Burdick, and Susan K. Burdick, both of San Francisco, Calif., assignors to The Burdick Group, San Francisco, Calif.
Filed Jun. 29, 1990, Ser. No. 545,079
Term of patent 14 years
U.S. Cl. D6—378



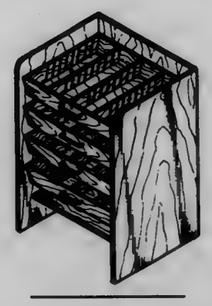
333,577
CHAIR
Peter J. Danko, P.O. Box 442, Accokeek, Md. 20607-0442
Filed Mar. 2, 1990, Ser. No. 487,238
Term of patent 14 years
U.S. Cl. D6—380



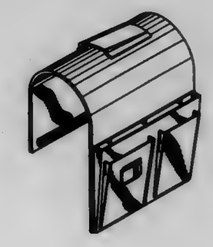
333,578
CABINET
Winsor D. White, Chicago, Ill., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Jun. 29, 1989, Ser. No. 374,387
Term of patent 14 years
U.S. Cl. D6—445



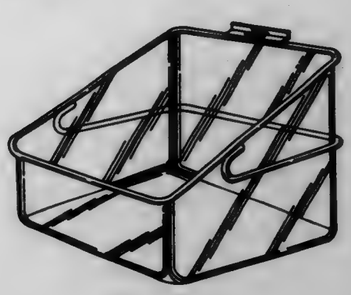
333,579
COMPACT DISC DISPLAYER
Stanleigh Wells, Bridgewater, Conn., assignor to The Croydon Company, Inc., Liverpool, N.Y.
Filed Jan. 17, 1991, Ser. No. 642,369
Term of patent 14 years
U.S. Cl. D6—446



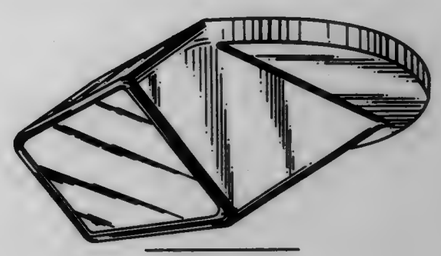
333,580
CONTROL CADDY
Beatrice L. Brummett, 5541 E. Tulare Ave., Sp87, Fresno, Calif. 93727
Filed Feb. 8, 1990, Ser. No. 476,649
Term of patent 14 years
U.S. Cl. D6—491



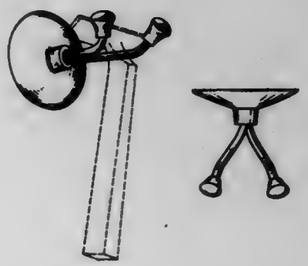
333,581
BIN
Ronald J. Macconti, and Frederick M. Avery, both of Phoenix, Ariz., assignors to The Niven Marketing Group, Scottsdale, Ariz.
Filed Jun. 15, 1990, Ser. No. 538,519
Term of patent 14 years
U.S. Cl. D6—510



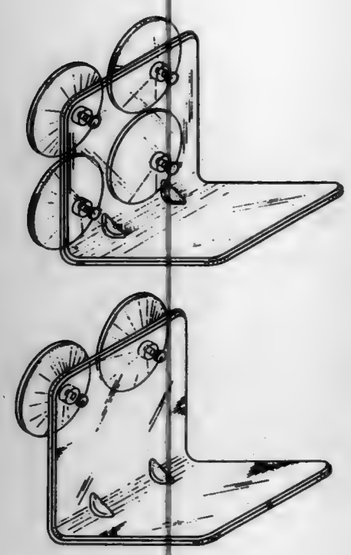
333,582
CEILING-MOUNTED TV MONITOR SUPPORT
Marty Sedighzadeh, 11504 W. Berry Pl., Littleton, Colo. 80127, and Robert Bromley, Boulder, Colo., assignors to Marty Sedighzadeh, Littleton, Colo.
Filed Sep. 19, 1991, Ser. No. 762,957
Term of patent 14 years
U.S. Cl. D6—513



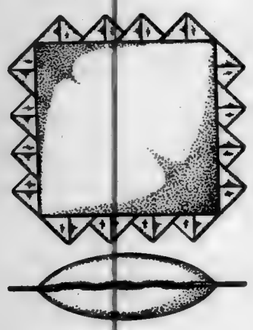
333,583
RAZOR HOLDER
Robert E. Hurd, 800 Frank Ct., Manteca, Calif. 95336
Filed Mar. 1, 1990, Ser. No. 486,728
Term of patent 14 years
U.S. Cl. D6—526



333,584
SHELF
Harry W. Starr, IV, 215 Clearwater, Plainview, Ill. 62676
Filed Jul. 23, 1990, Ser. No. 556,794
Term of patent 14 years
U.S. Cl. D6—574

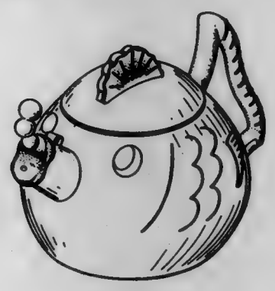


333,585
PILLOW WITH BORDER OF INTERLEAVED FINS
Rena S. DeStefanis, 1390 SW. Hallinan St., Lake Oswego, Oreg. 97034
Filed Aug. 12, 1991, Ser. No. 744,005
Term of patent 14 years
U.S. Cl. D6—601

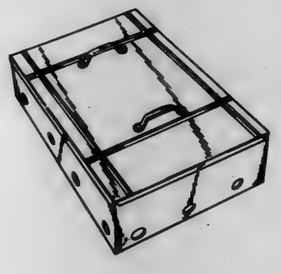


333,586
POP UP STRAW
Jacob Cohen, 21300 NE. 20th Ave., N. Miami Beach, Fla. 33179, and Jake Sasson, 114 E. 40th St., Apt. 5-B, New York, N.Y. 10016
Filed Jun. 5, 1990, Ser. No. 533,699
Term of patent 14 years
U.S. Cl. D7—300.1

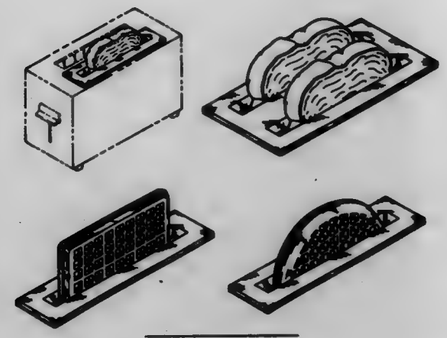
333,587
KETTLE
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Aug. 30, 1990, Ser. No. 573,785
Term of patent 14 years
U.S. Cl. D7—302



333,588
FISH SMOKER
William L. Bergman, Englewood, Colo., assignor to Sportmens Specialties, Inc., Englewood, Colo.
Filed Dec. 3, 1990, Ser. No. 621,549
Term of patent 14 years
U.S. Cl. D7—332



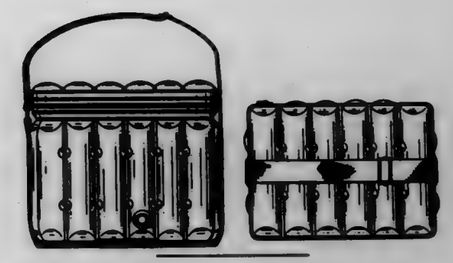
333,589
TOASTER COVER
Jesse J. Ransome, Jr., P.O. Box 371, Deepwater, N.J. 08023
Filed Jul. 2, 1990, Ser. No. 553,135
Term of patent 14 years
U.S. Cl. D7—390



333,590
PIE CRUST EDGE COVER
Christine Harris, 103 Berkshire Dr., Ozark, Ala. 36360
Filed Jun. 14, 1990, Ser. No. 538,164
Term of patent 14 years
U.S. Cl. D7—392.1

333,591
MUG
Raymond J. Gradocki, Mundelein; Gerald R. Sorensen, Elgin, and Steven Holt, Des Plaines, all of Ill., assignors to NCM International, Inc., Arlington Heights, Ill.
Filed Jun. 4, 1991, Ser. No. 710,299
Term of patent 14 years
U.S. Cl. D7—514

333,592
INFLATABLE COOLER
Kyle B. Walker, 4217 Baccarat Dr., Garland, Tex. 75043
Filed May 22, 1991, Ser. No. 704,006
Term of patent 14 years
U.S. Cl. D7—605



333,593
SAUCE BOTTLE CONVERING
Margaret Edison, 5389 Covey Creek, and Troy E. White, 5389 Covey Creek Cir., both of Stockton, Calif. 95207
Filed May 28, 1991, Ser. No. 705,888
Term of patent 14 years
U.S. Cl. D7—625

333,594
COMBINED CUTLERY AND KITCHEN UTENSIL HOLDER OR SIMILAR ARTICLE
Chen-Fu Lin, No. 11, Shing-Gong Rd, Yeong-Kang Industrial Dist., Yeong-Kang Hsiang, Tainan Hsien, Taiwan
Filed Oct. 28, 1991, Ser. No. 784,005
Term of patent 14 years
U.S. Cl. D7—638

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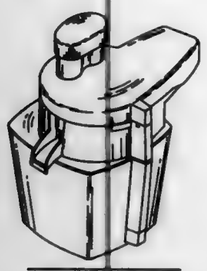
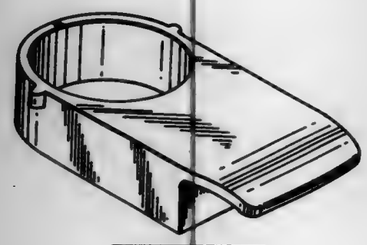
333,595
JUICER
Robert D. Lamson; Brent Markus, and Harold Kawaguchi, all of Seattle, Wash., assignors to Trillium Health Products, Inc., Seattle, Wash.
Filed Dec. 20, 1991, Ser. No. 812,367
Term of patent 14 years
U.S. Cl. D7—665

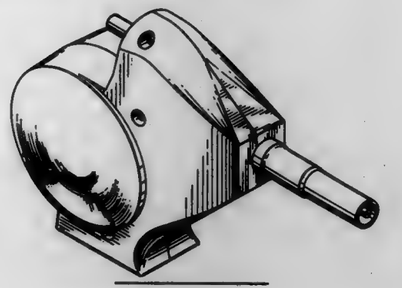


333,596
DISPENSING SCOOP
Wayne D. Husted, 2960 Scott St., San Francisco, Calif. 94123
Filed Jun. 20, 1991, Ser. No. 718,852
Term of patent 14 years
U.S. Cl. D7—691



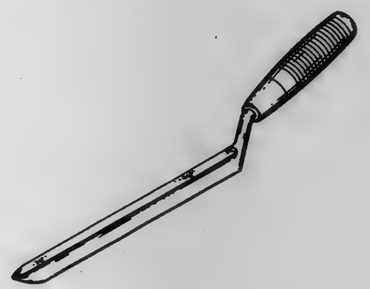
333,597
WEED EXTRACTOR
David A. Davis, P.O. Box 250, Springfield, Tenn. 37172
Filed May 8, 1992, Ser. No. 882,094
Term of patent 14 years
U.S. Cl. D8—9

333,598
HAND-HELD WELDING ADAPTOR FOR A DRILL
Peter F. Hayes, Santa Fe, N. Mex., and Theodore S. Cribari, Jr, Los Gatos, Calif., assignors to Omniverse Research, Inc., Gatos, Calif.
Filed Feb. 8, 1991, Ser. No. 652,746
Term of patent 14 years
U.S. Cl. D8—30

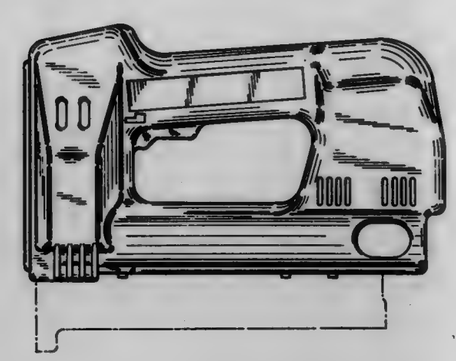


333,599
COMBINED INFANT CARRIER AND BED
Mark A. Wojtkiewicz, Lancaster, N.Y., assignor to Fisher Price, Inc., East Aurora, N.Y.
Filed Oct. 3, 1990, Ser. No. 592,068
Term of patent 14 years
U.S. Cl. D3—31

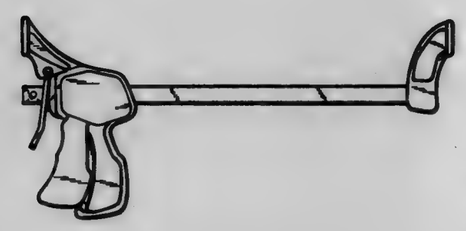
333,600
CONCRETE GROOVER
Christopher J. Brandvold, 9870 Pioneer Cir., Chanhassen, Minn. 55317
Filed Jun. 3, 1991, Ser. No. 709,400
Term of patent 14 years
U.S. Cl. D8—45



333,601
ELECTRIC STAPLE GUN TACKER
Rudolf Wingert, West Milford, N.J., assignor to Electro-Matic Staplers, Inc., Saddle Brook, N.J.
Filed Oct. 16, 1990, Ser. No. 598,324
Term of patent 14 years
U.S. Cl. D8—49



333,602
QUICK ACTION BAR CLAMP/SPREADER
Dwight L. Gatzemeyer, and Joseph A. Sorensen, both of Lincoln, Nebr., assignors to Petersen Manufacturing Co., Inc., DeWitt, Nebr.
Continuation-in-part of Ser. No. 298,498, Jan. 18, 1989. This application Feb. 5, 1990, Ser. No. 475,088
The portion of the term of this patent subsequent to Oct. 22, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—72

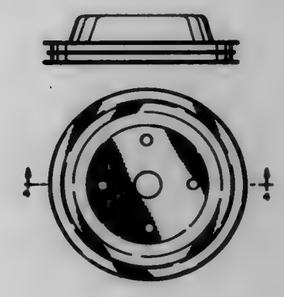


333,603
FIFTH WHEEL PIN PULLER
Ralph Eagle, Jr., 5317 Dupont St., Chattanooga, Tenn. 37412
Continuation-in-part of Ser. No. 559,602, Jul. 30, 1990. This application Feb. 5, 1991, Ser. No. 650,644
Term of patent 14 years
U.S. Cl. D8—89

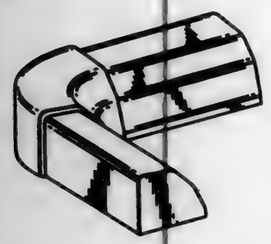
333,604
FOLDING KNIFE
Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001, and Denis Lemaire, Boucherville, Canada, assignors to Lynn C. Thompson, Ventura, Calif.
Filed Jun. 24, 1991, Ser. No. 719,596
Term of patent 14 years
U.S. Cl. D8—99

333,605
GAS PUMP NOZZLE TRIGGER HOLDER
William S. Powell, Jr., P.O. Box 566, St. Stephen, S.C. 29479
Filed Jul. 18, 1991, Ser. No. 731,887
Term of patent 14 years
U.S. Cl. D8—349

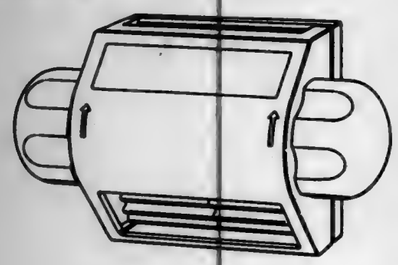
333,606
PULLEY
Toshiaki Kanemitsu, Kobe, and Kazuyuki Oda, Hyogo, both of Japan, assignors to Kabushiki Kaisha Kanemitsu, Japan
Filed May 29, 1991, Ser. No. 706,729
Claims priority, application Japan, Dec. 12, 1989, 2-41689; Dec. 12, 1990, 2-41697
Term of patent 14 years
U.S. Cl. D8—360



333,607
CORNER FITTING OF A TONNEAU COVER MOUNTING FRAME FOR THE BED OF A PICKUP TRUCK
Mark Isler, 8447 Tod Ave., SW., Lordstown, Ohio 44481
Filed Aug. 28, 1989, Ser. No. 399,293
Term of patent 14 years
U.S. Cl. D8—382



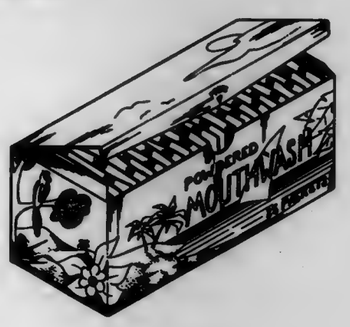
333,608
TUBE DISPENSER
Yosef Yisrael, and Mordechai Reriv, both of Eilat, Israel, assignors to R. Y. Patents Development & Applications Ltd., Eilat, Israel
Filed Jul. 10, 1991, Ser. No. 728,067
Claims priority, application Israel, Jan. 15, 1991, 17331
Term of patent 14 years
U.S. Cl. D6—541



333,609
SPRAY BOTTLE
William Beaumont, Albion, Calif., assignor to EGL 1, Inc., Carlsbad, Calif.
Filed May 9, 1991, Ser. No. 697,953
Term of patent 14 years
U.S. Cl. D9—300

333,610
DISK STORAGE SLEEVE
Scott J. Oakry, and Sean B. Broomith, both of Redondo Beach, Calif., assignors to Roundhouse Design Group, Inc., Redondo Beach, Calif.
Filed Feb. 28, 1991, Ser. No. 661,637
Term of patent 14 years
U.S. Cl. D9—306

333,611
PACKAGE FOR POWDERED MOUTHWASH
Mary O'Neil, 2 Shell La., Levittown, N.Y. 11756
Filed Jul. 25, 1990, Ser. No. 556,985
Term of patent 14 years
U.S. Cl. D9—307

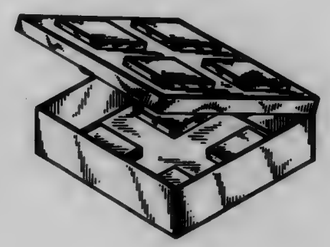


333,612
BOTTLE
Marc Gobe, New York, N.Y., assignor to Victoria's Secret Stores, Inc., Reynoldsburg, Ohio
Filed Aug. 3, 1992, Ser. No. 925,432
Term of patent 14 years
U.S. Cl. D9—315

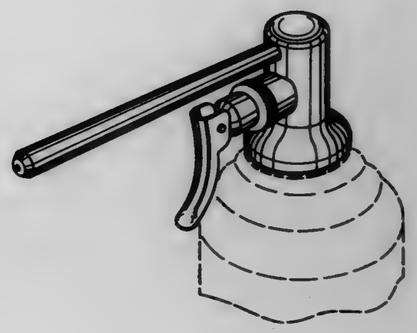
333,613
PACKAGE FOR TAPE MEASURE
Brian S. Theros, Lemont, Ill., assignor to Klein Tools, Inc., Chicago, Ill.
Filed Jul. 29, 1991, Ser. No. 736,830
Term of patent 14 years
U.S. Cl. D9—415

333,614
CONTAINER FOR PRAYER CARDS
Gae L. Mignel, 51 Knight La., Hollister, Calif. 95023
Filed Sep. 26, 1990, Ser. No. 588,960
Term of patent 14 years
U.S. Cl. D9—423

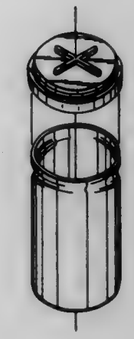
333,615
STACKABLE CONTAINER
Aaron Zatler, 19 Clearmeadow La., Woodbury, N.Y. 11797
Filed Mar. 22, 1990, Ser. No. 503,363
Term of patent 14 years
U.S. Cl. D9—423



333,616
DETACHABLE SPRAY NOZZLE FOR SPRAY CANS
Robert A. Perkins, and Henry F. Hansing, both of Janesville, Wis., assignors to Poca Products, Inc., Janesville, Wis.
Filed Dec. 27, 1990, Ser. No. 634,291
Term of patent 14 years
U.S. Cl. D9—448



333,617
COMBINED FILM CONTAINER AND REVERSIBLE CAP
Suzanne E. Brown, 2910 Dungate Rd., Pasadena, Md. 21122
Filed Oct. 1, 1990, Ser. No. 591,499
Term of patent 14 years
U.S. Cl. D9—503



333,618
BOTTLE
Manharbhai K. Patel, Saddle Brook, N.J., and John Lister, Wilton, Conn., assignors to Reckitt & Colman Inc., Wayne, N.J.
Filed Aug. 5, 1991, Ser. No. 740,489
Term of patent 14 years
U.S. Cl. D9—522

333,619
COMBINED BOTTLE AND CAP
Thierry Lamahieu, Boulogne Billancourt, France, assignor to Innovation Scientifique Dermatologique, Paris, France
Filed Oct. 2, 1990, Ser. No. 591,529
Term of patent 14 years
U.S. Cl. D9—573

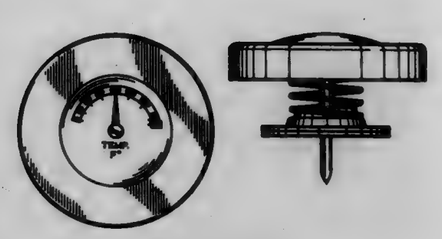
333,620
WALL-CLOCK
Don-Son Moore, Taichung Hsien, Taiwan, assignor to Centre Clock Industry Co., Ltd., Taichung Hsien, Taiwan
Filed Dec. 18, 1990, Ser. No. 631,072
Term of patent 14 years
U.S. Cl. D10—29

333,621
WATCH CASE
Hanspeter Grädel, Brügg, Switzerland, assignor to Lucien Rochat SA, Bienne, Switzerland
Filed Nov. 9, 1989, Ser. No. 434,974
Claims priority, application Int'l Pat. Institute, May 10, 1989, DM/013555
Term of patent 14 years
U.S. Cl. D10—30

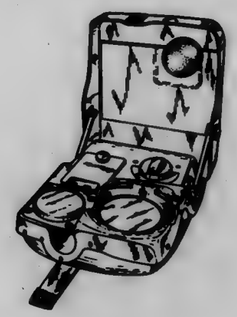
333,622
WRISTWATCH
Joseph D. Vogel, 623 Shadow Creek La., Norcross, Ga. 30093
Filed Sep. 4, 1990, Ser. No. 576,726
Term of patent 14 years
U.S. Cl. D10—33

333,623
COMBINED RADIATOR CAP, PRESSURE GAUGE AND TEMPERATURE GAUGE
Tommy Doyle, 14924 Henry Rd., Houston, Tex. 77060
Filed Nov. 1, 1990, Ser. No. 607,487
Term of patent 14 years
U.S. Cl. D10—53

333,624
COMBINED RADIATOR CAP AND TEMPERATURE GAUGE
Tommy Doyle, 14924 Henry Rd., Houston, Tex. 77060
Filed Nov. 1, 1990, Ser. No. 607,488
Term of patent 14 years
U.S. Cl. D10—53

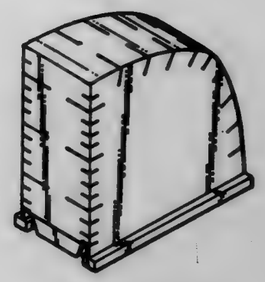


333,625
NAVIGATIONAL BOARD INSTRUMENT FOR USE IN SKY DIVING
Tomio Miya, Culver City, Calif., assignor to American Safety Flight Systems, Inc., Glendale, Calif.
Filed Aug. 20, 1990, Ser. No. 570,289
Term of patent 14 years
U.S. Cl. D10—65

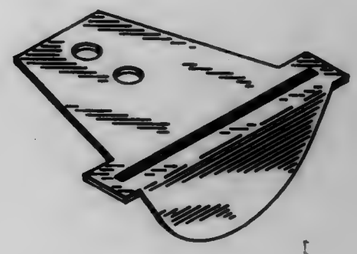


333,626
COMBINATION COMPASS AND WRIST STRAP
Gin-Sung Chang, No. 21, Lane 385, Kuang-Ming Rd., Wu-Jih Hsiang, Taichung Hsien, Taiwan
Filed Dec. 13, 1990, Ser. No. 627,218
Term of patent 14 years
U.S. Cl. D10—32

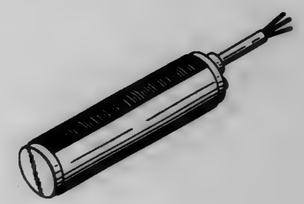
333,627
COMBINATION TAPE MEASURE AND SQUARE
Dennis Douglas, 1615 Ora Dr., Napa, Calif. 94559
Filed May 10, 1991, Ser. No. 699,798
Term of patent 14 years
U.S. Cl. D10—72



333,628
MEASURING TAPE TIP
Kenneth J. Piotrowski, 106 Avenue D, Holbrook, N.Y. 11741
Filed Jan. 8, 1990, Ser. No. 536,223
Term of patent 14 years
U.S. Cl. D10—74



333,629
PHOTOELECTRIC SENSOR HOUSING
Donald D. Johnson, Pearl City, Ill., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 2, 1991, Ser. No. 801,129
Term of patent 14 years
U.S. Cl. D10—80



333,630
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,224
Term of patent 14 years
U.S. Cl. D10—86

333,631
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,225
Term of patent 14 years
U.S. Cl. D10—86

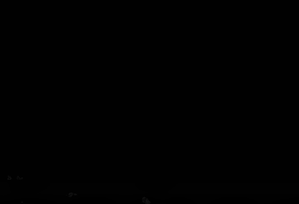
333,632
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,226
Term of patent 14 years
U.S. Cl. D10—86

333,633
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,227
Term of patent 14 years
U.S. Cl. D10—86

333,634
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,228
Term of patent 14 years
U.S. Cl. D10—86

333,635
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,229
Term of patent 14 years
U.S. Cl. D10—86

333,636
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,230
Term of patent 14 years
U.S. Cl. D10—86



333,637
TOOTHBRUSH
Ronald Dickson, Hong Kong, assignor to Dickson Industrial Co., Ltd., Hong Kong
Filed Jan. 8, 1990, Ser. No. 536,231
Term of patent 14 years
U.S. Cl. D10—86

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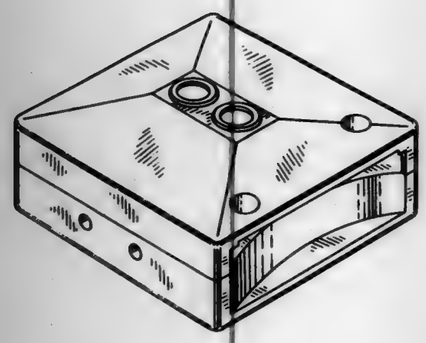
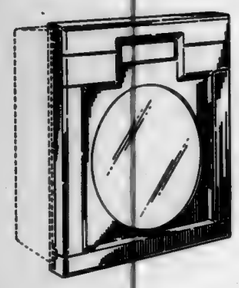
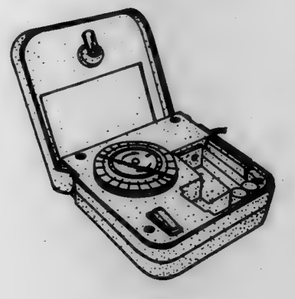
333,630
INSTRUMENT FOR TESTING LIQUID SAMPLES
Colin E. Marks, Tyne & Wear, England, assignor to Palintest Ltd., Tyne & Wear, England
Filed May 22, 1990, Ser. No. 527,169
Claims priority, application United Kingdom, Jan. 16, 1990, 2004536
Term of patent 14 years
U.S. Cl. D10—81



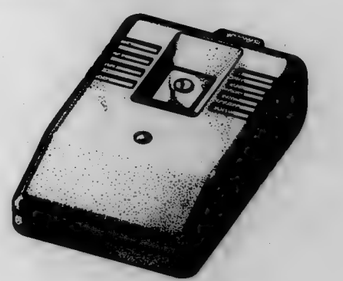
333,631
CHART RECORDER DOOR
Justin M. Maguire, Jr., 233 Narragansett Ave., Barrington, R.I. 02806, and Michael Pagliuca, Fremont St., Taunton, Mass. 02780
Filed Nov. 6, 1990, Ser. No. 609,945
Term of patent 14 years
U.S. Cl. D10—103



333,632
UNIT FOR PREVENTING THE USE OF AN ELECTRONIC APPLIANCE DURING CERTAIN TIME INTERVALS
Soo-Young Oh, 43553 Euclid Dr., Fremont, Calif. 94539, and Yong Paik, 35 Grandview Ct., Danville, Calif. 94506
Filed Nov. 9, 1990, Ser. No. 612,276
Term of patent 14 years
U.S. Cl. D10—104



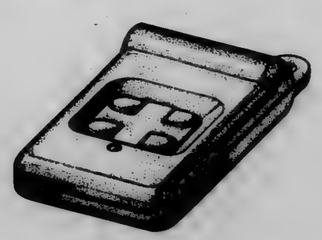
333,633
TRANSMITTER FOR A VEHICLE ALARM
Darrell E. Issa, 1598 Parkview Dr., Vista, Calif. 92083
Filed Dec. 12, 1991, Ser. No. 805,901
Term of patent 14 years
U.S. Cl. D10—106



333,634
TRANSMITTER FOR A VEHICLE ALARM
Darrell E. Issa, 1598 Parkview Dr., Vista, Calif. 92083
Filed Dec. 12, 1991, Ser. No. 805,911
Term of patent 14 years
U.S. Cl. D10—106

333,635
TRANSMITTER FOR A VEHICLE ALARM
Darrell E. Issa, 1598 Parkview Dr., Vista, Calif. 92083
Filed Dec. 12, 1991, Ser. No. 805,915
Term of patent 14 years
U.S. Cl. D10—106

333,636
TRANSMITTER FOR A VEHICLE ALARM
Darrell E. Issa, 1598 Parkview Dr., Vista, Calif. 92083
Filed Dec. 12, 1991, Ser. No. 806,136
Term of patent 14 years
U.S. Cl. D10—106

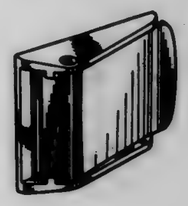


333,637
JEWELRY CHAIN
Carmen P. Zizola, Bassano del Grappa, Italy, assignor to OroAmerica, Inc., Burbank, Calif.
Filed Jan. 5, 1990, Ser. No. 461,452
Term of patent 14 years
U.S. Cl. D11—13

333,638
BIRD CAGE
Bruce A. Rachner, 346 Mill Rd., Buffalo, N.Y. 14224
Filed Apr. 1, 1991, Ser. No. 677,973
Term of patent 14 years
U.S. Cl. D11—162

333,639
BOW FOR A BOTTLE
Adelheid Matas, 1911 Franklin St., Glenview, Ill. 60025
Filed May 10, 1991, Ser. No. 698,575
Term of patent 14 years
U.S. Cl. D11—184

333,640
CAM BUCKLE
Steven C. Keller, Island Lake, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Mar. 14, 1990, Ser. No. 493,237
Term of patent 14 years
U.S. Cl. D11—218



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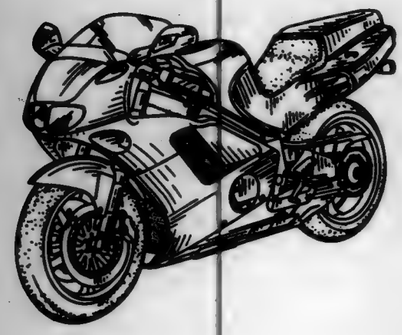
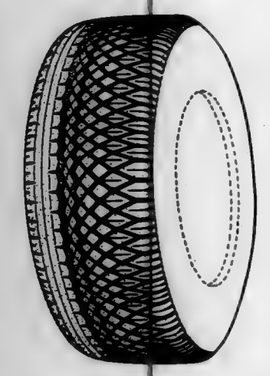
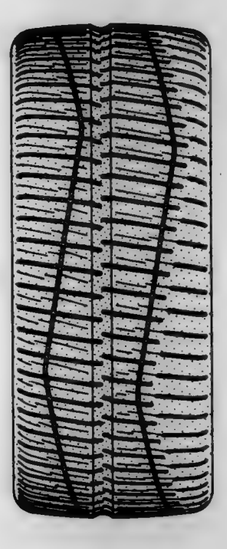
333,641
MOTORCYCLE
Shigeki Sakaguchi, Fujisawa; Nobuyuki Shiwa, Tokyo, and Keiji Arai, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd), Tokyo, Japan
Filed Jan. 24, 1991, Ser. No. 648,429
Claims priority, application Japan, Jul. 27, 1990, 2-25581
Term of patent 14 years
U.S. Cl. D12—110



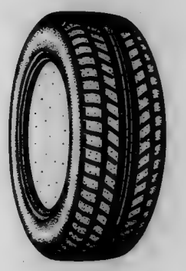
333,642
PNEUMATIC TIRE TREAD AND BUTTRESS
Randall R. Brayer, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 20, 1990, Ser. No. 569,331
Term of patent 14 years
U.S. Cl. D12—146



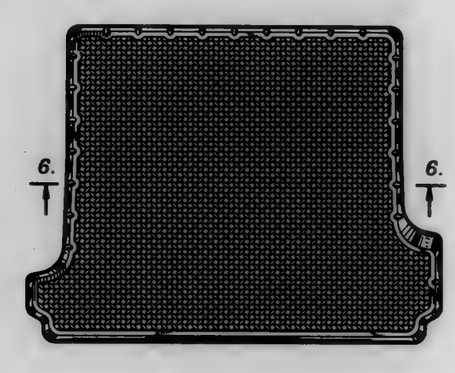
333,643
PNEUMATIC TIRE TREAD AND BUTTRESS
Paul B. Maxwell, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 14, 1990, Ser. No. 538,948
Term of patent 14 years
U.S. Cl. D12—147



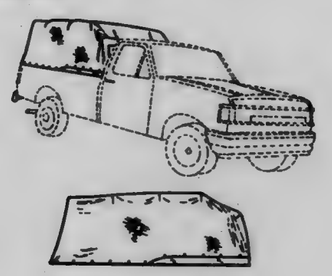
333,644
AUTOMOBILE TIRE
Mineo Kawabata, and Hisao Uchikubo, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 4, 1990, Ser. No. 622,093
Claims priority, application Japan, Jun. 5, 1990, 2-18670
The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



333,645
LINER FOR STORAGE/BED AREA OF A SPORT/UTILITY VEHICLE
Robert D. Tyler, 3120 Lakeview Ct., Winfield, Kans. 67156
Filed Apr. 4, 1991, Ser. No. 680,269
Term of patent 14 years
U.S. Cl. D12—155

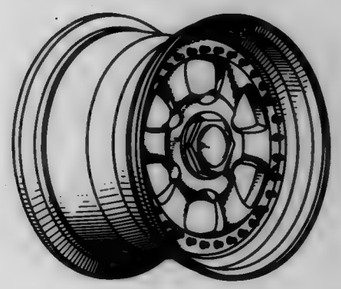


333,646
COLLAPSIBLE CANOPY FOR A PICKUP TRUCK
Sam Levy, 626 Mill Valley Rd., Mechanicsville, Va. 23111
Filed Jul. 8, 1991, Ser. No. 726,563
Term of patent 14 years
U.S. Cl. D12—156

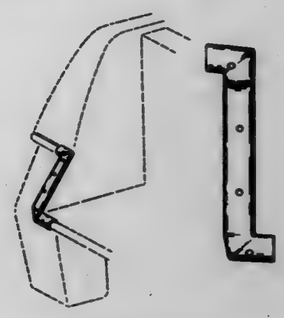


333,647
VEHICLE WHEEL HUB
William E. Carmichael, Prince George, Canada, assignor to Transtech Industries Inc., Vancouver, Canada
Filed Jun. 20, 1991, Ser. No. 718,096
Term of patent 14 years
U.S. Cl. D12—207

333,648
VEHICLE WHEEL
Franz Schwenk, Alpirsbach, Fed. Rep. of Germany, assignor to BBS Kraftfahrzeugtechnik Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 19, 1990, Ser. No. 495,301
Term of patent 14 years
U.S. Cl. D12—209



333,649
OFFSET RUB RAIL CAP
Rick A. Videon, 6177 Lillian La., Traverse City, Mich. 49684
Filed Apr. 9, 1991, Ser. No. 684,399
Term of patent 14 years
U.S. Cl. D12—317

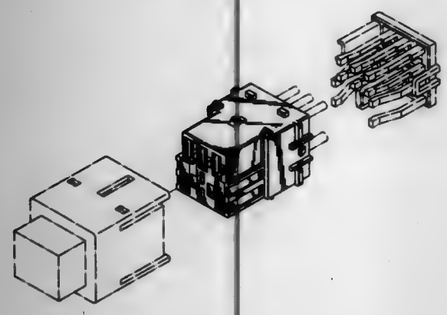


333,650
ROTARY POWERED PARAPLANE
Copeland J. Wallace-Morrison, 712 Dorbett Pl., Plainfield, N.J. 07060
Filed Mar. 7, 1991, Ser. No. 665,715
Term of patent 14 years
U.S. Cl. D12—327

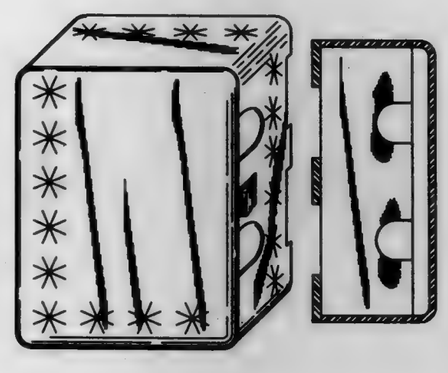
333,651
BATTERY CHARGER FOR A FACSIMILE TRANSMITTER AND RECEIVER
Akihide Itou; Izuto Murakawa, and Hideji Takemasa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Nov. 8, 1991, Ser. No. 789,476
Claims priority, application Japan, May 9, 1991, 3-13601
Term of patent 14 years
U.S. Cl. D13—108

333,652
COMBINED ELECTRICAL RACEWAY AND TELECOMMUNICATIONS CONNECTOR
Steven Feldman, Hudson, and William G. Mengelson, Clearwater, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 9, 1989, Ser. No. 364,391
Term of patent 14 years
U.S. Cl. D13—155

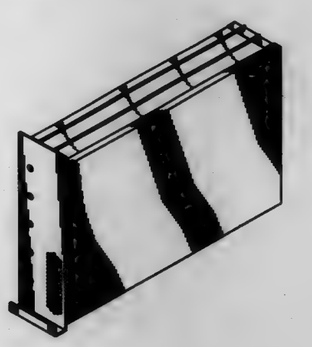
333,653
ELECTRICAL CONNECTOR HOUSING
Makoto Yamanashi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Jan. 25, 1990, Ser. No. 552,674
Claims priority, application Japan, Dec. 27, 1989, 1-47404
Term of patent 14 years
U.S. Cl. D13—147



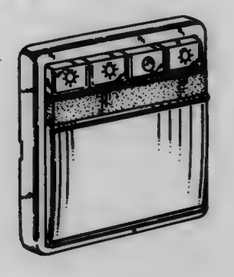
333,654
PLUG PROTECTOR COVER
Teresa D. Aris, and Philip G. Aris, III, both of 2307 Inverness Dr., Rawlins, Wyo. 82301
Filed Nov. 9, 1990, Ser. No. 611,148
Term of patent 14 years
U.S. Cl. D13—156



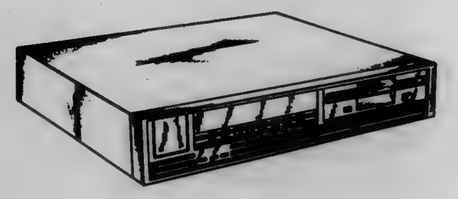
333,655
ELECTRONIC EQUIPMENT RECEIVER MODULE
Janice M. Weber, Elgin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 4, 1991, Ser. No. 771,918
Term of patent 14 years
U.S. Cl. D13—164



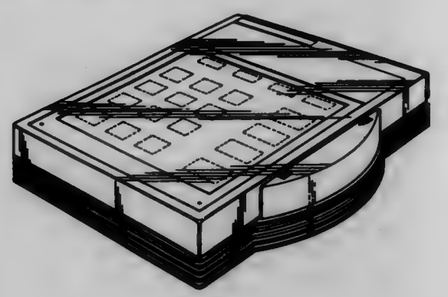
333,656
WALL-MOUNTED, MULTI-SWITCH CONTROL UNIT FOR A PROGRAMMABLE BUILDING SYSTEM
Thomas Blumel, Erlangen, and Werner Podzus, Weissenohe, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Sep. 13, 1990, Ser. No. 581,651
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 9002019; Aug. 2, 1990, 9005174
Term of patent 14 years
U.S. Cl. D13—162



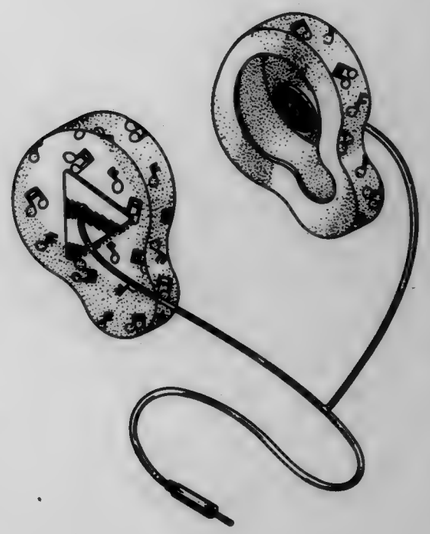
333,657
COMPUTER
Jin S. Wang, Carson, Calif., assignor to Towercom, Inc., Carson, Calif.
Filed Dec. 14, 1990, Ser. No. 628,729
Term of patent 14 years
U.S. Cl. D14—100



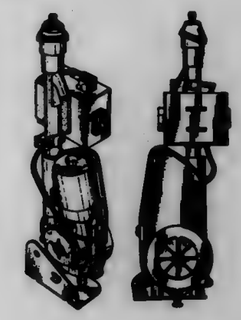
333,658
POINT OF SALE TRANSACTION TERMINAL
Jeffrey K. Sasaki, San Jose, Calif., assignor to Verifone, Inc., Redwood City, Calif.
Filed Aug. 2, 1991, Ser. No. 740,021
Term of patent 14 years
U.S. Cl. D14—105



333,659
HEADPHONES
Christopher Williams, 392 8th St. Apt. C, Atlanta, Ga. 30309
Filed Nov. 5, 1990, Ser. No. 608,904
Term of patent 14 years
U.S. Cl. D14—205



333,660
ANTENNA FOR AUTOMOBILES
Ryouichi Miyakawa, Tokyo, Japan, assignor to 501 Harada Industry Co., Ltd., Tokyo, Japan
Filed Aug. 8, 1990, Ser. No. 564,439
Claims priority, application Japan, Feb. 9, 1990, 2-3649
Term of patent 14 years
U.S. Cl. D14—230



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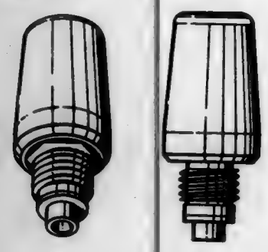
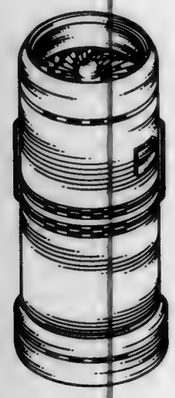
333,661
ANTENNA
Michael L. Elliott, and Matti J. Martikainen, both of Tiberias, Israel, assignors to Technophone Limited, Surrey, England
Filed Aug. 27, 1990, Ser. No. 574,083
Claims priority, application United Kingdom, Feb. 27, 1990, 2005018
Term of patent 14 years
U.S. Cl. D14—236

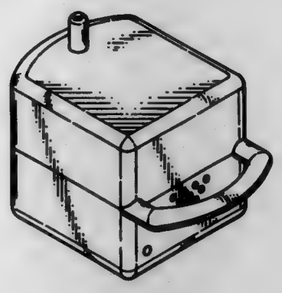


333,662
TURBINE ENGINE
Donald L. Harris, 180 South View Dr. #4, Marion, Iowa 52302
Filed Feb. 22, 1991, Ser. No. 659,156
Term of patent 14 years
U.S. Cl. D15—1

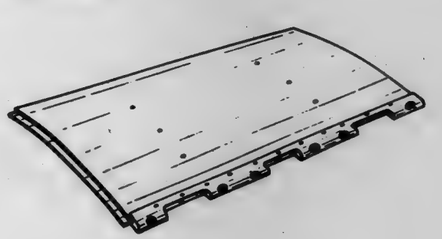


333,663
PROPELLER COVER FOR AN OUTBOARD MOTOR
Robert G. Faber, Rte. 1, Arkansas City, Kans. 67005
Filed Apr. 4, 1990, Ser. No. 504,280
Term of patent 14 years
U.S. Cl. D15—4

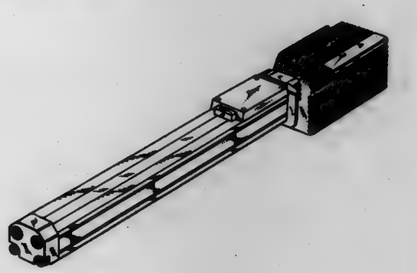
333,664
BALLOON INFLATOR
William G. Carroll, Salt Lake City, Utah, assignor to Maxim Marketing, Inc., Salt Lake City, Utah
Filed Oct. 19, 1990, Ser. No. 600,503
Term of patent 14 years
U.S. Cl. D15—7



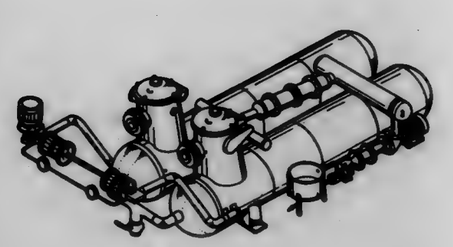
333,665
COMBINE HEADER SHIELD
Wesley W. Bruns, Gibbon, Minn., assignor to May-Wes Manufacturing, Inc., Gibbon, Minn.
Filed Apr. 2, 1990, Ser. No. 502,757
Term of patent 14 years
U.S. Cl. D15—28



333,666
POSITIONING ACTUATOR
Sousuke Kawashima, and Toshiyuki Onizuka, both of Gunma, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 1, 1991, Ser. No. 662,882
Term of patent 14 years
U.S. Cl. D15—142

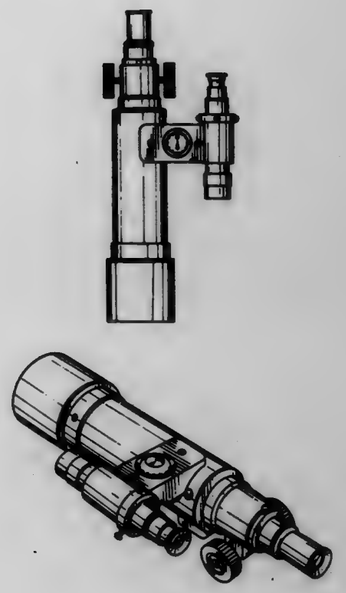


333,667
DYEING MACHINE
Lin C. Yun, P.O. Box 82-144, Taipei, Taiwan
Filed Feb. 6, 1991, Ser. No. 652,287
Term of patent 14 years
U.S. Cl. D15—199

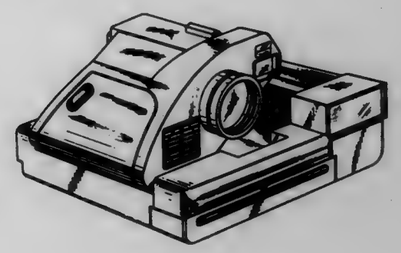


333,668
NOVELTY VISOR/SUNSHADE
Jonathon M. W. McIntyre, 6733 Hinds Ave., North Hollywood, Calif. 91606
Filed Oct. 24, 1990, Ser. No. 602,723
Term of patent 14 years
U.S. Cl. D16—110

333,669
ASTRONOMICAL TELESCOPE
Keiji Ohshima, Tokyo, Japan, assignor to Dai-Ichi Kogaku Co., Ltd., Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 507,172
Claims priority, application Japan, Feb. 1, 1990, 2-2970
Term of patent 14 years
U.S. Cl. D16—132



333,670
FOLDABLE PHOTOGRAPHIC CAMERA
Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sep. 4, 1990, Ser. No. 577,590
Term of patent 14 years
U.S. Cl. D16—211



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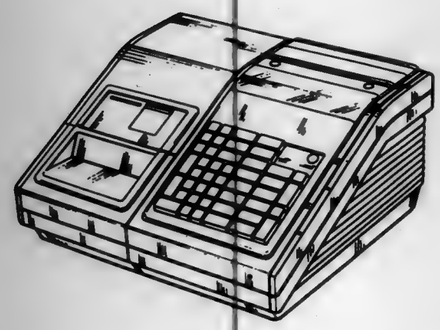
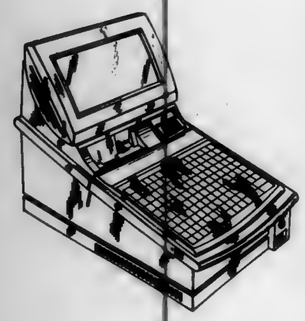
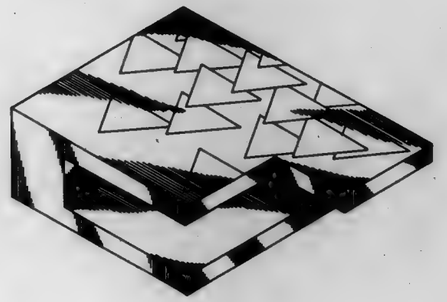
333,671
CASH REGISTER
Emilio Fabbri, Via DEL Decoratore, 4 - 40138 Bologna, Italy
Filed Apr. 4, 1991, Ser. No. 680,289
Claims priority, application World Int. Prop. O., Oct. 22, 1990, DM/017895
Term of patent 14 years
U.S. Cl. D18—4



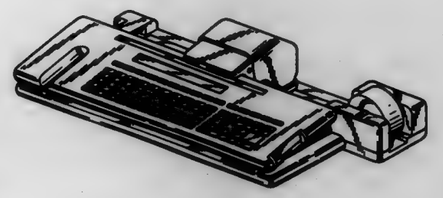
333,672
SALES PROCESSING TERMINAL
Masaki Minaminono, Kawasaki, Japan, assignor to Nitsuko Corporation, Kawasaki, Japan
Filed Oct. 8, 1991, Ser. No. 773,205
Claims priority, application Japan, May 23, 1991, 2-14790
Term of patent 14 years
U.S. Cl. D18—4



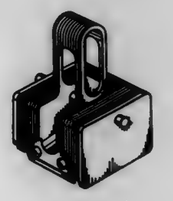
333,673
MARGIN SETTER FOR USE WITH A TYPEWRITER OR PRINTER
Barbara R. Riggs, and David Riggs, both of 3513 E. Redbud Dr., Knoxville, Tenn. 37920
Filed Jan. 16, 1991, Ser. No. 641,574
Term of patent 14 years
U.S. Cl. D18—12



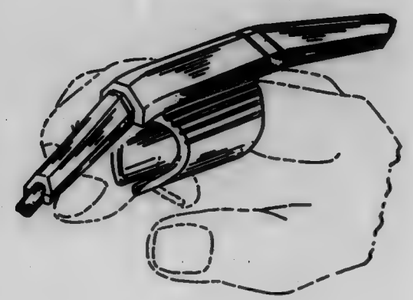
333,674
AUTOMATIC LETTERING MACHINE
Tetsuya Iwanaga, Tokyo, Japan, assignor to Mutoh Industries, Ltd., Tokyo, Japan
Filed Sep. 24, 1990, Ser. No. 586,978
Claims priority, application Japan, Apr. 5, 1990, 2-11709
Term of patent 14 years
U.S. Cl. D18—19



333,675
PRINTING HEAD
Angelo M. Chiovitti, 585 Joslin Rd., Harrisville, R.I. 02830
Filed May 14, 1990, Ser. No. 522,965
Term of patent 14 years
U.S. Cl. D18—56

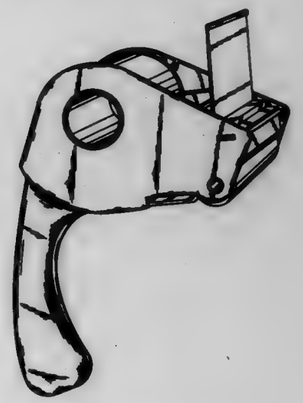


333,676
FINGER-MOUNTABLE MARKING INSTRUMENT
Mark A. Bedol, 6980 Fabriano Pl., Rancho Cucamonga, Calif. 91701
Filed May 14, 1991, Ser. No. 699,785
Term of patent 14 years
U.S. Cl. D19—36

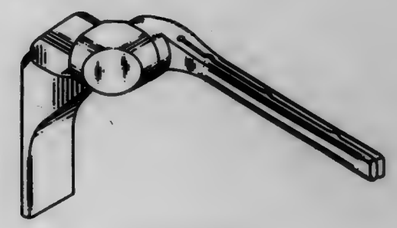


333,677
WRITING INSTRUMENT
Jules Giralt, 14, rue Paul Lecombe, 11000 Carcassonne, France
Filed Oct. 9, 1990, Ser. No. 594,815
Claims priority, application France, Apr. 10, 1990, 902945
Term of patent 14 years
U.S. Cl. D19—48

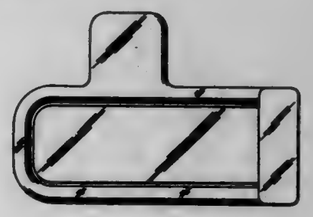
333,678
HAND-HELD ADHESIVE TAPE DISPENSER
Adelio Limoni, Vedano Olona, Italy, assignor to S.I.A.T. Societa Internazionale Applicazioni Tecniche S.p.A., Turate, Italy
Filed Jun. 6, 1990, Ser. No. 534,022
Claims priority, application Italy, Dec. 15, 1989, 22247B/89
Term of patent 14 years
U.S. Cl. D19—69



333,679
DOCUMENT HOLDER
Craig A. Hoffman, and David H. Hoffman, both of Waco, Tex., assignors to Fellowes Manufacturing Company, Itasca, Ill.
Filed Sep. 16, 1991, Ser. No. 760,204
Term of patent 14 years
U.S. Cl. D19—88



333,680
CLIP FOR HOLDING A BOOK OPEN
Phillip E. Mark, Palmetto, Fla., assignor to Monte Carlo Group, Inc., Tampa, Fla.
Filed Aug. 8, 1991, Ser. No. 742,664
Term of patent 14 years
U.S. Cl. D19—33



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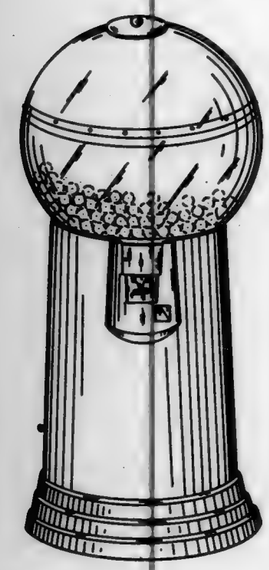
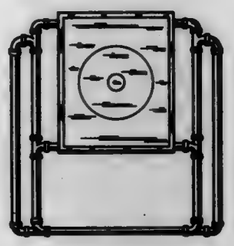
333,681
GIANT GUMBALL DISPENSING MACHINE
Kim H. Stern, Phoenix, Ariz., assignor to Mr. Gumball, Inc., Phoenix, Ariz.
Continuation of Ser. No. 403,324, Sep. 6, 1989, abandoned. This application Apr. 30, 1992, Ser. No. 879,064
Term of patent 14 years
U.S. Cl. D20—7



333,682
FOOD AND BEVERAGE MENU HOLDER FOR RESTAURANT TABLES
Karen E. Burgess, Branford, Conn., assignor to Gastro-Gnomes, Inc., West Hartford, Conn.
Filed Aug. 15, 1991, Ser. No. 747,537
Term of patent 14 years
U.S. Cl. D20—40

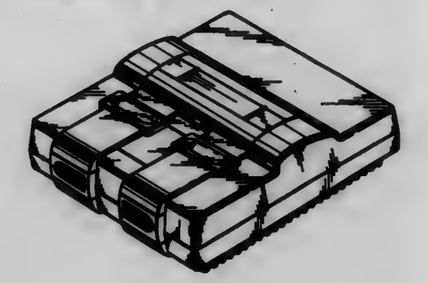
333,683
GAME TARGET STAND
Ronald L. Trachet, Ann Arbor, Mich., assignor to Mid-Tech, Inc., Ann Arbor, Mich.
Filed May 13, 1991, Ser. No. 699,235
Term of patent 14 years
U.S. Cl. D21—5



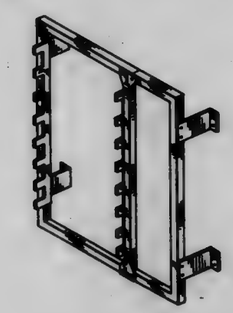
333,684
TOY TOW TRUCK
Ian T. Revell, Kentsford, Great Britain, assignor to Kiddicraft Limited, Berkshire, England
Filed Jul. 10, 1991, Ser. No. 728,077
Claims priority, application United Kingdom, Jan. 11, 1991, 2012278
Term of patent 14 years
U.S. Cl. D21—139

333,685
STUFFED ANIMAL FIGURE
Osmani A. Rodriguez, 6 Wyman St., Boston, Mass. 02136
Filed Feb. 15, 1990, Ser. No. 480,515
Term of patent 14 years
U.S. Cl. D21—148

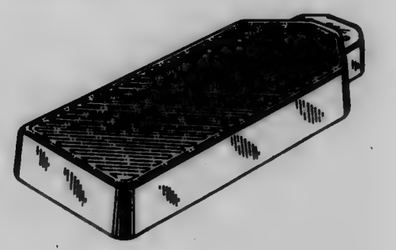
333,686
VIDEO GAME MACHINE
Lance Barr, Redmond, Wash., and Mitsuru Hitomi, Kyoto, Japan, assignors to Nintendo Co., Ltd., Kyoto, Japan
Filed Sep. 10, 1991, Ser. No. 757,432
Claims priority, application Japan, Mar. 26, 1991, 3-8432
Term of patent 14 years
U.S. Cl. D21—48



333,687
PHYSICAL THERAPY EXERCISE FRAME
David C. Smith, 3717 Barrington Bridge Pl., Richmond, Va. 23233
Filed May 16, 1991, Ser. No. 701,964
Term of patent 14 years
U.S. Cl. D21—191



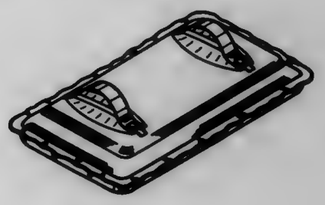
333,688
FOOT PEDAL FOR A PHYSICAL EXERCISER
Eric Beyer, Vincennes, Ind., assignor to Formula Ventures, North Miami Beach, Fla.
Filed Dec. 17, 1991, Ser. No. 810,667
Term of patent 14 years
U.S. Cl. D21—191



333,689
BALL CHIPPING GAME TARGET
Burch L. Schleimer, and Nancy L. Stiller-Schleimer, both of 3753 Carritos Ave., Long Beach, Calif. 90807
Filed Jul. 16, 1990, Ser. No. 553,677
Term of patent 14 years
U.S. Cl. D21—200

333,690
POOL TABLE
Larry McKenzie, 5700 St. Augustine Rd., Suite 104, Jacksonville, Fla. 32207
Filed Jun. 5, 1991, Ser. No. 710,982
Term of patent 14 years
U.S. Cl. D21—232

333,691
LIQUID FILLABLE BOMB BLAST INHIBITOR
Garth J. M. Barrett, Northcliff, South Africa, assignor to Cabe Overseas Trading Limited, Jersey, Channel Islands
Filed May 25, 1989, Ser. No. 356,839
Term of patent 14 years
U.S. Cl. D22—112



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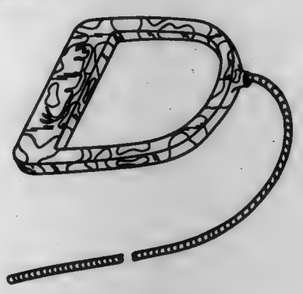
333,692
POLICE SIDE HANDLE BATON
Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems and Procedures, Inc., Appleton, Wis.
Filed Sep. 28, 1990, Ser. No. 590,064
Term of patent 14 years
U.S. Cl. D22—117

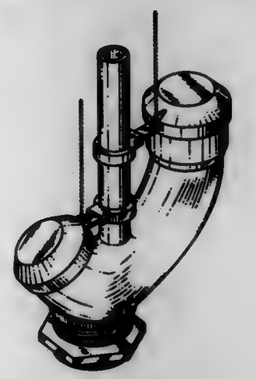
333,693
POLICE SIDE HANDLE TRAINING BATON
Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems and Procedures, Inc., Appleton, Wis.
Filed Sep. 28, 1990, Ser. No. 590,065
Term of patent 14 years
U.S. Cl. D22—117

333,694
FISHING LURE
Paul E. Bruehl, 2019 Windsor Rd., Petersburg, Va. 23805
Filed Oct. 12, 1990, Ser. No. 596,591
Term of patent 14 years
U.S. Cl. D22—128

333,695
COMBINED BIG GAME DRAG ROPE AND HANDLE
Steven A. Gatto, 29 Kinney St., and Timothy D. Gatto, 23 Fay St., both of Brocton, N.Y. 14716
Filed Apr. 19, 1990, Ser. No. 511,009
Term of patent 14 years
U.S. Cl. D22—199

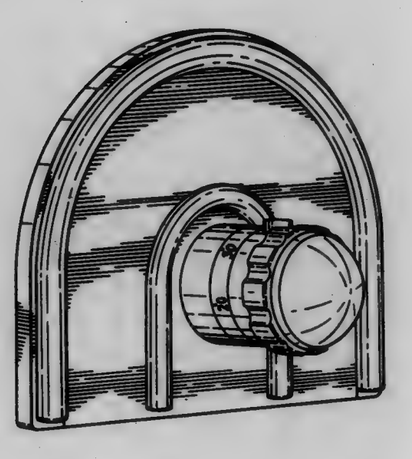


333,696
DUAL FLUSH UNIT FOR A TOILET
David Berrocal, 312 Buckley St., Bristol, Pa. 19007
Filed Jan. 16, 1990, Ser. No. 465,003
Term of patent 14 years
U.S. Cl. D23—236

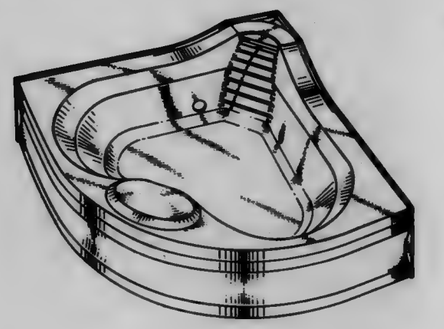


333,697
HANDLE FOR A FAUCET
Neville G. Thomas, Glen Waverley, Australia, assignor to Dorf Industries Pty. Ltd., Oakleigh South, Australia
Filed Feb. 19, 1991, Ser. No. 656,616
Claims priority, application Australia, Aug. 22, 1990, 2725/90
Term of patent 14 years
U.S. Cl. D23—250

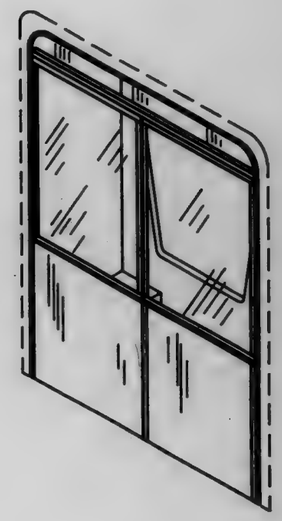
333,698
COMBINED CONTROL HANDLE AND ESCUTCHEON FOR SHOWERS OR THE LIKE
Adolf Gottwald, Iserlohn, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Oct. 11, 1990, Ser. No. 595,926
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1990, M9002736.1
The portion of the term of this patent subsequent to Nov. 3, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—254



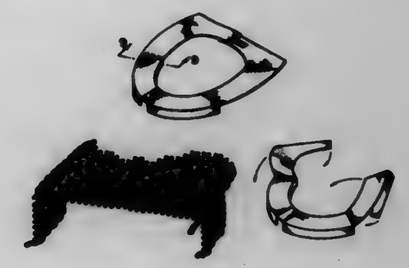
333,699
WHIRLPOOL BATH TUB
Roy A. Jacuzzi, Lafayette; Darrell M. Hunger, Berkeley; Ralph D'Innocente, Pittsburg, all of Calif., assignors to Jacuzzi Inc., Walnut Creek, Calif.
Filed Jan. 16, 1990, Ser. No. 465,875
Term of patent 14 years
U.S. Cl. D23—281



333,700
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,811
Term of patent 14 years
U.S. Cl. D23—305



333,701
FOLDABLE SANITARY TOILET SEAT PROTECTION COVER
Dorneal F. Meeks, 2930 Rustwood, Eustis, Fla. 32726
Filed Nov. 2, 1990, Ser. No. 608,649
Term of patent 14 years
U.S. Cl. D23—311



333,702
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,812
Term of patent 14 years
U.S. Cl. D23—305

333,703
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,813
Term of patent 14 years
U.S. Cl. D23—305

333,704
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,814
Term of patent 14 years
U.S. Cl. D23—305

333,705
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,815
Term of patent 14 years
U.S. Cl. D23—305

333,706
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,816
Term of patent 14 years
U.S. Cl. D23—305

333,707
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,817
Term of patent 14 years
U.S. Cl. D23—305

333,708
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,818
Term of patent 14 years
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333,709
SHOWER STALL
John Barrett, Sr., Clearwater, Fla., assignor to Thomas J. Fitzgerald, Clearwater, Fla.
Continuation of Ser. No. 696,322, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 38,919, Apr. 16, 1987, abandoned. This application Dec. 13, 1991, Ser. No. 807,819
Term of patent 14 years
U.S. Cl. D23—305

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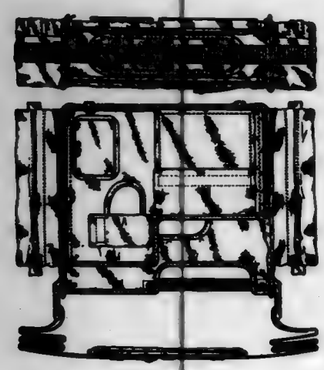
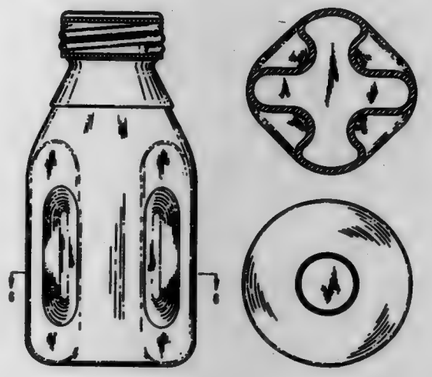
333,702
COMBINED OSTOSCOPE SPECULUM AND CLEANING LOOP
Stephen L. Hufman, 12579 Spring St., Leavenworth, Wash. 98826
Continuation-in-part of Ser. No. 331,509, Mar. 31, 1989, abandoned. This application Aug. 8, 1990, Ser. No. 564,625
Term of patent 14 years
U.S. Cl. D24—135

333,703
HEART MONITOR CASE
Wayne R. Stepler, 209 Stephen Pl., Magnolia, N.J. 08049
Filed Sep. 26, 1990, Ser. No. 588,310
Term of patent 14 years
U.S. Cl. D24—167



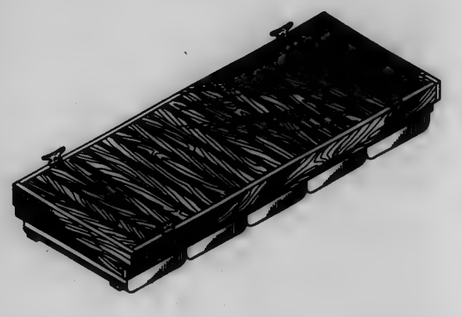
333,704
BABY BOTTLE
Alexander R. Malcolm, Dudley, Mass., assignor to Kinder-Grip International, Inc., West Greenwich, R.I.
Continuation-in-part of Ser. No. 360,374, Jan. 23, 1989, Pat. No. Des. 320,859, which is a continuation-in-part of Ser. No. 190,235, May 4, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 414,070
The portion of the term of this patent subsequent to Oct. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—194



333,705
PIPETTE
Ralph F. Garren, Chatsworth, and Ara Martirosian, Woodland Hills, both of Calif., assignors to Beral Enterprises, Inc., Chatsworth, Calif.
Filed Feb. 13, 1990, Ser. No. 479,589
Term of patent 14 years
U.S. Cl. D24—222

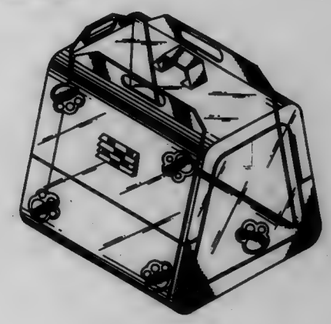
333,706
PORTABLE CLOTHES CHANGING BOOTH
Kevin J. Hachkowski, 80 Rockwood Ave #302-B/St., Catharines, Ont, Canada L2P-3P2
Filed Mar. 8, 1990, Ser. No. 490,255
Term of patent 14 years
U.S. Cl. D25—16

333,707
DOCK
Vincent M. Carbone, 837B Massachusetts Ave., Lexington, Mass. 02173
Filed Jun. 19, 1990, Ser. No. 540,512
Term of patent 14 years
U.S. Cl. D25—138

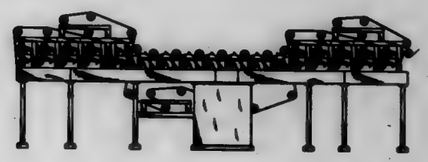


333,708
LAMP SHADE
Fran M. Dordick, Shaker Heights, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed May 15, 1991, Ser. No. 700,649
Term of patent 14 years
U.S. Cl. D26—134

333,709
COMBINED PET CARRIER AND CONTAINER FOR DESTROYING PET VERMIN
James P. Warren, 36 Zane St., Glassboro, N.J. 08028
Filed Oct. 10, 1990, Ser. No. 595,015
Term of patent 14 years
U.S. Cl. D30—158



333,710
WEB DRYING SECTION
Borgeir Skaugen, and Gregory L. Wedel, both of Beloit, Wis., assignors to Beloit Technologies, Inc., Wilmington, Del.
Continuation of Ser. No. 540,075, Jun. 19, 1990, Pat. No. D. 321,269, Division of Ser. No. 14,569, Feb. 13, 1987, Pat. No. 4,934,067. This application Oct. 29, 1991, Ser. No. 784,811
The portion of the term of this patent subsequent to Oct. 29, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—1



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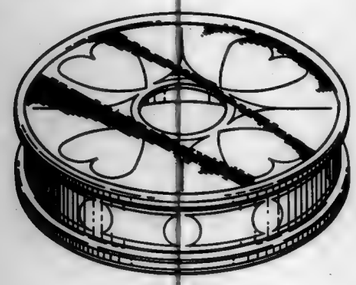
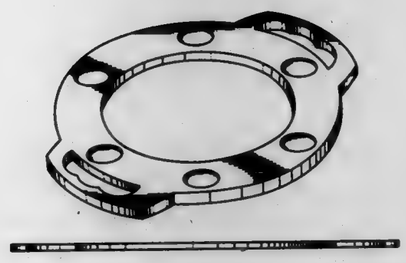
333,711
SPLASH GUARD FOR FLOOR SCRUBBING MACHINE
Thomas Wilson, 1761 Martello, Pomona, Calif. 91767
Filed Jul. 10, 1990, Ser. No. 550,362
Term of patent 14 years
U.S. Cl. D32—19



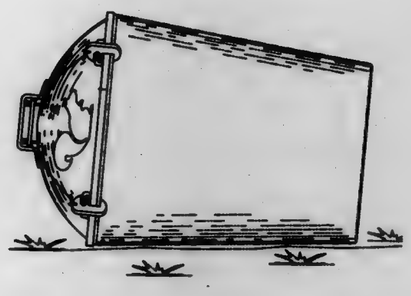
333,712
CARRIER FOR DUST MOPS
Terry D. Moore, 575 Windchase La., Stone Mountain, Ga. 30083
Filed Jul. 17, 1989, Ser. No. 381,014
Term of patent 14 years
U.S. Cl. D32—20

333,713
COMPACT TUMBLER
Grant Blakemore, Charlton, United Kingdom, assignor to Blackwall Products Ltd., London, United Kingdom
Filed Jul. 30, 1991, Ser. No. 738,277
Claims priority, application United Kingdom, Jul. 24, 1991, 2016184
Term of patent 14 years
U.S. Cl. D34—1

333,714
TRASH CONTAINER LINER RETAINING RING
John Pizzo, 9650 Jerome Dr., New Port Richey, Fla. 34654
Filed Jun. 21, 1991, Ser. No. 718,857
Term of patent 14 years
U.S. Cl. D34—10



333,715
ANIMAL PROOF GARBAGE CAN LID
Jeff Mahler, 29 Mountainside Dr., Randolph, N.J. 07869
Filed May 1, 1991, Ser. No. 694,044
Term of patent 14 years
U.S. Cl. D34—11



333,716
TRASH RECYCLING CONTAINER
David A. Bird, Akron, and John L. Hradisky, Medina, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 31, 1991, Ser. No. 738,289
Term of patent 14 years
U.S. Cl. D34—8

333,717
RECEPTACLE LID
Antonio R. Raposo, 46011 Cleveland Ave., Chilliwack, British Columbia, Canada V2P 2U8
Filed Dec. 28, 1990, Ser. No. 635,330
Claims priority, application Canada, Jun. 29, 1990, 2006908
Term of patent 14 years
U.S. Cl. D34—11

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LIST OF PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
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A. H. Robins Company, Incorporated: *See*—
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A. Raymond et Cie.: *See*—
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Abe, Shunichi, to Canon Kabushiki Kaisha. Image reproducing system. 5,191,361, Cl. 346-157.000.

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Abe, Yasuo: *See*—
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Abele, John E.; Daniels, Douglas J.; Robinson, Donald E.; and Thistle, Stephen R., to Boston Scientific Corporation. Surgical instrument and method. 5,190,541, Cl. 606-46.000.

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Allen, Fritz S.; Bustamante, Carlos; Niemczyk, Thomas M.; and Dorman, Burton P., 5,190,857, Cl. 435-7.210.

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Adachi, Hiroo: *See*—
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Adachi, Masakazu, to Japan Immuno Research Laboratories Co., Ltd.; and Otsuka Pharmaceutical Co., Ltd. Use of ovomacroglobulin as an agent for treating wound and inflammation. 5,190,916, Cl. 514-8.000.

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Oike, Takayasu; Endoh, Kazuhiko; Suzuki, Takashi; Watanabe, Kazahiro; Suzuki, Hirochika; Shimada, Jun; Ishii, Takashi; Adachi, Tateo; and Horie, Yoshihiro, 5,189,909, Cl. 73-155.000.

Adams, Leslie G.; Smith, III; Roger; Templeton, Joe W.; and Overholt, Kathleen A., to Texas A & M University System, The. Differential diagnostic assay for brucellosis. 5,190,860, Cl. 435-7.320.

Adamski, Maximilian, Jr.; Berg, Paul A.; and Kosrow, Robert L., to Union Special Corporation. Sleeve loader. 5,190,275, Cl. 271-9.000.

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AG Communication Systems Corporation: *See*—
Kabat, Zbigniew; and Capulong, Arcangel N., 5,191,514, Cl. 361-415.000.

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Goedeweeck, Rudi A., 5,190,854, Cl. 430-576.000.
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Ahad, Elie, to Canada, Her Majesty the Queen in right of, as represened by the Minister of National Defence of Her Majesty's Canadian Government. Branched energetic polyether elastomers. 5,191,034, Cl. 525-407.000.

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Aho, Kenneth A.: *See*—
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Aigo, Seiichiro. Apparatus for washing semiconductor materials. 5,190,064, Cl. 134-84.000.

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Black, Andrew W.; and Kleinke, Richard M., 5,190,217, Cl. 239-154.000.

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Boldrini, Fulvio; Minarelli, Alessandro; and Gamberini, Antonio, to G.D Societa' per Azioni. Stabilizing output conveyor for a cigarette packing machine. 5,190,141, Cl. 198-689.100.

Bolen, Richard K., to Northwestern Corporation, The. Bulk vending machine apparatus. 5,190,133, Cl. 194-350.000.

Bolin, P. Stanley; and Mason, Reginald B., to Intechnica International, Inc. Voice interactive computer system. 5,191,617, Cl. 381-51.000.

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Borresen, Anne-Lise. Method and apparatus for detecting single base mutations in DNA with denaturing gradient electrophoresis. 5,190,856, Cl. 435-6.000.

Bosco, James J.; Annis, David H.; and Prouty, Kathleen M., to ITT Corporation. Integrated group insurance information processing and reporting system based upon an enterprise-wide data structure. 5,191,522, Cl. 364-401.000.

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Brackmann, Warren A.; and Liew, Tow P., to Rothmans, Benson & Hedges Inc.; and Rothmans International Services Limited. Cigarette smoke filter. 5,190,061, Cl. 131-332.000.

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Ford New Holland, Inc.: *See*—
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Forde, Stephen J., III; and Rosenberg, Harold A., to Digital Equipment Corporation. Method and apparatus for shared use of a multiplexed address/data signal bus by multiple bus masters. 5,191,656, Cl. 395-325.000.

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Fort, Yves: *See*—
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Forte, Paulino, to UOP. Process for the separation of aromatic hydrocarbons with energy redistribution. 5,191,152, Cl. 585-833.000.

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Fortin, Conrad. Precision linoleum edge trimming tool. 5,189,795, Cl. 30-294.000.

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Foster-Miller, Inc.: *See*—
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Foster, Stephen I.; Stimler, Jeffrey J.; and Nonnemacher, Gail S., to Dow Chemical Company, The. Non-dusting window envelope film utilizing a particulate anti-flecking agent. 5,190,814, Cl. 428-327.000.

Fourgon, Fernand A. J.: *See*—
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Frazin, Leon J. Method and device for doppler-guided and imaged retrograde catheterization. 5,190,045, Cl. 128-662.060.

Frederiksen, Wilfred C.; and Kim, Sun Y. Collection netting for fruit and nut trees. 5,189,871, Cl. 56-329.000.

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Freeman, Gerald C.: *See*—
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Frehel, Daniel: *See*—
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French, Leonard; and Gottlieb, Marc, to Affordable Dental Products. Rack for storing and dispensing dental trays, and dental trays for use therewith. 5,190,168, Cl. 211-59.200.

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Frossati, Giorgio; and Oliveira, Nei F., Jr. Dilution refrigerators. 5,189,880, Cl. 62-51.300.

Frost, Howard H.; Graham, Pamela S.; Fiedler, Ronald D.; and Gujarathi, Ramesh N., to Goodyear Tire & Rubber Company, The. Process for the production of latexes by the selective monomer addition. 5,191,006, Cl. 524-460.000.

Frost, R. Jack; and Erlinger, William G., to Interstate Electronics Corporation. Multiple bandpass filter. 5,191,305, Cl. 333-202.000.

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Frushour, Robert H. Modified end assembly for high pressure, high temperature reaction vessels. 5,190,734, Cl. 422-242.000.

Fudalla, Manfred, to Weener-Plastik GmbH & Co. KG. Moldable two-part valve body. 5,190,190, Cl. 222-105.000.

Fuhr, Karl; Muller, Friedemann; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Flameproofed, non-dripping polyalkylene terephthalate molding compounds. 5,191,000, Cl. 524-117.000.

Fuji Electric Co., Ltd.: *See*—
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Nishikawa, Naoyuki; and Ono, Mitsunori, 5,190,822, Cl. 428-402.200.
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Fuji Yakuhin Kogyo Kabushiki Kaisha: *See*—
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Fujii, Hiroyasu: *See*—
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Fujiki, Hiroshi: *See*—
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Fujimaki, Yoshihide; Tadokoro, Hajime; Oda, Yasuhiro; and Yoshioka, Hiroshi, to Konica Corporation. Electrophotographic photoreceptor. 5,190,839, Cl. 430-78.000.

Fujimiya, Hitoshi; and Nasu, Hisanori, to Hitachi Software Engineering Co., Ltd. Multi-colored electrophoresis pattern reading system. 5,190,632, Cl. 204-299.00R.

Fujimoto, Hiroaki, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor. 5,190,488, Cl. 440-53.000.

Fujimoto, Junichiroh, to Ricoh Company, Ltd. Pattern matching system for speech recognition system, especially useful for discriminating words having similar vowel sounds. 5,191,635, Cl. 395-2.000.

Fujimoto, Masakazu; and Osuna, Toshio, to Ebara Corporation. Condenser for refrigerator and method of operating the same. 5,190,095, Cl. 165-1.000.

Fujimura, Naoto: *See*—
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Frost, Howard H.; Graham, Pamela S.; Fiedler, Ronald D.; and Gujarathi, Ramesh N., 5,191,008, Cl. 524-460.000.

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Gunter, Jurgen; Kohler, Siegfried; Lang, Siegfried; Schellhorn, Luise; and Lutz, Erwin, to Mercedes-Benz AG. Infrared radiation process for a high contrast in the natural grain of a naturally pale wood. 5,190,791, Cl. 427-554.000.

Gunze Limited: *See*—
Yanagizawa, Hirofumi; Oikawa, Katsuhiko; Nakamura, Shigeru; and Kamiya, Yoshinori, 5,189,840, Cl. 49-493.000.

Gupta, Ashis S.; and Antao, Leonard F., to Coca-Cola Company, The. Multiple fluid space dispenser and monitor. 5,190,083, Cl. 141-18.000.

Gurley, John A.: *See*—
Elings, Virgil B.; Gurley, John A.; and Sarid, Dror, 5,189,906, Cl. 73-105.000.

Gursoz, E. L.: *See*—
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Gustafsson, Carl-Erik, to C. E. Johansson AB. Method and arrangement for determining the linear (heat) expansion of elongated bodies. 5,189,807, Cl. 33-702.000.

Gustavsson, Mats B., to Telefonaktiebolaget L M Ericsson. Terminal for a frequency divided, optical communication system. 5,191,625, Cl. 385-14.000.

Guthauser, Werner; and Rohner, Philippe, to Ciba-Geigy Corporation. Continuous process for the preparation of bisazo pigment mixtures. 5,191,070, Cl. 534-582.000.

Gutowski, Gerard J.: *See*—
Dynes, James W.; Gutowski, Gerard J.; and Lajoie, M. Stephen, 5,191,097, Cl. 534-156.000.

Guy, Charles B.: *See*—
Cadambi, Sudarshan B.; Guy, Charles B.; Gray, David R.; and Gonzales, Mark A., 5,191,649, Cl. 395-200.000.

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Ni, Shimao, 5,189,885, Cl. 62-117.000.

H.G. Tech AB: *See*—
Larsson, Hans-Gunnar, 5,190,701, Cl. 264-8.000.

Haas, Lee C.; Loeb, Mitchell L.; and Stillwell, George R., Jr., to International Business Machines Corporation. Reduction of intersymbol interference in optical fiber systems by wavelength filtering. 5,191,627, Cl. 385-24.000.

Haberey, Martin: *See*—
Nickolson, Robert; Vorbrueggen, Helmut; Stuerzebecher, Claus S.; and Haberey, Martin, 5,190,973, Cl. 514-470.000.
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Habermehl, Robert, Jr.; Knauer, Norman M.; and Kwasnesake, Alan L., to Habermehl-Knauer Controls, Inc. Method for controlling a boiler. 5,190,215, Cl. 236-91.00F.

Habing, Theodore G.; and Gibson, Ronald S., to Pacific Fitness Corporation. Dual station exercise bench. 5,190,513, Cl. 482-145.000.

Hachiya, Satoshi; Endo, Hiroyuki; and Uchida, Shunji, to Idemitsu Kosan Co., Ltd. Liquid-crystalline polymers and copolymers. 5,190,687, Cl. 252-299.010.

Hachiya, Satoshi: *See*—
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Hachiyama, Hiroki; Iwasawa, Takahiro; Ohmae, Masanori; Yoshida, Masakatsu; Hatano, Toshinobu; and Tsuji, Masakazu, to Matsushita Electric Industrial Co., Ltd. Image pickup apparatus having a Gray counter. 5,191,425, Cl. 358-213.150.

Hachmann, Klaus; Bansemir, Klaus; and Disch, Karlheinz, to Henkel Kommanditgesellschaft auf Aktien; and ESPE Stiftung & Co. Produktions-und Vertriebs KG. Process for disinfecting medical molding materials. 5,190,724, Cl. 422-28.000.

Hadad, Itzhak: *See*—
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Haddad, Nabil M.: *See*—
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Hagiwara, Hiroshi; Hosoltawa, Toshio; and Suzuki, Katsumi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Impact-resistant graft copolymer and thermoplastic resin composition containing same. 5,191,018, Cl. 525-86.000.

Hagiwara, Mitsutoshi, to Aisin Seiki Kabushiki Kaisha. Fluid coupling having a pump seal. 5,190,131, Cl. 192-58.00B.

Hair, Arthur R. Method for transmitting a desired digital video or audio signal. 5,191,573, Cl. 369-84.000.

Hakkarainen, Simo P.: *See*—
D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., 5,191,265, Cl. 315-295.000.

Halasa, Adel F.; Bergh, Jean; and Fourgon, Fernand A. J., to Goodyear Tire & Rubber Company, The. Tire with tread containing styrene, isoprene, butadiene terpolymer rubber. 5,191,021, Cl. 525-237.000.

Haruch, James, to Spraying Systems Co. Spray nozzle with recessed

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Halevi, Evistar: *See*—
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Halim, Nagui; Nikolaou, Christos N.; and Pershing, John A., Jr., to International Business Machines Corporation. Apparatus and method for making of interconnected processors act like a single node in a multinode communication system. 5,191,651, Cl. 395-200.000.

Hall, Charles E., to Hall United Technologies, Inc., Int'l. Method for sealing tubes. 5,189,789, Cl. 29-890.031.

Hall, Clint A.: *See*—
Hawke, Ronald S.; Asay, James R.; Hall, Clint A.; Konrad, Carl H.; Sauve, Gerald L.; Shahinpoor, Mohsen; and Susoeff, Allan R., 5,191,164, Cl. 89-8.000.

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Hall, Ronald H. Buried cable removal apparatus. 5,190,409, Cl. 405-154.000.

Hall United Technologies, Inc., Int'l: *See*—
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Halliburton Logging Services, Inc.: *See*—
Gianzero, Stanley C.; and Chemali, Roland E., 5,191,290, Cl. 324-374.000.

Halperin, Janet R. P. Control system with two level sensor system. 5,191,636, Cl. 395-22.000.

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Hamada, Tooru; Iwase, Masahiko; and Ohga, Syogo, to Kabushiki Kaisha Daikin Seisakusho. Release bearing assembly. 5,190,381, Cl. 384-617.000.

Hamaguchi, Tadahiko; Katoh, Masatoshi; and Sato, Tsuneo, to Mitsubishi Denki Kabushiki Kaisha. Color scanning system. 5,191,409, Cl. 358-75.000.

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Hamase, Tetsuya, to Takata Corporation. Belt retractor shaft-rotating pretensioner. 5,190,240, Cl. 242-107.000.

Hamer, Harry H., III. Paint ball magazine apparatus. 5,190,196, Cl. 224-208.000.

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Hamilton, Bruce K.: *See*—
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Hamilton, Dannie E.; and Scola, Roberta, to Baxter International Inc. Intravenous metering device. 5,190,527, Cl. 604-153.000.

Hamilton, Douglas C., to Lexmark International, Inc. Fuser low power control. 5,191,375, Cl. 355-205.000.

Hamilton, Harold F., to Hein-Werner Corporation. Heavy duty auxiliary tower for a repair rack. 5,189,898, Cl. 72-457.000.

Hamilton, Richard J., to Spraying Systems Co. Quick disconnect nozzle assembly. 5,190,224, Cl. 239-600.000.

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Hammerlund, Gary M., to Ranir/DCP Corporation. Biodegradable dental floss container. 5,190,200, Cl. 225-42.000.

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Hanson, Frank; and Dick, David, to United States of America, Navy. Blue generation at the H-Beta Fraunhofer wavelength using noncritically phase-matched optical parametric generation in lithium borate (LiB_3O_5). 5,191,587, Cl. 372-21.000.

Hara, Ryuichi, to Fanuc Limited. Mirror image method for use in a robot. 5,191,639, Cl. 395-99.000.

Hara, Seinosuke, to Atsugi Unisia Corporation. Valve mechanism of internal combustion engine. 5,189,998, Cl. 123-90.160.

Hara, Takahiro, to NEC Corporation. Semiconductor integrated circuit device having substrate potential detection circuit. 5,191,235, Cl. 307-296.200.

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Harms, Weldon M.; Allen, Thomas E.; Norman, Lewis R.; and Hamid, Syed, to Halliburton Company. Method and apparatus for continuously mixing well treatment fluids. 5,190,374, Cl. 366-165.000.

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Harrison, Michael G.: *See*—
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Hartlepp, Karl. Sorting machine. 5,190,162, Cl. 209-583.000.

Haruch, James, to Spraying Systems Co. Spray nozzle with recessed deflector surface. 5,190,222, Cl. 239-523.000.

Haruna, Motoaki: *See*—
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Harvey, Arthur J., to Delta Systems, Inc. Interlock circuit for deactivating an engine. 5,190,019, Cl. 123-630.000.

Harvey, T. Jeffrey; and Jones, P. Alan, to AEC-Able Engineering Co., Inc. Mast forming and deployment system. 5,189,773, Cl. 29-33.00D.

Hase, Brigitte, to Henkel Kommanditgesellschaft auf Aktien. New crosslinked polymers and process for their production. 5,191,054, Cl. 528-48.000.

Hasegawa, Akira; Kiao, Makoto; Uesato, Shinichi; Suzuki, Masanobu; Ishida, Tomio; and Saito, Yutaka, to Japan Tobacco Inc.; and Akira Hasegawa. Lipid A monosaccharide analogues. 5,191,072, Cl. 536-117.000.

Hasegawa, Akiro, to Micron Co., Ltd. Air-driven dental scaler. 5,190,456, Cl. 433-120.000.

Hasegawa, Hirokazu; Endo, Isamu; Koyama, Shingo; Isozaki, Masashi; Yoshiyama, Yukari; Nozawa, Shigenori; and Arakawa, Norio, to Terumo Kabushiki Kaisha. Thiourea derivatives and antimicrobial agent and antulcer agent containing the same. 5,190,961, Cl. 514-331.000.

Hasegawa, Hiroshi; Isomae, Kazuo; Kotsugai, Takeshi; Shioiri, Noriaki; Sekine, Kumiko; Taido, Naokata; Sato, Susumu; and Kuraishi, Tadayuki, to SS Pharmaceutical Co., Ltd. Quinoline derivatives. 5,190,951, Cl. 514-292.000.

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Hasegawa, Masahide; and Tanaka, Yasuyuki, to Canon Kabushiki Kaisha. Recording apparatus having plural operating modes involving diverse signal compression rates and different apportioning of pilot signal recording area. 5,191,431, Cl. 358-323.000.

Hashiguchi, Yoshiharu: *See*—
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Hashimoto, Akira; and Ohtsu, Shinji, to Murata Mfg. Co., Ltd. Deflection yoke apparatus. 5,191,307, Cl. 335-214.000.

Hashimoto, Atsuko; and Iwata, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Knocking control method and apparatus for internal combustion engine. 5,190,011, Cl. 123-425.000.

Hashimoto Corporation: *See*—
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Hashimoto, Matsuo; Futamura, Nobuyuki; Yoda, Sumio; and Saiki, Yoshifumi, to Nippon Kayaku Kabushiki Kaisha. Photosensitive resin composition and color filter comprising a polymer dyeable with an anionic dye, an azide compound and a compound with at least two acrylol groups. 5,190,845, Cl. 430-196.000.

Hashimoto, Norihiko: *See*—
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Hashimoto, Ryuji; Mizushima, Shigeaki; Nishimura, Eiichiro; Minezaki, Shigehiro; and Takemoto, Toshio, to Sharp Kabushiki Kaisha. Driving circuit for a liquid crystal display apparatus. 5,191,455, Cl. 359-85.000.

Hashimoto, Shunichi: *See*—
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Hashizume, Yoshio; Kariyone, Akio; Hayashi, Ryuzo; and Oka, Minako, to Kanzaki Paper Mfg. Co., Ltd. Immobilized alcohol utidase for use in an alcohol measuring apparatus. 5,190,872, Cl. 435-176.000.

Hatano, Rikuo; and Iwata, Yoshifumi, to Aisin Seiki K.K. Power supply circuit for an automobile. 5,191,500, Cl. 361-64.000.

Hatano, Toshinobu: *See*—
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Haug, Werner, to Frama AG. Franking machine. 5,191,533, Cl. 364-464.030.

Hauglin, Bernt-Otto; and Popp, Eugen, to Witco A.S. Cross-country ski binding having a releasable retaining hook assembly. 5,190,310, Cl. 280-615.000.

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Hayakawa, Atsuya: *See*—
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Hayakawa, Seiichiro: *See*—
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Hayakawa, Taro; Kodama, Shuji; Iwata, Kazushi; Kishi, Junichi; Yamashita, Kyoko; and Iwata, Hisashi, to Fuji Yakuhin Kogyo Kabushiki Kaisha. Method for the diagnosis of rheumatoid arthritis. 5,190,861, Cl. 435-7.940.

Hayamatsu, Masatoshi, to Clarion Co., Ltd. Structure which fastens an LCD holder and a volume control unit. 5,191,515, Cl. 361-417.000.

Hayase, Toru, to Sharp Kabushiki Kaisha. Bass enhancing device for a speaker system. 5,191,619, Cl. 381-96.000.

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He, Chin C. Combined decorative flower pot and air filter. 5,190,570, Cl. 55-279.000.

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Kayser, Howard H.; and Claude, Steven A. Spraying liquids with a small tractor. 5,190,218, Cl. 239-172.000.

Kazino, Hiroshi; and Onogi, Muneyuki, to K.K. Aoyama Seisakusho. Bolt for use with resin clips. 5,190,424, Cl. 411-171.000.

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Kendell, Lamar C., to DelMed, Inc. Prefilled sterilant fluid releasable coupling connector apparatus for catheter applications. 5,190,534, Cl. 604-905.000.

Kengaku, Toru: *See*—
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Kennedy, Juan. Clamp for a battery cable. 5,190,484, Cl. 439-761.000.

Kennedy, Randall J.; and Moritz, David A., to Consolidated NBS, Inc. Electric motor driven imprinter. 5,189,953, Cl. 101-269.000.

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Key Plastics Sales, Inc.: *See*—
Appelt, John W., 5,189,772, Cl. 29-91.100.

Keyes, Tyrone M.: *See*—
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Khasin, Erik: *See*—
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Kida, Shigeru: *See*—
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Kido, Kunio, to Tanashin Denki Co., Ltd. Plate spring and nut interconnecting for use in an optical pick-up moving apparatus. 5,191,575, Cl. 369-223.000.

Kies, Luzian: *See*—
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Kihira, Michiharu: *See*—
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Kikuchi, Makoto; Fukasawa, Yoshiharu; and Ishihara, Hideo, to Kabushiki Kaisha Toshiba. Sputtering target. 5,190,630, Cl. 204-192.120.

Kikuchi, Makoto; Takeshita, Fusayuki; Ichihashi, Mitsuyoshi; Terashima, Kanetsugu; and Furukawa, Kenji, to Chisso Corporation. Ferroelectric liquid crystal composition. 5,190,691, Cl. 252-299.610.

Kikuchi, Yutaka: *See*—
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Kilham, Lawrence B., to Flow Vision, Inc. Apparatus for detecting and analyzing particulate matter in a slurry flow. 5,191,388, Cl. 356-335.000.

Killian, Mark A.: *See*—
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Kim, Dong K.: *See*—
Lionetti, Robert E.; Joseph, Patrick E.; Kim, Dong K.; and Helfer, Farrel B., 5,189,897, Cl. 72-278.000.

Kim, Kye-Jong, to Samsung Electronics Co., Ltd. Digital image signal playback circuit for combining two channel parallel picture data into a single channel. 5,191,437, Cl. 358-337.000.

Kim, Sun Y.: *See*—
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Kim, Yong-je, to Samsung Electronics Co., Ltd. Synchronizing signal restoration circuit. 5,191,434, Cl. 358-335.000.

Kim, Young S. Pharmaceutical liquid composition containing benzovindiflupyr and preparation for its manufacture. 5,190,757, Cl. 424-195.100.

Kimock, Fred M.; Knapp, Bradley J.; and Finke, Steven J., to Diamonex, Incorporated. Abrasion wear resistant polymeric substrate product. 5,190,807, Cl. 428-216.000.

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King, Ann C., to Burroughs Wellcome Company. Agents for potentiating the effects of antitumor agents and combating multiple drug resistance. 5,190,949, Cl. 514-290.000.

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King, David M.: *See*—
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King, Stephen W., to Union Carbide Chemicals & Plastics Technology Corporation. Processes for the preparation of hydroxyl-containing compounds. 5,191,123, Cl. 564-507.000.

Kinkade, Joseph M., Jr.: *See*—
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Kirk, Ole; Bjorkling, Frederik; and Godtfredsen, Sven E., to Novo Nordisk A/S. Monoesters of glycosides and a process for enzymatic preparation thereof. 5,191,071, Cl. 536-4.100.

Kirkpatrick, James: *See*—
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Kishimoto, Daishiro: *See*—
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Kishimoto, Kiyoshi; and Yodoshi, Shigeyasu, to Hitachi Tool Kabushiki Kaisha. Solid end mill for finishing the face or side of hard work. 5,190,420, Cl. 407-54.000.

Kiso, Makoto: *See*—
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Kitajima, Shinichi: *See*—
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Kitayama, Daisuke, to Seaja Seiyaku Kabushiki Kaisha. Portable chiller. 5,189,890, Cl. 62-293.000.

Kitsukawa, Kaoshiro: *See*—
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Kiyokawa, Nobuo; and Nishimura, Jun, to Mitsui Petrochemical Industrial Products Ltd.; and Mitsui Petrochemical Industries, Ltd. Vertical drainage device. 5,190,404, Cl. 405-45.000.

Klag, Robert W. Swivel teat for baby bottle. 5,190,174, Cl. 215-11.100.

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Klotz, Sheldon M.; Masia, Michael; and Tomlinson, Cynthia A., to Raychem Corporation. Method of making a sensor cable. 5,191,292, Cl. 324-446.000.

Klug, Mark W.; Toth, Thomas E.; Lamb, Stephen R.; Swendrowski, Steven D.; Tsurishima, Kazuyuki; and Tani, Mitsuaki, to Sym-Tek Systems, Inc.; and Advantest Corp. Separation and transfer apparatus. 5,190,431, Cl. 414-417.000.

Klugl, Wendelin; and Putz, Walter, to Mercedes-Benz AG. Arrangement for regenerating a soot burn-off filter in the exhaust duct of an air-compressing fuel-injected internal-combustion engine. 5,190,010, Cl. 123-380.000.

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Kobayashi, Hisashi; Tanaka, Osamu; and Fujii, Hiroyasu, to Nippon Steel Corporation. Process for producing grain-oriented electrical steel sheet having improved magnetic and surface film properties. 5,190,597, Cl. 148-111.000.

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Kobler, Ingo; Holl, Roland; and Dettinger, Dietrich, to MAN Roland Druckmaschinen AG. Sheet-conveying drum for skew register correction. 5,189,957, Cl. 101-409.000.

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Kojima, Takao: *See*—
Mizumoto, Katsuyoshi; Kitsukawa, Kanehisa; Yasuda, Toshikatsu; and Kojima, Takao, 5,189,916, Cl. 73-724.000.

Kokusho, Yoshitaka; Oshima, Akio; Tsunoda, Akira; and Iwasaki, Shinjiro, to Meito Sangyo Co., Ltd. Continuous process for the interesterification of fats or oils. 5,190,868, Cl. 435-134.000.

Kolich, Charles H.; Manimaran, Thanikavelu; and Klobucar, W. Dirk, to Ethyl Corporation. Asymmetric hydrogenation of aromatic-substituted olefins using metal or metal alloy catalysts. 5,190,905, Cl. 502-162.000.

Kolich, Charles H.: *See*—
Manimaran, Thanikavelu; Klobucar, W. Dirk; and Kolich, Charles H., 5,191,095, Cl. 554-35.000.

Kolimlim, Quirino S.: *See*—
Gallup, Darrell L.; Barnes, Michael L.; Cope, Douglas; Kolimlim, Quirino S.; and Leong, John K., 5,190,664, Cl. 210-696.000.

Komamura, Takeo. Frame. 5,189,820, Cl. 40-156.000.

Komatsu Mec Kabushiki Kaisha: *See*—
Ikari, Masanori, 5,190,445, Cl. 417-218.000.

Komuro, Kyoji; Yokoe, Masaaki; Matsushita, Narihiro; Sekine, Kiyokazu; Hayakawa, Atsuya; Asano, Fumiaki; and Shimizu, Hideaki, to Brother Kogyo Kabushiki Kaisha. Embroidery data preparing apparatus. 5,191,536, Cl. 364-470.000.

Kondo, Hirosato; Taguchi, Masahiro; Jinbo, Yoshikazu; Inoue, Yoshimasa; Kotera, Yasuo; and Sakamoto, Fumio, to Kanebo, Ltd. Quinolinecarboxylic acid derivatives. 5,191,079, Cl. 544-229.000.

Kondo, Naofumi: *See*—
Katayama, Mikio; Kondo, Naofumi; Kanemori, Yuzuru; Fujihara, Toshiaki; Fujiki, Hiroshi; and Nakazawa, Kiyoshi, 5,191,451, Cl. 359-59.000.

Kondo, Toshihiko; Tanaka, Kazuo; and Yasuda, Hirofumi, to Seiko Epson Corporation. Semiconductor device having an inter-layer insulating film disposed between two wiring layers. 5,191,402, Cl. 257-288.000.

Kondo, Yoshio, to Sony Corporation. Tape cassette having a lid opened by a force in the same direction as a tape loading force. 5,191,496, Cl. 360-132.000.

Konica Corporation: *See*—
Fujimaki, Yoshihide; Tadokoro, Hajime; Oda, Yasuhiro; and Yoshioka, Hiroshi, 5,190,839, Cl. 430-78.000.
Itaya, Masahiko; Saito, Hisahiro; and Miyamoto, Takayuki, 5,191,378, Cl. 355-274.000.

Konishi, Satoshi: *See*—
Bito, Masami; Konishi, Satoshi; and Fukazawa, Fumimasa, 5,190,983, Cl. 521-56.000.

Konopka, John G., to Motorola Lighting, Inc. Ballast circuit utilizing a boost to heat lamp filaments and to strike the lamps. 5,191,263, Cl. 315-209.00R.

Konrad, Carl H.: *See*—
Hawke, Ronald S.; Asay, James R.; Hall, Clint A.; Konrad, Carl H.; Sauve, Gerald L.; Shahinpoor, Mohsen; and Susoeff, Allan R., 5,191,164, Cl. 89-8.000.

Konteatis, Zenon D.; and Palmer, David C., to BOC Health Care, Inc. Peptide amides and amide dimers useful as muscle relaxants. 5,190,924, Cl. 514-19.000.

Kool-Fire Research & Development: *See*—
Vandervaart, Gerry, 5,189,887, Cl. 62-238.700.

Koper, Jan G.: *See*—
Eriks, John C.; van der Goot, Henderikus; Timmerman, Hendrik; and Koper, Jan G., 5,190,589, Cl. 548-311.700.

Kopfer, Rudolph J. Protective eyewear for use in sports and the like. 5,191,364, Cl. 351-62.000.

Kopp, Frans: *See*—
Langner, Carl G.; and Kopp, Frans, 5,190,107, Cl. 166-355.000.

Korenkova, Alma V.: *See*—
Sharygin, Leonid M.; Barybin, Vladimir I.; Gonchar, Valery F.; Smyshlyaeva, Olga J.; Shtin, Anatoly P.; Tretyakov, Sergei Y.; Moiseev, Valery E.; Perekhozhiva, Tatyana N.; Galkin, Vladimir M.; Korenkova, Alma V.; Zlokazova, Elena I.; Vovk, Sergei M.; and Ponomarev, Valery G., 5,190,907, Cl. 502-400.000.

Koriyama, Shin-ichi; Sakuyama, Kazuhiro; Maeda, Toshihiko; Yamauchi, Hisao; and Tanaka, Shoji, to International Superconductivity Technology Center; Kyocera Corporation; Tohoku Electric Power Company, Inc.; and Furukawa Electric Co., Ltd. Superconducting material of metal oxides. 5,190,914, Cl. 505-1.000.

Koros, Robert M.: *See*—
Ajinkya, Milind B.; Koros, Robert M.; and Tarmy, Barry L., 5,190,733, Cl. 422-231.000.

Kortenbrede, Ludger, to Aug. Winkhaus GmbH & Co. KG. Shackle lock with a pivotable locking arrangement. 5,189,893, Cl. 70-38.00A.

Koshiishi, Osamu; Asada, Takashi; Koike, Kiyofumi; and Shimomura, Masaki, to Seiko Epson Corporation. Print element arrangement in serial matrix printer. 5,190,382, Cl. 400-121.000.

Kosrow, Robert L.: *See*—
Adamski, Maximilian, Jr.; Berg, Paul A.; and Kosrow, Robert L., 5,190,275, Cl. 271-9.000.

Kotera, Yasuo: *See*—
Kondo, Hirosato; Taguchi, Masahiro; Jinbo, Yoshikazu; Inoue, Yoshimasa; Kotera, Yasuo; and Sakamoto, Fumio, 5,191,079, Cl. 544-229.000.

Kothe, Norbert: *See*—
Moller, Wolfgang; Dichtelmuller, Hebert; Kothe, Norbert; Rudnick, Dieter; and Piechaczek, Detlef, 5,190,752, Cl. 424-85.800.

Kotsifas, Peter N.: *See*—
Paradis, Joseph R.; and Kotsifas, Peter N., 5,190,067, Cl. 137-1.000.

Kotsugai, Takeshi: *See*—
Hasegawa, Hiroshi; Isomae, Kazuo; Kotsugai, Takeshi; Shioiri, Noriaki; Sekine, Kumiko; Taido, Naokata; Sato, Susumu; and Kuraishi, Tadayuki, 5,190,951, Cl. 514-292.000.

Kovac, Jimmy L.; and LeVie, Jeffrey T., to International Business Machines Corporation. Self-contained washing unit for printed circuit boards. 5,190,065, Cl. 134-107.000.

Kowalski, Jacek, to Gemplus Card International. Safety decive for integrated circuit. 5,191,498, Cl. 361-1.000.

Koyama, Noboru: *See*—
Suzuki, Kiyosuke; Wanami, Hideki; Shirata, Atsushi; Koyama, Noboru; and Sato, Tatsuru, 5,191,441, Cl. 358-451.000.

Koyama, Shingo: *See*—
Hasegawa, Hirokazu; Endo, Isamu; Koyama, Shingo; Isozaki, Masashi; Yoshiyama, Yukari; Nozawa, Shigenori; and Arakawa, Norio, 5,190,961, Cl. 514-331.000.

Koyama, Takashi: *See*—
Sakai, Kiyoshi; Tanaka, Hisami; Fujimura, Naoto; Sakakibara, Teigo; and Koyama, Takashi, 5,190,837, Cl. 430-58.000.

Koyama, Toshihiro: *See*—
Murai, Satoshi; Shimano, Masanao; Yamamoto, Hiroshi; Koyama, Toshihiro; Nakamura, Tsutomu; Ogawa, Masaru; Watanuki, Mitsuru; Okamoto, Taira; and Hori, Toshimitsu, 5,190,959, Cl. 514-318.000.

Koyama, Yoshihisa: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; Uchiyama, Yuji; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,191,408, Cl. 358-49.000.

Koyo Seiko Co., Ltd.: *See*—
Nomura, Keiji; Nishimura, Katsutoshi; Okamoto, Kazunori; Horiuchi, Tomoharu; Watanabe, Masayuki; Nakao, Hirohisa; and Noguchi, Masahiko, 5,190,119, Cl. 180-132.000.

Krabbenhoft, Herman O.; and Boden, Eugene P., to General Electric Company. Preparation of branched polycarbonate composition from cyclic aromatic polycarbonate oligomer, polyhydric phenol and polycarbonate. 5,191,038, Cl. 525-462.000.

Kraft General Foods, Inc.: *See*—
Andersoa, Wendy A.; Dulin, Dreena; Loh, Jimbay; and Fitch, Mark D., 5,190,786, Cl. 426-631.000.
Baumann, Vitus W., 5,190,776, Cl. 426-94.000.
Herrick, James P.; Smith, Robert F.; and Bruncaj, Mete, 5,190,653, Cl. 210-477.000.

Kraftanlagen AG: *See*—
Baumgarten, Wilfried, 5,190,771, Cl. 425-171.000.

Kramer, Dirk K.; and Lerner, Michael A., to International Business Machines Corporation. Virtual chains for session initiation in a distributed computer network. 5,191,650, Cl. 395-200.000.

Krantz, Anders, to Airchitect I Soderhamn AB Arrangement for mounting a tube or member provided with a flange. 5,190,321, Cl. 285-192.000.

Krashkevich, David G.: *See*—
Pucilowski, Sally; Krashkevich, David G.; and Klimek, Ronald A., 5,190,896, Cl. 501-64.000.

Kratochvil, William R.: *See*—
Crapo, Harold B., III; Blades, Brian J.; and Kratochvil, William R., 5,191,186, Cl. 219-76.160.

Krause, Arthur A. Side-pivoting frangible opening for container end wall. 5,190,149, Cl. 220-269.000.

Krause, Joachim: *See*—
Finkelmann, Heino; Hessel, Friedrich; Eidenschink, Rudolf; and Krause, Joachim, 5,190,689, Cl. 252-299.010.

Kraut, Jonathan D.: *See*—
Costello, John W.; DeFilippi, Dino J.; and Kraut, Jonathan D., 5,190,018, Cl. 123-573.000.

Kravitz, Fran K.: *See*—
Shay, Gregory D.; and Kravitz, Fran K., 5,191,051, Cl. 526-301.000.

Krebs, Paul B.: *See*—
Austin, George K., Jr.; Hoven, El Don L.; Tewell, Tony J.; Irwin, Shawn R.; Krebs, Paul B.; and Rice, Bradley A., 5,190,349, Cl. 297-316.000.

Kreckel, Douglas A., to Xerox Corporation. Park and ride method for determining photoreceptor potentials. 5,191,293, Cl. 324-452.000.

Kreft, Keith A.: *See*—
Quinlan, Michael M.; Jackson, Bernard; Pacey, Gordon C.; Borner, Willy; O'Sullivan, Brendan; and Kreft, Keith A., 5,189,912, Cl. 73-462.000.

Kreitmeier, Franz, to Asea Brown Boveri Ltd. Axial-flow gas turbine cooling arrangement. 5,189,874, Cl. 60-39.750.

Kremer, Lawrence N.: *See*—
Roof, Glenn L.; Kremer, Lawrence N.; and Market, Robert V., 5,190,640, Cl. 208-236.000.

Kresge, Edward N.: *See*—
Thaler, Warren A.; Jones, Cruise K.; Drake, Evelyn N.; Manalastas, Pacifico V.; and Kresge, Edward N., 5,190,797, Cl. 427-385.500.

Kress Corporation: *See*—
Kress, Edward S.; and Carpenter, Gene C., 5,190,617, Cl. 202-227.000.

Kress, Edward S.; and Carpenter, Gene C., to Kress Corporation. Coke

Kunugiyama, Hiroyuki: *See*—

Kyocera Corporation: *See*—

Larkin, John M.: *See*—

Kress, Edward S.; and Carpenter, Gene C., to Kress Corporation. Coke handling apparatus including coke box and carrier vehicle. 5,190,617, Cl. 202-227.000.

Kresse, Franz: *See*—
Osberghaus, Rainer; Kresse, Franz; and Scheller, Bernfrid, 5,190,694, Cl. 252-321.000.

Krichever, Mark: *See*—
Metlitsky, Boris; Krichever, Mark; Barkan, Ed; Shepard, Howard M.; Swartz, Jerome; and Sandor, Joseph, 5,191,197, Cl. 235-472.000.

Krieg, Wolfgang: *See*—
Nuebling, Christoph; Theobald, Hans; Kardorff, Uwe; Krieg, Wolfgang; and Kuenast, Christoph, 5,190,963, Cl. 514-363.000.

Krone, Volker: *See*—
Erbel, Raimund; Zotz, Rainer; Krone, Volker; Magerstadt, Michael; and Walch, Axel, 5,190,932, Cl. 521-56.000.

Kroninger, Peter: *See*—
Bemmerl, Hans-Ferdinand; Scheunert, Alois; Kroninger, Peter; Rose, Peter; and Bollmann, Alfred, 5,190,414, Cl. 405-296.000.

Kruljanin, Milan: *See*—
Richards, John W.; Kruljanin, Milan; and Ozaki, Yoshio, 5,191,427, Cl. 358-214.000.

Krumme, Thomas; Strohl, Robert; and Wachter, Dieter, to Durkopp Adler Aktiengesellschaft. Looper which rotates in a horizontal plane for a double lock-stitch sewing machine. 5,189,973, Cl. 112-231.000.

Krutza, Lloyd J. Element protection cover applicator for round hay bales. 5,189,866, Cl. 53-587.000.

Kuang, Ser-hou: *See*—
Landman, Howard; Bucher, Tim; and Kuang, Ser-hou, 5,191,541, Cl. 364-489.000.

Kubo, Kimihiro: *See*—
Masamoto, Junzo; Nakamoto, Tetsuo; and Kubo, Kimihiro, 5,191,020, Cl. 525-189.000.

Kubota, Hideko, to Seiko Epson Corporation. Dual antifuse memory device. 5,191,550, Cl. 365-96.000.

Kubota, Kanemitsu: *See*—
Iijima, Chiyoaki; Wada, Hiroshi; and Kubota, Kanemitsu, 5,191,454, Cl. 359-64.000.

Kubota, Yasuhiko: *See*—
Mima, Hiroshi; Suzuki, Tadashi; and Kubota, Yasuhiko, 5,189,872, Cl. 57-264.000.

Kuchar, Francis A., Jr.: *See*—
Davidge, Ronald V.; Dewitt, John R.; Galinis, Paul J.; Kuchar, Francis A., Jr.; Neer, Jay R.; and Newsom, Thomas H., 5,190,465, Cl. 439-304.000.

Kucharczyk, John: *See*—
Rocklage, Scott M.; Kucharczyk, John; and Moseley, Michael E., 5,190,744, Cl. 424-9.000.

Kuenast, Christoph: *See*—
Nuebling, Christoph; Theobald, Hans; Kardorff, Uwe; Krieg, Wolfgang; and Kuenast, Christoph, 5,190,963, Cl. 514-363.000.

Kuhlig, Steffen; Pakull, Ralf; Grigo, Ulrich; Tacke, Peter; Freitag, Dieter; and Alewelt, Wolfgang, to Bayer Aktiengesellschaft. Process for the production of solventless polycarbonate. 5,191,001, Cl. 524-125.000.

Kuhns, Douglass J.: *See*—
Jorgensen, Douglas K.; Kuhns, Douglass J.; Wiersholm, Otto; and Miller, Timothy A., 5,191,156, Cl. 588-249.000.

Kuhstoss, Stuart A.: *See*—
Cox, Karen L.; Kuhstoss, Stuart A.; Rao, R. Nagaraja; Richardson, Mark A.; Schoner, Brigitte E.; and Seno, Eugene T., 5,190,871, Cl. 435-172.300.

Kuindersma, Pieter I.; Van Dongen, Teunis; Van Der Hofstad, Gerardus L. A. H.; and Kemp, Marcellinus B. M., to U.S. Philips Corp. Semiconductor diode laser with monitor diode. 5,191,590, Cl. 372-50.000.

Kuka Schweissanlagen & Roboter GmbH: *See*—
Hobmaier, Daniel, 5,191,271, Cl. 318-568.100.

Kula, Maria-Regina: *See*—
Steinke, Doerte; Kula, Maria-Regina; Schwarz, Alexander; and Wandrey, Christian, 5,190,875, Cl. 435-227.000.

Kulkarni, Rajendra D. Method of refining liquified petroleum gases into aerosol propellants. 5,191,149, Cl. 585-802.000.

Kunagai, Shigeru: *See*—
Nakai, Hiroto; Iwahashi, Hiroshi; Kanazawa, Kazuhisa; Kumagai, Shigeru; and Sato, Isao, 5,191,252, Cl. 365-189.010.

Kumagai, Yoshiharu: *See*—
Doi, Yoshiharu; and Kumagai, Yoshiharu, 5,191,037, Cl. 525-450.000.

Kumar, Anuradha: *See*—
Fair, Daryl S.; and Kumar, Anuradha, 5,190,919, Cl. 514-15.000.

Kumazawa, Tsutomu: *See*—
Omika, Yukihiro; Sato, Kuniaki; Matsushita, Eiji; Kojima, Kazuo; Kumazawa, Tsutomu; and Ogawa, Yasuo, 5,189,851, Cl. 52-66.000.

Kumobayashi, Hidenori: *See*—
Saito, Takao; Kumobayashi, Hidenori; and Murahashi, Shunichi, 5,191,076, Cl. 340-357.000.

Kuninori, Takeshi: *See*—
Matsuo, Katsuhiko; and Kuninori, Takeshi, 5,190,830, Cl. 428-626.000.

Kunkle, Albert C.; Hardy, Robert E.; and Skipper, Bobby Ray, to J. M. Huber Corporation. Low brightness functional pigment from process by-product. 5,190,615, Cl. 162-135.000.

Kunugiyama, Hiroyuki: *See*—
Imoto, Katsuyuki; and Kunugiyama, Hiroyuki, 5,190,364, Cl. 385-24.000.

Kunz, Walter: *See*—
Schurter, Rolf; Kunz, Walter; and Nyfeler, Robert, 5,190,928, Cl. 514-63.000.

Kuo, Long-Far, to Young-Life International Co., Ltd. Pair of shears with tongs. 5,189,794, Cl. 30-135.000.

Kupp, Donald: *See*—
Precht, Walter; Kobs, Richard; Kupp, Donald; and Cummings, Delwyn, 5,190,890, Cl. 437-100.000.

Kuraishi, Tadayuki: *See*—
Hasegawa, Hiroshi; Isomae, Kazuo; Kotsugai, Takeshi; Shioiri, Noriaki; Sekine, Kumiko; Taido, Naokata; Sato, Susumu; and Kuraishi, Tadayuki, 5,190,951, Cl. 514-292.000.

Kurata, Masafumi: *See*—
Tyouno, Susumu; Kurokawa, Norihiro; Kurata, Masafumi; and Yoshida, Hideo, 5,191,490, Cl. 360-71.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Hagiwara, Hiroshi; Hosokawa, Toshio; and Suzuki, Katsumi, 5,191,018, Cl. 525-86.000.

Kurematsu, Katsumi; Minoura, Nobuo; Yanagi, Haruyuki; and Mitsutake, Hideaki, to Canon Kabushiki Kaisha. Apparatus having a screen with light blocking elements. 5,191,472, Cl. 359-619.000.

Kuriyama, Takashi: *See*—
Kurokawa, Hiromitsu; Miyoshi, Tadayoshi; Kuriyama, Takashi; and Shishido, Ichiro, 5,191,445, Cl. 358-461.000.

Kuroda, Shigeo: *See*—
Tazunoki, Masanori; Mishimagi, Hiromitsu; Homma, Makoto; Sakuta, Toshiyuki; Nakamura, Hisashi; Sasaki, Keiji; Enomoto, Minoru; Satoh, Toshihiko; Sahara, Kunizo; Kuroda, Shigeo; Otsuka, Kanji; Kawamura, Masao; Kurosawa, Hinoko; and Ito, Kazuya, 5,191,224, Cl. 257-724.000.

Kurokawa, Hiromitsu; Miyoshi, Tadayoshi; Kuriyama, Takashi; and Shishido, Ichiro, to Victor Company of Japan, Ltd. Image reader. 5,191,445, Cl. 358-461.000.

Kurokawa, Norihiro: *See*—
Tyouno, Susumu; Kurokawa, Norihiro; Kurata, Masafumi; and Yoshida, Hideo, 5,191,490, Cl. 360-71.000.

Kurosawa, Atsushi; Kimoto, Toshiyuki; Onishi, Sei; and Kajihara, Kiyohito, to Pioneer Electronic Corporation. Disk playback device. 5,191,569, Cl. 369-38.000.

Kurosawa, Hinoko: *See*—
Tazunoki, Masanori; Mishimagi, Hiromitsu; Homma, Makoto; Sakuta, Toshiyuki; Nakamura, Hisashi; Sasaki, Keiji; Enomoto, Minoru; Satoh, Toshihiko; Sahara, Kunizo; Kuroda, Shigeo; Otsuka, Kanji; Kawamura, Masao; Kurosawa, Hinoko; and Ito, Kazuya, 5,191,224, Cl. 257-724.000.

Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Ishikawa, Hideyuki; Suzuki, Kazuo; and Yuzuriha, Yoshiki, to Fuji Jukogyo Kabushiki Kaisha; Japan Electronic Control Systems; and Polaris Industries L.P. Fuel injection control system for a two-cycle engine. 5,191,531, Cl. 364-431.050.

Kurylko, Lubomry: *See*—
Wang, Lawrence K.; Kurylko, Lubomry; and Wang, Mu Hao S., 5,190,659, Cl. 210-663.000.

Kurzinski, Cass R. Apparatus and method for cleaning the outside of the mold tube in a continuous casting machine. 5,190,593, Cl. 134-3.000.

Kusagaya, Tomio: *See*—
Futami, Tohru; Sakata, Masao; Todoriki, Tsuyoshi; and Kusagaya, Tomio, 5,191,266, Cl. 315-307.000.

Kusaka, Yosuke; and Utagawa, Ken, to Nikon Corporation. Camera with focus detecting device for removing vignetting effects. 5,191,201, Cl. 250-201.800.

Kushida, Yasuhiro: *See*—
Seto, Kazuo; Inoue, Minoru; Haruna, Motoaki; Kimura, Hiroshi; Nagano, Yasutoshi; and Kushida, Yasuhiro, 5,190,804, Cl. 428-192.000.

Kuster, Anton: *See*—
Marek, Daniel; Kuster, Anton; Kasten, Arne; and Tschopp Werner, 5,191,287, Cl. 324-307.000.

Kusters, Karl-Heinz, to Eduard Kusters Maschinenfabrik GmbH & Co KG. Roller. 5,189,776, Cl. 492-7.000.

Kuwabara, Tadao: *See*—
Murakami, Daisuke; and Kuwabara, Tadao, 5,191,234, Cl. 307-265.000.

Kuzunuki, Soshiro: *See*—
Shojima, Hiroshi; Kuzunuki, Soshiro; Fukunaga, Yasushi; Matsuda, Toshihiko; Takekoshi, Toshio; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 5,191,622, Cl. 382-13.000.

Kwak, Doo-Shin, to Samsung Electronics Co., Ltd. Device for adjusting the heat-generating time of a thermal printer head. 5,191,355, Cl. 346-76.0PH.

Kwan, Chiu K.: *See*—
Lee, James S. W.; and Kwan, Chiu K., 5,190,298, Cl. 273-430.000.

Kwasneske, Alan L.: *See*—
Habermehl, Robert, Jr.; Knauer, Norman M.; and Kwasneske, Alan L., 5,190,215, Cl. 236-91.00F.

Kwasnick, Robert F.: *See*—
Saia, Richard J.; Kwasnick, Robert F.; and Giambattista, Brian W., 5,191,394, Cl. 257-52.000.

Kwok, John: *See*—
Dan, Ervin R.; and Kwok, John, 5,190,984, Cl. 521-59.000.

Kyocera Corporation: *See*—
Koriyama, Shin-ichi; Sakuyama, Kazuhiro; Maeda, Toshihiko; Yamauchi, Hisao; and Tanaka, Shoji, 5,190,914, Cl. 505-1.000.

La Crosse Footwear, Inc.: *See*—
Barma, Tarachand S., 5,189,814, Cl. 36-4.000.

Labatut, Brigitte: *See*—
Hert, Marius; Labatut, Brigitte; and Lebez, Jean, 5,191,050, Cl. 526-272.000.

Labinal, societe anonyme: *See*—
Le Chatelier, Robert, 5,190,247, Cl. 244-103.00R.

Laboratoire Europeen de Recherches Electroniques Avancees, Societe En Nom Collectif: *See*—
Tran, Francis, 5,191,418, Cl. 358-142.000.

Labthermics Technologies, Inc.: *See*—
Fetter, Richard W.; Gadsby, Peter D.; and Kabachinski, Jeffrey L., 5,190,054, Cl. 128-804.000.

Lacombat, Michel: *See*—
Hignette, Olivier; and Lacombat, Michel, 5,191,393, Cl. 356-384.000.

Ladoco AG: *See*—
Lechner, Rudolf, 5,190,184, Cl. 220-581.000.

Lafferty, W. Michael; Middle, George H.; Banys, Algis R.; and Kline, Daniel S., to Citation Medical Corporation. Method for manufacturing a disposable arthroscopic probe. 5,190,028, Cl. 128-6.000.

Lafferty, William M.: *See*—
Slemon, Charles S.; Lafferty, William M.; and Guest, Clark C., 5,191,208, Cl. 250-227.210.

Lafleur, Jean-Claude. Window and frame structure therefor. 5,189,862, Cl. 52-771.000.

La Force, Jeffrey. Alignment gauge. 5,189,798, Cl. 33-1.00Q.

Lagerberg, Christopher W.: *See*—
Evans, Michael D.; Gnagy, Curtis L.; Herold, William F.; Lagerberg, Christopher W.; and Nelson, Bruce W., 5,189,808, Cl. 33-836.000.

Lagoni, William A.; and O'Brien, Robert L., to Thomson Consumer Electronics, Inc. Video system with feedback controlled "white stretch" processing and brightness compensation. 5,191,420, Cl. 358-168.000.

Lai, Ming: *See*—
Diels, Jean-Claude M.; and Lai, Ming, 5,191,390, Cl. 356-350.000.

Lai, Nelson, to Necer International Co., Ltd. Computer-controlled block to block shifting type multi-floor multi-block equipment conveying and storage system. 5,190,427, Cl. 414-278.000.

Lajoie, M. Stephen: *See*—
Dynes, James W.; Gutowski, Gerard J.; and Lajoie, M. Stephen, 5,191,097, Cl. 554-156.000.

Lamb, Stephen R.: *See*—
Klug, Mark W.; Toth, Thomas E.; Lamb, Stephen R.; Swendrowski, Steven D.; Tsurishima, Kazuyuki; and Tani, Mitsuaki, 5,190,431, Cl. 414-417.000.

Lamboley, Eric: *See*—
Abbes, Gilles; Lamboley, Eric; Roman, Thierry; and Vachee, Pierre, 5,191,323, Cl. 340-825.370.

Lambright, Terry M.: *See*—
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Lammel, David G.: *See*—
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Oka, Kengo, to Sumitomo Rubber Industries, Ltd. Golf ball. 5,190,294, Cl. 273-232.000.
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Okumura, Fujio, to NEC Corporation. Active matrix substrate for liquid-crystal display and method of fabricating the active matrix substrate. 5,191,453, Cl. 359-59.000.
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Quinlan, Michael M.; Jackson, Bernard; Pacey, Gordon C.; Borner, Willy; O'Sullivan, Brendan; and Kreft, Keith A., to Interbalco AG. Ultrasonic wheel measuring apparatus and wheel balancer incorporating same. 5,189,912, Cl. 73-462.000.

Qureshi, Javaid I., to Westinghouse Electric Corp. Steam turbine components having duplex coatings for improved erosion resistance. 5,190,598, Cl. 148-217.000.

Raad, Bernard A.; and Lee, Hong, to Allied-Signal Inc. Minimum length, air cooled ac generator arrangement. 5,191,254, Cl. 310-112.000.

Rabe, Juergen. Process for the production of a roller bearing cage with molded-on spring elements. 5,190,713, Cl. 264-328.100.

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Shinoki, Toshio; Sasaki, Akira; and Matsumoto Shuichi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for measuring the flow rate of water vapor in a process gas including steam. 5,190,726, Cl. 422-62.000.

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Shiow-Lan, Liou. Adjustable flexible back cushion with adjusting belts and attachment belt. 5,190,347, Cl. 297-284.500.

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Shirai, Tomoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Optical head locating mechanism for magnetically locating an optical head. 5,191,570, Cl. 369-44.220.

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Bengford, Steven C.; and Small, Ronald D., 5,190,397, Cl. 404-88.000.

Smart House, L.P.: *See*—
Nichols, Edward L., III; and Jakopin, David A., 5,190,468, Cl. 439-404.000.

SMC Kabushiki Kaisha: *See*—
Nagai, Shigekazu; Sakurai, Shuuzou; and Kawamoto, Tadasu, 5,190,332, Cl. 294-64.100.

Smelser, Donald W.: *See*—
Wu, Andrew L.; Smelser, Donald W.; Bruce, E. William, II; and O'Dea, John, 5,191,404, Cl. 257-724.000.

Smirlock, Martin E.; Sykes, Robert C.; Alesi, Anthony L.; and Prifti, Joseph J., to Foster-Miller, Inc. Survivability enhancement. 5,191,166, Cl. 89-36.020.

Smith, Addison M.: *See*—
Yates, Stephen F.; Smith, Addison M.; and Murphy, Arthur F., 5,190,626, Cl. 204-157.950.

Smith, David J.: *See*—
Tenney, Linwood P.; Kettering, Timothy J.; Minchak, Robert J.; Benedikt, George M.; and Smith, David J., 5,190,808, Cl. 428-224.000.

Smith, Diana M.: *See*—
Smith, Terry L.; and Smith, Diana M., 5,191,363, Cl. 351-62.000.

Smith & Hawken: *See*—
Long, Richard, 5,190,572, Cl. 71-9.000.

Smith, III; Roger: *See*—
Adams, Leslie G.; Smith, III; Roger; Templeton, Joe W.; and Overholt, Kathleen A., 5,190,860, Cl. 435-7.320.

Smith, K. Scott: *See*—
Webster, Ronald B.; Boisvert, David P.; Gordon, Thomas A.; Baron, Michael; Raczkowski, Michael L.; MacQueen, Raymond J., Jr.; Evans, Robert; and Smith, K. Scott, 5,189,951, Cl. 101-128.100.

Smith, Lawrence A., Jr.; Hearn, Dennis; and Jones, Edward M., Jr., to Chemical Research & Licensing Company. Reactor for exothermic reactions. 5,190,730, Cl. 422-109.000.

Smith, Leroy H., Jr.: *See*—
Murphy, Guy C.; Gordon, Bruce J.; Smith, Leroy H., Jr.; Schilling, Jan C.; and Stuart, Alan R., 5,190,441, Cl. 416-129.000.

Smith, Mark A.: *See*—
Thomas, Bruce A.; Smith, Mark A.; Birchmeier, Mark T.; and Reiber, Lawrence D., 5,189,749, Cl. 7-138.000.

Smith, Mark D.: *See*—
Dinsmore, Bruce E.; and Smith, Mark D., 5,191,349, Cl. 343-751.000.

Smith, Robert F. Bird feeder enclosure. 5,189,984, Cl. 119-52.200.

Smith, Robert F.: *See*—
Herrick, James P.; Smith, Robert F.; and Bruncaj, Mete, 5,190,653, Cl. 210-477.000.

Smith, Scott D.; and Rudd, Howard T., to Tray-L-File, Inc. Portable file box. 5,190,152, Cl. 206-425.000.

Smith, Terry L.; and Smith, Diana M. Sports glasses with watertight seal. 5,191,363, Cl. 351-62.000.

Smith, William A.: *See*—
Su, Wei-Yang; Smith, William A.; and Tooloian, Roya, 5,191,143, Cl. 585-640.000.

Smith, William M.: *See*—
Behan, John M.; Ness, Jeremy N.; Perring, Keith D.; and Smith, William M., 5,190,915, Cl. 512-2.000.

SMS Hasenclever GmbH: *See*—
Groos, Horst; and Zeuch, Bernhard, 5,190,236, Cl. 242-81.000.

Smyshlyaeva, Olga J.: *See*—
Sharygin, Leonid M.; Barybin, Vladimir I.; Gonchar, Valery F.; Smyshlyaeva, Olga J.; Shtin, Anatoly P.; Tretyakov, Sergei Y.; Moiseev, Valery E.; Perekhozhiva, Tatyana N.; Galkin, Vladimir M.; Korenkova, Alma V.; Zlokazova, Elena I.; Vovk, Sergei M.; and Ponomarev, Valery G., 5,190,907, Cl. 502-400.000.

Snider, James H.: *See*—
Palmo, Daura; and Snider, James H., 5,189,932, Cl. 76-108.200.

Snow/Taft-Peirce Company: *See*—
Zika, Frank J.; and Flair, Henry J., 5,190,272, Cl. 269-309.000.

Snyder, Keith A.: *See*—
Chang, Chi S.; Hoffarth, Joseph G.; Markovich, Voya R.; Snyder, Keith A.; and Wiley, John P., 5,191,174, Cl. 174-266.000.

Societe de brevets industriels-Etablissement: *See*—
Sarfati, Alberto G., 5,190,231, Cl. 242-47.080.

Societe Nationale Des Poudres Et Explosifs: *See*—
Alcaraz, Jean-Marie; Lecacheur, Maryse; and Robin, Yves, 5,191,087, Cl. 548-373.100.
Caubere, Paul; Fort, Yves; Gautier, Jean-Claude; and Mondet, Jean-Claude, 5,190,671, Cl. 210-767.000.

Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A.": *See*—
Debeneix, Pierre, 5,190,245, Cl. 244-54.000.

Societe Technique d'Automatismes et d'Ensembles A Ressorts - S.T.A.E.R.: *See*—
Michelena, Jean-Marie, 5,190,187, Cl. 221-186.000.

Soes, Lucas; and Gilissen, Hermanus P. J., to AMP Incorporated. Electrical wire connector and an electrical terminal therefor. 5,190,470, Cl. 439-417.000.

Sogo, Koji: *See*—
Tsutsui, Keiichi; Tsuboi, Kazuo; and Sogo, Koji, 5,191,572, Cl. 369-44.380.

Solladie, Guy; Forestier, Serge; and Lang, Gerard, to L'Oreal. Process for the synthesis of vitamin A and certain ones of derivatives. 5,191,110, Cl. 560-260.000.

Solund, Jorgen, to ITS-Intern Transport Systems A/S. Tray for use in a sorting machine. 5,190,135, Cl. 198-365.000.

Sommer, Gordon M., to Midwest Brake Bond Co. Press drive with oil shear clutch/brake drives. 5,190,129, Cl. 192-18.00A.

Sonoco Products Company: *See*—
Gordon, Gerald A.; Shepard, John K.; and Swihart, William L., deceased, 5,190,209, Cl. 229-5.700.
Shepard, John K.; Vander Sanden, Thomas P.; Tomczak, Arthur R.; and Renck, Lawrence E., 5,189,778, Cl. 29-426.400.

Sonoda, Tomiya: *See*—
Yoshino, Thunekazu; and Sonoda, Tomiya, 5,190,794, Cl. 427-162.000.

Sonoda, Yukitaka: *See*—
Ozawa, Kanji; and Sonoda, Yukitaka, 5,190,205, Cl. 228-44.700.

Sony Broadcast & Communications Limited: *See*—
Richards, John W.; Kruljanin, Milan; and Ozaki, Yoshio, 5,191,427, Cl. 358-214.000.

Sony Corporation: *See*—
Fukumoto, Atsushi; and Ohsato, Kiyoshi, 5,191,571, Cl. 369-44.370.
Hayashi, Masatake; Muchi, Tsuneo; and Ohzeki, Minoru, 5,191,259, Cl. 313-497.000.
Isozaki, Masaaki, 5,191,489, Cl. 360-64.000.
Kondo, Yoshio, 5,191,496, Cl. 360-132.000.
Matsunaga, Osamu, 5,191,415, Cl. 358-138.000.
Murakami, Daisuke; and Kuwabara, Tadao, 5,191,234, Cl. 307-265.000.
Muto, Takayasu; Osato, Mamoru; Sugita, Junkichi; Kashiwagi, Masami; Tanaka, Toru; and Seto, Hidekazu, 5,191,568, Cl. 369-32.000.
Nakamura, Shinji; Oshima, Tomohiro; and Moriwake, Katsuakira, 5,191,487, Cl. 360-19.100.
Nishimura, Hajime, 5,191,432, Cl. 358-330.000.
Suzuki, Kiyosuke; Wanami, Hideki; Shirata, Atsushi; Koyama, Noboru; and Sato, Tatsuru, 5,191,441, Cl. 358-451.000.
Tamura, Masafumi, 5,191,493, Cl. 360-96.500.
Yonemitsu, Jun, 5,191,436, Cl. 358-335.000.

Sony Corporation of America: *See*—
Carlucci, John; and Uenaka, Kathlynn, 5,191,645, Cl. 395-159.000.
MacKay, Michael T., 5,191,320, Cl. 340-706.000.

Sorin Biomedica S.p.A.: *See*—
Deutsch, Edward; Libson, Karen; and Lunghi, Fabio, 5,190,742, Cl. 424-1.100.

Sortie, Kjell, to Caterpillar Industrial Inc. Carriage assembly having side shiftable and adjustable forks. 5,190,436, Cl. 414-667.000.

Sorvillo, John M.; Valenzuela, David M.; and Reynolds, Frederick H., Jr., to Oncogene Science, Inc. Monoclonal antibodies directed to epitopes of human transforming growth factor—α and uses thereof. 5,190,858, Cl. 435-7.230.

Sotomura, Tadashi, to Matsushita Electric Industrial Co., Ltd. Methods to produce solid electrolyte and solid electrode composites. 5,190,695, Cl. 252-500.000.

Sousa, Lawrence; and Hill, Duncan, to Central Auto-Vacc Ltd.; and Zee Investments Limited. Automobile vacuum cleaner. 5,189,753, Cl. 15-313.000.

Sovak, Milos; and Ranganathan, Ramachandran, to Cook Imaging Corp. Process for producing non-ionic radiographic contrast media utilizing π-allylation. 5,191,119, Cl. 564-153.000.

Spangler, James E.: *See*—
Arterbury, Bryant A.; Spangler, James E.; and Malorzo, Thomas V., 5,190,102, Cl. 166-228.000.

Sparks, Bryan D.; Coleman, Richard D.; Toll, Floyd N.; Meadus, F. Weldon; and Ikura, Michio, to Energy, Mines and Resources Canada. Incorporation of a coprocessing additive into coal/oil agglomerates. 5,190,566, Cl. 44-627.000.

Sparta Systems, Inc.: *See*—
Henshaw, Philip D.; and Lia, Steven A., 5,191,574, Cl. 369-100.000.

Spector, George: *See*—
Prentiss, Dee; and Spector, George, 5,190,304, Cl. 280-47.290.
Robinson, Antonio; and Spector, George, 5,189,878, Cl. 60-309.000.

Spectro GmbH: *See*—
Falk, Heinz; and Wollnik, Hermann, 5,191,212, Cl. 250-288.000.

Spectrospin AG: *See*—
Marek, Daniel; Kuster, Anton; Kasten, Arne; and Tschopp Werner, 5,191,287, Cl. 324-307.000.

Speenburgh, Gary L.: *See*—
Koenig, H. Steve; and Speenburgh, Gary L., 5,191,098, Cl. 554-156.000.

Speicher, Edwin W., to M. E. Cunningham Company. Dome and round parts rotary marker. 5,190,384, Cl. 400-128.000.

Spencer, Terrel F.; and Brooks, Gary L., to Sta-Rite Industries, Inc. Filter cartridge. 5,190,651, Cl. 210-305.000.

Spencer Wright Industries, Inc.: *See*—
Satterfield, William H., 5,189,966, Cl. 112-80.530.

Speranza, George P.: *See*—
Cuscurida, Michael; Speranza, George P.; and Sellstrom, Kathy B., 5,191,033, Cl. 525-407.000.

Spira, Joel S.: *See*—
D'Aleo, Michael J.; Ference, Jonathan H.; Hakkarainen, Simo P.; Spira, Joel S.; and Tucker, Darryl W., 5,191,265, Cl. 315-295.000.

Spires, Randall C.: *See*—
Brandao, Ruy L.; Parker, Anthony; and Spires, Randall C., 5,191,340, Cl. 342-373.000.

Spitaler, Engelbert; Wittmann, Heinz; and Erdei, Roland, to HTM Sport-und Freizeitgeraete Gesellschaft m.b. H. Ski binding for a cross country ski or touring ski. 5,190,309, Cl. 280-615.000.

Spraying Systems Co.: *See*—
Hamilton, Richard J., 5,190,224, Cl. 239-600.000.
Haruch, James, 5,190,222, Cl. 239-523.000.

Springer, Timothy: *See*—
Dustin, Michael; and Springer, Timothy, 5,190,859, Cl. 435-7.240.

Sprinter System AB: *See*—
Wallin, Kay; and Nilsson, Ingmar, 5,190,278, Cl. 271-147.000.

Sprunger, Tamae. Snow and ice remover. 5,189,756, Cl. 15-322.000.

Square D Company: *See*—
Glennon, Oliver, 5,191,318, Cl. 340-635.000.

Srb, Karel: *See*—
Rauscher, Erich; Jacoby, Hans D.; and Srb, Karel, 5,191,249, Cl. 310-90.500.

SS Pharmaceutical Co., Ltd.: *See*—
Hasegawa, Hiroshi; Isomse, Kazuo; Kotsugai, Takeshi; Shioiri, Noriaki; Sekine, Kumiko; Taido, Naokata; Sato, Susumu; and Kuraishi, Tadayuki, 5,190,951, Cl. 514-292.000.

Sta-Rite Industries, Inc.: *See*—
Spencer, Terrel F.; and Brooks, Gary L., 5,190,651, Cl. 210-305.000.

Stachura, Leonard M.: *See*—
Logadon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Rajat S., 5,190,685, Cl. 252-171.000.

Stadler, Jeffery A., to Excel Corporation. Lift and carry accumulating conveyor. 5,190,142, Cl. 198-774.300.

Stahl, Henrik O., to Haldor Topsoe A/S. Process and apparatus for exothermic reactions. 5,190,731, Cl. 422-148.000.

Stamicarbon B.V.: *See*—
Marissen, Roelof; and Hornman, Hans H. H., 5,190,809, Cl. 428-225.000.

Standard Microsystems Corporation: *See*—
Sarkissian, Haig, 5,191,655, Cl. 395-275.000.

Stanelle, Ambros; and Stanelle, Andric, to Stanelle, Karl-Heinz. System for loading a silo vehicle or similar with pourable bulk material. 5,190,132, Cl. 193-30.000.

Stanelle, Andric: *See*—
Stanelle, Ambros; and Stanelle, Andric, 5,190,132, Cl. 193-30.000.

Stanelle, Karl-Heinz: *See*—
Stanelle, Ambros; and Stanelle, Andric, 5,190,132, Cl. 193-30.000.

Stanislowski, Anna G.; and England, J. Bruce, to Clorox Company, The. Odor controlling animal litter with pine oil. 5,189,987, Cl. 119-171.000.

Stanley Electric Co., Ltd.: *See*—
Sekiguchi, Tsuneo, 5,190,368, Cl. 362-61.000.

Stanley Home Automation: *See*—
Duhame, Dean C., 5,191,268, Cl. 318-266.000.

Starr, James W.: *See*—
Maresca, Joseph W., Jr.; Starr, James W.; and Wilson, Christopher P., 5,189,904, Cl. 73-40.50R.

Stasch, Johannes-Peter: *See*—
Fey, Peter; Frobel, Klaus; Lenfers, Jan-Bernd; Knorr, Andreas; Stasch, Johannes-Peter; Bischoff, Erwin; Dellweg, Hans-Georg; and Beuck, Martin, 5,190,971, Cl. 514-431.000.

State of Israel, Ministry of Defence, Rafael Armament Development: *See*—

Suginuma, Takeshi, to Mitsubishi Denki K.K. Armature of DC motor. Suzuki, Katsumi: *See*—

State of Israel, Ministry of Defence, Rafael Armament Development Authority, The: *See*—
Netzer, Ehud; and Porat, Itzhak, 5,189,913, Cl. 73-505.000.

State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University and University of Oregon: *See*—
Weber, Eckard; and Keana, John F. W., 5,190,976, Cl. 514-634.000.

Statoil Europarts AB: *See*—
Oskarsson, Leif; Andersson, Sigge; and Pettersson, Bengt, 5,191,165, Cl. 89-15.000.

Staubli, Markus: *See*—
Nazmy, Mohamed; and Staubli, Markus, 5,190,603, Cl. 148-671.000.

Stearns, Donald M., to PEC Research, Inc. Process and system for separating and condensing contaminants from a liquid. 5,190,670, Cl. 210-767.000.

Steer, Carol V.; and Steer, Peter R. Hand actuated load lifting device. 5,190,329, Cl. 294-15.000.

Steer, Peter R.: *See*—
Steer, Carol V.; and Steer, Peter R., 5,190,329, Cl. 294-15.000.

Steere, Robert E., Jr., to Silicon Technology Corporation. Wafer slicing and grinding machine and a method of slicing and grinding wafers. 5,189,843, Cl. 51-165.760.

Stegmeier, George L.: *See*—
Vinegar, Harold J.; Stegmeier, George L.; de Rouffignac, Eric P.; and Chou, Charles C., 5,190,405, Cl. 405-128.000.

Steigleder, Karl Z., to UOP. Low acidity Y zeolite. 5,190,903, Cl. 502-79.000.

Steiner, Walter, to Stewi AG. Clothes arm for hanging up articles of clothing. 5,190,170, Cl. 211-104.000.

Steinke, Doerte; Kula, Maria-Regina; Schwarz, Alexander; and Wandrey, Christian, to Forschungszentrum Juelich GmbH; and Degussa Aktiengesellschaft. Peptide amidase and the use thereof. 5,190,875, Cl. 435-227.000.

Stenberg, Dale E.: *See*—
Nauman, Leonard G.; and Stenberg, Dale E., 5,190,306, Cl. 280-202.000.

Stepanski, Horst: *See*—
Werner, Joachim; Meckel, Walter; Stepanski, Horst; and Colinas-Martinez, Jose , 5,190,607, Cl. 156-331.100.

Stephenson, Kenneth E., to Schlumberger Technology Corporation. Electrostatic particle accelerator having linear axial and radial fields. 5,191,517, Cl. 363-59.000.

Stephenson, Paul, to Hewlett-Packard Company. Digital time interpolation system. 5,191,336, Cl. 341-111.000.

Stern, David L.: *See*—
Han, Scott; Michaels, James N.; Palermo, Robert E.; Stern, David L.; and Walsh, Dennis E., 5,191,138, Cl. 585-500.000.

Stern, Thomas E., to Columbia University in the City of New York, The Trustees of. Optical communications system and method. 5,191,626, Cl. 385-24.000.

Sterner, Carl L. Screed spreader box and compaction roller. 5,190,400, Cl. 404-103.000.

Sterzel, Hans-Josef: *See*—
Ter Maat, Johan H. H.; Oppenlaender, Knut; and Sterzel, Hans-Josef, 5,190,898, Cl. 501-127.000.

Stevens, Victoria L.: *See*—
Merrill, Alfred H., Jr.; Kinkade, Joseph M., Jr.; and Stevens, Victoria L., 5,190,876, Cl. 435-240.200.

Stewart, John E. Weighted wobbling lure. 5,189,825, Cl. 43-42.030.

Stewi AG: *See*—
Steiner, Walter, 5,190,170, Cl. 211-104.000.

Stickley, Frances L.: *See*—
Thomson, Alan R.; Stickley, Frances L.; Clark, Stephen E.; and Daiss, John L., 5,191,068, Cl. 530-413.000.

Stiernvall, Jan-Erik: *See*—
Backstrom, Tomas O.; Kahre, Ragnar E.; and Stiernvall, Jan-Erik, 5,191,598, Cl. 375-100.000.

Stillwell, George R., Jr.: *See*—
Haas, Lee C.; Loeb, Mitchell L.; and Stillwell, George R., Jr., 5,191,627, Cl. 385-24.000.

Stimler, Jeffrey J.: *See*—
Foster, Stephen I.; Stimler, Jeffrey J.; and Nonnemacher, Gail S., 5,190,814, Cl. 428-327.000.

Stoddard, David C. F.; and Orr, Ladd M., to Mead Corporation, The. Snack display. 5,190,211, Cl. 229-120.210.

Stokes, Carl T.: *See*—
Brady, James L.; and Stokes, Carl T., 5,189,985, Cl. 119-60.000.

Stoklosa, David P.: *See*—
Ghosh, Syamal K.; Cox, William A.; Bowerman, Larry H.; and Stoklosa, David P., 5,190,400, Cl. 418-189.000.

Stoll, Kurt; and Kettner, Siegfried, to Festo KG. Sealing device for a multiway valve and a method for the production thereof. 5,190,078, Cl. 137-625.690.

Stoller, Marshall: *See*—
Borodulin, German; Persidsky, Maxim; Shkolnik, Alexander; and Stoller, Marshall, 5,190,557, Cl. 606-127.000.

Stone, Charles L.: *See*—
Le, John O.; Stone, Charles L.; and Tapper, Myron L., 5,190,453, Cl. 431-170.000.

Stoyan, Nick. Corneal contact lens and method for treating myopia. 5,191,365, Cl. 351-160.00R.

Strasser, Karl-Heinz; and Rock, Martin, to Handtmann A-Punkt Automation GmbH. Apparatus for filling a transport container. 5,190,138, Cl. 198-468.800.

Strato Medical Corporation: *See*—
Fenton, Paul V., Jr.; Gorman, William J.; and Young, Thomas M., 5,190,520, Cl. 604-43.000.

Strebtechnik Bochum GmbH & Co.: *See*—
Bemmerl, Hans-Ferdinand; Scheunert, Alois; Kroninger, Peter; Rose, Peter; and Bollmann, Alfred, 5,190,414, Cl. 405-296.000.

Strepparola, Ezio; Gavezotti, Piero; and Corti, Costante, to Ausimont S.r.l. Antirust additives for lubricants or greases based on perfluoropolyethers. 5,190,681, Cl. 252-51.50R.

Stress-Tek, Inc.: *See*—
Reichow, Keith W., 5,190,116, Cl. 177-211.000.

Streubel, Wolfgang; and Hansen, Rainer, to Benteler Aktiengesellschaft. Method of fabricating a double walled pipe elbow. 5,189,790, Cl. 29-890.149.

Strike, Donald P.: *See*—
Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald P., 5,190,940, Cl. 514-227.500.

Strittmatter, Donald J.: *See*—
Wickholm, David R.; and Strittmatter, Donald J., 5,191,470, Cl. 359-375.000.

Strohl, Robert: *See*—
Krumme, Thomas; Strohl, Robert; and Wachter, Dieter, 5,189,973, Cl. 112-231.000.

Stuart, Alan R.: *See*—
Murphy, Guy C.; Gordon, Bruce J.; Smith, Leroy H., Jr.; Schilling, Jan C.; and Stuart, Alan R., 5,190,441, Cl. 416-129.000.

Studer, John C.: *See*—
Davis, Eric W.; and Studer, John C., 5,191,229, Cl. 307-66.000.

Stuerzebecher, Claus S.: *See*—
Nickolson, Robert; Vorbrueggen, Helmut; Stuerzebecher, Claus S.; and Haberey, Martin, 5,190,973, Cl. 514-470.000.

Sturzebecher, Claus-Steffen: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Haberey, Martin; Sturzebecher, Claus-Steffen; and Towa, Michael-Harold, 5,190,964, Cl. 514-374.000.

Styron, Robert W.: *See*—
Shannonhouse, Hugh P.; and Styron, Robert W., 5,190,406, Cl. 405-129.000.

Su, Shun-Fa; and Lin, Ching C. Automatic inking mechanism for paperboard printing machines. 5,189,955, Cl. 101-351.000.

Su, Wei-Yang; Smith, William A.; and Tooloian, Roya, to Texaco Chemical Company. Preparation of isobutylene. 5,191,143, Cl. 585-640.000.

Sudmanns, Hans, to MTU Friedrichshafen GmbH. Exhaust gas line for an internal-combustion engine and its method of manufacture. 5,189,879, Cl. 60-321.000.

Sudoh, Eisho; and Suzuki, Masahiro, to Oki Electric Industry Co., Ltd. Printing apparatus and method using a raster buffer divided into a writing layer, a reading layer, and a write-waiting layer for handling data overflow. 5,191,430, Cl. 358-296.000.

Suehiro, Misayo: *See*—
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 5,191,036, Cl. 525-439.000.

Suga, Toshiyuki; Kitajima, Shinichi; and Kobayashi, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Vaporized fuel control system for vehicular internal combustion engine. 5,190,014, Cl. 123-519.000.

Sugata, Hiroyuki: *See*—
Santoh, Tsuyoshi; Mihara, Chieko; and Sugata, Hiroyuki, 5,190,849, Cl. 430-495.000.

Sugaya, Shoichi: *See*—
Ohkita, Kumakazu; Ueno, Akira; Abe, Toshiaki; and Sugaya, Shoichi, 5,190,697, Cl. 252-511.000.

Sugazaki, Kazuo: *See*—
Iwamoto, Mune; Ito, Norifumi; Matsubara, Tetsuyuki; Sugazaki, Kazuo; and Ando, Toshihiko, 5,191,023, Cl. 525-314.000.

Sugda, Peter J. Sewer chimney coupling and method of building a sewer chimney. 5,189,861, Cl. 52-745.030.

Sugie, Kiyoshi; Inata, Hiroo; and Matsumura, Shunichi, to Teijin Limited. Arylene sulfide ketone copolymer and preparation process thereof. 5,191,056, Cl. 528-125.000.

Sugihara, Mitsuru; and Ogawa, Masashi, to Fuji Photo Film Co., Ltd. Electrophoresis medium membrane. 5,190,629, Cl. 204-182.800.

Sugimori, Kiyoyuki: *See*—
Saba, Hayato; Yamamoto, Keisaku; Imai, Akio; Sugimori, Kiyoyuki; and Wakatsuki, Kizuku, 5,191,041, Cl. 526-142.000.

Sugimoto, Yasuhiro: *See*—
Mizoguchi, Satoshi; and Sugimoto, Yasuhiro, 5,191,553, Cl. 365-189.060.

Sugita, Junkichi: *See*—
Muto, Takayasu; Osato, Mamoru; Sugita, Junkichi; Kashiwagi, Masami; Tanaka, Toru; and Seto, Hidekazu, 5,191,568, Cl. 369-32.000.

Sugiura, Haruyuki; and Takahashi, Katsumasa, to Kitagawa Industries Co., Ltd. Securing device. 5,191,513, Cl. 361-399.000.

Sugiura, Keiji: *See*—
Enomoto, Norihide; Naruse, Yoshihiro; Sugiura, Keiji; Ohtsu, Kimiyo; and Takagi, Masato, 5,191,049, Cl. 526-272.000.

Sugiura, Yuzuru: *See*—
Suzuki, Kazuhiko; Miwa, Akihiko; Sugiura, Yuzuru; and Kawasumi, Satoshi, 5,190,125, Cl. 188-357.000.

Sugiyama, Kenji, to Victor Company of Japan, Ltd. Interfield predictive encoder and decoder for reproducing a signal subjected to predictive encoding by encoder into an image signal. 5,191,414, Cl. 358-136.000.

Sugiyama, Takeshi, to Mitsubishi Denki K.K. Armature of DC motor. 5,191,257, Cl. 310-198.000.

Sugiyama, Toshihisa: *See*—
Nakata, Kunihiko; Yoshioka, Mamoru; Sugiyama, Toshihisa; and Kanto, Yuji, 5,190,015, Cl. 123-520.000.

Sule, Akos. Pinch valve assembly. 5,190,071, Cl. 137-595.000.

Sulek, Stanislaw: *See*—
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Takizawa, Yasuo; Ikeda, Shinyu; Nishiyama, Masataka; Yoshinari, Takaaki; and Suwashita, Masakuni, to Asahi Kogaku Kogyo Kabushiki Kaisha. Installation of optical component in optical device. 5,191,483, Cl. 359-819.000.

Talmadge, Richard D.; Appley, Kenneth E.; and DeFrancesco, Salvatore, to United States of America, Air Force. Programmable remote transducer with filtering, differentiation, integration, and amplification. 5,191,327, Cl. 340-870.380.

Tamamaki, Masahiro; Onoda, Yoshihiro; Nozaki, Masaru; and Suzuki, Naruo, to Japan Abrasive Co., Ltd. Sintered aluminous abrasive grains and method of producing the same. 5,190,567, Cl. 51-293.000.

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Tammera, Robert F.; Shaw, Donald F.; Reinman, Kenneth J.; and Melfi, George, to Exxon Research and Engineering Company. Tangential solids separation transfer tunnel. 5,190,650, Cl. 210-256.000.

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Tamura, Masafumi, to Sony Corporation. Cassette ejecting mechanism of a tape player. 5,191,493, Cl. 360-96.500.

Tamura, Yasumitsu; Haruta, Junichi; and Koichi, Nishi, to Tamura, Yasumitsu; and Shionogi & Co., Ltd. β-lactam compounds and production process thereof. 5,191,074, Cl. 540-200.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Iwakuma, Takeo; Kohno, Harumichi; Sasaki, Yasuhiko; Ikezawa, Katsuo; and Odawara, Akio, 5,190,975, Cl. 514-562.000.

Tanahashi, Masao: *See*—
Otsuka, Kiyotaka; Shirakawa, Kenzo; Kita, Masakazu; Tanahashi, Masao; and Iwasaki, Jyuzaemon, 5,189,792, Cl. 30-43.920.

Tanaka, Hideo: *See*—
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Tanaka, Hirohisa: *See*—
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Tanaka, Hisami: *See*—
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Tanaka, Kazuhiko, to Nippon Thompson Co., Ltd. Linear motion rolling contact guide unit having an asymmetrical guide channel. 5,190,378, Cl. 384-49.000.

Tanaka, Kazuo: *See*—
Kondo, Toshihiko; Tanaka, Kazuo; and Yasuda, Hirofumi, 5,191,402, Cl. 257-288.000.

Tanaka, Osamu: *See*—
Kobayashi, Hisashi; Tanaka, Osamu; and Fujii, Hiroyasu, 5,190,597, Cl. 148-111.000.

Tanaka, Shoji: *See*—
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Koriyama, Shin-ichi; Sakuyama, Kazuhiro; Maeda, Toshihiko; Yamauchi, Hisao; and Tanaka, Shoji, 5,190,914, Cl. 505-1.000.

Tanaka, Toru: *See*—
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Tanaka, Yasuhira: *See*—
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Tanaka, Yasuyuki: *See*—
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Tanashin Denki Co., Ltd.: *See*—
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Taneda, Hirohito; and Takebuchi, Masataka, to Kabushiki Kaisha Toshiba. Method of forming a wiring layer of a semiconductor device. 5,190,894, Cl. 437-195.000.

Tang, Daniel N.; and Atwood, Gregory E., to Intel Corporation. Method of making electrically erasable and electrically programmable memory cell with extended cycling endurance. 5,190,887, Cl. 437-43.000.

Tani, Mitsuaki: *See*—
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Taniguchi, Yousuke; and Aoki, Hiroshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Car air conditioning equipment with temperature variation system to avoid occupant boredom with constant temperature air. 5,190,096, Cl. 165-12.000.

Taniyama, Minoru; Mase, Masahiro; Nakamori, Kazuaki; and Nagaoka, Takashi, to Hitachi, Ltd. Vacuum pump. 5,190,438, Cl. 415-90.000.

Tapper, Myron L.: *See*—
Le, John O.; Stone, Charles L.; and Tapper, Myron L., 5,190,453, Cl. 431-170.000.

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Bruening, Ronald L.; Tarbet, Bryon J.; Izatt, Reed M.; and Bradshaw, Jerald S., 5,190,661, Cl. 210-670.000.

Tarlow, Kenneth A.: *See*—
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Tarmy, Barry L.: *See*—
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Tas, Adrianus W. Apparatus for orienting spherical products having at least one substantially flattened surface. 5,190,137, Cl. 198-387.000.

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Taylor, George. Method and apparatus for determining the performance capabilities of secondary batteries. 5,191,291, Cl. 324-429.000.

Taylor, Matthew: *See*—
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Teasdale, Alistair S.: *See*—
Cullen, Michael J.; Samson, Rogelio G.; Teasdale, Alistair S.; and Wanat, Richard L., 5,190,017, Cl. 123-571.000.

Technophone Limited: *See*—
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Tecnol Medical Products, Inc.: *See*—
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Teijin Limited: *See*—
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Telefonaktiebolaget L M Ericsson: *See*—
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Tenuta, Ralph D.: *See*—
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Toro, Luigi; Marabini, Anna Maria; Paponetti, Bruno; and Passariello, Bruno, to Consiglio Nazionale Delle Ricerche. Process for removing iron from kaolin, quartz and other mineral concentrates of industrial interest. 5,190,900, Cl. 501-148.000.

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Toth, Douglas J.; Shankle, Steven J.; and Brooks, Eric R., to Undersea Industries, Inc. Low air warning system for scuba divers. 5,191,317, Cl. 340-676.000.

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Toya, Ichizo; Inoue, Rikio; and Ito, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material and method for processing the same. 5,190,855, Cl. 430-599.000.

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Toyoda Koki Kabushiki Kaisha: *See*—
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Toyota Jidosha Kabushiki Kaisha: *See*—
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Hirota, Shinya; and Inoue, Tokuta, 5,189,876, Cl. 60-286.000.
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Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, 5,190,008, Cl. 123-306.000.

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Tran, Francis, to Laboratoire Europeen de Recherches Electroniques Avancees, Societe En Nom Collectif. Method for the processing of digital control data associated with an HD-MAC type video signal and device for the implementation of the method. 5,191,418, Cl. 358-142.000.

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Trotta, Paul P., to Schering Corporation. Treatment of certain leukemias with a combination of gamma interferon and alpha interferon. 5,190,751, Cl. 424-85.400.

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Uchida, Yoshihiro; Yoshimura, Shurji; Aso, Yasuhiro; and Murayama, Masami, to Fujitsu Limited. Switch stage number setting apparatus for MSSR channels. 5,191,577, Cl. 370-60.000.

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Higashiyama, Kazutoshi; Ushida, Takahisa; Hirabayashi, Izumi; and Tanaka, Shoji, 5,190,913, Cl. 505-1.000.
Ushizawa, Norihiko; Yamaguchi, Shuichiro; Uchida, Naoto; and Shimomura, Takeshi, to Terumo Kabushiki Kaisha. Ion-sensitive film, method of producing the same and ion sensor. 5,190,636, Cl. 204-416.000.
Utagawa, Ken: *See*—
Kusaka, Yosuke; and Utagawa, Ken, 5,191,201, Cl. 250-201.800.
UTDC Inc.: *See*—
Roxborough, Andrew, 5,191,246, Cl. 310-13.000.
Vachee, Pierre: *See*—
Abbes, Gilles; Lamboley, Eric; Roman, Thierry; and Vachee, Pierre, 5,191,323, Cl. 340-825.370.
Vachss, Frederick R.; and Hong, John H., to Rockwell International Corporation. Photorefractive square law converter. 5,191,448, Cl. 359-7.000.
Val-Kro, Inc.: *See*—
Wietig, Frederick G., 5,190,002, Cl. 123-188.300.
Valcic, Marko: *See*—
van Schaik, Peter J.; and Valcic, Marko, 5,190,000, Cl. 123-90.390.
Valdes, Osvaldo. Hydropneumatic constant pressure device. 5,190,443, Cl. 417-38.000.
Valentini, Fredric; and Moore, David W. Apparatus and method for controlling temperature of printing plate on cylinder in rotary press. 5,189,960, Cl. 101-487.000.
Valenzuela, David M.: *See*—
Sorvillo, John M.; Valenzuela, David M.; and Reynolds, Frederick H., Jr., 5,190,858, Cl. 435-7.230.
Valeo Neiman: *See*—
Rydel, Charles, 5,191,324, Cl. 340-825.720.
Valleylab Inc.: *See*—
Zieve, David A.; and Klicek, Michael S., 5,190,517, Cl. 604-22.000.
Valois: *See*—
Lina, Jean-Pierre; and Pacaud, Herve , 5,190,192, Cl. 222-321.000.
Valster, Karl C.; and Reicks, Allen V., to Precision Pulley, Inc. Replaceable pulley lagging device. 5,190,146, Cl. 198-843.000.
Valter, Karel: *See*—
Ramu, Avner; and Valter, Karel, 5,190,946, Cl. 514-255.000.
Valu Engineering, Inc.: *See*—
Ledgingham, Stuart J.; and Goldberg, Dale I., 5,190,145, Cl. 198-841.000.
Van den Bergh Foods Co., Division of Conopco, Inc.: *See*—
Van Heterea, Jan; King, David M.; and Moriarty, Evelyn M., 5,190,781, Cl. 426-521.000.
Van-Rob Stampings Inc.: *See*—
van Schaik, Peter J.; and Valcic, Marko, 5,190,000, Cl. 123-90.390.
Vandeberghe, Mark H.: *See*—
Parma, George F.; Vandeberghe, Mark H.; and Ruiz, Steve C., 5,190,392, Cl. 403-171.000.
van den Brink, Marinus A.: *See*—
van der Werf, Jan E.; van den Brink, Marinus A.; Linders, Henk F. D.; and Beltman, Johannes M. M., 5,191,200, Cl. 250-201.400.

van der Goot, Henderikus: *See*—

W. R. Grace & Co.-Conn.: *See*—
Wang, Mu Hao S.: *See*—

van der Goot, Henderikus: *See—*
Erika, John C.; van der Goot, Henderikus; Timmerman, Hendrik; and Koper, Jan G., 5,190,389, Cl. 548-311.700.

Van Der Hofstad, Gerardus L. A. H.: *See—*
Kuindersma, Pieter I.; Van Dongen, Teunis; Van Der Hofstad, Gerardus L. A. H.; and Kemp, Marcellinus B. M., 5,191,590, Cl. 372-50.000.

Van der Platt, Johannes B.: *See—*
Osinga, Klaas A.; Beudeker, Robert F.; Van der Platt, Johannes B.; and de Hollander, Johannes A., 5,190,877, Cl. 435-256.000.

Vander Sanden, Thomas P.: *See—*
Shepard, John K.; Vander Sanden, Thomas P.; Tomczak, Arthur R.; and Renck, Lawrence E., 5,189,778, Cl. 29-426.400.

VanDerStuyf, Allen F.; Patil, Ravindra; Burgess, James P.; and Marshall, Daniel P., to Electro-Wire Products, Inc. Bulkhead connector assembly. 5,190,482, Cl. 439-686.000.

Vandervaart, Gerry, to Kool-Fire Research & Development. Heat condensing furnace with de-intensifier tubes. 5,189,887, Cl. 62-238.700.

van der Werf, Jan E.; van den Brink, Marinus A.; Linders, Henk F. D.; and Beltman, Johannes M. M., to U.S. Philips Corp. Imaging apparatus having a focus-error and/or tilt detection device. 5,191,200, Cl. 250-201.400.

Van Dongen, Teunis: *See—*
Kuindersma, Pieter I.; Van Dongen, Teunis; Van Der Hofstad, Gerardus L. A. H.; and Kemp, Marcellinus B. M., 5,191,590, Cl. 372-50.000.

VanDuyne, Edward A., to Charles Stark Draper Laboratory, Inc., The. Cross-seam alignment apparatus. 5,189,970, Cl. 112-121.260.

van Hattem, Jan C.: *See—*
van Thoor, Bernardus M.; and van Hattem, Jan C., 5,190,652, Cl. 210-474.000.

Van Heteren, Jan; King, David M.; and Moriarty, Evelyn M., to Van den Bergh Foods Co., Division of Conopco, Inc. Spoonable non-dairy creams. 5,190,781, Cl. 426-521.000.

van Raemdonck, Joris: *See—*
Couturez, Jean-Pierre; Chretien, Jean-Claude; and van Raemdonck, Joris, 5,190,308, Cl. 280-281.100.

van Rossalen, Gerard E.; and Opheij, Willem G., to U.S. Philips Corporation. Optical device determining the position and orientation of an object, and optical recording and/or reproducing apparatus including the device. 5,191,221, Cl. 250-561.000.

Van Ryzin, William: *See—*
Merkatoris, John R.; and Van Ryzin, William, 5,190,606, Cl. 156-164.000.

van Schaik, Peter J.; and Valcic, Marko, to Van-Rob Stampings Inc. Rocker arm assembly. 5,190,000, Cl. 123-90.390.

van Thoor, Bernardus M.; and van Hattem, Jan C., to Sara Lee/DE N.V. Filter holder for coffee cartridges. 5,190,652, Cl. 210-474.000.

Varley, Sean: *See—*
Penman, Richard; and Varley, Sean, 5,191,297, Cl. 330-146.000.

Varvello, Angelo: *See—*
Moretti, Roberto; and Varvello, Angelo, 5,191,284, Cl. 324-174.000.

Vasas, Martin M., to Bridgeport Metal Goods Manufacturing Co., The. Wiper mounting ring. 5,190,389, Cl. 401-122.000.

Vasile, Carmine F., to Grumman Aerospace Corporation. Dual FET circuits having floating voltage bias. 5,191,238, Cl. 307-443.000.

Vayda, John T.: *See—*
Axelson, Scott R.; and Vayda, John T., 5,191,508, Cl. 361-257.000.

Veatch, Fred C.: *See—*
Keller, Alfred E.; Veatch, Fred C.; Cummings, Arthur L.; Thompsen, James C.; and Severson, Regina A., 5,190,662, Cl. 210-673.000.

Velazquez, Juan F., to Secom Information Products Company. Computer networking method. 5,191,585, Cl. 371-53.000.

Venaleck, John T.: *See—*
Barile, Dawn; Venaleck, John T.; Cloud, Randy G.; and McCoy, Michael, 5,190,471, Cl. 439-455.000.

Venturedyne, Ltd.: *See—*
Liken, Peter A.; Holmes, Robert J.; and Bouwman, George J., 5,191,282, Cl. 324-158.00F.

Verdi, Fred W.: *See—*
Levy, Robert B.; and Verdi, Fred W., 5,190,285, Cl. 273-85.00G.

Verhoeven, Dean, to Institut Francais Du Petrole. Device for measuring by holography the deviations of light rays in transparent media. 5,191,389, Cl. 356-348.000.

Vetter, Gerhard, to Michael Hosauf Maschinenfabrik GmbH & Co. KG. Methods and apparatus for the continuous heat treating of yarn. 5,189,810, Cl. 34-1.800.

Veyre, Annie J.: *See—*
Moreau, Marie-France; Michelot, Josette; Veyre, Annie J.; Madelmont, Jean-Claude; Godeneche, Denise; Lebarre, Pierre; Parry, Daniel; and Meyniel, Gaston, 5,190,741, Cl. 424-1.100.

Vick, Robert L., to Minnesota Mining and Manufacturing Company. Fire resistant connector for oil containment booms. 5,190,402, Cl. 405-70.000.

Victor Company of Japan, Ltd.: *See—*
Kurokawa, Hiromitsu; Miyoshi, Tadayoshi; Kuriyama, Takashi; and Shishido, Ichiro, 5,191,445, Cl. 358-461.000.
Sugiyama, Kenji, 5,191,414, Cl. 358-136.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; Uchiyama, Yuji; Negishi, Ichiro; Suzuki, Tetsuji; Tatsumi, Fujiko; Takahashi, Ryusaku; and Maeno, Keiichi, 5,191,408, Cl. 358-49.000.

Vigouret, Jean-Marie: *See—*
Nozulak, Joachim; Sauter, Andre ; and Vigouret, Jean-Marie, 5,190,941, Cl. 514-229.800.

Vijayakumar, Kallambella M.; and Dong, Junchang, to Boston University, Trustees of. Electrical mercury manometer. 5,189,917, Cl. 73-750.000.

Vilenchik, Lev Z.; Ayotte, Roger C.; Asrar, Jawed; and Hardiman, Christopher J., to Monsanto Company. Method for size exclusion chromatography. 5,190,658, Cl. 210-656.000.

Villarreal, William M.: *See—*
Dickson, Stewart P.; and Villarreal, William M., 5,191,416, Cl. 358-140.000.

Vilsboll, Niels. Stand or separation, especially a book-end. 5,190,166, Cl. 211-43.000.

Vincent, Leo: *See—*
Buffard, Laurent; Raymond, Michel; Vincent, Leo; Girones, Renee-Paule; and Barrier, Andre, 5,190,718, Cl. 266-96.000.

Vincent, Michel; Remond, Georges; Portevin, Bernard; Herve, Yolande; and Lepagnol, Jean, to Adir Et Compagnie. Peptide compounds containing a cyclic amide structure. 5,190,923, Cl. 514-19.000.

Vincent, Paul; Laukien, Gunther; and Kasten, Arne, to Bruker Analytic. X-ray computer tomography system with split detector ring. 5,191,600, Cl. 378-10.000.

Vinegar, Harold J.; Stegmeier, George L.; de Rouffignac, Eric P.; and Chou, Charles C., to Shell Oil Company. Vacuum method for removing soil contaminants utilizing thermal conduction heating. 5,190,405, Cl. 405-128.000.

Viola, Paul J.: *See—*
Corsi, George M.; Brooks, Richard M.; and Viola, Paul J., 5,190,545, Cl. 606-74.000.

Virginia Commonwealth University: *See—*
Byron, Peter R.; and Dalby, Richard N., 5,190,029, Cl. 128-200.140.

Virginia Tech Intellectual Properties, Inc.: *See—*
Gibson, Harry W.; and Jois, Yajnanarayana H. R., 5,191,059, Cl. 528-220.000.

Viselli, Michael A., to AMP Incorporated. Contact retention. 5,190,483, Cl. 439-751.000.

Vista Research, Inc.: *See—*
Maresca, Joseph W., Jr.; Starr, James W.; and Wilson, Christopher P., 5,189,904, Cl. 73-40.50R.

Vitaliano, Silingardi; and Paolo, Ranuzzi, to Azienda S.R.L., R. P. Color S.R.L. Method for the realization of a ceramic tile, glazed or enamelled, and tile obtained by this method. 5,190,708, Cl. 264-62.000.

Voest-Alpine Industrianlagenbau GmbH: *See—*
Pirklbauer, Wilfried; Weber, Alfred; and Auer, Johann, 5,190,719, Cl. 266-144.000.

Vogt, Rolf, to Carl Freudenberg, Firma. Pressure regulating inlet-and-outlet valve. 5,190,073, Cl. 137-493.000.

Voigt, Dieter, to Volkswagen AG. Cylinder block for an internal combustion engine. 5,190,003, Cl. 123-195.00R.

Volkmann, Robert A., to Pfizer Inc. Diastereomeric 5R,6S-6-(1R-hydroxyethyl)-2-(cis-1-oxo-3-thiolanylthio)-2-penem-3-carboxylic acids. 5,191,077, Cl. 540-357.000.

Volkswagen AG: *See—*
Dieter, Steinke; and Kammann, Uwe, 5,190,001, Cl. 123-179.150.
Voigt, Dieter, 5,190,003, Cl. 123-195.00R.

Voltz, John A.; and Hansell, George A., III, to W. L. Gore & Associates, Inc. Miniaturized high-density coaxial connector system with staggered grouper modules. 5,190,472, Cl. 439-579.000.

von Bagh, Hans-Karl, to Nokia Kaapeli Oy. Connector for optical fiber preforms. 5,191,633, Cl. 385-147.000.

von Blucher, Hasso: *See—*
von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, 5,190,110, Cl. 169-46.000.

von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest. Use of an aqueous swollen macromolecule-containing system as water for fire fighting. 5,190,110, Cl. 169-46.000.

von Sprecher, Georg: *See—*
Mickel, Stuart J.; and von Sprecher, Georg, 5,190,934, Cl. 514-114.000.

Vorbrueggen, Helmut: *See—*
Nickolson, Robert; Vorbrueggen, Helmut; Stuerzebecher, Claus S.; and Haberey, Martin, 5,190,973, Cl. 514-470.000.

Vorbruggen, Helmut: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Haberey, Martin; Sturzebecher, Claus-Steffen; and Town, Michael-Harold, 5,190,964, Cl. 514-374.000.

Voumard, Bertrand P., to Isafrance. Strap clasp. 5,189,763, Cl. 24-175.000.

Vovk, Sergei M.: *See—*
Sharygin, Leonid M.; Barybin, Vladimir I.; Gonchar, Valery F.; Smyshlyaeva, Olga J.; Shtin, Anatoly P.; Tretyakov, Sergei Y.; Moiseev, Valery E.; Perekhozhiva, Tatyana N.; Galkin, Vladimir M.; Korenkova, Alma V.; Zlokazova, Elena I.; Vovk, Sergei M.; and Ponomarev, Valery G., 5,190,907, Cl. 502-400.000.

W. E. Bassett Company, The: *See—*
Rommerdale, Eric, 5,190,335, Cl. 294-99.200.

W. L. Gore & Associates, Inc.: *See—*
Nomi, Haruo, 5,190,806, Cl. 428-198.000.
Ohashi, Kazuhiko; Kato, Hiroshi; and Wani, Takayuki, 5,190,813, Cl. 428-319.300.
Voltz, John A.; and Hansell, George A., III, 5,190,472, Cl. 439-579.000.

W. P. Hickman Company: *See—*
Braine, Mark D.; Kirby, Ralph; Schultz, Donald W.; Tuttle, Richard G.; and Hickman, John B., 5,189,853, Cl. 52-96.000.

W. R. Grace & Co.-Conn.: *See—*
Deutch, Alan H.; and Tuszynski, George, 5,190,918, Cl. 514-15.000.
Eyal, Jacob; Hamilton, Bruce K.; and Tuszynski, George P., 5,190,920, Cl. 514-17.000.
Parker, Brian A., 5,191,081, Cl. 544-384.000.
Parker, Brian A., 5,191,106, Cl. 558-346.000.

W. Schlafhorst & Co.: *See—*
Grecksch, Hans; Mayer, Rolf; Lys, Michael; Kohlen, Helmut; and Radziejewski, Gerhard, 5,190,136, Cl. 198-372.000.

Wabco Automotive U.K. Limited: *See—*
Knowles, James G., 5,190,356, Cl. 303-7.000.

Wachtel, Jack S. Adjustable pipe wand for bubbles. 5,190,490, Cl. 446-15.000.

Wachter, Allan J.: *See—*
Lezdey, John; and Wachter, Allan J., 5,190,917, Cl. 514-12.000.

Wachter, Dieter: *See—*
Krumme, Thomas; Strohl, Robert; and Wachter, Dieter, 5,189,973, Cl. 112-231.000.

Wada, Hiroshi: *See—*
Iijima, Chiyoaki; Wada, Hiroshi; and Kubota, Kanemitsu, 5,191,454, Cl. 359-64.000.
Taguchi, Tetuo; Wada, Hiroshi; Emura, Keiichi; Shinohara, Yutaka; Wada, Yoshihiro; Onuki, Isao; Suzuki, Kazunori; and Sakai, Kazuo, 5,190,385, Cl. 400-200.000.

Wada, Masami: *See—*
Yamashita, Fumitoshi; and Wada, Masami, 5,190,684, Cl. 252-62.540.

Wada, Takuo: *See—*
Chiba, Kaoru; Yonemura, Shinji; Noguchi, Tatsuo; Wada, Takuo; and Moriyama, Satoru, 5,190,764, Cl. 424-408.000.

Wada, Yoshihiro: *See—*
Taguchi, Tetuo; Wada, Hiroshi; Emura, Keiichi; Shinohara, Yutaka; Wada, Yoshihiro; Onuki, Isao; Suzuki, Kazunori; and Sakai, Kazuo, 5,190,385, Cl. 400-200.000.

Wagh, Meghanad D.: *See—*
Frankel, Samuel R.; and Wagh, Meghanad D., 5,189,971, Cl. 112-220.000.

Waidhas, Manfred; Pantel, Kurt; and Richter, Gerhard, to Siemens Aktiengesellschaft. Method of making solid electrolyte capacitor. 5,189,770, Cl. 29-25.030.

Wakami, Noboru; Hayashi, Isao; Nomura, Hiroyoshi; and Naito, Eiichi, to Matsushita Electric Industrial Co., Ltd. Fuzzy-boolean multi-stage inference apparatus. 5,191,638, Cl. 395-51.000.

Wakatsuki, Kizuku: *See—*
Saba, Hayato; Yamamoto, Keisaku; Imai, Akio; Sugimori, Kiyoyuki; and Wakatsuki, Kizuku, 5,191,041, Cl. 526-142.000.

Wakuda, Osamu: *See—*
Namba, Toyoaki; Karasuda, Kazuaki; Wakuda, Osamu; and Yamamoto, Hiranaga, 5,190,276, Cl. 271-13.000.

Walch, Axel: *See—*
Erbel, Raimund; Zotz, Rainer; Krone, Volker; Magerstadt, Michael; and Walch, Axel, 5,190,982, Cl. 521-56.000.

Waldrop, James L., to Gas Jack, Inc. Integral gas compressor and internal combustion engine. 5,189,905, Cl. 73-54.090.

Wallin, Kay; and Nilsson, Ingmar, to Sprinter System AB. Magazine for container forming sheets or the like adjustable for predetermined sheetsizes. 5,190,278, Cl. 271-147.000.

Wallstrom, Lars-Gunnar: *See—*
Lindberg, Hans; and Wallstrom, Lars-Gunnar, 5,190,419, Cl. 407-42.000.

Wallwey, Erich; and Suss, Siegfried, to Wegmann & Co. GmbH, Firma. Device for setting fuzes in large-caliber shells. 5,191,163, Cl. 89-6.000.

Walsh, Dennis E.: *See—*
Han, Scott; Michaels, James N.; Palermo, Robert E.; Stern, David L.; and Walsh, Dennis E., 5,191,138, Cl. 585-500.000.

Walter, Bruno H., to Intech International Inc. Flow pulsing apparatus for drill string. 5,190,114, Cl. 175-56.000.

Walter, Helmut: *See—*
Misslitz, Ulf; Meyer, Norbert; Kast, Juergen; Goetz, Norbert; Harreus, Albrecht; Wuerzer, Bruno; Walter, Helmut; Westphalen, Karl-Otto; and Gerber, Matthias, 5,190,573, Cl. 504-292.000.

Walters, David K.: *See—*
Bullen, John V.; and Walters, David K., 5,190,680, Cl. 252-51.50A.

Walz, Gerard F.; and Bentzen, Duane O., to Walz Postal Solutions, Inc. Continuous mailing forms and mailing preparation system. 5,190,210, Cl. 229-69.000.

Walz Postal Solutions, Inc.: *See—*
Walz, Gerard F.; and Bentzen, Duane O., 5,190,210, Cl. 229-69.000.

Wanami, Hideki: *See—*
Suzuki, Kiyosuke; Wanami, Hideki; Shirata, Atsushi; Koyama, Noboru; and Sato, Tatsuru, 5,191,441, Cl. 358-451.000.

Wanat, Richard L.: *See—*
Cullen, Michael J.; Samson, Rogelio G.; Teasdale, Alistair S.; and Wanat, Richard L., 5,190,017, Cl. 123-571.000.

Wandrey, Christian: *See—*
Steinke, Doerte; Kula, Maria-Regina; Schwarz, Alexander; and Wandrey, Christian, 5,190,875, Cl. 435-227.000.

Wang, Duan-Fan: *See—*
Bernier, Robert J.; and Wang, Duan-Fan, 5,191,062, Cl. 528-483.000.

Wang, Lawrence K.; Kurylko, Lubomry; and Wang, Mu Hao S., to International Environmental Systems Inc. Contamination removal system employing filtration and plural ultraviolet and chemical treatment steps and treatment mode controller. 5,190,659, Cl. 210-663.000.

Wang, Mu Hao S.: *See—*
Wang, Lawrence K.; Kurylko, Lubomry; and Wang, Mu Hao S., 5,190,659, Cl. 210-663.000.

Wang, Ping, to Silicon Storage Technology, Inc. High frequency voltage multiplier for an electrically erasable and programmable memory device. 5,191,232, Cl. 307-264.000.

Wani, Takayuki: *See—*
Ohashi, Kazuhiko; Kato, Hiroshi; and Wani, Takayuki, 5,190,813, Cl. 428-319.300.

Washington Chain and Supply, Inc.: *See—*
Epstein, Irving, 5,190,435, Cl. 414-635.000.

Wason, James R.: *See—*
Orr, William M.; Panuganti, Badari N.; Ryan, James L.; Sambataro, George J.; and Wason, James R., 5,191,534, Cl. 364-468.000.

Wasson, Robert C.: *See—*
Phillips, Emyr; and Wasson, Robert C., 5,190,723, Cl. 422-15.000.

Wat, Pamela K.: *See—*
Jao, Frank; Wong, Patrick S. L.; Huynh, Hoa T.; McChesney, Kathy; and Wat, Pamela K., 5,190,765, Cl. 424-473.000.

Watanabe, Akio: *See—*
Yokota, Tadafumi; and Watanabe, Akio, 5,191,096, Cl. 554-129.000.

Watanabe, Hisashi: *See—*
Top, Abdul G. Md.; Leong, Leong W.; Ong, Augustine S. H.; Kawada, Tsukasa; Watanabe, Hisashi; and Tsuchiya, Nozomu, 5,190,618, Cl. 203-34.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus with conveying path access. 5,191,383, Cl. 355-321.000.

Watanabe, Kazuhiro: *See—*
Oike, Takayasu; Endoh, Kazuhiko; Suzuki, Takashi; Watanabe, Kazuhiro; Suzuki, Hirochika; Shimada, Jun; Ishii, Takashi; Adachi, Tateo; and Horie, Yoshihiro, 5,189,909, Cl. 73-155.000.

Watanabe, Masayuki: *See—*
Nomura, Keiji; Nishimura, Katsutoshi; Okamoto, Kazunori; Horiuchi, Tomoharu; Watanabe, Masayuki; Nakao, Hirohisa; and Noguchi, Masahiko, 5,190,119, Cl. 180-132.000.

Watanabe, Naoki; Shinbo, Toshiaki; and Ogata, Mitsuru, to Namco, Ltd. Image synthesizing system and shooting game machine using the same. 5,190,286, Cl. 273-85.00G.

Watanabe, Tetsuya: *See—*
Ogura, Shinichi; Adachi, Hiroo; Shishido, Osamu; Watanabe, Tetsuya; Mineo, Yuuichi; Kageyama, Tohru; Nishiyama, Yoichi; Yamaguchi, Takashi; and Ogawa, Keiichi, 5,191,512, Cl. 361-386.000.

Watanabe, Toshiaki: *See—*
Ida, Takashi; Ohzeki, Kazuo; Dachiku, Kenshi; Ueno, Hideyuki; Watanabe, Toshiaki; and Matsumura, Yoshikumi, 5,191,601, Cl. 379-53.000.

Watanabe, Toshio: *See—*
Matsushita, Akihiro; Takemura, Shinya; Watanabe, Toshio; Sakai, Shigeo; and Fukuda, Nobuo, 5,191,579, Cl. 370-85.150.

Watanabe, Touichi: *See—*
Matushita, Masaharu; Ito, Tomoyasu; Watanabe, Touichi; Shoji, Akira; Moritani, Michitaka; and Okuta, Takatoshi, 5,190,588, Cl. 118-635.000.

Watanabe, Yoshitane; Suzuki, Keitaro; Shishido, Kouji; and Teranishi, Masayuki, to Nissan Chemical Industries, Ltd. Flame retardant for halogen-containing vinyl resins. 5,190,700, Cl. 252-609.000.

Watanuki, Mitsuru: *See—*
Murai, Satoshi; Shimano, Masanao; Yamamoto, Hiroshi; Koyama, Toshihiro; Nakamura, Tsutomu; Ogawa, Masaru; Watanuki, Mitsuru; Okamoto, Taira; and Hori, Toshimitsu, 5,190,959, Cl. 514-318.000.

Watari, Fumie: *See—*
Zanka, Yukihito; Hayakawa, Seiichiro; Isaka, Tsutomu; and Watari, Fumie, 5,191,061, Cl. 528-376.000.

Watkins, Joseph A.: *See—*
Nelson, Jayson J.; Payment, William E.; Sisson, Thomas A.; and Watkins, Joseph A., 5,190,233, Cl. 242-56.00R.

Watson, Julian M.; and McFarlane, Ian D., to Wool Research Organization of New Zealand, Inc. Method and apparatus for filling duvets and the like. 5,190,082, Cl. 141-1.000.

Watterson, Scott R.: *See—*
Dalebout, William T.; and Watterson, Scott R., 5,190,505, Cl. 482-52.000.

Watts, Dion M. Flushing apparatus for vehicle oil pump pickup tube and screen. 5,190,120, Cl. 184-1.500.

Watts, Leonard A.: *See—*
Andrade, Jose A.; and Watts, Leonard A., 5,189,865, Cl. 53-466.000.

Webb, Thomas H.; and Cocco, Anthony, to Firon Metal Industries Ltd. Switch for use as a vertically mounted cut out or in-line switch. 5,191,311, Cl. 337-168.000.

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Yokoyama, Kenji, 5,191,616, Cl. 381-98.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamakawa, Akira; and Sesame, Akira, to Sumitomo Electric Industries, Ltd. Surface structure of ceramics substrate and method of manufacturing the same. 5,190,601, Cl. 148-518.000.

Yamamatsu, Setsuo; and Yamaguchi, Tatsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of methacrylic acid and methacrolein. 5,191,116, Cl. 562-549.000.

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Yamamoto, Hiranaga: *See*—
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Yamamoto, Hiroshi: *See*—
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Yamamoto, Kazuhiro: *See*—
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Yamamoto, Kazutoshi: *See*—
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Yamamoto, Susumu; Kawabe, Nozomu; and Murai, Teruyuki, to Sumitomo Electric Industries, Ltd. Sintered oxide superconducting wires. 5,190,912, Cl. 505-1.000.

Yamamoto, Yasushi; Fujimura, Shigeru; Nakane, Futoshi; Nagaya, Toshikazu; Harada, Shigeaki; and Takiguchi, Yasuhiro, to Sharp Kabushiki Kaisha. Cursor shift speed control system. 5,191,641, Cl. 395-118.000.

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Yamane, Koichi; and Abe, Masayuki, to Kao Corporation. High-speed spinning oil composition containing an organophosphuric ester salt and an oxyalkylene polymer. 5,190,676, Cl. 252-8.900.

Yamasaki, Hirofumi; Yagi, Kiyoshi; Tsukamoto, Keisuke; Takaoka, Toshio; and Fukuma, Takao, to Fujitsu Ten Limited; and Toyota Jidosha Kabushiki Kaisha. Lean burn internal combustion engine. 5,190,008, Cl. 123-306.000.

Yamashita, Fumitoshi; and Wada, Masami, to Matsushita Electric Industrial Co., Ltd. Rare earth containing resin-bonded magnet and its production. 5,190,684, Cl. 252-62.540.

Yamashita, Kazuhiro; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Optical apparatus for alignment of reticle and wafer in exposure apparatus. 5,191,465, Cl. 359-287.000.

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Yamazaki, Shuntaro, to NEC Corporation. WDM optical communication wherein optical beams are modulated by channel discrimination signals of different frequencies before by data signals. 5,191,457, Cl. 359-124.000.

Yana, Victor Y., to Aerospatiale Societe Nationale Industrielle. Anti-resonant suspension device for a helicopter. 5,190,244, Cl. 244-17.270.

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Yamanami, Tsuguya; Senda, Toshiaki; and Murakami, Azuma, to Wacom Co. Ltd. Coordinates input system. Re. 34,187, Cl. 178-19.000.

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TO WHOM

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Asano, Masamichi: *See*—
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Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., to Cypress Semiconductor (Minnesota) Inc. CMOS output buffer providing high drive current with minimum output signal distortion. B1 4,638,187, 3-2-93, Cl. 307-451.000.
Campione, Ben, to Harris Corporation. Predrive circuit having level sensing control. B1 5,051,619, 3-2-93, Cl. 307-443.000.
Crossley, Peter W.; Fellerman, Bernard F.; and Goodchild, Graham H., to Thorn Emi Patents Limited. Heating assembly using tungsten-halogen lamps. B1 4,864,104, 3-2-93, Cl. 219-464.000.
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Harris Corporation: *See*—
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Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, to Kabushiki Kaisha Toshiba; and Tosbac Computer System Co., Ltd. Electrostatic diacharge protection circuit with variable limiting threshold for MOS device. B1 4,692,834, 3-2-93, Cl. 361-91.000.
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Narita, Akira: *See*—
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Rai, Surinder S.: *See*—
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Watson, James D.: *See*—
Kennelley, Kevin J.; Thomas, Eugene R.; Voorhees, Robert J.; Watson, James D.; and Sullivan, Daniel S., H1147, Cl. 252-8.552.
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NOTE.—First number, class; second number, subclass; third number, patent number

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	5,190,683	5,190,105	5,190,865	5,191,368	5,190,254	5,190,549
	5,190,808	5,190,126	5,190,873	5,191,391	5,190,304	5,190,550
	5,191,264	5,190,127	5,190,884	5,191,396	5,190,389	5,190,598
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	5,191,269	5,190,268	5,191,119	5,191,548	5,191,343	5,191,642
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	5,191,349	5,190,376	5,191,169	5,191,558	5,191,522	5,189,748
	5,191,452	5,190,400	5,191,176	5,191,583	5,191,524	5,189,859
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	5,189,765	5,190,546	5,191,242	5,189,828	5,189,835	5,190,879
	5,189,773	5,190,551	5,191,243	5,189,877	5,189,845	5,190,926
	5,189,798	5,190,555	5,191,244	5,189,901	5,189,856	5,191,002
	5,189,802	5,190,556	5,191,247	5,190,459	5,189,865	5,191,008
	5,189,833	5,190,557	5,191,254	5,190,517	5,189,892	5,191,035
	5,189,857	5,190,572	5,191,261	5,190,519	5,189,894	5,191,158
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	5,189,871	5,190,614	5,191,279	5,190,831	5,189,949	5,191,459
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	5,190,034	5,190,725	5,191,329	5,189,938	5,190,377	5,189,885
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5,190,444	5,189,831	5,191,181	36 : 5,189,764	5,190,657		5,191,586
5,190,478	5,189,844	5,191,267	5,189,838	5,190,777	44 :	5,190,176
5,190,503	5,189,848	4,638,187	5,189,867	5,190,949		5,190,242
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5,191,262	5,190,962	5,190,339	5,190,280	5,190,471		5,190,433
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5,190,026	5,191,563	5,189,768	5,190,536	5,191,009		5,189,819
5,190,055	5,191,574	5,189,830	5,190,542	5,191,021		5,189,875
5,190,195	5,191,656	5,189,843	5,190,552	5,191,047		5,189,883
5,190,401	26 : 5,189,749	5,190,020	5,190,593	5,191,083		5,189,915
5,190,756	5,189,755	5,190,037	5,190,595	5,191,097		5,189,919
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5,190,863	5,189,782	5,190,071	5,190,659	5,191,206		5,189,939
5,190,871	5,189,827	5,190,104	5,190,685	5,191,327		5,189,963
5,191,073	5,189,839	5,190,122	5,190,698	5,191,521		5,189,981
5,191,211	5,189,854	5,190,232	5,190,762	40 : 5,189,868		5,190,052
5,191,420	5,189,941	5,190,252	5,190,775	5,189,905		5,190,056
19 : 5,189,784	5,189,976	5,190,266	5,190,776	5,190,374		5,190,102
5,189,826	5,189,984	5,190,281	5,190,786	5,190,395		5,190,106
5,190,146	5,190,013	5,190,302	5,190,789	5,190,398		5,190,107
5,190,207	5,190,017	5,190,346	5,190,792	5,190,454		5,190,109
5,190,218	5,190,053	5,190,412	5,190,796	5,190,560		5,190,193
5,190,363	5,190,101	5,190,545	5,190,816	5,190,662		5,190,216
5,190,397	5,190,120	5,190,565	5,190,819	5,190,675		5,190,291
5,191,215	5,190,121	5,190,580	5,190,823	5,190,678		5,190,357
5,191,256	5,190,129	5,190,634	5,190,827	5,190,702		5,190,392
5,191,350	5,190,142	5,190,639	5,190,840	5,191,153		5,190,405
20 : 5,189,745	5,190,197	5,190,650	5,190,841	5,191,617		5,190,411
5,189,809	5,190,198	5,190,669	5,190,842	41 : 5,189,754		5,190,511
5,189,817	5,190,200	5,190,733	5,190,851	5,189,761		5,190,521
5,190,466	5,190,225	5,190,743	5,190,858	5,189,787		5,190,539
5,190,953	5,190,320	5,190,748	5,190,929	5,190,118		5,190,547
5,191,129	5,190,322	5,190,749	5,190,966	5,190,158		5,190,562
21 : 5,189,948	5,190,334	5,190,751	5,190,986	5,190,164		5,190,640
5,190,087	5,190,348	5,190,782	5,190,987	5,190,349		5,190,645
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22 : 5,189,977	5,190,502	5,190,882	5,191,080	5,191,328		5,190,860
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5,190,638	5,191,053	5,190,942	5,191,199	5,189,863		5,191,033
5,190,905	5,191,190	5,190,950	5,191,223	5,189,896		5,191,052
5,191,095	5,191,228	5,190,956	5,191,231	5,189,964		5,191,128
5,191,114	5,191,268	5,190,970	5,191,238	5,189,971		5,191,130
5,191,145	5,191,282	5,190,996	5,191,240	5,190,032		5,191,139
23 : 5,189,795	5,191,529	5,191,022	5,191,285	5,190,111		5,191,143
5,190,238	5,191,585	5,191,042	5,191,293	5,190,151		5,191,149
5,191,229	5,191,610	5,191,043	5,191,301	5,190,159		5,191,157
5,191,605	27 : 5,189,943	5,191,060	5,191,302	5,190,172		5,191,173
24 : 5,189,752	5,189,944	5,191,062	5,191,335	5,190,173		5,191,258
5,189,978	5,190,035	5,191,063	5,191,339	5,190,196		5,191,290
5,189,979	5,190,046	5,191,084	5,191,348	5,190,267		5,191,326
5,190,099	5,190,058	5,191,086	5,191,353	5,190,285		5,191,351
5,190,303	5,190,140	5,191,100	5,191,380	5,190,384		5,191,413

5,191,502	5,190,661	5,190,578	5,190,435	55 : 5,189,777		5,190,215
5,191,525	5,191,297	5,191,059	5,190,610	5,189,814		5,190,351
5,191,526	5,191,528	5,191,162	5,190,611	5,189,823		5,190,606
5,191,554	50 : 5,190,311	5,191,278	5,191,319	5,189,850		5,190,637
5,191,555	5,190,888	5,191,559	5,191,406	5,189,866		5,190,651
5,191,632	51 : 5,189,975	53 : 5,189,751	5,191,549	5,189,870		5,190,679
5,191,643	5,190,029	5,189,808	54 : 5,190,352	5,189,898		5,190,711
49 : 5,189,836	5,190,194	5,189,945	5,190,373	5,189,907		5,190,909
5,190,022	5,190,212	5,190,116	5,191,091	5,189,926		5,191,411
5,190,123	5,190,246	5,190,292	5,191,103	5,189,933		5,191,485
5,190,505	5,190,413	5,190,330	5,191,104	5,190,054		
5,190,534	5,190,554	5,190,337	5,191,123	5,190,201	56 : 5,190,147	

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	333,681		333,676		333,584		333,665	39 :	333,562	48 :	333,592
06 :	333,559		333,689		333,591	29 :	333,568		333,563		333,623
	333,571		333,699		333,613	31 :	333,602		333,607		333,624
	333,576		333,705		333,629	34 :	333,557		333,642		333,679
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	333,583	08 :	333,582		333,640		333,573		333,708		333,664
	333,593		333,588		333,655		333,589		333,716	51 :	333,646
	333,596	09 :	333,579	18 :	333,688		333,601	41 :	333,551		333,687
	333,604		333,682	19 :	333,662		333,618		333,553		333,694
	333,609	12 :	333,586	20 :	333,645		333,650		333,554	53 :	333,556
	333,610		333,652		333,663		333,703		333,555		333,595
	333,614		333,680	24 :	333,548		333,709		333,575		333,686
	333,625		333,690		333,577		333,715		333,585		333,702
	333,627		333,700		333,617	35 :	333,598	42 :	333,549	55 :	333,547
	333,632		333,701	25 :	333,670	36 :	333,587		333,696		333,616
	333,633		333,714		333,685		333,599	44 :	333,631		333,692
	333,634	13 :	333,622		333,704		333,611		333,675		333,693
	333,635		333,659		333,707		333,612	45 :	333,605		333,710
	333,636		333,712	26 :	333,564		333,615	47 :	333,597	56 :	333,654
	333,657	17 :	333,546		333,649		333,628				

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08 :	H1149	34 :	H1146		H1154	48 :	H1144		H1147

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	H1153

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Patent Cooperation Treaty Update

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rates of the U.S. dollar with regard to the Swiss franc and the German mark, the dollar amount of the international fees for international applications filed in the United States Receiving Office will decrease, effective May 1, 1993.

Effective May 1, 1993, the amount of the international fees for international applications filed in the United States Receiving Office will be:

Basic Fee (first 30 pages)	$530.00
Basic supplemental fee (for each page over 30)	$10.00
Designation fee (per country or region up to 10)	$128.00
Handling fee	$162.00
European Patent Office (EPO) search fee (EPO as International Searching Authority)	$1512.00

Feb. 11, 1993

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 6, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,905,320 through 4,907,294
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 4, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,573,216 through 4,574,395
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f)	$465.00
By other than a small entity	$930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f)	$935.00
By other than a small entity	$1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f))	$1,410.00
By other than a small entity	$2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f)	$65.00
By other than a small entity	$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable	$620.00
(2) unintentional	$1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 27, 1992 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,658	06/816,499	5/03/88
(4,489,829)	(06/477,151)	(12/25/84)
4,489,443	06/523,713	12/25/84
4,489,446	06/398,084	12/25/84
4,489,447	06/426,101	12/25/84
4,489,448	06/493,283	12/25/84
4,489,451	06/422,074	12/25/84
4,489,453	06/384,373	12/25/84
4,489,454	06/394,776	12/25/84
4,489,456	06/422,902	12/25/84
4,489,458	06/537,171	12/25/84
4,489,460	06/481,031	12/25/84
4,489,464	06/396,071	12/25/84
4,489,465	06/498,725	12/25/84
4,489,467	06/368,733	12/25/84
4,489,476	06/497,931	12/25/84
4,489,487	06/344,410	12/25/84
4,489,490	06/380,220	12/25/84
4,489,492	06/383,864	12/25/84
4,489,494	06/344,199	12/25/84
4,489,495	06/422,877	12/25/84
4,489,502	06/438,973	12/25/84
4,489,504	06/345,203	12/25/84
4,489,508	06/417,729	12/25/84
4,489,510	06/414,943	12/25/84
4,489,511	06/354,871	12/25/84
4,489,512	06/429,174	12/25/84
4,489,514	06/409,448	12/25/84
4,489,515	06/477,263	12/25/84
4,489,517	06/431,267	12/25/84
4,489,520	06/288,657	12/25/84
4,489,521	06/388,747	12/25/84
4,489,523	06/553,602	12/25/84
4,489,526	06/473,237	12/25/84
4,489,528	06/409,321	12/25/84
4,489,531	06/451,992	12/25/84
4,489,533	06/446,911	12/25/84
4,489,537	06/400,611	12/25/84
4,489,538	06/352,743	12/25/84
4,489,539	06/508,402	12/25/84
4,489,541	06/505,698	12/25/84
4,489,542	06/452,720	12/25/84
4,489,544	06/521,110	12/25/84
4,489,546	06/495,813	12/25/84
4,489,547	06/400,606	12/25/84
4,489,548	06/392,771	12/25/84
4,489,549	06/524,047	12/25/84
4,489,550	06/458,063	12/25/84
4,489,559	06/401,264	12/25/84
4,489,560	06/401,265	12/25/84
4,489,561	06/428,651	12/25/84
4,489,564	06/488,264	12/25/84
4,489,568	06/599,601	12/25/84
4,489,571	06/565,856	12/25/84
4,489,576	06/589,349	12/25/84
4,489,577	06/448,686	12/25/84
4,489,579	06/475,694	12/25/84
4,489,581	06/459,610	12/25/84
4,489,584	06/446,313	12/25/84
4,489,586	06/241,689	12/25/84
4,489,587	06/474,935	12/25/84
4,489,588	06/480,463	12/25/84

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Patent Number	Serial Number	Issue Date
4,489,589	06/392,966	12/25/84
4,489,590	06/342,048	12/25/84
4,489,591	06/429,874	12/25/84
4,489,592	06/468,787	12/25/84
4,489,593	06/416,164	12/25/84
4,489,595	06/479,170	12/25/84
4,489,597	06/512,024	12/25/84
4,489,599	06/474,049	12/25/84
4,489,600	06/471,851	12/25/84
4,489,602	06/440,402	12/25/84
4,489,603	06/415,546	12/25/84
4,489,604	06/406,371	12/25/84
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4,489,607	06/497,043	12/25/84
4,489,610	06/599,152	12/25/84
4,489,611	06/459,391	12/25/84
4,489,618	06/351,569	12/25/84
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4,489,627	06/342,278	12/25/84
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4,489,655	06/456,098	12/25/84
4,489,656	06/468,422	12/25/84
4,489,657	06/347,685	12/25/84
4,489,661	06/367,596	12/25/84
4,489,665	06/590,119	12/25/84
4,489,666	06/590,144	12/25/84
4,489,670	06/495,047	12/25/84
4,489,672	06/222,333	12/25/84
4,489,673	06/492,024	12/25/84
4,489,674	06/238,101	12/25/84
4,489,675	06/339,866	12/25/84
4,489,676	06/550,830	12/25/84
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4,489,716	06/549,313	12/25/84
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4,490,517	06/538,705	12/25/84

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4,393,178	07/064,119	12/22/87

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4,490,814	06/574,885	12/25/84
4,490,816	06/424,081	12/25/84
4,490,822	06/389,316	12/25/84
4,490,824	06/514,267	12/25/84
4,490,825	06/424,572	12/25/84
4,490,827	06/514,573	12/25/84
4,490,829	06/445,646	12/25/84
4,490,832	06/397,043	12/25/84
4,490,833	06/550,726	12/25/84
4,490,834	06/404,695	12/25/84
4,490,835	06/421,398	12/25/84
4,490,838	06/513,788	12/25/84
4,490,839	06/463,414	12/25/84
4,490,847	06/442,415	12/25/84
4,490,848	06/363,665	12/25/84
4,490,849	06/354,722	12/25/84
4,490,851	06/369,045	12/25/84
4,490,852	06/322,336	12/25/84
4,490,854	06/461,495	12/25/84
4,793,001	07/174,592	12/27/88
4,793,004	07/152,939	12/27/88
4,793,005	07/078,620	12/27/88
4,793,007	07/061,977	12/27/88
4,793,010	07/113,304	12/27/88
4,793,012	06/879,003	12/27/88
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4,793,016	06/925,053	12/27/88
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4,793,022	07/136,496	12/27/88
4,793,025	07/070,402	12/27/88
4,793,030	06/499,512	12/27/88
4,793,034	07/088,075	12/27/88
4,793,042	06/533,240	12/27/88
4,793,060	07/072,557	12/27/88
4,793,061	07/102,098	12/27/88
4,793,066	07/064,015	12/27/88
4,793,068	07/132,766	12/27/88
4,793,069	07/061,816	12/27/88
4,793,070	07/069,488	12/27/88
4,793,071	07/118,482	12/27/88
4,793,073	07/085,984	12/27/88
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4,793,081	07/050,871	12/27/88
4,793,083	06/923,267	12/27/88
4,793,089	07/045,528	12/27/88
4,793,091	07/042,986	12/27/88
4,793,092	07/098,685	12/27/88
4,793,093	07/060,192	12/27/88
4,793,094	07/000,634	12/27/88
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4,793,139	07/070,213	12/27/88
4,793,142	07/022,639	12/27/88
4,793,143	07/103,030	12/27/88
4,793,144	07/133,033	12/27/88
4,793,145	07/122,182	12/27/88
4,793,152	06/717,433	12/27/88
4,793,157	07/143,046	12/27/88
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4,793,170	07/064,119	12/27/88
4,793,171	07/163,655	12/27/88
4,793,172	07/108,110	12/27/88
4,793,175	07/028,715	12/27/88
4,793,176	07/084,217	12/27/88
4,793,179	07/154,418	12/27/88
4,793,181	07/057,050	12/27/88
4,793,182	07/057,034	12/27/88
4,793,185	07/039,672	12/27/88
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4,793,199	06/941,397	12/27/88
4,793,205	07/018,537	12/27/88
4,793,211	07/128,181	12/27/88
4,793,233	07/117,750	12/27/88
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4,793,253	06/930,775	12/27/88
4,793,257	07/039,185	12/27/88
4,793,258	07/123,180	12/27/88
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4,793,265	07/148,567	12/27/88
4,793,266	07/033,727	12/27/88
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4,793,370	07/056,905	12/27/88
4,793,372	07/115,011	12/27/88
4,793,373	06/836,289	12/27/88
4,793,376	07/037,879	12/27/88
4,793,380	07/136,351	12/27/88
4,793,381	07/121,790	12/27/88
4,793,382	07/133,753	12/27/88
4,793,383	07/110,089	12/27/88
4,793,387	07/093,917	12/27/88
4,793,389	07/096,151	12/27/88
4,793,392	07/151,951	12/27/88
4,793,394	07/151,218	12/27/88
4,793,396	06/908,412	12/27/88
4,793,405	06/941,150	12/27/88
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4,793,422	07/168,833	12/27/88
4,793,426	06/935,428	12/27/88
4,793,429	07/184,308	12/27/88
4,793,436	06/938,389	12/27/88
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4,793,470	06/885,215	12/27/88
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4,793,472	07/064,942	12/27/88
4,793,474	06/354,442	12/27/88
4,793,481	07/197,425	12/27/88
4,793,483	07/186,629	12/27/88
4,793,487	06/914,930	12/27/88
4,793,489	07/011,023	12/27/88
4,793,490	06/674,490	12/27/88
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4,793,510	07/073,080	12/27/88
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4,793,538	07/133,149	12/27/88
4,793,541	07/099,246	12/27/88
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4,794,026	06/737,846	12/27/88
4,794,029	07/018,358	12/27/88
4,794,041	06/534,229	12/27/88
4,794,046	07/062,660	12/27/88
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4,794,075	06/770,841	12/27/88
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4,794,088	06/908,793	12/27/88
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4,794,108	06/651,033	12/27/88
4,794,109	07/003,118	12/27/88
4,794,113	07/000,203	12/27/88
4,794,119	06/844,642	12/27/88
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4,794,121	06/908,680	12/27/88
4,794,132	06/947,054	12/27/88
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4,794,142	07/083,230	12/27/88
4,794,149	07/093,172	12/27/88
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4,794,166	07/077,803	12/27/88
4,794,177	06/809,929	12/27/88
4,794,186	06/681,252	12/27/88
4,794,189	07/129,493	12/27/88
4,794,194	06/888,540	12/27/88
4,794,213	07/173,218	12/27/88
4,794,216	06/860,134	12/27/88
4,794,228	06/900,282	12/27/88
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4,794,232	06/908,279	12/27/88
4,794,240	06/907,339	12/27/88
4,794,245	07/021,214	12/27/88
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4,794,261	07/041,941	12/27/88
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4,794,326	06/582,968	12/27/88
4,794,330	07/010,423	12/27/88
4,794,337	07/013,319	12/27/88
4,794,350	06/220,931	12/27/88
4,794,359	07/144,146	12/27/88
4,794,360	07/092,836	12/27/88
4,794,365	06/914,701	12/27/88
4,794,367	06/943,028	12/27/88
4,794,370	06/854,821	12/27/88
4,794,372	07/088,561	12/27/88
4,794,373	06/900,826	12/27/88
4,794,377	06/863,057	12/27/88
4,794,378	07/137,328	12/27/88
4,794,380	07/078,301	12/27/88
4,794,388	06/348,518	12/27/88
4,794,390	06/842,420	12/27/88
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4,794,414	07/116,644	12/27/88
4,794,415	07/039,733	12/27/88
4,794,426	07/123,335	12/27/88
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4,794,523	06/782,664	12/27/88
4,794,534	06/764,261	12/27/88
4,794,547	06/896,869	12/27/88
4,794,549	06/910,914	12/27/88
4,794,552	06/793,263	12/27/88
4,794,566	07/013,233	12/27/88
4,794,577	07/039,857	12/27/88
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4,794,587	07/140,719	12/27/88
4,794,596	07/006,679	12/27/88
4,794,599	06/896,756	12/27/88
4,794,610	07/013,436	12/27/88
4,794,616	06/815,326	12/27/88
4,794,617	06/906,503	12/27/88
4,794,622	07/196,882	12/27/88
4,794,624	06/938,955	12/27/88
4,794,628	07/110,726	12/27/88
4,794,634	06/896,009	12/27/88
4,794,636	06/756,144	12/27/88

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,742,277	07/079,049	5/03/88	7/29/87	1/13/93
4,749,905	06/930,416	6/07/88	11/14/86	1/13/93
4,778,683	06/937,997	10/18/88	12/04/86	1/13/93
4,676,790	06/779,808	6/30/87	9/25/85	1/19/93

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,411,273, Re. S.N. 07/926,334, Filed Aug. 6, 1992, Cl. 128/731, SYSTEM AND METHOD FOR ELECTRODE PAIR DERIVATIONS IN ELECTROENCEPHALOGRAPHY, E. Roy John, Owner of Record: *New York Medical College*, Attorney or Agent: Eliot S. Gerber, Ex. Gp.: 3309

4,631,267, Re. S.N. 08/002,221, Filed Jan. 8, 1993, Cl. 502/439, METHOD OF PRODUCING HIGH-STRENGTH HIGH SURFACE AREA CATALYST SUPPORTS, Irwin M. Lachman, et. al., Owner of Record: *Corning Glass Works, Corning, N.Y.*, Attorney or Agent: Angela N. Nwaneri, Ex. Gp.: 1106

4,801,762, Re. S.N. 08/006,421, Filed Jan. 19, 1993, Cl. 585/500, METHANE CONVERSION PROCESS, David W. Leyshon, Owner of Record: *Atlantic Richfield Co., Los Angeles, Calif.*, Attorney or Agent: Roderick W. MacDonald, Ex. Gp.: 1106

4,984,881, Re. S.N. 08/003,568, Filed Jan. 13, 1993, Cl. 359/198, ROTATION SUPPORTING DEVICE OF A POLYGON MIRROR, Horiyuki Osada, et. al., Owner of Record: *EB ARA Corp., Tokyo Japan*, Attorney or Agent: V.M. Creedon, Ex. Gp.: 2507

4,985,766, Re. S.N. 08/004,082, Filed Jan. 13, 1993, Cl. 358/133, VIDEO CODER, David G. Morrison, et. al., Owner of Record: *British Telecommunications Public Ltd., Co., London, England*, Attorney or Agent: Paul J. Henon, Ex. Gp.: 2615

5,014,810, Re. S.N. 07/999,030, Filed Dec. 31, 1992, Cl. 180/268, METHOD FOR CONTROLLING THE RELEASE OF PASSENGER RESTRAINT SYSTEMS, Bernhard Mattes, et. al., Owner of Record: *Robert Bosch GmbH, Stuttgart, Federal Republic of Germany*, Attorney or Agent: Richard L. Mayer, Ex. Gp.: 3106

5,015,581, Re. S.N. 08/003,277, Filed Jan. 12, 1993, Cl. 435/172.3, METHOD FOR PRODUCING THE HINCII RESTRICTION ENCLONUCLEASE AND METHYLASE, Jack S. Benner, et. al., Owner of Record: *New England Biolabs, Inc., Boston, Mass.*, Attorney or Agent: Gregory O. Williams, Ex. Gp.: 1804

5,061,213, Re. S.N. 08/005,153, Filed Jan. 15, 1993, Cl. 440/63, CONTROL CABLE HOUSING SEAL AND LUBRICANT FOR MARINE STEERING SYSTEM, Thomas C. Burroughs, Owner of Record: *Inventor*, Attorney or Agent: Eugene N. Riddle, Ex. Gp.: 3105

5,100,380, Re. S.N. 08/004,138, Filed Jan. 13, 1993, Cl. 604/67, REMOTELY PROGRAMMABLE INFUSION SYSTEM, Paul Epstein, et. al., Owner of Record: *Abbott Laboratories, Abbott Park, Ill.*, Attorney or Agent: Ronald M. Anderson, Ex. Gp.: 3309

5,117,917, Re. S.N. 08/004,846, Filed Jan. 19, 1993, Cl. 169/46, FIRE EXTINQUISHING METHODS UTILIZING

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PERFLUOROCARBONS, Mark L. Robin, et. al., Owner of Record: *Great Lakes Chemical Corp., West Lafayett, Ind.*, Attorney or Agent: Thomas Q. Henry, Ex. Gp.: 3102

5,146,193, Re. S.N. 08/000,939, Filed Jan. 4, 1993, Cl. 333/206, MONOLITHIC CERAMIC FILTER OR DUPLEXER HAVING SURFACE MOUNT CORRECTIONS AND TRANSMISSION ZEROES, Raymond L. Sokola, Owner of Record: *Motorola, Inc., Schaumburg, Ill.*, Attorney or Agent: Joseph F. Krause, Ex. Gp.: 2502

5,151,239, Re. S.N. 08/001,137, Filed Jan. 6, 1993, Cl. 264/272.110, WIRE JUNCTION ENCAPSULATING WIRE CONNECTOR AND METHOD OF MAKING SAME, Lloyd Herbert King, Jr., Owner of Record: *King Technology of Missouri, Inc., St. Louis, Mo.*, Attorney or Agent: Carl L. Johnson, Ex. Gp.: 1307

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,200,276, Reexam. No. 90/002,940, Requested Jan. 26, 1993, Cl. 271/279, SHINGLING AND STACKING OF CONVEYED SHEET MATERIAL, Carl R. Marschke, Owner of Record: *Marquip, Inc., Phillips, Wis.*, Attorney or Agent: Andrus, Sceales, Starke & Sawall, Milwaukee, Wis., Ex. Gp.: 3101, Requester: Thomas K. Stine, Wallenstein, Wagner & Hattis, Ltd., Chicago, Ill.

4,273,325, Reexam. No. 90/002,941, Requested Jan. 26, 1993, Cl. 271/220, SHINGLED SHEET ALIGNMENT, Dennis W. Rodewald, Owner of Record: *Marquip, Inc., Phillips, Wis.*, Attorney or Agent: Andrus, Sceales, Starke & Sawall, Milwaukee, Wis., Requester: Thomas K. Stine, Wallenstein, Wagner & Hattis, Ltd., Chicago, Ill.

4,335,107, Reexam. No. 90/002,913, Requested Dec. 30, 1992, Cl.424/93.000, MAXTURE TO PROTECT POULTRY FROM SALMONELLA, Glenn H. Snoeyenbos, et. al., Owner of Record: *Orion-Yhtyma Oy, Tuuky, Finland*, Attorney or Agent: Ronald L. Grudziecki, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 1203, Requester: Owner

4,421,574, Reexam. No. 90/002,920, Requested Jan. 4, 1993, Cl. 148/111, METHOD FOR SUPRESSING INTERNAL OXIDATION IN STEEL WITH ANTIMONY ADDITION, Grigory Lyudkovsky, Owner of Record: *Inland Steel Corp., Chicago, Ill.*, Attorney or Agent: Alvin D. Shulman, Marshall, O'Toole, Gerstein, Murray & Bicknell, Chicago, Ill., Ex. Gp.: 1101, Requester: USX Corp., Pittsburgh, Pa.

4,509,916, Reexam. No. 90/002,919, Requested Jan. 4, 1993, Cl. 431/273, DEVICE FOR PRODUCING IGNITION SPARKS WHEN FALLING ON A PYROPHORIC FLINT, Guy La Forest Le Boudic, Owner of Record: *BIC & Co., Milford, Conn.*, Attorney or Agent: Wenderoth, Lind & Ponack, Washington, D.C., Ex. Gp.: 3405, Requester: John S. Egbert, Houston, Tex.

4,528,481, Reexam. No. 90/002,933, Requested Jan. 8, 1993, Cl. 315/248, TREATMENT OF AMORPHOUS MAGNETIC ALLOYS TO PRODUCE A WIDE RANGE OF MAGNETIC PROPERTIES, Joseph J. Becker, et. al., Owner of Record: *Inventor, Schenectady, N.Y.; Fred E. Luborsky, Schenectady, N.Y.; Isreal S. Jacobs, Schenectady, N.Y.; Richard O'McCary, Schenectady, N.Y.*, Attorney or Agent: Marvin Snyder, General Electric Co., Schenectady, N.Y., Ex. Gp.: 2606, Requester: Dann, Dorfman, Harrell & Skillman, Philadelphia, Pa.

4,780,451, Reexam. No. 90/002,938, Requested Jan. 27, 1993, Cl. 514/012, COMPOSITION AND METHOD FOR PRODUCING SUPEROVULATION IN CATTLE, Llyod E. Donaldson, Owner of Record: *Asua International, Inc., Dallas, Tex.*, Attorney or Agent: Hubbard, Thurman, Turner & Turner, Dallas, Tex., Ex. Gp.: 1806, Requester: Robert J. Patch, Arlington, Va.

4,865,854, Reexam. No. 90/002,927, Requested Dec. 23, 1992, Cl. 426/107, MICROWAVE FOOD PACKAGE, Curtis L. Larson, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Leland D. Schultz, St. Paul, Minn., Ex. Gp.: 1302, Requester: Owner

4,898,092, Reexam. No. 90/002,937, Requested Jan. 25, 1993, Cl. 099/487, FEED GRAIN CONDITIONING APPARATUS, David G. Greer, Owner of Record: *Agri Chem, Inc., Anoka, Minn.*, Attorney or Agent: Burd, Bartz & Gutenkauf, Minneapolis, Minn., Ex. Gp.: 2402, Requester: Owner

4,926,840, Reexam. No. 90/002,934, Requested Jan. 13, 1993, Cl. 126/110, PILOT GAS BYPASS SYSTEM FOR FUEL-FIRED FURNACES, Timothy J. Shellenberger, et. al., Owner of Record: *Rheem Manufacturing Co., New York, N.Y.*, Attorney or Agent: J. Richard Konneker, Konneker & Bush, Plano, Tex., Ex. Gp.: 3406, Requester: Owner

5,009,982, Reexam. No. 90/002,935, Requested Jan. 14, 1993, Cl. 430/280, RESIST INK COMPOSITION, Yuichi Kamayachi, et. al., Owner of Record: *Taiyo Ink Manufacturing Co., Tokyo, Japan*, Attorney or Agent: Martin J. Miller, Frost & Jacobs, Cincinnati, Ohio, Ex. Gp.: 1507, Requester: Owner

5,110,570, Reexam. No. 90/002,921, Requested Dec. 23, 1992, Cl. 423/277, PREPARATION OF CRYSTALLINE POROUS BOROSILICATES, Giuseppe Bellussi, et. al., Owner of Record: *Enirichem Sp. A. Corso, Milan, Italy; Enrichem Synthsesis Spa, Palermo, Italy; Sramprogetti Spa, Milan, Italy*, Attorney or Agent: Philip E. Roux, Shea & Gould, New York, N. Y., Ex. Gp.: 1106, Requester: Owner

5,111,871, Reexam. No. 90/002,912, Requested Dec. 21, 1992, Cl. 164/063, METHOD OF VACUUM CASING, Arnold J. Cook, Owner of Record: *P Cast Equipment Corp., Pittsburgh, Pa.*, Attorney or Agent: Ansel M. Schwartz, Pittsburgh, Pa., Ex. Gp.: 3205, Requester: Massachusetts Institute of Technology, Cambridge, Mass.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED JAN. 25, 1993 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
86,208	71/056,862	4/23/1912
86,209	71/056,863	4/23/1912
289,978	71/317,343	12/15/1931
293,238	71/320,565	4/19/1932
293,252	71/322,058	4/19/1932
293,255	71/321,748	4/19/1932
293,263	71/318,951	4/19/1932
293,268	71/320,945	4/19/1932
293,297	71/290,960	4/19/1932
293,301	72/320,534	4/19/1932
293,308	71/322,257	4/19/1932

Reg. Number	Serial Number	Reg. Date
293,319	71/319,085	4/19/1932
293,354	71/317,198	4/19/1932
293,360	71/322,133	4/19/1932
293,392	71/315,877	4/19/1932
293,397	71/316,032	4/19/1932
293,400	71/317,563	4/19/1932
293,409	71/321,410	4/19/1932
293,426	71/322,417	4/19/1932
293,735	71/322,077	5/03/1932
444,682	71/521,262	4/22/1952
555,421	71/611,558	2/26/1952
557,791	71/523,903	4/22/1952
557,792	71/523,912	4/22/1952
557,801	71/540,941	4/22/1952
557,802	71/540,942	4/22/1952
557,814	71/562,605	4/22/1952
557,815	71/562,689	4/22/1952
557,834	71/576,769	4/22/1952
557,836	71/576,896	4/22/1952
557,841	71/579,205	4/22/1952
557,848	71/581,486	4/22/1952
557,849	71/581,930	4/22/1952
557,851	71/583,216	4/22/1952
557,852	71/584,163	4/22/1952
557,856	71/586,224	4/22/1952
557,859	71/587,487	4/22/1952
557,860	71/587,577	4/22/1952
557,861	71/587,658	4/22/1952
557,868	71/589,816	4/22/1952
557,872	71/590,192	4/22/1952
557,874	71/590,445	4/22/1952
557,877	71/591,458	4/22/1952
557,898	71/598,500	4/22/1952
557,907	71/600,499	4/22/1952
557,909	71/600,510	4/22/1952
557,912	71/600,659	4/22/1952
557,930	71/603,255	4/22/1952
557,939	71/603,687	4/22/1952
557,941	71/604,024	4/22/1952
557,942	71/604,025	4/22/1952
557,943	71/604,026	4/22/1952
557,946	71/604,042	4/22/1952
557,953	71/604,841	4/22/1952
557,961	71/605,711	4/22/1952
557,968	71/606,745	4/22/1952
557,973	71/607,974	4/22/1952
557,984	71/609,543	4/22/1952
557,987	71/609,723	4/22/1952
557,988	71/609,737	4/22/1952
557,997	71/610,928	4/22/1952
557,999	71/611,162	4/22/1952
558,000	71/611,164	4/22/1952
558,006	71/611,620	4/22/1952
558,008	71/611,723	4/22/1952
558,014	71/612,293	4/22/1952
558,021	71/612,905	4/22/1952
558,025	71/612,961	4/22/1952
558,032	71/613,148	4/22/1952
558,049	71/613,791	4/22/1952
558,052	71/613,896	4/22/1952
558,055	71/613,959	4/22/1952
558,057	71/614,159	4/22/1952
558,058	71/614,161	4/22/1952
558,059	71/614,162	4/22/1952
558,060	71/614,201	4/22/1952
558,062	71/614,317	4/22/1952
558,067	71/614,565	4/22/1952
558,071	71/614,635	4/22/1952
558,073	71/614,768	4/22/1952
558,074	71/614,910	4/22/1952
558,077	71/615,061	4/22/1952
558,078	71/615,170	4/22/1952
558,082	71/616,124	4/22/1952
558,087	71/616,976	4/22/1952
558,088	71/616,982	4/22/1952
558,089	71/616,985	4/22/1952
558,092	71/617,971	4/22/1952
558,096	71/619,017	4/22/1952
558,101	71/545,450	4/22/1952
558,132	71/586,405	4/22/1952
558,134	71/586,493	4/22/1952
558,145	71/605,315	4/22/1952
558,146	71/605,316	4/22/1952
558,156	71/607,170	4/22/1952
558,158	71/607,825	4/22/1952
558,170	71/613,634	4/22/1952
913,252	72/363,095	6/08/1971
928,858	72/384,610	2/08/1972
932,431	72/312,632	4/18/1972
932,432	72/338,603	4/18/1972
932,435	72/377,277	4/18/1972
932,436	72/386,806	4/18/1972
932,440	72/328,265	4/18/1972
932,442	72/367,317	4/18/1972
932,443	72/369,733	4/18/1972
932,446	72/379,462	4/18/1972
932,448	72/395,084	4/18/1972
932,450	72/365,484	4/18/1972
932,452	72/393,008	4/18/1972
932,454	72/369,352	4/18/1972
932,455	72/369,354	4/18/1972
932,456	72/372,517	4/18/1972
932,458	72/348,396	4/18/1972
932,460	72/376,278	4/18/1972
932,462	72/383,185	4/18/1972
932,463	72/383,875	4/18/1972
932,464	72/401,566	4/18/1972
932,465	72/347,641	4/18/1972
932,474	72/395,730	4/18/1972
932,475	72/397,850	4/18/1972
932,476	72/399,568	4/18/1972
932,479	72/400,942	4/18/1972
932,480	72/401,136	4/18/1972
932,484	72/401,759	4/18/1972
932,486	72/396,090	4/18/1972
932,487	72/389,100	4/18/1972
932,489	72/384,383	4/18/1972
932,492	72/373,002	4/18/1972
932,493	72/373,003	4/18/1972
932,494	72/373,004	4/18/1972
932,499	72/378,628	4/18/1972
932,500	72/378,869	4/18/1972
932,504	72/396,964	4/18/1972
932,506	72/349,217	4/18/1972
932,508	72/366,235	4/18/1972
932,511	72/372,018	4/18/1972
932,512	72/375,838	4/18/1972
932,515	72/400,516	4/18/1972
932,517	72/328,962	4/18/1972
932,518	72/395,953	4/18/1972
932,519	72/328,285	4/18/1972
932,521	72/376,297	4/18/1972
932,522	72/378,738	4/18/1972
932,523	72/380,377	4/18/1972
932,524	72/380,655	4/18/1972
932,525	72/389,207	4/18/1972
932,526	72/347,944	4/18/1972
932,527	72/347,945	4/18/1972
932,529	72/361,982	4/18/1972
932,532	72/377,629	4/18/1972
932,533	72/382,791	4/18/1972
932,534	72/386,145	4/18/1972
932,537	72/387,710	4/18/1972
932,541	72/357,992	4/18/1972
932,542	72/358,489	4/18/1972
932,543	72/361,097	4/18/1972
932,546	72/365,950	4/18/1972
932,548	72/372,108	4/18/1972
932,549	72/372,594	4/18/1972
932,551	72/376,543	4/18/1972
932,559	72/401,265	4/18/1972
932,568	72/377,328	4/18/1972
932,570	72/382,882	4/18/1972
932,571	72/367,504	4/18/1972
932,578	72/384,397	4/18/1972
932,579	72/393,799	4/18/1972

Reg. Number	Serial Number	Reg. Date
932,586	72/346,837	4/18/1972
932,590	72/358,067	4/18/1972
932,591	72/378,697	4/18/1972
932,594	72/379,673	4/18/1972
932,600	72/388,974	4/18/1972
932,601	72/388,975	4/18/1972
932,602	72/388,976	4/18/1972
932,608	72/381,056	4/18/1972
932,610	72/383,274	4/18/1972
932,614	72/366,175	4/18/1972
932,616	72/375,186	4/18/1972
932,619	72/381,024	4/18/1972
932,621	72/383,783	4/18/1972
932,625	72/398,796	4/18/1972
932,630	72/372,026	4/18/1972
932,634	72/381,557	4/18/1972
932,635	72/398,258	4/18/1972
932,639	72/383,220	4/18/1972
932,644	72/385,522	4/18/1972
932,645	72/379,117	4/18/1972
932,648	72/391,427	4/18/1972
932,650	72/307,820	4/18/1972
932,653	72/354,841	4/18/1972
932,655	72/361,671	4/18/1972
932,656	72/362,589	4/18/1972
932,657	72/363,114	4/18/1972
932,660	72/375,857	4/18/1972
932,661	72/375,887	4/18/1972
932,662	72/380,383	4/18/1972
932,665	72/381,375	4/18/1972
932,666	72/381,376	4/18/1972
932,667	72/381,377	4/18/1972
932,668	72/381,895	4/18/1972
932,669	72/382,515	4/18/1972
932,671	72/384,289	4/18/1972
932,674	72/386,016	4/18/1972
932,679	72/397,645	4/18/1972
932,680	72/397,647	4/18/1972
932,683	72/365,473	4/18/1972
932,684	72/365,474	4/18/1972
932,685	72/370,860	4/18/1972
932,686	72/381,733	4/18/1972
932,687	72/390,366	4/18/1972
932,689	72/393,262	4/18/1972
932,694	72/377,734	4/18/1972
932,695	72/378,048	4/18/1972
932,696	72/384,498	4/18/1972
932,697	72/384,499	4/18/1972
932,699	72/384,631	4/18/1972
932,719	72/364,758	4/18/1972
932,722	72/374,315	4/18/1972
932,723	72/380,499	4/18/1972
932,727	72/374,598	4/18/1972
932,747	72/380,343	4/18/1972
932,752	72/380,827	4/18/1972
932,753	72/372,113	4/18/1972
932,755	72/374,423	4/18/1972
932,756	72/374,425	4/18/1972
934,300	72/385,108	5/23/1972

Erratum

"All reference to Reexamination Certificate No. B1 D309,129 (1648th and 1777th) for 'L-SHAPED ELECTRICAL CONNECTOR' appearing in the *Official Gazette* of Mar. 3, 1992 and Aug. 25, 1992 should be deleted since no rexamination certificate has been granted."

"All reference to Patent No. 5,100,411 to Panos G. Koutrouvelis of Virginia for 'STEREOTACTIC DEVICE' appearing in the *Official Gazette* of Mar. 31, 1992 should be deleted since no patent was granted."

"All reference to Patent No. 5,181,121 to Toshio Matsumoto, et. al., of Nara, Japan, for 'LIQUID CRYSTAL DISPLAY DEVICE' appearing in the *Official Gazette* of Jan. 19, 1993 should be deleted since no patent was granted."

Patents Available for License or Sale

D,322,870 PET FEEDING DISH STAND, Janet M. Battalene, P.O. Box 642, Killingworth, Conn. 06419

5,127,775 FAIL SAFE STOP FOR A DRILL PRESS CONTROL DEVICE, James M. Broadment, et. al., Steven N. Fox, Chaplin, Neal & Dempsey, 1331 Main St., Springfield, Mass. 01103

5,131,195 EARTHQUAKE-RESISTANT INSULATOR FOR BUILDINGS, Patrice Bellavista, Neil F. Greenblum, Sandler, Greenblum & Bernstein, 2920 South Glebe Rd., Arlington, Va. 22206

5,143,343 AUTOMOBILE RADIO SECURITY SYSTEM, Daniel P. Katz, Robert F. Zielinski, Ballard Spahr Andrews & Ingersoll, 1735 Market St., 51st Floor, Philadelphia, Pa. 19103-7599

5,146,557 USER INTERFACE FOR A GOLF GREEN AND A GOLF PUTT MODELING SYSTEM, Boris Yamrom, et. al., Douglas E. Stoner, General Electric Co., P.O. Box 8, Bldg. K-1, Rm. 5A1A, Schenectady, N.Y. 12301

5,152,065 TOOL HEAD HAVING AN EASILY REPLACEABLE HANDLE ATTACHED THERETO, Alfred F. Harding, P.O. Box 7, Orleans, Calif. 95556

5,156,618 LASER MIST EVACUATOR ATTACHMENT, Nello Fiore, 4945 Carlyn Dr., Pittsburgh, Pa. 15236

5,159,703 SILENT SUBLIMINAL PRESENTATION SYSTEM, O. M. Lowery, 5188 Falconwood Ct., Norcross, Ga. 30071

5,163,574 PEDAL TRASH BIN. Folarin Sosan, 117 Varnum St., N.E. #6, Washington, D.C. 20011

5,192,177 MOBILE HARVESTER FOR HAY BALES, Marcel E. Cardinal, Roland L. Morneau, 4101 Jarry Est., Suite 305, Montreal, Que., Canada H1Z 2H4

Reinstatement to Register

The following list of persons, whose names have been previously removed from the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.11(b), have been reinstated in view of the required fee and information they furnished to the Office of Enrollment and Discipline.

Abers, Julia E., Amgen Inc., 1840 Dehavilland Dr., 10-2-E-431, Thousand Oaks, Calif. 91320
Abrams, Hugh A., William Brinks Olds Hofer Gilson & Lione, 455 N. Cityfront Plaza Dr., NBC Tower, Suite 3600, Chicago, Ill. 60611
Adams, Paul E., Raycom System, Inc., 16525 Sherman Way, Unit C-8, Van Nuys, Calif. 91406
Adler, Carolyn R., Genentech, Inc., 460 Point San Bruno Blvd., Box 49, South San Francisco, Calif. 94080
Alberstadt, Samuel L., Niro, Scavone, Haller & Niro, 181 W. Madison St., Suite 4600, Chicago, Ill. 60602
Alice, Ronald W., American Home Products Corp., 685 Third Ave., New York, N.Y. 10017
Alter, Mitchell E., Coulter Corp., 600 W. 20th St., Hialeah, Fla. 33010
Andersen, Donald R., Rumberger, Kirk, Caldwell & Wechsler, 11 E. Pine St., P.O. Box 1873, Orlando, Fla. 32802
Anderson, Philip J., 2410 E. Chevy Chase Dr., Glendale, Calif. 91206
Andewelt, Roger B., U.S. Claims Court, 717 Madison Pl., Washington, D.C. 20005
Andrus, Frank S., 17403 Foothills Dr., Sun City, Ariz. 85373
Antton, Duane L., Dickstein, Shapiro & Morin, 2101 L St., N.W., Washington, D.C. 20037

Arnhem, Erik M., 4250 Wilshire Blvd., 2nd Floor., Los Angeles, Calif. 90010
Auber, Robert P., 1220 Greenside Dr., Concord, N.C. 28027
Bak-Boychuk, I. Michael., 444 W. Ocean Blvd., Suite 1020, Long Beach, Calif. 90802
Barber, William J., Ware, Fressola, Van Der Sluys & Adolphson, P.O. Box 224 Main St., Monroe, Conn. 06468
Barker, Bruce J., Pennie & Edmonds, 1155 Avenue of the Americas, New York, N.Y. 10036
Bauer, John A., Foley & Lardner, 1800 Diagonal Rd., Alexandria, Va. 22313
Beavers, Walter L., 326 E. Eugene St., Greensboro, N.C. 27401
Becker, Robert W., 5300 Sequoia N.W., Suite 200, Albuquerque, N. Mex. 87120
Bick, Vincent F., Jr., R. J. Reynolds Tobacco Co., 401 N. Main St., Winston-Salem, N.C. 27102
Birch, Harold J. Banner, Birch, McKie & Beckett, 1001 G St., N.W. Suite 1100, Washington, D.C. 20001
Blackburn, Robert P., Chiron Corp., 4560 Horton St., Emeryville, Calif. 94608
Blasey, Thomas M., Cushman, Darby & Cushman, 1100 New York Ave., N.W. 9th Floor., Washington, D.C. 20005
Blumenkopf, Norman, 2150 Center Ave., Apt. 5H, Fort Lee, N.J. 07024
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Feb. 5, 1993

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

PATENT NOTICES

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PATENT NOTICES

Certificates of Correction For Week of March 9, 1993

D 317,774	4,984,779	5,030,887	5,047,225
D 318,527	4,985,910	5,031,136	5,047,407
D 320,375	4,989,262	5,031,746	5,047,424
D 320,651	4,990,296	5,031,859	5,047,947
D 320,665	4,990,514	5,032,196	5,048,037
D 321,193	4,990,624	5,032,404	5,048,352
D 321,511	4,990,657	5,032,560	5,048,386
D 321,668	4,991,830	5,032,739	5,048,537
D 322,079	4,992,156	5,033,063	5,048,625
4,321,748	4,993,741	5,033,172	5,048,703
4,365,462	4,994,531	5,033,479	5,048,799
4,432,049	4,994,671	5,033,649	5,048,841
4,435,047	4,995,124	5,034,228	5,048,971
4,517,404	4,996,175	5,034,260	5,049,077
4,680,437	4,996,393	5,035,016	5,049,267
4,771,465	4,997,865	5,035,376	5,049,464
4,795,673	4,998,979	5,035,865	5,049,869
4,808,798	5,002,842	5,035,981	5,049,982
4,810,227	5,002,945	5,036,331	5,050,090
4,818,600	5,002,989	5,036,824	5,050,430
4,849,479	5,004,179	5,037,843	5,050,459
4,851,375	5,005,019	5,037,903	5,050,586
4,860,086	5,005,025	5,038,174	5,050,667
4,861,420	5,005,068	5,038,240	5,050,747
4,862,470	5,007,541	5,038,527	5,050,867
4,876,308	5,008,690	5,039,357	5,050,897
4,881,989	5,009,251	5,039,613	5,051,112
4,890,628	5,009,897	5,039,654	5,051,156
4,890,792	5,010,446	5,039,779	5,051,293
4,897,779	5,010,534	5,039,815	5,051,556
4,897,926	5,010,565	5,040,072	5,051,944
4,903,837	5,010,912	5,040,199	5,051,950
4,904,446	5,001,497	5,040,431	5,051,986
4,905,762	5,011,859	5,040,446	5,052,099
4,908,557	5,013,303	5,040,736	5,052,724
4,909,772	5,013,937	5,040,744	5,053,600
4,910,259	5,014,151	5,040,781	5,053,761
4,912,642	5,014,284	5,041,293	5,053,781
4,917,878	5,016,035	5,041,437	5,053,864
4,918,627	5,016,205	5,041,493	5,054,255
4,919,707	5,016,593	5,041,509	5,054,383
4,927,665	5,016,902	5,041,558	5,054,594
4,929,470	5,017,532	5,041,613	5,054,605
4,931,559	5,018,518	5,041,873	5,054,869
4,935,011	5,019,308	5,041,921	5,054,964
4,935,055	5,019,911	5,042,797	5,055,036
4,938,045	5,020,184	5,043,042	5,055,039
4,940,223	5,020,261	5,043,221	5,055,075
4,943,145	5,020,393	5,043,564	5,055,259
4,946,579	5,021,051	5,043,747	5,055,381
4,946,786	5,021,308	5,043,769	5,055,411
4,949,070	5,021,416	5,043,849	5,055,488
4,949,107	5,021,517	5,043,860	5,055,525
4,949,878	5,022,217	5,044,217	5,056,002
4,950,631	5,022,677	5,044,273	5,056,031
4,952,567	5,023,139	5,044,360	5,056,057
4,957,304	5,023,248	5,044,467	5,056,153
4,959,106	5,023,612	5,044,713	5,056,358
4,963,110	5,024,040	5,044,802	5,056,450
4,964,109	5,026,348	5,045,092	5,057,241
4,967,704	5,026,439	5,045,183	5,057,290
4,970,073	5,026,599	5,045,476	5,057,529
4,971,906	5,026,618	5,045,610	5,057,659
4,971,923	5,027,405	5,045,640	5,057,904
4,972,406	5,028,157	5,045,780	5,058,006
4,973,335	5,028,613	5,045,887	5,058,032
4,975,635	5,028,647	5,046,094	5,058,130
4,978,660	5,028,833	5,046,098	5,058,157
4,978,709	5,029,161	5,046,172	5,058,413
4,979,901	5,029,207	5,046,381	5,058,430
4,979,921	5,029,212	5,046,610	5,058,772
4,980,696	5,029,228	5,046,718	5,058,809
4,980,757	5,029,456	5,046,775	5,058,921
4,982,789	5,029,622	5,046,937	5,059,029
4,983,518	5,029,668	5,047,143	5,059,052
4,984,276	5,029,988	5,047,205	5,059,178
5,059,254	5,061,903	5,064,440	5,068,223
5,059,401	5,062,317	5,064,542	5,068,514
5,059,599	5,062,439	5,064,569	5,068,521
5,059,601	5,062,449	5,064,578	5,068,988
5,059,715	5,062,469	5,064,614	5,069,039
5,059,835	5,062,549	5,064,735	5,069,161
5,060,070	5,062,580	5,064,748	5,069,616
5,060,082	5,062,586	5,064,770	5,070,121
5,060,181	5,062,594	5,065,200	5,070,122
5,060,197	5,062,691	5,065,268	5,070,860
5,060,220	5,062,748	5,065,456	5,070,989
5,060,289	5,062,781	5,056,500	5,070,996
5,060,504	5,062,810	5,065,872	5,071,302
5,060,529	5,062,818	5,066,053	5,071,574
5,060,583	5,062,872	5,066,172	5,071,839
5,060,637	5,062,885	5,066,294	5,072,104
5,060,640	5,062,934	5,066,308	5,072,551
5,060,666	5,063,024	5,066,397	5,072,782
5,060,748	5,063,374	5,066,493	5,073,810
5,060,913	5,063,459	5,066,762	5,095,673
5,061,013	5,063,509	5,066,769	5,126,800
5,061,119	5,063,642	5,066,836	5,139,568
5,061,160	5,063,711	5,066,851	5,146,153
5,061,191	5,063,997	5,067,224	5,148,472
5,061,353	5,064,011	5,067,426	5,161,484
5,061,635	5,064,232	5,067,506	
5,061,672	5,064,354	5,067,850	
5,061,734	5,064,405	5,067,970	

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REEXAMINATIONS

VOL 1148 ISS 2 MR 9 1993

PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	3/14/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	6/11/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	5/15/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	5/15/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	8/08/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	8/20/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	8/03/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	11/07/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	2/21/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	7/27/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	10/21/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	1/18/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	5/12/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	4/28/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	5/15/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/11/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during February 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,935,596 to 3,946,800 inclusive
Plant Patents ..... 3,828 to 3,830

1993 UMI

REEXAMINATIONS

MARCH 9, 1993

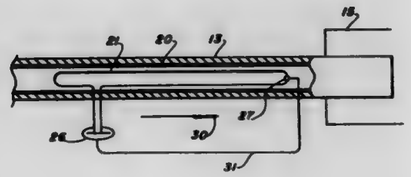
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,976,230 (1941st)

SYSTEM FOR DISPENSING POLYURETHANE AND THE LIKE

Charles R. Sperry, Wilton, Conn., assignor to Instapak Corporation, Danbury, Conn.

Reexamination Request No. 90/002,051, Jan. 12, 1990.
Reexamination Certificate for Patent No. 3,976,230, issued Aug. 24, 1976, Ser. No. 512,441, Oct. 7, 1974.
Continuation of Ser. No. 318,167, Dec. 26, 1972, abandoned
Int. Cl.[5] B67D *5/62*
U.S. Cl. 222—146.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2** and **3** are cancelled.

[1. In a system for dispensing a reactive mixture of at least two reacting substances such as polyurethane precurser chemicals wherein said substances are required to be heated above ambient temperature to cause proper and timely reaction thereof and which system includes receptacles for said reacting substances, conduits therefor and a common dispensing means at the output end of said conduits, the improvements comprising:

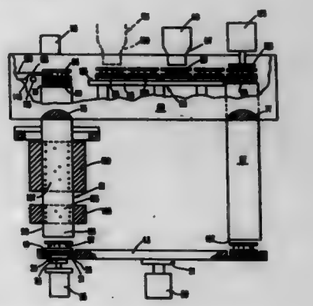
a. a conduit member for each such reacting substance extending from the receptacle thereof to said common dispensing means for the reaction mixture;
b. an electrically conducting wire heating element, comprising the sole heating means in the present system, loosely positioned in the bore of each such conduit member and adapted to be in intimate contact with the reacting substance therein, which heating element extends essentially from the input end to the output end of said conduit and which heating element is capable of raising the temperature of flowing reacting substance from ambient temperature, lower than the reacting temperature, to proper and constant reaction temperature at the output end as it passes through the length of said conduit;
c. an electrical power supply for said heating element; and
d. a temperature sensing device positioned in the bore of at least one of said conduits downstream and adjacent the output end thereof, said device directly controlling the output of said electrical power supply and thus indirectly the energization of said heating element whereby the temperature of said reacting substance at said output end is maintained substantially constant at reaction temperature.]

B1 4,733,631 (1942nd)

APPARATUS FOR COATING SUBSTRATE DEVICES

David Boyarsky, Cherry Hill, N.J., and Robert T. Vaughan, Cheltenham, Pa., assignors to Denton Vacuum Inc., Cherry Hill, N.J.

Reexamination Request No. 90/002,163, Oct. 12, 1990.
Reexamination Certificate for Patent No. 4,733,631, issued Mar. 29, 1988, Ser. No. 913,714, Sep. 30, 1986.
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—719



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 3–5** and **13** are cancelled.

Claims **2, 6, 9, 10,** and **12** are determined to be patentable as amended.

Claims **7, 8** and **11**, dependent on an amended claim, are determined to be patentable.

New claims **14–18** are added and determined to be patentable.

14. An arrangement for coating a plurality of substrates, each of which substrates, is formed to have a generally planar upperside upon which a coating is intended to be deposited and an underside, comprising in combination: a plurality of carrier means with one each holding an associated different one of said substrates, each of said carrier means formed to have said underside of its associated substrate nested therein to form a first open space above the substrate and a second open space below the substrate and each of said carrier means formed to have aperture means therein in close proximity to said underside of its associated substrate, to readily enable degassing of its associated substrate, said aperture means including a first aperture means connected to said first open space and a second aperture means connected to said second open space;

a plurality of sealing devices, each of which is securely fitted onto a different associated one of said carrier means whereby each of said sealing devices moves with its associated carrier means;

first vertical elongated cavity means, having first and second ends and having a vertical central axis extending from the first end to the second end, and having sidewall means and having a plurality of apertures in at least one section of said sidewall means;

said first vertical elongated cavity means, designed to have said plurality of carrier means move in a train-like formation in a vertical direction therethrough with the uppersides of the

ceiver for controlling the transfer characteristics of said

not covered by the uncured silicone elastomer, and so particles

an elongated hollow generally tubularly shaped housing com-

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substrates held generally normal to said central axis and further designed to enable each of said carrier means to hold its associated sealing device firmly against said sidewall means whereby, as each of said sealing devices moves, with its associated carrier means, through said first vertical section, to be degassed via said first and second aperture means and to have contaminate material removed by the degassing;

transport means, designed and disposed to move said carrier means which have passed through said first elongated cavity means;

vacuum chamber coating means, designed to house said transport means, said vacuum chamber coating means including pump means which is formed to maintain the pressure, in said vacuum chamber coating means, at a pressure which is higher than said high vacuum condition in said at least one section, said vacuum chamber coating means further designed to house means to materially coat said substrates, said means to materially coat disposed with respect to said transport means and formed to materially coat said substrates, which are being moved by said transport means;

and, means to remove said carrier means from said transport means and from said vacuum chamber coating means.

B1 4,889,744 (1943rd)

METHOD FOR MAKING OPEN-CELL, SILICONE-ELASTOMER MEDICAL IMPLANT

Joel Quaid, Santa Barbara, Calif., assignor to Medical Products Development, Inc., Santa Barbara, Calif.

Reexamination Request No. 90/002,542, Dec. 13, 1991.
Reexamination Certificate for Patent No. 4,889,744, issued Dec. 26, 1989, Ser. No. 180,195, May 2, 1988.
Division of Ser. No. 927,272, This application Nov. 4, 1986

Int. Cl.[5] A61F *2/12*

U.S. Cl. 427—2

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 2 is cancelled.

Claims 1, 3, 10 and 16 are determined to be patentable as amended.

Claims 4–9 and 11–15 dependent on an amended claim, are determined to be patentable.

New claims 17–23 are added and determined to be patentable.

1. A method for providing an open-cell structure to a surface of a layer of a silicone elastomer *shell of a mammary prosthesis, the method* comprising the steps of [applying a layer silicone elastomer;[*;***

forming a layer of uncured silicone elastomer having an exposed surface;

forcing a first group of solid particles through the exposed surface and into the layer to a first range of depths where they are completely below the exposed surface of the uncured silicone elastomer;

forcing a second group of solid particles against the exposed surface and into the layer to a second range of depths less than the first so a part of each particle in the second group is not covered by the uncured silicone elastomer, and so particles in the second group contact particles in the first group,

[applying solid particles to the surface before the layer is fully cured;] *wherein the solid particles have a diameter ranging from about 10 microns to about 600 microns;*

fully curing the layer *of uncured silicone elastomer in the shell of the mammary prosthesis;* and

[dissolving the solid particles with a solvent that does not dissolve the silicone elastomer to any appreciable extent] *contacting the exposed surface of cured silicone elastomer with a solvent for the particles, but which does not dissolve the silicone elastomer to any appreciable extent so particles in the second group dissolve and provide a way for the particle solvent to reach and dissolve particles in the first group to form the open-cell structure having an interconnected network of cells, wherein some of the cells open directly to the exposed surface, and other cells communicate with the exposed surface only through cells which open directly to the exposed surface.*

B1 4,947,432 (1944th)

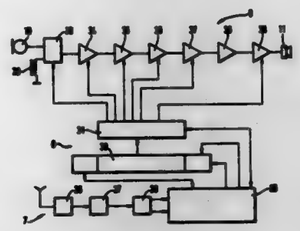
PROGRAMMABLE HEARING AID

Jan Topholm, Holte, Denmark, assignor to Topholm & Westermann Aps, Vaerloese, Denmark

Reexamination Request No. 90/002,658, Feb. 13, 1992.
Reexamination Certificate for Patent No. 4,947,432, issued Aug. 7, 1990, Ser. No. 5,976, Jan. 22, 1987.
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603204; Dec. 16, 1986, 3642828

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—68.2



AS A RESULT OF REEXAMINATION, IT THAS BEEN DETERMINED THAT:

The patentability of claims 1–15 is confirmed.

New claims 16–20 are added and determined to be patentable.

1. A remote controlled programmable hearing aid system of the type comprising an amplifier and signal processing section with remotely controllable transfer characteristics, wherein the transfer characteristics at any given time are determined by a group of parameters, said system further comprising user-operable external control unit and a transmitter for wireless transmission of control signals, a hearing aid and a receiver located in said hearing aid for receiving and demodulating said control signals, characterized in that:

said external control unit comprises: a memory (20) for storing a plurality of groups of parameters each for determining a different transfer characteristic of the hearing aid; a control panel with user-operable entry means (2) for randomly accessing and recalling a stored group of parameters from said memory; and a transmitter (4) for transmitting said recalled parameters as control signals; and

said hearing aid contains a hearing aid control unit (8) responsive to demodulated control signals from said receiver for controlling the transfer characteristics of said signal processing section.

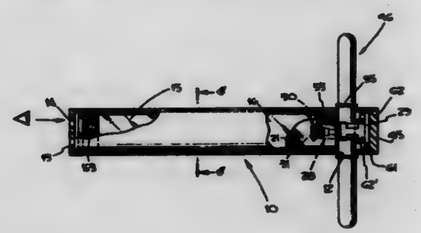
B1 5,029,954 (1945th)

KALEIDOSCOPE

Mark W. Ellrich, Sonora, Calif., and Hazel O. Baker, Bethesda, Md., assignors to Wildewood Creative Products, Sonora, Calif.

Reexamination Request No. 90/002,813, Aug. 10, 1992.
Reexamination Certificate for Patent No. 5,029,954, issued Jul. 9, 1991, Ser. No. 607,373, Oct. 31, 1990.
Int. Cl.[5] G02B *23/00*

U.S. Cl. 359—617



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–7, 9–12 and 14–16 are cancelled.

Claims 8, 13 and 17–24 are determined to be patentable as amended.

8. [In the kaleidoscope of claim 1 including] *A kaleidoscope comprising:*

an elongated hollow generally tubularly shaped housing comprised of a generally cylindrical wall open at both ends;

a first end cap closing off one open end of said tubularly shaped housing;

a mirror assembly mounted internally of said housing being triangularly configured with a central triangularly shaped viewing channel extending down through the interior of said assembly, said assembly being comprised of a plurality of mirrors, at least two of said mirrors being silvered on the inside, said first end cap having an opening therethrough aligned with said viewing channel;

said housing having a hole through said generally cylindrical wall, said mirror assembly extending from a point adjacent said first end cap to a point adjacent to but terminating before said hole;

a second opaque end cap closing off the other open end of said housing;

an elongated object tube removably mounted in said hole and reciprocal along an axis extending generally normal to the longitudinal axis of said housing, said tube being transparent and having a closed off interior filled with a clear transparent viscous fluid having a plurality of discrete particles of a reflective material floating therein; and

a light assembly mounted in the other open end of said housing adapted to provide light in the interior of said housing, *said light assembly being gravity actuated being normally unlighted when said housing is in a horizontal position and being lighted when said housing is in a position other than horizontal, said light assembly having a first extension portion extending into the interior of said housing on one side of said mirror assembly having a light socket with a removable light bulb therein, and a battery housing on said light assembly extending into the interior of the housing having at least one removable battery thereon, and a mercury switch mounted on said light assembly and being electronically connected to said light bulb socket and said battery housing, said light bulb extending toward said object tube between said object tube and said mirror assembly.*

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REISSUES

MARCH 9, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,190

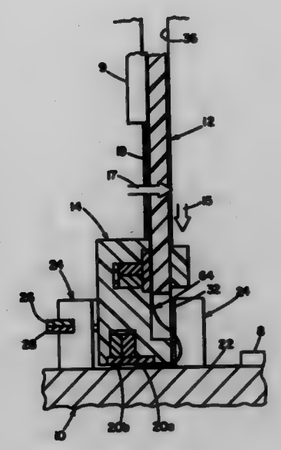
CONNECTOR ARRANGEMENT

Leon Rubinstein, Natick, Mass., assignor to Rogers Corporation, Rogers, Conn.

Original No. 4,744,764, dated May 17, 1988, Ser. No. 867,473, May 27, 1986. Application for reissue May 17, 1990, Ser. No. 525,875

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—67 39 Claims



21. An electrical connector system for electrically interconnecting, in a readily removable manner, circuit boards that have a generally orthogonal relationship with each other, comprising:

first and second rigid circuit boards on which arrays of conductive paths of respective first and second circuits are disposed,

first connector structure,

a flexible circuit that carries conductive paths that correspond to the circuits to be connected, said flexible circuit being supported by said first connector structure,

second connector structure with which said first connector structure can be mateably, releasably engaged,

one of said connector structures being mounted on said first rigid circuit board in position to engage the other of said connector structures, and the other of said connector structures being mounted on the face of said second rigid circuit board in position to be engaged,

an electrical interconnection between the conductive paths of the circuit board on which said first connector structure is mounted and the corresponding conductive paths of said flexible circuit, and

said mateable connector structures constructed and arranged to enable, releasable electrical interconnection between conductive paths on the other of said circuit boards and the corresponding conductive paths of said flexible circuit by reversible motions that include engaging motion of said first circuit board edgewise toward the face of said second circuit board, to carry the connector structure mounted on said first circuit board into mating engagement with the connector structure mounted on the face of said second board, and motion of one of said connector structures in a direction transverse to the direction of said engaging motion.

Re. 34,191

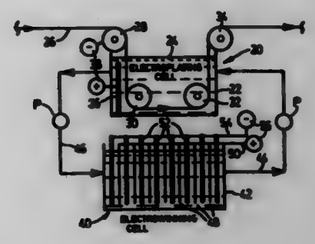
PROCESS FOR ELECTROPLATING METALS

Craig J. Brown, Pickering, Canada, assignor to Eco-Tec Limited, Pickering, Canada

Original No. 4,906,340, dated Mar. 6, 1990, Ser. No. 359,298, May 31, 1989. Application for reissue Sep. 6, 1991, Ser. No. 756,257

Int. Cl.[5] C25D *17/00, 21/00*

U.S. Cl. 205—96 15 Claims



10. An apparatus for electroplating metals comprising:

an electroplating cell including a bath for containing a plating solution of a metallic salt, a cathode comprising a workpiece to be plated, and a soluble anode, the anode current efficiency of said cell being greater than the cathode current efficiency;

an electrowinning cell which includes a bath [and], at least one insoluble anode; *and at least one insoluble cathode;*

means for coupling said electroplating cell bath with said electrowinning cell bath for permitting circulation of said plating solution between said cells;

a source of direct electric current for connection across the anode and cathode of the electroplating cell for electroplating a metal onto said workpiece; [and,]

a source of direct current for connection across said anode and cathode of the electrowinning cell so as to cause deposition of metal from said plating solution onto said cathode[.] ep *; and,*

means for controlling the amount of current flowing through the electrowinning cell which results in deposition of metal to be at least substantially equal to the amount of current flowing through the electroplating cell which results in the evolution of hydrogen gas.

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Re. 34,192

MINIATURIZED Q-SWITCHED DIODE PUMPED SOLID STATE LASER

Thomas M. Baer, Mountain View, Calif., assignor to Spectra-Physics, Laser Diode Systems, Inc., Mountain View, Calif.

Original No. 4,761,786, dated Aug. 2, 1988, Ser. No. 945,609, Dec. 23, 1986. Continuation of Ser. No. 397,662, Aug. 23, 1989, Abandoned, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056, and Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056 and Ser. No. 864,928, May 19, 1986, Pat. No. 4,665,529. Application for reissue Feb. 18, 1992, Ser. No. 837,098

Int. Cl.[5] H01S *3/092*

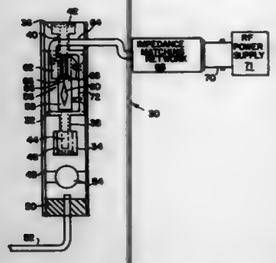
U.S. Cl. 372—10 34 Claims

27. A compact Q-switched solid state laser for producing short high peak power pulses, comprising:

a miniaturized solid state laser rod;

cavity forming means for defining a compact resonant cavity which contains the laser rod, said cavity forming means including output coupling means for extracting laser pulses from the cavity;

laser diode pumping means positioned to longitudinally end pump the laser rod and to match the pumping volume to the mode volume in the laser rod; and



a miniaturized Q-switch mounted in the resonant cavity in a position to introduce a loss in the cavity so the rod can be pumped to store energy without lasing, and to remove the loss so that lasing in the cavity occurs with stored energy being dumped into a short high peak power pulse of at least 10 microJoules TEMOO output.

Re. 34,193

[SNACK BAG] *BAG FOR OBJECTS SUCH AS SNACKS*

Robert J. Carey, P.O. Box 403, Middletown, N.J. 07748

Original No. 4,950,087, dated Aug. 21, 1990, Ser. No. 469,362, Jan. 24, 1990. Application for reissue Feb. 19, 1991, Ser. No. 656,516

Int. Cl.[5] B65D *33/24, 43/04*

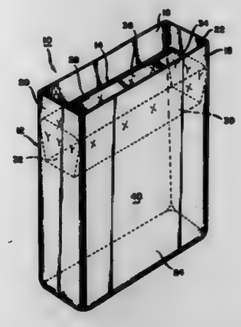
U.S. Cl. 383—43 3 Claims

2. Bag for containing snacks, comprising:

a first bag including opposed sides, opposed ends, a bottom and an open top;

a second bag including opposed sides, opposed ends, a bottom and an open top;

said second bag being inverted and at least portions thereof residing in said first bag with at least portions of said ends of said second bag being opposed to and secured to said ends of said first bag, with at least portions of said sides of said second bag being opposite at least portions of said sides of said first



bag and being in substantial engagement therewith but not secured thereto to provide a substantially air-tight seal therebetween, and with said bottom of said second bag being opposite said bottom of said first bag, said bottoms, said sides and said ends of said second bag and portions of said ends of said sides of said first bag providing in combination a chamber for receiving said snacks; and

access to said snacks contained in said chamber being provided by physically separating said opposed portions of said sides of said first and second bags.

PLANT PATENTS

GRANTED MARCH 9, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,169

P.F. 17 PEACH TREE

Paul J. Friday, P.O. Box 850, Coloma, Mich. 49038

Filed Jul. 5, 1991, Ser. No. 726,320
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—43.2 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described as large size, vigorous and upright in growth and a regular and productive bearer of large size, yellow flesh freestone fruit with good flavor and eating quality; and being further characterized by a partially showy blossom of about ¾" diameter when in full bloom, said fruit at maturity being of substantially spheroidal shape with firm flesh and a red skin color cover 80% of the fruit, said maturity occurring about 15 days after maturity of the Redhaven peach.

8,170

VINCA MINOR NAMED SUMMERSNOW

Carl R. Perrine, 6205 Lansing Ave., Jackson, Mich. 49201

Filed Nov. 5, 1990, Ser. No. 609,174
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—54.1 1 Claim

1. A new and distinct form of *Vinca minor* substantially as herein shown and described named 'Summersnow', characterized in particular by its variegated foliage with variations of green and white having profuse compact growth in full sunlight.

8,171

CHRYSANTHEMUM PLANT NAMED LYNN

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 7, 1991, Ser. No. 741,758
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—76 1 Claim

1. A new and distinct Chrysanthemum plant named Lynn, as described and illustrated.

8,172

CHRYSANTHEMUM PLANT NAMED CANTATA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 16, 1991, Ser. No. 745,701
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—82.4 1 Claim

1. A new and distinct Chrysanthemum plant named Cantata, as described and illustrated.

8,173

GERANIUM PLANT NAMED FISLANTIS

Ingeborg Schumann, Münster, Fed. Rep. of Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 18, 1991, Ser. No. 779,542
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant named Fislantis, as illustrated and described.

8,174

GERANIUM PLANT NAMED FISHOG

Ingeborg Schumann, Münster, Fed. Rep. of Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 18, 1991, Ser. No. 779,298
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of Geranium plant named Fishog, as illustrated and described.

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GRANTED Mar. 9, 1993

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414-477 5,192,189
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086-020 5,192,819
340-444 5,192,929
340-477 5,192,930
340-550 5,192,931
340-604 5,192,932
340-621 5,192,933
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257-192 5,192,986
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360-097 5,193,046
257-668 5,193,053

PATENTS

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PATENTS

GRANTED MARCH 9, 1993

GENERAL AND MECHANICAL

5,191,658
OFFSET ZIPPER CLOSED WET SUIT
William R. Meistrell, Manhattan Beach, Calif., assignor to Dive N'Surf, Inc., Hermosa Beach, Calif.
Continuation of Ser. No. 694,095, May 1, 1991. This application Feb. 7, 1992, Ser. No. 832,326
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] B63C *11/04;* A41D *27/00*
U.S. Cl. 2—2.1 R 4 Claims

1. In a wet suit having a lower trunk portion, leg portions integral with said lower trunk portion, upper trunk and neck portions, first and second arm portions integral with said upper trunk and neck portions, and a waist portion between said upper and lower trunk portions, the wet suit consisting of resiliently stretchable elastomeric sheet material, the improvement comprising:

a) said upper trunk and neck portions including a first section integral with the first arm portion, and a second section integral with the second arm portion, the said sections defining a split that extends therebetween, downwardly and diagonally sidewardly at a rear side of the suit to terminate at a locus in sidewardly offset relation to a center of the waist portion,

b) means, including diagonally extending zipper structure on said sections to interconnect them along a length of the split, said means comprising zipper structure that extends from proximate a top of said neck portion above a mid-region of the suit downwardly and diagonally into proximity to said sidewardly offset locus, said zipper structure terminating generally above one of said leg portions,

c) a rear center of the suit being continuous and uninterruptedly stretchable from said lower trunk portion upwardly to a locus substantially above said waist portion,

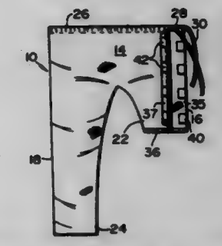
d) and means on at least one of the sections cooperating with the zipper structure to block leakage of water into the suit, said means including a protective and concealed flap at an inner side of the suit, and overlapping said zipper structure at the inner side thereof, said flap carried by said one section, said sections also including associated flaps extending adjacent said zipper structure at an outer side thereof, said zipper structure including one section confined between said concealed flap and one of said associated flaps, and another section confined between said concealed flap and another of said associated flaps,

d) the lower trunk portion of the suit being annularly continuous and stretchable, below the level of the split,

f) the zipper sections being non-stretchable.

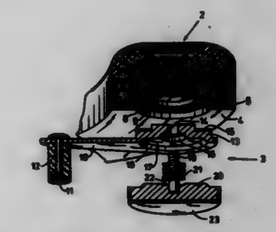
5,191,659
ORTHOPEDIC ACCESS PANTS
Darlene F. Backus, 6445 Gillis Dr., Jackson, Mich. 49201
Filed Jan. 23, 1992, Ser. No. 824,386
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—227 3 Claims

1. An orthopedic pant garment characterized by its ease of access to the wearer's leg and hip and modesty of wear comprising, in combination, a first panel portion, a second panel portion, said panel portions being the mirror image of each other and the general configuration, cut and fullness of said panel portions being identical so that either of said panel portions may constitute a front or a rear of the garment with respect to a wearer, an outer edge defined upon each of said panel portions, first and second leg portions defined on each of said panel portions, said outer edges defining outer edges of said leg portions, an upper edge defined on each of said panel portions, a belt loop defined in said panel portions upper edges, a drawstring located within said belt loop whereby said panel



portions are slidably mounted on said drawstring, a lower edge defined upon each of said leg portions, and releasable hook and loop fasteners spaced from each other located along at least one of said panel portions outer edges releasably interconnecting the adjacent outer edges of aligned leg portions so that said fasteners may be released to provide full access to the wearer's leg and limited leg access is available intermediate adjacent fasteners, the vertical distance between said panel portions upper and lower edges at said leg portions differing to define a full leg portion and a short leg portion, said fasteners being located at the outer edge of said short leg portion.

5,191,660
DEVICE FOR ATTACHING A TOILET ELEVATOR TO THE BOWL OF A TOILET
Kurt Francke, Tyresö , Sweden, assignor to Rfsu Rehab AB, Stockholm, Sweden
Filed Nov. 12, 1991, Ser. No. 789,877
Claims priority, application Sweden, Nov. 12, 1990, 9003603
Int. Cl.[5] A47K *13/00, 13/04*
U.S. Cl. 4—239 12 Claims



1. A device for detachably holding toilet seats (2) on the bowls of toilets or water closets (1), said device comprising a plurality elongate of arms (10, 38) adapted to be fitted to the underside (4) of the seat (2), said arms (10, 38) being pivotal about an axis and capable of being locked in selected pivotal positions, wherein one end of each respective arm is provided with a pin (11, 41) which depends there from at a generally right angle to the arm (10, 38), said pins (11, 41) being intended

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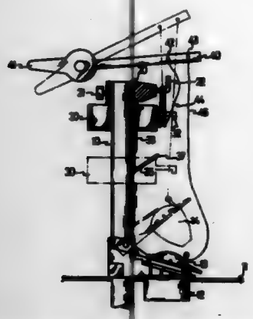
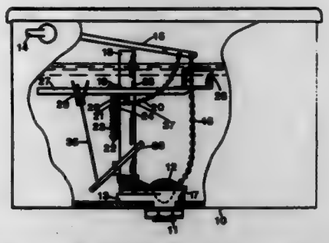
to rest against the outer surface of the rim of a toilet bowl when the seat (2) is placed in a position of use on said bowl, each of said arms (10, 38) having at its other end a circular disc-shaped part (13, 39) protruding therefrom having a centrally located aperture (14, 43) therethrough, said part (13, 39) adapted to being received in a complementary recess (8, 31) in the underside (4) of the seat (2); a stem of a screw (19, 45) extending through the central aperture (14, 43) for engaging a screw threaded part (6, 33) in the toilet seat (2) and defining said pivot axis, wherein tightening of the screw (19, 45), with a head (20, 46) of said screw engaging the lower surface of the disc-shaped part (13, 39), locks the arm (10, 38) in its adjusted position; and, mutually coacting engagement devices (9, 15) arranged on the mutually engaging surfaces of the recess (8, 31) and the circular, disc-shaped part (13, 39).

5,191,661
CONTROL DEVICE FOR A WATER TANK
Feng C. Chang, No. 72, Minli St., Taichung City, Taiwan
Filed Sep. 5, 1991, Ser. No. 755,431
Int. Cl.[5] E03D *3/12*
U.S. Cl. 4—324 2 Claims



1. A control device for a water tank comprising an inlet pipe and an outlet pipe disposed in said water tank, a valve disposed on top of said outlet pipe, a block fixed on top of said inlet pipe, a hanger laterally extended from said block, a pawl having a middle portion rotatably supported on said hanger and having a hook formed in a first end thereof and including a second end, a first float slidably engaged on said inlet pipe and movable upward and downward along said inlet pipe, a catch laterally extended from said first float, a pusher extended downward from said first float and located above said valve and moving in concert with said first float, said valve being actuated by said pusher when said pusher and said first float move downward along said inlet pipe, said first float including an opening formed in a center thereof, said opening including a plurality of protrusions formed in one side surface thereof, said pusher including a plurality of holes formed therein for receiving said protrusions of said first float so that said pusher can be adjusted upward and downward relative to said first float, a lever having a middle portion pivotally supported in an upper portion of said water tank and having a knob formed in a first end thereof and including a second end which is movable upward when said knob is depressed downward, said knob being reachable from outside of said water tank, a first cable second end of said pawl so that, when said second end of said lever moves upward, said pawl can be caused to rotate from a first position to a second position where said hook of said pawl is located below said catch of said first float, and a second cable coupled between said valve and said second end of said lever so that said valve can be pulled open when said second end of said lever moves upward and so that water contained within said water tank can be discharged via said outlet pipe, said first float will be lowered when said water discharges out through said outlet pipe, said catch of said first float will be caught by said hook of said pawl when said first float moves downward and when said knob is depressed for a short period of time, so that said valve will move downward to close said outlet pipe after almost all of said water contained within said water tank has been discharged, and said catch of said first float will not be caught by said hook of said pawl when said knob is released right after depression operation thereof so that said first float may move downward along said inlet pipe and so that said valve can be caused to move downward in order to close said outlet pipe.

5,191,662
FLUSH LIMITING MECHANISM
John A. Sharrow, Apt. #307, 4050 W. Lake Sammamish Pkwy. NE., Redmond, Wash. 98052
Filed Jul. 24, 1992, Ser. No. 918,595
Int. Cl.[5] E03D *1/14*
U.S. Cl. 4—325 9 Claims

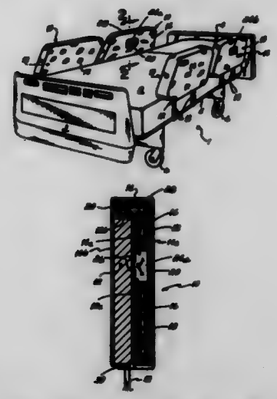


1. A flush limiting mechanism for toilets having a tank with an outlet, an overflow pipe, a float type flapper valve pivotally mounted on said overflow pipe and having a portion thereof, positioned over said outlet, said flapper valve being controlled by a flush handle located externally of said tank which handle in turn controls the position of an internal flush lever which in turn is connected to said flapper valve, said flapper valve preventing the flow of water through the outlet until lifted by the action of said flush handle, at which time said flapper valve holds itself open, through the buoyant action of an integral float chamber, until the tank empties, the present invention allowing the user to select, at the time of initiating a flush, either a full duration flush or a water-saving limited duration flush, dictated by the length of time that said handle is depressed, which present invention is comprised of:

a float arm, pivotally mounted near its mid point to said stand pipe to one end of which float arm is attached a weighted float, which float arm pivots about said mount in response to the rise and fall of water present in the toilet tank, as a result of the action of said weighted float;

a flapper valve depressor, which is pivoted on said stand pipe and so positioned and aligned as to contact said flapper valve to effectively cause reseating and closure of the toilet tank outlet valve; a float arm coupler adjustably attached to an end of the pivotally mounted float arm opposite said one end, an actuator rod pivotally attached at one end to said arm coupler and at another end to the flapper valve depressor in such a manner that the position of said float determines the respective position of said flapper valve depressor, the settings of which adjustable float arm coupler determine the initial position of said flapper valve depressor and also the rate of movement of said flapper valve depressor relative to the rate of movement of said float, said adjustable float arm coupler adjustably clamps to said pivotally mounted float arm at the end opposite said float and adjustably clamps to the actuator rod.

5,191,663
HOSPITAL BED SIDEGUARD PADS
Frederick J. Holder, Shelbyville, Ind.; John W. Lannen, Salem, Va., and Raymond H. Grote, Hamilton, Ohio, assignors to Hill-Rom Company, Inc., Batesville, Ind.
Filed Jul. 2, 1992, Ser. No. 907,634
Int. Cl.[5] A47C *21/08*
U.S. Cl. 5—424 6 Claims



1. A sideguard pad for use in conjunction with a hospital bed having sideguards comprising:

a slipcover defining first and second compartments, said first compartment adapted to be placed over, around and secured to a hospital bed sideguard;

a foam pad disposed in said second compartment, said foam pad having a planar slab portion and an upper lip portion, said planar slab portion adapted to substantially cover an inboard vertical plane of the sideguard, said lip portion adapted to cover an upper edge of the sideguard;

means for selectively opening and closing said second compartment for facilitating removal and insertion of said foam pad into said second compartment of said slipcover; and

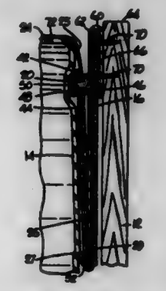
means for securing said first compartment of said slipcover to the sideguard; said sideguard pad further including an aperture in at least one side of said sideguard pad for providing access to hospital bed controls mounted on the sideguard.

5,191,664
WATERBED SHEET SECURING CLIP
Kent E. Wyatt, 1003 Longview Dr., #29, Rogers, Ark. 72756
Filed Apr. 21, 1992, Ser. No. 862,408
Int. Cl.[5] A47C *21/02*
U.S. Cl. 5—498 5 Claims

1. A device for holding bedding neatly in place on a waterbed, the waterbed having a fluid-filled mattress supported within a frame structure which is lined with a waterproof plastic liner for preventing fluid from leaking out of the waterbed if the fluid-filled mattress begins leaking, said device comprising:

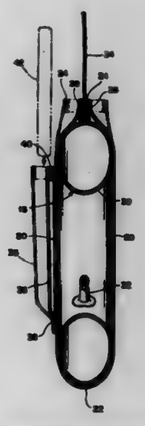
fastening means for gripping an edge portion of bedding for a waterbed; and

means for positioning said fastener means at a location below the top surface of the fluid-filled mattress between the mattress and the waterbed liner, said positioning means being secured to the frame structure without piercing the waterproof plastic liner, said means for positioning further including flexible elastic means for elastically stretching



when waterbed bedding gripped by said fastener means is pulled.

5,191,665
INFLATABLE CUSHION
Michael E. Broedlove, 7918 County Rd. #2, Howey-in-the-Hills, Fla. 34737
Filed Apr. 5, 1991, Ser. No. 682,312
Int. Cl.[5] A47C *27/00*
U.S. Cl. 5—656 1 Claim



1. An inflatable seat cushion comprising an outer cover consisting of a pair of substantially circular panels constructed of flexible, fabric-like material, means securing a major portion of the periphery of the panels together to form an outer cover with substantially less than one-half of the periphery of the panels being openable, closure means for the openable portion of the periphery of the panels, an inflatable annular tube positioned interiorly of the outer cover with the openable portion of the periphery of the panels enabling insertion and removal of the inflatable tube and a shoulder strap attached to said outer cover to form a support for the cushion when transporting to a point of use, said shoulder strap being an elongated flexible strap of wedging material having the ends thereof secured to the periphery of the panels adjacent the ends of the openable portion of the periphery, said shoulder strap having a length to enable it to encircle and be anchored to a seat, a pocket forming panel secured to the exterior surface of one of said cover forming panels, said pocket forming panel being of rectangular construction and secured to the cover forming panel by stitching along three sides thus forming a pocket having an open side

spraying said rinse water onto said fabric while spinning

wash chamber to effect less than a one gravity centrifugal

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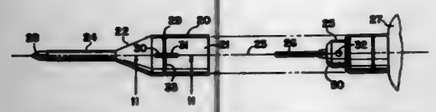
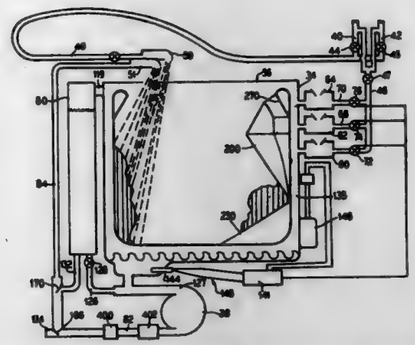
which faces the openable portion of the periphery of the cover forming panels to enable the open side of the pocket to face upwardly when the cushion is supported by the shoulder, strap a heating unit removably positioned in the pocket to form a warm surface upon which to set, said annular tube including an inflation and deflation valve extending into a central open area of the tube in spaced relation to the cover forming panels, said pocket forming panel being centrally located on said one cover forming panel, said pocket forming panel being aligned with the central open area of the tube, said inflatable tube and cover forming panels being dimensioned such that the cover forming panels will be maintained generally parallel and taut by the inflated tube, the openable portion of the periphery of the cover forming panels being defined by a portion of the peripheral edge of each cover forming panel projecting laterally outwardly to form an openable entrance with the inner surfaces of the laterally projecting edge portions of the cover forming panels facing inwardly, said closure means including hook and loop pile fasteners on the opposing surfaces of the laterally projecting edge portions of the cover forming panels, said shoulder strap having the ends thereof mounted immediately adjacent the ends of the laterally projecting edge portions of the cover forming panels.

5,191,666
DRILL ADAPTER
Lian N. Corbin, 2325 Bishop Estates Rd., Jacksonville, Fla. 32259
Filed Jul. 24, 1991, Ser. No. 735,041
Int. Cl.[5] B25F *1/00*
U.S. Cl. 7—158 **20 Claims**

1. A drill adapter for rapid conversion of a drill having a chuck with equally spaced keyholes and a drill bit clamped therein to a power tool having a different tool bit, said adapter comprising an elongated tubular body having a longitudinal axis and a rearwardly opening hollow adapted to receive the chuck and the drill bit, said body having an elongated tubular nose extending forwardly therefrom with the forward end of said nose having a recess for receiving a tool bit in operational engagement, said body having a plurality of detents carried by said body and being equally spaced from each other about said hollow, each of said detents being movable radially of said longitudinal axis, said adapter including spring means engaging each of said detents for biasing said detents inwardly to extend into said hollow and to engage respective keyholes in the chuck, said detents respectively being engaged with the keyholes of the chuck and being adapted to cause rotation of said adapter with rotation of the chuck in either direction of rotation, said each of said detents having a camming surface generally aligned with said longitudinal axis, said adapter being removed from the chuck by a pulling force away from the chuck along said longitudinal axis whereby said camming surfaces move said detents against the bias of said spring means to release said detents from engagement with the keyholes in the chuck.

5,191,667
METHOD OF WASHING FABRIC ARTICLES IN A VERTICAL AXIS WASHER
Phalguni S. Roy, St. Joseph Township, Berrien County; Jim J. Pastryk, Weesaw Township, Berrien County; Sheryl L. Farrington, Lincoln Township, Berrien County; Devinder Singh; John W. Euler, both of St. Joseph; Anthony H. Hardaway, Lincoln Township, Berrien County, and Mark B. Kovich, St. Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 2, 1992, Ser. No. 816,166
Int. Cl.[5] D06F *21/08*
U.S. Cl. 8—158 **22 Claims**

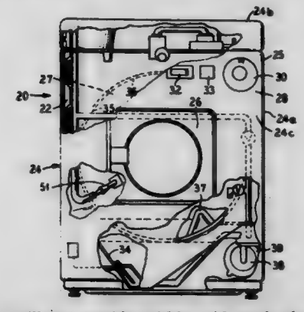


15. A method of washing a fabric wash load in an automatic washer having a wash basket rotatable about a vertical axis and charged with a detergent liquor comprising the steps:
(1) rotating said wash basket about its vertical axis at a predetermined speed, wherein said fabric wash load and said detergent liquor travel up a side wall of said wash basket;
(2) periodically decelerating said wash basket, wherein said fabric wash load and said detergent liquor continue to rotate upon deceleration;
(3) impinging said fabric wash load on structures in said wash basket as said fabric wash load continues to rotate along said wash basket upon deceleration of said wash basket, thus causing said fabric to move upwardly and inwardly of said wash basket; and
(4) repeating steps 1–3 a predetermined number of times.

5,191,668
SPIN METHOD OF RINSING FABRIC IN A HORIZONTAL AXIS WASHER
John W. Euler, St. Joseph; Mark B. Kovich, St. Joseph Township, Berrien County; Sheryl L. Farrington, Lincoln Township, Berrien County; Jim J. Pastryk, Weesaw Township, Berrien County; Jeanne C. Van Newenhizen, Benton Township, Berrien County, and Anthony H. Hardaway, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 2, 1992, Ser. No. 815,784
Int. Cl.[5] D06B *1/02*; D06F *23/02*
U.S. Cl. 8—158 **16 Claims**

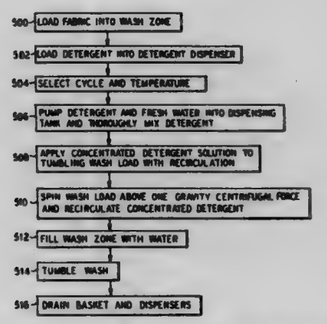
1. A method of rinsing fabric in a washer having a wash chamber rotatable about a horizontal axis comprising the steps:
loading fabric to be washed into the wash chamber of said washer;
washing said fabric in a detergent solution while rotating said wash chamber about its horizontal axis for a first period of time;
draining said detergent solution from said wash chamber subsequent to said first period of time;
rinsing said fabric by adding water to said wash chamber and

spraying said rinse water onto said fabric while spinning said wash chamber at a speed to effect more than a one gravity centrifugal force on said fabric such that said



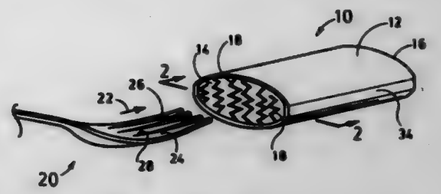
fabric will not tumble within said wash chamber as it spins;
draining said wash chamber of said rinse water.

5,191,669
SPIN METHOD OF WASHING FABRIC IN A HORIZONTAL AXIS WASHER
John W. Euler; Mark B. Kovich, both of St. Joseph; Jim J. Pastryk, Weesaw Township; Sheryl L. Farrington, and Anthony H. Hardaway, both of Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 2, 1992, Ser. No. 815,774
Int. Cl.[5] D06F *21/04*
U.S. Cl. 8—158 **17 Claims**



1. A method of washing fabric in a washer having a wash chamber rotatable about a horizontal axis comprising the steps:
rotating said wash chamber about its horizontal axis at a spin speed to effect less than a one gravity centrifugal force on said fabric such that said fabric will tumble in said wash chamber;
directing a recirculating spray of concentrated detergent solution onto said fabric for a first period of time as said fabric is tumbling in said wash chamber;
subsequently increasing the spin speed of said wash chamber to effect more than a one gravity centrifugal force on said fabric such that said fabric will be retained on the wall of said wash chamber as it spins;
continuing said recirculating spray of concentrated detergent solution onto said fabric for a second period of time as said fabric is held against the wall of said wash chamber;
after said second period of time, diluting said concentrated detergent solution and slowing said spin speed of said wash chamber to effect less than a one gravity centrifugal force on said fabric such that said fabric will again tumble in said wash chamber;
continuing said recirculating spray of diluted detergent solution onto said fabric for a third period of time as said fabric is tumbling in said wash chamber; and
draining the diluted detergent solution from said wash chamber.

5,191,670
FORK SCRUBBER
Ron W. Lake, 1550 Connoley Ave., Chula Vista, Calif. 91911, and Debra Green, 1032 S. Windy Ridge Ct., Anaheim Hills, Calif. 92808
Filed Dec. 30, 1991, Ser. No. 815,820
Int. Cl.[5] A46B *3/00, 9/02*; A47L *21/00*
U.S. Cl. 15—160 **24 Claims**



1. A fork scrubber comprising:
a tube having first an second opposing interior walls; and
a plurality of substantially parallel zigzag bristles mounted to the first wall and having free ends extending toward the second wall, said zigzag bristles each having a plurality of segments connected by sharp vertex points.

5,191,671
TOOTHBRUSH HANDLE
Martin E. Rudnick, 2353 Rupert Dr., San Jose, Calif. 95124
Filed Aug. 22, 1991, Ser. No. 748,597
Int. Cl.[5] A46B *05/02*
U.S. Cl. 15—167.1 **10 Claims**

1. A toothbrush comprising:
a. an elongated handle having a proximal end and a distal end, and a longitudinal axis extending therebetween, the handle comprising:
a transverse cross section adjacent said proximal end in the shape of a trapezoid, wherein said trapezoid comprises a bottom edge, a top edge, and side edges extending from said bottom edge to said top edge, said top edge being smaller than said bottom edge, and
a second transverse cross section adjacent said distal end in the shape of a second trapezoid, said second trapezoid comprising a second bottom edge, a second top edge, and second side edges extending from said second bottom edge to said second top edge, said second top edge being smaller than said second bottom edge,
wherein said second top edge is smaller than said top edge, and said second bottom edge is smaller than said bottom edge, whereby said handle tapers in width from said proximal end to said distal end;
b. a head attached to the distal end of said handle, said head having a top side and a bottom side, said top side being contiguous with said second top edge, and said bottom side being continuous with said second bottom edge;

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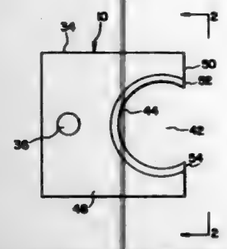
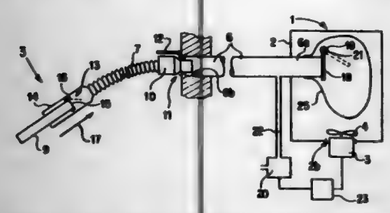
c. a plurality of bristle tufts attached to the top side of said head.

5,191,672
CLEANING DEVICE FOR A THREADED SHAFT
William A. Boston; Frank A. Balow, both of Western Springs, and Eugene Skiper, Hickory Hills, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Aug. 19, 1991, Ser. No. 747,304
Int. Cl.[5] B21C 43/00
U.S. Cl. 15—256.5 13 Claims



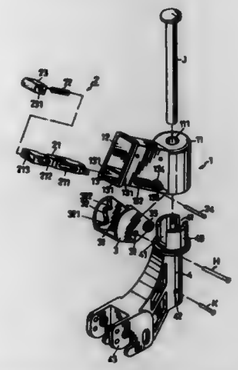
1. A cleaning device for a threaded shaft having a pair of opposed ends comprising a cleaning member having a predetermined width and a threaded recess received on the shaft and extending partially around the shaft, with the threads of the cleaning member meshing with the threads of the shaft, said cleaning member extending only partially around the shaft throughout the width of the cleaning member such that the cleaning member may be snap-fit onto the shaft intermediate the ends of the shaft, said cleaning member having a cut-out to receive the shaft, a pair of spaced opposed edges adjacent and on opposite sides of said cut-out, with the edges being spaced a distance slightly less than the diameter of the shaft, with the cleaning member being constructed from a resilient material, such that the edges flex slightly when the cleaning member is placed on the shaft such that the cleaning member is snap-fit onto the shaft.

5,191,673
REMOTE CONTROL DEVICE VACUUM OR VENTILATION SYSTEM
Patrick Damizet, Venissieux, France, assignor to Aldes Aeraulique and Societe d'Etudes et de Recherche de Ventilation et d'Aeraulique S.E.R.V.A., Bussy Saint Georges, France
Filed May 23, 1990, Ser. No. 527,372
Claims priority, application France, May 23, 1989, 89 06974
Int. Cl.[5] A47L 5/38
U.S. Cl. 15—314 24 Claims



1. Device for remote control of a vacuum comprising a housing, a motorized vacuum turbine connected pneumatically to an outlet of the housing for creating a vacuum in the housing, and at least one tube with a downstream end which terminates in the housing, means connected to an upstream end of the tube for generating a single pneumatic pressure pulse in the direction of said downstream end, said downstream end being associated with means for detecting the pneumatic pressure pulse and acting on an electric motor of the vacuum turbine to start the motor, the pneumatic pressure pulse being conducted by the tube from said upstream end to said downstream end, said downstream end being provided with a shutoff flap normally held in the closed position and capable of opening under the influence of vacuum created in housing.

5,191,674
DIRECTION SETTING DEVICE FOR A STROLLER
Hong-Fu Zan, No. 59, Alley 85, Lane 673, Chung-Chen Rd., Jen-Te Hsiang, Tainan Hsien, Taiwan
Filed Feb. 6, 1992, Ser. No. 831,843
Int. Cl.[5] B60B 33/00
U.S. Cl. 16—35 R 4 Claims



1. A direction setting device for a roller of a stroller, including a first connector adapted to be connected to a leg which supports a seat of said stroller, said first connector having a tubular member and a housing extending at an incline from said tubular member and in communication with the same, said housing confining a receiving space;

a second connector adapted to be connected to said roller of said stroller and having a tubular top portion with a control notch rotatably and slidably connected to said first connector;

a spring biased key member movably provided in said receiving space of said housing, which key member is biased to extend into said control notch of said second connector to prevent rotation of said second connector relative to said first connector:

characterized in that said housing includes two aligned first elongated slots;

said spring biased key member has a second elongated through slot therethrough and a through-hole adjacent to said second elongated through slot;

a control member includes a plate which is provided on said housing, and has an inner surface with a control groove formed therein, which inner surface abuts against said housing, said control groove including a first trough, a second trough deeper than said first trough and a ridge between said first and second troughs;

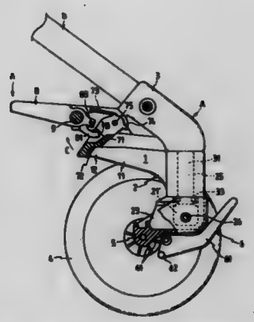
a first pin member pivotally connects said plate to said housing and passes through said second elongated through a slot of said key member;

a second pin member passes through said through-hole of said key member and said first elongated slots of said housing with one free end of said second pin member extending into said second trough of said plate; and

said second pin member being movable in said control groove of said plate between a first position in said second trough where said key member extends into said control notch, preventing the rotation of said second connector relative to said first connector, and a second position in

said first trough where said key member retracts from said control notch permitting the rotation of said second connector relative to said first connector.

5,191,675
CASTER MECHANISM FOR CARRIAGE
Takashi Ishikura, Tokyo, Japan, assignor to Combi Corporation, Tokyo, Japan
Filed Aug. 27, 1991, Ser. No. 750,688
Claims priority, application Japan, Sep. 27, 1990, 2-100204[U]
Int. Cl.[5] B60B 33/00
U.S. Cl. 16—35 R 22 Claims



1. A caster mechanism adapted for use with a carriage having a plurality of wheels and a foot rod coupled to each wheel, said caster mechanism comprising:

a stopper mechanism fixedly secured to each foot rod of said carriage; and

a wheel support mechanism rotatably positioned below said stopper mechanism, said wheel support mechanism including an engagement bracket extending parallel to said stopper mechanism, said engagement bracket having an arm plate and an engagement fitting portion formed at a first end of said arm plate,

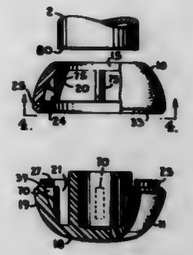
wherein said stopper mechanism comprises a base plate, an actuating lever coupled to a first end of said base plate and adapted to turn upwardly and downwardly about an end thereof, and an engagement member adapted to turn up and down in operative association with said actuating lever and positioned below said first end of said base plate to selectively engage said engagement fitting portion, said engagement member and said engagement fitting portion simultaneously being engaged or disengaged together such that said wheel either is selectively fixed in a predetermined orientation or is steerable,

said caster mechanism further comprising a rod positioned on said engagement member; and

means for selectively engaging and disengaging said rod, said engaging means being formed on said actuating lever.

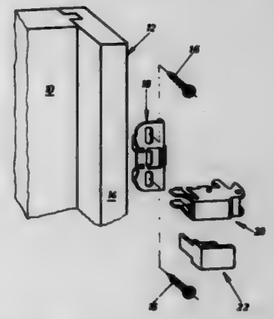
5,191,676
SPLIT HEMISPHERE FOOT WITH COOPERATING SNAP-OVER RETAINING LIPS
James L. Gerner, Shawnee, Kans., assignor to Fixtures Manufacturing Corporation, Kansas City, Mo.
Filed Dec. 13, 1991, Ser. No. 808,102
Int. Cl.[5] A47B 91/06
U.S. Cl. 16—42 T 17 Claims

1. In a glide for a structural leg comprising a first portion, a second portion and means for securing said glide to said leg, the improvement comprising:



(a) cooperating interference means on said first portion and said second portion for interferingly securing said first portion to said second portion.

5,191,677
CABINET HINGE
Horst Lautenschläger, Reinheim, and Gerhard W. Lautenschläger, Brensbach, both of Fed. Rep. of Germany, assignors to Karl Lautenschlager GmbH & Co. KG, Reinheim, Fed. Rep. of Germany
Filed Sep. 12, 1991, Ser. No. 758,745
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1990, 4031305
Int. Cl.[5] E05D 7/10, 11/00
U.S. Cl. 16—257 18 Claims



1. Hinge for hanging a door on the carcase of a piece of furniture, having a door-related part which can be fastened to the door and a carcase-related part which is coupled by a linkage mechanism to the door-related part and removably fastened on a mounting plate which can be fastened to the carcase and a supporting arm straddling the mounting plate with an inverted U-shaped cross-section, which is releasably joined by a catch mechanism to the mounting plate and has in each bottom edge of its lateral flanges, in their front end portion nearer the door, open-mouthed, hook-like hanging notches which can be hooked on associated corner portions in the area of the mounting plate nearer the door, while at the carcase-interior end of the supporting arm remote from the door two resiliently flexible tongues each with a hook are formed, which in the intended joining position are in form-fitting engagement each with a notch at the carcase-interior end portion of the mounting plate, the hooks and the notches being able to be brought out of engagement by contrary bending of the tongues together parallel to the supporting wall surface, and each tongue having a handle accessible in the locked position of the supporting arm on the mounting plate for exerting a pressure directed one against the other parallel to the

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supporting wall surface, said resiliently flexible tongues (52) being pointed at the mounting plate, beginning from the web (38) of the supporting arm (20) at right angles to the fastening surface of the mounting plate (18) on the cabinet carcase, and being provided at their free ends with the hooks (54*a*; 54*b*), and said mounting plate (18) having in its front end portion facing the door a projection (28) reaching between the lateral flanges (40) of the installed supporting arm, whose lateral edges (28*a*; 28*b*) facing the flanges run at an angle from the free end toward the mounting plate, the distance between the sloping edges (28*a*; 28*b*) measured at the free end of the projection (28) being less than, and the distance of the two sloping edges from one another, measured in the area of transition to the mounting plate, being substantially equal to the clear distance between the lateral flanges (40) of the supporting arm.

5,191,678

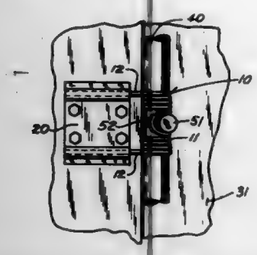
WIND RESISTANT DOOR HARDWARE

Harold A. Firari, Wauwatosa, Wis., assignor to T.J. Firari Enterprises, Milwaukee, Wis.

Continuation-in-part of Ser. No. 428,722, Oct. 30, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 711,722

Int. Cl.[5] E05F *1/08*

U.S. Cl. 16—305 **14 Claims**



1. A spring loaded hinge for a door having a door frame comprising:
- a generally vertical rod that moves with said door as said door pivots;
- a first collar means for holding said rod to said door;
- a second collar means for holding said rod to said door frame;
- at least one spring means attached to said rod at various intervals;
- moving means for moving said spring means with said rod;
- said rod extending substantially from the top of said door to the bottom of said door;
- said moving means being attached to said rod at generally the same said intervals of said spring means;
- each said spring means having a portion in contact with said moving means;
- each said spring means having a free end;
- each said free end of each said spring means being oriented in a direction such that as said door opens said portion of each said spring means causing said free end of said spring means to move as said vertical rod rotates such that as said door opens each said free end of each said spring means contacts said door frame when said door is nearly fully opened and thereafter applies increasing force to said rod through said moving means eventually preventing rotation of said rod whereby said door is prevented from being opened any further.

5,191,679

DISPLACEABLE HINGE

James B. Harper, Plaza Luna 1, Lomas Pueblo, Marbella, Malaga, Spain

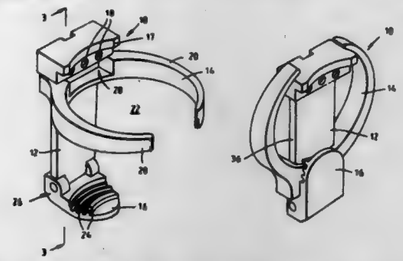
PCT No. PCT/GB89/01358 § 371 Date May 20, 1991 § 102(e) Date May 20, 1991; PCT Pub. No. WO90105473 PCT Pub. Date May 31, 1990

PCT Filed Nov. 16, 1989, Ser. No. 689,768

Claims priority, application United Kingdom, Nov. 18, 1988, 8827063

Int. Cl.[5] F05D *7/00*; A47K *1/09*

U.S. Cl. 16—363 **6 Claims**



1. A displaceable hinge comprising:
- an elongate first member having a pair of opposite side faces extending along its length and pair of opposite end faces extending along its length;
- a second member which has an aperture therethrough, said aperture being bounded by two side portions and two end portions, each of said end portions including a pair of intersecting channels, which separate ends of said pair of side portions from an end protrusion extending from a respective one of said end portions;
- at least one of said first and second members being resiliently deformable;
- said first member passing through said aperture in said second member such that said end faces of said first member are always in abutment with said end portions of said second member; and
- said second member being displaceable relatively to said first member along the length of said first member, and being pivotable relatively to said first member at any location selected at random along the length of said first member between a first position in which said second member lies perpendicularly to said first member and a second position in which said second member lies parallel to said first member;
- wherein resilient deformation of at least one of said first and second members allows said end faces of said first member and said end protrusions of said second member to snap past one another during pivoting of said second member relative to said first member.

5,191,680

FILAMENT THREADING IN AN AIR GUN FOR PRODUCING NONWOVEN FABRICS

Akira Kaneko; Nobuo Higashiya, and Hiroyuki Hamasuna, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

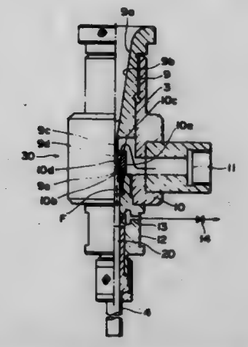
Filed Aug. 22, 1991, Ser. No. 748,806

Claims priority, application Japan, Aug. 27, 1990, 2-224753

Int. Cl.[5] D01G *25/00*

U.S. Cl. 19—299 **13 Claims**

1. An air gun for producing nonwoven fabrics having means for facilitating threading of a filament in said gun, comprising;
- (I) a first nozzle having a air gun inlet for receiving a filament delivered from a spinning nozzle, including;
  - (a) a tapered pipeline provided in an interior of said air gun inlet and reduced in diameter up to a middle portion thereof, and
  - (b) a first generally straight pipeline provided in the interior of said air gun inlet, having said same diameter from the middle portion to an extreme end forming the filament outlet,
- (II) a second nozzle connected to said first nozzle and including;
  - (a) a blow port encircling a periphery of the extreme end of the first generally straight pipeline, an inner surface of the blow port being gradually reduced in diameter from a blow port air inlet side and then gradually increased in diameter downstream a maximum constriction portion thereof and then forms a second generally straight pipeline having a slightly larger diameter than that of the filament outlet, and
  - (b) a slight clearance formed between the inner surface of said blow port and an outer surface of said extreme end of said first generally straight pipeline,
- (III) a compressed air inlet communicated with the blow port air inlet of the blow port, and air introduced into the blow port from a compressed air inlet increases in flow velocity to a maximum at a time passing through the



maximum constriction portion having the minimum inside diameter whereby air is jetted from the compressed air blow port so as to draw the filament,
- (IV) a connection pipe connected to the second nozzle in a direction downstream of the maximum constriction portion,
- (V) an accelerating pipe connected to said connection pipe for guiding the filament,
- (VI) a carrier path extending through the first nozzle, second nozzle, the connection pipe and the accelerating pipe from the air gun inlet of the first nozzle and having an air flow for transmitting said filament received in said air gun inlet, said filament delivered thereafter and adapted to form said nonwoven fabric, and
- (VII) an exhaust path branched off from said carrier path on the downstream side from said compressed air blow port for removing a part of the air flowing in the carrier path, and having opening and closing means for facilitating threading of the filament in the carrier path.

5,191,681

NAPKIN- OR DRAPE-HOLDER

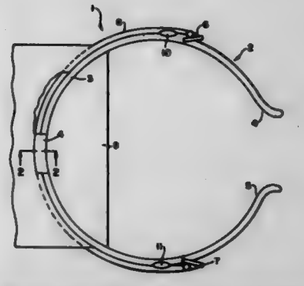
Oddvin Lokken, 131 Forest Ave., Rye, N.Y. 10580

Filed Mar. 11, 1992, Ser. No. 849,486

Int. Cl.[5] A45F *5/00*

U.S. Cl. 24—9 **4 Claims**

1. A napkin- or drape holder in the form of a one-piece molding, comprising:
- a) a spring-like first plastic member having a body portion terminating in opposed proximal ends, said body portion being shaped to fit around the human neck;
- b) a spring-like second plastic member having a body portion terminating in free ends, each of said free ends being connected to said body portion of said first member by integral plastic hinge means;
- c) said first and second members having a normally open position in which said members lie in planes oblique to one another and a closed position in which said members are coplanar, said members being swingable about said hinge means between said positions;



- d) said members being operable when in said closed position to clamp a napkin in place inserted between said body portions of said members; and
- e) integral plastic locking means carried by one of said members for releasably locking said members in said closed position.

5,191,682

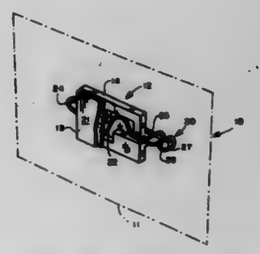
APPARATUS FOR PROVIDING A BADGE FINDING

Beverly J. Davis-Reardon, Addison; Elizabeth M. Gomez, Wood Dale, and Andru J. Ryalec, Addison, all of Ill., assignors to Ambrit, Inc., Elk Grove, Ill.

Filed Jan. 15, 1991, Ser. No. 641,186

Int. Cl.[5] A44C *3/00*

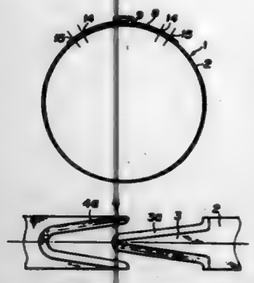
U.S. Cl. 24—13 **6 Claims**



1. A badge finding for attachment to a display article including a badge, comprising:
- a backer body having opposed sides with a cavity in one side,
- walls in said body defining the cavity,
- a locking pin of one piece wire having a central body portion and a coil at one end, and a hook at an opposite end of the central body portion,
- a free end on the locking pin for piercing clothing and for locking engagement with the hook,
- a cover for covering the cavity in the body and prohibiting the central body portion of the pin within the cavity from removal from the cavity,
- a first adhesive layer on one side of the cover adhering the cover to the side of the body to cover the cavity and the central body portion of the pin therein,
- a second adhesive layer on the other side of the cover for later affixing of the badge finding to the display article,
- and a liner adhesively secured to the second adhesive layer

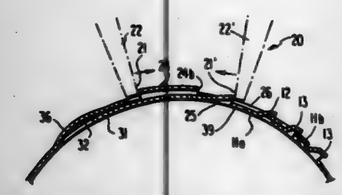
and peelable therefrom to expose the second adhesive layer at the time of affixing the badge finding to the display article.

5,191,683
HOSE BAND
Juji Ojima, Aikawa, and Isao Hino, Komagane, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan
Filed Dec. 10, 1991, Ser. No. 804,583
Claims priority, application Japan, Dec. 12, 1990, 2-410475
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—20 R 2 Claims



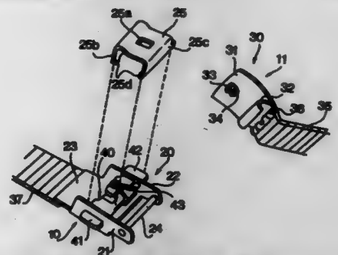
1. A hose band comprising an elongated ring band member having separated ends, each said end being fixed to a clamping ear member, a first of said ends comprising a tongue portion and a second of said ends comprising a tongue receiving portion, each said end comprising at least one bevelled surface becoming thinner toward an outside edge thereof and disposed in corresponding positions for engaging together in clamped position of said ring band member.

5,191,684
CLAMP STRUCTURE
Eric T. Kenwright, Creemore, Canada, assignor to Hans Oetiker AG Maschinen- und Apparatefabrik, Horgen, Switzerland
Filed Nov. 8, 1991, Ser. No. 789,671
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—20 R 33 Claims



1. An open clamp structure with a clamping band means having overlapping inner and outer band portions which are adapted to be mechanically interconnected by the use of at least one hook-like means in one band portion operable to engage in a hook-receiving means in the other band portion, and which includes means enabling tightening of the clamp structure about an object to be fastened thereby, characterized in that the means enabling tightening of the clamp structure includes means for preventing over-torquing of the clamping band means in the presence of continuing tightening forces by positively limiting further relative movement between the inner and outer band portions of the clamp structure.

5,191,685
BUCKLE FOR WATCH BANDS
Yasushi Aoki, Saitama; Masaaki Azuma, Tokyo; Shigeo Tsuchigane, Saitama; Akihiro Tanaka; Katsuzo Hirayama, both of Tokyo, and Eiichiro Tanaka, Saitama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Tokyo, and Eiichiro Tanaka, Saitama; Hidekumi Kasai, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
PCT No. PCT/JP89/00383, § 371 Date Jan. 25, 1990, § 102(e) Date Jan. 25, 1990, PCT Pub. No. WO89/11232, PCT Pub. Date Nov. 30, 1989
PCT Filed Apr. 10, 1989, Ser. No. 459,832
Claims priority, application Japan, May 27, 1988, 63-70155[U]; Jan. 6, 1989, 1-352[U]
Int. Cl.[5] A44C *5/20*
U.S. Cl. 24—656 8 Claims

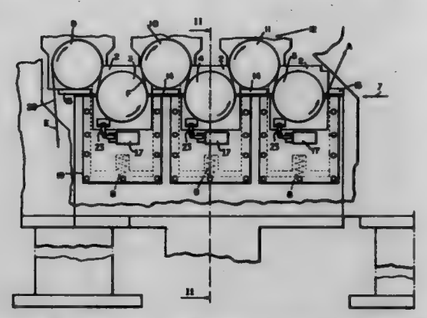


1. A buckle for a watch with opposite bands, the buckle having a first engaging member and a second engaging member, the first engaging member comprising a frame member having at least one base frame and a pair of side frames, each of the side frames having a hole, the holes correspond to one another with both holes being located at the same height int he side frames, a lock lever having a locking portion, and a pressing-up lever having a body and a pressing-up slant on the body, each of the levers being laterally slidable relative to the side frames and being mounted in the frame member and having an operating lug projected form the hole of one of the side frames, and the second engaging member comprising a lock member engageable with the lock lever and a slant member to be raised by the pressing-up lever, a spring being provided between the lock lever and the pressing-up lever so as to urge outwardly both of the levers characterized in that
the pressing-up lever is located lower than the lock lever, and
the locking portion of the lock lever and the body of the pressing-up lever are disposed so as to overlap with each other, and a surface of the operating lug of one of the levers is located higher than the body by a height substantially equal to a thickness of the locking portion so that the operating lug is inserted into the corresponding hole.

5,191,686
APPARATUS FOR PROTECTING STRETCHING ROLLERS IN SYNTHETIC FILM STRETCHERS
Hans-Juergen Malerhofer, Lindau; Willi Eberle, Wangen, and Adolf Mueller, Weissensberg, all of Fed. Rep. of Germany, assignors to Lindauer Dornier GmbH, Lindau, Fed. Rep. of Germany
Filed Feb. 13, 1991, Ser. No. 654,832
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1990, 4004696
Int. Cl.[5] D06C *3/06*
U.S. Cl. 26—71 7 Claims

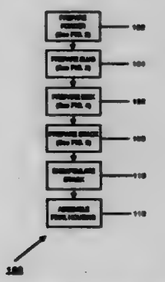
1. An apparatus for protecting stretching rollers in a lengthwise stretching machine for synthetic film webs, comprising a machine frame, a first group of stretching rollers mounted in said machine frame, a second group of stretching rollers also mounted in said machine frame in such a position relative to said first group of rollers that a film web to be stretched must loop partially around all rollers of both groups, mounting

means for movably mounting one of said roller groups for movement relative to the other roller group, stop means (14, 15) in said machine frame for limiting a movement of said one roller group in a first direction toward the other roller group, said mounting means for said one roller group comprising force generating means (8) for pressing said one roller group in said first direction against said stop means (14, 15) for maintaining an operative relationship between said roller groups, electrical limit switch means arranged for sensing a movement of said one roller group away from said stop means in a second direction opposite to said first direction to provide an electrical signal for stopping said machine when at least one roller of said



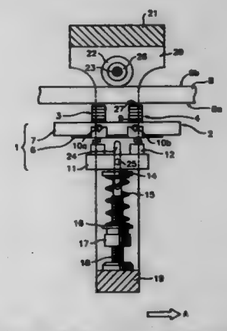
one roller group moves away from said other roller group to an extent determined by said electrical limit switch means, and wherein each of said force generating means (8) is arranged in a space (20) formed between a first and a second guide plate (18, 19), said mounting means comprising a bearing plate (21) connected to said machine frame (13) and to said first and second guide plates, a bearing slider (22) slideably received in said space (20), said bearing slider (22) having one end operatively connected with said force generating means, said bearing slider being slideably held between said first and second guide plates (18, 19), said bearing slider having its other end rigidly connected with a bearing housing (1, 2) of said one group of rollers.

5,191,687
PROCESS FOR MAKING PIEZOELECTRIC STACKS
Chuong Q. Dam, Peoria; Virgil R. Hester, Delevan; Kurtis C. Kelley, Washington, and Carey A. Towe, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Sep. 28, 1990, Ser. No. 589,853
Int. Cl.[5] H04R *17/00*
U.S. Cl. 29—25.35 9 Claims



1. A method for making piezoelectric solid state motor stack disks without post cutting lapping of the disks, comprising the steps of:
preparing a piezoelectric ceramic powder;
preparing a substantially cylindrical piezoelectric ceramic slug having an axial length greater than its diameter from said powder, by:
(1) pressing said ceramic powder to form said ceramic slug; and
(2) thereafter, heating said ceramic slug substantially above room temperature to cure it; and
cutting said slug substantially at right angles to its axial length into finished disks of predetermined thickness using an ID saw, without subsequent post-cutting lapping of the disks, wherein said disks of predetermined thickness are superior for use in the piezoelectric solid state motor stack than conventional lapped disks.

5,191,688
METHOD FOR PRODUCING A SUPERIOR LONGITUDINAL VIBRATOR
Hiroyuki Takizawa; Sumio Kawai, both of Hachioji, and Sadayuki Ueha, Machida, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Division of Ser. No. 558,826, Jul. 26, 1990, Pat. No. 5,136,200. This application Dec. 12, 1991, Ser. No. 806,167
Claims priority, application Japan, Jul. 27, 1989, 1-195767; Nov. 28, 1989, 1-310011; Dec. 21, 1989, 1-332155; Mar. 27, 1990, 2-79800; Apr. 10, 1990, 2-95399; Apr. 20, 1990, 2-104589; Apr. 27, 1990, 2-113683; May 18, 1990, 2-128852
Int. Cl.[5] H01L *41/22*
U.S. Cl. 29—25.35 9 Claims



1. A method for producing a superior longitudinal vibrator comprising the steps of:
providing a plurality of piezoelectric ceramic sheets of substantially uniform thickness length and width;
coating at least one major surface of each ceramic sheet with a conductive material;
polarizing each coated sheet in the thickness direction;
bonding all of said sheets together to fabricate a matrix wherein adjacent ceramic sheets in opposite polarizing directions are next to one another;
bonding a film-like anti-abrasion member upon the surface of one of the exposed ceramic sheets of said matrix;
cutting the matrix to form a plurality of individual piezoelectric laminates so that the conductive coatings are exposed along both longitudinal sides of each laminate;
electrically insulating alternating ones of the conductive coatings exposed along one longitudinal side of each of said piezoelectric laminates;
electrically insulating the conductive coatings exposed along the opposite longitudinal side of each of said piezoelectric laminates wherein the alternating ones of the conductive coatings being electrically insulated are interspersed with the alternating ones of the conductive coatings being insulated on the opposite side of said piezoelectric laminate; and
applying a conductive coating to substantially the entire surface of both longitudinal sides of each piezoelectric

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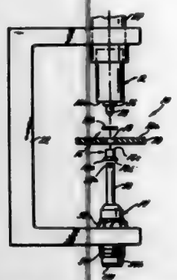
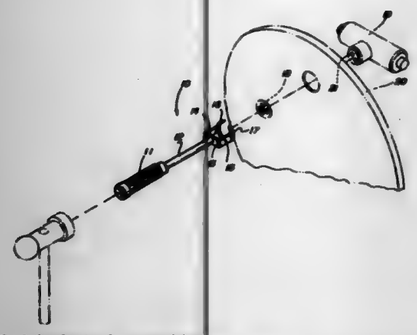
laminate whereby each of said conductive coatings is electrically connected with conductive coatings between said ceramic sheets which extend to the longitudinal side of the associated conductive coating.

5,191,689
GROMMET INSTALLATION DEVICE
Raymond J. Sleziuki, Arnold, and Christian E. Schaefer, Glendale, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed May 1, 1992, Ser. No. 877,406
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—243.517 8 Claims



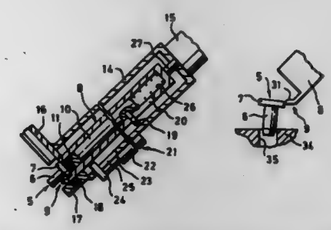
1. A device for installing a grommet into a workpiece defining an aperture, comprising:
(a) means for swaging said grommet into said aperture:
(b) means for supporting said grommet within said aperture of said workpiece, wherein said supporting means comprises:
(1) a cylindrical housing:
(2) retractable means, having a headed end retained within said cylindrical housing, for maintaining said grommet in said workpiece during installation; and
(3) means, enclosed within said cylindrical housing, for retractably extending said retractable maintaining means; and
(c) means for aligning said swaging means with said supporting means during installation.

5,191,690
BRAKE TOOL
Robert S. Kocha, 24940 Monroe St., Kansasville, Wis. 53139
Filed Apr. 7, 1992, Ser. No. 864,558
Int. Cl.[5] B25B *27/14*
U.S. Cl. 29—275 2 Claims



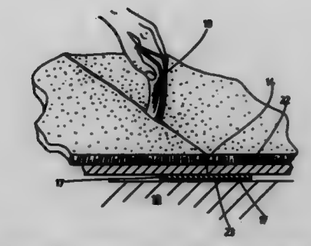
1. A brake tool, comprising,
an elongate handle, the handle including an elongate shank integrally mounted to the handle extending forwardly thereof, with the shank and the handle coaxially aligned along a single axis, and
a support flange orthogonally and integrally mounted to a forward distal end of the shank spaced from the handle, the support flange including a first and second distal end spaced on opposed sides of the shank, with the first distal end having a first mounting flange integrally and orthogonally mounted to the support flange projecting forwardly of the support flange, with a second mounting flange arranged in a parallel spaced relationship relative to the first mounting flange integrally mounted to the second distal end, and
a first semi-cylindrical ring segment integrally mounted to the first mounting flange, and a second semi-cylindrical ring segment mounted to the second mounting flange, with the first and second semi-cylindrical ring segments concentric relative to one another and coaxially aligned about the axis, and
the first ring segment includes a planar first abutment surface, and the second ring segment includes a planar second abutment surface, wherein the first abutment surface and the second abutment surface are arranged in a coplanar relationship about a single plane, and the single plane orthogonally oriented relative to the axis, and
the first ring segment includes a semi-cylindrical first groove and the second ring segment includes a semi-cylindrical second groove, wherein the first groove and the second groove are coaxially aligned about the axis, and a first semi-cylindrical magnet and a second semi-cylindrical magnet, with the first semi-cylindrical magnet magnetically received within the first groove, and the second semi-cylindrical magnet received within the second groove for magnetic adherence of a brake clip to the first abutment surface and the second abutment surface.

5,191,691
APPARATUS FOR FEEDING SLENDER PARTS
Yoshitaka Aoyama, 20-11, Makitsukadai 2-chome, Sakai-shi, Osaka 590-01, Japan
Continuation of Ser. No. 667,933, Mar. 12, 1991, abandoned, which is a division of Ser. No. 392,513, Aug. 11, 1989, Pat. No. 5,035,039. This application Feb. 10, 1992, Ser. No. 830,970
Claims priority, application Japan, Aug. 15, 1988, 63-202948; Aug. 22, 1988, 63-208624; Aug. 22, 1988, 63-208625
Int. Cl.[5] B25B *27/14*
U.S. Cl. 29—281.4 5 Claims



1. An apparatus for feeding slender parts, comprising:
a feed rod operatively mounted for advancing in an oblique downward and horizontal direction and for retraction in a reverse direction;
part transfer means operatively connected to a fore end of said feed rod, for holding and transferring a slender part held thereon to a selected location; and
a magnet means located at the fore end of said feed rod and operatively positioned with said part transfer means, for magnetically attracting and holding the part in said part transfer means so as to allow transfer of the part, said magnet means being further for releasing the part from said part transfer means when positioned at the selected location,
said part transfer means including a stopper portion for receiving a head of the part during transfer of the part and release guide means for guiding a rotative release motion of the part when said magnet means releases the part therefrom, the release guide means having a horizontal support extension that contacts a stem portion of the part during transfer and releasably guides the rotative release motion of the part through contact with the stem portion during release of the part.

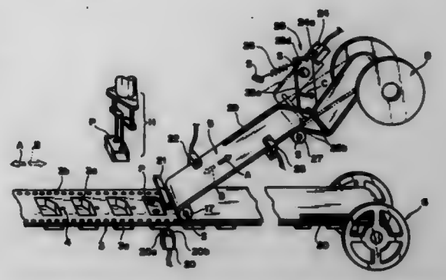
5,191,692
CARPET JOINTING METHOD
Joseph R. Paciona, Thornhill, Canada, assignor to Tac-Fast Systems SA, Switzerland
Filed Mar. 1, 1991, Ser. No. 663,006
Int. Cl.[5] B31F *5/00*
U.S. Cl. 29—423 13 Claims



1. A method of forming a seam between abutting edges of pile carpet wherein the carpet edges are attached to a base tape, comprising:
laying a composite tape comprising a cover tape and a base tape on a substrate along a line of abutment for selected carpet edges wherein the cover tape is wider than the line of abutment;
placing carpet pieces on the substrate in location for abutment of selected respective edges; and
attaching the carpet edges to the base tape by removing at least sections of the cover tape from the base tape wherein the cover tape passes between the selected edges, brushes the pile of the carpet in the removal direction and pulls down-turned pile upwardly through the seam.

5,191,693
TAPE TYPE WORK CONVEYING METHOD AND CONVEYING APPARATUS
Sachio Umetsu, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 28, 1990, Ser. No. 635,872
Claims priority, application Japan, Dec. 29, 1989, 1-341983; Dec. 29, 1989, 1-341984
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—429 11 Claims

1. A method for operating a workpiece handling apparatus having a main controller and a robot hand and being interconnected to a tape conveying apparatus with the tape conveying apparatus having a conveying tape with a plurality of successive placing portions for placing and conveying workpieces, a cover tape for covering openings of the placing portions on the conveying tape, a first reel for fixing end portions of the conveying tape and the cover tape and simultaneously taking up the conveying tape and the cover tape, a second reel for fixing an end portion of the conveying tape and taking up only the conveying tape, a third reel for fixing an end portion of the cover tape and taking up only said cover tape, drive assemblies for rotatably driving the first, second, and third reels, an intermittent driver for intermittently driving the conveying tape, a controller for controlling the driver assemblies and the intermittent driver, a first detector for detecting indicating portions on the conveying tape to indicate the placing portions, and a guiding mechanism for interconnecting the workpiece handling apparatus and the tape conveying apparatus, said method comprising the steps of:
interconnecting the workpiece handling apparatus and the tape conveying apparatus together;
connecting the main controller of the workpiece handling apparatus and the controller of the tape conveying apparatus;
winding the conveying tape and cover tape;
detecting the indicating portions on the conveying tape with the first detector to determine the placing portions on the conveying tape;

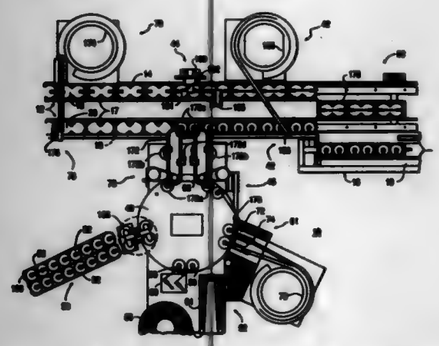


manipulating the robot hand to pick up or place workpieces in the placing portions on the conveying tape;
synchronizing the mainpulating step with movement of the placing portions to precisely pick up or place the workpieces in the placing portions based on the detecting indicating portions;
driving the first reel and the intermittent driver on the basis of the detection result from the first detector when the workpieces are manipulated after the tape conveying apparatus is guided and positioned with respect to the workpiece handling apparatus; and
detecting with a second detector a detection member arranged near an end portion of the cover tape fixed to the third reel for indicating that the conveying tape is almost full of workpieces.

5,191,694
CASSETTE ASSEMBLY LINE
Ralph Ruggiero; Thomas R. Plourde, and Joseph Kaczynski, Jr., all of Tucson, Ariz., assignors to Shape Inc., Biddeford, Me.
Filed Jul. 3, 1991, Ser. No. 725,480
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—430 5 Claims

1. A method for assembling a cassette, comprising the steps of:
(a) conveying a cassette shell base and cassette shell cover along an assembly line;
(b) supplying a first tape reel to a movable member;
(c) moving the movable member;
(d) supplying second and third tape reels to the movable member, adjacent each other but spaced from the first tape reel;
(e) feeding leader supply to the first tape reel;
(f) connecting said leader supply to said first tape reel;
(g) moving the movable member so that the leader supply extends across the second and third tape reels;
(h) connecting the leader supply to the second and third tape reels;
(i) cutting said connected leader supply between the second

and third tape reels from the remainder of said leader supply; and



(j) transferring the first and second tape reels, connected by the leader, from the movable member to the cassette shell base.

5,191,695
METHOD OF RETAINING A TOKEN IN A RING PULL OR LEVER

Andrew P. Pavely, Lower Blunsdon; Roy J. Marr, Newbury; Peter S. Foskett, and David M. White, both of Abingdon, all of United Kingdom, assignors to CMB Foodcan plc, United Kingdom

Filed Oct. 23, 1991, Ser. No. 781,693
Claims priority, application United Kingdom, Oct. 25, 1990, 9023243
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—451 11 Claims

1. A method of retaining a token in a ring pull or lever, said method being characterised by the steps of feeding a strip of material including token portions to a parting station, applying pressure to the strip to part a token from the strip and apply the parted token to the lever or ring pull, and clinching a peripheral portion of the material of the lever or ring pull into engagement with the token.

5,191,696
METHOD FOR JOINING ROLLED PLATES

Osamu Kishi; Kanji Hayashi; Hideaki Furumoto; Osamu Miyamoto; Kazuo Morimoto; Hideki Akita; Yasuyuki Yoshida, and Ikuo Wakamoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1991, Ser. No. 774,181
Claims priority, application Japan, Oct. 15, 1990, 2-273219; Oct. 15, 1990, 2-275889; Nov. 7, 1990, 2-299810
Int. Cl.[5] B21D *39/00*
U.S. Cl. 29—521 8 Claims

1. In a method for joining rolled plates in a continuous rolling line wherein the tail end part of a preceding rolled plate and the head end part of a following rolled plate are joined after rough rolling and then subjected to continuous finish rolling, the improvement which comprises

forming the tail end of the preceding rolled plate and the head end of the following rolled plate into a nearly rectangular convex and concave shape so as to inlay each other;

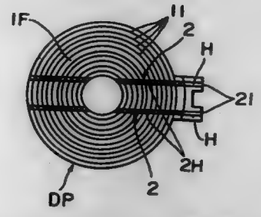
joining the convex part and the concave part in the same plane as the rolling line; and then

subjecting the joined plates to continuous finish rolling.

5,191,697
LOUDSPEAKER DAMPER AND METHOD OF MANUFACTURING THE SAME

Yoshio Sakamoto, Hachioji, and Akihiko Haga, Shinjo, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo and Mogami Denki Kabushiki Kaisha, Yamagata, all of Japan

Filed Oct. 4, 1991, Ser. No. 770,861
Claims priority, application Japan, Oct. 5, 1990, 2-267872
Int. Cl.[5] H04R *31/00*
U.S. Cl. 29—594 5 Claims



1. A method of manufacturing a loudspeaker damper having the steps of varnishing a woven cloth with thermosetting resin and drying the varnished woven cloth into a semi-dry state, attaching a conductive material to the surface of the varnished woven cloth in a semi-dry state and thermally molding the woven cloth with the conductive material to form concentric corrugation along which the conductive material used as a conductive wire for a voice signal is formed, wherein said method comprising the step of:

after attaching said conductive material to said varnished woven cloth in a semi-dry state, coating creamy solder to said conductive material at a predetermined area, melting said creamy solder by the heat at said thermal molding step to form preparatory solder at the end portion of said conductive material.

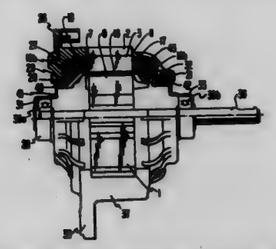
5,191,698
METHOD OF MAKING A RESIN-MOLDED MOTOR

Masatomo Sumi; Shigeo Inaki, both of Takefu; Yutaka Takamiya, Osaka, and Genki Kondo, Takefu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 406,356, Sep. 12, 1989, Pat. No. 5,134,327. This application Jun. 2, 1992, Ser. No. 878,610
Claims priority, application Japan, Sep. 14, 1988, 63-230446
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—596 1 Claim

1. A method of producing a resin-molded motor comprising disposing a punched-out stator member with independent magnetic poles between a couple of units of punched-out core

member with magnetic poles interconnected at inner edges of its slots to form a ring, laminating said members, cladding said slots, inner edges and ends of the assembly by resin molding for insulation and bonding to fabricate a magnet pole member, forming a generally cylindrical synthetic resin shroud, the inner diameter of which is equal to that of the magnetic pole member and the outer diameter of which is equal to that of the insulation layer at the bottom of the slot, with the inner and outer diameters being tapered toward the tip, with the length of the shroud being slightly greater than the length of the coil end, applying windings to said magnetic pole member, con-

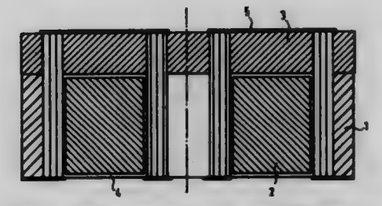


necting the coil ends of windings to connector terminals, inserting wedges, fitting projections of a yoke member having cut-out groves for passage of resin along its outer periphery into the slot openings of the magnetic pole member to form a stator, disposing a separately molded shroud of the same shape as the first-mentioned shroud at the other end face of said magnetic pole member, disposing a sheet steel bracket with journal means for supporting a bearing for a rotor at the end of such shrouds, applying windings to said stator, connecting coil ends of said windings to connector terminals, and forming a frame for housing said stator, windings, shrouds and brackets and said connector in an integral unit by resin molding.

5,191,699
METHODS OF PRODUCING A CHIP-TYPE HF MAGNETIC COIL ARRANGEMENT

Michael Gaudmeier, Grafenhaun, and Horst Wünschmann, München, both of Fed. Rep. of Germany, assignors to GW-Elektronik GmbH, München, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,587
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4027994; European Pat. Off., Apr. 12, 1991, 91105864
Int. Cl.[5] H01F *41/04*
U.S. Cl. 29—602.1 22 Claims



1. A method of producing a chip-type HF magnetic coil arrangement, comprising the steps of:

locating a toroidal magnetic core within an annular opening in an insulating basic body (1), the annular opening corresponding to a size of the toroidal magnetic core, the basic body having a bottom side and being composed of an embedding plastic material, the core extending about an axis and in an axial direction;

attaching a cover to the basic body for enclosing the core;

providing a first plurality of holes which extend through the basic body in the axial direction of the core so that the holes extend radially outside of the core and providing a second plurality of holes which extend through the basic body in the axial direction of the core so that the holes extend radially inside of the core; and

forming at least one winding which extends around the core in turns, the step of forming including

extending an electrically conductive material (8) within each of first and second plurality of holes and fully between the cover and the bottom side of the basic body;

providing a first plurality of conductors (5) on the bottom side of the basic body each being arranged for electrically connecting the conductive material within respective ones of the first and second plurality of holes; and

providing a second plurality of conductors on the cover each being arranged for electrically connecting the conductive material within respective ones of the first and second plurality of holes,

whereby the steps of providing the first and second pluralities of conductor elements include arranging the first and second plurality of conductors in an arrangement which, together with the conductive material within the first and second plurality of holes, constitute the turns of the at least one winding.

5,191,700
METHOD FOR MAKING PACKETS OF AMORPHOUS METAL STRIP FOR TRANSFORMER-CORE MANUFACTURE

Willi Klappert, and David R. Freeman, both of Hickory, N.C., assignors to General Electric Company, Malvern, Pa.

Continuation of Ser. No. 626,213, Dec. 12, 1990, Pat. No. 5,063,654. This application Aug. 1, 1991, Ser. No. 739,341
Int. Cl.[5] H01F *41/02*
U.S. Cl. 29—609 8 Claims

1. A method of making packets of amorphous metal strip adapted to be wrapped about the arbor of a transformer-core-making machine, each packet comprising a plurality of groups of strip, each group comprising many thin layers of strip, each layer having two longitudinally-extending edges at opposite sides of the layer and two-transversely extending edges at opposite ends of the layer, the longitudinally-extending edges at each side of the layers of each group being substantially aligned and the transversely-extending edges at each end of the layers in each group being substantially aligned, said method comprising:

(a) providing composite strip comprising many thin layers of amorphous metal strip stacked in superposed relationship,

(b) cutting said composite strip a first time to form a first multi-layer section of predetermined length,

(c) cutting said composite strip a second time to form a second multi-layer section of predetermined length,

(d) substantially aligning said multi-layer sections to form from said substantially aligned multi-layer sections one of said groups, and

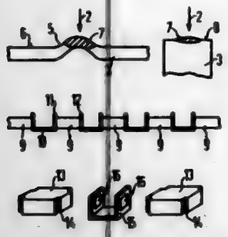
(e) carrying out the cutting steps of (b) and (c) hereinabove with blades capable of cutting only a predetermined maximum number of said layers of amorphous metal strip without causing the life of the blades to sharply drop, said maximum number being less than the number of layers in each group but greater than the number of layers cut in each of steps (b) and (c).

5,191,701

METHOD FOR THE AUTOMATED MANUFACTURE OF WOUND ELECTRICAL COMPONENTS BY CONTACTING THIN INSULATED WIRES TO TERMINAL ELEMENTS ON THE BASIS OF LASER WELDING

Manfred Espenhain, Heidenheim, Fed. Rep. of Germany, assignor to Siemens Matsushita Comp. GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 3, 1991, Ser. No. 802,048
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1990, 4039527
Int. Cl.[5] B23P *17/00*; H01F *7/06*; H01R *43/02*
U.S. Cl. 29—605 14 Claims



1. A method for automated manufacture of wound electrical components wherein thin insulating wires are attached to terminal elements, comprising the steps of:

by laser welding, melting only the terminal element so as to form a welding spot by direct laser irradiation at a location desired for the welding; and

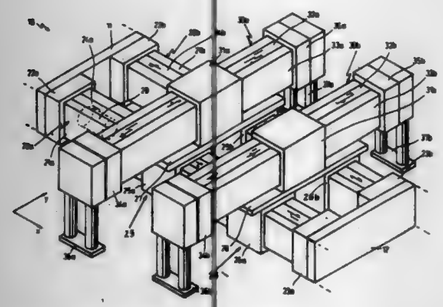
subsequently embedding the wire into the welding spot as soon as the welding spot has cooled to such an extent that the wire subsequently melts only superficially.

5,191,702

MANIPULATING APPARATUS FOR MANIPULATION OF WORKPIECES

Wolf-Dieter Goedecke, Unterkirnach; Bernhard Moosmann, Hardt, and Ralf Huber, Brigachtal, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 25, 1991, Ser. No. 646,147
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002075
Int. Cl.[5] H05K *3/30, 13/04*
U.S. Cl. 29—742 14 Claims



1. A manipulating apparatus comprising

a first individual axis element;

a second individual axis element disposed parallel relative to the first individual axis element and forming with the first individual axis element a first linear axis element;

a first double slider furnished at and engaging the first linear axis element, wherein the first double slider runs on profiles of the first individual axis element and of the second individual axis element;

a second drive means formed at the second individual axis element, wherein the first double slider is coupled to the second drive means and runs non-driven on the profile of the first individual axis element;

a second double slider running on the profile of the first individual axis element and non-driven on the profile of the second individual axis element;

a first drive means formed at the first individual axis element, wherein the second double slider is coupled to the first drive means,

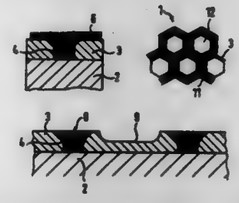
wherein the first individual axis element is formed by a first piston-cylinder unit without piston rod and including a first piston, and wherein the second individual axis element is formed by a second piston-cylinder unit without piston rod and including a second piston, wherein the first double slider is connected to the second piston via a second belt, and the second double slider is connected to the first piston via a first belt, wherein the second belt of the second individual axis element is connected at a defined position to the first double slider and runs loosely through a second passage of the second double slider, wherein the first belt of the first individual axis element is connected at a defined position with the second double slider and runs loosely through a first passage of the first double slider.

5,191,703

METHOD OF MAKING AN ANILOX ROLLER OR CYLINDER

Thomas John, Augsburg, Fed. Rep. of Germany, assignor to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 19, 1991, Ser. No. 762,582
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1990, 4036661
Int. Cl.[5] B21B *31/08*; B41F *31/26*
U.S. Cl. 29—895.32 16 Claims



1. A method of making an anilox roller or cylinder, for use in an inker of a rotary printing machine, in which the anilox roller or cylinder (1) has

a roller or cylinder core (2);

ribs (8) of wear-resistant material projecting from the core;

a layer (3) of ink accepting material between the ribs, located on the core (2) and formed with ink accepting receptor depressions or cells (9) which extend only through a portion of the thickness of said layer,

said method comprising, the steps of

applying a layer (3) of ink accepting material on a core (2) with a thickness which exceeds the depth of the receptor depressions or cells (9) to be formed on said ink accepting layer;

forming grooves (4) in said layer (3) of ink accepting material;

filling said grooves (4) with said wear-resistant material, thereby forming said ribs (8); and

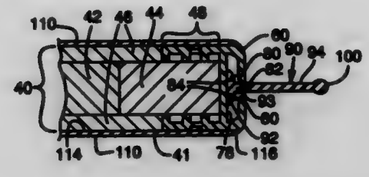
forming said receptor depressions or cells (9) in said layer (3) of ink accepting material in the regions between the ribs.

5,191,704

INSULATING INDUSTRIAL DOOR MANUFACTURING METHOD

Lon H. McCarty, Estacada, Oreg., assignor to Ecoso Max Manufacturing, Gresham, Oreg.

Division of Ser. No. 638,843, Jan. 8, 1991. This application Feb. 27, 1992, Ser. No. 843,613
Int. Cl.[5] B23P *19/00, 25/00*
U.S. Cl. 29—897.32 11 Claims



1. A method of making a door comprising:

mounting an edge rail to at least one peripheral edge section of a core of a door, the core having first and second opposed major surfaces;

mounting first and second face sheets to the respective first and second major surfaces, the face sheets being sized to extend beyond the edge rail with the edge rail positioned therebetween; and

cutting the face sheets along the edge of the rail to define the edge of the door.

5,191,705

COMBINATION FOR REMOVABLY SUPPORTING A MAGNETIC TRANSDUCER CARRYING ARM

Eyvand E. Toensing, Savage, Minn., assignor to Seagate Technology Inc., Scotts Valley, Calif.

Division of Ser. No. 444,622, Dec. 1, 1989, Pat. No. 5,012,367.
This application Jan. 14, 1991, Ser. No. 641,164
The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—764 20 Claims

1. In combination:

a support arm including a hole defined in the support arm creating a first passageway therethrough;

a transducer carrying arm for carrying a magnetic transducer for reading and writing magnetically encoded information, the transducer carrying arm having a hole therein for creating a second passageway therethrough;

a ball stake connector for mounting the support arm to the transducer carrying arm, the ball stake connector including a mounting plate joined to the carrying arm and sandwiched between the transducer carrying arm and the support arm and a tubular member extending from the mounting plate into the first passageway for ball stake connection to the support arm;

opposing surfaces of the support arm and the mounting plate defining tool insertion gaps between the transducer carrying arm and the support arm for use in disengaging the ball stake connector; and

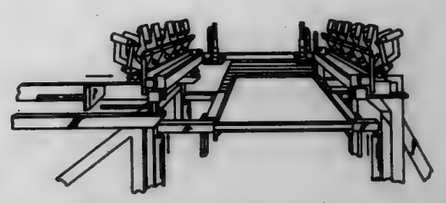
a tool adapted for being received in the tool insertion gaps wherein opposing surfaces of the support arm and the mounting plate receive a separation force from the tool to cause separation of the transducer carrying arm and the support arm.

5,191,706

MACHINE AND METHOD FOR ATTACHING CASING TO A STRUCTURAL FRAME ASSEMBLY

Marvin P. Coulon, Dover, Del., assignor to Delmarva Sash & Door Company of Maryland, Inc., Barclay, Md.

Filed Jul. 15, 1991, Ser. No. 730,223
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—787 43 Claims



1. A machine for attaching casing to a structural frame assembly, said machine comprising:

a support frame assembly;

a fixed bank of stapling units supported by said support frame assembly, said fixed bank including

a fixed bank pivot bar rotatably supported by said support frame assembly,

at least one fixed bank stapling unit, attached to said fixed bank pivot bar, for driving staples to attach said casing to said structural frame assembly,

fixed bank clamping means for clamping said casing adjacent said structural frame assembly during the stapling of said casing to said structural frame assembly, said fixed bank clamping means being attached to said fixed bank pivot bar, and

a fixed bank jamb locator fixedly supported by said support frame assembly;

a movable bank of stapling units spaced from and oriented substantially parallel to said fixed bank of stapling units and including

support bars slidably supported by said support frame assembly,

a movable bank pivot bar rotatably supported by said support bars,

a movable bank jamb locator fixedly supported by said support bars,

at least one movable bank stapling unit, attached to said movable bank pivot bar, for driving staples to attach said casing to said structural frame assembly,

movable bank clamping means for clamping said casing adjacent said structural frame assembly during the stapling of said casing to said structural frame assembly, said movable bank clamping means being attached to said movable bank pivot bar, and

means for reciprocally sliding said support bars relative said support frame assembly;

a head bank of stapling units located at one end of said fixed and movable banks of stapling units and including

a head bank pivot bar rotatably supported by said support frame assembly,

a head bank stapling unit, attached to said head bank pivot bar, for driving staples to attach said casing to said structural frame assembly, and

head bank clamping means for clamping said casing adjacent said structural frame assembly during the stapling

of said casing to said structural frame assembly, said head bank clamping means being attached to said head bank pivot bar; and

means for controlling and activating said sliding means of said movable bank, all of said stapling units and all of said clamping means;

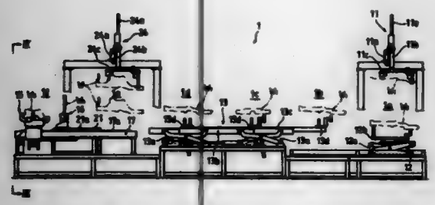
wherein said jamb locators are designed and positioned to receive and engage the structural frame assembly.

5,191,707

WORKING LINE FOR REAR FLOOR OF VEHICLE

Hiroshi Sasamoto, and Keizaburo Ohtaki, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1991, Ser. No. 790,037
Claims priority, application Japan, Nov. 28, 1990, 2-326468
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—783 3 Claims



1. A working line for a rear floor of a vehicle for assembling the rear floor by combining a rear frame, rear wheel housings and a rear panel to a rear floor panel, said working line comprising:

a first setting station for setting the rear floor panel on the rear frame;

a combining station for combining the rear floor panel to the rear frame;

an assembling station for assembling the rear floor by combining the rear wheel housings and the rear panel to the combined rear floor panel and rear frame;

a second setting station, said first setting station through said second setting station being disposed in the order described above from a starting end towards a finishing end of said working line;

right and left first setting means, which are reciprocated between said second setting station and said assembling station for assembling the rear wheel housings, which are preliminarily set to said right and left setting means in said second setting station to the rear floor panel when said first setting means are advanced to said assembling station;

second setting means which is provided within a space defined by said right and left first setting means and is reciprocated between said second setting station and said assembling station, for assembling the rear panel, which is preliminarily set to said second setting means in said second setting station, to the rear floor panel when said second setting means is advanced to said assembling station; and

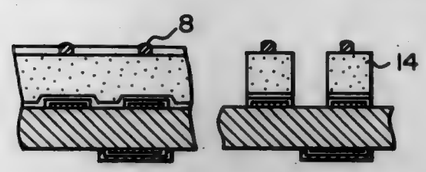
discharging means for hanging the assembled rear floor and passing it out of said assembling station.

5,191,708

MANUFACTURING METHOD OF A PROBE HEAD FOR SEMICONDUCTOR LSI INSPECTION APPARATUS

Susumu Kazukabe, Yokohama, and Ryuichi Takagi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1991, Ser. No. 711,864
Claims priority, application Japan, Jan. 20, 1990, 2-159734
Int. Cl.[5] H05K *3/02*
U.S. Cl. 29—846 27 Claims



1. A manufacturing method of a probe head for a semiconductor LSI inspection apparatus which transmits an electric signal to an inspection apparatus body by coming in contact with electrode pads of a semiconductor LSI, the probe head having probes, comprising the steps of:

providing a wiring substrate in which electrode pads for forming probes are arranged on one surface, electrode pads for transmitting an electric signal between the inspection apparatus and the electrode pads of said LSI are arranged on an underside thereof, and the pads on said both sides are interconnected electrically;

forming a conductive attaching layer for improving attaching strength on the electrode pads for forming said probes;

forming a conductive lower layer, having a thickness almost corresponding to a height required for the probes, on said wiring substrate including said conductive attaching layer;

forming a first mask pattern in which openings in the first mask pattern are aligned on a central axis of electrode pads for forming said probes;

forming a probe tip-forming conductive upper layer in said first mask pattern;

removing said first mask pattern on said conductive lower layer;

forming a second mask pattern which covers both said probe tip-forming conductive upper layer and said conductive lower layer, a central axis of the second mask pattern being made to coincide with that of said electrode pads;

forming a pin configuration by applying etching to said conductive lower layer with said second mask pattern as a mask, exposing portions of the conductive attaching layer;

removing the exposed portions of said conductive attaching layer by etching; and

removing the second mask pattern which covers said probe tip forming conductive upper layer.

5,191,709

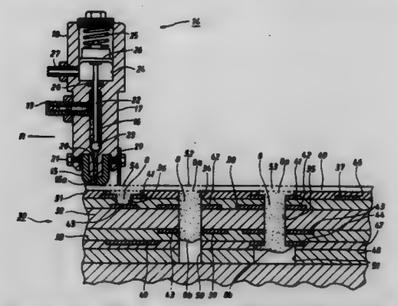
METHOD OF FORMING THROUGH-HOLES IN PRINTED WIRING BOARD

Shin Kawakami; Satoshi Haruyama, and Hirotaka Okonogi, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Aug. 2, 1991, Ser. No. 739,706
Claims priority, application Japan, Aug. 10, 1990, 2-213150
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] H01K *3/10*
U.S. Cl. 29—852 4 Claims

1. A method for filling through-holes in a printed wiring board having printed circuits formed on both sides of a substrate, and through-holes in the substrate for interconnecting the printed circuits on both sides thereof, the method comprising the steps of:

mounting and setting said substrate on the upper side of a cover plate while aligning said individual through-holes of the substrate with relief holes of the cover plate and mounting and setting a mask on the upper side of said substrate while aligning the through-holes of the mask with said individual through-holes of the substrate, and



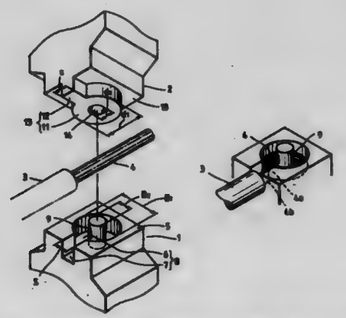
then injecting and filling a conductive material into the individual through-holes of said substrate from a filling nozzle through the individual through-holes of said mask and removing the excessive part of the conductive material filled in the individual through-holes of said substrate by the use of a squeegee.

5,191,710

METHOD OF FORMING AN ELECTRODE UNIT

Hirohiko Fujimaki, and Kazuhito Sano, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 31, 1991, Ser. No. 815,181
Claims priority, application Japan, Jan. 8, 1991, 3-11554
Int. Cl.[5] H01R *43/04*
U.S. Cl. 29—863 15 Claims



1. A method of forming an electrode unit comprising the steps of:

setting a conductor of electric wire in an electric wire housing groove of a female pressing electrode in such a manner that said conductors are wound on a guide pin of said female pressing electrode;

compressing said conductor by supplying said female pressing and a male pressing electrodes with compression; and

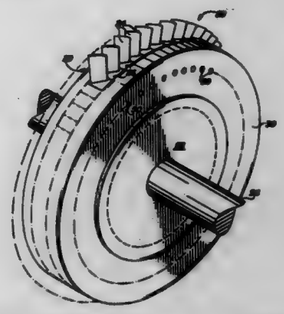
heating said conductors by applying an electric current to said female pressing and said male pressing electrodes.

5,191,711

COMPRESSOR OR TURBINE BLADE MANUFACTURE

Thomas E. Vickers, Mesa, and James A. Sanger, Prescott, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 23, 1991, Ser. No. 812,776
Int. Cl.[5] B23B *1/00*
U.S. Cl. 29—889.21 8 Claims



1. A method of machining compressor or turbine blade outer diameters comprising:

loosely assembling an annular array of blades upon the outer periphery of a rotor, with platform portions of the blades protruding axially forwardly and aft from opposite sides of the rotor;

mounting first and second ring fixtures on the opposite sides of the rotor;

axially intersecuring the ring fixtures to axially fix and locate the blades;

applying a generally circumferentially uniform radially outward force to the protruding platform portions of the blades to radially position and fix the blades; and

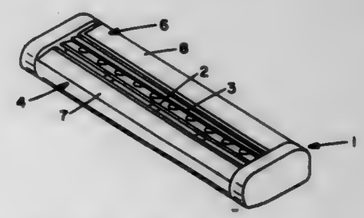
machining the outer tips of the blades while so axially and radially fixed.

5,191,712

SAFETY RAZORS AND GUARDS

Alan Crook, Basingstoke; Oliver D. Oglesby, Tadley, and Brian Oldroyd, Reading, all of England, assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 659,430, May 16, 1991, abandoned.
This application Sep. 11, 1992, Ser. No. 943,993
Claims priority, application United Kingdom, Oct. 28, 1988, 8825268
Int. Cl.[5] B26B *19/42*
U.S. Cl. 30—34.2 13 Claims



1. A safety razor having one or more blades and a skin engaging surface wherein said surface is formed by a plurality of upstanding straight filaments said filaments extending throughout their length away from said surface, said filaments present at a density of at least 100 per sq. mm, the filaments having a uniform length of 0.3 to 2.00 mm and diameters in the range of $(1.5 \text{ to } 3.2) \times 10^{-2}$ mm.

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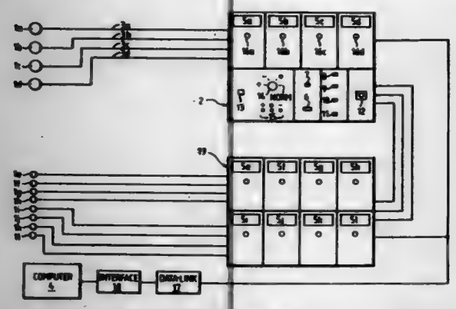
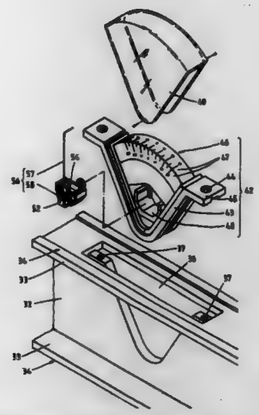
5,191,713
ELECTRONIC TILT MEASURING SYSTEM
Robert M. Alger, Hampshire, and Joseph S. Falzon, deceased, late of Hampshire, England by Leonora Falzon, administratrix , assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
PCT No. PCT/GB88/01064, § 371 Date Jul. 12, 1991, § 102(e) Date Jul. 12, 1991, PCT Pub. No. WO89/05961, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 2, 1988, Ser. No. 555,422
Claims priority, application United Kingdom, Dec. 16, 1987, 8729382
Int. Cl.[5] G01C 9/06
U.S. Cl. 33—366 21 Claims



1. A means for measuring relative tilt of one or more platforms to a nominated datum platform, comprising at least one inclinometer per platform and characterised in that it further comprises:
a) means to average each inclinometer output over a synchronised time period; and
b) a computer programmed to analyse measured data, calculate tilt angles and relative tilts and display the results.

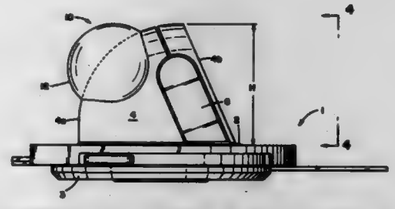
5,191,714
PROTRACTOR
Wun-hui Liu, No. 2, Jiann Guoo Lane, Jiuan Huon Li, Taichung, Taiwan
Filed May 22, 1992, Ser. No. 886,901
Int. Cl.[5] G01C 9/12
U.S. Cl. 33—391 2 Claims

1. A protractor comprising;
a main body having a center beam,
an upper elongated board and a lower elongated board respectively integrally engaged to an upper edge and a lower edge of said beam,
said upper elongated board and said lower elongated board having a width greater than a width of said center beam,
said upper elongated board having a rectangular hole communicating with a first V-shaped hole in said beam,
a V-shaped frame having two arms joined together at a first end of each of said two arms,
a slot on an outer surface of said each of said two arms,
an arc piece having a first scale marked on a side of said arc piece and a second scale marked on a top of said arc piece,
said arc piece engaged to a second end of said each of said two arms,
said V-shaped frame having a seat integrally engaged between said first end of each of said two arms,
said V-shaped frame fastened in said rectangular hole and said first V-shaped hole so that a rim of said first V-shaped hole extends into and engages said slot of said each of said two arms,
an indicating means having a shaft base engaged in said seat, a pointer pivotally mounted on a shaft engaged on said shaft base,



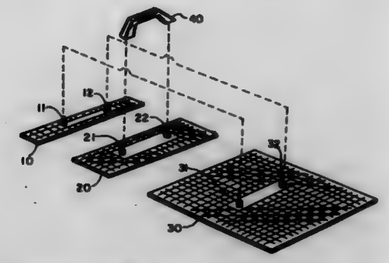
said pointer having a first end extending to reach over said first scale and said second scale and a second end with a balancing weight.

5,191,715
DRAFTING HEAD FOR A DRAFTING MACHINE
Uwe Jopt, Wilhelmshaven, Fed. Rep. of Germany, assignor to Franz Kuhlmann Prazisions-Mechanic und Maschinenbau GmbH & Co. K.G., Wilhelmshaven, Fed. Rep. of Germany
Filed Aug. 6, 1991, Ser. No. 740,806
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025886
Int. Cl.[5] B43L 13/08
U.S. Cl. 33—438 16 Claims



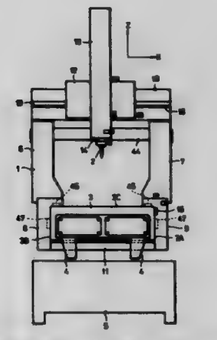
1. Drafting head for a drafting machine, comprising a gripping member having several actuating elements arranged on the gripping member and capable of being actuated by a hand of the user that is resting on the gripping member for the purpose of executing various switching statuses, including disengaging, and/or free-switching, secured locking of the normal side and releasing the locking of the normal side of the drafting head, wherein at least one actuating element is provided for disengaging and/or free-switching the normal side of the drafting head, and one actuating element for locking the normal side of the drafting head and wherein the actuating element for locking is disposed on the gripping member such that it rests against the inner surface of the ball of the thumb of the user hand that is to be rested on the gripping member.

5,191,716
TOOL FOR MEASURING, MARKING AND CUTTING FABRIC MATERIALS
James E. Anderson, 832 S. Ashland, LaGrange, Ill. 60525
Filed Jun. 29, 1992, Ser. No. 905,322
Int. Cl.[5] B43L 13/00
U.S. Cl. 33—483 11 Claims



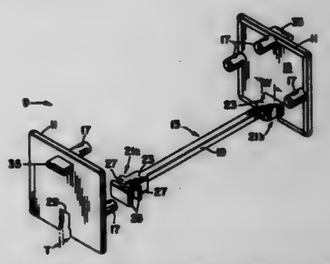
1. A tool for holding fabric or similar material comprising:
a C-shaped handle;
a plurality of selectively interchangeable rectangular sheets of transparent material and of different sizes each including first and second connecting means for connecting said sheet to said handle;
said handle further including two receiving means to receive said connecting means of each of said transparent sheets;
said first and second connecting means adapted to be engaged by said two receiving means;
a plurality of indicia marked on said transparent sheets;
said handle readily detachable, or in the alternative attachable to each of said plurality of sheets separately.

5,191,717
COORDINATE MEASURING INSTRUMENT
Matsutro Fujitani, Kawasaki; Hideo Takaku, Tokyo, and Yukiji Yoda, Kawasaki, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 917,942, Sep. 19, 1986, Pat. No. 4,727,653. This application Sep. 8, 1987, Ser. No. 94,440
Claims priority, application Japan, Jan. 22, 1985, 60-7546; Jan. 25, 1985, 60-12249
Int. Cl.[5] G01B 5/03, 7/03
U.S. Cl. 33—503 4 Claims



1. In combination with a coordinate measuring machine of the type including a base having a table portion spaced above a base portion; a bridge having a pair of spaced vertical members an upper cross member connecting together said vertical members, above said table portion, and a lower cross member connecting together said vertical members below said table portion; a probe; means mounting said probe for horizontal and vertical motion relative to said upper cross member; and means for supporting said bridge for movement on said base in a horizontal direction orthogonal to said probe horizontal movement on said bridge, the improvement comprising:
a guide rail located along the central axis of said base and applied to said table portion; and means, carried by the central section of said lower cross member for acting on said guide rail to guide movement of said guide rail and said bridge on said support means as said bridge moves in the horizontal direction along the central axis of said base.

5,191,718
MASONRY BLOCK SPACER TOOL
Robert E. Fox, St. Clair Shores, Mich., assignor to Trend Products Inc., Warren, Mich.
Filed Apr. 3, 1992, Ser. No. 862,723
Int. Cl.[5] G01B 3/30, 5/14; F04G 21/18, 17/075
U.S. Cl. 33—526 12 Claims



1. In a masonry block spacer tool for holding glass blocks in proper spaced alignment during construction of a panel or wall being formed of said blocks, said spacing between said blocks being fillable with mortar and said tool including a pair of opposing plate-like base members having opposite, opposing faces, a plurality of pin-like projections extending from each said opposing face toward the other opposing face of said other plate-like base member, said pin-like projections being so arranged on each of said opposing plate-like base members and of such a size and location so as to project into said spacing fillable with said mortar, but not to displace any significant portion of said mortar if, and when, said spacing is filled therewith, and so as to receive and retain opposing corner surfaces of said blocks, each said pin-like projection extending from one of said opposing faces having a substantially co-axially aligned corresponding pin-like projection extending from the other of said opposing faces, thereby to properly space and align said block with respect to each other, and means for firmly securing said spacing and alignment of said blocks which includes for each pair of said opposing plate-like base members, a cross-member means sufficiently thin so as not to displace a significant portion of said mortar if, and when, the spacing in which it resides is filled with said mortar, and aperture means located in one half and approximate horizontal center of each of said opposing faces and aligned with the other, said cross-member means being fastenable in said aperture means thereby to tightly secure said spacing and alignment of said blocks, the improvement comprising, as said cross-member means an integral elongated member having at each of its ends means for securing said member in said aperture means, said member extending inwardly therefrom and through said aperture means thereby to form one of said pin-like projections extending from each said opposing face toward the other opposing face of said other plate-like base member.

adsorbing moisture which passes through said apertures from and sugar cane manufacturing processes for use in animal

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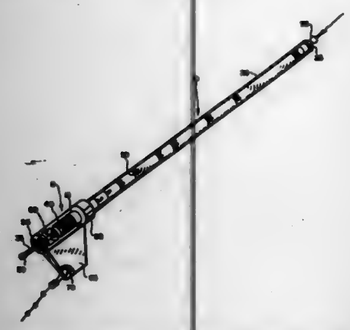
5,191,719

DEPTH GAUGE FOR A FISHING LINE

Steve B. Kitt, 1245 26th St., Ogden, Utah 84401

Filed Oct. 21, 1991, Ser. No. 780,154
Int. Cl.[5] G01B 3/02
U.S. Cl. 33—719 6 Claims



1. A method of submerging baits and lures at desired depths in a body of water for trolling for fish, wherein a fishing line is towed extending rearwardly from a towing vessel, comprising the steps;

providing a fishing line having an elongate water depth gauge secured at an end thereof selectively carrying baits and lures;

towing the line through the body of water;

withdrawing the line from the water to determine the depth of submersion of the baits and lures by reading of the gauge;

adjusting one or more conditions known to effect the depth of submersion, selected from among a group of conditions including the speed of the vessel and the weight of the baits and lures, and trolling the line, bait and lure, and gauge again through the water;

repeating the trolling, withdrawing, gauge reading and adjusting steps until the desired depth of submersion is indicated by the gauge; wherein

the water depth gauge comprises

an elongate light transmitting tube, having an opening extending longitudinally therethrough and having one end closed;

valve means allowing water to enter the open end of the tube when the external water pressure exceeds the pressure therewithin, and preventing the escape of air and water therefrom when the internal pressure exceeds the external pressure;

scale means carried by the tube, indicating the depth of submersion in accordance with Boyle's Law;

reset means for releasing the water and pressure contained in the tube; and

attachment means for securing the gauge to the lure and bait end of the fishing line.

5,191,720

SPOT WELDING INSPECTING APPARATUS

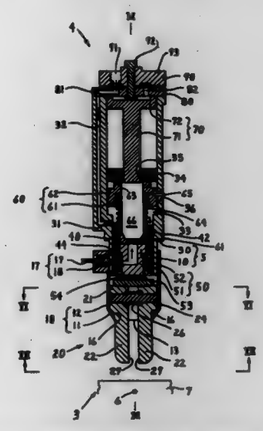
Yoshimi Miura, 5-16, Itsukaichi 2-chome, Saeki-ku, Hiroshima-shi, Hiroshima-ken 731-51, Japan, and Masaaki Miura, 12-35, Miyauchi 1-chome, Hatsukaichi-shi, Hiroshima-ken 738, Japan

Filed Oct. 2, 1991, Ser. No. 771,320
Claims priority, application Japan, Oct. 3, 1990, 2-267107; Feb. 3, 1991, 3-35673
Int. Cl.[5] G01B 5/00
U.S. Cl. 33—785 5 Claims

1. An inspection apparatus for spot welds, comprising:

an elongated tubular casing having a central longitudinal axis, said casing comprising a cylinder and a front cover at the front end of said cylinder, said front cover having tapered internal surfaces which are disposed symmetrically with each other with respect to said central longitudinal axis;

a pair of laterally spaced-part symmetrical knife gauges projecting frontwardly from said front cover and mounted for lateral movement toward and away from each other, said knife gauges having rear end surfaces and portions engaging said tapered surfaces for lengthwise



movement therealong whereby to change the lateral spacing between said knife gauges;

an air-operated hammer disposed inside said casing for continually applying forcible strokes to said rear end surfaces of said knife gauges;

a valve case disposed inside said cylinder for selectively supplying air for operating said hammer; and

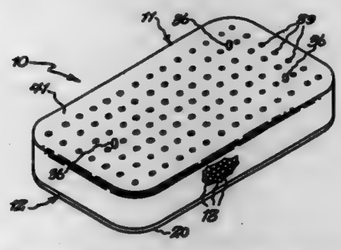
a piston for applying pressure to said hammer when said valve case is not supplying air for operating said hammer.

5,191,721

MICROWAVE REGENERABLE DESICCANT CARTRIDGE

Samuel A. Incorvia, Tonawanda, and Joseph L. Iwaniszek, Lancaster, both of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Sep. 30, 1991, Ser. No. 767,490
Int. Cl.[5] F26B 3/34
U.S. Cl. 34—1 P 17 Claims



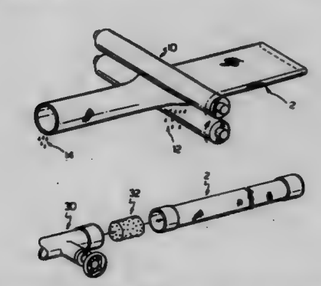
1. A microwave regenerable and reusable desiccant cartridge comprising a casing fabricated of plastic which transmits microwave energy without itself being deleteriously affected, apertures in said casing for permitting communication between the inside of said casing and the environment in which said casing is located, desiccant material within said casing for adsorbing moisture which passes through said apertures from the environment and for being regenerated by microwave energy which drives moisture from said desiccant material through said apertures, said casing having two opposing walls which are larger than the side walls thereof, and said apertures being located in said opposing walls.

5,191,722

METHOD AND ARRANGEMENT FOR DRYING OF FIRE HOSES

Baldev K. Nayyar, Markham; Gabor Kellner, Toronto; Peter Pinchis, Thornhill; Joseph Martinek, Toronto; Anthony Ayuso, Toronto, and Julius Weiss, Toronto, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Province of Ontario, Toronto, Canada

Filed Jan. 22, 1992, Ser. No. 901,945
Int. Cl.[5] F26B 7/00, 5/14
U.S. Cl. 34—12 13 Claims



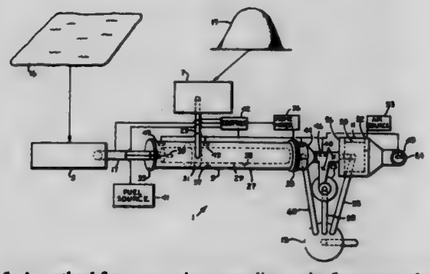
9. A method of drying a fire hose of the type having a fabric outer layer and an inner liner layer, said method comprising compressing the hoses to remove water therefrom, stripping water from the interior of the hose by forcing a plug through each hose with the plug in close contact with said inner liner whereby water on the surface of said inner liner is removed from the hose, and exposing said hoses to a drying arrangement where drying air is circulated about said hoses to remove water by evaporation from said fabric layer.

5,191,723

APPARATUS AND METHOD FOR RECOVERING SPENT LIME FOR USE AS A NUTRITIONAL FLOWING AGENT FOR POULTRY AND ANIMAL FEEDS

William E. Herzog, St. Joseph, Mo., assignor to Herzog Contracting Corporation, St. Joseph, Mo.

Filed Jan. 9, 1991, Ser. No. 639,195
Int. Cl.[5] F26B 7/00
U.S. Cl. 34—12 14 Claims
MICROFICHE APPENDIX INCLUDED
(051920056 Microfiche, Pages)



1. A method for recovering spent lime cake from sugar beet and sugar cane manufacturing processes for use in animal feeds, the steps comprising:

(a) thermally removing excess moisture from a mixture consisting essentially of spent lime from sugar beet and sugar cane manufacturing processes with a dryer;

(b) mechanically breaking down said mixture into its particulate constituents such that some of said particulate constituents become air-borne and some of said particulate constituents remain non-air-borne;

(c) directing said air-borne particulate constituents through a dust collector for collecting said air-borne particulate constituents;

(d) conveying said non-air-borne particulate constituents from said dryer and said particulate constituents collected in said dust collector to a product storage bin; and

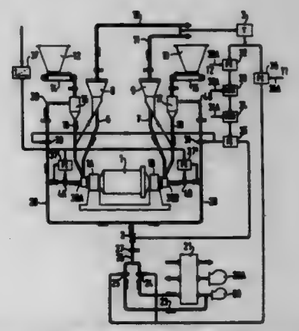
(e) incorporating said particulate constituents as a dry additive to animal feed in sufficient quantity to function as a flowing agent.

5,191,724

METHOD AND A SYSTEM FOR GRINDING AND DRYING A SOLID FUEL

Daniel Fontanille, Rambouillet, France, assignor to Stein Industrie, Velizy-Villacoublay, France

PCT No. PCT/FR91/00180, § 371 Date Oct. 29, 1991, § 102(e) Date Oct. 29, 1991, PCT Pub. No. WO91/14133, PCT Pub. Date Sep. 19, 1991
PCT Filed Mar. 6, 1991, Ser. No. 775,951
Claims priority, application France, Mar. 6, 1990, 90 02804
Int. Cl.[5] F23K 1/00
U.S. Cl. 34—12 2 Claims



1. A method of adjusting the operation of apparatus (1) for grinding a solid fuel material having a variable moisture content, and for drying said material, said apparatus (1) being fed with material via pre-drying means (16, 17) in which there is a gas feed (20, 24, 25) whose temperature can be adjusted over a range, the gas being split into two fractions, one fraction of the gas passing through the grinding apparatus (1) and the other fraction of the gas being sent to the pre-drying means (16, 17), the flow rate Q_1 of the fraction of the gas passing through the apparatus (1) being adjusted to be proportional to the quantity Q_c of material to be ground, the fraction Q_2 of gas passing through the pre-drying means (16, 17) rejoining the fraction Q_1 of gas leaving the apparatus (1) together with the ground material, and all of the gas and ground material being sent via conveyor pipework (10, 11), the temperature T of the gas and the ground material in said conveyor pipework (10, 11) being measured, the temperature of the feed gas being adjusted as a function of the difference between a set temperature T_1 and the measured temperature T in such a manner as to cause the measured temperature T to move closer to T_1, the flow rate of the gas fraction feeding the pre-drying means (16, 17) being adjusted in such a manner that the total gas flow rate Q_4 in the conveyor ducting (10, 11) lies between a minimum flow rate

Q_{Amin} and a maximum flow rate Q_{Amax}, the method being characterized in that a temperature T_2 is set for the mixture of gas and ground material, which temperature is lower than T_1, T_2 depending on the moisture content of the material, and in that when the minimum gas flow rate Q_{Amin} does not suffice for reaching the set temperature T_2 with the temperature of the feed gas raised to the maximum of its range, then the flow rate Q_2 of the gas fraction sent to the pre-drying means (16, 17) is increased by the amount necessary for reaching the temperature T_2.

5,191,725

VENTING SYSTEM FOR HEAT TREATING FLAT MATERIAL WEBS

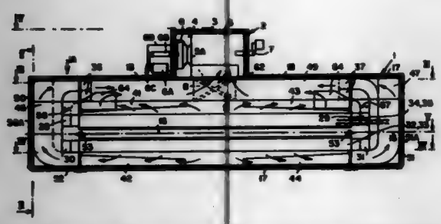
Horst Wohlgemannt, Bregenz, and Adolf Mueller, Weissenberg, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Mar. 22, 1991, Ser. No. 673,803

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1990, 4009313

Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—155 **10 Claims**



1. An apparatus for treating a flat material web with a gaseous treatment medium, comprising means having a central cross-axis (16) for substantially enclosing a treatment chamber, an inlet slot in said housing means for passing a material web into said treatment chamber, an outlet slot in said housing means for withdrawing said material web from said treatment chamber in a defined web motion direction, treatment means arranged for applying said treatment medium to a surface of said material web, said treatment means comprising blowing slot nozzle means for blowing treatment medium onto a surface of said material web, said blowing nozzle means extending across said material web motion direction and having blowing slot nozzles facing said material web, said treatment means further comprising a venting unit (2) including a single blower (6) centrally mounted relative to said housing means, a compression chamber in said venting unit communicating with a blower outlet, a suction chamber in said venting unit communicating with a blower inlet, said treatment means further comprising first flow guide means including two treatment medium mixing chambers (10, 11), one of said mixing chambers being arranged on one side of said single blower, the other of said two mixing chambers being arranged on the other side of said single blower, both mixing chambers being arranged in parallel to said central cross-axis (16) of said housing means on opposite sides of said cross-axis (16), said first flow guide means comprising distribution channels (18, 19, 20, 21; 24, 25, 26, 27) communicating said mixing chambers with said blowing nozzle means (32, 33, 34, 35) in said housing means, said treatment means further comprising suction channel means including suction nozzles communicating with said blowing slot nozzles for removing treatment medium from said web, and second flow guide means leading in said housing means to said suction chamber from said suction channel means for returning treatment medium to said suction chamber, said first and second flow guide means forming together with said single blower a substantially closed treatment medium circulating circuit, and wherein said second flow guide means include a return flow central suction channel (49) leading to said suction chamber, said second flow guide means leading into said central suction channel, whereby used treatment medium must follow a defined suction path in a controlled manner and cannot adversely influence a temperature of incoming treatment medium.

5,191,726

ASYMMETRIC BALLET SHOE AND PAIR OF SUCH SHOES

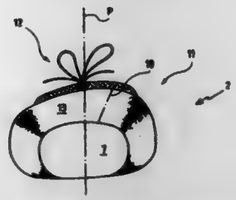
Jean-Marie Vallee, Asnieres, France, assignor to Repetto, Paris, France

Filed Apr. 30, 1992, Ser. No. 876,860

Claims priority, application France, May 3, 1991, 91 05467

Int. Cl.[5] A43B *5/12*

U.S. Cl. 36—88 **6 Claims**



1. Ballet shoe comprising a sole to which is fixed a flexible upper stiffened in a front part up to a substantially flat end, by a vamp covered by said upper and adapted to surround the front part of the foot of a dancer wherein said front part of said upper has on its upper surface a peak line formed by points of maximum height of transverse cross-sections of said front part of said upper which is offset to one side of a longitudinal plane of the shoe, diverging from this plane in the direction away from the end of the shoe, said front part of said upper being joined transversely on the other side of said longitudinal plane to an area forming a flat widening in the direction away from said end, whereby said shoe is specifically intended for a respective foot of a dancer, said peak line being adapted to run along the top of the big toe of the foot in question.

5,191,727

PROPULSION PLATE HYDRODYNAMIC FOOTWEAR

Daniel T. Barry, Ann Arbor; Raymond M. Frederickson; Robert W. Soutas-Little, both of Okemos, and Rak R. Peterson, Grand Rapids, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Continuation-in-part of Ser. No. 510,671, Apr. 18, 1990, Pat. No. 5,052,130, which is a continuation-in-part of Ser. No. 131,309, Dec. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 942,245, Dec. 15, 1986, abandoned. This application Aug. 8, 1991, Ser. No. 743,483

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.[5] A43B *13/18, 13/12, 13/24*

U.S. Cl. 36—107 **22 Claims**

1. An athletic shoe comprising an upper, and a sole assembly attached to said upper;

said sole assembly comprising an outsole, a midsole and a spring plate therebetween, said sole assembly having a heel region with a lateral portion and a medial portion, an arch region and a forefoot region which includes a metatarsal head region and a toe region;

said spring plate extending from beneath the medial portion of the heel region of said shoe, through the arch region of said shoe to and beneath the metatarsal head region and toe region of said shoe;

said spring plate in said heel region extending primarily beneath the medial portion of said heel region and not significantly beneath the lateral portion of said heel region, leaving the lateral portion of said outsole in said heel region in engagement with the lateral portion of said midsole in said heel region;

said midsole having a cavity in said heel region;

a fluid dynamic pad in said cavity extending in both said medial and said lateral portions of said heel region, above said spring plate in said medial region but not said lateral region.

5,191,728

SKI BOOT HAVING A REAR SPOILER, A FRONT CUFF AND A LINKAGE, WHEREIN THE LINKAGE EXTENDS FROM LATERAL SPACED LOCATIONS AT THE SIDES OF THE BOOT TO ANCHORAGE POINTS

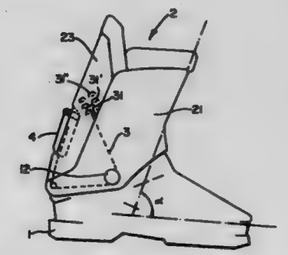
Jean Paris, Sevier, and Claude Perrissoud, Saint-Jorioz, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Mar. 5, 1990, Ser. No. 488,975

Claims priority, application France, Mar. 6, 1989, 89 02891

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—121 **25 Claims**



1. A ski boot comprising:

(a) a shell base having an upper journalled on said shell base around a first transverse axis at two laterally spaced locations, said upper comprising:

(i) at least one cuff having two rearwardly extending lateral extensions; and

(ii) a rear spoiler, said rear spoiler being journalled on said lateral extensions around a second transverse axis, said second transverse axis being spaced apart from said first transverse axis, said rear spoiler comprising anchorage points for said linkage, said anchorage points being located on respective opposite sides of the boot;

(b) an inextensible means extending between said two laterally spaced locations and being in contact with said rear spoiler at at least one location spaced from said second transverse axis, said inextensible means being formed by:

(i) at least two portions of a linkage positioned between said first transverse axis and said anchorage points located on said spoiler; and

(ii) a portion of said linkage on said rear spoiler between said anchorage points; and

(c) means for tensioning said inextensible means comprising a tensioning lever mounted on said rear spoiler, wherein said linkage has a pair of ends which are anchored at a respective one of said anchorage points on said rear spoiler, and wherein said linkage extends around said first transverse axis and is connected to said tensioning lever.

5,191,729

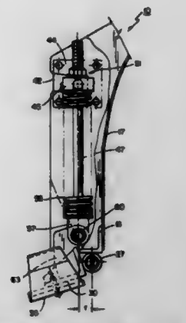
TRIP APPARATUS FOR MOLDBOARD ASSEMBLY

Jan H. Verseef, Clayton, N.Y., assignor to Frink America, Inc., Clayton, N.Y.

Filed Sep. 30, 1991, Ser. No. 767,477

Int. Cl.[5] E01H *5/04*

U.S. Cl. 37—232 **19 Claims**



16. A method of biasing a trip blade unit of a moldboard assembly that includes the steps of

pivotally mounting at least one trip blade unit beneath a moldboard so that the unit rotates between an operative plowing position and a fully tripped position,

holding the unit in the operative position under an initial predetermined moment, and

controlling the moment force acting upon the unit to increase the force from a first initial level to a second higher level and then decrease the force to a third lower level which is less than said first initial level as the trip blade unit moves from said operative position into said fully tripped position.

5,191,730

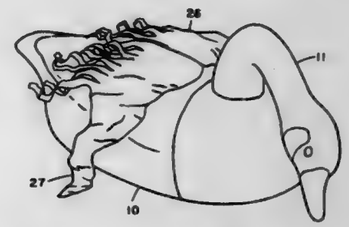
WING ATTACHMENT FOR BIRD DECOYS

Bruce Balmer, 75 Fremont St., P.O. Box 271, Douglas, Mich. 49406-0271

Filed Oct. 2, 1990, Ser. No. 591,949

Int. Cl.[5] A01M *31/06*

U.S. Cl. 43—3 **4 Claims**



1. In combination with a bird decoy, said decoy having a body portion and a head-neck portion, a wing attachment comprising:

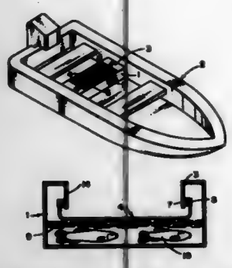
at least one sheet of unreinforced material having a wing configuration having a leading and a trailing edge, said material having a degree of flexiblity such that it is incapable of cantilever self-support, at least a major portion of said sheet normally drooping down about said body portion in the absence of wind action; and

fastening means disposed along said body portion adjacent the top center line thereof, and adapted to secure said sheet of material thereto.

5,191,731
FISHING LURE BODY
Charles E. Petersen, 273 Shore Dr., St. Helens, Oreg. 97051
Filed Sep. 16, 1991, Ser. No. 760,613
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.36 2 Claims

1. In combination,
an elongate member having a fishhook at one end,
a nonmetallic fishing lure body of monolithic construction for attachment to said elongate member, said body including,
a central portion defining an axial opening of a cross section greater than that of the elongate member to receive the elongate member in a loose manner, said axial opening comprising means for allowing rotation of said lure body about said elongate member when the lure body is drawn through the water,
internal wall surfaces of said body defining a slot in communication with said opening, said wall surfaces spaced apart a distance less than the maximum cross sectional dimension of the opening and less than the cross section of the elongate member for retention of the elongate member in said opening, and
said body of a material having a degree of resiliency to permit momentary deformation of the wall surface during lateral passage of the elongate member therealong.

5,191,732
FISHING LIVE WELL COVER DEVICE
Marvin Berdinsky, 3820 Parapet Dr., Cocoa, Fla. 32926; Robert P. Smithwick, II, 250 Spruce Ave.; Michael J. Wilson, 235 Spruce Ave., both of Merritt Island, Fla. 32953, and Charles J. Antetomaso, 585 Parkside Ave., Merritt Island, Fla. 32952
Filed Jul. 8, 1991, Ser. No. 726,890
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—55 9 Claims



1. A device for covering a holding container for fish and aquatic animals comprising:
a plurality of parallel single-layer resilient web-like members spaced apart from each other;
a common connecting border means for said resilient members at each end; and
attachment means on the common connecting border means and matching attachment means on the side wall of the holding container for attaching the common connecting border means to the holding container wherein the attachment means comprises hook and loop fastening material attached to one side of the common connecting border means and matching fastening means on the walls of the holding container.

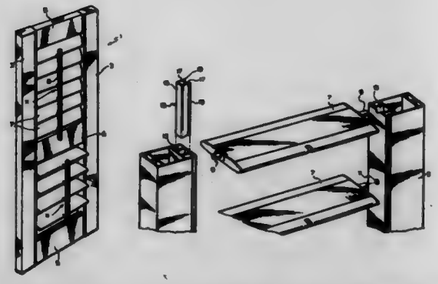
5,191,733
MOLE SPEAR
Virdean N. Withrow, R.R. #1, Box 57, Grandville, Ill. 61326
Filed Apr. 29, 1992, Ser. No. 872,689
Int. Cl.[5] A01M *23/30*
U.S. Cl. 43—124 2 Claims

1. A mole spear which comprises:
a) a base member said base member being a plate having a central aperture with a foot step extending outwardly from one side of said plate, so that a foot of the person can engage with a foot step to further force a plurality of spikes into a mole tunnel;
b) an elongated shaft attached to and extending upwardly from the center of said base member wherein said elongated shaft has a threaded lower end;
c) a sleeve that slides upon said elongated shaft, in which said sleeve is gripped by a first hand of a person;
d) a handle affixed to an upper end of said elongated shaft, in which said handle is gripped by a second hand of the person;
e) said plurality of spikes attached to and extending downwardly from said base member, so that the second hand of the person can press down upon said handle to drive said elongated shaft through said sleeve to force said spikes into a mole tunnel beneath a raised surface of the earth and pierce a mole therein to kill it
said spikes being a pair of U-shaped double spikes;
f) a retainer cap threaded onto said threaded lower end of said elongated shaft, before said threaded lower end is inserted through said central aperture in said plate;
g) a nut threaded onto said threaded lower end of said elongated shaft after said threaded lower end is inserted through said central aperture in said plate, so that said elongated shaft will be secured to said plate; and
h) a second plate having a central aperture, and a plurality of holes, each located at one corner of said second plate, said second plate positioned aligned under said first plate, with each said U-shaped double spike extending through two of said corner holes and sandwiched between said first plate and said second plate, so that said threaded lower end of said elongated shaft will extend through said first central aperture in said first plate and said second central aperture in said second plate with said nut threaded thereon to secure said elongated shaft and said U-shaped double spikes thereto.

5,191,734
BIODEGRADABLE LATEX WEB MATERIAL
Robert E. Weber, Marietta, and Mary L. Delucia, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 24, 1990, Ser. No. 513,656
Int. Cl.[5] A01G *31/00*
U.S. Cl. 47—9 5 Claims

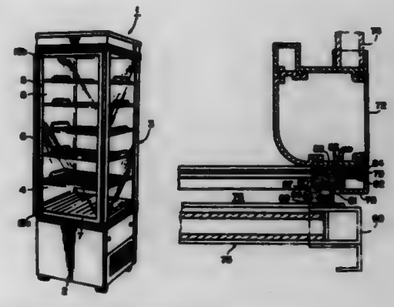
1. An agricultural row cover comprising:
a fibrous web including a plurality of cellulose fibers, said web having a breaking length of at least 0.80 kilometers and no greater than about 6.20 kilometers,
said web being treated with a saturant containing a latex in an add on from about 16 to about 80 dry parts saturant per 100 parts fiber by weight to form a latex web composite, said web composite having an average strength of at least about 50 kg/cm^2 and a ratio of web strength to dry strength ranging from about 0.2 to about 0.6.

5,191,735
MOVABLE LOUVRE CLAMP
Alan Ross, Ontario, Canada, assignor to Dominion Plastics Inc., Woodbridge, Canada
Filed Apr. 6, 1992, Ser. No. 863,878
Int. Cl.[5] E05F *17/00*
U.S. Cl. 49—74 L 3 Claims



1. A louvred structure comprising a frame with opposing first and second styles, each style having an interior side with a plurality of pivot pin openings therethrough, a plurality of pivotal louvres having louvre pins fitted in the pin openings in said styles, at least said first style being hollow and fitted with a flexible louvre pin clamp extending lengthwise therealong, said clamp comprising an elongated body of flexible material defined by a pair of side walls and a clamp base to which said side walls are flexible connected, said side walls having free ends which diverge from one another forming a clamp mouth facing the interior side of and spanning a plurality of the pivot pin openings through said first style, said side walls converging toward one another between said clamp mouth and said clamp base to define a louvre pivot pin grip region narrower than said clamp mouth, said clamp mouth providing a cam guide of said louvre pivot pins into said grip region.

5,191,736
CABINET WITH DOOR SEAL
Katsuyoshi Ilao; Ryoichi Takahashi, both of Maebashi, and Shoji Takeuchi, Gunma, all of Japan, assignors to Sanden Corporation, Gunma, Japan
Continuation of Ser. No. 543,534, Jun. 26, 1990, abandoned, which is a division of Ser. No. 378,029, Jul. 11, 1989, abandoned.
This application Jul. 11, 1991, Ser. No. 729,874
Claims priority, application Japan, Jul. 12, 1988, 63-92183; Jul. 12, 1988, 63-92184; Jul. 12, 1988, 63-92188; Jul. 18, 1988, 63-94078
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—484.1 8 Claims



1. A display case compriaing:
a goods display compartment;
a frame fixedly mounted to said compartment, said frame enclosing an access opening providing access to said compartment, said frame having two inner side surfaces on opposite sides of said access opening generally facing each other;
a door which opens and closes said access opening; and
a seal support plate extending transversely of said access opening between said inner side surfaces, said seal support plate having connected thereto a sealing means for sealing said compartment at a portion of said door, at least one of said seal support plate or said frame inner side surfaces having grooves extending to an outer end thereof, and the other of said seal support plate or said frame inner side surfaces having flange portions extending therealong, whereby said flange portions are fitted into said grooves from said outer end for laterally removably attaching said seal support plate to said frame;
said seal support plate having an opening therethrough; and
said sealing means being connected to said seal support plate and extending substantially around the periphery of said opening therein.

5,191,737
HOLLOW GRINDING FIXTURE
Lowell G. Snoddy, 419 Warner St., N.W., Huntsville, Ala. 35805
Filed Aug. 22, 1990, Ser. No. 570,889
Int. Cl.[5] B24B *3/36*
U.S. Cl. 51—218 R 12 Claims

1. A fixture assembly for retaining a workpiece, such as the edge of a knife, against a grinding device having a grinding element for performing a hollow grinding operation of said edge comprising:
means for supporting said fixture assembly in fixed relation to said grinding device;
an upper and lower plate mounted for relative movement therebetween;
workpiece supporting means mounted on said first of said plates for movement therewith toward and away from said grinding element;

another gear and a rotating speed of said one gear, during

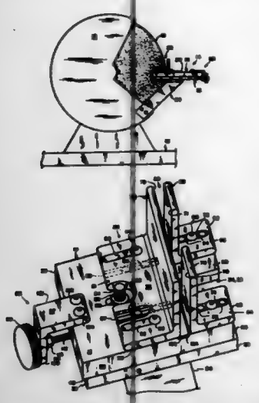
5,191,741

VOL 1148 ISS 2 MR 9 1993 UMI

spring-biased securing means for securing said plates together;

manual adjusting means interconnected between said plates for imparting said relative movement thereto, whereby said workpiece supporting means is disposed for retention of said edge against said grinding element during the grinding operation;

said upper plate being provided with an upper surface having said workpiece supporting means secured thereto and a lower surface having a first guide means disposed thereon;



said lower plate including upper and lower surfaces, said upper surface of said lower plate having a second said guide means disposed thereon for coaction with said first said guide means of said upper plate; and

said workpiece supporting means including a first upstanding support plate secured to said upper plate and second and third upstanding support plates secured in spaced, end-to-end relation on said upper plate, said first support plate being disposed in spaced relation with said second and third support plates to provide a workpiece receiving space therebetween.

5,191,738

METHOD OF POLISHING SEMICONDUCTOR WAFER

Yasuaki Nakazato, Kounoike, and Hiroo Ogawara, Nagano, both of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 539,180, Jun. 18, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 781,644

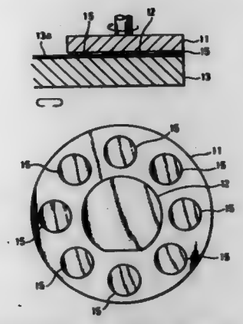
Claims priority, application Japan, Jun. 16, 1989, 1-153748

Int. Cl.[5] B24B *37/04*

U.S. Cl. 51—283 R **14 Claims**

1. In a method of polishing a semiconductor wafer wherein said semiconductor wafer is bonded to the plane of a plate and polished to a desired thickness by pressing said semiconductor wafer against a side of a rotating turntable, the improvement wherein said semiconductor wafer is bonded to a central area of the plane of said plate and a thickness regulating member, at least a surface layer of which is made of a material slower to polish than said semiconductor wafer, is circumferentially arranged around said semiconductor wafer on the plane of said plate in order to control the thickness of said semiconductor wafer, said thickness regulating member has a matrix made of silicon and said surface layer which member has a matrix made of silicon and said surface layer which is formed on said matrix facing the side of said turnable is a silicon oxide film constituting the material, and said semiconductor wafer and said thickness regulating member are pressed against the side of the rotating turntable to polish said semiconductor wafer, said thickness regulating member bearing part of the pressure applied to said semiconductor wafer during the polishing process.

12. In a method of polishing a semiconductor wafer wherein said semiconductor wafer is bonded to the plane of a plate and polished to a desired thickness by pressing said semiconductor wafer against a side of a rotating turntable, the improvement wherein said semiconductor wafer is bonded to a central area of the plane of said plate and a thickness regulating member, at least a surface layer of which is made of a material slower to polish than said semiconductor wafer, is circumferentially



arranged around said semiconductor wafer on the plane of said plate in order to control the thickness of said semiconductor wafer, wherein said thickness regulating member is made of a material selected from the group consisting of quartz, plastic, sapphire and metal and said semiconductor wafer and said thickness regulating member are pressed against the side of the rotating turntable to polish said semiconductor wafer, said thickness regulating member bearing part of the pressure applied to said semiconductor wafer during the polishing process.

5,191,739

METHOD AND APPARATUS FOR LAPPING GEAR TEETH WHILE CHANGING AT LEAST ONE OF LOAD TORQUE, ROTATING SPEEDS AND RATE OF TEETH CONTACT POINT MOVEMENT OF THE GEARS

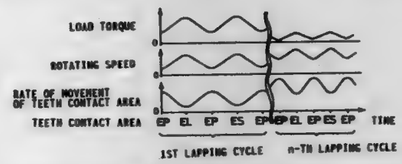
Norihiko Kondo, Okazaki; Mikio Tsuzaki, Nishio, and Yoshinori Miura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 5, 1990, Ser. No. 622,596

Claims priority, application Japan, Dec. 7, 1989, 1-318192

Int. Cl.[5] B24B *37/00*

U.S. Cl. 51—287 **12 Claims**



1. A method of lapping teeth of a pair of gears comprising the steps of:

rotating one of said pair of gears in engagement with another of said pair of gears while applying a load torque to said another gear;

moving said pair of gears relative to each other during the step of rotating such that a teeth contact area of the gears is moved in a direction of width of contacting faces of the teeth of the gears to lap the face of each tooth of the gears over a substantially entire width thereof; and

changing at least one of said load torque applied to said another gear and a rotating speed of said one gear, during the step of moving said pair of gears relative to each other, in a predetermined pattern in synchronization with a movement of said teeth contact area in said direction of width of the contacting faces of the gears.

5,191,740

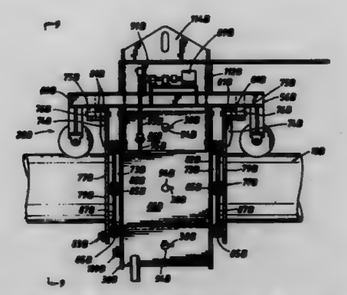
APPARATUS FOR CLEANING PIPE

James L. Rose, Houston, Tex., assignor to E. B. Thomas, Houston, Tex.

Continuation of Ser. No. 646,499, Jan. 28, 1991, Pat. No. 5,107,633, which is a continuation-in-part of Ser. No. 470,819, Jan. 26, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 840,286

Int. Cl.[5] B24C *3/06*

U.S. Cl. 51—429 **13 Claims**



1. A carriage adapted to be supported on the upper surface of a pipe for longitudinal movement along the pipe to clean the outside of the pipe; said carriage comprising:

an upper support frame having rollers for contact with the pipe to support the carriage thereon for travel along the pipe;

a housing having a pair of spaced ends with aligned openings therein adapted to receive the pipe therein, and an outer peripheral wall extending between said ends about said pipe to form a substantially enclosed chamber with said ends about the periphery of said pipe, said housing being divided into sections for fitting about the pipe and having a discharge opening for waste material from the cleaning operation;

means pivotally connecting said housing sections to each other for inward swinging movement relative to said pipe for assembly about said pipe to define said enclosed chamber about said pipe and for outward swinging movement for disassembly from said pipe;

a plurality of nozzles mounted within said housing between said spaced ends and spaced about the periphery of said pipe for the discharge of cleaning material within the enclosed chamber against the outer periphery of said pipe, said nozzles being mounted on said housing sections for pivotal movement therewith when said housing sections are assembled about said pipe and disassembled from said pipe;

means for moving said nozzles in a predetermined pattern relative to the outer periphery of said pipe for cleaning the outer periphery of said pipe;

collecting means adapted to receive said waste material from said discharge opening; and

conduit means between said discharge opening and said collecting means connected to said discharge opening to receive waste material from said cleaning operation.

5,191,741

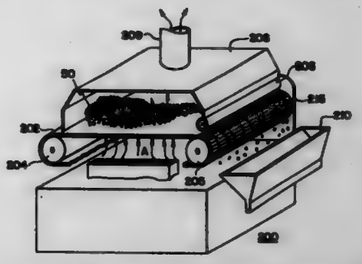
FLUIDIZED BED BOTTLE FILLING SYSTEM

Jay J. Jones, Willow Grove, Pa., assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed Jul. 25, 1991, Ser. No. 735,482

Int. Cl.[5] B65B *1/30, 35/48, 37/16*

U.S. Cl. 53—475 **15 Claims**



1. Apparatus for counting a predetermined number of tablets and transferring the number of tablets to a means for filling bottles, the apparatus comprising:

a tablet bin for retaining a plurality of tablets the tablet bin having a vertical dimension and a lateral dimension;

a plurality of connected slat bars comprising a predetermined number of cavities and a plurality of orifices, the slat bars disposed beneath the tablet bin and adapted to move across the lateral dimension of the tablet bin the orifices being provided in sufficient size and placement for creating an airflow within the tablet bin sufficient to cause a plurality of tablets to exhibit the characteristics of a fluidized bed;

a vacuum airflow means for creating a negative pressure within each of the cavities; and

means for selectively disconnecting the vacuum airflow means from the cavities;

whereby as the slat bars move beneath the tablet bin the cavities are filled with tablets and after exit from beneath the tablet bin the tablets are transferred to a means for filling bottles.

5,191,742

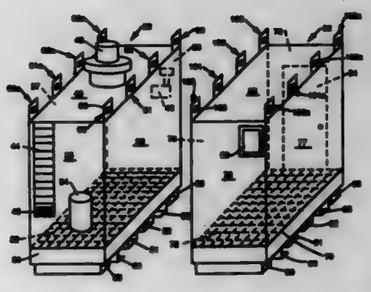
HAZARDOUS MATERIAL CONTAINER STORAGE BUILDING AND RELATED METHOD

Frederick W. Romig, Wexford, and Charles D. Ledford, New Alexandria, both of Pa., assignors to CID Associates, Inc., Leechburg, Pa.

Filed Apr. 2, 1991, Ser. No. 678,830

Int. Cl.[5] E04H *7/00*

U.S. Cl. 52—79.9 **26 Claims**



1. A hazardous material storage building for storing a plurality of hazardous material containers comprising:

a plurality of modules each having

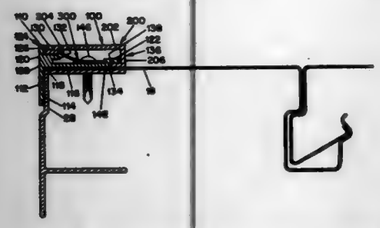
a floor for supporting containers of hazardous material;
a containment sump disposed underneath said floor for collecting leakage from said containers; and
tube means underlying said containment sump;
said plurality of modules including a first and second module; and
said first module having a first module tube means and said second module having a second module tube means; and
mechanical joining means extending at least partially through said first module tube means and said second module tube means for securing said first module to said second module, whereby said first and second modules are formed into a single, unitary hazardous material container storage building.

5,191,743

CONCEALING TRIM CAP ASSEMBLY FOR A WALL OR CEILING PANEL SYSTEM

J. Lynn Gailey, Clover, S.C., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Feb. 12, 1991, Ser. No. 655,312
Int. Cl.[5] E04B 9/00
U.S. Cl. 52—718.05 13 Claims



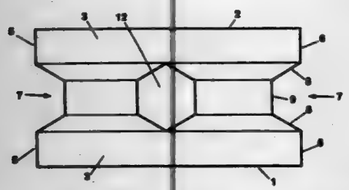
1. A concealing trim assembly for a wall or ceiling panel system, comprising:
a trim member fastenable to a channel member of a ceiling or wall panel support, the trim member having a base portion and first and second means for slidably retaining a trim cap;
means for fastening the trim member to the channel member;
a trim cap for concealing said means for fastening the trim member to the channel member, said trim cap having first and second edges matable with said first and second means for slidably retaining a trim cap;
at least one clip means for biasing said first and second edges of said trim cap against said first and second means for retaining a trim cap.

5,191,744

CONSTRUCTION ELEMENT

Keith D. Bowes, P.O. Box 557, Glen Innes, New South Wales, Australia

Filed May 16, 1991, Ser. No. 701,096
Claims priority, application Australia, May 17, 1990, PK 0198; Sep. 21, 1990, PK 2440
Int. Cl.[5] E04C 1/10
U.S. Cl. 52—564 8 Claims



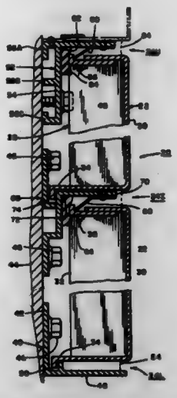
1. A construction element having front, back, top, bottom and end faces, each of said top, bottom and end faces containing a channel having side walls joined by a base and arranged so as to surround the periphery of said element and an aperture formed between the top and bottom faces, characterized in that the aperture is hexagonal in cross-section and further characterized in that in each channel each side wall forms an angle of approximately 120 degrees with the base of the channel.

5,191,745

MOUNTING SYSTEM FOR PRE-FABRICATED PANELS

Thomas J. Story, 146 Locust St., Tuckerton, N.J. 08087

Filed Jun. 21, 1991, Ser. No. 719,260
Int. Cl.[5] E04B 2/38
U.S. Cl. 52—589 16 Claims



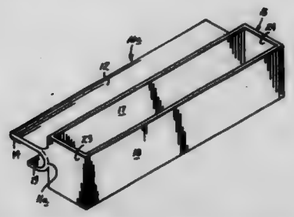
1. A prefabricated building covering system having an arrangement of support members selectively arrayed on a buildings under-structure, said under-structure adapted for supporting the walls and roof of the building, said pre-fabricated system comprising:
(a) a plurality of panel members, each of said panel members having a predetermined thickness and shape, each of said panel members having an external surface, and internal surface, and at least two selectively positioned engaging means along its peripheral sides;
(b) a first of said support members being disposed in a substantially continuous array on said under-structure, said first of said support members being substantially L-shaped and having a substantially continuous channel formed in and on an interior portion of one leg member, said channel being selectively sized and shaped to receive one of said engaging means of each of said panel member;
(c) a second of said support members being substantially continuously disposed on said under-structure, said second support member being fastened in a selectively spaced and parallel relationship with said first support member, said second support member being substantially L-shaped, said second support member having at least one leaf spring member selectively positioned on an interior surface of its extending leg member and said leaf spring having its free end facing an interior corner of said second support member; and
(d) wherein one of said engagement means of said panel member is retained in and by said channel in said first support member and a second of said engagement means of said panel member is removably retained by said leaf spring attached to said second support member and each retained panel member adapted for being individualy removed from said under-structure and said support members absent disturbing any adjacent panel member.

5,191,746

WINDOW SILL EXTENSION APPARATUS

Robert J. Russell, 2368 Randolph St., Huntingdon Valley, Pa. 19006

Filed Oct. 4, 1991, Ser. No. 771,111
Int. Cl.[5] E06B 1/00; A01G 9/00
U.S. Cl. 52—97 6 Claims



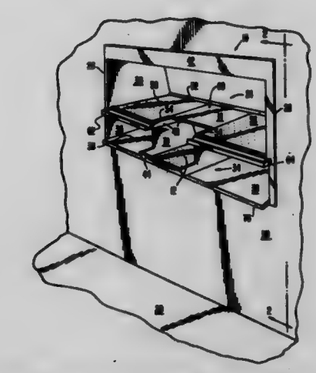
1. A window sill extension apparatus, comprising,
a "U" shaped unitary bracket, the bracket including a first plate arranged parallel to and coextensive with a second plate, wherein said first and second plates are joined together by a bracket central web having a window box fixedly mounted to said central web, wherein the first plate is defined by a first width and the second plate defined by a second width, the first width substantially greater than the second width, and the first plate defined by a first edge and the second plate defined by a second edge, the first edge and second edge arranged in a parallel spaced coextensive relationship relative to one another, with the first edge extending beyond the second edge wherein said apparatus further includes a plurality of threaded locking rods threadedly and orthogonally directed through said second plate in confrontation with a bottom surface of said first plate,
and
an adhesive strip mounted to a bottom surface of the first plate adjacent the first edge, wherein the adhesive strip extends beyond the second edge.

5,191,747

PREFABRICATED PASS-THROUGH SERVICE SYSTEM FOR FAST FOOD RESTAURANTS AND THE LIKE

David C. Tengquist, 10721 Keithwood Pkwy., Richmond, Va. 23236, and Patrick M. Kelly, 1133 Kittery Dr., Virginia Beach, Va. 23464

Filed May 8, 1991, Ser. No. 696,861
Int. Cl.[5] A47J 39/02
U.S. Cl. 52—36.4 9 Claims



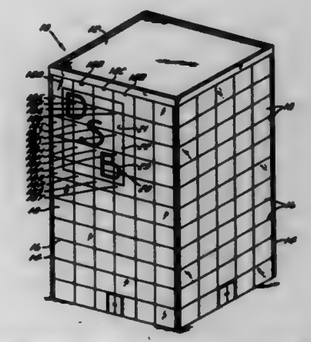
1. A prefabricated pass-through apparatus for installation in the walls of restaurants between the kitchen area and the customer area comprising:
an upper section including an upper shelf forming the bottom of said upper section, and extending substantially the entire width of said upper section for temporarily holding and passing through of food from the kitchen area to customer area;
a top for said upper section, two sides for said upper section connecting said top and said upper shelf;
a lower pass-through section having a lower pass-through shelf;
two sides for said lower section extending downward from said upper section sides;
a bin for food such as french fries located at said lower pass-through section having an accessible end from the kitchen area side and an accessible end from the customer area side; and
a recessed cut-out in said upper shelf located over said bin on the kitchen area side for making more accessible the placing of of food into said bin.

5,191,748

ILLUMINATED DISPLAY

Daniel G. Bengtsson, Rte. 1, Box 624, Fontana, Wis. 53125

Filed Dec. 12, 1991, Ser. No. 806,864
Int. Cl.[5] E04H 14/00
U.S. Cl. 52—28 8 Claims



1. An illuminated display comprising a building having a plurality of transparent windows, shade devices for at least two adjacent ones of said windows, each of said shade devices including a portion of a display, said shade devices being adapted, only in combination, to transmit an artistic or informational display to observers of said building when light is passed therethrough from the interior of the building, means interiorly of said building for backlighting said shade devices, and wherein at least two of said adjacent shade devices include in combination a first portion of relatively lower transparency and a second portion of relatively greater transparency, at least said first portion being located on more than one shade device.

5,191,749

PLASTIC BAG DISPENSING APPARATUS FOR SUPERMARKETS INCORPORATING DEVICES FOR THE REGISTERING OF THE PURCHASED ITEMS

Angelo Cappi, Modena, and Renato Rimondi, Bologna, both of Italy, assignors to A.W.A.X. Progettazione E Ricerca S.R.L., Modena, Italy

Filed Oct. 25, 1991, Ser. No. 782,140
Claims priority, application Italy, Nov. 2, 1990, 21957 A/90
Int. Cl.[5] B65B 67/04, 5/02, 5/08
U.S. Cl. 53—502 5 Claims

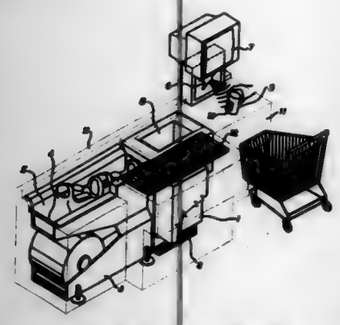
1. Apparatus for self-serving scanning, registering and bag-

ging a product purchased in a supermarket, the product having prod-uct information concerning the product imprinted on a label on packaging of the product, comprising:

a bag dispensing and opening unit (1) for dispensing and opening a single flexible bag from a continuous web of successively joined, preformed flexible bags;

a reel supporting unit (3) for supporting the continuous web of flexible bags and for feeding the web to said bag dispensing and opening unit (1);

a balance (2) for determining the actual weight of the product and for providing and output indicating the actual weight of the product; and



a scanning and computing unit comprising a computer (7) and a scanner (6), said scanner (6) detecting the product information imprinted on the label on the packaging of the product and transmitting the product information to the computer (7) said computer (7) using the product information detected by said scanner (6) to determine a projected weight of the product, said computer (7) receiving the output from the balance (2) indicating actual weight of the product, said computer (7) comparing the actual weight of the product to the projected weight of the product, and said computer (7) providing an output indicating whether the actual weight of the product exeeds a predetermined deviation from the projected weight of the product.

5,191,750

APPARATUS FOR THE FORMING, FILLING AND CLOSING OF BAGS MADE FROM A HEAT-SEALABLE SHEET

Roman Kammler, Worms, Fed. Rep. of Germany, assignor to Rovema Verpackungsmaschinen GmbH, Fernwald-Annerod, Fed. Rep. of Germany

PCT No. PCT/DE91/00122, § 371 Date Sep. 23, 1991, § 102(e) Date Sep. 23, 1991, PCT Pub. No. WO91/12177, PCT Pub. Date Aug. 22, 1991

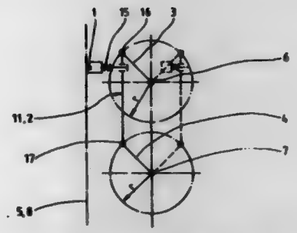
PCT Filed Feb. 18, 1991, Ser. No. 761,787

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005078

Int. Cl.[5] B65B *51/30, 9/08*

U.S. Cl. 53—551 14 Claims

1. In an apparatus for the forming, filling and closing of bags made from a heat-sealable sheet utilizing means for forming a tube out of said sheet, a filling mechanism and a cross-sealing station, which includes at least two cyclically movable cross-sealing jaw means arranged on opposite sides of a vertically extending central axis on the apparatus for the tube, the improvement wherein each cross-sealing jaw means includes a pair of vertically spaced, synchronously driven, rotary drive members rotatable about vertically spaced and parallel axes, each rotary drive member having a connection means thereon spaced radially outwardly from said axes therefor, a support member connected to and extending between said connecting means on each said rotary drive member, the theoretical lines extending between (1) said spaced and parallel axies, (2) each of said axes and a respective one of said connection means, and (3) each connection means, defining a parallelogram, the thoretical line extending between said connection means always remaining parallel to the theoretical line extending between said axes and said central axis of the tube, wherein each cross-sealing jaw means further includes a cross-sealing jaw reciprocally movably supported on said support member for horizontal movement in a direction that is always perpendicular to said theoretical line extending between said spaced and parallel axes, and wherein resilient means is provided on said support member for elastically yieldably urging said cross-sealing jaw reciprocally movably supported on said support member for horizontal movement in a direction that is always perpendicular to said theoretical line extending between said spaced and parallel axes, and wherein resilient means is provided on said support member for elastically yieldably urging said cross-sealing jaw in said direction perpendicular to said theoretical line extending between said spaced and parallel axes toward said central axis of the tube so that when said cross-sealing jaw of each cross-sealing jaw means engages the tube on opposite sides of said central axis of the tube, said resilient means will yield as a space between said central axes and said support member decreases while effectively clamping said tube therebetween to facilitate the forming of a cross seal in the tube.



5,191,751

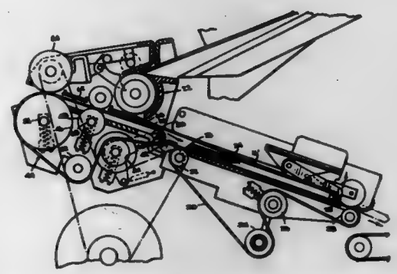
ENVELOPE OPENING APPARATUS

Joseph H. Marzullo, Brookfield; Sandra J. Graveson, Waterbury; Michael D. Ballard, Sandy Hook, and Curtis L. Mroziński, Redding, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 438,029, Nov. 20, 1989, abandoned. This application Jan. 25, 1991, Ser. No. 646,482

Int. Cl.[5] B65B *43/26*

U.S. Cl. 53—569 7 Claims



1. Apparatus for inserting one or more documents into a waiting envelope having a flap, comprising:

a supporting frame;

means mounted in said frame for holding said envelope;

a movable, endless belt rotatably mounted in said frame for transporting said one or more documents into said waiting envelope; and

a datum guide plate secured to said frame above said movable belt for holding open the flap of said envelope, and in cooperation with said movable belt for guiding said documents into said envelope; and

means for biasing a reach of said movable belt toward said datum guide plate, wherein said documents are transported between said datum guide plate and said reach, said datum guide plate defining a plane along which said documents are fed into said envelope.

5,191,752

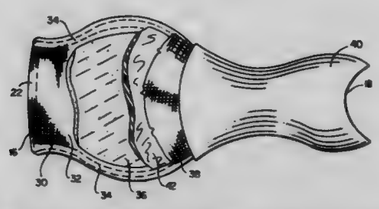
ELASTOMERIC GEL SADDLE

Robert J. Murphy, 602 Woburn Dr., Camillus, N.Y. 13031

Filed May 4, 1992, Ser. No. 878,365

Int. Cl.[5] B68C *1/02*

U.S. Cl. 54—44.5 8 Claims



1. Equestrian saddle for mounting a rider on a horse, comprising a tree frame including left and right longitudinal frame members, a rear cantle joining rear ends of the left and right frame members, and a front bow joining the front ends of the left and right frame members; at least one longitudinal web stretched between the bow and the cantle; a series of cross webs attached to the left and right frame members and stretched over the longitudinal web, said webs together forming a firm spring-like seat base; a seat cushion layer disposed on said seat base; a leather cover fitted over said cushion layer and said tree frame and forming a seat on which said rider is in sitting contact to define a contact area on the seat; and at least one panel disposed beneath the left and right frame members to cushion said tree frame as it rests on the horse; and the improvement wherein said seat cushion layer is formed of a silicone dielectric gel molded in a profile to match the web seat base and being approximately one-half inch thick and having the properties of (a) high energy absorbency to absorb shock and bounce of the rider on the saddle, and (b) resilient displaceability under both vertical and lateral forces to distribute the rider's sitting weight evenly over the contact area of the saddle and avoid pressure concentrations within the contact area.

5,191,753

HYDRAULIC DRIVE SYSTEM FOR A COTTON HARVESTER

Robert M. Fachini, Naperville, Ill.; John H. Chance; Daniel A. Miller, both of Amarillo, Tex., and David Brandt, Downers Grove, Ill., assignors to Case Corporation, Racine, Wis.

Filed Dec. 18, 1991, Ser. No. 809,950

Int. Cl.[5] A01D *46/10*

U.S. Cl. 56—10.9 19 Claims

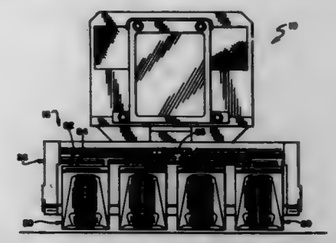
1. A system for hydraulically driving harvesting units of a cotton harvester, each harvesting unit including a rotatable harvesting mechanism for removing cotton from plants as the harvester is driven across a field, said hydraulic driving system comprising:

means mounted on the harvester for generating an actuating fluid pressure;

at least one fluid pressure driven motor mounted on each harvesting unit for individually driving the rotatable harvesting mechanism thereof in forward and reverse directions;

conduit means for directing fluid between each driven motor and an output of said actuating fluid pressure generating means; and

electro/hydraulic control means connected between the output of said actuating fluid pressure generating means and each of said motors for selectively and conjointly controlling the rotational direction of said motors and thereby controlling the harvesting mechanisms driven



thereby, said control means including first selectively actuatable ON/OFF electro/hydraulic valve means carried on the harvester for controlling actuating fluid pressure flow to each of said motors thereby selectively driving the harvesting mechanism of the harvesting units in a forward direction, and second selectively actuatable ON/-OFF electro/hydraulic valve means carried on the harvester for controlling actuating fluid pressure flow to each of said motors thereby selectively driving the harvesting mechanism of the harvesting units in a reverse direction.

5,191,754

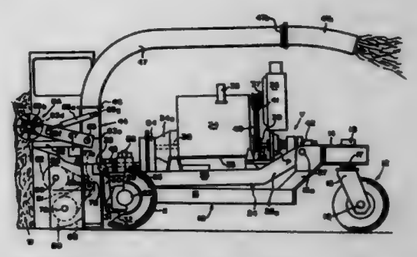
SELF-PROPELLED COMPOST WINDROW TURNING AND AERATING MACHINE AND METHODS OF OPERATING THE MACHINE

Norval K. Morey, Weidman, Mich., assignor to Wood Technology, Inc., Winn, Mich.

Filed Jun. 18, 1992, Ser. No. 900,577

Int. Cl.[5] A01D *84/00*

U.S. Cl. 56—13.3 19 Claims



1. In a self-propelled compost windrow turning and aerating machine:

a. a longitudinally extending vehicle main frame having a front and rear end, supported on front and rear wheels;

b. an upper longitudinally extending subframe having a front and rear end, supported from the rear end of said main frame for vertical movement relative to said main frame to raise and lower the front end of said subframe relative to said main frame;

c. a blower housing mounted on said subframe and having a material admitting opening leading to a rotary fan provided in said housing, the blower housing having a discharge opening with a spout for directing material blown

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out of said housing by said fan to a desired discharge location;

d. rotary shaft driven material feeding mechanism supported on said subframe in advance of said blower housing for vertical movement therewith, for removing material from a compost windrow and delivering it to said material admitting opening; and

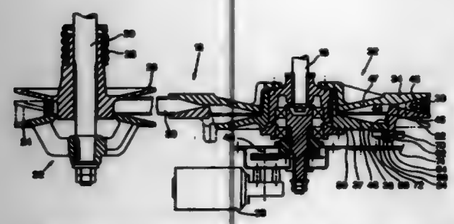
e. an engine drive system for powering said front wheels, said fan, and said material feeding mechanism.

5,191,755

COMBINE HARVESTER WITH DUAL RANGE VARIABLE SPEED BLOWER

Jose G. T. Gryspeerdt, Nevele, Belgium, assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Apr. 25, 1991, Ser. No. 691,196
Claims priority, application European Pat. Off., Apr. 26, 1990, 90201055.2
Int. Cl.[5] A01D *87/10*
U.S. Cl. 56—13.4 8 Claims



1. In a combine harvester having a mobile frame adapted for movement over a field; a threshing and separating means supported from said frame for receiving harvested grain from the field and separate grain crop from trash material in said harvested grain; a cleaning mechanism supported from said frame to received separated grain crop and trash material from said threshing and separating means and to effect a removal of said trash material from said grain crop, said cleaning mechanism having a fan rotatably mounted on said frame to blow air through said separated grain crop and trash material to make said trash material airborne for removal thereof from said combine harvester, said fan being provided with a drive mechanism for rotatably driving said fan, an improved fan drive mechanism comprising:

a variable diameter belt-type power transfer assembly having an adjustable sheave including a pair of opposing, coaxial flanges, one of said flanges being axially movable relative to the other said flange, both said flanges having opposed first belt engaging surfaces flaring radially outwardly with respect to each other so as to define a first, variable diameter belt receiving groove therebetween, and opposed second belt engaging surfaces flaring radially outwardly with respect to each other so as to define a second, variable diameter belt receiving groove therebetween; and the alignment of said second belt receiving groove being located radially inwardly with respect to the alignment of said first belt receiving groove.

5,191,756

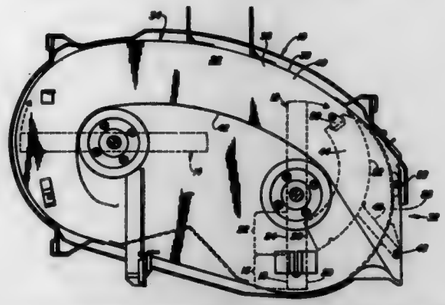
MULCHING MOWER APPARATUS

John B. Kuhn, Rubicon, Wis., assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 651,851, Feb. 4, 1991, abandoned. This application Feb. 3, 1992, Ser. No. 829,639
Int. Cl.[5] A01D *55/18*
U.S. Cl. 56—17.5 35 Claims

1. A mulching apparatus for use in a mower having a housing including a horizontally extending top wall and generally vertically extending side walls, a discharge outlet and a blade rotatable about an axis of rotation in a generally horizontal plane within the housing for cutting vegetation and for creating a circular path of air within the housing, said apparatus comprising:

a guide means coupled with the housing for guiding air and vegetation clippings radially inwardly and downwardly towards the blade for re-cutting of the vegetation; and



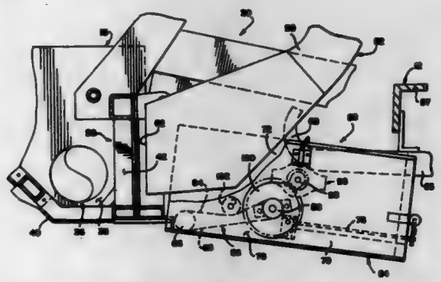
blocking means coupled with the housing for partially blocking a portion of the air and clippings from being discharged through the discharge outlet, said blocking means allowing a portion of the air to be discharged through the discharge outlet.

5,191,757

DISCHARGE CONVEYING SYSTEM FOR A COTTON HARVESTER

Robert L. Fachini, Naperville, Ill.; Kenneth D. Walser, Hereford, Tex.; John H. Chance, and Daniel A. Miller, both of Amarillo, Tex., assignors to Case Corporation, Racine, Wis.

Filed Nov. 18, 1991, Ser. No. 798,330
Int. Cl.[5] A01D *46/08, 46/10*
U.S. Cl. 56—30 20 Claims



8. A discharge conveying system for a cotton harvester having a material outlet through which harvested materials pass, said discharge conveying system comprising:

duct structure having a material inlet arranged adjacent said cotton harvester outlet;

an air system for directing an air stream through said duct structure such that lighter materials passing from the material outlet are drawn into the duct structure; and

conveyor means arranged beneath the duct structure for gravitationally receiving heavier materials passing from said outlet, said conveyor means including a conveyor defining a fore-and-aft extending and movable surface for conveying said heavier materials away from the inlet to said duct structure to facilitate the flow of lighter materials into said duct structure, said conveyor surface being

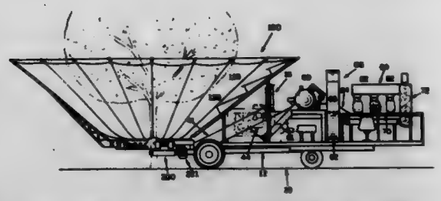
penetrable by stones, rocks and the like passing from the material outlet of said cotton harvester.

5,191,758

METHOD AND APPARATUS FOR NUT HARVESTING

Jean P. Cote, Prairie Lee, Tex., assignor to Continental Wholesale Florists, Inc., San Antonio, Tex.

Filed Sep. 11, 1991, Ser. No. 757,695
Int. Cl.[5] A01D *46/00, 46/22, 46/26*
U.S. Cl. 56—329 45 Claims



1. The method of harvesting tree-grown nuts formed in a hull and normally droppable with the hull when ripened, comprising the steps of:

surrounding the trunk of the tree with an inverted, cone-shaped canopy having an upper perimeter at least equal to the largest perimeter of the tree, said canopy being mounted on a self-propelled chassis and being movable from a folded position to a full conical position completely surrounding the tree by hydraulic means mounted on said chassis;

providing an opening in said canopy adjacent the lower portions thereof and located between the chassis and the tree trunk;

providing trunk-engaging arms beneath the bottom portions of said canopy and shaking the tree by said trunk-engaging arms;

directing the falling nuts, hulls and trash toward said opening in said lower end of said canopy;

catching nuts, full and empty hulls and other trash dislodged by shaking the tree, on a conveyor mounted on said chassis and disposed of below said canopy opening;

drawing an air stream in contact with said conveyor by a vacuum system mounted on said chassis to remove empty hulls and other trash having a weight less than the nuts from said conveyor, thereby leaving nuts and hulls containing nuts on said conveyor;

discharging the empty hulls and other trash on the ground to provide a mulch; and

passing said hulls containing nuts through a dehulling machine mounted on said chassis.

12. Apparatus for collecting nuts and hulls shaken from a nut-growing tree comprising, in combination:

a self-propelled chassis having an elevated operator's station adjacent one end of said chassis;

a nut-catching canopy;

means for mounting said canopy on said one end of said chassis in front of said operator's station;

said canopy being formed of a plurality of vertically pivotally interconnected conical segments forming in one position a transverse array across said one end of said chassis for transport, and in a second position, an inverted, generally cone-shaped configuration having a small-diameter bottom end constructed and arranged to surround the trunk of a nut tree to be harvested;

said canopy having a nonpivoted, vertically inclined wall portion positioned on said chassis between said operator's station and a tree to be harvested;

means on said chassis for engaging and shaking the nut tree to be harvested; and

at least one window mounted in said vertically inclined wall portion to provide operator visibility of the tree to be harvested during the approach of the chassis to the tree and during the nut-harvesting operation.

36. Apparatus for collecting nuts and hulls shaken from a nut-growing tree comprising, in combination:

a self-propelled chassis having an operator's station;

shaking means attached to said chassis for dislodging nuts from the tree;

nut-catching means attached to said chassis positioned below and surrounding the lower branches of the tree;

nut-dehulling means attached to said chassis; and

means for conveying the nuts received in said nut-catching means to said dehulling means whereby nuts are released from the hulls; and

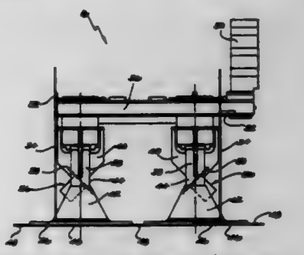
means for separating the nuts from the empty hulls.

5,191,759

BASECUTTER GEARBOX FOR A SUGAR CANE HARVESTER

Malcolm J. Baker, Bundaberg, Australia, assignor to Austoft Industries Limited, North Bundaberg, Australia

Filed Aug. 16, 1991, Ser. No. 746,391
Claims priority, application Australia, Aug. 17, 1990, PK1809
Int. Cl.[5] A01D *45/10*
U.S. Cl. 56—500 2 Claims



1. In a sugar cane harvester of the type having:

a frame including a pair of spaced apart plate-like side walls between which are mounted a base cutting assembly and feed rollers and billet cutting means which together define a path for the passage of sugar cane through the harvester,

the improvement in which the base cutting assembly comprises:

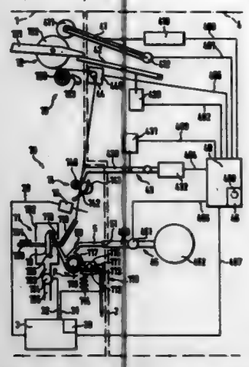
a gear box mounted to each side wall with a fastening means which connects the gear box to a mounting means provided on each side wall such that the gear box extends across the space between the side walls, above the path for the sugar cane, and projects beyond at least one of the side walls, the side wall beyond which the gear box projects having a recess extending from a lower edge thereof which receives the projecting part of the gearbox and allows the base cutting assembly to be moved laterally outwards from between the side walls of the harvester and through the recess for servicing;

a pair of spaced apart drive shafts extending downwardly from the gear box in the space between the side walls;

base cutting blade means carried at or adjacent a lower end of each of the drive shafts, and

a motor for driving the base cutting assembly being mounted on the gear box where it projects beyond the said one of the side walls so as to be on the outside of the space between the side walls.

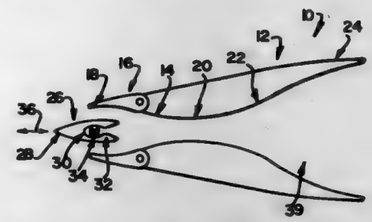
5,191,760
PROCESS AND DEVICE FOR PIECING ON AN OPEN-END SPINNING DEVICE
Anthony A. Ball, Reichertshausen, and Ulrich Rodiger, Ingolstadt, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik AG, Ingolstadt, Fed. Rep. of Germany
Continuation of Ser. No. 467,022, Jan. 18, 1989, abandoned. This application Apr. 16, 1991, Ser. No. 686,871
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803782
Int. Cl.[5] D01H *15/00*
U.S. Cl. 57—263 10 Claims



1. A process for piecing yarn on an open-end spinning device which includes means for feeding fiber to an opening device, means for conveying a stream of opened fibers in an air stream to a fiber collection surface of a spinning element, and means for drawing off spun yarn from said fiber collection surface of said spinning element, comprising the following steps:
(a) detecting a missing yarn in said spinning device;
(b) stopping the feed of fiber material to said opening device;
(c) shifting said air stream from said fiber collection surface;
(d) backfeeding a yarn to said fiber collection surface;
(e) restarting the feeding of a fiber tuft to said opening device;
(f) feeding said fibers into said shifted air stream;
(g) completely shifting the entire said air stream from said opening device to said fiber collection surface so that a single full air stream from said opening device is directed to said fiber collection surface and all of the fibers entering the air stream from said opening device air directed fully to said fiber collection surface before the fiber density in said completely shifted air stream attains full production density strength; and
(h) drawing off yarn from said fiber collection surface as the fiber density in said air stream increases to its full production strength.

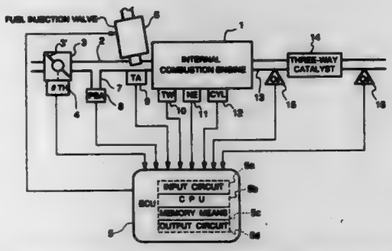
5,191,761
AEROSPACE PLANE AND ENGINE
Charl E. Janeke, 261 Loveday Street, Muckleneuk; Pretoria, Transvaal Province, South Africa
Continuation of Ser. No. 657,881, Feb. 19, 1991, abandoned, which is a continuation of Ser. No. 409,411, Sep. 18, 1989, abandoned. This application Aug. 21, 1991, Ser. No. 751,601
Claims priority, application South Africa, Sep. 16, 1988, 88/6955
Int. Cl.[5] F02K *7/18*
U.S. Cl. 60—224 13 Claims

1. An engine suitable for use in an aerospace plane, the engine comprising:
a casing having an inlet end and an outlet end;
a diffuser positioned within said casing at said inlet end;
an intermediate passage within said casing and positioned downstream of, and in series with, the diffuser;
a diverging outlet within said casing and positioned downstream of, and in series with, the intermediate passage, the intermediate passage and an upstream portion of the diverging outlet forming combustion chamber within the casing;



a hollow aerodynamic core member having an internal cavity and a rearwardly directed outlet in communication with the internal cavity, the core member being shaped to have a closed pointed leading end such that the core member diverges rearwardly from said pointed leading end and is arranged in association with, and in proximity to, the diffuser; and
a rocket engine accommodated within the internal cavity of the core member and being operatively in alignment with the rearwardly directed outlet.

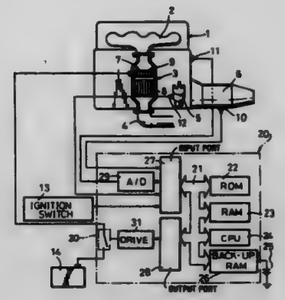
5,191,762
SYSTEM FOR DETECTING DETERIORATION OF A THREE-WAY CATALYST OF AN INTERNAL COMBUSTION ENGINE
Shigetaka Kuroda, and Hiroshi Ono, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan
Filed May 15, 1991, Ser. No. 700,542
Claims priority, application Japan, May 30, 1990, 2-056617[U]
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—276 6 Claims



1. A system for detecting deterioration of a three-way catalyst of an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, an exhaust passage, said three-way catalyst being arranged in said exhaust passage, and an air-fuel ratio sensor arranged in said exhaust passage at a location down-stream of said three-way catalyst for detecting the air-fuel ratio of an air-fuel mixture supplied to said engine, said system comprising:
fuel supply control means for (i) starting to cut off the fuel supply to said engine when said engine is decelerated with said throttle valve substantially fully closed, and (ii) resuming the fuel supply to said engine when the rotational speed of said engine has become lower than a predetermined value;

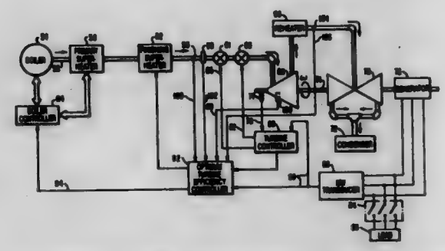
time-measuring means for measuring the time which the output from said air-fuel ratio sensor has required to reach a predetermined reference value after the resumption of the fuel supply to said engine by said fuel supply control means; and
deterioration-determining means for determining that said three-way catalyst is deteriorated when said measured time is shorter than a predetermined time period.

5,191,763
DEVICE FOR CONTROLLING HEATING OF CATALYZER FOR PURIFYING EXHAUST GAS
Kiyoshi Yuuki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Jun. 11, 1992, Ser. No. 897,034
Claims priority, application Japan, Aug. 2, 1991, 3-194327
Int. Cl.[5] F01N *3/20*
U.S. Cl. 60—284 18 Claims



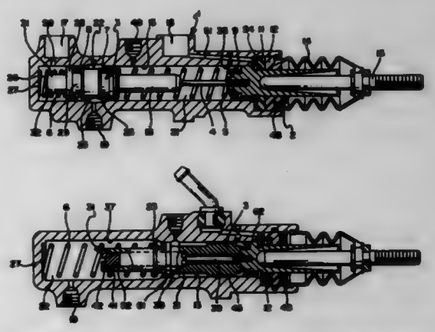
1. A device for controlling the heating of a catalyzer arranged in an exhaust passage of an engine, said device comprising:
heating means for heating the catalyzer;
calculating means for calculating a cumulative period of use of the catalyzer; and
control means for controlling said heating means in response to a result of the calculation by said calculating means to temporarily heat the catalyzer when the engine is started and to increase an amount of heat applied to the catalyzer by said heating means as said cumulative period of use of the catalyzer becomes longer.

5,191,764
GOVERNOR VALVE POSITIONING TO OVERCOME PARTIAL-ARC ADMISSION LIMITS
George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 9, 1992, Ser. No. 896,039
Int. Cl.[5] F01K *13/02*
U.S. Cl. 60—660 7 Claims



1. A method for improving heat rate of a partial-arc steam turbine, the turbine including a plurality of control valves each arranged for admitting steam to a predetermined arc of admission at a control stage of the turbine, the method comprising the steps of:
selecting a maximum allowable control stage pressure drop;
determining an arc of admission range including the maximum allowable control stage pressure drop at normal turbine operating pressure, the range being defined by upper and lower valve points operatively associated with one of the control valves;
sequentially closing each of the control valves for reducing turbine output power while holding steam pressure substantially constant until the control stage pressure drop reaches a value predeterminately less than the maximum allowable control stage pressure drop and the one of the control valves is only partially closed; and
holding each control valve in its respective present position while reducing steam pressure to control turbine output power.

5,191,765
MASTER CYLINDER FOR A HYDRAULIC BRAKE SYSTEM AND STEERING BRAKE SYSTEM
Ute Ruehl, Rosbach, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
PCT No. PCT/EP90/00202, § 371 Date Dec. 17, 1990, § 102(e) Date Dec. 17, 1990, PCT Pub. No. WO90/12714, PCT Pub. Date Nov. 1, 1990
PCT Filed Feb. 8, 1990, Ser. No. 634,172
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913353; Nov. 6, 1989, 3936832
Int. Cl.[5] B60T *11/21*; B62D *11/08*
U.S. Cl. 60—581 14 Claims



1. A hydraulic brake and brake steering system for an automotive vehicle having a wheel brake on either side of said vehicle, said system comprising:
a pair of master cylinders each including a master cylinder housing having a bore formed therein and a primary piston slidably mounted therein and defining in part at one end a pressure chamber,
said primary piston movable between a first retracted position and a second advanced position in said bore;
means for supplying brake fluid to said system including a pressureless storage reservoir containing fluid and supply passage means allowing fluid flow into each of said pressure chambers with said primary pistons in said retracted position;
a pair of brake pedals, each drivingly engaged with a respective primary piston to enable pressurization of a respective pressure chamber by causing advancing movement thereof;
a pair of operating pistons, each mounted in a respective master cylinder housing bore adjacent an associated primary piston and defining in part a respective compensat-

ing chamber separate from an associated pressure chamber therein, said operating pistons movable in said bore between a first retracted position and a second advanced position;

return spring means associated with a respective primary piston and associated operating piston urging each of said primary pistons and associated operating piston to said retracted, first position thereof;

sealing means carried by each operating piston acting to seal an associated compensating chamber from its associated pressure chamber in said first retracted position of the respective operating pistons and open communication therebetween in said second advanced position in said bore of said operating pistons;

compensating fluid passage means extending between said respective compensation chambers to establish fluid communication therebetween;

fluid passage means extending between each master cylinder pressure chamber and a respective one of said wheel brakes;

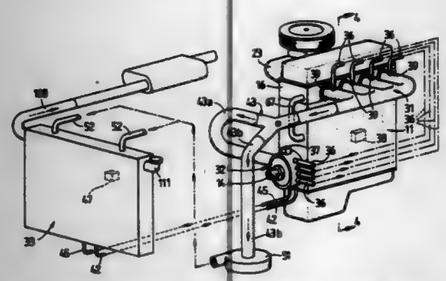
a driving interconnection between each primary piston and an associated opgrating piston causing said associated operating piston to advance from said first position to said second position as said primary piston is advanced from said retracted position to said advanced position by operation of an associated brake pedal, whereby upon operation of both of said brake pedals, both primary pistons are advanced to advance both of said operating pistons and establish communication between said pressure chambers via said compensating chambers and said compensating fluid passage means but when only one of said brake pedals is operated, the other compensating chamber remains sealed from its associated pressure chamber.

5,191,766

HYBRID INTERNAL COMBUSTION/STEAM ENGINE

Frank L. Vines, 607 Columbiana Rd., Birmingham, Ala. 35209

Filed Jan. 10, 1991, Ser. No. 712,569
Int. Cl.[5] F02G *3/02, 5/02*; B60K *3/04, 6/12*
U.S. Cl. 60—619 **28 Claims**



1. A hybrid internal combustion/steam engine having a plurality of cylinders with pistons therein connected to a crankshaft, comprising in combination therewith:

(a) means for introducing a combustible fuel/air mixture into each cylinder of said plurality of cylinders for combustion to provide a power stroke for the piston;

(b) a plurality of exhaust ports each connected to and in communication with a cylinder of said plurality of cylinders, such that exhaust combustion gases are discharged through selected ones of said plurality of exhaust ports during an exhaust stroke of said piston;

(c) a steam generator connected to and in communication with each exhaust port having a water injection port therein proximal the exhaust port of each cylinder;

(d) means for selectively injecting a predetermined volume of water proximal the exhaust port of selected cylinders concurrently with the end of the exhaust stroke and the end of the compression stroke of pistons associated with said selected cylinders such that the volume of water contacts the exhausted combustion gases and is substantially vaporized into a pressurized volume of steam within said steam generator;

(e) means for allowing exhaust combustion gases into said steam generator from said exhaust port of said cylinder and means to prevent steam generated in said steam generator from reentering said cylinder; and

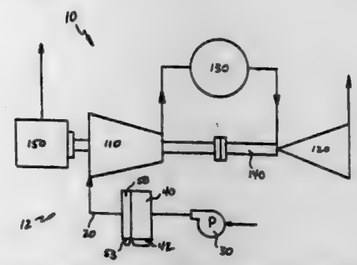
(f) a pressurized steam powered take off means connected to and in communication with said steam generator for converting said exhaust combustion gases into a usable power source.

5,191,767

GAS TURBINE AIR HANDLING SYSTEM

David M. Kane, Darien, and William E. Fry, Stamford, both of Conn., assignors to Mistop, Inc., East Norwalk, Conn.

Continuation-in-part of Ser. No. 610,431, Nov. 7, 1990, Pat. No. 5,074,117. This application Dec. 17, 1991, Ser. No. 808,906
Int. Cl.[5] F02C *1/02*
U.S. Cl. 60—728 **17 Claims**



1. A gas turbine comprising a compressor, a turbine, a combustion zone, and a generator, wherein said gas turbine further comprises a passage for the supply of intake air to said compressor; means for generating a flow of air through said air intake passage; cooling means disposed within said air intake passage so as to be contacted by the flow of intake air; and elimination means disposed within said air intake passage so as to be contacted by the flow of air after said cooling means is contacted by the flow of air, said elimination means comprising a knitted mesh pad in order to reduce the moisture level of the intake air.

5,191,768

AUTOMOBILE AIR CONDITIONER COMPRESSOR DISCHARGE CAPACITY CONTROLLER

Kazuo Fujii, Konan, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Jan. 23, 1992, Ser. No. 824,524
Claims priority, application Japan, Apr. 26, 1991, 3-125267
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—209 **5 Claims**

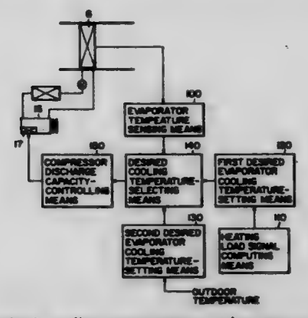
1. An automobile air conditioner compressor discharge capacity controller, which has an evaporator installed inside the air-conditioning duct of an automobile air conditioner and a variable discharge capacity compressor at least executing a cooling cycle together with the aforementioned evaporator, an expansion valve, and a condenser, and which controls, by means of its variable discharge capacity structure, the discharge capacity of the aforementioned variable discharge capacity compressor, are equipped with the following means:

(a) an evaporator temperature-sensing means for sensing the temperature of the aforementioned evaporator;

(b) a heat load signal-computing the heat load signals to control the air conditioner for environmental conditions inside/outside the passenger compartment, including the temperature in the passenger compartment, the outdoor temperature, and set temperature in the passenger compartment;

(c) a first evaporator cooling temperature-setting means for setting a first desired temperature for the aforementioned evaporator based on the aforementioned heat load signals and on the pattern of the desired cooling temperature characterized by its being high when the cooling load is low;

(d) a second evaporator cooling temperature-setting means for setting a second desired cooling-temperature for the aforementioned evaporator based on the pattern of the desired cooling temperature characterized by its being high when the outdoor temperature is moderate, and by being low when the outdoor temperature is low or high;



(e) a desired cooling temperature-setting means that compares the first desired cooling-temperature set by aforementioned first evaporator cooling temperature-setting means, with the second desired cooling temperature set by the aforementioned second evaporator cooling temperature-setting means, when the aforementioned evaporator cooling temperature sensed by the aforementioned evaporator temperature-sensing means is above a specific value, and selects the lower desired cooling temperature;

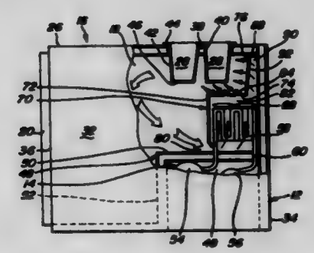
(f) a compressor discharge capacity controlling means for controlling the variable capacity structure of the aforementioned variable capacity compressor based on the desired cooling temperature selected by the aforementioned desired cooling-temperature selecting means.

5,191,769

FOOD PREPARATION TABLE HAVING A REFRIGERATED INGREDIENT ZONE

Daniel J. Mangini, Turnersville, N.J., and John P. Morris, Broomall, Pa., assignors to Glenco-Star, Inc., Philadelphia, Pa.

Filed Sep. 6, 1991, Ser. No. 755,860
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—258 **30 Claims**



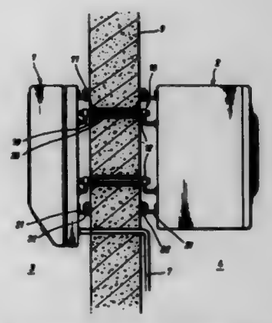
5. In a refrigerated appliance for cooling foodstuffs, an enclosure having an insulated chamber for storing foodstuffs, and refrigerator means including a fan for supplying and moving cooling air to maintain a refrigerated environment in said chamber for cooling the foodstuffs stored therein, said enclosure having a generally horizontally disposed top wall provided with one or more spaced openings communicating with said chamber, and said openings being adapted for receiving and spacing heat transferring bottom and sidewall surfaces of foodstuff containers extending vertically downwardly from said top wall and inwardly of the chamber, the improvement comprising baffle means disposed in close proximity to said top wall for substantially simultaneously directing said cooling air from said refrigerator into said chamber and against the heat transferring bottom and sidewall surfaces of said containers, said baffle means including a horizontally disposed first baffle plate having a plurality of first outlet openings confronting the heat transferring surfaces of said containers and configured to direct said cooling air generally vertically, and a vertically disposed second baffle plate connected to said first baffle plate, said second baffle plate having a plurality of second outlet openings confronting the heat transferring surfaces of said containers and configured to direct said cooling air generally horizontally and in a direction transverse to the air from said first outlet openings, said cooling air being substantially simultaneously directed by said fan directly against each said baffle plate and directly into the chamber against said heat transferring surfaces.

5,191,770

MOUNTING ASSEMBLY OF A SEPARATE TYPE AIR-CONDITIONER

Sung Ki Kim, Suweon-City, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon-City, Rep. of Korea

Filed Dec. 17, 1991, Ser. No. 808,608
Claims priority, application Rep. of Korea, Dec. 17, 1990, 90-20054
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—263 **10 Claims**



1. In an air conditioner system including:

an indoor unit and a separate outdoor unit disposed on opposite sides of a building wall and situated above a floor and the ground, respectively; and

at least three conduit means interconnecting said indoor and outdoor units for the transfer of media therebetween and for supporting said indoor and outdoor units above said floor and said ground, respectively, each of said conduit means comprising:

a hollow first pipe extending through the building wall such that each first pipe has an indoor end and an outdoor end,

a pair of hollow second pipes disposed at respective ends of said first pipe, each second pipe including

a coupling portion connected to said end first pipe, and

a conducting portion extending from said coupling portion, and

connecting means for removably securing said second pipes to said first pipe such that a passage is formed which communicates the interior of said first pipe with the interior of said second pipes;

said indoor unit being connected to, and supported by, each of said second pipes located at said indoor end of its respective first pipe;

said outdoor unit being connected to, and supported by, each of said second pipes located at said outdoor end of its respective first pipe;

two of said conduit means conducting a medium in the form of heat transfer fluid between said indoor and outdoor units such that the fluid contacts interior surface of said first pipe and said second pipe of said two conduit means; and

a third of said conduit means containing an electrical wire for conducting medium in the form of electricity between said indoor and outdoor units.

5,191,771

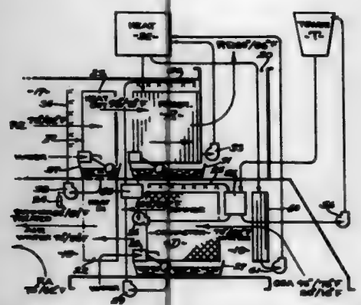
POLYMER DESICCANT AND SYSTEM FOR DEHUMIDIFIED AIR CONDITIONING

Milton Meckler, 930 20th St. No. 2, Santa Monica, Calif. 90403

Filed Jul. 5, 1991, Ser. No. 726,040

Int. Cl.[5] F25D *23/00*

U.S. Cl. 62—271 **19 Claims**



1. An air conditioning system having an outside air inlet duct and a conditioned air supply duct into a conditioned space, and an air dehumidifier means for processing a water vapor adsorptive liquid desiccant including;

a contacter section in the inlet duct for interface contact of outside air with said liquid desiccant applied thereto by a distribution means to adsorb water vapor therefrom and thereby weakening the liquid desiccant,

a regenerater section to remove said adsorbed water vapor from said weakened desiccant from the contacter section and returned thereto by said distribution means,

and a heat source means applying heat to the regenerater section for said removal of adsorbed water vapor therefrom,

the liquid desiccant being a hygroscopic polymer-salt sulfonated and in solution.

5,191,772

AUGER-TYPE ICE-MAKING APPARATUS

Franklin D. Engel, Englewood, Colo., assignor to Pacific Rockies, Inc., Denver, Colo.

Filed Feb. 13, 1992, Ser. No. 834,803

Int. Cl.[5] F25C *1/14*

U.S. Cl. 62—320 **20 Claims**

1. Apparatus for producing ice particles comprising:

a housing mounted at a relatively fixed location;

a hollow member having a longitudinal axis and a generally cylindrical inner surface mounted on said housing so that it extends generally in a vertical direction;

an auger having a longitudinal axis coinciding with said longitudinal axis of said hollow member and mounted for rotational movement relative to said hollow member;

said auger having a generally cylindrical central body portion for providing an ice forming chamber between said generally cylindrical inner surface and said central body portion;

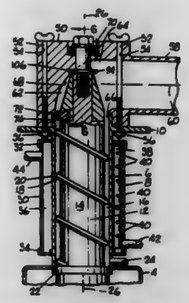
water supply means for maintaining a level of water in said ice-forming chamber;

ice forming means for forming a layer of ice on said generally cylindrical inner surface;

said auger having a helically extending flight having an ice shearing edge for removing said layer of ice from said generally cylindrical inner surface and for moving said removed ice in said vertical direction;

support means extending radially outwardly from said hollow member and spaced a predetermined distance below the upper end of said hollow member;

discharge means mounted on said support means and having



a modified elbow portion and a discharge tube extending outwardly therefrom;

pressure forming means mounted on said central body portion for rotation therewith and located in said modified elbow portion for applying pressure on said ice being moved upwardly by said ice shearing edge and said helically-extending flight;

said pressure forming means having at least a generally conical outer surface extending upwardly into said modified elbow portion;

said discharge tube having a longitudinal axis perpendicular to said longitudinal axis of said auger; and

said modified elbow having an inner surface, a portion of which comprises a partial generally oval surface located opposite to at least a portion of said generally conical outer surface and having a longitudinal axis extending parallel to said longitudinal axis of said auger but spaced therefrom a predetermined distance along said longitudinal axis of said discharge tube.

5,191,773

RECIRCULATING CHILLING APPARATUS WITH A SUBMERGED ELECTRIC MOTOR AND IMPELLER

Allan J. Cassell, 12 Leigh Street, Werribee, Victoria 3030, Australia

PCT No. PCT/AU90/00362, § 371 Date May 22, 1991, § 102(e) Date May 22, 1991, PCT Pub. No. WO91/02933, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 22, 1990, Ser. No. 700,131

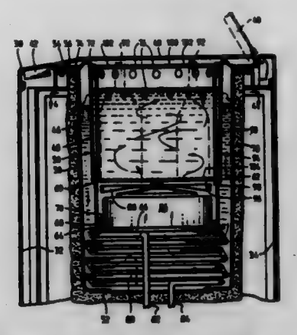
Claims priority, application Australia, Aug. 22, 1989, PJ5878; Dec. 14, 1989, PJ7872

Int. Cl.[5] F25D *17/02*

U.S. Cl. 62—373 **12 Claims**

1. Apparatus for the chilling of articles, said apparatus including a refrigeration system; a container having a main bowl in which a cooling fluid is located; an inner bowl within said main bowl, said inner bowl having a side wall with at least one

opening therethrough adjacent the top of said side wall to allow said cooling fluid to pass therethrough into a gap between said side wall and said main bowl, said inner bowl having at least one hole therethrough at its lower end, said hole being operatively connected to said gap; circulation means in



one of said bowls for assisting circulation of said cooling fluid; and cooling means in said one bowl for cooling said cooling fluid, the circulation means comprising an electric motor and impeller both submerged in the cooling fluid, and the impeller causing circulation of fluid by lifting and agitating the fluid.

5,191,774

REFRIGERATING COMPARTMENT TEMPERATURE CONTROL DEVICE

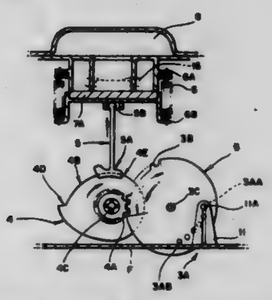
Suk Heung Park, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Sep. 26, 1991, Ser. No. 765,686

Claims priority, application Rep. of Korea, Sep. 26, 1990, 90-15323

Int. Cl.[5] F25D *17/04*

U.S. Cl. 62—408 **9 Claims**



1. A refrigerator comprising:

frame means defining a refrigerating chamber;

means for supplying cold air to said refrigerating chamber through a cold air channel;

a damper including a channel closing portion and being mounted for movement in a first direction such that said channel closing portion moves away from said channel and in a second direction such that said channel closing portion moves toward said channel, said damper being pivotably mounted for rotation about a horizontal axis;

biasing means for biasing said damper in one of said first and second directions; and

actuating means operably connected to said damper for moving said damper in the other of said first and second directions against the bias of said biasing means, said actuating means comprising:

a rotary means including a rotary knob and a cam surface rotatable with said rotary knob and operably connected to said damper for moving said damper in said other of said first and second directions, said rotary knob being rotatable about a vertical axis; and

a pin-and-recess coupling for yieldably retaining said rotary means in various positions of angular adjustment.

5,191,775

REFRIGERANT RECEIVER

Kaniehi Shiina; Katsuhisa Suzuki, and Yuji Yamamoto, all of Tochigi, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Continuation of Ser. No. 663,084, Mar. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 428,672, Oct. 30, 1989, abandoned. This application Mar. 30, 1992, Ser. No. 860,565

Claims priority, application Japan, Oct. 31, 1988, 63-142822

Int. Cl.[5] F25B *43/00*

U.S. Cl. 62—503 **21 Claims**

1. A refrigerant receiver comprising:

a tubular body having a trunk wall including

an open upper end portion having a first diameter,

a lower portion having a second diameter which is larger than said first diameter, and

an intermediate tapered portion connecting said upper end portion and said lower portion; and

a closure fitted in the open end portion, the open end portion being constricted and crimped, by electromagnetic forming, and therein secured to the closure, said closure having a flat upper surface which is one of even with and slightly higher than an upper surface of a lip of said tubular body, said closure having a refrigerant inlet channel extending therethrough, said refrigerant inlet channel having an enlarged inlet diameter portion formed in said flat upper surface of said closure at an upper end portion of said refrigerant inlet channel, and said closure having a refrigerant outlet channel extending therethrough, said refrigerant outlet channel having an enlarged outlet diameter portion formed in said flat upper surface of said closure at an upper end portion of said refrigerant outlet channel, and said closure having tapped holes formed in said flat upper surface for connection with auxiliary devices.

5,191,776

HOUSEHOLD REFRIGERATOR WITH IMPROVED CIRCUIT

Martin C. Severance, and Stephen Searl, both of Louisville, Ky., assignors to General Electric Company, N.Y.

Filed Nov. 4, 1991, Ser. No. 787,233

Int. Cl.[5] F25B *5/02, 39/02*

U.S. Cl. 62—513 **17 Claims**

1. A refrigerator comprising:

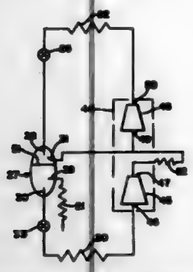
compressor means;

condenser means connected to receive refrigerant discharged from said compressor means;

a refrigerant phase separator connected to receive refriger-

ant discharged from said condenser means and including a receptacle for accumulating liquid phase refrigerant in its lower portion and vapor phase refrigerant in its upper portion;

a fresh food compartment, a fresh food evaporator for refrigerating said fresh food compartment, said fresh food evaporator being connected to said phase separator to receive liquid phase refrigerant from said phase separator and to discharge vapor phase refrigerant back to said phase separator;



a freezer compartment, a freezer evaporator for refrigerating said freezer compartment and connected to receive liquid phase refrigerant from said phase separator and to discharge vapor phase refrigerant to said compressor means; and

means connecting said upper portion of said phase separator with said compressor means for conducting vapor phase refrigerant from said phase separator to said compressor means.

5,191,777

WEFT INSERTED, WARP KNIT, WOVEN-LOOK FABRIC AND APPARATUS AND METHODS OF MAKING THE FABRIC

Julius R. Schnegg, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 329,368, Mar. 27, 1989, abandoned. This application Sep. 14, 1990, Ser. No. 582,340

Int. Cl.[5] D04B *21/14*

U.S. Cl. 66—195 28 Claims

1. A warp knit, weft inserted, fabric having selvages along opposite sides and a woven-like appearance, comprising:

plural stitch wales having a plurality of substantially parallel courses and a stitch in each wale at each course having a technical face side and a technical back side;

a first set of weft yarns each of which is held in the fabric by the technical back sides of predetermined ones of said stitches;

a second set of weft yarns each of which is held in the fabric by the technical face sides of predetermined ones of said stitches and spaced along said fabric from said firs set of weft yarns; and

each of said first set of weft yarns and said second set of weft yarns extending to and between the selvages along opposite sides of the fabric; and

each weft yarn being longitudinally spaced along the fabric from each other weft yarn in the fabric;

plural warp yarns spaced form one another disposed between said firs and second sets of weft yarns and extending in a warp direction between predetermined stitch wales;

whereby said first and second sets of weft yarns and said warp yarns are interlaced one with another such that at least one side of the fabric has said woven-like appearance.

5,191,778

PROCESS FOR PRODUCING THIN-WEBBED H-BEAM STEEL

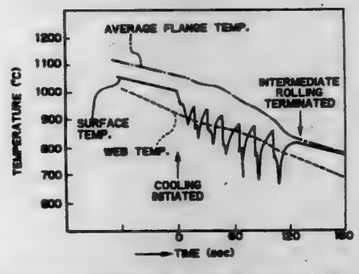
Akira Inagaki; Masao Kurokawa; Hiroyuki Hasegawa, all of Sakai; Toshihiro Ishibashi, Kitakyushu; Hiroaki Hadano, Kitakyushu; Takeshi Hioki, Kitakyushu; Yoshimi Toriyama, Kitakyushu; Kazuo Fujita, Sakai; Yasuaki Takeshima, Sakai; Teruyuki Wakatsuki, Sakai, and Yasushi Horiuchi, Sakai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 20, 1991, Ser. No. 719,122

Claims priority, application Japan, Jun. 21, 1990, 2-161403; Jun. 21, 1990, 2-161405; Nov. 6, 1990, 2-298885

Int. Cl.[5] B21B *37/10*; B21D *37/16*; C21D *1/00, 9/00*

U.S. Cl. 72—13 4 Claims



1. A process for producing a steel thinwebbed H-beam having a selected size and a length, having a web thinner than flanges with said flanges having an outer surface, and with said steel having a microstructure, which comprises the steps of:

forcibly water cooling the outer surface of the flanges during an intermediate hot rolling prior to a final hot rolling, so that the flange outer surfaces are cooled to a temperature of 700° C. or lower;

interrupting said forcible water cooling during the intermediate hot rolling so that the flange outer surfaces are returned to a temperature higher than 700° C.;

repeating said forcible water cooling and said interruption thereof during said intermediate hot rolling to refine the microstructure of the steel of the flange outer surfaces to a predetermined depth from the outer surface;

final-hot rolling the intermediate-hot rolled H-beam steel; and

forcibly water cooling the flanges of the final-hot rolled H-beam steel with a selected density of cooling water quantity immediately after completing final hot rolling for a selected cooling time, in a manner such that either the cooling time is not longer than an upper time limit or for a time such that the flange and the web temperature difference upon completion of the forcible water cooling after final hot-rolling is not less than a lower temperature limit, within which upper time limit and lower temperature limit the web does not wave during the forcible water cooling after final hot-rolling, and such that either the cooling time is not less than a lower time limit or for a time such that the flange and the web temperature difference upon completion of the forcible water cooling after final hot-rolling is not more than an upper temperature limit, within which lower time limit and upper temperature limit a thermal stress, generated in the web during air cooling to room temperature, does not exceed a buckling strength of the web, the upper time and temperature limits and the lower time and temperature limits being predetermined with respect to the selected size of the H-beam and the selected density of coolant water quantity.

5,191,779

METHOD OF PRODUCING A METALLIC CAN USING A SATURATED BRANCHED CHAIN CONTAINING HYDROCARBON LUBRICANT

Katsuhiro Imazu; Kazuhiro Sato; Takuro Ito, all of Yokohama; Shunji Kaneko, Ebina, and Toshio Sue, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

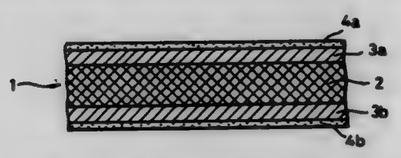
PCT No. PCT/JP90/01595, § 371 Date Aug. 5, 1991, § 102(e) Date Aug. 5, 1991, PCT Pub. No. WO91/08066, PCT Pub. Date Jun. 13, 1991

PCT Filed Dec. 6, 1990, Ser. No. 743,350

Claims priority, application Japan, Dec. 6, 1989, 1-315205; Nov. 1, 1990, 2-293680

Int. Cl.[5] B21B *45/00*

U.S. Cl. 72—46 8 Claims



1. A method of producing a metallic container comprising:

uniformly coating a thermoplastic resin on a surface of a metallic material with a saturated branched chain containing hydrocarbon lubricant, wherein the branched chains are present in an amount of at least one branch per 2 to 10 carbon atoms of the main chain, and the number of branched chains having one carbon atom is at least 70% of the number of entire branched chains present;

subjecting the coated metallic material to at least one drawing; and

heating the can obtained by drawing to volatilize a major portion of the lubricant adhering to the can.

5,191,780

ROLLER-TYPE STRAIGHTENING APPARATUS FOR H-BEAMS

Kazuo Ohmori; Tsuneo Seto; Hitoshi Itakura; Mikio Kohno, all of Okayama; Masaru Nagae, Osaka; Tatsuya Morishita, Osaka, and Masayuki Tanigawa, Osaka, all of Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Dec. 18, 1991, Ser. No. 809,926

Claims priority, application Japan, Mar. 19, 1991, 3-54283; Apr. 22, 1991, 3-90338; Nov. 1, 1991, 3-286936

Int. Cl.[5] B21D *1/14*

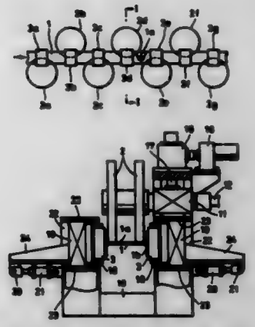
U.S. Cl. 72—164 7 Claims

1. A straightening apparatus for an elongated H-beam movable along a longitudinally extending pass line, said H-beam having a horizontally arranged web and a pair of opposed vertically arranged flanges extending along a longitudinal axis of said H-beam comprising:

a plurality of spaced-apart horizontal web-engaging rolls arranged in a substantially straight line for pressing the web of the H-beam and alternately vertically disposed against opposite faces of said web above and below the web, said web-engaging rolls being arranged so that said web is unsupported on a face directly opposite from each web engaging roll, said horizontal web engaging rolls having axes extending substantially horizontally,

a plurality of pairs of spaced-apart flange-engaging vertical rolls arranged in a substantially straight line in position for pressing the surfaces of said flanges, said vertical rolls having axes extending substantially vertically,

said pairs of vertical flange-engaging rolls being disposed to correspond substantially in position along the length of



said H-beam to the positions of each of said horizontal web-engaging rolls along the H-beam so that the axes of each pair of vertical rolls substantially cross the axis of the corresponding horizontal roll.

5,191,781

RATIOMETRIC SIGNAL CORRECTION SYSTEM FOR A VEHICLE ELECTRONIC CONTROL SYSTEM

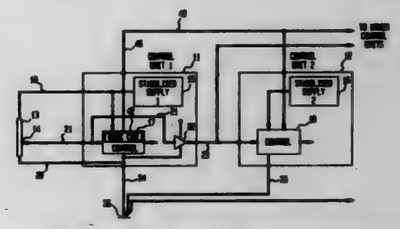
Helmut Denz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/01138, § 371 Date May 23, 1991, § 102(e) Date May 23, 1991, PCT Pub. No. WO91/05154, PCT Pub. Date Apr. 18, 1991

PCT Filed Sep. 28, 1989, Ser. No. 688,960

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—1 E 15 Claims



1. A ratiometric signal correction system for a vehicle electronic control system, comprising:

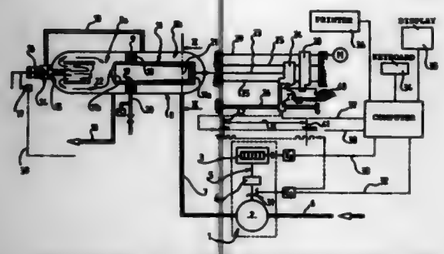
a sensor for detecting a predetermined vehicle parameter that changes in response to changing operating conditions of the vehicle and generating an output signal representative of the changing vehicle parameter;

a first control unit that receives, as an input signal, the output signal from the sensor that is representative of the changing vehicle parameter, the first control unit providing a supply voltage input to the sensor and generating reference signals corresponding to predetermined states of the sensor; and

at least one second control unit that receives, as an input signal, the output signal from the sensor that is representative of the changing vehicle parameter, and the reference signals from the first control unit for correcting inaccuracies in the detected changes in the vehicle parameter at the second control unit.

VOL 1148 ISS 2 MR 9 1993 UMI

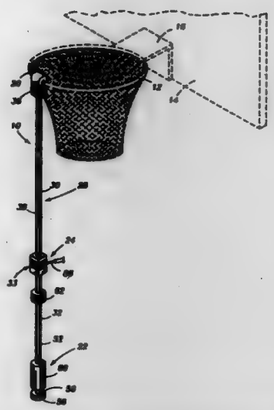
5,191,782
DEVICE FOR GAUGING A VOLUMETRIC METER
Georges F. D. Malaquet, Villeneuve, France, assignor to Mesure Controle et Automatisme Mestrole, France
Filed Oct. 17, 1990, Ser. No. 599,303
Claims priority, application France, Oct. 17, 1989, 89 13565
Int. Cl.[5] G01F *25/00*
U.S. Cl. 73—3 6 Claims



1. A device for gauging a volumetric liquid meter comprising a measuring member and a volume indicator, said device comprising a first pulse generator driven by the measuring member for generating a first pulse corresponding to the true volume passing into the measuring member, a second pulse generator driven by the volume indicator for generating a second pulse corresponding to the volume read by the indicator, means for forming a ratio of the number of the first and second pulses for comparing the value read by the volume indicator and the true volume passing into the measuring member, an enclosure containing a piston hydraulically connectable to said measuring member of said meter, said piston comprising a plunger piston having a cross-section smaller than the cross-section of said enclosure, said piston being slidably mounted in sealing relationship through an opening in at least one wall transversely mounted within said enclosure to define at least two fluid-tight capacities within said enclosure, wherein both capacities are connectable to a circuit for conveyance of liquid passing into said measuring member of said meter and both capacities communicate with each other through at least one duct provided with at least one valve arranged along a center line axis of the sliding motion of said piston, said valve allowing for a gradual flow of liquid from one capacity to the other capacity or discontinuance of the flow.

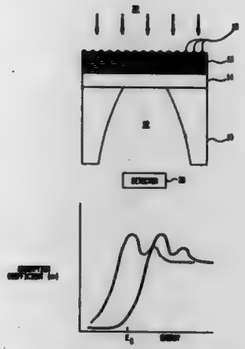
5,191,783
PORTABLE BASKETBALL RIM TESTING DEVICE
W. Bruce Abbott, 610 Clover St., Cheney, Wash. 99004
Filed Apr. 25, 1991, Ser. No. 691,386
Int. Cl.[5] G01L *1/04;* G01N *3/08*
U.S. Cl. 73—12.06 35 Claims

13. A portable basketball rim testing device for determining the rebound characteristics of a basketball rim, comprising:
- a weight guide;
- attachment means for attaching the weight guide to the basketball rim;
- a drop weight received by the weight guide;
- an impact face to terminate downward motion of the drop weight and to generate an impact force, the impact face being operably connected to the weight guide to transmit the impact force to the basketball rim, wherein the impact force has a magnitude sufficient to deflect the basketball rim to simulate the impact of a falling basketball striking the basketball rim;
- a transducer operably connected to the weight guide to generate a signal that contains information concerning the magnitude of the deflection of the basketball rim in response to the application of the impact force; and



signal processing means responsive to the transducer signal for determining the rebound characteristics of the basketball rim.

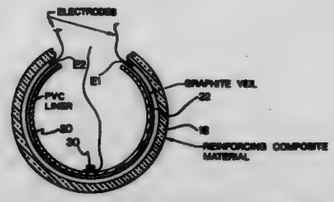
5,191,784
OPTO-ELECTRONIC GAS SENSOR
Kevin W. Jelley, Allentown, N.J., and G. J. Maclay, Maywood, Ill., assignors to Siemens Corporate Research, Inc., Princeton, N.J.
Filed Dec. 28, 1989, Ser. No. 458,032
Int. Cl.[5] H01L *29/205;* G01J *3/10*
U.S. Cl. 73—31.06 6 Claims



1. A semiconductor device adapted for operation as a gas sensor, comprising:
- a body of semiconductor material including a substrate region and a multiple quantum well (MQW) structure over said substrate region, said MQW structure having first and second different materials arranged alternately in a plurality of parallel planar layers in a vertical direction, said planar layers exhibiting an absorption edge for electromagnetic radiation at a first wavelength thereof and having a respective predetermined relatively thin thickness dimension of a value wherein an electric field acting perpendicularly to said planar layers causes a shifting of said absorption edge from said first wavelength of said electromagnetic radiation to a second wavelength of said electromagnetic radiation;
- a layer of a transition metal formed over a topmost layer of said MQW structure, said layer of a transition metal having a relatively thin thickness dimension being substantially transparent to the electromagnetic radiation and substantially permeable to a gas to be detected; and
- a light detector, located below said substrate region, for detecting the sifting in wavelength of said electromagnetic radiation transmitted in the vertical direction through said layer of transition metal, said MQW structure, and said substrate region,

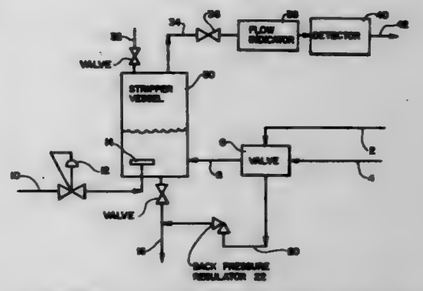
wherein said layer of transition metal allows gas atoms to permeate into the topmost layer of said MQW structure so as to form a dipole layer resulting in an electric field acting perpendicularly to said planar layers of said MQW structure, thereby causing a shifting in wavelength of said electromagnetic radiation which is detected by said light detector to indicate the presence of the gas.

5,191,785
METHOD AND APPARATUS FOR IDENTIFYING AND LOCATING A LEAK IN THE INNER LINER OF A VESSEL HAVING A LAMINATED WALL STRUCTURE
John A. Kidd, Rosemere; Swong V. Hoa, Brossard, and Ramesh Janardhanam, Montreal, all of Canada, assignors to CPF Chemical Equipment Ltd., Canada
Filed Apr. 16, 1991, Ser. No. 685,653
Int. Cl.[5] G01M *3/16;* B65D *90/04*
U.S. Cl. 73—49.2 11 Claims



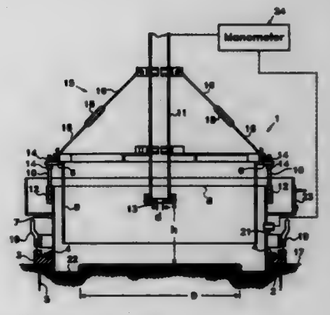
1. A vessel for containing an electro-conductive fluid, said vessel having a laminated wall structure, including:
- an outer structural shell;
- an inner corrosion-resistant lining made of electrically non-conductive material, constituting a barrier between said structural shell and electro-conductive fluid in the vessel;
- an electrically resistive medium between said structural shell and said corrosion-resistant lining;
- an array of electrodes mounted in a spaced apart relationship at fixed and known locations to said resistive medium;
- a main electrode in said vessel extending into the electro-conductive fluid which forms an electric path between said main electrode and said resistive medium in occurence of a fault in said corrosion-resistant lining, such that electro-conductive fluid is allowed to contact said resistive medium;
- means for impressing a voltage difference across electrodes of said array for causing electric current to flow through said resistive medium; and
- means for obtaining voltage drop measurements across said resistive medium between electrodes of said array and the contact point of electro-conductive fluid on said resistive medium, to determine the location of said fault on said lining which corresponds to said contact point, each of said voltage drop measurements being between a respective electrode of said array and said main electrode.

5,191,786
METHOD FOR DETECTING THE PRESENCE AND CONCENTRATION OF RELATIVELY LOW MOLECULAR WEIGHT COMPONENTS IN A LIQUID
Ernest H. Baughman, Naperville; John R. Winston, Bolingbrook, and Kenneth W. Andresen, Glen Ellyn, all of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Jan. 28, 1991, Ser. No. 722,958
Int. Cl.[5] G01N *7/16*
U.S. Cl. 73—64.45 11 Claims



1. A method for measuring the concentration of at least one target component present in a liquid comprising the steps of:
- (a) obtaining a sample of said liquid having a predetermined volume;
- (b) commingling said sample with a diluent to form a sample-diluent mixture;
- (c) passing said mixture to a stripping zone;
- (d) stripping said target component from said mixture with a stripping gas at a predetermined stripping gas flow rate and predetermined stripping conditions;
- (e) passing said stripped target component to a detection zone at a predetermined rate;
- (f) generating a signal in said detection zone responsive to the quantity of said target component; and
- (g) utilizing a chemometric model to correlate said signal to said concentration and determining said concentration of said target component in said liquid.

5,191,787
SOIL ERODIBILITY TESTING
Gregory J. Hanson, Stillwater, Okla., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Apr. 11, 1990, Ser. No. 507,440
Int. Cl.[5] G01N *17/00*
U.S. Cl. 73—86 8 Claims



1. An apparatus comprising:
an outer backwater tank defining a first aperture at an upper

portion thereof for egress of water, said outer backwater tank also defining a second aperture at a lower portion thereof through which soil to be tested may be exposed to the interior of said tank;

an inner liner positioned at least partially within said outer backwater tank, said inner liner defining a first aperture at an upper portion thereof through which a feed tube extends, said inner liner also defining a second aperture in a lower portion thereof through which soil to be tested may be exposed to the interior of said inner liner;

said feed tube having a lower terminus positioned within the interior of said inner liner, said feed tube having at said lower terminus thereof a nozzle, said nozzle defining a circular aperture having a rounded nozzle entrance and a nozzle exit diameter of about 13 millimeters;

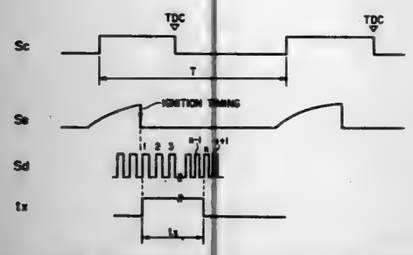
said nozzle being positioned within the interior of said inner liner such that said nozzle will be about 0.22 meters from said soil to be tested and said nozzle is lower than said first aperture of said outer backwater tank, whereby when said outer backwater tank is filled with water said nozzle will be submerged, and;

foundation ring means sealed to said lower portion of said outer backwater tank for providing an essentially water tight seal between said lower portion of said outer backwater tank defining said second aperture and said soil to be tested.

5,191,788
MISFIRE DETECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Yukisobu Nishimura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,278
Claims priority, application Japan, Nov. 28, 1990, 2-335333; Nov. 28, 1990, 2-335429
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 **7 Claims**



1. A misfire detection device for an internal combustion engine including ignition signal generation means for generating an ignition timing signal for controlling ignition timings of the internal combustion engine, said misfire detection device comprising:

crank angle signal generation means for generating pulses at predetermined angular intervals of a crank shaft of said internal combustion engine;

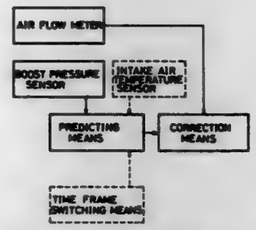
time measurement means for measuring a time length from each ignition timing as determined on the basis of said ignition timing signal, to a predetermined crank angle after said ignition timing, as determined on the basis of said pulses of said crank angle signal generation means; and

misfire detection means for detecting an occurrence of misfire on the basis of a variation of said time length measured by said time measurement means.

5,191,789
METHOD AND SYSTEM FOR DETECTING INTAKE AIR FLOW RATE IN INTERNAL COMBUSTION ENGINE COUPLED WITH SUPERCHARGER

Junichi Furuya, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

Filed Nov. 26, 1991, Ser. No. 797,971
Claims priority, application Japan, Nov. 27, 1990, 2-321044; Nov. 27, 1990, 2-321046
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.2 **14 Claims**



1. A method of detecting an intake air flow rate for an internal combustion engine having a supercharger, including a throttle valve disposed within an induction passage downstream of a compressor of said supercharger, and an air flow meter disposed within the induction passage upstream of said compressor, the method comprises the steps of:

detecting a boost pressure by said supercharger;

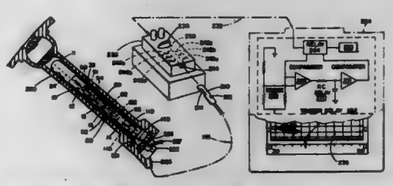
predicting variations an amount of air in a boost chamber, on the basis of a volume of the boost chamber between said compressor and said throttle valve, and variations of a boost pressure by said supercharger; and

correcting an intake air flow rate detected by said air flow meter based on the predicted variations of the amount of air in said boost chamber.

5,191,790
CARRIER

John L. Layport, Mattapoisett, Mass., assignor to Sippican, Inc., Marion, Mass.

Continuation of Ser. No. 543,691, Jan. 24, 1975, Pat. No. 5,046,359. This application Sep. 9, 1991, Ser. No. 756,832
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] G01W *1/08*; B63G *8/22*; G01K *13/00*
U.S. Cl. 73—170.33 **5 Claims**



1. An assembly capable of being launched from a submarine to carry into seawater an element responsive to a property of the water to be measured by a measurement circuit, comprising

a carrier member coupled to said element,

a lifting body,

a tether for connecting said lifting body to said submarine to pull said lifting body through the water when said submarine is moving,

a supply of conductive cable connected to said element for connecting said element in said measurement circuit,

releasable coupling means for holding said member and said lifting body together during their launch from the submarine and thereafter releasing said lifting body from said member,

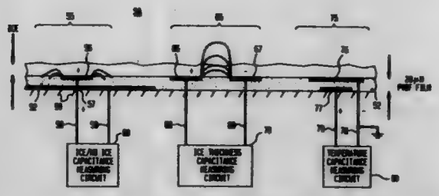
means for storing said cable for payout between said lifting body and said member after release of said lifting body from said member, to permit movement of said member relative to said lifting body while said lifting body is being pulled through the water by said submarine via said tether,

said lifting body having means operable during said payout to maintain said lifting body at a distance above said submarine.

5,191,791
PIEZOELECTRIC SENSOR

Joseph J. Gerardi, 81 Crystal Dr., Dryden, N.Y. 13053; Philip R. Dahl, 16919 Strawberry Dr., Encino, Calif. 91436, and Gail A. Hickman, 81 Crystal Dr., Dryden, N.Y. 13053

Continuation-in-part of Ser. No. 295,722, Jan. 10, 1989. This application May 4, 1990, Ser. No. 518,043
Int. Cl.[5] G01C *21/00*
U.S. Cl. 73—178 R **14 Claims**



1. An apparatus for measuring localized ice thickness comprising:

an ice presence sensor having a first metallization layer facing towards an environment, a second metallization layer, and a dielectric layer between said first and second metallization layers, said second metallization layer being greater in surface area than said first metallization layer, wherein existence of ice in an area surrounding said first metallization layer causes a capacitance value associated with said ice presence sensor to change; and

an ice thickness sensor having a dielectric layer, and having first and second metallization layers located on one side of said dielectric layer and facing towards the environment, wherein existence of ice in an area between said first and second layers of said ice thickness sensor causes a capacitance value associated with said ice thickness sensor to change.

5,191,792
INSTRUMENT FOR INDICATING ALTITUDE OR DIRECTION

Hans Gloor, Biel, Switzerland, assignor to Recta AG, Biel, Switzerland

Filed Jul. 1, 1991, Ser. No. 723,816
Int. Cl.[5] G01C *21/00*
U.S. Cl. 73—178 R **11 Claims**

1. A hand-held instrument for selectively indicating at least two different variables, such as altitude and direction, said instrument comprising:

(a) a first sensor responsive to one of the variables to produce an analog signal corresponding thereto;

(b) a second sensor responsive to the other variable to produce an analog signal corresponding thereto;

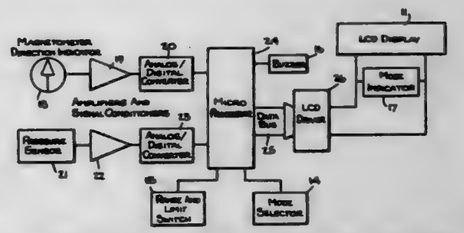
(c) a microprocessor having an input and an output;

(d) means to convert the first sensor signal into a first digital value and to apply said value to the input of said microprocessor;

(e) means to convert the second sensor signal into a second digital value and to apply said value to the input of said microprocessor:

(f) a function selector switch coupled to said microprocessor to render it operative either in a first mode to process said first value to provide an output representing said first variable, or in a second mode to process said second value to provide an output representing said second variable; and

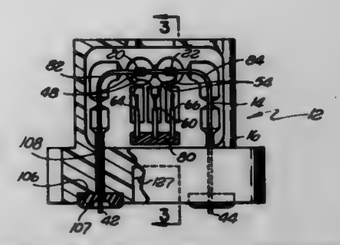
(g) an electronic display coupled to the output of the microprocessor to indicate said first and second values.



5,191,793
FLUID MASS FLOW METER DEVICE WITH REDUCED ATTITUDE SENSITIVITY

Charles F. Drexel, Rolling Hills Estates, and Richard F. Blair, Long Beach, both of Calif., assignors to Tylan Corporation, Carson, Calif.

Continuation of Ser. No. 283,050, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 150,463, Feb. 5, 1988, abandoned, which is a continuation of Ser. No. 9,008, Jan. 30, 1987, abandoned, which is a continuation of Ser. No. 834,150, Feb. 26, 1986, abandoned, which is a continuation of Ser. No. 588,586, Mar. 12, 1984, abandoned. This application Jul. 10, 1992, Ser. No. 912,007
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—204.22 **15 Claims**



1. A mass flow meter for measuring the flow rate of a fluid flowing in the interior of a sensing conduit having a pair of fluid flow ports, comprising:

a first self-heating coil element positioned along the flow path of the fluid externally of the sensing conduit closer to one of the fluid flow ports and a second self-heating coil element positioned along the flow path of the fluid externally of the sensing conduit closer to the other of the fluid flow ports, said coil elements being formed of temperature-sensitive resistance wire wound around the outside of the sensing conduit for sensing the temperatures of said coil elements modified by the fluid flow;

means for heating said coil elements;

means for detecting a temperature differential between said coil elements; and

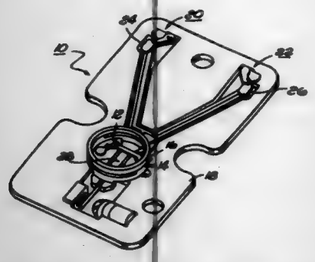
a housing having wall structure spaced along said coil elements to substantially define the thickness of an ambient gaseous atmosphere along said coil elements, the maxi-

mum spacing between said wall structure, along said coil elements, being less than or equal to about 270 mils, said wall structure being formed of a metallic material, or of a polyamide material having a heat conductivity much larger than air.

5,191,794
INTEGRATED ACCELEROMETER WITH RESILIENT LIMIT STOPS

Henry C. Abbink, Westlake; Daryl K. Sakaida, Northridge, and Stanley F. Wyse, Encino, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 24, 1990, Ser. No. 633,260
Int. Cl.[5] G01P *15/02*
U.S. Cl. 73—514 **5 Claims**

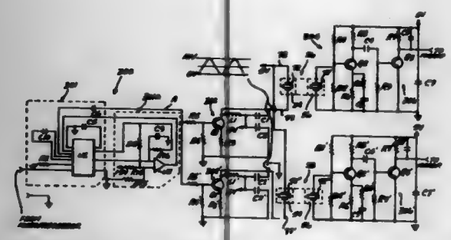


1. An integrated accelerometer comprising, in combination:
a) a planar support base having an internal aperture;
b) a pendulous mass including a pair of arms;
c) a pair of spaced flexible hinges, a first end of each being joined to said support base and a second end of each being joined to one of said arms, for pivotally supporting said pendulous mass within said aperture;
d) a pair of limit stops welded to opposed sides of said support base; and
e) each of said limit stops being generally U-shaped and resilient.

5,191,795
ULTRASONIC DETECTOR

George H. Fellingham, San Jose; Lance B. Koll, Santa Clara, and Timothy J. Hughes, Palo Alto, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 448,006, Dec. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 307,489, Feb. 6, 1989, Pat. No. 4,944,191, which is a division of Ser. No. 45,951, May 1, 1987, Pat. No. 4,821,558. This application Aug. 23, 1991, Ser. No. 753,009
Int. Cl.[5] G01N *9/24*; G08B *21/00*
U.S. Cl. 73—599 **28 Claims**

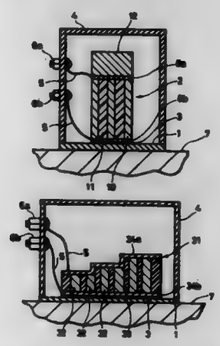


1. A device for detecting the presence of liquid-state fluid in a conduit, comprising:
(a) acoustic transmitter means for generating acoustic signals across the conduit, said acoustic transmitter means generating said acoustic signals in response to a drive signal at a selected frequency applied thereto;
(b) signal generating means for applying a drive signal to said acoustic transmitter means, said signal generator means continuously generating said drive signal over a sweep range of frequencies including said acoustic transmitter drive signal selected frequency so as to cause said acoustic transmitter means to periodically emit said acoustic signals; and
(c) acoustic receiver means responsive to said acoustic signals emitted by said acoustic transmitter means, for producing a signal indicative of whether or not liquid-state fluid is present in the conduit wherein said signals indicative of the presence of liquid-state fluid is periodically produced when said acoustic signals are received.

5,191,796
ACOUSTIC-EMISSION SENSOR

Teruo Kishi, Minato; Mitsuharu Shiwa, Fujisawa; Yoshinobu Ohara, Nara, and Yasuhiro Nakagami, Ikoma, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Aug. 9, 1991, Ser. No. 744,096
Claims priority, application Japan, Aug. 10, 1990, 2-212622; Sep. 18, 1990, 2-249848; Feb. 28, 1991, 3-34610
Int. Cl.[5] G01N *29/04, 29/22*
U.S. Cl. 73—632 **8 Claims**

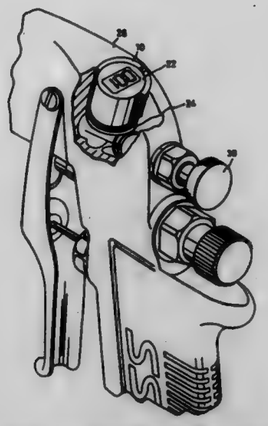


1. An acoustic-emission sensor comprising:
a receiving plate for receiving acoustic-emission waves; and
a composite synthetic resin-ceramic piezoelectric element for converting the acoustic-emission waves received by the receiving plate into electric signals, wherein the composite synthetic resin-ceramic piezoelectric element includes
a plurality of columnar ceramic piezoelectric bodies disposed in a synthetic-resin matrix, each columnar ceramic piezoelectric body polarized in a longitudinal direction, each columnar ceramic body arranged substantially mutually parallel to each other, and
first and second electrodes being provided at respective ends of said columnar ceramic piezoelectric bodies and the receiving plate being fixed to said first electrode,
wherein a weight for pressing down the composite synthetic resin-ceramic piezoelectric element on the receiving plate is attached to said second of the electrodes, the second electrode being opposite to the first electrode whereon the receiving plate is fixed.

5,191,797
MINIATURE ELECTRONIC PRESSURE GAUGE

Rowland C. Smith, Wimborne, United Kingdom, assignor to ITW Limited, Windsor, United Kingdom

Filed Oct. 11, 1991, Ser. No. 775,196
Int. Cl.[5] G01L *9/00*
U.S. Cl. 73—714 **2 Claims**

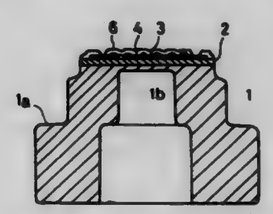


1. A paint spray gun including a body defining an interior space through which air under pressure can be passed, a bore defined in said body leading from said interior space, pressure gauge means for indicating the air pressure in said interior space, means releasably retaining said pressure gauge means in said bore, and wherein said pressure gauge means includes a pressure transducer, a power source connected to supply power to said transducer, digital pressure display means for indicating air pressure sensed by said pressure transducer, and a sealed housing enclosing said pressure transducer, said power source and said display means.

5,191,798
PRESSURE SENSOR

Aki Tabata, Isehara; Jun Tajika; Hiroshi Inagaki, both of Hiratsuka; Yukio Kobayashi, Isehara, and Noritake Suzuki, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP89/00923, § 371 Date Jun. 10, 1991, § 102(e) Date Jun. 10, 1991, PCT Pub. No. WO90/03664, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 7, 1989, Ser. No. 490,565
Claims priority, application Japan, Sep. 30, 1988, 63-247073
Int. Cl.[5] G01L *7/08, 9/06*
U.S. Cl. 73—727 **20 Claims**

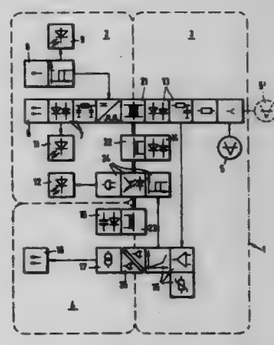


1. A thin film pressure sensor module comprising a diaphragm body having an annular body segment with a thin diaphragm segment extending across one end of said annular body segment, said thin diaphragm segment having a pressure receiving side facing the interior of said annular body segment and having a reverse side opposite said pressure receiving side, a strain gauge located on said reverse side of said diaphragm segment, said annular body segment having a holding surface on the exterior thereof at a location remote form said thin diaphragm segment, said holding surface being suitable for engagement with a holding member in an assembly to mount the pressure sensor module in the assembly, the portion of said annular body segment located between said holding surface and said thin diaphragm segment having a first annular section adjacent said holding surface and remote from said thin diaphragm segment and a second annular section adjacent said thin diaphragm segment and remote form said holding surface, said second annular section having a circumference which is smaller than the circumference of said first annular section such that said first and second annular sections form a step in the exterior surface of said annular body segment such that the influence on said pressure receiving side of variations in the position of the holding member with respect to the holding surface is reduced.

5,191,799
MEASURED VALUE RECEIVER FOR VACUUM MEASUREMENT

Anno Schoroth, Königsweiler, and Theo Koopmann, Brauweiler, both of Fed. Rep. of Germany, assignors to Leybold AG, Hanau, Fed. Rep. of Germany

Filed Jun. 27, 1990, Ser. No. 544,525
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 8908069[U]
Int. Cl.[5] G01L *9/00*
U.S. Cl. 73—753 **12 Claims**



1. A measured value pickup for vacuum measurements, said pickup comprising:
sensor means for sensing characteristics of a vacuum and for producing a signal corresponding to values of the sensed characteristics;
electronic circuit means connected to the sensor means for supplying the sensor means with voltage and for converting and reshaping the signal produced by the sensor means into an electrical output signal suitable for transmission to and use by remotely located evaluation devices;
a transmitter housing;
said electronic circuit means being disposed in the transmitter housing and comprising a supply circuit providing a source of voltage, high-voltage and signal processing circuit means connected for stepping up the voltage provided by the supply circuit to the sensor means and for processing the signal produced by the sensor means, and output circuit means connected to the high voltage and signal processing means for outputting an output signal, corresponding to the processed signal of the sensor means.

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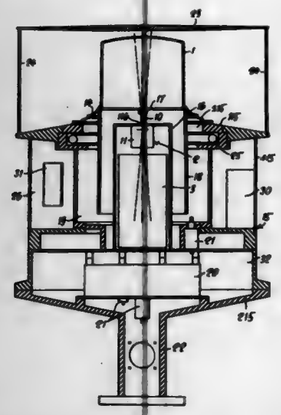
adapted for transmission to the remote evaluation devices; and

means for galvanically separating the supply circuit, high-voltage and signal processing means, and output circuit means from one another.

5,191,800
ANEMOMETER

Remo Trombella, Pontremoli, Italy, assignor to Sitep S.p.A., Italy

Filed Jan. 29, 1991, Ser. No. 647,139
Claims priority, application Italy, Jan. 31, 1990, 12414 A/90
Int. Cl.[5] G01F *1/28*
U.S. Cl. 73—861.74 17 Claims



1. An anemometer, comprising:

a) a box with a bottom part, side walls, an upper wall and chambers therein,

b) a flow-capturing surface which is responsive to a pressure force as exerted by an air flow and is mounted on the top of the box externally thereto, so as to be yieldable in all directions,

c) an electrical transducer fixed inside the box and comprising a control lever which is operatively connected to the flow-capturing surface so that the pressure force, as exerted by the air flow on the flow-capturing surface, is converted into electrical signals corresponding to the direction and to the extent of said force,

d) the flow-capturing surface being carried by the control lever of the electrical transducer and being fixed to a cylindrical hollow body arranged in an annular chamber which surrounds the electrical transducer and is of such a size as to permit the cylindrical body to oscillate in all directions transversely to its axis,

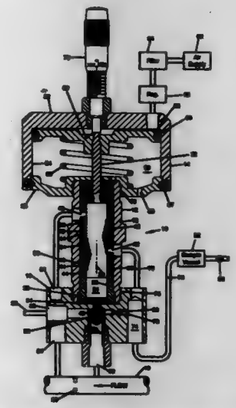
e) the cylindrical body having an upper part extending through an opening which is formed in the upper wall of the box and is closed by a annular collar made of resilient material, said annular collar having an inner circumference and an outer circumference and being sealingly fastened by at said inner circumference to the cylindrical body and at said outer circumference to the upper wall of the box,

f) said cylindrical body having an open bottom end and the electrical transducer being fixed to the top of a support which is fastened to the bottom part of the box and extends into the interior of the cylindrical body through the open bottom end thereof.

5,191,801
FLUID SAMPLING PUMP

Paul V. Allen; Spencer M. Nimberger, and Robert L. Ward, all of Houston, Tex., assignors to Precision General, Inc., Houston, Tex.

Continuation of Ser. No. 496,368, Mar. 20, 1990, Pat. No. 5,074,154. This application Dec. 12, 1991, Ser. No. 806,594
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—864.34 19 Claims



1. A pump for pumping a selected quantity of fluid with each pump driving stroke from a fluid inlet port to a fluid outlet port, an inlet valve for selectively controlling fluid flow through the fluid inlet port, a pump body defining a pump bore therein, a piston slidably movable within the pump bore and having a fluid inlet end and an opposing operator end, an operator unit for reciprocating the piston within the pump bore, and a manifold interconnected with the pump body, the manifold having (a) a flow path therein extending from a manifold inlet port to a manifold outlet port, the flow path being in communication with the fluid inlet port in the pump body, (b) a filter positioned within the manifold and extending across a portion of the flow path, the filter defining a filtered zone within within the flow path adjoining the inlet port in the pump body, and an unfiltered zone within the flow path extending from the manifold inlet to the manifold outlet, such that filtered fluid enters the pump bore while unfiltered fluid bypasses the filter and passes out the manifold outlet port, (c) a purge passageway extending from the flow path to a purge outlet, (d) a purge valve for regulating fluid flow through the purge passageway.

5,191,802
DEVICE FOR MEASURING MASS FLOW

Hans-Georg Fassbinder, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to Applikations und Technikzentrum für Energieverfahrens, Umwelt und Strömungstechnik, Sulzbach-Rosenberg, Fed. Rep. of Germany

Filed Aug. 30, 1991, Ser. No. 753,351
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4028141
Int. Cl.[5] G01F *1/82*
U.S. Cl. 73—861.37 4 Claims

1. An apparatus for measuring the flow rate of a stream of material, comprising

(a) an impeller shaft;

(b) an impeller wheel secured to said impeller shaft;

(c) a first roller bearing having an inner race receiving and supporting said impeller shaft; said first roller bearing having an outer race;

(d) a drive motor having an output shaft;

(e) a first gear secured to said output shaft;

(f) a second gear secured to said impeller shaft;

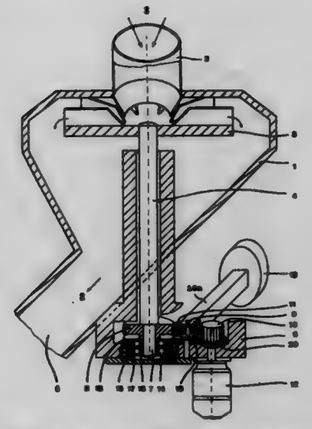
(g) a third gear meshing with said first and second gears, whereby said drive motor is drivingly connected to said impeller shaft by said first, second and third gears for rotating said impeller shaft with a predetermined rpm;

(h) means for directing the stream of material onto said impeller wheel, whereby a braking torque is applied to the impeller wheel by the stream of material impinging thereon;

(i) a force measuring device operatively coupled to said third gear for measuring excursions thereof in response to the braking torque;

(j) a second roller bearing receiving and rotatably supporting the outer race of said first roller bearing; and

(k) drive means for rotating said outer race with an rpm being greater than or equal to the rpm of the impeller shaft.



5,191,803
DETECTION OF AN ANTICORROSION OIL APPLIED INTO A SHIP'S BALLAST

Roger A. Gamache, Ile des Soeurs, Canada, assignor to Mag Chem Inc., Boucherville, Canada

Filed Jan. 22, 1991, Ser. No. 644,919
Int. Cl.[5] G01M *19/00;* G01N *21/33*
U.S. Cl. 73—865.8 5 Claims

1. A method for detecting the presence of a discontinuity in an anticorrosion oil coating applied onto the interior walls of a metallic nautical ballast, comprising:

providing an anticorrosion oil for preventing corrosion in a metallic nautical ballast,

adding an oil-soluble tracer to said anticorrosion oil prior to the application as a coating on the internal walls of said nautical ballast, said tracer being substantially insoluble in water and rust, said tracer being also substantially inert to said oil, rust and water and primarily useful for emitting visible light under the effect of a black light,

applying said anticorrosion oil to the internal walls of said nautical ballast to form a coating,

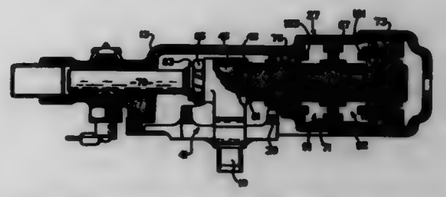
after application of said coating, submitting the internal walls of said ballast coated with said anticorrosion oil to the effect of a black light, and

checking the continuity of the visible light being emitted by the oil coating, whereby presence of said oil coating is detected by visible light emitted by said tracer and absence of said oil coating is detected by the absence of any visible light emitted back.

5,191,804
DUAL FORCE FLUID ACTUATED SHIFT DEVICE

Thomas A. Genise, Dearborn, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 23, 1992, Ser. No. 919,349
Int. Cl.[5] B60K *20/10*
U.S. Cl. 74—335 9 Claims



1. A fluid operated shift actuator for a mechanical transmission having a neutral condition and a plurality of selectable ratios, said actuator being of the type comprising an actuator housing defining a piston bore within which is reciprocally disposed a main piston member having a centered position corresponding to said neutral condition, and a piston rod fixed relative to said piston member to reciprocate therewith, said piston member and said actuator housing cooperating with said piston rod to define a first fluid pressure chamber in fluid communication with a source of fluid pressure by means of a first fluid control means; said main piston member having an effective area under the influence of said first fluid pressure chamber to bias said main piston member and piston rod in a first direction corresponding to one of said plurality of selectable ratios; characterized by:

(a) said main piston member and said actuator housing cooperating with said piston rod to define a second fluid pressure chamber in fluid communication with said source of fluid pressure by means of a second fluid control means; said piston member having an effective area under the influence of said second fluid pressure chamber to bias said piston and piston rod in a second direction corresponding to another of said plurality of selectable ratios;

(b) a first auxiliary piston operably associated with said piston rod whereby movement of said piston rod in said first direction moves said first auxiliary piston in said first direction, said first auxiliary piston having an effective area under the influence of said first fluid pressure chamber to bias said first auxiliary piston and piston rod in said second direction, opposite said first direction, after said main piston member has beea displaced from said centered position in said first direction; and

(c) a second auxiliary piston operably associated with said piston rod whereby movement of said piston rod in said second direction moves said second auxiliary piston in said second direction, said second auxiliary piston having an effective area under the influence of said second fluid pressure chamber to bias said second auxiliary piston and piston rod in said first direction, after said main piston member has been displaced from said centered position in said second direction.

5,191,805
ANTI-FRICTION NUT

John D. Parsons, Bethel, Conn., assignor to Norco, Inc., Ridgefield, Conn.

Filed Jan. 10, 1992, Ser. No. 818,886
Int. Cl.[5] F16H *55/17*
U.S. Cl. 74—459 8 Claims

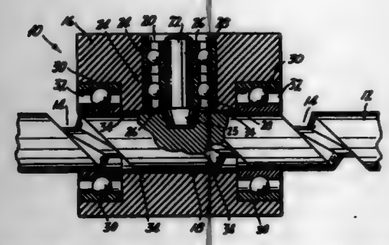
1. A light-weight miniature, high-speed light-load, anti-fric-

tion nut assemblage adapted to receive a grooved member having side walls in the groove thereof, comprising in combination:

a) a nut body having an axial bore with wall portions through which said grooved member can pass, and having a transverse bore extending entirely through said wall portions and transversely of its axis and intersecting said axial bore, said transverse bore having walls,

b) a roller pin disposed in said transverse bore, having a nose adapted for engagement with the side walls of the groove of said grooved member,

c) miniature anti-friction bearing means, mounting said roller pin in said transverse bore, said bearing means having inner and outer races and having innermost and outermost surfaces,



d) an adhesive securing an inner race of said bearing means to said roller in, and securing an outer race of said bearing means to the walls of said transverse bore,

e) additional anti-friction bearing means disposed in the axial bore of the nut body, for mounting the nut body on said grooved member for relative turning with respect thereto, said additional anti-friction bearing means having inner and outer races,

f) said nut body having a recess in its axial bore, forming walls in which recess the additional anti-friction bearing is disposed, and

g) an adhesive securing an outer race of said additional anti-friction bearing means to the walls of the said recess,

h) said transverse bore having a substantially cylindrical smooth wall surface devoid of projections.

5,191,806

SAFETY INTERLOCK DEVICE FOR A MOTOR VEHICLE GEARBOX CONTROL

Fosco De Silvestri, Maranello, Italy, assignor to Ferrari SpA, Modena, Italy

Filed Dec. 27, 1991, Ser. No. 813,916
Int. Cl.[5] F16H *59/00, 61/00*
U.S. Cl. 74—477 **3 Claims**

1. A motor vehicle gearbox control device for a gearbox of the type having

at least one shaft carrying a series of gears which are freely rotatable on said shaft, said shaft further carrying a plurality of coupling devices for selectively coupling the gears of said series to said shaft for rotation therewith,

said control device comprising:

a plurality of selector rods slidable in the gear box casing along parallel directions, each said selector rod carrying at least one fork member for actuation of a respective said coupling device, each selector rod being displaceable between a neutral position and at least one operative position, and

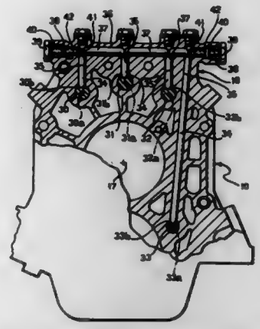
safety means comprising locking means for locking all said selector rods with respect to said gearbox casing with the exception of that which is selected at the time, said locking means comprising:

a series of locking dowels slidably mounted in respective seats of said gearbox casing and having active ends adapted to cooperate with respective reference notches provided on said selector rods, when these are in their neutral positions, whereby when a selector rod is moved away from its neutral position, the other selector rods are retained in their neutral positions by the engagement of said locking dowels within respective said reference notches,

the improvement comprising:

a plurality of said selector rods are disposed with their axes at the same distance from the axis of the shaft of the gear box with which said coupling devices are associated,

the seats for said locking dowels have separate substantially



parallel axes and open at their ends opposite the active ends of said locking dowels into a common cylindrical cavity extending transversely with respect to said seats, and

a train of locking pins is housed in said common cylindrical cavity, resiliently urged against one another and disposed in such a way that when a selector rod is actuated the associated said locking dowel projects into said common cylindrical cavity and constrains the locking pins to obstruct the exits from the seats of the locking dowels associated with the remaining said selector rods.

5,191,807

INDEXED GEAR-SHIFT MECHANISM

Yi-Hsung Hsu, No. 9, Lane 130, Sec. 1, Kwangfu Rd., Sanchung City, Taipei County, Taiwan

Filed Dec. 3, 1991, Ser. No. 802,126
Int. Cl.[5] B60K *20/00*
U.S. Cl. 74—501.6 **5 Claims**

1. An indexed gear-shift mechanism for a bicycle comprising:

(a) a housing comprising a base and a cover, said base being attached to handlebars of the bicycle, said cover being attached to said base, a cable port being formed in said housing for guiding a gear-shift cable having a block formed on an end thereof into and out of said housing;

(b) a ratchet plate defining an outer curvature and comprising a groove formed therein conforming to said curvature, an inner row of teeth projecting inward from said curvature into said groove, and an outer row of teeth projecting outward from said curvature, teeth of said inner row having a front side, teeth of said outer row having a front side and a backside; said ratchet plate having a through hole formed therethrough and defining an axis of rotation thereof;

(c) an up-shifting means for shifting said gear-shift mechanism to a higher gear comprising:

(i) an up-shifting lever having an internal portion, an external portion, and a through hole being formed and defining an axis of rotation therebetween, said external portion projecting through a first slot formed in said housing to an outside of said housing;

(ii) an inner pawl and an outer pawl protruding from said internal portion of said up-shifting lever and being spaced apart such that said outer pawl is positioned outside said groove and said inner pawl is positioned in said groove; and

(iii) a first spring for urging said outer pawl of said up-shifting lever toward said ratchet plate to bear thereagainst;

said up-shifting means being pivotally attached to said base by fastening means utilizing said through hole of said up-shifting lever;

(d) a down-shifting means for shifting said gear-shift mechanism comprising:

(i) a down-shifting lever having an internal portion and an external portion, said internal portion being fixedly attached to said ratchet plate by fastening means and having a through hole formed therethrough, corresponding to that of said ratchet plate, and defining an axis of rotation of said down-shifting lever, said external portion projecting outside said housing through a second slot formed in said housing; and

(ii) a second spring for urging said ratchet plate toward said cable port such that said front side of a tooth of said outer row bears against said outer pawl;

said down-shifting means being pivotally attached to said base by fastening means utilizing said through holes of said ratchet plate and said internal portion of said down-shifting lever; and

(e) retaining means for retaining the block of the gear-shift cable being formed in at least one of said down-shifting lever and said ratchet plate;

whereby when an external force is applied on said external portion of said up-shifting; ever, said outer pawl is drawn off said front side of said tooth of said outer row and said inner pawl is drawn toward said curvature, said outer pawl clearing a vertex of said tooth, allowing said ratchet plate to rotate toward said cable port, urging the gear-shift cable out of said housing, said ratchet plate rotating until said front side of a tooth of said inner row is retained by said inner pawl; and when said external force is removed, said first spring rotates said up-shifting lever toward said ratchet plate, said inner pawl being drawn off said front side of said tooth of said inner row, said ratchet plate rotating until said front side of a next adjacent tooth of said outer row is retained by said outer pawl; and

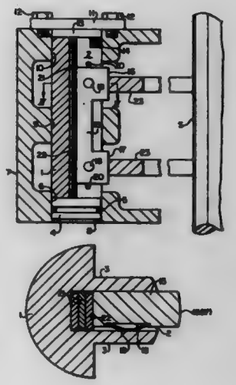
whereby when an external force is applied on said external portion of said down-shifting lever, said ratchet plate rotates away from said cable port, said backside of a tooth of said outer row being drawn toward said outer pawl, said backside of said tooth of said outer row contacting said outer pawl and urging said outer pawl outward, said outer pawl clearing a vertex of said tooth, said inner portion of said up-shifting lever rotating toward said ratchet plate, said outer pawl contacting said front side of said tooth of said outer row, said external force being removed or constantly applied.

5,191,808

ACTUATOR END STOP ARRANGEMENT

Michael A. Calvert, Kirkaldy, Great Britain, assignor to Prime Actuator Control Systems Limited, Glenrothes, United Kingdom

PCT No. PCT/GB90/00615, § 371 Date Dec. 20, 1991, § 102(e) Date Dec. 20, 1991, PCT Pub. No. WO90/12964, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 20, 1990, Ser. No. 768,756
Claims priority, application United Kingdom, Apr. 20, 1989, 8908985
Int. Cl.[5] F01B *31/14;* **G05G** *1/04*
U.S. Cl. 74—526 **4 Claims**



1. An end stop arrangement for angular motion of an arm means in an actuator wherein linear motion is received by the arm means and is converted by the arm means into angular motion and delivers such angular motion to a shaft, the arrangement comprising an assembly of a stop bar formed from a cylindrical rod but having a lengthwise slot therein, securing means for securing the stop bar to a fixed support within the actuator casing both in a sense lengthwise of the stop bar and angularly about its axis, a stop plate slidably secured in the slot and presenting a stop edge for engagement with the arm means, the position of the stop edge relative to the stop bar being adjustable by the insertion or removal of the spacer means in the slot and engaging an edge of the stop plate remote from the stop edge.

5,191,809

EXERCISE BICYCLE FLYWHEEL

Marion N. Craig, Calhoun, Ill., assignor to Roadmaster Corporation, Olney, Ill.

Filed Sep. 16, 1991, Ser. No. 760,700
Int. Cl.[5] G05G *1/00;* **F16F** *15/22, 15/10*
U.S. Cl. 74—572 **2 Claims**

1. An exercise bicycle flywheel comprising a right half and a left half which are matingly connected; each said half includ-

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ing a central hub and a rim portion extending around the periphery of said flywheel, said rim portion having a concave inner surface;

said rim portions of said right and left halves defining an annular cavity around the periphery of said flywheel when said right and left halves are joined;

said cavity being filled with a heavy, flowable, settable material; and

an annular wall on an outer side of said rim portion of each flywheel half, an annular lip on an inner side of said rim portion of one of said halves, and an annular groove on an inner side of said rim portion of said other flywheel half; said outer walls covering one another and said annular lip being received in said annular groove when said two

halves are brought together to make said cavity water tight.

5,191,810

VEHICLE MODULAR CLUTCH ATTACHING ARRANGEMENT

Barrie G. Craft, 7566 West Rd., Washington, Mich. 48094; Peter Doll, 6421 Elsey Dr., Troy, Mich. 48098, and Frank Martin, Matthias Gruenewald Ring 67, 8720 Schweinfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 812,488, Dec. 23, 1991, abandoned. This application Aug. 17, 1992, Ser. No. 929,479

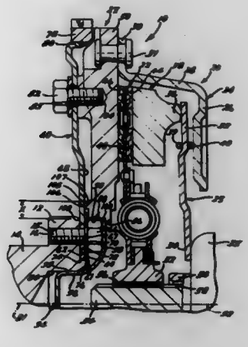
Int. Cl.[5] G05G *01/00, 03/00*; F16D *13/00*; F16B *09/00*

U.S. Cl. 74—572 **7 Claims**

1. A vehicle manual transmission modular clutch attaching arrangement including a flywheel disc assembly adapted to be rotated about a central axis by an engine crankshaft at one output end thereof, said crankshaft rotatable about said central axis with one end thereof formed with a radial collar having a cylindrical outer periphery and a plurality of circumferentially distributed apertures each adapted to receive an associated inner fastener extending through an aligned inner hole of an automatic transmission drive plate for pre-attachment thereto, said drive plate provided with a plurality of circumferentially distributed outer holes, each said inner fastener including a head portion and a shaft portion with the shaft portion extending through an associated drive plate inner holes and engaging an associated aperture in said collar so as to clamp said drive plate on said collar one end, said crankshaft one end formed with an axially extending central bore concentric with said crankshaft axis, said crankshaft one end formed with an axially extending concentrically disposed annular neck portion, said drive plate having a central circular aperture sized for snug reception on said annular neck portion thereby positioning a starter ring gear, fixed on the outer periphery of said drive plate, in concentric relation with said crankshaft central axis, an arrangement enabling the pre-attachment of said drive plate on said crankshaft for subsequent combination with either a manual transmission modular clutch assembly or an automatic transmission comprising:

a flywheel disc for said modular clutch, said flywheel disc having one side adapted to face toward said crankshaft one end with an opposite side thereof facing away from said crankshaft one end, a central circular opening in said flywheel disc having a predetermined diameter substantially equal to the diameter of said collar outer periphery, said central opening bordered by a countersunk annular recess formed in said flywheel disc one side, said flywheel disc recess having an axially extending cylindrical internal shoulder concentric with said modular clutch central axis and a radially disposed locating wall portion;

a pilot member, having a central axially extending cup portion and an outwardly extending radial flange portion,



said axial cup portion having an outer cylindrical surface adapted for frictional press-fit engagement with said crankshaft central bore and said radial flange portion having outer circular edge means adapted for press-fit frictional engagement with said flywheel disc recess internal shoulder such that a principal axis of said pilot member axis cup portion coincides with said crankshaft central axis;

said pilot member central axial cup portion engaging said crankshaft central bore and said pilot member radial flange portion engaging said flywheel disc recess internal shoulder such that each said drive plate outer hole is aligned with an associated mounting bore in said flywheel disc one side, wherein upon a plurality of outer fasteners extending through their associated drive plate circumferentially distributed outer holes and engaging associated aligned flywheel disc mounting bores said modular clutch flywheel disc is positively rigidly attached to said drive plate enabling said flywheel disc to be directly rotatively driven by said crankshaft.

5,191,811

DAMPER DEVICE FOR A MOTOR

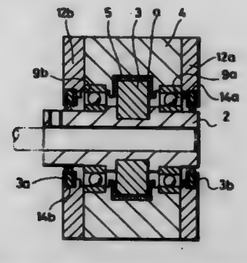
Toshiharu Kogure, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan

Division of Ser. No. 569,374, Aug. 13, 1990, Pat. No. 5,081,882, which is a continuation of Ser. No. 234,816, Aug. 22, 1988, abandoned. This application Oct. 2, 1991, Ser. No. 771,305

Claims priority, application Japan, Sep. 4, 1987, 62-135671[U]

Int. Cl.[5] F16F *1/10*

U.S. Cl. 74—574 **4 Claims**



1. A damper device for damping oscillliations of a rotationally driven shaft, comprising: a boss section connectable during use of the damper device to a rotationally driven axially extending shaft so that the boss section is rotationally driven by the shaft; a ring-shaped magnet carried by and extending radially outwardly of and circumferentially around the boss section; a mass inertia section encircling the boss section and the magnet, the mass inertia section having an annular concave portion facing the boss section, the magnet extending radially outwardly into the concavity of the concave portion and being spaced from the surface of the concave portion to define therebetween an annular gap; a viscous magnetic fluid disposed in the annular gap for imparting a viscous resistance to rotation of the mass inertia section when the boss section is rotationally driven, the magnetic fluid being confined within the annular gap by the magnetic field created by the ring-shaped magnet; mechanical bearing means rotatably and mechanically supporting the mass inertia section directly on the boss section, the mechanical bearing means comprising a pair of roller bearings interposed between the boss section and mass inertia section on either side of the ring-shaped magnet; a pair of annular cover plates connected to opposed sides of the mass inertia section outwardly of the respective roller bearings, each cover plate carrying a ring-shaped magnet having an inner peripheral surface which is radially spaced from another peripheral surface of the boss section; and viscous magnetic fluid confined in the spaces between the inner and outer peripheral surfaces by the magnetic fields created by the ring shaped magnets.

5,191,812

Patent Not Issued For This Number

5,191,813

HYDROSTATIC TRANSAXLE HAVING A FAN AND PULLEY ARRANGEMENT

Dale I. Havens, Addison, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jul. 22, 1991, Ser. No. 734,220

Int. Cl.[5] F16H *57/04*

U.S. Cl. 74—606 R **12 Claims**

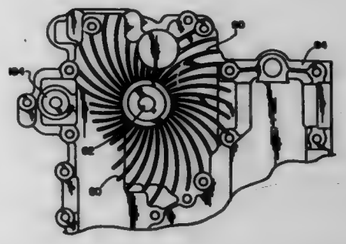
1. A hydrostatic transmission comprising:

a housing having an input aperture and external radially projecting fins outwardly curved from said input aperture in a generally helical fashion;

an input drive shaft extending through said input aperture;

a hydrostatic unit within said housing operably connected to said input drive shaft; and

a fan disposed on said input drive shaft external to said



housing, said fan including a plurality of blades extending axially towards said housing whereby a helical air flow pattern is imparted from said fan over said radially projecting fins thereby providing a substantially non-turbulent air flow along said fins.

5,191,814

SPEED CHANGE CONTROL SYSTEM IN AUTOMATIC TRANSMISSION

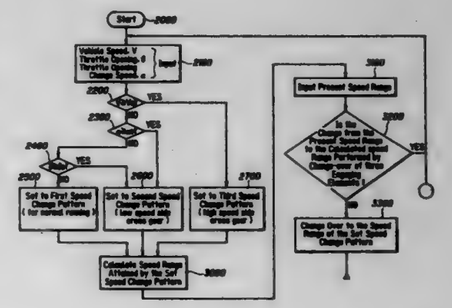
Masahiko Ando; Masahiro Hayabuchi, both of Anjo; Kazumasa Tsukamoto, Toyota; Hideo Tomomatsu; Yasuo Hojo, both of Nagoya, and Kunihiro Iwatsuki, Toyota, all of Japan, assignors to Aisan A W Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Jul. 31, 1991, Ser. No. 738,381

Claims priority, application Japan, Aug. 2, 1990, 2-205881

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **1 Claim**



1. A speed change control system of an automatic transmission, comprising: a transmission including a gear train for attaining a plurality of speed ranges by selective engagement and disengagement of a plurality of frictional engaging elements, a hydraulic controller for controlling the selective engagement and disengagement of the frictional engaging elements of the transmission, and an electronic controller for

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controlling said hydraulic controller and attaining a change-over between a plurality of speed change patterns comprising a row of speed ranges of different gear ratios and a speed change diagram for controlling the gear shift between speed ranges in said speed range row,

said electronic controller including a speed change pattern selecting means, a present speed range detecting means and a speed change pattern determining means,

said speed change pattern selecting means for selectively selecting one speed change pattern out of a first and a second speed change patterns and outputting a signal to said speed change pattern determining means based on outputs from a throttle opening sensor and a vehicle speed sensor, wherein said first speed change pattern comprises a row of speed ranges greater than a gear ratio width relative to changes in vehicle speed at a region where a throttle opening is less than a preset throttle opening value and a speed change diagram for controlling the gear shift between speed ranges included in said row of speed ranges at a region of the throttle opening being less than said preset value, and wherein the second speed change pattern comprises a row of speed ranges less than a gear ratio width relative to changes in vehicle speed at a throttle opening greater than said preset value and a speed change diagram for controlling the gear shift between speed ranges included in said row of speed ranges at a region of the throttle opening being greater than said preset value,

said present speed range detecting means for detecting the present speed range in the transmission and outputting a detected signal to said speed change pattern determining means, and

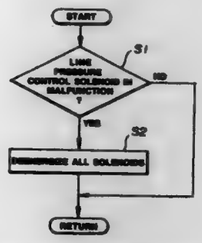
said speed change pattern determining means for judging in a comparative manner whether the gear shift from the present range detected by the present speed range detecting means to a speed range in the speed change pattern outputted by the speed change selecting means falls under any one of a predetermined prohibited conditions based on the signal inputted from said speed change pattern selecting means and said present speed range detecting means; and means for outputting to said hydraulic controller a signal indicating said gear shift and change-over to a speed range according to the selected speed change pattern selected by said speed change pattern determining means that said gear shift does not fall under any of said prohibited conditions, and outputting to said hydraulic controller a signal to temporarily carry out said speed range change-over to a speed range which is included in a row of speed ranges to be controlled by a speed change diagram in a temporary speed change pattern and gear shift thereto when it is judged by said speed change pattern determining means that said gear shift does not fall under any one of said prohibited conditions and outputting a signal indicating a re-starting operation of said electronic controller when it is judged by said speed change pattern determining means that said gear shift falls under one of said prohibited conditions, wherein said predetermined prohibited conditions include change-overs between two newly occurred speed ranges requiring simultaneous engagement and/or disengagement of three or more of frictional engaging elements in which the engagement and/or disengagement of the frictional engagements was not previously done and a changeover between two adjacent speed ranges in each of said row of speed ranges including said first, second and temporary speed change patterns.

5,191,815

CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION

Joji Kouta, Shizuoka, Japan, assignor to Jatco Corporation, Japan

Filed Nov. 22, 1991, Ser. No. 795,989
Claims priority, application Japan, Nov. 27, 1990, 2-324446
Int. Cl.[5] B60K 41/06
U.S. Cl. 74—866 **9 Claims**



1. A control system for controlling a hydraulically operated automatic transmission, comprising:

a plurality of solenoids, one of said solenoids being a line pressure control solenoid having at least one electrical input signal thereto, said line pressure solenoid, when electrically deenergized, increases the line pressure to its highest level;

first means for detecting a malfunction of said line pressure control solenoid by sensing input signals errors to said first means; and

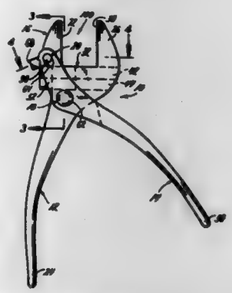
second means for electrically deenergizing all of said solenoids when said first means detects the malfunction of said line pressure control solenoid whereby the line pressure is increased to it's highest level for permitting said transmission to operate at a high speed ratio.

5,191,816

PARALLEL JAW PLIERS WITH REINFORCED CONSTRUCTION FOR SYMMETRIC FORCE DISTRIBUTION

Gary D. Burpo, 2528 Manchester Dr., Springfield, Ill. 62704

Filed Nov. 20, 1991, Ser. No. 796,035
Int. Cl.[5] B25B 7/12
U.S. Cl. 81—361 **14 Claims**



1. A pliers apparatus comprising:

a first lever having a first jaw surface and a first handle formed thereon;

a jaw member connected to the first lever for translatory movement relative thereto, the jaw member having a second jaw surface formed thereon, the second jaw surface being parallel to and mutually opposed by the first jaw surface as the jaw member is moved relative to the first lever, the first and second jaw surfaces defining a working area therebetween for receiving objects to be engaged between the first and second jaw surfaces;

a second lever having a pair of spaced arms and a second handle formed thereon, the first lever and the jaw member begin received in a space between the pair of arms and the pair of arms being connected to both the first lever and the jaw member for pivoting movement relative thereto, the pair of arms having a configuration that positions the pair of arms outside the working area defined between the first and second jaw surfaces and prevents the pair of arms from extending over the working area from opposite sides of the jaw member for all adjusted relative positions of the first and second jaw surfaces as the second jaw is moved relative to the first jaw;

a cam surface is formed on a side of the jaw member; and

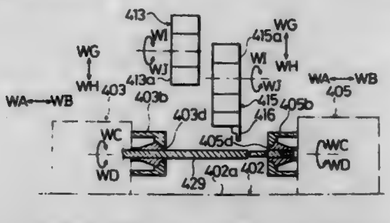
a back brace is formed on the pair of arms extending across the space between the pair of arms and connecting the pair of arms, the back brace engages in sliding contact with the cam surface of the jaw member as the second jaw surface is moved toward and away form the first jaw surface.

5,191,817

MACHINING METHOD FOR THE USE OF A COMPLEX MACHINING MACHINE TOOL

Yukio Mitsukuchi, Aichi; Shuichi Hashimoto, Gifu; Shoji Momoi, Gifu; all of Japan, assignors to Yamazaki Mazak Corporation, Aichi, Japan

Division of Ser. No. 182,452, Apr. 18, 1988, Pat. No. 4,949,444. This application Nov. 21, 1989, Ser. No. 439,939
Claims priority, application Japan, Apr. 17, 1987, 62-58205[U]; Apr. 28, 1987, 62-105439; Apr. 28, 1987, 62-105441; Apr. 28, 1987, 62-105442; Apr. 28, 1987, 62-105443; Apr. 28, 1987, 62-105444; May 29, 1987, 62-134150; May 29, 1987, 62-134151; Jun. 23, 1987, 62-156054; Jun. 23, 1987, 62-156055; Jul. 10, 1987, 62-172488; Jul. 24, 1987, 62-185006; Sep. 25, 1987, 62-241521; Oct. 13, 1987, 62-258012; Dec. 24, 1987, 62-327652
Int. Cl.[5] B23B 1/00
U.S. Cl. 82—1.11 **4 Claims**



1. A machining method in a machine tool comprising:

providing a machine tool having a frame and first and second spindle stocks on said frame disposed so as to face each other with a space provided in said frame therebetween, said first and second spindle stocks having first and second workpiece spindles rotatably supported thereby, respectively, each said workpiece spindle having a chuck for jointly holding therebetween, or independently and separately holding, a workpiece to be machined, said machine tool further comprising:

said first and second spindle stocks on said frame having means capable of moving at least one of said spindle stocks relative to the other only in the direction of a central axis of said first and second workpiece spindles and transferring a workpiece from one of said first and second spindle stocks to the other said spindle stock over said space,

first and second tool rests disposed on said frame on the same side of said central axis corresponding to and adjacent to said first and second workpiece spindles, respectively, each said tool rest having means for moving said tool rest in at least a direction substantially perpendicular to said central axis of said first and second workpiece spindles and each of said tool rests having a side thereof oriented substantially perpendicular to said central axis and facing the other said tool rest,

first and second rotatable tool holding turrets disposed on said first and second tool rests, respectively, free to be rotated on an axis parallel to said direction of said central axis of said first and second workpiece spindles, said first rotatable tool holding turret disposed on said side of said first tool rest facing said second workpiece spindle and said second rotatable tool holding turret disposed on said side of said second tool rest facing said first workpiece spindle, said first and second turrets being disposed over said space,

said first turret having a peripheral portion with a plurality of tool installation portions formed thereon such that when one of said plurality of tool installation portions is selectively positioned at a position for machining a workpiece, said positioned tool installation portion protrudes toward said central axis of said workpiece spindle beyond a front portion of the workpiece spindle central axis side of said first tool rest having said first turret installed thereon,

said second turret having a peripheral portion with a plurality of tool installation portions formed thereon such that when one of said plurality of tool installation portions is selectively positioned at a position for machining a workpiece, said positioned tool installation portion protrudes toward said central axis of said workpiece spindle beyond a front portion on the workpiece spindle central axis side of said second tool rest having said second turret installed thereon,

a plurality of tools on said tool installation portions of said first tool holding turret, said tools each having a workpiece machining portion, and each said workpiece machining portion of said plurality of tools positioned on said tools and said tools positioned on said first tool holding turret such that said workpiece machining portions are directed toward said first workpiece spindle such that said tools are selectively positionable by said first tool holding turret to machine a workpiece on said first workpiece spindle;

a plurality of tools on said tool installation portions of said second tool holding turret, said tools each having a workpiece machining portion, and each said workpiece machining portion of said plurality of tools positioned on said tools and said tools positioned on said second tool holding turret such that said workpiece machining portions are directed toward said second workpiece spindle such that said tools are selectively positionable by said second tool holding turret to machine a workpiece on said second workpiece spindle, and

at least one tool among said tools installed on said first and second tool holding turrets being an inside diameter machining tool;

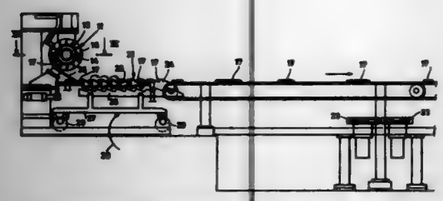
said method further comprising execution of the following steps at least once:

after a workpiece is held by said first and second spindle stocks and a predetermined machining operation is performed, releasing the holding relation between said second spindle stock and said workpiece, relatively moving said second spindle stock toward said first spindle stock and thereafter again holding said workpiece with said first and second workpiece spindles;

subsequently releasing the holding relation between said first spindle stock and said workpiece and relatively moving said second spindle stock together with said workpiece to a position a predetermined distance away from said first spindle stock, wherein a raw portion of said workpiece is exposed by a predetermined length from said first spindle stock; and

after said raw portion has been exposed by said predetermined length from said first spindle stock, holding said workpiece with both said first and second spindle stocks and machining said raw portion.

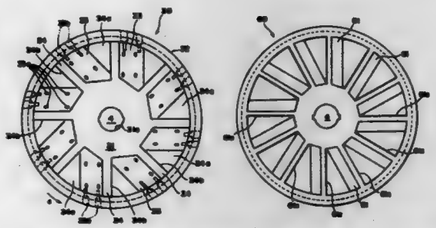
5,191,818
PROCESS AND FACILITY FOR SHEARING TO LENGTH STEEL BARS COMING FROM A ROLLING MILL
Gianfranco Mantovan, Busto Arsizio, and Gianfranco Fay, Milan, both of Italy, assignors to Pomini Farrel S.p.A., Verona, Italy
Continuation of Ser. No. 556,295, Jul. 20, 1990. This application Mar. 10, 1992, Ser. No. 847,887
Claims priority, application Italy, Jul. 31, 1989, 21398 A/89
Int. Cl.[5] B21F *43/04*
U.S. Cl. 83—27 5 Claims



5. A process for continuously cutting to commercial length steel bars coming from a rolling mill, which comprises:
a) feeding in an axial direction a rolled product from the rolling mill to a first of a plurality of circumferential collection chambers in a collecting drum;
b) shearing the rolled product to form a first bar of commercial length and a new leading edge on the rolled product;
c) braking the first bar of commercial length in phase with the shearing step of the first bar of commercial length, in the first of a plurality of collection chambers by drive rolls which face the interior of the collection chambers; and
d) rotating the collection drum in phase with the shearing of the first bar and continuous feeding of the rolled product to introduce the new leading edge of the rolled product into a second of a plurality of collection chambers in the collecting drum and to distribute the first bar of commercial length onto conveyor means.

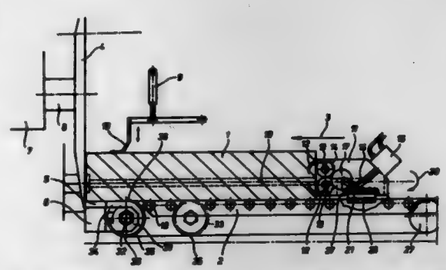
5,191,819
CUTTER ASSEMBLY FOR STRAND CUTTING MACHINE AND RESIN MATERIAL CUTTING ASSEMBLY
Tadaichi Hoshi, Tochigi, Japan, assignor to Kabushiki Kaisha Hoshi Plastic, Tochigi, Japan
Filed Jun. 14, 1991, Ser. No. 715,245
Claims priority, application Japan, Jun. 20, 1990, 2-161978; Apr. 25, 1991, 3-95089
Int. Cl.[5] B26D *1/29*
U.S. Cl. 83—349 9 Claims

1. A resin material cutting assembly, comprising:
(a) a fixed cutter member over which a resin material is to be supplied; and
(b) a rotary cutter member coacting with said fixed cutter member, said rotary cutter member including a rotary shaft extending in the feed direction of the resin material and supporting said rotary cutter member and a plurality of blades arranged about said rotary shaft to be spaced apart and extending radially and disposed in a forward inclined posture in the direction of rotation, each said blade having a cutting edge at its forward position toward said fixed cutter member in the direction of rotation,
wherein said rotary cutter member includes a central portion connected to said rotary shaft, and a ring portion disposed around said rotary shaft concentrically thereof, an outer surface of said central portion and a confronting inner surface of said ring portion each having a corresponding plurality of grooves each disposed in a forward inclined



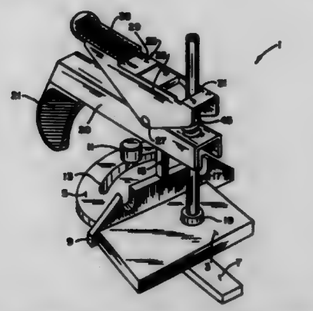
posture in the direction of rotation, each said blade being fitted at opposite ends in corresponding grooves of said central portion and said ring portion.

5,191,820
FEED DRIVE FOR A CUTTING MACHINE FOR CUTTING FOODS
Franz Hartmann, Sinsheim, Fed. Rep. of Germany, assignor to Natec, Reich, Summer GmbH & Co. KG, Fed. Rep. of Germany
Filed Jun. 20, 1991, Ser. No. 717,984
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1991, 9104588[U]
Int. Cl.[5] B26D *7/06*
U.S. Cl. 83—409 9 Claims



5. A cutting machine for cutting elongated products into slices, comprising:
undriven roller conveyor means for supporting a product to be sliced, the conveyor means having a forward end and a rear end;
cutter means adjacent the forward end of the conveyor means for cutting slices from a front end of the product;
first feed means for driving the product forwardly in a feed direction along the conveyor means into the cutting range of the cutter means, the first feed means comprising claw means for gripping a rear end of the product, and drive means for driving the claw means in the feed direction; and
second feed means for guiding a forward portion of the product towards said cutter means in synchronism with the driving of the claw means, said second feed means being located adjacent said cutter means and comprising at least one feed roller separate from said roller conveyor means for engaging a bottom surface of the product in the vicinity of said cutter means in a force-locking and form-locking manner.

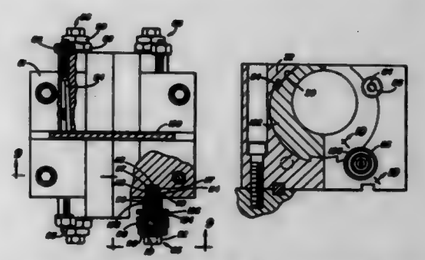
5,191,821
LEVER LOCK HOLD DOWN MECHANISM
James I. Metzger, Jr., Bellwin, and Frank Tomiser, Jr., St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Continuation-in-part of Ser. No. 507,459, Apr. 11, 1990, abandoned. This application Nov. 29, 1991, Ser. No. 800,212
Int. Cl.[5] B27B *5/29*
U.S. Cl. 83—425 10 Claims



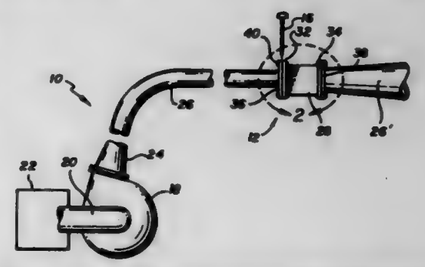
1. A lever lock hold down mechanism for clamping workpieces to a miter gauge including a base for supporting workpieces, a generally vertically directed head extending upwardly from said base, and clamping means extending upwardly from said head and overlying said base for clamping workpieces against the base and head, said clamping means including a vertically adjustable rod having a clamping foot at its lower end, a spring biased rod gripper mechanism which is capable of being moved from a free mid position to a lower clamping position or to an upper released position relative to said rod, said spring biased rod gripper mechanism engaging and gripping said rod in its lower clamping position while being disengaged from said rod in its upper released position for vertical adjustment of said rod to accommodate workpieces of different thickness, lever lock means for applying a downward force to the spring biased rod gripper mechanism for overcoming the spring force thereof and for moving the rod gripper mechanism to its lower clamped position for continuous gripping engagement with said rod so as to apply a clamping force through said clamping foot to workpieces resting on said base and positioned against said head, and said lever lock means being moved upwardly to a free mid position for partially disengaging the spring biased rod gripper mechanism relative to said rod so as to permit downward movement while limiting upward movement of said rod, and means for completely disengaging the spring biased rod gripper mechanism from said rod when said lever lock means is moved to an upper released position.

5,191,822
ADJUSTABLE CLAMP JAWS
John J. Borzym, 4820 School Bell La., Birmingham, Mich. 48010
Continuation-in-part of Ser. No. 661,504, Feb. 26, 1991. This application Nov. 15, 1991, Ser. No. 792,711
Int. Cl.[5] B26D *7/02*; B25B *1/24*
U.S. Cl. 83—466 17 Claims

1. An assembly comprising:
a clamp having at least one body and one liner, said liner having a longitudinally extending rear face supported on said body, and a longitudinally extending forward face for holding a part to be clamped;
a cutting element movable adjacent to one longitudinal end face of said liner; and
a threaded member having a radially outer portion received in a channel in said rear face of said liner, said threaded member being movable longitudinally relative to said body, with said radially outer portion rotating within said channel in said rear face, and causing said liner to move longitudinally, such that said liner is longitudinally adjusted to any one of a plurality of longitudinal positions relative to said body towards and away from said cutting element to control the clearance between said one longitudinal end face of said liner and said cutting element.



5,191,823
HYDRAULIC KNIFE ASSEMBLY WITH CROSS-CUT KNIFE
Thomas R. Miller, and David E. Frickey, both of Caldwell, Id., assignors to J. R. Simplot Company, Caldwell, Id.
Filed Apr. 17, 1992, Ser. No. 870,666
Int. Cl.[5] B26D *1/03*
U.S. Cl. 83—857 7 Claims



1. An hydraulic knife assembly for removable in-line mounting to a flow conduit adapted for passage of a product to be cut, wherein the product is propelled through the flow conduit by an hydraulic flow stream, said knife assembly comprising:
a knife housing defining an internal flow passage extending along a first direction;
an array of knife blades mounted within said knife housing to extend across said flow passage and defining cutting edges presented in an upstream direction;
means for removably mounting said knife housing in-line with said flow conduit, for flow-through passage of the product to be cut and the propelling hydraulic flow stream through said internal flow passage whereby the product is cut by said knife blades into strips;
means defining a transversely open slot disposed generally at an upstream end of said knife housing, said slot being oriented generally perpendicular to said first direction; and
a cross-cut knife having a size and shape for reception into said slot, to extend from a position outside said internal flow passage through said slot and into said internal flow passage, and to be thrust in a direction generally transversely across and generally perpendicular to said internal flow passage to sever a product lodged at an upstream side of said knife blades along a plane oriented generally perpendicular to said first direction.

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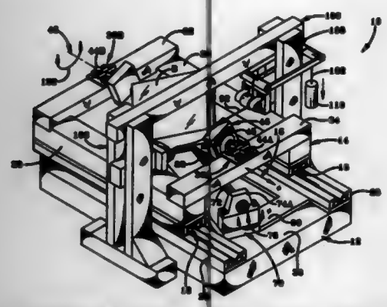
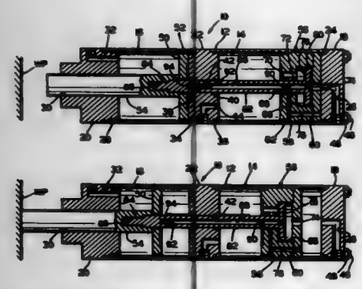
5,191,824
METHOD AND APPARATUS FOR FORMING A CONTOURED SURFACE
Alan E. Rathbun, Jr., Kent, Ohio, assignor to Luxaire Cushion Co., Newton Falls, Ohio
Filed Dec. 4, 1991, Ser. No. 803,344
Int. Cl.[5] B26F 3/12
U.S. Cl. 83—874 21 Claims



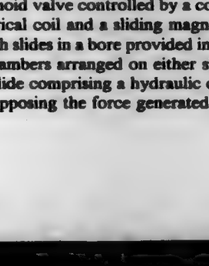
7. A method of forming a contoured surface with a compound curvature on a block comprising the steps of:
mounting the block to be contoured on a cradle having a translational direction and a rotational axis substantially parallel with the translational direction;
presenting a substantially linear cutting member substantially perpendicular to the translational direction and non-parallel with the rotational axis;
simultaneously effecting selective translation and rotation of the cradle relative to the cutting member; and,
cutting the block with the cutting member in response to the simultaneous relative translation and rotation to form a contoured surface on the block.

5,191,825
LOW-IMPACT AIR CYLINDER
David M. Beneteau, Amherstburg, and Mark J. Dolata, Windsor, both of Canada, assignors to Doben Limited, Windsor, Canada
Filed Jun. 12, 1992, Ser. No. 897,438
Int. Cl.[5] F01B 7/20, 7/00
U.S. Cl. 91—173 19 Claims



12. A low-impact drive unit comprising wall means forming a pressure chamber and an annular working chamber, separator means separating said chambers, first passage means for supplying gas under pressure to a rear portion of said pressure chamber, a working piston in said working chamber and having a working piston rod extending out of said working chamber, said separator means having a central bore, an outer rear piston in said pressure chamber having a cylindrical recess and a second central bore therein, an inner rear piston located in said cylindrical recess and having a main rod extending through said bores and movable with said working piston rod, said main rod having a longitudinal passage, a rear hole communicating with said passage, and a front hole communicating with said passage, said outer rear piston having a central port through which gas under pressure is supplied to said cylindrical recess from said first passage means, and said outer rear piston having second passage means communicating with said second central bore.

5,191,826
HYDRAULIC CONTROL DEVICE
Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Hellmeier & Weinlein Fabrik Fur Oel-Hydraulik, Fed. Rep. of Germany
Filed Apr. 25, 1991, Ser. No. 691,239
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1990, 4021347; European Pat. Off., Feb. 7, 1991, 91101694
Int. Cl.[5] F15B 11/08
U.S. Cl. 91—418 10 Claims

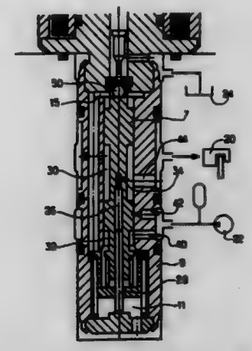


1. A hydraulic control device for an oscillating load moving system, comprising a double-acting hydroconsumer (V), which is adapted to be selectively connected to a pressure source (P) or to a reservoir (T) via two separate main lines (9, 10) and a control valve (C), and further comprising a load supporting valve (H), which is arranged in at least one of the main lines (9, 10) between the control valve (C) and the hydroconsumer (V) and adapted to be opened from another one of the main lines (9, 10) via a pilot line (16), characterized in that the pilot line (16) of the load supporting valve (H) has arranged therein a hydraulic damping device (X) for damping pressure fluctuations, which consists of a bypass line (23) branching off the pilot line (16) and provided with an interference throttle aperture (D2), and further characterized in that a throttle aperture (D1) is provided in the pilot line (16) between a branching point (22) of the bypass line (23) and main line (10).

5,191,827
ELECTRICALLY CONTROLLED PRESSURE-REGULATING SYSTEM FOR A HYDRAULIC CIRCUIT
Gilbert Kervagoret, Argenteuil, France, assignor to Bendix Europe Services Techniques, Drancy, France
Division of Ser. No. 674,472, Mar. 25, 1991, abandoned. This application Feb. 18, 1992, Ser. No. 837,576
Claims priority, application France, Apr. 12, 1990, 90 04701
Int. Cl.[5] F15B 13/044
U.S. Cl. 91—433 5 Claims

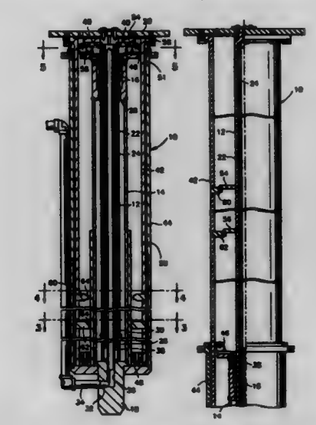
1. A pressure-regulating system for a hydraulic circuit, comprising at least one generator of fluid under pressure, a hydraulic motor and a reservoir of fluid under low pressure and including a solenoid valve controlled by a computer and comprising an electrical coil and a sliding magnetic core controlling a slide which slides in a bore provided in a body, said slide defining two chambers arranged on either side of the slide in said bore, said slide comprising a hydraulic cell determining a reaction force opposing the force generated by said coil, said

cell being connected to one of said chambers as long as the solenoid valve is not energized, elastic means returning said slide and said core to a rest position, wherein said chambers are in connection with said source by means of a conduit when the



solenoid valve is not energized, and a normally closed valve being located between one of said chambers and the reservoir so as to isolate the hydraulic circuit under pressure from the reservoir when the solenoid valve is not energized.

5,191,828
TELESCOPIC CYLINDER WITH INCREASED LATERAL LOADING CAPACITY
Robert B. McCreery, 524 N. Galloway St., Xenia, Ohio 45385
Filed Jun. 18, 1992, Ser. No. 900,297
Int. Cl.[5] F16J 15/18
U.S. Cl. 92—165 R 12 Claims



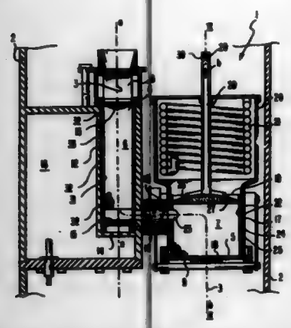
1. An upstanding telescopic cylinder with increased side loading capacity and including upper and lower ends, said cylinder including an elongated piston section and an elongated cylinder section, said sections being relatively extendable and retractable and telescopically engaged with said piston section projecting outwardly of the upper end of said cylinder section, said piston section including a first sleeve concentric therewith and loosely telescoped over said cylinder section from the upper end thereof, said cylinder section including a second sleeve telescoped over said first sleeve from the lower end of said first sleeve, said cylinder and piston sections including coacting sliding seal means sealing said piston section to said cylinder section, adjacent the upper end thereof, including first guide means guidingly engaged with the inner surface of said first sleeve, the lower end of said first sleeve including second guide means guidingly engaged with the exterior of said cylinder section, said second sleeve including third guide means adjacent the upper end thereof guidingly engaged with the exterior of said first sleeve, said piston section including at least one guide slidingly disposed thereon above the upper end of said cylinder section, gravity biased downwardly into engagement with stop means provided therefore on the upper end of said cylinder section and loosely received within said first sleeve, said first sleeve including internal abutment means thereon intermediate the upper end and lower ends thereof operative to engage and elevate said guide therewith during an intermediate portion of extension of said piston section relative to said cylinder section and, when engaged with said guide forming, a brace between said piston section and first sleeve preventing relative lateral displacement of the adjacent portions of said piston section and said first sleeve.

11. An upstanding telescopic cylinder including an elongated piston section and an elongated cylinder section, said sections being relatively extendable and retractable and telescopically engaged with said piston section projecting outwardly of the upper end of said cylinder section, said cylinder and piston sections including coacting sliding seal means sealing said piston section to said cylinder section, said piston section comprising a first tubular member telescoped downwardly into said cylinder section, said cylinder section including a second tubular member loosely telescoped upwardly into said first tubular member, open at its upper end and adapted at its lower end for connection with a fluid supply and discharge line, said piston section including a third tubular member concentric with and disposed within said first tubular member, including an open lower end and loosely telescoped downwardly over said second tubular member, the upper end of said third tubular member being closed, the lower end of said third tubular member being sealed relative to the lower end of said first tubular member, the upper end of said second tubular member having radial oil exhaust port means opening therethrough from the interior of said second member to the exterior of said second tubular member.

5,191,829
FAST COOKER OF SPAGHETTIS, BUCATINIS, AND THE LIKE
Giuseppe Caffarella, Milan, Italy, assignor to Spaghetti Express S.r.l., Milan, Italy
PCT No. PCT/EP89/00797, § 371 Date Apr. 19, 1991, § 102(e) Date Apr. 19, 1991, PCT Pub. No. WO90/04345, PCT Pub. Date May 3, 1990
PCT Filed Jul. 18, 1989, Ser. No. 671,779
Claims priority, application Italy, Oct. 21, 1988, 22395 A/88
Int. Cl.[5] A47J 27/14; G07F 9/10
U.S. Cl. 99—352 10 Claims

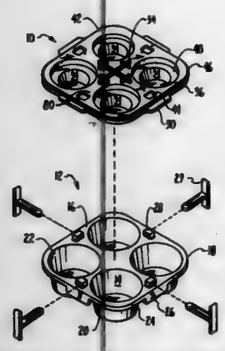
1. A fast cooker of metered amounts of a pasta product, comprising:
path means defining a path of travel (3) for a metered amount of a pasta product, said path of travel including an inlet opening (4) for receiving a metered amount of raw pasta product, a cooking chamber (6) communicating with the inlet opening, in which the metered amount of pasta product is cooked, a normalization chamber (7) communicating with the cooking chamber in which the metered amount of pasta is normalized after cooking, and an outlet opening (5) communicating with the normalization chamber for discharging the cooked and normalized metered amount of pasta from the path of travel;
cooking means connected to the path means for cooking pasta in the cooking chamber;
a first wire mesh (31) extending around the cooking chamber for receiving pasta in the cooking chamber;

normalization means connected to the path means for normalizing pasta in the normalization chamber; and



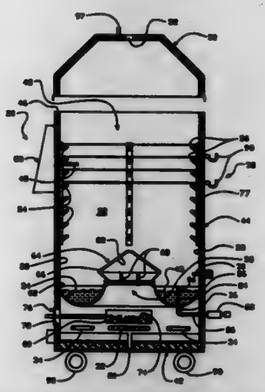
a second wire mesh (22) extending around said normalization chamber for receiving pasta in said normalization chamber.

5,191,830
BAKING APPARATUS FOR MAKING CUP-SHAPED COMESTIBLES
Fred M. Jacobsen, 1978 Fairway Circle Dr., Lake San Marcos, Calif. 92069
Continuation of Ser. No. 578,397, Sep. 7, 1990, abandoned. This application Jun. 30, 1992, Ser. No. 908,482
Int. Cl.[5] A23P *1/00*
U.S. Cl. 99—439 22 Claims



1. An assembly of compatible trays for baking cup-shaped comestibles comprising:
a bottom receiving tray having a plurality of vessels interconnectably surrounded by a first planar support, said first planar support having a first rim downwardly extending perpendicular to, and along a perimeter of, said first planar support;
a top shaping tray having a plurality of mold caps compatibly aligned with the vessels of the receiving tray, said mold caps interconnectably surrounded by a second planar support, said second planar support having a second rim downwardly extending perpendicular to, and along a perimeter of, said second planar support, wherein the first rim and said second rim are slidably engaged when the top shaping tray is assembled with the bottom receiving tray;
a plurality of baking chambers having bottom and outer surfaces shaped by said bottom receiving tray, and top and inner surfaces shaped by said top shaping tray, when the top shaping tray is securely assembled atop the bottom receiving tray;
a plurality of raised arch eyelets each extending upwardly from the first planar support and a corresponding number of apertures in the second planar support for individually receiving each said eyelet, such that said eyelet has a portion extending above the second planar support; and
a plurality of locking rods, each of said locking rods having a first portion slidably engageable with one of said eyelets and a second portion at an angle relative to the first portion which can be placed in contact with an edge of the top tray when said trays are securely engaged, for locking the receiving tray to the shaping tray.

5,191,831
OVEN WITH WATER RING ASSEMBLY
Max W. Walden, 401 Porter St., Hanford, Calif. 93230
Filed Sep. 3, 1991, Ser. No. 753,963
Int. Cl.[5] A47J *27/00*
U.S. Cl. 99—446 24 Claims

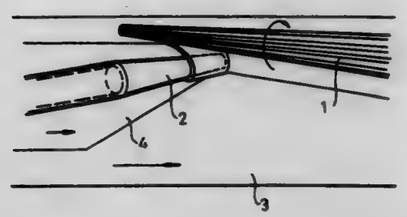


1. An oven including a housing having a top, a bottom wall and a side wall extending between said top and said bottom wall which defines an interior volume formed for receipt and cooking of food therein, and heating means positioned proximate said bottom wall, the improvement comprising:
an annular trough positioned in said housing proximate said bottom wall between said top and said heating means and opening into said interior volume for communication of water vapor to food positioned in said interior volume for cooking, said trough having an outer trough perimeter dimensioned to extend and directly contact an inner perimeter surface of said side wall to be positioned for receipt of gravitating substances deposited on said side wall directly into said trough, and said trough being formed to receive and collect said substances and to retain a quantity of a liquid sufficient for humidification of food cooked in said interior volume of said oven; and
drainage means extending from said trough to an outside of said housing for removal of said substances and said liquid from said trough.

5,191,832
TUBULAR STUFFING APPARATUS
Shih C. Tsay, No. 62, Line 313, Wen Hsien Rd., Taisan, Taiwan
Filed Sep. 5, 1991, Ser. No. 755,051
Int. Cl.[5] A21C *9/06*
U.S. Cl. 99—450.6 2 Claims

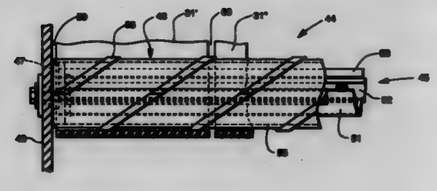
1. A tubular stuffing apparatus comprising;
a roller shaped conic, provided with a plurality of longitudinal straight embossed lines, positioned to be only a little

above the surface of a conveying belt and to have its smaller end inclinedly pointing against the moving direction of the conveying belt which is moved by a power source, and picking and rolling up a corner of the beginning of a band dough sheet laid and moved forward on the conveying belt;



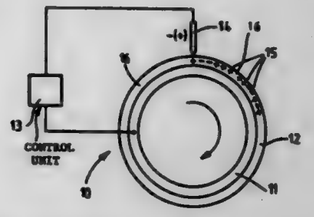
a stuff transporting tube having stuff contained in its hollow interior and able to be transported forward to go out of an end opening of the tube, and positioned ot have its end opening to be located at the point where the corner of the begining of the dough sheet is picked up by the roller; and
a conveying belt for a band dough sheet to lie on and be moved forward by a power source.

5,191,833
ROLL STRIPPING APPARATUS FOR ROUND BALER
James T. Clevenger, Jr., Lancaster, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.
Filed Apr. 16, 1992, Ser. No. 868,935
Int. Cl.[5] B30B *5/06*; A01D *39/00*
U.S. Cl. 100—88 10 Claims



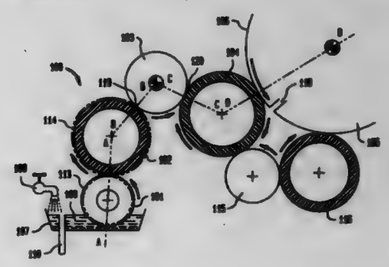
1. In a round baler having a frame, conveying means including rotatable transverse rolls mounted on said frame, said conveying means providing a series of inwardly facing moving surfaces that define a baling chamber for forming cylindrical bales of crop material, means for feeding crop material into said chamber, and scraper means mounted adjacent one of said rolls for preventing buildup of unwanted material on said roll, the improvement comprising:
rigid strips affixed to and extending from the outer surface of said one roll along a path in the shape of a closed loop, said strips including a leading edge portion for engaging crop material randomly deposited on said roll and urging said crop material in a generally axial direction under conditions where said roll is rotated.

5,191,834
PRINTING SYSTEM WITH PRINTING FORM HAVING A FERRO-ELECTRIC LAYER
Hartmut Fuhrmann, Karlsfeld, and Alfred Hirt, Munich, both of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany
Continuation of Ser. No. 418,137, Oct. 6, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 609,009
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 335091
Int. Cl.[5] B41N *1/10*
U.S. Cl. 101—130 16 Claims



1. A method of printing comprising
providing a printing form support (11, 30) having thereon a particle transferring ferroelectric layer (12, 32);
selectively polarizing said ferroelectric layer (12, 32), point-by-point, in accordance with an image to be reproduced, in a selected direction of polarization to generate polarized domains of selected directions of polarization on said ferroelectric layer;
selectively electrically charging toner or ink particles with a polarity opposite the polarity of polarization of the respective points of the ferroelectric layer (12, 32); and
applying said charged toner or ink particles on said point-by-point polarized ferroelectric layer (12, 32) by attraction of the respective reversely charged toner or ink elements on selectively oppositely polarized domains of the ferroelectric layer.

5,191,835
FILM DAMPENING SYSTEM FOR A ROTARY OFFSET PRESS
Alain Blanchard, Chantilly, France, assignor to Heidelberg Harris GmbH, Heidelberg, Fed. Rep. of Germany
Filed Jun. 21, 1991, Ser. No. 720,221
Claims priority, application France, Jun. 21, 1990, 90 07769
Int. Cl.[5] B41L *25/16*
U.S. Cl. 101—148 18 Claims



1. A dampening system for a rotary press, comprising:
a pan roller rotatably driven by a first motor and including a hydrophilic covering and being at least partially immersed in a container of dampening solution;
a metering roller including an elastomeric covering for rotation in contact with the pan roller;

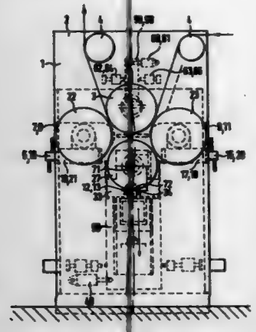
a dampening drum including a hydrophilic covering;
a dampening roller including an elastomeric covering for rotation in contact with the dampening drum and a plate cylinder of the press; and
means for selectively driving the dampening drum at a speed corresponding to the speed of the metering roller to establish inter-roller differential slipping between the dampening drum and the dampening roller, or at a speed corresponding to the speed of the plate cylinder to establish inter-roller differential slipping between the dampening drum and the metering roller, thus making it possible to use either of two different dampening modes, wherein the means for selectively driving includes a second motor coupled to the dampening drum for rotatably driving the dampening drum.

5,191,836

PRINTING UNIT FOR A ROTARY PRESS

Anton Weis, Lorsch, Fed. Rep. of Germany, assignor to Albert-Frankenthal Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Apr. 9, 1992, Ser. No. 865,944
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1991, 4112925
Int. Cl.[5] B41F *13/24, 31/36*
U.S. Cl. 101—219 5 Claims



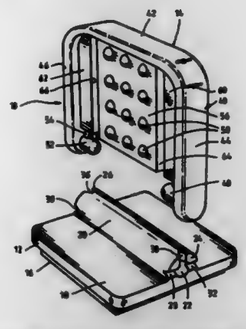
1. A printing unit in a rotary printing press capable of executing a flying plate change, said printing unit comprising:
first and second forme cylinders;
an impression cylinder engageable with a selected one of said first and second forme cylinders;
means to move said impression cylinder between first and second printing positions in contact with said first and second forme cylinders;
an ink forme roller engageable with a selected one of said first and second forme cylinders and having an axis of rotation, said ink forme roller being movable between said first and second printing positions about a swivel axis, said axis of rotation of said ink forme roller being intermediate said first and second forme cylinders and said swivel axis and parallel thereto;
an inking unit associated with said ink forme roller and movable about said swivel axis;
a swinging arm assembly supporting said ink forme roller and said inking unit, said swinging arm assembly being movable about said swivel axis; and
means to move said ink forme roller between said first and second printing positions in contact with said first and second forme cylinders by moving said swinging arm assembly about said swivel axis.

5,191,837

HAND STAMP WITH FOLDING HANDLE

John G. Bolton, Camberwell, Australia, assignor to Chasid Pty. Ltd., Australia

PCT No. PCT/AU89/00179, § 371 Date Jan. 3, 1991, § 102(e) Date Jan. 3, 1991, PCT Pub. No. WO89/10267, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 24, 1989, Ser. No. 601,752
Claims priority, application Australia, Apr. 27, 1988, PI7984; Aug. 15, 1988, PI9859
Int. Cl.[5] B41K *1/54, 1/56*
U.S. Cl. 101—333 5 Claims



1. A stamp for applying a marking, including a handle and a base, said base forming or adapted to have secured to it an impression block for applying said marking, said handle being adapted to be manually gripped in order to effect the applying of said marking, said handle being adapted to be rotatable between an operational position in which said handle is located in a plane normal to that of said base and is generally upstanding relative to said base, and a transportation position in which said handle is located in a plane parallel to that of said base and generally adjacent to at least a portion of said base, said stamp being provided with means to firmly but releasably hold said handle in each of said operational position and said transportation position, said handle is provided with axle portions, and said means includes a bore associated with said base, said bore being adapted to cooperate with said axle portions located on said handle to permit rotation of said handle about said bore, said means further including elements being located in the vicinity of said bore and each of said axle portions releasably holding said handle in at least said operational position and said transportation position.

5,191,838

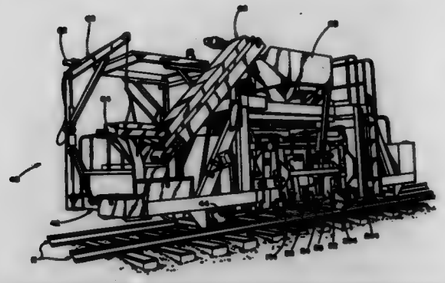
RAIL CLIP APPLICATOR AND METHOD OF APPLYING RAIL CLIPS

Kevin A. Hansen, Ludington, Mich., assignor to Pandrol Jackson, Inc., Ludington, Mich.

Filed Jun. 30, 1991, Ser. No. 709,640
Int. Cl.[5] E01B *29/24, 29/04*
U.S. Cl. 104—2 57 Claims

1. A rail clip applicator for inserting spring clips into tie shoulders of a railway track comprising:
a first carrier frame adapted for rolling along a track rail in longitudinal alignment therewith;
an applicator assembly carried by said carrier frame and mounted for longitudinal movement with respect to said carrier frame;
clip magazine means carried by said applicator assembly for containing the clips and dispensing a series of clips at a lateral distance from the track rail;
a head assembly carried by said applicator assembly and mounted for vertical movement with respect to said applicator assembly;

clip shuttle means carried by said head assembly for receiving clips dispensed from said magazine means, for moving the clips received therein away from said magazine means toward the track rail, and for placing said clips adjacent the tie shoulders in position for insertion therein;



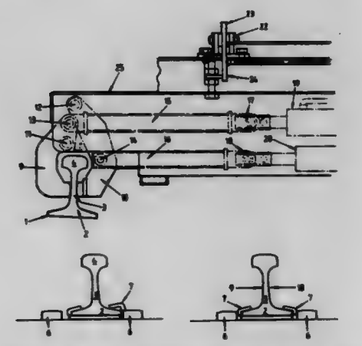
backup block means carried by said head assembly for pressing against the tie shoulders opposite the clips to be inserted;
drive block means carried by said head assembly and mounted for longitudinal movement thereon for driving clips held in position by said clip shuttle means into said tie shoulders.

5,191,839

RAIL HANDLING APPARATUS

Hartley F. Young, West Melton, and Josef Nevidal, Wynn Vale, both of Australia, assignors to Pandrol Canada Limited, Montreal, Canada

Filed Jan. 28, 1992, Ser. No. 827,157
Claims priority, application Australia, Jan. 31, 1991, PK4386
Int. Cl.[5] B61H *13/00*
U.S. Cl. 104—2 2 Claims



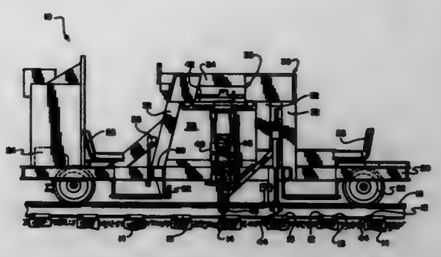
1. A method of fitting rail insulators into proper positions at the foot of a railway rail having a foot-constituting bottom flange located between two rail fastener supporting shoulders, each of said insulators when in use having a portion located between the rail bottom flange and one of said shoulders and another portion overlying a proximate part of said bottom flange, said rail further having a head and a vertical web between said head and said bottom flange, comprising the steps of:
(a) prior to attaching railway clips to said fastener supporting shoulders, placing said rail insulators approximately at said proper positions; and
(b) applying a pulsating force alternately to the opposite sides of said rail web for moving the rail sufficiently relative to said fastener supporting shoulders to enable at least one of said insulators to be displaced into said proper position.

5,191,840

SPIKE DRIVING MACHINE HAVING PUSHING AND PERCUSSIVE SPIKE DRIVING FUNCTIONS

Dennis J. Cotic, and Jack K. Hosking, both of Waukesha, Wis., assignors to Oak Industries, Inc., Waltham, Mass.

Filed Sep. 11, 1991, Ser. No. 758,902
Int. Cl.[5] E01B *29/26*
U.S. Cl. 104—17.1 26 Claims



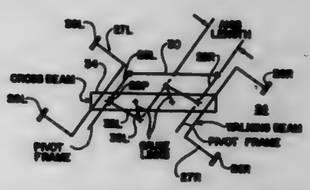
1. A machine for performing an operation on spikes of a railroad track having a plurality of ties, comprising:
a frame having a plurality of wheels for rotatably engaging the railroad track;
drive means for driving said frame along the track; and
spike driving means movably disposed relative to said frame for gripping spikes and driving gripped spikes into the ties, said spike driving means including spike pushing means for performing a spike pushing function and spike percussive means for performing a spike percussive function, said spike driving means being configured for driving the spike completely into the tie using selected application of said spike pushing function and said spike percussive function;
wherein said spike driving means is configured for performing one of said percussive function only, said pushing function only, and said pushing and percussive function only.

5,191,841

RAILROAD BOGIE AND RAIL GRINDER USING THE BOGIE

Michael B. Gilbert, Fairmount, Minn., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Feb. 18, 1992, Ser. No. 836,526
Int. Cl.[5] B61F *5/00*
U.S. Cl. 105—167 21 Claims



1. An apparatus comprising a first bogie for rails having: first and second opposite side pivot frames respectively pivotable about separate first and second vertical axes which are offset from a rail direction center line, first and second pairs of rail engagement wheels respectively supported by said first and second pivot frames, a first walking beam movably mounted to said first pivot frame via a mounting means for allowing the

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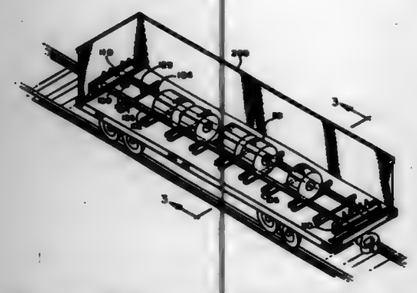
first walking beam to move transversely relative to said first pivot frame, said first walking beam having said first pair of rail engagement wheels mounted to said first walking beam, a first gauge maintainer operably connected to said first walking beam, and a tie member operably connected to said first and second pivot frames so as to cause said first and second pivot frames to pivot in unison at curved rail sections with said first gauge maintainer causing said first walking beam to move transversely relative to said first pivot frame such that the first bogie tends to be maintained in gauge.

5,191,842

MODULAR STRUCTURE FOR CONVERTING RAIL CARS FOR CARRYING BOTH COILED AND PLATE MATERIALS DIRECTLY ON LONGITUDINAL RAILS AND CROSS MEMBERS

Robert W. Tinkler, Colmar, Pa., assignor to Consolidated Rail Corporation, Philadelphia, Pa.

Filed Oct. 1, 1991, Ser. No. 770,980
Int. Cl.[5] B61D *3/16*
U.S. Cl. 105—355 **20 Claims**



1. Apparatus for transporting materials comprising: a cargo area and a conversion structure for retaining materials, the conversion structure disposed within the cargo area, the conversion structure comprising:

a pair of longitudinal extending rails for directly supporting and retaining materials, wherein the materials are in direct contact with the rails;

a plurality of cross members extending between the rails, the cross members also for retaining the materials, wherein the materials are in direct contact with the cross members; and

bulkhead means disposed laterally across the rails at ends thereof for preventing the materials from shifting longitudinally beyond the rails.

5,191,843

PALLET WITH MOLDED PLASTIC PALLET SPACER FEET

Timothy C. Assavich; Kevin P. Cohr, both of Sheboygan, Wis., and Glyn Carver, Deerfield, Ill., assignors to Assa Technologies, Inc., Sheboygan, Wis.

Filed Dec. 24, 1991, Ser. No. 813,081
Int. Cl.[5] B65D *19/12*
U.S. Cl. 108—56.3 **6 Claims**

1. A pallet having a platform, feet, and runners wherein the improvement comprises;

a. pallet spacer feet comprising a plastic molding having a substantially oblate spheroid plan shape and

b. said pallet spacer feet having a solid flat base and

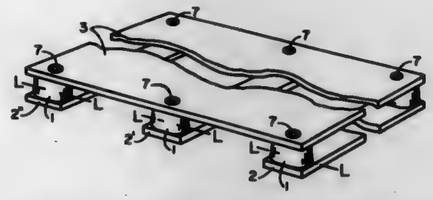
c. said pallet spacer feet having a top surface and a bottom surface, a central vertical section extending from said top surface to said bottom surface and a reinforcing web extending from said bottom of said spacer feet to one third to full height of said pallet spacer feet and

d. hollow substantially cylindrical segments extending from said top to said bottom adjoining to and on each side of said central vertical section of said pallet spacer feet and

e. said reinforcing web spanning a portion of said substantially cylindrical segments of said pallet spacer feet and

f. said pallet spacer feet attached to said platform and extending to a pallet spacer foot runner and

g. said pallet spacer feet having a long axis of said pallet spacer feet mounted at right angles to a long axis of said pallet spacer feet runner and,



h. fastening of said pallet spacer feet to said platform and said pallet spacer foot runner by means of a through bolt extending from said pallet platform, through said pallet spacer foot and through said pallet spacer foot runner and

i. a threaded nut attached to said through bolt and

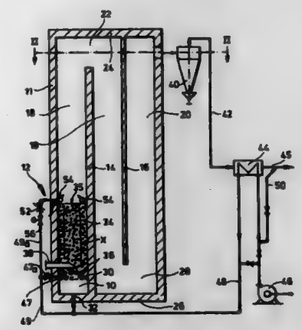
j. nails extending upward through said pallet spacer foot runner and through the bottom of said pallet spacer foot and into each of said substantially cylindrical segments of each of said pallet spacer feet.

5,191,844

PROCESS AND APPARATUS FOR THE TREATMENT OF DUST OR LIKE MATERIAL WHICH IS CAPABLE OF TRICKLE FLOW

Hans-Joachim Scheel, Niederfischbach, Fed. Rep. of Germany, assignor to Alb. Klein GmbH & Co. KG, Niederfischbach, Fed. Rep. of Germany

Filed Jan. 16, 1992, Ser. No. 821,794
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1991, 4102168
Int. Cl.[5] F23G *5/00*
U.S. Cl. 110—346 **14 Claims**



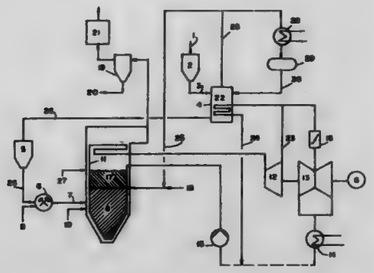
1. A process for the treatment of dust or the like which contains organic constituents, in particular filter dust from foundry sands containing binding agent, whereby the dust is introduced into a furnace and heated and burnt therein in the presence of a fluidisable heat carrier of refractory material, the improvement comprising: passing a first air flow through the heat carrier material at a flow rate sufficient to combust the organic constituents in the dust; and pulsing a second air flow through the heat carrier material at an intensity sufficient to circulate the heat carrier within the furnace.

5,191,845

METHOD OF REPROCESSING SEWAGE SLUDGE

Heinz Spliethoff, Friedrichsthal, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrucken, Fed. Rep. of Germany

PCT No. PCT/DE90/00175, § 371 Date Aug. 22, 1991, § 102(e) Date Aug. 22, 1991, PCT Pub. No. WO90/12249, PCT Pub. Date Oct. 18, 1990
PCT Filed Mar. 9, 1990, Ser. No. 743,325
Int. Cl.[5] F23G *5/00, 7/00*
U.S. Cl. 110—346 **10 Claims**



1. A process for reprocessing sewage sludge using a fossil-fuel power plant comprising:

initially drying the sewage sludge in indirect heat exchange with condensed steam from a steam generator of the power plant;

supplying exhaust vapors produced during the drying process into a reduction zone of a combustion chamber of the power plant for reducing nitric oxides and other toxic substances;

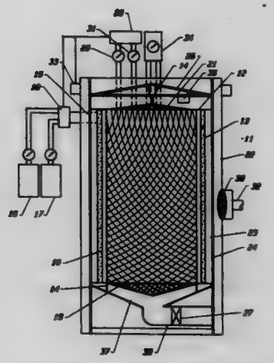
supplying the dried sewage sludge to a furnace zone of the combustion chamber of the power plant for burning the sewage sludge and thereby producing ash and exhaust gases.

5,191,846

SELF-CONTAINED HOUSEHOLD GARBAGE INCINERATOR

Haile S. Clay, P.O. Box 326, La Honda, Calif. 94020

Filed Feb. 3, 1992, Ser. No. 829,421
Int. Cl.[5] F23G *5/00*
U.S. Cl. 110—346 **13 Claims**



1. A self-contained incinerator apparatus for burning refuse, comprising:

a chamber for containing refuse;

a porous membrane at least partially enclosing said chamber;

an air-tight housing enclosing said porous membrane and said chamber;

fuel means for supplying fuel to said porous membrane; and

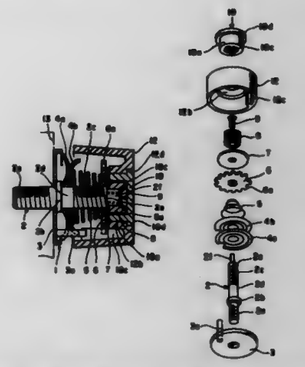
surface combustion means at the surface of said porous membrane facing said chamber for burning refuse contained in said chamber by surface combustion.

5,191,847

TENSION REGULATING DEVICE

Shinji Kojima, and Makoto Kamewada, both of Tochigi, Japan, assignors to The Singer Company N.V., Edison, N.J.

Filed Mar. 2, 1992, Ser. No. 844,095
Claims priority, application Japan, Apr. 16, 1991, 3-33842
Int. Cl.[5] D05B *47/02; B65H 59/22*
U.S. Cl. 112—254 **2 Claims**



1. A tension regulating device adapted to be secured to the frame of a sewing machine and comprising:

a tension regulating shaft having a screwed rod portion extending from one end, a shaft portion extending from the other end and a collar portion disposed between the rod portion and the shaft portion, the shaft portion having a male screw section terminating in a reduced shoulder and a front hollow cylindrical section extending from the shoulder, the rod portion being secured to the frame;

a collar secured to the collar portion;

first and second tension discs, the first disc being disposed on the collar portion and engaging the collar, the second disc being disposed on the collar portion and engaging the one side of the collar, the discs being adapted to receive a sewing machine thread therebetween;

a compression spring disposed on the male screw portion with one end of the spring bearing against the second disc;

a regulating nut engaging the male screw portion and bearing against the other end of the spring to adjust the compression of the spring;

a regulating dial stop disposed on the male screw portion and bearing against the shoulder of the regulating shaft;

a regulating dial having scales, the dial being disposed on the male screw portion and bearing against the dial stop, said dial engaging the nut so that rotation of the dial rotates the nut;

a short cylindrical member secured in the front hollow cylindrical section of the regulating shaft for clamping the dial stop, the member having spline grooves at the outer periphery thereof; and

a cap having an indicating needle corresponding to one of the scales of the dial and engaging the spline grooves of the member to rotatably clamp the dial between the cap and the dial stop.

1993 UMI

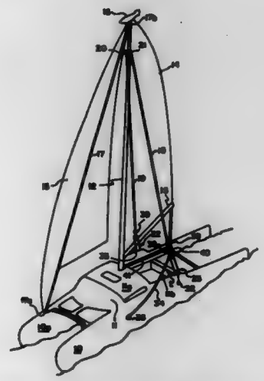
5,191,848
MULTIHULL VESSELS, INCLUDING CATAMARANS, WITH WAVE PIERCING HULL CONFIGURATION
Roger C. Hatfield, St. Croix, V.I., assignor to Gold Coast Yachts, Inc., St. Croix, V.I.
Continuation-in-part of Ser. No. 804,924, Dec. 11, 1991, abandoned. This application Sep. 17, 1992, Ser. No. 946,156
Int. Cl.[5] B63D *1/06, 1/08, 1/12*
U.S. Cl. 114—56 20 Claims

1. An ocean going vessel comprising: at least a pair of laterally spaced apart parallel long thin hulls, a connecting means, including stilt means connected to each hull, connecting said spaced apart hulls and means for driving said vessel through the water; at least one of said hulls comprising: a buoyant, sealed and watertight wave piercing hull configuration, with the length to beam ratio of said hull being within the range of from about 12:1 to about 30:1; said hull having a prow which is substantially knife-edged and vertical; the vertical section contours of the forward ⅓ to ½ portion of the length of the hull are of progressively varying elliptical shape from said prow and have a height to width ratio which averages essentially 2:1 between the prow and the rearward section of the elliptical portion of the hull; and the sections of the rearward portion of the hull are shaped to transition from the rearmost elliptical section of the forward portion of the hull to a substantially polygonal section contour adjacent the stern of said hull.

5,191,849
MULTI-HULLED BOAT
Mark Labrucherie, 105 ru du Champ de Mont, Varanval 60880 le Meux, France, and Daniel Tollet, Regence Park, Apartment 313, Avenue Jean Moulin, 83400 Hyeres, France
Filed May 6, 1991, Ser. No. 695,822
Int. Cl.[5] B63B *1/12*
U.S. Cl. 114—61 3 Claims

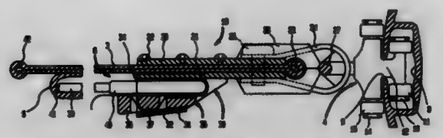
1. A multi-hull boat comprising:
a superstructure having a boat bottom,
a pair of outside hulls parallel to each other and attached at said bottom,
at least one inside hull attached at said bottom parallel to and disposed between said outside hulls,
each said outside hull having a hull extension on said front end whereby said outside hulls extend forward of said at least one inside hull,
said inside and outside hulls each having a continuously increasing cross-sectional area from said front end to said rear end,
each hull having a substantially flat hull bottom sloping upwardly from rear to front at an angle between 0.5° and 5° from the horizontal.

5,191,850
SAIL BOAT RIGHTING SYSTEM
Jan C. Gougeon, Bay City, Mich., assignor to Gougeon Manufacturing Corp., Bay City, Mich.
Filed Oct. 7, 1991, Ser. No. 772,146
Int. Cl.[5] B63B *15/00*
U.S. Cl. 114—91 12 Claims



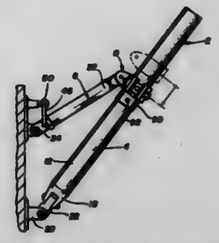
1. A relatively large, multi-hulled sailing vessel having a bow and stern, which is easily self-righted without outside assistance comprising:
a. at least first and second parallel hulls joined by a connecting boat portion;
b. a floatable mast with a lower end tiltably laterally centrally mounted on said connecting boat portion;
c. an aft stay system including a pair of mast supporting aft stay cables connected to the mast at their upper ends and to the vessel at their lower ends on opposite sides of the vessel aft of the mast to normally tend to prevent forward and lateral tipping of the mast;
d. a stay cable system connected to the mast and connected also to the bow of the vessel to tend to normally prevent rearward tipping of the mast;
e. a boom for the mast for a sail assembled to the boom and mast;
f. a generally compression load bearing pole swivelly connectable to the vessel at the mast and extending to releasably connect to one of said aft stay cables and hold it out away from said mast;
g. a righting line connectable to said one of said aft stay cables near the connection of the pole to said one of said aft stay cables and connectable to the side of the vessel forwardly of the connection of said one aft stay cable to said vessel; and
h. a mechanical advantage exerting tackle system connectable to said other of said aft stay cables and to said vessel for effectively tautening the said other aft stay cable and imposing a load on said one aft stay cable which is transmitted in part to said righting line.

5,191,851
ARRANGEMENT FOR SAILS
Göran Rutgerson, Marstrand, Sweden, assignor to Rutgerson Marin AB, Sweden
PCT No. PCT/SE88/00556, § 371 Date Apr. 2, 1991, § 102(e) Date Apr. 2, 1991, PCT Pub. No. WO90/04539, PCT Pub. Date May 3, 1990
PCT Filed Oct. 21, 1988, Ser. No. 674,352
Int. Cl.[5] B63H *9/08*
U.S. Cl. 114—102 7 Claims

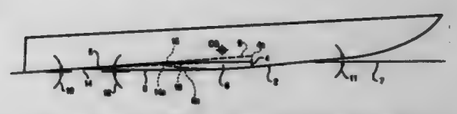


1. Apparatus for supporting a sail including batten means on a mast comprising track slide means moveably slideable along said mast, fitting means for coupling said track slide means to said sail and for securing said batten means in a predetermined position on said sail, said fitting means including first eye means having an outer surface, said first eye means being affixed to said track slide means, and second eye means affixed to said fitting means, said first and second eye means being interlocking, said second eye means including a support surface having a predetermined configuration corresponding to said outer surface of said first eye means, whereby when said sail is urged in a first direction away from said mast, said first and second eye means engage each other so as to provide for mutual freedom of movement therebetween, and when said sail is urged in a second direction towards said mast said support surface of said second eye means engages said outer surface of said first eye means so as to limit lateral displacement therebetween.

5,191,852
FISHING BOAT OUTRIGGER DEVICES
Herbert E. Rupp, 4761 Anchor Ave., Port Salerno, Fla. 33692
Filed Mar. 30, 1992, Ser. No. 859,851
Int. Cl.[5] B63B *35/14*
U.S. Cl. 114—255 3 Claims



1. An outrigger device for use with a motorboat having an upwardly extending wall upon which said device can be mounted for movement between an inboard storage position and an outboard trolling position, said device comprising:
a tube unit, a position unit moveable relative to said tube unit and a lock unit to releasably prevent said relative movement,
said tube unit including:
an elongated tube defined by a an inboard end portion and an outboard end portion integrally joined together by a straight central portion,
a first shackle member fixed to said inboard end portion,
a first bracket member for mounting on said wall, and
a universal joint mounting said shackle member on said first bracket member,
said position unit including:
a V-shaped yoke defined by first and second end portions integrally joined together by an arcuate central portion,
clevis members fixed to said first and second end portions,
second and third bracket members upon which said clevis members are pivoted, said second bracket member including latch means to engage said first end portion to lock said device in said inboard storage position, and
said lock unit including:
a collar defined by first and second U-shaped straps hinged together at one of their ends and having tongues extending from the other of their ends,
said elongated tube of said tube unit extending through said collar for sliding movement of said collar along said elongated tube,
said first strap carrying a laterally extending second shackle,
a lug having a bore therein fixed to said arcuate central portion of said yoke,
a pin extending through said bore and said second shackle to releasably fasten said lock unit to said position unit,
said tongues having transverse bores therein through which a bolt extends, and
a cam member carried by said bolt having a lever extending therefrom by which said cam member may be moved between a lock position which prevents said collar sliding movement and an unlock position which permits said collar sliding movement.

5,191,853
STEPPED HYDROPLANE HULL
Alan J. Adler, 752 La Para Ave., Palo Alto, Calif. 94306
Filed May 24, 1991, Ser. No. 705,240
Int. Cl.[5] B63B *1/20*
U.S. Cl. 114—291 6 Claims

1. A hydroplane hull comprising a forebottom surface, an afterbottom surface, and a step;
said forebottom and afterbottom surfaces connected by said step which comprises an abrupt upward transition from said forebottom surface to said afterbottom surface such that water flow will separate from the hull bottom surface immediately aft of said step,
said forebottom surface aligned with a positive trim angle relative to the horizontal water flow so as to provide hydrodynamic lift in said flow,
an aft portion of said afterbottom surface formed with a positive trim angle relative to the water flow so as to provide lift when said separated water flow re-contacts said aft portion of said afterbottom surface,
a forward portion of said afterbottom surface formed with a non-negative trim angle which is less than said trim angle of said aft portion of said afterbottom surface,
said aft portion of said afterbottom surface formed with a trim angle which is 0.25 to 1 degree less than said trim angle of said forebottom surface,
an abrupt angular transition of trim angle between said forward and aft portions of said afterbottom surface.

339-698 O.G.-93-4

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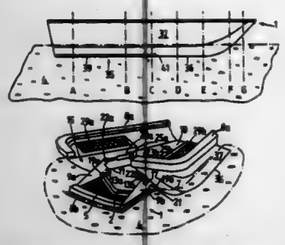
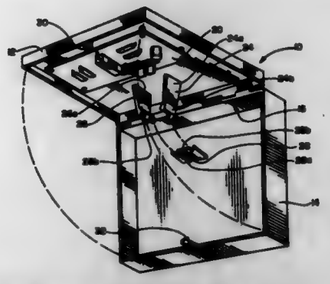
5,191,854
BOAT
Hans-Rudolf Lehmann, Solothurn, and Marcel Lehmann, Balmwald 45, 4525 Balm B. Günsberg, both of Switzerland, assignors to Marcel Lehmann, Balm B. Günsberg, Switzerland
Filed Jan. 7, 1991, Ser. No. 638,327
Claims priority, application Switzerland, Jan. 18, 1990, 00134/90; Jul. 13, 1990, 02355/90
Int. Cl.[5] B63B *1/04*
U.S. Cl. 114—291 11 Claims



1. A boat with a stern and a bow comprising,
a portside and a starboard boat side with an inner and an outer wall adjacent to the interior and exterior of the boat respectively,
a bow opening (15) in said bow extending from the interior to the exterior of the boat, a bow outer wall portion underneath said bow opening (15), a flap (1) closing said bow opening (15) and forming part of said bow, means connected to move said flap (1) between a closed position closing said bow opening (15) and an open position pivoted out of said bow opening (15) in a direction exterior of the boat,
said flap (1) having an inner and an outer wall, and a bottom edge portion,
two bow side parts adjacent said bow opening (15) at said portside and said starboard boat side respectively having an inner and an outer wall,
said outer wall of said flap (1) having a V-shaped contour,
said outer walls of said two bow side parts and said outer wall of said flap (1), when said bow opening (15) is closed by said flap (1), forming a V-shaped bow,
said means connected to move said flap (1) including at least one projection (9*a*, 9*b*) extending from said flap (1) into said interior of the boat,
at least one swivel joint means (13*a*, 13*b*) set back into said interior of said boat relative to said inner wall of said flap (1), connecting said projection (9*a*, 9*b*) to the inner wall of the boat, and
said swivel joint means (13*a*, 13*b*) and projection (9*a*, 9*b*) positioned so that when moving said flap (1) from the closed positioned to the open position to open said bow opening (15), said bottom edge portion of said flap (1) is moveable partly underneath said bow opening (15) forming an open space (2) between said bottom edge portion of said flap (1) lying underneath said bow opening (15) and said outer bow wall portion underneath said bow opening (15).

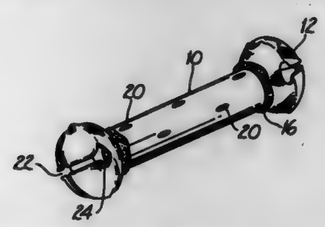
5,191,855
BATTERY MISSING INDICATOR
Fred J. Conforti, Wheaton, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Feb. 26, 1990, Ser. No. 485,221
Int. Cl.[5] G01D *13/00*; H01M *2/10*
U.S. Cl. 116—280 2 Claims

1. An apparatus for inhibiting latching of a cover to a base of a battery powered unit in the absence of a battery comprising:
a base;
a cover;
first and second spaced apart, substantially identical, deflectable, non-latching, elongated battery retaining members biased toward one another and carried on one of said base or said cover, said members each having a free, battery retaining end wherein said ends are deflectable away from one another in response to the presence of the battery;



a blocking flange carried on the other of said base or said cover, wherein said flange engages at least one of said ends in the absence of the battery thereby inhibiting latching of said cover to said base; and
a latch mechanism carried at least in part on one of said base or cover displaced from said members.

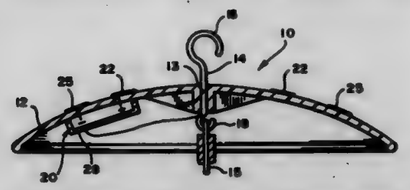
5,191,856
ANIMAL TOY
Richard Gordon, 95 W. 3rd St., Freeport, N.Y. 11520
Filed Aug. 18, 1992, Ser. No. 931,832
Int. Cl.[5] A01K *15/00*
U.S. Cl. 119—29.5 7 Claims



1. An animal toy comprising a hollow tube, a closure at each end of said tube, and spring means located within said tube to normally tension said closure into abutment with the ends of said tube, and a quantity of scented material is housed in said tube and the tension on said closures is such as to permit the escape of said material scent and prevent the escape of the material.

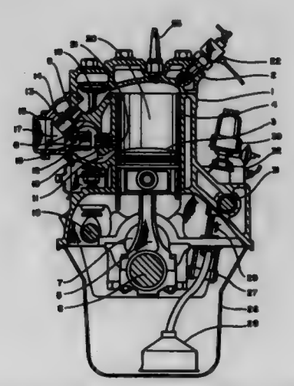
5,191,857
ELECTRONIC BIRD FEEDER AND BAFFLE
John M. D. Boax, 14222 Rock Canyon Dr., Centreville, Va. 22020
Continuation-in-part of Ser. No. 748,546, Aug. 22, 1991, Pat. No. 5,150,665, which is a continuation-in-part of Ser. No. 594,626, Oct. 9, 1990, abandoned. This application Jun. 8, 1992, Ser. No. 894,913
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—52.3 14 Claims

1. An electrical shock baffle for use with bird feeders comprising:
a baffle;
an attachment means for suspending the baffle; and
an open electronic circuit means for producing an electrical shock interconnected between a conductive portion of said baffle and a conductive portion of said attachment means whereby one of said conductive portions forms a positive contact and the other of said conductive portions



forms a negative contact so that an electrical shock will result when both said positive and negative contacts are simultaneously engaged.

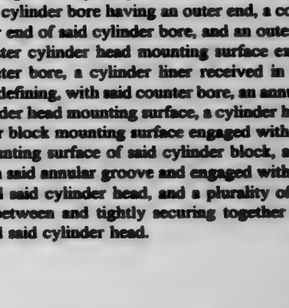
5,191,858
DUAL CYCLE ENGINE
Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95621
Filed Jul. 20, 1992, Ser. No. 916,394
Int. Cl.[5] F02B *35/10*
U.S. Cl. 123—21 7 Claims



1. In a reciprocating piston driven internal combustion engine, an air-chest manifold, said air-chest manifold comprising an upper cylinder ejector nozzle fixedly attached to said air-chest manifold and in communication with an upper cylinder port, a side-port ejector nozzle fixedly attached to said air-chest manifold in line with and in communication with a cylinder wall side-port, a lower cylinder wall side-port, an air inlet to said air-chest manifold, an exhaust gas manifold, said exhaust gas manifold comprising an upper cylinder diffuser, said upper cylinder diffuser fixedly mounted in said exhaust gas manifold and aligned with said upper cylinder ejector nozzle, a side-port diffuser fixedly mounted in said exhaust gas manifold and aligned with said side-port ejector nozzle, an exhaust outlet in said exhaust gas manifold.

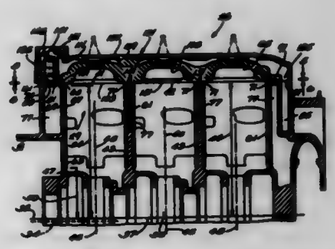
5,191,859
WATER PUMPING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Hideo Fujiwara, Shizuoka, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan
Filed Feb. 12, 1992, Ser. No. 835,183
Claims priority, application Japan, Feb. 22, 1991, 3-050761
Int. Cl.[5] F01P *5/10*
U.S. Cl. 123—41.44 2 Claims

1. A water pumping apparatus for an internal combustion engine having a cylinder block with first and second cylinder banks in a V-configuration wherein a cam shaft and a crank shaft are drivingly connected by a timing chain, comprising:
a water pump having a water pump sprocket disposed coextensively with said timing chain to allow said timing chain to drive said water pump; and



said water pump being provided at the end face of the cylinder block between said cylinder banks over said crank shaft within a timing chain cover enclosing said timing chain.

5,191,860
MARINE PROPULSION DEVICE WITH CLOSED DECK CYLINDER BLOCK CONSTRUCTION
George L. Broughton, Zion, Ill., and Paul W. Breckenfeld, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.
Division of Ser. No. 583,008, Sep. 14, 1990, Pat. No. 5,048,468, which is a continuation of Ser. No. 509,609, Apr. 16, 1990, abandoned. This application Jul. 24, 1991, Ser. No. 734,896
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] F02B *75/18*
U.S. Cl. 123—41.74 1 Claim



1. An engine comprising a closed deck cylinder block including a cylinder bore having an outer end, a counter bore at said outer end of said cylinder bore, and an outer wall including an outer cylinder head mounting surface extending from said counter bore, a cylinder liner received in said cylinder bore and defining, with said counter bore, an annular groove in said cylinder head mounting surface, a cylinder head including a cylinder block mounting surface engaged with said cylinder head mounting surface of said cylinder block, a seal member located in said annular groove and engaged with said cylinder block and said cylinder head, and a plurality of fasteners extending between and tightly securing together said cylinder block and said cylinder head.

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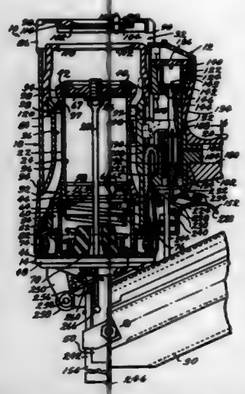
5,191,861
INTERNAL COMBUSTION ACTUATED PORTABLE TOOL

Rudolph J. Kellerman, North Kingstown; Arthur E. Perra, Hope Valley; Leo E. La Barre, West Warwick, and Walter G. Lemos, North Smithfield, all of R.I., assignors to Stanley-Bostitch, Inc., East Greenwich, R.I.

Filed Jul. 12, 1991, Ser. No. 729,194
Int. Cl.[5] F02B *75/04, 21/04, 71/04;* B25C *1/08*
U.S. Cl. 123—46 SC 69 Claims



1. An internal combustion actuated portable tool comprising

a housing assembly including a workpiece engaging portion having means defining a fastener drive track therein, a main body portion above said workpiece engaging portion defining an acceptable housing profile and having means defining a cylindrical drive chamber therein and a handle portion extending transversely from said main body portion for enabling a user to manually move the housing assembly in portable fashion,

a drive piston slidably sealingly mounted in said cylindrical drive chamber for movement through repetitive cycles each of which includes a drive stroke and a return stroke,

a fastener driving element operatively connected with said piston and mounted in said fastener drive track for movement therein through a drive stroke in response to the drive stroke of said piston and a return stroke in response to the return stroke of said piston,

magazine means carried by said housing assembly for containing a supply of fasteners and feeding successive leading fasteners of the supply into said fastener drive track to be driven therefrom by said fastener driving element during the drive stroke thereof,

combustion chamber means above said drive chamber within the acceptable profile defining portion of said housing assembly communicating with an upper open end of said drive chamber,

an annular mixing chamber within said housing assembly in surrounding relation with said cylindrical drive chamber below said combustion chamber means,

fresh air inlet means communicating with a lower portion of said mixing chamber within said housing assembly,

main valve means movable between (1) an open position wherein said combustion chamber means is open at a position of communication with an upper portion of said annular mixing chamber and at a spaced position of communication with the atmosphere and (2) a closed position wherein said combustion chamber means is closed from communication with said mixing chamber and the atmosphere,

gaseous fuel chamber means within said housing assembly,

a series of annular spaced nozzles operable when a predetermined charge of gaseous fuel under pressure from said gaseous fuel chamber means is communicated therewith to direct said charge into said annular mixing chamber in jet stream formations with said combustion chamber means open so that the jet stream formations are operable (1) to cause fresh air from said fresh air inlet means to be entrained and mixed with the charge of fuel forming the jet stream formations and (2) to cause the jet stream formations of fuel mixed with entrained air to flow from said mixing chamber into the open combustion chamber means and move sufficient residual gas in said combustion chamber means therethrough and into the atmosphere to fill the combustion chamber means with a charge of combustible gases in the form of an air-fuel mixture,

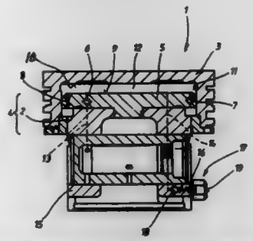
means for igniting a charge of combustible gases in said combustion chamber means, and

means operable in response to a predetermined manual actuating procedure for (1) causing a predetermined charge of gaseous fuel under pressure within said gaseous fuel chamber means supplied thereto from a source of fuel under pressure to be communicated with said series of nozzles so as to fill said combustion chamber means with a charge of combustible gases, (2) causing said main valve means to move from said open position into said closed position in timed relation to the filling of the combustion chamber means with the charge of combustible gases, and (3) causing said igniting means to ignite the charge of combustible gases in said combustion chamber means while the charge is at generally atmospheric pressure so as to create pressure conditions in said combustion chamber means in communication with said drive chamber sufficient to drive said drive piston and said fastener driving element through a drive stroke.

5,191,862
RECIPROCATING PISTON WITH VARIABLE COMPRESSION HEIGHT FOR INTERNAL COMBUSTION ENGINES

Friedrich Wirbeleit, Esslingen-Rüdern, and Martin Bechtold, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed May 26, 1992, Ser. No. 887,811
Claims priority, application Fed. Rep. of Germany, May 25, 1991, 4117131
Int. Cl.[5] F01B *31/14*
U.S. Cl. 123—48 B 9 Claims



1. Reciprocating piston arrangement with variable compression height, for internal combustion engines in particular, comprising:

a connecting rod,

an inner piston part hinged on the connecting rod,

an outer piston part guided on the inner piston part so that it can be displaced axially,

a control chamber located between a surface of the inner piston part and a surface of the outer piston part facing towards a piston end, to which control chamber are connected a first oil hole in the inner piston part for oil supply and a second oil hole for removal of oil from the control chamber to an engine crank case,

a pressure limiting valve in the second oil hole which opens in the direction of the crank case and which has a valve body loaded by a closing spring, and

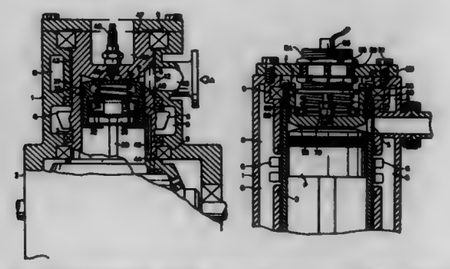
a temperature responsive element provided within the extent of the second oil hole which permits a higher oil pressure in the control chamber when the engine is cold than when it is warm and which operates as a function of temperature,

wherein the temperature response element is formed by a spring consisting of a shape memory alloy, which spring interacts with the pressure limiting valve.

5,191,863
ROTARY SLEEVE-VALVE INTERNAL COMBUSTION ENGINE

Akira Hagiwara, Sagamihara, Japan, assignor to Oshima Construction Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP89/01211, § 371 Date Sep. 17, 1991, § 102(e) Date Sep. 17, 1991, PCT Pub. No. WO90/11432, PCT Pub. Date Apr. 10, 1990
PCT Filed Dec. 1, 1989, Ser. No. 761,750
Claims priority, application Japan, Mar. 24, 1989, 1-70394; May 17, 1989, 1-121485; Aug. 29, 1989, 1-220314
Int. Cl.[5] F02B *75/20*
U.S. Cl. 123—59 AC 13 Claims



1. A rotary sleeve-valve internal combustion engine comprising:

a. an engine block (1)

b. an inlet port (10) provided in said engine block (1) to suck in a fuel mixture;

c. an exhaust port (15) provided in said engine block (1) to discharge the fuel mixture;

d. a cylindrical rotary cylinder valve (3) rotatably supported by at least one bearing (9) in said engine block (1), said valve (3) being hermetically sealed at one end thereof and opened at the other end and having a cylindrical space therein;

e. an opening (5) provided in the outer peripheral side wall surface of said rotary cylinder valve (3) to communicate with said inlet port (10) during admission and with said exhaust port (15) during exhaust;

f. a gear (4) provided on said offer end of said rotary cylinder valve (3);

g. a piston (P) slidably fitted in said cylindrical space in said rotary cylinder valve (3);

h. a crankshaft (20) connected to said piston (P) through a connecting rod (30);

i. a crank gear (26) provided on said crankshaft (20) to be in mesh with said gear (4);

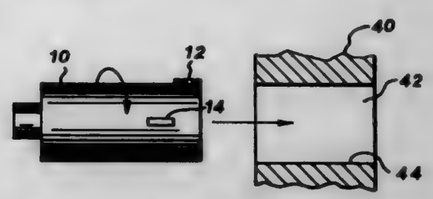
j. an annular seal ring (40) disposed around said opening (5), said seal ring (40) being pushed by centrifugal force produced by the rotation of said rotary cylinder valve (3) in come in contact with the inner peripheral wall surface (7) of said engine block (1) in order to effect gas seal for said inlet port (10) and said exhaust port (15); and

k. a cylinder head (47) formed at said one end of said rotary cylinder valve (3) as an integral part of it for gas seal.

5,191,864
ENGINE CYLINDER BORE

John Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Feb. 3, 1992, Ser. No. 829,710
Int. Cl.[5] F02F *1/00*
U.S. Cl. 123—193.2 5 Claims



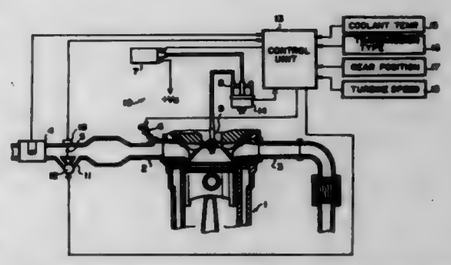
1. In an improved internal combustion engine having an engine housing, a mechanical cylinder bore formed within said housing, a piston that is reciprocable within and contacting said bore, and a rotatable crankshaft interconnected with said piston, the improvement comprising:

a bore surface of said cylinder bore, said bore surface being substantially free of visible tool marks and being substantially free of compressive state material.

5,191,865
ENGINE IDLE CONTROL SYSTEM FOR VEHICLE

Kunitomo Minamitani; Hiromo Yoshioka, and Shigeki Kakizaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

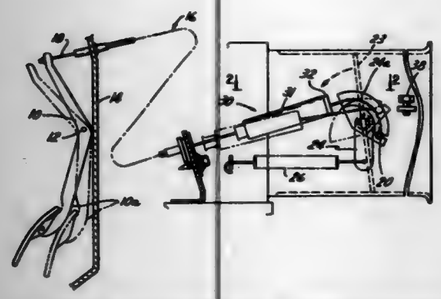
Filed Sep. 23, 1991, Ser. No. 763,599
Claims priority, application Japan, Sep. 27, 1990, 2-255355
Int. Cl.[5] F02D *41/16*
U.S. Cl. 123—339 4 Claims



1. An engine idle control system for a vehicle which causes the engine speed to converge on a target idling speed by a feedback control when the engine idles characterized in that said control system is provided with an engine speed sensor and a means for detecting whether the engine is revolving by itself or is being driven by the vehicle, and controls the engine speed by a proportional feedback control on the basis of the difference between an actual engine speed and the target idling speed when the engine is being driven by the vehicle while controlling the engine speed by a control at least a part of which is an integral feedback control when the engine is revolving by itself.

VOL 1148 ISS 2 MR 9 1993 UMI

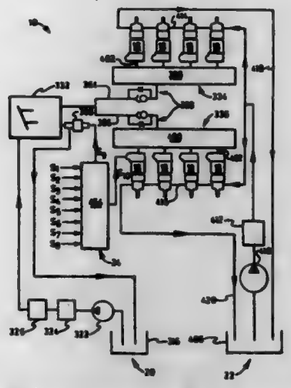
5,191,866
THROTTLE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE
Thomas M. Tesdale, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jan. 1, 1992, Ser. No. 891,115
Int. Cl.[5] F02D 7/00
U.S. Cl. 123—400 **8 Claims**



1. A throttle control system for an automotive vehicle, comprising:
an accelerator pedal;
a rotatable throttle shaft having a crank means and a throttle device affixed thereto, with said shaft being rotatable from an idle position to a wide open throttle position;
a first spring means for biasing said crank means to an idle position;
stop means for engaging said crank means and for preventing further opening of the throttle device when the throttle shaft has reached the wide open throttle position; and
a motion transmitting member having a length sufficient to extend between said accelerator pedal and said crank means such that depression of the accelerator will cause rotation of the throttle shaft and concurrent opening of said throttle device, with said motion transmitting member comprising a first end operatively engaged with said accelerator pedal, a second end operatively engaged with said crank means, and a second spring means, positioned intermediate the first and second ends, for deflecting so as to allow further movement of the accelerator pedal without further opening of the throttle device once the throttle shaft has been moved to the wide open throttle position.

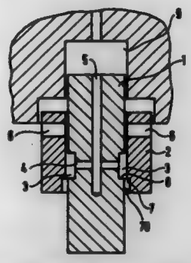
5,191,867
HYDRAULICALLY-ACTUATED ELECTRONICALLY-CONTROLLED UNIT INJECTOR FUEL SYSTEM HAVING VARIABLE CONTROL OF ACTUATING FLUID PRESSURE
Stephen F. Glassey, East Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed Oct. 11, 1991, Ser. No. 775,327
Int. Cl.[5] F02M 47/02
U.S. Cl. 123—446 **9 Claims**

1. A hydraulically-actuated electronically-controlled unit injector fuel system comprising:
at least one hydraulically-actuated electronically-controlled unit injector;
means for supplying fuel at a first pressure to the unit injector;
means for supplying hydraulically actuating fluid, separate from said fuel, to the unit injector, said supplying means including means for pressurizing the hydraulically actuating fluid, said unit injector including means for intensifying the first pressure of said fuel supplied tot he unit injector, said intensifying means being actuated by the hydraulically actuating fluid supplied to the unit injector;
means for detecting the pressure of the hydraulically actuating fluid supplied to the unit injector and generating a pressure indicative signal indicative of said pressure detected;
means for detecting at least one other parameter and generating a parameter indicative signal indicative of said parameter detected; and



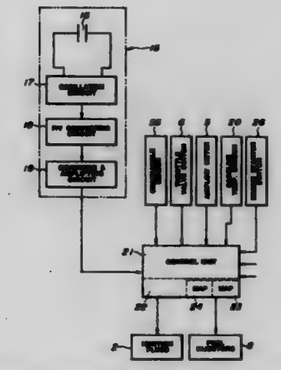
means for electronically controlling the pressure of the hydraulically actuating fluid supplied to the unit injector in response tot he at least one parameter indicative signal and for correcting said pressure amount based on the pressure indicative signal, said pressure controlling means controlling the intensified pressure of said fuel injected by the unit injector independent of the quantity of said fuel injected by the unit injector.

5,191,868
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES HAVING A LOAD-AND/OR RPM-DEPENDENT INJECTION COURSE
Manfred Kraemer, Schwieberdingen, and Johann Warga, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Dec. 13, 1991, Ser. No. 806,512
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1991, 4100093
Int. Cl.[5] F02M 37/04, 41/00
U.S. Cl. 123—449 **13 Claims**



1. A fuel injection pump in a pump housing for internal combustion engines with a load and rpm-dependent injection course and at least one pump piston, a pump cylinder which is embodied as a cylinder liner is fixed in a suitable bore of the pump housing and the pump piston (1) is driven for a reciprocating drive stroke and is optionally rotatable for controlling fuel, and at least one slide (2) located inside a recess of the cylinder liner on the pump piston (1), the at least one slide being axially displaceable on the pump piston (1) in order to control fuel flow, the pump piston includes control slits (3) in an outer surface and the at least one slide (2) includes on a lower edge (7) a graduated recess (70, 71) oriented toward the pump piston, and the pump piston (1) has a throttling control location on a lower edge (81, 82) of the control slits (3).

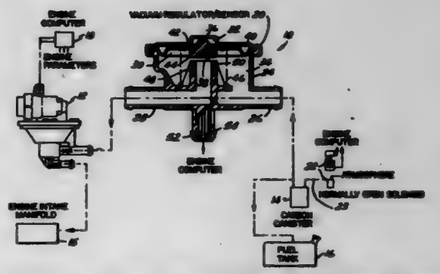
5,191,869
GASOLINE NATURE SENSING SYSTEM
Hideki Kamioka, and Masahiko Shimamura, both of Gunma, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan
Filed Mar. 19, 1992, Ser. No. 853,660
Claims priority, application Japan, Oct. 9, 1991, 3-290942
Int. Cl.[5] F02M 51/00
U.S. Cl. 123—494 **7 Claims**



1. A system for sensing the nature of gasoline, comprising:
a capacitance type sensor for producing a first information signal representative of the dielectric constant of the gasoline;
a temperature sensor for producing a second information signal representative of the temperature of the gasoline;
temperature coefficient deriving means for deriving a temperature coefficient of the gasoline from said first and second information signals;
additive concentration deriving means for deriving the concentration of any additive in the gasoline from said temperature coefficient;
correcting means for correcting said first information signal in view of a reference temperature; and
judging means for judging the nature of the gasoline from the derived concentration of the additive and the corrected first information signal.

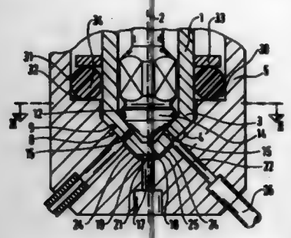
5,191,870
DIAGNOSTIC SYSTEM FOR CANISTER PURGE SYSTEM
John E. Cook, Chatham, Canada, assignor to Siemens Automotive Limited, Chatham, Canada
Continuation-in-part of Ser. No. 676,672, Mar. 28, 1991. This application Oct. 2, 1991, Ser. No. 770,009
Int. Cl.[5] F02M 33/02
U.S. Cl. 123—520 **15 Claims**

1. A canister purge system comprising a collection canister for collecting volatile fuel vapors from a fuel tank, and means for selectively purging collected fuel vapors from said canister to an internal combustion engine's intake manifold for entrainment with a combustible mixture that passes from the manifold into combustion chamber space of the engine for combustion therein, said means including a purge flow path between said canister and manifold, characterized by a diagnostic system that detects unacceptable leakage in a portion of the canister purge system which portion includes said canister and tank and that comprises atmospheric vent means for selectively venting and unventing the canister and headspace of the tank to atmosphere and vacuum regulator/sensor means that is disposed in said flow path and that is selectively operable to open and close said flow path, characterized further by means for causing said diagnostic system to perform a multiple-part diagnostic test to determine whether any such leakage is present comprising means for performing one part of the test comprising pressure increase detection means comprising means for operating said atmospheric vent means to unvent said portion of the canister purge system to atmosphere, flow control means disposed in said flow path between said vacuum regulator/sensor means and intake manifold for selectively opening and closing said flow path, and means for obtaining a measurement of increase in the vapor pressure in said portion in consequence of unventing of said portion to atmosphere and of closing of said flow path by said flow control means, and means for performing another part of the test comprising means for performing a leakage test on said portion comprising means for operating said atmospheric vent means to unvent said portion to atmosphere and means for operating said flow control means to open said flow path so as to allow engine intake manifold vacuum to commence drawing vacuum in said portion, said vacuum regulator/sensor means comprises means for closing said flow path upon the drawing of a certain magnitude of



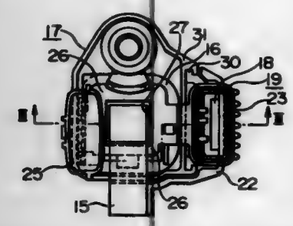
vacuum in said portion within a certain measure of time indicative of the absence of a gross unacceptable leak in said portion, means for distinguishing a gross unacceptable leak in said portion from less gross unacceptable leaks by distinguishing the non-attainment of closure of said flow path by said vacuum regulator/sensor means within said measure of time from the attainment of closure of said flow path by said vacuum regulator/sensor means within said measure of time, means effective after the attainment of closure of said flow path by said vacuum regulator/sensor means within said measure of time for operating said flow control means to cause the magnitude of manifold vacuum delivered through said flow path to said vacuum regulator/sensor means to be attenuated from the magnitude that was delivered prior to closure of said flow path by said vacuum regulator/sensor means, and indicator means for indicating the absence of such a less gross unacceptable leak comprising means for indicating whether or not said vacuum regulator/sensor means has, after having closed said flow path, maintained said flow path closed for a certain period of time, and if maintenance of closure of said flow path for said certain period of time is not indicated, for distinguishing between the presence and absence of such a less gross unacceptable leak comprising means for utilizing the measurement obtained from said one test in distinguishing between the presence and absence of such a less gross unacceptable leak.

5,191,871
APPARATUS FOR INJECTING A FUEL-GAS MIXTURE
Uwe Liskow, Kerpenstheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE91/00153, § 371 Date Nov. 8, 1991, § 102(e) Date Nov. 8, 1991, PCT Pub. No. WO91/14093, PCT Pub. Date Sep. 19, 1991
PCT Filed Feb. 23, 1991, Ser. No. 781,161
Int. Cl.[5] F02M 69/08, 69/04, 61/14, 61/18
U.S. Cl. 123—531 18 Claims



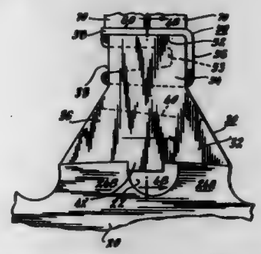
1. An apparatus for injecting a fuel-gas mixture, having a fuel injection valve having a longitudinal axis which has, in a valve housing, a valve closing body actuatable as a function of operating state and a number of injection ports corresponding with the number of cylinders of injection groups, each encompassing a plurality of cylinders, of an internal combustion engine, and having a mixing housing which has a gas delivery line serving to deliver gas and extending concentrically with the longitudinal valve axis and, which in alignment with the injection ports has a number of mixing lines corresponding to the number of injection ports, wherein the valve head, embodied concentrically with the longitudinal valve axis, protrudes into a valve holder of the mixing housing, and the gas delivery line communicates with the mixing lines, the valve head (3, 53) rests by a contact face (8, 50) on a bearing face (9, 51) of the mixing housing (5, 60), and one gas conduit (24, 70) for each mixing line leads away from the gas delivery line (17, 62) to each of the mixing lines (22, 68), and each of the gas conduits (24, 70) has a smaller cross-sectional area in comparison with the mixing lines (22, 68).

5,191,872
IGNITION COIL UNIT FOR AN INTERNAL COMBUSTION ENGINE
Tadao Takahshi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 28, 1992, Ser. No. 875,639
Claims priority, application Japan, Apr. 30, 1991, 3-029826[U]; Apr. 30, 1991, 3-029827[U]
Int. Cl.[5] F02P 3/04; H01F 31/00
U.S. Cl. 123—647 7 Claims



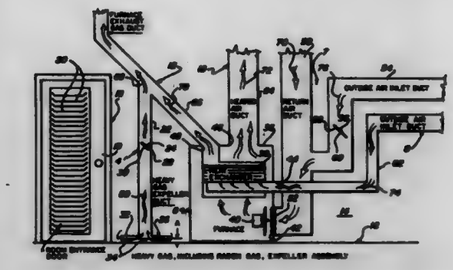
1. An ignition coil unit for an internal combustion engine, comprising:
a magnetic iron core;
an igaition coil wound around said iron core;
a coil case containing said iron core and said ignition coil therein;
an ignitor for controlling a primary current flowing through said ignition coil;
an ignitor case containing said ignitor;
a heat sink connected between said coil case and said ignitor case for dissipating heat generated in said ignitor and supporting said ignitor case with respect to said coil case;
additional support means mounted between said ignitor case and said coil case for detachably attaching said ignitor case to said coil case; and
a resin filler material filled in said coil case for holding said ignition coil within said coil case.

5,191,873
USEFUL IMPROVEMENTS IN SAWING DEVICES
Robert E. Browning, 168 Northfield St., Montpelier, Vt. 05602, and R. McKim Browning, Carpenter Hill Rd., Alfred, Me. 04002
Filed Feb. 24, 1992, Ser. No. 840,120
Int. Cl.[5] B24D 5/12, 5/06
U.S. Cl. 125—15 20 Claims



1. Apparatus for use with a saw core comprising an extender that includes sidewall members having inner surfaces which are retained in side by side and spaced-apart relationship with respect to each other by means of a first separator portion located in the vicinity of a first end of said extender and of a second separator portion located in the vicinity of a second end of said extender which second separator portion is located at the opposite end of said extender from said first end, and
that includes a cavity internal of said extender that is bounded at its sides, top and bottom respectively by said inner surfaces of said sidewall members and said first and second separator portions, and includes openings from said cavity to the outside in those regions not occupied by said sidewalls and said separator portions, said first separator portion being adapted to slideably receive a cutting member base from the direction of one of said openings and positionally retain said base thereon, and said sidewall members being so dimensioned that when the cutting member base to be positioned on said first separator portion is so positioned, at least part of said cavity and said openings are not occupied by said cutting member base, and
that is adapted to be affixed at said first end to a saw core with said openings extending outward past the peripheral edge surface of said core in the direction of an extension of radii of said core and with the opening into said extender in the direction from which first separator is adapted to so receive said cutting member base facing in the direction in which the core is to turn when in use.

5,191,874
HEAVY GAS, INCLUDING RADON GAS, EXPELLER ASSEMBLY
Oliver B. McWilliams, 2748 Fawn Grove Ct., Colorado Springs, Colo. 80906
Filed Jun. 13, 1991, Ser. No. 714,448
Int. Cl.[5] F24F 7/00
U.S. Cl. 126—312 6 Claims

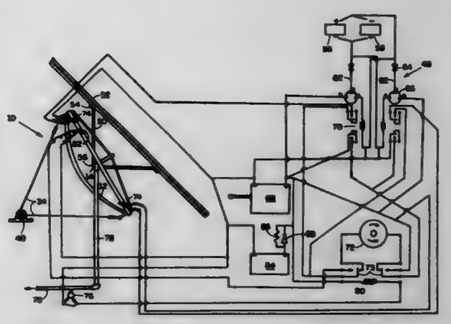


1. A heavy gas expeller assembly connected to a furnace assembly to remove air and/or heavy gas, including radon gas, adjacent a support floor, comprising:
a) a fluid collector duct member connected in a sealed, fluid flow manner at one end to an exhaust flue duct member from the furnace assembly at an opposite end to a collector inlet assembly positioned adjacent the support floor; and
b) an outside air inlet duct member connected to and supplying fresh inlet air to a return air duct and pulled through a filter member by a return air fan assembly in the furnace assembly for positive fluid flow discharge of a mixture of return air and outside fresh air throughout a building structure;
whereby a vacuum is created in said fluid collector duct member to receive fluid from said collector inlet assembly for subsequent discharge from the exhaust fluid duct member.

5,191,875
HIGH EFFICIENCY SOLAR BOILER
Jack V. Edling, 2116 Camino Dr., Escondido, Calif. 92026, and Dale G. Hamreus, Rt. 1 Box 199, Long Beach, Wash. 98631
Filed Sep. 27, 1991, Ser. No. 766,513
Int. Cl.[5] F24J 2/38
U.S. Cl. 126—576 37 Claims

1. A high efficiency solar boiler which comprises:

5,191,876
ROTATABLE SOLAR COLLECTION SYSTEM
Curtis L. Atchley, 7531 Oriental Trail, San Antonio, Tex. 78244
Filed Mar. 4, 1992, Ser. No. 845,620
Int. Cl.[5] F24J 2/38
U.S. Cl. 126—576 8 Claims



1. A solar heat collection apparatus comprising, in combination:
an elongated metallic conduit for a heat absorbing fluid;
a plurality of longitudinally spaced brackets for supporting said conduit in a position exposed to the sun;
a plurality of elongated support elements transversely disposed relative to said conduit at longitudinally spaced intervals;
bearing means on each said support element rotatably engaging said conduit;
each said support element having a parabolic surface with a focal axis substantially coincident with the axis of said conduit;
a pair of elongated frames respectively rigidly secured to the outer end portions of said elongated support elements;
a flexible rectangular sheet having at least one reflective surface;
a pan having a generally flat bottom and upstanding walls;
a grid in said pan comprising a plurality of substantially parallel tubes, a water manifold connecting first ends of said tubes, a steam manifold connecting second ends of said tubes and means for introducing water into said water manifold and removing steam from said steam manifold;
a cover adapted to be secured to said upstanding walls to close said pan with a plurality of optically cylindrical lenses oriented parallel to said tubes and positioned to focus sunlight falling on said lens in a narrow line along corresponding tubes;
support means adapted to support said pan for rotation in a substantially horizontal plane and for tilting in a substantially vertical plane with the steam manifold end of the pan uppermost;
sensor means comprising two sensors, one aligned with the upper edge of said pan to measure azimuth and the other aligned with a side edge of the pan to measure altitude for detecting orientations of said cover other than perpendicular to the direction of the sun;
each of said sensors comprises a housing having two end surfaces sloping outwardly from the upper housing surface and a photocell coplanar with each end surface so that when the direction of the sun is perpendicular to said cover all of the sensors will be substantially equally exposed to the sun; and
drive means for receiving signals from said sensor means and moving said pan in azimuth and altitude as necessary to return said cover to a position substantially perpendicular to the direction of the sun.

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means on said elongated frames for engaging the respective longitudinal edges of said sheet and deforming said sheet into conformity with said parabolic surfaces to define a parabolic reflective surface having focal axis coincident with the longitudinal axis of said conduit;

a motor driven shaft disposed beneath said sheet; and

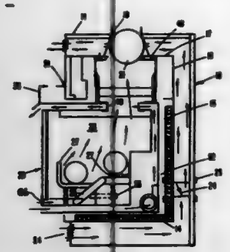
a plurality of cables respectively secured to all ends of said support elements by one cable end and having the other cable end wound around said shaft, each cable connected to one end of a said support element being wound on said shaft in a direction opposite to the cable connected to the other end of said support element, whereby reverse rotations of said shaft respectively effect reverse rotations of said parabolic reflective surface about said focal axis without warping of said parabolic reflective surface.

5,191,877

INSERTABLE GAS CONVERSION UNIT

Ronald J. Shimek, 8944 W. 154th St., Prior Lake, Minn. 55372, and Daniel C. Shimek, 5260 W. 132d St., Apple Valley, Minn. 55124

Filed Aug. 29, 1991, Ser. No. 751,510
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—512 **18 Claims**



1. A gas fireplace conversion unit adapted to be inserted into a previously installed existing wood burning fireplace, having a exhaust outlet, to provide a gas burning fireplace conversion unit, comprising:

an insertable gas fireplace conversion unit adapted to be mounted inside the combustion chamber of an existing fireplace at a user's site without custom fitting,

said gas conversion unit having a fire fox combustion chamber, an exhaust gas outlet in the top of said fire box and a gas burner mounted in said firebox combustion chamber,

decorative glass door means mounted on said gas conversion unit covering the front of said gas fireplace combustion chamber,

down draft diverter means mounted on top of said fire box over said exhaust gas outlet, said down draft diverter means comprising:

first coupling means for connection to the exhaust outlet of an existing wood burning fireplace,

second coupling means connected to said exhaust gas outlet of said fire box of said combustion chamber of said gas conversion unit, and

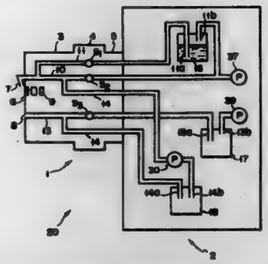
vertical guide means on said first and said second coupling means having side openings for telescopingly fitting said first coupling means into said second coupling means whereby said gas fireplace conversion unit is rapidly connected to a wood burning fireplace through the interconnection of said coupling means without custom fitting of said gas fireplace conversion unit into said existing wood burning fireplace.

5,191,878

ENDOSCOPE DEVICE

Yoshihiro Iida, Tama; Jin Kira, Tokyo; Yutaka Ohshima, Hachioji; Toshiyuki Takara, Higashimurayama, and Koji Yamaya, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1991, Ser. No. 682,739
Claims priority, application Japan, Apr. 12, 1990, 2-39839[U]; Apr. 25, 1990, 2-107547; Aug. 22, 1990, 2-221681; Oct. 26, 1990, 2-286979
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 **13 Claims**



1. An endoscope device comprising:

an endoscope having a front end portion provided with a nozzle and a sucking opening;

fluid supply means haivng a first passage connected to the nozzle for supplying a fluid to said nozzle;

suction means having a second passage connected to said sucking opening;

fluid circulating means having a fluid circulation pump attached to a third passage, said third passage being in fluid communication with both said first and second passages, said fluid circulation means circulating a sucked-in fluid through said third passage such that said sucked-in fluid is sucked in through said sucking opening and said second passage and expelled as a jet stream through said first passage and said nozzle; and

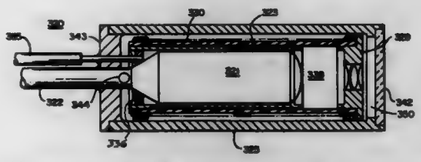
a vessel attached to said third passage, said vessel being in fluid communication with a discharge side of said circulation pump, said vessel separating a gas from said sucked in fluid flowing through said third passage.

5,191,879

VARIABLE FOCUS CAMERA FOR BORESCOPE OR ENDOSCOPE

Allan I. Krauter, Syracuse, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 24, 1991, Ser. No. 735,269
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—4 **10 Claims**



1. A remotely focusing camera assembly for a borescope or endoscope of the type wherein an elongated insertion tube has a distal head which contains an imager, the insertion tube having an image-carrying cable extending proximally from the image within the insertion tube to a viewing device for displaying an image of an object in the field of view of the imager, the camera assembly comprising:

a tubular head sleeve at the distal head of said insertion tube,

a lens assembly including a focusing lens set and a tubular lens holder mounting same disposed at a distal end of the head sleeve;

an imager sleeve within the head sleeve, the imager sleeve containing the imager fixedly mounted therewithin;

with one of said lens assembly and said imager sleeve being fixedly mounted within the head sleeve, and the other thereof being axially slidable within said head sleeve;

means sealing the proximal end of said imager sleeve;

an elongatable braid and bladder assembly mounted onto a portion of said imager sleeve and said lens assembly such that the lens assembly, the braid and bladder assembly, the imager, the imager sleeve, and said sealing means define a confined volume, said bladder assembly including an elastomeric tube affixed at its one end over the imager sleeve and at its other end over said tubular lens holder of the lens assembly, and a braid disposed over said elastomeric tube and having substantially inelastic filaments oriented at an angle relative to the axis of the tube that substantially exceeds 54.7 degrees; and

means for applying a controlled pressure into said confined volume for controllably elongating said bladder assembly to move said imager sleeve relative to said lens assembly between a far-focus positioned and a near-focused position.

5,191,880

METHOD FOR THE PROMOTION OF GROWTH, INGROWTH AND HEALING OF BONE TISSUE AND THE PREVENTION OF OSTEOPENIA BY MECHANICAL LOADING OF THE BONE TISSUE

Kenneth J. McLeod, 28 Setalcott Pl., Setauket, N.Y. 11733, and Clinton T. Rubin, 108 Bleeker St., Port Jefferson, N.Y. 11776

Continuation of Ser. No. 560,186, Jul. 31, 1990, Pat. No. 5,103,806. This application Apr. 13, 1992, Ser. No. 865,148
The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—24 AA **13 Claims**

1. A method for preventing osteopenia, as well as for promoting growth, ingrowth and healing of bone tissue, which comprises the step of:

subjecting the bone tissue to a mechanical load sufficient to cause a strain in the bone tissue at a relatively low level of between about 10 and about 1000 microstrain, peak-to-peak, and at a relatively high frequency of between about 10 and about 100 hertz, said step being administered for a total of about 5 to about 60 minutes per day.

5,191,881

INSUFFLATING/SUCTIONING VALVE

Blaine E. Beck, Roswell, Ga., assignor to Genesis Medical, Ltd., Roswell, Ga.

Filed Jan. 28, 1991, Ser. No. 646,581
Int. Cl.[5] A62B *9/02*
U.S. Cl. 128—205.24 **5 Claims**

1. An insufflating valve comprising:

a) a valve body;

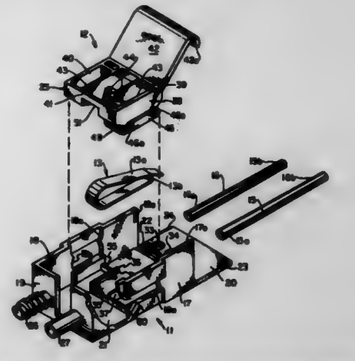
b) resilient tube means extending within said body adapted for connection individually to sources externally of said body of oxygen and of suction to conduct oxygen and suction flow respectively through said body;

c) said tube means being connected to catheter means externally of said valve body to permit flow of oxygen and suction into and from said catheter means;

d) means for crimping said tube means to permit flow there through and means for releasing said crimping means to permit flow there through;

e) said tube means comprising two separate resilient tubes one of which is connected to a source of oxygen and the other to a source of suction; said crimping means and said releasing means including means for alternatively crimping one tube while releasing the other;

f) said tube crimping means and said releasing means including means to shut off flow in both tubes prior to permitting flow alternatively through either tube;



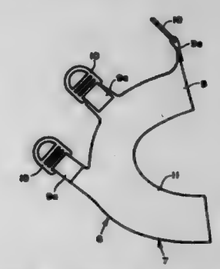
g) said tube crimping means and said means for releasing said crimping means includes a valve actuating mechanism having an actuating arm extending from said valve body, and spring means automatically connected with said actuating mechanism to shut off flow in both tubes upon release of said actuating arm.

5,191,882

APPARATUS FOR ENABLING A STRAPLESS BREATHING MASK TO BE WORN WITHOUT A PROTECTIVE HELMET

German Vogliano, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 480,738, Feb. 16, 1990, abandoned. This application Mar. 12, 1991, Ser. No. 667,879
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907428
Int. Cl.[5] A62B *18/08*
U.S. Cl. 128—207.11 **5 Claims**



1. An apparatus for enabling a strapless breathing mask including a strapless body, a window shield and a window frame, that is normally worn by a user in conjunction with a protective helmet, to be worn by the user without the protective helmet, the apparatus comprising:

a resilient holder having an opening through which the window frame of the mask is inserted and within which the mask is supported, wherein the opening corresponds substantially to the shape of the periphery of the window frame; and

a head strap assembly connected to the resilient holder.

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5,191,883

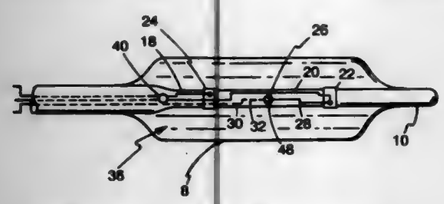
DEVICE FOR HEATING TISSUE IN A PATIENT'S BODY

Charles D. Lennox, Nashua, N.H.; Richard A. Noddin, Hollliston, and Ronald Sahatjian, Lexington, both of Mass., assignors to Prutech Research and Development Partnership II, San Jose, Calif.

Division of Ser. No. 263,815, Oct. 28, 1988, Pat. No. 4,955,377. This application May 22, 1990, Ser. No. 527,047

Int. Cl.[5] A61F *7/12*

U.S. Cl. 128—401 **22 Claims**



1. Catheter device for heating tissue, comprising

a flexible catheter shaft constructed for insertion into a patient's body and sized to pass through a body lumen,

a chamber mounted on the shaft, the chamber defined by a wall which at least in part is expandable, the chamber being associated with a lumen for fluid flow between said chamber and a fluid source outside of said body, the chamber being fillable after placement in the body with an electrically conductive fluid preselected to produce resistive heating, said chamber having dimensions suitable for use within said body lumen,

a plurality of spaced, low-profile electrical contacts enclosed within the chamber and a corresponding plurality of conductors for connecting the low-profile electrical contacts to a power supply for applying a radio frequency electrical potential between the contacts,

said low-profile contacts being exposed to the fluid-containing space of said chamber so that said radio frequency electrical potential can cause current to flow through fluid between the contacts,

said chamber and said low-profile contacts being cooperatively constructed and arranged to cause said current to be substantially confined to said fluid within the chamber,

whereby on the basis of I^2R losses of said radio frequency electric current flowing between the low-profile electrical contacts, the fluid can be heated and the fluid in turn can heat the surrounding tissue by thermal conduction through a wall of the chamber.

5,191,884

RECONFIRMATION PRIOR TO SHOCK FOR IMPLANTABLE DEFIBRILLATION

Norma L. Gilli, Mosman; Lorraine Holley, Rockdale; Geoffrey A. Drane, Annandale; Anthony C. Stephens, Willoughby; Christopher N. Daly, Bilgola Plateau, all of Australia, and Steven M. Maas, Englewood, Colo., assignors to Telectronics N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 239,624, Sep. 1, 1988, abandoned. This application Aug. 29, 1990, Ser. No. 576,178

Claims priority, application Australia, Sep. 2, 1987, PI4104

Int. Cl.[5] A61N *1/39*

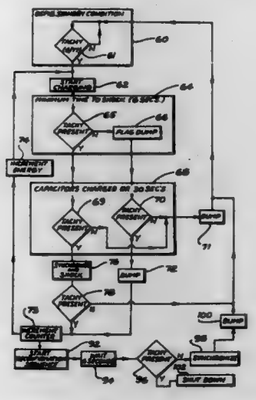
U.S. Cl. 128—419 D **14 Claims**

1. An apparatus for treating a tachyarrhythmia of the heart comprising:

detection means for detecting a tachyarrhythmia;

shock means for delivering a shock to the heart; and

reconfirmation means for confirming a presence of the tachyarrhythmia subsequent to detection by said detection means and for reconfirming the presence of the tachyarrhythmia immediately prior to delivery of a shock by said shock means, said reconfirmation means controlling said shock means so that only if the presence of said tachyarrhythmia is both confirmed and reconfirmed does said shock means deliver said shock to the heart, said reconfirmation means confirming the presence of said tachyarrhythmia at a first predetermined time after detection of



said tachyarrhythmia by said detection means, and reconfirming the presence of said tachyarrhythmia at a second time after detection by said detection means, said second time being no greater than a second predetermined time after said first time.

5,191,885

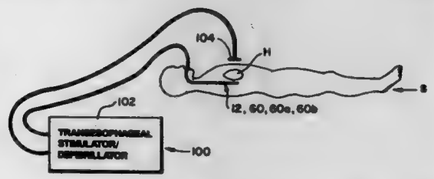
METHOD OF TERMINATING AN ARRHYTHMIA

Richard M. Bilof, Wonder Lake, and Stuart E. Schwartz, Arlington Heights, both of Ill., assignors to Arczo Medical Electronics, Inc., Vernon Hills, Ill.

Continuation-in-part of Ser. No. 608,200, Nov. 2, 1990, which is a continuation-in-part of Ser. No. 306,997, Feb. 6, 1989, Pat. No. 5,069,215. This application Apr. 9, 1991, Ser. No. 682,246

Int. Cl.[5] A61N *1/39, 1/05*

U.S. Cl. 128—419 D **6 Claims**



1. A method of terminating an arrhythmia of a patient's heart comprising:

positioning a plurality of substantially identical conducting members in the patient's esophagus adjacent to a posterior surface of the heart;

pulsing selected of the conducting members with electrical signals of a predetermined frequency thereby terminating the arrhythmia, wherein the arrhythmia terminating electrical signals have a current amplitude in a range of 10–40 milliamps, and

wherein the electrical signals have a pulse width on the order of 10 milliseconds.

5,191,886

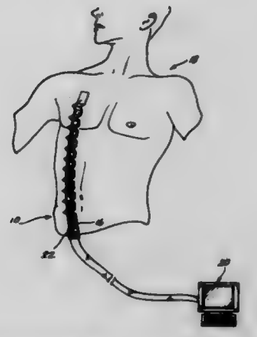
MULTIPLE ELECTRODE STRIP

David S. Paeth, Seattle; Stephen W. Groos, Snohomish, and Thomas D. Lyster, Bothell, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Apr. 18, 1991, Ser. No. 687,302

Int. Cl.[5] A61B *5/0402*

U.S. Cl. 128—640 **24 Claims**



1. An electrode strip for placement on a body, comprising:

a substantially inextendible substrate having first and second surfaces, a plurality of electrode sites on the first surface of the substrate, and a region of extensibility defined in the substrate between a pair of adjacent electrode sites to allow selective positioning of the adjacent electrode sites on the body; and

a plurality of spaced-apart conductive leads that extend along the first surface of the substrate to a different one of the electrode sites.

5,191,887

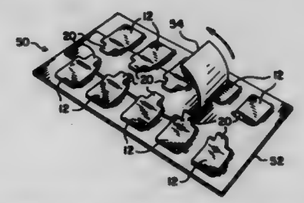
ASSEMBLY FOR DISPENSING TAB ELECTRODES

James V. Cartmell, Xenia, Ohio, assignor to NDM Acquisition Corp., Minneapolis, Minn.

Division of Ser. No. 708,741, May 31, 1991. This application Jul. 20, 1992, Ser. No. 915,314

Int. Cl.[5] A61B *5/0402*

U.S. Cl. 128—640 **9 Claims**



1. An assembly for dispensing electrodes used in conjunction with electrocardiograph apparatus comprising:

a carrier sheet;

a pull strip releasably mounted along a longitudinal center of said carrier sheet; and

an electrode having a projecting tab, said electrode being mounted on said carrier sheet such that said tab at least partially overlies said pull strip, whereby said pull strip may be pulled upwardly to expose said tab of said electrode for access thereto.

5,191,888

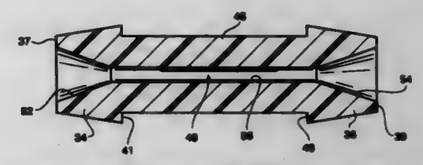
ASSEMBLY OF AN EXTENSION GUIDEWIRE AND AN ALIGNMENT TOOL FOR SAME

Matthew Palmer, Miami; John J. Starkey, Cooper City, and Fernando M. Viera, Hialeah, all of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 510,537, Apr. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 510,522, Apr. 18, 1990, Pat. No. 5,139,032, and a continuation-in-part of Ser. No. 510,523, Apr. 18, 1990, Pat. No. 5,113,872. This application Mar. 31, 1992, Ser. No. 860,264

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—657 **10 Claims**



1. An assembly of an extension wire and an alignment tool for aligning the proximal end of a medical catheter wire with connecting means at the distal end of said extension wire or at the proximal end of the medical catheter wire, said alignment tool comprising a body having (a) enlarged end portions, (b) a smaller-in-cross-section middle portion so that said large end portions define abutment means facing inwardly of said body toward said middle portion, and (c) passage means extending through said body along a longitudinal axis of said body and including a middle, generally cylindrical portion of substantially uniform diameter and first and second inlet means for receiving and guiding into each end, respectively, of said passageway and into said middle portion both the proximal end of a medical catheter wire or the distal end of said extension wire and the connecting means at the distal end of the extension wire or at the proximal end of the medical catheter wire, each of said inlet means at each end of the passage means of the alignment tool extending along the longitudinal axis and including an outwardly opening passage opening onto one of two opposite end faces of the body, and the body of the alignment tool being generally cylindrical in shape with the middle cylindrical portion of uniform diameter and with the opposite end faces facing outwardly and each lying in a plane generally normal to the longitudinal axis, the enlarged end portions comprising generally frusto-conical end portions each tapering or flaring radially outwardly from one of the end faces and axially toward the other end portion to an axially facing annular surface extending radially outwardly from the middle uniform diameter portion, the axially facing annular surfaces defining the abutment means.

5,191,889

TRANSDUCER HEAD FOR A MEDICAL INSTRUMENT AND METHOD OF USE

Markus Morahinweg, Ulm, and Fritz Stepper, Boeblingen, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 4, 1991, Ser. No. 680,563

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 9004824[U]

Int. Cl.[5] A61B *8/02*

U.S. Cl. 128—662.04 **8 Claims**

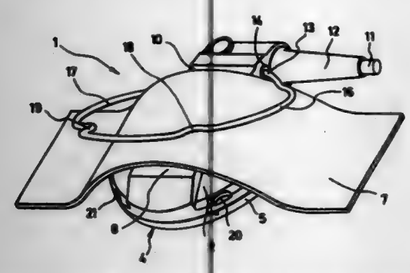
1. A transducer head for a medical instrument, comprising:

a housing for a transducer adapted to be held, by a belt, in contact with a patient; and

fastening means for affixing said housing to said belt, said fastening means comprising a bow adapted to be locked relative to said housing in such a position that said belt extends across said housing on a side of said housing

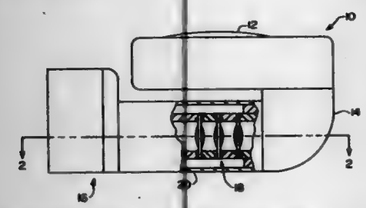
facing away from the patient and rests between said bow and said housing;

said housing comprising at least one swivel bearing sleeve having an axis extending in a lengthwise direction of the belt; and



said bow forming a bearing pin on at least one of its ends, said bearing pin being supported in said swivel bearing sleeve.

5,191,890
ULTRASONIC PROBE ASSEMBLY
Ronald E. Hileman, Lewistown, Pa., assignor to Interspec, Inc., Ambler, Pa.
Filed Apr. 22, 1991, Ser. No. 689,185
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 31 Claims



1. An ultrasonic probe assembly comprising:

an ultrasonic array unit including an ultrasonic array for scanning in a scan plane and an array mount upon which said ultrasonic array is mounted, said ultrasonic array unit movable through a positioning angle extending in a plane perpendicular to said scan plane to change the disposition of said scan plane;

a base unit;

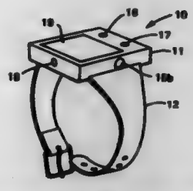
a flexible coupling extending between said base unit and said ultrasonic array unit;

a flexible tube extending between said base unit and said ultrasonic array unit and within which said flexible coupling extends;

a remote control unit for selecting an angular position of said ultrasonic array unit corresponding to a selected disposition of said scan plane of said ultrasonic array;

and position control means, including flexible connecting means, extending from said remote control unit through said base unit and said flexible tube to said ultrasonic array unit and responsive to said remote control unit for moving said ultrasonic array unit to said selected angular position, said flexible connecting means having a length which permits positioning said base unit and said ultrasonic array unit within a body cavity of a patient while said remote control unit remains outside the body of the patient.

5,191,891
PORTABLE ECG MONITOR/RECORDER
William H. Righter, Aloha, Oreg., assignor to Ralin, Inc., Bannockburn, Ill.
Filed Sep. 10, 1991, Ser. No. 757,254
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—710 30 Claims

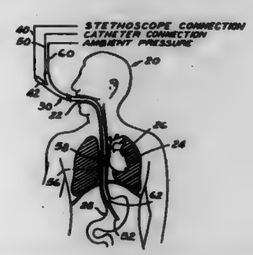


1. A wrist-worn, encased apparatus having electronic circuitry for selectively monitoring, recording and transmitting a user's electrocardiographic (ECG) signals, wherein an electrode arrangement is provided for acquiring said ECG signals, said arrangement comprising:

a first conductive electrode disposed on a first surface of the apparatus casing for contact with an ECG lead position on the user's body; and

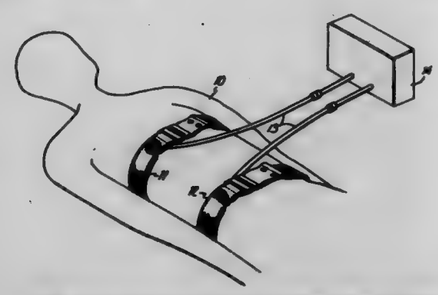
second and third conductive electrodes disposed on at least one other surface of the apparatus casing and positioned for ease of contact by the user's hand when the first electrode is placed in contact with an ECG lead position on the user's body, wherein one the second and third electrodes provides a ground signal source for the electronic circuitry, and wherein the electronic circuitry is activated only when the user touches the three electrodes.

5,191,892
ESOPHAGEAL/STETHOSCOPIC GASTRIC TUBE
Wayland G. Blikken, 69 Bay Circle Dr., Holland, Mich. 49424
Filed Sep. 10, 1991, Ser. No. 757,269
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—715 3 Claims



1. An instrument for use during surgical operations in which a general anesthetic is administered, comprising a composite multi-lumen tube having a proximal end and a distal end for nasal or oral introduction into the esophagus, said tube having a main lumen extending from the proximal end of the tube and ending in a catheter at a distal end to be located in the stomach, means at the proximal end of the main lumen for connection to a negative pressure source, a second lumen having a proximal end and a distal end positioned lineally of the composite tube having a distal end in the general area of the heart and lung when inserted, a stethoscopic pick-up in said second lumen adjacent its distal end, a stethoscopic connection connected to the pick up at the proximal end of the composite tube, and a third lumen having a proximal end and a distal end co-lineal with said first and second lumens extending from an atmospheric opening at the proximal end of the composite tube to a distal vent opening positioned proximal to the catheter between the distal end of the main lumen and the stethoscopic pick-up to be open to the stomach to relieve negative pressure.

5,191,893
VOLUME VARIATION SENSOR AND METHOD FOR OBSTRUCTIVE SLEEP APNEA MONITORING
Denise M. Reites, Champlin, Minn., assignor to CNS, Inc., Chanhassen, Minn.
Continuation of Ser. No. 525,892, May 18, 1990, abandoned.
This application May 12, 1992, Ser. No. 884,853
Int. Cl.[5] A61B *5/113*
U.S. Cl. 128—721 7 Claims



1. A first volume change sensor for sensing volume changes in a flexible body subject to such volume changes, said first sensor comprising:

a tubular enclosure formed by a flexible wall about an interior region, said tubular enclosure being airtight except for at least one conduit having a conduit wall about a conduit passsageway therein connected to said flexible wall at an end of said conduit such that said conduit passageway opens to said interior region of said tubular enclosure with said conduit having an opposite end adapted for connection to a pressure monitor, said tubular enclosure being sufficiently elongated so as to be capable of being positioned substantially about a said flexible body, said flexible wall being sufficiently thin so as to be easily deformable;

an elongated insert formed of a unitary body of resiliently deformable, open cell foam and positioned in said interior region of said tubular enclosure; and

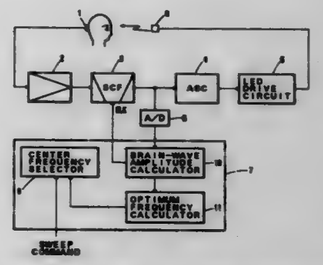
an elastic belt with a pair of opposite sides against one of which said tubular enclosure is positioned, said belt having fastening means at opposite ends thereof for being selectively joined together to secure said tubular enclosure about a said flexible body between said belt and that said flexible body; said insert, if undeformed by external forces at a cross section thereof taken substantially perpendicular to its direction of elongation, having an extent at that cross section in a direction substantially parallel to said belt exceeding its extent there in a direction substantially perpendicular to said belt; wherein said insert is an entity that, if undeformed, has an area at said cross section thereof that exceeds half that area at its greatest extent of a substantially parallel cross section of said tubular enclosure at that same location.

5,191,894
BRAIN WAVE INDUCING APPARATUS
Mitsuo Yasushi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Feb. 11, 1992, Ser. No. 833,936
Claims priority, application Japan, May 28, 1991, 3-123687
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—733 17 Claims

1. A brain wave inducing apparatus, in which the brain waves of a testee are first subjected to filtering to provide a brain wave inducing signal having an optimum frequency for inducing a desired brain wave and in which the testee is optically stimulated by the brain wave inducing signal, comprising;

a band pass filter, having a variable center frequency, for outputting a selected frequency component of said brain waves based on a selected center frequency said center frequency being varied in accordance with a signal supplied thereto, in order to sweep across a frequency of brain waves of the testee;

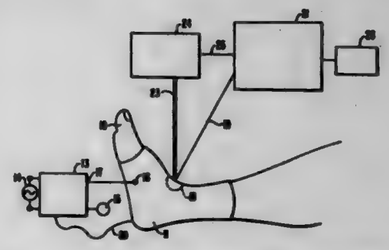
a brain wave amplitude calculator for calculating and storing therein each selected center frequency and each corresponding amplitude of the output of said band pass filter;



an optimum frequency calculator for calculating and outputting a command indicative of an optimum center frequency of said band pass filter based on the center frequencies and corresponding amplitudes stored by the brain wave amplitude calculator; and

a center frequency selector for changing the center frequency of said band pass filter in accordance with the command from said optimum frequency calculator.

5,191,895
METHOD AND APPARATUS FOR THE DIAGNOSIS OF POLYNEUROPATHY SYNDROMES
Peter Koltringer, Lortzingasse 20, Graz, Austria
PCT No. PCT/EP89/00378, § 371 Date Dec. 1, 1989, § 102(e) Date Dec. 1, 1989, PCT Pub. No. WO89/09562, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 7, 1989, Ser. No. 445,724
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811855; Sep. 22, 1988, 3832245
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—736 6 Claims



1. A method for determining a subject's nerve damage comprising:

determining an initial temperature value at an extremity of the subject;

provoking an increase in skin temperature at the extremity;

determining a plurality of skin temperature values at the extremity as the skin temperature rises and measuring a time interval for the skin to rise between said values; and

evaluating the measured time interval as a measure of the nerve damage.

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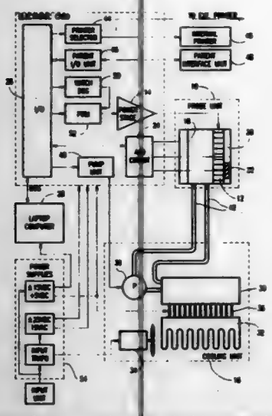
5,191,896
APPARATUS FOR MEASURING THRESHOLD SENSITIVITY TO A STIMULUS
Ehud Gafni, Ramat Yishai, and David Yaraitsky, Haifa, both of Israel, assignors to Medoc Ltd., Ramat Yishai, Israel
Filed Jun. 28, 1991, Ser. No. 722,666
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—742 **12 Claims**

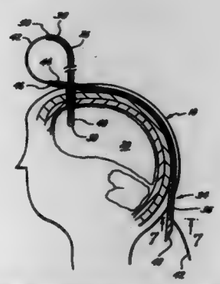


10. Apparatus for measuring threshold sensitivity to a stimulus comprising:
sensory stimulation application means for providing stimulus to a subject;
computer means for governing operation of said sensory stimulation application means; and
operator interface means for interfacing between an operator and said computer means,
said computer means and said operator interface means including means for enabling an operator to selectably apply said stimulus to a patient in accordance with the following protocols, each including a plurality of different trials:
method of limis; forced choice method; and staircase method,
said operator interface means comprising:
means for selectably providing randomization of the order of said trials.

5,191,897
SELF-ADHERENT EYE OCCLUDER
LeRoy G. Meshel, San Francisco, Calif., assignor to Lens Plus Corporation, San Francisco, Calif.
Continuation of Ser. No. 349,454, May 8, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 725,788
Int. Cl.[5] A61F *9/00*
U.S. Cl. 128—745 **13 Claims**

1. A disposable self-adherent eye occluder for use in visual diagnostic testing and treatment said eye occluder comprising eye occluder means including a flexible thin sheet, having top and bottom edges and posterior and anterior sides, and a pressure-sensitive adhesive material applied directly only to a region proximal to the top edge of the posterior side of said flexible sheet, said adhesive being capable of adhering said eye occluder to either the periorbital tissue of said eye or to spectacles worn over said eye, said flexible sheet shaped to contour to periorbital tissue, said eye occluder means being constructed to cause said flexible thin sheet to flexibly drape or contour over only one eye and to depend downwardly and terminate in a free end to substantially block the forward vision of said eye, without being fully light occlusive to the eye's periphery when said eye occluder is placed over said eye.

5,191,898
METHOD AND ASSEMBLY FOR MEASURING INTRACRANIAL FLUID CHARACATERISTICS
Huntly D. Millar, Houston, Tex., assignor to Millar Instruments, Inc., Houston, Tex.
Division of Ser. No. 602,152, Oct. 22, 1990, Pat. No. 5,117,836. This application May 5, 1992, Ser. No. 878,858
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—748 **21 Claims**

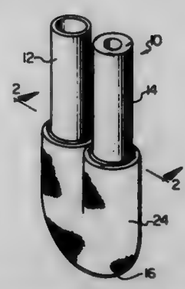


1. An assembly for measuring the fluid characteristics in a region of intercranial fluid, comprising:
a flexible in-dwelling catheter having a proximal end and a distal end, the distal end having a plurality of openings, wherein the distal end of the in-dwellings catheter is adapted to be placed in communication with said intracranial fluid through a passage in the skull;
a grooved stainless steel needle adapted to be routed subdermally between the scalp and skull from said passage to an exit point spaced from said passage, and having a proximal end removably attachable to the proximal end of said in-dwelling catheter and a distal end having a beveled point, wherein the distal end of the in-dwelling catheter and the distal end of the needle extend in opposite directions when the two elements are connected;
a transducer tipped catheter to measure fluid characteristics in a region of intracranial fluid, dimensioned to be positioned through said exit point, through the groove of said needle and to reside within the distal end of said in-dwelling catheter;
means for connecting said needle to the proximal end of said in-dwelling catheter, so that the needle and the proximal end of said in-dwelling catheter can be drawn out of said exit point; and
a monitor to analyze fluid characteristics in a region of intracranial fluid, the monitor being electrically connected to said transducer tipped catheter.

5,191,899
PAP SMEAR COLLECTION DEVICE WITH BRISTLES ORIENTED IN A PLANE
Richard D. Strickland, Sandy, Utah, and Geno Saccomanno, Grand Junction, Colo., assignors to Beal Associates, Inc., Sandy, Utah
Filed Dec. 12, 1991, Ser. No. 806,583
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—756 **36 Claims**

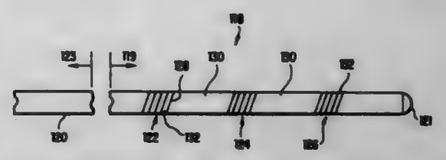
1. A device for collection of tissue cells from a cervical face and endocervical canal of a uterus comprising:
(a) an elongated handle having a forward end and a rear end;
(b) tissue sampling means, located at the forward end of said handle, for simultaneously collecting tissue cells from the cervical face and endocervical canal, said sampling means comprising:
(i) first means providing a plurality of bristles oriented in a row and in a plane for contacting and collecting cells within the endocervical canal as said handle is rotated, said first means aligned with said handle and extending from said forward end therefrom; and
(ii) second means providing a plurality of bristles oriented in a row and in the same said plane for contacting and collecting cells from the cervical face as said handle is rotated, said second means extending from said forward end of said handle in a direction generally orthogonal to said first means; and
(c) flexible means positioned at said forward end of said handle for bending said tissue sampling means at an acute angle with respect to the handle for assistance in dislodging the collected tissue cells from said first and second means onto an area for examination.

5,191,900
DIALYSIS PROBE
Pravin K. Mishra, Peoria, Ill., assignor to The Board of Trustees of the University of Illinois, Ill.
Filed Apr. 10, 1991, Ser. No. 683,080
Int. Cl.[5] A61M *25/00*
U.S. Cl. 128—769 **14 Claims**



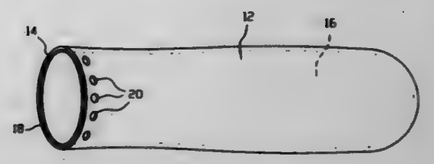
1. In microdialysis probe apparatus for fluid sampling of biological substances in living tissue, including an inlet tube for continuously delivering a fluid flow under positive fluid pressure to said living tissue, an outlet tube for continuously removing a fluid flow and biological substances from said living tissue, and a semipermeable dialysis fiber membrane at one end of said inlet and outlet tubes for insertion into said living tissue and performing dialysis, the improvement comprising:
membrane support means, including said outlet tube inner diameter bring less than the inner diameter of said inlet tube, and said fluid flow being maintained at a rate with respect to the inner diameter of said outlet tube and the length of said outlet tube sufficient for enabling an effective optimum positive pressure to be maintained within said membrane provided by partial restriction of the continuous fluid flow sufficient to reliably self-support and maintain the shape of said membrane during insertion and dialysis sampling without requiring a physical support to maintain the membrane shape.

5,191,901
CONTROLLED DISCHARGE DEFIBRILLATION ELECTRODE
Roger W. Dahl, Andover, and Ronald W. Heil, Jr., Roseville, both of Minn., assignors to Mieczyslaw Mirowski, Owings Mills, Md.
Filed Aug. 29, 1991, Ser. No. 751,533
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 **3 Claims**



1. An electrode for implantation in, on or about the heart for connection to a defibrillation/cardioversion system, said electrode comprising:
an elongated cardiac catheter having a distal active portion and a proximal lead portion;
a discharge surface region positioned along substantially the entire length of said distal active portion for delivering energy to the heart;
a plurality of electrically conductive wires filling said discharge surface region, said wires being spaced apart, attached to, and wound around the periphery along the length of the distal active portion of said catheter, said wires being electrically connected together and electrically connected to said defibrillation/cardioversion system; and
an electrically insulative element covering the surface of said electrode opposite said discharge surface region.

5,191,902
PROPHYLACTIC DEVICE
Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023
Filed Jan. 3, 1992, Ser. No. 816,461
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—844 **10 Claims**



1. A prophylactic device comprising:
a first condom having a first base, said condom being closed at an end opposite said base;

a second condom inserted inside said first condom, said second condom having a second base, said second condom being open at said second base and closed at an end opposite said second base; and

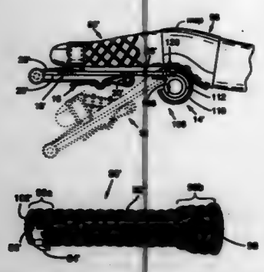
means for attaching said first condom and said second condom to one another about their respective bases, said first condom being provided in a region about said first base with an opening for permitting the evacuation of air from between said first condom and said second condom during use of the device.

5,191,903

DIGITAL TRACTION SYSTEM

Patrick T. Donohue, 1822 N.E. 143rd, Portland, Oreg. 97230

Filed Jun. 6, 1991, Ser. No. 711,916
Int. Cl.[5] A61F 5/04
U.S. Cl. 128—879 17 Claims



1. A traction system for applying traction to at least one of the metacarpophalangeal joints (mcp) of a hand, the hand having a plurality of digits (f) and crotches (fc) between the digits, the system including a traction frame (18, 18') for anchoring alongside the hand and means (16) connectable between at least one digit and the frame for applying an axial traction force through the digit to the corresponding metacarpophalangeal joint characterized in that

the system includes a glove-like anchoring member (58) embracing and covering at least part of the hand in a substantially fixed relationship with the hand and in that the traction frame (18, 18') is anchored to the hand by means of connection to the anchoring member (58) and in that the means (16) for applying a traction force comprises an elongated flexible element having first and second opposite ends and including an elastic portion, the first end being connectable to the at least one digit and the second end being connectable directly to the frame, and so that, in use, retraction of the traction frame under the action of the traction force applying means (16) is resisted substantially by the engagement of the anchoring member (58) with the hand.

5,191,904

TRASH REMOVAL APPARATUS AND METHOD

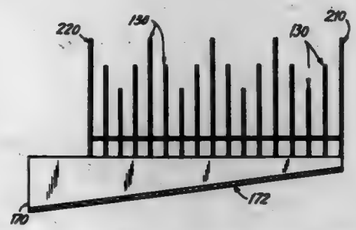
Robert A. Arents, Richmond, and Everett C. Patterson, Midlothian, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 19, 1991, Ser. No. 746,746
Int. Cl.[5] A24C 5/36
U.S. Cl. 131—96 27 Claims

1. An apparatus for separating the components of a mixture comprising cigarettes, cigarette wrapper, large trash, small trash and loose tobacco, comprising:

a trash removal conveyor having a first end and a second end, wherein said trash removal conveyor comprises a plurality of vertical plates each of which has a top surface, the top surfaces being arranged in a pattern comprising at least three levels;

a vibrating means for vibrating the trash removal conveyor; and



a screen means that is mounted on the trash removal conveyor below the vertical plates.

5,191,905

FILTER CIGARETTE HAVING FILTER CONTAINING ABSORPTIVE SYNTHETIC GRAFT POLYMER FIBERS PRODUCED FROM IRRADIATED POLYETHYLENE REACTED WITH VAPOR PHASE STYRENE OR ABSORPTIVE SYNTHETIC MAGNETIC FIBERS

Kenkichi Tsukamoto, Tokyo, Japan, assignor to Costarica Sogo Kaihatsu Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1991, Ser. No. 667,950
Int. Cl.[5] A24D 3/00
U.S. Cl. 131—332 13 Claims

1. A filter cigarette comprising:

a cigarette section formed by wrapping shredded tobacco in a cigarette paper sheet; and

a filter section having a filter chip and integrally joined to the cigarette section;

wherein the filter chip is formed by combining in a bundle absorptive synthetic graft polymer fibers produced from irradiated polypropylene reacted with vapor phase styrene and containing adsorptive, functional groups and at least one absorptive synthetic fiber selected from the group consisting of (1) activated carbon fibers, (2) charged electret fibers, and (3) magnetic plastic fibers and chopping the combined fiber bundle to a predetermined length.

5,191,906

PROCESS FOR MAKING WRAPPERS FOR SMOKING ARTICLES WHICH MODIFY THE BURN RATE OF THE SMOKING ARTICLE

James L. Myracle, Jr., Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

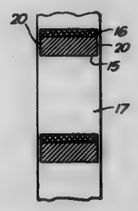
Continuation of Ser. No. 777,466, Oct. 17, 1991, abandoned, which is a continuation of Ser. No. 605,402, Oct. 30, 1990, abandoned. This application Mar. 23, 1992, Ser. No. 855,491
Int. Cl.[5] A24D 1/02
U.S. Cl. 131—365 11 Claims

1. A process for modifying the burn rate of a smoking article by applying segments of band paper to the wrapper of a smoking article comprising:

applying adhesive to a surface of a continuous web of moving band paper, said band paper having been selected to modify the burn rate of a smoking article when adhered to the wrapper of said smoking article;

cutting the continuous web of band paper into segments having specified length, said cutting occurring along an axis perpendicular to the direction of travel of the web of band paper;

spacing the segments of band paper a first distance apart from one another;



adhering the segments of band paper to a surface of a continuous web of moving smoking article wrapper, said segments being spaced a second distance apart from one another.

5,191,907

CURLING DEVICE HEAD WITH A HOLDING ELEMENT

Suzy C. Hirzel, 933 Shellwood Way, Sacramento, Calif. 95831

Filed Aug. 20, 1991, Ser. No. 747,704
Int. Cl.[5] A45D 24/30
U.S. Cl. 132—107 12 Claims

1. A hair curling, picking, and brushing device comprising:

a horizontal base having an upper panel and lower panel, a vertical holding element extending perpendicular to and away from said lower panel;

an outer row of teeth and at least one row of inner teeth extending away from said upper panel, said at least one row of inner teeth being of shorter length than the outer row of teeth and located within the perimeter of said outer row of teeth, said outer row of teeth having upper teeth tips and lower teeth ends;

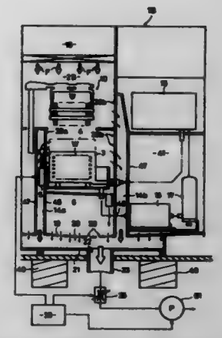
said outer row of teeth being tapered outwardly from a vertical plane as said outer teeth extend from said lower teeth ends to said upper teeth tips and at least said horizontal base, outer row of teeth and said at least one row of inner teeth being molded in one piece; whereby said outer row of teeth are long enough to lift a sufficient amount of hair to use the device as a pick and said at least one row of inner teeth provides a brushing and teasing element.

5,191,908

DIPPING TYPE SURFACE TREATMENT APPARATUS

Toshio Hiroe, and Kenji Sugimoto, both of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Dec. 27, 1991, Ser. No. 815,323
Claims priority, application Japan, Dec. 28, 1990, 2-406312[U]
Int. Cl.[5] B08B 3/02
U.S. Cl. 134—76 16 Claims



1. A dipping type wafer treatment apparatus comprising:

a housing having first and second openings through which a wafer can pass, said housing defining a space in which the wafer is treated;

a wafer treatment bath provided inside said housing;

means provided above said housing for producing a downflow of air;

gas flow introducing means provided at an upper part of said housing for introducing said air downflow into said housing;

bottom enclosing means provided below said housing being partitioned from said housing for defining an enclosed spaced in which gas can pass and having an air outlet for gas to outside;

first air guiding means for guiding air in the vicinity of said treatment bath inside said housing into said enclosed space;

means for forcing out the air inside said enclosed space from said air outlet;

air flow guiding means provided in association with said first opening for guiding an air downflow from said air downflow producing means along an outer wall of said housing from a portion above said first opening for forming an air curtain to prevent air inside and outside said housing from mixing with each other; and

means for further guiding the air flow guided by said air flow guiding means into said enclosed space.

5,191,909

TRANSIT MIX TRUCK DUST HOOD ASSEMBLY

Ronald P. Nadeau, Syracuse, and Frank V. Smith, Jr., Marcellus, both of N.Y., assignors to Griffin Environmental Co., Inc., Syracuse, N.Y.

Filed Apr. 3, 1991, Ser. No. 680,160
Int. Cl.[5] E04H 15/14
U.S. Cl. 135—93 9 Claims

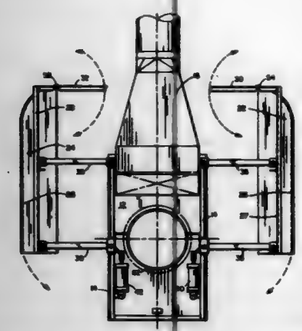
1. A dust hood assembly for enclosing a particulate material filling aperture in a truck to capture dust created by the filling operation which comprises:

a generally rectangular top frame member spaced from the ground so as to extend over top of a truck;

a top panel mounted on said frame member having filling chute and exhaust hood openings therein;

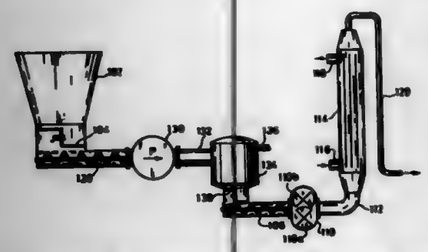
first and second top side panel member pivotally mounted on

said top frame member and extending outwardly therefrom;
first and second side curtain members mounted on the outer edges of said top side panel members and extending downwardly about the sides of a truck parked under said top frame member;
a pair of back curtain members mounted at the back end of said side curtain members generally perpendicularly to said side curtain members to form an end closure for the dust hood assembly;



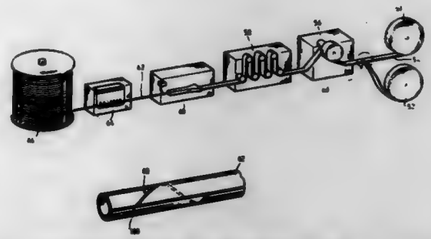
means for moving said top side panels from a position closely adjacent to the sides of said top frame member to an extended position away from the sides of said top frame member;
so that when said panels are in the extended position a driver may freely drive a truck under the hood assembly to position the truck for filling, and when the hood assembly is closed about the truck during the filling operation the dust of filling will be captured by an exhaust fan drawing air therefrom.

5,191,910
METHOD AND APPARATUS FOR CONTINUOUS LIQUEFACTION OF GELLED PHOTOGRAPHIC MATERIALS
Donald E. Eston; James K. Toner, and Daniel J. Wooster, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 14, 1990, Ser. No. 613,422
Int. Cl.[5] F16K *49/00*
U.S. Cl. 137—2 **17 Claims**



1. A method for continuously liquefying a gelled photographic material in granular or chunk form, comprising:
conveying said gelled photographic material in granular or chunk form to a positive displacement pump to keep said positive displacement pump filled with said material;
continuously advancing a substantially undisrupted mass of said material, with said positive displacement pump, into a heat exchanger; and
liquefying said material in said heat exchanger.

5,191,911
CONTINUOUS LENGTH OF COILABLE TUBING
Jon D. Dubois, Houston, Tex., assignor to Quality Tubing, Inc., Houston, Tex.
Continuation of Ser. No. 617,429, Nov. 19, 1990, abandoned, which is a continuation of Ser. No. 253,662, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 29,171, Mar. 18, 1987, Pat. No. 4,863,091. This application Jan. 28, 1992, Ser. No. 825,838
Int. Cl.[5] F16L *9/16*
U.S. Cl. 138—100 **15 Claims**

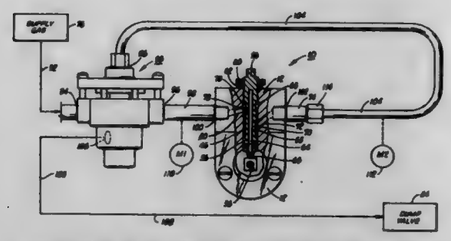


1. A continuous length of coiled tubing having a means to withstand repeated coiling and uncoiling stresses, said coiled tubing being made by:
(a) trimming a trailing end of a first length of flat strip stock and a leading end of a second length of flat strip stock at supplementary angles wherein one of said supplementary angles is an acute angle;
(b) butting the trimmed ends together so that the ends engage, but do not overlap, to form an angular joint;
(c) welding said separate strips of flat metal end-to-end to form a composite strip with an end weld, said end weld projecting beyond the surfaces of the composite strip;
(d) finishing the composite strip by removing the projecting weldment from the edges and one flat surface of the composite strip such that the edges and the flat surface of the weld conform to a same thickness and width dimension as the remainder of the composite strip and blend smoothly with the edges and the flat surface of the composite strip to thereby enhance the mechanical properties of the composite strip;
(e) forming the finished, composite strip into tubing with the substantially smooth surface of the composite strip as the internal wall surface of the tubing to thereby facilitate uninterrupted fluid flow and mechanical transport in the tubing when fluids or devices are moved through the tubing; and
(f) welding opposing edges of the composite strip tubing to form a longitudinal seam such that the end weld follows a spiral path around the tubing that begins and ends in the longitudinal seam, but never crosses the longitudinal seam, to enhance the non-destructive inspectability of the spiral end weld.

5,191,912
LIQUID LEVEL CONTROLLER
Roy L. McDaniel, P.O. Box 141, Perryton, Tex. 79070
Filed Jan. 10, 1992, Ser. No. 819,485
Int. Cl.[5] F16K *31/34*
U.S. Cl. 137—413 **5 Claims**

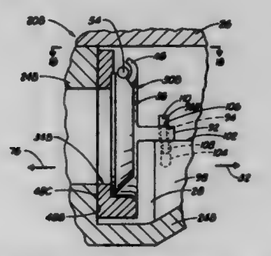
1. Apparatus consisting of a float control valve in combination with a snap-action pilot valve for control of liquid level within a liquid container by providing dump valve actuation without bleeding gas to the external surrounds, comprising:
level sensing means supported from said container and having a vertically pivotable float secured on one end and a snubber head on the other end and extending external of said container such that upward movement of said float causes downward movement of said snubber head;

a control head secured to said level sensing means and defining a reaction space in surround of said snubber head, a central bore extending downward through the control head in communication with said space, and first and second threaded ports in opposite sides of the control head and in communication with said central bore;
an orifice post threadedly secured downward in said central bore, said orifice post having first and second annular grooves spaced therealong and an axial void extending therethrough and terminating in said reaction space adjacent said snubber head as a nozzle; and
first and second transverse ports formed through the orifice post each in communication between respective first and second annular grooves and said axial void, said axial void nozzle being sealed by upward movement of said snubber head when no flotation pressure is present on said float;



a snap action pilot valve having a sample inlet, first and second supply connections, and a diaphragm outlet;
a supply gas of pre-set pressure connected for input to said second supply connection;
first conduit means connecting said first supply connection as output for connection to said control head first threaded port;
a second conduit connecting the control head second threaded port back to the pilot valve sample inlet; and
third conduit means connecting the output from said diaphragm outlet to a dump valve;
whereby commencement of gas release at said nozzle reduces pressure in said second conduit means to said pilot valve sample inlet to actuate the pilot valve and produce an output pressure pulse from the diaphragm outlet to actuate the dump valve.

5,191,913
TOP-ENTRY CHECK VALVE WITH PIN FASTENERS
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170
Division of Ser. No. 762,539, Sep. 18, 1991. This application Jun. 19, 1992, Ser. No. 901,061
Int. Cl.[5] F16K *15/03*
U.S. Cl. 137—454.2 **9 Claims**



1. A top entry check valve, comprising:
a valve cartridge assembly, including a seat, cage and disc;
a body having an upstream end, a downstream end, a valve chamber therein communicating with the upstream and downstream ends thereof, and an access opening in a side wall thereof communicating with the valve chamber of a size to accommodate the entry and removal of the valve cartridge assembly therethrough, said body also having an annular shoulder therein facing downstream sized to engage and prevent the valve cartridge from moving upstream;
a bonnet removably attached to the body over said access opening forming a wall of the valve chamber; and
at least one extension protruding downstream from the valve cartridge assembly and having a fastener slot therethrough; and
a pin fastener extending through the fastener slot of each extension of the valve cartridge assembly;
wherein the body has a mating opening corresponding with the fastener slot of each extension of the valve cartridge assembly and wherein each pin fastener extends into the corresponding mating opening to hold the valve cartridge assembly against movement downstream.

5,191,914
REDUNDANT VALVE DISCONNECT COUPLING
Antonio E. Gonzalez, La Mirada, Calif., assignor to Fairchild Space and Defense Corporation, Germantown, Md.
Filed May 30, 1991, Ser. No. 708,056
Int. Cl.[5] F16L *29/00*
U.S. Cl. 137—614.03 **8 Claims**

1. A fluid coupling comprising a pair of coupling members adapted to engage each other substantially along an axis and to permit fluid flow between the coupling members when they are engaged, at least one of said coupling members comprising a body having a long axis, a plurality of spaced apart valve seats located in said body, a plurality of independent reciprocating valve members located within said body for reciprocal movement substantially along the long axis of said body and positioned to make sealing contact with said spaced apart valve seats located in said body, means associated with said reciprocating valve members and said valve seats for urging said reciprocating valve members and the sealing surfaces of said valve seats into contact when said pair of coupling members are disconnected, means for moving said independent valve members and associated spaced apart valve seats out of contact with each other when said pair of coupling members engage each other and means located in said body for permitting rotational movement of said plurality of spaced apart valve seats and said plurality of independent reciprocating valve members when said pair of coupling members are engaging each other whereby misalignment between said pair of coupling members during engagement can be accommodated.

5,191,915
VISCOUS FLUID SHEAR CLUTCHES AND CONTROL VALVES THEREFOR
Arthur E. H. Elmer, Nailsworth, England, assignor to Kysor Industrial Corporation, Cadillac, Mich.
Division of Ser. No. 461,535, Jan. 5, 1990, Pat. No. 5,042,629. This application Jun. 19, 1991, Ser. No. 717,611
Claims priority, application United Kingdom, Jan. 13, 1989, 8900756; Apr. 11, 1989, 8908129
Int. Cl.[5] F16K *11/04*; F15B *13/04*
U.S. Cl. 137—625.27 **5 Claims**

1. A control valve comprising:
a body defining first, second and third ports;

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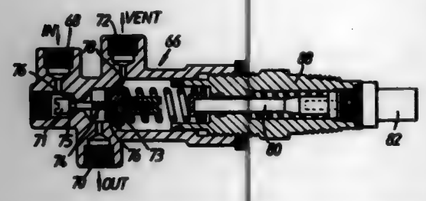
a shuttle spool means movably mounted in said body;
two spaced flow control zones disposed one intermediate said first and second ports and one intermediate said first and third ports for controlling the flow therebetween;
each flow control zone comprising resilient seal means associated with one of said shuttle spool means and said body for cooperating with seal surface means, the other of said shuttle spool means and said body having seal surface means for cooperating with said resilient seal means, each said resilient seal means preventing the respective cooperating seal surface from moving beyond said resilient seal means, thereby constraining movement of said shuttle spool means with respect to said body so that movement of said shuttle spool means in one sense causes said seal surface means in one flow control zone sealingly to displace the associated resilient seal means and causes the seal surface means in the other flow control zone to lift off the

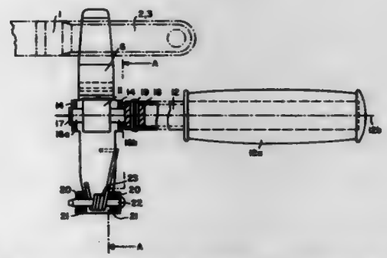


associated resilient seal means to thereby open that flow control zone, whereby movement of said shuttle spool means in one sense causes said first port to be in communication with said second port, and movement in an opposed sense causes said first port to be in communication with said third port;
said control valve modulating an output pressure at said first port, wherein said second port is connected in use to a source of fluid pressure and said third port is connected in use to a vent, and wherein transducer means is provided for moving said shuttle spool means in response to a sensed parameter;
said shuttle spool means including fluid piston means exposed to the output pressure at said first port for urging the shuttle spool means in a first direction tending to allow flow between said first and third ports to vent said output pressure, and a balancing spring urging said shuttle spool means in the opposite direction.

5,191,915
PRESSURE-RESISTANT HELICAL CORRUGATED PIPE
Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan
Filed Nov. 22, 1989, Ser. No. 440,170
Claims priority, application Japan, Nov. 26, 1988, 299336
Int. Cl.[5] F16L *9/16, 9/06*
U.S. Cl. 138—173 **6 Claims**

1. A pressure-resistant helical corrugated pipe, the pipe defining a longitudinal axis and comprising:
a helical corrugated pipe wall having a top portion disposed remote with respect to the longitudinal axis of the pipe, a bottom portion disposed close to the longitudinal axis of the pipe, and opposite side wall portions extending from said top portion to said bottom portion; and
belt plates formed separately from each other and made of a thin metal plate; wherein
said belt plates are disposed respectively in said top portion and said bottom portion as constituent elements of said pipe wall for reinforcing said pipe wall;
at least one of said metal belt plates being bent so that opposite edges of said two metal belt plates are disposed in abutted relation without overlap or in spaced opposed relation without overlap in said opposite side wall portions; and
wherein said opposite side wall portions include synthetic resin or rubber connective portions at which said two metal belt plates are connected.

5,191,917
SPREADER TOOL FOR COUPLING AND DECOUPLING HEALD SHAFTS IN A LOOM
Valentin Krumm, Hergensweiler, and Armin Hiemer, Lindau, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany
Filed Jan. 17, 1992, Ser. No. 822,602
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1991, 4101532
Int. Cl.[5] D03C *13/00, 9/06*
U.S. Cl. 139—380 **10 Claims**

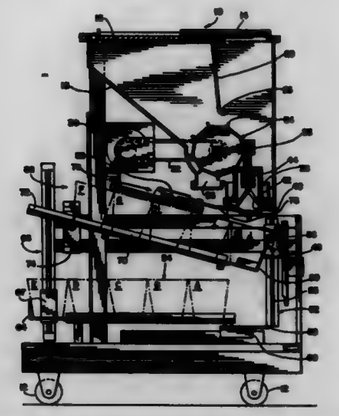


1. A spreader tool for the individual coupling and decoupling of a heald shaft to or from respective drive means in a heald loom, comprising a first spreader jaw and a second spreader jaw forming a pair of spreader jaws, means for journalling said spreader jaws to each other at their ends opposite to a spreading end of said spreader jaws, said journalling means permitting rotation of said spreader jaws about a common axis, means for normally biasing said spreader jaws into a jaws closed position, and drive means for opening said spreader jaws in a direction opposite to an effective direction of said biasing means, said drive means comprising a drive cam (11), a handle secured to said drive cam, and means for mounting said drive cam between said spreader jaws, whereby rotating said handle rotates said drive cam to move said spreader jaws away from each other.

5,191,918
FOOD DISPENSER AND METHOD
Robert L. Cahlander, Red Wing; David W. Carroll, Cannon Falls, both of Minn.; Alfred C. Hollingsworth, Naperville, Ill.; Gregory A. Lawrence, Red Wing, and Brian R. Rudesill, Woodbury, both of Minn., assignors to Restaurant Technology, Inc., Oak Brook, Ill.
Filed May 4, 1990, Ser. No. 519,068
Int. Cl.[5] B65B *1/04, 1/30*
U.S. Cl. 141—1 **40 Claims**

1. A dispenser for dispensing bulk food items into a container comprising:
a storage bin for receiving and holding a quantity of bulk food items;

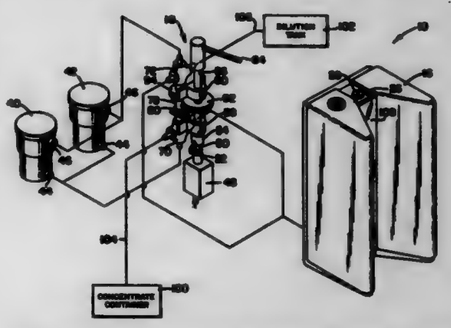
secondary bin receiving means for receiving at least a portion of bulk food items of desired size from said storage bin;
conveyor means for conveying food items from said storage bin to said secondary bin receiving means;
container conveyance means for conveying a container to and from a container filling station along a generally continuous path located within a single substantially vertical plane, said path having at least one horizontal and one vertical component, the container being slidably conveyed on said conveyance means along said horizontal component;
discharge means for dispensing items from said secondary bin means into an empty container at said filling station; and



measuring means for measuring the quantity of food items present in said secondary bin receiving means and initiating the dispensing of food items from said secondary bin receiving means in response to a measured predetermined quantity of food items in said secondary bin receiving means;
wherein said container conveyance means includes means for sequentially accepting a plurality of empty containers, sequentially conveying said empty containers to a filling station, and sequentially discharging filled containers from said filling station; and
wherein said container conveyance means further includes a downwardly inclined ramp for accepting and slidably conveying empty containers towards said filling station.

5,191,919
CLOSED TRANSFER MEANS
Peter S. Barrows, Yardley, Pa., and Clyde D. Watson, San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.
Filed Oct. 18, 1991, Ser. No. 779,217
Int. Cl.[5] B65B *1/04*
U.S. Cl. 141—2 **4 Claims**

1. A closed transfer means for transferring liquid from a container to a dilution tank in measured volume comprising:
a transfer tank;
electric pump means having an inlet and an outlet;
valve means connected between said pump means, said tanks and said container;
switch means for activating said pump means;
actuating means movable to first and second positions from a center neutral position in which said pump means, said tanks and said container are isolated from each other;
said actuating means in said first position connecting said inlet to said container and said outlet to said transfer tank, and in said second position connecting said inlet to said transfer tank and said outlet to said dilution tank; and



said actuating means including means to close said switch means when in said first and second positions only.

5,191,920
Z-BELT TYPE LIFTING AND STABILIZING MECHANISM FOR VERTICAL BAG FILLING MACHINES
Harold R. McGregor, 645 Riverwood Dr., Owatonna, Minn. 55060
Filed May 1, 1991, Ser. No. 694,457
Int. Cl.[5] B66B *11/04;* **B65B** *1/04*
U.S. Cl. 141—313 **46 Claims**

1. A lifting and stabilizing apparatus for use in controllably raising and lowering a carriage relative to a frame along a vertical path having a top end and a bottom end, said carriage having a pair of opposing sides between which is measured a width and a pair of opposing ends between which is measured a length, said lifting and stabilizing apparatus comprising:
at least one drive wheel assembly is adapted for, said drive wheel assembly being rotatably mounted on at least one of the pair of opposing sides of the carriage proximate to one of the opposing ends thereof, said drive wheel assembly having a plurality of drive teeth, said drive wheel assembly having a top side and a bottom side generally opposing said top side;
a drive mechanism connected to said drive wheel assembly and capable of selectively rotating said drive wheel assembly at an angular velocity for a selected time interval;
at least one tensioning wheel assembly, said tensioning wheel

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assembly is adapted for being rotatably mounted on said one of the pair of opposing sides of the carriage to which said drive wheel assembly is mounted, said tensioning wheel assembly being mounted proximate to an end of the carriage opposing said one end to which said drive wheel assembly is proximate such that said drive wheel assembly is spaced apart from and generally aligned with and confronts said tensioning wheel assembly, said tensioning wheel assembly having a top side and a bottom side generally opposing said top side of said tensioning wheel assembly;

a pair of belts, each said belt being flexible and having a drive surface and a pair of opposing ends, said drive surface defining a multiplicity of belt teeth sized and shaped so as to mesh with and engage said drive teeth on said drive wheel assembly, each of said pair of belts having a longitudinal length measured between said pair of opposing ends thereof;

a plurality of clamping assemblies, each of said plurality of clamping assemblies is adapted for being connected to the frame, each of said plurality of clamping assemblies being capable of engagingly clamping one of said opposing ends of at least one of said pair of belts to maintain said opposing ends of said belts in a substantially fixed position relative to the frame and exert a longitudinal tension on said one of said pair of belts, each of said clamping assemblies being mounted at a height either proximate to or above the top end of the path or proximate to and below the bottom end of the path,

such that a first belt of said pair of belts extends from one of said plurality of clamping assemblies generally adjacent the bottom end of the path upwardly and at least partially around said top side of said drive wheel assembly and toward said tensioning wheel assembly generally along the length of the carriage, said first belt further extending at least partially around said bottom side of said tensioning wheel assembly and upwardly to one of said plurality of clamping assemblies generally adjacent to the top of the path, and such that a second belt of said pair of belts extends from one of said plurality of clamping assemblies generally adjacent the top end of the path downwardly and at least partially around said bottom side of said drive wheel assembly and toward said tensioning wheel assembly generally along the length of the carriage, said second belt further extending at least partially around said top side of said tensioning wheel assembly and downwardly to on of said plurality of clamping assemblies generally adjacent to the bottom of the path,

whereby the drive mechanism may be selectively actuated to cause the drive wheel assembly to rotate a number of revolutions, the rotation of the drive wheel assembly causing the drive wheel assembly to move along and relative to both the drive surface of the first belt and the drive surface of the second belt thereby causing the carriage to be raised or lowered a linear distance along the path, said linear distance being directly proportional to said number of revolutions of the drive wheel assembly, the first belt and the second belt being maintained under sufficient longitudinal tension by the clamping assemblies, the drive wheel assembly, and the tensioning wheel such that the first belt and the second belt hold and constrain the carriage in a predetermined horizontal orientation.

5,191,921

ADJUSTABLE DEPTH OF CUT STOP MECHANISM FOR A PLUNGE TYPE ROUTER

Ronald C. McCarry, West Union, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.

Filed Oct. 18, 1991, Ser. No. 779,074
Int. Cl.[5] B23C *1/20*; B27C *5/10*
U.S. Cl. 144—134 D **6 Claims**

1. A plunge type router comprising:

a motor housing with a drive motor secured therein, said drive motor having a shaft extending outwardly from the lower end of said motor housing and adapted to have a cutting tool secured thereto;

a base plate displaceable substantially vertically relative said motor housing;

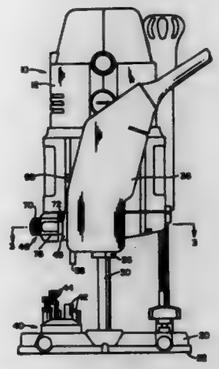
means for judging the displacement of said base plate relative said motor housing;

abutment means mounted on said base plate; and

depth stop means mounted on said motor housing for cooperating with said abutment means to limit the relative displacement of said base plate toward said motor housing, said depth stop means including:

a stop bar;

means for supporting said stop bar on said motor housing for vertical displacement in interfering relationship with said abutment means;



a toothed rack on said stop bar;

a pinion gear;

a shaft having first and second ends with said pinion gear secured to said shaft first end;

a knob secured to said shaft second end;

means for selectively engaging and disengaging said rack and said pinion gear;

means for rotating said pinion gear to adjust the vertical displacement of said stop bar when said rack and said pinion gear are engaged; and

lock means surrounding said shaft between said pinion gear and said knob for selectively locking said stop bar in a desired position on said motor housing.

5,191,922

TWO-ON-ONE SNAP, SELF INSTALLING AND SUPPORTING CURTAIN AND VALANCE ASSEMBLY

Debra A. Wade, 4204 Palm Dr., Knoxville, Tenn. 37914

Filed Feb. 7, 1992, Ser. No. 832,737
Int. Cl.[5] A47H *1/00*
U.S. Cl. 160—124 **6 Claims**

1. A self-supporting curtain and valance assembly for direct mounting onto a conventional, transverse curtain or drapery rod installed at an installation area over a window, door or the like, and having front and back portions, the front portion of a curtain rod so installed facing away from an installation area and the back portion of a curtain rod facing toward an installation area, said curtain and valance assembly comprising:

a curtain subassembly having flap and bottom end portions and inside and outside surfaces, said curtain subassembly comprising:

a first coupling means attached to the inside surface of said flap end of said curtain along a first common plane portion,

a second coupling means attached to the inside surface of said flap end along a second common plate portion spaced from said first common plate portion and parallel thereto,

wherein said flap can be loopably engaged around a transverse curtain rod and the first coupling means can be attached to the second coupling means bringing the two inside common plane portions together for loopably self-supporting the curtain on a curtain rod, and

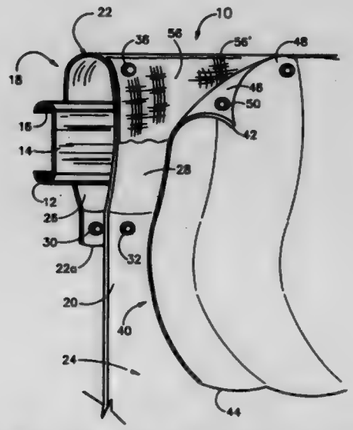
a third coupling means attached to the outside surface of said flap along a third common plane portion parallel to said first and second common plane portions and facing in a direction away from an installation area where a curtain rod is installed when said flap is loopably engaged around a curtain rod;

a valance subassembly having top and bottom sections and inside and outside surfaces, said top section being substantially equivalent in transverse dimensions to the flap end portion of said curtain subassembly,

said valance comprising a fourth coupling means attached to the inside surface of said top section along a fourth common plane portion,

whereby the fourth coupling means can be attached to the third coupling means such that the valance is attachably supported by the curtain substantially parallel to an installed transverse curtain rod, and the outside surface of said valance faces away from an installation area,

each of said coupling means being a reciprocal component of a two part snap combination means, said first and second



coupling means means being a first snap combination means, and said third and fourth coupling means being a second snap combination means;

a porous surface member having a plurality of pores therein, and having transverse substantially equivalent to the flap end portion of said curtain, said porous surface being fixedly attached to a transverse portion of the outside surface of said flap such that when the flap is loopably engaged around a curtain rod the porous surface faces away from an installation area, said porous surface covering said third coupling means and allowing said third and fourth coupling means to attach to one another through the pores of said surface element when said valance is supportably attached to said curtain; and

a shear subassembly, said shear having flap and bottom sections and inside and outside surfaces, said flap having a top transverse end, said subassembly comprising:

a first snap-coupling means attached to the inside surface of said flap section along a first common axis, proximate to the top transverse end of said flap; and

a second snap-coupling means attached to the inside surface of said flap along a second common axis, spaced from and parallel to the first common axis,

whereby the flap section of said shear can be loopably engaged around a transverse curtain rod for self-support thereon, and the flap end portion of said curtain can be loopably engaged around a same curtain rod and said shear installed thereon, and attached to itself for self-support by said first and second coupling means of the curtain which attach to one another through the shear constructed of said flexibly tractable substance, such that the surfaces of the shear pressed between the coupling means are molded to fit securely therein, between said means, without interfering with the attachment of said coupling means and the support of said curtain and said shear;

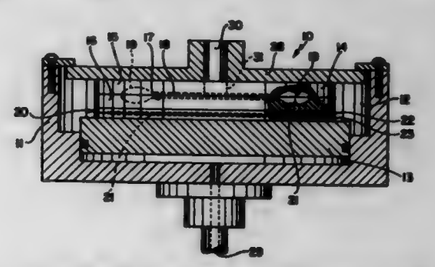
said curtain subassembly being constructed from material selected from a group consisting of antique satin, 70 percent polyester/30 percent cotton, 100 percent polyester, 70 percent polyester/27 percent to 30 percent rayon/1 percent to 3 percent cotton and 35 percent rayon/60 percent coloray acetate with rubber or cotton backing, other polyester, cotton, satin, rayon and coloray acetate combinations, other flexible fabric material and other flexible fabric material and other flexible, pliant substances.

5,191,923

IMPROVED USE OF SELF-LEVELING SHIMS IN CENTRIFUGAL APPARATUS

Douglas J. Goss, North Kingstown, R.I., assignor to Conley Casting Supply Corp., Warwick, R.I.

Filed Mar. 1, 1991, Ser. No. 664,994
Int. Cl.[5] B22D *10/10*
U.S. Cl. 164—292 **3 Claims**



1. In centrifugal casting apparatus of the type comprising a housing, a clamping piston mounted in said housing for receiving thereon an elastomer mold comprising face-to-face mold halves having cooperating mold cavities on their abutting inner surfaces, and a fixed cover engaging the top of said mold whereby movement of said piston toward said cover causes clamping of said mold halves against each other, the improvement comprising a shim located between said piston and said mold to compress the latter at selected locations to close any gap between said abutting surfaces, said shim comprising a hollow inflatable circular bladder having opposed walls secured to each other at selected locations to define a predetermined pattern of unsecured inflatable portions, and fluid means within said bladder that automatically migrates within the confines of said pattern to the location where any such gap exists, said shim being an integral part of one of said mold halves.

5,191,924

BUILT-UP INGOT MOLD FOR THE CONTINUOUS CASTING OF METAL

Dominique Werquin, Ronchin, France, assignor to Sollac, Paris and Ciecim, Pontoise, both of France

Filed Jul. 18, 1990, Ser. No. 554,704
Claims priority, application France, Jul. 19, 1989, 89 09731
Int. Cl.[5] B22D *11/00*
U.S. Cl. 164—418 **4 Claims**

1. A built-up ingot mold for the continuous casting of metal, said mold comprising a large pair and a small pair of opposed

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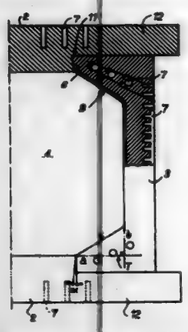
cooled plates (2,3; 2,30), said large and small pairs of opposed plates delimiting between them a cavity (4), said cavity having corners, said corners being cut by bevels (9), said large pair of opposed plates bearing on corresponding bearing faces (8) of said small pairs of opposed plates (2), said large and small pairs of opposed plates (2,3; 2,30) being intended to be tightened against one another by tightening devices (10) acting approximately perpendicularly to said bearing faces (8), each of said bevels and corners forming a right triangle, each of said right



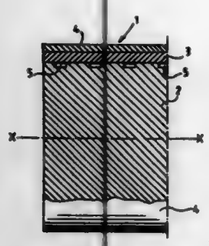
triangles having a hypotenuse, a large side, and a small side, characterized in that said bevel comprises said hypotenuse, said large side being located in a plane of an inner wall of each of said large plates, said small side being located in a plane of an inner wall of each of said small plates, said small side having a length not equal to a length of said large side, said length of said small side being greater than 30 mm characterized in that the sides forming the right angle of the right-angled triangle are, respectively, equal to 80 and 50 mm for slabs which are 300 mm thick.

5,191,925

ROLL FOR A DEVICE FOR THE DIRECT CONTINUOUS CASTING OF THIN STRIPS OF MOLTEN METAL

Laurent Soula, Fameck, France, assignor to Usinor Sacilor, Puteaux, France

Continuation-in-part of Ser. No. 591,292, Oct. 1, 1990, abandoned. This application Jan. 9, 1992, Ser. No. 818,784
Claims priority, application France, Oct. 2, 1989, 89 12855
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—428 16 Claims



1. An apparatus for the direct continuous casting of thin strips of molten metal, comprising:

a source of molten metal; and

at least one cooled roll which receives the molten metal to be solidified, said at least one roll having a longitudinal axis around which it rotates, said at least one roll comprising:

a cylindrical inner core having a longitudinal axis,

a first sleeve enclosing said inner core, said first sleeve having a longitudinal axis parallel to the axis of said core, cooling channels provided between said first sleeve and the core, and

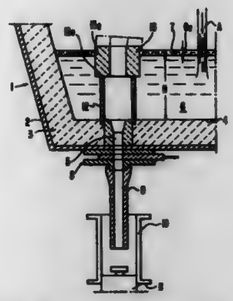
a second sleeve enclosing said first sleeve and being in contact with the molten metal, said second sleeve having a longitudinal axis parallel to the longitudinal axis of said first sleeve and the longitudinal axis of said core and forming, with said first sleeve, two superposed cylindrical layers which are chosen of materials such that said first sleeve has a coefficient of thermal expansion higher than that of said second sleeve, wherein the thicknesses of said first and second sleeves are chosen, in relation to the thermal conductivity and coefficient of thermal expansion of the materials from which the sleeves are formed, so as to reduce, when said apparatus is in use, the difference between an axial expansion of said first sleeve along its longitudinal axis, which first sleeve is maintained at a low temperature by a circulating cooling fluid in said cooling channels, and an axial expansion of said second sleeve along its longitudinal axis, which second sleeve is maintained at a high temperature due to its contact with the molten metal.

5,191,926

DEVICE FOR SLAG-FREE POURING WITH CONTINUOUS CASTING MACHINES

Bernhard Tinnes, Zollikerberg, Switzerland, assignor to Metacon AG, Zürich, Switzerland

PCT No. PCT/EP90/01025, § 371 Date Mar. 4, 1991, § 102(e) Date Mar. 6, 1991, PCT Pub. No. WO91/00788, PCT Pub. Date Jan. 24, 1991
PCT Filed Jun. 27, 1990, Ser. No. 659,334
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 3922549
Int. Cl.[5] B22D *11/10*
U.S. Cl. 164—437 18 Claims



1. A device for the slag-free discharge of molten material through a discharge orifice in the bottom of a vessel, said device comprising:

a starting pipe to be positioned about the discharge orifice at the vessel bottom to extend upwardly therefrom;

a starting member separate from said starting pipe and loosely positioned with respect thereto such that molten material initially introduced into the vessel is blocked from access into said starting pipe and to the discharge orifice; and

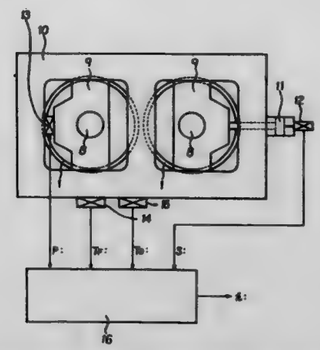
said starting member having a buoyancy in the molten material such that when the level of molten material in the vessel reaches a determined level said starting member is lifted relative to said starting pipe, thereby providing access of the molten material into said starting pipe and to the discharge orifice.

5,191,927

METHOD AND APPARATUS FOR DETECTING A SHEET THICKNESS IN A CONTINUOUS CASTING MACHINE

Sadamu Terado; Hidenori Hattori, both of Hiroshima; Yoshio Morimoto, and Yasuhiro Yamakami, both of Futtsu, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Nippon Steel Corporation, both of Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,327
Claims priority, application Japan, Nov. 22, 1990, 2-315826
Int. Cl.[5] B22D *11/06, 11/16*
U.S. Cl. 164—452 3 Claims



1. A method for detecting a sheet thickness in a twin-drum type continuous casting machine including a pair of drums having rotary shafts supported in parallel to each other from a pair of frames via chocks and rotating in the opposite directions to each other with a gap space held therebetween, and a depressing device for said drums, in which machine a thin sheet is cast by pouring molten metal into the gap space between said drums; comprizing the steps of calculating a distance of said gap space by detecting a depressed position from said depressing device, further calculating a correction value for said gap space distance from a deflection of said frame by detecting a depressing force of said depressing device, calculating a correction value for said gap space distance from a thermal deformation of said frame by detecting a temperature of frame coolant water of said frame, calculating a correction value for said gap space distance from a thermal deformation of said drums by detecting a temperature of drum coolant water of said drums, correcting said calculated gap space distance with said respective calculated correction values, and thereby detecting the sheet thickness of the thin sheet, which is being cast.

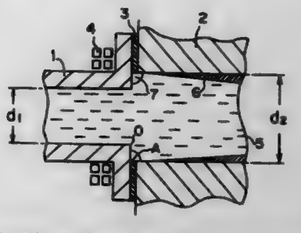
2. An apparatus for detecting a sheet thickness in a continuous casting machine; comprizing a pair of frames adapted to be cooled by coolant water, a pair of drums respectively having rotary shafts supported in parallel to each other from said frames via chocks and adapted to be rotated in the opposite directions to each other with a gap space held therebetween and to be cooled by coolant water, a depressing device provided on said frames for depressing said drums, a depressed position detector provided in said depressing device for detecting a depressed position, a depressing force detector provided on said frames for detecting a depressing force of said drums, a frame coolant water temperature detector provided on said frames for detecting a temperature of the frame coolant water, a drum coolant water temperature detector provided on said frames for detecting a drum coolant water temperature of said drums, and a computing unit responsive to the outputs of said depressed position detector, said depressing force detector, said frame coolant water temperature detector and said drum coolant water temperature detector for calculating a sheet thickness of the sheet which is being cast.

5,191,928

METHOD FOR CONTINUOUS CASTING OF STEEL AND APPARATUS THEREFOR

Toshio Sato; Shunichi Sugiyama; Toshio Ishii; Masayuki Nakada; Takashi Ooseko, and Kentaro Mori, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 798,506
Claims priority, application Japan, Nov. 27, 1990, 2-324601
Int. Cl.[5] B22D *11/06, 27/02*
U.S. Cl. 164—466 14 Claims



1. A method for continuous casting of steel, comprising the steps of:

feeding molten steel to cooling means for cooling molten steel by use of feeding means for feeding molten steel, said feeding means being followed by said cooling means;

cooling fed molten steel by said cooling means;

generating a high-frequency magnetic field near a zone where said feeding means, said cooling means and molten steel contact each other; and

converging said high-frequency magnetic field on the zone where said feeding means, said cooling means and molten steel contact each other.

8. An apparatus for continuous casting of steel, comprising:

feeding means for feeding molten steel;

cooling means for cooling molten steel fed by said feeding means, said feeding means being followd by said cooling means;

generating means for generating a high-frequency magnetic field near a zone where said feeding means, said cooling means and molten steel contact each other; and

converging means for converging the magnetic field on the zone where said feeding means, said cooling means and molten steel contact each other.

5,191,929

MOLTEN METAL SUPPLYING APPARATUS

Shoko Kubota, and Sadayoshi Yamada, both of Zama, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00530, § 371 Date Jan. 5, 1990, § 102(e) Date Jan. 5, 1990, PCT Pub. No. WO89/00469, PCT Pub. Date Jan. 26, 1989
PCT Filed May 30, 1988, Ser. No. 449,913
Claims priority, application Japan, Jul. 9, 1987, 62-171927; Jul. 9, 1987, 62-171928
Int. Cl.[5] B22D *39/00*
U.S. Cl. 164—500 12 Claims

11. A method for supplying molten metal from an apparatus having a constant-level molten metal holding furnace; a substantially linear molten metal feed tube for feeding molten metal from the constant-level molten metal holding furnace to a molten metal receiving member, an electromagnetic pump disposed in said molten metal feed tube, and an adapter disposed between a tip end of said molten metal feed tube and the molten metal receiving member including an injection sleeve and said adapter having a molten metal feed passage capable of keeping a surface level of molten metal therein at a position higher than said molten metal feed tube, the method steps comprising:

filling said molten metal feed tube with molten metal; and

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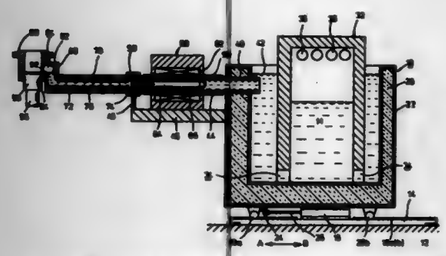
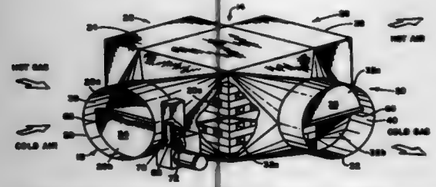
actuating said electromagnetic pump, while filling said molten metal feed tube, to discharge the molten metal from



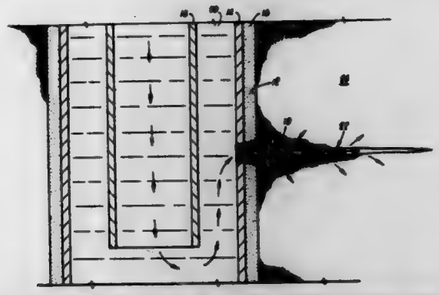
the molten metal feed tube to said molten metal receiving member.

5,191,930
HEAT REGENERATOR
Ross P. Chaney, 5233 W. Timberwood Dr., Newburgh, Ind. 47630
Filed May 20, 1991, Ser. No. 702,966
Int. Cl.[5] F28D *17/02*
U.S. Cl. 165—4 **7 Claims**



1. A heat regenerator comprising an outer encasing means, said encasing means including means for forming at least two fluid input openings and at least two fluid output openings, different said input and output openings forming part of two different continuous fluid flow paths directionally substantially straight through said encasing means,
said different flow paths also formed by at least a first and second discrete fluid path system and wherein said different flow paths have a cross relationship to each other in said fluid path systems sufficient to effect a heat transfer through said fluid path systems from one fluid path system to the other fluid path system,
valve means for selectively opening and closing each said different flow path of said fluid path systems,
said valve means include means for alternately opening a portion of an associated said opening and at the same time closing a different portion of the same said associated opening,
a cooperative one of said input and output openings associated with said first fluid path system receiving and discharging, respectively, a first fluid to which heat is to be transferred,
a cooperative one of said input and output openings associated with said second fluid path system receiving and discharging, respectively, a second fluid which is to surrender heat,
means in said fluid path systems through which said flow paths pass for providing mass storage and heat transfer for said fluids,
the relationship of said different flow paths being such that said first fluid passing through said first fluid path system is exposed to the heat of said second fluid path system, through which said second fluid passes, upon selectively positioning of said valve means in a manner to effect a substantial continuous transfer of heat from said second fluid through said mass storage and heat transfer means to said first fluid on the continuous flow of said fluids into said input openings.

5,191,931
FLUID LOSS CONTROL METHOD
Ronald E. Himes, and Walter R. Dill, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Sep. 24, 1991, Ser. No. 765,076
Int. Cl.[5] E21B *43/27, 43/28*
U.S. Cl. 166—282 **20 Claims**



1. A method of substantially stopping fluid loss into a subterranean formation from a well bore penetrating the formation by way of at least one perforation extending from the well bore into the formation comprising the steps of:
introducing a first particulate solid material which is soluble in a selected solvent into said well bore and into said formation by way of said perforation, said first particulate solid material having a particle size such that it bridges on the face of said formation and fills said perforation but allows fluid flow therethrough;
thereafter introducing a second particulate solid material which is soluble in a selected solvent into said well bore, said second particulated solid material having a smaller particle size than said first particulate solid material whereby it bridges on said first solid material and forms a fluid flow barrier over said perforation within said well bore; and
subsequently removing said first and second particulate solid materials from said well bore, said perforation and the face of said formation by flowing at least one solvent for said particulate solid materials through said well bore into contact with said second particulate solid material therein whereby said barrier over said perforation within said well bore is dissolved and said solvent flows through said perforation into said formation and dissolves said first particulate solid material therein.

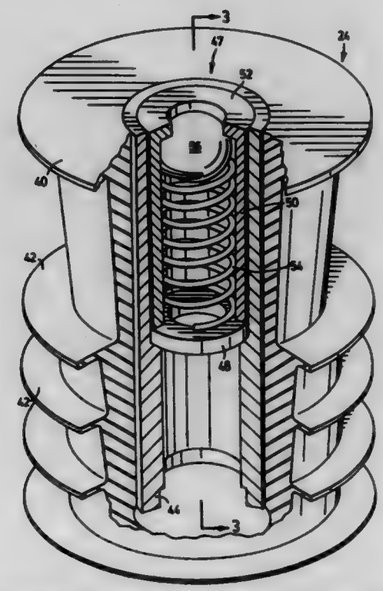
2. The method of claim 1 wherein said first and second particulate solid materials are introduced into said well bore, perforation and formation as suspensions in one or more carrier liquids in which said particulate solid materials are not soluble.

5,191,932
OILFIELD CEMENTING TOOL AND METHOD
Douglas Seefried, 1602 Summit Street, S.W., Calgary, Alberta, Canada T3C 2M1 , and Vernon E. Stone, #30, 185 Woodridge Drive, S.W., Calgary, Alberta, Canada T2W 3X7
Filed Jul. 9, 1991, Ser. No. 727,080
Int. Cl.[5] E21B *33/16, 34/10*
U.S. Cl. 166—291 **16 Claims**

1. A cementing tool for placement in a well casing between a slug of cement and a secondary fluid pumped into the casing during the cementing operation thereof, said cementing tool comprising:

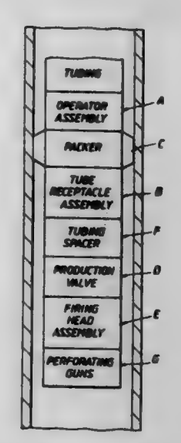
a generally cylindrical body having an outer surface for sealing engagement with the interior wall of said well casing and having an interior passage therethrough; and
pressure actuated valve means within said passage, wherein in normal operation, said pressure actuated valve means is in a condition to block said passage to allow said cementing tool to force cement down said well casing under the pressure of said secondary fluid, said pressure actuated valve means being actuable to an open condition under increased downward pressure not normally encountered during said normal operation and when a pressure differential equal to approximately 80% of the burst pressure of said casing is placed thereon to permit cement thereabove to pass through said cementing tool via said passage if said cementing tool is placed in said well casing before said cement.

7. In a well cementing method wherein top and bottom cementing tools are in a well casing above and below a desired amount of cement and fluid is pumped into the casing at a first



pressure on top of the top cementing tool to move the top and bottom cementing tools and the cement to the bottom of the casing, the bottom cementing tool allowing cement to pass therethrough and out of the casing when its downward movement is inhibited adjacent the bottom of the casing while the fluid is being pumped into the casing at the first pressure to cause the top plug to move towards the bottom plug, the improvement comprising:
providing a valve mechanism in the top cementing tool which is maintained in a closed condition at the first pressure but which is conditioned to an open condition at an increased pressure; and increasing the pressure of the fluid being pumped into the casing to actuate the valve mechanism to the open condition if the top cementing tool is placed in the casing below the desired amount of cement and another cementing tool is placed in the casing above the desired amount of cement, the valve mechanism allowing cement to pass therethrough and be expressed from the casing.

5,191,933
WELLBORE APPARATUS INCLUDING A RATHOLE PRESSURE BALANCED-DIFFERENTIAL PRESSURE FIRING SYSTEM
A. Glen Edwards, Hockley; Klaus B. Huber; Joe C. Hromas, both of Sugar Land, all of Tex.; Antoni K. L. Mitszewski, Budleigh Salterton, England, and William M. Hill, Pearland, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed May 1, 1992, Ser. No. 877,340
Int. Cl.[5] E21B *43/1185, 34/10*
U.S. Cl. 166—297 **10 Claims**



1. A firing system adapted to be disposed below a packer in a wellbore, said packer defining a rathole annulus below said packer and another annulus above said packer, comprising:
first means for defining a first hydraulic passage between said rathole annulus and one end of said firing system;
second means for defining a second hydraulic passage between said rathole annulus and another end of said firing system, said firing system being rathole pressure balanced when the ends of said firing system are open to said rathole annulus;
third means for defining a third hydraulic passage between said another end of said firing system and said another annulus above said packer; and
fourth means responsive to a first pressure in the annulus above said packer for closing said second hydraulic passage and opening said third hydraulic passage in response to said first pressure when said packer is set and said first pressure in the annulus above said packer is greater than a second pressure in said rathole annulus.

9. A method of safely locating a firing system in a wellbore, said firing system being located in said wellbore when a packer connected above said firing system in said wellbore is set thereby isolating a rathole annulus below said packer from an annulus above said packer, said firing system including a firing apparatus, comprising the step of:
opening a top end and a bottom end of said firing apparatus to said rathole annulus when said firing system is initially disposed in said wellbore, said firing apparatus being pressure balanced at a rathole pressure when the top and bottom ends of said firing apparatus are open to said rathole annulus; and
maintaining the top end and the bottom end of said firing apparatus open to said rathole annulus until said packer is set in said wellbore and a pressure in said annulus above said packer is increased to a point which exceeds a pressure in said rathole annulus.

5,191,934
PORTABLE TIRE BEAD BREAKER APPARATUS
Dale L. Wicklund, P.O. Box 431, Deer River, Minn. 56636
Filed May 27, 1992, Ser. No. 889,483
Int. Cl.[5] B60C *25/06*
U.S. Cl. 157—1.17 20 Claims

1. A tire bead breaker apparatus, comprising:
(a) a first tube having an outer end;
(b) a second tube telescopically engaged with said first tube, said second tube having an opposing end to said first tube outer end;
(c) a first clamp attached to said first tube at said outer end thereof;
(d) a second clamp attached to said second tube at said opposing end thereof;
(e) an upstanding power screw cooperatively disposed on said first tube outer end, said screw threaded vertically through a nut attached to a face plate disposed on said first tube outer end; and
(f) a breaker foot operatively attached to said screw at a lower end thereof adjacent to said first clamp;
wherein said breaker foot is displaceable in a perpendicular direction to said first and second tubes by movement of said power screw for pushing down upon a bead of a tire mounted on a wheel rim.

5,191,935
UNIVERSAL TABLE-TOP JIG FOR TABLE-MOUNTED POWER TOOLS
James N. McCombie, 5273 Gertrude Street, Port Alberni, British Columbia, V9Y 6L1, Canada
Filed Mar. 13, 1991, Ser. No. 851,474
Int. Cl.[5] B27B *5/18*; B27C *9/02*; B27H *1/00*
U.S. Cl. 144—286 R 17 Claims

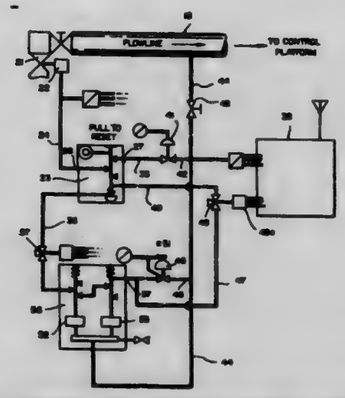
9. A table-top jig for a power tool mounted to a table-top, said jig comprising:
(a) a first planar member having a planar surface at least as large as the surface of said table-top;
(b) means for snug, slidable mating of said first member over said table-top;
(c) a second member mounted upon and transversely across one end of said first member; and,
(d) means for releasably securing said first member in fixed relation to said table-top,
wherein:
(e) said means for snug, slidable mating of said first member over said table-top comprises parallel guide rails mounted to said first member for constraining said first member to said slidable mating over said table-top in a direction perpendicular to a plane containing a power tool blade protruding vertically through said table-top;
(f) said first member has an aperture therein for free passage of said blade through said aperture as said first member is slidably moved over said table-top; and,
(g) said means for releasably securing said first member is releasably securable to allow sliding movement of said first member to a selected position relative to said table-top.

5,191,936
METHOD AND APPARATUS FOR CONTROLLING A WELL TOOL SUSPENDED BY A CABLE IN A WELLBORE BY SELECTIVE AXIAL MOVEMENTS OF THE CABLE
A. Glen Edwards, Hockley; Klaus B. Huber, Sugar Land, and Antoni K. L. Miszewski, Missouri City, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed Apr. 10, 1991, Ser. No. 684,083
Int. Cl.[5] E21B *43/116*
U.S. Cl. 166—297 25 Claims

1. A well tool arranged for suspension in a well bore from a cable and comprising:
a body;
means for dependently coupling said body to a cable including a mandrel telescopically arranged on said body and operable only after said body has been stationed at a selected depth location in said well bore for being shifted between a first position and a second position in response to a first movement and a second movement of said cable coupled to said mandrel;
an anchor on said body cooperatively arranged to be moved into and out of engagement with a well bore wall;
actuating means selectively operable when said body has been stationed at said selected depth location for engaging said anchor with said well bore wall in response to said first movement of said cable coupled to said mandrel shifting said mandrel to its said second position and for subsequently disengaging said anchor from said well bore wall in response to said second movement of said cable coupled to said mandrel shifting said mandrel to its said first position;
an impact-actuated explosive on said body;
explosive-detonating means on said body including a movable detonating member, and biasing means operable for forcibly moving said detonating member against said impact-actuated explosive to achieve a high-order detonation thereof; and
means releasably securing said detonating member to said body and operable for releasing said detonating member to be forcibly moved by said biasing means against said impact-actuated explosive solely in response to an interim first movement of a cable coupled to said mandrel applying a force of a predetermined magnitude to said mandrel during a selected time interval between an initial and a final cable movement.

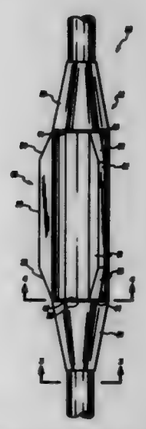
17. A method for completing a cased well bore comprising the steps of:
setting a perforating gun having an actuating detonator at a selected depth location in said well bore for positioning said actuating detonator where it is accessible from the surface;
coupling a suspension cable to a wireline tool carrying an impact-actuated explosive charge and including a selectively-releasable pressure-responsive actuator cooperatively arranged in the body of said wireline tool for successive movements therein in a first travel span without restraint and in a second travel span, extendible tool-anchoring means coupled to said actuator and detonating means including a selectively-releasable firing pin coupled to said actuator;
lowering said suspension cable and wireline tool into said well bore for stationing said wireline tool therein where said impact-actuated explosive charge is in detonating proximity of said actuating detonator on said perforating gun;
moving said suspension cable downwardly for releasing said pressure-responsive actuator for movement in its said first travel span to extend said tool-anchor means; and
moving said suspension cable upwardly for releasing said pressure-responsive actuator for movement in its said second travel span to release said firing pin for striking said impact-actuated explosive charge to set off said actuating detonator on said perforating gun.

5,191,937
OFFSHORE WELL REMOTE CONTROL SYSTEM
Fred R. Cook, Sr., Pearl River, La., assignor to Texaco Inc., White Plains, N.Y.
Filed Feb. 22, 1991, Ser. No. 659,781
Int. Cl.[5] E21B *34/04*
U.S. Cl. 166—363 11 Claims



1. A combination with a subterranean well for producing a pressurized fluid stream, which well includes a flow line for conducting said fluid stream to the surface, a main valve in said flow line having a main valve actuator associated therewith for adjusting said main valve to opened and closed positions, of
a flow control system for adjusting said main valve to open position subsequent to closing thereof under an emergency or elective condition, including:
means for establishing initial communication between said main valve actuator and said flow line in response to a remotely transmitted signal, whereby to provisionally open said main valve to fluid flow,
means for maintaining said initial communication during a predetermined time interval to allow fluid pressure in said flow line to stabilize to a level within a desired operating flow pressure range, and
pressure sensing means communicated with said main valve actuator to disestablish communication between said main valve actuator and said flow line subsequent to lapse of said predetermined time interval, in the event the pressure in said flow line fails to stabilize within the desired operating flow pressure range.

5,191,938
ROD GUIDE ASSEMBLY AND METHOD OF ITS INSTALLATION ON A ROD SHANK
Donald E. Sable, 4301 Edmondson, Dallas, Tex. 75205, and Donald E. Sable, II, 3400 Santa Monica, Denton, Tex. 76205
Filed Dec. 16, 1991, Ser. No. 807,601
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—378 10 Claims



1. A sucker rod guide assembly for the shank of a sucker rod positionable in a well tubing, said assembly including: a centralizer mount having a tubular body on and rigid with the shank of a sucker rod, said body having an elongate bushing portion having a tubular surface concentric with the longitudinal axis of the rod and end portions at opposite ends of said bushing portion extending radially outwardly of said bushing portion, said end portions having spaced facing annular stop shoulders; and a tubular centralizer rotatably disposed on said body about said bushing portion and between said stop shoulders, said stop shoulders limiting longitudinal movement of said centralizer on said bushing portion, said centralizer having a tubular body having annular opposite end surfaces engageable with said annular stop shoulders and tubing engageable means extending from said tubular body radially outwardly of said annular stop shoulders of said mount.

8. A method of installing a rod guide assembly on the shank of a sucker rod including: moulding on the shank a centralizer mount having a longitudinal cylindrical bushing portion and spaced facing annular stop shoulders extending outwardly from opposite ends of said bushing portion; positioning an elongate centralizer having a central bore and a longitudinal slit opening to said bore about said bushing portion and be-

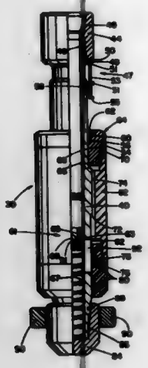
tween said stop shoulders by resiliently outwardly flexing portions of said centralizer from said slit and moving said centralizer onto said bushing portion until said bushing portion is positioned in said central bore.

5,191,939

CASING CIRCULATOR AND METHOD

Charles O. Stokley, Houston, Tex., assignor to TAM International, Houston, Tex.

Related U.S. Application Data Continuation-in-part of Ser. No. 460,566 Jan 3, 1990, Pat. No. 4,997,042.
Filed Mar. 1, 1991, Ser. No. 663,322
Int. Cl.[5] E21B *33/04*
U.S. Cl. 166—379 19 Claims



1. An improved method of circulating fluid through a casing string and from a lowermost end of a casing string into a well bore for facilitating lowering of the casing string into a well bore, an uppermost end of the casing string extending above the rig floor to a position adjacent an elevator for grasping the uppermost end of the casing string and moving the casing string axially with respect to the rig floor, the elevator being supported from bails extending from a traveling block of the rig, the method comprising:

providing a casing circulator having an exterior sealing member and an interior packer tube defining a flow path therein;

providing a casing circulator guide for engagement with the bails to guide the position of the casing circulator with respect to the uppermost end of the casing string as the traveling block is lowered;

supporting the casing circulator from the traveling block;

lowering the traveling block with respect to the uppermost end of the casing string such that the casing circulator will be positioned within the uppermost end of the casing string when the elevator is lowered about the uppermost end of the casing string;

thereafter setting the casing circulator to seal the sealing member between the casing string and interior packer tube;

thereafter pumping fluid through a flow line, through the flow path in the packer tube of the set casing circulator and into the casing string to wash the well bore adjacent the lowermost end of the casing string; and

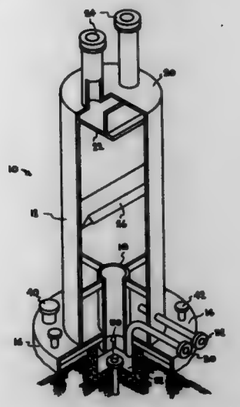
thereafter deactivating the casing circular to unseal the sealing element from the casing string.

5,191,940

OIL/GAS SEPARATOR FOR INSTALLATION AT BURNING WELLS

Carol T. Alonso, Orinda; Donald A. Bender, Dublin; Barry R. Bowman; Alan K. Burnham, both of Livermore; Dwayne A. Chesnut, Pleasanton; William J. Comfort, III, Livermore; Lloyd G. Guymon, Livermore; Carl D. Henning, Livermore; Knud B. Pedersen, Livermore; Joseph A. Sefcik, Tracy; Joseph A. Smith, and Mark S. Stranch, both of Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 22, 1991, Ser. No. 748,586
Int. Cl.[5] A62C *3/00*
U.S. Cl. 169—69 20 Claims



1. An oil/gas separator comprising: a metal vessel having a bottom and a top, with an opening in the bottom and at least one opening in the top;

at least one metal obstruction in the interior of said vessel and secured to said vessel for blocking a projection of said bottom opening onto said at least one top opening;

a metal tube secured in and extending upwards from said bottom opening and into said vessel to form an internal container within an inner periphery of a lower section of said vessel;

means for sealing said vessel around a source of oil passing into said vessel;

pumping means connected to said internal container of said vessel and to a region beneath said metal tube for pumping oil to an oil distribution system.

5,191,941

SUSPENSION DEVICE FOR A PLOW

Olav Njå, and Einar Ogsedal, both of Kvernaland, Norway, assignors to Kverneland Klepp AS, Kvernaland, Norway

Filed Oct. 23, 1991, Ser. No. 781,591
Claims priority, application Spain, Nov. 15, 1990, 9002903
Int. Cl.[5] A01B *3/28, 61/00*
U.S. Cl. 172—224 11 Claims

11. A suspension device for a plow, comprising:

a plow body;

a plow frame;

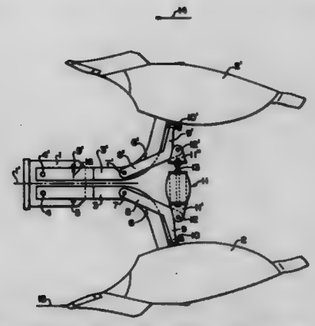
a plow beam being connected to said plow body and being pivotally connected to said plow frame;

a rotation restricting mechanism located on the plow frame, said rotation restriction mechanism preventing a rotation of said plow beam beyond a predetermined point;

a lever being pivotally connected at a first portion thereof to said plow beam and having a stop member at a second portion thereof, said stop member resting against said plow beam; and

an elastic, compliant, resilient damper connecting a third portion of said lever to said plow frame, such that a damper force is provided to said plow body;

wherein when said plow body is in a plowing position, said plow body vibrates due to said damper force.

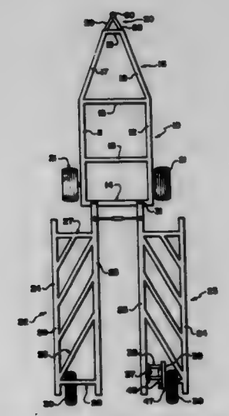


5,191,942

AGRICULTURAL FRAME FOR PROPULSION OF GROUND WORKING IMPLEMENTS

Raymond Bussiere, Saskatchewan, Canada, assignor to High-Line Manufacturing Inc., Vonda, Canada

Filed Jun. 19, 1990, Ser. No. 540,005
Int. Cl.[5] A01B *73/00*
U.S. Cl. 172—286 23 Claims



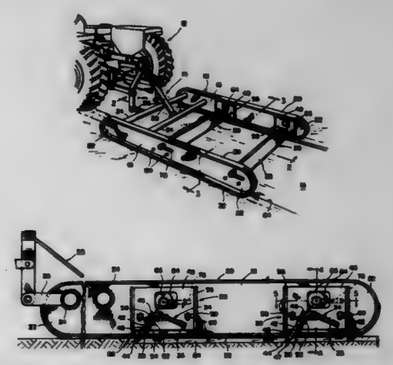
1. An agricultural frame for propulsion of ground working implements across a field in a working position and in a transport position comprising a centre frame having a hitch portion for attachment to a tractor, ground wheels mounted on the centre frame for movement of the centre frame across the ground in a direction of forward movement, a pair of wing frames attached to the centre frame each at a respective side of the centre frame, a ground wheel mounted on each wing frame for movement of the wing frame across the ground, a plurality of ground working implements each mounted on a respective one of the centre frame and the wing frames for movement therewith, means mounting each ground wheel on the respective one of the centre and wing frames for movement in a vertical direction relative to the respective one of the frames from a first position in which the ground working implements on said one frame are in ground working engagement with the ground to a second raised position in which the ground working implements are in raised non-operative position above the ground, first connecting means connecting each wing frame to the centre frame for pivotal movement about a horizontal axis substantially parallel to the forward direction, second connecting means connecting each wing frame to the centre frame for pivotal movement about a vertical axis for movemeat from a working position in which a longitudinal axis of the wing frame projects outwardly to a respective side of the centre frame in a direction generally at right angles to the forward direction to a transport position trailing rearwardly of the centre frame in which said longitudinal axis extends therefrom in a direction parallel to the forward direction, and means for steering the ground wheel on each wing frame from a position at right angles to said longitudinal axis to a position parallel to the longitudinal axis, each wing frame including a front beam parallel to said longitudinal axis, a rear beam parallel to said longitudinal axis and spaced rearwardly of the front beam and a plurality of transverse beams interconnecting the front and rear beams, said second connecting means being arranged to provide said vertical axis adjacent said rear beam, and latch means for releasable coupling between the centre frame and the wing frame at a position forwardly of said vertical pivot axis, said latch means including a pin having a longitudinal axis of the pin lying along said horizontal axis with said pin mounted on one of said centre frame and said wing frame, a receptacle mounted on the other of said centre frame and said wing frame for receiving said pin for pivotal movement of the pin relative to the receptacle about said axis longitudinal of the pin and transverse to the receptacle and a latch member for engaging the pin and pulling the pin into said receptacle, said latch means thus providing one part of said first connecting means.

5,191,943

THREE-POINT HITCH ATTACHED GRADER WITH ADJUSTABLE BLADES

Michael K. Minor, 7411 Kinston Cove, Southhaven, Miss. 38671, and Bernie B. Bierman, 8569 Kings Cross Cove, Cordova, Tenn. 38018

Filed Aug. 22, 1991, Ser. No. 748,524
Int. Cl.[5] A01B *35/20*; F16B *1/00*
U.S. Cl. 172—393 16 Claims



1. A grader comprising a rigid frame defined by a pair of parallel ground engaging side frame members rigidly interconnected by transverse frame means, a pair of longitudinally spaced, transversely extending parallel blade assemblies, means connecting said blade assemblies to said side frame members, each of said blade assemblies including a continuous cutting blade oriented at an angle of 17° in relation to vertical, said means connecting the blade assemblies to the side frame members including an end plate rigidly connected to each end of

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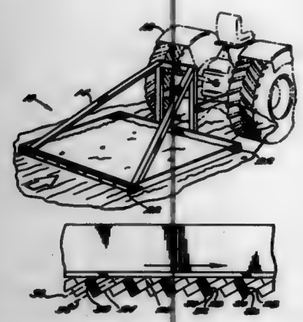
each blade assembly and oriented vertically for engagement with the side frame members, each side frame member including a pair of vertical guides engaging and guiding each of said end plates, said means connecting the blade assemblies to the side frame members further including cam means interconnecting the end plates and side frame members to move the end plates vertically and means interconnecting the end plates and side frame members to lock the end plates in a vertically adjusted position to provide a rigid support for the blade assemblies.

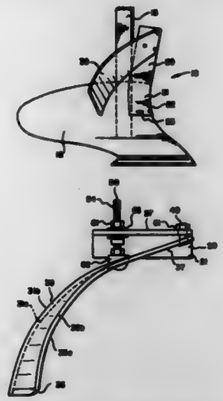
5,191,944
DEVICE FOR DRESSING A LAWN
Howard R. Thorn, 169 Liberty Hill Rd., Lexington, S.C. 29073
Filed Aug. 21, 1991, Ser. No. 748,185
Int. Cl.[5] A01B *59/043*
U.S. Cl. 172—445.1 2 Claims



1. A device for towing behind a vehicle to dress a lawn, said device comprising:
a cartridge having
a grid made of a section of expanded metal, said grid having a first end and an opposing, second end, and
a first angle iron,
a second angle iron,
said first end of said grid welded to said first angle iron and said second end of said grid welded to said second angle iron;
a frame;
bolts for releasably attaching said cartridge to said frame;
means for connecting said frame to a vehicle so that said vehicle can pull said frame and said frame can hold said grid in direct engagement with the surface of said lawn.

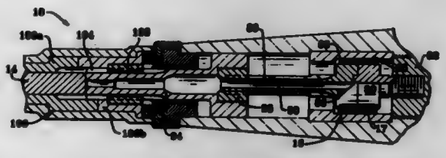
5,191,945
PLOW DEBRIS DEFLECTOR
Noe T. Leya, Raymondville, Tex., assignor to L & M Industries, Raymondville, Tex.
Filed Jun. 18, 1991, Ser. No. 716,879
Int. Cl.[5] A01B *15/00*
U.S. Cl. 172—759 20 Claims

1. A plow debris deflector comprising:
a first portion configured to connect a plow moldboard;
a second portion exhibiting a lower surface; and
an adjustable connector adjustably connecting said first portion to said second portion and comprising at least an adjusting bolt exhibiting a longitudinal axis and an angled portion positioned at a range of approximately 10° to 40° from the longitudinal axis and configured to adjust an



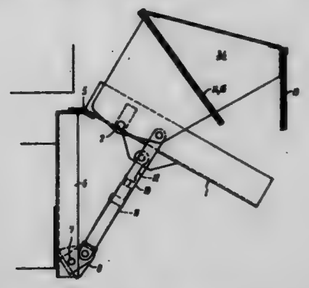
angular connection between said first and second portions.

5,191,946
WRAP SPRING CLUTCH FOR PERCUSSIVE APPARATUS
Leland H. Lyon, Roanoke, and Robert R. Kimberlin, Troutville, both of Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Division of Ser. No. 687,333, Apr. 18, 1991, abandoned. This application Jul. 14, 1992, Ser. No. 913,259
Int. Cl.[5] B25D *16/00*
U.S. Cl. 173—97 2 Claims



1. A clutch assembly for transmitting rotary motion in a percussive apparatus to a drill steel, the clutch assembly comprising:
a first hub having a first cylindrical surface formed thereon;
a second hub, substantially rotationally coupled to the drill steel, having a second cylindrical surface formed thereon, the second cylindrical surface being coaxial with the first cylindrical surface;
a wrap spring in engagement with a portion of both the first cylindrical surface and the second cylindrical surface, wherein relative rotary motion between the first hub and the second hub is permitted in a first direction and restricted in a second direction;
said first hub being a driver hub and said second hub being a driven hub;
and a piston reciprocally mounted in said apparatus, said piston alternately loosening and tightening said wrap spring to cause relative motion between said first and second hubs.

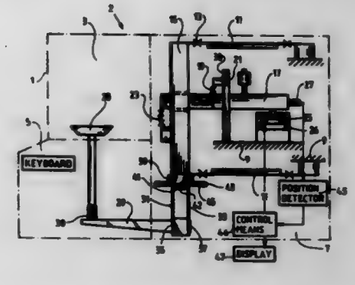
5,191,947
WEIGHING PAN FOR WEIGHING BATCHES OF PRODUCTS AND A COMBINATION WEIGHING MACHINE EQUIPPED WITH A NUMBER OF SUCH WEIGHING PANS
Gunnar C. Petersen, 14 Rodkildevaenget, DK-5230 Odense M, Denmark
Filed Dec. 5, 1990, Ser. No. 622,799
Claims priority, application Denmark, Dec. 13, 1989, 6284/89
Int. Cl.[5] G01G *13/00*
U.S. Cl. 177—25.18 10 Claims



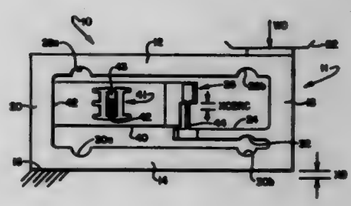
1. A weighing pan for weighing products to be packaged batchwise, for use in combination weighing of irregularly shaped and comparatively fragile fruit and vegetable products comprising:
a stationary supporting frame, a pair of side walls and a bottom flap disposed between said side walls, said bottom flap pivotally connected with said stationary supporting frame between a product collecting position and a product discharging position, said side walls and said bottom flap defining a product discharge opening, said product discharge opening being covered by a front wall, said bottom flap being shaped and positioned to collect individual product units substantially arranged in a single row when said bottom flap is oriented in said product collecting position, said bottom flap extending downwardly towards said discharge opening such that said product units collected in said single row are discharged through said discharge opening in a substantially sliding movement when said bottom flap is oriented in a product discharge position.

5,191,948
WEIGHING APPARATUS WITH RESILIENTLY SUSPENDED PAN SUPPORT ARM
Ernst Strickler, Wolfhausen, Switzerland, assignor to Mettler - Toledo AG, Greifensee, Switzerland
Filed Apr. 25, 1991, Ser. No. 690,395
Claims priority, application Switzerland, May 23, 1990, 1757/90
Int. Cl.[5] G01G *21/10*
U.S. Cl. 177—188 5 Claims

1. Electronic weighing apparatus, comprising:
(a) a frame (9);
(b) a vertical load receiving member (15) having an upper end and a lower end;
(c) parallel guide means (11) connecting said load receiving member for vertical movement relative to said frame;
(d) a weighing pan (28);
(e) a horizontal support arm (29) having a pair of ends a first one of which is connected with said weighing pan; and
(f) resilient means for suspending the other end of said support arm from the lower end of said load receiving member, said resilient means including a pair of vertical parallel generally flat leaf springs (31, 33) arranged normal to, and spaced longitudinally of, said horizontal support arm.



5,191,949
WEIGHING APPARATUS WITH AN ADJUSTABLE RATIO OF STRESSES IN THE LOAD BEARING MEMBERS
Nigel G. Mills, Inman, S.C., and Ronald J. Gainer, Worthington, Ohio, assignors to Mettler-Toledo, Inc., Worthington, Ohio
Filed Jul. 2, 1991, Ser. No. 724,833
Int. Cl.[5] G01G *3/08*
U.S. Cl. 177—229 44 Claims



1. Weighing apparatus for measuring load force applied to a receiving portion thereof and having a force communication path to ground, comprising:
first spring means within said force communication path, coupled in force transfer relationship between said receiving portion and ground and deflectable under said load force to exhibit a first value of stress, for providing force transfer response to said load force;
a sensor positioned within said path to deflect under an applied force to generate an output correlatable with the force value of said load force; and
a transmission spring within said path in parallel force relationship with said first spring and in series force relationship with said sensor for asserting an applied force upon said sensor while exhibiting a second value of stress greater than said first stress value exhibited by said first spring by an amount effective to cause substantial cancellation of error within the weighing apparatus including said first and said transmission spring.

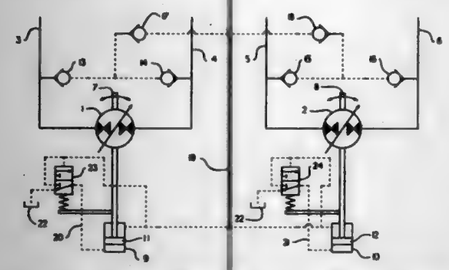
5,191,950

assembly including first and second wheel units and an

5,191,953

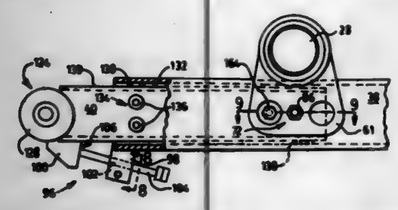
in an inverted U-shaped hook overlying the next adjacent

5,191,950
HYDROSTATIC TRAVELLING MECHANISM FOR TRACK-LAYING VEHICLES
Gustav Kleinsteuber, Maimaschaft, and Horst Deininger, Hoerstein/Alzmaus, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany
Filed May 9, 1991, Ser. No. 697,774
Claims priority, application Fed. Rep. of Germany, May 22, 1990, 4016496
Int. Cl.[5] B62D *11/04*; B60K *17/00*; F16D *31/02*
U.S. Cl. 180—6.3 4 Claims



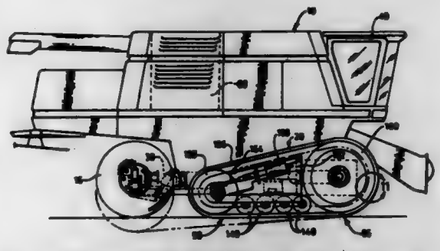
1. Hydrostatic travelling gear for track-laying vehicles comprising at least two drive motors 1, 2; each said drive motor operably connected to the tracks of a track laying vehicle; each said drive motor operably connected to a hydrostatic pump by means of at least one pressure medium supply line 3, 4, 5, 6; each said drive motor being operably connected to an adjusting device 9, 11, 10, 12 to provide an adjustable working volume; each said adjusting device controlled by a control valve 23, 24 whereby the drive motors can be supplied with different amounts of pressure medium independently of each other; and operating comparator means connected to said at least one pressure medium supply line 3, 4, 5, 6 of each said drive motor 1, 2 for generating a control pressure dependent on the operating pressure of the drive motor 1, 2 and the supply line 3, 4, 5, 6 with the highest operating pressure of all the drive motors 1, 2 and all the supply lines 3, 4, 5, 6 to control the working volume adjusting devices 9, 11, 10, 12 of all the drive motors 1, 2 whereby the supply of pressure medium to the adjusting devices 9, 11, 10, 12 is controlled by said control valve 23, 24 being acted upon by pressure medium under operating pressure; and said control pressure is conveyed through a signal line 19 both to the control valves and adjusting devices of all the drive motors.

5,191,951
BELTED UNDERCARRIAGE ASSEMBLY
Brent C. Bargfrede, Dunlap; Carl W. Carter; James G. Neal, both of Peoria, and Robert J. Purcell, Washington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Aug. 30, 1991, Ser. No. 752,811
Int. Cl.[5] B62D *55/30*
U.S. Cl. 180—9.1 15 Claims



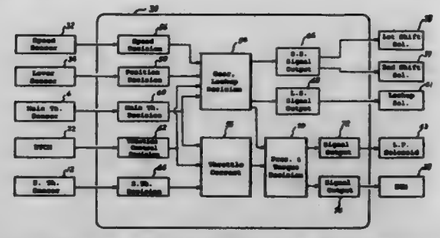
1. A belted undercarriage assembly for a vehicle having first and second side portions and a frame, comprising:
first and second spaced apart endless belt assemblies, each assembly including first and second wheel units and an endless elastomeric belt encircling said first and second wheel units, said first belt assembly being positioned adjacent said first side portion of said vehicle and said second belt assembly being positioned adjacent said second side portion of said vehicle;
first and second wheel supporting frame assemblies, each associated with respective first and second belt assemblies, each frame assembly including first and second tubes, each tube being of a substantially rectangular configuration, said first tube having a first end portion connected to said first wheel unit and said second tube having a first end portion connected to said second wheel unit, one of said first and second tubes having a portion positioned within the other, and one of said tubes first end portion being controllably movable toward and from the first end portion of the other tube;
a vehicle supporting axle having first and second end portions connected to a respective first and second wheel supporting frame assembly, at locations between each first and second wheel units; and
means for connecting said axle first and second end portions to said vehicle frame.

5,191,952
TRACK-TYPE VEHICLE HAVING STEERABLE WHEELS
Ronald L. Satzler, Princeville, and Edward E. Schmillen, Metamora, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Sep. 19, 1991, Ser. No. 762,285
Int. Cl.[5] B62D *55/00*, *61/10*
U.S. Cl. 180—9.52 20 Claims



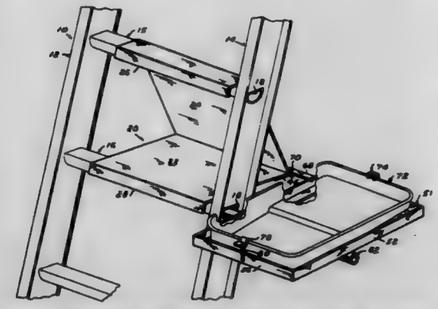
1. A track-type vehicle having a main frame, an axle, and first and second steerable wheels connected to said axle, comprising:
first and second endless track assemblies, one positioned on each lateral side of said frame;
means for steering said steerable wheels:
a source of pressurized fluid;
a weight distributing cylinder connected between said frame and said axle;
means for controlling the pressure of said pressurized fluid to said cylinder in response to receiving a control signal;
means for measuring the angle of steer of said steerable wheels and producing a signal in response thereto; and
means for receiving the angle of steer signal, generating a control signal, and delivering said control signal to said control means.

5,191,953
ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION
Yasunobu Ito, Okazaki, and Yasuo Mizuno, Chiryu, both of Japan, assignors to Aisin Aw Co., Ltd., Japan
Filed Aug. 7, 1991, Ser. No. 740,847
Claims priority, application Japan, Aug. 15, 1990, 2-214312
Int. Cl.[5] B60K *20/00*
U.S. Cl. 180—197 1 Claim



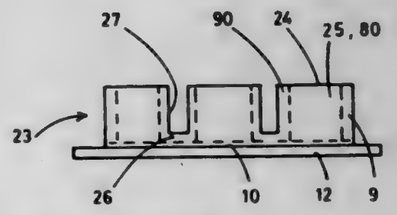
1. An electronically controlled automatic transmission comprising:
skid-detecting means for detecting skid of the wheels of a vehicle and for generating skid signals responsive to detection of skid;
traction control means for receiving said skid signals from the skid-detecting means and for generating a torque signal in accordance with said skid signals;
engine control means for reducing engine torque responsive to said torque signal from the traction control means; and
transmission control means for receiving at least one of the torque signal from the traction control means and the skid signal from the engine control means and for reducing hydraulic line pressure in the transmission by a predetermined value only when the traction control means is operating.

5,191,954
LADDER RUNG SUPPORTED COMBINATION PLATFORM AND UTENSIL RACK
Jim D. Ledford, 37 Brentwood Dr., Stillwater, Okla. 74075
Filed Jul. 6, 1992, Ser. No. 909,326
Int. Cl.[5] E04C *7/00*
U.S. Cl. 182—129 4 Claims



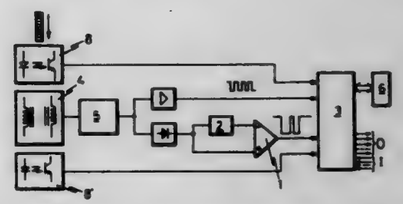
1. A tradesman's equipment support means for use on a ladder having forward and rearward surfaces and having spaced uprights joined by vertically spaced hollow open end horizontal rungs, comprising:
a generally L-shaped foot plate having a front edge portion projecting substantially horizontal forward through the ladder and overlying a ladder rung and having a leg portion opposite its front edge portion terminating upwardly in an inverted U-shaped hook overlying the next adjacent upward rung of the ladder;
means on said foot plate for preventing movement thereof relative to the first named ladder rung;
an elongated rod extending at one end portion into the first named rung and projecting laterally of one ladder upright at its other end portion;
a generally horizontal frame having opposing ends and having one end portion overlying and supported by said rod other end portion; and,
frame stabilizing means for connecting said foot plate with the end portion of said frame opposite said rod.

5,191,955
MULTI-STUD BRAKE FITTING
Hassan Youssef, Taverny, and Yves Bigay, Versailles, both of France, assignors to Le Carbone Lorraine, Courbevoie, France
Filed May 6, 1991, Ser. No. 696,126
Claims priority, application France, May 18, 1990, 90 06601
Int. Cl.[5] F16D *69/02*, *69/04*, *13/68*
U.S. Cl. 188—251 A 8 Claims



1. A brake fitting comprising:
a plurality of studs separated from each other by spaces, each said stud being made of a sintered friction product and being laterally sheathed by a less fragile sintered metal bead; and
a metal support having a surface on which said studs are fixed;
wherein said surface of the metal support is coated by grains of braze-welding powder which are diffusion bonded thereto, said studs being continuously welded at base portions thereof to said coated metal support surface,
and wherein said less fragile sintered metal bead extends into the spaces between the studs, covering the coated metal support to a depth of at least about 0.5 mm.

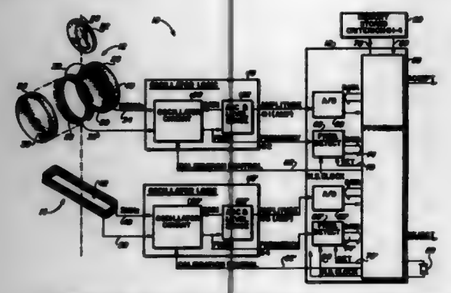
5,191,956
ELECTRONIC METHOD AND CIRCUIT FOR ANALYZING ANALOG SIGNALS
Jesus E. Iberrola, Peralta-Navarra, Spain, assignor to Azkoyen Industrial, S.A., Peralta Navarra, Spain
Filed Jan. 8, 1991, Ser. No. 638,622
Claims priority, application Spain, Jan. 29, 1990, 9000252
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—317 3 Claims



1. Method for analyzing analog signals applicable to electronic selectors of coins and like metallic pieces comprising the

steps of establishing in an analog signal an amplitude which is provided by a measurement sensor, of different measurement areas based upon positive/negative gradient changes in said analog signal and adapting said changes to a digital signal in order to establish measurement areas related to a waveform of the analog signal wherein time and oscillation frequency are measured at each of the measurement areas in order to establish duration and frequency ratios between each measurement area and adjacent areas.

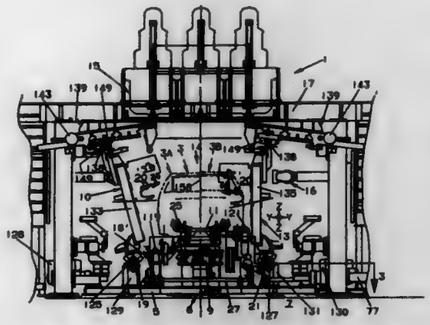
5,191,957
COIN DISCRIMINATION METHOD
Stephen J. Hayes, Swansea, England, assignor to Protel, Inc., Lakeland, Fla.
Filed Jun. 28, 1991, Ser. No. 722,480
Int. Cl.[5] G07F 3/02
U.S. Cl. 194—318 **11 Claims**



1. A method for determining whether or not a coin is acceptable comprising the steps of:
providing a signal to induce an electromagnetic field across an inductor coil where the electrical characteristics of the signal change when a coin passes through the field;
sensing the changes in the electrical characteristics when a coin passes through the field;
determining electrical characteristics for acceptable coin types by passing a plurality of coins of each type past at least one inductor coil and then sensing the changes in the electrical characteristics for each coin passing through the field and then determining statistical variables for the electrical characteristics of each coin type;
storing the statistical variables in a memory by coin type;
computing a statistical variation value for each coin being sampled which passes through the field, related to the stored statistical variables for the corresponding coin type; and
providing an indication that the coin being samples is acceptable when its statistical variation value is less than a predetermined value.

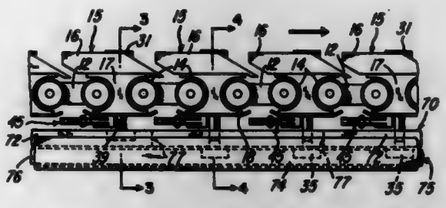
5,191,958
AUTOMATIC FRAMING SYSTEM
Gary Telecko, Milton, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.
Filed Feb. 1, 1991, Ser. No. 649,478
Int. Cl.[5] B65G 37/00
U.S. Cl. 198—346.2 **38 Claims**

1. A framing station for processing a workpiece comprising:
a. a base;
b. pallet means for transporting the workpiece to a transfer point;
c. critical lift means supported on the base for selectively lifting the workpiece at the transfer point from the pallet means to a work station, wherein the critical lift means comprises:
i. frame means for contacting the workpiece to lift it off the pallet means;
ii. first lift means mounted to the base for raising the frame means from a lowered position thereof remote from the workpiece on the pallet means to an intermediate position higher above the base than the lowered position and proximate the workpiece at the transfer point; and
iii. second lift means mounted to the frame means for raising the frame means from the intermediate position thereof to a third position whereat the frame means has lifted the workpiece at the transfer point from the pallet means to the work station;



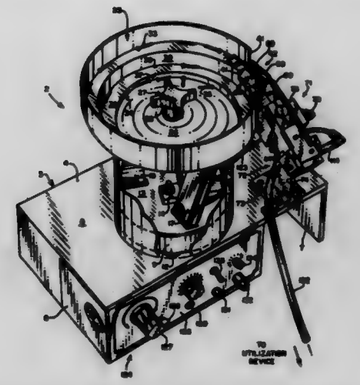
d. gate means for selectively pivoting between an open configuration remote from the work station and a closed configuration proximate the work station and for selectively clamping the workpiece at the work station when in the closed configuration; and
e. processing means for performing selected operations on the workpiece at the work station.

5,191,959
SORTING CONVEYOR WITH VERTICAL SWITCHING SYSTEM
Hendrik Leemkuil, Pickerington, Ohio, assignor to Alvey Inc., St. Louis, Mo.
Filed Jun. 10, 1992, Ser. No. 896,374
Int. Cl.[5] B65G 47/46
U.S. Cl. 198—365 **15 Claims**



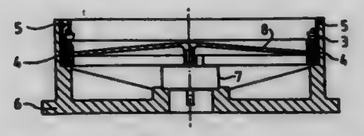
1. A conveyor system for transporting and sorting packages and other articles, comprising an elongated endless flexible carrier having a generally horizontal upper run and including a series of longitudinally spaced transfer members each supported for independent lateral movement, each of said transfer members including a follower supported for generally vertical movement along said upper run between an upper retracted position and a lower extended position, an upper track position for engaging each of said followers in said retracted position, a lower track disposed at a lower level than said upper track for engaging each of said followers in said extended position, one of said tracks diverting from the other said track for moving selected said transfer members laterally across said carrier for diverting an article from said carrier, and means for moving each of said followers between said retracted and extended positions.

5,191,960
AUTOMATED FASTERNER FEED SYSTEM FOR FASTENER ATTACHMENT DEVICES
Robert C. Wareham, Oakdale, Calif., assignor to Haeger Corporation, Oakdale, Calif.
Filed Oct. 11, 1991, Ser. No. 775,727
Int. Cl.[5] B65G 47/24
U.S. Cl. 198—391 **18 Claims**



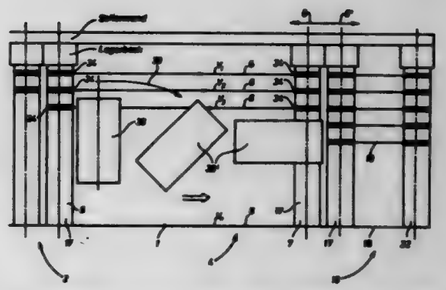
1. An automated fastener feed system for fastener attachment devices required to be delivered to a utilization device, comprising:
a) a bowl having an outer periphery for receiving a quantity of said fastener attachment devices in a disoriented mass;
b) means for vibrating the bowl to effect individual migration of said fastener attachment devices radially and circumferentially within the bowl toward and along said outer periphery of the bowl;
c) an orientation module detachably mounted on the outer periphery of the bowl for vibration therewith and adapted to receive said migrating fastener attachment devices and operable to orient said fastener attachment devices for delivery to said utilization device in an acceptable orientation; and
d) a singulator module operatively associated with said orientation module in a manner to be isolated from the vibration of said orientation module and adapted to receive said oriented fastener attachment devices from said orientation module in said acceptable orientation and propel them to said utilization device in said acceptable orientation.

5,191,961
BOWL-FEED APPARATUS
Colin D. Wilson, Largs; Alexander F. MacGregor, Renfrew, and Alistair J. McKillop, Gourock, all of Scotland, assignors to International Business Machines Corp., Armonk, N.Y.
Filed Mar. 23, 1990, Ser. No. 498,074
Claims priority, application United Kingdom, Mar. 31, 1989, 8907327.4
Int. Cl.[5] B65G 29/00
U.S. Cl. 198—392 **9 Claims**



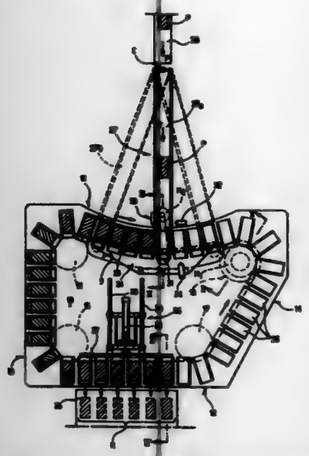
1. A bowl-feed apparatus for supplying workpieces 3 in a desired orientation comprising a central reservoir into which the workpieces 3 are initially loaded in a random orientation, and surrounded by a feedtrack 4 for orientating the workpieces 3 around the periphery of the bowl along which the workpieces 3 travel, different segments of the feedtrack 4 causing misorientated workpieces 3 to fall back into the reservoir, and is characterized in a gas flow emanating from said feedtrack for propelling workpieces 3 along the feedtrack 4 and including means 17, 18, 21 for controlling the gas flow conditions in each of the feedtrack segments to allow the flow conditions along the track 4 to be adjusted.

5,191,962
TURNING DEVICE FOR PARCELS TRANSPORTED ON A BELT CONVEYOR
Jürgen Wegscheider, Issy; Franz Hartmann, Weiler, and Roland Zenschner, Horgatz, all of Fed. Rep. of Germany, assignors to Natec, Reich, Summer GmbH & Co. KG., Fed. Rep. of Germany
Filed Jun. 5, 1991, Ser. No. 710,698
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041477
Int. Cl.[5] B65G 29/00
U.S. Cl. 198—415 **11 Claims**



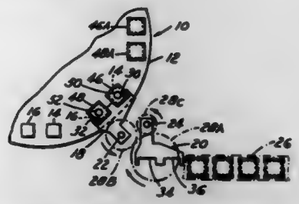
1. A turning device for articles being carried by a conveyor comprising:
a plurality of endless part conveyor belts extending parallel to one another in a conveying plane, each said part conveyor belt being arranged to run around a set of idler pulleys which are rotatable independently of the idler pulleys of the other part conveyor belts;
a drive shaft drivable in rotation, on which are mounted a plurality of belt pulleys, one engaging each of said part conveyor belts, the effective diameters of said pulleys increasing over the length of said shaft;
means for driving said shaft in rotation;
means for coupling together the pulleys on said shaft to rotate together whereby when the shaft is driven said part conveyor belts are driven at different speeds and a velocity gradient is set up across the width of said conveying plane to turn articles being carried thereon;
a make-up conveyor located at the downstream end of said conveying plane for receiving articles from said conveyor belts, said make-up conveyor including a rotatably mounted return roller at the article receiving end of said make-up conveyor;
one set of idler pulleys being mounted on a shaft provided at the end of the conveying plane, the position of said idler pulley shaft and return roller being adjustable in the conveying direction to vary the length of said conveying plane; and
said driving means comprising a single drive for said drive shaft and said make-up conveyor.

5,191,963
MACHINE FOR GROUPING IN PARALLEL ROWS PRODUCTS ARRIVING IN A SINGLE LINE, PARTICULARLY FOR FEEDING CARTONING MACHINES AND THE LIKE
Mario Delsanto, Feletto Canavese, Italy, assignor to Meca-Tronic S.n.c. di Rasina'V., Spatolisano F., & C., Mappano, Italy
Filed Feb. 20, 1992, Ser. No. 838,176
Claims priority, application Italy, Feb. 26, 1991, T091 A-000128
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—429 10 Claims



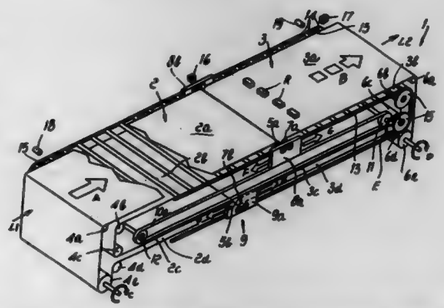
1. Machine for grouping in parallel rows products arriving in a single line, particularly for feeding cartoning machines, comprising:
- at least one actuation chain which is closed in a loop and is guided by toothed pinions along a path which comprises a side for loading individual products, which has the shape of an arc of a circle, and a straight side for unloading the rows,
- a plurality of movable seats which are supported by said chain with a constant spacing pitch and are suitable for moving along the entire perimeter of said path to receive the products on the loading side and carry them to the unloading side,
- first advancement motor means for moving said chain by steps which are equal in length to the number of products which form each row and for moving the seats from the loading side to the unloading side of the path,
- a belt conveyor for the single line of products, comprising at least one terminal portion which swings in the horizontal plane and is pivoted at the center of curvature of the circular arc-like loading side of the path of the chain,
- second advancement motor means which are supported by the swinging portion of the conveyor and mesh with said chain in order to move said terminal portion in a stepwise manner, align its end with the individual seats and feed the products into each seat both during translatory motion and when the first motor means are inactive,
- means for removing the rows of products from the unloading side of the path of the chain, and
- means for controlling said first and second advancement motor means and for energizing them for a fixed duration according to the translatory motion of each row of seats and according to the stepwise movement of the swinging portion of the conveyor.

5,191,964
ROTATING CARTON TRANSFER MECHANISM
Anthony F. Spisak, Redford, and James A. Kirn, Union Lake, both of Mich., assignors to Elopak Systems A.G., Glattbrugg, Switzerland
Filed Mar. 26, 1992, Ser. No. 858,032
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—447 8 Claims



1. On a forming, filling, and sealing machine, a carton transfer mechanism comprising an indexing turret having a plurality of dual mandrels formed thereon, two bottom closed cartons mounted on each of said dual mandrels, a conveyor adapted to receive two sets of two cartons before indexing the four cartons, and carrier means for alternately moving two cartons at a time from two respective dual mandrels to said conveyor.

5,191,965
BUFFER STORAGE UNIT
Manfred Scheid, Ferrara, Italy, assignor to Mopa S.r.l., Italy
Filed Nov. 4, 1991, Ser. No. 787,391
Claims priority, application Italy, Nov. 5, 1990, 3720 A/90
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—460 2 Claims

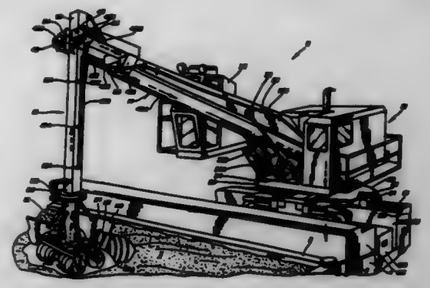


1. A buffer storage unit, for accumulating and releasing, in rows which are equidistant or have a programmed timing, products which arrive from a continuous advancement line and which are arranged in a non-equidistant rows, the buffer storage unit comprising:
- a first endless conveyor belt means (2) wound around a first set of rollers (*4a–e*, *5a–b*) of which at least one roller (*4e*) is continuously motor drivable for driving said first endless conveyor belt means in a continuous manner; and
- a second endless conveyor belt means (3) wound around a second set of rollers (*6a–e*, *7a–b*) of which at least one roller (*6e*) is stepwise motor drivable for driving said second endless conveyor belt means in an intermittent manner;

said first endless conveyor belt means comprising a first horizontally arranged active portion (*2a*) for supporting products thereon and said second endless conveyor belt means comprising a second horizontally arranged active portion (*3a*) also for supporting products thereon, said first set of rollers comprising an output roller (*5a*) arranged at an output end of said first active portion (*2a*) and said first endless conveyor belt means having a first return portion (*2b*) which extends from said output roller and which is arranged below said first active portion, said second set of rollers comprising an input roller (*7a*) arranged at an input end of said second active portion (*3a*) and said second endless conveyor belt means having a second return portion (*3b*) which extends from said output roller and which is arranged below said second active portion, said first endless conveyor belt means further comprising first upper (*2c*) and lower (*2d*) compensation portions which are wrapped about an input end roller (*5b*) of said first set of rollers, said second endless conveyor belt means further comprising second upper (*3c*) and lower (*2d*) compensation portions which are wrapped about an output end roller (*7b*) of said second set or rollers, the buffer storage unit further comprising:
- a first sliding block means (*8a,8b*) which rotatably supports both said output roller (*5a*) and said input roller (*7a*) in a mutually near relationship thereby for transfer of said products from said first active portion (*2a*) to said second active portion (*3a*), said first sliding block means being reversably slidable in a direction which is parallel to an extension of said first and second active portions;
- a second sliding block means (9) which is reversably slidable and which rotatably supports both said input end roller (*5b*) and said output end roller (*7b*);
- a traction element means (*10a*) which is ridigly connected between said first sliding block means (*8a,8b*) and said second sliding block means (9);
- gearwheel means (11,12) about which is wrapped said traction element means and which are rotatably motor drivable in opposite directions for mutually sliding simultaneously both said first and second sliding block means, said gearwheel means being drivable independently of said at least one roller (*6e*) of said second set of rollers;
- product sensor means (16) for detecting products at said output end of said first active portion (*2a*) and for commanding the drive of said gearwheel means;
- a sliding block sensor means (18,19) for detecting a position of said first sliding block means and for providing a signal of excessive filling or emptying depending on said position of said first sliding block means; and
- a second product sensor means (17) for detecting products at an output end of said second active portion (*3a*).

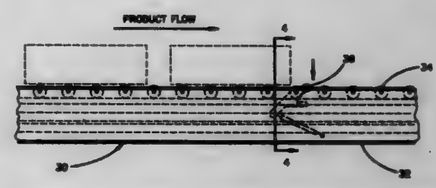
5,191,966
APPARATUS AND METHOD FOR UNLOADING BULK MATERIALS
David J. Miller; Allen R. Miller, and Charles P. Miller, all of McHenry, Ill., assignors to Miller Formless Co., Inc., McHenry, Ill.
Division of Ser. No. 549,895, Jul. 9, 1990, Pat. No. 5,078,261, which is a division of Ser. No. 144,428, Jan. 15, 1988, Pat. No. 4,957,198, which is a division of Ser. No. 848,907, Apr. 4, 1986, Pat. No. 4,738,350, which is a continuation of Ser. No. 672,151, Nov. 16, 1984, abandoned, which is a continuation of Ser. No. 414,383, Sep. 2, 1982, abandoned. This application Aug. 28, 1991, Ser. No. 750,971
Int. Cl.[5] B65G *47/22*
U.S. Cl. 198—493 10 Claims

1. An apparatus for conveying bulk dry powder material comprising an auger conveyor including a housing and an auger therein, power means for rotating said auger for advancing such powder material along said conveyor, and selectively operable aeration means for injecting a compressed gaseous medium into such material in the interior of said housing while portions of said powder materials are passing therethrough, said injecting means being responsive to the load exerted on said auger in moving said powder material along said conveyor for selectively injecting such gaseous medium and thereby



aerating such powder material when such load exceeds a predetermined value.

5,191,967
CONVEYOR SYSTEM HAVING NON-SINGULATING ACCUMULATION CONVEYOR
Bernard H. Woltjer, Jenison, and Arthur J. Terpstra, Jr., Allendale, both of Mich., assignors to Rapistan Corp., Grand Rapids, Mich.
Filed Oct. 30, 1990, Ser. No. 605,544
Int. Cl.[5] B65G *13/06*
U.S. Cl. 198—781 15 Claims



1. In a conveyor system having a sortation system including means or directing product selectively to a plurality of outbound conveyors and an accumulation conveyor in at least one of said outbound conveyors downstream of said sortation system, said accumulation conveyor comprising:
- a multiplicity of conveying rollers for supporting product and being rotatable for conveying said cases, said rollers being grouped into adjacent zones;
- driving means associated with each of said zones that is actuable for rotating the rollers in that zone;
- product sensing means associated with each of said zones for sensing product in the vicinity of that zone;
- control means associated with each of said zones for actuating the driving means of that zone if the product sensing means for that zone does not sense the presence of product;
- said control means further being responsive to said product sensing means downstream of the associated zone in order to actuate the driving means of that zone if any of said product sensing means downstream of that zone do not sense the presence of product in order to produce a transport portion in which all zones upstream of the empty zone are actuated to transport product without singulation of any upstream grouped product; and
- wherein said control means deactivates the driving means of the associated zone if said product sensing means for that zone and all of said product sensing means downstream of that zone sense the presence of product in order to produce an accumulation portion in which no zones are actuated, whereby an interface between zones in said accumulation portion and zones in said transport portion is dy-

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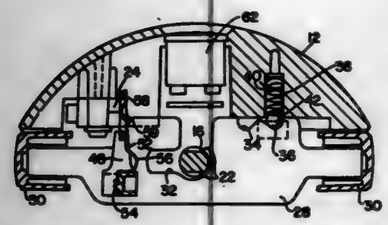
namically shifting in response to product movement along said accumulation conveyor to provide product accumulation without singulation.

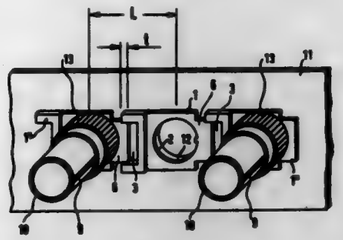
5,191,968
SHAFT LOCK ARRANGEMENT FOR A POWER TOOL
Ronald C. McCurry, West Union, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.
Filed Sep. 23, 1991, Ser. No. 764,239
Int. Cl.[5] H01H *9/28*; B27C *5/00*
U.S. Cl. 200—43.11 6 Claims



1. A shaft lock arrangement for a power tool, the power tool including a housing, a motor mounted in said housing, said motor having a shaft, and a main switch mounted in said housing and controllable for selectively applying power to the motor for rotating said shaft, said arrangement comprising:
- a flatted portion of said shaft;
- a secondary switch in series with said main switch, said secondary switch having a first contact and an actuator arranged for movement toward and away from said first contact to close and open, respectively, said secondary switch, said actuator being yieldably biased to maintain said secondary switch in its open state;
- a lock bar mounted for movement in said housing between first and second positions, said lock bar being formed with an open slot so dimensioned to prevent rotation of said shaft when the flatted portion of said shaft is within said slot, said flatted portion of said shaft being within said slot when said lock bar is in said first position and outside said slot when said lock bar is in said second position; and
- an actuator arm mounted on said lock bar and arranged so as to engage said secondary switch actuator and place said secondary switch in its closed state when said lock bar is in its second position with said flatted portion of said shaft outside said slot and free to rotate, said actuator arm releasing said secondary switch actuator when said lock bar is moved from said second position toward said first position to allow said secondary switch to assume its open state.

5,191,969
SWITCH ORIENTING DEVICE
Fritz Berger, Oberbuchsiten, Switzerland, assignor to Elektro-Apparatebau Olten AG, Olten, Switzerland
Filed Jan. 24, 1989, Ser. No. 301,540
Claims priority, application Switzerland, Feb. 1, 1988, 330/88
Int. Cl.[5] H01H *9/26*
U.S. Cl. 200—296 11 Claims

1. A device for orienting switches and like objects, comprising at least one plate-like member having (a) an opening for reception of an object therein, (b) a projection at one side of and spaced apart from said opening, (c) a recess complementary to said projection and disposed at another side of said opening opposite said one side and being spaced apart from said opening, (d) a first pair of substantially parallel surfaces flanking said recess, and (e) a second pair of surfaces flanking said projection, each surface of said first pair being aligned with a surface of said second pair, said member further having a first thickness in the region of said first pair of surfaces and a

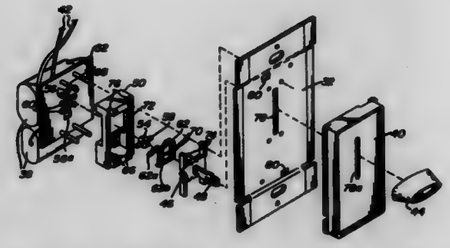


different second thickness in the region of said second pair of surfaces.

5,191,970
APPARATUS FOR EQUIPMENT UNIT PROTECTION SWITCHING
Robert C. Brockway, Salem; Philip S. Dietz, East Hampstead, and Le C. Nguyen, Windham, all of N.H., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 27, 1991, Ser. No. 767,304
Int. Cl.[5] H01H *3/04*, *3/20*
U.S. Cl. 200—335 32 Claims

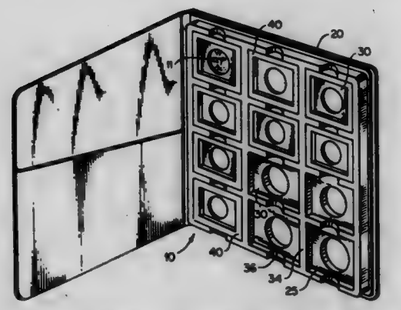
1. Apparatus for effecting an equipment unit protection switch from an equipment unit being removed from an equipment frame in which it is intended to be inserted to a standby equipment unit, the equipment unit including a circuit board intended to be inserted in a connector in the equipment frame and a latch pivotally mounted on said circuit board for securing the equipment unit in the equipment frame, the apparatus being characterized by,
- said latch being physically dimensioned to allow prescribed initial movement thereof from a closed position before any movement of the circuit board in its connector in the equipment frame when attempting to remove said equipment unit from the equipment frame,
- means associated with said latch and being responsive to said initial movement of said latch for generating an equipment unit removal indication signal for initiating the equipment unit protection switch prior to any movement of said circuit board in its connector, and
- means responsive to said equipment unit removal indication signal for effecting the protection.

5,191,971
MULTI-POSITION WALL MOUNTABLE CONTROL SWITCH WITH TACTILE FEEDBACK LINEAR ACTUATOR
Susan S. Hakkarainen, Bethlehem; Robert S. Hanna, Coopersburg; Elliot G. Jacoby, Glenside, and Robert F. Taylor, III, Bethlehem, all of Pa., assignors to Latron Electronics Co., Inc., Coopersburg, Pa.
Filed Apr. 5, 1991, Ser. No. 680,990
Int. Cl.[5] H01H *15/06*
U.S. Cl. 200—550 76 Claims



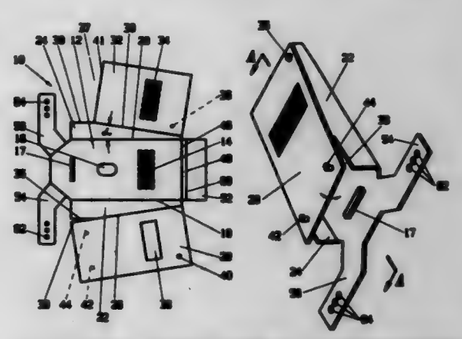
1. A switch comprising:
- (a) a plurality of electrical contacts defining a plurality of different switch settings;
- (b) an actuator movable in a linear path between positions corresponding to each switch setting;
- (c) roller means disposed between the actuator and a stationary bearing surface for rolling the actuator in the linear path over the stationary bearing surface upon application of an external sliding force to the actuator, the stationary bearing surface being distinct from, and the roller means being substantially electrically isolated from, the electrical contacts, the roller means carrying a conductor for establishing an electrical connection between the contacts at each setting, the conductor being raised away from the electrical contacts between switch settings.

5,191,972
STORAGE AND DISPLAY DEVICE FOR COINS AND THE LIKE
James A. Heizer; David P. Hanefeld, and Dwight Hayes, all of Cheyenne, Wyo., assignors to Unicover Corporation, Cheyenne, Wyo.
Filed Mar. 11, 1992, Ser. No. 849,593
Int. Cl.[5] A45C *1/00*
U.S. Cl. 206—840 14 Claims



1. An article display and storage device for displaying a generally planar article having opposed major faces, said device comprising:
- (a) an article holder having a pair of opposed, rigid generally planar walls, at least one of said walls being transparent to permit viewing a major face of an article in said cavity, and means to secure said wall members together to form a closed article-holding cavity therebetween;
- (b) a generally planar article-displaying compartment for receiving in an article displaying position in said compartment, an article holder having in said article-holding cavity thereof an article to be displayed;
- (c) an apertured, generally planar article holder retaining member for retaining an article holder in said article-displaying position in said article-displaying compartment, said retaining member being releasably retainable in an article holder retaining position in said article-displaying compartment, having an article holder engaging portion for bearing against an article holder in a respective article-displaying compartment to retain an article holder in said compartment, and having an aperture to permit viewing a major face of an article in the article-holding cavity of an article holder in said article-displaying position in said article-displaying compartment;
- (d) means for preventing lateral motion of an article holder, when an article holder is positioned in said article displaying position, in a plane parallel to that of the article displaying compartment; and
- (e) means for releasably retaining said article holder retaining member in an article holder retaining position in said article-displaying compartment such that, when an article holder having an article is in said article-displaying position in said compartment, the article holder engaging portion of said retaining member bears against the article holder and retains the article holder in position in said article displaying compartment such that a major face of the article is viewable through the aperture in the article holder retaining member and through a transparent wall of the article holder.

5,191,973
ADJUSTABLE PAINTBRUSH HOLDER
Boris Shteynberg, San Francisco, Calif., assignor to Kass Enterprises, San Bruno, Calif.
Filed Jun. 24, 1992, Ser. No. 903,721
Int. Cl.[5] B65D *75/14*, *5/50*
U.S. Cl. 206—15.2 18 Claims



1. A one-piece paintbrush holder for a paintbrush having bristles, a ferrule, and a handle, said holder having an inner face and an outer face, said holder comprising:
- a main panel for covering one face of said paintbrush, said main panel including first circulation means for ventilating said bristles, viewing means for inspecting said bristles and said ferrule, and brush-supporting means for tapering said bristles at a specific angle;
- a first side panel being foldably connected to a right side of said main panel, said first side panel having a taper from a

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top to a bottom thereof, said taper having said specific angle;

a second side panel being foldably connected to a left side of said main panel, said second side panel having said taper from the top to the bottom thereof and a wedge-shaped longitudinal cutout at a top thereof;

an intermediate panel foldably connected to a right side of said first side panel, said intermediate panel including second circulation means for ventilating the bristles of said paintbrush, the outer face of said intermediate panel having a first fastener;

a spacer panel foldably connected to a bottom side of said main panel;

a lower panel foldably connected to a bottom side of said spacer panel;

a front panel foldably connected to a left side of said second side panel, an outer face of said front panel having a second fastener and a third fastener, said front panel having an aperture large enough to expose said second circulation means once said intermediate panel and said front panel are folded, said front panel incorporating closure means for locking with said first fastener; and

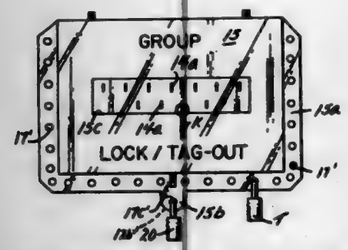
fastening means for adjustably locking with said second and third fasteners, said fastening means being attached to a top side of said main panel.

5,191,974

SAFETY BOX

Marion J. Seaman, Rte. 2, Box 100, Tell City, Ind. 47586

Filed May 19, 1992, Ser. No. 885,543
Int. Cl.[5] A45C *11/32*
U.S. Cl. 206—37.6 7 Claims



1. A safety container for storing at least one key therein, which key is used to render power driven machinery operative, said container comprising

a base defining a storage cavity therein,

a lid which is transparent on at least a portion thereof and which is pivotally attached to said base, for selectively opening and closing said cavity and for permitting viewing of the contents of said cavity therethrough when said lid is closed against said base such that said cavity is closed,

means disposed in said cavity for supporting at least one key thereon so as to be viewable through said transparent portion when said lid is closed against said base,

a first flange attached to and along at least a portion of the periphery of said lid and projecting outwardly therefrom,

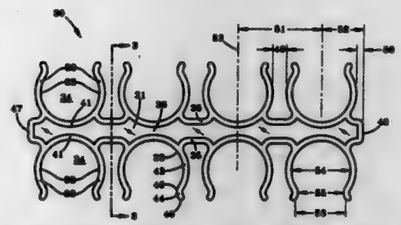
a second flange attached to and along at least a portion of the periphery of said base and projection outwardly therefrom, said first and second flanges lying in registry with one another when said lid is closed against said base, said first and second flanges each defining a plurality of spaced apart apertures, the plurality of apertures in one of said flanges registering with the plurality of apertures in the other of said flanges when said lid is closed against said base such that an identification member can be inserted through any one pair of registered apertures to secure said lid against said base.

5,191,975

PACKAGING DEVICE AND PACKAGING ASSEMBLY

Paul A. Pezzoli, Worthington; Antonino Araujo, Jr., Arlington, and Raymond W. Hazlett, Sugar Grove, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 13, 1990, Ser. No. 627,152
Int. Cl.[5] B65D *75/00*; B66C *1/42*
U.S. Cl. 206—151 23 Claims



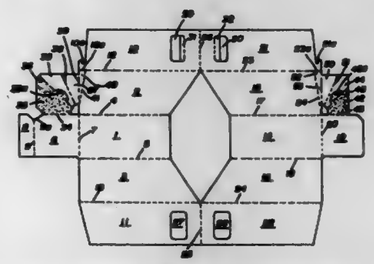
1. A packaging device for retaining a plurality of containers, said device comprising a longitudinal central section and a plurality of means for gripping containers integral therewith, each of said gripping means comprising a pair of opposed resilient gripping members with opposite sides of said longitudinal central section having at least two of said paris of gripping members extending therefrom, each gripping member of each said pair of gripping members having a gripping surface and each pair of gripping members forming an opening for receiving and retaining a container, each said opening having a centerline that is perpendicular to a longitudinal axis of said longitudinal central section and is colinear with the centerline of an opening located on the opposite side of said longitudinal axis, said longitudinal central section having a pair of opposed longitudinal ends which are each disposed longitudinally outwardly of the nearest gripping members, and the distance between the centerlines of the openings formed by any next adjacent pairs of gripping members is twice as large as the distance between each said longitudinal end and the centerline of the openings formed by the nearest pairs of gripping members, as measured along the longitudinal axis of the longitudinal central section.

5,191,976

BASKET CARRIER WITH WEBBED REINFORCED BOTTOM

James T. Stout, Acworth, and James B. DeMaio, Marietta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 3, 1991, Ser. No. 801,884
Int. Cl.[5] B65D *71/00*
U.S. Cl. 206—198 6 Claims



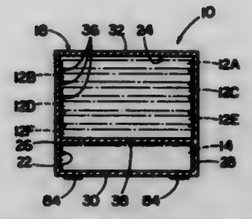
1. An article carrier comprising opposed side walls, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, riser panels foldably joined to said end wall panels remote from said side walls and extending medially inward of the carrier and having upwardly extending portions, a multiple ply handle formed in the upwardly extending portions of said riser panels, a bottom panel foldably joined to the lower edge of each one of said side walls, an anchoring panel foldably joined to a side edge of each of said bottom panels and secured in flat face containing relation therewith, a first web panel foldably joined to each of said anchoring panels along a diagonal edge of each of such anchoring panels which edge is angularly disposed relative to said side edge of the associated bottom panel, a second web panel foldably joined to each of said first web panels along a diagonal fold line which is angularly disposed to said diagonal edge, and an attachment flap foldably joined to each of said second web panels along one edge of each of said second web panels wherein said one edge is generally coaxial with an side wall lower edge and each attachment flap being also foldably joined to the lower part of an adjacent one of said end wall panels along a fold line which is angularly disposed relative to said fold line between said second web panels and said attachment flap and forming a lower bottom portion of the associated end wall panel.

5,191,977

STORAGE CONTAINER FOR STORING COMPACT DISC CASES AND MULTI-DISC CHANGER CARTRIDGE

Scott H. Markovitz, 23 Oakhurst Cir., Pittsburgh, Pa. 15215

Filed Mar. 9, 1992, Ser. No. 848,476
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—309 13 Claims



1. A storage container for storing cases for holding compact discs and for storing a multi-disc changer cartridge for a compact disc player, said storage container comprising:

(a) a housing having an interior cavity and including an interior partition wall extending across said interior cavity so as to define a pair of separate interior compartments in said cavity of said housing;

(b) one of said pair of separate interior compartments of said housing having means for removably storing a multi-disc changer cartridge containing a plurality of compact discs in a given order; and

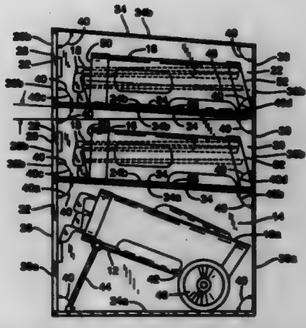
(c) the other of said pair of separate interior compartments of said housing being greater in height than said one of said pair of separate interior compartments and having means for removably storing a plurality of cases for the plurality of compact discs in the same order as the given order of the compact discs contained in the changer cartridge.

5,191,978

LOCKER SET FOR STORING GOLF EQUIPMENT

Stuart W. Strader, Portland, and John P. Wells, Molalla, both of Oreg., assignors to Strader, Wells & Jamison, Inc., Portland, Oreg.

Filed Jul. 19, 1991, Ser. No. 732,608
Int. Cl.[5] A63B *55/00*, *55/08*, *57/00*
U.S. Cl. 206—315.2 4 Claims



2. In combination, a set of lockers for storing golf equipment including a golf club bag and a golf club cart;

the set of lockers comprising first and second enclosures, each of the enclosures being defined by top and bottom walls, first and second vertical side walls, and first and second vertical end walls, the first enclosure being disposed above the second enclosure;

the top and bottom walls having a length and a width;

each of the side walls having a length and a height, and each of the end walls having a height and a width, the widths of each of the end walls being substantially equal;

the first and second end walls of each enclosure being rectangular in shape, the first end wall of each enclosure comprising a door and including means for pivotally mounting said door to provide access to the enclosure;

the lengths of the top and bottom walls of the first and second enclosures being longer, by at least a factor of two, than the widths of the walls;

the heights of the end walls of the second enclosure being substantially greater than the widths of the end walls;

the top and bottom walls of each enclosure being rectangular in shape;

the end walls of both the first and second enclosures being oriented vertically;

the first and second side walls of the first enclosure each having four corners, the corner adjacent to the bottom wall and the first end wall defining an angle greater than ninety degrees and the corner adjacent to the bottom wall and the second end wall defining an angle less than ninety degrees;

the second end wall of the second enclosure having a height substantially less than the height of the first end wall of the second enclosure;

wherein the bottom wall of the first enclosure defines a floor thereof that is inclined downwardly as it extends from the first end wall to the second end wall thereof;

the golf club bag being disposed in the fist enclosure;

the golf club bag including a plurality of golf clubs;

the golf club bag having a longitudinal axis and comprising generally an open top and a closed bottom;

the golf club bag being disposed in the first enclosure with the longitudinal axis generally parallel to the bottom wall of the first enclosure and the open top adjacent to the first end wall, for urging the golf clubs int he golf club bag toward the bottom of the golf club bag;

the golf club cart being disposed in the second enclosure, the golf club having a frame portion, a handle portion, and a wheel portion;

the frame portion being adapted for carrying a second golf club bag;

the handle portion being integral with the frame portion for pushing or pulling the golf club cart;

the wheel portion being mounted on the frame portion, the wheel portion, the wheel portion being positioned to permit the golf club cart to be rolled on the bottom wall of the second enclosure to facilitate withdrawal of the card from the second enclosure.

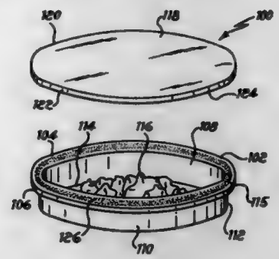
5,191,979
INDIVIDUAL DISPOSABLE DRINKING CUPS AND METHOD
Allan Nemeroff, 124N Beaver Hill, 309 Florence, Jenkintown, Pa. 19046
Filed Jan. 23, 1985, Ser. No. 694,108
Int. Cl.[5] B65D *3/00, 79/00;* B65B *5/00;* G09F *19/00*
U.S. Cl. 206—459.5 4 Claims

1. Drinking cup identification apparatus comprising an elongated container, a set of drinking cups comprising a plurality of cups nestably received in said container and sequentially removable therefrom, and individual identifying indicia associated with each of said cups so as to facilitate visual discrimination of one cup from the others of said set, said indicia including a visually discernible identifying symbol attached to said cup, said identifying symbol being different from the symbols of the other cups in said set so as to distinguish the cups in said set from one another, said indicia being affixed to said cups in a preselected order during manufacture so that said cups, when removed from said container, carry said indicia, and said cups being received in said container in said preselected order.

2. A method of distinguishing disposable drinking cups one from another, comprising the steps of: providing a set comprising a plurality of drinking cups and applying to the cups of said set individual identifying indicia different from the indicia of the other cups of the set so as to facilitate visual discrimination of said cups one from the other, said step of supplying individual indicia to said cups consisting of selecting individual indicia to be associated with individual cups of said set and affixing said indicia to said cups in a preselected order during manufacture of said cups, and the further step of placing said cups in a container in said preselected order.

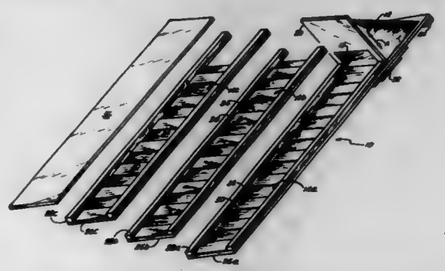
5,191,980
PROTECTIVE VESSEL FOR A GETTER MATERIAL
Claudio Boffito, and Giuliano Benati, both of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy
Filed Mar. 20, 1992, Ser. No. 855,507
Claims priority, application Italy, Apr. 16, 1991, M191A001037
Int. Cl.[5] B65D *85/72*
U.S. Cl. 206—524.4 21 Claims

1. A protective vessel for a getter material comprising:
i) a first sheet of thermally stable material which is attached to;
ii) an adhesive, which in turn is attached to;



iii) a second sheet of thermo-retractable plastics material, said first and second sheets enclosing said getter material.

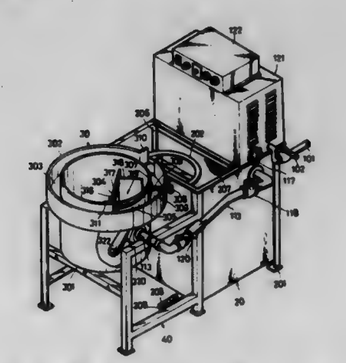
5,191,981
SPECIFIC GRAVITY METAL SEPARATOR
Frederick W. Young, 122 Wilder St., Niceville, Fla. 32578
Filed Dec. 2, 1991, Ser. No. 801,411
Int. Cl.[5] B03C *1/30*
U.S. Cl. 209—39 13 Claims



1. A material separator for separating desired material from a slurry comprising:
(a) a hopper having an open top and a bottom opening therein;
(b) at least one passageway in fluid connection with said bottom opening, each said passageway being angled downwardly from said bottom opening and comprising an elongated tray along which the to-be-separated slurry flows, said tray further comprising magnetic separator means for separating and collecting the desired material from said slurry, said magnetic separator means comprising a plurality of spaced apart magnetic spoilers projecting slightly above said tray and extending transverse to the direction of flow of said slurry along said tray; and,
(c) a discharge chute, secured to the end region of each said passageway and extending upwardly from said end region, said discharge chute being open at the top and terminating at an elevation below said open top of said hopper.

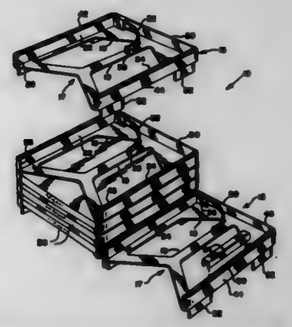
5,191,982
BEAN SIFTING DEVICE
Hsu C. Tong, No. 63-1, Kuei Sui St., Taipei, Taiwan
Filed May 15, 1992, Ser. No. 884,717
Int. Cl.[5] B03B *5/28*
U.S. Cl. 209—155 1 Claim

1. A bean sifting device comprising:
water-supply assembly being fixedly mounted on upper right side of a water tank, and having a water inlet for supplying water therein through a valve connected two pipes, of which a smaller pipe being connected into a pump and blades therein, while a larger pipe being connected into a water tank, and said larger pipe being mounted with a water level controller which is to control on or off of said pipe in accordance with signal from a water level detector; said pump being mounted over said water tank by means of a supporting frame; the front end of said pump having a pipe extended into a lower part of said water tank, and said pipe being mounted with a netting filter and a one-way valve above said netting filter; said pump having a pipe extended in a floating-sifting tank with a water outlet; said pipe having a shunt pipe mounted between said pump and said water tank, and opening of said pipe being positioned above the water level in said water tank, and said pipe having a valve; said pipe connected with said floating-sifting tank being mounted with a valve and a one-way valve to limit water to flow only in said floating-sifting tank; said water-supply assembly being covered with a body casing, on which an electric control box being mounted;
said water tank being a rectangular cubic tank supported with supporting legs; a supporting frame being attached to an inner wall of said water tank for receiving a sieve basket; both front and rear inner wall of said water tank being furnished with sliding grooves respectively for inserting sieves respectively; the bottom of said water tank being furnished with a water outlet controlled by means of a valve;



said floating-sifting tank being pivotally mounted with bearing blockets on a supporting frame that is fixed beside said water tank; said floating-sifting tank being round-shaped tank slightly inclined towards said water tank; said floating-sifting tank also being able to turn leftwards (i.e., opposite to said water tank) for pouring off one class of beans; bottom of said floating-sifting tank being a curved one, and an outer wall with a larger diameter bein mounted around said floating-sifting tank in concentric-circle manner to form into a round passage; top edge of said floating-sifting tank having a slot hole being in communication with said round passage; a curved movable plate similar in shape to said slot hole being mounted in front of said slot hole, and said movable plate being attached with a screw bolt which is mounted with a spring; one end of said screw bolt being fastened with a knob on said outer wall; said screw bolt able to move axially upon said knob being turned so as to adjust space between said slot hole and said movable plate; said outer wall having an exhausting port extended to and over said supporting frame on said water tank; a fastening bracket being attached to inner wall of said tank body, and said fastening bracket having two oblong holes for receiving two screw bolts on a rectangular sliding channel plate, and then two knobs being fastened to said two screw bolts respectively; said sliding channel plate fastened to said fastening bracket able to be adjusted up and down upon loosening said two knobs; said sliding channel plate being mounted nearing said slot hole and having two U-shaped channels for receiving a sliding plate which has a damping plate on one side thereof; said damping plate being slightly smaller than said sliding plate; moving said sliding plate able to vary the dimensions of a water damping area formed with said sliding channel plate, said damping plate and said tank body; said tank body being slightly inclined to said water tank; a pipe of said water-supply assembly passing through a front bearing block to extend in the lower part of said tank body with a water outlet, which is fixed in place at an angle; a locking means being furnished under the exhausting port of said floating-sifting tank so as to retain said floating-sifting tank beside said water tank;
said water-supply assembly able to draw out water with said pump to flow through said netting filter, said one-way valve, a pipe and finally to said pump, from which a pressurized water flowing through a pipe, a valve and a water outlet to said floating-sifting tank; said water outlet being set at an angle and bottom of said tank body being round and curved in shape, which can cause water flowed in to generate a whirl so as to have beans having a light specific gravity become floating in upper water and to flow into said water damping area which is formed with said sliding plate, said damping plate and said slot hole, and then flowing to outside of said tank body, and through said round passage, and to said exhausting port and finally to a sieve basket on said supporting frame of said water tank so as to automatically sift beans into different classes.

5,191,983
MODULAR STORAGE RACK
Stephen N. Hardy, Copley, Ohio, assignor to RTC Industries, Inc., Chicago, Ill.
Filed Oct. 31, 1991, Ser. No. 785,926
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—40 16 Claims

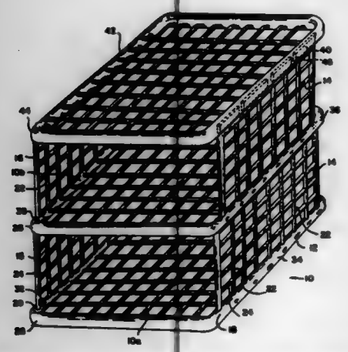


1. A modular storage rack for storing a plurality of objects such as compact disc boxes, tape cassettes or the like comprising:
a plurality of individual storage units, each unit being adapted to retain one of said objects therein;
modular means on said storage unit cooperable for frictionally engaging and stacking one unit above another;
resilient means in said storage unit cooperable with a first edge of an inserted object for locking and retaining said object in its unit; and
fulcrum means in said storage unit cooperable with a retained object for rotating said object responsive to inward pressure applied to said object whereby said resilient means urges said object from the storage unit.

5,191,984
DISPLAY OR STORAGE RACK FOR NECKTIES AND THE LIKE
Richard H. Kon, Avon, Conn.; Stephen J. Jamperson, Riverside, and Terasi T. T. Jerila, West Covina, both of Calif., assignors to The Stanley Works, New Britain, Conn.
Filed Apr. 13, 1992, Ser. No. 867,886
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—115 18 Claims

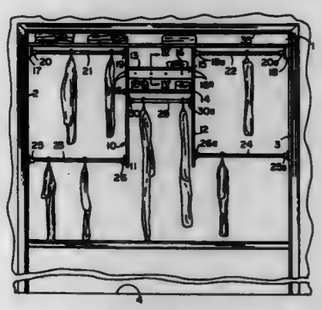
1. A necktie storage rack comprising:
an elongated housing;
means for mounting the housing horizontally in a closet;
an elongated slide having a transverse external cross-section complementary to the internal cross-section of the housing for support within the housing with freedom to slide in the longitudinal direction between a retracted position within the housing and an extended position extending forwardly from the housing;
a plurality of wheels rotatably mounted beneath the slide, each wheel including a plurality of radially extending legs having a horizontal top surface; and
means on the outer end of each leg for retaining a stored necktie on the leg.

5,191,985
MODULAR SUPPORT AND DISPLAY UNIT
Yaffa Licari, 875 Ocean Ave., Elberton, N.J. 07740
Continuation of Ser. No. 567,394, Dec. 30, 1983. This application Jan. 6, 1986, Ser. No. 826,281
Int. Cl.[5] A47B *47/00*
U.S. Cl. 211—188 18 Claims



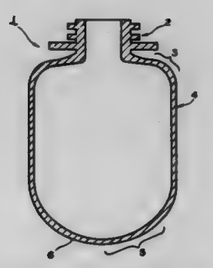
1. Stackable one-piece integral plastic modular support and display unit comprising
side walls of selective thickness, each having a top edge and a bottom edge, the bottom edge having a bottom edge lateral boundary surface portion,
a generally horizontal base of selective thickness and having a top side and an underside, the top side having opposed corresponding top side lateral boundary surface portions to the bottom edge lateral boundary surface portions of the side walls,
a corresponding integral plastic flexible hinge of reduced thickness relative to the thickness of the side walls and relative to the thickness of the base integrally permanently connecting each corresponding said side wall to the base, each said hinge being disposed between the bottom edge of the corresponding side wall and the top side of the base and arranged in laterally offset relation thereto at a corresponding lateral boundary surface portion of the bottom edge of the side wall thereat and at a corresponding opposed lateral boundary surface portion of the top side of the base thereat, for movement of the side walls relative to the base from an outward generally flat horizontal position in generally horizontal alignment with the base to an upward generally vertical position generally normal to the base, and
two cooperating joining means comprising modular extensions having an outer surface as first joined means and corresponding modular recesses having an inner surface as second joining means, one of said first and second joining means being provided on the top edges of said side walls and the other of said first and second joining means being provided in the underside of the base and corresponding adjacent the hinges,
the outer surface of said extensions being of similar dimensions as the dimensions of the inner surface of said recesses to accomplish a snap fit or friction fit therebetween upon stacking one such unit upon the next.

5,191,986
STORAGE ORGANIZER SYSTEM AND METHOD FOR INSTALLING THE SAME
Lee M. Huizenga, 1298 Waukazoo Dr., Holland, Mich. 49424
Filed Jun. 9, 1992, Ser. No. 896,147
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—189 12 Claims



1. A storage organizer system for a storage space having a back wall extending vertically upwardly, two spaced parallel side walls extending vertically upwardly and perpendicularly forward of said back wall and a floor comprising:
a center section assembly including two vertical panels spaced parallel to each other and having a vertical edge with at least one shelf extending therebetween and rigidly secured thereto;
a wooden cleat having a length equal to the distance between said vertical panel/, said cleat being secured horizontally to said back wall a distance above the floor greater than the vertical length of said vertical panels, said cleat having sufficient thickness extending from said back wall to receive a fastener extending into the ends thereof;
said center section assembly mounted on said cleat with the vertical edges of said vertical panels abutting the back wall and said shelf resting on the top edge of said cleat with fasteners extending through said vertical panels and into the ends of said cleat; and
support rods extending between and secured to said vertical panels and said side walls.

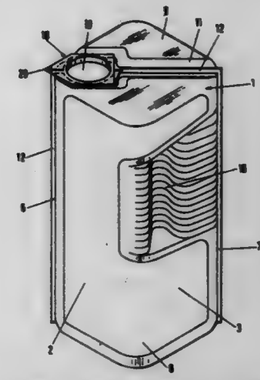
5,191,987
BOTTLE MADE OF SATURATED POLYESTERS
Hiroji Niimi, and Yoshimitsu Moritani, both of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Oct. 21, 1991, Ser. No. 779,851
Claims priority, application Japan, Oct. 19, 1990, 2-282515
Int. Cl.[5] B65D *1/02, 1/42*
U.S. Cl. 215—1 C 4 Claims



1. A bottle made of saturated polyesters comprising a mouth, an upper shoulder, a barrel, a lower shoulder and a bottom, characterized in that the saturated polyester at the upper and/or lower shoulders has an orientation degree of not more than 0.6, the saturated polyester at the upper and lower shoulders has an orientated crystallinity of not more than 50%, and the thickness of the upper and lower shoulders is not less than 0.25 mm.

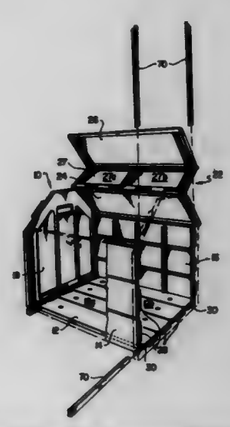
5,191,988
PACK WITH PERIPHERAL SEAM FOR FLOWABLE CONTENTS
Wilhelm Reil, Bensheim; Ulrich Deutschbein, Mühltal; Gerd Knobloch, Griesheim, and Udo Liebram, Pfungstadt, all of Fed. Rep. of Germany, assignors to Tetra Pak Holdings S.A., Pully, Switzerland
Filed Nov. 30, 1990, Ser. No. 621,616
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1989, 3939970; European Pat. Off., Apr. 11, 1990, 90106965.8
Int. Cl.[5] B65D *1/42*
U.S. Cl. 220—4.24 16 Claims

1. A plastic container for a flowable material, said container having side walls which together form a tube, two end walls, one of which is an essentially flat bottom wall and the other of which is an essentially flat top wall, one of said end walls having a closable hole, each of said bottom and top walls having a depression extending thereacross, a seam standing out from said side walls of said container encompasses said container and lies in a plane which is disposed so that it is parallel to the longitudinal central axis of said tube, said seam being arranged so that it extends in said depression in the region of



said top and bottom walls, and that part of the depression surrounds the closable hole.

5,191,989
SYSTEM FOR CONSTRUCTING STORAGE CONTAINERS FOR READY ASSEMBLY AND DISASSEMBLY
Bruce J. Butler, 5 Gladney Street, St. John's, Newfoundland, A1E 4T7, Canada
Filed Feb. 20, 1992, Ser. No. 839,304
Int. Cl.[5] B65D *6/24*
U.S. Cl. 220—4.34 12 Claims



1. A component system for constructing storage containers adapted for ready assembly and disassembly, said system comprising:
a series of panels, at least some of which include tongues or grooves along at least two edges thereof,
each said tongued panel comprising a sheet section having an edge flange therearound, and at least one tongue disposed longitudinally of and extending outwardly from at least two associated said edges,
each said grooved panel comprising a sheet section having an edge flange therearound and having a receiving channel associated with at least two edges thereof and spaced from said edges, said receiving channel comprising a

recessed part of said sheet section, said channel including at least one opening through said sheet section,

and wherein each said tongue of a tongued panel is adapted for insertion through a corresponding said opening of an adjacent grooved panel into an associated receiving channel,

said system further comprising at least one locking member slidable in each said receiving channel and for slidably engaging and locking each said tongue in position when said tongue is inserted through a corresponding opening into an associated receiving channel.

5,191,990

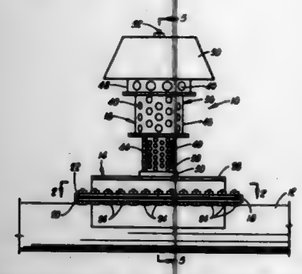
FLASH GAS VENTING AND FLAME ARRESTING APPARATUS

Donald K. Fritts, Tulsa, Okla., assignor to BS&B Safety Systems, Inc., Tulsa, Okla.

Continuation of Ser. No. 719,516, Jun. 24, 1991, abandoned. This application Oct. 23, 1992, Ser. No. 965,531

Int. Cl.[5] F17D *3/00*

U.S. Cl. 220—88.1 **14 Claims**



1. A flash gas venting and flame arresting apparatus for preventing damage to a closed vessel or system by flash gas formed therein, said vessel or system having an outlet connection attached thereto comprising:

pressure responsive valve means connected to said outlet connection or relieving pressure exerted thereon from within said vessel or system as a result of the presence of flash gas therein and for venting said flash gas from said vessel or system; and

a flame arresting receptacle connected to said valve means external of said vessel or system for receiving said flash gas and arresting flame associated therewith prior to releasing said flash gas, said receptacle including an elongated housing having an inlet end connected to said valve means and being of generally increasing internal diameter as the distance from said inlet end of said housing increases, sides having a plurality of flash gas exit ports therein which ports generally increase in size as the distance thereof from said inlet end of said housing increases, and a closed opposite end for changing the direction of flow of flash gas which impinges thereon.

5,191,991

HOUSINGS WITH SAFETY PRESSURE RELIEF MEANS THEREON

Leonard Jackson, Newcastle Upon Tyne, England, assignor to Northern Engineering Industries PLC, Newcastle Upon Tyne, England

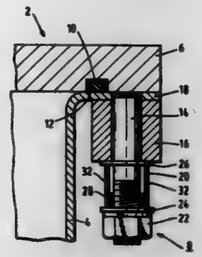
Continuation-in-part of Ser. No. 517,731, May 2, 1990, abandoned. This application May 28, 1991, Ser. No. 707,290

Claims priority, application United Kingdom, May 8, 1989, 8910495

Int. Cl.[5] B65D *51/16*

U.S. Cl. 220—207 **5 Claims**

1. A housing comprising a body member and a closure member secured together in a sealing relationship by a plurality of bolts, each of said bolts having a shaft and a head, a tubular deformable member being provided for each of said bolts to surround the shaft of said each bolt to react between the head of said each bolt in and an abutting one of the body member and the closure member, each of said tubular deformable members being provided with a spacing means for spacing the deformable member coaxially with respect to said each bolt, said spacing means comprising a ring encircling said tubular member and having a thickness so as to assure co-axial positioning of said tubular member about said shaft of said associated bolt to thereby assure uniform loading of said deformable member thereby hindering premature collapsing of said tubular deformable member, whereby upon an increase in pressure within the housing above a predetermined critical value, controlled deformation of the tubular deformable member is effected through relative movement between the body member and the closure member to provide a gap between said members to relieve pressure within the housing.



5,191,992

TAMPERPROOF SEALING ARRANGEMENT FOR GAS CYLINDERS

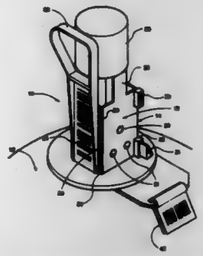
Derek I. Darley, Chaiwan, Hong Kong, assignor to Safe T Seal Limited, Nassau, The Bahamas

Filed May 18, 1992, Ser. No. 884,019

Claims priority, application United Kingdom, May 24, 1991, 9111333

Int. Cl.[5] B65D *51/16*

U.S. Cl. 220—214 **20 Claims**



1. A tamperproof seal arrangement for the pin index outlet valve of a gas cylinder, comprising a body capable of being positioned closely and securely around the pin index valve and having a number of faces matching those of the valve, one face having at least one inwardly directed projection engaging in and matching either the outlet of the valve and/or the pin index hole or holes of the valve, and another face having non-removably associated with it a unique identification marking, that face being joined to adjacent faces by rupturable means, whereby removal of that face with the identification marking will destroy the continuity of the body, whereafter the rest of the body can be removed from the pin index valve to allow use of the pin index valve whilst it is apparent that the seal arrangement has been destroyed or otherwise visibly damaged.

5,191,993

DEVICE FOR THE SHIFTING AND TILTING OF A VESSEL CLOSURE

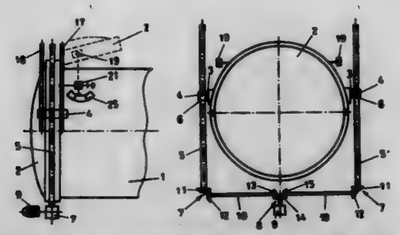
Freddy Wanger, Oberrohrdorf; Marcel Refer, Mohnthal, and Rainer Schneckenburger, Stein, all of Switzerland, assignors to Xorella AG, Wettingen, Switzerland

Filed Feb. 24, 1992, Ser. No. 840,462

Claims priority, application Switzerland, Mar. 4, 1991, 00645/91

Int. Cl.[5] B65D *43/14*

U.S. Cl. 220—333 **6 Claims**



1. A device for the shifting and tilting of a vessel closure having a locking device to seal the vessel under pressure or vacuum, comprising at least one shifting means mounted to the vessel closure for shifting and unlocking the closure after pressure or vacuum in the vessel has been relieved and at least one swivel arm mounted to said vessel closure and vessel for the tilting of the unlocked vessel closure, said at least one swivel arm being journaled to said vessel to permit both rotation and transverse motion of said at least one swivel arm, said at least one swivel arm having a first end and a roller mounted to said end, said vessel having an arcuate support for supporting said roller over at least a part of the range of rotation of said at least one swivel arm.

5,191,994

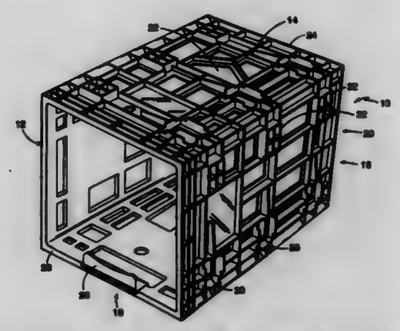
WATER BOTTLE CRATE

Alfred G. Stauble, P.O. Box 17, 2 Main St., Hollis, N.H. 03049

Filed Jun. 10, 1992, Ser. No. 896,228

Int. Cl.[5] B65D *11/16*

U.S. Cl. 220—771 **3 Claims**



1. A molded plastic crate for the storage and transport of a water bottle comprising

two pairs of opposed side walls joined at their adjoining longitudinal edges to define a square box,

a back wall, joined to rear widthwise edges of said side walls, closing one end of the box,

at least one of said side walls having a handle opening, dimensioned so that the fingers of a human hand can be inserted through said opening, in a location which is approximately over the center of gravity of the box when the box contains a full water bottle.

5,191,995

GOLF BALL STORAGE AND DISPENSING DEVICE

Gayle McDonald, 151 W. 5275 South, Murray, Utah 84107

Filed Jan. 13, 1992, Ser. No. 819,998

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—24 **7 Claims**

1. A golf ball storage and dispensing device comprising, a straight cylindrical tube for containing a column of golf balls, which straight cylindrical tube is closed on one end and is open at the other; platform means arranged to slide within said straight cylindrical tube under the urgings of spring biasing means and including means for moving said platform means against said spring biasing means; and a means for passing a number of golf balls into said straight cylindrical tube onto said platform means that is also a means for dispensing one at a time, golf balls from said straight cylindrical tube open end and consists of a sleeve whereto is secured, at a right angle a collar, that opens into said sleeve and is arranged for mounting over the open end of the straight cylindrical tube, and a piston means for movement in said sleeve, to travel across the open end of said collar and straight cylindrical tube, said piston means including means for receiving a golf ball when positioned opposite to said straight cylindrical tube open end and for dispensing said golf ball therefrom when said piston is moved in said sleeve to where said means for receiving a golf ball is beyond the side of said straight cylindrical tube.

6. A golf ball storage and dispensing device comprising, a cane shaped cylindrical tube for containing a column of golf balls, which cylindrical tube is closed on one end and is open at the other cane head end; platform means arranged to slide within said cylindrical tube under the urgings of spring biasing means and including means for moving said platform means against said spring biasing means; an opening formed through the cane head end of said cylindrical tube with gate means arranged for closing off said opening for passing a number of golf balls into said cylindrical tube onto said platform means; and a cup that has a concave portion to receive a golf ball seated therein, and pivot means for mounting said cup across the cylindrical tube cane head open end to allow said cup to rotate to where the cup concave portion is across the cylindrical tube cane head open end such that a golf ball seated therein will fall from that cup.

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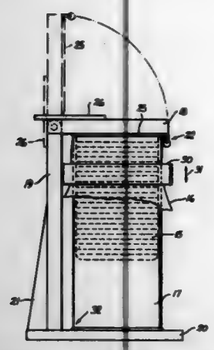
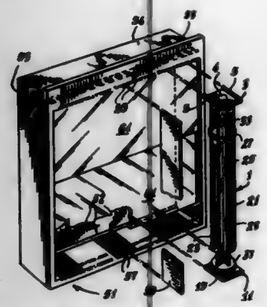
5,191,996
BREAD DISPENSING APPARATUS
George C. Jenkins, P.O. Box 1527, Statesboro, Ga. 30458
Filed Dec. 18, 1991, Ser. No. 809,168
Int. Cl.[5] B65G *59/02*; B65D *83/00*
U.S. Cl. 221—64 6 Claims



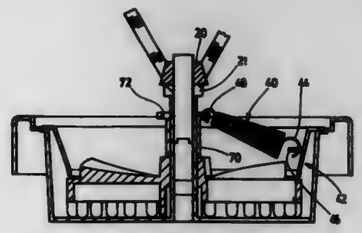
6. A dispenser for a loaf of sliced bread packaged in a plastic wrapping having an open end, comprising in combination, a storage compartment with a dispensing opening for storing the loaf of bread with the open end of the plastic wrapping extending out of the dispensing opening with an unwrapped upper slice of bread exposed within the dispensing opening, a dispensing means movable downwardly outside the compartment having a mechanism for grasping the open end of the wrapping thereby to move the bread slice by slice toward the dispensing opening for manual removal as the dispensing means is moved downwardly and sealing cover means for closing the opening over the unwrapped upper slice with limited exposure to air thereby to sanitarily protect the stored bread and prolong its life.

5,191,997
CAROUSEL-TYPE GRAVITY FEED FILM DISPENSER AND FILM CASSETTE THEREFOR
Anthony C. Squitieri, Norwalk, Conn., assignor to Mechtronics Corporation, Stamford, Conn.
Filed Jun. 3, 1992, Ser. No. 892,970
Int. Cl.[5] A47F *1/00*
U.S. Cl. 221—119 7 Claims



1. A carousel for dispensing canisters of film, said carousel including
a film-holding base secured to a vertical spine mounted centrally of said base,
a plurality of vertical channels formed about said spine and proximate to one another, said channels having vertical slots therein narrower than said canisters, said slots being on that portion of said channels farthest removed from said spine,
the uppermost portions of said slots being widened and so dimensioned as to form openings to receive said canisters, and the lowermost ends of said channels having openings to permit removal of individual canisters, and
means associated with said base and with the upper end of said spine for pivotally securing said carousel to a display device, said last-named means including a bottom plate pivotally secured to said base and a top plate pivotally secured to said upper end of said spine.

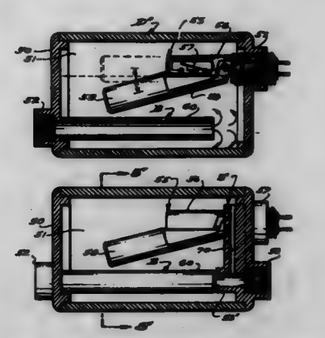
5,191,998
BRUSH HOUSING FOR BULK VENDOR
Josef W. Schwarzli, Vandorf Road, R.R. #4, Stouffville, Ontario, Canada L0H 1L0
Filed May 8, 1992, Ser. No. 880,692
Int. Cl.[5] G07F *11/00*
U.S. Cl. 221—203 10 Claims



1. A coin operated bulk vending apparatus for dispensing articles comprising
a product bin for storing the articles, disposed above a dispensing wheel advanced by a coin operated gear mechanism and having containers for advancing the articles toward a dispensing aperture located beneath the dispensing wheel, and
means disposed above the dispensing apparatus for preventing loose articles in the product bin from accessing the dispensing aperture, comprising resilient members extending over the dispensing aperture above the dispensing wheel having one end anchored adjacent to a periphery of the dispensing wheel and another end anchored to an adjusting ring adjustably engaged around a bushing disposed about an axis of the dispensing wheel, the bushing having means for releasably retaining the adjusting ring in a selected position.

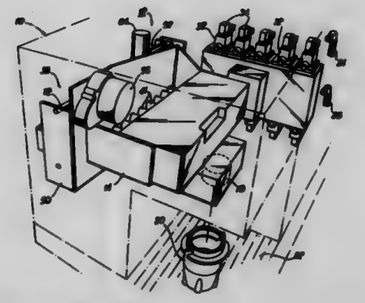
5,191,999
LIQUID ACTUATED SWITCH DEVICE
Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720
Filed Feb. 25, 1992, Ser. No. 841,094
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—56 11 Claims

1. A liquid actuating switch device to control the operation of electrically operated devices in response to the presence of a full flow of liquid at an operating pressure in a fluid conducting passage, said switching device includes a case defining an accumulator chamber normally filled with gas with an upper and with a lower portion communicating with upstream and downstream sections of the fluid-conducting passage; and a liquid actuated control switch unit positioned in the chamber to be actuated by a pressurized liquid forcibly moved into and through the chamber rises to an actuating level therein where



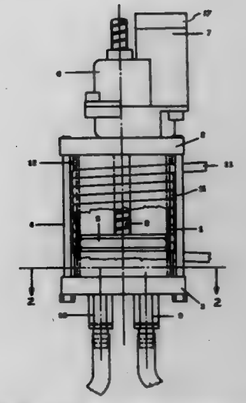
pressures on the gas in the upper portion of the chamber and on the liquid therein reach substantial equilibrium.

5,192,000
BEVERAGE DISPENSER WITH AUTOMATIC RATIO CONTROL
Lisa C. Wandrick, Decatur; George H. Hoover, Marietta; Roger C. Whigham, Atlanta, and John H. Bearden, Marietta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 522,627, May 14, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,743
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—59 15 Claims



1. Apparatus comprising:
(a) a post-mix beverage dispenser including a beverage dispenser valve having separate syrup and water conduits, a solenoid controlled on-off valve in each of said conduits, and an adjustable, piston/sleeve, pressure compensating flow control in each of said conduits;
(b) means for measuring the flow rate through each of said conduits;
(c) means for automatically comparing each of said measured flow rates with a preferred flow rate;
(d) means for automatically adjusting a selected one of said flow controls a selected amount in response to said comparing means;
(e) wherein said adjusting means includes a flow control sprocket wheel connected to each of said flow controls and for rotating a selected one of said sprocket wheels a selected amount to adjust the flow control connected to said selected sprocket wheel; and
(f) wherein said comparing means includes means for detecting a flow error trend over a plurality of separate pours.

5,192,001
PUMP AND MEASURING DEVICE FOR COFFEE MACHINES WITH THREADED PISTON ROD
Carlo Bianco, Milan, Italy, assignor to Ricerca Elettromeccanica S.r.l., Milan, Italy
Filed Sep. 24, 1991, Ser. No. 765,905
Claims priority, application Italy, Jan. 25, 1991, MI 91 U 00064
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—63 8 Claims



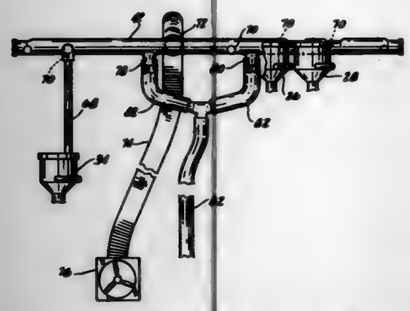
1. A measuring pump for small electrical household appliances, comprising:
a cylinder (1) having opposite ends;
a first end wall (2) fixed to and closing one end of said cylinder;
a second end wall (3) fixed to and closing an opposite end of said cylinder;
a circulating ball screw type actuator (6) mounted to said first end wall, said actuator having an externally threaded piston shaft (8) extending therethrough and moveable by actuation of said actuator, said piston shaft extending through said first end wall and into said cylinder;
a piston (5) mounted for sliding movement in said cylinder and directly connected to said piston shaft for movement of said piston with actuation of said actuator;
motor means (7) operatively connected to said actuator for actuating said actuator to move said piston shaft and piston in said cylinder;
heating means closely engaged around said cylinder for heating said cylinder;
an exit duct (10) communicating with an interior of said cylinder for discharging liquid from said cylinder with movement of said piston in one direction; and
a suction duct (9) communicating with the interior of said cylinder for supplying liquid into said cylinder with movement of said piston in an opposite direction.

5,192,002
INGREDIENT MIXING BOWL AND EVACUATION SYSTEM
Robert J. Reese, St. Charles, and Franklin D. Newkirk, Florissant, both of Mo., assignors to Unidynamics Corporation, New York, N.Y.
Filed Oct. 1, 1991, Ser. No. 769,961
Int. Cl.[5] B67D *1/16*
U.S. Cl. 222—108 3 Claims

1. An overflow evacuation system for mixing bowls in a vending machine for producing and dispensing mixed beverages formed from a mixture of selected dry ingredients and liquids, said system comprising:

top panel and terminating in an inner edge, said peripheral
said piston and having a sealing portion sized for frictional

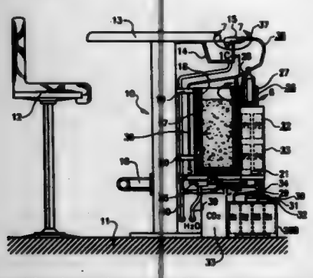
a plurality of mixing bowls of generally conical shape each having an open upper portion and forming an outlet spout in their lower portion from which the mixed beverage is expelled, an annular cap covering said upper portion and having a central opening through which said dry ingredients can be introduced, steam evacuation means in said upper portion of said mixing bowl connected to a vacuum source for producing a vacuum for removing steam from said bowl and for removing overflow liquid from said bowl when it becomes clogged;



an evacuation tube interconnected to said evacuation means of each said mixing bowl, said tube being connected to said vacuum source and having at least one liquid outlet means downstream of said mixing bowl and upstream of said vacuum source for removing liquid from said tube;

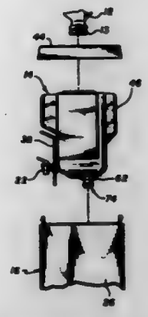
said evacuation tube having a first tube portion disposed generally horizontally and having a plurality of inlets each connected to a respective steam evacuation means of each said mixing bowl, a second tube portion connecting said vacuum source with said first tube portion through an inlet in a side portion of the first tube portion, and at least one drain port in a bottom portion of the first tube portion.

5,192,003
BEVERAGE BAR STRUCTURE AND SYSTEM
Chris L. Billings, 527 Miller Ave., Layton, Utah 84041
Filed Jan. 13, 1992, Ser. No. 820,197
Int. Cl.[5] B67D 5/56
U.S. Cl. 222—129.1 14 Claims



13. In combination, a beverage dispenser system, a pumping unit coupled to said beverage dispenser system for delivering pressured beverage liquids to said beverage dispenser system, a series of beverage liquid supplies coupled to said pumping unit to be pumped by said pumping unit, a container well upstanding from said pumping unit, and an ice chest releasably supporting said pumping unit and container well.

5,192,004
BOTTLED WATER STATION WITH REMOVABLE RESERVOIR
Bruce D. Burrows, Valencia, Calif., assignor to Ebtech, Inc., Columbus, Ohio
Filed Apr. 22, 1991, Ser. No. 688,861
Int. Cl.[5] B67D 5/62
U.S. Cl. 222—146.1 27 Claims



1. A water station, comprising:

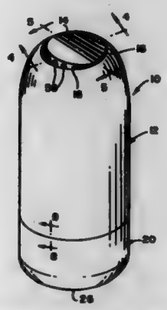
a reservoir module including a hollow reservoir for receiving and storing a supply of water and faucet means for dispensing water from said reservoir;

a station housing having support means for receiving and supporting said reservoir module, said station housing including a temperature control probe; and

means for sealed reception of said probe through an opening formed in said reservoir module to contact water within said reservoir, when said reservoir module is supported by said station housing support means, said reservoir module being removable as a unit from said station housing;

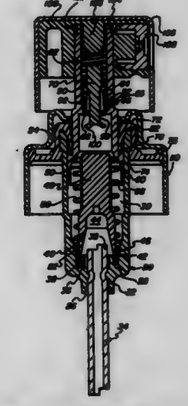
said station housing further including means for controlling the temperature of said probe to correspondingly control the temperature of the water within said reservoir.

5,192,005
CONDIMENT SHAKER
Larry G. Zimmerman, Champaign, Ill., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Aug. 1, 1991, Ser. No. 739,264
Int. Cl.[5] B65D 47/00
U.S. Cl. 222—148 22 Claims



1. A condiment shaker comprising a hollow body adapted to contain a condiment for selective dispensing thereof, an opening defined through said body, wall means peripherally encircling said opening, a lid for said opening received within said wall means, said lid including a top panel generally coextensive with said opening, and a peripheral flange depending from said top panel and terminating in an inner edge, said peripheral flange being received within said wall means in sufficiently close peripheral proximity thereto to substantially preclude discharge of shaker contents therebetween, said lid including a dispensing section and a pressure section extending from said dispensing section and defining a pivot line therebetween, a first portion of said lid flange, within said dispensing section, including dispensing slot means defined therein and extending transversely between said inner edge and said top panel, and pivot means mounting said lid in said opening for pivotal movement along said pivot line of said lid between a dispensing position and a closed position; said dispensing slot means in said dispensing position of said lid being positioned at least partially outward of said hollow body and said opening wall means and defining a through passage outward from said hollow body to the exterior of said hollow body for a dispensing of a condiment therefrom, said lid flange peripherally beyond said first portion being in substantially sealed engagement with said opening wall means; said dispensing slot means in said closed position of said lid being positioned within said opening and in transverse alignment with a corresponding portion of said opening wall means to preclude dispensing through said slot means.

5,192,006
LOW PROFILE PUMP
Owen F. Van Brocklin, Bristol, and Glenn W. McGarvey, Watertown, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.
Filed May 1, 1991, Ser. No. 694,418
Int. Cl.[5] B65D 88/54
U.S. Cl. 222—321 25 Claims



1. A pump for dispensing liquids from a container, comprising:

a hollow body having upper and lower ends having openings therein;

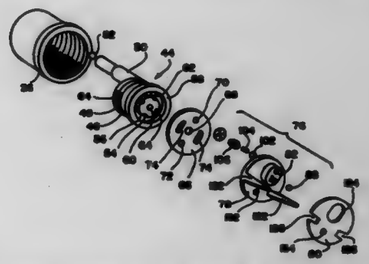
a lower valve located in and adapted to close said opening in said lower end of said body during an increase in pressure inside said hollow body and to open said opening in said lower end during a decrease in pressure inside said hollow body, said lower valve having an upper end extending upwardly inside said body;

a hollow piston fitted into said upper end of said body and retained in and slidable reciprocally with sealing fit in said body against a spring bias, said piston having upper and lower ends having openings therein, said piston having an upper chamber and a lower chamber connected together, said lower chamber having a diameter which is less than the diameter of said upper chamber;

an upper valve fitted into and slidable reciprocally inside said piston and having a sealing portion sized for frictional fit inside said lower chamber of said piston, said sealing portion being sized to provide a clearance between said sealing portion and said upper chamber of said piston, said upper valve being movable from said lower chamber to said upper chamber to vent said body during an increase in pressure inside said hollow body and being movable from said upper chamber to said lower chamber to close said body during a decrease in pressure inside said hollow body, said upper valve further comprising a central stem extending downwardly, said stem having a length selected such that said stem will contact said upper end of said lower valve during the terminal portion of a downward stroke of said piston and an initial portion of an upward stroke of said piston whereby said upper valve is held open during said terminal portion of said downward stroke of said piston and said initial portion of said upward stroke of said piston; and

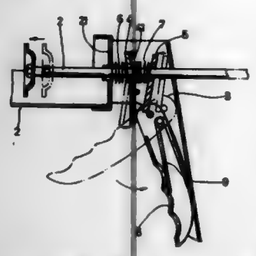
means for biasing said upper valve against upward movement, said biasing means having biasing force selected to operate in conjunction with frictional forces between said sealing portion of said upper valve and said lower chamber to keep said upper valve closed during an increase in pressure inside said body until said frictional force is released when said upper valve is caused to slide upwardly against said biasing means into said upper chamber of said piston to thereby vent said body, and thereafter when pressure in said body has decreased to return said upper valve from said upper chamber to said lower chamber to close said body.

5,192,007
VALVE ASSEMBLY FOR INVERTED DISPENSING FROM A CONTAINER WITH A PUMP
Leonard A. Blomquist, Williamsburg, Va., assignor to Continental Plastic Containers, Inc., Norwalk, Conn.
Filed Dec. 21, 1990, Ser. No. 631,958
Int. Cl.[5] B67D 5/00
U.S. Cl. 222—376 20 Claims



1. A valve assembly for an adapter for coupling a manual pump to a container for dispensing a liquid from such container with such container in an inverted position, said valve assembly comprising a disc adapted to seal a pump from a container body, a valve unit carried by said disc and including a vent passage and a liquid passage through said disc, a floating check valve for closings aid vent passage only in an inverted position of said valve unit, and a spring loaded check valve seated against said liquid passage when said container is in an upright position, said spring loaded check valve being loaded for unseating by liquid pressure from liquid seated thereof when said container is in an inverted position.

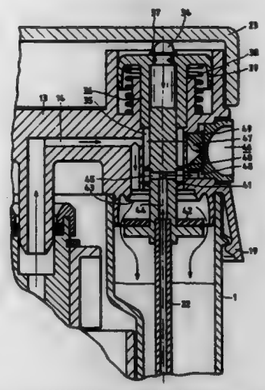
5,192,008
PULLING MECHANISM OF AN ADHESIVE-DISPENSING GUN
Chi-Chuan Hwan, Changhua Hsien, Taiwan, assignor to Dai Shyan Enterprise Co., Ltd., Changhua Hsien, Taiwan
Filed Jan. 23, 1992, Ser. No. 824,394
Int. Cl.[5] B67D 5/42
U.S. Cl. 222—391 **1 Claim**



1. An improved pulling mechanism of an adhesive-dispensing gun, comprising a gun barrel having rear wall, a gun base, a trigger and a push rod, said push rod extending through said rear wall of said gun barrel, said pulling mechanism being characterized in that a stopper plate and a push plate are fitted on said push rod between said rear wall and said gun base, a first spring being disposed on said push rod between said rear wall and said stopper plate, a second spring being disposed on said push rod between said stopper plate and said push plate, a pivot rod being welded at the upper end of said stopper plate on two lateral walls of said gun base, said stopper plate being formed with a hole through which said push rod extends and formed with a lower bent portion which contacts said trigger, said push plate being formed with a hole through which said push rod extends, the lower end of said push plate contacting said trigger to be driven thereby, a torque spring being disposed on a pivot of said trigger to restore said trigger back to its home position after triggered, whereby said stopper plate is pushed out of the stopping position and said push rod is free from any force so that no excessive adhesive will be further dispensed and said push rod can be freely pulled back.

5,192,009
DEVICE FOR SPRAYING FLUIDS, HAVING ELECTRICALLY OPERATED AIR COMPRESSOR AND FREE BLOWING NOZZLE
Bodo Hildebrandt, Riedstadt; Detlef Mattinger, Bickenbach, and Karl Trinkaus, Darmstadt, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
PCT No. PCT/EP90/01051, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO91/00149, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 30, 1990, Ser. No. 656,054
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 392143; Jun. 30, 1989, 8907976[U]; Jun. 30, 1989, 8907977[U]
Int. Cl.[5] B65D 83/00
U.S. Cl. 222—400.5 **32 Claims**

1. A device for spraying of fluids, comprising an electrically driven air pump; a switch for actuating said air pump; a container for a fluid to be sprayed; a nozzle having inlet air and fluid openings; a compressed air duct communicating the inlet air opening with said air pump; a fluid conduit communicating the inlet fluid opening with an interior of said container; a valve having a control cylinder including a first opening which is in communication with said inlet air opening of said nozzle, a second opening which is in communication with said inlet fluid opening of said nozzle, and a third opening which is in communication with an air space of said container, and a control piston axially displaceable in said control cylinder for controlling flow through said first and second openings and having at least one circumferential sealing ring engaging an inner wall of said control cylinder, said air pump being actuated in response to actuation of said switch to provide for air flow from said compressed air duct into the interior of said container and for fluid flow into said inlet fluid opening of said

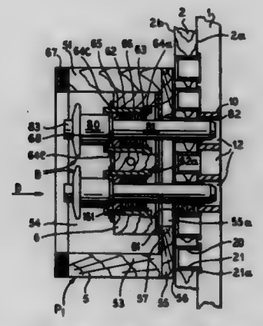


nozzle said valve deactivating said switch after communication between said compressed air duct and the interior of said container and between said fluid conduit and said inlet fluid opening is blocked by said valve at an end of a spraying process.

5,192,010
LOAD SUPPORTING DEVICE USEFUL AS A FISH STRINGER
William J. Green, 3821 Barbara Way, Salt Lake City, Utah 84124
Filed Jul. 1, 1991, Ser. No. 723,748
Int. Cl.[5] A01K 65/00
U.S. Cl. 224—103 **5 Claims**

1. A fish stringer carrier for holding and carrying fish comprising: a canted receiver arm to accept the fish in through the gills and out through the mouth and having a receiver neck, a carrier arm provided with an upper clip attachable to an external object and having a lower, depending cam loop, and a receiver loop integral with and interposed between said receiver arm at said receiver neck and said carrier arm at said depending cam loop, said receiver arm being angulated upwardly and outwardly above the horizontal and provided said receiver neck which overlaps at an acute angle and partially twists about said depending cam loop whereby fish from the force of gravity can slide down the receiver arm between and past said receiver neck and said cam loop at such overlap and onto said receiver loop with no further action from the user.

5,192,011
DEVICE FOR SEPARATING BLANKS FOR PACKAGES FROM A SHEET OF BLANKS
Werner Fuchs, Lausanne, Switzerland, assignor to Bobst SA, Switzerland
Filed Apr. 10, 1991, Ser. No. 683,075
Claims priority, application Switzerland, Apr. 10, 1990, 01220/90
Int. Cl.[5] B26F 3/02
U.S. Cl. 225—97 **15 Claims**

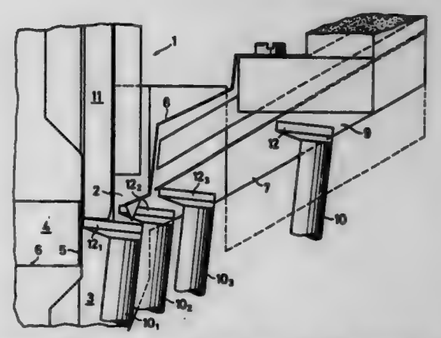


1. In a device for separating blanks formed in a sheet of material, which blanks will be subsequently formed into packages, said device comprising an upper vertical movable tool provided with several punches which are adjustably positioned on the upper tool and have adjustable dimensions and a lower fixed tool provided with several apertures corresponding in their position and dimensions to the punches so that the punches will push a blank through the apertures, the improvements comprising the upper tool comprising a first plate member having a plurality of holes being arranged in a pattern, each punch being provided with quick-locking means for pressing an upper surface of the punch under an elastic load against a lower surface of the first plate member, said quick-locking means including a first end engaged within the punch and a second end extending through a hole in said first plate member, and a second plate member being secured to an upper surface of the first plate member, said second plate member having enlarged apertures encompassing several holes in the first plate member and having separate openings aligned with other holes of the first plate member, which other holes are not encompassed by said apertures of the second plate member.

5,192,012
NAIL DRIVING TOOL
Manfred Schafer, Bad Homburg; Alfred Schneider, Langen; Horst Tacke, Bad Vilbel, and Gerhart Hartmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to ITW Befestigungssysteme GmbH, Eschborn-Niederhochstadt, Fed. Rep. of Germany
Filed Dec. 5, 1991, Ser. No. 802,573
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1990, 9016493[U]
Int. Cl.[5] B25C 1/00
U.S. Cl. 227—113 **10 Claims**

1. A nail driving tool, comprising:
a magazine for housing a plurality of serially disposed nails, said magazine including a guide path along which said plurality of serially disposed nails are moved, and an outlet opening through which said plurality of serially disposed nails are serially conveyed from said guide path;
a discharge channel, disposed adjacent to said outlet opening of said guide path, through which a leading one of said plurality of serially disposed nails, conveyed through said outlet opening of said guide path, is discharged;
means for engaging said leading one of said plurality of serially disposed nails which is disposed within said discharge channel for discharging said leading one of said plurality of serially disposed nails through said discharge channel; and
a cantilevered leaf spring having a first proximal end thereof fixedly mounted upon said magazine and an opposite, distal free end thereof engaged with a nail, of said plurality of serially disposed nails, which is disposed immediately upstream of said leading one of said serially disposed nails disposed within said discharge channel, for retaining all of said plurality of serially disposed nails disposed within said guide path and upstream of said leading one of said serially disposed nails disposed within said discharge channel.

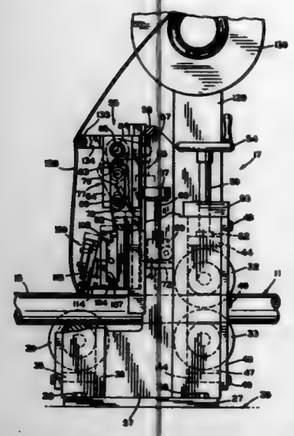
4. A nail driving tool, comprising:
a magazine for housing a plurality of serially disposed nails, said magazine including a guide path along which said plurality of serially disposed nails are moved, and an outlet opening through which said plurality of serially disposed nails are serially conveyed from said guide path;
a discharge channel, disposed adjacent to said outlet opening of said guide path, through which a leading one of said plurality of serially disposed nails, conveyed through said outlet opening of said guide path, is discharged;



means for engaging said leading one of said plurality of serially disposed nails which is disposed within said discharge channel for discharging said leading one of said plurality of serially disposed nails through said discharge channel;
a cantilevered leaf spring having a first proximal end thereof fixedly mounted upon said magazine and an opposite, distal end thereof engaged with a nail, of said plurality of serially disposed nails, which is disposed immediately upstream of said leading one of said plurality of serially disposed nails disposed within said discharge channel, for retaining all of said plurality of serially disposed nails disposed within said guide path and upstream of said leading one of said plurality of serially disposed nails disposed within said discharge channel; and
magnet means disposed upon a side of said discharge channel which is opposite the side upon which said outlet opening of said guide path is disposed and within the vicinity of said leading one of said plurality of serially disposed nails for retaining said leading one of said plurality of serially disposed nails within said discharge channel in preparation of said discharge of said leading one of said plurality of serially disposed nails from said discharge channel by said means for engaging said leading one of said plurality of serially disposed nails.

VOL 1148 ISS 2 MR 9 1993 UMI

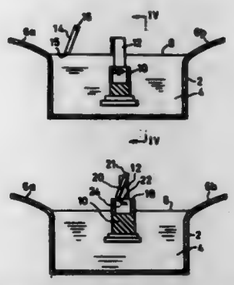
5,192,013
SCARFING APPARATUS
Nelson D. Abbey, III, Mentor, and Timothy J. Lewandowski, Swanton, both of Ohio, assignors to Abbey Etna Machine Company, Perrysburg, Ohio
Filed Sep. 20, 1991, Ser. No. 763,338
Int. Cl.[5] B23K *37/08*
U.S. Cl. 228—13 8 Claims



3. Apparatus for scarfing a longitudinally extending raised bead from the outer surface of an advancing elongated member comprising a base, rollers mounted upon said base for advancing said elongated member along a predetermined path, a carrier member mounted for reciprocating movement toward and away from said advancing elongated member, a mounting block, pivotally interconnected elongated linkage means connecting said mounting block to said carrier member, said linkage means selectively affixing said mounting block in a predetermined position relative to said carrier member for movement in unison with said carrier member and for reciprocating movement toward and away from said carrier member, a traveling support block carried by said mounting block, means for moving said support block relative to said mounting block and transversely of said path, and at least one scarfing blade carried by said support block, said scarfing blade having at least one cutting edge adapted to scarfingly engage said surface and sever said raised bead from said advancing member, the rollers including a first said roller over which said elongated member passes and positioned beneath the point at which said cutting edge scarfingly engages said surface, an associated pair of cooperating second said rollers positioned to receive said elongated member therebetween following scarfing of said raised bead, and means for adjusting the elevation of said pair of second rollers relative to said first roller.

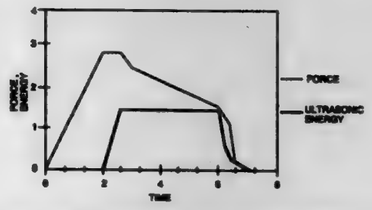
5,192,014
DIP SOLDERING APPARATUS
Alexander J. Cialglo, and Neil C. Squire, both of Essex, Great Britain, assignors to Pillarhouse International Limited, Great Britain
Filed Oct. 15, 1991, Ser. No. 775,747
Claims priority, application United Kingdom, Oct. 15, 1990, 9022333; Oct. 15, 1990, 9022336
Int. Cl.[5] B23K *1/00*
U.S. Cl. 228—34 6 Claims

1. Soldering apparatus comprising a bath for containing molten solder, a pot movable from beneath a surface of the solder in the bath, and scraper means for scraping the surface of the solder in the bath before the pot is moved upwards through the surface, and for scraping an upper surface of the pot after it has moved upwards through the surface of the solder in the bath, wherein the scraper means comprises two



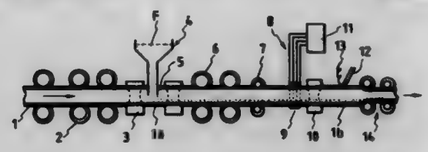
blades, a first blade to scrape the surface of the solder in the bath, and a second blade to scrape the surface of the pot.

5,192,015
METHOD FOR WIRE BONDING
Lloyd D. Ingle, Lompoc, and John D. Koontz, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Filed Nov. 20, 1991, Ser. No. 795,416
Int. Cl.[5] H01L *21/607*
U.S. Cl. 228—111 8 Claims



1. A method for bonding a first article to a second article at a selected location, using a wire bonding technique in which a bonding force and ultrasonic energy are applied at the location simultaneously, the method comprising the steps of:
furnishing a first article and a second article, at least one of the first article and the second article being sufficiently soft that it deforms when the bonding force is applied independently of applied ultrasonic energy;
placing the first article over the second article;
positioning the first article and second article between a pair of bonding tools, with the bonding tools at a selected location of the first article and second article where bonding is to be achieved;
pressing the selected location of the first article and second article between the pair of bonding tools with an applied force, the applied force increasing from zero to a prebonding force, maintaining the prebonding force for a prebonding force period of time, thereafter changing the applied force from the prebonding force to a bonding force, and thereafter decreasing the force from the bonding force to zero; and
applying ultrasonic energy to the selected location through at least one of the bonding tools, the ultrasonic energy increasing to a prebonding energy during the period that the force is being increased from zero to the bonding force, maintaining the prebonding energy for a prebonding energy period of time, thereafter changing the ultrasonic energy to a bonding energy prior to the time that the applied force is decreased from the bonding force to zero, and thereafter decreasing the ultrasonic energy to zero.

5,192,016
METHODS FOR MANUFACTURING TUBES FILLED WITH POWDERY AND GRANULAR SUBSTANCES
Nobuo Araki; Takeji Kagami; Yoji Chatani; Shunichi Kikuta; Iwao Yamada; Masao Kamada; Seiji Hashimoto; Shuichi Ueno, all of Tokyo; Takeshi Fukui, Fukuchiyama; Takumi Nakamura, Tokyo; Nobuo Mizuhashi, and Yasushi Ishikawa, both of Sagamihara, all of Japan, assignors to Nippon Steel Corporation and Nippon Steel Welding Products & Engineering Co., Ltd., both of Tokyo, Japan
PCT No. PCT/JP91/00836, § 371 Date Feb. 21, 1992, § 102(e) Date Feb. 21, 1992, PCT Pub. No. WO91/19590, PCT Pub. Date Dec. 26, 1991
PCT Filed Jun. 21, 1991, Ser. No. 835,957
Claims priority, application Japan, Jun. 21, 1990, 2-161398; Jun. 21, 1990, 2-161399; Jun. 25, 1990, 2-164260
Int. Cl.[5] B23K *13/02*
U.S. Cl. 228—147 13 Claims

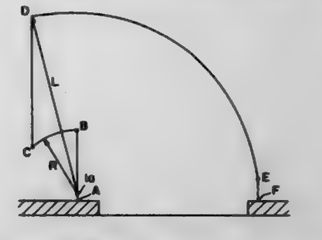


1. A method of continuously manufacturing tubes filled with a powdery and/or granular substance by forming a metal strip fed in the longitudinal direction thereof into an unwelded tube (1*a*) with forming rolls (2), feeding a powdery and/or granular substance (F) through an opening in the unwelded tube (1*a*) being formed, butt welding the fringing edges of the opening, and reducing the diameter of the welded tube (1*b*) which is characterized in that:
the minimum allowable heat input below which cold cracking occurs and the maximum allowable heat input above which spatters not smaller than 0.83 times the inside diameter of the finished tube are expelled in the butt welding are determined beforehand; and
the butt welding is performed with a heat input that is greater than the minimum allowable heat input and smaller than the maximum allowable heat input.

5,192,017
Patent Not Issued For This Number

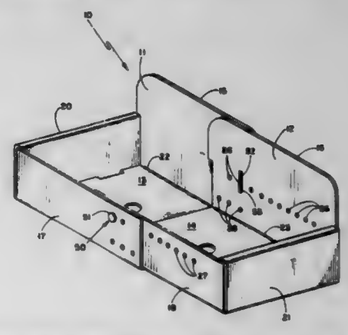
5,192,018
WIRE BONDING METHOD
Yoshimitsu Terakado, and Nobuto Yamazaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan
Filed Feb. 27, 1992, Ser. No. 842,257
Claims priority, application Japan, Feb. 27, 1991, 3-53700
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—179 3 Claims

1. A wire bonding method comprising the ordered steps of:
bonding an end of a bonding wire to a first bonding point;
unclamping said bonding wire;
raising a capillary to a first predetermined point above said first bonding point;
stopping said capillary temporarily at said first predetermined point;
moving said capillary through a circular arc of a constant radius in a direction opposite to that of a second bonding point to a second predetermined point;
raising said capillary to a third predetermined point above said second predetermined point a distance sufficient to form a bonding wire loop;
clamping said bonding wire;
moving said capillary through another circular arc of an-



other constant radius to a forth predetermined point above said second bonding point;
lowering said capillary to said second bonding point; and
bonding said bonding wire to said second bonding point.

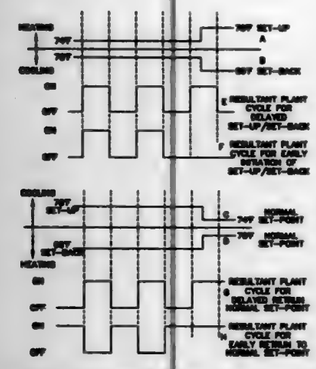
5,192,019
PACKAGE PRODUCT DISPLAY BOX HAVING ADJUSTABLE LENGTH FEATURE
Kermit E. Meehan, Wayzata, Minn., assignor to The Mike Meehan Company, Plymouth, Minn.
Filed Jun. 18, 1992, Ser. No. 900,353
Int. Cl.[5] B65D *5/32*
U.S. Cl. 229—101 2 Claims



1. In a point-of-purchase product display receptacle assembly comprising nesting and telescoping first and second mating receptacle segments adapted to mate together to form an open-top display container with each of said segments having a back panel, upstanding side and end flaps, said receptacle segments being characterized in that:
(a) said first receptacle segment comprising a generally rectangular parallelepipedon with a back panel, a pair of side flaps extending from said back panel and forming opposed juncture lines with said back panel, and one end flap extending at right angles from said back panel to form an open-end female segment;
(b) said second receptacle segment comprising a generally rectangular parallelepipedon with a back panel, a pair of side flaps extending from said back panel and forming opposed juncture lines with said back panel; and one end flap extending at right angles from said back panel to form an open-end male segment, with the one end flap of the male segment being arranged in oppositely disposed relationship to the end flap of said female segment;
(c) spaced-apart rows of aligned bores formed in the side flaps of said first and second receptacle segments and being disposed along row axes generally parallel to said opposed juncture lines and including an upper row and a lower row with the axes of each of the respective rows positioned to be aligned with a correasponding row on the

other mating receptacle segment, and with the number of bores disposed along the axes closer to each of said opposed juncture lines being substantially fewer in number than those disposed more remote to each of said opposed juncture lines, the arrangement being such that the receptacle segments may be telescopically engaged one to the other in a predetermined selected relationship.

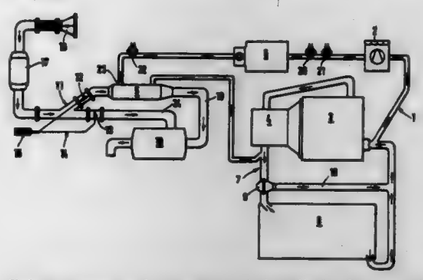
5,192,020
INTELLIGENT SETPOINT CHANGEOVER FOR A PROGRAMMABLE THERMOSTAT
Dipak J. Shah, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 8, 1991, Ser. No. 789,503
Int. Cl.[5] G05D *23/19*
U.S. Cl. 236—46 R **18 Claims**



1. An apparatus to match initiation of temperature changeover settings of a thermostat to a duty cycle of an air temperature conditioning plant without degrading comfort level comprising:
a programmable changeover thermostat;
an input means for programming said thermostat with changeover temperature settings at selectable time of day periods;
a clock means to determine time of day;
a timing means for determining the length of time of an "on" portion and an "off" portion of said duty cycle of said air temperature conditioning plant;
a comparison means to determine a time until an upcoming temperature conditioning plant cycle;
a means to advance or delay said temperature changeover until the beginning of the upcoming "on" period or upcoming "off" period of the upcoming duty cycle or the last "on" period or the last "off" period of the last duty cycle of said air temperature conditioning plant when the time until the upcoming temperature changeover is less than the time of the last "on" period duty cycle or less than the time of the last "off" period duty cycle of said air temperature conditioning plant.

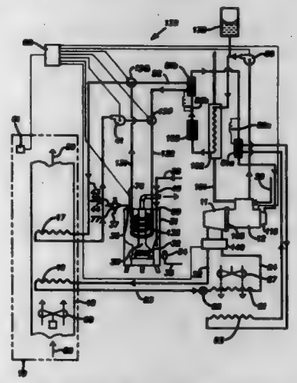
5,192,021
ARRANGEMENT FOR HEATING PASSENGER AREAS OF VEHICLES
Richard Meier, Stein, and Herbert Knorr, Reduitzhembach, both of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Aug. 22, 1991, Ser. No. 748,639
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1990, 4026595
Int. Cl.[5] B60H *1/18*
U.S. Cl. 237—2 A **2 Claims**

1. An arrangement for heating the passenger area of a vehicle, including a warm water circuit means which serves for the transfer of heat and in which are connected, in series, an internal combustion engine, a torque converter transmission, an exhaust gas heat exchanger, and heating units for said passenger area, said arrangement further comprising:
an exhaust gas diverter that is disposed upstream of said exhaust gas heat exchanger and is controllable via valve means for selective conveyance of exhaust gas through said exhaust gas heat exchanger or directly via an exhaust gas pipe to a muffler, with a downstream side of said exhaust gas heat exchanger communicating with said muffler;



a linkage system and a compressed air cylinder for operating said valve means of said exhaust gas diverter;
thermal-lag switch means disposed in said warm water circuit means for controlling said compressed air cylinder;
a catalytic converter disposed upstream of said exhaust gas heat exchanger between an exhaust manifold of said internal combustion engine and said exhaust gas diverter; and
a burner heating means disposed in said warm water circuit means downstream of said exhaust gas heat exchanger.

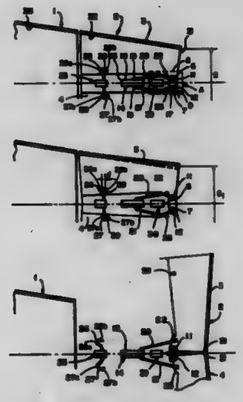
5,192,022
FUEL-FIRED HEAT PUMP SYSTEM
Paul F. Swenson, Shaker Heights, Ohio, assignor to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.
Filed May 26, 1992, Ser. No. 888,910
Int. Cl.[5] F25B *27/00*
U.S. Cl. 237—2 B **12 Claims**



1. A heat pump system for an occupied space of a building comprising a fuel-fired heat engine and a heat pump compressor driven by the heat engine, the mechanical horsepower output capacity of the engine being substantially equal to the input power requirement of the compressor, an indoor refrigeration circuit heat exchanger in thermal communication with air in the occupied space, and an outdoor refrigeration circuit heat exchanger in thermal communication with the outdoor environment of the building, a refrigerant circuit connecting

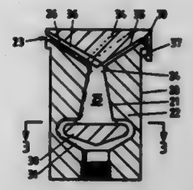
the refrigeration heat exchangers and the compressor to permit the compressor to pump heat between the heat exchangers when operated by the engine, a heat storage medium for absorbing heat rejected by the engine during its operation, the heat storage medium having a capacity to store a substantial quantity of heat for a period at least substantially as long as a maximum expected time that the engine is inoperative between ordinary cycles of operation, and means for selectively transferring said substantial quantity of heat stored in the storage medium to the engine to preheat the engine, after it has been at rest for a time sufficient to cool off, to a temperature substantially equal to its operating temperature.

5,192,023
JET ENGINE PROVIDED WITH A THRUST REVERSER
Etienne Fage, Ramatuelle, and Jean-Pierre Lair, Plaisance, both of France, assignors to The Dee Howard Company, San Antonio, Tex.
Division of Ser. No. 263,224, Oct. 27, 1988, Pat. No. 4,966,327. This application Aug. 24, 1990, Ser. No. 573,481
Int. Cl.[5] F02K *1/10, 1/12*
U.S. Cl. 239—11 **1 Claim**



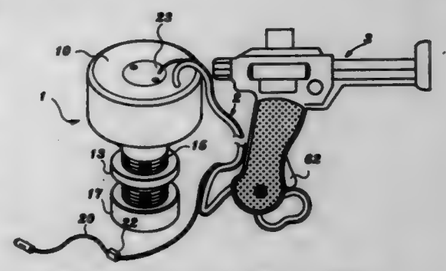
1. A method of reversing the thrust of a jet engine and varying the cross-sectional area of the throat of an ejection nozzle for said jet engine in a target door reversing system comprising the steps of:
(a) pivoting a thrust reverser target door means of a jet engine between stowed and deployed positions with an actuator means, said target door means defining it its stowed position at least a portion of the throat of the ejection nozzle of the jet engine and in its deployed position at least a portion of a target door reverser,
(b) selectively retaining said target door means in its stowed position,
(c) independently and selectively moving said thrust reverser target door means while in its stowed position between at least first and second limiting position to vary the cross-sectional area of the throat of said ejection nozzle between respective minimum and maximum values, said door retaining means permitting sufficient movement of said thrust reverser door when it is selectively moved between said first and second limiting positions, and for controlled varying of the area of the throat,
(d) said thrust reverser door functioning when deployed to reverse the thrust of the jet engine exiting the ejection nozzle during thrust reversing operation and also being effective while remaining stowed to vary the cross-sectional area of the throat of the throat of the ejection nozzle of the jet engine to thereby permit optimization of engine thrust to suit different engine operating regimes.

5,192,024
SPRINKLER
Leonard J. Blee, 66 Leslie Ave., Blair Athol, Australia 5084
Filed Sep. 16, 1991, Ser. No. 760,404
Claims priority, application Australia, Sep. 17, 1990, PK 2371; Jun. 25, 1991, PK 6875
Int. Cl.[5] B05B *3/08*
U.S. Cl. 239—222.21 **14 Claims**



1. A sprinkler useful as an irrigation device comprising a body containing an annular surface extending from an upstream end to a discharge end, including a throat intermediate said ends, a generally conical surface diverging from said throat to said discharge end, and fair surfaces in the region of said throat,
swirl imparting surfaces at the upstream end of said generally conical surface, and
an impeller in a conical depression having a generally conical surface, diverging in a discharge direction and substantially complementary in shape to said diverging conical surface to said body, so that, in use, most of the impeller surface lies contiguous with said diverging conical body surface, said impeller conical surface containing surfaces defining a plurality of discharge channels extending outwardly from near its center, said discharge channels being of size and shape to be co-operable with said diverging conical body surface to confine water when discharging into respective coherent water jets.

5,192,025
ELECTRIC WATER JET FOR AUTOMOBILE
Ming-Thy Hu; Yun-Wen Hwang, both of 3 Fl., No. 11, 62 Lane, Wan-Lung St., Chin-Mei District, Taipei; Min-Sheng Hwang, 5 Fl., No. 12, 393 Lane, Chung-Shan Rd., Hsinchu, and Eong-Chan Sheen, No. 19, 60 Lane, Jen-Ai St., Chin-Tung Tsun, Lin-Chin Village, Taisan Hsien, all of Taiwan
Filed Jul. 19, 1991, Ser. No. 733,193
Int. Cl.[5] B05B *9/03*
U.S. Cl. 239—394 **2 Claims**



1. An electric water spray gun system comprising:
a) a floatable intake device having a body made of lightweight material having a stem portion extending therefrom; a plurality of weight rings engaging the stem portion by threads for adjustment of the center of gravity of the floatable intake device by adjusting at least one of the position and number of such weight rings; a filter ring

having a plurality of filter elements of different filtration sizes arranged thereon so as to cover an opening defined at a lower end of the stem portion which opening serves as an inlet port; a first d.c. motor located in an upper section of a passage defined within the body, a lower section of the passage serving as a water inlet passage and an upper section serving as a first water outlet port; a first vane fixed to a drive shaft of the first d.c. motor; a first wall between the first vane and the first d.c. motor; a check valve located in the passage at the first water outlet port; a retention plate to attach the first d.c. motor to the body; and a power cord extending from the first d.c. motor and adapted to engage a d.c. power source;

b) an electric spray gun having a gun body defining a generally "L" shaped water passage with a second water inlet port at one end and a second water outlet port at another end; a second d.c. motor located at the turning point of the water passage; a second vane fixed to a drive shaft of the second d.c. motor to pump and change direction of water flow approximately 90 degrees; a nozzle adjacent to the second water outlet port to spray out the water from the outlet port; a second power cord extending from the second d.c. motor and adapted to engage a d.c. power source; and

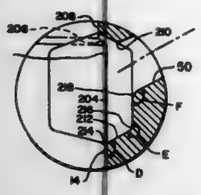
c) a hose connecting the first water outlet port of the floatable intake device to the second water inlet port of the spray gun.

5,192,026

FUEL INJECTORS AND METHODS FOR MAKING FUEL INJECTORS

David M. Rix, Columbus, and Christine M. Yingling, North Vernon, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Mar. 29, 1990, Ser. No. 501,023
Int. Cl.[5] F02M *61/18*
U.S. Cl. 239—533.3 1 Claim



1. A fuel injector for an internal combustion engine, said fuel injector comprising:

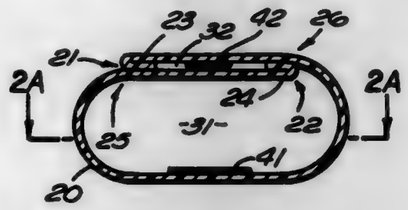
a body having a fuel flow path defined by a first bore intersected at an acute angle by a second bore, the sidewall surface defining said first bore and the sidewall surface defining said second bore being separated by an interface region, said interface region having an acute angle side and an obtuse angle side as dictated by the intersection of the first and second bores, said acute angle side of said interface region including a radiused surface portion disposed between the sidewall of said first bore and the sidewall of the second bore, and the obtuse angle side of said interface region including three transition surface portions, the one closest to said second bore sidewall surface being radiused.

5,192,027

DRIP IRRIGATION DEVICES AND PLASTIC FILMS WITH COPPER POWDER INCORPORATED

Daniel W. C. Delmer, 17067 Roundhill Dr.; Robert J. Delmer, 16922 Pacific Coast Hwy., #204, and William A. Delmer, 16901 Bedford La., all of Huntington Beach, Calif. 92649

Filed Feb. 11, 1992, Ser. No. 834,006
Int. Cl.[5] B05B *1/02, 15/00*
U.S. Cl. 239—542 3 Claims



1. A multichamber drip irrigation hose, comprising

a larger primary tube and a smaller secondary tube of flexible water impermeable material and joined at a common wall, with each of said tubes having an inner surface,

said common wall having a series of first passages facing the interior of said primary tube in communication with the interior of said secondary tube,

said secondary tube having a series of second passages leading from the interior of said secondary tube to the exterior, and

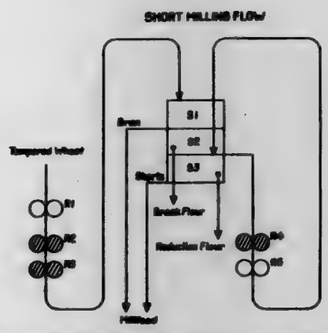
copper powder adhered to at least one of said inner surfaces along the length of the hose.

5,192,028

SIMPLIFIED METHOD AND APPARATUS FOR PRODUCING WHITE FLOUR FROM WHEAT GRAIN

Steven P. Curran, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 625,085, Dec. 10, 1990, Pat. No. 5,114,079. This application Nov. 19, 1991, Ser. No. 794,241
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.
Int. Cl.[5] B02C *9/04*
U.S. Cl. 241—3 50 Claims



1. Apparatus for processing wheat to produce wheat flour by substantially removing the bran layer and germ portion from the endosperm portion of the wheat grains, said apparatus comprising:

a pair of compression rolls for receiving wheat to be processed therebetween, said compression rolls being in spaced relationship and the surfaces thereof configured to flatten the individual grains of wheat without substantial comminution thereof;

a first pair of corrugated breaking rolls positioned to receive the flattened grains of wheat directly from the compression rolls without intermediate processing of the wheat grains, and to break said wheat grains,

said first breaking rolls each being provided with at least about 20 surface corrugations per circumferential inch of the outer circumference thereof;

a second pair of corrugated grinding rolls positioned to receive broken wheat grains directly from said first pair of breaking rolls, said grinding rolls each having a greater number of circumferentially arranged corrugations than the number of corrugations on said breaking rolls,

said breaking rolls and grinding rolls being operable to produce a comminuted wheat product wherein the bran layer is separated from the endosperm and germ portions; and

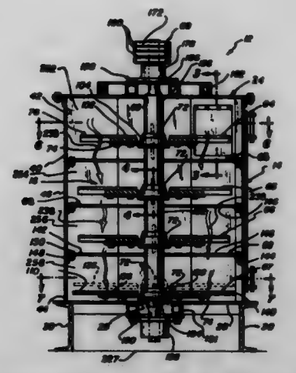
classification means for separating at least a portion of the bran fraction from the endosperm and germ portions of the comminuted wheat product.

5,192,029

GYROSCOPIC CENTRIFUGE AND MILL APPARATUS AND METHOD OF USE FOR TREATMENT OF SOLID WASTE PRODUCTS

Curtis L. Harris, Denver, Colo., assignor to Universal Eatech, A Colorado Corporation, Englewood, Colo.

Filed Feb. 5, 1990, Ser. No. 473,901
Int. Cl.[5] B02C *13/09*
U.S. Cl. 241—27 20 Claims



20. A gyroscopic centrifuge and mill apparatus operable to receive, process, impact, separate, and discharge waste/trash material, comprising:

a) a main mill housing assembly to receive and process the waste/trash material therein;

b) a material impact means mounted within said main mill housing assembly to impact and separate the waste/trash material;

c) said material impact means having a plurality of impact blade assemblies mounted in spaced relationship on a drive means for rotation therewith; and

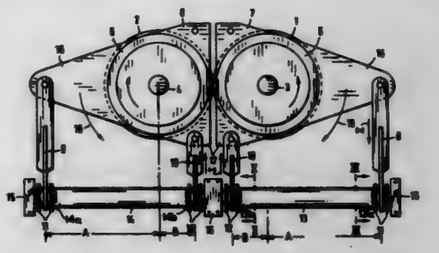
d) each of said impact blade assemblies includes striker blade members which are adjustable about a horizontal plane to various angular relationship to regulate volume and velocity of air flow through said main mill housing assembly.

5,192,030

TWO ROLLER MACHINE, PARTICULARLY A ROLLER PRESS

Willy Jakobs, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jul. 30, 1991, Ser. No. 737,681
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1990, 4024109
Int. Cl.[5] B02C *4/32*
U.S. Cl. 241—101.2 8 Claims



1. A two roll mechanism such s a roller press having parallel rollers forming a crushing nip therebetween comprising in combination:

drive gearings connected to drive parallel rollers of a roller press adapted to each rotate about an axis;

torque supports for absorbing the reaction moments of the gearing having a plate member for each roller pivotable about the roller axis and extending longitudinally in opposite directions having an inner end between the rollers and an outer end outwardly of the rollers;

a torsion shaft for each plate member extending longitudinally beneath the torque supports each having an inner end and an outer end and having lever arms at each end to twist the shaft with the load on the gearings;

first rods connecting the lever arms at the outer ends of the torsion shafts to the outer ends of the plate members;

and second rods connecting the lever arms at the inner ends of the torsion shafts to the inner ends of the plate members;

the distance between the axis of each of the rollers and the outer ends of the plate members being greater than the distance between the axis of the rolls and the inner ends of the plate members.

5,192,031

COMBINED TRASH COMPACTOR/CONVEYOR FOR GARBAGE TRUCK

Hervé Gilbert, 299, Parc Industriel, Lac-Etchemin Québec, Canada G0R 1S0

Filed Jul. 5, 1991, Ser. No. 726,234
Int. Cl.[5] B60P *1/00*
U.S. Cl. 241—101.7 1 Claim

1. A trash compactor for use within a box of a garbage collecting truck, said trash compactor comprising:

(a) a first conveyor member, to be carried generally horizontally within said box and defining a front end and a rear end and first top and bottom runs, said first top run for supporting and moving uncompacted trash from an uncompacted, trash intake end, along an intermediate, trash compacting area, to a compacted, trash unloading end;

(b) a second conveyor member, mounted in spaced overlying register with said first conveyor member at an angle relative thereto whereby said conveyor members are configured in a generally V-shape assembly, said second conveyor member also to be located within said box and defining a front end and a rear end and second upper and lower runs; said second lower run moving trash in a frontward direction, to further draw trash movably supported

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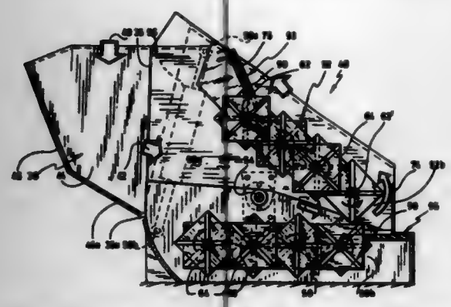
by said first top run toward said unloading end; said second upper run moving trash in a rearward direction, whereby a compacted trash discharge channel is defined between said front ends of said first and second conveyor members, and whereby said V-shape assembly defines an inner V-shape throat with a large uncompacted trash intake mouth at one end and a narrow, said discharge channel at its opposite end, said trash being progressively wedge-compacted within said V-shape inner throat as said trash moves from said intake mouth toward said discharge channel of said V-shape conveyor members assembly;



(c) first biasing means, for biasing at least part of said compacted trash exiting from said discharge channel toward and over said second conveyor member front end and onto said second upper run, whereby said compacted trash will be moved from said front and towards said rear end of said second conveyor member; and

(d) second biasing means, for biasing said compacted trash on said second upper run at said rear end of said second conveyor member toward and into a first storage area, located at a distance from said conveyor members and to be housed within said garbage box.

5,192,032

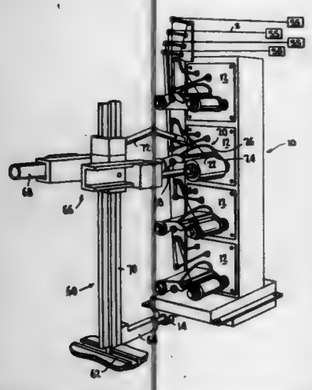
AUTOMATIC WINDING UNIT

Charles W. Brouwer, Greensboro; Roger D. Lang, Gibsonville, and Thomas W. Perrino, Burlington, all of N.C., assignors to John Brown Inc., West Warwick, R.I.

Filed Oct. 31, 1990, Ser. No. 607,653

Int. Cl.[5] B65H *67/04*

U.S. Cl. 242—35.5 A **13 Claims**



1. Method of operating a tension compensator take-up machine including the steps of

(a) advancing at least one strand from a supply to a rotating spindle;

(b) traversing said strand with a traverse means to wind said strand into a package on said spindle;

(c) controlling said strand tension by engaging said strand on a tension compensator arm;

(d) doffing a full strand package by

(i) cutting said strand, thereby initiating the steps of arresting the rotation of said package, releasing said package on said spindle, and moving said traverse means from a wind position to a doff position; and

(ii) removing said package from said spindle;

(e) inserting an empty tube on said spindle;

(f) positioning said strand around said tension compensator arm, thereby restarting said spindle rotation at a pre-set speed, securing said empty tube, moving said transverse means to the wind position; and

(g) bringing said strand across said spindle to engage and retain said strand on said spindle, restarting said winding.

5,192,033

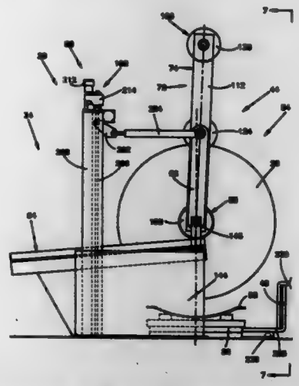
APPARATUS FOR MOVING ROLLS FROM A LOADING STATION TO AN UNWINDING STATION AND FOR MOVING EMPTY ROLL CORES FROM THE UNWINDING STATION TO THE LOADING STATION

George R. Pipes, Salt Lake City, Utah, assignor to Eaton-Kenway, Inc., Salt Lake City, Utah

Filed Feb. 26, 1991, Ser. No. 664,180

Int. Cl.[5] B65H *19/30, 16/02;* B21C *47/24*

U.S. Cl. 242—58.6 **74 Claims**



62. An apparatus for use in sequentially moving rolls of material having cores from a loading station to an unwinding station and for sequentially moving empty roll cores from the unwinding station back to the loading station, said apparatus comprising frame means having a first end portion for holding a first roll by its core during movement of the first roll from the loading station to the unwinding station and for holding the empty core of the first roll during movement of the core of the first roll from the unwinding station back to the loading station, said frame means having a second end portion for holding a second roll by its core during movement of the second roll from the loading station to the unwinding station and for holding the empty core of the second roll during movement of the core of the second roll from the unwinding station to the loading station, said frame means includes a first longitudinal member extending between the first and second end portions of said frame means, and a second longitudinal member extending between the first and second end portions of said frame means, said first and second members extending parallel to each other and being spaced apart from each other by a distance which is at least as great as the axial extent of one of the rolls to enable the rolls to be sequentially positioned between said members, said first and second members reach having a length which is as great as the distance from the loading station to the unwinding station to enable the second roll to be positioned between the first and second members at the loading station while the empty core of the first roll is disposed between the first and second members at the unwinding station, first lift means at the loading station for supporting a first end portion of the second roll and second lift means at the loading station for supporting a second end portion of the second roll opposite from the first end portion, said first lift means including first motor means to raise the first end portion of the second roll to a position in which a first end portion of the core of the second roll is disposed at the loading station adjacent to an end portion of the first member, said second lift means including second motor means to raise the second end portion of the second roll to a position in which a second end portion of the core of the second roll is disposed at the loading station at the same level as the first end portion of the core of the second roll and is adjacent to an end portion of the second member, control means for determining when a central axis of the core of the second roll is horizontal, said control means including first photoelectric sensor means for detecting light reflected from a first end portion of the core of the second roll while the first end portion of the second roll is supported by said first lift means and second photoelectric means for detecting light reflected from a second end portion of the core of the first roll while the second end portion of the second roll is supported by said second lift means, and drive means for pivoting said frame means about a central axis of the core of the second roll while the second roll is stationary at the loading station to move the empty core of the first roll from the unwinding station toward the loading station.

5,192,034

WINDER FOR WINDING A RUNNING WEB

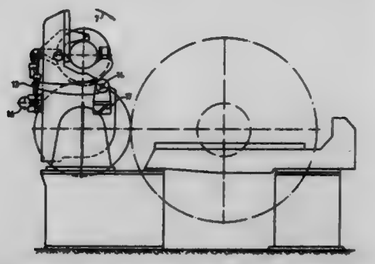
Rudolf Beiswenger, Steinheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Apr. 4, 1991, Ser. No. 680,316

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1990, 4011010

Int. Cl.[5] B65H *18/16*

U.S. Cl. 242—65 **2 Claims**



1. A winder for winding a running web, comprising:

a frame for said winder, said frame having two sides;

a winding drum on which said web is to be wound into a roll, said web having a width, said winding drum having two ends and having a journal on each of said ends;

a backing roll for said winding drum, said backing roll having a curved shell surface and having a width, said backing roll further having an axis, said width being substantially equal to the width of the web;

a pair of primary levers, each of said primary levers having two ends and having a fork at one end thereof whereby each of said forks receives a separate one of said journals, each of said primary levers being mounted at the other end thereof in closely spaced relationship to said backing roll axis;

said winding drum being swivelable from a first position whereby said winding drum is situated generally above said backing roll in the running direction of the web to a second position, said winding drum approaching said backing roll and passing through a primary section as it passes from said first position to said second position, said web being progressively wound on said winding drum as said drum passes from said first position to said second position;

a pair of secondary levers situated at said second position, said secondary levers being adapted to receive said winding drum from said primary levers as said drum passes to said second position;

a generally horizontal guideway extending from said second position via a secondary section to a third position;

a contact pressure device for forcing said winding drum and said roll being wound thereon onto said backing roll; and

a pair of support beams, each of said support beams having two ends, said two ends of each support beam being mounted on the respective primary levers, one of said support beams being positioned at each side of said frame; each of said support beams being operable by way of controlled movement of at least one end thereof to relieve said winding drum, directly or indirectly, in at least said primary section; said support beams being configured and arranged so that said winding drum, or the journals disposed at the respective ends of said drum, can roll on said beams.

5,192,035

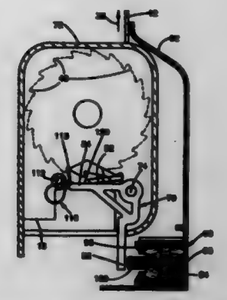
RETRACTOR WITH MANUAL CINCH

William T. Dufour, Sterling Heights, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Continuation of Ser. No. 574,758, Aug. 29, 1990, abandoned. This application Nov. 22, 1991, Ser. No. 796,913

Int. Cl.[5] B65H *75/48*

U.S. Cl. 242—107.4 R **14 Claims**



1. A vehicle seat belt retractor comprising:

a spool on which seat belt webbing is wound and which is rotatable in belt withdrawal and belt retraction directions;

at least one spool locking ratchet wheel fixed to said spool for rotation therewith;

a pawl movable into a locking position in engagement with said spool locking ratchet wheel to lock said spool locking ratchet wheel and said spool against rotation in the belt withdrawal direction;

a pawl actuator movable relative to said pawl between a first position and a second position to move said pawl into its locking position;

a manually movable member for engaging said pawl actuator to move said pawl actuator into its second position; and

biasing means directly engaging said pawl actuator and spaced from said pawl, said biasing means biasing said pawl actuator into its first position when said pawl actuator is in its first position and biasing said pawl actuator into

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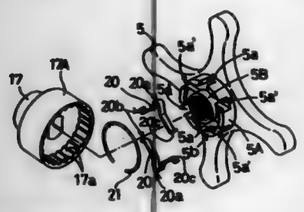
its second position when said pawl actuator is in its second position.

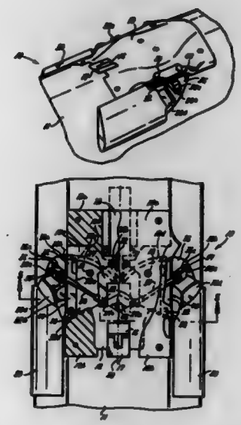
5,192,036
TWO-BEARING REEL
Jun Sato, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Mar. 4, 1991, Ser. No. 663,615
Claims priority, application Japan, Mar. 12, 1990, 2-25446[U]
Int. Cl.[5] A01K *89/015, 89/00*
U.S. Cl. 242—268 6 Claims



1. A two-bearing reel comprising:
a drag adjustment control member,
a pressing member acting upon a drag mechanism in response to movement of the drag adjustment control member, and
an anti-slack mechanism for the drag mechanism mounted between the drag adjustment control member and the pressing member to allow the drag adjustment control member to be operated with an operational force exceeding a predetermined value and to fix the drag adjustment control member to an adjusted position,
wherein said anti-slack mechanism includes an engaging element having an elastic engaging projection and a plurality of engaging recesses for engaging the elastic engaging projection,
said engaging element including at a center position thereof a fold-back portion acting as said engaging projection to be inserted into a first recess peripherally defined in a boss portion projecting from the drag adjustment control member, said first recess including corners, and said engaging element further including an opposed pair of flared end legs supported respectively on contact surfaces in second recesses peripherally defined in said boss portion whereby said engaging element is removably attached to the drag adjustment control member,
said engaging element and engaging recesses creating the predetermined operational force for operating the drag adjustment control member, said flared end legs including contact surfaces, said engaging projecting being located between said end legs,
said plurality of engaging recesses being defined in the pressing member, and
wherein said engaging element is made of resiliently deformable sheet metal, said engaging element being substantially V-shaped, said contact surfaces of said flared end legs being in contact with said contact surfaces of said second recesses, and wherein said legs of said engaging element are in contact with said corners of said first recesses.

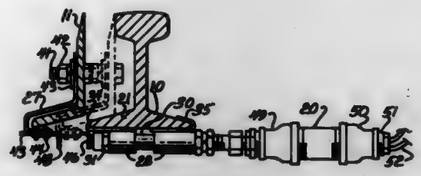
5,192,037
DOUBLE-PIVOTING DEPLOYMENT SYSTEM FOR AEROSURFACES
William J. Moorefield, St. Peters, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Aug. 23, 1991, Ser. No. 749,316
Int. Cl.[5] F42B *10/14*; B64C *3/56*
U.S. Cl. 244—46 8 Claims

1. In combination with a support structure of an aerospace vehicle, an aerosurface deployment assembly, comprising:
(a) an actuating means;
(b) a plurality of aerosurfaces, each having an inner segment and an outer segment, wherein each said inner segment is pivotally connected to said support structure at an axis of rotation substantially perpendicular to the longitudinal axis of the aerospace vehicle, and wherein an outer side portion of each said inner segment is pivotally connected to an inner side portion of each said outer segment at an axis of rotation parallel to said longitudinal axis when said aerosurfaces are in the stowed position;
(c) a yoke means, operably connected to said actuating means, for translational travel along said support structure; and



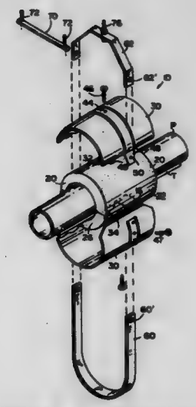
(d) a plurality of linkage rods for interconnecting said yoke means and said aerosurfaces, wherein a single linkage rod interconnects said yoke means to each said aerosurface, and
wherein translational travel of said yoke means, initiated by said actuating means, moves said plurality of linkage rods to rotate said aerosurfaces about each of said axes of rotation substantially perpendicular to said longitudinal axis and each of said axes of rotation parallel to said longitudinal axis thereby deploying said aerosurfaces.

5,192,038
SAFETY DETECTOR FOR RAILROAD SWITCH POINTS WITH VISUAL INDICATOR MECHANISM
Salvador C. Ocampo, 4715 W. Wrightwood Ave., Chicago, Ill. 60639
Continuation-in-part of Ser. No. 776,725, Mar. 19, 1992, Pat. No. 5,116,006, which is a continuation of Ser. No. 405,656, Sep. 11, 1989, abandoned. This application May 26, 1992, Ser. No. 889,061
Int. Cl.[5] B61L *5/10*
U.S. Cl. 246—220 27 Claims



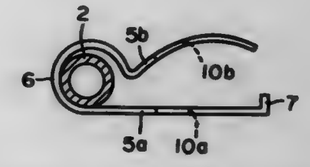
1. A safety detector for a railroad switch point where a switch rail is intended to contact a stock rail in a given plane, said safety detector comprising
a detector mechanism secured to said stock rail at said point, said detector mechanism having a spring loaded plunger assembly normally biased in the direction of said switch rail reciprocally secured in alignment with said switch rail at said point and electrical contact means connected to said plunger assembly for reporting contact or the lack of contact between said switch rail and said stock rail, and
adjustable means mounted on said switch rail at said point adapted to contact and reciprocate said plunger against said electrical reporting means when said switchrail is in physical contact with said stockrail at said point,
said detector mechanism having a housing located beneath said rail for containing said electrical contact means and plunger assembly,
said housing comprising a closed body secured to said stockrail,
said plunger assembly having a contact tip extending from said housing adjacent said switchrail and an end remote therefrom in contact with said electrical contact means and a rigid connection extending between and affixed to said contact end and said remote end,
said electrical contact means comprising electrical contact members secured in said housing and means on said remote end for contacting said electrical contact members when said plunger is reciprocated.

5,192,039
HANGER INSULATION SYSTEM
Robert O. Williams, Gladwin, Mich., assignor to Ticon, Inc., Midland, Mich.
Filed Oct. 7, 1991, Ser. No. 772,269
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—62 5 Claims



1. A unitary, clamshell, pipe insulation and shield assembly comprising:
upper and lower, generally semicylindrical, insulation elements which together form a cylindrical subassembly having a rigid portion to support a pipe;
said elements each having a partial cylindrical passage therethrough to collectively form a generally cylindrical passage for a pipe to extend through;
a water repellant jacket around said elements having a pair of adjacent ends at a peripheral location around said jacket, and having a flexible hinge portion intermediate said ends for enabling said jacket ends to be spaced apart or together;
said jacket ends having extensions which overlap each other when said assembly is closed;
semicylindrical channel ring clamp elements having interconnectable ends for securing said clamp elements together around said jacket;
said channel ring elements having pairs of radially outwardly extending curved flanges to define a curved channel therebetween for receiving and retaining a U-clamp; and
said clamp elements, said jacket and said insulation elements being fastened together to form a hinged clamshell arrangement capable of being placed around a pipe and then closed and connected.

5,192,040
PIPING/WIRING CLAMPING DEVICE
Katsushi Washizu, Numazu, Japan, assignor to Unel Kokusai Sangyo Kaisha Ltd., Japan
Filed Dec. 20, 1991, Ser. No. 811,802
Claims priority, application Japan, Dec. 12, 1990, 2-413296
Int. Cl.[5] F16L *3/08*
U.S. Cl. 248—74.5 6 Claims



1. A piping/wiring clamping device formed from an elongated band of resiliently flexible material having opposed first and second ends, a substantially planar engaging ear disposed at the first end of the band, an elongated first mounting wall extending substantially orthogonally from the engaging ear, the first mounting wall having a first mounting hole spaced a selected distance from the engaging ear, a clamping wall extending from the first mounting wall and curled back toward the first mounting wall, an elongate second mounting wall of a selected length extending from the clamping wall to the second end of the band, portions of the band intermediate the length of the second mounting wall being arched away from the first mounting wall, the second mounting wall being provided with a second mounting hole extending therethrough at a distance from the second end substantially equal to the distance between the engaging ear and the first mounting hole, the lengths of the clamping wall and the second mounting wall being selected such that the clamping wall securely clamps a piping-/wiring member engaged therein when the second end of the band is engaged by the engaging ear and when the second mounting wall is urged from the arched configuration and into face to face contact with the first mounting wall.

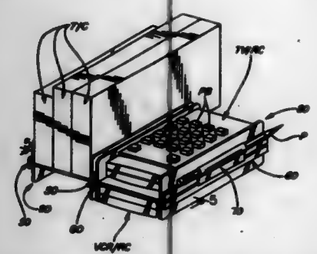
5,192,041
BABY BOTTLE HOLDER
Sheree M. Bryant, 1804 E. Oliver St., Baltimore, Md. 21213
Filed Jun. 17, 1991, Ser. No. 716,562
Int. Cl.[5] A47D *15/00*
U.S. Cl. 248—104 3 Claims

2. A device for supporting an infant's feeding bottle selected from a plurality of feeding bottles having a range of different diameters, while feeding an infant in a seat placed on a surface, comprising:
a bottle holder including a flexible member for wrapping around said feeding bottle, said flexible member including means for securing said feeding bottle to said bottle holder;
a first flexible rod having a first end attached to said bottle holder, and having a second end;
a second flexible rod having a first end attached to said first flexible rod, and having a second end;

means attached to the second end of said second flexible rod for attaching to said seat; and

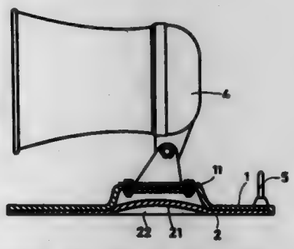
stand means attached to said second end of said first flexible rod for stabilizing said device on said surface.

5,192,042
HOLDER FOR VCR AND TV REMOTE CONTROLS
Randall C. Wetring, 9824 Blackburn, Livonia, Mich. 48150, and Richard N. Clark, 25360 Lynford Dr., Farmington Hills, Mich. 48018
Filed Nov. 1, 1989, Ser. No. 429,969
Int. Cl.[5] A47F *7/00*
U.S. Cl. 248—176 23 Claims



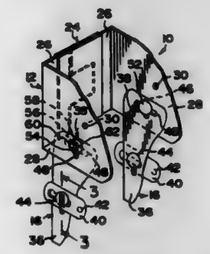
1. A one-piece, lightweight, hand-holdable holder for VCR and TV keyboard remote control units and other articles of like dimension, said holder being injection molded or extruded in one piece from plastic material to form two planar, parallel side walls spaced apart and integrally interconnected by a central web, said side walls and central web being generally co-extensive in length and having an overall length dimension at least about twice the spacing between said side walls, said holder having a generally "H" configuration in cross-section transverse to the longitudinal axis of said holder, said central web having first and second flat surfaces on opposite sides thereof, said side walls having portions flanking said web surfaces and protruding respectively therefrom to define with the associated web surfaces first and second remote control receiving spaces apart for removable affixation therein of associated first and second removable remote control units by separate adhesive strips attached to an underside of each remote control unit and to the opposite surfaces of said center web to thereby removably mount said remote control units keyface-outwardly and in back-to-back inverted relationship relative to one another on said holder, said side walls and central web having free edges at opposite longitudinal ends thereof formed to provide open, unobstructed end opening spaces to permit the remote control units to project beyond the opposite longitudinal ends of said holder when mounted in said first and second holder spaces, said side walls protruding from said central web to free longitudinal edges of said side walls defining first and second side wall height dimensions a distance sufficient to enable nesting of the remote control units respectively in the associated one of said first and second holder spaces such that said holder supports either remote control unit when inverted with said holder with the remote control unit keyboard spaced clear of a flat supporting surface on which the holder is placed.

5,192,043
MAGNETIC RUBBER SUCTION DISC
Yen C. Fu, 5F, No. 10, Lane 560, Chung Cheng Rd., Hsinten, Taipei Hsien, Taiwan
Filed Dec. 11, 1991, Ser. No. 805,056
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—206.2 1 Claim



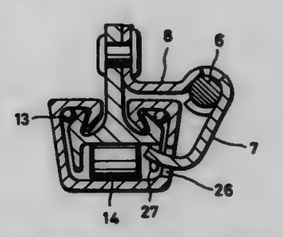
1. A magnetic rubber suction disc assembly for releasably securing an alarming device to a metal surface by both suction and magnetic attraction, comprising:
a suction disc member formed of a magnetic rubber composition, said suction disc member having a peripheral portion and a centrally disposed first raised portion, said first raised portion defining a vacuum formation zone; and
a seat member coupled to said peripheral portion of said suction disc member, said seat member having a centrally disposed second raised portion for coupling to said alarming device, said second raised portion being located in overlying relation with respect to said first portion, said first and second raised portions being spaced each from the other in detached relation therewith, whereby said second raised portion of said seat member substantially isolates said first raised portion from vibration of said alarming device.

5,192,044
EXTRA ROLL CADDY FOR TOILET PAPER AND THE LIKE
Arnold B. Baskin, 6836 108th St., Apt. A-46, Forest Hills, N.Y. 11375-3366
Filed Dec. 13, 1991, Ser. No. 808,166
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—309.1 4 Claims



1. An extra roll caddy for toilet paper and the like which comprises:
a) an adjustable auxiliary holder for dispensing an auxiliary roll of toilet paper therefrom, wherein said adjustable auxiliary holder includes:
i) a telescopic back section having two interconnecting slide friction segments, so as to adjust to various sized existing fixed toilet paper holders;
ii) a pair of side sections, each extending at a right angle from one of said slide friction segments with each said side section having a hole for supporting an auxiliary roller for the auxiliary roll of toilet paper; and
iii) means for mounting said back section to a flat vertical wall; and
b) means for adjustable mounting said adjustable auxiliary holder to a roller in an existing fixed toilet paper holder on the flat vertical wall, so that in one instance said adjustable auxiliary holder can be positioned above the existing fixed toilet paper holder and in another instance said adjustable auxiliary holder can be positioned below the existing fixed toilet paper holder.

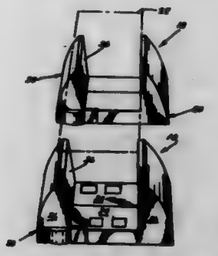
5,192,045
SEAT SLIDE ADJUSTER FOR VEHICLES
Yukifumi Yamada, and Kunichiro Akizuki, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, Japan
Filed Jan. 17, 1992, Ser. No. 822,046
Claims priority, application Japan, Jan. 21, 1990, 2-19190
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—430 8 Claims



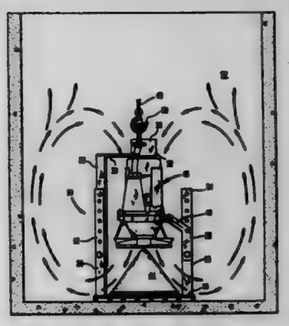
1. A seat slide adjuster for a vehicle comprising:
a lower rail fixable to a vehicle body;
said lower rail including a horizontal base portion, and upwardly extending side portions from both ends of said horizontal base portion defining corner portions;
upper portions extending horizontally inwardly from both ends of said side portions to define an opening, and oblique portions extending outwardly from both ends of said upper portions;
an upper rail slidable with respect to said lower rail and having a bracket with a seat belt anchorage;
said upper rail including a vertical base portion projecting through said opening of said lower rail, a lower portion extending horizontally from a lower end of said vertical base portion and being parallel with said base portion of said lower rail, and oblique portions extending inwardly and upwardly from said lower portion; and
balls positioned in spaces defined by the corner portions of said lower rails and the oblique portions of said upper rail.

5,192,046
PROCESSOR SUPPORT
Paul L. Howard, Belmont, Calif., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed May 29, 1991, Ser. No. 706,656
Int. Cl.[5] F16M *1/00*
U.S. Cl. 248—676 18 Claims

1. A device for use in supporting computer equipment in a vertical position, said device comprising:
a support member defining a horizontally extending foot portion and a vertically extending end portion;
an elongated rack joined to said foot portion; and
a pawl member including a base hinged to said support member and an elongated leg joined to said base, said leg defining a tooth portion and said base including an actuator, and wherein said foot portion includes an upper support surface, an outer wall and an inner wall defining an opening at an end of said foot portion, said rack being formed as part of said inner wall.



5,192,047
TETHERABLE FRAME FOR, AND IN COMBINATION WITH, A SUBMERSIBLE MIXER
Dominic A. List, Trumbull, and Robert L. Dellus, Newtown, both of Conn., assignors to ITT Corporation, New York, N.Y.
Filed Jan. 28, 1992, Ser. No. 827,174
Int. Cl.[5] F16M *3/00*
U.S. Cl. 248—676 19 Claims



1. A tetherable frame for a submersible mixer, comprising:
elongate limb means for mounting a submersible mixer thereto, said limb means comprises a plurality of spaced-apart, parallel limbs, each thereof being joined, at one end, to said base; wherein a pair of said limb means have, at one end thereof, tether-attaching means and, at the opposite end thereof, a base, and means, intermediate said base and said attaching means, means for removably fastening a submersible mixer thereto.

5,192,048
FUEL INJECTOR BEARING CARTRIDGE
Russell J. Wakeman, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.
Filed Jun. 26, 1992, Ser. No. 905,500
Int. Cl.[5] F16K *31/02*
U.S. Cl. 251—129.16 10 Claims

1. An electrically operated valve comprising a valve body, an electro-mechanical actuator that acts through a needle for setting the extent to which the valve is opened, spaced apart

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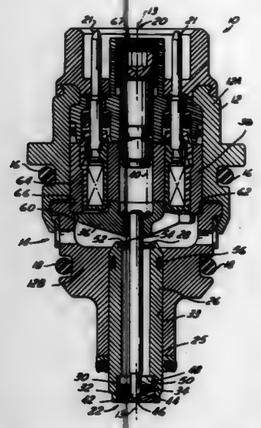
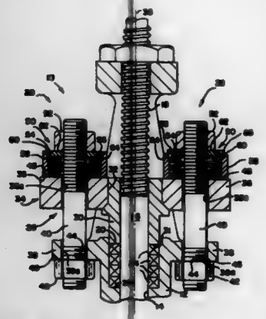
bearings on said body acting at axially spaced apart locations on said needle for guiding motion that is imparted to said needle by said actuator, characterized in that said bearings are disposed in a tube that is disposed in a bore in said valve body.

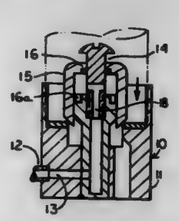


5,192,049
DUAL RATED LIVE LOADED PACKING SYSTEM FOR A VALVE STEM
William A. Ridge, Inman, Kans., assignor to Cashco, Inc., Ellsworth, Kans.
Filed Jun. 12, 1992, Ser. No. 897,864
Int. Cl.[5] F16K *41/02*; B65D *53/00*
U.S. Cl. 251—214 23 Claims



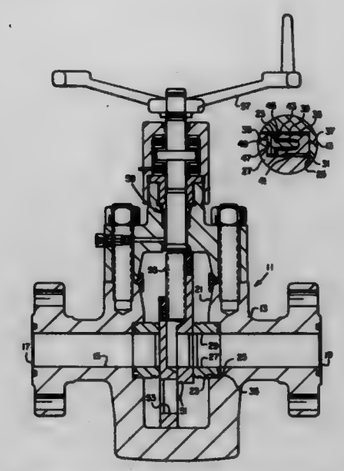
1. A dual rated, live loaded packing system for a valve of the type including a stem extending into a packing chamber having an annular shoulder at one end around said stem and an open end for receiving a packing gland for exerting thrust toward said shoulder against a packing ring mounted in said chamber, said valve including a fixed ear extending radially of said stem and said gland including a movable ear confronting and movable toward and away from said fixed ear, the improvement comprising:
- at least one loading assembly extending between said ears for exerting a live load on said packing ring through said packing gland;
- said loading assembly comprising an elongated tension member having a first end secured to a first of said ears and a second end for resilient biasing engagement with a second of said ears;
- said second end including adjustable nut means threadedly engaged on said tension member with a thrust face spaced from a thrust face on said second ear, resilient spring means mounted on said tension member between said thrust faces for biasing the same away from each other and spacer means mounted on said tension member between said thrust faces for setting up a minimum spacing between said thrust faces; and
- washer means mounted on said tension member between said nut means and said spacer means having opposed first and second stop surfaces for selectively engaging a surface on said spacer means to provide different biasing values between said ears dependent on which of said first and second stop surfaces is facing said thrust face on said second ear.

5,192,050
FOOT OPERATED WATER VALVE APPARATUS
Peter C. Mele, P.O. Box 1596, Burlington, Vt. 05402
Filed May 7, 1992, Ser. No. 879,564
Int. Cl.[5] F16K *31/122*, *31/62*
U.S. Cl. 251—295 2 Claims



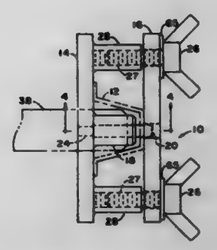
1. A foot operated water valve apparatus, for use in situations that require or would benefit from the user controlling the flow of water without the use of one's hands, comprising:
- a valve housing;
- said valve housing having threading means for attaching said housing to a water line fitting;
- said valve housing comprising a circular body;
- said valve housing having sealing means positioned at the junction of said valve housing and said water line fitting;
- centerline rod means;
- said centerline rod means comprising a fixed rod;
- said centerline rod means having a hollow lower portion;
- moving piston means surrounding said centerline rod means;
- said moving piston means having an open base portion;
- said moving piston comprising a circular shell;
- internal aperture means for permitting flow of fluid when said moving piston means is in the open position;
- said internal aperture means comprising main line aperture means for directing fluid to the main outlet;
- a pressure control line;
- pressure control line aperture means;
- said pressure control line aperture means having at least one sealing means positioned within said moving piston means;
- said sealing means comprising u-shaped seals;
- said u-shaped seal comprising a seal to permit sufficient leakage to allow for the pressurization when said moving piston means is in the closed position;
- foot valve means;
- means for connecting said foot valve to said pressure control line aperture means;
- said foot valve means having bladder means for providing a fluid reservoir in order to allow a foot induced pressure positive differential;
- said foot valve means further having bleed means for allowing said pressure control line to charge with fluid only.

5,192,051
UNIDIRECTIONAL SEAT SEAL FOR GATE VALVE
Willie Roberson, Spring, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.
Filed Jul. 30, 1992, Ser. No. 922,710
Int. Cl.[5] F16K *3/00*
U.S. Cl. 251—328 9 Claims



1. In a gate valve having a body containing a chamber, a flow passage having an axis and extending transversely through and intersecting the chamber, a counterbore formed in the flow passage at each intersection with the chamber, a cylindrical seat ring located in each counterbore, a gate, and actuator means for moving the gate through the chamber between the seat rings between open and closed positions, an improved seal assembly located between each counterbore and each seat ring, comprising in combination:
- each of the counterbores having a cylindrical counterbore wall terminating at an outer end with an inward facing shoulder, the inward facing shoulder being perpendicular to the counterbore wall;
- a reduced diameter cylindrical surface formed on an outer end of each of the seat rings, defining an outward facing shoulder axially spaced from and opposing the inward facing shoulder, the outward facing shoulder, inward facing shoulder, reduced diameter cylindrical surface and counterbore wall defining an annular cavity;
- an annular seal located in each of the cavities, the seal having a base on an outer end and two legs extending inward therefrom and separated by an annular recess, the base being positioned adjacent the inward facing shoulder, one of the legs being positioned to seal against the counterbore wall and the other of the legs being positioned to seal against the cylindrical surface when the gate is closed and outward directed pressure is applied to the seal;
- a standoff ring located in each of the cavities, the standoff ring having an outer end extending into the recess of the seal into contact with the base and an inner end protruding axially from the recess for contact with the outward facing shoulder if inward directed test pressure is applied when the gate is closed, the seal having an inner diameter and an outer diameter; and
- the standoff ring having a flowby passage communicating the inner diameter of the seal to the outer diameter of the seal, to allow flowby past the seal when the inward directed test pressure is applied when the gate is closed.

5,192,052
POST EXTRACTING FIXTURE
Eugene V. Aberotin, 3538 McWilliams Rd., Murrysville, Pa. 15668
Filed Mar. 19, 1992, Ser. No. 853,999
Int. Cl.[5] E21B *19/00*
U.S. Cl. 254—30 4 Claims

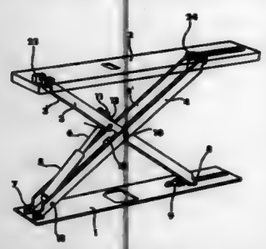


1. A device for removing a post from the ground, comprising:
- a bracket for engaging opposed faces of the post, said bracket comprising a first rigid plate member having spaced apart internally threaded spacers capable of straddling the post when the plate member is placed thereagainst,
- a second rigid plate member having openings that straddle the post when the two plate members are aligned and disposed together in generally parallel planes on the post,
- threaded fasteners sized to be received by the openings in the second plate member and the internally threaded spacers of the first plate member,
- said fasteners and internally threaded spacers being effective to tightly secure the plate members on the post, the length of the spacers being somewhat less than the thickness of the post such that the two plate members tightly grip the post when the fasterners are suitably threaded into the spacers, and
- the plate member provided with said spacers having a center member sized to enter and seat in a recess of the post,
- said bracket being effective to extract the post from the ground when an upwardly directed force is applied to at least one of the plate members.

5,192,053
DEVICE FOR INITIATING A LIFTING MOVEMENT IN A LIFTING DEVICE
Per-Olof Sehlstedt, Berga, S-870 10 Alandsbro, Sweden
PCT No. PCT/SE89/00584, § 371 Date May 7, 1991, § 102(e) Date May 7, 1991, PCT Pub. No. WO90/04565, PCT Pub. Date May 3, 1990
PCT Filed Oct. 24, 1989, Ser. No. 681,539
Claims priority, application Sweden, Oct. 25, 1988, 8803815
Int. Cl.[5] B66F *3/22*
U.S. Cl. 254—122 6 Claims

1. A device for initiating a lifting movement in a lifting mechanism comprising at least a first lifting arm and a second lifting arm interconnected by a first joint, the lifting mechanism also including a force applying means for acting on one of said first and second lifting arms, said force applying means and said first and second lifting arms in an initial position being oriented generally parallel with respect to each other before the initiation of the lifting movement, wherein a force from said force applying means is transmitted to said first lifting arm by a double-armed lever connected to said first lifting arm by a second joint, said force applying means acting on a first lever arm of said double-armed lever via a third joint in such a way that the force from said force applying means is transmitted eccentrically relative to said second joint, a second lever arm of said double-armed lever acting against a lever support pro-

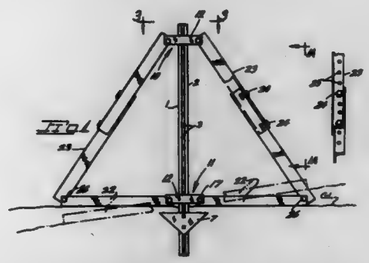
vided on said second lifting arm between said first joint and said second joint, a first abutment on said double-armed lever engaging a second abutment provided on said first lifting arm after a limited movement of said double-armed lever, corresponding to the initiation of the lifting movement, such that said double-armed lever is blocked against said first lifting arm and in continued lifting movement is disengaged from said second lifting arm such that the force from said force applying means is transmitted entirely to said first lifting arm.



5,192,054
PREFABRICATED SIMULATED WROUGHT IRON AND LIKE FENCING SYSTEMS AND METHODS
Ivan Sharp, 5413 N. 3100 West, Amalga, Utah 84335
Filed Jan. 24, 1991, Ser. No. 645,164
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—24 21 Claims

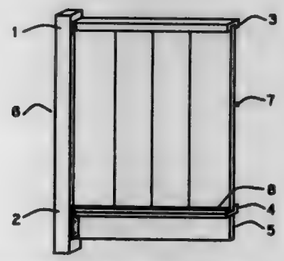
1. Fencing apparatus comprising:
a section of fence comprising at least two spaced horizontal members comprised of steel, each horizontal member comprising opposed exposed ends;
a plurality of vertical bars comprised of steel spanning between and above and below the horizontal members;
means attaching each vertical bar to each horizontal member;
a floor or ground-engaging, vertically-extending post disposed at each end of the fence section the posts being spaced one from the other the distance substantially the same as the length of horizontal members;
a two part clamshell connector spanning between each post and each adjacent end of each horizontal member, each connector means defining a two part first collar contiguously surrounding the associated post and a two part second collar contiguously surrounding an end of the associated horizontal steel member whereby weight of the section of fence is transferred directly across the connector means to the posts the two part connector being held in position by at least one releasably fastener passing centrally through both connector parts.

5,192,055
POST BRACE ASSEMBLY
Billy A. Griggs, 43495 SE. George Rd., and Kenneth B. Weaver, 40585 SE. George Rd., both of Estacada, Oreg. 97023
Filed Apr. 2, 1992, Ser. No. 862,431
Int. Cl.[5] B21F *27/00*
U.S. Cl. 256—35 8 Claims



1. A brace assembly for attachment to a fence post, said assembly comprising,
an upper bracket assembly and a lower bracket assembly for clamped attachment to said post in a spaced apart manner,
elongate ground engageable members attached at one of their ends to said lower bracket assembly, elongate braces each attached at one of their ends to said upper bracket assembly, and
coupling means attaching the remaining end of each of said braces to one each of said ground engaging members, and wherein said upper bracket assembly and said lower bracket assembly each comprise a main clamping plate, angular clamping members, fastener means engageable with said main clamping plate and said angular clamping members, additional fastener means engageable solely with said angular clamping members.

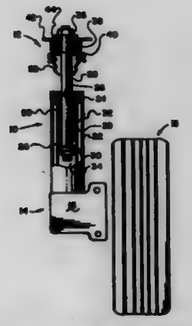
5,192,056
FENCE CONSTRUCTION SYSTEM
Belarmino G. Espinueva, 2710 Glen Evans Ct., San Jose, Calif. 95148
Filed Oct. 25, 1991, Ser. No. 782,826
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—65 6 Claims



1. A fence construction system comprising:
an upper bracket having a U-shaped channel for receiving the upper rail of a fence and having one or more flanges for attachment of said upper bracket to a fence post,
and a T-shaped lower bracket with the lower portion of the T-shape comprising a U-shaped channel for receiving the kickboard of a fence, and the upper portion of the T-shape

comprising a shallow U-shaped channel for receiving the lower rail of a fence and having one or more flanges for attachment of said lower bracket to a fence post.

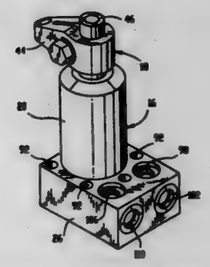
5,192,057
ELASTOMER REBOUND, JOUNCE AND RELATED COMPRESSION SPRINGS
Neal E. Wydra, Glen Ellyn, and David W. Geick, North Aurora, both of Ill., assignors to Miner Enterprises, Inc., Geneva, Ill.
Filed Aug. 12, 1991, Ser. No. 743,650
Int. Cl.[5] F16F *1/52, 13/00*
U.S. Cl. 267—153 13 Claims



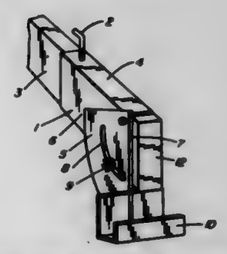
1. In an vehicle strut assembly having a housing, a piston and piston rod extending through said housing and interconnecting the vehicle body to the wheel assembly for damping the vehicle spring system, an improved rebound bumper compression spring comprising:
a) an elongated member formed of an elastomer having a ratio of plastic strain to elastic strain that is greater than 1.5 to 1, said member being mounted in said strut assembly so as to attenuate noise, vibration and road shocks;
b) said member having wall sections and connecting angles to define a bellows shape;
c) the molecular structure of the walls and angles of said member being oriented as a result of plastic deformation of said member in at least one direction;
d) the dimensions of said member being such that the ratio of the combined height of two adjoining wall sections to the thickness of the wall is less than 17;
e) the thickness of said walls increasing over a substantial portion of the length of the elongated member in order to provide a variable spring rate; and
f) said member having a length so as to cushion said spring system upon rebound for a distance of greater than 3 millimeters and to provide for an initial soft spring rate for a portion of its travel and a higher spring rate for the remainder of its travel.

5,192,058
SWING CLAMP
John H. VanDaleen, and Roger L. Craft, both of Emporia, Kans., assignors to Vektek, Inc., Emporia, Kans.
Filed Jan. 2, 1992, Ser. No. 816,861
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—24 4 Claims

1. A swing clamp apparatus adapted to be mounted adjacent a work surface and operable to clamp a work article against the work surface in order for work to be carried out on the article, the apparatus comprising:
a housing including a bore defining a longitudinal axis, a mounting flange extending outward from the housing in a direction perpendicular to the longitudinal axis, and means for permitting the apparatus to be mounted relative to the work surface in any one of the plurality of different positions;
a piston received within the bore and being movable in the direction of the longitudinal axis, the piston being in sealing engagement with the housing to divide the bore into first and second bore regions;
a clamping arm supported on the piston for movement therewith between a clamping position in which the arm moves towards the work surface to permit clamping of work article against the work surface and a releasing position in which the arm moves away from the work surface to release the work article;
a first passageway for delivering pressurizing fluid from a source of pressurized fluid to the first bore section of the housing to move the piston in a first direction between the clamping and releasing positions;
shifting means for shifting the piston in a second direction opposite the first direction between the clamping and releasing position;
the passageway including a first plurality of external ports formed in the flange and a first manifold with which the first plurality of ports communicate to permit pressurizing fluid to be delivered to the first passageway; and
plugging means for plugging any of the plurality of ports not used during delivery of pressurizing fluid to the passage,
wherein the flange includes a plurality of contiguous surfaces, each of the first external ports being formed in a different one of the contiguous surfaces.



5,192,059
FASCIA BOARD HOLDER
Earl Silver, RR4, Napanee, Ontario, Canada K7R 3K9
Filed Apr. 27, 1992, Ser. No. 873,780
Int. Cl.[5] B25B *5/14*
U.S. Cl. 269—41 5 Claims



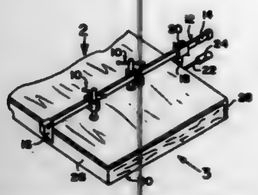
1. A fascia board holder for removable attachment adjacent one end of a roof rafter, said holder comprising:
(a) a first channel section adapted to receive said roof rafter;
(b) means to releasably secure said channel section to said rafter;
(c) a planar quadrant element pivotally mounted on said channel section for rotation about a horizontal axis when

said channel section is operatively mounted on said roof rafter;

(d) means to releasably secure said planar-element in a selected angular position relative to said channel section; and

(e) a second channel section rigidly mounted on planar element in a plane perpendicular thereto, adapted to slidably receive and retain therein a fascia board in perpendicular abutting relation to said rafter.

5,192,060
AUXILIARY PRESSURE CLAMP
John Novak, 1808 Craig Cir., Rogers, Ark. 72756
Filed Apr. 20, 1992, Ser. No. 872,686
Int. Cl.[5] B25B *1/00*
U.S. Cl. 269—147 2 Claims



1. An auxiliary pressure clamp for a bar clamp which has an elongated bar, a fixed jaw, a sliding head with a multiple pad clutch and an operating screw with a handle at one end and a movable jaw at another end, so as to engage the sides of a work piece, said auxiliary pressure clamp comprises:

a) an internally threaded sleeve;

b) means on said sleeve for adjustably engaging the elongated bar of the bar clamp at a right angle thereto, wherein said adjustable engaging means includes an L-shaped member affixed to one side of said sleeve, so as to form a slot therebetween, in which the elongated bar of the bar clamp can slideably fit within the slot, wherein said L-shaped member includes:

I) a short arm that is affixed to the one side of said sleeve; and

II) a long arm bent upwardly at a right angle to said short arm and extending parallel to said sleeve, further including:

i) said long arm having a threaded hole running longitudinally within its distal end;

ii) a washer having a diameter larger than the thickness of said long arm; and

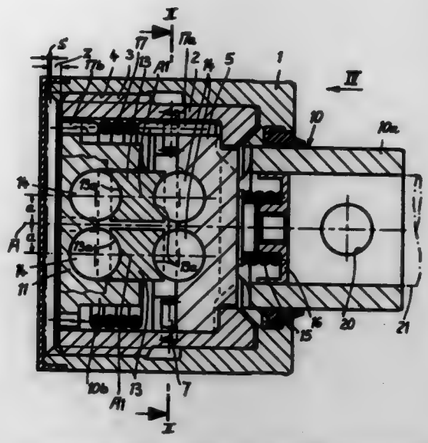
iii) a securement screw threaded into said threaded hole in said long arm to retain said washer thereto, so as to keep the elongated bar within the slot between said sleeve and said L-shaped member and prevent accidental removal therefrom;

c) a force-applying screw which is threaded into said sleeve;

d) a head at one end of said force-applying screw; and

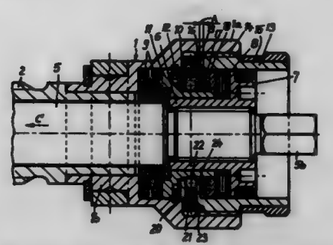
e) an operating handle at other end of said force-applying screw to rotate said force-applying screw within said sleeve, so that said head will engage with the work piece at a right angle to the clamping action of the bar clamp to apply pressure thereto, especially when various parts of the work piece are being glued together.

5,192,061
CLAMP ELEMENT, INCLUDING A RAPID FEED DEVICE COMBINED WITH A FORCE AMPLIFIER
Thomas Schlabitz, Mönchwilen, and Heinrich Berchtold, Nänikon/Uster, both of Switzerland, assignors to Gressel AG, Aadorf, Switzerland
Filed Apr. 8, 1992, Ser. No. 865,064
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1991, 4112512
Int. Cl.[5] B25B *1/14*
U.S. Cl. 269—228 11 Claims



1. A clamp element, including a rapid feed device combined with a force amplifier, having a rotatable feed sleeve surrounding the force amplifier and having an external thread engaging in a female thread of a housing surrounding the feed sleeve, the rotational movement of the sleeve relative to the housing being restricted by stop surfaces, a first tightening member fixedly arranged in the feed sleeve, a second tightening member arranged for limited rotation in the feed sleeve, a plurality of tightening pins arranged between the tightening members, which pins are inclined at an acute angle to a plane running through the feed sleeve axis in a relaxed position of the second tightening member and are arranged approximately parallel to this plane in the clamping position of the second tightening member, a compression spring biasing the two tightening members towards one another, and an actuating and tensioning rod extending through at least one aperture of the first tightening member and connected fast rotationally and in tension to the second tightening member, such that, on rotation of the actuating and tensioning rod in its tightening sense it is drawn axially into the housing in a feed stroke and a following tightening stroke, firstly by rotation of the feed sleeve relative to the housing and then by rotation of the second tightening member relative to the first tightening member, with consequent moving of the tightening pins into the clamping position parallel to the plane, wherein the tightening pins are supported on the second tightening member at the smallest possible distance from the feed sleeve axis, and wherein the actuating and tensioning rod is hollow and is passed through two diametrically opposite axial apertures provided between the first tightening member and the feed sleeve, the apertures being sufficiently large in the peripheral direction of the feed sleeve to allow a limited rotation of the actuating and tensioning rod relative to the feed sleeve sufficient for the rotation of the second tightening member relative to the first tightening member.

5,192,062
CLAMPING FORCE ADJUSTING DEVICE FOR A CLAMP DEVICE
Heinrich Berchtold, Nänikon/Uster, Switzerland, assignor to Gressel AG, Aadorf, Switzerland
Filed Apr. 16, 1992, Ser. No. 869,628
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1991, 4112547
Int. Cl.[5] B25B *1/10*
U.S. Cl. 269—244 11 Claims



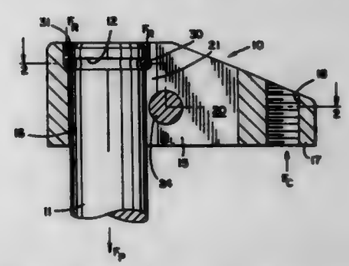
1. A clamping force adjusting device for a clamp device having a hollow housing supported directly or indirectly on a movable clamp part, a tension rod passing through the housing and being rotatable and slidable relative thereto, a first end of the tension rod being coupled to a force amplifier and a second end carrying a tension sleeve provided with an abutment flange, the tension sleeve acting axially on the housing through an adjusting sleeve axially adjustable by means of a fine thread, a thrust bearing and a plurality of Belleville springs, wherein the abutment flange is provided on an end of the tension sleeve adjoining the second end of the tension rod and the thrust bearing is provided on a side of the abutment flange facing away from the second end of the tension rod, wherein the Belleville springs are supported directly in the housing, wherein an intermediate sleeve is provided between the Belleville springs and the thrust bearing, abutting the thrust bearing at one end and abutting the Belleville springs at an other end, and wherein the adjusting sleeve can screw into a fine thread of the housing and has a radially inwardly directed first stop member on an end facing the Belleville springs, the first stop member so cooperating with a radially outwardly directed second stop member on the intermediate sleeve and a spacer ring bearing on the thrust bearing that the axial spacing of the first stop member form the second stop member and from the spacer ring is adjustable in the unstressed state by screwing the adjusting sleeve relative to the housing, whereby the stroke of the intermediate sleeve which on tightening up to abutment of the first stop member on the second stop member and the spacer ring is adjustable.

5,192,063
CLAMP ARM
Jeffrey M. Peterson, Menomonee Falls; Ronald P. Evers, Cedarburg; Peter G. Rusch, Oconomowoc; Duane D. Dwyer, Milwaukee; Barry L. Macky, Grafton, and James D. Boldt, Wauwatosa, all of Wis., assignors to Applied Power Inc., Butler, Wis.
Filed Sep. 12, 1991, Ser. No. 758,028
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—257 9 Claims

1. A clamp arm adapted for attachment to a plunger forming a part of a clamp, comprising:

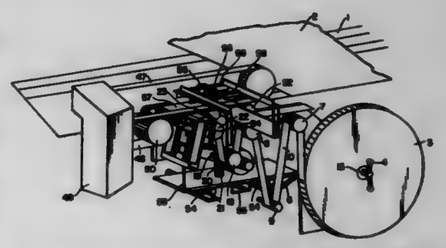
a body having a central opening for receiving the plunger and at least one working arm portion extending outwardly from the opening,

said body also including a slot extending radially from the central opening and a bore in the body that extends transversely through the slot, one portion of the bore being threaded to receive a headed bolt to draw the sides of the slot together to lock the body on the plunger, and



means mounted inside the body for axially restraining the body on the plunger including an element mounted for engagement with a circumferential groove on the outer perimeter of the plunger.

5,192,064
AUTOMATIC THIN WEB FEED AND CUT MECHANISM FOR FEEDING, CUTTING AND MATCHING THIN WEBS WITH PANEL EDGES
John Rancourt, Milpitas, Calif., assignor to Max Kahn Curtain Corporation, New York, N.Y.
Filed Dec. 16, 1991, Ser. No. 808,362
Int. Cl.[5] B65H *41/00, 39/02*
U.S. Cl. 270—52.5 14 Claims



1. An apparatus for cutting and feeding web material from a roll stock and for merging a cut web material feed strip with a passing panel of material within a textile panel assembly host unit, said host unit having a drive system for moving said panel, said feeding being conducted in such a way as to dispose leading and trailing ends of the web feed strip even with leading and trailing edges respectively of the passing panel being processed, said apparatus comprising:

a roll of web material;

means for rotating said roll to allow for unwinding of web material therefrom;

means for cutting a strip of web material from said roll;

means for guiding web material from said roll to said means for cutting;

means for sensing a leading edge and a trailing edge of a passing panel moving within said host unit;

means for feeding a cut strip of web material and for merging the cut strip with said passing panel within said host unit, said means for feeding comprising a pair of opposing rollers having a nip therebetween for gripping web material from the means for guiding, and means for changing the relative position of the opposing rollers with respect to each other from a first position where the rollers can grip web material in said nip to a second position where the rollers cannot grip web material; and

means for controlling actuation of said means for cutting and

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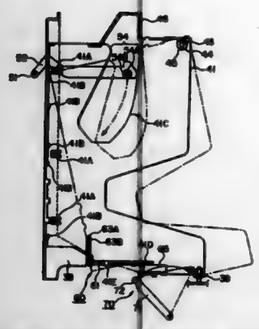
said means for feeding which is responsive to said means for sensing so that the means for cutting cuts web material into a strip having a leading end and a trailing end and the means for feeding feeds the strip and merges the strip with said passing panel such that the leading end and trailing end of said strip coincide with the leading edge and trailing edge, respectively, of said passing panel.

5,192,065
SORTER WITH TRAYS ROTATABLE INTO A STAPLING POSITION

Kunihiro Hirota, Hachioji; Hisao Hosoya, Sagamihara; Yasushi Yamada, Tachikawa; Kazunobu Miura, Hachioji, and Akihiko Nishiki, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 31, 1991, Ser. No. 815,416
Claims priority, application Japan, Jan. 16, 1991, 3-003379; Feb. 25, 1991, 3-030364; Mar. 15, 1991, 3-051302; Apr. 2, 1991, 3-069908
Int. Cl.[5] B42B *2/00*; B65H *39/02*
U.S. Cl. 270—53 13 Claims



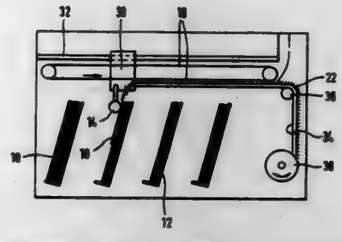
1. A sheet sorting apparatus for sorting a plurality of sheets into a plurality of groups and stapling said sheets by the group, said apparatus comprising:
means for sorting said sheets into a plurality of groups;
means for supporting each of said groups of sheets;
means for positioning the sheets of each of said groups in a setting position on said supporting means;
means for pressing the sheets of each of said groups onto said supporting means to fix said sheets of each of said groups in the setting position on said supporting means;
moving means for oscillating said supporting means to a stapling position, said pressing means setting said sheets of each of said groups at said setting position on said supporting means during movement of said supporting means to said stapling position; and
means for stapling said sheets of each of said groups at said stapling position.

5,192,066
DEVICE FOR TRANSPORTING SHEETS IN OFFICE MACHINES

Helmut Steinhilber, Sonnenbergstrasse 40, CH-6052 Hergiswil, Switzerland

Filed Aug. 28, 1991, Ser. No. 751,132
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1990, 4033237
Int. Cl.[5] B65H *3/44, 5/02, 39/10*
U.S. Cl. 271—9 9 Claims

1. A device for transporting individual sheets of a sheet-form recording medium in office machines comprising:
an endlessly circulating conveyor belt for positively engaging the sheets and comprising a carrier run,
a pressure device for holding the sheets in positive contact with the conveyor belt, the pressure device comprising at least one flat body parallel to the surface of the carrier run of the conveyor belt, said flat body being located at a fixed distance from said conveyor belt said body comprising thin, soft elastic mutually spaced pressure elements directed against said conveyor belt, the length of said pressure elements being greater than the distance between said flat body and said conveyor belt, and the mutual spacing of said elements being less than the linear dimensions of the sheets being transported,
a transport unit movable substantially parallel to said carrier run of said conveyor belt in front of magazines or storage compartments,

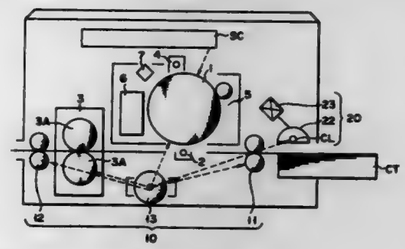


said flat body of said pressure device comprising at least a portion of a flexible belt having first and second ends, one said end of said flexible belt being attached to said transfer unit, a spring, said flexible belt having a second end attached to said spring for keeping said flexible belt under tension;
whereby said transfer unit may feed sheets out of a plurality of magazines or dispense sheets into a plurality of storage compartments disposed along said conveyor belt by movement of said transfer unit along said conveyor belt in from of said magazines or storage compartments.

5,192,067
PAPER FEED FOR PAGE PRINTER

Akihiro Saito, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 578,725, Sep. 6, 1990, abandoned. This application Mar. 10, 1992, Ser. No. 850,231
Claims priority, application Japan, Sep. 8, 1989, 1-234080
Int. Cl.[5] B65H *5/00*; G03G *21/00*
U.S. Cl. 271—10 7 Claims



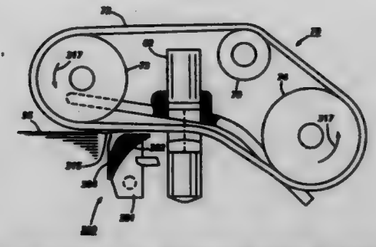
1. A paper feeder comprising:
a paper pick up section for supplying paper;
an image carrier;
a feeding mechanism for receiving paper supplied from said pick up section and transporting the paper to an image transfer position for a toner image formed on said image carrier and rotated along with said image carrier;
a stepping motor for driving said image carrier and said feeding mechanism;

motor driving means for sequentially generating drive pulses to be supplied to said stepping motor; and
control means for controlling the operation of said paper pick up section in accordance with the number of the drive pulses generated from said motor driving means;
said control means including:
counting means for counting the drive pulses generated from the motor driving means;
detecting means for detecting that the count of said counting means has reached at least one preset value; and
determining means for determining an actuating period of said pick up section in accordance with an output signal of said detecting means.

5,192,068
SHEET FEEDING AND SEPARATING APPARATUS WITH AN IMPROVED ENTRANCE GUIDE

Frank E. Parker, Fairport; Demosthenes K. Kiriazides, Penfield; Joseph S. Vetromile, Rochester, and Brian R. Ford, Walworth, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1992, Ser. No. 889,575
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—34 5 Claims

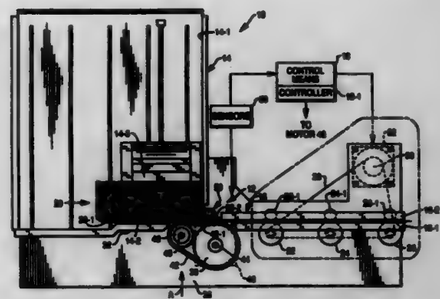


1. A sheet feeding and separating apparatus for feeding and separating sheets individually from a stack of sheets, comprising:
tray means for holding the stack of sheets, said tray means includes elevator means that lifts any sheet to be fed from said tray means to a feeding position above the confines of said tray means so that the sheets in the stack are initially unobstructed as they are fed from the stack;
endless feed belt means mounted in sheet feeding engagement with the top of the stack of sheets and applying a normal force thereto;
said feed belt means being rotatably mounted between spaced supports to provide a deformable unsupported section therebetween;
a retard roll having a curvilinear portion thereof deformably engaging said feed belt means to form a nip therebetween for separating any overlapped sheets reaching the nip; and
an integrally molded stationary multiple piece entrance guide positioned between said retard roll and said tray means such that said entrance guide is the first obstruction sheets being fed by said feed belt means encounter en route to the nip formed between said retard roll and said feed belt means, said entrance guide includes a high friction urethane first portion with a radiused edge that serves to shingle slugs of sheets and a polycarbonate second portion that supports said first portion, said polycarbonate second portion having an elongated third portion that is cantilevered, said elongated third portion includes an upper surface that terminates at a sharp edge and extends to a position immediately adjacent said curvilinear portion of said retard roll and works in conjunction with an upper surface of said high frictional urethane first portion to support sheets the entire distance from the stack into said curvilinear portion of said retard roll to prevent lightweight sheets from causing jams at the nip formed between said retard roll and said feed belt means, and a flexible deflector means for assisting in reducing the initial feed coefficient of friction and preventing down curled sheets from stubbing on said first portion of said entrance guide.

5,192,069
DOCUMENT FEEDER EMPLOYING A BELT

Kenneth S. Seymour, Conestoga, and Dennis T. Sommerburg, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 5, 1992, Ser. No. 846,091
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—35 6 Claims



1. An apparatus for feeding documents comprising:
a hopper for storing a stack of documents to be fed in a substantially vertical plane, said hopper having an alignment side and a stop;
feed means for moving the documents in the hopper along said alignment side towards the stop;
a drive roller and an idler roller having an endless belt mounted thereon to provide a linear portion of the endless belt parallel to the first document to be picked from the stack, with said linear portion engaging the first document to be picked;
a retard mechanism positioned adjacent said alignment side and in opposed relationship with said linear portion of said endless belt;
said retard mechanism having a retard member including a first portion to engage the documents in the stack and also having a second portion substantially parallel to said linear portion to permit only one document to be moved towards a document track by aid linear portion of said endless belt; and
a resilient member to bias said second portion towards said lien ar portion of said endless belt;
said stop being aligned with said linear portion of said endless belt, and said idler roller being positioned between said stop and said retard mechanism.

5,192,070
SUCTION PAD

Shigekazu Nagai; Shunzou Sakurai, and Tadasu Kawamoto, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 755,745
Claims priority, application Japan, Sep. 6, 1990, 2-093900[U]
Int. Cl.[5] B65H *3/08*
U.S. Cl. 271—90 2 Claims

1. A suction pad for attracting and holding a workpiece, comprising:
a suction base coupled via a connector to a vacuum suction source;
a suction skirt connected with said suction base, said suction

skirt including a separating wall disposed between said

5,192,073

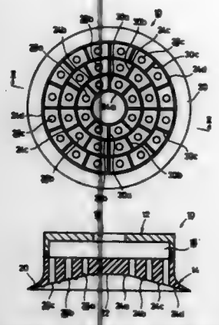
stacked on one another with said lower grip adjacent said

skirt including a separating wall disposed between said suction base and an inside of said suction skirt;

a first vacuum chamber defined inside said suction base above said separating wall, said separating wall separating said first vacuum chamber and the inside of said suction skirt;

a plurality of small diameter through holes defined in said separating wall for allowing said first vacuum chamber to communicate with the inside of said suction skirt;

a plurality of circular partition walls concentrically disposed on said separating wall facing the inside of said suction skirt and adjacent said through holes; and



a plurality of radial projections radially disposed on said separating wall, said projections being disposed between respective concentrically disposed partition walls and adjacent said through holes, wherein said partition walls and said projections jointly define a plurality of second vacuum chambers surrounding each of said through holes, and wherein when said suction pad is holding a workpiece said second vacuum chambers are defined between said separating wall and the workpiece held by said suction pad.

5,192,071

IMAGE-FORMING APPARATUS PROVIDED WITH AUTOMATIC ORIGINAL DELIVERY MECHANISM AND CARRIER SHEET FOR USE IN SAID APPARATUS

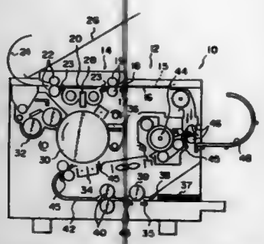
Kiyofumi Kodama, Hannan, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 437,689, Nov. 17, 1989, Pat. No. 5,114,139. This application Nov. 20, 1991, Ser. No. 795,030

Claims priority, application Japan, Nov. 18, 1988, 63-151354; Nov. 30, 1988, 63-300865

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—225 **3 Claims**



1. An image-forming apparatus provided with an automatic original delivery mechanism for automatically receiving and guiding an original set at an insertion opening to a copying position by automatic original delivery means and discharging the original to the outside of the apparatus after the coping operation, said apparatus comprising first original detecting means arranged at the initial setting position of the original, second original detecting means for detecting the absence or presence of the original from the original insertion opening to the original discharge opening, including the copying position, copying paper sheet delivery trouble detecting means arranged in a delivery path for a copying paper sheet to detect a delivery trouble of the copying paper sheet, and original delivery means capable of delivering the original from the original insertion opening to the discharge opening and performing the reverse delivery of the original, said original delivery means being controlled by said first original detecting means, second detecting means and said copying paper sheet delivery trouble detecting means so that in the state where said second original detecting means detects the original and the copying paper sheet delivery trouble detecting means detects a delivery trouble of the copying paper sheet, said original delivery means is actuated to perform the reverse delivery, and in the state where no trouble occurs in the copying paper sheet delivery path and said first original detecting means detects the original, said original delivery means is actuated to perform the normal delivery.

5,192,072

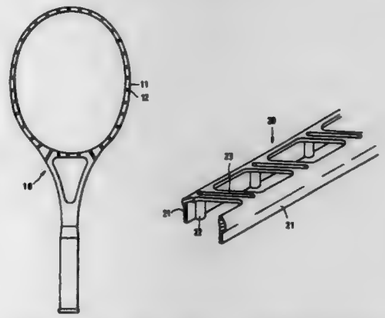
GAME RACKET HAVING IMPROVED STRINGING MEANS

Arthur Hong, No. 96, Sec. 4, Pei-Ping Rd., Taichung City, Taiwan

Filed Apr. 23, 1992, Ser. No. 872,380

Int. Cl.[5] A63B *49/02, 51/10*

U.S. Cl. 273—73 C **2 Claims**



1. A game racket having improved stringing means comprising a head frame, a hand grip, a shaft located between said head frame and said hand grip, and a netted surface formed by strings stretched horizontally and longitudinally across said head frame having a predetermined number of stringing elements through which said strings pass, each length of the strings which traverses the frame forming two turning points located respectively at two opposite sides of a center line of an outer surface of said head frame in such a manner that a line connecting said turning points intersects said center line obliquely and that said netted surface so formed has a front face and a rear face, wherein said game racket is characterized in that said head frame consists of a predetermined number of recess cuts, and that each of said stringing elements has two shoulders parallel to each other and a predetermined number of stringing tubes, with two of said stringing tubes located respectively and correspondingly on said two shoulders coupled by a connection portion, and further that said stringing elements are disposed in such a manner that said stringing tubes thereof are inserted into said recess cuts and that said connection portion covers the side surface of said head frame.

5,192,073

GOLF CLUB SET

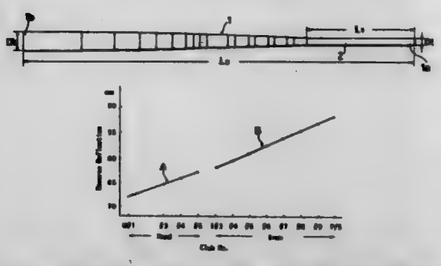
Takeshi Iwanaga, Kobe, and Hideaki Kawamotsu, Takarazuka, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Mar. 12, 1991, Ser. No. 668,123

Claims priority, application Japan, Mar. 20, 1990, 2-70828

Int. Cl.[5] A63B *53/00*

U.S. Cl. 273—77 A **9 Claims**



1. A golf club set comprising a plurality of differently numbered wood clubs and a plurality of differently numbered iron clubs, each club including a shaft which diametrically increases stepwise from a head end to a grip end, the shaft of said each iron club including a first step at the head end, each shaft having an overall length L_0, and each first step having a length L_1, the overall length L_0 of the iron club shafts decreasing by an amount ΔL_0 as the iron club number increases by one, the length L_1 of the respective first steps of the iron club shafts decreasing by an amount ΔL_1 as the iron club number increases by one, and wherein ΔL_1 is set larger than ΔL_0, and wherein ΔL_0 and ΔL_1 are of the same sign.

5,192,074

GUARD BATON WITH ROTATING CROSSHANDLE

Hideyuki Ashihara, 360-1, 8-chome, Sanbancho, Matsuyama-shi, Ehime-ken, Japan

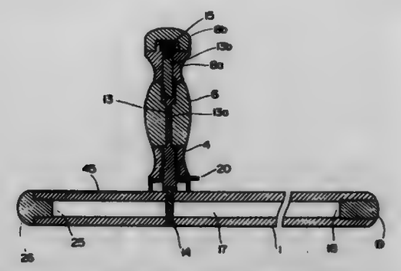
Continuation of Ser. No. 588,525, Sep. 26, 1990, abandoned, which is a continuation of Ser. No. 313,003, Feb. 21, 1989, abandoned. This application Jan. 13, 1992, Ser. No. 820,016

Claims priority, application Japan, Feb. 27, 1988, 63-45512; Mar. 19, 1988, 63-66803; May 20, 1988, 63-124713; Dec. 29, 1988, 63-335208

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] F41B *15/02*

U.S. Cl. 273—84 R **12 Claims**



1. A crosshandled guard baton which comprises:

a club having a longitudinal axis and a crosshandle perpendicular to the longitudinal axis of the club and supported internally by a shaft secured to a moupting base located toward one end of said club, said crosshandle having a length substantially equal to the width of a man's palm and comprising a lower grip, a central grip and an upper grip stacked on one another with said lower grip adjacent said mounting base, said shaft being secured internally of said central grip and rotatably supported internally of said lower grip and said upper grip, whereby said central grip and said shaft are rotatable together relative to said upper grip and said lower grip thereby permitting turning movement of said club relative to said lower grip and said upper grip.

5,192,075

TELESCOPING GUARD BATON WITH ROTATABLE CROSS HANDLE

Hideyuki Ashihara, 360-1, 8-chome, Sanbancho, Matsuyama-shi, Ehime-ken, Japan

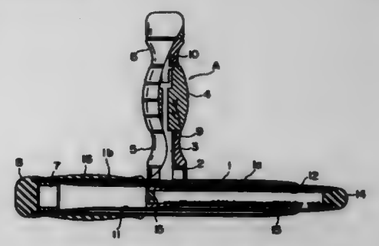
Continuation of Ser. No. 593,716, Oct. 4, 1990, abandoned, which is a continuation of Ser. No. 394,030, Aug. 15, 1989, abandoned. This application Jan. 17, 1992, Ser. No. 821,884

Claims priority, application Japan, Aug. 22, 1988, 63-209060; Mar. 27, 1989, 1-75529

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] F41B *15/02*

U.S. Cl. 273—84 R **12 Claims**



1. A crosshandled guard baton which compriaes:

a club having a hollow cylindrical form open at one end;

a crosshandle perpendicular to the club and supported internally by a shaft secured to said club at a position toward one end of said club, said crosshandle having a length substantially equal to the width of a man's palm;

the crosshandle comprising three portional members consisting of an upper, a central and a lower portional member which are stacked on one another with said lower portional member adjacent said club and a slide plane between adjacent portional members, said upper and lower portional members being rotatably supported by said shaft such that the club and said central portional member are rotatable relative to said upper and lower portional members;

at least one diametrically smaller cylindrical member telescopically received internally of the hollow space of the club and having one end extending out of said open end of the club, said at least one diametrically smaller cylindrical member being tapered radially inward at said end extending out of said open end of the club and tapered radially outward at a second end so as to be slidable internally of said club, whereby said at least one diametrically smaller cylindrical member is slidably movable relative to said open end of said club to extend outward of said open end of said club by a swing movement of said club and said radially outward tapered second end is retained internally of said open end of said club.

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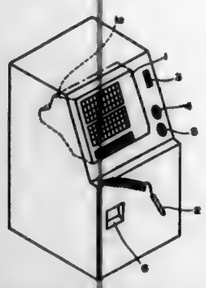
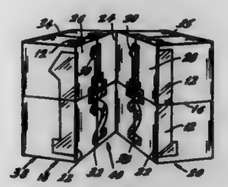
5,192,076
KENO GAME PLAYING APPARATUS
Takashi Komori, Tokyo, Japan, assignor to Sigma, Inc., Tokyo, Japan
Continuation of Ser. No. 443,492, Nov. 30, 1989, abandoned. This application Nov. 14, 1991, Ser. No. 793,293
Int. Cl.[5] A63B 71/06
U.S. Cl. 273—138 A 2 Claims



1. A Keno game playing apparatus comprising:
first display means for displaying a plurality of natural numbers;
designating means for designating a plurality of designated numbers chosen by a player from the plurality of natural numbers displayed on said first display means;
random number generating means for randomly generating a subset of numbers comprising a plurality of randomly generated numbers from the plurality of natural numbers displayed on said first display means;
selection display means, responsive to said random number generating means, for sequentially displaying the plurality of randomly generated numbers from the plurality of natural numbers displayed on said first display means;
judging means for judging whether which, if any, of said plurality of designated numbers coincide with the subset of randomly generated numbers; and
second display means having a plurality of blocks arranged in a single line, each of said blocks being sequentially changed to a first color whenever a random number from said subset of numbers coincides with a designated number from said plurality of designated numbers and to a second color whenever a designated number from said plurality of designated numbers does not coincide with a random number from said subset of numbers; said first color being indicative of a player hit; said second color being indicative of a player miss; whereby, the player can visually determine the relative number of hits from misses by looking at the color of each block in the second display means as each random number from the subset of natural numbers is generated.

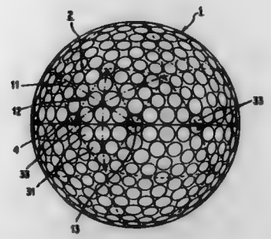
5,192,077
FRACTION ILLUSTRATING POLYHEDRON
Oswald A. Caicedo, New Milford, N.J., assignor to Sylvia Caicedo, N.J.
Filed Jun. 26, 1992, Ser. No. 904,826
Int. Cl.[5] A63H 33/10
U.S. Cl. 273—155 8 Claims

1. A polyhedron with indicia carrying sections, comprising:
the polyhedron being comprised of a first plurality of first larger sections which may be assembled together to define the complete polyhedron;
a respective first hinge connecting between each of the first sections and at least another one of the first sections, the first hinge being placed on each first section such that the connected first sections may be assembled together and may be hingedly openable apart around the respective first hinge between them;
at least one of the connected first larger sections having a first surface which is hidden from view when the first sections are assembled together to define the polyhedron and the first surface is so placed on the first section and with respect to the first hinge as to be exposed to view when the first sections are opened apart;
indicia representative of the fraction of the entire polyhedron of which the first section is comprised being defined on the first surface;
at least one of the first sections being comprised of a respective second plurality of second smaller sections which, when the second sections of which the one first section is comprised are assembled together, the second plurality of second sections define the one first section;



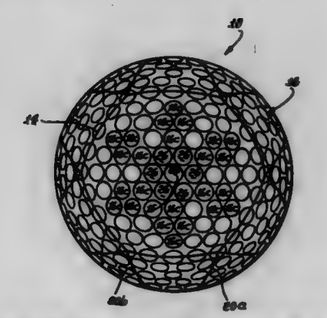
a respective second hinge connecting between each of the second sections and at least another one of the second sections, the second hinge being placed on each second section such that the connected second sections may be assembled together and be hingedly openable apart around the respective second hinge between them;
at least one of the connected second sections having a second surface which is hidden from view when the second sections are assembled together to define the one first section and which is exposed to view when the second sections are opened apart;
indicia representative of the fraction of the entire polyhedron of which the second section is comprised being defined on the second surface.

5,192,078
GOLF BALL
Young-Kyu Woo, Kwangju, Rep. of Korea, assignor to Kumho & Company, Inc., Seoul, Rep. of Korea
Filed Feb. 22, 1991, Ser. No. 659,503
Claims priority, application Rep. of Korea, Apr. 4, 1990, 4677/90
Int. Cl.[5] A63B 37/14
U.S. Cl. 273—232 7 Claims



1. A molded golf ball having a dimpled spherical surface definable as an icosahedron of regular spherical triangles, and comprising:
two hemispheres joined by a mold-parting line, said mold-parting line being devoid of any dimples and disposed along a great circle of said spherical surface;
a plurality of first dimples disposed within said regular spherical triangles;
a plurality of intersecting points formed by intersections of sides of some of said regular spherical triangles and said mold-parting line; and
a plurality of pairs of second dimples, with at least one pair of said second dimples being disposed at each of said intersecting points and exhibiting aerodynamic characteristics generally equivalent to at least one of said first dimples, and said second dimples of each said pair being located on opposite sides of said mold-parting line.

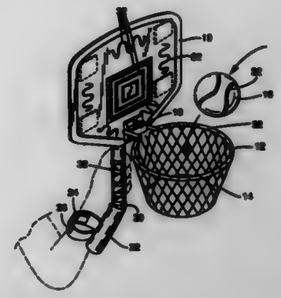
5,192,079
GOLF BALL WITH SMALLER AND LARGER DIMPLES
Donald J. C. Sun, 4521 Ocean Valley La., San Diego, Calif. 92130, and Eric C. P. Kuo, 14501 Maplewood St., Poway, Calif. 92064
Continuation-in-part of Ser. No. 552,089, Jul. 13, 1990, Pat. No. 5,087,048. This application Sep. 16, 1991, Ser. No. 760,088
Int. Cl.[5] A63B 37/14
U.S. Cl. 273—232 7 Claims



1. In a golf ball characterized by enhanced flight distance and enhanced aerodynamic symmetry, the ball having a generally spherical surface with dimple pattern thereon, the improvement comprising:
a) between about 75% and 85% of the ball spherical surface occupied by the dimples,
b) there being dimples of at least two different diameters, all of which have diameters within the range of 0.110 to 0.160 inches,
c) there being multiple dimple intersecting segments or arcs of great circles on the ball surface, which define six-sided spherical surface hexagons associated with axially opposite polar zones,
d) and there being 24 of the smaller dimples within each of said hexagons,
e) the smaller dimples within each said hexagon grouped in clusters symmetrically spaced about an axis of said ball centrally intersecting said hexagons,
f) the ball also having an equator, and certain of said segments or arcs of great circles also defining multiple spherical surface triangles with legs on said equator, and legs coincident with said sides of said hexagon,
g) and wherein there are six of said clusters equally spaced about said axis, in each hexagon, each said cluster comprising four dimples.

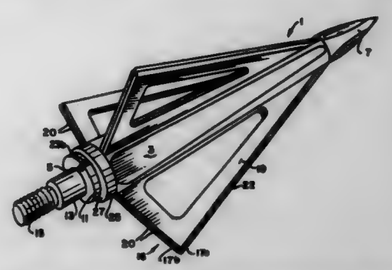
5,192,080
BASKETBALL TYPE GAME
Don Duncan, 22718 SW. Johnson Rd., West Linn, Oreg. 97068
Filed Mar. 2, 1992, Ser. No. 844,454
Int. Cl.[5] A63B 67/00
U.S. Cl. 273—412 5 Claims

1. A basketball-type game comprising:
a reduced size ball,
a reduced size backboard having a face surface,
a hoop supported on the face surface of said backboard in angular relation,
and a handle depending integrally from said backboard by means of which a person can grasp and hold the backboard and hoop in an upright position with one hand and maneuver it so that said ball when approaching the person can by skill of the person be caused to pass through the hoop,



said handle including an integral downward extension on a lower portion thereof angled relative to said handle so as to lie in abutted engagement against the wrist when said handle is gripped in the hand for playing.

5,192,081
MULTI-BLADE ARROWHEAD
Gary L. Cooper, HC-04 Box 62, Pocahontas, Ark. 72455
Filed Jan. 9, 1990, Ser. No. 462,455
Int. Cl.[5] F42B 6/08
U.S. Cl. 273—422 9 Claims



1. In an arrowhead including an elongated ferrule, the improvement comprising at least one blade cluster mounted on said ferrule, said blade cluster comprising a plurality of blades mounted in side-by-side relation on said ferrule, said blades having webs parallel with one another and sharp edges spaced from one another to produce a channel cut as they penetrate, each of said blades including a blade web, a blade base, and front and rear mounting fingers at opposite ends of said base, said blades being mounted in axially extending groves in said ferrule and being mounted to said ferrule at their rear ends by a collar which covers said mounting fingers, said collar being held in securing position by said shaft.

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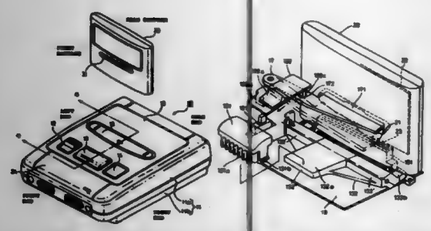
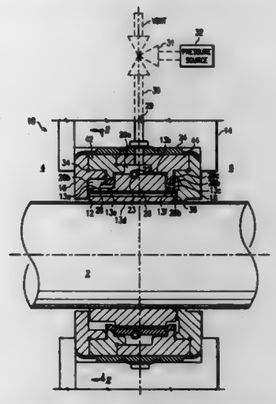
5,192,083
TV GAME MACHINE
Yoshihiro Inoue, Kyoto, and Kenichiro Ashida, Amagasaki, both of Japan, assignors to Nintendo Company Limited, Kyoto, Japan
Continuation of Ser. No. 748,938, Aug. 23, 1991, abandoned. This application Aug. 12, 1992, Ser. No. 928,076
Claims priority, application Japan, Aug. 24, 1990, 2-89036[U]; Nov. 1, 1990, 2-115097[U]
Int. Cl.[5] A63F *9/22*
U.S. Cl. 273—435 10 Claims



1. A TV game machine to and from which a cartridge storing a game program can be attached and detached, for executing processes for a game by reading the game program from the attached cartridge, comprising:
a housing having a hole for inserting said cartridge at an upper surface; and
a power switch mechanism provided related to the upper surface of said housing; wherein
said cartridge has a flat shape with one and the other major surfaces, and a locking groove extending in horizontal direction formed approximately at the center of one major surface;
said power switch mechanism includes
a slide switch slidably provided on the upper surface of said housing,
a power switch contained in said housing and turned on/off in response to operation of said slide switch, and
locking means axially supported in said housing and rotated in response to operation of said slide switch, a part of which is fit in the locking groove of said cartridge when it is rotated; whereby
when said cartridge is attached to said housing and said power switch is turned on, said lock means is fit in the locking groove of said cartridge to lock said cartridge to prevent ejection of the cartridge.

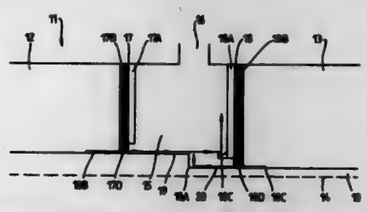
5,192,083
SINGLE RING SECTOR SEAL
Henry F. Jones, Jr., and Wilbur Shapiro, both of Schenectady, N.Y., assignors to Dresser-Rand Company, Corning, N.Y.
Filed Jan. 16, 1992, Ser. No. 821,789
Int. Cl.[5] F16J *9/00*
U.S. Cl. 277—29 20 Claims

1. A single ring sector seal assembly for mounting around a shaft for sealing against the passage of high pressure fluid along said shaft from a high pressure side of said seal assembly to a low pressure side of said seal assembly, said seal assembly comprising:
a seal housing adapted to be circumferentially located around said shaft;
at least two arcuate sectors adapted to be circumferentially positioned about said shaft and joined together to collectively form a single ring sector seal having an annular outer surface and an annular inner seal surface, with a fluid film between said annular inner seal surface and said shaft during the motion of said shaft, said sectors being encircled by and in floating relationship to said seal housing, said annular outer surface comprising first, second, and third annular portions, said second annular portion being positioned between said first and third annular portions;
an annular vent chamber formed by said seal housing and said second annular portion and isolated from said high pressure side of said seal assembly; and



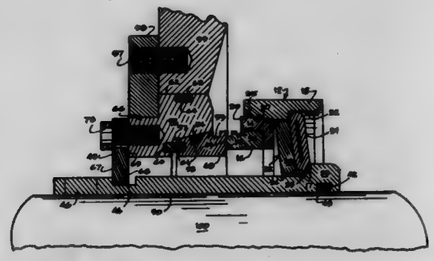
means to vent said vent chamber to a suitable low pressure environment in order to maintain the pressure in said vent chamber substantially below the pressure of said high pressure side of said seal assembly while said shaft is in motion, thereby preventing contact of said sectors with the moving shaft.

5,192,084
BRUSH SEAL ARRANGEMENT
David S. Norbury, Bristol, England, assignor to Rolls-Royce plc, London, England
Filed Dec. 10, 1991, Ser. No. 805,329
Claims priority, application United Kingdom, Dec. 12, 1990, 9026971
Int. Cl.[5] F16J *15/447*
U.S. Cl. 277—53 5 Claims



1. A brush seal arrangement to effect sealing between relatively rotating first and second coaxial members which define therebetween an axially extending annular enclosure, the enclosure having in axial sequence a high pressure fluid region, a low pressure fluid region, and a intermediate pressure fluid region having a pressure between that of the high and low pressure regions,
the arrangement being provided by first and second radially disposed brush seals secured to the first member, the first seal being located between the high pressure region and the low pressure region, and the second seal being located between low pressure region and the intermediate pressure region,
the axial width of the annular enclosure in the high pressure region being less than the axial width of the annular enclosure in the intermediate pressure region, the difference in width being provided by a step in the radius of the second member within the low pressure region,
wherein there is provided between the step and the second seal adjacent the distal end of the second seal but spaced from the second member an element adapted to direct high pressure fluid leaking past the first seal away from the contact region of the second seal with the second member.

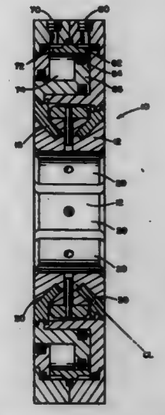
5,192,085
RUBBER DRIVE SYSTEM MECHANICAL SEAL
Robert McOuie, 1485 A 29th St., Kenner, La. 70062
Continuation-in-part of Ser. No. 628,372, Dec. 17, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 847,748
Int. Cl.[5] F16J *15/38*
U.S. Cl. 277—81 S 18 Claims



1. A split ring mechanical seal device for use in rotating equipment, comprising:
a rotating drive sleeve;
means for sealably securing said rotating drive sleeve to the shaft of said rotating equipment;
a fractured rotating seal ring with wear face;
a fractured stationary seal ring with wear face;
an annular cone spring removably engaged at its inner periphery to said drive sleeve and removably engaged at its outer periphery to said fractured rotating seal ring whereby a compressive force is applied tending to thrust said wear faces together;
an elastomeric cup fixably bonded to said fractured rotating seal ring, said cup being cut entirely through its cross section at a point directly adjacent to a fracture line of said rotating seal ring;
an 'O' ring engaging said fractured stationary seal ring, said 'O' ring being split at a point directly adjacent to a fracture line of said stationary seal ring;
means for flexibly and sealably transferring rotary motion of said drive sleeve to said rotating seal ring;
means for sealably securing said stationary seal ring to the vessel wall of said rotating equipment, and
means for pre-setting the amount of said compressive force tending to thrust said ware faces together.

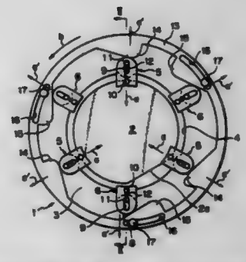
5,192,086
DOUBLE RAMP, FULL LENGTH GRIP COLLET
James L. Bucks, 7353 Cadle Ave., Mentor, Ohio 44060
Filed Jul. 9, 1991, Ser. No. 727,650
Int. Cl.[5] B23B *31/20*
U.S. Cl. 279—4.09 16 Claims

1. A collet chuck for gripping an associated workpiece, said collet chuck comprising:
first and second actuating rings, each actuating ring having an inward and an outward surface and a sliding section, said sliding section having a configuration of a portion of the surface of a cone; and,
a plurality of slide blocks, each slide block having an inward surface and an outward surface and two side surfaces, each of said blocks having a radial centerline, each of said blocks having a pair of opposed slots, said slots having a configuration of a portion of the surface of a cone, each of one of said slots slidably receiving one of said sliding sections of said actuating rings therein, a centerline of



each of said slots of one of said slid blocks intersecting the radial centerline of one of said slide blocks at an angle whereby movement by one of said actuating rings causes radial movement of said slide block.

5,192,087
DEVICE FOR SUPPORTING A WAFER
Hideaki Kawashima, and Kouhei Eguchi, both of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Oct. 2, 1991, Ser. No. 769,432
Claims priority, application Japan, Oct. 2, 1990, 2-264488; Oct. 12, 1990, 2-274566
Int. Cl.[5] B23B *31/171*
U.S. Cl. 279—71 5 Claims



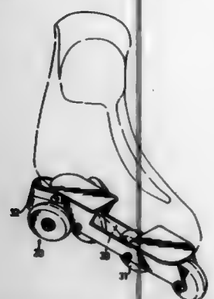
1. A device for supporting a wafer, comprising:
a base plate;
a group of first supports circumferentially arranged at regular intervals on said plate to support a periphery of the wafer above said plate, and a group of second supports circumferentially arranged on said plate, in spaced relation to each of the first supports, to support the periphery of the wafer above said plate, each of the first and second supports being movable between a supporting position for supporting the wafer and a releasing position, radially outward of said supporting position, in which the support is released from the wafer;
releasing means urging each of said first and second supports radially outwardly toward said releasing position; and
means for alternatively
(1) moving each of said first supports into said supporting position while simultaneously allowing said releasing

second surfaces each being oriented at a different first and end thereof foldably connected to each other by a ninth factor-

means to urge each of said second supports into said releasing position or

(2) moving each of said second supports into said supporting position while simultaneously allowing said releasing means to urge each of said first supports into said releasing position, said alternatively moving means including an annular member rotatably mounted on said base plate, said annular member having a plurality of internal projections circumferentially arranged along an inside surface of said annular member in correspondence with said first and second supports.

5,192,088
ROLLER SKATE WITH DEVICE FOR ASSISTING THE TURNING AND BRAKING ACTION THEREOF
Chung-Hsiung Yu, 2nd Fl., No. 94, Chung-Yuan St., Taipei City, Taiwan
Filed Mar. 2, 1992, Ser. No. 844,726
Int. Cl.[5] A63C *17/06*
U.S. Cl. 280—11.22 10 Claims



1. A device for assisting the turning and braking action of a roller skate which has rollers aligned along an axis extending between a first end and a rear end of said roller skate, comprising:

at least one mounting seat to be attached to the roller skate adjacent to at least one of said ends, said mounting seat including a plate which has a first end, a second end, two mounting arms extending upward from said first end and said second end of said plate, said mounting arms adapted to be connected to said roller skate along said axis of aid roller skate, a main screw member provided at a point on said axis of said roller skate and two adjustment screw members on two sides of said axis;

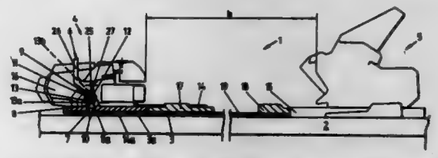
a pair of mounting shafts mounted on said mounting seat and extending in a fashion that they form an angle therebetween and that they are symmetric with respect to said axis of said roller skate, each of said mounting shafts having a flat end, said flat end having a main screw hole through which said flat end is screwed to said plate via said main screw member; and

a pair of auxuliary rollers mounted respectively to said mounting shafts so that they lie in two imaginary planes which are perpendicular to said mounting shafts, respectively, and which form an angle therebetween, said flat end of each of said mounting shafts further having an elongated adjustment slot outward of said main screw hole to receive a respective one of said adjustment screw members, whereby the angle between said auxiliary rollers can be adjusted so that said auxiliary rollers are symmetric with respect to said axis of said roller skate.

5,192,089
PEDAL-OPERATED SCOOTER
Walter R. Taylor, Rte. 2, Box 181, Rayville, La. 71269
Filed Nov. 22, 1991, Ser. No. 796,471
Int. Cl.[5] B62M *1/00*
U.S. Cl. 280—221 20 Claims

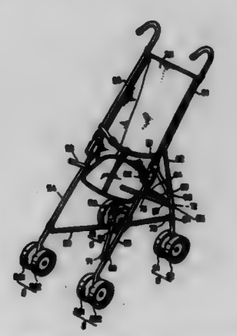
1. A pedal-operated vehicle comprising a frame having at least two wheels; pedal means pivotally mounted on said frame for receiving an operator; a pair of sprockets carried by one of said wheels in forwardly-driving and rearwardly freely-rotating relationship and a pair of sprocket chains engaging said sprockets, respectively; first pulley means carried by said frame and a front cable engaging said first pulley means and having one end attached to the front portion of said pedal means and the opposite end of said front cable attached to one end of one of said sprocket chains; second pulley means carried by said frame and a rear cable engaging said second pulley means and having one end attached to the rear portion of said pedal means and the opposite end of said rear cable attached to one end of the other one of said sprocket chains; and bias means connecting the opposite ends of said sprocket chains, whereby said sprockets are alternately deployed in said forwardly-driving relationship for propelling said vehicle forwardly in drive mode and in said rearwardly free-rotating relationship, responsive to pivotal operation of said pedal means and the tension in said bias means, respectively.

5,192,090
SKI BINDING COMPONENT, PARTICULARLY A FRONT JAW
Klaus Damborsky, Klosterneuburg-Kierling, Austria, assignor to HTM Sport- und Freizeitgeraete Gesellschaft m.b.H., Schwechat, Austria
PCT No. PCT/EP91/00062, § 371 Date Sep. 27, 1991, § 102(e) Date Sep. 27, 1991, PCT Pub. No. WO91/11231, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 16, 1991, Ser. No. 768,274
Claims priority, application Austria, Feb. 5, 1990, 231/90
Int. Cl.[5] A63C *9/22*
U.S. Cl. 280—634 4 Claims



1. In a ski binding, comprising a guide rail adapted to be fastened on an upper side of a ski, and a jaw unit guided on said guide rail for movement in a longitudinal direction of the ski and being selectively fixed in predetermined positions on said guide rail by a locking device which has a movable locking part supported on said jaw unit and for movement, urged by a force of a spring, into selective reception in one of a plurality of complementary locking recesses in said guide rail, said locking part including an operating member pivotally supported for movement about a pivot axis for facilitating said locking part becoming disengaged from said complementary locking recess, said operating member having at least first and second surfaces each being oriented at a different first and second distance from said pivot axis and thus determining a locked and an unlocked condition of said locking device, said first and second surfaces being held in said locked and unlocked conditions urged by said spring against a complementary surface on said jaw unit, the improvement wherein said operating member includes a further, third surface spaced a still different third distance from said pivot axis, wherein said guide rail includes a front portion and a rear portion, said jaw unit being movably supported on said front portion, a heel holder being movably supported on said rear portion of said guide rail, said heel holder having a metal band extending forwardly thereof to a position underlaying said jaw unit, said metal band and said front portion of said guide rail being in superposed relation, said metal band being movable longitudinally of the ski with said heel holder and relative to said front portion of said guide rail, said heel holder being prevented from lifting away from the ski by said rear portion of said guide rail, wherein said locking part and said operating member together define first and second locking positions, said first locking position effectively locking said jaw unit and said metal band to said front portion of said guide rail, whereas said second locking position effectively locking only said jaw unit to said front portion of said guide rail, said metal band together with said heel holder, in said second locking condition, being movable in said longitudinal direction of the ski and a desired position by said locking device when in said first locking position.

5,192,091
FOLDING TOY BABY CART
Kun-Hei Liu, 2F, No. 32, Lane 200, Tung Hwa Street, Taipei, Taiwan
Filed Apr. 9, 1992, Ser. No. 865,986
Int. Cl.[5] B62B *7/08*
U.S. Cl. 280—644 4 Claims



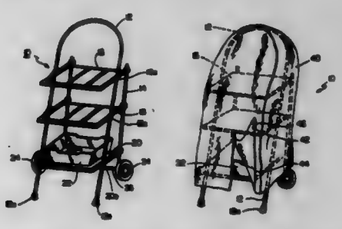
1. A folding toy baby cart which comprises of a canvas stretched on a folding frame assembly, said folding frame assembly comprised of a pair of handle rods, a pair of front wheel rods respectively having a top connected by a first U-shaped connection and a first fastening bolt to said handle rods and a bottom holding a front wheel assembly, a pair of rear wheel rods respectively having a top connected to said handle rods by a second U-shaped connection and a second fastening bolt and a bottom holding a rear wheel assembly, a pair of side rods respectively connecting said front wheel rods and said rear wheel rods by third fastening bolts, two bottom rods pivoted together at respective centers thereof by a fourth fastening bolt and crossedly connecting between said front wheel rods and said rear wheel rods by first L-shaped connections and fifth fastening bolts, two back rods pivoted together at respective centers thereof by a sixth fastening bolt and crossedly connecting said handle rods by second L-shaped connections and seventh fastening bolts and said rear wheel rods by eighth fastening bolts, two connecting plates with one end thereof foldably connected to each other by a ninth fastening bolt and an opposite end thereof respectively connected to said back rods by a tenth fastening bolt, two connections with one end thereof respectively connected to said connecting plates and said back rods by eleventh fastening bolts and an opposite end thereof respectively connected to said side rods by twelfth fastening bolts,

wherein said handle rods; said front wheel rods; said rear wheel rods; said side rods; said bottom rods; said back rods; said connecting plates; said two connections; said first and second U-shaped connections; said first and second L-shaped connections; said first, second, third, fourth, fifth, sixth, seventh, eight, ninth, tenth, eleventh and twelfth fastening bolts are made of impact resistant plastic material;

said first, second, third, fourth, fifth, sixth, seventh, eight, ninth, tenth and eleventh and twelfth fastening bolts having a shape of a cylindrical rod with heads at each end thereof with a larger diameter than said cylindrical rod, one of said heads having a cone shape with a pointed end thereof facing outward relative to said cylindrical rod, and

said first U-shaped connections are respectively integrally formed with said front wheel rod, said second U-shaped connections are respectively integrally formed with said handle rod, said first L-shaped connections are respectively integrally formed with said front wheel rods and said rear wheel rods, said first L-shaped connections respectively surround said front wheel rods and said front wheel rods and have an extended tab with a hole for receiving said fifth fastening bolts, and said second L-shaped connections are respectively integrally formed with said handle rods, said second L-shaped connections respectively surround said handle rods and have an extended tab with a hole for receiving said seventh fastening bolts.

5,192,092
RECYCLING BIN CART
Richard DiBenedetto, 27202 S.W. 164th Ave., Homestead, Fla. 33031
Filed Mar. 21, 1991, Ser. No. 674,000
Int. Cl.[5] B62B *1/12*
U.S. Cl. 280—654 4 Claims



1. A recycling bin cart for storing and transporting a plurality of recycling bins comprising:

a rigid axle; a pair of wheels attached at opposite ends of said rigid axle; a first rigid frame having at least three sides rectangularly disposed and attached for vertical disposition relative to said rigid axle;

first and second movable shelves spaced a predetermined distance apart for horizontal disposition in a working position and sufficiently sized to receive recycling bins with additional space for placing objects in said recycling bins, said first and second shelves attached along one side to said rigid vertical support frame;

a vertical U-shaped frame movably coupled to said first and second shelves, said vertical frame including legs for engaging the ground and a U-shaped handle at the opposite end, said U-shaped frame having a first position,

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whereby the first and second shelves are horizontally locked in a position and a second position where the first and second shelves are rotated and oriented vertically for a storage position;

a cover support frame mounted above said first two shelves and attached to said rigid vertical frame movably to said U-shaped vertical support frame movably, said cover support frame extended horizontally in the locked position of said vertical frame member; and

a decorative covering means shaped to fit over and surround said cart, including a curved portion for engagement with said U-shaped handle of said vertical U-shaped frame and a cylindrical portion to engage said cover support frame;

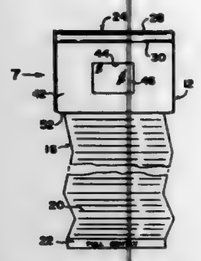
said cover means including a flap area for access to bins mounted on said cart, said cover means including a fabric fastening means for holding the cover in an open position and disengagement for closing the cover.

5,192,098

INDICIA CARD STORAGE DEVICE

Andre L. Zeisky, 55 W. 14th St., Apt. 4-D, New York, N.Y. 10011, and Maurice Grunfeld, 37 Doral Ct., New City, N.Y. 10956

Filed Apr. 20, 1992, Ser. No. 872,680
Int. Cl.[5] B42D *19/00*
U.S. Cl. 281—5 **4 Claims**



1. An indicia card storage device which comprises:

a) a pair of planar opposed covers;

b) an elongated sheet having a plurality of foldable panels with indicia thereon and a foldable pull strip on a lower edge of the bottom panel; and

c) means for securing an upper edge of a top panel of said elongated sheet between an upper edge of said covers, so that the panels can be folded up and stored between said covers, wherein said securing means is a heat seal formed at the upper edge of said covers and the upper edge of the top panel of said elongated sheet, whereby a user may unfold the pull strip and pull out all the panels causing them to be unfolded and spread out for viewing.

5,192,094

EXPANSION PIPE JOINT

Kiyoshi Hamamoto, Saita, Japan, assignor to Yano Giken Co., Ltd., Osaka, Japan

Filed Feb. 3, 1992, Ser. No. 829,897
Claims priority, application Japan, Feb. 8, 1991, 3-17187
Int. Cl.[5] F16L *27/04*
U.S. Cl. 285—165 **6 Claims**

1. An expansion pipe joint comprising:

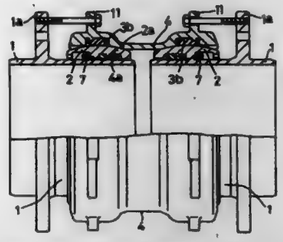
a pair of inner sleeve means, having substantially the same shape, each said inner sleeve means including an annular projection formed on an outer surface thereof;

a pair of outer sleeve means, having substantially the same shape, for receiving said pair of inner sleeve means to be axially slidable relative to and inseparable from said pair of inner sleeve means, each of said outer sleeve means including an annular groove formed on an inner surface thereof;

ring means mounted in said annular groove for engaging said annular groove and said annular projection along a circumferential direction;

a casing pipe surrounding said pair of outer sleeve means and interconnecting said pair of outer sleeve means;

wherein each of said outer sleeve means defines an inner end portion through which said annular projection is inserted



to a position spaced further from said inner end portion than said ring means;

said ring means is C-shaped with a portion thereof cut out so as to be elastically deformable radially outwardly; and

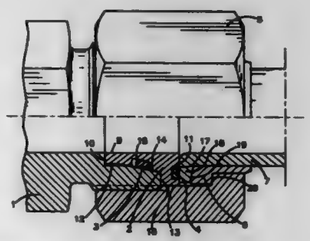
said annular projection is placed further from said inner end portion than said ring means by elastically deforming said ring means radially outwardly in said annular groove.

5,192,095

COUPLING DEVICE

Gunter Behrens, Schlob-Holte, Fed. Rep. of Germany, assignor to Parker Ermeto GmbH, Bielefeld, Fed. Rep. of Germany

Filed Nov. 1, 1991, Ser. No. 786,446
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1990, 4034803
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—332.1 **8 Claims**



1. A coupling device, comprising:

a coupling body of the type having an outer thread, an internal bore and an inner bevel;

a pipe with an outwardly flared flange;

a nut with an inner thread which mates with the outer thread of the coupling body for threaded connection thereto and an inner flange which is captured by the outwardly flared flange of the pipe; and

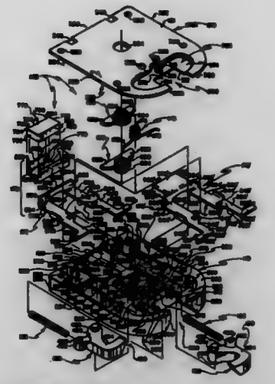
an adapter piece which is received in said coupling body so that said nut can be extended over said adapter piece to threadedly join said coupling body with said pipe with said adapter piece pressed therebetween by the tightening of the nut, said adapter piece having an outer bevel which mates with the inner bevel of the coupling body, and radially arranged end ring faces of different dimensions disposed at opposite axial ends of said adapter piece at least one of which forms a sealing face with a sealing ring disposed for mating with and sealing against said outwardly flared flange of said pipe.

5,192,096

DOOR LOCK ASSEMBLY

Lee S. Weinerman, Medina; John V. Pastva, Jr., Parma Hts., and Steven A. Mayo, Akron, all of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 665,982, Mar. 7, 1991, and a continuation-in-part of Ser. No. 666,404, Mar. 7, 1991, and a continuation-in-part of Ser. No. 666,793, Mar. 8, 1991. This application Dec. 4, 1991, Ser. No. 802,204
Int. Cl.[5] E05C *3/34*
U.S. Cl. 292—45 **30 Claims**



1. A lock assembly, comprising:

a) housing means including first and second housing members having wall portions thereof that extend in spaced, substantially parallel planes for defining a hollow housing interior that is bounded at least in part by formation means for protectively housing and operably mounting selected operating components of the lock assembly within the hollow interior, with the housing means having first and second end regions thereof that are spaced one from the other along an imaginary center plane that extends substantially centrally through the hollow interior and substantially perpendicular to said spaced parallel planes, with the housing means including passage-defining means located near said first end region for defining a keeper-receiving passage that extends along an imaginary passage axis that extends within the center plane and extends substantially perpendicular to said spaced parallel planes, with the keeper-receiving passage being configured to receive portions of a keeper therein when the housing means and the keeper portions are moved relatively toward each other, with the passage-defining means including opposed first and second wall portions that face toward each other and extend along opposite sides of said passage axis and along opposite sides of said center plane so as to be located substantially symmetrically about the center plane, with the passage-defining means also defining opposed first and second latch-member-receiving passages that open through the opposed first and second wall portions into opposite sides of the keeper-receiving passage, with the housing means including lock operator mounting means located near said second end region for mounting lock operator means for rotation about a lock operator axis that extends within the center plane and extends substantially perpendicular to the spaced parallel planes, and with said wall portions of the housing means cooperating to define said hollow housing interior such that it includes first and second communicating portions that are adjacent to each other but are located on opposite sides of said center plane, with the first and second communicating portions cooperating to define a common central chamber that extends from a first end region thereof to a second end region thereof in a manner that is substantially symmetrical in configuration with respect to said center plane, with the housing means having opposed pairs of guide surfaces extending in parallel, end-to-end directions and being arranged symmetrically about the center plane so as to provide slide-guide surfaces at various locations within the central chamber, with the first and second latch-member-receiving passages opening into the first end region of said first and second portions of the central chamber, respectively, to thereby communicate the keeper-receiving passage with a first end region of the central chamber, and with the lock operator mounting means including aligned holes formed through the first and second housing members and opening into the second end region of the central chamber;

b) operating component means connected to the housing means and having at least portions thereof that are protectively housed by the central chamber, including:

i) first and second latch members pivotally connected to the housing means for movement about parallel pivot axis that are spaced equidistantly from the center plane but are located on opposite sides thereof within the first end region of the central chamber, with the latch members each having a base portion that extends from the location of the associated pivot axis in a direction extending away from said center plane toward an associated abutment location with the abutment locations being near opposite peripheral portions of the first end region of the central chamber, and with the latch members having abutment formations connected thereto at said abutment locations, with the latch members also having oppositely curved hook-shaped latching formations that extend away from the base portions and into the latch-member-receiving passages, and with the latch members also having keeper engagement formation means defined on distal end regions of the latching formations for releasably latchingly engaging keeper portions that may be positioned so as to extend into the keeper-receiving passage;

ii) latch member biasing means interposed between the housing means and the first and second latch members for biasing the latch members oppositely about their associated pivot axes to bias the keeper engagement formations toward each other so as to extend into latching engagement with such keeper portions as may be positioned to extend into the keeper-receiving passage;

iii) slide means slidably supported within the central chamber of the housing means and having abutment means connected thereto for extending into the first end region of the central chamber for abuttingly engaging the abutment formations of the latch members for concurrently pivoting the first and second latch members in opposite directions abut their associated pivot axes to effect "unlatching" movement of the first and second latch members from engagement with such keeper portions as may be positioned to extend into the keeper-receiving passage, with the aforesaid unlatching movement serving to retract the keeper engagement formation means into the latch-member-receiving passages to release their engagement with such keeper portions as may be positioned to extend into the keeper-receiving passage, with said "unlatching" movement of the latch members resulting from sliding type of corresponding unlatching movement executed by the slide means being moved within the central chamber in a direction extending away from the first end region thereof and toward the second end region thereof, and with the slide means having first driving formation means that extends transversely within the second end region of the central chamber a location near said lock operator axis;

iv) slide biasing means interposed between the housing means and the slide means for biasing the slide means away from the second end region of the central chamber and toward the first end region of the central cham-

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ber so that said sliding type of unlatching movement of the slide means is opposed by the slide biasing means;

v) lock operator means pivotally connected to the housing means for pivoting about the lock operator axis, with the lock operator means having second drive formation means for extending into said second end region of the housing means and into driving engagement with the first driving formation means for effecting unlatching movement of the slide means in response to pivotal unlatching movement of the lock operator means about said lock operator axis;

c) said slide means includes a sheet metal stamping that is characterized by a generally U-shaped configuration that is symmetric about the center plane in that it includes first and second leg formations that are mirror images of each other, that define a plurality of edge surface formations for extending into sliding engagement with said slide-guide surfaces at said various locations within the central chamber, that have oppositely extending foot-like formation means that are located within the first end region of the central chamber for defining said abutment formation means, and that extend into the second end region of the central chamber where the first and second leg formations join with an integrally-formed bridging leg that extends transversely through the second end region of the central chamber so as to cross the center plane relatively near to the lock operator axis, with the bridging leg being configured to define at least a portion of the first driving formation means, with the first and second leg formations being substantially flat and extending in a substantially common plane that parallels said spaced, substantially parallel planes of the housing means except that, at locations midway along the lengths of the first and second leg formations, a first pair of upwardly turned, tab-like formations is provided for engaging the slide biasing means, and a second pair of upwardly turned, tab-like formations is provided for enhancing the area of contact between said edge surfaces of the first and second leg formations and a selected pair of said opposed slide-guide surfaces, and with the bridging leg extending in a plane that is substantially perpendicular to said common plane so as to define a relatively flat, thin bridging leg that is drivingly engaged by the lock operator means to effect unlatching movement of the slide means in response to pivotal movement of the lock operator means about the lock operator axis;

d) a selected one of the first and second housing members is formed as a substantially flat sheet metal stamping while the other of the first and second housing members is formed as a cast metal part that provides the majority of the thickness of the resulting assembly of the first and second housing members, with both of the first and second housing members nonetheless contributing to the definition of the opposed first and second wall portions that face toward each other and extend along opposite sides of the keeper-receiving passage;

e) said selected one of the first and second housing members being formed as a substantially flat sheet metal stamping;

f) a portion of said selected housing member being pressed inwardly toward said other of the housing members to provide a substantially flat C-shaped surface portion that extends in a plane that is located inwardly relative to a plane in which a majority of the remainder of the portions of said selected housing member extend; and,

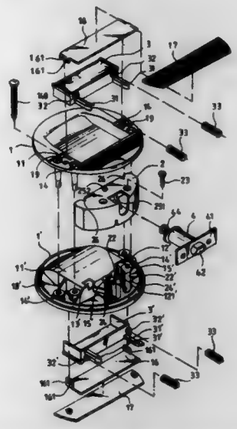
g) said C-shaped surface portion overlying at least portions of the first and second wall portions that extend along opposite sides of the keeper-receiving passage so as to contribute to the definition of portions of the opposed first and second latch-member-receiving passages.

5,192,097

PLASTIC DOOR LOCK

Jyh-Yeong Su, Kaohsiung, Taiwan, assignor to Jyi Shen Industrial Co., Ltd., Taipei, Taiwan

Filed Mar. 23, 1992, Ser. No. 855,865
Int. Cl.[5] E05C 1/14
U.S. Cl. 292—166 **10 Claims**



1. A door lock comprising opposed, substantially flat inner and outer cover plates each of which is recessed to receive therein an associated drag unit slidable relative to the cover plate between a rest position and a displaced position, a core unit located between said cover plates including a pair of dragging elements each being pivotal, about an associated axis extending substantially perpendicular to the plane of the sliding movement of the drag units, between a rest position and a displaced position, said dragging elements co-operating with a latch unit whereby, on movement of the dragging elements from their rest positions to their displaced positions, the latch unit is moved from a normally closed position to an open position, and a limit switch pivotally mounted on the inner cover plate between a locked position and an unlocked position, said limit switch being formed with a notch having an associated surface position, the arrangement being such that, with the limit switch in the unlocked position, both of the drag units can be moved relative to the associated cover plate from their rest positions to their displaced positions to engage associated dragging elements to pivot said dragging elements and to actuate the latch unit with at least a portion of the inner drag unit being permitted to freely extend through the notch formed in said limit switch and, with the limit switch in its locked position, movement of the outer drag unit is prevented but, on initial movement of the inner drag unit from its rest position towards its displaced position, the inner drag unit engages the surface portion associated with said notch to cause the limit switch to be pivoted by said inner drag unit from its locked position to its unlocked position, said inner drag unit further engaging a dragging element to pivot said element towards its displaced positions to actuate the latch unit.

5,192,098

LATCH CONSTRUCTION

Michael Barnes, Newtown, and Joseph Koskelowsky, Danbury, both of Conn., assignors to Norco, Inc., Ridgefield, Conn.

Filed Aug. 28, 1991, Ser. No. 751,312
Int. Cl.[5] E05C 1/16
U.S. Cl. 292—207 **6 Claims**

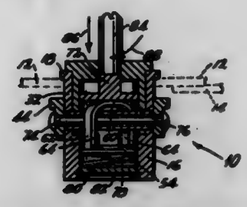
1. A releasable latch construction for holding in place panels and the like, comprising in combination:

a) a body member having means for attaching it to a panel,

b) a latching member and means turnably mounting the same on the body member for arcuate movement between a latching position and a releasing position,

c) locking means movably carried by the body member, operable to lock the latching member in either its latching position or else in its releasing position,

d) actuator means movably carried in the body member and engageable with said locking means to actuate the latter for effecting either the locking or else the release of said latching member, and



e) keying means connected with said latching member, said keying means being directly engageable by a latch key to enable the latter to apply turning forces to the latching member and said actuator means being directly engageable by said latch key and being shiftable thereby to effect unlocking of the latching member,

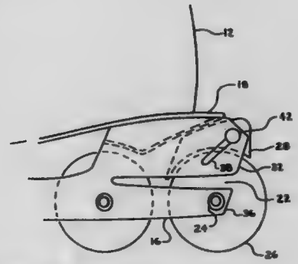
f) said locking means comprising a slide member movable axially of said body member, and restrained against turning with respect thereto.

5,192,099

ROLLER SKATE STARTING AND STOPPING AIDS

Raine R. Riutta, 7816 Jasper Crescent, Vancouver, British Columbia, Canada V5P 3S9

Filed Aug. 27, 1991, Ser. No. 751,162
Int. Cl.[5] A63C 17/14
U.S. Cl. 280—11.2 **4 Claims**



1. A roller skate comprising:

(a) a boot;

(b) a plurality of wheels;

(c) wheel support means adapted to be rigidly secured to said boot, said wheel support means including first and second parallel spaced integral side frame members disposed on opposite sides of said wheels, each of said members having a first slot extending forwardly from a rearmost end of said member to define upper and lower spaced portions with free ends, said upper portion being rigidly secured to said boot and said lower portion rotatably supporting a rearmost wheel of said plurality of wheels, said upper and lower portions being an integral part of said member, said lower portion being capable of flexure to move towards said upper portion upon application of a downward force on said upper portion by said boot; and,

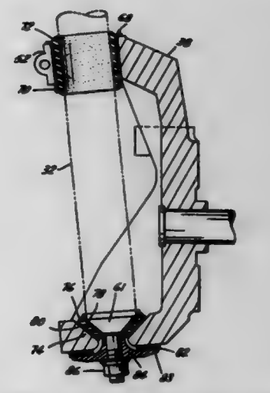
(d) a brake pad coupled between said upper portions and located between said boot and said rearmost wheel, wherein said brake pad is adapted to engage said rearmost wheel upon application of said downward force on said upper portion by said boot for applying a braking force to said rearmost wheel.

5,192,100

INDEPENDENT SUSPENSION WITH DOUBLE ISOLATED SUSPENSION UNIT

Manfred Rumpel, Birmingham, and Sino J. Van Dyk, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1990, Ser. No. 634,253
Int. Cl.[5] B60G 11/56
U.S. Cl. 280—668 **17 Claims**



1. An independent suspension for a vehicle, comprising:

a chassis;

an upwardly extending telescopic suspension unit;

means connecting the upper end of said suspension unit to said chassis; and

a wheel support member for rotatably mounting a road wheel, said wheel support member including double isolation means for resiliently mounting the lower end of said suspension unit to said wheel support member and for rotating said wheel support member relative to said suspension unit about a substantially vertical axis during compression and rebound movement of said wheel support member.

5,192,101

LOCK MECHANISM FOR AN AXLE LIFT SUSPENSION

Gregory A. Richardson, Holton, Mich., assignor to Neway Corp., Muskegon, Mich.

Filed Oct. 15, 1991, Ser. No. 776,667
Int. Cl.[5] B60G 11/26
U.S. Cl. 280—704 **6 Claims**

1. An axle lift suspension apparatus for a vehicle having a frame, the apparatus comprising:

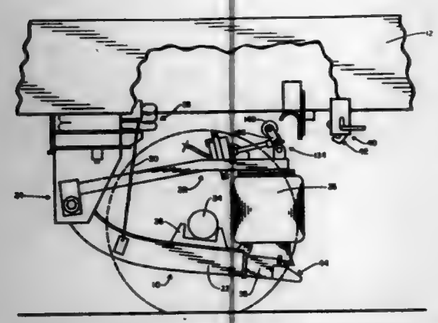
an arm pivotably mounted to the frame;

an axle adapted to carry a ground engaging wheel and mounted to the arm;

lifting means to selectively move the arm and the axle to and from a lifted position relative to the frame; and

a latch assembly mounted to the frame and adapted to automatically engage the arm when the arm is in the lifted position and restrain it from movement away from the lifted position, the latch assembly comprising a support bracket mounted to the frame, and a latch plate pivotably mounted to the support bracket for movement between a catch position and a reset position, the support bracket

having an elongated aperture, and a rod extending through the aperture and mounted relative to the frame

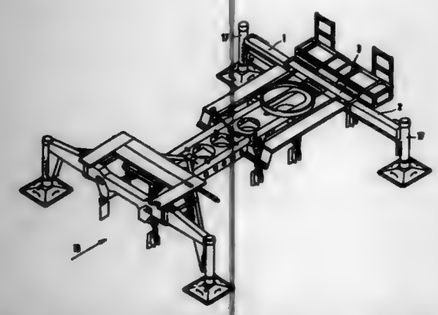


for rotational movement about its longitudinal axis, the latch plate being fixedly mounted to the rod.

5,192,102
BASIC FRAME ARRANGED ON THE CARRYING CHASSIS OF A TRUCK

Armin Mertens, Munich; Peter Hinze, Altomünster Randelsried; Rudolf Ebert, Karlsfeld, and Herbert Grach, Unterschleissheim, all of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft and Siemens Aktiengesellschaft, both of Munich, Fed. Rep. of Germany

Filed Nov. 15, 1991, Ser. No. 792,817
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040267
Int. Cl.[5] B60S *9/12*
U.S. Cl. 280—766.1 6 Claims

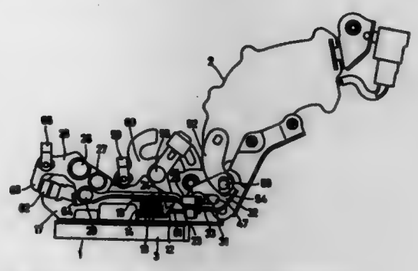


1. A basic frame on the carrying chassis of a truck for receiving units changeable in orientation and extendable in a plurality of directions, said basic frame having at least one transverse hollow beam and struts extendable in a direction of width, said struts having supports arranged at a respective end thereof that are vertically lowerable, said extendable struts guided in said hollow beam and telescopically movable in a longitudinal direction thereof into a desired extended position by a signal transmitted by a control device, said basic frame further comprising electromechanical switches arranged on said hollow beam, said switches having respective feelers extending through a wall of said hollow beam and said struts having recesses on a side thereof facing said feelers, said feelers engaging said recesses and acting on said switches in response to a depth of said recesses, so that manufacturing inaccuracies and play between said struts and said hollow beams are without influence, with said respective feelers of a corresponding one of said switches comprising a leveling feeler and a switch feeler that are mounted slidably on said corresponding switch and are movable independent of each other in relation to said hollow beam and said struts.

5,192,103
AUTOMOTIVE DOOR LOCK DEVICE

Ryoichi Fukumoto, Nagoya; Shigeru Hayakawa, Chiryu, and Nonomu Torii, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1989, Ser. No. 413,532
Claims priority, application Japan, Sep. 30, 1988, 63-244525
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—216 5 Claims



1. An automotive door lock device comprising:
a latch pin;
a latch striker having a pawl portion rotatably mounted on the latch pin;
a pawl pin spaced from and substantially parallel to the latch pin;
a pawl member, having a meshing surface, rotatably mounted on the pawl pin; the pawl member being rotatably urged into meshing engagement with the latch striker, the pawl portion of the latch striker being rotatably fixed in the locked position by the meshing surface of the pawl member, the latch striker being rotatably urged to the unlocked position upon rotation of the pawl member out of meshing engagement;
a lift lever, having an edge surface, mounted on the pawl pin and rotatable with the pawl member, said lift lever being rotatable to release the meshing surface of the pawl member from engagement with the latch striker;
an outer lever rotatably mounted on the pawl pin, the outer lever having an extension extending substantially radially from the pawl pin;
a release bushing, mounted on the extension of the outer lever, slidable radially on and disposed in an engagable position with the edge surface of the lift lever; and
a locking link having a guide portion with an arcuate slot extending substantially concentric with the pawl pin for guiding the release bushing into engagement with the edge surface of the lift lever for rotating the lift and pawl member to the position effective to release the meshing surface of the pawl member from the pawl portion of the latch striker.

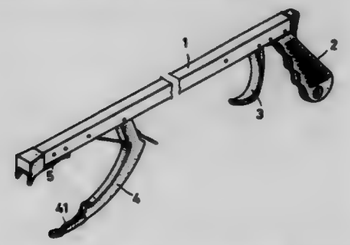
5,192,104
ELONGATED CLAMP

Chin-Liang Lin, No. 55,, Chin-Tung Chiao, Chia Fang Li, Hsin-Ying Hsih, Tainan Hsien, Taiwan

Filed May 29, 1992, Ser. No. 890,074
Int. Cl.[5] B25J *1/00*
U.S. Cl. 294—19.1 1 Claim

1. An elongated clamp for releasably gripping an object comprising:
(a) a hollow elongated housing defining opposing first and second end sections, said hollow elongated housing having a top wall and a pair of opposing sidewalls;

(b) a grip member fixedly secured to said first end section of said housing;
(c) a C-shaped trigger member positioned adjacent said grip member, said trigger member being pivotally secured to said opposing sidewalls of said housing within an interior of said hollow elongated housing, said trigger member having one end coupled to a first end of a rope member;
(d) a substantially L-shaped arm member pivotally secured to said opposing sidewalls adjacent said second end section of said hollow elongated housing, said L-shaped arm member defining a first arm and a second arm, said first arm having a through opening for inserting therethrough a second end of said rope member secured to said first arm by a hook member, said first arm being rotatable about a pin member secured to said opposing housing sidewalls, said second arm having at least a portion thereof forming a serrated surface for contacting said object;

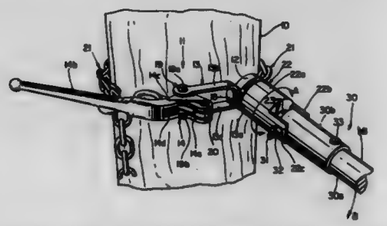


(e) an elastic support block member fixedly secured to said second end section of said housing and at least partially mounted within said hollow elongated housing, said support block member having an inner surface being at least partially serrated for contacting said object;
(f) a pair of rotatable pulley members rotatably secured to said opposing sidewalls of said housing adjacent respectively said first and second end sections of said housing, said rope member passing contiguous said pulley members for coupling said C-shaped trigger member and said L-shaped arm member in a responsive displacement coupling; and,
(g) a torsion spring being rotatably mounted substantially interior of said housing on said pin member and having a first end contiguous said top wall of said housing and a second end contiguous an end of said first arm of said L-shaped arm member for biasing said second arm and said support block member in a displaced manner each from the other.

5,192,105
POLE HANDLER

G. Glenn Walker, 113 Greenbriar Rd., Gadsden, Ala. 35901

Filed Jan. 28, 1992, Ser. No. 826,852
Int. Cl.[5] B25J *1/02*
U.S. Cl. 294—19.1 16 Claims

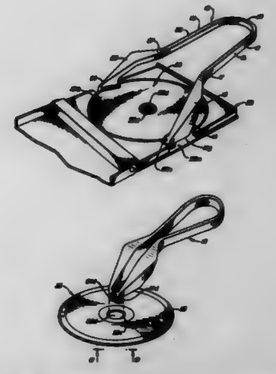


1. A manual tool for applying force to an elongated object with spaced-apart ends along its longitudinal axis, such as a pole, which comprises:
(a) means for tightly gripping said object around its perimeter between the ends thereof;
(b) swivel means pivotally connected to said gripping means so that said swivel means can rotate at least 180 degrees about an axis of said swivel means which is approximately perpendicular to the longitudinal axis of said object; and
(c) elongated handle means pivotally connected at one end thereof to said swivel means so that said handle means can rotate at least 180 degrees about a transverse axis of said handle means, which handle axis is also transverse to and intersects said swivel means axis.

5,192,106
COMPACT DISC HANDLING DEVICE

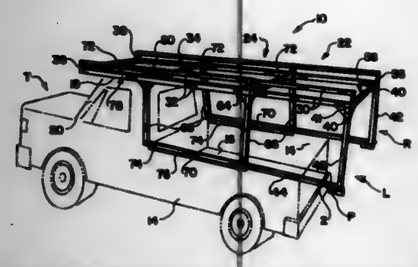
Craig A. Kaufman, Studio City, Calif., assignor to I.A.F. Enterprises, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 534,027, Jun. 4, 1990, abandoned. This application Mar. 24, 1992, Ser. No. 858,426
Int. Cl.[5] B25B *9/02*
U.S. Cl. 294—99.2 17 Claims



1. A device for handling a disc having an aperture, the disc having an outer edge and an inner edge, each edge of a given thickness, the inner edge defining the aperture, the device including:
a first flexible arm having a free end;
a second flexible arm attached to the first flexible arm and having a free end; and
receiving means, attached to the free end of the first and second flexible arms, for selectively receiving and encompassing one of the outer edge of the disc and the inner edge defining the aperture of the disc, wherein said receiving means comprises, in said free end of each said flexible arm, first and second grooves which are substantially parallel to one another, said first groove being oriented to encompass the outer edge of the disc and said second groove being oriented to encompass the inner edge of the disc, and said receiving means are dimensioned to both fit into the disc aperture.

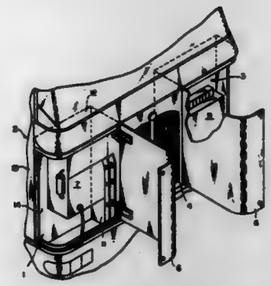
5,192,107
TELESCOPIC TRUCK RACK
Delbert L. Smith, Sr., P.O. Box 249, Salem, N. Mex. 87941
Continuation-in-part of Ser. No. 705,703, May 6, 1991, which is a continuation-in-part of Ser. No. 482,824, Feb. 21, 1990, abandoned. This application Jan. 24, 1992, Ser. No. 903,332
Int. Cl.[5] B60P *3/00*
U.S. Cl. 293—3 8 Claims



1. An adjustable truck rack assembly supported upon the side walls of a truck bed comprising;
a front section including pairs of substantially parallel and vertically spaced apart upper and lower side rails with each said pair defining the forward portion of a frame side unit,
forward and rearward uprights having opposite ends connecting each said upper and lower side rails of each said side unit,
fittings on each said side unit removably receiving said uprights,
adjustable transverse brace members spanning said frame side units between said upper side rails,
a rear section including pairs of substantially parallel and vertically spaced apart upper and lower side rails with each said pair defining the rearward portion of a frame side unit,
a pair of rearmost uprights having opposite ends connecting each said rear section upper and lower side rails of each said side unit,
fittings on each said frame side unit of said rear section removably receiving said rearmost uprights,
an adjustable transverse brace member spanning said rear section side units,
said rails comprising tubular member; means for attaching said front section to said side walls; said front and rear section rails telescopically interfitting substantially along the entire length of said side rails of said rear section; means for repositioning said rear section an amount sufficient to overhang the rear of the truck bed in a fully extended position and to extend rearwardly over a portion of the truck bed in a fully telescoped position while said front section is attached to said side walls, and
said upper rails of both frame side units projecting forwardly of said forward uprights to define an extended top rack portion adapted to overlie a truck cab, wherein;
said frame side units are inclined inwardly toward one another at their tops.

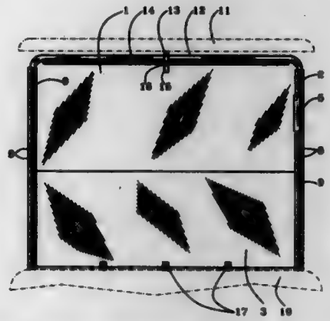
5,192,108
PROTECTIVE EQUIPMENT COMPARTMENT FOR TRUCKS
Donald A. Richardson, and James E. Schatzer, both of Renton, Wash., assignors to Paccar Inc., Bellevue, Wash.
Filed Jan. 8, 1992, Ser. No. 818,167
Int. Cl.[5] B60R *11/00*
U.S. Cl. 296—37.1 14 Claims

1. An apparatus for closing an equipment compartment located adjacent the front of a vehicle cab, comprising:
a corner panel forming part of the exterior of the vehicle cab, said corner panel adapted for use with the equipment compartment and having a generally flat forward surface and a generally flat side surface combined at an angular curved corner; and



means for pivotally attaching said corner panel to the vehicle cab and for swinging the corner panel about a vertical axis.

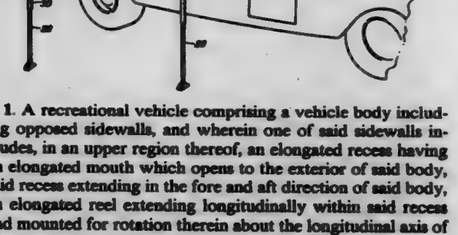
5,192,109
GOLF CART WINDSHIELD
Marc W. Roberts, Tampa, Fla., assignor to Larry W. Carroll, Tampa, Fla.
Filed Apr. 28, 1992, Ser. No. 875,690
Int. Cl.[5] B60J *1/06*
U.S. Cl. 296—84.1 31 Claims



1. A dual windshield having:
a bottom panel attachable to a side windshield column at each side of the bottom panel;
a top panel slidable up-and-down in a channel having walls attachable to a side column at each side of the top panel;
an inwardly-projecting handle on a top of the top panel; and
a panel latch attachable to a frame member at a top of the windshield;
the panel latch being snap-latchable onto the inwardly-projecting handle with the top panel in a raised position.

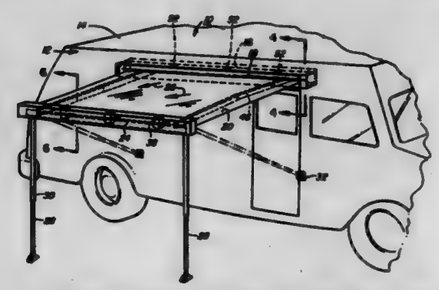
5,192,110
SUNSHADE AND VANITY MIRROR SYSTEM FOR A MOTOR VEHICLE
William Mykytiuk, Taylor, and Abdi Lawassani, Pontiac, both of Mich., assignors to United Technologies Automotive, Dearborn, Mich.
Filed Aug. 30, 1991, Ser. No. 752,408
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.8 15 Claims

1. In a motor vehicle having a windshielded, the interior of said vehicle having a headliner covering the inner surface of the motor vehicle's roof, and a vanity mirror being selectively positionable from a stored position to an operating position from which an occupant of the vehicle may view himself or herself and a visor panel for selectively shading said occupant from light entering said vehicle through said windshield, the improvement characterized by:
said visor panel being selectively positionable from a stored position thereof between said headliner and roof, to an operating position thereof between the occupant of the vehicle and the windshield to provide said shading;



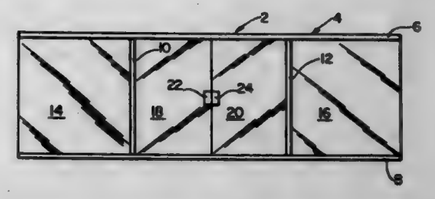
said stored position of said vanity mirror comprising a concealed location between said headliner and said roof;
said vanity mirror being mounted on said visor panel and independently deployable with respect thereto, to said operating position of said mirror while said visor panel remains in said stored position thereof; and
means disposed between said headliner and said roof on which said vanity mirror is mounted for guiding movement of said vanity mirror and visor panel between said stored positions between said roof and said headliner and said operating positions.

5,192,111
BUILT-IN AWNING FOR RECREATIONAL VEHICLE
Jacobus N. Hanemaayer, Kitchener, Canada, assignor to Hanmar Motor Corporation, Kitchener, Canada
Filed Mar. 3, 1992, Ser. No. 845,380
Claims priority, application Canada, Oct. 30, 1991, 2054531
Int. Cl.[5] B60P *3/34*
U.S. Cl. 296—163 19 Claims



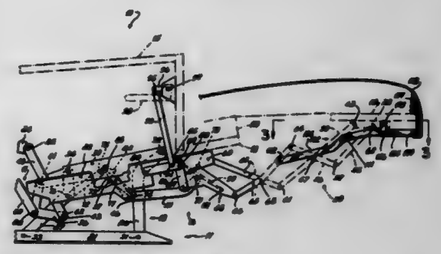
1. A recreational vehicle comprising a vehicle body including opposed sidewalls, and wherein one of said sidewalls includes, in an upper region thereof, an elongated recess having an elongated mouth which opens to the exterior of said body, said recess extending in the fore and aft direction of said body, an elongated reel extending longitudinally within said recess and mounted for rotation therein about the longitudinal axis of said reel, said reel carrying a length of awning material thereon, means for rotating said reel to effect wrapping or unwrapping of said awning material thereon or therefrom to permit said awning material to be retracted into said recess or to be extended outwardly of said recess beyond said one sidewall of the body, and a door for closing said mouth of said recess when said awning material has been fully retracted into said recess.

5,192,112
SAFETY CAPTAIN WINDOW FOR TRUCKS
Nicholas Gherardi, 185-1 Black River Rd., Long Valley, N.J. 07853, and Sari Steller, R.D. 1 Box 390-3, Upper Black Eddy, Pa. 18972-9605
Filed Jan. 7, 1992, Ser. No. 817,504
Int. Cl.[5] B62D *33/06*; E06B *3/00*
U.S. Cl. 296—190 9 Claims



1. A safety captain window for a truck, which comprises: a captain window housing comprising inner, middle, and outer channel member of same channel width, wherein said inner channel member comprises at least one slidable glass window member slidably movable within said inner channel member, said middle channel member comprises first and second fixed glass plate members fixedly mounted within said middle channel member so as to define an opening therein between said first and second fixed glass plate members, and said outer channel member comprises first and second immovable channel sections wherein said inner, middle or outer channel members is separated by a safety screen means, whereby said safety screen means prevents the influx of solid matter through an opening formed when said at least on slidable glass window member is moved in a lateral direction within said inner channel member.

5,192,113
UPHOLSTERY TENSION ADJUSTMENT LINKAGE MECHANISM
Glenn N. Wiecek, Shelbyville, Ky., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Aug. 27, 1990, Ser. No. 573,468
Int. Cl.[5] A47C *1/02*
U.S. Cl. 297—85 20 Claims



1. A recliner chair comprising
a base,
a seat and backrest,
a footrest having an inner side edge and an outer side edge,
seat and backrest linkage means including a seat link mounting said seat to said base for movement of said seat and backrest between upright and reclined positions, and linkage means being operable to change the inclination of

said seat in the course of movement between upright and reclined positions,

footrest linkage means mounting said footrest to said seat, said footrest linkage means being operable to move said footrest between retracted and extended positions, said retracted position disposing said footrest generally vertically and with the inner side edge located adjacent to said seat, said extended position disposing said footrest generally horizontally and with said inner side edge spaced substantially forward of said seat,

upholstery tension adjustment linkage means, and

a layer of upholstery overlying and fixed to said seat, said upholstery extending continuously to, over, and around said footrest and being connected to said upholstery tension adjustment linkage means for adjusting movement of said layer of upholstery relative to said footrest in response to extension and retraction of said footrest.

5,192,114

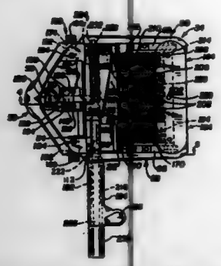
TILT ADJUSTMENT CONTROL FOR A CHAIR

Geoffrey A. Hollington, London, England; Robert A. Nagelkirk, Zeeland, Mich.; Lynne M. Allen, and Mark E. Kuyper, both of Holland, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Division of Ser. No. 317,582, Mar. 1, 1989. This application Mar. 8, 1991, Ser. No. 666,881

Int. Cl.[5] A47C *1/032*

U.S. Cl. 297—304 **33 Claims**



1. A chair having a seat, a back and a base, said seat and back each being pivotally mounted to the base and the seat and back further being pivotally connected to each other so that the back and seat move synchronously and the back pivots at a rate proportional to the seat as one of the seat and back is pivoted,

a tilt mechanism between the base and the seat for controlling said synchronous movement, the tilt mechanism comprising a stationary housing mounted to the base, said housing having opposed top and bottom walls,

a seat support member slidably mounted to the housing for movement between fore and aft positions, said seat being mounted to the seat support member,

a spring mounted within the housing for biasing the seat toward the fore position, and

an adjustment mechanism for adjusting the force of the spring, wherein the spring force, adjustment mechanism comprises:

an actuating rod journaled to the housing for rotation relative thereto and having a portion thereof within the housing and an outward portion thereof extending laterally outwardly of the housing to a point approximately in a vertical plane extending through a side edge of the seat,

a wedge mounted to the rod within the housing and positioned between said top and bottom walls for movement along the rod in response to rotation of the rod, said bottom and top walls interfering with rotation of the wedge upon rotation of the rod to effect linear movement of the wedge along the rod, and

a carriage disposed within the housing in engagement with the wedge for movement in a direction transverse to the axis of the rod, the spring being mounted between the carriage and the seat support member to resist movement of the seat support member toward the aft position as the spring is compressed and the force of the spring resistance being adjustable by rotation of the rod.

5,192,115

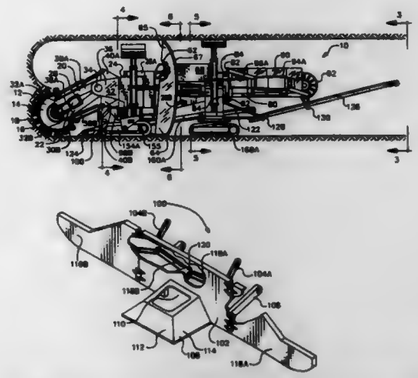
TRAMMING MOBILE MINING MACHINE

Thomas M. Hartman, Des Moines, Wash., and David B. Sugden, Tasmania, Australia, assignors to The Robbins Company, Kent, Wash.

Filed May 28, 1991, Ser. No. 706,052

Int. Cl.[5] E21C *29/22, 35/20*

U.S. Cl. 299—31 **19 Claims**



12. A holding apparatus for mobile mining machine having a front crawler means, a rear crawler means, and a front frame portion and a rear frame portion interconnected by thrust means and adapted to reciprocate axially with respect to each other, said holding apparatus comprising:

fixed front support means having front support pad means adapted to anchor against the tunnel floor and front gripper cylinder means adapted to anchor against the tunnel wall, said fixed front support means being mounted on the front frame portion to move on an axis longitudinal of said mobile mining machine for movement of said fixed front support means and the front frame portion with respect to each other;

fixed rear support means having rear support pad means adapted to anchor against the tunnel floor and rear gripper cylinder means adapted to anchor against the tunnel wall, said fixed rear support means fixedly mounted on the rear frame portion;

attachment link means connecting said fixed front support means and said fixed rear support means; and lift means connecting the front crawler means and the front frame portion and connecting the rear crawler means and the rear frame portion for configuring said mobile mining machine in a gripping configuration and a re-gripping configuration.

16. A muck apron assembly for a mobile mining machine comprising:

a substantially planar center section adapted to be oriented on the mobile mining machine such that said substantially planar center section is substantially parallel to a tunnel work face;

a hopper on said center section having a conveyor feed opening adapted to communicate with muck conveyor means;

substantially planar wing sections pivotally attached to ends of said center section;

wing section swing cylinder means for pivotal movement of said wing sections between a substantially planar orientation with said center section and a tunnel work face and a substantially perpendicular orientation to said center section and a tunnel work face; and

much apron lift cylinder means connecting for lift-up and lowering said much apron assembly relative to the mobile mining machine.

5,192,116

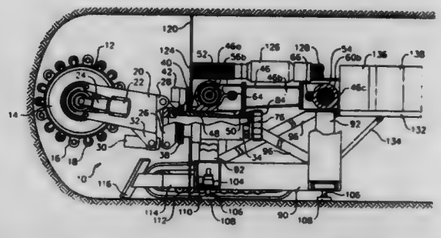
GANTRY-TYPE MOBILE MINING MACHINE

John Turner, Renton, and Neil J. Dahmen, Seattle, both of Wash., assignors to The Robbins Company, Kent, Wash.

Filed May 28, 1991, Ser. No. 706,402

Int. Cl.[5] E21C *29/26, 31/08*

U.S. Cl. 299—75 **19 Claims**



17. In a mobile mining machine having a frame and of the type wherein a cutterwheel is mounted for pivotal movement on boom means and rotated about an axis substantially parallel to the tunnel work face while being swept progressively across the tunnel work face, the improvement wherein said boom means is carried by mounting means enabling pivotal movement of said boom means about an axis generally parallel to said work face and said mounting means is in turn supported by rotatable means rotatable about an axis generally perpendicular to the tunnel work face so that the axis of rotation of the cutterwheel is positionable in any desired direction generally parallel to the work face and means mounted on said frame for causing traverse movement of said cutterwheel and said boom means relative to said frame.

5,192,117

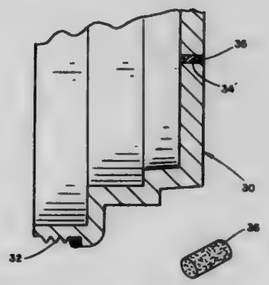
HUBCAP WITH VENT

Gary L. Kuck, 692 W. Lakeshore, Lincoln, Nebr. 68525

Filed Jan. 13, 1992, Ser. No. 820,152

Int. Cl.[5] B60B *7/00*

U.S. Cl. 301—108.1 **2 Claims**



1. A hubcap for a wheel comprising,

a generally cup-shaped member adapted to be secured to a wheel to prevent contaminants from entering the wheel bearings of the wheel,

said cup-shaped member having a vent opening formed therein,

and a plug means comprised of a bronze powder material cast into a cylindrical shape and press-fitted into said vent opening which permits the continuous passage of air therethrough to vent the wheel bearings but which prevents the passage of water and other contaminants therethrough.

5,192,118

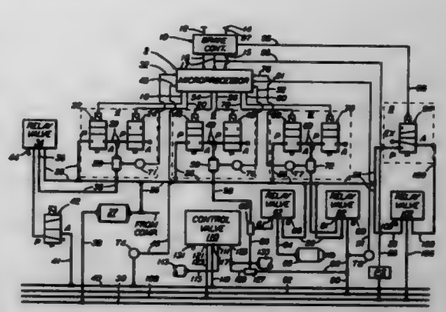
ELECTRO-PNEUMATIC LOCOMOTIVE BRAKE CONTROL SYSTEM

Richard F. Balukin; John B. Newingham, both of Pittsburgh, and Frank J. Jerina, Irwin, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 6, 1991, Ser. No. 710,849

Int. Cl.[5] B60T *15/14*

U.S. Cl. 303—15 **18 Claims**



1. An electro-pneumatic brake control system for a railway train having a brake pipe normally charged to a certain chosen pressure comprising:

(a) a brake controller having a first handle including means for generating an automatic brake command signal in accordance with a selected position of said first handle;

(b) a first brake control circuit having first electro-pneumatic valve means for controlling the pressure of said brake pipe;

(c) a second brake control circuit having second electro-pneumatic valve means for controlling the brake pressure of a locomotive of said railway train;

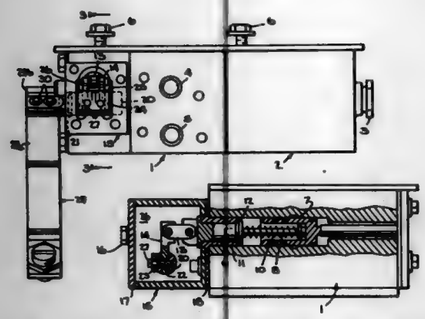
(d) microprocessor means for controlling said first electro-pneumatic valve means in accordance with said automatic brake command signal, and for controlling said second electro-pneumatic valve means in accordance with a change of said brake pipe pressure;

(e) pneumatic back-up control means operative in response to variation of said brake pipe pressure for controlling the brake pressure of said locomotive in parallel with said second electro-pneumatic valve means, said variation of said brake pipe pressure in a negative sense effecting application of the locomotive brakes; and

(f) said first electro-pneumatic valve means being arranged to effect said variation of said brake pipe pressure in said negative sense in a deenergized condition thereof, and said second electro-pneumatic valve means being arranged to effect a release of said locomotive brake pressure in a de-energized condition thereof.

VOL 1148 ISS 2 MR 9 1993 UMI

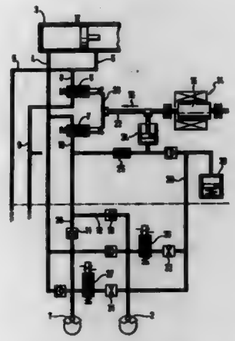
5,192,119
PROTECTIVE COVER FOR EMPLY/LOAD VALVE ACTUATOR
Robert Shepherd, Hamburg, and Neal Dauber, Hopatcong, both of N.J., assignors to Ellcon National, Inc., Greenville, S.C.
Continuation-in-part of Ser. No. 452,279, Dec. 15, 1989, Pat. No. 5,039,174. This application Oct. 30, 1990, Ser. No. 605,681
Int. Cl.[5] B60T *8/22*
U.S. Cl. 303—22.8 **7 Claims**



1. In an empty/load valve having a housing, said housing comprising a first air port for receiving air under pressure above atmospheric pressure and a second air port outlet for supplying air to a brake cylinder, air received at said first air port being supplied to said second air port outlet, a control valve within said housing for controlling the pressure of the air supplied to said second air port outlet and control means mounted on the within said housing for operating said control valve, the improvement comprising:
a rigid cover mounted on said housing in dust-free relation thereto, said cover overlying said control means;
a pivotable shaft pivotally mounted on said cover with at least a first portion thereof within said cover and a second portion thereof externally of said cover and having a pivot axis;
a relatively long and narrow load measuring arm mounted on said second portion of said shaft externally of said cover and with its length extending transversely to said pivot axis; and
interconnecting means within said cover and interconnecting said shaft and said control means for causing movement of said control means with pivoting of said shaft, said interconnecting means comprising a linkage pivotally secured to said shaft and said control means whereby movement of said control means in either of two directions causes pivoting of said shaft.

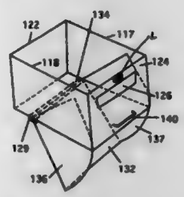
5,192,120
BRAKE PRESSURE CONTROL SYSTEM WITH AN ELECTRICAL MOTOR OPERATING A PUMP AND CONTROL VALVE
Hans-Dieter Reinartz, Frankfurt am Main; Peter Volz, Darmstadt; Erhard Beck, Weilburg, and Andre F. L. Goossens, Rumst, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
PCT No. PCT/EP91/00485, § 371 Date Feb. 19, 1992, § 102(e) Date Feb. 19, 1992, PCT Pub. No. WO91/18775, PCT Pub. Date Dec. 12, 1991
PCT Filed Mar. 14, 1991, Ser. No. 809,534
Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016745
Int. Cl.[5] B60T *8/34*
U.S. Cl. 303—113.2 **13 Claims**

1. A brake pressure control system, in particular for automotive vehicles having wheel brakes, with at least one of an antilocking locking control system (ABS) and a traction slip control system (TSS), which operates with hydraulic fluid pressure, being comprised of a master cylinder, at least one wheel cylinder for each of said wheel brakes, a pressure modulator comprising a plurality of control valves actuatable for the modulation of the hydraulic pressure in said at least one wheel cylinder of the wheel brakes during a brake pressure control mode for each, at least one electric motor having a rotor, and



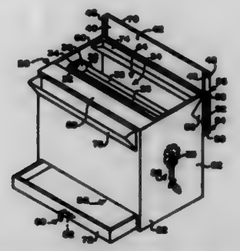
a pump driven by said rotor of said motor for the generation of a fluid pressure,
at least a part of said rotor of said motor including an axially movable thrust member axially moved upon energization of said motor, said thrust member actuating at least one of said control valves of said pressure modulator by said movement thereof.

5,192,121
TRASH ORGANIZER FOR RECYCLING
Mark Stutler, Rte. 3, Box 150E, Hurricane, W. Va. 25526
Continuation-in-part of Ser. No. 669,087, Mar. 15, 1991. This application Sep. 13, 1991, Ser. No. 759,546
Int. Cl.[5] B65F *1/12*
U.S. Cl. 312—212 **10 Claims**



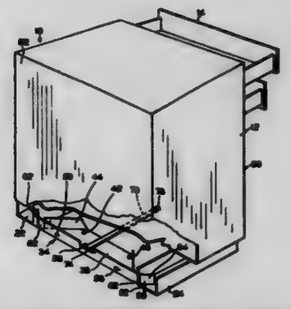
1. A trash collection and sorting system having a vertically extending main housing having left and right sidewalls and a plurality of individual vertically stacked storage volumes in said main housing, said individual storage volumes being adapted to receive a particular category of trash, a lower one of said storage volumes being for miscellaneous trash and an upper one of said storage volumes being for flat paper articles, said upper one of said storage volumes including a drawer having side, rear and front panels secured together, a slot in said front panel for receiving said flat paper articles, guide rails supporting said drawer in said housing, and a bottom panel, said bottom panel having an inner short portion secured to lower edges of said side and rear panels and having a forward edge, and a longer front portion having means for hingedly securing said front portion to said forward edge of said short portion, said longer front portion having a length such that the center of gravity of paper stored in said rear is over said longer front portion.

5,192,122
CARROUSEL TOOL BOX WITH LOCKING CRANK
Leroy Hill, Rte. 2, Box 57-A, Smithville, Ark. 72466
Filed Nov. 4, 1991, Ser. No. 787,417
Int. Cl.[5] A47B *49/00*
U.S. Cl. 312—267 **6 Claims**



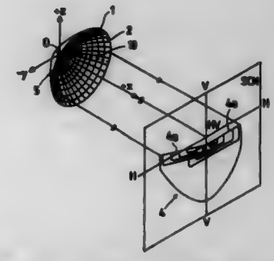
1. An improved carrousel tool box having a cabinet, a carrousel of trays mounted for rotation about an axis within the cabinet, and a shaft attached to the carrousel of trays along the axis of rotation of the carrousel of trays and extending outwardly through the cabinet, wherein the improvement comprises a locking crank means for turning the shaft, thereby rotating the carrousel of trays, and for locking the shaft from turning, said crank means comprising:
(a) an arm attached to the shaft and extending radially outward therefrom, said arm having a proximate end adjacent the shaft and having a remote end distant from the shaft;
(b) a handle pivotally mounted to said remote end for movement in a radial plane of the shaft, said handle having a cranking position and a locking position;
(c) a fulcrum attached to said arm between said remote and proximate ends;
(d) locking means for allowing and preventing the turning of the shaft; and
(e) lever means pivoted on said fulcrum and operated by said handle for causing said locking means to prevent the turning of the shaft when said handle is in said locking position, and for causing said locking means to allow the turning of the shaft when said handle is in said cranking position.

5,192,123
FLOOR ANCHOR FOR A CABINET
Robert M. Wallin, Aurora, Ill., assignor to Aurora Equipment Co., d/b/a Equipto, Aurora, Ill.
Filed Nov. 5, 1990, Ser. No. 610,381
Int. Cl.[5] A47B *96/00*
U.S. Cl. 312—351.7 **19 Claims**



1. A floor anchor assembly for securing a cabinet to a grade comprising:
a cabinet having a floor portion at a back end of the cabinet;
a base plate secured to grade;
a first prong and a second prong each mounted to said base plate and arranged to provide a clearance between a bottom of said prongs and grade and said base plate shaped so said cabinet si slidable over said base plate with said floor portion slidable beneath said prongs, said prongs overlying said floor portion, preventing said floor portion from lifting;
a back wall mounted to said base plate and extending a width of said base plate and terminating laterally outwardly of said base plate in said first prong at one end and in said second prong at an opposite end, said prongs turned angularly toward a front of said cabinet; and
wherein said floor portion comprises bottom portions of a back end of laterally arranged fork lift channels for receiving the tines of a fork lift.

5,192,124
REFLECTOR FOR VEHICLE HEADLIGHT
Hiroshi Kawashima; Takao Watanabe, and Akira Miura, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Oct. 29, 1991, Ser. No. 783,992
Claims priority, application Japan, Jan. 23, 1991, 3-021430
Int. Cl.[5] B60Q *1/04*
U.S. Cl. 362—61 **20 Claims**

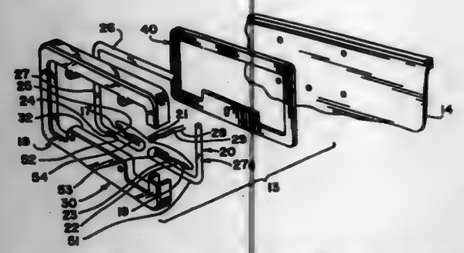


1. A headlight for a vehicle comprising;
a light source comprising a filament, and having a central axis defining a direction of light radiation; and
a reflector comprising a plurality of reflector regions, each region being defined by a first surface having an optical axis, each said optical axis being identical with said central axis, said first surface being shaped by adjusting configurational parameters and applying vector control to produce a second surface which projects a filament image having a longitudinal central axis and a periphery along a cutline, th longitudinal central axes of all said filament images being coincident with one another.

5,192,125
APPARATUS FOR ILLUMINATING A VEHICLE LICENSE PLATE AND METHOD OF USING SAME
Jaime D. Gonzalez, 9390 Suva St., Downey, Calif. 90240
Continuation of Ser. No. 741,784, Aug. 6, 1991, Pat. No. 5,150,961. This application Feb. 21, 1992, Ser. No. 839,814
The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.
Int. Cl.[5] B60Q *1/56*
U.S. Cl. 362—83.2 **13 Claims**

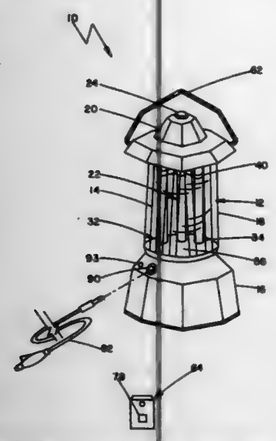
1. An illuminating apparatus for use with an electrical system of a motor vehicle, comprising:
tube means for providing a source of bright glowing light, said tube means having a set of spaced apart electrodes;
low-voltage high-frequency power means coupled to the electrical system of the motor vehicle for producing low-voltage high-frequency power;
small-sized high-voltage high-frequency transformer means

responsive to said low-voltage high-frequency power means for producing high-voltage electrical power to energize said tube means;
low-voltage conductor means for coupling said high-voltage high-frequency transformer means to said low-voltage high-frequency power means;
high-voltage conductor means for coupling said high-voltage high-frequency transformer means to said electrodes of said tube means;
tube holder means for receiving and supporting said tube means in a stationary manner relative to the motor vehicle;



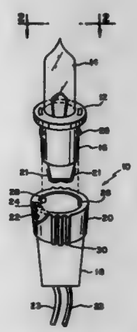
means defining a small space for receiving said high-voltage high-frequency transformer means within said tube holder means
means for mounting said tube holder means to the motor vehicle; and
non-conductive protective cover means for insulating said tube means and said high-voltage high-frequency transformer means within said tube holder means to from the motor vehicle substantially prevent an electrical short circuit between said high voltage transformer means and the motor vehicle.

5,192,126
REMOTE CONTROL FLUORESCENT LANTERN
Steven C. Remeyer, Mission Viejo, and Rudy B. Meoli, Jr., Placentia, both of Calif., assignors to E-Z Sales and Manufacturing, Inc., Gardena, Calif.
Filed Aug. 1, 1991, Ser. No. 738,883
Int. Cl.[5] F21L *3/00*, *7/00*; F21Y *23/00*
U.S. Cl. 362—184 **24 Claims**



1. A portable fluorescent lantern, comprising:
a globe;
a top member mounted on a top portion of said globe;
a base for supporting said globe and said top, said globe mounted on said base;
means for detachably securing said base, said globe and said top together;
a fluorescent light mounted within said globe;
a bracket secured to said means for detachably securing, said bracket dimensioned and positioned so that a portion thereof is adjacent a generally medial portion of said fluorescent light when said light is operationally positioned within said globe in order to facilitate operational positioning of said fluorescent light within said globe and to retain said fluorescent light in its operational position within said globe by providing lateral support thereto;
an upper electrical contact means mounted in said top member for connecting an electric circuit to an upper end of said fluorescent light;
a lower electrical contact means mounted in said base for connecting an electric circuit to a lower end of said fluorescent light.

5,192,127
TWO-PIECE LOCKING LAMP FIXTURE
Irving W. Schaef, Hialeah, Fla., assignor to GKI, Miami, Fla.
Filed Feb. 14, 1992, Ser. No. 835,796
Int. Cl.[5] H01R *33/00*
U.S. Cl. 362—226 **21 Claims**

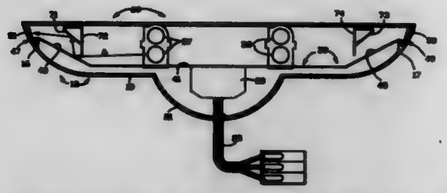


1. A locking lamp fixture comprising
a lamp base for containing a light bulb;
a socket for holding said lamp base;
said lamp base cooperatively dimensioned and configured to fit within said socket such that there is a spaced distance between said lamp base and said socket
latch means on said lamp base for extending across said spaced distance toward said socket;
catch means on said socket for extending across said spaced distance for mating engagement with said latch means on said lamp base; and
disconnection means capable of reshaping said spaced distance, whenever a sufficient force is applied to said disconnection means, to permit said catch means to disengage from said latch means to terminate said mating engagement thereof.

5,192,128
LENSED LUMINAIRE WITH LENS BRIGHTNESS CONTROL AND METHOD
Peter Y. Y. Ngai, Danville, Calif., assignor to Peerless Lighting Corporation, Berkeley, Calif.
Filed Jun. 4, 1991, Ser. No. 709,838
Int. Cl.[5] F21V *5/02*, *7/00*
U.S. Cl. 362—297 **34 Claims**

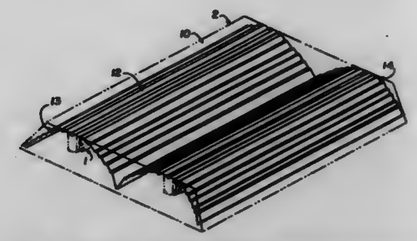
1. A luminaire comprising
a housing,

a light source associated with said housing,
a light transmissive element mounted in relation to said housing for receiving light from said light source and for transmitting at least a portion of said light into normal viewing angles such that, when the luminaire is observed at such normal viewing angles, said light transmissive element acts as a source of observable brightness,
reflector means disposed in said housing between said light source and said light transmissive element for reflecting source light along an indirect light path to said light transmissive element for inducing observable brightness in said light transmissive element, and



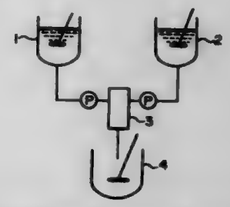
means along said indirect light path for producing a substantially specular reflection from said reflector means so that said light transmissive element receives substantially source light,
means for shielding said light transmissive element from direct illumination by said light source such that the observable brightness of the light transmissive element is determined substantially entirely by indirect source light.

5,192,129
CUSTOMIZED LIGHT REFLECTOR
Luisito A. Figueroa, c/o Excel Products Products, Inc., Suite 504, Jovan Condominium, 600 Shaw Blvd., Mandaluyong, Metro Manila, Philippines
Continuation-in-part of Ser. No. 624,605, Dec. 10, 1990, Pat. No. 5,062,030. This application Sep. 6, 1991, Ser. No. 756,076
The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.
Int. Cl.[5] F21V *7/12*
U.S. Cl. 362—346 **6 Claims**



1. A light reflector for use with a lighting fixture concave disposed in a direction parallel to an elongated light source, said reflector comprising:
a central section, said central section having at least a substantial part of its surface disposed in a horizontal plane to reflect light from said source downwardly said central section being intersected by at least one pair of opposed, longitudinally extending ridges, the sums of the widths of said ridges being substantially less than the part of said central section disposed in said horizontal plane; and
a pair of substantially arcuate wing sections, each of said wing sections being symmetrically positioned on one side of said central section opposite the other wing section and parallel to said central section, said wing sections being connected to said central section to form a substantially concave shape and comprising a plurality of individually dimensioned and oriented light reflective portions, each said portion comprising a first surface and a second surface, said first surface extending downwardly-outwardly relative to a horizontal plane, and said second surface extending outwardly-upwardly from the lower edge of its corresponding first surface, said first surface being substantially greater in length than its corresponding second surface.

5,192,130
METHOD FOR PRODUCING AN EMULSION AND AN APPARATUS THEREFOR
Kiyoshi Endo, and Masami Ishikura, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Mar. 5, 1991, Ser. No. 664,787
Claims priority, application Japan, Mar. 6, 1990, 2-54269
Int. Cl.[5] B01F *15/04*
U.S. Cl. 366—161 **11 Claims**



1. A process of making an emulsion for photographic material, comprising;
preparing a water phase solution in a first tank,
preparing an oil phase solution in a second tank,
premixing the water phase solution and the oil phase solution with an in-line mixer,
emulsifying said pre-mixed the water phase solution and the oil phase solution in an emulsification tank, said first tank being air-tightly connected to an inlet of the in-line mixer and the second tank being air-tightly connected to the inlet of the in-line mixer, and
an outlet of the in-line mixer being connected to the emulsification tank.

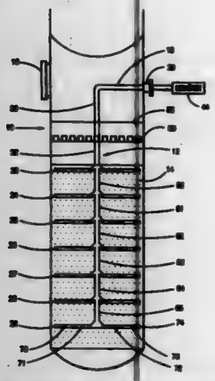
5,192,131
STIRRING DEVICE
Charlotte A. Hatfield, 3505 Porter St., Texarkana, Ark. 75502
Filed Jul. 8, 1992, Ser. No. 910,582
Int. Cl.[5] B01F *7/16*
U.S. Cl. 366—308 **4 Claims**

1. A stirring device, comprising,
an outer tubular sleeve slidably mounted within an inner sleeve, the outer tubular sleeve defined by a predetermined internal diameter, and the inner tubular sleeve defined by a predetermined outer diameter, wherein the predetermined outer diameter is substantially equal to the predetermined internal diameter, and
the outer tubular sleeve including an outer sleeve lower distal end spaced from an outer sleeve upper distal end, the inner sleeve including an inner sleeve lower distal end spaced from an inner sleeve upper distal end, and
the outer sleeve and the inner sleeve coaxially aligned relative to one another about a common axis, and
the inner sleeve including a first actuator link and a second actuator link mounted pivotally to the inner sleeve adjacent the inner sleeve upper distal end, wherein the first actuator link and the second actuator link effect coaxial

displacement of the inner sleeve relative to the outer sleeve, and

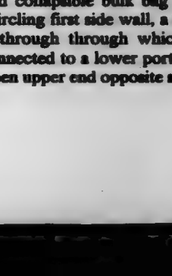
the inner sleeve lower distal end including a plurality of paddle members pivotally mounted to the inner sleeve lower distal end.

5,192,132
TEMPERATURE MONITORING OF A FIXED-BED CATALYTIC REACTOR
Martha T. Polensky, Yardley, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Dec. 12, 1991, Ser. No. 808,794
Int. Cl.[5] G01K 07/06, G01N 25/20
U.S. Cl. 374—166 **16 Claims**



1. A system for monitoring temperatures in an elongated fixed-bed catalytic reactor having a diameter sufficiently large to accommodate personnel during catalyst loading and a manway to provide personnel access to the reactor for assembling a multi-level thermowell therein during catalyst loading, said system comprising:
- a central thermal sensor conduit of said thermowell extending vertically within a bed of catalyst in said reactor;
- a plurality of arrays of lateral thermal sensor conduits of said thermowell within the bed of catalyst and spaced along said central conduit, each one of said arrays being formed by its respective lateral conduits extending outwardly from said central conduit such that the bed of catalyst provides structural support for said thermowell;
- at least one thermal sensor in each of said lateral conduits;
- means outside of said reactor for monitoring said thermal sensors;
- a thermowell inlet formed in said reactor; and
- a plurality o thermal sensor leads connected to said thermal sensors and extending upwardly through said central conduit and out said thermowell inlet to said monitoring means.

5,192,133
FLEXIBLE CONTAINER WITH IMPROVED BOTTOM AND TOP
Anders Juel; Olaf Strand; Bjarne Oudal, all of Porsgrunn, and Roger Lysfjord, Stathelle, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway
PCT No. PCT/NO90/00039, § 371 Date Sep. 10, 1991, § 102(e) Date Sep. 10, 1991, PCT Pub. No. WO90/09929, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 28, 1990, Ser. No. 752,559
Claims priority, application Norway, Feb. 28, 1989, 890860
Int. Cl.[5] B65D 30/04, 30/20, 33/10
U.S. Cl. 383—7 **8 Claims**

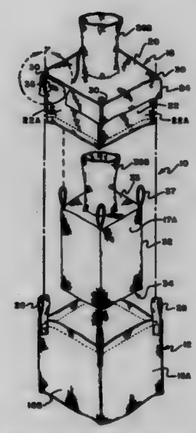


1. A flexible intermediate bulk container for the transportation and storage of bulk material, said container comprising:
- a hose shaped blank of woven material, said blank having a longitudinal axis, a top and a bottom;
- said blank having formed therein at least two longitudinal folds extending parallel to said axis and defining at least three folded blank sections each including two layers of said woven material, with said at least three folded blank sections being superimposed, thus defining at least six superimposed layers of said woven material;
- at least one of said top and said bottom of said blank having a seam extending transverse to said axis and formed by joining said at least six superimposed layers of woven material, said seam having a length in a direction transverse to said axis equal to less than one-quarter of the circumference of said hose shaped blank and therefore of said container; and
- said top of said blank having therein a filling opening for filling bulk material into said container and having at least one lifting loop formed by at least one integral extension of the entire circumference of said blank of woven material.

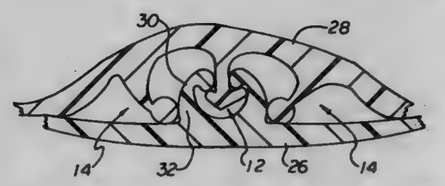
5,192,134
RE-USABLE FLEXIBLE BULK CONTAINERS
Walter J. Polett, P.O. Box 55, Mount Holly, N.J. 08060
Filed Nov. 12, 1991, Ser. No. 790,488
Int. Cl.[5] B65D 30/08, 33/14
U.S. Cl. 383—24 **13 Claims**

1. A flexible bulk container for handling and storage of flowable materials comprising in combination:
- (a) a flexible and collapsible bulk bag bottom component having an encircling first side wall, a bottom end with an opening therethrough through which the contents are discharged connected to a lower portion of said first side wall and an open upper end opposite said bottom end; and

- (b) a flexible and collapsible bulk bag top component having a top end, an encircling second side wall connected to said top end which is separably receivable within and generally complementary to the first side wall of said bag bottom component, said top component also having an open lower end opposite said top end, said lower end having an opening substantially equal in size to the outermost perimeter of said top component, said top and bottom ends and first and second side walls defining an interior storage space therebetween for flowable granular or powdered bulk material with the second side wall being adapted to be in firm engagement with said first side wall when said storage space is at least partially filled.

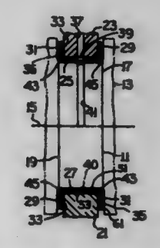


5,192,135
PROFILE AND ADJACENT RIB-TYPE CLOSURE ELEMENT FOR RECLOSABLE THERMOPLASTIC BAGS
Jamie M. Woods, Kawkawlin; Jose Porchia, and Brian C. Dais, both of Midland, all of Mich., assignors to Dowbrands L.P., Indianapolis, Ind.
Filed May 31, 1991, Ser. No. 708,411
Int. Cl.[5] B65D 33/24
U.S. Cl. 383—63 **7 Claims**



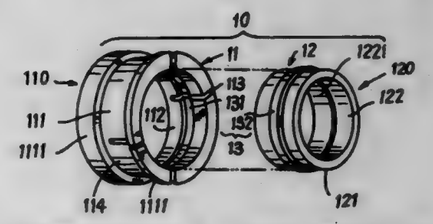
1. A closure member for a reclosable plastic bag, comprising:
- a longitudinally-extending profile interlockable with an opposing longitudinally-extending profile of a second closure member; and
- a longitudinally-extending rib located adjacent and generally parallel to the profile, the rib being characterized in cross-section by a lower generally triangularly-shaped portion and by an upper bulbous portion defined generally at an apex of the lower generally triangularly shaped portion said bulbous portion providing an amount of polymer at said apex sufficient to prevent the fracturing of said rib and to maintain the rib continuous over its length upon forming the rib; and said bulbous portion of the rib adopted to turning inwardly toward the base of the opposing longitudinally-extending profile of a second closure member responsive to contact with a sidewall portion of the bag upon interlocking engagement of the longitudinally-extending profile with the opposing longitudinally-extending profile of a second closure member.

5,192,136
CRANKSHAFT BEARING HAVING HYDRODYNAMIC THRUST FLANGES
Ronald J. Thompson, Howell; Ned L. Misner, Stanton, and Michael D. Winegard, Greenville, all of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Dec. 19, 1991, Ser. No. 810,225
Int. Cl.[5] F16C 32/06, 9/02, 33/10
U.S. Cl. 384—123 **7 Claims**



1. A flanged half bearing for a rotary shaft, comprising a one piece element that includes a semi-cylindrical wall having a convex surface and a concave surface, and two flange walls extending radially from the convex surface of said semi-cylindrical wall; each flange wall having an external axially-facing surface and an internal axially-facing surface; said concave surface constituting a radial bearing surface; each external axially-facing surface constituting a thrust bearing surface; oil supply means formed in each thrust bearing surface and subdividing the associated thrust bearing surface into a plural number of thrust bearing pads; each thrust bearing pad comprising a circumferentially extending ramp surface, said ramp surface being effective to induce- a flow of lubricating oil from the oil supply means along the ramp surface, whereby a lubricant film is maintained between each bearing pad and the rotary shaft.

5,192,137
FLEXIBLE PLAIN BEARING AND ITS APPLICATION TO MOTOR VEHICLE STEERING MECHANISMS
Henri J. A. Renard, Seloncourt, France, assignor to ECIA, France
Filed Nov. 21, 1991, Ser. No. 795,388
Claims priority, application France, Nov. 28, 1990, 90 14891
Int. Cl.[5] F16C 17/10, 23/04
U.S. Cl. 384—275 **11 Claims**



1. Flexible plain bearing for mounting a shaft on a support coaxially in such a way that only one degree of freedom in relative rotation between shaft and support is possible, this bearing (10) being characterised in that it comprises an outer ring (11) made from a sleeve (110) which is delimited by an

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outside wall (111) and an inside wall (112) and which carries on its outside wall (111) in the proximity of at least one of its ends a protruding bush (1111), engaged in this outer ring (11) an inner ring (12) which is made from a sleeve (120) which is delimited by an outside wall (121) and an inside wall (122) and which carries on its inside wall (122) in the proximity of at least one of its ends a protruding bush (1221), a link (13) located out of plumb with the bushes (1111, 1221) in order to connect these rings (11, 12) while allowing only a relative rotation between them (11, 12), made by a female element (131) carried by one of these facing walls (112, 121) of the rings (11, 12) and made by a male element (132) carried by the other of these facing walls (112, 121) of the rings (11, 12), these male and female elements (132, 121) being coupled to each other by mutual engagement.

5,192,138

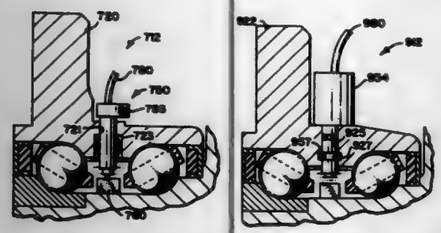
ANTIFRICTION BEARING ASSEMBLY SPEED SENSOR

Bradley D. Faye, Goshen; James A. Hilby, Watertown, both of Conn.; Denis Aliff, and Christian Hajzler, both of Annecy, France, assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 794,559, Nov. 19, 1991, Pat. No. 5,129,743, which is a division of Ser. No. 736,676, Jul. 26, 1991, Pat. No. 5,123,755, which is a division of Ser. No. 562,502, Aug. 2, 1990, abandoned, which is a division of Ser. No. 422,218, Oct. 16, 1989, Pat. No. 4,960,333. This application Jan. 21, 1992, Ser. No. 822,780

Int. Cl.[5] F16C *33/30*; G01P *3/48*

U.S. Cl. 384—448 9 Claims



1. An antifriction bearing assembly for mounting on a rotatable shaft, said bearing assembly comprising:
an outer race which is stationary relative to said shaft, said outer race having an inner surface and an outer surface;
an inner race which is rotatable relative to said outer race, said inner race being attachable to said shaft;
two annular rows of rolling elements between said inner and outer races;
an encoder mounted on said inner race between said two rows of rolling elements;
a sensor assembly having a sensor aligned with said encoder to provide an output signal proportional to the rotational speed of said shaft; and
means for mounting said sensor assembly in said outer race, said means for mounting said sensor assembly in said outer race comprising a radial bore penetrating said outer race, said bore having a counterbore in its inner end, said sensor assembly further comprising a head portion and a body portion with an outer surface, said body portion having multiple elongated vertical slots in said outer surface, each of said slots having a leaf-spring loaded therein, said leaf-springs making a press-fit inside said counterbore, and said head portion of said sensor assembly having an axially-extending portion providing means for prying said sensor assembly out of said bore.

2. An antifriction bearing assembly for mounting on a rotatable shaft, said bearing assembly comprising:
an outer race which is stationary relative to said shaft, said outer race having an inner surface and an outer surface;
an inner race which is rotatable relative to said outer race, said inner race being attachable to said shaft;
two annular rows of rolling elements between said inner and outer races;
an encoder mounted on said inner race between said two rows of rolling elements;
a sensor assembly having a sensor aligned with said encoder to provide an output signal proportional to the rotational speed of said shaft; and
means for mounting said sensor assembly in said outer race, said means for mounting said sensor assembly in said outer race comprising a radial bore penetrating said outer race, said bore having an inner end and an outer end, and said bore having a counterbore, said sensor assembly being inserted into said bore, said sensor assembly further comprising a body portion having multiple O-rings press-fit onto said body portion, at least one of said O-rings sealing out the environment from said sensor, encoder, and rolling elements, and at least one of said O-rings making an interference fit inside said counterbore so as to lock said sensor assembly in position so as to be aligned with said encoder.

5,192,139

APPARATUS FOR COOLING A SPINDLE BEARING OF A MACHINE

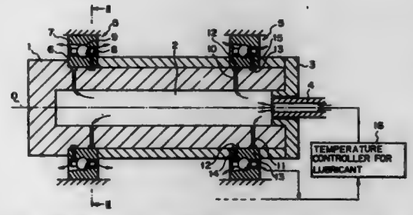
Kazuyuki Hiramoto, Atsugi; Hiromi Hara, Aiko, and Akihiro Mochizuki, Zama, all of Japan, assignors to Makino Milling Maching Co., Ltd., Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,179

Claims priority, application Japan, May 21, 1990, 2-129010; Jun. 29, 1990, 2-170217; Dec. 21, 1990, 2-404935; Dec. 27, 1990, 2-407719

Int. Cl.[5] F16C *19/52*, *33/66*

U.S. Cl. 384—476 22 Claims



1. An apparatus for cooling a bearing for rotatably supporting a spindle of a machine by a liquid lubricant supplied to a cavity of the spindle, the bearing including an inner race fitted on an outer cylindrical face of the spindle, an outer race stationarily held in a housing element of the machine, and rolling elements rotatably held in tracks of the inner and outer races thereof, comprising in combination:
a first means for permitting said liquid lubricant to flow from said cavity of said spindle toward said outer cylindrical face of said spindle when said spindle is rotated, said first means comprising at least one radical lubricant passageway provided in said spindle and radially extending from said cavity toward said outer cylindrical face of said spindle;
a second means for permitting said liquid lubricant to flow in a circumferential direction on said outer cylindrical face of said spindle when said liquid lubricant flowing from said cavity of said spindle reaches said outer cylindrical face, said second means comprising an annularly extending recess provided in at least one of a cylindrical inner face of said inner race of said bearing and said outer cylindrical face of said spindle, said annularly extending recess being in communication with said radial lubricant passageway of said spindle; and
a third means for permitting said liquid lubricant to be sprouted from said annularly extending recess into a space between said inner and outer races of said bearing to thereby permit said lubricant to come into contact with said rolling elements and said tracks of said inner and outer races when said spindle is rotated, said third means comprising at least one radial lubricant passageway provided in said inner race which radially extends from said annularly extending recess toward an outer face of said inner race having said track thereof, said radical lubricant passageway being spaced in a circumferential direction from said radial lubricant passageway of said spindle;
a fourth means for returning said liquid lubricant from said spacing between said inner and outer races of said bearing to a predetermined lubricant receiving means for receiving said liquid lubricant returned from said bearing and applying a temperature control treatment to said returned liquid lubricant; and
a fifth means for routing said liquid lubricant after said temperature control treatment from said predetermined lubricant receiving means to said cavity of said spindle, thereby enabling said liquid lubricant for lubricating and cooling said bearing to be reused;
said fifth means comprising a liquid delivery pump having an outlet for delivering said liquid lubricant after said liquid has undergone said temperature control treatment under a predetermined pressure,
a lubricant supply piping having one end connected to said outlet of said liquid delivery pump and the other end connected to an opening of an end of said spindle for supplying said liquid lubricant delivered by said liquid delivery pump into said cavity of said spindle, said other end of said lubricant supply piping being spaced relative to said opening of said end of said spindle to provide a small cylindrical gap therebetween when said spindle is rotated,
a means for setting an amount of liquid lubricant delivered from said liquid delivery pump at a predetermined value which is larger than an amount of said liquid lubricant supplied to said bearing through said first through third means, and
a lubricant collecting means for collecting any excess liquid lubricant with respect to said liquid lubricant supplied to said bearing which returns said collected excess liquid lubricant to said lubricant receiving means.

5,192,140

APPARATUS AND METHOD OF PRINTING DATA IN A BOOK, A NOTEBOOK, OR THE LIKE

Hideki Nukada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

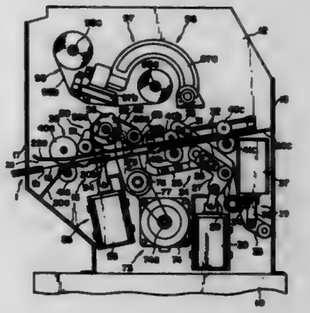
Filed Nov. 23, 1990, Ser. No. 617,366

Claims priority, application Japan, Nov. 24, 1989, 1-303212; Dec. 7, 1989, 1-316444; Dec. 12, 1989, 1-320653

Int. Cl.[5] B41J *3/28*, *13/22*

U.S. Cl. 400—26 7 Claims

1. An apparatus for printing data on any specified page of a book formed of a plurality of pages fastened together at a seam, said printing apparatus comprising:
means for positioning and holding a specified page of the book, on which to print data;
a tension-applying means for pulling any selected page of the book, other than the specified page, so as to apply a tension on the specified page through the seam of the book; and
means for printing data on the specified page applied with the tension;
wherein said positioning/holding means comprises a support member for supporting the specified page and chucking means for cooperating with the support member to chuck the specified page, and said chucking means has a chucking member movable between a chucking position where the chucking member contacts said support member and a waiting position where the chucking member is remote from said support member, means for pressing said chucking member onto said support member with a force having a vector component extending in the same direction said tension acts on the specified page, when said chucking member moves to the chucking position, and means for detecting whether or not the specified page is clamped between said chucking member and said support member, in accordance with the position of said chucking member.



5,192,141

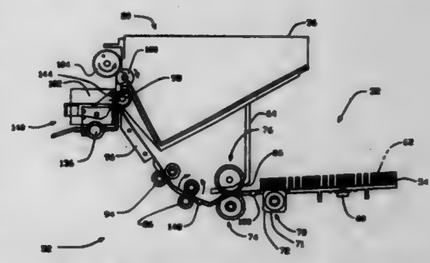
MULTI-DIMENSIONAL MEDIA PRINTER WITH MEDIA BASED REGISTRATION AND FREE EDGE PRINTING

T. Mark Chung, Carrollton; Anthony G. Orchard, Dallas; William H. Baker, Arlington, and Charles L. Bradford, Garland, all of Tex., assignors to Tidemark Corporation, Newark, Calif.

Filed May 2, 1991, Ser. No. 694,930

Int. Cl.[5] B41J *11/20*

U.S. Cl. 400—56 45 Claims



1. A printer for imprinting data on a variety of multi-dimensional media including a means for transporting the media, which media transporting means includes:
a pick roller means adapted for contacting the bottommost media from a stack of media and for urging the bottommost media out from the bottom of the stack of media;
a feed roller means adapted for engaging the bottommost media urged out from the stack of media by the pick roller means and for initiating the feeding of the bottommost media through the printer in a media feeding direction;
wherein said feed roller means includes a feed roller with a plurality of media engaging notches provided about the periphery of the feed roller, which notches allow a leading edge of the media to be caught by the feed roller means.

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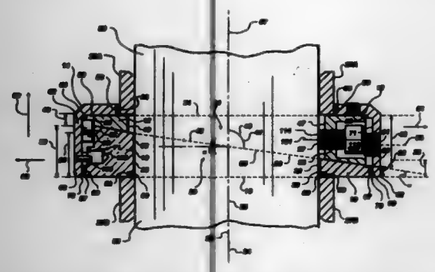
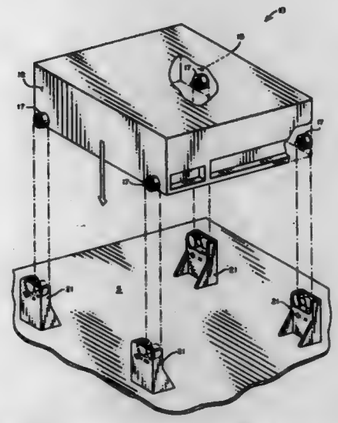
5,192,142
PUMP IMPELLER RELEASE COLLAR ASSEMBLY
John Hyll, Sandy, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Sep. 27, 1990, Ser. No. 589,319
Int. Cl.[5] F16B *1/00*; F04D *29/08*
U.S. Cl. 403—16 24 Claims



1. A pump impeller release collar assembly for use in releasing compression loaded members stacked on a shaft, said assembly comprising:
a pair of collars, a first collar being mountable on a shaft, said first collar having a first planar inner surface which is orientable transverse to a longitudinal axis of said shaft;
a second collar mountable on said shaft contiguous said first collar, said first collar and said second collar being positionable between a plurality of members stacked on said shaft; said second collar defining a second inner surface positioned contiguous said first inner surface, said second collar having a mounting means associated therewith adapted for rendering said second collar radially displaceable from said shaft's longitudinal axis, said first collar and said second collar having an outer surface adapted for engaging a respective said member stacked on said shaft; said pair of continuously mounted collars defining a distance between said outer surfaces;
wherein said distance is reduced by displacing said second collar radially and axially of said shaft's longitudinal axis, said distance reduction functioning to release compressive loading on members stacked on said shaft.

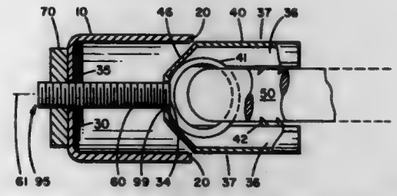
5,192,143
QUICK CONNECT MODULAR UNIT RETAINER ASSEMBLY WITH DAMPING
Robert J. Lajara, San Jose; Steven J. Furuta, Santa Clara, and Vincent P. Hileman, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.
Filed May 15, 1992, Ser. No. 883,533
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 20 Claims

1. A retainer assembly for securely mounting a modular unit to a base, the retainer assembly comprising:
a plurality of compliant inserts projecting from the modular unit;
a plurality of bosses attached to and projecting upward from the base, each boss comprising an "L"-shaped receiving channel embedded in a first vertical surface for slideably receiving the insert corresponding to said boss, the "L"-shaped receiving channel further comprising a vertical channel and a horizontal channel, the vertical channel having an upper and a lower end, the horizontal channel having a terminus and being connected perpendicularly to the lower end of the vertical channel, the upper end of the vertical channel having an opening in the boss, the horizontal channel being narrower than the insert and having an upper and a lower wall, the upper wall having an upper detent ridge disposed opposite a corresponding lower detent ridge disposed in the lower wall, the upper and lower detent ridges located so that the insert is urged against the upper and the lower detent ridges when the insert is positioned in the terminus;
said vertical channels of said "L"-shaped receiving channels receiving said inserts until the inserts rest upon the lower walls of said horizontal channels, said horizontal channels



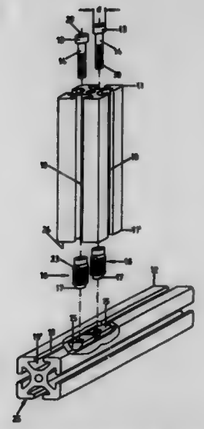
of said "L"-shaped receiving channels further receiving said inserts between the upper and lower detent ridges until the inserts reach the termini, the compliant inserts compressing when passing the upper and lower detent ridges and then expanding to substantially conform to the termini and securely mounting the modular unit to the base.

5,192,144
END FINISHING DEVICE FOR ROPE, WIRE, CABLE, AND THE LIKE
Michael B. Doninger, 1815 Yale Rd., Merrick, N.Y. 11566
Filed Jun. 4, 1991, Ser. No. 710,106
Int. Cl.[5] F16B *1/00*
U.S. Cl. 403—209 19 Claims



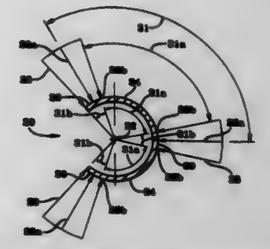
1. An apparatus for engagement with and for end finishing of a termination of a flexible item such as a rope, cord, wire, cable or the like, and for use with a bolt means having an eye member through which the termination can extend and also having a longitudinally extending threaded rod member coupled at a first end to said eye member with said eye member being in alignment with the longitudinal axis of the threaded rod member, said apparatus comprising:
(a) a hollow rigid sleeve member open at one end and having a first opening at its opposite end, wherein the rod member can pass through said first opening in said sleeve member; and
(b) a compressible gripping member open at one end and having a second opening at its opposite end through which said rod member can pass, and having inwardly extending barbs for gripping said termination, said gripping member at least partially surrounding a doubled over portion of the termination, and configured to engage said eye member to substantially prevent rotation of said eye member relative to said compressible gripping member, said gripping member being adapted to be drawn into said hollow sleeve member and to be compressed thereby so as to be in a close nesting fit within said sleeve member.

5,192,145
CROSS COUPLING FOR BARS
Wolfgang Rixen, and Gerrit Pies, both of Friedenstrasse 107-109, 5650 Solingen 11, Fed. Rep. of Germany
Filed May 20, 1991, Ser. No. 702,424
Claims priority, application Fed. Rep. of Germany, May 21, 1990, 4016320
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—255 16 Claims



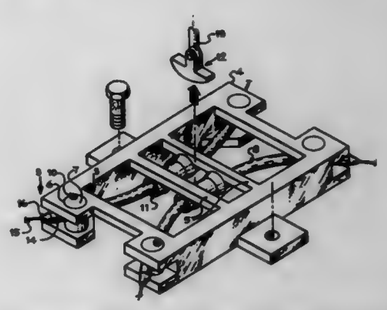
1. A cross coupling arrangement for two bars disposed at right angles to one another, which bars have undercut longitudinal grooves said coupling arrangement including a threaded fastening with a head at one end, which threaded fastening is disposed parallel to the symmetry axis of longitudinally running bar in an undercut longitudinal groove of same, and the other end of which engages a nut disposed in an undercut longitudinal groove of a transversely running bar, and the head of which extends beyond or behind a cylindrical insert installed axially into the undercut longitudinal groove of the longitudinally running bar, and which has a bore through it for the screw, characterized in that the symmetry axis of the cylindrical insert is coaxial with the symmetry axis of the bore through it for the screw, and the outside diameter of the cylindrical insert is so adapted to the cross section of the undercut longitudinal groove of the longitudinally running bar that a thread provided on the outer circumference of the cylindrical insert provides a self-tapping thread cutting into the material of the bar longitudinally running and having within its length a transversely disposed bore forming cutting edges along the intersection of the bore with the self tapping threads.

5,192,146
OPEN SEAM FRICTION ROCK STABILIZER
Thomas J. Landsberg, Princeton, N.J., assignor to Simmons-Rand Company, Bristol, Va.
Filed Aug. 30, 1991, Ser. No. 753,186
Int. Cl.[5] E21D *21/00*
U.S. Cl. 405—259.1 11 Claims



1. A friction rock stabilizer for use in a substantially circular cross sectional borehole comprising:
a. an elongated hollow tubular body having a tapered top end, a bottom end and a shank portion therebetween; and
b. compression means extending along the length of the body for permitting resilient compression of the body during insertion into an undersized borehole, and for resiliently urging a plurality of friction load bearing surfaces extending the length of said shank into frictional load bearing contact against the borehole wall, said friction load bearing surfaces, after said body is inserted into the borehole, being spaced apart from each other at an angle between 70 degrees and 150 degrees, as measured around a center axis of the borehole, said friction load bearing surfaces having therebetween wall portions of said shank that are substantially in noncontact with the wall of the borehole, said compression means comprising a slit extending along the length of the body, said slit, after said body is inserted into the borehole, having a width extending completely between two adjacent friction load bearing surfaces.

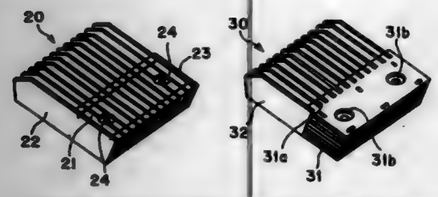
5,192,147
NON-PYROTECHNIC RELEASE SYSTEM
Thomas E. McCloskey, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Filed Sep. 3, 1991, Ser. No. 753,556
Int. Cl.[5] B25G *3/18*
U.S. Cl. 403—322 7 Claims



1. A pyrotechnic free release system comprising at least one shape memory rod assembly, said rod assembly having a first shape at normal temperatures and a second shape when heated to an elevated temperature, means for retaining one end of the rod assembly for rotatable movement and means for retaining

the other end of the rod assembly for rotatable movement and sliding movement, a toggle assembly, said toggle assembly including a shaft and a pivoting toggle, means mounted on said shape memory rod assembly for selectively retaining and releasing said pivoting toggle.

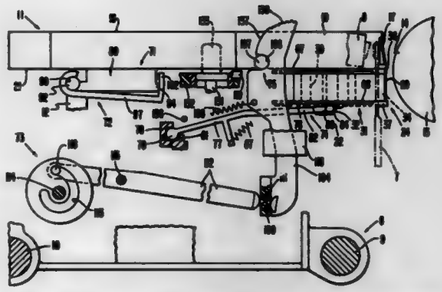
5,192,149
DOT LINE PRINTER HAVING IMPROVED COMB YOKE
Shigenori Suematsu; Yoshikane Matsumoto; Shinichi Sakamoto, and Hirotaka Kobayashi, all of Katsuta, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed May 22, 1991, Ser. No. 704,149
Claims priority, application Japan, May 25, 1990, 2-135752
Int. Cl.[5] B41J 9/38
U.S. Cl. 400—157.2 16 Claims



1. A hammer bank assembly of a dot line printer for providing dot impression images on a printing sheet during reciprocal movement of the hammer bank assembly, the printing sheet being fed in a line to line direction, the hammer bank assembly comprising:
a hammer base reciprocally movable in a shuttling direction, the hammer base having a front face;
a plurality of leaf spring type printing hammers held on the front face of the hammer base and arranged side by side at a predetermined pitch in the shuttling direction, the printing hammers having front faces in confrontation with the printing sheet, and having rear faces;
permanent magnets mounted on the hammer base for attracting the printing hammers away from the printing sheet;
a comb yoke mounted on the hammer base, the comb yoke having a base portion positioned on the permanent magnets and pole portions secured by the base portion and extending from the base portion toward the rear faces of the printing hammers, the rear faces of the printing hammers being attracted toward the pole portions by the permanent magnets, the pole portions being made of a first material having a first, highly saturated magnetic flux density, and the base portion comprising a plurality of metal plates laminated together and containing a second material having a second, lower saturated magnetic flux density; and
electromagnetic coils wound over the pole portions for releasing the attracted printing hammers from the pole portions for creating dot impressions, wherein the comb yoke comprises first yoke pieces and second yoke pieces alternately arranged side by side in the shuttling direction in a laminating fashion, the second yoke pieces constituting the pole portions and the alternate first and second yoke pieces laminated together constituting the base portion.

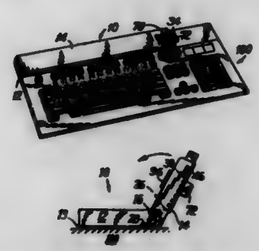
5,192,149
CASSETTE FOR TYPING RIBBON FOR TYPEWRITERS
Claudio Gillio, Fresno Canavese, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Oct. 31, 1990, Ser. No. 606,946
Claims priority, application Italy, Dec. 21, 1989, 68145 A/89
Int. Cl.[5] B41J 33/14
U.S. Cl. 400—208 18 Claims

1. A unitary typing and correction cassette for a typing machine or the type comprising a platen roller having a typing point, and a carriage movable parallel to the platen, said carriage having support means for pivotally supporting the cassette, a ribbon feed mechanism for feeding a typing ribbon of the cassette, a lifting device for the cassette, and a hooked lever for feeding a correction ribbon in response the lifting of the cassette, wherein said support means comprise two pivot seats spaced apart from each other parallel to the platen, wherein said ribbon feed mechanism comprises a feed shaft having a connection member positioned between the pivot seats and the platen and wherein said lifting means comprises a lifting lever having a seat also positioned between the pivot seats and the platen for providing a vertical reciprocatory movement, said unitary cassette comprising:
a container for accommodating a typing ribbon, having a bottom wall and two projecting arms, wherein said arms have guide ends for positioning an external portion of the typing ribbon in front of the typing point;
a feed roller and a pinch roller rotatably supported by said container and engaging the typing ribbon, wherein said feed roller is engageable with said connection member of the feed shaft for producing unidirectional feed of the typing ribbon;
two members projecting downwardly from said bottom wall and having respective lateral pivot projections, wherein said pivot projections are engageable with the pivot seats



of said support for oscillatory movement of said cassette about an axis of oscillation parallel to the platen;
a pin projecting laterally from one of said arms and engageable with the seat of said lifting lever for actuating said oscillatory movement of the cassette in response to the reciprocatory movement of said lifting lever; and
a correction portion with a correcting ribbon attached downwardly to said bottom wall, said correction portion comprising:
a supply spool and a take up spool for the correction ribbon rotatably supported by two respective coupling members projecting downwardly from said arms, wherein said coupling members comprise a plurality of flexible tongues with bevel surface of manual snap fitting and removal of said spools;
two guide elements projecting downwardly from said guide ends for guiding a portion of said correction ribbon below the external portion of the typing ribbon in parallel relationship to the platen; and
a toothed ring on said take up spool, wherein said hooked lever has two hook portions cooperative with oppositely disposed teeth of said ring upon engagement of said pivot projections with said pivot seats and said lever seat with said pin for advancing the correcting ribbon upon the oscillatory movement of said cassette.

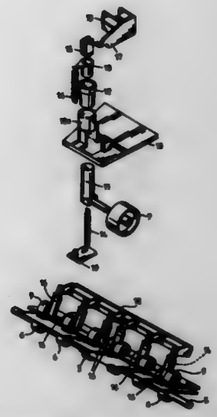
5,192,150
COMPUTER KEYBOARD TEMPLATE SELECTOR
Karl A. Riggsberg, 129 Lancer Rd., Riverside, Conn. 06878
Filed Sep. 10, 1991, Ser. No. 757,223
Int. Cl.[5] B41J 5/00
U.S. Cl. 400—477 12 Claims



1. An apparatus for selecting and displaying a computer keyboard template from among a plurality of computer keyboard templates, the apparatus comprising:
a base including means for attaching said base to a computer keyboard;
a lid including hinge means attached to said base;
a plurality of separator sheets rotatably engaging said base, each of said separator sheets providing a surface including an adhesive strip for engaging a computer keyboard template, at least one of said separator sheets further including a laterally extending tab;
wherein each of said laterally extending tabs are wider than any lower adjacent laterally extending tab thereby forming an inverted stair structure;
selecting means which is movable to a plurality of positions, each of said plurality of positions corresponding to one of said separator sheets;
said selecting means moving a lifting means which selectably engages said laterally extending tabs whereby when said lid is subsequently opened, a selected laterally extending tab, a selected separator sheet corresponding thereto, and all separator sheets above said selected separator sheet are lifted to expose a separator sheet below said selected separator sheet; and
a label adjacent to each of said plurality of positions corresponding to a computer template exposed by said lifting means when said selecting means is placed in a respective position chosen from said plurality of positions.

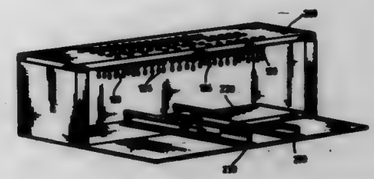
5,192,151
PRINTER
Reijo Mattila, Helsinki, Finland, assignor to ICL Personal Systems Oy, Helsinki, Finland
Filed Mar. 16, 1992, Ser. No. 851,948
Claims priority, application Finland, Mar. 25, 1991, 911427
Int. Cl.[5] B41J 11/42
U.S. Cl. 400—579 2 Claims

1. A printer for printing on a document, comprising:
a print head;
a paper path for the document to be printed; and
a document transfer device arranged in connection with said paper path, said document transfer device comprising: a plurality of drive pulleys arranged in parallel for gripping an underside of the document and positioned in at least two sequential rows, and a plurality of spring-actuated pressure rollers arranged in parallel and disposed across the entire paper path in two rows sequentially above said drive pulleys so as to form pairs of drive pulleys and pressure rollers, with said pressure rollers pressing the document from above against said drive pulleys;
said document transfer device further comprising: support means for each of said pressure rollers situated in one of said two rows of pressure rollers; a first spring and a second spring, for pressing each of said pressure rollers downwards against a corresponding drive pulley, are arranged in connection with said support means of each of said pressure rollers, whereby a stiffness of said first spring is substantially stronger than a stiffness of said second spring; and release means for releasing said first spring having the stronger stiffness, in which case only said second spring having a weaker stiffness influences the corresponding pressure roller and presses it downwards, and



wherein said support means comprises a support arm, on which a corresponding one of said pressure rollers is mounted in bearings; a support base; a sleeve connected to said support base, within which sleeve said support arm is slidingly arranged from below; said first stiffer spring being arranged to press said support arm, and said second weaker spring being arranged between said support arm and said support base so that said first and second springs press said support arm and said corresponding one of said pressure rollers connected thereto against a corresponding one of said drive pulleys.

5,192,152
SWITCH ACTUATOR
James T. Silvestri, Woodlands; Todd D. Podhajsky, Spring; Timothy E. Klein, Cypress; Mark W. Baker, Spring, and David J. Czarnek, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed May 31, 1991, Ser. No. 708,344
Int. Cl.[5] B41J 29/00
U.S. Cl. 400—679 4 Claims



1. An apparatus for testing press-to-actuate switches comprising:
a plurality of fluid-actuated actuators having an element which extends and retracts in response to fluid pressure with each actuator positioned to align its extending/retracting element with a corresponding switch in an array of switches;

means for supplying either a lower fluid pressure or a higher fluid pressure to any actuator;
means for selecting either a first fluid pressure or a second fluid pressure as the lower fluid pressure;
means for selecting either atmospheric or subatmospheric pressure as the second fluid pressure; and,
control means for selecting the lower fluid pressure, higher fluid pressure, first fluid pressure, second fluid pressure, atmospheric pressure, and subatmospheric pressure.

5,192,153
AGITATOR ASSEMBLY FOR A PASTY COSMETIC PRODUCT

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

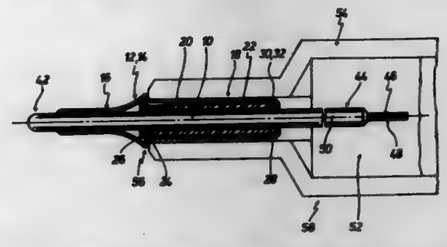
Filed Jun. 10, 1991, Ser. No. 713,058
Claims priority, application France, Jun. 27, 1990, 90 08083
Int. Cl.[5] A45D *40/00, 40, 18*
U.S. Cl. 401—4 8 Claims

1. An applicator assembly comprising a container for a pasty cosmetic product having a heterogenous or thixotropic composition, said container having lateral wall, at one end of said lateral wall a neck and a bottom at an opposite end of said lateral wall, said neck having a drainage lip, a cap having means for fixing said cap on said neck and carrying a rod, said rod having an end remote from said cap, said end having an applicator element, said rod having a length so that said applicator element is disposed adjacent said bottom when said cap is mounted on said neck of said container, a stirring element rotatably mounted in said container, said container having driving means for rotatably driving said stirring element upon movement of said rod out of said container, said stirring element having extensions extending radially from said rod toward said lateral wall when said rod is in said container, said extensions defining axial passages between adjacent said extensions, said assembly further including control means for moving said stirring element along said lateral wall with said rod while permitting rotation of said stirring element, said stirring element having at least two oppositely extending radial projections, said driving means comprising two helical grooves on said lateral wall each receiving a said projection.

5,192,154
APPLICATOR INSERT FOR AN APPLICATOR IMPLEMENT

Gerhard Mosek, Kirchehrenbach, Fed. Rep. of Germany, assignor to Schwan-Stabilo Schwanhaeusser GmbH & Co, Nuremberg, Fed. Rep. of Germany

Filed May 6, 1991, Ser. No. 696,213
Claims priority, application European Pat. Off., Jan. 15, 1990, 90111302.7
Int. Cl.[5] B43K *3/00, 8/02*
U.S. Cl. 401—198 9 Claims



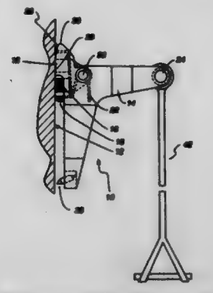
1. An applicator insert for an applicator implement comprising: a fine liner applicator member having a diameter of from about 0.5 to 2 mm and having capillary spaces and having a front end portion providing an applicator portion and a rearward end portion providing a feed portion for feeding application medium to the applicator member; a holding means accommodating the applicator member and having a continuous, single, unitary, tubular sleeve adjacent the applicator member including a front end portion of an internal cross-section adapted to the applicator member, with the applicator portion of the applicator member projecting from the sleeve at the front end portion thereof, and the sleeve including a rearward sleeve portion from which said feed portion projects and which is of an internal cross-section larger than the cross-section of applicator member so that an intermediate space is provided between the rearward sleeve portion and the applicator member, said rearward sleeve portion including a support shoulder means formed by an edge portion of said rearward sleeve portion, said edge portion being turned over inwardly of the sleeve; a spring means disposed in said space and having a front end portion and a rear end portion which is fixed with respect to the rearward sleeve portion, wherein said spring means is supported with its rear end portion against said support shoulder means and wherein said spring means is a tubular sleeve comprising a resiliently yielding plastic material; and a ring element on the applicator member and co-operating with said front end portion of said spring means to fix same with respect to the applicator member to provide for resilient displaceability of the applicator member with respect to the sleeve, the ring element being adapted in a non-loaded condition to be fitted on to the applicator member and in the fixing condition being clamped against the outside peripheral surface of the applicator member with a defined clamping force which does not interfere with said capillary spaces.

5,192,155
MAGNETIC GRIPPER DEVICE

Ross E. Meyer, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1992, Ser. No. 870,965
Int. Cl.[5] B25G *3/12*
U.S. Cl. 403—410 6 Claims

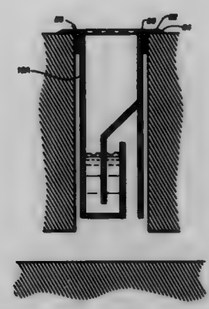
1. Apparatus for releasable attachment to a ferromagnetic surface, comprising:
magnet means for adhering to said ferromagnetic surface;
a frame rotatably attached to said magnet means; and
cam means defined by said frame having a first dimension effective for placing said magnet means against said ferromagnetic surface and a second dimension effective to detach said magnet means from said ferromagnetic surface, where the spacing of said magnet means from said ferromagnetic surface varies as said cam means is rotated by said frame on said ferromagnetic surface between said first and said second dimensions.



5,192,156
DRAIN APPARATUS WITH LIQUID TRAP

James E. Webb, Richmond, Calif., assignor to Nsertaseal Corporation, Richmond, Calif.

Filed May 28, 1991, Ser. No. 706,322
Int. Cl.[5] E01C *11/22*
U.S. Cl. 404—4 4 Claims

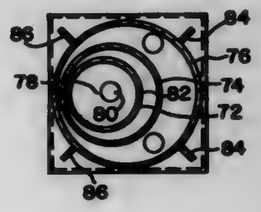


1. Apparatus for draining liquid from a surface into a sewer through a passageway extending between said surface and said sewer and for forming a liquid barrier between said sewer and said surface for preventing the flow of gases from said sewer to said surface, said apparatus being selectively, positionable in said passageway and removable therefrom as a unit, and said apparatus comprising, in combination:
a conduit including a peripheral wall defining an interior and having an upper end, a lower end, and a longitudinal axis extending through upper and lower ends;
support means for supporting said conduit within said passageway with the lower end of said conduit below said surface, said conduit upper end being substantially open and defining an upwardly directed drain opening providing communication between said interior and ambient atmosphere above said surface and allowing liquid to drain from said surface directly downwardly in a vertical direction along said longitudinal axis through said drain opening into the interior of said conduit;
a bottom wall connected to said peripheral wall and partially extending across said lower end to define an opening at said lower end with said peripheral wall, said bottom wall being in partial registry with said drain opening;
a partition extending upwardly from said bottom wall and connected to said peripheral wall to define a trough within said conduit interior, said partition having a distal end spaced from said lower end;
a deflector connected to said peripheral wall and disposed above said partition and said opening and below said drain opening whereby liquid draining from said surface directly downwardly in a vertical direction through said drain opening will directly impact said deflector, said deflector slanting downwardly and having a lower deflector edge located over said trough, said deflector having an upper liquid impact surface deflecting the liquid entering said conduit through said drain opening and directly impacting said deflector and directing said deflected liquid into said trough, said deflector also having a lower impact surface disposed over a segment of said bottom wall and over said opening; and
a baffle extending downwardly from the lower deflector edge of said deflector and having a lower distal end located in said trough above said bottom wall and below the level of said partition distal end, said conduit, said bottom wall, said partition, said deflector, and said baffle being fixedly connected whereby said apparatus is of integral construction, said conduit peripheral wall, said baffle, and said partition defining a generally S-shaped fluid flow path within said interior, said generally S-shaped fluid flow path including a first fluid flow path portion disposed at a first side of said interior between said conduit peripheral wall and said baffle, a second fluid flow path portion between said baffle and said partition substantially parallel to said first fluid flow path portion and communicating therewith at said conduit lower end, and a third fluid flow path portion disposed at a second side of said interior between said conduit peripheral wall and said partition, said third fluid flow path portion substantially parallel to said first and second fluid flow path portions and in communication with said second fluid flow path portion through an aperture defined by said conduit peripheral wall, said deflector, and said partition distal end, said third fluid flow path portion leading to said opening whereby liquid in said third fluid flow path portion flowing to said opening facilitates flow of liquid through said generally s-shaped fluid flow path, said third fluid flow path portion being longer than said second fluid flow path portion whereby liquid in said third fluid flow path portion creates a siphoning effect on the liquid in said generally S-shaped fluid flow path, and said deflector lower liquid impact surface for reorienting liquid flow when said liquid flows from said second fluid flow path portion into said third fluid flow path portion.

5,192,157
VEHICLE CRASH BARRIER

John F. Laturner, Carmichael, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Jun. 5, 1991, Ser. No. 710,830
Int. Cl.[5] E01F *15/00*
U.S. Cl. 404—6 47 Claims



1. A vehicle crash barrier adapted to decelerate an impacting vehicle, said crash barrier comprising:
at least one energy-absorbing element comprising at least

one column and a foam disposed within the column, wherein the column comprises a sheet of material which defines an array of perforations extending along and around the column, wherein the column defines a longitudinal axis extending along a length direction of the column; and

a mounting system coupled to the column and configured to mount the column alongside a roadway with the longitudinal axis extending substantially parallel to the roadway;

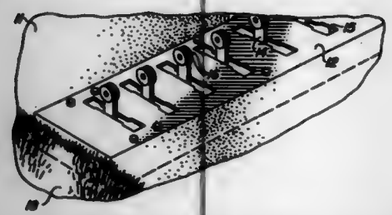
said column having sufficient rigidity such that, when an impacting vehicle having an initial kinetic energy impacts the energy-absorbing element and collapses the column along the longitudinal axis, the foam braces the column against buckling, and deformation of the column absorbs a greater fraction of the initial kinetic energy than does deformation of the foam.

5,192,158

APPARATUS FOR CONTROLLING THE DIRECTION OF VEHICULAR TRAFFIC MOVEMENT

Richard E. Bailey, Gilbert, and Clarence G. Austin, Scottsdale, both of Ariz., assignors to Park N' Shade, Phoenix, Ariz.

Filed Mar. 11, 1991, Ser. No. 667,458
Int. Cl.[5] E01F *9/00, 13/00*
U.S. Cl. 404—11 **12 Claims**



1. Apparatus for allowing vehicle traffic flow in a permitted direction while inhibiting flow in the reverse direction which comprises:

a) a planar member for supporting motor vehicles traveling thereacross, said member having a plurality of openings spaced thereacross;

b) a plurality of actuating levers, each lever having a first end extending upwardly through one of said openings and positioned to contact a vehicle tire passing across the planar member;

c) coupling means located beneath said planar member for rotationally mounting said levers to permit movement in the directions of said traffic flow, said levers moving to a position beneath said planar member when contacted by a vehicle tire;

d) contacting means rotationally mounted on the first end of said levers and having a circumferential surface for contacting a vehicle tire and moving along the surface thereof; and

e) a plurality of piercing members operatively connected to said actuating levers beneath the planar member, said piercing members rotating with the levers to engage a tire when a vehicle is moving in the reverse direction.

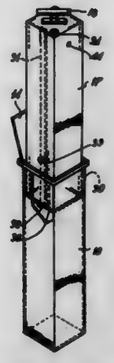
5,192,159

SECURITY POST

Barry Higginson, 281 Newton Road, Lowton, Warrington, Cheshire, England, assignor to Barry Higginson and Arthur Kirkham et al. Crook, both of Cheshire, England

Filed Mar. 22, 1991, Ser. No. 673,529
Int. Cl.[5] E01F *9/00*
U.S. Cl. 404—11 **11 Claims**

1. A security post comprising a tubular member to be located in the ground with its upper open end substantially level with the surface, a post slidably located within the tubular member between a first position in which it is at least substantially enclosed within the latter and a second position in which it is upstanding therefrom, means for locking the post in at least the second of said two positions, a cover for the upper open end of the tubular member, further means within the tubular member separate from the locking means, to prevent unauthorized



removal of the post therefrom, and wherein for the two parts comprising the tubular member and the post, the removal prevention means includes an abutment located within one of said parts and a movable bar fixed within the other of said parts and having a member extending outwardly therefrom to engage the abutment, and further including means for enabling authorized disengagement of the bar from the abutment.

5,192,160

METHOD AND APPARATUS FOR MAKING MANHOLES

Alexander Muehlstaedter, Gartenstr. 7, D-6749 Birkenhoerdt-Bad Bergzabern, Fed. Rep. of Germany

PCT No. PCT/EP89/00361, § 371 Date Dec. 19, 1991, § 102(e) Date Dec. 19, 1991, PCT Pub. No. WO89/09307, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 31, 1989, Ser. No. 585,113
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3810933
Int. Cl.[5] E01C *23/06, 23/09, 23/12*
U.S. Cl. 404—72 **11 Claims**

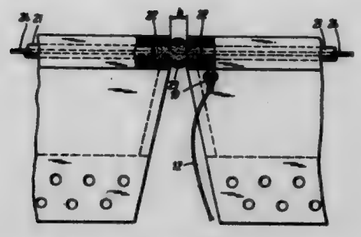
1. In a method of making manholes and trenches in hard top traffic areas, which comprise a substructure and a top structure which top structure consists of a support layer disposed on a support structure and a final top layer of bituminous or concrete material, the improvement comprising the steps of cutting the top layer down to the support layer by means of a circular saw, then cutting the support layer at a distance of about 30 cm from the top layer saw cut toward the center of the manhole or trench and finally cutting the support structure suitably in stepped fashion by means of a hydraulic jack hammer with a chisel blade thereby generating cut material and removing the cut material by an excavator.

5,192,161

FLOATING STRUCTURE FOR USE AS A BREAKWATER

Ulf Helgesson, Angvagen 21, and Bjorn Helgesson, Lycke 743, both of Brastad, Sweden S-450 30

Division of Ser. No. 530,239, May 30, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,983
Int. Cl.[5] B63B *35/38*
U.S. Cl. 405—26 **6 Claims**



1. A floating structure suitable for use as a breakwater comprising a plurality of concrete displacement members having a pair of longitudinal sides, a pair of transverse sides and a top portion, each of said plurality of concrete displacement members being at least partially filled with buoyancy means comprising lightweight filler material whereby said plurality of concrete displacement members are sufficiently buoyant to be maintained above the water line when placed in a body of water, and means for maintaining said plurality of said concrete displacement members in a longitudinal series comprising corresponding longitudinally-extending channels along each of said plurality of concrete displacement members between said pairs of transverse sides and below said top portion and including end portions at said pairs of transverse sides, each of said longitudinally-extending channels including recess means at said end portions thereof whereby said recesses are juxtaposed between each of said plurality of concrete displacement members, said recesses having a length of between about 2 and 4 inches, resilient members contained within said juxtaposed recesses between each of said plurality of concrete displacement members and having a length greater than that of said juxtaposed recesses by a distance of at least about 0.4 inches such that upon the application of a compressive force between said plurality of concrete displacement members said resilient members will bulge outwardly so as to partially fill the space between said pair of transverse sides and prevent said transverse sides from contacting each other, said resilient means including a predetermined resiliency and having a Shore hardness of between about 70 and 98 whereby said resilient members are contained within said recesses and spaced from said pairs of transverse sides and from said top portion such that relative movement of said resilient members with respect to said plurality of concrete displacement members is substantially prevented, and tension means for rigidly attaching each of said plurality of concrete displacement members to each other with said resilient members therebetween, with sufficient tension such that said plurality of concrete displacement members are rigidly attached to each other while said corresponding transverse sides of said concrete displacement members are prevented from inadvertently contacting each other by means of said resilient member bulging outwardly so as to partially fill said space between said pair of transverse sides.

5,192,162

POOL APPARATUS AND METHOD OF MAKING

Gordon McKinnon, 119 South Oregon Ave., Tampa, Fla. 33606

Filed Nov. 8, 1991, Ser. No. 790,649
Int. Cl.[5] E04H *3/16, 3/18*
U.S. Cl. 405—55 **18 Claims**

1. A swimming pool apparatus, comprising:

a base extending within a peripheral edge;

said base being contoured to form the bottom of the pool;

a plurality of upright supports disposed adjacent said peripheral edge of said base;

a side wall sheet extending about said peripheral edge of said base;

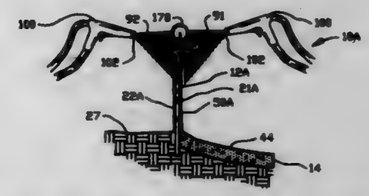
said side wall sheet being disposed between said peripheral edge of said base and said plurality of upright supports;

said side wall sheet having an inner surface facing an interior of the pool and an outer surface facing an exterior of the pool;

means for affixing said side wall sheet to said plurality of upright supports;

an inner coating disposed on said inner surface of said side wall sheet and disposed on said base for affixing said side wall sheet to said base and for forming an interior surface for the pool; and

an outer coating disposed on said outer surface of said side wall sheet for affixing said side wall sheet to said plurality of upright supports.



16. The method of making an in ground swimming pool, comprising the steps of:

excavating a hole in the ground in the shape and the depth of the desired pool;

installing plurality of upright supports into the ground about the periphery of the excavated hole;

affixing a side wall sheet to the plurality of upright supports for defining the sidewall of the pool;

pouring a cementitious base within the side wall sheet to form the bottom of the pool;

applying a fiberglass coating on an inner surface of the side wall sheet and on the cementitious base for affixing the side wall sheet to the cementitious base and for forming an interior surface for the pool; and

applying a fiberglass coating on an outer surface of the side wall sheet for affixing the side wall sheet to the plurality of upright supports.

5,192,163

CORRECTION METHOD FOR CONTAMINATED SITES

Joseph W. Fleming, 8381 Post Rd., Allison Park, Pa. 15101

Filed May 29, 1992, Ser. No. 890,718
Int. Cl.[5] B09B *1/00*; C02F *11/02*
U.S. Cl. 405—128 **42 Claims**

1. A method for decontaminating soil contaminated with toxic radicals or compounds containing a higher valence state metal, said method comprising the steps of:

a) introducing a non-biological composition for treating toxic radicals or reducing the valence of the higher valence metal into a body of water which is adjacent to a contaminated soil site;

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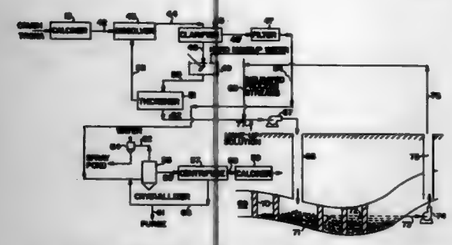
b) moving a portion of contaminated soil located along a first side of said body of water into said body of water;
c) permitting said composition for reducing the valence of high valence metals to reduce the valence of said higher valence metal in said portion of contaminated soil in order to form a portion of decontaminated soil;
d) moving said portion of decontaminated soil to a second side of said body of water to form shore material of decontaminated soil at said second side; and
e) repeating steps (b) through (d) until substantially all portions of contaminated soil are decontaminated by said composition for reducing the valence of higher valence metals.

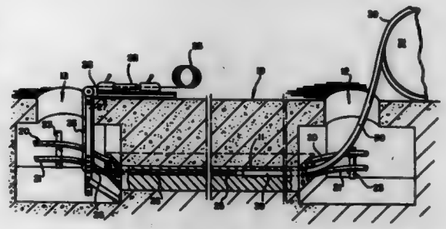
5,192,164
SODA ASH PRODUCTION
William R. Frint; Michael M. Bithell, and William G. Fischer, all of Green River, Wyo., assignors to FMC Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 574,837, Aug. 29, 1990, Pat. No. 5,043,149. This application Jul. 25, 1991, Ser. No. 735,586
Int. Cl.[5] B09B *3/00*; E02D *15/00*
U.S. Cl. 405—128 6 Claims



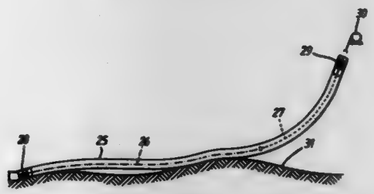
1. Process for disposal of insoluble tailings underground, said tailings being derived from insolubles that remain when solubilizing uncalcined or calcined trona in the process of producing soda ash, comprising slurrying the tailings with a saturated or substantially saturated aqueous solution of a salt selected from sodium carbonate, sodium bicarbonate and mixtures thereof, pumping said slurry into a well connected to an underground mined-out cavity in a trona bed with sufficient pressure to prevent build-up of tailings from plugging the bottom of the well opening, continuing to pump said tailings slurry into said cavity, dispersing and settling said tailings along with a retained portion of said aqueous solution in said cavity, removing aqueous solution from said cavity and conveying it to the surface, recovering the removed aqueous solution from said cavity for recycle and slurrying additional tailings, and adding as make-up liquor to replace the retained portion of solution in said cavity a saturated or substantially saturated aqueous solution of a salt selected from the group of sodium carbonate, sodium bicarbonate and mixtures thereof.

5,192,165
TRENCHLESS REPLACEMENT OF CONDUITS IN AN UNDERGROUND CONDUIT BANK
Robert J. Torielli, Piscataway, N.J., assignor to PIM Corporation, Piscataway, N.J.
Filed Apr. 6, 1992, Ser. No. 864,358
Int. Cl.[5] F16L *55/18*
U.S. Cl. 405—156 4 Claims

1. In a conduit bank of the type having a plurality of individual conduits packed together and extending for an extended distance underground, a method of replacing only one of the individual conduits of the bank while leaving the other individual conduits operable, comprising the steps of:
moving into the individual conduit a front end of a conduit expander, which front end is narrow enough to enter one end of the individual conduit, which conduit expander also has an enlarged portion rearwardly of that front portion, the enlarged portion having its largest outside diameter being greater than the original inside diameter of the existing individual conduit,
moving the conduit expander through the existing individual conduit, breaking the existing individual conduit and causing the enlarged portion to move the broken individual conduit outwardly by an amount which does not damage the adjacent other individual conduits of the bank, and
moving into the individual conduit a replacement conduit which is attached to the conduit expander and which has an internal diameter at least approximately equal to the original inside diameter of the existing individual conduit.

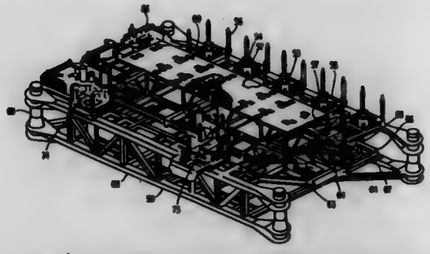


5,192,166
METHOD OF CONTROLLED BENDING OF A PIPELINE DURING LAYING THEREOF IN THE SEA
Tor Persson, Kristianstad, Sweden, assignor to International Technologies A/S, Oslo, Norway
Filed Mar. 26, 1992, Ser. No. 858,282
Claims priority, application Norway, Apr. 15, 1991, 911464
Int. Cl.[5] F16L *1/16*
U.S. Cl. 405—168.1 8 Claims



1. A method of controlled bending of an empty pipeline during the laying thereof on a bed in the sea, said method comprising the steps of;
locating and engaging a bend controlling/stopping means for limiting said controlled bending of said pipeline to a predetermined angular configuration on an exterior of said empty pipeline at a selected bending zone of said pipeline on said bed,
transporting weight-loaded means for bending by weight said empty pipeline along an interior of said empty pipeline to said selected bending zone of said empty pipeline on said bed,
wherein weight of said weight-load means permanently bends said empty pipeline to a predetermined angular configuration in cooperation with said bend controlling/-stopping means and said bed.

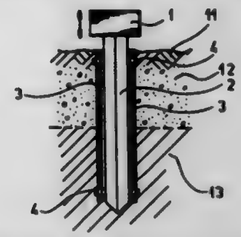
5,192,167
SUBSEA PRODUCTION SYSTEM
José E. M. da Silva; Cesar A. S. Paula; Amauri G. Santos Filho, and Eduardo J. J. Coelho, all of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil
Filed Oct. 15, 1991, Ser. No. 776,641
Claims priority, application Brazil, Oct. 12, 1990, PI 9005123
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—195.1 20 Claims



1. A subsea production system comprising: a template structure, a manifold structure, means for mounting said manifold structure to said template structure, a plurality of wet christmas tree modules, a plurality of satellite tree modules, said manifold structure containing pipes, control lines, check valves for said pipes and connectors, said template structure comprising means for detachably mounting said plurality of wet christmas tree modules and said plurality of satellite tree modules adjacent said manifold and about the perimeter of said template structure, and wherein said wet christmas tree modules and said satellite tree modules comprise at least one maneuver valve, choke, control module and transducer constituting active components of the subsea production system such that the subsea production system may be utilized in deep waters, offer a high operational flexibility while allowing the active components of the system within the detachably mounted christmas tree and satellite tree modules to be serviced at the surface of the sea after removal from the subsea production system template structure.

5,192,168
METHOD AND APPARATUS FOR STABILIZING FRICTION SOIL AND ADJACENT COHESION SOIL LAYERS
Karl R. Massarsch, Waterloo, Belgium, and Günter Hoppel, Marburg an der Lahn, Fed. Rep. of Germany, assignors to Dr.-Ing. Ludwig Muller & Sohne Gesellschaft fur Bautechnik mbH & Co. KG, Marburg an der Lahn, Fed. Rep. of Germany
Filed Apr. 30, 1992, Ser. No. 876,232
Claims priority, application Fed. Rep. of Germany, May 1, 1991, 4114193
Int. Cl.[5] E02D *7/18*
U.S. Cl. 405—258 14 Claims

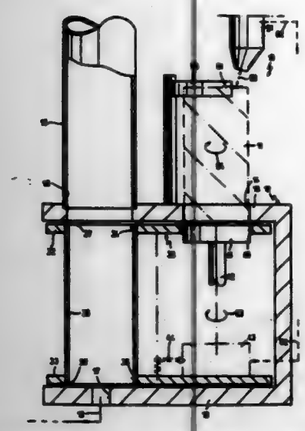
1. A method of stabilizing friction soils and adjacent cohesion soil layers, comprising the steps of:
(a) affixing to a compaction beam at least one ground nail in a form of an elongated rod;
(b) vibrating said beam with said ground nail affixed thereto into the ground through said friction soil and an adjacent cohesion soil layer with a vibrator attached to an upper end of said beam; and
(c) thereafter withdrawing said beam from the ground while vibrating said beam and leaving said ground nail in the ground after extraction of said beam whereby said ground nail transfixes the friction soil and at least a portion of a cohesion soil layer.



5,192,169
FRICTION ROCK STABILIZER
Thomas J. Landeberg, Princeton, N.J., assignor to Simmons-Rand Company, Bristol, Va.
Filed Nov. 12, 1991, Ser. No. 790,626
Int. Cl.[5] E21D *21/00*
U.S. Cl. 405—259.1 11 Claims

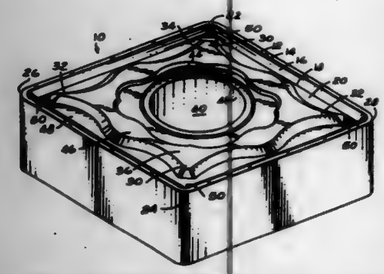
1. A friction rock stabilizer, for use in a borehole having a longitudinal center axis and a substantially circular cross section transverse to said center axis, comprising:
a. an elongated, nondeformable center spine having a top end and a bottom end, said nondeformable spine adapted to extend within said borehole adjacent to said longitudinal center axis;
b. support arm means extending transversely outwardly from said nondeformable spine, for exerting a radial force outwardly from said center axis toward a borehole wall, for urging at least three spaced-apart friction surfaces into contact with the borehole wall, said friction surfaces having therebetween a portion of said nondeformable spine spaced from the borehole wall, when said stabilizer is positioned within the borehole;
c. said friction surfaces being positioned on an arc of a circle measured around said center axis, said arc spanning a center angle of at least 180 degrees;
d. said support arm means extending longitudinally along said nondeformable spine; and
e. compression means on said support arm means for permitting resilient compression of said support arm means and for transmitting compressive stress in a radial direction between said friction surfaces and said nondeformable spine, during insertion of said stabilizer into an undersized borehole.

5,192,170
PNEUMATIC TUBE CONVEYOR STATION
Hartmut Lang, Plochingen, Fed. Rep. of Germany, assignor to Indutronic Vertriebsgesellschaft fuer Kommunikationssysteme mbH, Plochingen, Fed. Rep. of Germany
Filed Sep. 18, 1991, Ser. No. 761,681
Int. Cl.[5] B65G *51/28, 51/44, 51/36*
U.S. Cl. 406—147 5 Claims



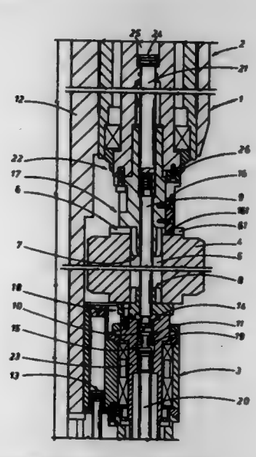
1. A pneumatic tube conveyor station, comprising:
a conveyor case for conveying goods between said station and another station of a tube conveyor system, said conveyor case being provided with a machine-readable label bearing identification and routing information about said other station;
a housing comprising a loading position for loading said conveyor case to be dispatched to said other station and supporting means for placing said conveyor case thereon, said supporting means being rotatable under the action of drive means; and
label reading means arranged adjacent said supporting means and being connected to said drive means for reading said identification and routing information from said label when said conveyor case is rotated by said supporting means.

5,192,171
CHIP CONTROL INSERT
James Thor, Troy; Brendan L. Brockett, Dearborn Heights, and John H. Patterson, Hazel Park, all of Mich., assignors to GTE Valenite Corporation, Troy, Mich.
Filed Jan. 7, 1991, Ser. No. 638,236
Int. Cl.[5] B23B *27/22, 27/16*
U.S. Cl. 407—114 8 Claims



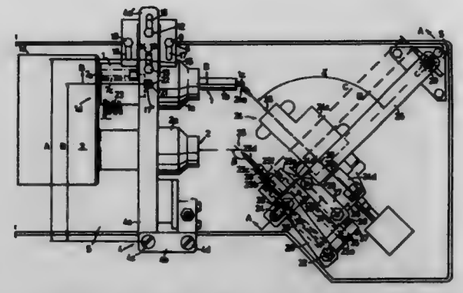
1. A chip control insert comprising a polygon side cutting edge periphery, an inclined entry surface descending from said periphery to bottom surface, a planar annular seating surface projecting from said bottom surface above said periphery, polygon corner chip breaking means, said seating surface having a surrounding ramp wall, ascending from said bottom surface above said periphery, said annular seating surface having radius bulges intermediate each polygon side, a central through aperture, and a substantial area planar recess surrounding said aperture within said seating surface.

5,192,172
GEAR HOBBING MACHINE WITH ARBORLESS SUPPORT FOR HOB
Alessandro Lanzani, Bologna, Italy, assignor to Mikron S.p.A. Bologna, Bologna, Italy
Filed May 26, 1992, Ser. No. 889,046
Claims priority, application Italy, May 31, 1991, B091A000189
Int. Cl.[5] B21F *23/12*
U.S. Cl. 409—11 5 Claims



1. A gear hobbing machine, comprising:
a pair of coaxial heads, the first head capable of movement along its own axis toward and away from the second head, between and by which a hob having an axial bore is supported coaxially, said hob set in rotation bout the common axis of the coaxial heads;
a first timing member disposed on one of the two heads;
a second timing member disposed on the hob and interacting with the first timing member;
a pair of axially hollow alignment spigots with respective stop collars, associated one with each of the heads and said spigots insertable in the axial bore of the hob to a depth at which the collars engage the hob;
a tension rod coaxially disposed in at least one of the heads and having a free end, insertable through one of the spigots and through the hob, and
gripping and tensioning means for engaging and restraining the tension rod to cause a force of axial compression to be applied through the spigots to the hob, said gripping and tensioning means disposed on the remaining head.

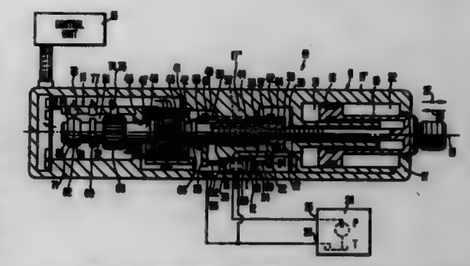
5,192,173
COPYING METHOD AND DEVICE
Matts Andersson, Fåker, and Värne Gustavsson, Karlskoga, both of Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden
Filed Feb. 23, 1990, Ser. No. 483,725
Claims priority, application Sweden, Feb. 23, 1989, 8900621
Int. Cl.[5] B23Q *35/10*
U.S. Cl. 409—84 7 Claims



1. A method for producing an article from a blank, the contour of the article being altered with respect to a selected model by using a copying machine including a first pair of units having a first unit for supporting the model and a second unit for supporting the blank and a second pair of units including a third unit for supporting a detecting member, and a fourth unit for supporting a machining member, said method comprising the steps of:
1) controlling said units of said first and second pair for execution of first relative longitudinal displacement movements of said pairs of units towards and way from each other such that said detecting member is brought in cooperation with the model for detecting its contour and the machining member is brought into contact for working upon the blank;
2) controlling one of said first and second units in said first pair by a first linkage system associated with said first pair such that the other of said first and second units executes second displacement movements with respect to the one unit to provide a desired alteration of the article contour in the longitudinal direction;
3) controlling one of said third and fourth units in said second pair by a second linkage system associated with said second pair such that the other of said third and fourth units executes second displacement movements with respect to the one unit to provide a desired alteration of the article contour in the radial direction; and
4) wherein said units are positioned such that longitudinal axes of said first and third unit relative to said second and fourth unit respectively are at an angle with respect to each other.

5,192,174
HYDRAULIC DRIVE FOR A TOOL HEAD
Hans Hartmann, Ensser Strasse 14, D-7000 Stuttgart 50, Fed. Rep. of Germany
PCT No. PCT/DE90/00319, § 371 Date Jan. 7, 1992, § 102(e) Date Jan. 7, 1992, PCT Pub. No. WO90/13747, PCT Pub. Date Nov. 15, 1990
PCT Filed May 4, 1990, Ser. No. 777,226
Claims priority, application Fed. Rep. of Germany, May 7, 1989, 3914960
Int. Cl.[5] B23Q *5/36*; F15B *9/00*
U.S. Cl. 409—283 12 Claims

1. A hydraulic drive for adjustment, feed, and return movements of a toolhead of a machine tool, the hydraulic drive comprising:
a hydraulic motor including a movable drive element fixedly coupled to the toolhead, said drive element being drivable by alternative pressurization and pressure relief of drive pressure chambers in accordance with tool movements;
a follow-up control valve operating in response to an electromechanically controllable reference position value setting for the movable drive element and mechanical actual position value return indication;
means for setting a reference position value and return indication of an actual position value including a threaded spindle and a spindle nut fashioned as a hollow shaft and meshing with a thread of the spindle, one of the threaded spindle and the spindle nut forming a reference value setting element, one of the threaded spindle and spindle nut being adapted to be driven by an electric motor in a direction of rotation of the electric motor in accordance with a setting of the reference position value, and the



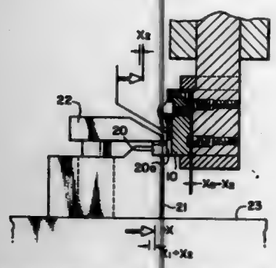
other of the threaded spindle and spindle nut being adapted to be axially displaced by a drive element in accordance with an actual position value return indication;
an electronic control unit provided with an interface for an NC or a CNC control for producing signals required for motion control of the electric motor;
a rotational and angular position pickup system for producing output signals containing information relating to a total number of revolutions by the reference value setting element as well as the azimuthal position of the reference value setting element within each revolution; and
an electronic displacement pickup system providing output signals which constitutes a direct measure for axial deflections of the reference value setting element and a valve operating member of the follow-up control valve also executing these axial deflections from a rest position and providing a measure for the lag error by which at least one of the toolhead or the drive element of the hydraulic motor trails with respect to a reference position.

5,192,175
BURR TRIMMING METHOD AND APPARATUS FOR MACHINING SHOCK TESTING PIECES, AND AUTOMATIC MACHINING SYSTEM THEREOF
Morio Ozawa, Ibaraki; Takao Ikeda, Hitachi; Yuji Nasu, Hitachi, and Yoshio Kamijyo, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 23, 1989, Ser. No. 370,867
Claims priority, application Japan, Jul. 6, 1988, 63-166762
Int. Cl.[5] B23D *13/00*
U.S. Cl. 409—345 15 Claims

1. A tool adapted for trimming burrs formed on an edge of a groove machined in a testing piece, the tool comprising: a body including supporting means having a cushion mechanism; a holder supported on one surface of said body by said supporting means; and a cutting edge fixedly mounted to said holder so as to enable the cutting edge to be pressed against a surface of

VOL 1148 ISS 2 MR 9 1993 UMI

the testing piece where the burrs have formed and in this condition enable a substantially linear movement of the current



edge along said surface of the testing piece to trim off the burrs.

5,192,176

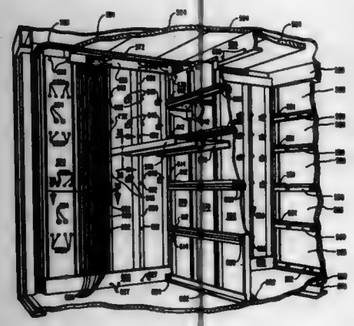
SECTIONAL VAN TRAILER HAVING DETACHABLE, INTERCHANGEABLE COMPARTMENTS CAPABLE OF FORMING A CONTINUOUS VAN BODY WITH ACCOMPANYING SYSTEM FOR FORMING SHELF DECKS AND PARTITION WALLS WITHIN CARGO HOLDING SECTIONS

Hardy G. Roberts, Orem, Utah, assignor to T-W Management Company, Orem, Utah

Continuation of Ser. No. 460,658, Jan. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 296,575, Jan. 12, 1989, abandoned. This application Jul. 10, 1991, Ser. No. 727,270

Int. Cl.[5] B61D *45/00*; B60P *1/00*

U.S. Cl. 410—140 7 Claims



1. A system for constructing removable horizontal decks and vertical partitions for use in a cargo holding section having at least two walls, the system comprising:

a plurality of planar units, wherein each of the planar units includes means for supporting objects thereon when the planar unit is oriented in a substantially horizontal position;

means for storing each of the plurality of the planar units, wherein said means for storing is formed within the cargo holding section and is formed within at least one wall of said two walls;

means for removably supporting the plurality of the planar units between said two walls of the cargo holding section to form at least one of said removable horizontal decks; and

means for removably holding the plurality of the planar units in at least one vertical position within the cargo holding section to form at least one of said removable vertical partitions.

5,192,177

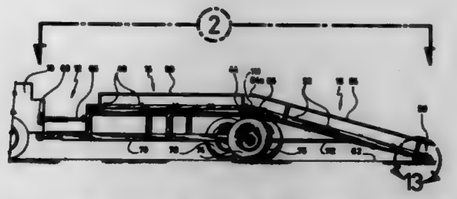
MOBILE HARVESTER FOR HAY BALES

Marcel E. Cardinal, 5451, Rg. St-Vincent, Mirabel, Quebec, Canada J0N 1K0

Filed Apr. 13, 1992, Ser. No. 867,452

Int. Cl.[5] B60P *1/38*

U.S. Cl. 414—501 8 Claims



1. A mobile harvester movable on a ground surface for receiving, loading and unloading hay bales, comprising,

an elongated bale receiving platform on which successive and adjacent bales, sidewisely positioned are adapted to longitudinally slide thereon in a single row,

a loading platform adjacently positioned sidewise relative to said receiving platform, said loading platform being substantially at the same level as the receiving platform,

means for pivoting said receiving platform for tilting a row of aligned bales on said receiving platform onto said loading platform, wherein a preceding row of aligned bales are adapted to be pushed transversally onto said loading platform when a following row of aligned bales is tilted on the loading platform, said loading platfo m having a supporting surface for said bales comprising a first conveyor mechanism for longitudinally moving said bales onto said supporting surface,

first means for actuating said first conveyor mechanism,

an unloading platform adjacently positioned lengthwise relative to said loading platform for receiving the bales from said loading platform when said first conveyor mechanism is moving, said unloading platform having a supporting surface comprising a second conveyor mechanism for consecutively moving said bales longitudinally to an end of said unloading platform opposite said loading platform,

second means for actuating said second conveyor mechanism,

said unloading platform leaning backwardly relative to the surface of the loading platform, said unloading platform having a skate member located at said opposite end under said unloading platform, said skate member adapted to slide on the ground surface when the harvester is moving,

whereby said opposite end is adapted to lie at a level adjacent the ground to allow the bales to smoothly slide onto the ground when the second conveyor mechanism is actuated.

5,192,178

EXTENSIBLE DISCHARGE CHUTE ASSEMBLY

Frederick J. Silbernagel, 4007 Fontana Dr., Oklahoma City, Okla. 73116

Filed May 2, 1991, Ser. No. 694,751

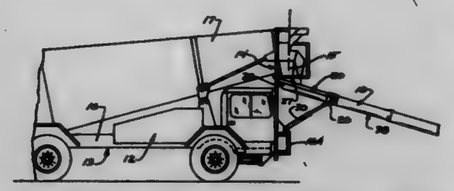
Int. Cl.[5] B65G *11/12*

U.S. Cl. 414—523 20 Claims

1. A discharge chute assembly for discharging material from a discharge apparatus having a storage reservoir, the discharge chute assembly comprising a first discharge chute section for receiving the material from the reservoir:

a second chute section comprising a trough-shaped body extending longitudinally between a second inlet end and a second outlet end and having spaced upper edges, means to couple the inlet end to the first chute section to receive materials from the first chute section;

a third chute section comprising a body of complemental cross-sectional shapes to the second chute section and being of larger size so as to telescopically slide over the second chute section and moveable to extend outwardly from the second chute section and having a pair of edges extending longitudinally between a third inlet end and a third outlet end; and



fastening means connecting the third inlet end to the second outlet end for pivotable movement of the third chute section with respect to the second chute section, and permitting detachably disconnecting the third inlet end from the second outlet end for telescopically sliding movement of the third chute section relative to the second chute section.

5,192,179

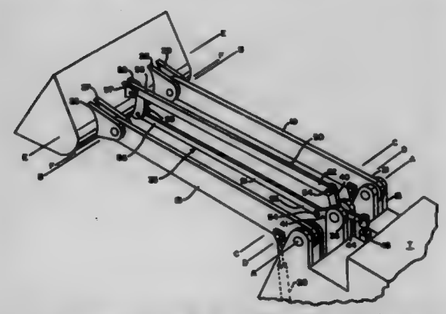
LIFT ARM AND TILT LINKAGE SYSTEMS FOR LOAD ELEVATING VEHICLES

Geza Kovacs, 1102 Sugartree Dr. S., Lakeland, Fla. 33813

Filed May 24, 1991, Ser. No. 705,581

Int. Cl.[5] E02F *3/34*

U.S. Cl. 414—710 20 Claims



17. In a linkage assembly for self-levelling of an implement relative to a vehicle having a lift arm assembly having one end pivotably mounted to the vehicle about a first pivot axis and a second end pivotably mounted to the implement about a second pivot axis and wherein the first and second pivot axis are generally parallel with respect to one another, the improvement comprising, an implement tilt assembly including two generally parallel link means having first and second ends, said implement tilt assembly further including first and second arm means mounted to the vehicle and having inner and outer end portions, means for mounting said inner end portions of said first and second arm means so as to be selectively rotatable about said first pivot axis, said outer end portions of said first and second arm means being disposed in angular relationship with respect to one another relative to said first pivot axis, a first pivot means for pivotably connecting said first end of one of said parallel link means to said first arm means and a second pivot means for pivotably connecting said first end of the other of said parallel link means to said outer end portion of said second arm means, a third pivot means for pivotably connecting said second end of said one of said parallel link means to said implement and a fourth pivot means for pivotably connecting said second end of said other of said parallel link means to said implement, said third and fourth pivot means being spaced from one another and said second pivot axis, and means for selectively rotating said first and second arm means relative to said first pivot axis.

5,192,180

LOAD-RELIEVING DEVICE FOR SERVOMOTORS ADJUSTING THE HEIGHT OF CANTILEVER ARMS

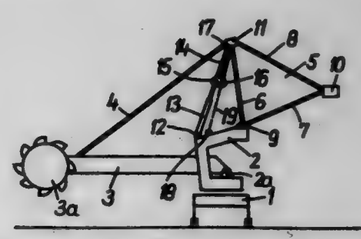
Horst Kolloth, Krefeld, Fed. Rep. of Germany, assignor to Krupp Industrietechnik Gesellschaft mit beschränkter Haftung, Duisburg, Fed. Rep. of Germany

Filed Dec. 13, 1991, Ser. No. 806,316

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1990, 4039973

Int. Cl.[5] B66C *3/20*

U.S. Cl. 414—719 4 Claims



1. In an apparatus including a frame, a cantilever arm movably mounted on the frame, counterweight means connected to said frame for counterbalancing said frame and said cantilever arm, and a servomotor connected to the frame and the cantilever arm for setting a height position of the cantilever arm; said servomotor being connected to the frame and the cantilever arm such that tension loads derived from forces acting on the cantilever arm are being introduced into the servomotor; a device for relieving the servomotor of the tension loads for an arbitrary period; said device including a tension member attached parallel to the servomotor for the arbitrary period; the improvement wherein said device comprises an intermediate member having a first pivot joint operatively articulated to said cantilever arm for introducing the tension loads into said intermediate member, a second pivot joint for being coupled to an end of said tension member and a third pivot joint for being releasably coupled to said servomotor; said first, second and third pivot joints being spaced from one another and forming the three corners of an imaginary triangle.

5,192,181

MACHINE FOR STACKING CUP-SHAPED CONTAINERS

Bent Bryde-Hansen, No. 13 Knudsvej, DK-4623 Lille Skensved, Denmark

Filed Sep. 3, 1991, Ser. No. 753,573

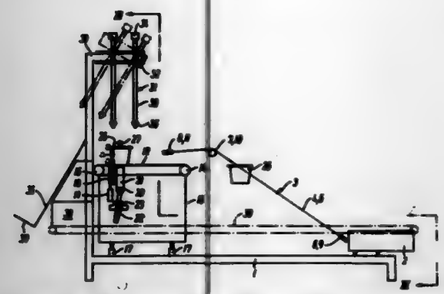
Claims priority, application Denmark, Apr. 23, 1991, 743/91

Int. Cl.[5] B65G *57/30*

U.S. Cl. 414—795.3 11 Claims

1. A machine for stacking cup-shaped containers (25), comprising: an oscillating chute (2) and a conveyor (3) feeding the containers in an upright position to a height-adjustable conveyor belt (12), a plurality of photosensors (27) to detect, in connection with a programmable control unit, the orientation of a container on the conveyor belt (12), a stop (18) to halt a container under a stack holder (31) which at its downwards facing end has releasable grippers (35), a vertically displaceable stack disc (20) for lifting said container to the stack holder, and means (39) for returning an incorrectly oriented container to the oscillating chute,

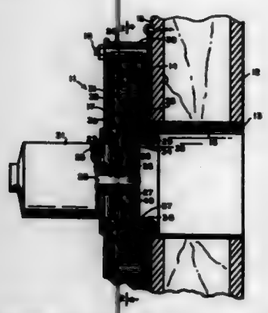
wherein the stack holder (21), the stop (18) and the stack disc (20) are positioned relative to a point on the height-adjustable conveyor belt (12) at which the orientation of the container (15) is detected by said photosensors (27) immediately prior to stacking,



said stop (18) being activated to move between a passive position allowing movement of the container (25) past the stop

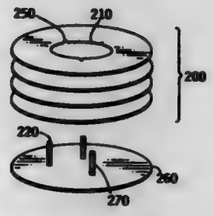
and an active position preventing said movement and stopping the container (25) in response to detection by said photosensors (27) that the container 25 is correctly oriented on the conveyor belt (12).

5,192,182
SUBSTANTIALLY NOISELESS FAN
Clarence R. Pennell, 11618 Placid Ct., Colton, Calif. 92324
Filed Sep. 20, 1991, Ser. No. 763,258
Int. Cl.[5] F01D *1/36*
U.S. Cl. 415—90 1 Claim



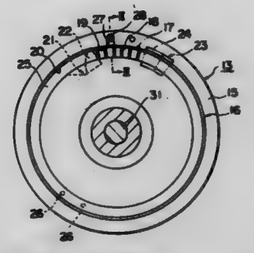
1. A substantially noiseless fan for moving air comprising;
a first housing part forming a first wall;
a second housing part forming a second wall;
means on said first housing part supporting said second housing part with said second wall in spaced relationship with said first wall to form a partial enclosure which is open at its periphery to the atmosphere;
a rotatable drive shaft;
bearing means rotatably supporting said drive shaft partially within said partial enclosure;
a first disk in said partial enclosure carried by said shaft;
a second disk in said partial enclosure having a central opening therein;
a plurality of disks, each with a central opening therein of the same size, positioned in parallel relationship with the first and second disks;
said second housing part having an air intake opening coaxial with said central opening in said second disk;
said second housing part including a substantially tubular extension sized to slidingly extend through a receptive cylindrical opening in a structure wall, said substantially tubular extension comprising an air intake conduit terminating coaxially with said central opening;
said tubular extension having an annular lip extending within said air intake opening in said second housing part;
the central openings in said second disk and in said plurality of disks being all round openings of substantially the same diameter;
the inside diameter of said annular lip being substantially the same as the diameter of each of the central openings in said plurality of disks, and said fan including means forming a throat intermediate said lip and the remainder of said substantially tubular extension, said throat having a smaller cross sectional area throughout than the cross sectional area of the interior of said remainder of said substantially tubular extension;
said throat narrowing convexly from the remainder of said substantially tubular extension to said lip;
said substantially noiseless fan including a cylindrical screen encircling said first disk, said second disk and said plurality of disks spaced outwardly therefrom between said first wall and said second wall; and
means supporting said second disk and said plurality of disks in spaced parallel and rotational relationship with said first disk and each other whereby when the disks are rotated at a suitable speed bodies of air in the spaces therebetween are rotated due to boundary layers of the air on the facing sides of said disks and portions of said bodies of air are sheared from said boundary layers and moved radially outward in spiral paths by centrifugal force created by said rotation.

5,192,183
LAMINAR FLOW FANS
Philip R. C. Wilkinson, Southhampton, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 28, 1991, Ser. No. 751,425
Claims priority, application European Pat. Off., Sep. 11, 1990, 90309938.0
Int. Cl.[5] F01D *1/36*
U.S. Cl. 415—90 13 Claims



1. A laminar flow fan comprising:
a plurality of fan elements, each having a central aperture therein; and
a support member passing through the central aperture in each element, wherein relative rotation of the support member from a first position to a second position with respect to the fan elements fastens the support member to an aperture edge in each element, thereby maintaining the support member and elements in the second relative position.

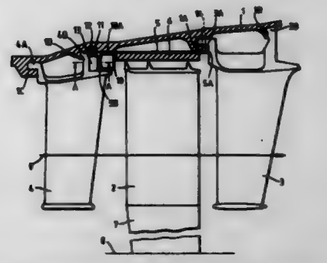
5,192,184
FUEL FEED PUMP
Yamada Nobuo, Kiryu, and Keiji Kiuchi, Yabumoku-honmachi, both of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan
Continuation of Ser. No. 717,925, Jun. 20, 1991, abandoned. This application Jun. 3, 1992, Ser. No. 893,608
Claims priority, application Japan, Jun. 22, 1990, 2-164770; Jun. 29, 1990, 2-69052[U]
Int. Cl.[5] F04D *5/00*
U.S. Cl. 415—169.1 5 Claims



1. A fuel feed pump comprising:
a casing immersed in a fuel tank for a motor vehicle, said casing comprising a pump head and a pump plate;
an impeller rotatably installed in the casing and provided on the outer peripheries thereof with a plurality of grooves;
a liquid sealing portion formed in a position close to the impeller rotating loci of a group of the grooves of the impeller in the casing;
an intake port and a discharge port respectively opened in positions interposing the liquid sealing portion in the circumferential direction in the casing, the intake port being provided in the pump head and the discharge port in the pump plate;
a generally annular groove path formed between the intake port and the discharge port in a zone excluding the liquid sealing portion of the casing;
a deairing hole disposed in said groove path in the pump head; and
an exhaust port formed having a length substantially equal to said impeller's thickness and opened in the intermediate portion of the liquid sealing portion in a manner to communicate with an inner space of the liquid sealing portion and with the outside of the casing through said pump head to environmental pressure whereby said exhaust port is at a pressure level of the outside of the casing said pressure level being lower than a discharge pressure at said discharge port.

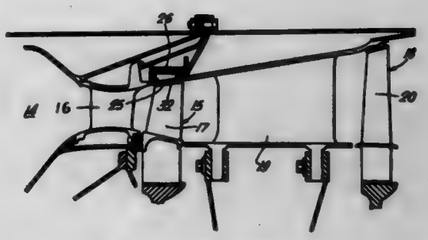
5,192,185
SHROUD LINERS
John F. Leonard, Bristol, England, assignor to Rolls-Royce plc, London, England
Filed Oct. 30, 1991, Ser. No. 785,013
Claims priority, application United Kingdom, Nov. 1, 1990, 9023880
Int. Cl.[5] F01D *5/00*
U.S. Cl. 415—170.1 2 Claims

1. A shroud liner for use in a gas turbine, the turbine including a casing and a first set of stator vanes and a second set of stator vanes; the shroud liner being formed of sheet metal bearing an abradable coating on a part of one face, the shroud liner having a first portion at a downstream end thereto and a second resilient portion at its upstream end thereto, the first portion being shaped to fit between the first set of vanes and the casing, the resilient second portion comprising the sheet metal of the shroud liner formed in a U shape to fit between the second set of vanes and the casing, and a resilient element which closes the open end of the U shape, said first and second portions being arranged so that, in operation, gas loads on the vanes compress the first and second portions between the vanes and the casing so that the first portion is held between



the first set of vanes and the casing while the second resilient portion is compressed between the second set of vanes and the casing but able to move relative thereto.

5,192,186
GAS TURBINE ENGINE
John H. R. Sadler, Derby, United Kingdom, assignor to Rolls-Royce plc, London, England
Continuation of Ser. No. 295,328, Jul. 31, 1981, abandoned. This application Nov. 20, 1984, Ser. No. 699,446
Claims priority, application United Kingdom, Oct. 3, 1980, 8031989
Int. Cl.[5] F01D *25/08*
U.S. Cl. 415—177 8 Claims



1. A shroud ring suitable for a turbine of a gas turbine engine, said shroud ring comprising:
an annular surface defining means having an annular radially inwardly facing surface;
an annular heat pipe positioned radially outwardly of said annular surface defining means; and
spacing means positioned to radially space apart at least a major portion of said annular heat pipe from said annular surface defining means and defining an annular thermal barrier between said at least major portion of said heat pipe and said surface defining means.

5,192,187
ADJUSTABLE LOAD BRACING CROSSBAR
Lawrence H. Sweet, Rte. 6, Box 432-S, Mooresville, N.C. 28115
Filed Oct. 23, 1991, Ser. No. 780,636
Int. Cl.[5] B61D *45/00*
U.S. Cl. 410—151 12 Claims

1. An adjustable load bracing crossbar comprising
an elongate, substantially hollow support body having opposing ends,
means positioned at one end of the support body for engaging a wall of a compartment,
a telescoping extension tube slidably received within the other end of the support body and including an end por-

tion projecting from the tube and adapted for engaging another side wall of the compartment, and

a hydraulic pump mechanism secured within the support body and including a piston movable within the telescoping wall-engaging tube between a retracted position and an extended position toward the end portion of the tube, and

biasing means connected to the piston and the end portion of the telescoping tube for creating a biasing force between the piston in its extended position and telescoping tube when the crossbar is mounted within the compartment to compensate for slack created between the end portion and compartment wall such as occurs when the compartment is in transit.

5,192,188

LOCK FOR THE LOADING AND/OR DISCHARGING OF BULK MATERIALS

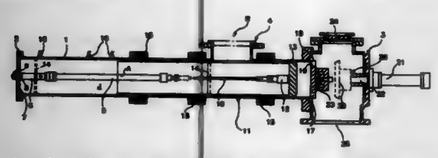
Alfred Kunz, Witterswil; Walther Schwenk, Kaiseraugst, and Jörg M. List, Pratteln, all of Switzerland, assignors to List AG, CH-Pratteln, Switzerland

Filed Dec. 10, 1990, Ser. No. 624,583

Claims priority, application Switzerland, Dec. 22, 1989, 04-588/89

Int. Cl.[5] C10J *3/30*

U.S. Cl. 414—217 10 Claims



1. A lock for the loading and/or discharging of, in particular, not easily flowing, adhering bulk materials into or out of a pressurized or vacuum chamber through a discharge opening of a discharge housing, comprises a housing having an inlet connector adjoining an operating chamber and a piston guided in the housing, a movable piston for transporting the bulk material from the inlet connector to a discharge housing, wherein the discharge housing is closed off in relation to the housing by a valve wherein the piston is guided by a sealing arrangement and is movable from one end position on one side of the inlet connector wherein the piston is sealed and exposes the inlet connector for receiving bulk material into the housing to the other end position on the other side of the inlet connector wherein the piston is sealed and the valve is opened for discharging bulk material into the discharge housing and thereafter to an intermediate position between the end positions wherein the valve closes.

5,192,189

CAR CARRIER TRUCK USED ALSO AS DUMP TRUCK

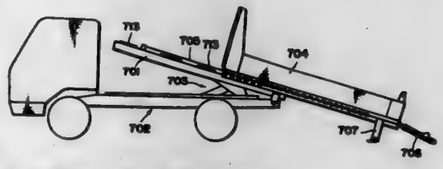
Masaichi Murata; Hiroaki Kuriyama; Yoshiyuki Maeda; Megumi Yamashita, and Kouzou Ueda, all of Hyogo, Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd.,, Hyogo, Japan

PCT No. PCT/JP89/00116, § 371 Date Sep. 18, 1990, § 102(e) Date Sep. 18, 1990

PCT Filed Feb. 3, 1989, Ser. No. 573,131

Int. Cl.[5] B60P *1/32*

U.S. Cl. 414—477 6 Claims



1. A car carrier truck, comprising:

a truck body having a chassis;

a dump frame pivotably disposed on said chassis, said dump frame comprising longitudinally extending beams having top and bottom surfaces;

a tilting device connected between said chassis and said dump frame;

a load carrying platform slidably mounted on said dump frame, said load carrying platform including longitudinally extending main girders having upper, lower and side surfaces and said main girders being slidably engaged with said beams of said dump frame;

a slide device connected between said dump frame and said load carrying platform for sliding said load carrying platform on said dump frame;

moving pads slidable on said beams of said dump frame fixed to said main girders at longitudinally forward positions on said main girders, said moving pads slidably engaging said beams of said dump frame; and

a plurality of fixed pads longitudinally aligned on and fixed to said top surfaces of said beams of said dump frame at intervals along said beams, said main girders being slidably disposed on said fixed pads, and one of said fixed pads at a longitudinally rearward position on each said beam having a side surface projecting laterally from said dump frame and contacting a said side surface of a said main girder.

5,192,190

ENVELOPE FORGED STATIONARY BLADE FOR L-2C ROW

Jurek Ferleger, Longwood, and David H. Evans, Lake Mary, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 624,367, Dec. 6, 1990, abandoned. This application May 8, 1992, Ser. No. 884,268

Int. Cl.[5] F01D *9/04*

U.S. Cl. 415—191 21 Claims

1. A stationary blade for mounting in a stream turbine stationary cylinder comprising:

an airfoil portion having an inner diameter end and an outer diameter end;

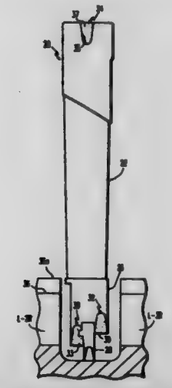
a portion of an inner ring corresponding to the airfoil portion being integrally formed at the inner diameter end of the airfoil portion; and

a portion of an outer ring corresponding to the airfoil portion, being integrally formed at the outer diameter end of the airfoil and being connected to the stationary cylinder of the steam turbine,

the airfoil, inner ring and outer ring portions being one piece,

said blade having a first groove formed in an end surface of the outer ring portion and extending from side to side for receiving weld material when additional blades of the same configuration are grouped together with the outer and inner ring portions juxtaposed side-by-side so that the weld material interconnects the outer ring portions,

said inner ring portion having a stepped end and including a first step surface and a second step surface,



said blade further having second and third grooves formed respectively in the first and second stepped surfaces of the inner ring portion and extending from side to side for receiving weld material when the additional blades of the same configuration are grouped together so that the weld material interconnects the inner ring portions.

5,192,191

PROPELLER VANE STRUCTURE FOR MARINE PROPULSION UNIT

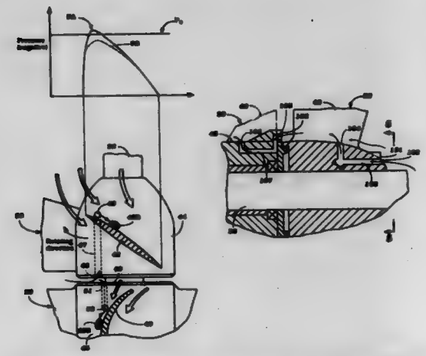
Hiroshi Tasaki, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 28, 1991, Ser. No. 706,582

Claims priority, application Japan, May 28, 1990, 2-135347

Int. Cl.[5] B64C *11/24*

U.S. Cl. 416—90 A 38 Claims



1. A blade construction for positioning in a stream of flowing fluid comprising hub having an outer generally cylindrical surface, at least one blade having a base formed at said cylindrical surface of said hub and a blade portion extending outwardly therefrom into the stream of flow, said blade portion having an upstream side and a downstream side, and a passage for delivering a pressurized flow of fluid to said base on the upstream side of said blade along its leading edge for precluding cavitation.

5,192,192

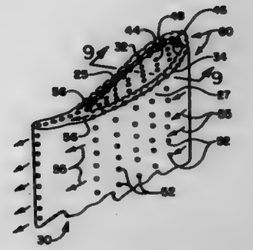
TURBINE ENGINE FOIL CAP

Tracy R. Ourhaan, Miami, Fla., assignor to The United States of America as represented by The Secretary of the Air Force, Washington, D.C.

Filed Nov. 28, 1990, Ser. No. 619,271

Int. Cl.[5] F01D *5/18*

U.S. Cl. 416—97 R 5 Claims



1. In a foil cap for a gas turbine engine for hollow blades or hollow vanes, having blade or vane cooling apertures from inside to outside thereof, which cap has top and outer side surfaces which meet to define outside corners, the improvement comprising, cap cooling apertures located in said cap which include corner apertures which exit at said outside corners at both said top and outer side surfaces at locations on the high and low pressure sides of said cap, wherein said corner, apertures cannot be blocked by contacting said top surfaces with a movable engine member, said top surfaces also intersecting with inside walls to define a ridge having inside corners, which ridge defines an enclosure such that at least some of said corner apertures exit at the outside corners of said ridge while some of said cap apertures exit proximate said inside walls of said ridge so that the outside corners of said ridge are scalloped by said corner apertures and the inside corners of said ridge are scalloped by extensions of said cap apertures.

5,192,193

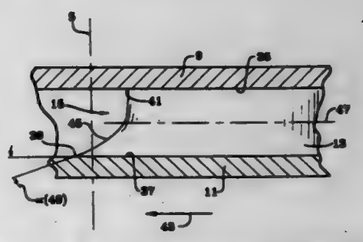
IMPELLER FOR CENTRIFUGAL PUMPS

Paul Cooper, Titusville, N.J., and Donald P. Slotsman, New Hope, Pa., assignors to Ingersoll-Dresser Pump Company, Liberty Corner, N.J.

Filed Jan. 21, 1991, Ser. No. 719,025

Int. Cl.[5] F04D *29/22, 29/66*

U.S. Cl. 416—186 R 5 Claims



1. In an impeller for liquid-conveying centrifugal pumps having a front shroud member, a rear hub member, a plurality of vanes therebetween having leading inlet edges disposed at the periphery of a circle, and an inlet throat opening between

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a suction side of one vane and a pressure side of an adjacent vane, means for inhibiting cavitation comprising:

(a) each vane including:

(i) a span between said shroud member and said hub member;

(ii) a leading inlet edge having a root portion extending upstream of a tip portion;

(iii) said leading inlet edge forming a concave surface beginning at a location between said tip portion and the mid-point of said span, said concave surface extending upstream to said root portion; and

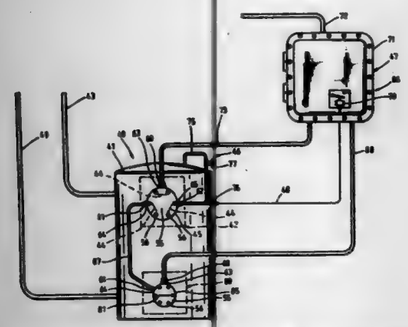
(iv) a vane thickness upstream of said inlet throat opening greater than a vane thickness downstream of said throat opening.

5,192,194

EXPLOSION PROOF COMPRESSOR AND A METHOD FOR EXPLOSION PROOFING A COMPRESSOR

Gaylon W. Birdwell, Houston, Tex., assignor to Air Engineers, Inc., Houston, Tex.

Filed Apr. 23, 1991, Ser. No. 690,045
Int. Cl.[5] F03B 49/02
U.S. Cl. 417—9 16 Claims



1. A compressor for use with air conditioning or refrigeration systems in a hazardous location where flammable gases or vapors may exist, comprising:

a compressor housing;

a compressor motor located within the compressor housing;

a low pressure refrigerant gas inlet line associated with the compressor housing;

electrical supply terminals associated with the compressor housing;

a first gas tight housing for the electrical supply terminals, the first gas tight housing being associated with the compressor housing;

supply means for supplying low pressure refrigerant gas into the first gas tight housing;

a first pressure responsive control means for controlling electrical power to the compressor motor;

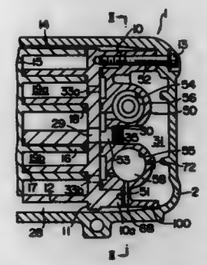
a first refrigerant gas pressure line disposed between, and in a fluid-transmitting relationship with, the first gas tight housing and the first pressure responsive control means, whereby upon a pre-selected decrease in pressure in the first gas tight housing, electrical power to the electrical supply terminals is terminated and the flammable gases or vapors are prevented from being ignited by the electrical supply terminals or compressor motor.

5,192,195

SCROLL TYPE COMPRESSOR WITH SEPARATE CONTROL BLOCK

Takayuki Iio, Nishikasugai; Takahisa Hirano, and Yoshiharu Morita, both of Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 766,403
Claims priority, application Japan, Nov. 14, 1990, 2-308193; Nov. 16, 1990, 2-311082
Int. Cl.[5] F04B 49/00
U.S. Cl. 417—299 5 Claims



1. A scroll type compressor in which a stationary scroll and a revolving scroll formed by setting up spiral wraps on end plates, respectively, are made to engage with each other while shifting the angle so as to form compression chambers, said stationary scroll is installed fixedly in a housing, and said revolving scroll is made to revolve in a solar motion by means of a mechanism for driving revolution while checking rotation on its axis by a mechanism for checking rotation on its axis, thereby to move said compression chambers toward the center of the spiral while reducing volumes thereof so as to compress gas, thus discharging the compressed gas into a discharge cavity formed in said housing through a discharge port provided in the end plate of said stationary scroll, wherein the scroll type compressor comprises:

bypass ports which communicate with said compression chambers are bored in the end plate of said stationary scroll;

a capacity control block contained inside a bypass passage which has the bypass ports communicate with a suction chamber formed in said housing and a valve mechanism which opens and closes the bypass passage is formed separately from said stationary scroll, the capacity control block is engaged with said stationary scroll and installed fixedly in said housing;

a fitting recessed portion is formed on either one of the outer surface of the end plate of said stationary scroll and the side surface of said capacity control block and a fitting projected portion is formed on the other thereof;

said fitting recessed portion and said fitting projected portion are engaged with each other; and

said stationary scroll and said capacity control block are installed fixedly in said housing.

5,192,196

FLOW CONTROL ORIFICE FOR PARALLEL FLOW FLUID SUPPLY TO POWER STEERING GEAR

Roger W. Gettel, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

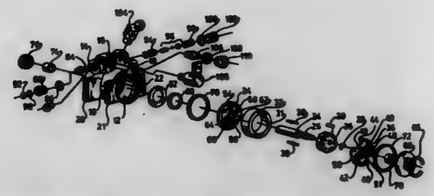
Filed Mar. 11, 1991, Ser. No. 667,123
Int. Cl.[5] F04B 49/00
U.S. Cl. 417—300 14 Claims

1. A flow control valve for controlling the flow rate of fluid from a fluid pressure source to a load, comprising:

a valve cylinder having a spool slidable therein having first and second pressure surfaces;

an outlet port through which fluid enters said valve cylinder, said outlet port communicating with the discharge side of the fluid pressure source and the first pressure surface;

a bypass port communicating with the valve cylinder, admitting therethrough fluid from the outlet port, opened and closed to said cylinder as said spool moves in said cylinder;



orifice means hydraulically connecting the outlet port and the load, having an inlet end thereof located eccentric of the longitudinal axis of the valve cylinder adjacent the bypass port and an outlet end thereof connected to the load; and

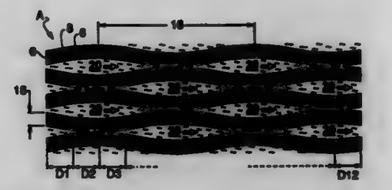
a pressure feedback passage connecting the outlet end of the orifice means and the second pressure surface.

5,192,197

PIEZOELECTRIC PUMP

Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Nov. 27, 1991, Ser. No. 799,525
Int. Cl.[5] F04B 35/04
U.S. Cl. 417—322 10 Claims



9. A pump comprising:

a housing defining a fluid flow-through internal cavity;

at least one flexible waveplate disposed within said housing further comprising shear transducer piezoelectric material planarly electrically segmented with film elecrodes, said electrodes being in a plane perpendicular to fluid flow within said cavity;

a housing fluid inlet communicating with said internal cavity;

a housing fluid outlet communicating with said internal cavity; and

a phased multiple-output controller associated with said waveplate.

5,192,198

DIAPHRAGM PUMP CONSTRUCTION

Gerhard Gebauer, Bermatingen; Wilfried Goes, Meersburg, and Otto Rosenauer, Langenargen, all of Fed. Rep. of Germany, assignors to J. Wagner GmbH, Fed. Rep. of Germany

Filed Aug. 27, 1990, Ser. No. 573,626
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928949
Int. Cl.[5] F04B 9/08
U.S. Cl. 417—383 41 Claims

1. A diaphragm pump comprising:

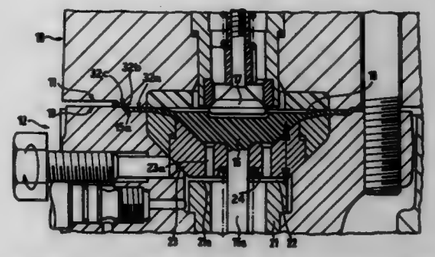
a first compartment means for receiving a first liquid therein and directing said first liquid thereout, said first compartment means having a first surface;

a second compartment means for holding a second liquid therein, said second compartment means having means for exerting a pressure force on said second liquid, said second compartment means comprising a second surface;

said first compartment means mounted to said second compartment means with said first surface facing said second surface; and

a diaphragm located between said first compartment means and said second compartment means, said diaphragm receiving a pressure force from said second liquid and transferring said pressure force across said diaphragm upon said first liquid to cause expulsion of said first liquid from said first compartment means;

wherein said first surface and said second surface each provide a first peripheral region and a second peripheral region, said second peripheral region adjoining and contiguous with said first peripheral region and surrounding said first peripheral region, said second peripheral region angled off in profile from said first peripheral region at a first oblique angle defined as the included acute angle between said first peripheral region and said second peripheral region, said first peripheral regions opposing each other and said second peripheral regions opposing each other, said first peripheral regions and said second peripheral regions cooperating to clamp a peripheral clamping region of said diaphragm residing therebetween, said peripheral clamping region conforming to a shape defined between said opposing first peripheral regions and said opposing second peripheral regions when said first compartment means is mounted to said second compartment means; and



an assembled thickness measured between said first peripheral regions of said first and second surfaces is greater than a thickness measured between said second peripheral regions of said first and second surfaces.

5,192,199

MACHINE FOR A GASEOUS MEDIUM

Hans Olofsson, Haddinge, Sweden, assignor to Svenska Rotor Maskiner AB, Stockholm, Sweden

PCT No. PCT/SE89/00505, § 371 Date Mar. 12, 1991, § 102(e) Date Mar. 12, 1991, PCT Pub. No. WO90/04107, PCT Pub. Date Apr. 19, 1990
PCT Filed Sep. 20, 1989, Ser. No. 663,858
Claims priority, application Sweden, Oct. 11, 1988, 8803595
Int. Cl.[5] F04B 17/00
U.S. Cl. 417—406 5 Claims

1. A machine of the rotary screw type for use with a gaseous medium, the rotary screw type machine having a compression section and an expansion section driving the compression section, said machine further comprising:

one male rotor (14) and one female rotor (16) operating in a single working space having the general shape of two intersecting cylinders and forming said compression and expansion sections for the gaseous medium, each of said rotors (14, 16) being uniform and being provided with

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scroll, said lower orbiting scroll having a second spiral-

5,192,204

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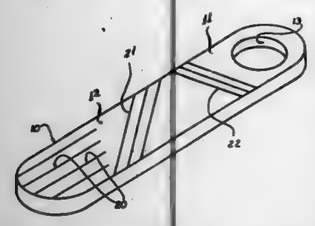
helical lobes (18, 20) and grooves (22, 24) of uniform shape, pitch angle and axial pitch over their entire respective rotor lengths, said rotors (14, 16) intermeshing through said grooves (22, 24) to form chevron-shaped working chambers which in said expansion sections have continuously increasing volume and which in said compression section have continuously decreasing volume; and

a housing limiting said single working space and having first and second end walls (4, 6) and a barrel wall (2) extending therebetween, one low pressure port (32; 232; 332), one high pressure port (30; 230; 330) and intermediate pressure port means (34; 234; 334, 335).

5,192,200
REED VALVE FOR A HERMETIC COMPRESSOR
Dietmar E. B. Lilie; Jose L. Driessen; Marcio L. Todescat, and Manfred Krueger, all of Joinville, Brazil, assignors to Empresa Brasileira De Compressores S/A-Embraco, Joinville, Brazil
Filed Jun. 7, 1991, Ser. No. 712,900
Claims priority, application Brazil, Jun. 8, 1990, 9002787
Int. Cl.[5] F04B 21/04
U.S. Cl. 417—566 16 Claims



1. The combination comprising:

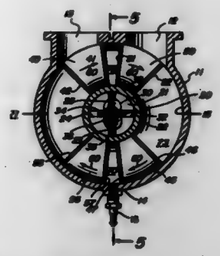
a compressor having a cylinder and a piston moving therein,

first means attached to said cylinder including at least one gas passage therethrough for communicating with the cylinder, said gas passage having an outlet opening,

a flexible valve member in the form of an elongated blade element having one end secured to said first means and another end for opening and sealing the gas passage outlet opening as the blade element is flexed in response to gas pressure,

said blade element being formed of a resin which is reinforced with fiber filaments arranged in at least one group, each group of said at least one group comprising a plurality of parallel fiber filaments which occupy the thickness of the blade and are extended according to a respective direction in relation to the longitudinal axis of the blade element, said respective direction being maintained through the thickness of the blade element.

5,192,201
ROTARY ENGINE AND DRIVE COUPLING
Jacek Beben, 2426 W. Bobby La., Santa Ana, Calif. 92706
Filed Oct. 15, 1990, Ser. No. 597,367
Int. Cl.[5] F01C 1/42
U.S. Cl. 418—38 23 Claims



1. Rotary engine comprising:

a housing defining an annular cavity, said annular cavity defining a predetermined cross-section;

a first piston rotor having a first rotating member defining a first plurality of curved slots and a first plurality of outwardly extending pistons having a cross-section corresponding to said predetermined cross section;

a second piston rotor having a second rotating member defining a second plurality of curved slots and a second plurality of outwardly extending pistons having cross-section corresponding to said predetermined cross-section;

a pin guide defining a plurality of radially extending slots;

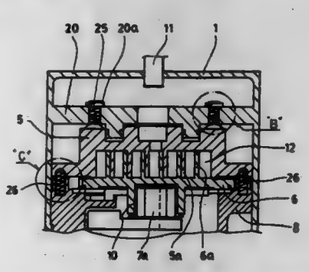
a first shaft coupled to said pin guide;

a drive cam defining a cam surface;

a second shaft coupled to said cam; and

a plurality of pins each partially received within one of said curved slots in each of said first and second piston rotors and one of said slots in said pin guide and each contacting said cam surface.

5,192,202
SCROLL-TYPE COMPRESSOR WITH AN APPARATUS FOR RESTRAINING COMPRESSED FLUID FROM BEING LEAKED
Byung C. Lee, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Rep. of Korea
Filed Dec. 5, 1991, Ser. No. 803,116
Claims priority, application Rep. of Korea, Dec. 8, 1990, 20185/1990; Dec. 31, 1990, 22011/1990
Int. Cl.[5] F04C 18/04
U.S. Cl. 418—55.5 8 Claims



1. An apparatus for restraining leakage of compressed fluid in a scroll-type compressor having a main frame and a partition, said apparatus comprising:

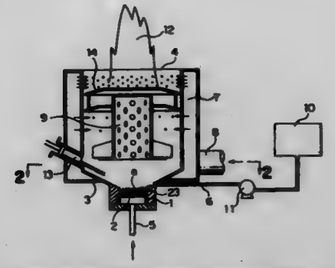
upper stationary scroll having a first spiral-shaped wrap;

lower orbiting scroll interleaved with said upper stationary scroll, said lower orbiting scroll having a second spiral-shaped wrap being of the same shape as said first spiral-shaped wrap;

means for orbiting said lower orbiting scroll without rotation;

elastic supporting means for elastically supporting said upper stationary scroll in order to allow said upper stationary scroll to wobble upwardly and downwardly as said lower orbiting scroll performs the orbital motion simultaneously with wobbling upwardly and downwardly, said elastic supporting means comprising: upper elastic supporting means mounted on said partition over said upper stationary scroll, said means being adapted for elastically supporting said upper stationary scroll downwardly; and lower elastic supporting means mounted on said main frame supporting said lower orbiting scroll, said means being adapted for elastically supporting said upper stationary scroll upwardly.

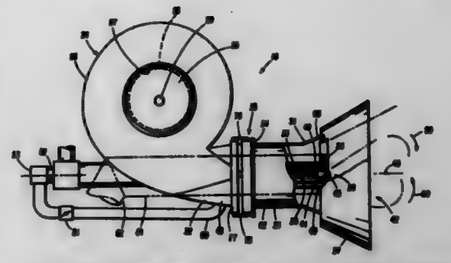
5,192,203
METHOD AND APPARATUS FOR BURNING FOAMED LIQUID FUEL
Norio Aszawa, and Koji Adachi, both of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
PCT No. PCT/JP91/00353, § 371 Date Jul. 31, 1991, § 102(e) Date Jul. 31, 1991, PCT Pub. No. WO91/14900, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 15, 1991, Ser. No. 741,503
Claims priority, application Japan, Mar. 20, 1990, 2-71557; Mar. 4, 1991, 2-37515
Int. Cl.[5] F23D 11/36
U.S. Cl. 431—2 15 Claims



1. A method for burning foamed liquid fuel by supplying foaming air to a liquid fuel through a porous element having a mean pore diameter of not less than 1 μm and not greater than 200 μm, thereby converting the liquid fuel into a foam constituted as an aggregation of small-diameter bubbles, and thereafter burning the foamed fuel in a combustion chamber while separately supplying thereto adequate air for complete combustion.

3. An apparatus for burning foamed liquid fuel comprising a fuel foamer including a porous element having a mean pore diameter of not less than 1 μm and not greater than 200 μm and an air supply pipe connected with the porous element, the fuel foamer defining a foaming zone, and a combustion chamber disposed immediately above the fuel foamer and adapted for supplying combustion air to the foamed fuel, the combustion chamber defining a combustion zone.

5,192,204
DUAL ATOMIZING MULTIFUEL BURNER
Joseph E. Musil, Ely, Iowa, assignor to Coderapids, Inc., Cedar Rapids, Iowa
Filed Mar. 20, 1992, Ser. No. 854,210
Int. Cl.[5] F23M 3/04
U.S. Cl. 431—10 10 Claims



1. A method of providing combustion gases over a range of combustion settings of a turbo burner assembly, comprising:

generating a supply of turbo air under a first pressure above atmospheric pressure;

dispersing a quantity of liquid fuel by means of compressed air above the first pressure of the turbo air;

introducing the quantity of dispersed fuel into a flame region adjacent the burner assembly and varying a rate of introduction of the fuel between a low setting and a high setting over the range of combustion settings;

introducing a first stream of primary combustion air from the supply of turbo air into the flame region in a conically expanding pattern, and entraining the dispersed fuel into the conically expanding first stream of primary combustion air;

introducing a second stream of primary combustion air from the supply of turbo air into the flame region and varying the rate separately from said first stream in accordance with variations in the rate of introduction of the fuel and mixing the first stream of primary combustion air and the entrained fuel with the second stream of combustion air, thereby providing a desirable combustion air to fuel mixture ratio over the range of combustion settings; and

passing a portion of the second stream of primary combustion air through means forming an annular gap and means forming a further annular gap communicating with the ambient on entering the flame region, the portion of the second stream of primary combustion air drawing additional air from the ambient into the flame region.

5,192,205
DEVICE FOR THE GASIFICATION AND FLOW CONTROL OF LIQUIFIED PETROLEUM GAS
Masayuki Iwaberi, 15-19, Nakada Honmachi, Shimoda-shi, Japan
Filed Jul. 26, 1991, Ser. No. 736,737
Claims priority, application Japan, Aug. 17, 1990, 2-217330
Int. Cl.[5] F23D 14/28
U.S. Cl. 431—344 10 Claims

1. An improved device for the gasification and flow control of liquefied petroleum gas in an apparatus comprising a pressure container, a valve and a nozzle, the valve having a passage into the nozzle, said pressure container containing liquefied petroleum gas, said liquefied petroleum gas being subjected to gasification and flow control when said valve is opened such that gasified liquefied petroleum gas is emitted through said passage and through said nozzle, the improvement comprising:

an orifice having a diameter of between 30 and 200 μm; and

a microporous film having a hydrophobic property, said

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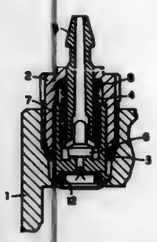
orifice being disposed at an upstream side of said valve, said orifice opening to the passage of said valve, said

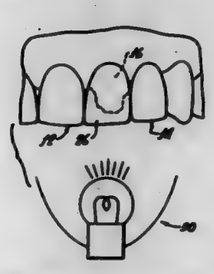


microporous film being disposed at an upstream of said orifice.

5,192,206
DENTAL SYRINGE TIP AND ADAPTOR
Warren Davis, 3626 Sullivan Ave., Rosemead, Calif. 91770; David Wasserman, 2095 Mohigan Way, Las Vegas, Nev. 89109, and Richard R. Mathews, 7950 S. Alameda St., Huntington Park, Calif. 90255
Continuation-in-part of Ser. No. 351,431, May 12, 1989, Pat. No. 5,049,071, which is a continuation-in-part of Ser. No. 241,081, Sep. 6, 1988, abandoned. This application Oct. 11, 1990, Ser. No. 596,987
Int. Cl.[5] A61C *17/00*
U.S. Cl. 433—80 32 Claims

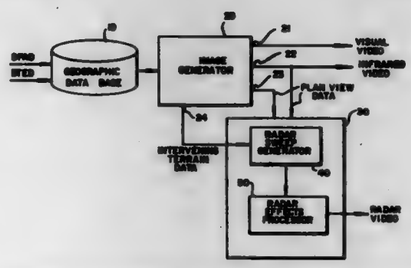
1. A syringe tip adaptor for connecting a syringe tip to a handpiece body comprising:
a) a generally cylindrical body having a hollow interior,
b) a first means for threadably connecting the cylindrical body to the handpiece body,
c) a baffle mounted within the hollow interior of the cylindrical body and having an axial passageway therein for receiving water from the handpiece body,
d) means for mounting a syringe tip to the baffle on the interior of the adaptor, the means for mounting comprising an elongated tapered male connector formed integrally with the baffle and having an axial opening therethrough adapted to cooperate with a central passageway in the syringe tip to provide a water passageway from the handpiece through the adaptor and into the syringe tip whereby when the syringe tip is mounted on the tapered male connector, the syringe tip will be tightly held on the tapered male connector to prevent axial rotation of the syringe tip and to ensure that the air and water passageways do not leak into each other, the tapered male connector being of sufficient length to prevent the syringe tip from cracking when it is mounted on the tapered male connector,
e) at least one channel for introducing air from the handpiece body into the interior of the adaptor and a chamfered surface on the cylindrical body aligned with the channel,
f) a first sealing means mounted on the cylindrical body for preventing leakage of water from the handpiece body to the interior of the adaptor,
g) a second sealing means mounted on the cylindrical body for preventing the leakage of air passing from the handpiece body to the interior of the adaptor, and
h) a third sealing means mounted on the cylindrical body for securing the syringe tip to the interior of the adaptor.

5,192,207
COMPOSITE RESIN CROWN, REPLACEMENT TOOTH AND METHOD
Davey G. Rosellini, 1950 Balearic Dr., Costa Mesa, Calif. 92626
Filed Sep. 17, 1991, Ser. No. 760,980
Int. Cl.[5] A61C *5/10*
U.S. Cl. 433—223 22 Claims



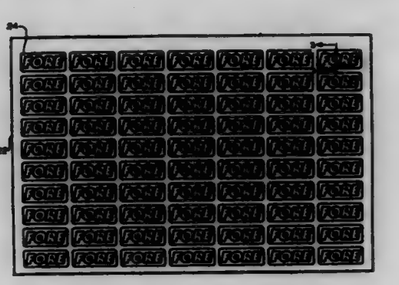
1. A method of making a permanent crown for a tooth comprising:
grinding and shaping the tooth to form a prepared tooth;
filling a transparent shell tooth form with a light setting resin;
disposing the filled shell tooth form onto the prepared tooth;
illuminating the filled transparent shell tooth form to set the light setting resin therein and bond the light setting resin to the shell tooth form and prepared tooth; and
shaping and polishing the shell tooth form in situ to form a crown.

5,192,208
RADAR SIMULATION FOR USE WITH A VISUAL SIMULATOR
Robert L. Ferguson, Glenwood; John R. Ellis, Ormond Beach, and Kenneth B. Donovan, Daytona Beach, all of Fla., assignors to General Electric Company, Syracuse, N.Y.
Filed Aug. 21, 1989, Ser. No. 396,890
Int. Cl.[5] G09B *9/00*
U.S. Cl. 434—2 20 Claims



1. A system for providing simulated radar video, comprising:
image generator means for providing visual and/or infrared video and further for providing from a predetermined viewpoint plan view data of an area to be illuminated by a radar; and
radar processor means coupled to the image generator means, the radar processor means for producing the simulated radar video in response to the plan view data.

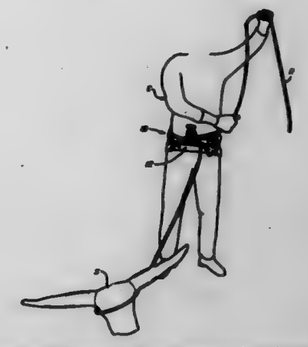
5,192,209
COLOR DEMONSTRATOR
John P. Sweet, 2273 New York Ave., Scotch Plains, N.J. 07076
Filed Sep. 9, 1991, Ser. No. 756,521
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—98 8 Claims



1. A design color demonstrator comprising:
a plastic support board;
a transparent plastic background sheet supported by the plastic board and having a plurality of spaced identical but differently colored panels each with identical transparent letterings;
a transparent plastic lettering sheet unit supported on the background sheet and having a plurality of spaced identical but differently colored letterings, corresponding to the identical transparent letterings of said colored panels, printed thereon for superimposing one at a time on each panel transparent lettering, and
a mask overlay sheet supported on the lettering sheet unit and having a printed mask portion with a plurality of spaced identically shaped clear openings for superimposing a selective opening on a chosen panel and a chosen superimposed lettering and for recording respective code numbers of the panel color and the lettering color and the lettering outline color, said mask overlay sheet and background sheet and lettering sheet unit being slidable relative to each other and relative to the support board.

5,192,210
TRAINING APPARATUS FOR CATTLE ROPING
Darrell E. Thomas, P.O. Box 1103; Donald E. Standley, Rt. 2 Box 86B, Haynes Rd., and Leon J. Jackson, Rt. 2, Box 817B, all of Anahuac, Tex. 77514
Filed Sep. 27, 1991, Ser. No. 767,104
Int. Cl.[5] A63B *69/00*; G09B *9/00*
U.S. Cl. 434—247 14 Claims

1. A training apparatus for cattle roping to be used by a roper, comprising:
a frame assembly having a front portion and a rear portion, the front portion spaced from said rear portion a fixed distance adequate for clearance of the hand of the roper when forming a dally during cattle roping operations;
means for securing said rear portion of said frame assembly to the body of the roper; and
a saddle horn attached to said front portion of said frame assembly, said saddle horn being spaced from the body of the roper by said frame assembly a distance allowing

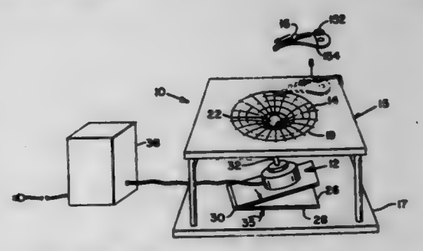


clearance of the hand of the roper when forming a dally during cattle roping operations.

5,192,211
METHOD OF MAKING ANIMAL SPECIMEN
Tzuoo-Lie Yeh, No. 23, tzu Li Li, Chung Li City, Taiwan
Filed Jul. 29, 1991, Ser. No. 737,011
Int. Cl.[5] G09B *23/00*
U.S. Cl. 434—296 3 Claims

1. A method for making animal specimen capable of maintaining its natural color and elasticity, said method comprising the steps of:
(a) preparing a 3-in-one mixed liquid solution by adding, per 10 liters of said 3-in-one mixed liquid solution, 5 liters of 35% formaldehyde into 5 liters of volatile alcohol to form an intermediate mixed solution, then adding a granular mixture containing 10 grams of 100% boric acid, 150 grams of sodium chloride and 30 grams of phenol into said intermediate mixed solution to form said 3-in-one mixed liquid solution, and agitating said 3-in-one mixed liquid solution until said granular mixture is completely dissolved;
(b) cleaning and washing said specimen to be treated;
(c) soaking said specimen in said 3-in-one mixed liquid solution; and
(d) removing said specimen from said 3-in-one mixed liquid solution.

5,192,212
FLEXIBLE HYPRESURFACE ORBITAL MODEL
Chong Kyu Kim, 2580 Coney Island Ave., Brooklyn, N.Y. 11223
Filed Aug. 14, 1992, Ser. No. 930,263
Int. Cl.[5] G09B *23/08*
U.S. Cl. 434—302 8 Claims



1. A hypersurface orbital model, comprising:
a) a large closed hypersurface made of a highly flexible

material, wherein said hypersurface is supported by a rigid frame having a circular opening;

b) means for creating a moving deformation on said large hypersurface such that said moving deformation produces a moving local hypersurface whose geometry is similar to said large hypersurface; and

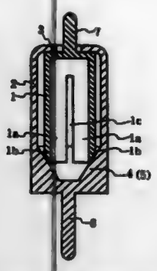
c) means for injecting a projectile sphere onto the surface of said large hypersurface such that said projectile sphere maintains a fixed orbit on the surface of said large hypersurface due to the initial trajectory of said projectile sphere and the movement of said deformation.

5,192,213

NEST TYPE PRESSURE CONNECTING DEVICE

Motoki Kosugi, Tokyo; Noriyuki Matsuoka, and Toru Takahashi, both of Yokohama, all of Japan, assignors to Yamaichi Electric Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1992, Ser. No. 851,797
Claims priority, application Japan, Mar. 27, 1991, 3-87484
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—66 **5 Claims**



1. A nest type pressure connecting device comprising a an inner jacket member having split elements split by grooves and opened up at a front end face thereof, an outer jacket member with the inner jacket member inserted therein first from said front said outer jacket member having end, an inner jacket member pressing portion formed therein in such a manner as to be opposite said front end of said inner jacket member and adapted to push front end portions of said split elements, which are split by said split grooves, inwardly from outside against elasticity thereof in order to close said inner jacket member when said inner jacket member is pushed into said outer jacket member, and a male terminal disposed at a tail end of either of said outer and inner jacket members and adapted to contact an electric part under pressure.

5,192,214

PLANAR INTERCONNECT WITH ELECTRICAL ALIGNMENT INDICATOR

Victor M. Sumarov, Carlisle, and George A. Doumani, N. Andover, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 10, 1992, Ser. No. 834,073
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—67 **10 Claims**

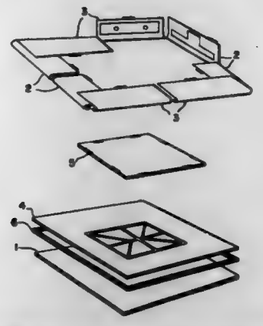
1. An electrical connector that electrically indicates connector mis-alignment that exceeds a tolerance, comprising:

a rigid substrate having a plurality of electrical signal contacts on a planar, electrically insulating surface;

a flexible substrate having a respective plurality of electrical signal contacts on a planar, electrically insulating surface, said surface of said flexible substrate to be placed in contact with said surface of said rigid substrate in an aligned position such that said plurality of signal contacts on said flexible substrate are coupled to and aligned with corresponding ones of said respective plurality of signal contacts on said rigid substrate to within said tolerance;

spaced-apart first and second electrically conductive trace materials on one of said surfaces bounding first and second target areas, respectively;

third and fourth electrically conductive trace materials on the other of said surfaces, sized such that the size of said first target area exceeds the size of said third trace material by less than twice said tolerance and the size of said second target area exceeds the size of said fourth trace material by less than twice said tolerance, and located such that when said flexible substrate is in said aligned position, said third trace material is located within said first target area



and said fourth trace material is located within said second target area; and

means for coupling said first, second, third, and fourth trace material to a circuit to determine whether said trace materials form a short circuit,

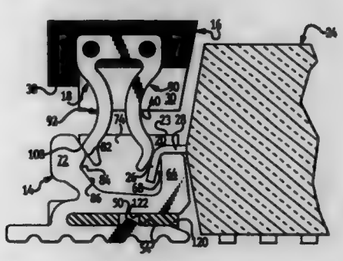
said connector indicating mis-alignment that exceeds said tolerance by forming a short circuit between either said first trace material and said third trace material or between said second trace material and said fourth trace material.

5,192,215

ELECTRICAL SOCKET FOR LEADED CHIP CARRIERS

Dimitry G. Grabbe, Middletown; Iosif Korsunsky, Harrisburg, and Daniel R. Ringler, Elizabethville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 17, 1991, Ser. No. 780,666
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—73 **2 Claims**



1. A chip carrier socket for use with a leaded chip carrier, the chip carrier socket comprising:

a base having a chip carrier receiving opening, contacts positioned proximate the chip carrier receiving opening, the contacts have means for electrically engaging circuits on a substrate, arms extend outwardly from the contacts, each contact has a pair of spaced arms, respective arms have a recess provided on the inner surfaces thereof;

a cover with a discrete locking members extending therefrom, the discrete locking members have resilient cantilever beams which extend from the cover toward the base, each locking member has a pair of spaced apart cantilever beams, the cantilever beams are positioned in alignment with the arms of the contacts, respective cantilever beams have heel portions on outside surfaces thereof, the heel portions are configured to have a similar configuration to the recesses of the respective arms of the contacts;

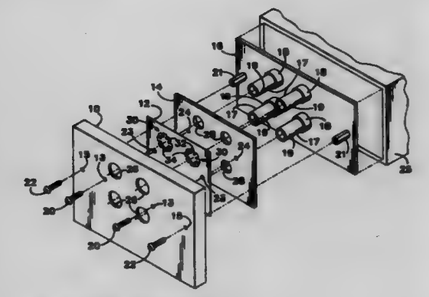
whereby the heel portion of the respective cantilever beams are positioned in, and cooperate with, the recesses of the respective arms to provide a positive lock to insure that the cover is maintained in position on the base, and to insure that the positive electrical connection will be maintained between the chip carrier and the chip carrier socket.

5,192,216

APPARATUS FOR GROUNDING CONNECTORS TO INSTRUMENT CHASSIS

Steven K. Kassner, and Daniel Reiswig, both of Grass Valley, Calif., assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Nov. 8, 1991, Ser. No. 789,492
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—108 **14 Claims**



1. An apparatus comprising:

an electrical connector having a conductive barrel;

a conductive chassis member defining an aperture with a dimension that is larger than a corresponding dimension of the barrel;

a thin, substantially planar ground sheet of springy and conductive material defining an aperture, with the aperture in the thin ground sheet having a periphery that includes a plurality of alternating gaps and extensions, said extensions being substantially coplanar with said ground sheet, with a dimension defined by the gaps being larger than the corresponding dimension of the barrel, and a dimension defined by the extensions being smaller than the corresponding dimension of the barrel, the thin ground sheet being in electrical contact with and parallel to the conductive chassis member; and

means for securing the thin ground sheet to the chassis member with the apertures in the thin ground sheet and the conductive chassis member in alignment;

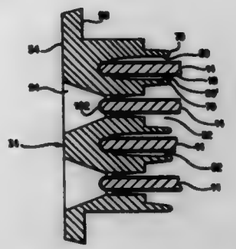
whereby, when the barrel of the electrical connector is made to pass through the aperture in the thin ground sheet and the aperture in the conductive chassis member, the barrel of the electrical connector contacts the extensions causing the extensions to bend so that the extensions of the thin ground sheet remain in electrically conducting contact with the barrel of the electrical connector thereby grounding the electrical connector to the conductive chassis member.

5,192,217

ELECTRICAL BUSWAY DISTRIBUTION SYSTEM HAVING PROVISIONS FOR PREVENTING UNINTENTIONAL CONTACT WITH LIVE CONDUCTORS AT TAP-OFF LOCATIONS

Daniel L. Wittmer, Fredericktown, Ohio, assignor to Square D Company, Palatine, Ill.

Filed Dec. 31, 1991, Ser. No. 816,587
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—211 **11 Claims**



1. An improved electrical distribution system having a plurality of bus bars, each having at least one edge and each bus bar being partially enclosed in an insulating sheath, a housing for enclosing and supporting the bus bars, a plurality of access openings spaced at intervals along the housing, each access opening providing access to an uninsulated contact surface on a bus bars for the electrical connection of a tap-off unit, and a plug-in base assembly connected to the housing and including a base having a plurality of plug-in openings for accessing the contact surfaces of the bus bars, said improvement comprising:

a plurality of finger barriers for preventing unintentional human finger contact with live bus bars proximate said plug-in openings, said finger barriers further comprising:

a body member having a first end, a second end, an inside surface, an outside surface;

each said body member attached to said base such that said member traverses one of said plug-in openings of said base.

5,192,218

LAMPHOLDER ASSEMBLY

Adrianus M. Kuiper, Lieutnant 27, Leudemeer, Netherlands 1121 AR

PCT No. PCT/NL90/00159, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO91/06991, PCT Pub. Date May 16, 1991
PCT Filed Oct. 22, 1990, Ser. No. 691,037
Claims priority, application Netherlands, Oct. 23, 1989, 8902616
Int. Cl.[5] H01R *33/02*
U.S. Cl. 439—226 **10 Claims**

1. A lampholder assembly for one or more fluorescent lamps having a single lamp cap, comprising at least one lampholder module, which lampholder module comprises a part for receiving the lamp (the lamp part) and a narrower part supporting the lamp part (the support part), as well as at least one ballast, wherein the assembly comprises a base plate for mounting thereof the lampholder module and the ballast, as well as a caplike member having a top surface which, when said caplike member has been mounted, is disposed in a plane below the lamp part of the lampholder module, which top surface has an opening provided therein formed to have a broad portion and an adjacent narrower portion, in such a way that at least the lamp part of the lampholder module can pass through said opening when the caplike member is being mounted, said opening further being provided in a location such that when the cap has been mounted, the support part of the lampholder module is disposed in the narrower portion of the opening,

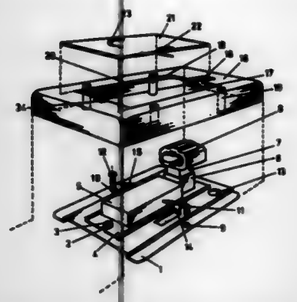
which narrower portion itself is narrower than the lamp part of

5,192,220

able plate in spaced relationship with said socket body

housing (1) and being inclined to the outer wall (3) at an

which narrower portion itself is narrower than the lamp part of the lampholder module, and a cover plate of suitable dimensions for covering the broader portion of said opening, which



broader portion, when said cap has been mounted, is disposed before the support part of the lampholder module, there being provided means for attaching said cover plate, said caplike member and said base plate to each other.

5,192,219

VIBRATION RESISTANT LOCKING COUPLING

Clifford C. Fowler, Chatsworth, and Edward P. Goett, Geyserville, both of Calif., assignors to Engineered Transitions Co., Inc., Healdsburg, Calif.

Filed Sep. 17, 1991, Ser. No. 761,303
Int. Cl.[5] H01R *4/38*
U.S. Cl. 439—321 15 Claims

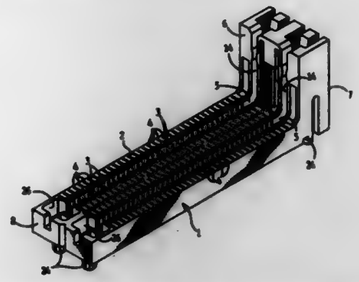
1. A locking coupling comprising
a body having a plurality of axially extending teeth;
a first collar movably mounted on said body;
a plurality of spring fingers extending axially from said first collar;
said spring fingers having axially extending teeth engageable with said teeth on said body; and
a locking collar mounted on said body for movement between various positions;
said locking collar in one of said positions causing the teeth of said spring fingers to engage the teeth on said body whereby to resist movement of said first collar relative to said body.

5,192,220

DUAL READOUT EXTENDED SOCKET

Timothy B. Billman, King, and Roger L. Thrush, Clemmons, both of N.C., assignors to AMP Inc., Harrisburg, Pa.

Filed Jan. 31, 1992, Ser. No. 829,795
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—327 12 Claims



1. A socket system comprising: first and second sockets for receiving a circuit panel having circuit traces thereon, each socket having multiple electrical terminals in terminal receiving slots for engaging circuits on both sides of the circuit panel, the terminals of the first socket being relatively densely spaced, the terminals of the second socket being relatively widely spaced, and the first and second sockets having panel receiving slots in longitudinal alignment with one another to receive a circuit panel on which first circuit traces that are tolerant of relatively dense spacing are routed on the circuit panel for alignment with the relatively densely spaced terminals of the first socket, and second circuit traces that are intolerant of relatively dense spacing with other circuit traces are relatively widely spaced, and are routed on the circuit panel away from the first circuit traces and into alignment with the relatively widely spaced terminals of the second socket, the first socket has a panel support member projecting upward from the panel receiving slot, and an end of the second socket is adjacent the first socket, and is adapted without a panel support member so as to position the terminal receiving slots thereof relatively close to the panel support member of the first socket.

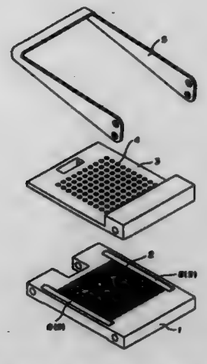
5,192,221

SOCKET FOR ELECTRIC PART

Noriyuki Matsuoka, Kanagawa, and Kazumi Uratsuji, Tokyo, both of Japan, assignors to Yamaichi Electric Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 757,532
Claims priority, application Japan, Sep. 12, 1990, 2-243370
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—342 4 Claims

1. A socket for an electric part comprising:
a socket body formed of an insulator material and having a plurality of socket body contacts arranged in an area of said socket body and positioned so as to be contacted by terminals of an electric part;
a movable plate for receiving an electric part with a plurality of terminals and positioned above an upper surface of said socket body in such a manner as to direct the plurality of terminals into the socket body contacts and to be movable laterally along said upper surface, a lateral movement in one direction forming a contacting state between corresponding contacts and terminals and a lateral movement in an opposite direction releasing said contacts and terminals from said contacting state; and
a conductive shoe means interposed between said socket body and said movable plate and in an area other than the area of the socket body in which the contacts are arranged, said conductive shoe means supporting said movable plate in spaced relationship with said socket body above said socket body and allowing said movable plate to



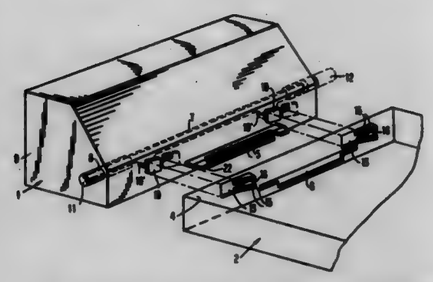
slip along said socket body when said movable plate is laterally moved.

5,192,222

PLUG CONNECTION DEVICE FOR SIMULTANEOUS MECHANICAL AND ELECTRICAL CONNECTION OF TWO ELECTRONIC UNITS

Klaus D. Krause, Dietenhofen; Rudolf Schmeykal, Heuhofen, and Florian Stolzenberger, Altenthann, all of Fed. Rep. of Germany, assignors to Ta Triumph-Adler AG, Nuremberg, Fed. Rep. of Germany

Filed Sep. 26, 1991, Ser. No. 766,434
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1990, 4032801
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—347 8 Claims



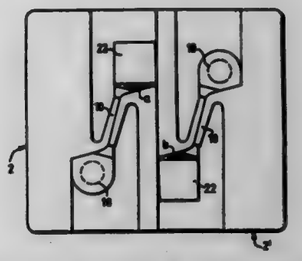
1. A plug connection device for mechanical and electrical connection of a first electronic unit with a second electronic unit, said connection device comprising an electronic plug (5) provided in an outer wall (3) of a first housing (1) of a first electronic unit, the first housing having at least one side wall (9) connected to the outer wall (3) of the first housing (1); a plug socket (6) provided in an outer wall (4) of a second housing (2) of a second electronic unit, the electronic plug (5) being electrically connectable with the plug socket (6); and a mechanical locking means separate from the electronic plug (5) and plug socket (6),
said mechanical locking means comprising an operating device including an operating rod (7) protruding from the at least one side wall (9) of the first housing (1) and moveable substantially parallel to the outer wall (3) of the first housing (1); at least two plate-like lock studs (10), each of the plate-like lock studs (10) being connected to the operating rod (7) by an arm (10'), extending from the first housing (1) and being inclined to the outer wall (3) at an angle α; a lock stud recess (13) provided in the outer wall (4) of the second housing (2) for each of the plate-like lock studs (10), each of the plate-like lock studs being engageable in one of the lock stud recesses (13), and each of the lock stud recesses (13) being bounded by an inclined running surface (15) provided in the outer wall (4) of the second housing (2) and a corresponding housing wall portion (17) extending parallel to the running surface (15) and being spaced therefrom a distance corresponding approximately to a thickness of the plate-like lock studs, each of the inclined running surfaces (15) being inclined substantially at the angle α to the outer wall (4) of the second housing (2) and having a horizontal slot (16) in which one of the arms (10') is slidable; and lateral plate-like guide shoulders (22) projecting from the outer wall (3) in the vicinity of the electronic plug (5) on the first housing (1) and engagable on each side of the plug socket (6) in the second housing (2) to provide additional guidance during connection of the electronic plug and the plug socket (6), so that, when the lock studs (10) are engaged in the lock stud recesses (13) and the operating rod (7) is moved so that the first and second electronic units are pulled together and the lock studs (10) contact and run on the running surfaces (15), the electronic plug (5) is connected simultaneously electrically and mechanically with the plug socket (6).

5,192,223

WIRE CONNECTOR FOR CABLE WIRE, IN PARTICULAR OF TELECOMMUNICATION CABLES

Dieter Gerke, and Manfred Müller, both of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 30, 1990, Ser. No. 605,952
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 3938365
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—402 8 Claims



1. A wire connector for cable wires, such as telecommunication cables, comprising:
a lower housing section defining at least two substantially parallel guide channels for receiving cable wires, each guide channel having a side defined by crosspieces, said lower housing section having side walls extending substantially in parallel with said guide channels, said side walls including a longer side wall and a shorter side wall, said longer side wall including a receiving groove shaped complimentary to said shorter side wall;
an upper housing section substantially identical to said lower housing section;
cutting/clamping contacts positioned in the guide channels of said lower housing section;
snap-fit elements connected to each of said housing sections, said housing sections being snap-fit together after rotating one of the housing sections 180 degrees relative to the other one of said housing sections, said crosspieces of said upper housing section forming a press-in section for press-

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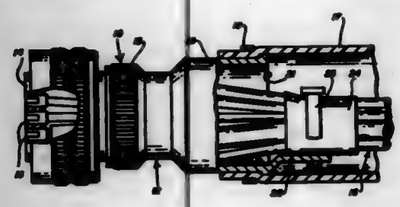
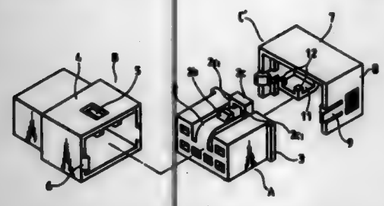
ing cables wires into the cutting/clamping contact elements of the lower housing section, said snap-fit elements being formed one on each of said side walls of each of the housing sections.

5,192,224
CONNECTOR BACKSHELL FOR USE WITH FLEXIBLE CONDUIT WITH AN INTERNAL STRAIN RELIEF CLAMP
Allan J. Bernardini, Southbury, Conn., assignor to Litton Systems, Inc., Watertown, Conn.
Filed Feb. 19, 1992, Ser. No. 839,934
Int. Cl.[5] H01R *13/56, 13/58*
U.S. Cl. 439—471 5 Claims



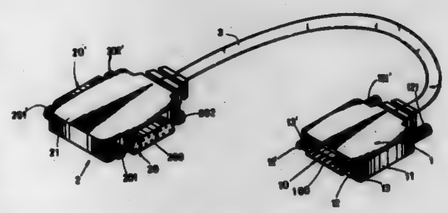
1. A heavy duty multi-pin connector for use with a protective hose comprising:
- a plugshell and an insert having a plurality of electrical terminals mounted therein;
- a backshell coupled to the plugshell;
- a plurality of conductors extending through the backshell and the plugshell and coupled to the electrical terminals;
- a backshell extension on the rear of the backshell;
- a protective hose removably mounted on the backshell extension and means for securing the protective hose to the backshell extension;
- means for providing a strain relief for the plurality of conductors coupled to the electrical terminals, said means comprising a protruding finger extending from the rear of the backshell extension and a strain relief band encircling the protruding finger and the plurality of conductors, whereby the plurality of conductors are secured to the protruding finger by the strain relief band; and
- a protective bushing between the strain relief band and the plurality of conductors.

5,192,225
CONNECTOR LOCKING CONNECTION DETECTION DEVICE
Tetsuaki Suzuki, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Nov. 1, 1991, Ser. No. 786,517
Claims priority, application Japan, Nov. 8, 1990, 2-301097; Nov. 9, 1990, 2-302786
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—489 10 Claims



1. A connector locking connection detection device comprising:
- a male connector housing having a flexible lock arm;
- a female connector housing having an engagement portion for said flexible lock arm;
- a locking connection detection member to be attached to a rear portion of said male connector housing in advance of mating said male and female connector housings;
- resilient retaining pieces for retaining said locking connection detection member to the rear portion of said male connector housing in such a manner that said locking connection detection member is extended rearwardly from said male connector housing; and
- engagement release projections for said resilient retaining pieces, provided on said female connector housing; wherein when said male and female connector housings are completely connected together with said lock arm engaged with said engagement portion, said engagement release projections acting to disengage said resilient retaining pieces, thereby enabling the removal of said locking connection detection member.

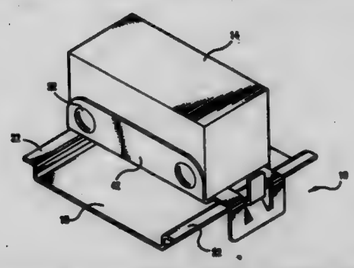
5,192,226
DOUBLE-OUTPUT PORT CABLE ASSEMBLY FOR NOTEBOOK COMPUTERS
Tsan-Cai Wang, 1 F., No. 13, Lane 312, Chung Chen Rd., Hsin Tien City, Taipei Hsien, Taiwan
Filed May 6, 1992, Ser. No. 878,971
Int. Cl.[5] H01R *11/00*
U.S. Cl. 439—502 8 Claims



1. A cable assembly comprising:
- a connector assembly, said connector assembly comprising a male D-miniature connector;
- an output adapter, said output adapter comprising two female D-miniature connectors; and
- a coaxial cable connected between said connector assembly and said output adapter to electrically connect said female D-miniature connectors to said male D-miniature connector.

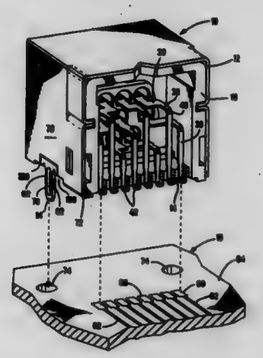
5,192,227
DIN RAIL MOUNTING BRACKET
Ronald K. Bales, Raleigh, N.C., assignor to Square D Company, Palatine, Ill.
Filed Dec. 23, 1991, Ser. No. 811,728
Int. Cl.[5] H01R *13/60*
U.S. Cl. 439—532 7 Claims

1. An apparatus for adapting an electrical or electronic device enclosure to be mounted on a DIN rail having two opposed outwardly extending flanges, said apparatus comprising:
- a bracket, generally rectangular in shape, having a top surface, a bottom surface, a first end, a second end generally parallel to and spaced apart from said first end, at least one mounting flange having apertures therein for receiving means for attaching to the electrical or electronic device



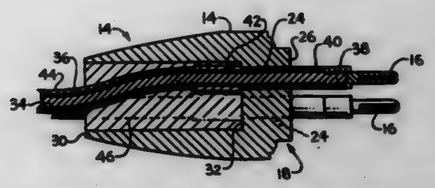
enclosure, and means for rotatively attaching to the DIN rail and means for selectively releasing from the DIN rail.

5,192,228
SHIELDED SURFACE MOUNT ELECTRICAL CONNECTOR WITH INTEGRAL BARBED BOARD LOCK
Henry B. Collins, Harrisburg; Benjamin H. Mosser, III, Middletown, and Steven G. Smith, Linglestown, all of Pa., assignors to AMP Inc., Harrisburg, Pa.
Continuation of Ser. No. 760,421, Sep. 16, 1991, abandoned. This application Aug. 11, 1992, Ser. No. 928,523
Int. Cl.[5] H01R *13/73, 13/658*
U.S. Cl. 439—567 16 Claims



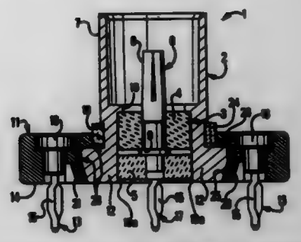
1. An electrical connector, comprising: an insulative housing, conductive electrical contacts in said housing having bendable portions connected to solder tails extending to initial positions below said housing, a conductive shield over said housing, and circuit board engaging board locks extending from said shield below said housing, barbs on said board locks gripping walls of apertures in a circuit board for holding said housing against said circuit board and for holding said solder tails against pads on said circuit board while said solder tails have been moved upwardly from their initial positions bending the bendable portions of said contacts and creating forces exerted by said solder tails against said pads on said circuit board, and further comprising solder barriers in the form of recessed score lines in said shield, said score lines extending above respective board locks, and opposite ends of said score lines intersecting respective edges of said shield.

5,192,229
ELECTRICAL CABLE TERMINATION
George W. Clark, Irvine, and Jess L. List, Jr., Westminster, both of Calif., assignors to Sonic Electric, Inc., Paramount, Calif.
Filed May 29, 1992, Ser. No. 891,278
Int. Cl.[5] H01R *13/56*
U.S. Cl. 439—604 8 Claims



1. A plug type electrical termination for an armored electrical cable with a plurality of insulated electrical conductors therewithin comprising:
- a hollow connector head open at one end, through which open end said insulated electrical conductors extend into said head, said head having a cylindrical plug portion extending outwardly from the other end of the connector head so as to close said other end,
- said plug portion having an axial bore extending therethrough for each of said electrical conductors, whereby each of said electrical conductors extends into the head and through a preselected bore of the plug portion so as to terminate beyond the plug portion in an uninsulated threaded conductor tip, to which a conductor terminal is attached;
- individual enclosing means for enclosing the portion of each conductor within said bore; and
- a body of high temperature solder filling said head so as to close said head open end to hold the electrical conductors fixed within the head and provide a water-tight seal thereabout.

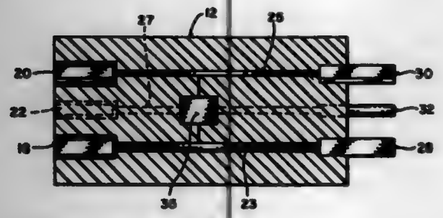
5,192,230
VERTICAL MOUNT CONNECTOR
Andrew J. Gabany, Mechanicsburg, and James G. Dunbar, Lancaster, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 18, 1992, Ser. No. 885,101
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 14 Claims



1. An electrical connector comprising: a conductive contact connected to a circuit board mounting terminal, an insulative body surrounding the contact, an electrically conductive shell surrounding the insulative body, an electrically conductive base surrounding the shell, a mating portion of the shell projecting forwardly of the base, conductive circuit board mounting posts on the base, and an electrical capacitance element

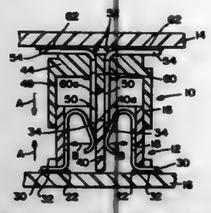
between the shell and the base, thereby establishing capacitive coupling therebetween.

5,192,231
POWER LINE COMMUNICATIONS COUPLER
Robert A. Dolin, Jr., Menlo Park, Calif., assignor to Echelon Corporation, Palo Alto, Calif.
Continuation of Ser. No. 540,594, Jun. 19, 1990, abandoned. This application Mar. 26, 1991, Ser. No. 679,153
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 4 Claims



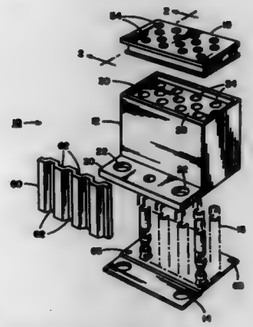
1. An electrical coupler comprising:
a generally cylindrical housing;
a male portion disposed in one end of said housing and comprising first and second power line prongs and an additional line prong for engaging a 220 volt receptacle;
a female portion disposed at the other end of said housing and comprising first and second power prong receiving slots and an additional prong receiving slot for mating with a 220 volt plug and electrically connected to said first and second prongs and said additional line prong, respectively;
coupling means electrically connected between said first and second power line prongs for providing a high impedance to low frequency alternating current and low impedance to high frequency electrical signals for coupling high frequency communication signals between said first and second power line prongs.

5,192,232
ELECTRICAL CONNECTOR SYSTEM UTILIZING THIN MALE TERMINALS
William R. Lenz, Crestwood; Arvind Patel, Naperville; James T. Roberts, Oak Park, and Jack J. Schafer, LaGrange, all of Ill., assignors to Molex Incorporated, Lisle, Ill.
Filed Jul. 13, 1992, Ser. No. 912,922
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—660 8 Claims



1. In an electrical connector system which includes a first connector assembly having an insulative housing defining a cavity with a thin male terminal extending thereinto, and a second connector assembly having an insulative housing defining a cavity with a spring contact terminal located therein, the thin male terminal being engageable with the spring contact terminal upon mating of the connector assemblies, wherein the improvement comprises said first connector assembly including a supporting wall for supporting one side of the thin male terminal and extending only partially along the length of the male terminal to leave an unsupported distal end of the terminal, said second connector assembly including a preloading wall against which the spring contact terminal is biased for preloading the spring contact terminal, and the distal end of said thin male terminal being insertable between the spring contact terminal and the preloading wall, with the preloading wall supporting the distal end of the male terminal on said one side thereof, upon mating of the connector assemblies, whereby the supporting wall of the first connector assembly and the preloading wall of the second connector assembly combine to provide support along a substantial length of the thin male terminal.

5,192,233
GROUNDING BLOCK
Nino R. Suffredini, Monroe, and James D. Anderson, Norwalk, both of Conn., assignors to Burndy Corporation, Norwalk, Conn.
Filed Jan. 7, 1992, Ser. No. 817,713
Int. Cl.[5] H01R *11/09*
U.S. Cl. 439—723 10 Claims

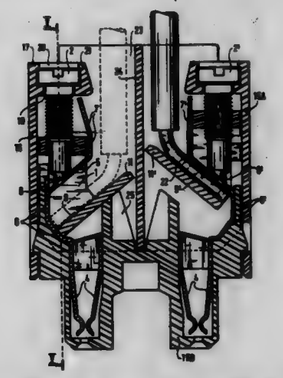


1. A grounding block comprising:
a housing having a contact receiving area for receiving contact and a grommet receiving area for receiving at least a portion of a grommet;
contacts positioned in the contact receiving area;
a contact alignment spacer located between the contacts inside the housing in the contact receiving area, the spacer having a substantially planar corrugated shape;
a grommet comprising of a resilient polymer material located, at least partially, in the grommet receiving area, the grommet including holes therethrough and grooves on an exterior of the grommet; and
means for fixedly connecting the grommet to the housing comprising a bonding adhesive located between portions of the housing in the grommet receiving area and portions of the exterior of the grommet and in the grooves.

5,192,234
ELECTRICAL TERMINAL AND A HOUSING FOR ELECTRICAL APPARATUS INCLUDING SUCH A TERMINAL
Jean-Paul Heng, Lyon, and André Marmonier, Bron, both of, France, assignors to Estrelec S.A., Villeurbanne, France
Filed Apr. 24, 1992, Ser. No. 873,226
Claims priority, application France, Apr. 26, 1991, 91 05191
Int. Cl.[5] H01R *4/38*
U.S. Cl. 439—806 9 Claims

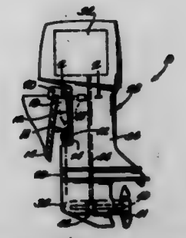
1. An electrical terminal for putting a conductor wire into connection with a conducting strip of electrical equipment by holding the wire against a clamping element of the strip between said element and another clamping element which constitutes the at least approximately parallel bottom of a cage

which surrounds the strip, clamping being obtained under drive from a clamping screw screwed into an element of the cage and situated opposite to the bottom, the end of the screw pressing against the face of the clamping element of the strip which faces away from the clamping element of the cage, said screw being disposed obliquely relative to the clamping elements of the strip and of the cage, and pressing against at least one lateral thrust structure opposing the transverse repulsion



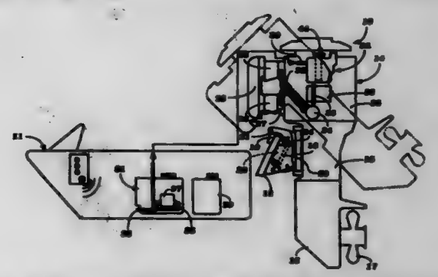
reaction of the end of the screw on the clamping elements on the strip on clamping, the clamping elements of the strip and of the cage delimiting between them an insertion duct for the wire, which duct extends obliquely relative to the screw, wherein the clamping element of the cage is extended by an extension constituting a wire-guide which projects beyond the cage from one of the sides into which the wire insertion duct opens out.

5,192,235
OUTBOARD MOTOR VIBRATION ISOLATION SYSTEM INCLUDING IMPROVED RUBBER MOUNT
William D. Dunham, and John C. Heitl, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Oct. 25, 1991, Ser. No. 782,545
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—52 19 Claims



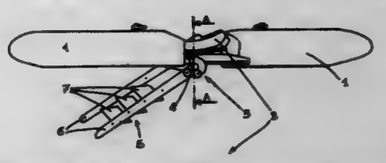
1. A marine propulsion device comprising a propulsion unit including wall means defining a cavity, and a mounting member which is located in said cavity and which includes an annular outer shell including an outer surface engaging said wall means and an inner surface defining an axially extending bore having a minimum diameter, an inner core extending through said bore, being adapted to be connected to a kingpin, and including an end core portion having a diameter less than said minimum diameter, and an opposite end core portion having a diameter greater than said minimum diameter, and resilient means extending between said outer shell surface and said inner core.

5,192,236
LUBRICATING DEVICE FOR OUTBOARD MOTOR
Kazuhiro Nakamura, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed Apr. 11, 1990, Ser. No. 507,970
Foreign Application Priority Data April 13, 1989 [JP] Japan, 1-91867
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—88 7 Claims



1. A lubricant delivery system for an outboard motor mounted for trim adjustment upon the transom of a watercraft hull, said outboard motor comprising an internal combustion engine and a lubricant system for said engine comprising a lubricant tank carried by said outboard motor and a lubricant pump for pumping lubricant between said tank and another component of the lubricating system, sensing means for sensing a change of the trim of said outboard motor of sufficient magnitude to affect operation of said lubricant system and providing an output signal in response to the sensing of a change, and means for changing the operation of said lubricant pump when said sensing means provides an output signal.

5,192,237
AQUATIC SKI WITH HUMAN PROPULSION GENERATED BY DEAMBULATORY ACTION
Paolo Pegoraro, Via Asolana 22, 31030 S. Vito Di Altivole (TV), Italy
PCT No. PCT/IT90/00015, § 371 Date Aug. 5, 1991, § 102(e) Date Aug. 5, 1991, PCT Pub. No. WO90/09310, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 12, 1990, Ser. No. 743,346
Claims priority, application Italy, Feb. 13, 1989, 02500 A/89
Int. Cl.[5] B63B *35/83*
U.S. Cl. 441—76 5 Claims



1. An aquatic ski for human propulsion generated by deambulatory action comprising:
a floatable hull;
a propulsive oscillating means connected to said floatable hull for causing movement of said floatable hull in response to the deambulatory action, said propulsive oscillating means comprising:
a foot seat positioned generally centrally in said hull, said foot seat angularly pivotable relative to said hull; and
a movable fin means in articulated and cooperative connection to said foot seat, said movable fin means angularly pivotable relative to said hull, said movable fin means comprising a plurality of free oscillating vanes pivotally connected between a pair of parallel arms, said oscillating vanes movable between a position aligned with said arms and a position transverse to said

arms, said position transverse being parallel to a flow of water between adjacent vanes, said position aligned being occlusive to a flow of water between adjacent vanes.

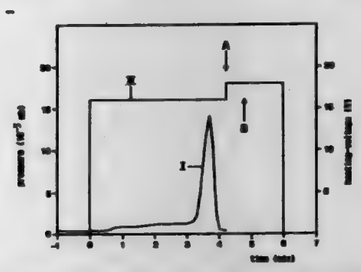
5,192,238
SELF-ACTIVATED MAN OVERBOARD RECOVERY SYSTEM
John B. Brown, 53849 Bruden Blue Ln., Mishawaka, Ind. 46545
Filed Jul. 14, 1992, Ser. No. 918,175
Int. Cl.[5] B63C *9/26*
U.S. Cl. 441—84 24 Claims

1. A man overboard activated retrieval system to rescue a person in a body of water from a vessel underway, comprising:
a) a length of line trailing in water from the vessel underway and having a free, distal end and a proximal end;
b) pulley means on the vessel and through which said trailing line is reeved, said pulley means arranged such that said trailing line passes through said pulley means and is movable therethrough in a direction toward the vessel and said trailing line proximal end, and oppositely of said free distal end;
c) container means mounted on the vessel adjacent a stern of the vessel, said container means including openable closure means, said trailing line being operatively associated with said closure means at a portion thereof intermediate said trailing line distal end and said pulley means, whereby upon tension being exerted on said trailing line, said closure means are caused to be opened; and
d) sea anchor means normally housed within said container means and operatively attached to said trailing line proximal end; whereby upon a person overboard grasping said trailing line, tension is exerted on the portion of said trailing line between the person overboard and said pulley means, thereby causing said closure means to open and said trailing line proximal end and said sea anchor to deploy in the water behind the vessel underway, the person overboard being pulled towards the vessel underway as said sea anchor means moves relative to and thus away from the vessel underway.

5,192,239
METHOD AND APPARATUS TO MAKE A DISCHARGE VESSEL FOR A SODIUM HIGH-PRESSURE DISCHARGE LAMP
Wolfram Grasser, Munich, Fed. Rep. of Germany, assignor to Patent Treuhand Gesellschaft fur Elektrische Gluhlampen m.b.H., Munich, Fed. Rep. of Germany
Filed Nov. 1, 1991, Ser. No. 786,514
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1990, 4037721
Int. Cl.[5] H01J *9/395*
U.S. Cl. 445—21 18 Claims

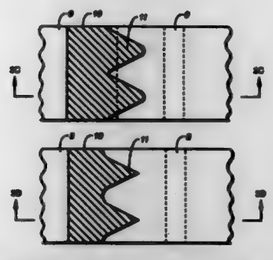
1. A method of making a discharge vessel of a sodium high-pressure discharge lamp, comprising the steps of

a1) providing a ceramic discharge vessel having two open ends;
a2) providing two electrode systems and a glass melt or glass solder mass on each system;
b) introducing one of the electrode systems into one open end of the vessel and melt-sealing the electrode system into said vessel by means of the glass melt or glass solder mass to form a subassembly;
c) introducing a fill which includes sodium by introducing NaN_3 through the second end of the vessel;
d1) fitting the second electrode system on the second end of the vessel;
d2) introducing the subassembly into a vacuum chamber;



d3) while the vessel is in the vacuum chamber, heating said second end;
d4) while carrying out the heating step of d3), monitoring the pressure arising in the vessel and sensing the occurrence of a sharp pressure pulse indicative of dissociation of the NaN_3;
e) awaiting decay of the pressure pulse and, while the vessel is in the vacuum chamber, then introducing a noble gas or mixture of noble gases into the vessel;
f) after step d2), melt-sealing the second electrode system to the vessel; and
g) cooling the discharge vessel.

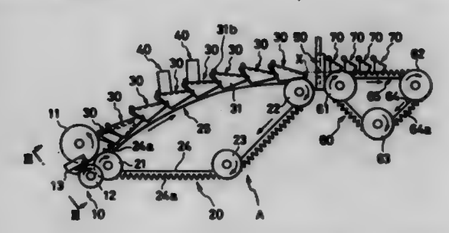
5,192,240
METHOD OF MANUFACTURING A MICROELECTRONIC VACUUM DEVICE
Hiroshi Komatsu, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Feb. 21, 1991, Ser. No. 659,218
Claims priority, application Japan, Feb. 22, 1990, 2-41948; Apr. 11, 1990, 2-96004; Feb. 5, 1991, 3-14398
Int. Cl.[5] H01J *1/02, 9/02*
U.S. Cl. 445—24 16 Claims



1. A method of microfabrication for making a planar microelectronic field emission device, comprising the steps of:
a) depositing an insulation layer on the surface of a substrate;
b) depositing a first conductive layer on the surface of the insulation layer;
c) forming a photo-resist pattern on said first conductive layer;

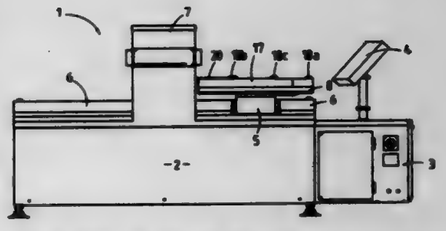
d) etching the first conductive layer using an excess etching method to form a cathode electrode and an anode electrode, said cathode electrode being a serrated cathode electrode having tips;
e) etching the insulation layer using the cathode electrode and anode electrode as an etching mask such that cathode tips for electron emission are exposed by an undercutting of the cathode electrode;
f) depositing a second conductive layer using a directional particle deposition method said second conductive layer being conformally self-aligned to said cathode and anode electrodes; and
g) etching the second conductive layer to form a gate electrode, said gate electrode being spaced a first distance from said cathode electrode and spaced a second distance from said anode electrode, wherein said first distance is less than said second distance.

5,192,241
APPARATUS FOR DEBONING DARK MEAT OF FOWL
Tatuji Saito, Isehara, Japan, assignor to Gordex Corporation, Japan and Geno Gasbarro, Columbus, Ohio
Filed May 26, 1992, Ser. No. 887,834
Claims priority, application Japan, May 29, 1991, 3-124182
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—135 4 Claims



1. A deboning apparatus for deboning dark meat of a fowl, comprising:
a straightening device for straightening "< "-shaped boned dark meat, including a pair of driving rollers mounted for rotation about horizontal axes and disposed such that their roll surfaces oppose each other leaving a predetermined gap therebetween, at least the upper one of said driving rollers being provided with an annular groove formed in the roll surface thereof;
a first conveyor device for conveying the boned dark meat straightened by said straightening device along a predetermined path, said first conveyor device being provided with means for gripping the bone in said dark meat and having a starting end adjacent to said straightening device and a terminal end remote from said straightening device;
a plurality of first bone pressing devices arranged at a predetermined spacing along the path of convey by said first conveyor device;
said first bone pressing device each including a scoring means for scoring said dark meat along the bone, said scoring means having a channel member having an channel opposing said gripping means of said first conveyor device leaving a predetermined gap therebetween such that said channel extends in the direction of convey by said first conveyor means, said scoring means further having means for urging the leading end of said channel member as viewed in the direction of convey by said first conveyor means towards said gripping means of said first conveyor means;
a scoring device for scoring said dark meat along the bone and disposed at an intermediate portion of the path of convey by said first conveyor means and having a jetting nozzle for jetting pressurized water;
a separation device disposed adjacent to but spaced from said terminal end of said first conveyor device and adapted for jetting pressurized water to separate bone from said dark meat;
said separation device having a ring-shaped nozzle having an axis extending in the direction of convey by said first conveyor means and means for reciprocately rotating said ring-shaped nozzle about its axis, said ring-shaped nozzle being provided with a plurality of jetting ports disposed along a circle on one side surface of said ring-shaped nozzle opposing said ring-shaped nozzle, said plurality of jetting nozzles being located and oriented towards a predetermined point on said axis;
a second conveyor device having a starting end adjacent to said separation device and a terminal end remote from said separation device, said second conveyor device having gripping means for gripping the bone, thereby conveying the bone separated from said dark meat; and
a plurality of spaced second bone pressing devices disposed along the path of convey by said second conveyor device;
said second bone pressing device each including a channel member opposing said gripping means of said second conveyor device leaving a gap therebetween such that the channel extends in the direction of path of convey by said second conveyor device, and further including means for urging the leading end of said channel member as viewed in the direction of convey by said second conveyor device towards the gripping means of said second conveyor device.

5,192,242
METHOD AND APPARATUS FOR REMOVING MEAT
David A. Sandes, Ensabbe, Australia; William F. van Berkum, and Gordon Wickham, both of Hamilton, New Zealand, assignors to The Meat Industry Research Institute of New Zealand Inc., Hamilton, New Zealand
Continuation of Ser. No. 509,674, Apr. 12, 1990, abandoned.
This application Oct. 4, 1991, Ser. No. 771,788
Claims priority, application Netherlands, Apr. 14, 1989, 228761; Jun. 8, 1989, 229449
Int. Cl.[5] A22C *17/04*
U.S. Cl. 452—136 16 Claims



1. Mechanical apparatus for the removal of whole-tissue meat from the region of the vertebrae of an animal carcass, said apparatus comprising:
support means which provide support to the bones of the carcass from which meat is to be removed, said support means including locating means for locating the carcass or part of the carcass;
cutting means having a substantial vertical cutting edge which is able, in use, to form a longitudinal cut through the meat to be immediately adjacent to the vertebrae, such cut being along the line of the vertical dorsal protrusions of the vertebrae;
substantially rigid clearing means including a wing which projects laterally relative to the cutting edge and has a leading edge which is generally rearwardly inclined relative to the direction of said longitudinal movement along said carcass, said wing being positioned rearwardly of said cutting edge and substantially below said cutting edge

such that in use it can be located immediately adjacent the

through during cold weather conditions, wherein said

second portion of each thresher element having a material

5,192,247

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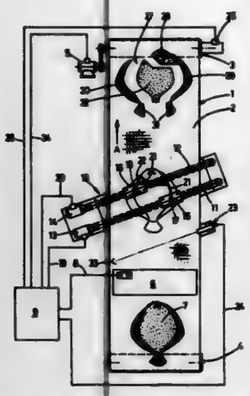
such that in use it can be located immediately adjacent the lateral protrusions of the vertebrae;

moving means for causing relative movement between said support means and said clearing means such that said clearing means are able to move longitudinally relative to the carcass; and

pressure applying means for causing a pressure directed toward said support means to be applied to said clearing means such that contact occurs between the bones supported by said support and said clearing means so that said clearing means follows the contours of the bones to thereby force the meat away from the dorsal and lateral protrusions of the vertebrae and, if present, at least part of the length of the ribs extending from the vertebrae.

5,192,243
APPARATUS FOR PROCESSING FLATFISH
Wilhelmus J. H. Weustink, P.O. Box 16, 1510 AA Oostzaan, Netherlands, assignor to Wilhelmus Josephus Henricus Weustink, Oostzaan, Netherlands
Filed May 21, 1991, Ser. No. 703,462
Claims priority, application Japan, May 31, 1990, 9001240
Int. Cl.[5] A22C *25/14*
U.S. Cl. 452—157 10 Claims



1. Apparatus for processing flatfish, comprising a conveyor means for the flatfish, registration means for determining the geometry of the flatfish and their position relative to said conveyor means, a cutting device for cutting loose the head, the dorsal fin, the anal fin and the tail fin from the flatfish in response to said registration means and with a control unit connected between said registration means and said cutting device for processing and storing information obtained from said registration unit for later use.

5,192,244
AIR VENT STOPPER
Kenneth A. Rose, 689 Coleman Ave., Holly Springs, Miss. 38635
Filed Feb. 11, 1992, Ser. No. 833,946
Int. Cl.[5] F24F *13/20*
U.S. Cl. 454—276 3 Claims

1. An air vent stopper for a ventilation grill having a plurality of ribs mounted within an opening in a building wall, said air vent stopper comprising:

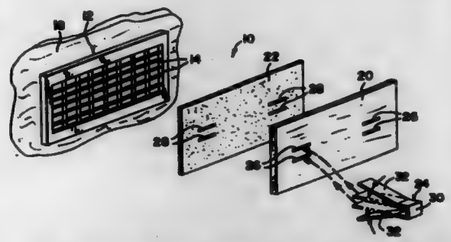
a) a plate being of a size and shape to completely cover over the ribs in the ventilation grill;

b) a gasket being of a same size and shape as said plate for and positioning between said plate and the ventilation grill; and

c) means for removably securing said plate with said gasket to some of the ribs of the ventilation grill, so as to completely seal the ventilation grill from leaking air therethrough during cold weather conditions, wherein said removably securing means includes:

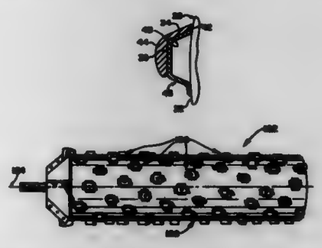
i) said plate having at least two spaced apart slots therethrough;

ii) said gasket having at least two spaced apart slot therethrough aligned with the at least two spaced apart slots in said plate; and



iii) at least one clip-on fastener being a U-shaped having two outwardly extending flared flexible fingers which when squeezed together can be pushed through the at least two spaced apart slots in said plate, the at least two spaced apart slots in said gasket and past through the ribs in the ventilation grill, whereby said two outwardly extending flared flexible fingers will spread apart when released to retain said plate with said gasket thereto.

5,192,245
THRESHER ELEMENTS FOR A COMBINE
Robert L. Francis, Molina, Ill., and James W. Misselhorn, Racine, Wis., assignors to Case Corporation, Racine, Wis.
Filed Sep. 9, 1991, Ser. No. 756,628
Int. Cl.[5] A01F *12/20*
U.S. Cl. 460—71 22 Claims

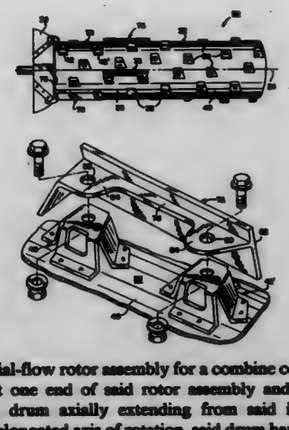


10. A rotor assembly mounted for rotation within an elongated cylindrical housing in a fore-and-aft relation and secured to a frame of an agricultural combine, said housing having an apertured portion which acts in combination with said rotor assembly to thresh and process crop material, said rotor assembly comprising:

a driven rotor having a generally cylindrical outer wall, the outer wall of said rotor and an inner surface of said housing defining a generally annular space therebetween and through which crop material circulates and advances rearwardly toward an outlet end of the combine; and

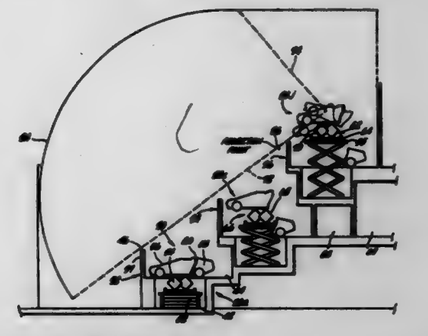
a plurality of thresher elements affixed to the outer wall along the length of said rotor, each thresher element projecting into the annular space to impact with and thresh crop materials advancing therethrough, and with each thresher element having fist and second portions, the first portion of each threaher element extending away from the outer wall of the rotor at a swept back angle relative to the direction of rotor rotation, the second portion of the threaher elements extending away from said first portion and about the outer wall of said rotor, the second portion of each threaher element having a material engaging outer area defined by length and width boundaries of the second portion of each threaher element, and wherein the entire outer area of the second portion of the threaher elements being provided with a continuous and smooth surface configuration such that the threshing elements impart substantially no abrading action to the crop materials during the threshing process.

5,192,246
ROTOR ASSEMBLY FOR A COMBINE
Robert L. Francis, Molina, Ill., and James W. Misselhorn, Racine, Wis., assignors to Case Corporation, Racine, Wis.
Filed Nov. 15, 1991, Ser. No. 795,930
Int. Cl.[5] A01F *12/20*
U.S. Cl. 460—72 4 Claims



1. An axial-flow rotor assembly for a combine comprising an impeller at one end of said rotor assembly and a generally cylindrical drum axially extending from said impeller and having an elongated axis of rotation, said drum having an outer wall with a plurality of outwardly extending mounting lugs circumferentially secured about and lengthwise along the outer wall of the drum and adapted to have thresher elements secured thereto, the majority of said lugs forming arrays of helical rows extending about the outer wall of the drum to enable said thresher elements to be individually connected thereto to form various orientations to maximize threshing efficiency and separating action, and with a plurality of said lugs being circumferentially secured in corresponding mounting sets about that end of the drum adjacent to said impeller, each mounting set of lugs including at least two lugs linearly spaced apart from each other and being longitudinally aligned relative to each other, with a series of said threaher elements having a linearly extended configuration, each linearly extended threaher element having a length which bridges the linear distance separating linearly aligned lugs of a mounting set and a width extending away form said drum and a material engaging area extending between the length and width of the linearly extended threaher element, the material engaging area of each linearly extended threaher element having a continuous and smooth surface, and means for connecting the linearly extended threaher elements to the mounting sets of lugs such that said linearly extended threaher elements extend generally parallel to the rotational axis of and about the drum to provide a paddle-like mechanism which offers improved control over the material being threshed by the rotor assembly.

5,192,247
RIDE ATTRACTION
Craig K. Barr, Tujunga, Calif., and Peter N. Alexander, Winter Park, Fla., assignors to Universal City Studios, Inc., North Hollywood, Calif.
Continuation of Ser. No. 675,662, Mar. 27, 1991, abandoned.
This application May 28, 1992, Ser. No. 892,402
Int. Cl.[5] A61G *31/16*
U.S. Cl. 472—60 11 Claims



1. A ride attraction comprising:

a projection screen;

a stationary projector for projecting motion pictures on said screen;

a plurality of motion bases, each motion base supporting a viewer platform;

means for elevating each motion viewer vehicle out of a staging room to a viewing position, said motion bases mutually arranged with respect to each other such that a viewer on any motion base can view the screen but not any other viewer platform; and

means for moving each viewer vehicle on its respective motion base in coordination with the motion pictures.

5,192,248
MULTI-STAGE SPROCKET ASSEMBLY FOR BICYCLE
Masashi Nagano, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Aug. 29, 1991, Ser. No. 752,635
Claims priority, application Japan, Jan. 24, 1990, 3-151243; Sep. 4, 1990, 2-234972
Int. Cl.[5] F16H *7/18*
U.S. Cl. 474—140 12 Claims

1. A multi-stage sprocket assembly for a bicycle comprising:

a small sprocket;

a large sprocket disposed coaxially with the small sprocket;

a shift assist projection provided to the large sprocket for assisting a shifting movement of a chain from the small sprocket to the large sprocket;

a guide face for guiding an outer side face of a link plate of the chain,

said guide face being formed in a side face of a second tooth of the large sprocket facing the small sprocket, said second tooth being forwardly adjacent, relative to a moving direction of the chain, a first tooth of the large sprocket which comes into engagement with a leading portion of the shifting chain;

said shift assist projection being so displaced toward the small sprocket that said projection comes into engagement with the shifting chain portion at a position forwardly distant from a position of said engagement between the leading end of the shifting chain portion and said first tooth by a distance which is substantially an integer multiple of a disposing pitch of the large sprocket teeth;

said shift assist projection including an inclined face facing the large sprocket, said inclined face being inclinded closer to the large sprocket relative to a dedendum of the large sprocket;

wherein, when said guide face and said inclinded face come into contact with the shifting chain portion, said contact prevents the chain portion engaging said shift assist projection from being excessively displaced from a shifting path of the entire shifting chain portion and prevents also excessive radial engagement between said chain portion and said shift assist projection so as to render said shifting path non-angular as viewed from the axial direction of the sprocket assembly.

5,192,249

MULTI-STAGE SPROCKET ASSEMBLY FOR BICYCLE

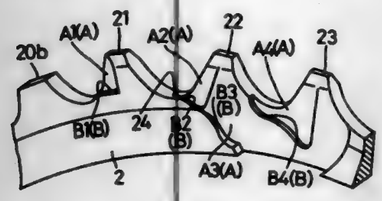
Masashi Nagano, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Feb. 26, 1991, Ser. No. 660,942

Claims priority, application Japan, Feb. 28, 1990, 2-50150; Feb. 28, 1990, 2-50151

Int. Cl.[5] F16H 55/30

U.S. Cl. 474—160 14 Claims



1. A multi-stage sprocket assembly comprising:

a larger diameter sprocket;

a smaller diameter sprocket adjacent to said larger diameter sprocket;

disengagement-facilitating means provided on said larger diameter sprocket, said disengagement-facilitating means operating to facilitate the disengagement of a portion of a chain from said larger diameter sprocket when said chain portion is manipulated to shift from said larger diameter sprocket to said smaller diameter sprocket;

a recessed portion provided on a side face of said larger diameter sprocket facing said smaller diameter sprocket for permitting said chain portion to pass therethrough when said chain portion shifts from said larger diameter sprocket to said smaller diameter sprocket;

a chain supporting portion provided on said larger diameter sprocket for supporting an outer link plate of said chain portion shifted from said larger diameter sprocket, said chain supporting portion including at least one support face provided on said side face of said larger diameter sprocket for directly contacting with and supporting said chain portion; and

teeth of said smaller diameter sprocket being provided with a phase arrangement relative to said chain supporting portion such that said shifted chain portion comes into engagement with said teeth of said smaller diameter sprocket while said chain portion extends substantially straight.

5,192,250

MULTIPLE SPROCKET ASSEMBLY FOR BICYCLE

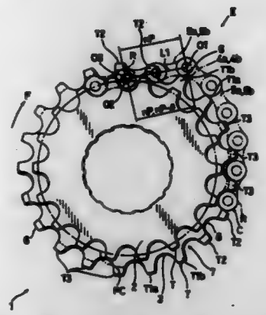
Jun Kobayashi, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Mar. 9, 1992, Ser. No. 848,844

Claims priority, application Japan, Apr. 23, 1991, 3-122372

Int. Cl.[5] F16H 55/30

U.S. Cl. 474—162 12 Claims



1. A bicycle multiple sprocket assembly comprising at least two adjacent sprockets which include a diametrically smaller sprocket and a diametrically larger sprocket, each sprocket having teeth alternate with furrows for engagement with a chain, each tooth having an apex, each furrow having a bottom;

wherein the teeth of the larger sprocket includes at least one reluctantly disengageable tooth, at least one chain supporting tooth immediately following the reluctantly disengageable tooth with respect to a forward rotational direction of the sprocket assembly, and at least one easily disengageable tooth immediately following the chain supporting tooth with respect to the forward rotational direction, and

wherein the apex of the chain supporting tooth supports the chain at the time of shifting from the larger to smaller sprockets.

5,192,251

TRANSMISSION CHAIN STRUCTURE

Pekka Tuunilkoski, Rauma, Finland, assignor to Kotjunyynti Tuunilkoski Ky, Finland

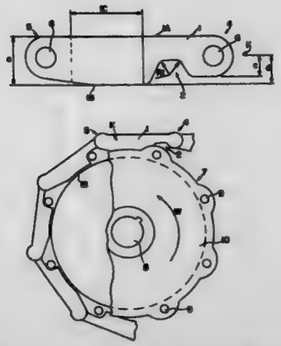
Filed Oct. 3, 1991, Ser. No. 770,452

Claims priority, application Finland, Oct. 3, 1990, 904864

Int. Cl.[5] F16H 7/02

U.S. Cl. 474—206 16 Claims

1. A transmission chain structure comprising several form pieces linked together by means of articulation means and a wheel arrangement including at least one drive wheel or a corresponding means for transferring the chain, which is formed on said form pieces linked together by said articulation means, wherein the bearing surface of each form piece consists of at least one opening which is transverse relative to the direction of motion of said chain and which is eccentrically arranged relative to the articulation pitch near one of the articulations, said opening including the contact edge, the bottom and the back edge, whereupon for moving said chain when the chain is in mesh said openings of said form pieces of said chain cooperate with joint pins of said drive wheels the joint pins being transverse relative to the direction of motion of said chain and being fitted in accordance with the openings and the free length of the joint pins substantially corresponding to the width of the form pieces, the contact area formed during the contact in said mesh of said pins and the openings substantially corresponding in length to the width of the form pieces, whereby, after said contact, said pin leaves the opening of the chain from that end thereof which is on the side of the trailing edge, wherein, during said contact and seen from a direction



perpendicular to the largest axial cross-sectional area of said pin, the free area of said opening is substantially larger than the cross-sectional area of the corresponding pin, whereupon said contact area is formed on that part of the contact edge of the opening on said bearing surface which joins said bottom, and wherein the largest distance of said contact edge from the center line, which goes through the centers of the holes of said articulations at the ends of the form piece, is substantially larger than the corresponding distance of said trailing edge from said center line.

5,192,252

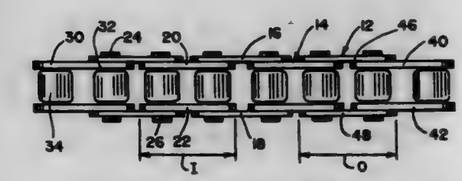
ROLLER CHAIN WITH RANDOMIZED PITCH

John C. Skurka, Ithaca, and Francis J. Hunter, Rochester, both of N.Y., assignors to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Del.

Filed Oct. 16, 1991, Ser. No. 776,994

Int. Cl.[5] F16G 13/10

U.S. Cl. 474—210 26 Claims



1. A chain for use with a sprocket, said chain having a series of interleaved inner links and outer links;

each outer link having a pair of outer link plates fixedly mounted to spaced pin members;

each inner link having a pair of bushings mounted to turn on said pins of said outer links, said inner links having inner link plates fixedly mounted to said bushings;

a roller mounted to turn on each bushing and adapted to contact the teeth of a sprocket;

each of said inner links and said outer links being adapted to receive a sprocket tooth;

some of said rollers having a first configuration and others of said rollers having a second configuration, said second configuration being different from said first configuration.

5,192,253

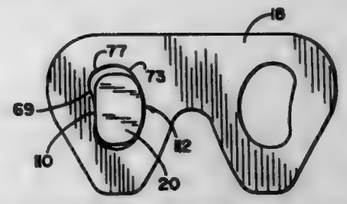
SINGLE PIN ROCKER JOINT CHAIN

Edward H. Cole, Jr., Ithaca, and Phillip J. Mott, Dryden, both of N.Y., assignors to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Filed Oct. 17, 1991, Ser. No. 778,469

Int. Cl.[5] F16G 13/04

U.S. Cl. 474—214 30 Claims



1. A rocker joint for a chain constructed of an assembly of links and pivot members, said chain comprising a plurality of sets of interleaved links, each link having a pair of spaced apertures, the apertures of one link set being transversely aligned with one set of apertures of the next adjacent link set, said apertures being defined by a series of surfaces, at least one of said aperture surfaces being convexly arcuate,

at least one of said pivot members having a substantially flat front surface and a convex back surface, said back surface being defined by a plurality of radii,

said pivot member being received in the apertures of some of said links such that the front surface of said pivot member and said convexly arcuate surface of said link aperture engage and rock on one another,

the back surface of said pivot member being positioned for clearance from said aperture back surface in the chain tight strand as the surfaces move relative to one another before the chain articulates.

5,192,254

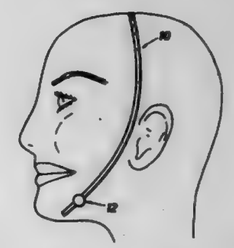
FACIAL EXERCISE SENSOR

Sharon Young, 1315 Crossfield, Katy, Tex. 77450

Filed Mar. 2, 1990, Ser. No. 487,765

Int. Cl.[5] A63B 23/03

U.S. Cl. 482—8 14 Claims



1. A sensor device to detect and signal the exercise of a subject's craniofacial and cervical muscles that comprises:

a flexible, semi-rigid, U-shaped band shaped and dimensioned to fit over a portion of a subject's head and face;

a trigger housing adjustably attachable to the band along the length of the band;

a trigger attached to the housing, located to interface between the face and the housing and sensitive to movement

with respect to the band, said trigger not sensitive to gravity;

a signal emitter in communication with the trigger that emits a signal upon the sensing of movement by the trigger; and

means for powering the signal sender.

5,192,255

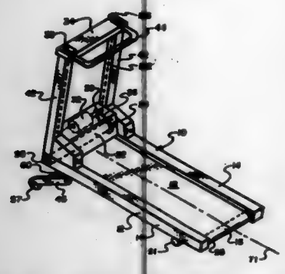
ADJUSTABLE INCLINE SYSTEM FOR EXERCISE EQUIPMENT

William T. Dalebout; S. Ty Meacham, and Scott R. Watterson, all of Logan, Utah, assignors to Weslo, Inc., Logan, Utah

Continuation of Ser. No. 494,890, Mar. 16, 1990, abandoned, which is a continuation of Ser. No. 256,486, Oct. 12, 1988, Pat. No. 4,913,396. This application Dec. 12, 1991, Ser. No. 806,977

Int. Cl.[5] A63B *23/06*

U.S. Cl. 482—54 2 Claims



1. A method of adjusting the incline of a treadmill, said method comprising:

providing a treadmill having a first end, a second end, a frame and a walking surface, said treadmill having a support pivotedly connected to said frame proximate said first end of said treadmill, said support having a proximal end adapted for engaging an underlying surface and supporting said treadmill frame above said underlying surface, said treadmill further including an adjustable pneumatic spring pivotedly mounted to said support on one end of said adjustable pneumatic spring and to said frame on an opposing end of said adjustable pneumatic spring, said adjustable pneumatic spring including a control means adapted for controlling a force exerted by said adjustable pneumatic spring on said support and said frame by opening and closing a valve contained within said adjustable pneumatic spring, said control means being operable by a user standing upright on said walking surface, said treadmill further including an underlying surface engaging fulcrum mounted on said frame proximate said second end of said treadmill;

positioning a user in an upright orientation atop said walking surface;

said user actuating said control means to open said valve, said adjustable pneumatic spring thereby operating to urge said proximal end of said support outward away from said frame and along said underlying support surface, said proximal end of said support thereby applying an upwardly directed force to said treadmill frame and urging said treadmill frame upwardly;

said user walking along said walking surface between said underlying surface engaging fulcrum and said first end of said treadmill to apply a downwardly directed force on said treadmill in opposition to said force being applied by said adjustable pneumatic spring;

said user positioning himself at a location on said walking surface between said fulcrum and said first end of said treadmill to a selected, downwardly directed force on said treadmill sufficient to counteract said upwardly directed force and to position said treadmill walking surface in a selected inclination; and

said user operating said control means from an upright orientation atop said walking surface to close said valve and thereby lock said adjustable pneumatic spring in place to lock said treadmill walking surface in said selected inclination.

5,192,256

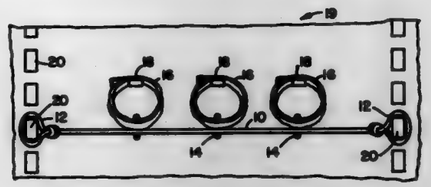
SWIM EXERCISE OR TRAINING APPARATUS

William T. Ryan, 248 Northridge Dr., Landisville, Pa. 17538

Continuation of Ser. No. 644,324, Jan. 22, 1991, abandoned. This application Apr. 29, 1992, Ser. No. 876,116

Int. Cl.[5] A63B *23/00*

U.S. Cl. 482—55 7 Claims



1. A swimmers exercise apparatus kit comprising a user tether means having a pool attachment mechanism means on each end of said tether line, for attachment to opposite ends of a pool, said tether means being continuous and unbroken and having one or more coupling means slidably mounted by ring means on said tether means for movement along the tether line thereof; harness means integrally connected to the coupling means, said harness means for mounting on a swimmer's body, said coupling means providing for selective positioning of one or more swimmers along said line and allowing freedom of a swimmer's arm and leg motion and orientation of the swimmer's body in a direction generally perpendicular to said line and generally within the plane of the surface of water in said pool.

5,192,257

EXERCISE APPARATUS

John E. Panasewicz, Boulder, Colo., assignor to Fittraxx, Inc., Boulder, Colo.

Continuation of Ser. No. 728,188, Jul. 10, 1991, abandoned. This application Apr. 28, 1992, Ser. No. 875,074

Int. Cl.[5] A63B *23/00*

U.S. Cl. 482—70 12 Claims

1. An exercise apparatus comprising in combination:

a frame,

a pair of foot supporting members, slidably mounted on said frame for linear reciprocating movement, each foot supporting member having a first idler pulley thereon,

a pair of hand engaging members slidably mounted on said frame for linear reciprocating movement in parallel relationship with the movement of said foot supporting members, and

a control system operably interconnecting said foot supporting members and said hand engaging members, said control system including a drive pulley mounted on said frame for reciprocal pivotal movement and a drive belt extending around said drive pulley, said drive belt having opposite ends fixed to said foot supporting members whereby movement of one foot supporting member in a first direction will cause the other foot supporting member to move simultaneously in a second opposite direction, a secondary belt having opposite ends anchored to said frame, said secondary belt being fixed to said hand engaging members for unitary movement therewith and being operably connected to said foot supporting members by frictionally passing around said first idler pulleys on the foot supporting members, and a group of second idler pulleys mounted on said framework around which said secondary belt extends whereby linear reciprocating movement of said foot supporting members causes said hand engaging members to reciprocate at a linear speed of approximately twice the speed of said foot supporting members.

5,192,258

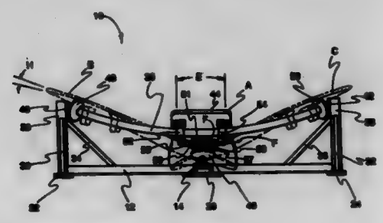
TRAINING DEVICE ESPECIALLY ADAPTED FOR TEACHING SNOW BOARDING TECHNIQUES

Martin Keller, 13880 Wide Acres Rd., Golden, Colo. 80401

Filed Oct. 26, 1990, Ser. No. 603,651

Int. Cl.[5] A63B *22/00*

U.S. Cl. 482—71 78 Claims



1. A training device, comprising:

a frame;

an arcuate track secured to said frame, said track having opposite ends disposed at a vertical elevation above an intermediate portion of said track;

at least one support member;

a ball and socket mounting said support member for pivotal movement;

said track lying on a surface of an imaginary sphere having a center at the center of said ball;

said track forming a segment of a circle lying in a plane obliquely inclined to a horizontal plane, said segment being orientated downwardly and outwardly away from said ball such that said track disposes said support member in an orientation obliquely declined to said horizontal plane downwardly and inwardly toward said ball; and

guide means mounting sad support member for movement along said arcuate track.

5,192,259

EXERCISE SYSTEM

Robert A. Badolfson, 18525 Sixth Ave. North, Plymouth, Minn. 55447

Filed Jul. 18, 1991, Ser. No. 731,995

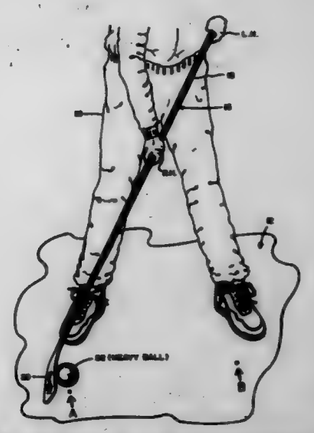
Int. Cl.[5] A63B *21/06*

U.S. Cl. 482—93 1 Claim

1. A method for developing and strengthening wrists and hands of a human athlete, said method being adapted to be practiced on a flat hard surface by the athlete and with the athlete operating:

(i) a wooden hockey stick having an elongated handle portion and a double-sided blade portion, each side of the blade portion being flat, and

(ii) a spherically shaped and dense ball, said ball being of steel material and formed by a forging process and having a diameter in the range of 2.5 to 3.0 inches,



whereby the athlete (a) places the ball on the hard surface in front of but proximate to the front of the feet of the athlete and holds the elongated handle portion of the stick with spaced apart hands, and (b) uses the hockey stick to move the ball back and forth on the hard surface by engaging said ball with alternating sides of the blade portion of the hockey stick to thereby accelerate and decelerate the ball, so that, upon the aforesaid ball acceleration and deceleration being repeated by the athlete, a beneficial strengthening of the wrists and hands of the athlete occurs.

5,192,260

APPARATUS FOR TRANSFER OF A MACHINE PART

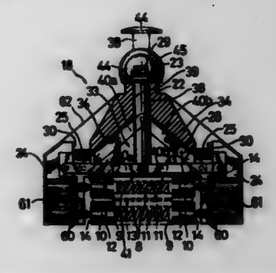
Franco Sarterio; Mario Scavino, and Stefano Vergano, all of Turin, Italy, assignors to Amada Company, Limited, Japan

Filed Nov. 14, 1990, Ser. No. 612,576

Claims priority, application Italy, Nov. 14, 1989, 67998 A/89

Int. Cl.[5] B23Q *3/00*

U.S. Cl. 483—59 10 Claims



1. An apparatus for transferring a machine part, comprising:

a frame body;

an opposed pair of machine part gripper members each supported on the frame body, the pair of machine part gripper members being apart from each other by at least a predetermined distance so that the machine part is to be

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put therebetween, and being adapted to move toward and away from each other for gripping and disengaging, respectively, the machine part;

a resilient means for biasing the pair of machine part gripper members toward each other, for engagement of the gripper members with the machine part;

a gripper member movement mechanism for moving the pair of gripper members away from each other against the resilient force of the resilient means, for disengagement of the gripper members from the machine part; and

a gripper member lock mechanism for locking the movement of the gripper members when the gripper members are at said predetermined distance from each other.

5,192,261

APPARATUS FOR POST-PROCESSING SHEETS

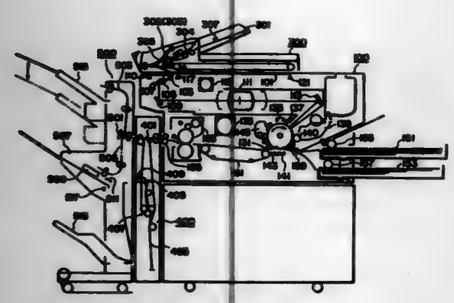
Takeshi Hoaje, Kawasaki, and Koichi Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 511,204, Apr. 19, 1990, abandoned, which is a division of Ser. No. 175,347, Mar. 30, 1988, Pat. No. 4,938,467. This application Sep. 12, 1991, Ser. No. 759,718

Claims priority, application Japan, Mar. 31, 1987, 62-078017; Mar. 31, 1987, 62-078018; Mar. 31, 1987, 62-078023; Apr. 1, 1987, 62-080486

Int. Cl.[5] B31B *1/24*

U.S. Cl. 493—29 21 Claims



6. A sheet processing apparatus comprising:

input means for inputting a signal indicating whether or not sheet processing is to be performed;

sheet processing means for processing sheets in accordance with th signal of said input means;

an ejection unit for ejecting the sheets from said sheet processing means;

a tray for stacking the sheets ejected from said ejection unit;

movement means for moving relatively a position of said ejection unit and a position of said tray to which the sheets are being ejected while the sheets are ejected from said ejection unit; and

control means for controlling said movement means in accordance with the signal input from said input means.

5,192,262

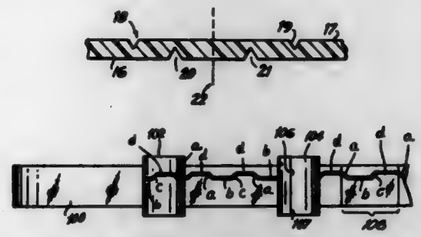
CONTAINER WRAPPERS WITH INTEGRAL TEAR TAPE, AND METHODS AND APPARATUS FOR MAKING SAME

Angel Amandola, Millersville, Md., and Xuan M. Pham, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 508,227, Apr. 12, 1990, abandoned, which is a division of Ser. No. 342,240, Apr. 24, 1989, Pat. No. 4,938,363. This application Oct. 25, 1991, Ser. No. 782,917

Int. Cl.[5] B31B *1/25*

U.S. Cl. 493—365 16 Claims



1. A method for making a wrapper having an integral tear tape for a container, comprising the steps of:

feeding a web of material having a longitudinal axis, and first and second major surfaces on respective opposite sides of said web member;

scoring a first set of substantially parallel score lines partially through the thickness of said first major surface to extend a first depth through the wrapper, said first set of score lines being spaced apart by a first predetermined distance;

scoring a second set of substantially parallel score lines partially through the thickness of said second major surface to extend a second depth through the wrapper, said second set of score lines being spaced apart by a second predetermined distance, wherein said first depth is greater than said second depth and wherein said second predetermined distance between said second set of score lines is larger than said first predetermined distance between said first set of score lines, such that said second set of score lines straddles said first set of score lines to form an integral tear tape,

wherein said first and second sets of score lines are scored in a longitudinally repeating pattern of first through fourth longitudinal segments, at least two of said segments being parallel to said longitudinal axis and connected to each other by a third segment that is transverse to said longitudinal axis, wherein the connections between said segments are rounded; and

severing completely through said longitudinal web, perpendicular to the longitudinal axis, to form a wrapper;

wherein said integral tear tape formed by said first and second sets of scored lines will not deviate from the path of said pattern.

5,192,263

ELECTROMEDICAL APPARATUS FOR GENERATING LOW-FREQUENCY MAGNETIC FIELDS

Werner Kraus, Augustenstrasse 41, 8000 Muenchen 2, Fed. Rep. of Germany

Filed May 21, 1991, Ser. No. 703,802

Claims priority, application Fed. Rep. of Germany, May 29, 1990, 9006057[U]

Int. Cl.[5] A61N *1/00*

U.S. Cl. 600—14 7 Claims

1. An electromedical apparatus for generating low-frequency magnetic fields comprising a generator section having a housing (120) and including

a) first means (10) for generating low-frequency electrical oscillations,

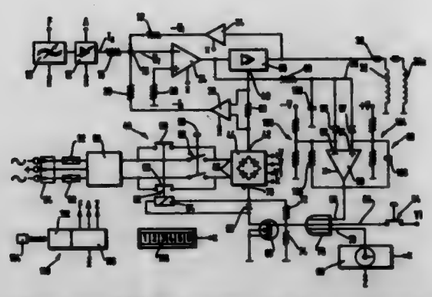
b) second means (110) for setting the frequency of the oscillations,

c) third means (12) for setting the amplitude of the oscillations,

d) fourth means for time control (80) for setting the duration of the oscillation generation,

e) a mains unit (44) for generating operating and bias voltages for said first to fourth means and

f) a mains switch (48) for connecting the mains unit (44) to a mains terminal (54), and



g) sixth means (30) for coupling at least one applicator coil (32) to the generator section for receiving said low-frequency electrical oscillations to generate a low-frequency magnetic field corresponding to the electrical oscillations, wherein the mains switch (48) includes a key switch (56, 58) which is connected between the mains terminal (54) and the mains unit (44) and connects them as long as an activating key (58) is depressed, and a relay (62) which comprises operating contacts (60) connected in parallel with the key switch (56) and a winding fed by the mains unit (44), and the operating and bias voltages are supplied to said mains unit 44 directly without interposition of a further switching device so that the apparatus starts to operate when then mains switch is switched on.

5,192,264

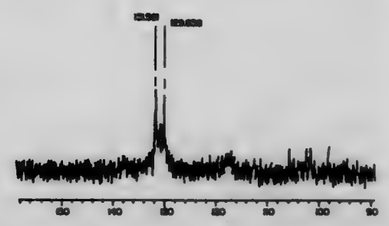
METHODS AND APPARATUS FOR TREATING DISEASE STATES USING OXIDIZED LIPOPROTEINS

Eric T. Fossel, Chestnut Hill, Mass., assignor to The Beth Israel Hospital Association, Boston, Mass.

Continuation-in-part of Ser. No. 418,382, Oct. 6, 1989, abandoned. This application Oct. 4, 1990, Ser. No. 592,553

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—4 24 Claims



1. A method for treating a disease state characterized by diseased cells with an enhanced uptake of lipoproteins comprising

(a) detecting the disease state,

(b) supplying blood,

(c) providing a container,

(d) introducing blood into the container,

(e) adding oxidized lipoprotein to the blood,

(f) performing a proton and carbon-13 nuclear magnetic resonance analysis of the blood to determine the level of oxidized lipoproteins,

(g) injecting the blood once a therapeutic dose of oxidized lipoproteins is obtained.

5,192,265

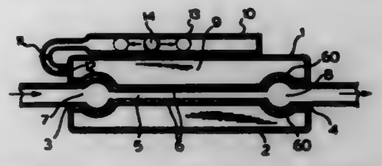
ADJUSTABLE-RESISTANCE ANTI-SIPHON DEVICE

James M. Drake; Richard Fox, both of Toronto, and Andre Baberic, Don Mills, all of Canada, assignors to HSC Research & Development Limited Partnership, Toronto, Canada and James M. Drake

Filed Dec. 10, 1990, Ser. No. 625,268

Int. Cl.[5] A61M *27/00*

U.S. Cl. 604—10 11 Claims



1. An adjustable-resistance anti-siphon device for a cerebrospinal fluid shunt comprising a substantially rigid housing having an internal cavity which contains a first chamber and a second chamber, said first chamber having at least one flexible wall, an inlet port and an outlet port for inflow and outflow respectively of cerebrospinal fluid, said ports passing through apertures in said housing;

said second chamber being gas-filled and being in pressure communication with at least a portion of said at least one flexible wall of said first chamber; and

gas pressure control means connected to said gas-filled chamber whereby the pressure in said gas-filled chamber may be adjusted.

5,192,266

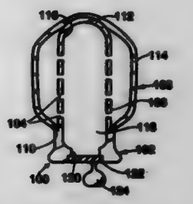
DEVICE AND RELATED METHOD FOR REDUCING SWELLING OF HEMORRHOIDAL TISSUES

Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Continuation-in-part of Ser. No. 837,869, Feb. 18, 1992. This application Jul. 23, 1992, Ser. No. 919,088

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—11 8 Claims



8. A device for the treatment of hemorrhoids, comprising:

a body member capable of being rectally inserted;

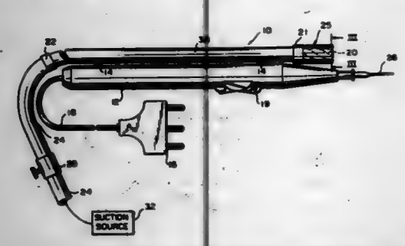
a solution inside said body member which is hypertonic with respect to hemorrhoidal tissues; and

an elastic semipermeable membrane defining an outer surface portion of said body member, said membrane being positioned along said body member so that said membrane is in contact with hemorrhoidal tissues upon insertion of said body member into a rectum,

said body member being provided with a closable access means for obtaining access to said body member to replace

diluted hypertonic solution in said body member with new hypertonic solution upon a use of the device.

5,191,267
VORTEX SMOKE REMOVER FOR ELECTROSURGICAL DEVICES
Nadiv Shapira, 5249 LaJolla Hermosa Ave., LaJolla, Calif. 92037, and John T. M. Wright, 10831 Oehlmann Ave., Conifer, Colo. 80433
Continuation of Ser. No. 300,180, Jan. 23, 1989, abandoned. This application Mar. 28, 1991, Ser. No. 678,169
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 17 Claims

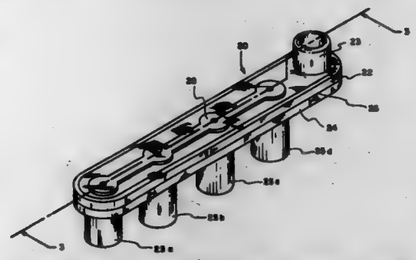


1. An electrosurgical device including a cutting and cauterizing means in electrical communication with an external power source, said cutting and cauterizing means engaged to a tubular housing having vortex means extending up to an end of said tubular housing for creating a vortex at an entrance end of said tubular housing, said tubular housing connected to a vacuum generator for removing smoke created with the cutting and cauterizing means from an adjacent immediate area, and means for turning on and off the vacuum created by said vacuum generator, said means for turning on and off the vacuum located at a distance spaced from an end of said cutting and cauterizing means of said device.

5,192,268
FLEXIBLE THROMBECTOMY SYSTEM
Samuel Shiber, P.O. Box 1366, Atkinson, N.H. 03811
Filed Jan. 27, 1991, Ser. No. 722,126
Int. Cl.[5] A61B *17/22*
U.S. Cl. 604—53 5 Claims

1. A process for removing a thrombus from a blood vessel, comprising the following steps:
inserting into the vessel a flexible thrombectomy system comprising a flexible piston, having proximal and distal ends, which is slidably disposed in a flexible catheter which also has proximal and distal ends,
advancing the distal ends of the flexible piston and the flexible catheter to the immediate vicinity of the thrombus,
pulling the proximal end of the flexible piston and sliding it proximally relative to the flexible catheter, thereby sucking the thrombus into the flexible catheter,
withdrawing the system containing the thrombus out of the vessel.

5,192,269
MULTI-VALVE MANIFOLD FOR DRUG INFUSION SYSTEMS
Robert G. Poll, Campbell, and Noel L. Johnson, San Jose, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jul. 24, 1991, Ser. No. 734,828
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—82 15 Claims

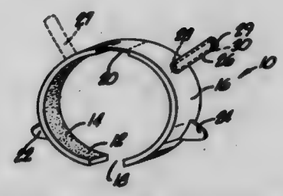


1. A multi-channel drug infusion system having a plurality of pumping mechanisms, each pumping mechanism having a separate fluid line for delivering fluid under pressure to a respective valve inlet of a multiple inlet manifold for mixing and transporting therethrough fluids under pressure, said manifold comprising:
a manifold body comprising a first member including a plurality of valve inlets, each valve inlet including a respective valve seat, and a second member having at least one outlet said first and second members joined at a manifold body interface;
a mixing chamber provided between the first and second members at the manifold body interface;
and a flexible membrane disposed in the mixing chamber between the first and second members, the flexible membrane comprising separate valve seat portions, each valve seat portion aligned with and overlying a separate valve seat on the first member and held in place by a respective valve interior portion provided on the second member and opposite said valve seat portion to retain each of the valve inlets of the first member normally closed at a respective preset level of inlet pressure, with fluid under pressure exceeding said preset level pressing against a respective valve seat portion to open a respective valve inlet to enable fluid flow into the mixing chamber, each such valve seat portion opening and closing its respective valve inlet independently of the remaining valve inlets to minimize inadvertent mixing of fluids in the chamber or back flow to the inlets.

5,192,270
HYPODERMIC SYRINGE AND A METHOD FOR MARKING INJECTIONS
Donald D. Carswell, Jr., 3100 Merritt Pkwy., Reading, Pa. 19609
Filed Nov. 19, 1990, Ser. No. 615,325
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—116 9 Claims

1. A hypodermic syringe including a cylindrical body portion, a needle attached in sealed fluid communication with the body portion and a removable protective cover for the needle which cover is closed at one end and open at the other end to receive the needle, characterized in that a colorant is disposed on one end of the cover, said colorant adapted to print a visible indicia when the one end is pressed against the skin.

5,192,271
DEVICE AND METHOD FOR EFFECTING AN ERECTION
Irvin M. Kalb, 327 Alta Ave., Santa Monica, Calif. 90406; Robert H. Shaw, 343 Peck Dr., Beverly Hills, Calif. 90212, and Michael J. Rasa, 1 Horseshoe Rd., Bell Canyon, Calif. 91307
Filed Nov. 25, 1991, Ser. No. 797,319
Int. Cl.[5] A61M *5/00*; A61F *5/00*
U.S. Cl. 604—116 16 Claims

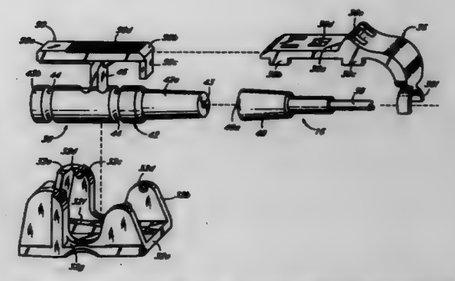


11. A device to aid in the delivery of an erection inducing drug to the penis comprising:
a flexible ring sized to partially encircle a flaccid penis,
the ring having a break therein to aid in properly placing the ring on the flaccid penis and at least one needle guide extending from its surface, said needle guide located above the penile erectile tissue and the break straddling the urethra when properly placed on the penis, the needle guide being angled and oriented so that a syringe needle placed through the needle guide penetrates through the covering skin and into the erectile tissue without penetrating other surrounding tissue.

5,192,272
PACK FOR ADMINISTRATION OF STERILE LIQUIDS INCLUDING PHARMACEUTICAL, NUTRIENT AND ENERGY-SOURCE LIQUIDS
Jean-Marie Faure, 100, avenue du Président Kennedy, 75016 Paris, France
Filed Oct. 25, 1990, Ser. No. 603,323
Claims priority, application France, Oct. 26, 1989, 89 14037
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—141 37 Claims

1. A container for administering a flowable substance to a patient comprising wall means defining a first chamber adapted to be at least partially filled with the flowable substance, said first chamber having means defining an opening for supplying the flowable substance to the patient, and means for detecting a leak in said wall means comprising means defining a space contiguous with said wall means for receiving the flowable substance accidentally leaked through said wall means, and a leak indicator medium accommodated in the space responsive to the presence of the leaked-in substance to provide a visible indication that a leak has occurred.

5,192,273
CATHETERIZATION SYSTEM
Steven F. Bierman, 143 Eight St., Del Mar, Calif. 92014, assignor to Steven F. Bierman, Del Mar, Calif.
Continuation-in-part of Ser. No. 384,326, Jul. 24, 1989, abandoned. This application May 4, 1990, Ser. No. 518,964
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—174 14 Claims



7. An apparatus for supporting and facilitating the changing of tubing connected to a catheter, said apparatus comprising:
an adaptor having a tubular body with a forward end configured to connect to a hub of a catheter, and a rear end configured to connect to a tubing; and
a base for mounting on a patient's skin, said base having a pair of upstanding legs spaced to define a space for receiving said adaptor body, said base legs having detents which fit within an annular groove on said tubular body in a manner permitting rotation of said adaptor about a longitudinal axis of said adaptor tubular body while remaining captured on said base.

5,192,274
ANCHOR PAD FOR CATHETERIZATION SYSTEM
Steven F. Bierman, 143 Eighth St., Del Mar, Calif. 92014
Filed May 8, 1991, Ser. No. 697,640
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—180 10 Claims

1. An anchoring system for securing a catheter to the body of a patient comprising:
a catheter connector comprising a substantially planar seat having at least one suture hole formed therein; and
an anchoring apparatus comprising:

adapted to provide a light transmitting enclosure for said cath-
(a) a generally tubular working element having a proximal

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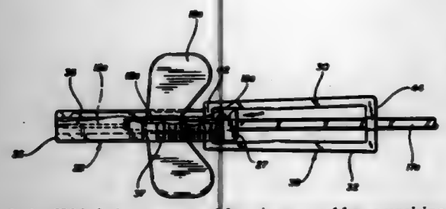
an adhesive member for secure attachment to the body of the patient; and

at least one retention member mounted on said adhesive member, said retention member being configured to insert through said suture hole of said catheter seat and to engage with the catheter seat about the suture hole to prevent accidental disengagement of said catheter from said adhesive member, whereby the catheter seat is attached to the adhesive member.

5,192,275
IV INFUSION OR BLOOD COLLECTION GUARD ASSEMBLY
James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Sep. 18, 1991, Ser. No. 762,535
Int. Cl.[5] A61M *5/00, 5/32*
U.S. Cl. 604—263 19 Claims



1. An IV infusion cover and housing assembly comprising:

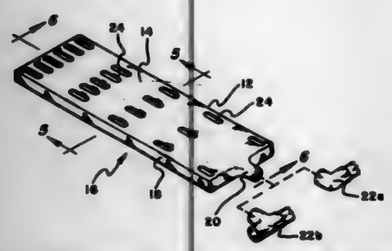
a protective cover comprising a rearward and forward end connected by opposite sidewalls, and a top and bottom side connected to said sidewalls;

a housing surrounding said cover, said housing comprising a rearward closed end and a forward opened end with protrusions extending into said housing;

means for advancing said cover out of said housing to a fully extended position; and

means for locking said cover to said housing in the fully extended position.

5,192,276
SMOKE ASPIRATING DEVICE
John E. Gatti, 104 Trusty Ehrs Ln., Haddonfield, N.J. 08033
Filed Dec. 14, 1990, Ser. No. 627,769
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—313 8 Claims



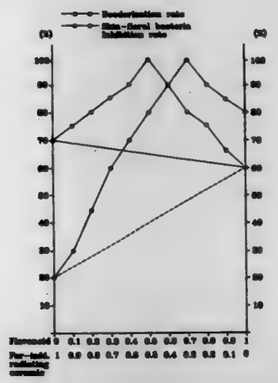
1. A smoke aspirating device for eliminating smoke generated during electrocautery surgery comprising:

an elongated substantially flat and flexible panel structure having spaced elongated upper and lower panel members with a closed area defined therebetween, said lower panel member having releasable securing means for said panel structure adapted for mounting said panel structure on the anatomy of a patient undergoing electrocautery surgery and said upper panel member having a plurality of spaced apertures therethrough connecting with said closed area wherein the apertures through the upper panel member increase in number from a first end of said panel structure to a second opposite end thereof and there are more apertures located through said upper panel member at the second opposite end thereof than through the first end;

connecting means projecting from said first end of said panel structure and in communication with the closed area in said panel structure;

vacuum connector means for connecting said connecting means to vacuum drawing source means wherein a flow of air is created from above said upper panel member of said panel structure inwardly through the apertures in said upper panel member and the closed area.

5,192,277
DISPOSABLE ABSORBENT ARTICLE
Dae B. Chung; Sung S. Suh, and Chun S. Kwak, all of Choongju, Rep. of Korea, assignors to LUCKY Ltd., Seoul, Rep. of Korea
Filed Dec. 18, 1991, Ser. No. 810,430
Claims priority, application Rep. of Korea, Dec. 20, 1990, 90-21162
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—360 5 Claims

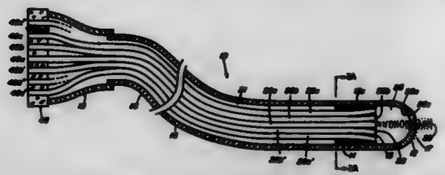


1. In an improved disposable absorbent article comprising a liquid-permeable top sheet, a superabsorbent polymer core, a fluff pulp layer and a liquid-proof back sheet, the improvement which comprises a mixture of a flavonoid and a far-infrared radiating ceramic incorporated in the top sheet, the polymer core, the fluff pulp layer and/or the back sheet.

5,192,278
MULTI-FIBER PLUG FOR A LASER CATHETER
Gary B. Hayes, Leominster; Carter Kittrell; Martin R. Prince, both of Cambridge, all of Mass.; Jill M. Tobin, Great Neck, N.Y., and Michael S. Feld, Weban, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Division of Ser. No. 235,721, Aug. 17, 1988, Pat. No. 4,969,745, which is a continuation of Ser. No. 37,091, Apr. 10, 1987, abandoned, which is a continuation of Ser. No. 715,234, Mar. 22, 1985, abandoned. This application Jun. 13, 1990, Ser. No. 537,925
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—15 25 Claims

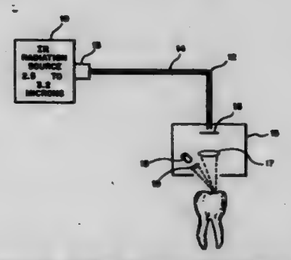
1. A laser catheter comprising a flexible tubular catheter, a plurality of optical fibers coaxially disposed within said catheter and bound together at a distal end of said catheter to form a unitary retainer module with a polished distal surface, a rigid optical shield enclosing the distal end of said catheter that is positioned adjacent to the optical fiber retainer module and

adapted to provide a light transmitting enclosure for said catheter in which the distal surface of the optical shield may be brought in contact with material in a body lumen to be treated



by a laser coupled at a proximal end of the catheter to the optical fibers, the optical shield transmitting a diverging beam of laser radiation from each of the fibers onto the material.

5,192,279
DENTAL TISSUE CUTTING, DRILLING AND FUSING SYSTEM
Mark A. Samuels, and Scott Patterson, both of 4023 Everett Ct., Duluth, Ga. 30136
Continuation of Ser. No. 398,825, Aug. 8, 1989, abandoned. This application Jun. 26, 1991, Ser. No. 725,237
Int. Cl.[5] A61C *5/00*
U.S. Cl. 606—17 2 Claims



1. A method for cutting the enamel of a human tooth and removing carious lesions without damaging the nerve and pulp of the tooth, comprising the steps of:

a. providing an Erbium YSGG laser oscillator;

b. projecting a pulsed output from the Erbium YSGG laser oscillator, which pulsed output has (1) a wavelength of approximately 2.79 microns, (2) a pulse width of less than approximately 250 microseconds, (3) an energy of approximately 200 millijoules and (4) a repetition rate of approximately 10 pulses per second;

c. transmitting the pulsed output projected from the laser oscillator to a condensing lens;

c. transmitting the condensed pulsed output via an optical waveguide; and

d. variably convergently irradiating the transmitting pulsed output via a focusing lens upon the enamel to be cut, thereby disrupting the crystal structure of the enamel and exposing the carious lesion for removal.

5,192,280
PIVOTING MULTIPLE LOOP BIPOLAR CUTTING DEVICE
David J. Parins, Columbia Heights, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.
Filed Nov. 25, 1991, Ser. No. 797,531
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—48 13 Claims

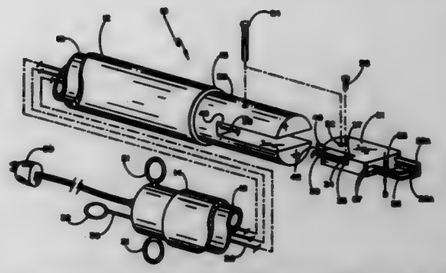
1. An electrosurgical cutting instrument connectable to a power source comprising:

(a) a generally tubular working element having a proximal end, a distal end and a lumen extending therebetween;

(b) a head member comprised of an insulative material pivotally mounted at a pivot point to said distal end of said working element;

(c) a pair of closely spaced bipolar electrodes extending outward from said head member and separated by a dielectric;

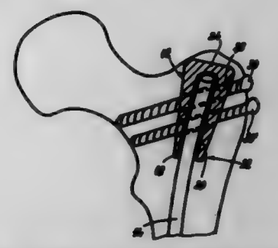
(d) a pair of conducting wires, insulated from one another



and each electrically connected at one end individually to one of said pair of bipoter electrodes, the other ends facilitating connection to said power source; and

(e) pull-wire means extending through said working element and connected to said head member for pivoting said head member about said pivot point, said wire means being sufficiently rigid such that motioning said wire means towards and away from said proximal end of said working element creates rotation of said head member about said pivot point.

5,192,281
UPPER LOCKING DEVICE FOR CENTROMEDULLARY PINS USED FOR OSTEOSYNTHESIS OF FRACTURES OF THE FEMUR, TIBIA, AND HUMERUS
Jean-Yves de la Caffiniere, Paris, France, assignor to Fixano SA, Bourg en Bresse, France
Filed Jan. 10, 1992, Ser. No. 818,892
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—69 10 Claims



1. An upper locking device for centromedullary pins used for osteosynthesis of fractures of the femur, tibia, and humerus, comprising:

a lock having a generally trapezoidal body having a lower end and an upper end, and a plurality of separate channels, each channel having one blocked end disposed toward the upper end of the body and one open end disposed at the lower end of the body, said body being designed to be introduced into a recess of matching shape provided in a bone to be locked thereto; and

a plurality of elongate pins, each pin having first and second ends, the first end of each pin being adapted for axial introduction in one of the plurality of channels in the lock substantially in the direction of the longitudinal axis of

5,192,285

be shifted between an open and a closed configuration by

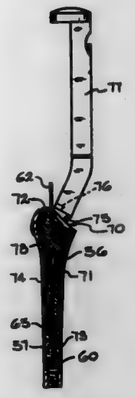
each pin and the second end of each pin being located opposite the first end and being recurved to immobilize the pin relative to the bone both longitudinally and rotationally, the first end of each of the pins being divergent and being introducible into one of the channels so that the upper blocked end of each channel of the lock opposes the upward and vertical forces transmitted by the pin received in that channel.

5,192,282
SUCTION DRAINAGE-BONE SCREW
Klaus Draenert, Gabriel-Max-Str. 3, DE-8000 München 90, Fed. Rep. of Germany
Division of Ser. No. 541,099, Jun. 20, 1990, Pat. No. 5,047,030. This application Sep. 9, 1991, Ser. No. 756,835
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705541
Int. Cl.[5] A61B 17/36; A61F 2/32
U.S. Cl. 606—65 5 Claims

1. A method of establishing therapeutic communication with the interior of a bone, the method comprising:
providing at least one bone screw, each bone screw having a first end and a second end and a continuous bore establishing a communication canal between the first and second ends;
inserting at least the first end of each bone screw into the bone such that each bone screw is firmly anchored in the bone in an essentially vacuum-tight manner; and
delivering substances to or from the interior of the bone through the communication canal of each bone screw.

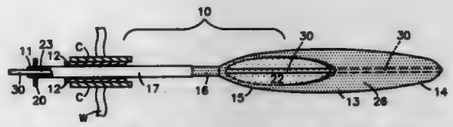
5,192,283
SYSTEM FOR PERFORMING HIP PROSTHESIS REVISION SURGERY
Robin S. M. Ling; Graham A. Gie, both of 2 The Quadrant, Wonford Road, Exeter, EX2 4LE, England; W. E. Michael Mitchell, 4283 Shanley Green, Toledo, Ohio 43623; James J. Elting, Otsego Orthopaedics, P.C., 35 Academy St., Oneonta, N.Y. 13820, and Tom J. J. H. Skeoff, University Hospital, St. Radboud, Th. Crannenlaan 7, Postbus 9101, 6500 HB Nijmegen, Netherlands
Continuation-in-part of Ser. No. 565,149, Aug. 10, 1990, Pat. No. 5,067,035. This application Jul. 23, 1991, Ser. No. 735,524
Int. Cl.[5] A61F 2/36, 5/04
U.S. Cl. 606—93 9 Claims

1. A method of performing revision surgery to replace a previously implanted hip prosthesis having a stem portion previously implanted in a medullary canal of a femur with a new hip prosthesis having a stem portion of predetermined configuration comprising the steps of:
(a) removing said previously implanted hip prosthesis from said femur thereby leaving a space in said femur;
(b) enlarging said space in said femur previously occupied by said previously implanted hip prosthesis to form a cavity larger than the stem portion of the new hip prosthesis to be implanted therein, said cavity having a bottom and an open top;
(c) placing a restricter at the bottom of said cavity, said restricter having a guidewire engaged thereto, said guidewire extending from said restricter to a point beyond said open top;
(d) placing bone graft material in said cavity;
(e) providing a tamp having a stem extending from a proximal end to a distal end and having a configuration similar to said predetermined configuration and having a passageway extending through said tamp stem from said distal end to said proximal end;
(f) placing said tamp over said guidewire with the guidewire extending through said passageway;



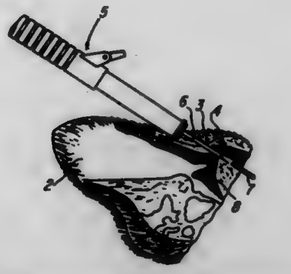
(g) impacting said tamp while guided by said guidewire to compact said bone graft material and to form a prosthesis receiving cavity larger than and similar in shape to said predetermined configuration.

5,192,284
SURGICAL COLLECTOR AND EXTRACTOR
Mark A. Plantman, 3328 Bloomfield Shore Dr., West Bloomfield, Mich. 48033
Filed Jan. 10, 1992, Ser. No. 818,929
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—114 14 Claims



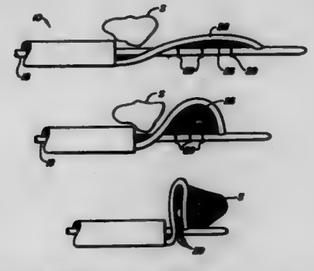
1. A surgical collector and extractor for specimen collection and removal in a body cavity, comprising:
(a) a substantially tubular elongated cannula having a confining space therein, said cannula being adapted for laparoscopic insertion through an incision into a body cavity and for removal from said cavity through said incision,
(b) a sac of flexible material adapted to be confined within said confining space within said cannula, and having an opening adapted for specimen collection,
(c) means for causing said sac to expand, when not confined, to form a receptacle having a size larger than said confining space, said means for expanding comprising rigidity of said material of said sac enough to hold its expanded shape, but collapsible to be confined within said cannula, and
(d) a handle connected to said sac for displacing said sac into said confining space for specimen collection and for subsequently removing said sac from said body cavity, wherein said handle has an internal passageway extending into said sac.

5,192,285
METHOD FOR INSERTION OF A TRANSPONDER INTO A LIVING BEING
Jeroen J. M. Bolscher, Ootmarsum, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 8, 1991, Ser. No. 773,060
Claims priority, application Netherlands, Oct. 8, 1990, 9002183
Int. Cl.[5] A61D 7/00
U.S. Cl. 606—117 5 Claims



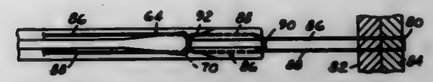
1. A method for insertion of an object into an animal having a lengthwise direction, said animal having ears, and earflaps having frontsides and backsides and central axes, and having cartilago scutiformis which lies along the frontside of the central axis of said earflaps and a base wherein said ears attach to said animal, said method comprising the steps of: inserting a needle-shaped guide along an insertion path to a point lying beneath the cartilago scutiformis and injecting said object with said guide such that said object is lodged beneath the cartilago scutiformis to protect said object from damage or migration.

5,192,286
METHOD AND DEVICE FOR RETRIEVING MATERIALS FROM BODY LUMENS
Cu N. Phan, and Marshall L. Stoller, both of San Francisco, Calif., assignors to Regents of the University of California, Oakland, Calif.
Filed Jul. 26, 1991, Ser. No. 736,173
Int. Cl.[5] A61M 25/00
U.S. Cl. 606—127 26 Claims



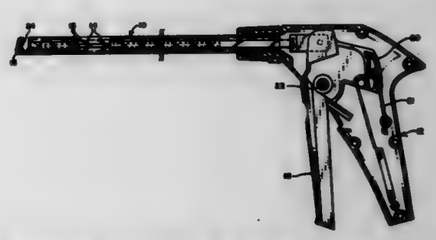
7. A retrieval catheter comprising:
an elongate body having proximal and distal ends;
a pull wire having proximal and distal ends and being slidably mounted within the elongate body, wherein the distal end of the pull wire extends distally of the distal end of the said body;
a flexible loop member, having first and second securing ends, wherein the first securing end is attached to the distal end of the elongate body and the second securing end is attached to the pull wire near the distal end of said pull wire; and
a slack net attached to the flexible loop, whereby the net can be shifted between an open and a closed configuration by axially shifting the pull wire relative to the elongate body.

5,192,287
SUTURE KNOT TYING DEVICE
Donald J. Fournier, North Providence, R.I., and Donald Ross, New Rochelle, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Filed Apr. 5, 1991, Ser. No. 681,577
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—139 9 Claims



1. A device for tying knots in a suture, comprising:
a stationary shaft member having at least first and second fixed prongs at its distal end;
a movable shaft member having a distal head and being slidable between said first and second prongs from a proximal, retracted position to a distal, extended position;
actuation means for moving said movable shaft member from said retracted position to said extended position;
said first and second prongs defining first and second grooves, respectively, each said groove extending along a front surface and a distal part of an outer side surface of said respective prong;
said distal head of said movable shaft member defining a third groove; and
said first and second grooves being shaped to guide a first one-half knot in the suture, and said third groove being shaped to guide a second one-half knot which is tightened against the first one-half knot to form a full knot when said movable shaft member is slid to said extended position.

5,192,288
SURGICAL CLIP APPLIER
Todd Thompson, San Jose; Terrance Kieocki, Palo Alto, both of Calif.; Peter F. Costa, Winthrop; William A. Heiman, Marblehead, both of Mass., and Jay Deaton, San Jose, Calif., assignors to Origin Medsystems, Inc., San Carlos, Calif.
Filed May 26, 1992, Ser. No. 888,723
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—143 33 Claims



1. Apparatus for applying clips having a pair of connected legs, the apparatus comprising:
a shaft having a distal end and a proximal end;
means for advancing clips along the shaft toward the distal end with the legs oriented in a distal direction;
means at the distal end of the shaft for rotating the clips relative to the shaft to orient the legs in a lateral direction; and
means for closing the legs of the clips after said rotation.

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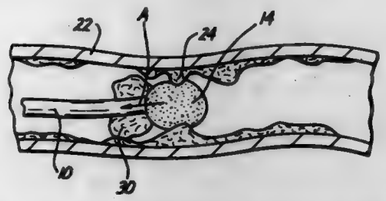
5,192,289
ANASTOMOSIS STENT AND STENT SELECTION SYSTEM
John W. Jessen, Seattle, Wash., assignor to Avatar Design and Development, Inc., Seattle, Wash.
Continuation of Ser. No. 689,668, Apr. 23, 1991, abandoned, which is a continuation of Ser. No. 320,983, Mar. 9, 1989, abandoned. This application Dec. 23, 1991, Ser. No. 814,328
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—155 12 Claims

1. A stent for use in the reconnection of a severed vessel that may carry fluid and that has a first free portion and a second free portion, said stent comprising:
support means for supporting the first and second portions of the vessel, said support means having first and second sections that are insertable into the first and second free portions of the vessel, said first and second sections having first and second outer surfaces and terminating in first and second ends, respectively, said support means including a tube having an inner passage extending between said first and second ends, wherein the outer diameter of said first section of said tube is reduced at said first end and the outer diameter of said second section of said tube is reduced at said second end; and
first and second flanges provided on said first and second outer surfaces of said support means, respectively, to sealably engage the first and second portions of the vessel, said first flange including a first seal surface that defines an obtuse angle with respect to said first outer surface extending toward said first end, said second flange including a second seal surface that defines an obtuse angle with respect to said second outer surface extending toward said second end, said support means and said first and second flanges being made of a material that dissolves when exposed to fluid, allowing the seal between the first seal surface and the first portion of the vessel and the seal between the second seal surface and the second portion of the vessel to vary during use of said stent to minimize trauma to the vessel.

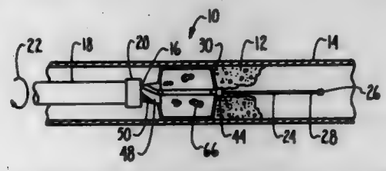
5,192,290
EMBOLECTOMY CATHETER
Said Hilal, Laguna Niguel, Calif., assignor to Applied Medical Resources, Inc., Laguna Hills, Calif.
Filed Aug. 29, 1990, Ser. No. 574,648
Int. Cl.[5] A61M *1/00*
U.S. Cl. 606—159 12 Claims

1. A catheter comprising:
a flexible tubular nondistensible catheter body having first and second ends;
an elastomeric nonwoven foam catheter tip attached to and extending outwardly from the catheter body at the first end;
a retractable flexible stylet extending through said catheter body and being attached to said catheter tip;



wherein operation of said stylet at said second end of the catheter body deforms said elastomeric foam catheter tip at said first end of the catheter body.

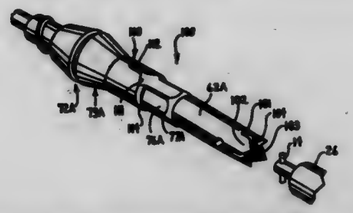
5,192,291
ROTATIONALLY EXPANDABLE ATHERECTOMY CUTTER ASSEMBLY
Edward J. Pasnek, Jr., Oceanside, Calif., assignor to InterVentional Technologies, Inc., San Diego, Calif.
Filed Jan. 13, 1992, Ser. No. 820,754
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—159 17 Claims



1. An atherectomy cutter assembly having a longitudinal axis, said cutter assembly comprising:
a plurality of blade elements radially spaced about said longitudinal axis, each of said blade elements having a distal end and a proximal end;
a hub at said distal ends of said blade elements wherein said distal ends of said blade elements are fixably connected to said hub; and
an extension tube positioned coaxially with said blade elements, said tube having a plurality of helical slots formed therein extending in a direction of said longitudinal axis and slidably retaining each of said proximal ends of said blade elements.

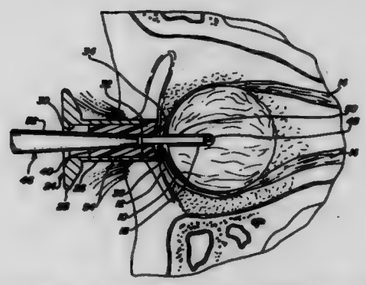
5,192,292
SURGICAL APPARATUS USEABLE FOR ARTHROSCOPIC SURGERY
Haim Cezana, South San Francisco, and Donald C. Savage, San Jose, both of Calif., assignors to Stryker Corporation, Kalamazoo, Mich.
Filed Nov. 2, 1990, Ser. No. 609,156
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—170 10 Claims

7. In surgical apparatus particularly usable for arthroscopic surgery, a tool adapted for insertion in a hollow, powered handpiece, the tool comprising:
a hollow tool housing having a hollow base mountable on a handpiece and a hollow sleeve extending forward from said base;
a driven member having a drive shaft drivable by a handpiece and a shaft extension protruding forward from said drive shaft and insertable in said hollow tool housing to extend from said base along said sleeve;
the improvement comprising:
first means on said base for nonrotatably locating said base in a desired angular position in a first handpiece, said first means including radially outwardly facing noncircular surface means extending forward from the adjacent rear end of said base for fixedly angularly locating said base in a first handpiece;
second means on said base for nonrotatably locating said base in a desired angular position in a second handpiece



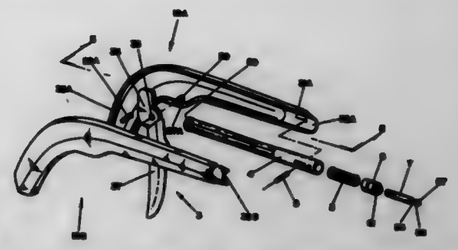
structurally different from said first handpiece, said second means being located forward of said first means on said base, said second means including funnel-shaped groove means extending forward from said first means for fixedly angularly locating said base in a second handpiece; such that said tool is alternatively usable in handpieces having structurally differing tool base engaging portions.

5,192,293
DRILL GUIDE FOR ORBITAL IMPLANT
Mont J. Cartwright, Laguna Niguel, Calif., and Christine C. Nelson, Ann Arbor, Mich., assignors to The Regents Of The University Of Michigan, Ann Arbor, Mich.
Filed Jul. 6, 1992, Ser. No. 909,579
Int. Cl.[5] A61B *17/32*; A61F *2/14*
U.S. Cl. 606—172 11 Claims



1. A drill guide for use in drilling a hole in an orbital implant for placement of a prosthesis mounting peg using a surgical drill having a rotating drill burr and a nonrotating drill nose, comprising:
a cylindrical housing assembly defining a proximal end and a distal end, said distal end defining a plurality of axially protruding fixation pegs, said housing assembly further having a central bore extending between said proximal and distal ends,
an adaptor insert having an outer cylindrical surface dimensioned to freely slide into said housing bore and having an inside bore shaped to engage said drill nose, and
stop means for allowing said adaptor insert to be displaced into said housing bore to a predetermined depth whereby when said distal end is placed against said implant and said adaptor insert is placed onto said drill nose, said drill is guided to form a hole in said implant of a limited depth.

5,192,294
DISPOSABLE VASCULAR PUNCH
Joseph W. Blake, III, 80 Main St., New Canaan, Conn. 06840
Continuation-in-part of Ser. No. 346,995, May 2, 1989, abandoned. This application Jun. 6, 1991, Ser. No. 711,636
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—184 34 Claims



1. A vascular punch for cutting openings in blood vessels comprising a pistol-shaped housing having an opening at the front end thereof; a blade drum provided at said opening of said housing; a punch mandrel having an end thereof passing through said opening in said housing; a trigger having an arm pivot means for pivoting said trigger on said housing,
said housing having port means through which said trigger arm of said trigger can extend outwardly; restraining means in said housing for engaging said punch mandrel; and blade pusher barrel means movably mounted between said trigger and said blade drum, said trigger further comprising a lower portion extending outside of said housing; and an upper portion residing within said housing comprising means for transferring motion to said blade pusher barrel means, said blade pusher barrel means being axially and reciprocally movable within barrel receiving means of said housing, and comprising an elongated cylindrical body comprising means for receiving motion transferred from the upper portion of said trigger, cavity means to contain said blade drum and said punch mandrel, opposing elongated longitudinal slots through which said punch mandrel restraining means passes to engage said punch mandrel, said punch mandrel further comprising an elongated cylindrical rod having a transverse hole therethrough to receive said punch mandrel restraining means and a reduced stem at its distal end terminated by a circular mandrel disc normal thereto, said blade drum comprising a hollow cylindrical body having a longitudinal lumen for passage of said punch mandrel therethrough; and blade means for cooperating with said circular disc of said punch mandrel to form said opening in the blood vessel, said restraining means preventing movement of said punch mandrel when said blade pusher barrel means and said blade drum move axially and reciprocally; and restoring means for restoring said trigger to a normal position after use.

5,192,295
ANGIOPLASTY DILATATION BALLOON CATHETER/GUIDEWIRE SYSTEM
John W. Danforth, San Francisco; Jeff L. Kraus; Michael J. Hernawski, both of San Jose, and Hugh R. Sharkey, San Francisco, all of Calif., assignors to Danforth Biomedical, Inc., Menlo Park, Calif.
Filed Jun. 20, 1990, Ser. No. 540,957
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—194 13 Claims

1. A dilatation balloon catheter/guidewire system, comprising:
an outer member comprising a tubular catheter shaft and a

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balloon secured to the distal end of said tubular catheter shaft;

an inner tubular member extending through said balloon and secured to said outer member proximally and distally relative to said balloon; and

a guidewire extending through said tubular catheter shaft and said inner tubular member, said guidewire containing at least a first section and a second section proximal to, and of larger diameter than, said first section;

said inner tubular member being:

non-axially-collapsible and thereby maintaining said balloon in an axially extended condition, and

resiliently radially expandable from a reduced-diameter condition sufficiently wide to receive said first section of said guidewire but not said second section, to an expanded-diameter condition sufficiently wide to receive said second section.

5,192,296

DILATATION CATHETER

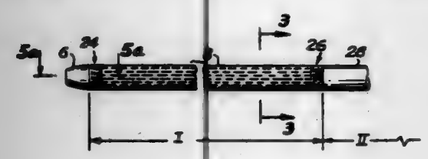
Anandkumar Bhate, St. Louis, Mo., and David Catlin, Middletown, N.J., assignors to Meadox Medicals, Inc., Oakland, N.J.

Continuation of Ser. No. 460,631, Aug. 30, 1989, Pat. No. 4,994,072, which is a continuation-in-part of Ser. No. 239,081, Aug. 31, 1988, Pat. No. 4,895,667. This application Nov. 29, 1990, Ser. No. 619,623

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] A61M *29/00*

U.S. Cl. 606—194 15 Claims



1. A dilatation catheter, comprising:

a length of a hollow shaft with an inner passageway for inflating the balloon, the hollow shaft formed of flexible material having a longitudinal axis and a first diameter;

a balloon portion formed at one end of the flexible shaft of flexible material, and communicating with the inner passageway the balloon portion being capable of expanding to a predetermined diameter when subjected to internal pressure to provide a balloon having a greater diameter than the first diameter;

the balloon portion formed from a substrate and a fluid impermeable elastomer on the substrate to provide a smooth outer surface, the substrate formed with circumferential crimps running length-wise about the circumference of the balloon portion; and

a transition portion at each end of the balloon portion for coupling the balloon portion to the flexible shaft, the transition portions being capable of longitudinal extension in response to minor longitudinal contraction of the balloon portion when the balloon portion is inflated.

5,192,297

APPARATUS AND METHOD FOR PLACEMENT AND IMPLANTATION OF A STENT

Vincent W. Hull, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 31, 1991, Ser. No. 815,449

Int. Cl.[5] A61F *2/06*

U.S. Cl. 606—195 7 Claims

1. Apparatus for placement and implantation of a stent, the apparatus comprising in combination:

a catheter having proximal and distal ends,

an elongate cylindrical outer sheath enclosing a distal portion of the catheter,

a balloon on the catheter being adapted for inflation and deflation in site,

a radially self-expandable stent of generally cylindrical configuration carried coaxially on the catheter in a distal position with respect to the balloon and enclosed within the sheath, and

means for distally ejecting the stent from the sheath, whereby the stent may be positioned at a selected implant site by placement of the distal end of the catheter and ejected out of the sheath in a distal direction to position it at the selected site followed by insertion of the balloon coaxially in the stent and expansion thereof to implant the stent at the selected site.

5,192,298

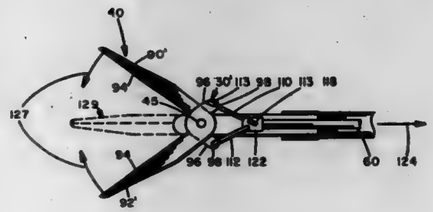
DISPOSABLE LAPAROSCOPIC SURGICAL INSTRUMENTS

Kevin W. Smith, Miami; Charles R. Slater, Fort Lauderdale; Gregory J. Murphy, Sunrise; Thomas O. Bales, Coral Gables; John W. Box, Miami, and Frank A. Scarfone, Boca Raton, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 521,766, May 10, 1990. This application Apr. 4, 1991, Ser. No. 680,392

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—205 19 Claims



1. A surgical instrument for insertion through a trocar tube, comprising:

a) a hollow tube having a first end and a second end and a longitudinal axis;

b) a clevis means separately formed from said tube and mechanically coupled to said first end of said tube, said clevis means having first rotation means substantially transverse to said longitudinal axis;

c) two end effector means for grasping, cutting, clamping, dissecting, or extracting, one of said end effector means having a first hole for receiving said first rotation means and for pivotally engaging said clevis means at said first rotation means, and a second hole substantially parallel to said first hole;

d) a rod extending at least partially through said hollow tube and having a first end and a second end, said rod having a third hole;

e) a unitary resilient staple-like connecting means linking said first end of said rod with said end effector means having said first and second holes, said unitary resilient staple-like connecting means having a first terminal portion pivotally engaging said third hole of said rod, an oppositely extending second terminal portion pivotally engaging said second hole of said end effector means having said first and second holes, and a substantially U-shaped middle portion coupling said first and second terminal portions; and

f) actuating means engaging said second end of said rod for imparting reciprocal motion to said rod relative to said tube which is translated at said clevis means to pivotal motion of said end effector having said first and second holes.

5,192,299

Patent Not Issued For This Number

5,192,300

INSERTION ASSEMBLY AND METHOD OF INSERTING A VESSEL PLUG INTO THE BODY OF A PATIENT

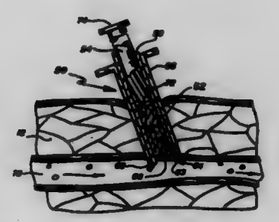
Bradford C. Fowler, Woodinville, Wash., assignor to Quinton Instrument Company, Seattle, Wash.

Continuation of Ser. No. 591,342, Oct. 1, 1990, Pat. No. 5,108,921. This application Jan. 28, 1992, Ser. No. 826,719

Int. Cl.[5] A61B *17/09*

U.S. Cl. 606—213 16 Claims

1. An insertion assembly for sealing an incision formed in the body of a patient wherein the incision extends from the skin of the patient into a selected blood vessel of the patient, said insertion assembly comprising in combination:



a vessel plug constructed of a material which is absorbable within the body of a patient and having distal and proximal ends and wherein said vessel plug is an elongate member which is dimensioned to be received in the incision such that said distal end is sized to be located at a predetermined position in the incision proximally of the blood vessel of the patient and the remainder of said vessel plug extends proximally therefrom in the incision after insertion, and

a removable positioning means operatively associated with said vessel plug for assisting in the positioning said distal end of said vessel plug in said predetermined position.

5,192,301

CLOSING PLUG OF A DEFECT FOR MEDICAL USE AND A CLOSING PLUG DEVICE UTILIZING IT

Tetsuro Kamiya, Saito; Shigeyuki Echigo, Toyosaka; Takehisa Matsuda, Mino; Ryuichiro Yoda, Yokohama, and Nobuko Satoh, Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

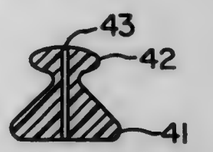
Filed Sep. 3, 1991, Ser. No. 754,163

Related U.S. Application Data Continuation of Ser. No. 468,273, July 2, 1990, ABN.

Claims priority, application Japan, Jan. 17, 1989, 1-7916

Int. Cl.[5] A61B *17/04*

U.S. Cl. 606—213 12 Claims



1. A closing plug for closing an opening in a body part of a living body, said opening in said body part including one of a patent ductus arteriosus (PDA), atrial septal defect (ASD), ventricular septal defect (VSD), aneurysm and varix, said opening having a rim defining a boundary of said opening, and said body part having an interior surface and an exterior surface adjacent said rim of said opening, the closing plug comprising:

a body portion having opposite end portions; and

an enlarged portion at each opposite end portion of said body portion, said enlarged portions each having a predefined size and shape which is larger than said opening to be closed and larger than a cross sectional size of said opening to be closed; and

wherein at least said enlarged portions are made of a shape memory polymer having a shape recovery temperature in the range of from 20° C. to 70° C., such that at least said enlarged portions are physically able to be reduced in size to a size to freely pass through said opening without further enlarging said opening, prior to introduction into said opening in the body part, and are able to be enlarged to their respective original predefined larger size and shape after insertion through said opening in said body part and after exposure to a temperature within said shape recovery temperature range so that said enlarged portions contact said interior surface and exterior surface, respectively, of said body part adjacent said rim of said opening to close said opening and to prevent said closing plug from coming out of said closed opening;

said closing plug having a narrow through-hole therein, which extends between each of said enlarged portions and which provides effective closure of said opening of said body part, and through which a guide wire is passable between each of said enlarged portions.

5,192,302

PLUG DEVICES FOR SEALING PUNCTURES AND METHODS OF USE

Kenneth Kensey, Chester Springs, and John Nash, Downingtown, both of Pa., assignors to Kensey Nash Corporation, Exton, Pa.

Continuation-in-part of Ser. No. 445,315, Dec. 4, 1989, Pat. No. 5,061,274. This application Oct. 28, 1991, Ser. No. 783,648

Int. Cl.[5] A61B *17/04*

U.S. Cl. 606—213 32 Claims

5,192,303

the neck while lying on said table for treatment adjacent

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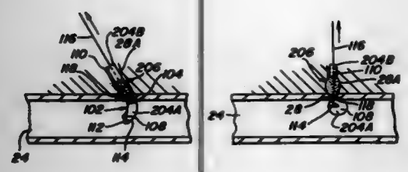
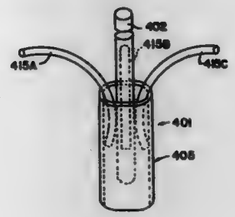
1. A closure device for sealing a small incision or puncture i tissue separating a first internal portion of the body of a living being from a second internal portion thereof to prevent the flow of bodily fluid therebetween, said incision or puncture comprising a track portion extending through said first internal portion, said closure device comprising plug means and retraction means, said plug means comprising a generally elongated member having a central longitudinal axis, a distally located portion and a proximally located portion, said distally located portion of said elongated member being deformable and including a free end, said retracting means comprising a filament secured to said distally located portion of said plug means adjacent the free end thereof, said filament being connected to said distal portion of said elongated member adjacent the free end thereof and said filament having a first portion extending



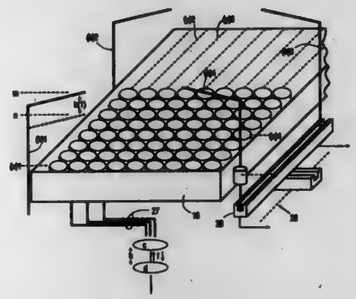
laterally of said central longitudinal axis of said elongated member along a first part of said distal portion of said elongated member for a portion of the length of said elongated member and said filament also having a second portion extending along a second part of said elongated member and closer to said central longitudinal axis of said elongated member than said first portion of said filament, said second portion of said filament extending out said proximal portion of said elongated member, said closure device being arranged to be positioned so that said distally located portion of said elongated member is disposed within said first internal portion of said body of said living being while said proximal portion of said elongated member is disposed within said track, and with said filament extending through said incision or puncture, said filament being arranged to be pulled to deform said distal portion of said plug means so that it cannot pass back through said incision or puncture and so that said incision or puncture is sealed by said deformed distal portion of said plug means.

5,192,303
SUTURE ANCHOR
Roland F. Gatturna, Walpole; James E. Nicholson, Lincoln, and James O'Leary, Medford, all of Mass., assignors to Mitek Surgical Products, Inc., Norwood, Mass.
Continuation of Ser. No. 711,145, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 439,452, Nov. 20, 1989, Pat. No. 5,046,513, which is a continuation of Ser. No. 51,367, May 18, 1987, Pat. No. 4,898,156. This application Mar. 18, 1992, Ser. No. 853,261
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—232 **15 Claims**

1. A post and post anchor assembly for attaching a post to bone, said post and post anchor assembly comprising:
(a) a post having a first end and a second end;
(b) a coupling member; and
(c) at least one barb, said barb having a first end and a second end and being curved in its normal unstressed state and being capable of being elastically deformed to a substantially straight length when desired, said barb extending transversely from said coupling member so that said second end of said barb is substantially laterally spaced from said coupling member when said barb is in its normal unstressed state but is capable of being aligned with said coupling member when said barb is deformed to a substantially straight length, and said post being attached to said coupling member at said first end of said post so that said second end of said post is free for use in attaching objects to a bone when said post anchor is anchored in said bone.

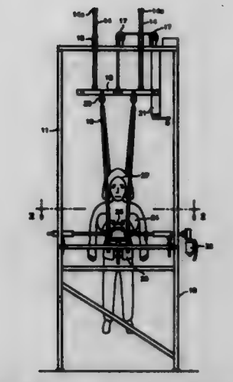


5,192,304
APPARATUS FOR MANIPULATING BACK MUSCLES
William R. Rassman, 29391 Laro Dr., Agoura, Calif. 91301
Filed Jun. 17, 1991, Ser. No. 716,137
Int. Cl.[5] A61H *9/00*; A47C *27/10*
U.S. Cl. 606—238 **9 Claims**



5. Apparatus for manipulating the bones, joints and muscle groups of the human back, said apparatus comprising a frame a planar array of pockets mounted on said frame on which a patient may be placed, each of said pockets having a cross sectional area which is small with respect to the surface area of the back;
locator means attached to said frame and spaced from said array for determining fixed skeletal reference positions of said patient and control means connected to said locator means for obtaining an initial equal force contour for said array of pockets with respect to said reference positions wherein said control means repetitively alter the vertical dimensions of individual ones of said pockets from respective positions defined by said initial equal force contour to impart a cyclical pattern of forces to said back of said patient.

5,192,305
PROCESS AND APPARATUS FOR PHYSIOTHERAPY IN SCOLIOSIS AND DEVIATIONS OF THE RACHIS IN GENERAL
Santos F. Sastre, Balmes no. 89 -30 1a, 08008 Barcelona, Spain
Filed Jun. 14, 1991, Ser. No. 714,185
Claims priority, application Spain, Jun. 15, 1990, 9001779
Int. Cl.[5] A61H *1/02*
U.S. Cl. 606—241 **8 Claims**

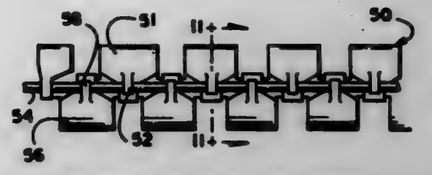


1. Apparatus for treating scoliosis and deviations of the human spinal cord in general comprising an upright main frame, suspension means for suspending a patient in the main frame under gravity, immobilization means connected with the main frame for gripping the patient's torso to substantially immobilize the patient when suspended and force-applying means associated with the main frame for applying a substantially horizontally directed pressure force to a selected area of the patient's spinal cord while the patient is suspended and immobilized, wherein the suspension means includes a cross-bar attached to the frame, a patient-fitting harness, and straps suspending the harness from the cross-bar.

5,192,306
CHIROPRACTIC MANIPLUATION TABLE WITH FLEXION/DISTRACTION HEADPIECE
Gerald R. Scott, Elmhurst, Ill., and James M. Cox, Fort Wayne, Ind., assignors to Standex International, Salem, N.H.
Filed Apr. 4, 1991, Ser. No. 680,309
Int. Cl.[5] A61H *1/02*
U.S. Cl. 606—243 **24 Claims**

1. A treatment table for supporting a patient while lying in a face down generally horizontal prone position for chiropractic manipulation of the patient's spine said table comprising:
a base projecting upwardly of the floor toward a convenient working level;
first support means on said base having an upwardly facing first support surface for supporting a patient's body below the neck while lying on said table for treatment adjacent said working level;
second support means having an upwardly facing second support surface for supporting the patient's neck and head and spaced apart from said first support surface along a central longitudinal axis of said table; and
first pivot means for pivotally interconnecting said first and second support means for controlled relative rotational movement about a first axis extending generally horizontal and transverse with respect to said central longitudinal table axis, said first axis positioned at a level spaced above and proximate to said first support surface wherein said first axis is positioned substantially at or beneath the level of the patient's spine while lying on said table.

5,192,307
ANGIOPLASTY STENT
W. Henry Wall, 5139 Jimmy Carter Blvd., Ste. 201, Norcross, Ga. 30071
Division of Ser. No. 129,834, Dec. 8, 1987. This application Feb. 5, 1992, Ser. No. 831,384
Int. Cl.[5] A61F *2/04*
U.S. Cl. 623—1 **7 Claims**



4. An implantable prosthesis for use in maintaining an opening within an artery, said prosthesis comprising a generally cylindrical sleeve having a wall, said wall defining a gap longitudinally thereof for allowing said sleeve selectively to assume a first position wherein said wall moves inwardly for providing a collapsed diameter of said sleeve, and a second position wherein said wall moves outwardly for providing an expanded diameter of said sleeve, means for urging said wall in one direction towards either said collapsed diameter or said expanded diameter, and locking means for preventing motion of said wall by said means for urging said wall in one direction, said wall having a bottom, a top diametrically removed from said bottom, and comprising a plurality of segments, a spine extending longitudinally of said sleeve along said bottom of said sleeve, each segment of said plurality of segments extending from said spine, around one side of said sleeve and to said top of said sleeve, said plurality of segments being spaced apart along each side of said spine so that said sleeve is longitudinally bendable.

5,192,308
VASCULAR PROSTHESIS WITH AN ELASTOMER COATING
George J. Ostapchenko, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 19, 1991, Ser. No. 687,673
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—1 **10 Claims**

1. A process for making a vascular prosthesis, said process comprising the following sequential steps:
(i) wetting with water a porous tubing made of polyester fibers for a sufficient time to cause the tubing to pick up water in an amount close to the maximum absorbable weight thereof;
(ii) removing excess water from the inside surface of the tubing, while still leaving water droplets in the interstices between the fibers forming the tubing;
(iii) briefly contacting the inside surface of the tubing with a

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solution of a copolyetherester consisting essentially of a multiplicity of recurring intralinear long chain and short chain ester units connected head-to-tail through ester linkages, such long chain ester units being represented by the following formula (I):

(I)

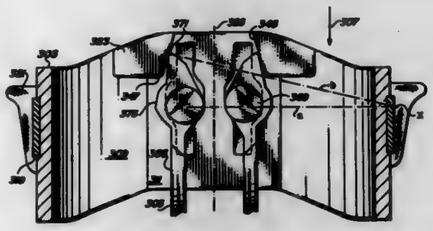
and short chain units being represented by the following formula (II):

(II)

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having an average molecular weight above about 400 and a ratio of the number of alkylene oxide carbon to oxygen atoms of 2.5 to 4.3, preferably 2.5 to 3.5, and a melting point below about 60° C.;
D is a divalent radical remaining after the removal of hydroxyl groups from a diol having a molecular weight of less than about 250; and
R and R′ are divalent radicals remaining after the removal of carboxyl groups from a dicarboxylic acid having a molecular weight of less than 300;
with the proviso that
(a) the copolyetherester contains about 23–82 weight percent of repeating units (II);
(b) at least about 80 percent of the combined R and R′ groups R+R′) are 1,4-phenylene groups; and
(c) at least 80% of D groups in formula (II) are 1,4-butylene groups;
with the further proviso that the total percentage of (R+R′) groups which are not 1,4-phenylene groups and of D groups which are not 1,4-butylene groups is at most 20%;
in a solvent or combination of two or more solvents which are not miscible with water and removing excess of that solution beyond what remains absorbed on the inside surface of the tubing;
(iv) removing solvent from the thus adsorbed solution to form an elastomer coating on the inside surface of the tubing, and determining elastomer add-on; and
(v) repeating steps (iii) and (iv) to the extent required to obtain sufficient add-on of elastomer to form a substantially continuous, nonporous coating on the inside surface of the tubing.

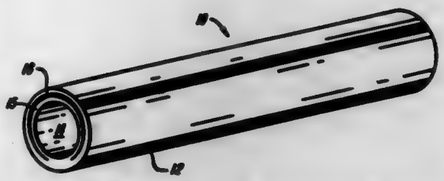
5,192,309
PROSTHETIC HEART VALVE
Jonathan C. Stupka; Jack C. Bokros; Michael R. Emken, all of Austin; Axel D. Haubold, Liberty Hill, and T. Scott Peters, Georgetown, all of Tex., assignors to Orx, Inc., Austin, Tex.
Continuation-in-part of Ser. No. 674,871, Mar. 25, 1991, Pat. No. 5,152,795. This application Feb. 18, 1992, Ser. No. 837,761
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **20 Claims**

1. A prosthetic heart valve including
a generally annular valve body having an interior wall which defines a central passageway, having a longitudinal axis, for blood flow therethrough,
occluder means having an inflow surface and an outflow surface, said occluder means being mounted in said valve body to alternate between an open position where the flow of blood therethrough is permitted in a downstream direction generally parallel to said longitudinal axis, and a closed position where the flow of blood in the reverse direction is blocked, said inflow surface facing generally upstream and said outflow surface facing generally downstream with said occluder means in the closed position, and
a pivot arrangement by which said occluder means is guided in sliding-pivoting movement between said open position and said closed position,
said pivot arrangement including projection means which extends generally radially inward from said valve body interior wall and is located where a portion of said occluder means lying generally along said inflow surface will slidingly engage said projection means at a first location on said valve body during the closing movement of said occluder means,
said pivot arrangement also including interengaging elements on said valve body and on said occluder means, which elements interengage at a second location and



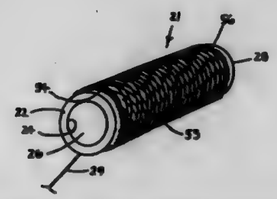
cooperate with said projection means in guiding the closing movement of said occluder means,
said projection means being positioned so that said sliding engagement between said occluder means and said projection means at said first location is axially upstream of said second location wherein the interengaging contact occurs between said interengaging elements,
whereby said sliding engagement between said projection means and said occluder means in combination with said contact between said interengaging elements, as said occluder means is being displaced upstream at the beginning of the reverse flow of blood through said central passageway, is such as to cause said occluder means to immediately begin to pivot about a shifting axis toward said closed position.

5,192,310
SELF-SEALING IMPLANTABLE VASCULAR GRAFT
Steve A. Herweck, Nashua; Theodore Karwoski, Hollis, and Paul Martakos, Pelham, all of N.H., assignors to Atrium Medical Corporation, Hollis, N.H.
Filed Sep. 16, 1991, Ser. No. 760,718
Int. Cl.[5] A61F *2/04*
U.S. Cl. 623—1 **11 Claims**



1. A self-sealing implantable prosthetic device for connection to a fluid flow pathway of a patient, the device comprising
a. an implantable body of unitary construction adapted for attachment to said fluid flow pathway, said body defining a primary lumen for accommodating fluid flow therethrough and a secondary lumen sharing a common side wall with said primary lumen, each of the lumina being bounded by a single, continuous surface provided by the body; and
b. a non-biodegradable self-sealing elastomeric material disposed in said secondary lumen.

5,192,311
MEDICAL IMPLANT AND METHOD OF MAKING
Wendell L. King, North Oaks; Lawrence M. Kane, Roseville, and Theodore P. Adams, Edina, all of Minn., assignors to Angelon Corporation, Plymouth, Minn.
Continuation of Ser. No. 186,002, Apr. 25, 1988, abandoned. This application Aug. 13, 1990, Ser. No. 566,257
Int. Cl.[5] A61F *2/06, 2/04*
U.S. Cl. 623—1 **13 Claims**



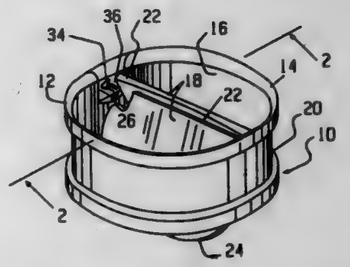
1. The method of growing a homograft in a vessel having a lumen of sufficient size to accommodate a foreign body and carrying blood flow in a living body which comprises the steps of:
a. making an incision in a vessel;
b. inserting a tubular substrate into the vessel;
c. said substrate having an inside surface and an outside surface, said substrate having a first open end and a second open end to permit blood flow along said inside surface at least one of said surfaces being thrombogenic to promote growth of collagenous tissue on said thrombogenic surface;
d. said tubular substrate having an outside diameter at said outside surface no greater than the diameter of the lumen of said vessel;
e. positioning said tubular substrate in said vessel to permit blood flow through said substrate from said first end to said second end and along said inside surface;
f. anchoring said first end to prevent said substrate from moving with the flow of blood in said vessel, said anchor leaving said second end free to move within said vessel;
g. leaving said substrate suspended in the blood flow of said vessel for a sufficient time for collagenous tissue generated by said body to form on the thrombogenic surface and form a homograft;
h. removing said substrate from said vessel;
i. removing said homograft from said substrate; and,
j. inverting said homograft to position the surface of the collagenous homograft with the surface exposed to blood flow in said vessel to form an inside surface for the homograft and thereby provide a homograft having a surface compatible with blood flow.

5,192,312
TREATED TISSUE FOR IMPLANTATION AND METHODS OF TREATMENT AND USE
E. Christopher Orton, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.
Filed Mar. 5, 1991, Ser. No. 664,902
Int. Cl.[5] A61F *2/24, 2/02, 2/54*; A01N *1/02*
U.S. Cl. 623—2 **24 Claims**

1. An implantable human heart valve treated with growth factor effective on fibroblast cells and populated with fibroblast cells in an amount and for a time period effective for

rendering the heart valve substantially non-immunogenic upon implant into a mammal.

5,192,313
HEART VALVE PROSTHESIS WITH IMPROVED BI-LEAFLET PIVOT DESIGN
John C. Budd, and Louis A. Campbell, both of Austin, Tex., assignors to Carbomedics, Inc., Austin, Tex.
Continuation-in-part of Ser. No. 427,246, Oct. 25, 1989, Pat. No. 5,147,390. This application Jan. 11, 1992, Ser. No. 896,831
Int. Cl.[5] A61F *2/24*
U.S. Cl. 623—2 **15 Claims**



1. A heart valve prosthesis comprising:
a generally annular valve body configured around an axis and having an inner surface defining a central passageway through which blood flows;
a pair of leaflet occluders proportioned to be pivotally received within said valve body and to move between an open position permitting blood to flow in a downstream direction and a closed position blocking flow of blood in an upstream direction, said leaflet occluders each having
a diametral edge;
a generally arcuate edge opposite the diametral edge; and
a pair of opposed outwardly protruding mounting ears on the generally arcuate edge adjacent the diametral edge for pivotally mounting the leaflet occluder to the valve body, the mounting ears having a proximal end adjacent the diametral edge; and a distal end spaced away from the diametral edge;
said valve body defining four recesses, a pair for each leaflet occluder, each recess comprising a generally triangular-

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shaped opening in the valve body inner surface, each said recess further comprising

a first arcuate end portion adjacent an upstream side of said annular valve body and configured to periodically receive the proximal end of the respective mounting ear in generally rolling contact and

second and third arcuate end portions downstream from said first arcuate end portion with a downstream side wall extending between said first end portion and said second end portion and a convex upstream side wall extending between said first end portion and said third end portion, said second arcuate end portion being adjacent to a center line lying parallel to the axis of the valve body and between the two occluders and said third arcuate end portion being spaced away from said center line, the second end portion being downstream from the third end portion, and said downstream side wall being angled away from the center line from the first arcuate end portion to the second arcuate end portion, and

a third side wall extending between said second end portion and said third end portion and configured to periodically receive the distal end of the respective mounting ear in generally sliding contact.

5,192,314
SYNTHETIC INTRAVENTRICULAR IMPLANTS AND METHOD OF INSERTING
Michael K. Daskalakis, 623 James Pl., Anaheim, Calif. 92801
Filed Dec. 12, 1991, Ser. No. 806,696
Int. Cl.[5] A61F 1/10, 2/02
U.S. Cl. 623—3 17 Claims

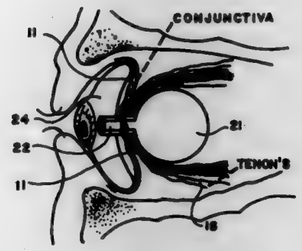
1. A synthetic intraventricular implant device capable of being surgically secured within a ventricle of a human heart, said ventricle having a wall with exterior and interior surfaces and an interior cavity with a distal end, comprising:

a generally oblong, shaped and contoured body having an inner wall adapted to face said interior cavity of said ventricle and an outer wall adapted to be snugly secured against said interior surface of said ventricle;

said inner and outer walls of said contoured body being sealingly fixed together; and

a cuff formed from a portion of one of said inner and outer walls of said contoured body so as to completely surround said inner and outer walls of said contoured body for securing said implant in position within said wall of said ventricle, with said cuff capable of being fixed to said interior surface of said ventricle wall, within said interior cavity.

5,192,315
TOTAL OCULAR REPLACEMENT APPARATUS WITH MUSCLE ATTACHMENT SITES
Jean T. Jacob-LaBarre, 135 Arlington Dr., Metairie, La. 70001
Filed Mar. 24, 1992, Ser. No. 856,465
Int. Cl.[5] A61F 2/14
U.S. Cl. 623—4 45 Claims



1. A total ocular replacement comprising:

a) an implant body that includes an outer surface, and comprising a spherically shaped portion with a forwardly positioned cell ingrowth surface at least on the spherical portion that is receptive of ocular conjunctiva tissue;

b) a conformer having a rear concave surface that is shaped to conform generally to the spherical implant body and to conjunctival tissue attaching to the cell ingrowth surface of the implant body;

c) wherein the conformer rear concave surface has a peripheral portion that extends over the ingrowth surface and the surface is shaped to interface with the combination of the implant body and attached conjunctival tissue without substantial damage to the said attached conjunctival tissue;

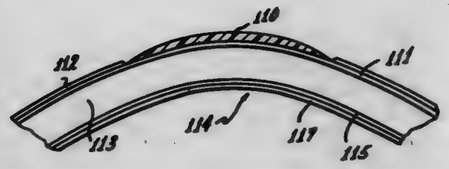
d) the implant having a porous muscle ingrowth material that covers a portion of the implant body outer surface and including a plurality of muscle attachment sites for attaching a plurality of ocular muscles to the spherical implant body at spaced locations; and

e) said outer surface having regions devoid of ingrowth material to discourage muscle attachment.

5,192,316
OCULAR DEVICE
Albert C. Ting, Laguna Niguel, Calif., assignor to Allergan, Inc., Irvine, Calif.
Continuation of Ser. No. 443,102, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 156,033, Feb. 16, 1988, abandoned. This application Jun. 12, 1992, Ser. No. 898,241
Int. Cl.[5] A61F 2/14
U.S. Cl. 623—5 20 Claims

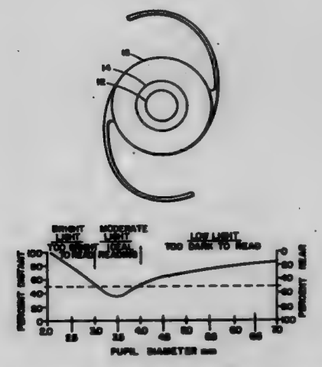
7. An ocular device comprising a lens means structured to be surgically implanted into or onto a living cornea to change the optical properties of the eye associated with said living cornea and at least one added component covalently bonded to and

substantially uniformly located throughout said lens means and acting to promote at least one of the growth of epithelial cells



of said living cornea onto said lens means and the adhesion of said living cornea to said lens means.

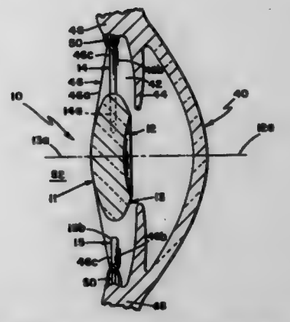
5,192,317
MULTI FOCAL INTRA-OCULAR LENS
Irvin M. Kalb, Santa Monica, Calif., assignor to Irvin Kalb, Beverly Hills, Calif.
Division of Ser. No. 366,638, Jun. 14, 1989, Pat. No. 5,139,519, which is a continuation-in-part of Ser. No. 224,540, Jul. 26, 1988, abandoned. This application Apr. 8, 1992, Ser. No. 866,668
Int. Cl.[5] A61F 2/16
U.S. Cl. 623—6 6 Claims



4. An intra-ocular lens for eye implantation comprising:

a lens body having optical portions comprised of a unitary material and additionally comprising at least a center zone and inner and outer concentrically located ring correction zones, said center zone having a distance power correction, said inner ring correction zone having a near power correction and said outer ring correction zone having a distance power correction, said center and outer ring correction zones sized to assure that under bright light and low light conditions, more than 75% of light focused on the eye's retina passes through distance power correction zones, and under moderate light conditions wherein reading is accomplished, more than 50% of light focused on the eye's retina passes through said inner ring correction zone.

5,192,318
ONE-PIECE BIFOCAL INTRAOCULAR LENS CONSTRUCTION
Richard T. Schneider, 17 Alachua Highlands, Alachua, Fla. 32615, and Richard H. Kenton, 456 W. 10th Ave., Columbus, Ohio 43210
Continuation of Ser. No. 561,256, Jul. 30, 1990, abandoned, which is a continuation of Ser. No. 297,966, Nov. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 182,253, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 15,878, Feb. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 871,077, Jun. 5, 1986, abandoned. This application Aug. 11, 1992, Ser. No. 928,141
Int. Cl.[5] A61F 2/16
U.S. Cl. 623—6 3 Claims



1. A rigid intraocular lens implant adapted for use as an artificial lens implant in a posterior chamber of an eye; said intraocular lens comprising:

(a) means for non-movably retaining said lens implant within a posterior chamber of a user's eye; and,

(b) a lens body comprising a material having a first index of refraction and substantially no index of refraction gradient therein; said lens body having a first circular lens portion and a second annular lens portion, said second annular lens portion surrounding said first circular lens portion;

(i) said first lens portion comprising a portion of said lens body having said first index of refraction and a first radius of curvature defining a first optical power;

(ii) said second lens portion comprising a portion of said lens body having said first index of refraction and a second radius of curvature defining a second optical power;

(iii) said second lens portion being constructed and arranged for viewing relatively distant objects and having an optical power of between about +15 and about +25 diopters;

(iv) said first lens portion being constructed and arranged for viewing relatively near objects and having: a power of at least +3.0 diopters greater than said second lens portion; and, a diameter of no greater than about 2.0 mm.

5,192,319
INTRAOCULAR REFRACTIVE LENS
Jan G. F. Worst, Julianalaan 11, Haren, Netherlands
Filed May 20, 1991, Ser. No. 703,271
Int. Cl.[5] A61F 2/16
U.S. Cl. 623—6 10 Claims

1. An iris tissue support fixation intraocular lens comprising:

a) an optical portion having a periphery and adapted to be positioned in the anterior chamber of a phakic eye;

b) a support portion extending radially from the optical portion, and comprising flexible, normally abutting pincer arm means for pinching a portion of the anterior surface

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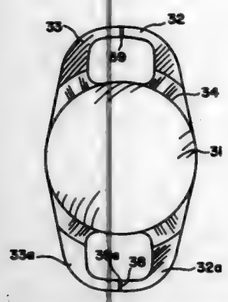
only of iris tissue without penetrating to the posterior surface;

c) said pincer arm means comprising a plurality of pincer arms that define generally a plane, and including at least first and second pairs of pincer arms that are spaced circumferentially about the optical portion;

d) a gap positioned between the two pincer arms that form each of the pairs, said gaps communicating with the periphery of the optical portion;



e) said optical portion being a lens having a flat or convex curve on its front and a concave curve on its back, said concave curve forming, when the pincer arms pinch the anterior surface of the iris tissue, a space between said optical portion and the pupil of the eye, said space being defined generally by said optical portion and said plane; and

f) a plurality of lateral side gates formed in the optical portion and positioned between the optical portion and the gap between respective pairs of pincer arms, and each gate communicating with the space.

5,192,320

ARTIFICIAL LUNG AND METHOD OF USING IT

Takanori Asazawa; Kazutaka Murata, both of Sakura; Hiroyuki Akasu, and Rishichi Mizuno, both of Kurashiki, all of Japan, assignors to Dainippon Ink and Chemicals Inc., Tokyo and Kuraray Co., Ltd., Okayama, both of Japan

Continuation of Ser. No. 216,567, Jul. 8, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 488,452

Claims priority, application Japan, Jul. 11, 1987, 62-172067

Int. Cl.[5] A61F 2/04

U.S. Cl. 623—12 8 Claims

1. A hollow fiber artificial lung adapted to perform exchange of gases between blood and a gas through a hollow fiber membrane by passing blood over one side of the membrane and oxygen or an oxygen-containing gas over the other side, said hollow fiber membrane consisting essentially of a polyolefin, said hollow fiber membrane having:

an inside diameter of 10 to 500 micrometers;

a thickness of 5 to 100 micrometers;

a porosity of 7 to 50%,

an oxygen flux, $Q(O_2)$, of at least 1×10^{-6},

a barrier layer having an average thickness of not more than 2 micrometers as calculated from oxygen flux $Q(O_2)$ and nitrogen flux $Q(N_2)$, and

an ethanol flux across the hollow fiber membrane of not more than 30 ml/(min.m^2).

5,192,321

APPARATUS AND METHOD FOR KNEE SURGERY

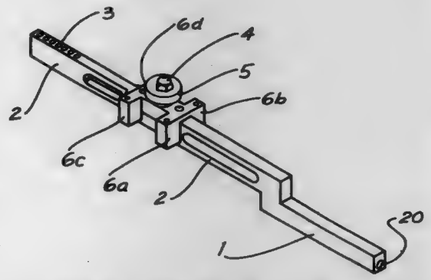
Andrew Strokon, 49 Renwick St., Leichhardt, New South Wales 2040, Australia

Filed Mar. 27, 1990, Ser. No. 499,884

Claims priority, application Australia, Mar. 29, 1989, PJ3415

Int. Cl.[5] A61F 2/00

U.S. Cl. 623—13 4 Claims



1. A method of cruciate ligament replacement comprising harvesting a graft comprising first and second plugs of boney structure interconnected by superficial fibers of a patellar tendon, the method comprising:

surgically exposing the patella and its associated tendons;

advancing a dowel cutter along boney structure of the tibia so as to harvest the first plug of boney structure comprising a contiguous bone block containing the superficial fibers of the patellar tendon along its surface; and

repeating the procedure to harvest the second plug of boney structure comprising boney structure from the patella;

installing the graft by drilling a canal through the femur and inserting a stem of a fixing pin guide into the canal;

driving a fixing pin through the femur to come into abutment with the stem inserted in the drilled canal in the femur and removing the fixing pin guide by withdrawing the stem from the canal;

inserting one of the plugs of boney structure into the canal and advancing the previously inserted fixing pin across the inserted plug of boney structure to secure it; and

repeating the procedure to insert the other boney plug in the tibia and to secure it with a further fixing pin.

5,192,322

IMPLANT FOR A PROSTHETIC LIGAMENT AND/OR TENDON REPLACEMENT

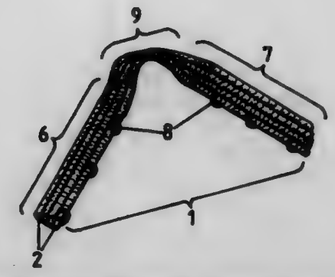
Rudolf Koch, Berlingen; Stefan Fremdiger, Bremgarten, and Hans Fluckiger, Ostwil, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur and Protek AG, Berne, both of Switzerland

Filed Dec. 3, 1990, Ser. No. 621,299

Claims priority, application Switzerland, Jan. 8, 1990, 46/90

Int. Cl.[5] A61F 2/08

U.S. Cl. 623—13 9 Claims



1. An implant for a prosthetic replacement of one of a ligament and tendon comprising

a plurality of discrete longitudinal strands disposed in side-by-side parallel relation, said strands defining a pair of axially spaced apart sub-zones, each sub-zone being folded over about a longitudinal axis, and a central zone between said sub-zones, wherein each longitudinal strand is free to move relative to each other longitudinal strand within said central zone; and

transverse filaments disposed about at least some of said strands of each sub-zone to reinforce said strands.

5,192,323

METHOD OF SURFACE HARDENING ORTHOPEDIC IMPLANT DEVICES

H. Ravindranath Shetty; Walter H. Otterberg, both of Warsaw; Jack E. Parr, North Webster, and Roy D. Crowninshield, Warsaw, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind. and Bristol-Myers Squibb Co., New York, N.Y.

Division of Ser. No. 609,269, Nov. 5, 1990. This application Jan. 27, 1991, Ser. No. 722,117

Int. Cl.[5] A61F 2/28

U.S. Cl. 623—16 2 Claims

1. An orthopedic implant having enhanced surface hardness and wear resistance properties, said implant comprising a titanium substrate, an outer titanium nitride hardened surface layer substantially free of surface roughness, and a hardened diffusion layer underneath said outer surface layer comprising a solid solution of nitrogen, oxygen and carbon, said outer layer being thinner than said diffusion layer, said implant being prepared by hardening the surface of the titanium substrate by exposing said titanium substrate to an atmosphere of substantially non-rarified, non-activated molecular nitrogen gas at a process temperature within the range of 750° F. to 1300° F. for a process time duration sufficient to achieve the hardened diffusion layer and the hardened outer surface layer, said process resulting in enhanced wear resistance properties by substantially avoiding increased surface roughness.

5,192,324

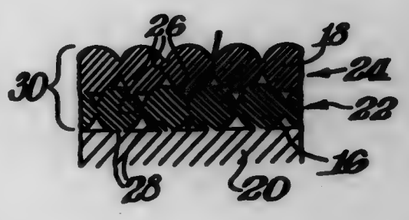
BONE PROSTHESIS WITH POROUS COATING

Robert V. Kenna, New York, N.Y., assignor to Howmedica Inc., New York, N.Y.

Continuation of Ser. No. 356,976, May 25, 1989, abandoned, which is a continuation of Ser. No. 786,978, Oct. 15, 1985, Pat. No. 4,834,756, which is a division of Ser. No. 350,130, Feb. 18, 1982, Pat. No. 4,550,448. This application Jan. 2, 1990, Ser. No. 635,394

Int. Cl.[5] A61F 2/28

U.S. Cl. 623—16 7 Claims



1. In a bone prosthesis comprising a substrate of a metallic material and a porous coating of said metallic material bonded to and extending over at least a portion of the surface of said substrate, with said porous coating consisting essentially of a multiplicity of spherical particles of said metallic material bonded together at their points of contact, and with said particles defining between themselves a plurality of connected interstitial pores extending through said porous coating to said surface of said substrate,

the improvement wherein said porous coating consists essentially of first and second layers of said particles, and no additional layers of said particles, with the particles in said first layer being bonded to said substrate and said first layer being bonded to said second layer, the particles in said first and second layers being distributed upon said substrate and said first layer, respectively, at substantially uniform surface densities and the particles in said first layer being of substantially uniform size, the particles in said second layer being of substantially uniform size and the particles in said first layer being of substantially the same size as the particles in said second layer, and the size of said particles and their distribution in each of said layers are such that a strong and fatigue-resistant fixation of said prosthesis to the living bone of a patient may be achieved by tissue ingrowth into said porous coating.

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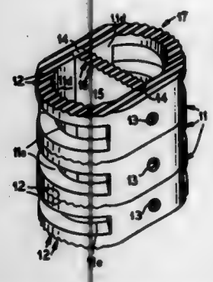
5,192,325
CERAMIC IMPLANT
Naoto Kijima, Yokohama, and Yasuo Oguri, Tokyo, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
Division of Ser. No. 596,954, Oct. 15, 1990, which is a division of Ser. No. 307,640, Feb. 8, 1989, Pat. No. 4,983,182. This application Jun. 24, 1992, Ser. No. 903,327
Claims priority, application Japan, Feb. 8, 1988, 63-27027; Feb. 8, 1988, 63-27029; Feb. 8, 1988, 63-27031
Int. Cl.[5] A61F *2/28*
U.S. Cl. 623—16 7 Claims

1. A ceramic implant comprising a sintered body of zirconia and a coating layer of a porous sintered body of a mixture comprising α-tricalcium phosphate and zirconia, formed on the surface of the sintered body of zirconia.

5,192,326
HYDROGEL BEAD INTERVERTEBRAL DISC NUCLEUS
Qi-Bin Bao, Livingston, and Paul A. Higham, Ringwood, both of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 633,711, Dec. 21, 1990, Pat. No. 5,047,055. This application Sep. 9, 1991, Ser. No. 756,957
Int. Cl.[5] A61F *2/44*
U.S. Cl. 623—17 26 Claims

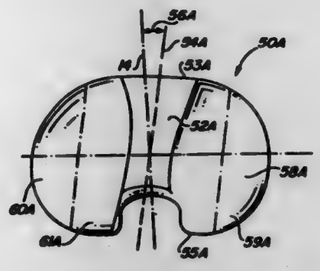
1. A prosthetic nucleus for implanting in the disc space after the removal of the degenerated or damaged nucleus of an intervertebral disc comprising:
a multiplicity of hydrogel beads having a water content of at least 30%; and
a flexible semi-permeable cover surrounding said hydrogel beads.

5,192,327
SURGICAL PROSTHETIC IMPLANT FOR VERTEBRAE
John W. Brantigan, 328 Overlook Brook Ct., Chagrin Falls, Ohio 44022
Filed Mar. 22, 1991, Ser. No. 673,474
Int. Cl.[5] A61F *2/44*
U.S. Cl. 623—17 14 Claims



1. A prosthetic device to integrate with and support vertebrae in a vertebral column which comprises a plurality of inert generally oval shaped rings conforming in shape and size with hard end plates of vertebrae on which it is to be seated, each of said rings having ridged top and bottom faces adapted to selectively interdigitate with surfaces of adjacent rings to form a stack and having peaks to bite into the end plates of adjoining vertebrae together with valleys between the peaks to receive bone ingrowth from the vertebrae for fusing the vertebrae together through the rings.

5,192,328
KNEE JOINT REPLACEMENT APPARATUS
Thomas F. Winters, 2031 Venetian Way, Winter Park, Fla. 32789
Division of Ser. No. 414,804, Sep. 29, 1989, Pat. No. 5,059,216. This application Oct. 18, 1991, Ser. No. 778,704
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 5 Claims



1. Apparatus for replacing a removed portion of the upper end of a human tibia, the apparatus comprising:

a bearing member, the bearing member, the bearing member having a central longitudinal prominence emulating the natural eminence of the tibia and outward, low friction bearing surfaces on either side of the central prominence for engaging opposing bearing surfaces of the femur and thereby function as the upper end of the tibia; and wherein the bearing member is structured such that, upon implantation,

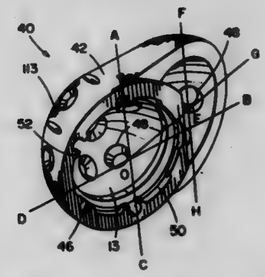
the direction of the central prominence is rotated at an angle on the order of between 3°–15° with respect to the longitudinal direction across the cut of the tibia at the level of the removed portion.

5,192,329
OBLONG ACETABULAR CUP
Michael J. Christie, Nashville, Tenn.; Alfred F. DeCarlo, Jr., Stamford, Conn.; Timothy McTighe, Chagrin Falls, Ohio, and Douglas G. Noiles, New Canaan, Conn., assignors to Joint Medical Products Corporation, Stamford, Conn.
Filed Mar. 7, 1991, Ser. No. 665,952
Int. Cl.[5] A61F *2/31*
U.S. Cl. 623—22 19 Claims

1. An acetabular cup for implantation in a patient's pelvis comprising a body having:

(a) a first outer surface for engagement with bone,
(b) a second outer surface having an overall oblong configuration which defines a longitudinal plane and a longitudinal axis, and
(c) a cavity formed in the body for receiving a bearing element,

said cavity having an opening formed in a portion of said second outer surface which defines a first plane, said first plane forming an acute angle with said longitudinal plane in a direction along the longitudinal axis such that when the acetabular cup is implanted in the patient's pelvis said first plane is more adducted than the longitudinal plane.



5,192,330
ORTHOPEDIC DEVICE OF BIOCOMPATIBLE POLYMER WITH ORIENTED FIBER REINFORCEMENT
Fu-Kuo Chang, Palo Alto, Calif.; Kenneth Reifsnider, Blacksburg, Va.; James A. Davidson, Germantown, Tenn., and Frederick S. Georgette, Troy, Mich., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.
Division of Ser. No. 5,091, Jan. 20, 1987. This application Aug. 6, 1991, Ser. No. 740,723
Int. Cl.[5] A61F *2/32*
U.S. Cl. 623—22 66 Claims

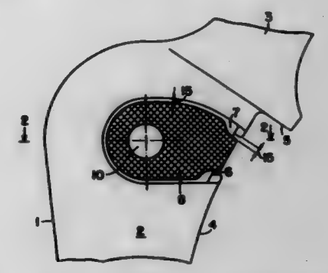
1. An orthopaedic device, for human implantation having improved axial bending and torque bearing properties, said device comprising:

a curved elongated body having an outer surface and a longitudinal axis, the body comprising a matrix of biocompatible polymeric material defining the shape of the body; and

reinforcing plies embedded within said matrix, said plies being curved in approximate correspondence with the curvature of the device and said plies being formed from fibers, said fibers being continuous and generally parallel to each other within each ply;

wherein a majority of the plies are oriented at a non-zero angle to the longitudinal axis of the curved elongated body.

5,192,331
SHANK FOR A FEMUR HEAD PROSTHESIS
Lorenzo Spotorno, Finale Ligure, Italy, and Otto Frey, Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Oct. 30, 1991, Ser. No. 784,895
Claims priority, application Switzerland, Nov. 16, 1990, 03645/90
Int. Cl.[5] A61F *2/36*
U.S. Cl. 623—23 27 Claims



17. A shank for a femur head prosthesis comprising
a single piece body for implanting in a femur;
a neck extending from one end of said body;
a collar disposed between said body and said neck, said collar having a base for bearing on cortical tissue of a femur;
a cavity in said shank, said cavity extending from a medial side of said shank towards a lateral side of said shank with an opening in said medial side;
an elastic filler in said cavity for damping movements of said neck relative to said shank body; and
a sheet covering disposed over said filler to maintain said filler in said cavity during compression of said filler in response to bending of said neck relative to said body.

5,192,332

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5,192,332

COSMETIC TEMPORARY COLORING COMPOSITIONS CONTAINING PROTEIN DERIVATIVES

Gérard Lang, Saint-Gratien; Serge Forestier, Claye-Souilly; Gérard Malle, Villiers-Sur-Marin, and Alex Jusino, Aulnay-Sous-Bois, all of France, assignors to L'Oreal, Paris, France

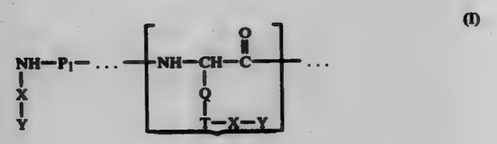
Continuation-in-part of Ser. No. 447,532, Dec. 7, 1989, abandoned. This application Oct. 7, 1991, Ser. No. 771,478

Claims priority, application Luxembourg, Oct. 14, 1983, 85 047

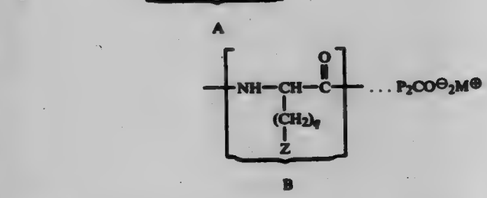
Int. Cl.[5] A61K 7/13

U.S. Cl. 8—405 8 Claims

1. A process for the temporary coloring of human hair, nails or the skin comprising applying thereto in an amount effective to color said human hair, nails or skin a composition comprising a solution in water, a lower mono-alcohol or polyol or an aqueous alcoholic mixture wherein the alcohol is present in an amount ranging from 0.5 to 50 percent by weight of protein derivative having a molecular weight of from 500 to 50,000 and having the formula:



(I)



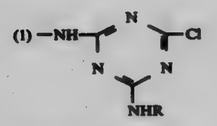
A

B

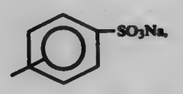
wherein

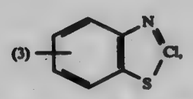
Y is a residue of a molecule of dye of formula YX' selected from the group consisting of CI 13245, CI 14824, CI 16202, CI 17865, CI 17756, CI 17757, CI 17910, CI 18096, CI 18097, CI 18105, CI 18156, CI 18157, CI 18159, CI 18852, CI 18972, CI 18990, CI 19036, CI 61200, CI 61210, CI 61211, CI 74460 and CI 74459,

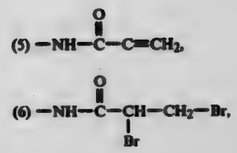
wherein X' is



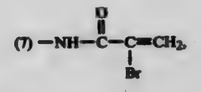
wherein R is



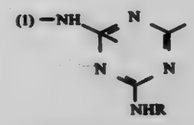




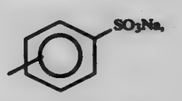
or

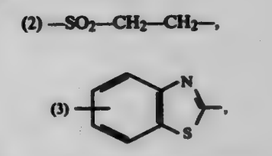


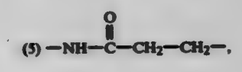
X is:



wherein R is:







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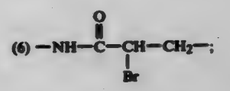


P_1 and P_2 are non-acylated chains of said protein which are not modified chemically by addition or nucleophilic substitution, said protein being selected from the group consisting of:

(1) a protein of animal origin selected from the group consisting of keratin, gelatin, egg albumin, blood serum albumin, casein and lactalbumin,

(2) a protein of vegetable origin selected from the group consisting of soya, groundnut and cotton seed, and

(3) a hydrolyzate of the protein defined in (1) and (2),

M is hydrogen, alkali metal, magnesium or $N^+(R_2)_4$, wherein each R_2 is, independently, hydrogen, alkyl having 1–4 carbon atoms or hydroxyalkyl having 1–4 carbon atoms,

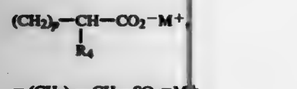
Q is an alkyl, aryl or aralkyl group of side chain of amino acid of unit A of said protein derivative,

T is O, NH or S,

Z is:

(1) $SO_3^-M^+$, wherein M has the meaning given above,

(2) SR_3, wherein
R_3 is



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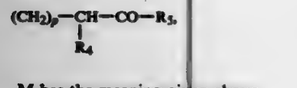
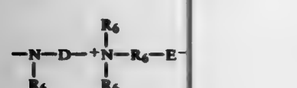


M has the meaning given above,
p is 0 or an integer from 1–5,
R_4 is hydrogen or alkyl having 1–4 carbon atoms and
R_5 is



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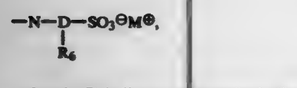
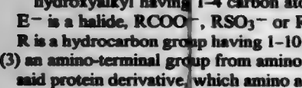


wherein D is linear or branched alkylene having 2–10 carbon atoms,
M has the meaning given above and each R_6 is, independently, hydrogen, alkyl having 1–4 carbon atoms, hydroxyalkyl having 1–4 carbon atoms and
E^- is a halide, $RCOO^-$, RSO_3^- or RSO_4^-, wherein R is a hydrocarbon group having 1–10 carbon atoms, or
(3) an amino-terminal group from amino acid of unit B of said protein derivative, which amino acid is basic and is unsubstituted or mono- or disubstituted on the amino group with an R_3 group, wherein
R_3 is



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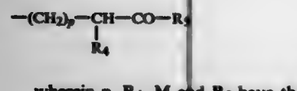
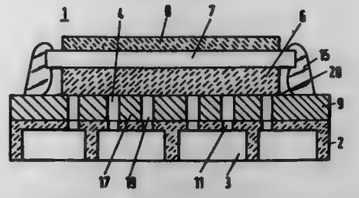


wherein p, R_4, M and R_5 have the meanings given above, with the proviso that Z is only $SO_3^-M^+$ or SR_3 when the amino acid of the unit B contains cysteine,
q is an integer from 1 to 5 with the proviso that when Z is $SO_3^-M^+$ or SR_3, q is 1 and the amino acid of the unit B contains cysteine,
the units A make up 1 to 70 percent by weight of said protein derivative,
the units B make up 0 to 15 percent by weight of said protein derivative, and
said protein derivative is present in an amount ranging from 0.005 to 10 percent by weight based on the total weight of said composition.

5,192,333
AQUEOUS PROGRESSIVE HAIR COLORANT HAVING SOLUBLE SULFUR SOURCE AND AMPHOTERIC SURFACTANT
Herbert Lapidus, Ridgefield, Conn., assignor to Combe Incorporated, White Plains, N.Y.
Continuation of Ser. No. 576,787, Sep. 4, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 834,387
Int. Cl.[5] A61K *7/13*
U.S. Cl. 8—405 28 Claims

1. A clear, aqueous, shelf-stable composition for dyeing human hair, comprising:
a soluble salt of a metal selected from the group consisting of lead and bismuth;
a soluble source of sulfur, said salt of a metal and said source of sulfur being in respective amounts sufficient to cause the gradual deposit by said unit of a metal, in the presence of said source of sulfur, of insoluble metallic dye on the cuticle and within the shaft of human hair;
an amphoteric surfactant in an amount sufficient to form a complex both with said salt of a metal and with said source of sulfur; and
a pH controller that controls the pH of the composition to be within the range of about 7.5 to about 11.0, thereby producing a clear, shelf-stable composition.

5,192,334
METHOD FOR MECHANICALLY CONNECTING HIGH-TEMPERATURE FUEL CELLS TO A FUEL CELL SUPPORT
Franz J. Rohr, Abtsteinach; Andreas Belzner, Heidelberg, and Heinz Stadelmann, Schrobenhausen, all of Fed. Rep. of Germany, assignors to ABB Patent GmbH, Mannheim, Fed. Rep. of Germany
Filed May 4, 1992, Ser. No. 877,860
Claims priority, application Fed. Rep. of Germany, May 4, 1991, 4114644
Int. Cl.[5] H01M *8/00*
U.S. Cl. 29—623.5 12 Claims



1. A method for producing a gas-tight mechanical connection between at least one prefabricated fuel cell having a fixed electrolyte disk with opposed main surfaces and anode and cathode electrodes applied to the opposed main surfaces, and a ceramic fuel cell support on which the at least one fuel cell is disposed, which comprises:
a) applying a nickel layer to the fuel cell support by screen printing, for mechanically connecting the fuel cell to the support, for tapping current from the cathode electrode and as a current connection for an electrical connection to further fuel cells;
b) laying the fuel cell on the freshly printed nickel layer on the fuel cell support to form a fuel cell system; and
c) sintering the fuel cell system with the imposition of a slight mechanical pressure upon the fuel cell, by initially performing the sintering for approximately one hour in air at a temperature of approximately 400° C. and subsequently in a nitrogen atmosphere at a temperature of approximately 1150° C.

5,192,335
FUEL ADDITIVE COMPOSITIONS CONTAINING POLY(OXYALKYLENE) AMINES AND POLYALKYL HYDROXYAROMATICS
Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.
Filed Mar. 20, 1992, Ser. No. 854,172
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—387 23 Claims

1. A fuel additive composition comprising:
(a) a poly(oxyalkylene) amine having at least one basic nitrogen atom and a sufficient number of oxyalkylene units to render the poly(oxyalkylene) amine soluble in hydrocarbons boiling in the gasoline or diesel range; and
(b) a polyalkyl hydroxyaromatic compound or salt thereof wherein the polyalkyl group has sufficient molecular weight and carbon chain length to render the polyalkyl hydroxyaromatic compound soluble in hydrocarbons boiling in the gasoline or diesel range.

5,192,336
ANTI-FOAM DIESEL FUEL
Rupinder S. Grewal, Sugar Land, Tex., assignor to Nalco Chemical Company, Naperville, Ill.
Filed Dec. 4, 1991, Ser. No. 802,157
Int. Cl.[5] C10L *5/00*
U.S. Cl. 44—418 2 Claims

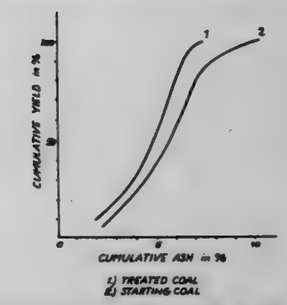
1. A hydrocarbon fuel composition, wherein said hydrocarbon fuel is a diesel fuel including from 1–50 ppm of a bis amide selected from the group consisting of an ethylene bis stearamide, an ethylene bis oleamide, an ethylene bis lauramide, an ethylene bis palmitamide, and an ethylene bis myristamide.

5,192,337
AGENT FOR THE SUPPRESSION OF COAL DUST
Mark T. Wajer, Baltimore, Md.; David M. Smith, Kearneysville, W. Va., and Vernon D. Miles, Columbia, Md., assignors to Martin Marietta Magnesia Specialties Inc., Bethesda, Md.
Filed Jul. 10, 1991, Ser. No. 727,776
Int. Cl.[5] C10L *10/00*
U.S. Cl. 44—602 15 Claims

1. A dust control agent comprising from about 20 to about 99 weight percent blending oil selected from the group consisting of reclaimed motor oil, oil obtained from petroleum crude, animal oil, vegetable oil, mineral oil, and combinations thereof, and from about 1 to about 80 weight percent petroleum resin obtained from the deresination of cylinder stock.

5,192,338
COAL ASH MODIFICATION AND REDUCTION
Allan B. Waugh, Sutherland, and Keith M. Bowling, Turramurra, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia
Continuation of Ser. No. 478,005, May 1, 1990, abandoned. This application Apr. 6, 1992, Ser. No. 863,535
Claims priority, application Australia, Sep. 3, 1987, PI4128
Int. Cl.[5] C10L *9/02*
U.S. Cl. 44—627 11 Claims

1. A process for the benefication of a solid carbonaceous material which contains at least one mineral consisting essentially of:
(a) forming an aqueous solution of an effective amount of a compound selected form the group consisting of citric acid, acetic acid, ascorbic acid, oxalic acid, formic acid, succinic acid, adipic acid, ethylenediaminetetraacetic acid, a disodium salt of ethylenediaminetetraacetic acid, 8-hydroxyquinoline, mercaptoethanol, sorbitol, mannitol, threitol, sucrose, maltose, dextrose, lactose, starch, glycogen, cellulose, a cellulose derivative and galactose, which compound will react with the at least one mineral and with the provision that in the case of citric acid, the effective amount of the citric acid in this aqueous solution is 3 molar;
(b) contacting said carbonaceous material with said at least one solution at a temperature less than the boiling point of said solution for a sufficient time to allow the compound to react with the at least one mineral to selectively remove or chemically modify at least one mineral contained in



said carbonaceous material, said modification resulting in facilitated removal of said mineral by washing in step (c) or resulting in altering ashforming properties of said carbonaceous material to yield improved ash characteristics; and
(c) subsequently washing the carbonaceous material with water.

5,192,339
ABRASIVE GRAIN AND METHOD FOR MANUFACTURING THE SAME
Mitsuru Hasegawa; Tadashi Hiraiwa, and Tetsuo Hatanaka, all of Shiojiri, Japan, assignors to Showa Denko K.K., Tokyo, Japan
Continuation of Ser. No. 474,041, Apr. 25, 1990. This application Mar. 6, 1992, Ser. No. 845,828
Claims priority, application Japan, Aug. 25, 1988, 63-211087
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—309 7 Claims

1. An abrasive grain comprising alpha-Al_2O_3 crystal particles substantially smaller than 0.5 microns, solidly dissolved with 0.005 to 2.23 mol % of at least one of Ti, Mn, V, Ga, Zn, and Rh added in the form of particles having a size of less than 2 microns, wherein the a-axis length of the hexagonal unit cell of the alpha-Al_2O_3 is 4.75892 to 4.76340 angstroms when measured by a powder x-ray diffraction and having a density greater than 90% of the theoretical value.

5,192,340
HOLLOW FIBER FILTER CLEANING SYSTEM AND MORE PARTICULARLY TO THE CONTROL OF EMISSIONS FROM SOLVENT CLEANING EQUIPMENT
David C. H. Grant, Selbyville, Del.; Randolph H. Watkins, Wonder Lake, Ill.; Robert M. Shuga, Gurnee, Ill.; Steven J. Wurgler, Cary, Ill.; Gregory D. Mills, Mountain Home, Ark.; Dennis C. Berry, Woodstock, and Jerry D. Fisher, McHenry, both of Ill., assignors to Baxter International, Inc.
Continuation-in-part of Ser. No. 581,020, Sep. 12, 1990, Pat. No. 5,106,404. This application Feb. 21, 1992, Ser. No. 839,965
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—23 18 Claims

1. A method for controlling atmospheric emission of volatile fluids used in cleaning a hollow fiber dialyzer by contact with a fluid composition comprised of volatile constituents, comprising the steps of:
(a) positioning the dialyzer in a chamber capable of maintaining pressure or vacuum and a selected temperature;

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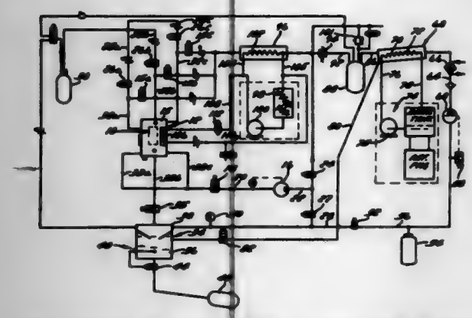
(b) evacuating said chamber to reduce ambient air contamination, discharging chamber contents to atmosphere;
(c) first flushing said chamber with a fluid composition comprised of volatile constituents;
(d) recovering said fluid composition following said first flushing step;
(e) flushing said chamber with a drying fluid derived form the recovered fluid; and
(f) subsequently, evacuating said chamber in one or more iterations, discharging chamber contents within the system and breaking the final vacuum from atmosphere.

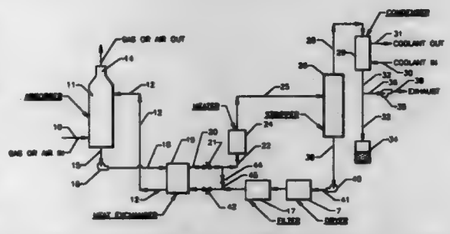
7. An emission control system for a fluid composition comprised of volatile constituents used to clean a hollow fiber filter or capillary flow dialyzer comprising:
(a) a housing having a chamber for receiving the dialyzer to be cleaned by contact with or exposure to a volatile fluid;



(b) control means for establishing a desired environment in said chamber, in the dialyzer and in the fibers including means for establishing a desired pressure within said chamber, dialyzer and fibers and means for introducing the fluid composition into said chamber, dialyzer, and fibers;
(c) separator means operatively associated with said chamber for separating gas and liquid components of said fluid composition;
(d) stripping means communicating with said separator means for fractionating the lower boiling point volatile constituents form said gas component, to return the higher boiling point volatiles form said gas component to the fluid phase and yield a stripped or solvent humidified gas; and
(e) means for delivering said stripped gas to said chamber, dialyzer and fibers for service as a drying agent.

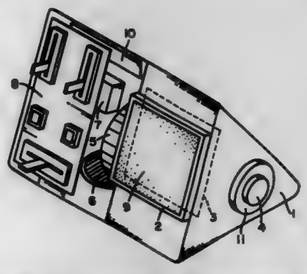
5,192,341
SELECTED SOLVENT COMPOSITION AND PROCESS EMPLOYING SAME
Arthur J. Elsler, Brooklyn, Ohio, assignor to Sandoz Ltd., Basel, Switzerland
Continuation of Ser. No. 623,486, Dec. 4, 1990, abandoned, which is a continuation of Ser. No. 539,502, Jun. 18, 1990, abandoned, which is a continuation of Ser. No. 432,242, Nov. 6, 1989, abandoned, which is a continuation of Ser. No. 123,227, Nov. 20, 1987, abandoned, which is a continuation of Ser. No. 24,850, Mar. 13, 1987, Pat. No. 4,708,721, which is a continuation of Ser. No. 677,233, Dec. 3, 1984, abandoned. This application Oct. 25, 1991, Ser. No. 782,936
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—68 5 Claims

1. A method of removing a pollutant or other material from a gaseous stream containing the same which comprises contacting said gaseous stream with a liquid selective solvent composition consisting essentially of at least two of the selective solvents selected from the group consisting of diethyl phthalate, dioctyl phthalate, dioctyl adipate, acetyltributyl citrate and diisohexyl phthalte, said composition having a viscosity of less than about 30 centipoises at a temperature of



about 77° F. and removing the resulting treated gaseous stream now having a reduced amount of said pollutant therein.

5,192,342
APPARATUS FOR ENHANCING THE ENVIRONMENTAL QUALITY OF WORK SPACES
Robert A. Baron, 27 Sunnyside Rd., Scotia, N.Y. 12302, and Frederick Haber, Box 128, Old Chatham, N.Y. 12136
Filed Apr. 15, 1992, Ser. No. 868,650
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—97 13 Claims

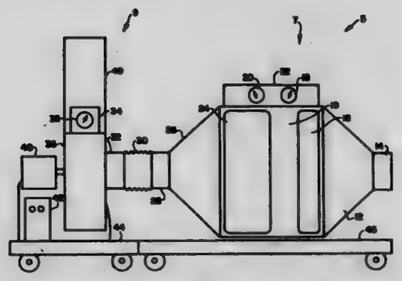


12. A method for enhancing the environment quality of a workspace comprising in combination:
(a) lowering the level of particulate matter in a body of air within said workspace below 10^4 particles per liter;
(b) introducing a fragrance into said air in said workspace; and
(c) introducing broad band noise into said workspace, said broad band noise comprising sound waves in the range from 80 Hz to 10 KHz in frequency and 10 to 70 dB in strength and having no outstanding pure tones.

5,192,343
HIGH EFFICIENCY PARTICULATE AIR FILTER VENTILATION SYSTEM
Harold G. Henry, 41 Ponderosa La., Palmyra, Va. 22963
Filed Nov. 1, 1991, Ser. No. 786,762
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—213 10 Claims

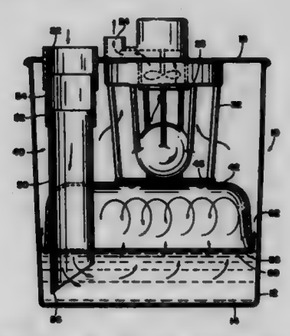
1. An apparatus for ventilating an area, said apparatus comprising:
a housing having an inlet and an outlet;
a fan for moving air through the housing;
first monitoring means for monitoring a first static pressure across said fan;
first filter means mounted in said housing for prefiltering the air moving through the housing;
second monitoring means for monitoring a second static pressure across said first filter means;

second filter means mounted in said housing for filtering the air filtered by said first filter means;
third monitoring means for monitoring a third static pressure across said second filter means; and



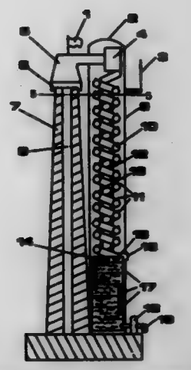
means for varying a volume of air flowing through said housing and said fan;
wherein said varying means comprises a damper mounted in an outlet passage from said fan.

5,192,344
WET FILTER VACUUM CLEANER
Ronald J. House, Bixby, Okla., assignor to Andre E. Thera Bacon and Sydney J. Thera Bacon, both of Bixby, Okla., a part interest
Filed Sep. 10, 1991, Ser. No. 757,661
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—216 15 Claims



1. In combination with a vacuum cleaner having a substantially cylindrical tank with a bottom, a cover pneumatically closing the tank to define a vacuum chamber, an eccentric inlet through the cover at a radius from the vertical axis of the tank, an outlet through the cover and water therein, apparatus comprising:
a convex baffle having a rim of diameter less than the diameter of the tank, an eccentric aperture disposed therethrough at said radius from an axis of said baffle and a lower edge disposed slightly above the water;
a tube extending snugly through said aperture and having a lower opening at an angle other than 90 degrees in relation to a longitudinal axis thereof facing substantially toward said axis of said baffle and entirely disposed slightly beneath the water; and
means disposed on an upper end of said tube for connecting said tube to the inlet with said baffle substantially concentrically mounted in the tank with said aperture vertically aligned with the inlet.

5,192,345
SYSTEM AND PROCESS FOR THE PURIFICATION TREATMENT OF SMOKES, DUSTS AND EXHAUST GASES AFTER COMBUSTION
Luca Pala, via Capo delle arnai, 54, 00122 Ostia Lido, Rome, Italy
PCT No. PCT/IT90/00034, § 371 Date Jul. 30, 1991, § 102(e) Date Jul. 30, 1991, PCT Pub. No. WO91/09663, PCT Pub. Date Jul. 11, 1991
PCT Filed Mar. 29, 1990, Ser. No. 730,917
Claims priority, application Italy, Dec. 22, 1989, 48690 A/89
Int. Cl.[5] B01D *47/12*
U.S. Cl. 55—223 10 Claims



1. A system for purifying pollutants contained in post combustion gases travelling out of an exhaust conduit, comprising:
a cap, said cap being positioned so as to direct the post combustion gases into said system;
a suction fan for drawing the post combustion gases through said cap and further into said system;
a serpentine treatment tube having an upstream end and a downstream end, the upstream end of said serpentine treatment tube being in communication with the post combustion gases exiting said cap;
nozzles spaced along said treatment tube between the first and second ends of said treatment tube;
means for introducing water and air to said treatment tube such that water is nebulized by said nozzles and pollutants are separated from the post combustion gases and combined with the water so as to form sewage and such that sewage flow from the upstream end of said treatment tube to the downstream end is facilitated; and
means for storing the sewage and separating the water and the pollutants contained in the sewage, said means for storing and separating being in fluid communication with the downstream end of said treatment tube out through which the purified exhaust gases exit, and wherein the exhaust conduit is an automobile exhaust conduit and said cap includes an inlet tube that is dimensioned and arranged so as to direct automobile exhaust into said system, and wherein said means for storing and separating includes a recycling water conduit and a first water storage tank, said recycling water conduit extending from the downstream end of said treatment tube and opening into said first water storage tank, and
said system further comprising a sewage line, a filter and an additional water storage tank in fluid communication with said first water storage tank through said filter, said water storage tanks each including a sloped bottom and a discharge tube extending from the sloped bottom and in communication with said sewage line positioned below said water storage tanks.

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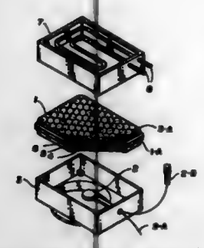
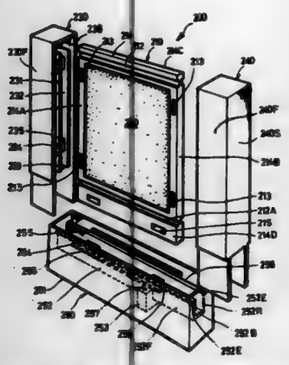
5,192,346
AIR PURIFIER PLEATED FILTER TO STOP POLLUTION FOR PASSENGER INSIDE OF THE MOTOR VEHICLE
Theddeus Kowalczyk, 8163 Lochdale, Dearborn Heights, Mich. 48127
Filed Jul. 22, 1992, Ser. No. 917,855
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—269 5 Claims



1. An air purification filter for passenger compartment of a motor vehicle, said filter comprising
a housing having an inlet and an outlet disposed opposite each other to define an essentially straight direction of fluid flow therebetween,
a first flat pleated layer of filtering material with a sufficient amount of activated carbon to remove at least partly pollutants from air passing through the filter,
a second flat pleated layer of a particulate filtering material in stacked relationship with said first flat pleated layer,
a heater located upstream of said filtering layers for raising the temperature of air entering said filtering layers,
wherein said first pleated flat layer and said second pleated flat layer are disposed essentially perpendicularly to the direction of fluid flow between the inlet and the outlet.

5,192,347
FILTER ASSEMBLY
Joung C. Lee, Seongyo, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea
Filed Dec. 10, 1991, Ser. No. 804,596
Claims priority, application Rep. of Korea, Dec. 10, 1990, 90-19435
Int. Cl.[5] B01D *29/05, 29/44*
U.S. Cl. 55—359 22 Claims



1. An air filter assembly adapted to be removably mounted in an air treating unit, comprising:
housing means having sides defining a space for receiving a filter panel, and
cover means mounted in said housing means for displacement between a retracted position wherein said cover means is disposed in a contracted condition within said housing and an extended position wherein said cover means is disposed in an expanded condition within said housing, said cover means being disposed adjacent one of said sides when in said contracted position to enable said filter to remove dust from an air flow, and being displaceable from said contracted position to said expanded position wherein it extends across at least one face of the filter panel to resist the escape of dust from the filter panel to the surrounding environment during handling of said air filter assembly.

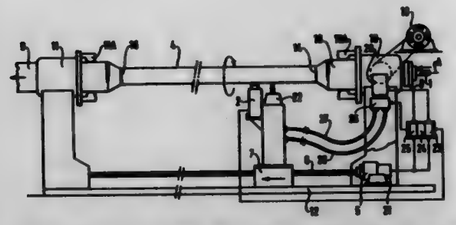
5,192,348
DIRECTIONAL AIR DIFFUSER PANEL FOR CLEAN ROOM VENTILATION SYSTEM
Craig S. Ludwig, Portland, Oreg., assignor to Brod & McClung-Pace Co., Portland, Oreg.
Filed Aug. 21, 1991, Ser. No. 748,229
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—385.2 15 Claims

1. A clean room air diffusion system for controlling an airflow, the system comprising:
a support grid having grid elements defining a panel space for transmitting the airflow, and defining a dead space below the grid elements; and
a diffuser panel attached to the grid in registration with the panel space having a central region and a peripheral region, the central region defining a plurality of perforations, the aggregate area of the perforations being a first fraction of the total area of the central region, the peripheral region defining a plurality of openings, the aggregate area of the openings being a second fraction of the total area of the peripheral region, the second fraction being greater than the first fraction, in that the peripheral region is more perforated per unit area than the central region, thereby to fill in the dead space below the grid.

5,192,349
FILTER ELEMENT FOR SEPARATING DUSTS FROM GASES
Ekkehard Weber, Essen, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed May 7, 1990, Ser. No. 519,887
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915187
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—522 5 Claims

1. A filter element for separating dust from a gas which element comprises a thin walled structure having a wall thickness of 0.05 to 2 mm and a front surface having a plurality of substantially regularly arranged holes of a non-circular cross-section with a hydraulic diameter of 0.01 to 1 mm wherein the area of the holes is 3 to 25% of the front surface of the filter element, said element being of a metal, alloy or plastic.

5,192,350
METHOD OF FLAME FINISHING OPTICAL FIBER PREFORMS
Christian Le Sergent, Marcoussis, France, assignor to Alcatel Fibres Optiques, Bezons Cedex, France
Filed Feb. 1, 1991, Ser. No. 648,939
Claims priority, application France, Feb. 2, 1990, 90 01237
Int. Cl.[5] C03B *37/025*
U.S. Cl. 65—3.11 5 Claims

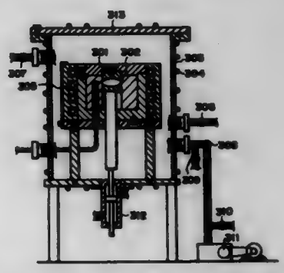


1. A method of correcting the exterior surface of an optical fiber, solid cylindrical preform constituted by a cylindrical piece of glass made of silica and having an axis (A), comprising the following steps:
installing said piece of silica glass on a glassmaker's lathe, with said axis (A) extending lengthwise and with the exterior surface thereof substantially circularly cylindrical about said axis (A), said lathe including rotation means for rotating said piece of silica glass about said axis, a carriage for carrying an oxygen-hydrogen torch facing said glass piece exterior surface to flame heat an elementary area of said exterior surface, and displacement means for displacing said carriage longitudinally; and
effecting multiple heating passes of said carriage and imparting a speed of rotation to said piece of glass and displacing said torch at a longitudinal speed along the length of said piece of glass, and heating said piece by applying a flame of said oxygen-hydrogen torch to the exterior surface of said cylindrical piece of silica glass while controlling the speed of rotation of said piece of glass, the longitudinal speed of said carriage and the heating power of said torch;
the improvement further comprising the step of performing an opto-geometrical measurement pass after said installation operation by means of a measurement assembly which includes at least one measurement sensor providing a set of measurement signals in which the signals from said assembly are associated with respective elementary areas in a set of such areas covering said exterior surface of said piece of glass, and are representative of optical and/or geometrical defects presented by said piece of glass in said elementary surface areas as outside projection portions of said silica glass, and wherein said method includes, for at least one of said multiple heating passes, effecting a correction heating pass subsequent to the provision of said measurement signals during said opto-geometrical measurement pass and evaporating said outside projection portions of said silica glass by applying said oxygen-hydrogen torch flame to the surface of said glass piece;
at least one of said heating parameters constituting a correction parameter, and said method further comprises controlling said correction parameter at each instant during said correction heating pass as a function of said measurement signals associated with said one elementary area being heated at said instant by said torch to correct said optical and/or geometrical defect presented by said piece of silica glass in said one area by flame vaporization removal of the excess glass from the surface of said glass piece.

5,192,351
PRODUCTION OF DEHYDROXYLATED GLASS
Akshay Mathur, and Lenwood D. Pye, both of Alfred, N.Y., assignors to Alfred University, Alfred, N.Y.
Filed Dec. 17, 1991, Ser. No. 812,130
Int. Cl.[5] C03B *37/016*
U.S. Cl. 65—18.1 24 Claims

1. A process of preparing a substantially dehydroxylated glass comprising:
impregnating a dry porous silica gel with a quanidine compound, urea, or a mixture thereof in an organic solvent which the quanidine compound, urea, or mixture thereof is soluble in and
sintering the impregnated gel in a non-oxidizing atmosphere to form a substantially dehydroxylated silica glass.

5,192,352
MOLDING METHOD USING GLASS BLANK
Tetsuo Kawahara, Urawa, and Shuji Murakami, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 17, 1991, Ser. No. 731,319
Claims priority, application Japan, Jul. 24, 1990, 2-194031
Int. Cl.[5] C03C *25/02;* C03B *11/08*
U.S. Cl. 65—60.53 4 Claims



1. A molding method for molding a glass lens comprising the steps of:
preparing a core glass having a predetermined shape;
covering an evaporation glass upon aid core glass, said evaporation glass containing, in weight %, SiO_2:70 to 90, Na_2O: no more than 3, Al_2O_3: no more than 3, B_2O_3: the remaining %, wherein a thickness of a surface cover layer of said evaporation glass is in the range of 50 A to 500 A; and
molding said core glass covered by said evaporation glass, wherein said core glass is heated up to a molding temperature and the heated core glass is pressed, thereby being molded to a less shape.

5,192,353
METHOD FOR PRESS MOLDING NEAR NET-SHAPE GLASS ARTICLES
Jackson P. Trumbelmas, Painted Post, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Apr. 9, 1991, Ser. No. 682,556
Int. Cl.[5] C03B *11/12*
U.S. Cl. 65—66 3 Claims

1. A method for press molding a near net-shape glass article utilizing a mold having receiving and opposing molding surfaces, which comprises the steps of:
a) preheating said receiving and opposing molding surfaces to different predetermined preheat temperature, said predetermined preheat temperature of said receiving surface being greater than said predetermined preheat temperature of said opposing molding surface;
b) maintaining, within a tolerance of 5° C., said predeter-

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mined preheat temperature of said receiving molding surface;

c) maintaining, within a tolerance of 5° C., said predetermined preheat temperature of said opposing molding surface;

d) delivering to said receiving molding surface a charge of molten glass of a predetermined volume to form a glass article of desired shape and dimensions;

e) bringing said receiving and opposing molding surfaces of said mold into close proximity with each other;

f) pressing said charge for a press time sufficient to symmetrically transfer enough heat from said charge of molten glass such that the temperature of the molding surfaces and said glass charge are all nearly simultaneously made nearly equal and are below said glass charge's softening point thereby forming said glass article from said glass charge; and

g) removing said glass article from said receiving molding surface.

5,192,354

SOIL SUBSTITUTE

Christopher J. Drysdale, Berwick, and David G. Nichols, Devon Meadows, both of Australia, assignors to Debco Pty. Ltd., Australia

Filed Feb. 22, 1990, Ser. No. 482,950

Claims priority, application Australia, Feb. 24, 1989, PJ2929/89

Int. Cl.[5] C05F *9/04, 11/02*

U.S. Cl. 71—9 6 Claims

1. A method for making a soil substitute comprising intimately mixing by volume from 50 to 70% of shredded treebark particles, from 10 to 40% of quarry stone particles and from 5 to 25% of silica sand particles to form a mixture and thereafter composting the shredded treebark particles while in the mixture; the quarry stone particles comprising relatively coarse aggregate having a range of particle sizes up to about 9.5 mm and relatively fine aggregate having a range of particle sizes up to about 6.7 mm; and the silica sand particles comprising relatively coarse and fine sand aggregates, a major proportion of the coarse sand particles falling within a size range of from 300 microns to 2.36 mm and a major proportion of the fine sand particles falling within a size range of from 75 microns to 1.18 mm.

5,192,355

MANUFACTURING AND USING NITROGEN FERTILIZER SOLUTIONS ON A FARM

John A. Eastin, Lincoln, Nebr., assignor to Kanterter Products, Inc., Lincoln, Nebr.

Division of Ser. No. 691,742, Jan. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 507,166, Jun. 23, 1983, Pat. No. 4,511,389, which is a division of Ser. No. 379,466, May 19, 1982, Pat. No. 4,435,201, which is a continuation-in-part of Ser. No. 100,825, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 824,289, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 728,788, Oct. 19, 1976, abandoned, which is a division of Ser. No. 581,050, May 27, 1975, abandoned. This application Jan. 27, 1987, Ser. No. 7,115

Int. Cl.[5] C05C *3/00, 5/00*

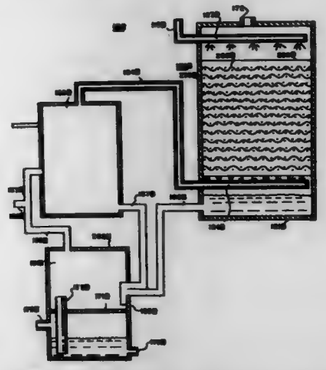
U.S. Cl. 71—54 20 Claims

1. A method of nitrogeneous fertilizing comprising the steps of:

oxidizing nitrogen in a continuous process by burning ammonia to obtain nitrogen oxides;

bringing the nitrogen oxides into contact with a surface catalyst and with flowing water at a predetermined rate in a continuous process as the nitrogen oxides are being formed to form a dilute solution of nitric acid as the nitrogen oxides are formed,

said step of bringing the nitrogen oxides into contact with a surface catalyst including the step of bringing the nitrogen oxides into contact with a series of layers of surface catalyst vertically arranged with respect to each other; and



using the dilute solution of nitric acid in a process leading to and including the application of nitrogenous fertilizer on a farm.

5,192,356

METHOD AND COMPOSITION FOR TREATING SPLIT-SHELL CROPS

Charles H. Keller, 9005 Vista Rd., Chowchilla, Calif. 93610

Continuation-in-part of Ser. No. 158,567, Feb. 22, 1988, Pat. No. 5,043,005. This application Aug. 21, 1991, Ser. No. 748,266

Int. Cl.[5] A01N *59/06, 37/02*

U.S. Cl. 504—187 2 Claims

1. A method for treating crop plants which are a member of the genus Gossypium to increase the percentage of split-shell crops produced which comprises:

exposing selected Gossypium, prior to crop harvest, to an aluminum treatment for times and under conditions sufficient to increase the proportion of split-shelled to non-split crops, relative to plants not so treated.

5,192,357

ACRYLATE FUNGICIDES

Geoffrey R. Cliff, Whittlesford, and Ian C. Richards, Keddington, both of England, assignors to Schering Agrochemicals Limited, England

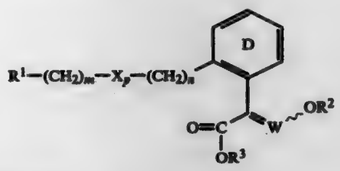
Filed Jul. 8, 1988, Ser. No. 216,831

Claims priority, application United Kingdom, Jul. 11, 1987, 8716392; Mar. 29, 1988, 8807388

Int. Cl.[5] A01N *31/00;* A61K *31/235;* C07C *321/06*

U.S. Cl. 504—315 15 Claims

1. A compound of formula I



(I)

wherein either

A) W is CH, in which case p is 1 and

(i) n is 1, m is 0 and R^1 is R^5, where R^5 is optionally substituted alkenyl, optionally substituted alkynyl or optionally substituted N-substituted iminomethylene, or

(ii) n is 0, m is 1 to 18, and R^1 is optionally substituted aryl; or

B) W is N, in which case m is 0, p and n are 1, and R^1 is R^5;

and acid addition salts of any compounds which are basic and basic addition salts of any compounds which are acidic.

5,192,358

OXALIC ACID DERIVATIVES, THEIR PREPARATION AND PLANT GROWTH REGULATORS CONTAINING THEM

Costin Rentzea, Heidelberg, and Wilhelm Radenacher, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 1, 1991, Ser. No. 723,872

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1990, 4022265

Int. Cl.[5] A01N *37/44;* C07C *229/00, 69/74*

U.S. Cl. 504—307 5 Claims

1. Oxalylhydroxamic acid derivatives of the formula

$$R^1—ON(R^2)—CO—CO—X—R^3 \qquad I,$$

where the substituents have the following meanings:

X is oxygen or sulfur;

R^1 is

C_3–C_{18}-alkenyl or C_3–C_8-alkynyl, where these groups may carry from one to five halogen atoms;

monocyclic or polycyclic C_3–C_{10}-cycloalkyl or C_3–C_{10}-cycloalkylmethyl, where these rings may carry from one to three C_1–C_4-alkyl groups and/or one phenyl ring; or

phenyl, where the aromatic radical may carry from one to five halogen atoms and/or from one to three of the following groups: nitro, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio and C_1–C_4-haloalkylthio;

R^2 is hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or benzyl, where the aromatic radical may carry from one to five halogen atoms and/or from one to three of the following groups: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio and C_1–C_4-haloalkylthio;

R^3 is

C_1–C_{20}-alkyl which may carry from one to five halogen atoms and/or from one to three of the following groups: cyano, C_1–C_{10}-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio, C_3–C_{10}-cycloalkyl, C_3–C_{10}-cycloalkoxy, C_3–C_{10}-cycloalkylthio and C_3–C_{12}-alkenyloxy;

C_3–C_{18}-alkenyl or C_3–C_8-alkynyl, where these groups may carry from one to five halogen atoms;

monocyclic or polycyclic C_3–C_{10}-cycloalkyl which may carry from one to three C_1–C_4-alkyl groups;

phenyl-C_1–C_4-alkyl or phenoxy-C_1–C_4-alkyl, where the aromatic radicals may carry from one to five halogen atoms and/or from one to three of the following groups: nitro, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio and C_1–C_4-haloalkylthio;

and agriculturally useful salts thereof.

5,192,359

RECOVERY OF ALUMINUM FROM FURNACE DROSS

Gilbert F. Bourcier, Richmond; John F. Krzyston, Chesterfield; Philip E. Smith, and Larry C. Venable, both of Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jan. 11, 1992, Ser. No. 897,228

Int. Cl.[5] C22B *7/00;* B03C *1/02*

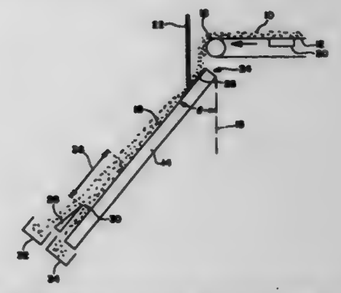
U.S. Cl. 75—10.67 15 Claims

1. A method of separating from aluminum furnace dross particles containing substantial amounts of metallic aluminum, said method comprising:

a. providing aluminum furnace dross in particulate form, the particles having a nominal particle size of less than about one inch;

b. generating a linear electromagnetic force field defined by linearly travelling electromagnetic waves, wherein the linear force field is provided by a linear induction motor that has a substantially planar surface inclined at an angle of from about 40° to about 60° relative to a vertical axis, the electromagnetic force field oriented to levitate conductive particles above the surface of the motor and to provide moving electromagnetic waves that travel substantially parallel to the planar surface from a lower portion of the motor toward an upper portion of the motor;

c. dropping the dross particles onto an upper portion of the planar surface of the motor so that particles having a substantial content of metallic aluminum are levitated above the planar surface of the motor and are allowed to



fall in a generally downward direction along and substantially parallel to the planar surface of the motor;

d. separating the dross particles into at least two groups of particles by providing a flow splitter extending across and spaced outwardly a predetermined distance from a lower portion of the planar surface of the motor, the groups of particles including a first group of particles that have been levitated above the planar surface by at least the predetermined distance by the electromagnetic field, and a second group of particles that have not been levitated above the planar surface by at least the predetermined distance; and

e. separately collecting the first and second groups of dross particles.

5,192,360

WATER-SOLUBLE FLUX FOR CORED SOLDER

Raymond L. Turner, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 607,208, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,765, May 15, 1990. This application May 31, 1991, Ser. No. 708,961

Int. Cl.[5] B23K *35/34*

U.S. Cl. 75—303 12 Claims

1. A composite cored solder comprising a hollow cylinder of solder, said hollow filled with flux, said flux comprising citric acid.

5,192,361

SUBMICRON LIGNIN-BASED BINDERS FOR WATER-BASED BLACK INK FORMULATIONS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 27, 1992, Ser. No. 827,765

Int. Cl.[5] C09D *11/14;* C08L *97/00;* C07G *1/00*

U.S. Cl. 106—26 R 8 Claims

1. An improved submicron lignin binder resin composition comprising a colloidal lignin dispersion wherein the lignin is "A" lignin derived from the kraft pulping process and the dispersion is characterized by monodispersed lignin particles exhibiting a median lignin particle diameter size of less than about 300 angstroms, wherein the improvement comprises replacing 10 to 25% by weight of the submicron lignin resin

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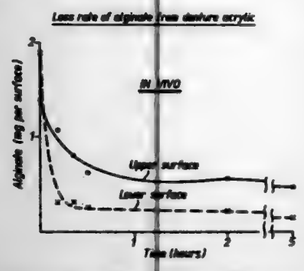
with acrylic resin, rosin resin, styrene-maleic anhydride copolymer resin, or a combination thereof.

5,192,362
DENTINE PROTECTION
Wilson Harvey, Dartford, and Michael Wilson, London, both of England, assignors to National Research Development Corporation, London, England
PCT No. PCT/GB89/00134, § 371 Date Jun. 29, 1990, § 102(e) Date Jun. 29, 1990, PCT Pub. No. WO89/07437, PCT Pub. Date Aug. 24, 1989
Continuation of Ser. No. 536,573, Jun. 29, 1990, abandoned.
This PCT application Feb. 10, 1989, Ser. No. 735,752
Claims priority, application United Kingdom, Feb. 11, 1988, 8803157; Oct. 17, 1988, 8824256
Int. Cl.[5] C09K *3/00*; C08L *1/00*; A61C *13/02*, *5/00*
U.S. Cl. 106—35 9 Claims



1. A method for providing dentures with a protective coating, which method comprises applying to the dentures, from a aqueous dispersion, a non self-supporting, initially adhesive but subsequently ablative, coating of a non-toxic, negatively charged polysaccharide which, when subjected to an in vitro becterial adhesion test, as hereinafter defined, reduces the adhesion of *Streptococcus salivarius* cells to denture acrylic by at least 25% compared with an uncoated control, and wherein after a 5-hour in vitro ablation test, as hereinafter defined, at least 2% of the coating remains, said bacterial adhesion test comprising spraying strips of denture-grade acrylic sheet (1.5×6.0×0.3 cm thick) with an aqueous dispersion of said polysaccharide and drying these at room temperature, standing the strips upright in a suspension of 10^7 colony-forming units of *Streptococcus salivarius* per ml of an artificial saliva obtainable by dissolving 1.492 grams of potassium chloride (KCl), 0.213 gram of calcium chloride ($CaCl_2$), 0.820 gram of sodium dihydrogen phosphate dihydrate ($NaH_2PO_4.2H_2O$) and 0.264 gram of disodium hydrogen phosphate dodecahydrate ($Na_2HPO_4.12H_2O$) in one liter of deionized water, shaking the strips for 18 hours at 37° C. so that the saliva continually washes the coated surface, removing the strips from the saliva, washing them three times in sterile water, placing them on a thin layer of mitis-salivarius agar, immersing them in said agar by pouring it over the strips, incubating the immersed strips at 37° C. for 24 hours, counting the number of colonies of bacteria attached and comparing them with a control test carried out in the same way except that the strips are not coated with the polysaccharide, and said in vitro ablation test being one in which strips of denture-grade acrylic sheet are sprayed with an aqueous dispersion of the polysaccharide and dried at room temperature, the strips are stood in an artificial saliva obtainable by dissolving 1.492 grams of potassium chloride (KCl), 0.213 gram of calcium chloride ($CaCl_2$), 0.820 gram of sodium dihydrogen phosphate dihydrate ($NaH_2PO_4.2H_2O$) and 0.264 gram of disodium hydrogen phosphate dodecahydrate ($Na_2HPO_4.12H_2O$) in one liter of deionized water and shaken at 37° C. for 5 hours so that the solution continually washes the coated surface, and the weight loss of the coated strips is determined by swabbing the coating material from them and assaying it for carbohydrate.

5,192,363
PAPER SIZING COMPOSITIONS
William R. Bussell, and Nicholas S. Morgan, both of Bristol, United Kingdom, assignors to EKA Nobel Landskrona AB, Landskrona, Sweden
Continuation of Ser. No. 499,562, Mar. 26, 1990, abandoned, which is a continuation of Ser. No. 194,381, May 16, 1988, abandoned. This application Aug. 30, 1991, Ser. No. 753,401
Claims priority, application United Kingdom, May 26, 1987, 8712370
Int. Cl.[5] C08C *89/00*
U.S. Cl. 106—218 22 Claims

1. A paper-sizing composition in the form of a preformed stable aqueous dispersion for subsequent use in a paper-sizing process, said composition having the ability to size paper stock, sheet or web to an effective extent, without the necessity to add any further materials, when brought into contact with said stock, sheet or web during said sizing process, the composition comprising:
(a) a rosin size,
(b) an amine salt of a rosin acid, said amine salt being the salt of rosin acid and a C_1–C_4 mono-, di- or tri-alkanolamine; and
(c) a polyaluminum chloride.

5,192,364
PRIMER COMPOSITIONS
Yoshifumi Inoue; Kin Saito, both of Annaka; Keisuke Imai, Tomioka, and Masatoshi Arai, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1991, Ser. No. 720,727
Claims priority, application Japan, Jun. 26, 1990, 2-168039
Int. Cl.[5] C09K *3/00*
U.S. Cl. 106—287.16 10 Claims

1. A primer composition comprising:
(A) at least one organosilicon compound selected from the group consisting of:
organosilicon compounds having the following general formula [II]:

$$(R^1O)_cSi\text{-}(CH_2)_n\text{-}Si(OR^1)_c \quad [II]$$

wherein c is 1 or 2, n is a positive integer, and R^1 and R^2 are as defined above, and
organosilicon compounds having the following general formula [III]:

$$(R^1O)_cSiO\text{-}(CH_2)_n\text{-}OSi(OR^1)_c \quad [III]$$

wherein R^1, R^2, c and n are as defined above, and
partially hydrolyzed products of these organosilicon compounds;
(B) at least one compound selected from the group consisting of an alkoxytitanium, a partially hydrolyzed product thereof and a cohydrolytic condensation product of the same;
(C) an acid and water; and
(D) an organic solvent.

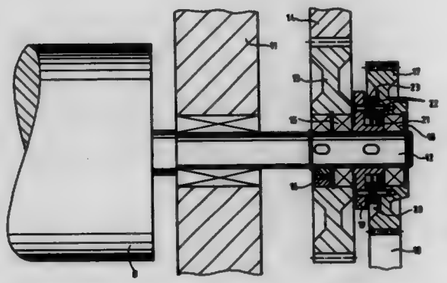
5,192,365
BUFF RUTILE PIGMENT COMPOSITIONS
Zoltan M. Modly, Shaker Hts., Ohio, assignor to Engelhard Corporation, Iselin, N.J.
Filed Jun. 6, 1991, Ser. No. 711,446
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] C09C *1/36*
U.S. Cl. 106—439 17 Claims

1. A buff rutile pigment composition comprising about 40 to about 55% by weight of titanium, from about 0.4 to about 5% by weight of cobalt, from about 7 to about 14% by weight of tungsten, from 0.01 to about 5% by weight of lithium and from about 0.1 to about 20% by weight of cerium.

5,192,366
CEMENT ADMIXTURE AND CEMENT COMPOSITION
Asaaki Nishioka; Etsuo Sakai, both of Machida; Tomohiro Kaneko, Ichihara, and Masaki Ogasawara, Machida, all of Japan, assignors to Denki Kagaku Koygo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 4, 1990, Ser. No. 621,878
Claims priority, application Japan, Dec. 5, 1989, 1-315746; Dec. 5, 1989, 1-315748
Int. Cl.[5] C04B *24/00*
U.S. Cl. 106—724 8 Claims

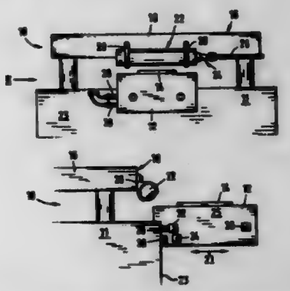
1. A cement additive admixture comprising a polymer latex and a soluble water reducing agent wherein the copolymer latex comprises a copolymer of monomers comprising ethylene, vinyl acetate and an acrylic ester, in a ratio of 98:2 to 10:90 by weight of copolymer latex solids to the soluble water reducing agent, said soluble water reducing agent being an additive to cement capable of reducing the required water/cement ratio for achieving a specified fluidity for the cement additive admixture, an emulsion stabilizer for stabilizing the copolymer latex, said emulsion stabilizer being a surfactant which is an anionic, cationic, or nonionic surfactant, and
inorganic ultrafine particles wherein the ratio of solid content of the copolymer latex to the ultrafine particles is 95:5 to 5:95 by weight, said ultrafine particles having an average particle size smaller than the particle size of the cement.

5,192,367
DRIVE MECHANISM FOR A PRINTED SHEET VARNISHING DEVICE OF A PRINTING MACHINE
Günther Hofmann, Walldorf, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Filed Apr. 29, 1991, Ser. No. 693,860
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013462
Int. Cl.[5] B05C *1/02*, *1/10*
U.S. Cl. 118—46 19 Claims



6. A varnishing device for a printing press comprising:
a varnish metering roller;
a varnish dipping roller;
motor means for rotating said varnish metering roller and said varnish dipping roller;
torque transmission means for connecting said motor means to said varnish metering roller and said varnish dipping roller;
said torque transmission means including a first torque transmission part for being connected to said motor means;
said torque transmission means further including a second torque transmission part for being connected to said varnish metering roller and said varnish dipping roller;
said first torque transmission part and said second torque transmission part each being configured and relatively positioned with respect to one another such that said motor means and said first torque transmission part provide rotational power to said second torque transmission part, said varnish metering roller, and said varnish dipping roller;
said first torque transmission part being out of contact with said second torque transmission part such that said first torque transmission part can rotate independently of said second torque transmission part;
mechanical clutch means for mechanically connecting a printing press drive to said varnish metering roller and said varnish dipping roller;
said mechanical clutch means and the printing press drive being for rotating said varnish metering roller and said varnish dipping roller;
said non-contacting torque transmission means for continuously transmitting torque between said first torque transmission part and said second torque transmission part; wherein said mechanical clutch means overruns said non-contacting torque transmission means when said press drive is engaged with said varnishing meter roller and said varnishing dipping roller.

5,192,368
SCREEN PRINTING MACHINE PROVIDED WITH A COMPRESSED AIR CLEANER
Ralf Harlizius, Neuss, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Ratingen, Fed. Rep. of Germany
Filed Jan. 30, 1992, Ser. No. 830,905
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1991, 4106330
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—72 7 Claims

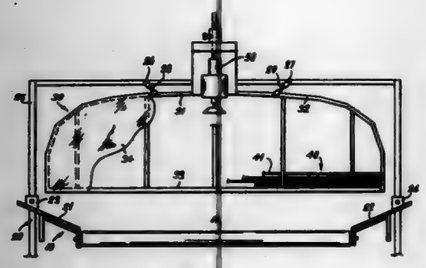


1. A screen printing machine for the production of printed hybrid circuit boards, comprising a basic support housing; a printing table having an upper surface portion for a circuit board to be printed, said printing table mounted on said support housing for horizontal movement along a path between a first position, wherein a circuit board to be printed can be placed on said upper surface of said printing table, and a second printing position; a vertically raising frame member attached to said support housing and extending above said path of movement of said print table; compressed air cleaning

5,192,372

means, which are connected to a compressed air conduit containing a controllable valve and are mechanically fastened to an end surface of said frame member above said path of movement of said printing table, for directing compressed air onto said portion of said upper surface of said printing table during movement of said printing table along said path of movement; and, an electrical switching means, disposed on said printing table and on said basic support housing and responsive to the position of said printing table along said path of movement, for controlling the actuation and deactuation of said control valve to control the flow of said compressed air to said compressed air cleaning means.

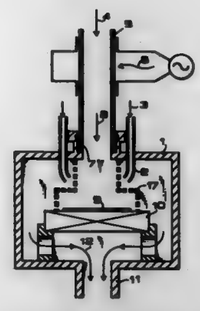
5,192,369
APPARATUS FOR SPRAYING HARVESTED CROPS
Barry J. Pye, Luton, England, assignor to British Technology Group Ltd., London, England
Continuation of Ser. No. 572,546, Aug. 27, 1990, abandoned, which is a division of Ser. No. 399,743, May 9, 1989, Pat. No. 4,971,818. This application Nov. 8, 1991, Ser. No. 789,773
Claims priority, application United Kingdom, Nov. 20, 1986, 8627795
Int. Cl.[5] B05D *1/04*
U.S. Cl. 118—624 19 Claims



1. A spray apparatus for the treatment of a harvested crop, comprising:
- a high voltage electrostatic sprayhead,
- a sprayhood surrounding the sprayhead and having an aperture opposite the sprayhead, and
- insulating suspension means to suspend the sprayhood with the aperture adjacent a region of a conveyor to establish and maintain the sprayhood covering said region of said conveyor,
- the sprayhood having an insulating cover and an insulated electrode extending around and above said aperture,
- the electrode being energizable in operation to a potential similar to that applied to the sprayhead for applying an electrostatically charged spray from the sprayhead in a controlled manner throughout said region of the conveyor under the sprayhood to a quantity of crops conveyed past on the conveyor.

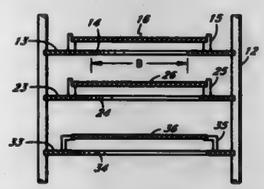
5,192,370
METHOD AND APPARATUS FOR FORMING THIN FILM
Masao Oda, and Tatsuya Iwase, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 22, 1990, Ser. No. 542,148
Claims priority, application Japan, Sep. 5, 1989, 1-229951
Int. Cl.[5] H01L *21/00*
U.S. Cl. 118—723 4 Claims

1. A thin film forming apparatus wherein a substrate is enclosed, and a first reaction gas and an active species produced by separately exciting a second reaction gas are introduced into a reaction chamber provided to form a thin film on the surface of the substrate, said reaction chamber comprising:
- a heater means for holding said substrate and heating it to a prescribed temperature;
- a reaction gas supply port provided with an opening for directing the first reaction gas towards said substrate and supplying the reaction gas thereto;
- an active species supply port provided with an opening for directing the active species of a separately excited second reaction gas toward said substrate and supplying the active species thereto separately from said first reaction gas; and



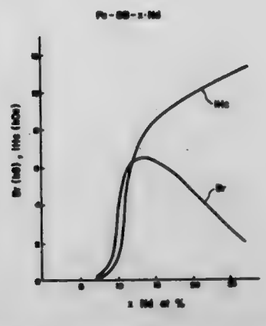
- a metal porous plate having a number of small holes therein installed between said active species supply port and said heater means so as to enclose at least said substrate and said active species supply port;
- said metal porous plate having one end between said active species supply port and said reaction gas supply port so as to enclose said active species supply port and having other end so as enclosing said substrate.

5,192,371
SUBSTRATE SUPPORTING APPARATUS FOR A CVD APPARATUS
Mitsutoshi Shuto; Yasushi Fukunawa, both of Tokyo, and Minoru Ohnaki, Kumamoto, all of Japan, assignors to ASM Japan K.K., Tokyo, Japan
Filed May 21, 1991, Ser. No. 703,809
Int. Cl.[5] C23C *16/46*
U.S. Cl. 118—728 3 Claims



1. A CVD apparatus for depositing a thin film on a plurality of subtrates, characterized in that substrate supporting apparatus having a plurality of support plates positioned in parallel for supporting a plurality of substrates is positioned in the CVD apparatus, each of said plates having a central opening and a plurality of clips along the periphery of the opening for supporting a substrate above the opening, said CVD apparatus including means for providing reactive gas to the plurality of substrates, said openings in said plates having different sizes with respect to the other openings the sizes of which are determined by flow characteristics of said reactive gas in said CVD.

5,192,372
PROCESS FOR PRODUCING ISOTROPIC PERMANENT MAGNETS AND MATERIALS
Setsuo Fujimura, Kyoto; Masato Sagawa, Nagaokakyo, and Yutaka Matsuura, Ibaraki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan
Division of Ser. No. 271,894, Nov. 16, 1988, abandoned, which is a division of Ser. No. 567,640, Dec. 30, 1983, Pat. No. 4,840,684. This application Jun. 18, 1991, Ser. No. 717,002
Claims priority, application Japan, May 6, 1983, 58-79096; May 6, 1983, 58-79098
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 18 Claims



1. A process for preparing an isotropic permanent magnet material comprising:
- (a) melting and preparing alloys consisting essentially of, in atomic percent, 10–20% of R wherein R represents at least one element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and wherein at least 50% of R consists of Nd and/or Pr, 5–18% of B and at least 62% Fe and inevitable impurities,
- (b) cooling the resultant molten alloys,
- (c) pulverizing the resulting alloys, and
- (d) mixing a bonding agent with the resultant alloy powders.

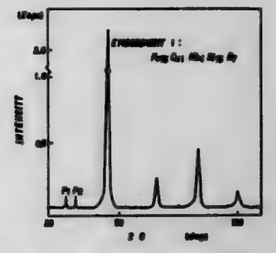
5,192,373
MAGNESIUM OXIDE COATING FOR ELECTRICAL STEELS AND THE METHOD OF COATING
Wade S. Wright, Fairfield, and Robin A. Murphy, Franklin, both of Ohio, assignors to Armco, Inc., Middletown, Ohio
Division of Ser. No. 404,714, Sep. 8, 1989, abandoned. This application Apr. 12, 1991, Ser. No. 686,019
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—113 21 Claims

1. A method for producing a glass film on oriented silicon steel strip, said method comprising the steps of:
- a) providing a magnesia bath consisting essentially of magnesia particles with a majority of said magnesia particles having a citric acid activity less than 200 seconds, up to 15 weight % TiO_2 based on the weight of said magnesia, up to 10 weight % SiO_2 based on the weight of said magnesia, up to 15 weight % Cr based on the weight of said magnesia, up to 0.3 weight % B based on the weight of said magnesia, up to 20 weight % phosphate based on the weight of said magnesia, and a metal chloride selected from the group consisting of magnesium chloride, calcium chloride, sodium chloride and/or potassium chloride;
- b) maintaining said magnesia bath at temperature from above freezing to 25° C.;
- c) applying an aqueous magnesia slurry from said bath to said strip;
- d) drying said magnesia slurry to remove excess water and provide a dried magnesia coating weighing about 6.4 grams per square meter, said dried coating having 0.01 to 0.20 weight % total chlorine based on the weight of said dried magnesia with at least 0.01 weight % based on the weight of said dried magnesia being from said metal chloride; and
- e) providing a final high temperature anneal to form said glass film wherein said metal chloride seals said coating surface during said anneal to control grain growth inhibitors in said steel to stabilize secondary grain growth and develop improved magnetic properties.

5,192,374
CHROMIUM-FREE METHOD AND COMPOSITION TO PROTECT ALUMINUM
Andrew Kindler, San Marino, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Sep. 27, 1991, Ser. No. 766,319
Int. Cl.[5] C23C *22/56*
U.S. Cl. 148—272 17 Claims

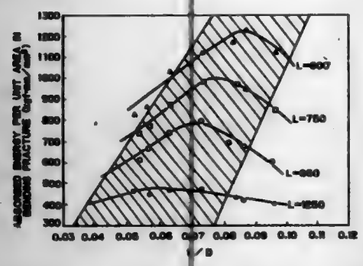
1. A method for providing the surface of aluminum or aluminum alloys with a protective coating consisting of:
- (a) removing contaminants from said surface of said aluminum or aluminum alloys to provide a cleaned surface;
- (b) exposing said cleaned surface to deionized water at a temperature within the range of 50° to 100° C. to form a porous boehmite coating on said surface;
- (c) exposing said surface with said boehmite coating to an aqueous solution comprising a salt of cerium and a metal nitrate at a temperature within the range of 70° to 100° C. for a sufficient period of time to form oxides and hydroxides of said cerium within the pores of said porous boehmite coating to thereby provide said protective coating.

5,192,375
FE-BASED SOFT MAGNETIC ALLOY
Takao Sawa; Masumi Okamura, both of Yokohama, and Yasuiko Takahashi, Kashigaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation-in-part of Ser. No. 661,687, Feb. 28, 1991, abandoned, which is a division of Ser. No. 454,019, Dec. 20, 1989, Pat. No. 5,019,190. This application Mar. 26, 1991, Ser. No. 675,857
Claims priority, application Japan, Dec. 28, 1988, 63-319417
The portion of the term of this patent subsequent to May 28, 2008, has been disclaimed.
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—306 6 Claims



1. A toroidal choke coil comprising an Fe-based soft magnetic alloy essentially consisting of an Fe-based alloy, wherein said Fe-based alloy includes fine crystal grains having an average size of 300 Å or less and each of said fine crystal grains is composed of a body-centered cubic phase at least partially including a super lattice.

5,192,376
PROCESS FOR PRODUCING AUTOMOBILE BODY REINFORCING STEEL PIPE
Hiroto Tanabe, and Kazumasa Yamazaki, both of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Division of Ser. No. 796,768, Nov. 25, 1991. This application May 21, 1992, Ser. No. 887,439
Int. Cl.[5] C21D *8/10*
U.S. Cl. 148—520 8 Claims



1. A process for producing an automobile body reinforcing steel pipe having a wall thickness-to-outer diameter ratio, t/D, defined by the following formula;

$$0.09-4.8\times10^{-5}\times L\leq t/D\leq 0.16-6.0\times10^{-5}\times L$$

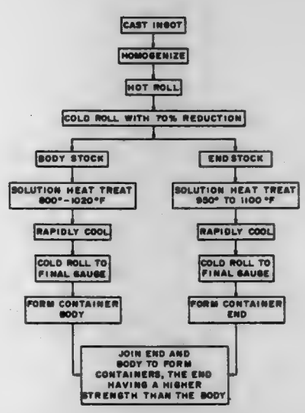
where L(mm) is a span of a bending load applied to the pipe, said process comprising the steps of:
hot rolling to form a steel sheet from a steel consisting of;
C in an amount of from 0.15 to 0.25,
Mn in an amount sufficient to prevent a self-tempering during quench hardening of said steel, but not more than 1.8 wt %,
Si in an amount sufficient to obtain a sound weld-bonding of said pipe, but not more than 0.5 wt %,
Ti in an amount sufficient to fix N in steel, so that B effectively improves the steel hardenability, but not more than 0.04 wt %,
B in an amount from 0.0003 to 0.0035 wt %, and
the balance of Fe and unavoidable impurities, including N in a minimum amount of not more than 0.0080 wt %;
coiling said steel sheet in an as-hot rolled state at a temperature of 600° C. or higher;
roll-forming said steel sheet to a pipe shape having adjacent edges;
electric welding said pipe shape at said adjacent edges to form an electric welded steel pipe; and
quench hardening said steel pipe.

5,192,377
PROCESS OF PRODUCING CONTINUOUSLY CAST MONOTECTIC ALUMINUM-SILICON ALLOY STRIP AND WIRE
Bruno Prinz, Oberursel; Alberto Romero, and Ingrid Müller, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Apr. 22, 1991, Ser. No. 689,413
Claims priority, application Fed. Rep. of Germany, May 5, 1990, 4014430
Int. Cl.[5] C22C *21/02, 21/04, 11/08, 12/00*
U.S. Cl. 148—551 5 Claims

1. A process of producing strip or wire, which strip or wire consists of a monotectic aluminum-silicon alloy comprising a matrix consisting of aluminum, an aluminum-silicon eutectic system, and 1 to 50% by weight lead or bismuth as a phase, said process comprising heating the matrix to above the segregation temperature to form molten matrix, continuously casting the strip or wire at a high casting velocity and a high cooling rate from the molten matrix, then subjecting the strip or wire to a

plastic deformation and then to a heat treatment at a temperature of 550° to 600° C.

5,192,378
ALUMINUM ALLOY SHEET FOR FOOD AND BEVERAGE CONTAINERS
Roger D. Doherty, Wynnewood; John Liu, Lower Burrell, and Robert E. Sanders, Jr., New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Nov. 13, 1990, Ser. No. 611,982
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—691 42 Claims



1. A method of making an aluminum alloy sheet having a strength in the range of 55 to 60 ksi for forming into container panels for container ends comprising:
(a) providing a body of an aluminum alloy consisting essentially of 0.45 to 0.60 wt.% Cu, 1.1 to 1.7 wt.% Mg, 0.3 to 0.6 wt.% Si, 0.3 to 0.55 wt.% Fe, 0.5 to 1.2 wt.% Mn, the remainder aluminum, incidental elements and impurities;
(b) hot rolling said body to a gauge to provide a hot rolled product;
(c) cold rolling said hot rolled product to provide a reduction of 50 to 80% in thickness;
(d) solution heat treating said cold rolled product in a range of 800° to 1020° F.;
(e) rapidly cooling said solution heat treated product; and
(f) cold rolling said cooled product to final sheet gauge by providing a reduction of 50 to 90% in thickness.

5,192,379
DENSIFYING AND STABILIZING INGREDIENT
Craig E. Johnson, Indian Head, and Paul F. Dender, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 6, 1974, Ser. No. 521,977
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.4 13 Claims

1. In a propellant comprising a nitrocellulose-containing binder, and an oxidizer, the improvement comprising including as a component of the propellant at least one lead fluoride selected from a formula of the group consisting of PbF_2 and PbF_4.

4. In a propellant comprising a binder, and an oxidizer, the improvement comprising including as a component of the propellant at least one lead fluoride selected from a formula of the group consisting of PbF_2 and PbF_4, wherein the lead fluoride comprises 17% to 26% by weight of the propellant.

5,192,380
PNEUMATIC RADIAL TIRE FOR PASSENGER VEHICLE INCLUDING A PARTICULAR CARCASS LINE
Ryoji Hanada, Isehara; Masaki Nara, Hiratsuka; Yukimasa Minami, Hiratsuka, and Motohide Takasugi, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Dec. 5, 1990, Ser. No. 622,568
Claims priority, application Japan, Dec. 19, 1989, 1-327420
Int. Cl.[5] B60C *3/00, 9/02, 9/08*
U.S. Cl. 152—454 4 Claims

1. A pneumatic radial tire for a passenger vehicle, characterized in that at least a portion of a carcass line extending radially outwardly from the maximum width position in a carcass line of a tire fitted to a normal rim and inflated up to its normal internal pressure is configured so as to substantially conform to an equilibrium carcass line expressed by the following equations (1) and (2) calculated by using an internal pressure allotment ratio g(y) of a carcass layer at the tread portion that is obtained by setting the distributional configuration index α of the following equation (3) at 4 or more, and that a tread pattern having a direction property is provided to the tread surface thereof, wherein:

$$\text{in } y_D \leq y \leq y_A,$$

$$\eta = \frac{\int_{y_D}^{y_A} g(y)\cdot y\,dy + (y_D^2 - yc^2)/2}{g(y)\cdot y} \quad (1)$$

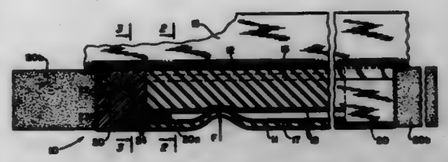
$$\text{in } y_B \leq y \leq y_D,$$

$$\eta = \frac{\int_{y_D}^{y_A} g(y)\cdot y\,dy + (y_D^2 - yc^2)/2}{y} \quad (2)$$

$$g(y) = \frac{1-\eta}{(y_D - y_A)^\alpha}(y - y_A)^\alpha + \eta \quad (3)$$

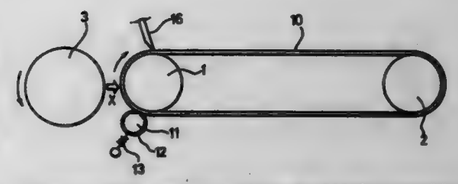
wherein, provided that a line drawn vertically downwardly from the center of the tread portion to the axle of the tire is y axis of coordinates with the axle of the tire being z axis of coordinates, y_A, y_D, y_C, y_B and η denote as follows:
y_A: y axis of coordinates for the carcass line at the center of the tread portion;
y_D: y axis of coordinates for the carcass line at the effective width end portion of the belt layer;
y_C: y axis of coordinates for the carcass line at the maximum width position in a tire carcass line;
y_B: y axis of coordinates for the carcass line at the bead portion; and
η: the internal pressure allotment ratio of the carcass layer at the center of the tread portion.

5,192,381
POWER DOOR SENSING STRIP
Robert Pariot, New Windsor, N.Y., and J. Mortimer Trangott, Riverton, N.J., assignors to Techstrip Inc., Oaklyn, N.J.
Division of Ser. No. 634,412, Dec. 27, 1990, Pat. No. 5,087,799. This application Dec. 12, 1991, Ser. No. 806,705
Int. Cl.[5] B32B *5/20*
U.S. Cl. 156—79 4 Claims



1. A process of providing an elongated sensing strip for attachment to a power door edge for sensing an object obstructing closure of the door comprising the steps of adhering two foil conductors to opposite inner sides of a flexible plastic tube, positioning an elongated jacket for the strip in a mold, inserting a mandrel into the plastic tube, positioning the plastic tube and mandrel in the mold, injecting low density urethane foaming chemicals into the mold, placing a cover in the mold engaging the edges of the jacket and the urethane, closing the mold and molding the strip under pressure, removing the formed strip from the mold and the mandrel from the tube, molding relatively incompressible plastic blocks with at least one of the blocks encapsulating electric connectors and conductors adapted to be connected to the foil conductors, and adhesively securing the molded blocks in the jacket and to the foam with the conductors electrically connected to the foil conductors in the plastic tube.

5,192,382
METHOD OF MANUFACTURING LOW-EDGE V-BELTS
Takeshi Hamura, Aichi, and Hideki Tanaka, Hyogo, both of Japan, assignors to Mitsuboshi Belting Ltd., Hyogo, Japan
PCT No. PCT/JP90/00417, § 371 Date Jul. 6, 1991, § 102(e) Date Jul. 6, 1991, PCT Pub. No. WO91/14567, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 28, 1990, Ser. No. 536,544
Int. Cl.[5] B29C *53/56, 59/00, 67/00*
U.S. Cl. 156—137 5 Claims



1. A method of manufacturing low-edge V-belts comprising the steps of:
forming an unvulcanized belt from an inside portion to an outside portion by winding respective components comprising an elongated portion, a tension-resistant portion, and a compressed portion, in laminated form, on a circumferential surface of a forming drum;
vulcanizing said unvulcanized belt to obtain a vulcanized belt;
removing said vulcanized belt from said forming drum;
rotating said vulcanized belt on drums comprising a drive drum and a driven drum;
grinding multiple, V-shaped grooves on a surface of said vulcanized belt using a grinding wheel having a group of

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adjacent grindstones, each of said grindstones exhibiting a V-shaped cross-section, said grinding wheel being in pressure contact with said vulcanized belt on one of said drive and driven drum;

causing projections arranged on a positioning member, said positioning member gradually increasing a depth of engagement, to engage with said V-shaped grooves;

and cutting said vulcanized annular body thus processed.

5,192,383

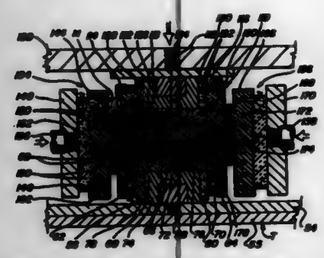
METHOD FOR CONTINUOUSLY FORMING COMPOSITE MATERIAL INTO A RIGID STRUCTURAL MEMBER

Michael G. Civin, Federal Way, Wash., assignor to Graphite Design and Detail, Incorporated, Boulder, Colo.

Division of Ser. No. 687,121, Apr. 18, 1991, Pat. No. 5,127,980. This application Mar. 16, 1992, Ser. No. 851,935

Int. Cl.[5] B32B *17/04, 27/04, 31/04*

U.S. Cl. 156—189 3 Claims



1. A method of continuously forming layered composite material into a rigid structural member as the material is moved from an upstream location to a downstream location, said method comprising the steps of:

pulling uncured layered composite material from a supply at said upstream location through a forming die in incremental movements to form the material into a structural member having a desired shape;

providing a series of clamping dies for pulling, heating and cooling the structural member as it is moved from the upstream location to the downstreatm location, which are reciprocal in the upstream and downstream directions and grip the structural member when they move in the downstream direction and release the structural member when they move in the upstream direction;

providing at least one liner which extends through all of the dies between the path of the structural member and the dies; and

feeding the structural member through the liner to prevent the formation of indentions or parting lines from the dies during clamping and incremental movement of the structural member.

5,192,384

METHODS FOR FORMING COMPOSITE TUBING HAVING TAPERED ENDS

James M. Barrier, Anaheim Hills; Mark D. Drey, Murrieta; Leslie V. Montford, Pleasanton, and Stephen S. Tan, Albany, all of Calif., assignors to Kaiser Aerospace and Electronics Corporation, Foster City, Calif.

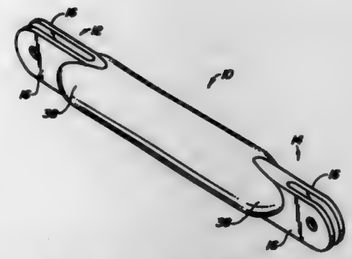
Filed May 30, 1991, Ser. No. 707,560

Int. Cl.[5] B31C *13/00;* B65H *81/00*

U.S. Cl. 156—189 19 Claims

1. A method for forming a reinforced composite tube having integral tapered ends, said method comprising:

conforming a fabric over an elongate mandrel, the mandrel having a non-tapered central portion with a first thickness, non-tapered end portions with a second thickness, the first thickness being thicker than the second thickness, and tapered portions between the central portion and end portions tapering from the first thickness to the second thickness, such that the fabric is formed into a hollow fabric structure having first and second tapered ends and an opening in at least one of said fabric structure tapered ends which is smaller than the central portion of the mandrel;



removing the mandrel from the interior of the fabric structure by disassembling the mandrel to fit through the opening;

curing a matrix precursor material in the fabric to form the reinforced composite tube

and, forming at least one of the tapered ends in the fabric into a tapered connector configuration.

5,192,385

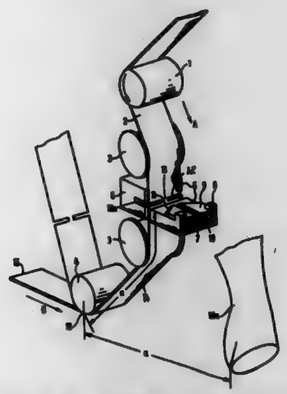
METHOD FOR THE APPLICATION OF LENGTHS OF TAPE TO A SURFACE

Karl-Andreas Moll, Kaarst, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 738,535, Jul. 31, 1991, abandoned, which is a division of Ser. No. 345,634, May 1, 1989, Pat. No. 5,068,004. This application Jul. 29, 1992, Ser. No. 922,346

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—250 3 Claims



1. A method for the application of tape having a desired length to a surface by a tape applicator device including a tape applicator element for placing a trailing edge of the tape onto the surface and a tear lien forming element, comprising the steps of:

(a) adhering the trailing edge of a section of the tape tot he surface at a given application line;

(b) applying a portion of a desired length of the tape to the surface;

(c) metering the distance between the applied length of tape and a desired leading edge of the tape by comparing an indicator provided on the tape applicator device to a desired point on the surface for the leading edge of the tape to be located;

(d) interrupting the movement of the tape at a predetermined point from the desired leading edge of the tape;

(e) forming a tear line in the tape by the tear line forming element at the predetermined distance from the desired leading edge of the tape;

(f) applying the remaining portion of the tape to the surface; and

(g) tearing the tape at the tear line so as to separate the desired length of tape from the section of tape.

5,192,386

METHOD OF MAKING A COSMETIC SAMPLER

David Moir, Woodcliff Lake, and Robert M. O'Connell, Belle Mead, both of N.J., assignors to Alford Industries Inc., N.J.

Division of Ser. No. 199,175, May 26, 1988, Pat. No. 4,848,378, which is a division of Ser. No. 875,172, Jun. 17, 1986, Pat. No. 4,751,934. This application Feb. 6, 1989, Ser. No. 306,394

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—268 14 Claims

1. A method for making a cosmetic sampler comprising:

(a) heating an oily, non-liquid substance to be sampled into a viscous liquid;

(b) screen printing said viscous liquid onto a base comprising a pressure sensitive adhesive stock with a removable liner;

(c) applying a perimeter adhesive to said base;

(d) laminating a protective overlay to said base; and

(e) die cutting said screen printed base into labels.

5,192,387

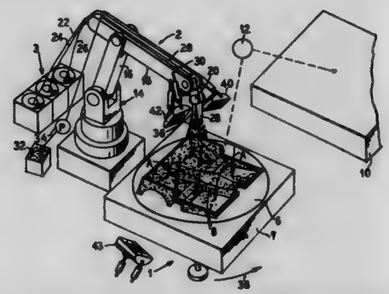
METHOD OF MAKING PREFORMS

Daniel T. Buckley, Shrewsbury, Vt., assignor to The C.A. Lawton Company, DePere, Wis.

Filed Nov. 5, 1990, Ser. No. 609,420

Int. Cl.[5] B28B *1/32;* B29C *43/02;* B32B *31/00;* D04H *1/64*

U.S. Cl. 156—275.5 8 Claims



1. A method for making a rigid three-dimensional structural preform using a separable mold including a perforate first mold part and a pressing second mold part, the mold parts, when closed, together defining a desired three-dimensional shape of the preform and including inner surfaces disposed at angles with respect to one another forming inside and outside corners, comprising the steps of:

(a) cutting fibers of reinforcement material into short lengths;

(b) propelling the cut fibers onto the perforate first mold part while contemporaneously flowing air through the first mold part to direct the fibers onto all surfaces of the first mold part to a predetermined thickness;

(c) spraying an electromagnetic energy-curable binder onto the cut fibers to at least partially coat the fibers with the binder without filling interstices among the fibers;

(d) closing the separable mold parts to press the binder-coated cut fibers into the desired three-dimensional shape of the preform between the pressing second mold part and the perforate first mold part of the closed mold, such that fibers bridging inside and outside corners of the closed mold are deformed into desired shapes defined by the corners of the closed mold;

(e) applying electromagnetic energy to the binder-coated pressed fibers while in the closed mold to cure the binder and bond the fibers to produce the rigid three-dimensional structural preform;

(f) opening the mold; and

(g) removing the rigid three-dimensional structural preform from the mold.

5,192,388

PROCESS AND DEVICE FOR PRODUCING A COMPOSITE WEB

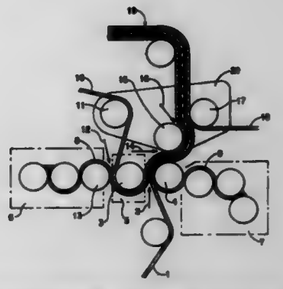
Ernst Schöllkopf, Reichalten; Walter Rimmele, Freiburg; Roland Stiwitz, Dudingen, and Konrad Vogel, Bern, all of Switzerland, assignors to Maschinenfabrik Polytype A.G., Freiburg, Switzerland

Filed Apr. 16, 1991, Ser. No. 686,417

Claims priority, application European Pat. Off., Apr. 17, 1990, 90810299

Int. Cl.[5] B32B *31/06*

U.S. Cl. 156—324 5 Claims



1. A process producing a composite web from a substrate, and a first and second laminate, the first and second laminate being joined to the substrate by first and second adhesives operating at different temperatures, the method comprising the steps of:

providing a first counterroller at a first temperature, said first temperature being an operating temperature of the first adhesive;

providing a first adhesive applicator means for applying the first adhesive at said first temperature to the first laminate, and for defining a first adhesive roller gap with said first counterroller;

feeding the first laminate through said first adhesive roller gap;

combining the first laminate with the first adhesive in said first adhesive roller gap;

providing a second counterroller at a second temperature for optimal adhesion of the second adhesive between the second laminate and the substrate, said second counter-

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roller being adjacent said first counterroller, said second counterroller and said first counterroller defining a counterroller gap;
providing a second adhesive applicator means for applying the second adhesive to said second counterroller and for defining a second adhesive roller gap;
feeding the first laminate combined with the first adhesive around said first counterroller at said first temperature and then through said counterroller gap;
feeding the substrate through said counterroller gap;
combining in said counterroller gap a first side of the substrate with the first laminate combined with the first adhesive; and
combining in said counterroller gap a second side of the substrate with the second adhesive from said second counterroller.

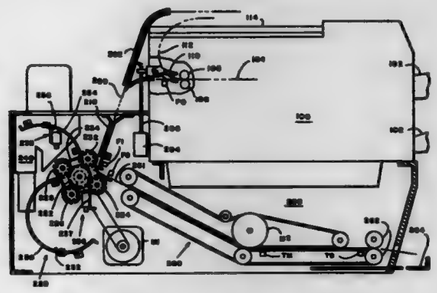
4. A process for producing a composite web, the apparatus comprising:
first adhesive applicator means for dispensing a first adhesive;
a first counterroller positioned adjacent said first adhesive applicator means and defining a first adhesive gap with said first adhesive applicator;
first feeding means for feeding a first laminate into said first adhesive gap and combining said first laminate with said first adhesive;
a second counterroller positioned adjacent said first counterroller and defining a counterroller gap;
a second adhesive applicator means for dispensing a second adhesive onto said second counterroller and defining a second adhesive gap means;
second feeding means for feeding said first laminate combined with said first adhesive around said first counterroller and into said counterroller gap, said second feeding means also feeding a substrate into said counterroller gap and combining a first side of said substrate with said first laminate and said first adhesive, said second feeding means also combining a second side of said substrate with said second adhesive from said second counterroller; and
temperature control means for controlling a first temperature of said first adhesive from said first adhesive applicator means to said counterroller gap, said first temperature being of a value for optimal adhesion between said first laminate and said substrate, said temperature control means also for controlling a second temperature of said second adhesive from said second adhesive applicator means to said counterroller gap, said second temperature being of a value for optimal adhesion between said second laminate and said substrate.

5,192,289
APPARATUS FOR PREPARING A SELF-MAILER HAVING PRINTER, FOLDER, AND TRANSPORT MEANS

Samuel W. Martin, Weston, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Continuation of Ser. No. 407,583, Sep. 14, 1989. This application Oct. 18, 1991, Ser. No. 782,749
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] B32B *31/00*; B43M *3/00*
U.S. Cl. 156—364 21 Claims

1. Apparatus for processing a form sheet to prepare a self-mailer, said form sheet being a continuous sheet having obverse and reverse sides and including a first continuous portion and a second continuous portion, said apparatus comprising:
a) printing means, responsive to text signals defining information to be printed, for printing said reverse side of said first portion with address information; and
b) folder means for receiving said form sheet output from said printing means and folding said form sheet to prepare said self-mailer so that said self-mailer comprises an envelope having a front panel and a back panel, said folder means further comprising:
b1) first means for folding said form sheet about a first transverse line to bring said obverse side of said second portion in contact with said obverse side of said first portion;
b2) second means for then folding said first and second portions about a second transverse line so that said first portion forms said envelope, with said reverse side forming the outside of said envelope and said second portion being essentially fully enclosed between and adjacent to said front and back panels; and wherein,
b3) said folder means has an input path for input of said form sheet and an exit path for output of said form sheet after folding, said input path crossing said exit path.

8. Apparatus for processing a form sheet to prepare an envelope, comprising:
a) transport means for transporting said envelope in a substantially horizontal direction, said transport means having an input substantially horizontally spaced from an output;
b) printing means positioned above said transport means, and responsive to text signals defining information to be printed, for printing said form sheet with address information, said printing means having an input vertically spaced from and horizontally substantially adjacent to said output of said transport means, and an output vertically spaced from and horizontally substantially adjacent to said input means; and



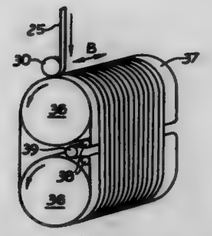
c) folder means for:
c1) receiving said form sheet as it is output from said printing means;
c2) folding said form sheet to form said envelope;
c3) as said form sheet is being folded changing the direction of motion of said form sheet such that when said form sheet is folded to form said envelope said envelope is moving in a direction substantially opposite to the direction of movement of said form sheet through said printing means; and,
c4) transferring said envelope to said transport means for output.

14. An apparatus for preparing a self-mailer, comprising:
a) printing means, responsive to text signals defining information to be printed, for printing a form sheet with address information in a first portion of said form sheet; and,
b) folder means for receiving said form sheet output from said printing means and folding said form sheet to prepare said self-mailer; wherein,
c) said folder means further comprises:
c1) a central roller;
c2) a first roller forming a first nip with said central roller, said first nip being aligned with the input path of said form sheet so as to capture said form sheet for folding;
c3) a final roller forming a final nip with said central roller, said final nip being aligned to transport along an exit path, said exit path crossing said input path;

c4) means for folding said form sheet positioned intermediate said first and final rollers.

5,192,390
MANDREL MEANS

David J. B. Perkins, Liverpool, United Kingdom, assignor to Bridgestone/Firestone Inc., Akron, Ohio
PCT No. PCT/GB88/00989, § 371 Date May 1, 1990, § 102(e) Date May 1, 1990, PCT Pub. No. WO89/04756, PCT Pub. Date Jun. 1, 1989
Continuation of Ser. No. 474,133, May 1, 1990. This PCT application Nov. 14, 1988, Ser. No. 771,883
Claims priority, application United Kingdom, Nov. 13, 1987, 8726665
Int. Cl.[5] B65H *81/00*
U.S. Cl. 156—425 18 Claims

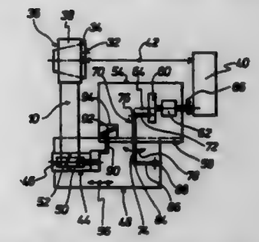


1. Mandrel means; at least two support drums rotatably mounted for rotation about respective axes the relative spacing of which is selectively variable to vary the length of a peripheral path defined at least in part by said drums, a belt guide means assembly, an endless support belt which extends around said drums and belt guide means assembly and which defines at least in part a mandrel support surface, said belt guide means assembly comprising a pair of guide rollers arranged to divert the endless belt to follow an inwardly extending path between the support drums and thereby result in a peripheral discontinuity of the mandrel support surface, and said belt guide means assembly additionally comprising a belt control device to engage and maintain tension in the belt for any of a range of relative spacings of said support drums, and applicator means arranged for traversing movement across the width of the endless belt for applying strip material to the endless belt during movement of the endless belt around the drums whereby the strip material is caused to extend helically relative to said axes of rotation of the support drums.

5,192,391
APPARATUS FOR DECORATING ARTICLES HAVING A CONICAL SURFACE

Karl Kammerer, Schwaigstetten, Fed. Rep. of Germany, assignor to Leonhard Kurz GmbH & Co., Fuerth, Fed. Rep. of Germany
Division of Ser. No. 582,248, Sep. 14, 1989, Pat. No. 5,139,599. This application Apr. 24, 1992, Ser. No. 873,367
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1989, 3931556
Int. Cl.[5] B44C *1/00*
U.S. Cl. 156—540 5 Claims

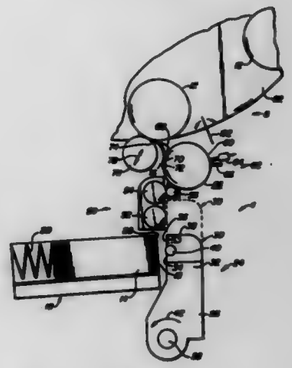
1. An apparatus for decorating articles having a conically-extending surface with a decoration from an embossing foil which comprises:
a supply roll for said embossing foil provided with a plurality of decorations;
an embossing station for receiving an article to be decorated, said embossing station including a means for holding said article to be decorated;
an embossing roller for applying said decoration to said conically-extending surface of said article;
a deflection roller disposed upstream of said embossing station in a forward feed direction of said embossing foil to guide said embossing foil towards said embossing station; and
a displacement means operatively associated with said deflection roller to displace said deflection roller in a direction parallel to an axis of said embossing roller and pivotably about a pivot axis perpendicular to its longitudinal axis, said displacement means including a stationary base member, a displacement platform linearly movable on said base member, a drive means for moving said displacement platform relative to said base member, said drive means including a disc rotatably mounted on said base member



and drivable about its central axis, said disc having a groove of a spiral configuration, said drive means further including a bell crank lever pivotally mounted to said base member and having first and second limbs, said first limb engaging into said groove, and a connecting element pivotally connected to the second limb of the bell crank lever and to said displacement platform, a mounting member supporting said deflection roller rotatably about its longitudinal axis and connected to said displacement platform pivotably about said pivot axis, a guide member associated with said base member, and a follower element carried by said member to produce pivotal movement of said mounting member.

5,192,392
CONTAINER LABELER

Preston E. Peterson; Chester L. Peterson, and Andrew J. Ryan, all of Napa, Calif., assignors to The Bottling Room, Inc., Napa, Calif.
Filed Feb. 28, 1991, Ser. No. 662,063
Int. Cl.[5] B65C *9/00*
U.S. Cl. 156—566 9 Claims



1. A container labeler comprising:
a label supply hopper for storing a supply of labels and presenting a label at a label pick-off point;

5,192,396
first flash cyclone which receives the other part of the

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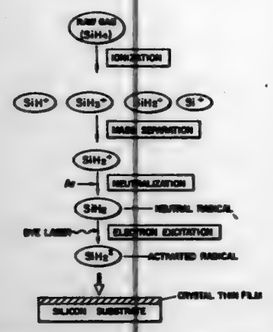
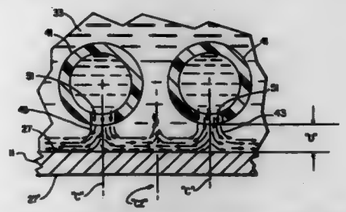
a label drive assembly;
a transfer assembly including a transfer head, which transfers the label from the pick-off point to the label drive assembly, and an idler roller mounted to the transfer head;
an adhesive applying assembly;
the drive assembly driving the label from the transfer assembly to the adhesive applying assembly;
a conveyor line having a straight conveyor portion and a rotary conveyor portion thereof;
the adhesive applying assembly applying adhesive to a back side of the label and transferring the label at a chosen speed to a label applying position along the conveyor line;
the rotary conveyor portion of the conveyor line having continuously rotating pedestals configured to support and rotate the containers about the containers' own axes as the containers move along the said rotary conveyor portion line, the pedestals rotating at a speed so that the surface speed of a container supported buy the pedestal at the label applying position is generally equal to the chosen speed of movement of the label at the label applying position; and
a label pressing roller at the label applying position biased to press the label against the rotating container.

5,192,393
METHOD FOR GROWING THIN FILM BY BEAM DEPOSITION AND APPARATUS FOR PRACTICING THE SAME
Yasushi Muranaka, Katsuto; Hisao Yamashita, Hitachi; Akira Kato, Hitachi, and Hiroshi Miyadera, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 18, 1990, Ser. No. 524,980
Claims priority, application Japan, May 24, 1989, 1-128850
Int. Cl.[5] C30B *23/08*
U.S. Cl. 156—610 22 Claims



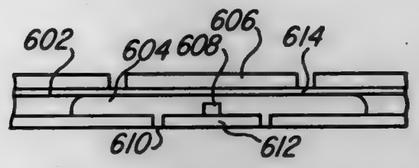
1. A method of growing a thin film on a substrate, which comprises the steps of:
(I) producing ions of an element or a compound from a starting gas substance, said element or said compound being a material of the thin film;
(II) effecting neutralization of the ions by injecting electrons into the ions or transferring charges of the ions to produce neutral particles;
(III) electronically exciting said neutral particles with an electromagnetic wave without ionizing said neutral particles; and
(IV) guiding the excited neutral particles along a path towards a surface of the substrate, whereby the excited neutral particles impinge the surface and deposit thereon to form the thin film.

5,192,394
FLUID TREATMENT APPARATUS AND METHOD
Steven L. Bard, Endwell, and Jeffrey D. Jones, Newark Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1991, Ser. No. 808,134
Int. Cl.[5] B44C *1/22*; C23F *1/00*
U.S. Cl. 156—640 33 Claims



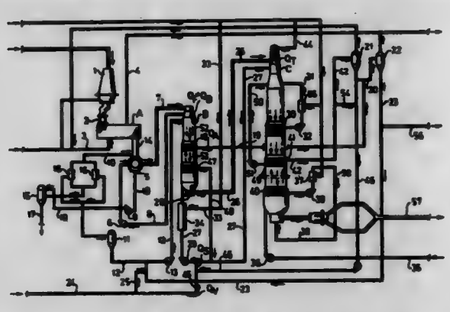
24. A method of fluid treating a substrate, said method comprising:
moving said substrate in a predetermined direction of travel;
collecting a first fluid substantially adjacent a first surface of said moving substrate and maintaining said first fluid at a predetermined level above said first surface;
directing a plurality of fluid jets of said first fluid through said collected first fluid onto said first surface of said moving substrate at spaced-apart locations thereon in such a manner that each of said directed fluid jets maintains a sufficient velocity across said first surface to substantially prevent mixing of said directed fluid jets with said collected first fluid prior to engagement with the nearest, adjacent directed fluid jet; and
providing said first fluid at a pressure sufficient to maintain said fluid jets at said velocity across said first surface of said substrate.

5,192,395
METHOD OF MAKING A DIGITAL FLEXURE BEAM ACCELEROMETER
Robert M. Boysel, and Jeffrey B. Sampsell, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 12, 1990, Ser. No. 596,841
Int. Cl.[5] B44C *1/22*; C23F *1/00*
U.S. Cl. 156—643 8 Claims



1. A process for fabrication of sensor elements comprising the following:
a) forming a ground plane layer upon a substrate;
b) fabricating addressing circuitry and electrical contacts upon said ground plane;
c) spinning a spacer layer upon the entire substrate;
d) depositing a layer of thin metal upon said spacer layer;
e) patterning said thin metal layer;
g) depositing a layer of heavy metal upon said thin metal layer;
h) patterning and forming said heavy metal layer so each sensor element has a different mass;
i) dividing said substrate into individual chips; and
j) undercutting said spacer layer.

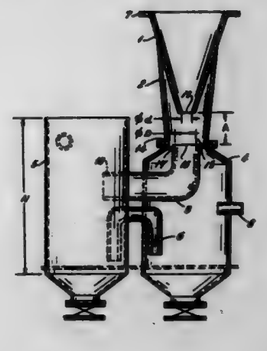
5,192,396
PROCESS FOR THE CONTINUOUS DIGESTION OF CELLULOSIC FIBER MATERIAL
Ake Backlund, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden
Continuation of Ser. No. 420,322, Oct. 12, 1989, Pat. No. 5,080,755. This application Sep. 24, 1991, Ser. No. 765,004
Claims priority, application Sweden, Dec. 20, 1988, 8804578
The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.
Int. Cl.[5] D21C *3/26*, *7/12*
U.S. Cl. 162—19 20 Claims



1. A process for the continuous digestion of cellulosic fiber material using a closed impregnation system having a concurrent flow zone followed by a countercurrent flow zone, and a digester system, said process comprising the steps of impregnating the fiber material with liquid in the closed impregnation system, withdrawing a predetermined amount of liquid from the impregnation system at a point located between the concurrent flow zone and the countercurrent flow zone, and supplying to the concurrent flow zone black liquor, and to the countercurrent flow zone white liquor and a predetermined amount of black liquor and withdrawing a predetermined amount of liquid from a portion of said digester system;
wherein the liquids withdrawn from the impregnation system and the digester system are transferred to a first and a second serially connected flash cyclone for heat recovery, the black liquor supplied to the countercurrent flow zone of the impregnation system comprising the liquid withdrawn from the digester system between a digester system concurrent flow zone and a digester system countercurrent flow zone, and the black liquor supplied to the concurrent flow zone of the impregnation system comprising the effluent from said second flash cyclone which receives liquid withdrawn from the digester system via said first flash cyclone and liquid withdrawn from the impregnation system.

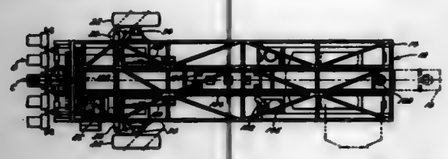
2. A process for the continuous digestion of cellulosic fiber material using a closed impregnation system having a concurrent flow zone followed by a countercurrent flow zone, and a digester system, said process comprising the steps of impregnating the fiber material with liquid in the closed impregnation system, withdrawing a predetermined amount of liquid from the impregnation system at a point located between the concurrent flow zone and the countercurrent flow zone, and supplying to the concurrent flow zone black liquor, and to the countercurrent flow zone white liquor and a predetermined amount of black liquor, and withdrawing a predetermined amount of liquid from a portion of said digester system;
wherein the liquids withdrawn from the impregnation system and the digester system are transferred to a first and a second serially connected flash cyclone for heat recovery, the black liquor supplied to the countercurrent flow zone of the impregnation system comprising a first part of the liquid withdrawn from the digester system between a digester system concurrent flow zone and a digester system countercurrent flow zone and the effluent from said first flash cyclone which receives the other part of the liquid withdrawn from the digester system, and the black liquor supplied to the concurrent flow zone of the impregnation system comprising the effluent from said second flash cyclone which receives liquid withdrawn from the digester system via said first flash cyclone and liquid withdrawn from the impregnation system.

5,192,397
METHOD AND APPARATUS FOR CLEANING OF A PULP SUSPENSION
Ake Bohman, Johanneshov, Sweden, assignor to Milan Kolman, Sweden
PCT No. PCT/SE90/00095, § 371 Date Aug. 13, 1991, § 102(e) Date Aug. 13, 1991, PCT Pub. No. WO90/09242, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 13, 1990, Ser. No. 761,767
Claims priority, application Sweden, Feb. 13, 1989, 8900472
Int. Cl.[5] B04C *5/14*, *9/00*; D21D *5/24*
U.S. Cl. 162—55 3 Claims



3. A method for cleaning of heavy and light contaminate particles from a fibre suspension by a fibre reclaimer comprising at least one vessel (4,5) having an opening (15), which is via a connecting arrangement in the form of a cone (1), which is inserted and fixed and terminates in a conical housing (2), connected to a cyclone or cleaner, wherein said at least one vessel comprises a first vessel with the opening and at least one adjacent vessel comprising pressing a reject fraction from the cyclone or cleaner through the cone (1) and downwardly through its outlet (13) to expand in the conical housing (2) and flow the first vessel (4) through a ring shaped opening gap (17) situated in the opening (15) of the first vessel (4) between a suction pipe (3) emerging in said opening and the first vessel (4), said suction pipe (3) having a tail end extending from said at least one adjacent vessel (5), filling said adjacent vessel with the fibre suspension by a connection pipe which connects said first vessel and said adjacent vessel, creating a vacuum so that all the fibre suspension which is near the tail end (18) of the suction pipe (3) in said adjacent vessel (5) is, due to the vacuum, resucked into the suction pipe (3) and through the cone (1) into the cyclone or cleaner.

5,192,398
COKE BOX WITH INDIRECTLY COOLED RECEIVING CHAMBER AND EXHAUST GAS BURNER
Edward S. Kress, Brimfield, and Gene C. Carpenter, Galesburg, both of Ill., assignors to Kress Corporation, Brimfield, Ill.
Division of Ser. No. 331,519, Mar. 30, 1989, Pat. No. 4,997,527, which is a continuation-in-part of Ser. No. 185,089, Apr. 22, 1988, Pat. No. 4,886,580, which is a continuation-in-part of Ser. No. 41,876, Apr. 22, 1987, abandoned. This application Mar. 4, 1991, Ser. No. 664,330
Int. Cl.[5] C10B *39/02, 39/12*
U.S. Cl. 202—227 20 Claims

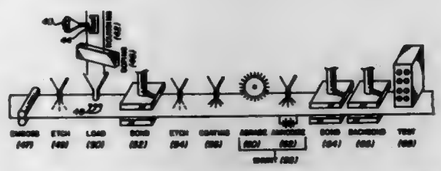


1. A coke box for dry quenching a charge of coke received from the discharge end of a coke oven comprising, in combination,
a chamber for receiving a charge of coke, said receiving chamber formed of metal panels having an exterior surface, and an interior shape and a volume in substantially the form of a rectangular parallelepiped substantially equal to that of the shape and volume of the charge of coke, the receiving chamber having a top, a bottom, and opposite sides, a rear end and a door opening,
door means for selectively closing the door opening to enclose the coke within the receiving chamber to substantially isolate the coke from the atmosphere and external cooling media,
means for cooling the exterior surface of the receiving chamber to indirectly cool the charge of coke by passing an external cooling media over the exterior surfaces of the receiving chamber,
means for creating an effective seal between the discharge end of the coke oven and the receiving chamber to substantially prevent the escape of combustible gases and particulate matter therefrom,
means defining a burner chamber for burning combustible gases and particulate matter exhausted from the receiving chamber,
and means interconnecting the receiving chamber of the coke box and the burner chamber for communicating combustible gases and particulate matter from the receiving chamber into the burner chamber.

5,192,399
PURIFICATION OF AMINONITRILES OR DIAMINES
James B. Sieja, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 648,002, Jan. 30, 1991, abandoned. This application Sep. 10, 1991, Ser. No. 757,287
Int. Cl.[5] B01D *3/10, 3/34;* C08F *20/42*
U.S. Cl. 203—36 3 Claims

1. A process for separating an aliphatic aminonitrile or diamine having 4 to 12 carbon atoms from a mixture consisting essentially of a cyclic, aliphatic, mono-unsaturated amine having a corresponding number of carbon atoms, said aliphatic aminonitrile being selected from the group consisting of 4-aminobutyronitrile, 5-aminovaleronitrile, 2-methyl-5-aminovaleronitrile, 6-aminocapronitrile, 12-aminododecanenitrile, said diamine being selected from the group consisting of 1,4-tetramethylenediamine, 1,5-pentamethylenediamine, 2-methyl-1,5-pentamethylenediamine, 1,6-hexamethylenediamine, 1,12-dodecanediamine, and said cyclic, aliphatic mono-unsaturated amine being selected from the group consisting of dihydropyrrole, tetrahydropyridine, 2-methyltetrahydropyridine, tetrahydroazepine, and mono-unsaturated cyclododecylamine, which consists essentially of adding a caustic compound to the mixture in the amount in the range of about 0.025% by weight to an amount about 5% in excess of the stoichiometric amount of the cyclic, aliphatic, mono-unsaturated amine in the mixture, and then distilling the aliphatic aminonitrile or diamine from the mixture at a temperature less than about 170 degrees C. and at a pressure less than atmospheric.

5,192,400
METHOD OF ISOLATING SHORTED SILICON SPHERES
Sidney G. Parker; Milfred D. Hammerbacher; Jules D. Levine, all of Dallas, and Gregory B. Hotchkiss, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jul. 31, 1989, Ser. No. 387,244
Int. Cl.[5] C25D *11/32*
U.S. Cl. 205—124 30 Claims



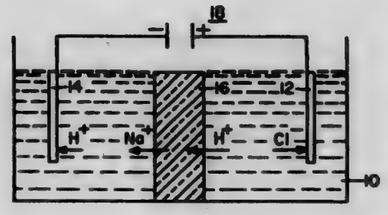
1. A method for isolating defective silicon spheres having an exposed P-type region where said spheres are affixed to a foil matrix, and comprising the steps of:
applying an insulating cover to said exposed P-type region of said spheres;
removing a portion of said insulating cover from a partial area of said sphere; and
anodizing said foil matrix and said spheres for a time sufficient to form an insulating oxide coating to those of said spheres having a short between said P-type region and said foil matrix.

5,192,401
DIAPHRAGM FOR USE IN CHLOR-ALKALI CELLS
Donald W. DuBois, Irwin, and Colonel R. Dilmore, Jeannette, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 494,911, Mar. 9, 1990, abandoned, which is a continuation of Ser. No. 284,015, Dec. 14, 1988, abandoned. This application Jan. 3, 1991, Ser. No. 637,110
Int. Cl.[5] C25B *1/16, 13/04*
U.S. Cl. 204—98 17 Claims

1. A method of preparing a liquid-permeable diaphragm for use in an electrolytic chlor-alkali cell having an anode in an anolyte compartment, a cathode in a catholyte compartment and a diaphragm that separates said anolyte and catholyte compartments, which comprises the steps of:
(a) impregnating a pre-formed, uncoated non-asbestos fibrous diaphragm comprised of material resistant to a chlor-alkali cell environment with an aqueous medium comprising water-soluble, hydrolyzable inorganic zirconium-containing compound, thereby providing said zirconium-containing compound within the diaphragm,
(b) hydrolyzing the impregnated zirconium-containing compound, thereby to form hydrous oxide of zirconium,
(c) drying the zirconium hydrous oxide-containing diaphragm to a moisture content of less than about 10 weight percent, thereby to deposit particulate substantially unhydrated zirconia within the fibrous diaphragm, and
(d) depositing a topcoating of inorganic, particulate refractory material on the anode face of the particulate zirconia-containing diaphragm of step (c), said particulate refractory material being selected from the group consisting of

silicon carbide, the oxides, borides, carbides, silicates or nitrides of valve materials selected from the group consisting of vanadium, chromium, zirconium, niobium, molybdenum, hafnium, tantalum, titanium and tungsten, and mixtures of such particulate refractory materials.
7. The method of claim 1 wherein the particulate refractory material is selected from the group consisting of finely-divided zirconium oxide, zirconium silicate and mixtures thereof.

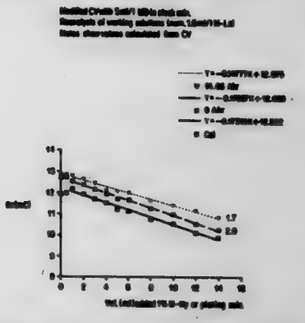
5,192,402
METHOD OF DEALKALIZING GLASS
Roger J. Araujo, and Walter F. Love, both of Horseheads, N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Feb. 13, 1992, Ser. No. 834,840
Int. Cl.[5] C25F *5/00*
U.S. Cl. 204—130 22 Claims



1. A method of removing alkali metal ions from a glass body that contains at least one alkali metal ion, the method comprising the steps of bringing a hydrogen-ion-producing anode into intimate contact with a portion of the glass body surface, bringing an oxide receptor of the alkali metal ion to be removed into intimate contact with another portion of the glass body surface as a cathode, and exposing the assembly of glass body and electrodes to a hydrogen-containing atmosphere while the assembly is at an elevated temperature and has a direct current applied across the electrodes.

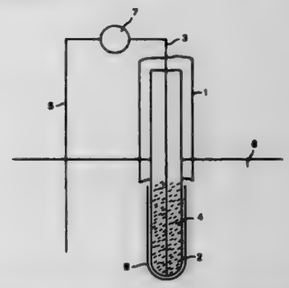
5,192,403
CYCLIC VOLTAMMETRIC METHOD FOR THE MEASUREMENT OF CONCENTRATIONS OF SUBCOMPONENTS OF PLATING SOLUTION ADDITIVE MIXTURES
I-Chia H. Chang, Peekskill, and Wilma J. Herkaus, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 16, 1991, Ser. No. 701,278
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—153.1 7 Claims

1. A cyclic voltammetric method for measuring concentrations of subcomponents of additive mixtures, comprising the steps of:
(a) preparing a basis solution which contains all of the components of an unknown solution to be measured, except a component of interest;
(b) preparing a calibration solution which contains said component of interest in a known concentration near that which would be expected in said unknown solution;
(c) adding measured amounts of said calibration solution to a first defined volume of said basis solution;
(d) applying an electrical potential to an electrode in the mixed calibration/basis solution and plotting the calibration cathodic charge against the added volume of the calibration solution;
(e) adding measured amounts of said unknown solution to a second volume of said basis solution;
(f) applying an electrical potential to an electrode in the mixed



unknown/basis solution and plotting the cathodic charge against the added volume of the unknown solution; and
(g) comparing the slopes of the calibration and unknown cathodic charge versus volume curves to determine the concentration of said component of interest in said unknown solution.

5,192,404
METHOD FOR MEASURING A MINOR ELEMENT IN A MOLTEN METAL
Derek J. Fray, and Ramachandran V. Kumar, both of Cambridge, United Kingdom, assignors to Mineral Industry Research Organization, London, United Kingdom
Division of Ser. No. 417,764, Oct. 6, 1989, abandoned. This application Sep. 18, 1991, Ser. No. 762,076
Claims priority, application United Kingdom, Oct. 6, 1988, 8823507
Int. Cl.[5] G01N *27/411*
U.S. Cl. 204—153.19 7 Claims



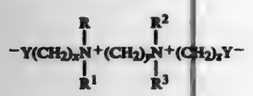
1. A method for the detection and measurement of a minor element in a molten metal, said minor element being selected from the group consisting of phosphorous, silicon, arsenic, antimony and sulphur comprising:
immersing a first electrical lead in said molten metal;
disposing a solid electrolyte in said molten metal in spaced relationship to said first electrical lead, said solid electrolyte comprising a matrix of alumina selected from the group consisting of β-alumina and $\alpha+\beta$ alumina and including a compound comprising the element to be detected and measured, oxygen, and an element selected from the group consisting of alkali and alkaline earth metal elements, said elements being chemically combined with said oxygen, said compound dissociating into its

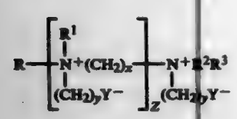
constituent elements under the condition of measurement in said molten metal;
connecting a second electrical lead to said solid electrolyte matrix so that said solid electrolyte matrix is between said leads and separates said second lead from said first lead when said first lead and said solid electrolyte matrix are disposed in said molten metal; and
measuring the EMF between said leads as an indication of the concentration of the minor element in said molten metal.

5,192,405
PROCESS FOR EFFECTING HIGH EFFICIENCY SEPARATIONS BY CAPILLARY ELECTROPHORESIS
John S. Petersen, Acton, and Michael Merion, Upton, both of Mass., assignors to Millipore Corporation, Bedford, Mass.
Continuation of Ser. No. 640,177, Jan. 11, 1991, abandoned. This application Sep. 9, 1991, Ser. No. 756,718
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—180.1 16 Claims

1. The process for effecting electrophoretic separation of molecules in a sample within a capillary which comprises:
introducing into said capillary a buffer solution containing at least one zwitterion comprised of substantially equal numbers of positive and negative charges and having the formula selected from the group consisting of:

$$RR^1R^2N^+(CH_2)_xY^- \quad \text{Formula I}$$
$$RR^1R^2P^+(CH_2)_xY^- \quad \text{Formula II}$$


Formula III

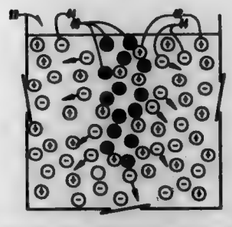

Formula IV

and mixtures thereof wherein x, y and z can be the same or different and are integers from 1 to 30; R, R^1, R^2, R^3, R^4 and R^5 can be the same or different and are hydrogen, alkyl groups containing from 1 to 30 carbon atoms, two R groups bonded to the same nitrogen as part of a cyclic structure or hydroxyalkyl groups containing from 1 to 30 carbons: Y can be the same or different and is sulfate or sulfonate, introducing said sample into said capillary and establishing an electrical field through said capillary to cause the sample to migrate through said capillary and detecting the separated analytes.

5,192,406
DEACTIVATED CAPILLARY COLUMNS FOR USE IN CAPILLARY ELECTROPHORESIS
Cole L. Woolley, Centre Hall, Pa., assignor to Supelco, Bellefonte, Pa.
Filed Jan. 9, 1991, Ser. No. 638,934
Int. Cl.[5] G01N *27/26, 27/447*; B01D *57/02*
U.S. Cl. 204—180.1 13 Claims

1. A method of performing capillary zone electrophoresis separations and micellar electrokinetic capillary chromatography separations which comprises the steps, performed in the order in which they appear, of
(a) introducing a buffered solution of analytes into a small-bore, glass or fused-silica capillary column having a bore diameter smaller than about 100 μm; having its inner surface covalently bonded to a polymer having a silicon backbone selected from the group consisting of polymeric silyl hydrides, polymeric siloxanes, polymeric cyclic siloxanes, polymeric silazanes and silicone polymers; and having its bore filled with a buffer solution,
(b) establishing a high-voltage differential from one end of the column to the other,
(c) allowing the analytes to separate within the column and migrate from the column in the buffer solution as it exits the column by electro-osmotic flow, and
(d) detecting the analytes in the buffer solution at or near the end of the column.

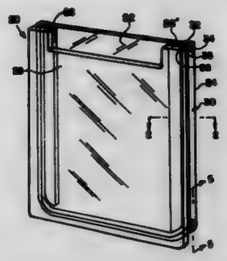
5,192,407
MEANS AND METHOD OF DETECTION IN CHEMICAL SEPARATION PROCEDURES
Edward S. Yeung; Lance B. Koutny; Barry L. Hogue; Chen K. Cheung, and Yinfa Ma, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Jan. 30, 1990, Ser. No. 472,315
Int. Cl.[5] G01N *27/26, 27/447*; B01D *57/02*
U.S. Cl. 204—182.8 27 Claims



1. The method of detection of certain components of a mixture in gel electrophoresis, comprising:
taking an encapsulated gel segment comprised of a gel slab means;
impregnating said gel segment with a fluoresecing substance comprised of positive and negative ions to create a generally uniform background fluorescence across said segment when the fluoresecing substance is excited;
imposing an electrical potential through said segment to enable electrophoresis;
injecting in said gel segment a liquid specimen of an ionic mixture having constituent ionic molecular components to be detected, each component having an ionic charge of one of the set consisting of positive and negative charges, whereby each component of said specimen will generally rectalinearly migrate in said gel segment according to type and magnitude of electrical charge and will create a negative image at the end of migration by displacing the identically charged ions of the fluoresecing substance in that general area within said gel segment;
measuring the length of the rectalinear migration of each negative image within said gel segment; and
comparing said length of migration of any negative image within said gel segment with lengths of migration of known ionic molecular components in a similar gel segment to identify the components of the mixture by correlating said lengths of migration with known ionic molecular components having similar lengths of migration.

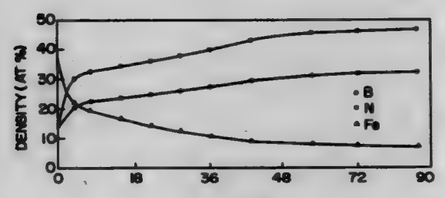
5,192,408
ELECTROPHORESIS GEL SEALING GASKET AND SYSTEM
Charles B. Scott, Rancho Santa Fe, Calif., assignor to CBS Scientific, Inc., Del Mar, Calif.
Filed Aug. 27, 1991, Ser. No. 750,826
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—182.8 23 Claims

1. An electrophoresis gel casting chamber sealing gasket comprising an elongate deformable member comprising:
a plate retention channel portion adapted to conform to and releasably retain a portion of the edge of a substantially planar base plate; and
a gasket portion formed integral with said plate retention



channel portion and adapted to form a seal between a face of said base plate and a face of a substantially planar top plate placed in close proximity thereto, thereby forming a gel casting chamber.

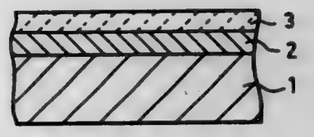
5,192,409
METHOD OF SPUTTERING A MIXTURE OF HEXAGONAL BORON NITRIDE AND STAINLESS STEEL ONTO A STEEL VESSEL AND HEATING THE FILM SO AS TO PRECIPITATE THE BORON NITRIDE ONTO THE FILM SURFACE
Masahiro Tosa, and Kazuhiro Yoshihara, both of Ibaragi, Japan, assignors to National Research Institute For Metals, Tokyo, Japan
Division of Ser. No. 491,428, Mar. 9, 1990. This application Apr. 3, 1992, Ser. No. 863,041
Int. Cl.[5] C23C *14/00*
U.S. Cl. 204—192.16 2 Claims



1. A low-temperature coating method for high-vacuum materials comprising depositing, through sputtering, a mixture film of stainless steel/boron nitride on the surface of a metal or an alloy and heating the same in a vacuum to around 300° C. to allow hexagonal boron nitride to precipitate on the surface thereof.

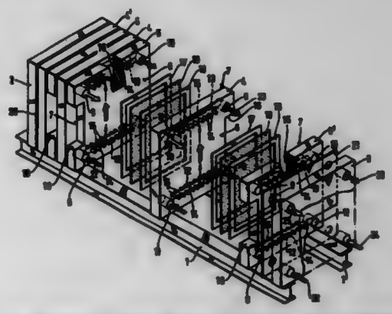
5,192,410
PROCESS FOR MANUFACTURING MULTI CERAMIC LAYER-COATED METAL PLATE
Wataru Ito; Shunpei Miyajima; Mineo Hashimoto, all of Kawasaki; Isao Itoh, and Tadashi Komori, both of Hikari, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Division of Ser. No. 385,413, Jul. 26, 1989, Pat. No. 5,079,089. This application Oct. 4, 1991, Ser. No. 771,211
Claims priority, application Japan, Jul. 28, 1988, 63-186940
Int. Cl.[5] C23C *14/34, 14/32*
U.S. Cl. 204—192.16 5 Claims

1. A process for manufacturing a multi ceramic layer-coated stainless steel plate, comprising the steps of:
providing a stainless steel plate;
dry depositing a colored ceramic layer by ion plating or sputtering over and adjacent to the stainless steel plate, the colored ceramic layer being made of at least one member selected from the group consisting of nitrides and carbides of titanium, zirconium, hafnium, chromium, niobium, and aluminum and having a thickness of 0.1 μm to 1 μm; and
dry depositing a transparent ceramic layer by plasma CVD



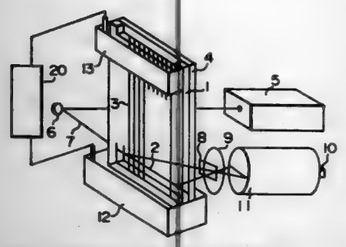
or sputtering over and adjacent to the colored ceramic layer, the transparent ceramic layer being made of at least one member selected from the group consisting of silicon oxide, silicon nitride, and aluminum oxide and having a thickness of 0.1 μm to 3 μm, whereby the metal plate is provided with an interference color.

5,192,411
ELECTRODE FOR ELECTROCHEMICAL REACTORS
Hans-Karl W. von Baur, deceased, late of Frankfurt am Main by Elke H. von Baur née Spiller, Silke V. C. von Baur, legal heirs; Steffen Dapperheld, Hofheim am Taunus; Klaus Kretschmann, Bischofsheim; Werner Lindner, Hofheim am Taunus; Rudolf Rosmeisel, Mertingen; Hans Millarg, Eschborn, and Gerhard Ullmann, Gross-Gerau, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Jan. 8, 1991, Ser. No. 638,839
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000505
Int. Cl.[5] C25B *11/02*
U.S. Cl. 204—280 3 Claims



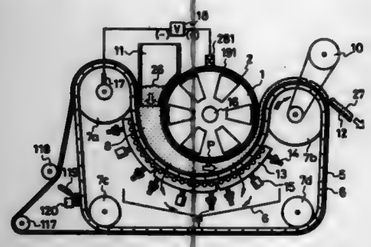
1. An electrode in the form of a rectangular parallelpiped composed of impregnated graphite material for electrochemical reactors, wherein the electrode is provided with openings extending perpendicular to its active electrode surfaces at its corners thereby defining collection channels for electrolyte, canals which extend parallel to the active electrode surfaces in the direction of adjacent openings across the electrode originating from said perpendicular openings situated diagonally opposite each other, and the canals feeding electrolyte into communicating channels which feed electrolyte directly to the active electrode surfaces.

5,192,412
ELECTROPHORETIC APPARATUS HAVING ARRAYED ELECTROPHORESIS LANES
Hideki Kambara, Hachioji, and Keiichi Nagai, Higashiyamato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 29, 1991, Ser. No. 800,042
Claims priority, application Japan, Nov. 30, 1990, 2-337074
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—299 R 21 Claims



1. An electrophoretic apparatus comprising:
an electrophoresis panel including first and second plane plates, a principal surface of said first plane plate being in close contact with said second plane plate and being provided with a plurality of lengthwise grooves which do not intersect one another and a widthwise groove intersecting said lengthwise grooves and extending to opposite edges of said principal surface of said first plane plate, said lengthwise grooves defining gaps adapted to be filled with an electrophoresis medium to provide a plurality of electrophoresis lanes;
voltage applying means for applying an electric field for electrophoresis to said plurality of electrophoresis lanes; and
detection means for discretely detecting fragments passing through the electrophoresis lanes at predetermined detection positions in the electrophoresis panel.

5,192,413
ELECTROOSMOTIC DEWATERER
Mikinaga Yamaguchi; Michio Nakagawa; Hideyuki Ohnemori; Masayuki Yoshida; Toshitaka Arai, and Hiroshi Matsushita, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Aug. 6, 1987, Ser. No. 82,332
Claims priority, application Japan, Apr. 13, 1987, 62-90026; Apr. 13, 1987, 62-90030
Int. Cl.[5] B01D *61/42*; C03C *5/02*; C02F *11/12, 1/469*
U.S. Cl. 204—300 R 15 Claims

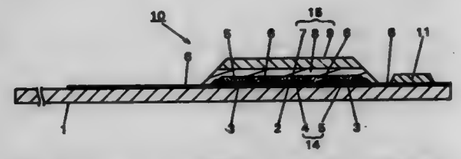


1. An electroosmotic dewaterer for dehydrating a liquid substance, comprising:
a power supply for generating a d.c. voltage;
an anode electrode for applying said d.c. voltage to the liquid substance, said anode electrode being mounted to a rotary body;
an insulation member covering all of the outer surface along the periphery of said rotary body, said anode electrode arranged over said insulation member, said insulation member electrically insulating and completely physically isolating said anode from said rotary body;
a cathode electrode facing said anode electrode for applying said d.c. voltage to the liquid substance located between said anode electrode and said cathode electrode and for collecting water from said liquid substance to cause the formation of dehydrated mud cake and mineral deposits on said cathode electrode;
means for receiving said collected water;
means for removing said dehydrated mud cake from said cathode electrode;
means for removing mineral deposits from said cathode electrode; and
means for applying said d.c. voltage from said power supply means to the surface of said anode electrode facing out from said rotary body.

5,192,414
ELECTRODE PROBE FOR USE IN AQUEOUS ENVIRONMENTS OF HIGH TEMPERATURE AND HIGH RADIATION
Maurice E. Indig, Fremont, and Jerry F. Hanlon, Livermore, both of Calif., assignors to General Electric Company, San Jose, Calif.
Filed Dec. 20, 1990, Ser. No. 633,748
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—400 18 Claims

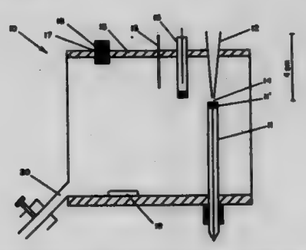
1. An electrode probe for employment in monitoring electrochemical potentials, comprising:
(a) a metal cap electrode having a tip, and an annulus extending therefrom which defines a cavity having an interior surface;
(b) an elongate annular metal jacket having an annular retainer securing mouth at one end and an outlet at its opposite end;
(c) an alumina retainer having a recessed cap securing portion nestably disposed within said cap electrode cavity and sealingly attached thereto, and an oppositely-disposed recessed jacket securing portion nestably secured to the interior of said annular jacket retainer securing mouth, and an access channel penetrating therethrough from said cap to said jacket securing portion;
(d) a first insulated electrical conductor in electrical connection with said cap electrode and extending through said retainer access channel and through said annular metal jacket to said jacket outlet;
(e) a positioning and signal transfer assembly associated with said jacket outlet for providing support for said jacket and for conveying electrical signals from said conductor; and
(f) an annular metal transition sleeve interposed between said annular metal jacket and said positioning and signal transfer assembly, said metal transition sleeve being formed of a material which is different than the material from which said annular metal jacket is formed.

5,192,415
BIOSENSOR UTILIZING ENZYME AND A METHOD FOR PRODUCING THE SAME
Toshihiko Yoshioka, Osaka, and Shiro Nankai, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 2, 1992, Ser. No. 845,073
Claims priority, application Japan, Mar. 4, 1991, 3-37259; Mar. 4, 1991, 3-37261; Sep. 2, 1991, 3-221402; Jan. 14, 1992, 4-04592
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—403 13 Claims



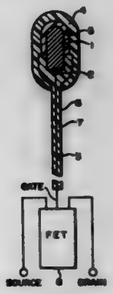
1. A biosensor for quantifying a substrate contained in a sample liquid by reducing electron acceptors using electrons generated in a reaction of the substrate to enzyme and then by measuring the reduced amount of the electron acceptors electrochemically, the biosensor comprising:
an electrical insulating substrate, an electrode system including at least a working electrode and a counter electrode which are formed on the insulating substrate, a reaction layer including the enzyme provided on the electrode system, and a hydrogen ion concentration control layer;
the reaction layer being in contact with the electrode system.

5,192,416
METHOD AND APPARATUS FOR BATCH INJECTION ANALYSIS
Joseph Wang, and Ziad H. Taha, both of Las Cruces, N. Mex., assignors to New Mexico State University Technology Transfer Corporation, Las Cruces, N. Mex.
Filed Apr. 9, 1991, Ser. No. 682,907
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—409 38 Claims



1. A batch injection analysis apparatus for measuring analyte sample concentration comprising:
vessel means;
single batch electrolyte means confined within said vessel means;
means for serially introducing into said vessel means, for dilution in said single batch electrolyte means, multiple analyte samples to be analyzed, the volume of each said analyte sample having a proportional ratio to the volume of said single batch electrolyte means within the range of 1/20,000 to 1/50,000;
planar detection means in said vessel means for sensing said analyte samples to be analyzed; and
means for analyzing said analyte samples.

5,192,417
LITHIUM ION SENSOR
Nobuo Oyama, Fuchu, and Toshiyuki Shono, Saito, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 5, 1990, Ser. No. 593,520
Claims priority, application Japan, Sep. 21, 1987, 62-234956
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—418 6 Claims



1. A lithium ion sensor comprising:
a FET;
a redox layer having a redox function covering a gate isolating membrane of said FET wherein said redox layer is obtained by electrolytically polymerizing a p-p'biphenol; and
a lithium ion-sensitive layer for selectively sensing lithium ion covering said redox layer, said lithium ion-sensitive layer being a polyvinyl chloride layer containing dibenzyl-14-crown-4, a derivative of dibenzyl-14-crown-4 or a mixture thereof, dioxaheptyl-dodecyl-14-crown-4, a derivative of dioxaheptyl-dodecyl-14-crown-4 or a mixture thereof, or diethoxyphosphorioxyethyl-dodecyl-14-crown-4, a derivative of diethoxyphosphorioxyethyl-dodecyl-14-crown-4 or a mixture thereof.

5,192,418
METAL RECOVERY METHOD AND SYSTEM FOR ELECTROPLATING WASTES
Charles R. Hughes; Stewart T. Herman, both of Hellertown, and Richard N. Steinbicker, Allentown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.
Filed Jul. 8, 1991, Ser. No. 726,931
Int. Cl.[5] C02F *1/00*
U.S. Cl. 205—100 18 Claims

1. The method of recovering useful metals used in a plating system from a plurality of process streams including the steps of:
a) providing a first process stream having a constant flow and concentration of a useful metal;
b) concentrating the useful metal in the first stream to a level sufficient to permit return thereof to the plating system and thereby simultaneously create a dilute raffinate stream;
c) providing a second process stream having a varying flow and concentration of a useful metal;

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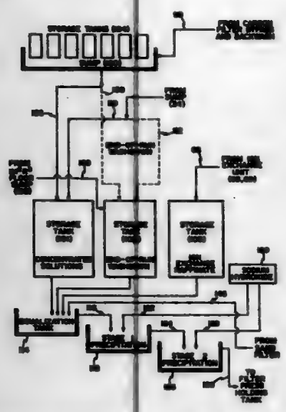
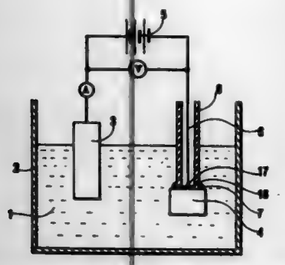
d) blending the raffinate stream with the second process stream and thereby creating a blended stream;
e) subsequently neutralizing free acid in the blended stream by adding a base thereto;



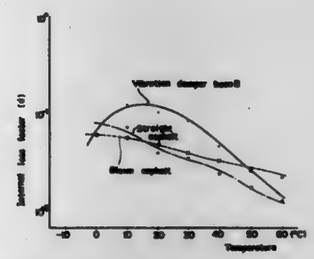
f) subsequently precipitating the useful metal in the neutralized stream by adding a sufficient amount of base thereto; and,
g) removing water from the precipitated useful metal.

5,192,419
METHOD FOR PRODUCING A ZINC SELENIDE BLUE LIGHT EMITTING DEVICE
Koichi Matsuura; Fumikori Takeda, both of Tottori, and Kenichi Kurisu, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Sep. 25, 1991, Ser. No. 765,425
Claims priority, application Japan, Sep. 25, 1990, 2-255923
Int. Cl.[5] C25D 3/56, 7/12
U.S. Cl. 205—244 2 Claims



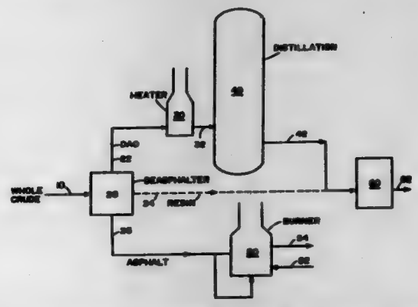
1. A method for producing a ZnSe blue light emitting device comprising the steps of:
mixing sodium sulfite (Na_2SO_3), selenium (Se) and water (H_2O) to produce a selenium sulfite ($SeSO_3$) solution;
mixing sodium nitrilotriacetic acid (Na_2—NTA) and zinc chloride ($ZnCl_2$) with the selenium sulfite solution to prepare a material solution;
connecting a platinum wire to a low-resistivity n-type ZnSe singlecrystal substrate;
immersing the low-resistivity n-type ZnSe singlecrystal substrate and a zinc electrode into the material solution being kept between room temperature and 70° C.;
sending an electric current from the zinc electrode as an anode to the n-type ZnSe singlecrystalline substrate as a cathode;
depositing a p-type ZnSe film on the n-type ZnSe singlecrystalline substrate; and
forming electrodes on the p-type ZnSe film and on the n-type ZnSe singlecrystalline substrate.

5,192,420
VIBRATION DAMPER OBTAINED BY ADJUSTING THE RESIN AND AROMATIC COMPONENTS OF THE ASPHALT BASE
Hisao Ohta, Hanazono, and Tadahiko Matsumawa, Yorii, both of Japan, assignors to Kabushiki Kaisha Asahi Corporation, Tokyo, Japan
Filed Dec. 10, 1990, Ser. No. 625,011
Int. Cl.[5] C10C 3/00
U.S. Cl. 208—23 7 Claims



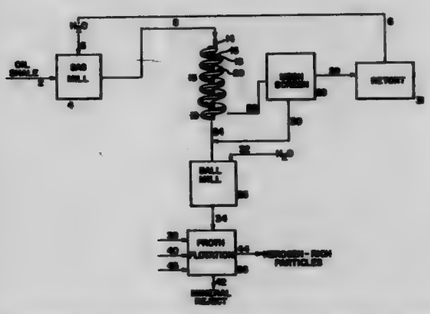
1. A vibration damper comprising:
30–70 wt. % of a vibration damper base containing approximately 30–38 wt. % of a resin component and approximately 55–65 wt. % of aromatic components and obtained either by adjusting the components contained in an asphalt base crude oil in the course of its refining or by blending and adjusting a resin component and aromatic component contained in petroleum asphalt; and
50–20 wt. % of an inorganic filler in the form of a thin flake of 20–200 mesh,
the sum of said vibration damper base and filler being at least 80 wt. %.

5,192,421
INTEGRATED PROCESS FOR WHOLE CRUDE DEASPHALTING AND ASPHALTENE UPGRADING
Costandi A. Audeh, and Lillian A. Rankel, both of Princeton, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Apr. 16, 1991, Ser. No. 685,758
Int. Cl.[5] C10C 3/00; C10G 7/00; B01D 3/00
U.S. Cl. 208—309 11 Claims



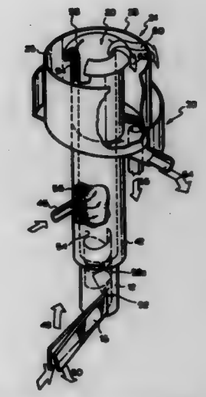
1. A process for recovering distilled hydocarbon product from a whole asphaltic crude comprising at least 40 volume % non-distillable residue at distillation conditions and thermally unstable, high boiling, metal containing compounds present in said non-distillable residue comprising
(a) deasphalting the asphaltic crude in a deasphalting means to produce a deasphalted oil with a reduced asphalt content relative to the feed and wherein the whole crude is deasphalted by contact with an aromatic solvent, then contacted with an aliphatic solvent to precipitate asphalt components,
(b) heating the deasphalted crude to a temperature in excess of 500° F. in a downstream refinery process.

5,192,422
OIL SHALE BENEFICIATION PROCESS USING A SPIRAL SEPARATOR
Bernard Y. C. So, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.
Filed Dec. 31, 1991, Ser. No. 817,794
Int. Cl.[5] B03B 5/62, 7/00; B03D 1/02
U.S. Cl. 209—164 19 Claims



1. A method of beneficiating oil shale, comprising the steps of:
(a) comminuting said oil shale in the presence of a first liquid to form a first stream comprising a first group of kerogen-rich particles, a first group of mineral-rich particles, and said first liquid, said kerogen-rich particles having a specific gravity less than that of said mineral-rich particles;
(b) flowing said first stream in a downward helical course such that said stream is confined in a manner to give said first stream an outer and upper side having a first depth and comprising a first portion of said kerogen-rich particles, and an inner and lower side having a second depth and comprising said mineral-rich particles and a second portion of said kerogen-rich particles, said first depth being greater than said second depth;
(c) separating said first portion of said kerogen-rich particles from both of said mineral-rich particles and said second portion of said kerogen rich particles;
(d) retorting said first portion of said kerogen-rich particles;
(e) comminuting said mineral-rich particles and said second portion of said kerogen-rich particles in the presence of a second liquid to form a second stream comprising a second group of kerogen-rich particles, a second group of mineral-rich particles, and a second liquid; and
(f) contacting said second stream with a frothing agent to form a frothing mixture and treating said frothing mixture by froth flotation, whereby air bubbles adhere to the second group of kerogen-rich particles, thereby causing said second group of kerogen-rich particles to float above said mixture and form a kerogen-rich froth and a mineral-rich mixture, separating said kerogen-rich froth from said mineral-rich mixture, and recovering said second group of kerogen-rich particles.

5,192,423
APPARATUS AND METHOD FOR SEPARATION OF WET PARTICLES
Tomasz Ducmal, and Jakob H. Schneider, both of Calgary, Canada, assignors to Hydro Processing & Mining Ltd., Calgary, Canada
Filed Jan. 6, 1992, Ser. No. 817,298
Int. Cl.[5] B03C 1/30; B03D 1/24, 1/14; B04C 3/00
U.S. Cl. 209—164 27 Claims



1. A process for separating particles in a slurry based on different physical, magnetic and/or chemical properties of said particles, said slurry including a mixture of solid particles and/or liquid particles which are immiscible in said slurry, said process comprising:
i) introducing a stream of said slurry into a cylindrical chamber having a cylindrical inner wall, said chamber being vertically oriented and closed at its lower end and open at its end, said stream being introduced near said closed lower end at an incline end and tangentially of said chamber to develop a spiral flow of said stream along said chamber inner wall toward said open end,
ii) introducing said stream in sufficient volume and pressure to develop a vortex in said slurry which extends downwardly from said chamber upper end,
iii) introducing air into said stream during at least a portion of its upward travel in said chamber, said air being introduced to said stream through means located at said chamber inner wall and for developing said air bubbles which move into said stream,
iv) said chamber being of a height sufficient to provide a residence time in said chamber which permits a separation of particles on their physical, electrical and/or chemical properties with at least lighter hydrophobic particles combining with air bubbles and moving inwardly towards said vortex and at least heavier particles under influence of centrifugal forces of said spiral flow, moving outwardly towards said chamber inner wall, said stream developing into a whirlpool at said chamber upper end,
v) directing said whirlpool stream outwardly at said open end into a catch basin surrounding said open end, said whirlpool stream swirling outwardly as said stream flows into said catch basin having a liquid level proximate said open end to permit said air bubbles to float toward a peripheral edge of said catch basin,
vi) separating said floating air bubbles with lighter hydrophobic particles from said heavier particles by collecting outwardly floating air bubbles from an upper zone of said catch basin, while said heavier particles sink downwardly of said catch basin and removing said heavier particles from a lower zone of said catch basin to effect said separation.

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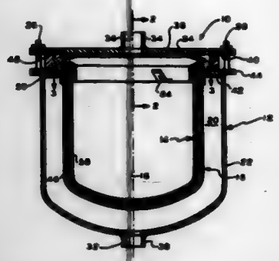
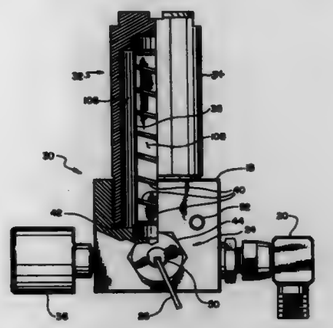
5,192,424
FILTER IDENTIFICATION DEVICE
Patrick Beyne, Suresne, and Georges Seon, Saint-Witz, both of France, assignors to ISP Investments Inc., Wilmington, Del.
Filed Dec. 5, 1991, Ser. No. 802,587
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] B01D *29/11*
U.S. Cl. 210—85 12 Claims



1. A filter apparatus comprising:
an enclosure subassembly having an axis and having a housing with a top flange and having a cover plate connected to the housing;
a basket subassembly having a basket portion and having an annular ring in sealing engagement with the top flange;
an identification subassembly having a filter bag and an integral collar in sealing engagement with the annular ring and with the cover plate;
said collar having a lower portion fixedly connected to the filter bag and having a middle portion supported by the annular ring and having a top lip portion engaging the cover plate;
said collar having an inner surface with an inner groove having a lower sidewall disposed adjacent to the middle portion and having an upper sidewall disposed adjacent to the top lip portion;
said collar having a pivotable web portion disposed between the middle portion and the top lip portion;
said identification subassembly having a cantilever identification tag fixedly connected to the collar; said identification tag having a face which contains information related to the apparatus, wherein the tag is connected to indicating means for signalling the presence of the filter in place, and wherein the indicating means is a slot through which the tag passes and an electrical switch for indicating the presence of the tag in the slot.

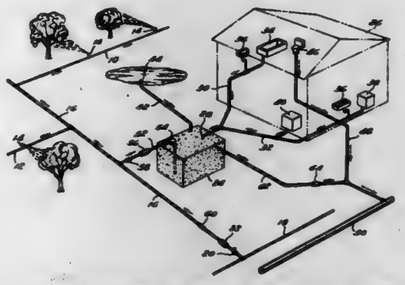
5,192,425
MOUNTING BASE AND ASSEMBLY FOR PRESSURE SENSOR, FILTER AND PRESSURE RELIEF VALVE
Norman A. Cyphers, Rogers; Dwaine D. Straight, St. Paul, and Robert D. Cooper, Jr., Blaine, all of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.
Filed Jul. 22, 1991, Ser. No. 733,226
Int. Cl.[5] B01D *35/14*; B67D *5/33, 5/58*; G01L *7/06*
U.S. Cl. 210—90 16 Claims

1. A combined pressure sensor and filter assembly for pressurized painting systems comprising:
a) a strain gage type pressure sensor for transducing pressure in a paint supply line;
b) a cylindrical filter having an upstream side and a downstream side and located downstream from the pressure sensor for removing particulates from paint in the paint supply line;
c) a pressure relief valve located upstream of the filter for limiting pressure in the paint supply line from rising above a predetermined maximum pressure;
d) a base formed of a single block of metal and having a plurality of faces on the exterior thereof and carrying the pressure sensor, filter and pressure relief valve and wherein the base has
i) a first straight bore extending through first and second faces of the base and forming an inlet port at an upstream end thereof in the first face and a pressure relief valve mounting port receiving and mounting the pressure relief valve therein at a downstream end of the first bore in the second face,
ii) a second bore extending from a third face into the base transverse to and intersecting the first bore, the second bore forming a pressure sensor mounting port,



iii) a third bore extending from a fourth face into the base transverse to the first ore and having at least one channel communicating between the first and third bores and wherein the third bore forms a filter mounting port such that the channel is in communication with the upstream side of the filter, and
iv) a fourth bore extending from a fifth face into the base forming a paint outlet port and communicating with the downstream side of the filter
wherein the flow path from the inlet path past the pressure sensor is relatively streamlined such that paint solids are carried away from the pressure sensor when a solvent is flushed through the base.

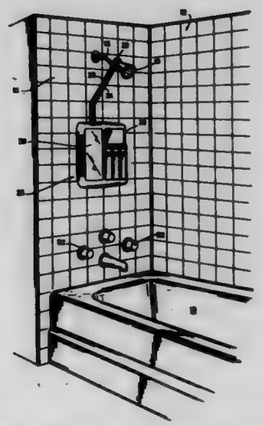
5,192,426
WATER RECLAMATION SYSTEM FOR LANDSCAPE IRRIGATION
Marc DeCoster, 759 Tawney Ct., Oceanside, Calif. 92056, and Jay L. Hoffman, 751 Tawney Ct., Oceanside, Calif. 92057
Filed May 16, 1991, Ser. No. 701,489
Int. Cl.[5] E02B *13/02*
U.S. Cl. 210—117 7 Claims



1. A water reclamation system for use with a landscape irrigation system, comprising:
a storage reservoir located adjacent a domestic dwelling;

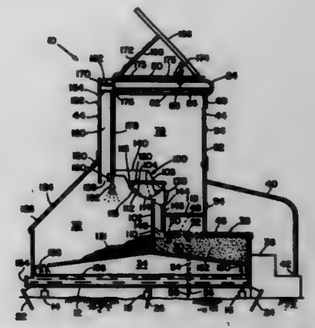
a first reservoir inlet conduit for inputing gray water from sources within said dwelling into said reservoir;
a second reservoir inlet conduit for inputing gray water from sources outside of said dwelling into said reservoir;
at least one drain disposed within a lawn of said dwelling and connected to said second inlet conduit for inputing ground water into said reservoir;
a first reservoir outlet conduit for placing said reservoir in fluid communication with said landscape irrigation system;
a second reservoir outlet conduit for providing an overflow drain line from said reservoir to a sewage line;
a pump positioned within said first outlet conduit for pumping water from within said reservoir into said irrigation system; and
a filter positioned within said first outlet conduit for filtering water pumped from said reservoir before the water is inputed into said irrigation system.

5,192,427
SHOWER FILTERS AND ACCESSORIES
Douglas R. Egar, 97 Lakeview Village, Montgomery, Tex. 77356; Douglas W. Smith, and Robert E. Dawson, both of Ridgefield, Conn., assignors to Douglas R. Egar, Montgomery, Tex.
Filed May 24, 1990, Ser. No. 528,149
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—133 49 Claims



1. A water filter assembly for use with a shower bath, comprising:
housing means having inlet and outlet means;
filter means mounted in the housing means in communication with the inlet and outlet means so that water flowing into the housing means through the inlet means will pass through the filter means and out the outlet means;
a bypass adapter having:
means defining a source port opening through a rear surface of the bypass adapter, the means being adapted for connection to a water source pipe to communicate the water source pipe with the source port,
means defining upstream and downstream bypass parts opening through a lower surface of the bypass adapter, the means defining the bypass ports being adapted for connection to the housing means to communicate the inlet and outlet means, respectively, with the upstream and downstream bypass ports,
means defining a head port opening through a front surface of the bypass adapter, the means defining the head port being adapted for connection to a shower head to communicate the head port with the interior of the shower head,
and the adapter having internal passage means communicating the source port with the upstream port and communicating the downstream port with the head port.

5,192,428
PORTABLE SYSTEM FOR TREATING HUMAN WASTE
Carl R. Lindstrom, Cambridge, Mass., assignor to Clivus Multrum, Inc., Lawrence, Mass.
Filed Apr. 18, 1991, Ser. No. 687,146
Int. Cl.[5] C02F *3/02*
U.S. Cl. 210—143 8 Claims



8. In a system for composting feces and for collecting urine by collecting feces and urine in a treatment vessel which has a urine treatment retainer, a composting retainer and means for exposing the collected feces to sufficient air and moisture in said composting retainer to allow feces to compost:
the improvement comprising a substrate supporting aerobic nitrifying bacteria disposed in the urine-treatment retainer which is at least partially partitioned from the composting retainer, means for passing urine through the urine-treatment retainer, whereby when urine is passed through the substrate, the substrate thereby forms liquid product, and means for adding water to said composting retainer and controlling means which controls the amount of water to be added to allow composting of feces at an adequate rate, thereby preventing the feces from becoming over-dried or over-wet.

5,192,429
SELF-CLEANING FILTER
Bernard R. Bader, 6802 Bristol Way, Yakima, Wash. 98908
Filed Jul. 1, 1991, Ser. No. 724,190
Int. Cl.[5] B01D *29/15*
U.S. Cl. 210—170 9 Claims

1. A self-cleaning filter, said self-cleaning filter comprising:
an enclosed screen assembly, said enclosed screen assembly being substantially hollow, attachable to an inlet for drawing fluid from a fluid source and having an exposed, substantially fluid permeable screen to pass fluid from said fluid source to said inlet;
a cleaning system, said cleaning system rotatable mounted to and located substantially within said enclosed screen assembly and said cleaning system further having the capacity to deliver a plurality of outwardly directed cleaning fluid streams; and

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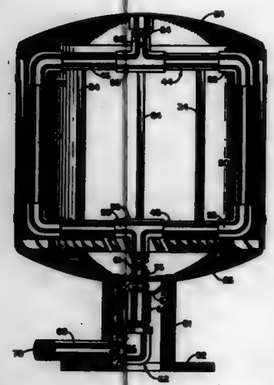
a propulsion system, said propulsion system located proximate said cleaning system so that said propulsion system



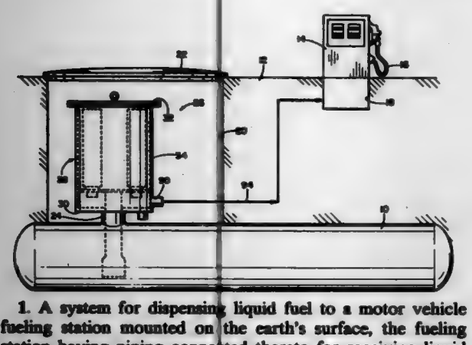
causes said cleaning system to rotate relative to said enclosed screen assembly.

5,192,430

SYSTEM FOR DISPENSING LIQUID FUEL TO A MOTOR VEHICLE FUELING STATION

Kirby S. Mohr, Tulsa County, Okla., assignor to Facet Quantek, Inc., Tulsa, Okla.

Filed Jun. 17, 1991, Ser. No. 716,302
Int. Cl.[5] B01D *35/01, 35/027*
U.S. Cl. 210—172 9 Claims



1. A system for dispensing liquid fuel to a motor vehicle fueling station mounted on the earth's surface, the fueling station having piping connected thereto for receiving liquid fuel, the system comprising:

an underground sump positioned adjacent the fueling station;

an underground storage tank buried in the earth below said underground sump and having a vertical pump riser pipe extending upwardly therefrom and into said underground sump;

an upright vessel positioned with the underground sump, the vessel having a bottom, a sidewall, an open top and having a partition therein spaced from the bottom dividing the vessel interior into an upper zone and a lower zone, and the vessel having aligned inlet openings in the bottom and the partition and having an outlet opening communicating with the vessel lower zone, the bottom inlet opening being sealably attached to said storage tank vertical pump riser pipe providing closed communication between the underground storage tank and the vessel, the partition having at least one adapter opening therethrough spaced from said inlet opening in the partition, the vessel being supported by said pump riser pipe within said underground sump, the vessel outlet opening being connected to the fueling station piping;

a vertical fuel outlet pipe received within said vessel bottom inlet opening and telescopically received in said pump riser pipe, said fuel outlet pipe having a lower end extending within said fuel storage tank and an upper end sealably secured to said inlet opening in the partition;

means sealing the exterior of said fuel outlet pipe to said vessel bottom inlet opening;

at least one filter cartridge removably positioned within said vessel upper zone having a filter fuel outlet in closed communication with said at least one adapter opening in said partition; and

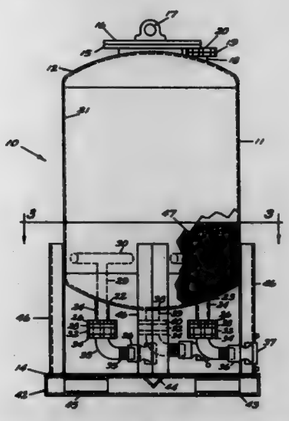
a removable lid attachable to and for sealably closing said vessel top, fuel flowing from the storage tank passing upwardly through said fuel outlet pipe and into said vessel upper zone, through said at least one filter cartridge into said vessel lower zone, out through said vessel outlet opening and through the fueling station piping to the motor vehicle fueling station.

5,192,431

FORKLIFT MANIPULABLE, LINED, DISSOLVER FOR TRANSPORTING AND FEEDING CHEMICALS FOR WATER PURIFICATION

Norman A. Holmes, 2906 Little Bear, Kingwood, Tex. 77339

Filed May 23, 1991, Ser. No. 704,444
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—198.1 2 Claims



1. A portable dissolver for transporting water-purifying chemicals and dissolving and introducing them into a water supply comprising

a cylindrical tank with semispherical top and bottom members,

a metal transportable skid positioned to support said tank,

said metal skid being rectangular in shape and constructed for transport by a fork-lift,

a chemical-resistant, plastic lining on substantially the entire inner surfaces of said tank to prevent chemical attack thereto,

pellets or granules of water-purifying chemicals substantially filling said tank,

an inlet opening and an outlet opening on the bottom of said tank for connection to a water supply,

said bottom inlet opening comprising a first standpipe with a header at one end thereof comprising a closed end tube with holes for facilitating water flow therethrough,

a valve controlling flow through said inlet opening,

said bottom outlet opening comprising a standpipe with a header at one end thereof comprising a closed end tube with holes for facilitating water flow therethrough,

said inlet and outlet headers being positioned on opposite sides of said tank, parallel to each other and at substantially the same level in said tank a predetermined distance above the bottom,

a valve controlling flow through said outlet opening,

said valves controlling water flow through the contents of said tank to determine the rate of dissolution of water-purifying chemicals and rate of introduction of said chemicals into said water supply,

said tank having a flanged top opening with removable cover for introduction of said water-purifying chemicals,

a top tank inlet for introduction of water for flushing and cleaning said tank, and

a bottom tank outlet for removal of water used in flushing and cleaning said tank.

5,192,432

FLOW-THROUGH CAPACITOR

Marc D. Andelman, 6 Nadine Rd., Framingham, Mass. 01701

Continuation of Ser. No. 512,970, Apr. 23, 1990, abandoned. This application Nov. 15, 1991, Ser. No. 792,902
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 25 Claims

16. A flow-through capacitor adapted for use in a controlled charge chromatographic column for the purification of liquids, which capacitor comprises:

a) a plurality of spirally wound layers wound about a central, hollow, perforated plastic tube from inside to outside, with each end of the layers sealed, the layer composed of a first spacer layer, a first backing layer, a first high surface layer, a second spacer layer, a second backing layer and a second high surface layer;

b) the first and second spacer layers comprises a porous, electrically non-conductive layer to permit the flow of liquid therethrough, the first and second backing layer comprising an electrically conductive graphite foil with pin holes therein, and the first and second surface area layers comprising a porous, activated carbon woven fiber cloth to act as the stationary phase in a chromatographic column; and

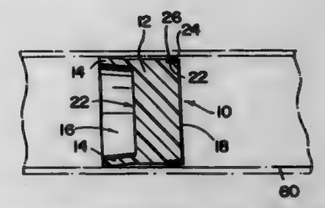
c) a cathode and an anode lead, each integrally formed from and extending electrically respectively to the first and second backing layers and adapted to be connected to a DC power source to provide for the first and second backing layers to become the anode and cathode of the flow-through capacitor and separate and opposite charges on the backing layer.

5,192,433

SLURRY COMPRESSOR, APPARATUS FOR GUIDING COMPRESSOR, AND METHOD FOR PACKING SLURRY IN COLUMN

Yehuda Shalon, St. Louis, Mo., assignor to MODcol Corporation, St. Louis, Mo.

Continuation of Ser. No. 501,122, Mar. 29, 1990, abandoned. This application Apr. 17, 1992, Ser. No. 870,217
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 10 Claims



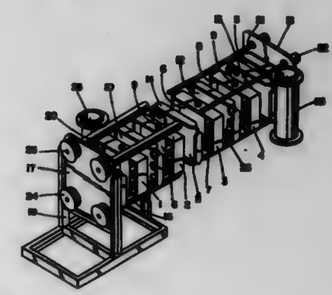
1. A slurry compressor for use in packing a chromatographic column adapted to contain a bed of particles comprising a slurry, said compressor compriaing a shaped member having an inner portion and an outer portion, said inner portion comprising a solid segment that includes a generally planar surface that is adapted to contact slurry, said outer portion comprising a hollowed interior defined by a wall structure sized for contacting a chromatographic column wall and extending from the solid segment forming the inner portion, said inner portion including an annular groove positioned intermediate said generally planar surface and said outer portion, said groove comprising means for receiving resilient means adapted to seal an inner face of a column wall and said compressor when said compresor is in a chromatography column, and further including resilient means for sealing a chromatography column positioned within said group.

5,192,434

MEMBRANE FILTRATION APPARATUS AND METHOD OF MAKING A MEMBRANE FILTRATION UNIT

Jens K. Moller, Maribo, Denmark, assignor to Dow Denmark A/S, Copenhagen, Denmark

Continuation of Ser. No. 476,463, Jun. 7, 1990, abandoned. This application May 13, 1992, Ser. No. 882,651
Int. Cl.[5] B01D *61/50, 63/08, 69/06*
U.S. Cl. 210—227 14 Claims



1. An apparatus comprising

I. a filtration unit comprising

A. a stack of rectangular membrane pairs, wherein two opposite edges of each pair are sealed and a third edge is bound in a cured binder such that a fluid tight seal is formed along such edge and along the entire third edge the interior between the membrane pairs is open, and the

fourth edge is sealed or bound in cured binder along the entire edge;

B. a permeate selection collection sealed about the edge of the stack of membrane pairs bound in curable binder, in contact with the open edge of the stack of membrane pairs and in communication with the space between each membrane pair;

C. two end plates adjacent to the two ends of the membrane stack, and

D. a bottom plate which interconnects the two end plates at the underside of the membrane stack;

II. a cassette frame arranged about the filtration unit such that two free zones are created adjacent to the two sealed sides of the membrane stack the two free zones adapted for communicating feed and/or concentrate streams with the outside of the membrane pairs and the flow passages between the membrane pairs; wherein the portion of the filtration unit in contact with the free zones created by the cassette frame is isolated from the interior of the membrane pairs and the permeate collection chamber.

5,192,435

SELF-CLEANING VACUUM HEAD FOR RECOVERING OIL FROM BEACHES AND THE LIKE

Allen C. Francisco, Jr., Bellevue, Wash., assignor to Fraser Environmental Systems, Inc., Seattle, Wash.

Continuation of Ser. No. 519,284, May 4, 1990, Pat. No. 5,076,919. This application Jun. 7, 1991, Ser. No. 712,192
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—241 16 Claims

9. A vacuum pick up device constructed and arranged for removing fluid media from selected particulate matter comprising:

a first substantially planar surface for contacting particulate matter, the first surface having an elongated slot aperture for passage of fluid media therethrough in a transverse direction, the slot having a predetermined length and width defining a slot axis;

a second substantially planar surface adjacent to the first surface, the second surface having an elongated area of perforation having a predetermined width and defining a perforation axis transverse to the slot axis;

moving means for moving the first and second surfaces with respect to one another in a moving direction which is transverse to both the slot axis and the perforation axis and substantially parallel to the first and second surfaces from a first relative position to a second relative position, wherein at the first position the slot and the area of perforation are at least partially aligned so as to form an intersection having a maximum dimension selected to substantially be smaller than a smallest cross sectional dimension of the selected particulate matter, and wherein at the second position the slot and the area of perforation are not aligned; and

vacuum means for establishing a pressure differential across the first and second surfaces so that particulate matter is drawn against the first surface and tends to roll in the intersection as the surfaces move with respect to one another so as to promote thorough separation of the fluid media from the particulate matter until the slot and area of perforation are no longer coincident so as to release the particulate matter from the first surface during operation of the device.

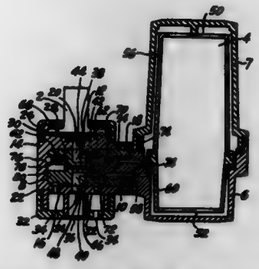
16. The device of claim 9, including a vehicle for carrying the device in a suspended manner over the fluid media to be treated and steam jets mounted forwardly of the device to decrease the viscosity of the fluid media to be removed from the particulate matter.

5,192,436

TAP WATER PURIFIER TO BE DIRECTLY COUPLED TO FAUCET PIPE

Tsutomu Sasaki, 30-21, Otsubata-cho, Misogagi, Yamashina-ku, Kyoto, and Satoshi Sasaki, Kyoto, both of Japan, assignors to Tsutomi Sasaki, Kyoto, Japan

Filed Nov. 18, 1991, Ser. No. 793,865
Claims priority, application Japan, Nov. 21, 1990, 2-319096; Apr. 24, 1991, 3-122562
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—264 8 Claims



1. A tap water purifier to be directly coupled to a faucet pipe comprising:

a purifying barrel filled with a filter medium and having opposite opening ends;

a casing including a cylindrical bore formed therein and having tap water inlet port means, tap water outlet port means and purified water outlet port means formed therein, said tap water inlet port means and said purified water outlet port means opening to said cylindrical bore of the casing at an angular distance of 180° from each other in the same axial position;

a cylindrical valve body integral with said purifying barrel and inserted in said cylindrical bore of the casing for rotation about the longitudinal axis of the valve body;

first flow path means formed in said valve body and communicated with one opening end of said purifying barrel;

second flow path means formed in said valve body and communicated with the other opening end of said purifying barrel, said first and second flow path means opening to the peripheral surface of said valve body at an angular distance of 180° from each other in an axial position corresponding to the opening positions of said tap water inlet port means and said purified water outlet means; and

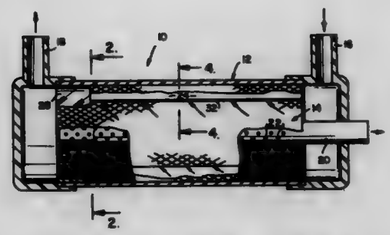
third flow path means formed in said valve body and communicated with said tap water outlet port means, said third flow path means opening to the peripheral surface of said valve body in an angular position between the opening positions of said first and second flow path means and in said axial position corresponding to the opening position of said tap water inlet port means.

5,192,437

SPIRAL FILTRATION MODULE WITH IMPROVED CLEANABILITY AND OPERATING EFFICIENCY

Jikuo Cheng, Tyngsboro, and Robert G. Blanck, Stoneham, both of Mass., assignors to Koch Membrane Systems, Inc., Wilmington, Mass.

Filed Aug. 20, 1990, Ser. No. 570,138
Int. Cl.[5] B01D *61/18*
U.S. Cl. 210—321.83 4 Claims



1. A device for use in ultrafiltration of a liquid feed stream, said device comprising:

a housing including means for receiving said feed stream at one end thereof;

a filtration cartridge for separating said feed stream into concentrate and permeate,

said cartridge being disposed within said housing in spaced relationship to the latter to accommodate the flow of said feed stream around the periphery of and radially inward through at least a portion of the cartridge along its length;

means for maintaining said cartridge in spaced relationship to said housing without blocking liquid flow through said housing;

means coupled with said housing for accommodating withdrawal of permeate; and

potting means for sealing said cartridge to said housing at the end of the latter opposite said one end only, the other end of said housing being open to accommodate liquid flow into said housing in the direction of said one end, whereby when said feed stream enters said housing at said other end it flows between said cartridge and said housing and then enters said cartridge but is precluded from by-passing said cartridge by said potting means.

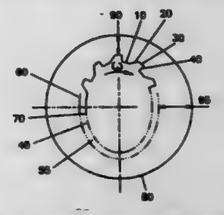
5,192,438

ROTATING ELEMENT FOR SCREENING APPARATUS WITH A CONTOUR SURFACE PRODUCED BY A PLURALITY OF PROTRUSIONS IN THE DIRECTION OF THE AXIAL LENGTH OF THE ROTOR

Frey Frejborg, Glen Falls, N.Y., assignor to A.Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 252,810, Oct. 3, 1988, Pat. No. 4,950,402, which is a continuation-in-part of Ser. No. 41,241, Apr. 22, 1987, Pat. No. 4,776,957, said Ser. No. 61,594, is a continuation-in-part of Ser. No. 738,743, May 29, 1985, Pat. No. 4,676,903, which is a continuation-in-part of Ser. No. 472,742, Mar. 7, 1983, Pat. No. 4,529,520. This application Aug. 14, 1990, Ser. No. 567,258
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] B01D *29/62;* B07B *1/20*
U.S. Cl. 210—413 29 Claims

1. In an apparatus for screening pulp which comprises a vessel, a screen cylinder having an envelope surface and a contour surface within the vessel, a rotor moving in the vicinity of the screen cylinder at a predetermined speed on an axis of rotation, said rotor having an axial length, an inlet for the unscreened pulp, a first outlet for the accept screened pulp in said vessel and a second outlet for the reject, said first and second outlets being in operative communication with said screen cylinder, said rotor having a non-cylindrical shape, the improvement which comprises said rotor having a contoured surface including a plurality of spaced protrusions disposed about the periphery of the rotor, each of said protrusions being shorter than the axial length of said rotor, each protrusion having a side plane essentially perpendicular to the rotor surface which is the leading surface, two edge surfaces, an upper



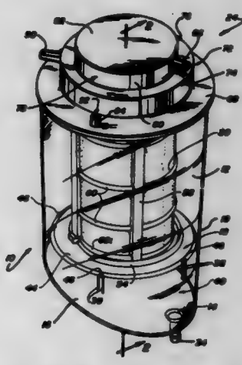
plane parallel to the rotor surface and an inclined plane, said inclined plane forming an angle between 5°–60° with said rotor surface whereby a lower frequency pumping action, high frequency high intensity positive pulses are generated with additional high intensity axial shears with improved screening at a pulp concentration up to 6%.

5,192,439

BLOOD COLLECTION RESERVOIR AND FILTER DEVICE

Gary L. Roth, Elizabeth, and William D. Zillmann, Broomfield, both of Colo., assignors to Electromedics, Inc., Englewood, Colo.

Filed Feb. 3, 1992, Ser. No. 829,691
Int. Cl.[5] B01D *29/11, 29/27*
U.S. Cl. 210—485 14 Claims



1. A device for filtering and storing blood comprising in combination, a tubular housing having a vertical central axis, a continuous side wall extending substantially parallel to said axis, a top wall and a bottom wall, a tubular vertically extending cage supported within said housing in spaced relationship with said side wall, an outwardly flared and downwardly tapered ring operatively connected to a lower portion of said cage, said ring having an outer edge closely spaced from said side wall, a cylindrical filter medium confined to said cage and defining a chamber within said housing, an inlet to the interior of said housing in communication with said chamber for admitting blood to the chamber and an outlet from the bottom of said housing through which blood can be removed from the housing whereby blood entering said chamber must pass through said filter medium and onto said ring before flowing across the ring and cascading to an internal surface of the side

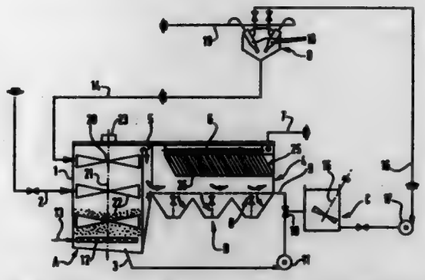
wall of the housing where it flows downwardly along said side wall for removal through said outlet.

5,192,440
HOLLOW CELLULOSE DIALYSIS FIBERS
Gunter von Sengbusch, Wuppertal, Fed. Rep. of Germany, assignor to Akzo N.V., Netherlands
Filed Nov. 27, 1991, Ser. No. 798,897
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1990, 4038247
Int. Cl.[5] B01D *71/10, 71/12*
U.S. Cl. 210—500.29 6 Claims

1. A cellulose dialysis membrane in the form of a hollow fiber formed from cellulose-cuoxam solutions, with an internal cavity formed by a liquid or a gas and with a UFR of at least 4 ml/m^2-h-mm Hg, wherein:
hydrogel components of the cellulose are distributed in cells with an average free path length, as determined by a freeze-etching replica method after swelling of the cellulose membrane with water, of 3–10 mm in the membrane wall in a log-normal distribution, the average free path length being the distance between the cells;
more than 65% of hydrogel cell interfaces in the membrane have a form factor between 1.0 and 5.0; and
said membrane having properties for enabling its UFR following storage for more than ten days in a humid atmosphere at 20° C. and 100% relative humidity to be maintained at more than 50% of the value obtained immediately after drying or after storage in a dry environment.

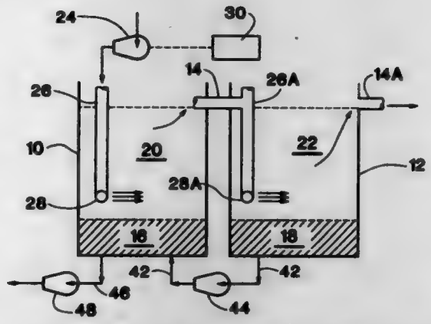
5,192,441
PROCESS AND INSTALLATION FOR BIOLOGICAL TREATMENT, E.G. BY NITRIFICATION AND/OR DENITRIFICATION, OF AN EFFLUENT INCLUDING NITRATED POLLUTION
Jacques Sibony, Paris, and Gilbert Desbos, Maisons-Laffitte, both of France, assignors to Omnium de Traitements et de Valorisation (OTV), Courbevoie, France
Continuation of Ser. No. 478,865, Feb. 12, 1990, abandoned.
This application Sep. 11, 1991, Ser. No. 759,146
Claims priority, application France, Feb. 14, 1989, 89 01886
Int. Cl.[5] C02F *3/12, 3/30*
U.S. Cl. 210—603 40 Claims

1. A method for biological treatment of sewage effluent water containing nitrogen pollution, comprising:
bringing an incident flow of said sewage into a mixing zone with at least one compartment and effecting, by high turbulent mechanical agitation within said compartment, homogeneous suspension of a substantially unconsumable and insoluble granular material in a concentration of at least about 5 g/l, loaded with biomass in a concentration of less than 1 g/liter, in said sewage, and maintaining a generally constant mass concentration in said homogeneous suspension;
circulating said sewage and said granular material in suspension to a separation zone and decanting clarified water from the granular material loaded with active biomass using laminar flow decantation; and



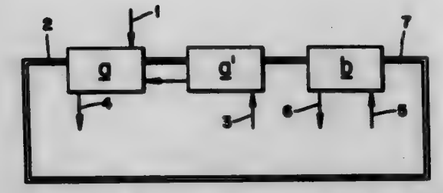
effecting forced and direct recycling of at least 75% of the active biomass fixed to said granular material to the mixing zone.

5,192,442
MULTIPLE ZONE BATCH TREATMENT PROCESS
John Piccirillo, and John A. Meidl, both of Weston, Wis., assignors to Zimpro Passavant Environmental Systems, Inc., Rothschild, Wis.
Filed Dec. 2, 1991, Ser. No. 801,211
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—605 36 Claims

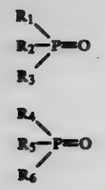


1. A process for operating a multiple zone batch treatment system for wastewater, said system comprising at least a first batch treatment zone and a last batch treatment zone, influent wastewater treated by sequential passage into and from said first zone, through any intervening zones, into and from said last zone, each treatment zone fitted with means to produce plug flow of liquid through that zone, the process comprising the steps;
a) mixing a biomass solids mixture with wastewater within each treatment zone;
b) settling each zone by ceasing mixing to produce a settled solids phase and a clarified liquid phase within each treatment zone;
c) transferring wastewater between adjacent zones in said system by adding a predetermined volume of influent liquid in a plug flow mode to at least one of said treatment zones, said added volume of influent liquid displacing a like volume of clarified liquid phase in a plug flow mode from that treatment zone to a following treatment zone; and
d) repeating steps a through c.

5,192,443
SEPARATION OF RARE EARTH VALUES BY LIQUID/LIQUID EXTRACTION
Thierry Delloye, Villeparisis, and Jean-Louis Sabot, Maisons Laffitte, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Continuation of Ser. No. 172,423, Mar. 23, 1988, abandoned.
This application Feb. 21, 1991, Ser. No. 657,957
Claims priority, application France, Mar. 23, 1987, 87 03959
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 36 Claims



1. A process for the separation of rare earth values from an aqueous solution of the nitrates of at least two rare earth elements, comprising liquid/liquid extracting such aqueous nitrate solution with a liquid organic phase capable of containing high concentrations of the rare earth values which comprises a mixture of different organophosphorus extractants having the formulae (I) and (I'):



(I)

(I')

wherein formula (I), R_1, R_2 and R_3, which may be identical or different, are each a hydrogen atom or a substituted or unsubstituted linear or branched chain, or cyclic, saturated or unsaturated hydrocarbon radical, with the proviso that the sum of the carbon atoms of the radicals R_1, R_2 and R_3 is equal to at least 12 carbon atoms; and wherein formula (I'), R_4, R_5 and R_6, which may be identical or different, are each a hydrogen atom or a substituted or unsubstituted linear or branched chain, or cyclic, saturated or unsaturated hydrocarbon radical, also with the proviso that the sum of the number of carbon atoms of the radicals R_4, R_5 and R_6 is equal to at least 12 carbon atoms.

5,192,444
SEPARATING WITH AN AGENT COMPRISING AN ALIPHATIC ESTER OF A POLYSACCHARIDE
Toru Shibata; Hajime Namikoshi, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan
Division of Ser. No. 640,079, Jan. 11, 1991, Pat. No. 5,089,138, which is a division of Ser. No. 430,736, Nov. 2, 1989, Pat. No. 5,041,226, which is a division of Ser. No. 225,866, Jul. 27, 1988, Pat. No. 4,892,659, which is a division of Ser. No. 18,814, Feb. 18, 1987, Pat. No. 4,786,415, which is a continuation of Ser. No. 716,798, Mar. 27, 1985, abandoned. This application Dec. 18, 1991, Ser. No. 809,680
Claims priority, application Japan, Apr. 2, 1984, 59-65323
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—635 9 Claims

5. A method for chromatographically separating an optical isomer from a racemic mixture thereof which comprises contacting said mixture, under liquid chromatographic separation conditions, with a chromatographic separation material consisting essentially of inorganic carrier particles having a particle size of from 1 μm to 10 mm and coated with from 1 to 100% by weight of resolving agent, based on the weight of said carrier particles, said resolving agent consisting essentially of cellulose triscyclopropanecarboxylate.

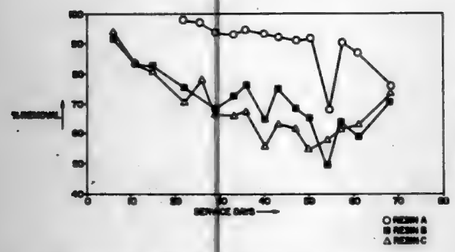
5,192,445
MEMBRANE SUITABLE FOR THE DEHYDRATION OF ORGANIC OXYGENATES
Craig R. Bartels, Wappingers Falls, N.Y., assignor to Texaco, Inc., White Plains, N.Y.
Filed Oct. 11, 1990, Ser. No. 597,966
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 11 Claims

11. The method of concentrating a charge aqueous solution of an organic oxygenate which comprises
maintaining a non-porous separating layer of a poly (vinyl pyridine) including a first non-porous membrane of a poly (vinyl pyridine) which has been formed by cross-linking, with an aliphatic polyhalide, a polymer of vinyl pyridine and, deposited thereon, a second non-porous membrane of a poly (vinyl pyridine) which has been formed by cross-linking, with an aliphatic polyhalide, a polymer of vinyl pyridine;
maintaining a pressure drop across said non-porous separating layer;
passing a charge aqueous solution of an organic oxygenate into contact with the high pressure side of said non-porous separating layer whereby at least a portion of said water in said charge aqueous solution and a lesser portion of organic oxygenate in said charge aqueous solution pass by pervaporation through said non-porous separating layer as a lean mixture containing more water and less organic oxygenate than are present in said charge aqueous solution and said charge aqueous solution is converted to a rich liquid containing less water and more organic oxygenate than are present in said charge aqueous solution;
recovering as permeate from the low pressure side of said non-porous separating layer said lean mixture containing more water and less organic oxygenate than are present in said charge aqueous solution, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and
recovering as retentate from the high pressure side of said non-porous separating layer said rich liquid containing a lower water content and a higher organic oxygenate content than are present in said charge aqueous solution.

5,192,446
CATION EXCHANGE RESINS HAVING AN ENHANCED CAPACITY FOR IRON OXIDES
Eli Salem, Deal, and Robert Kunin, Trustee, both of N.J., assignors to The Graver Company, Union, N.J.
Filed Jan. 24, 1992, Ser. No. 824,998
Int. Cl.[5] C02F *1/42*
U.S. Cl. 210—685 15 Claims

1. A method for removing transition metal oxides and soluble cationic species from condensate comprising:
hydrating a strongly acidic dual morphology cation exchange resin in a microreticular, desiccated morphology to convert said dual morphology cation exchange resin to a macroreticular, hydrated morphology;
said dual morphology cation exchange resin being gelular in a dry state and substantially macroreticular in a hydrated state; and
passing an aqueous stream containing condensate which has a first concentration of a transition metal oxide into a

separation zone that includes a first particulate bed constituted by said dual morphology cation exchange resin in a



macroreticular, hydrated morphology and in a hydrogen form.

5,192,447

USE OF MOLYBDATE AS A COOLING WATER CORROSION INHIBITOR AT HIGHER TEMPERATURES

Kenneth P. Fivizzani, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 9, 1991, Ser. No. 727,413
Int. Cl.[5] C23F 11/167; C02F 5/14
U.S. Cl. 210—697 7 Claims

1. A method of treating cooling water systems operating at temperatures in excess of 130° F. with a stabilizing agent which is an anionic polymer, a general corrosion and scale inhibitor comprising zinc, nickel or a combination thereof, orthophosphate, and a 2-phosphonobutane-1,2,4 tricarboxylic acid, in which the level of the general corrosion and scale inhibitor required to achieve a given level of corrosion inhibition in the absence of a localized corrosion inhibitor is reduced by at least one third by introducing a localized corrosion inhibitor chosen from the group consisting of water-soluble salts of molybdenum, vanadium, and tungsten.

5,192,448

PROCESS FOR BREAKING OIL-IN-WATER EMULSIONS

Thomas Augustin, Cologne, and Jörg Keldenich, Langenfeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1992, Ser. No. 843,655
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1991, 4107643
Int. Cl.[5] B01D 17/04
U.S. Cl. 210—708 6 Claims

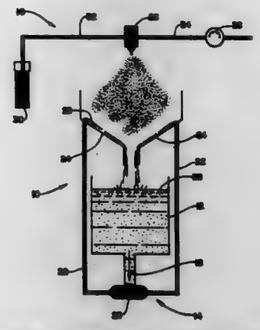
1. A process for breaking an oil-in-water emulsion having a surfactant content of more than 0.1% weight, a salt content of less than 3.0% weight and an oil content of from 0.5% weight to 5.0% weight, comprising measuring the streaming current potential of the emulsion, determining the amount of demulsifier required to break said emulsion from said measurement and adding the determined amount of demulsifier to break said emulsion.

5,192,449

METHOD FOR DETACKIFYING OVERSPRAYED PAINT

Shu-Jen W. Huang, Naperville; Chandrashekar S. Shetty, Lisle; Nang T. Bui, Aurora; Yvonne O. Dunn, Naperville; Uma Bhattacharyya, and Bhupati R. Bhattacharyya, both of Downers Grove, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 681,751, Apr. 8, 1991, Pat. No. 5,116,514.
This application Apr. 17, 1992, Ser. No. 870,058
The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.
Int. Cl.[5] C02F 1/56
U.S. Cl. 210—712 13 Claims



1. A method for the detackification of oversprayed paint in a paint spray operation wherein said oversprayed paint comes into contact with water of a waste water system, comprising:

dosing said water of said waste water system with a composition comprising a polymer and aluminum sulfate,

said polymer consisting essentially of from about 10 to about 50 mole percent of cationic mer units of monoethylenically unsaturated monomer, selected from dimethylaminoethylmethacrylate methyl chloride quaternary ammonium salt, dimethylaminoethylmethacrylate methyl sulfate quaternary ammonium salt, and acrylamidopropyltrimethyl ammonium chloride, and from about 50 to about 90 mole percent of (meth)acrylamide mer units,

said polymer having an intrinsic viscosity of from about 1.2 to about 4.0,

said composition containing from about 0.2 to about 10.0 parts by weight of aluminum sulfate as the octadecahydrate for each part by weight of said polymer,

wherein said composition is present in said water of said waste water system in sufficient amount to detackify oversprayed paint when said oversprayed paint comes into contact with said water.

5,192,450

ACOUSTOPHORESIS SEPARATION METHOD

Joseph S. Heyman, Williamsburg, Va., assignor to The United States of America as represented by the Administrator of the United States National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 628,062, Dec. 17, 1990, Pat. No. 5,147,562.
This application Jan. 17, 1992, Ser. No. 901,627
Int. Cl.[5] B01D 17/06
U.S. Cl. 210—748 1 Claim

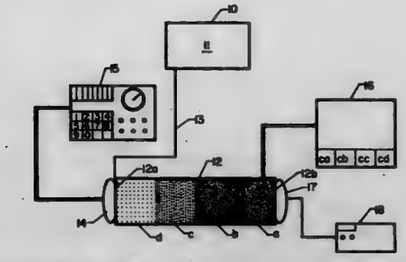
1. A method for separation of particulates in a liquid medium comprising the steps of:

filling a sample container with the liquid medium containing various sizes of particulates to be separated;

applying an acoustic wave having a particular frequency to the liquid medium in said sample container, whereby larger particulates are separated;

removing the larger separated particulates from the sample container;

increasing the frequency of the acoustic wave to separate smaller particulates; and



removing the smaller separated particulates from the sample container.

5,192,451

METHOD FOR CONTROLLING ZEBRA MUSSELS IN SHIP BALLAST TANKS

Patrick H. Gill, Zelienople, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 6, 1991, Ser. No. 696,439
The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.
Int. Cl.[5] C02F 1/50
U.S. Cl. 210—755 9 Claims

1. A method for controlling the growth of zebra mussels in ballast water which contains zebra mussels or which is prone to the growth of zebra mussels comprising adding to said ballast water an effective amount of a water soluble dialkyl diallyl quaternary ammonium polymer.

5,192,452

CATALYST FOR WATER TREATMENT

Kiichiro Mitsui, Akashi; Tooru Ishii, Himeji; Sadao Terui, Hyogo; Kunio Sano, Ako, and Akira Inoue, Hirakata, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo, Co., Ltd., Osaka, Japan

Continuation of Ser. No. 540,140, Jun. 19, 1990, abandoned, which is a division of Ser. No. 378,990, Jul. 12, 1989, abandoned.
This application Oct. 24, 1991, Ser. No. 782,787
Claims priority, application Japan, Jul. 12, 1988, 63-171824; Sep. 29, 1988, 1-242380
Int. Cl.[5] C02F 1/78
U.S. Cl. 210—760 5 Claims

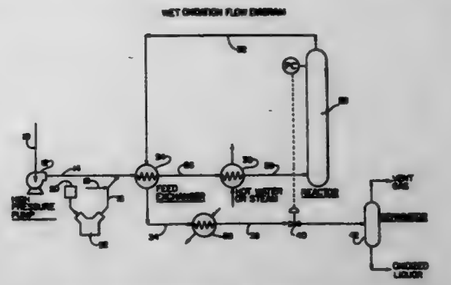
1. A method for treating water which comprises causing the water under treatment to contact a catalyst thereby deodorizing, sterilizing, and decoloring said water by the action of ozone or to decompose the remove ozone dissolved in said water, wherein said catalyst comprises a first catalyst component formed of the oxide of at least one metal selected from the group consisting of titanium, silicon, and zirconium and a second catalyst component formed of at least one metal selected from the group consisting of manganese, iron, cobalt, nickel, cerium, tungsten, copper, silver, gold, platinum, palladium, rhodium, ruthenium, and iridium or a sparingly water-soluble compound of said metal, wherein manganese, iron, cobalt, nickel, cerium, tungsten, copper, and silver are used in said second catalyst component only as oxide or sulfide, and gold, platinum, palladium, rhodium, ruthenium and iridium are used in said second catalyst component only as metal, said catalyst comprising in the range of 70 to 99.99% by weight of said first catalyst component and in the range of 30 to 0.01% by weight of said second catalyst component, provided that the sum of the two catalyst components is 100%, and wherein said treatment is carried out at 0° to 60° C.

5,192,453

WET OXIDATION PROCESS FOR ACN WASTE STREAMS

Kenneth P. Kackler, Broadview Heights, Ohio; Bruce L. Brandenburg, Wausau, Wis.; Joseph A. Mousseau, Mosinee, Wis., and Richard W. Lehmann, Wausau, Wis., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 6, 1992, Ser. No. 817,172
Int. Cl.[5] C02F 1/72, 1/74
U.S. Cl. 210—761 9 Claims



1. A process for noncatalytic wet oxidation of aqueous ammonium sulfate waste stream obtained from an acrylonitrile production plant containing organic impurities, comprising the steps:

a) introducing oxygen into said aqueous waste stream in an amount in excess of the stoichiometric amount required for complete oxidation of the organic impurities present in the stream; and

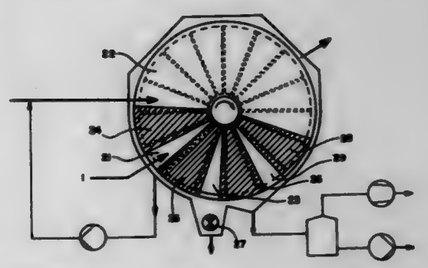
b) heating said aqueous waste stream to a temperature of about 315° C. to about 370° C., and a pressure of about 1550 psig to about 4500 psig for a time sufficient to enable said oxygen present in said waste stream to react with said organic impurities to produce N_2, CO_2, and H_2O while maintaining said oxygen gas in said aqueous waste stream at an excess of said stoichiometric amount.

5,192,454

METHOD FOR TREATING FIBER SUSPENSION

Paul Immonen, and Ramio Kohonen, both of Savonlinna, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Division of Ser. No. 544,832, Jun. 26, 1990, Pat. No. 5,073,264, which is a continuation-in-part of Ser. No. 265,508, Nov. 1, 1988, abandoned. This application Sep. 16, 1991, Ser. No. 760,166
Claims priority, application Finland, Nov. 5, 1987, 874987
Int. Cl.[5] B01D 24/28
U.S. Cl. 210—780 10 Claims



1. A method of treating a fiber suspension in a disc type pulp treatment apparatus comprising a pressure-proof casing having inlet means for said fiber suspension and discharge means for treated suspension and filtrate, a shaft rotating inside the casing

and a plurality of discs arranged on the shaft, said discs being formed of sectors having filter surfaces, between which surfaces there is a liquid compartment communicating with the liquid discharge means, the method comprising:

feeding the fiber suspension to be treated overpressurized into said casing;

filling said casing up with the fiber suspension;

carrying out the treatment in a closed airless space in three different treatment stages comprising a first treatment stage, a second treatment stage and a third treatment stage, the first treatment stage being further divided into a number of adjacent zones; and

discharging the pulp from said casing.

5,192,455

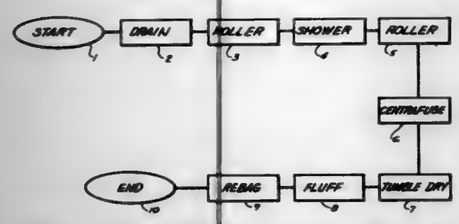
POLLUTION PAD RECONDITIONING/RECYCLING SYSTEM

Raymond C. Marcel, Jr., P.O. Box 89, Berwick, La. 70342

Filed Aug. 26, 1991, Ser. No. 749,892

Int. Cl.[5] B01D *21/26*

U.S. Cl. 210—787 3 Claims



1. A method of removing liquid hydrocarbons from pollution pads, restoring the pollution pads to a reusable state, comprising the following steps:

A. providing an apparatus for the removal of liquid hydrocarbons from pollution pads, comprising-

drain means for draining excess liquids from the pollution pads;

squeeze means associated with said drain means for squeezing out additional liquid from pollution pads;

a recirculating solvent shower having an upper portion and a medial layer for diluting and removing the liquid hydrocarbons from the pollution pads, said recirculating solvent shower further including—

at least one shower head forming the upper portion of said recirculating solvent shower, said shower head being configured for evenly dispersing a fluid solvent over the spray area;

a fluid permeable support for supporting a single layer of the pollution pads within the spray area of said shower head, said fluid permeable shower forming the medial layer of said recirculating solvent shower;

basin means for receiving a quantity of shower fluid, comprising the solvent and a percentage of the liquid hydrocarbon permeating said fluid permeable support, said basin means further including storage means for storing said fluid; and

circulation means for circulating the shower fluid from said basin means to said shower head, said circulation means further comprising a fluid pump and fluid conveying lines directed from said basin to said shower head; said apparatus further comprising;

a centrifuge extractor for extracting fluid absorbed by the pollution pads after having been treated by said solvent shower; and

a tumble dryer for drying residual solvent absorbed by the pollution pads;

B. draining said pollution pads in said drain means for a period of time so as to allow draining of any excess fluids from the pollution pads;

C. squeezing the pollution pads through said squeeze means so as to remove additional fluid from the pollution pads;

D. pacing the pollution pads in a single layer upon said fluid permeable support;

E. showering the pollution pads with a solvent, thereby diluting and substantially removing any remaining absorbed liquid hydrocarbons;

F. draining the solvent from the showered pollution pads;

G. squeezing the pollution pads again through said squeeze pads;

H. extracting the remaining absorbed solvent from the pollution pads by placing them in a centrifuge and spinning them in a centrifuge and spinning them at a rate of about seven hundred to a thousand (700–1000) revolutions per minute; and

I. tumbling in the pollution pads in a tumble dryer until any remaining solvent in the pollution pads has drained or evaporated.

5,192,456

APPARATUS FOR TREATING ACTIVATED SLUDGE AND METHOD OF CLEANING IT

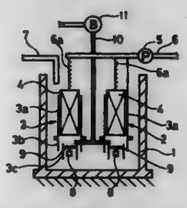
Hiroshi Ishida, Kodaira; Yutaka Yamada, Sakai; Kiyoshi Izumi, Takatsuki, and Masashi Moro, Kobe, all of Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Mar. 4, 1992, Ser. No. 846,130

Claims priority, application Japan, Mar. 7, 1991, 3-40334; Aug. 30, 1991, 3-219066

Int. Cl.[5] B01D *24/46*; C02F *3/00*

U.S. Cl. 210—791 10 Claims



10. A method of cleaning the filter membrane modules in an apparatus for treating sewage sludge, said apparatus comprising:

a treating tank in which water to be treated is stored;

a plurality of filter membrane modules vertically arranged in spaced relation within the treating tank for separating said water to be treated into solid and liquid by passing the water therethrough, thereby to extract treated water; an agitating element disposed at a level below said filter membrane modules for creating upward flow currents;

a first casing member accommodating said filter membrane modules;

a second, vertically extending cylindrical casing member connected to a lower end of said first casing member and having a length of more than 500 mm but less than 2000 mm;

said filter membrane modules and said agitating element being accommodated in said casing members to form a filter unit; and

a plurality of said filter units are arranged in said treating tank;

wherein said filter membrane modules are plate filters; and the apparatus further comprising:

a frame member for housing said plate filter membrane modules; and

a plurality of guide grooves formed in said frame member for causing said plate filter membrane modules to be housed in said frame member and to be arranged at predetermined intervals;

wherein the method comprises:

lifting the filter membrane modules along the guide grooves;

stopping said lifting operation while holding the filter membrane modules in such condition that their lower ends are in engagement with the guide grooves, then supporting the filter membrane modules in suspension; and

cleaning by washing the filter membrane modules thus lifted and supported in suspension.

5,192,457

LUBRICATING OIL FOR USE UNDER RADIOACTIVE OR ENERGY IRRADIATION CONDITIONS

Jun Nishimura, Takahagi, Japan, assignor to Nok Kluber Company Ltd., Tokyo, Japan

Filed Mar. 9, 1992, Ser. No. 848,532

Int. Cl.[5] C10M *169/04*, *125/10*

U.S. Cl. 252—25 5 Claims

1. A lubricating oil that is useful under radioactive or energy irradiation conditions which comprises a perfluoropolyether oil and a finely pulverized magnesium oxide distributed in the perfluoropolyether oil.

5,192,458

SILICONE GREASE COMPOSITION INCLUDING AN ORGANOMOLYBDENUM COMPOUND

Masahiko Minemura, Annaka; Takayuki Takahashi, Myougimachi, and Satoshi Kuwata, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1990, Ser. No. 596,395

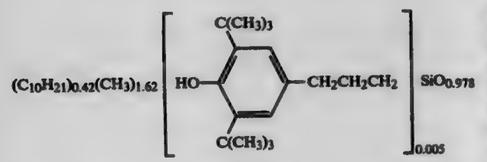
Claims priority, application Japan, Oct. 16, 1989, 1-269834

Int. Cl.[5] C10M *105/76*, *135/18*

U.S. Cl. 252—42.7 4 Claims

1. A silicon grease composition comprising;

(A) 100 parts by weight of decyl(3,5-di-t-butyl-4-hydroxyphenylpropyl)methylsilicone having a viscosity of about 350 cSt at 25° C. and represented by the following formula:



(B) 1 to 60 parts by weight of a thickener; and

(C) 3 to 30 parts by weight of molybdenum dithiocarbamate.

5,192,459

STERILANT COMPOSITIONS

Elaine N. Tell, Fort Lee, N.J., and Preston L. Veltman, Severna Park, Md., assignors to Erika, Inc., Rockleigh, N.J.

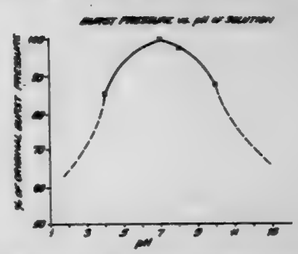
Continuation of Ser. No. 60,479, Jun. 11, 1987, abandoned, which is a continuation of Ser. No. 740,643, Jun. 3, 1985, Pat. No. 4,690,772. This application Apr. 14, 1989, Ser. No. 338,569

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[5] C11D *3/48*

U.S. Cl. 252—106 25 Claims

1. A sterilant composition which when mixed with water comprises by weight, based on the total weight of the composition, an effective amount, in a range of from about 10 ppm to about 50,000 ppm of a water soluble oxidant sterilant, a water soluble acid in a range of from about 100 ppm to about 10,000 ppm and a water soluble buffer in a range of from about 1000 ppm to about 100,000 ppm sufficient to provide an isotonic solution with a pH of approximately 7.3, wherein none of the three components, the water soluble oxidant sterilant, the water soluble acid and the water soluble buffer, are the same,



and wherein the composition is biocompatible and suitable for use in a membrane-containing device.

5,192,460

SAFE ACIDIC HARD SURFACE CLEANER

Michel Thomas, Couthuin; Genevieve Blandiaux, Troox, and Baudouin Valange, Gembloux, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 154,837, Feb. 10, 1988, abandoned. This application Jul. 31, 1989, Ser. No. 388,731

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] C11D *1/12*, *1/34*, *1/66*, *1/83*

U.S. Cl. 252—142 20 Claims

1. An acidic aqueous cleaner for bathtubs and other hard surfaces items which are acid resistant or are of zirconium white enamel, which cleaner is of a pH in the range of 1 to 4, and which removes lime scale, soap acum and greasy soil from surfaces of such items without damaging such surfaces, which comprises 3 to 14% of synthetic organic detergent(s) selected from the group consisting of anionic and nonionic detergents and mixtures thereof, 2 to 10% of organic acids(s) having 2 to 10 carbon atoms therein, which group of acids excludes oxalic and malonic acids, 0.01 to 2% of aminoalkylene phosphonic acid(s) and 0.05 to 5% of phosphoric acid, with the balance of the cleaner being an aqueous medium, with the proportions of the aminoalkylenephosphonic, phosphoric and organic acids being in the range of 1:1–2,000:10–4,000, in which proportions the combination of aminoalkylenephosphonic and phosphoric acids synergistically prevents damage to zirconium white enamel surfaces of items to be cleaned of lime scale, soap scum and greasy soil by the synthetic organic detergent and organic acid.

5,192,461

AQUEOUS DEGREASING SOLUTION HAVING HIGH FREE ALKALINITY

Lillie C. Tomaszewski, Dearborn, and James R. Crain, Northville, both of Mich., assignors to Esthone-OMI, Inc., West Haven, Conn.

Filed Aug. 23, 1991, Ser. No. 749,126

Int. Cl.[5] C11D *3/22*, *7/08*; C23G *1/06*

U.S. Cl. 252—156 42 Claims

1. A low solids, solvent free liquid aqueous degreasing concentrate composition having high free alkalinity comprising:

from about 20% to about 40% by weight of an alkali builder constituent;

from about 15% to about 25% by weight of a wetting agent mixture which will remain effective in high alkaline solutions comprising; from about 60% to about 85% of an anionic ar amphoteric wetting agent selected from the group consisting of anionic surfactants and amphoteric and anionic hydrotropes and water.

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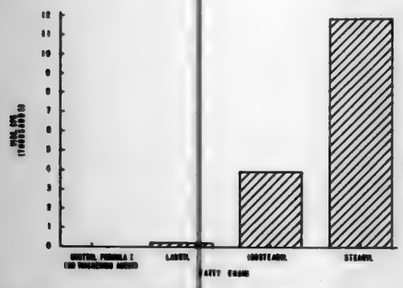
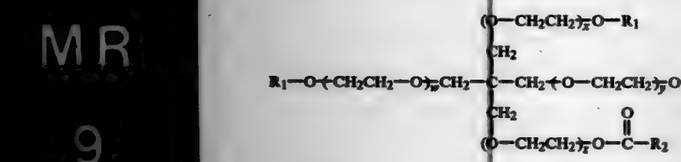
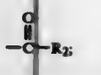
5,192,462
THICKENING AGENTS FOR TOPICAL PREPARATIONS
Guy J. Gloor, Tinton Falls; Kevin F. Gallagher, Middletown, and Abel G. Pereira, Belleville, all of N.J., assignors to Croda Inc., New York, N.Y.
Continuation of Ser. No. 326,296, Mar. 21, 1989, abandoned.
This application Jul. 27, 1992, Ser. No. 920,011
Int. Cl.[5] C11D *3/37, 1/90*
U.S. Cl. 252—174.21 12 Claims



1. A shampoo composition comprising:
from about 3% to about 5% by weight of a detergent selected from the group consisting of anionic surfactants, non-ionic surfactants, amphoteric surfactants and mixtures thereof, water, and from about 0.25 to about 6% by weight of a polyether ester thickening agent of the formula:



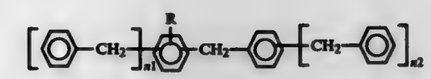
wherein:
R_1 is —H or



R_2 is a straight hydrocarbon chain having greater than 5 carbon atoms; and
(W+X+Y+Z) is greater than 60.

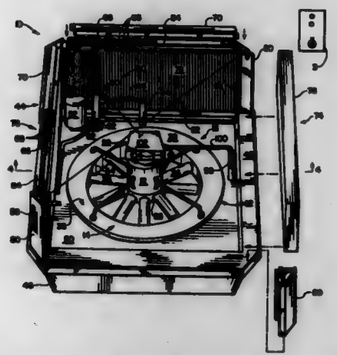
5,192,463
LOW TEMPERATURE, POLYPHENYLMETHANE-BASED DIELECTRIC COMPOSITIONS
Noelle Berger, Ecully; Raymond Commandeur, Vizille, and Pierre Jay, Didier Au Mont D'Or, all of France, assignors to Atochem, Puteaux, France
Continuation of Ser. No. 481,539, Feb. 20, 1990, abandoned.
This application Aug. 20, 1991, Ser. No. 750,702
Claims priority, application France, Feb. 20, 1989, 89/02166
Int. Cl.[5] C11D *1/18, 7/72;* C09D *9/00;* H01B *3/24*
U.S. Cl. 252—570 16 Claims

1. A dielectric composition of matter comprising admixture of the two oligomers A_1 and A_2, wherein:
(i) A_1 comprises an isomer or mixture of isomers of the formula:



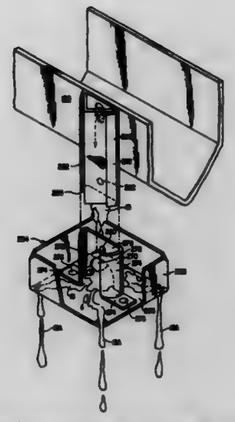
in which n_1 and n_2=0, 1 or 2, with the proviso that n_1+n_2 is less than or equal to 3 and R is a hydrogen atom; and
(ii) A_2 comprises an isomer or mixture of isomers of the same formula as A_1, except that R is methyl and n_1 and n_2 are designated q_1 and q_2 but have the same values, and with the further proviso that at least one of the oligomers A_1 and A_2 comprises an isomer having three benzene nuclei.

5,192,464
EVAPORATIVE COOLER
Lech Pawlowski, and Andrew Pawlowski, both of 11 Clearview Ave., Belair, Australia
Filed Apr. 23, 1992, Ser. No. 872,416
Int. Cl.[5] B01F *5/00, 3/04*
U.S. Cl. 261—27 11 Claims



1. An evaporative air cooler employing water for cooling comprising: vertical outer walls of evaporative pads; tank means holding a supply of water and retaining water not evaporated by said evaporative material; pumping means forcing said water supply to a top of said evaporative material; conduit means conducting said water supply from said pumping means to the top of said evaporative material; an electric motor; a direct driven axial fan having an axis of rotation and having more than four fan blades; and an air inlet ring, said axial fan forcing air downwardly through said air inlet ring, said inlet ring defining an aperture centrally located within said evaporative air cooler, said inlet ring comprising a substantially cylindrical portion concentrically surrounding said fan and a flared portion upstream of the cylindrical portion with respect to the direction of air flow, said flared portion curving radially outwardly with respect to the cylindrical portion, whereby laminar air flow is maintained upon operation of said fan, and said evaporative air cooler operates with reduced objectionable air flow noise;
a speed controller connected to alternating electrical power, said speed controller providing alternating current to said motor of frequency characteristics selectively identical to an input frequency of the alternating electrical power and reduced therefrom, whereby said motor runs at a manufacturer's predetermined efficiency at any selected speed equal to and less than a manufacturer's predetermined nominal speed, to rotate said fan at a selected output;
said fan having adjustable blade pitch, whereby said fan and said motor operate to move a selected quantity of air at a selected pressure at a speed selected to avoid vibration of said motor and said fan.

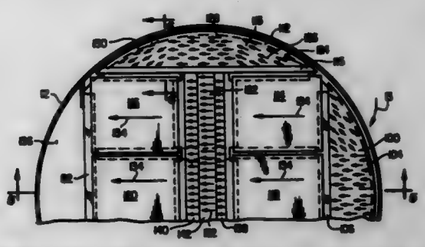
5,192,465
METHOD OF AND APPARATUS FOR LIQUID DISTRIBUTION
Tullio Petrich, Rome, and Paolo Martinenghi, Pavia, both of Italy, assignors to Glitsch, Inc., Dallas, Tex.
Filed Feb. 5, 1991, Ser. No. 650,747
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—97 25 Claims



1. An improved liquid flow distributor for a process column of the type wherein said distributor comprises a plurality of liquid flow members horizontally positioned above a packing section for the distribution of liquid downwardly therethrough, said flow members being constructed with ports formed therein for discharging said liquid therefrom, and said improvement comprising:
a plurality of separate distributor plates disposed beneath said flow members and horizontally secured in association with individual ones of said ports for select orientation and collection of the discharge of liquid therefrom;
said separate plates being formed so that the greatest linear distance between any two oppositely disposed points on each of said plates is on the order of less than twice the width of said flow member; and
said separate plates also being formed with means for distributing liquid horizontally thereacross and discharging said liquid downwardly from a plurality of individual drip points formed on each of said separate plates and associated with individual ports.

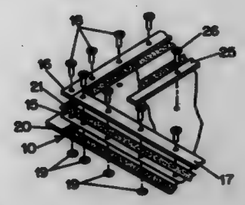
5,192,466
METHOD OF AND APPARATUS FOR FLOW PROMOTION
Michael J. Binkley, Glenn Heights, Tex., assignor to Glitsch, Inc., Dallas, Tex.
Filed Oct. 9, 1991, Ser. No. 775,299
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—114.3 25 Claims

12. An improved method of mixing vapor with liquid discharged from a first downcomer of a process column onto an underlying tray of the type wherein descending liquid mixes with ascending vapor flowing through said tray, said liquid flowing across said tray prior to discharge through a second downcomer, said improvement comprising the steps of providing substantially uniformly raised active tray areas adapted for vapor-liquid flow promotion, securing said raised tray areas between said downcomers in select areas of said tray, imparting preferential vapor flow through said raised tray areas, and



injecting said preferential vapor flow into said liquid flowing across said tray for directional liquid flow therefrom.

5,192,467
AERATION PANEL STRUCTURE
Robert W. Struse, Coral Springs, and Oscar L. Bauge, Miami, both of Fla., assignors to Parkson Corporation, Fort Lauderdale, Fla.
Filed Jul. 2, 1992, Ser. No. 908,307
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—122.1 7 Claims



1. An aeration panel structure comprising a support plate, a porous membrane mounted adjacent to the support plate arranged to produce fine air bubbles when subjected to air pressure beneath a liquid, air inlet means for introducing air between the panel and the membrane, peripheral hold-down strip means for clamping the membrane to the plate and secured by attachment means at spaced positions to the plate, and foam tape means made of a foamed material and having adhesive on both surfaces interposed between the membrane and the plate beneath the peripheral hold-down strip means to seal the membrane to the plate and hold the membrane in place in the spaces between the attachment means.

5,192,468
PROCESS FOR FLASH SPINNING FIBER-FORMING POLYMERS
Don M. Coates, Midlothian; Carl K. McMillin, Richmond, both of Va., and John C. Chen, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 602,344, Oct. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 440,156, Nov. 22, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 688,017
Int. Cl.[5] B29B *9/00*
U.S. Cl. 264—13 12 Claims

1. A process for flash spinning plexifilamentary film-fibril strands of a polymer that is substantially plasticizable in carbon dioxide or water and has a melting point less than 300° C., comprising the steps of:
(a) forming a spin mixture of water, carbon dioxide and the polymer at a temperature of at least 130° C. and a pressure that is greater than the autogenous pressure of the mix-

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ture, the carbon dioxide being present from 30 to 90 percent based on the total weight of the spin mixture; and
(b) then flash spinning the mixture into a region of substantially lower temperature and pressure.

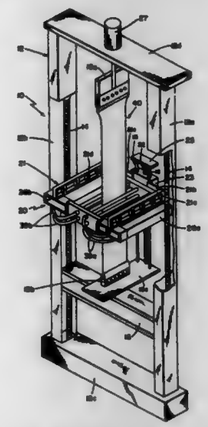
5,192,469
SIMULTANEOUS MULTIPLE LAYER CURING IN STEREOLITHOGRAPHY
Dennis R. Smalley, Baldwin Park, and Thomas J. Vorgitch, Simi Valley, both of Calif., assignors to 3D Systems, Inc., Valencia, Calif.
Filed Oct. 30, 1990, Ser. No. 606,802
Int. Cl.[5] B29C *35/08, 41/02, 41/52*
U.S. Cl. 264—22 **42 Claims**

1. A method of making at least a portion of an object, the object defining an object an object envelope, by stereolithography from layers of a medium being stacked along a z-dimension, the medium having a minimum solidification depth and being solidifiable upon exposure to synergistic stimulation, comprising the steps of:
selecting an area element of a first cross-section at an upper surface of a first layer of medium, the area element having a z-dimension value corresponding to a z-dimension value of said first cross-section of the object;
determining a thickness along the z-dimension between the area element at the upper surface of the first layer of medium and the object envelope underlying the area element;
comparing the determined thickness to the maximum solidification depth;
forming at least one next layer of medium over the first layer, thereby increasing the thickness along said z-dimension, without exposing the area element of the first cross-section to synergistic stimulation, until said at least one next layer of medium is formed over the first layer and said thickness is at least approximately as great as said minimum solidification depth; and
exposing at least the area element to synergistic stimulation to form said at least portion of the object.

5,192,470
METHOD OF STRETCHING AND POLARIZING POLYMER MATERIALS
David T. Wilson, Billerica, and Roger H. Tancrell, Cambridge, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 290,225, Dec. 27, 1988, abandoned, which is a division of Ser. No. 86,176, Aug. 13, 1987, Pat. No. 5,024,872, which is a continuation of Ser. No. 834,290, Feb. 27, 1986, abandoned. This application Feb. 24, 1990, Ser. No. 515,688
Int. Cl.[5] B29C *35/08*
U.S. Cl. 264—22 **19 Claims**

1. A method of providing a sheet comprising a molecularly polarized polymer material, comprises the steps of:
radiantly heating a narrow portion of a polarizable polymer sheet while stretching said sheet to provide a pair of neck-down regions with one of said neckdown regions propagating through unstretched portions of the sheet while keeping the propagating neckdown region in the radiantly heated narrow portion of the sheet and applying an electric field to said propagating neckdown region.

19. Apparatus for orientating a molecularly polarized polymer material comprises:
a housing;
at least one threaded shaft member supported by said housing;
a moveable cross member engaged with the threaded shaft member;
a pair of locking jaw members, with a first one of said members affixed to said housing, and a second one of said members disposed on the cross member such that the second member moves at a first rate in relation to the first member in response to rotation of the threaded shaft member;
a second threaded shaft member;
a heating and polarizing assembly disposed within a region of said housing comprising:



a pair of corona discharge bars disposed opposite one another; and
a pair of infrared lamps disposed opposite one another;
means, engaged with the second threaded shaft member, for moving said assembly relative to the fixed locking jaw member.

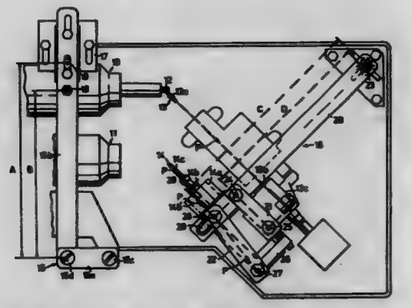
5,192,471
PROCESS FOR PREPARING CARBON/CARBON COMPOSITE
Seiichi Uemura, Ota; Yoshio Sohda, Machida; Osamu Kato, Yokohama; Takefumi Kouno, Kawasaki, and Tsutomu Kihara, Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan
Filed May 10, 1991, Ser. No. 698,663
Claims priority, application Japan, May 11, 1990, 2-119917
Int. Cl.[5] C01B *31/02*
U.S. Cl. 264—29.5 **12 Claims**

1. A process for preparing a carbon/carbon composite, which process comprises impregnating a bundle of carbon fibers with a polymer of a nitrogen-containing heterocyclic compound, carbonizing the thus-impregnated carbon fiber bundle under pressure or under pressing, and optionally, further carbonizing the thus-carbonized carbon fiber bundle at atmospheric pressure.

5,192,472
METHOD FOR PRODUCING A CERAMIC ARTICLE
Matts Andersson, Fåker, Sweden, assignor to Nobelpharma AB, Gothenburg, Sweden
Continuation of Ser. No. 483,726, Feb. 23, 1990, abandoned. This application Jul. 12, 1991, Ser. No. 729,844
Claims priority, application Sweden, Feb. 23, 1989, 8900620
Int. Cl.[5] A61C *13/00*; C04B *33/32*; B29C *59/00, 33/40*
U.S. Cl. 264—40.1 **21 Claims**

1. A method for producing an article of ceramic material for replacement of lost substance of tissue in the human body, said method comprising the steps of:
a) making a model having a contour of the article to be produced;
b) positioning both said model and a blank from which a tool is made in a copying machine having sensing members and mechanical members;

c) sensing the contour of said model and transferring said contour towards said blank by said sensing members of said copying machine;
d) linearly enlarging said contour transferred towards onto said blank by said mechanical members of said copying machine to provide a linearly enlarged contour for said blank;
e) forming from said blank a tool which has a contour corre-

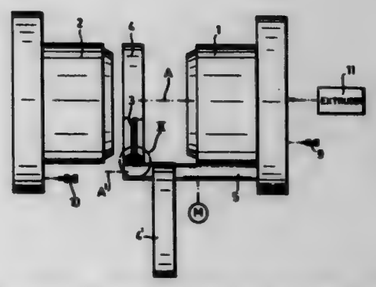


sponding to said linearly enlarged contour is capable of withstanding high pressures and of maintaining high accuracy;
f) applying and compacting a ceramic starting material over said contour of said tool to produce an article with an enlarged contour; and
g) removing said article from said tool and sintering said article whereby said article linearly shrinks until said article contour corresponds to said model contour.

5,192,473
METHOD OF MAKING NON-ORGANIC/POLYMER FIBER COMPOSITE
Louis W. Hruska, Geneva; Carl W. Brown, Jr., and Christopher E. Graham, both of Painesville, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.
Continuation of Ser. No. 318,577, Mar. 3, 1989, abandoned, which is a division of Ser. No. 93,469, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 768,941, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 651,248, Sep. 17, 1984, abandoned. This application Sep. 16, 1991, Ser. No. 766,240
Int. Cl.[5] B29C *67/02*
U.S. Cl. 264—102 **18 Claims**

1. The method of making a fiber manufacture of individual, non-isotropic fibers having non-uniform morphology, with individual fibers comprising organic polymer in fiber form having finely-divided non-organic and refractory particulates bound firmly with said organic polymer fiber within a surface thereof, which method comprises sequentially:
(1) preparing a mix of said non-organic particulates together with polymer particles which are precursors for said organic polymer in fiber form;
(2) heating said mix of particulates and particles to an elevated temperature sufficient for said organic polymer particles to be heat-softened and flow under pressure but insufficient for substantial decomposition of said polymer particles.
(3) maintaining said mix of particulates and particles at said elevated temperature, providing heat-softened polymer particles; and then
(4) vigorously grinding or shearing said mix of particulates and particles at said elevated temperature for a time sufficient to allow said heat-softened polymer particles to flow under grinding or shearing pressure, thereby
(a) preparing fibrillated and attenuated individual polymer fibers of said heat-softened polymer particles in the presence of said particulates, while
(b) binding firmly said particulates with said heat-softened polymer particles during polymer fiber formation to form said fiber manufacture of said individual, non-isotropic fibers having said non-uniform morphology.

5,192,474
MAKING A DATA-CARRYING OPTICAL DISK
Martin Eichleder, Tettenweis, and Peter Lichtinger, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany
Division of Ser. No. 669,357, Mar. 14, 1991, Pat. No. 5,160,751. This application May 15, 1992, Ser. No. 883,833
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008310
Int. Cl.[5] B29C *45/42*
U.S. Cl. 264—106 **2 Claims**



1. A method of making an optical disk having a pair of axially oppositely directed faces and an annular outer periphery, the method comprising the steps of sequentially:
a) forming a mold cavity corresponding to the shape of the disk between a pair of axially spaced parts and a demolding ring sandwiched between the parts;
b) filling the cavity with a hardenable resin that shrinks when cooled, whereby the parts form the respective faces and an inner periphery of the ring forms the outer periphery of the disk;
c) at least partially hardening the resin in the cavity;
d) axially oppositely separating the parts from each other and from the disk and leaving the disk in the ring with both of the disk faces exposed;
e) transversely displacing the ring with the disk engaged in the ring out from between the mold parts; and
f) cooling and shrinking the disk such that its outer periphery separates from the inner periphery of the ring and the disk separates from the ring.

5,192,475
METHOD OF MAKING DISCONTINUOUS CARBON FIBER REINFORCED GLASS MATRIX COMPOSITES WITH SECONDARY MATRIX REINFORCEMENT
William K. Tredway, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 662,649, Mar. 1, 1991, Pat. No. 5,118,560. This application Mar. 16, 1992, Ser. No. 851,593
Int. Cl.[5] C03C *14/00*
U.S. Cl. 264—115 **7 Claims**

1. A method of fabricating a discontinuous carbon fiber reinforced glass matrix composite, comprising:
(a) mixing a glass powder and boron nitride reinforcing particles in a carrier liquid to create a slurry;
(b) adding a binder to the slurry;
(c) impregnating a continuous multifilament carbon fiber yarn with the slurry;

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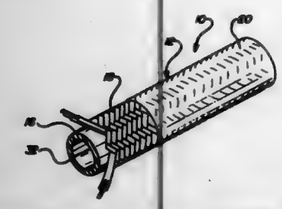
(d) drying the impregnated carbon fiber yarn to remove the carrier liquid;
(e) cutting the impregnated carbon fiber yarn to a suitable length; and

(f) molding the impregnated carbon fiber yarn in a suitable molding means to form a discontinuous carbon fiber reinforced glass matrix composite.

5,192,476
METHOD FOR FORMING A CONDUIT BY PRE-COATING THE CONDUIT PRIOR TO BRAIDING
Edward A. Green, Mantua, Ohio, assignor to Teleflex Incorporated, Limerick, Pa.
Filed Dec. 2, 1991, Ser. No. 801,023
Int. Cl.[5] B29C 63/06
U.S. Cl. 264—127 9 Claims

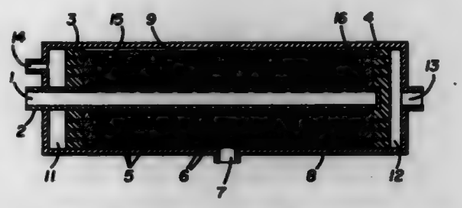


1. A method of forming a hose assembly (10) comprising the steps of:
providing an inner liner (16) consisting essentially of a polymeric fluorocarbon material;
coating the inner liner with a fluorocarbon dispersion;
applying a woven or braided material (18) having gaps therein about the exterior of the inner liner and the fluorocarbon dispersion coating;
dispersing the fluorocarbon dispersion into the gaps of the woven or braided material (18) to form a single layer of fluorocarbon dispersion and the woven or braided material (18); and
sintering the inner liner and woven material to cure the fluorocarbon polymer coating (20).

5,192,477
SURFACE TREATMENT OF POLYAMIDE MOLDINGS
Walter Betz, Ludwigshafen, and Gerd Blinne, Bobenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 527,581, May 24, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 758,721
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1989, 3919367
Int. Cl.[5] B05D 3/10; B29C 41/20
U.S. Cl. 264—129 6 Claims

1. A process for treating a surface of a polyamide molding, comprising
(i) contacting said surface with an aqueous acid, wherein said aqueous acid is a 30 to 85% strength by weight solution of H_3PO_4 and wherein said H_3PO_4 solution further comprises an additive selected from the group consisting of
a) a polyvinylimidazole containing cationic groups,
b) an organic ether, and
c) a chloride of a divalent or tetravalent metal, to obtain a treated surface; and
(ii) metallizing said treated surface.

5,192,478
METHOD OF FORMING TUBESHEET FOR HOLLOW FIBERS
Terrence L. Cauley, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 287,508, Dec. 19, 1988, abandoned, which is a continuation of Ser. No. 663,742, Oct. 22, 1984, abandoned. This application Jan. 15, 1992, Ser. No. 823,007
Int. Cl.[5] B32B 31/06, 35/00
U.S. Cl. 264—139 18 Claims



1. A method of preparing a hollow fiber membrane device comprising sequentially:
(a) forming at least one tubesheet on a plurality of hollow fiber membranes, each of the hollow fiber membranes having a first end, a second end, and a lumen extending therebetween, the at least one tubesheet being in part defined by a first face proximate to and a second face remote from the first ends of the hollow fiber membranes,
(b) treating the hollow fiber membranes embedded in the tubesheet whereby the cross-section of the hollow fiber membranes shrink to cause gaps between the hollow fiber membranes and the tubesheet;
(c) casting a liquid resin on the second face of the tubesheet whereby the resin penetrates between the hollow fiber membranes and into the gaps; and
(d) curing the resin to form at least one normally solid adherent layer in intimate contact with the second face of the tubesheet and the hollow fiber membranes embedded in the tubesheet, so as to seal the gaps between the hollow fiber membranes and the tubesheet.

5,192,479
METHOD FOR DISPERSING MISCIBLE POLYMERIC COMPONENTS
Frank E. Karasz, Amherst, Mass., and Wansoo Huh, Dayton, Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio
Division of Ser. No. 443,294, Nov. 29, 1989, Pat. No. 5,106,918. This application Feb. 6, 1992, Ser. No. 832,100
Int. Cl.[5] B29C 47/88, 71/00; B32B 31/20; C08J 5/00
U.S. Cl. 264—171 7 Claims

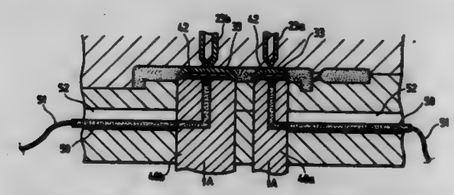
1. A method of shaping a plastic article comprising the steps of:
selecting a first and second polymer which are mutually soluble at a temperature above the Tg of the higher Tg polymer component and which blend exhibits a lower critical solution temperature (LCST) above the Tg of the higher Tg polymer component;
blending said first and second polymer at a temperature above the Tg composition line of said polymer pair and below the LCST phase boundary of the resulting miscible polymer blend;
shaping said miscible polymer blend into a desired article:
heating the shaped article to a temperature above the LCST

of its component blended polymers to effect a phase separation of said component blended polymers; and
cooling said shaped article to a temperature at least below the Tg composition line of the polymer pair wherein the polymers become irreversibly fixed in the phase separated state.

5,192,480
METHOD OF PRODUCING MOLECULAR COMPOSITE MATERIAL INCLUDING AROMATIC POLYTHIAZOLE
Tatsuya Hattori, Tokyo, and Hiroshi Akita, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 30, 1991, Ser. No. 753,372
Claims priority, application Japan, Sep. 3, 1990, 2-232699
Int. Cl.[5] B29C 47/00; D01F 6/74
U.S. Cl. 264—204 28 Claims

1. A method of producing a molecular composite material comprising a rigid aromatic polythiazole and a matrix polymer, which comprises the steps of:
(a) polymerizing an aromatic diaminodithiol compound, wherein hydrogen atoms of thiol groups of said aromatic diaminodithiol compound are substituted with substituted or unsubstituted alkyl groups, with a dicarboxylic acid derivative to form an alkyl groups-substituted aromatic polythiazole prepolymer in an organic solvent;
(b) preparing a homogeneous solution of said alkyl group-substituted aromatic polythiazole prepolymer and said matrix polymer in an organic solvent; and
(c) after removing said organic solvent, heating a mixture of said alkyl group-substituted aromatic polythiazole prepolymer and said matrix polymer to cause a thiazole ring closure reaction.

5,192,481
METHOD AND APPARATUS FOR MOLDING ARTICLE IN PLURALITY OF COLORS
Kiyoo Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 1, 1989, Ser. No. 444,235
Claims priority, application Japan, Dec. 2, 1988, 63-304215
Int. Cl.[5] B29C 45/16, 45/33
U.S. Cl. 264—246 9 Claims

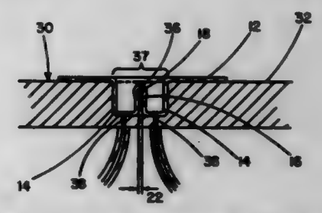


1. A method for molding an article having first and second portions formed of different plastic materials, comprising the steps of:
inserting a slide core into a primary mold cavity;
injecting a first plastic material into said primary mold cavity to mold said first portion of said article;
allowing said first plastic material injected into said primary cavity to harden;
at least partially withdrawing said slide core from said primary mold cavity while said first plastic material remains firmly in place in said primary mold cavity to form a space for receiving an adhesive;
injecting a small amount of an adhesive through at least one passage in said slide core along an edge of said first portion to be joined to an abutting edge of said second portion to adhere said edge of said first portion to said abutting edge of said second portion;
further withdrawing said slide core from said primary mold cavity; and
injecting a second plastic material into a secondary mold cavity left by withdrawal of said slide core to mold said second portion of said article,
wherein only said adhesive is injected through said slide core.

5,192,482
METHOD OF PRODUCING A LOCAL REINFORCEMENT IN A SANDWICH STRUCTURE
Johan A. Brambach, Leimuiden, Netherlands, assignor to Schreiner Luchtvaart Groep B.V., Leiden, Netherlands
Division of Ser. No. 476,533, Feb. 7, 1990. This application Jan. 3, 1992, Ser. No. 816,257
Claims priority, application Netherlands, Feb. 17, 1989, 8900398
Int. Cl.[5] B29C 45/16
U.S. Cl. 264—257 22 Claims

1. A method for providing a local reinforcement in a sheet material comprising a core material sandwiched between two reinforced top layers, said core material being one of a thermoplastic, foamed core material and a core material having a honeycomb structure, and wherein said top layers comprise a thermoplastic synthetic plastic material reinforced with fibers, the process comprising the steps of injecting an amount of plastic material under pressure through one of the top layers into the core material, and allowing the plastic material to harden after injection.

5,192,483
METHOD OF THERMOFORMING A SHEET AROUND A SUTURE NEEDLE TO FORM A HOLDER
Bret J. Kilgrow, and Stanley L. Mish, both of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Dec. 2, 1991, Ser. No. 801,552
Int. Cl.[5] B29C 51/10, 51/12
U.S. Cl. 264—510 2 Claims



1. A method of forming a suture needle holder for a suture needle comprising:
a) placing a suture needle into a trough cut into the surface of a die, wherein a cavity is cut into the surface of the die such that the trough intersects the cavity;
b) placing a sheet of planar plastic onto the surface of the die after placing the needle in the trough; and
c) thermoforming the sheet of planar plastic into the cavity of the die to form a pedestal around the needle thereby capturing the needle and forming a slot that retains the suture needle.

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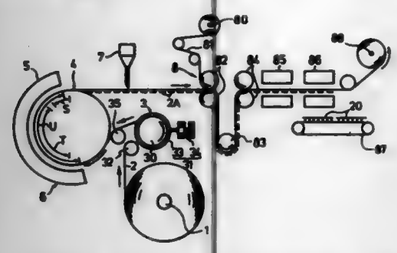
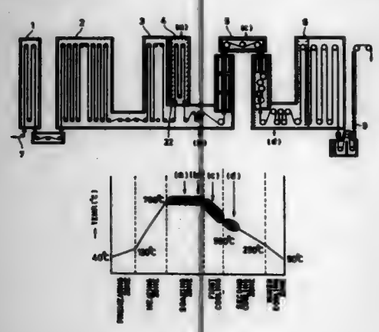
5,192,484
METHOD OF FORMING BLISTERS
Kozaburo Matsuzawa, Tokyo, and Atsushi Fujii, Himeji, both of Japan, assignors to Matsuzawa Co., Ltd. and Idemitsu Petrochemical Co., Ltd., both of Tokyo, Japan
Continuation of Ser. No. 406,727, Sep. 13, 1989, abandoned. This application Aug. 15, 1991, Ser. No. 749,493
Claims priority, application Japan, Sep. 14, 1988, 63-231578
Int. Cl.[5] B29C *51/06, 51/10*
U.S. Cl. 264—555 7 Claims



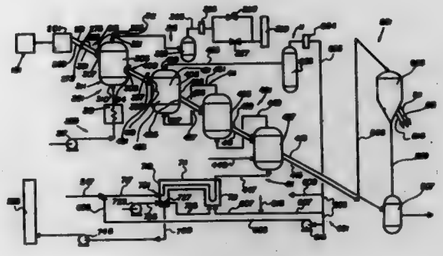
1. A method of forming blisters comprising the steps of: feeding a web material which consists of a thermoplastic resin to a rotary forming drum while applying to it a tension in the range of 5 kg/215 mm to 50 kg/215 mm, and heating the web material thus fed to the rotary forming drum, thereby forming a plurality of blisters.

5,192,485
CONTINUOUS ANNEALING LINE HAVING CARBURIZING/NITRIDING FURNACE
Koshi Kuramoto; Tsuguhiko Nakagawa; Satoshi Shibuya; Takao Ogawa; Toshikazu Kaihara, all of Kurashiki, and Kazuo Furukawa, Chiba, all of Japan, assignors to Kawasaki Steel Corp., Tokyo, Japan
Filed Jul. 30, 1991, Ser. No. 738,231
Claims priority, application Japan, Jul. 31, 1990, 2-202833; Nov. 30, 1990, 2-334147; Nov. 30, 1990, 2-334149
Int. Cl.[5] C23C *8/00*
U.S. Cl. 266—80 4 Claims



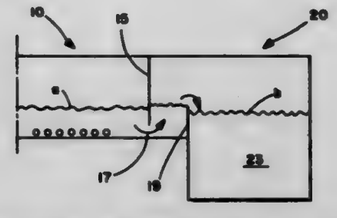
1. A continuous annealing line for annealing a cold-rolled steel strip, comprising:
a heating vertical furnace for heating said steel strip which is fed continuously, with or without a soaking furnace following said heating furnace;
a cooling vertical furnace in which the heated steel strip is cooled; and
a carburizing/nitriding vertical furnace disposed between said heating furnace or said soaking furnace and said cooling furnace.

5,192,486
PLANT AND PROCESS FOR FLUIDIZED BED REDUCTION OF ORE
Roy H. Whipp, Miami, Fla., assignor to Flor de Venezuela, Pte. Ordaz, Venezuela
Division of Ser. No. 501,490, Mar. 30, 1990. This application May 31, 1991, Ser. No. 708,896
Int. Cl.[5] C21B *7/22*
U.S. Cl. 266—156 25 Claims



1. In a processing plant for reducing wet iron ore fines under ¼" including a reactor assembly, a preheat reactor assembly, and, an ore feed assembly with an ore feed conduit means for transferring iron ore to said reactor assembly, said preheat reactor assembly comprising:
a preheat reactor;
a quench and gas cleanup system;
an airstream source means for providing an airstream;
a natural gas source means for providing natural gas;
said preheat reactor including:
a reactor vessel including an upper cavity portion and a lower cavity portion;
ore inlet port means for connecting said upper cavity portion to the ore feed conduit means;
gaseous exhaust port means for connecting said upper cavity portion to said quench and gas cleanup system;
ore outlet port means for providing an exit for ore fines from said lower cavity portion and out of said preheat reactor;
air intake port means connecting said lower cavity portion to said airstream source means and facilitating the development of an airstream upward from the lower cavity portion to the upper cavity portion and out of the gaseous exhaust port means;
said airstream passing through falling iron ore fines and developing a fluidized bed of iron ore fines within said reactor vessel;
said air intake port means being located below said ore outlet port means;
natural gas injection means for injecting natural gas into said airstream and for igniting said natural gas in said airstream;
said natural gas injection means including natural gas intake port means connecting said lower cavity portion to said natural gas source means; and,
combustion air means for providing combustion air and mixing combustion air with said natural gas to facilitate combustion, said mixture being referred to as flue gas.

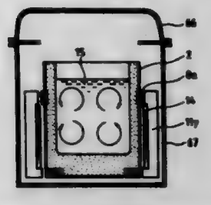
5,192,487
APPARATUS FOR TREATING ZINC CONCENTRATES
Rolf Malmström, Helsingfors, Finland, and Stig Petersson, Skellefteåsen, Sweden, assignors to A. Ahlstrom Corporation, Karkula, Finland
Division of Ser. No. 609,531, Nov. 6, 1990, Pat. No. 5,131,944. This application Feb. 3, 1992, Ser. No. 829,236
Claims priority, application Finland, Nov. 10, 1989, 895358
Int. Cl.[5] F27B *3/16*
U.S. Cl. 266—201 1 Claim



1. An apparatus for treating zinc concentrate comprising:
a combined furnace having a smelting portion and a slag treating portion, said furnace having side walls, a top wall and a bottom wall, and in which
said smelting portion and said slag treating portion are arranged side by side,
a first partition wall is arranged between said smelting portion and said slag treating portion for separating gas spaces in each of said smelting and slag treating portions from each other and
a second partition wall is arranged between said smelting portion and said slag treating portion for separating slag layers in each of said smelting and slag treating portions from each other, and wherein
(a) said slag treating portion is divided into an inlet zone and a fuming zone by means of a third partition wall extending downwardly from said top wall of said furnace through the gas space and through a part of the slag layer, for separating the gas spaces and the slag layers of the inlet zone and the fuming zone from each other, said third partition wall leaving a gap between said third partition wall and said bottom wall of said furnace for allowing slag to flow from the inlet zone to the fuming zone;
(b) an overflow is arranged in a first section of said second partition wall between said smelting portion and the inlet zone so as to facilitate slag flowing from said smelting portion, where a first slag level is higher than a second slag lever in the inlet zone, to the inlet zone; and
(c) a second overflow is arranged in a second section of said second partition wall between the fuming zone and said smelting portion so as to facilitate flowing of reduced slag to said smelting portion from the fuming zone, where a third slag level has been raised over the first slag level in said smelting portion by injecting air, coal, or hydrocarbon via an inlet opening in the fuming zone.

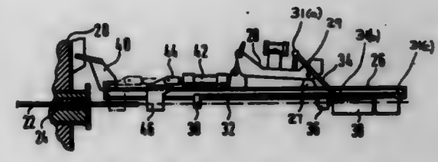
5,192,488
APPARATUS FOR HEATING MOLTEN IN A LADLE
Michio Kawasaki, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan
Division of Ser. No. 610,249, Nov. 8, 1990. This application Oct. 25, 1991, Ser. No. 782,483
Claims priority, application Japan, Nov. 9, 1989, 1-291533; Aug. 1, 1990, 2-204631
Int. Cl.[5] B22D *18/00*
U.S. Cl. 266—208 4 Claims

1. An apparatus for heating molten metal comprising:
a ladle for holding said molten metal and provided with a refractory heat-insulating material having an outer circumference;
first cores arranged in pairs and attached to the outer circumference of said refractory heat-insulating material of said ladle;
a tray capable of mounting said ladle;
second cores attached to said tray and having magnetic pole



portions at both ends of said respective second cores so as to face said first cores;
a coil for exciting said second cores; and
a vacuum container having a cover capable of being opened and closed for receiving said ladle.

5,192,489
DEVICE FOR OPENING THE TAPHOLE OF A SHAFT FURNACE
Jean Metz, Luxembourg; Pierre Mailliet, Howald, and Henri Redoux, Bereldange, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg
Filed Jan. 5, 1990, Ser. No. 462,415
Claims priority, application Luxembourg, Jan. 16, 1989, 87427
Int. Cl.[5] E21B *19/00*
U.S. Cl. 266—271 5 Claims



1. An apparatus for opening a taphole through a wall of a shaft furnace, said taphole being sealed by a rod held within the taphole by a hardened sealing compound, said rod extending axially in a first direction from the taphole to a free end, comprising:
a mount having a front end and a rear end, said front end being positioned in front of said taphole;
a working tool slidably displaced along said mount;
coupling means for coupling the free end of the rod to said working tool;
clamp means, slidably mounted on said mount between said front end of said mount and said working tool and axially aligned with the coupling means, for gripping the rod as the rod passes through said clamp means;
hydraulic jack means, said hydraulic jack means having a preselected stroke distance, said jack means mounted on the front end of said mount and connected to said clamp means for displacing said clamp means along a limited path, said limited path corresponding to the stroke distance of said jack means.

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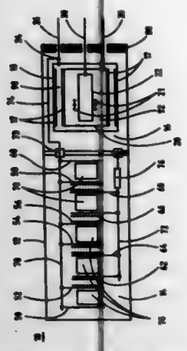
5,192,490
EXTENDED RANGE NEUTRON DETECTION DEVICE FOR MONITORING AND CONTROL OF NUCLEAR REACTORS

Jean-Pierre Burel, Meylan, France, assignor to Merlin Gerin, France

Filed Nov. 27, 1991, Ser. No. 799,066
Claims priority, application France, Dec. 7, 1990, 90 15462
Int. Cl.[5] G01T *3/00*
U.S. Cl. 376—154 8 Claims



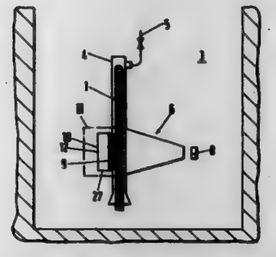
1. A neutron detection device for measuring the neutron fluence rate outside the core of a nuclear reactor, said device being housed in a tight enclosure and comprising:
- a first detector formed by a uranium-lined fission type ionization chamber, said first detector having a positive electrode polarized by a positive voltage source by means of a first cable, and delivering a pulse output signal applied outside the enclosure to an electronic measuring circuit;
- a second detector placed in the enclosure, and comprising a differential ionization chamber compensated for gamma rays, said second detector having two polarization electrodes and one measuring electrode, delimiting first and second adjacent elementary chambers of positive and negative polarities, respectively, the electrodes of said first elementary chamber being provided with a boron lining, whereas at least one of the electrodes of said second elementary chamber comprises a uranium lining so as to form a fission chamber having a lower sensitivity than that of the first detector; and
- a measuring electrode connected to a second cable used to transmit an output selected from the group consisting of a pulse output signal from said second elementary chamber, and a current output signal from said first elementary chamber.

5,192,491
APPARATUS FOR THE NEUTRON-RADIOGRAPHY TESTING OF A BOILING WATER REACTOR CONTROL ELEMENT

Wolfgang Schulz, Wunstorf, Fed. Rep. of Germany, assignor to ABB Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 13, 1992, Ser. No. 850,865
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1991, 4108438
Int. Cl.[5] G21C *17/00*; G01T *3/00*; G01N *23/00*
U.S. Cl. 376—159 4 Claims

1. In a boiling water reactor having a control element disposed in a water pond, an apparatus for the neutron-radiography testing of the control element, comprising a film cassette having a recording area, a water-free hood fitting over the control element, said hood having an open bottom and a wall facing said film cassette, said wall having an opening formed therein with a cross section corresponding to said for receiving said film cassette, said holding device having a downwardly open side extended below said opening through which said film cassette is to be introduced into said holding device, a

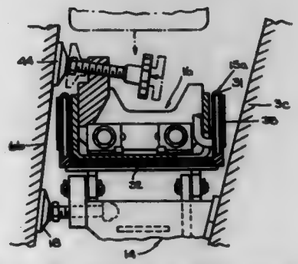


neutron source, and a collimator, said neutron source, said collimator and said film cassette lying in one measurement plane.

5,192,492
METHOD AND APPARATUS FOR FLUID SEALING OF STEAM GENERATOR

Daniel M. Gately, Peekskill, N.Y.; Louis J. Zezza, Brookfield, Conn., and William R. Masetti, White Plains, N.Y., assignors to Consolidation Edison Company of New York, Inc., New York, N.Y.

Filed Jun. 28, 1991, Ser. No. 724,389
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—203 26 Claims



1. The method of reducing exposure of a human within the space between an inner tube co-axial with an outer tube to harmful radiation emitted by a radiation emitting structure within said inner tube, said inner tube having a liquid impenetrable outer surface portion which encircles at least a portion of said radiation emitting structure and said outer tube having a liquid impenetrable inner surface portion facing and coextensive with said outer surface portion and spaced from said outer surface to define said space, said space normally having liquid communication with the interior of said inner tube at one end of said space and said interior of said inner tube containing a liquid which absorbs said radiation and which normally enters into said space, said method comprising:

installing a liquid seal at said one end of said space for preventing the flow of said liquid into said space from said interior of said inner tube, the installation of said liquid seal comprising encircling a circumferential portion of said outer surface portion of said inner tube at sad end of said space with a plurality of inflatable tubes disposed end-to-end in liquid sealing relation and inflating said inflatable tubes until said inflatable tubes engage said outer surface portion and said inner surface portion of said outer tube, said inflatable tubes also being deflatable and removable from between said inner tube and said outer tube and performing one of the following two steps:

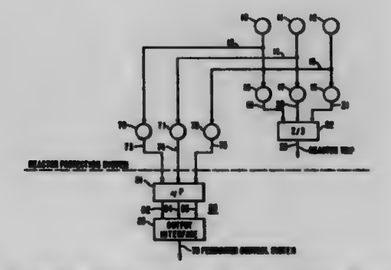
(a) during the installation of said liquid seal, maintaining said portion of said radiation emitting structure at least substantially covered by said liquid and maintaining said liquid in said space and thereafter, removing at least a portion of said liquid from said space at the side of said liquid seal opposite from said end of said space; and

(b) before the installation of said liquid seal, removing said liquid from said interior of said inner tube until said space is at least partially free of said liquid and thereafter, installing said liquid seal and then adding said liquid to said interior of said inner tube until said radiation emitting structure is at least substantially covered by said liquid.

5,192,493
MEDIAN SIGNAL SELECTOR FOR FEEDWATER CONTROL SYSTEMS

Lawrence E. Erin, Monroeville; William J. Catullo, Jr., Plum Boro; Richard E. Paris, Monroeville, and John M. Gallagher, Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1989, Ser. No. 400,837
Int. Cl.[5] G21C *7/32*
U.S. Cl. 376—211 12 Claims



1. A system for improving the performance of nuclear power plant feedwater control systems and simplifying steam generator low water level reactor protection logic, comprising:
- means for redundantly measuring steam generator water level and generating a plurality of signals representative thereof;
- means for selecting a median steam generator water level signal from among said plurality of steam generator water level signals; and
- means for communicating said median steam generator water level signal to the feedwater control system.

5,192,494
ARRANGEMENT FOR PROTECTING REACTOR CONTAINMENT INTEGRITY

Kurt M. Becker, Illerstigen 16, S-171 71 Solna, and Johan Engström, Dalagatan 62, S-113 24 Stockholm, both of Sweden

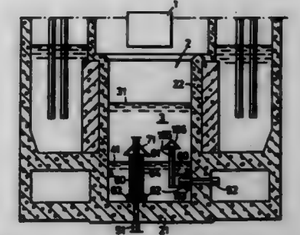
PCT No. PCT/SE90/00147, § 371 Date Aug. 29, 1991, § 102(e) Date Aug. 29, 1991, PCT Pub. No. WO90/10936, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 7, 1990, Ser. No. 752,517
Claims priority, application Sweden, Mar. 10, 1989, 8900843
Int. Cl.[5] G21C *9/016*
U.S. Cl. 376—280 7 Claims

1. An arrangement for protecting the integrity of a nuclear reactor containment, the arrangement comprising:

the nuclear reactor containment including a reactor vessel for containing a nuclear reactor core, a pool beneath the reactor vessel for receiving molten core material from the vessel, the pool being adapted to be filled with water to cool and granulate molten core material which may descend from the reactor vessel during a core meltdown to form a granulate bed of the core material in a lower part of the pool;

a tubular surface penetrating into the pool of the nuclear reactor containment and below the reactor vessel;

a pipe around the tubular surface and being so sized and separated from the tubular surface as to define a gap between them for the pipe to protect the tubular surface from the effects of the core meltdown; the pipe having an upper end and a first opening in the pipe at the upper end, the first opening being located below the height of the surface of water that will enter the pool on a meltdown

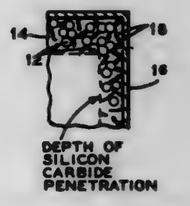


and above the highest level in the pool which the granulate bed could be expected to reach; the pipe having a lower end and a second opening at the lower end, the second opening being located at the height in the pool as to be in the granulate bed, and the second opening communicating with the lower part of the pool so that water flowing into the gap through the first opening flows through the gap around the tubular surface and out through the second opening into the granulate bed to cool the granulate bed.

5,192,495
SIC BARRIER OVERCOATING AND INFILTRATION OF FUEL COMPACT

Colin S. Caldwell, Lynchburg, and Helen H. Moeller, Concord, both of Va., assignors to Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 661,153, Feb. 27, 1991, abandoned.
This application Jan. 16, 1992, Ser. No. 821,873
Int. Cl.[5] G21C *3/00*
U.S. Cl. 376—417 13 Claims



1. An outer barrier comprising an independent silicon carbide overcoating of a nuclear fuel compact, said compact comprising a multitude of individually coated fuel particles held or dispersed within a carbonaceous matrix composed of material other than primarily silicon carbide, said matrix having an outer surface and fingers extending inward therefrom into which said silicon carbide overcoating is deposited thereby completely sealing said matrix, and hence said nuclear fuel compact, and also locking said overcoating in place so as to contain the majority of fission products therein.

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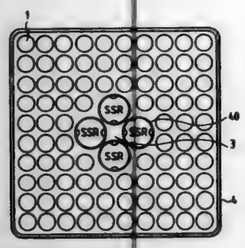
5,192,496
FUEL ASSEMBLY AND UPPER TIE PLATE THEREOF
Hideo Soneda; Junichi Yamashita; Yukihisa Fukasawa; Taro Ueki, and Sadayuki Izutsu, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,168
Claims priority, application Japan, Jul. 4, 1990, 2-176565
Int. Cl.[5] G21C *7/06*
U.S. Cl. 376—428 13 Claims



1. A fuel assembly comprising:
a plurality of fuel rods arranged in a square 10×10 lattice other than at a central region thereof corresponding to a rectangular space for accommodating an arrangement of 4×4 fuel rods;
four fuel rods arranged so that a respective one of the four fuel rods is disposed at each of four corner portions of the central region; and
water rod means including one of a plurality of water rods and a plurality of spectral shift water rods being disposed in the central region, one of the plurality of water rods and the plurality of spectral shift water rods being arranged adjacent to and spaced form one another along a circular path so as to delimit intervals therebetween in the central region in a space of the central region other than the four corner portions for accommodating 12 fuel rods.

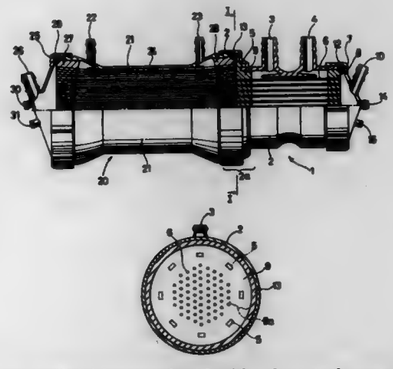
5,192,497
SUPERALLOYS WITH LOW THERMAL-EXPANSION COEFFICIENT
Koji Sato, Yasugi, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan
Filed Mar. 2, 1992, Ser. No. 844,287
Claims priority, application Japan, Dec. 18, 1990, 2-411479
Int. Cl.[5] C22C *38/08, 30/00*
U.S. Cl. 420—581 9 Claims

1. A superalloy with a low thermal expansion coefficient consisting essentially of, by weight percent: 0.1% or less of carbon, 1.0% or less of Si, 1.0% or less of Al, 1.0% or less of Mn, 0.5 to 2.5% of Ti, Nb part of which can be substituted by Ta to satisfy 3.0% $<$(Nb+0.5 Ta) $\leqq$6.0% $>$0 to 0.01% of boron, 20 to 32% of Ni and more than 16% and not more than 30% of Co within a range of 48.8% $\leqq$(1.235 Ni+Co) $<$55.8%, and the balance essentially Fe except for incidental impurities, the superalloy having a mean coefficient of thermal expansion of 7.0×10^{-6}/° C. or less from room temperature to 400° C.

5,192,498
ELIMINATION OF SULFIDE ODOR IN THIOCARBAMATE HERBICIDES
Chin-Chung Chen, Taoton, Taiwan, and Ray J. Lo, Alameda, Calif., assignors to Imperial Chemical Industries plc, London, Great Britain
Filed Oct. 11, 1991, Ser. No. 775,680
Int. Cl.[5] A61L *2/00*; A01N *37/00*
U.S. Cl. 422—5 7 Claims

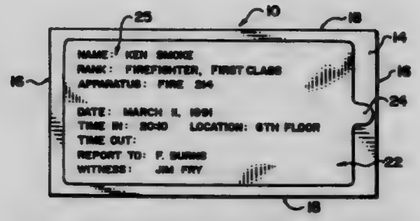
1. A process for reducing mercaptan odor from a thiocarbamate compound comprising the steps of:
A) mixing an aqueous solution containing from about 1 to about 10 parts by weight of sodium hypochlorite, calcium hypochlorite, chloramine-B hydrate or chloramine-T-hydrate with 100 parts by weight of thiocarbamate to form treated thiocarbamate and an aqueous layer;
B) separating the aqueous layer from the treated thiocarbamate; and
C) mixing from about 0.01 to about 0.5 parts by weight of oxalic acid, maleic acid or citric acid with 100 parts by weight of the treated thiocarbamate.

5,192,499
FLUID PROCESSING APPARATUS AND ARTIFICIAL LUNG
Satoru Sakai, Kanagawa, and Kiyohide Ishikawa, Shizuoka, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1990, Ser. No. 551,942
Claims priority, application Japan, Jul. 14, 1989, 1-183499
Int. Cl.[5] A61M *1/03, 1/16, 1/36*
U.S. Cl. 422—46 14 Claims



1. An artificial lung equipped with a heat exchanger comprising:
a heat exchanger comprising:
a heat exchange housing having:
an internal wall;
a heat-exchange fluid inlet;
a heat-exchange fluid outlet;
a first end portion; and
a second end portion;
heat-exchange tubular means positioned in said heat exchange housing;
first and second partitions formed of a potting composition for respectively securing a first and a second end portion of said heat-exchange tubular means to said heat exchange housing in a fluid tight seal to partition an interior portion of said heat exchange housing into a heat-exchange fluid chamber in fluid communication with said heat-exchange fluid inlet and said heat-exchange fluid outlet, said heat exchange fluid chamber being defined by an outside surface of said heat exchange tubular means, said internal wall of said heat exchange housing and an internal surface of each of said first and second partitions, said internal surfaces of said partitions facing an interior of said heat exchange fluid chamber, and a blood chamber being defined by an internal surface of said heat-exchange tubular means;
a blood inlet and a blood outlet in fluid communication with said blood chamber;
a plurality of spaced apart projections formed on an inner surface of said first end portion of said heat exchange housing so as to project in a direction toward an end of said first end portion of said heat exchange housing and away from said second end portion of said heat exchange housing;
said first end portion of said heat exchange housing being positioned relative to said first partition so that an entirety of each of said plurality of spaced apart projections formed on said inner surface of said first end portion of said heat exchange housing are embedded in an annular area within said first partition such that a plurality of projection-free areas are formed between adjacent projections where said plurality of projections are not present, said projection-free areas enabling said potting composition to flow therethrough when said first partition is being formed from said potting composition; and
an artificial lung comprising:
an artificial lung housing having a gas inlet and a gas outlet;
a bundle of gas-exchange hollow fibers positioned in said artificial lung housing;
partitions for respectively securing a first and a second end portion of said bundle of gas-exchange hollow fibers to said artificial lung housing in a fluid tight seal, to partition an interior of said artificial lung housing into a gas chamber in fluid communication with said gas inlet and said gas outlet, and a blood chamber defined in said gas-exchange hollow fibers; and
a blood inlet portion and a blood outlet portion in fluid communication with said blood chamber;
said first partition of said heat exchanger formed in said first end portion of said heat exchange housing facing and being connected to a given one of said partitions of said artificial lung.

5,192,500
FIREFIGHTER SAFETY BADGE
George A. Treddenick, 234 Kingston Row, Winnipeg, Manitoba, Canada R2M 0T4
Filed Apr. 5, 1991, Ser. No. 681,005
Int. Cl.[5] G01N *21/00*
U.S. Cl. 422—56 3 Claims



1. A method for generating records relating to the entry into a hazardous area of a person comprising providing a badge body having thereon indicia identifying and relating to the person intended to use the badge body, providing on the badge body means for indicating the presence near the badge of a toxic compound, providing a detachable adhesive label attached to the badge body and covering said indicating means, providing on an exposed surface of the adhesive label indicia identifying the person and providing blank areas arranged for manual entry of further indicia relating to a time of entry into the hazardous area and identifying the hazardous area, prior to entering the hazardous area, manually marking the adhesive label with said indicia relating to the hazardous area and a time of entry into the hazardous area, removing the adhesive label from the badge body to expose the indicating means to the atmosphere, attaching the badge body to the person for transportation by the person into a hazardous area, attaching the marked label to a surface adjacent the hazardous area for collection, and subsequently collecting the adhesive label and badge body to provide record of any exposure to said toxic compound by said person.

5,192,501
METHOD OF FORMULATING A TEST INK FOR A FECAL OCCULT BLOOD TEST PRODUCT
Philip A. Guadagno, Vidor, and Janice P. Burrows, Orange, both of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.
Filed Apr. 4, 1989, Ser. No. 333,828
Int. Cl.[5] H01N *33/50*
U.S. Cl. 422—56 19 Claims

1. A method of formulating a test ink for a fecal occult blood test product, the method comprising the steps of:
a. dissolving at least one chromogen reagent in a solvent comprising a surfactant to provide a first solution, said surfactant being present in an amount effective to prevent premature reaction of the at least one chromogen reagent and an oxygen donor reagent, and said at least one chromogen reagent being capable of being oxidized by an oxygen donor reagent in the presence of a substance having peroxidase-like activity to provide a visible change of color;
b. providing a second solution comprised of at least one oxygen donor reagent dissolved in a solvent comprising a surfactant, which surfactant is the same surfactant as contained in the first solution; and
c. adding the second solution to the first solution to provide a test ink.

5,192,502
DEVICES FOR USE IN CHEMICAL TEST PROCEDURES
John W. Attridge, Weybridge, and Alan M. Smith, Altrincham, both of United Kingdom, assignors to Arac-Serono Research & Development Limited Partnership, Boston, Mass.
PCT No. PCT/GB90/00764, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO90/14590, PCT Pub. Date Nov. 29, 1990
PCT Filed May 17, 1990, Ser. No. 623,734
Claims priority, application United Kingdom, May 18, 1989, 8911462
Int. Cl.[5] G01N *21/01*
U.S. Cl. 422—57 5 Claims

1. In a sample collecting and testing device used in an optical assay for analyte present in a sample liquid, said device comprising a pair of parallel transparent plates with a capillary cavity therebetween to allow uptake of sample liquid therein, one of said plates being a light-transmissive waveguide having a reagent appropriate to the assay immobilized on its internal surface, the improvement wherein the other of said plates has an opaque or light-absorbing material coated on its external surface.

5,192,503
PROBE CLIP IN SITU ASSAY APPARATUS
Charles M. McGrath, 6669 Beach, Troy, Mich. 48098, and Jennipher Gradzien, 440 Brecker Rd., Metamora, Mich. 48455
Filed May 23, 1990, Ser. No. 528,067
Int. Cl.[5] G01N *21/01, 21/78*; B65D *49/02, 49/08*
U.S. Cl. 422—57 7 Claims

1. A reaction chamber apparatus for in situ assay of a tissue section mounted on a slide, the reaction chamber apparatus comprising:

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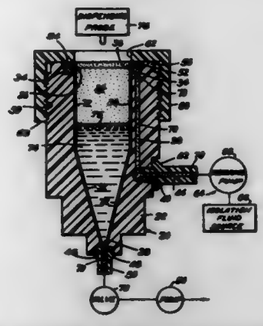
a planar slide having a tissue section mounted thereon;
a planar plate formed of a plastic material;
a material layer mounted on one end of the plate to form a raised surface on one major side of the plate, the material layer being integral with the plate;
a first seal member mounted on the material layer and having a closed periphery formed of opposed pairs of side walls defining an interior cavity on the material layer between the opposed pairs of the side walls of the first seal member;
a second seal member mounted on the material layer intermediate one pair of side walls of the material layer, the second seal member having first and second ends, the first and second ends of the second seal member being spaced from another pair of opposed side walls of the first seal member to form first and second free gravity fluid flow communicating channels each providing flow communication between first and second surfaces on the material layer, the first and second surfaces being located between the sides of the second seal member and the one pair of opposed side walls of the first seal member; and

a probe formed of a dried, soluble reagent material mounted on the second surface of the material layer;
the first and second seal members sealing contacting the slide when the slide brought into proximity with the material layer to form a sealed reaction chamber between the portion of the slide having the tissue section mounted thereon and the first surface of the material layer, a liquid reactant disposed in the reaction chamber, and a sealed mixing chamber between a remaining portion of the slide and the second surface of the material layer, the reaction chamber and the mixing chamber being disposed in bi-directional fluid flow communication by the first and second fluid flow channels for transfer of the liquid reactant to the mixing chamber to release the probe from the second surface of the material layer and for transfer of the released probe to the reaction chamber for reaction with the tissue section through the first and second fluid flow channels upon bi-directional, end-to-end rotation of the sealingly connectrd slide and plate.

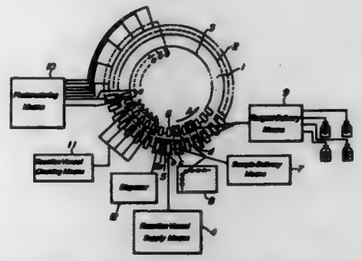
5,192,504
FLUSHABLE LOW CARRYOVER CONTAINER
Michael M. Cassaday, Valhalla, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Continuation of Ser. No. 9,424, Feb. 2, 1987, abandoned, which is a continuation of Ser. No. 721,919, Apr. 11, 1985, abandoned. This application Jul. 28, 1989, Ser. No. 387,267
Int. Cl.[5] G01N *21/05*
U.S. Cl. 422—64 **41 Claims**

1. In an analysis system for the successive analyses of a series of discrete samples liquids with minimum carryover therebetween, the improvements comprising, a container comprising container wall means defining a container bore for the successive containment and processing for analysis of said discrete samples liquids, container bore inlet means for the successive introductions of said discrete sample liquids into said container bore, and container bore outlet means for the successive flows of said discrete liquids from said container bore, means operatively associated with said container bore inlet means for successively introducing said discrete sample liquids into said container bore, said discrete sample liquids introduction means only being operable to introduce a succeeding discrete sample liquid into said container bore after a precedingly introduced discrete sample liquid has flowed completely from said container bore, means operatively associated with said container bore inlet means for introducing at least one discrete sample liquid processing liquid into said container bore for concomitant containment therewithin the each of said discrete sample liquids, and mean independent of said discrete sample liquids and processing liquids introduction means for introducing an isolation liquid which is immiscible with said discrete sample liquids and said processing liquid into said container bore inlet means for flow through said container bore to cover the walls of said container bore from said container bore inlet means to



said container bore outlet means with an independently flowing stream of said isolation liquid, said discrete sample liquids and said processing liquids being essentially aqueous liquids, said isolation liquid being a non-aqueous liquid, and said container bore walls being formed by a fluorinated hydrocarbon material which is selectively wettable by non-aqueous liquids to the substantial exclusion of aqueous liquids whereby, contact by said discrete sample liquids and said processing liquids with the walls of said container bore is substantially prevented by said isolation liquid stream to minimize carryover between said discrete sample liquids attendant the successive containment and processing thereof in said container bore.

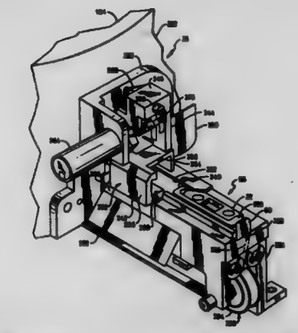
5,192,505
AUTOMATIC ANALYZING APPARATUS
Toshio Sakagami, Chofu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 18, 1990, Ser. No. 510,882
Claims priority, application Japan, Apr. 25, 1989, 1-103458
Int. Cl.[5] G01N *21/00*
U.S. Cl. 422—64 **5 Claims**



1. An automatic analyzing apparatus comprising:
a first reaction line on which a plurality of first reaction vessels are detachably mounted to be disposable;
a second reaction line on which a plurality of second reaction vessels are non-detachably mounted to be reusable;

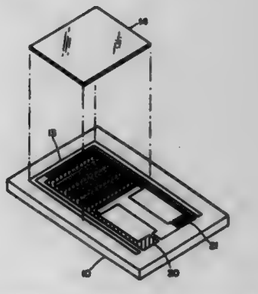
a common transportation means for transporting the first and second reaction vessels respectively mounted on said first and second reaction lines to a reaction vessel supply position, a sample delivery position, a reagent delivery position, a photometering position, a reaction vessel cleaning position and a disposing position;
reaction vessel supply means for supplying said first reaction vessels to said first reaction line at the reaction vessel supply position;
sample delivery means for delivering a sample into at least one reaction vessel mounted on at least one of said first and second reaction lines at the sample delivery position in accordance with at least one test item to be analyzed for the relevant sample;
reagent delivery means for delivering reagents into the vessels mounted on said first and second reaction lines at the reagent delivery position in accordance with items to be analyzed;
photometering means for measuring given substances contained in test liquids contained in the reaction vessels mounted on the first and second reaction lines at the photometering position, each of said test liquids being a mixture of a sample and a reagent;
first cleaning means for cleaning the second reaction vessels mounted on the second reaction line at the reaction vessel cleaning position; and
reaction vessel disposing means for disposing the first reaction vessels mounted on the first reaction line at the disposing position.

5,192,506
INCUBATOR PORT CLOSURE FOR AUTOMATED ASSAY SYSTEM
Fareed Kureshy; Charles A. DeAngelis, both of Westwood, and Robert C. MacIndoe, Jr., Linwood, all of Mass., assignors to P B Diagnostic Systems, Inc., Westwood, Mass.
Filed Feb. 14, 1991, Ser. No. 655,541
Int. Cl.[5] G01N *33/48*
U.S. Cl. 422—64 **4 Claims**



1. An automated assay system for use with assay cartridges, the system comprising
a temperature controlled chamber, the chamber having a top wall and a bottom wall and a sidewall connecting the top wall with the bottom wall, the sidewall encircling the chamber, there being a port in the sidewall and a door for closing the port;
a plurality of berths disposed in the chamber for receiving cartridges;
a conveyor disposed in the chamber for conveying said berths along the sidewall and sequentially past said port;
an injector disposed outside said chamber and at said port for inserting a cartridge via said port into one of said berths and for extracting a cartridge via said port from one of said berths; and
wherein said injector includes means for opening the door prior to cartridge insertion or cartridge extraction and for closing the door subsequent to a cartridge insertion or a cartridge extraction and means for ejecting a spent cartridge subsequent to extraction of the cartridge from said chamber
said injector including a track for guiding a cartridge along a path into said chamber, a portion of said track being included in said ejecting means, wherein said track portion is arranged to swing away from said path during ejection of a cartridge to dislodge a cartridge from the path to accomplish ejection of the cartridge.

5,192,507
RECEPTOR-BASED BIOSENSORS
Richard F. Taylor, W. Boxford; Ingrid G. Marenchic, Walpole, and Edward J. Cook, South Hamilton, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.
Continuation of Ser. No. 203,281, Jun. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 58,309, Jun. 5, 1987, Pat. No. 5,001,148. This application Mar. 4, 1991, Ser. No. 664,440
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] G01N *33/483*
U.S. Cl. 422—68.1 **9 Claims**



1. An opiate receptor-containing biosensor for the determination of an opiate in a sample comprising:
a) a polymeric film formed by chemical copolymerization of a solution comprising:
1) a base component which is a protein,
2) an opiate receptor; and
3) at least one stabilizer selected from the group consisting of lipids, detergents and antioxidants;
b) a first sensor comprising a first conductor and a second conductor which are in contact with said film; and
c) a current source in conductive contact with the first and second conductors for measuring an electrical characteristic of the polymeric film.

5,192,508
CARBOHYDRATE CELLULAR ADHESION APPARATUS
Ronald L. Schnaar, Columbus, Md., assignor to The Johns Hopkins University, Baltimore, Md.
Continuation of Ser. No. 192,959, May 12, 1988, abandoned. This application Jun. 23, 1992, Ser. No. 902,755
Int. Cl.[5] B01L *3/08*; C12M *1/18*
U.S. Cl. 422—70 **6 Claims**

1. An apparatus for binding cells to a thin layer chromatogram surface, said apparatus comprising:
(a) a sealable chamber suitable for fitting into a multiwell plate centrifuge carrier, said chamber having a side opening for receiving a thin layer chromatogram;
(b) blocks adjacent the floor of said chamber and along the sides of said chamber to hold said chromatogram against the ceiling of said chamber;

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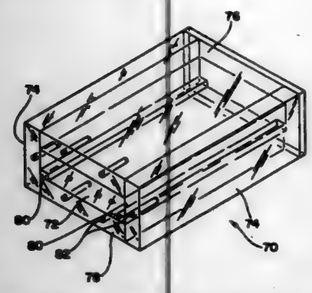
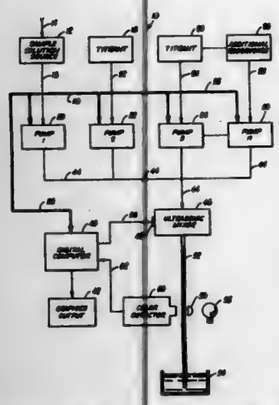
(c) gasket means and a cover cooperating to provide an air-tight seal for said opening; and
(d) means for locking said cover into a sealing position with respect to said opening;



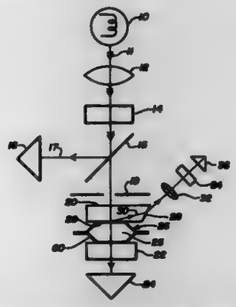
wherein said locking means and said seal are capable of withstanding centrifugal forces in the range of approximately 250 to 1000 times the force of gravity.

5,192,509
APPARATUS FOR AUTOMATIC TITRATION
Jim B. Surjaatmadja, and Clyde L. Lee, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed Aug. 22, 1991, Ser. No. 748,986
Int. Cl.[5] G01N *31/16*
U.S. Cl. 422—75 17 Claims



1. Apparatus for continuous titration of liquid sample comprising:
a delivery tube;
first means including a sample source for receiving and pumping a continuous flow of liquid sample into said delivery tube;
second means including a reservoir for pumping reagent at a controlled rate into said delivery tube;
third means including a reservoir for pumping selected titrant at a controlled rate into said delivery tube;
an ultrasonic mixer receiving liquids from said delivery tube;
a mixing tube passing mixed liquids from said ultrasonic mixer therethrough;
optical detector means disposed in viewing relationship adjacent to said mixing tube and producing an output signal indicative of sample titrant fluid equivalence; and
a computer receiving said detector means output signal and producing a first signal output to control the first means for receiving and pumping liquid sample, a second signal output to control the second means for pumping reagent, and a third signal output to control the third means for pumping titrant.

5,192,510
APPARATUS FOR PERFORMING FLUORESCENT ASSAYS WHICH SEPARATES BULK AND EVANESCENT FLUORESCENCE
Steven J. Zoha, Jarrettsville, Md.; James E. Davis; Alan R. Craig, both of Wilmington, Del., and Alan M. Hochberg, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 30, 1991, Ser. No. 648,005
Int. Cl.[5] G01N *21/01, 21/64*
U.S. Cl. 422—82.05 1 Claim



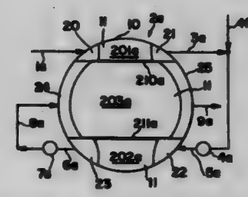
1. Apparatus for optically detecting an analyte of interest by separating bulk and evanescent emission from a tag capable of producing inelastic scattering of excitation radiation, comprising:
an optically transparent sample holder having an inner wall and holding a sample having the tag,
means for binding the tag to the inner wall immobilized on the inner wall, wherein at least a portion of the tag is bound to the inner wall in the presence of the analyte,
a prism connecting the sample holder contiguous the inner wall to provide an optical interface with the sample, the prism having an exit surface, and
means to excite the sample and tag to produce bulk emission and evanescent emission such that the bulk emission reaches the exit surface at an angle of incidence with the exit surface which is greater than the critical angle, whereby the bulk emission is totally internally reflected and the evanescent emission is passed through the exit surface.

5,192,511
PIPETTE TIP AND PISTON
William J. Roach, Auburn, Calif., assignor to Tri-Continent Scientific, Inc., Grass Valley, Calif.
Filed May 31, 1991, Ser. No. 708,909
Int. Cl.[5] B01L *3/02*
U.S. Cl. 422—100 13 Claims

1. A fluid handling apparatus for a pipette, comprising:
(a) a tube, said tube including an open first end and an open second end, said tube including interior and exterior walls, said interior and exterior walls being conically tapered toward said first end;
(b) a radially projecting collar, said collar extending from said second end of said tube, said collar including an interior region;
(c) snap coupling means for coupling said collar to the body of a positive displacement pipette, said snap coupling means located within said interior region of said collar;
(d) a piston, said piston extending into said tube, said piston having a first end and a second end, said first end of said piston aligned with said first end of said tube, said piston being conically tapered toward said first end, said piston being slidable within said tube; and
(e) a plurality of spaced apart inwardly converging resilient prongs, said prongs extending from said second end of said

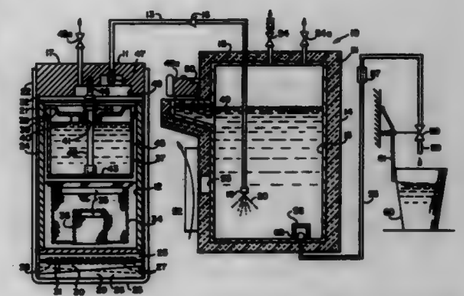
piston, said prongs having beveled ends, said prongs forming a receptacle for coupling to a plunger in a positive displacement pipette, whereby said prongs will expand outwardly upon insertion of a plunger in a positive displacement pipette into said receptacle thereby frictionally engaging the plunger.

5,192,512
APPARATUS FOR PERFORMING CHEMICAL REACTIONS UNDER PRESSURE IN A MULTI-STAGE REACTION ZONE WITH EXTERNAL INTERMEDIARY THERMAL CONDITIONING
Dang V. Quang, Neuilly; Pierre Ham, La Celle Saint Cloud; Daniel Gelas, Croissy Sur Seine, and Christian Legrand, Cergy, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France
Division of Ser. No. 146,665, Jan. 21, 1988, Pat. No. 5,045,568.
This application Jun. 4, 1991, Ser. No. 709,932
Claims priority, application France, Jan. 27, 1987, 87 00751
Int. Cl.[5] B01J *8/04*
U.S. Cl. 422—190 13 Claims



1. An apparatus for conducting chemical reactions, comprising:
a reactor of elongated shape containing at least one catalyst bed, said reactor comprising a substantially cylindrical casing having a generatrix, and first and second tight end parts;
at least two tight adjacent compartments contained in said reactor of elongated shape, said compartments extending lengthwise, in the direction of the generatrix, along substantially the entire length of said reactor;
each group of two adjacent compartments having a common partition-wall, said common partition-wall having a longitudinal axis which is either substantially parallel to said generatrix or substantially oblique with respect thereto, said common partition-wall being in fluid tight connection with said casing, and each of said compartments having a first end and a second end opposite said first end;
each compartment further comprising at least one inlet means located at said first end for introduction of fluid into said compartment and at least one outlet means located at said second end for removal of fluid which has passed through said compartment, said inlet and outlet means being in fluid communication with the exterior of said reactor through said casing;
at least one distribution means in each of said compartments for crosswise distributing fluid in a direction substantially perpendicular to said generatrix, said at least one distribution means being in fluid communication with said at least one inlet means;
at least one collecting means in each of said compartments for removing fluid therefrom, said at least one collecting means being in fluid communication with said at least one outlet means, whereby fluid introduced into each of said compartments via said at least one inlet means is distributed by said at least one distribution means, traverses said compartment from said first end to said second end, is collected by said at least one collecting means, and is removed by said at least one outlet means; and
at least one heat transfer means interposed between said at least one outlet means of one of said compartments and said at least one inlet means of another of said compartments, said at least one heat transfer means being external to said casing.

5,192,513
HIGH SPEED PROCESS AND APPARATUS FOR CARBONATING WATER
William C. Stumphauzer, 44550 Stang Rd., Elyria, Ohio 44035; Hugh F. Groth, Richfield, and L. Scot Duncan, Independence, both of Ohio, assignors to William C. Stumphauzer, Elyria, Ohio
Filed Jul. 26, 1991, Ser. No. 736,628
Int. Cl.[5] A23L *2/26*; B01J *8/00*
U.S. Cl. 422—305 9 Claims



1. A high speed process for carbonating water comprising the steps of:
(A) providing a first pressure vessel having an upper portion and a lower portion temporarily separated therefrom;
(B) providing a second pressure vessel;
(C) operatively connecting the interiors of the first and second pressure vessel to each other with a gas conducting means;
(D) positioning a selected quantity of a carbon dioxide generating compound at a first location within the lower portion of the first pressure vessel at the bottom thereof;
(E) positioning a contained selected quantity of water in a container at a second location within the first pressure

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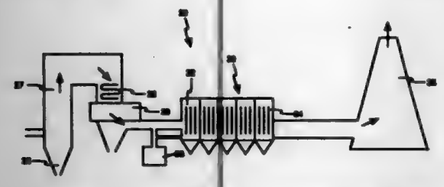
vessel above and out of contact with the carbon dioxide generating compound;
(F) filling the second pressure vessel to a selected level with a larger quantity of water than that in the first pressure vessel;
(G) sealing the second pressure vessel from the outside atmosphere;
(H) sealing the first pressure vessel from the outside atmosphere by moving the lower portion of the first pressure vessel into sealing contact with the upper portion thereof;
(I) releasing the contained quantity of water from the container into the carbon dioxide generating compound in the first pressure vessel to chemically react with the carbon dioxide generating compound and generate pressurized carbon dioxide gas therein with sufficient pressure to pass into the second pressure vessel and carbonate the water therein;
(J) the selected level of the water in the first and second pressure vessels being such that the combined head space remaining within both the pressure vessels is at least 5% of the total combined volume of both said pressure vessels, and
(K) providing a means to remove carbonated water from the second pressure vessel upon demand.

5,192,514
METHOD OF REMOVING SELENIUM FROM FLUE GASES
Edward B. Diamukes, Birmingham, Ala., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Feb. 24, 1992, Ser. No. 840,452
Int. Cl.[5] B01D *47/00*; B01J *8/00*; C01B *19/00*
U.S. Cl. 423—210 12 Claims



1. A method of removing gaseous selenium from a glue gas produced by the combustion of a carbonaceous fuel, said method comprising the steps of:
injecting ammonia within said flue gas in an effective amount to react with said gaseous selenium of said flue gas at a temperature of approximately 300° F. to produce a solid selenium reaction product; and
providing a filter assembly for receiving said solid selenium reaction product.

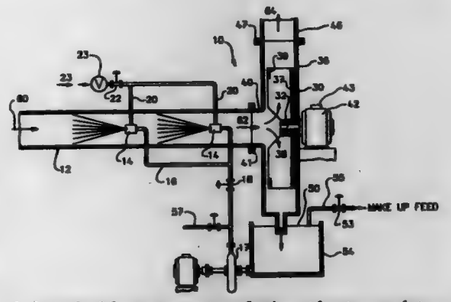
5,192,515
REDUCTION OF NITROGEN OXIDE AND CARBON MONOXIDE IN EFFLUENT GASES
Ralph A. Gardner-Chavis, Cleveland, and Michael P. May, Canton, both of Ohio, assignors to Molecular Technology Corporation, Canton, Ohio
Continuation-in-part of Ser. No. 585,937, Sep. 20, 1990, abandoned. This application Mar. 12, 1991, Ser. No. 668,196
Int. Cl.[5] C01B *21/02*
U.S. Cl. 423—213.2 6 Claims

1. A method for simultaneously reducing the nitrogen oxide and carbon monoxide content of a gas stream and converting the nitrogen oxide and carbon monoxide to nitrogen and carbon dioxide which comprises
(A) contacting said gas stream with a dysprosium-containing catalyst at a temperature of from about 300° F. to about 1200° F. for a period of time sufficient to remove nitrogen oxide from the gas by reaction with the carbon monoxide, said catalyst being free of additional metals capable of promoting the oxidation of carbon monoxide, and thereafter
(B) contacting the gas with a second metal-containing catalyst capable of promoting the oxidation of carbon monoxide in the presence of oxygen to reduce further the amount of carbon monoxide in the gas, provided that the second metal-containing catalyst does not contain dysprosium.

5,192,516
METHOD FOR LOW NITROGEN OXIDE COMBUSTION IN SUPERSONIC TRANSPORTS
Sanjay M. Correa, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Sep. 24, 1991, Ser. No. 764,869
Int. Cl.[5] C01B *21/00*
U.S. Cl. 423—235 9 Claims

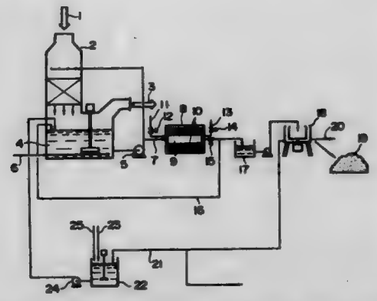
1. A method of reducing the amount of nitrogen oxides produced by combustion in a jet engine of a supersonic aircraft having a combustor, said method comprising injecting a reducing agent into a downstream portion of the combustor of the jet engine perpendicularly to the primary direction of airflow through the combustor.

5,192,517
GAS REACTING METHOD
Donald R. Spink, Waterloo, Canada, assignor to Turbotak Inc., Waterloo, Canada
Continuation-in-part of Ser. No. 438,047, Nov. 30, 1989, which is a division of Ser. No. 243,720, Sep. 13, 1988, Pat. No. 4,963,329, which is a continuation-in-part of Ser. No. 20,953, Mar. 2, 1987, Pat. No. 4,865,817. This application Jan. 28, 1991, Ser. No. 646,197
Int. Cl.[5] C01B *17/00*
U.S. Cl. 423—243.08 25 Claims



1. A method for wet mass transferring at least one solute gas from a process gas stream into a reacting medium for said solute gas, comprising:
(a) providing an elongate conduit having an inlet thereto and an outlet therefrom and which is divided into a plurality of individual gas-atomized liquid contact zones;
(b) passing a gas stream containing at least one solute gas comprising sulfur dioxide into the inlet end of the elongate conduit;
(c) injecting a liquid reacting medium comprising an aqueous alkaline medium capable of adsorbing said at least one solute gas directly into said gas stream under an atomizing pressure of about 20 to about 100 psi from a plurality of dual-fluid spray nozzles coaxially disposed in said conduit one in each of the individual gas-atomized liquid contact zones so as to form a spray pattern from each of said nozzles filling homogeneously the cross-section of said conduit in each of the individual gas-atomized liquid contact zones and containing liquid droplets ranging in size from about 5 to about 100 microns, thereby to form a plurality of individual contact spray zones whereby mass transfer of said at least one solute gas into said reacting medium is carried out in a very efficient way due to the large interfacial surface area for mass transfer, turbulent mixing and relatively long residence time generated therein;
(d) contacting the gas stream exiting each individual gas-atomized liquid contact zone with demisting means to agglomerate and remove entrained droplets from the gas stream before the gas stream passes to the next such zone and out of the outlet end; and
(e) discharging a clean gas stream from the outlet end.

5,192,518
METHOD FOR DESULFURIZING EXHAUST SMOKE
Naohiko Ukawa, Hiroshima; Susumu Okino, Kaconshin; Toru Takashina, Kaconshin; Masakazu Onizuka, Kaconshin, and Kenji Inoue, Kaconshin, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 16, 1991, Ser. No. 701,652
Claims priority, application Japan, Jun. 20, 1990, 2-159869
Int. Cl.[5] B01D *53/34*, *47/06*; C01F *11/46*
U.S. Cl. 423—244.08 2 Claims



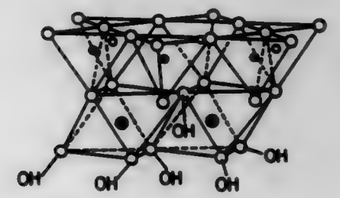
1. In a method for desulfurizing an exhaust gas containing aluminum and fluorine components which comprises the steps of leading said exhaust gas containing fly ash with aluminum components to a gas absorbing step, removing SO_2 and said fly ash from said exhaust gas by the use of an absorbing slurry solution to which calcium carbonate is fed as an absorbent in said gas absorbent step, and blowing air into said absorbing solution slurry circulating through said gas absorbing step to oxidize it and to thereby produce a gypsum, the improvement which comprises introducing a portion of said absorbing solution slurry containing said fly ash to a magnetic field to separate and recover said fly ash from said absorbing solution slurry, and then returning at least a portion of said absorbing solution slurry from which said fly ash has been separated to said gas absorbing step to promote dissolution of said calcium carbonate and wherein a portion of the absorbing solution slurry from which fly ash has been separated is treated to separate and recover gypsum of reduced fly ash content relative to that recovered without the magnetic field.

5,192,519
SUBSTITUTED STANNOSILICATES AND PREPARATION THEREOF
Edward W. Corcoran, Jr., Easton, Pa., and David E. W. Vaughan, Flemington, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Continuation-in-part of Ser. No. 496,471, Feb. 28, 1990, Pat. No. 5,110,571, which is a continuation-in-part of Ser. No. 91,657, Sep. 1, 1987, abandoned. This application Mar. 9, 1992, Ser. No. 848,596
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—713 16 Claims

1. Crystalline substituted stannosilicate of the formula

$$xM_2O\text{-}S_nO_2\text{-}4\pm0.5(Si+T)O_2\text{-}yH_2O\text{-}zR$$

wherein M is a Group 1A metal, a Group IIA metal, whereupon M_2O becomes MO, or a quaternary amine; T is germanium, aluminum, gallium, zinc or mixtures thereof;
x is 1.5 to 4
y is 4 to 15



R is an amine; and
Z is 0 to 4
wherein the framework species comprises tin in octahedral coordination, Si and T in tetrahedral coordination, and oxygen.

5,192,520
SYNTHESIS OF ALUMINOSILICATE ZEOLITES OF FAUJASITE STRUCTURE
François Delprato, Rueil-Malmaison; Jean-Louis Guth, Brumath; Frédérique Hoffner, Saint-Amarin, and Catherine Zivkov, Narosse, all of France, assignors to Societe National Elf Aquitaine, Courbevoie, France
PCT No. PCT/FR90/00899, § 371 Date May 10, 1991, § 102(e) Date May 10, 1991, PCT Pub. No. WO91/04226, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 11, 1990, Ser. No. 689,832
Claims priority, application France, Sep. 13, 1989, 89 11949
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—702 28 Claims

1. A process for the preparation of a zeolite with an aluminosilicate skeleton belonging to the faujasite structural group and exhibiting an Si : Al ratio higher than 1, said process comprising:
(a) producing a reaction mixture which has a pH higher than 10 and contains water, a source of tetravalent silicon, a source of trivalent aluminum, a source of hydroxide ions in the form of a strong base and a structuring agent ST, so as to produce an aluminosilicate gel having a composition effective to permit its crystallization into a compound of the faujasite structural group;
(b) maintaining said gel at a temperature not exceeding 150° C. and at a pressure which is at least equal to the autogenous pressure of the gel for a sufficient period to effect crystallization of this gel into a precursor of said zeolite containing the structure agent ST in its cavities; and
(c) calcining said precursor to destroy said structuring agent and to produce said zeolite;
wherein the structuring agent ST consists of at least one compound chosen from the polyalkylene oxides corresponding to the formula

$$R\text{—}O\text{—}(C_mH_{2m-1}X\text{—}O)_n\text{—}R'$$

in which each of R and R', which are identical or different, denotes a hydrogen atom or a C_1–C_4 alkyl radical, X denotes a hydrogen atom or an —OH radical, m is equal to 2 or 3 and may be different from one unit to another and n is a number ranging from 1 to 12.

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5,192,521

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-12

Ahmad Moini, Lawrenceville, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Nov. 19, 1991, Ser. No. 794,274
Int. Cl.[5] B01J *29/28*; C01B *33/28*
U.S. Cl. 423—713 18 Claims

1. A method for synthesizing crystalline material exhibiting a characteristic X-ray diffraction pattern including d-spacing maxima values, in Angstroms, as follows:

Interplanar d-Spacing, (A)
11.9 ± 0.2
10.1 ± 0.2
4.76 ± 0.1
4.29 ± 0.08
3.98 ± 0.08
3.87 ± 0.07
3.49 ± 0.07
3.38 ± 0.07
3.20 ± 0.06
3.05 ± 0.05
2.54 ± 0.03

which comprises (i) preparing a mixture capable of forming said material, said mixture comprising sources of alkali or alkaline earth metal (M), an oxide of trivalent element (X), an oxide of tetravalent element (Y), water and decamethonium cation directing agent (R), and having a composition, in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	30 to <100
H_2O/YO_2	10 to 80
OH^-/YO_2	0.05 to 1.0
M/YO_2	0.05 to 1.0
R/YO_2	0.02 to 0.80

(ii) maintaining said mixture under sufficient conditions until crystals of said material are formed; and (iii) recovering said crystalline material from step (ii), said recovered crystalline material containing said R.

5,192,522

ZEOLITE LZ-277 AND PROCESS FOR PREPARING SAME

Gary W. Skeels, Brewster, and Marilyn R. Sears, Ossining, both of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Nov. 26, 1991, Ser. No. 798,382
Int. Cl.[5] C01B *33/28*; B01J *29/06*
U.S. Cl. 423—713 8 Claims

1. A synthetic microporous crystalline zeolite having an as-synthesized chemical composition on an anhydrous basis and expressed in terms of molar oxide ratios of

$1.0\pm0.1\ Na_2O:Al_2O_3:3–15\ SiO_2$

said zeolite having an x-ray powder diffraction pattern having at least the following d-spacings

d,A	Relative Intensity
11.77 ± 0.5	M
9.44 ± 0.2	M–S
6.84 ± 0.1	VS
4.93 ± 0.1	M–S
4.29 ± 0.1	M–S
3.42 ± 0.1	S
2.91 ± 0.1	VS
2.82 ± 0.1	M
2.59 ± 0.1	M

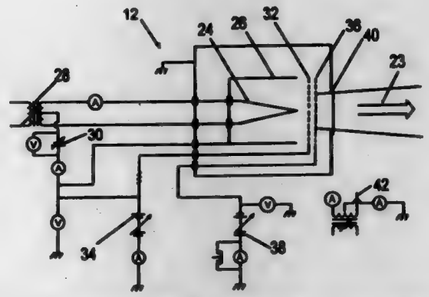
said as-synthesized zeolite having an adsorption capacity for SF_6 at 25° C. and 400 torr SF_6 pressure of less than 1 weight percent, the sodium cations of said zeolite being completely replaceable by ion-exchange without prior calcination or oxidative reaction involving said zeolite, with at least one cation species selected from the group consisting of H^+, NH_4^+, other alkali metals, alkaline earth metals and transition metals.

5,192,523

METHOD FOR FORMING DIAMONDLIKE CARBON COATING

Richard L. Wu, Xenia, and Peter P. Pronko, Kettering, both of Ohio, assignors to Universal Energy Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 362,642, Jun. 7, 1989, abandoned. This application May 28, 1991, Ser. No. 707,319
Int. Cl.[5] C01B *31/04*
U.S. Cl. 427—523 23 Claims



1. A method of forming a diamondlike carbon coating on a substrate comprising the steps of:

generating a carbon containing ionized beam having an ion kinetic energy in the range of substantially 500 to 1,000 eV; and

impinging said ionized beam onto the substrate.

5,192,524

CAPTOPRIL AS A CANCER CHEMOPREVENTIVE AGENT

William F. Ward; Agostino Molteni, both of Evanston; Chung-hsin Ts'ao, Prospect Heights, and Joann M. Hinz, Chicago, all of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Apr. 26, 1990, Ser. No. 514,589
Int. Cl.[5] A61K *43/00*, *31/40*
U.S. Cl. 424—1.1 4 Claims

1. A method of protecting against carcinogenesis induced by radiation therapy, said method including the steps of: irradiating a tissue with X-ray or gamma radiation; administering Captopril after irradiation in an amount effective for reducing the severity radiation induced normal tissue injury and decreasing the incidence of a secondary malignancy in the irradiated tissue.

5,192,525

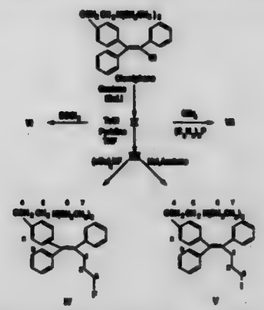
HIGH AFFINITY TAMOXIFEN DERIVATIVES AND USES THEREOF

David Yang, Sugarland, and Sidney Wallace, Houston, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 589,928, Oct. 1, 1990. This application Jan. 28, 1991, Ser. No. 722,322
Int. Cl.[5] A61K *49/02*, *43/00*
U.S. Cl. 424—1.1 10 Claims

1. A method for imaging estrogen receptors in an estrogen receptor-rich tissue of a patient comprising labeling the estrogen receptor with a radiolabeled lower alkyl-halo aliphatic chain substituted tamoxifen derivative comprising the steps of:

administering a sufficient quantity of the radiolabeled lower alkyl-halo aliphatic chain substituted tamoxifen derivative to an estrogen receptor rich tissue of the patient;



positioning the patient supine in a PET device;

performing an emission scan of the estrogen-receptor rich tissue, and obtaining a PET image of the tissue; and

evaluating the PET image for the presence or absence of focally increased uptake of the radiolabel in the tissue.

5,192,526

KIT FOR PREPARATION OF RHENIUM THERAPEUTIC AGENTS FOR BONE CANCER WITHOUT PURIFICATION

David W. Pipes, St. Louis, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 346,411, May 2, 1989, Pat. No. 5,021,235. This application Mar. 21, 1991, Ser. No. 673,000
Int. Cl.[5] A61K *43/00*; C01G *47/00*
U.S. Cl. 424—1.1 22 Claims

1. A kit for forming a rhenium therapeutic agent comprising:

a bone-seeking ligand, a reductant and an anti-oxidant in an aqueous solution wherein the ligand is present in a concentration between about 0.01M and 0.15M, the reductant is present in a concentration between about 0.005M and 0.020M and the anti-oxidant is present at a concentration of between about 3×10^{-3}M and 3.5×10^{-2}M.

5,192,527

METHOD OF REVERSING LOCAL ANESTHESIA AND REAGENT SYSTEM THEREFOR

Glenn M. Abrahamsohn, 5055 Collins Ave., Miami, Fla. 33140

Continuation-in-part of Ser. No. 723,899, Jul. 1, 1991, abandoned. This application Dec. 23, 1991, Ser. No. 812,469
Int. Cl.[5] A61K *49/00*, *33/14*, *33/00*, *31/70*
U.S. Cl. 424—10 15 Claims

1. A reagent system for inducing and limiting the duration of local anesthesia comprising:

(a) a first container containing an anesthetic agent; and

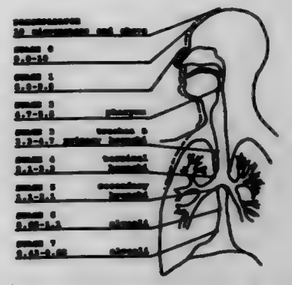
(b) a second container containing an inorganic or organic salt reversing agent which when diluted with a fluid has a pH of at least about 7.

5,192,528

CORTICOSTEROID INHALATION TREATMENT METHOD

Ramachandran Radhakrishnan; Paul J. Mihalko, both of Fremont, and Robert M. Abra, San Francisco, all of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 22,937, Mar. 6, 1989, Pat. No. 4,895,719, which is a continuation-in-part of Ser. No. 737,221, May 22, 1985, abandoned. This application Dec. 1, 1989, Ser. No. 444,369
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[5] A61K *9/12*, *31/47*
U.S. Cl. 424—45 8 Claims



1. A method for administering a therapeutic dose of a corticosteroid to the respiratory tract, for treatment of a condition or disease of the respiratory tract, comprising

(a) preparing an aqueous suspension of liposomes having sizes less than about 0.5 microns and containing the corticosteroid in entrapped form,

(b) aerosolizing the suspension in a pneumatic nebulizer under conditions which produce aerosol particle sizes in the range between about 0.4 and 6 microns, favoring aerosol particle deposition in the respiratory tract, and

(c) administering by inhalation, a quantity of the aerosol containing such therapeutic dosage of the corticosteroid in liposome-entrapped form.

5,192,529

LOW STRINGING TOOTHPASTE

Theodore H. Garlick, Jr., Litchfield, and Philip E. Miner, Newtown, both of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jun. 2, 1992, Ser. No. 892,294
Int. Cl.[5] A61K *7/16*, *7/18*
U.S. Cl. 424—49 10 Claims

1. A low-stringiness and relatively nonweeping toothpaste compositions comprising:

(i) a polyol present in an effective amount to function as a humectant;

(ii) an abrasive present in an effective amount to polish teeth; and

(iii) a thickener system comprising:

(a) a low viscosity carboxymethyl cellulose gum having a viscosity ranging from about 50 to about 500 cps when 4% is placed in water at 25° C.; and

(b) a low viscosity hydroxyethyl cellulose gum having a viscosity ranging from about 75 to about 200 cps when 5% is placed in water at 25° C., the amount of the carboxymethyl cellulose and hydroxyethyl cellulose being present in a weight ratio of about 5:1 to about 1:5, said toothpaste having good cohesion and sufficient shortness of texture so as not to become significantly stringier upon additional shear, and upon extrusion retains body without stringiness, slump, separation, shrinking, collapse or weeping.

5,192,530

ANTIBACTERIAL ANTIPLAQUE ORAL COMPOSITION

Abdul Gaffar, Princeton; Nurun Nabi, No. Brunswick; John Affiitto, Brookside, all of N.J., and Orum Stringer, Yardley, Pa., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 399,606, Aug. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 291,712, Dec. 29, 1988, Pat. No. 4,894,220, and a continuation-in-part of Ser. No. 346,258, May 1, 1989, Pat. No. 5,043,154, each is a continuation-in-part of Ser. No. 8,901, Jan. 30, 1987, abandoned. This application Sep. 6, 1991, Ser. No. 754,887

Int. Cl.[5] A61K 7/16, 7/18

U.S. Cl. 424—52 20 Claims

1. In a method of preparing an oral composition dentifrice wherein delivery and retention of a plaque-inhibiting antibacterial agent is enhanced by attaching, adhering or bonding to oral tooth and gum surfaces, comprising an orally acceptable aqueous vehicle, about 5–30% by weight of a siliceous polishing agent and an effective amount in the range of about 0.01–5% by weight of substantially water insoluble noncationic antibacterial agent, the improvement comprising employing in said composition about 0.5–50% by weight of a solubilizing material for said antibacterial agent in amount sufficient to dissolve said antibacterial agent in saliva and permit delivery of said antibacterial agent to soft oral tissues at or near the gum line, and about 0.05–5% by weight of a water-soluble or swellable antibacterial-enhancing agent, which contains at least one delivery-enhancing functional group and at least one organic retention-enhancing group, which delivery-enhancing group enhances delivery of said antibacterial agent to oral tooth and gum surfaces and said retention-enhancing group enhances attachment, adherence or bonding of said antibacterial agent on oral tooth and gum surfaces.

5,192,531

ANTIBACTERIAL ANTIPLAQUE ORAL COMPOSITION

Abdul Gaffar, Princeton; Nurun Nabi, Brunswick; John Affiitto, Brookside, all of N.J.; Orum Stringer, Yardley, Pa., and Michael Prencipe, East Windsor, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 399,569, Aug. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 291,712, Dec. 29, 1988, Pat. No. 4,894,220, and Ser. No. 346,258, May 1, 1989, Pat. No. 5,043,154, which is a continuation of Ser. No. 8,901, Jan. 30, 1989, abandoned, said Ser. No. 291,712, is a continuation-in-part of Ser. No. 8,901, Jan. 30, 1989. This application Sep. 9, 1991, Ser. No. 758,345

Int. Cl.[5] A61K 7/16, 7/18

U.S. Cl. 424—52 23 Claims

1. In a method of preparing an oral composition dentifrice free of polyphosphate anticalculus agent in an effective anticalculus amount wherein delivery and retention of a plaque-inhibiting antibacterial agent is enhanced by attaching, adhering or bonding to oral tooth and gum surfaces, which composition comprises an orally acceptable aqueous vehicle, about 30–75% by weight of a dentally acceptable water-insoluble polishing agent, an effective amount in the range of about 0.01–5% by weight of substantially water insoluble noncationic antibacterial agent and at least one of a surface active agent or a flavoring oil, the improvement comprising employing in said composition about 0.05–4% by weight of a water-soluble or swellable antibacterial-enhancing agent, which contains at least one delivery-enhancing functional group and at least one organic retention-enhancing group, wherein said delivery-enhancing group enhances delivery of said antibacterial agent to oral tooth and gum surfaces and said retention-enhancing group enhances attachment, adherence or bonding of surfaces.

5,192,532

ORAL COMPOSITIONS CONTAINING MONOPEROXY ACIDS

Christopher B. Gray, and Joanna P. Hinton, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 568,292, Aug. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 421,039, Oct. 13, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,467

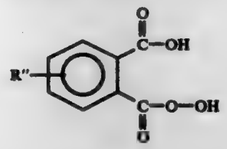
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[5] A61K 7/16, 7/22

U.S. Cl. 424—53 13 Claims

1. A composition for treating or preventing dental plaque, or gingival or periodontal diseases of the oral cavity in humans or lower animals comprising:

(a) a safe and effective amount of a monoperoxyphthalate compound having the structure:



or the pharmaceutically acceptable salts or esters thereof, wherein R" is one or more substituents compatible with the peroxy acid functionality of the aromatic ring; and

(b) a suitable carrier;

wherein said composition has a pH of about 3.0 to about 5.0 and contains a mono-, di- or tricarboxylic acid buffering agent.

5,192,533

NONIRRITATING ANTITARTAR AND ANTIPLAQUE ORAL COMPOSITIONS

David L. Elliott, Hawthorne, and Esther Patrick, Ridgefield, both of N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Mar. 25, 1992, Ser. No. 858,374

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.[5] A61K 7/16, 7/22

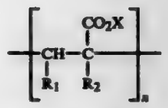
U.S. Cl. 424—54 17 Claims

1. An oral composition comprising:

(i) a polymer present in an effective amount to control build-up of tartar, said polymer having the formula I:

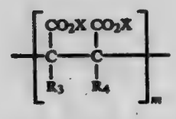
(I)

wherein A is a random polymeric residue comprising at least one unit of structure II.



(II)

and at least one unit of structure III, different from a unit of structure II,



(III)

and B is hydrogen or a residue A; m and an are integers sufficient to provide polymer of weight averaged molecular weight ranging from about 400 to about 5000; m and n in residue A may each be the same or different from respective m and n in residue B; R is an —OX, where X is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, transition metal ammonium, alkyl amine, alkanolammonium residues and mixtures thereof; R_1, R_2, R_3 and R_4 are hydrogen, methyl, ethyl radicals or combinations thereof; and

(ii) an effective amount of antibacterial agent for destroying microorganisms selected from the group consisting of diphenyl ethers, bis-biguanides, halogenated carbanilides and salicylamides.

5,192,534

COMPOSITION FOR INDUCING AND STIMULATING HAIR GROWTH AND/OR RETARDING ITS LOSS, BASED ON PYRIMIDINE DERIVATIVES AND SUNSCREENS

Jean F. Grollier, and Isabelle Richoux, both of Paris, France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 459,128, Dec. 29, 1989, abandoned. This application Feb. 13, 1992, Ser. No. 834,977

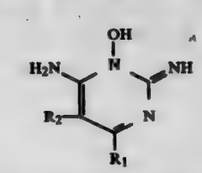
Claims priority, application France, Dec. 30, 1988, 88 17466

Int. Cl.[5] A61K 7/42

U.S. Cl. 424—59 31 Claims

1. A composition for inducing and stimulating hair growth and for decreasing hair loss, said composition comprising, in a physiologically acceptable aqueous or anhydrous medium:

(a) at least an effective concentration of at least one pyrimidine derivative having the formula:



(I)

or of an acid addition salt thereof with a physiologically acceptable acid; and

(b) a sufficient concentration of at least one compound or mixture of compounds that screens out ultraviolet (UV) radiation to increase the solubility of said pyrimidine derivative in said medium compared to the solubility of the pyrimidine in the same medium in the absence of said compound or mixture of compounds that screens out UV radiation, wherein:

R_1 is a group having the formula

R_3 and R_4 are either selected from the group consisting of hydrogen, lower alkyl, alkenyl, alkylaryl and cycloalkyl, in which the alkyl portions are lower alkyl, or R_3 and R_4 with the nitrogen to which they are each bound form a heterocyclic group, which is unsubstituted or is substituted on the carbon atoms with one to three lower alkyl, hydroxy, or alkoxy groups, and which is selected from the group consisting of aziridinyl, azetidinyl, pyrrolidinyl, piperidino, hexahydroazepinyl, heptamethyleneimino, octamethyleneimino, morpholino and 4-(lower alkyl) piperazinyl;

R_2 is selected from the group consisting of hydrogen, lower alkyl, alkenyl, alkoxyalkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, alkylarylalkyl, alkoxyarylalkyl and haloarylalkyl, in which the alkyl portions are lower alkyl radicals; and

said effective concentration of pyrimidine derivative is effective for inducing and stimulating the growth of hair and reducing its loss;

said UV screening compound is selected from the group consisting of 2-hydroxy-4-methoxybenzophenone, 2-ethylhexyl paradimethylaminobenzoate, pentyl para-dimethylaminobenzoate, 2-ethylhexyl para-methoxycinnamate, 4-(1,1-dimethylethyl)-4'-methoxydibenzoylmethane, N-(2-ethylhexyl)-3-[(3'-methoxy-4'-n-butoxy)benzylidene]-10-camphorsulphonamide, 3-(4-methylbenzylidene)camphor, homomenthyl salicylate, 2-ethylhexyl salicylate, para-aminobenzoic acid and 2-hydroxy-4-methoxybenzophenone-5-sulphonic acid;

said aqueous medium consists essentially of water or a mixture of water and a physiologically acceptable solvent; and

said anhydrous medium is a physiologically acceptable solvent or mixture of solvents that contains less than 1% water.

5,192,535

OPHTHALMIC SUSPENSIONS

Jeffrey P. Davis, Madison, Wis.; Santosh K. Chandrasekaran, Moraga, Calif.; Yaosheng Su, Shandong, China; Roy D. Archibald, Fremont, Calif., and Joseph R. Robinson, Madison, Wis., assignors to InSite Vision Incorporated, Alameda, Calif.

Continuation-in-part of Ser. No. 537,005, Jun. 12, 1990, abandoned, which is a continuation of Ser. No. 301,114, Jan. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 153,762, Feb. 8, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 544,518

Int. Cl.[5] A61F 2/14; A61K 9/64, 9/70, 31/765

U.S. Cl. 424—78.04 35 Claims

1. A sustained release topical ophthalmic medicament delivery system, comprising:

an aqueous suspension at a pH of from about 3 to about 6.5 and an osmotic pressure of from about 10 to about 400 mOsM containing from about 0.1% to about 6.5% by weight, based on the total weight of the suspension, of a carboxyl-containing polymer prepared by polymerizing one or more carboxyl-containing monoethylenically unsaturated monomers and less than about 5% by weight of a crosslinking agent, such weight percentages of monomers being based on the total weight of monomers polymerized,

said suspension having a viscosity of from about 1,000 to about 30,000 centipoises and being administrable to the eye in drop form,

said polymer having average particle size of not more than about 50 μm in equivalent spherical diameter and being lightly cross-linked such that although the suspension is administrable in drop form, upon contact of the lower pH suspension with the higher pH tear fluid of the eye, the suspension is rapidly gellable to a substantially greater viscosity than the viscosity of the suspension as originally administered in drop form,

whereby the resulting more viscous gel can remain in the eye for sustained release of a medicament contained therein.

5,192,536
METHOD AND COMPOSITION FOR COATING A WOUND WITH POLYETHER POLYURETHANE
Carl A. Huprich, 22333 County Rd. 62 North, Robertsdale, Ala. 36567
Continuation-in-part of Ser. No. 605,105, Oct. 26, 1990, abandoned. This application Nov. 19, 1991, Ser. No. 794,680
Int. Cl.[5] A61K 9/70; A61L 15/26, 25/00; A61F 13/02
U.S. Cl. 424—78.08 7 Claims

1. A method for coating a wound comprising the steps of:
(a) coating a wound with a mixture consisting of polyether polyurethane resin and tetrahydrofuran
(b) allowing said mixture to dry thereafter forming a nonfibrous film whereby healing is promoted.

5,192,537
METHOD OF TREATING RENAL CELL CARCINOMA USING ACTIVATED MONONUCLEAR CELLS, RENAL TUMOR ANTIGEN AND CIMETIDINE
Michael E. Ostrand, Brookline, Mass., assignor to Cellcor Inc., Newton, Mass.
Continuation of Ser. No. 681,458, Apr. 8, 1991, abandoned, which is a continuation of Ser. No. 405,044, Sep. 11, 1989, abandoned, which is a continuation of Ser. No. 903,489, Sep. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 595,081, Mar. 30, 1984, abandoned. This application Aug. 19, 1991, Ser. No. 747,484
Int. Cl.[5] A61K 45/05, 39/00; A01N 63/00, 43/24
U.S. Cl. 424—85.2 5 Claims

1. A method of treating renal cell carcinoma comprising administering to a patient having same an effective, renal cell carcinoma-inhibiting amount of the immunoreactive, sensitized cells and administering to the patient an amount of cimetidine effective to inhibit the patient's suppresor cells
wherein said immunoreactive, sensitized cells are prepared by a process comprising the steps of:
(a) collecting mononuclear cells from the blood of an individual patient afflicted with renal cell carcinoma;
(b) incubating the mononuclear cells with an effective amount of an H2 receptor antagonist and removing or chemically inactivating the suppressor T-cells from the mononuclear cells;
(c) suspending the mononuclear cells of step (b) in culture medium and admixing the suspended mononuclear cells with autologous blood serum, a non-specific lymphocyte activator and an effective amount of an extract of the patient's tumor containing antigen specific to renal cell carcinoma;
(d) culturing the admixture of step (c) under hyperthermic conditions of about 38° C. to about 41° C. in the presence of an amount of cimetidine effective to reduce suppressor cell activity for a period of time sufficient to activate and sensitize the mononuclear cells in vitro against the patient's renal cell carcinoma; and
(e) irradiating the immunoreactive, sensitized cells with an effective amount of gamma radiation to re-deplete any radiosensitive suppressor cells that may be present in the culture of activated and immunized mononuclear cells, thereby providing immunoreactive, sensitized cells specific to the patient's renal cell carcinoma.

5,192,538
STABLE FORMS OF ANTIGENIC *TAENIA OVIS* POLYPEPTIDES
Gavin B. L. Harrison; Robert P. Dempster, both of Upper Hutt, New Zealand; Michael D. Rickard, Werribee; Marshall W. Lightowlers, Victoria, both of Australia; David D. Heath, Paremata; Stephen B. Lawrence, Upper Hutt, both of New Zealand, and Kim L. O'Hoy, Pascoe Vale, Australia, assignors to Pitman-Moore New Zealand Limited, Upper Hutt, New Zealand; The University of Melbourne, Melbourne, Australia and Her Majesty The Queen in right of New Zealand through the Ministry of Agriculture & Fisheries, Wellington, New Zealand
Continuation of Ser. No. 470,691, Jan. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 349,723, May 9, 1989. This application Jan. 3, 1992, Ser. No. 818,453
Claims priority, application New Zealand, May 12, 1988, 224597; Jun. 1, 1988, 224862
Int. Cl.[5] A61K 39/002
U.S. Cl. 424—88 5 Claims

1. A stable antigenic peptide essentially free from naturally occurring admixtures, comprising a fragment of a *T.ovis* oncosphere antigen which runs as a 47–52 kD doublet on SDS-PAGE, which fragment:
(a) has a molecular weight of from about 23 kD to about 24 kD; and
(b) generates a protective immunological response to *T.ovis* infection in a ruminant;
or a stable subfragment of said 23–24 kD fragment which generates a protective immunological response *T.ovis* infection.

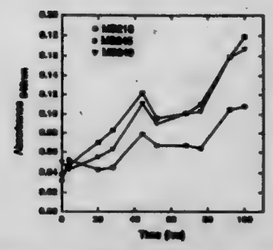
5,192,539
INFECTIOUS BURSAL DISEASE VIRUS PRODUCTION IN CONTINUOUS CELL LINES
Piet Van Der Marel, Veeray, and Pieter G. Mooren, Kronenberg, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands
Filed May 11, 1989, Ser. No. 350,656
Claims priority, application Netherlands, Jul. 21, 1988, 88 01843
Int. Cl.[5] A61K 39/12; C12N 7/00
U.S. Cl. 424—89 11 Claims

1. A line infectious bursal disease virus (IBDV) vaccine free of avian cell material comprising IBDV derived from a mammalian cell line infected with IBDV, wherein said vaccine induces a protective immune response when administered to poultry in a medium selected from the group consisting of eye drops, nose drops, drinking water and sprays.

5,192,540
HAEMOPHILUS INFLUENZAE TYPE B OXIDIZED POLYSACCHARIDE-OUTER MEMBRANE PROTEIN CONJUGATE VACCINE
Joseph S. C. Kuo, Tappan, and James E. Bristol, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 183,206, Apr. 19, 1988, abandoned. This application Feb. 21, 1989, Ser. No. 311,873
Int. Cl.[5] A61K 39/02; C07K 3/00
U.S. Cl. 424—92 7 Claims

1. An immunogenic polysaccharide-protein conjugate comprising the reductive amination product of (a) an oxidized polyribosyl-ribitol-phosphate polysaccharide fragment derived from the capsular polysaccharide of *Haemophilus influenzae* type b, and (b) the outer membrane protein of *Haemophilus influenzae* type b having a molecular weight of, about, 38,000 daltons or 40,000 daltons as determined by SDS-PAGE.

5,192,541
WEED KILLING *XANTHOMONAS CAMPESTRIS*
Steven D. Savage, San Marcos, and Robert A. Haygood, San Diego, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.
Filed Aug. 30, 1991, Ser. No. 753,270
Int. Cl.[5] A01N 63/00; A61K 37/00; C12N 1/12, 1/20
U.S. Cl. 424—93 D 5 Claims



1. A biologically pure culture of a microorganism selected from the group consisting of microbes having all the identifying characteristics of the following isolates: MB245 (NRRL B-18855), MB249 (NRRL B-18857), and MB276 (NRRL B-18861), (NRRL B-18863).

5,192,542
TISSUE SEALANT PRODUCT AND METHOD
James J. Hubbs, 1939 E. Apollo, Tempe, Ariz. 85254, and Jonathan Hubbs, 3131 E. Mulberry, Phoenix, Ariz. 85016
Filed Feb. 2, 1990, Ser. No. 473,927
Int. Cl.[5] A61K 35/78; A01N 1/00
U.S. Cl. 424—195.1 3 Claims

1. A method of treating tissue of a corpse in an embalming procedure comprising applying a sealant to the area to be treated consisting of the dried and ground plants selected from the group consisting of: Plantago Insularis; Plantago Lanceolata; Plantago Ovata; Plantago Fastigium; and Spanish Psyllium to form a seal in the area bonded to tissue to minimize fluid leakage and escape of odor.

5,192,543
HEATED DIE PLATE FOR MAKING EXTRUDED PASTA SHAPES
Scot A. Irvin, Baldwinsville; Carleton G. Merritt, Phoenix, and Raymond G. Kowalski, Weedsport, all of N.Y., assignors to Borden, Inc., Columbus, Ohio
Division of Ser. No. 539,185, Jun. 18, 1990, Pat. No. 5,089,284. This application Aug. 28, 1991, Ser. No. 751,057
Int. Cl.[5] B29C 47/86, 47/94
U.S. Cl. 425—378.1 7 Claims

1. An extrusion die plate for forming shaped alimentary pastes, said plate being formed with a plurality of orifices, each defined respectively by a surface;
wherein said die plate comprises means for heating said plate;
wherein a portion of said surface of each of said orifices of said die plate has a coating thereon and wherein another portion of said surface of each of said orifices is uncoated, such that heat transfer to a paste being extruded through said orifices is substantially inhibited within said portion of said surfaces of each said orifices having the coating and heating of said paste occurs substantially only in the uncoated portion of said surface of each of said orifices.

5,192,544
COSMETIC OR PHARMACEUTICAL COMPOSITION FOR TOPICAL APPLICATION CONTAINING AT LEAST ONE RETINOID DERIVATIVE AND AT LEAST ONE PYRIMIDINE DERIVATIVE, ITS USE AS A MEDICINAL PRODUCT AND CORRESPONDING TREATMENT PROCESS
Jean-François Grollier, Paris; Georges Rosenbaum, Asnieres, and Isabelle Richoux, Paris, all of France, assignors to L'Oreal, Paris, France
Filed Oct. 11, 1990, Ser. No. 595,674
Claims priority, application France, Oct. 12, 1989, 89 13388
The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.
Int. Cl.[5] A61K 7/06, 9/10, 31/505, 31/44
U.S. Cl. 424—401 21 Claims

1. Cosmetic or pharmaceutical composition for topical application containing, in combination, at least one retinoid derivative and at least one pyrimidine derivative, characterized in that it consists of a dispersion of vesicles of at least one ionic and/or nonionic amphiphilic lipid, the vesicles being bounded by one or more lipid lamella(e) in a physiologically acceptable aqueous dispersion phase D, the retinoid derivative(s) being in the lipid lamellae of the vesicles whereas the pyrimidine derivative(s) is (or are) in the form of a solution or, partially or totally, in the form of a suspension in the aqueous phase D.

5,192,545
SILICA GELS FOR CONTROLLING INSECT PESTS
Yoshito Nakashima, Miyazaki, Japan, assignor to Fuji-Davison Chemical Ltd., Aichi, Japan
Division of Ser. No. 666,563, Mar. 8, 1991, Pat. No. 5,135,750, which is a continuation of Ser. No. 326,674, Mar. 21, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 804,822
Claims priority, application Japan, Apr. 8, 1988, 63-87649
Int. Cl.[5] A01N 25/34
U.S. Cl. 424—405 4 Claims

1. A method for killing insects by exposing insects to an insect-killing effective amount of a biotically toxic composition, consisting essentially of a relative humidity controlling effective amount of silica gel having a minimum particle size of 350 μm, and about 0.05% to about 5% by weight silica particles having a maximum diameter of about 50 μm.

5,192,546
SYNERGISTIC PESTICIDAL COMPOSITIONS
Kenneth D. Abercrombie, Sanger, Calif., assignor to Mycogen Corporation, San Diego, Calif.
Filed Jan. 15, 1991, Ser. No. 641,419
Int. Cl.[5] A01N 25/00
U.S. Cl. 424—405 30 Claims

1. A composition for the control of a pest, said composition comprising a first ingredient which is a monocarboxylic acid having about seven to about twenty carbon atoms, or a salt thereof, or a mixture of said monocarboxylic acids or salts thereof, and a second ingredient which is an avermectin, ivermectin, or milbemycin wherein said first ingredient is present at a concentration of at least about 0.2%, and said second ingredient is present in a concentration between about 0.25 to about 3 ppm.

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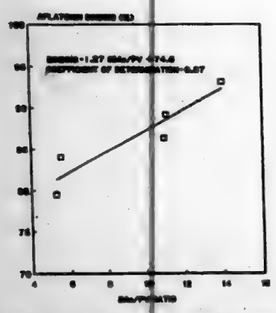
5,192,547
ANIMAL FEED CONTAINING SELECTED MONTMORILLONITE CLAY AS ADDITIVE AND METHOD FOR SELECTING THE CLAY
Dennis R. Taylor, Houston, Tex., assignor to Engelhard Corporation, Iselin, N.J.
Filed Oct. 1, 1990, Ser. No. 590,900
Int. Cl.[5] A23K *1/18*
U.S. Cl. 424—438 5 Claims

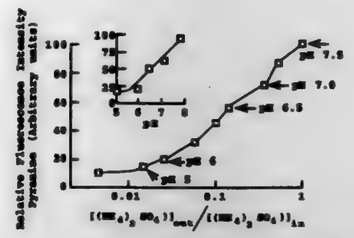


1. A dry solid animal feed composition in which biodegradable feed is contaminated with a mycotoxin and is admixed with of a calcium montmorillonite in an amount ranging from about 0.05 to 1.5 weight percent of the composition selected to have a ratio of surface acidity divided by porosity greater than 6, wherein surface acidity of said calcium montmorillonite is for sites whose pKa values fall in the range of 5.0–6.8 and porosity is for pores who diameters fall in the range of 50–600 Angstrom units.

5,192,548
DEVICE
David J. Velasquez; Peter D. Hodson, and Clyde D. Calhoun, all of St. Paul, Minn., assignors to Riker Laboratoires, Inc., St. Paul, Minn.
Filed Apr. 30, 1990, Ser. No. 516,327
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—443 22 Claims

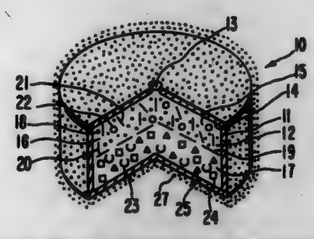
1. A flexible sheet material comprising a plurality of discrete depressions in at least one surface thereof, each of said depressions having a depth of about 5 to 500 μm, but less than the thickness of said sheet material, and an opening at the surface of said sheet of about 10 to 500 μm across, a substantial number of said depressions being at least partially filled with micronized medicament, and the area of said surface between said depressions being substantially free of said micronized medicament, wherein said medicament may be aerosolized from said depressions.

5,192,549
METHOD OF AMPHIPHATIC DRUG LOADING IN LIPOSOMES BY PH GRADIENT
Yechezkel Barenolz, Israel, and Gilad Haran, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Israel
Continuation-in-part of Ser. No. 250,687, Sep. 29, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 413,037
Int. Cl.[5] A61K *37/22*
U.S. Cl. 424—450 2 Claims



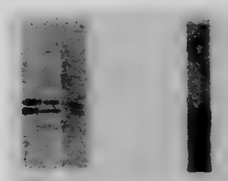
1. A method for loading into liposomes, an amphiphatic compound which exists in a uncharged, deprotonated form or a charged, protonated form, said method comprising:
(a) preparing a suspension of liposomes having a greater concentration of ammonium ions inside the liposomes than outside the liposomes, thereby to establish a pH gradient from inside to outside the liposomes,
(b) adding the amphipathic compound to the liposome suspension, and
(c) by said adding, achieving uptake of the said compound into the liposomes, to a final concentration of said compound within the liposomes which is greater than that outside the liposomes.

5,192,550
DOSAGE FORM FOR TREATING CENTRAL NERVOUS SYSTEM DISORDERS
David E. Edgren, El Granada; Howard A. Carpenter, Palo Alto; Gurdish K. Bhatti, Fremont, and Atul D. Ayer, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Continuation-in-part of Ser. No. 717,293, Jun. 17, 1991, which is a continuation of Ser. No. 520,295, May 7, 1990. This application Mar. 5, 1992, Ser. No. 846,097
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—473 14 Claims



1. A dosage form for administering a drug for treating central nervous system disorders, wherein the dosage form comprises:
(a) a wall that surrounds;
(b) a compartment;
(c) at least one exit in the wall that connects the exterior with the interior of the dosage form for delivering a dispensable drug formulation from the compartment;
(d) a second composition in the compartment comprising up to 85 wt % of an osmopolymer, up to 45 wt % of an osmagent, up to 3 wt % of a coloring agent, up to 3 wt % of a flow-promoting agent, and up to 3 wt % of a lubricant, which second composition comprises 100 wt % in the presence of fluid that enters the compartment exhibits a 2 to 60 fold increase in dimensions; and wherein the dosage form is characterized by:
(e) a first composition comprising 100 wt % in the compartment that defines a first laminar arrangement with the second composition, said first composition comprising a pharmaceutical drug carrier and 100 nanograms to 700 milligrams of drug granules present in the first composition substantially-free of adverse effects on the drug, and wherein the drug is indicated for treating central nervous system disorders comprising the occurrence of sudden and transitory episodes of abnormal motor, sensory and autonomic origin for administration to a patient having the central nervous system disorders.

5,192,551
NEUTRAL GLYCOLIPID AS AN ADSORBENT FOR ENTERIC VIRAL PATHOGENS
Rodney E. Willoughby, Jr., and Robert H. Yolken, both of Baltimore, Md., assignors to Johns Hopkins University, Baltimore, Md.
Filed May 2, 1989, Ser. No. 346,450
Int. Cl.[5] A61K *9/16, 31/74*
U.S. Cl. 424—489 8 Claims



1. A method of treating a human or other mammal to prevent or diminish enteric viral infections comprising
orally administering gangliotetraosylceramide to said human or other mammal to bind to enteric viruses in an amount effective to prevent or diminish enteric viral infections.

5,192,552
PROCESS FOR PREPARING MICROCAPSULES PROVIDING THE RAPID RELEASE OF A DRUG AS ACTIVE INGREDIENT
Pál Fekete; Dénes Bezsegh; Katalin Zakovics; Zsuzsanna Jámbor, and János Tombor, all of Budapest, Hungary, assignors to EGIS Gyogyszergyar, Hungary
Filed Dec. 29, 1989, Ser. No. 458,600
Claims priority, application Hungary, Dec. 30, 1988, 6662/88
Int. Cl.[5] A61K *9/50*; B01J *13/20, 13/06*
U.S. Cl. 424—4.95 17 Claims

1. A process for preparing ethylcellulose-coated microcapsules, comprising mixing ethylcellulose, a dialkyl sulfosuccinate surface active agent soluble in cyclohexane and a cyclohexane insoluble drug to be microencapsulated together in cyclohexane at room temperature, said drug having a particle size of at most 1000 μm, heating the system to about 80° C. and stirring for 30 to 120 minutes in order to dissolve the ethylcellulose, cooling the system down to room temperature under constant stirring, thereby forming a microcapsule suspension, removing microcapsules formed by filtration and drying them, the proportion of ethyl cellulose to drug being 1:30 to 1:15, and the amount of dialkyl sulfosuccinate surface active agent being 0.001 to 1.0% by weight/volume in relation to the cyclohexane.

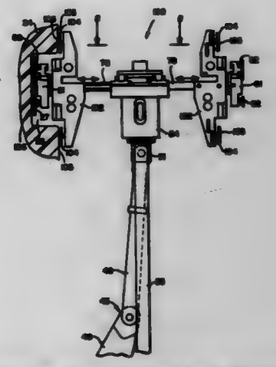
5,192,553
ISOLATION AND PRESERVATION OF FETAL AND NEONATAL HEMATOPOIETIC STEM AND PROGENITOR CELLS OF THE BLOOD AND METHODS OF THERAPEUTIC USE
Edward A. Boyse, Tucson, Ariz.; Hal E. Broxmeyer, Indianapolis, Ind., and Gordon W. Douglas, New York, N.Y., assignors to Biocyte Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 119,746, Nov. 12, 1987, Pat. No. 5,004,681. This application Nov. 10, 1988, Ser. No. 269,926
Int. Cl.[5] A61K *35/50, 35/14*
U.S. Cl. 424—529 64 Claims

1. A method for obtaining human neonatal for fetal hematopoietic stem or progenitor cells comprising:
(a) isolating human neonatal or fetal blood components containing hematopoietic stem or progenitor cells;
(b) cryopreserving the blood components; and
(c) thawing the blood components,
such that the stem or progenitor cells are viable.

13. A method for hematopoietic or immune reconstitution of a human comprising:
(a) isolating human neonatal or fetal blood components containing hematopoietic stem cells;
(b) cryopreserving the blood components;
(c) thawing the blood components; and
(d) introducing the blood components into a suitable human host,
such that the hematopoietic stem cells are viable and can proliferate within the host.

47. A method for hematopoietic or immune reconstitution of a human comprising:
(a) isolating human neonatal or fetal blood components containing hematopoietic stem and progenitor cells;
(b) cryopreserving the blood components;
(c) thawing the blood components; and
(d) introducing the blood components into a suitable human host,
such that the hematopoietic stem and progenitor cells are viable and can proliferate within the host.

5,192,554
LABEL DISPENSER FOR BLOW MOLDING MACHINES
Peter P. Savich, Longmeadow, Mass., assignor to First Brands Corporation, Danbury, Conn.
Filed Jan. 15, 1991, Ser. No. 641,219
Int. Cl.[5] B29C *49/24*
U.S. Cl. 425—504 27 Claims



1. A label carrier for an in-mold label dispenser having a dispensing head including means for slidably mounting one end of said label carrier thereto, said label carrier including at its opposite end a vacuum head having vacuum cups for depositing a label within the mold cavity of an open mold and an

adjustable stop assembly mounted to said label carrier at a point behind said vacuum head and having elongated arms extending transversely in a direction perpendicular to the direction of movement of said label carrier, said elongated arms having adjustable contact members positioned to make contact with a surface portion of said mold to stop movement of said label carrier after said vacuum cup has moved a predetermined distance within said mold cavity.

5,192,555

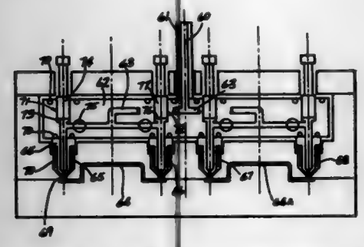
APPARATUS FOR MOLDING PLASTIC ARTICLES

Robin Arnott, Alliston, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Continuation-in-part of Ser. No. 480,866, Feb. 16, 1990, Pat. No. 5,069,840. This application Jul. 22, 1991, Ser. No. 734,148

Int. Cl.[5] B29C 45/02

U.S. Cl. 425—544 **9 Claims**



1. Apparatus for molding plastic articles which comprises:
at least one mold cavity;
at least two nozzles communicating with said mold cavity for feeding molten plastic to said mold cavity;
a hot runner system communicating with said nozzles for feeding molten plastic to said nozzles;
feeding means for feeding said molten plastic to said hot runner system;
valve means in the hot runner system operative to permit flow of said molten plastic to said nozzles from said feeding means and to shut-off the flow of said molten plastic to said nozzles from said feeding means;
at least one shooting pot communicating with each nozzle and with the hot runner system, said communication being downstream of said valve means; and
means for alternately feeding said molten plastic from said at least one shooting pot to each nozzle, whereby the molten plastic is oscillated in the mold cavity.

5,192,556

PLASTIC MOLDING APPARATUS FOR EQUALIZING FLOW PRESSURE AND FLOW VELOCITY OF PLASTIC MELT

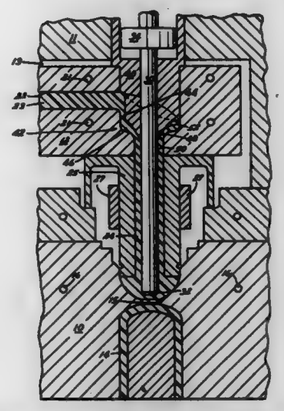
Harald Schmidt, Georgetown, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Oct. 3, 1991, Ser. No. 770,246

Int. Cl.[5] B29C 45/23

U.S. Cl. 425—549 **9 Claims**

1. A plastic molding apparatus for delivering a melt stream of moldable plastic material under pressure through a flow passageway and into a mold cavity, which comprises:
a distributing plate including a distribution channel for conveying a plastic melt;
a nozzle including a nozzle channel communicating with said distribution channel;
a mold cavity communicating with said nozzle channel;
connecting channel means connecting said distribution channel with said nozzle channel, said connecting channel means including a flow entry portion, a reservoir portion and a flow restriction portion, wherein the melt flows from the distribution channel to the flow entry portion, to the reservoir portion, to the flow restriction portion, and to the nozzle channel, and wherein the flow entry portion comprises a varying height channel that distributes the melt substantially equally and wherein the reservoir portion has a larger capacity than the flow restriction portion



so that the flow restriction portion holds back the melt flow from the reservoir portion;
whereby said connecting channel means substantially equalizes flow pressure and flow velocity of the plastic melt to the nozzle channel.

5,192,557

CLAMPING APPARATUS FOR MOLDING MACHINE

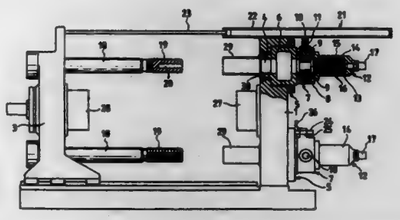
Hisakazu Hirata; Kazuyuki Okubo, and Motomi Kitazawa, all of Nagano, Japan, assignors to Nissei Jushi Kogyo K.K., Nagano, Japan

Filed Jul. 17, 1991, Ser. No. 731,849

Claims priority, application Japan, Jul. 27, 1990, 2-200593; Aug. 31, 1990, 2-230273; Aug. 31, 1990, 2-230274; Aug. 31, 1990, 2-230275; Aug. 31, 1990, 2-230276

Int. Cl.[5] B29C 45/64

U.S. Cl. 425—589 **5 Claims**



1. A clamping apparatus for a molding machine, comprising:
a fixed board disposed on a base;
a movable board disposed on said base, said movable board being movable relative to said fixed board;
a plurality of mold clamping cylinder devices each having a mold clamping piston with a tie bar insertion hole, said plurality of mold clamping cylinder devices being provided in predetermined positions of one of said fixed board and said movable board;
a plurality of tie bard disposed on the other of said fixed board and said movable board, each insertable into a respective one of said insertion holes;
a plurality of half nut connection devices respectively connected to said mold clamping pistons for clamping said tie bars to said one board;
a mold opening/closing cylinder device for moving said movable board relative to said fixed board; and
a mold thickness adjustment device disposed at an outer position of each of said connection devices for controlling the axial position of each of said tie bars with respect to each of said connection devices during said clamping, said mold thickness adjustment device having a stopper for containing an end of each of the bars, said stopper being movable in the axial direction thereof.

5,192,558

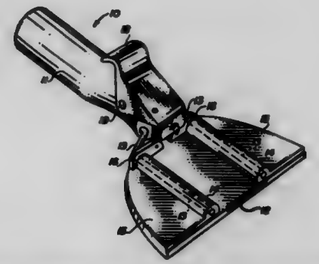
OUTSIDE-CORNER PLASTERING TOOL

Jesse R. Sparrow, Phoenix, and John A. Estep, Laveen, both of Ariz., assignors to Dan Hasselmann and Kenneth Oakes, both of Phoenix, Ariz.

Filed Feb. 18, 1992, Ser. No. 833,293

Int. Cl.[5] B05C 17/10

U.S. Cl. 425—87 **3 Claims**



1. A tool for applying a bead of cementatious material where two surfaces meet at a junction having an exterior angle of 180° or greater, said tool comprising:
a flexible blade conformable to the junction of two surfaces for carrying cementatious material to the junction to leave a bead of cementatious material on the junction;
means coupled to said blade for dynamically folding said blade to further conform said blade to the two surfaces which form the junction to which a bead of cementatious material is to be applied;
a handle coupled to said means for dynamically folding said blade whereby said tool may be manipulated and said blade dynamically folded by a person holding said handle;
wherein said blade has first and second sides and said means for dynamically folding said blade further comprises:
first and second folding plates coupled to said blade adjacent said first and said second sides respectively;
first and second pivot means pivotally coupling respectively said first and said second folding plates to said handle; and
first and second moment arms coupled respectively to said first and second folding plates for creating first and second oppositely directed moments of force to pivotally rotate said first and said second folding plates and fold said blade.

5,192,559

APPARATUS FOR BUILDING THREE-DIMENSIONAL OBJECTS WITH SHEETS

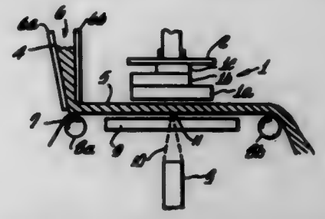
Charles W. Hull, Santa Clarita; Paul F. Jacobs, La Crescenta; Kris A. Schmidt, Granada Hills; Dennis R. Smalley, Baldwin Park, and Wayne A. Vinson, Valencia, all of Calif., assignors to 3D Systems, Inc., Santa Clarita, Calif.

Continuation of Ser. No. 589,040, Sep. 27, 1990. This application Dec. 3, 1991, Ser. No. 803,681

Int. Cl.[5] B29C 35/08, 41/02

U.S. Cl. 425—89 **39 Claims**

1. An apparatus for producing a three-dimensional object from sheets of material solidifiable upon exposure to synergistic stimulation, wherein portions of said sheets solidify to form cross-sections of said object, comprising:
a source of said sheets;
means for dispensing successive sheets from said source onto a working surface adjacent to previously formed cross-sections;
a source of said synergistic stimulation;
means for forming successive cross-sections of said object by selectively exposing first portions of said successive sheets to said synergistic stimulation according to corresponding



representations of said successive cross-sections, whereupon said first portions solidify, and unexposed regions comprise second portions of said sheets;
means for substantially removing at least some material from said second portions of said sheets; and
means for adhering said successive cross-sections to said previously formed cross-sections to form said three-dimensional object.

5,192,560

VARIABLE MOLD APPARATUS

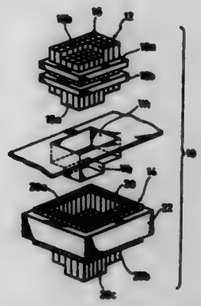
Sachio Umetsu, and Toshihiko Miura, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 489,357, Mar. 6, 1990, abandoned. This application Feb. 13, 1992, Ser. No. 834,978

Claims priority, application Japan, Mar. 7, 1989, 1-052906; Mar. 7, 1989, 1-052907; May 16, 1989, 1-120421

Int. Cl.[5] B28B 7/02

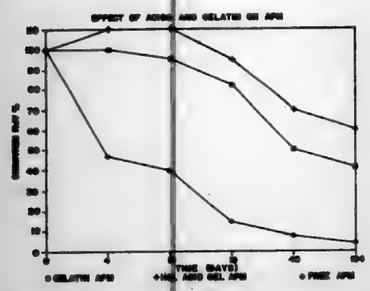
U.S. Cl. 425—175 **9 Claims**



1. A mold forming apparatus capable of varying a mold shape, comprising:
a first molding member having a plurality of bar-shaped die members arranged in a body and disposed in a matrix state in X and Y directions;
a second molding member having a plurality of bar-shaped die members arranged in a body and disposed in a matrix state in X and Y directions;
depressing means for vertically depressing, in accordance with a predetermined sequence, predetermined bar-shaped materials in said first molding member, wherein said first and second molding members are vertically aligned such that depressing said predetermined bar-shaped members in said first molding member also depresses a corresponding bar-shaped member in said sec-

ond molding member, and said first and second molding members are depressed based on their X and Y position in the matrix;
fixing means for fixing said bar-shaped members of said first and second molding members after said predetermined bar-shaped members of said first molding member are depressed;
shifting means for shifting said depressing means; and
control means for controlling said shifting means in the X and Y directions in accordance with the predetermined sequence.

5,192,561
ASPARTAME STABILITY IN CHEWING GUM USING AN ACID GELATIN SYSTEM
Michael T. Bunczak, Dolton, and Philip W. Urazeis, Lombard, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.
Continuation of Ser. No. 762,508, Sep. 19, 1991, abandoned. This application Aug. 20, 1992, Ser. No. 932,921
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—3 23 Claims

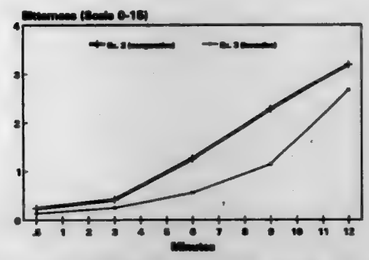


1. A method of preparing a sweetener ingredient for use in chewing gum, comprising in the following sequence the steps of:
mixing aspartame and an inorganic acid with water, to a concentration of about 40 to 400 grams of aspartame per liter of water, and about 0.125 to about 2.5 mols of acid per liter of water, to form an intimate blend;
mixing an encapsulating agent with the aspartame, acid and water, in an amount of about 1.4 to about 4.2 parts by weight of encapsulating agent per part by weight of aspartame; and
evaporating the water to form a sweetener ingredient.

5,192,562
METHOD OF MANUFACTURING A CHEWING GUM
Ronald T. Grey, Chicago; Manoukh M. Patel, Downers Grove, and Charles M. Copper, Willowbrook, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.
Continuation of Ser. No. 808,560, Nov. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 568,462, Aug. 16, 1990, Pat. No. 5,085,872. This application Jul. 10, 1992, Ser. No. 912,225
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—4 19 Claims

1. A method of manufacturing a chewing gum comprising the following steps:
a) in a first mixing step mixing until homogenous an amount of a low fat gum base having a premix temperature of about 200–240° F., an amount of HFO gum base having a premix temperature of about 60–80° F. and an amount of a bulking agent to yield a gum base blend; and
b) in a final mixing step mixing with the gum base blend an amount of flavor and an amount of bulking agent.

5,192,563
STRONGLY MINT-FLAVORED CHEWING GUMS WITH REDUCED BITTERNESS AND HARSHNESS
Manoukh M. Patel, Downers Grove; Kevin B. Broderick, Berwyn; Marc A. Meyers, Naperville; Philip G. Schnell, Downers Grove; Joo H. Song, Northbrook; Robert J. Yatka, Orland Park, and Steven E. Zibell, Tinley Park, all of Ill., assignors to Wm. Wrigley, Jr. Company, Chicago, Ill.
Continuation-in-part of Ser. No. 358,692, May 26, 1989, and a continuation-in-part of Ser. No. 134,948, Dec. 18, 1987, Pat. No. 4,863,745, and a continuation-in-part of Ser. No. 565,605, Aug. 9, 1990, which is a continuation-in-part of Ser. No. 383,291, Jul. 17, 1989, which is a continuation of Ser. No. 205,495, Jun. 6, 1988, abandoned, which is a continuation of Ser. No. 921,753, Oct. 22, 1986, abandoned, said Ser. No. 565,605, is a continuation-in-part of Ser. No. 311,125, Feb. 15, 1989, said Ser. No. 358,692, is a continuation-in-part of Ser. No. 205,495, Jun. 6, 1988, abandoned, which is a continuation of Ser. No. 921,753, Oct. 22, 1986, abandoned, said Ser. No. 134,948, is a continuation-in-part of Ser. No. 921,754, Oct. 22, 1986, abandoned. This application Dec. 17, 1991, Ser. No. 810,669
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—5 20 Claims



1. A method of producing high-impact mint-flavor chewing gum comprising the steps of:
a) preparing an ingredient comprising zein and a cellulose derivative and
b) mixing the zein-cellulose derivative ingredient in a chewing gum formulation comprising about 5% to about 95% gum base, about 5% to about 95% bulking agent and about 0.1% to about 10% of a mint-flavoring agent.

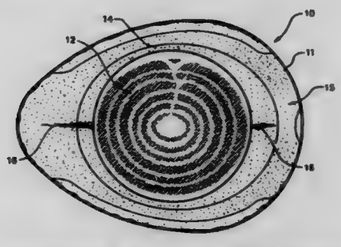
5,192,564
COMPOSITE DOUGH PRODUCT AND A PROCESS FOR PRODUCING SAME
Abdel Abdelrahman, St. Louis, Mo., assignor to Continental Baking Company, St. Louis, Mo.
Filed Jul. 5, 1991, Ser. No. 726,427
Int. Cl.[5] A21D *10/00*
U.S. Cl. 426—19 2 Claims

1. A composite yeast leavened dough mass for the formation of bread having an effective oven spring comprising an inner dough portion and outer dough portion which enrobes said inner portion, said inner and outer dough portions comprising a weight ratio of about 4:1 to about 3:2, said outer dough comprising a yeast leavened bread dough with an effective oven spring; said inner dough comprising a yeast leavened bread dough which contains a fibrous source in an amount of 5 to 25% by weight of the inner dough thereby providing a dough with less oven spring than the outer dough portion.

5,192,565
PRESERVATION OF VEGETABLES AND FRUITS
Marcel Bahler, Tolochenaz; Thang Ho Dac, Le Mont-s/Lausanne; Hugh Hose, Yverdon, and Robert D. Wood, Lausanne, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland
Filed Sep. 9, 1991, Ser. No. 756,816
Claims priority, application Switzerland, Sep. 28, 1990, 3130/90-2
Int. Cl.[5] A23B *7/10*
U.S. Cl. 426—69 12 Claims

1. A process for preserving foods comprising:
heat-treating at least one food selected from the group of foods consisting of vegetables and fruits for from 1 minute to 15 minutes at a temperature of from 80° to 95° C. and then cooling the heat-treated food;
fermenting the cooled heat-treated food with a lactic bacterium in the presence of water for from 10 hours to 3 days at a temperature of from 15° C. to 45° C. to obtain a fermented food and a water of fermentation having a pH of from 3.1 to 4.4;
draining the water of fermentation from fermented food;
washing the fermented food with water to remove water of fermentation from the food, and if the pH of the washed food is not at a pH of from 3.8 to 4.4, adjusting the pH of the washed food to a pH of from 3.8 to 4.4; and
pasteurizing the washed food having a pH of from 3.8 to 4.4 for from 2 minutes to 30 minutes at a temperature of from 80° C. to 110° C. to obtain a pasteurized food.

5,192,566
WHOLE POULTRY EGG ANALOGUE COMPOSITION AND METHOD
James P. Cox, and Jeanne M. Cox, both of 246 E. Bartlett Rd., Lynden, Wash. 98264
Continuation of Ser. No. 348,310, May 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 190,885, May 6, 1988, abandoned. This application Sep. 21, 1990, Ser. No. 588,517
Int. Cl.[5] A23L *1/32*; A23P *1/12*
U.S. Cl. 428—89 54 Claims



27. A whole poultry egg analogue which comprises:
an egg yolk material with characteristics which emulate the characteristics of a natural egg yolk;
an at least semitransparent egg white which can be set and made opaque by the application of heat; and
a rupture resistant membrane surrounding and encapsulating the yolk, said membrane simulating the vitelline membrane of a naturally occurring egg and having means for forming the yoke into a shape resembling that of a natural egg yolk and for attaching said egg white to said yolk;
said egg yolk material being so formulated that, when the egg analogue is cooked, said yolk material assumes a consistency similar to that of a cooked natural egg yolk.

5,192,567
GLOSSY COATED FRIED AND BAKED FOODS AND METHOD FOR MAKING
Lisa A. Vickers, Aurora; Annette P. Zyck, North Riverside; Donald T. Komora, Palatine; Mary P. Kirby, Palos Heights, and Donald B. Bernacchi, Chicago, all of Ill., assignors to Griffith Laboratories Worldwide, Inc., Alsip, Ill.
Filed Jan. 21, 1992, Ser. No. 823,198
Int. Cl.[5] A23L *1/31, 1/315*
U.S. Cl. 426—92 4 Claims

1. A method for obtaining a glossy coating on fried and baked foods comprising applying to a heated fried or baked food substrate a blend of about 20 to 49.9 percent by weight gum arabic, about 50 to 75 percent by weight tapioca dextrin and about 0.1 to 5.0 percent by weight xanthan gum.

5,192,568
CAVITY FORMING AGENT FOR EDIBLE FOODS
Kazuaki Yokoyama, Chiba; Kiyomi Taniguchi, Koshigaya; Hisao Sekiguchi, Tokyo, and Tomiatsu Kaneko, Ichikawa, all of Japan, assignors to Myoshi Oil & Fat Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 585,775, Sep. 20, 1990, abandoned. This application Dec. 20, 1991, Ser. No. 811,717
Claims priority, application Japan, Sep. 22, 1989, 1-247429
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—94 6 Claims

1. A cavity forming agent for edible foods wherein the food is selected from the group consisting of cakes and breads comprising by weight 10% to 30% edible oils and fats, 1% to 10% proteins, 1% to 10% polysaccharides, 0.1% to 5% phosphates, citrates or mixtures thereof, and 40% to 88% water, with the proteins selected from the group consisting of reanet casein, sodium caseinate, acid casein, soybean protein, wheat protein and skim milk powder.

5,192,569
FAT-LIKE BULKING AGENT FOR AQUEOUS FOODS COMPRISING MICROCRYSTALLINE CELLULOSE AND A GALACTOMANNAN GUM
Emanuel J. McGinley, Morrisville, and Domingo C. Tuason, Jr., Bensalem, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.
Continuation of Ser. No. 519,693, May 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 359,065, May 26, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,857
Int. Cl.[5] A23L *1/0526, 1/0534*
U.S. Cl. 426—96 37 Claims

1. A composition comprising dry, water-dispersible, water-stable, substantially spheroidal-shaped particles having an average particle size in the range of about 0.1–100 microns, each particle consisting essentially of an aggregate of about 60–99% by weight of microcrystalline cellulose and about 40–1% by weight of a galactomannan gum, which aggregate remains impact if dispersed in an aqueous medium.

5,192,570
PROCESS FOR TREATING RED MEAT TO CONTROL BACTERIAL CONTAMINATION AND/OR GROWTH
Fredric G. Bender, 142 Irwin Ave., Houston, Pa. 15342, and Eugene Brotsky, 5453 Covode St., Pittsburgh, Pa. 15217
Filed Jan. 7, 1991, Ser. No. 712,245
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] A23L *3/34, 1/317*
U.S. Cl. 426—332 10 Claims

1. A process for treating red meat comprising treating the surface of eviscerated red meat, with a treatment solution comprising trialkali metal orthophosphate at a pH exceeding 11.5 in an amount and for a period of time effective to retard, reduce or remove bacterial contamination and/or growth

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without substantial color change caused by the treatment solution pH and with the proviso that the solution does not contain alcohol, nitrate or nitrite, or ascorbic acid.

5,192,571

PROCESSES FOR EFFECTING THE DECHLORINATION OF TAP WATER ADDED TO BEVERAGES

Elad Levy, 1033 Chestnut Hill Cir., Marietta, Ga. 30064

Continuation-in-part of Ser. No. 606,307, Oct. 31, 1990, Pat. No. 5,096,721. This application Feb. 6, 1992, Ser. No. 832,031
The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.
Int. Cl.[5] A23B *3/18, 5/26*
U.S. Cl. 426—433 13 Claims

1. A process for removing chlorines from a coffee beverage in a coffee making process comprising the step of introducing water which is used for making said beverage at a temperature and in an amount sufficient to brew the coffee beverage, said water having a chlorine content of 1–3 ppm and a pH of 6 to 9, into a basket of a coffee maker that holds a filter and coffee grounds in said filter, said filter having added to it a material consisting of an alkali metal or alkaline earth metal thiosulfate selected from the group consisting of sodium thiosulfate, magnesium thiosulfate and calcium thiosulfate, in a quantity that reacts with 60% to 100% the chlorines in said water on a 0.25–1.00 to one molecular basis with the stoichiometric amount of chlorine present in said water that is so reacted with, said reaction being substantially complete in less than about twenty seconds from when said alkali metal or said alkaline earth metal thiosulfate in said filter was exposed to and dissolved by said water, said water contacting said coffee grounds in said filter for a sufficient time and at a sufficient temperature to make said coffee beverage.

10. A process for removing chlorines from a tea beverage in the tea making process comprising introducing a tea beverage making substance into water which is used for making said tea beverage at a temperature and in an amount sufficient to make said tea beverage by the dissolution of said substance, said water having a chlorine content of about one to three parts per million and a pH of about 6 to 9 wherein the tea beverage substance is selected from a group consisting of instant tea and tea leaves, said tea beverage substance having added to it a material consisting of an alkali metal or an alkaline earth metal thiosulfate selected from the group consisting of sodium thiosulfate, magnesium thiosulfate and calcium thiosulfate, in a quantity of 0.2 to 0.6 milligrams per liter of that amount of said water which is used in the process, said thiosulfate's reaction with said chlorines in said water being substantially complete in less than about three seconds from when said thiosulfate was exposed to and dissolved by said water, said water contacting said substance at a sufficient temperature and within a sufficient period of time to make said tea beverage.

5,192,572

METHOD OF USING SILICA TO DECREASE FAT ABSORPTION

Magda El-Nokaly, Hamilton, and George D. Hiler, Harrison, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 674,300, Mar. 25, 1991, Pat. No. 5,100,684. This application Dec. 16, 1991, Ser. No. 808,115
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—438 22 Claims

1. A process for lowering the fat absorption of fried potato pieces comprising frying potato pieces in an oil comprising from about 0.1% to about 2% silica and about 98% to about 99.9% oil wherein said silica is a hydrophilic silica with a particle size of between about 7 and 100,000 nm.

5,192,573

METHOD FOR MAKING A FLAVORING COMPOSITION

Cirello Alfredo, Via Arona, 16, 20145 Milano, Italy

Filed Sep. 20, 1991, Ser. No. 764,138
Claims priority, application Italy, Sep. 21, 1990, 21537 A/90
Int. Cl.[5] A23L *1/226*
U.S. Cl. 426—533 3 Claims

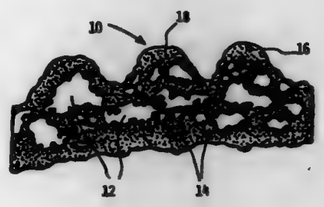
1. A method for making a truffle flavour composition comprising the steps of providing natural casein as a precursor material of said composition, adding to said casein 37% hydrochloric acid and 95% by volume ethyl alcohol to provide a reaction mixture, heating said reaction mixture to cause said reaction mixture to provide reaction vapors, refluxing said reaction vapors for a time sufficient to bring said reaction mixture to a stable temperature of 102.5° C., neutralizing said reaction mixture with sodium carbonate to a pH value of 6.2, filtering said reaction mixture to provide a concentrated mixture and a first clear liquid, concentrating said first clear liquid to about 20 Bé, further filtering said concentrated mixture to provide a second clear liquid and concentrating said second clear liquid to provide an end truffle flavouring product.

5,192,574

CORN RINGS AND METHOD OF MANUFACTURE

Dewey R. Hunt; Veldon M. Hix, both of Idaho Falls, Id.; Miles J. Willard, 229 N. Lloyd Cir., Idaho Falls, Id. 83402, and Kyle E. Dayley, Rigby, Id., assignors to Miles J. Willard, Idaho Falls, Id.

Division of Ser. No. 743,078, Aug. 9, 1991, Pat. No. 5,100,686, which is a continuation of Ser. No. 424,061, Oct. 19, 1989, abandoned. This application Dec. 13, 1991, Ser. No. 806,627
Int. Cl.[5] A23L *1/10*
U.S. Cl. 426—549 17 Claims



1. A fried corn product having a controlled expanded texture comprising:

a food piece having uniformly sized comminuted corn particles which uniformly sized comminuted corn particles are made from cooked and washed whole corn kernels that are comminuted to a preferred particle size distribution by successively impelling the corn against a blade and through a first screen sized to produce a first particle size distribution and then through a second screen sized to produce a second particle size distribution.

5,192,575

Patent Not Issued For This Number

5,192,576

THICK-THIN RETORT STARCH

Shau-Gan Chang, Chicago, Ill.; Linda L. Charlton, Wheatfield, Ind.; Jane D. Gottnaid, Griffith, Ind., and Ibrahim R. Abbas, Munster, Ind., assignors to American Maize-Products Company, Stamford, Conn.

Filed Oct. 11, 1991, Ser. No. 775,219
Int. Cl.[5] A23L *1/0522*
U.S. Cl. 426—578 20 Claims

1. A thick-thin retort starch comprising an oxidized, non-crosslinked, substituted hydroxy alkylated starch ether wherein the starch ether is made from a base starch selected from the group consisting of waxy starches and root starches; the starch ether has a degree of substitution of up to about 0.93; and the starch ether is oxidized with a hypochlorite solution with about 0.08% to about 3.5% available chlorine by weight starch, at a pH of about 3.5 to about 5.0, to obtain a retort starch having a hot paste viscosity of about 4000 cps to about 6000 cps when measured with a Brookfield viscometer at 20 rpm.

5,192,577

NUTRITIONAL COMPOSITION AND A PROCESS FOR ITS PRODUCTION

Gérard Masson, Cully, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Sep. 20, 1991, Ser. No. 763,411
Claims priority, application Switzerland, Oct. 26, 1990, 3430/90
Int. Cl.[5] A23D *7/00*
U.S. Cl. 426—602 22 Claims

1. A process for preparation of a nutritional composition comprising preparing an oil-in-water emulsion, preparing a colloidal solution containing an amino acid source and a glucide, adding kappa-carrageenan and a xanthan gum to the colloidal solution and then mixing the emulsion and colloidal solution to obtain the nutritional composition, wherein the kappa-carrageenan and xanthan gum are added to the colloidal solution in amount so that the composition contains per part at least $0.6 \cdot 10^{-3}$ part kappa-carrageenan and at least $0.1 \cdot 10^{-3}$ part xanthan gum by weight.

5,192,578

METHOD OF PRODUCING COATING USING NEGATIVE DC PULSES WITH SPECIFIED DUTY FACTOR

Jürgen Ramm, Flaesch; Helmut Daxinger, Wangs; Rainer Buhl, Sargans, and Erich Bergmann, Mels, all of Switzerland, assignors to Balzers AG, Furstentum, Liechtenstein

Filed Nov. 14, 1990, Ser. No. 613,390
Claims priority, application Switzerland, Nov. 22, 1989, 4192/89
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—576 10 Claims

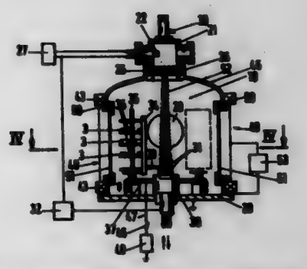
1. A method for the production of a coating made of a ceramic, electrically non-conducting material, on a surface of a workpiece, comprising:

placing the workpiece in, and insulating the workpiece from a vacuum chamber;

a first process step wherein at least one of an oxide and nitride former, acting as at least one first material, is converted into a gaseous state and is at least partially ionized in the vacuum chamber using a first electrical voltage;

a second process step wherein at least one of nitrogen and oxygen, acting as at least one second material, is introduced into and at least partially ionized in the vacuum chamber using the first electrical voltage; and

at least during the second process step, applying a second voltage to the workpiece for depositing at least one of an electrically non-conducting oxide, nitride, and oxinitride layer on the surface of the workpiece, the second voltage being a negative pulsating dc voltage having a period and



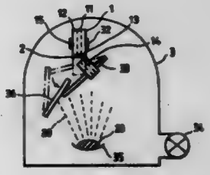
a pulse duty factor, the period being a few microseconds and the pulse duty factor being between 60 and 90% of the period.

5,192,579

METHOD OF FORMING THIN FILM ON FIBER END SURFACE BY BREAKING IT IN A VACUUM

Takafumi Uemiya; Naoto Uemichi; Akira Miyaguchi, and Yasuhiro Hattori, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 28, 1991, Ser. No. 751,091
Claims priority, application Japan, Aug. 29, 1990, 2-228630; Dec. 19, 1990, 2-403916
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—571 12 Claims



1. A method of forming a thin film on an end surface of a fiber comprising an organic core formed from a material selected from organic crystals and high molecular weight organic material, and a clad made of glass, said method comprising:

(a) placing the fiber in a vacuum chamber;

(b) reducing the pressure in the chamber;

(c) cutting the fiber under reduced pressure; and

(d) forming a thin film on the cut surface of said fiber, using a vapor phase film forming process, simultaneously with or immediately after the cutting.

5,192,580

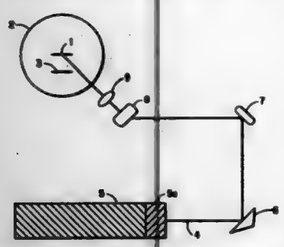
PROCESS FOR MAKING THIN POLYMER FILM BY PULSED LASER EVAPORATION

Graciela B. Blanchet-Fincher, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 869,651, Apr. 16, 1992. This application Jul. 22, 1992, Ser. No. 916,663
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—596 23 Claims

1. A process for producing thin film of a first addition polymer on a substrate comprising: bombarding a target, consisting essentially of a second addition polymer, with radiation from a pulsed laser in a vacuum or gas atmosphere of gaseous fluoro-

carbon or inert gas to form a plume of components of said second addition polymer; and depositing said plume on the

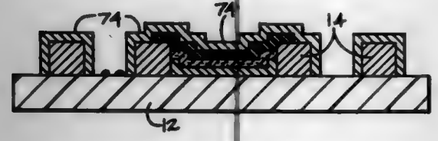


substrate, whereby a film of said first addition polymer is formed.

5,192,581
PROTECTIVE LAYER FOR PREVENTING ELECTROLESS DEPOSITION ON A DIELECTRIC

Tom J. Hirsch, Austin; Charles W. C. Lin, San Antonio; Chung J. Lee, and Heinrich G. O. Mahler, both of Austin, all of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 600,361, Oct. 19, 1990, Pat. No. 5,084,299, which is a continuation-in-part of Ser. No. 494,897, Mar. 3, 1990, Pat. No. 4,981,715, which is a continuation-in-part of Ser. No. 393,170, Aug. 10, 1989, abandoned. This application Jan. 14, 1992, Ser. No. 822,383
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] B05D *3/06, 5/12;* H01L *21/306*
U.S. Cl. 427—556 48 Claims

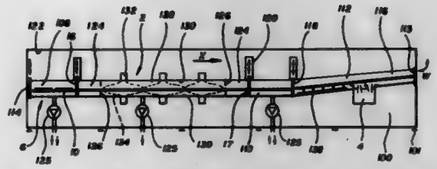


1. A process for the selective deposition of a metal on a substrate comprising the following steps in the sequence set forth:
(a) providing a substrate with a top dielectric surface;
(b) coating the substrate with a protective layer;
(c) coating the protective layer with a catalyst film which can initiate electroless deposition;
(d) directing a laser beam at the substrate to irradiate the catalyst film in a pattern;
(e) placing the substrate in a wet chemical etch that etches the non-irradiated catalyst film without etching the irradiated catalyst film or the protective layer;
(f) removing the substrate from the wet chemical etch after all the non-irradiated catalyst film is removed from the substrate;
(g) placing the substrate in an electroless plating bath so that an electrically conductive metal is deposited on the irradiated catalyst film without depositing the metal on the protective layer or the dielectric and without removing the protective layer from the dielectric; and
(h) removing the substrate from the electroless plating bath wherein the only metal which adheres to the protective layer is formed in the pattern on the irradiated catalyst film.

5,192,582
PROCEDURE FOR PROCESSING JOINTS TO BE SOLDERED

Volker Liedke, Elsenfeld/Eichelsbach; Karl H. Grasmann, Stadprozelten; Hans-Jurgen Albrecht, Berlin; Harald Wittrich, Berlin; Wilfred John, Berlin, and Wolfgang Scheel, Berlin, all of Fed. Rep. of Germany, assignors to WLS Karl-Heinz Grasmann Weichlötanlagen-und Service, Faulbach/Main, Fed. Rep. of Germany

Filed Nov. 5, 1990, Ser. No. 609,400
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1989, 3936955; Oct. 11, 1990, 4032328
Int. Cl.[5] C23C *26/00*
U.S. Cl. 228—206 41 Claims

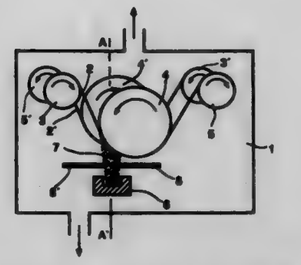


41. An arrangement for processing joints, printed board assemblies, to be soldered comprising a soldering arrangement (4) and a low pressure process chamber (2) allocated to this soldering arrangement for subjecting the joints to plasma pretreatment, whereby
said process chamber (2) having a first temporary storage tank (110) for holding the plasma-treated joints (10), from which the joints are fed to said soldering arrangement (4),
said process chamber (2) having a second temporary storage tank
the joints (10) are brought into a predetermined (108) for holding the joints (10) to be treated in said process chamber (2),
said first and second temporary storage tanks (110, 108) are each separated from each process chamber (2) by first (16, 17) and (114, 118) locks, a plurality of high-frequency generators (132) for generating the gas plasma are arranged on covering surfaces (130) of process chamber (2) so that the joints are treated in essentially a uniform manner with the gas plasma,
the first and/or second temporary storage tanks (110,108) are evacuated and ventilated by means of a vacuum pump (125),
a protective gas tunnel (112) through the joints are supplied to soldering arrangement (4) follows the first temporary storage tank (110),
the process chamber (2), the soldering arrangement (4), the first temporary storage tank (110), the second temporary storage tank (108) and the protective gas tunnel (112) are arranged in a shared through tunnel (100), through which printed board assemblies (10) are conveyed by means of a shared conveying system (106), and whose inlet and outlet openings are sealed by means of an inlet or outlet gate (114,115),
the section on the inlet and outlet side of process chamber (2) viewed in transport direction (X) is designed as a relaxation zone (124), in which no energy input takes place, each printed circuit board (20) being positioned on an auxiliary frame of conveying system (106) during transport,
and the soldering arrangement (4) is a double-wave soldering arrangement.

5,192,583
PRODUCTION OF A MAGNETIC RECORDING MEDIUM

Hans J. Richter, St. Martin; Hartmut Hibst, Schriesheim, and Gerd Fischer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Magnetics GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 10, 1992, Ser. No. 866,739
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1991, 4112095
Int. Cl.[5] H01F *10/02*
U.S. Cl. 427—128 1 Claim

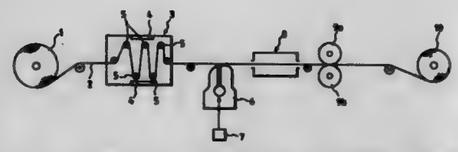


1. A process for the production of a magnetic recording medium, consisting essentially of a polymeric substrate and a coherent thin layer of a ferromagnetic material, in a chamber under reduced pressure by producing a vapor jet of the ferromagnetic material from an evaporator unit provided with said material and depositing the vapor jet on the substrate guided over a cylindrical drum, the vapor jet striking the substrate at angles differing from 90°, wherein, in the chamber under reduced pressure, a vapor jet of ferromagnetic material, emerging from an evaporator unit in the direction of the cylindrical drum, comes into contact at angles of incidence of not less than 30° and not more than 90° with the surfaces of two web-like substrates guided in opposite directions over two separate, cylindrical drums, with the proviso that the evaporator unit is shifted in the axial direction of the drums so that it is located essentially between the two cylindrical drums.

5,192,584
METHOD FOR MANUFACTURING MAGNETIC RECORDING MEDIUM

Toshio Miyashiro, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 8, 1992, Ser. No. 818,093
Claims priority, application Japan, Jan. 9, 1991, 3-044514
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—129 4 Claims

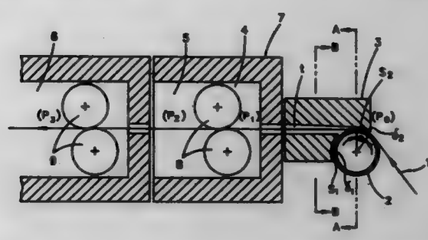


1. In a method for manufacturing a magnetic recording medium, the improvement wherein immediately before the surface of a flexible strip-like support is coated with a magnetic coating liquid, the flexible strip-like support is heated at a temperature of 90° to 120° C. while running while being subjected to a tension of 5 to 12 kg/m.

5,192,585
DIFFERENTIAL PRESSURE SEALING APPARATUS AND METHOD

Yukio Inokuti, and Yo Ito, both of Chiba, Japan, assignors to Kawasaki Steel Corp. and Nihon Shinku Gijutsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 192,535, May 11, 1988, abandoned.
This application Sep. 26, 1990, Ser. No. 590,583
Claims priority, application Japan, May 20, 1987, 62-121016; Jun. 25, 1987, 62-156457; Aug. 5, 1987, 62-194699; Mar. 18, 1988, 63-63704
Int. Cl.[5] B05D *3/12, 3/00;* C23C *14/56*
U.S. Cl. 427—172 17 Claims



1. An apparatus for continuously processing an elongated sheet through successive zones of reduced pressure, comprising:
(a) means forming at least one chamber containing at least one of said zones of reduced pressure, said chamber having an entrance through which said elongated sheet may be introduced,
(b) vacuum means connected to maintain reduced pressure in said chamber,
(c) a guide roller arranged adjacent to said chamber and around which said elongated sheet may be wrapped prior to entering said chamber, said guide roller including a plurality of pores and a vacuum means communicating with the interior of said guide roller and acts through said pores to suck said elongated sheet against the wrapped surface of said guide roller,
(d) means forming a sealing structure encompassing at least a portion of said chamber entrance and a portion of said elongated sheet to restrict the passage of atmospheric air past said guide roller into said chamber,
(e) means for wrapping said elongated sheet upon said guide roller, and
(f) means for urging the wrapped portion of said elongated sheet tightly against the wrapped surface of said guide roller.

5,192,586
METHOD AND APPARATUS FOR COATING A SUBSTRATE WITH A LIQUID RESIN

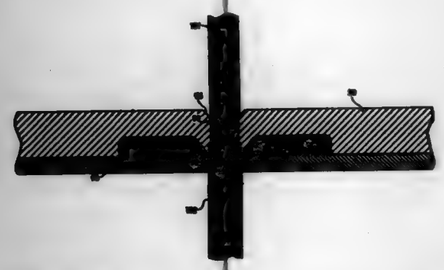
Peter E. Mertinooke, Amesbury; Louis Halberstadt, Andover; Dan C. Maassel, Danvers, all of Mass., and Joseph V. Perry, Chester, N.H., assignors to Amesbury Industries, Inc., Amesbury, Mass.

Continuation of Ser. No. 270,778, Nov. 14, 1988, abandoned.
This application Feb. 1, 1991, Ser. No. 650,974
Int. Cl.[5] B05D *5/08, 1/26, 3/12;* B05C *3/15*
U.S. Cl. 427—210 40 Claims

1. A method of applying a coating to a substrate utilizing a die including a die plate, a face plate coupled to said die plate so as to define a resin channel therein, a die opening formed in said die plate and said face plate for passing said substrate therethrough, and a wall disposed between said resin channel and said die opening so as to form a metering gap between a top of said wall and said face plate, said method comprising the steps of:

introducing a resin in a liquid state into said resin channel at a predetermined pressure;
maintaining the liquid resin within a first pressure range in said resin channel;
metering the liquid resin from said resin channel to said die opening through said metering gap so as to bring the liquid resin from the first pressure range to a second pressure range, the pressures in the second pressure range being generally lower than the pressures in the first pressure range;
passing said substrate through said die opening; and
applying the liquid resin at a pressure within the second pressure range to said substrate as said substrate passes through said die opening.

32. A die for coating a substrate, said die comprising:

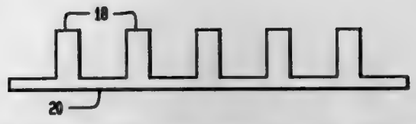


a die plate;
a face plate coupled to said die plate so as to define a resin channel therein for maintaining a resin in a liquid state within a first pressure range;
a die opening in said die plate and said face plate for passing said substrate therethrough; and
a wall disposed between said resin channel and said die opening so as to form a metering gap between a top of said wall and said face plate for metering the liquid resin from said resin channel to said die opening so as to bring the liquid resin from the first pressure range to a second pressure range in order to coat said substrate with the liquid resin, the pressures in the second pressure range generally being lower than the pressures in the first pressure range.

5,192,587
METHOD FOR COLORING WOOD CHIPS
Gregory J. Roudy, Barberton, Ohio, assignor to Kurtz Bros., Inc., Cuyahoga Heights, Ohio
Filed Aug. 23, 1991, Ser. No. 749,141
Int. Cl.[5] B05D 7/06
U.S. Cl. 427—212 7 Claims

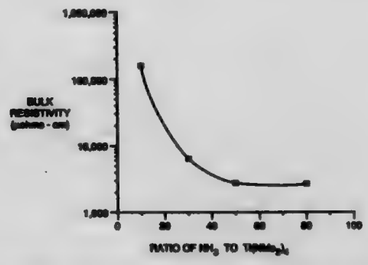
1. A method of preparing a colored wood product, useful as mulch, comprising:
a) feeding comminuted wood into an angularly upward positioned screw conveyor having a first end situated lower than a second end thereof, said screw conveyor further having a solid helical auger disposed axially within and in a close fitting relation to the internal surface of a generally closed cylindrical channel with a feed port near said first end on the top side of the conveyor and a discharge port near said second ed on the bottom side of the conveyor, said helical auger capable of being rotated by a drive means, and the angularly positioned first end of said cylindrical channel effectively forming a basin portion for the retention of liquid, wherein the comminuted wood is fed in a continuous manner by a gravity feed on top of the auger through the feed port into said first end of said angularly upwardly positioned screw conveyor,
b) contacting said comminuted wood with an aqueous color-imparting solution containing at least one color-imparting agent therein, said contact occurring in the basin portion of said screw conveyor for sufficient time to disperse said color-imparting solution upon the surfaces of said comminuted wood, effectively forming a wet colored wood product;
c) rotating the auger whereby the auger sides remain in close proximity to the internal surface of the cylindrical channel so that said wet colored wood product is drawn upwardly out of said basin and toward said second end, during which process excess said color-imparting solution drains away from said wet colored wood product and returns by gravity to said basin portion, effectively drying said wet colored wood product into a moist colored wood product; and
d) discharging said moist colored wood product by gravity from said screw conveyor via said discharge port and, if necessary further drying said moist colored wood product.

5,192,588
ELECTROFORMED METHOD FOR FABRICATING ROUND MESA MILLIMETER WAVE WAFFLELINE STRUCTURE
Ralph D. DiStefano, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed Mar. 5, 1991, Ser. No. 665,263
Int. Cl.[5] H01L 21/00
U.S. Cl. 427—247 24 Claims



22. A method of manufacturing a waffleline-configured structure comprised of an array of conductive mesas that extend from a support base, said mesas being of predetermined dimensions and disposed in a predetermined array pattern, comprising the steps of:
(a) drilling an array of holes of predetermined dimensions through a conductive substrate, so as to intersect first and second surfaces thereof, said array of holes defining a predetermined hole pattern in said conductive substrate;
(b) electrolessly depositing and building up multiple layers of conductive material on sidewalls of the holes of said array and on said first and second surfaces of said conductive substrate, so as to completely fill said holes and build up conductive material on said first and second surfaces of said conductive substrate;
(c) machining built up conductive material that has been deposited upon said first surface of said conductive substrate, thereby exposing conductive material within the holes of said array; and
(d) etching away said conductive substrate, thereby leaving an array of conductive mesas corresponding to the conductive material that has been deposited in and fills the holes of said array, said array of conductive mesas extending from conductive material that has built up on said second surface of said conductive substrate which forms a support base for said array of conductive mesas.

5,192,589
LOW-PRESSURE CHEMICAL VAPOR DEPOSITION PROCESS FOR DEPOSITING THIN TITANIUM NITRIDE FILMS HAVING LOW AND STABLE RESISTIVITY
Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Sep. 5, 1991, Ser. No. 755,202
Int. Cl.[5] C23C 16/18, 16/34
U.S. Cl. 427—255.1 15 Claims

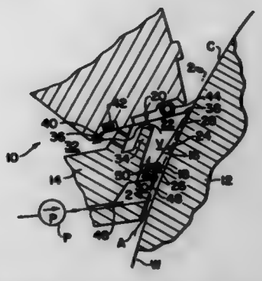


1. An improved process for creating a titanium nitride film having stable bulk resistivity on a substrate via chemical vapor deposition, said process comprising the following sequence of steps:
a) introducing the substrate in a chemical vapor deposition chamber;
b) purging the chamber of oxygen;
c) establishing a flow of gaseous ammonia and gaseous titanium metal organic compound into the chamber such that the flow rate of the former is more than approximately thirty times the flow rate of the latter: and
d) heating the substrate to at least 200° C.

5,192,590
COATING METAL ON POLY(ARYL ETHER KETONE) SURFACES
Edward S. Sherman, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Continuation-in-part of Ser. No. 431,515, Nov. 3, 1989, abandoned. This application Dec. 18, 1989, Ser. No. 452,170
Int. Cl.[5] B05D 3/10
U.S. Cl. 427—304 19 Claims

1. A method of coating a surface comprising a poly(aryl ether ketone) composition with metal which comprises:
a) treating the surface with a swelling agent for a period of time sufficient to swell the surface, said swelling agent being selected from the group consisting of (i) sulfuric acid and mixtures of sulfuric acid and phosphoric acid in which the phosphoric acid is less than 50% by weight based on the weight of the mixture , (ii) hydrofluoric acid, (iii) chlorosulfonic acid, (iv) fluorosulfuric acid, (v) trifluoroalkane sulfonic acids and mixtures thereof with antimony pentafluoride, tantalum pentafluoride, or niobium pentafluoride, (vi) mixtures of hydrogen fluoride with at least one of antimony pentafluoride, arsenic pentafluoride, tantalum pentafluoride, niobium pentafluoride, and boron pentafluoride, (vii) a Lewis acid-Lewis base complex in a diluent, (viii) diphenyl sulfone, and (ix) N-methyl caprolactam;
b) removing the swelling agent;
c) etching the treated surface; and
d) depositing metal on the etched surface to provide a first metal layer.

5,192,591
SHORT DWELL COATER APPARATUS
James L. Chance, Rockton, Ill., assignor to Beloit Technologies, Inc., Wilmington, Del.
Filed Nov. 14, 1991, Ser. No. 791,722
Int. Cl.[5] B05C 3/18, 11/04; B05D 3/12
U.S. Cl. 427—356 13 Claims



1. A short dwell coater apparatus for the application of coating material to a web which is supported by a backing member, said apparatus comprising:
a housing disposed closely adjacent to the backing member such that the web moves between said housing and the backing member, said housing defining an application zone which is connected to a pressurized source of the coating material, said application zone having an open face directed towards the web;
blade means adjustably secured to said housing and extending from said housing towards the web, said blade means defining a downstream extremity of said application zone;
movable flow divider means supported by said housing and extending into said application zone, said divider means having an upstream and a downstream end, said downstream end being movably disposed in the vicinity of said blade means for reducing the size of a flow vortex generated within said application zone due to movement of the web past said open face, said upstream end being stationary relative to the web; and
said divider means is a flexible sheet which is unsupported at said downstream end thereof such that said sheet oscillates within said application zone for dampening and reducing the size of said vortex.

13. A method for the application of coating material to a web which is supported by a backing roll, said method comprising the steps of:
moving the web between a housing and the backing roll, the housing defining an application zone which is connected to a pressurized source of the coating material, the application zone having an open face directed towards the web;
adjustably securing a blade to the housing such that the blade extends from the housing towards the web, the blade defining a downstream extremity of the application zone for metering excess coating material from the web; and
dividing a flow of coating material entering the application zone into a first and a second flow path by the provision of a flow divider which is supported by the housing and which extends into the application zone, the divider having an upstream and a downstream end with the downstream end being movably disposed in the vicinity of the blade such that the divider oscillates within the application zone for reducing the size of a flow vortex generated within the application zone due to movement of the web past the open face, thereby reducing streaking of the coated web at high coating velocities.

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5,192,592

METHOD OF COATING SUBSTRATES UTILIZING AN ALKALI-FUNCTIONAL ASSOCIATIVE THICKNER CONTAINING COATING COMPOSITION

Gregory D. Shay, Oak Forest, Ill., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 559,164, Jul. 30, 1990, abandoned. This application Mar. 5, 1992, Ser. No. 845,367
Int. Cl.[5] B05D 3/12
U.S. Cl. 427—358 15 Claims

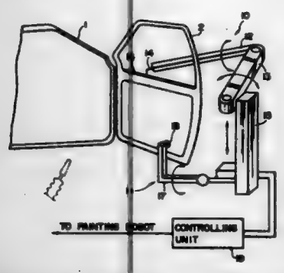
1. A high speed roll or blade method of coating a substrate comprising the step of applying to a substrate selected from the group consisting of paper, cardboard, films, yarns, fabrics and leather, an aqueous coating composition comprising an alkali-swellable associative thickener comprising (A) about 2 to about 70 weight percent, based on the total weight of associative thickener, of an alpha, beta-monoethylenically unsaturated carboxylic acid, (B) about 20 to about 80 weight percent of a monoethylenically unsaturated monomer lacking surfactant capacity, (C) about 0.5 to about 50 weight percent of a non-ionic urethane monomer that is the reaction product of a monohydric non-ionic surfactant and a monoethylenically unsaturated monoisocyanate, and (D) 0 to about 2 weight percent of a polyethylenically unsaturated monomer.

5,192,593

METHOD FOR PAINTING AUTOMOBILE DOORS BY SEQUENTIALLY HOLDING AND PAINTING PORTIONS OF THE DOOR

Hisashi Matsuo, and Jyunji Itoh, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 25, 1991, Ser. No. 720,697
Claims priority, application Japan, Jun. 27, 1990, 2-68125; May 16, 1991, 3-111989
Int. Cl.[5] B05B 13/02; B05C 13/02; B05D 1/02; B25J 11/00
U.S. Cl. 427—421 2 Claims



1. A method of painting an automobile in an automated assembly line, comprising the steps of:
using an automated door opening and closing device to open an automobile door;
using the door opening and closing device engaging a first portion of the automobile door for maintaining the automobile door in an open state;
using a robot painting device to partially paint the held open automobile door in a region not including said first portion;
engaging a second portion of the automobile door with an automated door fixing unit so as to maintain the automobile door in an open state, the second portion being spaced from the first portion;
releasing the door opening and closing device from the automobile door; and
using the robot painting device to further paint the partially painted automobile door, while engaged by the fixing unit, in said first portion.

5,192,594

PROCESS FOR THE PREPARATION OF A POLYURETHANE STRUCTURAL SUPPORT

Sanjeev Madan, Corapolis; Hans-Joachim Kogelnik, Pittsburgh, both of Pa., and Majid Daneshvar, Leverkusen, Fed. Rep. of Germany, assignors to Miles Inc., Pittsburgh, Pa.

Filed Nov. 7, 1991, Ser. No. 788,891
Int. Cl.[5] B05D 1/02
U.S. Cl. 427—421 6 Claims

1. A process of preparing a polyurethane structural support comprising:
1) spraying a reaction mixture onto a substrate, said reaction mixture comprising:
A) a polyol mixture comprising:
1) from 50 to 95 parts by weight of a triol having an OH number of from 200 to 500 and being prepared by reacting propylene oxide with a member selected from the group consisting of glycerin, trimethylolpropane, and mixtures thereof, and
2) from 5 to 20 parts by weight of a triol having an OH number of from 20 to 50 and being prepared by reacting propylene oxide and ethylene oxide with a member selected from the group consisting of glycerin, trimethylolpropane, and mixtures thereof, said triol 3) having a primary hydroxyl content of from 50 to 90%,
3) from 0 to 30 parts by weight of a triglyceride of a fatty acid having an OH number of from 140 to 200, said parts by weight of 1), 2) and 3) totalling 100 parts by weight,
B) from 1 to 5 parts by weight per 100 parts by weight of component A) of an organic diamine having a molecular weight of from 60 to 2000,
C) from 1 to 10 parts by weight per 100 parts by weight of component A) of one or more additives to absorb moisture,
D) from 0 to 2 parts by weight per 100 parts by weight of component A) of one or more catalysts capable of catalyzing the reaction between an isocyanate group and a hydroxyl group,
E) at least 0.025 parts by weight per 100 parts by weight of component A) of one or more polysiloxane defoaming agents,
F) from 0 to 20 parts by weight per 100 parts by weight of component A) of glass fibers, and
G) an isocyanate terminated prepolymer prepared by reacting a polyisocyanate with a polyether polyol, said prepolymer having an NCO content of from 18 to 35% by weight, at an equivalent ratio of isocyanate groups to isocyanate reactive groups of from 0.70:1 to 1.2:1, and
2) allowing said reaction mixture to fully react.

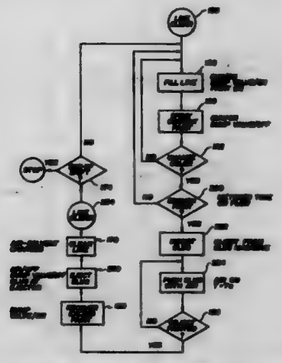
5,192,595

METHOD FOR THE PRODUCTIVE UTILIZATION OF PAINT IN A PAINT SUPPLY LINE UTILIZING A CLEANING SLUG IN PRODUCTION PAINT OPERATIONS

Hadi A. Akeel, Rochester Hills, and Alexander H. Joyce, Livonia, both of Mich., assignors to GMFanuc Robotics Corporation, Auburn Hills, Mich.

Filed Aug. 13, 1991, Ser. No. 744,360
Int. Cl.[5] B05D 1/02; B05B 15/02
U.S. Cl. 427—421 5 Claims

1. A method for changing paint colors, cleaning and productively utilizing paint in a paint supply line in a paint system, the system having applicator means being fed with paint by the supply line, a first source of pressurized paint of a first color, a second source of pressurized paint of a second color, a source of pressurized air and a source of cleaning fluid adapted to be selectively connected to the supply line, interior walls of the supply line having a substantially constant inside diameter, the method comprising the steps of:
connecting the supply line to the first source of pressurized paint to fill the supply line with the first color paint to allow the applicator means to paint an article;
disconnecting the supply line form the first source of pressurized paint when the remaining paint in the supply line is sufficient to complete the painting of the article;
inserting a termination piston having an exterior surface with an outside diameter which forms a close sliding fit within the supply line after the step of disconnecting;
propelling the termination piston through the supply line so as to cause the termination piston to wipe paint off the interior walls of the supply line by virtue of the termination piston being propelled through the supply line, thus feeding the paint in the supply line to the applicator means



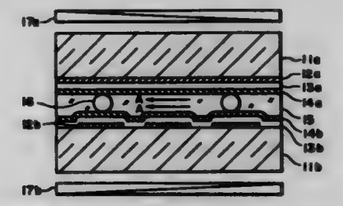
until essentially no paint of the first color remains in the supply line;
removing the termination piston from the supply line after the step of propelling, then alternating the connection of the supply line between the source of pressurized air and the source of cleaning fluid to cause charges of cleaning fluid to be propelled through the supply line at a speed sufficient to cause the walls of the supply line to be washed clean of substantially all traces of paint of the first color; and
connecting the supply line to the second source of paint so as to fill the supply line with the second color paint to allow said applicator means to again paint an article.

5,192,596

LIQUID CRYSTAL DEVICE

Yukio Hanyu, Atsugi, and Masanobu Asaoka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1990, Ser. No. 529,509
Claims priority, application Japan, Jun. 2, 1989, 1-141395; Jun. 2, 1989, 1-141396; Jun. 22, 1989, 1-160278; Apr. 24, 1990, 2-109658
Int. Cl.[5] G02F 1/1337
U.S. Cl. 428—1 62 Claims



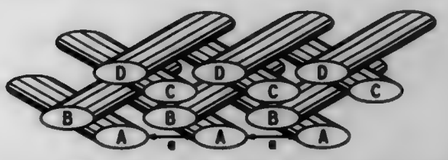
1. A liquid crystal device, comprising:
a pair of substrates and a chiral smectic liquid crystal disposed between the substrates, said pair of substrates being disposed to have a spacing small enough to suppress the formation of a helical alignment structure of the chiral smectic liquid crystal;
wherein at least one of said pair of substrates has thereon an alignment film comprising a polyimide which has a fluorine-containing substituent in its diamino-originated moiety.

5,192,597

PROCESS FOR STAGED MULTIPLE YARN WINDING AND RESULTING PRODUCT

George D. Forsythe, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1990, Ser. No. 631,434
Int. Cl.[5] A47G 19/22; B32B 1/08, 5/06, 5/22
U.S. Cl. 428—34.5 4 Claims



1. A hollow cylindric al package having a wall through which gases flow, said wall formed of a plurality of layers of yarns laid down in a diamond shaped pattern wherein each layer is formed of a fixed small number of superposed yarns forming the walls of the diamonds and the yarns forming the walls of the diamonds of each layer completely cover the diamond shaped openings of each adjacent layer to form a series of diamond shaped openings, each layer of which interferes with direct flow of ga from one layer to the next layer, yet leave openings sufficient to provide for dividing and mixing of the gases flowing from one layer to the next layer.

5,192,598

FOAMED BUILDING BOARD COMPOSITE AND METHOD OF MAKING SAME

Don A. Forte, Evergreen; Jeffrey T. Kates, and Dennis R. Larratt, both of Littleton, all of Colo., assignors to Manville Corporation, Denver, Colo.

Filed Sep. 16, 1991, Ser. No. 760,797
Int. Cl.[5] B32B 3/26
U.S. Cl. 428—71 30 Claims

14. A building wall construction, comprising: exterior end faces and interior end faces;
thermal insulation between the side faces of the studs;
an interior wall panel attached to the interior end faces of the studs;
an exterior sheathing panel attached to the exterior end faces of the studs;
the sheathing panel having opposite major surfaces and being comprised of a first material which is relatively impermeable to water vapor and a plurality of spaced areas of a second material which is relatively permeable to water vapor, the areas of the second material extending from one major surface of the panel to the other, the sheathing panel surfaces between adjacent studs containing at least one area of the second material;

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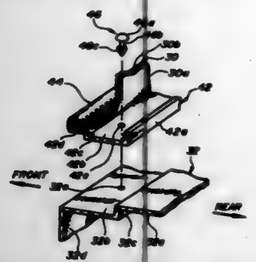
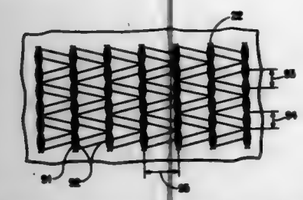
whereby water vapor is transmissible through the areas of the second material of the sheathing panel.

5,192,599
STRUCTURE FOR FIXING CARPET ON VEHICULAR FLOOR PANEL
Masaho Sakamoto, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan
Filed Sep. 24, 1991, Ser. No. 764,637
Claims priority, application Japan, Sep. 26, 1990, 2-100613[U]
Int. Cl.[5] B32B *3/02, 33/00, 23/02;* A47G *27/04*
U.S. Cl. 428—82 15 Claims



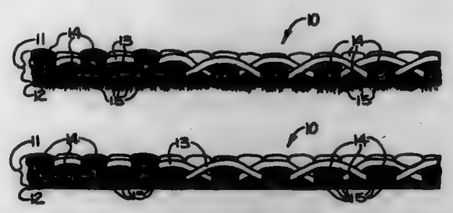
1. A structure for fixing a carpet on a vehicular floor panel, said structure comprising:
an edging member retainer for retaining a peripheral portion of said carpet on said floor panel, said retainer being fixed to said floor panel by a mechanical fastener and located below said carpet so as to be concealed by said carpet; and
a covering member for covering a peripheral edge of said peripheral portion of said carpet and an edge portion of said retainer, said peripheral edge of said carpet and said edge portion of said retainer being sewn together with said covering member so as to secure said carpet to said retainer.

5,192,600
STITCHBONDED COMFORT FABRIC
Gene J. Pentecoff, Wilmington, and Dimitri P. Zafiropis, Greenville, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 27, 1990, Ser. No. 634,646
Int. Cl.[5] D04B *23/08*
U.S. Cl. 428—102 15 Claims



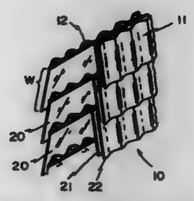
1. A durable, nonwoven comfort fabric having a basis weight of from 20 to 120 grams per square meter, the fabric comprising:
(a) an absorbent, evaporation-reservoir layer formed from a nonwoven web that is stitched through with at least one bulkable stitching yarn that forms spaced-apart rows of stitches extending along the length of the web; and
(b) a nonabsorbent, transport layer weighing at least 10 grams per square meter and formed from a network of stitching yarns which are not significantly water absorbent and which are stitched through the web, the network exhibiting stitching gaps no wider than 3 millimeters,
wherein the resulting dual-layered, stitchbonded fabric has a bulk of at least 10 cubic centimeters per gram and is capable of absorbing at least 5 times its weight in water.

5,192,601
DIMENSIONALLY STABILIZED, FUSIBLY BONDED MULTILAYERED FABRIC AND PROCESS FOR PRODUCING SAME
Henry P. Noisier, Kings Mountain, N.C., assignor to Dicey Fabrics, Incorporated, Shelby, N.C.
Filed Mar. 25, 1991, Ser. No. 674,703
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—120 15 Claims



1. A fabric having the desired dimensional stability without the presence of a latex backing which is normally present thereon, comprising:
a woven first layer formed of yarns of thermoplastic fibers with some of the fibers having a lower melting temperature then other fibers;
a nonwoven fibrous second layer contacting said woven first layer in underlying relation; and
a plurality of thermoplastic fibers including said lower melting temperatures fibers being displaced from said woven first layer and extending into and through said nonwoven second layer, said displaced thermoplastic fibers being flattened against the distal side of said nonwoven second layer and fusibly bonded thereto to interconnect said woven first layer and said nonwoven second layer to each other.

5,192,602
LOUVERED FILTER AND PAINT ARRESTOR
Victor V. Spencer, deceased, late of Tillsonburg; by Mary Spencer, executrix, 4 Highland Drive, Tillsonburg, Ontario, both of Canada N4G 2E9 , and Leonid A. Bagrin, 257 Burlington Street, London, Ontario, Canada N5Z 3W3
Filed May 14, 1991, Ser. No. 699,657
Int. Cl.[5] B32B *3/28;* B03C *11/11*
U.S. Cl. 428—179 11 Claims



1. A filter suitable as a paint arrestor comprising:
a panel formed from a plurality of overlaying runs, each run formed of a single-faced corrugated material comprising, a flat substrate sheet and an overlaying corrugated sheet juxtaposed to the substrate sheet so that the two sheets define therebetween a family of channels each with an axis of said channel oriented at an acute angle relative to the medial plane of the panel.

5,192,603
PROTECTION OF SUBSTRATES AGAINST AQUATIC FOULING
William W. Slater; John Kelly, and Michael J. Winter, all of Houston, Tex., assignors to Courtaulds Coatings Inc., Houston, Tex.
Filed Sep. 13, 1991, Ser. No. 759,673
Int. Cl.[5] B32B *7/02, 27/40*
U.S. Cl. 428—217 19 Claims

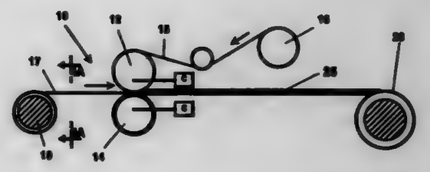
1. A process for protecting a rigid substrate against aquatic fouling comprising coating the substrate with an elastomeric undercoat as a 200 to 1500 micron thick layer and with a top coat of a room temperature vulcanizable silicone rubber, the elastomer of said undercoat being a polymer having the ability to be stretched to at least twice its original length and to retract rapidly, with retraction of at least 90% of extension, when released, said undercoat being harder than the room temperature vulcanizable silicone rubber top coat.

5,192,604
FIBRILLATED FIBERS AND ARTICLES MADE THEREFROM
Robert D. Gigla, Rye, N.Y., assignor to Amerian Cyanamid Company, Stamford, Conn.
Division of Ser. No. 408,587, Sep. 18, 1989, which is a division of Ser. No. 918,246, Oct. 14, 1986, Pat. No. 4,929,502. This application May 6, 1991, Ser. No. 696,467
Int. Cl.[5] B32B *9/00, 19/00;* D04H *11/00*
U.S. Cl. 428—224 3 Claims

1. A personal protection device incorporating a non-woven fabric material comprising a wet-laid sheet containing a fibrillated monoethylenically unsaturated monomer based fiber having a Canadian Standard Freeness of less than 100 in combination with a Tensile Strength of at least 5 pounds per inch.

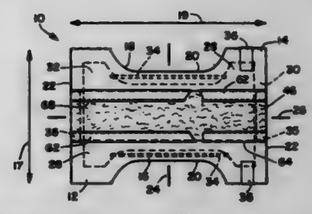
5,192,605
EPOXY RESIN BONDED FLEXIBLE GRAPHITE LAMINATE AND METHOD
Robert A. Mercuri, Seven Hills; Edwin J. Olneth, North Olmsted, and Richard T. Lewis, Parma Heights, all of Ohio, assignors to UCAR Carbon Technology Corporation, Danbury, Conn.
Filed Oct. 1, 1991, Ser. No. 769,554
Int. Cl.[5] B32B *5/16, 15/08, 17/10, 27/38*
U.S. Cl. 428—224 5 Claims

1. A flexible graphite laminate of flexible graphite and a core material composed of metal, fiberglass or carbon with the flexible graphite bonded to said core material through an intermediate coating of an epoxy resin composite comprising an epoxy resin having a glass transition temperature after cure of below 120° C. and particles of a thermoplastic agent dispersed in the epoxy resin and having a crystalline or partially crystalline structure and a melting temperature in the range of 120° C. and 200° C. with the laminate formed upon contact between said flexible graphite, said core material and a cured coating of



said epoxy composite upon reheating at a temperature equal to or above the melting temperature of said thermoplastic agent.

5,192,606
ABSORBENT ARTICLE HAVING A LINER WHICH EXHIBITS IMPROVED SOFTNESS AND DRYNESS, AND PROVIDES FOR RAPID UPTAKE OF LIQUID
Deborah L. Proxmire, Larsen, Wis.; Wanda W. Jackson, Alpharetta, Ga.; Nancy D. Kollin, Roswell, Ga.; Tamara L. Mace, Alpharetta, Ga.; Ann L. McCormack, Cumming, Ga., and Daniel R. Schlinz, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sep. 11, 1991, Ser. No. 757,778
Int. Cl.[5] B32B *5/06;* D04H *1/00;* A61F *13/15, 13/20*
U.S. Cl. 428—284 49 Claims



1. An absorbent article, comprising:
a backsheet layer which has length and width dimensions and which includes a front waistband section, a rear waistband section, and an intermediate section interconnecting said front and rear waistband sections;
an absorbent body which is superposed on said backsheet layer;
a liquid permeable intermediate transfer layer which is disposed in facing relation with said absorbent body to generally sandwich said absorbent body between said backsheet and transfer layer, said transfer layer having an appointed inward surface and a width dimension which is substantially coextensive with said backsheet width over at least a portion of said backsheet intermediate section; and
a liquid permeable bodyside liner layer located on said inward surface of said transfer layer, said bodyside liner having a width dimension which is less than the width of said transfer layer, said body side liner comprising a bonded carded web which has a basis weight within the range of about 15–40 gsm and is composed of bicomponent fibers having a fiber denier within the range of about 1.0–3.0, said bodyside liner constructed to provide for a Penetration Rate index of at least about 1.5 ml/sec and a Retention index of not more than about 0.8 gm.

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5,192,607

DISPERSANT FOR CARBON BLACK-FILLED FOAM

Thomas G. Soukup, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla. and Apache Building Products Company, Meridian, Miss.

Division of Ser. No. 823,108, Jan. 21, 1992, Pat. No. 5,137,930, which is a division of Ser. No. 751,393, Aug. 28, 1991, Pat. No. 5,149,722. This application Jul. 31, 1992, Ser. No. 922,419

Int. Cl.[5] B32B *3/26*; B05D *3/02*

U.S. Cl. 428—314.4 26 Claims

1. A laminate comprising at least one facing sheet adhered to a closed cell, rigid, polymer foam which comprises the reaction product of a polyisocyanate and an isocyanate-reactive compound in the presence of (a) a foaming agent, (b) at least about 2 percent by weight of carbon black, based on the weight of the polymer in the foam, and (c) an endcapped polyoxyalkylene compound which is nonreactive with isocyanate groups, and is present in an amount sufficient to help bring about a uniform dispersion of the carbon black throughout the foam so that there is present in the cell walls of the foam an amount of predominantly non-agglomerated carbon black which reduces the aged k-factor of the foam to below the aged k-factor of the corresponding unfilled foam having the same density and prepared from the same foam-forming composition as the filled foam except that the carbon black is omitted and the amount of foaming agent is adjusted to equalize the densities of the filled and unfilled foams.

5,192,608

VINYL BASED COATINGS

Scott Hanel, Coon Rapids, and Mark Kenow, Circle Pines, both of Minn., assignors to PDI, Inc., Circle Pines, Minn.

Filed Oct. 24, 1991, Ser. No. 781,861

Int. Cl.[5] B32B *27/00, 27/22, 27/30*

U.S. Cl. 428—319.7 2 Claims

1. Composite film forming formulation including a base coat formulation and a top coat formulation, wherein the working formulation for the base coat has the following formulation:

Component	Generic Description	Weight % Range
Plasticized vinyl chloride copolymer (plasticized with diethylhexyl phthalate), a synthetic latex containing 57% solids, balance water	Vinyl chloride copolymer	82.26%
Surfactant-defoamer	Polyglycol silane	.18%
N-butyl acetate	Ester-based solvent	4.84%
Slow evaporating coalescent	N-methyl pyrrolidone	2.67%
Acrylic-based emulsion	Acrylic-based emulsion containing acid carboxyl functional groups	.47%
Water	Used as solvent	balance;

and wherein the top coat formulation has the following composition:

Component	Generic Description	Weight % Range
Vinyl chloride-vinyl acetate copolymer resin	A mixture of vinyl chloride-vinyl acetate	10.43%
Xylene	Aromatic solvent	38.89%
Methylethyl ketone	Aliphatic solvent	35.08%
Methyl isobutyl ketone	Aliphatic solvent	10.43%
Plasticizers, polyester-based	Polyester plasticizer	1.94%
Phthalate ester	Phthalate esters	1.48%

-continued

Component	Generic Description	Weight % Range
Plasticizer		
Plasticizer/stabilizer	Epoxidized soybean oil	.56%
Stabilizer	Alkyl tin maleate	.27%
Light stabilizer	A hindered amine	.13%
UV absorber/stabilizer	Hydroxy-benzophenone	.07%
Unsaturated fatty monoamide derived from erucic acid	The unsaturated fatty monoamide of mono-ethenoid acid	.42%
Methyl alkyl polysiloxane copolymer for defoaming/slip properties	Methyl alkyl polysiloxane copolymer	.30.

5,192,609

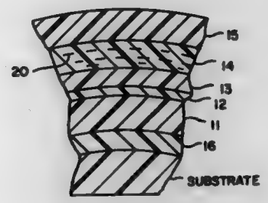
THERMOFORMABLE SHEET MATERIAL

John F. Carroll, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 457,915, Dec. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 267,906, Nov. 7, 1988, Pat. No. 4,900,611. This application Jan. 13, 1992, Ser. No. 821,297

Int. Cl.[5] B32B *5/16, 7/12*

U.S. Cl. 428—328 17 Claims



1. A flexible and stretchable sheet material adapted for use in a thermoforming process in which it is stretched and bonded to a substrate to form thereon a decorative and protective surface having a high degree of geometric metamerism, said sheet material comprising:

a series of layers including (a) a stretchable, thermoplastic polymeric carrier film having heat-softenable and tensile elongation properties which adapt it to use in said thermoforming process and (b) a clear topcoat layer;

one of said series of layers being a dark colored layer which has an L^* value less than about 60;

above said dark colored layer, a flake-containing layer which is light transmissive and comprises light-reflective flakes dispersed in a transparent film-forming binder;

the flake concentration in the flake-containing layer being sufficiently low that the dark colored layer is visible through the flake-containing layer and the topcoat; all of said layers having heat-softening and tensile elongation properties that are compatible with those of the carrier film; and

said sheet material being capable of stretching at least 100 percent during thermoforming and, when stretched, exhibiting a flop in areas stretched up to 100 percent at least equal to the flop of the unstretched material.

5,192,610

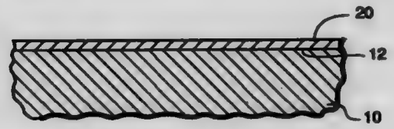
CORROSION-RESISTANT PROTECTIVE COATING ON ALUMINUM SUBSTRATE AND METHOD OF FORMING SAME

D'Arcy H. Lorimer, San Luis Obispo, and Craig A. Bercaw, Hayward, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 7, 1990, Ser. No. 534,796

Int. Cl.[5] B32B *15/04, 15/20*

U.S. Cl. 428—33.6 20 Claims



1. A corrosion-resistant protective coating on an aluminum substrate formed by contacting a high purity aluminum oxide layer on said aluminum substrate having a purity of at least about 97 wt. % aluminum oxide with one or more fluorine-containing gases at an elevated temperature ranging from about 375° C. to about 500° C., said aluminum oxide layer having a minimum thickness of at least about 0.1 micrometers (1000 Angstroms) prior to said contact with said one or more fluorine-containing gases.

5,192,611

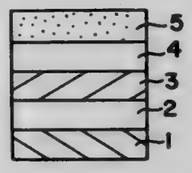
PATTERNED FILM FORMING LAMINATED SHEET

Takeshi Tomiyama; Masahiro Endo; Sadaaki Hashimoto, and Kenji Maeda, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 487,263, Mar. 2, 1990, Pat. No. 5,079,058. This application May 31, 1991, Ser. No. 708,862

Int. Cl.[5] B32B *5/16, 7/12, 15/04*

U.S. Cl. 428—354 3 Claims



1. A patterned film-forming laminated sheet comprising a multi-layer construction prepared by successively laminating a release sheet layer, a pressure-sensitive adhesive layer, a plastic base sheet layer having a thickness of 30 to 120 μm, a primer layer and a patterned film layer, said patterned film layer being prepared by a process which comprises coating a fluid coating composition containing a powdery magnetic material comprising at least one selected from a group consisting of nickel, stainless steel having a high content or iron, iron and cobalt, on one side of the base sheet layer to form a fluid film, and acting a magnetic force on the powdery magnetic material contained in the fluid film in such a fluid state that the fluid film has a viscosity of 0.5–3 poise at 20° C. to form a pattern, the magnetic force being acted on the powdery magnetic material from behind the plastic base sheet layer by use of magnetic sheet having the same shape as that of the pattern to be formed or a shape to cover the back side of the plastic sheet layer, wherein a pigmented film layer is formed between the primer and the patterned film layer.

5,192,612

POSITIONABLE-REPOSITIONABLE PRESSURE-SENSITIVE ADHESIVE

James W. Otter, Geneva, and Gary R. Watts, Ashtabula, both of Ohio, assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 429,719, Oct. 31, 1989, abandoned. This application Feb. 12, 1990, Ser. No. 478,675

Int. Cl.[5] C09J *7/02*

U.S. Cl. 428—355 29 Claims

1. A laminate comprising a substrate and a layer of pressure-sensitive adhesive for adhering the laminate to a mounting surface, said pressure-sensitive adhesive containing a pressure-sensitive adhesive base resin, a detackifying resin and a detackifying particulate, said detackifying resin comprising a substantially linear polycaprolactone polymer having a molecular weight in the range of from about 3,000 to about 342,000, said detackifying resin and particulate interacting to increase the effectiveness of the particulate in raising the dynamic shear storage modulus of the pressure-sensitive adhesive to about 30×10^5 dynes/cm^2 or higher at 1 rad/sec at a temperature of 23° to 25° C. with a lesser decrease in ultimate peel strength as compared with a similar laminate except for the omission of said detackifying resin, and thereby reducing tack and suppressing adhesion build-up temporarily during installation of said laminate to said mounting surface and causing adhesion build-up subsequently due to the passage of time such that said laminate is permanently bonded to said mounting surface in about one week.

5,192,613

ELECTROGRAPHIC RECORDING ELEMENT WITH REDUCED HUMIDITY SENSITIVITY

Ray A. Werk, III, Kennett Square, Pa.; Clifford E. Milner, Rochester, N.Y.; Sarah J. Kintner, Wilmington, Del.; James E. Genthe, Chillicothe, Ohio; Stephen Strella, Boca Raton, Fla., and Charles R. Iacovella, Monroe, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 471,150, Jan. 26, 1990, abandoned. This application Nov. 30, 1990, Ser. No. 620,251

Int. Cl.[5] B32B *7/02*; G01D *15/06*

U.S. Cl. 428—363 36 Claims

1. An electrographic recording element with reduced sensitivity to humidity, comprising, in order:

(1) a base,

(2) a conductive layer comprising a continuous coating of an electroconductive composition, said electroconductive composition comprising:

(a) a polymeric binder and

(b) an electroconductive powder comprising particles being:

(i) hollow shells of amorphous silica or a silica-containing material, or

(ii) solid cores coated with amorphous silica or a silica-containing material, coated with a two-dimensional network of antimony-containing tin oxide crystallites in which the antimony content ranges from 1 to about 30% by weight of tin oxide; and

(3) a dielectric layer.

5,192,614

Patent Not Issued For This Number

5,192,615

COMPOSITION COMPRISING ENCAPSULATED SUBSTRATE AND THERMOPLASTIC POLYMER OVERCOATING

Lee A. McDougall, Houston; John C. Newlove, Kingwood, both of Tex.; Pacifico V. Manalastas, Edison, and Evelyn N. Drake, Bernardsville, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 637,401, Jan. 4, 1991, Pat. No. 5,102,558, which is a continuation-in-part of Ser. No. 446,572, Dec. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 446,831, Dec. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 446,958, Dec. 6, 1989, abandoned. This application Jan. 3, 1992, Ser. No. 816,912

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] B32B *27/06, 27/00*

U.S. Cl. 428—402.24 6 Claims

1. An encapsulated particulate composition comprising:

(a) a solid particulate substrate;

(b) a coating substantially free of pinholes comprising a neutralized sulfonated elastomeric polymer having a thickness of at least about 1 micron deposited on the surface of particles of said substrate, wherein said neutralized sulfonated polymer encapsulates said substrate, wherein said neutralized sulfonated polymer is permeable to said substrate at conditions of use and said neutralized sulfonated polymer is non-reactive to said substrate, and

(c) a layer of thermoplastic polymer overcoating said coating.

5,192,616

MACROMOLECULAR MONOMERS FROM LIVING POLYMERS

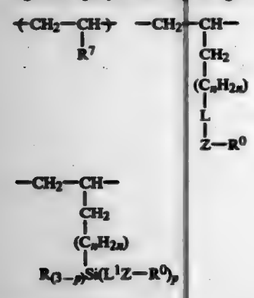
Gaddam N. Babu, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 614,307, Nov. 15, 1990, Pat. No. 5,104,952. This application Oct. 15, 1991, Ser. No. 775,684

Int. Cl.[5] B32B *27/08*; C08F *30/08, 236/20*

U.S. Cl. 428—407 9 Claims

1. A graft copolymer comprising units having the formula



wherein

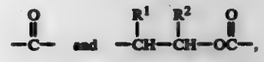
R^8 is a saturated or unsaturated, linear hydrocarbyl group having 2 to 20 carbon atoms, a branched hydrocarbyl group having 3 to 20 carbon atoms, or a cyclic hydrocarbyl group having 5 to 20 carbon atoms;

n is an integer having a value from 0 to 16;

p is an integer having a value of 1, 2, or 3;

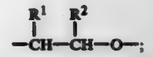
R is independently a monovalent hydrocarbyl group which is selected from alkyl groups having from 1 to 18 carbon atoms, aryl groups having from 6 to 10 carbon atoms, and cyclic hydrocarbyl groups having from 5 to 10 carbon atoms;

L is a vidalent linking group selected from the group consisting of



in which each R^1 and R^2 is independently hydrogen, a C_1 to C_4 alkyl group, phenyl group, or both of R^1 and R^2 together with the carbon atoms to which they are attached form a ring having 5 or 6 carbon atoms;

L^1 is a covalent bond or a divalent linking group



ZX is a divalent polymeric group derived from either or both of polymerizable ethenylarene and conjugated diene monomers;

and R^7 is hydrogen or an alkyl group having 1 to 16 carbon atoms.

5,192,617

TRANSPARENT LIQUID ABSORBENT MATERIALS

John J. Stofko, Jr., St. Paul, Minn., and Mohammad Iqbal, Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 602,481, Oct. 24, 1990, Pat. No. 5,134,198. This application Jan. 4, 1992, Ser. No. 893,915

Int. Cl.[5] B32B *9/04*

U.S. Cl. 428—411.1 22 Claims

1. A transparent film comprising a transparent backing bearing on at least one major surface thereof a layer formed from a composition comprising (a) a polymeric matrix component comprising crosslinked tertiary amino moieties and carboxyl moieties said matrix component having one carboxyl moiety for each amino moiety that has been crosslinked, and (b) a liquid-absorbent component comprising a water-absorbent polymer that is not crosslinked.

5,192,618

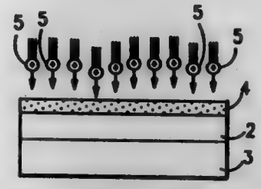
CORROSION PROTECTION BY FEMN BY ION IMPLANTATION

Gerald S. Frankel, Ossining; Igor Y. Khandros, and Peter B. Madakson, both of Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1991, Ser. No. 692,349

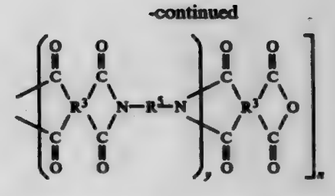
Int. Cl.[5] B32B *15/04*; G11B *5/127, 5/66*; B05D *5/12*

U.S. Cl. 428—457 30 Claims



1. A highly corrosion resistant and wear resistant FeMn film comprising a layer of FeMn and at least one protective layer formed at a surface of said FeMn layer by implanting ions of two reactive elements into the surface, said reactive elements being capable upon subsequent annealing to form, from the combination of said two reactive elements, said at least one protective layer, wherein one of said two reactive elements is selected from the group consisting of chromium, titanium, silicon and aluminum and the other reactive element is selected from the group consisting of nitrogen, carbon and oxygen.

-continued



(II)

wherein R^1 is an aromatic hydrocarbon group of

R^2 is an aliphatic hydrocarbon group having 5 or less carbon atoms or an aromatic hydrocarbon group having 9 or less carbon atoms, R^3 is a tetravalent aromatic hydrocarbon group, R^4 is a divalent aromatic hydrocarbon group, R^5 is divalent siloxane chain, R^6 is a divalent aliphatic hydrocarbon group having 3 to 5 carbon atoms or a divalent aromatic hydrocarbon group having 6 to 9 carbon atoms, Y is —O—, —CO—, $—SO_2—$ or $—CH_2$, r is 2 or 3, x:y is 97:3 to 60:40 and m:n is 50–100:50–0.

5,192,619

FLEXIBLE COPPER-APPLIED SUBSTRATES

Shiro Konotsune, Yokosuka; Kazutsune Kikuta; Masaya Uetsuki, both of Yokohama, and Hiroshi Hase, Kawasaki, all of Japan, assignors to Chisso Corporation, Osaka, Japan

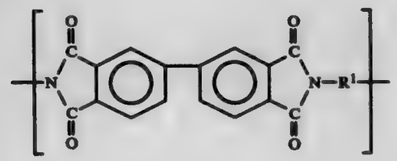
Continuation of Ser. No. 367,255, Jun. 16, 1989, abandoned. This application Nov. 4, 1991, Ser. No. 787,624

Claims priority, application Japan, Jun. 30, 1988, 63-162982; Aug. 29, 1988, 63-214185

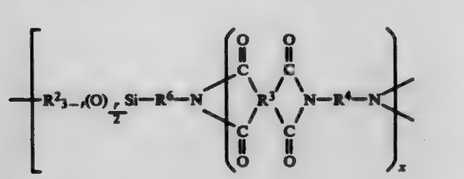
Int. Cl.[5] B32B *15/08, 27/06*; C08G *77/04*

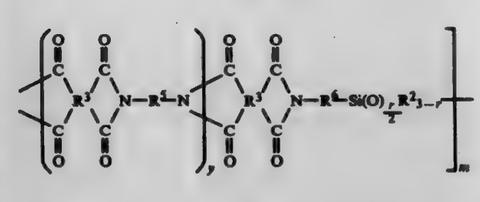
U.S. Cl. 428—458 8 Claims

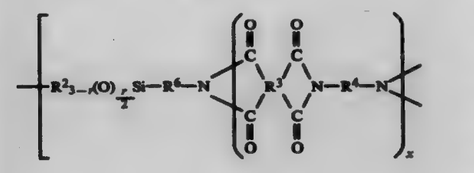
1. A flexible copper-applied substrate having curling properties of at least 25 cm indicated with a curvature radius of the substrate having a size of 10 cm by 10 cm which comprises a copper foil and a resin layer comprising a composite material of a polyimide having a repeating unit represented by the general formula (I) and a polyimide silicone having a repeating unit represented by the following general formula (II), said resin layer being directly formed on the surface of the copper foil:



(I)







5,192,620

METALLIZED COMPOSITE FILM STRUCTURE AND METHOD

Shaw-Chang Chu, Cranbury, N.J., and James A. Johnson, Farmington, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 8, 1991, Ser. No. 789,560

Int. Cl.[5] B32B *15/08*

U.S. Cl. 428—461 8 Claims

1. A metallized film combination comprising an oriented polymer substrate layer of polypropylene or a copolymer thereof which substrate is susceptible, in unmodified form, to transmitting oxygen and moisture, at least one surface of which having a layer of a blend of (a) a polyvinyl alcohol homo or copolymer and (b) an ethylene-acrylic acid copolymer; and the surface of said layer blend having a metal layer thereon.

5,192,621

ARTICLES CONTAINING SIDE CHAIN POLYMERIC ULTRAVIOLET PROTECTING AGENTS

Gunilla E. Gilberg-Laforce, Summit, and Josefina L. Prukner-mukai, Montclair, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

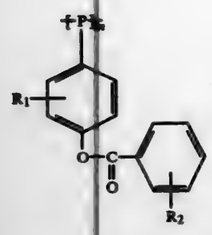
Division of Ser. No. 646,965, Jan. 28, 1991, Pat. No. 5,145,928. This application Apr. 9, 1992, Ser. No. 865,427

Int. Cl.[5] B32B *27/06*

U.S. Cl. 428—480 6 Claims

1. A polyester substrate coated with a composition comprising polymers that contain, in their side chains, 4-benzoyloxyphenyl moieties, and being represented by the formula:

VOL 1148 ISS 2 MR 9 1993 UMI

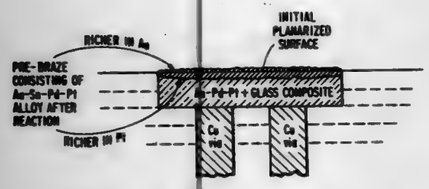


wherein P is the polymer main chain unit, R_1 numbers from 1 to 4 substituents, could be the same or different, and is selected from the group consisting of H, alkyl containing from 1 to 6 carbon atoms, cycloalkyl containing from 4 to 6 carbon atoms, and aralkyl containing from 7 to 10 carbon atoms; and R_2 numbers from 1 to 5 substituents, could be the same or different, and is selected from the group consisting of OH, SO_3H, H, alkyl containing from 1 to 6 carbon atoms, cycloalkyl containing from 4 to 6 carbon atoms, and aralkyl containing from 7 to 10 carbon atoms and m ranges from about 50 to 500.

5,192,622
LOW-COST TERNARY COMPOSITE FOR USE IN VIAS IN GLASS-CERAMIC STRUCTURES

Armando S. Cannarsaro, Hyde Park; Giulio DiGiacomo, Hopewell Junction, and Nunzio DiPaolo, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 9, 1991, Ser. No. 743,439
Int. Cl.[5] B22F *3/00, 5/00, 7/00*
U.S. Cl. 428—551 7 Claims



1. A precious metal alloy/glass composite for use in vias in glass-ceramic electronic structures, comprising:

an alloy including gold, palladium, and a metal selected from the group consisting of platinum and silver, where the gold ranges between 5 and 50% by weight of said alloy; and

a glass, said glass being mixed with said alloy to form a precious metal alloy/glass composite, said glass ranges between 5 and 50% by volume of said precious metal alloy/glass composite.

5,192,623
LAMINATED STRUCTURAL PANELS AND THE METHOD OF PRODUCING THEM

Yitzhak Gewelber, La Mirada, Calif., assignor to Lockhart Industries, Paramount, Calif.

Continuation of Ser. No. 602,011, Oct. 23, 1990, abandoned. This application Jul. 16, 1992, Ser. No. 917,511
Int. Cl.[5] B32B *3/12, 3/30*
U.S. Cl. 428—593 25 Claims

1. A method of producing laminated structural panels comprising the steps of:

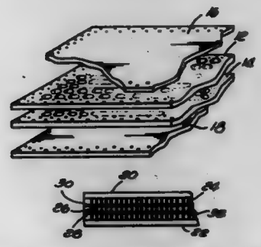
a) starting with a plurality of sheets of sheet metal perforated with a desired pattern;

b) providing imperforate top and bottom metal sheets;

c) providing brazing material at the interface between said metal sheets;

d) stacking said sheets with said perforated sheets aligned to provide desired areas of contact with the unperforated parts thereof and placed between said top and bottom sheets;

e) placing said stack in an oven and subjecting it to an initial



vacuum of at least 200 microns and backfilling said oven with an inert gas;

f) increasing the vacuum to approximately 1×10^{-5} Torr and increasing temperature to an amount sufficient to braze said stacked sheets and vacuum seal the panels;

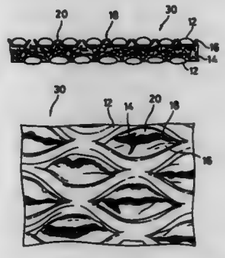
g) permitting the stack to cool in said oven to a temperature significantly below said brazing temperature; and

h) removing said stack from said oven.

5,192,624
SOUND ABSORBING MATERIALS

Toru Morimoto, Chiba, Japan, assignor to Unix Corporation Ltd., Tokyo, Japan, a part interest

Filed Apr. 12, 1991, Ser. No. 688,996
Claims priority, application Japan, Apr. 26, 1990, 2-111488; Nov. 30, 1990, 2-334299
Int. Cl.[5] B32B *3/24, 5/02, 15/14;* E04B *1/82*
U.S. Cl. 428—596 15 Claims



8. A sound absorbing material comprising an aluminum base expanded metal and/or an aluminum base metal screen which are laminated with an aluminum base metal fiber layer and an aluminum base metal foil that has ruptures adapted to be vibrated by sound waves.

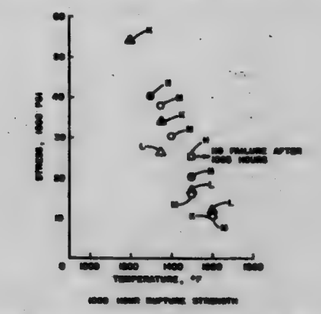
5,192,625
COBALT-BASE WROUGHT ALLOY COMPOSITIONS AND ARTICLES

Marvin Fishman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 28, 1990, Ser. No. 486,531
Int. Cl.[5] C22C *30/00;* B32B *15/00*
U.S. Cl. 428—668 4 Claims

4. A composite article in the form of a hot stage gas turbine

engine component coated locally with a layer of a cobalt-base alloy consisting essentially of about 29% chromium, about

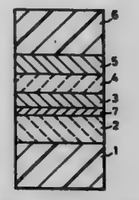


20% nickel, about 6% tantalum, about 0.75% of cerium and about 0.05% carbon, remainder cobalt.

5,192,626
OPTICAL RECORDING MEDIUM

Masahiko Sekiya, Hino; Takayuki Ishizaki, Toyonaka, and Kiyoshi Chiba, Chofu, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 447,172, Dec. 7, 1989, abandoned. This application Jun. 13, 1991, Ser. No. 715,024
Claims priority, application Japan, Dec. 14, 1988, 63-313751; Dec. 28, 1988, 63-328151; Jun. 1, 1989, 1-137382
Int. Cl.[5] G11B *5/66*
U.S. Cl. 428—694 16 Claims



1. An optical recording medium, comprising a substrate, a transparent dielectric layer as a protecting and/or enhancing layer, and an optical recording layer, wherein said transparent dielectric layer is amorphous, and consists of an oxide of at least one metal selected from the group consisting of indium, tin and tantalum, said oxide further consisting of at least one element selected from the group consisting of nitrogen and bismuth.

5,192,627
CLOSED LOOP REACTANT/PRODUCT MANAGEMENT SYSTEM FOR ELECTROCHEMICAL GALVANIC ENERGY DEVICE

John H. Perry, Jr., Riviera Beach; Abraham Person, Palm Beach Shores; Steven M. Mieiaszek, Tequesta, and Donald P. Alessi, Jr., Lake Park, all of Fla., assignors to Energy Partners, Inc., West Palm Beach, Fla.

Continuation of Ser. No. 612,350, Nov. 13, 1990, Pat. No. 5,047,298. This application Aug. 2, 1991, Ser. No. 739,627
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—17 12 Claims

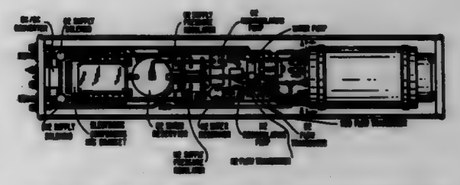
1. A closed loop reactant/product management system for electrochemical galvanic energy devices, the system comprising:

a) a modular package comprising a plurality of galvanic cells, two internal gas flow conduit means for independently carrying each of two gaseous reactants, which form a liquid product within the galvanic cells, and an internal liquid flow conduit means for independently carrying a cooling liquid to the galvanic cells, the cooling liquid being derived from the liquid product;

b) first and second gas supply connecting means each designed to provide make-up gaseous reactants, respectively, to the system;

c) indirect heat exchanger means in fluid flow connection with the internal liquid flow conduit means;

d) first and second liquid-gas separator means and first and second liquid reservoir means, the respective separator means and reservoir means being in open fluid flow connection, each of the reservoir means being designed to



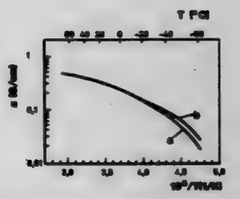
provide a liquid-free, gas-filled space in an upper portion thereof and to maintain liquid in the lower portion, the first reservoir means being in pressure-tight fluid flow connection with the heat exchanger means and with the respective internal liquid flow passage, each of the first and second reservoir means being in pressure-tight fluid flow connection with the respective first and second gas supply connecting means, and the first and second liquid-gas separator means being in pressure tight fluid flow connection with the respective gas flow conduit means; and

respective means located in said first and second gas supply connecting means between each of said first and second reservoir means and said internal gas flow conduit means, said respective means functioning to regulate flow rate in said first and second gas supply means.

5,192,628
ALKALINE ELECTROLYTE FOR GALVANIC ELEMENTS

Heinz P. Fritz, Garching, and Heinz Frauendorf, Landshut, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 18, 1991, Ser. No. 779,058
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1990, 4033102
Int. Cl.[5] H01M *6/14*
U.S. Cl. 429—190 10 Claims



1. An alkaline electrolyte for galvanic elements, wherein the electrolyte contains substances with a gelling or adsorption capability, and wherein the electrolyte is immobilized by an addition selected from the group consisting of magnesium hydroxide and basic magnesium salts combined with lye or an

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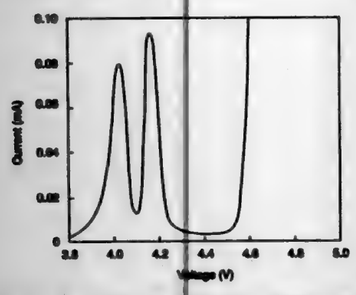
aqueous potassium carbonate solution in a proportion by weight of from about 1:0.5 to about 1:2.

5,192,629
HIGH-VOLTAGE-STABLE ELECTROLYTES FOR $Li_{1+x}Mn_2O_4$/CARBON SECONDARY BATTERIES
Dominique Guyomard, Middletown, and Jean-Marie Tarascon, Martinsville, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.
Filed Apr. 21, 1992, Ser. No. 871,855
Int. Cl.[5] H01M *10/40*
U.S. Cl. 429—197 19 Claims



1. A high-voltage-stable electrolyte for a lithiated intercalation secondary battery, said electrolyte consisting essentially of about a 0.5 to 2M solution of a solute selected from the class consisting of:
a) $LiPF_6$; and
b) mixtures of $LiPF_6$ with up to about equal mole parts of $LIBF_4$,
dissolved in a mixture of non-aqueous dimethylcarbonate (DMC) and ethylene carbonate (EC) solvents wherein said solvents are present in a weight percent ratio range from about 95 DMC:5 EC to 20 DMC:80 EC.

5,192,630
IMAGE TRANSFER TO DIVERSE PAPER STOCKS
Stephen J. W. Platzer, Califon, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.
Division of Ser. No. 513,016, Apr. 23, 1990, Pat. No. 5,094,931, which is a continuation of Ser. No. 328,729, Mar. 23, 1989, abandoned, which is a continuation of Ser. No. 38,739, Apr. 15, 1987, abandoned. This application Nov. 25, 1991, Ser. No. 798,309
Int. Cl.[5] G03C *1/68, 11/12*
U.S. Cl. 430—11 21 Claims

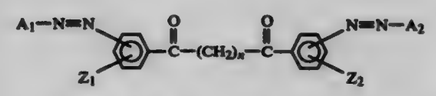
1. An article which is a colored image on a permanent support, which article is prepared by the method which comprises:
A) providing a photosensitive element which comprises, in order;
a substrate having a release surface; and a photosensitive member directly attached to said release surface, which member comprises
a colored, adherent, photosensitive layer, which layer comprises light sensitive, positive working or negative working compound; a resinous binder and at least one colorant; and
B) providing a temporary element, which comprises a dimensionally heat stable support having a release surface;
C) either
i) laminating said photosensitive member with heat and pressure to the release surface of the temporary element; and removing said substrate from the photosensitive element by the application of peeling forces thus transferring the photosensitive member to the release surface of the temporary element; and imagewise exposing said photosensitive layer to actinic radiation to thereby form image and non-image portions of the photosensitive member on the release surface of the temporary element; or
ii) imagewise exposing said photosensitive layer to actinic radiation; and laminating said photosensitive member with heat and pressure to the release surface of the temporary element; and removing said substrate from the photosensitive element by the application of peeling forces thus transferring the image and non-image portions of the photosensitive member to the release surface of the temporary element; or
iii) laminating said photosensitive member with heat and pressure to the release surface of the temporary element; and imagewise exposing said photosensitive layer to actinic radiation; and removing said substrate from the photosensitive element by the application of peeling forces, thus transferring the image and non-image portions of the photosensitive member to the release surface of the temporary element; and thereafter
D) removing the nonimage areas of said photosensitive layer with a liquid developer, thereby providing a colored image on the release surface of the temporary element; and
E) providing a protective element, which element consists essentially of a dimensionally heat stable base having a release surface on which release surface is applied an adhesive; and
F) laminating said protective element to said colored image via said adhesive; and
G) removing the support of the said temporary element thereby transferring said image to said protective element and uncovering at least a portion of an adhesive layer; and laminating the protective element via said uncovered adhesive layer to a permanent support.

5,192,631
VARIABLE ELECTROCONDUCTIVITY MATERIAL
Eiichi Inoue, Setagaya; Atsumi Nochiro, Chiba, and Minoru Utsumi, Yokohama, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan
Division of Ser. No. 274,938, Jan. 4, 1989, Pat. No. 4,997,593. This application Oct. 9, 1990, Ser. No. 594,026
Claims priority, application Japan, Mar. 18, 1987, 62-61350; PCT Int'l Appl., Mar. 17, 1988, PCT/JP88/00277
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—56 10 Claims

1. A recording material comprising an electrically conductive electrode material and a memorizable converting layer comprising a variable electroconductivity material exhibiting electronic charge conduction, said memorizable converting layer being formed on said electrically conductive electrode material, wherein said variable electroconductivity material comprises:
(a) an electroconductivity variation imparting agent which changes its ionic structure when exposed to light or heat energy, reversibility or irreversibly between nonionic and ionic structures, said electroconductivity variation imparting agent comprising at least one component selected from the group consisting of spiropyrane compounds, diazonium compounds, derivatives thereof, a mixture of a leuco dye and a halide compound, and an ionic dye; and
(b) a charge transport substance, the electroconductivity of which varies in relation to the ionic structural change of said electroconductivity variation imparting agent, said charge transport substance comprising at least one component selected from the group consisting of an organic or inorganic charge transport material, a π-electron conjugated polymer, and a charge-transfer complex compound.

5,192,632
ELECTROPHOTOGRAPHIC BISAZO PHOTOSENSITIVE MEMBER, AND ELECTROPHOTOGRAPHIC APPARATUS AND FACSIMILE EMPLOYING THE SAME
Satomi Ohmura, Kawasaki, and Yoshio Kashizuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1991, Ser. No. 737,015
Claims priority, application Japan, Jul. 30, 1990, 2-199308
Int. Cl.[5] G03G *5/06, 5/09, 15/00*; H04N *1/23*
U.S. Cl. 430—58 19 Claims

1. An electrophotographic photosensitive member comprising an electroconductive support and a photosensitive layer formed thereon, said photosensitive layer comprising
(a) a charge-generating layer containing a compound of the general formula (1) and a charge-transporting layer, or
(b) a layer containing a compound of the general formula (1) and a charge-transporting substance,
wherein the compound of the general formula (1) is represented below:



(1)

wherein Z_1 and Z_2 are each independently a hydrogen atom, an alkyl group, a halogen atom, an alkoxy group, a nitro group, a cyano group, or a trifuluromethyl group; A_1 and A_2 are each a coupler residue having a phenolic hydroxyl group, which may be the same or different; and n is an integer of 1 or 2.

5,192,633
LAMINATE TYPE PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY
Hiroaki Iwasaki, Hirakata; Yoichi Takegawa, Suita; Hiroshi Takemoto, Osaka; Masashi Tanaka, Kishiwada; Keizo Kimoto, Hirakata, and Tadashi Sakuma, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 521,345, May 9, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 763,150
Claims priority, application Japan, May 9, 1989, 1-114308; Nov. 30, 1989, 1-313645
Int. Cl.[5] G03G *5/047*
U.S. Cl. 430—59 10 Claims

1. A laminate type photosensitive material for electrophotography, which comprises a charge-generating layer comprising a charge-generating material and a charge-transporting layer, which layers are formed on an electroconductive substrate, wherein the charge-transporting layer comprises a first charge-transporting material having an ionization potential smaller than that of the charge-generating material in the charge-generating layer and a second charge-transporting material having an ionization potential larger than that of the charge-generating material, wherein the differences of the ionization potentials of the first and second charge-transporting materials from the ionization potential of the charge-generating material are within ±0.2 eV and said first and second charge-transporting materials are used in such amounts that the first charge-transporting material/second charge-transporting material weight ratio is from 10/90 to 90/10.

9. The photosensitive material for electrophotography according to claim 1, wherein the charge-generating material is selected from the group consisting of phthalocyanine pigment, perylene pigment, quinacridone pigment, pyranthrone pigment, disazo pigment and trisazo pigment and the charge-transporting materials are selected from the group consisting of stilbene, N,N'-bis(o,p-dimethylphenyl)-4,4'-(diphenyl) benzidine, 1,1-bis(p-diethylaminophenyl)-N,N'-diphenylhydrazone, N,N-diethylaminobenzaldehyde-N,N-diphenylhydrazone, N,N-dimethylaminobenazldehyde-N,N-diphenylhydrazone, N-methyl-N-phenylaminobenazldehyde-N,N-diphenylhydrazone, 4-diphenylamino-α-phenylstilbene, triphenylamine, and 4-(N,N-diethylamino)benzaldehyde-N,N-diphenylhydrazone.

5,192,634
A-SELENIUM-TELLURIUM PHOTOSENSITIVE MEMBER AND ELECTROSTATIC INFORMATION RECORDING METHOD
Kohji Ichimura, and Minoru Utsumi, both of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan
Filed Feb. 7, 1991, Ser. No. 652,189
Claims priority, application Japan, Feb. 7, 1990, 2-28694; Jul. 11, 1990, 2-183564
Int. Cl.[5] G03G *5/085*
U.S. Cl. 430—85 4 Claims

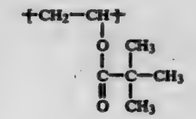
1. An electrostatic information recording method, characterized in that a photosensitive member comprises an electric charge injection preventive layer, an a-eclenium-tellurium mixed vacuum evaporation layer having tellurium concentration within the range of 20–50 wt % with uniform concentration on the vacuum-deposited surface and having thickness of 0.03–0.2 μm, and an electric charge transport layer of 30 μm thick sequentially laminated on a transparent electrode layer, that said photosensitive member is placed face-to-face to an electric charge carrying medium comprising an electrode layer and an electric charge retaining layer on optical axis, and that electrostatic latent image corresponding to the incident light image is formed on the electric charge carrying medium by performing exposure under voltage application between two electrodes or by applying voltage under exposure.

5,192,635
FLUORINE-CONTAINING COPOLYMERS AND CARRIERS FOR DEVELOPING ELECTROSTATIC IMAGES
Hiroshi Isukai; Takahiro Kitahara; Kayoko Sugioka, and Mario Mizuguchi, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Japan
Filed Jun. 12, 1991, Ser. No. 713,855
Claims priority, application Japan, Jun. 12, 1990, 2-154355
Int. Cl.[5] G03G *9/00*; B32B *23/02, 27/02, 27/02*
U.S. Cl. 430—108 7 Claims

1. A carrier for developing electrostatic image, the carrier comprising a core and coating on the core, the coating being formed from a copolymer comprising:
(a) 50 to 85 mole % of a structural unit represented by the formula

(b) 5 to 40 mole % of a structural unit represented by the formula

wherein X is H or F, and
(c) 3 to 18 mole % of a structural unit represented by the formula



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5,192,636
TONER AND A PROCESS FOR PREPARING THEREOF
Masanao Kamagi; Hidenori Kin, and Tsuneo Handa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Aug. 16, 1990, Ser. No. 568,465
Claims priority, application Japan, Aug. 18, 1989, 1-212605; May 17, 1990, 2-127408; May 17, 1990, 2-127409
Int. Cl.[5] G03G *9/087*
U.S. Cl. 430—109 10 Claims

1. A toner material for use in a dry electrophotographic process, said toner material comprising mono-component toner particles for use in developing a latent electrostatic image on the surface of a receptor in which external electrostatic field lines extend above the receptor surface along the periphery of said latent image, each of said toner particles containing at least a colorant and a binder, each of said toner particles having sufficient electrical resistance to enable it to be stably charged and transferred with the aid of the external field lines to the receptor surface, each of said toner particles further comprising an inside portion having a relatively high permittivity and an outside portion having a relatively low permittivity, the respective permittivities of said inside and outside portions being such as to provide toner material within proximity of the receptor with the ability to modify the electric field lines extending above said latent image whereby the toner material may be used to promote development of a central portion of the image.

5,192,637
ELECTROPHOTOGRAPHIC TONER COMPOSITION
Susumu Saito; Takashi Imai; Satoshi Inoue, and Yutaka Sugizaki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Jun. 5, 1991, Ser. No. 710,617
Claims priority, application Japan, Jun. 6, 1990, 2-146254
Int. Cl.[5] G03G *9/087*
U.S. Cl. 430—109 15 Claims

1. An electrophotographic toner composition comprises a toner particle and an additive, wherein said toner particle comprises at least a binder resin and a colorant, and said additive is an amorphous titania particle subjected to a surface treatment using a coupling agent.

5,192,638
TONER FOR USE IN COMPOSITIONS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES, METHOD OF MAKING THE SAME, AND LIQUID COMPOSITION USING THE IMPROVED TONER
Benzion Landa, Edmonton, Canada; Peretz Ben-Auraham; Joseph Hall, both of Rehovot, Israel, and George A. Gibson, Endwell, N.Y., assignors to Spectrum Sciences B.V., The Hague, Netherlands
Division of Ser. No. 394,141, Aug. 16, 1989, Pat. No. 5,047,307, which is a continuation of Ser. No. 287,840, Dec. 21, 1988, abandoned, which is a division of Ser. No. 157,122, Feb. 10, 1988, Pat. No. 4,794,651, which is a continuation of Ser. No. 45,168, Apr. 24, 1987, abandoned, which is a continuation of Ser. No. 679,906, Dec. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 242,242, Sep. 9, 1988, abandoned. This application Sep. 9, 1991, Ser. No. 756,641
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] G03G *9/13*
U.S. Cl. 430—137 8 Claims

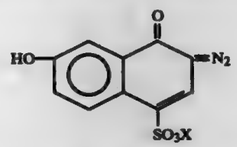
1. A method of producing toner particle for a liquid toner, comprising the steps of:
(a) plasticizing a thermoplastic polymer with a non-polar liquid at an elevated temperature;
(b) cooling the plasticized material and forming a polymer particle having a size suitable for wet grinding;
(c) adding more non-polar liquid to the plasticized material;
(d) wet-grinding the plasticized material; and
(e) continuing the grinding process to pull the particles apart to form fibers extending therefrom.

5,192,639
LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT, POLYMERIZABLE COMPOUND AND CHROMIUM MOLYBDENUM OR TUNGSTEN COMPOUND
Hiroyuki Hirai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 10, 1991, Ser. No. 774,483
Claims priority, application Japan, Oct. 11, 1990, 2-272878
Int. Cl.[5] G03C *1/72, 1/725*
U.S. Cl. 430—138 15 Claims

1. A light-sensitive material comprising a support and a light-sensitive layer provided thereon, which contains silver halide, a reducing agent and an ethylenically unsaturated polymerizable compound,
wherein the light-sensitive layer further contains a chromium (VI) compound, a molybdenum (VI) compound or a tungsten (VI) compound.

5,192,640
PROCESS FOR PREPARING 7-HYDROXY-1,2-NAPHTHOQUINONE-2-DIAZIDE-4-SULFONIC ACID OR SALTS THEREOF
Siegfried Scheler, Wiesbaden; Gerhard Buhr, Koenigstein, and Klaus Bergmann, Mainz-Bretzenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Aug. 9, 1990, Ser. No. 564,643
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926774
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] G03F *7/022*; G07C *309/35, 245/12*
U.S. Cl. 430—169 16 Claims

1. A process for preparing a compound of the formula Z



Z

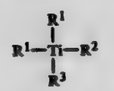
in which X=hydrogen, a metal or an ammonium group, comprising the steps of:
1) nitrosating 2,7-dihydroxynaphthalene;
2) sulfonating the resulting 2,7-dihydroxy-1-nitrosonaphthalene (I) with an alkali metal hydrogen sulfite and reducing the bisulfite addition compound formed in acidic solution to 2,7-dihydroxy-1-aminonaphthalene-4-sulfonic acid (II);
3) oxidizing the 2,7-dihydroxy-1-aminonaphthalene-4-sulfonic acid to 7-hydroxy-1,2-naphthoquinone-4-sulfonic acid (III) and precipitating this acid as a first salt; and
4) converting this salt with an arylsulfonic acid hydrazide to a salt of 7-hydroxy-1,2-naphthoquinone-2-diazide-4-sulfonic acid (IV), isolating this salt, and optionally converting this salt to the corresponding acid.

5,192,641
METHOD OF THERMAL WAX TRANSFER AS A MASK FOR DIGITAL COLOR PROOFING
Sonya Y. Shaw, Carrollton, Tex., and Douglas A. Seeley, High Bridge, N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Filed Dec. 19, 1990, Ser. No. 630,891
Int. Cl.[5] G03B *33/04*; G03F *3/06*
U.S. Cl. 430—200 5 Claims

1. A process for producing a color image on color proofing film which comprises:
(i) providing digital data representative of the shape and color of an original image;
(ii) inputing said digital data into a computer;
(iii) providing a color printer which is in communication with and controlled by said computer;
(iv) providing said printer with a precoated photosensitive color proofing film, a thermal wax and means for transferring said wax to said color proofing film;
(v) melting said thermal wax, in response to said digital data, in a manner which provides a pattern corresponding to the shape of said original image, said pattern providing a temporary thermal wax optical mask;
(vi) exposing the photosensitive layer of said color proofing film, through said wax mask, to actinic radiation, whereby the wax on said color proofing film absorbs said actinic radiation and a photoreaction occurs in the non-wax, exposed areas of said photosensitive layer of said color proofing film; and
(vii) developing said color proofing film to provide a color image corresponding to said original image.

5,192,642
OXYGEN-CONTAINING TITANOCENES, AND THE USE THEREOF
Eginhard Steiner, Füllinsdorf; Harry Beyeler, Basel; Martin Riediker, Rerbas; Vincent Desobry, Marly; Kurt Dietliker, Fribourg, and Rinaldo Hüsler, Wünnewil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed May 23, 1990, Ser. No. 527,988
Claims priority, application Switzerland, Jun. 1, 1989, 2074/89
Int. Cl.[5] G03F *7/029*; C07F *17/00*
U.S. Cl. 430—281 16 Claims

1. A titanocene of the formula I



(I)

in which both the R^1 radicals, independently of another, are cyclopentadienyl⊖, indenyl⊖ or 4,5,6,7-tetrahydroindenyl⊖, each of which is unsubstituted, monosubstituted or polysubstituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy, C_2–C_{18}alkenyl, C_5–C_8cycloalkyl, C_6–C_{10}aryl, C_7–C_{16}aralkyl, —Si(R^4)$_3$, —Ge(R^4)$_3$, cyano or halogen, and R^4 is C_1–C_{12}alkyl, C_5–C_8cycloalkyl, C_6–C_{10}aryl or C_7–C_{16}aralkyl, R^2 is a 6-membered carbocyclic or 5- or 6-membered heterocyclic aromatic ring which is substituted by fluorine atoms at least in the two ortho-positions to the titanium-carbon bond, and in which the aromatic ring may contain 1 or 2 fluoro atoms as further substituents, and R^3, independently, is as defined for R^2, R^2 and R^3 in the titanocenes being substituted by a radical of the formula II

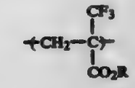
—O—Y—R^5 II

in which Y is a —CO—, —CS—, —CO—O—, —SO_2—, —Si(R^6)$_2$—, —CO—NR^6—, —CS—NR^6— or —SO_2—NR^6— group, R^5 is linear or branched C_1–C_{20}alkyl, C_2–C_{20}alkenyl, C_3–C_8cycloalkyl, C_6–C_{15}-cycloalkylalkyl or -alkylcycloalkyl, C_7–C_{16}-alkylcycloalkylalkyl, C_6–C_{20}cycloalkenylalkyl, C_7–C_{20}bicycloalkyl, C_6–C_{14}aryl, C_7–C_{12}aralkyl, C_7–C_{20}alkylaryl or C_8–C_{20}alkylaralkyl, these radicals being unsubstituted or substituted by C_1–C_{18}alkoxy, C_1–C_{12}alkylthio, C_1–C_{12}alkylsulfonyl, C_6–C_{10}arylsulfonyl, C_7–C_{20}alkylarylsulfonyl, —COOH, —CN, —COOR^4, —CO—(C_1–C_2-alkyl) or halogen, R^6 is hydrogen or has one of the meanings mentioned for R^5, or R^5 and R^6 together are C_3–C_5alkylene, which may be interrupted by —O—, —S— or —N(R^7)—, in which R^7 is hydrogen, C_1–C_{12}alkyl, C_3–C_{12}alkenyl, C_7–C_{12}-aralkyl or C_2–C_{30}alkanoyl.

12. A radiation-polymerizable composition containing (a) at least one non-volatile, monomeric, oligomeric or polymeric compound containing at least one polymerizable ethylenically unsaturated double bond, and (b) at least one titanocene of the formula I according to claim 1 as photoinitiator.

5,192,643
PATTERN-FORMING METHOD AND RADIATION RESIST FOR USE WHEN WORKING THIS PATTERN-FORMING METHOD
Akiko Kotachi, Yokohama, and Satoshi Takechi, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 22, 1991, Ser. No. 643,960
Claims priority, application Japan, Jan. 24, 1990, 2-012640
Int. Cl.[5] G03C *5/00*; G03F *7/075*
U.S. Cl. 430—296 6 Claims

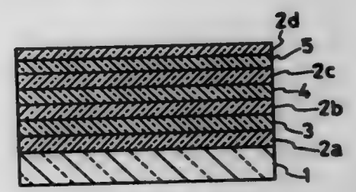
1. A pattern-forming method, which comprises irradiating a positive resist composed mainly of a polymer or copolymer comprising structural units represented by the following formula (1):



(1)

wherein R represents a hydrocarbon group containing a substituent with at least one Si atom,
patternwise with an energy beam, and developing the irradiated resist pattern.

5,192,644
OPTICAL MEMORY DEVICE
Kenji Ohta, and Kazuo Van, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 29, 1990, Ser. No. 604,581
Claims priority, application Japan, Oct. 30, 1989, 1-284602
Int. Cl.[5] G11B *7/24*
U.S. Cl. 430—338 12 Claims



1. An optical memory device which comprises a substrate and a plurality of optical memory layers made of an organic photochromic material and formed over the substrate, the plurality of optical memory layers being laminated to each other through a heat conductive transparent film.

5,192,645
THERMAL IMAGING METHOD

Roger A. Bogg, Wayland, Mass.; Alan L. Borror, Cape Elizabeth, Me.; Patrick R. Conlon, Wakefield, Mass.; Richard L. Cournoyer, San Jose, Calif.; Ernest W. Ellis, Leverett, and David P. Waller, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 277,014, Nov. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 221,032, Jul. 18, 1988, abandoned. This application Jul. 12, 1991, Ser. No. 729,420
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—338 20 Claims

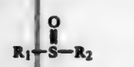
1. A heat-sensitive recording element which comprises a support carrying at least one layer of a colorless precursor of a preformed image dye substituted with (a) at least one thermally removable protecting group that undergoes fragmentation from said precursor upon heating and (b) at least one leaving group that is irreversibly eliminated from said precursor upon heating, provided that neither said protecting group nor said leaving group is hydrogen, said protecting and leaving groups maintaining said precursor in its colorless form until heat is applied to effect removal of said protecting and leaving groups whereby said colorless precursor is converted to an image dye.

5,192,646
PHOTOGRAPHIC ELEMENTS HAVING SULFOXIDE COUPLER SOLVENTS AND ADDENDA TO REDUCE SENSITIZING DYE STAIN

Paul B. Merkel, Rochester; Edward Schofield, and Tientch Chen, both of Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 9, 1991, Ser. No. 804,787
Int. Cl.[5] G03C *1/38*
U.S. Cl. 430—377 31 Claims

1. A method of forming color in a silver halide photographic element wherein the silver halide is sensitized with a dye, which comprises reacting an oxidized developing agent with a phenolic or naphtholic cyan dye-forming coupler in a sulfoxide coupler solvent having the formula:



wherein R_1 and R_2 are individually selected from the group consisting of straight and branched chain alkyl groups, alkylene groups and alkenyl groups, any of which may be substituted with one or more substituents selected from the group consisting of alkoxy, aryloxy, aryl, alkoxycarbonyl, aryloxycarbonyl, acyloxy, carbonamido and carbamoyl groups, and halogen atoms; a phenyl group; and a phenyl group having at least one substituent selected from alkyl, alkoxy, aryloxy, aryl, alkoxycarbonyl, aryloxycarbonyl, acyloxy, carbonamido and carbamoyl groups and halogen atoms; and wherein R_1 and R_2 combined have at least 12 carbon atoms.

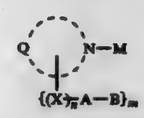
5,192,647
METHOD FOR DEVELOPMENT PROCESSING OF SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tetsuro Kojima; Shoji Ishigaro; Hisashi Okada, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

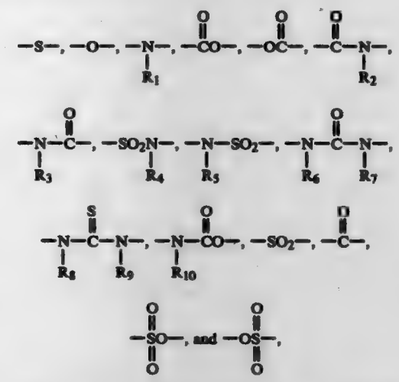
Continuation of Ser. No. 339,443, Apr. 17, 1989, abandoned, which is a continuation of Ser. No. 112,183, Oct. 26, 1987, abandoned. This application Mar. 7, 1991, Ser. No. 668,688
Claims priority, application Japan, Oct. 24, 1986, 61-252846
Int. Cl.[5] G03C *5/26*
U.S. Cl. 430—448 13 Claims

1. A method for development processing of a silver halide photographic material, comprising the step of developing a light-sensitive silver halide photographic material comprising a support having thereon at least one surface latent image type silver halide emulsion layer in the presence of a non-cleaving compound represented by formula (I):

(I)



wherein Q represents an atomic group necessary for forming a 5- or 6-membered heterocyclic ring which may be fused with an aromatic carboxylic ring, or an aromatic heterocyclic ring, provided that Q is selected from the group consisting of an indazole ring, a benzotriazole ring, an imidazole ring, a tetrazole ring, a tetraazaindene ring, a triazaindene ring, a pentaazaindene ring, a diazaindene ring, a pyrazole ring, and an indole ring; X represents a divalent linking group selected from the group consisting of:



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkenyl group, or a substituted or unsubstituted aralkyl group, and X is linked to Q via a straight or branched chain alkylene group; A represents a linking group containing at least one group selected from a straight or branched chain alkylene group having at least two carbon atoms, a straight or branched chain alkenylene group, a straight or branched chain aralkylene group and an arylene group; B represents a substituted or unsubstituted amino group or a nitrogen-containing heterocyclic ring selected from the group consisting of a morpholino group, a piperidino group, a pyrrolidino group, a pyridyl group, and an imidazolyl group; M represents a hydrogen atom, an alkali metal atom or an ammonium group; m is 1 or 2; and n is 1.

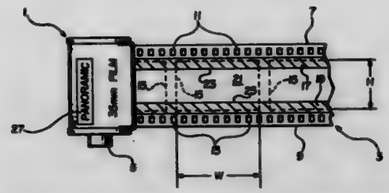
5,192,648
PHOTOGRAPHIC FILM AND CARTRIDGE

William L. Burnham, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1992, Ser. No. 838,119
Int. Cl.[5] G03C *3/00*
U.S. Cl. 430—496 6 Claims

1. A photographic film comprising an elongated light-sensitive strip having a longitudinal series of similar size rectangular exposure areas whose proportion of the width to the height is less than 2:1, is characterized in that:

each exposure area is pre-exposed along a topmost portion and/or a bottom-most portion to limit the useable size of each exposure area during picture-taking to one whose proportion of the width to the height is at least 2:1,



whereby said usable size of each exposure area provides a panorama-like image format.

5,192,649
COLOR DIFFUSION TRANSFER LIGHT-SENSITIVE MATERIAL

Katsumi Hirano; Munehisa Fujita, and Katsuhisa Okuzaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1991, Ser. No. 787,594
Claims priority, application Japan, Nov. 5, 1990, 2-299262
Int. Cl.[5] G03C *5/54*
U.S. Cl. 430—497 4 Claims

1. A color diffusion transfer light-sensitive material comprising a support having thereon light-sensitive silver halide emulsions and an electron donor in combination with reducible dye providing compounds each of which releases a diffusible dye when reduced and, further, a silver halide emulsion having substantially no light sensitivity in addition to the light-sensitive silver halide emulsions.

4. A color diffusion transfer unit comprising a color diffusion transfer light-sensitive material as in claim 1 and an alkaline processing solution containing an electron transfer agent in a rupturable container.

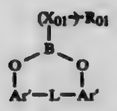
5,192,650
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING A COLOR IMAGE STABILIZER

Nobuo Seto, and Masakazu Morigaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 23, 1991, Ser. No. 644,839
Claims priority, application Japan, Jan. 25, 1990, 2-15792; Jul. 17, 1990, 2-188242
Int. Cl.[5] G03C *1/38, 7/32, 7/388, 1/34*
U.S. Cl. 430—546 14 Claims

1. A silver halide color photographic material comprising a support having a photographic layer thereto, said layer containing at least one compound represented by formula (I-2):

(I-2)



wherein Ar' represents a divalent aromatic group; L represents a mere bond or a divalent organic group; and R_{01} represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group; X_{01} represents a mere bond, —O—, —S— or

and R_{04} has the same meaning as R_{01}.

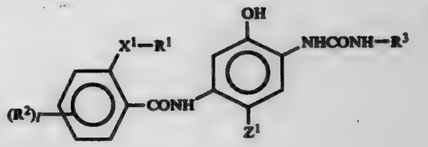
5,192,651
SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS CONTAINING AT LEAST TWO TYPES OF CYAN DYE FORMING COUPLERS

Jiro Tsukahara, and Hidetoshi Kobayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Dec. 19, 1990, Ser. No. 630,257
Claims priority, application Japan, Dec. 20, 1989, 1-330766
Int. Cl.[5] G03C *7/34*
U.S. Cl. 430—549 18 Claims

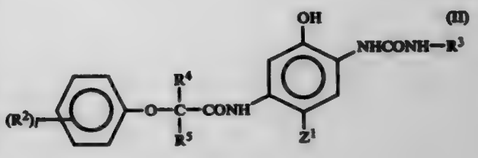
1. A photographic photosensitive material comprising a support having thereon at least one silver halide emulsion layer, said photosensitive material containing at least one cyan dye forming coupler represented by formula (I):

(I)

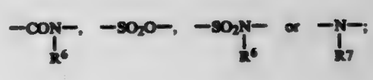


and at least one cyan dye forming coupler represented by formula (II):

(II)



in proportions, respectively, from 20 to 99 wt % and from 1 to 80 wt %, based on the total amount of both couplers of formulae (I) and (II), wherein R^1 represents a substituted or unsubstituted alkyl group, alkenyl group, alkynyl group, cycloalkyl group or aryl group; X^1 represents a single bond, —O—, —S—, —SO—, $—SO_2—$, —COO—,



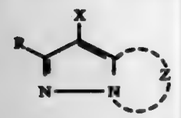
R^2 represent a group which can be substituted on a benzene ring; l represents an integer from 0 to 4; R3 is selected from the group consisting of 4-cyanophenyl, 4-cyano-3-halogenophenyl, 3-cyano-4-halogenophenyl, 4-alkylsulfonylphesyl, 4-alkylsulfonyl-3-halogenophenyl, 4-alkylsulfonyl-3-alkoxypho-

nyl, 3-alkoxy-4-alkylsulfonyl-phenyl, 3,4-dihalogenophenyl, 4-halogenophenyl, 3,4,5-trihalogenophenyl, 3,4-dicyanophenyl, 3-cyano-4,5-dihalogenophenyl, 4-trifluoromethylphenyl and 3-sulfonamidophenyl; R^4 and R^5 each independently represent a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, a cycloalkyl group, an acyl group, an alkoxycarbonyl group or an aryl group; Z^1 represents a hydrogen atom or a coupling-off group; R^6 represents a hydrogen atom, an acyl group or a group as defined for R^1; and R^7 represents a hydrogen atom or a group as defined for R^1.

5,192,652
SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL
Makoto Kajiwara, and Masayoshi Miyoshi, both of Odawara, Japan, assignors to Konica Corporation, Kanagawa, Japan
Continuation of Ser. No. 527,702, May 24, 1990, abandoned, which is a continuation of Ser. No. 299,369, Jan. 23, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 723,677
Claims priority, application Japan, Jan. 30, 1988, 63-20364
The portion of the term of this patent subsequent to Apr. 3, 2007, has been disclaimed.
Int. Cl.[5] G03C *1/34, 7/32*
U.S. Cl. 430—551 21 Claims

21. The light-sensitive silver halide photographic material comprising a support and provided thereon at least one silver halide emulsion layer containing a magenta dye-forming coupler represented by formula M-I;

M-1



wherein Z represents a group of non-metal atoms necessary to complete a nitrogen-containing heterocyclic ring which may have a substituent; X represents a hydrogen atom or a substituent capable of being split off upon reaction with an oxidation product of a color developing agent; and R represents a hydrogen atom or a substituent, wherein an elementary sulfur has been added to said silver halide emulsion at an arbitrary timing before formation of said silver halide emulsion layer on said support.

5,192,653
METHOD FOR SPECTRALLY SENSITIZING SILVER HALIDE PHOTOGRAPHIC EMULSIONS
Tadaaki Tani, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 468,512, Jan. 23, 1990, abandoned. This application Feb. 26, 1992, Ser. No. 840,588
Claims priority, application Japan, Jan. 23, 1989, 1-13377
Int. Cl.[5] G03C *1/015, 1/12*
U.S. Cl. 430—569 11 Claims

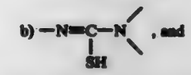
1. A method for spectrally sensitizing a silver halide emulsion comprising the steps of

adding a heterocyclic compound containing a mercapto group to an emulsion in an amount sufficient to increase the ϕ_r, said heterocyclic compound containing one of the following as a partial structure:

a)

and

-continued

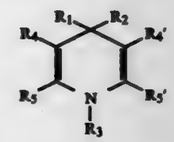
b)  , and

subsequently adding a cyanine dye, which provides a J-band when added to silver halide emulsions, to the silver halide emulsion under a ripening temperature of 60° C. or above and such other conditions such that in the absence of said heterocyclic compound the relative quantum yield ϕ_r of spectral sensitization would assume a value of $\frac{1}{4}$ or less of the ϕ_r of spectral sensitization obtained when the dye is added to the emulsion under ripening conditions of 40° C. and 20 minutes from the time of the addition of the dye to the emulsion until the time of coating the emulsion.

5,192,654
SILVER HALIDE PHOTOGRAPHIC EMULSIONS
Takanori Hioki, and Haruo Takei, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 507,539, Apr. 11, 1990, abandoned. This application Dec. 4, 1991, Ser. No. 801,628
Claims priority, application Japan, Apr. 11, 1989, 1-91241
Int. Cl.[5] G03C *1/28*
U.S. Cl. 430—576 4 Claims

1. A silver halide photographic emulsion including a spectrally sensitizing dye and at least one compound represented by general formula (I) as shown below:

General Formula (I)



wherein R_1 and R_2 each represents a hydrogen atom, an ethyl group or a phenyl group;

R_3 represents a hydrogen atom, a methyl group or a phenyl group;

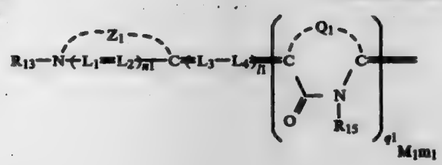
R_4 and R_4' each represents an alkoxycarbonyl group, a cyano group, an acetyl group or a carbamoyl group; and

R_5 and R_5' each represents a methyl group or a phenyl group, wherein the methyl group or phenyl group can be substituted with an adsorbable group represented by $(L_{16})_r$-Het,

wherein L_{16} represents a divalent linking group comprising an atom or group of atoms which includes at least one carbon atom, nitrogen atom or oxygen atom; Het represents a five-, six- or seven-membered heterocyclic ring which contains at least one nitrogen atom and which may contain hetero atoms other than nitrogen; and r is 0, 1 or 2.

2. The silver halide photographic emulsion of claim 1 wherein the spectrally sensitizing dye is a compound represented by general formula (III) or general formula (IV) as shown below:

General Formula (III)



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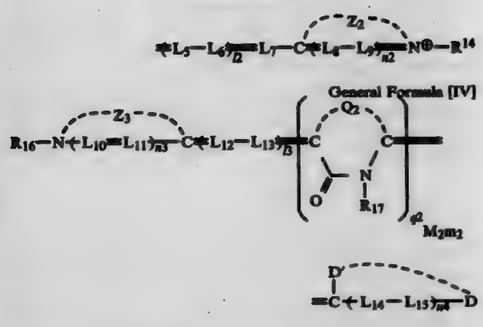


wherein R_{13}, R_{14} and R_{16} represent alkyl groups; R_{15} and R_{17} represent alkyl groups, aryl groups or heterocyclic groups;

Z_1, Z_2 and Z_3 represent groups of atoms which are required to form five or six membered nitrogen containing heterocyclic rings;

Q_1 and Q_2 represent groups of atoms which are required to form five or six membered nitrogen containing heterocyclic rings;

D and D' represent groups of atoms which are required to form cyclic or non-cyclic acidic nuclei;

L_1, L_2, L_3, L_4, L_5, L_6, L_7, L_8, L_9, L_{10}, L_{11}, L_{12}, L_{13}, L_{14} and L_{15} represent methine groups;

n_1, n_2, n_3 and n_4 are 0 or 1;

l_1, l_2 and l_3 represent 0, 1, 2 or 3;

q_1 and q_2 represent 0 or 1;

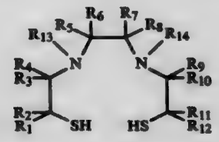
M_1 and M_2 represent charge balancing counter ions;

and m_1 and m_2 are the numbers of value at least zero which are required to balance the charge.

5,192,655
SILVER HALIDE ELEMENTS WITH IMPROVED SPEED AND LOW FOG
Dominic M. Chen, Wilmington, Del., and Raymond J. LeStrange, Hendersonville, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 5, 1991, Ser. No. 726,331
Int. Cl.[5] G03C *1/09*
U.S. Cl. 430—600 8 Claims

1. In a photosensitive element having at least one gelatino silver halide emulsion coated on a support wherein the improvement comprises said emulsion containing a sensitizing amount of a cysteine derivative selected from the group consisting of:

(a)



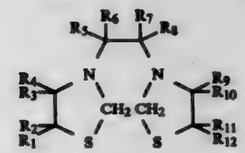
or the HCl or oxalic acid salt thereof wherein

each of R_1–R_{12} individually is selected from the group consisting of H, alkyl of 1–10 carbon atoms and —COOR;

R is H, alkyl of 1–10 carbon atoms, unsubstituted phenyl or phenyl substituted with up to 5 ring substituents each selected from alkyl of 1–4 carbon atoms;

each of R_{13} and R_{14} individually is selected from the group consisting of H and alkyl of 1–10 carbon atoms containing zero of 1 heteroatoms selected from N, O or S and

(b)



or the HCl or oxalic acid salt thereof wherein:

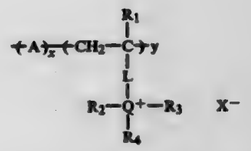
each of R_1–R_{12} individually is selected from the group consisting of H, alkyl of 1–10 carbon atoms and —COOR;

R is H, alkyl of 1–10 carbon atoms, unsubstituted phenyl or phenyl substituted with up to 5 ring substituents each selected from alkyl of 1–4 carbon atoms.

5,192,656
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL
Toshihiro Nishikawa; Shinji Ueda, and Hideo Ueni, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan
Filed Apr. 13, 1988, Ser. No. 181,096
Claims priority, application Japan, Apr. 15, 1987, 62-92371
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[5] G03C *1/005*
U.S. Cl. 430—627 8 Claims

1. A silver halide color photographic light-sensitive element comprising at least one silver halide emulsion layer applied onto a substrate, at least one of the layers being formed from a silver halide emulsion containing not less than 7 mole % of silver iodide, the total amount of iodine included in the silver halide emulsion layers being not less than 4×10^3 moles/m^2 expressed as AgI and an anion exchange polymer represented by the following general formula (I):

(I)



wherein A represents an ethylenically unsaturated monomer unit; R_1 represents a hydrogen atom, or a lower alkyl group having 1 to about 6 carbon atoms; L represents a bivalent group having 1 to about 12 carbon atoms; R_2 to R_4 may be the same or different and each represents an alkyl group having 1 to about 20 carbon atoms, an aralkyl group having 7 to about 20 carbon atoms or a hydrogen atom with the proviso that R_2 to R_4 may form a ring together with O; O represents a nitrogen or phosphorus atom; X represents an anion other than an iodide ion; x is 0 to about 90 mole % and y is about 10 to 100 mole %, which anion exchange polymer is added in an amount of 0.3 to 100 cationic site units per mole of total iodine in the element to at least one of the non-light-sensitive and light-sensitive layers wherein the non-light-sensitive layer is applied to the side of the substrate the same or opposite to that having the light sensitive layers.

5,192,661
system resulting from an organic injury, which comprises the

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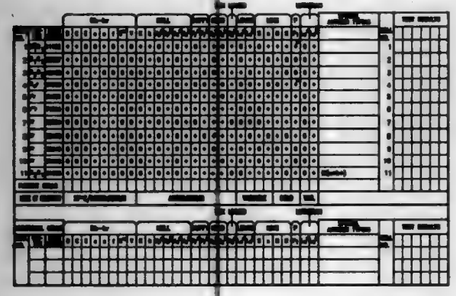
5,192,657
STABILIZED PROTEOLYTIC SOLUTION AND REAGENT KIT
Janice Jakway, Bridgewater, and Dennis Mochnal, Clinton, both of N.J., assignors to Ortho Diagnostic Systems, Inc., Raritan, N.J.
Filed Dec. 18, 1990, Ser. No. 629,307
Int. Cl.[5] C12Q *1/00*
U.S. Cl. 435—4 20 Claims



1. A stabilized proteolytic solution comprising ficin, L-cysteine, and dithiothreitol (DTT) in an acidic aqueous medium.

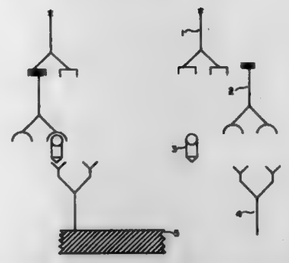
5,192,658
COMPOSITIONS AND PROTOCOLS APPLICABLE TO GENETIC ANALYSIS
Zvi G. Loewy, Bronx, N.Y.; Nancy Y. Ip, Stamford, Conn.; Howard J. Beam, Stony Point, N.Y.; Susan L. Leary, Hopewell Junction, N.Y., and Ingrid L. M. van de Stadt, Ossining, N.Y., assignors to Lifecodes Corporation, Stamford, Conn.
Filed Mar. 30, 1989, Ser. No. 331,414
Int. Cl.[5] C12Q *1/68, 1/00;* C07H *15/12*
U.S. Cl. 435—6 11 Claims

1. A polynucleotide which hybridizes to the human genetic locus D18S27 selected from the group consisting of:
(a) the human DNA insert in plasmid pAC387;
(b) the human DNA insert in plasmid pAC388;
(c) the human DNA insert in plasmid pAC404; and
(d) the human DNA insert in plasmid pAC405.

5,192,659
INTRON SEQUENCE ANALYSIS METHOD FOR DETECTION OF ADJACENT AND REMOTE LOCUS ALLELES AS HAPLOTYPES
Malcolm J. Simons, Fryerstown, Australia, assignor to GeneType AG, Zug, Switzerland
Continuation-in-part of Ser. No. 465,863, Jan. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 405,499, Sep. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 398,217, Aug. 25, 1989, abandoned. This application Jul. 11, 1990, Ser. No. 551,239
Int. Cl.[5] C12Q *1/68;* C12P *19/34*
U.S. Cl. 435—6 11 Claims

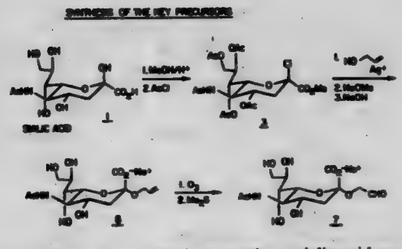
7. A method for detection of at least one allele of an HLA locus comprising:
A. amplifying genomic DNA with a primer pair that spans a non-coding region sequence selected from the group consisting of untranslated sequences between exons, 5' and 3' untranslated regions associated with a genetic locus, and spacing sequences between genetic loci, said primer pair defining a DNA sequence, said DNA sequence being in genetic linkage with said allele and containing a sufficient number of said non-coding region sequence nucleotides to produce an amplified DNA sequence characteristic of said allele; and
B. analyzing said amplified DNA sequence to detect the presence of a genetic variation in said amplified sequence.

5,192,660
ELISA METHODS FOR THE DETERMINATION OF HUMAN PLATELET DERIVED GROWTH FACTOR (PDGF) DIMER FORMS PRESENT IN HUMAN TISSUES AND FLUIDS
Berenice Y. Reed-Gitomer, Washington Grove, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Apr. 24, 1989, Ser. No. 341,949
Int. Cl.[5] G01N *33/543*
U.S. Cl. 435—7.21 10 Claims

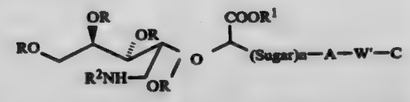


1. An enzyme linked immunosorbent assay for the quantitative determination of human platelet derived growth factor homodimer BB and heterodimer AB present in human bodily fluids, tissue extracts, or a fluid contacting human cells in culture, which comprises the steps of:
(I) providing an anti-human platelet derived growth factor homodimer BB polyclonal antibody coated surface;
(II) contacting a test sample of a patient's bodily fluid, tissue extract or a fluid contacting said patient's cells in culture, with said coated surface to bind human platelet derived growth factor homodimer BB or heterodimer AB present in said patient's bodily fluids, tissue extracts, or a fluid contacting said patient's cells in culture, to said coated surface;
(III) contacting, after step II, a second anti-platelet derived growth factor polyclonal antibody with said coated surface, to bind said second antibody to said coated surface when human platelet derived growth factor homodimer BB or heterodimer AB has previously bound to said coated surface in step II;
(IV) contacting after step III, an enzyme labelled antibody, which is reacted with said second antibody, with said coated surface to bind said enzyme labelled antibody to said coated surface when said second antibody has previously bound to said coated surface in step III;
(V) contacting after step IV, said coated surface with a chemical enzyme label indicator which indicates the presence of said enzyme labeled antibody bound to said coated surface; and
(VI) quantitatively determining the amount of said human platelet derived growth factor homodimer BB and heterodimer AB which are present in the test sample based on the amount of the enzyme labelled antibody bound to the coated surface.

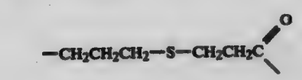
5,192,661
MULTICOMPONENT KIT CONTAINING AN ANTIBODY TO A SYNTHETIC ANTIGEN OF SIALIC ACID
Rene Roy, Gatineau, and Craig A. Laferriere, Mississauga, both of Canada, assignors to University of Ottawa, Ottawa, Canada
Division of Ser. No. 81,431, Aug. 4, 1987, Pat. No. 5,034,516.
This application May 31, 1991, Ser. No. 708,671
Int. Cl.[5] C12Q *1/00;* G01N *33/53;* C07K *3/00, 15/00*
U.S. Cl. 435—7.23 2 Claims



1. A multicomponent kit for detecting a sialic acid-containing antigen in a sample which kit comprises at least first and second components are in separate containers, said first component comprising an antibody which selectively binds to a compound having a terminal sialic acid moiety, said compound having the formula



wherein each R separately represents hydrogen or acetyl,
R^1 represents hydrogen, methyl, sodium or potassium;
R^2 represents hydrogen, acetyl or hydroxyacetyl; each (sugar) represents a sugar moiety selected from the group consisting of galactose, glucose and lactose;
n is 0, 1 or 2,
A represents a heteroatom selected from the group consisting of oxygen, sulphur, and nitrogen and stands for or replaces an oxygen atom at the reducing end of the sugar moiety or sialic acid moiety; and
W' represents $—CH_2CH_2CH_2—S—CH_2CH_2NHCOCH_2CH_2—$, $—CH_2—CH_2—$, $—CH_2CH_2CH_2—S—CH_2CH_2NH—$,



$—CH_2CH_2CH_2—S—CH_2CH_2C$

or $—CH_2CH_2CH_2—S—CH_2CH_2NHCOCH_2—$; and
C constitutes a carrier,
said second component comprising detection means for detecting a reaction between said antibody and said compound.

5,192,662
ANTI-GANGLIOSIDE GD_1A MONOCLONAL ANTIBODY MZ, MZ-PRODUCING CELLS AND MZ-CONTAINING REAGENT
Shimo Shimada; Daiji Iwata, both of Mobara, and Wakao Sato, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Sep. 7, 1988, Ser. No. 241,291
Claims priority, application Japan, Sep. 7, 1987, 62-221862
Int. Cl.[5] G01N *33/574, 33/532;* C07K *15/28*
U.S. Cl. 435—7.23 10 Claims

5. A method of screening for cancer, systemic lupus erythematosus (SLE) and pathological conditions of the nervous system resulting from an organic injury, which comprises the steps of:
(a) binding ganglioside GD_{1a} present in a mixture of gangliosides in the serum of a sample of mammalian blood from an individual being diagnosed for cancer, SLE or a pathological condition of the nervous systems to an anti-ganglioside GD_{1a} monoclonal antibody;
(b) separating the thus-produced GD_{1a}-antibody complex from the other gangliosides; and
(c) detecting and determining the relative proportion of GD_{1a} present in the sample of blood compared to that present in a corresponding sample of blood from a healthy human being.

5,192,663
ARTICLE HAVING AN ORGANIC DYE AND A MONOLAYER OF DRIED MAMMALIAN CELLS AND A METHOD FOR UTILIZING THE ARTICLE
Lyle T. Sinor, and Ralph A. Estr, both of Roswell, Ga., assignors to Immunocor, Inc., Norcross, Ga.
Division of Ser. No. 267,014, Nov. 4, 1988, Pat. No. 5,030,560.
This application May 21, 1991, Ser. No. 702,888
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] G01N *33/543*
U.S. Cl. 435—7.25 18 Claims

1. An article for performing solid-phase immunological assays comprising:
a solid phase support;
a coating of an organic dye having a net-positive charge and a hydrophobic aromatic ring structure adsorbed to said support; and
a dried monolayer comprising a sugar, a salt, and mammalian cells said mammalian cells antigenicity having been substantially preserved, immobilized to said organic dye.

5,192,664
PARATHYROID HYPERTENSIVE FACTOR, ANTIBODIES AND USES THEREOF
Peter K. T. Pang, 52225 Range Road 232, 205 Carriage Lane, Sherwood Park, Alberta, Canada T8A 2A5; Richard Z. Lewanczuk, Edmonton, Canada; Christine G. Beninger, Ardrossen, Canada, and Toyoji Kaneko, Kanagawa, Japan, assignors to Peter K. T. Pang, Alberta, Canada
PCT No. PCT/US90/01577, § 371 Date Nov. 21, 1990, § 102(e) Date Nov. 21, 1990, PCT Pub. No. WO90/11074, PCT Pub. Date Oct. 4, 1990
Continuation-in-part of Ser. No. 327,450, Mar. 22, 1989, abandoned, and a continuation-in-part of Ser. No. 460,482, Jan. 3, 1990. This PCT application Nov. 21, 1990, Ser. No. 693,745
Int. Cl.[5] C12Q *1/00;* C07K *15/00*
U.S. Cl. 435—79 15 Claims

1. Substantially pure parathyroid hypertensive factor.
2. Substantially pure parathyroid hypertensive factor according to claim 1 having a molecular weight of about approximately 3,000 to 4,000 daltons.
4. A method for the preparation of substantially pure parathyroid hypertensive factor comprising:
(a) isolating blood plasma from a hypertensive mammal;
(b) removing components having a molecular weight less than 1,000 daltons from said plasma by dialysis against distilled water to obtain a dialysate;
(c) separating plasma components having a molecular weight lower than 5000 daltons from said dialysate by ultrafiltration to obtain a filtrate;
(d) concentrating the filtrate by lyophilization to obtain a concentrate;
(e) fractionating said concentrate on a molecular sieve column and eluting to obtain a plurality of fractions and identifying the fraction having hypertensive factor activity;

(f) concentrating said fraction having parathyroid hypertensive factor activity by lyophilization; and
(g) purifying the fraction obtained in step (f) by reverse phase HPLC.

14. A kit for the detection of parathyroid hypertensive factor in a mammal, comprising, in a single package:
a) an antibody to parathyroid hypertensive factor bound to a solid phase;
b) a secondary antibody to anti-parathyroid hypertensive factor antibody labeled with an enzyme;
c) a substrate for said enzyme label on said secondary antibody; and
d) standard solutions of parathyroid hypertensive factor.

5,192,665

METHOD OF OPHTHALMIC TESTING

Eeva-Marjatta Salonen, Espoo, Finland, assignor to Labsystems Oy, Helsinki, Finland

Division of Ser. No. 838,339, Mar. 11, 1986, Pat. No. 4,849,406.
This application Apr. 11, 1989, Ser. No. 336,249
Int. Cl.[5] C12Q *1/34*
U.S. Cl. 435—18 4 Claims

1. A method of determining the presence of epithelial lesions of an eye of a patient which comprises, taking a sample of tears from an epithelial region of the eye suspected to have said lesions, and testing said tears for the presence of a plasmin.

3. A method of detecting allergic sensitivity of a patient to an allergen which comprises administering said allergen to an eye and testing tears of said patient for proteolytic activity.

5,192,666

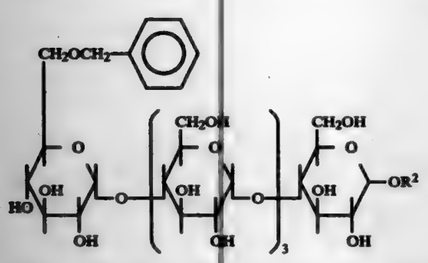
α-AMYLASE ASSAY USING MODIFIED OLIGOSACCHARIDE AND PROCESS FOR PRODUCING SAID MODIFIED OLIGOSACCHARIDE

Tokuji Ikezaka, Sakai; Kaoru Omichi, Toyonaka; Shinji Satosawa, Osaka, and Yuko Nagamine, Toyonaka, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

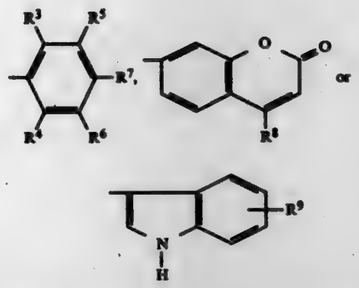
Continuation of Ser. No. 72,208, Jul. 10, 1987, abandoned. This application Dec. 29, 1989, Ser. No. 465,660
Claims priority, application Japan, Jul. 11, 1986, 61-163054; Jan. 9, 1987, 62-2730; Jan. 26, 1987, 62-15776
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[5] C12Q *1/40, 1/34, 1/54, 1/00;* C07H *1/00, 3/00, 15/00, 17/00, 17/02;* C08B *37/00, 30/18;* C07G *3/00*
U.S. Cl. 435—22 4 Claims

1. A process for determining the activity of α-amylase in a sample which comprises
using as a substrate for α-amylase a modified oligosaccharide of the formula:

(I)



wherein R^2 is selected from the group consisting of the formula (III):



(III)

in which R^3 through R^6 are independently hydrogen, a lower alkyl group, a lower alkoxy group, a nitro group, a carboxyl groups, a sulfonic acid group or a halogen atoms, and R^3 and R^5 or R^4 and R^6, together with the ring toms to which they are attached may form a fused aromatic ring; R^7 is hydrogen, a lower alkoxy group, a halogen atom or a nitro group; R^8 is hydrogen, a methyl group or a trifluoromethyl group; R^9 is a hydrogen or a halogen atom,
contacting said sample with said substrate in the presence of at least one exo-enzyme, and
measuring an optically measurable change as a measure of α-amlase activity in said sample.

5,192,667

METHOD FOR EVALUATING ANTI-FOULING PAINTS

Arthur V. Stiffey, Slidell, La., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1989, Ser. No. 394,400
Int. Cl.[5] C12Q *1/18*
U.S. Cl. 435—32 14 Claims

1. A method of assaying marine paints for their ability to inhibit attachment and growth of marine fouling organisms, which comprises the steps of:
applying a preselected volume of a marine paint solution to a bottom surface in a first test container;
drying the paint solution to form a dried paint coating on the first test container bottom surface;
adding a preselected volume of an assay medium to the first test container, the assay medium containing a predetermined number per unit volume of bioluminescent dinoflagellate cells of the genus Pyrocystis;
after a preselected settling time, agitating the dinoflagellate cells in the first test container for a preselected agitation time while simultaneously measuring the light output of the dinoflagellate cells in the first test container.

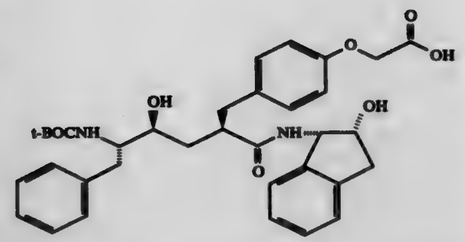
5,192,668

SYNTHESIS OF PROTEASE INHIBITOR

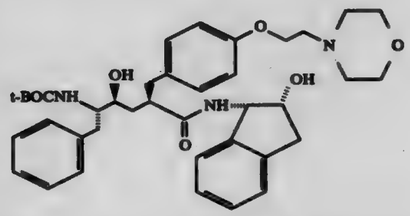
Laszlo R. Treiber, Gillette; Lawrence F. Colwell, Jr., Estontown; Byron H. Arison, Watchung; Georgette Deseny, Short Hills; Russell B. Lingham, Watchung, all of N.J.; Wayne J. Thompson, Lansdale, and Suresh K. Balani, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 595,095, Oct. 11, 1990, abandoned.
This application Feb. 27, 1992, Ser. No. 842,814
Int. Cl.[5] C12P *1/00, 21/04*
U.S. Cl. 435—41 1 Claim

1. A method of preparing a compound of the formula:



comprising the steps of
(1) providing a quantity of N-(Cis-2(R)-hydroxy-1(S)-indanyl)-5(S)-(1,1-dimethylethoxycarbonylamino)-4(S)-hydroxy-6-phenyl-2(R)-((4-(2-(4-morpholinyl)ethoxy)-phenyl)methyl)-hexanamide of the formula:



(2) incubating the compound of step (1) with Streptomyces culture #S-26-487 at temperatures ranging from about 20° C. to about 42° C. and at a pH in the range of from about 5.5 to 8.0 under aerobic conditions to prepare compound 1; and
(3) isolating the compound produced by step (2).

5,192,669

METHOD TO PRODUCE RECOMBINANT PROTEINS USING AN EXPRESSION VECTOR COMPRISING TRANSCRIPTIONAL AND TRANSLATIONAL ACTIVATING SEQUENCES

Brigitte E. Schoner, and Ronald G. Schoner, both of Monrovia, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 449,199, Dec. 12, 1989, Pat. No. 5,063,158, which is a continuation-in-part of Ser. No. 118,678, Nov. 9, 1987, abandoned. This application Aug. 13, 1991, Ser. No. 744,612
Int. Cl.[5] C12P *21/06;* C12N *1/20, 15/00*
U.S. Cl. 435—69.4 28 Claims

1. A method for producing a polypeptide, the method comprising
1) transforming a prokaryotic cell with a recombinant DNA expression vector which sequentially comprises
a) a transcriptional activating sequence,
b) a translational activating sequence selected from the group consisting of

```
1) 5'-CTAGAGGGTATTAATAATCTATCGATTA
                |||||||||||||||||||||||||
   3'-  TCCCATAATTATTAGATAGCTAAT
        AATAAGGAGGAATAACA   -3'
        |||||||||||||||||
        TTATTCCTCCTTATTGTAT-5'

2) 5'-CTAGAGGGTATTAATAATCTATCGATTT
                |||||||||||||||||||||||||
   3'-  TCCCATAATTATTAGATAGCTAAA
        AATAAGGAGGAATAACA   -3'
        |||||||||||||||||
        TTTATTCCTCCTTATTGTAT-5'
```



```
3) 5'-CTAGAGGGTATTAATAATCTATCGATTT
                |||||||||||||||||||||||||
   3'-  TCCCATAATTATTAGATAGCTAAA
        AAAAAAGGAGGAATATAA  -3'
        |||||||||||||||||||
        TTTTTTCCTCCTTATATTAT-5'

4) 5'-CTAGCGATTAAATAAGGAGGAATAACA  -3'
                |||||||||||||||||||||||||||
   3'-  GCTAATTTATTCCTCCTTATTGTAT-5'

5) 5'-CTAGCGGATCCGCGATTAAATAAGGAGG
                |||||||||||||||||||||||||||
   3'-  GCCTAGGCGCTAATTTATTCCTCC
        AATAACA  -3'
        |||||||
        TTATTGTAT-5'

6) 5'-CTAGCGTTAACGCGATTAAATAAGGAGG
                |||||||||||||||||||||||||||
   3'-  GCAATTGCGCTAATTTATTCCTCC
        AATAACA  -3'
        |||||||
        TTATTGTAT-5'

7) 5'-CTAGCGATTTAAATAAGGAGGAATAACA  -3'
                |||||||||||||||||||||||||||||
   3'-  GCTAAATTTATTCCTCCTTATTGTAT-5'
```

and

```
8) 5'-CTAGCGGGATCCCGCGATTTAAATAAGG
                |||||||||||||||||||||||||||
   3'-  GCCCTAGGGCGCTAAATTTATTCC
        AGGAATAACA  -3'
        ||||||||||
        TCCTTATTGTAT-5'
```

wherein
A is deoxyadenyl,
G is deoxyguanyl,
C is deoxycytidyl,
T is thymidyl, and
c) a DNA sequence that codes for the functional polypeptide with a methionine as the first amino acid at the amino-terminus; subject to the limitation that sequences a and b are positioned for microbial expression of sequence c and

2) culturing the transformed cell under conditions suitable for gene expression.

5,192,670

Patent Not Issued For This Number

5,192,671

PROCESS FOR THE GLYCOSYLATION OF AVERMECTIN COMPOUNDS

Byron H. Arison, Watchung; Marvin D. Schulman, Scotch Plains, and Patrick J. Doherty, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 26, 1991, Ser. No. 721,744
Int. Cl.[5] C12P *19/04*
U.S. Cl. 435—101 5 Claims

1. A process for the preparation of a compound having the formula:

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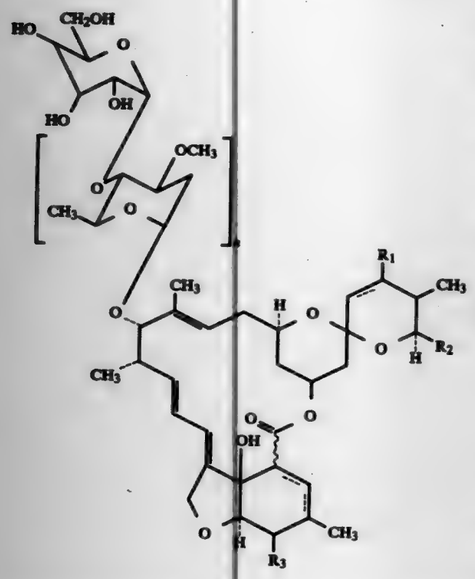


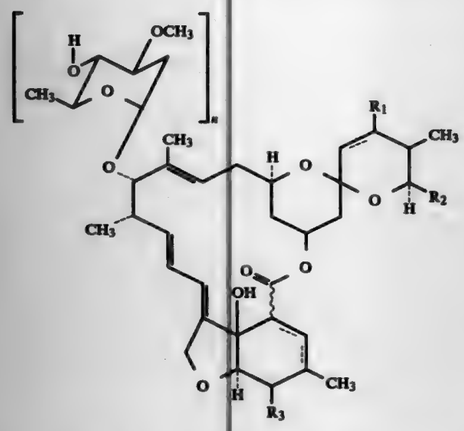
wherein the broken line at the 22, 23-position indicates a single or a double bond at the 22, 23-position;

n is 1 or 2

R_1 is present only when the broken line represents a single bond at the 22, 23-position and is hydrogen or hydroxy;

R_2 is alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms or cycloalkyl of 3 to 8 carbon atoms;

R_3 is hydroxy or methoxy; and the broken line at the 2,3,4-position indicates a double bond at either the 2,3-position or the 3,4-position, which comprises fermenting in a nutrient medium containing sources of carbon, sources of nitrogen and inorganic salts, Saccharopolysporaerythrea ATCC 11635, at a pH of from 5 to 8.5, a temperature of from 20° to 40° C., for from 2 to 10 days, from 0.1 to 10 mg/ml of fermentation medium a compound having the formula:



where n, R_1, R_2, and R_3 are as defined above and recovery of the products from the fermentation medium.

5,192,672

METHOD FOR OXIDIZING HYDROCARBONS WITH A HYDROXYLASE FROM A METHANE MONOOXYGENASE

John D. Lipscomb, Wayzata, Minn., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 600,575, Oct. 8, 1990, which is a continuation-in-part of Ser. No. 352,721, May 16, 1989, abandoned. This application Jan. 21, 1991, Ser. No. 718,620

Int. Cl.[5] C12P 17/12, 17/02; C12N 1/26, 1/28

U.S. Cl. 435—155 8 Claims

1. A method for oxidizing hydrocarbons in the absence of reductase and B components of a soluble methane monooxygenase comprising contacting purified hydroxylase from a soluble methane monooxygenase with said hydrocarbons and hydrogen peroxide until at least a portion of the corresponding oxidized product is produced in an isolable amount.

5,192,673

MUTANT STRAIN OF *C. ACETOBUTYLICUM* AND PROCESS FOR MAKING BUTANOL

Mahendra K. Jain, Okemos; Daniel Beacom, East Lansing, both of Mich., and Rathin Datta, Chicago, Ill., assignors to Michigan Biotechnology Institute, East Lansing, Mich.

Filed Apr. 30, 1990, Ser. No. 516,610

Int. Cl.[5] C12P 7/16; C12N 1/20

U.S. Cl. 435—160 2 Claims

1. A method of producing butanol which comprises anaerobically culturing a biologically pure culture of *Clostridium acetobutylicum* ATCC 55025 in a nutrient medium with assimilable sources of carbon, nitrogen, and inorganic substances and then recovering the butanol.

5,192,674

THERMOSTABLE DNA POLYMERASE THERMUS THERMOPHILUS AND A METHOD OF PRODUCING THE SAME

Tairo Oshima, Machida; Hitoshi Sakashita; Hakuji Matsumoto, both of Ohtsu, and Yoshihiko Maekawa, Tsuruga, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1989, Ser. No. 398,178

Claims priority, application Japan, Aug. 26, 1988, 63-213330

Int. Cl.[5] C12N 9/12

U.S. Cl. 435—194 1 Claim

1. A DNA polymerase derived from *Thermus thermophilus* which has the following characteristics:

(1) it catalyzes the elongation reaction of nucleotide sequence that is complementary to a template nucleotide sequence, using nucleoside triphosphates as substrates;

(2) its optimal pH is approximately 8.0;

(3) its optimal temperature is approximately 75° C.;

(4) it requires magnesium ions, and the optimal magnesium ion concentration being in the range from 6 to 20 mM;

(5) its optimal saline concentration is approximately 20 to 60 mM of sodium chloride or potassium chloride;

(6) its molecular weight is approximately 85,000 to 95,000 daltons (measured by sodium dodecyl sulfate polyacrylamide gel electrophoresis); and

(7) it retains at least about 60% of its activity when placed in a solution comprising 67 mM tris HCl, pH 8.0, 16.6 mM ammonium sulfate, 6.7 mM magnesium chloride, 10 mM 2-mercaptoethanol and 170 μg/ml BSA for 2 hours at 85° C.

5,192,675

CLONED KPNI RESTRICTION-MODIFICATION SYSTEM

Deb K. Chatterjee, N. Potomac, and Alan W. Hammond, Gaithersburg, both of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Division of Ser. No. 496,283, Mar. 20, 1990, Pat. No. 5,082,784. This application Jan. 17, 1992, Ser. No. 822,047

Int. Cl.[5] C12N 9/22

U.S. Cl. 435—199 18 Claims

1. A method of producing a restriction endonuclease which recognizes the palindromic sequence:

5'G GTAC'C3'

3'C'CTAG G5'

wherein said endonuclease cleaves said sequence between the C residues, producing a four-base 3' extension, said method comprising the steps of:

(a) culturing a recombinant host expressing a gene encoding said restriction endonuclease; and

(b) isolating said restriction endonuclease.

5,192,676

TYPE II RESTRICTION ENDONUCLEASE, ASCI, OBTAINABLE FROM ARTHROBACTER SPECIES AND A PROCESS FOR PRODUCING THE SAME

Richard D. Morgan, Middleton, Mass., assignor to New England Biolabs, Inc., Beverly, Mass.

Filed Feb. 5, 1991, Ser. No. 650,802

Int. Cl.[5] C12N 9/22

U.S. Cl. 435—199 5 Claims

1. A substantially pure Type II restriction endonuclease AscI, which recognizes the following base sequence in double-stranded deoxyribonucleic acid molecules:

and has a cleavage position defined by the arrows.

5,192,677

ALKALI AND HEAT STABLE PROTEASE FROM THERMOMONOSPORA FUSCA

John E. Kinsella; Todd W. Gasek, and David B. Wilson, all of Ithaca, N.Y., assignors to Cornell Research Foundation Inc., Ithaca, N.Y.

Continuation of Ser. No. 174,168, Mar. 28, 1988, which is a continuation-in-part of Ser. No. 930,090, Nov. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 860,934, May 8, 1986, abandoned. This application Jan. 11, 1991, Ser. No. 713,602

Int. Cl.[5] C12N 9/52, 9/50

U.S. Cl. 435—220 18 Claims

1. An exocellular protease from *Thermomonospora fusca* YX having the following physicochemical properties:

(1) molecular mass:

the protease has a molecular mass of from about 10,000 to 14,000 Daltons as measured by SDS-polyacrylamide gel electrophoresis;

(2) influence of inhibitors:

the protease activity is inhibited by serine protease inhibitors;

(3) substrate specificity:

a non-specific protease which can hydrolyze food proteins and bovine serum albumin at a rate of 50–100 nmoles peptide bonds/μm enzyme/minute at 55° C., pH 8.5 in 0.05M Tris buffer without showing any substrate and/or product inhibition;

(4) reactivity:

a broad spectrum serine type protease having activity at least 5 times greater than trypsin or chymotrypsin towards bovine serum albumin and food proteins;

(5) optimum activity temperature and temperature range:

the optimum activity temperature is 80° C. at a pH of 8.0 in 0.05M Tris buffer at an ionic strength of 0.2M NaCl; The temperature range is 35° to 95° C. under the same pH, buffer and ionic strength;

(6) pH range and optimum pH value:

the protease has a pH activity range of from about 7 to 11, and the optimum pH is 9.0;

(7) tolerance to ionic strength conditions and optimum ionic strength:

the protease is tolerant to ionic strengths of from 0.0 to about 1.0M NaCl; Optimum ionic strength is 0.2M NaCl;

(8) isoelectric point:

the isoelectric point is at an alkaline pH; and

(9) structure:

the protease is a monomer.

5,192,678

CEPHALOSPORIN C ACYLASE

Morita Iwami, Tsukuba; Ichiro Aramori, Kyoto; Masao Fukagawa, Tsuchiura; Takao Isogai, Ibaraki, and Hitoshi Kojo, Tsuchiura, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 20, 1991, Ser. No. 747,901

Claims priority, application United Kingdom, Sep. 10, 1990, 9019724

Int. Cl.[5] C12N 9/80

U.S. Cl. 435—228 2 Claims

1. An isolated and purified cephalosporin C acylase having the following characteristics:

(a) has ability to catalyze the enzymatic conversion of cephalosporin C, glutaryl 7-ACA, adipyl 7-ACA, succinyl 7-ACA, N-acetylcephalosporin C, N-benzoylcephalosporin C and cephalothin into 7-amino cephalosporanic acid,

(b) is composed of an α-subunit with a molecular weight of 26,000 daltons as measured by SDS-PAGE and a β-subunit with a molecular weight of 58,000 daltons as measured by SDS-PAGE,

(c) has N-terminal amino acid sequence of the α-subunit: Thr-Met-Ala-Ala-Asn-Thr-Asp-Arg-Ala-Val-Leu-Gln-Ala-Ala-Leu-Pro-Pro-Leu- (SEQ ID NO:1).

5,192,679

GROWING EHRLICHIA SPECIES IN A CONTINUOUS CELL LINE

Jacqueline E. Dawson, Atlanta, Ga., and Yasuko Rikihisa, Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

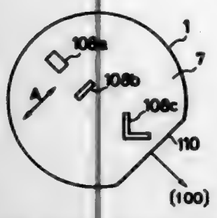
Filed May 3, 1990, Ser. No. 518,182

Int. Cl.[5] C12N 5/00, 1/04

U.S. Cl. 435—243 5 Claims

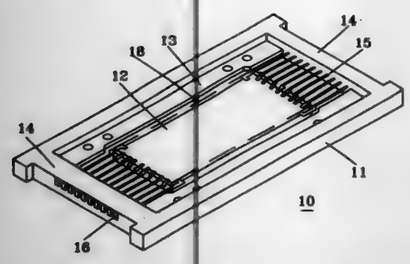
1. A method for continually growing a bacterial pathogen comprising infecting the immortal, canine, macrophage cell line DH82 with *Ehrlichia canis* and cultivating the infected cells in a suitable culture medium until at least 30% of the DH82 cells are infected.

5,192,680
METHOD FOR PRODUCING SEMICONDUCTOR DEVICE
Yasuhiro Naruse, Isehara; Gozoo Mosuna, Tokyo, and Hiroshi Yamashara, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1989, Ser. No. 360,341
Claims priority, application Japan, Jun. 6, 1988, 63-138866; Feb. 9, 1989, 1-29686
Int. Cl.[5] H01L *21/205*
U.S. Cl. 437—81 3 Claims



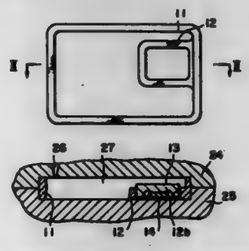
1. A method for producing a semiconductor device comprising:
(i) preparing a semiconductor wafer having an isotropic crystal growth speed as a semiconductor substrate, said semiconductor wafer has a (100) orientation flat;
(ii) forming a desired pattern of an embedded layer on surface of said semiconductor wafer;
(iii) forming a stepped pattern on the surface of said wafer such that at least one of the edges of said stepped pattern forms an angle less than 90° with respect to a direction of faster crystal growth of said wafer;
(iv) growing an epitaxial layer on said wafer; and
(v) effecting the alignment of said semiconductor wafer utilizing, as a reference, a step appearing on the surface of said epitaxial layer whereby the semiconductor device having a semiconductor substrate, an embedded layer and a epitaxial layer is formed.

5,192,681
LOW COST ERASABLE PROGRAMMABLE READ ONLY MEMORY PACKAGE
Anthony M. Chiu, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 576,310, Aug. 31, 1990, Pat. No. 5,136,367.
This application Apr. 14, 1992, Ser. No. 868,606
Int. Cl.[5] H01L *21/60*
U.S. Cl. 437—217 2 Claims



1. A method for manufacturing a low cost package for Erasable-Programmable-Read-Only-Memory device, including a tape leadframe having leads integral connected to the top side of the semiconductor chip, comprising the steps of:
inner lead bonding to leads on a tape leadframe through bumped contacts;
cutting the tape having mounted semiconductor chips into strips of a plurality of mounted chips;
coating the top side of the mounted semiconductor chip with a thin layer of an ultra violet transmissive material;
molding a frame around the encapsulated chip;
trim dam bars;
deflash leads;
singulate the molded frame from the strips;
form test contacts;
test the device; and
trim the semiconductor device from the molded frame prior to mounting the device.

5,192,682
MANUFACTURING METHOD FOR THIN SEMICONDUCTOR DEVICE ASSEMBLIES
Syojiro Kodai, Itami, and Osamu Murakami, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 10, 1991, Ser. No. 697,963
Claims priority, application Japan, May 10, 1990, 2-121554
Int. Cl.[5] H01L *21/52, 21/56, 21/58*
U.S. Cl. 437—219 8 Claims



1. A manufacturing method for a thin semiconductor device assembly comprising sequentially:
forming a unitary frame for a thin semiconductor device assembly including an external frame having opposed first and second surfaces and a side surface transverse to the first and second surfaces for forming a periphery of a thin semiconductor device assembly and an internal frame for positioning an IC module in the external frame;
positioning an IC module including an integrated circuit and a substrate on which the integrated circuit is mounted, the substrate having an electrode terminal surface on which electrode terminals are disposed, in the internal frame so that the electrode terminal surface of the IC module is; substantially coplanar with the second surface;
filling the external and internal frames with a resin, thereby fixing the IC module in place within the unitary frame; and
curing the resin.

5,192,683
MONOCLONAL ANTIBODIES TO CRUCIFORM DNA STRUCTURE
Gerald Price, Montreal; Maria Zannis-Hadjopoulos, Westmount, both of Canada, and Lori Frappier, New York, N.Y., assignors to The Royal Institution for the Advancement of Learning (McGill University), Quebec, Canada
Continuation-in-part of Ser. No. 16,356, Feb. 19, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 223,610
Int. Cl.[5] C12N *5/20, 15/02;* C07K *15/28;* C12P *21/08*
U.S. Cl. 435—240.27 12 Claims

1. A monoclonal antibody of class IgG produced by a hybridoma formed by fusion of cells from a mouse myeloma line and spleen cells from a mouse previously immunized with a stable heteroduplex constructed from two DNA plasmids said heteroduplex possessing at least one cruciform structure, wherein the antibody:
a) binds specifically to stable cruciform DNA structures;
b) binds specifically to heteroduplex T-shaped DNA structures;
c) does not bind to either double stranded or single stranded linear DNA;
d) does not bind to single stranded DNA containing a single stem-loop or hairpin; and
e) does not bind to native yeast tRNA.

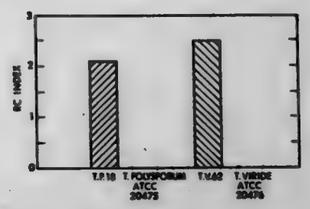
5,192,684
HUMAN IGG$_1$ MONOCLONAL ANTIBODY SPECIFIC FOR THE NICOTINIC ACETYLCHOLINE RECEPTOR AND HYBRIDOMA PRODUCING THE ANTIBODY
Masao Tanihara; Hideaki Yamada, both of Kurashiki; Toshihide Nakashima, Toyonaka; Yoshiaki Omura, Mitsu, and Koichi Takahara, Nishinomiya, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan
Filed Mar. 30, 1988, Ser. No. 175,304
Claims priority, application Japan, Sep. 5, 1987, 62-223174
Int. Cl.[5] C12N *5/24, 15/02;* C07K *15/28;* C12P *21/08*
U.S. Cl. 435—240.27 2 Claims

1. Hybridoma strain T/G-59(5C) which is deposited with the Fermentation Research Institute under the accession number FERM BP-1798, obtained by the fusion of human cells which produce an antibody against nicotinic acetylcholine receptor with propagable human lymphoblastoid cell line G(Ag$_1$)$_2$-cl 7B, whereby said hybridoma produces a human IgG$_1$ monoclonal antibody which possesses a molecular weight on the range of 180,000±20,000 Daltons as measured under non-reducing conditions by the method of polyacrylamide gel electrophoresis performed in the presence of sodium dodecyl sulfate and is specific for nicotinic acetylcholine receptor.

5,192,685
BIFIDOBACTERIUM STRAINS HAVING HIGH IGA INDUCTION POTENTIAL
Hisako Yasui; Kazuhito Hayakawa; Makoto Ohwaki, and Tatsuhiko Kan, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan
Filed Apr. 20, 1990, Ser. No. 512,131
Claims priority, application Japan, Apr. 21, 1989, 1-100282
Int. Cl.[5] C12Q *1/00*
U.S. Cl. 435—252.1 4 Claims

1. A biologically pure bacterial strain selected from *Bifidobacterium longum* or *Bifidobacterium breve* having IgA induction potential of 12 or more, which is obtained by the method comprising:
culturing, aseptically in a culture medium, cells of Peyer's patch containing a great amount of IgA production cells, bacterial strains,
adding a solution of a substance which has IgA induction potential to be screened, or a suspension thereof, to the culture medium for culturing for a given period,
measuring the IgA secreted from the IgA production cells in the culture medium after culturing for a given period, and
isolating said strain having IgA induction potential, of 12 or more based on a ratio of the produced IgA in a group containing said bacterial strain to that in a group without said bacterial strain,
said bacterial strain being that of *Bifidobacterium longum* (*B. longum*) or *Bifidobacterium breve* (*B. breve*).

5,192,686
RHIZOSPHERE-COMPETENT TRICHODERMA STRAINS
Syed J. Ahmad, Tahir Ahmadiyya Muslim High School, Mamelodi (L.R.D.) The Gambia, South Africa, and R. Ralph Baker, 1216 Southridge, Ft. Collins, Colo. 80521
Continuation of Ser. No. 72,347, Jul. 10, 1987, abandoned. This application Apr. 20, 1990, Ser. No. 512,748
Int. Cl.[5] C12N *1/14, 15/00;* A01N *63/00;* A01C *1/06*
U.S. Cl. 435—254 2 Claims



1. A rhizosphere competent biocontrol agent, said biocontrol agent comprising *Trichoderma polysporum* ATCC 20852.

5,192,687
ELECTROENZYMATIC METHOD FOR PRODUCING COMPOUNDS OF CONTROLLED ENANTIOMERIC PURITY
Christian Bourdillon, Le Meux; Jacques Moiroux; Jacques P. B. Bonnefoy, both of Paris, and Jean-Marc Laval, Compiegne, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France
PCT No. PCT/FR88/00189, § 371 Date Sep. 29, 1989, § 102(e) Date Sep. 29, 1989, PCT Pub. No. WO88/08029, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 15, 1988, Ser. No. 432,760
Claims priority, application France, Apr. 17, 1987, 87 05547
Int. Cl.[5] C12P *7/02, 13/04, 7/56*
U.S. Cl. 435—280 18 Claims

1. A process for producing a compound of controlled enantiomeric purity, D-isomer or L-isomer, respectively, from a) a substrate which consists of the oxidized form of the corresponding D/L-P racemate, b) the D/L-P racemate, or c) the optical isomer which is the inverse of that desired; the process comprising introducing (a), (b), or (c), together with an oxidoreductase enzyme capable of catalyzing reversible oxidation of (c) to form a reaction medium, into an electrochemical reactor having electrodes, applying sufficient potential difference between the electrodes to effect non-stereospecific cathodic reduction of (a) until the compound having the desired enantiomeric purity is obtained, and regenerating cosubstrate of the enzyme by anodic oxidation in the electrochemical reactor.

5,192,688
HISTOLOGICAL ANALYSIS METHOD
Robert C. Switzer, III, 10053 Thornton Dr., Knoxville, Tenn. 37922; Shannon K. Campbell, Laurel Ave., Knoxville, Tenn. 37919, and Tere L. Murdock, 6781 Shoreline Cir., Memphis, Tenn. 38115
Continuation of Ser. No. 232,675, Aug. 15, 1988, abandoned. This application Sep. 25, 1991, Ser. No. 765,378
Int. Cl.[5] G01N *21/75*
U.S. Cl. 436—63 8 Claims

1. A method for the histological analysis of tissue for the hallmarks of Alzheimer's Disease comprising the steps of:
selecting a section of nerve tissue,
incubating said section in a first solution of pyridine, silver and carbonate for a period of time sufficient to cause said solution to substantially permeate said section and generate multiple silver micronuclei sites within selected ones of the cell components of said tissue,

said pyridine being present in said first solution at a concentration of between about 2.5% and 12% by volume, developing said section in a physical developer solution comprising (a) silver ions, alkali metal carbonate, ammonium nitrate, Tungstosilicic acid, and formaldehyde as a reducing agent, for time sufficient to produce silver deposits at micronuclei sites generated during incubation of said section,

said quantity of reducing agent being effective for providing control over the development of the micronuclei sites,

thereafter subjecting said section to a dilute acid solution for a time sufficient to reduce the pH of the environment of the section to below about 7 and halt further reduction of silver within said section, and

analyzing said section of nerve tissue for the presence of the hallmarks of Alzheimer's Disease, including neuritic plaques and neurons with neurofibrillary tangles.

5,192,689

METHOD FOR DETERMINING THE ENDOGENOUS THROMBIN POTENTIAL OF PLASMA AND BLOOD

Hendrik C. Hemker, Tongerestraat 41, 6211 LM Maastricht, and Suzette L. Beguin, Akerstraat 12b, 6221CL Maastricht, both of Netherlands

Filed Sep. 27, 1990, Ser. No. 588,924

Claims priority, application Netherlands, Sep. 27, 1989, 8902406

Int. Cl.[5] G01N *33/86*

U.S. Cl. 436—69 33 Claims

1. A method for determining the amount of thrombin present in a sample of either clotting blood or plasma through determination of the potential of endogenous thrombin comprising adding a thrombin formation activator to the sample together with a thrombin substrate, wherein the amount and also the kinetic properties of said thrombin substrate are chosen such that the amount of thrombin generated in the sample cannot completely consume said thrombin substrate, thereby to produce a conversion product, measuring the amount of said conversion product thus produced, and from this determining the endogenous thrombin potential in the sample.

5,192,690

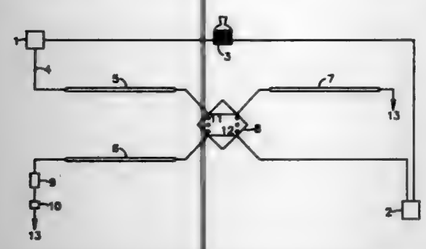
PROCESS FOR THE ANALYTICAL DETERMINATION OF ACETYLCYANAMIDE IN URINE

Ulrich Rust, Trostberg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 603,256, Oct. 25, 1990, abandoned, which is a continuation of Ser. No. 391,435, Aug. 9, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 825,645

Int. Cl.[5] G01N *33/00*

U.S. Cl. 436—106 8 Claims



1. A process for the analytical determination of acetylcyanamide in urine comprising:

(a) separating the acetylcyanamide in a sample from one of a purified urine matrix and an extract which is obtained from a purified urine matrix by passing said sample, without derivatisation of said acetylcyanamide, through a first column, separating a first fraction of said acetylcyanamide from the eluent of said first column, and passing the first column fraction through a second ion chromatography column; and

(b) detecting the acetylcyanamide in the eluent of said second column fraction by spectrophotometry at a wavelength of 220 nm.

5,192,691

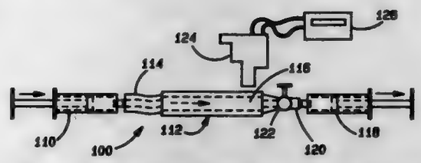
METHOD FOR SENSING INDIVIDUAL ION CONCENTRATIONS WITHIN MIXTURES USING SAMPLE FRONT ION EXCHANGE ELUTION AND INDIRECT PHOTOMETRIC DETECTION

Karen D. Quinn, and Theodore E. Miller, Jr., both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 319,217, Mar. 3, 1989, abandoned. This application Mar. 3, 1992, Ser. No. 845,867

Int. Cl.[5] G01N *30/96*

U.S. Cl. 436—161 8 Claims



1. An indirect photometric method of sensing photometrically transparent ion concentrations in situ by frontal analysis comprising:

providing a sample including photometrically transparent ions;

providing a known quantity of detectable ions;

combining said sample and said detectable ions to form a solution prior to forcing either of said sample or said detectable ions into an ion exchange medium;

disposing said solution in a retaining member operable to forcibly urge said solution therefrom upon the application of manual force by an operator thereto;

passing only said solution including said sample with said photometrically transparent ions and said known quantity of detectable ions through an ion exchange medium; and

sensing the detectable ions to indirectly provide qualitative and quantitative information on said photometrically transparent ions from descending sample fronts eluting from said ion exchange medium.

5,192,692

METHOD OF JUDGING PARTICLE AGGLUTINATION PATTERN

Ko Sakai, Pt. Jefferson Sta., and Hiroyuki Yonekawa, St. James, both of N.Y., assignors to Olympus Optical Co., Ltd., Japan

Filed Jul. 25, 1989, Ser. No. 384,497

Int. Cl.[5] G01N *15/04*

U.S. Cl. 436—165 10 Claims

1. A method of judging a particle pattern formed on an inclined bottom surface of a reaction vessel, said reaction vessel being formed in a microplate having a plurality of reaction vessels formed therein in a matrix, said method comprising the steps of:

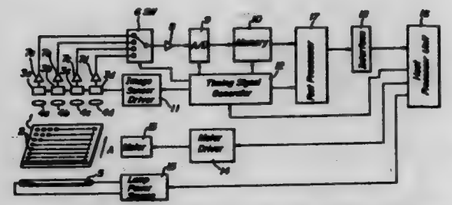
photoelectrically scanning an entire image of said microplate via a plurality of solid state image sensors to derive an image signal representing a two-dimensional image including the entirety of the particle pattern formed in said reaction vessel;

storing image signals supplied from said solid state image sensors in a memory;

detecting a pair of edge positions of said reaction vessel for each of a plurality of scanning lines passing across said reaction vessel with the aid of a first operator;

calculating a plurality of middle points of detected plural pairs of edge positions of said reaction vessel;

determining a center position of said reaction vessel by deriving an average of said plurality of middle points as a position signal;



processing said image signal of the two-dimensional image on the basis of said position signal to derive at least two characteristics of the particle pattern; and

judging the particle pattern on the basis of said at least two characteristics.

5,192,693

METHOD OF USING CHEMICAL ANALYSIS SLIDE

Kenichiro Yazawa; Masao Kitajima, and Asaji Kondo, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 481,934, Feb. 20, 1990, abandoned, which is a continuation of Ser. No. 682,478, Dec. 17, 1984, Pat. No. 4,981,805, which is a continuation of Ser. No. 225,819, Jan. 16, 1981, abandoned. This application May 7, 1991, Ser. No. 700,032

Claims priority, application Japan, Jan. 18, 1980, 3606/80

The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.

Int. Cl.[5] G01N *21/78*

U.S. Cl. 436—169 15 Claims

1. In a method for the colorimetric determination of a specific component in an aqueous liquid sample by applying the aqueous liquid sample to a chemical analysis element for the colorimetric determination, wherein the chemical analysis element is covered after the sample is applied to prevent the evaporation of water, the improvement comprising:

applying a body fluid sample, as the aqueous liquid sample, to said chemical analysis element, said chemical analysis element being a component of a chemical analysis slide comprised of (a) a slide frame and (b) a sheet-like or film-like chemical analysis element for the colorimetric determination, and

covering the upper face of the side of said slide frame which contains the chemical analysis element to which said body fluid sample is applied by placing a sheet-like, plate-like or block or brick-like cover on said upper face of the slide frame to thereby ensure a closed space between said chemical analysis element and said cover and to either prevent evaporation of water, or to control evaporation rate of water, and to control the amount of air or oxygen reaching said aqueous liquid body fluid samples.

5,192,694

ANTI-PCI MONOCLONAL ANTIBODY

Hiroshi Nakao, Ibaraki; Takao Nagoya, Tokorozawa, and Yuzki Saino, Tokyo, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Nov. 5, 1987, Ser. No. 116,908

Claims priority, application Japan, Nov. 14, 1986, 61-269586

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[5] G01N *33/577*; C12P *21/08*; C12N *5/20*

U.S. Cl. 436—548 4 Claims

1. A monoclonal antibody specific to a human placenta-derived coagulation inhibitor substantially free from glucose having the following properties:

(1) a molecular weight, as determined by SDS-polyacrylamide gel electrophoresis, reduced state, of 34,000±2,000;

(2) an isoelectric point, as determined by isoelectric column electrophoresis, reduced state, of 4.7±0.1;

(3) a stability such that said substance is (a) inactivated by heat treatment at 50° C., for 30 minutes, (b) stable at a pH of 4 to 10, and (c) stable in plasma at 37° C., for 30 minutes,

(4) an activity such that said substance is

(a) capable of prolonging a recalcification time (b) capable of prolonging a prothrombin time,

(c) capable of prolonging an activated partial thromboplastin time; and said substance has

(5) an amino acid composition consisting essentially of, in mole percent: Aspartic acid 9.8, Threonine 7.0, Serine 6.3, Glutamic acid 13.3, Proline 2.0, Glycine 7.5, Alanine 8.0, ½ Cystine 0.3, Valine 4.6, Methionine 1.8, Isoleucine 5.3, Leucine 11.8, Tyrosine 3.6, Phenylalanine 4.2, Histidine 1.4, Lysine 7.2, Arginine 6.2.

5,192,695

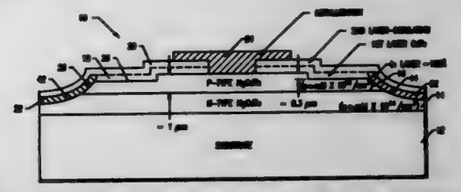
METHOD OF MAKING AN INFRARED DETECTOR

Cheng-Chi Wang; Yet-Zen Liu, both of Westlake Village, and Maren Chu, Thousand Oaks, all of Calif., assignors to Ferroelectrics Corporation, Simi Valley, Calif.

Filed Jul. 9, 1991, Ser. No. 727,402

Int. Cl.[5] H01L *31/18*

U.S. Cl. 437—5 39 Claims



1. A method for passivating a junction in a semiconductor device comprising the steps of:

forming a first semiconductor device layer on a substrate;

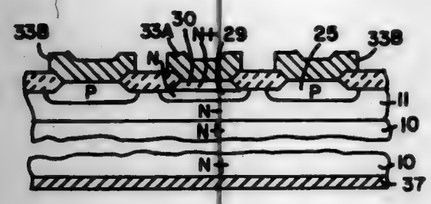
forming a second semiconductor device layer to form a junction between said first device layer and said second device layer;

grading the composition of said second layer to vary the bandgap of said second layer between said junction and an upper surface of said second layer;

etching selectively each of said first layer and said second layer to form a mesa wherein said mesa has an edge wall, said junction having a lateral edge exposed along said wall; and

metallizing said wall with a metal forming an ohmic contact with the first one of said first device layer and said second device layer and forming a Schottky barrier with a second one of said first device layer and said second device layer.

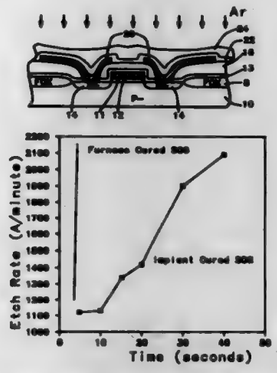
5,192,696
FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATING
Emel S. Bulat, Framingham, and Charles Herrick, Reading, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Jan. 15, 1992, Ser. No. 821,518
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—27 6 Claims



1. The method of fabricating a junction field effect transistor comprising
providing a body of semiconductor material including a substrate of semiconductor material of one conductivity type of relatively low resistivity and a layer of semiconductor material of the one conductivity type of relatively high resistivity contiguous with said substrate; said layer having a surface at a surface of the body;
forming a layer of adherent, nonconductive, protective material adherent at said surface having openings therein exposing alternating source surface areas and gate surface areas;
introducing conductivity type imparting material of the opposite conductivity type into said layer of semiconductor material of the one conductivity type of relatively high resistivity from said gate surface areas to produce gate regions of the opposite conductivity type in said layer of semiconductor material of the one conductivity type of relatively high resistivity at said gate surface areas;
introducing conductivity type imparting material of the one conductivity type into said layer of semiconductor material of the one conductivity type of relatively high resistivity only from said source surface areas to produce first zones of the one conductivity type of lower resistivity in said layer of semiconductor material of the one conductivity type of relatively high resistivity only at said source surface areas;
introducing conductivity type imparting material of the one conductivity type into said first zones only from said source surface areas to produce second zones of the one conductivity type of lower resistivity than said first zones within said first zones leaving portions of said first zones interposed between said second zones and said layer of semiconductor material of the one conductivity type of relatively high resistivity;
said first and second zones forming source regions at said source surface areas; and
applying conductive material to form source and gate contacts in ohmic contact with the second zones of the source regions and with the gate regions, respectively.

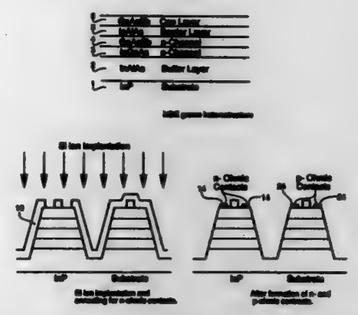
5,192,697
SOG CURING BY ION IMPLANTATION
Joe H. K. Leong, Lodge, Singapore, assignor to Chartered Semiconductor Manufacturing PTE Ltd., Singapore, Singapore
Filed Jan. 27, 1992, Ser. No. 826,115
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—37 23 Claims

1. The method of curing the spin-on-glass layer of an integrated circuit comprising:
ion implantation of ions into said spin-on-glass layer of an integrated circuit;
the said ions are applied in sufficient dosage and energy to



cause heating within the spin-on-glass layer during their movement through the spin-on-glass layer; and
said heating cures the said spin-on-glass layer of the integrated circuit.

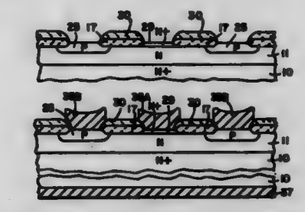
5,192,698
MAKING STAGGERED COMPLEMENTARY HETEROSTRUCTURE FET
Fritz L. Schuermeyer, Yellow Springs; Paul E. Cook, Dayton, both of Ohio; Edgar J. Martinez, Charlottesville, Va., and Marino J. Martinez, Dayton, Ohio, assignors to The United State of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Mar. 17, 1992, Ser. No. 853,150
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—40 4 Claims



3. A method of integrated circuit fabrication for forming staggered complementary heterostructure field effect transistors on the same wafer substrate, comprising:
providing a wafer having a substrate of a semi-insulating compound of a group III and a group V element, on which there is a semi-insulating buffer layer, followed by a n-channel layer, followed by a p-channel layer, followed by an undoped barrier layer, followed by a top layer as a cap layer to improve formation of ohmic contacts, all said layers being epitaxially grown of compounds of group III and group V elements and lattice matched to the substrate;
forming a structure having isolated areas for n-channel and p-channel transistor areas by etching said layers;

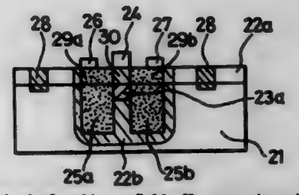
depositing and delineating a refractory metal for a gate on each of the isolated areas;
covering the structure with a first photo resist and opening areas for n-ohmic contacts on the isolated areas for the n-channel transistor areas;
ion implanting the areas for n-ohmic contacts with Si ions to obtain low resistance n-ohmic contacts, stripping the first photo resist, and annealing to activate the Si ions;
covering the structure with a second photo resist and opening areas for p-ohmic contacts on the isolated areas for p-channel transistor areas;
ion implanting the areas for p-ohmic contacts with Be ions to obtain a high doping density in these areas, stripping the second photo resist, and annealing to activate the Be ions;
depositing and annealing p-ohmic and n-ohmic metal contacts respectively on the p-ohmic and n-ohmic areas;
depositing and patterning interconnect metal to complete the integrated circuit.

5,192,699
METHOD OF FABRICATING FIELD EFFECT TRANSISTORS
Emel S. Bulat, and Maureen Sullivan, both of Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Dec. 17, 1990, Ser. No. 628,763
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—41 7 Claims



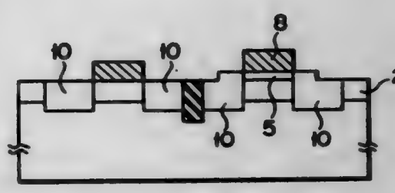
1. The method of fabricating a junction field effect transistor comprising
providing a body of silicon including a substrate of silicon of one conductivity type of relatively low resistivity and a layer of silicon of the one conductivity type of relatively high resistivity contiguous with said substrate, said layer having a surface at a surface of the body;
forming a first layer of adherent, nonconductive, protective material adherent at said surface having openings therein exposing alternating source surface areas and gate surface areas with nonconductive, protective material of said first layer between adjacent source and gate surface areas and isolating adjacent source and gate surface areas from each other;
introducing conductivity type imparting material of the opposite conductivity type into said layer of silicon of the one conductivity type of relatively high resistivity from said gate surface areas to produce gate regions of the opposite conductivity type in said layer of silicon of the one conductivity type of relatively high resistivity at said gate surface areas;
introducing conductivity type imparting material of the one conductivity type into said layer of silicon of the one conductivity type of relatively high resistivity from said source surface areas to produce source regions of the one conductivity type of lower resistivity in said layer of silicon of the one conductivity type of relatively high resistivity at said source surface areas;
forming a second layer of adherent, nonconductive, protective material overlying the nonconductive, protective material of said first layer of adherent, nonconductive, protective material between adjacent source and gate surface areas and leaving exposed said source surface areas and said gate surface areas with nonconductive, protective material of said first layer and nonconductive, protective material of said second layer between adjacent source and gate surface areas and isolating adjacent source and gate regions from each other; and
applying conductive material to form source and gate contacts in ohmic contact with the source and gate regions, respectively.

5,192,700
METHOD OF MAKING FIELD EFFECT TRANSISTOR
Teruyuki Shimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 289,390, Dec. 22, 1988, Pat. No. 5,101,245.
This application Jan. 30, 1992, Ser. No. 828,374
Claims priority, application Japan, Dec. 28, 1987, 62-335087
Int. Cl.[5] H01L 21/70
U.S. Cl. 437—41 9 Claims



1. A method of making a field effect transistor including:
depositing on a semi-insulating substrate a semiconductor layer of a first conductivity type;
forming a channel of a second conductivity type opposite from said first conductivity type in said substrate, thereby forming a pn junction with said layer;
disposing a metallic gate electrode on said layer opposite said channel; and
forming spaced apart source and drain regions of said second conductivity type in said layer, extending into said substrate, and contacting said channel, said source and drain regions lying on opposite sides of said gate electrode.

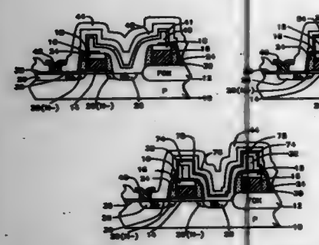
5,192,701
METHOD OF MANUFACTURING FIELD EFFECT TRANSISTORS HAVING DIFFERENT THRESHOLD VOLTAGES
Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 323,697, Mar. 15, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 609,010
Claims priority, application Japan, Mar. 17, 1988, 63-64041
Int. Cl.[5] H01L 21/20, 21/335
U.S. Cl. 437—41 2 Claims



2. A method of manufacturing a field effect transistor, comprising the steps of:
forming a first epitaxial layer of a first conductivity type for forming at least one first channel active layer on a semi-insulating substrate by a crystal growth technique which

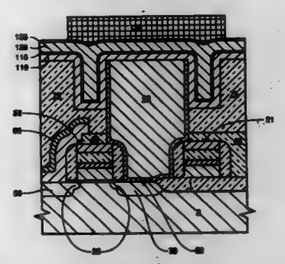
is capable of controlling a film thickness at an atomic level;
selectively depositing a second epitaxial layer of said first conductivity type on a portion of said first epitaxial layer for forming at least one second channel active layer having a thickness greater than said first channel active layer by a crystal growth technique which is capable of controlling a film thickness at an atomic level;
forming an element isolation trench between said first channel active layer and second channel active layer;
selectively forming a gate electrode on each of said first channel active layer and said second channel active layer; and
performing ion implantation using said each gate electrode as a mask to form source/drain regions.

5,192,702
SELF-ALIGNED CYLINDRICAL STACKED CAPACITOR DRAM CELL
Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed Dec. 23, 1991, Ser. No. 811,991
Int. Cl.[5] H01L 91/265, 21/70
U.S. Cl. 437—47 23 Claims



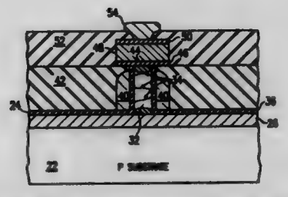
1. A method for fabricating a dynamic random access memory having a high capacitance stacked capacitor comprising:
selectively forming relatively thick field oxide areas on the surface of a semiconductor substrate while leaving device areas for fabrication of field effect devices;
forming a gate dielectric layer on said substrate in the said device areas;
depositing a relatively thick first layer of polysilicon on the said field oxide areas and said device areas;
removing portions of said first polysilicon layer while leaving portions thereof for the gate structure in said device areas, and portions over said field oxide areas;
forming source/drain structures within said device areas of said semiconductor substrate associated with said gate structures;
forming a first insulator layer composed at least in part of silicon nitride over said device and field oxide areas and patterning the layer to leave source/drain structures open in the said device areas where electrical contact is desired to said stacked capacitors; and
forming said stacked capacitors by,
depositing a second polysilicon layer over the device and field oxide areas,
depositing a second insulator layer composed at least in part of silicon nitride over said second polysilicon layer and patterning said second insulator layer and said second polysilicon layer anisotropically with an etch mask to define the stacked capacitor areas,
controlably etching said etch mask to laterally remove a certain portion of the mask and to thereby expose said second insulator layer,
etching the exposed said second insulator layer and removing said etch mask,
thermally oxidizing exposed said second polysilicon layer and removing the said second insulating layer,
anisotropically etching said exposed second polysilicon layer through a portion of its thickness and remove said thermally oxidized layer of polysilicon,
forming a capacitor dielectric layer over the said second polysilicon layer, and
depositing and patterning a third polysilicon layer as the top storage node electrode to complete said stacked capacitors.

5,192,703
METHOD OF MAKING TUNGSTEN CONTACT CORE STACK CAPACITOR
Roger R. Lee, and Fernando Gonzalez, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Oct. 31, 1991, Ser. No. 786,242
Int. Cl.[5] H01L 21/70
U.S. Cl. 437—52 17 Claims



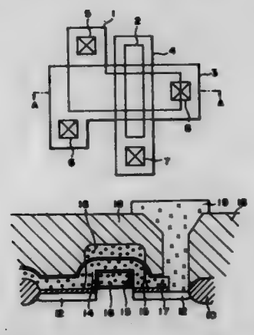
1. A method for forming a plurality of capacitors on a semiconductor substrate comprising:
a) depositing an isolation interlayer to overlie at least said substrate;
b) masking said interlayer with a contact photoresist pattern, said masking defining self-aligned regions in which to form said plurality of capacitors, said contact photoresist pattern also patterning periphery contacts;
c) etching said interlayer to form first openings in said interlayer in order to expose contact areas of said substrate;
d) removing said contact photoresist pattern;
e) depositing a layer of diffusion barrier material to overlie said interlayer and said contact area, said depositing sufficient to effect minimal substrate damage;
f) depositing a refractory metal to overlie said layer of diffusion barrier material and to fill said first opening;
g) removing portions of said layer of diffusion barrier material and said refractory metal in order to expose said interlayer, said removing forming a plurality of cores, each of said plurality comprising said layer of diffusion barrier material and said refractory metal remaining after said removing;
h) masking said interlayer with photoresist, said masking defining further etch regions adjacent to said plurality of said cores;
i) etching said interlayer to expose an upper portion of a sidewall of each of said cores;
j) removing said photoresist;
k) depositing an electrically conductive layer to overlie said sidewalls, said cores, and said interlayer exposed during said etching;
l) depositing a dielectric layer to overlie said electrically conductive layer;
m) performing a wet anneal in order to oxidize said dielectric layer;
n) depositing a capacitive layer to overlie said dielectric layer; and
o) individualizing each of said plurality of capacitors.

5,192,704
METHOD AND APPARATUS FOR A FILAMENT CHANNEL PASS GATE FERROELECTRIC CAPACITOR MEMORY CELL
James M. McDavid, Dallas, and David R. Clark, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 731,305, Jul. 16, 1991, Pat. No. 5,136,534, which is a continuation of Ser. No. 373,431, Jun. 30, 1989, abandoned. This application Apr. 24, 1992, Ser. No. 874,280
Int. Cl.[5] H01L 21/72
U.S. Cl. 437—52 13 Claims



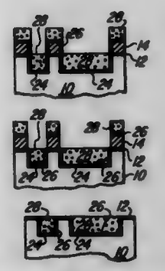
1. A method for constructing a memory cell on a surface of a substrate, comprising the steps of:
forming a transistor comprising a channel comprising a substantially cylindrical semiconductor filament, a first end of said filament formed in contact with a bitline;
forming a wordline disposed about said filament such that said wordline is operable to actuate said channel; and
forming a capacitor comprising a first electrode, a storage layer and a second electrode, said first electrode formed substantially vertically above and coupled to a second end of said filament such that said filament is between said bitline and said first electrode, said storage layer formed substantially vertically above said first electrode and said second electrode formed substantially vertically above said storage layer.

5,192,705
METHOD FOR MANUFACTURING SEMICONDUCTOR STACKED CMOS DEVICES
Masahiro Itoh, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 6, 1991, Ser. No. 711,149
Claims priority, application Japan, Jun. 13, 1990, 2-152720
Int. Cl.[5] H01L 21/70, 27/00
U.S. Cl. 437—57 10 Claims



9. A method of producing a semiconductor stacked CMOS device comprising the steps of:
forming an active area of a lower MOS FET and element isolation areas over a semiconductor substrate by a LOCOS process, and forming silicon nitride films in portions serving as gate areas of lower and upper MOS FETs
or leaving a silicon oxide film on said active area of the lower MOS FET when said element isolation areas are formed;
forming source and drain areas of said lower MOS FET on said semiconductor substrate;
after a polycrystalline Si region is formed in an active area of the upper MOS FET through an insulation film formed on said semiconductor substrate, removing said silicon nitride film or silicon oxide film;
forming a gate oxide film for the lower MOS FET on a lower surface of the polycrystalline Si from which said silicon nitride film or said silicon oxide film has been removed, and simultaneously forming a gate oxide film for the upper MOS FET on an upper surface thereof; and
embedding a gate polycrystalline Si film serving as a gate electrode for the lower MOS FET, in the gate film of said lower layer MOS FET, and simultaneously forming a gate polycrystalline Si film serving as a gate electrode for the upper MOS FET, on the gate oxide film of said upper MOS FET.

5,192,706
METHOD FOR SEMICONDUCTOR ISOLATION
Mark S. Rodder, University Park, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 30, 1990, Ser. No. 575,259
Int. Cl.[5] H01L 21/76
U.S. Cl. 437—67 8 Claims

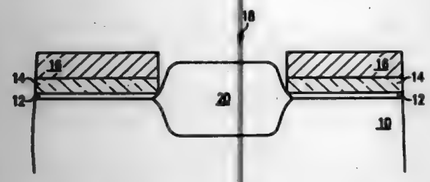


8. A method for isolating a selected area on an integrated circuit substrate, comprising the steps of:
(a) forming an amorphous silicon layer on top of said substrate;
(b) removing portions of said amorphous silicon layer and said substrate to form trenches around selected areas in said semiconductor body;
(c) anisotropically depositing trench-fill material; and
(d) removing said amorphous silicon layer thereby removing said deposited trench-fill material deposited above said amorphous silicon layer.

5,192,707
METHOD OF FORMING ISOLATED REGIONS OF OXIDE
Robert Hodges, Euless, and Frank Bryant, Denton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Filed Jul. 31, 1991, Ser. No. 738,580
Int. Cl.[5] H01L 21/76
U.S. Cl. 437—70 18 Claims

12. A method of forming isolated regions of oxide of an integrated circuit comprising the steps of:
forming a pad oxide layer over the integrated circuit;
forming a nitrogen doped polysilicon layer over the pad oxide layer;
forming a nitride layer over the nitrogen doped polysilicon layer;

forming in the nitrogen doped polysilicon and nitride layers exposing a portion of the pad oxide layer;



annealing the nitrogen doped polysilicon layer to encapsulate the nitrogen doped polysilicon layer in silicon nitride; and,

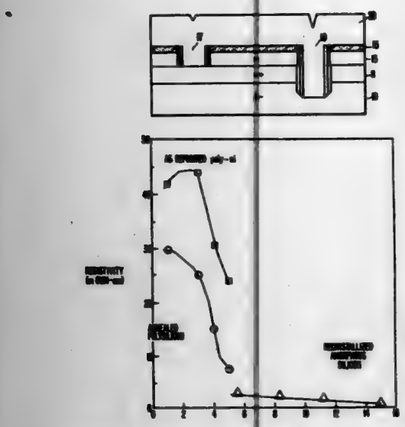
forming a field oxide region in the opening.

5,192,708

SUB-LAYER CONTACT TECHNIQUE USING IN SITU DOPED AMORPHOUS SILICON AND SOLID PHASE RECRYSTALLIZATION

Klaus Beyer, Poughkeepsi, N.Y.; Edward C. Fredericks, Manassas, Va.; Louis L. Hsu, Fishkill, N.Y.; David E. Kotecki, Hopewell Junction, N.Y., and Christopher C. Parks, Beacon, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1991, Ser. No. 693,979
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—90 12 Claims



1. A method of filling at least one trench in a surface of a semiconductor substrate comprising the steps of:

providing a surface of said semiconductor substrate having at least one trench having substantially vertical sidewalls extending down from said surface to a sublayer of said semiconductor substrate to a chemical vapor deposition system;

evacuating and heating said chemical vapor deposition system to a temperature less than 570° C.;

entering a mixture of silicon containing source gas and a dopant source gas into said chemical vapor deposition system to form a layer of doped amorphous silicon filling said trench;

annealing said layer of doped amorphous silicon at a temperature less than 500° C. to form a doped large grained polysilicon layer; and,

activating a dopant in said doped amorphous silicon layer through a short, high temperature anneal.

8. A method of forming a plurality of sublayer contacts in a surface of a semiconductor substrate having a plurality of vertically-walled trenches etched therein and extending to at least one sublayer of said semiconductor substrate comprising the steps of:

depositing a layer of doped amorphous silicon on said surface filing said plurality of trenches in a chemical vapor deposition system at a temperature less than 570° from a mixture of a silicon containing source gas and a dopant source gas;

annealing said layer of doped amorphous silicon at a temperature less than 500° C. to form a doped large grained polysilicon layer; and,

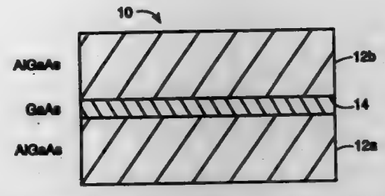
activating a dopant in said doped amorphous silicon layer through a short, high temperature anneal.

5,192,709

NANOSCALE MODULATION DOPING METHOD

Pierre M. Petroff, Santa Barbara, Calif., assignor to University of California Office of Technology Transfer, Alameda, Calif.

Filed Sep. 17, 1991, Ser. No. 761,308
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—110 24 Claims



1. A method of fabricating a modulation doped structure comprising the steps of:

forming a quantum well layer;

forming a donor implantation layer above said quantum well layer; and

depositing an amount of dopant atoms within said donor implantation layer; substantially all of said deposited dopant atoms being located at a distance from said quantum well layer.

5,192,710

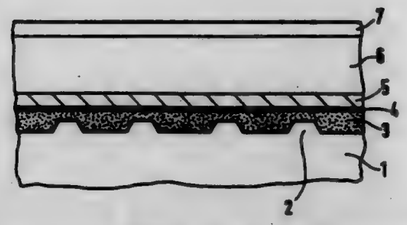
METHOD OF MAKING A SEMICONDUCTOR LASER WITH A LIQUID PHASE EPITAXY LAYER AND A PLURALITY OF GAS PHASE OR MOLECULAR BEAM EPITAXY LAYERS

Michael Schilling, Stuttgart, Fed. Rep. of Germany, assignor to Alcatel N. V., Amsterdam, Netherlands

Filed Apr. 30, 1991, Ser. No. 692,378
Claims priority, application Fed. Rep. of Germany, May 2, 1990, 4014032
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—129 9 Claims

1. In a method of producing a semiconductor laser comprising the steps of

providing a substrate having a diffraction grating on a surface of the substrate, forming a waveguide layer on the grating, and disposing a plurality of layers on the waveguide layer; the improvement wherein said step of forming a waveguide layer on the grating comprises forming the waveguide layer by liquid phase epitaxy, and wherein said step of disposing comprises growing the plurality of



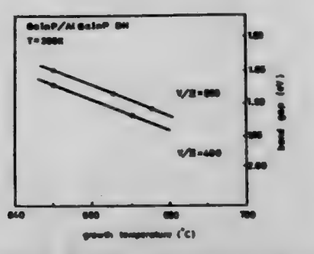
layers on the waveguide layer by means of one of a gas phase and a molecular beam epitaxy process.

5,192,711

METHOD FOR PRODUCING A SEMICONDUCTOR LASER DEVICE

Takashi Murakami, and Nobuaki Kasano, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 383,135, Sep. 17, 1990, Pat. No. 5,105,432.
This application Jan. 21, 1992, Ser. No. 822,662
Claims priority, application Japan, Sep. 18, 1989, 1-241418
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—129 5 Claims



1. A method for producing a semiconductor laser device having a double heterojunction structure comprising AlGaInP series semiconductor layers including a p type GaAs contact layer, a p type AlGaInP cladding layer, and a p type GaInP buffer layer disposed between and contacting said contact and cladding layers comprising:

growing a portion of said p type GaInP buffer layer on said p type AlGaInP cladding layer at a first temperature to produce GaInP having a first energy band gap and growing a portion of said buffer layer adjacent to said p type GaAs contact layer at a second temperature lower than the first temperature to produce GaInP having a second energy band gap smaller than the first energy band gap.

5,192,712

CONTROL AND MODERATION OF ALUMINUM IN SILICON USING GERMANIUM AND GERMANIUM WITH BORON

Sheldon Aronowitz, and Amolak Ranade, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

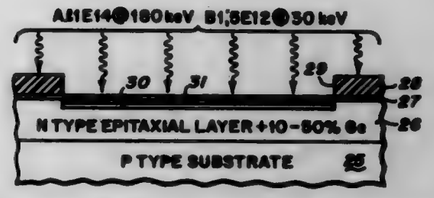
Filed Apr. 15, 1992, Ser. No. 868,808
Int. Cl.[5] H01L *21/266*
U.S. Cl. 437—143 6 Claims

1. A process for controlling the diffusion of aluminum in silicon to form PN junction isolation regions in a monolithic integrated circuit silicon wafer comprising the steps of:

incorporating germanium into said silicon wafer in those regions where an isolation diffusion is desired by ion implantation prior to the incorporation of aluminum to produce a germanium concentration of about 10 atoms % to about 50 atomic %

annealing said silicon, with said germanium therein, to drive said germanium to take up substitutional atomic sites in the crystal lattice of said silicon;

applying aluminum to said silicon after said annealing in said regions where an isolation diffusion is desired; and



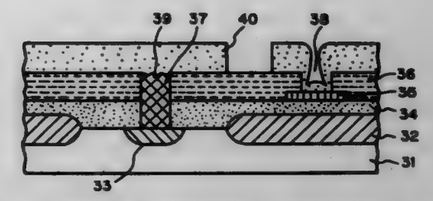
diffusing said aluminum whereby said diffusion is retarded where said germanium is present and, therefore, said diffusion is relatively enhanced after said aluminum has diffused completely through said germanium containing silicon.

5,192,713

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING MULTI-LAYERED STRUCTURE

Yusuke Harada, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1991, Ser. No. 658,239
Claims priority, application Japan, Feb. 27, 1990, 2-44628
Int. Cl.[5] H01L *21/44, 21/48*
U.S. Cl. 437—192 14 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

(a) preparing a semiconductor substrate;

(b) forming a field oxide layer on a surface of the substrate for isolation between active areas;

(c) forming a diffusion layer in an active area of the surface of the semiconductor substrate;

(d) depositing a first insulating interlayer on the surface of the semiconductor substrate;

(e) forming a W-polycide layer including As on a selected portion of the first insulating interlayer;

(f) depositing a second insulating interlayer on the first insulating interlayer and on the W-polycide layer;

(g) forming a first contact hole with a shallow depth on the W-polycide layer and a second contact hole with a deep depth on the diffusion layer;

(h) depositing a W layer in only the second contact hole by selective CVD to fill the second contact hole so as not to form a step with the second insulating interlayer; and,

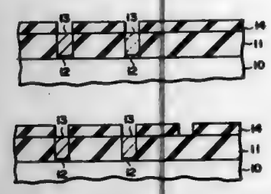
(i) forming a wiring layer on the surface of the second insulating layer to contact the W layer in the second contact hole and the W-polycide layer via the first contact hole.

VOL 1148 ISS 2 MR 9 1993 UMI

5,192,714
METHOD OF MANUFACTURING A MULTILAYERED METALLIZATION STRUCTURE IN WHICH THE CONDUCTIVE LAYER AND INSULATING LAYER ARE SELECTIVELY DEPOSITED

Kyoichi Sugure, Yokohama, and Haruo Okano, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1991, Ser. No. 654,895
Claims priority, application Japan, Feb. 14, 1990, 2-32689; Feb. 7, 1991, 3-16586
Int. Cl.[5] H01L 21/28, 21/283
U.S. Cl. 437—195 12 Claims

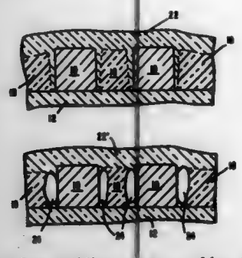


1. A method of manufacturing a semiconductor device, comprising the steps of:
forming a first insulating layer having a hole on a substrate;
selectively forming a conductive layer in said hole;
selectively forming a second insulating layer on said first insulating layer;
patterning said second insulating layer; and
forming an interconnection layer in an opening portion of said second insulating layer formed by patterning so as to be electrically connected to said conductive layer.

5,192,715
PROCESS FOR AVOIDING SPIN-ON-GLASS CRACKING IN HIGH ASPECT RATIO CAVITIES

John W. Sliwa, Jr., Palo Alto, and Pankaj Dixit, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 652,306, Feb. 5, 1991, Pat. No. 5,119,164, which is a continuation of Ser. No. 385,649, Jul. 25, 1989, abandoned. This application Apr. 24, 1992, Ser. No. 873,920
Int. Cl.[5] H01L 21/316
U.S. Cl. 437—195 22 Claims

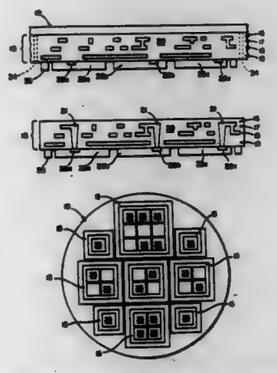


1. A process for avoiding stress-cracking in spin-on-glass used in high aspect ratio cavities between metal interconnects formed on an dielectric substrate supported on a semiconductor wafer, each said interconnect having sidewalls and a top surface, said process comprising:
(a) exposing said sidewalls and said top surface of each interconnect so as to permit subsequent selective tungsten deposition on said interconnects;
(b) growing a layer of selective tungsten on said exposed sidewalls and top of each interconnect;
(c) forming a spin-on-glass layer covering said interconnects, including filling cavities therebetween;
(d) soft-curing said spin-on-glass layer;
(e) etching said spin-on-glass layer to expose said top surfaces of said metal interconnects and leave free-standing portions of said spin-on-glass between said interconnects;
(f) removing at least that tungsten remaining on said sidewalls of said metal interconnects;
(g) hard-curing said spin-on-glass portions; and
(h) forming a layer of a dielectric material covering said spin-on-glass portions and said top surfaces of said metal interconnects.

5,192,716
METHOD OF MAKING A EXTENDED INTEGRATION SEMICONDUCTOR STRUCTURE

Scott L. Jacobs, Apex, N.C., assignor to Polylithics, Inc., San Diego, Calif.

Division of Ser. No. 301,972, Jan. 25, 1989, Pat. No. 5,055,907. This application Jul. 24, 1991, Ser. No. 735,340
Int. Cl.[5] H01L 21/60
U.S. Cl. 437—209 106 Claims



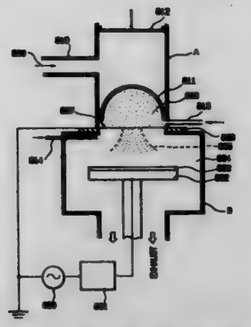
1. A method of forming an extended integration structure comprising the steps of:
forming on a support substrate; a thin film decal having at least one wiring layer therein;
aligning at least one integrated circuit chip to said thin film decal;
attaching the at least one integrated circuit chip to said thin film decal;
mounting a support ring on said thin film decal, surrounding said at least one integrated circuit chip;
removing said support substrate; and
electrically connecting said at least one wiring layer to said at least one integrated circuit chip.

5,192,717
PROCESS FOR THE FORMATION OF A POLYCRYSTALLINE SEMICONDUCTOR FILM BY MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION METHOD

Soichiro Kawakami, Hikone; Masahiro Kanai, Tokyo, and Takeshi Aoki, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 515,640, Apr. 27, 1990, abandoned. This application Dec. 2, 1991, Ser. No. 799,900
Claims priority, application Japan, Apr. 28, 1989, 1-107391; Apr. 28, 1989, 1-107392; Apr. 20, 1990, 1-102926
Int. Cl.[5] H01L 21/00, 21/02, 21/306
U.S. Cl. 439—233 4 Claims

1. A process for forming a polycrystalline semiconductor film on an insulating substrate which comprises using a MWPCVD apparatus comprising a plasma generation chamber provided with a microwave introducing means, and a film-forming chamber connected through a grid electrode to said plasma generation chamber, said film-forming chamber containing said insulating substrate positioned on a substrate holder made of a conductive material being installed therein, producing plasma by contacting a film-forming raw material gas with a microwave energy applied through said microwave introducing means in said plasma generation chamber and



introducing said plasma into said film-forming chamber while maintaining the inner pressure of said film-forming chamber at a vacuum of 1×10^{-4} to 5×10^{-3} Torr and applying a high frequency voltage with a frequency in the range of from 20 MHz to 500 MHz between said grid electrode and said substrate holder to thereby cause the formation of polycrystalline semiconductor film on said insulating substrate maintained at a temperature in the range of from 200° to 400° C.

5,192,718
LEAD SILICATE GLASSES

Paul S. Danielson, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Oct. 24, 1991, Ser. No. 782,528
Int. Cl.[5] C03C 3/105
U.S. Cl. 501—60 12 Claims

1. A family of lead silicate glasses having internal liquidi below 750° C., electrical resistivities over 8.0 ohm-cm (Log $R_{350°\ C.}$) and linear x-ray absorption values of at least 95 cm^{-1} at a wavelength of 0.6 Angstrom units, the glasses having compositions consisting essentially of, in weight percent as calculated on an oxide basis, 46–51% SiO_2, 0.5–2% Al_2O_3, 0.3–3% Na_2O, 9–13% K_2O, 2.5–6% SrO, 1–4% BaO, 30–33% PbO and 0.3–1% Sb_2O_3.

5,192,719
METHOD OF PRODUCING HIGH-STRENGTH β-TYPE SILICON CARBIDE SINTERED BODIES

Hidetoshi Yamauchi, Gifu; Haruhisa Hasegawa, and Yasuji Hiramatsu, both of Ohgaki, all of Japan, assignors to Ibiden Co., Ltd., Japan

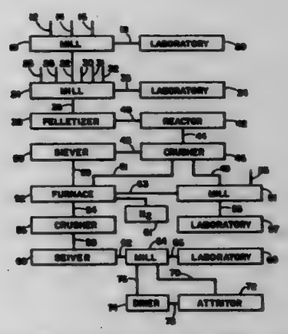
Continuation of Ser. No. 298,887, Jan. 11, 1989, abandoned. This application Sep. 30, 1991, Ser. No. 768,337
Int. Cl.[5] C04B 35/56
U.S. Cl. 501—88 2 Claims

1. A method of producing a high-strength β-type silicon carbide sintered body, comprising the following steps:
combining starting materials of β-type silicon carbide powder, elemental boron or a boron-containing compound in an amount of 0.1–2.0 wt % in boron, and elemental carbon or a carbon-containing compound in an amount of 1.0–5.0 wt % in carbon;
forming the starting materials into a shaped body; and
heating the shaped body within a temperature range of 1200°–1600° C. in a non-oxidizing atmosphere for 1–3 hours and then to a sintering temperature of not lower than 1900° C. at a rate of 0.3°–2.5° C./min in a non-oxidizing atmosphere, and thereafter holding the shaped body at the sintering temperature.

5,192,720
SIALON COMPOSITION

George T. Hide; Rodica S. Hide, both of Amherst, and Conor C. Delcos, Cheektowaga, all of N.Y., assignors to Benchmark Structural Ceramics Corporation, Amherst, N.Y.

Continuation-in-part of Ser. No. 535,035, Jun. 7, 1990, Pat. No. 5,030,600, Ser. No. 365,696, Jun. 13, 1989, abandoned, Ser. No. 364,014, Jun. 19, 1989, abandoned, Ser. No. 339,137, Apr. 14, 1989, Pat. No. 4,957,885, and Ser. No. 254,175, Oct. 6, 1988, Pat. No. 5,006,290. This application Jun. 27, 1991, Ser. No. 722,104
Int. Cl.[5] C04B 35/58
U.S. Cl. 501—98 3 Claims



1. A process for preparing a composition of the formula $Si_{6-z}Al_zO_zN_{8-z}$ wherein z is from about 2.5 to about 3.5, and wherein said composition is comprised of from about 35 to about 25 weight percent of silicon, from about 24 to about 31 weight percent of aluminum, from about 14 to about 20 weight percent of oxygen, and from about 27 to about 22 weight percent of nitrogen, comprising the steps of:
(a) providing a mixture comprising from about 28 to about 38 weight percent (by weight of aluminum material, aluminum nitride, and silica) of aluminum material, from about 5 to about 25 weight percent of aluminum nitride, and from about 45 to 65 weight percent of silica, wherein:
1. said aluminum material is selected from the group consisting of aluminum, aluminum alloy and mixtures thereof, wherein:
(a) said aluminum material comprises less than about 1.0 weight percent of combined oxygen and less than about 0.1 weight percent of moisture, and
(b) said aluminum material has a specific surface area of from about 0.2 to about 1.1 square meters per gram, and the particles of said material range in size from about 4 to about 28 microns;
2. said aluminum nitride is comprised of less than about 2.0 weight percent of combined oxygen and less than about 0.1 weight percent of moisture; and
3. said silica is comprised of less than about 0.1 weight percent of moisture, and substantially all of the particles of said silica are smaller than about 53 microns;
(b) thereafter comminuting said mixture while contacting it with nitrogen until said mixture, as revealed by scanning electron microscopy, comprises substantially a single phase material;
(c) thereafter heating said material to a temperature of at least about 760 degrees centigrade until ignition occurs; and
(d) thereafter cooling the ignited material.

5,192,721
PROCESS FOR LINING A DISTRIBUTOR FOR CONTINUOUS CASTING OF METALS WITH A REFRACTORY MATERIAL CORRESPONDING DISTRIBUTOR AND REFRACTORY LINING
Joseph G. Provost, Bargaen, France, assignor to Sollac, Puteaux, France
PCT No. PCT/FR90/00130, § 371 Date Aug. 23, 1991, § 102(e) Date Aug. 23, 1991, PCT Pub. No. WO90/09970, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 26, 1990, Ser. No. 752,667
Claims priority, application France, Feb. 27, 1991, 8902926
Int. Cl.[5] C04B 35/06, 35/22
U.S. Cl. 501—113 12 Claims

1. A process for lining a distributor for continuous casting of metals, according to which a layer of refractory wear lining is placed in position in aqueous form, characterized in that said refractory wear lining is prepared from a material consisting essentially of raw natural dolomite or raw natural calcite, or of a mixture thereof, which is chosen with a particle size of between 0 and 5 mm, and a binder, in proportions of 0.5 to 5% by weight, and an inorganic or organic plasticizer, in proportions of 0.2 to 3% by weight, are incorporated in this material and in that after it has been placed in position on the distributor, the decarbonization of this lining is carried out during the drying and calcining thereof.

5,192,722
HIGH DENSITY LEUCITE/POLLUCITE BASED CERAMICS FROM ZEOLITE
Robert L. Bedard, Fishkill, and Edith M. Flanigen, White Plains, both of N.Y., assignors to UOP, Des Plaines, Ill.
Filed Jul. 15, 1991, Ser. No. 729,660
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] C04B 35/10
U.S. Cl. 501—128 11 Claims

1. A substantially crack free ceramic article having less than 5% porosity, having as its principal crystalline phase a leucite/pollucite solid solution and having an empirical formula expressed in terms of the metal oxides:

$$vNa_2O{:}wK_2O{:}xRb_2O{:}yCs_2O{:}zSiO_2{:}Al_2O_3$$

where v is less than 0.5, w varies from about 0.01 to about 0.99, x varies from about 0.01 to about 0.99, y varies from about 0.99 to about 0.01, z varies from about 3.5 to about 7.5 and v+w+x+y=1, the ceramic article characterized in that it has a coefficient of thermal expansion of about 2×10^{-6} to about 27×10^{-6}°C.$^{-1}$ over the range 20° to 700° C.

5,192,723
METHOD OF PHASE TRANSITION, METHOD FOR PRODUCING LEAD NIOBATE-BASED COMPLEX OXIDE UTILIZING SAID PHASE TRANSITION METHOD, AND LEAD NIOBATE-BASED COMPLEX OXIDE PRODUCED BY SAID METHOD
Takanobu Fujie, Tokyo; Akira Tanaka; Kenichi Muramatsu, both of Kawasaki, and Tetsuo Hattori, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Sep. 3, 1991, Ser. No. 754,015
Claims priority, application Japan, Sep. 4, 1990, 2-233871; Apr. 11, 1991, 3-078909; May 13, 1991, 3-107320
Int. Cl.[5] C04B 35/46, 35/48, 35/49; H01B 1/00
U.S. Cl. 501—136 5 Claims

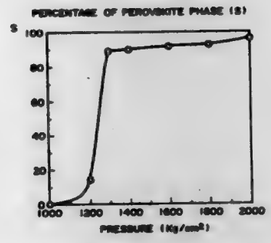
1. A method of producing a lead niobate-based complex oxide which comprises treating a raw material represented by a general formula:

$$Pb(A_{\frac{1}{3}}Nb_{\frac{2}{3}})\times(Zn_{\frac{1}{3}}Nb_{\frac{2}{3}})_yO_3 \text{ or}$$

$$Pb(Fe_{\frac{1}{2}}Nb_{\frac{1}{2}})\times(Zn_{\frac{1}{3}}Nb_{\frac{2}{3}})_yO_3 \quad (1)$$

wherein A is Mg or Ni; x is an atomic ratio within a range of 0–1; and y is an atomic ratio within a range of 1–0 with a relation x+y=1, and containing pyrochlore phase, under conditions of:

a high temperature in a range of 500°–1300° C. and



a high pressure in a range of 1000–4000 kg/cm^2 thereby causing transition of said pyrochlore phase into perovskite phase.

5,192,724
REACTIVATION OF SPENT CRACKING CATALYSTS
Chia-Min Fu, and Michael K. Mahoney, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Mar. 17, 1992, Ser. No. 852,475
Int. Cl.[5] B01J 29/38, 38/62; C10G 11/05
U.S. Cl. 502—28 21 Claims

1. A process for reactivating a spent cracking catalyst composition comprising the step of contacting a spent zeolite-containing catalytic cracking catalyst composition which contains at least one metal contaminant selected from the group consisting of nickel compounds and vanadium compounds with an aqueous solution comprising both dissolved lactic acid and at least one dissolved calcium compound;

wherein said catalyst reactivation process produces a reactivated catalytic cracking catalyst composition exhibiting lower hydrogen generation, when employed in catalytic cracking of a hydrocarbon-containing oil, than said spent zeolite-containing catalytic cracking catalyst composition;

wherein said aqueous solutions is essentially free of antimony, bismuth and fluorine and contains about 0.001–10 mol/l of lactic acid; and wherein about 0.01–1 weight-% of calcium has been incorporated into said reactivated catalytic cracking catalyst composition.

5,192,725
GALLIUM/GERMANIUM DIOCTAHEDRAL SMECTITE CLAY AND PROCESS FOR PREPARING THE CLAY
Jennifer S. Holmgren, Bloomingdale, Ill., assignor to UOP, Des Plaines, Ill.
Filed Sep. 3, 1991, Ser. No. 753,511
Int. Cl.[5] B01J 20/06, 21/16
U.S. Cl. 502—61 19 Claims

1. A dioctahedral smectite layered clay composition having the empirical formula

$$A_x[M_4](M'_{8-z}M_z)(O_{20})(OH)_4$$

where A is a templating agent, M is aluminum or gallium, M' is silicon or germanium, except that when M is aluminum, M' is not silicon and x is the moles of A and varies from about 0.1 to about 2.0.

5,192,726
BEIDELLITE CLAY AND PROCESS FOR PREPARING THE CLAY
Jennifer S. Holmgren, Bloomingdale, Ill., assignor to UOP, Des Plaines, Ill.
Filed Sep. 3, 1991, Ser. No. 753,514
Int. Cl.[5] B01J 20/16, 21/16
U.S. Cl. 502—62 11 Claims

1. A beidellite layered clay composition having the empirical formula

$$A_x[Al_4](Si_{8-x}Al_x)(O_{20})(OH_4)$$

where A is a templating agent and x is the moles of the templating agent and varies from about 0.1 to about 2.0, the composition characterized in that it has crystals whose average crystallite size is about 50–150 Angstroms, has a surface area of at least 80 m^2/g, has its 060 X-ray diffraction peak at a d-spacing of 1.50 Angstroms and is substantially free of sodium cations.

2. The composition of claim 1 where the clay layers are separated by pillars selected from the group consisting of alumina, rare earth containing alumina, ZrO_2, TiO_2, Cr_2O_3, SiO_2 and silica/alumina.

3. The composition of claim 1 where A is selected from the group consisting of secondary amines, tertiary amines, quaternary ammonium ions, quaternary phosphonium ions and mixtures thereof.

5,192,727
PROCESS FOR MODIFYING THE PORE SYSTEM OF ZEOLITE LZ-202
Vinayan Nair, East White Plains; Donald F. Best, Mahopac, and Lawrence D. Vail, Tappan, all of N.Y., assignors to UOP, Des Plaines, Ill.
Filed Aug. 19, 1991, Ser. No. 747,050
Int. Cl.[5] B01J 29/06
U.S. Cl. 502—64 6 Claims

1. Process for treating a zeolite having the mazzite crystal structure and crystallized from a reaction mixture essentially free of amine or quaternary ammonium templating agents to increase its adsorptive capacity for molecular species having kinetic diameters of at least about 5.5×10^{-4} micrometers which comprises the steps of:

(a) providing said zeolite in the alkali metal cation form as the starting material;

(b) contacting the composition of step (a) with an aqueous solution of non-metallic cations under ion-exchange conditions to lower the alkali metal content to below 0.1 equivalent per cent;

(c) calcining the ion-exchanged product of step (b) in contact with at least 3 psia steam at a temperature of from about 300° C. to 800° C.; and thereafter;

(d) contacting the steamed product of step (c) with a sufficient amount of an aqueous solution of ammonium ions having a pH of less than about 4.0 and for a sufficient time to increase the bulk Si/Al_2 ratio of the zeolite composition with respect to the starting composition of step (a) and to a value of at least 7.0.

5,192,728
TIN-COLATING MICROPOROUS CRYSTALLINE MATERIALS AND THEIR USE AS DEHYDROGENATION, DEHYDROCYCLIZATION REFORMING CATALYSTS
Ralph M. Dessau, Edison, N.J.; Ernest W. Valyocsik, Yardley, and James C. Vartuli, West Chester, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Division of Ser. No. 211,198, Jun. 24, 1988, Pat. No. 4,990,710.
This application Oct. 6, 1989, Ser. No. 418,377
Int. Cl.[5] B01J 29/30
U.S. Cl. 502—66 32 Claims

1. A non-acidic catalyst composition consisting essentially of dehydrogenation metal and a non-acidic microporous crystalline material containing tin.

4. The catalyst composition of claim 1 wherein the material exhibits an X-ray diffraction pattern of a zeolite.

5. The catalyst composition of claim 1, wherein the dehydrogenation metal is a Group VIII metal.

5,192,729
HIGHLY ACTIVE ZIEGLER-NATTA CATALYST FOR POLYMERIZING HDPE AND LLDPE AND METHOD FOR PREPARATION THEREOF
Seong I. Woo, Seoul, and Il Kim, Kyungsangnam-Do, both of Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Daejeon, Rep. of Korea
Filed Oct. 9, 1991, Ser. No. 773,512
Claims priority, application Rep. of Korea, Oct. 10, 1990, 16059/1990
Int. Cl.[5] C08F 4/649, 4/654
U.S. Cl. 502—104 22 Claims

1. A highly active Ziegler-Natta catalyst for ethylene polymerization, comprising:

a catalyst precursor obtained by reacting a magnesium compound, a halogen compound, and a titanium compound with an electron donor compound, wherein the molar ratio of magnesium to titanium is between 1 and 10, and the molar ratio of halogen to magnesium is between 0.5 and 5;

a surfactant in an amount of between 5% and 10% by weight of the magnesium compound; and

an organoaluminum compound for partially activating the catalyst, the organoaluminum compound being present in an amount such that the molar ratio of aluminum to titanium is between 1 and 10.

5,192,730
STABLE SOLUTIONS OF TETRA(HYDROCARBYL)METAL COMPOUNDS AND USE THEREOF FOR CATALYST PREPARATION
Steven D. Ittel, Wilmington, and Frederick N. Tebbe, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 13, 1991, Ser. No. 791,943
Int. Cl.[5] C08F 4/64
U.S. Cl. 502—108 14 Claims

1. A composition comprising a chemically stable solution of:

a tetra(hydrocarbyl)metallic compound of the formula, $(RCH_2)_4M$, wherein M is an element selected from the group consisting of Ti, Zr and Hf, and R is a hydrocarbyl group wherein the carbon atom located β to M is devoid of hydrogen,

in an olefin of the formula, $R^1R^2C{=}CR^3R^4$, wherein each of R^1 and R^2, independently, is an aliphatic group containing 1–10 carbon atoms, or an aralkyl group containing 7–10 carbon atoms; and each of R^3 and R^4, independently, is H, an aliphatic group containing 1–10 carbon atoms, or an aralkyl group containing 7–10 carbon atoms; or wherein R^1, taken together with either R^2, R^3, or R^4 forms a carbocyclic ring containing 5–12 carbon atoms;

wherein the final concentration of said tetra(hydrocarbyl)-metallic compound in solution is at least about 0.01 mol/L.

modified resin containing one or more hydrolyzable silyl combined with each other to form a ring and that R_4 and R_5

VOL 1148 ISS 2 MR 9 1993 UMI

5,192,731

TITANIUM CATALYST COMPONENTS, PROCESS FOR PREPARING SAME, CATALYSTS CONTAINING SAME FOR PREPARING ETHYLENE POLYMERS AND PROCESS FOR PREPARING SAID ETHYLENE POLYMERS

Masaru Kioka; Kazunitsu Kawakita, and Akinori Toyota, all of Kuga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 415,336, Sep. 18, 1989, abandoned. This application Oct. 23, 1991, Ser. No. 781,667

Claims priority, application Japan, May 13, 1988, 63-116626; May 13, 1988, 63-116627; May 18, 1988, 63-122655; May 18, 1988, 63-122656; Jul. 20, 1988, 63-181406; Jul. 20, 1988, 63-181407

Int. Cl.[5] C08F 4/646

U.S. Cl. 502—110 20 Claims

12. A process for preparing a carrier-supported titanium catalyst component containing magnesium, aluminum, halogen and titanium as essential ingredients, which process comprises preparing a magnesium containing support (I) by bringing a support into contact with an organometallic compound of a metal of the Group II to IIIA of the periodic table having at least one hydrocarbon group attached directly to the metal atom or with a halogen containing compound selected from the group consisting of halogenated hydrocarbon, hydrogen halide, halogen and a compound having halogen atoms directly attached to silicon, tin, phosphorus, titanium or vanadium element, contacting the treated support with a magnesium compound in the liquid state containing a magnesium compound and an alcohol, and having no reducing ability, and then bringing the resulting magnesium containing support into contact with a reducing organometallic compound (II) and a titanium compound in the liquid state (III).

5,192,732

PROPYLENE POLYMERIZATION COCATALYST CONTAINING SILANE AND RESULTANT CATALYSTS

Laurent Duranel, Arthex de Buern; Roger Spitz, St Syphorien d'Ozon, and Thierry Soto, Lyons, all of France, assignors to Atochem, France

Filed Nov. 22, 1991, Ser. No. 798,235

Claims priority, application France, Nov. 27, 1990, 90 14800

Int. Cl.[5] C08F 4/656

U.S. Cl. 502—126 15 Claims

1. A cocatalyst for use in association with a catalytic component comprising a titanium compound and an internal electron donor on a magnesium halide support for the polymerization of propylene alone or propylene with ethylene or a C_4 or C_{12} alpha-olefin, said cocatalyst consisting essentially of an organic aluminum compound and an external electron donor consisting essentially of the combination of a hydrocarbyl monoether and/or a hydrocarbyl silane having a single Si—O—C bond with a non-aromatic saturated hydrocarbyl silane having two Si—O—C bonds.

5,192,733

OXYCHLORINATION CATALYSTS COMPRISING COPPER CHLORIDE SUPPORTED ON RARE-EARTH-MODIFIED ALUMINA, PROCESS FOR MAKING SUCH CATALYSTS, AND OXYCHLORINATION PROCESSES USING THEM

Eric L. Maine, Colwich; William Q. Beard, Jr.; Robert P. Hirschmann, both of Wichita, all of Kans.; Barry M. Little, Castlewood, S. Dak., and Earl B. Smith, Newton, Kans., assignors to Vulcan Materials Company, Wichita, Kans.

Division of Ser. No. 533,513, Jun. 5, 1990, Pat. No. 5,113,027, which is a continuation-in-part of Ser. No. 451,303, Dec. 15, 1989, Pat. No. 5,004,849. This application Dec. 4, 1991, Ser. No. 802,190

Int. Cl.[5] B01J 21/04, 23/10, 27/10, 27/122

U.S. Cl. 502—225 11 Claims

1. A catalyst composition for use in the production of a chlorinated hydrocarbon product selected from the group consisting of perchloroethylene, trichloroethylene and mixture thereof from a less completely chlorinated precursor thereof by oxychlorination of said precursor in a fluidized bed of catalyst, which catalyst composition comprises (1) a catalyst support in microspheroidal form composed of at least 90 percent alumina and from 0.2 to 10 percent of a Lanthanide Oxide selected from the group consisting of the oxides of lanthanum, neodymium, praseodymium and yttrium and mixtures comprising at least two of said oxides, said Lanthanide Oxide being integrally incorporated in the alumina by heat treatment at a temperature of at least 800° C. and up to 1500° C., said support having an initial surface area in excess of 20 and less than 100 m^2/g, and (2) from 4 to 25 percent (based on said support) of a mixture of copper chloride and potassium chloride deposited on said support.

5,192,734

HYDROPROCESSING CATALYST COMPOSITION

John E. Creighton, Columbia, and Leo Rheaume, Hyattsville, both of Md., assignors to W. R. Grace & Co.- Conn., New York, N.Y.

Filed Oct. 25, 1991, Ser. No. 783,067

Int. Cl.[5] B01J 21/04, 23/85, 23/88

U.S. Cl. 502—314 5 Claims

1. A catalyst comprising alumina and catalytically effective amounts of a metal selected from the group consisting of a Group VIB metal and a Group VIII metal and mixture thereof, said catalyst having a surface area of greater than 330 m^2/g, a total pore volume above about 0.5 cc/g as determined by mercury porosimetry, and less than 0.25 cc/g pore volume in pores greater than 250 Å diameter.

5,192,735

PREPARATION OF LOW CHROMIUM ACTIVE CHARCOAL BY FREEZE DRYING IMPREGNATED CHARCOAL

Jack G. Pagotto, Kanata, and Septimus H. C. Liang, Ottawa, both of Canada, assignors to Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Feb. 20, 1992, Ser. No. 837,913

Claims priority, application Canada, Mar. 1, 1991, 2037438

Int. Cl.[5] B01J 23/20, 20/32; C01B 31/08; C01C 3/00

U.S. Cl. 502—417 10 Claims

1. A process for producing an activated carbon adsorbent having crystals of chromium VI uniformly distributed over the carbon surface, said process comprising the steps of:

(a) soaking charcoal in an impregnating solution of chromium VI;

(b) draining excess impregnating solution from the charcoal, and thereafter

(c) freeze-drying the thus impregnated charcoal to provide chromium VI crystals uniformly distributed over the carbon surface.

5,192,736

HEAT-SENSITIVE RECORDING MATERIALS

Kazuyuki Hanada; Iwao Mizutze; Masashi Saito; Katsutoshi Torii, and Katsumi Kuriyama, all of Tokyo, Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed Dec. 24, 1991, Ser. No. 813,180

Claims priority, application Japan, Dec. 28, 1990, 2-415441

Int. Cl.[5] B41M 5/26

U.S. Cl. 503—226 10 Claims

1. In a heat-sensitive recording material comprising a base sheet material, a heat-sensitive recording layer provided on one side of the base sheet material and a heat-resistant layer provided on the other side of the base sheet material, the improvement wherein the heat-resistant layer is formed of a resin modified with a silane coupling agent, said silane coupling agent containing at least one free isocyanate group, and the modified resin containing one or more hydrolyzable silyl groups in side chains of the molecule of the resin.

5,192,737

HEAT TRANSFER DYE-PROVIDING MATERIAL

Seiiti Kobodera, and Kono Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

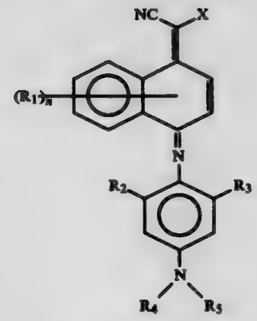
Filed Nov. 4, 1991, Ser. No. 787,611

Claims priority, application Japan, Nov. 6, 1990, 2-299007

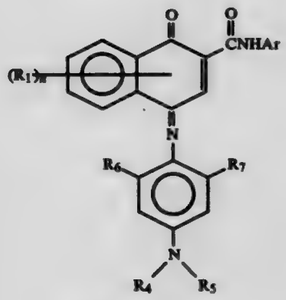
Int. Cl.[5] B41M 5/035, 5/26

U.S. Cl. 503—227 13 Claims

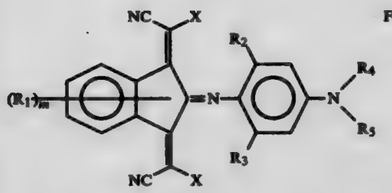
1. A thermal transfer dye-providing material comprising a support having provided thereon a layer containing a thermally migrating dye, wherein at least one of the dye-containing layer and a layer adjacent thereto contains an infrared-absorbing dye represented by Formula (I), (II) or (III):



Formula (I)



Formula (II)



Formula (III)

wherein R_1 represents a halogen atom, an alkoxy group, an aryloxy group, an acylamino group, an alkoxycarbonylamino group, a sulfonylamino group, a sulfamoyl group, a hydroxyl group, a sulfonyl group, or a ureido group; n represents an integer of from 0 to 3, provided that R_1's may be the same or different when n is 2 or 3; m represents an integer of from 0 to 2, provided that R_1 may be the same or different when m is 2; R_2 and R_3 can be the same or different and independently represent a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, an acylamino group, an alkoxycarbonylamino group, or a ureido group; R_4 and R_5 can be the same or different and independently represent a hydrogen atom, an alkyl group, or an aryl group, provided that R_4 and R_5 may be combined with each other to form a ring and that R_4 and R_5 may be combined with a benzene ring to form a 5- or 6-membered nitrogen-containing heterocyclic group; R_6 and R_7 can be the same or different and independently represent an alkyl group, an alkoxy group, a halogen atom, an acylamino group, an alkoxycarbonylamino group, or a ureido group; X represents a cyano group, an acyl group, an alkoxycarbonylamino group, or a ureido group; Ar represents an aryl group or a heteroaryl group; provided that the above groups can be substituted with other groups and that, in Formulae (I) and (III), the CN and X groups which are bonded to the same carbon atom can change positions with each other.

5,192,738

HEAT TRANSFER DYE-PROVIDING MATERIAL

Yoshio Inagaki, and Seiiti Kobodera, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

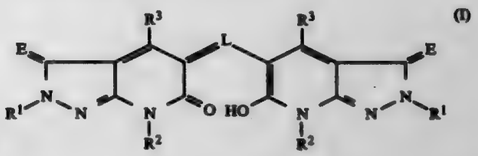
Filed Nov. 4, 1991, Ser. No. 787,609

Claims priority, application Japan, Nov. 5, 1990, 2-297165

Int. Cl.[5] B41M 5/035, 5/38

U.S. Cl. 503—227 14 Claims

1. A thermal transfer dye-providing material comprising a support having provided thereon a layer containing a thermally migrating dye, wherein at least one of the dye-containing layer and a layer adjacent thereto contains an infrared-absorbing dye represented by Formula (I):



(I)

wherein L represents a substituted or unsubstituted methine group, trimethine chain or pentamethine chain, which is formed by linking the methine groups with a conjugated double bond; E represents O, S or N—R^4; R^1 and R^4 can be substituted or unsubstituted and independently represent an alkyl group, an alkenyl group, an alkynyl group, an aryl group, a heterocyclic group, an amino group, a hydrazino group, or a diazenyl group, provided that R^1 and R^4 may be combined to form a ring; R^2 can be substituted or unsubstituted and represents a hydrogen atom, an alkyl group, an aryl group, an alkenyl group, an alkynyl group, or a heterocyclic group; and R^3 can be substituted or unsubstituted and represents a hydrogen atom, a halogen atom, a cyano atom, a nitro group, a hydroxy group, a carboxyl group or a salt thereof, an alkyl group, an aryl group, an alkenyl group, a heterocyclic group, an alkoxy group, an aryloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an amino group, an acyloxy group, a carbamoyl group, a sulfamoyl group, an alkylthio group, an arylthio group, an alkylsulfonyl group, an arylsulfonyl group, or an alkynyl group.

5,192,739

METHOD OF FORMING A TAPE OF THE HIGH TEMPERATURE OXIDE SUPERCONDUCTORS

Kenneth W. Lay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 28, 1991, Ser. No. 723,032

Int. Cl.[5] H01L 39/12

U.S. Cl. 505—1 3 Claims

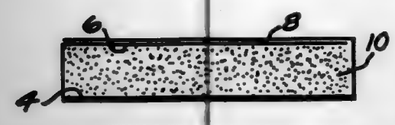
1. A method of forming a superconducting tape having a silver sheath and a polycrystalline oxide superconductor core, comprising:

forming at least one silver foil, having a length and a width dimension, to have a receiving surface extending along the length dimension for supporting a deposit, and at least one enclosing surface that can cover the deposit and overlap

another portion of the foil so that the surfaces form the sheath, the foil having a first thickness at the receiving surface and a second thickness at the enclosing surface;

forming a precursor deposit of the superconductor on the receiving surface;

wrapping the enclosing surface to cover the deposit and



overlap another portion of the foil to form the sheath, the first and second thicknesses being preselected so that the thickness of the overlapping foils is equivalent to the thickness of foil oppositely facing the overlapping foils;

urging the overlapping foils together to form a seal, and

reaction-sintering the precursor deposit to form the superconductor core.

5,192,740

COMPOSITIONS AND METHODS FOR IMPROVING COLD TOLERANCE IN ANIMALS AND HUMANS

Tse-Fun Lee, and Lawrence C. Wang, both of Edmonton, Canada, assignors to University of Alberta, Edmonton, Canada

Continuation of Ser. No. 287,974, Dec. 20, 1988, abandoned.
This application May 9, 1991, Ser. No. 700,320
Claims priority, application United Kingdom, Dec. 21, 1987, 8729714
Int. Cl.[5] A61K *37/00, 31/70, 31/715, 31/52*
U.S. Cl. 514—2 38 Claims

1. A method of improving the cold tolerance of animals and humans which comprises administering to an animal or human in need thereof an orally ingestible composition consisting essentially of an adenosine receptor antagonist selected from the group of caffeine, theobromine, 8-phenyltheophylline, 8-cyclopentyltheophylline, 8-(4-(2-aminoethyl)amino carboxymethyloxyphenyl)-1,3-dipropylxanthine, 8-(amino-4-chlorophenyl)-1,3-dipropyl xanthine, and 8-(p-sulfophenyl)-1,3-dipropyl xanthine, alone or mixed with two or more thereof, or in combination with theophylline or aminophylline or both, and a nutritional supplement mixture of 47 to 66% by weight of carbohydrate, 15–50% by weight of protein and 0 to 25% by weight of fat, said composition administered in an amount sufficient to improve the cold tolerance of said animal or human.

5,192,741

SUSTAINED AND CONTROLLED RELEASE OF WATER INSOLUBLE POLYPEPTIDES

Piero Orsolini, Martigny; Roland-Yves Mauvernay, and Romano Deghenghi, both of Lausanne, all of Switzerland, assignors to Debiopharm S.A., Lausanne, Switzerland

Filed Sep. 20, 1988, Ser. No. 247,060
Claims priority, application United Kingdom, Sep. 21, 1987, 8722134
Int. Cl.[5] A61K *37/26*; C07K *7/40*
U.S. Cl. 514—4 14 Claims

1. A process for preparing a pharmaceutical composition designed for sustained and controlled release of a peptide, said process comprising selecting a water-insoluble peptide salt; dispersing the water-insoluble peptide salt into a solution of a polylactide polymer, a polyglycolide polymer, a copolymer of lactic and glycolic acids, or a mixture of said polymers and a solvent; removing the solvent of the solution to form a residue; and shaping the residue into solid particles of said pharmaceutical composition suitable for administration by parenteral injection or as a subcutaneous implant.

5,192,742

COMPOUNDS AND COMPOSITIONS FOR THE TREATMENT OF BACTERIAL INFECTIONS IN ANIMALS

Nigel J. Coates; Rachel Sykes; Davis Christopher J., and Lawrence M. Curtis, all of Betchworth, England, assignors to Beecham Group PLC, England

Continuation of Ser. No. 454,708, Dec. 21, 1989, abandoned.
This application Dec. 18, 1991, Ser. No. 809,845
Claims priority, application United Kingdom, Dec. 23, 1988, 8830225
Int. Cl.[5] A61K *37/02, 35/74*; C07K *7/54, 9/00*
U.S. Cl. 514—8 11 Claims

2. A substance or compound obtained by fermentation of a microorganism of the genus Amycolatopsis NCIB 40089 accession number comprised of compounds having a molecular weight of 2190±1 and 2204±1 and having antibiotic activity measured in MIC μg/ml against *Bacillus subtilis* ATCC 6633 of 16.0, *Corynebacterium xerosis* NCTC 9755 of 16.0, *Sarcina lutea* NCTC 8340 of 16.0, *Staphylococcus aureus* "Oxford" of 32.0, *Staphylococcus aureus* "Russell" of 64.0, *Staphylococcus aureus* "V573" MR of 16.0, *Staphylococcus saprophyticus* "FLI" of 64.0, *Staphylococcus epidermidis* 60137 of 16.0, *Streptococcus pyrogenes* CN10 of 4.0, *Streptococcus agalactiae* "Hester" of 8.0, *Streptococcus sanguis* ATCC 10556 of 16.0, *Streptococcus pneumoniae* Pu7 of 8.0 and *Streptococcus faecalis* 1 of 32.0, wherein said *Staphylococcus aureus* "V573" MR is resistant to methicillin, tetracycline, erythromycin and gentamycin.

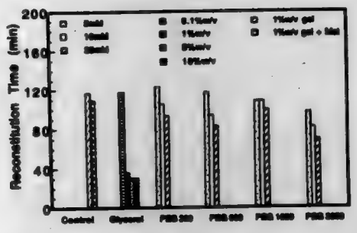
11. A method of treating bacterial infections in animals, which comprises administering an antibacterially effective amount of a substance or compound according to claim 2 to an animal in need thereof.

5,192,743

RECONSTITUTABLE LYOPHILIZED PROTEIN FORMULATION

Chung C. Hsu, Los Altos Hills; Hoc M. Nguyen, San Francisco, and Sylvia S. Wu, San Ramon, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Jan. 16, 1992, Ser. No. 821,206
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—8 13 Claims



1. A formulation comprising tissue factor, glycerol, and a water-soluble etherified cellulose in an amount that upon reconstitution of the mixture will form a topical gel.

5,192,744

METHOD OF INHIBITING ANGIOGENESIS OF TUMORS

Neal P. Bouck, Oak Park; Peter J. Polverini, Evanston; Deborah J. Good, Chicago, all of Ill., and Farnaz Rastinejad, Los Altos, Calif., assignors to Northwestern University, Evanston, Ill.

Filed Jan. 12, 1990, Ser. No. 464,369
Int. Cl.[5] A61K *37/02*; C07K *15/06, 15/14*
U.S. Cl. 514—8 24 Claims

1. A method of inhibiting angiogenesis in a human patient, comprising administering to the patient a vascularization inhibitor comprising substantially pure human thrombospondin in trimer or monomer form, or a substantially pure fragment thereof capable of inhibiting vascularization.

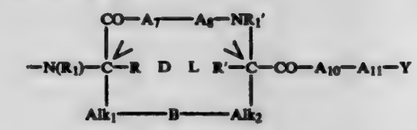
5,192,745

CYCLIC ANTICOAGULANT PEPTIDES

John L. Kretzmansky, Cincinnati, and Simon J. T. Mao, Loveland, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 405,106, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 53,204, May 21, 1987, abandoned. This application Sep. 23, 1991, Ser. No. 764,989
Int. Cl.[5] A61K *37/02*; C07K *7/06, 7/08*
U.S. Cl. 514—9 8 Claims

1. A peptide derivative of the formula



wherein

X is an amino terminal residue selected from hydrogen, one or two alkyl groups of from 1 to 6 carbon atoms, one or two acyl groups of from 2 to 10 carbon atoms, carbobenzyloxy, and t-butyloxycarbonyl;

A_1 is Gly-Asp, or a bond;

A_2 is Phe or Tyr;

A_3 is Glu;

A_4 is Glu;

A_5 is Ile;

A_7 is Glu;

A_8 is Glu;

A_{10} is Leu;

A_{11} is Gln;

Y is a carboxy terminal residue selected from OH, (C_1–C_6)alkoxy, amino, mono- or di-(C_1–C_4)alkyl substituted amino, and benzylamino;

R, R', R_1, and R_1' are each selected from a hydrogen, and (C_1–C_4)alkyl group;

B is -S-S-; and

Alk_1 and Alk_2 are each selected from a (C_1–C_8)methylene group; and wherein "D" and "L" indicate that the stereochemistry of the indicated carbon of attachment of said Alk_1 and Alk_2 when said Alk_1 and Alk_2 correspond to the amino acid side chains of D-cysteine and L-cysteine, respectively, or a pharmaceutically acceptable salt thereof.

5,192,746

CYCLIC CELL ADHESION MODULATION COMPOUNDS

Thomas J. Lobl, Encinitas; Shiu-Lan Chiang, and Pina M. Cardarelli, both of San Diego, all of Calif., assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jul. 9, 1990, Ser. No. 550,330
Int. Cl.[5] A61K *37/02*; C07K *5/00, 7/00, 15/00*
U.S. Cl. 514—11 15 Claims

1. A compound of the formula

and pharmaceutically acceptable salts thereof, wherein

L^1 and L^2 are each, or are together, a residue of an amino acid, an amino acid analog or an amino acid mimetic having a functional group suitable for the formation of a cyclizing bridge between L^1 and L^2;

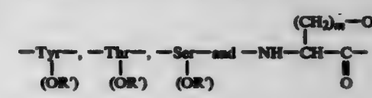
Z is a cyclizing moiety or bond between L^1 and L^2;

1 is optional and, where present, is selected from the group consisting of Leu, Sar, D-Nal, Tyr, Phe, Ile, Pro, Gly, Ala, Val, norLeu, norVal, β-Ala, Trp, and (Ada -Ala;

2 is selected from the group consisting of Arg, homoArg and norArg.

4 is selected from Asp and, where 2 is norArg, Glu.

5 is optional and, where present, is selected from the group consisting of Ser, Thr, Tyr, Trp, Ala, Val, Phe



wherein m is 2, 3 or 4;

6 is optional and, where present, is selected from the group consisting Pro, 3-thioPro, 1,1-ACC, Dhp, Hyp, homoPro and Phe;

X^1 and Y^1 are each optional and, where present, are independently selected from sequences of 1 to 4 D- or L-amino acids or amino acid analogs;

X^2 is an optional N^{α}-substituent selected from R'-(including hydrogen) and R'CO—; and

Y^2 is an optional carboxyl terminal substituent selected from the group consisting of —OR' (including hydroxy), —NR'$_2$ (including —NH_2 and —NHR'), —$NHNH_2$ and —SR';

and wherein each R' is individually a pharmaceutically suitable substituent group, preferably one selected from the group consisting of hydrogen, linear and branched, unsubstituted and substituted C_1–C_8 lower alkyls, C_2–C_8 alkenyls, C_2–C_8 alkenyls, C_2–C_8 alkynyls, C_6–C_{14} aryls, C_7–C_{14} alkaryls, C_7–C_{14} alkaryls and C_3–C_{14} cycloalkyls, and, in the case of —NR'$_2$, from cyclized groups forming (in an attachment with the nitrogen atom) a 5–8 membered heterocyclic ring optionally containing oxygen, nitrogen or sulfur as a further ring heteroatom.

5,192,747

ANTICOAGULANT PEPTIDES

John L. Kretzmansky, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 416,336, Oct. 3, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 803,666
Int. Cl.[5] A61K *37/00, 37/02*; C07K *5/00, 7/00*
U.S. Cl. 514—15 34 Claims

1. A peptide derivative of the formula

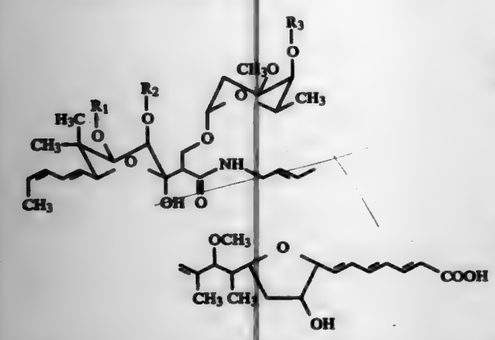
X-A1-A2-A3-A4-A5-A6-A7-A8-A9-A10-Y

wherein;

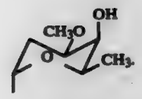
X is an amino terminal substituent selected from hydrogen, one or two alkyl groups of from 1 to 10 carbon atoms, one or two acyl groups of from 2 to 10 carbon atoms, carbobenzyloxy or t-butyloxy carbonyl;
A_1 is a sequence of Gly-Asp, 1–11 amino acids of hirudin or natural variants of hirudin, or a bond;
A_2 is a bond or is Phe, SubPhe, pChloroPhe, D-Phe, NMePhe, Pgl, Tha, His, Cin, Nap, Leu, Gln, 3,4-dihydro-Cin, β-(2- and 3-thienyl)alanine, β-(2-and 3-furanyl)alanine, β-(2-, 3-, and 4-pyridyl)alanine, β-(benzothienyl-2- and 3-)alanine, β-(1- and 2-naphthyl)alanine, Tyr or Trp;
A_3 is a bond, Glu, or Asp;
A_4 is a bond, Pro, or Glu;
A_5 is a bond, or Ile;
A_6 is a bond, [Tiq,]Pro, Hyp, 3,4-dihydroPro, thiazolidine-4-carboxylate, Sar, NMePgl, Azt, Pip;
A_7 is a bond, Glu, or asp;
A_8 is a bond, Glu, Asp, or Ala;
A_9 is a bond, or is a Tyr, I-Tyr, D-Tyr, Trp, Phe, Leu, Nle, Ile, Val, Ala, Cha or Pro or is a dipeptide containing at least one of these amino acids;
A_{10} is a sequence of 1–11 amino acids of hirudin or natural variants of hirudin, D-Glu, Glu, Gln, Asn, or a bond;
Y is a carboxy terminal substituent selected from OH, (C_1–C_8) alkoxy, amino, mono di (C_1–C_4) alkyl substituted amino acids, or is an alcohol terminal residue; and where at least one of the positions in A_3 through A_9 is a bond.

5,192,748
ANTIBIOTICS UNPHENELFAMYCIN AND PHENELFAMYCINS A-D
Jill E. Hochlowski, Green Oaks; Mark H. Buytendorp, Cary; Randal H. Chen, Buffalo Grove; James B. McAlpine, Libertyville, all of Ill.; Robert J. Theriault, Kenosha, Wis.; Marianna Jackson, Waukegan, and James P. Karwowski, Mundelein, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Continuation-in-part of Ser. No. 160,614, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 104,902, Oct. 6, 1987, abandoned. This application Aug. 5, 1991, Ser. No. 740,627
Int. Cl.[5] A61K *31/71*; C07H *15/00*
U.S. Cl. 514—25 **12 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R_1 and R_2 are independently selected from the group consisting of hydrogen and —C(O)$CH_2C_6H_5$, with the proviso that at least one of R_2 and R_2 is hydrogen, and R_3 is selected from the group consisting of hydrogen and



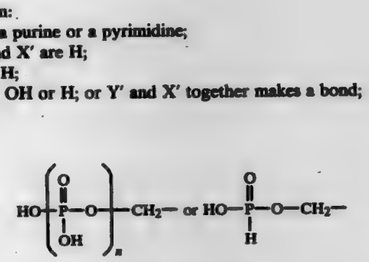
8. A method of increasing the growth rate and feed efficiency of animals comprising administering to said animals an effective amount of a compound of claim 1.

5,192,749
4'-SUBSTITUTED NUCLEOSIDES
Connie O-Yang, Sunnyvale; Keith A. M. Walker, Los Altos Hills; Walter Kurz, Mountain View, and Helen Y. Wu, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed May 21, 1990, Ser. No. 526,485
Int. Cl.[5] A61K *31/70*; C07H *17/00, 15/12*
U.S. Cl. 514—45 **31 Claims**

1. A compound of the formula

I

wherein:
B is a purine or a pyrimidine;
X and X' are H;
Y is H;
Y, is OH or H; or Y' and X' together makes a bond;
Z is



where n is zero, one, two or three;
or Y' and Z together form a cyclic phosphate ester;
Z' is —CN, —CH_3, —CH_2N_3 or —CH_2J, where J is a halogen atom;
or Z' and Y' together are —CH_2O—;
and pharmaceutically acceptable esters, ethers, amides, N-acyl moieties and salts thereof.

5,192,750
METHOD AND COMPOSITION FOR TREATMENT OF FOOD ALLERGY
Albert F. Burton, Comox, and Stephen Gislason, Vancouver, both of Canada, assignors to The University of British Columbia, Vancouver, Canada
Filed Jan. 28, 1992, Ser. No. 826,763
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—62 **7 Claims**

1. A method of alleviating food sensitivity and food allergy in a human being suffering from food intolerance or food allergy comprising feeding said human being a therapeutically effective amount of N-acetyl glucosamine as required to alleviate food sensitivity or food allergy in said human being.

5,192,751
USE OF COMPETITIVE NMDA RECEPTOR ANTAGONISTS IN THE TREATMENT OF URINARY INCONTINENCE
Karl B. Thor, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Jul. 24, 1992, Ser. No. 919,480
Int. Cl.[5] A61K *31/47, 31/675*
U.S. Cl. 514—82 **15 Claims**

1. A method of treating motor urge urinary incontinence in mammals which comprises administering to a mammal in need of treatment therefor an effective amount of a competitive NMDA antagonist.

5,192,752
SWALLOWABLE PHARMACEUTICAL COMPOSITIONS CONTAINING COLLOIDAL BISMUTH SUBCITRATE
Francis B. Chapuis, Hamilton, and Sekhar Mitra, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 14, 1991, Ser. No. 640,920
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.[5] A61K *31/65, 31/43, 31/545, 31/415, 31/29*
U.S. Cl. 514—152 **22 Claims**

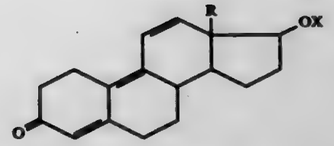
1. An oral pharmaceutical composition in solid unit dosage form suitable for swallowing comprising a safe and effective amount of solid colloidal bismuth subcitrate and, optionally, pharmaceutically-acceptable carrier materials, wherein the packing density of the pharmaceutical composition is less than about 1 g/ml.

5,192,753
ANTI-RHEUMATOID ARTHRITIC DRUGS IN THE TREATMENT OF DEMENTIA
Patrick L. McGeer, 4727 West 2nd Ave., Vancouver, B. C., Canada V6T 1C1 ; Joseph Rogers, 7646 W. Julie Dr., Glendale, Ariz. 85308; John Sibley, 87 Leddy Crescent, Saskatoon, Saskatchewan, Canada S7H 3Y9 , and Edith McGeer, 4727 West 2nd Ave., Vancouver, B. C., Canada V6T 1C1
Filed Apr. 23, 1991, Ser. No. 689,499
Int. Cl.[5] A61K *31/60, 31/615, 31/54, 31/44, 31/425, 31/42, 31/415, 31/40, 31/38, 31/195, 31/19*
U.S. Cl. 514—159 **6 Claims**

1. A method of treating dementia in a human being in need thereof which comprises administering to said human being on a daily basis a sufficient amount of a non-steroidal anti-inflammatory drug to inhibit prostoglandin synthesis in vivo but insufficient to induce unwanted side effects in said human.

5,192,754
FISH STRESS RESISTANCE METHOD
Saburo Kubota, Akishima, Japan, assignor to Roussel Uclaf, Paris, France
Filed Feb. 11, 1992, Ser. No. 833,768
Claims priority, application Japan, Feb. 13, 1991, 3-40648
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—170 **6 Claims**

1. A method of relieving stress in fish and increasing resistance to pathogenic agents selected from the group consisting of fungi, viruses and bacteria comprising orally administering daily to the fish an amount of 0.1 to 0.5 mg of a compound of the formula



I

wherein R is alkyl of 1 to 4 carbon atoms and X is acyl of an organic carboxylic acid of 1 to 18 carbon atoms per kg of fish body weight sufficient to relieve stress and increase resistance to fungi, viruses and bacteria.

5,192,755
PREGNANE DERIVATIVES AS IMMUNOMODULATORS
Robert T. Logan, Lanark, Scotland, and Gilbert F. Woods, Beaumaris, Wales, assignors to Akzo N.V., Arnhem, Netherlands
Continuation of Ser. No. 3,107, Jan. 14, 1987, abandoned. This application May 17, 1990, Ser. No. 525,299
Claims priority, application United Kingdom, Jan. 15, 1986, 8600879
Int. Cl.[5] A61K *31/56*
U.S. Cl. 514—180 **24 Claims**

1. A method of supporting the cellular immune system comprising administering a pharmaceutical composition having the formula:

wherein
X=F, Cl or Br;
R_1=F or Cl;
R_2=H(βOH) or O;
R_3=alkyl (1–4 C);
R_4=alkyl (1–4 C); and
the dotted line indicates the presence of a single or a double boad in 1,2-position,
and a pharmaceutically acceptable non-toxic carrier, in an effective amount to suppress the cellular immune system.

5,192,756
AMINOSTEROL ANTIBIOTIC
Michael Zasloff, Merion; Karen Moore, Lansdowne, and Suzanne Wehrli, Bala Cynwyd, all of Pa., assignors to The Children's Hospital of Pennsylvania, Philadelphia, Pa.
Filed Mar. 18, 1992, Ser. No. 853,634
Int. Cl.[5] A61K *31/56*; C07J *41/00*
U.S. Cl. 514—182 **4 Claims**

1. A substantially homogeneous composition of the compound 3β(N-[3-aminopropyl]-1,4-butanediamine)- 7α,24[-dihydroxy-5α-cholestane 24-sulfate.

4. A method of treating microbial infections in human or non-human animals comprising administering to said animal an effective antibiotic amount of the compound 3β(N-[3-aminopropyl]-1,4-butanediamine)-7α,24[-dihydroxy-5α-cholestane 24-sulfate or a pharmaceutically acceptable salt thereof.

VOL 1148 ISS 2 MR 9 1993 UMI

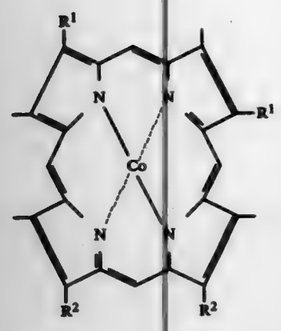
5,192,757

COBALT PORPHYRINS

Michael R. Johnson, Chapel Hill, and Stephen V. Frye, Durham, both of N.C., assignors to Glaxo Inc., Research Triangle Park, N.C.

Filed Dec. 20, 1990, Ser. No. 631,129
The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.
Int. Cl.[5] A61K *31/555*; C07D *487/22*
U.S. Cl. 514—185 14 Claims

1. A cobalt porphyrin of the following formula (I):



(I)

or a salt or complex thereof with a ligand wherein the cobalt atom is in the +2 oxidation state, wherein said ligand is up to 2 molecules of an aromatic base selected from the group consisting of pyridine, imidazole or 2-methyl-imidazole and wherein:

R^1 is $-(CH_2)_a-X^1$;

a is 0, 1, 2 or 3;

X^1 is hydrogen, —COOH, —$CONHSO_2X^2$, —$CONHCOX^2$ or tetrazole which is unsubstituted or alkyl-substituted;

X^2 is alkyl, phenyl or phenyl independently substituted by one or more of halogen, alkoxy, nitro, alkyl, hydroxy, amino and mono- and dialkyl substituted amino;

R^2 is independently a value of R^1, provided that i) in one of R^1 and R^2, X^1 is other than hydrogen, ii) n is not 0 when X^1 is tetrazole and iii) R^1 is not H, $-CH_2CH_3$ or $-CH_2CH_2COOH$ when R^2 is $-CH_2CH_2COOH$.

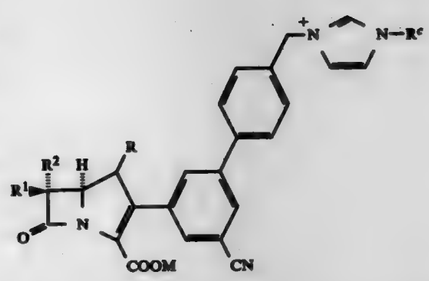
5,192,758

2-BIPHENYL-CARBAPENEM ANTIBACTERIAL AGENTS

Frank DiNinno, Old Bridge; Kevin D. Dykstra, Hewitt, and James V. Heck, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 28, 1992, Ser. No. 843,139
Int. Cl.[5] A01N *43/00*; A61K *31/395*; C07D *487/00*
U.S. Cl. 514—210 14 Claims

1. Carbapenem compounds of the formula:



(I)

wherein:

R is H or CH_3;

R^1 and R^2 are independently H, CH_3-, CH_3CH_2-, $(CH_3)_2CH-$, $HOCH_2-$, $CH_3CH(OH)-$, $(CH_3)_2C(OH)-$, $FCH_2CH(OH)-$, $F_2CHCH(OH)-$, $F_3CCH(OH)-$, $CH_3CH(F)-$, CH_3CF_2-, or $(CH_3)_2C(F)-$;

R^c is selected from the group consisting of $-CF_3$, and C_{1-6} alkyl where the C_{1-6} alkyl may be mono-substituted with a substituent selected from the group consisting of:

a) a trifluoromethyl group: $-CF_3$;

b) a halogen atom: —Br, —Cl, —F, or —I;

c) C_1–C_4 alkoxy radical: $-OC_{1-4}$ alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of —OH, $-OCH_3$, —CN, $-C(O)NH_2$, $-OC(O)NH_2$, CHO, $-OC(O)N(CH_3)_2$, $-SO_2NH_2$, $-SO_2N(CH_3)_2$, $-SOCH_3$, $-SO_2CH_3$, —F, $-CF_3$ and $-COOC_{1-4}$alkyl;

d) a hydroxy group: —OH;

e) a carbonyloxy radical: $-O(C{=}O)R^z$, where

R^z is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above;

f) a carbamoyloxy radical; $-O(C{=}O)N(R^y)R^z$ where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or $—S(O)_2—$, to form a ring (where the ring is optionally mono-substituted with R^q as defined above);

g) a sulfur radical: $—S(O)_n—R^z$ where n=0–2, and R^z is defined above;

h) a sulfamoyl group: $—SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

i) azido; N_3

j) a formamido group: $—N(R^t)(C{=}O)H$, where

R^t is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

k) a (C_1–C_4 alkyl)carbonylamino radical: $—N(R^t)(C{=}O)C_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

l) a (C_1–C_4 alkoxy) carbonylamino radical: $—N(R^t)(C{=}O)OC_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

m) a ureido group: $—N(R^t)(C{=}O)N(R^y)R^z$ where R^t, R^y and R^z are as defined above;

n) a sulfonamido group: $—N(R^t)SO_2R^z$, where R^z and R^t are as defined above;

o) a cyano group: —CN;

p) a formyl or acetalized formyl radical; —(C=O)H or $—CH(OCH_3)_2$;

q) (C_1–C_4 alkyl)carbonyl radical wherein the carbonyl is acetalized: $—C(OCH_3)_2C_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

r) carbonyl radical: $—(C{=}O)R^z$, where R^z is as defined above;

s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: $—(C{=}NOR^z)R^y$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

t) a (C_1–C_4 alkoxy)carbonyl radical: $—(C{=}O)OC_1$–C_4 alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

u) a carbamoyl radical: $—(C{=}O)N(R^y)R^z$ where R^y and R^z are as defined above;

v) an N-hydroxycarbamoyl or $N(C_1$–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group; $—(C{=}O)—N(OR^y)R^z$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

w) a thiocarbamoyl group: $—(C{=}S)N(R^y)(R^z)$ where R^y and R^z are as defined above;

x) thiocyanate: —SCN;

y) trifluoromethylthio: $—SCF_3$;

z) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH or $N(C_1$–C_4 alkyl) and in which one additional carbon atom may be replaced by NH or $N(C_1$–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

aa) C_2–C_4 alkenyl radical;

ab) C_2–C_4 alkenyl radical;

ac) C_2–C_4 alkynyl radical;

ad) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from —S— and $>NR^t$ (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents a) to ac) above;

M is selected from:

i) hydrogen;

ii) a pharmaceutically acceptable esterifying group or removable carboxyl protecting group;

iii) an alkali metal or other pharmaceutically acceptable cation; or

iv) a negative charge.

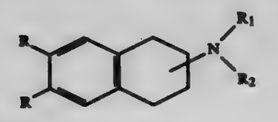
5,192,759

DERIVATIVES OF 1,2,3,4-TETRAHYDRONAPHTYLAMINE ENDOWED WITH NOOTROPIC ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Fabio Giannessi; Orlando Ghirardi; Domenico Misiti; Maria O. Tinti, and Roberto Cozzolino, all of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

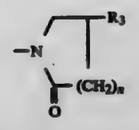
Filed Dec. 18, 1991, Ser. No. 809,874
Claims priority, application Italy, Dec. 21, 1990, 48605 A/90
Int. Cl.[5] C07D *223/10*; A61K *31/55*
U.S. Cl. 514—212 4 Claims

1. 1,2,3,4-tetrahydronaphtylamine of formula (I)



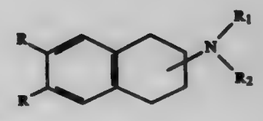
wherein
R is H OCH_3;

is either at 1 or 2 position
R_1 is H;
R_2 is selected from:
L-prolyl, optionally N-substituted with acetyl or carbobenzoxy,
L-pyroglutamyl,
(pyrrolidin-2-one-1-yl)acetyl,
3-carboxy-2-hydroxypropyl;
or R_1 and R_2 taken together with the nitrogen atom form the ring



wherein n=1,2,3 and R_3=H, OH.

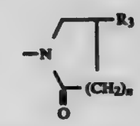
3. An orally or parenterally administrable pharmaceutical composition for enhancing the processes of learning and memory which comprises, as active ingredient, a 1,2,3,4-tetrahydronaphtylamine of formula (I)



(I)

wherein
R is H or OCH_3;

is either at 1 or 2 position
R_1 is H;
R_2 is selected from:
L-prolyl, optionally N-substituted with acetyl or carbobenzoxy,
L-pyroglutamyl,
(pyrrolidin-2-one-1-yl)acetyl,
3-carboxy-2-hydroxypropyl;
or R_1 and R_2 taken together with the nitrogen atom form the ring



wherein n=1,2,3 and R_3=H, OH.

5,192,760

3-CARBALKOXYAMINO-5-(ALPHA-AMINOPROPIONYL)-5H-DIBENZ[B,F]AZEPINES AND METHOD FOR THEIR MAKING

Helmut Wunderlich, Dresden; Andreas Stark, Radebeul; Dieter Lehmann, Radebeul; Lothar Zenker, Radebeul; Reni Bartsch; Hildegard Poppe, both of Dresden, all of German Democratic Rep.; Aleksandr P. Skoldinov, Moskau, U.S.S.R.; Natalja V. Kaverina, Moskau, U.S.S.R.; Anna N. Grinenko, Moskau, U.S.S.R.; Valentin V. Lyshtovsev, Moskau, U.S.S.R., and Ekaterina K. Grigoreva, Moskau, U.S.S.R., assignors to Arzneimittelwerk Dresden GmbH, Radebeul, German Democratic Rep.

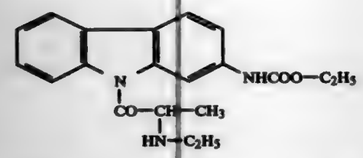
Filed Jun. 29, 1990, Ser. No. 546,375

Claims priority, application German Democratic Rep., Jun. 30, 1989, 330175-3

Int. Cl.[5] A61K *31/55*; C07D *223/18*

U.S. Cl. 514—217 **2 Claims**

1. A compound of the formula



and its pharmaceutically acceptable acid addition salts.

5,192,761

1,2,4-TRIAZOLIDINE-3,5-DIONES AND 1,3,5-TRIAZINE-2,4(1-H,3H)-DIONES, PHARMACEUTICAL COMPOSITIONS

Robert A. Izydore, Durham, and Iris H. Hall, Chapel Hill, both of N.C., assignors to North Carolina Central Univ., Durham and University of North at Chapel Hill, Chapel Hill, both of N.C.

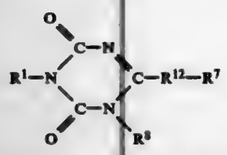
Division of Ser. No. 224,680, Jul. 27, 1988, Pat. No. 5,034,528. This application Nov. 6, 1990, Ser. No. 609,750

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/53*, *31/41*

U.S. Cl. 514—241 **5 Claims**

1. A pharmaceutical composition for controlling hyperlipidemia in mammals comprising of a hypolipidemically effective amount of a compound having the structure:



IV

wherein R^1 is hydrogen, a C_1 to C_{10} alkyl or substituted alkyl, a C_2 to C_{10} alkenyl or substituted alkenyl, a C_2 to C_{10} alkynyl or substituted alkynyl, a C_4 to C_{10} cycloalkyl or substituted cycloalkyl, a C_4 to C_{10} cycloalkenyl or substituted cycloalkenyl, aryl, substituted aryl, cyano, phenalkyl, —CO—R^9, or Y—CO—R^9;

R^7 is hydrogen, a C_1 to C_{10} alkyl or substituted alkyl, a C_4 to C_{10} cycloalkyl or substituted cycloalkyl, aryl or substituted aryl, aralkyl, aroxy or substituted aroxy, a C_1 to C_5 alkoxy or substituted alkoxy, —Y—CO—R^9, or —$NR^{10}R^{11}$;

R^8 is hydrogen, a C_1 to C_5 alkyl, a C_4 to C_{10} cycloalkyl, —CO—R^9, or —Y—CO—R^9;

R^9 is hydrogen, a C_1 to C_{10} alkyl or substituted alkyl, aryl or substituted aryl;.

R^{10} and R^{11} can be the same or different and each has the same meaning as R^9

R^{12} is —CO, —CS

Y is a C_1 to C_{10} alkylene or substituted alkylene;

with the proviso that when R^8 is hydrogen and R^7 is ethoxy, R^1 is not phenyl, methoxyphenyl, chlorophenyl, or n-butyl;

in combination with a pharmaceutically acceptable carrier.

5,192,762

USE OF BRIDGED TRICYCLIC AMINE DERIVATIVES AS ANTI-ISCHEMIC AGENTS

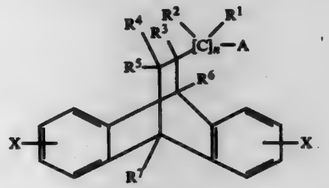
Nancy M. Gray, 261 DeSimone Dr., Marlborough, Mass., and Patricia C. Contreras, 300 E. Evans, Apt. L143, West Chester, Pa. 19380

Division of Ser. No. 428,531, Oct. 30, 1989, Pat. No. 5,055,468. This application Aug. 14, 1991, Ser. No. 745,027

Int. Cl.[5] A61K *31/50*, *31/495*

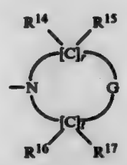
U.S. Cl. 514—249 **9 Claims**

1. A method for treating a patient afflicted by or susceptible to a neurodegenerative disorder or neurotoxic injury, said method comprising administering a therapeutically-effective amount of compound of the formula



(I)

wherein A is a group selected from



wherein each of R^1 and R^2 is independently selected from hydrido, alkyl, cycloalkyl, cycloalkylalkyl, aralkyl, aryl, hydroxyalkyl, alkoxyalkyl and halo; wherein R^1 and R^2 may be taken together to form oxo; wherein each of R^3 through R^7 is independently selected from hydrido, alkyl, hydroxy, cycloalkyl, cycloalkylalkyl, aralkyl, aryl alkoxy, alkoxyalkyl, aryloxy, aralkoxy, hydroxyalkyl, halo and haloalkyl; wherein R^4 and R^5 may be taken together to form oxo; wherein n is a number selected from zero to five, inclusive; wherein each X is independently one or more groups selected from hydrido, hydroxy, alkyl, cycloalkyl, cycloalkylalkyl, aralkyl, aryl, alkoxy, aralkoxy, aryloxy, alkoxyalkyl, haloalkyl, hydroxyalkyl, halo, cyano, amino, monoalkylamino, dialkylamino, nitro, carboxy, carboxylalkyl and alkanoyl; wherein each of R^{14} through R^{17} is independently selected from hydrido, alkyl, cycloalkyl, cycloalkylalkyl, aralkyl, aryl, alkoxyalkyl, hydroxyalkyl and halo; wherein R^{14} and R^{15} may be taken together to form oxo; wherein R^{16} and R^{17} may be taken together to form oxo; wherein each of r and t is a number independently selected from one to four, inclusive; wherein G is selected to form a heterocyclic ring containing one or more groups independently selected from

wherein each of R^{19} through R^{22} is independently selected from hydrido, hydroxy, alkyl, cycloalkyl, cycloalkylalkyl, aralkyl, aryl, alkoxy, aralkoxy, aryloxy, alkoxyalkyl, haloalkyl, hydroxyalkyl, halo, cyano, amino, monoalkylamino, dialkylamino, carboxy, carboxyalkyl and alkanoyl; or a pharmaceutically-acceptable salt thereof.

5,192,763

[(1-ARYLPYRROLIDIN-2-YL)METHYL]PIPERAZINE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Pascal Georges, St. Arnoult en Yvelines; Jacques Maslin, Vitry sur Seine; Jean-Pierre Merly, Sceaux; Dennis Bigg, Castres; Daniel Obitz, Antony; Michel Peynot, L'Hay-les-Roses, and Corinne Varoxigos, Villejuif, all of France, assignors to Synthelabo, Paris, France

Filed Jun. 6, 1991, Ser. No. 710,711

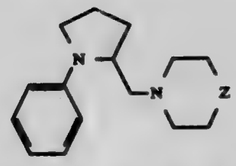
Claims priority, application France, Jun. 7, 1990, 90 07067

Int. Cl.[5] H61K *31/495*; C07D *403/06*

U.S. Cl. 514—252 **8 Claims**

1. piperazine compounds in the form of racemates or enantiomers, which compounds correspond to the formula:

(I)



in which Z represents a group of formula -N-R_1 in which R_1 is hydrogen, C_{1-3} alkyl, a group of formula Ar—C_nH_{2n}— in which n is 0, 1 or 2 and Ar represents a phenyl group optionally substituted by one or more halogen atoms and/or C_{1-3} alkyl or C_{1-3} alkyl or C_{1-3} alkoxy group, or a group of formula —COR_2 in which R_2 represents —CH_3, —C_6H_5, —$CH_2C_6H_5$ or —OC_2H_5, or their pharmaceutically acceptable acid addition salts.

5,192,764

PYRAZINONE N-OXIDE NUCLEOSIDES AND ANALOGS THEREOF

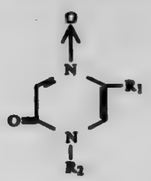
Yung-Chi Cheng, Woodbridge; Tai-Shun Lin, North Haven, both of Conn., and Thomas J. Barden, Snyder, N.Y., assignors to Research Foundation of State of N.Y., Albany, N.Y. and Yale University, New Haven, Conn.

Filed May 30, 1991, Ser. No. 707,536

Int. Cl.[5] A61K *31/495*; C07D *241/02*

U.S. Cl. 514—252 **46 Claims**

1. A compound according to the structure:



where

where

R_1 is H, CH_3, C_2H_5, C_3H_7, i-C_3H_7, —CH_2—C_6H_5, —CH=CH_2, —CH=CH—CH_3,

—C≡CH, —C≡C—CH_3, —C≡C—C_6H_5, I, Br, CF_3, —CH=CHBr, or —CH=CH C_6H_5;

R_2 is

such that

X is H, OH, CH_2OH, N_3, NH_2, F, Cl or I, when Y is H, F or OH and Z is H or F;

Y is H, OH, N_3, NH_2, F, Br, Cl or I, when X is H, F or OH and Z is H or F;

Z is H, CH_2OH, F, Cl, I, N_3 or NH_2, when X and Y are H, F or OH,

provided that R_1 is not H or CH_3 when Y=Z=H and X=OH;

R_3 is H, F, Br, Cl, I or OH; and

R_4 is H, CH_2OH, CH_2N_3, CH_2NH_2, OH, F, Br, Cl or I.

5,192,765

CERTAIN AMINES WHICH ARE MUSCARINIC RECEPTOR ANTAGONISTS

David Alker; Robert J. Bass, both of Birchington, and Peter E. Cross, Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP89/01230, § 371 Date Jun. 6, 1991, § 102(e) Date Jun. 6, 1991, PCT Pub. No. WO90/04583, PCT Pub. Date May 3, 1990

PCT Filed Oct. 16, 1989, Ser. No. 687,913

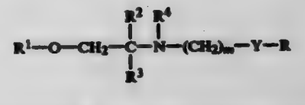
Claims priority, application United Kingdom, Oct. 17, 1988, 8824262.3

Int. Cl.[5] C07C *217/10*, *217/12*; A16K *31/135*

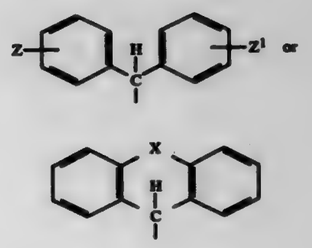
U.S. Cl. 514—255 **13 Claims**

1. A compound of the formula:

(I)



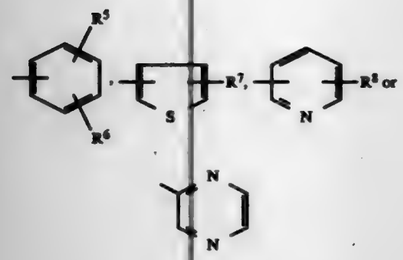
or a pharmaceutically acceptable salt thereof, wherein R^1 is a group of the formula:



where

VOL 1148 ISS 2 MR 9 1993

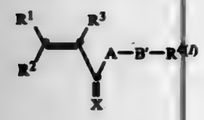
Z and Z^1 are each independently hydrogen, halo or C_1–C_4 alkyl;
X is $-(CH_2)_2-$, $-CH=CH-$, $-CH_2-S-$, $-CH_2-O-$, $-S-$ or $-O-$;
Y is a direct link, O or S;
R^2 and R^3 are each independently C_1–C_4 alkyl or together represent $-(CH_2)_p-$ where p is 2, 3, 4 or 5;
R^4 is H or C_1–C_4 alkyl;
m is 1, 2, or 3, with the proviso that when m is 1, Y is a direct link; and
R is a group of the formula



where
either R^5 and R^6 are each independently hydrogen, C_1–C_4 alkyl, hydroxy—(C_1–C_4 alkyl), hydroxy, C_1–C_4 alkoxy, halo, halomethyl, nitro, cyano, sulphamoyl, —CO(C_1–C_4 alkyl), —OCO(C_1–C_4 alkyl), —CO_2(C_1–C_4 alkyl), carboxy, $-(CH_2)_qCONR^9R^{10}$, $-(CH_2)_qOCONR^9R^{10}$, $-(CH_2)_qNR^{11}R^{12}$ or $-NHSO_2NH_2$ in which R^9 and R^{10} are each independently H or C_1–C_4 alkyl, q is 0, 1 or 2, and either R^{11} and R^{12} are each independently H or C_1–C_4 alkyl or R^{11} is hydrogen and R^{12} is —SO_2(C_1–C_4 alkyl), —CO(C_1–C_4 alkyl) or —CONH(C_1–C_4 alkyl; or
R^5 and R^6, when attached to adjacent carbon atoms, together represent a group of the formula $-O(CH_2)_rO-$ where r is 1, 2 or 3, $-O(CH_2)_2-$ or $-(CH_2)_3-$;
R^7 is H, C_1–C_4 alkyl or —$CONH_2$; and
R^8 is H, C_1–C_4 alkyl or C_1–C_4 alkoxy.

5,192,766
N-ACRYLOYLPIPERAZINE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS PAF ANTAGONISTS
Norio Nakamura; Nobuyuki Ohkawa; Takeshi Oshima; Masaaki Miyamoto, and Yasutaro Iijima, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 514,523, Apr. 25, 1990, abandoned. This application Aug. 28, 1991, Ser. No. 751,871
Claims priority, application Japan, Apr. 28, 1989, 1-111295
Int. Cl.[5] A61K *31/495*; C07D *241/04*
U.S. Cl. 514—255 **87 Claims**

1. A compound of formula (I):



wherein:
R^1 and R^2 are the same or different, and each represents a group having the formula $-R^5$, $-CH=CH-R^5$ or $-C\equiv C-R^5$,

wherein R^5 represents a C_6–C_{14} carbocyclic aryl group which is unsubstituted or has one to three substituents selected from the group consisting of substituents (a), defined below, or an aromatic heterocyclic group having from 5 to 14 ring atoms, of which from 1 to 3 are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur hetero-atoms, said heterocyclic group being unsubstituted or having one to three substituents selected from the group consisting of substituents (a), defined below:

R^3 represents a hydrogen atom, a C_1–C_6 alkyl group, a cyano group, or a group having the formula $-R^5$, in which R^5 is as defined above;

X represents an oxygen atom or a sulfur atom;

A represents a 1,4-piperazin-1,4-diyl group;

B represents a C_1–C_6 alkylene group, a carbonyl group, a thiocarbonyl group, a sulfinyl group or a sulfonyl group;

R^4 represents an unsubstituted phenyl group or a substituted phenyl group having from 1 to 5 substituents selected from the group consisting of substituents (a) and substituents (b), defined below;

substituents (a): C_1–C_6 alkyl group; C_1–C_6 alkoxy groups; C_1–C_6 haloalkyl groups; hydroxy groups; C_1–C_4 alkylenedioxy groups; C_1–C_6 aliphatic carboxylic acyloxy groups; substituted C_1–C_6 aliphatic carboxylic acyloxy groups having one to three substituents selected from the group consisting of substituents (c), defined below; C_7–C_{15} carbocyclic aromatic carboxylic acyloxy groups; substituted C_7–C_{15} carbocyclic aromatic carboxylic acyloxy groups having one to three substituents selected from the group consisting of substituents (d), defined below; C_8–C_{15} aralkyloxycarbonyloxy groups in which the aryl part is unsubstituted or has one to three substituents selected from the group consisting of substituents (d), defined below; C_1–C_6 alkanesulfonyloxy groups in which the alkane part is unsubstituted or has one to three substituents selected from the group consisting of substituents (c), defined below; arylsulfonyloxy groups in which the aryl part is unsubstituted or has one to three substituents selected from the group consisting of substituents (d), defined below; halogen atoms; and nitro groups;

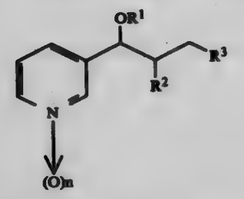
substituents (b): C_1–C_6 alkylsulfonyl groups; C_1–C_6 alkylsulfinyl groups; and C_1–C_6 alkylthio groups; substituents (c): C_1–C_6 alkyl groups; C_1–C_6 haloalkyl groups; halogen atoms; C_1–C_6 alkoxy groups; and (C_1–C_6 alkanoyloxy)methoxycarbonyl groups;

substituents (d): C_1–C_6 alkyl groups; C_1–C_6 alkoxy groups; halogen atoms; unsubstituted C_6–C_{10} aryl groups; nitro groups; and (C_1–C_6 alkoxy)carbonyl groups;

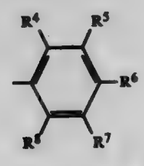
and pharmaceutically acceptable salts thereof.

5,192,767
3-SUBSTITUTED PYRIDINES AND FUNGICIDES CONTAINING THEM
Bernhard Zipperer; Norbert Goetz, Worms; Ernst Buschmann, Ludwigshafen; Lisbard Sprossser, Bad Duerkheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 257,278, Oct. 19, 1988, abandoned. This application Nov. 26, 1990, Ser. No. 617,374
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734750
Int. Cl.[5] A61K *31/44*; C07D *213, 28, 213, 55, 213, 57*
U.S. Cl. 514—277 **7 Claims**

1. A 3-substituted pyridine of the formula:



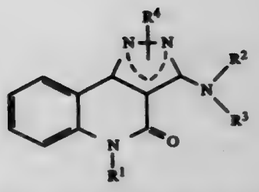
where
R^1 is hydrogen, C_1–C_8-alkyl, C_3–C_8-alkenyl, C_3–C_8-alkynyl, C_2–C_{12}-acyl, C_2–C_{12}-haloacyl, acryloyl, benzoyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, acetoxy, C_1–C_4-haloalkyl, halogen or nitro, or is benzyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, halogen, cyano or nitro;
R_2 is C_1–C_{12}-alkyl
R^3 is the radical:



with one or two of groups R^4 to R^8 being identical or different and each selected from the group consisting of hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_2–C_4-alkoxycarbonyl, phenyl, hydroxy or halogen with the remaining groups being hydrogen, or R^4 and R^5, or R^5 and R^6, denoting the group —CH=CH—CH=CH—,
n is 0 or 1,
and its plant-tolerated salts.

5,192,768
PYRAZOLOQUINOLINE DERIVATIVES
Fumio Suzuki; Yoshisuke Nakazato; Kenji Ohmori; Tadafumi Tamura; Hisashi Hosoe; Kazuhiro Kubo, and Ikufumi Yoshitake, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1991, Ser. No. 757,988
Claims priority, application Japan, Sep. 14, 1990, 2-245389
Int. Cl.[5] C07D *471/04*; A61K *31/44*
U.S. Cl. 514—293 **6 Claims**

1. A 3-aminopyrazolo [4,3-c]quinolin-4-one compound having the following formula (I):



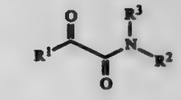
(I)

wherein R^1, R^2, and R^3 independently represent a hydrogen atom or a lower alkyl group; R^4 represents a hydrogen atom, a lower alkyl group, a halogen-substituted lower alkyl group or a lower alkoxycarbonyl group; the dotted line means that the pyrazole ring has two conjugated double bonds; and R^4 is bounded to the nitrogen atom at the 1-position or 2-position, or pharmacologically acceptable salt thereof.

5,192,769
Patent Not Issued For This Number

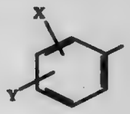
5,192,770
SEROTONERGIC ALPHA-OXOACETAMIDES
Robin D. Clark, Palo Alto; Richard M. Eglen, Mountain View; Joseph M. Muchowski; William L. Smith, both of Sunnyvale, and Klaus K. Weinhardt, San Francisco, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Dec. 7, 1990, Ser. No. 624,828
Int. Cl.[5] A61K *31/44*; C07D *453/02*
U.S. Cl. 514—305 **34 Claims**

1. A compound of Formula I

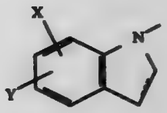


(I)

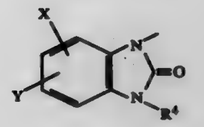
wherein R^1 is selected from



(a)

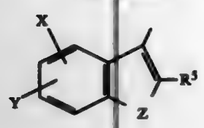


(b)



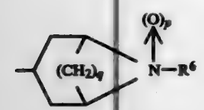
(c)

-continued



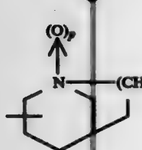
(d)

in which:
the dashed line denotes an optional bond;
X and Y are independently selected from hydrogen, halo, cyano, hydroxy, lower alkoxy, lower alkyl, nitro, amino, aminocarbonyl, (lower alkyl)amino, di(lower alkyl)amino, and (lower alkanoyl)amino;
Z is —O—, —S— or —N(R^4)—; and
R^4 and R^5 are independently selected from hydrogen or lower alkyl or are together —$(CH_2)_n$— wherein n is an integer from 3 to 5; and
R^2 is selected from



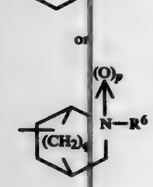
(e)

(f)



(g)

or



(h)

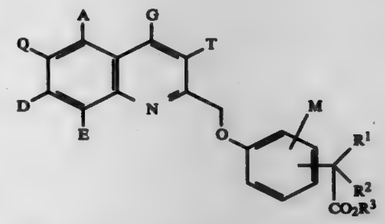
in which:
p is 0 or 1;
q is 1, 2 or 3; and
R^6 is C_{1-7} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl, or a group $(CH_2)_tR^7$ where t is 1 or 2 and R^7 is thienyl, pyrrolyl, or furyl, each optionally further substituted by one or two substituents selected from C_{1-6} alkyl, C_{1-6} alkoxy, trifluoromethyl or halogen, or is phenyl optionally substituted by one or two substituents selected from C_{1-4} alkoxy, trifluoromethyl, halogen, nitro, carboxy, esterified carboxy, and C_{1-4} alkyl optionally substituted by hydroxy, C_{1-4} alkoxy, carboxy, esterified carboxy or in vivo hydrolyzable acyloxy; and
R^3 is selected from hydrogen or lower alkyl; or a pharmaceutically acceptable salt, as an individual isomer or mixture of isomers thereof.

5,192,771
(QUINOLIN-2-YL-METHOXY)PHENYLACETIC ACID DERIVATIVES CONTAINING CYCLIC SUBSTITUENTS

Klaus Mohrs, Wuppertal; Siegfried Raddatz; Romanis Fruchtmann, both of Cologne; Christian Kohlsdorfer, Erftstadt; Reiner Müller-Peddinghaus, and Pia Theisen-Popp, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

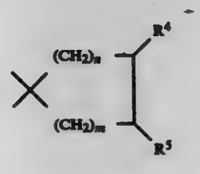
Filed Aug. 1, 1990, Ser. No. 561,038
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927930
Int. Cl.[5] A01N *43/42*; C07D *215/12, 214/14*
U.S. Cl. 514—311 11 Claims

1. A (quinolin-2-yl-methoxy)phenylacetic acid derivative containing a cyclic substituent of the formula



(I)

in which
A, Q D, E, G, T and M are identical or different and
represent hydrogen, hydroxyl, halogen, trifluoromethyl, trifluoromethoxy or carboxyl,
represent straight-chain or branched alkyl having up to 10 carbon atoms, which is optionally substituted by hydroxyl or halogen,
represent straight-chain or branched alkoxy or alkoxycarbonyl having up to 10 carbon atoms, or
represent aryl having 6 to 10 carbon atoms, which is optionally substituted by halogen, nitro, cyano or by straight-chain or branched alkyl of the alkoxy having up to 8 carbon atoms,
R^1 and R^2, together with the carbon atom, form a 4- to 8-membered, saturated or unsaturated carbocyclic ring, which is optionally substituted by up to 3 identical or different substituents from the group consisting of straight-chain or branched alkyl or alkoxy having in each case up to 8 carbon atoms, halogen, hydroxyl and aryl having 6 to 10 carbon atoms, or
R^1 and R^2, together with the carbon atom, represent a radical of the formula



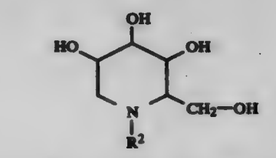
wherein
m and n are identical or different and denote the number 0, 1, 2, 3 or 4, and
R^4 and R^5 together complete an aryl radical having 6 to 10 carbon atoms or which is optionally substituted by straight-chain or branched alkyl or alkoxy having in each case up to 8 carbon atoms, halogen or aryl having 6 to 10 carbon atoms, and
R^3—represents hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl, or a salt thereof.

5,192,772
THERAPEUTIC AGENTS

Yoshiaki Yoshikumi, Uji; Nobutoshi Ojima, Moriyama, and Kazuya Meri, Kyoto, all of Japan, assignors to Nippon Shinyaku Co. Ltd., Japan

Continuation of Ser. No. 281,495, Dec. 8, 1988, abandoned. This application Aug. 12, 1991, Ser. No. 747,454
Claims priority, application Japan, Dec. 9, 1987, 62-311348
Int. Cl.[5] A61K *31/445*
U.S. Cl. 514—315 2 Claims

1. A method of accelerating fibronoylsis in humans and animals which compriaes administering to a human or animal in need thereof an effective amount sufficient to accelerate fibronolysis of a compound of the formula:

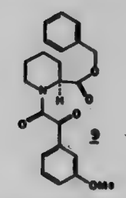


a pharmaceutically acceptable acid addition salt thereof or a quaternary salt thereof wherein R^2 is hydrogen, alkyl of 1 to 10 carbon atoms, carboxyalkyl of 1 to 10 carbon atoms in the alkyl moiety, lower alkyloxycarbonylalkyl of 1 to 10 carbon atoms int he alkyl moiety, hydroxyalkyl of 1 to 10 carbon atoms, cycloalkyl lower alkyl of 3 to 7 carbon atoms in the cycloalkyl moiety, arylalkyl of 1 to 10 carbon atoms in the alkyl moiety, aryloxyalkyl of 1 to 10 carbon atoms in the alkyl moiety, alkenyl of 2 to 10 carbon atoms, hydroxyalkenyl of 2 to 10 carbon atoms, arylalkenyl of 2 to 10 carbon atoms in the alkenyl moiety, aryloxyalkenyl of 2 to 10 carbon atoms in the alkenyl moiety or lower alkylcarbamoylalkyl of 1 to 10 carbon atoms int he alkyl moiety in combination with a pharmaceutically acceptable carrier.

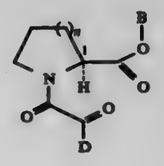
5,192,773
IMMUNOSUPPRESSIVE COMPOUNDS

David A. Armistead, Maynard; Joshua S. Boger, Concord; Harold V. Meyers, Lexington; Jeffrey O. Saunders, Littleton, and Roger D. Tung, Cambridge, all of Mass., assignors to Vertex Pharmaceuticals, Inc., Cambridge, Mass.

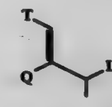
Filed Jul. 2, 1990, Ser. No. 547,814
Int. Cl.[5] C07D *211/32, 211/04, 267/08*
U.S. Cl. 514—315 10 Claims



1. An immunosuppressant compound represeated by the formula:



and pharmaceutically acceptable salts thereof, wherein n is 1 or 2;
wherein B is CHL-Ar, (C1–C6)-straight or branched alkyl, (2—C6)-straight or branched alkenyl, (C5–C7)-cycloalkyl, (C5–C7)-cycloalkenyl or Ar substituted (C1–C6)-alkyl or alkenyl, or



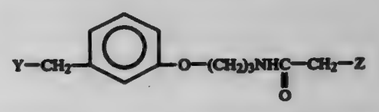
wherein L and Q are independently hydrogen, (C1–C6)-straight or branched alkyl or (C2–C6)-straight or branched alkenyl;
wherein T is Ar or substituted cyclohexyl with substituents at positions 3 and 4 which are independeatly selected from the group consisting of hydrogen, hydroxyl, O—(C1–C4)-alkyl or O—(C2–C4)-alkenyl and carbonyl;
wherein Ar is selected from the group consisting of 1-naphthyl, 2-naphthyl, 2-furyl, 3-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl and phenyl having one to three substituents which are independeatly selected from the group consisting of hydrogen, halo, hydroxyl, nitro, CF_3, (C1–C6)-straight or branched alkyl or (C2–C6)-straight or branched alkenyl, O—(C1–C4)-straight or branched alkyl or O—(C2–C4)-straight or branched alkenyl, O-benzyl, O-phenyl, amino and phenyl;
wherein D is O—(C1–C4)-straight or branched alkyl or O—(C2–C4)-straight or branched alkenyl, (C1–C6)-straight or branched alkyl or (C2–C6)-straight or branched alkenyl, (((C5–C7)-cycloalkyl or (C5–C7)-cycloalkenyl) which may be substituted with (C1–C4)-straight or branched alkyl, (C2–C4)-straight or branched or alkenyl, 2-indolyl, 3-indolyl, ((C1–C4)-alkyl or (C2–C4)-alkenyl)-Ar or Ar;
wherein the stereochemistry at carbon position 1 is R or S;
provided that when n=1 then B is not methyl, ethyl, propyl or butyl when D is butyl or methyl; and
provided that when n=1 then D is a group other than phenyl and B is a group other than benzyl, and when n=2 then B is into methyl or t-butyl.

5,192,774
SUBSTITUTED ACETAMIDE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND ANTIULCER DRUG CONTAINING SAME

Katuo Shinozuki; Katsuyuki Ishii, both of Kanan, and Ikuo Ueda, Toyonaka, all of Japan, assignors to Zeria Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00670, § 371 Date May 7, 1990, § 102(e) Date May 7, 1990, PCT Pub. No. WO90/00544, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 4, 1989, Ser. No. 465,238
Claims priority, application Japan, Jul. 5, 1988, 63-165822
Int. Cl.[5] A01N *43/40*; C07D *211/32, 211/60*
U.S. Cl. 514—315 9 Claims

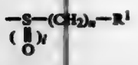
1. A compound of the formula (I):



(I)

in which Y is piperidino, 1-pyrrolidinyl, or 3-hydroxy-1-pyrrolidinyl, and Z is a group selected from the group consisting of those having the formulas (a) to (e):
(a) cyano;
(b) a group of the formula

VOL 1148 ISS 2 MR 9 1993 UMI



in which l represents an integer from 0 to 2, n represents an integer from 1 to 3, R^1 is a hydroxy group, 1,2-dihydroxyethyl group, 1-hydroxyethyl group, 2-phenoxy-1-hydroxyethyl group, 2-hydroxyethoxy group, lower alkoxycarbonyl group, 2,2-dimethyl-1,3-dioxolan-4-yl group, or a lower acyloxymethyl group;

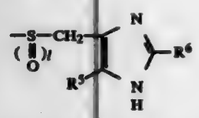
(c) a group of the formula

in which R^2 is amino, lower alkylamino, di(2-hydroxyethyl)amino, lower alkyl, or lower alkoxy;

(d) a group of the formula

in which R^3 and R^4 independently are hydrogen or lower alkyl; and

(e) a group of the formula



in which l represents an integer from 0 to 2, and R^5 and R^6 independently are hydrogen or lower alkyl; or a salt or cyclodextrin inclusion compound thereof.

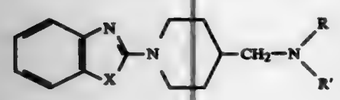
5,192,775

NEW AMINOMETHYLPIPERIDINE COMPOUNDS

Charles Malen, Fresnes; Guillaume de Nanteuil, Suresnes, and Francis Colpaert, Vesinet, all of France, assignors to Adir et Compagnie, Courbevoie, France

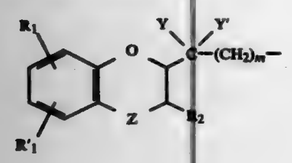
Filed Feb. 26, 1991, Ser. No. 661,494
Claims priority, application France, Feb. 27, 1990, 90 02394
Int. Cl.[5] A61K *31/445*; C07D *401/04*
U.S. Cl. 514—321 6 Claims

1. A compound selected from those of formula (I) :



(I)

in which:
X represents sulfur,
R represents hydrogen or A:



A

in which:
Z represents oxygen or CH_2,
Y represents hydrogen,
Y' represents hydrogen, or,
Y and Y' form together oxygen,
R_1 represents hydrogen, halogen, linear or branched lower alkyl, or linear or branched lower alkoxy,
R'_1 represents hydrogen, halogen, or linear or branched lower alkoxy,
R_2 represents hydrogen or linear or branched lower alkyl, and
m is equal to 0 or 1,
R' represents hydrogen, linear or branched lower alkyl or A, E or F, with the qualification that R' represents hydrogen when R represents the group G, the term lower indicates that the groups thus qualified have 1 to 6 carbon atoms, as well as its enantiomers, diasteroisomers, and epimers an additional salts thereof with a pharmaceutically, acceptable, acid.

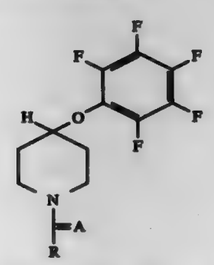
5,192,776

1-SUBSITUTED-4-PENTAFLUOROPHENOXYPIPERIDINES

Grover C. Helsley, Pinckenin; Larry Davis, Sergeantsville, and Gordon E. Olson, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Continuation of Ser. No. 167,935, Mar. 14, 1988, abandoned.
This application Sep. 23, 1991, Ser. No. 764,280
Int. Cl.[5] A61K *31/445*; C07D *211/46*
U.S. Cl. 514—327 13 Claims

1. A compound of the formula



wherein A is oxygen or sulfur; and R is amino, loweralkylamino, diloweralkylamino or arylamino.

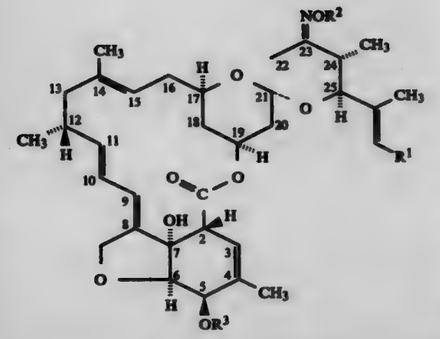
5,192,777

MACROLIDE COMPOUNDS

Michael V. J. Ramsay, South Harrow; Edward P. Tiley, Pinner, and Derek R. Sutherland, Chalfont St Giles, all of United Kingdom, assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 242,184, Sep. 9, 1988, abandoned. This application Dec. 11, 1990, Ser. No. 626,125
Claims priority, application United Kingdom, Sep. 11, 1987, 8721377
Int. Cl.[5] A61K *31/44*, *31/38*, *31/335*; C07D *315/00*
U.S. Cl. 514—333 8 Claims

1. A compound of formula (I)



or a pharmaceutically or an agronomically acceptable salt thereof, wherein R^1 represents a methyl, ethyl or isopropyl group; R^2 represents a C_5–C_7 alkyl group interrupted by an oxygen, C_2–C_7 alkyl group interrupted by a sulphur atom, phenyl C_2–C_7 alkyl optionally substituted by nitrogen, halogen, C_1–C_7 alkoxy or C_1–C_7 alkyl or C_1–C_7 alkyl group substituted with an unsaturated 5-membered monocyclic ring containing one heteroatom selected from the group consisting of oxygen, nitrogen and sulphur or an unsaturated 6-membered monocyclic ring containing one nitrogen; OR^3 is a hydroxyl group, $OCOR^4$, OCO_2R^4, $OCSOR^4$, formyloxy group, OR^5, OSO_2R^6, a silyloxy group, a cyclic or acyclic acetaloxy group, $OCO(CH_2)_nCO_2R^7$, where n represents zero, 1 or 2, or $OCONR^8R^9$; wherein R^4 and R^5 are each independently C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, C_3–C_{12} cycloalkyl, phenyl, an unsaturated 5-membered monocyclic ring containing one heteroatom selected from the group consisting of oxygen, nitrogen and sulphur, an unsaturated 6-membered monocyclic ring containing one nitrogen or C_1–C_6 alkyl group substituted with a phenyl, an unsaturated 5-membered monocyclic ring containing one heteroatom selected from the group consisting of oxygen, nitrogen and sulphur or an unsaturated 6-membered monocyclic ring containing one nitrogen; R^6 is a C_1–C_4 alkyl, phenyl or naphthyl; R^7 is a hydrogen atom, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, C_3–C_{12} cycloalkyl, phenyl, an unsaturated 5-membered monocyclic ring containing one heteroatom selected from the group consisting of oxygen, nitrogen and sulphur, an unsaturated 6-membered monocyclic ring containing one nitrogen or C_1–C_6 alkyl group substituted with a phenyl, an unsaturated 5-membered monocyclic ring containing one heteroatom selected from the group consisting of oxygen, nitrogen and sulphur or an unsaturated 6-membered monocyclic ring containing one nitrogen; and R^8 and R^9 are each independently a hydrogen atom or C_1–C_4 alkyl; and the group $=NOR^2$ is in the E configuration.

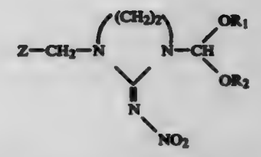
5,192,778

DIALKOXYMETHYLIMIDAZOLIDINE DERIVATIVES, PREPARATION THEREOF, INSECTICIDES CONTAINING SAME AS AN EFFECTIVE INGREDIENT AND INTERMEDIATES THEREFOR

Kenji Kodaka; Katsutoshi Kinoshita; Michihiko Nakaya; Koichi Ekihara; Shiroo Shiraishi; Eiichi Yamada, all of Mobara, and Satoshi Numata, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,030
Claims priority, application Japan, Apr. 3, 1990, 2-87368; Feb. 26, 1991, 3-30815
Int. Cl.[5] C07D *401/06*; A61K *31/44*
U.S. Cl. 514—341 4 Claims

1. An imidazolidine of the formula (I)



(I)

wherein Z represents a 2-chloropyridia-5-yl group or a 2-chlorothiazol-5-yl group, R_1 and R_2, respectively, represent a lower alkyl group having from 1 to 6 carbon atoms, a lower haloalkyl group having from 1 to 3 carbon atoms or a lower alkyl group having from 1 to 3 carbon atoms and substituted with a lower alkoxy group having from 1 to 3 carbon atoms, or R_1 and R_2 are joined to form a cyclic alkylene group having from 2 to 3 carbon atoms.

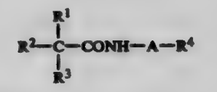
5,192,779

SUBSTITUTED-ACETAMIDE COMPOUND AND A PROCESS FOR THE PREPARATION THEREOF

Youichi Shiokawa, Ibaraki; Kazuo Okamura, Toyono; Kazuhiko Take, Osaka, and Kazunori Tsuboki, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 475,301, Feb. 5, 1990. This application Aug. 28, 1991, Ser. No. 751,120
Claims priority, application United Kingdom, Feb. 14, 1989, 8903253; Apr. 28, 1989, 8909796
Int. Cl.[5] C07D *213/56*, *213/81*, *213/84*; A61K *31/44*
U.S. Cl. 514—346 8 Claims

1. A substituted-acetamide compound of the formula:



wherein
R^1 is phenyl, naphthyl, or anthracenyl, each of which may have one or more substituents selected from the group consisting of halo, lower alkyl, and lower alkoxy;
R^2 is phenyl, naphthyl, or anthracenyl, each of which may have one or more substituents selected from the group consisting of halo, lower alkyl or lower alkoxy; lower alkyl; or cyclo(lower)alkyl,
R^3 is hydrogen, hydroxy, halogen, lower alkenyl, amino or protected amino,
R^4 is pyridyl or tetrahydropyridyl, independent of one another, optionally substituted with a member selected from the group consisting of lower alkyl, hydroxy, hydroxyl(-lower)alkyl, amino protective groups and cyanoimino and
A is lower alkylene or a pharmaceutically acceptable salt thereof.

5,192,780

METHODS USING ANTIALLERGICS AND ANTIHISTAMINES

Billie M. York, Fort Worth; Stella M. Robertson, Arlington, and John M. Yanni, Burleson, all of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 616,049, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 452,189, Dec. 18, 1989, abandoned. This application Jul. 23, 1991, Ser. No. 734,728
Int. Cl.[5] A61K *31/47*, *31/275*
U.S. Cl. 514—357 4 Claims

1. A pharmaceutical composition for treating ophthalmic allergic responses, comprising:
about 0.01 to about 4.0 wt. % of an antiallergic compound selected from the group consisting of lodoxamide, al-

buterol, terbutaline, pirbuterol acetate, fenotenol, and bitolterol and about 0.01 to about 3.0 wt. % of an anthistamine selected from the group consisting of 1-(2-ethyoxyethyl)-2-(4-methyl-1-homopiperazinyl)-benzimidazole difumerate (emedastine), levocabastine, and meguitazine.

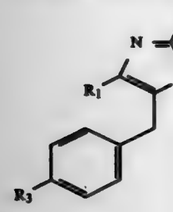
5,192,781

THIAZOLE DERIVATIVES WHICH ARE ANGIOTENSIN II RECEPTOR ANTAGONISTS, THEIR METHODS OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Nicole Bru-Magniez, Paris; Michèle Launay, Rueil-Malmaison, and Jean-Marie Teulon, La Celle Saint Cloud, all of France, assignors to Laboratoires UPSA, Agen, France

Filed Jul. 11, 1991, Ser. No. 728,393
Claims priority, application France, May 31, 1991, 91 06595
Int. Cl.[5] A61K *31/425*; C07D *277/30*
U.S. Cl. 514—365 8 Claims

1. A thiazole compound of the formula



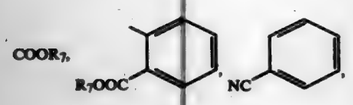
wherein:

R_1 is a lower alkyl radical having 1 to 6 carbon atoms or a C_3–C_7 cycloalkyl radical;

R_2 is a hydrogen atom, a halogen atom, a lower alkyl radical having 1 to 6 carbon atoms, a lower halogenoalkyl radical having 1 to 6 carbon atoms, a C_3–C_7 cycloalkyl radical, a phenyl radical or an heteroaromatic ring selected from the group consisting of heteroaromatic rings having 5 to 7 atoms and containing at least one nitrogen, oxygen or sulfur atom in the ring, optionally substituted by a lower alkyl group, a halogen, a halogenoloweralkyl group, a loweralkoxy group or a thioloweralkyloxy group;

R_2 can also be $X-(CH_2)_n-CN$, $X-(CH_2)_n-COOR_4$, $X-(CH_2)_n-OR_4$, $X-(CH_2)_n-SR_4$ or $X-(CH_2)_n-CONR'R''$, wherein X is a bond, a sulfur atom or a group NH, n is an integer from 0 to 5, R_4 is a hydrogen atom, a lower alkyl radical having 1 to 6 carbon atoms, a lower halogenoalkyl radical having 1 to 6 carbon atoms or a C_3–C_7 cycloalkyl radical, R_5 is defined in the same way as R_4 can also be phenyl, a heteroaromatic ring as defined above or methanebiphenyl, and R′ and R″ are independently a hydrogen atom, a lower alkyl radical having 1 to 6 carbon atoms or a C_3–C_7 cycloalkyl radical or they can form, together with the nitrogen atom to which they are attached, a heterocycle selected from the group consisting of pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and N-substituted piperazine wherein the N-substituent is a lower alkyl radical having 1 to 6 carbon atoms, phenyl or a heteroaromatic ring as defined above; and

r_3 is a nitro or amino group or one of the following groups:



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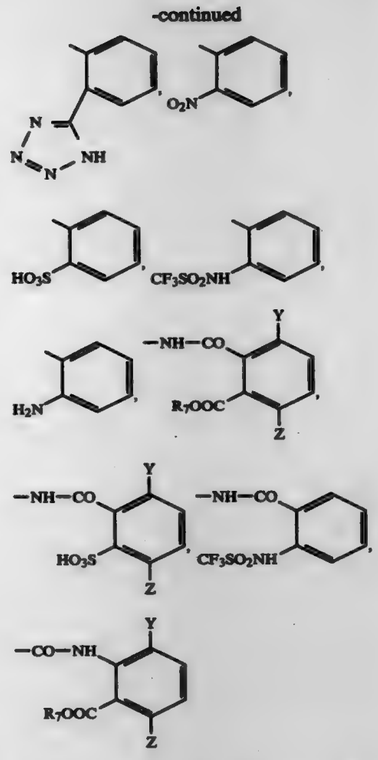


in which R_7 is a hydrogen atom, a lower alkyl radical having 1 to 6 carbon atoms or a benzyl radical and Y and Z are independently a hydrogen atom, a halogen atom, a lower alkyl radical having 1 to 6 carbon atoms, an O-lower alkyl radical or trifluoromethyl;

or a pharmaceutically acceptable addition salt thereof.

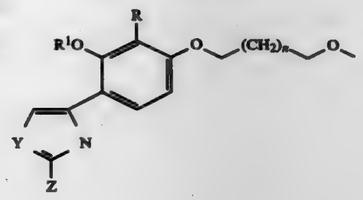
5,192,782

ALKOXY-SUBSTITUTED DIHYDROBENZOPYRAN-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

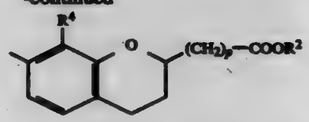
Stevan W. Djuric, Glenview; Thomas D. Penning, Elmhurst, and James P. Snyder, Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 521,777, May 10, 1990, Pat. No. 5,073,562.
This application Sep. 13, 1991, Ser. No. 759,272
Int. Cl.[5] C07D *413/12*; A61K *31/42*
U.S. Cl. 514—376 21 Claims

1. A compound of the formula:



-continued



wherein

R represents alkyl having 2 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, alkynyl having 2 to 6 carbon atoms, or $-(CH_2)_m-R^3$ wherein R^3 represents cycloalkyl of 3 to 5 carbons atoms and m is 1 or 2;

R^1 represents alkyl having 1 to 4 carbon atoms;

R^2 represents hydrogen or alkyl having 1 to 5 carbon atoms;

R^4 represents alkyl having 1 to 6 carbon atoms;

n is an integer from 1 to 5;

p is an integer from 0 to 6;

Y represents oxygen; and

Z represents hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, NR^4R^5 wherein R^4 and R^5 are independently hydrogen or alkyl having 1 to 4 carbon atoms, or SR^6 wherein R^6 is, hydrogen, benzyl or alkyl having 1 to 4 carbon atoms;

and the stereoisomers and pharmaceutically acceptable salts thereof.

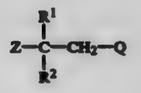
5,192,783

1-ARALKYL-1,2,4-TRIAZOLES

George A. Miller, Maple Glen, and Hak-Foon Chau, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 252,633, Apr. 9, 1981, abandoned, which is a continuation of Ser. No. 798,716, May 19, 1977, abandoned. This application Sep. 30, 1985, Ser. No. 781,848
Int. Cl.[5] A01N *43/653*; C07D *249/08*, *249/14*
U.S. Cl. 514—383 29 Claims

1. A compound of the formula



wherein

Z is phenyl or phenyl substituted with up to two halogen substituents;

R^1 is hydrogen;

R^2 is $(C_1$–$C_{12})$alkyl, phenyl, benzyl, phenethyl, or phenyl, benzyl or phenethyl substituted with up to two halogen substituents; and

Q is 1-(1,2,4-triazolyl); and the agronomically acceptable enantiomorphs, acid addition salts and metal salt complexes.

5,192,784

ETANIDAZOLE INJECTABLE SOLUTION

Surendra M. Bahel, Wayne, Pa.; Kenneth S. Field, New Castle, and Michael B. Maurin, Newark, both of Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Continuation of Ser. No. 709,174, Jun. 3, 1991, abandoned. This application Jun. 26, 1992, Ser. No. 906,822
Int. Cl.[5] A61K *31/415*
U.S. Cl. 514—398 7 Claims

1. A stable, injectable, ready to use aqueous pharmaceutical composition having a pH in the range of 3.0 to 4.5, and comprising:

a) a chemotherapeutically effective amount of etanidazole in an amount of from about 20 to 150 mg of etanidazole/ml of composition;

b) a buffer system selected from the group consisting of citrate, acetate and phosphate,

c) a tonicity adjusting agent which is sodium chloride; and

d) a stabilizing agent selected from the group consisting of imidazole, ethanolamine, diethanolamine, triethanolamine, thiethylamine and ethylenediamine in an amount of about 0.001% to about 5% of the composition and effective to inhibit precipitation of the etanidazole;

e) said composition minimizing the degration of etanidazole by hydrolysis, whereby the stability of etanidazole in an aqueous composition is enhanced.

5,192,785

SULFAMATES AS ANTIGLAUCOMA AGENTS

Yeong S. Lo, Hockessin, Del.; Joseph C. Nolan, Millbottom, and Dwight A. Shanablee, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 406,736, Sep. 3, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 712,858
Int. Cl.[5] A61K *31/415*, *31/255*, *31/325*
U.S. Cl. 514—399 20 Claims

1. A method for reducing intraocular pressure in a mammal, comprising administering to said mammal an effective amount of a compound having the formula:

$$(HO)_p-A-\{-OS(O)_2NR^1R^2\}_z$$

wherein

A is aryloxy-alkyl, in which the aryl moiety is a substituted phenyl group of the formula:

where

X is hydrogen, halo, CF_3, nitro-, $-SO_2NR_1R_2$, loweralkoxy, hydroxy, amino, loweralkylamino, diloweralkylamino, methylcarbonylamino, loweralkyl, methyloxycarbonyl, 1H-imidazol-1-yl, 3-thiazole, 1-pyrrole, phenyl, 1H-triazol-1-yl, cyano, 2-loweralkyl-1H-imidazol-1-yl, 4-loweralkyl-1H-imidazol-1-yl, 4-phenyl-1H-imidazol-1-yl, —COOH, —COOM wherein M is a pharmaceutically acceptable metal cation, aryloxy or aroyl;

Y is hydrogen, halo, loweralkoxy, hydroxy or loweralkyl; and

W is hydrogen, loweralkoxy or loweralkyl;

and said alkyl portion of A being substituted on one or more carbon atoms by the depicted sulfamyloxy group, where

Z is the number of $—OS(O)_2NR^1R^2$ groups present on the alkyl moiety of A and is always at least one;

p is the number of hydroxyl groups present on the alkyl moiety of A which have not been converted to $—OS(O)_2NR^1R^2$ groups, including zero;

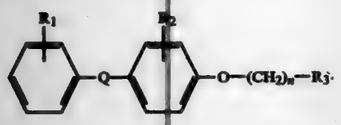
R^1 is hydrogen or loweralkyl;

R^2 is hydrogen, loweralkyl, $—CO_2R^1$, or $—CO_2—M+$ wherein M is defined above;

and the pharmaceutically acceptable salts thereof when they can be formed and the optical isomers thereof, when they can be formed.

5,192,786
SUBSTITUTED BIPHENYLALKOXYAMINES
Jeffery B. Press, Penllyn, Pa., and Pauline Sanfilippo, Flemington, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.
Filed Dec. 21, 1990, Ser. No. 632,274
Int. Cl.[5] A61K *31/415*; C07D *233/60*
U.S. Cl. 514—399 9 Claims

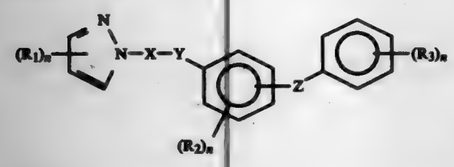
1. A compound of the formula



where
R_1 and R_2 are the same or different and are hydrogen, halogen, C_1–C_6 alkyl or C_1–C_6 alkoxy;
R_3 is imidazole;
R_4 and R_5 are the same or different and are hydrogen or C_1–C_6 alkyl;
Q is a carbonyl, methylene or a vinylene and
n is 3–6, and the pharmaceutically acceptable acid addition salts thereof.

5,192,787
PYRAZOLE-CONTAINING JUVENILE HORMONE MIMICS FOR PEST CONTROL
William S. Bowers, Tucson, Ariz., and Takayoshi Sugiyama, Sendai, Japan, assignors to Arizona Board of Regents Acting for the University of Arizona, Tucson, Ariz.
Division of Ser. No. 284,394, Dec. 14, 1988, Pat. No. 4,943,586. This application Jan. 15, 1990, Ser. No. 538,422
Int. Cl.[5] A01N *43/56*; C07D *231/16*, *231/20*, *231/28*
U.S. Cl. 514—404 14 Claims

1. A compound having pesticidal activity and which has the following formula:



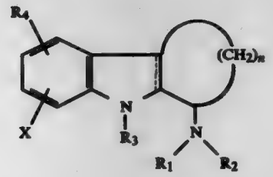
wherein
each n is independently 1, 2 or 3;
R_1 is hydrogen, C_{1-6} alkyl, halogen, C_{1-6} alkoxy, C_{2-6} alkoxycarbonyl, amino, nitro, CF_3, or C_{1-5}-(alkyl and dialkyl) amino;
X is a divalent hydrocarbon radical having 1 to 8 carbon atoms in its backbone, which may be interrupted by one or two of O or S, and which may be substituted by one or more OH groups, CF_3 groups, halogens, C_{1-4} alkyl groups or C_{1-4} alkoxy groups;
R_2 is hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy, C_{2-6} alkoxycarbonyl, amino, nitro, or CF_3;
R_3 is hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy, C_{2-6} alkoxycarbonyl, amino, nitro, C_{1-5}-(alkyl or dialkyl) amino or CF_3; and
Y and Z are, independently, S, SO, SO_2 or CH_2, with the proviso that when Y and Z are independently S, SO or SO_2, R_2 is amino, nitro or CF_3, or R_3 is amino, nitro, or C_{1-5}-(alkyl and dialkyl) amino.

5,192,788
PORPHYRIN ANTIVIRAL COMPOSITIONS
Delaney W. Dixon, Atlanta; Raymond F. Schinazi, Tucker, and Luigi G. Marzilli, Atlanta, all of Ga., assignors to Georgia State University Foundation, Inc. and Emory University, both of Atlanta, Ga.
Filed May 23, 1988, Ser. No. 197,764
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—410 12 Claims

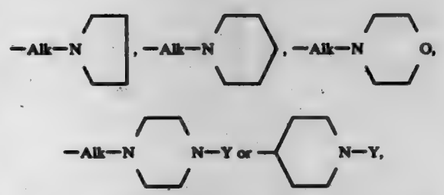
1. A method for treating and preventing HIV infection in a human comprising administering an amount of a porphyrin or a derivative thereof to a human in an amount effective to inhibit infection by HIV.

5,192,789
SUBSTITUTED 1,2,3,4-TETRAHYDROCYCLOPENT[B]INDOLES, 1,2,3,3A,4,8A-HEXAHYDROCYCLOPENT[B]INDOLES AND RELATED COMPOUNDS
Helen H. Ong, Whippany, N.J.; Gerard J. O'Malley, Newtown; Michael C. Merriman, Hellertown, both of Pa., and Mark G. Palermo, Piscataway, N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.
Continuation-in-part of Ser. No. 642,952, Jan. 18, 1991, Pat. No. 5,100,891. This application Jan. 9, 1992, Ser. No. 818,703
Int. Cl.[5] A61K *31/40*; C07D *209/94*
U.S. Cl. 514—411 9 Claims

1. A compound of the formula,

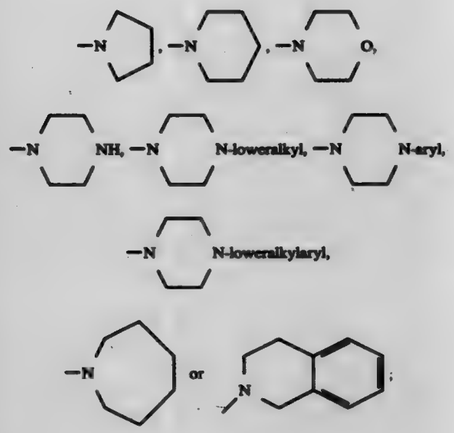


where
n is 2,3,4 or 5;
X is hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, trifluoromethyl or nitro;
R_1 is hydrogen, loweralkyl, loweralkenyl, loweralkynyl, aminoloweralkyl, loweralkylaminoloweralkyl, diloweralkylaminoloweralkyl, cycloalkyl, cycloalkylloweralkyl, cycloalkenyl, aryl, arylloweralkyl, arylcycloalkyl,

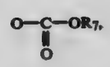


the group "Alk" signifying a divalent loweralkylene group, and Y signifying hydrogen, loweralkyl, aryl or arylloweralkyl;
R_2 is hydrogen, loweralkyl, formyl, loweralkylcarbonyl, benzyloxycarbonyl or loweralkylaminocarbonyl; or alternatively, the group

as a whole is



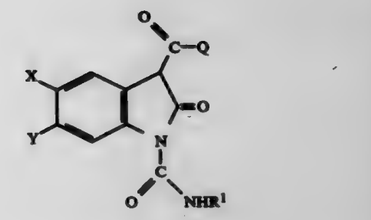
R_3 is hydrogen, loweralkyl, arylloweralkyl, loweralkylcarbonyl or loweralkoxycarbonyl;
R_4 is



wherein R_7 is loweralkyl, aryl or arylloweralkyl; or a pharmaceutically acceptable addition salt thereof.

5,192,790
3-SUBSTITUTED-2-OXINDOLE DERIVATIVES AS INHIBITORS OF INTERLEUKIN-1 BIOSYNTHESIS
Carl J. Goddard, Groton; Douglas C. Hanson, Niantic, and Gary R. Schulte, Stonington, all of Conn., assignors to Pfizer Inc, New York, N.Y.
Continuation of Ser. No. 529,050, May 25, 1990, which is a continuation-in-part of Ser. No. 421,445, Oct. 13, 1989, abandoned. This application Dec. 17, 1991, Ser. No. 808,491
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—414 41 Claims

1. A method of inhibiting interleukin-1 biosynthesis in a mammal in need thereof which comprises administering to said mammal an interleukin-1 biosynthesis inhibiting amount of a compound of the formula

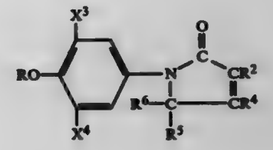


or a pharmaceutically-acceptable base salt thereof, wherein X and Y are each H, F, Cl, Br or CF_3; R^1 is H or (C_1–C_4) straight or branched-chain alkyl; and Q is

where R^2 is H or (C_1–C_3)alkyl that when R^2 is H, R^1 is not H.

5,192,791
FUSED RING HETEROCYCLES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME
Sung J. Lee, Clarks Summit, Pa., assignor to Biofor, Ltd., Waverly, Pa.
Division of Ser. No. 248,942, Sep. 26, 1988, Pat. No. 4,958,482. This application Aug. 14, 1990, Ser. No. 551,457
Int. Cl.[5] C07D *209/46*; A61K *31/40*
U.S. Cl. 514—418 20 Claims

15. A method for treating inflammation in a mammal which comprises administering a safe and effective amount of an active ingredient of the formula:



wherein:
R is a member selected from the group consisting of hydrogen, alkyl, alkanoyl and aroyl;
R^2 and R^4 are joined to form an unsaturated hydrocarbylene chain having four carbon atoms between their points of attachment to the heterocyclic ring;
R^3–R^6 are the same or different and represent a member selected from the group consisting of hydrogen and lower alkyl; and
X^3 and X^4 are the same or different and represent a member selected from the group consisting of tertiary-alkyl and trimethylsilyl; or a non-toxic pharmacologically acceptable salt thereof.

VOL 1148 ISS 2 MR 9 1993 UMI

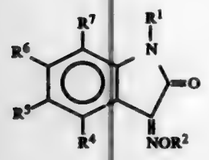
5,192,792

ISATINE DERIVATIVES, AND THEIR METHOD OF USE

Graham Johnson, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 7, 1990, Ser. No. 624,157
Int. Cl.[5] A61K *31/40*; C07D *209/04, 209/56*
U.S. Cl. 514—418 16 Claims

1. A method of antagonizing the biological effects of an excitatory amino acid of a subject in need of such antagonization comprising the step of administering to said subject an effective excitatory amino acid antagonizing amount of an indole-2,3-dione-3-oxime compound having the formula



and isomers thereof wherein

R^1 is hydrogen, C_{1-6}-alkyl which may be branched, C_{3-7}-cycloalkyl, benzyl, phenyl which may be substituted, acyl, hydroxy, C_{1-6}-alkoxy, CH_2CO_2R' wherein R' is hydrogen or C_{1-6}alkyl which may be branched, CH_2CN, $CH_2CONR^{IV}R^V$ wherein R^{IV} and R^V independently are hydrogen or C_{1-6}alkyl, or $CH_2C(=NOH)NH_2$;

R^2 is (1) alkenyl of from two to six carbon atoms, (2) of from two to six carbons, (3) $(CH_2)_{1-6}$ CO_2H, (4) $(CH_2)_{1-6}CONHR$ wherein R is C_{1-6}alkyl, optionally branched; aryl which is phenyl optionally substituted by one or more of lower alkyl of from one to four carbons, halogen trifluoromethyl, cyano, carboxy, alkoxycarbonyl wherein the alkoxy is of from one to four carbons, alkylthio wherein the alkyl is of from one to four carbons, nitro, acyl of from two to four carbons, hydroxy, C_{1-6}-alkoxy, CH_2CO_2R' wherein R' is hydrogen or C_{1-6}-alkyl which may be branched, CH_2CN, $CH_2CONR^{IV}R^V$ wherein R^{IV} and R^V independently are hydrogen or C_{1-6}-alkyl, optionally branched; aralkyl which is aryl as defined above attached through C_{1-4}alkyl; or SO_2R^{10} wherein R^{10} is C_{1-12}alkyl, optionally branched; aryl which is phenyl optionally substituted by ne or more of lower alkyl of from one to four carbons, halogen trifluoromethyl, cyano, NH_2, NHR^{11} wherein R^{11} is C_{1-4}alkyl, $NHCOR^{11}$ wherein R^{11} is as defined above, carboxy, alkoxycarbonyl wherein the alkoxy is of from one to four carbons, alkylthio wherein the alkyl is of from one to four carbons, nitro, acyl of from two to four carbons, hydroxy, C_{1-6}-alkoxy, CH_2CO_2R' wherein R' is hydrogen or C_{1-6}-alkyl which may be branched, CH_2CN, $CH_2CONR^{IV}R^V$ wherein R^{IV} and R^V independently are hydrogen or C_{1-6}-alkyl, optionally branched; aralkyl which is aryl as defined above attached through C_{1-4}alkyl; R^4R^5, R^6, R^7 independently are hydrogen, C_{1-6}-alkyl which may be branched, phenyl, halogen, C_{1-6}-alkoxy, NO_2, CN, CF_3, or $SO_2NR''R'''$ wherein R'' and R''' independently are hydrogen or C_{1-6}-alkyl; or R^6 and R^7 together form an additional 4- to 7-membered ring which may be aromatic or partial saturated and which may be substituted with halogen, NO_2, CF_3CN, $SO_2NR''R'''$ wherein R'' and R''' independently are hydrogen or C_{1-6}-alkyl, and R^4 and R^5 have the meanings set forth above.

5,192,793

PLANT PROTECTIVE MICROEMULSION COMPOSITION COMPRISING PYRETHROIDS

István Székely, Dunakeszi; András Szegi; Laszlo Pap, both of Budapest; Lajos Nagy, Szentendre; Viktória Kollárik née Hasek, Budapest; Katalin Mármarosi née Kellner, Biatorbágy; Zoltán Karádi, Budapest; Andrea Tóth, Solymár, and György Szucsány, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Rt., Budapest, Hungary

PCT No. PCT/HU89/00065, § 371 Date Jul. 24, 1990, § 102(e) Date Jul. 24, 1990, PCT Pub. No. WO90/06681, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 21, 1989, Ser. No. 548,917
Claims priority, application Hungary, Dec. 22, 1988, 6558/88
Int. Cl.[5] A01N *37/34, 43/38, 53/00, 31/14*
U.S. Cl. 514—421 5 Claims

1. A solution of a plant protective agent which comprises as active ingredient 1–150 g of at least one synthetic pyrethroid
as a surface active agent 40–70 g of ethoxylated (EO=1-0–14)-propoxylated (PO=18–22) nonylphenol,
10–20 g of linear calcium dodecylbenzene sulfonate, and
90–120 g of polyoxyethylene (20)-sorbitan monolaurate, and a solvent mixture in a quantity needed for 1 liter from the following (A) composition:
9–11% by volume of a hydrogenated aliphatic hydrocarbon containing 45% of naphthene,
18–30% by volume of propylene glycol,
28–35% by volume of pine fatty acid,
25–30% by volume of sunflower oil, and
5–10% by volume of a 1:1 by volume mixture of methanol or ethanol with isobutanol.

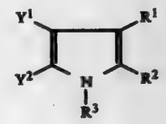
5,192,794

SUBSTITUTED 2-ARYLPYRROLES

Hermann Uhr; Albrecht Marhold, both of Leverkusen; Peter Andres; Christoph Erdelen, both of Leichlingen; Ulrike Wachendorff-Neumann, Monheim, and Wilhelm Standel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

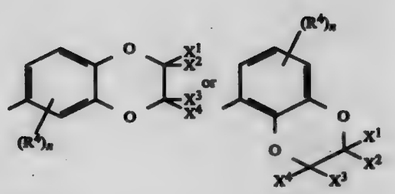
Filed May 20, 1992, Ser. No. 886,262
Claims priority, application Fed. Rep. of Germany, May 30, 1991, 4117752
Int. Cl.[5] C07D *405/09*; H01N *43/36*
U.S. Cl. 514—422 9 Claims

1. Substituted 2-arylpyrroles of the general formula (I)



(I)

in which
R^1 represents cyano or nitro,
R^2 represents the radicals



wherein
X^1, X^2, X^3 and X^4 can be identical or different and represent hydrogen, halogen or alkyl,
R^4 represents halogen and
n represents a number from 0 to 3,
R^3 represents hydrogen, alkyl, alkenyl or alkinyl , the alkyl, alkenyl or alkinyl radicals optionally being substituted by 1 to 4 identical or different halogen atoms, C_1–C_6-alkoxy, C_1–C_6-alkylthio, C_1–C_6-acyloxy, C_2–C_6-alkoxycarbonyl, phenyl, cyano or nitro,
Y^1 represents halogen and
Y^2 represents halogen, alkyl or halogenoalkyl.

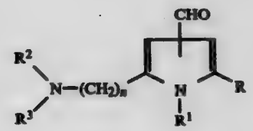
5,192,795

2-(AMINOALKYL)PYRROLEALDEHYDES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Gerhard Zoller, Schlueck, and Ursula Schindler, Bad Soden, both of Fed. Rep. of Germany, assignors to Cassella Aktiengellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1991, Ser. No. 715,120
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020851
Int. Cl.[5] A61K *31/40*; C07D *207/327, 207/325*
U.S. Cl. 548—423 16 Claims

1. 2(Aminoalkyl)pyrrolealdehyde of the formula I



(I)

in which
R: denotes hydrogen or alkyl (C_1–C_3);
R^1: denotes hydrogen, cyanoalkyl (C_1–C_4), hydroxycarbonylalkyl (C_1–C_4), alkoxy(C_1–C_4)carbonylalkyl(C_1–C_4), $R^4(R^5)$N-carbonylalkyl-C_1–C_4), alkyl(C_1–C_6)carbonylaminoalkyl(C_1–C_4), phenylcarbonylaminoalkyl (C_1–C_4), phenoxyalkyl (C_1–C_3)-carbonyl-aminoalkyl(-C_1–C_4);
R^2 and R^3: independently of one another denote hydrogen, alkyl(C_1–C_6), alkanoyl(C_1–C_6), phenylalkyl(C_1–C_4)carbonyl, phenoxyalkyl (C_1–C_3)carbonyl, benzoyl or pyridylcarbonyl;
R^4 and R^5 independently of one another denote hydrogen, or alkyl(C_1–C_4); where the phenyl, phenoxy or benzoyl substituents can also be mono- or disubstituted by halogen, alkyl(C_1–C_4), hydroxyl, alkoxy(C_1–C_4), $R^4(R^5)$N, mercapto, alkylmercapto(C_1–C_4), nitro, cyano, hydroxycarbonyl, alkoxy(C_1–C_4) carbonyl, alkoxy(C_1–C_4)carbonylalkyl(C_1–C_4), formyl or alkanoyl-(C_1–C_4);
n: denotes 1, 2 or 3;
and pharmacologically acceptable acid addition salts thereof in the case of compounds which contain a basic group.

5,192,796

Patent Not Issued For This Number

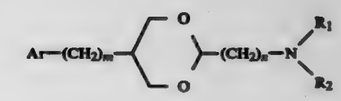
5,192,797

DERIVATIVES OF 2-AMINOALKYL-5-ARYLALKYL-1,3-DIOXANES, THEIR PREPARATION AND THEIR THERAPEUTIC APPLICATION

Bernard Rainon, Vigneux; Yannick Evanno, Paris, and Odette LeGalloudec, Morigny, all of France, assignors to Synthelabo, Paris, France

Filed Jun. 14, 1991, Ser. No. 714,182
Claims priority, application France, Jun. 15, 1990, 90 07483; Apr. 15, 1991, 91 04578
Int. Cl.[5] A61K *31/335*; C07D *319/06*
U.S. Cl. 514—452 8 Claims

1. A compound which is a 2-aminoalkyl-5-arylalkyl-1,3-dioxane of general formula (I)



(I)

in which
m represents 0 or 1;
n represents 1, 2, 3 or 4;
R_1 represents hydrogen or methyl;
R_2 represents hydrogen, methyl or an alkanoyl group of the general formula COR' in which R' represents a hydrogen atom or a linear or branched C_1–C_4-alkyl group, or an alkoxycarbonyl group of the general formula COOR'' in which R'' represents a linear or branched C_{1-C4}-alkyl group; and
Ar represents either a phenyl group optionally carrying one or two substituents selected from halogen, C_1–C_4 alkyl, methoxy and trifluoromethyl, or a naphthalen-1-yl or naphthalen-2-yl group optionally carrying a substituent selected from halogen, methyl, methoxy and cyclopropylmethoxy groups,
in the form of a cis- or trans-stereoisomer, and in the form of a free base or a acid addition salt thereof.

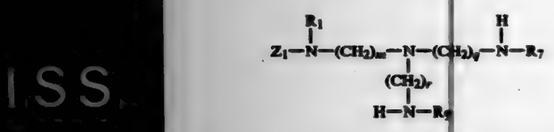
5,192,798

LIPOPHILIC POLYAMINES USEFUL FOR TREATING HYPERCHOLESTEROLEMIA

James W. Alban, Plainwell; Charles H. Spilman, and Edward W. Thomas, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

PCT No. PCT/US89/03490, § 371 Date Aug. 16, 1990, § 102(e) Date Aug. 16, 1990
Continuation-in-part of Ser. No. 158,213, Feb. 19, 1988, abandoned. This PCT application Feb. 13, 1989, Ser. No. 566,441
Int. Cl.[5] A61K *31/16*; C07C *211/18*
U.S. Cl. 514—462 10 Claims

1. A compound of formula X, below,



wherein Z_1 is

(a) —C_3—C_{20}-cycloalkyl substituted with zero or one =O, —C(0)OR_{11}, —C(0)NH_2, —CH=CH_2, or ethylene ketal;

wherein R_1 is

(a) —H,

(b) —C_1—C_4alkyl;

wherein R_7, or R_9 is each independently

(a) —H,

(b) —C_3—C_{20}cycloalkyl substituted with zero or one =O, C(0)OR_{11}, —C(0)NH_2, —CH=CH_2, or ethylene ketal,

(c) —C_3—C_{20}alkyl substituted with one =O, —C(0)OR_{11}, —C(0)NH_2, —CH=CH_2, or ethylene ketal, or C=N, provided that R_7 and R_9 are not both —H. wherein R_{11} is each independently

(a) —H,

(b) —C_1—C_8alkyl, or

(c) —$(CH_2)_n$—NH_2;

wherein a is zero to five, inclusive;

wherein m, q, or r is each independently one to three, inclusive.

6. A method of treating hypercholesterolemia in an affected patient which comprises administering to said patient an effective amount for reducing serum cholesterol in said patient of a member selected from the group consisting of the free bases and pharmaceutically acceptable salts of a compound of claim 1.

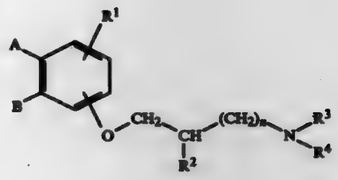
5,192,799

COUMARAN GROUP CONTAINING AMINE COMPOUNDS AND THEIR ACID ADDITION SALTS AND QUATERNARY AMMONIUM SALTS AND THE USE THEREOF AS ANTI ARRHYTHMIC AGENTS AND AS PSYCHOTROPIC AGENTS

Ikuo Tomino, Obtake; Masaharu Ishigaru, Obtake; Takumi Kitahara, Obtake; Keiichi Yokoyama, Iwakuni; Joji Kamiya, Mobara; Kanji Yoshihara, Mobara; Masaaki Ishii, Mobara; Akira Mizuchi, Mobara; Kazutoshi Horikomi, Mobara; Akira Awaya, and Takuo Nakano, both of Yokohama, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 780,546, Oct. 22, 1991, abandoned, which is a continuation of Ser. No. 392,964, Aug. 3, 1989, abandoned. This application Jan. 5, 1992, Ser. No. 895,417
Claims priority, application Japan, Dec. 11, 1987, 62-312113; Dec. 14, 1987, 62-314234
Int. Cl.[5] C07D *307/80, 307/83*; A61K *31/34*
U.S. Cl. 514—469 16 Claims

1. An amine represented by the following formula (1), or its acid addition salt or its quaternary ammonium salt



(1)

wherein

A and B together form a group selected from the group of the following formulae:

—CO—CR^5R^6—O—,

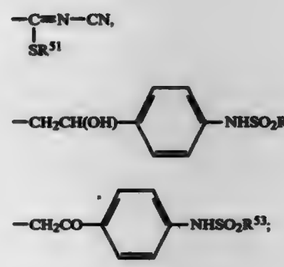
—$CR^{13}R^{14}$—$CR^{15}R^{16}$—O—and

—CH(OH)—$CR^{17}R^{18}$—O—;

R^1 is hydrogen, lower alkyl, lower alkoxy, halogen, amino, nitro or lower alkylsulfamoyl;

R^2 is hydrogen, hydroxyl or lower alkyl;

R^3 is hydrogen, alkyl, lower alkoxy-lower alkyl, lower alkoxy-lower alkoxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, lower acyl-lower alkyl, ethylenedioxy lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, phenyl, benzyl,



R^4 is alkyl, lower alkenyl, lower alkynyl, lower alkoxy-lower alkyl, hydroxyalkyl, cycloalkyl, benzyl or adamantyl;

R^5, R^6, R^{13}, R^{14}, R^{15}, R^{16}, R^{17} and R^{18} are identical or different, and each represents hydrogen or lower alkyl;

R^{51}, R^{52} and R^{53} are identical or different, and each represents lower alkyl;

n is a number of 0, 1, 2, 3 or 4; and

with the proviso that when A and B, taken together, represent —$CR^{13}R^{14}$—$CR^{15}R^{16}$—O—, R^2 is hydrogen or lower alkyl.

6. A method for treatment of arrythmia in a patient in need thereof, comprising administering to said patient a pharmacologically effective amount of the compound of claim 1 as an active ingredient.

8. A method for treating psychoneurological diseases treatable with dopamine or serotonin antagonists in a patient in need thereof, comprising administering to said patient a psychoneurologically effective amount of the compound of claim 1 as an active ingredient.

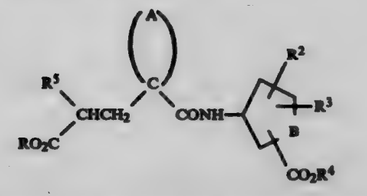
5,192,800

GLUTARAMIDE DIURETIC AGENTS

Ian T. Barnish, Ramsgate; John C. Danilewicz, Ash; Keith James, Deal; Gillian M. B. Samuels, Barham; Nicholas K. Terrett; Michael T. Williams, both of Deal, and Martin J. Wythes, Dover, all of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 354,170, May 19, 1989, Pat. No. 5,030,654, which is a continuation-in-part of Ser. No. 131,157, Dec. 10, 1987, abandoned. This application May 30, 1991, Ser. No. 707,589
Claims priority, application United Kingdom, Dec. 11, 1986, 8629663; Jul. 3, 1987, 8715722
Int. Cl.[5] A61K *31/21*
U.S. Cl. 514—510 9 Claims

1. A method for treating hypertension and renal insufficiency in an afflicted subject, which comprises administering to said subject an effective antihypertensive/diuretic amount of a compound of the formula:



(I)

or a pharmaceutically acceptable salt thereof, wherein:

A completes a 5- or 6-membered saturated or monounsaturated carbocyclic ring which is optionally fused to another 5- or 6-membered saturated carbocyclic ring or is optionally benzofused;

B is —$(CH_2)_m$— wherein is an integer of from one to two;

R and R^4 are each independently hydrogen, C_1–C_6 alkyl or benzyl, or they represent a biolabile ester-forming group other than C_1–C_6 alkyl or benzyl;

R^1 is hydrogen or C_1–C_4 alkyl;

R^2 and R^3 are each independently hydrogen, hydroxy, C_1–C_4 alkyl or C_1–C_4 alkoxy; and

R^5 is C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_3–C_7 cycloalkyl, C_3–C_7 cycloalkenyl, aryl (C_2–C_6 alkynyl), —NR^6R^7, —NR^8COR^9, —$NR^8SO_2R^9$, tetrahydrofuranyl or homodioxanyl; or C_1–C_6 alkyl substituted by halogen, hydroxy, C_1–C_6 alkoxy, C_2–C_6 hydroxyalkoxy, C_1–C_6 alkoxy(C_1–C_6 alkoxy), C_3–C_7 cycloalkyl, C_3–C_7 cycloalkenyl, aryl, aryloxy, aryloxy(C_1–C_4 alkoxy), heterocyclyl, heterocyclyloxy, —NR^6R^7, —NR^8COR^9, —$NR^8SO_2R^9$, —$CONR^6R^7$, —SH, —$S(O)_pR^{10}$, —COR^{11} or —$COOR^{12}$; wherein

R^6 and R^7 are each independently hydrogen, C_1–C_4 alkyl, aryl, aryl(C_1–C_4 alkyl), C_2–C_6 alkoxyalkyl, heterocyclyl or C_3–C_7 cycloalkyl optionally substituted by hydroxy or C_1–C_4 alkoxy;

R^6 and R^7, when taken together with the nitrogen atom to which they are attached, form a pyrrolidinyl, piperidino, morpholino, piperazinyl or N—(C_1–C_4 alkyl)piperazinyl group;

R^8 is hydrogen or C_1–C_4 alkyl;

R^9 is C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, aryl, aryl(C_1–C_4 alkyl), aryl(C_1–C_4 alkoxy), heterocyclyl or —NR^6R^7;

R^{10} is C_1–C_4 alkyl, aryl, heterocyclyl or —NR^6R^7;

R^{11} is C_1–C_4 alkyl, C_3–C_7 cycloalkyl, aryl or heterocyclyl;

R^{12} is hydrogen or C_1–C_4 alkyl; and

p is zero, one or two;

said biolabile ester-forming group other than C_1–C_6 alkyl or benzyl in the definition of R and R^4 being selected from C_1–C_8 alkanoyloxy(C_1–C_8 alkyl), and the C_1–C_8 alkyl and C_3–C_7 cycloalkyl-substituted derivatives thereof and the aryl-substituted derivatives thereof, aroyloxy(C_1–C_8 alkyl), aryl, aryl(C_1–C_8 alkyl) and halo(C_1–C_8 alkyl), wherein said aryl groups are phenyl, naphthyl or indanyl with said aryl groups being optionally substituted with halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy groups;

said aryl groups in the definition of R^5, R^6, R^9, R^{10} and R^{11} having up to ten carbon atoms the nuclear ring, with said groups being optionally substituted with halogen, hydroxy, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, carbamoyl, amino, mono- or di(C_1–C_4 alkyl)amino or C_1–C_4 alkanoylamino groups; and

said heterocyclyl groups in the definition of R^5 being pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, triazolyl, tetrazolyl, furanyl, tetrahydrofuranyl, tetrahydropyranyl, dioxanyl, thienyl, oxazolyl, isoxazolyl, thiazolyl, indolyl, isoindolinyl, quinolyl, quinoxalinyl, quinazolinyl and benzimidazolinyl, with said groups being optionally substituted with halogen, hydroxy, oxo, C_1–C_4 alkyl, benzyl, carbamoyl, amino, mono- or di(C_1–C_4 alkyl)amino or C_1–C_4 alkanoylamino groups.

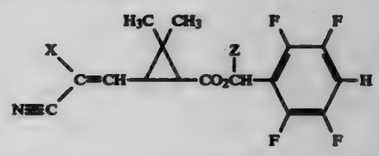
5,192,801

3-[2-CYANO-2-HALO-ETHENYL]-2,2-DIMETHYL-CYCLOPROPANECARBOXYLATES

Didier Balsin, Montigny; Marc Benoit, Roquevaire; Jean-Pierre Demoute, Neuilly Plaisance, and Jean Tessier, Viaconnax, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 661,383, Feb. 26, 1991, Pat. No. 5,135,951. This application Feb. 20, 1992, Ser. No. 839,093
Claims priority, application France, Feb. 27, 1990, 90-02406
Int. Cl.[5] A01N *37/34*; C07C *255/39, 255/31*
U.S. Cl. 514—521 16 Claims

1. All stereoisomeric forms and mixtures thereof of a compound of the formula



Id

wherein the cyclopropane copula has (1R, cis) or (1R, trans) structure, the geometry of the double bond carried by the 3-carbon atom is (E) or (Z), X is halogen, Z is hydrogen.

5,192,802

BIOADHESIVE PHARMACEUTICAL CARRIER

William F. Rencher, Devon, Pa., assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed Sep. 25, 1991, Ser. No. 766,493
Int. Cl.[5] A61K *9/02, 9/06, 47/00*; A61L *15/03*
U.S. Cl. 514—535 14 Claims

1. A teething gel consisting essentially from about 5 to 10% benzocaine; 5 to 20% NaCMC; an agent selected from the group consisting of 5 to 20% xanthan gum and 10 to 20% sodium alginate and a diluent selected from the group consisting of polyethylene glycol and polyethylene glycol with glycerine wherein the percentages are by percent weight of the teething gel and optionally there may be added to said teething gel an effective amount of a pharmaceutically acceptable excipient selected from the group consisting of acidifying agents, antimicrobial preservatives, antioxidants, buffering agents, colorings, flavors, sweetener and mixtures thereof.

5,192,803

1-(2-HYDROXY-3-ALKOXYPROPYL)-1H-IMIDAZOLE DERIVATIVES

Jean-Pierre Bouchaud, Paris; Jean-Claude Lacroix, Le Plessis Robinson; Jean-Pierre Maffrand, Antony, and Jean-Pierre Marxer, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 661,383, Feb. 26, 1991, Pat. No. 5,135,951. This application Feb. 20, 1992, Ser. No. 839,093
Claims priority, application France, Feb. 27, 1990, 90-02406
Int. Cl.[5] A01N *37/34*; C07C *255/39, 255/31*
U.S. Cl. 514—521 16 Claims

1. All stereoisomeric forms and mixtures thereof of a compound of the formula

Id

wherein the cyclopropane copula has (1R, cis) or (1R, trans) structure, the geometry of the double bond carried by the 3-carbon atom is (E) or (Z), X is halogen, Z is hydrogen.

5,192,804

1-(2-HYDROXY-3-ALKOXYPROPYL)-1H-IMIDAZOLE DERIVATIVES

Jean-Pierre Bouchaud, Paris; Jean-Claude Lacroix, Le Plessis Robinson; Jean-Pierre Maffrand, Antony, and Jean-Pierre Marxer, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 661,383, Feb. 26, 1991, Pat. No. 5,135,951. This application Feb. 20, 1992, Ser. No. 839,093
Claims priority, application France, Feb. 27, 1990, 90-02406
Int. Cl.[5] A01N *37/34*; C07C *255/39, 255/31*
U.S. Cl. 514—521 16 Claims

1. All stereoisomeric forms and mixtures thereof of a compound of the formula

Id

wherein the cyclopropane copula has (1R, cis) or (1R, trans) structure, the geometry of the double bond carried by the 3-carbon atom is (E) or (Z), X is halogen, Z is hydrogen.

5,192,805

1-(2-HYDROXY-3-ALKOXYPROPYL)-1H-IMIDAZOLE DERIVATIVES

Jean-Pierre Bouchaud, Paris; Jean-Claude Lacroix, Le Plessis Robinson; Jean-Pierre Maffrand, Antony, and Jean-Pierre Marxer, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 661,383, Feb. 26, 1991, Pat. No. 5,135,951. This application Feb. 20, 1992, Ser. No. 839,093
Claims priority, application France, Feb. 27, 1990, 90-02406
Int. Cl.[5] A01N *37/34*; C07C *255/39, 255/31*
U.S. Cl. 514—521 16 Claims

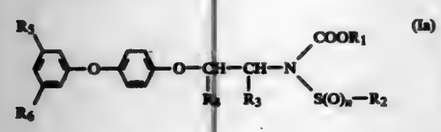
1. All stereoisomeric forms and mixtures thereof of a compound of the formula

Id

wherein the cyclopropane copula has (1R, cis) or (1R, trans) structure, the geometry of the double bond carried by the 3-carbon atom is (E) or (Z), X is halogen, Z is hydrogen.

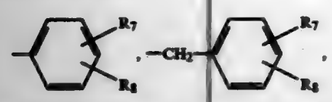
5,192,803
SULFENYLATED CARBAMIC ESTERS AND THEIR USE IN PESTICIDES
Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation-in-part of Ser. No. 508,149, Apr. 11, 1990, abandoned. This application Jun. 24, 1991, Ser. No. 719,870
Claims priority, application Switzerland, Apr. 14, 1989, 1422/89
Int. Cl.[5] A61K *31/325*; C07C *309/32*, *321/16*, *381/14*
U.S. Cl. 514—539 10 Claims

1. A compound of the formula Ia



(Ia)

where R_1 is C_1–C_4alkyl or C_3–C_4alkenyl, R_2 is C_1–C_4alkyl or a radical of the formula



—$C(CH_3)_2$—CN or —$N(R_9)$—COO—C_1–C_4alkyl, R_3 and R_4 independently of one another are hydrogen or methyl, R_5 is fluorine or chlorine, R_6 is fluorine when R_5 is fluorine or is hydrogen when R_5 is chlorine, R_7 and R_8 independently of one another are hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy or nitro, R_9 is C_1–C_4alkyl and n is zero, one or two.

5,192,804
CARNITINE-SUPPLEMENTED DIET FOR STARTER PIGS
Stephen A. Blum, Des Moines, Iowa; Robert D. Goodband; Jim L. Nelssen, both of Manhattan, Kans., and G. Larry Newton, Tifton, Ga., assignors to Lonza Inc., Fair Lawn, N.J.; Kansas State University Research Foundation, Manhattan, Kans. and University of Georgia Research, Athens, Ga.
Continuation of Ser. No. 673,986, Mar. 22, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 905,149
Int. Cl.[5] A61K *35/78*; A01N *37/30*; A23K *1/18*
U.S. Cl. 514—554 12 Claims

1. A feed composition for starter pigs weighing up to 16 pounds and as young as fourteen days which comprises at least 5 ppm of L-carnitine in admixture with a high nutrient density diet containing at least 30% milk products suitable for feeding to starter pigs, between 5 to 15% added fat, and at least 15% protein.

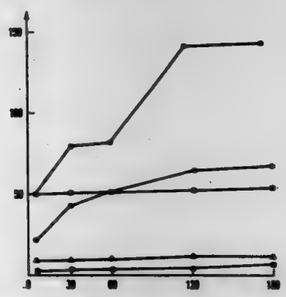
5,192,805
USE OF ACETYL L-CARNITINE IN THE THERAPEUTIC TREATMENT OF COMA
Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy
Filed Jan. 3, 1992, Ser. No. 816,224
Claims priority, application Italy, Jan. 4, 1991, 91 000002
Int. Cl.[5] A61K *31/205*
U.S. Cl. 514—556 4 Claims

1. A therapeutical method for the treatment of coma which comprises parenterally administering to a subject in a coma an amount of acetyl L-carnitine or a pharmacologically acceptable salt thereof effective for arousing the patient from coma.

5,192,806
METHOD OF PREVENTING PENILE TISSUE DEGENERATIVE CHANGE
Johannes Piel, Leimen; Johannes Aufenanger, Hirschberg; Thomas Konrad, Neckargemünd/Dilsberg, and Klaus-Peter Jünemann, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Fed. Rep. of Germany
Filed Apr. 15, 1991, Ser. No. 684,740
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1990, 90121343; PCT Int'l Appl., Dec. 22, 1990, PCT/EP90/02299
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—562 12 Claims

1. A method of preventing or reducing degenerative changes in penile tissue in a patient in need of such prevention or reduction, said method comprising administering to said patient an effective amount of at least one TXA_2 receptor antagonist.

5,192,807
SIDEROPHORES AS ANTIPARASITIC AGENTS
Jurg Gyula; Yves Cross, both of Cayenne; Luis Pereira da Silva, and Catherine Breton, both of Paris, all of France, assignors to Institut Pasteur, Paris Cedex, France
Continuation of Ser. No. 372,370, Jul. 21, 1989, abandoned. This application Sep. 19, 1991, Ser. No. 762,086
Claims priority, application France, Oct. 2, 1987, 87 13623
Int. Cl.[5] A01N *37/18*
U.S. Cl. 514—563 3 Claims



1. A method of killing *Plasmodium falciparum*, comprising administering to a man or an animal in need thereof an effective amount of an antiparasitic composition containing a siderophore substance with at least one hydroxamate group, which is able to penetrate red blood cells infected with *Plasmodium falciparum* and which is obtained by the method comprising:
bacterial synthesis of said siderophore substance by a pathogenic enterobacteria *Klebsiella pneumoniae* of serotype K5 cultivated in an iron-depleted medium,
isolating a siderophore substance excreted by said bacteria from the supernatant of the culture by introducing said supernatant in an anion exchange chromatographic column, followed by elution with a chloride gradient,
collecting the fractions containing hydroxamate groups, and gel filtration of the pool of hydroxamate fractions collected by the ion exchange chromatography, followed by elution with an appropriate buffer.

5,192,808
THERAPEUTIC EFFECT OF L-DEPRENYL IN THE MANAGEMENT OF PITUITARY-DEPENDENT HYPERADRENOCORTICISM (CUSHING'S DISEASE)
William W. Ruehl, Overland Park; David S. Bruyette, Manhattan, and David Stevens, Overland Park, all of Kans., assignors to Deprenyl Animal Health, Inc., Overland Park, Kans.
Continuation-in-part of Ser. No. 643,452, Jan. 18, 1991, which is a continuation-in-part of Ser. No. 576,011, Aug. 31, 1990, Pat. No. 5,151,449. This application Mar. 27, 1992, Ser. No. 858,702
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—654 7 Claims

1. A method of treating Cushing's disease, said method comprising:
administering a small but Cushing's disease treating effective amount of the compound L-deprenyl, or a biologically active salt form thereof, to an affected individual for a time sufficient to result in remission of Cushing's disease.

5,192,809
PROCESS FOR RECLAIMING A THERMOSET POLYMER
C. Andrew Jones, Newtown Square; Anne M. Gaffney, West Chester; David W. Leyshon, West Chester; Glenn E. Connone, West Chester, and John A. Sofranko, West Chester, all of Pa., assignors to ARCO Chemical Technology, L.P., Wilmington, Del.
Filed Mar. 30, 1992, Ser. No. 860,638
Int. Cl.[5] C08L *101/00*
U.S. Cl. 521—40 33 Claims

1. A process for reclaiming a filled thermoset polymer comprising the steps of:
(a) Contacting particles of the polymer and a zeolite-containing particulate catalyst in a fluidized bed reaction zone at a temperature effective to produce a coarse filler component, coke, a volatile organic component, and a spent catalyst component;
(b) Withdrawing a first stream comprising the volatile organic component from the reaction zone;
(c) Withdrawing a second stream comprising spent catalyst, coke, and the coarse filler component from the reaction zone;
(d) Heating the second stream in a regeneration zone in the presence of oxygen at a temperature effective to convert the coke to carbon dioxide and water and to regenerate the catalyst; and
(e) Separating the regenerated catalyst and coarse filler component.

5,192,810
METHOD AND APPARATUS FOR MANUFACTURING DIMPLED STRUCTURES FROM ELASTIC CLOTH
Francis U. Hill, San Diego, Calif., assignor to Sorrento Engineering Corporation, Calif.
Division of Ser. No. 702,952, May 20, 1991, Pat. No. 5,135,959. This application Dec. 16, 1991, Ser. No. 807,189
Int. Cl.[5] C08J *9/38*, *9/40*
U.S. Cl. 521—52 2 Claims

1. A reticulated open-cell polyimide foam product which comprises:
a reticulated open-cell foam sheet having at least 90 volume percent open space and containing a finely divided microwave absorbing material; and
a polyimide foam substantially filling said open space, said polyimide foam having substantially uniform density and cell size.

5,192,811
PROCESS FOR PREPARING A FLAME-RESISTANT, ELASTIC SOFT POLYURETHANE FOAM
Ulrich Heitmann, Memmingen, and Heribert Rossel, Buxheim, both of Fed. Rep. of Germany, assignors to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany
Filed Mar. 27, 1991, Ser. No. 676,198
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1990, 4010752
Int. Cl.[5] C08K *21/00*; C08G *18/14*
U.S. Cl. 521—99 6 Claims

1. A process for preparing a flame-resistant, elastic soft polyurethane foam, which comprises admixing a portion of expanded graphite having a particle size of from 0.2 to 1 mm as a flame retardant and a portion of melamine, with a foam reaction mixture of polyol, polyisocyanate, water, organic blowing agents, activators, accelerators and cross-linking agents, whereby the expanded graphite and the malamine are added in a ratio of from 1:3 to 2:3, adjusting a combined proportion of expanded graphite and melamine to equal from 20 to 40% by weight of the reaction mixture.

5,192,812
CELL OPENERS FOR URETHANE FOAM SURFACTANTS
David D. Farris; James D. Reedy, both of Marietta, Ohio, and Raymond L. Cobb, Buda, Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Feb. 12, 1991, Ser. No. 654,232
Int. Cl.[5] C08J *9/04*; C08G *18/06*; C08F *203/00*
U.S. Cl. 521—112 15 Claims

1. A composition, comprising:
a first silicone polyether copolymer in which the copolymer backbone possesses at least 20 Si—O—Si linkages, more than 50% of the Si atoms carry at least two methyl groups, and the sum of the atomic masses of the oxyethylene units and the oxypropylene units constitute at least 50% of the average molecular weight of the copolymer; and
a second silicone polyether copolymer, said second polyether copolymer having the generalized formula

$(Me_3SiO_{1/2})_\alpha(Me_2SiO_{2/2})_\beta(MeSiO_{3/2})_\gamma(RMeSiO_{2/2})_\delta(R^5MeSiO_{2/2})_\epsilon(RMe_2SiO_{1/2})_\zeta$

wherein
$\alpha+\zeta=\gamma+2$;
$\alpha=0$ to $\gamma+2$;
$\beta=10$ to 180;
$\gamma=0$ to 15;
$\delta=1$ to 40;
$\epsilon=0$ to 20;
$\zeta=0$ to $\gamma+2$;
$\delta+\zeta\geq 2$;
$\Sigma(\alpha+\beta+\gamma+\epsilon+\zeta)\geq 20\leq 200$; and
R is a polyether of formula $—(CHR')_nO(C_2H_4O)_x(C_2H_3R''O)_zQ$ or a mixture thereof, wherein
n is 2 to 10;
$x+z=5$ to 40;

$\frac{x}{x+z}\geq 0.04$;

and with the proviso that
when $z=0$, $x\leq 18$; and wherein
R' is H, alkyl of 1 to 3 carbon atoms, phenyl, or alkyl-substituted phenyl in which the alkyl substituents contain 1 to 2 carbon atoms, and where there are several R' groups, these may be the same or different;
R'' is alkyl of 1 to 18 carbon atoms, phenyl, or alkyl-substituted phenyl in which the alkyl substituents contain 1 to 4 carbon atoms;

Q is selected from the group consisting of:
H;
alkyl of 1 to 18 carbon atoms;
benzyl;
alkyl-substituted benzyl in which the alkyl substituents contain 1 to 4 carbon atoms;
CO_2R^2 in which R^2 is alkyl of 1 to 2 carbon atoms;
$CONHR^3$ in which R^3 is alkyl of 1 to 3 carbon atoms, phenyl, or alkyl-substituted phenyl in which the alkyl substituents contain 1 to 4 carbon atoms;
COR^4 in which R^4 is alkyl of 1 to 18 carbon atoms, phenyl, or alkyl-substituted phenyl in which the alkyl substituents contain 1 to 4 carbon atoms; atoms,
R^5 is alkyl of 2 to 18 carbon atoms, phenyl, phenyl-substituted alkyl of 2 to 3 carbon atoms, or cyano- or fluoro-substituted alkyl of 2 to 18 carbon atoms;
the ratio of hydrophilic character to lipophilic character for the second silicon polyether copolymer being ≧0.3;
the weight % of polyether groups in said second silicon polyether copolymers being at least 5% less than the weight % of polyether groups in said first silicone polyether copolymer; and
said second silicone polyether copolymer constituting from about 0.05% to about 40% of the sum of said first and second silicone polyether copolymers.

5,192,813
PREPARATION OF HARD FOAMS CONTAINING URETHANE GROUPS OR URETHANE AND ISOCYANURATE GROUPS BY POLYISOCYANATE POLYADDITION, AND POLYOXYALKYLENE-POLYOLS WHICH ARE SUITABLE THEREFOR

Rolf Hesse, 3 Lilienweg, 6834 Ketsch; Werner Hinz, 1 Hanne-Fay-Str., 6710 Frankenthal; Ludwig Schuster, 44 Weisheimer Str., 6703 Limburgerhof, and Klaus Verspohl, 1 Ruedigerstr., 6700 Ludwigshafen, all of Fed. Rep. of Germany

Filed May 2, 1991, Ser. No. 694,621
Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4014923
Int. Cl.[5] C08G *18/32, 18/48;* C08J *9/08, 9/12*
U.S. Cl. 521—159 7 Claims

1. A process for the preparation of a hard foam containing bonded urethane groups or containing bonded urethane and isocyanurate groups comprising by reacting
a) at least one polyhydroxyl compound, and,
b) optionally, a low-molecular-weight chain extender and-/or crosslinking agent with
c) an organic and/or modified organic polyisocyanate, in the presence of
d) a blowing agent,
e) a catalyst
and optionally,
f) assistants and/or additives,
wherein the polyhydroxyl compound (a) used is a polyoxypropylenepolyol or a polyoxyethylene-polyoxypropylene-polyol containing up to 30% by weight, based on the weight of the alkylene oxide units, of oxyethylene units bonded within the chain, containing secondary hydroxyl groups,
having a functionality of from 3.5 to 4.3,
a hydroxyl number of from 350 to 650 and
a viscosity of from 500 to 2,500 mPa.s at 23° C., and prepared by anionic polymerization of 1,2-propylene oxide or ethylene oxide and 1,2-propylene oxide onto an initiator molecule mixture containing, based on the total weight,
a1) from 40 to 80% by weight of a hexanetetrol,
a2) from 1 to 30% by weight of a hexanetriol,
a3) from 0 to 35% by weight of glycerol and
a4) from 0 to 15% by weight of sorbitol or mannitol, or a mixture thereof.

5,192,814
REACTION INJECTION MOLDING POLYUREA RESIN COMPOSITION

Toshiyuki Oshima, Ibaraki; Hideo Ishibashi, Neyagawa; Rie Tamura, Toyonaka; Satoshi Yamamoto, Hirakata, and Takaharu Izumo, Shimamoto, all of Japan, assignors to Nippon Paint Company, Ltd., Osaka, Japan

Filed Apr. 29, 1992, Ser. No. 875,764
Claims priority, application Japan, Apr. 30, 1991, 3-128419
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—163 7 Claims

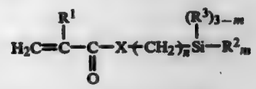
1. A reaction injection molding polyurea resin composition comprising
(a) a polyoxyalkylenepolyamine,
(b) an aromatic polyamine and/or a xylylenediamine, and
(c) a polyisocyanate,
said polyoxyalkylenepolyamine (a) or polyamine (b) is an at least partially secondary amino-terminated modified polyamine such that either the whole or part of (a) and/or (b) has been modified by a Michael reaction with an unsaturated compound of the formula $CH_2{=}C(R){-}Y$ wherein R means a hydrogen atom or a methyl group and Y means an electron attracting group with the proviso that R cannot represent methyl when the polyamine is an aromatic polyamine.

5,192,815
DENTAL RESTORATIVE MATERIAL

Koichi Okada, and Ikuo Omura, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

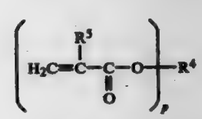
Filed Nov. 2, 1989, Ser. No. 430,331
Claims priority, application Japan, Nov. 11, 1988, 63-286404
Int. Cl.[5] A61F *2/00;* C08J *5/10;* C08K *3/36;* C08L *33/12*
U.S. Cl. 523—115 10 Claims

1. A dental restorative material comprising:
(a) an ultrafine inorganic filler with a size of 0.1 μm or less which is insoluble in water and surface-treated with a silane coupling agent represented by the following general formula (I) in an amount of at least 3% by weight based on the weight of the filler:



(I)

wherein R^1 is a hydrogen atom or a methyl group, R^2 is a hydrolyzable group, R^3 is a hydrocarbon group having 1 to 6 carbon atoms, X is an oxygen or sulfur atom, m is 2 or 3 and n is an integer of 8 to 20; and
(b) a (meth)acrylate monomer composition containing at least 50% by weight based on the weight of the composition of at least one hydrophobic multifunctional (meth)acrylate represented by the following general formula (II)



(II)

wherein R^4 is an organic group having 7 to 40 carbon atoms, composed of 1 to 8 hydrocarbon groups having 2 to 40 carbon atoms, at least one of said hydrocarbon groups having at least 4 carbon atoms, the ratio of the number of total carbon atoms, x, contained in the hydrocarbon groups to the number of the hydrocarbon groups, y, contained in said organic group satisfying: $x/y > 3$; R^5 is a hydrogen atom or a methyl group and p is an integer of 2 to 8;

wherein said surface-treated inorganic filler is incorporated in an amount of at least 100 parts by weight based on 100 parts by weight of said monomer composition.

5,192,816
PIPE INNER SURFACE COATING COMPOSITION

Hiroshi Iizuka, Sodegaura, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,133
Claims priority, application Japan, Nov. 29, 1990, 2-331502
Int. Cl.[5] C08L *63/00*
U.S. Cl. 523—463 7 Claims

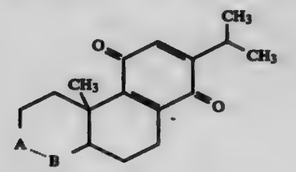
1. A coating composition for forming a film on the inner surface of a pipe through which chlorine-containing water passes, the film coating when cured absorbing or consuming no more than 1 part per million chlorine, the coating composition comprising:
(A) an epoxy resin containing at least 90% by weight of a bisphenol glycidyl ether, the epoxy resin containing epoxy groups;
(B) an aliphatic polyamine compound sufficient to provide 0.5 to 0.9 equivalent of active hydrogen per equivalent of the epoxy group of said epoxy resin;
(C) about 3 to about 20 parts by weight per 100 parts by weight of the sum of components (A) and (B) of at least one member selected from the group consisting of 1-xylyl-1,3-diphenyl-butane, bis(α-methylbenzyl)xylene and 1-xylyl-1-(3-α-methyl-benzylphenyl)ethane; and
(D) at least one member selected from the group consisting of a coloring pigment and an inorganic filler.

5,192,817
PHENANTHRENE DERIVATIVES

Yoshihisa Takeishi, Tokushima; Kiyoto Goto, Naruto; Takuji Uesako, Tokushima; Toshiko Kuwahara, Tokushima; Masaaki Takai, Tokushima; Yukihisa Ono, Tokushima; Yoshihiro Taniguchi, Tokushima; Sachiko Manabe, Tokushima, and Takahiro Asakuni, Kagawa, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd. and Otsuka Pharmaceutical Factory, Inc., both of Japan

PCT No. PCT/JP91/00289, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO91/13855, PCT Pub. Date Sep. 19, 1991
PCT Filed Mar. 5, 1991, Ser. No. 775,973
Claims priority, application Japan, Mar. 6, 1990, 2-056184
Int. Cl.[5] C07C *49/215, 50/32;* C07D *307/77*
U.S. Cl. 549—298 8 Claims

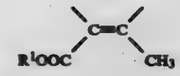
1. A phenanthrene derivative selected from the group consisting of compounds represented by the general formula (1),



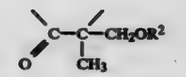
(1)

wherein the group of the formula

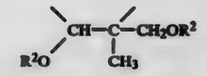
is a group of the formula



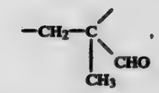
wherein R^1 is a hydrogen atom or a lower alkyl group, a group of the formula



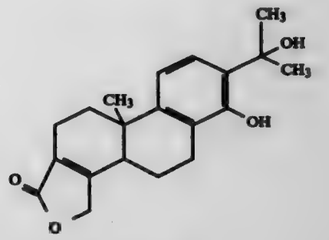
wherein R^2 is a hydrogen atom or a lower alkanoyl group, a group of the formula



wherein R^2 is the same as defined above, a group of the formula

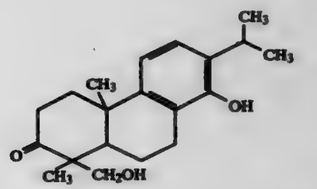


a compound of the formula (2),



(2)

a compound of the formula (3),



(3)

compounds represented by the general formula (4),

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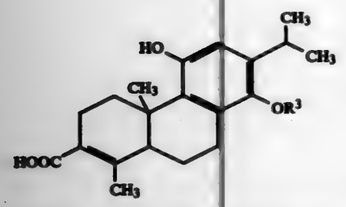
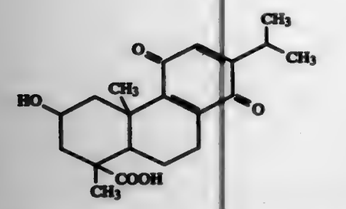


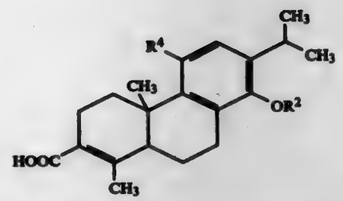
(4)

wherein R^3 is a hydrogen atom or a methyl group, a compound of the general formula (7),



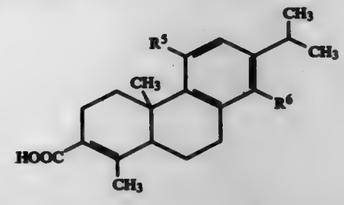
(7)

compounds represented by the general formula (8),



(8)

wherein R^2 is the same as defined above and R^4 is a lower alkanoyloxy group,
or compounds represented by the general formula (9),

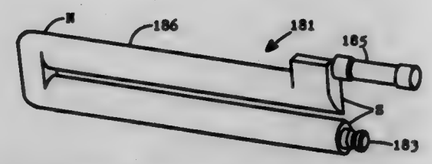


(9)

wherein R^5 and R^6 are each a lower alkoxy group, or a salt thereof.

8. An interleukin-1 (IL-1) inhibitor containing, as active ingredient(s), phenanthrene derivative(s) selected from the group consisting of compounds represented by the general formulas (1), (4), (8) and (9) and the formulas (2), (3) and (7) as defined in claim 1 or salt(s) thereof.

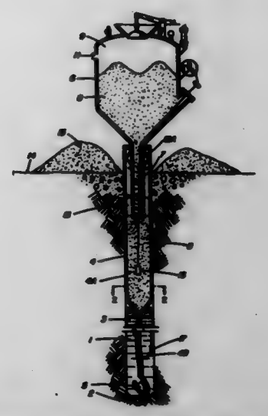
5,192,818
MEANS FOR REDUCING THE CRIMINAL USEFULNESS OF HAND WEAPONS
John M. Martin, 316 Roosevelt St., Lafayette, La. 70501
Continuation-in-part of Ser. No. 188,646, May 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 880,095, Jun. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 589,773, Mar. 15, 1984, abandoned. This application Jul. 18, 1990, Ser. No. 553,555
Int. Cl.[5] F41A *17/08, 17/30*
U.S. Cl. 42—70.01 4 Claims



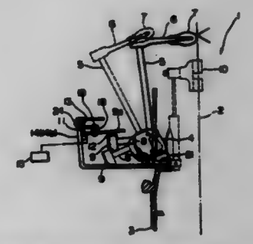
1. An apparatus comprising:
a dischargeable hand weapon;
means, connected to said weapon, for preventing the discharging of said weapon
means for detecting a condition necessary for using said weapon for a use which involves the moving of said weapon;
first determining means, connected to said detecting means, for determining the existence of a requirement where more than one hour has past since said detecting means detected said condition;
second determining means, connected to said detecting means and to said first determining means, for determining the existence of a second requirement where less than thirty minutes has past since said detecting means detected said condition while said first determining means was determining the existence of said first requirement; and
means, connected to said second determining means and to said preventing means for disabling said preventing means, and thereby allowing the discharging of said weapon, when said second determining means is determining the existence of said second requirement.

5,192,819
BULK EXPLOSIVE CHARGER
Otto F. Baumgartner, P.O. Box 351, Elkford, British Columbia, Canada V0B 1H0
Filed Jun. 11, 1992, Ser. No. 897,078
Claims priority, application Canada, Jun. 11, 1991, 2044311
Int. Cl.[5] F42B *3/00*
U.S. Cl. 86—20.15 14 Claims

1. An apparatus for loading bulk explosives into a cylindrical blast hole comprising:
a pressure charger vessel adapted to be filled with bulk explosives and pressurized with compressed air;
at least one water impervious cylindrical flexible sleeve adapted to be lowered into a blast hole and connected to said pressure charger vessel;
said flexible sleeve including an irregular outer surface with recessions and projections; said projections adapted to abut inner walls of said blast hole;
a pressure means adapted to convey pressurized air into said pressure charger vessel and said sleeve; and
a conveying means adapted to convey bulk explosives into said pressure charger vessel;
wherein, when in operation, pressurized air is conveyed into said pressure charger vessel, and said sleeve is expanded to substantially fill said blast hole, said sleeve is filled with bulk explosives and pressurized air, simultaneously forcing any water in of said blast hole and said recessions on the outer surface of said sleeve, thereby permitting said sleeve to be filled with explosives to the desired level, while preventing said explosives from being contaminated with water.



5,192,820
MUSICAL INSTRUMENT KEYBOARD STRIKING FORCE SENSOR
Kiyoshi Kawamura, and Shigeru Muramatsu, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Jun. 28, 1991, Ser. No. 722,685
Claims priority, application Japan, Jun. 28, 1990, 2-170590
Int. Cl.[5] G10C *3/18*
U.S. Cl. 84—236 12 Claims



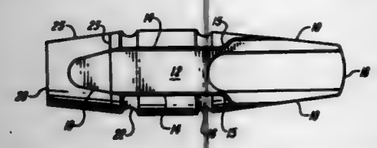
1. A key striking force sensor including:
(a) displacement measuring means for continuously measuring displacement of a component of a hammer mechanism over an entire range of motion, the component moving in concert with the hammer mechanism; and
(b) calculation means for calculating velocity or acceleration of movement of the hammer mechanism based on displacement data from the displacement measuring means.

5,192,821
MOUTHPIECE FOR A SINGLE-REED WOODWIND INSTRUMENT
Bradley Goldstein, 110 Longwood Ave., Brookline, Mass. 02146, and Martin Goldstein, 87-10 204th St. Apt A-28, Hollis, N.Y. 11423
Filed Nov. 14, 1990, Ser. No. 612,799
Int. Cl.[5] G10D *9/02*
U.S. Cl. 84—383 R 17 Claims

1. A single-reed woodwind mouthpiece assembly including a proximal tip portion and a distal chamber portion, said mouth-

piece assembly having enhanced vibrational quality, stability, and response comprising:

a lay disposed in at least said proximal tip portion, upon which a reed rests when said reed is in playing position;



a reed groove including reed groove walls extending upward from at least a portion of said lay for limiting transverse slippage of the reed; and

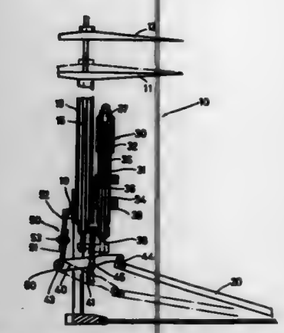
reed holding means for maintaining the reed in playing position within said reed groove.

5,192,822

HIGH HAT STAND PEDAL INITIAL HEIGHT ADJUSTMENT

Yoshiki Hoshino, Asahi, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Jun. 26, 1991, Ser. No. 721,276
Claims priority, application Japan, Feb. 26, 1991, 3-16669[U]
Int. Cl.[5] G10D *13/00*
U.S. Cl. 84—422.3 13 Claims



1. A high hat stand with an adjustable height operating pedal comprising:

a stand; a stationary cymbal supported by the stand to be contacted; a movable cymbal movable into contact with and away from the stationary cymbal;

an operating rod connected with the movable cymbal, the operating rod being movable for moving the movable cymbal toward the stationary cymbal; biasing means for normally biasing the movable cymbal away from the stationary cymbal;

a foot pedal connectable with the operating rod, the pedal being movable in one direction to move the operating rod to move the movable cymbal to contact the stationary cymbal, and the biasing means also biasing the pedal opposite the one direction;

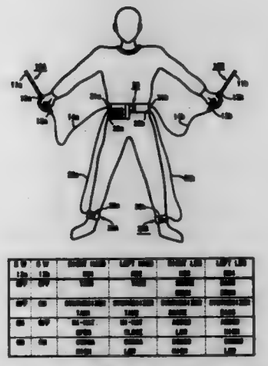
connecting means for connecting the pedal to the operating rod, the connecting means comprising a pedal initial height adjusting member connected between the pedal and the stand, the adjusting member having a selectively adjustable length for setting the initial height of the pedal while the movable cymbal is separated from the stationary cymbal and before the operator moves the pedal to move the movable cymbal into contact with the stationary cymbal.

5,192,823

MUSICAL TONE CONTROL APPARATUS EMPLOYING HANDHELD STICK AND LEG SENSOR

Hideo Suzuki, and Masao Sakama, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 4, 1989, Ser. No. 417,788
Claims priority, application Japan, Oct. 6, 1988, 63-252377
Int. Cl.[5] G10H *5/02*
U.S. Cl. 84—600 8 Claims



1. A musical tone control apparatus comprising:

(a) a stick having a shape which can be held by a person's hand, said stick being provided with a first sensor and at least one switch, said first sensor detecting a physical parameter accompanied with a spatial displacement of said stick to be moved with a free motion of a person's arm;

(b) detecting means to be mounted to a person's leg, said detecting means being provided with a second sensor for detecting a physical parameter accompanied with a spatial displacement of said detecting means in any of plural directions moved with a free ranging motion of the person's leg;

(c) musical tone generation control means for generating first and second musical tone generation control signals for controlling generation of musical tones which are respectively assigned to said stick and said detecting means based on detection results of said first and second sensors; and

(d) tone control means for generating a tone color control signal for independently controlling tone colors of the musical tones, whose generation are controlled by said first and second musical tone generation control signals, in response to an operation of said switch.

5,192,824

ELECTRONIC MUSICAL INSTRUMENT HAVING MULTIPLE OPERATION MODES

Takeo Shibukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 20, 1990, Ser. No. 631,475
Claims priority, application Japan, Dec. 21, 1989, 1-331882
Int. Cl.[5] G10H *1/00, 1/06, 7/00*
U.S. Cl. 84—615 25 Claims

1. An electronic musical instrument comprising:

a) performance data generating means for generating performance data;

b) multiple musical tone generating systems for producing musical tone signals in response to said performance data;

c) multiple musical sound producing systems to which said musical tone signals are supplied and which produce musical sound in response to said musical tone signals;

d) mode indicating means for indicating:

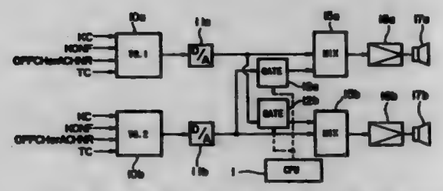
i) a first mode wherein musical sound is generated in response to operation of one of said musical tone generating systems,

ii) a second mode wherein musical sound is generated in response to operation of at least two musical tone generating systems;

e) selections means for:

i) allocating the performance data output from said performance data generating means to a single musical tone generating system when the mode indicated by said mode indicating means is said first mode,

ii) allocating the performance data output from said performance data generating means to each of said multiple musical tone generating systems when the mode indicated by said mode indicating means is said second mode;



f) distribution means for:

i) supplying to at least one of said multiple musical sound producing systems the musical tone signal output from the signal musical tone generating system to which said performance data is allocated when the mode indicated by the mode indicating means is said first mode,

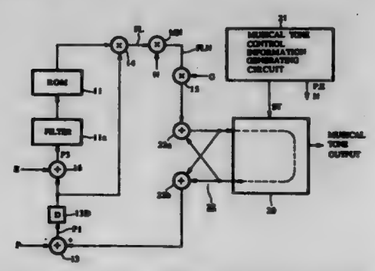
ii) supplying to each of said multiple musical sound producing systems the musical tone signal output from a corresponding musical tone generating system when the mode indicated said mode indicating means is said second mode, such that each musical tone signal is supplied to a difference musical sound producing system.

5,192,825

APPARATUS FOR SYNTHESIZING MUSICAL TONES

Toshifumi Kunimoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Apr. 25, 1990, Ser. No. 514,112
Claims priority, application Japan, Apr. 27, 1989, 1-108699
Int. Cl.[5] G10H *1/12*
U.S. Cl. 84—661 7 Claims



1. An apparatus for synthesizing musical tones comprising;

means for providing performance information corresponding to at least one parameter of a tone to be synthesized;

excitation means for generating an excitation signal in response to performance information and a feedback signal;

delay means for delaying the excitation signal in accordance with a transmission characteristic corresponding to the performance information, wherein an output of the delay means is provided as the feedback signal to the excitation means to form a loop circuit for circulating the excitation signal, wherein the circulated excitation signal is used as a musical tone signal;

noise generation means for generating a noise signal; and

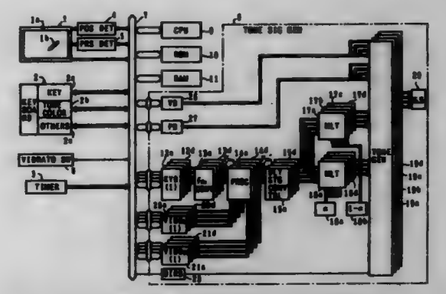
noise combining means contained in the loop circuit for combining the circulated excitation signal with the noise signal separate from the performance information, thereby causing the musical tone signal to have a noise component.

5,192,826

ELECTRONIC MUSICAL INSTRUMENT HAVING AN EFFECT MANIPULATOR

Eiichiro Aoki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 31, 1990, Ser. No. 636,209
Claims priority, application Japan, Jan. 9, 1990, 2-2093
Int. Cl.[5] G10H *1/02*
U.S. Cl. 84—737 13 Claims



1. An electronic musical instrument comprising:

manipulation means including an at least two dimensional continuous surface manipulation region, and a positioning element operative proximate said continuous surface of said manipulation region for achieving performance manipulation within said manipulation region;

means for detecting time based serial position data coordinates on the basis of serial positioning of the performance manipulation of said positioning element within said manipulation region;

means for detecting directional change and for conversion of data pertaining to a determination of the geometric coordinate locus of the performance manipulation, on the basis of a predetermined number of time based, serially detected position data coordinates; and

a tone signal generation circuit for performing effect control on musical tones based on the detected position and directional change and conversion data from said means for detecting and said manipulation means.

5,192,827

MICROWAVE PROJECTILE

Louis J. Jasper, Jr., Fulton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 19, 1991, Ser. No. 810,608
Int. Cl.[5] F42B *12/36*
U.S. Cl. 89—1.11 7 Claims

1. A microwave radio frequency radiation projectile system for radiating a single pulse of high power microwave/radio frequency (HPM/RF) energy comprising a projectile comprising a body with a portion of said body transparent to microwave/radio frequency radiation thereby allowing microwave/radio frequency energy to propagate through said portion of said body, means for generating high power microwave/radio frequency energy, means for radiating high power microwave/radio frequency energy, means for storing electrical energy, means for charging said projectile with

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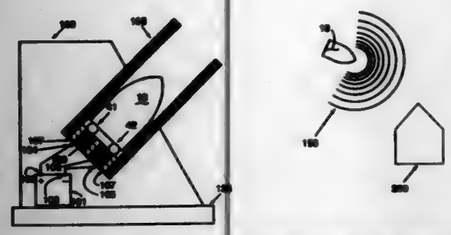
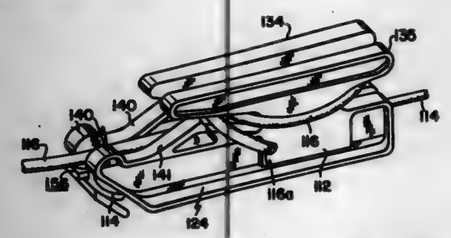
electrical energy prior to launching, and means for launching said projectile wherein said system further comprises:
a plurality of pulse forming lines for storing said electrical energy,



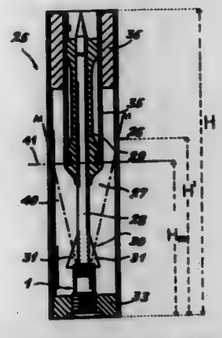
a subnanosecond switch for converting said stored electrical energy in said pulse forming lines to high power microwave/radio (HPM/RF) frequency energy,
an antenna for radiating said high power microwave radio frequency energy, and
a timing circuit for initiating said subnanosecond switch.

5,192,828
DETONATING CORD AND BLASTING CAP CONNECTOR BLOCK HAVING A RESILIENT FREE END CORD LATCH
Dennis K. Austin, Simsbury, and J. Donaldson Thomas, East Granby, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.
Filed Mar. 13, 1992, Ser. No. 851,045
Int. Cl.[5] F42B *5/26*; C06C *5/00*
U.S. Cl. 102—275.12 3 Claims



1. An elongated connector block for mounting an elongated blasting cap and a detonating cord in side-by-side association for side initiation, comprising a longitudinally extending body of generally U-shaped transverse cross section with an intermediate longitudinally extending slot the full length thereof and a pair of opposed sides forming the sides of the slot contoured to receive the detonating cord, said body providing an enlarged elongated blasting cap cavity extending longitudinally from a front end of the body along at least a portion of said slot, an upward integral extension of at least one side of the body forming a pinch-cleat for longitudinally positioning a flexible detonating cord along the slot in intimate parallel side-by-side association with and above a blasting cap inserted in said cavity and for retaining the detonating cord in said position by winding it about the pinch-cleat extension, the space between said one pinch-cleat extension and said body having a flexible retainer clip positioned therein for retaining the free end of the detonating cord after winding the cord about the cleat.

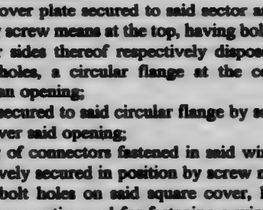
5,192,829
INITIATION DEVICE FOR THE PROPULSIVE CHARGE OF AMMUNITION, FOR EXAMPLE TELESCOPED AMMUNITION, AND AMMUNITION IGNITED BY SUCH AN IGNITION DEVICE
Christian G. Suire, Bourges, France, assignor to Giat Industries, France
Filed Jan. 23, 1992, Ser. No. 824,320
Claims priority, application France, Jul. 31, 1991, 91 09725
Int. Cl.[5] F42B *5/045*
U.S. Cl. 102—434 1 Claim



1. A telescoped ammunition cartridge, comprising:
a cartridge casing;
a projectile and propellant charge disposed within said cartridge casing; and
an ignition device disposed at an aft end of said cartridge casing, said ignition device comprising:
(i) a cylindrical case having an end wall and a longitudinal axis; and
(ii) a pyrotechnic composition and ignition means for igniting said pyrotechnic composition housed within said cylindrical case, said cylindrical case including a plurality of angled channels in said end wall for providing flame communication between said pyrotechnic composition and said propellant charge, each of said angled channels having a central axis angled relative to said longitudinal axis such that said central axis intersects said casing at a point beyond a mid-point of said casing wherein said projectile includes a plurality of fins at an aft section of said projectile; and
support means for supporting said fins, said support means comprising a plurality of recesses in the end wall of said cylindrical case, said angled channels opening between said fins of said projectile.

5,192,830
SABOT FOR HIGH DISPERSION SHOT SHELL
Lawrence J. Puckett, Churchville, Md., assignor to The United States of America as represented by the Secretary of The Army, Washington, D.C.
Division of Ser. No. 828,321, Jan. 29, 1992. This application Aug. 21, 1992, Ser. No. 931,469
Int. Cl.[5] F42B *7/02, 14/06*
U.S. Cl. 102—457 4 Claims

1. A sabot for a shotgun shell, said sabot comprising a tubular portion and a base, wherein said tubular portion attaches to said base forming a cup-like member for launching a load of shot, and said base is provided with a centrally disposed recess

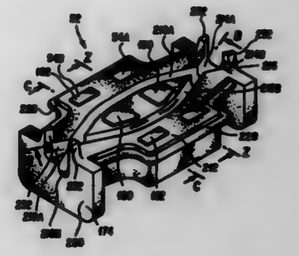


which protrudes into said load of shot, said recess being defined by an involute surface resembling a cone.

5,192,831
STRUCTURE OF FLOOR JUNCTION BOX
Chin-Hui Yang, 4F., No. 2, Lane 409, Chung Cheng Road, Hsin Tien City, Taipei Hsien, Taiwan
Filed Jan. 30, 1991, Ser. No. 647,885
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.[5] H02G *3/28*
U.S. Cl. 174—48 1 Claim

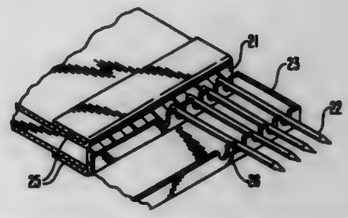
1. A floor junction box, comprising:
a square base having sector columns at the four corners thereof, a plurality of recesses around the four sides thereof between said sector columns, a plurality of square columns respectively releasably fastened in said recesses defining with said sector columns a plurality of wiring holes therebetween;
a square cover plate secured to said sector and square columns by screw means at the top, having bolt holes around the four sides thereof respectively disposed above said wiring holes, a circular flange at the center defining therein an opening;
a top cap secured to said circular flange by screw means to cover over said opening;
a plurality of connectors fastened in said wiring holes and respectively secured in position by screw means fastened in said bolt holes on said square cover, having each a tubular connecting end for fastening a wire conduit, said tubular connecting end having a bolt hole through which screw means can be fastened to secure said wire conduit in position; and
wherein a plurality of inserts can be used to block up said wiring holes when said connectors are removed therefrom, said inserts having each a flange at one side which is stopped at the outside of said wiring holes to completely seal the gap when inserted.

5,192,832
ELECTROMAGNET INSERT FOR DATA CURRENT COUPLER
William J. Rady, Jr., Annville, and Howard R. Shaffer, Millersburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 31, 1990, Ser. No. 576,335
Int. Cl.[5] H05K *5/00*; H01F *7/00*
U.S. Cl. 174—52.1 11 Claims



1. An electromagnet insert for a data coupler for coupling to a twisted pair cable of a data bus, comprising a dielectric member including means defined therein for receipt of at least one electromagnet and defining positions for at least a central leg of said electromagnet with a mating face exposed in one direction along a surface, said member having a pair of arcuate wire-receiving channels along a wire-receiving face and coursing from a first common wire exit at one side to a second common wire exit at an opposing side of said member defining pathways on each side of a central leg of said electromagnet, said arcuate channels adapted to receive thereinto from said wire-receiving face respective ones of wires of said twisted pair calbe, and shaped to conform to the shape of an open loop of the twisted pair calbe, said dielectric member having a periphery of said wire-receiving face including a flexible lip to form a seal when engaged and compressed between opposed surfaces.

5,192,833
ASSEMBLY FOR TERMINATING A CABLE AND PROCESSES FOR MANUFACTURE AND TERMINATION THEREOF
Rowland W. Gibson, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.
Filed Jul. 17, 1991, Ser. No. 731,575
Int. Cl.[5] H02G *15/02*
U.S. Cl. 174—74 R 7 Claims



1. An assembly for terminating a cable comprising:
(a) at least one center conductor surrounded by insulating material and having a segment of said insulating material stripped from the end of said conductor;
(b) a supporting tray, including at least one set of alignment slots formed across the width of said tray, said tray positioned adjacent said insulating material to support said at least one center conductor lying in one of the slots in the

ory for each elevator car for storing travel times between

with respective ones of the tracks when the core is inte-

at least one set of alignment slots, said tray being of a width to leave a portion of said at least one center conductor extending unsupported by said one slot outwardly past the outermost edge of said tray; and

(c) an easily-removable hardenable reinforcing material surrounding said at least one center conductor in said one slot in said tray.

4. A process for preparing an assembly for terminating a cable having at least one center conductor surrounded by insulating material, comprising the steps of:

(a) stripping a segment of said insulating material from the end of said cable having at least one center conductor surrounded by insulating material;

(b) positioning a support tray, including at least one set of alignment slots formed across the width of said tray, said tray positioned adjacent said insulating material to support said at least one center conductor lying in one of the slots in the at least one set of alignment slots, said tray being of a width to leave a portion of said at least one center conductor extending unsupported by said one slot outwardly past the outermost edge of said tray; and

(c) applying and allowing to harden an easily-removable hardenable reinforcing material surrounding said at least one center conductor in said one slot of said tray to affix said at least one center conductor in place in said one slot in said tray.

5,192,834

INSULATED ELECTRIC WIRE

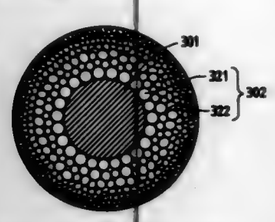
Toru Yamanishi; Tatsuya Kakuta, both of Kanagawa, and Akinori Mori, Tochigi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 492,794, Mar. 13, 1990. This application Dec. 9, 1991, Ser. No. 803,954

Claims priority, application Japan, Mar. 15, 1989, 1-60881; Apr. 17, 1989, 1-95371; May 1, 1989, 1-109141; Aug. 4, 1989, 1-201405

Int. Cl.[5] H01B 7/00

U.S. Cl. 174—120 SR 4 Claims



1. An insulated electric wire, comprising:

a conductor;

an energy radiation curable resin composition layer having microspheres incorporated therein and surrounding said conductor, the outside diameter of said microspheres in said energy radiation curable resin composition layer being maximum in the vicinity of said conductor and decreasing gradually toward the periphery of said energy radiation curable resin composition layer.

5,192,835

BONDING OF SOLID STATE DEVICE TO TERMINAL BOARD

David N. Ball, Rochester; Edward J. Ozimek, Penfield, and Terry Tara, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1990, Ser. No. 594,786

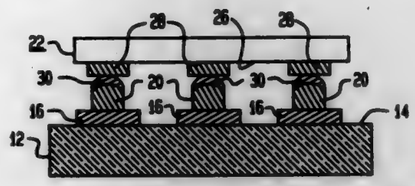
Int. Cl.[5] H05K 1/00

U.S. Cl. 174—260 19 Claims

1. A solid state device assembly comprising:

a pattern of conductive bumps only on a surface of a terminal board of an insulating material;

a solid state image sensor device which has features which cannot withstand high temperatures and which has a plurality of conductive terminals pads on a surface thereof in a pattern corresponding to the pattern of the conductive bumps on the terminal board, the solid state image sensor device terminal pads being over and adjacent the terminal board conductive bumps; and



a hardened amalgam between each of the conductive bumps and its corresponding solid state image sensor device terminal pad bonding the solid state image sensor device to the terminal board.

5,192,836

APPARATUS FOR SELECTING AN ELEVATOR CAR FOR PHYSICALLY HANDICAPPED PERSONS FROM A GROUP OF ELEVATORS WITH IMMEDIATE ALLOCATION OF TARGET CALLS

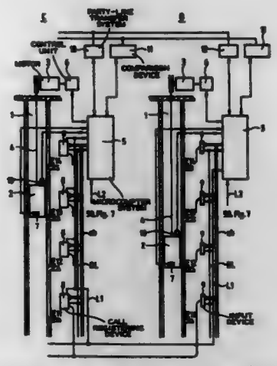
Joris Schroder, deceased, late of Lucerne, Switzerland by Irmgard Schröder-Müller, heiress , assignor to Inventio AG, Hergiswil, Switzerland

Filed Feb. 4, 1991, Ser. No. 651,748

Claims priority, application Switzerland, Feb. 5, 1990, 00357/90

Int. Cl.[5] B66B 1/20

U.S. Cl. 187—126 8 Claims



8. An apparatus for the selection of a elevator car for use by physically handicapped persons from a group of elevators, the elevators of the group having immediate allocation of target calls, including call registering and indicating devices which are located on the floors served by the elevators and each including a keyboard for the input of calls for desired target floors, a floor call memory for each elevator car of the group and connected with the call registering and indicating devices wherein a call identifying the input floor and a call identifying the target floor are stored in the floor call memories upon actuation of one of the call registering and indicating devices by the input of a call on a floor, a load memory for each elevator car for storing a number of the persons present in the respective elevator car for each floor, a travelling time memory for each elevator car for storing travel times between floors, a comparison device for each elevator car, and a computer for each elevator car forming the floor call memory, the load memory, the travelling time memory and the comparison device wherein the computer computes operating costs corresponding to the waiting times of passengers from data specific to the elevator, and an operating costs register formed by the computer with an allocation memory connected to the floor call memory, wherein the operating costs for the elevators are compared one with the other by the comparison device and the call concerned is allocated to that elevator which has the smallest operating costs through entry of an allocation instruction into the allocation memory and wherein the elevator concerned and its position are indicated immediately after the call allocation on an indicating field of the actuated call registering and indicating device, comprising:

a switching circuit for each elevator car of an elevator group and for each floor served by the elevator car connected at inputs with a load memory and a second memory portion of a floor call memory which stores calls for target floors;

a first comparator having an output connected to an input of said switching circuit, said first comparator having inputs connected to an output of a travelling time memory and an output of an additional memory, wherein the times needed by physically handicapped persons for travelling the paths between the respectively actuated call registering and indicating devices and the shaft doors of the elevators of the elevator group are stored in said additional memory;

said switching circuit being connected at an output with a switching device connected between an operating costs register and a comparison device wherein, in the absence of an alighting call in the second memory portion and for a load which is smaller than a load limit value as well as for a travelling time of the elevator car which is greater than the time needed by a physically handicapped person to travel from the actuated call registering and indicating device to the shaft door of the elevator concerned, said switching device is actuated by said switching circuit and the elevator car is enabled to participate in the operating costs comparison; and

an additional key provided on the keyboards of the call registering and indicating devices and connected for activating said switching circuit associated with a floor.

5,192,837

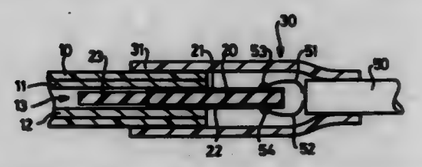
OBSTACLE DETECTOR SYSTEM INCLUDING AN IMPROVED CONNECTION ASSEMBLY

Jérôme Chardon, Courbevoie, France, assignor to Jaeger, France

Filed Jan. 4, 1990, Ser. No. 532,595

Int. Cl.[5] H01H 3/16

U.S. Cl. 200—61.41 24 Claims



1. A system for detecting an obstacle interposed between an electrically-driven motor vehicle window and an associated frame, the system being of the type comprising an obstacle detector device including a flexible and deformable elongate body made of electrically insulating material provided with at least two electrically conductive tracks held apart at rest by resilient flexible means, wherein the system further includes a connection assembly comprising:

a support core made of electically insulating material;

at least two separate electrically conductive elements carried by the support core and intended to make contact with respective ones of the tracks when the core is interposed between them; and

envelope means comprising a heat shrinkable sleeve suitable for engaging the outside surface of the obstacle detector device in order to clamp said obstacle detector device against the support core and its electrically conductive elements in order to maintain electrical contact between the tracks and these elements and also in order to seal the detector device, wherein the support core extends inside the detector device beyond its electrically conductive elements in the form of an insert of electrically insulating material which prevents the clamping effect of the envelope means from bringing the tracks into contact with each other.

5,192,838

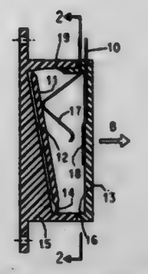
FRONTAL IMPACT CRUSH ZONE CRASH SENSORS

David S. Breed, 270 Hillcrest Rd., Boonton Township, Morris County, N.J. 07005, and Anthony S. Prussenski, Jr., Plum Island, Mass., assignors to David S. Breed, Boonton Township, Morris County, N.J.

Filed Feb. 15, 1990, Ser. No. 480,257

Int. Cl.[5] H01H 35/14

U.S. Cl. 200—61.45 R 14 Claims



1. A frontal impact crash senior mounted in the crush zone of a vehicle for sensing crashes and deploying an occupant protection apparatus, comprising:

(a) a sealed housing, said housing formed from at least two members and containing a chamber therein, said housing having a thickness in the sensing direction less than both its height and width;

(b) a sensing mass within said housing chamber movable relative to said housing from a first at rest position to a second actuating position in response to a velocity change of said housing of sufficient magnitude to require the deployment of occupant protection apparatus;

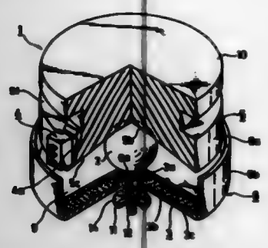
(c) a narrow passageway between said sensing mass and said housing, said passageway substantially surrounding said sensing mass;

(d) damping means to dampen the motion of said sensing mass from said first at rest position to said actuating position, said damping means comprising the flow of a fluid through said passageway;

(e) biasing means within said housing to bias said sensing mass toward said first at rest position; and

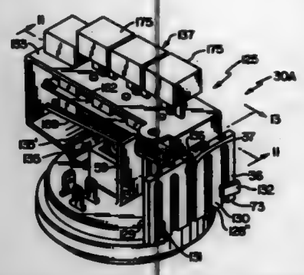
(f) means responsive to the motion of said mass to initiate an occupant protection apparatus.

5,192,839
ACCELERATION SENSOR
Noritoshi Imado, Fujisawa, and Katsuyasu Ono, Chigasaki, both of Japan, assignors to NSK Ltd., Tokyo, Japan
Filed Dec. 20, 1991, Ser. No. 811,225
Claims priority, application Japan, Dec. 26, 1990, 2-404876[U]
Int. Cl.[5] H01M *35/14*
U.S. Cl. 200—61.45 R 12 Claims



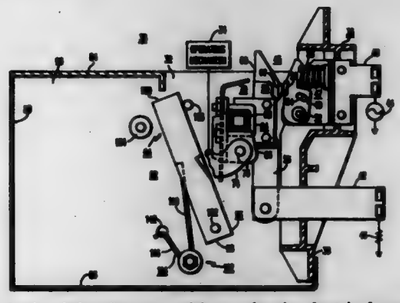
1. An acceleration sensor comprising:
a spherical inertia element having a predetermined mass;
a plate-like member defining a retainer hole on which the inertia element is allowed to rest and is retained until a predetermined acceleration is applied to the inertia element;
a switch change-over member for changing over a switch in response to movement of the inertia element from the retainer hole to an upper wall of the plate-like member upon application of the predetermined acceleration;
a rod slidably inserted in the retainer hole; and
a biasing member for biasing the rod toward the inertia element resting on the retainer hole;
whereby, when the inertia element has moved from the retainer hole to the upper wall of the plate-like member, the rod is caused to move under the biasing force of the biasing member and the retainer hole is closed by a free end portion of the rod.

5,192,840
PRESSURE OPERATED SWITCH HOUSING MEMBER WITH EXTERNAL BRACKET STRUCTURE FOR ADJUSTABLE
William J. Keigler, North Huntingdon, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 479,957, Feb. 14, 1990, Pat. No. 5,109,144. This application Jan. 6, 1992, Ser. No. 817,453
Int. Cl.[5] H01H *35/26*
U.S. Cl. 200—83 R 5 Claims



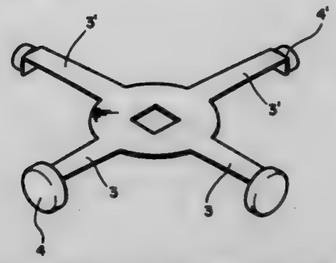
1. In a housing member for a pressure operated switch construction, said housing member having an external surface means and forming a housing means for carrying an electrical switch unit and a diaphragm assembly and a compression spring means that is operatively associated with said switch unit and said diaphragm assembly to control the operation thereof in relation to the compressive setting of said compression spring means, said housing member having a bracket member extending outwardly from said external surface means thereof in a flange-like manner and having first means for interconnecting a first movable actuator means to said housing member that is operatively associated with said compression spring means to select the desired compressive setting thereof, the improvement wherein said bracket member has second means for interconnecting with a bracket that carries a second movable actuator means that is operatively associated with said compression spring means to select the desired compressive setting thereof whereby said bracket is only used with said housing means when said housing means is to carry a second movable actuator means and said bracket member is not used for interconnecting said first movable actuator means to said housing means.

5,192,841
CIRCUIT BREAKER WITH SHOCK ABSORBING MECHANISM
Stanislaw A. Miltenowicz, Monroeville; Edward J. Klimek, Jeannette, and Robert N. Krevolsach, West Newton, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 6, 1991, Ser. No. 788,700
Int. Cl.[5] H01H *3/60*
U.S. Cl. 200—298 8 Claims



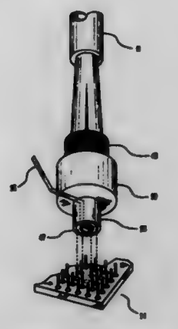
1. A circuit breaker comprising a chassis; electrical contact means insulatively supported by the chassis, with the electrical contact means including pivotable first electrical contact means and relatively stationary second electrical contact means; means for pivoting the first electrical contact means between closed and open positions in which the first and second contact means are respectively engaged and disengaged, with the first contact means having a first movement range which includes first and second limits at the open and closed positions, respectively; and shock absorbing means for absorbing energy from the movement of the first electrical contact means, characterized by:
said shock absorber means including at least one metallic bar pivotally mounted on the chassis, first and second limit means which respectively establish first and second limit positions for the pivotable movement of said metallic bar, with the first and second limit means defining a second movement range having a portion which overlaps a portion of said first movement range, and bias means biasing the metallic bar towards the second limit position of the second movement range,
whereby the first electrical contact means, during movement to the open position thereof, strikes the metallic bar, removing kinetic energy from the first electrical contact and pivoting the metallic bar against the first limit means.

5,192,842
MICROWAVE OVEN HAVING ROTATABLE TRAY WHICH MOVES UP AND DOWN DURING ROTATION
Yong H. Kim, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea
Filed May 16, 1991, Ser. No. 701,065
Claims priority, application Rep. of Korea, May 16, 1990, 90-6549[U]; May 16, 1990, 90-7010[U]
Int. Cl.[5] H05B *6/78*
U.S. Cl. 219—10.55 F 10 Claims



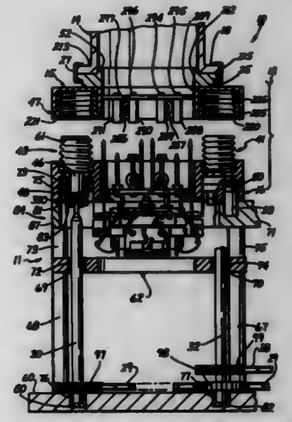
1. In a microwave oven comprising a cooking chamber having a floor; microwave generating means for supplying microwaves to said cooking chamber; and a tray disposed within said cooking chamber carrying food to be cooked; the improvement comprising:
a rotation member including a body mounted at its center in said cooking chamber for rotation about an upright axis, and a plurality of rollers freely rotatably mounted to said body and arranged to ride upon said floor;
said tray being seated upon said rotation member; and
drive means for rotating said rotation member and said tray about said upright axis;
a radial spacing of at least one of said rollers from said upright axis being different than that of at least one other of said rollers, and said one roller having a larger diameter than said other roller, whereby said tray is inclined relative to horizontal during rotation.

5,192,843
PIN ATTACHMENT TOOL AND METHOD OF CAPACITIVE BRAZING
Robert A. Cargael, Export, and James R. Morras, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 14, 1991, Ser. No. 669,649
Int. Cl.[5] B23K *1/00*
U.S. Cl. 219—56.22 17 Claims



1. A method for replacing a damaged pin, separated near its base from the substrate in a module for an integrated circuit assembly including at least one circuit device mounted on a circuitized substrate, with a new pin, said method comprising,
(a) locating a terminal portion of a ribbon of brazing alloy above and in close proximity to said base,
(b) matingly locating undamaged pins in said module to position the head of said new pin above said terminal portion of said ribbon,
(c) establishing an electrically conductive path from said ribbon to one terminal of a power supply,
(d) establishing an electrically conductive path from said new pin to the other terminal of said power supply,
(e) maintaining the head of said new pin and said terminal portion of said ribbon at a distance insufficient to fire a capacitive charge stored in said power supply, and,
(f) decreasing said distance so as to fire said charge, while leaving said old base out of the circuit for firing said charge,
whereby said ribbon is melted, brazing the head of said new pin to said old base without damaging said integrated circuit.

5,192,844
ROBOTIC TOOL ADAPTOR APPARATUS
Thomas Todd, and Todd B. Skinner, both of San Diego, Calif., assignors to Toddco General, Inc., San Diego, Calif.
Filed Feb. 19, 1991, Ser. No. 657,563
Int. Cl.[5] B23K *3/03;* B23Q *3/155*
U.S. Cl. 219—85.16 18 Claims



1. A tool adaptor for coupling a robotic controlled tool to a robotic unit, said adaptor comprising:
coupling means disposed intermediate the tool and the robotic unit;
means defining a centrally disposed cavity in said coupling means for helping to facilitate supplying power to the tool;
means defining a robotic power passageway between the robotic unit and said means defining a cavity for permitting source power supplied through the robotic unit to be interconnected to the tool;
means defining a tool power passageway between the tool and said means defining a cavity for permitting source power supplied through the robotic unit to be interconnected to the tool;
fastening means for attaching said coupling means intermediate the tool and the robotic unit;
means for mounting said fastening means to said coupling means, wherein said means defining a cavity is disposed intermediate said means for mounting;
wherein said coupling means includes tool coupling means secured to the tool for helping to couple electrical power

to the tool, robotic coupling means for supporting from above said tool coupling means, said robotic coupling means being adapted to be secured to the robotic unit, and engaging means partially disposed in said robotic coupling means and partially disposed in said tool coupling means for securing matingly removably together said robotic coupling means and said tool coupling means;

wherein said robotic coupling means including means defining a large centrally disposed opening, said opening being sufficiently large to receive therein a plurality of electrical conductors, and said tool coupling means including another large centrally disposed opening, said other opening being sufficiently large to receive therein a plurality of electrical conductors;

wherein said coupling means further includes connector means for coupling electrical power between the robotic unit and the robotic controlled tool;

wherein said coupling means further includes means for mounting said connector means within said cavity; and

wherein said means for mounting includes a robotic coupled printed circuit board having a group of downwardly depending electrical connectors adapted to be coupled to the robotic unit and a tool coupled printed circuit board having a group of upwardly depending electrical connectors adapted to be coupled to the robotic controlled tool.

5,192,845

PROCESS AND DEVICE FOR AUTOMATIC DETERMINATION OF PARAMETERS FOR PROCESS CONTROL SYSTEMS WITH UNKNOWN TRANSFER BEHAVIOR, IN PARTICULAR FOR PROCESS CONTROL SYSTEMS FOR RESISTANCE SPOT WELDING

Helmut Kirnasse, and Ludger Wesselmann, both of Berlin, Fed. Rep. of Germany, assignors to Innovationsgesellschaft für Fortgeschrittene-Produktionssysteme in der Fahrzeugindustrie mbH, Berlin, Fed. Rep. of Germany

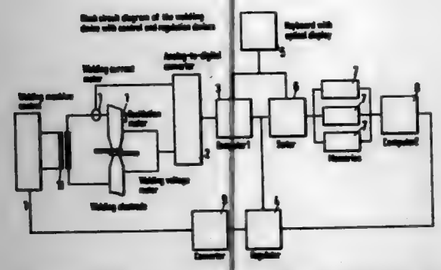
PCT No. PCT/DE90/00803, § 371 Date Jul. 26, 1991, § 102(e) Date Jul. 26, 1991, PCT Pub. No. WO91/06392, PCT Pub. Date May 16, 1991

PCT Filed Oct. 21, 1990, Ser. No. 721,425

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3936329

Int. Cl.[5] B23K *11/24*

U.S. Cl. 219—110 6 Claims



1. A method of determining nominal value functions for a plurality of command variables to be applied as actual values to a regulator for controlling a process over time, which process produces a plurality of output parameters to be maintained within selected limits, each command variable falling into one of at most three categories including, category c where the command variable produces an optimum process result, category a where the command variable produces too small a result and represents a negative deviation from the optimum result and b where the command variable produces too large a result and represents a positive deviation from the optimum result, the method comprising:

applying the command variable to the regulator to control the process and produce the output parameters over time;

sorting and storing each command variable over time into one of the categories;

finding a mean value function $F_i(t)$ over time for the command variables stored in each category;

finding standard deviations $S_c(t)$, $S_b(t)$ and $S_a(t)$ over time for the command variables stored in each category;

applying the mean value function of the category c command variable to the regulator as the nominal value function for that command variable;

inputting the mean value and standard deviation functions of all categories into a computer for determining weighing functions for each command variable according to computing rules as follows:

determining for each command variable, two evaluation functions $Q_1(t)$ as:

$$Q_{ac} = \frac{|d_1(t)| - [S_c(t) + S_a(t)]}{|d_1(t)|}$$

$$Q_{bc} = \frac{|d_2(t)| - [S_c(t) + S_b(t)]}{|d_2(t)|}$$

wherein $d_1(t)$ and $d_2(t)$ are respective distances between mean value functions of categories a and b from category c;

determining for both evaluation functions amounts of each weighing function $W_i(t)$ as:

$$|W_i(t)| = 1/(G_o - G_u) \cdot Q_i(t) - G_u/(G_o - G_u),\ G_u < Q_i(t) < G_o$$
$$|W_i(t)| = 1/(G_o - G_u) \cdot Q_i(t) - G_u/(G_o - G_u),\ Q_i(t) > G_o$$
$$|W_i(t)| = 0/(G_o - G_u) \cdot Q_i(t) - G_u/(G_o - G_u),\ Q_i(t) < G_u$$

wherein G_o is an upper limit of $Q_i(t)$; G_u is a lower limit of $Q_i(t)$ and i is ac or bc;

selecting a weighing function for each command variable which, in terms of amount, is least at everypoint in time, over the time of the process;

determining a sign of each weighing function according to:

$$\frac{W_i(t)}{|W_i(t)|} = \frac{d_1(t)}{|d_1(t)|} = \frac{d_2(t)}{|d_2(t)|}$$

wherein at $\frac{d_1(t)}{|d_1(t)|}$ not equal to $\frac{d_2(t)}{|d_2(t)|}$

$W_i(t)$ is zero; and

using the weighing functions for each command variable to produce a nominal value function for each command variable for application to the regulator.

5,192,846

EQUIPMENT FOR DRILLING AND/OR CLOSING OFF BY LASER THE SEAL WELD HOLE OF A FUEL ROD

Dominique Duthoo, Romans, France, assignor to Societe Franco-Belge de Fabrication de Combustibles-FBFC, Paris, France

Filed Sep. 27, 1991, Ser. No. 766,747

Claims priority, application France, Oct. 8, 1990, 90 12362

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 6 Claims

1. Equipment for one of drilling and closing off a seal weld hold in a fuel rod with a laser beam, comprising:

a housing for focusing a laser beam, said housing including:

an outlet arm; and

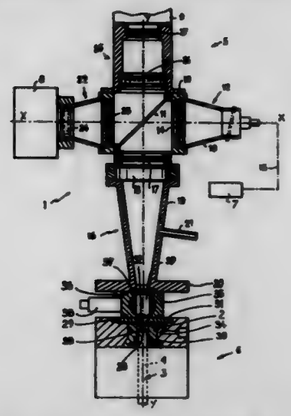
a pipe connected to said outlet arm for supplying a pressurized gas to said outlet arm;

an enclosure having:

a window for admitting the laser beam into the enclosure;

a passage for receiving said fuel rod and for positioning said fuel rod therein to face said window; and

a sealing means for sealing said passage; and



a stop valve interposed between and sealing an end flange of said outlet arm of said housing and said window of said enclosure.

5,192,847

NOZZLE FOR A TOOL FOR WORKING MATERIAL

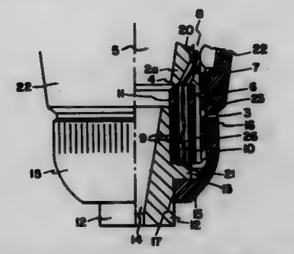
Manfred Jagiella, Karlsruhe; Wolf Wiesemann, Gaggenau, and Michael Holzmann, Rastatt, all of Fed. Rep. of Germany, assignors to C.A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 755,658

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1990, 4028338

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.6 17 Claims



1. A nozzle for a tool for working material, with an electrically conducting nozzle body (2), at the tip of which a nozzle electrode (12) electrically insulated from it is secured using an electrically conducting cap element (15) which is in engagement with the nozzle body (2), wherein the cap element (15) accommodates the nozzle electrode (12) and presses against the latter and wherein the cap element (15) and the nozzle electrode (12) are insulated from one another by means of an electrically nonconducting layer.

5,192,848

LASER MACHINING CELL

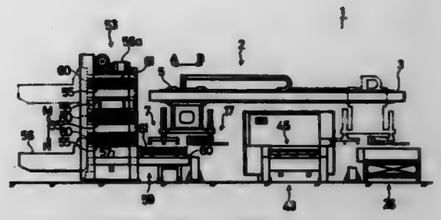
Noboru Miyakawa, Gifu; Kazuyuki Toda, Aichi; Yukiyasu Nakamura, Inazawa; Minoru Tashiro, Gifu; Yoshihiro Yamaoka, Seki, and Isao Kuwayama, Aichi, all of Japan, assignors to Yamazaki Mazak Kabushiki Kaisha, Japan

Filed Oct. 31, 1991, Ser. No. 786,882

Claims priority, application Japan, Oct. 31, 1990, 2-294578; Oct. 31, 1990, 2-294579; Oct. 31, 1990, 2-294580; Nov. 9, 1990, 2-305413

Int. Cl.[5] B23K *26/02*

U.S. Cl. 219—121.82 7 Claims



1. A laser machining cell, comprising:

a stock means for stocking a plurality of raw workpieces, one or more than one laser processing machines,

a putting means for putting machined said workpieces thereon, and

a carrying means for carrying said workpiece from said stock means to said laser processing machine and from said laser processing machine to said putting means.

5,192,849

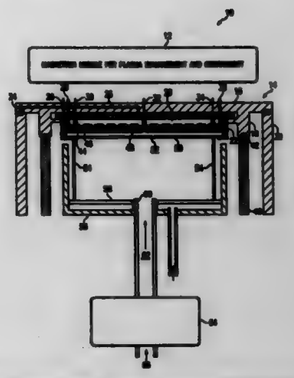
MULTIPURPOSE LOW-THERMAL-MASS CHUCK FOR SEMICONDUCTOR PROCESSING EQUIPMENT

Mehrdad M. Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1990, Ser. No. 565,765

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.43 25 Claims



1. A multipurpose low-thermal-mass chuck for semiconductor processing equipment for plasma-enhanced processing of semiconductor wafers, comprising a stacked multi-layered structure of:

a vacuum base plate for providing vacuum seal and mechanical support;

a coolant module layer for extracting heat from the semiconductor wafer;

a heating element layer adjoining said coolant module for

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heating said semiconductor wafer said heating element layer comprising a thin film resistor; and

a radio-frequency plate for associating an electromagnetic radio frequency power source with the semiconductor wafer.

5,192,850

PROCESS AND CIRCUIT FOR REGULATING WELDING CURRENT AND POWER AS A FUNCTION OF WELDING SPEED

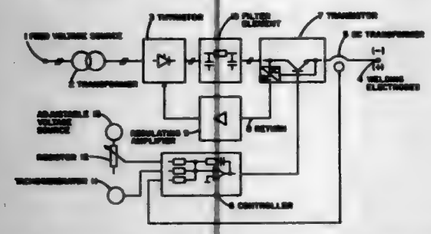
Rainer Brian, Essel, and Wolfen Klebl, Isernhagen, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 11, 1991, Ser. No. 683,995

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1990, 4011647; May 4, 1990, 4014275

Int. Cl.[5] B23K *9/095, 26/00*

U.S. Cl. 219—130.21 18 Claims



18. A circuit for a DC arc-welding system for continuous longitudinal-seam welding, comprising;

a transformer being connectable to a voltage source;

welding electrodes connected to said transformer to be supplied from said voltage source;

a thyristor/rectifier arrangement disposed between said transformer and said electrodes for controlling and rectifying welding current;

a controller having an output for controlling said thyristor/-rectifier arrangement;

a welding-speed-dependent tachogenerator for developing a voltage in accordance with the welding speed along a longitudinal seam, said voltage being connected to an input of said controller; and

a series-connected transistor unit disposed between said thyristor/rectifier arrangement and said electrodes, said series-connected transistor unit being driven by the output of said controller and providing an output for controlling the thyristor/rectifier arrangement.

5,192,851

CORED ELECTRODE WIRES

Horace S. B. James, North Balwyn, and Ian E. French, Semaphore Park, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization and Welding Industries Limited, Australia

Continuation of Ser. No. 555,287, Aug. 3, 1990, abandoned, which is a continuation of PCT/AU89/00045 filed Feb. 6, 1989.

This application Oct. 5, 1991, Ser. No. 641,875

Claims priority, application Australia, Feb. 5, 1988, PI6643

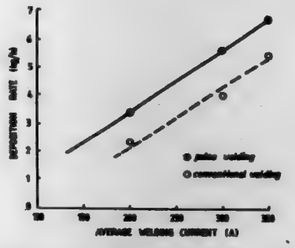
Int. Cl.[5] B23K *9/09, 35/362*

U.S. Cl. 219—130.51 15 Claims

6. A pulsed electric arc welding apparatus operating with the following welding pulse parameters:

Pulse Energy	8 to 250 J
Pulse Frequency	10 to 500 Hz
Background Current	8 to 250 A
Wire Feed Speed	1 to 20 m/min

and including a cored electrode wire wherein the core constitutes 15–28% of the weight of the wire and contains slag-forming components which include from 2.5–12% calcium fluoride,



2–8% calcium carbonate, 0.2–2% silicon dioxide, 0.5–1.5% fused mixed-oxide and no intentional aluminum, and said core excludes silicate components.

5,192,852

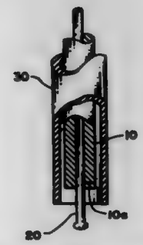
SUBSTANTIALLY OXYGEN-FREE CONTACT TUBE

James F. Pike, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 14, 1991, Ser. No. 791,728

Int. Cl.[5] B23K *9/24*

U.S. Cl. 219—137.61 18 Claims



1. A device for arc welding, comprising:

(a) a continuously-fed consumable electrode wire; and

(b) a contact tube which is in electrical contact with said electrode wire, wherein said tube is comprised of a substantially oxygen-free conductive alloy for reducing electrical erosion of said contact tube.

5,192,853

HEATING SET HAVING POSITIVE TEMPERATUE COEFFICIENT THERMISTOR ELEMENTS ADHESIVELY CONNECTED TO HEAT RADIATOR DEVICES

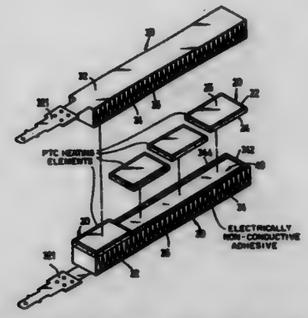
Yuan-Chang Yeh, No. 101, 223 Alley, Sec. 1, Tay Pyng Rd., Tsao Twen, Nan Tour, Taiwan

Filed Oct. 22, 1991, Ser. No. 780,504

Int. Cl.[5] H05B *3/14;* H01C *7/02;* F24H *3/04*

U.S. Cl. 219—540 3 Claims

1. A heating set having a positive temperature coefficient thermistor heating element (PTCR) comprising a positive temperature coefficient resistor member having opposite substantially horizontal surfaces along with the electrodes adhered correspondingly to said surfaces, a metal heat radiating device having a flat metal surface adjacent to an exposed surface of at least one of said electrodes, and an electrically nonconducting adhesive on a portion of said flat metal surface of said metal heat radiating device bonding the exposed surface of said electrode to the adjacent flat surface of said heat radiating device, said heating set further characterized in that it is provided with an electrically conductive thin piece having a surface area which is disposed in such a manner that it makes



direct surface to surface contact with both the flat surface of said heat radiating device other than on said portion provided with said adhesive and the exposed surface of said electrode.

5,192,854

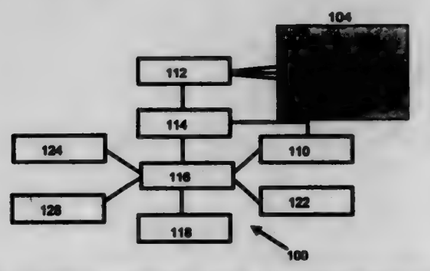
SYSTEM FOR ELECTRONICALLY RECORDING AND REDEEMING COUPONS

Reginald D. Counts, 1714 Legend La., St. Louis, Mo. 63146

Continuation of Ser. No. 558,775, Jul. 26, 1990, abandoned. This application Feb. 5, 1992, Ser. No. 829,561

Int. Cl.[5] G06F *7/20, 15/74*

U.S. Cl. 235—375 3 Claims



1. A coupon redemption system for redeeming product coupons having a first set of data thereon, said first set of data being in a machine readable format and comprising coupon value, expiration date, and product identification, said system comprising:

personal coupon scanner means for use by a purchaser of products for scanning, decoding, and storing said first set of data, and also having a display means associated therewith for displaying scanned and stored information contained in said coupon scanner, said personal coupon scanner means being a self contained remote handheld device adapted to be carried by said purchaser of product and used to record coupon information obtained from advertising media at locations remote from a purchasing location;

register means located at a product purchase location for scanning and tallying a second set of data, said second set of data comprising product identification data corresponding to product selected for purchase by said purchaser of product;

recorder means for connecting to said coupon scanner and said register means for comparing said first set of data to said second set of data and accumulating a tallied value of correspondence between said sets of data for redemption of said tallied value against said product selected for purchase; and

kiosk means providing a central in-store database for accumulating from all the recorder means connected in the system the tally of correspondence of said first and second sets of data.

5,192,855

IMPROVEMENTS IN CASH PAYMENT MACHINES ENABLING ACCEPTANCE OF CREDIT CARD PAYMENT

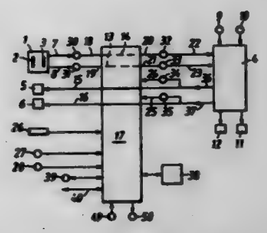
Björn Insulander, and Torbernt Hjelmvik, both of Järfälla, Sweden, assignors to Modul-Elektronik AB, Järfälla, Sweden

Filed Dec. 5, 1990, Ser. No. 622,520

Claims priority, application Sweden, Dec. 6, 1989, 8904126

Int. Cl.[5] G06F *7/08;* G06K *5/00*

U.S. Cl. 235—381 8 Claims



1. An arrangement in pay machines of the kind which include a received money verifier, a first computer unit which functions to activate an intermediate cash till which receives money from said received money verifier, said intermediate cash till being adapted to guide received money to a final cash storage means, and which said first computer unit also functions, subsequent to received money payment having been verified and accepted, to activate devices for delivering that for which payment has been made, said arrangement further comprising a supplemental second computer unit (17) which is connected between the money verifier (1) and the first computer unit (4); said second computer unit being adapted to simulate payment as being effected by money when payment, in fact, has been effected by a credit card; and wherein said second supplemental computer unit (17) is adapted to detect a control signal delivered by said first computer unit (4) to a device (5, 6) which is adapted to function to control said intermediate cash till and said final cash storage means; a credit card reader and input button means connected to said supplemental second computer unit (17) and said input button means being adapted, when activated, to deliver to the supplemental second computer unit (17) a signal which corresponds to a given sum of money; and, when payment is made by credit card and said input button means (27, 28) are activated and payment of a given sum has been accepted, said supplemental second computer unit (17) simulates and will deliver to the first computer unit (4) a signal which corresponds to receipt by the money verifier (1) of one or more accepted pieces of money constituting said given sum.

5,192,856

AUTO FOCUSING BAR CODE READER

Moshe Schuham, West Hartford, Conn., assignor to An Con Genetics, Inc., Melville, N.Y.

Filed Nov. 19, 1990, Ser. No. 615,367

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—462 19 Claims

1. An apparatus for use in reading a bar code having a spaced alternating sequence of electromagnetically absorptive and reflective regions along a scan axis at a distance from a target, said apparatus comprising:

a housing adapted to be manually placed in communication

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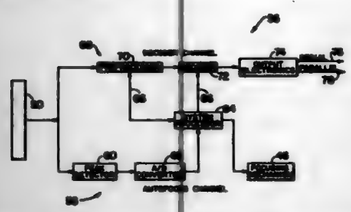
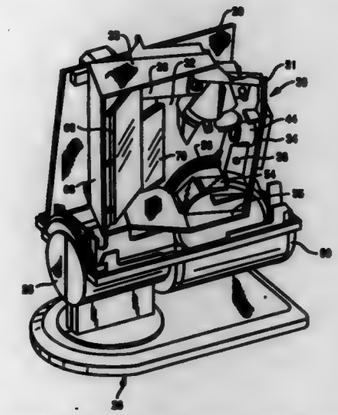
with said bar code having a port for sending and receiving electromagnetic beams;
an electromagnetic signal source located within said housing for providing an electromagnetic illumination beam at a selected frequency and intensity;
an optical train positioned within said housing including fixed beam shaping optics for receiving and spreading said illumination beam to exit said housing port and irradiating said bar code completely along said scan axis with said housing at a single position relative to said target, and
auto-focusing optics for receiving a reflected beam from said bar code and adjusting the focal point of said reflected beam exiting therefrom;
a motor means for adjusting the position of said auto-focusing optics in dependence on received control signals;
a sensor means for receiving said focused reflected beam from said auto-focusing optics and for providing electrical signal equivalents thereof;
a processor means mounted within said housing, receiving said reflected beam electrical signal equivalents, for first generating said auto-focusing optics control signals in accordance with a method comprising the steps of:
detecting maximum and minimum signal magnitudes in said signal equivalents;



digitizing said maximum and minimum signal magnitudes in said signal equivalents;
computing a contrast value for said maximum and minimum signal magnitudes in said signal equivalents;
generating said control signals to move said auto-focusing optics by an amount inversely proportional to the magnitude of said contrast value;
said processor means repeating said method until said control signals have a minimum value wherein the difference between said contrast value and a previously computed contrast value is less than a preselected value and wherein said contrast value is greater than a threshold value;
said processor means, after generating said control signal minimum value, further for subsequently decoding said reflected beam signal equivalents with a method comprising the steps of:
digitizing said signal equivalents;
measuring the width of portions of said digitized signal equivalents along said scan axis corresponding to said electromagnetically absorptive and reflective regions to generate bar code width sequence signals; and
generating an output signal corresponding to an equivalent bar code digit sequence from said bar code width sequence signals.

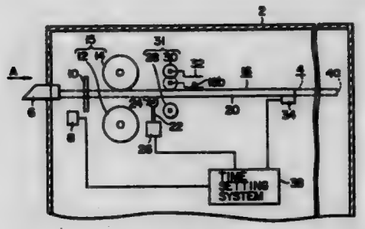
5,192,857
COMPACT OPTICAL SCANNER ROTATABLE BETWEEN HORIZONTAL AND VERTICAL POSITIONS
Paul O. Detwiler, New Concord, Ohio, assignor to NCR Corporation, Dayton, Ohio
Filed Sep. 28, 1990, Ser. No. 590,202
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—467 **15 Claims**

1. A compact optical scanning apparatus adapted for movement between a horizontal and a vertical position for reading bar code symbols on objects passing adjacent the scanning apparatus comprising:
a housing assembly including a surface having an aperture therein, a floor portion and oppositely located first and second wall portions located adjacent said aperture and a third wall portion extending between said first and second wall portions;
a support member having a socket portion rotatably supporting said housing assembly for movement between a horizontal and a vertical position;
a pivot member including a pair of flexible arm portions secured to said housing assembly and positioned within the socket portion for exerting a frictional force on the socket portion of the support member for holding the housing assembly in an adjusted position;
a source of a coherent light beam mounted in said third wall portion for projecting the light beam along the floor portion of said housing assembly;
first light deflecting means mounted on said floor portion for reflecting the projected light beam along a first light path;
a multifaceted mirror member having an axis of rotation and being mounted adjacent said floor portion and said second and third wall portions in said first light path for cyclically sweeping the light beam along a plurality of second light paths, said mirror member including a plurality of mirror facets in which a first mirror facet slopes downwardly in and towards the axis of rotation at a first predetermined



angle from the axis and an adjacent second mirror facet slopes downwardly out and away from the axis of rotation at a second predetermined angle from the axis;
drive means mounted adjacent said floor member and rotatably supporting said multifaceted mirror member for rotating said multifaceted mirror member;
second light deflecting means mounted adjacent the floor member in a stationary position with respect to the multifaceted mirror member and in said second light paths for establishing a range of path lengths for said second light paths, which includes a minimum path length and a maximum path length, and for deflecting the light beams in said second light path along a plurality of third light paths through said aperture in the form of a scanning pattern for scanning a bar code label positioned adjacent the aperture;
a lens member positioned adjacent said first light deflecting means and said first wall portion for collecting the light beams reflected from the scanned bar code label and directing the collected light beams along a fourth light path; and
detecting means mounted in said first wall portion and in said fourth light path for generating electrical signals in response to receiving the collected light beams form said lens member.

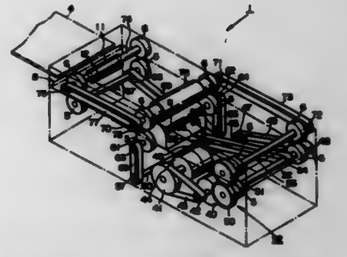
5,192,858
OPTICAL CARD SCANNING APPARATUS
Takefumi Sakurada, Akishima, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 18, 1991, Ser. No. 687,445
Int. Cl.[5] G06K *13/00*
U.S. Cl. 235—475 **8 Claims**



1. An optical card scanning apparatus comprising:
a housing having an insertion port;
a card convey path provided within the housing and having a first-end side defined by the insertion port and a second-end side, and wherein an optical card loading/unloading position is set in the vicinity of said first-end side, and an optical card is conveyed along the card convey path from said first-end side toward said second-end side;
support means having a first end on the first-end side of the card convey path, a second end on the second-end side of the convey path, and a support member for supporting the optical card between the first and second ends of the support means, said support means being movable while supporting the optical card between the loading/unloading position of the card convey path and the second-end side of the convey path;
convey means for conveying the optical card, selectively in a forward direction from the insertion port towards the support member of the support means and in a reverse direction from the support member of the support means towards the insertion port;
a detection system having a plurality of detection means arranged along the card convey path, each of said detection means detecting the presence of the optical card along the convey path at the respective position of the detection means, and generating an output signal while the presence of the card is being detected;
a time setting system having time setting means for comparing time differences between the output signals from two detection means with a standard time, and, when the compared values are different, outputting operation abnormality detection signals; and
control means for controlling the convey means, on the basis of the operation abnormality detection signal, so as to convey the optical card in the reverse direction and eject the card from the insertion port.

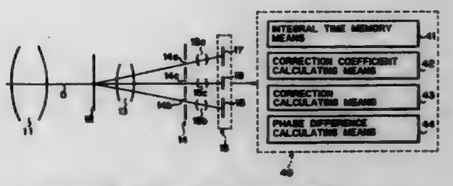
5,192,859
CARD CARRIER IN CARD READER
Suenaga Kojima, and Masanori Tanaka, both of Sakado, Japan, assignors to Kabushiki Kaisha Nippon Conlux, Tokyo, Japan
Continuation of Ser. No. 382,950, Jul. 21, 1989, abandoned. This application Nov. 26, 1991, Ser. No. 797,152
Claims priority, application Japan, Jul. 26, 1988, 63-90695; Jul. 26, 1988, 63-90696; Jul. 26, 1988, 63-90697; Jul. 26, 1988, 63-90698; May 22, 1989, 1-58825; May 22, 1989, 1-58826
Int. Cl.[5] G06K *13/077, 13/30*
U.S. Cl. 235—481 **19 Claims**

1. A card carrier in a card reader in which a magnetic card having a magnetic recording surface on and around a center portion thereof is moved in a card conveyor passageway provided with a magnetic sensor for reading and writing data from and into the magnetic card, and the magnetic card is temporarily stopped in the card conveyor passageway to make a punch hole in the card, comprising:
card conveyor means including a plurality of driving roller units, each unit comprising an upper driving roller (6) and a lower driving roller (5) for holding therebetween only both sides of the magnetic card in the card conveyor passageway and for forcibly conveying the magnetic card along a longitudinal direction of the card conveyor passageway without contacting the magnetic recording surface, said roller units being disposed at a predetermined spacing along a longitudinal direction of the card conveyor passageway;
drive means including a single motor;



power transmission means including a plurality of timing pulleys and a plurality of timing belts for simultaneously transmitting a driving force of the motor to all of the driving rollers;
a clutch mechanism disposed between the power transmission means and the motor for transmitting the drive force of the motor to the power transmission means when the motor arrives at a predetermined rated rotational speed; and
power interrupting means including a brake mechanism for stopping the operation of the power transmission means instaneously.

5,192,860
FOCUS STATE DETECTION DEVICE
Junichi Shinohara, Yokohama, and Yoshimi Ohno, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 12, 1991, Ser. No. 758,694
Claims priority, application Japan, Sep. 18, 1990, 2-246211; Nov. 13, 1990, 2-304011; Nov. 15, 1990, 2-307242; Jan. 30, 1991, 3-185341
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.8 **8 Claims**



1. A focus state detection device comprising:
a first optical conversional system for introducing an optical flux of a region in a view field frame to be photographed to one of two symmetric positions with respect to an optical axis of said optical flux;
a second optical conversional system for introducing an optical flux of said region to the other of said two symmetric positions;

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a third optical conversional system for introducing an optical flux of said region to a position including said optical axis;

first and second photoelectric converting portions for respectively receiving two light beams formed by said first and second optical conversional systems in a region in which a plurality of photoelectric converting elements of a charge storing type are arranged in line;

a third photoelectric converting portion for receiving a light beam formed by said third optical conversional system in a region in which a plurality of photoelectric converting elements of a charge storing type are arranged in line;

a charge clearing section for clearing a charge stored to each of said first, second and third photoelectric converting portions;

a charge transfer section for transferring data indicative of an amount of the charge stored to each of the photoelectric converting elements in said first, second and third photoelectric converting portions to a data memory section;

control means for selectively generating a clearing signal in said charge clearing section and a transfer signal in said charge transfer section to respectively obtain three image data by said first, second and third photoelectric converting portions at a plurality of time points;

a monitor photometric section arranged in the vicinity of at least one of said first, second and third photoelectric converting portions;

monitor control means for making an average of the stored charge amount in said photoelectric converting portions constant on the basis of an output of the monitor photometric section;

integral time memory means for providing data of an integral time at a plurality of time points from the generation of the clearing signal in said charge clearing section to the generation of the transfer signal in said charge transfer section, and for storing the integral time data thereto;

correction coefficient calculating means for calculating a correction coefficient corresponding to a ratio of integral times at preceding and present times with respect to the data of integral times obtained by the integral time memory means at the plural time points;

correction calculating means for correcting image data at the present or preceding time with respect to the image data obtained by said first, second and third photoelectric converting portions at the plural time points, on the basis of data of the correction coefficient obtained by said correction coefficient calculation means; and

phase difference calculating means for providing phase difference data based on the image data at preceding or present time and phase difference data based on the image data corrected by said correction calculating means at the present or preceding time.

5,192,861

X-RAY IMAGING DETECTOR WITH A GASEOUS ELECTRON MULTIPLIER

Amos Breskin, Rehovot; Rachel Chechik, Bet Hanan, both of Israel, and Stanislaw Majewski, Grafton, Va., assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Mar. 27, 1991, Ser. No. 675,652

Claims priority, application Israel, Apr. 1, 1990, 93969

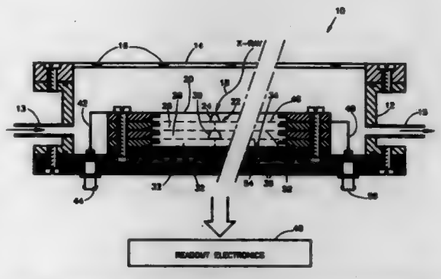
Int. Cl.[5] H01J *31/50, 40/14, 43/20*

U.S. Cl. 250—214 VT **21 Claims**

1. An X-ray detector comprising:

a photocathode for receiving X-ray radiation and being operative to provide in response thereto an output of electrons; and integrally formed therewith

at least one gaseous electron multiplier having a gas and operative in response to the output of electrons from the photocathode to provide an avalanche comprising an increased number of electrons, and wherein



said at least one electron multiplier includes a pre-amplification stage and said photocathode constitutes a cathode of said preamplification stage.

5,192,862

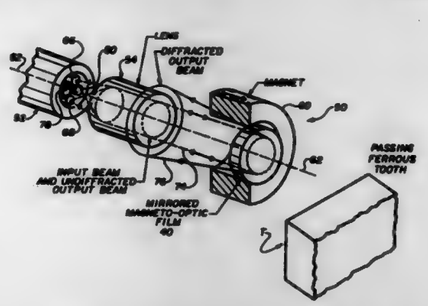
POLARIZERLESS MAGNETO-OPTIC SPEED AND TORQUE SENSOR

Robert E. Rudd, III, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Akron, Ohio

Filed Dec. 19, 1991, Ser. No. 810,290

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.21 **34 Claims**



1. A polarizerless sensor for determining speed/torque of a rotatable member comprising a magneto-optic material, a magnetic field source and optic fiber means connectable to a s source of light for providing an optical path for input light between said light source and said magneto-optic material and for output light exiting said magneto-optic material, said material being positionable within said magnetic field with said magnetic field being modulated by rotation of the member so that said magnetic field modulation corresponds to speed/-torque of the rotatable member, said magneto-optic material having domains responsive to said modulated magnetic field and diffracting said light, said output light having a diffraction pattern with an energy distribution that changes in response to said modulated magnetic field-, said fiber optic means receiving a predetermined portion of said output light.

5,192,863

OPTICAL TAPER FOR INCREASING THE EFFECTIVE AREA OF A PHOTODIODE IN ATMOSPHERIC FREE SPACE COMMUNICATIONS APPLICATIONS

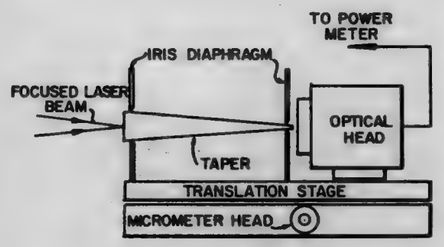
Mohsen Kavehrad, Cumberland, and Gang Yun, Vanier, both of Canada, assignors to The University of Ottawa, Ottawa, Canada

Filed Jan. 23, 1991, Ser. No. 644,571

Claims priority, application Canada, Jan. 24, 1990, 2008515

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—227.24 **8 Claims**



1. For use as an optical receiver in a free space, an atmospheric link, or a free space and an atmospheric link, the combination of:

i) a photodiode having a surface area of a size selected to permit reception of a signal at a high bit rate;

ii) an optical taper having a head with a flat face and a tail, said head being of greater diameter than said tail, and axially aligned with said tail, said tail being axially aligned with said photodiode; and

wherein the magnification M of the taper, being the ratio between the diameter of the head to the diameter of the tail, satisfies:

$$M \leq \frac{D_1}{D_{N+1}} \leq \frac{\sin(\Phi_T + 2\alpha)}{\sin(\theta_o + \alpha)}$$

where θ is the angle between a given ray of light at the head of the taper and linear axis of the taper, α is the angle between the side surface of the taper and the linear axis thereof, $\Phi_T = \pi/2 - \theta_T$ where θ_T is the critical angle of the total internal reflection from the internal material of the taper relative to the surrounding atmosphere, D_1 is the diameter of the taper at its head and D_{N+1} is the diameter of the taper near its tail.

5,192,864

TWO DIMENSIONAL DISPLAY PRODUCED BY ONE DIMENSIONAL SCANNED EMITTERS

Robert K. McEwen, and Alan D. MacLeod, both of Essex, United Kingdom, assignors to GEC-Marconi Limited, Stanmore, United Kingdom

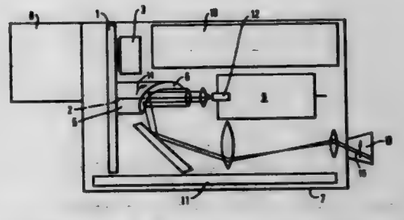
Filed Aug. 21, 1991, Ser. No. 748,212

Claims priority, application United Kingdom, Sep. 5, 1990, 9019335

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—234 **7 Claims**

1. An imager comprising: a sensor array consisting of a two dimensional array of sensing elements positioned relative to the lens such that the lens focuses on image on the sensor array; a rotatable chopper providing a shuttering function for the array; readout means for the sensor array; mechanical drive means for the chopper synchronized to the readout means; a linear array of optical elements, arranged to sequentially receive signals representative of the intensity of a sub-region of the image and to produce a sub-image in dependence thereon; and a reflective surface mechanically coupled to said chopper and arranged to scan the sub-images sequentially formed by the optical elements to produce, to an observer due to the persistence of vision, a two dimensional image which is representative of the received image.



5,192,865

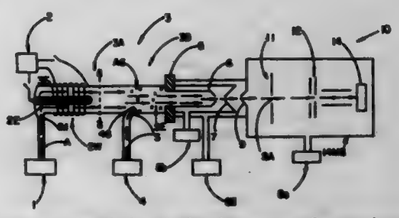
ATMOSPHERIC PRESSURE AFTERGLOW IONIZATION SYSTEM AND METHOD OF USE, FOR MASS SPECTROMETER SAMPLE ANALYSIS SYSTEMS

Jianzhong Zhu, Omaha, Nebr., assignor to Cetac Technologies Inc., Omaha, Nebr.

Filed Jan. 14, 1992, Ser. No. 821,770

Int. Cl.[5] H01J *49/04*

U.S. Cl. 250—288 **26 Claims**



1. An electric discharge chamber system for use in mass spectrometer sample analysis systems using metastable species at atmospheric pressure to controllably fragment and ionize sample comprising:

an electric discharge chamber, which electric discharge chamber is elongated and essentially tubular in shape, and which electric discharge chamber is encompassed by an outer electric coil at an extent thereof at which means for accessing a source of matrix carrier gas is present; which electric discharge chamber, at an extent thereof distal to that at which the outer electric coil and means for accessing the source of matrix carrier gas are present, termed the "afterflow" portion of the electric discharge chamber, provides means for accepting sample and means for connecting to a mass spectrometer; such that during use electrical energy is provided to the outer electric coil and matrix carrier gas is entered into the electric discharge chamber through the means for accessing a source of matrix carrier gas, such that interaction between electric energy and matrix carrier gas during electric discharge causes formation of metastable species, which metastable species are caused to be transported to the afterglow portion of the electric discharge chamber whereat the energy therein interacts with sample introduced thereto at the means for accepting sample, which introduced sample does not pass through the extent of the electric discharge chamber in which electric discharge occurs and, hence, is not directly affected by energy other than that released from said metastable species, to produce ionized sample molecules and/or ionized sample fragments; which ionized sample molecules and/or ionized sample fragments are, during use, transported into a mass spectrometer which is connected to the means for connection thereto

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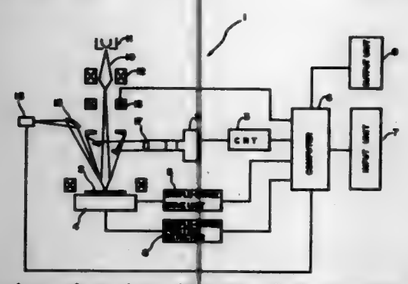
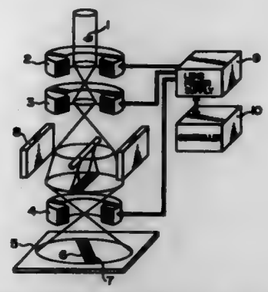
present on the electric discharge chamber, for detection by an ion detector element therein.

5,192,866
SAMPLE-MOVING AUTOMATIC ANALYZING APPARATUS
Hideto Kosai, Mukou, Japan, assignor to Shimadzu Corporation, Kyoto, Japan
Filed Jul. 16, 1991, Ser. No. 730,422
Claims priority, application Japan, Jul. 26, 1990, 2-200278
Int. Cl.[5] H01J 37/26
U.S. Cl. 250—310 5 Claims



1. A sample-moving auitomatic analyzing apparatus for analyzing a sample by irradiating the sample with a charged-particle beam, comprising:
magnification means for optically magnifying the surface of the sample, creating a magnified image;
display means coupled to said magnification means for displaying the magnified image of the surface of the sample on a CRT at a fixed magnification;
setting means for setting analytical areas or analytical positions on the image of the sample displayed on said CRT;
designating means for designating a travel path of the charged-particle beam between said analytical areas or said analytical positions, said designating means including an input unit for inputing said analytical areas or analytical positions, as well as non-irradiated areas, a travel path computing unit for computing the travel path based upon input data from said input unit, said travel path computing unit having means for computing a straight line connecting an end point and a starting point of analytical areas or analytical positions which are mutually adjacent to each other in an order of analysis, and means for obtaining points of intersection at which the straight line intersects the non-irradiated area, said travel path computing unit also having a travel path memory for storing data indicative of the travel path inputed from said input unit, wherein said travel path computing unit computes a plurality of diverse, specialized travel paths based on said input data, to prevent irradiation of the non-irradiated areas; and
moving means for moving a sample stage said moving means including means for computing an amount of drive of the sample stage based upon data indicative of a designated position or travel path on said CRT, and a sample stage drive in such a manner that a point on the sample corresponding to the travel path designated by said designating means will be brought to an optic axis of the charged-particle beam.

5,192,867
ELECTRON OPTICAL MEASUREMENT APPARATUS
Nobuyuki Osukabe, Kawagoe; Junji Endo, Sakado; Akira Tonomura, Saitama; Masahiro Tomita, Katsuta, and Tadao Furuta, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 663,672, Mar. 4, 1991, abandoned, which is a continuation of Ser. No. 462,769, Nov. 10, 1990, Pat. No. 4,998,788. This application May 9, 1991, Ser. No. 697,576
Claims priority, application Japan, Jan. 13, 1989, 1-004999; May 9, 1990, 2-117544
Int. Cl.[5] G03H 1/00
U.S. Cl. 250—311 5 Claims



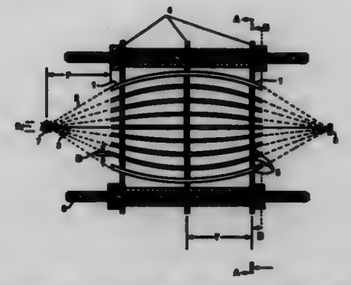
1. An electron holography apparatus having an electron source, a specimen holder, an electron lens system and electron biprism means, said apparatus comprising means for rotating at least one of a specimen and said electron biprism means about the electron optics axis so as to adjust and maintain a determined directional relationship between a specimen image and said electron biprism means independent of changes of a magnification of the electron lens system.

5,192,868
IMPROVED PROPORTIONAL COUNTER DETECTOR
John M. Dudley, Knoxville, Tenn., assignor to Tennelic/Nucleus Inc., Oak Ridge, Tenn.
Filed Aug. 7, 1991, Ser. No. 741,543
Int. Cl.[5] G01T 1/185
U.S. Cl. 250—374 19 Claims

1. An improved proportional detector for determining low concentrations of radioactivity, said detector comprising:
a detector body member defining a cavity having an open face;
a proportional detector gas composition contained within said cavity;
at least one anode member traversing said cavity for multiplying and collecting electrons resulting from interaction of said radioactivity with said gas, said at least one anode member being electrically insulated from said body member;

a conductive perforated grid member substantially concentric with said at least one anode member, said perforated grid member having openings for the passage of said electrons and being electrically insulated from said body member and from said at least one anode member for isolating said at least one anode member from said body;
a source for applying a selected voltage to said at least one anode member; and
a further source for applying a selected voltage to said grid member of a value less than said selected voltage on said at least one anode member.

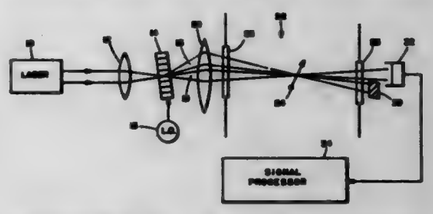
5,192,869
DEVICE FOR CONTROLLING BEAMS OF PARTICLES, X-RAY AND GAMMA QUANTA
Muradin A. Kumakhov, Moscow, U.S.S.R., assignor to X-Ray Optical Systems, Inc., Voorheesville, N.Y.
Continuation-in-part of Ser. No. 607,456, Oct. 31, 1990, abandoned. This application Apr. 1, 1991, Ser. No. 678,208
Int. Cl.[5] G02B 5/124
U.S. Cl. 250—505.1 69 Claims



1. A device for controlling beams of particles, X-ray and gamma quanta, comprising a plurality of channels having inner surfaces exhibiting multiple total external reflections, input butt-ends facing a radiation source, and output butt-ends aimed at a radiation receiver, said channels being formed by channel-forming elements located along generatrices of imaginary controlled surfaces, said channel-forming elements are rigidly located relative to one another at multiple locations by means of a rigid support structure, said plurality of channel supporting means being mounted along said channels with a spacing of supports less than, or equal to, the spacing at which sagging of the channel-forming elements begins to interfere with beam propagation for the radiation spectrum for which high transmission efficiency is desired.

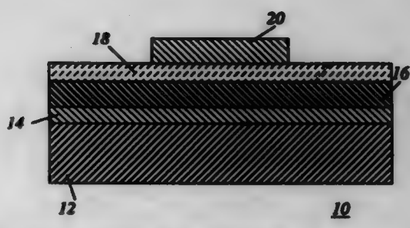
5,192,870
OPTICAL SUBMICRON AEROSOL PARTICLE DETECTOR
John S. Batchelder, Somers; Donald M. DeCain, New York, and Philip C. D. Hobbs, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 14, 1992, Ser. No. 820,709
Int. Cl.[5] G01N 15/06
U.S. Cl. 250—574 16 Claims

1. A particle detector for detecting particles within an enclosed volume, the detector comprising:
beam splitter means;
laser means for directing a coherent optical beam along a path to said beam splitter means, said beam splitter means splitting said coherent optical beam into at least first and second beams, the first beam deflected from the path of said second beam, both said first and second beams having a point of origin in the vicinity of said beam splitter means;
optical means for imaging said point of origin into said enclosed volume, whereby said first and second beams are caused to cross and interfere at an interaction region within said enclosed volume;
detector means responsive to at least one said beam for sensing optical energy scattered by a particle's passage through said interaction region, said particle creating a



Doppler shifted burst in said optical energy, said detector means producing an electrical signal including a Doppler tone burst analogue of said Doppler shifted burst; and means for processing said electrical signal to determine the presence of said particle in said interaction region.

5,192,871
VOLTAGE VARIABLE CAPACITOR HAVING AMORPHOUS DIELECTRIC FILM
E. S. Ramakrishnan; Kenneth D. Cornett, and Wei-Yean Howng, all of Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 15, 1991, Ser. No. 776,834
Int. Cl.[5] H01L 29/92
U.S. Cl. 257—595 25 Claims

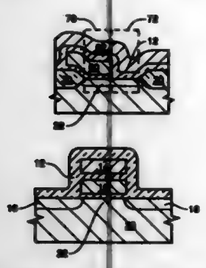


1. A semiconductor device, comprising:
a semiconductor substrate having a layer of semiconductor material deposited thereon, said material having higher resistivity than the substrate;
a dielectric layer deposited on the higher resistivity layer;
an amorphous layer of dielectric material deposited on the dielectric layer; and
a top electrode formed on the amorphous layer.

5,192,872
CELL STRUCTURE FOR ERASABLE PROGRAMMABLE READ-ONLY MEMORIES
Ruojia Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Sep. 13, 1991, Ser. No. 759,273
Int. Cl.[5] H01L 29/68
U.S. Cl. 257—315 22 Claims

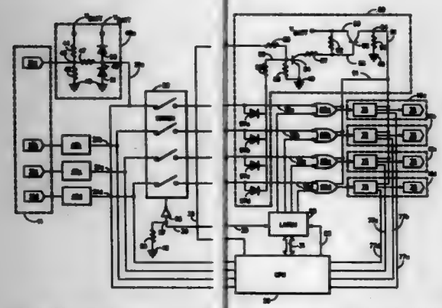
1. A semiconductor device having a transistor comprising:
a) a transistor source;
b) a transistor drain;
c) a transistor channel interposed between said source and said drain;
d) a gate having first and second segments, said first segment being substantially centered between and in a superior plane to said source and said drain and over a portion of

said channel, and said second segment extends beyond said channel, said source, and said drain,



whereby said second segment extension results in an improved coupling coefficient of the transistor.

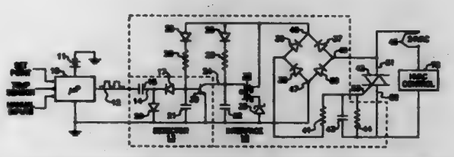
5,192,873
FAIL-OPERATIONAL CONTROL SYSTEM FOR VEHICLE LOADS
Bruce R. Wrenbeck, Dearborn, and David A. Parker, Westland, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.
Filed Feb. 26, 1991, Ser. No. 660,383
Int. Cl.[5] H02D *9/26*
U.S. Cl. 307—38 **16 Claims**



1. A fail-operational control system having a normal operating mode and a fail-operational mode, comprising:
a plurality of low current switches for providing input signals in response to the selective activation of said switches;
a plurality of high current loads;
means for providing control signals for selectively controlling said loads in response to said input signals and for providing a valid signal in response to the operation of said control system in a normal operating mode; and
switching means responsive to the absence of said valid signal for selectively connecting certain ones of said switches directly to a corresponding one or combination of said loads, thereby providing said input signals directly to said corresponding one or combination of said loads.

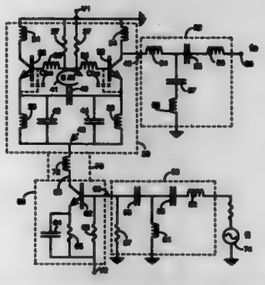
5,192,874
INTERFACE CIRCUIT FOR LOW POWER DRAIN MICROPROCESSOR-BASED THERMOSTAT
John T. Adams, Minneapolis, Minn., assignor to Honeywell, Inc.
Filed Sep. 26, 1991, Ser. No. 765,855
Int. Cl.[5] H01H *47/00*
U.S. Cl. 307—125 **7 Claims**

1. A microprocessor-controlled power switching circuit for controlling flow of electrical power to a system including a thyristor having a control terminal and conducting between power terminals responsive to a first state of a first control signal and not conducting responsive to a second state of the first control signal, a microprocessor having an output port providing a power-on signal having an alternating voltage pattern in response to an external condition signal and a power-off signal comprising a steady state voltage otherwise, said switching circuit including
a) a detector circuit receiving the power-on and power-off signals and comprising converter means for converting the power-on and power-off signals to a second control signal having respectively a constant first voltage near ground and a constant second voltage displaced from ground, and a first transistor having a base terminal and



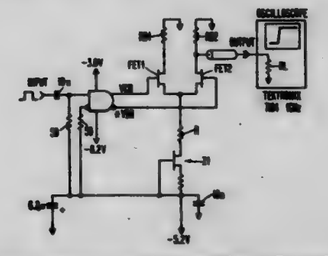
power terminals and receiving the second control signal at its base terminal and entering first and second conduction states responsive respectively to the first and second voltages of the second control signal; and
b) an interface circuit including a rectifier circuit having input terminals connected across the thyristor power terminals and an output terminal providing DC power when the thyristor is nonconductive, and a second transistor having a control terminal connected to the first transistor, said second transistor allowing current flow comprising the first and second states of the first control signal from the rectifier circuit output terminal to the thyristor control terminal responsive respectively to the first and second conduction states of the first transistor.

5,192,875
ANALOG FREQUENCY DIVIDER UTILIZING TWO AMPLIFIERS AND A LC RESONANT CIRCUIT
Ronald F. Kielmeyer, Jr., Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 4, 1991, Ser. No. 787,474
Int. Cl.[5] H03B *19/00*
U.S. Cl. 307—219.1 **20 Claims**



12. A frequency divider for receiving an input frequency f_i and providing an output frequency $f_o=f_i/N$ where N is an even number, comprising:
first and second amplifying devices, each having control, reference and output terminals;
first and second tuned circuits having high resonant impedance at f_o, wherein a first port of the first tuned circuit is couple to the reference terminal of the first amplifying device and a first port of the second tuned circuit is coupled to the reference terminal of the second amplifying device and second ports of the tuned circuits are coupled to a port for receiving input frequency f_i; and
a closed loop circuit comprising the control and reference terminals of the first amplifying device and the reference and control terminals of the second amplifying device and an inductance and a capacitance, wherein the inductance and capacitance are chosen to provide a low impedance in the closed loop circuit at f_o, wherein the output frequency f_o is at the output terminal of one of the amplifying devices;

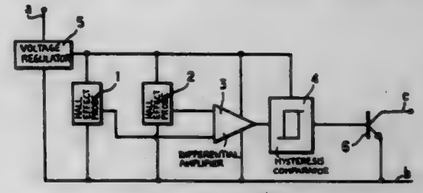
5,192,876
FLAT PULSE GENERATOR
Koji Karube, Hinoshi, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 425,755, Oct. 23, 1989, abandoned. This application Aug. 16, 1991, Ser. No. 749,507
Claims priority, application Japan, Dec. 18, 1987, 62-320846
Int. Cl.[5] H03K *4/00, 5/01, 6/00*
U.S. Cl. 307—260 **14 Claims**



1. A flat pulse generator for providing a flat pulse signal, comprising:
a pair of first and second FETs, said first and second FETs having commonly connected sources which are further connected to a current source;
a first input terminal for applying a first input signal to agate of said first FET;
a second input terminal for applying a second input signal which is in inverse-phase to said first input signal to a gate of said second FET;
a terminal for connecting a load directly to a drain of said second FET; and
a first resistance connected between a drain of said first FET and ground and a second resistance connected between a drain of said second FET and ground, said first and second resistances having values whereby a composite resistance value between the drain of said second FET and ground when said load is connected thereto is the same as a composite resistance value between the drain of said first FET and ground such that a loading condition of said current source by said load is maintained at the same constant level before and after said first and second input signals change logic levels.

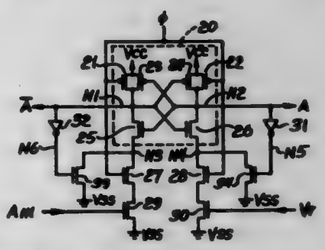
5,192,877
HALL EFFECT SENSOR AND COMPONENT PROVIDING DIFFERENTIAL DETECTION
Jean Bittebierre, Compagne des Granges, and Philippe Biton, Calaire, both of France, assignors to l'Electricfil Industrie, France
Filed May 29, 1991, Ser. No. 707,059
Claims priority, application France, May 30, 1990, 90 06966
Int. Cl.[5] H03K *17/90, 5/22*
U.S. Cl. 307—309 **18 Claims**

1. A differential detection Hall effect component, comprising:
first and second groups of Hall effect probes;
positioning means for positioning the two groups at locations spaced apart from each other;
pole means for subjecting the probes to induction fields which vary in response to movement of a field-disturbing member relative to the probes and which are created by at least one permanent magnet;
differential amplifier means for generating an induction difference signal representative of a detected induction difference between the two groups of probes;
a hysteresis level comparator;
means for applying the induction difference signal to the hysteresis level comparator to cause the comparator to generate a first logic signal in a first logic state when the detected induction difference is greater than a high switchover threshold and to generate a complementary



logic signal in a second logic state when the detected induction difference is less than a low switchover threshold,
wherein said pole means is arranged to subject the groups of probes, in the absence of field-disturbing members detectable by the probes to different respective ones of said induction fields so that a bias induction difference is present between the two groups in said absence of field-disturbing members,
thereby obtaining logic signals in predetermined logic states at an output of the hysteresis level comparator in spite of induction difference dispersions in the component which lie between a minimum value of the low switchover threshold and a maximum value of the high switchover threshold.

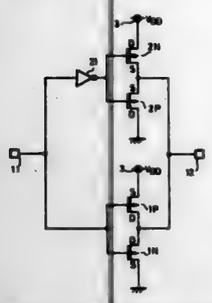
5,192,878
HIGH-SPEED DIFFERENTIAL AMPLIFIER
Sunpei Miyamoto, and Hidetoshi Uehara, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 476,494, Jun. 7, 1990, which is a continuation of PCT/JP89/01029 filed Oct. 6, 1989, abandoned. This application Nov. 27, 1991, Ser. No. 799,866
Claims priority, application Japan, Oct. 11, 1988, 63-255542
Int. Cl.[5] H03K *5/24, 3/356*
U.S. Cl. 307—362 **23 Claims**



1. A differential amplifier comprising:
first, second, third and fourth nodes;
a first transistor of a first conductivity type having a first control electrode coupled to the first node, said first transistor being coupled between the second node and a source of a first potential;
a second transistor of the first conductivity type having a

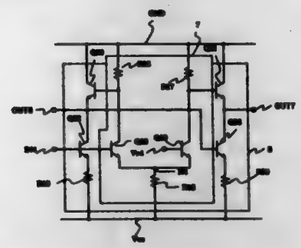
second control electrode coupled to the second node, the second transistor being coupled between the first potential source and the first node;
a third transistor of a second conductivity type having a third control electrode coupled to the second node, the third transistor being coupled between the first node and the third node;
a fourth transistor of the second conductivity type having a fourth control electrode coupled to the first node, the fourth transistor being coupled between the second node and the fourth node;
a first potential defining circuit, having a first input terminal and being coupled to the third node, for defining a potential of the first node in response to a signal applied to the first input terminal;
a second potential defining circuit, having a second input terminal and being coupled to the fourth node, for defining a potential of the second node in response to a signal applied to the second input terminal;
a fifth transistor having a fifth control electrode and being coupled to a source of a second potential and to the third node; and
a potential detecting circuit for detecting the potential of the first node and causing the fifth transistor to be conductive when the potential of the first node is less than a middle potential between the first potential and the second potential.

5,192,879
MOS TRANSISTOR OUTPUT CIRCUIT
Kazuo Aoki, and Daisuke Shichinohe, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 25, 1991, Ser. No. 765,577
Claims priority, application Japan, Nov. 26, 1990, 2-324277
Int. Cl.[5] H03K *19/094, 17/16*
U.S. Cl. 307—451 18 Claims



1. An MOS transistor output circuit comprising:
an L-level output section connected between an output terminal of said MOS transistor output circuit and a point of ground potential; and
an H-level output section connected between said output terminal and a V_{DD} voltage supply terminal;
said L-level output section comprising:
a grounded-source first N-channel transistor having its gate connected to an input terminal of said MOS transistor output circuit, having its drain connected to said output terminal, and having its source connected to a point of ground potential; and
a source-follower second P-channel transistor having its gate connected to said input terminal through an inverter, having its drain connected to a point of ground potential, and having its source connected to said output terminal;
said H-level output section comprising:
a first P-channel transistor having its gate connected to said input terminal, having its drain connected to said output terminal, and having its source connected to said V_{DD} voltage supply terminal;
a source-follower second N-channel transistor having its gate connected to said input terminal through said inverter, having its drain connected to said V_{DD} voltage supply terminal, and having its source connected to said output terminal; and
a channel width-to-length ratio of said second P-channel and N-channel transistors being at least two times as large as that of said first P-channel and N-channel transistors.

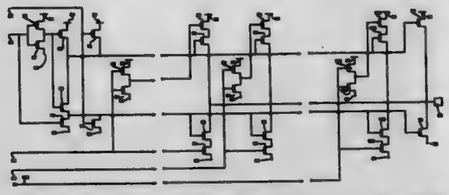
5,192,880
HIGH-SPEED EMITTER COUPLED LOGIC CIRCUIT WITH LARGE CURRENT DRIVING CAPABILITY
Teiji Danzi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Nov. 12, 1991, Ser. No. 791,065
Claims priority, application Japan, Nov. 13, 1990, 2-306556; Feb. 22, 1991, 3-28473
Int. Cl.[5] 307 *270*
U.S. Cl. 307—455 10 Claims



1. An emitter coupled logic circuit comprising
a) a switching gate state coupled with an input port, and operative to carry out a logical operation so as to produce a pair of intermediate signals complementary in logic level to each other,
b) an output stage having a first series combination of a first emitter follower, a first bipolar transistor and a first resistor coupled between first and second constant voltage lines different in voltage level from each other, and a second series combination of a second emitter follower, a second bipolar transistor and a second resistor coupled between said first and second constant voltage lines, and
c) a first output node and a second output node,
said first and second emitter followers having emitter nodes coupled with said first and second output nodes, respectively, said first and second emitter followers being controlled by said pair of intermediate signals, a base node of said first bipolar transistor being coupled with said input port, a base node of said second bipolar transistor being coupled with said first output node.

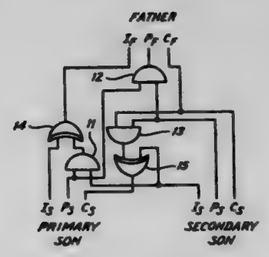
5,192,881
CIRCUIT WHICH REDUCES NOISE CAUSED BY HIGH CURRENT OUTPUTS
William C. Martin, Carrollton, Tex., assignor to VLSI Technology, Inc., San Jose, Calif.
Filed Jun. 28, 1991, Ser. No. 723,110
Int. Cl.[5] H03K *15/173, 17/16*
U.S. Cl. 307—468 12 Claims

1. A buffer circuit comprising:
input circuitry for receiving an input signal;
an output on which the buffer circuit places an output signal;
a reference voltage;
a power voltage;
a first transistor having a first gate, a first source and a first drain, the first gate being coupled to the input circuitry, the first source being coupled to the power voltage, and the first drain being coupled to the output;
a second transistor having a second gate, a second source and a second drain, the second gate being coupled to the input circuitry, the second source being coupled to the output, and the second drain being coupled to the reference voltage;
a third transistor having a third gate, a third source and a third drain, the third gate being electrically connected directly to the first gate, and the third drain being coupled to the output;
a fourth transistor having a fourth gate, a fourth source and a fourth drain, the fourth gate being electrically connected directly to the second gate, and the fourth source being coupled to the output;



a fifth transistor having a fifth gate, a fifth source and a fifth drain, the fifth source being coupled to the power voltage, and the fifth brain being coupled to the third source;
a sixth transistor having a sixth gate, a sixth source and a sixth drain, the sixth source being coupled to the fourth drain, and the sixth drain being coupled to the reference voltage; and
first selection circuitry means, coupled to the fifth gate and the sixth gate, for turning off the fifth transistor and the sixth transistor when a first amount of output current is selected, and for turning on the fifth transistor and the sixth transistor when a second amount of output current is selected.

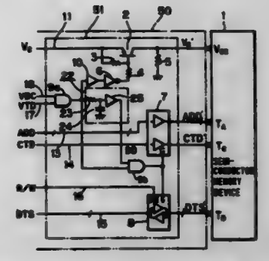
5,192,882
SYNCHRONIZATION CIRCUIT FOR PARALLEL PROCESSING
G. Jack Lipovski, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.
Continuation of Ser. No. 359,075, May 30, 1989. This application Apr. 20, 1992, Ser. No. 871,584
Int. Cl.[5] H03K *19/21;* G06F *7/50*
U.S. Cl. 307—471 20 Claims



1. A logic operation circuit comprising:
circuit input C_f and circuit outputs I_f and P_f of a father;
circuit inputs I_s and P_s and circuit output C_s of a primary son of said father; and,
circuit inputs I_s and P_s and circuit output C_s of a secondary son of said father;

I_s of said primary son being a first input to a first exclusive-OR circuit;
P_s of said primary son being a first input to a first AND circuit and being a first input to a second AND circuit;
I_s of said secondary son being a second input to said first AND circuit and being a first input to a second exclusive-OR circuit;
P_s of said secondary son being a second input to said second AND circuit and being a first input to a third AND circuit;
C_f of said father being a second input to said third AND circuit and being C_s of said secondary son;
an output from said first exclusive-OR circuit being I_f of said father;
an output from said second AND circuit being P_f of said father;
an output from second exclusive-OR circuit being C_s of said primary son;
an output for said first AND circuit being a second input to said first exclusive-OR circuit; and
an output for said third AND circuit being a second input to said second exclusive-OR circuit.

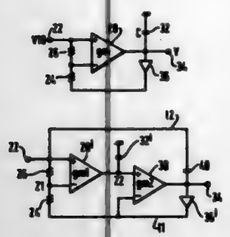
5,192,883
INTERFACE CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE
Masatoshi Kimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 14, 1991, Ser. No. 744,749
Claims priority, application Japan, Aug. 30, 1990, 2-231123
Int. Cl.[5] H03K *19/0175*
U.S. Cl. 307—475 9 Claims



1. An interface circuit for a semiconductor memory device including a semiconductor integrated circuit, said interface circuit comprising:
a control signal input end for receiving a control signal;
a power input line for supplying a power supply voltage to said semiconductor memory device;
power supply control means for connecting/disconnecting said power supply voltage in response to said control signal
input/output buses connected to said semiconductor memory device;
bus control means for connecting/disconnecting said input-/output buses to said semiconductor memory device in response to a delay control signal and which operates at a higher speed than said power supply control means;
a delay circuit for delaying said control signal from said input end a predetermined delay time, said predetermined delay time being a function of the difference in operating speed between said power supply control means and said bus control means; and
delay control signal supply means for supplying said control signal, delayed by said delay circuit, to said bus control means as said delay control signal, wherein
said power supply voltage is applied to said semiconductor memory device prior to inputting data on said input/out-

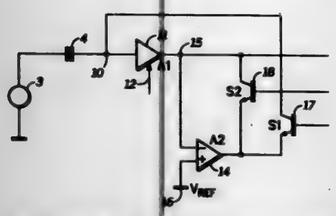
put buses to said semiconductor memory device, preventing latch-up of said semiconductor integrated circuit.

5,192,884
ACTIVE FILTER HAVING REDUCED CAPACITOR AREA BUT MAINTAINING FILTER CHARACTERISTICS
Takahiro Kasano, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
Filed Oct. 15, 1990, Ser. No. 597,043
Claims priority, application Japan, Nov. 30, 1989, 1-312617
Int. Cl.[5] H03K 5/00; H04B 1/10
U.S. Cl. 307—520 6 Claims



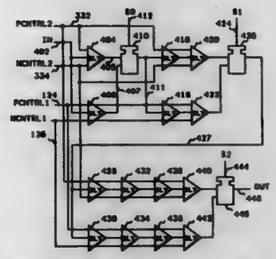
1. An active filter in an integrated circuit comprising:
a differential circuit voltage-controlled current source including a first and a second input terminal and an output terminal, said first input terminal being connected to a first signal source for supplying a signal to be filtered by the active filter;
a first resistor connected between the output terminal and the second input terminal of the voltage controlled current source;
a second resistor connected between the first input terminal and the second input terminal of the voltage-controlled current source; and
a capacitor connected between a second signal source and the output terminal of the voltage controlled current source.

5,192,885
CLAMP CIRCUIT
Michael J. Gay, Vaud, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 25, 1991, Ser. No. 796,979
Claims priority, application United Kingdom, Dec. 13, 1990, 9027044
Int. Cl.[5] H03K 5/08; H04N 9/64, 5/18
U.S. Cl. 307—555 5 Claims



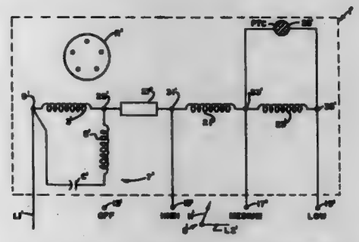
1. A clamp circuit for establishing a predetermined clamp voltage, the circuit comprising a signal input terminal for receiving an input signal, a first amplifier having an input terminal and an output terminal; the input terminal of the first amplifier being capacitively coupled to the signal input terminal; means for selecting operation of the first amplifier; an operational amplifier having a first input coupled to the output of the first amplifier and a second input for receiving a reference voltage and first and second selectively operable feedback loops coupled between the output of the operational amplifier and the inputs of the first and operational amplifiers respectively, whereby the output of the first amplifier may be selectively clamped to the predetermined clamp voltage in dependence upon the selective operation of the feedback loops and the first amplifier.

5,192,886
SUB-NANOSECOND CALIBRATED DELAY LINE STRUCTURE
Gary D. Wetlaufer, Longmont, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of Ser. No. 494,020, Mar. 15, 1990, abandoned. This application Feb. 7, 1991, Ser. No. 652,149
Int. Cl.[5] H03K 5/159, 3/01
U.S. Cl. 307—595 6 Claims



1. A digital delay circuit for delaying an input signal to provide a delayed output signal, said delay circuit having a delay control input bit, said delay circuit comprising:
an incremental delay circuit having an input connected to said input signal, a delay control input connected to an incremental control signal, and having a first incremental control output signal,
a reference delay circuit having an input connected to said input signal, a delay control input connected to a reference control signal, and having a first reference control output signal,
means responsive to said delay control input bit for selecting said first incremental control output signal or said first reference control output signal to provide said output signal.

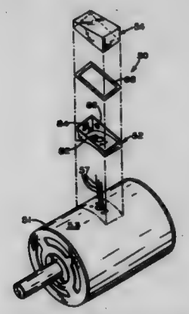
5,192,887
STARTING MULTI-SPEED MOTORS AT A LOW SPEED CONNECTION
Kenneth R. Theis, Collinsville, Ill., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Sep. 23, 1991, Ser. No. 764,185
Int. Cl.[5] H02K 11/00; H02P 1/34, 7/36, 1/42
U.S. Cl. 310—68 C 12 Claims



1. An electric motor having at least a "HIGH" speed of operation and a "LOW" speed of operation, the motor having

a main electrical winding, an additional electrical winding series connected with the main electrical winding, and a circuit branch comprising a series connected capacitor and auxiliary winding, the main winding being connected in parallel with the branch circuit means for applying power to the main winding for HIGH speed operation of the motor and for applying power across at least the main winding and the additional winding for LOW speed operation of the motor, and a temperature sensitive element connected in parallel across at least the additional electrical winding to improve the starting torque characteristics of the motor when it is started in other than its HIGH speed operating condition, the power applying means including switch means for selecting the motor operating speed.

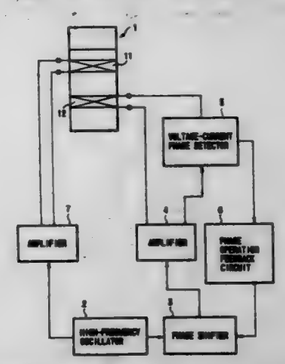
5,192,888
MOTOR TERMINAL BOX
Mark F. Fleer, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Continuation of Ser. No. 543,643, Jun. 26, 1990, abandoned. This application Sep. 13, 1991, Ser. No. 759,605
Int. Cl.[5] H02K 5/22; H02G 3/08
U.S. Cl. 310—71 12 Claims



1. A generally rectangular terminal box for mounting directly on a generally cylindrical surface segment of an electric motor housing, the terminal box comprising a one piece base and a cover, the base having a curved bottom surface preselectively contoured to conform to the curved surface of the electric motor housing and also having a wire accommodating opening therein, and further having four sidewalls including first and second intersecting sidewalls respectively having first and second means for receiving conduit feedwires, the sidewalls of the terminal box being dimensioned and shaped so that at least a portion of each of the first and second conduit feedwire receiving means is substantially unobstructed by any sidewall of the terminal box base when the cover is removed to thereby permit feedwires to be pulled in an essentially unobstructured path through terminal box feedwire receiving means.

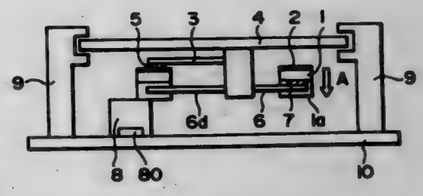
5,192,889
ULTRASONIC MOTOR DRIVER
Osamu Myohga, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 26, 1992, Ser. No. 841,551
Claims priority, application Japan, Mar. 4, 1991, 3-37007
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—316 3 Claims

1. An ultrasonic motor drive, comprising:
an ultrasonic motor of the standing wave type using a longitudinal/torsional vibrator assembly as a stator, excited by a voltage of a high-frequency as an ultrasonic frequency and having first and second piezoelectric elements for respectively generating longitudinal and torsional vibrations,
voltage-current phase difference detecting means for detecting a phase difference between a voltage and a current applied to said second piezoelectric element, and



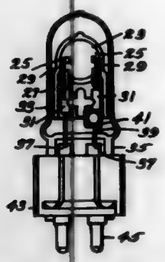
phase shifting means for adjusting phases of two voltages applied to said first and second piezoelectric elements so that the phase difference detected by said voltage-current phase difference detecting means is minimized.

5,192,890
VIBRATION DRIVEN ACTUATOR
Atsushi Kimura, Yokohama; Hiroyuki Seki, Urawa, and Yoshifumi Nishimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 587,785, Sep. 25, 1990, abandoned. This application Jun. 3, 1992, Ser. No. 892,483
Claims priority, application Japan, Sep. 25, 1989, 1-111859[U]; Nov. 6, 1989, 1-288148
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—323 20 Claims



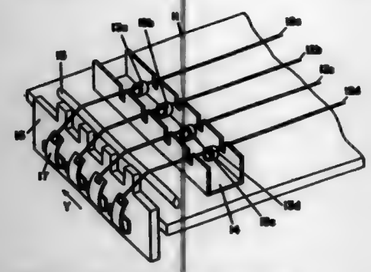
1. A vibration wave driven apparatus, comprising:
a supporting member having a first contact surface with a predetermined surface area and a second contact surface with a predetermined surface area, said surface area of said second contact surface being less than said surface area of said first contact surface;
a vibration member having a frictional surface in contact with said first contact surface of said supporting member and an electro-mechanical energy conversion member for generating a travelling vibration wave in response to an applied electrical signal, the vibration wave causing relative movement between said vibration member and said supporting member; and
a bottom plate having a surface which comes in contact with said second contact surface of said supporting member, wherein
said supporting member is fixed to a predetermined position on said bottom plate.

5,192,891
METAL HALIDE LAMP
Atsushi Matsuura; Shinji Inukai, and Hitonori Sano, all of Kanagawa, Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan
Filed Jan. 7, 1992, Ser. No. 817,649
Claims priority, application Japan, Jan. 11, 1991, 3-18226
Int. Cl.[5] H01J 61/20, 61/22, 61/34
U.S. Cl. 313—25 15 Claims



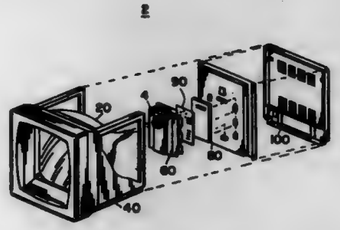
1. A metal halide lamp, comprising:
a discharge glass tube defining a discharge space;
a pair of electrodes provided in the discharge glass tube for generating a discharge therebetween;
mercury in the glass tube for generating the discharge;
halogen fillings comprising bromine and iodine contained in the discharge glass tube, the mol ratio of the bromine to the halogen fillings being not less than 0.3; and
metals reacting with the halogen and emitting light in the discharge glass tube by the discharge, the metal comprising tin, sodium, thallium and indium, the tin being contained in the discharge glass tube in an amount of 1 to 14 μ-mol per 1 cc of discharge space, each mol ratio of the amount of the sodium, the thallium and the indium to the amount of the tin being not less than 0.2.

5,192,892
PICTURE DISPLAY DEVICE WITH A VIBRATION-PREVENTING ELEMENT
Hiroshi Aono; Mitsunori Yokomakura, both of Takatsuki; Keiji Nagata, Hirakata; Takatsugu Kurata, Ibaraki, and Kanji Imai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
PCT No. PCT/JP89/01317, § 371 Date Nov. 6, 1990, § 102(e) Date Nov. 6, 1990, PCT Pub. No. WO90/07788, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 28, 1989, Ser. No. 576,469
Claims priority, application Japan, Jan. 6, 1989, 1-1546; Mar. 15, 1989, 1-62462; May 9, 1989, 1-115344
Int. Cl.[5] H01J 29/04, 29/70, 31/12
U.S. Cl. 313—422 21 Claims



1. A linear cathode apparatus comprising:
a back electrode extending along a first plane;
at least one linear cathode provided along said back electrode in a plane parallel to said first plane;
holding means for holding said linear cathode at a predetermined height above a surface of said back electrode;
at least one vibration prevention element, formed of inorganic materials, each having inner surfaces defining a hole of much larger diameter than an outer diameter of said linear cathode, each said vibration prevention element being freely engaged around each said linear cathode at one end part of said linear cathode, with only a weight of said vibration prevention element holding it on said linear cathode to allow its free movement; and
restricting means for restricting an extent of said free movement of said vibration prevention element, in a direction along which said linear cathode extends, within predetermined limits outside of a working picture area.

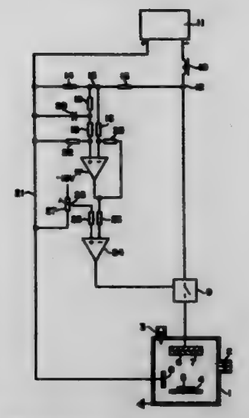
5,192,893
ELECTROMAGNETIC RADIATION SHIELD FOR A VIDEO AMPLIFIER
Daniel J. J. Velasco, Hudson; Dennis C. Robinson, Marlboro; Jeffrey P. Copeland, Holden, and Ricardo L. Fernandez, Beverly, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Apr. 6, 1992, Ser. No. 863,615
Int. Cl.[5] H01J 1/52, 5/02
U.S. Cl. 315—85 9 Claims



1. A video display system comprising:
a cathode ray tube having a stem with a plurality of stem leads;
an electrically conductive electromagnetic shielding enclosure having an access opening;
a video amplifier positioned within the enclosure;
a socket coupled to the stem leads of the cathode ray tube, the socket being positioned at the access opening of the enclosure by the stem leads;
a plurality of unshielded video amplifier wires corresponding to the plurality of stem leads, one end of each of the video amplifier wires being coupled to the socket, the other end of each of the video amplifier wires being coupled to the video amplifier, the one end of each of the video amplifier wires being positioned at the access opening and the remainder of each of the video amplifier wires being positioned within the enclosure, the enclosure being effective to retard the propagation of electromagnetic radiation emitted from the video amplifier wires and from the video amplifier.

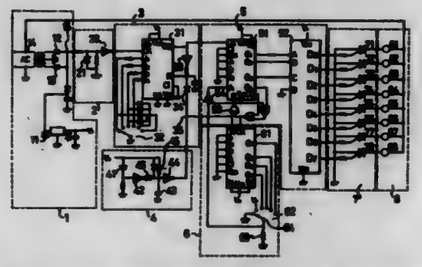
5,192,894
DEVICE FOR THE SUPPRESSION OF ARCS
Götz Teschner, Gelnhausen, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany
Filed Dec. 13, 1991, Ser. No. 807,278
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1991, 4127504
Int. Cl.[5] H05H 1/24
U.S. Cl. 315—111.21 6 Claims
1. Circuit configuration for the suppression of arcs in a

plasma wherein to a plasma path a voltage source is connected, comprising a means for sensing an instantaneous value of the voltage of the plasma path, a means for generating a mean plasma voltage determined over a given time and a means for



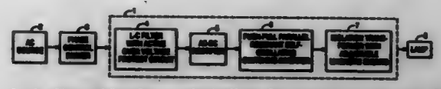
comparing said instantaneous value of the voltage of the plasma path with the mean plasma voltage and for isolating said voltage source (11) from said plasma path if the difference between the instantaneous value of the plasma voltage and the mean plasma voltage exceeds a given value.

5,192,895
SYNCHRONOUSLY-CONTROLLED LIGHT STRING
Ming C. Chang, Taipei Hsien, Taiwan, assignor to Taiwan Goal Electronics Co., Ltd., Taipei Hsien, Taiwan
Filed Mar. 16, 1992, Ser. No. 851,332
Int. Cl.[5] H05B 37/00, 39/00
U.S. Cl. 315—201 2 Claims



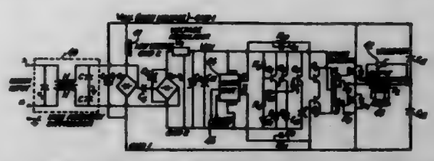
1. A synchronously-controlled light string comprising a plurality of light string units, each of which comprises a plug and a socket disposed in respective ends thereof for coupling with those of adjacent said light string, a plurality of flashable lights, and a synchronous control circuit for receiving a power source frequence as actuating pulses to control said lights to flash with a predetermined frequency;
each said synchronous control circuit comprising a rectifier, a frequency divider, a shifting circuit, a driving circuit, and a resetting circuit, such that when an ac power source is input to said rectifier, the sine wave thereof is converted to a square wave which is then input into said frequency divider to obtain a required clock signal which triggers said shifting circuit and said driving circuit to drive said lights to flash with a predetermined frequency; said resetting circuit resetting a corresponding said frequency divider and said shifting circuit when power is initially applied thereby synchronizing each said light string unit.

5,192,896
VARIABLE CHOPPED INPUT DIMMABLE ELECTRONIC BALLAST
Kang Qin, 13928 Mustang Hill La., Gaithersburg, Md. 20878
Filed Apr. 10, 1992, Ser. No. 866,514
Int. Cl.[5] H05B 41/29, 41/391
U.S. Cl. 315—224 9 Claims



1. A dimmable electronic ballast for one or more gas discharge lamps, each lamp including a filament, comprising:
L-C filter means for receiving a variable chopped AC input current from an AC power source and for smoothing said received variable chopped AC current and for outputting smoothed AC current;
AC-DC rectifier means, connected to receive the smoothed AC current output from the L-C filter means and acting to convert the smoothed AC current to DC voltage and outputting said DC voltage;
push-pull parallel resonant self-oscillating switching inverter means, connected to receive the DC voltage output from the AC-DC rectifier means, for generating and outputting a sinusoidal high frequency voltage; and
isolation transformer means, connected to receive the sinusoidal high frequency voltage output from the switching inverter means, for adjusting the light level of the gas discharge lamp.

5,192,897
ELECTRONIC HIGH FREQUENCY CONTROLLED DEVICE FOR OPERATING GAS DISCHARGE LAMPS
Edwin Vosseugh, Doo Wby, and Mohammad A. Helal, Harbord, both of Australia, assignors to Minitronics Pty. Ltd., Brookvale, Australia
Continuation of Ser. No. 758,167, Sep. 11, 1991, abandoned, which is a continuation of Ser. No. 583,081, Sep. 14, 1990, abandoned, which is a continuation of Ser. No. 453,228, Dec. 14, 1989, abandoned, which is a continuation of Ser. No. 312,411, Feb. 17, 1989, abandoned, which is a continuation of Ser. No. 204,936, Jun. 6, 1988, abandoned, which is a continuation of Ser. No. 99,647, Sep. 23, 1987, abandoned, which is a continuation of Ser. No. 935,114, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 788,692, Oct. 18, 1985, abandoned, which is a continuation of Ser. No. 541,335, Sep. 13, 1983, abandoned. This application Apr. 16, 1992, Ser. No. 869,867
Claims priority, application Australia, Jun. 15, 1982, PF2301
Int. Cl.[5] H05B 41/36
U.S. Cl. 315—308 6 Claims



1. A high frequency electronic ballast for gas discharge lamps comprising a controlled oscillator providing two complementary high frequency outputs which are variable in frequency under at least one control input to said oscillator, said complementary outputs inputing to driver means which in turn provides an input to a non-resonant inverter, said inverter

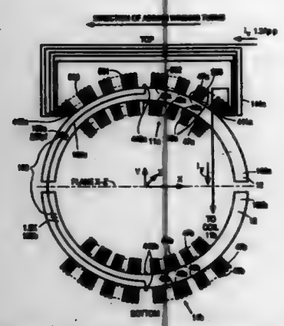
having a substantially constant duty cycle, said inverter having a frequency variable as a function of the controlled oscillator frequency, the output of said inverter being a source to a transformer or choke which enables the inverter to directly drive a gas discharge lamp, said controlled oscillator and driver means being adapted to be supplied from a low d.c. voltage source and said inverter being adapted to be supplied from a high d.c. voltage source, and wherein dimming control is provided by said at least one control input to the oscillator to vary the frequency of the oscillator and thereby vary the frequency of the inverter and the light output of the gas discharge lamp.

5,192,898

DEFLECTION YOKE WITH RINGING SUPPRESSION MEANS

Alain Desnot, Chevigny Saint Sauveur, and Jean-Pierre Fourché, Dijon, both of France, assignors to Videocolor, Paris la Defense, France

Filed Jun. 6, 1991, Ser. No. 710,880
Int. Cl.[5] H01J *29/56*
U.S. Cl. 315—370 6 Claims



1. A deflection yoke for producing electron beam scanning in a cathod ray tube of a video display, comprising:
a core made of a permeable magnetic material;
a toroidal, first vertical deflection coil cooperating with said core for producing a vertical deflection field, said first vertical deflection coil having a plurality of winding layers wound around said core in a multiple layer winding technique;
a horizontal deflection coil for producing a horizontal deflection field; and
a ringing suppressing impedance coupled to an intermediate terminal between end winding turns of a winding layer of said first vertical that is remote from a center winding layer of said first vertical deflection coil for suppressing ringings that are produced in said first vertical deflection coil by said horizontal deflection field.

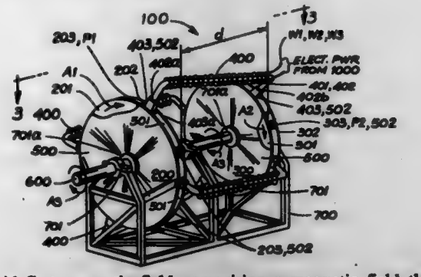
5,192,899

ELECTROMAGNETICALLY POWERED ROTARY MOTOR APPARATUS AND METHOD

Alvin B. Simpson, 437 W. Scott, Clovis, Calif. 93612, and Charley W. Bisel, 286 E. 12th Ave., Broomfield, Colo. 80501

Continuation-in-part of Ser. No. 524,189, May 17, 1990, Pat. No. 5,036,930. This application Aug. 5, 1991, Ser. No. 740,091
Int. Cl.[5] H02K *37/12*; B60L *15/20*
U.S. Cl. 318—139 9 Claims

1. A rotary motor apparatus, said apparatus comprising:
energy source means for powering said apparatus;
at least one electromagnet means electrically coupled and responsive to said energy source means for producing controlled magnetic fields; and
at least one rotatable permanent magnet means having a mechanically coupled shaft for producing rotation of said shaft and converting energy from said energy source means to work, said rotatable permanent magnet means being mechanically disposed proximate said electromagnet means for being magnetically coupled by said controlled magnetic fields for producing said rotation, said electromagnet means comprising a coil member and a fixedly and centrally located magnetic core member with respect to said coil member,
said energy source means comprises a first energy source circuit for producing a first magnetic field on said core member and a second energy source circuit for producing a second magnetic field on said core member, said first magnetic field and said second magnetic field coacting to produce a composite magnetic field that effects rotationally cranking said shaft,



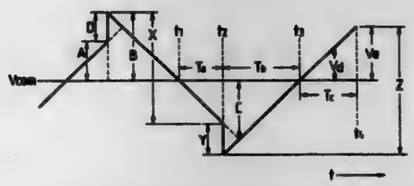
said first magnetic field comprising a magnetic field that polarizes an end of said core member at a first polarity that is the same as a permanent polarity on a plurality of permanent magnet members of said at least one rotatable permanent magnet means, and
said second magnetic field comprises a controlled on/off neutralizing magnetic field that neutralizes said first magnetic field during on-states of said second energy source circuit such that said composite magnetic field has no magnetic effect on said at least one rotatable permanent magnet means and that during an off-state facilitates said composite magnetic field having a rotational driving magnetic effect on said at least one rotatable permanent means such that repeated rotational urging of said at least one rotatable permanent magnet means effects said cranking of said crank shaft.

5,192,900

METHOD AND APPARATUS FOR DRIVING A BRUSHLESS MOTOR USING FEEDBACK CONTROL

Yasuhiro Ueki, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 30, 1991, Ser. No. 706,594
Claims priority, application Japan, Jun. 5, 1990, 2-146590
Int. Cl.[5] H02P *6/00*
U.S. Cl. 318—254 8 Claims



7. A method of driving a brushless dc motor having polyphase stator windings and a rotor, the polyphase stator windings having first ends and second ends, the first ends being

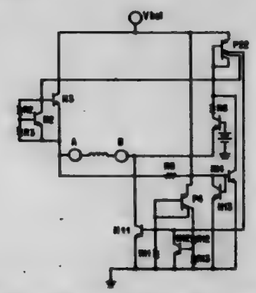
connected in common at a common junction, wherein two of the second ends are sequentially selected and a drive current is supplied between the selected two second ends to rotate the rotor, the rotor having magnetic poles arranged in a predetermined configuration, the method comprising the steps of:
sequentially measuring a voltage at one of the second ends when said one of the second ends is not supplied with the drive current, and thereby obtaining measured values of the voltages at the second ends respectively; and
controlling a rotation of the rotor in response to the measured values of the voltages at the second ends,
said step of controlling a rotation comprising:
(1) measuring a difference "D" between values of the measured value of a currently-measured one of the voltages at the second ends which occurs before and after a first change of a supply of the drive current to the stator windings respectively;
(2) measuring a difference "X" between the measured value of a currently-measured one of the voltages at the second ends which occurs after the first change of the supply of the drive current to the stator windings and the measured value of a currently-measured one of the voltages at the second ends which occurs before a second change of the supply of the drive current to the stator windings;
(3) measuring a difference "Y" between values of the measured value of a currently-measured one of the voltages at the second ends which occurs before and after the second change of the supply of the drive current to the stator windings respectively;
(4) calculating values "Z" given as $Z=X-(D/2)+Y$ or $Z=X+(D/2)-Y$; and
(5) during a period after the second change of the supply of the drive current to the stator windings, performing a third change to the supply of the drive current to the stator windings when the measured value of a currently-measured one of the voltages at the second ends becomes equal to one of the values "Z".

5,192,901

SHORT CIRCUIT PROTECTION

Walter S. Gontowki, Jr., Thompson, Conn., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Mar. 16, 1990, Ser. No. 494,605
Int. Cl.[5] H02K *17/34*
U.S. Cl. 318—430 8 Claims



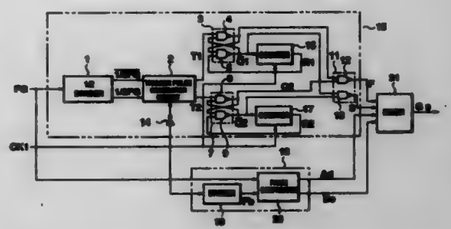
1. Transistor power output stage for driving an electric motor load characterized by having two sides from a pair of supply leads comprising:
first output transistor means connected between one side of the load and one of said supply leads providing current gain for energizing said load at a current level which is a function of the level of drive current provided to said output transistor means;
second output transistor means connected between the other side of the load and the other one of said supply leads and providing current gain for energizing said load;
means for providing drive current to said first output transistor means only at a first level which is independent of the voltage at said one side of the load; and
voltage sensing means for providing drive current at a level which is substantially greater than said first level to said first output transistor means when the voltage at said one side of said load is close to that on said one supply lead and for also providing drive current to said second output transistor means.

5,192,902

VELOCITY/PHASE CONTROLLER FOR DC SERVO MOTOR

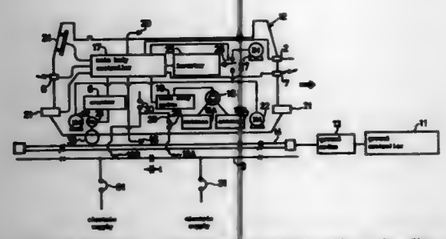
Masao Mizumoto; Koichiro Ougiso; Tatsuo Shimazaki, all of Oura; Tomohiro Inoue, and Yasuhiro Okada, both of Yonago, all of Japan, assignors to Sanyo Electric Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Nov. 1, 1990, Ser. No. 607,673
Claims priority, application Japan, Nov. 10, 1989, 1-292819
Int. Cl.[5] G05B *13/00*
U.S. Cl. 318—561 11 Claims



1. A velocity/phase controller for a DC servo motor comprising:
(a) a velocity control circuit including
a trigger pulse generator for producing a trigger pulse in synchronization with a reference clock signal from a rotation detection signal detected in response to a rotation of the DC servo motor,
a counter for counting said reference clock signal and outputting a count termination signal when a counted value reaches a preset value, and
a velocity control signal generator for outputting, on a basis of the trigger pulse and the count termination signal, a fast signal when said DC servo motor is rotating faster than a predetermined rotating speed and a slow signal when said DC servo motor is rotating slower than said predetermined rotating speed;
(b) a phase control circuit for outputting an advance signal when a phase-angle of said DC servo motor is advanced relative to a predetermined value and a delay signal when the phase angle of said DC servo motor is retarded relative to said predetermined value in response to a phase difference between a reference signal which represents said DC servo motor rotating at said predetermined rotating speed and said rotation detection signal;
(c) a mixer for outputting a rotation control signal for said DC motor by generating a first output having a first amplitude range and a second output having a second amplitude range smaller than the first amplitude range,
the first output being generated from at least one of said fast signal and said slow signal and the second output being generated from at least one of said advance signal and said delay signal,
said mixer performing a mixing operation so that a control function of the rotation control signal is preponderantly due to the contribution of the first output.

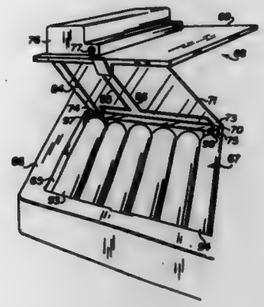
5,192,903
EQUIPMENT FOR TRANSPORTING A LOAD
Hiroshi Kito; Keiichi Murata, both of Kasugai, and Mamoru Nakano, Komaki, all of Japan, assignors to Daifuku Co., Ltd., Japan
Continuation of Ser. No. 775,538, Oct. 15, 1991, abandoned, which is a division of Ser. No. 720,637, Jun. 25, 1991, Pat. No. 5,134,353. This application Jan. 30, 1992, Ser. No. 808,436
Claims priority, application Japan, Jul. 10, 1990, 2-183472; Jul. 19, 1990, 2-192508
Int. Cl.[5] B62D *1/28*; G06F *15/50*
U.S. Cl. 318—587 3 Claims



1. Load transport equipment provided with a plurality of self-propelled trucks self-propelled along a predetermined route to transport a load, said self-propelled trucks each having, detecting means provided at the front of said self-propelled truck and for detecting the existence of an object within a predetermined region in front of said self-propelled truck,
receiving means provided on the front of said self-propelled truck for detecting a first signal emitted from the front of said self-propelled truck,
projecting means provided at the rear of said self-propelled truck for projecting a second signal toward a remote region far from said predetermined region at the rear of said self-propelled truck,
means for detecting a curved portion at said predetermined route, and
control means which, when said curve detecting means does not operate and both said object detecting means and receiving means do not operate, drives said self-propelled truck at high speed, when said receiving means only operates, drives said self-propelled truck at a first low speed, when said object detecting means operates, stops said self-propelled truck, when said curve detecting means operates and said receiving means does not operate, drives said self-propelled truck at a second low speed, and when said receiving means operates, stops said self-propelled truck.

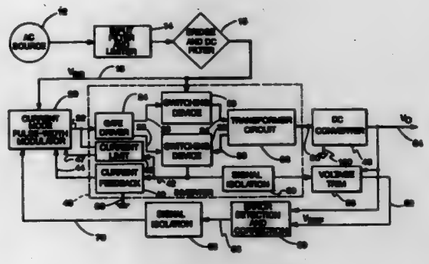
5,192,904
RECHARGEABLE BATTERY CONVERSION KIT
Steven B. Leiserson, 10845 Wheatlands, Ste. C, Santee, Calif. 92071
Continuation-in-part of Ser. No. 793,122, Nov. 18, 1991. This application May 22, 1992, Ser. No. 887,479
Int. Cl.[5] H01M *2/10*
U.S. Cl. 320—2 12 Claims

1. The combination of an electrical device having a compartment shaped and dimensioned to hold at least a first battery having a positive pole and a negative pole, said compartment having an opening sized to allow loading and unloading said first battery, positive and negative terminals protruding from lateral sections of said compartment, said terminals being positioned to contact said poles and wired to carry electrical currents form said poles to electrical circuits in said device, and a removable cover shaped and dimensioned to close said opening, a rechargeable power supply assembly which comprises:
a support member;
a current conducting means secured at a first end to said support and having first and second tips at an opposite end, each tip being shaped and dimensioned for insertion between one of said poles and one of said terminals, each of said tips having a terminal-contact area on a side and a pole-contacting area on an opposite side; and



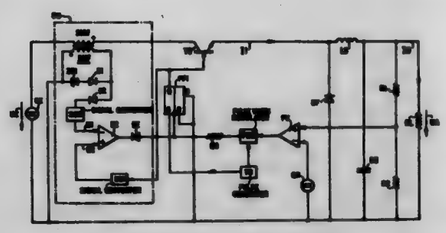
an electrical circuit on said support member for feeding current from a remote current source to said poles and terminals via said current conducting means.

5,192,905
CHARGING VOLTAGE CONTROL AND CURRENT LIMIT FOR BATTERY CHARGERS
Richard A. Karlin, Chicago, Ill., and Hussein I. Bittar, Dearborn, Mich., assignors to MagneTek, Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 634,093, Dec. 24, 1990. This application Sep. 23, 1991, Ser. No. 763,630
Int. Cl.[5] H02J *1/04*
U.S. Cl. 320—23 22 Claims



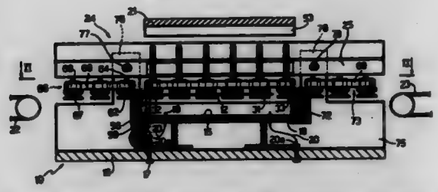
1. In a battery charger of the type having an output charging voltage which remains substantially constant over a relatively wide output charging current range, the improvement in combination therewith comprising voltage trim means for stepwise increasing the output charging voltage when the output charging current decreases below a predetermined value.

5,192,906
SWITCHING REGULATOR WITH CURRENT LIMITING SHUTDOWN
Adolf Nathan, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany
PCT No. PCT/DE90/00157, § 371 Date Sep. 9, 1991, § 102(e) Date Sep. 9, 1991, PCT Pub. No. WO90/10972, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 5, 1990, Ser. No. 752,687
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907410
Int. Cl.[5] G05F *1/40*
U.S. Cl. 323—284 8 Claims



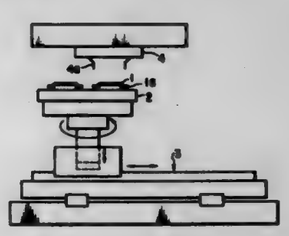
1. A method of operating a switching regulator employing one of pulse width control and pulse frequency control of an actuator, the switching regulator including a current limiting device which receives a signal that is a function of current through the actuator comprising:
receiving in the current limiting device a signal that is a function of turn-on pulses for the actuator; and
blocking the actuator by means of the current limiting device using the signal that is a function of the turn-on pulses as a reference for the current limiting device if the signal that is a function of the turn-on pulses becomes smaller than the signal that is a function of the current through the actuator.

5,192,907
ELECTRONIC MODULE HANDLING DEVICE FOR AN AUTOMATIC TEST APPARATUS
Luciano Bonaria, Turin, Italy, assignor to S.P.E.A. S.R.L., Turin, Italy
Filed Sep. 23, 1991, Ser. No. 763,929
Claims priority, application Italy, Sep. 25, 1990, 67713 A/90; Sep. 25, 1990, 67714 A/90
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 F 18 Claims



1. An automatic test apparatus for electronic modules of which each module has a printed circuit plate provided with a plurality of test points, the apparatus comprising a fixed support; means for gripping and handling printed circuit plates of said electronic modules; an adapter removably mounted on said fixed support and provided with a plurality of probes arranged thereon in accordance with said plurality of test points on a printed circuit plate being tested in the apparatus; movable actuating means for moving said gripping means and causing said plate to move towards said adapter, said gripping and handling means including a pair of mechanism engaging a pair of opposite side edges of said plate, respectively, each of said mechanisms including a gripping member for gripping a respective one of said side edges, each gripping member, upon actuation of the respective mechanism by said actuating means, conveying said plate to a test position in which said test points are in alignment with said probes and said actuating means simultaneously displacing said gripping members for moving said plate in an aligned position with said probes so as to bring said test points in contact with said probes.

5,192,908
SEMICONDUCTOR DEVICE TESTING APPARATUS WITH POSITIONING MECHANISM
Junichiro Shibata, Urawa, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan
Filed Dec. 31, 1991, Ser. No. 814,787
Claims priority, application Japan, Jan. 16, 1991, 3-3317
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 F 14 Claims



1. A test apparatus for a semiconductor device having first and second adjacent sides which form an angle therebetween, comprising:
a test table having a support surface on which a setting position of the semiconductor device to be tested is formed;
testing means for testing the semiconductor device placed at the setting position;
a first guide provided on the test table so as to abut against the first side of the semiconductor device placed at the setting position;
a second guide provided on the test table so as to abut against the second side of the semiconductor device placed at the setting position;
fixing means, arranged on the test table, for fixing the semiconductor device placed at the setting position; and
driving means for moving the test table from a first position where the semiconductor device is placed on the support surface to a second position where the semiconductor device is tested by the testing means, and for linearly accelerating and moving the test table on a plane parallel to the support surface so as to generate vector components of a force for urging the first and second sides of the semiconductor device against the first and second guides, respectively;
wherein the semiconductor device on the support surface is slid by an inertia force during acceleration of the test table and is positioned at the setting position by causing the first and second sides thereof to abut against the first and second guides, respectively.

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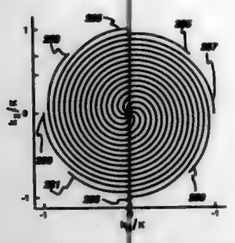
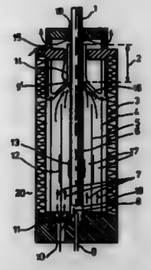
5,192,909
SPECROSCOPIC LOCALIZATION USING PINWHEEL NMR EXCITATION PULSES
Christopher J. Hardy, Schenectady; Paul A. Bottomley, Clifton Park, and Harvey E. Cline, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 7, 1991, Ser. No. 637,910
Int. Cl.[5] G01V *3/00*
U.S. Cl. 324—309 6 Claims



1. A method for obtaining an NMR chemical-shift spectrum localized to a region of interest within a subject, the steps comprising:
a) producing a polarizing magnetic field over said subject;
b) applying a two-dimensional NMR selective excitation pulse to produce an excitation region encompassing said region of interest, the two-dimension selective excitation pulse including the substantially simultaneous application of:
i) an RF excitation pulse having a bandwidth encompassing a desired portion of the chemical-shift spectrum;
ii) a first magnetic field gradient pulse which varies in magnetic as a function of time; and
iii) a second magnetic field gradient pulse which varies in magnitude as a function of time and which is orthogonal to the first magnetic field gradient, in which the vector sum of the time-varying first and second magnetic-field gradient pulses defines a spiral path in k space;
c) acquiring an NMR signal from the excitation region in the absence of a readout magnetic-field gradient and storing the same;
d) repeating steps a), b) and c) to obtain and store a set of NMR signals in which the magnetic field gradient pulses applied during step b) are phase-shifted, causing each spiral path in k-space to be rotated for each repeat;
e) summing together the stored set of NMR signals from each repeat of steps a), b), and c) so that the signals from the region of interest add constructively while the signals outside the region of interest and inside the excitation region substantially cancel one another, to produce a final summed NMR signal from the region of interest, and
f) applying a Fourier transformation to the final summed NMR signal to produce a chemical-shift spectrum of sufficiently broad bandwidth to encompass peaks from the desired portion of the chemical-shift spectrum.

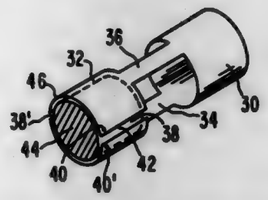
5,192,910
TEMPERATURE-CONTROL DEVICE FOR SAMPLES
Phillip Hepp, Binningen; Werner H. Tschopp, Aesch/Forch; Martin Riedlinbacher, Zürich, and Oskar Schott, Uster, all of Switzerland, assignors to Spectrospin AG, Switzerland
Filed Jun. 10, 1991, Ser. No. 715,107
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018734
Int. Cl.[5] G01V *3/00*
U.S. Cl. 324—315 15 Claims

1. Temperature-control device for NMR spectroscopy, comprising:
a vessel provided with an opening for receiving a measuring sample, at least one inlet opening for introduction of a temperature controlling fluid into the vessel, and one outlet opening for outflow of the temperature controlling fluid from the vessel;
flow channel means for separating the temperature controlling fluid into partial flows upon entry into the vessel and for guiding one partial flow of the temperature controlling



fluid past the sample as direct fluid flow, from a bottom to a top of the sample; and
at least one by-pass channel means for guiding another of the partial fluid flows past an upper area of the sample in the form of a by-pass fluid flow.

5,192,911
NMR PROBE INCORPORATING RF SHIELDING OF SAMPLE
Howard D. W. Hill, Cupertino, and Michael D. Cummings, Sunnyvale, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.
Filed Aug. 7, 1991, Ser. No. 741,720
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 5 Claims

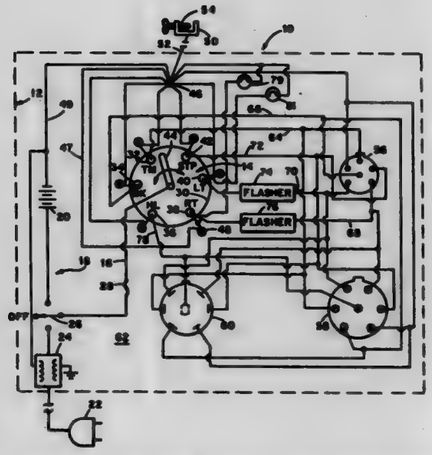


1. An RF coil for applying an RF magnetic field to a sample disposed within said RF coil structure, comprising
(a) RF saddle coil means,
(b) lead means for connecting said RF saddle coil means with an RF source,
(c) floating shield means disposed between said sample and said RF saddle coil means to shield a portion of said sample proximate said lead means from said lead means, said floating shield means comprising a hollow cylindrical shell and a closure disk forming a cap on said shell.

5,192,912
APPARATUS FOR DETERMINING WIRING ORIENTATION AT ELECTRICAL CONNECTORS INCLUDING PLURAL LIGHT INDICATORS AND ROTARY SWITCH
Neldon L. Lemon, 3200 Terrace Dr., Moab, Utah 84532
Filed Aug. 12, 1991, Ser. No. 743,677
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—504 8 Claims

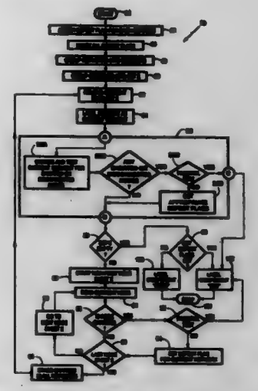
1. An apparatus for determining the orientation of each of a plurality of electrical leads coupled at a plurality of terminals

on a plug or receptacle portion of an electrical connector comprising:
housing means;
a plurality of connector means of different configurations supported by said housing means with each of said plurality of connector means having a plurality of terminals and adapted to receive a correspondingly configured mating connector means having a plurality of terminals thereon with selected ones of said plurality of terminals on said mating connector means each being coupled through each of a plurality of electrical leads to each of a plurality of electrically operatable means having separate selected functions:
rotary switch means supported by said housing and having a plurality of switch contacts corresponding to different switch positions and a rotary arm for selective connection to said switch contacts with each switch position being indicative of a particular function to be provided by one of said electrically operatable means;
first lead means connected to said rotary switch means contacts at each of the switch positions and to each of said



plurality of connector means at each terminal thereof disposed at a location thereon preselected to be coupled through a terminal on the mating connector means receivable by one of said plurality of connector means and one of said plurality of electrical leads to a selected one of said plurality of electrically operatable means;
lighting means connected to said rotary switch means contacts at each of said switch positions and to each of said plurality of terminals on said connector means; and
power supply means connectable to the rotary arm of said rotary switch means for providing an electrical current to any of said lighting means at any of said switch positions and any one of said plurality of electrial leads to one of said terminals on the mating connector means when coupled to a correspondingly configured one of said plurality of connector means for determining if the electrical lead coupled to a particular one of said terrminals on the mating connector means is coupled to the terminal of the mating connector means that is at a location thereon for providing the selected function as indicated by the lighting of a particular one of the lighting means.

5,192,913
SEGMENTED CHARGE LIMITING TEST ALGORITHM FOR ELECTRICAL COMPONENTS
Rama R. Goruganthu; Thomas K. Myers, and Andrew W. Ross, all of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.
Continuation-in-part of Ser. No. 631,111, Dec. 20, 1990, Pat. No. 5,122,753. This application Mar. 16, 1992, Ser. No. 851,716
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—537 35 Claims

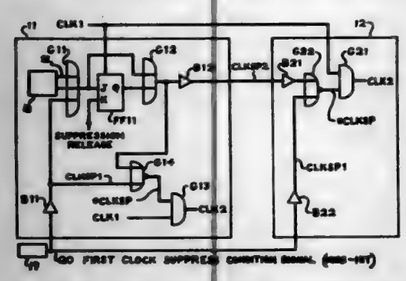


1. A method of electrically testing an electrical component with pads, comprising the steps of:
selecting a first portion of the component which is incapable of accumulating sufficient charge to cause any uncharged pad in the first portion to appear charged;
testing the first portion of the component by applying an electrical charge;
erasing accumulated charges in the component;
selecting a second portion of the component which is incapable of accumulating sufficient charge to cause any uncharged pad in the second portion to appear charged; and
testing the second portion of the component by applying an electrical charge, thereby preventing the accumulated charges from causing false readings.

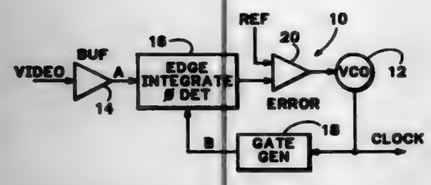
5,192,914
CLOCK CONTROL CIRCUIT FOR SUPPRESSING CLOCK PULSES
Kiyoshi Sado, Tokyo; Yasutomo Sakurai; Koichi Odahara, both of Kawasaki; Kenji Hoshi, Yokohama, and Hidekaru Kanaya, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan
Filed Jul. 15, 1991, Ser. No. 731,127
Claims priority, application Japan, Jul. 20, 1990, 2-193738
Int. Cl.[5] H03K *17/00, 19/00*
U.S. Cl. 328—72 13 Claims

1. A clock control circuit for suppressing a clock pulse, wherein said clock pulse is provided in a plurality of devices which operate in synchronization with each other, said clock control circuit comprising:
first detection means for detecting a first clock suppress condition and generating a first clock suppress condition signal;
second detection means for detecting a second clock suppress condition;
clock suppress signal generator means coupled to an output of the first and second detection means, said clock suppress signal generator means being provided in a selected device for generating a second clock suppress condition signal based on the detection of a clock suppress condition by said first or said second detection means; and
a plurality of clock suppression means provided in each of

the devices, each of said clock suppression means being connected to said first detection means and said clock suppress signal generator means, for suppressing the clock pulse based on the first or second clock suppress signal.



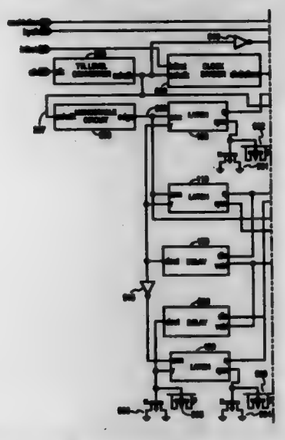
5,192,915
EDGE INTEGRATING PHASE DETECTOR
Alan E. Mathieu; Edward D. Wardzala, both of Portland, and Michael S. Overton, Aloha, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Continuation of Ser. No. 717,440, Jun. 19, 1991, abandoned. This application Jul. 27, 1992, Ser. No. 920,180
Int. Cl.[5] H03K 9/06, 5/13
U.S. Cl. 328—133 3 Claims



1. A phase locked loop of the type having an oscillator for generating a system clock, the frequency of the oscillator being determined by a control signal derived from the system clock and a repetitive component of an input signal, comprising:
means responsive to the system clock for generating a gate signal having a duration equal to a portion of a transition of the repetitive component; and
means for integrating the transition in response to the gate signal to produce the control signal.

5,192,916
CHARGE-PUMP PHASE LOCKED LOOP CIRCUIT
Kevin W. Glass, San Jose, Calif., assignor to MOS Electronics Corporation, Sunnyvale, Calif.
Filed Sep. 20, 1991, Ser. No. 763,087
Int. Cl.[5] H04K 3/13; G05F 5/00
U.S. Cl. 328—155 8 Claims

1. A phase locked loop circuit for providing a phase-stabilized output signal, said phase locked loop circuit comprising:
a first latch circuit having an output terminal that provides a first trigger signal having a first state and a second state, wherein said first trigger signal makes a transition from said first state to said second state in response to a transition of an input signal provided to said phase locked loop circuit;
a first variable delay circuit having a control terminal that receives a feedback signal to control the delay of said first variable delay circuit, said first variable delay circuit having an input terminal coupled to the output terminal of said first latch circuit and providing a first delay signal that is delayed with respect to said first trigger signal, wherein said first delay signal is provided to said first latch circuit to cause the first trigger signal to make a transition back to said first state from said second state;
a second latch circuit coupled to an output terminal of said first delay circuit for providing a second trigger signal having a first state and a second state wherein the second trigger signal makes a transition from said first state to said second state in response to a transition of said first delay signal;
a second variable delay circuit having a control terminal that receives said feedback signal to control the delay of said second variable delay circuit, said second variable delay circuit having an input terminal coupled to an output terminal of said second latch circuit and providing a second delay signal that is delayed with respect to said second trigger signal, wherein said second delay signal is

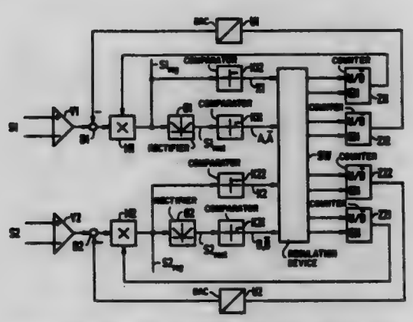


provided to said second latch circuit to cause the second trigger signal to make a transition back to said first state from said second state;
a phase comparator coupled to the output terminal of said first latch circuit and to the output terminal of said second latch circuit for generating said feedback signal, wherein said feedback signal causes the delays of said first and said second variable delay circuits to change if a transition of said first trigger signal is not coincident with a transition of said second trigger signal; and
an operational amplifier circuit coupled to an output terminal of said phase comparator and to the control terminals of said first and said second variable delay circuits, wherein said feedback signal is provided to said first and said second variable delay circuits through said operational amplifier.

5,192,917
CIRCUIT AND METHOD FOR DETECTING AN AMPLITUDE AND OFFSET DEVIATION OF TWO SINUSOIDAL SIGNALS
Ralf Schweigert, Adelsdorf, and Albrecht Donat, Dachsbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Dec. 3, 1991, Ser. No. 801,938
Claims priority, application European Pat. Off., Dec. 3, 1990, 90123125
Int. Cl.[5] H03B 1/00; H03K 5/00, 5/08
U.S. Cl. 328—162 9 Claims

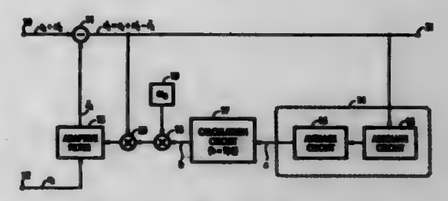
1. A circuit for detecting an amplitude deviation and/or offset deviation of two similar sinusoidal signals S1 and S2, out of phase by approximately 90°, with a predetermined reference amplitude, compriaing:

a first threshold stage, said first threshold stage accepting a signal based on S1 and supplying a first characteristic signal as condition A, when the signal S1 exceeds said predetermined reference amplitude;
a second threshold stage, said second threshold stage accepting a signal based of S2 and supplying a second characteristic signal as condition B, when said signal S2 exceeds the predetermined reference amplitude;
a third threshold stage, said third threshold stage accepting said signal based of S1, detecting zero passages of said signal based on S1 both in an upward and a downward direction, and supplying trigger times 1_{up} and 1_{down}, respectively based on the detected zero passages;
a fourth threshold stage, said forth threshold stage accepting said signal based of S2, detecting zero passages of the signal S2 both in an upward and a downward direction, and supplying trigger times 2_{up} and 2_{down}, respectively based on the detected zero passages; and
a regulating device, said regulating device accepting said first characteristic signal, said second characteristic signal, said trigger times 1_{up}, 1_{down}, 2_{up}, and 2_{down} (SW)
producing an output signal indicating that an amplitude of S1 is greater than the reference amplitude when condition A is met at two consecutive trigger times 2_{up} and 2_{down};
producing an output signal indicating that an amplitude of



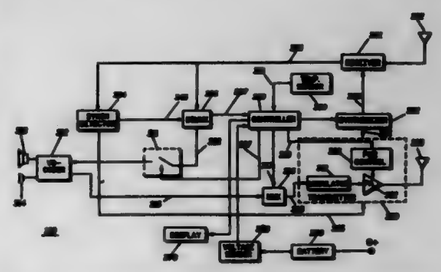
S1 is less than the reference amplitude when condition A is not met at two consecutive trigger times 2_{up} and 2_{down},
producing an output signal indicating that an offset of S1 is too great when condition A is met at trigger time 2_{up} and condition A is not met at trigger time 2_{down}, wherein trigger times 2_{up} and 2_{down} are consecutive,
producing an output signal indicating that an offset of S1 is too small when condition A is not met at trigger time 2_{up} and condition A is met at trigger time 2_{down}, wherein trigger times 2_{up} and 2_{down} are consecutive,
producing an output signal indicating that an amplitude of S2 is greater than the reference amplitude when condition B is met at two consecutive trigger times 1_{up} and 1_{down},
producing an output signal indicating that an amplitude of S2 is less than the reference amplitude when condition B is not met at two trigger consecutive times 1_{up} and 1_{down},
producing an output signal indicating that an offset of S2 is too great when condition B is met at trigger time 1_{up} and condition B is not met at trigger time 1_{down}, wherein trigger times 1_{up} and 1_{down} are consecutive, and
producing an output signal indicating that an offset of S2 is too small when condition B is not met at trigger time 2_{up} and condition B is met at trigger time 1_{down}, wherein trigger times 1_{up} and 1_{down} are consecutive.

5,192,918
INTERFERENCE CANCELLER USING TAP-WEIGHT ADAPTIVE FILTER
Akihiko Sugiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Nov. 1, 1991, Ser. No. 786,519
Claims priority, application Japan, Nov. 1, 1990, 2-298249
Int. Cl.[5] H03B 1/00; H03K 5/00; H04B 1/10
U.S. Cl. 328—165 8 Claims



1. An interference canceller comprising:
a first input terminal to which a combined signal and noise is supplied, and a second input terminal to which a reference signal correlated with said noise is supplied;
a subtractor having a first input port coupled to said first input terminal, a second input port, and an output port;
an adaptive filter having controllable tap weights, the filter having an input port connected to said second input terminal and an output port connected to the second input port of the subtractor;
detector means coupled to the output port of said subtractor for generating an output signal representative of the magnitude of an output signal from said subtractor;
modifier means coupled to said detector means for generating an output signal inversely variable as a function of the output signal of the detector means;
multiplier means for scaling a stepsize in accordance with said inversely variable signal and multiplying the output signal of said subtractor with the scaled stepsize, and controlling the tap-weights of said adaptive filter according to said multiplied signal; and
an output terminal coupled to the output port of said subtractor.

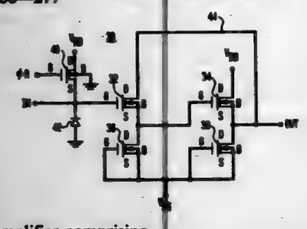
5,192,919
TRANSMITTER HAVING A TEMPERATURE ADJUSTED POWER AMPLIFIER
Alfred B. Wieczorek, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 3, 1991, Ser. No. 770,392
Int. Cl.[5] H03G 3/20
U.S. Cl. 330—129 6 Claims



1. A linear power amplifier system for a transmitter, comprising:
a linear power amplifier for amplifying a transmission signal having a power control means for controlling output

power and current drain of the power amplifier; wherein amplification of said transmission signal causes the power amplifier to have a non-constant current drain;
a temperature sensor for generating a temperature signal corresponding to the ambient temperature;
a controller responsive to the temperature signal for reducing the output power when the ambient temperature drops below a predetermined level; a battery for providing the supply current for the power amplifier; and
a voltage sensor coupled to the battery for sensing battery voltage, wherein the controller is responsive to the voltage sensor for adjusting the output so as to maintain the battery voltage above a predetermined threshold at cold temperatures.

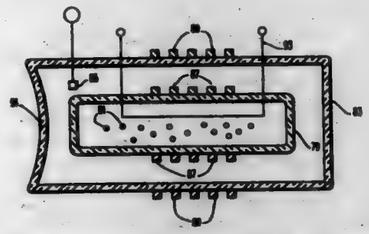
5,192,920
HIGH-SENSITIVITY, LOW-NOISE TRANSISTOR AMPLIFIER
Edward T. Nelson, Pittsford; Eric G. Stevens, and David M. Boisvert, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 18, 1992, Ser. No. 854,046
Int. Cl.[5] H03F *1/08*; H03K *23/46*
U.S. Cl. 330—277 17 Claims



6. An amplifier comprising:
an input, an output, and first and second field effect transistors of the same conductivity type each having a gate, a drain, and a source and being formed on a common semiconductor substrate, the second transistor being a depletion mode transistor;
means coupling the input to the gate of the first transistor;
means coupling the source of the first transistor to the gate of the second transistor;
means coupling the source of the second transistor to the output; and
a direct-coupled feedback path from the source of the second transistor to the drain of the first transistor.

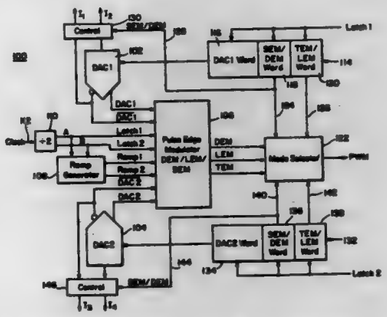
5,192,921
MINIATURIZED ATOMIC FREQUENCY STANDARD
Peter J. Chantry, Churchill Boro; Robert W. Weisert, Monroeville; Salvador H. Talisa, Edgewood; Bruce R. McAvoy, Pittsburgh, and Thomas J. Smith, Jr., Salem Twp., Westmoreland County; Irving Liberman, Pittsburgh; Harvey C. Nathanson, Pittsburgh; all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 31, 1991, Ser. No. 815,677
Int. Cl.[5] H03L *7/00*
U.S. Cl. 331—3 30 Claims

1. An atomic frequency standard comprising:
an oscillator operable to generate a microwave signal;
a gas cell;
a vapor contained in said gas cell;
a conductor connected to said oscillator, said conductor being located sufficiently near said gas cell to operatively couple said microwave signal to said vapor;
a laser diode operable to generate light and positioned such that said light passes through said vapor;
means for detecting said light having passed through said vapor;
means for controlling the frequency of said microwave signal in response to the amount of light detected by said detecting means;



wherein the circumference of said gas cell is no more than one-half the wavelength of said signal.

5,192,922
ANTI-FALSE TRIGGERING SYSTEM FOR A PULSE WIDTH MODULATION SYSTEM
Edward P. Jordan, Greensboro, N.C., assignor to Analog Devices, Inc., Norwood, Mass.
Filed May 29, 1992, Ser. No. 890,951
Int. Cl.[5] H03K *7/00*
U.S. Cl. 332—109 13 Claims

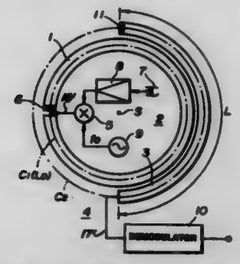


1. An anti-false triggering system for a pulse width modulation system, comprising:
ramp generator means for generating a ramp signal having a ramp portion and a rest portion;
latch enable signal generating means for providing a latch enable signal only during the ramp portion of said ramp signal; and
pulse edge modulation means, responsive to said ramp portion of said ramp signal, for providing a pulse with at least one of its edges modulated, said pulse edge modulation means being enabled by said latch enable signal only during the ramp portion of said ramp signal for suppressing false triggering of said pulse edge modulation means during said rest portion of said ramp signal.

5,192,923
ROTARY COUPLER
Yasutoshi Komatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 12, 1991, Ser. No. 714,015
Claims priority, application Japan, Jun. 13, 1990, 2-152584
Int. Cl.[5] H01P *1/06*; G11B *21/00*
U.S. Cl. 333—116 6 Claims

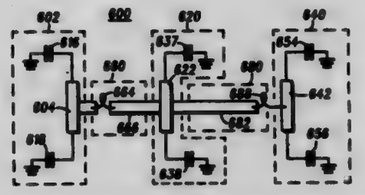
1. A rotary coupler, comprising:
an input circuit for inputting radio frequency signals;

an output circuit for picking up the radio frequency signals inputted by said input circuit;
a rotary portion including a first microstrip formed along substantially one lap of a first circumference of a circle having a circumferential length equivalent to a multiple of an odd number of substantially ½ of the electrical wave length of the radio frequency signal inputted by said input circuit, comprising a first microstrip line having one end connected with said input circuit and the other end terminated by a non-reflecting resistor and an electrically conductive layer which is disposed in parallel with said first microstrip via a layer made of a dielectric material, said rotary portion being rotatable around the center of said first circumference of the circle; and



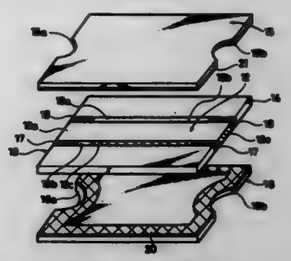
a stationary portion including a second microstrip which is formed along a length equivalent to a multiple of an odd number of substantially ½ of the electrical wave length of the radio frequency signal inputted by said input circuit and is disposed along a second circumference around said center of rotation in such a position that it faces and is close to said first microstrip to be electromagnetically coupled with said first microstrip and an electrically conductive layer provided in parallel with said second microstrip via a layer made of a dielectric material, said second microstrip comprising a second microstrip line having one end connected with said output circuit and the other end terminated by a non-reflecting resistor.

5,192,924
FILTER CIRCUIT FOR ATTENUATING HIGH FREQUENCY SIGNALS
Darioush Agahi-Kesheh, Buffalo Grove, and Duane C. Rabe, Rolling Meadows, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 31, 1991, Ser. No. 786,225
Int. Cl.[5] H03H *7/00*; H01P *1/20*
U.S. Cl. 333—175 13 Claims



1. A circuit board-mounted filter circuit for attenuating selected frequency component portions of a signal applied thereto, said filter comprising:
an L-C circuit having at least one inductor and at least one capacitor, wherein said at least one inductor is formed of first and second portions, respectively, with the first portion of the at least one inductor being comprised of a discrete inductive component disposed upon the circuit board and with the second portion of the at least one inductor being comprised of a distributed inductive component formed of a stripline portion disposed within the circuit board and a microstrip portion disposed upon a surface of the circuit board; and wherein said at least one capacitor is formed of first and second portions, respectively, with the first portion of the at least one capacitor being comprised of a discrete capacitive component disposed upon the circuit board and with the second portion of the at least one capacitor being comprised of a distributed capacitive component formed of a stripline portion disposed within the circuit board and a microstrip portion disposed upon a surface of the circuit board.

5,192,925
PIEZOELECTRIC RESONATOR AND METHOD OF FABRICATING THE SAME
Hiroaki Kaida, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan
Filed May 2, 1991, Ser. No. 694,815
Int. Cl.[5] H03H *9/00*
U.S. Cl. 333—187 22 Claims



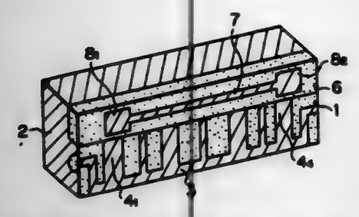
1. A piezoelectric resonator, comprising:
a piezoelectric resonance element, of an energy-trapped type, utilizing a thickness shear vibration mode, the piezoelectric resonance element having a piezoelectric substrate and a pair of electrodes formed on a pair of side surfaces of the piezoelectric substrate, the side surfaces being opposed to each other and the electrodes overlapping at and being separated by a center portion of the piezoelectric substrate, the center portion thereby forming a vibrating portion in a region where said electrodes are opposed to each other when an electric field is applied to the electrodes;
spacers respectively fastened to said opposed side surfaces of the piezoelectric substrate with gaps being provided between the spacers and at least said vibrating portion so as not to prevent the vibration of said vibrating portion; and
cover sheets respectively affixed to both major surfaces of said piezoelectric resonance element and said spacers so as to provide gaps on top and beneath the vibrating portion for the vibration of said vibrating portion.

5,192,926
DIELECTRIC FILTER WITH ATTENUATION POLES
Hiroyuki Sogo, Otawara; Yasuyuki Kondo, Nasu, and Kazuhiro Yamazaki, Hanamaki, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fuji Electrochemical Co., Ltd., Tokyo, both of Japan
Filed Jan. 17, 1991, Ser. No. 642,351
Claims priority, application Japan, Jan. 17, 1990, 2-006378
Int. Cl.[5] H01P *1/203*
U.S. Cl. 333—204 19 Claims

1. A dielectric filter having attenuation poles and having a plurality of resonance elements, comprising:
first dielectric means having surfaces and having a shape which is partially cut out to provide a cut out space;

a conductor coating partially covering the surfaces of said first dielectric means;

a first conductor pattern on a portion of said first dielectric means which is not covered by said conductor coating, said first conductor pattern having a plurality of projecting portions which provide all of said plurality of resonance elements, said first conductor pattern cooperating



with said first dielectric means and said conductor coating to form a dielectric resonator having a plurality of stages;

second dielectric means which fills the cut out space of said first dielectric means; and

a second conductor pattern formed on said second dielectric means and coupled with at least two of said plurality of resonance elements.

5,192,927

MICROSTRIP SPUR-LINE BROAD-BAND BAND-STOP FILTER

Jun-Huei Liu, Taichung, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jul. 3, 1991, Ser. No. 725,494
Int. Cl.[5] H01P *1/203*
U.S. Cl. 333—204 12 Claims

1. A microstrip spur-line band-stop filter having microstrip coupled lines tuned to the band-stop frequencies of said band-stop filter comprising:

three portions of microstrip transmission lines which comprise:

an input connection for receiving a signal to be filtered,

an output connection for outputting said signal,

multiple sections coupled between said input connection and said output connection along a longitudinal direction and having non-uniform, asymmetric said microstrip coupled lines for filtering said signal,

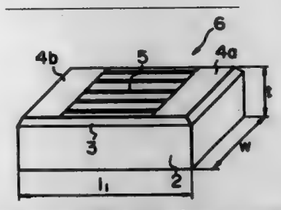
each of said non-uniform, asymmetric microstrip coupled lines having different widths in a direction transverse to the longitudinal direction; said non-uniform, asymmetric microstrip coupled lines being arranged to be asymmetric about said transverse direction for obtaining said band-stop frequencies.

5,192,928

CIRCUIT ELEMENT HAVING FERRIMAGNETIC FILM WITH DEVIATED END SURFACES FOR SUPPRESSING SPURIOUS MAGNETOSTATIC WAVE RESONANCE MODES

Yasuhide Murakami, Kasugaya, and Kohei Ito, Fukaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 4, 1991, Ser. No. 754,565
Claims priority, application Japan, Sep. 5, 1990, 2-234974
Int. Cl.[5] H01P *1/215*
U.S. Cl. 333—219.2 10 Claims



1. A circuit element utilizing a volume magnetostatic wave, the element being responsive to an externally applied magnetic field having a direction, the element comprising:

means for exciting the magnetostatic wave;

a medium for propagating the magnetostatic wave in a first plane defined thereby, said medium having end faces, and wherein said first plane is perpendicular to the direction of the applied magnetic field; and

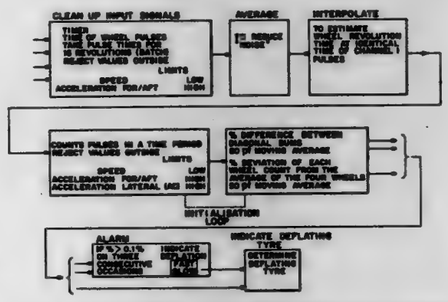
means for selectively suppressing spurious modes while allowing operation in a main resonance mode over a wide frequency range, said suppressing means including at least a part of said end faces of the medium being deviated from a second plane perpendicular to said first plane in which the magnetostatic wave is propagated.

5,192,929

METHOD OF DETECTING A DEFLATED TIRE ON A VEHICLE

John C. Walker, Coldfield, and Lavinder S. Rehal, Walsgrave-on-Sowe, both of Great Britain, assignors to Sumitomo Rubber Industries Limited, Japan

Filed Jan. 28, 1991, Ser. No. 646,678
Claims priority, application United Kingdom, Feb. 9, 1990, 9002925
Int. Cl.[5] B60C *23/00*
U.S. Cl. 340—444 19 Claims



1. A method of detecting a partially deflated pneumatic tire on a vehicle having first, second, third and fourth tires, each of the tires being mounted on a first, second, third and fourth wheel, respectively, comprising sensing the angular velocity of each of the wheels by providing for each of the wheels, a pulse generator means for providing a single pulse for each turn of

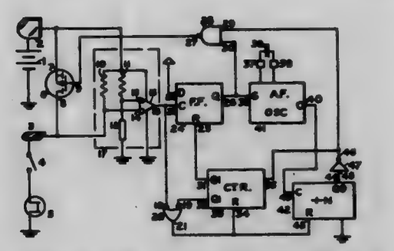
each of the wheels, selecting the first wheel and measuring the time for one rotation of the first wheel, after beginning the measuring for the first wheel similarly measuring the times of one rotation for each of the second, third and fourth wheels, storing the times, for rotation of each of the wheels for at least three rotations of each of the wheels and averaging the times to produce an average angular velocity value signal for each of the wheels, storing in a processor unit at least 3 successive average angular velocity value signals for each of the wheels and calculating by interpolating therein the angular velocity for each of the wheels at a predetermined time, so that the angular velocities of all of the wheels are known for the same time, processing the four signals in the processor unit which subtracts the sum of the signals from one pair of diagonally opposite wheels from the sum of the signals from the other pair of diagonally opposite wheels, and senses when the magnitude of the resulting value is in a range between 0.05% and 0.60% of the mean of the two sums, and, when the resulting value is in the range, operating a warning device to indicate at least one of the tires is partially or completely deflated.

5,192,930

F.E.T. FLASHER

Douglas C. Brueggemann, 745 Flamingo Dr., W. Palm Beach, Fla. 33401, and Norman R. Dittmer, 525 5th Ave. N.W., Rochester, Minn. 55901-2840

Continuation-in-part of Ser. No. 636,407, Feb. 15, 1992, abandoned. This application Dec. 26, 1991, Ser. No. 813,680
Int. Cl.[5] B60Q *1/40*
U.S. Cl. 340—477 5 Claims



1. An electronic flasher-switch device, in a motorized vehicle having a turn signal switch with Left detent, Off, and Right detent positions and having left and right turn signal lamps, a direct current (d.c.) power source and a system ground, said device comprising:

a. an accessory terminal, a flasher terminal, and a connection to said ground,

b. a field effect transistor (F.E.T.) having a source, a gate, and a drain, wherein said source is connected to said accessory terminal, and said drain is connected to said flasher terminal,

c. a turn signal switch detector having an input port and an output port, whereby a logic 1 is produced at said output port whenever said turn signal switch is in said Left detent position or said Right detent position,

d. a flip-flop having a clocking port, a data port, and output port, and a reset port, wherein said clocking port is connected to said turn signal switch detector output port, and said data port is held at logic 1,

e. an audio frequency oscillator having a gate and an output port, wherein said audio frequency oscillator gate is connected to said flip-flop output port, whereby said oscillator commences to oscillate whenever said turn signal switch is moved to said Left detent position or said Right detent position,

f. a frequency divider having a clocking port, an output port, and a reset port, wherein said frequency divider clocking port is connected to said oscillator output port, whereby a periodic pulse train of a standard flasher frequency is produced at said frequency divider output port,

g. an inverter having an input gate and an output port, for providing a periodic train of pulses corresponding to MARKS in said turn signal flashing sequence, wherein said inverter input gate is connected to said frequency divider output port,

h. a counter having a clocking port, an output port, a complementary output port, and a reset port, wherein said counter clocking port is connected to said inverter output port, whereby state of said counter is advanced whenever said inverter produces each one of said MARKS,

i. an OR circuit having first and second complementary input ports and an output port, wherein said second input port is connected to said counter complementary output port, and said first input port is connected to said turn signal switch detector output port, whereby, when said counter reaches a predetermined flash count, or when said turn signal switch is in said Off position, said counter and said divider are both reset,

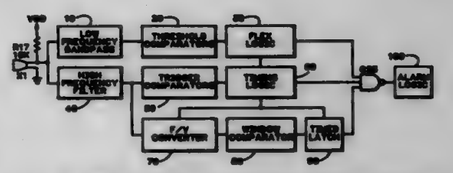
j. a NAND circuit having first and second gates and an output port, wherein said first NAND gate is connected to said inverter output port, and said second NAND gate is connected to said flip-flop output port, and said NAND output port is connected to said field effect transistor gate, so that when said turn signal switch is in said Left detent position or said Right detent position beyond said predetermined count, said signal lamps stop flashing.

5,192,931

DUAL CHANNEL GLASS BREAK DETECTOR

Richard A. Smith, Portland, and Christopher A. Bernhardt, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Feb. 11, 1992, Ser. No. 835,733
Int. Cl.[5] G08B *13/04*
U.S. Cl. 340—550 10 Claims



1. A glass break detector for detecting the breaking of a window or the like comprising:

(a) an acoustic transducer;

(b) a flex detection circuit responsive to the acoustic transducer for detecting a low frequency positive acoustic wave characteristic of an inward flex of the window; and

(c) an alarm circuit responsive to the flex detection circuit for generating an alarm.

5,192,932

SENSING MAT, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Henry J. Schwab, Jr., 429 Rittenhouse Cir., Havertown, Pa. 19083

Continuation-in-part of Ser. No. 430,146, Nov. 1, 1989, Pat. No. 5,086,291. This application May 2, 1991, Ser. No. 694,510
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—604 17 Claims

1. A warning device for the prevention of damage to electrical equipment and property by liquids, comprising:

a thin, flexible mat which is adaptable to various situations

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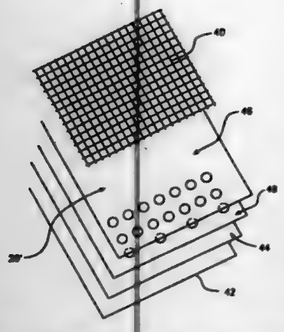
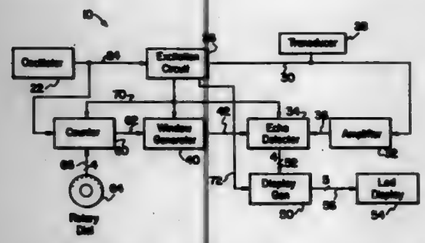
by changing the size to meet the required conditions on site including conductive and non-conductive portions;
a sensitivity layer for adjusting the sensitivity of said mat;
a monitoring means for sensing changes in the electrical properties of said mat;
means to electrically connect said mat to said monitoring means;



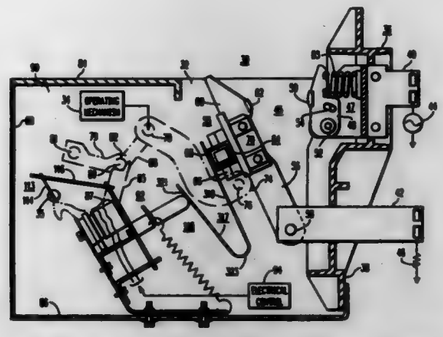
upon sensing a change in the electrical properties of said mat, a warning device is activated by said monitoring means;
said monitoring means deactivates said electrical equipment; and
said mat may be cut to change the size and shape.

5,192,933
FIELD-ADJUSTABLE ULTRASONIC DETECTOR
Al W. Rodriguez, 33 Valencia St., Hauppauge, N.Y. 11788
Filed Jun. 14, 1990, Ser. No. 538,385
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—621 15 Claims



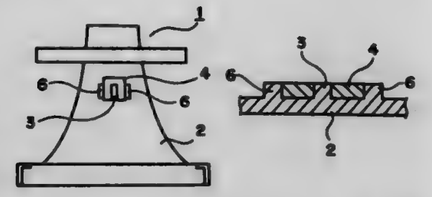
1. A method of determining the presence or absence of an ultrasonically conductive medium within a container comprising the steps of:
(a) providing information relating to the size of a container;
(b) adjusting the position of an electronic window of a predetermined duration based upon the information provided in said step (a), the electronic window being associated with the travel time of a burst of energy through the container;
(c) transmitting a burst of energy towards an opposing wall of the container; and
(d) detecting whether said ultrasonically conductive medium is present in the container by responding to the receipt of an echo from said burst of energy only during the time duration determined by the electronic window,
wherein said information comprises a respective container size for each of a plurality of discrete settings of a switch that controls the position of the electronic window.

5,192,934
CIRCUIT BREAKER HAVING A TRIP ACTUATOR
Stanislaw A. Milianowicz, Monroeville; Nagar J. Patel, Plum Boro; William O. Agiletti, Penn Hills Township, Allegheny County, all of Pa., and Brian F. McDonnell, Charlotte, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 6, 1991, Ser. No. 788,697
Int. Cl.[5] H01H *9/00*
U.S. Cl. 335—172 16 Claims



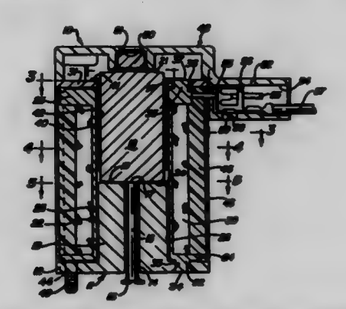
1. A circuit breaker having electrical contacts operable between open and closed positions, including a movable contact assembly which is pivoted to an open position when the electrical contacts are operated to the open position, and a trip actuator which provides a mechanical movement upon receiving an electrical trip pulse, with the mechanical movement actuating a trip mechanism of the circuit breaker to cause the electrical contacts to assume the open position, with the trip actuator being characterized by:
first and second parallel magnetic circuits,
said first magnetic circuit having a lower reluctance than said second magnetic circuit,
magnet means disposed to provide magnetic flux for both said first and second magnetic circuits, with the flux from said magnet means favoring the lower reluctance of the first magnetic circuit,
a pivotally mounted clapper member having a first position in which it is releasably held in said first magnetic circuit by a magnetic force, and a second position which opens said first magnetic circuit,
bias means providing a biasing force which biases said clapper member toward said second position, with the bias means being selected to provide a biasing force which is less than said magnetic force holding the clapper member in said first position,
electromagnetic means for receiving the electrical trip pulse, with the trip pulse causing said electromagnetic means to provide a magnetic flux which momentarily opposes the magnetic flux in said first magnetic circuit, switching the magnetic flux provided by the magnet means to the second magnetic circuit and reducing the magnetic force holding the clapper member in said first position below the magnitude of the biasing force, whereby said bias means pivots the clapper member to said second position,
linking means disposed between the clapper member and the trip mechanism of the circuit breaker, with the pivoting of the clapper member to said second position actuating the trip mechanism,
and including reset means fixed to the pivotable movable contact assembly which contacts and resets the pivotable clapper member to the first position thereof in response to the pivotable movement of the movable contact assembly to the open position.

5,192,935
ATTACHMENT STRUCTURE OF A MAGNETIC PIECE OF A DEFLECTION YOKE
Sang-Hyeog Yun, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co. Ltd., Rep. of Korea
Filed Nov. 19, 1991, Ser. No. 794,580
Claims priority, application Rep. of Korea, Nov. 22, 1990, 90-18005
Int. Cl.[5] H01F *3/12, 7/00*
U.S. Cl. 335—211 2 Claims



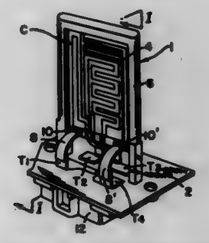
1. An attachment structure for a magnetic piece of a deflection yoke to be firmly fixed to a central part of a coil separator, said attachment structure comprising:
a center protuberance formed at the center of a supporting base of said coil separator, said center protuberance contacting said magnetic piece; and
supporting means integrally formed with said center protuberance for supporting the right and left side surfaces of said magnetic piece, said supporting means comprising two members respectively at the right and left of said center protuberance and protruding with the same height as said center protuberance.

5,192,936
SOLENOID
James A. Neff, Birmingham; Richard A. Fagerlie, West Bloomfield; Eric P. Janssen, Howell, and Michael E. Robert, Union Lake, all of Mich., assignors to Mac Valves, Inc., Wixom, Mich.
Filed Aug. 22, 1991, Ser. No. 748,457
Int. Cl.[5] H01F *3/00, 7/08*
U.S. Cl. 335—281 7 Claims



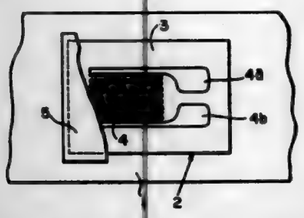
1. A solenoid (10) having a bobbin (22) and a coil (30) wound thereon, the bobbin (22) having a core hole (26) with an armature bushing (40) mounted therein, an armature (18) and pole piece (13) operatively mounted in the core hole (26), characterized in that:
(a) the bobbin (22) has a tubular body which forms a core hole (26) that is rectangular in cross section and has an upper end and a lower end;
(b) the armature bushing (40) is mounted in the upper end of the bobbin core hole (26) and it is rectangular in cross section;
(c) the armature (18) is movably mounted in the armature bushing (40) and it is in cross section;
(d) the pole piece (13) is fixedly mounted in the lower end of the bobbin core hole (26) and it is rectangular in cross section;
(e) the bobbin (22) is provided with an integral upper flange (25) and an integral lower flange (24) which enclose the upper and lower ends of the coil (30);
(f) a top flux plate (31) is mounted on the upper bobbin flange (25) and it has an axial hole formed therethrough which is rectangular in cross section and through which the armature bushing (40) is mounted;
(g) a bottom flux plate (12) is integral with the pole piece (13) and extends beneath the bobbin lower flange (24);
(h) a tubular can (43) having top and bottom open ends and a rectangular cross section is mounted around the coil (30), and it is held in contact, with and between, the top (31) and bottom (12) flux plates;
(i) fastening means (32,35) for securing the top (31) and bottom (12) flux plates to the bobbin flanges to hold the bobbin (22), flux plates (31,12) and tubular can (43) together; and,
(j) a sealing, electrically insulating and heat conducting encapsulant material is disposed within the tubular can (43) and surrounds the coil (30); and,
(k) the solenoid (10) includes a detachably mounted top end cover (48).

5,192,937
RESISTANCE UNIT FOR MOTOR SPEED CONTROL
Woo Y. Lee, Seoul, Rep. of Korea, assignor to Dong A Electric Parts Co., Ltd., Kuri, Rep. of Korea
Filed Dec. 18, 1991, Ser. No. 809,871
Claims priority, application Rep. of Korea, Dec. 24, 1990, 90-20771
Int. Cl.[5] H01H *61/02*
U.S. Cl. 337—104 3 Claims



1. A device for motor speed control comprising:
a board having first and second surfaces suitable for mounting speed control components;
a plurality of speed select terminals mounted on said first surface of said board and extending through to said second surface;
a resistance unit including a plurality of resistors formed by imprinting resistive materials on a substrate, each resistor is connected in series to a corresponding speed select terminal for selectively varying the amount of current through said speed select terminal;
at least one heat sensitive fuse connected between one of said speed select terminals and one of said resistors for disconnecting said resistor from said terminal upon reaching a predetermined temperature;
a heat-proof plate for protecting the outer edges of said substrate, said plate being disposed substantially orthogonal to said board; and
a housing mounted on said second surface of said board for protecting said extended portions of said speed select terminals.

5,192,938
STRAIN GAGE, TRANSDUCER EMPLOYING THE STRAIN GAGE, AND METHOD FOR PRODUCING THE STRAIN GAGE
Werner Ort, Darmstadt, Fed. Rep. of Germany, assignor to Hottinger Baldwin Messtechnik GmbH, Darmstadt, Fed. Rep. of Germany
Filed Apr. 5, 1991, Ser. No. 681,579
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1990, 4011314
Int. Cl.[5] G01L *1/22*
U.S. Cl. 338—5 8 Claims

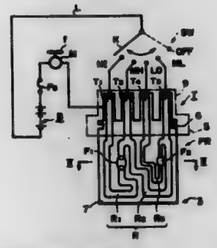


1. A strain gage, comprising a backing and at least one strain responsive measuring resistor grid secured to said backing, and wherein said backing is formed of polyphenylenesulfide, whereby said strain gage is substantially free of spurious error signals caused by changes in the relative humidity to which said strain gage is exposed in operation.

5,192,939
CLEANING DEVICE FOR ROTARY CONTROLS E.G. POTENTIOMETERS AND SWITCHES
Alan L. Keesow, 505 Thackeray, Maumee, Ohio 43537, and Alec W. Palmer, 6238 State Hwy. 109, Delta, Ohio 43515
Filed Mar. 16, 1992, Ser. No. 852,010
Int. Cl.[5] H01C *10/10, 13/00*; H01H *1/60*
U.S. Cl. 338—75 5 Claims

1. In combination, an electronic unit having a panel, at least one potentiometer having an externally-threaded cylinder extending outwardly through said panel and having a concentric rotatable shaft extending therethrough, a cleaning device for contacts of said potentiometer comprising a housing of plastic material having an opening at one end and closed at the other end, said one end having internal threads for connecting with the external threads of said cylinder, a small tube connected with the closed end of said housing and communicating with a chamber formed within said housing, and a pressurized container of contact cleaning fluid communicating with said small tube to supply cleaning fluid to said chamber and to an annular space between said shaft and said threaded cylinder to clean contact areas of said potentiometer.

5,192,940
FLAT RESISTANCE FOR BLOWER CONTROL UNIT FOR AUTOMOBILE AIR CONDITIONER AND BLOWER CONTROL UNIT USING THE SAME
Kiyoshi Yajima; Takao Suzuki, both of Funabashi; Masanori Itoh, Tokyo; Hitoshi Okuyama, Funabashi; Ken-ichi Uraga, Kokubunji, and Hisanaga Hirabayashi, Tokyo, all of Japan, assignors to Fujikura, Ltd.; Calsonic Corp. and Kohwa Mfg. Co., all of Tokyo, Japan
Division of Ser. No. 417,571, Oct. 5, 1989, Pat. No. 5,000,662.
This application Dec. 31, 1990, Ser. No. 636,901
Claims priority, application Japan, Mar. 6, 1989, 1-53515; Mar. 6, 1989, 1-53516; Mar. 6, 1989, 1-53517; Mar. 17, 1989, 1-63512; Apr. 18, 1989, 1-96385; Apr. 18, 1989, 1-96386; May 19, 1989, 1-124386; May 24, 1989, 1-60035[U]; Jun. 7, 1989, 1-65781[U]; Jun. 23, 1989, 1-74263[U]; Oct. 7, 1989, 63-252110
Int. Cl.[5] H01C *1/012*
U.S. Cl. 338—308 19 Claims

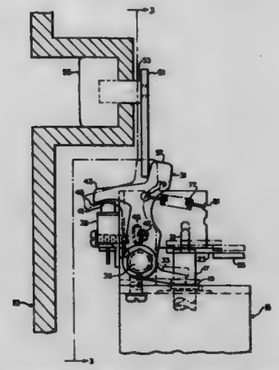


1. A flat resistance comprising:
a porcelain enameled metallic substrate including a flat head portion, having an edge, and parallel terminal supporting the head portion and the terminal supporting portions forming one surface;
a resistance circuit printed on the one surface of the head portion, the resistance circuit including a plurality of electrically interconnected resistances, at least one of the resistances having a first portion and a second portion, said first portion and said second portion each having a fuse connecting end, said fuse connecting end defining a gap between the first portion and the second portion, at least one of the fuse connecting ends comprising fuse attracting means;
a temperature fuse interposed in the resistance circuit and adapted to melt to break the resistance circuit when the porcelain enameled metallic substrate substantially reaches a permissible maximum temperature at a portion thereof, the temperature fuse being provided in the vicinity of the portion of the substrate, the temperature fuse being electrically coupled to the fuse connecting ends of the first portion and the second portion, the fuse attracting means attracting the temperature fuse when the temperature fuse is in a molten state when the substrate reaches the permissible maximum temperature; and
terminal means, printed on the one surface of both the head portion and the terminal supporting portions, the terminal means including terminals each connected to one end of a corresponding one of the resistances.

5,192,941
OVERCURRENT TRIP SWITCH
Anthony J. Fishovitz, New Sewickley Twp., Beaver Cty.; Allan V. Heberling, Daugherty Twp., Beaver Cty.; Thomas K. Fogle, Shaler, and Michael W. Chlystek, McMurray, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 29, 1991, Ser. No. 706,922
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—638 8 Claims

1. An alarm assembly for use with a circuit breaker contained within a circuit breaker housing comprising:

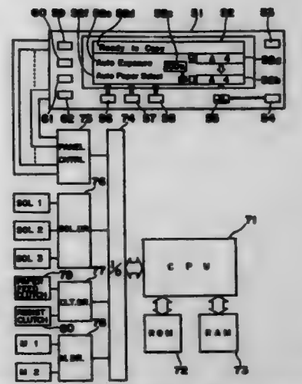
a trip mechanism for interrupting current through said circuit breaker when a predetermined current condition is reached;
a flux shunt trip device operatively associated with said trip mechanism, said flux shunt trip device having plunger means movable between an extended position and a retracted position, said plunger means moving to said extended position upon said predetermined condition and directly activating said trip mechanism to interrupt current through said circuit breaker;
an actuating member operatively associated with said plunger means and movable between an initial position



and an actuated position, said actuating member engageable directly by said plunger means so that motion of said plunger means to said extended position upon said predetermined condition also causes said actuating member to move from said initial position to said actuated position and said actuating member remains in said actuated position even if said plunger means returns to said retracted position; and
an electrical switch mechanism activated by said actuating member when said actuating member moves to said actuated position to generate an alarm signal indicating tripping of the circuit breaker by the flux shunt trip device.

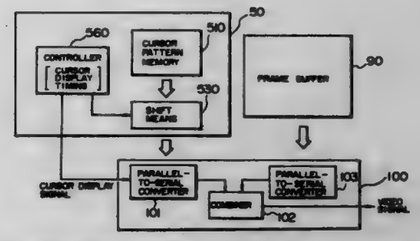
5,192,942
IMAGING APPARATUS FOR DISPLAYING RELATED IMAGING PROCESSING FUNCTIONS
Yoshikado Yamada, Kashihara; Kimihito Yamazaki, Nara; Syoichiro Yoshiura, Yamatokoriyama; Kazuyuki Ogita, Nara, and Osamu Iwasa, Kadoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 17, 1991, Ser. No. 716,690
Claims priority, application Japan, Dec. 21, 1987, 62-324802; Dec. 21, 1987, 62-324804; Dec. 21, 1987, 62-324805
Int. Cl.[5] G09G *5/00*
U.S. Cl. 340—706 5 Claims

1. An imaging apparatus comprising:
a plurality of image processing functions which are classified at least into a first group including a plurality of first related functions and a second group including a plurality of second related functions;
group selection means for selecting one of said groups of related functions;
display means for displaying a portion of related functions for said one selected group which is selected by said group selection means;
function selecting means for selecting from said portion of related functions for said one selected group displayed in said display means; and
listing means for listing said portion of related functions for said one selected group in said display means for confirming said portion of related functions selected by said group selecting means;



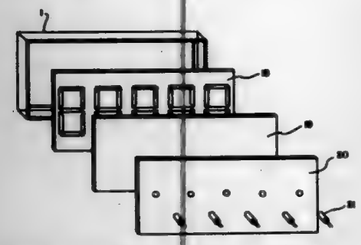
said portion of related functions comprising a display function for displaying the remaining portions of said one selected group of related functions in said display means.

5,192,943
CURSOR DISPLAY CONTROL METHOD AND APPARATUS IN A GRAPHIC DISPLAY SYSTEM
Shigeru Matsue; Tadashi Fukushima; Tooru Komagawa, and Masahisa Narita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of Japan
Filed Sep. 17, 1990, Ser. No. 583,584
Claims priority, application Japan, Sep. 20, 1989, 1-242256
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—709 13 Claims



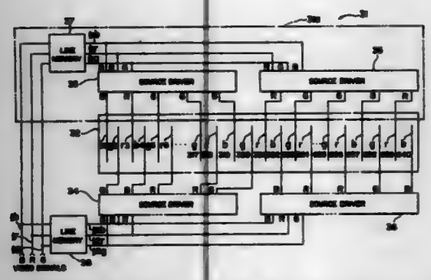
1. A cursor display control method for performing display of a cursor together with characters and/or figures on a display screen, said cursor display control method comprising the steps of:
reading parallel cursor pattern data from cursor pattern storage means for storing a cursor pattern on a bit mapping basis;
shifting all of said parallel cursor pattern data in said cursor pattern storage means using a shift register in a continuous operation during a single non-display period of said cursor on a bit-by-bit basis;
converting said shifted parallel cursor pattern data into serial cursor pattern data at a display timing of said cursor; and
performing display of said cursor based on said serial cursor pattern data.

5,192,944
SOLAR-POWERED DISPLAY DEVICE
Masatoshi Otsuki; Yasuyoshi Kawanishi; Kenji Sawada; Yoshinori Kaido; Takayuki Mizumura, and Masayoshi Maeba, all of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Dec. 12, 1990, Ser. No. 626,276
Claims priority, application Japan, Dec. 14, 1989, 1-144821[U]
Int. Cl.[5] G09G 3/18; G09F 9/35
U.S. Cl. 340—765 14 Claims



1. A light powered display device, comprising:
a front panel;
a solar battery on said front panel;
at least one window in said solar battery;
an electrical storage device for storing electrical energy generated by said solar battery;
at least one light emitter powered by said electrical storage device;
means for permitting said light emitter to provide background illumination for at least one character fixed on a surface of said front panel in said at least one window; and
means for permitting changing of said at least one character.

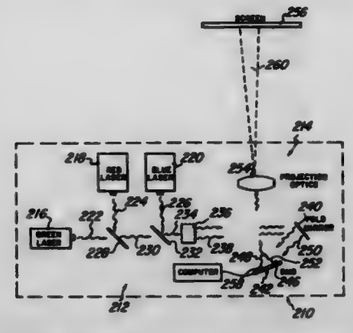
5,192,945
DEVICE AND METHOD FOR DRIVING A LIQUID CRYSTAL PANEL
Tokutarou Kaneda, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 430,422, Nov. 2, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 803,910
Claims priority, application Japan, Nov. 5, 1988, 63-280029; Dec. 23, 1988, 63-326472
Int. Cl.[5] G09G 1/28
U.S. Cl. 340—784 21 Claims



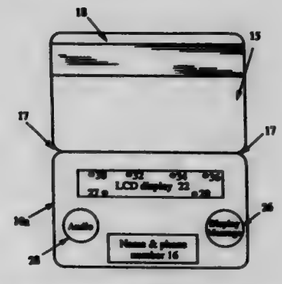
1. A device for driving a color liquid crystal display panel, the display panel including at least a plurality of color pixels arranged in a matrix of rows and columns according to a predetermined color order and a plurality of source lines, each of which is connected to one column of the plurality of color pixels having the same color, the plurality of source lines being divided into at least first and second groups, and each of the first and second groups being further divided into first and second sub-groups, said device comprising:
signal transmitting means for transmitting a signal to each of said plurality of source lines, said signal transmitting means includes first source drive means and second source drive means provided corresponding to said first and second groups of said source lines, respectively, and each of said first and second source drive means including a first driver provided corresponding to said first sub-group and a second driver corresponding to said second sub-group, said first driver and second driver being activated alternately for latching a color signal supplied thereto;
first signal supply means and second signal supply means provided corresponding to said first and second source drive means, respectively, for supplying color signals to the corresponding source drive means,
each of said first and second signal supply means including
input converting means for receiving a plurality of types of analog color signals of a plurality of different colors supplied in parallel and for converting the plurality of types of analog color signals to a serial digital data train, including the plurality of types of color signals arranged in a color order corresponding to the color order defined by the source lines of the corresponding group, and
a plurality of storing means for storing an output of said first converting means according to an address, each said storing means including a first area for storing data to be transmitted to said first sub-group and a second area for storing data to be transmitted to said second sub-group;
writing means for successively writing data into the first and second areas of each of said storing means at sequential addresses;
reading means for successively reading the stored data from a first of said storing means, said reading means including alternate reading means for reading the data alternately from said first area and said second area, said reading means and said one of said plurality of storing means and reading data from another of said plurality of storing means to produce a high speed signal supply means; and
output converting means for converting a serial data train read from said reading means to analog signals and transmitting the analog signals to the corresponding source drive means, said analog converting means including second converting means for converting said thus read serial data train to parallel analog signals for each respective color and outputting the parallel analog signals.

5,192,946
DIGITIZED COLOR VIDEO DISPLAY SYSTEM
E. Earle Thompson, Dallas, and Thomas W. DeMond, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 315,633, Feb. 27, 1989, abandoned. This application May 30, 1991, Ser. No. 711,495
Int. Cl.[5] G09G 3/34
U.S. Cl. 340—794 60 Claims

1. A color visual display system comprising:
(a) a plurality of light beams, with at least some of said beams being centered about different frequencies, time ordered in a sequence during a first time period less than the critical flicker frequency for the human eye with each light beam within said sequence being generally directed along an optical path for a second time period less than said first time period; and
(b) a plurality of individually controllable elements, each located along said optical path to have impinged thereon a predetermined portion of each said light beam, each said element switchable between a first state and a second state in a time period less than or equal to said second time period and allowing substantially all of said predetermined portion of said light beams to impinge at a predetermined location on a surface during said first state and not allowing said predetermined portion to impinge on said surface during said second state.

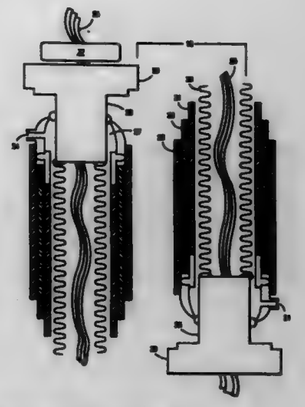


5,192,947
CREDIT CARD PAGER APPARATUS
Simon Nenstein, 415 East 64th St.-Apt. 1C, New York, N.Y. 10021
Filed Feb. 2, 1990, Ser. No. 473,885
Int. Cl.[5] H04Q 7/00
U.S. Cl. 340—825.44 33 Claims



1. A disposable credit card pager apparatus, comprising:
paging circuit means, indicator means coupled to said paging circuit means, said paging circuit means receiving paging signals directed to it from a remote transmitter location and in response thereto activating said indicator means to the holder of the apparatus;
housing means in the shape and size of a credit card and constructed for utilization in a standard credit card reader;
account identification means containing account identification information and located on said housing means for credit card usage in a standard credit card reader by the holder of the apparatus;
processing means in said housing means associated with the account identification means for processing information received from the paging signals;
a thin flat battery in said housing means, said indicator means, said paging circuit means and said processing means being integrated with as well as energized by said thin flat battery, and
wherein said housing means comprises a hingeable flap portion thinner than the rest of said housing means, said account identification information being on said thinner flap portion to thereby permit the hingeable flap portion to conform to ANSI credit card standards.

5,192,948
GEOPHONE BOREHOLE CABLE
William H. Troyer, Colleyville, and Victor L. Schoepf, Carrollton, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 4, 1991, Ser. No. 787,469
Int. Cl.[5] G01V 1/00
U.S. Cl. 340—855.1 34 Claims



1. A borehole cable, comprising:
a) a plurality of modules,
b) a plurality of cable conduits interconnecting said modules at spaced-apart positions to form said borehole cable, said cable conduits being capable of contraction and expansion due to external pressure and temperature changes during borehole operations, each of said conduits comprising:
i) an inner core of flexible, corrugated tubing which compresses longitudinally under continuous external pressure applied by a subsurface formation surrounding a borehole in which said cable is deployed, and
ii) an outer wall of interlock completely surrounding said inner core, which is flexible under atmospheric pressure on the surface of the earth and compresses longitudinally without change in radial dimension along with the longitudinal compression of said inner core under the continuous external pressure applied by said subsurface formation to lock and form a rigid outer cable wall to prevent any further compression of said inner core during cable deployment in said borehole.

5,192,949
DIGITAL DATA TRANSMISSION SYSTEM HAVING ERROR DETECTING AND CORRECTING FUNCTION
Hideto Suzuki; Yoshikuni Kurosu, and Shinji Aoki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 30, 1990, Ser. No. 575,377
Claims priority, application Japan, Aug. 31, 1989, 1-225855
Int. Cl.[5] H03M 7/14
U.S. Cl. 341—68 19 Claims

1. In an information transmission system for coding n-bit information data in the form of an NRZL code into m-bit coded data such that each of said information data corresponds to only one of said coded data which are all different from one another, n being greater than 2 and m being greater than n, NRZI converting said m-bit coded data such that m-bit coded data having a codeword digital sum (CDS) which does not have the same polarity as a digital sum variation (DSV) of previously NRZI converted m-bit coded data is selected as a next NRZI conversion input to limit the DSV of the NRZI

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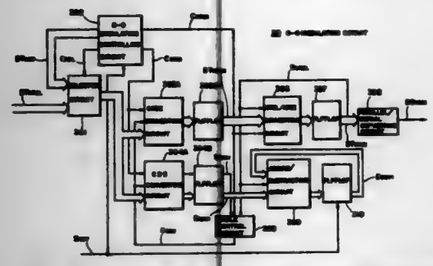
converted signal, and transmitting the thus NRZI converted coded data, the combination of:

first controlling means for generating a control signal to control NRZI conversion of said m-bit coded data and for generating a mode signal;

code generating means for generating identification data having a predetermined data pattern corresponding to said n-bit information data and for outputting said identification data and said m-bit coded data obtained by coding of said n-bit information data in response to said mode signal and a coding control signal;

CDS generating means for generating a CDS corresponding to said identification data and m-bit coded data output by said code generating means in response to said mode signal and the coding control signal;

NRZI converting means responsive to said control signal from said first controlling means for outputting the identification data obtained from said code generating means as



they are without NRZI converting the same and for executing NRZI conversion of said m-bit coded data outputted from said code generating means using an initial value determined by a conversion initial value signal;

latching means for latching the last bit of the identification data outputted from said NRZI converting means and providing the latched bit as said conversion initial value signal;

DSV detecting means for detecting a current DSV corresponding to an output signal of said NRZI converting means in response to said conversion initial value signal and a DSV immediately preceding said current DSV; and

second controlling means for generating said coding control signal in response to said control signal from said first controlling means, said identification data and m-bit coded data output from said CDS generating means, said conversion initial value signal and the detected current DSV from said DSV detecting means to limit the DSV of the output signal of said NRZI converting means.

5,192,950

PARTIAL WORD TO FULL WORD PARALLEL DATA SHIFTER

William H. Stephenson, Jr., Raleigh, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

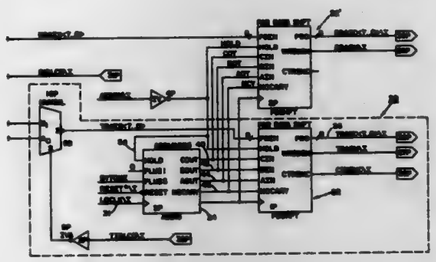
Filed Dec. 16, 1991, Ser. No. 808,533
Int. Cl.[5] H03M 7/00
U.S. Cl. 341—100 10 Claims

1. A partial word to full word parallel data shifter so as to convert incoming parallel data containing zero to N data bits into output data of N data bits, comprising:

A) means, under control of a selection signal, for selectively receiving bits from the incoming parallel data and selectively receiving remainder bits of data and for outputting the selectively received data in 2N−1 parallel bits;

B) means for receiving the 2N−1 bits from the selective receiving means for outputting N parallel data bits and for outputting up to N−1 remainder bits to the selective receiving means, said means for receiving 2N−1 bits including means for causing the output bits to be recirculated as remainder bits if a NOCARRY signal is enabled; and

C) means for adding the number of remainder bits to the number of data bits of the current incoming parallel data



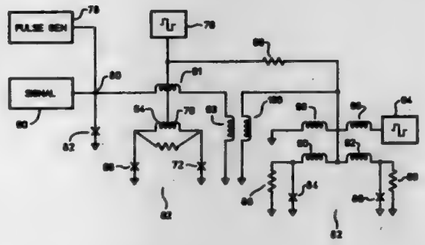
so as to generate an enabled NOCARRY signal if said addition is less than N, and for generating a selection signal based upon said addition for controlling the received bits of the selective receiving means.

5,192,951

ANALOG-TO-DIGITAL CONVERTER CIRCUITS AND METHODS USING SUPERCONDUCTIVE ELEMENTS

Herbert L. Ko, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 22, 1991, Ser. No. 796,276
Int. Cl.[5] H03M 1/34
U.S. Cl. 341—133 14 Claims



1. An apparatus for converting an analog input signal to a digital signal comprising:

input means for inputting an analog signal;

comparator means for comparing the analog signal with at least one predetermined threshold, said comparator means including first means for quantizing flux;

output means for outputting a digital signal proportional to a value of said analog value in response to said comparison;

feedback means for compensating variations in the comparator means; and

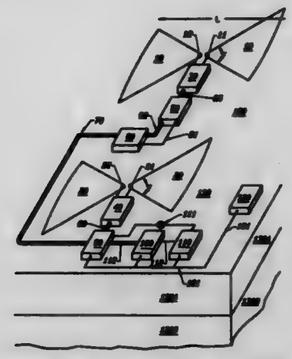
feedback enabling means for selectively enabling said feedback means to establish an equilibrium state within said comparator means.

5,192,952

METHOD AND APPARATUS FOR TRANSMITTING ELECTROMAGNETIC SIGNALS INTO THE EARTH FROM A CAPACITOR

J. Ralph Johler, 16796 W. 74th Pl., Golden, Colo. 80403-7916

Filed Jan. 11, 1991, Ser. No. 713,955
Int. Cl.[5] G01S 13/04; G01V 3/12, 3/38
U.S. Cl. 342—22 21 Claims



1. A method for transmitting an electromagnetic signal through an earth formation, including the steps of:

(a) disposing capacitor plates having a largest dimension L, in direct contact with the earth formation to form an earth capacitor comprising the plates and a region of the earth formation near the plates;

(b) applying a short voltage pulse across the capacitor plates to transmit electromagnetic radiation into the earth formation, wherein for each frequency component of the electromagnetic radiation, the largest dimension L satisifies the relation $Re[kL]<1$, where k is the wavenumber in the earth formation of said frequency component, wherein the short voltage pulse has frequency components in a broad band extending from below 1 MHz to above 100 MHz;

(c) detecting electromagnetic radiation that has propagated through the earth formation in response to application of the short voltage pulse; and

(d) processing only frequency components of the detected electromagnetic radiation, in a frequency window having an upper frequency less than 25 MHz, which have propagated into the earth formation to a penetration depth much greater than on the order of several hundred feet to image the earth formation.

5,192,953

PAVEMENT STRUCTURE EXAMINATION VEHICLE

Hiroshi Tomita, Tokyo, Japan, assignor to Geo Search Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1991, Ser. No. 787,012
Claims priority, application Japan, Nov. 6, 1990, 2-300299
Int. Cl.[5] G01V 3/12; E21B 7/02
U.S. Cl. 342—22 4 Claims

1. A pavement structure examination vehicle comprising:

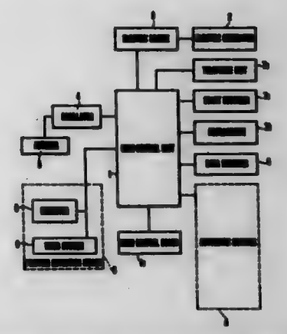
a vehicle body of a rear gate type having a rear door which rotates vertically to open and close;

underground radar means attached to said body vertically movable relative to the direction of traveling for providing observation data;

a stand for a boring operation removably attached to said door;

position detection means for detecting the distance covered by said vehicle and for recording visual images of an area surrounding said vehicle;

a radar system comprising underground radar control means for controlling said underground radar means and observation data recording means for recording said observation data of said underground radar means, said radar system recording in said data recording means information of the distance covered by said vehicle provided by



said position detection means, together with said observation data of said underground radar means; and

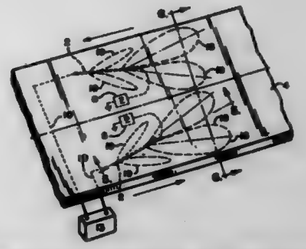
an image processing system for photographing a surface of an inner circumferential wall of a bored hole and for processing images thus photographed.

5,192,954

ROADWAY ANTENNAE

William K. Brockelsby; Conrad M. B. Walker; Michael H. Hryciuk, and Donald P. Gillis, all of Edmonton, Canada, assignors to Mark IV Transportation Products Corporation, Niles, Ill.

Continuation-in-part of Ser. No. 446,234, Dec. 5, 1989, which is a continuation-in-part of Ser. No. 383,169, Jul. 20, 1989, Pat. No. 4,937,581, which is a continuation of Ser. No. 195,400, May 13, 1988, Pat. No. 4,870,419, which is a continuation of Ser. No. 661,712, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 536,010, Sep. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 234,570, Feb. 13, 1981, abandoned. This application Mar. 8, 1991, Ser. No. 666,257
Int. Cl.[5] G01S 13/74
U.S. Cl. 342—42 17 Claims



1. An antenna array embedded in the surface of a bi-directional multi-lane roadway having predetermined land widths for establishing radio frequency communication between a roadside interrogator and a transponder mounted on the underside of a vehicle moving along one of said roadway lanes comprising:

a plurality of radiating elements each having an associated electromagnetic field, said elements generally disposed in said roadway pavement and configured to generate an electromagnetic field alternating at a predetermined frequency, said field defining a transponder capture zone along and above said roadway lane and extending across

said lane width for communicating with said transponder; and,

interrogator output means supplying alternating current at said frequency to said radiating elements.

5,192,955

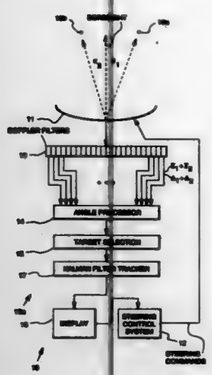
INDIVIDUAL TARGET ANGLE MEASUREMENTS IN A MULTIPLE-TARGET ENVIRONMENT

Bao N. Hoang, Laguna Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 25, 1991, Ser. No. 765,346

Int. Cl.[5] G01S *13/44*

U.S. Cl. 342—90 **7 Claims**



1. A method of tracking a selected target in a multiple-target environment using a radar system, said method comprising the steps of:

receiving sum (Σ) and difference (Δ) signals indicative of respective directions of a plurality of targets;

processing composite sum and difference signals from output energy of two adjacent Doppler filters of a single target's frequency spectrum of the targets to decompose the sum and difference signals into respective individual components (Σ_1, Δ_1, and Σ_2, Δ_2);

processing the individual components (Σ_1, Δ_1, and Σ_2, Δ_2) of the sum and difference signals to compute respective angle signals indicative of the relative angular direction (ϵ_1, ϵ_2) to each of the respective targets;

determining a number of targets in the multiple-target environment;

selecting a target for tracking;

maintaining a stable track on a selected target using a Kalman filter tracker; and

displaying the selected target.

5,192,956

CASCADED COMPLEMENTARY PHASE CODE COMPRESSOR

Henry E. Lee, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1991, Ser. No. 790,909

Int. Cl.[5] G01S *7/288, 13/30*

U.S. Cl. 342—204 **3 Claims**

1. A code decoder, comprising:

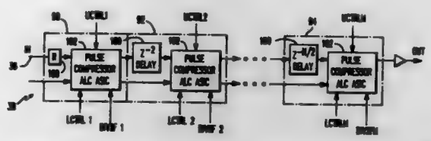
input means for receiving a phase code signal; and

decoding means for performing bidirectional crossover cascade compression of the complementary phase code signal, wherein when said code has a length of N, where N is a positive integer, said decoding means comprises $\log_2 N$ decoding stages,

wherein each of said stages includes a stage number K from 1 to $\log_2 N$ and comprises:

first and second input paths;

a delay unit connected to said first input path and providing a delay of 2^{k-1} time units;



an adder connected to said delay unit and said second input path; and

an adder/subtracter connected to said delay unit and said second input path.

5,192,957

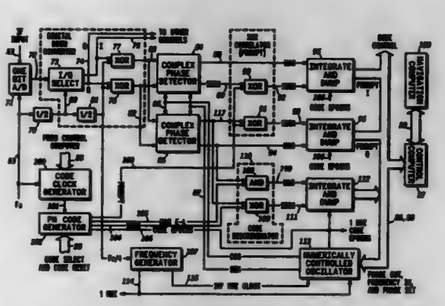
SEQUENCER FOR A SHARED CHANNEL GLOBAL POSITIONING SYSTEM RECEIVER

Howard L. Kennedy, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1991, Ser. No. 724,261

Int. Cl.[5] H04B *7/185*; G01S *5/02*

U.S. Cl. 342—357 **32 Claims**



1. A shared channel Global Positioning System (GPS) receiver for receiving a plurality of coded satellite signals from a plurality of satellites, said signals exhibiting Doppler shifting, said GPS receiver comprising:

means for converting said coded satellite signals to intermediate frequency signals;

A/D means coupled to said means for converting, said A/D means for simultaneously translating said intermediate frequency signals for said plurality of coded satellite signals to a plurality of digital signals;

correlation means coupled to said A/D means, said correlation means for simultaneously separating each of said plurality of digital signals corresponding to each said satellite to provide channel information signals for each said satellite;

channel means coupled to said correlation means, said channel means for estimating a plurality of parameters describing each satellite's expected position and an expected frequency of transmission of said coded satellite signals including Doppler compensation for each of said plurality of said satellites on a time division multiplexed basis; and

processor means coupled to said correlation means and to said channel means, said processor means for retrieving information transmitted from each of said satellites in response to channel information signals.

5,192,958

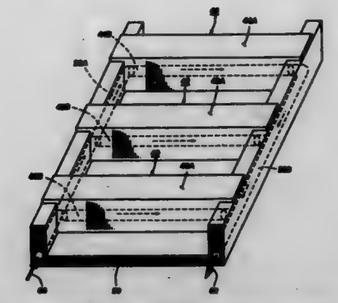
METHOD AND APPARATUS TO CONTROL OVERALL WRITE LENGTH IN LED PRINT BARS

George A. Charnitski, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 9, 1991, Ser. No. 773,793

Int. Cl.[5] G01D *9/42*

U.S. Cl. 346—107 R **5 Claims**



1. An image printer for forming images at a photosensitive surface, moving in a process direction comprising:

a plurality of image print bars aligned parallel to each other and perpendicular to the process direction, each print bar including at least an LED array,

a manifold subframe adapted to securely mount said arrays in said parallel and perpendicular alignment, said subframe having apertures therethrough for circulating a cooling medium through said subframe and through the interior of said arrays, said circulating media maintaining said arrays and said subframe at the same temperature.

5,192,959

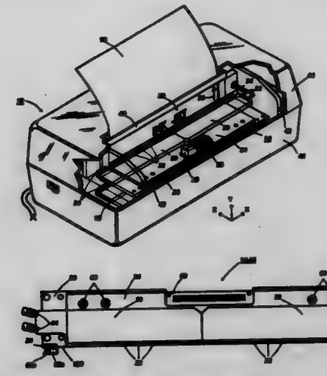
ALIGNMENT OF PAGEWIDTH BARS

Donald J. Drake, Rochester; Ivan Rezanka, Pittsford, and Fredrick A. Warner, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 3, 1991, Ser. No. 709,255

Int. Cl.[5] B41J *2/155*

U.S. Cl. 346—140 R **23 Claims**



1. An apparatus having a large area semiconductive device which is positioned to operate with respect to a target, said semiconductive device being formed by linear placement of functional sub-units, each functional sub-unit having a planar semiconductive substrate with an array of active elements, and supporting circuitry on a first surface thereof, said functional sub-units having been divided from a larger semiconductive wafer, comprising:

a reference plate;

a plurality of said functional sub-units affixed to said reference plate to form a linear array of sub-units thereon;

at least two locating sub-units affixed on opposite ends of said reference plate to form alignment pads thereon; and

means, located within the apparatus, for receiving said alignment pads in order to align said reference plate and the affixed linear array of sub-units in at least one dimension with respect to the target wherein the first surface of the functional sub-units is unobstructed by the receiving means.

5,192,960

GLASSES FOR STEREOSCOPIC VIEWING

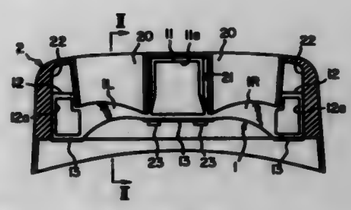
Toshio Komamura, Tokyo, Japan, assignor to Yugen Kaisha Semasha, Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 672,434

Claims priority, application Japan, Mar. 22, 1990, 2-29229[U]

Int. Cl.[5] G02C *13/00*

U.S. Cl. 351—41 **3 Claims**



2. Stereoscopic glasses comprising:

an integral lens body having a left lens and a right lens;

said left lens and said right lens each having a front convex surface and a rear concave surface; and

a lens frame having upper and lower halved portions between which said lens body is positioned and held.

5,192,961

REFLECTING ILLUMINATION TYPE PROJECTING DEVICE

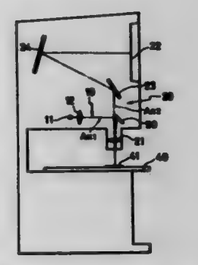
Kazushi Yoshida; Ryota Ogawa, and Tetsuya Abe, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 383,879, Jul. 21, 1989, abandoned. This application Apr. 25, 1991, Ser. No. 691,673

Claims priority, application Japan, Jul. 22, 1988, 63-183099; Jan. 13, 1989, 1-6786; May 26, 1989, 1-133260; Jun. 19, 1989, 1-157578

Int. Cl.[5] G03B *21/28, 21/08*

U.S. Cl. 353—66 **74 Claims**



1. A reflecting illumination projecting device, comprising:

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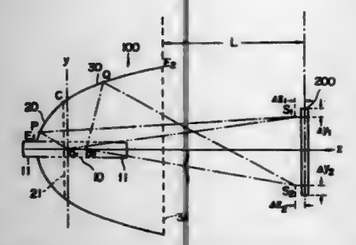
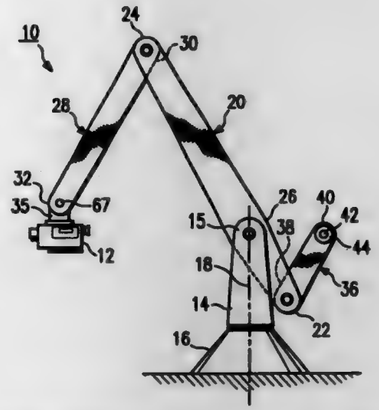
a projecting lens having an optical axis intersecting an object to be tested;
a light source portion for illuminating said object through said projecting lens;
a surface onto which an image of said object is projected by light that is reflected from said object and which passes through said projecting lens; and
an optical path separating element disposed in substantially at an exit pupil of said projecting lens, said optical path separating element being formed with a total reflecting mirror portion for reflecting substantially all illumination light or reflected light, said optical path separating element having a transmitting portion for transmitting a remaining light, thereby making said illuminating light incident to said projecting lens and guiding said reflected light towards said surface.

5,192,962
CONVERGING REFLECTOR AND LIQUID CRYSTAL DISPLAY DEVICE
Masami Nishida; Masataka Izawa, and Kunimoto Tsuchiya, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 29, 1992, Ser. No. 706,538
Claims priority, application Japan, May 29, 1990, 2-139396; Oct. 25, 1990, 2-288211
Int. Cl.[5] G03B *21/14*; F21V *7/12*
U.S. Cl. 353—98 **15 Claims**



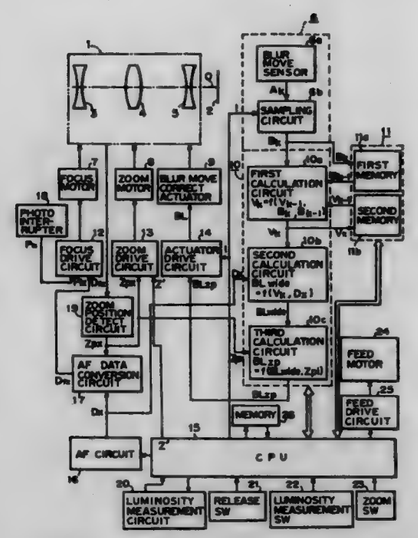
6. A liquid crystal display device, comprising:
a converging reflector with a linear light source having two end points positioned with a predetermined space therebetween;
a first reflection surface having a curvature so that one of the two end points forms one focal point, and a second reflection surface arranged adjacently to said first reflection surface and having a second curvature so that a second of the two end points forms one focal point; and
a liquid crystal panel for selectively passing a light reflected from said converging reflector,
wherein a contact point of said first and second reflection surfaces is positioned in the vicinity of a plane which is perpendicular to an optical axis of light reflected from said converging reflector onto said liquid crystal panel, and which passes through said one of said two end points of the linear light source, and
wherein other focal points of said first and second reflection surfaces are positioned between said light source and a plane of convergent projection of said liquid crystal panel, in a position relatively closer to said plane of convergent projection of said liquid crystal panel than said light source and inwardly of first and second ends of said plane of convergent projection of said liquid crystal panel, respectively.

5,192,963
CAMERA SUSPENSION APPARATUS
Kenneth R. Hill, 517 Sunset Ave., Dallas, Tex. 75208
Filed Jun. 12, 1991, Ser. No. 713,790
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—81 **15 Claims**



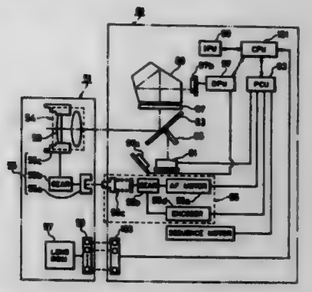
1. Camera suspension apparatus supported on a base, comprising:
a yoke rotatably mounted on the base for rotation about a vertical axis, the yoke including a pair of parallel-spaced structural members;
a primary lever arm having first and second ends and a medial portion pivotably mounted on the yoke to form a fulcrum, the primary lever arm including a pair of parallel-spaced structural members;
a counterweight arm having first and second ends, the first end of the counterweight arm pivotally attached to the first end of the primary lever arm;
each of the structural members of the primary lever arm including an opening in the first end thereof and wherein the first end of the counterweight arm is pivotally attached to the first end of the primary lever arm in a first support means comprising:
a high torque insert supported in each opening in the first end of the primary lever arm;
a cross member extending across the spaced structural members of the first end of the primary lever arm;
a bearing supported on the cross member; and
a bearing carrier attached to the bearing for rotation therewith, the bearing carrier for supporting the first end of the counterweight arm;
a secondary arm having first and second ends, the first end of the secondary arm pivotally attached to the second end of the primary lever arm, the secondary arm including a pair of parallel-spaced structural members;
means for supporting a camera from the second end of the secondary arm;
balance means including first and second sprockets mounted on the bearing carrier of the first support means, the balance means responsive to pivoting of the secondary arm about the second end of the primary lever arm in a first direction for pivoting the counterweight arm about the first end of the primary lever arm in a second opposed direction; and
level means for maintaining the camera level relative to the base as the secondary arm is pivoted about the second end of the primary lever arm.

5,192,964
CAMERA HAVING BLURRING MOVEMENT CORRECTION MECHANISM
Junichi Shinohara, Yokohama; Yoshimi Ohno, Kawasaki; Yoshio Seritawa, Ageo, and Tohru Nishida, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Mar. 4, 1992, Ser. No. 847,759
Claims priority, application Japan, Mar. 4, 1991, 3-61068; Mar. 4, 1991, 3-61069; Mar. 6, 1991, 3-63685; Nov. 30, 1991, 3-342441
Int. Cl.[5] G03B *5/00*
U.S. Cl. 354—202 **12 Claims**



1. A camera having blurring movement correction mechanism comprising:
a blurring movement correction optical element disposed in an optical path of a photo-taking optical system so as to correct shift of an image formed on a film surface caused by movement of hands holding a camera body;
a blurring movement correction actuator for moving said optical element in a necessary direction for correcting said shift of the image on the film surface;
a blurring movement detection unit for obtaining a blurring movement detection data by converting said blurring movement of said camera body to an electric signal;
a first memory means for temporarily registering said detection data output from said detection unit;
a calculation means for calculating blurring movement correction data for correcting said shift of the image formed on the film surface caused by movement of hands holding the camera body by actuating said optical element by said actuator; and
a second memory means for temporarily registering an output data of calculation from said calculation means,
said calculation means being so constructed that said blurring movement correction data is predictively calculated on the basis of said detection data of this time obtained from said detection unit, said detection data of the preceding time registered in said first memory means and said correction data of the preceding time registered in said second memory means so as to correct said shift of the image formed on the film surface by actuating said optical element by said actuator.

5,192,965
AUTOMATIC FOCUSING DEVICE
Nobuo Suzuki, and Shigeo Toji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan
Continuation of Ser. No. 542,607, Jun. 25, 1990, abandoned, which is a continuation of Ser. No. 364,505, Jun. 9, 1989, Pat. No. 4,952,962, which is a continuation of Ser. No. 143,905, Jan. 11, 1988, abandoned. This application May 5, 1992, Ser. No. 879,125
Claims priority, application Japan, Jan. 9, 1987, 62-1537[U]; Jan. 10, 1987, 62-2049[U]
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—400 **14 Claims**



1. An automatic focusing device comprising:
a lens system including a focusing lens;
drive means for driving said focusing lens to a focused position relative to an object;
a first means for calculating an amount of defocusing for the object;
a second means for determining whether the calculated amount of defocusing of said first means is effective in controlling said drive means;
a third means for detecting a power source voltage for said drive means; and
a first comparator for comparing the detected power source voltage of said third means with a reference voltage;
wherein said drive means drives said focusing lens to the focused position according to a DC mode of operation when said second means determines that the calculated amount of defocusing is not effective in controlling said drive means and said first comparator determines that the detected power source voltage is less than said reference voltage.

5,192,966
AUTOMATIC FOCUS CONTROL DEVICE
Masataka Hamada, Minamikawachi; Tokuji Ishida, Daito; Kenji Ishihashi, Sakai; Nobuyuki Taniguchi, Nishinomiya, and Hiroshi Ootsuka, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 741,785, Aug. 6, 1991, which is a division of Ser. No. 508,274, Apr. 11, 1990, Pat. No. 5,040,015, which is a division of Ser. No. 374,590, Jun. 28, 1989, Pat. No. 4,924,250, which is a continuation of Ser. No. 247,079, Sep. 20, 1988, abandoned, which is a division of Ser. No. 32,738, Mar. 30, 1987, Pat. No. 4,816,856. This application Jun. 22, 1992, Ser. No. 901,797
Claims priority, application Japan, Mar. 31, 1986, 61-74580
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—402 **8 Claims**

1. An automatic focusing device of a camera, comprising:
means for repeatedly detecting a focus state of a photographing lens of said camera to repeatedly produce a focus signal representative of the detected focus state;
means for setting a first predetermined time;
means for foreseeing an in-focus position of said photographing lens after said predetermined time has passed, and for

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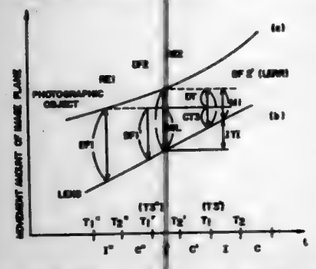
calculating a lens shifting value which is necessary for brining said photographing lens into its in-focus position after said first predetermined time has passed on the basis of a result of a past focus signal and the predetermined time;

means for setting a second predetermined time in accordance with said lens shifting value calculated by said foreseeing and calculating means;



means for calculating a resultant lens shifting value on the basis of a result of the past focus signal and the second predetermined time, and

means for driving said photographing lens in accordance with said resultant lens shifting value calculated by said calculating means.

5,192,967

Patent Not Issued For This Number

5,192,968

PHOTOMETER

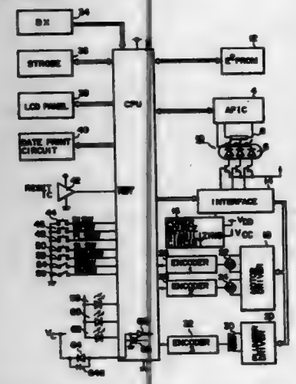
Kenichi Kishida; Atsushi Maruyama, and Akira Watanabe, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1991, Ser. No. 790,478

Claims priority, application Japan, Nov. 14, 1990, 2-309910

Int. Cl.[5] G03B 7/08; G01J 1/46; H01J 40/14

U.S. Cl. 354—410 13 Claims



1. A photometer for a camera, comprising:

a CPU having an input/output port connected to an N-MOS type open drain transistor with its source grounded and to a C-MOS type input circuit for inverting an input voltage with a value higher than a predetermined threshold value and outputting the inverted voltage;

a photodiode, having a cathode and an anode, for outputting a photoelectric current corresponding to an incident light amount, said anode being connected to said input/output port, said cathode being connected to a power source; and

a capacitor connected externally in parallel to said photodiode or constituted equivalently in said photodiode,

wherein, for carrying out a photometric operation, said CPU includes:

charging means for turning on said transistor and charging said capacitor up to a predetermined potential;

discharging means for turning off said transistor, after the charging, and releasing the charge in said capacitor by means of said photoelectric current;

counting means for counting a time from the turning-off of the transistor to the inversion of the output of the C-MOS type input circuit; and

luminance detecting means for detecting the luminance of an object on the basis of the count value of the counting means.

5,192,969

STEREOGRAPHIC PROJECTING AND RECORDING METHOD AND APPARATUS THEREFOR

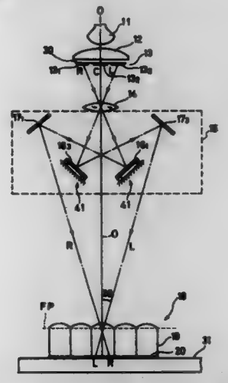
Shunkichi Igarashi, Tokyo, and Seiichi Taguchi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1992, Ser. No. 858,652

Claims priority, application Japan, Mar. 29, 1991, 3-67260; Apr. 19, 1991, 3-88037; May 29, 1991, 3-125715; Aug. 13, 1991, 3-203044

Int. Cl.[5] G03B 27/32, 35/14

U.S. Cl. 355—22 37 Claims



1. A stereographic projecting method by which a plurality of original images from at least three different viewpoints are projected as a plurality of linear picture elements onto a projection medium through a plurality of lenticular lenses of a lenticular sheet, comprising the steps of:

launching beams of light from the respective original images into a single projection lens;

separating the beams of transmitted light for the respective original images in a mirror optical assembly consisting of mirror units each composed of at least two mirrors for each original image;

adjusting optical pathlengths of the respective beams to said projection medium by means of said mirror optical assembly; and

allowing said beams to be incident on lenticular lenses at predetermined angles of projection so that they are imaged as linear picture elements on said projection medium, whereby the original images from at least three viewpoints are projected simultaneously onto said projection medium.

5,192,970

METHOD AND ARRANGEMENT FOR COPYING FILMSTRIPS

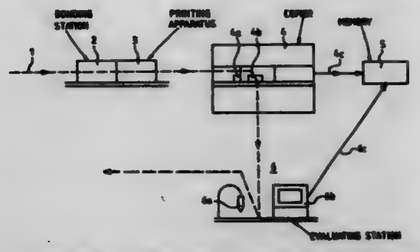
Günter Findeis, Sauerlach; Wilhelm Nitsch, München; Hans-Juergen Raab, Straubing-Haidlfing; Wolfgang Zahn; Helmut Treiber, both of München, and Hans-Georg Schindler, Holzkirchen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 760,018

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1990, 4031022

Int. Cl.[5] G03B 27/52

U.S. Cl. 355—41 18 Claims



1. A method of copying one or more masters of a strip of masters, comprising the steps of connecting said strip to a band so that the band extends by said masters; providing said band with an identification code for each of said masters at a location related to the position of the respective master; deriving base data relating to the optimum amount of copy light for each of said masters; storing the identification code for each of said masters in a memory together with the base data for the respective master; reading out from the memory the stored base data for at least one selected master using the respective code on the band and the corresponding code in the memory; and making a copy of the selected master using the respective base data.

5,192,971

IMAGE FORMING APPARATUS WITH IMAGE FORMING INTERRUPTION CAPABILITIES

Katsuichi Sasimizu, Hoya; Osamu Sawamura, Atsugi; Shunichi Masuda, Tokyo; Masahiro Tomosada, Kawasaki, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 280,497, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 28,025, Mar. 17, 1987, Pat. No. 4,816,868, which is a continuation of Ser. No. 604,924, Apr. 27, 1984, abandoned, which is a continuation of Ser. No. 329,019, Dec. 9, 1981, abandoned, which is a continuation of Ser. No. 882,626, Mar. 1, 1978, Pat. No. 4,314,754. This application Feb. 7, 1990, Ser. No. 477,113

Claims priority, application Japan, Mar. 2, 1977, 52-22982

Int. Cl.[5] G03G 21/00, 15/04

U.S. Cl. 355—206 22 Claims

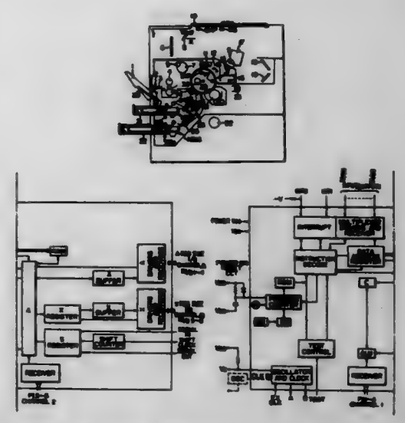
1. An image processing apparatus comprising:

processing means for forming an image on a recording medium, said processing means performing an adjustment operation after termination of the image forming operation;

input means for inputting a start instruction of image formation; and

control means comprising a program memory for storing a program for sequence-controlling said processing means and a program for monitoring an abnormality, and further comprising a data memory capable of storing data associated with the image formation for controlling said processing means and for monitoring the abnormality on the basis of data stored in said data memory,

wherein, in the event that a start instruction is entered at said input means while said processing means performs the adjustment operation after termination of the image forming operation, said control means is operable to cause data indicating entry of the start instruction to be set to said data memory, and wherein, in a first mode where an abnormality is not detected, said control means is operable to cause said processing means to perform a new image



forming operation, without entry of a new start instruction, if the data indicating entry of the start instruction is set to said data memory, and in a second mode where an abnormality is detected, said control means is operable to cause said processing means to be inhibited from performing a new image forming operation, even if the data indicating entry of the start instruction is set to said data memory.

5,192,972

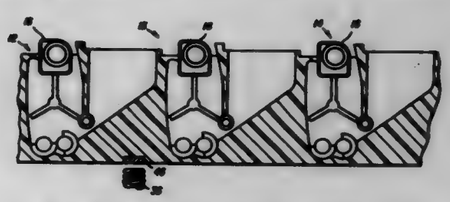
DEVELOPER MIX MONITORING FOR COLOR DEVELOPER STATIONS

Arthur S. Kroll, and Wunan Chang, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,677

Int. Cl.[5] G03G 21/00

U.S. Cl. 355—208 20 Claims



1. An electrostatographic machine comprising:

at least one development unit having a chamber containing a developer mixture of carrier particles and toner particles in a predetermined desired concentration;

monitor means for producing a signal representative of the concentration of toner particles in the developer mixture in the chamber;

means, independent of said developer mixture, for simulating to said monitor means an environmentally stable predetermined toner concentration such that said monitor means produces a signal having a value corresponding to the predetermined toner concentration; and

means for comparing the value of the signal corresponding

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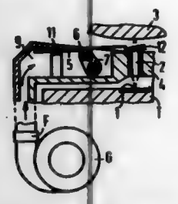
to the predetermined toner concentration to a stored base value to produce an indication of the calibration of the monitor means.

5,192,973

COVERING AND CLEANING DEVICE FOR THE OPTICAL CHARACTER GENERATOR IN AN ELECTROPHOTOGRAPHIC PRINTING DEVICE

Gerhard Hickisch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/DE88/00117, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO87/02162, PCT Pub. Date Apr. 9, 1987
PCT Filed Mar. 4, 1988, Ser. No. 473,950
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728663
Int. Cl.[5] G03G *21/00, 15/04*
U.S. Cl. 355—215 8 Claims



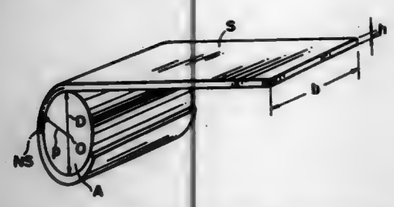
1. A character generator for a printing device operating according to the principle of electrophotography, said character generator comprising the following features:
- a plurality of light-emitting elements having light exit regions at a surface of the character generator and being arranged on a carrier part;
- a covering and cleaning device for said light exit region of said light-emitting elements of said character generator; and
- wherein said covering and cleaning device is fashioned such that it covers said light exit region when said character generator is in an idle condition in order to prevent the penetration of contaminating particles, and exposes and cleans said light exit region when said character operator is in an operating condition.

5,192,974

CONTRACT CHARGER

Akihito Ikegawa, Sakai; Masaki Asano, Amagasaki; Shuji Iino, Hirakata, and Izumi Ozawa, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1992, Ser. No. 827,337
Claims priority, application Japan, Feb. 6, 1991, 3-015461
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—219 13 Claims



1. A contact charger for charging an electrostatic latent image bearing member having a surface, comprising:
- a support member;
- a flexible film supported at a side end portion by the support member and having a free end portion adapted to contact the surface of the electrostatic latent image bearing member, said film having a bending moment M defined by the following formula,

$$0.001\ (g.cm) \leq M \leq 20(g.cm),$$

$$M = EI/\rho$$

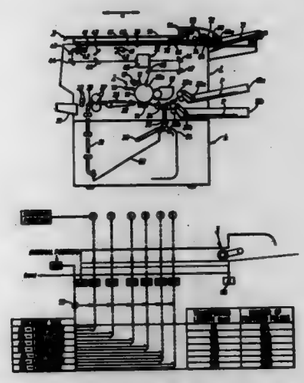
wherein E is Young's modulus (g/cm^2) of the film, I is the second moment of area (cm^4) of the film and ρ is a radius of curvature (cm) of the film when the film is curved; and
- a power source for applying a charging voltage to the film to charge the surface of the electrostatic latent image bearing member.

5,192,975

IMAGE FORMING APPARATUS WITH AN IMAGE SCANNING APPARATUS AND AN AUTOMATIC DOCUMENT FEEDER

Fumito Ide, and Noriyuki Nomura, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 24, 1991, Ser. No. 718,409
Claims priority, application Japan, Jun. 25, 1990, 2-166324
Int. Cl.[5] G02G *15/04*
U.S. Cl. 355—235 9 Claims



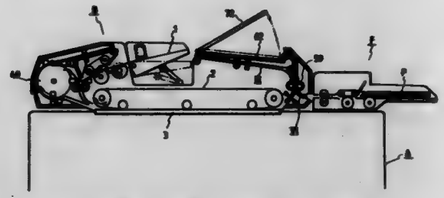
1. An image forming apparatus, comprising:
- a platen on which a document having an image is placed:
- means for positioning a first end of the document on the platen:
- means for detecting a position of a second end different from the first end of the document positioned by the positioning means on the platen;
- means for scanning the image of the document from a starting position of the second end detected by the detecting means; and
- means for forming an image on an image bearing member, the image formed corresponding to the image scanned by the scanning means.

5,192,976

SHEET ORIGINAL FEEDING APPARATUS WITH DETACHABLE AUXILIARY FEEDER

Tadayuki Kitajima, Yokohama; Masataka Naito, Kawasaki; Noriyoshi Ueda, Yokohama; Katsuaki Hirai; Takashi Honjo, both of Kawasaki; Yuji Morishige, Yokohama, and Akimaro Yoshida, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 868,328, Apr. 14, 1992, abandoned, which is a continuation of Ser. No. 610,045, Nov. 5, 1990, Pat. No. 5,132,741. This application Aug. 3, 1992, Ser. No. 921,615
Claims priority, application Japan, Nov. 5, 1989, 1-287741; Nov. 5, 1989, 1-287742; Nov. 5, 1989, 1-287743; Nov. 5, 1989, 1-287744
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—309 7 Claims



2. A sheet original feeding apparatus, comprising:
- a sheet original stacking tray on which sheet originals to be treated are stacked as an original stack;
- a sheet original separating means for separating and supplying the sheet original one by one from the original stack stacked on said sheet original stacking tray;
- a sheet original feeding path for directing the sheet original separated by said sheet original separating means;
- a sheet original feeding means for feeding the sheet original directed by said original feeding path to an image reading portion;
- a sheet original ejecting path for ejecting the sheet original fed by said sheet original feeding means to said sheet original stacking tray; and
- an auxiliary sheet original feeding apparatus which can be connected to said sheet original ejecting path, and wherein, when said auxiliary sheet original feeding apparatus is connected, said sheet original ejecting path serves as a bypass for directing the sheet original from said auxiliary sheet original feeding apparatus to said sheet original stacking tray.

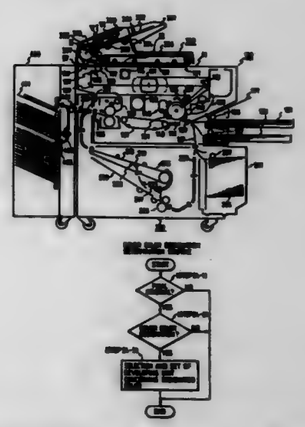
5,192,977

MULTI-COLOR IMAGE FORMING APPARATUS

Tokuharu Kaneko, Yokohama; Miho Nakayama, Tokyo; Masanori Miyata, Yokohama; Takeshi Honjo, Kawasaki; Hideki Adachi, Kawasaki, and Toshiya Kanazawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 321,840, Mar. 10, 1989, Pat. No. 5,079,598. This application Oct. 15, 1991, Ser. No. 775,769
Claims priority, application Japan, Mar. 14, 1988, 63-059660; Mar. 14, 1988, 63-059661; Mar. 14, 1988, 63-059662; Mar. 14, 1988, 63-059663; Mar. 14, 1988, 63-059664; Mar. 14, 1988, 63-059665
Int. Cl.[5] G03G *15/00, 15/01*
U.S. Cl. 355—313 9 Claims

1. An image forming apparatus comprising:
- feeding means for feeding originals;
- image forming means for forming images of the originals fed by said feeding means on recording sheets with a first color or a second color;
- selection means for selecting a specific mode in which a cover sheet is prepared; and
- control means for controlling said image forming means in such a manner that when the specific mode is selected by said selection means, an image of a specific one of the originals fed by said feeding means is formed with the first color, and images of the other originals are formed with the second color.

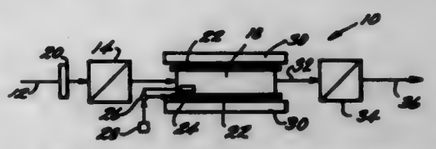


5,192,978

APPARATUS AND METHOD FOR REDUCING SOLAR NOISE IN IMAGING LIDAR, UNDERWATER COMMUNICATIONS AND LIDAR BATHYMETRY SYSTEMS

R. Norris Keeler, McLean, Va., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Sep. 17, 1991, Ser. No. 761,065
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—5 48 Claims



1. A light imaging system for detection and ranging of a volume in water, comprising:
- laser transmitter means for providing a transmitted light beam, said transmitted light beam comprising a plurality of short pulses of light of a first selected wavelength;
- expanding optics means for expanding said transmitted light beam and projecting an expanded light beam at said volume in water wherein said expanded light beam is reflected back from said volume generating a return light beam;
- collecting optics means for collecting said return light beam and providing a collected light beam;
- dividing means for dividing said collected light beam into first and second divided light beams;
- first filter means for filtering said first divided light beam, said filter means rejecting substantially all wavelengths other than said first selected wavelength, said first filter means providing a first filtered light beam;
- second filter means for filtering said second divided light beam, said second filter means rejecting substantially all wavelengths other than said first selected wavelength, said second filter means providing a second filtered light beam;

recombining means for recombining said first and second filtered light beams to provide a combined light beam; and detector means for detecting said combined light beam.

5,192,979

METHOD AND APPARATUS FOR RECOGNIZING AND IDENTIFYING TARGETS

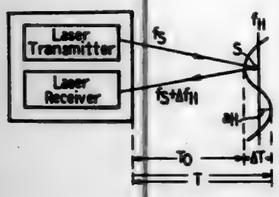
Ludger Grage, Eichenau; Wolfgang Kranz, Munich, and Gerhard Brunner, Eching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 796,352, Sep. 18, 1985, abandoned. This application Feb. 7, 1991, Ser. No. 652,374

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435295

Int. Cl.[5] G01S *13/00*; G01P *3/36*; H04B *10/00*

U.S. Cl. 356—28.5 **15 Claims**



1. A method using laser detecting and identifying targets on the basis of radar principles, comprising the steps of:

(a) generating a laser beam as a carrier exclusively having a fixed frequency f_{LO};

(b) shifting the carrier with an intermediate frequency f_{ZF} to obtain a further laser beam including the frequencies f_{LO} and f_{ZF};

(c) transmitting the further laser beam from a transmitter and illuminating a target having a surface in continuous vibration independently of said further laser beam with the further laser beam causing the production, due to the continuous, independent vibration of said surface, of at least one frequency f_H producing a frequency-modulated spectrum Δf_H in a reflected laser beam;

(d) receiving the reflected laser beam having a carrier frequency $f-f_{LO}+F_{ZF}$ and the frequency-modulated spectrum Δf_H;

(e) mixing the received reflected laser beam with the carrier frequency f_{LO} to obtain a modulation spectrum at the intermediate frequency f_{ZF}; and

(f) modulating the remaining frequency signal to remove the intermediate frequency f_{ZF} to provide a target signal having the frequency f_H of the vibrating surface for identification of the target.

5,192,980

APPARATUS AND METHOD FOR METHOD FOR SPATIALLY- AND SPECTRALLY-RESOLVED MEASUREMENTS

Arthur E. Dixon, 41 Lane Crescent, Kitchener, Ontario, Canada N2K 1P2 ; Savvas Damaskinos, Kitchener, and John W. Bowron, Waterloo, both of Canada, assignors to A. E. Dixon, Waterloo, Canada

Filed Jun. 26, 1991, Ser. No. 721,282

Claims priority, application United Kingdom, Jun. 27, 1990, 9014263

Int. Cl.[5] G01J *3/18*, *3/26*; G01N *21/64*

U.S. Cl. 356—326 **8 Claims**

1. A confocal scanning beam optical microscope for spectrally-resolved measurements comprising

means for supporting a specimen to be observed and measured,

an illumination source producing a light beam directed along an optical path toward said specimen,

means for focusing the light beam to a diffraction-limited spot in a prescribed specimen plane,

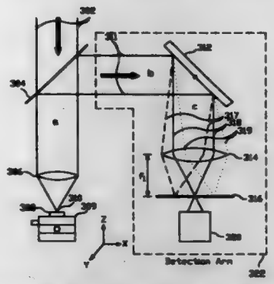
means for scanning the light beam to move the diffraction-limited spot in a predetermined scan pattern on said specimen plane,

a detection arm receiving light reflected, scattered or emitted from said diffraction-limited spot in said specimen plane comprising

a pinhole and a focusing lens for obtaining a focal point for confocal detection of the light returning from said specimen,

a detector placed behind said pinhole,

means for spectrally resolving said reflected, scattered or



emitted light passing from said specimen back toward said focusing lens, pinhole and detector,

a beamsplitter reflecting light returning from said specimen into said detection arm,

wherein said spectrally-resolving means in said detection arm is selected from the group consisting of diffraction gratings and prisms that can be rotated to direct light of various wavelengths towards said focusing lens, whereby the diffraction-limited spot at the specimen acts like the entrance aperture of an integrated monochromator, and the pinhole in front of the detector acts like its exit aperture,

means for measuring the intensity distribution with respect to wavelength of said reflected, scattered or emitted light.

5,192,981

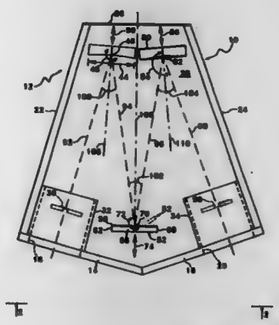
CZERNY-TURNER MONOCHROMATOR

Warren S. Slutter, Dunellen; Joseph Marcovecchio, Berkeley Heights; Robert E. Heinz, Piscataway, and David A. Kolb, Old Bridge, all of N.J., assignors to Spex Industries, Inc., Edison, N.J.

Filed Apr. 30, 1990, Ser. No. 516,784

Int. Cl.[5] G01J *3/18*

U.S. Cl. 356—334 **7 Claims**



1. In a monochromator of the Czerny-Turner type including

an entrance slit, a collimating mirror for receiving light output by said entrance slit, a planar grating for receiving light reflected by said collimating mirror, a focusing mirror for receiving light reflected by said grating, and an exit slit for receiving light focused by said focusing mirror, light generally proceeding along an optical axis which defines a plane, from said entrance slit to said collimating mirror, from said collimating mirror to said grating, from said grating to said focusing mirror and from said focusing mirror to said exit slit, the improvement comprising a toroidal collimating mirror in combination with a spherical focusing mirror, wherein the tangential focal length of said toroidal mirror substantially equals the focal length of said spherical mirror, the sagittal focal length of said toroidal mirror being less than the focal length of said spherical mirror and said sagittal focal length is measured in a plane perpendicular to the plane defined by the optical axis of the monochromator, wherein the angle of incidence with respect to the angle of reflection of the optical axis of the monochromator at the toroidal mirror is generally about 23.7 degrees and the difference between the angle of incidence and angle of reflection of the optical axis at the spherical mirror is generally about 28.2 degrees.

5,192,982

CODED-FRINGE INTERFEROMETRIC METHOD AND DEVICE FOR WAVEFRONT DETECTION IN OPTICS

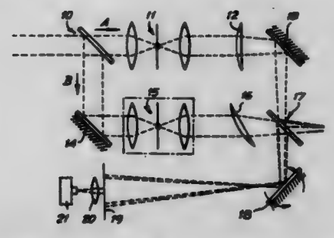
Antonio Lapucci, Florence, Italy, assignor to Office Galileo S.P.A., Florence, Italy

Filed Apr. 11, 1991, Ser. No. 684,690

Claims priority, application Italy, Apr. 13, 1990, 9367 A/90

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—345 **17 Claims**



1. A method for detection of a wavefront of a beam, the method comprising the steps of:

providing a Mach-Zehnder interferometric configuration;

constructing a different special carrier frequency for each y value in an intensity function I(x,y);

frequency coding phase information of a plurality of transverse profiles in said special carrier frequency of fringes present in said intensity function I(x,y);

acquiring a signal representing a section of said intensity function I(x,y) parallel to an x axis; and

processing a low frequency portion of said signal, said low frequency portion being centered around a special carrier frequency, said processing using Fourier analysis techniques in order to reconstruct a phase of the beam and thus detect the wavefront of the beam.

5,192,983

APPARATUS FOR AND METHOD OF CHECKING EXTERNAL APPEARANCE OF SOLDERING STATE

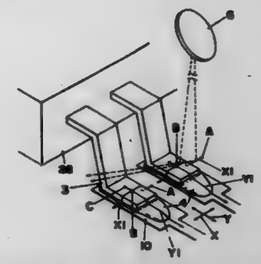
Nobufumi Tokura, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 13, 1990, Ser. No. 626,051

Claims priority, application Japan, Dec. 19, 1989, 1-330754; Oct. 9, 1990, 2-271094

Int. Cl.[5] G01B *11/24*; G01N *21/00*

U.S. Cl. 356—376 **6 Claims**



1. A method of checking an external appearance of a soldering fillet; comprising the steps of scanning a laser beam on one of a plurality of leads extended sideways from a mold member of an electronic component mounted on a circuit board, in a direction traversing the lead, and receiving the laser beam reflected by the lead, thereby to detect a widthwise center of the lead by light receiving means, scanning the laser beam in an extended direction of the lead so as to pass through the detected center of the lead and thereby to project the laser beam on the solder fillet, and receiving resulting reflected light by light receiving means which is disposed at a position above the lead and saiant a direction intersecting orthogonally to the extended direction of the lead, so as to measure a shape of a solder fillet.

5,192,984

APPARATUS AND METHOD FOR DETERMINATION OF CONCENTRATIONS

Gary R. Beecher, Laurel; David L. Kemper, Silver Spring, and John E. Jordan, Germantown, all of Md., assignors to Environmental Analytical Systems, Inc., Elkridge, Md.

Filed Dec. 19, 1990, Ser. No. 630,087

Int. Cl.[5] G01N *21/01*

U.S. Cl. 356—433 **9 Claims**

1. A method for determining the concentration of a substance in a sample comprising the steps of:

a. providing a sample containing an unknown amount of a substance,

b. providing a volume of carrier fluid,

c. providing a stirred dilution chamber with a magnet located therein,

d. providing an electromagnetic coil located adjacent said stirred dilution chamber,

e. providing an electromagnetic coil activating circuit connected to said electromagnetic coil for providing electronic pulses to said coil,

f. providing a detector for detecting the presence of said substance,

g. activating said electromagnetic coil activating circuit to provide electronic pulses to said coil to activate coil to cause stirring of the magnet in said stirred dilution chamber,

h. diluting said sample in a volume of carrier fluid in said stirred dilution chamber,

i. detecting the initial presence of said substance in said carrier fluid through the use of said detector,

j. detecting the subsequent lack of presence of said substance in said carrier fluid through the use of said detector, and

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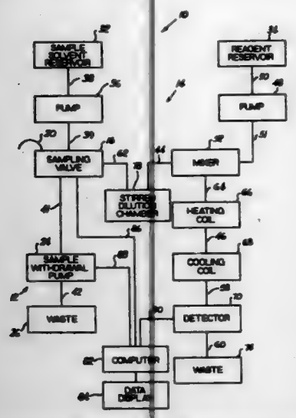
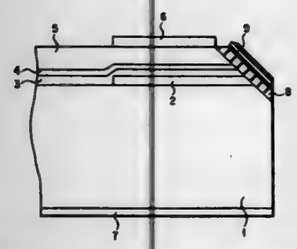
k. determining the elapsed time form said detection of the initial presence of said substance through the use of said detector and said detection of the subsequent lack of



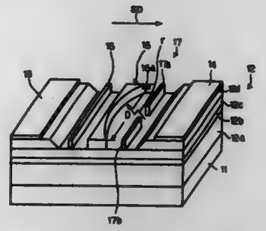
presence of said substance through the use of said detector to determine the concentration of the substance in said sample.

5,192,985
SEMICONDUCTOR LIGHT-EMITTING ELEMENT WITH LIGHT-SHIELDING FILM
Hirobisa Abe, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 13, 1992, Ser. No. 819,858
Claims priority, application Japan, Jan. 16, 1991, 3-3433
Int. Cl.[5] H01L *33/00*
U.S. Cl. 257—13 **1 Claim**



1. A semiconductor light-emitting element, characterized by comprising:
a current blocking layer formed in a predetermined position on one surface of a substrate;
a first cladding layer formed to cover said current blocking layer;
an active layer formed on said first cladding layer;
a second cladding layer formed on said active layer;
a first ohmic electrode formed in a predetermined position on said second cladding layer;
a second ohmic electrode formed on another surface of said substrate; and
a light-shielding film adhered to and electrically isolated from at least one side surface including an edge of said substrate, said current blocking layer, said first cladding layer, said active layer and second cladding layer.

5,192,986
HETEROJUNCTION FIELD EFFECT TRANSISTOR EQUIPPED WITH ELECTROSTATIC LENS FOR IMPROVING BALLISTIC PROPAGATION
Yuji Ando, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan
Filed Sep. 10, 1991, Ser. No. 757,297
Claims priority, application Japan, Sep. 17, 1990, 2-246598
Int. Cl.[5] H01L *29/80, 29/48, 29/161*
U.S. Cl. 257—192 **24 Claims**

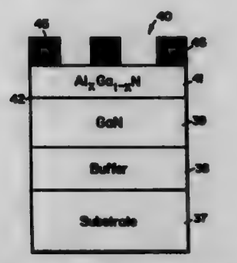


1. A heterojunction field effect transistor fabricated on a semi-insulating substrate, comprising:
a) an epitaxial structure having a channel forming layer of a first compound semiconductor material and a carrier supplying layer of a second compound semiconductor material;
b) source and drain electrodes provided on said epitaxial structure at spacing, and held in contact with said epitaxial structure in an ohmic manner;
c) a focusing gate electrode formed on said epitaxial structure between said source and drain electrodes, and operative to form an electrostatic lens in said channel forming layer, a focal distance of said electrostatic lens being variable depending upon a biasing voltage level at said focusing gate electrode;
d) an emitter gate electrode formed on said epitaxial structure between said source electrode and said focusing gate electrode, and operative to produce an abrupt potential discontinuity in the bottom edge of the conduction band of said first compound semiconductor material for producing hot carriers; and
e) a detecting gate electrode formed on said epitaxial structure between said focusing gate electrode and said drain electrode, and spaced apart from said emitter gate electrode by a predetermined distance equal to or less than a mean free path of carriers in said channel forming layer, the amount of said carriers passing through said detecting gate electrode to said drain electrode being varied depending upon said focal distance.

5,192,987
HIGH ELECTRON MOBILITY TRANSISTOR WITH GAN/$AL_xGA_{1-x}N$ HETEROJUNCTIONS
Muhammed A. Khan, White Bear Lake; James M. VanHove, Eagan; Jon N. Kuznia, Fridley, and Donald T. Olson, Circle Pines, all of Minn., assignors to APA Optics, Inc., Blaine, Minn.
Filed May 17, 1991, Ser. No. 701,792
Int. Cl.[5] H01L *29/80*
U.S. Cl. 257—183.1 **12 Claims**

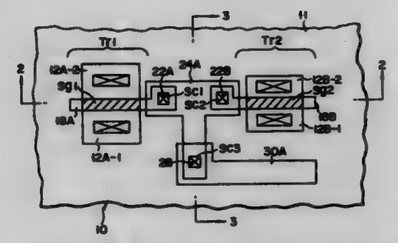
1. A transistor, comprising:
(a) a substrate;
(b) a buffer, the buffer being deposited on the substrate;
(c) a first active layer, the first active layer being composed essentially of GaN, the first active layer being deposited on the buffer;
(d) a second active layer, the second active layer being composed essentially of $Al_xGa_{1-x}N$, where x is greater than 0 and less than 1; and

(e) a plurality of electrical connections, the electrical connections residing on the second active layer, the plurality of electrical connections comprising:
(i) a source connection, the source connection residing on the second active region;
(ii) a gate connection, the gate connection residing on the second active region;



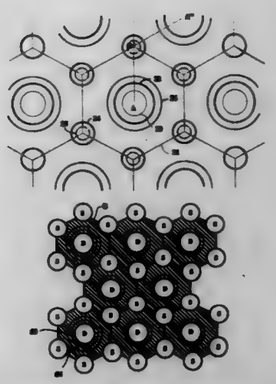
(iii) a drain connection, the drain connection residing on the second active region;
thereby permitting a difference of electrical potential to be applied to the second active region so as to permit operation as a transistor.

5,192,988
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE PRODUCED BY CHARGED-PARTICLE ETCHING
Ichiro Yoshii, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 11, 1991, Ser. No. 728,532
Claims priority, application Japan, Jul. 13, 1990, 2-186878
Int. Cl.[5] H01L *29/78, 29/10, 29/34, 29/06*
U.S. Cl. 257—774 **8 Claims**



1. A semiconductor integrated circuit device that has been formed on the basis of the design rules of 0.5 μm or less and undergone a process using charged particles, comprising:
a first insulating film;
a conducting layer formed on said first insulating film;
a second insulating film formed on said conducting layer; and
an opening made in said second insulating film so as to lead to said conducting layer; wherein
the relationship between the area S1 of said opening and the area S2 of said conducting layer is such as to meet the expression: $S1/S2 \leq 1.8$.

5,192,989
LATERAL DMOS FET DEVICE WITH REDUCED ON RESISTANCE
Tsutomu Matsushita; Teruyoshi Mihara; Masakatsu Hoshi, and Kenji Yao, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 27, 1990, Ser. No. 618,358
Claims priority, application Japan, Nov. 28, 1989, 1-306444; Mar. 8, 1990, 2-57578
Int. Cl.[5] H01L *29/78*
U.S. Cl. 257—342 **22 Claims**



1. A lateral DMOS FET device, comprising:
a cell structure formed by a plurality of unit cells, each of said unit cells including:
a source region of a first conduction type formed on one side of a substrate of said first conduction type;
a channel region of a second conduction type formed around the source region;
a plurality of drain contact regions of said first conduction type located around the channel region,
wherein the cell structure is formed in a hexagonal arrangement having hexagonal shaped cells, in which the drain contact regions are located on corners of a hexagonal outer form of each of said unit cells;
a source electrode, formed on said one side of the substrate, for connecting the source regions of the unit cells;
a gate electrode, formed on said one side of the substrate, over the channel regions of the unit cells; and
a drain electrode, formed on said one side of the substrate, for connecting the drain contact regions of the unit cells.

5,192,990
OUTPUT CIRCUIT FOR IMAGE SENSOR
Eric G. Stevens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 315,367, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 65,686, Jun. 23, 1987, abandoned, which is a continuation of Ser. No. 908,851, Sep. 18, 1986, abandoned. This application Jun. 17, 1991, Ser. No. 715,965
Int. Cl.[5] H01L *29/7, 29/10, 29/86*
U.S. Cl. 257—229 **30 Claims**

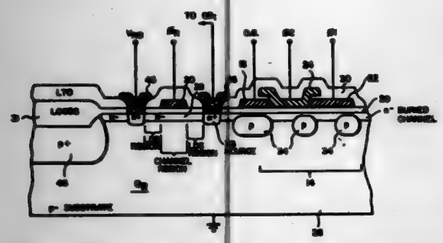
1. An output circuit for sequentially receiving charge and converting such charge collected in photoelements of an image sensor into an output signal which contains noise, said circuit comprising:
a. a first MOS transistor having a gate electrode, a channel region under the gate electrode, and source and drain electrodes, said source electrode having a highly doped region spaced from the channel region and a more lightly doped region between the highly doped region and the

a substrate of a first conductivity type and a first impurity

and having a second side defining an outer surface of said

channel region to provide a floating diffusion with reduced capacitance;

b. means for selectively applying pulses to the gate electrode of said first transistor to reset the potential across said floating diffusion and prepare it to receive charge produced in a photoelement; and



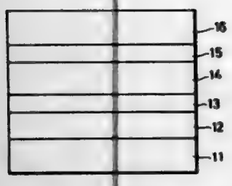
c. an output source-follower amplifier having a second transistor, a gate of which is electrically connected to said floating diffusion, whereby said amplifier produces a change in output voltage in response to charge collected in said floating diffusion with an improved signal to noise ratio.

5,192,991

CRYSTALLIZED POLYCRYSTALLINE SEMICONDUCTOR DEVICE

Makoto Hosokawa, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Sep. 24, 1991, Ser. No. 764,324
Claims priority, application Japan, Sep. 25, 1990, 2-254515
Int. Cl.[5] H01L *27/14*
U.S. Cl. 257—51 12 Claims



1. A semiconductor device comprising:

a substrate; and

a polycrystalline semiconductor film provided on said substrate,

wherein said substrate is made from a material having the property of contracting at substantially the same percentage as said semiconductor film, said contraction being caused by thermal treatment for crystallization of said semiconductor film.

5,192,992

BICMOS DEVICE AND MANUFACTURING METHOD THEREOF

Myung S. Kim, Seoul; Jong G. Kim, and Hyun S. Kim, both of Kyungki, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 18, 1991, Ser. No. 794,739
Claims priority, application Rep. of Korea, Jun. 27, 1991, 91-10768
Int. Cl.[5] H01L *27/02, 21/265*
U.S. Cl. 257—370 12 Claims

1. A BICMOS device comprising:

a first MOS transistor including first conductive-type second and sixth regions formed on a first part of a first conductive-type semiconductor substrate;

second conductive-type source and drain regions formed on said sixth region, separated by a channel region;

a gate including first and second polysilicon layers and a first metal silicide layer, formed on said channel region after growth of a gate oxide, and metal electrodes on said gate, source, and drain regions;

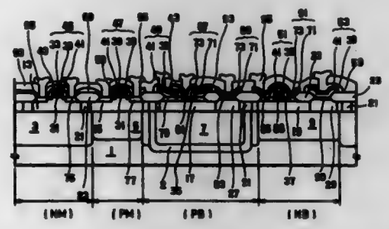
a second MOS transistor formed on second conductive-type third and seventh regions on a second part of said first conductive-type semiconductor substrate, said second MOS transistor having first conductive-type source and drain regions and the same structure as said first MOS transistor;

a vertical first bipolar transistor including first conductive-type fourth and eighth regions formed on a third part of said semiconductor substrate;

a field oxide layer formed on said seventh region;

a first conductive-type collector region formed on one side of said field oxide layer, connected to said fourth region;

a second conductive-type intrinsic base region formed on the other side of said field oxide layer, second conductive-



type extrinsic base regions formed on both sides of said intrinsic base region;

a first conductive-type emitter region formed between said extrinsic base regions;

a base electrode including a second polysilicon layer and a first metal silicide layer, formed on said extrinsic base regions;

emitter and collector electrodes including a third polysilicon layer and a second metal silicide layer, formed respectively on said emitter and collector regions; and

metal electrodes formed on said emitter electrode, said base electrode, and said collector electrode; and

a second bipolar transistor including respective regions formed in second conductive-type fifth and ninth regions on a fourth part of said semiconductor substrate, which are of conductive-type opposite that of said vertical first bipolar transistor;

emitter and collector electrodes including said second polysilicon layer and said first metal silicide layer;

a base electrode including said third polysilicon layer and said second metal silicide layer; and

metal electrodes formed on said emitter electrode, said collector electrode, and said base electrode.

5,192,993

SEMICONDUCTOR DEVICE HAVING IMPROVED ELEMENT ISOLATION AREA

Takashi Arai; Nakafumi Inada, both of Yokohama, and Tsutomu Takahashi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

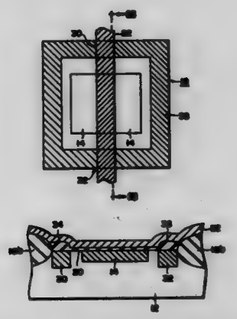
Continuation of Ser. No. 380,310, Jul. 17, 1989, abandoned. This application Oct. 23, 1990, Ser. No. 601,342
Claims priority, application Japan, Sep. 27, 1988, 63-241501
Int. Cl.[5] H01L *29/34*
U.S. Cl. 257—400 6 Claims

1. An electronic device having a high inversion threshold voltage, comprising:

a substrate of a first conductivity type and a first impurity concentration, having an upper surface portion;

a semiconductor portion of a second conductivity type disposed on the upper surface portion of said substrate, having an exposed surface;

guard ring means disposed on the upper surface portion of said substrate, having an exposed surface, defining an annulus around said semiconductor portion for isolating said semiconductor portion, including a first guard ring portion of said first conductivity type having a second impurity concentration greater than said first impurity concentration, and diametrically opposed second guard ring portions of said first conductivity type having a third impurity concentration greater than said second impurity



concentration for providing the high inversion threahold voltage;

a generally rectangular gate insulating film including a central portion having a first thickness overlaying and in contact with a portion of said exposed surface of said semiconductor portion, and end portions covering and in contact with said exposed surfaces of said diametrically opposed second guard ring portions of said guard ring means, having a second thickness greater than said first thickness; and

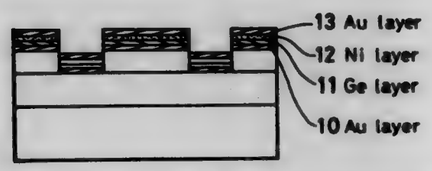
an interconnection layer overlaying said gate insulating film, intersecting said second guard ring portions of said guard ring means through said end portions of said gate insulating film.

5,192,994

AU-GE-NI OHMIC CONTACT FOR GA-AL-AS COMPOUND SEMICONDUCTOR

Toshihiko Ibuka, and Masahiro Noguchi, both of Ushiku, Japan, assignors to Mitsubishi Kasei Polytec Co. and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,756
Claims priority, application Japan, Aug. 30, 1989, 1-225903
Int. Cl.[5] H01L *23/54*
U.S. Cl. 257—766 7 Claims



1. An ohmic electrode for a $Ga_{1-x}Al_xAs$ ($0 \leq x \leq 1$) compound semiconductor, comprising:

an electrode material comprising Au, Ge and Ni, said electrode material having a first side at an interface between said ohmic electrode and said compound semiconductor and having a second side defining an outer surface of said ohmic electrode;

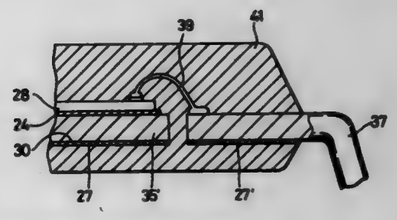
wherein said electrode material has a Ni content at said first side thereof at said interface between said ohmic electrode and said compound semiconductor of 20 wt % or less.

5,192,995

ELECTRIC DEVICE UTILIZING ANTI-OXIDATION FILM BETWEEN BASE PAD FOR SEMICONDUCTOR CHIP AND ORGANIC ENCAPSULATING MATERIAL

Shunpei Yamazaki, Tokyo; Kazuo Urata, Atsugi; Itaru Koyama, Hatano, and Naoki Hirose, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 392,581, Aug. 11, 1989, abandoned. This application Feb. 14, 1991, Ser. No. 655,032
Claims priority, application Japan, Aug. 26, 1988, 63-212886
The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.
Int. Cl.[5] H01L *23/48, 29/44, 29/52, 29/60*
U.S. Cl. 257—787 4 Claims



1. An electric device comprising:

a lead frame consisting of at least one lead and a base pad;

a semiconductor chip mounted on a surface of said base pad and electrically coupled with said lead; and

an enclosure made of an organic material enclosing said lead frame and said semiconductor device mounted thereon,

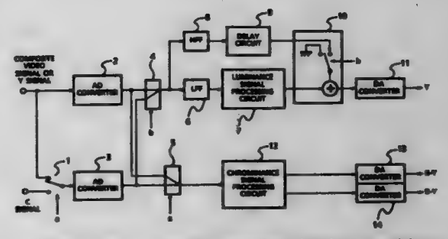
wherein an anti-oxidation film is formed at an interface between said base pad and said organic material.

5,192,996

VIDEO CHROMA SIGNAL PROCESSING CIRCUIT

Hirohiko Sakashita, Nara; Tetsuo Kutsuki, Toyonaka, and Naoji Okamura, Mino, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 5, 1991, Ser. No. 788,240
Int. Cl.[5] H04N *9/77*
U.S. Cl. 358—21 R 5 Claims



1. A video chroma signal processing circuit, comprising:

a first AD converter which receives an analog composite video signal and converts it into a digital code;

a second AD converter which receives said analog composite video signal, converts it into a digital code and per-

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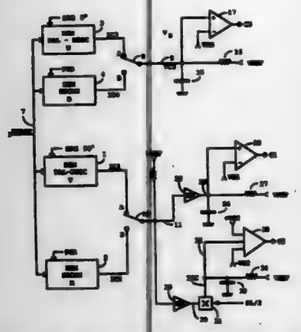
forms sampling in a phase reverse to that of said first AD converter;
a multiplexer circuit which receives the output signal of said first AD converter and the output signal of said second AD converter and outputs both output signals alternately at a speed two times as high as that of a sampling clock;
a low-pass filter which receives the output signal of said multiplexer circuit and passes frequencies not higher than one half of the sampling clock;
a luminance signal processing circuit which receives the output signal of said low-pass filter and performs luminance signal processing;
a high-pass filter circuit which receives the output of said multiplexer circuit, operates with a clock two times as high as the sampling clock and passes frequencies not lower than one half of the sampling clock;
a delay circuit which receives the output signal of said high-pass filter circuit and corrects the delay time of the luminance signal processing circuit;
an adding circuit which adds the output signal of said luminance signal processing circuit and the output signal of said delay circuit to each other;
a first DA converter which receives the output signal of said adding circuit and converts it into an analog signal with a clock two times as high as the sampling clock;
a chrominance signal processing circuit which receives the output signal of said first AD converter and converts a chroma signal into primary color signals of an R-Y signal and a b-Y signal; and
a second DA converter and a third DA converter which receive the output signals of said chrominance signal processing circuit and convert primary color signals of the R-Y signal and the B-Y signal in digital code into analog signals.

5,192,997

AUTOMATIC METHOD FOR IDENTIFYING A COLOR TV STANDARD

Michel Imbert, Seyssins, and Frédéric Lambert, Grenoble, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Feb. 5, 1991, Ser. No. 650,567
Claims priority, application France, Feb. 6, 1990, 90 01623
Int. Cl.[5] H04N 3/27
U.S. Cl. 358—21 R 3 Claims



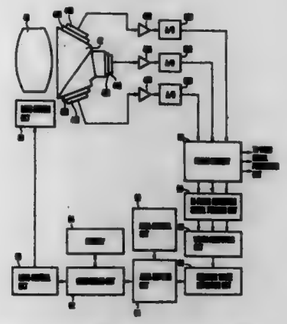
1. A method for automatically identifying the PAL or NTSC color TV standard comprising the following steps:
demodulating the chrominance signal bursts with the regenerated sub-carrier, 90°-phased with respect to said bursts, for providing a first demodulation signal;
demodulating the chrominance signal bursts with a signal at the reference frequency of one of the colors of the SECAM standard, for providing a second demodulation signal;
providing a first voltage by integrating in time the first demodulation signal, comparing this first voltage with a first predetermined threshold and providing a first logic criterion being at a first logic state if the first voltage is lower than the first threshold and at the other logic state otherwise; simultaneously applying the first demodulation signal to the input of a polarity inverter switched according to the rate of a non-half line-frequency phased signal, providing a second voltage by integrating in time the output signal of the polarity inverter, comparing the absolute value of the second voltage with a second predetermined threshold and providing a second logic criterion at the first logic state if the absolute value of the second voltage is lower than the second threshold and at the other logic state otherwise;
similarly providing, but from the second demodulation signal, the first logic criterion and the second logic criterion; and
identifying the standard received as being the PAL standard if, from the first demodulation signal, the first and second logic criteria are at said first and the other logic state, respectively, identifying the received standard as being the NTSC standard if, from the first demodulation signal, said first and second logic criteria are both at the first logic state and identifying the received standard as being the SECAM standard if, from the second demodulation signal, said first and second logic criteria are both at the other logic state.

5,192,998

IN-FOCUS DETECTING DEVICE

Jun Tokumitsu, Kanagawa; Minoru Yoshii, Tokyo; Shigeyuki Suda, Kanagawa, and Masayoshi Sekine, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 800,887, Nov. 27, 1991, , which is a continuation of Ser. No. 636,894, Jan. 2, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 902,548
Claims priority, application Japan, Jan. 5, 1990, 2-000257; Jan. 5, 1990, 2-000258
Int. Cl.[5] G02B 7/36; G03B 3/10; H04N 5/232, 9/64
U.S. Cl. 358—41 24 Claims



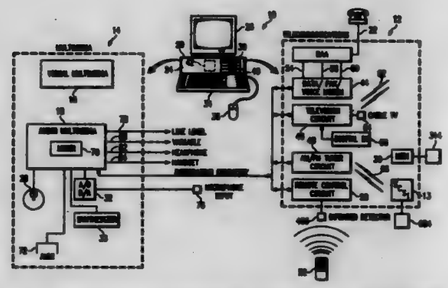
1. An in-focus detecting device comprising:
a) detecting means for detecting a width of a color transition area of a photographed object on the basis of color components of a video signal obtained from said color transition area; and
b) in-focus determining means for determining an in-focus state on the basis of an output of said detecting means.

5,192,999

MULTIPURPOSE COMPUTERIZED TELEVISION

Ronald B. Graczyk, Round Rock; James A. Glick, Granite Shoals, and Daniel K. Engberg, Cedar Park, all of Tex., assignors to Compaq Computer Corporation, Austin, Tex.

Filed Apr. 25, 1991, Ser. No. 691,377
Int. Cl.[5] H04N 7/14, 5/262
U.S. Cl. 358—85 40 Claims



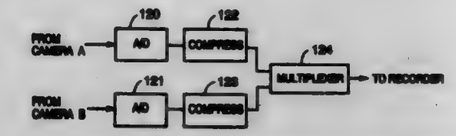
1. A multipurpose computerized television for generating a plurality of video images in association with a personal computer, comprising:
a computer, said computer comprising a computer chassis and a monitor;
a television circuit associated with said computer and within said chassis for receiving a plurality of television signals including broadcast television signals and directing said signals to said monitor for said monitor to display, said monitor operable to display said television signals on any portion of said monitor; and
control circuitry associated with said television circuit and said computer within said chassis for controlling the operation of said television circuit through said computer.

5,193,000

MULTIPLEXING TECHNIQUE FOR STEREOSCOPIC VIDEO SYSTEM

Lenny Lipton, Greenbrae; Lawrence D. Meyer, Mill Valley, and Frank K. Kramer, III, Los Gatos, all of Calif., assignors to StereoGraphics Corporation, San Rafael, Calif.

Filed Aug. 28, 1991, Ser. No. 751,883
Int. Cl.[5] H04N 13/00, 13/02, 13/04, 15/00
U.S. Cl. 358—92 33 Claims



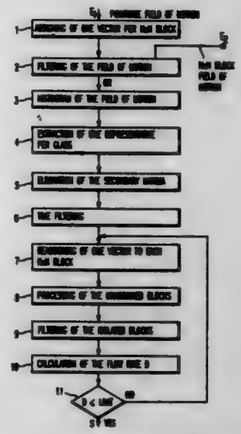
1. A method for time multiplexing a first video signal comprising horizontal lines and a second video signal comprising horizontal lines, including the steps of:
horizontally compressing the horizontal lines of the fist video signal to generate first compressed line signals;
horizontally compressing the horizontal lines of the second video signal to generate second compressed line signals; and
generating a multiplexed video signal comprising multiplexed line signals, wherein each of the multiplexed line signals consist of a first number of sample of one of the first compressed line signals concatenated with said first number of samples of one of the second compressed line signals.

5,193,001

METHOD OF SEGMENTING THE FIELD OF MOTION OF AN IMAGE AND ITS APPLICATION TO THE ENCODING OF VIDEO IMAGES

Michel Kerdranvrat, Rennes, France, assignor to Thomson Consumer Electronics, Courbevoie, France

PCT No. PCT/FR90/00461, § 371 Date Feb. 26, 1991, § 102(e) Date Feb. 26, 1991, PCT Pub. No. WO91/00577, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 22, 1990, Ser. No. 655,438
Claims priority, application France, Jun. 27, 1989, 8908547
Int. Cl.[5] H04N 7/18
U.S. Cl. 358—105 12 Claims



1. Method of segmenting the field of motion arising from an estimator of motion delivering, in the form of vectors with two components in the image plane, the displacement of pixels of an image relative to the preceding image, characterized in that it comprises:
a preliminary step of partitioning the image into blocks of n by n pixels and of assigning of a vector of motion chosen for each block from the possible vectors according to a majority criterion;
a step of setting-up of a histogram of the blockwise motion vectors at the termination of which a classifying of the motion vectors encountered is carried out according to their number of occurrences;
a step of reassigning of a motion vector for each of the blocks, the, reassigned vector being chosen from a limited number N of dominant vectors selected from the histogram, and being the vector, from these dominant vectors, closest to the initial vector of the block;
a step of determining isolated blocks which have motion vectors incoherent with those of the blocks of their neighbourhood and filtering the vectors of the isolated blocks having motion vectors incoherent with those of the blocks of their neighbourhood;
a step of calculating the flow rate necessary for the encoding of the resulting, filtered field of motion, and of verifying that this flow rate is less than or equal to a maximum possible flow rate, the step of reassigning of a motion vector for each of the blocks from a lower number or dominant vectors being taken up again when the flow is greater than the maximum possible flow rate.

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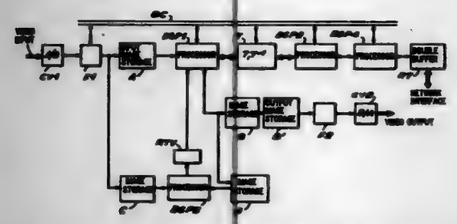
5,193,002

APPARATUS FOR THE CODING/DECODING OF IMAGE SIGNALS

Jacques Guichard, Paris, and Gérard Eude, Torcy, both of France, assignors to France Telecom Etablissement Autonome de Droit Public (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux, France

Filed Mar. 25, 1991, Ser. No. 674,142
Claims priority, application France, Mar. 26, 1990, 90 03817
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—133 8 Claims



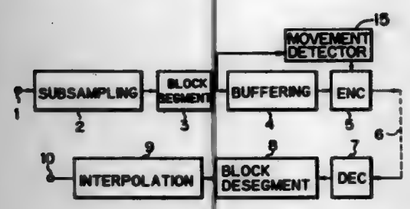
1. An apparatus for the coding-decoding of image signals by prediction transformation having means for coding the image signals to be transmitted and means for receiving and decoding remote image signals which are the transmitted image signals, said image signals being transmitted by means of a transmission network having a given speed, wherein the coding means comprise a coding loop for the images broken down into blocks and which has a coder incorporating transformation (T) and quantization (Q) means for coding the difference between each block of a local image and the corresponding block of a preceding local image and a decoder incorporating reverse transformation (T^{-1}) and reverse quantization (Q^{-1}) means for decoding each image block so as to reconstitute said blocks, so as to subtract the image blocks from image blocks of a following image, wherein the means for receiving and decoding the remote image signals are constituted by the decoder of the local image coding loop, said decoder thus ensuring the decoding of the local image blocks and the decoding of remote image blocks.

5,193,003

APPARATUS FOR DECODING DIGITAL VIDEO DATA WITH SMALL MEMORY REQUIREMENT

Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 563,921, Aug. 7, 1990. This application Apr. 15, 1992, Ser. No. 869,898
Claims priority, application Japan, Aug. 15, 1989, 1-210446
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—136 4 Claims



1. In combination, a coding apparatus for coding digital video data in a block format allowing compression of the video data representing a two dimensional group of picture elements belonging to a plurality of frames, the coding apparatus comprising:

sub-sampling means for sub-sampling picture elements in predetermined positions in each of a succession of frames, the phase being inverted between two continuous frames, to reduce the number of picture elements in each of the frames, thereby producing lines of thinned-out data with a picture element data in each line;

block segmentation means for arranging the picture elements of the thinned out data in time-sequential blocks, the block segmentation means including a two-line memory means and means for alternately writing a picture element data from each one of continuous pairs of lines of the thinned out data into the two-line memory means in a memory address pattern such that two successive picture element data are written in two contiguous memory addresses which are then followed by two contiguous memory addresses into which are written two successive picture element data from the next succeeding line of thinned out data, and reading out the data from the two-line memory means as block segmented data;

movement discriminating means for receiving the block segmented data and detecting movement in each block and generating a discriminating code indicative of detected movement; and

encoding the block segmented data and transmitting the discriminating code and the encoded block segmented data; and further including

a decoding apparatus comprising:

decoding means for receiving the encoded block segmented data and the discriminating code and decoding the encoded data to generate decoded block segmented data;

block desegmentation means connected to the decoding means for converting the decoded block segmented data into scanning picture element data;

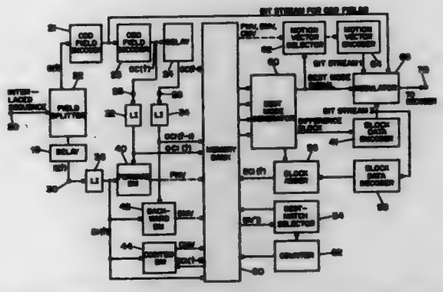
adaptive interpolation means connected to the block desegmentation means and supplied with the scanning picture element data, for performing spatial interpolation of the scanning picture element data, in accordance with the discriminating code, to reconstitute the original digital video data.

5,193,004

SYSTEMS AND METHODS FOR CODING EVEN FIELDS OF INTERLACED VIDEO SEQUENCES

Feng Ming Wang, and Dimitris Anastassiou, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,343
Int. Cl.[5] H04N 7/133
U.S. Cl. 358—136 45 Claims



1. A system, for multi-mode predictive interpolative coding of fields of video, comprising:

input means for coupling current and later fields of interlaced data, such fields including even fields having pixel data for line positions at which pixel data is omitted in prior and later odd fields;

separator means, coupled to said input means, for separating said even fields of data from said odd fields of data;

delayed coupling means, coupled to said separation means to receive odd fields of data, for providing past odd field data;

storage means for storing data and for providing past even field data from storage;

interpolation means, coupled to said separation means and delayed coupling means to receive current even, future odd and past odd fields of data, for deriving and coupling to said storage means enhanced fields of data corresponding to each of said fields of data and having estimated pixel data at omitted line positions;

block matching means, coupled to said interpolation means and storage means, for comparing said current even enhanced field data with each of said future odd and past odd enhanced fields and said past even field data to develop motion vector signals indicative of location of best matched blocks of future odd, past odd and past even data, and for coupling said motion-vector signals to said storage means;

comparator means, coupled to said storage means, for utilizing blocks of pixel data retrieved from said storage means in response to said motion vector signals for performing a plurality of mode comparisons of a block of current even pixel data with different ones of said best matched blocks alone or on an averaged basis for deriving a best mode signal representative of a single best mode block having the least error and deriving pixel error signals representing pixel by pixel errors in said bets mode block; and

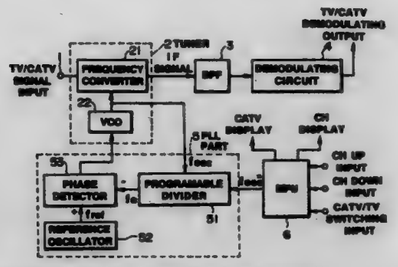
output means, coupled to said comparator means and separator means, for providing said pixel error signals, best matched block location signals based on motion vector signals corresponding to said best mode signal, and odd field pixel data signals for transmission for use by a decoder.

5,193,005

CHANNEL SELECTING APPARATUS HAVING A CHANNEL SKIP FUNCTION

Shigeru Tomita, Gunma, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 517,655, May 1, 1990, abandoned. This application Apr. 6, 1992, Ser. No. 863,533
Claims priority, application Japan, May 1, 1989, 1-112894
Int. Cl.[5] H04N 5/50
U.S. Cl. 358—191.1 16 Claims



4. A channel selecting apparatus comprising:

tuner means for mixing an input high frequency signal with a local oscillation signal controlled by a tuning voltage to provide an intermediate frequency signal representing a desired channel;

AFT detecting means for detecting a difference between a prescribed frequency and a frequency of the intermediate frequency signal when a frequency of the local oscillation signal is one of increased or decreased, the AFT detecting means outputting the difference as an AFT voltage;

controlling means for performing, in accordance with a channel-up or channel-down channel selecting operation, the functions of:

outputting data corresponding to local oscillation frequencies of the desired respective channels, said data corresponding to the local oscillation frequencies being output in accordance with the AFT voltage from the AFT detecting means,

preparing a tuning voltage in accordance with the data corresponding to the local oscillation frequencies,

controlling the local oscillation signal of the tuner means,

storing common channel selection inhibiting information indicating whether the controlling means is inhibited or permitted to select the respective desired channels at the time of a channel-up or channel-down channel selection, the common channel selection inhibiting information identifying a plurality of channels not allowed to exist simultaneously, and

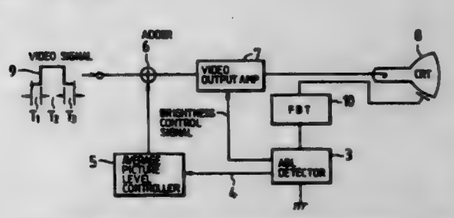
searching a frequency of a video carrier to determine a difference between the frequency of the video carrier and a frequency of a sound carrier of a lower adjacent channel and a difference between the video carrier frequency and a frequency of a color sub-carrier of a lower adjacent channel to determine whether the AFT voltage coincides with one of the sound carrier and the color sub-carrier and to determine whether the AFT voltage coincides with the video carrier, when the AFT coincides with one of the sound carrier and color sub-carrier, the video carrier is searched again until the AFT voltage is determined to coincide with the video carrier thereby identifying a frequency of the desired channel.

5,193,006

VIDEO DISPLAY APPARATUS FOR PICTURES WITH DIFFERENT ASPECT RATIOS

Eiichi Yamazaki, Ichihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,461
Claims priority, application Japan, Jan. 29, 1988, 63-17002; Jan. 29, 1988, 63-17003; Jan. 29, 1988, 63-17004
Int. Cl.[5] H04N 5/08, 7/08
U.S. Cl. 358—242 2 Claims



1. A video display apparatus for displaying pictures with different aspect ratios, comprising:

means for receiving a first video signal and a second video signal, the first and second video signals having different aspect ratios;

a picture display section for displaying a picture produced by one of the first and second video signals on a screen having fluorescent materials thereon; and

means for illuminating blank portions on the screen where no picture is displayed at a brightness level substantially equal to a picture mean luminance of a picture display portion when the second video signal is displayed on the display section, the blank portions being produced because of the difference in aspect ratio between the first and second video signals;

wherein the illuminating means includes means for continu-

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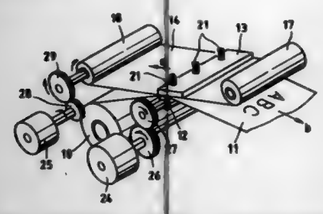
ously detecting a high-voltage mean current for driving the screen, and means responsive to the detecting means for obtaining a respective mean value of the continuously detected high-voltage mean current and for illuminating the blank portions at the brightness level substantially equal to the picture mean luminance in accordance with the mean value when the second video signal is displayed on the display section, the first video signal being a high-quality TV signal and the second video signal being a standard TV signal.

5,193,007

THERMAL TRANSFER RECORDING APPARATUS AND METHOD OF USE WITH PARTICULAR RELATIONSHIP BETWEEN RELATIVE CONVEYANCE DIRECTION, LENGTH, AND VELOCITY OF THE INK SHEET, RECORDING MEDIUM, AND IMAGE RECORDING

Minoru Yokoyama; Takashi Awai; Akihiro Tomoda, all of Yokohama; Yasushi Ishida, Tokyo; Hisao Terajima; Takeshi Ono, both of Yokohama; Takehiro Yoshida, Tokyo; Satoshi Wada, Kawasaki, and Makoto Kobayashi, Isana, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1989, Ser. No. 409,777
Claims priority, application Japan, Sep. 22, 1988, 63-236365
Int. Cl.[5] H04N *1/23*; G01D *15/10*; B41J *2/325, 33/36, 33/40*
U.S. Cl. 358—296 31 Claims



1. A thermal transfer recording apparatus for transferring ink of an ink sheet to a recording medium to thereby effect recording of an image on said recording medium, having:
an ink sheet loading portion for loading the ink sheet;
a recording medium loading portion for loading the recording medium;
recording means for acting on said ink sheet loaded into said ink sheet loading portion to effect recording of an image on said recording medium; and
conveying means for conveying said ink sheet loaded into said ink sheet loading portion in a direction opposite to a conveyance direction of said recording medium,
wherein recording of n lines is effected with said ink sheet remaining stopped, and after the recording, said ink sheet is conveyed by an amount smaller than n lines in the direction opposite to the conveyance direction of said recording medium.

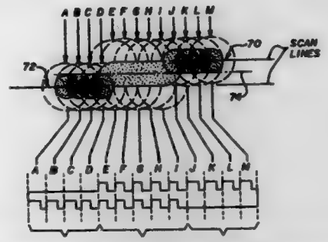
5. A thermal transfer recording apparatus for transferring ink of an ink sheet to a recording medium to thereby effect recording an image on said recording medium, said apparatus comprising:
a recording medium loading portion into which said recording medium is loaded;
an ink sheet recording medium loading portion into which said ink sheet is loaded;
recording means for acting on said ink sheet and effecting recording said image on said recording medium;
conveying means for said ink sheet and said recording medium so that a direction of recording said image on said recording medium is consistent with a direction of conveying said ink sheet; and
control means for causing said conveying means to convey said ink sheet and said recording medium by a same length to record said image of a predetermined length and control said conveying means to rewind said ink sheet by a length shorter than said predetermined length after recording by said predetermined length.

5,193,008

INTERLEAVING VERTICAL PIXELS IN RASTER-BASED LASER PRINTERS

Allen L. Frazier, Derby, and James S. Pierson, Augusta, both of Kans., assignors to DP-Tek, Inc., Wichita, Kans.

Filed Nov. 7, 1990, Ser. No. 610,094
Int. Cl.[5] H04N *1/21*
U.S. Cl. 358—298 22 Claims



7. In a raster based laser beam imaging system having a predetermined normal DPI (dots per inch) resolution, and having a single laser beam making horizontal sweeps corresponding to said resolution, and using imaging materials having a predetermined threshold level, the improvement comprising:
means for energizing the laser beam at a rate to provide a higher number of dots per inch in the horizontal scan direction than said predetermined DPI;
means for selectively creating predetermined, interleaved dots located at points between the horizontal scan lines of the laser beam by energizing said laser beam at two points on said scan lines directly above and below each predetermined desired interleaved dot, with the energization at one or both of said additional points on said scan lines being selectively below said threshold level, but with the cumulative energization at the interleaved predetermined point being greater than said threshold level so that dots appear at the predetermined interleaved points;
said apparatus including means for producing a complete image at a higher resolution than said predetermined normal DPI with a single pass of said laser beam; and
said apparatus including means for producing a laser beam which extends more than half way between adjacent scan lines.

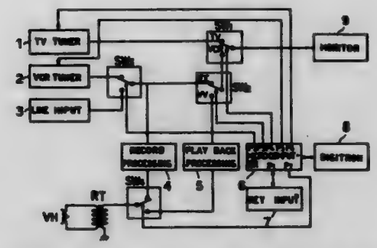
5,193,009

SIGNAL SWITCHING METHOD OF A TV-VCR COMBINATION HAVING TWO TUNERS

Keun Park, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 19, 1990, Ser. No. 467,374
Claims priority, application Rep. of Korea, Jan. 20, 1989, 661/1989
Int. Cl.[5] H04N *5/782*
U.S. Cl. 358—335 7 Claims

1. A signal switching method of a TV/VCR combination having two tuners which comprises the steps of:
(a) scanning the state of a key input unit by a microcomputer to display on display means the state of the key input unit and to simultaneously control a TV tuner and a VCR tuner by respective tuner control signals generated by the microcomputer in accordance with the state of the key input unit;
(b) controlling a recording/playback shifting switch with a recording/playback control signal generated by the microcomputer, to selectively couple a video head through a rotary transformer to one of a record processing unit and a playback processing unit;
(c) controlling a VCR tuner/line input shifting switch with a VCR tuner/line input control signal generated by the microcomputer to select one of output signals of the VCR tuner and the line input and to apply the selected output signals to the record processing unit;
(d) controlling a VCR-line/playback shifting switch with a



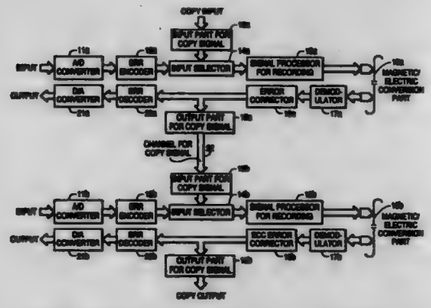
VCR-line/playback control signal generated by the microcomputer to select one of output signals of the VCR tuner/line input shifting switch and the playback processing unit; and
(e) controlling a TV/VCR shifting switch with a TV/VCR control signal generated by the microcomputer to select one of output signals of the TV tuner and the VCR-line/-playback shifting switch and to apply the selected output signals of the TV/VCR shifting switch to a monitor.

5,193,010

DIGITAL VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS HAVING AN ERROR CONCEALMENT CONTROL FUNCTION

Tatsuro Juri, Osaka; Chiyoko Matsumi, Suita; Shinya Kadono, Hirakata, and Hideki Ohtaka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 28, 1990, Ser. No. 574,288
Claims priority, application Japan, Aug. 29, 1989, 1-221978; Jun. 29, 1990, 2-173429
Int. Cl.[5] H04N *5/94, 5/78*
U.S. Cl. 358—336 30 Claims



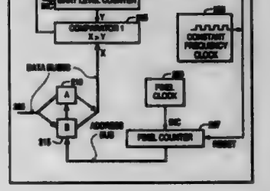
1. A digital video signal recording and reproducing apparatus comprising:
an encoding means for subjecting an input digital video signal to a bit rate reduction encoding to obtain a first bit rate reduction encoded video signal;
a copy input means for inputting as a copy input signal a second bit rate reduction encoded video signal supplied from outside of said apparatus;
a selection means for selectively outputting either said first bit rate reduction encoded video signal or said second bit rate reduction encoded video signal;
a recording signal processing means including a modulation means for modulating a selected bit rate reduction encoded video signal from said selection means to obtain a modulated video signal;
a recording and reproducing means for recording the modulated video signal from said recording signal processing means on a recording medium and for reproducing the recorded signal from said recording medium to obtain a reproduced modulated video signal;
a demodulation means for demodulating the reproduced modulated signal to obtain a reproduced bit rate reduction encoded signal;
an error correcting and concealing means for detecting errors of the reproduced bit rate reduction encoded signal which contain correctable errors and uncorrectable errors, said error correcting and concealing means correcting said correctable errors and concealing said uncorrectable errors to obtain an encoded video signal in which the errors have been corrected or concealed;
a copy output means for outputting the encoded video signal obtained from said error correcting and concealing means as a copy output signal; and
a decoding means for decoding the encoded video signal obtained from said error correcting and concealing means to obtain a reproduced digital video signal.

5,193,011

METHOD AND APPARATUS FOR PRODUCING VARIABLE WIDTH PULSES TO PRODUCE AN IMAGE HAVING GRAY LEVELS

Gary A. Dir, Fairport; Fred W. Schmidlin, Pittsford; John D. Sotack, Rochester, and Joseph F. Stephany, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1990, Ser. No. 592,468
Int. Cl.[5] H04N *1/23*
U.S. Cl. 358—455 29 Claims



1. A gray level reproduction system having a plurality of reproduction elements comprising:
first storing means for storing a plurality of gray level codes, each code corresponding to an area in a row to be printed;
addressing means for addressing each gray level code in the first storing means;
first clocking means, including means for generating a series of edges having a variable time difference between adjacent edges;
first counting means, coupled to the first clocking means, for counting gray levels;
first comparing means, coupled to the first storing means and to the first counting means for comparing a gray level read from the first storing means to the current gray level

count generated by the first counting means including means for generating an output indicating equality;

means, coupled to the first comparing means, for accessing each reproduction element; and

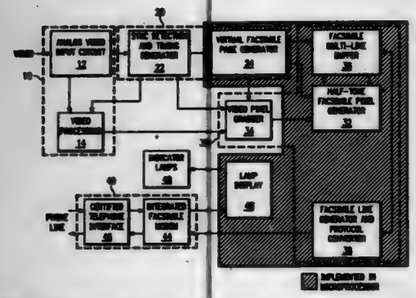
means for incrementing the first counting means after the addressing means has addressed a plurality of gray level codes in the first storing means.

5,193,012

REAL-TIME CONVERSION OF STILL-VIDEO TO HALF-TONE FOR HARD COPY OUTPUT (SUCH AS ON A FACSIMILE MACHINE)

Jonathan E. Schmidt, San Antonio, Tex., assignor to Snap-Fax Corporation, Dallas, Tex.

Filed Apr. 29, 1991, Ser. No. 693,444
Int. Cl.[5] H41J *3/02*
U.S. Cl. 358—456 27 Claims



21. A method of real-time still-video conversion for converting a still-video image frame captured by a still-video source into a half-tone facsimile reproduction produced by a conventional facsimile machine without requiring the creation or storage of an intermediate image frame, comprising the steps:

for each still-video image frame, receiving repeated transmissions of the still-video image frame from the still-video source until conversion is complete;

for each transmission of the still-video image frame, synchronizing the frame to a virtual facsimile page that defines a matrix of virtual facsimile pixels, with each virtual facsimile pixel being associated with a corresponding image pixel of the still-video frame which is characterized by an amplitude value;

the virtual facsimile page being formed by a predetermined number of virtual facsimile lines each with a predetermined number of half-tone dot positions, such that each virtual facsimile pixel is defined by a predetermined number of adjacent half-tone dot positions on a predetermined number of adjacent virtual facsimile lines, thereby forming a half-tone dot-matrix;

in successive still-video image frames, converting successive blocks of image pixels into a corresponding line of half-tone pixels, each line of half-tone pixels being formed by corresponding virtual facsimile lines, and each half-tone pixel having an appropriate half-tone dot pattern;

buffering the virtual facsimile lines associated with at least one line of half-tone pixels; and then

transmitting the buffered virtual facsimile lines to the facsimile machine for producing a half-tone facsimile output;

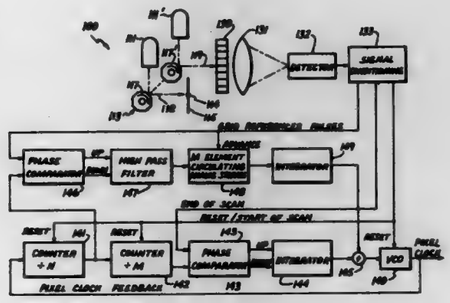
repeating this conversion process until the still-video image frame is completely converted into a half-tone facsimile reproduction.

5,193,013

SCANNER WITH NON-LINEARITY COMPENSATING PIXEL CLOCK

Melvin E. Swanberg, Claremont, Calif., assignor to Olive Tree Technology, Inc., San Marino, Calif.

Filed May 29, 1990, Ser. No. 529,959
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—481 25 Claims



1. A scanner system, comprising:

means defining a light source for producing a light beam;

scanning means for directing the light beam to a spot on a surface to be scanned that is located at a predetermined location relative to the scanning means and for moving the spot across the surface along a scan line of predetermined length in a series of scan cycles;

means defining a reference clock for producing a train of M reference pulses during each of the scan cycles such that each of the M reference pulses represents the occurrence of a respective one of M segments of the scan cycle, where M is an integer;

means defining a first oscillator for producing a train of clock pulses for use in controlling the light beam at a predetermined number of desired pixel positions along the scan line; and,

frequency control means responsive to the reference pulses for varying the rate of change of the frequency of the first oscillator during the occurrence of each of the M segments of the scan cycle and forcing phase coincidence with the reference pulses that define each of the M segments of the scan cycle in order to approximate an ideal frequency variation curve over the entire scan cycle,

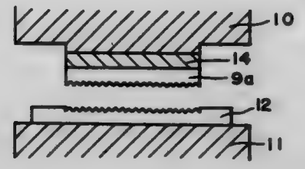
the frequency control means further including means defining an analog storage circuit for storing M analog error signals, each of which M error signals corresponds to a respective one the M segments of the scan cycle, and for switching to each of the M stored error signals as the respective one of the M segments of the scan cycle occurs.

5,193,014

METAL VESSEL HAVING HOLOGRAM OF DIFFRACTION GRATING FORMED THEREON

Ken Takenouchi; Kazuyuki Kuroswa, both of Yokohama; Makoto Horiguchi, Fujisawa; Tsuneo Imatani, and Hideo Kurashima, both of Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

PCT No. PCT/JP90/01548, § 371 Date Aug. 29, 1991, § 102(e) Date Aug. 29, 1991, PCT Pub. No. WO91/08525, PCT Pub. Date Jun. 13, 1991
PCT Filed Nov. 28, 1990, Ser. No. 721,581
Claims priority, application Japan, Nov. 28, 1989, 1-306670; Dec. 28, 1989, 1-338639
Int. Cl.[5] G03H *1/04*
U.S. Cl. 359—3 11 Claims



1. A process for the preparation of a metal vessel with a hologram or a diffraction grating, which comprises

preparing a metal plate mold having a concave-convex hologram or a diffraction grating formed on a gently curved face convex to the surface, wherein the ratio (P/D) of the diameter (D) of the curved surface to the protrusion height (P) is from 1.0×10^{-5} to 5.0×10^{-2} and

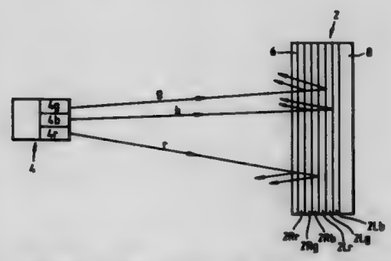
stamping a metal blank or a metal container having a smooth surface with the metal plate mold at room temperature to transfer a relief type hologram or a relief type diffraction grating on the surface of the metal blank or the metal container by plastic deformation of the metal blank or the metal container.

5,193,015

CHOLESTERIC LIQUID CRYSTAL SCREEN WHICH REFLECTS SUBSTANTIALLY ALL OF THE PROJECTED LIGHT

Ian A. Shanks, Buckinghamshire, England, assignor to Thorn EMI plc, London, England

Filed Oct. 5, 1990, Ser. No. 593,215
Claims priority, application United Kingdom, Oct. 5, 1989, 8922415
Int. Cl.[5] G02F *1/133, 1/1335;* G03B *21/56, 21/32*
U.S. Cl. 359—53 3 Claims



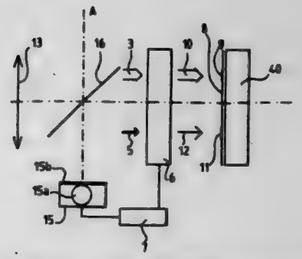
1. A diffusely reflective screen for use in front projection system, which screen receives light projected thereon from said front projection system and comprises a plurality of cholesteric liquid crystal material members each possessing a defined pitch of liquid crystal material having a respective wavelength reflection characteristic, such that each member reflects light within a wavelength range defined by said respective reflection characteristic and transmits light outside said wavelength range, each of which members reflects less light of wavelengths outside each respective wavelength range; and an optical absorber suitable for absorbing light not reflected by said plurality of members whereby substantially all of said light from said front projection system which is within each wavelength range is reflected by said members.

5,193,016

NON-LINEAR DEVICE FOR AMPLIFYING THE INTENSITIES OF LIGHT RAYS THAT PRODUCE AN IMAGE

Georges Corsaejois, Montferrier, France, assignor to Scanera S.G., France

Continuation of Ser. No. 500,740, Mar. 28, 1990, abandoned.
This application Oct. 10, 1991, Ser. No. 773,774
Claims priority, application France, Mar. 28, 1989, 89 04333; Nov. 30, 1989, 89 16149
Int. Cl.[5] G02F *1/33, 1/335, 1/35*
U.S. Cl. 359—53 26 Claims



3. A device for non-linearly amplifying the intensity of light rays, which comprises:

a flat photosensitive optical component;

an objective lens for directing initial light rays of an image of a scene onto the flat photosensitive optical component, the flat photosensitive optical component being positioned near the focal plane of the objective lens and the initial light rays passing through the flat photosensitive optical component and becoming final light rays having the same direction as the corresponding initial light rays;

a sensor for sensing the average intensity of the initial light rays and for generating a first electrical signal representative of said average intensity;

an electrical circuit connected to the flat photosensitive optical component and responsive to the first electrical signal from the sensor for applying a second electrical signal to said flat photosensitive optical component which is a function of the average intensity of the initial light rays;

the flat photosensitive optical component having a transparency that varies point by point in accordance with the intensities of the initial light rays striking that point and with said second electrical signal, such that the intensities of the final light rays are the products of the intensities of the corresponding initial light rays and the transparencies of each point on the flat photosensitive optical component where the initial light rays strike the flat photosensitive optical component, the ratios of the intensities of the final light rays differing from those of the intensities of the corresponding initial light rays.

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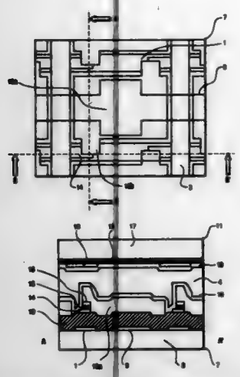
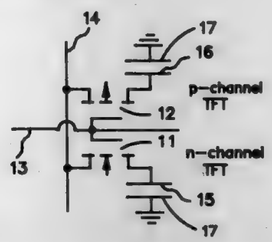
5,193,017
REFLECTIVE-TYPE ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE
Hiroshi Iwai, Hirakata; Yoshiharu Takubo, Toyonaka, and Sadayoshi Hotta, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 8, 1991, Ser. No. 638,536
Claims priority, application Japan, Jan. 11, 1990, 2-4163
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—59 5 Claims



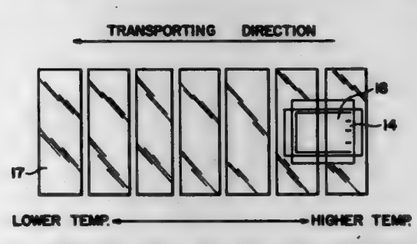
1. An active matrix liquid crystal display device comprising:
a first substrate having formed thereon an array of thin film transistors formed in a matrix, a plurality of parallel gate buses each having a constant width, a plurality of source buses each having a constant width and perpendicular to the gate buses, and an array of pixel electrodes formed in a matrix and driven by the array of thin film transistors;
a second substrate opposing the first substrate and having formed thereon a transparent common electrode opposing the array of pixel electrodes; and
a liquid crystal layer sandwiched between the first and second substrates;
wherein each of the thin film transistors comprises:
a gate bus formed on an insulating substrate and having a constant width and no projection not extended shape;
a gate insulating layer formed on the gate bus;
a semiconductors layer formed on the gate insulating layer in a portion above the gate bus, the semiconductor layer being elongated in a longitudinal direction of the gate bus and having a constant width which is smaller than the width of the gate bus;
a conductive material layer patterned into a first part constituting a source bus having a constant width and no projection nor extended shape and disposed on a part of the semiconductor layer and the gate insulating layer, a second part separated from the first part and constituting a drain electrode disposed an another part of the semiconductor layer, and a third part continuous from the second part and constituting a pixel electrode disposed on the gate insulating layer.

5,193,018
ACTIVE MATRIX LIQUID CRYSTAL DISPLAY SYSTEM USING COMPLEMENTARY THIN FILM TRANSISTORS
Bing-Seng Wu, Hsin-Chu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan
Filed Oct. 28, 1991, Ser. No. 783,575
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—59 16 Claims
1. A thin film transistor active matrix display system comprising:
a plurality of liquid crystal display picture elements arranged in rows and columns and divided into groups;
each said group of said pixels containing two said pixels,
a plurality of scan lines;
a plurality of data lines;
each said group addressed by the same scan line and the same data line,



two switches for connecting said pixels of one of said group with said data line, each one of said switches connected only to one of said pixels,
a n-channel thin film transistor (TFT) serving as one of said switches,
a p-channel TFT serving as another one of said switches,
said two TFTs having common gates connected to said scan line, common drains connected to said data line, and separate sources connected two said pixels in the same group.

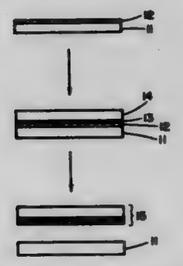
5,193,019
METHOD OF MANUFACTURING LIQUID CRYSTAL DEVICES
Toshio Watanabe, Atsugi, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Continuation-in-part of Ser. No. 466,961, Jan. 18, 1990, abandoned, which is a division of Ser. No. 254,096, Oct. 6, 1988, Pat. No. 4,917,473. This application May 22, 1991, Ser. No. 704,022
Claims priority, application Japan, Oct. 13, 1987, 62-257899; Oct. 13, 1987, 62-257900
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] G02F *1/1335, 1/1339, 1/137*
U.S. Cl. 359—62 3 Claims



1. A method of disposing a liquid crystal material between a pair of substrates comprising:
forming an electrode arrangement on the inside surfaces of said pair of substrates;
coating an orientation control film on the inside surface of at least one of said substrates;
giving orientation treatment to said orientation control film;
mating said pair of substrates with an inner space therebetween;
sealing the periphery of the mated substrates except for at least one inlet port;
placing the sealed substrates in a vacuum chamber;
descending the pressure in said vacuum chamber;

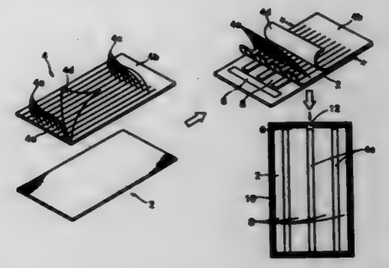
pouring said liquid crystal material into said inlet port such that said liquid crystal material is kept in its nematic or isotropic phase;
elevating the pressure in said vacuum chamber in order to introduce said liquid crystal material into said inner space;
descending the temperature of said liquid crystal material between said substrates below a temperature at which said liquid crystal material is driven;
sealing off said inlet port in order to avoid loss of said liquid crystal material contained in the inner space, said sealing occurring while said liquid crystal is substantially at the descended temperature; and
removing the remaining portion of said liquid crystal material from the vicinity of said inlet port.

5,193,020
METHOD FOR PRODUCING COMPENSATOR FOR LIQUID CRYSTAL DISPLAY
Iwane Shiozaki; Takehiro Toyooka, both of Yokohama, and Shigeki Iida, Kawasaki, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan
Filed Jan. 26, 1991, Ser. No. 721,174
Claims priority, application Japan, Jan. 27, 1990, 2-166833
Int. Cl.[5] G02F *1/1335, 1/13;* C09K *19/52*
U.S. Cl. 359—73 5 Claims



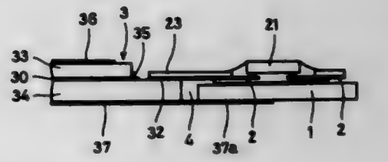
5. A method for producing a compensator for a liquid crystal display comprising forming a liquid crystal polymer layer, said polymer layer exhibiting twisted nematic orientation in the state of liquid crystallinity and a glassy state at temperatures below the liquid crystal transition point thereof, on an orienting base; and transferring said liquid crystalline polymer layer onto a light transmitting base.

5,193,021
FILM SPACER AND METHOD FOR FABRICATING LIQUID CRYSTAL CELL USING THE SAME
Byunghee Kim, Seoul, Rep. of Korea, assignor to Samsung Electron Device Co., Ltd., Kyunggi-Do, Rep. of Korea
Filed Oct. 21, 1991, Ser. No. 781,088
Claims priority, application Rep. of Korea, Dec. 22, 1990, 90-21553
Int. Cl.[5] G02F *1/1339, 1/1335*
U.S. Cl. 359—81 11 Claims
1. A film spacer for a liquid crystal display element comprising:
a PET sheet with one end having a blank area and through which a plurality of incised lines are formed at intervals, the lines starting at the blank area and extending to the other end of the sheet; and
a cover layer on one side of the sheet, the cover layer being fixed to the blank area, wherein the incised lines form the film spacer into a plurality of spacers arranged in strip form.
3. A method of fabricating a liquid crystal cell comprising the steps of:
a) providing a spacer sheet and cutting a plurality of slices through the sheet, the slices having first and second ends, the second ends extending to one edge of the sheet;
b) putting a cover over one side of the sheet;
c) supporting another side of the sheet on a first glass panel;
d) cutting the sheet such that the first ends of the slices are aligned with an edge of the first glass panel, thereby forming the sheet into separate strips defined by the slices;



e) removing the cover and at least one of the separate strips to leave predetermined ones of the separate strips; and
f) completing the cell by sealing a second glass panel to the first glass panel with the predetermined strips inbetween, and infusing liquid crystal.

5,193,022
PLANE-TYPE DISPLAY APPARATUS
Minoru Hirai, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan
Filed Feb. 25, 1992, Ser. No. 841,165
Claims priority, application Japan, Feb. 26, 1991, 3-030544; Feb. 26, 1991, 3-030548
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—88 3 Claims



1. A display apparatus comprising:
a display panel;
a drive signal supplying board arranged opposite to said display panel at a predetermined space therefrom for supplying a drive signal for the display panel;
a drive integrated circuit device mounted on the board through a flexible plate and connected to a connecting portion of said display panel through the flexible plate;
a first polarizing plate arranged on the upper surface of said display panel; and
a second polarizing plate arranged to the under surface of said display panel and extending to the under surface of said drive signal supplying board to be fixed thereto.

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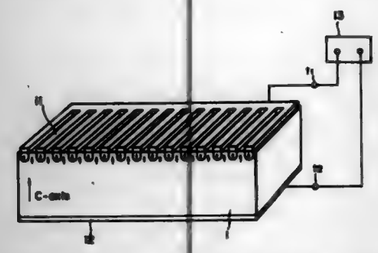
5,193,023

METHOD OF CONTROLLING THE DOMAIN OF A NONLINEAR FERROELECTRIC OPTICS SUBSTRATE

Masahiro Yamada, Miyagi, and Koichiro Kishima, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 553,395, Jul. 17, 1990, abandoned. This application Jul. 15, 1991, Ser. No. 729,897
Claims priority, application Japan, Jul. 17, 1989, 1-184362; Jul. 17, 1989, 1-184364; Dec. 28, 1989, 1-344270; May 15, 1990, 2-124706
Int. Cl.[5] G02F 1/03; G11C 11/22
U.S. Cl. 359—248 22 Claims



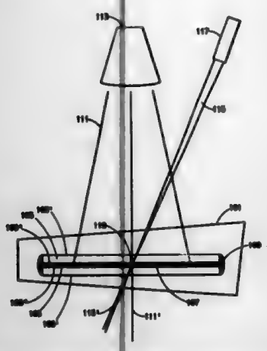
1. A method of controlling the domain of a nonlinear ferroelectric optics substrate, comprising:
forming a first electrode and a second electrode opposite to each other respectively on the opposite major surfaces of a single-domain nonlinear ferroelectric optics substrate, at least either the first electrode or the second electrode being formed in a given electrode pattern; and
applying a given dc voltage across the first and second electrodes to form local continuously alternating inverted domains in a pattern corresponding to the electrode pattern where the local inverted domains alternately have a constant, opposite, polarization direction.

5,193,024

LIQUID/VAPOR OPTICAL MODULATOR

John A. Lawton, Landenberg, Pa.; Evan D. Laganis, Wilmington, and James L. Hohman, Jr., Newark, both of Del., assignors to E. I du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1990, Ser. No. 606,364
Int. Cl.[5] G02F 1/03, 26/00
U.S. Cl. 359—253 17 Claims



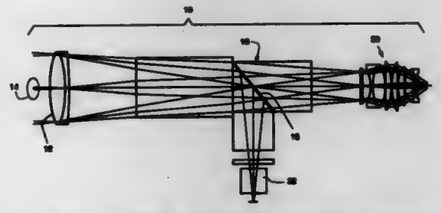
1. A method of modulating image radiation comprising the steps of:
a) containing a dye solution in a cell, said dye solution comprising a solvent and at least one dye capable of absorbing radiation from a heat-beam and converting energy from said heat-beam to heat;
b) illuminating said cell and said dye solution with illumination radiation having a wavelength, said solution being adaptable to substantially block said wavelength of said radiation; and
c) intersecting a region of said dye solution with said heat-beam, thereby forming a bubble within said region of said solution, allowing at least part of said illumination radiation of said wavelength to pass through said bubble and said cell, thereby modulating said image radiation.

5,193,025

OPTICAL VIEWING AND NEAR INFRARED TRACKING SYSTEM FOR A PORTABLE MISSLE LAUNCHER

James J. Carlson, Woodland Hills, and Gary R. Noyes, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 21, 1992, Ser. No. 823,413
Int. Cl.[5] G02B 1/10, 5/28, 13/14
U.S. Cl. 359—356 4 Claims



3. A prism assembly for use in the optical apparatus of a missile launcher for directing visual and near infrared light energy components along first and second substantially different angular paths, comprising:
first and second prisms with a single flat surface of each arranged facing one another;
a plurality of layers stacked between the facing flat surfaces of the prisms, said layers forming an interference coating allowing impinging visual electromagnetic energy to pass through the coating while reflecting near infrared components away from the coating,
an outer layer of the coating being constructed of MgF_2 having a 0.78 wavelength thickness, and the remaining layers in the coating being formed from a plurality of three-layer elements, each element including a pair of 0.5 wavelength layers sandwiched about a 1.0 wavelength layer of ZnS.

5,193,026

REFLECTIVE SAFETY STRIPES

Edward Purvis, 1714 17th St. East, Bradenton, Fla. 34208, and George Spector, 233 Broadway Rm 3815, New York, N.Y. 10007

Filed Sep. 30, 1991, Ser. No. 767,632
Int. Cl.[5] G02B 5/12
U.S. Cl. 359—516 1 Claim

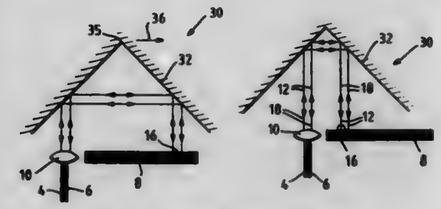
1. A reflective safety device which comprises an article made of light reflecting material worn on a person at night, so that the person can be seen by the lights of a motor vehicle to prevent accidents, wherein said article of light reflecting material is a C-shaped band having tapered ends, being of a bright color and which can be worn on a head of the person, on an arm, wrist, leg or ankle of a garment worn by the person, and wherein said C-shaped band is adjustable and includes telescopic segments with peel away coverings to expose adhesive rear surfaces, so that said adjustable C-shaped band can be better worn on various sized parts of the extremities of the person.

5,193,027

OPTICAL FILTER TUNING APPARATUS AND AN OPTICAL FILTERING METHOD

Keith R. Preston, Woodbridge, England, assignor to British Telecommunications plc, London, United Kingdom

PCT No. PCT/GB90/00049, § 371 Date Aug. 14, 1991, § 102(e) Date Aug. 14, 1991, PCT Pub. No. WO90/08335, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 12, 1990, Ser. No. 743,404
Claims priority, application United Kingdom, Jan. 13, 1989, 8900730
Int. Cl.[5] G02B 5/32, 5/18, 5/26
U.S. Cl. 359—566 17 Claims



1. An optical filter tuning apparatus comprising:
an optical filter which reflects light of a predetermined wavelength, said wavelength being determined by the position of incidence of said light on said filter; and
a retroreflector moveable relative to said filter and which is used to reflect light from an optical source to said position of incidence on said filter and reflect light of said predetermined wavelength to optical receiving means;
said position of incidence and said predetermined wavelength being adjustable by moving said retroreflector with respect to said filter.

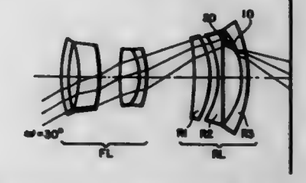
5,193,028

OPTICAL SYSTEM FOR ELIMINATING GHOST IMAGE IN WIDE WAVELENGTH BAND

Masato Noguchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1991, Ser. No. 790,410
Claims priority, application Japan, Sep. 11, 1990, 2-385778
Int. Cl.[5] G02B 1/10, 5/28, 7/04
U.S. Cl. 359—581 26 Claims

1. In a transmission optical system of the type including a plurality of transmission optical elements having boundary reflection surfaces which form a ghost image when light is reflected by at least two specific boundary reflection surfaces, the improvement comprising a ghost eliminating optical system in which said specific boundary reflection surfaces are coated with at least two anti-reflection coatings having complementary reflection characteristics to eliminate said ghost image, said two anti-reflection coatings being such that the total anti-reflection curve characteristic of the two coatings, over a wide wavelength band, is flatter than the anti-reflection curve characteristic of either of the two anti-reflection coatings taken individually.

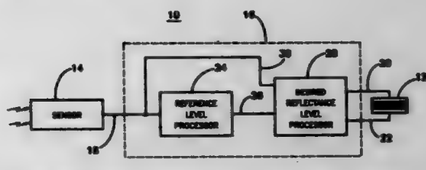


5,193,029

SINGLE SENSOR ADAPTIVE DRIVE CIRCUIT FOR REARVIEW MIRROR SYSTEM

Kenneth Schofield; Richard J. Cahan, both of Holland; Kenneth L. Schierbeek, Zeeland, and Mark L. Larson, Grand Haven, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Nov. 19, 1991, Ser. No. 794,441
Int. Cl.[5] G02B 17/00
U.S. Cl. 359—604 33 Claims



1. An automatic rearview mirror system for a vehicle comprising:
a reflective element that is actuatable between at least two different reflectance conditions;
a single light sensing means for sensing light incident to said reflective element; and
processing means responsive to said light sensing means for producing a slow-transient indication as a function of said light incident to said reflective element and for indicating a desired reflectance level of said reflective element as a function of said slow-transient indication and said light incident to said reflective element.

5,193,030

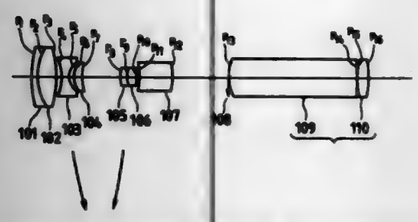
ZOOM FINDER SYSTEM

Katsuhiko Nozaki, and Tetsuya Abe, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Division of Ser. No. 426,655, Oct. 26, 1989, Pat. No. 4,992,809. This application Oct. 11, 1990, Ser. No. 596,102
Claims priority, application Japan, Oct. 28, 1988, 63-140823[U]; Dec. 27, 1988, 63-330466; Dec. 27, 1988, 63-330467
Int. Cl.[5] G02B 15/14; G03B 13/02, 13/10
U.S. Cl. 359—687 9 Claims

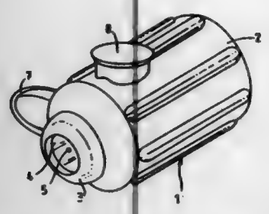
1. A zoom finder comprising an objective optical system having a positive overall power and an eyepiece optical system having a positive overall power, said objective optical system comprising, in order from the object side, a first lens group having a positive power, a second lens group having a negative power, and a third lens group having a positive power, the image formed by said objective optical system being focused

approximately at the first surface of said eyepiece optical system, said second and third lens groups being moved to effect



zooming with the eyesight through the finder being held constant.

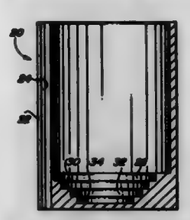
5,193,031
DIVERGENCE AND MARKING DEVICE FOR A TARGET MARKER
Michel Baikrich, 42 Xhierfomont, 4086 Stoumont, Belgium
PCT No. PCT/BE90/00025, § 371 Date Feb. 22, 1991, § 102(e) Date Feb. 22, 1991, PCT Pub. No. WO91/00489, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 1, 1990, Ser. No. 635,118
Claims priority, application Belgium, Jun. 28, 1989, 8900703
Int. Cl.[5] G02B *27/20, 27/00*
U.S. Cl. 359—900 13 Claims



1. A laser beam type marker comprising a casing in which a laser generator is accommodated, the head of the casing having an aperture to allow the passage of the laser beam produced by the laser generator, characterised in that the aperture is blocked by a divergent lens perforated by a central hole such that the laser rays which reach the lens round the central hole produce a divergent beam while the rays which reach the central hole pass through it without being deflected so as to form a fine pencil of light of higher intensity which serves to mark a target.

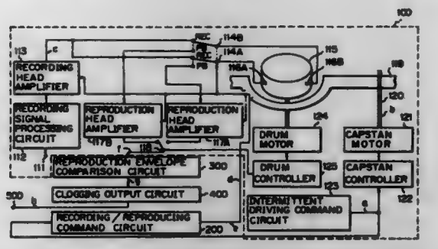
5,193,032
UNIVERSAL PRESCRIPTION BOTTLE INSTRUCTION LABEL MAGNIFIER
Frederick A. Hirth, 37547 Arbor La., Palmdale, Calif. 93552
Filed Mar. 19, 1992, Ser. No. 854,039
Int. Cl.[5] G02B *27/02*
U.S. Cl. 359—804 21 Claims

1. An apparatus for magnifying the instruction label on a medicine bottle, comprising:
a housing member having side walls, an open top side, and a bottom side;
receiving means, located in said bottom side of said housing member, for receiving one of a plurality of different sizes of medicine bottles inserted into said housing member through said open top side of said housing member;
a longitudinally extending slot located in said side walls of said housing member, said longitudinally extending slot being open on said top side of said housing member; and



a lens member for magnifying the instruction label on a medicine bottle, said lens member being installed in said longitudinally extending slot.

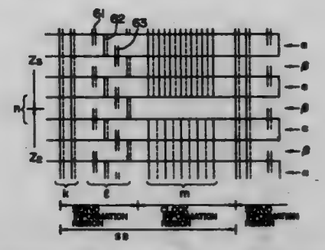
5,193,033
MAGNETIC RECORDING AND REPRODUCING APPARATUS INCORPORATING CLOGGING DETECTION
Hiroaki Shimoi, Kyoto; Takafumi Inadomi, Hyogo; Ryoichi Nakamura, Hyogo, and Kan Kawahara, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Continuation of Ser. No. 351,949, May 15, 1989, abandoned.
This application Nov. 18, 1991, Ser. No. 794,784
Claims priority, application Japan, May 17, 1988, 63-120922; Oct. 11, 1988, 63-255251
Int. Cl.[5] G11B *27/36, 5/41*
U.S. Cl. 360—31 8 Claims



1. A magnetic recording and reproducing apparatus including magnetic tape movement means in which a magnetic tape is wound around a rotary drum, comprising:
a magnetic head on said drum operating in a recording mode wherein the magnetic head intermittently records signals on the magnetic tape and also operating in a reproducing mode wherein the magnetic head reproduces signals from the magnetic tape;
a controller for controlling operation of the magnetic head, said controller including:
means for determining completion of an interval of reading signals;
means for automatically switching the magnetic head to reproducing mode, after completion of the interval of recording signals, to reproduce signals intermittently recorded during the interval;
envelope comparison means for producing a comparison signal when an envelope signal based on the reproduced intermittently recorded signals is higher than a predetermined value, said comparison signal comprised of peaks corresponding to portions of the envelope signal that exceed the predetermined value;
clogging output means for outputting a clogging signal in response to the comparison signal from the envelope comparison means; and
a cleaning mechanism for cleaning the magnetic head when the clogging signal indicates that the head is clogged, said cleaning mechanism comprising:

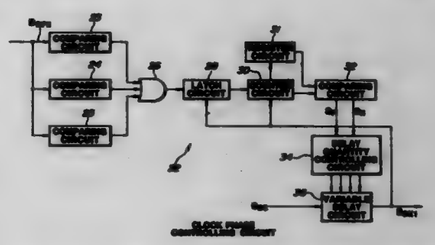
a solenoid that is energized in response to said clogging signal;
a solenoid shaft that moves when the solenoid is energized;
a roller that is urged against the head when the solenoid is energized to clean the head;
a support shaft that is coupled to the roller;
a transmitting plate coupled to said support shaft and to said solenoid shaft to transfer movement of the solenoid shaft when the energized to the support shaft such that the support shaft and the solenoid shaft concurrently move in parallel to each other; and
means for limiting movement of the support shaft.

5,193,034
MAGNETIC DISK APPARATUS OF CONSTANT-DENSITY RECORDING TYPE, MAGNETIC DISK USED THEREFOR AND SERVO-WRITING DEVICE FOR PATTERNING ON THE MAGNETIC DISK
Toshiaki Tsuyoshi, Kawasaki; Yosuke Seo, Sagamihara; Hajime Aoi, Tachikawa, and Makoto Saito, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 12, 1990, Ser. No. 551,808
Claims priority, application Japan, Jul. 17, 1989, 1-182575
Int. Cl.[5] G11B *27/30*
U.S. Cl. 360—51 20 Claims



12. A constant-density recording type magnetic disk, comprising:
at least one surface of said magnetic disk being divided into a plurality of zones having boundaries in the radial direction thereof;
a plurality of tracks provided in each of said divided zones and extending in the circumferential direction, the number of said tracks being arbitrary in each of the divided zones;
servo information regions and data recording regions alternately provided on each of said tracks;
a plurality of sectors, each constituted by a pair of adjacent ones of the servo information region and the data recording region, adjacent to each other in the circumferential direction of the disk, and forming in the same zone, substantially the same angle with respect to the rotation center of the magnetic disk;
the servo information regions in the same divided zone and in the same sector being arranged to form a sectoral region substantially extending from the center of said disk;
the physical length of one sector in the innermost track in each said divided zone being substantially the same for each said divided zone; and
a generally concentric, annular region provided at each of the boundaries between adjacent ones of said divided zones where not data is recorded by a user, but wherein servo information that is written in each one of the adjacent divided zones is further written in said annular region from respective side edges of said annular region by at least a half track width.

5,193,035
APPARATUS AND METHOD FOR PHASE CORRECTION OF A CLOCK SIGNAL BY CONTROLLING THE VARIABLE DELAYING THEREOF
Keiji Kanota, and Takahito Seki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 27, 1990, Ser. No. 558,624
Claims priority, application Japan, Jul. 31, 1989, 1-198882
Int. Cl.[5] G11B *5/09;* H04N *5/78*
U.S. Cl. 360—51 14 Claims



1. A phase correction apparatus for an input signal having an eye-pattern, comprising:
clock signal generating means for receiving said input signal and generating a clock signal in synchronization with said input signal;
clock signal delaying means for variably delaying said clock signal and providing therefrom a playback clock signal;
signal level comparing means for comparing a signal level of said input signal with a predetermined reference signal level and providing a corresponding output at times determined by said playback clock signal;
counter means for counting each said output from said signal level comparing means occurring in a predetermined time period;
memory means for storing a count value from said counter means at completion of each said predetermined time period and for holding said count value, as a previous count value, until a new count value is received from said counter means at completion of a next said predetermined time period, whereupon the memory means outputs said previous count value and stores the new count value;
count value comparing means for comparing said previous count value from said memory means and a current count value output from said counter means during said predetermined time period and determining a comparison value signal indicative of a comparison of said previous count value and said current count value; and
means for controlling the variable delaying of said clock signal by said clock signal delaying means in accordance with said comparison value signal and thereby controlling a phase of said playback clock signal so that pulses of said playback clock signal occur at times when said eye pattern of said input signal reaches a maximum value.

5,193,036
TRANSDUCER HEAD SKEW ARRANGEMENT FOR DISK DRIVE SYSTEM
Martin R. Green; Randolph B. Heinecke, and John J. Stephenson, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 2, 1990, Ser. No. 591,910
Int. Cl.[5] G11B *5/596, 5/584*
U.S. Cl. 360—78.14 16 Claims

1. A disk drive data storage system comprising:
a plurality of disk surfaces mounted in parallel for simultaneous rotation about an axis;
a plurality of data information tracks on each disk surface for storing data; corresponding consecutive ones of said plurality of data information tracks on successive consecutive

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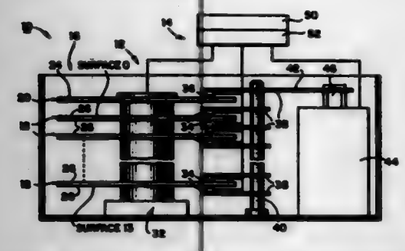
data disk surfaces defining a plurality of consecutive logical data cylinders;

at least one servo reference track on each disk surface for storing servo reference information; on each successive consecutive data disk surface said servo reference track being offset in a radial direction relative to a reference track on a prior data disk surface toward a next consecutive logical data cylinder;



said data information tracks disposed at predetermined positions relative to said at least one servo reference track on each said disk surface; sequential ones of said data information tracks in each cylinder being progressively offset in a radial direction toward a next consecutive logical data cylinder; and

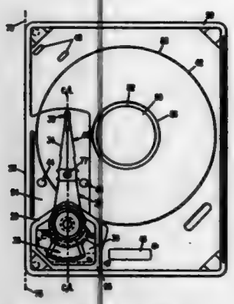
a plurality of data transducer heads mounted for movement in a radial direction across said disk surfaces for reading said servo reference tracks and for reading and/or writing data to said data information tracks.

5,193,037

COMPACT DISK DRIVE FOR USE WITH LAPTOP COMPUTER

Louis G. Pace, Santa Clara, Calif., assignor to Areal Technology, Inc., San Jose, Calif.

Filed Nov. 7, 1990, Ser. No. 610,855
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—106 10 Claims



1. A compact disk drive comprising :

a baseplate having a substantially rectangular configuration;

a drive motor mounted to said baseplate;

at least one magnetic disk having a central aperture for seating said disk to said drive motor for rotation by said drive motor; means for clamping said magnetic disk to said drive motor;

a rotatable head arm assembly having longitudinal flexures for supporting head sliders; and

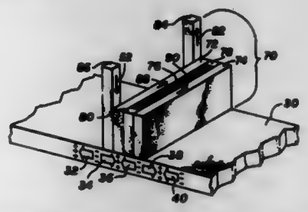
a rotary head actuator coupled to said head assembly, including a magnet housing, said housing being contoured and disposed substantially within a corner of the rectangular baseplate, said flexures being oriented in a direction substantially parallel to the longitudinal sides of said baseplate when said head arm assembly is in home position.

5,193,038

SHORTED DUAL ELEMENT MAGNETORESISTIVE REPRODUCE HEAD EXHIBITING HIGH DENSITY SIGNAL AMPLIFICATION

Neil Smith, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 500,978, Mar. 29, 1990, Pat. No. 5,084,794.
This application Dec. 5, 1991, Ser. No. 802,576
Int. Cl.[5] G11B *5/30*
U.S. Cl. 360—113 9 Claims



1. A magnetic head assembly for detecting magnetically recorded signals comprising:

a) a first thin film magnetoresistive element, having a first long dimension and a first short dimension, said first short dimension being orthogonal to said first long dimension,

b) a thin film non-magnetic electrically conductive spacer planarly in contact with said first magnetoresistive element, said spacer having a second long dimension at least equal to said first long dimension and having a second short dimension at least equal to said first short dimension,

c) a second thin film magnetoresistive element in contact with said conductive spacer and having a long and a short dimension, wherein said second magnetoresistive element is substantially matched to said first magnetoresistive element for magnetic and electrical characteristics, whereby said spacer separates said first and said second magnetoresistive elements,

d) means for producing longitudinal concurrent current flow in said first and second magnetoresistive elements, to unsaturatedly mutually magnetically bias said first and said second magnetoresistive elements in a direction that is less than ninety degrees from the direction of concurrent current flow,

e) means of coupling magnetic signal fields from said magnetically recorded signals to said first and said second magnetoresistive elements along said short dimensions of said magnetoresistive elements, whereby said first and said second magnetoresistive elements are concurrently responsive to said signal fields, further wherein said means for coupling signal fields for concurrently couples alternating direction signal fields to said first and said second magnetoresistive elements respectively, whereby said alternating fields cooperate with said first and said second magnetoresistive elements to provide amplification of the change in said magneto resistive elements in response to said signal fields, and

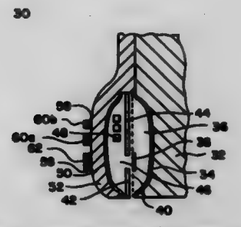
f) means for detecting said resistance change in said magnetoresistive elements in response to said signal fields.

5,193,039

PERMANET MAGNET EASY-AXIS BIASED MAGNETORESISTIVE HEAD

Alan B. Smith, Lincoln, and Michael Mallary, Berlin, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 17, 1991, Ser. No. 686,596
Int. Cl.[5] G11B *5/39*
U.S. Cl. 360—113 16 Claims



1. A thin film magnetic head for sensing of flux from a magnetic storage medium, the head comprising

a magnetoresistive element and a pole structure, the element and pole structure formed within a means for encapsulating the element and pole structure, such that magnetic flux can flow from an adjacent magnetic medium through the pole structure for sensing of the flux by the magnetoresistive element, and

magnetic bias means formed on the encapsulation layer for supplying biasing to the magnetoresistive element.

5,193,040

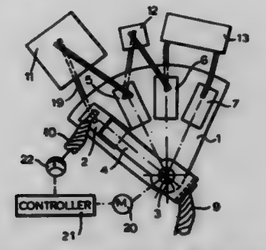
Patent Not Issued For This Number

5,193,041

ELECTRICAL CURRENT INTERRUPTER

Louis M. J. Chanois, Creches S/Saone, France, assignor to Stop Circuit, Macon, France

Filed Jun. 4, 1992, Ser. No. 894,844
Claims priority, application France, Jun. 7, 1991, 91 07194
Int. Cl.[5] H02H *7/00*
U.S. Cl. 361—13 11 Claims



1. An electrical circuit interrupter for connection between two conductors, the interrupter comprising:

a first fixed contact electrically directly connected to one of the conductors;

a second fixed contact adjacent the first fixed contact;

a movable contact electrically directly connected to the other of the conductors and displaceable between

a first closed position engaging only the first fixed contact,

a second position engaging only the second contact, and

an open position engaging neither of the fixed contacts; and

a positive-temperature-coefficient resistor connected between the first and second fixed contacts, whereby

in the first position current can flow between the conductors without passing through the resistor,

in the second position current flows through the resistor and current flow is limited thereby, and

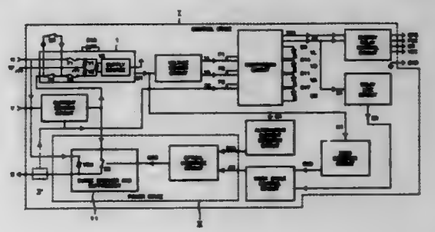
in the open position current does not flow between the conductors.

5,193,042

AUTOMATIC ENERGIZING DAMPING DEVICE

Carlos A. Espinosa, and Jose Velasquez, both of Edomex, Mexico, assignors to Dielpromex S.A. de C.V., Tacubaya, Mexico

Filed Dec. 7, 1990, Ser. No. 624,360
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—79 6 Claims



1. An automatic electronic, delayed-action energizing damper capable of connection to an electric power supply network of alternating current having voltage and current parameters and to which a load is connected, the damper comprising:

an electronic power supply means for providing electric energy to the circuitry of the energizing damper;

voltage sensing means connected to said electronic power supply means for sensing the voltage parameter of the electric power supply network;

current sensing means for sensing the current flow across the energizing damper to the load;

comparator means for comparing signals supplied by the current and voltage sensing means with reference values;

energy relay control means for generating operation control signals;

delay line means for delaying startup signals to the duty cycle control means;

zero crossing detector means for detecting when a signal output from the electronic power supply source means is zero providing an output signal in response thereto, and which signal is a multiple of the frequency of the electric power supply network synchronizing thus the operating frequency of the energizing damper;

alternating current detector means for detecting the presence of electric energy incoming to the energizing damper from the electric power supply network;

duty cycle control means responsive to the output signal of said zero crossing detector means and to the startup signal of said delay line means for generating a command signal

an optical interface circuit responsive to the output signal of the alternating current detector means and a command signal from the said duty cycle control means for generating a commuting command signal;

a solid state electronic switch means responsive to the commuting command signal for commuting the power to the load; and

surge suppressor means for limiting the amplitude of surge voltages across the energizing damper.

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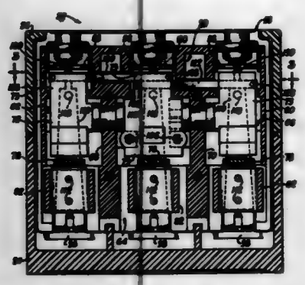
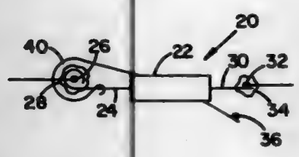
5,193,043
PHASE SENSITIVITY
Kurt A. Gramert, Beaver; Robert J. Tedesco, Coraopolis; John A. Wafer, Brighton Twp., Beaver County; Henry A. Wehrli, III, Monroeville, all of Pa.; Lawrence M. Hapeman, Fletcher, N.C., and Stephen A. Mrenna, Brighton Twp., Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 26, 1990, Ser. No. 543,985
Int. Cl.[5] H01H *75/10*
U.S. Cl. 361—93 15 Claims



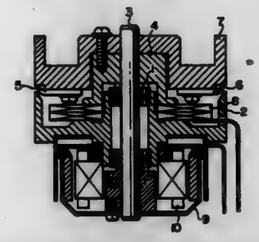
1. A multipole molded case circuit breaker comprising:
a base;
a plurality of pairs of separable main contacts disposed in said base;
means for opening said pairs of separable main contacts including a trip bar;
means for detecting an open circuit condition in an electrical load connected to said circuit breaker including means for interfacing said detecting means with said opening means which includes one or more movably mounted members disposed a predetermined distance from said trip bar during normal conditions adapted to engage said trip bar during an open circuit condition; and
wherein said detecting means includes a primary bimetal and a secondary bimetal per pole, said secondary bimetals having extending posts formed on a free end.

5,193,044
APPARATUS FOR LINE CARD POWER CROSS PROTECTION
Richard M. Czerwiec, Raleigh, N.C., assignor to Alcatel Network Systems, Inc., Richardson, Tex.
Filed Aug. 29, 1990, Ser. No. 576,201
Int. Cl.[5] H01H *37/00*
U.S. Cl. 361—104 15 Claims



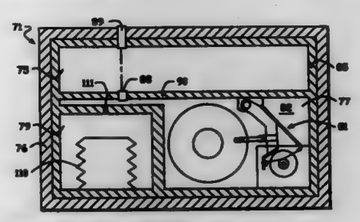
1. An apparatus for protecting a circuit from excessive current provided by a current-carrying metallic line connected to said circuit, said apparatus comprising:
resistive means, having first and second leads serially connected in said line, for generating heat in response to current carried in said line; and
fusible material means disposed in proximity to said resistive means and being responsive to said heat for breaking the serial connection of the resistive means in said current-carrying line; and
said first lead being hingedly connected and joined by said fusible material means to a first terminal post in said circuit, and the second lead being detachably mounted by said fusible material means to a second terminal post in said circuit.

5,193,045
HELICAL SCAN TYPE MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS HAVING COMBINATION TYPE VIDEO HEAD AND FLYING ERASE HEAD FOR LOW VIBRATION
Masanori Kochi; Juichi Morikawa; Hideo Zama, and Makoto Ibe, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 28, 1991, Ser. No. 723,182
Claims priority, application Japan, Jul. 13, 1990, 2-183904
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—84 2 Claims



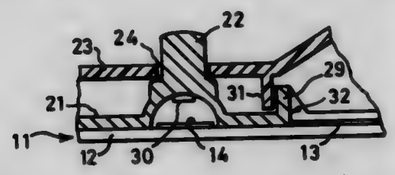
1. A helical scan type magnetic recording and/or reproducing apparatus having a combination type video head which has first and second video head chips fixed on a video head base and which is mounted on a rotating drum, wherein a flying erase head for erasing is provided on said rotating drum so as to be spaced substantially 180 degrees from said video head, and wherein the values of $M_d \times R_d$ and $M_f \times R_f$ are made substantially equal where M_d is the mass of said combination head, R_d is the distance between the center of gravity of said combination head and the rotation center of said rotating drum, M_f is the mass of said flying erase head, and R_f is the distance between the center of gravity of said flying erase head and the rotation center of said rotating drum.

5,193,046
INFORMATION RECORDING APPARATUS WITH A LIQUID BEARING
James U. Lemke, San Diego; William W. French, Encinitas, and William B. McHargue, La Jolla, all of Calif., assignors to Conner Peripherals, nc., San Jose, Calif.
Continuation of Ser. No. 259,344, Oct. 17, 1988, abandoned.
This application Sep. 25, 1990, Ser. No. 590,608
Int. Cl.[5] G11B *33/14, 5/60, 15/64, 17/32*
U.S. Cl. 360—97.02 24 Claims



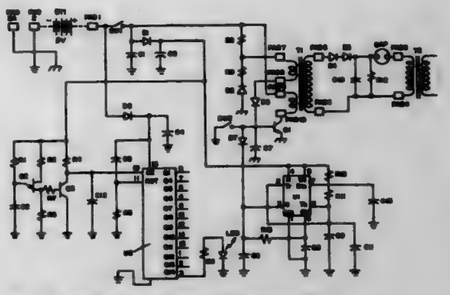
1. An information storage system, comprising:
a storage medium, said storage medium being relatively rigid;
means for rotating said storage medium;
transducer means positioned in a spaced relationship with said storage medium in response to movement of said storage medium for transferring information for storage on said storage medium and to receive stored information from said storage medium;
loading means for exerting a positioning force on said transducer means, said loading force being directed toward said storage medium; and
a liquid bearing provided between and in contact with said storage medium and said transducer means and cooperating with said loading means for supporting said transducer means in said spaced relationship at a distance of less than about 10 micro inches during said movement of said storage medium, said loading means maintaining said transducer means in contact with said liquid bearing.

5,193,047
PROTECTION OF ELECTRONIC CIRCUITS
Stephen C. Barratt, Hornchurch, and Brian W. Grant, Chelmsford, both of United Kingdom, assignors to Alcatel Business Systems Limited, Romford, United Kingdom
Filed Oct. 30, 1989, Ser. No. 428,980
Claims priority, application United Kingdom, Nov. 1, 1988, 825534
Int. Cl.[5] H05K *9/00*
U.S. Cl. 361—212 5 Claims



1. Electronic apparatus including a printed circuit board carrying on a face thereof electronic circuits and an array of switch contact pads; a face panel extending over and spaced from said printed circuit board and having an array of apertures therein; a mat of electrically insulating deformable material including an array of key buttons moulded in said mat, said key buttons being provided with electrically conductive contacts and extending through corresponding apertures in said face panel; said mat including an integral marginal portion extending outwardly from said array of key buttons; said mat extending over said face of said printed circuit board between said printed circuit board and said face panel with an air space between said face panel and said mat; said electrically conductive contacts being located opposite corresponding switch contact pads and movable into electrical contact with said corresponding switch contact pads by manual operation of the key buttons; said mat of electrically insulating material providing a continuous layer of electrically insulating material extending over substantially the whole of said face of said printed circuit board; wherein said marginal portion includes a wall extending away from the face of the printed circuit board and said face panel includes a rib extending toward the mat between said wall and said array of key buttons such that a static discharge track from the key buttons through said air space to the circuits on the circuit board is constrained to extend between the wall and the rib.

5,193,048
STUN GUN WITH LOW BATTERY INDICATOR AND SHUTOFF TIMER
Dennis R. Kaufman, 5508 Sutton La. #A, Willoughby, Ohio 44094, and William A. Kosley, 1951 N. Baldwin Rd., Oxford, Mich. 48051
Filed Apr. 27, 1990, Ser. No. 516,120
Int. Cl.[5] H05C *1/04*
U.S. Cl. 361—232 42 Claims

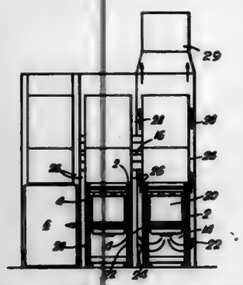


33. An electrical shock device comprising:
a housing containing a power supply and an electronic circuit having the electrical shock device;
trigger means on the housing for selectively connecting the power supply to the electric circuit when in a first position; and,
low power source indicating means for indicating the trigger means operated in the first position for a first predetermined time period.
39. An electrical shock device comprising:
a housing containing a power supply and an electronic circuit forming the electrical shock device;
trigger means on the housing for selectively connecting the power supply to the electronic circuit when in a first position; and,
means for disabling the electronic circuit when the trigger means is continuously operated in said first position for a first predetermined time period.

5,193,049
ENCLOSURES FOR ELECTRICAL SWITCHGEAR
Leonard Jackson, Newcastle upon Tyne, England, assignor to Northern Engineering Industries, plc, Newcastle upon Tyne, England
Continuation-in-part of Ser. No. 610,749, Nov. 8, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 764,080
Claims priority, application United Kingdom, Dec. 1, 1989, 8927193
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—379 9 Claims

1. An enclosure for electrical switchgear, comprising:
a plurality of walls defining an upper enclosure portion and lower enclosure portion;
at least one of said plurality of walls being one sidewall defining a part of said upper enclosure portion and said lower enclosure portion, said sidewall having an outlet in said lower enclosure portion, said outlet being closed with a flexible sheet cover displaceable from its closed position by an increase of pressure within said enclosure;
a vertically movable circuit breaker assembly contained within said lower enclosure portion, said vertically move-

able circuit breaker assembly having a sealed chamber which houses at least one circuit breaker, and



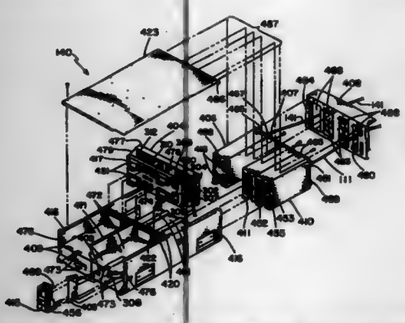
at least one exhaust chimney having a plurality of walls and defined in part by said sidewall, said outlet feeding into said exhaust chimney.

5,193,050

ENCLOSURE FOR ELECTRONIC SUBSYSTEMS IN A DATA PROCESSING SYSTEM

Roger F. Dimmick, Rochester; Vernon J. Kleve, Pine Island; Timothy L. Meyer, Mazeppa; Gary A. Thompson, Pine Island, and Gordon W. Westphal, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1991, Ser. No. 794,314
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—384 21 Claims



17. An apparatus for mounting multiple electronic modules of a first type and a second type together in a rack, said apparatus extending horizontally the full width of said rack and adapted to be mounted above and below other similar apparatus in said rack and electrically interconnected thereto by intra-rack cables coupled to said modules of the second type, said apparatus comprising:

a frame member forming the outlines of a substantially rectangular parallelepiped conforming to the interior width of said rack;

an interconnection carrier attached to said frame member, extending the width of said rectangular parallelepiped and dividing said parallelepiped into front and rear regions, said interconnection carrier having a front face facing said front region and a rear face facing said rear region, said front face bearing a first plurality of electrical connectors for receiving the electronic modules of said first type, and said rear face bearing a second plurality of electrical connectors for receiving the electronic modules of said second type, said carrier further including electrical wiring interconnecting said electrical connectors of said first and second pluralities;

one or more bay members attached to said frame member for dividing said front region into a plurality of front bays, each said bay extending from the front of said rectangular parallelepiped to the front face of said interconnection carrier, and adapted to receive said first type of the electronic module by horizontal sliding motion from the front of said apparatus into said front bay;

wherein said first plurality of electrical connectors comprise means for mating with electrical connection means of the electronic module of said first type as said electronic module is inserted into said bay by horizontal sliding motion;

wherein said second plurality of electrical connectors comprise means for mating with electrical connection means of the electronic module of said second type as said electronic module is inserted into said rear region of said apparatus by horizontal sliding motion;

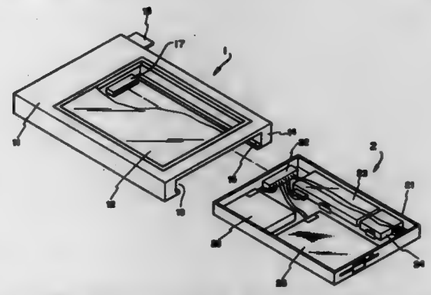
an environmental module attached to said frame member, mounted behind said rear region and extending the width of said parallelepiped, said environmental module including powered cooling means for moving air horizontally through said front bays, said interconnection carrier, and said rear region.

5,193,051

SLIDING BOX TYPE PEN BASE COMPUTER WITH LCD AND MOTHER BOARD IN A BASE AND WITH BATTERY, POWER SUPPLY, AND DISK DRIVES IN A SLIDING BOX

Hsi-Kuang Ma, 4F, No. 48, Sec. 2, Chung Cheng Road, Taipei, Taiwan

Filed Apr. 22, 1992, Ser. No. 872,026
Int. Cl.[5] H05K *7/10*; G06F *1/16*
U.S. Cl. 361—393 1 Claim



1. A sliding box type pen base computer comprising:

a base, said base comprising a mother board and a liquid crystal display (LCD) at the top and supported on two longitudinal side stands, and a connector circuit for connecting an external peripheral equipment, said side stands defining therebetween a receiving chamber and having inward flanges at the bottom; and

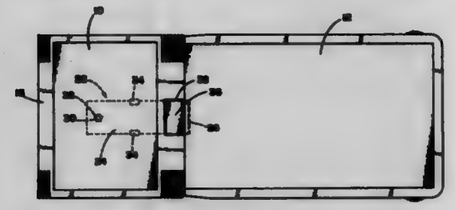
a sliding box movably inserted into said receiving chamber and supported on said inward flanges, said sliding box comprising a battery box, a power supply unit, a floppy disk drive and a hard disk drive on the inside surrounded by a vertical peripheral wall and electrically connected to said base.

5,193,052

FONT CARTRIDGE EXTENDER WITH SPRING HOOK LATCH

Gregory P. Larson, Moorpark, and Frank Wilkinson, Chatsworth, both of Calif., assignors to Advanced Matrix Technology, Inc., Camarillo, Calif.

Filed Nov. 7, 1991, Ser. No. 788,831
Int. Cl.[5] H05K *1/14, 7/12*; H01R *13/62*
U.S. Cl. 361—395 20 Claims



1. A latching mechanism for securing a font cartridge extender to a printer font cartridge, comprising:

(a) a font cartridge extender adapted for coupling to a printer font cartridge, the extender comprising a circuit board enclosed in a protective case for connecting a data bus between a printer, the font cartridge extender, and the font cartridge;

(b) a chute in the case;

(c) a spring hook residing in the chute for engaging a lip on the font cartridge; and

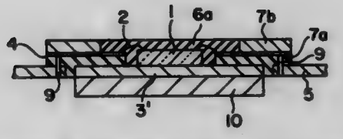
(d) braces for guiding the spring hook within the chute.

5,193,053

PLASTIC PACKAGED SEMICONDUCTOR DEVICE

Kaoru Sonobe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 23, 1991, Ser. No. 781,772
Claims priority, application Japan, Oct. 29, 1990, 2-291588
Int. Cl.[5] H05K *5/02*
U.S. Cl. 257—668 4 Claims



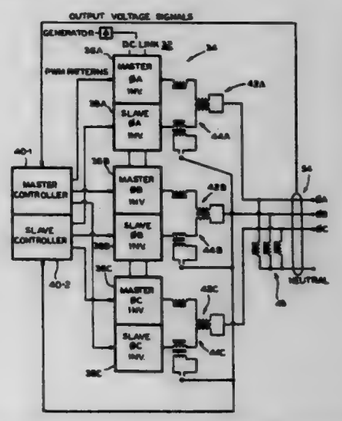
1. A plastic packaged semiconductor device comprising a lead frame provided with an island for loading a semiconductor element in the central part thereof and a plurality of leads which are projected from an outer frame having a square shape and distributed around the periphery of the island; an insulating substrate which covers one principal surface of the island and a part of the leads and is bonded thereto while exposing the semiconductor element; distributing wires which are formed on one principal surface of the insulating substrate so as to be in conformity with the leads; a conductive substance which connects the distributing wires to the leads and fills through-holes formed in the insulating substrate; bonding wires which connect input-output terminals of the semiconductor element to the leads; and a resin body which encloses and embeds the bonding wires and the semiconductor element.

5,193,054

DC CONTENT CONTROL IN A DUAL VSCF CONVERTER SYSTEM

Gary L. Galloway, Rockford; Thomas S. Latos, Huntley, and Derrick Rea, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 24, 1991, Ser. No. 781,920
Int. Cl.[5] H02M *7/48*
U.S. Cl. 363—72 14 Claims



1. In a polyphase electric power system with first and second inverters having common phase outputs connected in parallel to inductive elements for connection to a load, a control comprising:

a first sensing means for sensing per phase output voltage from said inductive elements;

a second sensing means operatively associated with the outputs of both inverters for each phase for sensing differential current from said inverters for such phase; and

an inverter control connected to said first and second sensing means including first control means for developing pulse width modulated control signals to said first inverter in response to said first sensing means to control output voltage and second control means for developing pulse width modulated control signals to said second inverter to reduce differential current sensed by said second sensing means.

5,193,055

ACCOUNTING SYSTEM

Gordon T. Brown, and Richard H. Scherer, both of 631 Iron City Dr., Pittsburgh, Pa. 15205

Continuation of Ser. No. 280,220, Dec. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 21,249, Mar. 3, 1987, abandoned. This application Jan. 14, 1991, Ser. No. 640,542
Int. Cl.[5] G06F *15/30*
U.S. Cl. 364—406 5 Claims

1. A method of producing through a service company an accounting statement suitable for a customer, such as an individual, a small business and the like, the method comprising the steps of

providing to the customer a pre-established group of standard category codes,

entering category codes selected by the customer from the pre-established group into a computer file,

entering information identifying a customer account into the computer,

determining the cash balance in the customer account from a bank statement for the account,

entering into the computer the account balance as shown by the bank statement balance for the account,

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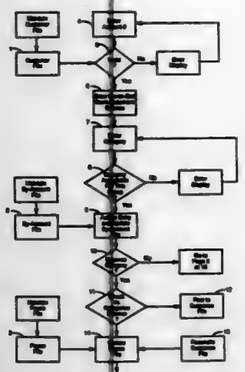
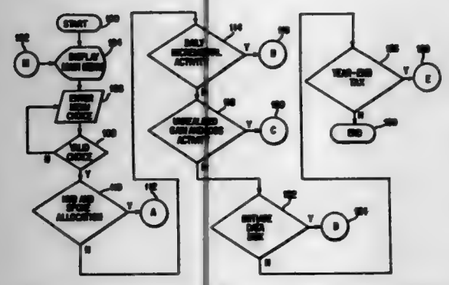
receiving copies of money transfer instructions including at least one category code selected by the customer,
entering into the computer debits made against the account along with category codes selected by the customer,
entering into the computer credits made to the account along with category codes selected by the customer,
holding in the computer prior computer-generated account balances,
generating, from the entries, reports from one or more of three tiers, namely,
(a) Income/Expense (cash basis)



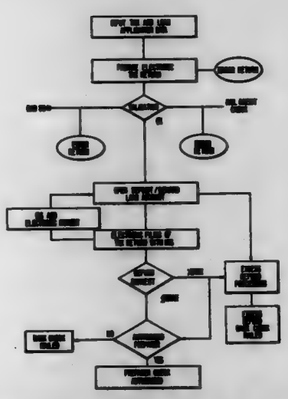
(b) Accruals
(c) Statistical
the steps of generating said reports including at least:
adding to the prior computer-generated account balance the amount of credits to the account, and subtracting the amount of debits represented by the money transfer instructions to obtain an updated computer-generated account balance based on the prior account balance,
reconciling the computer-generated account balance with the bank statement, and
printing an account statement.

5,193,056
DATA PROCESSING SYSTEM FOR HUB AND SPOKE FINANCIAL SERVICES CONFIGURATION
R. Todd Boss, Boston, Mass., assignor to Signature Financial Group Inc., Boston, Mass.
Filed Mar. 11, 1991, Ser. No. 667,777
Int. Cl.[5] G06F *15/21, 15/30*
U.S. Cl. 364—408 **6 Claims**



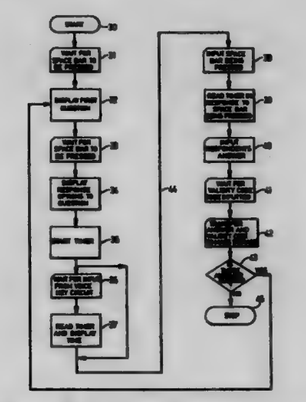
1. A data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds, comprising:
(a) computer processor means for processing data;
(b) storage means for storing data on a storage medium;
(c) first means for initializing the storage medium;
(d) second means for processing data regarding assets in the portfolio and each of the funds from a previous day and data regarding increases or decreases in each of the funds, assets and for allocating the percentage share that each fund holds in the portfolio;
(e) third means for processing data regarding daily incremental income, expenses, and net realized gain or loss for the portfolio and for allocating such data among each fund;
(f) fourth means for processing data regarding daily net unrealized gain or loss for the portfolio and for allocating such data among each fund; and
(g) fifth means for processing data regarding aggregate year-end income, expenses, and capital gain or loss for the portfolio and each of the funds.

5,193,057
ELECTRONIC INCOME TAX REFUND EARLY PAYMENT SYSTEM WITH MEANS FOR CREATING OF A NEW DEPOSIT ACCOUNT FOR RECEIPT OF AN ELECTRONICALLY TRANSFERRED REFUND FROM THE IRS
Ross N. Longfield, Far Hills, N.J., assignor to Beneficial Franchise Company Inc., Wilmington, Del.
Continuation of Ser. No. 384,654, Jul. 25, 1989, which is a continuation of Ser. No. 146,324, Jan. 20, 1988, Pat. No. 4,890,228. This application Nov. 20, 1990, Ser. No. 615,903
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] G06F *15/30*
U.S. Cl. 364—408 **5 Claims**



1. An electronic data processing system for electronic filing of income tax returns and authorizing tax refund payments comprising:
a) at least one programmable electronic data processing means for executing programmed arithmetic and logical processes and storing data;
b) at least one input means for inputting tax preparer data, tax return data and tax refund payment data to said at least one data processing means;
c) program means executable by said at least one data processing means for processing said tax preparer data and said tax return data and creating electronic tax return data files;
d) program means executable by said at least one data processing means for processing tax refund payment data and creating electronic deposit account files at an authorized financial institution;
e) program means executable by said at least one data processing means for processing said tax return data files and said electronic deposit account files and for transmitting electronic tax return data to at least one electronic data processing means controlled by at least one tax collecting authority and designating said electronic deposit account file at the authorized financial institution as the recipient of electronic funds transfer data from at least one electronic data processing means controlled by at least one tax collecting authority;
f) program means executable by said at least one data processing means for processing said tax return data files and said electronic deposit account files and authorizing payment by said financial institution of a tax refund amount from said deposit account upon electronic funds transfer of the refund payment by said tax collection authority; and
g) program means executable by said at least one data processing means for electronically closing said electronic deposit account file after payment of the tax refund amount to the taxpayer.

5,193,058
METHOD AND APPARATUS FOR THE MEASUREMENT OF RESPONSE TIME IN ATTITUDE SURVEY RESEARCH
John N. Bassili, and Joseph F. Fletcher, both of Toronto, Canada, assignors to Arkelon Research, Streetsville, Canada
Filed Oct. 26, 1990, Ser. No. 603,645
Int. Cl.[5] G06F *15/38*; G09B *5/04, 7/00*; H04N *7/00*
U.S. Cl. 364—419 **6 Claims**



1. An apparatus for use by an interviewer in conducting a survey of a person, the apparatus comprising:
(a) a means for displaying a menu of questions to be asked by the interviewer, said means for displaying including timing means and comprising a computer having a central processing unit, a disk drive, a data entry keyboard and a video display unit, and said computer including means for providing question prompts to the interviewer asking questions of the person being surveyed, by displaying said question prompts on the video display unit;
(b) a means for initiating said timing means upon completion of the question, said means for initiating being coupled to said means for displaying, and said means for displaying being responsive to said means for initiating;
(c) a means for detecting an audio response from the person being surveyed, and converting said audio response into an electronic control signal which stops the timing means, said means for detecting and converting being coupled to said means for displaying;
(d) said means for initiating said timing means upon completion of said question being responsive to a manual input from the interviewer and an electronically activated input for generating a control signal for initiating said timing means in response to one of said manual and electronic activated inputs; and
(e) said means for displaying, determining and recording a response time of the person being surveyed being based on the initiating and stopping of said timing means.

5,193,059
METHOD FOR IDENTIFYING AND CHARACTERIZING HYDRAULIC UNITS OF SATURATED POROUS MEDIA: TRI-KAPPA ZONING PROCESS
Djebbar Tiab, Norman, Okla.; David M. Marschall, Sugar Land, and Mehmet H. Altunbay, Houston, both of Tex., assignors to Western Atlas International Inc., Houston, Tex.
Continuation of Ser. No. 534,458, Jun. 6, 1990, abandoned. This application Oct. 28, 1991, Ser. No. 784,641
Int. Cl.[5] G01V *1/00*
U.S. Cl. 364—422 **13 Claims**

1. A method for logging a formation for permeability, comprising:
(a) defining geologic units of the formation based on analysis of core material from the formation;
(b) obtaining plugs from the core material, wherein selection of the plugs is based on the geologic units definition;
(c) determining a first set of hydraulic unit characterization factors based on core analysis of the plugs;
(d) identifying hydraulic units distributed within the geologic units based on the first set of hydraulic unit characterization factors;
(e) selecting a plurality of test samples of core material, wherein the selection is based on the hydraulic units distribution;
(f) determining a second set of hydraulic unit characterization factors based on core analysis of the test samples;
(g) determining a dynamic correlation between logging measurements and core analysis measurements of the formation based on the second set of hydraulic unit characterization factors;
(h) calibrating a logging tool based on the correlation; and
(i) logging a well in the formation with the calibrated logging tool to produce a permeability log of the formation.

5,193,060
METHOD OF HOLD-SPEED CONTROL DURING AN UPSHIFT
Maurice B. Leising, 877 Key West Dr., Clawson, Mich. 48017, and Gerald L. Holbrook, 866 Downhill Ln., Rochester Hills, Mich. 48063
Filed May 12, 1989, Ser. No. 351,895
Int. Cl.[5] B60K *41/04*
U.S. Cl. 364—424.1 **2 Claims**

1. In a vehicle having a transmission including an input member, an output member, a gear assembly for changing a ratio of torque between said input member and said output member, a plurality of friction elements for shifting said gear

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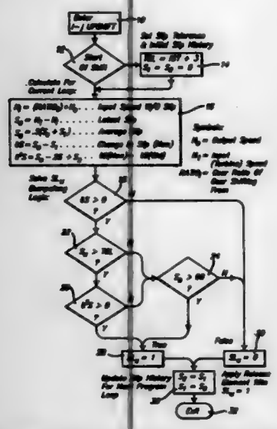
assembly, a plurality of input sensors for providing signals indicative of a current slip of said transmission, and a controller having memory for processing and storing said signals, storing predetermined slip conditions and providing output signals, a method of controlling a hold-speed during an upshift of said gear assembly to enable said transmission to rapidly respond to dynamic slip condition of a start of the transmission upshift, said method comprising the steps of:

(a) determining whether said transmission is at the start of said upshift;



(b) if said transmission is determined to be at the start of said upshift, calculating the magnitudes of current slip parameters including a slip between said input and said output members of said transmission, an average slip, a change in slip and a change in the change in slip;

(c) comparing the magnitudes of said current slip parameters against said predetermined slip conditions; and

(d) reapplying at least one of said friction elements of said transmission if certain of said current slip parameters satisfy said predetermined slip conditions.

5,193,061

SLIP CONTROL MECHANISM OF A MOTOR VEHICLE

Toshiaki Tsuyama, Higashi-Hiroshima; Kazutoshi Nobumoto, Hiroshima; Fumio Kageyama, Hiroshima; Akira Sone, Hiroshima, and Makoto Kawamura, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 4, 1990, Ser. No. 621,963

Claims priority, application Japan, Dec. 6, 1989, 1-317073

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 4 Claims

1. A slip control mechanism of a motor vehicle having driving wheels comprising:

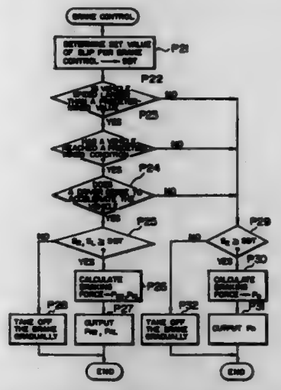
brake means for applying a braking force to each driving wheel;

first detection means for detecting slip of each driving wheel;

second detection means for detecting when a predetermined condition has been met during a starting period of said vehicle; and

slip control means for determining which driving wheel has a larger slip value and operating the brake means so that each driving wheel is provided with braking force when an excessive slip is detected, based on signals from the first detection means, to thereby eliminate such excessive slip;

said slip control means controlling the braking force applied by the brake means for respective driving wheels, based on said larger slip value, so that substantially the same amount of braking force is applied to the driving wheels when said second detection means detects that the predetermined condition is not met, and controlling the brake means for the respective driving wheels independently in



accordance with signals from the first detection means when said second detection means detects that the predetermined condition is met.

5,193,062

AUTOMATIC VEHICLE DRIVING SYSTEM AND METHOD OF DRIVING THE SAME ON CHASSIS DYNAMOMETER

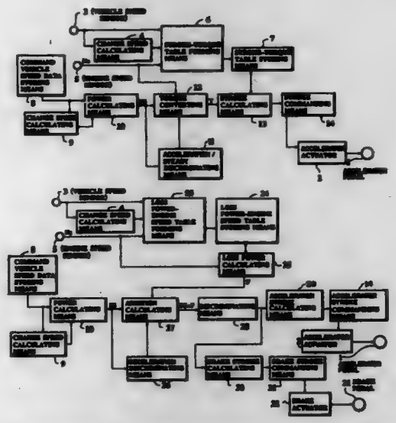
Isao Murase, and Akira Shimozono, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 29, 1991, Ser. No. 647,025

Claims priority, application Japan, Feb. 7, 1990, 2-28009

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—426.04 15 Claims



1. An automatic vehicle driving system on a chassis dynamometer, comprising:

(a) means for sensing engine speed;

(b) means for sensing vehicle speed;

(c) means for calculating vehicle change speed on the basis of sensed vehicle speed;

(d) means for actuating an accelerator pedal;

(e) means for forming a table indicative of a relationship between accelerator actuator stroke and engine output torque on the basis of the sensed engine speed, the sensed vehicle speed, and the calculated vehicle change speed;

(f) means for storing the formed stroke-torque table;

(g) means for storing command vehicle speed data;

(h) means for calculating command vehicle change speed;

(i) means for calculating necessary power to drive a vehicle at the command vehicle speed and the command vehicle change speed;

(j) means for discriminating whether the vehicle must be accelerated or kept at steady speed on the basis of the calculated necessary power;

(k) means for converting the calculated necessary power into an engine output torque according to the sensed engine speed when the vehicle must be accelerated or kept at steady speed;

(l) means for calculating an accelerator actuator stroke required to generate the converted engine output torque with reference to the stroke-torque table formed by said stroke-torque forming means; and

(m) means for controlling said accelerator pedal actuating means responsive to the calculated accelerator actuator stroke.

4. A method of driving a vehicle on a chassis dynamometer, comprising the steps of:

(a) reading actual engine speed and actual vehicle speed;

(b) reading a stored command vehicle speed and calculating a change speed on the basis of the command vehicle speed;

(c) calculating a necessary power PS with reference to a stored vehicle speed-steady travel power table;

(d) calculating an engine friction loss power F with reference to a stored friction loss power-engine speed table;

(e) calculating an addition PS+F of the calculated necessary power and the calculated friction power;

(f) checking whether the calculated addition is equal to or more than zero PS+F≧0;

(g) if equal to or more than zero, determining that vehicle speed can be decelerated by only engine brake;

(h) checking whether the calculated necessary power is equal to or more than zero PS≧0;

(i) if equal to or more than zero, determining that vehicle speed must be accelerated or kept at steady speed;

(j) converting the necessary power PS into an engine output torque T according to the current engine speed;

(k) calculating an accelerator actuator stroke with reference to a stored stroke-torque table; and,

(l) outputting a calculated command accelerator actuator stroke to an accelerator actuator.

5,193,063

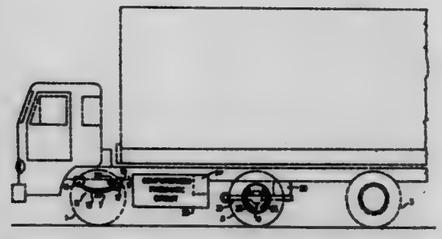
VEHICLE AXLE CONTROL SYSTEM

Daniel Asch, 1155 Turnbull, Quebec, P.Q., Canada G1R 5G3

Continuation-in-part of Ser. No. 383,012, Jul. 21, 1989, Pat. No. 5,025,877. This application May 4, 1990, Ser. No. 518,718

Int. Cl.[5] B62D *61/12*

U.S. Cl. 364—424.05 24 Claims



1. In a control system for deploying or applying load to an auxiliary axle on a wheeled vehicle having a chassis frame, said frame being mounted through axle suspension means on at least two non-deployable axles, at least one of said non-deployable axles serving as a principal axle from which the load on said principal axle is measured and the total vehicle load is determined, said vehicle having further an auxiliary axle, wherein:

(a) said auxiliary axle is coupled to the chassis frame by an adjustable auxiliary axle suspension that permits such axle to be retracted to an inactive, raised position out of contact with the ground, and to be deployed by being lowered to a load-bearing position in contact with the ground; and wherein

(b) said adjustable suspension is capable of deploying said auxiliary axle in a controlled manner so as to share a variable proportion of the total load of the vehicle being carried by all of its axles;

said vehicle further comprising:

(c) load sensing means for providing on a repetitive basis over time, while said vehicle is in motion, in the form of load signals, sample measurements of the momentary load carried by the principal axle;

(d) first control means for deploying said auxiliary axle when the load on said principal axle as determined from said load sensing means is above a predetermined drop-point value;

(e) second control means for retracting said auxiliary axle when the load on said principal axle as determined by said load sensing means is below a predetermined lift-point value;

(f) third control means for controlling, in response to said load signals, the load carried by the auxiliary axle once it is deployed;

the improvement comprising:

(g) fourth control means connected to receive said load signals from said load sensing means and connected to said first, second and third control means for activation of at least one of said first, second or third control means by sending thereto an activation signal derived by processing said load signals by the comparison by said fourth control means of:

(i) a time-averaged value for a series of sample load signals taken while said vehicle is in motion; with

(ii) predetermined load signal values provided to said fourth control means for effecting actuation of said first, second and third control means.

5,193,064

METHOD AND APPARATUS OF INTEGRATING GLOBAL POSITIONING SYSTEM AND INERTIAL NAVIGATION SYSTEM WITHOUT USING ACCELEROMETERS

Stanley C. Maki, Poway, Calif., assignor to General Dynamics Corporation, Space Systems Division, San Diego, Calif.

Filed Oct. 9, 1990, Ser. No. 594,894

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—454 5 Claims

1. A guidance system for a flying vehicle which includes:

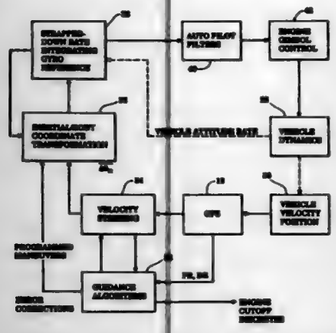
means to sense from the dynamics of the flying vehicle information relating to the position and the velocity of the vehicle;

a GPS means responsive to the position and velocity information to provide velocity and position vectors and components of the velocity vector;

a guidance algorithm means responsive to the current position and velocity vectors of the vehicle to provide certain steering information and to provide a velocity vector to be gained;

a velocity steering means responsive to the velocity vector to be gained provided by the guidance algorithm means

and to components of the velocity vector provided by the GPS to generate a steering rate vector, and



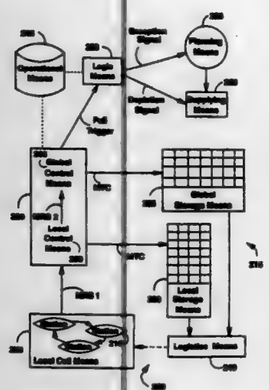
means responsive to the steering rate vector provided by the velocity steering means to adjust accordingly the attitude of the flight vehicle.

5,193,065

SYSTEM FOR REQUISTIONING AND DISTRIBUTING MATERIAL IN A MANUFACTURING ENVIRONMENT

Pierre C. Guerindon, Peoria, and Jon E. Barrow, Naperville, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 3, 1990, Ser. No. 621,662
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—468 **49 Claims**



28. A method for requisitioning and distributing material in a manufacturing environment, wherein the manufacturing environment includes a local manufacturing station adapted to utilize the material, a local storage unit adapted to store the material, and a logistics unit adapted to move the material, comprising the steps of:

utilizing said stored material and producing a first missing resource signal in response to the amount of material in said local storage unit being equal to a predetermined minimum value;

receiving said first missing resource signal, responsively searching said local storage unit, producing a material transfer command signal in response to the presence of said material, and producing a pull trigger signal in response to the absence of said material;

producing a material schedule; and

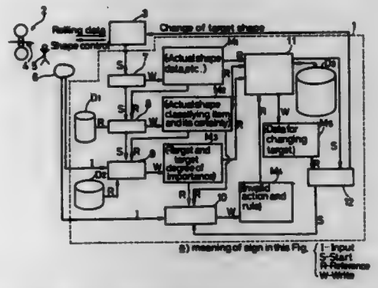
receiving said pull trigger signal and said material schedule, and producing a depletion signal in response to said pull trigger signal and said material schedule.

5,193,066

EQUIPMENT FOR ADJUSTING THE SHAPE OF A RUNNING BAND-LIKE OR PLATE-LIKE METAL MATERIAL IN THE WIDTH DIRECTION

Masami Konishi, Kobe; Hiroshi Narazaki, Amagasaki; Toshiharu Iwatani, Kobe; Kazuo Nose, Kobe; Takashi Sato, Kobe; Hiroo Oshima, Kobe; Soichi Kitagawa, Kobe, and Haxime Tubono, Itami, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 14, 1990, Ser. No. 493,471
Claims priority, application Japan, Mar. 14, 1989, 1-62654; Mar. 14, 1989, 1-62657; Mar. 14, 1989, 1-62658; May 2, 1989, 1-113171; Sep. 29, 1989, 1-256666; Mar. 9, 1990, 2-58819; Mar. 13, 1990, 2-62219; Mar. 13, 1990, 2-62220; Mar. 13, 1990, 2-62221; Mar. 13, 1990, 2-62222
Int. Cl.[5] G06F *15/46*; B21B *37/00*
U.S. Cl. 364—472 **13 Claims**



1. A target shape adjusting apparatus for adjusting the shape in the width direction of a moving band-like or plate-like metal material, said apparatus comprising:

a shape controlling section for controlling an actual shape of the metal material in the width direction thereof, said shape controlling section being responsive to target shape data supplied thereto, said shape controlling section including means for selectively cooling a portion of said metal material;

a sensor for detecting actual shape data representing said actual shape;

experience value memorizing means for memorizing experience values, said experience values representing changes of the actual shape corresponding to previous changes of the target shape data; and

operating means for preparing the target shape data on the basis of the actual shape data and the experience values, said operating means being adapted to output the target shape data to the shape controlling section.

5,193,067

BATTERY CONDITION DETECTON APPARATUS

Hirohide Sato, Toyokawa, and Yoshiya Hatakeyama, Joyo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Japan Storage Battery, Kyoto, both of Japan

Filed Dec. 4, 1989, Ser. No. 444,873
Claims priority, application Japan, Dec. 5, 1988, 63-307243; Dec. 15, 1988, 63-317164; Aug. 1, 1989, 1-199896
Int. Cl.[5] G01N *27/46*
U.S. Cl. 364—483 **8 Claims**

1. An apparatus which detects a condition of a battery which operates using a reactive substance in an electrolyte thereof, said apparatus comprising:

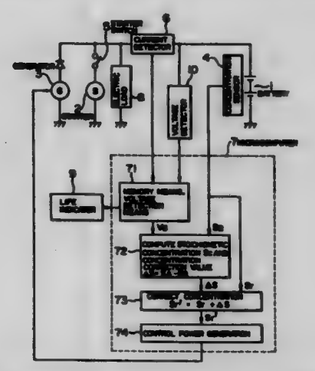
a battery voltage detector for detecting a voltage of the battery and providing a battery voltage signal;

a battery current detector, connected in a battery discharge path, for detecting a discharge current of said battery and providing a battery current signal;

a battery electrolyte concentration detector for detecting a value representing a concentration of the reactive substance in the electrolyte of the battery and providing a battery electrolyte concentration signal;

memory means for storing a standard characteristic representing a standard value of the concentration of the reactive substance in the electrolyte of said battery at a time when said battery current signal reaches a predetermined value, as a function of one of a voltage and an internal resistance of said battery;

computation means for receiving said battery voltage signal provided by said battery voltage detector at a time when said battery current signal reaches the predetermined value, and for obtaining a value representing the standard concentration of the reactive substance in said battery



using a value of the voltage of said battery or a value of the internal resistance to obtain the standard characteristic stored in said memory means, the value thus obtained being outputted as a standard concentration value;

correction value computation means for receiving said battery electrolyte concentration signal provided by said battery electrolyte concentration detector, at a time near when said computation means receives said battery voltage signal and for computing a concentration correction value on the basis of said battery electrolyte concentration signal and the standard concentration value inputted from said computation means; and

correction means for correcting said battery electrolyte concentration signal provided by said battery electrolyte concentration detector by using the concentration correction value obtained by said correction value computation means to provide a corrected battery electrolyte concentration signal.

5,193,068

METHOD OF INDUCING OFF-CIRCUIT BEHAVIOR IN A PHYSICAL MODEL

Sergio A. Britman, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 1, 1990, Ser. No. 590,832
Int. Cl.[5] G06F *11/00, 15/20*
U.S. Cl. 364—578 **6 Claims**

1. In a simulation system which produces digital input patterns for input to a model of a complex digital device, the operation of the device being modelled within the simulation system by the method steps of:

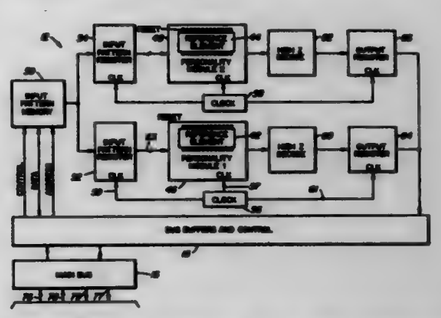
a) presenting a first sequence of the digital input patterns to a reference element which is a physical specimen of the complex digital device to produce a digital output pattern, wherein the presenting step occurs at a clock rate which differs from the rate at which the digital input patterns are produced by the simulation system;

b) sampling the digital output pattern after the first sequence of the digital input patterns has been presented to the complex digital device;

c) allowing the simulation system to respond to the digital output pattern in (b) to produce the next one of the digital input patterns;

d) storing the next one of the digital input patterns in succession with the first sequence of the digital input patterns to produce a second sequence of the digital input patterns;

e) resetting the reference element independent of operation of the simulation system; and



f) repeating steps (a) through (e), the second sequence becoming the first sequence;

a method of inducing off-circuit behavior of the complex digital device, the method comprising the ordered steps of:

i) after performing step (b) above, storing an off-circuit digital input sequence in succession with the first sequence to produce a mixed sequence;

ii) resetting the reference element independent of operation of the simulation system;

iii) presenting the mixed sequence to the reference element; and

iv) sampling the digital output pattern resulting from the presentation of the mixed sequence.

5,193,069

PORTABLE COMPUTER TO WHICH DIFFERENT TYPES OF FLAT DISPLAY PANELS CAN BE ATTACHED

Seiichi Furuya, Fuuu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 514,027, Apr. 27, 1990, abandoned. This application Jan. 31, 1992, Ser. No. 829,628
Claims priority, application Japan, Apr. 28, 1989, 1-51217[U]
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—708 **6 Claims**

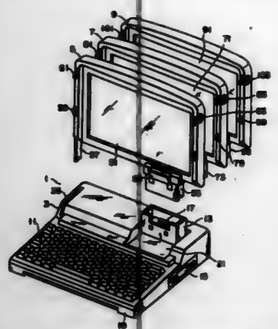
1. A portable computer system comprising:

a base unit including a keyboard, a power supply for supplying a standard voltage, a display controller for supplying standard display data, and a first connector electrically coupled to the power supply and the display controller for receiving the standard voltage and the standard display data;

a first display unit removably connecting to the base unit, the first display unit including a second connector removably and electrically connecting to the first connector, a first flat panel display module, and a first converter circuit comprising a first voltage converter circuit for automatically converting the standard voltage supplied by the power supply through the first and second connectors into a first inherent voltage for driving the first flat panel display module and a first data converter circuit for automatically converting the standard display data supplied by

the display controller through the first and second connectors into first inherent display data for use by the first flat panel display module; and

a second display unit removably connecting to the base unit in place of the first display unit, the second display unit comprising a third connector removably and electrically connecting to the first connector, a second flat panel display module, and a second converter circuit comprising one of a second voltage converter circuit for automatically converting the standard voltage supplied by the power supply through the first and third connectors into a second inherent voltage for driving the second flat panel display module and a second data converter circuit for automatically converting the standard display data supplied by the display controller through the first and third connectors into second inherent display data for use by the second flat panel display module.

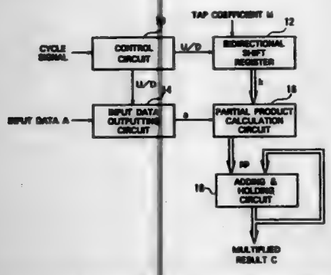


5,193,070

TRANSVERSAL FILTER CIRCUIT HAVING TAP CIRCUITS INCLUDING BIDIRECTIONAL SHIFT REGISTERS FOR SERIAL MULTIPLICATION

Shigeshi Abiko, Tokyo, and Shoji Saiki, Yokohama, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 15, 1991, Ser. No. 700,725
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.16 7 Claims



1. A transversal filter circuit comprising a plurality of tap circuits, each including a serial multiplication circuit having

a bidirectional shift circuit for shifting a tap coefficient by a predetermined number of bits in one of two directions,

a data input circuit for containing input data and providing the input data as an output in accordance with a predetermined pattern,

a partial product calculation circuit respectively operably connected to the outputs of said bidirectional shift circuit and said data input circuit for calculating a partial product of said tap coefficient output from said bidirectional shift circuit and said input data as output from said data input circuit,

an adding and holding circuit operably connected to the output of said partial product calculation circuit for adding an output from said partial product calculation circuit to a previously added value and holding the added output, and

a control circuit operably connected to said bidirectional shift circuit and to said data input circuit and providing a control signal as an input thereto for controlling the shift direction of said bidirectional shift circuit and the data output direction of said data input circuit by alternatively changing the shift direction at each successive operation cycle,

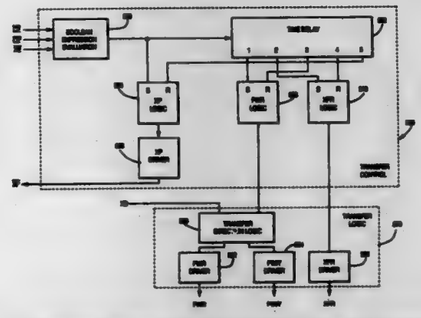
said serial multiplication circuit consecutively calculating and adding the partial product of a next tap coefficient and the input data for a plurality of times defined by a bit number of said input data, within each operation cycle.

5,193,071

MEMORY APPARATUS FOR MULTIPLE PROCESSOR SYSTEMS

Leonard J. Umina, Marlboro, and Robert A. Anselmo, Stow, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 696,738, May 7, 1991, abandoned, which is a division of Ser. No. 288,168, Dec. 22, 1988, Pat. No. 5,031,146. This application Mar. 3, 1992, Ser. No. 844,883
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—189.01 5 Claims



1. A memory storage cell constructed in a single integrated circuit substrate, comprising:

a first memory cell for retrievably storing a bit value;

a second memory cell for retrievably storing a bit value;

I/O means for making each of said first and second memory cells accessible for read and write operations independent of access to said second and first memory cells, respectively, for read and write operations;

a control element, operatively coupled between said first and second memory cells and respective to a transfer control signal, for copying the bit value stored in a sending one of said first and second memory cells to a receiving one of said first and second memory cells; and

first and second power supply lines coupled to said first and second memory cells, respectively, to maintain bit value storage, said first and second power supply lines providing adjustable power levels to said first and second memory cells, respectively;

wherein said control element further comprises

means, responsive to said transfer control signal, for providing a conductive path between said first and second memory cells in response to said transfer control signal; and

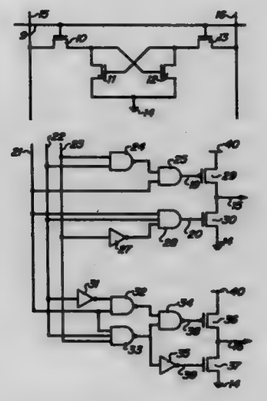
wherein the power supply power level to the receiving memory cell is reduced when said transfer control signal causes said control element to provide said conductive path, thereby copying the bit value stored in the sending memory cell into the receiving memory cell.

5,193,072

HIDDEN REFRESH OF A DYNAMIC RANDOM ACCESS MEMORY

Gerald L. Frankil, Brookline, and Steven E. Golson, Carlisle, both of Mass., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 21, 1990, Ser. No. 631,618
Int. Cl.[5] C11C *11/40*
U.S. Cl. 365—222 19 Claims



1. A random access memory having a plurality of memory cells which are refreshed responsive to a clock signal, the clock signal having a clock cycle and the random access memory comprising:

address selection means, coupled to the plurality of memory cells, for selecting a first subset of the plurality of memory cells for data access;

refresh selection means, coupled to the plurality of memory cells, for selecting a second subset of the plurality of memory cells to be refreshed; and,

refresh means, coupled to the plurality of memory cells, for, during a first segment of the clock cycle, refreshing data stored in the first subset of the plurality of memory cells selected by the address selection means and for, during the first segment of the clock cycle, refreshing data stored in the second subset of the plurality of memory cells selected by the refresh selection means;

wherein a data access to the first subset of the plurality of memory cells is performed in a second segment of the clock cycle, the second segment of the clock cycle occurring after the first segment of the clock cycle.

5,193,073

ON CHIP VOLTAGE REGULATOR FOR COMMON COLLECTION MATRIX PROGRAMMABLE MEMORY ARRAY

Rohit L. Bhava, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 820,286, Jan. 17, 1986. This application May 2, 1988, Ser. No. 166,960
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—226 8 Claims

5. A transient immune memory matrix in a memory chip, comprising:

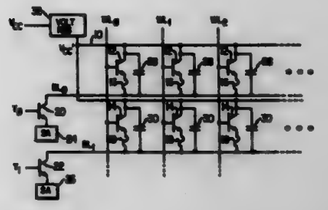
an external supply line for supplying voltage to the chip;

a matrix supply line;

isolation means disposed between said external supply line and said matrix supply line for supplying a constant voltage to said matrix supply line lower than the voltage on said supply line, said isolation means isolating said matrix supply line from voltage transients on said external supply line;

a matrix of common collector memory cells arranged in rows and columns and connected on one side to said matrix supply line, each memory cell having a first or second logic state; and

means for selectively connecting each of said memory cells to an external current sink such that selection of one of said memory cells causes current to flow from said matrix supply line through said selected memory cell and to the external current sink.

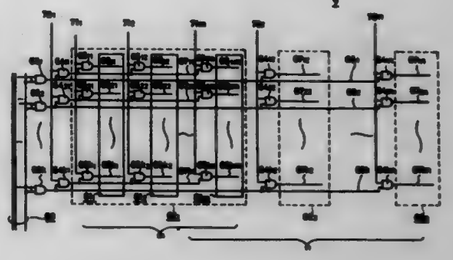


5,193,074

SEMICONDUCTOR MEMORY DEVICE HAVING HIERARCHICAL ROW SELECTING LINES

Kenji Anami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1991, Ser. No. 646,910
Claims priority, application Japan, Feb. 9, 1990, 2-30837
Int. Cl.[5] G11C *8/02*
U.S. Cl. 365—230.03 40 Claims



1. A semiconductor memory device comprising:

a memory cell array formed of a plurality of memory cells arranged in matrix and each including one transistor and one capacitor; wherein said memory cell array is divided in the direction of columns into a plurality of large groups of memory cells, and each of said plurality of large memory cell groups is further divided in the direction of columns into a plurality of small groups of memory cells, said semiconductor memory device further comprising:

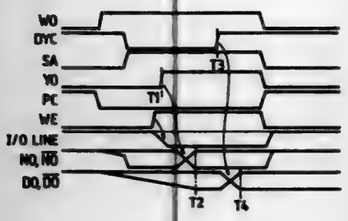
a plurality of first row-selecting lines provided in said memory cell array;
a plurality of second row-selecting lines provided in each of said plurality of large memory cell groups;
a plurality of word lines provided in each of said plurality of small memory cell groups and connected to said memory cells;
means for supplying a first selecting signal for selecting one of said plurality of large memory cell groups;
means for supplying a second selecting signal for selecting one of said plurality of small memory cell groups;
first decoder means responsive to an internal address signal for selecting one of said first row-selecting lines to activate the selected first row-selecting line;
a plurality of second decoder means provided in each said large memory cell group for selecting a second row-selecting line associated with said selected first row-selecting line to activate the selected second row-selecting line in the large memory cell group selected by said first selecting signal; and
a plurality of third decoder means provided in each said small memory cell group for selecting a word line associated with said selected second row-selecting line to activate the selected word line in the small memory cell group selected by said second selecting signal.

5,193,075

STATIC MEMORY CONTAINING SENSE AMP AND SENSE AMP SWITCHING CIRCUIT

Susumu Hatano; Kanji Oishi; Takashi Kikuchi; Yasuhiko Saigoo; Hiroshi Fukuta; Kunio Uchiyama; Hirokazu Aoki, and Osamu Nishii, all of Tokyo, Japan, assignors to Hitachi Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Mar. 8, 1990, Ser. No. 490,745
Claims priority, application Japan, Mar. 8, 1989, 1-55938
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—233 7 Claims



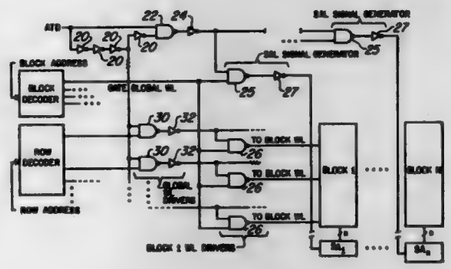
1. A method of reading and writing data from and to a memory cell which is connected by a pair of data lines to input/output lines, wherein the memory cell is associated with a sense amplifier connected between the pair of data lines for sensing and amplifying a voltage difference between the pair, a first switching means between the sense amplifier and the memory cell and a second switching means between the sense amplifier and the input/output lines, the method comprising the steps of:
for a reading operation;
opening the second switching means in preparation for the read operation;
as the sense amplifier commences a reading sense operation of a first voltage difference across the data lines, opening the first switching means;
continuing the reading sense operation with the sense amplifier disconnected from both the memory cell and the input/output lines;
a first predetermined time after commencement of the reading sense operation, closing the second switching means to convey a sense amplifier output to the input/output lines; and,
for a writing operation:
opening the first switching means in preparation for the writing operation;
closing the second switching means;
commencing a writing sense operation of a second voltage difference across the data lines by the sense amplifier;
continuing the writing sense operation of the voltage difference across the data lines with the sense amplifier disconnected from the memory cell;
a second predetermined time after the commencing of the writing sense operation, closing the first switching means to convey an output of the sense amplifier to the memory cell.

5,193,076

CONTROL OF SENSE AMPLIFIER LATCH TIMING

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 288,399, Dec. 22, 1988, abandoned.
This application Jan. 28, 1991, Ser. No. 647,615
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—233.5 6 Claims



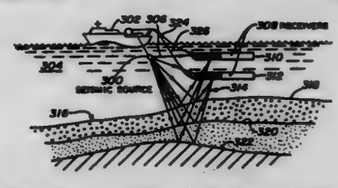
1. A static random access memory timing system for a static random access memory comprising:
at least one row and one column of memory cells,
a plurality of bit lines,
at least one word line,
circuitry for controlling a bit line precharge and equalization signal, and row address detection circuitry connected by a plurality of logic gates to at least one latching sense amplifier, to said circuitry for controlling said bit line precharge and equalization signal and to said at least one word line;
said at least one latching sense amplifier associated with a pair of said plurality of bit lines, wherein the memory is operable such that said bit line precharge and equalization signal is turned on when an address transition is detected by said row address detection circuitry and simultaneously an adequate differential voltage which said sense amplifier can latch is driven on said associated pair of bit lines and such that said at least one latching sense amplifier is timed to latch after said bit line precharge and equalization signal is turned off, wherein said bit line precharge and equalization signal is turned off after the establishment of said adequate differential voltage on said associated pair of bit lines, and wherein a signal controlling the latching of said latching sense amplifier originates from said bit line precharge and equalization signal, said bit line precharge and equalization signal originating from a chain of logic processing on a row address transition detection circuit signal.

5,193,077

METHOD AND APPARATUS FOR IMPROVED SEISMIC PROSPECTING

Arthur B. Weiglein, Grapevine; Timothy H. Kahn, Plano, and Bruce G. Secrest, Houston, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif. and BP Exploration Inc., Houston, Tex.

Continuation of Ser. No. 351,454, May 15, 1989, abandoned.
This application Oct. 2, 1990, Ser. No. 593,518
Int. Cl.[5] G01V *1/28, 1/38*
U.S. Cl. 367—23 51 Claims



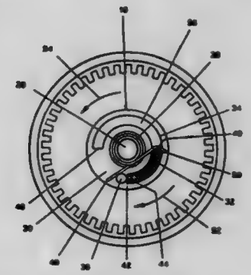
1 (four times amended). A method of operating a computer to determine a source signature from recorded signals related to detected changes in a medium in response to an input from a seismic source, comprising the steps of:
activating a seismic source to generate a source wavelet in a medium;
detecting changes associated with said source wavelet in said medium at two vertically offset positions;
converting said detected changes in said medium to signals related to said detected changes;
storing, in computer readable form, data corresponding to said [recorded] signals;
processing said stored data to generate a plurality of wavelet estimations by performing extrapolations for a plurality of distances from said source in the same direction; and
statistically combining said plurality of wavelet estimations to determine said source signature.

5,193,078

UNI-DIRECTIONAL ROTATION DEVICE FOR A CAM-OPERATED TIMER

David E. Zink, and Daniel K. Amonett, both of Indianapolis, Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 18, 1992, Ser. No. 836,700
Int. Cl.[5] G04F *8/00*; H01H *43/14*
U.S. Cl. 368—107 5 Claims



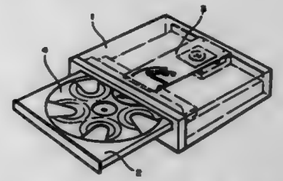
1. A cam-operated timer comprising:
(a) a cam means,
(b) a shaft means providing a rotational axis for said cam means, and
(c) a coupling-decoupling means selectively engaging said shaft means to said cam means in response to rotation of said shaft means in a predetermined direction comprising:
(1) a semi-circular tang protruding from said cam means,
(2) a semi-circular slot integral to said shaft means wherein said semi-circular tang is placed,
(3) a spring stop post attached to said shaft means, and
(4) a torsion spring having one end engaging said semi-circular tang and one end engaging said spring stop post.

5,193,079

COMPACT DISK CHANGER

Moon-Bai Ko; Chai-Il Lee, and Kwang-Lim Park, all of Seoul, Rep. of Korea, assignors to Inkel Corporation, Rep. of Korea

Filed Sep. 9, 1991, Ser. No. 758,982
Claims priority, application Rep. of Korea, Dec. 29, 1990, 90-21831[U]; Dec. 29, 1990, 90-21832[U]; Dec. 29, 1990, 90-21833[U]; Dec. 29, 1990, 90-22534
Int. Cl.[5] G11B *17/22*
U.S. Cl. 369—37 4 Claims



1. A front loading type compact disk changer which can load or replace a plurality of compact disks by drawing out a tray from a housing, comprising:
a tray feeding and locking pinion drum in which a pinion for feeding the tray to the outside and inside by being engaged with a rack formed on the lower surface of the tray has a semicircular wall part for locking the tray by being engaged to a stopper on the lower surface of the tray when the retracting operation of the tray is completed;
a CD double insertion preventing device composed of a fixed plate fixed on the upper inner surface of the housing and a rotating plate pivotably connected to the front of the fixed plate, for preventing a new CD from being inserted into a CD inserting portion when one of plural CDs is played; and
a plurality of protrusions disposed in a single line on the lower surface of a roulette for generating a specific CD selecting signal and a roulette stopping signal in cooperation with a single sensor.

5,193,080

MAGNETO-OPTICAL RECORDING MEDIUM AND APPARATUS

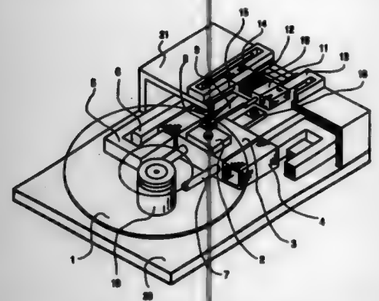
Masanari Mohri, Katano; Osamu Mizuno, Osaka, and Tohru Nakamura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 3, 1990, Ser. No. 547,154
Claims priority, application Japan, Jul. 6, 1989, 1-174712
Int. Cl.[5] G11B *17/00, 11/00*
U.S. Cl. 369—244 4 Claims

1. A magneto-optical recording and reproducing apparatus comprising:
an optical head for forming an optical spot on a magneto-optical recording medium;
first driving means for moving the optical head while maintaining a predetermined gap to the magneto-optical recording medium;
a magnetic bias field generator disposed at a position opposite to the optical head across the magneto-optical recording medium for generating a magnetic field in an area of the magneto-optical recording medium in which the optical spot is formed;
second driving means for moving the magnetic bias field generator in the same direction as a moving direction of the optical head;
detecting means for detecting a relative positional relationship between the optical head and the magnetic bias field generator and outputting a detection signal indicative of the relative positional relationship; and

control means responsive to the detection signal from the detecting means for controlling positions of the optical head and magnetic bias field generator to obtain a predetermined relative positional relationship therebetween,

position initializing means for initializing a position of the



magnetic bias field generator to a reference position relative to the magneto-optical recording medium, wherein said control means controls said first driving means to move the optical head to be in the predetermined relative positional relationship to the magnetic bias field generator.

5,193,081

TRACK-ACCESSING CONTROLLER FOR OPTICAL DISKS

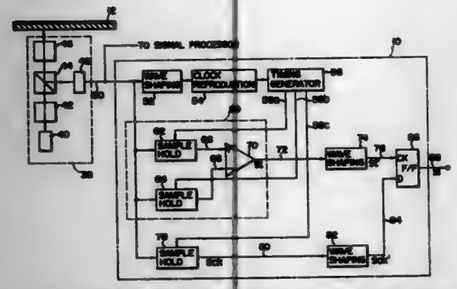
Hideaki Osawa, and Naobumi Seo, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 28, 1990, Ser. No. 486,385

Claims priority, application Japan, Feb. 28, 1989, 1-47256; Sep. 28, 1989, 1-250669

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.26 **13 Claims**



1. An optical disk apparatus for a rotatable optical disk which is formatted to have in a selected region of each track defined thereon, a clock pit positioned at a center of a corresponding track and first and second wobbled pits respectively formed on both sides of the center of the corresponding track, comprising:

(a) light-emitting means for emitting a light beam focused, by a focusing means, on the optical disk as a spot which is movable across the tracks on the optical disk;

(b) photodetector means for receiving input light of the light beam reflected from the optical disk to produce a light detection signal representing an intensity of light reflected from the clock pits and the first and second wobbled pits;

(c) clock detecting means, connected to said photodetector means, for detecting an intensity variation of the light beam reflected from the optical disk as the spot crosses the clock pits using the light detection signal, thereby producing a clock pit detection signal;

(d) tracking error detecting means, connected to said photodetector means, for detecting an intensity variation of the light beam reflected from the optical disk as the spot crosses the first and second wobbled pits using the light detection signal, thereby producing a tracking error signal representing a resultant intensity difference; and

(e) determining means, connected to said clock detecting means and said tracking error detecting means, for comparing a phase of the clock pit detection signal with a phase of the tracking error signal thereby producing a phase comparison result, and for using the phase comparison result to determine a direction in which the spot crosses some of the tracks on the optical disk.

5,193,082

OPTICAL/MAGNETIC COMPOSITE HEAD HAVING MAGNETIC AND OPTICAL HEADS IN ONE INTEGRATED UNIT

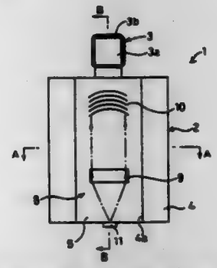
Tomoyuki Miyake, Tenri; Junichiro Nakayama, Nara; Hiroyuki Katayama, Nara; Akira Takahashi, Nara, and Kenji Ohta, Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 502,104

Claims priority, application Japan, Mar. 31, 1989, 1-81701

Int. Cl.[5] G11B *13/04, 7/12*

U.S. Cl. 369—112 **4 Claims**



1. An optical/magnetic composite head comprising

a floating type magnetic head that is supported in a non-contact position with regard to a rotatable recording medium and impresses a magnetic field on said recording medium so as to perform recording operations,

an optical head located on said magnetic head facing said recording medium and said optical head including

a laser beam-generating means for directing a laser beam on to said recording medium via an optical waveguide path, wherein said magnetic head and said optical head are integrated into one unit, said laser beam being directed so as to irradiate a point on said recording medium wherein said magnetic field is impressed from said magnetic head.

5,193,083

OPTICAL PICK-UP DEVICE

Naoharu Yanagawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 26, 1992, Ser. No. 888,962

Claims priority, application Japan, May 27, 1991, 3-121332

Int. Cl.[5] G11B *7/85*

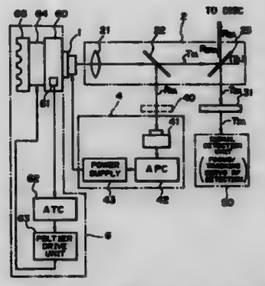
U.S. Cl. 369—116 **6 Claims**

1. An optical pick-up device for irradiating a light beam onto an information recording medium to record information thereon and reproduce information therefrom, comprising:

a light source for emitting and irradiating the light beam onto the information recording medium;

light beam switch means for switching the light beams emitted from said light source between a light beam having a recording wavelength and a light beam having a reproducing wavelength; and

light intensity change means for receiving a light beam reflected by the information recording medium and producing a transmitted light beam, said light intensity change means changing an intensity of the light beam having the recording wavelength with a first change ratio and an intensity of the light beam having the reproducing wavelength with a second change ratio.



5,193,084

DEVICE FOR ROTATING A DISC-SHAPED INFORMATION CARRIER INCLUDING A TURNTABLE AND FRAME

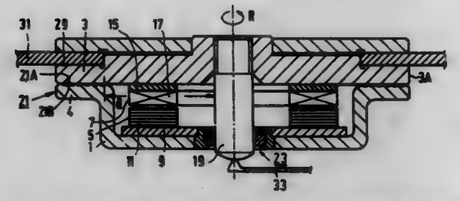
Alois E. Christiaens, Brussels, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 613,293, Nov. 15, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 865,736

Claims priority, application Netherlands, Nov. 15, 1989, 8902819

Int. Cl.[5] F16C *35/10*

U.S. Cl. 369—258 **7 Claims**



1. A device for rotating a disc-shaped information carrier, which device comprises a frame, a turntable which is rotatable about a shaft and is journalled relative to the frame by means of a radial bearing, the turntable having a supporting surface for the information carrier, and an electromagnetic drive unit comprising a stator section secured to the frame and a rotor section secured to the turntable, wherein the turntable and a frame portion facing the turntable are formed with facing annular bearing surfaces to form a dynamic axial bearing which is coaxial with and radially spaced from the shaft and extends parallel to the supporting surface, at least one of the bearing surfaces having at least one pattern of grooves which, as the rotor section is rotated relative to the stator section, acts to build up a pressure in a medium interposed between the bearing surfaces, said frame including an upwardly extending bowl shaped element, and wherein space is provided under the turntable and between said shaft and said upwardly extending bowl shaped element which space houses said stator section and said rotor section.

5,193,085

MAGNETO-OPTICAL RECORDING MEDIUM WITH EXCHANGE-COUPLED REPRODUCING LAYER CONTAINING PLATINUM

Klaus Harth, Altleiningen, and Hartmut Hibst, Schriesheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 17, 1991, Ser. No. 761,131

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029874

Int. Cl.[5] G11B *13/04*

U.S. Cl. 369—275.2 **7 Claims**

1. A magnetooptical computer disk having one or more optically transparent dimensionally stable substrates and one or more double layer systems consisting of two exchange-coupled magnetic layers which consist of alloys of rare earth metals with transition metals and have vertical magnetic anisotropy, wherein the first magnetic layer adjacent to the substrate has a thickness of from 20 to 40 nm and a composition corresponding to the formula I

$$RE_xTM_{100-x-y-a}Pt_yA_a \qquad I$$

and the second magnetic layer, which is arranged on that side of the first magnetic layer which faces away from the substrate, has a thickness of 40 to 60 nm and a composition corresponding to the formula II

$$RE_uTM_{100-u-b}B_b \qquad II$$

where

Re is one or more elements from the group consisting of Gd, Tb, Dy and Ho,

TM is one or more elements from the group consisting of Fe and Co,

A and B independently of one another are one or more elements from the group consisting of Cr, Nb, Ta, Al, Si, Ni and Mo,

and

$5 \leq x \leq 30$,

$0.5 \leq y \leq 20$,

$15 \leq u \leq 30$,

$0 \leq a \leq 25$ and

$0.5 \leq b \leq 25$.

5,193,086

NETWORK SYSTEM HAVING A LINE SWITCHING FUNCTION

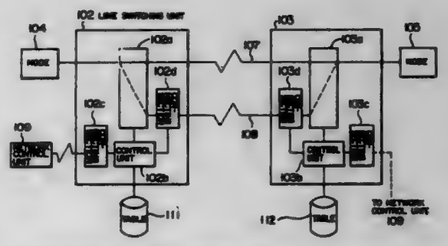
Shigeki Satomi, Tokyo, and Naoki Ono, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 398,171, Aug. 23, 1989, abandoned. This application Oct. 21, 1991, Ser. No. 779,797

Claims priority, application Japan, Aug. 26, 1988, 63-210726

Int. Cl.[5] H04J *03/14*

U.S. Cl. 370—16 **8 Claims**



1. A network system having a plurality of nodes and a line switching function comprising:

a plurality of line switching units interconnectable by means of a communication line and a backup communication

line, each of said plurality of line switching units being connected to one of said plurality of nodes such that nodes are connected to each other via said line switching units and either of said communication line and said backup communication line; and

a network control unit connected to a first of said pair of line switching units and sending a line switching instruction subsequent to a call to said first line switching unit;

said first line switching unit comprising:

a first storage device storing a call initiator number of said network control unit; and

a controller checking during a connection sequence whether or not a call initiator number of said call from said network control unit is consistent with the call initiator number stored in the first storage device, accepting the line switching instruction when the call initiator number of said call is consistent with the call initiator number stored in said first storage device, sending the line switching instruction subsequent to a call to a second of said plurality of line switching units and switching between said communication line and said backup communication line; and

said second line switching unit comprising:

a second storage device for storing a call initiator number of said first line switching unit; and

a second controller checking during a connection sequence whether or not a call initiator number of said call from said first line switching unit is consistent with the call initiator number of said first line switching unit stored in the second storage device, accepting the line switching instruction when the call initiator number of said call from said first line switching unit is consistent with the call initiator number stored in said second storage device, and switching between said communication line and said backup communication line.

5,193,087

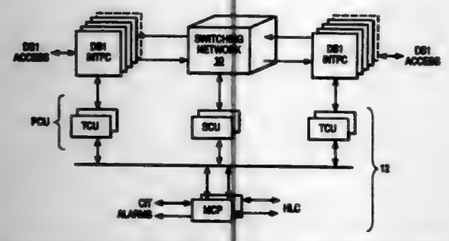
ELECTRONIC DIGITAL CROSS-CONNECT SYSTEM HAVING BIPOLAR VIOLATION TRANSPARENCY

Avi Lichtash, Ramat-Hasharon; Israel Vitelson; Zvi Husa, both of Givat'ina; Reuven Markus, Petach-Tikva; Michal Nowinski, Rishon Lezion; Baruch Gutman, Bnei-Brak; Shlomo Orbach, Haifa; Rafi Taler, Yavne; Yossi Moshe, Hertzlia; Leon Bruckman, Petach-Tikva, and Gideon Agmon, Tel-Aviv, all of Israel, assignors to Tadiran, Ltd., Petah-Tikva, Israel

Continuation-in-part of Ser. No. 524,003, May 16, 1990, abandoned. This application May 18, 1990, Ser. No. 524,930

Int. Cl.[5] H04Q *11/04*; H03K *7/08*; H04L *25/34*

U.S. Cl. 370—58.2 **8 Claims**



1. An electronic digital signal cross-connect system comprising:

a plurality of input terminals for respectively receiving bipolar 3-level input signals having a predetermined bit rate;

a plurality of output terminals for respectively providing bipolar 3-level output signals having said predetermined bit rate as outputs of said cross-connect system;

an interface circuit having an input section coupled to said input terminals to receive said plurality of bipolar 3-level input signals and having an output section coupled to said output terminals to output said bipolar 3-level output signals, wherein said input section includes means for converting said bipolar 3-level input signals into predetermined coded signals and wherein said output section includes means for converting said predetermined coded signals into said bipolar 3-level output signals;

a digital switching network having a plurality of inputs coupled to receive said predetermined coded signals from said input section of said interface circuit and having a plurality of outputs coupled to provide said predetermined coded signals to said output section of said interface circuit, wherein said digital switching network includes a plurality of switching units for coupling said plurality of inputs with said plurality of outputs; and

control means coupled to said digital switching network for controlling said switching units to couple at least a predetermined one of said inputs of said digital switching network to a predetermined one of said outputs of said digital switching network to provide a connection path through said switching matrix for at least one of said predetermined coded signals between said predetermined one of said inputs and said predetermined one of said outputs, wherein at least one of said input terminals will be cross-connected to at least one of said output terminals through said interface circuit and said digital switching network to provide a bipolar 3-level output signal at said at least one output terminal corresponding to a predetermined bipolar 3-level input signal at said at least one input terminal which bipolar 3-level output signal will include any bipolar violations which may exist in said predetermined bipolar 3-level input signal.

5,193,088

HIGH SPEED ATM CELL SYNCHRONIZING SWITCHING APPARATUS

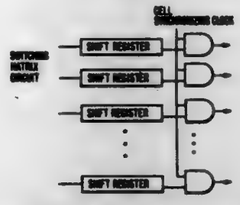
Jun K. Choi, Jungku; Mun K. Choi, Seoku; Kyung S. Kim, Yusongku; Tae S. Jeong, and Young S. Shin, both of Daejeonkku, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Jun. 24, 1991, Ser. No. 720,005

Claims priority, application Rep. of Korea, Jun. 27, 1990, 1990-9576

Int. Cl.[5] H04J *3/26*; H04L *12/56*

U.S. Cl. 370—60 **5 Claims**



2. A high speed ATM cell synchronizing switching apparatus having a switching memory, comprising:

a system clock generating means (7) for supplying system clocks and cell synchronizing clocks;

a plurality of ATM cell inputting means (1) for receiving optical ATM signals;

a routing control means (2) connected to the plurality of said ATM cell inputting means (1) for receiving address information from the plurality of said ATM cell inputting means (1);

a cell gate means connected to both the plurality of said ATM cell inputting means (1) and said routing control means (2) for transmitting the inputted cells from the plurality of said ATM cell inputting means (1) in synchronization with the cell synchronizing clocks;

a switching information table means (4) connected to said routing control means (2) for receiving a switching table setting information and for outputting a switching control information; and

a switching matrix means (5) connected to both said switching information table means (4) and said cell gate means (3) for receiving the switching control information and for outputting a cell data information,

wherein said routing control means (2) comprises: a routing line deciding means (21) for receiving address signals I_1–I_n and routing request information R_1–R_n from said ATM cell inputting means (1); a line allocation responding means (22) connected to the routing line deciding means (21) for transmitting the line allocation information T_j to said cell gate means (3); and a switch table setting means (23) connected to the routing line deciding means (21) for transmitting the switch table allocation information X_{ij} to the switching information table means (4).

5,193,089

KEY TELEPHONE SYSTEM

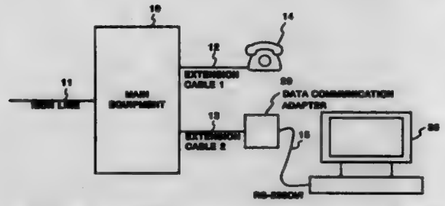
Shinji Tsuchida, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1989, Ser. No. 443,151

Claims priority, application Japan, Dec. 1, 1988, 63-304666

Int. Cl.[5] H04J *3/02*; H04M *1/26*

U.S. Cl. 370—84 **13 Claims**



12. A data exchange method in a key telephone system, comprising the steps of:

receiving data at a first transmitting speed from a data terminal connected to an extension;

converting the received data into data transmitted at a second transmitting speed faster than the first transmitting speed by adding fill data to the data received from said data terminal connected to the extension; and

transmitting the converted data transmitted at said second transmitting speed to a digital line accommodated in a line wire by a controlling exchange.

5,193,090

ACCESS PROTECTION AND PRIORITY CONTROL IN DISTRIBUTED QUEUEING

Janusz Filipiak, 233 North Terrace, Adelaide, Australia 5000 ; Leslie T. Berry, and James Gordon, both of C/- Bond University Gold Coast, Queensland, 4229, Australia

PCT No. PCT/AU89/00300, § 371 Date Jun. 22, 1991, § 102(e) Date Jun. 22, 1991, PCT Pub. No. WO90/00841, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 14, 1989, Ser. No. 490,684

Claims priority, application Australia, Jul. 15, 1988, PI9326

Int. Cl.[5] H04L *12/56*

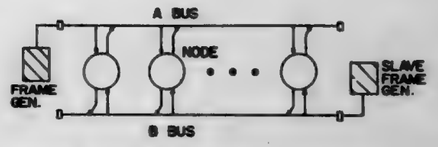
U.S. Cl. 370—94.1 **30 Claims**

1. A method of controlling the bandwidth of a communication medium useable by a station in a packet switching network having a plurality of stations coupled between first and second contra-directional communication mediums wherein the n^{th} station comprises:

a request bit counter responsive to request bits received in packets on the second communication medium from stations upstream of said n^{th} station;

a countdown counter responsive to free and occupied packets received on the first communication medium from stations downstream of said n^{th} station; and

a memory means to store a plurality of values, one of which is representative of an upper protection limit (Pmax(n)); wherein



when said request bit counter value is non-zero and a packet not addressed to said n^{th} station is received by said n^{th} station from outside said network, said method comprises the step of setting said countdown counter value equal to the lower of either said request bit counter value or Pmax(n) to control the bandwidth of the first communication medium useable by said n^{th} station.

5,193,091

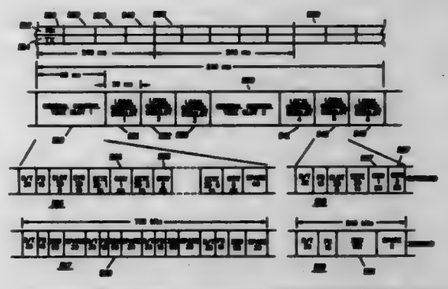
TDM COMMUNICATION SYSTEM FOR A WIDE AREA SITE AND A PLURALITY OF LOCAL SITES

Kenneth J. Crisler, Wheaton; Bradley M. Hilton, Glen Ellyn, both of Ill., and Anthony Van den Heuvel, Surry, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 12, 1990, Ser. No. 626,519

Int. Cl.[5] H04Q *7/04*

U.S. Cl. 370—95.1 **13 Claims**



1. A communication system capable of communicating communication messages within a wide area site and a plurality of local sites, wherein coverage area of said local sites are substantially smaller and contained within coverage area of said wide area site, using at least one radio frequency channel divided into at least one time slot and a plurality of subslots, said subslots having substantially shorter duration than said time slot, and wherein each of said subslots is assigned to a local site, comprising:

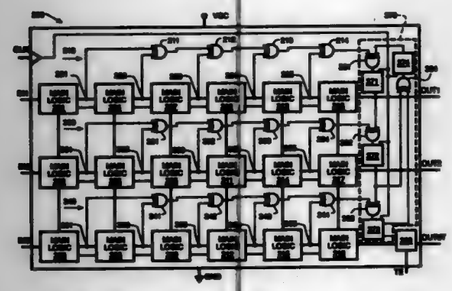
a plurality of local site communication units operating within the coverage area of said local sites;

a plurality of wide area communication units operating within the coverage are of the wide area site;

a plurality of local site communication means for communicating communication messages with at least one local site communication unit during said subslots;

a main site communication means for communicating communication messages with said local site communication means and said wide area communication unit during at least one of said time slots.

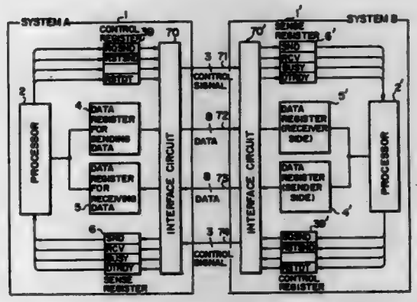
5,193,092
INTEGRATED PARITY-BASED TESTING FOR INTEGRATED CIRCUITS
Mark R. Hartoog, Los Gatos; James A. Rowson, Fremont; Robert D. Shaw, Los Altos, all of Calif., and Kenneth D. Van Egmond, Tempe, Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.
Filed Dec. 20, 1990, Ser. No. 632,281
Int. Cl.[5] G01R 31/28
U.S. Cl. 371—22.4 8 Claims



1. An integrated circuit comprising:
a substrate;
logic fabricated on said substrate, said logic including main logic and test logic,
said main logic including multiple integrated circuit elements arranged to provide main outputs as a function of main inputs, said main logic including multiple test nodes coupled to respective ones of said integrated circuit elements, said test nodes including power and ground power sources;
said test logic including at least a first parity chain, said first parity chain having plural parity elements including a first parity element and a last parity element, each of said parity elements having an output and at least two inputs, each of said parity elements providing an output signal which changes whenever exactly one input signal changes, each of said parity elements but the first one having at least one input coupled to a respective one of said test nodes and another input coupled to the output of the preceding parity element of said parity chain, said first parity element having at least two inputs coupled to said test nodes, the output of said last parity element being the output of said first parity chain; and
interface means attached to said substrate for communicating with a host system when said integrated circuit is incorporated in said host system and communicating with a test system when said integrated circuit is being tested, said interface means providing for inputs of test vectors from said test system, said interface means including test output means for providing the results of said test vectors to said test system.

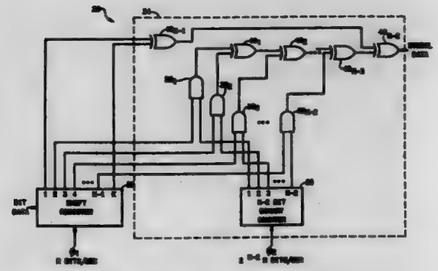
5,193,093
DATA TRANSFER PROCESS WITH LOOP CHECKING
Katsuyoshi Okazaki, Ebina, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 26, 1990, Ser. No. 470,793
Claims priority, application Japan, Jan. 27, 1989, 1-018422
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—34 15 Claims

1. A data transfer process for transferring data from a first system to a second system and carryout out loop checking, said process comprising the steps of:
(a) sending a part of the data from the first system to the second system;
(b) sending first information, from the first system to the second system, in response to said sending of the part of the data from the first system in step (a);
(c) reading the part of the data received in the second system when the first information is sent to the second system;
(d) sending the part of the data read in step (c) from the second system to the first system in response to said reading in step (c) to the first system;
(e) sending second information, from the second system to the first system, in response to said sending of the part of the data from the second system in step (d);
(f) reading the part of the data sent from the second system and received in the first system when the second information is sent to the first system in step (e);
(g) determining whether the part of the data sent from the first system in step (a) and the part of the data read in the second system in step (f) are equal;
(h) resending the part of the data sent from the first system in step (a) to the second system when it is determined, in step (g), that the part of the data sent from the first system in step (a) and the part of the data read in the first system in step (f) are not equal, said resending comprising the substeps of:
(h1) transforming the part of the data sent out in a preceding sending operation from the first system to the second system in a predetermined manner to produce a transformed part of the data;
(h2) sending gout the transformed part of the data from the first system to the second system;



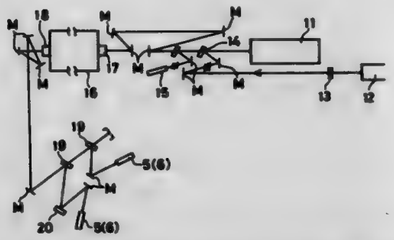
(h3) sending third information, from the first system to the second system, that the transformed part of the data has been sent out in step (h2);
(h4) receiving the transformed part of the data sent in step (h2) in the second system;
(h5) sending out the transformed part of the data received in step (h4) from the second system to the first system;
(h6) sending fourth information, from the second system to the first system, that the transformed part of the data has been sent out from the second system to the first system in step (h5);
(h7) receiving the transformed part of the data sent from the second system in step (h5l);
(h8) determining whether the transformed data sent out from the first system in step (h2) and the transformed data received in the first system in step (h7) are equal;
(h9) returning to step (h1) when the transformed data sent out from the first system in step (h2) and the transformed data received in the first system in step (h7) are not equal; and
(h10) continuing with step (i) when the transformed data sent out from the first system in step (h2) and the transformed data received in the first system in step (h7) are equal; and
(i) repeating steps (a)–(h) for another part of the data until all of the data has been transferred to the second system.

5,193,094
METHOD AND APPARATUS FOR GENERATING SUPER-ORTHOGONAL CONVOLUTIONAL CODES AND THE DECODING THEREOF
Andrew J. Viterbi, La Jolla, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.
Filed Mar. 7, 1990, Ser. No. 489,677
Int. Cl.[5] G06F 11/08
U.S. Cl. 371—43 20 Claims



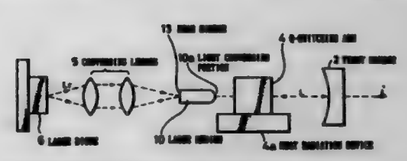
7. A data encoder comprising:
a register having an input for receiving an input sequence of data bits, and having a first through a K output at which is provided a respective one of the last K received bits of said input sequence of data bits;
an input EXCLUSIVE OR gate having a pair of inputs respectively coupled to said first and K outputs of said register, and an output;
an orthogonal function sequence generator having K−2 inputs each coupled to a respective one of a second through a K−1 output of said register, and having an output; and
an output EXCLUSIVE OR gate having a pair of inputs respectively coupled to said first EXCLUSIVE OR gate output and said generator output, and an output.

5,193,095
MULTIMODE RAMAN LASER SYSTEM
Hideo Tashiro; Katsumi Midorikawa, both of Saitama, and Mitsutoshi Suzuki, Ibaraki, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan
Filed Mar. 27, 1991, Ser. No. 676,008
Claims priority, application Japan, Mar. 28, 1990, 2-81906
Int. Cl.[5] H01S 3/30
U.S. Cl. 372—3 3 Claims



1. A multimode Raman laser system for performing Raman conversion, comprising a transversely excited atmospheric pressure CO_2 laser means for injecting a laser beam for excitation into Raman cell, wherein said transversely excited atmospheric pressure CO_2 laser means is an unstable resonator type oscillator, and wherein said Raman cell is a multimode Raman cell.

5,193,096
ACOUSTO-OPTIC Q-SWITCHED SOLID STATE LASER
Sho Amano, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan
Filed Dec. 2, 1991, Ser. No. 801,520
Claims priority, application Japan, Nov. 30, 1990, 2-339160
Int. Cl.[5] H01S 3/117
U.S. Cl. 372—13 20 Claims



1. A Q-switched solid state laser comprising:
a laser medium;
a pump source for generating pumping light used to pump the laser medium;
a pair of laser resonance mirrors respectively placed at both sides of the laser medium; and
a Q-switching acousto-optical element intervening between the pair of laser resonance mirrors for controlling Q-switching oscillation by abruptly changing a loss of resonant laser light passing therethrough, the Q-switching acousto-optical element satisfying a condition given by

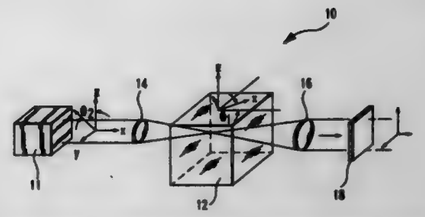
$$|Ms| \geq 1 \times 10^{-12} s^3/g \cdot °C.$$

where Ms denotes a parameter defined as

$$Ms = M/(ds/dT)$$

by letting (ds/dT) designate a thermal change in optical path of the Q-switching acousto-optical element and letting M represent a performance index of an acousto-optical material of the acousto-optical element.

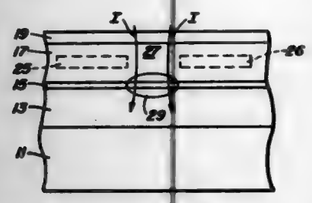
5,193,097
OPTICAL DEVICE USING A CERIUM-DOPED KTP CRYSTAL
Peter F. Bordui, Menlo Park; Richard G. Norwood, San Jose, and Ronald Blachman, Sunnyvale, all of Calif., assignors to Crystal Technology, Inc., Palo Alto, Calif.
Filed Feb. 19, 1992, Ser. No. 838,627
Int. Cl.[5] H01S 3/10
U.S. Cl. 372—21 26 Claims



1. An optical element, comprising a single crystal of potassium titanyl phosphate, which is represented by the formula $KTiOPO_4$ and doped with cerium.

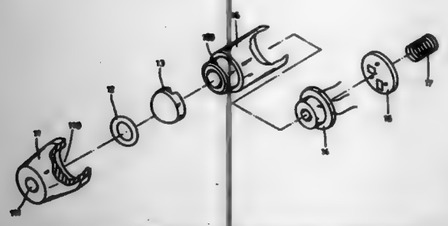
VOL 1148 ISS 2 MR 9 1993 UMI

5,193,096
METHOD OF FORMING CURRENT BARRIERS IN SEMICONDUCTOR LASERS
David F. Welch; Donald R. Scifres, both of San Jose, and William Streifer, Palo Alto, all of Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.
Continuation of Ser. No. 770,599, Oct. 3, 1991, abandoned, which is a division of Ser. No. 557,901, Jul. 25, 1990, which is a continuation-in-part of Ser. No. 303,754, Jan. 27, 1989, abandoned. This application Aug. 24, 1992, Ser. No. 935,475
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 22 Claims



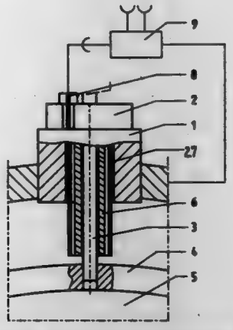
1. A semiconductor laser comprising:
a first plurality of adjacent semiconductor material layers of a first conductivity type,
an active lasing region defined by at least one semiconductor material layer disposed on said first plurality of layers,
a second plurality of adjacent semiconductor material layers disposed on said active region, said second plurality of layers including a plurality of semiconductor layers of a second conductivity type between side regions of said first conductivity type, said side regions of said first conductivity type having buried implant regions therein, said buried implants being characterized by a concentration distribution profile of a second conducting type impurity with a peak concentration greater than a concentration of first conductivity type impurities in said side regions, whereby said buried implant regions are of second conductivity type blocking current through said side regions, and
resonant cavity means disposed relative to opposed ends of said active region for providing feedback of light generated in said active lasing region.

5,193,099
DIODE LASER COLLIMATTING DEVICE
Chin-Li Chou, Taipei, Taiwan, assignor to Quarton, Inc., Taiwan
Filed Nov. 21, 1991, Ser. No. 795,792
Int. Cl.[5] G02B *6/00*; H01S *3/08, 3/11*
U.S. Cl. 372—107 3 Claims



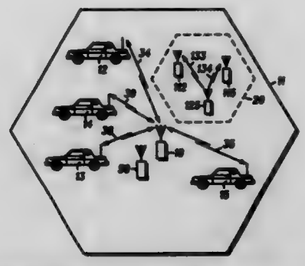
1. A diode laser collimatting device, the improvement comprising:
a laser collimatting socket made from a hollow, truncated cone defining therein a receiving chamber and having a center hole on the front end through the central axis thereof;
a socket holder made from a hollow metal tube having a tubular projection at the front tightly inserted into said receiving chamber in said laser collimatting socket, said socket holder being connected to a power supply at the positive terminal thereof;
a plastic lens mounted on said tubular projection at the front and received inside said receiving chamber;
a rubber ring to seal the gap between the inner wall surface of said laser collimatting socket and the outer wall surface of said tubular projection;
an exciter circuit board inserted in said socket holder;
a laser diode inserted in said socket holder in front of said exciter circuit board, said laser diode having connecting pins respectively connected to said exciter circuit;
a contact spring connected to said exciter circuit at the back, said contact spring having one end connected to the negative terminal of said exciter circuit and an opposite end connected to said power supply; and
wherein inserting said laser diode into said socket holder causes said socket holder, said laser diode, said exciter circuit board, said contact spring and said power supply to form into a circuit permitting said laser diode to be excited by said exciter circuit board to emit light through said plastic lens and said laser collimatting socket.

5,193,100
APPARATUS FOR DETECTING GASEOUS DISCHARGE IN VACUUM FURNACES
Robert Hack, Lahnau, and Wilhelm Polhede, Bruchköbel, both of Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany
Filed Jun. 21, 1991, Ser. No. 718,808
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1990, 4020818
Int. Cl.[5] F27D *7/06*
U.S. Cl. 373—112 9 Claims



1. An apparatus for protection of electrically heated vacuum furnaces from gaseous leakage comprising:
heating elements in a vacuum chamber which are provided with a lead-through device that serves for transmitting electrical current to said heating elements wherein said lead-through device is surrounded by a lead-through device insulation;
an auxiliary electrode surrounds said lead-through device insulation; and
means for detecting a signal indicative of a gaseous discharge inside a vacuum chamber which is connected to said auxiliary electrode.

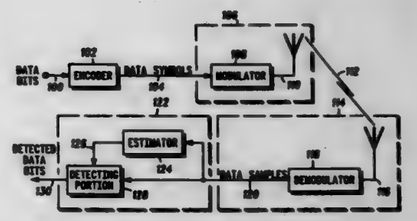
5,193,101
ON-SITE SYSTEM FREQUENCY SHARING WITH TRUNKING SYSTEMS USING SPREAD SPECTRUM
James A. McDonald, Buffalo Grove; Richard A. Comroe, Dundee; Arun Sobti, Wheaton; Paul M. Bocci, Roselle; Robert W. Furtaw, Arlington Heights, and Bradley M. Hiben, Glen Ellyn, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 4, 1991, Ser. No. 650,125
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 14 Claims



1. A communication system located within a service coverage area of trunked communication system, wherein the trunked communication system comprises:
A) a plurality of communication resources, each resource having a frequency pair;
B) means for measuring a signal quality factor of at least one transmitting communication unit; and,
C) means for transferring the signal quality factor to at least one small-cell receiving means;
said communication system comprising at least one small-cell communication system having:
A) a plurality of small-cell communication units each with means for communicating in a time division duplex format on an indexed communication resource from an indexing table of communication resources for an index interval;
B) at least one small-cell base site having at least one transceiver and a resource controller with means for communicating in a time division duplex format on an indexed control resource from an indexing table of communication resources for an index interval;
C) means for receiving the signal quality factor from the trunked communication system;
D) means for comparing the signal quality factor with a threshold to produce a result; and ,
E) means allocating an initial indexed communication resource from the indexing table of communication resources based at least in part upon the result to an at least one requesting small-cell communication unit of the plurality of communication units.

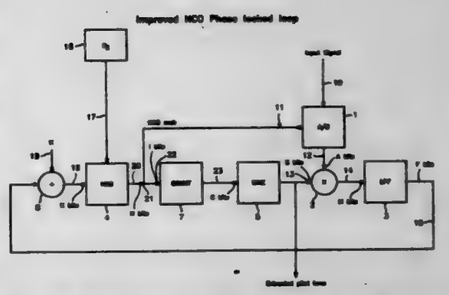
5,193,102
METHOD AND APPARATUS FOR IMPROVING DETECTION OF DATA BITS IN A SLOW FREQUENCY HOPPING COMMUNICATION SYSTEM
Reuven Meidan, Ramat Hasharon; Noam Livneh, D.N. Misgav; Glora Silbershatz, Haifa, and Mordechai Ritz, Givat-Elah, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 18, 1991, Ser. No. 794,104
Claims priority, application Israel, Nov. 10, 1991, 100029
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 20 Claims

1. An apparatus comprising a detector for detecting data bits in input data samples of a hop of a slow frequency hopping spread spectrum signal, the detector comprising:
(a) estimator means for estimating the carrier to interference power ratio of the hop of the slow frequency hopping signal by using the input data samples of the hop; and
(b) detecting means, operatively coupled to the estimator means, for detecting data bits in the input data samples of



the hop of the slow frequency hopping signal by using the estimated carrier to interference power ratio.

5,193,103
DIGITAL PHASE LOCKED LOOP CIRCUIT
Bhajan Singh, Birmingham, and Vincent Considine, Longbuckby, both of England, assignors to GEC - Marconi Limited, Stanmore-Middlesex, England
Continuation-in-part of Ser. No. 317,496, Mar. 1, 1989, abandoned. This application Jul. 15, 1991, Ser. No. 729,315
Claims priority, application United Kingdom, Mar. 2, 1988, 8804974
Int. Cl.[5] H04I *27/12*
U.S. Cl. 375—120 6 Claims



1. An all-digital phase locked loop circuit for providing from a noisy analog input containing a desired signal, a digital output signal matching in frequency and phase the desired signal, the circuit comprising:
an analog to digital converter whereto the noisy analog input is fed;
clocking means for clocking said converter to provide digital samples of the noisy analog input;
a numerically controlled oscillator, said oscillator having an output of frequency a predetermined multiple of a frequency of the desired signal;
a counter, said counter receiving, as an input thereto, the output of said oscillator, said counter serving to divide the output of said oscillator by the predetermined multiple, to provide a counter output;
a sinewave generator, said generator receiving as an input thereto, the counter output and providing, as an output of the generator, sinusoidally varying digital values representing the desired signal;
a mixer, said mixer receiving, as inputs, the digital samples and the generator output, said mixer having an output including a difference value between the inputs, the difference value being fed to said oscillator to control the frequency of the output thereof.

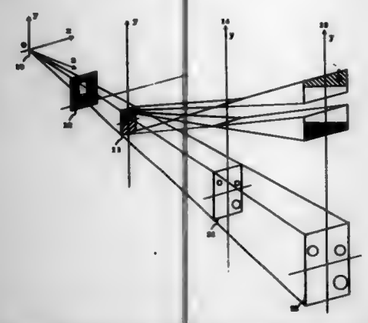
5,193,104
CELLULAR TELEPHONE SYSTEM WITH DIRECTIONAL ANTENNAS
Paul W. Dent, Stehag, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.
Filed Jun. 28, 1991, Ser. No. 722,356
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 379—59 20 Claims

1. A cellular telephone system comprising:
a plurality of cells, each cell having a base station with a plurality of directional antennas, each directional antenna having a beam width of less than 120°, each directional antenna having a beam direction, each beam direction being different from the beam direction of the other directional antennas in the same cell, each directional antenna having a receiver and a transmitter, each receiver having a receiver input, each transmitter having a transmitter output;
a plurality of mobile stations, each mobile station having a transceiver with a transceiver input and a transceiver output;
a plurality of radio channels, each radio channel having a channel number, each radio channel having a forward channel and a reverse channel, each forward channel having a forward channel frequency, each reverse channel having a reverse channel frequency;
a plurality of control channels, each control channel having a control channel number, each control channel having a forward control channel and a reverse control channel, each forward control channel having a forward control channel frequency, each reverse control channel having a reverse control channel frequency;
a plurality of voice channels, each voice channel having a voice channel number, each voice channel having a forward voice channel and a reverse voice channel, each forward voice channel having a forward voice channel frequency, each reverse voice channel having a reverse voice channel frequency;
a plurality of cell site control means, each cell site control means having a cell site control means input and a cell site control means output;
a plurality of cell site interface means, each cell site interface means having a cell site interface means input and a cell site interface means output;
a plurality of mobile telephone switching office means, each mobile telephone switching office means having a mobile telephone switching office means input and a mobile telephone switching office means output;
a plurality of public switched telephone network means, each public switched telephone network means having a public switched telephone network means input and a public switched telephone network means output;
a plurality of mobile station control means, each mobile station control means having a mobile station control means input and a mobile station control means output;
a plurality of mobile station interface means, each mobile station interface means having a mobile station interface means input and a mobile station interface means output;
a plurality of mobile station antenna means, each mobile station antenna means having a mobile station antenna means input and a mobile station antenna means output;
a plurality of mobile station receiver means, each mobile station receiver means having a mobile station receiver means input and a mobile station receiver means output;
a plurality of mobile station transmitter means, each mobile station transmitter means having a mobile station transmitter means input and a mobile station transmitter means output;
a plurality of mobile station frequency synthesizer means, each mobile station frequency synthesizer means having a mobile station frequency synthesizer means input and a mobile station frequency synthesizer means output;
a plurality of mobile station power control means, each mobile station power control means having a mobile station power control means input and a mobile station power control means output;
a plurality of mobile station memory means, each mobile station memory means having a mobile station memory means input and a mobile station memory means output;
a plurality of mobile station input means, each mobile station input means having a mobile station input means input and a mobile station input means output;
a plurality of mobile station output means, each mobile station output means having a mobile station output means input and a mobile station output means output;
a plurality of mobile station control means, each mobile station control means having a mobile station control means input and a mobile station control means output;
a plurality of mobile station interface means, each mobile station interface means having a mobile station interface means input and a mobile station interface means output;
a plurality of mobile station antenna means, each mobile station antenna means having a mobile station antenna means input and a mobile station antenna means output;
a plurality of mobile station receiver means, each mobile station receiver means having a mobile station receiver means input and a mobile station receiver means output;
a plurality of mobile station transmitter means, each mobile station transmitter means having a mobile station transmitter means input and a mobile station transmitter means output;
a plurality of mobile station frequency synthesizer means, each mobile station frequency synthesizer means having a mobile station frequency synthesizer means input and a mobile station frequency synthesizer means output;
a plurality of mobile station power control means, each mobile station power control means having a mobile station power control means input and a mobile station power control means output;
a plurality of mobile station memory means, each mobile station memory means having a mobile station memory means input and a mobile station memory means output;
a plurality of mobile station input means, each mobile station input means having a mobile station input means input and a mobile station input means output;
a plurality of mobile station output means, each mobile station output means having a mobile station output means input and a mobile station output means output;

5,193,105
MULTIMEDIA TRANSCEIVER
Jeffrey H. Reed, Blacksburg, Va., assignor to Glenayre Electronics, Ltd., Vancouver, Canada
Filed Nov. 30, 1990, Ser. No. 621,012
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 379—59 20 Claims

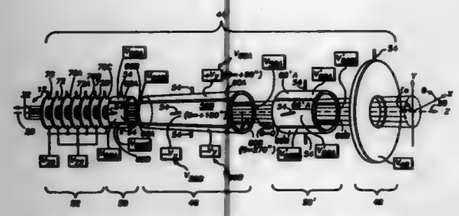
1. A multimedia transceiver comprising:
a plurality of cells, each cell having a base station with a plurality of directional antennas, each directional antenna having a beam width of less than 120°, each directional antenna having a beam direction, each beam direction being different from the beam direction of the other directional antennas in the same cell, each directional antenna having a receiver and a transmitter, each receiver having a receiver input, each transmitter having a transmitter output;
a plurality of mobile stations, each mobile station having a transceiver with a transceiver input and a transceiver output;
a plurality of radio channels, each radio channel having a channel number, each radio channel having a forward channel and a reverse channel, each forward channel having a forward channel frequency, each reverse channel having a reverse channel frequency;
a plurality of control channels, each control channel having a control channel number, each control channel having a forward control channel and a reverse control channel, each forward control channel having a forward control channel frequency, each reverse control channel having a reverse control channel frequency;
a plurality of voice channels, each voice channel having a voice channel number, each voice channel having a forward voice channel and a reverse voice channel, each forward voice channel having a forward voice channel frequency, each reverse voice channel having a reverse voice channel frequency;
a plurality of cell site control means, each cell site control means having a cell site control means input and a cell site control means output;
a plurality of cell site interface means, each cell site interface means having a cell site interface means input and a cell site interface means output;
a plurality of mobile telephone switching office means, each mobile telephone switching office means having a mobile telephone switching office means input and a mobile telephone switching office means output;
a plurality of public switched telephone network means, each public switched telephone network means having a public switched telephone network means input and a public switched telephone network means output;
a plurality of mobile station control means, each mobile station control means having a mobile station control means input and a mobile station control means output;
a plurality of mobile station interface means, each mobile station interface means having a mobile station interface means input and a mobile station interface means output;
a plurality of mobile station antenna means, each mobile station antenna means having a mobile station antenna means input and a mobile station antenna means output;
a plurality of mobile station receiver means, each mobile station receiver means having a mobile station receiver means input and a mobile station receiver means output;
a plurality of mobile station transmitter means, each mobile station transmitter means having a mobile station transmitter means input and a mobile station transmitter means output;
a plurality of mobile station frequency synthesizer means, each mobile station frequency synthesizer means having a mobile station frequency synthesizer means input and a mobile station frequency synthesizer means output;
a plurality of mobile station power control means, each mobile station power control means having a mobile station power control means input and a mobile station power control means output;
a plurality of mobile station memory means, each mobile station memory means having a mobile station memory means input and a mobile station memory means output;
a plurality of mobile station input means, each mobile station input means having a mobile station input means input and a mobile station input means output;
a plurality of mobile station output means, each mobile station output means having a mobile station output means input and a mobile station output means output;
a plurality of mobile station control means, each mobile station control means having a mobile station control means input and a mobile station control means output;
a plurality of mobile station interface means, each mobile station interface means having a mobile station interface means input and a mobile station interface means output;
a plurality of mobile station antenna means, each mobile station antenna means having a mobile station antenna means input and a mobile station antenna means output;
a plurality of mobile station receiver means, each mobile station receiver means having a mobile station receiver means input and a mobile station receiver means output;
a plurality of mobile station transmitter means, each mobile station transmitter means having a mobile station transmitter means input and a mobile station transmitter means output;
a plurality of mobile station frequency synthesizer means, each mobile station frequency synthesizer means having a mobile station frequency synthesizer means input and a mobile station frequency synthesizer means output;
a plurality of mobile station power control means, each mobile station power control means having a mobile station power control means input and a mobile station power control means output;
a plurality of mobile station memory means, each mobile station memory means having a mobile station memory means input and a mobile station memory means output;
a plurality of mobile station input means, each mobile station input means having a mobile station input means input and a mobile station input means output;
a plurality of mobile station output means, each mobile station output means having a mobile station output means input and a mobile station output means output;

5,193,104
METHOD FOR ANALYZING MONOCRYSTALLINE PARTS BY X-RAYS
Pierre Bastie, Cereac, and Bernard Hamelin, Seyssinet, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France
Filed Oct. 22, 1991, Ser. No. 779,191
Claims priority, application France, Oct. 23, 1990, 90 13330
Int. Cl.[5] G01N *23/207*
U.S. Cl. 378—73 17 Claims



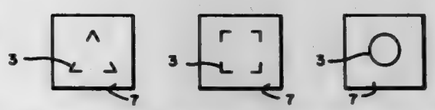
12. An apparatus for detecting crystalline defects of a specimen, comprising:
a source of a beam of X-rays having a bandwidth $\Delta\lambda$ and a predetermined angular divergence defined by $\Delta\theta \leq \Delta\lambda/2d\cdot\cos\theta$, d being an interreticular distance for predetermined reticular planes;
means for positioning the specimen in a plane situated substantially equidistant from the focus of the polychromatic source and a focusing plane;
means for orienting the specimen to obtain the diffraction on a chosen family of the reticular planes; and
means for collecting and analyzing the X-ray beam proximate the focusing plane.

5,193,105
ION CONTROLLING ELECTRODE ASSEMBLY FOR A SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER
Roy E. Read, Palo Alto, and Eugene Y. Tsiang, Belmont, both of Calif., assignors to Imatron, Inc., So. San Francisco, Calif.
Filed Dec. 18, 1991, Ser. No. 809,924
Int. Cl.[5] H01J *35/06*
U.S. Cl. 378—137 21 Claims



1. An electrode assembly for correcting space-charge density non-uniformity in an electron beam generated in a vacuum housing chamber containing a low pressure gas from which positive ions may be created, the electron beam traveling in a downstream direction defining a Z-axis, the assembly being disposed substantially coaxially with the electron beam along the Z-axis and comprising:
first and second members, spaced-apart diametrically relative to the Z-axis, defining a first electrode pair;
third and fourth members, spaced-apart diametrically relative to the Z-axis, defining a second electrode pair;
means for coupling said first, second, third and fourth members respectively to first, second, third and fourth potential sources;
said potential sources creating a potential difference between said members comprising each said electrode pair causing each said electrode pair to create an electric field;
the assembly producing a resultant electric field equal to the vector sum of each said electric field created by each said electrode pair;
wherein said resultant electric field is controllably rotated, by varying chosen ones of said potential sources, to an orientation controllably removing sufficient positive ions to compensate for space-charge density non-uniformity in said beam.

5,193,106
X-RAY IDENTIFICATION MARKER
Danforth DeSena, 4 Ivie Rd., Cape Elizabeth, Me. 04107
Filed Aug. 28, 1990, Ser. No. 573,897
Int. Cl.[5] H05G *1/28*
U.S. Cl. 378—163 10 Claims

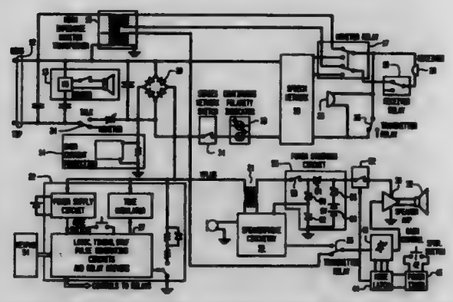


1. A marker device to be used in the x-ray examination of problematic deep structures of the foot, wherein said problematic deep structures of the foot are denoted by cutaneous landmarks, said marker device comprising:
a. a tape with pressure-sensitive adhesive on one surface thereof and a non-adhering surface on a side opposite, wherein said tape is suitable for attachment to the surface of the skin of the foot, and
b. a radiopaque material affixed to said non-adhering surface of said tape, wherein said radiopaque material is formed into a shape such that it completely surrounds a cutaneous landmark in a surrounding shape of an internal size comparable to that of cutaneous landmarks of podiatric pathologies.

5,193,107
SPEAKERPHONE TEST SET
Geoffrey H. Parker, Ventura, and Andrew J. Hefley, Channel Islands Beach, both of Calif., assignors to Harris Corporation, Melbourne, Fla.
Filed Sep. 20, 1991, Ser. No. 763,274
Int. Cl.[5] H04M *9/08*
U.S. Cl. 379—21 27 Claims

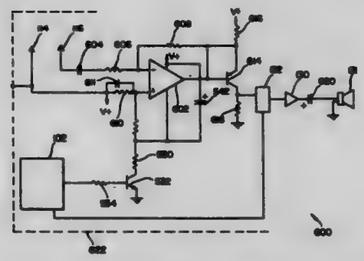
1. A telephone test set circuit comprising:
means for performing dry loop testing of telephone lines;
a passive speech network coupled to the means for performing dry loop testing;
a speakerphone circuit;

an amplifier and speaker coupled to the speakerphone circuit; and



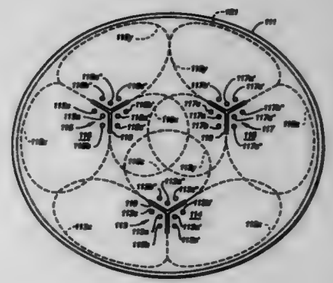
means for isolating the passive speech network and the speakerphone circuit.

5,193,108
PORTABLE TELECOMMUNICATIONS TEST INSTRUMENT WITH INDUCTIVE PROBE CIRCUIT
Clay A. Stocklin, Redmond, Wash., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 4, 1991, Ser. No. 771,457
Int. Cl.[5] H04M *3/26*
U.S. Cl. 379—21 4 Claims



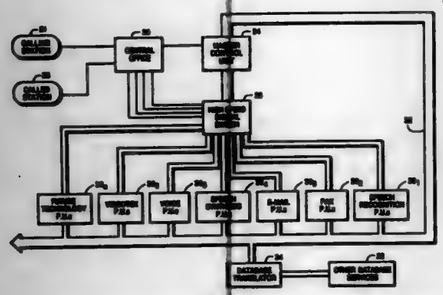
1. A portable, self-powered telecommunications test instrument for sensing a tone signal, the instrument comprising:
a case that is sized to be held in one hand and containing therein the circuitry of the instrument;
a battery to provide power to the instrument;
an inductive input means for inductively coupling an input signal to the instrument;
a differential amplifier circuit with first and second inputs, said first input being coupled to said inductive input means, said second input being a first reference input to said amplifier, said amplifier providing amplification of said input signal;
a reference means for permitting conversion of said amplified input signal which is referenced to said first reference to a converted signal which is referenced to a second reference;
an audio amplifier, referenced to said second reference, for further amplifying said converted signal;
means for generating an audio output responsive to said converted signal;
a second circuit within the instrument also being coupled to said first input of said differential amplifier, said second circuit being active and having high impedance input means for eliminating the flow of current from said first input of said differential amplifier into said second circuit; and
a third circuit within the instrument also coupled to said first input of said differential amplifier, said third circuit being inactive but having a leakage current flowing from said first input of said differential amplifier to said second reference through a high impedance pathway of said third circuit, said third circuit having shunting means for providing a low impedance pathway to couple said leakage current to said second input of said differential amplifier to convert said current leakage from a differential signal to a common mode signal which is not amplified by said differential amplifier.

5,193,109
ZONED MICROCELL WITH SECTOR SCANNING FOR CELLULAR TELEPHONE SYSTEM
William Chien-Yeh Lee, Corona Del Mar, Calif., assignor to PacTel Corporation, Walnut Creek, Calif.
Filed Oct. 25, 1991, Ser. No. 784,667
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—60 13 Claims



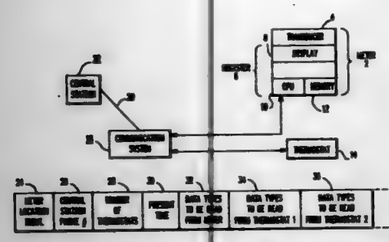
1. In a cellular telephone system wherein a plurality of contiguous cells, each having an assigned set of communication channels, are arranged with handoff means for maintaining continuous communication with mobile telephones moving from cell to cell,
a cell having a plurality of antenna sets, each set being positioned and having transmitting and receiving means directionally configured to limit propagation and reception of signals substantially to a zone within the boundaries of said cell,
each of said plurality of antenna sets being divided into a plurality of sub-sets, each sub-set being positioned and having transmitting and receiving means directionally configured to limit propagation and reception of signals substantially to a sector within the boundaries of the zone served by the associated antenna set,
control means including means for monitoring the strength of the signal associated with each one of the communication channels assigned to said cell and received by each of said sub-sets of each of said antenna sets,
and means for switching to a selected antenna sub-set in said cell having the strongest received signal associated with a selected one of the communication channels such that communication using said selected communication channel is maintained and is limited to the sector associated with the selected antenna sub-set.

5,193,110
INTEGRATED SERVICES PLATFORM FOR TELEPHONE COMMUNICATION SYSTEM
Scott A. Jones, Pride Crossing; Allen T. Arunasalaygam, Malden; Amitava Maikherjee, Boston; Donald F. Picard, Medford, and Richard E. Cohen, Somerville, all of Mass., assignors to Boston Technology, Incorporated, Wakefield, Mass.
Filed Oct. 9, 1990, Ser. No. 594,648
Int. Cl.[5] H04M *11/00, 1/64, 3/42, 7/00*; H04T *3/12*
U.S. Cl. 379—94 19 Claims



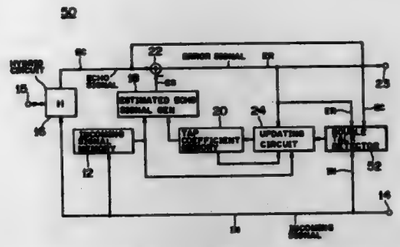
1. An information communication system for providing a requested information service, comprising:
processing means for providing a first information service to a user via at least two first service processing ports and a second information service to a user via at least two second service processing ports, the first and second information services being different types of services;
digital switching means for connecting the user to a selected one of said at least two first service processing ports and said at least two second service processing ports; and
control means for selecting an available one of said at least two first service processing ports and said at least two second service processing ports in response to the requested information service, and causing said digital switching means to connect the user to the selected one of said at least two first service processing ports and said at least two second service processing ports to provide the requested information service.

5,193,111
AUTOMATED DATA TRANSMISSION SYSTEM
Thomas C. Matty, N. Huntingdon, Pa.; Robert G. Colclaser, III, Grafton, Mass., and Gary O. Hitchins, Sewickley Township, Westmoreland County, Pa., assignors to ABB Power T&D Company, Blue Bell, Pa.
Continuation of Ser. No. 445,295, Dec. 4, 1989, abandoned. This application Jan. 6, 1992, Ser. No. 815,886
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—106 17 Claims



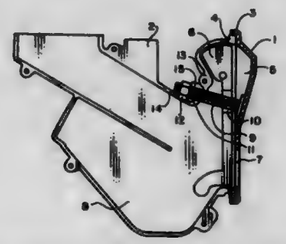
1. A method for controlling the transmission of data, via a telephone line, from a plurality of data reading and storage devices at a first location where data is collected to a central station, the plurality of data reading and storage devices including a first data reading and storage device having means for reading and storing data of at least one data type and a second data reading and storage device having means for reading and storing data of a plurality of different data types, the method comprising:
collecting and storing data of the at least one type in the reading and storing means of the first device and data of each of the plurality of different types in the reading and storing means of the second device at the first location;
providing an indication of the present time at the first location;
storing, in a first storing step at the first location an indication of a selected time which is later than the present time;
storing, in a second storing step at the first location, an indication of the at least one data type for which data is stored in the first device and an indication of at least a selected one of the plurality of data types for which data is stored in the second device;
comparing the indication of the present and selected times and establishing a connection, via the telephone line, from the first location to the central station when the present time becomes later than the selected time; and
effecting a communication, via the connection, which includes a first transmission of data of the selected ones of the stored data types from the first location to the central station and a second transmission, from the central station to the first location, of an indication of a new selected time and an indication of the data types for which data is to be transmitted during the next communication, which data types include the at least one data type for which data is stored in the first device and at least one, but less than all, of the plurality of different data types for which data is stored in the second device.

5,193,112
ARRANGEMENT AND METHOD FOR RAPIDLY DETECTING DOUBLE TALK IN LONG DISTANCE TELEPHONE COMMUNICATIONS SYSTEM
Hideo Sano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jan. 24, 1991, Ser. No. 645,905
Claims priority, application Japan, Jan. 24, 1990, 2-14250
Int. Cl.[5] H04B *3/20*
U.S. Cl. 379—410 11 Claims



1. An echo canceller for cancelling an echo signal in a telephone communications system, comprising:
an echo estimator including a transversal filter, said echo estimator receiving an incoming signal and adaptively producing an estimate echo signal;
a subtractor coupled to said echo estimator, said subtractor subtracting said estimated echo signal from the echo signal applied thereto, said subtractor outputting an error signal indicating residual echo;
a tap coefficient memory for storing tap coefficients and applying said tap coefficients to said echo estimator;
a tap coefficient updating circuit coupled to receive said error signal and said incoming signal and said tap coefficients, said tap coefficient updating circuit applying renewed tap coefficients to said tap coefficient memory;
a double talk detector coupled to receive said error signal and said incoming signal and said echo signal, said double talk detector producing a double talk detection signal in the event that a cross-correlation value between said incoming and echo signals is less than a first predetermined level while an estimated echo cancellation is larger than a second predetermined level.

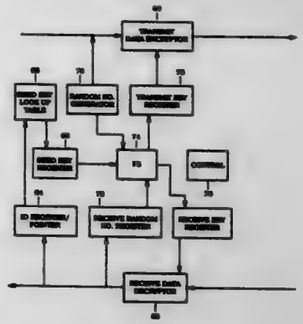
5,193,113
PROTECTIVE PLATE FOR PAYSTATION ANTI-STUFFING DEVICE
Gerald B. McGough, Huntsville, Ala., assignor to Quadrum Telecommunications, Inc., Arab, Ala.
Filed Jul. 29, 1991, Ser. No. 737,355
Int. Cl.[5] H04M *17/00*; B65G *11/04*
U.S. Cl. 379—437 8 Claims



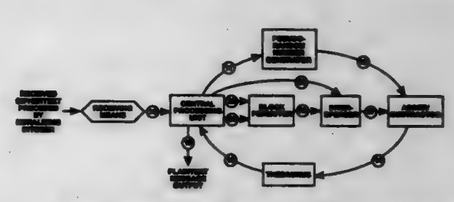
1. An anti-stuffing device protector for use with a coin chute of a telephone paystation including an anti-stuffing device including a tiltable door operable to make coins returned via said coin chute accessible by the user of said telephone paystation, said protector for said anti-stuffing device comprising:
a cover portion fitted securely over said door of said anti-stuffing device;
said cover portion including a raised portion adapted to facilitate movement of a portion of said door within said raised portion in response to manual movement of said door by said user of said paystation telephone;
fastening means for securing said cover to said anti-stuffing device.

5,193,114
CONSUMER ORIENTED SMART CARD SYSTEM AND AUTHENTICATION TECHNIQUES
Donald R. Moseley, 197 Johnson Ave., Meriden, Conn. 06450
Filed Aug. 5, 1991, Ser. No. 742,314
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—23 8 Claims

1. A method of authenticating a person's identity who claims authority to use a device as a part of a closed system comprising the steps of:
A. having said person enter an identification code on a plurality of electric switches and
B. measuring the amount of time each individual switch is activated and
C. measuring the amount of time between deactivation of each switch and activation of the following switch
D. measuring the cadence of code entry and,
E. comparing said measurements to counterpart measurements taken on previous code entries made by the known authorized person to determine if a predetermined positive correlation exists to authenticate the claiming person.

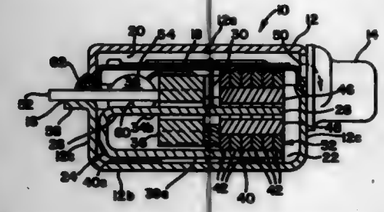


5,193,115
PSEUDO-RANDOM CHOICE CIPHER AND METHOD
Arnold R. Vobach, 11114 Ashcroft, Houston, Tex. 77096
Continuation-in-part of Ser. No. 577,936, Sep. 5, 1990, Pat. No. 5,113,444. This application Jan. 22, 1992, Ser. No. 824,025
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—46 24 Claims



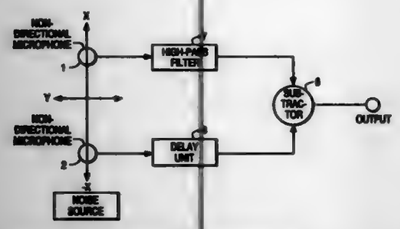
1. A cipher system for use by a sender and a receiver to generate cryptograms, the system comprising:
(a) a plaintext alphabet, each character of which is coded by a collection of numerical synonyms comprising non-negative integers of a common fixed length such that:
(i) the fraction, of all the numerical synonyms, for all the plaintext alphabet characters, corresponding to a given plaintext alphabet character is substantially equal to the relative frequency of use of that plaintext alphabet character in constructing meaningful plaintext messages;
(ii) the numerical synonyms for each plaintext alphabet character are randomly distributed in the collection of all non-negative integers, in their natural ordering, which have the common fixed length of the numerical synonyms; and
(iii) the choice of a numerical synonym to represent a plaintext alphabet character is pseudo-randomly made from the collection of numerical synonyms corresponding to that plaintext alphabet character;
(b) a concatenation of the numerical synonyms comprising a plaintext message string integer corresponding to a plaintext message; and
(c) a masking tape string comprising a pseudo-random sequence of digits, generated by an initializing seed, a new initializing seed for each cryptogram and the initializing seed concealed as a subset of the digits of an initializing integer, and added to the plaintext message string to form a ciphertext string.

5,193,116
HEARING AND OUTPUT TRANSDUCER WITH SELF CONTAINED AMPLIFIER
August F. Mostardo, Norridge, Ill., assignor to Knowles Electronics, Inc., Itasca, Ill.
Filed Sep. 13, 1991, Ser. No. 759,480
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—69 17 Claims



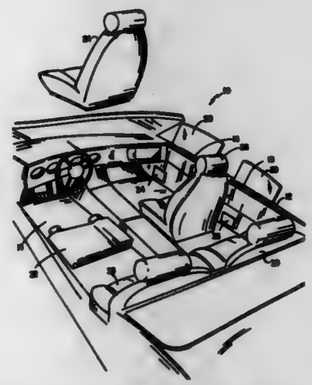
1. An integrated hearing aid receiver comprising:
a housing having a first outlet port;
a diaphragm disposed within said housing and defining a motor chamber and an output chamber, said output chamber communicating with said first outlet port;
an armature disposed within said motor chamber and having an operative element comprising a fixed end and a movable end;
coupling means for operably coupling said armature to said diaphragm;
a permanent magnet structure disposed about said armature movable end and providing a magnetic field at said armature movable end;
a drive coil disposed about said armature adjacent said permanent magnet structure; and
an amplifier coupled to said drive coil and disposed between said armature and said diaphragm.

5,193,117
MICROPHONE APPARATUS
Kiminori Ono, Katano; Michio Matsumoto, Sonan; Hiroyuki Naono, Yawata; Hiroshi Kobayashi, Moriguchi, and Yuuji Yamashina, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,145
Claims priority, application Japan, Nov. 27, 1989, 1-307036
Int. Cl.[5] H03B 29/00
U.S. Cl. 381—71 1 Claim



1. A microphone apparatus comprising:
a first non-directional microphone;
a second non-directional microphone disposed at a distance to the first non-directional microphone so that main axes of the first and second non-directional microphones are aligned on a straight line;
a delay unit for delaying an output signal of the second non-directional microphone;
a high-pass filter for removing low frequency components of an output signal of the first non-directional microphone; and
a subtracter for subtracting an output signal of the delay unit from an output signal of the high-pass filter.

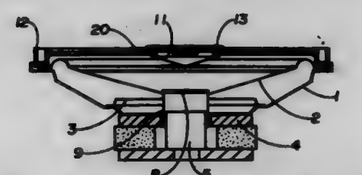
5,193,118
VEHICULAR SOUND REPRODUCING
Ernest Latham-Brown, Framingham; Brian J. Gawronski, Northboro, and Peter W. Hubbe, Marlboro, all of Mass., assignors to Bose Corporation, Framingham, Mass.
Continuation of Ser. No. 380,924, Jul. 17, 1989, abandoned. This application Feb. 27, 1992, Ser. No. 842,743
Int. Cl.[5] H04B 1/00
U.S. Cl. 381—86 11 Claims



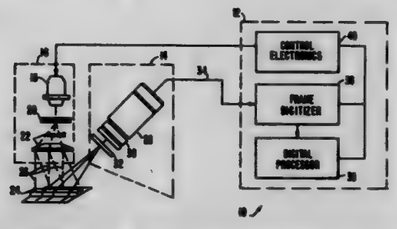
1. A vehicle with sound reproducing apparatus comprising
a vehicle body including a floor and front and rear, left and right side panels and windows above said side panels to partially define a passenger enclosure,
front seats and rear seats having seating surfaces in said passenger enclosure,
four upper frequency driver units that radiate in at least the upper frequency range and are located in lower portions of respective said front and rear, left and right side panels
wherein said front upper frequency driver units are located forward of and below the front passenger seats seating surfaces, and said rear upper frequency driver units are located forward of and below the rear passenger seats seating surfaces, and
a nonlocalizable woofer module acoustically coupled to said passenger enclosure that provides to said passenger enclosure low frequency spectral components of frequencies lower than those provided by the upper frequency driver units.

5,193,119
MULTIPLE LOUDSPEAKER
Franco Tontini, Via G. Matteotti, 41/A, Falconara Marittima (AN), and Carlo Sancisi, Via Milite Ignoto, 71, Pesaro, both of Italy
Continuation of Ser. No. 240,382, Aug. 30, 1988, abandoned, which is a continuation of Ser. No. 884,646, Jul. 11, 1986, abandoned. This application Apr. 27, 1990, Ser. No. 517,415
Claims priority, application Italy, Sep. 2, 1985, 625 A/85
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—182 9 Claims

1. A multiple loudspeaker, comprising:
housing means having a top and a bottom,
first speaker means supported by said housing means, said first speaker means including first diaphragm means having an inner surface and first acoustic transducer means,
second speaker support means supported by the top of said housing means, a portion of said second speaker support means spaced from said first speaker means,
second speaker means including second diaphragm means attached to said spaced portion of said second speaker support means, and piezoelectric means attached to said second diaphragm means between said second diaphragm means and said first speaker means, said piezoelectric means and second diaphragm means being spaced from said first speaker means and in unobstructed acoustic communication therewith so that acoustic waves emanating from said piezoelectric means and said second diaphragm means radiate unobstructed to the inner surface of said first diaphragm means of said first speaker means and are reflected forward from said first speaker and outside the multiple loudspeaker, and
attaching means for attaching only the top of said second diaphragm means to said spaced portion of said second speaker support means, said attaching means including a central annular flange supporting said second diaphragm means, whereby said second speaker means is spaced from said first speaker means.



5,193,120
MACHINE VISION THREE DIMENSIONAL PROFILING SYSTEM
Ronald W. Gamache, East Greenbush, and John A. Tourtellott, Latham, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.
Filed Feb. 27, 1991, Ser. No. 661,679
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 5 Claims



1. A system for generating a three dimensional image of an object comprising
light projector means for generating lines of light onto an object;
imaging means, including an imaging lens, for viewing the lines of light at points along said lines at an angle to provide a profile of the object and providing an output corresponding to an image of the lines of light reflected from the object;
processing means for processing the output from the imaging means at points along the lines of light, said processing includes determining centroids for said points generating a two dimensional image point defined by the ordered pair (x, y) and transforming said image point to a three dimensional point; and
wherein said processing means utilizes optical magnification of said imaging lens and the geometry of the lines of light to process the image points in the following manner:

$$X = m^{*}x + m^{*}e^{*}x^{3} + (dm/dz)^{*}Z$$

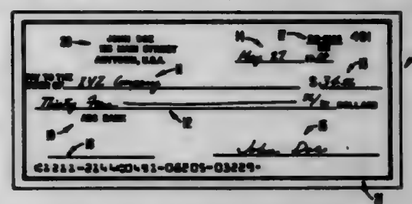
$$Y = m^{*}y + m^{*}e^{*}y^{3} + (dm/dz)^{*}Z$$

where m is the optical magnification and e is the optical distortion and the equation for the geometry of lines in a geometric plane is

$$a^{*}X + b^{*}Y + c^{*}Z = 1$$

where a, b, and c are calibration parameters; and wherein by solving these equations simultaneously image coordinates X, Y, Z are determined; and means for generating said three dimensional image based on the coordinates determined by said processing means.

5,193,121
COURTESY AMOUNT READ AND TRANSACTION BALANCING SYSTEM
Victor P. Eischer, Richmond; Ilan Kerot, Albany; Milton Johnson, Oakland; Ihsan Tumsubcter, Milpitas, and David B. Aragon, Berkeley, all of Calif., assignors to TRW Financial Systems, Inc., Berkeley, Calif.
Continuation of Ser. No. 200,143, May 31, 1988, Pat. No. 5,040,226. This application Aug. 15, 1991, Ser. No. 746,165
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—7 6 Claims



1. A method of processing documents to record handwritten numerical entries, a document to be processed including a plurality of first predetermined fields containing handwritten numerical entries and a second predetermined field containing a numerical entry representing the combined value of the numerical entries of said first predetermined fields, said method comprising the steps of:
locating said predetermined fields;
segmenting said predetermined fields into segments, each containing an individual character of the numerical entry of the associated predetermined field;
subjecting each said character segment to character recognition analysis so as to associate a character therewith;
assigning a character confidence level to each said character representing the accuracy with which the associated character was recognized.
deriving an overall confidence level for each numerical field from the associated character confidence levels;
automatically computing the combined value of the recognized numerical entries for said first predetermined fields;
automatically recognizing the numerical entry value of said second predetermined field;
comparing said computed combined value with the recognized numerical value of said second predetermined field to verify whether said computed combined value and said recognized value match;
if said computed and recognized values fail to match, displaying the images of the numerical entries in the order of increasing overall confidence levels, whereby a key operator may enter numerical entries from the images;
repeating said comparing step after each numerical entry

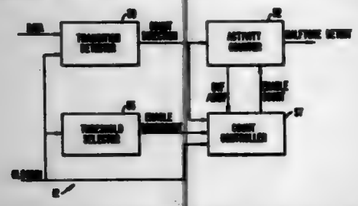
from the images; and terminating said displaying step when a match is found.

5,193,122

HIGH SPEED HALFTONE DETECTION TECHNIQUE

Robert P. Kowalski, Campbell, and Dan S. Bloomberg, Palo Alto, both of Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,478
Int. Cl.[5] G06K 9/34
U.S. Cl. 382—9 20 Claims



1. A method of processing a digital image presented as a serial bit stream representing lines of pixels in the image, comprising the steps of:
monitoring the bit stream;
maintaining a count within a predetermined range;
incrementing the count based on a condition relating to the occurrence of a transition;
decrementing the count based on a condition relating to the lack of transitions;
specifying which one of at least two numerical ranges the count falls; and
subjecting the bit stream to one set of a number of sets of operations, each set of which corresponds to a respective numerical range, wherein at least two sets are different from each other, the one set corresponding to the specified numerical range.

5,193,123

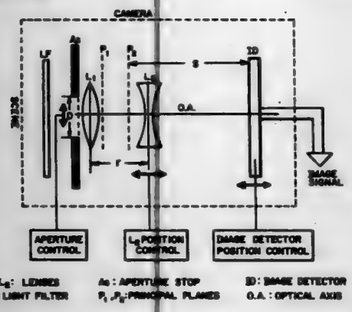
Patent Not Issued For This Number

5,193,124

COMPUTATIONAL METHODS AND ELECTRONIC CAMERA APPARATUS FOR DETERMINING DISTANCE OF OBJECTS, RAPID AUTOFOCUSING, AND OBTAINING IMPROVED FOCUS IMAGES

Muralidhara Subbarao, Setauket, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jun. 15, 1990, Ser. No. 537,117
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—41 22 Claims



1. A method of determining the distance of a surface patch of an object from a camera system having an aperture through which light enters, an image detector, an image forming optical system having first and second principal planes and a focal length, said second principal plane arranged closer to said image detector than said first principal plane, a light filter, a camera controller, and an image processor operatively connected to said image detector and to said camera controller, said method comprising:
a) setting said camera to a first set of camera parameters including at least one of (i) distance (s) between said second principal plane and said image detector, (ii) diameter (D) of said camera aperture, (iii) focal length (l) of said camera system, and (iv) spectral characteristic (λ) of light transmitted by said light filter;
b) forming a first image of said surface patch on said image detector;
c) recording said first image in said image processor as a first digital image;
d) preprocessing said first digital image to provide a first normalized image which is related to the point spread function of said camera system by a convolution operation;
e) calculating a first set of Fourier coefficients of said first normalized image at a set of discrete spatial frequencies;
f) changing at least one of said camera parameters;
g) forming a second image of said surface patch on said image detector;
h) recording said second image in said image processor as a second digital image;
i) preprocessing said second digital image to provide a second normalized image which is related to the point spread function of said camera by a convolution operation;
j) calculating a second set of Fourier coefficients of said second normalized image at said set of discrete spatial frequencies;
k) dividing said first set of Fourier coefficients by said second set of Fourier coefficients to provide a set of ratio values;
l) providing a signal mathematical relationship corresponding to each member of said set of ratios, said mathematical relationship provided without any intermediate parameter and representing the ratio of the optical transfer function of said first normalized image to the optical transfer function of said second normalized image, each said mathematical relationship dependent only on said camera parameters and having one unknown equal to said distance of said surface patch from said camera system;
m) substituting each ratio value resulting from step (k) in the signal corresponding mathematical relationship provided in step (l) to obtain a set of equations; and
n) solving said set of equations resulting from step (m) to determine said distance of said surface patch from said camera system.

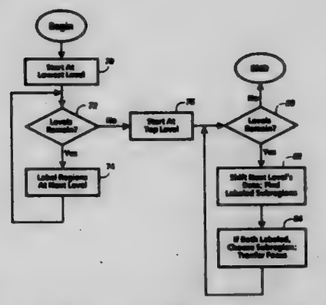
5,193,125

LOCAL HIERARCHICAL PROCESSING FOCUS SHIFT WITHIN AN IMAGE

James V. Mahoney, Sunnyvale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 8, 1990, Ser. No. 537,468
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—41 8 Claims

1. A method of operating a system that includes a memory array and a processor connected for accessing the memory array, the method comprising steps of:
storing in the memory array a body of data defining an image that includes a plurality of pixels, the body of data including a respective pixel data item for each of the pixels; each pixel's respective pixel data item including current focus data indicating whether the pixel is a current focus pixel; and
operating the processor to set the current focus data of a first one of the pixels to indicate that the first pixel is the current focus pixel; the step of operating the processor comprising a substep of:



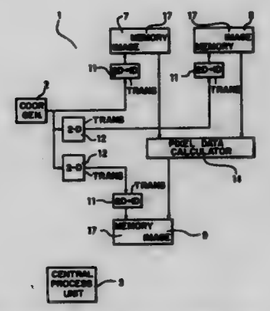
shifting the current focus data of all the pixels within the array so that the current focus data of a second pixel is shifted to the first pixel's respective pixel data item to set the first pixel's current focus data.

5,193,126

IMAGE DEFORMATION METHOD AND APPARATUS USING COORDINATE TRANSFORMATION

Hiroshi Matsuki, Moriguchi, Japan, assignor to Toyo Ink Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1991, Ser. No. 644,306
Claims priority, application Japan, Jan. 25, 1990, 2-15553; Jan. 25, 1990, 2-15554; Mar. 2, 1990, 2-51047; Mar. 2, 1990, 2-51048; Mar. 2, 1990, 2-51049
Int. Cl.[5] G06K 9/32
U.S. Cl. 382—44 14 Claims



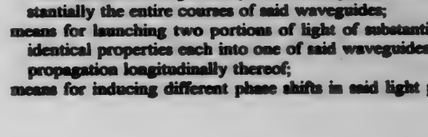
1. An image processing apparatus comprising:
a memory unit for storing pixels of an image by a two-dimensional array of pixel addresses;
an address supplier for generating two-dimensional addresses of pixels in the memory unit;
a two- to one-dimensional address coordinate transformation unit for transformation between a set of one-dimensional address coordinate values of an image and a set of two-dimensional address coordinate of the image values, said two- to one-dimensional address coordinate transformation unit comprising offset address reading means responsive to addresses of said address supplier for tabulating addresses as a sequence of addresses;
a two-dimensional coordinate transformation unit, operative with pixels of the image, for transforming coordinate values (x, y) of the image within a predetermined area on an x-y coordinate system into coordinate values (X, Y) within a predetermined area on an X-Y coordinate system;
an inter-pixel data calculation unit, operative with pixel data of the image and with pixel data of a further image, for calculating pixel data of a composite image from pixels of said first-mentioned image and said further image; and
wherein said memory unit stores each image.

5,193,127

METHOD AND DEVICE FOR DETECTING PATTERNS ADAPTED AUTOMATICALLY FOR THE LEVEL OF NOISE

Johannes A. C. Bernsen, Eindhoven, Netherlands, and Seiji Kashioka, Tokyo, Japan, assignors to U.S. Philips, New York, N.Y. and Hitachi, Ltd., Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,705
Claims priority, application Japan, Mar. 30, 1990, 2-80745
Int. Cl.[5] G06K 9/20
U.S. Cl. 382—48 14 Claims



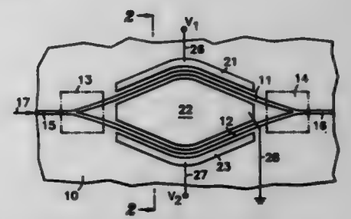
1. A method for distinguishing noise responses from true pattern responses comprising the steps of
a) receiving an input signal;
b) using a pattern detector to identify candidate locations where a pattern is detected in the input signal;
c) determining whether a count of candidate locations in a neighborhood of a particular candidate location exceeds a threshold;
d) distinguishing said particular candidate location as containing a true pattern response, when said count is below said threshold.

5,193,128

INTEGRATED OPTIC MODULATOR WITH SMOOTH ELECTRO-OPTIC BANDPASS CHARACTERISTICS

James D. Farina, Tolland, and Paul G. Suchoski, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 26, 1991, Ser. No. 813,468
Int. Cl.[5] G02B 6/10
U.S. Cl. 385—3 7 Claims



1. An optic intensity modulator comprising
a substrate of an optic material that is conductive to light and acoustic waves and has both electrooptic and piezoelectric properties;
a pair of associated elongated light waveguides formed in said substrate, extending substantially coextensively with one another, and separated from one another by a transverse distance that gradually varies along and over substantially the entire courses of said waveguides;
means for launching two portions of light of substantially identical properties each into one of said waveguides for propagation longitudinally thereof;
means for inducing different phase shifts in said light por-

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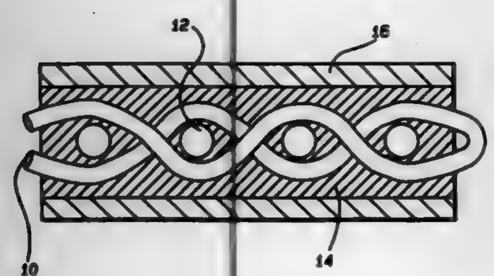
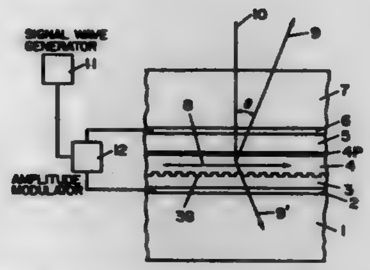
tions as they propagate in said waveguides, including means for imposing different variable electric fields onto each of said waveguides; and
means for combining said light portions with one another after the emergence thereof from said waveguides with attendant amplitude modulation of the combined output light due to interference between such phase-shifted light portions.

5,193,129
PRESSURE SENSOR UTILIZING MICROBENDING OF A FIBER OPTIC CABLE WOVEN THROUGH A LADDER SHAPED STRUCTURE
Dennis A. Kramer, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Sep. 27, 1991, Ser. No. 766,878
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—13 **9 Claims**



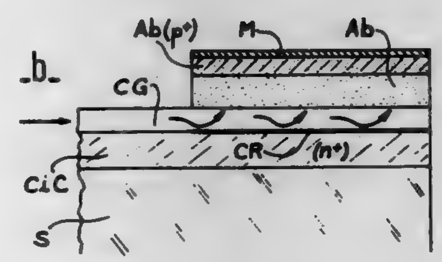
1. A pressure sensor comprising:
a plurality of parallel axially spaced members having a first portion disposed above an axis defined therethrough and a second portion disposed below said axis;
means for retaining said members in parallel axially spaced relation;
a light conduit disposed in contact with said parallel axially spaced members so as to alternatively engage first and second portions of sequential parallel axially spaced members;
a light source connected to an end of said conduit for directing a known quantity of light into said conduit;
a light detector connected to an opposing end of said conduit for detecting the quantity of light transmitted therethrough;
said conduit defining an undeformed transmission property characterized by a first transmission loss providing a first magnitude light quantity incident upon said light detector and a deformed transmission property characterized by a second transmission loss providing a second magnitude light quantity;
means for comparing the quantity of light transmitted therethrough to a threshold value; and
means for indication upon said second quantity becoming less than said threshold value.

5,193,130
LIGHT DEFLECTING DEVICE
Seiji Nishiwaki, Katano; Yoshinao Taketomi, Moriguchi; Shinji Uchida, Osaka; Takaaki Tomita, Moriguchi, and Junichi Asada, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP89/00797, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO90/01722, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 2, 1989, Ser. No. 474,763
Claims priority, application Japan, Aug. 5, 1988, 63-196584; Apr. 28, 1989, 1-109347
Int. Cl.[5] G02B *6/12*
U.S. Cl. 385—14 **13 Claims**



1. A light deflecting device comprising:
a substrate,
a conductive thin film formed on said substrate,
a waveguide layer for transmitting waveguide light therethrough, said waveguide layer being formed on said conductive thin film,
a transparent substrate,
a transparent conductive thin film formed on a surface of said transparent substrate,
a liquid crystal layer interposed between said transparent conductive thin film and said waveguide layer, said waveguide layer having a cyclical structure formed on its surface along the direction of propagation of the waveguide light, said cyclical structure including means for cooperating with said waveguide layer and said liquid crystal layer to radiate the waveguide light as radiated light outside of said waveguide layer such that the direction of the radiated light is changed by applying a voltage signal between said conductive thin film and said transparent conductive thin film.

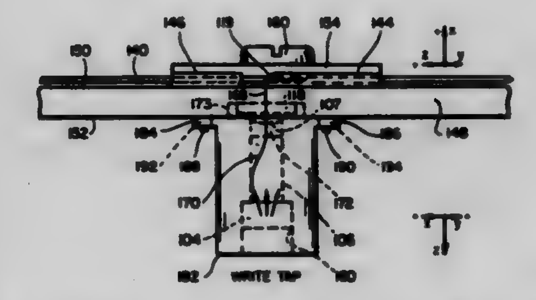
5,193,131
OPTOELECTRONIC DEVICE WITH AN INTEGRATED OPTICAL GUIDE AND PHOTODETECTOR
Adrien Bruno, Palaiseau, France, assignor to France Telecom Etablissement Autonome De Droit Public, Paris, France
Filed Apr. 28, 1992, Ser. No. 875,018
Claims priority, application France, Apr. 30, 1991, 91 05299
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—14 **12 Claims**



1. Optoelectronic device having an integrated optical guide and photodetector successively comprising on the same semiconductor substrate (S), a first, lower confinement layer (CiC) made from a first material having a first index (n1), a second

guide layer (CG) made from a second material having a second index (n2) higher than the first (n1), optionally a third, upper confinement layer (CsG) made from a third material having a third index (n3) below the second (n2), a fourth absorption layer (Ab) made from a fourth material having a fourth index (n4) and able to absorb the radiation from the guide wave (CG) by evanescence, characterized in that the device also comprises a partial reflecting layer (CR) inserted between the lower confinement layer (CiC) and the guide layer (CG) and positioned facing the absorbent layer (Ab), said partial reflecting layer (CR) being made from a fifth material having a fifth index (n5), whose value is outside the range defined by the first index (n1) of the lower confinement layer (CiC) and the second index (n2) of the guide layer (CG).

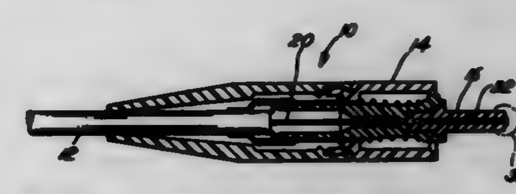
5,193,132
METHOD OF COUPLING LIGHT VIA A COUPLER ON A FIBER OPTIC LIGHT GUIDE USING PHASE SPACE MATCHING
William D. Uken, Fremont, and William T. Link, Berkeley, both of Calif., assignors to Raynet Corporation, Menlo Park, Calif.
PCT No. PCT/US90/02449, § 371 Date Sep. 30, 1991, § 102(e) Date Sep. 30, 1991
Continuation-in-part of Ser. No. 503,064, Mar. 29, 1990, abandoned, which is a continuation of Ser. No. 346,185, May 2, 1989, abandoned. This PCT application May 2, 1990, Ser. No. 768,644
Int. Cl.[5] G02B *6/26, 6/42*
U.S. Cl. 385—32 **27 Claims**



13. An apparatus for coupling light between a light emitting device and a target optical device, comprising:
the light emitting device for emitting light;
the target optical device;
an optical path for guiding at least some of the emitted light to the target optical device;
means for altering a direction of propagation of the emitted light, the altering means including at least one third or higher order corrective lens, at least one of the devices comprising a bent optical fiber whereby light passes through a side of the fiber at a bend.

5,193,133
METHOD OF TERMINATING OPTICAL FIBER UTILIZING A PLASTIC ALIGNMENT FERRULE WITH POLISHING PEDESTAL
Philip W. Schofield, Batavia; Paul R. Stonikas, Darien, and James W. McGinley, Schaumburg, all of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.
Filed Jan. 21, 1992, Ser. No. 823,305
Int. Cl.[5] G02B *6/26;* **B29D** *11/00*
U.S. Cl. 385—85 **5 Claims**

1. A method of making a fiber optic connector comprising the steps of forming a plastic ferrule comprising an elongated body having an opening therethrough, said opening having an entry end and an exit end, said opening being flared at the entry end for facilitating entry of a fiber, said ferrule having a raised pedestal surrounding the exit end of the opening, introducing a fiber into said opening for extension through said exit end and beyond said raised pedestal, bonding said ferrule to said fiber, cleaving the fiber, severing the free end of the fiber, and polish-



ing the ferrule to remove the raised pedestal and provide a smoothly polished end surface on the ferrule.

5,193,134
GROOVED-CORE CABLE FOR USE WITH RIBBON OPTICAL FIBRES AND PROCESS TO MAKE THE SAME
Massimo Pizzorno, Milan, and Alessandro Ginocchio, Sesto S. Giovanni, both of Italy, assignors to Pirelli Cavi S.p.A., Milan, Italy
Filed Feb. 11, 1992, Ser. No. 834,005
Claims priority, application Italy, Mar. 8, 1991, MI91A 000597; Mar. 8, 1991, MI91A 000598
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—105 **29 Claims**

1. An optical fibre telecommunications cable comprising a plurality of ribbons including at least a first and a second ribbon (1*a*, 1*e*) of optical fibres (2), each provided with at least a primary layered coating (3) comprising a first layer (5), in contact with the optical fibre, having a lower modulus of elasticity than a second layer (6) external thereto, a housing structure (9) having at least one groove (10) forming at least a closed housing (10) for said ribbons, said housing having a bottom and extending in a helical manner around the groove axis and being closed to the outside by a wall (11), in which the ribbons are radially superposed at different radial distances from said axis to provide a radially outermost second ribbon (1*e*) and a radially innermost first ribbon (1*a*), ribbons at radially longer distances from said axis overlying ribbons at radially smaller distances from said axis and ribbons at radially smaller distances from said axis underlying ribbons at radially longer distances from said axis, each of said ribbons being in elastic longitudinal tension so that overlying ribbons apply pressure to underlying ribbons, and a pulling element (14), characterized in that said first ribbon (1*a*) is located in the housing (10) so that it can exert a first pressure of a predetermined value on the said bottom of said housing at a temperature of 20° C., and said second ribbon (1*e*) is located in the housing so that it can exert a second pressure lower than the first pressure on said first ribbon (1*a*), said value of said first pressure and the ratio between said second pressure and said first pressure being such that an important radial travel of both ribbons to the outside (11) of the housing (10) is prevented with a temperature decrease up to a predetermined value, and respectively, that said first ribbon (1*a*) is prevented from radially moving away from the housing (10) bottom by a distance greater than the radial travel of said second ribbon (1*e*).

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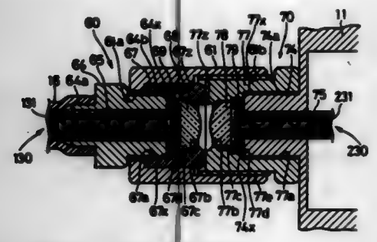
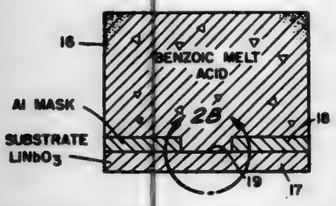
5,193,135
OPTICAL CONNECTOR AND ENDOSCOPE WITH OPTICAL CONNECTOR
Kunihiko Miyagi, Wako, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan
Filed Oct. 7, 1991, Ser. No. 772,674
Claims priority, application Japan, Oct. 31, 1990, 2-113490[U]
Int. Cl.[5] G02B *23/26*
U.S. Cl. 385—117 10 Claims



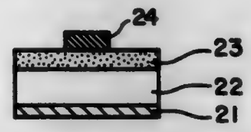
1. An optical connector comprising:
(a) a tubular connector body having a stopper portion and a first threaded portion formed on an outer periphery of said connector body, one end portion of a light guide being adapted to be inserted in and fixed to said connector body;
(b) a tubular retainer including an abutment portion, a second threaded portion which is formed on an inner periphery of a proximal end portion of said retainer and is threadedly engaged with said first threaded portion, and a radially inwardly-directed annular flange formed on the inner periphery of said retainer adjacent to an open distal end of said retainer, said retainer being threaded on said connector body to such an extent that said abutment portion is abutted against said stopper portion of said connector body;
(c) an optical element received in said retainer and disposed between said flange of said retainer and the one end face of said light guide; and
(d) an annular elastic member received in said retainer and disposed between said optical element and a distal end surface of said connector body, said elastic member urging said optical element against said flange of said retainer, thereby keeping said optical element away a predetermined distance from the one end face of said light guide.

5,193,136
PROCESS FOR MAKING MULTIFUNCTION INTEGRATED OPTICS CHIPS HAVING HIGH ELECTRO-OPTIC COEFFICIENTS
Chin L. Chang, West Covina; Daniel A. Nicholson, and Albert Choi, both of Woodland Hills, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.
Continuation of Ser. No. 702,140, May 31, 1991, abandoned, which is a continuation of Ser. No. 428,174, Oct. 27, 1989, abandoned. This application Nov. 26, 1991, Ser. No. 799,716
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—129 28 Claims



8. An integrated optics chip comprising a substrate formed from electro-optic material with at least one proton-exchanged optical waveguide formed in a surface of said substrate, said optical waveguide having:
proton-exchanged hydrogen ions substantially diffused into and below the surface of said optical waveguide;
a rhombohedral structure;
at least one input port to said at least one optical waveguide for light and at least one output port from said at least one optical waveguide for light;
a polarization extinction ratio of no more than about −55 dB;
coupling loses of not more than about −3 dB of optical power from said output port with respect to optical power into said input port; and
a restored electro-optic coefficient, said substrate being substantially free of stresses that lead to microcracking, and substantially free of microcracks, in the proton-exchanged waveguide regions of said substrate.

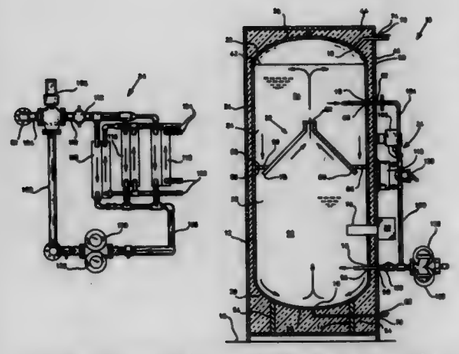
5,193,137
QUARTZ OPTICAL WAVEGUIDE AND METHOD FOR PRODUCING THE SAME
Sumio Hoshino; Hiroo Kanamori; Masumi Ito; Shinji Ishikawa, and Haruhiko Aikawa, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Sep. 25, 1991, Ser. No. 765,243
Claims priority, application Japan, Sep. 25, 1990, 2-251881
Int. Cl.[5] G02B *6/10, 6/26*
U.S. Cl. 385—129 6 Claims



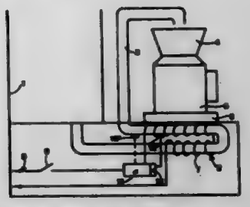
1. A quartz optical waveguide comprising:
a support;
a first quartz glass layer formed on said support;
a quartz glass core containing a functional material formed on said first quartz glass layer; and
a second quartz glass layer formed on said first quartz glass layer and said quartz glass core, said first and second quartz glass layers having a lower refractive index than that of said quartz glass core, said quartz glass core being surrounded by said first and second quartz glass layers.

5,193,138
OFF-PEAK THERMAL STORAGE SYSTEM PROVIDING A PLURALITY OF SELECTED TEMPERATURE OUTLETS
Steven M. Richey, 6960 W. Andrew Johnson Hwy., Talbot, Tenn. 37877; Richard E. MacDonald, 3117 Providence Cir., Morristown, Tenn. 37814-2584, and Jimmy F. Mathis, 512 Windridge La., Morristown, Tenn. 37814
Filed Apr. 16, 1991, Ser. No. 686,748
Int. Cl.[5] H05B *1/02*; G05D *23/13*; F24H *7/04*
U.S. Cl. 392—341 10 Claims

1. A thermal storage system for storing thermal energy in the form of heated fluid to be used in exchange with a plurality of independent systems including potable water supplies and space heating systems, said thermal storage system comprising:
a storage receptacle for storing a selected volume of a selected heat transfer fluid, said selected volume of said selected heat transfer fluid defining a fluid level;
at least one heating element for heating said selected volume of said selected heat transfer fluid to a selected temperature;
a pressurizer for pressurizing said storage receptacle to a selected pressure to prevent flashing of said selected heat transfer fluid;
an outlet for dispensing said selected heat transfer fluid at said selected temperature to a selected location;
a plurality of heat exchangers, each of said plurality of heat exchangers in fluid communication with said outlet at said selected location for heating a selected fluid to a selected system output temperature, each of said plurality of heat exchangers defining a primary chamber and a secondary chamber, said primary chamber including inlet and outlet ports for fluid communication therethrough of said selected heat transfer fluid and said secondary chamber including inlet and outlet ports for fluid communication therethrough of said selected fluid, each said primary chamber defined by each of said plurality of heat exchangers being connected in parallel with each other, and at least one said secondary chamber defined by one of said plurality of heat exchangers being connected independently from all other said secondary chambers defined by all other said plurality of heat exchangers and in fluid communication with one of said plurality of independent systems;
a recirculation line for recirculating said selected heat transfer fluid evacuated from each of said plurality of heat exchangers through said first outlet port, said selected heat transfer fluid being evacuated at a reduced temperature as compared to said selected temperature;
a thermostatic mixing valve in fluid communication between said storage receptacle, each of said plurality of heat exchangers, and said recirculation line for mixing said selected heat transfer fluid at said selected temperature with said selected heat transfer fluid at said reduced temperature in selected proportions to control a temperature defined by said selected heat transfer fluid delivered to each of said plurality of heat exchangers;
a temperature sensor for monitoring said temperature of said selected heat transfer fluid and producing a signal dependent upon said temperature;
a temperature controller for receiving said signal produced by said temperature sensor and selectively enabling and disabling said thermostatic mixing valve, said temperature controller being operably dependent on said signal received from said temperature sensor; and
an inlet in fluid communication between said recirculation line and said storage receptacle for introduction of said selected heat transfer fluid at said reduced temperature into said storage receptacle for reheating.

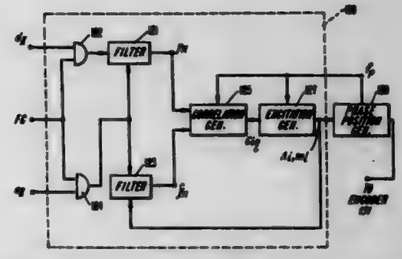


5,193,139
HOUSEHOLD COFFEEMAKER
Patrice J. C. Schlottsatte, Alencon, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France
Filed Mar. 25, 1991, Ser. No. 674,448
Claims priority, application France, Apr. 11, 1990, 90 04679
Int. Cl.[5] A47J *31/54*
U.S. Cl. 392—480 7 Claims



1. In a household coffeemaker comprising a cold water reservoir (1) supplying a water heater (2) of the circulating type whose output is connected to a water channel (3) of a coffee filter (4) disposed above an infusion collector (5), and a timing element (12) that regulates the duration of an initial pre-steeping phase and a subsequent infusion stage by an open and closed condition respectively, said water heater comprising a heating resistance (7) whose supply circuit is connected to the terminals (8) of a source of alternating current; the improvement wherein said supply circuit of said heating resistance (7) comprises a device (11) for changing the electric power supplied, according to whether said timing element (12) is in said open or said closed condition, to said heating resistance (7) so as to supply said heating resistance (7), during said pre-steeping phase, with low power to obtain a low flow rate of hot water, and during said infusion phase, with greater power to obtain a greater flow rate of hot water.

5,193,140
EXCITATION PULSE POSITIONING METHOD IN A LINEAR PREDICTIVE SPEECH CODER
Tor B. Minde, Lulea, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Mar. 30, 1990, Ser. No. 501,767
Claims priority, application Sweden, May 11, 1989, 8901697
Int. Cl.[5] G10L *9/14*
U.S. Cl. 395—2 4 Claims



1. A method for positioning excitation pulses for a linear predictive coder and for coding positioning information wherein a synthesized speech signal is formed from an original speech signal, comprising:
(a) determining a number of predictive parameters which characterize said original speech signal within a time frame interval;
(b) calculating a residual signal representing an error between said original speech signal and said synthesized speech signal within said frame interval and generating an

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array of excitation pulses within said frame interval based on said residual signal and said predictive parameters;

(c) generating a weighted, speech-representative signal Y_n by weighting said residual signal with said predictive parameters;

(d) generating a weighted, synthesized speech signal $\hat{Y}_n$ by weighting a representative signal which represents an amplitude and a time position of one of said excitation pulses with said predictive parameters;

(e) correlating for each of a number of modification stages i said weighted speech-representative signal Y_n with said weighted synthesized speech signal $\hat{Y}_n$ to determine a difference signal for each of said stages;

(f) determining for each of said stages a candidate for an excitation pulse representing an amplitude A_i and a time position m_i from said correlation of that stage, determining the minimum value of said difference signal among the difference signals for all candidates and selecting the candidate which corresponds to said minimum value to obtain the amplitude A_{mp} and the time position m_p for one of said excitation pulses, and repeating the pulse candidate determination procedure for a desired number of excitation pulses in a frame disregarding excitation pulses determined in previous modification stages;

(g) dividing a total number of possible time positions n for excitation pulses within said time frame into a number of phase positions n_f, each phase position including a number of phases f such that $n=n_fF+f$, where F is a total number of phases f in a particular phase position n_f;

(h) determining according to steps (d) through (f) an amplitude and a time position of a first and subsequent excitation pulses among time positions n having corresponding phases in each phase position but not occupied by time positions of preceding excitation pulses until a preset number of excitation pulses determined within said time frame interval have been positioned;

(i) coding each determined phase position n_f separately to form separate code words; and

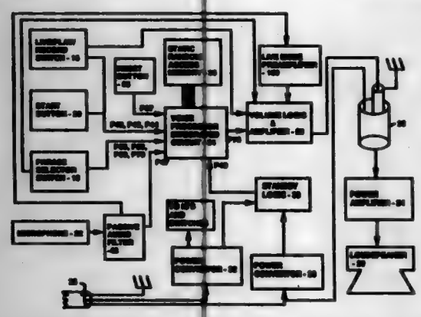
(j) coding said determined phases together to form a single code word.

5,193,141

VEHICULAR VOICE STORAGE, PLAYBACK, AND BROADCASTING DEVICE

Arthur L. Zwern, 170 S. Morrison Ave., San Jose, Calif. 95126

Filed Nov. 19, 1990, Ser. No. 615,212
Int. Cl.[5] G10L 9/00; G11C 15/00
U.S. Cl. 395—2 16 Claims



1. A device for storing and replaying speech in vehicles, comprising:

input means being disposed in said vehicle for receiving a plurality of audio messages from a user;

conversion means for converting said audio messages into electronic signals representative thereof;

memory storage means for the retained storage of said electronic signals, said memory storage means being capable of storing said electronic signals in a randomly accessible format;

memory address means acting in coordination with said memory storage means to provide a known address within said memory storage means at which said electronic signals are stored, each of said plurality of messages having a unique address within said memory storage means;

replay means being activatable by said user to cause the outputting from said memory storage means of user selected portions of said electronic signals which portions represent one of said audio messages; and

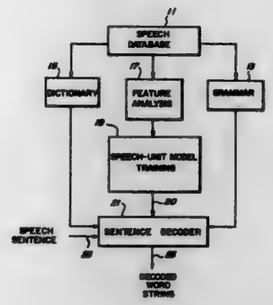
message broadcast means being disposed in said vehicle and being activated by said replay means and functioning to broadcast said audio messages externally from said vehicle.

5,193,142

TRAINING MODULE FOR ESTIMATING MIXTURE GAUSSIAN DENSITIES FOR SPEECH-UNIT MODELS IN SPEECH RECOGNITION SYSTEMS

Yunxin Zhao, Santa Barbara, Calif., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1990, Ser. No. 613,352
Int. Cl.[5] G10L 9/00
U.S. Cl. 395—2 30 Claims



1. A speech recognition system including a training module for estimating Gaussian densities for use in speech-unit models of the speech recognition system, said speech recognition system comprising:

means for receiving an input speech signal;

segmentation means for segmenting said speech signal into a plurality of speech units, each speech unit having a plurality of states, each state of each speech unit being a segment of said signal, each segment including a plurality of frames;

means for grouping all segments corresponding to like speech unit states for like speech units into respective sets of segments for all states of all speech units;

means for estimating parameters defining a Gaussian density for each segment of each set of segments;

means for merging said Gaussian densities of each set into a mixture Gaussian density for the set; and

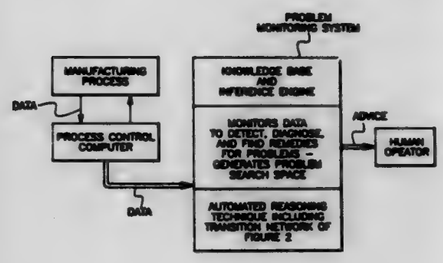
means for using said mixture Gaussian densities for identifying speech units of additional input speech signals.

5,193,143

PROBLEM STATE MONITORING

William F. Kaemmerer, Minneapolis, Minn., and James R. Allard, Brooklins, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 363,374, Jun. 2, 1989, abandoned, which is a continuation of Ser. No. 143,898, Jan. 12, 1988, abandoned. This application Nov. 7, 1989, Ser. No. 433,401
Int. Cl.[5] G06F 15/00
U.S. Cl. 395—51 4 Claims



1. A method for use with an expert system for diagnosing and providing remedies for problems incurred in the operation of a manufacturing process, wherein said manufacturing process has a plurality of data points from which the occurrence of said problems may be determined, and wherein said expert system has an inference engine means for inferencing which interfaces with and monitors said data points,

said inference engine means being operable relative to said manufacturing process to facilitate (1) the determination of an unconfirmed root problem associated with one of said data points, designated a root node, and (2) the generation of a hierarchical problem space relative to said root node listing a set of descendant nodes having unconfirmed operating problems associated therewith potentially causing said root problem;

and wherein said inference engine means has available an investigation procedure during the course of the use of such procedure a determination can be made for each of said unconfirmed operating problems whether it is an actual problem and whether said inference engine means has a remedy for said actual problem,

said method for use with such an expert system comprising the steps of:

A. monitoring said manufacturing process and reading said data points with the use of said inference engine means;

B. determining from said data point readings in association with said inference engine means the existence of any root problem and generating in association with said inference engine means a hierarchical problem space listing of a set of descendant unconfirmed operating problems potentially causing said root problem;

C. determining for each of said unconfirmed operating problems in association with said investigation procedure (1) whether said unconfirmed operating problem is in fact a cause of said root problem and (2) whether said inference engine has a remedy for said cause of said root problem;

D. providing a transition network having a format of transition states for said root problem during the course of said investigation procedure from the time said root problem is detected until it is either resolved or it is determined to be irresolvable; and

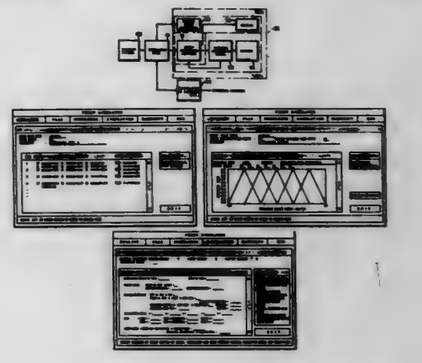
E. returning to step A.

5,193,144

FUZZY SYSTEM

Yasuhiro Tsutsumi, and Yutaka Ohtsubo, both of Takatsuki, Japan, assignors to Shimano, Inc., Osaka, Japan

Filed Dec. 12, 1989, Ser. No. 449,717
Claims priority, application Japan, Dec. 14, 1988, 63-315368; Feb. 7, 1989, 1-28373; Mar. 17, 1989, 1-67161
Int. Cl.[5] G06F 15/00, 9/44
U.S. Cl. 395—76 2 Claims



2. A fuzzy control system development support apparatus comprising:

a control objective model to be controlled in a simulation;

a knowledge base storing therein fuzzy rules and membership functions previously set;

a display means for enabling editing of said fuzzy rules and said membership functions stored in said knowledge base;

translation means for translating said knowledge base into an arbitrary language;

means for generating and supplying a pseudo input;

means for performing fuzzy inferences on said pseudo input supplied from said generating means and feedback from said model in accordance with said fuzzy rules and membership functions stored in said knowledge base and for supplying the inference result to said model; and

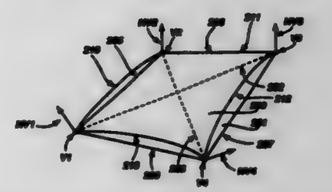
means for outputting at least one status of said model controlled by said fuzzy inference performing means.

5,193,145

METHOD AND APPARATUS FOR PRODUCING A VISUALLY IMPROVED IMAGE IN A COMPUTER SYSTEM

Kurt Akeley, Mountain View, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Continuation of Ser. No. 480,729, Feb. 16, 1990, abandoned. This application Mar. 13, 1992, Ser. No. 851,264
Int. Cl.[5] G06F 15/72
U.S. Cl. 395—123 12 Claims



1. A method for providing a visually improved image on a video display in a computer controlled video display system, wherein said image is generated at least in part from a collec-

tion of triangular primitives, said method including a process for converting a quadrilateral polygon in 3-dimensional space to a pair of triangles, said quadrilateral polygon having a normal unit vector associated with each of the four vertices of said quadrilateral polygon, two of said vertices forming a first pair of opposing vertices and the other two of said vertices forming a second pair of opposing vertices, said process comprising the steps of:

computing a first dot product of the normal unit vectors of said first pair of opposing vertices and computing a second dot product of the normal unit vectors of said second pair of opposing vertices;

determining which pair of opposing vertices will be connected to thereby form two triangles, said step of determining using said first and said second dot products in a predetermined way to determine which pair of opposing vertices will be connected;

connecting the vertices of the pair of opposing vertices which were determined to be connected in said determining step; and

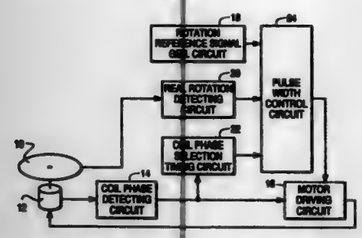
displaying two regions representative of said pair of triangles on said video display.

5,193,146

PULSE WIDTH MODULATION CONTROL SYTEM FOR A MOTOR

Keiichi Kohno, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1990, Ser. No. 570,022
Claims priority, application Japan, Aug. 18, 1989, 1-213467
Int. Cl.[5] H02P *5/17*
U.S. Cl. 388—811 16 Claims



1. A pulse width modulation (PWM) control system for a DC motor having a plurality of stator coils and rotor magnets, and having a position sensor for sensing a rotational position of the rotor, said PWM control system comprising:

(a) stator coil phase detecting means operatively connected to the position sensor for detecting a stator coil phase based on a signal from the position sensor and for providing a detecting signal based on the detected stator coil phase;

(b) rotation reference signal generating means for generating a rotation reference signal;

(c) real rotation detecting means for detecting a real rotation of the rotor and for providing an index signal based on said detection of real rotation;

(d) coil phase selection timing means for determining selection of timing of the stator coil phase based on the detecting signal and for providing a coil phase selecting signal based on said selection of timing and said detecting signal;

(e) pulse width control means for detecting a phase difference between the rotation reference signal and the index signal, and for providing the PWM control signal with the determined pulse width in synchronization with the determination of said coil phase selection timing; and

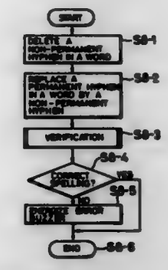
(f) motor driving means for selecting, based on the PWM control signal, at least one of the stator coils based on the detecting signal and for supplying power to the selected coil during the PWM control signal.

5,193,147

DOCUMENT PROCESSING APPARATUS

Takashi Amari, Tokyo, and Hideo Shibaoka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 569,987, Aug. 20, 1990, which is a division of Ser. No. 484,488, Feb. 26, 1990, Pat. No. 4,974,195, which is a continuation of Ser. No. 63,404, Jun. 18, 1987, abandoned. This application Mar. 30, 1992, Ser. No. 860,588
Claims priority, application Japan, Jun. 20, 1986, 61-145623; Jun. 20, 1986, 61-145624
Int. Cl.[5] G06F *9/20, 5/00*
U.S. Cl. 395—145 14 Claims



1. An apparatus comprising:

input means for inputting character data;

memory means for storing the character data input from said input means;

printing means for printing the character data stored in said memory means;

print width memory means for storing a print width defined by left and right margins; and

control means for controlling the feeding of a line of the character data by controlling said printing means to insert and print a hyphen when a word comprising some of the character data stored in said memory means exceeds the print width stored in said print width memory means,

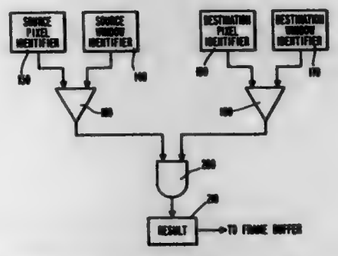
wherein when a former half portion of a word exceeds the print width, said control means discriminates whether a hyphen exists in the former half portion of the word.

5,193,148

METHOD AND APPARATUS FOR PIXEL CLIPPING SOURCE AND DESTINATION WINDOWS IN A GRAPHICS SYSTEM

Byron A. Alcorn, Fort Collins; Robert W. Cherry, Loveland; Mark D. Coleman, and Brian D. Ranchfuss, both of Fort Collins, all of Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 494,992, Mar. 16, 1990, abandoned. This application Dec. 4, 1991, Ser. No. 803,742
Int. Cl.[5] G06F *15/66*
U.S. Cl. 395—157 28 Claims



27. A computer graphics system, comprising:

(a) a frame buffer, having a source area and a destination area, for storing pixel data, said pixel data including a window identifier and a pixel identifier for each pixel, said window identifiers each comprising data indicative of one of a plurality of visible windows associated with said graphics system;

(b) a window cache, coupled to said frame buffer, comprising first and second memory areas;

(c) means for reading a block of pixel data from said source area into said first memory area according to a plurality of source tiles;

(d) means for reading a block of pixel data from said destination area into said second memory area according to a plurality of destination tiles;

(e) means for comparing pixel window identifiers read from the frame buffer with a pixel window identifier previously stored in the memory to determine whether the pixel window identifiers read from the frame buffer match the pixel window identifier previously stored in the memory;

(f) means for discarding each pixel whose corresponding window identifier does not match the previously stored window identifier with which the corresponding window identifier was compared; and

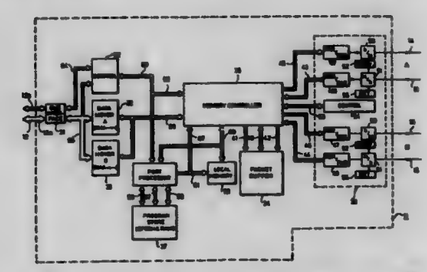
(g) means for updating the frame buffer with the pixel data not discarded.

5,193,149

DUAL-PATH COMPUTER INTERCONNECT SYSTEM WITH FOUR-PORTED PACKET MEMORY CONTROL

Desiré A. Awiszio, Worchester; Satish Soman, Hudson, and Paul H. Clark, Westborough, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 335,048, Apr. 7, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 774,725
Int. Cl.[5] G06F *13/18*
U.S. Cl. 395—200 51 Claims



1. A computer interconnect system having a plurality of nodes, each one of said nodes comprising:

a) a CPU or the like having a system bus;

b) a packet buffer;

c) a data mover means coupling said system bus to said packet buffer by a first path and coupling said packet buffer to said system bus by a second path for transferring packets of data from said system bus to said packet buffer via said first path and including means for simultaneously transferring packets of data from said packet buffer to said system bus via said second path, the data mover accessing said packet buffer on demand;

d) a serial link for transmitting packets to another of said nodes and receiving packets from another of said nodes;

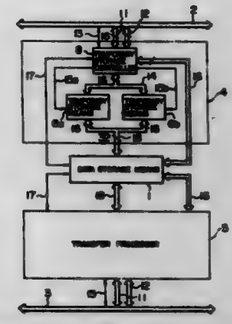
e) and packet buffer read/write control means coupled to said serial link and to said data mover; said read/write control means including means for storing packets received by said serial link into said packet buffer and means for accessing packets from the packet buffer for transmitting on said serial link; said read/write control means including means for controlling access to said packet buffer by said means for storing and means for accessing and said data mover, said means for controlling access including means for interleaving said storing packets and accessing packets for said means for storing and means for accessing with said transferring packets of data mover to grant access to said packet buffer for said means for storing and means for accessing during a transfer of a packet to or from said packet buffer by said data mover means.

5,193,150

DATA TRANSFER METHOD, DATA TRANSFER APPARATUS AND INFORMATION PROCESSING SYSTEM

Ikuo Takeuchi; Kohji Kanejima; Tomoyuki Hamada, all of Ibaraki, and Norihisa Miyake, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 401,861
Claims priority, application Japan, Sep. 5, 1988, 63-221851
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—200 3 Claims



1. An apparatus for transferring data, of a first data length of n bits, where n is an integer, between at least two systems each connected to a communication bus, each of said communication buses including a first data bus having a capacity of a second data length of n/N bits, where N is an integer, wherein data having the first data length is transferred between the at least two systems through said communication buses and data storage means connected between said communication buses, said apparatus comprising:

plural transfer processing means corresponding to said at least two systems, each transfer processing means being connected between said data storage means and one of said communication buses, for temporarily storing data having the first data length transmitted from one of said at least two system through the one communication bus connected thereto when said data is to be transferred from the one system connected to the one communication bus to the other system of said at least two systems connected to another of said communication buses and for temporarily storing data having the first data length received from the data storage means when said data is to be transferred from the other system to the one system, said each transfer processing means comprises:

temporary storage means having a capacity capable of storing at least (N−1) data blocks of data of the first data length having N data blocks, said temporary storage means being connected to said data storage means through a second data bus having a capacity of the first data length, and

temporary storage controlling means connected to said first data bus of the one communication bus and said temporary storage means for controlling transfer of data between the one system and said data storage means wherein, when the data of the first data length is to be transferred from the one system to the other system, at least (N−1) data blocks before a last data block of said

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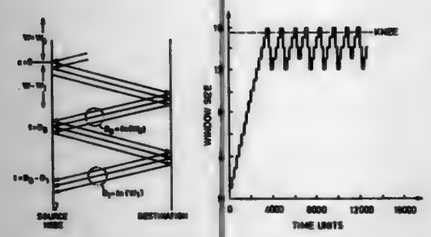
data of the first data length received from the one system through the first data bus of the one communication bus are stored in said temporary storage means, and when said last data block is received, said last data block and said (N−1) data blocks which are read out from said temporary storage means, are together as said data of the first data length transmitted through said second data bus to the data storage means for storage therein, and when said data of the first data length is to be transferred from the other system to the one system, N data blocks stored in the data storage means constituting said data of the first data length are together read out of said data storage means, and then sequentially transmitted one block by one block to the one system through said first data bus, while temporarily storing in said temporary storage means at least (N−1) data blocks of said data, which are to be transmitted succeeding to a first one of the N data blocks.

5,193,151

DELAY-BASED CONGESTION AVOIDANCE IN COMPUTER NETWORKS

Rajendra K. Jain, Sudbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 30, 1989, Ser. No. 400,858
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—200 **27 Claims**



8. A method of operating a computer network, said computer network including a source node and a destination node, wherein said source node includes a processor, comprising the steps of:

a) sending first data from said source node to said destination node by said network at a first loading level and receiving at said source node a first acknowledgement from said destination node of said network, said first acknowledgement confirming receipt of at least part of said first data; and measuring by said processor a first delay between said sending said first data and said receiving said first acknowledgement;

b) measuring by said processor in said source node a second delay between sending second data from said source node to said destination node and receiving at said source node a second acknowledgement from said destination node, said second acknowledgement confirming receipt of at least part said second data, said second data being sent by said source node with a second loading level different from said first loading level;

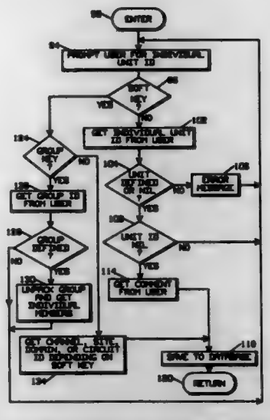
c) automatically changing the loading level by said processor of said source node, in response to a function of the difference in said measured first and second delays, said step of changing including decreasing from said second loading level if said second delay is greater than said first delay and increasing from said second loading level if said second delay is less than said first delay.

5,193,152

NETWORK MANAGEMENT SYSTEM WITH GROUP NAMING

Daniel L. Smith, Sunrise, Fla., assignor to Racal-Datacom, Inc., Sunrise, Fla.

Continuation of Ser. No. 431,416, Nov. 3, 1989, abandoned. This application Apr. 24, 1992, Ser. No. 875,004
Int. Cl.[5] H04L *12/24*
U.S. Cl. 395—200 **3 Claims**



1. In a computer based data communications network management system for managing a plurality of network units disposed in a data communications network, a method for allowing a user to define a plurality of groups of said network units in a computer database stored in a computer for said network management system; each of said groups being defined according to any user defined criteria, said computer being located at a single location, the method comprising in combination the steps of:

each of said network units having a preassigned individual unit identifier;

said computer prompting said user for an external group name for one of said groups;

in response to said user inputing said group external group name, said computer creating an internal group name for said one group to be used in addressing said one group;

said computer repeatedly prompting said user for a member identifier identifying at least one member of said one group; said member identifier, in the case of said member being one of said network units, being said individual unit identifier for said one network unit; said member identifier, in the case of said member being a predefined collective of said network units, being a predefined collective name;

in response to said user inputing said member identifier, said computer adding said individual unit identifier to a list of said network units to be included in said one group, in the case of said member identifier being for one of said network units, and said computer adding to said list a plurality of said individual unit identifiers for said network units of said predefined collective name, in the case of said member identifier being for said predefined collective;

storing said list along with said internal name in said computer database;

in response to said user inputting a group command to said computer specifying said one group as a destination for said group command; said computer converting said group command to a plurality of individual commands, each said individual command specifying one of said network units which are members of said one group as a destination for said each individual command; there being one of said individual commands for each of said members of said one group; and

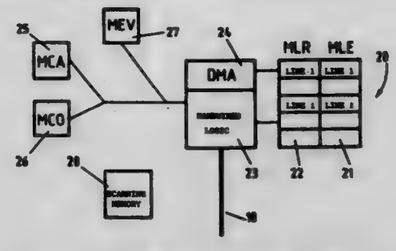
said network management system transmitting each said individual command to one of said network units.

5,193,153

SYSTEM FOR DETECTING OVERWRITING OF DATA IN A BUFFER MEMORY, PARTICULARLY FOR A DATA SWITCH

Michel Soutoul, Sceaux, France, assignor to Alcatel CIT, Paris, France

Filed Dec. 29, 1989, Ser. No. 459,407
Claims priority, application France, Dec. 30, 1988, 88 17503
Int. Cl.[5] G06F *12/16*; G11C *21/00, 29/00*
U.S. Cl. 395—250 **10 Claims**



1. A system for detecting overwriting of data in a buffer memory, said buffer memory being assigned to receive data supplied by a transmission line where said data is to be processed by a data switch, the buffer memory being a rotating FIFO memory accessed, on the one hand, by first means for writing data originating from a reception line, said writing being performed as a function of the rate at which said data is supplied, and said first means being able to overwrite data, and, on the other hand, by second means for reading the data in order to direct said data toward processing means within the switch, said reading being under the control of a sequencing of the processing means,

wherein the system further includes description means for describing the status of data locations in the buffer memory, by providing information indicating an unoccupied location where data has been read, a valid occupied location where data has not yet been read, and a non-valid occupied location indicating a location which has been overwritten,

and wherein said description means cooperates with said first means for writing and said second means for reading the data in the buffer memory, in order to update said information provided by said description means of the status of the data locations in the buffer memory.

5,193,154

BUFFERED PERIPHERAL SYSTEM AND METHOD FOR BACKING UP AND RETRIEVING DATA TO AND FROM BACKUP MEMORY DEVICE

Hiroyuki Kitajima; Akira Yamamoto, both of Yokohama; Takashi Doi, Hadano, and Masafumi Nozawa, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

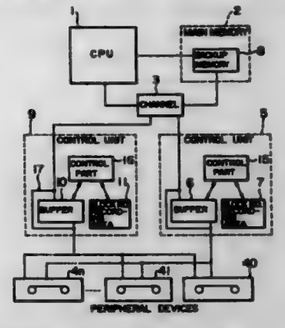
Continuation of Ser. No. 216,604, Jul. 8, 1988, abandoned. This application Oct. 25, 1991, Ser. No. 783,718
Claims priority, application Japan, Jul. 10, 1987, 62-170946
Int. Cl.[5] G06F *13/00, 11/00*; G11C *7/00*
U.S. Cl. 395—250 **5 Claims**

1. A buffered peripheral system which is connected to a central processing unit through a channelling means, comprising:

a peripheral device;

a backup memory means for storing blocks of data written by said central processing unit, which are to be written to said peripheral device in accordance with a command from said central processing unit;

a control unit, connected between said channelling means and said peripheral device, said control unit further comprising a buffer memory means for temporarily storing the block of data which is to be written to said peripheral device a recording means for recording a block number corresponding to a most recently written block of data in



said peripheral device from said buffer memory means, and said control unit comprising a control means for issuing a commabd necessary to write said block of data stored in the buffer memory means to said peripheral device, including the block number associated with the block of data stored in said buffer memory means; and

means for deleting the block of said which has been previously written to said peripheral device from said backup memory means.

5,193,155

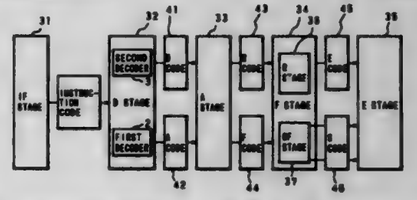
Patent Not Issued For This Number

5,193,156

DATA PROCESSOR WITH PIPELINE WHICH DISABLES EXCEPTION PROCESSING FOR NON-TAKEN BRANCHES

Toyohiko Yoshida, and Masahito Matsuo, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,554
Claims priority, application Japan, Feb. 23, 1988, 63-40026
Int. Cl.[5] G06F *9/38*
U.S. Cl. 395—375 **6 Claims**



1. A data processor having a pipeline processing mechanism for processing instructions, including a conditional branch instruction which is an instruction to branch to a target instruction provided a branch condition is fulfilled, comprising:

an address calculation stage

a first pipeline stage which has means for decoding said conditional branch instruction, a branch prediction mechanism, means for judging whether pre-branching is executed or not corresponding to indication of said branch prediction mechanism, means for detecting an exception generated at pre-branching, and means for outputting a code to the address calculation stage

a second pipeline stage coupled to receive information from said first pipeline stage which has means for judging whether branching is excused or not corresponding to the branch condition of said conditional branch instruction, and activatable means for starting exception processing with respect to said exception, and

means, coupled to said first and second pipeline stages, for transmitting an indication that said exception is detected from said first pipeline stage to said second pipeline stage,

wherein, when said indication is transmitted to said second pipeline stage, and after said pre-branching is executed said second pipeline stage activates said activatable means for starting exception processing when "execution" of said branch instruction causes branching to said target instruction and does not activate said activatable means for starting exception processing when said execution of said branch instruction does not cause branching to said target instruction.

5,193,157

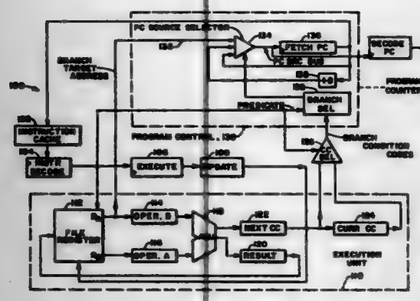
PIPLINED SYSTEM INCLUDES A SELECTOR FOR LOADING CONDITION CODE EITHER FROM FIRST OR SECOND CONDITION CODE REGISTERS TO PROGRAM COUNTER

Russell G. Barbour, Framingham; Carl A. Soeder, Boxborough, both of Mass., and Stephen J. Ciavaglia, Nashua, N.H., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 259,345, Oct. 18, 1988, abandoned. This application Sep. 27, 1991, Ser. No. 769,165

Int. Cl.[5] G06F *9/38*

U.S. Cl. 395—375 **3 Claims**



1. A computer system comprising:

a processor;

a first condition code register having a first port coupled to a first port of said processor;

a second condition code register having a first port coupled to a second port of said first condition code register wherein said first condition code register is capable of holding a first condition code generated as a result of said processor executing a first instruction and wherein upon said processor executing a second instruction said first condition code is automatically transferred from said first condition code register to said second condition code register and a second condition code is automatically transferred to said first condition code register;

a program counter unit having a first port; and

a condition code selector, having a first port coupled to the second port of said first condition code register and a second port coupled to the second port of said second condition code register and a third port coupled to the first port of said program counter unit, for selectively providing a first one of said first and second condition codes to said program counter unit from a first one of said first and second condition code registers.

5,193,158

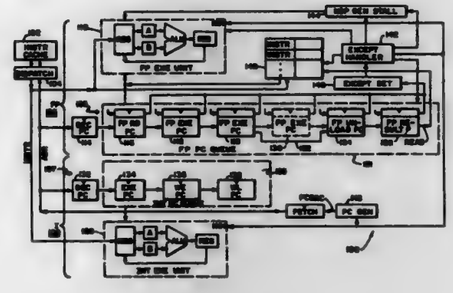
METHOD AND APPARATUS FOR EXCEPTION HANDLING IN PIPELINE PROCESSORS HAVING MISMATCHED INSTRUCTION PIPELINE DEPTHS

Daryl F. Kinney, Hopkinton; Anthony N. Drogaris, Wellesley; Christopher H. Mills, Chelmsford; Michael Kahaiyan, East Bridgewater, and John Manton, Marlboro, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 259,793, Oct. 19, 1988, abandoned. This application Oct. 18, 1991, Ser. No. 780,527

Int. Cl.[5] G06F *9/38, 15/16*

U.S. Cl. 395—375 **11 Claims**



1. Apparatus for executing a plurality of pipelined instructions, comprising:

an instruction source for providing pipelined instructions having variable length execution cycle times and including at least one short instruction and at least one long instruction;

a first pipelined processor, coupled to said instruction source, for executing a first sequence of said pipelined instructions, said first pipelined processor beginning execution of said at least one short instruction after beginning execution of said at least one long instruction, said first pipelined processor including

detection means for detecting an exception caused by an excepted instruction of said first sequence of pipelined instructions being executed, said detection means detecting said exception after said at least one short instruction has completed execution;

first inhibit means, coupled to said detection means and responsive to said detected exception, for inhibiting further execution of said excepted instruction;

identification means, coupled to said detection means and responsive to said detected exception, for identifying at least one pending instruction of said first sequence of pipelined instructions being executed, said at least one pending instruction including said at least one long instruction;

second inhibit means, responsive to the identification means, for inhibiting further execution of said at least one pending instruction;

exception handler means , coupled to said detection means and responsive to said detected exception, for saving states of said first pipelined processor, for serving said exception and for restoring the saved states of said first pipelined processor; and

re-execution means, coupled to said first and second inhibit means, and responsive to said exception handler means and said identification means, for causing said first pipelined processor to re-execute said excepted instruction and said at least one pending instruction in an order corresponding to said first sequence of pipelined instructions, said re-execution means precluding re-execution of said completed at least one short instruction, wherein said first pipelined processor re-executes only said excepted instruction and said at least one pending instruction.

5,193,159

MICROPROCESSOR SYSTEM

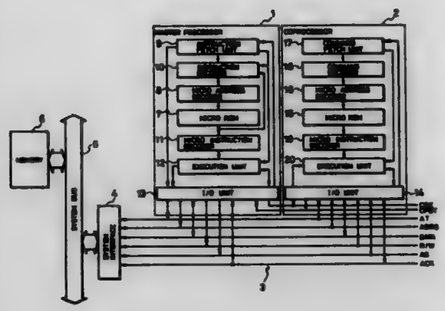
Kouzi Hashimoto, Mitaka; Atsushi Hasegawa, Koganei; Ikuya Kawasaki, Kodaira, and Kazuhiko Iwasaki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Microcomputer Engineering, Ltd., Kodaira, both of Japan

Continuation of Ser. No. 100,757, Sep. 24, 1987, abandoned. This application Jan. 3, 1991, Ser. No. 709,783

Claims priority, application Japan, Sep. 24, 1986, 61-223587

Int. Cl.[5] G06F *15/16*

U.S. Cl. 395—375 **35 Claims**



1. A microprocessor system comprising:

a bus;

a coprocessor coupled to said bus; and

a master processor coupled to said bus for executing a bus access cycle for said coprocessor; and

an external device coupled to said bus,

said coprocessor including first judge means for judging a completion of a sequence of data transfer operations effected between an internal section of said coprocessor and said external device with respect thereto; and

said master processor including second judge means for judging a completion of said sequence of data transfer operations independently of said first judge means, wherein said second judge means effects said judging of the completion of said sequence of data transfer operations, in said second judging means, based on a count of said data transfer operations, wherein said first judge means and said second judge means each are find first set bit circuits respectively disposed in said coprocessor and said master processor,

each said find first set bit circuit including means for effecting for each data transfer operation a code inversion on a predetermined code bit included in a plurality of bit sets of data transferred in said each data transfer operation, which bit sets are applied to each said find first set bit circuit so as to update said data of said plurality of bit sets, and means for effecting a judgement of a completion of operations for said each data transfer operation based on a condition that said updated data transferred in said each data transfer operation does not include said predetermined code bit.

5,193,160

ADDRESS TRANSLATION SYSTEM WITH REGISTER STORING SECTION AND AREA NUMBERS

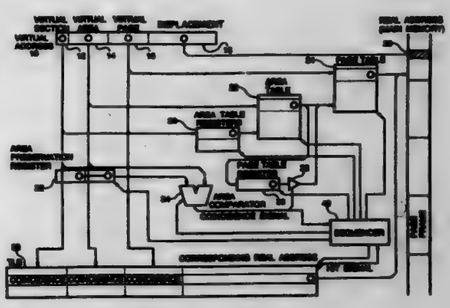
Masashi Tsubota, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 5, 1990, Ser. No. 474,261

Claims priority, application Japan, Feb. 3, 1989, 1-24859

Int. Cl.[5] G06F *12/08, 12/10*

U.S. Cl. 395—400 **3 Claims**



1. An address translation system for converting a virtual address including a virtual section number, a virtual area number and a virtual page number into a real address, said address translation system comprising:

a plurality of stages of tables, each including at least one area table and at least one page table;

a translation look-aside buffer having a plurality of entries each storing a virtual section number, a virtual area number and a virtual page number;

an area preservation register for preserving a virtual section number and a virtual area number of a given virtual address when a new entry is registered into the translation look-aside buffer;

a table register for preserving an output of an area table selected when said new entry is registered into said translation look-aside buffer; and

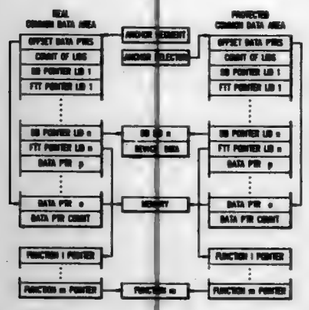
an area comparator for comparing a content of said area preservation register with a virtual section number and a virtual area number of a given virtual address,

wherein, when the translation look-aside buffer is retrieved on the basis of the given virtual address, and an entry having the same virtual section number, virtual area number and virtual page number as those of the given virtual address is not found, the area comparator is used for comparing the content of the area preservation register with the virtual selection number and the virtual area number of the given virtual address, and if coincidence is detected by the comparator, an address translation is performed by accessing a page table on the basis of the page table information preserved in the page table register, without accessing the area table.

5,193,161
COMPUTER SYSTEM HAVING MODE INDEPENDENT ADDRESSING

Richard Bealkowski, Delray Beach; Richard A. Dayan; David J. Doria; Scott G. Kinnear; Jeffrey I. Krantz, all of Boca Raton, Fla.; Robert B. Liverman, Raleigh, N.C.; Guy G. Sotomayor, West Palm Beach, Fla.; Donald D. Williams, and Gary A. Vaiskunckas, both of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 30,789, Mar. 27, 1987, Pat. No. 4,928,237. This application May 18, 1990, Ser. No. 525,792
The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.
Int. Cl.[5] G06F *12/00, 9/445*
U.S. Cl. 395—400 18 Claims



1. An addressing arrangement for a computer system that includes an addressable memory having addresses within a predefined addressing range and a system processor capable of addressing said memory in two distinctly different addressing modes, including a first mode in which said system processor is capable of addressing only a discrete sub-portion of said predefined addressing range and a second mode in which said processor is capable of addressing all of said predefined addressing range, said addressing arrangement comprising:

means for assigning selected first and second storage spaces in said memory as respective first and second common data areas for storing pointers to be used by said system processor in association with said first and second modes, respectively;

means for assembling a plurality of pointers in said common data areas, each of said pointers in said first common data area having an equivalent pointer in said second common data area, each said equivalent pointer, when accessed by said system processor in said second mode, effectively pointing said processor to an address within said sub-portion of said addressing range which is the same as the address to which the processor would be pointed if it had accessed the respective equivalent pointer in said first common data area in the first mode; and

means for locating said first and second common data areas comprising:

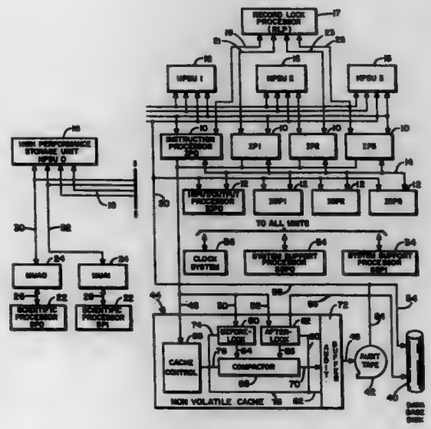
a first anchor pointer pointing to said first common data area such that when the system processor is in the first operating mode said processor forms addresses by first accessing the first common data area to retrieve a pointer that points to a predefined address in said sub-portion of said addressing range; and

a second anchor pointer pointing to said second common data area such that when the system processor is in the second operating mode, the system processor addresses the second common data area to gain access to a pointer which, if equivalent to a pointer in said first common data area, effectively points to the same predefined address in said sub-portion of said addressing range as the equivalent pointer in said first common data area; whereby in response to a memory access request in either operating mode of the system processor, said assigning means steers the system processor to address the same location in memory without the system processor switching modes.

5,193,162
CACHE MEMORY WITH DATA COMPACTION FOR USE IN THE AUDIT TRAIL OF A DATA PROCESSING SYSTEM HAVING RECORD LOCKING CAPABILITIES

Donald T. Bordsen, St. Paul; Thomas P. Cooper, New Brighton; Robert F. Eason; Michael J. Hill, both of Vadnais Heights; John R. Jordan, St. Paul; Joseph E. Kessler, St. Anthony; Dennis R. Konrad, Welch; Ralph E. Sipple, Shoreview; Robert E. Swenson, Mendota Heights; James F. Torgerson, Anoka, and Anthony P. vonArx, New Brighton, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 6, 1989, Ser. No. 432,421
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—425 1 Claim



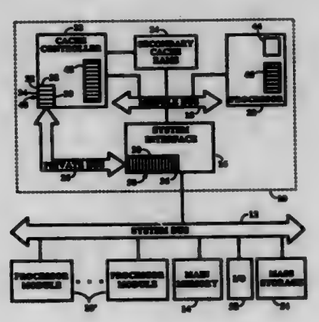
1. In a data processing system comprising a plurality of processing means each of which comprises a processing storage means, and each of which may request an object be locked and thus become a requesting processing means, object locking and unlocking means coupled to said processing means for first locking and then unlocking selected ones of data base objects for processing purposes, as requested by said requesting processing means, data base storage means coupled to said object locking means and said processing means for storage of said data base objects which has a first access time, read means for supplying a before-look image of a locked object to the processing storage means of said requesting processing means, write means for supplying information regarding said before-look image of said locked object in said processing storage means to said processing means for creating an after-look image in the processing storage means of said requesting processing means, non-volatile audit trail storage means which has a second access time for storing audit information for recreating the locked object after a systems malfunctioned data base update means for updating said locked object prior to the unlocking of said locked object by said object locking and unlocking means,

an improvement comprising non-volatile audit trail cache memory means coupled to said plurality of processing means, said non-volatile audit trail storage means and said data base storage means that has access times that are considerably less than said first and second access times wherein said non-volatile audit trail cache memory means functions as said data base update means and comprises before-look image storage means for receiving and storing a before-look image of a locked object of any said requesting processing means that has a lock on said locked object, after-look image receiving means for receiving and storing said after-look image of said locked object of said requesting processing means, data compaction means for comparing said before-look and said after-look images of said locked object of said requesting processing means and for providing a difference image of said locked object of said requesting processing means that is representative of the image difference between said before-look and said after-look images of said locked object of said requesting processing means, and coupling means for coupling said difference image of said locked object of said requesting processing means to said nonvolatile audit trail storage means.

5,193,163
TWO-LEVEL PROTOCOL FOR MULTI-COMPONENT BUS OWNERSHIP, AND IMPLEMENTATION IN A MULTI-PROCESSOR CACHE WRITE BACK PROTOCOL

Douglas E. Sanders, Framingham, and Michael A. Callander, Hudson, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 1, 1990, Ser. No. 591,197
Int. Cl.[5] G06F *12/00, 13/00*
U.S. Cl. 395—425 15 Claims



1. Apparatus comprising:

a cache memory;

a module bus coupled to said cache memory

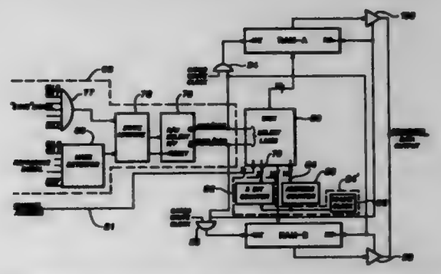
recording means, coupled to said module bus, for recording a main memory address of entries in said cache memory;

monitoring means coupled to said module bus for monitoring transactions on a system bus that require an issuance of an invalidate request;

issuing means, coupled to said module bus including at least a main memory address;

determining means for determining if said main memory address of said invalidate request corresponds to a main memory address in said recording means; and

storing means for storing said invalidate requests, said storing means having a first portion disposed in said issuing means and a second portion disposed in said determining means.



g. means, responsive to said signaling means, for writing into said first random access memory the temporarily stored channel byte at a random memory address corresponding to the channel address segment and the byte address segment of a byte written into said first random access memory;

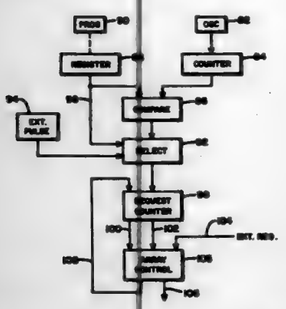
h. a second, byte oriented addressable random access memory having stored channel bytes therein from the block of bits preceding the block of bits from which the byte just written into said first random access memory belongs;

i. means for reading out previously written channel bytes from said second random access memory to thereby provided deskewed data;

j. means for bank switching said first random access memory and said second random access memory whereby a write function of said first random access memory and a read function of said second random access memory are interchanged; and

k. means for merging the bytes read from said first and said second random access memories, to provided deskewed blocks of digital data corresponding to a multiplicity of blocks of skewed data.

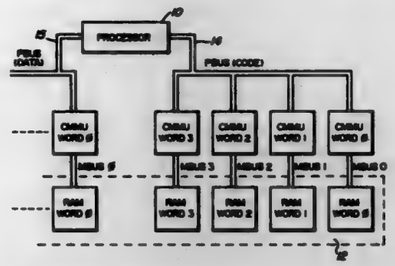
5,193,165
MEMORY CARD REFRESH BUFFER
Richard G. Elkill, and Charles P. Geer, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 13, 1989, Ser. No. 450,139
Int. Cl.[5] G06F *13/00*; G11C *13/00*
U.S. Cl. 395—425 **14 Claims**



1. An information processing network including:
a processing device configuration including a plurality of processing devices for manipulating bit-encoded data; a memory including a plurality of memory cards having data arrays for storing bit-encoded data, with the data arrays being dynamic and requiring periodic refresh cycles; an interface connected to and shared by the processing devices and the memory cards, for transmitting bit-encoded data between the processing configuration and the memory; and a timing signal means, independent of the processing devices and the memory cards, for generating timing pulses at a constant timing frequency;
a refresh request means in each of the memory cards for receiving the timing pulses and for generating, responsive to the timing pulses, periodic refresh request pulses at a request frequency proportional to the timing frequency according to a selected value determining the number of timing pulses required to generate each refresh request pulse, each of said refresh request means including means for controllably adjusting the selected value to change the proportion of refresh request pulses to timing pulses; and
wherein each of the memory cards further includes a buffering and control means for accumulating the refresh request pulses and delaying the generation of refresh pulses while the associated memory card is receiving and responding to an external access request and further, upon accumulating refresh request pulses equal to a predetermined threshold, inhibiting the associated memory card from responding to external access requests while providing at least one refresh pulse to the data arrays of the associated memory card, without gaining access to the interface and without inhibiting or otherwise interfering with operations of any of the processing devices.

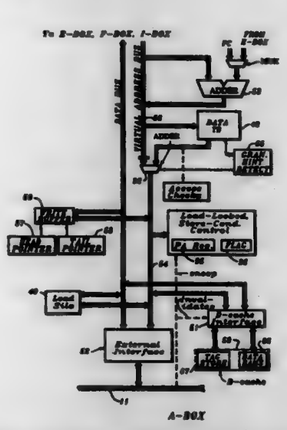
5,193,166
CACHE-MEMORY ARCHITECTURE COMPRISING A SINGLE ADDRESS TAG FOR EACH CACHE MEMORY
Victor J. Menasce, Nepean, Canada, assignor to Bell-Northern Research Ltd., Ontario, Canada
Continuation of Ser. No. 406,088, Aug. 29, 1989, abandoned. This application Apr. 20, 1992, Ser. No. 871,578
Claims priority, application Canada, Apr. 21, 1989, 597419
Int. Cl.[5] G06F *12/02, 9/34, 13/00*; G11C *8/00*
U.S. Cl. 395—425 **3 Claims**

1. A cache-memory system comprising:
a central processing unit (CPU);
a plurality of cache-memory management units (CMMUs), each of said CMMUs having a single cache address tag for addressing one associated cache;
a processor bus for providing communication between said CPU and said CMMUs;
a plurality of main-memory storage units; and
a plurality of buses for providing communication between



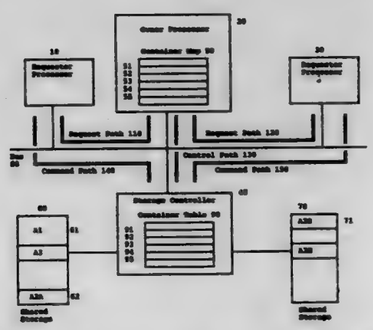
said CMMUs and said main-memory storage units, each of said memory buses being associated with only one of said CMMUs and with only one of said main-memory storage units, such that each word stored in one of said CMMUs is associated with only one word stored in one of said main-memory storage units, thereby increasing memory bandwidth while decreasing average memory latency.

5,193,167
ENSURING DATA INTEGRITY BY LOCKED-LOAD AND CONDITIONAL-STORE OPERATIONS IN A MULTIPROCESSOR SYSTEM
Richard L. Sites, Boylston, and Richard T. Witek, Littleton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 29, 1990, Ser. No. 547,618
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—425 **24 Claims**



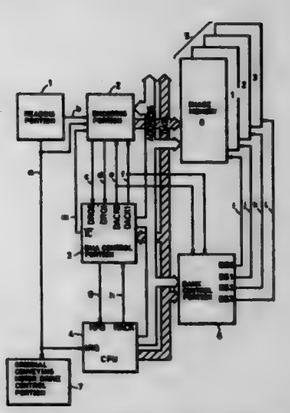
1. A method of performing an atomic byte write in an operation of a processor, said atomic byte write being performed in a memory by way of a system bus external to said processor, said system bus connecting said processor to said memory, comprising the steps of:
loading a content of a selected aligned multibyte external memory location from said memory to internal register means in said processor, said content including a non-aligned byte location to be written, and thereafter detecting on said system bus any other store to said selected aligned-multibyte external memory location;
providing in said processor an indication if any other store is made to said selected aligned-multibyte external memory location;
replacing in said internal register means a value in said non-aligned byte location with a new value to be written, while leaving remainder of said content intact; and thereafter
conditionally storing by said processor said content of said internal register means to said selected aligned multibyte external memory location, depending upon whether said indication is present.

5,193,168
MULTIPROCESSING SYSTEM WITH ENHANCED SHARED STORAGE
Michael J. Corrigan, Rochester; Harris L. Freeman, Kasson, and George G. Gorbatenko, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 265,114, Oct. 31, 1988, abandoned. This application Sep. 4, 1991, Ser. No. 754,339
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—425 **14 Claims**



1. A multiprocessor computer system having the ability to operate efficiently while sharing storage space in a direct access storage device, comprising:
a shared storage for storing data, comprising at least one direct access storage device, wherein said shared storage comprises a plurality of containers of data;
a communication bus for communicating between devices connected thereto;
a first storage controller connected to said shared storage and said communications bus, said storage controller further comprising a first container table, said first container table having a plurality of container table entries, wherein each said container table entry is associated with a unique container and each said entry containers a unique key for accessing said container;
an owner process connected to said communication bus, said owner processor further comprising a container map, said container map having a plurality of container map entries, wherein each said container map entry is associated with a unique container and each said entry contains a key associated with said container, wherein each said key in said container map entry associated with a respective unique container matches said unique key contained in a container table entry in said first container table associated with said respective unique container;
a first and second requestor processor connected to said communications bus, each said requestor processor comprising means for requesting a key associated with a container from said owner processor;
means in said owner processor for providing said key associated with a container from said container map in response to a request for said key from a requestor processor;
means in each said requestor processor for generating a plurality of requests for data contained in a container to said first storage controller, each said request for data contained in a container including said key associated with said container, said plurality of requests for data originating from a single request for said key associated with said container;
means in said first storage controller, responsive to a request from a requestor processor for data contained in a container, for accessing a container table entry associated with said container in said first container table;
means in said first storage controller for honoring said request if said requestor processor provides the key associated with said container, said key matching the key contained in said container table entry; and
means in said first storage controller for inhibiting said requestor processor from accessing said container of data if said requestor processor does not provide said key.

5,193,169
IMAGE DATA PROCESSING APPARATUS
Yuji Ishikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 25, 1989, Ser. No. 342,910
Claims priority, application Japan, Apr. 28, 1988, 63-106804
Int. Cl.[5] G06F *13/28*
U.S. Cl. 395—425 **13 Claims**



1. An image data processing apparatus, comprising:
entering means for entering image data;
storage means for storing the image data which has been entered by said entering means; and
transfer means, having a plurality of DMA channels each of which has a corresponding designation for designating a storage position in said storage means where image data is to be stored, said transfer means performing a DMA transfer of the image data entered by said entering means to said storage means using any one of the plurality of DMA channels,
wherein said transfer means comprises selection means for selecting one of the plurality of DMA channels to be used for the DMA transfer, and
wherein, whenever a predetermined number of the DMA transfers are terminated using one DMA channel according to the designation by the designation means corresponding to the one DMA channel, said selection means selects another DMA channel for the next DMA transfer which is to be performed according to the designation by

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the designation means corresponding to the another DMA channel, and

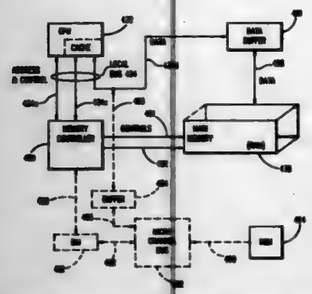
wherein while the DMA transfer is performed using one DMA channel, the storage position of the image data required for the next DMA transfer using the another DMA channel is set in the designation means corresponding to the another DMA channel.

5,193,170

METHODS AND APPARATUS FOR MAINTAINING CACHE INTEGRITY WHENEVER A CPU WRITE TO ROM OPERATION IS PERFORMED WITH ROM MAPPED TO RAM

Son H. Lam, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1990, Ser. No. 604,837
Int. Cl.[5] G06F *12/00, 13/00*
U.S. Cl. 395—425 18 Claims



6. A method for operating a memory controller to maintain cache integrity in a computer system that includes a central processing unit (CPU), cache memory associated with said CPU, Random Access Memory (RAM), Read Only Memory (ROM), and a local bus for interconnecting said memory controller and said CPU, wherein said computer system is capable of supporting a cacheable ROM mapped to RAM mode of operation, comprising the steps of:

(a) monitoring said local bus to determine if a memory write cycle has been initiated by said CPU;

(b) determining if ROM space address is on said local bus;

(c) determining if the cacheable ROM mapped to RAM mode of operating said computer system is enabled; and

(d) providing a cache entry invalidation signal to said CPU whenever said memory controller determines that a memory write cycle has been initiated with an address on said local bus being in ROM address space while said cacheable ROM mapped to RAM mode of operating said computer system is enabled.

5,193,171

METHOD OF MANAGING SPACE OF PERIPHERAL STORAGES AND APPARATUS FOR THE SAME

Yoshiaki Shimazaki, Chigasaki, and Kazuo Imai, Higashikurume, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

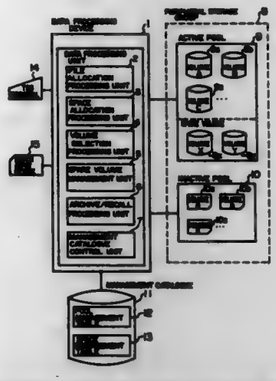
Filed Dec. 10, 1990, Ser. No. 625,046
Claims priority, application Japan, Dec. 11, 1989, 1-320933
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—425 18 Claims

1. A method of managing space in a peripheral storage in a data processing system having a data processing device connected to said peripheral storage, said peripheral storage consisting of both an active pool having a plurality of storage volumes to which files are allocated and an inactive pool having another plurality of storage volumes to which files are migrated from said active pool, comprising the steps of:

issuing a space allocation request for a file in response to a command from a user;

determining in response to the space allocation request whether or not the size of a requested space to be allocated to said file exceeds a total usable space size which amounts to a sum of a the size of free space available in the active pool and the size of free space available in the inactive pool;

checking whether or not the size of the free space available in the active pool is enough to fulfill the request for space when a negative decision results in said determining step;



selecting volumes from the active pool to allocate to the requested space when a positive decision results in said checking step; and

effecting a migration of a file in the active pool to move the migration file from the active pool to the inactive pool to produce a space in the active pool when the negative decision results in said checking step and then performing said selecting step again if the free space produced by the migration provides enough free space in the active pool to fulfill the request for space.

5,193,172

MEMORY MANAGEMENT SYSTEM FOR DISPATCHING ONLY TO A SELECTED HIGH-USE-PRIORITY TASK A MAXIMUM ALLOCATED AND GIVEN HIGHEST-USE-PRIORITY REAL-PAGES WHEN REQUESTED

Toshiaki Arai, Sagamihara; Yoshitaka Ohfuse, Yokohama; Hirokami Nagasuka, Kawasaki, and Yasufumi Yoshizawa, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

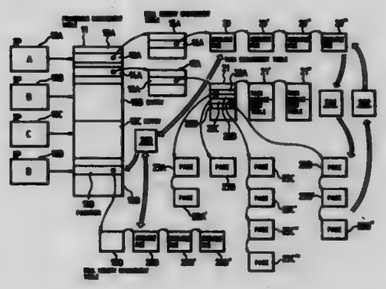
Filed Jan. 22, 1990, Ser. No. 468,355
Claims priority, application Japan, Jan. 23, 1989, 1-11932
Int. Cl.[5] G06F *12/06, 12/08*
U.S. Cl. 395—425 12 Claims

1. In an information processing system for managing a virtual memory by using a multiprocessor system having a plurality of processors sharing a real memory, a real memory management method comprising the steps of:

assigning to a first processor a highest use priority, said highest use priority being given to any real page of said real memory to be used for said first processor;

allocating said real page of highest use priority to said first processor, when a real page allocation request occurs in a processor of said plurality of processors;

measuring a number of real pages allocated to a group of pages in a task for each of said processors; and



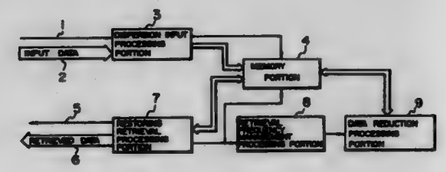
dispatching to said first processor a maximum number of real pages allocated to said group of pages in said task on a highest use priority basis when said task is dispatched.

5,193,173

METHOD AND DEVICE FOR STORING DATA SUBJECTED TO DISPERSION PROCESSING

Yoichi Seto, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 30, 1989, Ser. No. 428,878
Claims priority, application Japan, Nov. 2, 1988, 63-278408
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—425 24 Claims



1. A data memory means for processing input data with a dispersion process and for storing said data, comprising:

(a) first memory means for storing one or a plurality of dispersion functions and inverse functions of said dispersion functions;

(b) means for reading out one of said dispersion functions;

(c) dispersion processing means for executing a first convolution operation on the input data with the one dispersion function to obtain dispersed data;

(d) second memory means for storing the dispersed data obtained as a result of said first convolution operation;

(e) means for retrieving said dispersed data stored in said second memory means;

(f) means for reading out an inverse function of said dispersion function used in forming said dispersed data thus retrieved; and

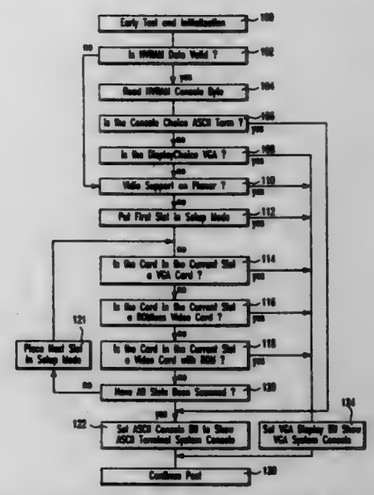
(g) restoring retrieval means for executing a second convolution operation on said dispersed at a with said inverse function thus read out and for restoring said input data from said dispersed data.

5,193,174

SYSTEM FOR AUTOMATICALLY REDIRECTING INFORMATION TO ALTERNATE SYSTEM CONSOLE IN RESPONSE TO THE COMPARISON OF PRESENT AND DEFAULT SYSTEM CONFIGURATION IN PERSONAL COMPUTER SYSTEM

Richard Benkowski, Delray Beach; Gerald Howard, Pompano Beach; Bharat Khatri, Boca Raton; George Mathew, West Palm Beach; Matthew T. Mittelstadt, Delray Beach; Lynda M. Salvetti, Boca Raton; Richard A. Sudanese, Boca Raton, and Carolyn J. Zemanek, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1990, Ser. No. 557,035
Int. Cl.[5] G06F *7/02, 11/00*
U.S. Cl. 395—500 2 Claims



1. A personal computer system having a high speed system processor compatible with application programs and operating system software, said personal computer system normally configured to operate with PC keyboard and a display, said personal computer system comprising:

a high speed system processor coupled to a high speed data bus;

a first non-volatile memory electrically coupled to a slower speed data bus, said first non-volatile memory storing present system configuration data representative of a present configuration of the personal computer system;

a second non-volatile memory electrically coupled to said slower speed data bus, said second non-volatile memory storing predetermined system configuration data, said predetermined system configuration data being representative of a default system configuration having the PC keyboard and display;

a bus controller for providing communications between the high speed data bus and the slower speed data bus;

diagnostic means coupled to said slower speed data bus for comparing the present system configuration data to the predetermined system configuration data to determine whether the present system configuration corresponds to the default system configuration and generating a signal indicating the comparison result;

means coupled to said slower speed data bus for redirecting information to an alternate remote system console in response to said signal indicating that the present system configuration does not correspond to the default system configuration.

d) an input terminal coupled by a two way control line to

tems of said software system while said software is run-

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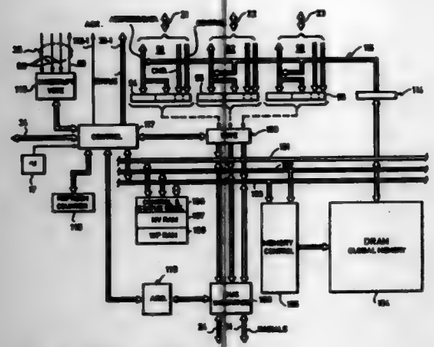
5,193,175
FAULT-TOLERANT COMPUTER WITH THREE INDEPENDENTLY CLOCKED PROCESSORS ASYNCHRONOUSLY EXECUTING IDENTICAL CODE THAT ARE SYNCHRONIZED UPON EACH VOTED ACCESS TO TWO MEMORY MODULES

Richard W. Cutts, Jr., Georgetown; Peter C. Norwood, Austin; Kenneth C. DeBacker, Austin; Nikhil A. Mehta, Austin; Douglas E. Jewett, Austin; John D. Allison, Austin, all of Tex., and Robert W. Horst, Champaign, Ill., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 282,628, Dec. 9, 1988, abandoned. This application Mar. 6, 1991, Ser. No. 666,495
Int. Cl.[5] G06F *11/16, 11/18, 11/28*
U.S. Cl. 395—575 26 Claims



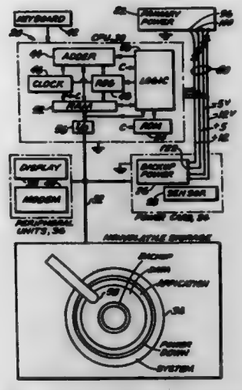
16. A computer system comprising:
first, second and third CPUs executing a same given instruction stream, each of said CPUs having an address range, each of said CPUs having a separate memory access port;
first and second memory means having identical address spaces within said address range of said CPUs for storing duplicative data at identical address spaces therein, each one of said first and second memory means having first, second and third input/output ports coupled to said memory access ports of said first, second and third CPUs, respectively; and
voting means coupled to each one of said first, second and third ports to compare information appearing at the ports upon asynchronous access occurring after asynchronous execution of plural consecutive instructions by said CPUs and to allow such asynchronous accesses to be completed only in response to the same information appearing at at least two of the ports.

5,193,176
COMPUTER WORK SAVING DURING POWER INTERRUPTION

Christopher L. Brandin, Sedalia, Colo., assignor to Powercard Supply C.A., Caracas, Venezuela

Filed Oct. 17, 1990, Ser. No. 599,098
Int. Cl.[5] G06F *11/00, 11/30*
U.S. Cl. 395—575 26 Claims

1. A method of saving work in a computer during an interruption of primary power to the computer, the computer having a central processing unit (CPU) and a memory operatively coupled to the CPU, the memory including an active storage medium and a nonvolatile storage medium, the CPU being operative to produce data under control of a system program and an application program, said active and said nonvolatile storage media being suitable for storing portions of said system program and said application program and said data;
the method comprising the steps of:
loading up a power-down procedure into the computer upon booting-up of a computer operating system;
designating a backup region in said nonvolatile storage medium for receipt of data during power-down;
providing a computer work saving system including a backup power source, a sensor, an auxiliary memory and a controller interconnected between said auxiliary memory and said sensor;
connecting said saving system to the CPU of the computer; and
upon an occurrence of the interruption of primary power to the computer, sensed by the sensor, performing the following steps:
storing a powerdown signal indicative of interruption of primary power to the computer in said auxiliary memory;
activating the backup power source in response to said signal;



running the computer on backup power of said backup power source;
terminating a further running of said application program at a program stage in effect at the power-interruption;
transferring data, said application program, and contents of all operating memory at said program stage from said active storage medium to said backup region in said nonvolatile storage medium; and
disconnecting the backup power from the computer, and
wherein, upon resumption of primary power and in response to a manually generated signal to resume operation of the computer, the method comprises further steps of:
reading the power-down signal;
returning the data and portions of the application program at said program stage from said backup region to said active storage medium; and
resuming a running of the application program from said program stage.

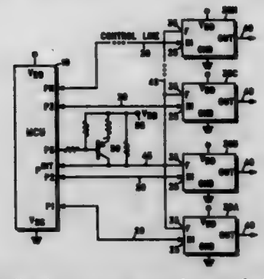
5,193,177
FAULT INDICATING MICROCOMPUTER INTERFACE UNITS

Michel Burri, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 435,124, Nov. 13, 1989, abandoned. This application Jul. 31, 1992, Ser. No. 921,426
Claims priority, application United Kingdom, Nov. 26, 1988, 8827663
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—575 8 Claims

1. A microcomputer interface arrangement comprising:
a microcomputer unit having a plurality of input/output (I/O) terminals and an interrupt indicating input terminal;
a plurality of interface units each comprising:

i) an input terminal coupled by a two way control line to a respective I/O terminal of the microcomputer unit;
ii) a latch having an input coupled to the input terminal and an output;
iii) an output terminal and a fault indicating terminal, the fault indicating terminals of the plurality of interface units being coupled together and to the interrupt indicating terminal of the microcomputer;
iv) output means coupled between the output of the latch and output terminals for setting a state of the output terminal in response to a data value held in the latch;

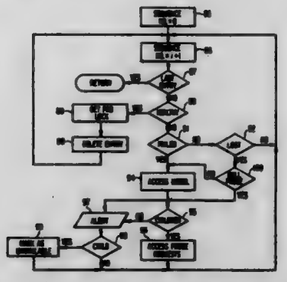


v) fault indicating means responsive to a fault condition at the output terminal for providing a fault indicating signal at the fault indicating terminal to interrupt the microcomputer unit;
vi) an inverter having an input coupled to the output of the latch and an output; and
vii) means responsive to the fault indicating signal for coupling the output of the inverter to the input terminal to invert a state thereof without affecting a state of the latch whereby the interface unit having a fault condition may be identified.

5,193,178
SELF-TESTING PROBE SYSTEM TO REVEAL SOFTWARE ERRORS

Ram Chillarege, Peekskill, and Philip L. Rosenfeld, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1990, Ser. No. 606,644
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—575 14 Claims

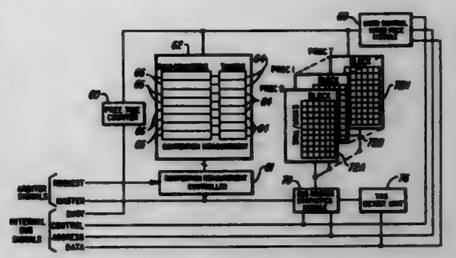


1. A method of detecting failed software components in a running software system, said method being performed by a probe mechanism installed on a computer system on which said software system is running, said method comprising the steps of:
requesting by said probe mechanism service, a certain level of service, or a change in the level of service from a target selected from a set of functions, modules and/or subsystems of said software system while said software is running on said computer system; and
check by said probe mechanism for a response to the request from said running software system within a predetermined period of time to determine if said target is healthy or failed.

5,193,179
ACTIVITY MONITOR SYSTEM NON-OBTRUSIVE STATISTICAL MONITORING OF OPERATIONS ON A SHARED BUS OF A MULTIPROCESSOR SYSTEM

Maria Laprade, Palm Bay, Fla., and Thomas L. Sterling, Crofton, Md., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 243,526, Aug. 9, 1988, abandoned. This application Mar. 5, 1991, Ser. No. 664,508
Int. Cl.[5] G06F *11/34*
U.S. Cl. 395—575 7 Claims



1. An activity monitor for monitoring activity in a multiprocessor system having a plurality of processor interconnected via an internal bus and a plurality of memory blocks with which the processors communicate for storing and retrieving data during read, write, and test-and-set operations, wherein at any time only one processor can operate on the internal bus, said activity monitor comprising:
a plurality of memory units wherein each one of said plurality of memory units includes a plurality of storage locations;
first means for determining the processor that is operating on the internal bus;
second means for determining the current function being performed by the processor operating on the internal bus;
third means for determining the current memory block being utilized by the current processor in performing the current function;
wherein each one of said plurality of memory units is associated with one of the plurality of processors, and wherein within each one of said plurality of memory units a group of said plurality of storage locations is associated with one memory block, and further wherein each storage location within said group is associated with one of the functions, such that each processor is associated with a memory unit and each storage location within each memory unit is associated with a function and memory block pair;
means responsive to said first, said second and said third means for storing information relative to the current processor, the current memory block, and the current function in said unique storage location associated with the current function, the current memory block and the current processor.

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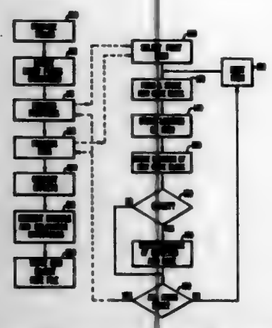
5,193,180

SYSTEM FOR MODIFYING RELOCATABLE OBJECT CODE FILES TO MONITOR ACCESSES TO DYNAMICALLY ALLOCATED MEMORY

Reed Hastings, La Honda, Calif., assignor to Pure Software Inc., Sunnyvale, Calif.

Filed Jun. 21, 1991, Ser. No. 718,573
Int. Cl.[5] G06F *11/34*
U.S. Cl. 395—575 11 Claims



7. A computer implemented method for equipping a computer program with the ability to monitor most of its own memory accesses, wherein memory access types include read and write, said method comprising the steps of:

performing the following computer implemented steps for substantially all relocatable object files for said program, said relocatable object files containing instruction items of preexisting object code, wherein instruction items include instructions and data, said instruction items having locations within said preexisting object code:

a) providing in a computer storage medium a new object code table for storing instruction items;

b) storing into said new object code table, for each preexisting instruction item in said preexisting object code, a new code block including said preexisting instruction item, said storing step comprising

i) adding memory read monitoring code to said new code block, for preexisting read instruction items, for which performance involves a memory access of a read type; and

ii) adding memory write monitoring code to said new code block, for preexisting write instruction items, for which performance involves a memory access of a write type;

c) updating offsets in said new object code table;

d) creating in a computer storage medium a new relocatable object film comprising instruction items from said new object code file.

5,193,181

RECOVERY METHOD AND APPARATUS FOR A PIPELINED PROCESSING UNIT OF A MULTIPROCESSOR SYSTEM

George J. Barlow, Tewksbury, Mass.; James W. Keeley, Nashua, N.H.; Richard A. Lemay, Carlisle, Mass.; Jian-Kuo Shen, Belmont, Mass.; Robert V. Ledoux, deceased, late of Litchfield, N.H. by Frances A. Ledoux, executrix; Thomas F. Joyce, Westford, Mass.; Richard P. Kelly, Nashua, N.H.; Robert C. Miller, Braintree, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

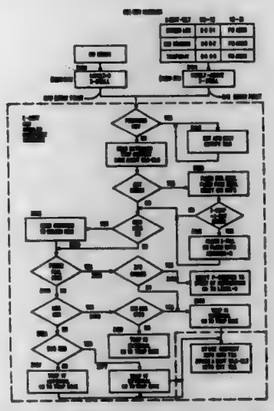
Filed Oct. 5, 1990, Ser. No. 593,458
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—575 18 Claims

1. A method for determining whether or not any one of a plurality of pipelined processing units which connect to a common system bus of a multiprocessor system running under a single operating system and each of which include a plurality of pipeline stages, is sufficiently trustworthy to recover from an error situation signaled through a trap operation, each pipelined processing units being constructed from a plurality of boards each of which define an optimum replaceable unit (ORU), said method comprising the steps of:

(a) including within each different ORU, an unusual event detector (UV) for determining when any of the stages contained on said ORU is not behaving properly;

(b) storing an indication of an unusual event having been detected by said UEV detector;

(c) collecting indications of said unusual events from each of said ORU's by one of said ORU's which provides an interface to said system bus;



(d) said one of said ORU's in response to a signal indicating the occurrence of an unusual event inhibiting any further transfer of requests by said processing unit to said system bus;

(e) broadcasting a signal to each of the remaining ORU's for causing the stages of said pipelined processing unit to emulate completion of all outstanding instructions contained within said plurality of pipeline stages for flushing said pipelined stages; and,

(f) upon such completion, transferring control to one of the ORUs containing a firmware handler routine for further processing of said unusual event to enable signalling said operating system for determining if reliable recovery from said fault by one of said processing units is possible.

5,193,182

COMPUTER SYSTEM FOR DEFINING LOGICAL OPERATIONS ON DESIGN DATA INCLUDING RETRIEVE ENTITY-SET, SEND, RECEIVE, SIGNAL, WHEN, REFERENCE TO ENTITY-SET, REFERENCE TO ENTITY METHOD, CONNECT AND DISCONNECT

Charles W. Bachman, Lexington, Mass.; Christopher P. Gane, New York, N.Y.; David A. Krieger, Cambridge, Mass.; John T. Micco, Waltham, Mass., and Igor Abramovich, Medford, Mass., assignors to Bachman Information Systems, Inc., Burlington, Mass.

Filed Apr. 27, 1990, Ser. No. 516,247
Int. Cl.[5] G06F *15/06*
U.S. Cl. 395—600 14 Claims

1. A computer system for processing information representative of business transactions comprising:

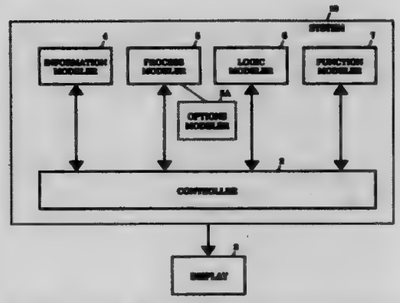
A. two or more modeler subsystems, each said subsystem including modeler means for creating, analyzing, and modifying two or more models corresponding to each of said modeler subsystems, each of said models having design data;

B. at least one of said modeler subsystems being a logic modeler subsystem (LMS), including Process Description Language (PDL) means for defining logical operations on at least one of said design data, said logical operations being defined by PDL design data;

C. operator means coupled to each said modeler subsystem for applying external signals to each of said modeler subsystems, said signals evoking a response from the group consisting of: creating, analyzing, and modifying, said response being evoked from at least one of said modeler means; and

D. wherein said PDL design data corresponds to at least one from the group consisting of Retrieve Entity-set, Send, Receive, Signal, When, Reference to an Entity Method, Reference to an Entity-set, Connect, and Disconnect, wherein:

i. Retrieve Entity-set defines retrieval of an entity set from an information store,



ii. Send defines the destination of information leaving a particular process,

iii. Receive defines the source of information entering a particular process,

iv. Signal identifies an exception condition or error and transfers control to a condition handler,

v. When defines an action to be taken when a specific condition occurs,

vi. Reference to an Entity-set defines a set of values which are references to entity instances,

vii. Reference to an Entity Method defines a procedure associated with a specific entity type,

viii. Connect defines the joinder of two instances of entities at a partnership set of each of said entities by a single partnership, and

iv. Disconnect defines the destruction of a partnership.

5,193,183

SYSTEM FOR ACCESSING DESIGN DATA OF MODELER SUBSYSTEMS BY REFERENCE TO PARTNERSHIP SET AND FOR DYNAMICALLY CORRELATING DESIGN DATA OF MODELER SUBSYSTEMS

Charles W. Bachman, Lexington, Mass., assignor to Bachman Information Systems, Inc., Burlington, Mass.

Filed Apr. 27, 1990, Ser. No. 516,248
Int. Cl.[5] G06F *15/40, 12/00*
U.S. Cl. 395—600 7 Claims

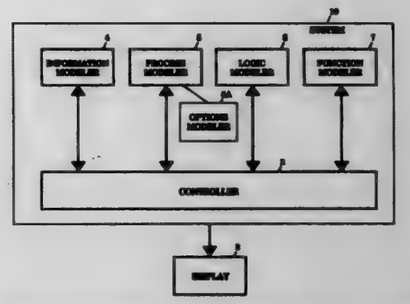
1. A computer system for information management systems of organizations, comprising:

A. one or more modeler subsystems including modeler means for creating, analyzing, and modifying one or more models corresponding to each of said modeler subsystems, each of said models having design data associated therewith;

B. partnership set subsystem coupled to one or more of said modeler subsystems, said partnership set subsystem including means for establishing in said computer system one or more partnership sets within at least one of said design data, each of said partnership sets being representative of zero, one or more partnership;

C. partnership subsystem coupled to said partnership set subsystem, said partnership subsystem including means for establishing one or more of said partnerships, wherein each of said partnerships is characterized by one partnership set associated with itself or associated with one other partnership set;

D. access subsystem coupled to said modeler subsystems, said partnership subsystem and said partnership set subsystem, said access subsystem including means for accessing in said computer system one or more of said design data by



reference to a partnership set which is in partnership with partnership sets of said one or more of said design data;

E. operator means coupled to said modeler subsystems for applying external signals to each of said modeler subsystems, said signals being effective to evoke a creating, analyzing, or modifying response from at least one of said modeler means; and

F. modeler linking means coupled to said modeler subsystems for dynamically correlating said design data, whereby a change to any of said design data of one of said modeler subsystems affects a substantially immediate corresponding change to said design data of others of said modeler subsystems.

5,193,184

DELETED DATA FILE SPACE RELEASE SYSTEM FOR A DYNAMICALLY MAPPED VIRTUAL DATA STORAGE SUBSYSTEM

Jay S. Belsan, Nederland; George A. Rudeseal, Boulder; Charles A. Milligan, Golden; Mogens H. Pedersen, Longmont, all of Colo.; John F. Kitchen, Lindfield, Australia, and Henry S. Ludlam, Longmont, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 18, 1990, Ser. No. 540,500
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—600 19 Claims

1. A dynamically mapped virtual memory data storage subsystem, that includes a plurality of data storage devices and that is connected to at least one host processor for storing data files for access by said host processor using a virtual address assigned by said host processor to each said data file and that deletes data files from said data storage devices independent of said host processor, wherein said host processor transmits predefined commands, each of which includes a set of parameters, to said data storage subsystem to activate said data storage subsystem to read and write data files on said data storage devices, comprising:

means, responsive to said host processor transmitting a data file to said data storage subsystem for storage therein, for mapping a virtual address assigned by said host processor to said transmitted data file into an address which defines

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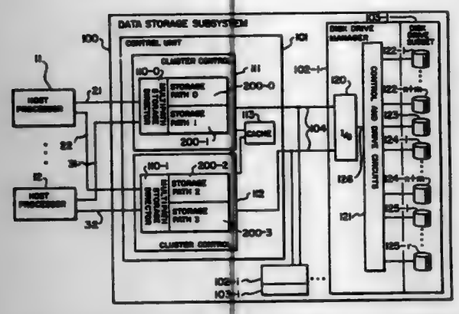
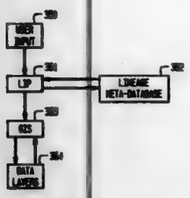
a physical memory location on one of said data storage devices;
means for writing said transmitted data file to said defined physical memory location on said data storage device;
means for storing data, including said address, indicative of said virtual address to physical memory location mapping for each of said data files stored on said data storage devices;
means, in said host processor, responsive to said host processor generating controls signals to scratch one of said data files, for transmitting commands to said data storage subsystem, independent of said host processor, identifying said scratched data file, comprising:
means for generating one of said predefined commands, independent of said host processor;



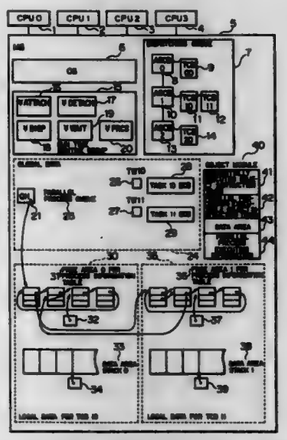
means for altering at least one of said set of predefined parameters in said one generated predefined command to indicate to said data storage subsystem that said one command containing said altered parameters originates from said transmitting means rather than said host processor;
means for forwarding said altered command to said data storage system; and
means, responsive to said scratched data file identifying commands, for expunging said data indicative of said virtual address to said physical memory location mapping from said storing means for said identified scratched data file.

5,193,185
METHOD AND MEANS FOR LINEAGE TRACING OF A SPATIAL INFORMATION PROCESSING AND DATABASE SYSTEM
David Lanter, 140 Westport Dr., Columbia, S.C. 29223
Filed May 15, 1989, Ser. No. 351,877
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—600 22 Claims



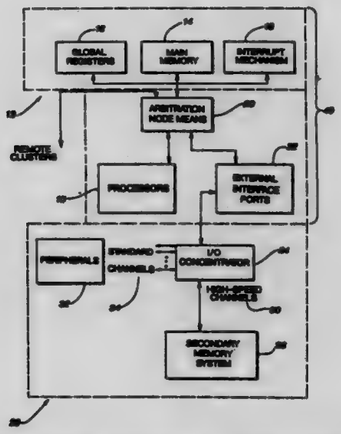
14. An apparatus for tracing lineage of at least one spatial data layer of a spatial information processing and database system, wherein said apparatus allows a user to create, and to provide queries to, a meta-database of information concerning said system, the apparatus comprising:
stored software modules capable of establishing and querying a meta-database,
means for accepting commands,
means for recognizing valid user commands
means for creating a semantic network depicting the relationship among data layers in said system,
means for integrating multiple spatial data applications,
means for allowing a user to make queries to said meta-database concerning the lineage relationships stored in the meta-database semantic network, and
means for providing answers to a user to enable a user to determine the lineage relationships stored in the meta-database semantic network from the answer to such queries.

5,193,186
PROCESSOR SYSTEM FOR EXECUTING PROCESSES IN PARALLEL UNDER MULTITASK, CONTROL METHOD OF WAITING FOR EVENT OF PROCESS
Yoshiko Tamaki, Kunitachi; Katsuyoshi Kitai, Hadano; Yasuhiro Inagami, Kodaira, and Yoshikazu Tanaka, Oniya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 30, 1991, Ser. No. 647,754
Claims priority, application Japan, Feb. 5, 1990, 2-026449
Int. Cl.[5] G06F *9/06*
U.S. Cl. 395—650 37 Claims



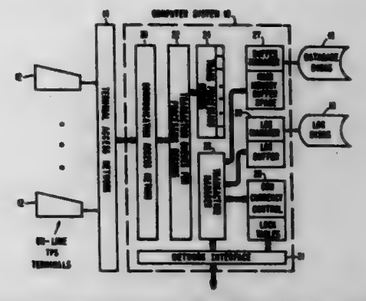
1. In a processor system for executing a plurality of tasks, which respectively control execution of one or more of a plurality of processes, a method of restarting execution of a first process which is under control of a particular one of said tasks after said first process is stopped to wait for occurrence of an event associated with at least one second process different from said first process, comprising steps executed by the particular task, the steps including:
(a) detecting whether or note said event associated with said second process has occurred;
(b) restarting execution of said first process when it is detected that said event has occurred;
(c) determining whether or not there is an execution waiting process when said event has not yet occurred;
(d) executing an executing waiting process when there is an execution waiting process; and
(e) repeating said steps (a) to (d) after completion of the execution of said execution waiting process when there is an execution waiting process or after said step (c) when there is no execution waiting process.

5,193,187
FAST INTERRUPT MECHANISM FOR INTERRUPTING PROCESSORS IN PARALLEL IN A MULTIPROCESSOR SYSTEM WHEREIN PROCESSORS ARE ASSIGNED PROCESS ID NUMBERS
Robert E. Strout, II, Livermore, Calif.; George A. Spix, Eau Claire, Wis.; Edward C. Miller, Eau Claire, Wis.; Anthony R. Schooler, Eau Claire, Wis.; Alexander A. Silbey, Eau Claire; Andrew E. Phelps, Eau Claire, Wis.; Brian D. Vanderwarn, Eau Claire, Wis., and Gregory G. Gaertner, Eau Claire, Wis., assignors to Supercomputer Systems Limited Partnership, Eau Claire, Wis.
Continuation of Ser. No. 536,199, Jun. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 459,083, Dec. 29, 1989. This application Jun. 10, 1992, Ser. No. 898,387
Int. Cl.[5] G06F *9/46*
U.S. Cl. 395—650 19 Claims



1. A fast interrupt mechanism for a multiprocessor system comprising:
a plurality of processors in the multiprocessor system wherein each processor is assigned a process number and a common process number defines a selected set of processors representing all of the processors which are working in parallel on a single process; and
a fast interrupt means uniquely connected to each processor for receiving interrupts and exceptions from one or more of the processors and for simultaneously interrupting all of the processors associated with the selected set of processors working in parallel on a single process within a bounded number of clock cycles in response to receiving the interrupt or exception, the fast interrupt means including:
a plurality of register means, one for each of the processors in the multiprocessor system, for storing the process number assigned to that processor;
a plurality of event means, one for each of the processors in the multiprocessor system, for indicating that an event request representing an exception or an interrupt was generated by that processor; and
comparison means operably connected to the register means and the event means for comparing the process number in the register means for a processor having a valid interrupt or exception as indicated in the event means with the process number in each of the register means and for generating an interrupt to be sent to each processor that matches the comparison, such that all processors working on the same process in parallel have the same process number and are interrupted in parallel.

5,193,188
CENTRALIZED AND DISTRIBUTED WAIT DEPTH LIMITED CONCURRENCY CONTROL METHODS AND APPARATUS
Peter A. Franaszek, Katonah; John T. Robinson, Yorktown Heights, and Alexander Thomasian, Pleasantville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 294,334, Jan. 5, 1989, abandoned. This application Feb. 25, 1991, Ser. No. 660,762
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—650 22 Claims



1. In a multi-user data processing system having a transaction manager including lock tables for managing accesses to a database by a plurality of concurrently running transactions, a waiting depth limited concurreacy control method performed by said transaction manager and comprising the steps of:
maintaining a wait depth data structure which graphically describes a waiting depth of transactions being processed by said system where, for each transaction in the system at any instant of time, a real-valued function provides a measure of a current length of a transaction, wherein said data processing system is a centralized system and locks granted by said transaction manager are shared or exclusive, said data structure being a directed graph describing a hierarchy of transactions waiting on other transactions for release of exclusive locks on portions of said database, and said real-valued function is a number of locks held by a transaction;
for each request for a lock by a transaction, testing the wait depth data structure to determine if said waiting depth exceeds a predetermined value;
using said real-valued function to determine which subset of transactions is to be restarted in case of a conflict between transactions which results in said waiting depth exceeding said predetermined value; and
restarting said subset of transactions so that the wait depth is reduced or kept to no more than said predetermined value.

5,193,189
PROGRAMMABLE CONTROLLER WITH MULTIPLE PRIORITY LEVEL TASK PROCESSING
Mark A. Flood; Michael D. Kalan, both of Mayfield Heights; Peter N. Preis, Lyndhurst, all of Ohio, and Alden L. Peterson, II, Brooklyn, N.Y., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.
Continuation of Ser. No. 404,307, Sep. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 105,815, Oct. 7, 1987, Pat. No. 4,937,777. This application Dec. 9, 1991, Ser. No. 809,085
Int. Cl.[5] G06F *15/46*; G05B *19/00*
U.S. Cl. 395—650 7 Claims

1. A programmable controller, for operating a machine to perform programmed functions, which comprises:
a first means for storing a plurality of user defined programs, including a machine control program;

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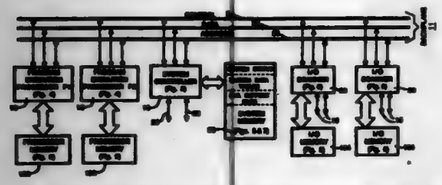
a processing means, coupled to said first means for storing, for executing the user defined programs;

a second means for storing a first data table containing pointers to different types of programs in a priority order in which the different types are to be executed by said processing means, two types of programs being the machine control program and the other user defined programs, said processing means being coupled to said second means for storing for the placement of pointers therein to designate programs for execution;

designating means for a user to define an amount of program execution time of said processing means to be devoted to



the execution of other user defined programs than the machine control program;

means, coupled to said second means for storing, for controlling amounts of time that the machine control program and other user defined programs are executed by said processing means on a time-alice basis by reversing the relative priority order of the machine control program and the other user to defined programs in the first data table in response to the amount of program execution time defined by said designating means to which is connected to said means for controlling; and

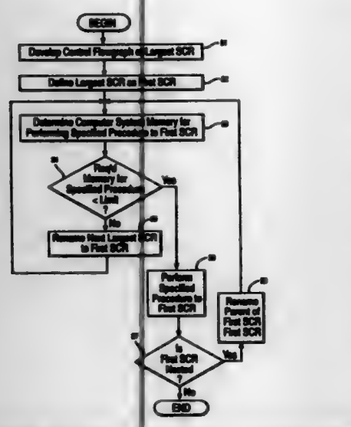
means for coupling input and output devices on the machine to the processor means.

5,193,190

PARTITIONING OPTIMIZATIONS IN AN OPTIMIZING COMPILER

Joyce M. Janczya, Toronto, Canada, and Peter W. Markstein, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,487
Int. Cl.[5] G06F 9/45
U.S. Cl. 395—700 7 Claims



1. A method for operating a compiler program in a computer system, said computer system utilizing said compiler program to execute a specified procedure for improving an intermediate language version of a computer program under development, comprising the steps of:

a) developing a control flowgraph representing a largest strongly connected region in said program under development;

b) by examining code sequences in said strongly connected region, determining an amount of memory of said computer system required to perform said specified procedure to said strongly connected region;

c) comparing said amount of memory determined in step b) to a predetermined computer system memory usage limit to determine if said amount of memory determined in step b) exceeds said predetermined computer system memory usage limit, thereby denoting an incapability of said computer system of applying said specified procedure to said strongly connected region;

d) if said amount of memory determined in step b) does not exceed said predetermined limit, applying said specified procedure to said strongly connected region examined in step b); otherwise

e) if said amount of memory determined in step b) exceeds said predetermined limit, executing steps b)–d) to a next largest previously unselected strongly connected region in said control flowgraph.

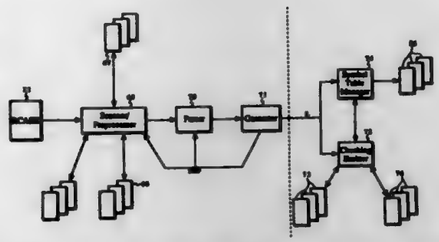
5,193,191

INCREMENTAL LINKING IN SOURCE-CODE DEVELOPMENT SYSTEM

William M. McKeeman, Hollis, and Shota Aki, Weare, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1989, Ser. No. 375,398
The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.
Int. Cl.[5] G06F 15/00, 9/30
U.S. Cl. 395—700 20 Claims

MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 202 Pages)



1. In a method of executing on a computer an edit-compile-link cycle in developing source code, said cycle including generating a plurality of modules of source text accessed by said computer, compiling said modules by said computer to generate a code table for each module, and linking said code tables by said computer to produce a link table and a link list and thereby create an executable object-code image, the improvement comprising the steps of:

a) editing one of said modules of said source text and storing edited source text in one of said source-text buffers in memory of said computer, said one of said modules including a plurality of lines of source text;

b) recompiling by said computer said one of said source-text buffers to update said code table for said one of said modules in said memory, by generating object code for said code table only for lines of source text which are changed in said step of editing;

c) relinking said one of said code tables by said computer to update said code image in a buffer in said memory;

said step of relinking including:

i) updating said link table in memory, where said link table includes a plurality of entries, where each said entry is an identification and location of an element needed by a statement in said code table or is an identification and location of an element supplied by a statement in said code table;

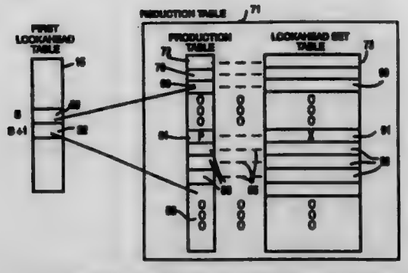
ii) updating only parts of said link list related to said elements supplied or elements needed which have been changed in said step of editing, said link list having been generated by matching said entries identifying elements needed with entries identifying elements supplied in said link table to produce matched entries in said link list; said link list including a matched entry for each one of said elements needed matched with an element supplied, and each said matched entry having an indicator of whether each said element supplied or element needed was changed in said step of editing; said step of updating said link list employing said indicators to determine whether a new matched entry is generated or alternatively a matched entry already in said link table is reused.

5,193,192

VECTORIZED LR PARSING OF COMPUTER PROGRAMS

David A. Seberger, Livermore, Calif., assignor to Supercomputer Systems Limited Partnership, Eau Claire, Wis.

Continuation-in-part of Ser. No. 537,466, Jun. 11, 1990, which is a continuation-in-part of Ser. No. 459,053, Dec. 29, 1989. This application Aug. 23, 1990, Ser. No. 571,502
Int. Cl.[5] G06F 9/45
U.S. Cl. 395—700 11 Claims



1. In a machine-effected method of operating a parser portion of a compiler for parsing a computer program in an input stream, said computer program being written in a predetermined programming language having a given grammar, including the machine-executed steps of:

automatically generating a parser state table means having a plurality of state indicating entries, one entry means for indicating each possible state of the parser, each of said state indicating entries including a declaration of said predetermined programming language in said given grammar;

automatically generating a linearized vector table means having an input table including a given plurality of input entries respectively related to the parser state table means entries such that one or more of the input entries relate to a one of the state indicating entries, respectively, and an output table having a predetermined plurality of output entries, arranged said output entries to be identically addressable within the output table as the input entries are respectively addressed within the input table, said predetermined plurality of being equal to said given plurality; and

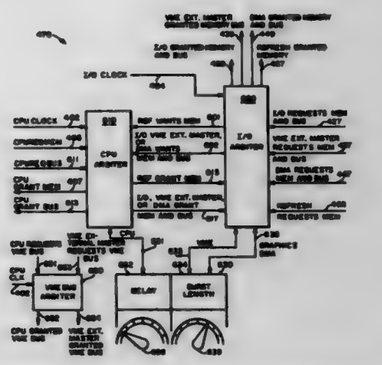
parsing the computer program in the input stream using the established parser state table means and said linearized table means.

5,193,193

BUS CONTROL SYSTEM FOR ARBITRATING REQUESTS WITH PREDETERMINED ON/OFF TIME LIMITATIONS

Sanjay Iyer, Stanford, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Continuation of Ser. No. 716,779, Jun. 18, 1991, abandoned, which is a division of Ser. No. 244,755, Sep. 14, 1988, abandoned. This application Feb. 24, 1992, Ser. No. 841,908
Int. Cl.[5] G06F 13/36, 13/372
U.S. Cl. 395—725 10 Claims



1. A method of controlling the use of a computer bus, comprising the steps of:

receiving a plurality of requests to use the bus from a plurality of sources, including a first source, a second source, and a third source;

preselecting a length of a first period for use of the bus and a length of a second period for use of the bus such that a combined length of the first and second periods is less than a maximum length of time that the third source can tolerate being off the bus, wherein the first source can request a first period use of the bus that would last for up to the length of the first period, the second source can request a second period use of the bus that would last up to the length of the second period in the presence of requests by the first source and the third source, and the third source can request a use of the bus that would last as long as it would take for the third source to complete a third source operation; and

granting each of the plurality of requests such that:

the plurality of sources do not use the bus more than one at a time;

first periods occur repetitively if the first source requests more than one first period use of the bus;

second periods occur repetitively whether or not the second source requests a second period use of the bus;

periods available for the third source to use the bus occur repetitively if the third source requests more than one use of the bus;

if requests from the first, second, and third sources are received at the same time, then the third period use of the bus is granted first in time, the first period use of the bus is granted second in time, and the second period use of the bus is granted third in time;

following a first period use of the bus and after any pending third source request has been granted and the third source operation has been completed, the second source is granted use of the bus for the second period, whether or not the second source requests a second period use of the use;

no other source is granted use of the bus while the first source is using the bus during the first period;

preference means responsive to receipt of said process re- at least one shared resource;

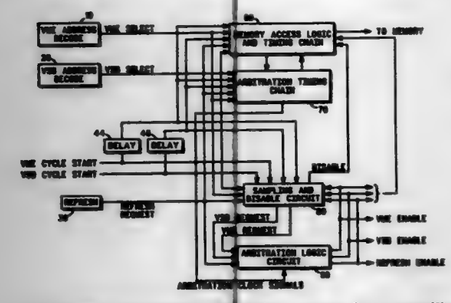
no other source is granted use of the bus while the second source is using the bus during the second period; and no other source is granted use of the bus while the third source is using the bus.

5,193,194

CONCURRENT ARBITRATION SYSTEM AND METHOD FOR BUS CONTROL

Eugene H. Gruender, Jr., and Douglas R. Kraft, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 566,711, Aug. 13, 1990, abandoned, which is a continuation of Ser. No. 259,559, Oct. 18, 1988, abandoned. This application Aug. 1, 1991, Ser. No. 742,154
Int. Cl.[5] G06F *13/362*
U.S. Cl. 395—725 10 Claims



1. A computer resource arbitration system for controlling access to a resource by a plurality of requesters, at least two of which are capable of generating corresponding cycle start signals and resource request signals, and for granting access to said resource by a first requester generating a first cycle start signal even though said first requester had been granted the immediately preceding access to said resource and a second requester generated a second resource request signal before said first requester generated said first cycle start signal, comprising:

arbitration logic means, responsive to the receipt of said first and second resource request signals for generating a requester enable signal on behalf of a requester granted highest priority according to a predetermined priority, said arbitration logic means requiring an arbitration cycle of at least a first predetermined time interval to generate said requester enable signal;

additional logic means for determining whether said first requester generated said first cycle start signal before said second requester generated said second resource request signal and for determining whether a requester enable signal generated during an immediately preceding arbitration cycle is coincidentally being asserted on behalf of said first requester and, if both of said determinations are true, generating a resource access signal on behalf of said first requester, said resource access signal being generated prior to the expiration of said first predetermined time interval; and

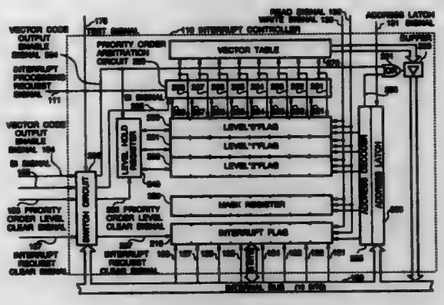
memory access means for immediately granting access to said first requester if said resource access signal is generated by said additional logic means and for granting access to said resource by said requester having highest priority based on said corresponding resource access signal after a previous memory access cycle is complete, said access to said resource by said first requester in response to said resource access signal occuring simultaneously with said arbitration logic means determining which requester has highest priority.

5,193,195

MICROCOMPUTER HAVING EASILY TESTABLE INTERRUPT CONTROLLER

Takashi Miyazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 21, 1990, Ser. No. 586,789
Claims priority, application Japan, Sep. 22, 1989, 1-246704
Int. Cl.[5] G06F *9/00*
U.S. Cl. 395—725 10 Claims



1. A microcomputer comprising:

a plurality external terminals, one of said external terminals being connected to receive a test mode signal;

an internal bus;

a central processing unit coupled to said internal bus;

an input/output interface connected to said external terminals and to said internal bus, said input/output interface controlling data transfer between the microcomputer and an external device connected to one of said external terminals under control of said central processing unit;

an interrupt request source connected to said internal bus;

an interrupt controller coupled to said internal bus, said interrupt controller receiving an interrupt request signal from said interrupt request source and generating an interrupt processing request signal to said central processing unit; and

a switch circuit connected to receive a vector code output enable signal and an interrupt enable signal from said central processing unit and first and second signals from said internal bus, said switch circuit being controlled by said test mode signal supplied through one of said external terminals to output said vector code output enable signal and said interrupt enable signal to said interrupt controller when said test mode signal is inactive and to output said first and second signals from said internal bus as the vector code output enable signal and the interrupt enable signal to said interrupt controller when said test mode signal is active.

5,193,196

PROCESS REQUEST ARBITRATION SYSTEM WHICH PREFERENTIALLY MAINTAINS PREVIOUSLY SELECTED PROCESS REQUEST UPON RECEIPT OF A SUBSEQUENT REQUEST OF IDENTICAL PRIORITY

Tetsuya Mochida; Shigeo Tsujioka, both of Yokohama; Masumi Jikihara, Yamato; Hitoshi Sadamitsu, Ashigarakami, and Kazushi Kobayashi, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

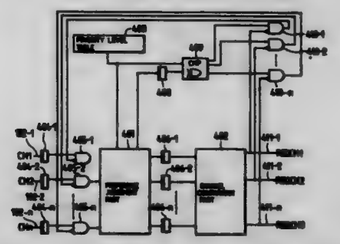
Filed Mar. 31, 1989, Ser. No. 331,297
Claims priority, application Japan, Apr. 4, 1988, 63-82617
Int. Cl.[5] G06F *13/36*
U.S. Cl. 395—725 8 Claims

3. An apparatus for controlling selection of process requests delivered from a plurality of devices having predetermined priority levels, comprising:

preference means responsive to receipt of said process requests for selecting a process request of highest priority level and outputting information, including a device identifying signal and a priority level identifying signal, identifying the device which delivered the selected process request;

storage means for storing the information outputted by said preference means and for outputting at least a signal indicating a selected device;

comparison means responsive to said preference means for



indicating when the information outputted by said preference means changes; and

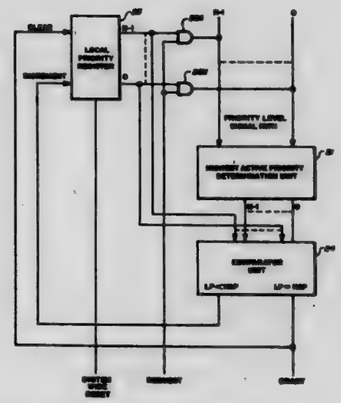
means responsive to said comparison means for controlling said storage means to change the signal outputted from said storage means to indicate a device having a priority level identified by the changed information outputted from said preference means when the priority level signal in said information has changed, and for controlling said storage means to maintain the signal outputted from said storage means when the priority level signal in said information has not changed.

5,193,197

APPARATUS AND METHOD FOR DISTRIBUTED DYNAMIC PRIORITY ARBITRATION FOR ACCESS TO A SHARED RESOURCE

Charles P. Thacker, Palo Alto, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 100,533, Sep. 24, 1987, abandoned. This application Aug. 30, 1990, Ser. No. 576,177
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—725 43 Claims



1. A data processing system comprising:

a plurality of processing units;

at least one shared resource;

a plurality of arbitration means, each arbitration means associated with a processing unit and exchanging signals therewith, said arbitration means for determining a priority of said associated processing unit;

a priority signal but having a signal path for each level of priority available to said processing units, all signal paths being coupled to all arbitration means, wherein each arbitration means applies a priority signal to a signal path related to a level of priority of said associated processing unit when a first signal is applied to an arbitration means by said associated processing unit, each arbitration means including comparator means coupled to said priority signal bus for applying a second signal to said associated processing unit when said arbitration means priority signal identifies a highest priority of all priority signals applied to said priority signal bus as corresponding to an indicia of priority of said processing unit; and,

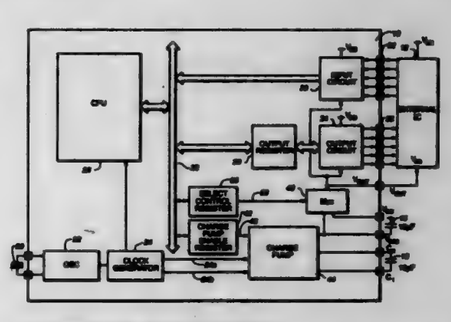
up-date means for incrementing said indicia of a priority of said processing unit, said indicia increased upon access by any of said plurality of processing units to said shared resource, and a last processing unit having access to said at least one shared resource having an associated indicia of priority set to a lowest priority.

5,193,198

METHOD AND APPARATUS FOR REDUCED POWER INTEGRATED CIRCUIT OPERATION

Hideaki Yokouchi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed May 6, 1991, Ser. No. 696,460
Claims priority, application Japan, May 7, 1990, 2-117176; Aug. 10, 1990, 2-213221; Mar. 15, 1991, 3-51381
Int. Cl.[5] H03K *3/01*; H02M *3/07*
U.S. Cl. 395—750 18 Claims



1. An integrated circuit comprising:

a) a charge pump circuit, connected to a first power supply voltage node, for producing a boosted power supply voltage as an output; and

b) a power supply multiplexer circuit, having said charge pump output and said first power supply voltage node connected as inputs, for selecting between said charge pump output and said first power supply voltage node to thereby output a selected one of said inputs;

c) a power supply terminal for supplying said power supply multiplexer output to other integrated circuits provided externally; and

d) at least one input circuit having power supply terminals wherein said multiplexer output voltage is connected to supply power to said input circuit.

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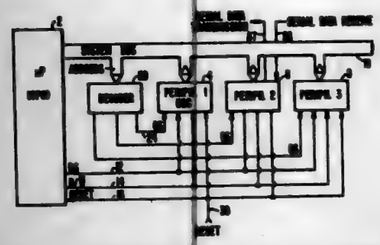
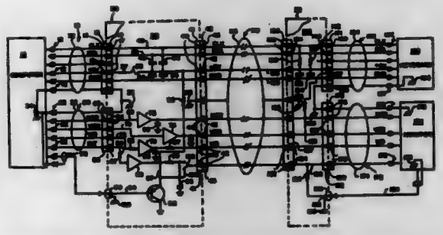
5,193,199
DEVICE AND METHOD FOR PROGRAMMING CRITICAL HARDWARE PARAMETERS
Monte J. Dalrymple, Fremont; Don Smith, Los Gatos, and Lois F. Brubaker, Newark, all of Calif., assignors to Zilog, Inc., Campbell, Calif.
Continuation of Ser. No. 181,732, Apr. 14, 1988, abandoned. This application Aug. 1, 1991, Ser. No. 742,152
Int. Cl.[5] G06F 9/22, 13/10
U.S. Cl. 395—775 4 Claims



1. In a computer system having a microprocessor chip and a plurality of additional individual circuit chips connected together through a system bus and control lines, at least one of said additional individual circuit chips having an internal control register, said register being loaded with control bits from said system bus in response to initialization of said computer system, the improvement comprising:
means within said at least one of said chips that is responsive to signals in said control lines for enabling loading of said internal control register with control bits from said system bus in response to said initialization of said computer system;
means within said at least one of said chips for providing a timing pulse to said other circuits, said timing pulse providing means including means responsive to a group of one or more of said control bits loaded in said control register for setting a duration of said timing pulse;
means responsive to said internal control register being loaded with control bits for disabling said loading means until a subsequent initialization of said computer system; and
said microprocessor providing software control of the control bits loaded into said control register and thus the duration of said timing pulse, wherein said at least one of said additional individual circuit chips includes at least one conductive pin extending outward of said at least one of said chips and connected to a circuit portion thereon that includes means responsive to a group of one or more of said control bits when loaded in said control register for connecting the pin to receive the timing pulse, thereby allowing the timing pulse to be measured from outside the at least one of said chips.

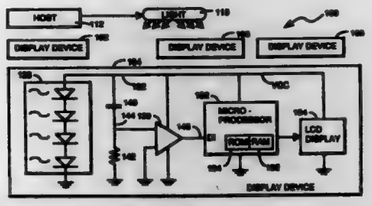
5,193,200
COMPUTER-MONITOR EXTENDED RANGE COMMUNICATIONS LINK FOR ATTENUATING AND SUBSEQUENTLY RESTORING HIGH FREQUENCY COMPONENTS OF TRANSMITTED VIDEO SIGNALS
Robert R. Asprey, Harvest, and Remigius G. Shatas, Huntsville, both of Ala., assignors to Cybex Corporation, Huntsville, Ala.
Continuation-in-part of Ser. No. 95,140, Sep. 11, 1987, Pat. No. 4,885,718. This application Dec. 5, 1989, Ser. No. 447,010
Int. Cl.[5] G06F 3/00, 3/14
U.S. Cl. 395—800 13 Claims

1. A communications link for coupling at least video signals comprising horizontal sync (HS), primary RED, GREEN, and BLUE and secondary red, green, and blue signals from a computer to a distantly located monitor, comprising:
a plurality of first discrete amplification means, one of each said first amplifications means coupled to one of each said HS, primary RED, GREEN, and BLUE, and secondary red, green, and blue signals, with a selected resistance in series between said secondary red, green, and blue signals and respective said first amplification means, for amplifying said video signals from said computer;
a plurality of discrete attenuation means, one of each said attenuation means coupled to one of each said plurality of first amplification means, for attenuating high frequency components of said video signals which radiate interfering crosstalk from one adjacent conductor to another and for providing attenuated video signals;
a cable having a plurality of discrete, adjacent conductors, one of each said conductors coupled to one of each of said plurality of attenuation means and being up to 300 feet long, said plurality of conductors conveying said attenuated video signals;



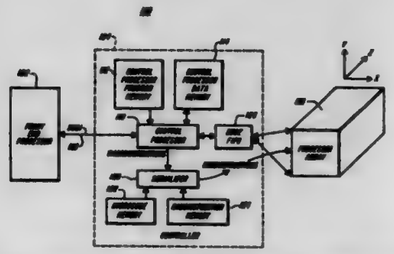
a plurality of discrete cable termination means, one of each said cable termination means coupled to one of each said conductors conveying a corresponding said attenuated video signal, for reducing crosstalk; and
a plurality of second discrete amplification means, one of each said second amplification means coupled to one of each said cable termination means, for receiving said attenuated video signals from said plurality of said cable termination means and having a selected voltage threshold such that when a terminated, attenuated video signal rises to and above said threshold, said second amplification means is triggered "on", for restoring said high frequency components to said video signals and providing said restored video signals to said monitor.

5,193,201
SYSTEM FOR CONVERTING A RECEIVED MODULATED LIGHT INTO BOTH POWER FOR THE SYSTEM AND IMAGE DATA DISPLAYED BY THE SYSTEM
LaRoy Tymes, 4032 Campana Dr., Palo Alto, Calif. 94306
Filed Apr. 23, 1990, Ser. No. 512,946
Int. Cl.[5] G06F 1/26, 3/00, 15/74
U.S. Cl. 395—800 8 Claims



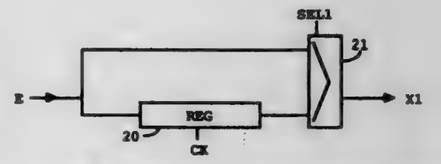
1. A data processing device, comprising:
data processing means, including a data processor, for performing specified data processing tasks;
photodiode means, coupled to said data processing means, for receiving modulated light and converting said received modulated light into an electrical voltage which provides power to said data processing means; and
demodulating means, coupled to said photodiode means and said data processing means, for demodulating said electrical voltage so as to generate a stream of data signals, and for transmitting said stream of data signals to said data processing means;
wherein said data processing tasks performed by said data processing means includes outputting image signals corresponding to said stream of data signals generated by said demodulating means;
said data processing device further including display means, coupled to said data processing means, for displaying images corresponding to said image signals output by said data processing means, said display means being coupled to said photodiode means, whereby said photodiode means powers said display means by said electrical voltage generated from said photodiode means.

5,193,202
PROCESSOR ARRAY WITH RELOCATED OPERAND PHYSICAL ADDRESS GENERATOR CAPABLE OF DATA TRANSFER TO DISTANT PHYSICAL PROCESSOR FOR EACH VIRTUAL PROCESSOR WHILE SIMULATING DIMENSIONALLY LARGER ARRAY PROCESSOR
James H. Jackson, and Ming-Chih Lee, both of Cary, N.C., assignors to Wavetracer, Inc., Acton, Mass.
Filed May 29, 1990, Ser. No. 529,947
Int. Cl.[5] G06F 15/80, 12/06
U.S. Cl. 395—800 10 Claims



1. A parallel processing system including a virtual processing instruction and address generator, for generating a plurality of processor cell instructions and corresponding physical processor cell operand memory addresses for a multi-dimensional processor array having at least one physical dimension that differs from a corresponding multi-dimensional problem dimension selectable from a plurality of multi-dimensional problem dimensions, comprising:
a multi-dimensional processor array including a predetermined number of physical processor cells arranged in a multi-dimensional array having predetermined dimensions, each physical processor cell having a predetermined amount of associated memory;
means for providing said plurality of selectable multi-dimensional problem dimensions;
means, responsive to the means for providing the plurality of selectable multi-dimensional problem dimensions and to the predetermined number of physical processor cells arranged in said multi-dimensional array having said predetermined dimensions, for assigning, for each dimension of said plurality of selectable multi-dimensional problem dimensions, a number of virtual processors to be associated with each of said predetermined number of physical processor cells, and for arranging, for each physical processor cell, said number of virtual processors in a predetermined multi-dimensional configuration as a function of said plurality of selectable multi-dimensional problem dimensions and of the predetermined number of physical processor cells, and for forming a multi-dimensional array of virtual processor cells having a plurality of multi-dimensional dimensions corresponding to said plurality of selectable multi-dimensional problem dimensions;
means, responsive to the means for assigning the number of virtual processors to be associated with each of said predetermined number of physical processor cells and to said arrangement of said number of virtual processors in a predetermined multi-dimensional configuration, for partitioning said predetermined amount of associated physical processor cell memory into a number of virtual processor memory segments corresponding to the number of virtual processors associated with each physical processor cell, for defining the address space of each virtual processor associated with each physical processor cell, and for defining, for each virtual processor, a physical processor cell memory address corresponding to a base virtual processor operand memory address defining the beginning operand memory address for each of said number of virtual processors associated with each physical processor cell;
means for providing one or more processor cell instructions, each of said processor cell instructions including operand address data;
means, responsive to said means for providing one or more processor cell instructions, for providing a virtual operand memory address for each operand to be processed by each virtual processor of said multi-dimensional array of virtual processors as directed by each processor cell instruction;
means, responsive to said means for providing each of said virtual operand memory addresses and to said means for defining said virtual processor base memory addresses, for summing each virtual operand memory address with a virtual processor base memory address, to produce a physical processor cell address relocated operand memory address for directly addressing within each physical processor cell, each virtual processor operand to be processed, and for any given processor cell instruction requiring operand data movement, for providing for each address relocated operand memory address, a value indicating the relative physical processor cell distance to be moved in each dimension;
means, responsive to said means for producing the physical processor cell address relocated operand memory address of each operand to be processed, and to said means for providing one or more processor cell instructions, for merging a processor cell instruction with a corresponding physical processor cell address relocated operand memory address, to produce an address relocated processor cell instruction to be broadcast to each virtual processor cell of the processor array.

5,193,203
SYSTEM FOR REARRANGING SEQUENTIAL DATA WORDS FROM AN INITIAL ORDER TO AN ARRIVAL ORDER IN A PREDETERMINED ORDER
Alain Artieri, Meylan, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France
Filed Jul. 2, 1990, Ser. No. 546,113
Claims priority, application France, Jul. 3, 1989, 89 09273
Int. Cl.[5] G06F 7/00
U.S. Cl. 395—800 4 Claims



1. A pipeline data shuffler receiving successive trains of

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sequential data words, and rearranging said sequential data words in each said train according to a predetermined order comprising:

a plurality of elementary processing units arranged and connected in series, each said elementary processing unit comprising:

an input;

an output;

a one-word storage register for temporarily storing one of said data words receiving from said input;

steering means for controlling the elementary processing unit to connect the input to the output through the register for temporarily storing the data word in response to a first level of a control signal and for connecting the input directly to the output thereby bypassing the register in response to a second level of the control signal; and

means, coupled to each said elementary processing unit, for periodically and concurrently supplying to each of the steering means of each said elementary processing unit a sequence of said control signals based upon a number of sequential data words in said each train and determined as a function of said predetermined order to rearrange the sequential data words.

5,193,204

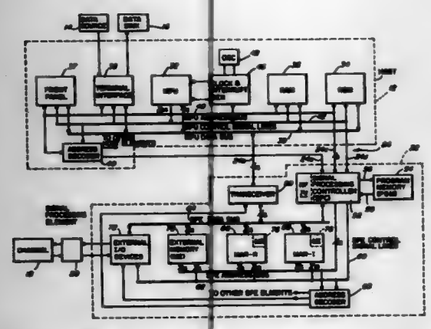
PROCESSOR INTERFACE CIRCUITRY FOR EFFECTING DATA TRANSFERS BETWEEN PROCESSORS

Shahid U. H. Qureshi, Natick, Mass., and George P. Chamberlin, Scottsdale, Ariz., assignors to Codex Corporation, Mansfield, Mass.

Continuation of Ser. No. 147,109, Jan. 21, 1988, abandoned, which is a continuation of Ser. No. 586,681, Mar. 6, 1984, abandoned. This application Feb. 7, 1990, Ser. No. 478,068

Int. Cl.[5] G06F *13/12*

U.S. Cl. 395—800 **4 Claims**



1. Apparatus for effecting a transfer of data between a first processor and a second processor in accordance with data transfer commands sent from said first processor to said second processor, said processors each having a program instruction memory, said processors operating independently and simultaneously when no data transfer is occurring between said processors, said apparatus comprising:

data transfer circuitry connected between said processors for transferring said data;

a program instruction decoder operably coupled by routing circuitry to said first processor and operably coupled to the program instruction memory of said second processor, said first processor sending said data transfer commands to said program instruction decoder which decodes said data transfer commands and sends signals to said data transfer circuitry to effect the transfer of data between said processors;

said second processor executing instructions stored in the program instruction memory of said second processor by decoding said instructions by said program instruction decoder when no data transfer is occurring between said processors; and

interface circuitry, coupled to one of said processors, for delivering to an information-carrying channel a carrier signal modulated by said one processor in accordance with said data transferred between said processors, said interface circuitry also for accepting a modulated carrier signal of data for processing by one of said processors.

5,193,205

PIPELINE PROCESSOR, WITH RETURN ADDRESS STACK STORING ONLY PRE-RETURN PROCESSED ADDRESS FOR JUDGING VALIDITY AND CORRECTION OF UNPROCESSED ADDRESS

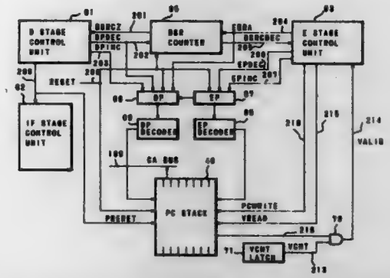
Masahito Matsuo, and Toyohiko Yoshida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,253

Claims priority, application Japan, Mar. 1, 1988, 63-49093; Apr. 7, 1988, 63-86704

Int. Cl.[5] G06F *9/38, 9/40, 9/42*

U.S. Cl. 395—800 **5 Claims**



1. A data processor having a pipeline processing mechanism which processes instructions including subroutine call instructions and subroutine return instructions in at least two stages, comprising:

an instruction memory for storing instructions;

a processor memory for storing a pre-return processed address;

a stack means;

a first writing means for writing an unprocessed address to said stack means, said unprocessed address decodable into a return address;

a second writing means for writing said pre-return processed address to said processor memory;

an address reading means for reading said pre-return processed address from said processor memory, said address reading means controlled by a first stage of said at least two stages;

an instruction fetching means for fetching a first instruction from said instruction memory at a location indicated by said pre-return processed address written to said processor memory;

a pipeline processing means for fetching a second instruction from said instruction memory at a location indicated by said unprocessed address written to said stack means, and for decoding said second instruction; and

a judging means for judging whether said pre-return processed address accurately represents said return address; and

an execution means for executing said first instruction when said judging means judges that said pre-return processed address is the same as said return address, otherwise said execution means executing said second instruction after said second instruction is decoded by said pipeline processing means.

5,193,206

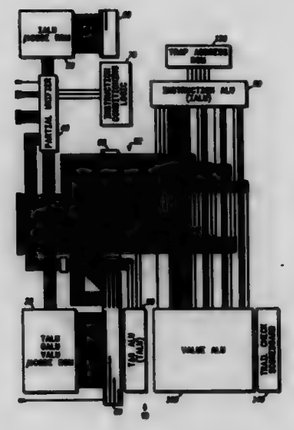
REDUCE INSTRUCTION SET MICROPROCESSOR

Jonathan W. Mills, Bloomington, Ind., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 457,628, Dec. 27, 1989, abandoned. This application Aug. 10, 1992, Ser. No. 926,366

Int. Cl.[5] G06F *9/22*

U.S. Cl. 395—800 **13 Claims**



1. A reduced instruction set microprocessor for processing operations designated by a plurality of tags, the microprocessor comprising:

means for processing instructions of an instruction set;

means for partially unifying the plurality of tags within the instruction set, generating a microcode address and an instruction condition signal when the plurality of tags are equal to a first set of values, the means for partially unifying coupled to the means for processing instructions;

means for latching the instructions of the instruction set, the means for latching coupled to both the means for processing instructions and the means for partially unifying;

means for generating alternate instructions of an alternate instruction set coupled to the means for partially unifying, the means for generating producing the alternate instructions when the plurality of tags are equal to a second set of values;

a tag arithmetic logic unit (ALU) for sending instruction decode information to the means for latching, the tag ALU coupled to the means for latching and to the means for partially unifying;

a value ALU for data fetching and data storing including storing of a status bit value, the value ALU coupled to the means for generating alternate instructions and to the means for latching; and

a trail checking ALU for tracking unbound variables, the trail checking ALU coupled to the value ALU.

5,193,207

LINK SORTED MEMORY

Stanley J. Vander Vegt, Los Angeles, and Darrell W. Chan, Monterey Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 31, 1990, Ser. No. 531,199

Int. Cl.[5] G06F *15/74, 13/00*

U.S. Cl. 395—800 **3 Claims**

1. A link sorted memory comprising:

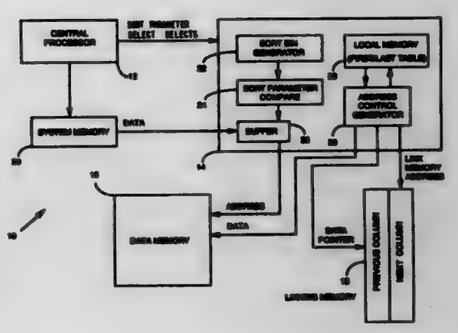
data memory means for storing unsorted data words in consecutive memory address locations;

linking memory means for storing selected memory address locations related to each memory address location in the data memory means; and

sorting means coupled to the data memory means and to the linking memory means, for receiving unsorting data words containing a predetermined sort parameter, for scanning a selected field of each of the incoming data words to find the predetermined sort parameter contained therein, for transferring the unsorted data words into consecutive memory address locations in the data memory means, for storing the lowest and highest memory address locations of the data words that contain the predetermined sort parameter, and for each memory address location in the data memory means, storing the previous and subsequent address locations of data words containing the same predetermined sort parameter in the linking memory means as a table of links, wherein the sorting means comprises:

sort bin generator means for receiving sort parameters,

local memory means coupled to the sort bin generator means for storing the lowest and highest memory address locations of the data words that contain the predetermined sort parameter,



sort parameter comparison means coupled to the sort bin generator means for scanning a selected field of each of the incoming data words to find the predetermined sort parameter contained therein, and

address control generator means coupled to the sort parameter comparison means, the local memory means, the data memory means and the linking memory means for transferring the unsorted data words into the consecutive memory address locations in the data memory means and storing the previous and subsequent address locations of data words containing the same predetermined sort parameter in the linking memory means;

and whereby sorting of the unsorted data words is achieved by retrieving the memory address location from the linking memory means of the first occurrence of a data word associated with a chosen sort parameter, referencing the table of links to sequentially retrieve the remainder of data words having the sort parameter, which is accomplished by sequentially retrieving the data words located at memory address locations identified in the table of links of the linking memory means until the last memory address location is referenced.

339-698 O.G.-93-18

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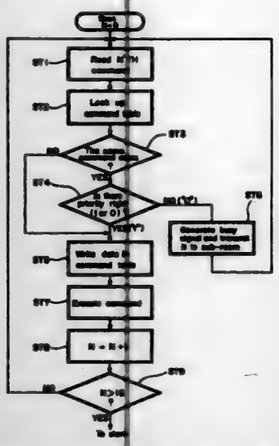
5,193,208
SIGNAL TRANSMISSION SYSTEM
Teppei Yokota, Chiba; Sunaga Morioka, Saitama; Yoshihiro Machinguchi, and Yuji Yamada, both of Tokyo, all of Japan, assignors to Sony Corporation, Japan
Filed Apr. 26, 1991, Ser. No. 691,986
Claims priority, application Japan, May 14, 1990, 1-23317; May 21, 1990, 1-30746; May 23, 1990, 1-33228
Int. Cl.[5] H04H 1/00
U.S. Cl. 455—4.1 4 Claims



1. A signal transmission system in which a plurality of electronic apparatus for respectively transmitting audio and/or video information are concentratedly installed in a single room, and said audio and/or video information from said plurality of said electronic apparatus are modulated by respective carrier frequencies in a frequency-multiplexed fashion and transmitted to a plurality of rooms via a single cable, comprising:

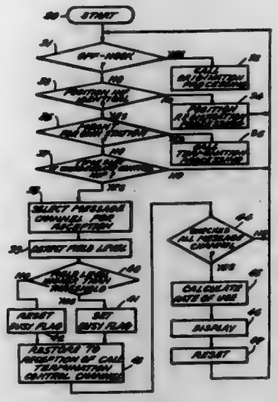
main control means, including means connected to said plurality of electronic apparatus and transmitting remote control signals to control said plurality of electronic apparatus, and means for modulating said audio and/or video information and said remote control signals in a frequency-multiplexed fashion and for allocating said audio and/or video information and said remote control information on respective channels, each having said carrier frequencies;

a plurality of receiving means, including means for selectively receiving one of said audio and/or video information from said electronic apparatus through said main control means, and input means for inputting a command to request to transmit said audio and/or video information from said electronic apparatus, and means for transmitting said remote control signals modulated by a predetermined carrier frequency to said main control means;

a cable means for transmitting said frequency-multiplexed, modulated audio and/or video signals and remote control signals between said main control means and said plurality of receiving means; and

means for giving priority to at least one of said plurality of receiving means which first transmitted a remote control signal to said main control means at the first time to operate one of said electronic apparatuses, and counting means for counting which is started under a condition when another of said receiving means has stopped said operation, and erasing means for erasing said priority after said counting means counts a predetermined number of times.

5,193,209
MOBILE TELEPHONE SYSTEM FOR PRODUCING BUSYNESS INFORMATION FOR SPEECH CHANNELS
Koji Maeda, and Shinji Kawamura, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Apr. 27, 1990, Ser. No. 515,453
Claims priority, application Japan, Apr. 27, 1989, 1-106005; Apr. 27, 1989, 1-106006
Int. Cl.[5] H04Q 7/00
U.S. Cl. 455—34.2 6 Claims



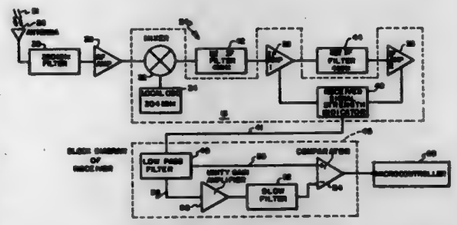
1. Vehicle-mounted telephone equipment for communicating with a base station by using one of a predetermined number of radio message channels, comprising:

detecting means for detecting a respective electric field level of each of said predetermined number of message channels to produce a respective detected electric field level;

counting means responsive to said detected electric field levels for counting the number of the message channels whose electric field levels are higher than a predetermined level; and

means for comparing the counted number to a preset number and for producing busyness information when said counted number exceeds said predetermined number.

5,193,210
LOW POWER RF RECEIVER
Michael G. Nicholas, Hawthorn Woods, and Warren Guthrie, Glen Ellyn, both of Ill., assignors to ABC Auto Alarms, Inc., Elk Grove Village, Ill.
Filed Jul. 29, 1991, Ser. No. 737,256
Int. Cl.[5] H04B 7/00
U.S. Cl. 455—38.1 20 Claims



1. A low power RF receiver for receiving a modulated carrier signal having a coded transmission so as to remotely control a number of vehicular devices comprising:

input means responsive to said modulated carrier signal for generating a RF signal;

oscillator means for generating a desired local oscillator frequency signal;

mixer means responsive to said RF signal and said local oscillator frequency signal for generating an IF signal;

first filter means responsive to said IF signal for generating a first filtered signal;

first FI amplifier means responsive to said first filtered signal for generating a first amplified signal;

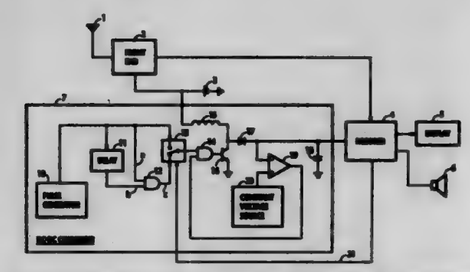
second filter means responsive to said first amplified signal for generating a second filtered signal;

second IF amplifier means responsive to said second filtered signal for generating a second amplified signal;

signal strength means connected to said first and second IF amplifier means and responsive to the amount of current drawn by said first and second IF amplifier means, said signal strength means generating a strength indicator signal derived form assumed current of the first and second amplified signal which is proportional to the strength of the modulated carrier signal received by said input means; and

adaptive threshold means being responsive to comparing said strength indicator signal to a varied threshold reference level to eliminate noise and for generating a logical signal based on said comparison of said varied threshold reference level to said strength indicator signal.

5,193,211
POWER SAVING DC-DC CONVERTER FOR RADIO PAGERS
Hideaki Nobusawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 30, 1991, Ser. No. 737,546
Claims priority, application Japan, Jul. 30, 1990, 2-201634
Int. Cl.[5] H04Q 3/02, 7/14
U.S. Cl. 455—38.2 8 Claims



1. A DC-DC converter for a radio pager having a front end and a decoder for processing an incoming signal received by said front end, wherein the front end is powered by a battery and the decoder generates a first signal indicating a first operating state of the decoder and a second signal indicating a second operating state of the decoder, the DC-DC converter comprising:

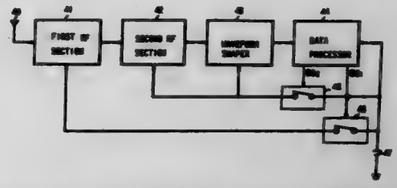
variable duty pulse generator means for generating a first pulse signal of a first duty ratio in response to said first signal or a second pulse signal of a second duty ratio in response to said second signal;

a voltage inducing circuit connected to said battery for receiving a DC voltage therefrom, the circuit including an inductor and a gate-controlled switching element coupled thereto, the switching element being responsive to either of the first and second pulse signals generated by said variable duty pulse generator for allowing a current to periodically pass through the inductor for a varying duration proportional to the duty of either of said pulse signals and inducing in said inductor a voltage higher than the DC voltage of said battery;

a capacitor coupled to the inductor for storing DC energy proportional to the duration of said current and powering the decoder with a voltage developed therein; and

power savings means for comparing the voltage developed in the capacitor with a reference voltage and preventing the voltage in said capacitor from increasing when the voltage developed in the capacitor is higher than the reference voltage.

5,193,212
CIRCUIT FOR SAVING BATTERY FOR USE IN A RADIO PAGING RECEIVER AND METHOD THEREOF
Jin-Hyun Seo, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 4, 1990, Ser. No. 460,995
Claims priority, application Rep. of Korea, May 31, 1989, 1989-7300
Int. Cl.[5] H04Q 3/02; H04B 7/02, 1/16
U.S. Cl. 455—38.3 20 Claims



1. A circuit for saving battery power in a radio paging receiver having first and second radio frequency sections, said circuit generating a first battery saving signal and a second battery saving signal, comprising:

waveform shaping means, coupled to receive said second battery saving signal, for charging a reference voltage to a level of a second voltage, converting output of said second radio frequency section into a digital signal, and cutting off a discharging path of said reference voltage for maintaining said reference voltage at a level of a first voltage;

means for generating said first battery saving signal and said second battery saving signal, and for processing data received from the output of said second radio frequency section, said first battery saving signal and said second battery saving signal being held in a specified state in accordance with the digital signal received from said waveform shaping means;

means for providing the first radio frequency section with power on a basis of said first battery saving signal; and

means for providing the second radio frequency section and said waveform shaping means with power on a basis of said second battery saving signal.

5,193,213
FM BROADCAST BAND SUBCARRIER RECEIVER
Hai-Jong H. Chen, 245 Bittersweet Rd., Orange, Conn. 06477
Filed Mar. 26, 1990, Ser. No. 499,830
Int. Cl.[5] H04B 5/00, 1/16
U.S. Cl. 455—45 16 Claims

1. An FM subcarrier receiver of the type useful for detection of a relatively high frequency desired subcarrier signal transmitted on an FM carrier which includes a baseband signal and said relatively high frequency subcarrier signal, comprising:

(a) radio frequency means for receiving a radio frequency signal having frequency modulated baseband and subcarrier components and outputting said baseband and relatively high frequency subcarrier signals;

(b) a high pass filter for receiving the output of said radio frequency means;

(c) a tuned circuit for receiving the output of said high pass filter, said tuned circuit comprising a first inductor of fixed

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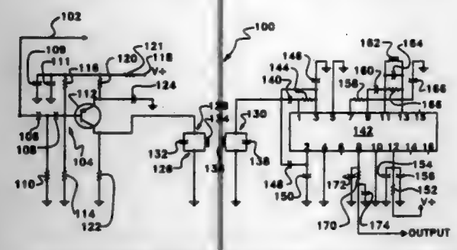
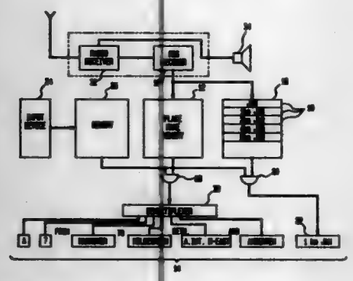
inductance and a first capacitor tuned substantially to the frequency of the subcarrier which one wishes to detect;
(d) a second tuned circuit tuned to said subcarrier which one wishes to detect, said second tuned circuit comprising a second inductor of fixed inductance and a second capacitor, said first and second inductors comprising ferrite



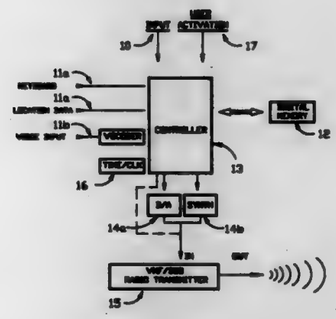
cores and adjustably positioned with respect to each other to allow magnetic coupling therebetween; and
(e) a subcarrier demodulator coupled to said second inductor and said second capacitor for providing an audio signal corresponding to the information carried by said desired subcarrier.

5,193,214
VEHICULAR RADIO RECEIVER WITH STANDARD TRAFFIC PROBLEM DATABASE
Claus Marder, Bad Salzdetfurth; Ralf Duckeck, and Peter Brügge, both of Hildesheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Continuation of Ser. No. 459,141, Dec. 29, 1989, abandoned.
This application Dec. 9, 1991, Ser. No. 803,570
Int. Cl.[5] H04B *7/00*; G08G *1/09*
U.S. Cl. 455—54.2 6 Claims



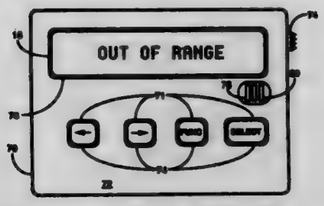
1. A radio receiver having;
a decoder (10) for decoding traffic announcements including traffic problem codes received in digital form,
at least one memory device (12, 16) adapted to contain both a plurality of items of factual information (b) and route specific characteristics, wherein said items of factual information respectively correspond to said traffic problem codes,
means (14), connected to an output of said decoder, for interpreting said traffic problem codes and retrieving corresponding traffic announcement information from said at least one memory device (12, 16) and indicating it to a vehicle operator by at least one of visual and acoustical indications,
wherein
each of said items of factual information (b) corresponding to the traffic problem code is stored, together with any numerical values (c) quantifying a distance parameter of the traffic problem, at a single respective address in said at least one memory device, thereby facilitating compact transmission of said traffic problem code and rapid retrieval of the items of factual information; and
each of said items of factual information (b) provided with the distance parameter numerical values (c) is also identically stored again in said at least one memory device without the numerical values.

5,193,215
LOCATION SIGNALLING DEVICE FOR AUTOMATICALLY PLACING A RADIO DISTRESS CALL
Anthony L. Ohmer, 1435 Bedford St., Apt. 6-E, Stamford, Conn. 06905
Filed Jan. 25, 1990, Ser. No. 470,267
Int. Cl.[5] H04B *7/00, 1/034*; G08G *1/123*
U.S. Cl. 455—66 12 Claims



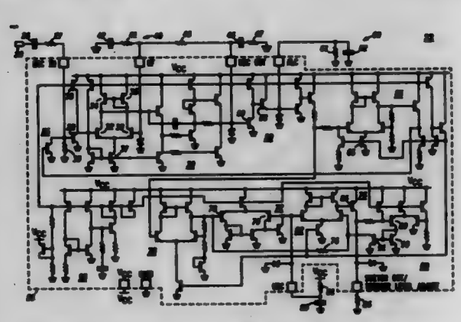
1. A location signalling device for use in combination with a coordinate location data generating unit and a radio transmitter having a transmitter input, comprising:
a device input/output port for communicating with the coordinate location data generating unit and entering location data provided from the coordinate location data generating unit into the location signalling device;
a memory for storing the entered coordinate location data;
a timer/clock having periodic time setting means for setting predetermined periodic time intervals for entering coordinate location data;
a device controller coupled to said device input/output port, said timer/clock, and said memory, including a microprocessor having programmed location data updating means for automatically communicating with the coordinate location at a generating unit to provide current coordinate location data at the predetermined periodic time intervals set by said timer/clock and storing current location data entries in said memory in order as to time of entry;
a device output including an output terminal connected to the transmitter input of the radio transmitter for automatically retrieving a most current entry of the location data stored in memory and sending said most current location data to the input of the radio transmitter in response to a distress activation signal; and
activation means for providing the activation signal to said device output means in response to an actuating action by a user when a distress call is to be sent.

5,193,216
DETECTING OUT OF RANGE IN RESPONSE TO A LOSS OF SIGNAL AND A HISTORY OF APPROACHING OUT OF RANGE PRIOR TO THE LOSS OF SIGNAL
Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 1, 1990, Ser. No. 531,603
Int. Cl.[5] H04B *17/00*
U.S. Cl. 455—67.7 9 Claims



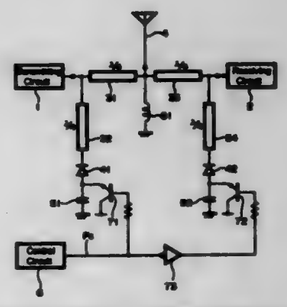
1. A method in a communications receiver for receiving a signal transmitted by a transmitter, the signal having a signal strength, the method comprising the steps of:
measuring the signal at a plurality of times to acquire a plurality of received signal strength values indicating the signal strength at the plurality of times;
storing the plurality of received signal strength values;
detecting loss of the signal; and
determining the communications receiver is out of range of the transmitter if both the loss of the signal is detected and ones of the plurality of received signal strength values stored within a predetermined time prior to detection of the loss of the signal indicate successively decreasing signal strength for the predetermined time before the loss of the signal was detected.

5,193,217
LOW VOLTAGE IC FOR VOICE OPERATED TRANSCEIVER
Gerald K. Lam, Harbour City; Man Chan, Ha Cha, and Chi M. Liu, Kowloon, all of Hong Kong, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 23, 1990, Ser. No. 513,453
Int. Cl.[5] H04B *1/46*
U.S. Cl. 455—79 5 Claims



1. A portable transceiver comprising:
a transmitter;
a receiver; and
a transmit/receive switch coupled to the transmitter and having a microphone operatively connected thereto, the transmit/receive switch being constructed to receive input signals from the microphone and to turn on the transmitter only when the input signals include a voice signal, the transmit/receive switch including
and audio amplifier coupled to receive input signals from the microphone and including variable circuitry providing a variable gain and bandwidth,
a level detector connected to the audio amplifier for providing an output level signal corresponding to the level of input signals applied to the audio amplifier,
a level adjusting circuit coupled to the level detector and the audio amplifier and providing automatic level control and including variable circuitry providing variable level detecting attack time and variable attenuation,
a noise monitoring circuit coupled to receive the output level signal from the level detector and including variable circuitry providing a variable attack and decay time connected to produce an output signal from the noise monitoring circuit when a voice signal occurs in the input signal of the audio amplifier,
a comparator circuit having two inputs and coupled to receive the output level signal from the level detector at one input and the output signal from the noise monitoring circuit at the other input,
the comparator circuit further including a trigger level and a circuit for adjusting the trigger level, the comparator being connected to supply a switching signal to the transmitter and including variable circuitry for adjusting the trigger level of the comparator,
the audio amplifier, the level detector, the level adjusting circuit, the noise monitoring circuit, and the comparator circuit all being direct coupled circuits and all being formed as an integrated circuit which operates in a range below approximately 1.8 volts on a single semiconductor chip, and
no more than eight external connections to the integrated circuit connecting the variable circuitry included in the audio amplifier, the variable circuitry included in the level adjusting circuit, the variable circuitry included in the noise monitoring circuit, and the variable circuitry included in the trigger level adjusting circuit external to the integrated circuit, providing the coupling between the microphone and the audio amplifier and the coupling between the audio amplifier and the transmitter and, for connecting power and reference supplies to the integrated circuit.

5,193,218
SIGNAL TRANSMISSION RECEPTION SWITCHING APPARATUS
Norio Shima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 4, 1991, Ser. No. 664,214
Claims priority, application Japan, Mar. 8, 1990, 2-057676
Int. Cl.[5] H04B *1/46*
U.S. Cl. 455—80 8 Claims



1. A signal transmission reception switching apparatus in which a transmission signal and a reception signal are selectively switched to access an antenna, comprising:
(a) a first transmission line connected between a transmission

put signal of said modulator while said modulator is in said

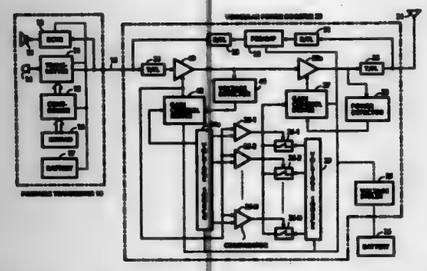
terminal from which the transmission signal is supplied and an antenna terminal, the first transmission line having a length substantially equal to ¼ of an average wavelength λ of the transmission and the reception signals;
(b) a first switching element connected to ground;
(c) a second transmission line connected between a transmission terminal and the first switching element, the second transmission line having a length substantially equal to ¼ of an average wavelength λ of the transmission and the reception signals;
(d) a third transmission line connected between the antenna terminal and a reception terminal to which the reception signal is supplied, the third transmission line having a length substantially equal to ¼ of an average wavelength λ of the transmission and the reception signals;
(e) a second switching element connected to ground;
(f) a fourth transmission line connected between the reception terminal and the second switching element, the fourth transmission line having a length substantially equal to ¼ of an average wavelength λ of the transmission and the reception signals, wherein when the transmission signal is transmitted, the first switching element is turned ON and the second switching element is turned OFF, while when the reception signal is received, the first switching element is turned OFF and the second switching element is turned ON.

5,193,219

VEHICULAR POWER BOOSTER CIRCUITRY FOR MULTI-LEVEL PORTABLE TRANSCEIVER

Yoshiharu Tamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 17, 1990, Ser. No. 569,041
Claims priority, application Japan, Aug. 18, 1989, 1-212334
Int. Cl.[5] H04B *1/38*
U.S. Cl. 455—89 9 Claims



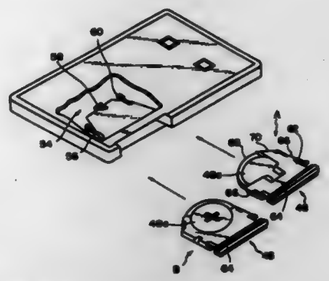
1. A mobile radio transceiver comprising:
a portable transceiver comprising a transmitter for generating a radio-frequency (RF) transmit signal, manual power setting means for setting said transmit signal at one of predetermined power levels and a receiver for receiving an RF receive signal; and
a vehicular power booster coupled by a connecting cable to said portable transceiver to receive said RF transmit signal, comprising:
first power detector means for detecting the power of the RF transmit signal received from the portable transceiver;
voltage setting means for generating reference voltages respectively representing said predetermined power levels;
decision means for identifying one of said reference voltages as corresponding to the power detected by said first power detector means;
gain controlled power amplifying means for amplifying said RF transmit signal and applying the power-amplified RF transmit signal to an antenna;
second power detector means coupled to the output of said power amplifying means for detecting power of said power-amplified RF transmit signal; and
gain control means responsive to a difference between the power detected by said second power detector means and said identified reference voltage for controlling the gain of said power amplifying means so that said difference is reduced to a minimum.

5,193,220

DEVICE FOR MOUNTING AN ELECTRONIC PART

Makoto Ichinohe; Masahiro Matai; Shiajiro Umetsu, and Seiji Nishikawa, all of Tokyo, Japan, assignors to NEC Corporation and Nippon Telegraph and Telephone Corporation, both of Japan

Filed Jun. 1, 1990, Ser. No. 531,838
Claims priority, application Japan, Jun. 2, 1989, 1-139096; Jun. 2, 1989, 1-140883
Int. Cl.[5] H04B *1/38;* H01M *2/10*
U.S. Cl. 455—89 12 Claims



1. A radio device, comprising:
(a) electronic circuitry and an antenna, said antenna having antenna related parameters associated therewith;
(b) a battery compartment;
(c) a removable battery pack including a battery, said battery pack being mountable in said battery compartment in first and second positions;
(d) detecting means for detecting the position of said battery pack in said battery compartment and for providing a detecting signal indicative of said position; and
(e) means coupled to said detecting signal and effective for control said antenna related parameters responsive to said detecting signal.

5,193,221

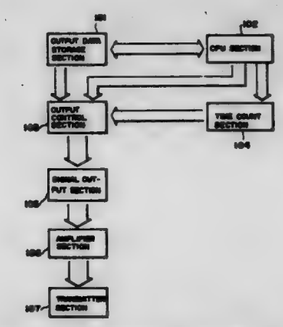
SIGNAL OUTPUT APPARATUS

Kazutaru Saginao, Yokohama, and Hideyuki Okazuma, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 12, 1990, Ser. No. 581,330
Claims priority, application Japan, Sep. 14, 1989, 1-239474
Int. Cl.[5] H04B *1/02*
U.S. Cl. 455—92 6 Claims

1. A signal output apparatus comprising:
a CPU section;
output data storage means for storing output data from said CPU section;
main clock signal generating means outputting a main clock signal;
a count circuit receiving said main clock signal and outputting a timing signal equal to a predetermined number of said main clock signals;
output control means for generating an output control signal comprised of "0" data and "1" data according to said output data, said "0" data and "1" data being expressed by different combinations of high level period and low level

period, in response to said timing signal, wherein said output control means includes:
an address selection circuit for decoding an address signal output by said CPU section and selecting an address of said output data storage unit,
a parallel-to-aerial circuit for time sequentially outputting the data in said output data storage unit at an address selected by said address selection circuit, and



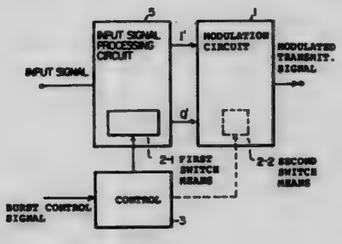
a one-data variable counter receiving a logical AND between an output from said count unit and an output from said parallel-to-aerial circuit at said selected address and outputting said output control signal; and
signal output means, receiving said main clock signal and said output control signal, for outputting said main clock signal intermittently in response to a level change of said output control signal.

5,193,222

SYSTEM FOR INTERRUPTING A TRANSMITTER OUTPUT WAVE

Susumu Sasaki, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 11, 1990, Ser. No. 522,096
Claims priority, application Japan, May 12, 1989, 1-117444
Int. Cl.[5] H04B *1/02;* H01Q *11/12*
U.S. Cl. 455—102 22 Claims



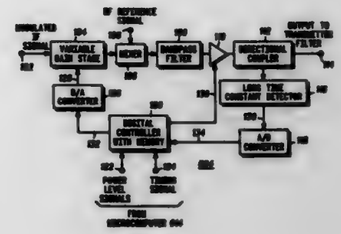
1. A transmitter comprising:
a modulator capable of selecting one of two modes of operations depending on types of parallel input signals, in a first mode operation an envelope of an output signal of said modulator never being substantially zero at any instant, in a second mode operation an envelope of said output signal of said modulator being substantially 100% amplitude-modulated or substantially 180 degrees phase-modulated;
first switch means for switching said types of the parallel input signals, between said first mode operation of said modulator and said second mode operation of said modulator;
second switch means for interrupting and resuming an output signal of said modulator while said modulator is in said second mode operation; and
control means for instructing said first and second switch means to operate.

5,193,223

POWER CONTROL CIRCUITRY FOR A TDMA RADIO FREQUENCY TRANSMITTER

Thomas J. Walczak, Woodstock, and Stephen V. Cahill, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 632,231, Dec. 20, 1990, abandoned.
This application Jul. 27, 1992, Ser. No. 920,178
Int. Cl.[5] H03C *1/62*
U.S. Cl. 455—115 30 Claims



1. A transmitter including power control circuitry responsive to level control signals and a transmit intermediate frequency (IF) signal from a signal source for maintaining the magnitude of a radio frequency (RF) output signal at a power level selected from a plurality of power levels by the level control signals, said transmitter comprising:
reference means for generating an RF reference signal;
adjusting means having variable gain for adjusting the transmit IF signal substantially in proportion to the value of a gain control signal to produce an adjusted transmit IF signal;
mixing means for combining the adjusted transmit IF signal and the RF reference signal to produce an RF transmit signal;
amplifying means for amplifying the RF transmit signal to produce the RF output signal;
detecting means coupled to the RF output signal for generating a detector output signal having a value related to the magnitude of the RF output signal; and
control means coupled to the detector output signal for, at a plurality of intervals, sampling the value of the detector output signal, and adjusting the value of the gain control signal in response to the difference between the sampled value of the detector output signal and a desired value of the selected power level.

5,193,224

ADAPTIVE PHASE CONTROL FOR A POWER AMPLIFIER PREDISTORTER

John D. McNicol, Ottawa, and Stephen G. Harman, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 24, 1991, Ser. No. 690,432
Int. Cl.[5] H03F *1/26;* H04B *15/00*
U.S. Cl. 455—126 8 Claims

1. A method of adaptively controlling a predistorter to

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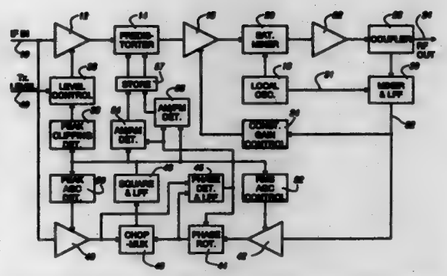
compensate for phase distortion in a power amplifier of an RF(radio frequency) communications system in which an IF(intermediate frequency) input signal is mixed with a local oscillator signal to produce an RF signal for transmission, comprising the steps of:

deriving from the local oscillator signal and the RF signal an IF output signal representative of the output power of the power amplifier;

detecting phase differences between the IF input and IF output signals to produce a phase difference signal;

comparing an amplitude of at least one of the IF input and IF output signals with a comparison level;

selectively inverting the phase difference signal in dependence upon a result of the comparison; and



integrating the selectively inverted phase difference signal to produce a phase control signal for the predistorter.

DESIGN PATENTS

GRANTED Mar. 9, 1993

ERRATA

For CLASS	See PATENT NO.
D07-350	333,782

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1148
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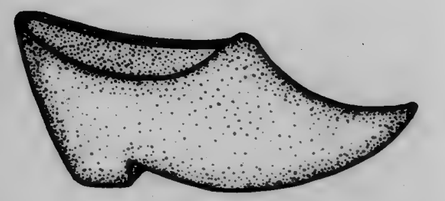
UMI

DESIGNS

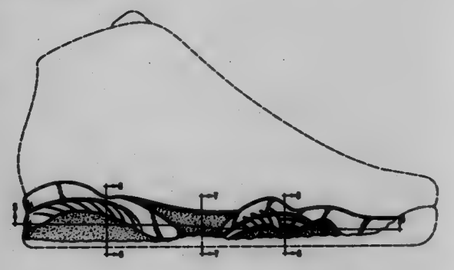
MARCH 9, 1993

333,718
SHOE
William P. Detmer, P.O. Box 641-Creek Rd., Pleasant Valley, N.Y. 12569
Filed Mar. 30, 1990, Ser. No. 502,425
Term of patent 14 years
U.S. Cl. D2—264



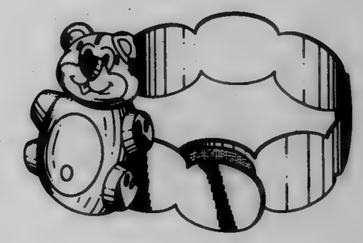
333,719
CLEAT SKIRT
Paul A. Latraverse; Harris L. MacNeill, both of Northborough, and Thomas W. Erich, Holliston, all of Mass., assignors to MacNeill Engineering Company, Inc., Marlborough, Mass.
Filed Aug. 30, 1989, Ser. No. 400,357
Term of patent 14 years
U.S. Cl. D2—314

333,720
SHOE MIDSOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 12, 1992, Ser. No. 897,535
Term of patent 14 years
U.S. Cl. D2—314



333,721
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 12, 1992, Ser. No. 897,539
Term of patent 14 years
U.S. Cl. D2—314

333,722
COMBINED BELT AND BANK FOR A BABY
Joseph J. Ricciardi, 719 S. Water St., Kent, Ohio 44240
Filed Jan. 24, 1991, Ser. No. 645,295
Term of patent 14 years
U.S. Cl. D2—629



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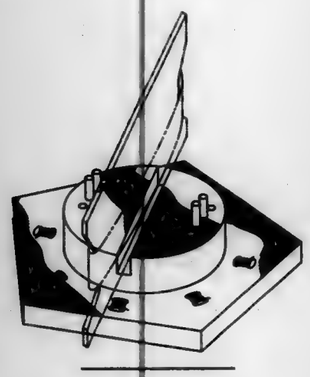
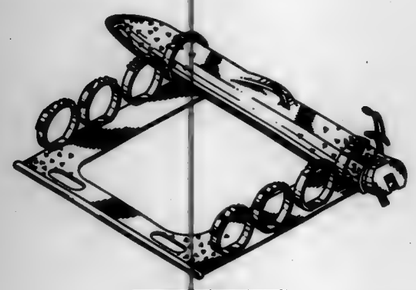
333,723
HOLDER FOR FABRIC REELS
Mary E. Risner, P.O. Box 731, Wheeler, Tex. 79096
Filed Mar. 7, 1991, Ser. No. 665,720
Term of patent 14 years
U.S. Cl. D3—23

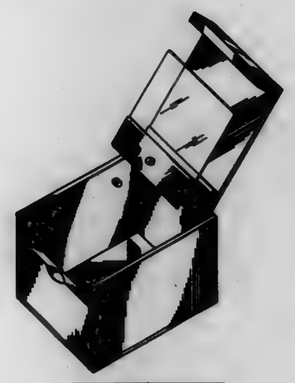


333,724
SKI CARRIER
Theodore Dimacopoulos, 7 Apple Tree La., Walpole, Mass. 02081
Filed Jan. 24, 1991, Ser. No. 645,671
Term of patent 14 years
U.S. Cl. D3—36



333,725
COMBINED SUITCASE AND CADDY
Robert E. Thomas, 650 Floyd Ave., Chula Vista, Calif. 92010
Filed Nov. 13, 1990, Ser. No. 611,954
Term of patent 14 years
U.S. Cl. D3—72

333,726
RECIPE BOX
Samuel L. Beder, Cape Elizabeth, Me., assignor to Sportingwood's, Inc., Portland, Me.
Filed Jan. 8, 1991, Ser. No. 638,653
Term of patent 14 years
U.S. Cl. D3—78

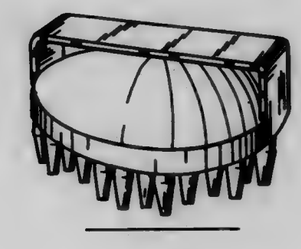


333,727
CARRYING CASE
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.
Filed Mar. 1, 1991, Ser. No. 662,884
Term of patent 14 years
U.S. Cl. D3—78

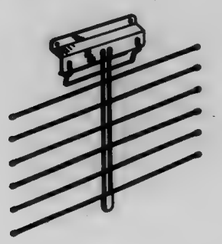
333,728
KNIFE SHEATH
Brett P. Seber, Escondido, Calif., assignor to Buck Knives, Inc., El Cajon, Calif.
Filed Sep. 30, 1991, Ser. No. 767,912
Term of patent 14 years
U.S. Cl. D3—102

333,729
BELT PACK
Ellen T. Hopp, 11751 Frederick Dr., Garden Grove, Calif. 92640
Filed Jul. 29, 1991, Ser. No. 736,807
Term of patent 14 years
U.S. Cl. D3—106

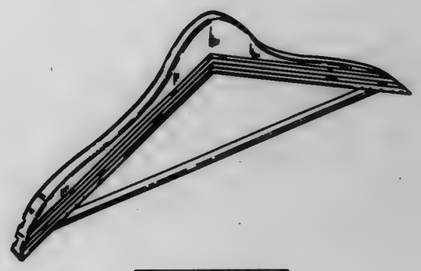
333,730
CURRY COMB
Jack L. Martin, Libertyville, Ill., assignor to Libertyville Saddle Shop, Inc., Libertyville, Ill.
Filed Jun. 27, 1990, Ser. No. 544,495
Term of patent 14 years
U.S. Cl. D4—136



333,731
TIE RACK
Rich Klein, Overland Park, Kans., and Vijay S. Malik, Kansas City, Mo., assignors to Lynk, Inc., Shawnee Mission, Kans.
Filed Oct. 9, 1990, Ser. No. 597,735
Term of patent 14 years
U.S. Cl. D6—317



333,732
CLOTHES HANGER BODY
Henry Mattesky, 77 Mawal Dr., Cedar Grove, N.J. 07009
Filed Mar. 26, 1991, Ser. No. 675,476
Term of patent 14 years
U.S. Cl. D6—328



333,733
STACKABLE INTERLOCKING CHAIR
John D. Sammons, Adairsville, Ga., assignor to Church Chair Industries, Inc., Rome, Ga.
Filed Jul. 7, 1992, Ser. No. 909,686
Term of patent 14 years
U.S. Cl. D6—334

333,734
CHAIR
Stanley L. Wright, 322 Gunwood Rd., Huron, Ohio 44839
Filed Jun. 19, 1990, Ser. No. 540,514
Term of patent 14 years
U.S. Cl. D6—358

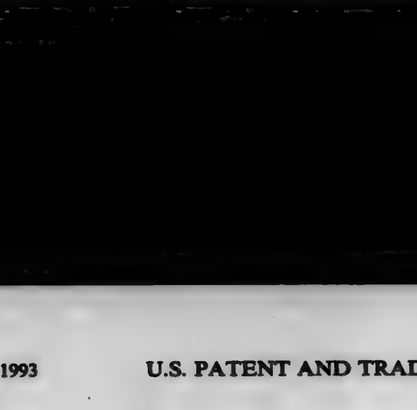
333,735
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,672
Term of patent 14 years
U.S. Cl. D3—36

333,736
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,673
Term of patent 14 years
U.S. Cl. D3—36

333,737
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,674
Term of patent 14 years
U.S. Cl. D3—36

333,738
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,675
Term of patent 14 years
U.S. Cl. D3—36

333,739
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,676
Term of patent 14 years
U.S. Cl. D3—36



333,740
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,677
Term of patent 14 years
U.S. Cl. D3—36

333,741
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,678
Term of patent 14 years
U.S. Cl. D3—36

333,742
SHOE
Jeffrey Lee Hamilton, 1 Bayberry Ln., Bedford, N.H. 03102
Filed Jan. 24, 1991, Ser. No. 645,679
Term of patent 14 years
U.S. Cl. D3—36

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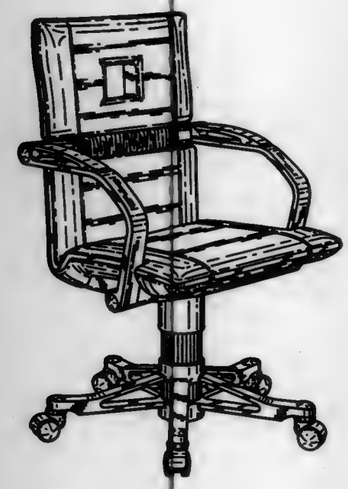
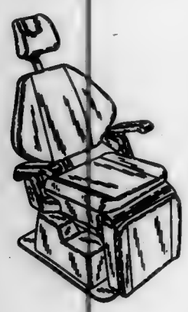
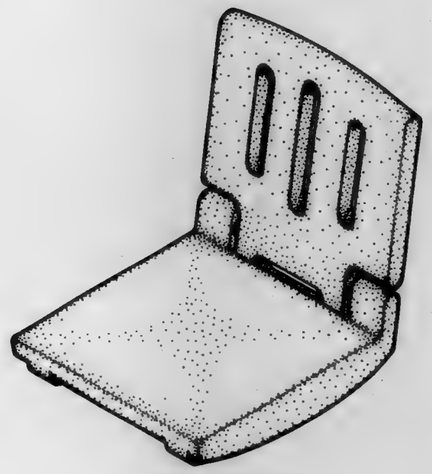
333,735
CHAIR
Raymond Carter, Marina del Rey, Calif., assignor to Grammer AG, Amberg, Fed. Rep. of Germany
Filed Mar. 28, 1989, Ser. No. 329,672
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1988, 8802455
Term of patent 14 years
U.S. Cl. D6—366



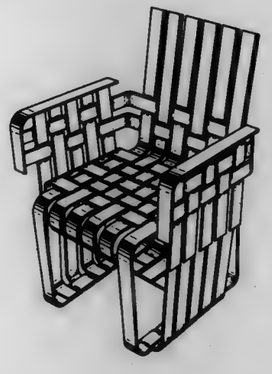
333,736
DENTAL CHAIR
Carl G. Nordstrom, Lake Oswego, Oreg., assignor to A-Dec, Inc., Newberg, Oreg.
Continuation-in-part of Ser. No. 501,657, Mar. 29, 1990. This application Apr. 30, 1991, Ser. No. 694,017
Term of patent 14 years
U.S. Cl. D6—367



333,737
PORTABLE FOLDING ROCKER SEAT
Joe L. Adams, 6203 Fruderburg Bend Rd., Pell City, Ala. 35125
Filed Jun. 19, 1990, Ser. No. 540,802
Term of patent 14 years
U.S. Cl. D6—368

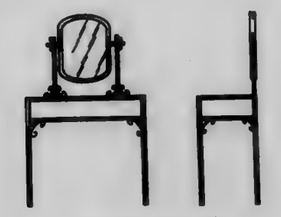


333,738
CHAIR
Frank O. Gehry, Santa Monica, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 24, 1990, Ser. No. 587,368
Term of patent 14 years
U.S. Cl. D6—369

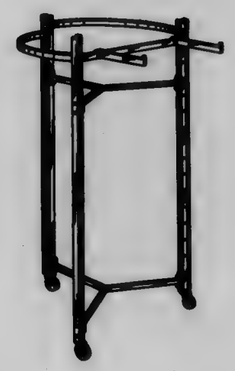


333,739
CHAIR
Michael Yeh, Hacienda Hgts, Calif., assignor to Coaster Co. of America, Inc., Santa Fe Springs, Calif.
Filed May 16, 1990, Ser. No. 523,937
Term of patent 14 years
U.S. Cl. D6—380

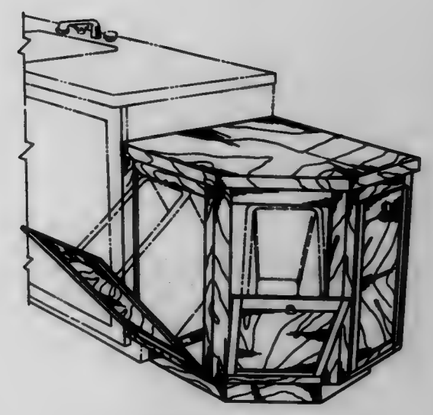
333,740
VANITY
Mark Ma, 1415 Martens Dr., Hammond, La. 70401
Filed May 7, 1990, Ser. No. 519,663
Term of patent 14 years
U.S. Cl. D6—397



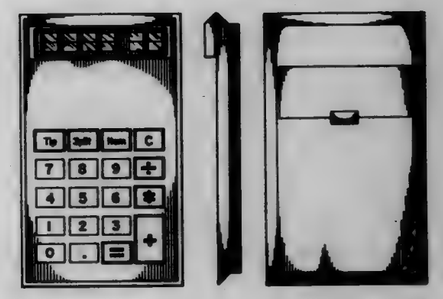
333,741
GARMENT DISPLAY RACK
David Katz, Friendsville, Pa., assignor to Kason Industries, Inc., Binghamton, N.Y.
Continuation of Ser. No. 128,675, Dec. 4, 1987, abandoned. This application Feb. 28, 1991, Ser. No. 662,795
Term of patent 14 years
U.S. Cl. D6—411



333,742
CABINET FOR RECYCLING BINS
James H. Rentenaar, Jr., and Donna M. Rentenaar, both of R.D. 1, Box 140-D, Chatham, N.Y. 12037
Filed Jul. 1, 1991, Ser. No. 724,355
Term of patent 14 years
U.S. Cl. D6—442



333,743
COMBINED RESTAURANT CHECK TRAY AND CALCULATOR
David H. Johnson, 175 Bartlett Ave., Providence, R.I. 02905
Filed May 13, 1991, Ser. No. 699,558
Term of patent 14 years
U.S. Cl. D6—449



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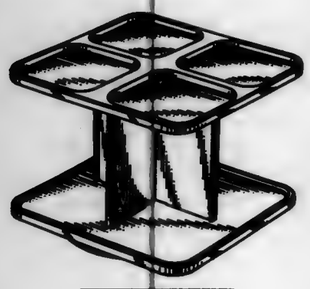
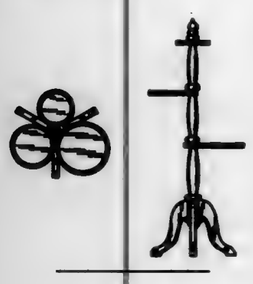
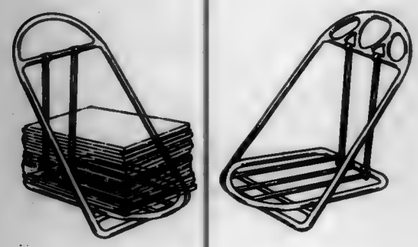
333,744
ROTATABLE TRAY
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Apr. 30, 1990, Ser. No. 516,877
Term of patent 14 years
U.S. Cl. D6—457



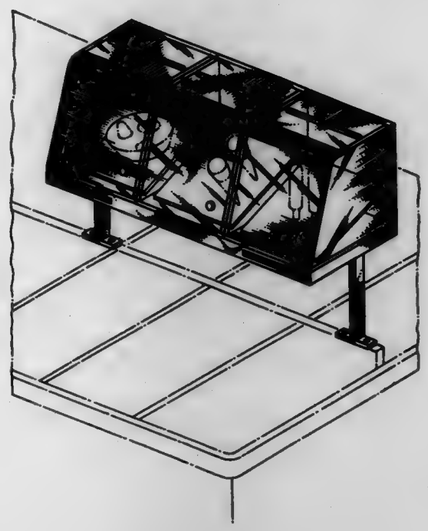
333,745
DISPLAY STAND
Mark Ma, 1415 Marteau Dr., Hammond, La. 70401
Filed Jan. 11, 1991, Ser. No. 640,006
Term of patent 14 years
U.S. Cl. D6—460



333,746
MAGAZINE/NEWSPAPER RACK
Gerald D. Willhite, Duncanville, Tex., assignor to Jokari/US, Inc., Dallas, Tex.
Filed Jan. 10, 1992, Ser. No. 819,502
Term of patent 14 years
U.S. Cl. D6—462

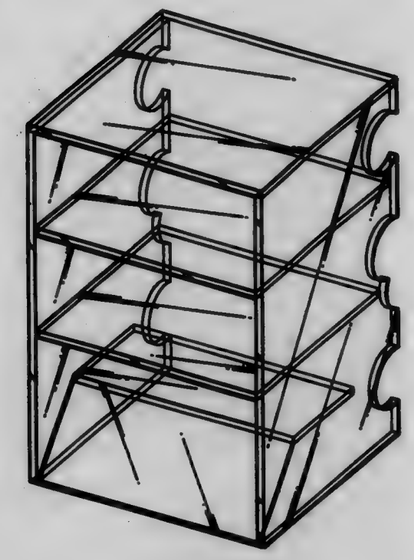


333,747
DISPLAY CASE
Nicholas Uchyn, 33 Sparrowhawk, Irvine, Calif. 92714
Filed Jun. 17, 1991, Ser. No. 716,339
Term of patent 14 years
U.S. Cl. D6—471

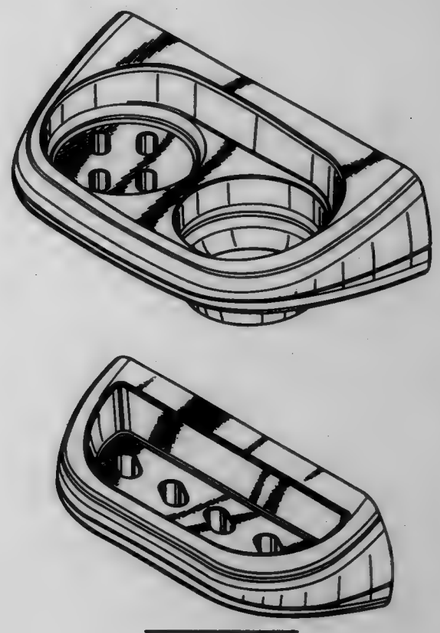


333,748
MERCHANDISING DISPLAY
David C. F. Stoddard, Atlanta, and Ladd M. Orr, Clarkston, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Apr. 27, 1992, Ser. No. 873,731
Term of patent 14 years
U.S. Cl. D6—479

333,749
STEREO STAND
Miranda Leonard, 492 Beacon St., Boston, Mass. 02115
Filed Aug. 1, 1991, Ser. No. 738,943
Term of patent 14 years
U.S. Cl. D6—479



333,751
BATHROOM ACCESSORY SUPPORT FIXTURE
Gregory M. Crook, Columbus, and Kent W. Murphy, Wooster, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed May 25, 1990, Ser. No. 528,774
Term of patent 14 years
U.S. Cl. D6—524



333,750
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company, Inc., Birmingham, Ala.
Filed Aug. 10, 1990, Ser. No. 565,615
Term of patent 14 years
U.S. Cl. D6—500

333,752
INFANT SUPPORT PAD
Cynthia A. Mason, 22 N. Granada Ave., Unit E, Alhambra, Calif. 91801
Filed Aug. 1, 1991, Ser. No. 738,746
Term of patent 14 years
U.S. Cl. D6—596

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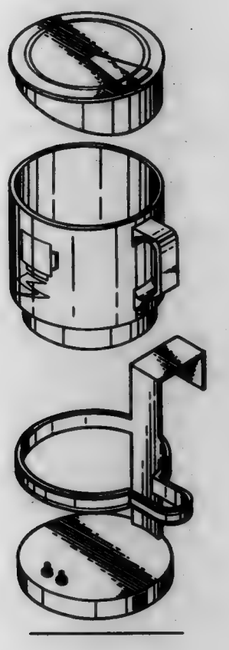
333,753
KETTLE
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Apr. 30, 1990, Ser. No. 513,591
Term of patent 14 years
U.S. Cl. D7—321

333,754
CASSEROLE DISH COVER
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Deerfield, Ill.
Continuation of Ser. No. 561,532, Aug. 1, 1990, abandoned. This application Jan. 22, 1992, Ser. No. 902,337
Term of patent 14 years
U.S. Cl. D7—392.1

333,755
REUSABLE COFFEE FILTER
Phyllis Olekszuk, 113 Gilbert Ave., Niles, Ohio 44446
Filed Mar. 4, 1991, Ser. No. 663,651
Term of patent 14 years
U.S. Cl. D7—400

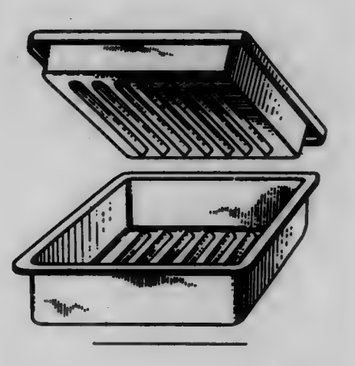
333,756
COMBINED CUP WITH HEATING ELEMENT
Teri R. Campbell, 2625 E. Fork Rd., Aberdeen, Ohio 45101-9792
Filed Dec. 7, 1990, Ser. No. 624,254
Term of patent 14 years
U.S. Cl. D7—507



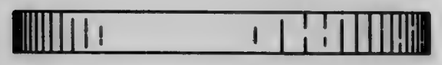
333,757
TRAY
Pieter K. J. DeCoster, Aalst, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.
Filed May 8, 1990, Ser. No. 520,706
Term of patent 14 years
U.S. Cl. D7—550

333,758
CANISTER
Stig Lillelund, Gentofte, Denmark, assignor to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 28, 1991, Ser. No. 677,272
Term of patent 14 years
U.S. Cl. D7—612

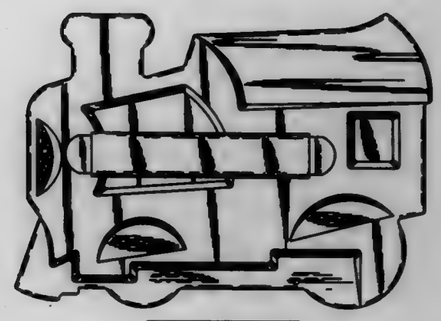
333,759
HAMBURGER PRESS
Kenneth M. Ferris, Gracy La., East Hampton, N.Y. 11937
Filed Feb. 11, 1991, Ser. No. 654,366
Term of patent 14 years
U.S. Cl. D7—672



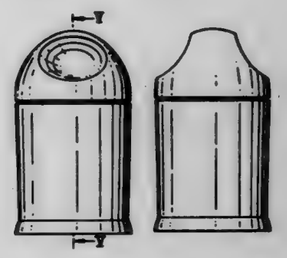
333,760
COMBINED TOP PIE CRUST SEALER AND TRIMMER
Robert D. Walker, 125 E. Guadalupe #148, Gilbert, Ariz. 85234
Filed Jul. 18, 1991, Ser. No. 731,938
Term of patent 14 years
U.S. Cl. D7—672



333,761
PANCAKE MOLD
Jenny Dicochea, 36442 Road 172, Visalia, Calif. 93291
Filed Aug. 19, 1991, Ser. No. 746,562
Term of patent 14 years
U.S. Cl. D7—675



333,762
CHEESE GRATER
Bruno Herren, Berne, Switzerland, assignor to Mehu Mederae Haushaltwaren A.G., Zollikofen, Switzerland
Filed Jul. 22, 1991, Ser. No. 733,409
Claims priority, application United Kingdom, Feb. 20, 1991, 2013169
Term of patent 14 years
U.S. Cl. D7—678



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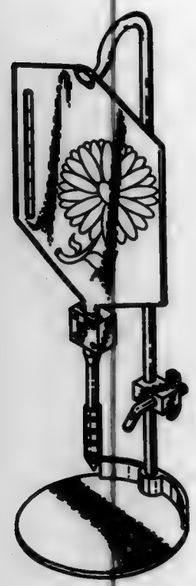
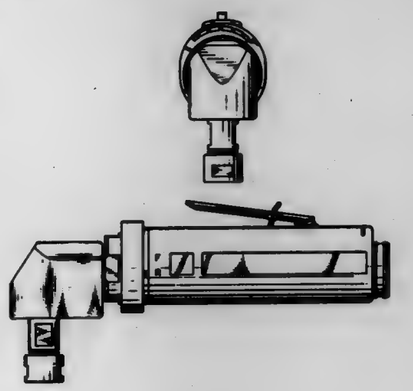
333,763
PLANT WATERER
Rita Collins, 2462 N. Nye #131, Fremont, Nebr. 68025
Filed Feb. 12, 1991, Ser. No. 654,555
Term of patent 14 years
U.S. Cl. D8—1



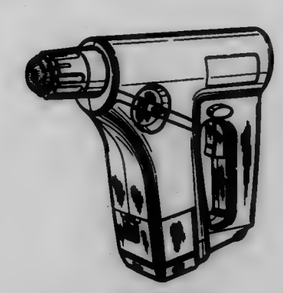
333,765
PORTABLE RECIPROCATING FILE
Osamu Tamanaha, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1990, Ser. No. 634,073
Term of patent 14 years
U.S. Cl. D8—61

333,766
ANGLED PNEUMATIC GRINDER
Gregory P. Albert, Waverly, N.Y.; Kenneth J. Dubuque, Shohequinth, Pa.; Bruce D. Fay, Sayre, Pa., and duane S. Gable, Ulster, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Oct. 11, 1990, Ser. No. 595,693
Term of patent 14 years
U.S. Cl. D8—62

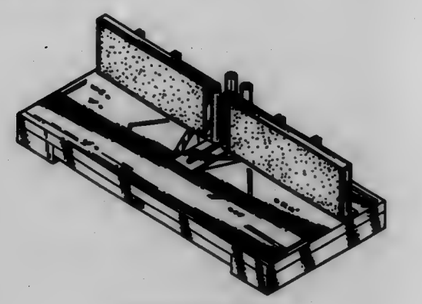


333,764
COMBINED SCISSORS AND COMB
dp Mal Pava, Via Carlo Grassi 47, 10078 Venaria Reale (Torino), Italy
Filed Oct. 18, 1990, Ser. No. 599,788
Claims priority, application Italy, Apr. 20, 1990, 52981 B/90
Term of patent 14 years
U.S. Cl. D8—57

333,767
PORTABLE CORDLESS HAMMER
Yuichiro Sasaki, and Chikai Yoshimizu, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan
Filed Oct. 19, 1990, Ser. No. 600,354
Claims priority, application Japan, Feb. 23, 1990, 2-5840
Term of patent 14 years
U.S. Cl. D8—69

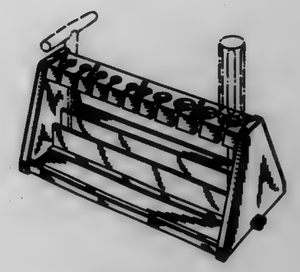


333,768
MITRE SAW GUIDE
Gary Schulenberg, 421 Woodrow Ave., Dunkirk, N.Y. 14048
Filed Apr. 4, 1990, Ser. No. 504,984
Term of patent 14 years
U.S. Cl. D8—71

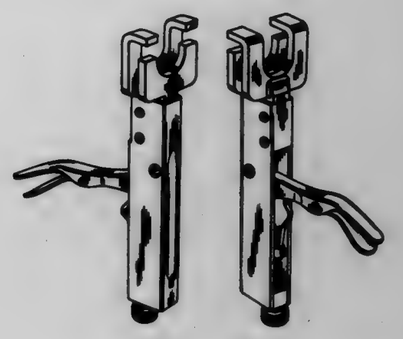


333,769
HEX KEY HOLDER
Mitchell Jurockson, Lancaster, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.
Filed Oct. 15, 1991, Ser. No. 775,380
Term of patent 14 years
U.S. Cl. D8—71

333,770
HEX KEY HOLDER
Mitchell Jurockson, Lancaster, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.
Filed Oct. 15, 1991, Ser. No. 775,379
Term of patent 14 years
U.S. Cl. D8—71



333,771
CLAMP
Nobuyuki Aoki, Tokyo, Japan, assignor to Koto Sangyo Co., Ltd., Tokyo, Japan
Filed Jan. 10, 1991, Ser. No. 641,120
Term of patent 14 years
U.S. Cl. D8—72



333,772
LETTER OPENER
Odo H. Klose, Wuppertal, Fed. Rep. of Germany, assignor to Priesenta KG, Weber & Co., Solingen, Fed. Rep. of Germany
Filed May 4, 1987, Ser. No. 446,412
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 5MR9723
Term of patent 14 years
U.S. Cl. D8—102

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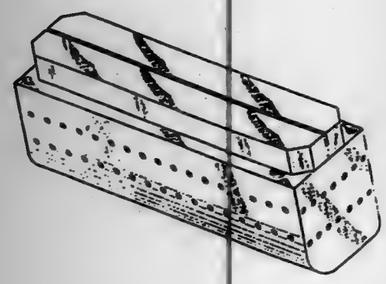
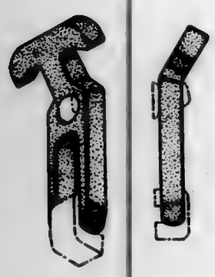
333,773
LETTER OPENER
Samuel H. Schapiro, Jr., Lexington, Ky., assignor to Blue Ribbon Pen & Pencil Co., Inc., Georgetown, Ky.
Filed Jul. 23, 1990, Ser. No. 556,215
Term of patent 14 years
U.S. Cl. D8—102

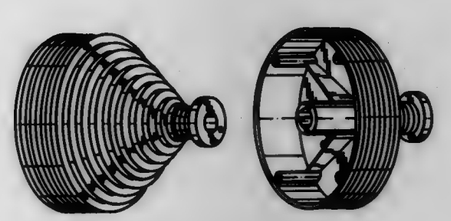
333,774
HANDLE FOR A KNIFE BLADE
Steven C. Black, 119 W. 8th Ave., Conshohocken, Pa. 19428
Filed Aug. 30, 1990, Ser. No. 574,944
Term of patent 14 years
U.S. Cl. D8—107



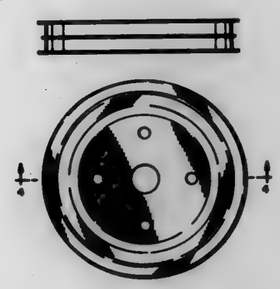
333,775
FLEXIBLE DRAW LATCH
Paul E. Krape, Westtown, Pa., assignor to Southco, Inc., Westtown Chester County, Pa.
Filed Feb. 28, 1991, Ser. No. 658,357
Term of patent 14 years
U.S. Cl. D8—342



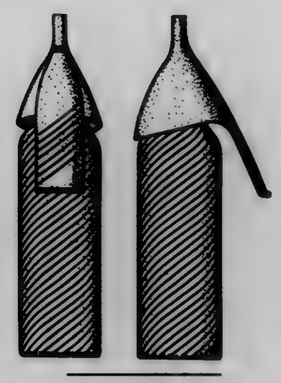
333,776
WINDING DRUM
Harmel R. Cloutier, Brredin Drive Concession 6, R.R. #4, Orillia, Ontario, Canada L3V 6H4
Filed Jun. 20, 1991, Ser. No. 718,118
Claims priority, application Canada, Dec. 20, 1990, 20-12-90-1
Term of patent 14 years
U.S. Cl. D8—358



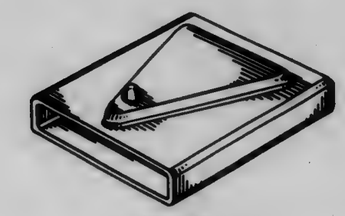
333,777
PULLEY
Toshiaki Kanemitsu, Kobe, and Kazuyuki Oda, Hyogo, both of Japan, assignors to Kabushiki Kaisha Kanemitsu, Japan
Filed May 29, 1991, Ser. No. 706,732
Claims priority, application Japan, Dec. 12, 1990, 2-41699; Dec. 12, 1990, 2-41700
Term of patent 14 years
U.S. Cl. D8—360



333,778
DISPENSER
Iris Magidson, New York, N.Y.; Thomas F. Wiegner, Norwalk, and Joseph Pereira, West Redding, both of Conn., assignors to Clairol, Inc., New York, N.Y.
Filed Mar. 11, 1991, Ser. No. 667,094
Term of patent 14 years
U.S. Cl. D9—300



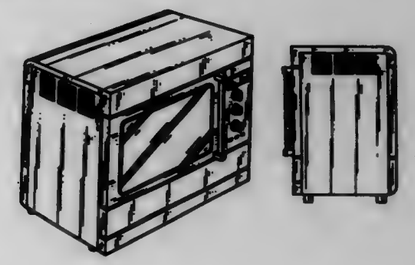
333,779
DIRECTIONAL INDICATING CLAMP FOR FIRE HOSES
Clifford Clement, 193 High St., Somerset, Mass. 02726
Filed May 2, 1991, Ser. No. 695,032
Term of patent 14 years
U.S. Cl. D8—395



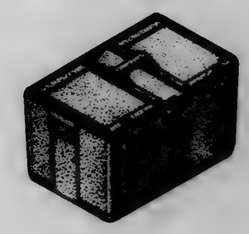
333,780
ROLL-ON APPLICATOR
John S. Jones, Eggertsville, N.Y., and Serge Desjardin, Cateau Dulac, Canada, assignors to FWJ Plastic Packaging, Inc., Tonawanda, N.Y.
Filed Mar. 13, 1991, Ser. No. 668,471
Term of patent 14 years
U.S. Cl. D9—338

333,781
DISPENSING CARTON
Carolyn B. Kobel, Hamburg, N.Y., assignor to Bristol-Myers Squibb Company, New York, N.Y.
Filed Mar. 28, 1991, Ser. No. 676,237
Term of patent 14 years
U.S. Cl. D9—339

333,782
OVEN
Adrianus A. J. van Berle, Eindhoven, Netherlands, assignor to Fri-Jado B.V., Netherlands
Filed Feb. 21, 1991, Ser. No. 659,188
Claims priority, application Int'l Pat. Institute, Aug. 23, 1990, DM/017453
Term of patent 14 years
U.S. Cl. D7—350



333,783
SHIPMENT CONTAINER
Frank Perugini, Aurora, Ill., assignor to Chemical Waste Management, Inc., Oak Brook, Ill.
Filed Feb. 11, 1991, Ser. No. 653,124
Term of patent 14 years
U.S. Cl. D9—424



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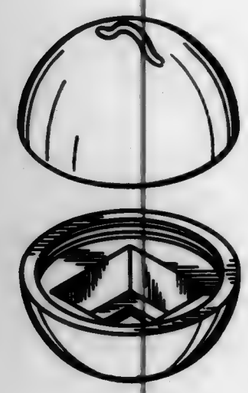
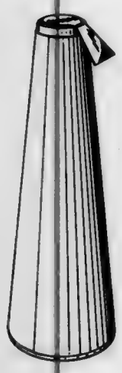
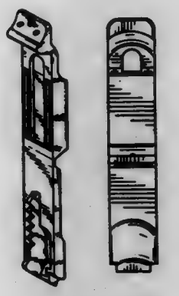
333,784
CONTAINER
Rudolph A. Goodman, 222 E. Akin, Sherman, Tex. 75090
Filed Mar. 19, 1991, Ser. No. 672,588
Term of patent 14 years
U.S. Cl. D9—424



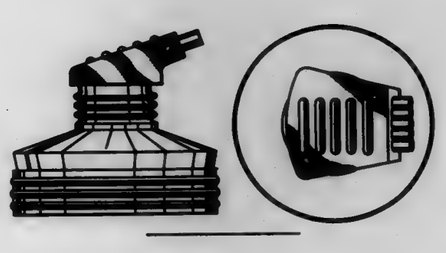
333,785
CONTAINER
Ingemar Ohlsson, Malmo, and Bengt Bjorck, Lund, both of Sweden, assignors to Tetra Alfa Holdings S.A., Pully, Switzerland
Filed Feb. 27, 1991, Ser. No. 661,318
Claims priority, application Sweden, Aug. 27, 1990, 901778
Term of patent 14 years
U.S. Cl. D9—431



333,786
CLIP FOR BAGS
Michael H. Carroll, 2210 Wilshire Blvd., #550, Santa Monica, Calif. 90403
Filed Aug. 30, 1991, Ser. No. 752,335
Term of patent 14 years
U.S. Cl. D9—435



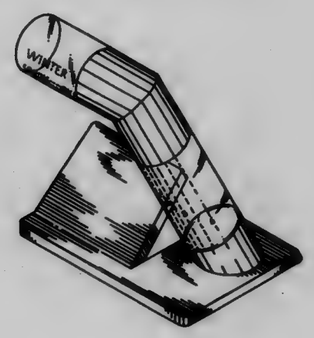
333,787
DISPENSER FOR A CONTAINER
Kenneth W. Hirst, New York, and John R. Peterson, Brooklyn, both of N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Jan. 11, 1991, Ser. No. 639,958
Term of patent 14 years
U.S. Cl. D9—448



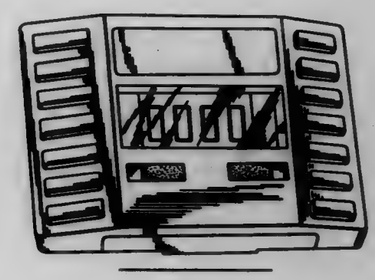
333,788
DISPENSER CAP
Robert C. Geschwender, 3855 Orchard St., Lincoln, Nebr. 68503
Filed Dec. 26, 1990, Ser. No. 634,338
Term of patent 14 years
U.S. Cl. D9—448

333,789
COMBINED BOTTLE AND CAP
Ulrich Relf, Duesseldorf, Fed. Rep. of Germany, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Nov. 26, 1991, Ser. No. 798,688
Claims priority, application United Kingdom, May 31, 1991, 2015040
Term of patent 14 years
U.S. Cl. D9—563

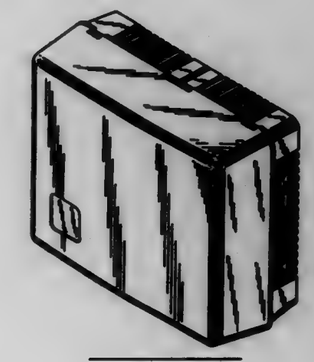
333,790
CLOCK
Timothy F. Cunningham, Spokane, Wash., assignor to B. Sirius Toys, Inc., Millville, N.J.
Filed May 3, 1990, Ser. No. 518,194
Term of patent 14 years
U.S. Cl. D10—2



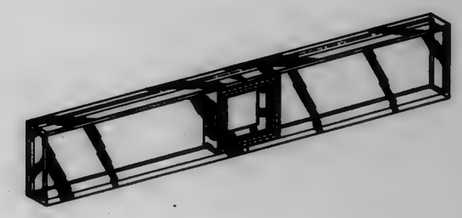
333,791
ELECTRIC CLOCK CASE
Stephen A. Glick, Charlestown, R.I., and E. Hubbard Yonkers, Centeocook, N.H., assignors to New England Yacht Consultants, Ltd., Charlestown, R.I.
Filed Jul. 3, 1990, Ser. No. 547,582
Term of patent 14 years
U.S. Cl. D10—15



333,792
THERMOSTAT HOUSING
James A. Odom, Jr., Apple Valley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 29, 1990, Ser. No. 530,942
Term of patent 14 years
U.S. Cl. D10—89



333,793
LEVEL
Jerry D. Pratt, 9333 Loma Vista Dr., Dallas, Tex. 75243
Filed Nov. 13, 1990, Ser. No. 614,648
Term of patent 14 years
U.S. Cl. D10—69



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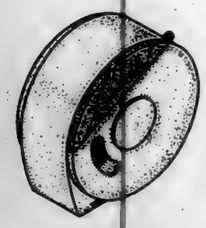
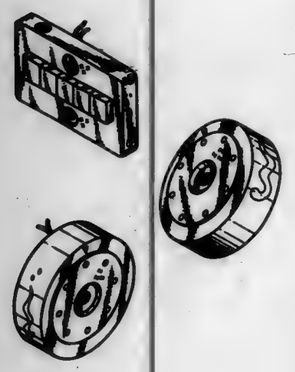
333,794
COATING THICKNESS TESTER
Motohiko Enari, Tokyo, Japan, assignor to Kett Electric Laboratory, Tokyo, Japan
Filed Jun. 7, 1990, Ser. No. 534,417
Claims priority, application Japan, Feb. 28, 1990, 2-6153
Term of patent 14 years
U.S. Cl. D10—70

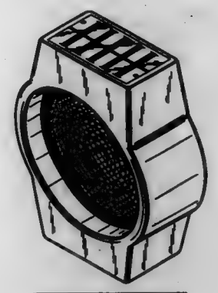


333,795
TRANSMITTER FOR A VEHICLE ALARM
Darrell E. Ison, 1598 Parkview Dr., Vista, Calif. 92083
Filed Dec. 12, 1991, Ser. No. 805,920
Term of patent 14 years
U.S. Cl. D10—106

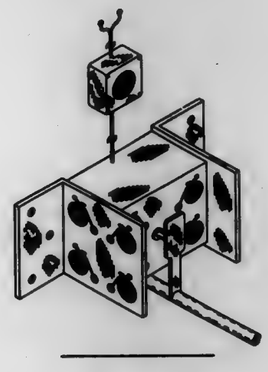
333,796
COMBINED SMOKE DETECTOR CONTROL UNIT AND SMOKE DETECTOR
Paul Bannon, 145 Crow Ln., Newburyport, Mass. 01950
Filed Jun. 21, 1990, Ser. No. 541,360
Term of patent 14 years
U.S. Cl. D10—106



333,797
SOLAR POWERED CONSTRUCTION LIGHT
Tsung Lu, 675 N. Rodeo Way, Walnut, Calif. 91789
Filed Mar. 12, 1991, Ser. No. 668,441
Term of patent 14 years
U.S. Cl. D10—114

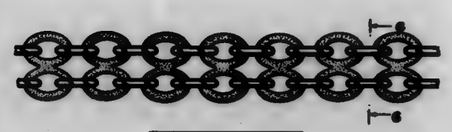


333,798
VEHICLE CLEARANCE WARNING SIGNAL
James J. Gaston, 5214 Sirbuck Way, Carmichael, Calif. 95608
Filed Aug. 19, 1991, Ser. No. 746,579
Term of patent 14 years
U.S. Cl. D10—114



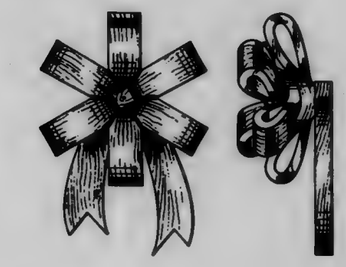
333,799
TIMEPIECE DIAL
Philippe Charriol, 66 Black's Link, Hong Kong, Hong Kong
Filed Aug. 23, 1990, Ser. No. 572,182
Claims priority, application World Int. Prop. O., Mar. 15, 1990, DM/016175
Term of patent 14 years
U.S. Cl. D10—126

333,800
ORNAMENTAL CHAIN
Matthew Akdemir, 465 Washington Ave., Cliffside Park, N.J. 07010
Filed Dec. 31, 1990, Ser. No. 636,390
Term of patent 14 years
U.S. Cl. D11—12

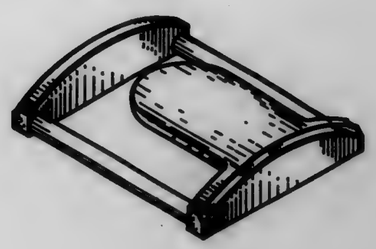


333,801
COMBINED BLANK FOR A DECORATION RIBBON AND STRING
Eiji Asano, 5-28, Nijigahama, Hiratsuka-shi, Kanagawa-ken, and Yoshiko Iwaki, 2-8-17-302, Minami Kugahara, Oota-ku, Tokyo, both of Japan
Division of Ser. No. 480,199, Feb. 14, 1990. This application Jun. 23, 1992, Ser. No. 903,215
Claims priority, application Japan, Aug. 15, 1989, 1-29832; Aug. 15, 1989, 1-29833; Aug. 15, 1989, 1-29834
Term of patent 14 years
U.S. Cl. D11—184

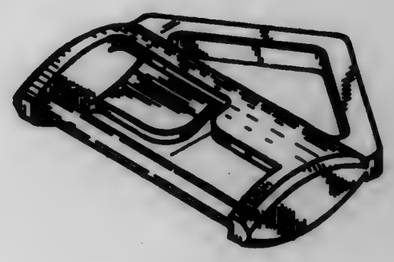
333,802
BOW-LIKE ORNAMENT
John D. Stabler, Rte. 1, Box 204F, Thomasville, Ala. 36784
Filed Mar. 13, 1991, Ser. No. 669,303
Term of patent 14 years
U.S. Cl. D11—184



333,803
BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,286
Term of patent 14 years
U.S. Cl. D11—218



333,804
BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,149
Term of patent 14 years
U.S. Cl. D11—218



333,805
BELT BUCKLE
S. David Hogan, 4657 S. 3250 West, Salt Lake City, Utah 84119
Filed May 13, 1991, Ser. No. 699,222
Term of patent 14 years
U.S. Cl. D11—232

333,806
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,148
Term of patent 14 years
U.S. Cl. D11—232

333,807
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,147
Term of patent 14 years
U.S. Cl. D11—232

333,808
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,146
Term of patent 14 years
U.S. Cl. D11—232

333,809
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,145
Term of patent 14 years
U.S. Cl. D11—232

333,810
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,144
Term of patent 14 years
U.S. Cl. D11—232

333,811
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,143
Term of patent 14 years
U.S. Cl. D11—232

333,812
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,142
Term of patent 14 years
U.S. Cl. D11—232

333,813
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,141
Term of patent 14 years
U.S. Cl. D11—232

333,814
BELT BUCKLE
Dana Franklin, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 15, 1991, Ser. No. 670,140
Term of patent 14 years
U.S. Cl. D11—232

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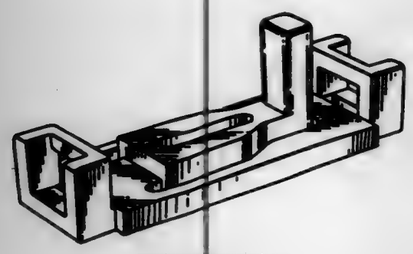
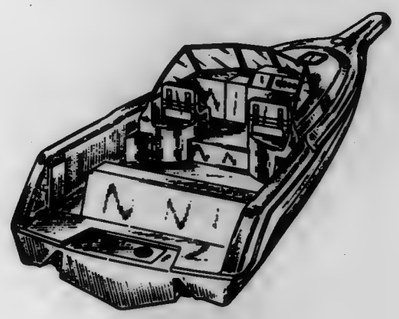
333,806
MOTORCYCLE
William G. Davidson, Elm Grove, Wis., assignor to Harley-Davidson, Inc., Milwaukee, Wis.
Filed May 31, 1990, Ser. No. 532,078
Term of patent 14 years
U.S. Cl. D12—110

333,807
PIN LATCH FOR A WINDSHIELD WIPER
Cedric S. K. Cherng, 3 F-1, No. 5, Lane, 56, Wen An Street, Meegar, Taipei City, Taiwan
Filed Nov. 6, 1991, Ser. No. 788,711
Term of patent 14 years
U.S. Cl. D12—155



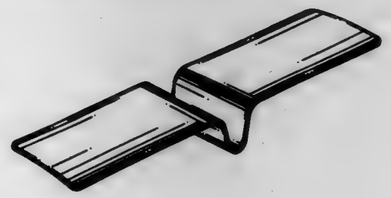
333,808
VEHICLE LUGGAGE CARRIER SIDE RAIL
John S. Cucherun, Lake Orion, Mich., assignor to John A. Bott, Grosse Pointe Farms, Mich.
Filed Apr. 19, 1991, Ser. No. 687,541
Term of patent 14 years
U.S. Cl. D12—157

333,809
RECREATION BOAT
Augusto Villalon, and Wolfgang Schneider, both of Cape Coral, Fla., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed May 15, 1991, Ser. No. 702,194
Term of patent 14 years
U.S. Cl. D12—313

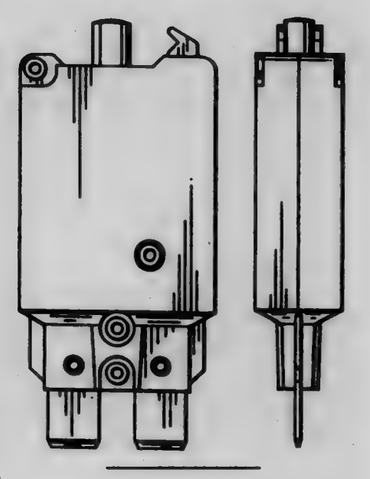


333,810
RECREATIONAL BOAT
Thomas Wenstadt, Cadillac, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed May 7, 1991, Ser. No. 699,804
Term of patent 14 years
U.S. Cl. D12—314

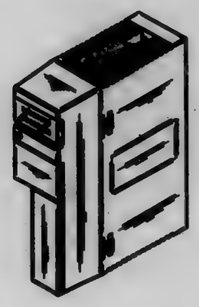
333,811
CATAMARAN HYDROFOIL
Robert W. Doughty, P.O. Box 1655, Casa Grande, Ariz. 85222
Filed Aug. 12, 1991, Ser. No. 744,013
Term of patent 14 years
U.S. Cl. D12—317



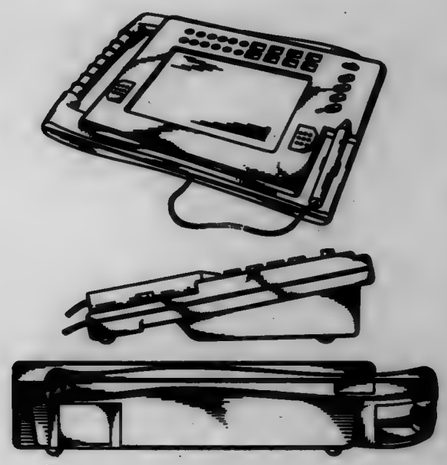
333,812
CIRCUIT BREAKER
Fritz Krauser, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany
Filed Mar. 4, 1991, Ser. No. 663,634
Term of patent 14 years
U.S. Cl. D13—160



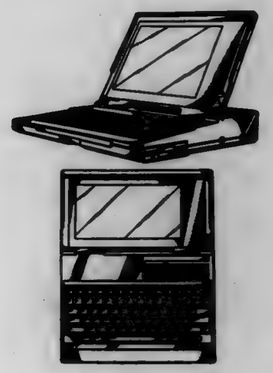
333,813
POWER UNIT OF SEQUENCE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 8, 1990, Ser. No. 490,978
Claims priority, application Japan, Sep. 13, 1989, 1-33564
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—162



333,814
COMBINED ELECTRONIC DRAWING STYLUS AND TABLET HOUSING
Lanette O. Swanson, Buffalo Grove, Ill., and Albert Y. Chung Cheung, Hong Kong, Hong Kong, assignors to Video Technology Industries, Inc., Wheeling, Ill.
Filed Oct. 30, 1990, Ser. No. 607,851
Term of patent 14 years
U.S. Cl. D14—100



333,815
COMPUTER
Kanji Mizuuagi; Kazuko Tsuji, and Fumikazu Shimamuki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 18, 1990, Ser. No. 584,186
Claims priority, application Japan, Mar. 20, 1990, 2-9335
Term of patent 14 years
U.S. Cl. D14—106



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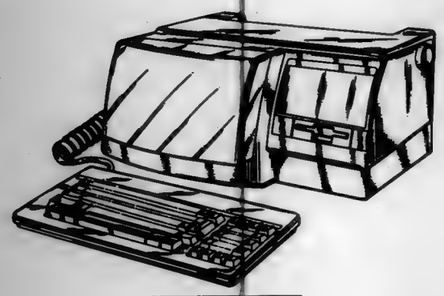
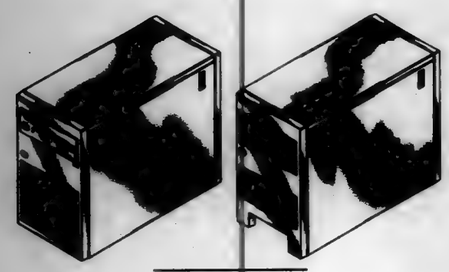
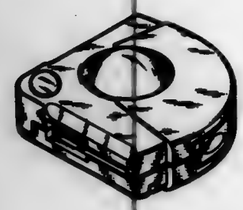
333,816
WORD PROCESSOR
Gregory W. Smiley, Cortland, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Apr. 3, 1991, Ser. No. 679,860
Term of patent 14 years
U.S. Cl. D14—106



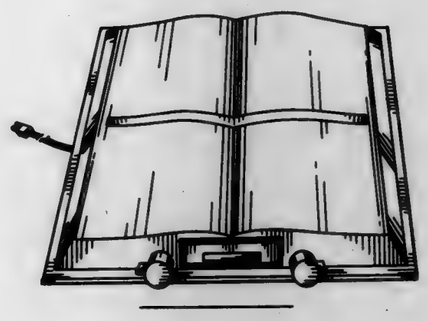
333,817
OPTICAL CARTRIDGE LIBRARY
Martin J. Marotti, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1990, Ser. No. 606,782
Term of patent 14 years
U.S. Cl. D14—109



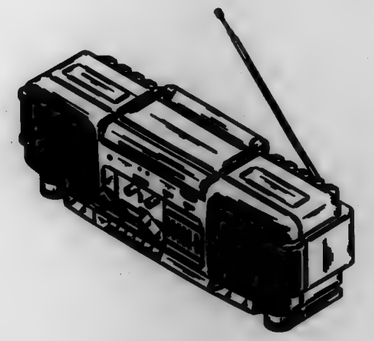
333,818
TRACK BALL
Tso S. Yang, 11Fl., No. 116, Sec. 2, Nanking E. Rd., Taipei, Taiwan
Filed Aug. 2, 1991, Ser. No. 740,015
Term of patent 14 years
U.S. Cl. D14—114



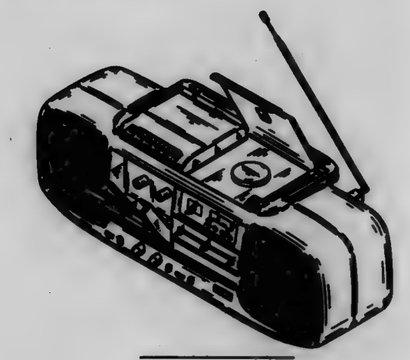
333,819
COMBINED CASSETTE PLAYER AND STAND FOR A FRAMED PICTURE
James C. Toney, 5636 Hamlet Ave., Cleveland, Ohio 44127
Continuation-in-part of Ser. No. 269,542, Nov. 10, 1988, abandoned. This application Dec. 28, 1990, Ser. No. 635,323
Term of patent 14 years
U.S. Cl. D14—162



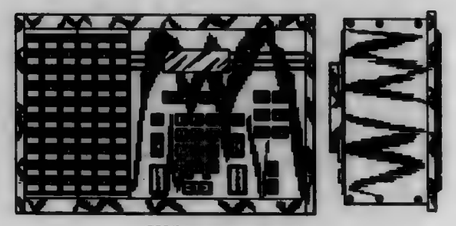
333,820
COMBINED RADIO TUNER AND TAPE RECORDER
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,714
Claims priority, application Japan, May 16, 1990, 2-16563
Term of patent 14 years
U.S. Cl. D14—163



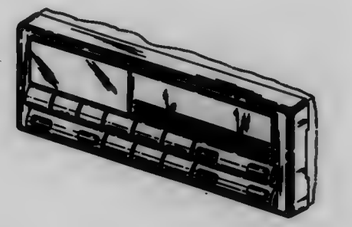
333,821
COMBINED DIGITAL AUDIO DISC PLAYER, RADIO TUNER AND TAPE RECORDER
Makoto Takimoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,713
Claims priority, application Japan, May 16, 1990, 2-16566
Term of patent 14 years
U.S. Cl. D14—168



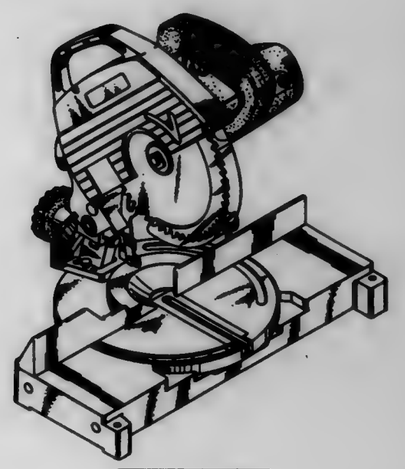
333,822
TELEPHONE CONSOLE
Tom Hughes, Newtown, and Neil A. Roth, Stamford, both of Conn., assignors to V Band Corporation, Elmsford, N.Y.
Filed Jul. 20, 1990, Ser. No. 556,198
Term of patent 14 years
U.S. Cl. D14—241



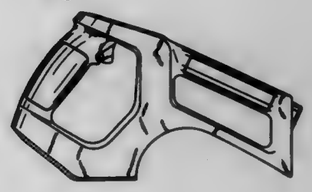
333,823
FRONT CONTROL PANEL FOR A COMBINED AUTOMOTIVE RADIO AND CASSETTE PLAYER
Stephen B. Sliper, Woodhaven; Walter A. Danilowicz, Livonia, and Soo Y. Kang, Inkster, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jan. 22, 1991, Ser. No. 648,425
Term of patent 14 years
U.S. Cl. D14—258



333,824
MITER SAW
Yasuo Suzuki, Nishio, and Giuichi Hirota, Nagoya, both of Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Jan. 29, 1991, Ser. No. 647,810
Claims priority, application Japan, Aug. 3, 1990, 2-26440
Term of patent 14 years
U.S. Cl. D15—133



333,825
HANDLE
Scott D. Price, Pylesville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jun. 27, 1989, Ser. No. 372,784
Term of patent 14 years
U.S. Cl. D15—142



333,826
COMBINED RADIO TUNER AND TAPE RECORDER
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,715
Claims priority, application Japan, May 16, 1990, 2-16564
Term of patent 14 years
U.S. Cl. D14—163

333,827
COMBINED RADIO TUNER AND TAPE RECORDER
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,716
Claims priority, application Japan, May 16, 1990, 2-16565
Term of patent 14 years
U.S. Cl. D14—163

333,828
COMBINED RADIO TUNER AND TAPE RECORDER
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,717
Claims priority, application Japan, May 16, 1990, 2-16567
Term of patent 14 years
U.S. Cl. D14—163

333,829
COMBINED RADIO TUNER AND TAPE RECORDER
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,718
Claims priority, application Japan, May 16, 1990, 2-16568
Term of patent 14 years
U.S. Cl. D14—163

333,830
COMBINED RADIO TUNER AND TAPE RECORDER
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,719
Claims priority, application Japan, May 16, 1990, 2-16569
Term of patent 14 years
U.S. Cl. D14—163

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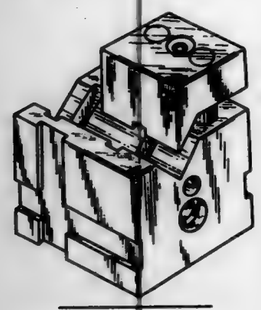
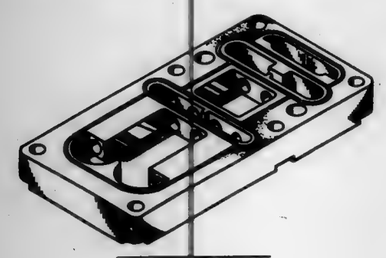
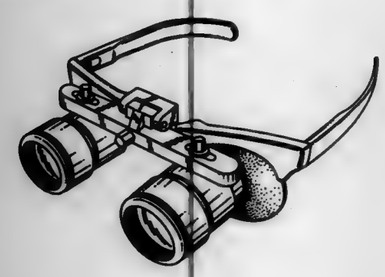
333,826
MACHINISTS V-BLOCK
Joseph A. Giangrasso, 11221 Elysian St., Oakland, Calif. 94605
Filed Jul. 11, 1991, Ser. No. 728,948
Term of patent 14 years
U.S. Cl. D15—145



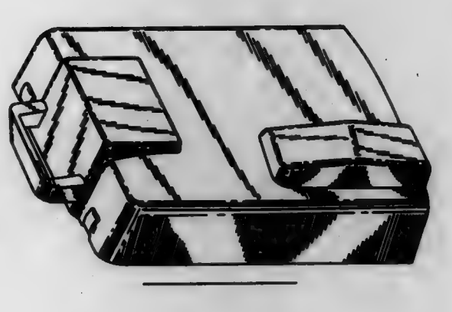
333,827
COMPACT EJECTOR UNIT
Peter Tell, Brevfiskvägen 27, S-184 00 Åkersberga, Sweden
Division of Ser. No. 280,537, Dec. 6, 1988. This application Oct. 21, 1991, Ser. No. 779,853
Claims priority, application Sweden, Jan. 8, 1988, 88-1421
Term of patent 14 years
U.S. Cl. D15—199



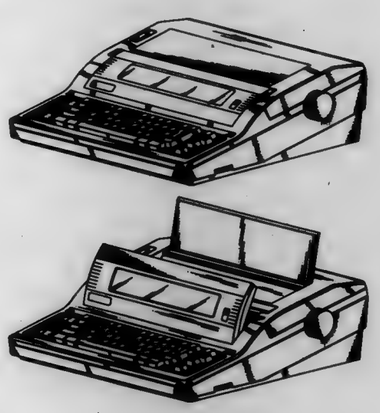
333,828
BINOCULAR
Fabio Baldassarre, Rome, Italy, assignor to Balda's Soc, Rome, Italy
Filed Sep. 6, 1990, Ser. No. 578,991
Claims priority, application Int'l Pat. Institute, Mar. 6, 1990, DM/016090
Term of patent 14 years
U.S. Cl. D16—133



333,829
COVER FOR AN OVERHEAD PROJECTOR
James E. Nash, and Dennis J. Roden, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 18, 1990, Ser. No. 600,215
Term of patent 14 years
U.S. Cl. D16—235

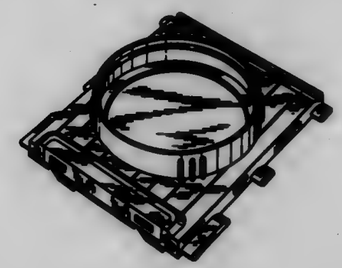


333,830
WORD PROCESSOR
Mark J. Lampe, Syracuse, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Jan. 22, 1991, Ser. No. 646,017
Term of patent 14 years
U.S. Cl. D18—1

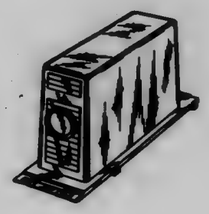


333,831
CALCULATOR
Paul Chen, Chung Ho, Taiwan, assignor to Datel Electrocraft Corp., Taipei, Taiwan
Filed Jul. 1, 1991, Ser. No. 724,349
Term of patent 14 years
U.S. Cl. D18—7

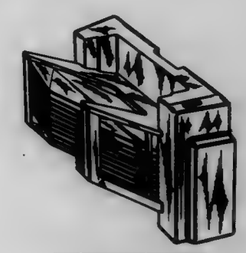
333,832
CAP FOR TONER BOTTLE
Noriyuki Suzuki, Yokohama, and Yutaka Ban, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 14, 1991, Ser. No. 744,788
Claims priority, application Japan, Feb. 19, 1991, 3-004163
Term of patent 14 years
U.S. Cl. D18—40



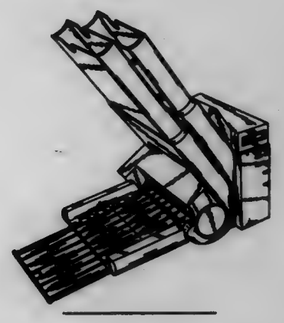
333,833
TONER CASE FOR COPYING MACHINE
Ei Yamamoto, Tokyo, and Akihito Kanamori, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 19, 1991, Ser. No. 732,715
Claims priority, application Japan, Jan. 31, 1991, 3-2460
Term of patent 14 years
U.S. Cl. D18—43



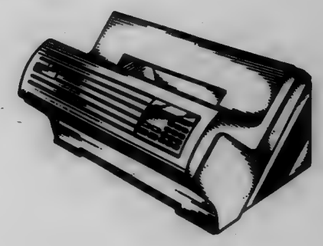
333,834
SORTER FOR COPYING MACHINE
Masataka Izumoto, Kawasaki, and Mitsuru Sakurai, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1991, Ser. No. 770,961
Claims priority, application Japan, Apr. 19, 1991, 3-11583
Term of patent 14 years
U.S. Cl. D18—48



333,835
PRINTER
Ilan Israely, Westwood, and Mauricio Mirand, Lakewood, both of Calif., assignors to Star Micronics Co., Ltd., Shizuoka, Japan
Filed May 24, 1991, Ser. No. 705,153
Term of patent 14 years
U.S. Cl. D18—55

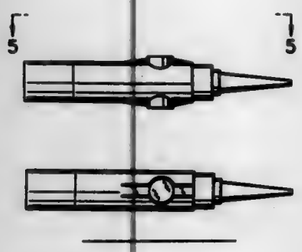


333,836
PRINTER
Louis G. Kelemen, Thousand Oaks, Calif., and James B. Pagella, Natick, Mass., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Filed Oct. 30, 1990, Ser. No. 605,983
Term of patent 14 years
U.S. Cl. D18—55



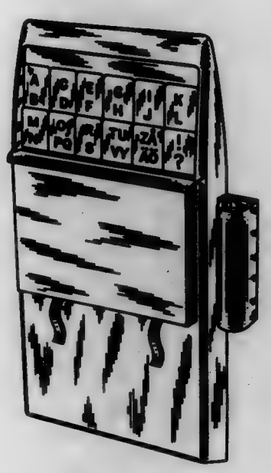
333,837
PEN
Richard F. M. Peermann, St Scheveningen, Netherlands, assignor to Pellyfilms International, B.V., Netherlands
Filed Jan. 15, 1990, Ser. No. 539,055
Claims priority, application World Int. Prop. O., Jan. 8, 1990, DM8915552
Term of patent 14 years
U.S. Cl. D19—46

333,838
GLUE DISPENSER
Jerry Gabel, 6311 Paceseat Dr., Huntington Beach, Calif. 92648
Filed Dec. 10, 1990, Ser. No. 624,773
Term of patent 14 years
U.S. Cl. D19—66

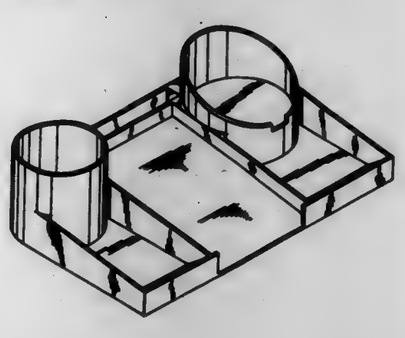


333,839
COMBINED VERTICALLY-MOUNTABLE PENCIL SHARPENER AND HOLDER
Jerrilyn C. Kiyokane, Torrance, Calif., assignor to Nanakang Promotions, Inc., Costa Mesa, Calif.
Filed Nov. 16, 1990, Ser. No. 614,751
Term of patent 14 years
U.S. Cl. D19—73

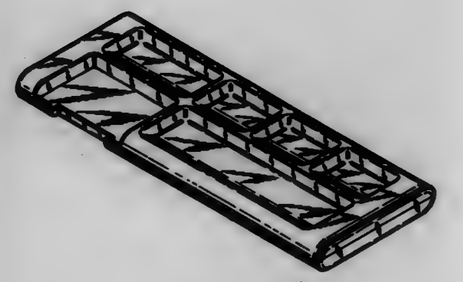
333,840
COMBINED TELEPHONE INDEX AND WRITING INSTRUMENT HOLDER
Olof Hagstrand, Stockholm, Sweden, assignor to AB Underphone, Sweden
Filed Feb. 28, 1991, Ser. No. 662,791
Claims priority, application Sweden, Aug. 29, 1990, 90-1805
Term of patent 14 years
U.S. Cl. D19—76



333,841
DESK ACCESSORY ORGANIZER
Douglas A. Henrickson, Boca Raton, Fla., assignor to Enginuity Inc., Boca Raton, Fla.
Filed Sep. 6, 1990, Ser. No. 578,860
Term of patent 14 years
U.S. Cl. D19—78

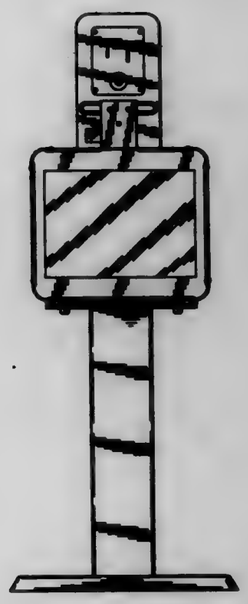


333,842
ORGANIZER TRAY FOR ASSORTED DESK ACCESSORIES
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft M.B.H., Eferding, Austria
Filed Aug. 17, 1990, Ser. No. 569,455
Claims priority, application Austria, Feb. 22, 1990, 27.886; Feb. 22, 1990, 27.887; Feb. 22, 1990, 27.888; Feb. 22, 1990, 27.889; Feb. 22, 1990, 27.890; Feb. 22, 1990, 27.891; Feb. 22, 1990, 27.892
The portion of the term of this patent subsequent to Dec. 22, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—78



333,843
COMBINED HOLDER FOR NOTE PAPER AND A WRITING INSTRUMENT
Jerome Hartmann, Carlisle; John Schenken, and Charles A. Haas, both of Des Moines, all of Iowa, assignors to Cobbs Manufacturing Company, Des Moines, Iowa
Filed Jan. 21, 1992, Ser. No. 822,990
Term of patent 14 years
U.S. Cl. D19—78

333,844
NEWSPAPER VENDING MACHINE
David V. Nichols, Springfield, Va., and Joel D. Powers, Rockvale, Tenn., assignors to Gannett Co., Inc., Arlington, Va.
Filed Feb. 7, 1991, Ser. No. 654,926
Term of patent 14 years
U.S. Cl. D20—6



333,845
RETRACTABLE SIGN
Brian T. Kamachi, Montebello, Calif., assignor to United Commercial Trading Co., Inc., Los Angeles, Calif.
Filed Aug. 23, 1991, Ser. No. 748,901
Term of patent 14 years
U.S. Cl. D20—21

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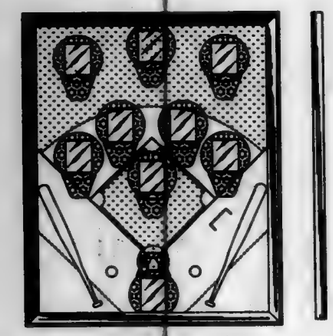
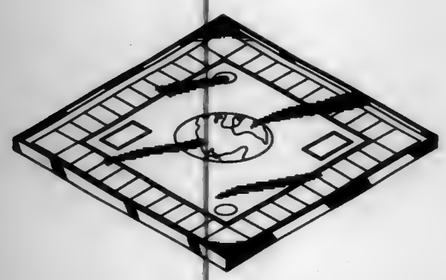
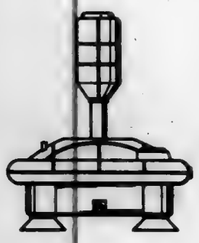
333,846
BASEBALL CARD DISPLAY BOARD
David M. Graham, 17116 Old Mill Run, Rockville, Md. 20855
Filed Jan. 28, 1991, Ser. No. 723,513
Term of patent 14 years
U.S. Cl. D20—40



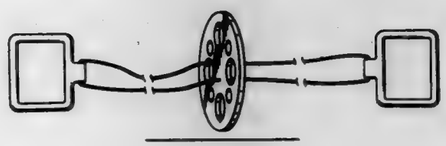
333,847
GAME BOARD
Kinney Redding, 3065 Crest Rd., College Park, Ga. 30349
Filed Nov. 5, 1990, Ser. No. 608,898
Term of patent 14 years
U.S. Cl. D21—31



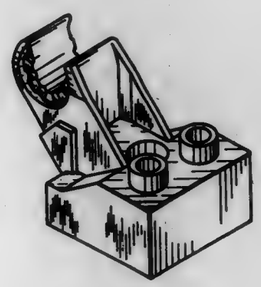
333,848
JOY STICK
Michael K. Tse, Kowloon, Hong Kong, assignor to STD Electronic International Ltd., Hong Kong, Hong Kong
Filed Jul. 22, 1991, Ser. No. 733,249
Term of patent 14 years
U.S. Cl. D21—48



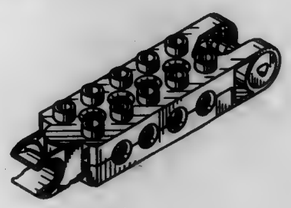
333,849
WHIRLING TOY
Jerry N. Gardner, and Clara R. Gardner, both of P.O. Box 387, Jacksonville, Fla. 32220
Filed Jan. 18, 1991, Ser. No. 643,008
Term of patent 14 years
U.S. Cl. D21—96



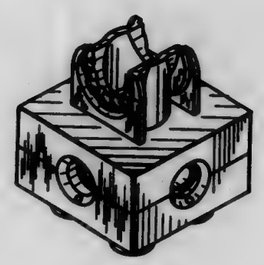
333,850
ELEMENT FOR A TOY BUILDING SET
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,115
Term of patent 14 years
U.S. Cl. D21—108



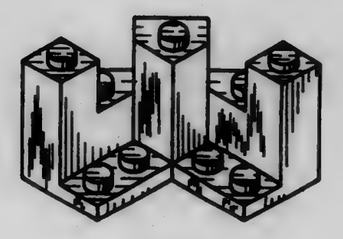
333,851
ELEMENT FOR A TOY BUILDING SET
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,129
Term of patent 14 years
U.S. Cl. D21—108



333,852
ELEMENT FOR A TOY BUILDING SET
Flemming H. Olsen, Esperg rde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,132
Term of patent 14 years
U.S. Cl. D21—108



333,853
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,123
Term of patent 14 years
U.S. Cl. D21—108



333,854
TOY TIGER SHARK
Dennis Kuppermann, Glenview, Ill., assignor to RB Toy Development Co., Skokie, Ill.
Filed Nov. 26, 1990, Ser. No. 617,853
Term of patent 14 years
U.S. Cl. D21—157

333,855
TRAY FOR AN EXERCISER
Takashi Ueda, Osaka, Japan, assignor to Cat Eye Co., Ltd., Osaka, Japan
Filed Mar. 23, 1991, Ser. No. 498,371
Claims priority, application Japan, Sep. 26, 1989, 1-35882
Term of patent 14 years
U.S. Cl. D21—194

333,856
BASEBALL PITCHING AID
Robert L. Cantey, 220 Kings Chapel Rd., Augusta, Ga. 30907
Filed May 9, 1990, Ser. No. 522,974
Term of patent 14 years
U.S. Cl. D21—200

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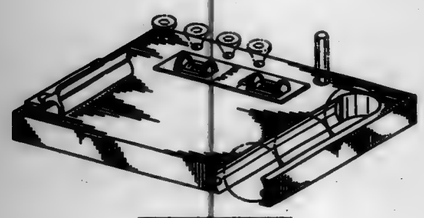
333,857
RAKE-LIKE GOLF BALL RETRIEVER
Otto Schropp, 1503 Richardson Dr., Anchorage, Ak. 99504
Filed Aug. 7, 1990, Ser. No. 563,332
Term of patent 14 years
U.S. Cl. D21—206

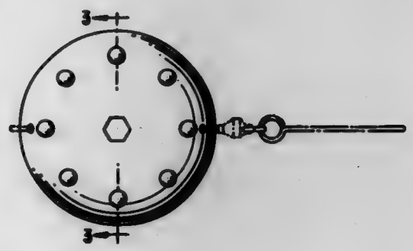
333,858
COMBINED SCORE KEEPER AND HOLDER FOR GOLF ACCESSORIES
Lawrence R. Pitz, 352 Newell St., Barberton, Ohio 44203
Filed Aug. 29, 1990, Ser. No. 574,918
Term of patent 14 years
U.S. Cl. D21—234



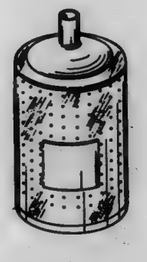
333,859
KNIFE BLADE
William E. Meyer, Dallas, Tex., assignor to The B & F System, Inc., Dallas, Tex.
Filed Jul. 2, 1990, Ser. No. 547,097
Term of patent 14 years
U.S. Cl. D22—118

333,860
FISHING JIG
Robert E. Barcus, Rte. 1, Box 273, Marcell, Minn. 56657
Filed Dec. 4, 1990, Ser. No. 621,902
Term of patent 14 years
U.S. Cl. D22—126

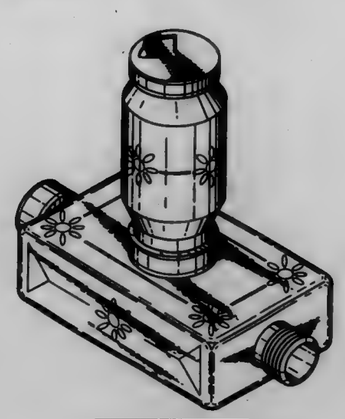
333,861
ARTIFICIAL FISH LURE
Joe A. Keranen, Hague, Va. 22469
Filed May 7, 1990, Ser. No. 519,680
Term of patent 14 years
U.S. Cl. D22—129



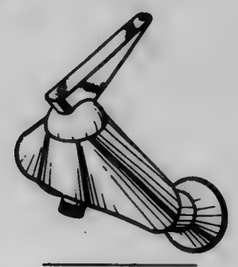
333,862
ILLUMINATED LIVE BAIT CONTAINER
Rick Merechka, 1115 Belmar Cir., Woodward, Okla. 73801
Filed Jul. 2, 1990, Ser. No. 546,798
Term of patent 14 years
U.S. Cl. D22—136



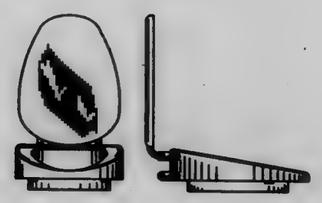
333,863
CHEMICAL MIXING CONTAINER FOR SPRINKLERS
Tennie Kimmons, 2111 W. 69th Pl., Chicago, Ill. 60636
Filed Dec. 20, 1990, Ser. No. 630,956
Term of patent 14 years
U.S. Cl. D23—214



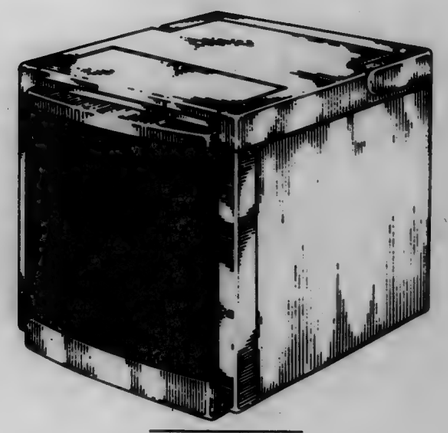
333,864
WATER CONTROL UNIT FOR A HAND SHOWER
Philippe Chretien, Dietlikon, Switzerland, assignor to KWC AG, Unterkulm, Switzerland
Filed Oct. 9, 1990, Ser. No. 594,208
Claims priority, application Switzerland, Apr. 9, 1990, DM/016382
Term of patent 14 years
U.S. Cl. D23—238



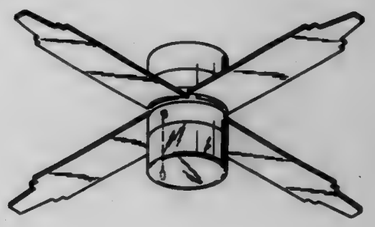
333,865
COMBINED TOILET SEAT FOR THE PHYSICALLY IMPAIRED AND TOILET SEAT COVER
James P. D'Aquila, 9 Turner Ave., Riverside, R.I. 02915
Filed Mar. 29, 1990, Ser. No. 501,191
Term of patent 14 years
U.S. Cl. D23—311



333,866
HEATER FAN
Jui-Sheng Wang, Taipei, Taiwan, assignor to Duracraft Corp., Sudbury, Mass.
Filed Dec. 26, 1991, Ser. No. 814,814
Term of patent 14 years
U.S. Cl. D23—335



333,867
COMBINED ELECTRIC CEILING FAN AND LIGHT
Michael A. Markwardt, Fort Worth, Tex., assignor to Encon Industries, Inc., Fort Worth, Tex.
Filed Jun. 8, 1992, Ser. No. 894,996
Term of patent 14 years
U.S. Cl. D23—377



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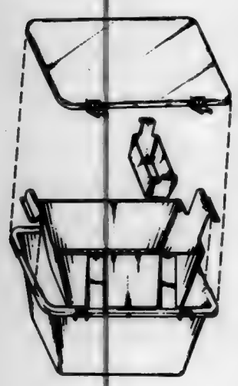
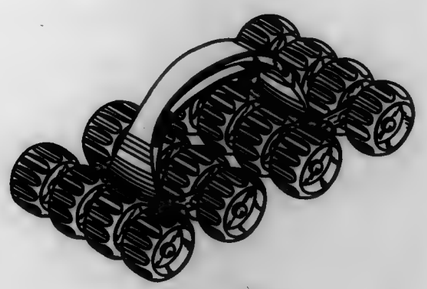
333,868
PROTECTIVE NET FOR ELECTRIC FANS
Mao-Lin Yeang, No. 83, Lane 159 An-Ho Rd. Sec 1, Tainan, Taiwan
Filed Jul. 1, 1991, Ser. No. 725,821
Term of patent 14 years
U.S. Cl. D23—412

333,869
COMBINED STERILIZING CONTAINER AND STRAINER INSERTS
Stanley L. Wachman, Cherry Hill, N.J., assignor to Cetylite Industries, Inc., Pennsauken, N.J.
Filed Jun. 4, 1990, Ser. No. 532,495
Term of patent 14 years
U.S. Cl. D24—117

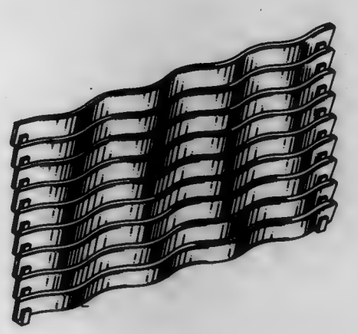


333,870
VACUUM CHAMBER FOR HOUSING A BLOOD BAG
John R. Wells, 4372 Keystone Ave., Culver City, Calif. 90232
Filed Aug. 27, 1990, Ser. No. 572,366
Term of patent 14 years
U.S. Cl. D24—169

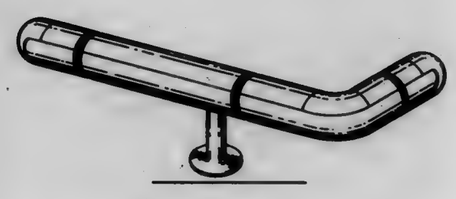
333,871
MASSAGER
Zlatko Grenko, Vere Bratonja 5, YU-51000 Rijeka, Yugoslavia
Filed Sep. 10, 1990, Ser. No. 579,493
Claims priority, application Yugoslavia, Mar. 27, 1990, M229/90
Term of patent 14 years
U.S. Cl. D24—211



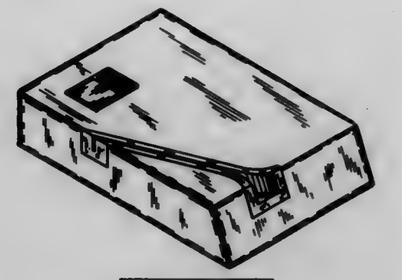
333,872
JALOUSIE SHUTTER
John Fennelly, 13132 N. 22nd Ave., Phoenix, Ariz. 85029, and Nancy Kitchell, 7522 E. MacDonald Dr., Scottsdale, Ariz. 85253
Filed Oct. 22, 1991, Ser. No. 781,934
Term of patent 14 years
U.S. Cl. D25—47



333,873
PROTECTIVE BASE RAIL
David S. McCue, Marblehead, Mass., assignor to McCue Corporation, Salem, Mass.
Filed Jan. 18, 1990, Ser. No. 466,745
Term of patent 14 years
U.S. Cl. D25—38

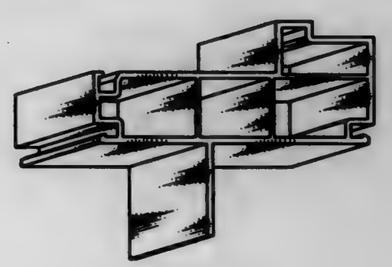


333,874
TURNSTILE COVER
Norman Diamond, Deerfield, Ill., assignor to General Signal Corporation, Stamford, Conn.
Filed Aug. 22, 1990, Ser. No. 570,714
Term of patent 14 years
U.S. Cl. D25—51

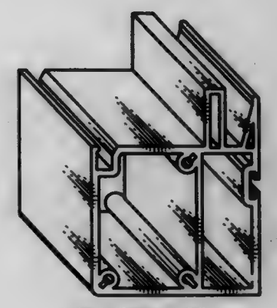


333,875
CANOPY
Bruce E. Jones, and Roland H. Jones, Sr., both of P.O. Box 315, Wallace, N.C. 28466
Filed Apr. 9, 1991, Ser. No. 682,221
Term of patent 14 years
U.S. Cl. D25—56

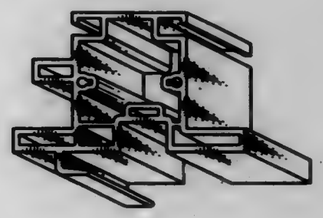
333,876
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Milgren Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,211
Term of patent 14 years
U.S. Cl. D25—124



333,877
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Milgren Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,100
Term of patent 14 years
U.S. Cl. D25—124



333,878
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Milgren Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,091
Term of patent 14 years
U.S. Cl. D25—124



333,879
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,000
Term of patent 14 years
U.S. Cl. D25—56

333,880
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,001
Term of patent 14 years
U.S. Cl. D25—56

333,881
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,002
Term of patent 14 years
U.S. Cl. D25—56

333,882
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,003
Term of patent 14 years
U.S. Cl. D25—56

333,883
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,004
Term of patent 14 years
U.S. Cl. D25—56

333,884
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,005
Term of patent 14 years
U.S. Cl. D25—56

333,885
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,006
Term of patent 14 years
U.S. Cl. D25—56

333,886
SHOWER CADDY
Jeffrey Lee Hall, 1 Hall Rd., Lincoln, Maine 04457
Filed Jan. 2, 1991, Ser. No. 636,007
Term of patent 14 years
U.S. Cl. D25—56

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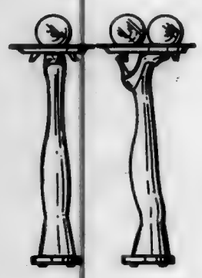
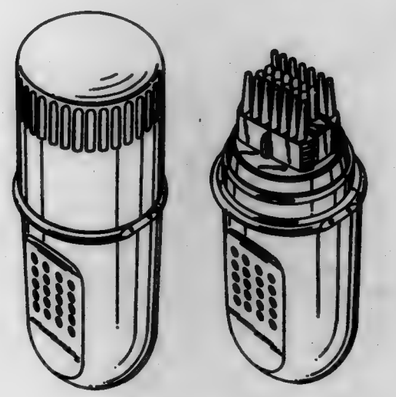
333,879
FOG LIGHT
Vincent Tsai, No. 138, Huan Ho Rd., Pan Chiao, Taiwan
Filed Oct. 24, 1990, Ser. No. 602,870
Term of patent 14 years
U.S. Cl. D26—28

333,880
ADJUSTABLE LAMP
Soddy Huang, No. 6, Alley 9, Lane 77, Hsien Hsing St., Shulin, Taipei Hsien, Taiwan
Filed May 14, 1991, Ser. No. 699,552
Term of patent 14 years
U.S. Cl. D26—65

333,881
NOVELTY TABLE LAMP
Roy Sigman, 127 Sunset Hollow Rd., West Chester, Pa. 19380
Filed Sep. 24, 1990, Ser. No. 586,738
Term of patent 14 years
U.S. Cl. D26—99

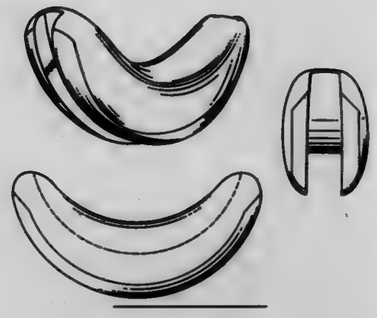


333,882
COMBINED COSMETIC APPLICATOR AND CAP
Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1991, Ser. No. 666,406
Claims priority, application Japan, Sep. 17, 1990, 2-31187
Term of patent 14 years
U.S. Cl. D28—7

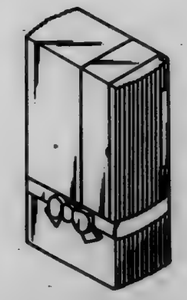


333,883
HOT WAX HAIR REMOVER APPARATUS
Samuel J. Mazza, Fair Lawn, N.J., assignor to Inversnap Corporation, Fair Lawn, N.J.
Filed Jun. 1, 1990, Ser. No. 531,809
Term of patent 14 years
U.S. Cl. D28—10

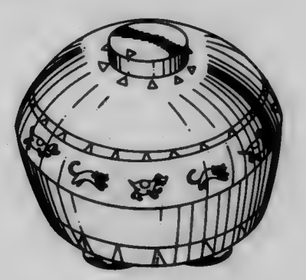
333,884
NECK SUPPORT CUSHION FOR A SHAMPOO BASIN
Anthony W. Colett, 1555 Shore Club Dr., St. Clair Shores, Mich. 48080
Filed Dec. 10, 1990, Ser. No. 632,737
Term of patent 14 years
U.S. Cl. D28—20



333,885
COSMETIC CASE
Chen T. Laing, P.O. Box 82-144, Taipei, Taiwan
Filed Jul. 22, 1991, Ser. No. 734,315
Term of patent 14 years
U.S. Cl. D28—76



333,886
PET DISH WITH TIMER
Michael Kennedy, 121 Hill Ln., Mechanicsburg, Pa. 17055
Filed Jun. 5, 1990, Ser. No. 533,702
Term of patent 14 years
U.S. Cl. D30—122



333,887
PET EXERCISER TREADMILL
Margaret A. Dowler, 902 Vine St., Collinsville, Ill. 62234
Filed Feb. 15, 1991, Ser. No. 655,925
Term of patent 14 years
U.S. Cl. D30—160

333,888
SCOOP FOR PICKING UP PET DROPPINGS
Dennis J. Visser, 4683 S. Hoyt St., Littleton, Colo. 80123
Filed Apr. 26, 1991, Ser. No. 692,861
Term of patent 14 years
U.S. Cl. D30—162

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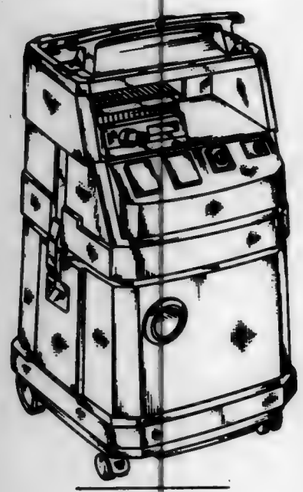
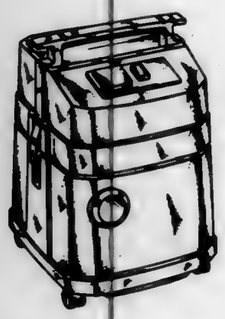
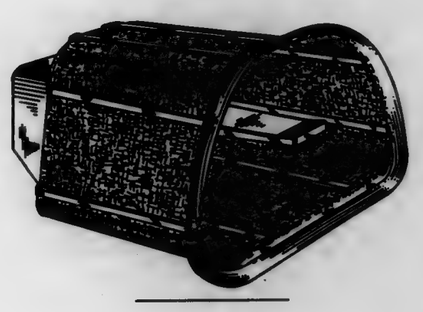
333,889
VACUUM CLEANER
Rainer Oberdorfer-Bogel, Kirchberg/Iller, Fed. Rep. of Germany, assignor to Wap Reinigungssysteme GmbH & Co., Fed. Rep. of Germany
Division of Ser. No. 524,098, May 10, 1990. This application Mar. 3, 1992, Ser. No. 847,240
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 8997254
Term of patent 14 years
U.S. Cl. D32—23



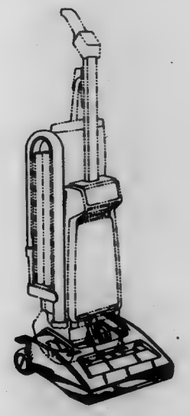
333,890
VACUUM CLEANER
Rainer Oberdorfer-Bogel, Kirchberg/Iller, Fed. Rep. of Germany, assignor to Wap Reinigungssysteme GmbH & Co., Fed. Rep. of Germany
Division of Ser. No. 524,098, May 10, 1990. This application Mar. 3, 1992, Ser. No. 847,241
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 8997254
Term of patent 14 years
U.S. Cl. D32—23



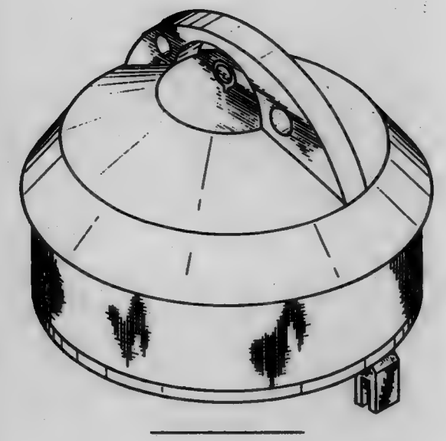
333,891
FILTER FOR A VACUUM CLEANER
Charles A. Reed, Jr., Shelton; Charles Z. Krasnasi, Trumbull; Richard B. Kosten, West Haven, and Maurice A. Melito, East Haven, all of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Jul. 11, 1990, Ser. No. 550,932
Term of patent 14 years
U.S. Cl. D32—30



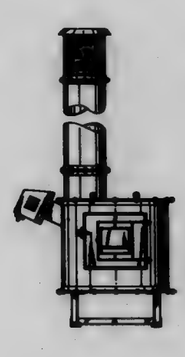
333,892
VACUUM CLEANER NOZZLE
Richard A. Wareham, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Dec. 23, 1991, Ser. No. 812,219
Term of patent 14 years
U.S. Cl. D32—32



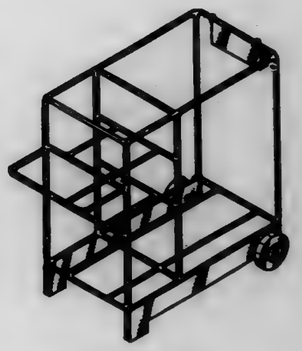
333,893
TRASH BURNING CONTAINER
Fred Washburn, 814 S. 4th St., Marshall, Ill. 62441
Filed Aug. 15, 1991, Ser. No. 745,378
Term of patent 14 years
U.S. Cl. D34—1.1



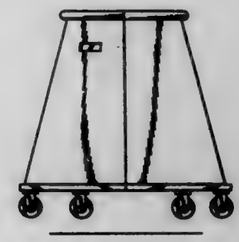
333,894
PATHALOGICAL WASTE INCINERATOR FOR FARM USE
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed Sep. 30, 1991, Ser. No. 767,924
Term of patent 14 years
U.S. Cl. D34—1.1



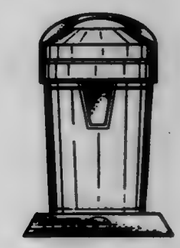
333,895
TRASH RECYCLING CART
Michael J. Niemeyer, 2916 N. Magellan Dr., McHenry, Ill. 60050
Filed Dec. 13, 1991, Ser. No. 806,440
Term of patent 14 years
U.S. Cl. D34—5



333,896
TRASH BAG TROLLEY
Charles W. Starkweather, 1231 Wells Ct. #33, Lincoln, Nebr. 68505
Filed May 24, 1991, Ser. No. 705,270
Term of patent 14 years
U.S. Cl. D34—5



333,897
NON-TIPPING TRASH CONTAINER
David E. Ward, 340 Graystone Dr., Hanover, Ind. 47243
Filed Jul. 18, 1991, Ser. No. 731,908
Term of patent 14 years
U.S. Cl. D34—7



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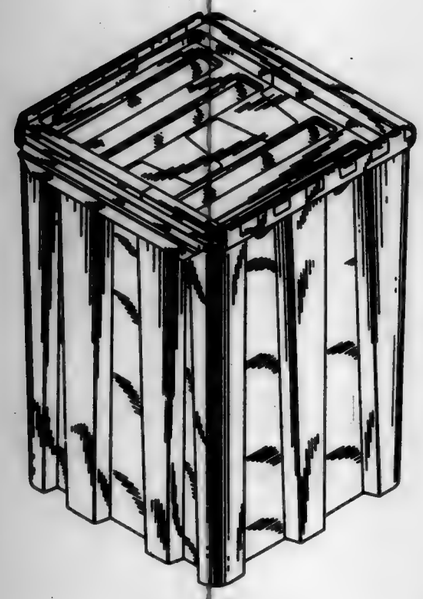
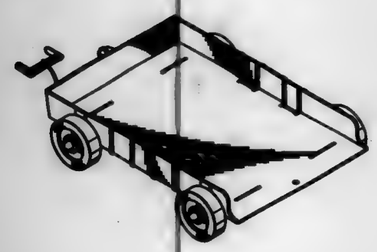
333,898
WASTE CONTAINER
Curt J. Schulze, Lakeland, Fla., and James M. Nichols, Old Saybrook, Conn., assignors to Browning-Ferris Industries Inc., Houston, Tex.
Filed Jul. 25, 1991, Ser. No. 735,478
Term of patent 14 years
U.S. Cl. D34—7

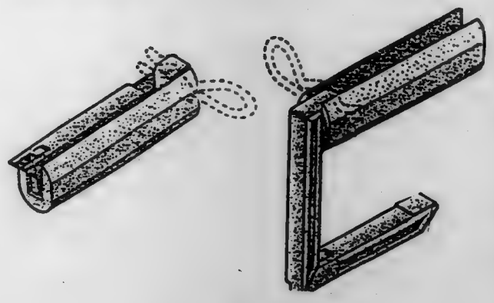


333,899
RECREATIONAL CART
Roberto Caceres, 730 W. 6th, Freeport, Tex. 77541
Filed Oct. 19, 1990, Ser. No. 600,504
Term of patent 14 years
U.S. Cl. D34—17



333,900
SHOPPING CART BUMPER
Kevin D. Kinnamon, Ft. Gibson, and Ronald J. Jones, Muskogee, both of Okla., assignors to Unarco Industries, Inc., Chicago, Ill.
Continuation of Ser. No. 706,055, May 28, 1991, Pat. No. 5,131,669. This application May 18, 1992, Ser. No. 885,204
Term of patent 14 years
U.S. Cl. D34—27

333,901
COLLAPSIBLE BLOCK CARRIER
William K. Swartz, 1316 Pritz Ave., Dayton, Ohio 45410
Filed Dec. 6, 1990, Ser. No. 624,908
Term of patent 14 years
U.S. Cl. D34—28



333,902
COMBINED TRACTOR TRAILER LIFTER AND SWITCH THEREFOR
Russell D. Cunningham, R.R. 8, Box 399, Decatur, Ill. 62522
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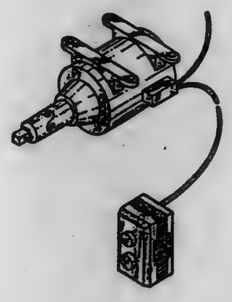

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Bunczak, Michael T.; and Urnezis, Philip W., to Wm. Wrigley Jr. Company. Aspartame stability in chewing gum using an acid gelatin system. 5,192,561, Cl. 426-3.000.

Bunel, Jean-Pierre, to Merlin Gerin. Extended range neutron detection device for monitoring and control of nuclear reactors. 5,192,490, Cl. 376-154.000.

Burlington Industries, Inc.: *See—*
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Burndy Corporation: *See—*
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Burnham, William L., to Eastman Kodak Company. Photographic film and cartridge. 5,192,648, Cl. 430-496.000.

Burns, James A., to Becton, Dickinson and Company. IV infusion or blood collection guard assembly. 5,192,275, Cl. 604-263.000.

Burpo, Gary D. Parallel jaw pliers with reinforced construction for symmetric force distribution. 5,191,816, Cl. 81-361.000.

Burri, Michel, to Motorola, Inc. Fault indicating microcomputer interface units. 5,193,177, Cl. 395-575.000.

Burrows, Bruce D., to Ebtech, Inc. Bottled water station with removable reservoir. 5,192,004, Cl. 222-146.100.

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Bussell, William R.; and Morgan, Nicholas S., to EKA Nobel Lendalkroos AB. Paper sizing compositions. 5,192,363, Cl. 106-218.000.

Bussiere, Raymond, to High-Line Manufacturing Inc. Agricultural frame for propulsion of ground working implements. 5,191,942, Cl. 172-286.000.

Butler, Bruce J. System for constructing storage containers for ready assembly and disassembly. 5,191,989, Cl. 220-4.340.

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Hochlowski, Jill E.; Buytendorp, Mark H.; Chen, Randal H.; McAlpine, James B.; Theriault, Robert J.; Jackson, Marianna; and Karwowski, James P., 5,192,748, Cl. 514-25.000.

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C.A. Weidmuller GmbH & Co.: *See—*
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Caffarella, Giuseppe, to Spaghetti Express S.r.l. Fast cooker of spaghettis, bucatinis, and the like. 5,191,829, Cl. 99-352.000.

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Cahlander, Robert L.; Carroll, David W.; Hollingsworth, Alfred C.; Lawrence, Gregory A.; and Rudesill, Brian R., to Restaurant Technology, Inc. Food dispenser and method. 5,191,918, Cl. 141-1.000.

Caicedo, Oswald A., to Caicedo, Sylvia. Fraction illustrating polyhedron. 5,192,077, Cl. 273-155.000.

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Caldwell, Colin S.; and Moeller, Helen H., to Babcock & Wilcox Company. Sic barrier overcoating and infiltration of fuel compact. 5,192,495, Cl. 376-417.000.

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Calvert, Michael A., to Prime Actuator Control Systems Limited. Actuator end stop arrangement. 5,191,808, Cl. 74-526.000.

Cammerano, Armando S.; DiGiacomo, Giulio; and DiPaolo, Nunzio, to International Business Machines Corporation. Low-cost ternary composite for use in via in glass-ceramic structures. 5,192,622, Cl. 428-551.000.

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Cardinal, Marcel E. Mobile harvester for hay bales. 5,192,177, Cl. 414-501.000.

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Carl, Willie, to ABB Vetco Gray Inc. Unidirectional seat seal for gate valve. 5,192,051, Cl. 251-328.000.

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Cassell, Allen J. Recirculating chilling apparatus with a submerged electric motor and impeller. 5,191,773, Cl. 62-373.000.

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Chan, Dominic M.; and LeStrange, Raymond J., to Du Pont de Nemours, E. I., and Company. Silver halide elements with improved speed and low fog. 5,192,655, Cl. 430-600.000.

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Chang, Fong C. Control device for a water tank. 5,191,661, Cl. 4-324.000.

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Chang, Jikuo; and Blaeck, Robert G., to Koch Membrane Systems, Inc. Spiral filtration module with improved cleanability and operating efficiency. 5,192,437, Cl. 210-321.830.

Chang, Ming C., to Taiwan Gesi Electronics Co., Ltd. Synchronously-controlled light string. 5,192,895, Cl. 315-201.000.

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Cliff, Geoffrey R.; and Richards, Ian C., to Schering Agrochemicals Limited. Acrylate fungicides. 5,192,357, Cl. 504-315.000.

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Dixon, Arthur E.; Damaskinos, Savvas; and Bowron, John W., to Dixon, A. E. Apparatus and method for method for spatially- and spectrally-resolved measurements. 5,192,980, Cl. 356-326.000.

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  Rand, Roy E.; and Tsiang, Eugene Y., 5,193,105, Cl. 378-137.000.
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  Cooper, Paul; and Sloteman, Donald P., 5,192,193, Cl. 416-186.00R.
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Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 5,193,161, Cl. 395-400.000.
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Lam, Son H., 5,193,170, Cl. 395-425.000.
Wilkinson, Philip R. C., 5,192,183, Cl. 415-90.000.
Wilson, Colin D.; MacGregor, Alexander F.; and McKillop, Alistair J., 5,191,961, Cl. 198-392.000.

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Hileman, Ronald E., 5,191,890, Cl. 128-662.060.

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Schroder, Joris, deceased, 5,192,836, Cl. 187-126.000.

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Hanada, Ryoji; Noro, Masaki; Minami, Yukimasa; and Takasugi, Motohide, 5,192,380, Cl. 152-454.000.
Minamitani, Kunitomo; Yoshioka, Hiromo; and Kakizaki, Shigeaki, to Mazda Motor Corporation. Engine idle control system for vehicle. 5,191,865, Cl. 123-339.000.
Minde, Tor B., to Telefonaktiebolaget L M Ericsson. Excitation pulse positioning method in a linear predictive speech coder. 5,193,140, Cl. 395-2.000.
Minemura, Masahiko; Takahashi, Takayuki; and Kuwata, Satoshi, to Shin-Etsu Chemical Co., Ltd. Silicone grease composition including an organomolybdenum compound. 5,192,458, Cl. 252-42.700.
Miner Enterprises, Inc.: *See*—
Wydra, Neal E.; and Geick, David W., 5,192,057, Cl. 267-153.000.
Miner, Philip E.: *See*—
Garlick, Theodore H., Jr.; and Miner, Philip E., 5,192,529, Cl. 424-49.000.
Mineral Industry Research Organisation: *See*—
Fray, Derek J.; and Kumar, Ramachandran V., 5,192,404, Cl. 204-153.190.
Minister of National Defence of Her Majesty's Canadian Government: *See*—
Pagotto, Jack G.; and Liang, Septimus H. C., 5,192,735, Cl. 502-417.000.
Ministry of International Trade and Industry: *See*—
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 5,192,684, Cl. 435-240.270.
Minitronics Pty. Ltd.: *See*—
Vosough, Ehsan; and Helal, Mohammed A., 5,192,897, Cl. 315-308.000.
Minnesota Mining and Manufacturing Company: *See*—
Babu, Gaddam N., 5,192,616, Cl. 428-407.000.
Moll, Karl-Andreas, 5,192,385, Cl. 156-250.000.
Stofko, John J., Jr.; and Iqbal, Mohammad, 5,192,617, Cl. 428-411.100.
Minnihan, James W.: *See*—
Francis, Robert L.; and Minnihan, James W., 5,192,245, Cl. 460-71.000.
Francis, Robert L.; and Minnihan, James W., 5,192,246, Cl. 460-72.000.
Minolta Camera Kabushiki Kaisha: *See*—
Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 5,192,966, Cl. 354-402.000.
Ikegawa, Akihito; Asano, Masaki; Iino, Shuji; and Osawa, Izumi, 5,192,974, Cl. 355-219.000.
Minor, Michael K.; and Bierman, Bernie B. Three-point hitch attached grader with adjustable blades. 5,191,943, Cl. 172-393.000.
Misaizu, Iwao: *See*—
Hanada, Kazuyuki; Misaizu, Iwao; Saito, Masashi; Torii, Katsutoshi; and Kuriyama, Katsumi, 5,192,736, Cl. 503-226.000.
Mish, Stanley L.: *See*—
Kilgrow, Bret J.; and Mish, Stanley L., 5,192,483, Cl. 264-510.000.
Mishra, Pravin K., to University of Illinois, The Board of Trustees of the. Dialysis probe. 5,191,900, Cl. 128-769.000.
Misiaszek, Steven M.: *See*—
Perry, John H., Jr.; Person, Abraham; Misiaszek, Steven M.; and Alessi, Donald P., Jr., 5,192,427, Cl. 429-17.000.
Misiti, Domenico: *See*—
Giannessi, Fabio; Ghirardi, Orlando; Misiti, Domenico; Tinti, Maria O.; and Cozzolino, Roberto, 5,192,759, Cl. 514-212.000.
Misner, Ned L.: *See*—
Thompson, Ronald J.; Misner, Ned L.; and Winegard, Michael D., 5,192,136, Cl. 384-123.000.
Mistop, Inc.: *See*—
Kane, David M.; and Fry, William E., 5,191,767, Cl. 60-728.000.
Miszewski, Antoni K. L.: *See*—
Edwards, A. Glen; Huber, Klaus B.; Hromas, Joe C.; Miszewski, Antoni K. L.; and Hill, William M., 5,191,933, Cl. 166-297.000.
Edwards, A. Glen; Huber, Klaus B.; and Miszewski, Antoni K. L., 5,191,936, Cl. 166-297.000.
Mita Industrial Co., Ltd.: *See*—
Iwasaki, Hiroaki; Takesawa, Youichi; Takemoto, Hiroshi; Tanaka, Masashi; Kimoto, Keizo; and Sakuma, Tadashi, 5,192,633, Cl. 430-59.000.
Kodama, Kiyofumi, 5,192,071, Cl. 271-225.000.
Mitek Surgical Products, Inc.: *See*—
Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, 5,192,303, Cl. 606-232.000.
Mitra, Sekhar: *See*—
Chapura, Francis B.; and Mitra, Sekhar, 5,192,752, Cl. 514-152.000.
Mitsuba Electric Manufacturing Co., Ltd.: *See*—
Nobuo, Yamada; and Kiuchi, Keiji, 5,192,184, Cl. 415-169.100.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Anami, Kenji, 5,193,074, Cl. 345-230.030.
Aoki, Kazuo; and Shichinohe, Daisuke, 5,192,879, Cl. 307-451.000.
Kimura, Masatoshi, 5,192,883, Cl. 307-475.000.
Kodai, Syojiro; and Murakami, Osamu, 5,192,682, Cl. 437-219.000.
Matuo, Masahito; and Yoshida, Toyohiko, 5,193,205, Cl. 395-800.000.
Murakami, Takashi; and Kaneno, Nobuaki, 5,192,711, Cl. 437-129.000.
Nishimura, Yukinobu, 5,191,7[illegible]8, Cl. 73-117.300.
Oda, Masao; and Iwasa, Tatsuya, 5,192,370, Cl. 118-723.000.
Shimoi, Hiroshi; Inadomi, Takafumi; Nakamura, Ryoichi; and Kawahara, Kan, 5,193,033, Cl. 360-31.000.
Shimura, Teruyuki, 5,192,700, Cl. 437-41.000.
Takaishi, Tadao, 5,191,872, Cl. 123-647.000.
Yoshida, Toyohiko; and Matuo, Masahito, 5,193,156, Cl. 395-375.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Iio, Takayuki; Hirano, Takahisa; and Morita, Yoshiharu, 5,192,195, Cl. 417-299.000.
Kishi, Osamu; Hayashi, Kanji; Furumoto, Hideaki; Miyamoto, Osamu; Morimoto, Kazuo; Akita, Hideki; Yoshida, Yasuyuki; and Wakamoto, Ikuo, 5,191,696, Cl. 29-521.000.
Terado, Sadamu; Hattori, Hidenori; Morimoto, Yoshio; and Yamakami, Yasuhiro, 5,191,927, Cl. 164-452.000.
Ukawa, Naohiko; Okino, Susumu; Takashina, Toru; Onizuka, Masakazu; and Inoue, Kenji, 5,192,518, Cl. 423-244.080.
Mitsubishi Kasei Corporation: *See*—
Ibuka, Toshihiko; and Noguchi, Masahiro, 5,192,994, Cl. 257-766.000.
Kijima, Naoto; and Oguri, Yasuo, 5,192,325, Cl. 623-16.000.
Mitsubishi Kasei Polytec Co.: *See*—
Ibuka, Toshihiko; and Noguchi, Masahiro, 5,192,994, Cl. 257-766.000.
Mitsuboshi Belting Ltd.: *See*—
Hamura, Takeshi; and Tanaka, Hiedaki, 5,192,382, Cl. 156-137.000.
Mitsui, Kiichiro; Ishii, Tooru; Terui, Sadao; Sano, Kunio; and Inoue, Akira, to Nippon Shokubai Kagaku Kogyo, Co., Ltd. Catalyst for water treatment. 5,192,452, Cl. 210-760.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Iizuka, Hiroshi, 5,192,816, Cl. 523-463.000.
Kaneko, Akira; Higashiya, Nobuo; and Hamasuna, Hiroyuki, 5,191,680, Cl. 19-299.000.
Kioka, Mamoru; Kawakita, Kazumitsu; and Toyota, Akinori, 5,192,731, Cl. 502-110.000.
Niimi, Hiroji; and Moritani, Yoshimitsu, 5,191,987, Cl. 215-1.00C.
Tomino, Ikuo; Ishiguro, Masaharu; Kitahara, Takumi; Yokoyama, Keiichi; Kihara, Noriaki; Kamiya, Joji; Yoshihara, Kanji; Ishii, Masaaki; Mizuchi, Akira; Horikomi, Kazutoshi; Awaya, Akira; and Nakano, Takuo, 5,192,799, Cl. 514-469.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Kodaka, Kenji; Kinoshita, Katsutoshi; Nakaya, Michihiko; Ebihara, Koichi; Shiraishi, Shirou; Yamada, Eiichi; and Numata, Satoshi, 5,192,778, Cl. 514-341.000.
Shimada, Shizuo; Iwata, Daiji; and Sato, Wakao, 5,192,662, Cl. 435-7.230.
Mitsukuchi, Yukio: *See*—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,191,817, Cl. 82-1.110.
Mittelstedt, Matthew T.: *See*—
Bealkowski, Richard; Gerald, Howard; Bharat, Khatri; Mathew, George; Mittelstedt, Matthew T.; Salvetti, Lynda M.; Sudasassi, Richard A.; and Zemanek, Carolyn J., 5,193,174, Cl. 395-500.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Fujitani, Matusiro; Takaku, Hideo; and Yoda, Yukiji, 5,191,717, Cl. 33-503.000.
Miura, Akira: *See*—
Kawashima, Hiroshi; Watanabe, Takao; and Miura, Akira, 5,192,124, Cl. 362-61.000.
Miura, Kazunobu: *See*—
Hirota, Kazuhiro; Hosoya, Hisao; Yamada, Yasushi; Miura, Kazunobu; and Nishiki, Akihiko, 5,192,065, Cl. 270-53.000.
Miura, Masaaki: *See*—
Miura, Yoshimi; and Miura, Masaaki, 5,191,720, Cl. 33-785.000.
Miura, Toshihiko: *See*—
Umetsu, Sachio; and Miura, Toshihiko, 5,192,560, Cl. 425-175.000.
Miura, Yoshimi; and Miura, Masaaki. Spot welding inspecting apparatus. 5,191,720, Cl. 33-785.000.
Miura, Yoshinori: *See*—
Kondo, Norihiko; Tsuzuki, Mikio; and Miura, Yoshinori, 5,191,739, Cl. 51-287.000.
Miyadera, Hiroshi: *See*—
Muranaka, Yasushi; Yamashita, Hisao; Kato, Akira; and Miyadera, Hiroshi, 5,192,393, Cl. 156-610.000.
Miyagi, Kunihiko, to Kabushiki Kaisha Machida Seisakusho. Optical connector and endoscope with optical connector. 5,193,135, Cl. 385-117.000.
Miyajima, Shumpei: *See*—
Ito, Wataru; Miyajima, Shumpei; Hashimoto, Misao; Itoh, Isao; and Komori, Tadashi, 5,192,410, Cl. 204-192.160.
Miyakawa, Naoomi; Toda, Kazuyuki; Nakamura, Yukiyasu; Tashiro, Minoru; Yamaoka, Yoshihisa; and Kuwayama, Isao, to Yamazaki Mazak Kabushiki Kaisha. Laser machining cell. 5,192,848, Cl. 219-121.820.
Miyake, Norihisa: *See*—
Takeuchi, Ikuo; Kamejima, Kohji; Hamada, Tomoyuki; and Miyake, Norihisa, 5,193,150, Cl. 395-200.000.
Miyake, Tomoyuki; Nakayama, Junichiro; Katayama, Hiroyuki; Takahashi, Akira; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Optical/magnetic composite head having magnetic and optical heads in one integrated unit. 5,193,082, Cl. 369-112.000.

Miyamoto, Masaaki: *See*—
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,192,766, Cl. 514-255.000.
Miyamoto, Osamu: *See*—
Kishi, Osamu; Hayashi, Kanji; Furumoto, Hideaki; Miyamoto, Osamu; Morimoto, Kazuo; Akita, Hideki; Yoshida, Yasuyuki; and Wakamoto, Ikuo, 5,191,696, Cl. 29-521.000.
Miyamoto, Sanpei; and Uehara, Hidetoshi, to Oki Electric Industry Co., Ltd. High-speed differential amplifier. 5,192,878, Cl. 307-362.000.
Miyashiro, Toshio, to Fuji Photo Film Co., Ltd. Method for manufacturing magnetic recording medium. 5,192,584, Cl. 427-129.000.
Miyata, Masanori: *See*—
Kaneko, Tokuharu; Nakayama, Miho; Miyata, Masanori; Honjo, Takeshi; Adachi, Hideki; and Kanazawa, Toshiya, 5,192,977, Cl. 355-313.000.
Miyazaki, Takashi, to NEC Corporation. Microcomputer having easily testable interrupt controller. 5,193,195, Cl. 395-725.000.
Miyoshi, Masanobu: *See*—
Kajiwara, Makoto; and Miyoshi, Masanobu, 5,192,652, Cl. 430-551.000.
Mizoguchi, Akira: *See*—
Uemiya, Takafumi; Uenishi, Naota; Mizoguchi, Akira; and Hattori, Yasuhiro, 5,192,579, Cl. 427-571.000.
Mizuchi, Akira: *See*—
Tomino, Ikuo; Ishiguro, Masaharu; Kitahara, Takumi; Yokoyama, Keiichi; Kihara, Noriaki; Kamiya, Joji; Yoshihara, Kanji; Ishii, Masaaki; Mizuchi, Akira; Horikomi, Kazutoshi; Awaya, Akira; and Nakano, Takuo, 5,192,799, Cl. 514-469.000.
Mizuguchi, Morio: *See*—
Inukai, Hiroshi; Kitahara, Takahiro; Sugioka, Kayoko; and Mizuguchi, Morio, 5,192,635, Cl. 430-108.000.
Mizuhashi, Nobuo: *See*—
Araki, Nobuo; Kagami, Takeji; Chatani, Yoji; Kikuta, Shunichi; Yamada, Iwao; Kamada, Masao; Hashimoto, Seiji; Ueno, Shuichi; Fukui, Takeshi; Nakamura, Takumi; Mizuhashi, Nobuo; and Ishikawa, Yasushi, 5,192,016, Cl. 228-147.000.
Mizumoto, Masao; Ougino, Kouichirou; Shimazaki, Tsutomu; Inoue, Tomohiro; and Okada, Yasuhiro, to Sanyo Electric Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Velocity/phase controller for DC servo motor. 5,192,902, Cl. 318-561.000.
Mizumura, Takayuki: *See*—
Otsuki, Masatoshi; Kawanishi, Yasuyoshi; Sawada, Kenji; Kaido, Yoshinori; Mizumura, Takayuki; and Maeba, Masayoshi, 5,192,944, Cl. 340-765.000.
Mizuno, Osamu: *See*—
Mohri, Masanari; Mizuno, Osamu; and Nakamura, Tohru, 5,193,080, Cl. 369-244.000.
Mizuno, Yasuo: *See*—
Ito, Yasunobu; and Mizuno, Yasuo, 5,191,953, Cl. 180-197.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A.; and Rankel, Lillian A., 5,192,421, Cl. 208-309.000.
Chu, Shaw-Chang; and Johnson, James A., 5,192,620, Cl. 428-461.000.
Dessau, Ralph M.; Valyocsik, Ernest W.; and Vartuli, James C., 5,192,728, Cl. 502-66.000.
Moini, Ahmad; and Valyocsik, Ernest W., 5,192,521, Cl. 423-713.000.
Pelensky, Martha T., 5,192,132, Cl. 374-166.000.
Troyer, William H.; and Schoepf, Victor L., 5,192,948, Cl. 340-855.100.
Mochida, Tetsuya; Tsujioka, Shigeo; Jikihara, Masami; Sadamitsu, Hitoshi; and Kobayashi, Kazushi, to Hitachi, Ltd. Process request arbitration system which preferentially maintains previously selected process request upon receipt of a subsequent request of identical priority. 5,193,196, Cl. 395-725.000.
Mochizuki, Akihiro: *See*—
Hiramoto, Kazuyuki; Hara, Hiromi; and Mochizuki, Akihiro, 5,192,139, Cl. 384-476.000.
Mochnal, Dennis: *See*—
Jakway, Janice; and Mochnal, Dennis, 5,192,657, Cl. 435-4.000.
MODcol Corporation: *See*—
Shalon, Yehuda, 5,192,433, Cl. 210-198.200.
Modly, Zoltan M., to Engelhard Corporation. Buff rutile pigment compositions. 5,192,365, Cl. 106-439.000.
Modul-Elektronik AB: *See*—
Insulander, Bjorn; and Hjelmvik, Torbernt, 5,192,855, Cl. 235-381.000.
Moeck, Gerhard, to Schwan-Stabilo Schwanhaeusser GmbH & Co. Applicator insert for an applicator implement. 5,192,154, Cl. 401-198.000.
Moeller, Helen H.: *See*—
Caldwell, Colin S.; and Moeller, Helen H., 5,192,495, Cl. 376-417.000.
Mogami Denki Kabushiki Kaisha: *See*—
Sakamoto, Yoshio; and Haga, Akihiko, 5,191,697, Cl. 29-594.000.
Mohr, Kirby S., to Facet Quantek, Inc. System for dispensing liquid fuel to a motor vehicle fueling station. 5,192,430, Cl. 210-172.000.
Mohri, Masanari; Mizuno, Osamu; and Nakamura, Tohru, to Matsushita Electric Industrial Co., Ltd. Magneto-optical recording medium and apparatus. 5,193,080, Cl. 369-244.000.
Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; Muller-Peddinghaus, Reiner; and Theisen-Popp, Pia, to Bayer Aktiengesellschaft. (Quinolin-2-yl-methoxy)phenylacetic acid derivatives containing cyclic substituents. 5,192,771, Cl. 514-311.000.
Moini, Ahmad; and Valyocsik, Ernest W., to Mobil Oil Corp. Synthesis of crystalline silicate ZSM-12. 5,192,521, Cl. 423-713.000.
Moir, David; and O'Connell, Robert M., to Alford Industries Inc. Method of making a cosmetic sampler. 5,192,386, Cl. 156-268.000.
Moiroux, Jacques: *See*—
Bourdillon, Christian; Moiroux, Jacques; Bonnefoy, Jacques P. B.; and Laval, Jean-Marc, 5,192,687, Cl. 435-280.000.
Molecular Technology Corporation: *See*—
Gardner-Chavis, Ralph A.; and May, Michael P., 5,192,515, Cl. 423-213.200.
Molex Incorporated: *See*—
Lenz, William R.; Patel, Arvind; Roberts, James T.; and Schafer, Jack J., 5,192,232, Cl. 439-660.000.
Moll, Karl-Andreas, to Minnesota Mining and Manufacturing Company. Method for the application of lengths of tape to a surface. 5,192,385, Cl. 156-250.000.
Moller, Jens K., to Dow Danmark A/S. Membrane filtration apparatus and method of making a membrane filtration unit. 5,192,434, Cl. 210-227.000.
Molteni, Agostino: *See*—
Ward, William F.; Molteni, Agostino; Ts'ao, Chung-hsin; and Hinz, Joaun M., 5,192,524, Cl. 424-1.100.
Momma, Genzo: *See*—
Naruse, Yasuhiro; Momma, Genzo; and Yuzurihara, Hiroshi, 5,192,680, Cl. 437-81.000.
Momoi, Shoji: *See*—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,191,817, Cl. 82-1.110.
Momont, Joseph A.: *See*—
Keckler, Kenneth P.; Brandenburg, Bruce L.; Momont, Joseph A.; and Lehmann, Richard W., 5,192,453, Cl. 210-761.000.
Montford, Leslie V.: *See*—
Barrier, James M.; Drey, Mark D.; Montford, Leslie V.; and Tan, Stephen S., 5,192,384, Cl. 156-189.000.
Moore, Karen: *See*—
Zasloff, Michael; Moore, Karen; and Wehrli, Suzanne, 5,192,756, Cl. 514-182.000.
Moorefield, William J., to McDonnell Douglas Corporation. Double-pivoting deployment system for aerosurfaces. 5,192,037, Cl. 244-46.000.
Mooren, Pieter G.: *See*—
Van Der Marel, Piet; and Mooren, Pieter G., 5,192,539, Cl. 424-89.000.
Moosmann, Bernhard: *See*—
Goedecke, Wolf-Dieter; Moosmann, Bernhard; and Huber, Ralf, 5,191,702, Cl. 29-742.000.
Mopa S.r.l.: *See*—
Scheid, Manfred, 5,191,965, Cl. 198-460.000.
Morey, Norval K., to Wood Technology, Inc. Self-propelled compost windrow turning and aerating machine and methods of operating the machine. 5,191,754, Cl. 56-13.300.
Morgan, Nicholas S.: *See*—
Bussell, William R.; and Morgan, Nicholas S., 5,192,363, Cl. 106-218.000.
Morgan, Richard D., to New England Biolabs, Inc. Type II restriction endonuclease, AscI, obtainable from arthrobacter species and a process for producing the same. 5,192,676, Cl. 435-199.000.
Mori, Akinori: *See*—
Yamanishi, Toru; Kakuta, Tatsuya; and Mori, Akinori, 5,192,834, Cl. 174-120.0SR.
Mori, Kazuya: *See*—
Yoshikuni, Yoshiaki; Ojima, Nobutoshi; and Mori, Kazuya, 5,192,772, Cl. 514-315.000.
Mori, Kentaro: *See*—
Sato, Toshio; Sugiyama, Shunichi; Ishii, Toshio; Nakada, Masayuki; Oosako, Takashi; and Mori, Kentaro, 5,191,928, Cl. 164-466.000.
Morigaki, Masakazu: *See*—
Seto, Nobuo; and Morigaki, Masakazu, 5,192,650, Cl. 430-546.000.
Morikawa, Juichi: *See*—
Kochi, Masanori; Morikawa, Juichi; Zama, Hideo; and Ibe, Makoto, 5,193,045, Cl. 360-84.000.
Morimoto, Kazuo: *See*—
Kishi, Osamu; Hayashi, Kanji; Furumoto, Hideaki; Miyamoto, Osamu; Morimoto, Kazuo; Akita, Hideki; Yoshida, Yasuyuki; and Wakamoto, Ikuo, 5,191,696, Cl. 29-521.000.
Morimoto, Toru, to Unix Corporation Ltd., a part interest. Sound absorbing materials. 5,192,624, Cl. 428-596.000.
Morimoto, Yoshio: *See*—
Terado, Sadamu; Hattori, Hidenori; Morimoto, Yoshio; and Yamakami, Yasuhiro, 5,191,927, Cl. 164-452.000.
Morioka, Susumu: *See*—
Yokota, Teppei; Morioka, Susumu; Machinguchi, Yoshihiro; and Yamada, Yuji, 5,193,208, Cl. 455-4.100.
Morishige, Yuji: *See*—
Kitajima, Tadayuki; Naito, Masataka; Ueda, Noriyoshi; Hirai, Katsuaki; Honjo, Takeshi; Morishige, Yuji; and Yoshida, Akimaro, 5,192,976, Cl. 355-309.000.
Morishita, Tatsuya: *See*—
Ohmori, Kazuo; Seto, Tsuneo; Itakura, Hitoshi; Kohno, Mikio; Nagao, Masaru; Morishita, Tatsuya; and Tanigawa, Masayuki, 5,191,780, Cl. 72-164.000.
Morita, Kiyoo, to Fuji Photo Film Co., Ltd. Method and apparatus for molding article in plurality of colors. 5,192,481, Cl. 264-246.000.

Nagao, Masaru: *See*—

Nakayama, Miho: *See*—

Morita, Yoshiharu: *See*—
Iio, Takayuki; Hirano, Takahisa; and Morita, Yoshiharu, 5,192,195, Cl. 417-299.000.

Moritani, Yoshimitsu: *See*—
Niimi, Hiroji; and Moritani, Yoshimitsu, 5,191,987, Cl. 215-1.00C.

Morshirweg, Markus; and Steppes, Fritz, to Hewlett-Packard Company. Transducer head for a medical instrument and method of use. 5,191,889, Cl. 128-662.040.

Moro, Masashi: *See*—
Ishida, Hiroshi; Yamada, Yutaka; Izumi, Kiyoshi; and Moro, Masashi, 5,192,456, Cl. 210-791.000.

Morran, James R.: *See*—
Cargnel, Robert A.; and Morran, James R., 5,192,843, Cl. 219-56.220.

Morris, John P.: *See*—
Mangini, Daniel J.; and Morris, John P., 5,191,769, Cl. 62-258.000.

MOS Electronics Corporation: *See*—
Glass, Kevin W., 5,192,916, Cl. 328-155.000.

Moseley, Donald R. Consumer oriented smart card system and authentication techniques. 5,193,114, Cl. 380-23.000.

Moshe, Yossi: *See*—
Lichtash, Avi; Vitelson, Israel; Huna, Zvi; Markus, Reuven; Notatzki, Michal; Gutman, Barach; Orbach, Shlomo; Taler, Rafi; Moshe, Yossi; Bruckman, Leon; and Agmon, Gideon, 5,193,087, Cl. 370-58.200.

Moslehi, Mehrdad M., to Texas Instruments Incorporated. Multipurpose low-thermal-mass chuck for semiconductor processing equipment. 5,192,849, Cl. 219-121.430.

Mosser, Benjamin H., III: *See*—
Collins, Henry B.; Mosser, Benjamin H., III; and Smith, Steven G., 5,192,228, Cl. 439-567.000.

Mostardo, August F., to Knowles Electronics, Inc. Hearing and output transducer with self contained amplifier. 5,193,116, Cl. 381-69.000.

Motorola, Inc.: *See*—
Agahi-Kesheh, Darioush; and Rabe, Duane C., 5,192,924, Cl. 333-175.000.
Burri, Michel, 5,193,177, Cl. 395-575.000.
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Ball, Anthony A.; and Rodiger, Ulrich, 5,191,760, Cl. 57-263.000.

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Schwarzli, Josef W. Brush housing for bulk vendor. 5,191,998, Cl. 221-203.000.
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Welch, David F.; Scifres, Donald R.; and Streifer, William, 5,193,098, Cl. 372-46.000.
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Toensing, Eyvand E., 5,191,705, Cl. 29-764.000.
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Skeels, Gary W.; and Sears, Marilyn R., 5,192,522, Cl. 423-713.000.
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Shaw, Sonya Y.; and Seeley, Douglas A., 5,192,641, Cl. 430-200.000.
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Yokouchi, Hideaki, 5,193,198, Cl. 395-750.000.
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Kimura, Atsushi; Seki, Hiroyuki; and Nishimoto, Yoshifumi, 5,192,890, Cl. 310-323.000.
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Smith, Richard A.; and Bernhardt, Christopher A., 5,192,931, Cl. 340-550.000.
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Seto, Yoichi, to Hitachi, Ltd. Method and device for storing data subjected to dispersion processing. 5,193,173, Cl. 395-425.000.
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Hodges, Robert; and Bryant, Frank, 5,192,707, Cl. 437-70.000.
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Artieri, Alain, 5,193,203, Cl. 395-800.000.
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Shalon, Yehuda, to MODcol Corporation. Slurry compressor, apparatus for guiding compresser, and method for packing slurry in column. 5,192,433, Cl. 210-198.200.
Shamblee, Dwight A.: *See*—
Lo, Young S.; Nolan, Joseph C.; and Shamblee, Dwight A., 5,192,785, Cl. 514-399.000.
Shanks, Ian A., to Thorn EMI plc. Cholesteric liquid crystal screen which reflects substantially all of the projected light. 5,193,015, Cl. 359-53.000.
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Ruggiero, Ralph; Plourde, Thomas R.; and Kaczynski, Joseph, Jr., 5,191,694, Cl. 29-430.000.
Shapira, Nadiv; and Wright, John T. M. Vortex smoke remover for electrosurgical devices. 5,192,267, Cl. 604-22.000.
Shapiro, Wilbur: *See*—
Jones, Henry F., Jr.; and Shapiro, Wilbur, 5,192,083, Cl. 277-29.000.
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Danforth, John W.; Kraus, Jeff L.; Horzewski, Michael J.; and Sharkey, Hugh R., 5,192,295, Cl. 606-194.000.
Sharp, Ivan. Prefabricated simulated wrought iron and like fencing systems and methods. 5,192,054, Cl. 256-24.000.
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Ohta, Kenji; and Van, Kazuo, 5,192,644, Cl. 430-338.000.
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Sharrow, John A. Flush limiting mechanism. 5,191,662, Cl. 4-325.000.
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Asprey, Robert R.; and Shatas, Remigius G., 5,193,200, Cl. 395-800.000.
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Shay, Gregory D., to Union Carbide Chemicals & Plastics Technology Corporation. Method of coating substrates utilizing an alkali-functional associative thickner containing coating composition. 5,192,592, Cl. 427-358.000.
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Sherman, Edward S., to Raychem Corporation. Coating metal on poly(aryl ether ketone) surfaces. 5,192,590, Cl. 427-304.000.
Shetty, Chandrashekar S.: *See*—
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Shetty, H. Ravindranath; Ottersberg, Walter H.; Parr, Jack E.; and Crowninshield, Roy D., to Zimmer, Inc.; and Bristol-Myers Squibb Co. Method of surface hardening orthopedic implant devices. 5,192,323, Cl. 623-16.000.
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Shimada, Shizuo; Iwata, Daiji; and Sato, Wakao, to Mitsui Toatsu Chemicals, Inc. Anti-ganglioside GD_1A monoclonal antibody MZ, MZ-producing cells and MZ-containing reagent. 5,192,662, Cl. 435-7.230.
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Komi, Hideto, 5,192,866, Cl. 250-310.000.
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Shimano, Inc.: *See*—
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Shimek, Daniel C.: *See*—
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Shimek, Ronald J.; and Shimek, Daniel C. Insertable gas conversion unit. 5,191,877, Cl. 126-512.000.
Shimo, Norio, to Sony Corporation. Signal transmission reception switching apparatus. 5,193,218, Cl. 455-80.000.
Shimoi, Hiroshi; Inadomi, Takafumi; Nakamura, Ryoichi; and Kawahara, Kaa, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recording and reproducing apparatus incorporating clogging detection. 5,193,033, Cl. 360-31.000.
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Murase, Isao; and Shimozono, Akira, 5,193,062, Cl. 364-426.040.
Shimura, Teruyuki, to Mitsubishi Denki Kabushiki Kaisha. Method of making field effect transistor. 5,192,700, Cl. 437-41.000.
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Inoue, Yoshifumi; Saito, Kin; Imai, Keisuke; and Arai, Masatoshi, 5,192,364, Cl. 106-287.160.
Minemura, Masahiko; Takahashi, Takayuki; and Kuwata, Satoshi, 5,192,458, Cl. 252-42.700.
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Shin, Young S.: *See*—
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Kishi, Teruo; Shiwa, Mitsuharu; Ohara, Yoshinobu; and Nakagami, Yasuhiro, 5,191,796, Cl. 73-632.000.
Shon, Russell D., to Eastman Kodak Company. Data deskewing apparatus utilizing bank switched random access memories. 5,193,164, Cl. 395-425.000.
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Shiina, Kanichi; Suzuki, Katsuhisa; and Yamamoto, Yuji, 5,191,775, Cl. 62-503.000.
Showa Denko K.K.: *See*—
Hasegawa, Mitsuru; Hiraiwa, Tadashi; and Hatanaka, Tetsuo, 5,192,339, Cl. 51-309.000.
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Shur, Robert D.: *See*—
Hartoog, Mark R.; Rowson, James A.; Shur, Robert D.; and Van Egmond, Kenneth D., 5,193,092, Cl. 371-22.400.
Shuto, Mitsutoshi; Fukazawa, Yasushi; and Ohaski, Minoru, to ASM Japan K.K. Substrate supporting apparatus for a CVD apparatus. 5,192,371, Cl. 118-728.000.
Sibley, John: *See*—
McGeer, Patrick L.; Rogers, Joseph; Sibley, John; and McGeer, Edith, 5,192,753, Cl. 514-159.000.
Sibony, Jacques; and Desbos, Gilbert, to Omnium de Traitements et de Valorisation (OTV). Process and installation for biological treatment, e.g. by nitrification and/or denitrification, of an effluent including nitrated pollution. 5,192,441, Cl. 210-603.000.
Sieja, James B., to Du Pont de Nemours, E. I., and Company. Purification of aminonitriles or diamines. 5,192,399, Cl. 203-36.000.
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Grage, Ludger; Krasz, Wolfgang; and Brumme, Gerhard, 5,192,979, Cl. 356-28.500.
Hickisch, Gerhard, 5,192,973, Cl. 355-215.000.
Mertens, Armin; Hinze, Peter; Ebert, Rudolf; and Grach, Herbert, 5,192,102, Cl. 280-766.100.
Schweigert, Ralf; and Donat, Albrecht, 5,192,917, Cl. 328-162.000.
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Siemens Automotive Limited: *See*—
Cook, John E., 5,191,870, Cl. 123-520.000.
Siemens Corporate Research, Inc.: *See*—
Jelley, Kevin W.; and Mackay, G. J., 5,191,784, Cl. 73-31.060.
Siemens Matsushita Comp. GmbH & Co. KG: *See*—
Espenhain, Manfred, 5,191,701, Cl. 29-605.000.
Sigma, Inc.: *See*—
Komori, Takashi, 5,192,076, Cl. 273-138.00A.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Cavazza, Claudio, 5,192,805, Cl. 514-556.000.
Giannessi, Fabio; Ghirardi, Orlando; Misiti, Domenico; Tinti, Maria O.; and Cozzolino, Roberto, 5,192,759, Cl. 514-212.000.
Signature Financial Group Inc.: *See*—
Boes, R. Todd, 5,193,056, Cl. 364-408.000.
Silbernagel, Frederick J. Extensible discharge chute assembly. 5,192,178, Cl. 414-523.000.
Silbershatz, Giora: *See*—
Meidan, Reuven; Livneh, Noam; Silbershatz, Giora; and Ritz, Mordechai, 5,193,102, Cl. 375-1.000.
Silbey, Alexander A.: *See*—
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Strella, Stephen: *See*—
Work, Ray A., III; Milner, Clifford E.; Kintner, Sarah J.; Genthe, James E.; Strella, Stephen; and Iacovella, Charles R., 5,192,613, Cl. 428-363.000.

Strickland, Richard D.; and Saccomanno, Geno, to Baal Associates, Inc. Pap smear collection device with bristles oriented in a plane. 5,191,899, Cl. 128-756.000.

Strickler, Ernst, to Mettler - Toledo AG. Weighing apparatus with resiliently suspended pan support arm. 5,191,948, Cl. 177-188.000.

Stringer, Orum: *See*—
Gaffar, Abdul; Nabi, Nuran; Affinito, John; and Stringer, Orum, 5,192,530, Cl. 424-52.000.
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Strokon, Andrew. Apparatus and method for knee surgery. 5,192,321, Cl. 623-13.000.

Strout, Robert E., II; Spix, George A.; Miller, Edward C.; Schooler, Anthony R.; Silbey, Alexander A.; Phelps, Andrew E.; Vanderwarn, Brian D.; and Gaertner, Gregory G., to Supercomputer Systems Limited Partnership. Fast interrupt mechanism for interrupting processors in parallel in a multiprocessor system wherein processors are assigned process ID numbers. 5,193,187, Cl. 395-650.000.

Strunc, Robert W.; and Bango, Oscar L., to Parkson Corporation. Aeration panel structure. 5,192,467, Cl. 261-122.100.

Stryker Corporation: *See*—
Cezana, Haim; and Savage, Donald C., 5,192,292, Cl. 606-170.000.

Stumphauzer, William C.; Groth, Hugh F.; and Duncan, L. Scot, to Stumphauzer, William C. High speed process and apparatus for carbonating water. 5,192,513, Cl. 422-305.000.

Stupka, Jonathan C.; Bokros, Jack C.; Emken, Michael R.; Haubold, Axel D.; and Peters, T. Scott, to Onx, Inc. Prosthetic heart valve. 5,192,309, Cl. 623-2.000.

Stutler, Mark. Trash organizer for recycling. 5,192,121, Cl. 312-212.000.

Su, Jyh-Yeong, to Jyi Shen Industrial Co., Ltd. Plastic door lock. 5,192,097, Cl. 292-166.000.

Su, Yansheng: *See*—
Davis, Jeffrey P.; Chandrasekaran, Santosh K.; Su, Yansheng; Archibald, Roy D.; and Robinson, Joseph R., 5,192,535, Cl. 424-78.040.

Subbarao, Muralidhara, to Research Foundation of State University of New York, The. Computational methods and electronic camera apparatus for determining distance of objects, rapid autofocusing, and obtaining improved focus images. 5,193,124, Cl. 382-41.000.

Suchoski, Paul G.: *See*—
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Sudo, Kiyoshi; Sakurai, Yasutomo; Odahara, Koichi; Hoshi, Kenji; and Kanaya, Hideharu, to Fujitsu Limited. Clock control circuit for suppressing clock pulses. 5,192,914, Cl. 328-72.000.

Sue, Toshio: *See*—
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Suematsu, Shigenori; Matsumoto, Yoshikane; Sakamoto, Shinichi; and Kobayashi, Hirotaka, to Hitachi Koki Co., Ltd. Dot line printer having improved comb yoke. 5,192,148, Cl. 400-157.200.

Saffredini, Nino R.; and Anderson, James D., to Burndy Corporation. Grounding block. 5,192,233, Cl. 439-723.000.

Sugden, David B.: *See*—
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Sugimoto, Kenji: *See*—
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Sugioka, Kayoko: *See*—
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Sugiyama, Akihiko, to NEC Corporation. Interference canceller using tap-weight adaptive filter. 5,192,918, Cl. 328-165.000.

Sugiyama, Shunichi: *See*—
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Sugiyama, Takeyoshi: *See*—
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Suguro, Kyoichi; and Okano, Haruo, to Kabushiki Kaisha Toshiba. Method of manufacturing a multilayered metallization structure in which the conductive layer and insulating layer are selectively deposited. 5,192,714, Cl. 437-195.000.

Suh, Sung S.: *See*—
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Suire, Christian G., to Giat Industries. Initiation device for the propulsive charge of ammunition, for example telescoped ammunition, and ammunition ignited by such an ignition device. 5,192,829, Cl. 102-434.000.

Sullivan, Maureen: *See*—
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Sulzer Brothers Limited: *See*—
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Spotorno, Lorenzo; and Frey, Otto, 5,192,331, Cl. 623-23.000.

Sumi, Masatomo; Inaki, Shigeo; Takamiya, Yutaka; and Kondo, Genki, to Matsushita Electric Industrial Co., Ltd. Method of making a resin-molded motor. 5,191,698, Cl. 29-596.000.

Sumitomo Electric Industries, Ltd.: *See*—
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Walker, John C.; and Rehal, Lavinder S., 5,192,929, Cl. 340-444.000.

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Sun, Donald J. C.; and Kuo, Eric C. P. Golf ball with smaller and larger dimples. 5,192,079, Cl. 273-232.000.

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Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Method for spectrally sensitizing silver halide photographic emulsions. 5,192,653, Cl. 430-569.000.
Tanigawa, Masayuki: *See*—
Ohmori, Kazuo; Seto, Tsuneo; Itakura, Hitoshi; Kohno, Mikio; Nagao, Masaru; Morishita, Tatsuya; and Tanigawa, Masayuki, 5,191,780, Cl. 72-164.000.
Taniguchi, Kiyomi: *See*—
Yokoyama, Kazuaki; Taniguchi, Kiyomi; Sekiguchi, Hisao; and Kaneko, Tomiatsu, 5,192,568, Cl. 426-94.000.
Taniguchi, Nobuyuki: *See*—
Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 5,192,966, Cl. 354-402.000.
Taniguchi, Yoshihiro: *See*—
Takaishi, Yoshihisa; Goto, Kiyoto; Uesako, Takuji; Kuwahara, Toshiko; Takai, Masaaki; Ono, Yukihisa; Taniguchi, Yoshihiro; Manabe, Sachiko; and Asakumi, Takahiro, 5,192,817, Cl. 549-298.000.
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Taracon, Jean-Marie: *See*—
Guyomard, Dominique; and Taracon, Jean-Marie, 5,192,629, Cl. 429-197.000.
Tarn, Terry: *See*—
Bull, David N.; Ozimek, Edward J.; and Tarn, Terry, 5,192,835, Cl. 174-260.000.
Tasaki, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Propeller vane structure for marine propulsion unit. 5,192,191, Cl. 416-90.00A.
Tashiro, Hideo; Midorikawa, Katsumi; and Suzuki, Mitsutoshi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Multimode raman laser system. 5,193,095, Cl. 372-3.000.
Tashiro, Minoru: *See*—
Miyakawa, Naoomi; Toda, Kazuyuki; Nakamura, Yukiyasu; Tashiro, Minoru; Yamaoka, Yoshihisa; and Kuwayama, Isao, 5,192,848, Cl. 219-121.820.
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Taylor, Richard F.; Marenchic, Ingrid G.; and Cook, Edward J., to Arthur D. Little, Inc. Receptor-based biosensors. 5,192,507, Cl. 422-68.100.
Taylor, Robert F., III: *See*—
Hakkarainen, Susan S.; Hanna, Robert S.; Jacoby, Elliot G.; and Taylor, Robert F., III, 5,191,971, Cl. 200-550.000.
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Tebbe, Frederick N.: *See*—
Ittel, Steven D.; and Tebbe, Frederick N., 5,192,730, Cl. 502-108.000.
Technicon Instruments Corporation: *See*—
Cassaday, Michael M., 5,192,504, Cl. 422-64.000.
Techstrip Inc.: *See*—
Pariot, Robert; and Traugott, J. Mortimer, 5,192,381, Cl. 156-79.000.
Tecumseh Products Company: *See*—
Havens, Dale I., 5,191,813, Cl. 74-606.00R.
Tedesco, Robert J.: *See*—
Grunert, Kurt A.; Tedesco, Robert J.; Wafer, John A.; Wehrli, Henry A., III; Hapeman, Lawrence M.; and Mrenna, Stephen A., 5,193,043, Cl. 361-93.000.
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Sekiya, Masahiko; Ishizaki, Takayuki; and Chiba, Kiyoshi, 5,192,626, Cl. 428-694.000.
Tektronix, Inc.: *See*—
Mathieu, Alan E.; Wardzala, Edward D.; and Overton, Michael S., 5,192,915, Cl. 328-133.000.
Telectronics N.V.: *See*—
Gilli, Norma L.; Holley, Lorraine; Drane, Geoffrey A.; Stephens, Anthony C.; Daly, Christopher N.; and Maas, Steven M., 5,191,884, Cl. 128-419.00D.
Teleflex Incorporated: *See*—
Green, Edward A., 5,192,476, Cl. 264-127.000.
Telefonaktiebolaget L M Ericsson: *See*—
Minde, Tor B., 5,193,140, Cl. 395-2.000.
Tell, Elaine N.; and Veltman, Preston L., to Erika, Inc. Sterilant compositions. 5,192,459, Cl. 252-106.000.
Tengquist, David C.; and Kelly, Patrick M. Prefabricated pass-through service system for fast food restaurants and the like. 5,191,747, Cl. 52-36.400.
Tennelic/Nucleus Inc.: *See*—
Dudley, John M., 5,192,868, Cl. 250-374.000.
Terado, Sadamu; Hattori, Hidenori; Morimoto, Yoshio; and Yamakami, Yasuhiro, to Mitsubishi Jukogyo Kabushiki Kaisha; and Nippon Steel Corporation. Method and apparatus for detecting a sheet thickness in a continuous casting machine. 5,191,927, Cl. 164-452.000.
Terajima, Hisao: *See*—
Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; Ishida, Yasushi; Terajima, Hisao; Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; and Kobayashi, Makoto, 5,193,007, Cl. 358-296.000.
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Terpstra, Arthur J., Jr.: *See*—
Woltjer, Bernard H.; and Terpstra, Arthur J., Jr., 5,191,967, Cl. 198-781.000.
Terrett, Nicholas K.: *See*—
Barnish, Ian T.; Danilewicz, John C.; James, Keith; Samuels, Gillian M. B.; Terrett, Nicholas K.; Williams, Michael T.; and Wythes, Martin J., 5,192,800, Cl. 514-510.000.
Terui, Sadao: *See*—
Mitsui, Kiichiro; Ishii, Tooru; Terui, Sadao; Sano, Kunio; and Inoue, Akira, 5,192,452, Cl. 210-760.000.
Terumo Kabushiki Kaisha: *See*—
Oyama, Noboru; and Shono, Toshiyuki, 5,192,417, Cl. 204-418.000.
Sakai, Satoru; and Ishikawa, Kiyohide, 5,192,499, Cl. 422-46.000.
Teschner, Gotz, to Leybold Aktiengesellschaft. Device for the suppression of arcs. 5,192,894, Cl. 315-111.210.
Teshigawara, Mikiro: *See*—
Kojima, Hiroshi; Sakata, Keikichi; Watanabe, Seigo; Mitsukuchi, Yukio; Hashimoto, Shuichi; Kato, Choji; Teshigawara, Mikiro; Furuhashi, Ryoichi; Momoi, Shoji; Inoue, Toshihiko; Uemura, Kazuki; and Oshima, Katsushi, 5,191,817, Cl. 82-1.110.
Tessier, Jean: *See*—
Babin, Didier; Benoit, Marc; Demoute, Jean-Pierre; and Tessier, Jean, 5,192,801, Cl. 514-521.000.
Tetra Pak Holdings S.A.: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; Knobloch, Gerd; and Liebram, Udo, 5,191,988, Cl. 220-4.240.
Teulon, Jean-Marie: *See*—
Bru-Magniez, Nicole; Launay, Michele; and Teulon, Jean-Marie, 5,192,781, Cl. 514-365.000.
Texaco, Inc.: *See*—
Bartels, Craig R., 5,192,445, Cl. 210-640.000.
Cook, Fred R., Sr., 5,191,937, Cl. 166-363.000.
Texas Instruments Incorporated: *See*—
Abiko, Shigeshi; and Saiki, Shoji, 5,193,070, Cl. 364-724.160.
Bhuva, Rohit L., 5,193,073, Cl. 365-226.000.
Bolscher, Jeroen J. M., 5,192,285, Cl. 606-117.000.
Boysel, Robert M.; and Sampsell, Jeffrey B., 5,192,395, Cl. 156-643.000.
Chiu, Anthony M., 5,192,681, Cl. 437-217.000.
Houston, Theodore W., 5,193,076, Cl. 365-233.500.

McDavid, James M.; and Clark, David R., 5,192,704, Cl. 437-52.000.
Moslehi, Mehrdad M., 5,192,849, Cl. 219-121.430.
Parker, Sidney G.; Hammerbacher, Milfred D.; Levine, Jules D.; and Hotchkiss, Gregory B., 5,192,400, Cl. 205-124.000.
Rodder, Mark S., 5,192,706, Cl. 437-67.000.
Thompson, E. Earle; and DeMond, Thomas W., 5,192,946, Cl. 340-794.000.
Thacker, Charles P., to Digital Equipment Corporation. Apparatus and method for distributed dynamic priority arbitration for access to a shared resource. 5,193,197, Cl. 395-725.000.
Theis, Kenneth R., to Emerson Electric Co. Starting multi-speed motors at a low speed connection. 5,192,887, Cl. 310-68.00C.
Theisen-Popp, Pia: *See*—
Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; Muller-Peddinghaus, Reiner; and Theisen-Popp, Pia, 5,192,771, Cl. 514-311.000.
Ther, James; Brockett, Brendan L.; and Patterson, John H., to GTE Valenite Corporation. Chip control insert. 5,192,171, Cl. 407-114.000.
Theriault, Robert J.: *See*—
Hochlowski, Jill E.; Buytendorp, Mark H.; Chen, Randal H.; McAlpine, James B.; Theriault, Robert J.; Jackson, Marianna; and Karwowski, James P., 5,192,748, Cl. 514-25.000.
Thomas, Darrell E.; Standley, Donald E.; and Jackson, Leon J. Training apparatus for cattle roping. 5,192,210, Cl. 434-247.000.
Thomas, E. B.: *See*—
Rose, James L., 5,191,740, Cl. 51-429.000.
Thomas, Edward W.: *See*—
Aiken, James W.; Spilman, Charles H.; and Thomas, Edward W., 5,192,798, Cl. 514-462.000.
Thomas, J. Donaldson: *See*—
Austin, Dennis K.; and Thomas, J. Donaldson, 5,192,828, Cl. 102-275.120.
Thomas, Michel; Blandiaux, Genevieve; and Valange, Baudouin, to Colgate-Palmolive Company. Safe acidic hard surface cleaner. 5,192,460, Cl. 252-142.000.
Thomasian, Alexander: *See*—
Franaszek, Peter A.; Robinson, John T.; and Thomasian, Alexander, 5,193,188, Cl. 395-650.000.
Thompson, E. Earle; and DeMond, Thomas W., to Texas Instruments Incorporated. Digitized color video display system. 5,192,946, Cl. 340-794.000.
Thompson, Gary A.: *See*—
Dimmick, Roger F.; Kleve, Vernon J.; Meyer, Timothy L.; Thompson, Gary A.; and Westphal, Gordon W., 5,193,050, Cl. 361-384.000.
Thompson, Ronald J.; Misner, Ned L.; and Winegard, Michael D., to Federal-Mogul Corporation. Crankshaft bearing having hydrodynamic thrust flanges. 5,192,136, Cl. 384-123.000.
Thompson, Todd; Kloeckl, Terrance; Costa, Peter F.; Holmes, William A.; and Daulton, Jay, to Origin Medsystems, Inc. Surgical clip applier. 5,192,288, Cl. 606-143.000.
Thompson, Wayne J.: *See*—
Treiber, Laszlo R.; Colwell, Lawrence F., Jr.; Arison, Byron H.; Dezeny, Georgette; Lingham, Russell B.; Thompson, Wayne J.; and Balani, Suresh K., 5,192,668, Cl. 435-41.000.
Thomson Consumer Electronics: *See*—
Kerdranvrat, Michel, 5,193,001, Cl. 358-105.000.
Thomson, Paul G.: *See*—
Hasson, Harrith M.; Pingleton, Edward D.; and Thomson, Paul G., 5,192,299, Cl. 606-206.000.
Thor, Karl B., to Eli Lilly and Company. Use of competitive NMDA receptor antagonists in the treatment of urinary incontinence. 5,192,751, Cl. 514-82.000.
Thorn Bacon, Andre E.: *See*—
House, Ronald J., 5,192,344, Cl. 55-216.000.
Thorn Bacon, Sydney J.: *See*—
House, Ronald J., 5,192,344, Cl. 55-216.000.
Thorn EMI plc: *See*—
Shanks, Ian A., 5,193,015, Cl. 359-53.000.
Thorn, Howard R. Device for dressing a lawn. 5,191,944, Cl. 172-445.100.
Thrush, Roger L.: *See*—
Billman, Timothy B.; and Thrush, Roger L., 5,192,220, Cl. 439-327.000.
Tiab, Djebbar; Marschall, David M.; and Altunbay, Mehmet H., to Western Atlas International Inc. Method for identifying and characterizing hydraulic units of saturated porous media: tri-kappa zoning process. 5,193,059, Cl. 364-422.000.
Ticon, Inc.: *See*—
Williams, Robert O., 5,192,039, Cl. 248-62.000.
Tidemark Corporation: *See*—
Chung, T. Mark; Orchard, Anthony G.; Baker, William H.; and Bradford, Charles L., 5,192,141, Cl. 400-56.000.
Tiley, Edward P.: *See*—
Ramsay, Michael V. J.; Tiley, Edward P.; and Sutherland, Derek R., 5,192,777, Cl. 514-333.000.
Ting, Albert C., to Allergan, Inc. Ocular device. 5,192,316, Cl. 623-5.000.
Tinkler, Robert W., to Consolidated Rail Corporation. Modular structure for converting rail cars for carrying both coiled and plate materials directly on longitudinal rails and cross members. 5,191,842, Cl. 105-355.000.
Tinnes, Bernhard, to Metacon AG. Device for slag-free pouring with continuous casting machines. 5,191,926, Cl. 164-437.000.
Tinti, Maria O.: *See*—
Giannessi, Fabio; Ghirardi, Orlando; Misiti, Domenico; Tinti, Maria O.; and Cozzolino, Roberto, 5,192,759, Cl. 514-212.000.
Tobin, Jill M.: *See*—
Hayes, Gary B.; Kittrell, Carter; Prince, Martin R.; Tobin, Jill M.; and Feld, Michael S., 5,192,278, Cl. 606-15.000.
Toda, Kazuyuki: *See*—
Miyakawa, Naoomi; Toda, Kazuyuki; Nakamura, Yukiyasu; Tashiro, Minoru; Yamaoka, Yoshihisa; and Kuwayama, Isao, 5,192,848, Cl. 219-121.820.
Todd, Thomas; and Skinner, Todd B., to Toddco General, Inc. Robotic tool adaptor apparatus. 5,192,844, Cl. 219-85.160.
Toddco General, Inc.: *See*—
Todd, Thomas; and Skinner, Todd B., 5,192,844, Cl. 219-85.160.
Todescat, Marcio L.: *See*—
Lilie, Dietmar E. B.; Driessen, Jose L.; Todescat, Marcio L.; and Krueger, Manfred, 5,192,200, Cl. 417-566.000.
Toensing, Eyvand E., to Seagate Technology Inc. Combination for removably supporting a magnetic transducer carrying arm. 5,191,705, Cl. 29-764.000.
Toji, Shigeo: *See*—
Suzuki, Noboru; and Toji, Shigeo, 5,192,965, Cl. 354-400.000.
Tokumitsu, Jun; Yoshii, Minoru; Suda, Shigeyuki; and Sekine, Masayoshi, to Canon Kabushiki Kaisha. In-focus detecting device. 5,192,998, Cl. 358-41.000.
Tokura, Nobufumi, to Matsushita Electric Industrial Co., Ltd. Apparatus for and method of checking external appearance of soldering state. 5,192,983, Cl. 356-376.000.
Tokyo Electric Co., Ltd.: *See*—
Saito, Akihiro, 5,192,067, Cl. 271-10.000.
Tokyo Electron Limited: *See*—
Shibata, Junichirou, 5,192,908, Cl. 324-158.00F.
Tollet, Daniel: *See*—
Labrucherie, Mark; and Tollet, Daniel, 5,191,849, Cl. 114-61.000.
Tolocko, Gary, to Giddings & Lewis, Inc. Automatic framing system. 5,191,958, Cl. 198-346.200.
Tomaszewski, Lillie C.; and Crain, James R., to Enthone-OMI, Inc. Aqueous degreasing solution having high free alkalinity. 5,192,461, Cl. 252-156.000.
Tombor, Janos: *See*—
Fekete, Pal; Bezzegh, Denes; Zukovics neSte, Katalin, nal/u/megh; Jambor neHoffmann, Zsuzsanna; and Tombor, Janos, 5,192,552, Cl. 424-4.950.
Tomino, Ikuo; Ishiguro, Masaharu; Kitahara, Takumi; Yokoyama, Keiichi; Kihara, Noriaki; Kamiya, Joji; Yoshihara, Kanji; Ishii, Masaaki; Mizuchi, Akira; Horikomi, Kazutoshi; Awaya, Akira; and Nakano, Takuo, to Mitsui Petrochemical Industries, Ltd. Coumaran group containing amine compounds and their acid addition salts and quaternary ammonium salts and the use thereof as anti arrhythmic agents and as psychotropic agents. 5,192,799, Cl. 514-469.000.
Tomiser, Frank, Jr.: *See*—
Metzger, James L, Jr.; and Tomiser, Frank, Jr., 5,191,821, Cl. 83-425.000.
Tomita, Hiroshi, to Geo Search Co., Ltd. Pavement structure examination vehicle. 5,192,953, Cl. 342-22.000.
Tomita, Masahiro: *See*—
Osakabe, Nobuyuki; Endo, Junji; Tonomura, Akira; Tomita, Masahiro; and Furutsu, Tadao, 5,192,867, Cl. 250-311.000.
Tomita, Shigeru, to Kabushiki Kaisha Toshiba. Channel selecting apparatus having a channel skip function. 5,193,005, Cl. 358-191.100.
Tomita, Takaaki: *See*—
Nishiwaki, Seiji; Taketomi, Yoshinao; Uchida, Shinji; Tomita, Takaaki; and Asada, Junichi, 5,193,130, Cl. 385-14.000.
Tomiyama, Takeshi; Endo, Masahiro; Hashimoto, Sadaaki; and Maeda, Kenji, to Kansai Paint Co., Ltd. Patterned film forming laminated sheet. 5,192,611, Cl. 428-354.000.
Tomoda, Akihiro: *See*—
Yokoyama, Minoru; Awai, Takashi; Tomoda, Akihiro; Ishida, Yasushi; Terajima, Hisao; Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; and Kobayashi, Makoto, 5,193,007, Cl. 358-296.000.
Tomomatsu, Hideo: *See*—
Ando, Masahiko; Hayabuchi, Masahiro; Tsukamoto, Kazumasa; Tomomatsu, Hideo; Hojo, Yasuo; and Iwatsuki, Kunihiro, 5,191,814, Cl. 74-866.000.
Tomosada, Masahiro: *See*—
Sumimiya, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakazaki, Hiroshi, 5,192,971, Cl. 355-206.000.
Toner, James K.: *See*—
Eaton, Donald E.; Toner, James K.; and Wooster, Daniel J., 5,191,910, Cl. 137-2.000.
Tong, Hsu C. Bean sifting device. 5,191,982, Cl. 209-135.000.
Tonomura, Akira: *See*—
Osakabe, Nobuyuki; Endo, Junji; Tonomura, Akira; Tomita, Masahiro; and Furutsu, Tadao, 5,192,867, Cl. 250-311.000.
Tontini, Franco; and Sancini, Carlo. Multiple loudspeaker. 5,193,119, Cl. 381-182.000.
Torgerson, James F.: *See*—
Bordeen, Donald T.; Cooper, Thomas P.; Eason, Robert F.; Hill, Michael J.; Jordon, John R.; Kessler, James E.; Konrad, Dennis R.; Sipple, Ralph E.; Swenson, Robert E.; Torgerson, James F.; and vonArx, Anthony P., 5,193,162, Cl. 395-425.000.
Torielli, Robert J., to PIM Corporation. Trenchless replacement of conduits in an underground conduit bank. 5,192,165, Cl. 405-156.000.

Torii, Katsutoshi: *See*—

TRW Financial Systems, Inc.: *See*—

Ueda, Ikuo: *See*—

United Kingdom of Great Britain and Northern Ireland, The Secretary

Torii, Katsutoshi: *See*—
Hanada, Kazuyuki; Misaizu, Iwao; Saito, Masashi; Torii, Katsutoshi; and Kuriyama, Katsumi, 5,192,736, Cl. 503-226.000.
Torii, Nozomu: *See*—
Fukumoto, Ryoichi; Hayakawa, Shigeru; and Torii, Nozomu, 5,192,103, Cl. 292-216.000.
Toriyama, Yoshimi: *See*—
Inagaki, Akira; Kurokawa, Masao; Hasegawa, Hiroyuki; Ishibashi, Toshihiro; Hadano, Hiroaki; Hioki, Takeshi; Toriyama, Yoshimi; Fujita, Kazuo; Takeshima, Yasushi; Wakatsuki, Teruyuki; and Horiuchi, Yasushi, 5,191,771, Cl. 72-13.000.
Torrington Company, The: *See*—
Faye, Bradley D.; Hilby, James A.; Alff, Denis; and Hajzler, Christian, 5,192,138, Cl. 384-448.000.
Tosa, Masahiro; and Yoshihara, Kazuhiro, to National Research Institute For Metals. Method of sputtering a mixture of hexagonal boron nitride and stainless steel onto a steel vessel and heating the film so as to precipitate the boron nitride onto the film surface. 5,192,409, Cl. 204-192.160.
Tosdale, Thomas M., to Ford Motor Company. Throttle control system for automotive vehicle. 5,191,865, Cl. 123-400.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Kubota, Shoko; and Yamada, Sadayoshi, 5,191,929, Cl. 164-500.000.
Toshiba Lighting & Technology Corporation: *See*—
Matsuura, Atsushi; Inukai, Shinji; and Sano, Hisanori, 5,192,891, Cl. 313-25.000.
Toth, Andrea: *See*—
Szekely, Istvan; Szego, Andras; Pap, Laszlo; Nagy, Lajos; Kollarik nee Hasek, Viktoria; Marosarosi nee Kellner, Katalin; Karadi, Zoltan; Toth, Andrea; and Szucsany, Gyorgy, 5,192,793, Cl. 514-421.000.
Tourtellott, John A.: *See*—
Gamache, Ronald W.; and Tourtellott, John A., 5,193,120, Cl. 382-1.000.
Towe, Carey A.: *See*—
Dass, Chuong Q.; Hester, Virgil R.; Kelley, Kurtis C.; and Towe, Carey A., 5,191,687, Cl. 29-25.350.
Toyo Boseki Kabushiki Kaisha: *See*—
Oshima, Tairo; Sakashita, Hitoshi; Matsumoto, Hakuji; and Mackawa, Yoshihiko, 5,192,674, Cl. 435-194.000.
Toyo Ink Mfg. Co., Ltd.: *See*—
Matsuki, Hiroshi, 5,193,126, Cl. 382-44.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Imazu, Katsuhiro; Sato, Kazuhiro; Ito, Takuro; Kaneko, Shunji; and Sue, Toshio, 5,191,779, Cl. 72-46.000.
Takenouchi, Ken; Kurosawa, Kazuyuki; Horiguchi, Makoto; Imatani, Tsuneo; and Kurashima, Hideo, 5,193,014, Cl. 359-3.000.
Toyooka, Takehiro: *See*—
Shiozaki, Iwane; Toyooka, Takehiro; and Iida, Shigeki, 5,193,020, Cl. 359-73.000.
Toyota, Akinori: *See*—
Kioka, Mamoru; Kawakita, Kazumitsu; and Toyota, Akinori, 5,192,731, Cl. 502-110.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ando, Masahiko; Hayabuchi, Masahiro; Tsukamoto, Kazumasa; Tomomatsu, Hideo; Hojo, Yasuo; and Iwatsuki, Kunihiro, 5,191,814, Cl. 74-866.000.
Kondo, Norihiko; Tsuzuki, Mikio; and Miura, Yoshinori, 5,191,739, Cl. 51-287.000.
Yamada, Yukifumi; and Akizuki, Kenichiro, 5,192,045, Cl. 248-430.000.
Yuuki, Kiyoshi, 5,191,763, Cl. 60-284.000.
Traugott, J. Mortimer: *See*—
Pariot, Robert; and Traugott, J. Mortimer, 5,192,381, Cl. 156-79.000.
Treddenick, George A. Firefighter safety badge. 5,192,500, Cl. 422-56.000.
Tredway, William K., to United Technologies Corporation. Method of making discontinuous carbon fiber reinforced glass matrix composites with secondary matrix reinforcement. 5,192,475, Cl. 264-115.000.
Treiber, Helmut: *See*—
Findeis, Gunter; Nitsch, Wilhelm; Rauh, Hans-Juergen; Zahn, Wolfgang; Treiber, Helmut; and Schindler, Hans-Georg, 5,192,970, Cl. 355-41.000.
Treiber, Laszlo R.; Colwell, Lawrence F., Jr.; Arison, Byron H.; Dezsny, Georgette; Lingham, Russell B.; Thompson, Wayne J.; and Balani, Suresh K., to Merck & Co., Inc. Synthesis of protease inhibitor. 5,192,668, Cl. 435-41.000.
Trend Products Inc.: *See*—
Fox, Robert E., 5,191,718, Cl. 33-526.000.
Trentelman, Jackson P., to Corning Incorporated. Method for press molding near net-shape glass articles. 5,192,353, Cl. 65-66.000.
Tri-Continent Scientific, Inc.: *See*—
Roach, William J., 5,192,511, Cl. 422-100.000.
Trinkaus, Karl: *See*—
Hildebrandt, Bodo; Mattinger, Detlef; and Trinkaus, Karl, 5,192,009, Cl. 222-400.500.
Trombella, Remo, to Sitep S.p.A. Anemometer. 5,191,800, Cl. 73-861.740.
Troyer, William H.; and Schoepf, Victor L., to Mobil Oil Corporation. Geophone borehole cable. 5,192,948, Cl. 340-855.100.
Trudeo, Jens E.: *See*—
Hoefler, Andrew C.; Sleep, Julia A.; and Trudso, Jens E., 5,192,575, Cl. 426-573.000.
TRW Financial Systems, Inc.: *See*—
Eliscber, Victor P.; Keret, Ilan; Johnsoa, Milton; Tumenbatur, Ihsan; and Aragon, David B., 5,193,121, Cl. 382-7.000.
TRW Vehicle Safety Systems Inc.: *See*—
Dufour, William T., 5,192,035, Cl. 242-107.40R.
Ts'ao, Chung-hsin: *See*—
Ward, William F.; Molteni, Agostino; Ts'ao, Chung-hsin; and Hinz, Joann M., 5,192,524, Cl. 424-1.100.
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3D Systems, Inc.: *See*—
Hull, Charles W.; Jacobs, Paul F.; Schmidt, Kris A.; Smalley, Dennis R.; and Vinson, Wayne A., 5,192,559, Cl. 425-89.000.
Smalley, Dennis R.; and Vorgitch, Thomas J., 5,192,469, Cl. 264-22.000.

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Fay, Bruce D.: *See*—

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TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF MARCH, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baer, Thomas M., to Spectra-Physics, Laser Diode Systems, Inc. Miniaturized Q-switched diode pumped solid state laser. Re. 34,192, Cl. 372-10.000.

Brown, Craig J., to Eco-Tec Limited. Process for electroplating metals. Re. 34,191, Cl. 205-96.000.

Carey, Robert J. **[Snack bag]** *bag for objects such as snacks.* Re. 34,193, Cl. 383-43.000.

Eco-Tec Limited: *See*—
Brown, Craig J., Re. 34,191, Cl. 205-96.000.

Rogers Corporation: *See*—
Rubinstein, Leon, Re. 34,190, Cl. 439-67.000.

Rubinstein, Leon, to Rogers Corporation. Connector arrangement. Re. 34,190, Cl. 439-67.000.

Spectra-Physics, Laser Diode Systems, Inc.: *See*—
Baer, Thomas M., Re. 34,192, Cl. 372-10.000.

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Baker, Hazel O.: *See*—
Eilrich, Mark W.; and Baker, Hazel O., B1 5,029,954, Cl. 359-617.000.

Boyarsky, David; and Vaughan, Robert T., to Denton Vacuum Inc. Apparatus for coating substrate devices. B1 4,733,631, 3-9-93, Cl. 118-719.000.

Denton Vacuum Inc.: *See*—
Boyarsky, David; and Vaughan, Robert T., B1 4,733,631, Cl. 118-719.000.

Eilrich, Mark W.; and Baker, Hazel O., to Wildewood Creative Products. Kaleidoscope. B1 5,029,954, 3-9-93, Cl. 359-617.000.

Instapak Corporation: *See*—
Sperry, Charles R., B1 3,976,230, Cl. 222-146.500.

Medical Products Development, Inc.: *See*—
Quaid, Joel, B1 4,889,744, Cl. 427-2.000.

Quaid, Joel, to Medical Products Development, Inc. Method for making open-cell, silicone-elastomer medical implant. B1 4,889,744, 3-9-93, Cl. 427-2.000.

Sperry, Charles R., to Instapak Corporation. System for dispensing polyurethane and the like. B1 3,976,230, 3-9-93, Cl. 222-146.500.

T pholm, Jan, to Topholm & Westermann Aps. Programmable hearing aid. B1 4,947,432, 3-9-93, Cl. 381-68.200.

Topholm & Westermann Aps: *See*—
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Adams, Joe L. Portable folding rocker seat. 333,737, 3-9-93, Cl. D6-368.000.

Akdemir, Matthew. Ornamental chain. 333,800, 3-9-93, Cl. D11-12.000.

Albert, Gregory P.; Dubugue, Kenneth J.; Fay, Bruce D.; and Gable, Duane S., to Ingersoll-Rand Company. Angled pneumatic grinder. 333,766, 3-9-93, Cl. D8-62.000.

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B. Sirius Toys, Inc.: *See*—
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Bannon, Paul. Combined smoke detector control unit and smoke detector. 333,796, 3-9-93, Cl. D10-106.000.

Barcus, Robert E. Fishing jig. 333,860, 3-9-93, Cl. D22-126.000.

Beder, Samuel L., to Sportingwood's, Inc. Recipe box. 333,726, 3-9-93, Cl. D3-78.000.

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Carroll, Michael H. Clip for bags. 333,786, 3-9-93, Cl. D9-435.000.

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Cole, Douglas L., to Mikron Industries. Window component extrusion. 333,877, 3-9-93, Cl. D25-124.000.

Cole, Douglas L., to Mikron Industries. Window component extrusion. 333,878, 3-9-93, Cl. D25-124.000.

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714 5,191,797
727 5,191,798
753 5,191,799
861.37 5,191,802
861.74 5,191,800
864.34 5,191,801
865.8 5,191,803

CLASS 74
335 5,191,804
459 5,191,805
477 5,191,806
501.6 5,191,807
526 5,191,808
572 5,191,809
5,191,810
574 5,191,811
5,191,812
606 R 5,191,813
866 5,191,814
5,191,815

CLASS 75
10.67 5,192,359
303 5,192,360

CLASS 81
361 5,191,816

CLASS 82
1.11 5,191,817

CLASS 83
27 5,191,818
349 5,191,819
409 5,191,820
425 5,191,821
466 5,191,822
857 5,191,823
874 5,191,824

CLASS 84
236 5,192,820
383 R 5,192,821
422.3 5,192,822
600 5,192,823
615 5,192,824
661 5,192,825
737 5,192,826
770 5,191,827

CLASS 86
20.15 5,192,819

CLASS 89
1.11 5,192,827

CLASS 91
173 5,191,825
418 5,191,826
433 5,191,827

CLASS 92
165 R 5,191,828

CLASS 99
352 5,191,829
439 5,191,830
446 5,191,831
450.6 5,191,832

CLASS 100
88 5,191,833

CLASS 101
130 5,191,834
148 5,191,835
219 5,191,836
333 5,191,837

CLASS 102
275.12 5,192,828
434 5,192,829
457 5,192,830

CLASS 104
2 5,191,838
5,191,839
17.1 5,191,840

CLASS 105
167 5,191,841
355 5,191,842

CLASS 106
26 R 5,192,361
35 5,192,362
218 5,192,363
287.16 5,192,364
439 5,192,365
724 5,192,366

CLASS 108
56.3 5,191,843

CLASS 110
346 5,191,844
5,191,845
5,191,846

CLASS 112
254 5,191,847

CLASS 114
5,191,848
61 5,191,849
91 5,191,850
102 5,191,851
255 5,191,852
291 5,191,853
5,191,854

CLASS 116
280 5,191,855

CLASS 118
46 5,192,367
72 5,192,368
624 5,192,369
719 B1 4,733,631
723 5,192,370
728 5,192,371

CLASS 119
29.5 5,191,856
52.3 5,191,857

CLASS 123
21 5,191,858
41.44 5,191,859
41.74 5,191,860
46 SC 5,191,861
48 B 5,191,862
59 AC 5,191,863
193.2 5,191,864
339 5,191,865
400 5,191,866
446 5,191,867
449 5,191,868
494 5,191,869
520 5,191,870
531 5,191,871
647 5,191,872

CLASS 125
15 5,191,873

CLASS 126
312 5,191,874
512 5,191,877
576 5,191,875
5,191,876

CLASS 128
4 5,191,878
5,191,879
24 AA 5,191,880
205.24 5,191,881
207.11 5,191,882
401 5,191,883
419 D 5,191,884
5,191,885
640 5,191,886
5,191,887
657 5,191,888
662.04 5,191,889
662.06 5,191,890
710 5,191,891
715 5,191,892
721 5,191,893
733 5,191,894
736 5,191,895
742 5,191,896
745 5,191,897
748 5,191,898
756 5,191,899
769 5,191,900
786 5,191,901
844 5,191,902
879 5,191,903

CLASS 131
96 5,191,904
332 5,191,905
365 5,191,906

CLASS 132
107 5,191,907

CLASS 134
76 5,191,908

CLASS 135
93 5,191,909

CLASS 137
2 5,191,910
413 5,191,912
454.2 5,191,913
614.03 5,191,914
625.27 5,191,915

CLASS 138
100 5,191,911
173 5,191,916

CLASS 139
380 5,191,917

CLASS 141
1 5,191,918
2 5,191,919
313 5,191,920

CLASS 144
134 D 5,191,921
286 R 5,191,935

CLASS 148
101 5,192,372
113 5,192,373
272 5,192,374
306 5,192,375
520 5,192,376
551 5,192,377
691 5,192,378

CLASS 149
19.4 5,192,379

CLASS 152
454 5,192,380

CLASS 156
79 5,192,381
137 5,192,382
180 5,192,383
189 5,192,384
250 5,192,385
268 5,192,386
275.5 5,192,387
324 5,192,388
364 5,192,389
425 5,192,390
540 5,192,391
566 5,192,392
610 5,192,393
640 5,192,394
643 5,192,395

CLASS 157
1.17 5,191,934

CLASS 160
124 5,191,922

CLASS 162
19 5,192,396
55 5,192,397

CLASS 164
292 5,191,923
418 5,191,924
428 5,191,925
437 5,191,926
452 5,191,927
466 5,191,928
500 5,191,929

CLASS 165
4 5,191,930

CLASS 166
282 5,191,931
291 5,191,932
297 5,191,933
5,191,936
363 5,191,937
378 5,191,938
379 5,191,939

CLASS 169
69 5,191,940

CLASS 172
224 5,191,941
286 5,191,942
393 5,191,943
445.1 5,191,944
759 5,191,945

CLASS 173
97 5,191,946

CLASS 174
48 5,192,831
52.1 5,192,832
74 R 5,192,833
120 SR 5,192,834
260 5,192,835

CLASS 177
25.18 5,191,947
188 5,191,948
229 5,191,949

CLASS 180
6.3 5,191,950
9.1 5,191,951
9.52 5,191,952
197 5,191,953

CLASS 182
129 5,191,954

CLASS 187
126 5,192,836

CLASS 188
251 A 5,191,955

CLASS 194
317 5,191,956
318 5,191,957

CLASS 198
346.2 5,191,958
365 5,191,959
391 5,191,960
392 5,191,961
415 5,191,962
429 5,191,963
447 5,191,964
460 5,191,965
493 5,191,966
781 5,191,967

CLASS 200
43.11 5,191,968
61.41 5,192,837
61.45 R 5,192,838
5,192,839
83 R 5,192,840
288 5,192,841
296 5,191,969
335 5,191,970
550 5,191,971

CLASS 202
227 5,192,398

CLASS 203
36 5,192,399

CLASS 204
98 5,192,401
130 5,192,402
153.1 5,192,403
153.19 5,192,404
180.1 5,192,405
5,192,406
182.8 5,192,407
5,192,408
192.16 5,192,409
5,192,410
280 5,192,411
299 R 5,192,412
300 R 5,192,413
400 5,192,414
403 5,192,415
409 5,192,416
418 5,192,417

CLASS 205
96 Re.34,191
100 5,192,418
124 5,192,400
244 5,192,419

CLASS 206
15.2 5,191,973
37.6 5,191,974
151 5,191,975
198 5,191,976
309 5,191,977
315.2 5,191,978
459.5 5,191,979
524.4 5,191,980
840 5,191,972

CLASS 208
23 5,192,420
309 5,192,421

CLASS 209
39 5,191,981
155 5,191,982
164 5,192,422
5,192,423

CLASS 210
85 5,192,424
90 5,192,425
117 5,192,426
133 5,192,427
143 5,192,428
170 5,192,429
172 5,192,430
198.1 5,192,431
198.2 5,192,432
5,192,433
227 5,192,434
241 5,192,435
264 5,192,436
321.83 5,192,437
413 5,192,438
485 5,192,439
500.29 5,192,440
603 5,192,441
605 5,192,442
634 5,192,443
635 5,192,444
640 5,192,445
685 5,192,446
697 5,192,447
708 5,192,448
712 5,192,449
748 5,192,450
755 5,192,451
760 5,192,452
761 5,192,453
780 5,192,454
787 5,192,455
791 5,192,456

CLASS 211
40 5,191,983
115 5,191,984
188 5,191,985
189 5,191,986

CLASS 215
1 C 5,191,987

CLASS 219
10.55 F 5,192,842
56.22 5,192,843
85.16 5,192,844
110 5,192,845
121.43 5,192,849
121.6 5,192,847
121.63 5,192,846
121.82 5,192,848
130.21 5,192,850
130.51 5,192,851
137.61 5,192,852
540 5,192,853

CLASS 220
4.24 5,191,988
4.34 5,191,989
88.1 5,191,990
207 5,191,991
214 5,191,992
333 5,191,993
771 5,191,994

CLASS 221
24 5,191,995
64 5,191,996
119 5,191,997
203 5,191,998

CLASS 222
56 5,191,999
59 5,192,000
63 5,192,001
108 5,192,002
129.1 5,192,003
146.1 5,192,004
146.5 B1 3,976,230
148 5,192,005
321 5,192,006
376 5,192,007
391 5,192,008
400.5 5,192,009

CLASS 224
103 5,192,010

CLASS 225
97 5,192,011

CLASS 227
113 5,192,012

CLASS 228
13 5,192,013
34 5,192,014
111 5,192,015
147 5,192,016
179 5,192,018
206 5,192,582

CLASS 229
101 5,192,019

CLASS 235
375 5,192,854
381 5,192,855
462 5,192,856
467 5,192,857
475 5,192,858
481 5,192,859

CLASS 236
46 R 5,192,020

CLASS 237
2 A 5,192,021
2 B 5,192,022

CLASS 239
11 5,192,023
222.21 5,192,024
394 5,192,025
533.3 5,192,026
542 5,192,027

CLASS 241
3 5,192,028
27 5,192,029
101.2 5,192,030
101.7 5,192,031

CLASS 242
35.5 A 5,192,032
58.6 5,192,033
65 5,192,034
107.4 R 5,192,035
268 5,192,036

CLASS 244
46 5,192,037

CLASS 246
220 5,192,038

CLASS 248
62 5,192,039
74.5 5,192,040
104 5,192,041
176 5,192,042
206.2 5,192,043
309.1 5,192,044
430 5,192,045
676 5,192,046
5,192,047

CLASS 250
201.8 5,192,860
214 VT 5,192,861
227.21 5,192,862
227.24 5,192,863
234 5,192,864
288 5,192,865
310 5,192,866
311 5,192,867
374 5,192,868
505.1 5,192,869
574 5,192,870

CLASS 251
129.16 5,192,048
214 5,192,049
295 5,192,050
328 5,192,051

CLASS 252
25 5,192,457
42.7 5,192,458
106 5,192,459
142 5,192,460
156 5,192,461
174.21 5,192,462
570 5,192,463

CLASS 254
30 5,192,052
122 5,192,053

CLASS 256
24 5,192,054
35 5,192,055
65 5,192,056

CLASS 257
13 5,192,985
81 5,192,991
183.1 5,192,987
192 5,192,986
229 5,192,990
315 5,192,872
342 5,192,989
370 5,192,992
400 5,192,993
595 5,192,871
668 5,193,053
766 5,192,994
774 5,192,988
787 5,192,995

CLASS 261
27 5,192,464
97 5,192,465
114.3 5,192,466
122.1 5,192,467

CLASS 264
13 5,192,468
22 5,192,469
5,192,470
29.5 5,192,471
40.1 5,192,472
102 5,192,473
106 5,192,474
115 5,192,475
127 5,192,476
129 5,192,477
139 5,192,478
171 5,192,479
204 5,192,480
246 5,192,481
257 5,192,482
510 5,192,483
555 5,192,484

CLASS 266
80 5,192,485
156 5,192,486
201 5,192,487
208 5,192,488
271 5,192,489

CLASS 267
153 5,192,057

CLASS 269
24 5,192,058
41 5,192,059
147 5,192,060
228 5,192,061
244 5,192,062
257 5,192,063

CLASS 270
52.5 5,192,064
53 5,192,065

CLASS 271
9 5,192,066
10 5,192,067
34 5,192,068
35 5,192,069
90 5,192,070
225 5,192,071

CLASS 273
73 C 5,192,072
77 A 5,192,073
84 R 5,192,074
5,192,075
138 A 5,192,076
155 5,192,077
232 5,192,078
5,192,079
412 5,192,080
422 5,192,081
435 5,192,082

CLASS 277
29 5,192,083
53 5,192,084
81 S 5,192,085

CLASS 279
4.09 5,192,086
71 5,192,087

CLASS 280
11.2 5,192,099
11.22 5,192,088
221 5,192,089
634 5,192,090
644 5,192,091
654 5,192,092
668 5,192,100
704 5,192,101
766.1 5,192,102

CLASS 281
5 5,192,093

CLASS 285
165 5,192,094
332.1 5,192,095

CLASS 292
45 5,192,096
166 5,192,097
207 5,192,098
216 5,192,103

CLASS 293
3 5,192,107

CLASS 294
19.1 5,192,104
5,192,105
99.2 5,192,106

CLASS 296
37.1 5,192,108
84.1 5,192,109
97.8 5,192,110
163 5,192,111
190 5,192,112

CLASS 297
85 5,192,113
304 5,192,114

CLASS 299
31 5,192,115
75 5,192,116

CLASS 301
108.1 5,192,117

CLASS 303
15 5,192,118
22.8 5,192,119
113.2 5,192,120

CLASS 307
38 5,192,873
125 5,192,874
219.1 5,192,875
260 5,192,876
309 5,192,877
362 5,192,878
451 5,192,879
455 5,192,880
468 5,192,881
471 5,192,882
475 5,192,883
520 5,192,884
555 5,192,885
595 5,192,886

CLASS 310
68 C 5,192,887
71 5,192,888
316 5,192,889
323 5,192,890

CLASS 312
212 5,192,121
267 5,192,122
351.7 5,192,123

CLASS 313
25 5,192,891
422 5,192,892

CLASS 315
85 5,192,893
111.21 5,192,894
201 5,192,895
224 5,192,896
308 5,192,897
370 5,192,898

CLASS 318
139 5,192,899
254 5,192,900
430 5,192,901
561 5,192,902
587 5,192,903

CLASS 320
2 5,192,904
23 5,192,905

CLASS 323
284 5,192,906

CLASS 324
158 F 5,192,907
5,192,908
309 5,192,909
315 5,192,910
322 5,192,911
504 5,192,912
537 5,192,913

CLASS 328
72 5,192,914
133 5,192,915
155 5,192,916
162 5,192,917
165 5,192,918

CLASS 330
129 5,192,919
277 5,192,920

CLASS 331
3 5,192,921

CLASS 332
109 5,192,922

CLASS 333
116 5,192,923
175 5,192,924
187 5,192,925
204 5,192,926
5,192,927
219.2 5,192,928

CLASS 335
42 5,192,934
80 5,192,935
204 5,192,936
357 5,192,937

CLASS 346
107 R 5,192,958
140 R 5,192,959

CLASS 361
41 5,192,960

CLASS 363
66 5,192,961
98 5,192,962

CLASS 364
81 5,192,963
202 5,192,964
400 5,192,965
402 5,192,966
410 5,192,968

CLASS 365
22 5,192,969
41 5,192,970
206 5,192,971
208 5,197,972
215 5,192,973
219 5,192,974
235 5,192,975
309 5,192,976
313 5,192,977

CLASS 386
5 5,192,978
28.5 5,192,979
326 5,192,980
334 5,192,981
345 5,192,982
376 5,192,983
433 5,192,984

CLASS 388
21 R 5,192,996
5,192,997
41 5,192,998
85 5,192,999
92 5,193,000
105 5,193,001
133 5,193,002
136 5,193,003
5,193,004
191.1 5,193,005
242 5,193,006
296 5,193,007
298 5,193,008
335 5,193,009
336 5,193,010
455 5,193,011
456 5,193,012
481 5,193,013

CLASS 389
3 5,193,014
53 5,193,015
5,193,016
99 5,193,017
5,193,018
62 5,193,019
73 5,193,020
81 5,193,021
88 5,193,022
245 5,193,023
253 5,193,024
356 5,193,025
516 5,193,026
566 5,193,027
581 5,193,028
604 5,193,029
617 B1 5,029,954
687 5,193,030
800 5,193,031
804 5,193,032

CLASS 360
31 5,193,033
51 5,193,034
5,193,035
78.14 5,193,036
84 5,193,045
97.02 5,193,046
106 5,193,037
113 5,193,038
5,193,039

CLASS 361
13 5,193,041
79 5,193,042
93 5,193,043
104 5,193,044
212 5,193,047
232 5,193,048
379 5,193,049
384 5,193,050
393 5,193,051
395 5,193,052

410 5,193,112
5,193,195

CLASS 422
576 5,192,578
240.27 5,192,683

126 5,193,224

CLASS 502
62 5,192,750
82 5,192,751
410 5,192,788
411 5,192,789

CLASS 600
14 5,192,263
195 5,192,296
5,192,297

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CLASS 362
61 5,192,124
83.2 5,192,125
184 5,192,126
226 5,192,127
297 5,192,128
346 5,192,129

CLASS 363
72 5,193,054

CLASS 364
406 5,193,055
408 5,193,056
5,193,057
419 5,193,058
422 5,193,059
434.05 5,193,063
434.1 5,193,060
436.02 5,193,061
436.04 5,193,062
454 5,193,064
468 5,193,065
472 5,193,066
483 5,193,067
578 5,193,068
708 5,193,069
724.16 5,193,070

CLASS 365
189.01 5,193,071
222 5,193,072
226 5,193,073
230.03 5,193,074
233 5,193,075
233.5 5,193,076

CLASS 366
161 5,192,130
308 5,192,131

CLASS 367
23 5,193,077

CLASS 368
107 5,193,078

CLASS 369
37 5,193,079
44.26 5,193,081
112 5,193,082
116 5,193,083
244 5,193,080
258 5,193,084
275.2 5,193,085

CLASS 370
16 5,193,086
38.2 5,193,087
60 5,193,088
84 5,193,089
94.1 5,193,090
95.1 5,193,091

CLASS 371
22.4 5,193,092
34 5,193,093
43 5,193,094

CLASS 372
3 5,193,095
10 Re.34,192
11 5,193,096
21 5,193,097
46 5,193,098
107 5,193,099

CLASS 373
112 5,193,100

CLASS 374
166 5,192,132

CLASS 375
1 5,193,101
5,193,102
120 5,193,103

CLASS 376
154 5,192,490
159 5,192,491
203 5,192,492
211 5,192,493
280 5,192,494
417 5,192,495
428 5,192,496

CLASS 378
73 5,193,104
137 5,193,105
163 5,193,106

CLASS 379
11 5,193,107
5,193,108
60 5,193,109
94 5,193,110
106 5,193,111

410 5,193,112
437 5,193,113

CLASS 380
23 5,193,114
46 5,193,115

CLASS 381
68.2 B1 4,947,432
69 5,193,116
71 5,193,117
86 5,193,118
182 5,193,119

CLASS 382
1 5,193,120
7 5,193,121
9 5,193,122
41 5,193,124
5,193,125
44 5,193,126
48 5,193,127

CLASS 383
7 5,192,133
24 5,192,134
43 Re.34,193
63 5,192,135

CLASS 384
123 5,192,136
275 5,192,137
448 5,192,138
476 5,192,139

CLASS 385
3 5,193,128
13 5,193,129
14 5,193,130
5,193,131
32 5,193,132
85 5,193,133
105 5,193,134
117 5,193,135
129 5,193,136
5,193,137

CLASS 388
811 5,193,146

CLASS 392
341 5,193,138
480 5,193,139

CLASS 395
2 5,193,140
5,193,141
5,193,142
5,193,143
81 5,193,144
76 5,193,145
123 5,193,147
145 5,193,148
157 5,193,149
200 5,193,150
5,193,151
5,193,152
250 5,193,153
5,193,154
375 5,193,156
5,193,157
5,193,158
5,193,159
400 5,193,160
5,193,161
425 5,193,162
5,193,163
5,193,164
5,193,165
5,193,166
5,193,167
5,193,168
5,193,169
5,193,170
5,193,171
5,193,172
5,193,173
500 5,193,174
575 5,193,175
5,193,176
600 5,193,177
5,193,178
5,193,179
5,193,180
5,193,181
5,193,182
5,193,183
5,193,184
5,193,185
650 5,193,186
5,193,187
5,193,188
5,193,189
700 5,193,190
5,193,191
725 5,193,192
5,193,193
5,193,194
5,193,195
5,193,196
5,193,197
750 5,193,198
775 5,193,199
800 5,193,200
5,193,201
5,193,202
5,193,203
5,193,204
5,193,205
5,193,206
5,193,207

CLASS 400
26 5,192,140
56 5,192,141
157.2 5,192,148
208 5,192,149
477 5,192,150
579 5,192,151
679 5,192,152

CLASS 401
4 5,192,153
198 5,192,154

CLASS 403
16 5,192,142
24 5,192,143
209 5,192,144
255 5,192,145
322 5,192,147
410 5,192,155

CLASS 404
4 5,192,156
6 5,192,157
11 5,192,158
5,192,159
72 5,192,160

CLASS 405
26 5,192,161
55 5,192,162
128 5,192,163
5,192,164
156 5,192,165
168.1 5,192,166
195.1 5,192,167
258 5,192,168
259.1 5,192,146
5,192,169

CLASS 406
147 5,192,170

CLASS 407
114 5,192,171

CLASS 409
11 5,192,172
84 5,192,173
283 5,192,174
345 5,192,175

CLASS 410
140 5,192,176
151 5,192,187

CLASS 414
217 5,192,188
477 5,192,189
501 5,192,177
523 5,192,178
710 5,192,179
719 5,192,180
795.3 5,192,181

CLASS 415
90 5,192,182
5,192,183
169.1 5,192,184
170.1 5,192,185
177 5,192,186
191 5,192,190

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97 R 5,192,192
186 R 5,192,193

CLASS 417
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299 5,192,195
300 5,192,196
322 5,192,197
383 5,192,198
406 5,192,199
566 5,192,200

CLASS 418
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55.5 5,192,202

CLASS 420
581 5,192,497

CLASS 422
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46 5,192,499
56 5,192,500
5,192,501
57 5,192,502
5,192,503
64 5,192,504
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68.1 5,192,507
70 5,192,508
73 5,192,509
82.05 5,192,510
100 5,192,511
190 5,192,512
305 5,192,513

CLASS 423
210 5,192,514
213.2 5,192,515
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243.08 5,192,517
244.08 5,192,518
702 5,192,520
713 5,192,519
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CLASS 424
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5,192,525
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4.95 5,192,552
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52 5,192,530
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59 5,192,534
78.04 5,192,535
78.08 5,192,536
85.2 5,192,537
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92 5,192,540
93 D 5,192,541
195.1 5,192,542
401 5,192,544
405 5,192,545
5,192,546
438 5,192,547
443 5,192,548
450 5,192,549
473 5,192,550
489 5,192,551
529 5,192,553

CLASS 425
87 5,192,558
89 5,192,559
175 5,192,560
378.1 5,192,543
504 5,192,554
544 5,192,555
549 5,192,556
589 5,192,557

CLASS 426
3 5,192,561
4 5,192,562
5 5,192,563
19 5,192,564
49 5,192,565
92 5,192,567
94 5,192,568
96 5,192,569
332 5,192,570
433 5,192,571
438 5,192,572
533 5,192,573
549 5,192,574
573 5,192,575
578 5,192,576
602 5,192,577

CLASS 427
2 B1 4,889,744
128 5,192,583
129 5,192,584
172 5,192,585
210 5,192,586
212 5,192,587
247 5,192,588
255.1 5,192,589
304 5,192,590
356 5,192,591
358 5,192,592
421 5,192,593
5,192,594
5,192,595
5,192,523
556 5,192,581
571 5,192,579
576 5,192,578
596 5,192,580

CLASS 428
1 5,192,596
33.6 5,192,610
34.5 5,192,597
71 5,192,598
82 5,192,599
89 5,192,566
102 5,192,600
120 5,192,601
179 5,192,602
217 5,192,603
224 5,192,604
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314.4 5,192,607
319.7 5,192,608
328 5,192,609
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363 5,192,613
402.24 5,192,615
407 5,192,616
411.1 5,192,617
457 5,192,618
458 5,192,619
461 5,192,620
480 5,192,621
551 5,192,622
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596 5,192,624
668 5,192,625
694 5,192,626

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190 5,192,628
197 5,192,629

CLASS 430
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56 5,192,631
58 5,192,632
59 5,192,633
85 5,192,634
108 5,192,635
109 5,192,636
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546 5,192,550
549 5,192,651
551 5,192,652
569 5,192,653
576 5,192,654
600 5,192,655
627 5,192,656

CLASS 431
2 5,192,203
10 5,192,204
344 5,192,205

CLASS 433
80 5,192,206
223 5,192,207

CLASS 434
2 5,192,208
98 5,192,209
247 5,192,210
296 5,192,211
302 5,192,212

CLASS 435
4 5,192,657
6 5,192,658
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7.21 5,192,660
7.23 5,192,661
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7.25 5,192,663
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228 5,192,678
240.27 5,192,683
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243 5,192,679
252.1 5,192,685
254 5,192,686
280 5,192,687

CLASS 436
63 5,192,688
69 5,192,689
106 5,192,690
161 5,192,691
165 5,192,692
169 5,192,693
548 5,192,694

CLASS 437
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17 5,192,696
37 5,192,697
40 5,192,698
41 5,192,699
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129 5,192,710
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143 5,192,712
192 5,192,713
195 5,192,714
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209 5,192,716
217 5,192,681
219 5,192,682

CLASS 439
66 5,192,213
67 Re.34,190
5,192,214
73 5,192,215
108 5,192,216
211 5,192,217
226 5,192,218
233 5,192,717
321 5,192,219
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342 5,192,221
347 5,192,222
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489 5,192,225
502 5,192,226
532 5,192,227
567 5,192,228
604 5,192,229
620 5,192,230
5,192,231
660 5,192,232
723 5,192,233
806 5,192,234

CLASS 440
52 5,192,235
88 5,192,236

CLASS 441
76 5,192,237
84 5,192,238

CLASS 445
21 5,192,239
24 5,192,240

CLASS 462
135 5,192,241
136 5,192,242
157 5,192,243

CLASS 464
276 5,192,244

CLASS 485
4.1 5,193,208
34.2 5,193,209
38.1 5,193,210
38.2 5,193,211
38.3 5,193,212
45 5,193,213
54.2 5,193,214
66 5,193,215
67.7 5,193,216
79 5,193,217
80 5,193,218
89 5,193,219
5,193,220
92 5,193,221
102 5,193,222
115 5,193,223

126 5,193,224

CLASS 449
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72 5,192,246

CLASS 472
60 5,192,247

CLASS 474
140 5,192,248
160 5,192,249
162 5,192,250
206 5,192,251
210 5,192,252
214 5,192,253

CLASS 482
8 5,192,254
54 5,192,255
55 5,192,256
70 5,192,257
71 5,192,258
93 5,192,259

CLASS 483
59 5,192,260

CLASS 493
29 5,192,261
365 5,192,262

CLASS 501
60 5,192,718
88 5,192,719
98 5,192,720
113 5,192,721
128 5,192,722
136 5,192,723

CLASS 502
28 5,192,724
61 5,192,725
62 5,192,726
64 5,192,727
66 5,192,728
104 5,192,729
108 5,192,730
110 5,192,731
126 5,192,732
225 5,192,733
314 5,192,734
417 5,192,735

CLASS 503
226 5,192,736
227 5,192,737
5,192,738

CLASS 504
187 5,192,356
307 5,192,358
315 5,192,357

CLASS 506
1 5,192,739

CLASS 516
2 5,192,740
4 5,192,741
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182 5,192,756
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421 5,192,793
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452 5,192,797
462 5,192,798
469 5,192,799
510 5,192,800
521 5,192,801
535 5,192,802
539 5,192,803
554 5,192,804
556 5,192,805
562 5,192,806
563 5,192,807
654 5,192,808

CLASS 521
40 5,192,809
52 5,192,810
99 5,192,811
112 5,192,812
159 5,192,813
163 5,192,814
115 5,192,815
463 5,192,816
423 5,192,795

CLASS 548
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CLASS 600
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CLASS 604
4 5,192,264
10 5,192,265
11 5,192,266
22 5,192,267
83 5,192,268
83 5,192,269
116 5,192,270
5,192,271
141 5,192,272
174 5,192,273
180 5,192,274
263 5,192,275
313 5,192,276
360 5,192,277

CLASS 606
18 5,192,278
17 5,192,279
48 5,192,280
59 5,192,281
65 5,192,282
93 5,192,283
114 5,192,284
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205 5,192,298
206 5,192,299
213 5,192,300
5,192,301
5,192,302
232 5,192,303
238 5,192,304
241 5,192,305
243 5,192,306

CLASS 623
1 5,192,307
5,192,308
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D2— 264 333,718
333,749
D9— 300 333,778
317 333,811
333,842
333,843
47 333,872
51 333,874

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CLASSIFICATION OF DESIGNS

D2—	264	333,718			333,749	D9—	300	333,778		317	333,811			333,842		47	333,872
	314	333,719		500	333,750		338	333,780	D13—	160	333,812			333,843		51	333,874
		333,720		524	333,751		339	333,781		162	333,813	D20—	6	333,844		56	333,875
		333,721		596	333,752		424	333,783	D14—	100	333,814		21	333,845		124	333,876
	629	333,722	D7—	321	333,753			333,784		106	333,815		40	333,846			333,877
D3—	23	333,723		350	333,782		431	333,785			333,816	D21—	31	333,847			333,878
	36	333,724		392.1	333,754		435	333,786		109	333,817		48	333,848	D26—	28	333,879
	72	333,725		408	333,755		448	333,787		114	333,818		98	333,849		65	333,880
	78	333,726		507	333,756			333,788		162	333,819		108	333,850		99	333,881
		333,727		558	333,757		563	333,789		163	333,820			333,851	D28—	7	333,882
	102	333,728		612	333,758	D10—	2	333,790		168	333,821			333,852		10	333,883
	106	333,729		672	333,759		15	333,791		241	333,822			333,853		20	333,884
D4—	136	333,730			333,760		50	333,792		258	333,823		157	333,854		76	333,885
D6—	317	333,731		675	333,761		69	333,793	D15—	133	333,824		194	333,855	D30—	122	333,886
	328	333,732		678	333,762		70	333,794		142	333,825		200	333,856		160	333,887
	334	333,733	D8—	1	333,763		106	333,795		145	333,826		206	333,857		162	333,888
	358	333,734		57	333,764			333,796		199	333,827		234	333,858	D32—	23	333,889
	366	333,735		61	333,765		114	333,797	D16—	133	333,828	D22—	118	333,859			333,890
	367	333,736		62	333,766			333,798		235	333,829		126	333,860		30	333,891
	368	333,737		64	333,767		126	333,799	D18—	1	333,830		129	333,861		32	333,892
	369	333,738		71	333,768	D11—	12	333,800		7	333,831		136	333,862	D34—	1.1	333,893
	380	333,739			333,769		184	333,801		40	333,832	D23—	214	333,863			333,894
	397	333,740			333,770			333,802		43	333,833		238	333,864		5	333,895
	411	333,741		72	333,771		218	333,803		48	333,834		311	333,865			333,896
	442	333,742		102	333,772			333,804		55	333,835		335	333,866		7	333,897
	449	333,743			333,773		232	333,805			333,836		377	333,867			333,898
	457	333,744		107	333,774	D12—	110	333,806	D19—	46	333,837		412	333,868		17	333,899
	460	333,745		342	333,775		155	333,807		66	333,838	D24—	117	333,869		27	333,900
	462	333,746		358	333,776		157	333,808		73	333,839		169	333,870		28	333,901
	471	333,747		360	333,777		313	333,809		76	333,840		211	333,871			333,902
	479	333,748		398	333,779		314	333,810		78	333,841	D25—	38	333,873			

CLASSIFICATION OF PLANTS

P.—	43.2	8,169		54.1	8,170		76	8,171		82.4	8,172		87.12	8,173			8,174

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01 :	5,191,737		5,192,126		5,192,695		5,192,029		5,191,764		5,191,786
	5,191,766		5,192,128		5,192,709		5,192,257		5,191,852		5,191,809
	5,192,105		5,192,143		5,192,712		5,192,258		5,191,888		5,191,816
	5,192,514		5,192,147		5,192,715		5,192,312		5,191,981		5,191,855
	5,192,536		5,192,156		5,192,743		5,192,439		5,192,092		5,191,860
	5,193,113		5,192,157		5,192,746		5,192,598		5,192,109		5,191,867
	5,193,200		5,192,182		5,192,749		5,192,686		5,192,127		5,191,885
04 :	5,191,694		5,192,197		5,192,770		5,192,886		5,192,162		5,191,900
	5,191,711		5,192,201		5,192,810		5,192,952		5,192,179		5,191,951
	5,192,158		5,192,206		5,192,844		5,193,148		5,192,190		5,191,952
	5,192,483		5,192,207		5,192,899		5,193,176		5,192,192		5,191,966
	5,192,542		5,192,216		5,192,904		5,193,184		5,192,208		5,192,005
	5,192,553		5,192,219		5,192,911	09 :	5,191,751		5,192,298		5,192,038
	5,192,558		5,192,229		5,192,916		5,191,767		5,192,318		5,192,057
	5,192,787		5,192,231		5,192,951		5,191,805		5,192,328		5,192,123
	5,192,875		5,192,247		5,192,955		5,191,984		5,192,467		5,192,232
	5,192,957		5,192,267		5,193,000		5,191,997		5,192,486		5,192,235
	5,193,204		5,192,269		5,193,013		5,192,006		5,192,527		5,192,245
05 :	5,191,664		5,192,271		5,193,025		5,192,047		5,192,588		5,192,246
	5,192,060		5,192,273		5,193,032		5,192,098		5,192,607		5,192,299
	5,192,081		5,192,274		5,193,037		5,192,138		5,192,627		5,192,306
	5,192,122		5,192,286		5,193,038		5,192,150		5,192,919		5,192,398
	5,192,131		5,192,288		5,193,046		5,192,224		5,192,930		5,192,422
06 :	Re.34,192		5,192,290		5,193,052		5,192,233		5,193,026		5,192,447
	5,191,658		5,192,291		5,193,064		5,192,294		5,193,152		5,192,449
	5,191,670		5,192,292		5,193,092		5,192,333		5,193,161		5,192,524
	5,191,671		5,192,293		5,193,094		5,192,389		5,193,170		5,192,561
	5,191,771		5,192,295		5,193,097		5,192,475		5,193,174		5,192,562
	5,191,793		5,192,304		5,193,098		5,192,529		5,193,179		5,192,563
	5,191,794		5,192,314		5,193,105		5,192,764		5,193,216		5,192,567
	5,191,795		5,192,316		5,193,107		5,192,790	13 :	5,191,734		5,192,576
	5,191,830		5,192,317		5,193,109		5,192,796		5,191,881		5,192,591
	5,191,831		5,192,330		5,193,121		5,192,828		5,191,976		5,192,592
	5,191,846		5,192,335		5,193,122		5,192,856		5,191,996		5,192,725
	5,191,853		5,192,356		5,193,125		5,192,901		5,192,000		5,192,726
	5,191,858		5,192,360		5,193,132		5,193,114		5,192,279		5,192,744
	5,191,875		5,192,374		5,193,136		5,193,128		5,192,307		5,192,748
	5,191,897		5,192,384		5,193,141		5,193,213		5,192,571		5,192,782
	5,191,907		5,192,392		5,193,142		5,193,215		5,192,663		5,192,887
	5,191,914		5,192,408		5,193,145		3,976,230		5,192,679		5,192,905
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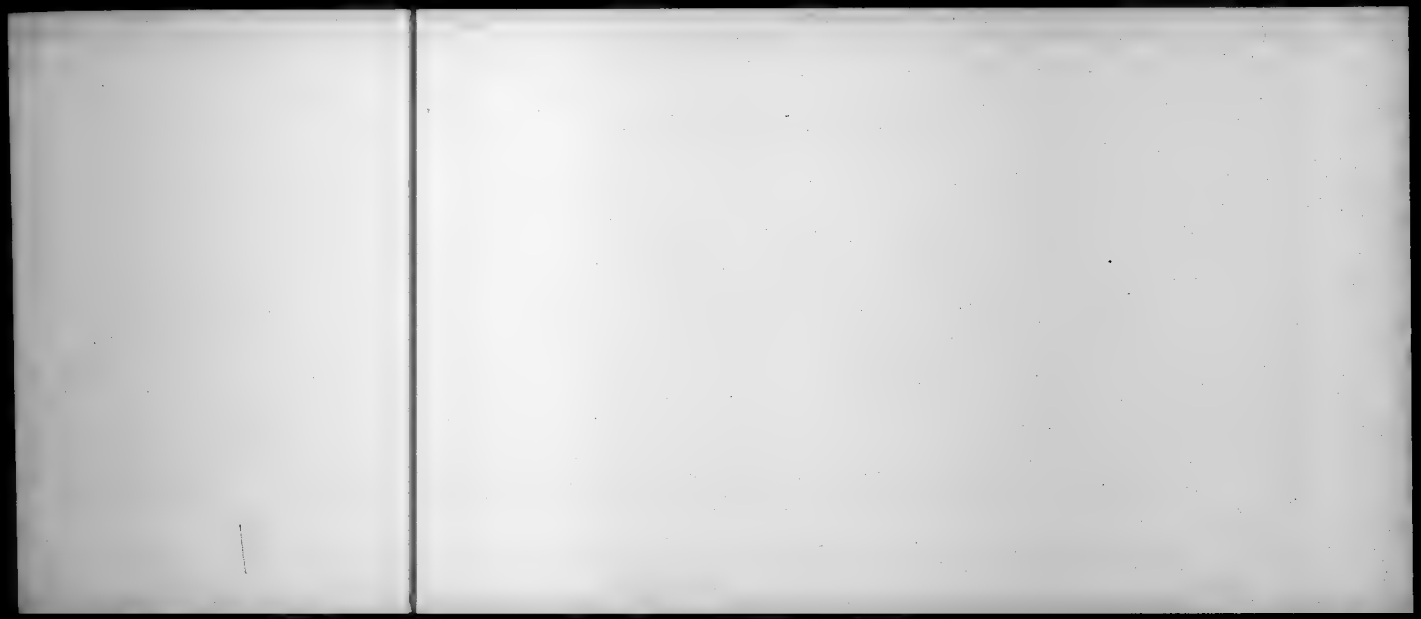

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Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 13, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,907,295 through 4,908,876
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 11, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,574,396 through 4,575,870
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 3, 1993
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,579	06/828,613	1/19/88
(4,491,775)	(06/315,052)	(1/01/85)
4,490,858	06/304,444	1/01/85
4,490,859	06/459,037	1/01/85
4,490,860	06/477,028	1/01/85
4,490,861	06/575,826	1/01/85
4,490,862	06/296,292	1/01/85
4,490,863	06/432,793	1/01/85
4,490,864	06/466,045	1/01/85
4,490,869	06/328,652	1/01/85
4,490,870	06/440,072	1/01/85
4,490,871	06/528,623	1/01/85
4,490,872	06/609,553	1/01/85
4,490,873	06/544,798	1/01/85
4,490,875	06/431,788	1/01/85
4,490,876	06/519,013	1/01/85
4,490,877	06/556,274	1/01/85
4,490,879	06/504,520	1/01/85
4,490,880	06/475,081	1/01/85
4,490,881	06/469,110	1/01/85
4,490,882	06/514,551	1/01/85
4,490,885	06/573,372	1/01/85
4,490,891	06/442,165	1/01/85
4,490,897	06/432,904	1/01/85
4,490,898	06/485,461	1/01/85
4,490,899	06/497,592	1/01/85
4,490,900	06/343,845	1/01/85
4,490,902	06/414,792	1/01/85
4,490,903	06/384,592	1/01/85
4,490,904	06/373,931	1/01/85
4,490,908	06/634,660	1/01/85
4,490,911	06/439,844	1/01/85
4,490,912	06/501,867	1/01/85
4,490,914	06/455,604	1/01/85
4,490,915	06/487,210	1/01/85
4,490,916	06/458,215	1/01/85
4,490,917	06/453,774	1/01/85
4,490,919	06/338,676	1/01/85
4,490,921	06/417,136	1/01/85
4,490,922	06/427,982	1/01/85
4,490,923	06/445,005	1/01/85
4,490,924	06/383,316	1/01/85
4,490,926	06/444,787	1/01/85
4,490,929	06/471,155	1/01/85
4,490,931	06/416,216	1/01/85
4,490,932	06/407,083	1/01/85
4,490,933	06/409,597	1/01/85
4,490,935	06/468,987	1/01/85
4,490,937	06/509,460	1/01/85
4,490,939	06/547,665	1/01/85
4,490,942	06/456,139	1/01/85
4,490,943	06/490,171	1/01/85
4,490,945	06/478,096	1/01/85
4,490,948	06/395,096	1/01/85
4,490,951	06/448,893	1/01/85
4,490,953	06/310,561	1/01/85
4,490,954	06/392,012	1/01/85
4,490,956	06/456,342	1/01/85
4,490,957	06/513,923	1/01/85
4,490,958	06/542,775	1/01/85
4,490,960	06/451,354	1/01/85
4,490,966	06/505,044	1/01/85
4,490,967	06/481,826	1/01/85
4,490,968	06/535,383	1/01/85
4,490,970	06/286,657	1/01/85
4,490,973	06/484,329	1/01/85
4,490,975	06/474,931	1/01/85
4,490,976	06/535,908	1/01/85
4,490,978	06/406,111	1/01/85
4,490,979	06/413,074	1/01/85
4,490,980	06/473,273	1/01/85
4,490,985	06/509,138	1/01/85
4,490,987	06/557,757	1/01/85
4,490,989	06/348,841	1/01/85
4,490,991	06/566,890	1/01/85
4,490,993	06/427,868	1/01/85
4,490,995	06/461,049	1/01/85
4,490,996	06/305,113	1/01/85
4,490,997	06/488,259	1/01/85
4,490,998	06/525,428	1/01/85
4,490,999	06/424,223	1/01/85
4,491,003	06/276,697	1/01/85
4,491,011	06/387,357	1/01/85
4,491,013	06/485,231	1/01/85
4,491,015	06/474,101	1/01/85
4,491,017	06/353,024	1/01/85

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Patent Number	Serial Number	Issue Date
4,491,022	06/467,352	1/01/85
4,491,026	06/432,997	1/01/85
4,491,027	06/462,721	1/01/85
4,491,029	06/376,202	1/01/85
4,491,030	06/361,335	1/01/85
4,491,031	06/376,392	1/01/85
4,491,037	06/465,624	1/01/85
4,491,038	06/408,421	1/01/85
4,491,040	06/376,426	1/01/85
4,491,041	06/481,992	1/01/85
4,491,042	06/465,603	1/01/85
4,491,043	06/242,314	1/01/85
4,491,048	06/330,840	1/01/85
4,491,050	06/545,126	1/01/85
4,491,051	06/455,249	1/01/85
4,491,052	06/332,044	1/01/85
4,491,053	06/383,213	1/01/85
4,491,055	06/317,429	1/01/85
4,491,057	06/404,797	1/01/85
4,491,059	06/362,644	1/01/85
4,491,060	06/509,345	1/01/85
4,491,062	06/563,034	1/01/85
4,491,063	06/437,743	1/01/85
4,491,064	06/484,972	1/01/85
4,491,066	06/571,255	1/01/85
4,491,067	06/380,022	1/01/85
4,491,069	06/509,935	1/01/85
4,491,070	06/460,408	1/01/85
4,491,072	06/518,019	1/01/85
4,491,076	06/395,461	1/01/85
4,491,077	06/293,896	1/01/85
4,491,078	06/524,150	1/01/85
4,491,079	06/450,150	1/01/85
4,491,081	06/346,054	1/01/85
4,491,082	06/364,367	1/01/85
4,491,085	06/517,736	1/01/85
4,491,086	06/573,103	1/01/85
4,491,089	06/437,818	1/01/85
4,491,090	06/609,716	1/01/85
4,491,091	06/540,551	1/01/85
4,491,093	06/593,404	1/01/85
4,491,095	06/515,390	1/01/85
4,491,098	06/427,980	1/01/85
4,491,099	06/531,269	1/01/85
4,491,100	06/490,233	1/01/85
4,491,101	06/529,369	1/01/85
4,491,102	06/406,889	1/01/85
4,491,106	06/617,144	1/01/85
4,491,112	06/339,155	1/01/85
4,491,113	06/415,952	1/01/85
4,491,116	06/494,586	1/01/85
4,491,117	06/532,481	1/01/85
4,491,118	06/426,023	1/01/85
4,491,122	06/587,162	1/01/85
4,491,123	06/362,904	1/01/85
4,491,124	06/383,558	1/01/85
4,491,125	06/518,803	1/01/85
4,491,128	06/409,734	1/01/85
4,491,129	06/259,481	1/01/85
4,491,130	06/442,791	1/01/85
4,491,137	06/521,825	1/01/85
4,491,138	06/457,510	1/01/85
4,491,144	06/512,013	1/01/85
4,491,145	06/410,662	1/01/85
4,491,146	06/421,371	1/01/85
4,491,147	06/413,671	1/01/85
4,491,148	06/488,437	1/01/85
4,491,149	06/520,819	1/01/85
4,491,150	06/325,987	1/01/85
4,491,151	06/605,068	1/01/85
4,491,152	06/610,278	1/01/85
4,491,153	06/384,391	1/01/85
4,491,158	06/482,207	1/01/85
4,491,162	06/432,021	1/01/85
4,491,163	06/343,359	1/01/85
4,491,164	06/415,393	1/01/85
4,491,168	06/498,537	1/01/85
4,491,170	06/365,956	1/01/85
4,491,171	06/287,629	1/01/85
4,491,172	06/256,595	1/01/85
4,491,174	06/425,235	1/01/85
4,491,175	06/393,009	1/01/85
4,491,177	06/395,175	1/01/85
4,491,178	06/522,129	1/01/85
4,491,179	06/371,926	1/01/85
4,491,184	06/407,855	1/01/85
4,491,190	06/462,212	1/01/85
4,491,191	06/454,198	1/01/85
4,491,192	06/545,371	1/01/85
4,491,193	06/427,642	1/01/85
4,491,194	06/443,186	1/01/85
4,491,200	06/407,300	1/01/85
4,491,201	06/445,067	1/01/85
4,491,202	06/395,478	1/01/85
4,491,203	06/500,202	1/01/85
4,491,204	06/353,944	1/01/85
4,491,206	06/470,250	1/01/85
4,491,208	06/334,631	1/01/85
4,491,211	06/391,461	1/01/85
4,491,214	06/484,670	1/01/85
4,491,216	06/417,782	1/01/85
4,491,219	06/357,165	1/01/85
4,491,221	06/507,594	1/01/85
4,491,222	06/514,998	1/01/85
4,491,224	06/435,920	1/01/85
4,491,226	06/386,889	1/01/85
4,491,227	06/507,933	1/01/85
4,491,230	06/488,850	1/01/85
4,491,231	06/494,520	1/01/85
4,491,232	06/606,165	1/01/85
4,491,233	06/460,764	1/01/85
4,491,237	06/398,487	1/01/85
4,491,238	06/560,314	1/01/85
4,491,240	06/446,752	1/01/85
4,491,243	06/341,630	1/01/85
4,491,244	06/514,665	1/01/85
4,491,247	06/363,511	1/01/85
4,491,248	06/531,605	1/01/85
4,491,249	06/379,774	1/01/85
4,491,252	06/385,738	1/01/85
4,491,253	06/368,140	1/01/85
4,491,254	06/421,122	1/01/85
4,491,255	06/496,400	1/01/85
4,491,256	06/439,826	1/01/85
4,491,257	06/501,182	1/01/85
4,491,259	06/356,333	1/01/85
4,491,260	06/399,921	1/01/85
4,491,261	06/338,791	1/01/85
4,491,263	06/478,261	1/01/85
4,491,264	06/383,988	1/01/85
4,491,265	06/501,605	1/01/85
4,491,266	06/318,951	1/01/85
4,491,267	06/425,508	1/01/85
4,491,268	06/525,014	1/01/85
4,491,269	06/488,736	1/01/85
4,491,272	06/461,407	1/01/85
4,491,275	06/392,761	1/01/85
4,491,278	06/575,306	1/01/85
4,491,282	06/408,660	1/01/85
4,491,283	06/485,632	1/01/85
4,491,286	06/486,042	1/01/85
4,491,288	06/503,135	1/01/85
4,491,291	06/344,619	1/01/85
4,491,292	06/521,022	1/01/85
4,491,293	06/419,905	1/01/85
4,491,296	06/519,900	1/01/85
4,491,303	06/534,867	1/01/85
4,491,307	06/412,933	1/01/85
4,491,308	06/438,911	1/01/85
4,491,309	06/490,140	1/01/85
4,491,314	06/457,671	1/01/85
4,491,315	06/421,254	1/01/85
4,491,316	06/450,670	1/01/85
4,491,317	06/388,750	1/01/85
4,491,319	06/541,977	1/01/85
4,491,321	06/428,699	1/01/85

Patent Number	Serial Number	Issue Date
4,491,322	06/512,584	1/01/85
4,491,325	06/462,093	1/01/85
4,491,328	06/401,084	1/01/85
4,491,329	06/526,572	1/01/85
4,491,330	06/519,322	1/01/85
4,491,334	06/420,004	1/01/85
4,491,335	06/363,619	1/01/85
4,491,337	06/378,836	1/01/85
4,491,338	06/367,040	1/01/85
4,491,342	06/496,276	1/01/85
4,491,345	06/290,464	1/01/85
4,491,347	06/336,695	1/01/85
4,491,349	06/553,405	1/01/85
4,491,351	06/347,069	1/01/85
4,491,352	06/429,218	1/01/85
4,491,353	06/490,299	1/01/85
4,491,355	06/293,245	1/01/85
4,491,356	06/428,984	1/01/85
4,491,357	06/558,990	1/01/85
4,491,358	06/370,299	1/01/85
4,491,359	06/471,273	1/01/85
4,491,363	06/396,886	1/01/85
4,491,364	06/348,275	1/01/85
4,491,366	06/308,810	1/01/85
4,491,367	06/405,305	1/01/85
4,491,368	06/604,437	1/01/85
4,491,369	06/445,904	1/01/85
4,491,370	06/526,163	1/01/85
4,491,372	06/483,972	1/01/85
4,491,375	06/519,046	1/01/85
4,491,378	06/470,357	1/01/85
4,491,383	06/420,359	1/01/85
4,491,385	06/396,473	1/01/85
4,491,390	06/375,570	1/01/85
4,491,392	06/378,780	1/01/85
4,491,393	06/373,181	1/01/85
4,491,400	06/355,203	1/01/85
4,491,405	06/491,578	1/01/85
4,491,408	06/567,729	1/01/85
4,491,409	06/516,659	1/01/85
4,491,410	06/369,788	1/01/85
4,491,411	06/392,824	1/01/85
4,491,412	06/409,366	1/01/85
4,491,413	06/370,755	1/01/85
4,491,414	06/390,954	1/01/85
4,491,415	06/586,303	1/01/85
4,491,417	06/487,447	1/01/85
4,491,419	06/498,646	1/01/85
4,491,420	06/528,809	1/01/85
4,491,422	06/518,723	1/01/85
4,491,425	06/538,015	1/01/85
4,491,426	06/429,068	1/01/85
4,491,427	06/322,321	1/01/85
4,491,430	06/478,170	1/01/85
4,491,433	06/527,234	1/01/85
4,491,434	06/544,547	1/01/85
4,491,436	06/477,117	1/01/85
4,491,438	06/466,847	1/01/85
4,491,439	06/402,179	1/01/85
4,491,440	06/524,262	1/01/85
4,491,441	06/541,557	1/01/85
4,491,443	06/466,637	1/01/85
4,491,444	06/392,066	1/01/85
4,491,449	06/260,761	1/01/85
4,491,450	06/304,901	1/01/85
4,491,452	06/433,225	1/01/85
4,491,454	06/527,500	1/01/85
4,491,457	06/500,901	1/01/85
4,491,458	06/479,600	1/01/85
4,491,461	06/495,243	1/01/85
4,491,463	06/517,302	1/01/85
4,491,464	06/495,269	1/01/85
4,491,465	06/378,221	1/01/85
4,491,466	06/424,987	1/01/85
4,491,467	06/395,781	1/01/85
4,491,470	06/491,458	1/01/85
4,491,471	06/570,822	1/01/85
4,491,472	06/472,670	1/01/85
4,491,477	06/411,041	1/01/85
4,491,478	06/521,773	1/01/85
4,491,479	06/550,760	1/01/85
4,491,484	06/513,742	1/01/85
4,491,485	06/503,621	1/01/85
4,491,490	06/499,950	1/01/85
4,491,492	06/437,244	1/01/85
4,491,494	06/499,721	1/01/85
4,491,495	06/482,888	1/01/85
4,491,497	06/492,671	1/01/85
4,491,502	06/448,649	1/01/85
4,491,504	06/461,314	1/01/85
4,491,505	06/558,021	1/01/85
4,491,510	06/460,891	1/01/85
4,491,511	06/549,693	1/01/85
4,491,515	06/360,055	1/01/85
4,491,518	06/521,760	1/01/85
4,491,520	06/612,895	1/01/85
4,491,521	06/412,198	1/01/85
4,491,524	06/559,340	1/01/85
4,491,525	06/358,983	1/01/85
4,491,526	06/481,761	1/01/85
4,491,528	06/514,236	1/01/85
4,491,532	06/301,046	1/01/85
4,491,537	06/511,965	1/01/85
4,491,542	06/431,896	1/01/85
4,491,545	06/482,416	1/01/85
4,491,548	06/489,627	1/01/85
4,491,549	06/409,942	1/01/85
4,491,550	06/618,326	1/01/85
4,491,551	06/450,365	1/01/85
4,491,552	06/510,775	1/01/85
4,491,556	06/484,514	1/01/85
4,491,564	06/525,354	1/01/85
4,491,566	06/368,831	1/01/85
4,491,576	06/429,457	1/01/85
4,491,578	06/516,937	1/01/85
4,491,580	06/365,068	1/01/85
4,491,581	06/437,280	1/01/85
4,491,582	06/471,594	1/01/85
4,491,585	06/355,044	1/01/85
4,491,586	06/450,479	1/01/85
4,491,590	06/498,344	1/01/85
4,491,591	06/512,910	1/01/85
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4,491,677	06/510,856	1/01/85
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4,491,685	06/498,401	1/01/85
4,491,688	06/486,824	1/01/85
4,491,690	06/468,467	1/01/85
4,491,692	06/439,407	1/01/85
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4,491,730	06/312,936	1/01/85
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4,491,740	06/353,183	1/01/85
4,491,745	06/307,372	1/01/85
4,491,751	06/578,601	1/01/85
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4,491,765	06/414,129	1/01/85
4,491,771	06/455,902	1/01/85
4,491,773	06/473,813	1/01/85
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4,795,888	07/073,351	1/03/89
4,795,894	06/901,578	1/03/89
4,795,901	07/051,923	1/03/89
4,795,922	07/036,470	1/03/89
4,795,930	07/128,139	1/03/89
4,795,936	07/104,337	1/03/89
4,795,938	06/940,376	1/03/89
4,795,951	07/096,692	1/03/89
4,795,952	07/161,313	1/03/89
4,795,954	06/944,070	1/03/89
4,795,959	07/120,196	1/03/89
4,795,960	06/937,100	1/03/89
4,795,970	07/054,763	1/03/89
4,795,974	07/077,579	1/03/89
4,795,994	07/058,168	1/03/89
4,795,998	06/938,346	1/03/89
4,796,001	07/057,725	1/03/89
4,796,006	06/932,678	1/03/89
4,796,016	06/859,945	1/03/89
4,796,023	06/938,635	1/03/89
4,796,027	07/157,132	1/03/89
4,796,044	07/024,133	1/03/89
4,796,046	06/830,949	1/03/89
4,796,086	06/802,223	1/03/89
4,796,094	07/113,889	1/03/89
4,796,121	06/837,869	1/03/89
4,796,139	07/139,155	1/03/89
4,796,143	07/161,752	1/03/89
4,796,144	07/088,736	1/03/89
4,796,152	07/145,543	1/03/89
4,796,155	07/088,520	1/03/89
4,796,156	07/128,847	1/03/89
4,796,158	07/072,036	1/03/89
4,796,161	07/114,112	1/03/89
4,796,163	06/938,052	1/03/89
4,796,167	07/130,150	1/03/89
4,796,168	07/041,830	1/03/89
4,796,172	07/118,760	1/03/89
4,796,174	07/032,560	1/03/89
4,796,181	06/922,689	1/03/89
4,796,190	06/870,534	1/03/89
4,796,192	06/781,656	1/03/89
4,796,197	06/855,341	1/03/89
4,796,198	06/919,994	1/03/89
4,796,210	06/882,187	1/03/89
4,796,214	06/817,498	1/03/89
4,796,220	06/941,411	1/03/89
4,796,222	06/791,833	1/03/89
4,796,232	07/111,428	1/03/89
4,796,237	07/008,015	1/03/89
4,796,240	07/132,819	1/03/89
4,796,255	06/859,288	1/03/89
4,796,257	06/926,487	1/03/89
4,796,259	07/053,158	1/03/89
4,796,262	06/840,421	1/03/89
4,796,268	07/004,860	1/03/89
4,796,269	07/053,697	1/03/89
4,796,275	07/032,860	1/03/89
4,796,276	06/621,639	1/03/89
4,796,284	06/929,960	1/03/89
4,796,289	07/163,953	1/03/89
4,796,290	07/159,720	1/03/89
4,796,295	06/911,833	1/03/89

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,375,480	06/275,633	3/01/83	6/22/81	1/13/93
4,402,986	06/286,088	9/06/83	7/23/81	1/13/93
4,655,120	06/812,848	4/07/87	12/23/85	1/15/93
4,674,503	06/240,728	6/23/87	3/05/81	1/13/93

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,676,240	06/773,991	6/30/87	9/09/85	1/13/93
4,707,361	06/761,988	11/17/87	8/02/85	1/15/93
4,719,937	06/802,997	1/19/88	11/29/85	1/13/93
4,726,929	07/041,650	2/23/88	4/21/87	1/13/93
4,731,980	06/942,849	3/22/88	12/17/86	1/14/93
4/732,755	06/489,590	3/22/88	4/28/83	1/14/93
4,758,187	07/061,184	7/19/88	6/11/87	1/15/93

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,300,359, Re. S.N. 08/003,445, Filed Jan. 12, 1993, Cl. 62/379, COLD PLATE SYSTEM FOR ICE DISPENSER, Robert M. Koeneman, et. al., Owner of Record: *Remcor Products Co., Glendale Heights, Ill.*, Attorney or Agent: Robert A. Lloyd, Ex. Gp.: 3404

4,685,221, Re. S.N. 08/004,624, Filed Jan. 14, 1993, Cl. 034, STEAM-SHOWER APPARATUS AND METHOD OF USING SAME, Bruce F. Taylor, et. al., Owner of Record: *Thermo Flectron-Web Systems, Inc., Auburn, Mass.*, Attorney or Agent: Anthony M. Lorusso, Ex. Gp.: 3404

4,756,422, Re. S.N. 08/007,850, Filed Jan. 22, 1993, Cl. 206/524.8, PLASTIC BAG FOR VACUUM SEALING, Hanns J. Kristen, Owner of Record: *TiLia, Inc., San Francisco, Calif.*, Attorney or Agent: Stephen M. Everett, Ex. Gp.: 2404

4,760,780, Re. S.N. 08/006,361, Filed Jan. 19, 1993, Cl. 99/584, APPARATUS FOR LOOSENING THE SKIN OF MOISTURE BEARING FRUIT, Jesus A. Silvestrini, et. al., Owner of Record: *IMDEC S.R.L., Mendoza, Argentina*, Attorney or Agent: C. Douglas McDonald, Jr., Ex. Gp.: 2402

4,771,012, Re. S.N. 08/004,652, Filed Jan. 14, 1993, Cl. 437, METHOD OF MAKING SYMMETRICALLY CONTROLLED IMPLANTED REGIOUS USING ROTATIONAL ANGLE OF THE SUBSTRATE, Toshiki Yabu, et. al., Owner of Record: *Matsushita Electric Industrial Co. Ltd., Kadoma, Japan*, Attorney or Agent: V. M. Creedon, Ex. Gp.: 1107

4,817,012, Re. S.N. 08/000,571, Filed Jan. 4, 1993, Cl. 364, METHOD FOR IDENTIFICATION OF PARASITIC TRANSISTOR DEVICES IN AN INTEGRATED STRUCTURE, Robert Cali', Owner of Record: *SGS Microelettronica S.P.A., Agrate, Italy*, Attorney or Agent: Richard K. Robinson, Ex. Gp.: 2314

4,818,394, Re. S.N. 07/982,029, Filed Nov. 24, 1992, Cl. 210, SEPARATING AGENT, Yoshio Okamoto, et. al., Owner of Record: *Daicel Chemical Industries, Ltd., Osaka, Japan*, Attorney or Agent: Terryence F. Chapman, Ex. Gp.: 1306

4,864,562, Re. S.N. 08/008,834, Filed Jan. 25, 1993, Cl. 370, SUB-RATE MULTI-MEDIA DATA TRANSMISSION CONTROL SYSTEM, Tokumichi Murakami, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Vincent M. Delucca, Ex. Gp.: 2603

4,965,676, Re. S.N. 07/965,076, Filed Oct. 22, 1992, Cl. 358/406, FACSIMILE REMOTE DIAGNOSTIC SYSTEM, Koichi Ejiri, et. al., Owner of Record: *Ricoh Co., Ltd., San Jose, Calif.*, Attorney or Agent: Aldo J. Test, Ex. Gp.: 2612

4,972,867, Re. S.N. 07/981,795, Filed Nov. 25, 1992, Cl. 137/15, VALVE STEM SEAL LEAK PROTECTION AND DETECTION APPARATUS, J.O. Rueach, Owner of Record: *Inventor*, Attorney or Agent: Timothy A. French, Ex. Gp.: 3407

4,986,197, Re. S.N. 08/006,604, Filed Jan. 21, 1993, Cl. 110/246, APPARATUS FOR USING HAZARDOUS WASTE TO FORM NON HAZARDOUS AGGREGATE, John M. Kent, Owner of Record: *Inventor*, Attorney or Agent: Stephen L. Peterson, Ex. Gp.: 3404

4,986,208, Re. S.N. 08/007,495, Filed Jan. 22, 1993, Cl. 114/270, ENGINE COVER CONSTRUCTION OF SMALL BOAT, Hoboru Kobayashi, Owner of Record: *Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-Ken, Japan*, Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 3105

5,027,696, Re. S.N. 08/005,740, Filed Jan. 19, 1993, Cl. 99/279, DEVICE FOR AUTOMATIC BEVERAGE BREWING, Michael Antonini, Owner of Record: *Inventor*, Attorney or Agent: Iman Abdallah, Ex. Gp.: 2402

5,066,494, Re. S.N. 08/005,732, Filed Jan. 19, 1993, Cl. 424/448, TRANSDERMAL THERAPEUTIC SYSTEM, Frank Becher, Owner of Record: *Lts Lohmann Therapic-Systeme, GmbH & Co., KG, Hevwied, Federal Republic of Germany*, Attorney or Agent: Rebecca J. Brandav, Ex. Gp.: 1502

5,138,880, Re. S.N. 07/995,203, Filed Dec. 22, 1992, Cl. 73/304C, DIGITAL LEVEL SENSING PROBE SYSTEM, Calvin S. Lee, et. al., Owner of Record: *Lee Maatuk Engineering, Inc., Santa Ana, Calif.*, Attorney or Agent: Lloyd M. Forster, Ex. Gp.: 2406

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,366,602, Reexam. No. 90/002,942, Requested Jan. 28, 1993, Cl. 024/025, METAL TIE, Thomas Colon, et. al., Owner of Record: *Panduit Corp., Tinley Park, Ill.*, Attorney or Agent: Charles R. Wentzel, Panduit Corp., Legal Dept., Tinley Park, Ill., Ex. Gp.: 3507, Requester: Robert L. Epstein, New York, N.Y.

4,720,292, Reexam. No. 90/002,950, Requested Jan. 29, 1993, Cl. 055/498, CYLINDRICAL AIR FILTER WITH LIGHTWEIGHT HOUSING AND RADIALLY DIRECTED SEAL, Donald F. Engel, et. al., Owner of Record: *Donaldson Co., Inc., Minneapolis, Minn.*, Attorney or Agent: Randall A. Hillson, Merchant, Gould, Smith, Edell, Welter & Schmidt, Minneapolis, Minn., Ex. Gp.: 1305, Requester: Owner

4,761,299, Reexam. No. 90/002,914, Requested Dec. 31, 1992, Cl. 427/27.00, METHOD AND APPARATUS FOR ELECTROSTATIC SPRAY COATING, Patrick A. Hufstetter, et. al., Owner of Record: *Ransburg Corp., Indianapolis, Ind.*, Attorney or Agent: Steven W. Weinrieb, Schwartz & Weinreib, Arlington, Va., Ex. Gp.: 1309, Requester: Owner

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5,088,841, Reexam. No. 90/002,944, Requested Jan. 29, 1993, Cl. 364/551.010, NON-INVASIVE SYSTEM AND METHOD FOR INSPECTION OF VALVES, John W. McElroy, Owner of Record: *Allied-Signal, Inc., Morris, N.J.*, Attorney or Agent: Panitch, Schwarze, Jacobs & Nadel, Philadelphia, Pa., Ex. Gp.: 2304, Requester: Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

5,043,736, Reexam. No. 90/002,943, Requested Jan. 28, 1993, Cl. 342/557, CELLULAR POSITION LOCATION SYSTEM, Ralph D. Darnell, et. al., Owner of Record: *Cae-Link Corp., Binghamton, N.Y.*, Attorney or Agent: Barry L. Haley, Mallin, Haley, McHale, DiMaggio & Crosby, Fort Lauderdale, Fla., Ex. Gp.: 2202, Requester: William E. Relton, Cooper & Dunham, New York, N.Y.

5,085,332, Reexam. No. 90/002,946, Requested Jan. 25, 1993, Cl. 215/249, CLOSURE ASSEMBLY, William A. Gettig, et. al., Owner of Record: *Gettig Technologies, Inc., Spring Mills, Pa.*, Attorney or Agent: Richard C. Litman, Arlington, Va., Ex. Gp.: 2401, Requester: The West Co., Inc., Phoenixville, Pa.

5,153,833, Reexam. No. 90/002,947, Requested Feb. 3, 1993, Cl. 364/424, ROBOTIC TELEVISION-CAMERA DOLLY, Gary B. Gordon, et. al., Owner of Record: *Total Spectrum Manufacturing, Inc., Valley Cottage, N.Y.*, Attorney or Agent: Spencer & Frank, Washington, D.C., Ex. Gp.: 2304, Requester: Vinten Broadcast, Ltd., Suffolk, England

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Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS
WHICH EXPIRED FEB. 1, 1993
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
38,208	07/038,208	4/29/1902
86,265	71/060,759	4/30/1912
86,276	71/060,585	4/30/1912
86,312	71/059,989	4/30/1912
86,323	71/060,025	4/30/1912
86,342	71/060,450	4/30/1912
86,343	71/060,151	4/30/1912
293,464	71/319,531	4/26/1952
293,475	71/320,961	4/26/1952
293,523	71/316,290	4/26/1952
293,530	71/319,695	4/26/1952
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558,180	71/523,225	4/29/1952
558,191	71/557,115	4/29/1952
558,194	71/561,545	4/29/1952
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558,196	71/562,717	4/29/1952
558,197	71/564,464	4/29/1952
558,201	71/568,098	4/29/1952
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558,222	71/588,971	4/29/1952
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932,762	72/372,394	4/25/1972
932,763	72/380,163	4/25/1972
932,764	72/384,779	4/25/1972
932,765	72/385,577	4/25/1972
932,769	72/342,830	4/25/1972
932,770	72/366,982	4/25/1972
932,771	72/370,977	4/25/1972
932,775	72/379,463	4/25/1972
932,778	72/385,676	4/25/1972
932,782	72/384,334	4/25/1972
932,784	72/382,276	4/25/1972
932,786	72/399,916	4/25/1972
932,792	72/381,305	4/25/1972
932,793	72/383,165	4/25/1972
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932,805	72/375,721	4/25/1972
932,808	72/380,424	4/25/1972
932,810	72/380,696	4/25/1972
932,821	72/377,251	4/25/1972
932,823	72/328,567	4/25/1972
932,824	72/345,385	4/25/1972
932,826	72/359,206	4/25/1972
932,828	72/374,018	4/25/1972
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932,834	72/350,001	4/25/1972
932,844	72/369,394	4/25/1972
932,851	72/380,931	4/25/1972
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932,858	72/382,293	4/25/1972
932,863	72/385,093	4/25/1972
932,868	72/352,749	4/25/1972
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932,872	72/364,839	4/25/1972
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932,874	72/368,300	4/25/1972
932,875	72/372,600	4/25/1972
932,879	72/384,369	4/25/1972
932,880	72/385,659	4/25/1972
932,890	72/372,824	4/25/1972
932,894	72/380,158	4/25/1972
932,895	72/381,142	4/25/1972
932,896	72/395,173	4/25/1972
932,897	72/389,490	4/25/1972
932,904	72/323,117	4/25/1972

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932,907	72/367,961	4/25/1972
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932,910	72/377,000	4/25/1972
932,911	72/385,637	4/25/1972
932,912	72/385,639	4/25/1972
932,913	72/389,387	4/25/1972
932,915	72/389,552	4/25/1972
932,916	72/390,975	4/25/1972
932,918	72/391,819	4/25/1972
932,923	72/385,368	4/25/1972
932,924	72/391,994	4/25/1972
932,926	72/383,459	4/25/1972
932,927	72/390,178	4/25/1972
932,928	72/391,983	4/25/1972
932,930	72/348,822	4/25/1972
932,933	72/385,591	4/25/1972
932,934	72/385,602	4/25/1972
932,935	72/387,126	4/25/1972
932,936	72/392,853	4/25/1972
932,937	72/392,854	4/25/1972
932,941	72/371,191	4/25/1972
932,944	72/391,066	4/25/1972
932,946	72/305,032	4/25/1972
932,952	72/374,083	4/25/1972
932,954	72/381,160	4/25/1972
932,955	72/382,544	4/25/1972
932,956	72/382,702	4/25/1972
932,959	72/384,291	4/25/1972
932,961	72/385,984	4/25/1972
932,964	72/343,248	4/25/1972
932,969	72/358,184	4/25/1972
932,973	72/379,471	4/25/1972
932,975	72/379,474	4/25/1972
932,976	72/379,983	4/25/1972
932,977	72/379,984	4/25/1972
932,978	72/379,985	4/25/1972
932,979	72/379,986	4/25/1972
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932,986	72/379,297	4/25/1972
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932,993	72/321,023	4/25/1972
932,997	72/353,652	4/25/1972
932,999	72/354,209	4/25/1972
933,000	72/354,342	4/25/1972
933,007	72/372,833	4/25/1972
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933,027	72/395,107	4/25/1972
933,029	72/348,490	4/25/1972
933,036	72/368,683	4/25/1972
1,698,639	74/077,560	7/07/1992

Erratum

"All reference to Patent No. 5,183,570 to Kohei Notoya, et. al., of Settsu, Japan, for 'PROCESS FOR PREPARING OSTEOGENESIS PROMOTING SUBSTANCE,' appearing in the *Official Gazette* of Feb. 2, 1993 should be deleted since no patent was granted."

"All reference to Patent No. 5,185,322 to Kenneth A. Kudsk, Memphis, Tenn., for 'HUMAN GROWTH HORMONE INDUCED IMPROVEMENT IN DEPRESSED T4/T8 RATIO' appearing in the *Official Gazette* of Feb. 9, 1993 should be deleted since no patent was granted."

"All reference to Patent No. 5,186,927 to Jean Spencer of Boston, Mass. for 'POLYMERIC PARTICLES FOR DENTAL APPLICATIONS,' appearing in the *Official Gazette* of Feb. 16, 1993 should be deleted since no patent was granted."

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Apr. 30, 1993.

Cohan, Alan, 6905 Northfield Dr., Annandale, Va. 22003
Griffin, Donald A., 5203 Oscar Ct., Temple Hills, Md. 20748
Kundrat, Andrew Vincent, 12806 Broadmore Rd., Silver Spring, Md. 20904
Sofia, Michael, 59 Carignan, Beloeil, Que., J3G 3L5, Canada
Spruill, Robert Louis, 7609 Lauralin Pl., Springfield, Va. 22150
Thompson, Jeffrey L., 815 S. 18th St., #610, Arlington, Va. 22202
Van Balen, William J., 3822 Gallows Rd., Annandale, Va. 22003

Feb. 8, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held Aug. 21, 1991. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Apr. 30, 1993.

Akers, Scott R., 3611 N. 13th St., Arlington, Va. 22201

Feb. 10, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held Apr. 8, 1992. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollmeat and Discipline on or before Apr. 30, 1993.

Colucci, David J., 3244 Arrowhead Cir., #H, Fairfax, Va. 22030

Feb. 10, 1993 CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held Oct. 14, 1992. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the

PATENT NOTICES

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person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Apr. 30, 1993.

McEwing, David L., 9 Sandy Brook La., Yarmouth, Me. 04096

Feb. 10, 1993

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person is applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Apr. 30, 1993.

Van Patten, Michele Annette, 434 W. Glebo Rd., Alexandria, Va. 22305

Feb. 18, 1993

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held Oct. 14, 1992. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Apr. 30, 1993.

Ekstrom, Richard C., 1501 Crystal Dr., #522, Arlington, Va. 22202

Feb. 18, 1993

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Invitation to Present Technical Seminars

Since 1982, contributions from industry have sponsored the Examiner Education Program, which provides examiners with first hand knowledge on the creation and development of new technology. Support for this program has not kept pace with the growth in the number of patent examiners over the past decade. In an effort to supplement the existing program, and to provide examiners with current knowledge in the fields of technology in which they specialize, the Office is seeking the assistance of individuals and organizations that could present technical seminars on location at the Office.

Seminars would typically be of two hours duration, and provide examiners with information on current technical developments and issues in the technical fields of interest. The Office can provide classroom space, audio/visual equipment, copying services and a nominal fee to cover expenses. The Office will not provide travel expenses to or lodging expenses associated with the presentation of a seminar at the Office.

The Office is particularly interested in having seminars presented in the following technology areas:

- Advanced Computer Architecture
- Heat Resistant Materials
- Artificial Intelligence, Neural Networks & Fuzzy Logic
- Biotechnology
- Imaging Technologies & Computer Graphics
- Medical Devices & Diagnostics
- Semiconductors
- Superconductors
- High-density Data Storage
- High-performance Computing Optoelectronics
- Sensor Technology
- Computer Communication Networks
- Massively Parallel Processing Systems (MPP)
- Reduced Instruction Set (RISC) Computers
- Database Management Systems
- Audio Processing Systems
- Object Oriented Programming
- Trends in Software Development
- Compilers
- Integrated Dissimilar Computer Systems
- Recent Developments in Computer Emulation & Simulation
- Agrochemicals
- Polymer Technologies
- Pharmaceuticals
- Liquid Crystals
- Nanostructured Matter
- Membrane Technology
- High Definition TV
- Telecommunications
- Conductive Compositions

Other suggestions for technology areas of interest are cordially invited.

Individuals and organizations that are interested in participating in this effort to keep examiners up to date in their knowledge of current technology are requested to contact Bernardette Sanders by mail addressed to:

Bernardette Sanders
Patent Academy, Suite 501
Patent and Trademark Office
Washington, D.C. 20231

or by fax [703-305-8825] or by telephone [703-305-8086].

Feb. 18, 1993

STEPHIN G. KUNIN
Acting Assistant Commissioner for Patents

PATENT NOTICES

Certificates of Correction For Week of March 16, 1993

Des. 313,838	5,008,812	5,038,582	5,056,621	5,067,965	5,069,283	5,070,872	5,091,719
Des. 314,817	5,008,954	5,039,820	5,056,690	5,068,105	5,069,323	5,071,370	5,113,696
Des. 315,578	5,009,640	5,040,023	5,056,890	5,068,169	5,069,640	5,071,793	5,119,022
Des. 319,096	5,009,650	5,040,976	5,057,006	5,068,430	5,069,715	5,073,287	5,126,529
Des. 320,984	5,010,101	5,041,431	5,057,057	5,068,542	5,069,806	5,073,690	5,128,460
Des. 321,107	5,010,204	5,041,573	5,057,093	5,068,601	5,069,879	5,074,202	5,138,217
Re. 33,747	5,010,429	5,041,581	5,057,174	5,068,662	5,069,889	5,075,670	5,144,942
4,590,884	5,010,659	5,041,608	5,057,194	5,068,779	5,070,304	5,076,218	5,147,521
4,701,441	5,010,865	5,041,662	5,057,320	5,068,813	5,070,439	5,077,644	5,160,969
4,745,182	5,011,801	5,042,225	5,057,321	5,069,191	5,070,763	5,083,393	5,161,740
4,761,402	5,012,936	5,042,427	5,057,698				
4,789,177	5,013,252	5,042,588	5,057,756				
4,798,408	5,013,827	5,042,781	5,057,893				
4,822,658	5,013,835	5,042,782	5,057,934				
4,832,129	5,014,710	5,042,913	5,057,978				
4,847,080	5,015,886	5,042,990	5,058,035				
4,858,253	5,016,037	5,043,332	5,058,188				
4,861,000	5,016,116	5,043,587	5,058,473				
4,863,781	5,017,423	5,043,685	5,058,488				
4,867,796	5,017,595	5,043,701	5,058,872				
4,869,271	5,017,906	5,043,785	5,059,038				
4,869,663	5,017,942	5,045,120	5,059,437				
4,873,316	5,018,121	5,045,875	5,059,926				
4,875,275	5,019,489	5,046,182	5,059,929				
4,876,081	5,020,004	5,046,216	5,059,931				
4,882,677	5,021,152	5,046,565	5,060,012				
4,891,957	5,022,352	5,046,568	5,060,416				
4,899,223	5,023,175	5,046,696	5,060,490				
4,907,193	5,023,569	5,046,838	5,061,014				
4,911,204	5,024,130	5,046,940	5,061,518				
4,912,925	5,024,363	5,047,056	5,061,639				
4,913,098	5,024,408	5,047,116	5,061,699				
4,923,895	5,024,541	5,047,248	5,061,791				
4,925,664	5,024,852	5,047,400	5,061,822				
4,929,644	5,024,897	5,047,963	5,061,866				
4,937,947	5,025,028	5,048,077	5,061,918				
4,926,371	5,025,483	5,048,146	5,062,017				
4,942,636	5,026,204	5,048,153	5,062,149				
4,943,130	5,026,278	5,048,538	5,062,371				
4,947,884	5,026,636	5,048,579	5,062,762				
4,951,336	5,026,659	5,048,591	5,063,275				
4,951,798	5,026,735	5,048,727	5,063,332				
4,957,390	5,026,831	5,048,996	5,063,420				
4,965,064	5,028,291	5,049,184	5,063,441				
4,966,408	5,028,957	5,049,552	5,063,457				
4,968,633	5,029,095	5,049,725	5,063,787				
4,970,938	5,029,194	5,050,048	5,063,859				
4,971,799	5,029,196	5,050,242	5,063,925				
4,972,378	5,029,209	5,050,936	5,063,995				
4,973,341	5,030,546	5,050,952	5,064,063				
4,975,438	5,031,458	5,051,263	5,064,166				
4,975,930	5,031,623	5,051,318	5,064,215				
4,977,111	5,031,830	5,051,912	5,064,394				
4,979,147	5,031,863	5,052,033	5,064,453				
4,979,613	5,032,236	5,052,615	5,064,461				
4,983,646	5,032,706	5,053,050	5,064,462				
4,987,067	5,033,012	5,053,502	5,064,550				
4,987,223	5,033,015	5,053,588	5,064,716				
4,988,706	5,033,199	5,053,614	5,064,783				
4,989,767	5,033,423	5,054,036	5,065,052				
4,990,498	5,033,764	5,054,316	5,065,584				
4,991,162	5,033,989	5,054,550	5,066,140				
4,991,290	5,034,310	5,054,596	5,066,305				
4,994,086	5,034,669	5,054,600	5,066,307				
4,994,187	5,035,310	5,055,332	5,066,423				
4,995,001	5,036,051	5,055,422	5,066,584				
4,995,658	5,036,231	5,055,564	5,066,665				
4,996,074	5,036,469	5,055,570	5,066,736				
4,996,649	5,036,512	5,055,666	5,067,141				
4,998,111	5,036,867	5,055,756	5,067,212				
4,999,193	5,037,075	5,055,894	5,067,519				
5,001,715	5,037,391	5,055,952	5,067,557				
5,002,732	5,037,789	5,055,962	5,067,661				
5,002,882	5,037,806	5,056,075	5,067,816				
5,003,287	5,038,332	5,056,233	5,067,861				
5,004,340	5,038,477	5,056,573	5,067,917				

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In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

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	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
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Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
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	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
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Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
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	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
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PATENT EXAMINING CORPS

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	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
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	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
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	Clemson University Libraries	Not Yet Operational
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	3/14/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	6/11/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	5/15/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	5/15/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	8/08/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	8/20/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	8/03/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	11/07/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	2/21/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	7/27/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	10/21/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	1/18/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	5/12/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	4/28/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	5/15/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/11/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during February 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,935,596 to 3,946,800 inclusive
Plant Patents ..... 3,828 to 3,830

REEXAMINATIONS

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REEXAMINATIONS

MARCH 16, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 4,396,391 (1946th)
TREATING CELLULOSE TEXTILE FABRICS WITH DIMENTHYLOL DIHYDROYETHYLENEUREE-POLYOL
Bernard F. North, Rock Hill, S.C., assignor to Sequa Chemicals, Inc., New York, N.Y.
Reexamination Request No. 90/002,687, Apr. 2, 1992.
Reexamination Certificate for Patent No. 4,396,391, issued Aug. 2, 1983, Ser. No. 393,640, Jun. 30, 1982.
Reexamination Certificate B1 4,396,391, issued Aug. 28, 1984.
Int. Cl.[5] D06M *13/34*
U.S. Cl. 8—181

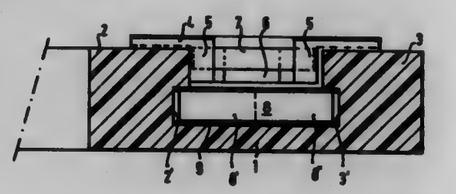
AS A RESULT OF REEXAMINATTION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 8 are determined to be patentable as amended.

Claims 2–7 and 9–12, dependent on an amended claim, are determined to be patentable.

1. A composition for treating a textile fabric which comprises the product of the reaction of (a) dimethyloldihydroxyethylene urea or an alkylated dimethyloldihydroxyethylene urea with (b) a polyol selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycols, butylene glycols, and glycerine, and their mixtures, *carried out at a pH of about 1.0 to 6.0 in aqueous solution.*

B1 4,805,764 (1947th)
CHAIN CONVEYOR, A CONVEYOR CHAIN AND A BEND SEGMENT FOR THE TRACK OF SUCH CHAIN CONVEYOR
George J. van Zijderveld, Jr., 's-Gravenzande, Netherlands, assignor to M.C.C. Nederland B.V., Gravenzande, Netherlands
Reexamination Request No. 90/002,197, Nov. 9, 1990.
Reexamination Certificate for Patent No. 4,805,764, issued Feb. 21, 1989, Ser. No. 176,143, Mar. 31, 1988.
Claims priority, application Netherlands, Apr. 6, 1987, 8700801
Int. Cl.[5] B65G *17/06, 21/20, 23/18*
U.S. Cl. 198—805



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2 and 8–10 are cancelled.

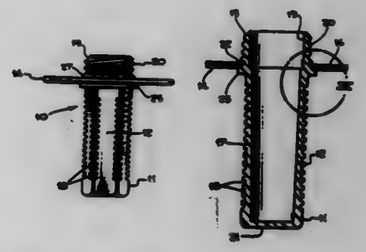
Claims 3, 11, 13 and 16 are determined to be patentable as amended.

Claims 4–7, 12, 14 and 15, dependent on an amended claim, are determined to be patentable.

New claims 17–19 are added and determined to be patentable.

17. A chain conveyor comprising a track including at least one bend zone and a conveyor chain, said track comprising two spaced parallel rails over which the chain can move, said chain having links presenting a substantially rectangular carrying surface made of non-ferromagnetic synthetic plastics material and a connecting system situated below said carrying surface and including at least two spacedeyes on one side of the link, at least one eye situated intermediate said spaced eyes on the opposite side of the link, all eyes being made of non-ferromagnetic synthetic plastics material, and a hinge pin for hinging adjacent links together, said hinge pin being embraced by the at least two spaced eyes connected to one of the links and the at least one eye situated intermediate said spaced eyes and connected to an adjacent link, the carrying surfaces, the hinge pins and the hinge eyes being designed so that the chain is capable of flexing not only about the hinge pins but also in the plane of transport defined by the carrying surfaces of the successive links, and guide surfaces depending from the underside of the carrying surfaces for guiding the chain laterally relative to the rails, the maximum perpendicular distance between these guide surfaces being shorter than the minimum perpendicular distance between the guide surfaces formed on the rails, characterized in that the hinge pin of the connecting system of the links is made of a ferromagnetic material, that, exclusively in the bend zones of the track, in the space between the two rails, under the connecting system of the links, at least one permanent magnet is provided for generating a magnetic field, the magnetic fieldlines of which in substance extend through the hinge pin, to attract the hinge pin.

B1 4,844,252 (1948th)
MULTI-PART DISPOSABLE HANDLE FOR HOSPITAL SURGERY ROOM LIGHT FIXTURE
John M. Barron, Granda Hills, Calif.; Robert T. Horan, Tucson, Ariz.; Moshe M. Hoffman, Northridge, Calif.; William L. Noack, Camarillo, Calif., and Dan Sandel, Tarzana, Calif., assignors to Devon Industries, Inc., Chatsworth, Calif.
Reexamination Request No. 90/002,432, Sep. 12, 1991.
Reexamination Certificate for Patent No. 4,844,252, issued Jul. 4, 1989, Ser. No. 224,896, Jul. 27, 1988.
Int. Cl.[5] B65D *69/00*
U.S. Cl. 206—223



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 13, 14, 15, 16 and 17 is confirmed.

Claim 8 is cancelled.

Claims 1, 2, 5, 6, 7, 9, 10 and 11 are determined to be patentable as amended.

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Claims 3, 4, and 12, dependent on an amended claim, are determined to be patentable.

1. A sterilizable multi-part handle for attachment to a handle receiving fitting on a medical surgery room light fixture, said handle comprising:

a handle body having a body grip portion and a head portion to engage said fitting, *said head portion having an annular protuberance;*

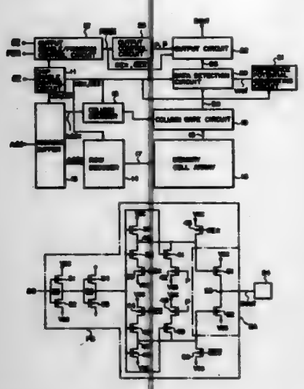
a disc separate from said handle and having a central aperture within a surrounding annular web, *said annular protuberance having a diameter less than the inner diameter of said central aperture;* and

[connecting means associated with said handle body head portion and said disc aperture for mounting said disc to said handle body preparatory to mounting said handle to said light fixture] *at least one detent protruding inwardly of said central aperture that is forced over the annular protuberance to provide a snap-on fit connection between said handle body and said disc.*

B1 4,882,507 (1949th)
OUTPUT CIRCUIT OF SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yuuichi Tatsumi, Tokyo; Hidenobu Minagawa, Kawasaki; Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo, and Mitsuko Imai, Annaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Reexamination Request No. 90/002,576, Feb. 14, 1992.
Reexamination Certificate for Patent No. 4,882,507, issued Nov. 21, 1989, Ser. No. 226,307, Jul. 29, 1988.
Claims priority, application Japan, Jul. 31, 1987, 62-191602
Int. Cl.[5] H03K *3/013, 17/06, 17/16, 17/284*
U.S. Cl. 307—443



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 4, 6 and 7 are cancelled.

Claims 1–3, 5, 8–10 and 13–24 are determined to be patentable as amended.

Claims 11 and 12 dependent on an amended claim, are determined to be patentable.

1. A semiconductor integrated circuit comprising:

[an output circuit including a transistor whose conduction state is controlled according to an internal signal and charging and discharging a preset node by controlling the conduction state of said transistor, thus outputting a signal; and]

an output circuit for generating an output signal, said output circuit including at least one transistor and a preset node, said at least one transistor having a conduction state controlled by an internal signal and said preset node being charged and discharged depending on the conduction state of said at least one transistor; and

control means *for switching an operation rate of said output circuit based on a predetermined mode of operation, said control means including output control means responsive to a control signal* for [increasing a rate of reduction in the conduction resistance of] *changing a rate of current flow to* said *at least one* transistor *to change a rate of charging or discharging of said preset node* for a preset period of time after [the] *receipt of said* control signal [has changed in level].

B1 4,917,706 (1950th)
LIQUID COMPOSITIONS OF PREREDUCED SULFUR DYES AND PRODUCTION THEREOF

Laszlo A. Mezaros, Charlotte, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Reexamination Request No. 90/002,421, Aug. 30, 1991.
Reexamination Certificate for Patent No. 4,917,706, issued Apr. 17, 1990, Ser. No. 145,545, Feb. 1, 1988.
Int. Cl.[5] C09B *49/00, 67/28*
U.S. Cl. 8—652

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–18, 24–26, 28–29, 36–39 and 41 is confirmed.

Claim 35 is cancelled.

Claims 19–20, 31–33 and 40 are determined to be patentable as amended.

Claims 21–23, 27, 30, 34 and 42, dependent on an amended claim, are determined to be patentable.

New claims 43–78 are added and determined to be patentable.

1. A process for producing a liquid composition of a sulfur dye in pre-reduced leuco form which comprises washing a sulfur dye which has been obtained by precipitation from a thionation reaction product with water to remove inorganic salts therefrom and reducing the washed sulfur dye by heating it in an aqueous alkaline medium which contains, as the reducing agent for the sulfur dye, a reducing sugar or a sulfide which is formed in situ and to which no sulfide reducing agent has been added, the heating being continued until at least 90%, by weight, of the dye becomes dissolved.

B1 5,029,278 (1951st)
TRANSDUCER INTERFACE CIRCUIT

David A. Topmiller, Ft. Wright, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Reexamination Request No. 90/002,592, Feb. 11, 1992.
Reexamination Certificate for Patent No. 5,029,278, issued Jul. 2, 1991, Ser. No. 459,879, Jan. 2, 1990.
Int. Cl.[5] H03K *17/14, 17/16, 17/06, 5/08*
U.S. Cl. 307—565

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

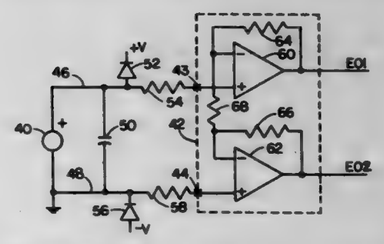
The patentability of claims 3, 4, and 5 is confirmed.

Claims 1 and 2 are cancelled.

3. A transducer interface circuit for detecting a loss of connection to a transducer normally connected to the interface circuit, the interface circuit comprising:

(a) a differential operational amplifier having first and second inputs normally connected to opposite electrical poles of the transducer, one of said poles being grounded proximate the transducer, the differential amplifier operating at less than saturation in response to the transducer output; and

(b) current supply means connected to each input, the current supply means providing current to saturate the differential amplifier in the event of loss of connection of the transducer to either or both of the amplifier inputs.



REISSUES

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REISSUES

MARCH 16, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,194

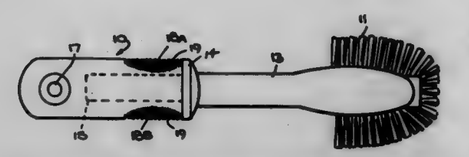
UNIVERSAL HANDLE FOR HAND-HELD IMPLEMENT

Davis Stowell, New York, and Michael Callahan, Brooklyn, both of N.Y., assignors to Oxo International L.P., New York, N.Y.

Original No. 4,974,286, dated Dec. 4, 1990, Ser. No. 498,729, Mar. 26, 1990. Application for reissue Jun. 5, 1991, Ser. No. 710,466

Int. Cl.[5] B25G *1/00*

U.S. Cl. 16—111 R 5 Claims



5. A universal handle for a household or other hand-held implement provided with a core shank, said handle comprising:

(a) a body having an elliptical cross section, said body having an internal cavity to socket the shank;

(b) a pair of concave depressions formed in the body at opposing sides thereof adjacent its upper end; and

(c) an array of spaced flexible fins anchored in each depression to define a grip site whereby when a user clenches the handle with the fingers of his hand, the internal region in the resultant fist conforms to the shape of the handle to provide a good grip, the grip sites being pressed in by the forefinger and the thumb of the hand to enhance the grip.

Re. 34,195

ARMATURE PAPER FEEDING, CUTTING, AND INSERTING DEVICE

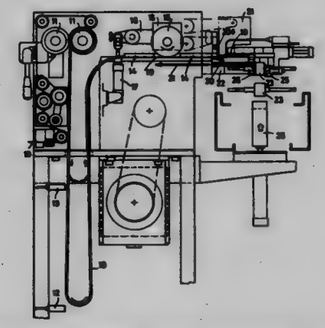
Luciano Santandrea, and Massimo Lombardi, both of Florence, Italy, assignors to Axis S.p.A., Florence, Italy

Original No. 4,878,292, dated Nov. 7, 1989, Ser. No. 182,955, Apr. 18, 1988. Application for reissue Nov. 6, 1991, Ser. No. 788,524

Claims priority, application Italy, May 6, 1987, 67390 A/87

Int. Cl.[5] H02K *15/02, 15/10*

U.S. Cl. 29—734 18 Claims



12. Apparatus for cutting a length of insulating material from an end of an elongated strip of said material for insertion in an electric motor part having a length which is subject to variation, said apparatus comprising:

means for automatically measuring the length of said electric motor part;

means responsive to said means for automatically measuring for feeding out a length of said strip which bears a predetermined relationship to the measured length of said electric motor part;

means for severing said length of said strip fed out by said means for feeding out from the remainder of said strip; and

means for inserting said length of said strip in said electric motor part.

16. The method of cutting a length of insulating material from an end of an elongated strip of said material for insertion in an electric motor part having a length which is subject to variation, said method comprising the steps of:

placing a first end of said length of said electric motor part in contact with a first reference surface;

automatically biasing a second reference surface into contact with a second end of the length of said electric motor part;

detecting the location of said second reference surface relative to said first reference surface in order to produce an output indication of the distance between said first and second reference surfaces while said first and second reference surfaces are respectively in contact with said first and second ends;

using said output indication to control the length of said strip which is allowed to be fed out past a cutter; and

cutting said strip with said cutter when the length of said strip fed out past said cutter bears a predetermined relationship to said distance between said first and second reference surfaces.

Re. 34,196

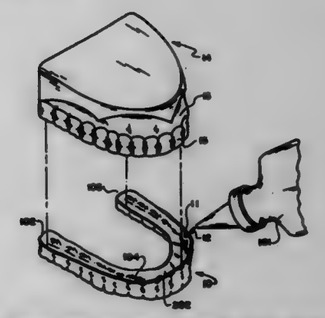
METHOD AND MATERIAL FOR BRIGHTENING TEETH

John R. Munro, Knoxville, Tenn., assignor to Dunhall Pharmaceuticals, Inc., Gravette, Ark.

Original No. 4,990,089, dated Feb. 5, 1991, Ser. No. 519,318, May 4, 1990. Continuation of Ser. No. 235,304, Aug. 23, 1988, abandoned. Application for reissue Aug. 7, 1991, Ser. No. 743,611

Int. Cl.[5] A61C *5/00*

U.S. Cl. 433—215 59 Claims



1. The process of brightening teeth *during sleep at night,* comprising the steps of:

obtaining a substantially liquid tight splint to cover the tooth or teeth to be brightened;

placing within said splint a brightener agent at the location within said splint associated with the tooth [surfaces] *or teeth* to be brightened; and

before sleep, placing the splint containing said brightener agent around the tooth or teeth to be brightened *for a*

PLANT PATENTS

GRANTED MARCH 16, 1993

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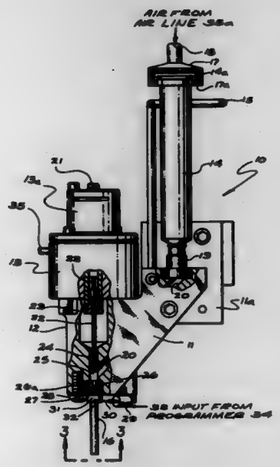
sufficient number of nights to effect a substantial brightening of said tooth or teeth.

Re. 34,197
COMPUTER CONTROLLER VISCOUS MATERIAL DEPOSITION APPARATUS
Harold J. Engel, 18932 Olympia St., Northridge, Calif. 91326
Original No. 4,941,428, dated Jul. 17, 1990, Ser. No. 303,077, Jan. 30, 1989. Continuation of Ser. No. 75,571, Jul. 20, 1987, abandoned. Application for reissue Jul. 3, 1991, Ser. No. 725,651
Int. Cl.[5] B05C *5/02*
U.S. Cl. 118—680 **10 Claims**

1. Apparatus for successive deposition of viscous fluid quantities on a planar surface at each of a corresponding succession of X Y coordinate locations on said surface, said apparatus comprising:

a positionable carriage and a plurality of hollow needle elements mounted on said carriage, each of said needle elements having an orifice directed to deposit said viscous fluid onto said surface from corresponding points of optimum Z axis clearance with respect to said surface, said plural hollow needle elements extending substantially mutually parallel and normal to said surface, said needle elements further being mounted to be rotatable in a plane parallel to said planar surface;

first means for successively positioning said carriage and therefore said needle elements for a corresponding dwell time in a succession of X, Y[, Z] positions with respect to said surface, said first means also including means for rotating said needle elements [for discretely determining the pattern of the corresponding plural depositions of said fluid on said surface] *to a desired orientation* during each of said dwell times.



GRANTED MARCH 16, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,175
MINIATURE ROSE PLANT NAME SAVACHILD
F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.
Filed Aug. 5, 1991, Ser. No. 740,500
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—7.1 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

8,176
MINIATURE ROSE PLANT NAMES SAVAWHOOP
F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.
Filed Aug. 5, 1991, Ser. No. 740,506
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—7.1 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

8,177
"RUBY" APRICOT TREE
Allen A. Corrin, 6541 S. Holbrook, Reedley, Calif. 93654
Continuation of Ser. No. 581,632, Sep. 10, 1990. This application Jun. 5, 1992, Ser. No. 897,444
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree substantially as illustrated and described and which is a sport of the "Royal" apricot tree (unpatented) and is somewhat remotely similar to the "Castlebrite" apricot tree (unpatented), but which is distinguished therefrom and characterized principally as to novelty by producing fruit which are mature for commercial harvesting and shipment approximately June 9 to June 12 in the San Joaquin Valley of central California, which has superior flavor and which has a skin coloration having a much higher percentage of the surface area covered with a red coloration and a blush coloration occurring in a striped pattern.

8,178
CHRYSANTHEMUM PLANT NAMED DENISE
Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Aug. 16, 1991, Ser. No. 745,703
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct Chrysanthemum plant named Denise, as described and illustrated.

8,179
CHRYSANTHEMUM PLANT NAMED RAPTURE
Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Aug. 9, 1991, Ser. No. 743,095
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—74.1 **1 Claim**

1. A new and distinct Chrysanthemum plant named Rapture, as described and illustrated.

8,180
CHRYSANTHEMUM PLANT NAMED CORRIDA
Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Aug. 16, 1991, Ser. No. 745,700
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—82.4 **1 Claim**

1. A new and distinct Chrysanthemum plant named Corrida, as described and illustrated.

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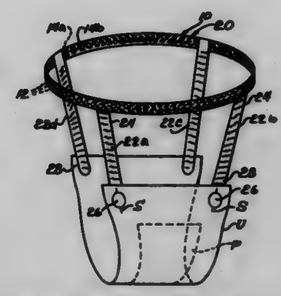
GRANTED MARCH 16, 1993

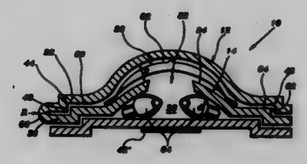
GENERAL AND MECHANICAL

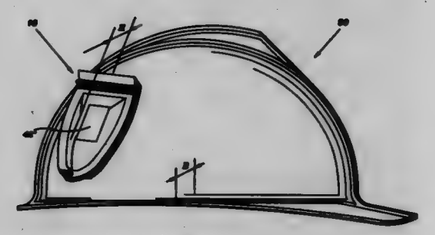
5,193,225
ELASTIC BAND
Hamzeh Karami, Mansfield, and Ronald F. Vitaris, Worcester, both of Mass., assignors to Manufacturers Hanover Trust Company
Filed Sep. 10, 1990, Ser. No. 580,221
Int. Cl.[5] A41F *9/00*
U.S. Cl. 2—312 7 Claims



1. A support for an undergarment comprising:
an elastic belt having a plurality of elongated spaced elastic members in a stretched conditions; said elastic members also having opposed sides and being sandwiched between a pair of flexible strips while in the stretched condition; and
a plurality of securement strips having two ends, wherein one end is secured to the belt and the other end of each respective securement strip having means for releasably securing the strips to the undergarment, the securement strips comprising elastic bands, wherein each of the elastic bands have a plurality of stretched elastic members with opposed sides and being sandwiched between a pair of flexible sheets while in the stretched condition.

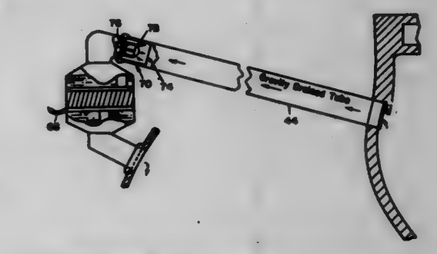
5,193,226
FACE MASK AND EARPLUG CASE
Steven C. Mortenson, Box 15, Charlestown, N.H. 03603
Filed Nov. 4, 1991, Ser. No. 787,512
Int. Cl.[5] A42B *1/24*
U.S. Cl. 2—422 16 Claims





12. A safety system comprising:
a helmet; and,
a case for carrying earplugs and face masks, the masks having a convex side and a concave side, the case being attachable to said helmet; the case comprising:
a first shell having a first shell upper surface and a first shell lower surface, said lower surface is configured to provide a cavity therein which substantially conforms to the convex side of the face mask;
a first shell rim attached to said first shell;
a second shell having a second shell upper surface and a second shell lower surface and a compartment therein, said second shell upper surface having a convex protrusion thereon, and said convex protrusion configured to substantially conform to said cavity in said first shell;
a passage in said second shell providing access to said compartment in said second shell;
a second shell rim attached to said second shell;
means for attaching said first shell rim to said second shell 1m, said protrusion being so positioned on said second shell that said first shell bordering said cavity is in close proximity but spaced apart from said protrusion on said second shell when said first shell rim and said second shell rim are attached; and means for fastening the case to said helmet, said means for fastening the case being centrally located on said lower surface of said second shell and on a back quardrant of said helmet.

5,193,227
VENTILATING SYSTEM FOR CONTINUOUSLY REMOVING AIR FROM A TOILET BOWL
Jim C. Crowley, Jr., #12 Sandpiper Rd., Hilton Head Island, S.C. 29928
Filed Aug. 7, 1991, Ser. No. 741,746
Int. Cl.[5] E03D *9/052*
U.S. Cl. 4—213 3 Claims



1. A ventilating system for continuously removing air from a toilet bowl comprising:
A) a toilet bowl having a front end, a rear end, a wall, a top rim on said wall, a sewage discharge pipe, and a sewer trap on said discharge pipe, water moving from said bowl to said discharge pipe in a downstream direction during a flush cycle whereby said trap is downstream of said bowl;
(B) means for continuously removing air from said toilet bowl including;
(1) an air pick-up conduit mounted in said toilet bowl and having an inlet fluidically connected with the interior of said toilet bowl and an outlet positioned vertically above said inlet and located outside of said toilet bowl, said pick-up conduit being oriented nearly horizontally and at an angle with respect to vertical,
(2) a fan fluidically connected to said air pick-up conduit outlet to receive air therefrom,
(3) said fan having an inlet fluidically connected to said air pick up conduit to receive air therefrom and an outlet fluidically connected to said toilet drainage system downstream of said trap,

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(4) a fluid flow control valve in said air pick-up conduit upstream of said fan, said valve including

(a) a cage having an inlet end and an outlet end, said outlet end being located adjacent to said air pick-up conduit outlet and being located downstream of said inlet end, said cage being oriented nearly horizontally and including a plurality of spaced apart side struts extending along said air pick-up conduit, a first strut located adjacent to said cage outlet end and a second strut located adjacent to said cage inlet end, said side strut connecting said first and second struts together, said cage including an outlet in said outlet end, with said outlet being spaced apart from said side struts, and

(b) a ball located in said cage and movable between a flow-permitting position adjacent to said cage inlet end and a flow-blocking position covering said outlet, said cage being located in said pick-up conduit and being angled with respect to vertical to have said cage inlet located below said cage outlet, said ball having a specific gravity greater than the specific gravity of air and less than the specific gravity of water whereby gravity biases said ball into said flow-permitting position and air flowing through said pick-up conduit will flow past said ball and water flowing past said ball moves said ball toward said flow-blocking position; and

C) a power source connected to said fan.

5,193,228

TOILET COVERING HINGE ASSEMBLY WITH DAMPING CAPABILITY

Kazuo Murasawa, Toyonaka; Toshiyuki Kakinoki, Yahata, and Yukio Yamamura, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 10, 1991, Ser. No. 698,221
Int. Cl.[5] A47K *13/12*
U.S. Cl. 4—236 **9 Claims**

1. A hinge assembly with damping capability for mounting a toilet covering to the rear of a toilet for rotation of the toilet covering about a hinge axis between a lowered and a raised position, said hinge assembly comprising:

a hinge shaft adapted to be connected to the toilet covering to be rotatable together therewith about the hinge axis; and

a dashpot adapted to be secured on the side of the toilet, said dashpot incorporating a cylinder containing a volume of damper fluid and a rotor rotatably received within said cylinder and connected to said hinge shaft to be rotatable together therewith, said rotor provided with a flap extending outwardly into said damper fluid and pivotable relative to said rotor such that said flap, in response to the toilet covering moving from the lowered position to the raised position, pivots into a folded condition where it receives no substantial resistance from said damper fluid and said flap, in response to the toilet covering moving from the raised position to the lowered position, pivots into an unfolded condition where it receives increased resistance from said damper fluid for dampening motion of the toilet covering,

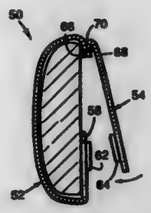
said flap being integrally formed at one end with an anchor bulb which is rotatably fitted within a corresponding bearing cavity formed in an outer surface of said rotor so that said flap is pivotable between the folded and unfolded conditions while said anchor bulb is retained within said bearing cavity.

5,193,229

CUSHIONED TOILET SEAT COVER FOR THE ELDERLY

Robert R. Smith, 584 Shenandoah Trail, Elgin, Ill. 60123

Filed Feb. 5, 1991, Ser. No. 651,324
Int. Cl.[5] A47K *13/14*
U.S. Cl. 4—245.5 **3 Claims**



1. A toilet seat cover for use on an oval shaped toilet seat having a center opening and being attached at its rear to a toilet bowl hinge structure comprising:

an upper assembly having a C-shaped cross-section at all places except its rear, with a first edge of said C-shape facing a second edge of said C-shape with a gap therebetween forming a pocket to receive and hug said toilet seat, the upper assembly having an upper surface extending in a plane corresponding to said oval shape with a central opening and an elastic tightener attached to said second edge of said C-shape along its entire length except for a rear portion;

a lower assembly having a planar surface bounded by a first and second edge defining a surface corresponding to said oval shape with a first edge of the lower assembly continuously joined to said first edge of the upper assembly; and

fabric hook and link securing means, one of said hook and link being attached along said second edge of the upper assembly inboard and adjacent to said elastic tightener and the other of said hook and link being attached along said second edge of the lower assembly, the securing means providing for positioning the lower assembly across said gap such that the toilet seat is enclosed within the toilet seat cover and the securing means securely holds the upper and lower assemblies in place on the toilet seat about said oval shape plane with said elastic tightener positioned intermediate said first and second edges of the lower assembly.

5,193,230

AUTOMATIC TOILET SEAT LOWERING APPARATUS

Harold G. Guerty, 14161 69th Dr. North, Palm Beach Gardens, Fla. 33418

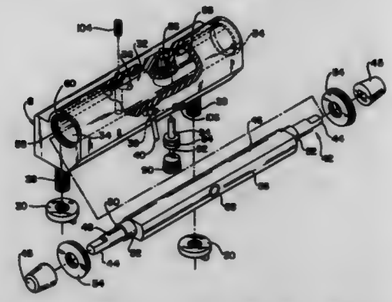
Filed Nov. 21, 1991, Ser. No. 795,721
Int. Cl.[5] A47K *13/04*
U.S. Cl. 4—246.2 **15 Claims**

1. A toilet seat lowering apparatus for automatically lowering a toilet seat from an upright position, said apparatus comprising:

a housing mountable to an upper surface of a toilet bowl, said housing defining an internal cavity, a water inlet passage for permitting the supply of water to said internal cavity, and a water evacuation passage for permitting the drainage of water from said internal cavity;

a descent delay assembly disposed in said internal cavity and providing mounting ends extending outside said housing for operative connection to the toilet seat for constant movement therewith, said descent delay assembly having a rotating dam means for dividing the internal cavity into an inlet chamber and an outlet chamber and defining at least one leakage passage between the inlet chamber and the outlet chamber, said rotating dam means being operatively connected to said mounting ends so that said rotating dam means and the toilet seat rotate together;

means for sealing the water inlet passage when the toilet seat is in a lower position for preventing further introduction



of water to said internal cavity, said inlet sealing means being operatively connected to said descent delay assembly for movement to and from said water inlet passage when the toilet is lowered and raised;

means for sealing the water evacuation passage when the toilet seat is in the upright position, said evacuation sealing means being operatively connected to said descent delay assembly for moving to and from said water evacuation passage when the toilet is raised and lowered; and

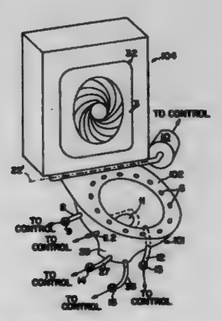
descent initiating means for moving the toilet seat from the upright position and commencing the lowering of the toilet seat.

5,193,231

LAVATORY HAVING A DISPENSER FOR EXCREMENT BAGS AND CONTROL AND EXCREMENT BAG FOR THIS PURPOSE

Elisabeth Stender, El Pedral A 302, Encamp, Andorra

Filed Apr. 30, 1990, Ser. No. 516,147
Claims priority, application Switzerland, May 3, 1989, 1678/89
Int. Cl.[5] A47K *11/02*
U.S. Cl. 4—449 **28 Claims**



1. A lavatory comprising

a lavatory bowl having an upper side on which a seat edge is provided and a lower side on which a base connection is provided,

a dispenser for receiving stacked excrement bags that can be removed individually from said dispenser and secured to said seat edge with the aid of a vacuum,

a vacuum line that enters said lavatory bowl and a suction line,

and a stack of excrement bags that lie flat one on top of the other, wherein

said dispenser has a receptacle with said stack of excrement bags removably positioned therein,

said seat edge is provided with suction holes connected to said suction line, and

said dispenser is adapted to be mounted with respect to said bowl such that

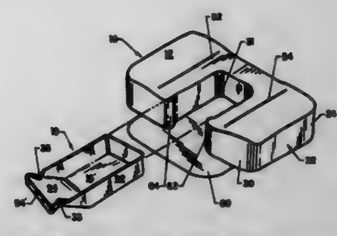
said seat edge and said dispenser can be brought into a relative position in which said seat edge and said excrement bags are parallel to one another, whereby the foremost of said excrement bags can be sucked-out of said dispenser and secured to said seat by negative pressure in said suction line and subsequently opened into said bowl by negative pressure in said vacuum line.

5,193,232

COLLAPSIBLE BED-PAN SUPPORT FOR INVALIDS

Robert Flood, 135 W. Lobos Marinos, and Robert Markus, 247 Ave. Del Poniente, Apt. D2, both of San Clemente, Calif. 92672

Continuation-in-part of Ser. No. 658,518, Feb. 21, 1991, abandoned. This application Sep. 13, 1991, Ser. No. 759,917
Int. Cl.[5] A61G *9/00*
U.S. Cl. 4—457 **16 Claims**



1. A collapsible bed-pan pad for bed-ridden persons, and the like, comprising:

an upper body-supporting surface;

a lower flat surface for resting on a bed, or the like;

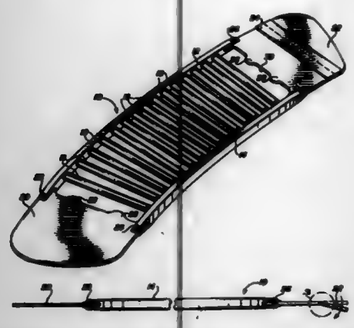
an annular surface connecting said upper surface and said lower surface together and defining a substantially hollow interior that may be inflated for erecting the bed-pan support; said annular surface defining a front surface, and rear surface, a first side surface, and a second side surface, the length of said upper body-supporting surface extending in a direction from said front surface toward said rear surface;

said front surface of said annular surface comprising a portion thereof defining a cutout for receiving a bed pan, said cutout being bounded by said portion of said front annular surface;

means in at least one of said surfaces for allowing inflation of said substantially hollow interior;

at least a part of said portion of said front annular surface forming said opening comprising a laminate having a first, outer layer of flexible, elastic material, and a second, inner layer facing said hollow interior of reinforcing material in order to prevent the outward bulging of said portion of said front annular surface when the pad is inflated, whereby said portion of said front surface does not interfere with the insertion and retention of a bed pan in said opening.

5,193,233
PATIENT TRANSFER UNIT
Miles S. Miller, 3431 E. Nisbet Rd., Phoenix, Ariz. 85032
Filed Aug. 20, 1992, Ser. No. 932,588
Int. Cl.[5] A61G *7/053, 7/08*
U.S. Cl. 5—81.1 4 Claims

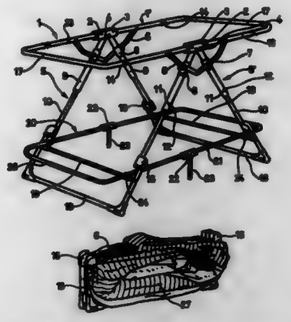


1. A curved, reversible patient transfer unit comprising:
(a) a central area defined by two curved elongated, and generally parallel side support members with a plurality of closely spaced, elongated rolling members positioned between said side support members, said central area being bounded by said side support members and two end portions; and
(b) two end areas, defined by a first end plate attached to one end portion of the central area, and a second end plate attached to the other end portion of the central area, with at least one of the end plates comprising a hinge portion adapted to permit the pivoting of a portion of one of said end plates relative to an adjacent portion of said end plate.

2. A curved, reversible patient transfer unit comprising:
(a) a central area defined by two curved elongated, and generally parallel side support members with a plurality of closely spaced, elongated rolling members positioned between said side support members, said central area being bounded by said side support members and two end portions; and
(b) two end areas, defined by a first end plate attached to one end portion of the central area, and a second end plate attached to the other end portion of the central area, with at least one of the end plates comprising an upholstery stabilizer (28) including an opening (30) through which seat upholstery material can protrude when said patient transfer unit has one end placed on an upholstered seat and a patient is being transferred to said seat, and upholstery engaging tabs (28) projecting into said opening (30), said opening further serving as a convenient hand hold for carrying said unit (10).

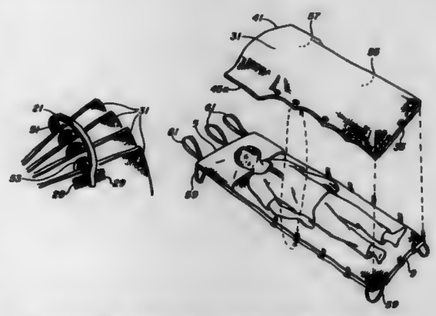
5,193,234
FOLDING COT FOR INFANTS
Jane L. Joaquin, Barcelona, Spain, assignor to Play S.A., Barcelona, Spain
Filed Jan. 9, 1992, Ser. No. 817,804
Claims priority, application Spain, Feb. 26, 1991, 9100484; Oct. 15, 1991, 91002267
Int. Cl.[5] A47D *7/00*
U.S. Cl. 5—99.1 4 Claims

1. A folding cot or crib for infants comprising an upper frame means including a first U-shaped member having free ends each pivotally connected to one of a spaced apart pair of block members and a second U-shaped member having free ends each pivotally connected to a said respective one of said block members, support frame means including a second pair of U-shaped frame members each having a first and second leg with said first and second legs each having a telescoping collapsible portion, said second pair each having an outer U-shaped portion having leg portions pivotally connected to a said respective telescoping portion of said first and second legs, each telescoping portion having an end pivotally connected to a said respective block member so as to permit folding of said



upper frame and support frame means relative to said block members to bring said first and second frame members and said second pair of frame members toward each other and to permit said telescoping portions and said block members to be folded inwardly towards each other through an angle of approximately 90° to at least partially overlap each other.

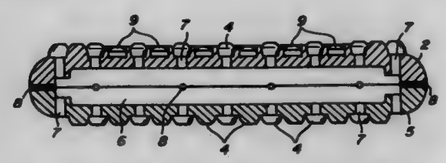
5,193,235
FLAT LYING SLEEPING BAG
Kathy Kircher, 2061 Combre Ct., Carlsbad, Calif. 92009
Filed May 29, 1992, Ser. No. 889,991
Int. Cl.[5] A47G *9/08*
U.S. Cl. 5—413 7 Claims



1. A flat lying sleeping bag comprising, in combination:
a) a full body length flat bottom layer having a head end, bounded by a first transverse end edge, a foot end, bounded by a second transverse end edge, and a torso section lying therebetween wherein said ends and said section are bounded by spaced apart first and second longitudinal side edges;
b) at least one shorter upper layer having a lower body portion defined by a transverse bottom end edge, for registration with said bottom layer second transverse end edge, and longitudinal first and second side edges spaced slightly further apart than said bottom layer side edges, and an upper body portion defined by a transverse top end edge terminating below said bottom layer first transverse end edge and spaced apart side wings that extend mutually outward substantially beyond said bottom layer side edges and are terminated at mutually spaced apart longitudinal side edges;

c) a plurality of apertures formed in spaced-apart arrangement along the lower half of said upper layer side edges and along said transverse bottom edge;
d) a like plurality of loop-type strips of pressure-sensitive, resilient, deformable strips of material mounted in similar spaced-apart arrangement along the lower half of said bottom layer side edges and along said second transverse end edge for passing through said apertures; and
e) said upper layer first longitudinal side edges being joined to said second longitudinal side edges by a transition edge.

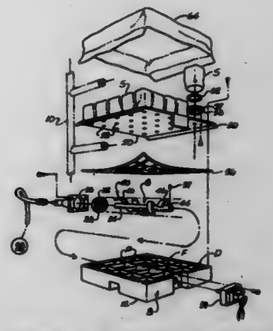
5,193,236
MAGNETIC PILLOW
Mitsuo Komuro, Tokyo, Japan, assignor to Nippon Athletic Industry Company, Tokyo, Japan
Continuation of Ser. No. 666,073, Mar. 7, 1991, abandoned. This application Aug. 14, 1992, Ser. No. 928,640
Int. Cl.[5] A47C *20/02*
U.S. Cl. 5—636 3 Claims



1. A magnetic pillow comprising a hollow pillow body consisting of a foamed synthetic resin; a large number of permanent magnets distributedly arranged on the upper surface of the pillow body; there being hollow cylindrical recesses on the upper surface of said pillow body and said permanent magnets being inserted in and fixed only to the foamed synthetic resin within said recesses; and a cover material covering the pillow body and the permanent magnets; said hollow pillow body having a large number of projections, which consist of the foamed synthetic resin itself and are distributedly arranged on its upper surface such that each recess is arranged between the projections, and further having a large number of projections consisting of the foamed synthetic resin itself and being distributedly arranged on its bottom surface, and said hollow pillow body further having a large number of vent holes distributedly formed so as to communicate the outside of the hollow pillow body with the hollow portion formed inside the body, said magnets having convex upper surfaces and cotton interposed between the hollow pillow body and the cover material, said cotton having deodorizing and antibiotic properties.

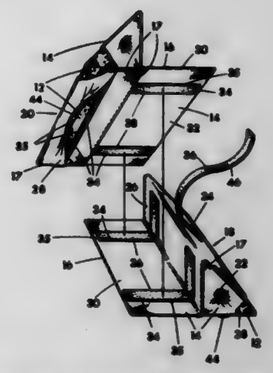
5,193,237
PNEUMATIC WHEEL CHAIR CUSHION FOR REDUCING ISCHEMIC INJURY
Terry K. Holdredge, 346 Town Creek Dr., Anderson, S.C. 29621
Filed Jan. 28, 1991, Ser. No. 647,031
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—654 31 Claims

1. Apparatus for reducing ischemic injury to a patient which includes a wheel chair frame and
a pneumatic cushion carried by the frame wherein said pneumatic air cushion comprises:
an open dynamic air distribution system which periodically reduces air pressure in selected portions of the cushion wherein said air distribution system includes:
an air distribution plenum having a plurality of air channels;
an air distribution manifold carried within said plenum for distributing air to said air channels having an air inlet;
said air distribution manifold extending generally centrally through said air plenum box with said air channels extending laterally from said central air distribution manifold;
a plurality of air ports in said air distribution manifold in open fluid communication with said air channels within said air distribution plenum;
air blocking means for periodically blocking said air ports in said manifold to periodically interrupt the distribution of air in said air channels in accordance with a preselected sequence;
a top member extending over the top of said air distribution plenum having a plurality of air openings in fluid communication with said air channels;



a plurality of inflatable air sacks carried by said top member over said air openings which are inflated and deflated according to a preselected pattern for reducing ischemic injury to a person seated on said wheel chair;
a cover extending over said plurality of air sacks which is secured around the periphery of said air sack; and
a blower for delivering air to said air inlet of said air distribution manifold.

5,193,238
INFANT SUPPORT PILLOW
L. Jason Clute, 3401 Deer Ridge Dr., Danville, Calif. 94506-6047
Filed Aug. 25, 1992, Ser. No. 934,256
Int. Cl.[5] A47C *20/02*
U.S. Cl. 5—655 5 Claims



1. A support pillow structured for maintaining a human on its side while sleeping, said support pillow comprising;
a first main section and a second main section,
said first main section comprising an elongated flexible and resilient pad having at least a generally vertically disposed planar side wall connected to a substantially horizontally disposed generally flat base, a panel extending from and beyond an intersection of said vertically disposed planar

side wall and said horizontally disposed base, said panel having a top surface and an oppositely disposed bottom surface, said top surface of said panel affixed with a first portion of a fastener means;

said second main section comprising an elongated flexible and resilient pad having at least a generally vertically disposed planar side wall connected to a substantially horizontally disposed generally flat base, a panel extending from and beyond an intersection of said vertically disposed planar side wall and said horizontally disposed base, said panel of said second main section having a top surface and an oppositely disposed bottom surface, said bottom surface of said panel of said second main section affixed with a second portion of fastener means releasably attached to said first portion of fastener means of said first main section with said panels of said first and second main sections overlapped, the overlapped panels in combination with said horizontally disposed generally flat bases of said first and second main sections providing a substantially flat anti-roll bottom on said support pillow,

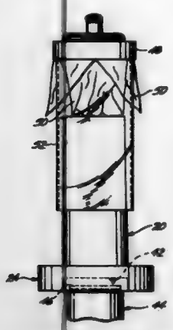
said support pillow including a channel having an open top and two oppositely disposed open ends, a bottom of said channel defined by the overlapped panels, said channel having oppositely disposed sides defined by said vertically disposed planar side walls of said first and second main sections positioned generally parallel to one another and further in spaced relationship to one another, the first and second portions of said fastener means further including means for allowing small increment adjustments in the spacing between the vertically disposed planar side walls and thus in the width of said channel.

5,193,239

BABY FOOD BOTTLE TOOL

Cyrus R. Dolce, deceased, late of San Pedro, and Theresa J. Dolce, 1711 Westmont Dr., San Pedro, Calif. 90732

Filed Jun. 13, 1991, Ser. No. 714,676
Int. Cl.[5] B25F *1/00*
U.S. Cl. 7—152 **5 Claims**



1. In a tool for use with baby-feeding bottles of the type that comprise a hollow, cylindrical shell and a flexible, bag-like liner suspended within the shell, the combination of:

(a) a circular base portion having an outside diameter substantially greater than that of the baby-bottle shell;

(b) a vertically-extending cylindrical portion having an outside diameter only slightly less than the inside diameter of said shell and having a length substantially corresponding to that of said shell;

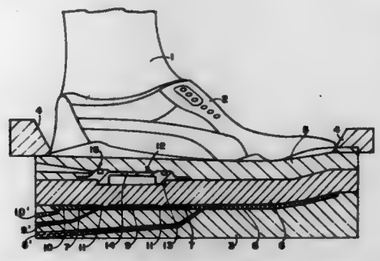
(c) with said base portion having at its bottom side a reentrant inner wall and a substantially planar component secured within said inner wall, said planar component including at least one piercing element extending downwardly from the bottom surface of said planar component, so that said base portion may be used to pierce, engage and remove the metallic cap commonly used on containers for strained solid foods while said vertically-extending cylindrical portion is used to support said shell and expel air from the bag-like liner suspended therewithin.

5,193,240

MOULD AND METHOD FOR PRODUCING SHOE SOLES OF INJECTED PLASTICS MATERIAL, COMPRISING AN EMPTY CHAMBER VISIBLE THROUGH A TRANSPARENT MATERIAL

Francesco Salpietro, Padova, Italy, assignor to Protec s.r.l., Padova, Italy

Filed Jan. 21, 1992, Ser. No. 822,997
Claims priority, application Italy, Aug. 6, 1991, MI91A 002214
Int. Cl.[5] A43D *65/00, 65/02*
U.S. Cl. 12—146 B **3 Claims**



1. Process for producing shoe soles of injected plastics material, which soles have an empty chamber visible through a transparent material, which process comprises the following steps:

a) injection, into a region comprised between a mobile die and a first, removable plate, of a multipart tread sole, with at least one of said sole parts being made from a transparent material;

b) injection, into a region comprised between said first removable plate and a second, removable plate, of a shaped body comprising a perimetrical wall 13 and a top wall 14;

c) removal of said first plate and injection into the region comprised between said tread sole and said shaped body, of a layer 17 made from a material suitable for bonding the shoe sole and said shaped body to each other;

d) removal of said second plate and injection, into the region comprised between the vamp, the tread sole and the external side of said shaped body, of a material which constitutes the intersole;

e) either partial or total filling of the empty chamber comprised between the tread sole and said shaped body, with a coloured liquid material.

5,193,241

MACHINE FOR REMOVING SLAG AND METAL REMINDERS FROM CRUCIBLES

Leif Meisingseth, and Jorn B. Lilleby, both of Sauda lagra, Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed May 23, 1991, Ser. No. 704,967
Claims priority, application Norway, May 23, 1990, 902275
Int. Cl.[5] B22D *43/00, 41/04*
U.S. Cl. 15—104.096 **7 Claims**

1. A machine for cleaning and removing slag and metal remainders from a crucible or casting ladle, said machine comprising:

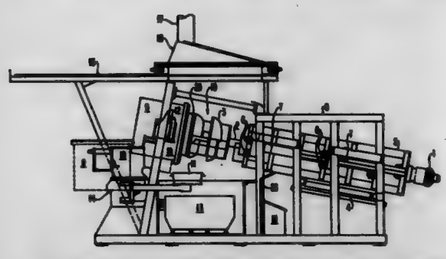
a frame;

a carriage mounted on said frame and guided for movement relative thereto in an upwardly inclined direction;

a rotatable cutter means having a tool head and mounted on said carriage for movement therewith in said direction;

holder means for supporting a crucible to be cleaned, said holder means being mounted for tilting movement between a first position, whereat a crucible to be cleaned may be placed on said holder means, and an operating second position, whereat a crucible to be cleaned and supported by said holder means is in coaxial alignment with said cutter means;

tools mounted on said tool head such that rotation of said cutter means and movement of said carriage and said cutter means in said direction toward a crucible to be cleaned will result in said tools cleaning a full interior of the crucible, said tools comprising a first plurality of tools



mounted in spaced relationship along a periphery of said tool head, thereby to clean slag and metal remainders from a side wall of the crucible, and a second plurality of tools fixedly mounted on a leading portion of said tool head, relative to said direction, in a radially spaced arrangement to insure cleaning of slag and metal remainders from an entire bottom wall of the crucible; and

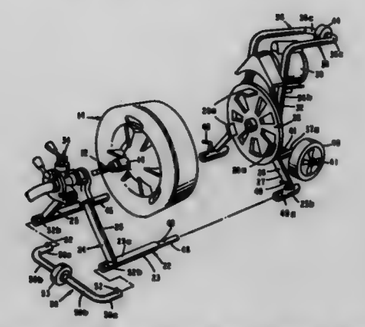
said tool head having extending therethrough axial through holes providing access for slag and metal remainders removed by said tools to be transported axially away from the crucible.

5,193,242

WASTELINE CLEANOUT APPARATUS

Lawrence F. Irwin, 12860 San Fernando Rd., Sylmar, Calif. 91342

Continuation of Ser. No. 448,378, Dec. 11, 1989, abandoned. This application Jun. 24, 1991, Ser. No. 720,228
Int. Cl.[5] B08B *9/02*
U.S. Cl. 15—104.33 **9 Claims**



1. A wasteline cleanout tool of the character having an elongated coiled spring housed within a drum having a forward neck portion through which the coiled spring can be withdrawn and a rearward hub, said tool comprising:

(a) a frame having a base, including first and second removable interconnected portions, a forward portion connected to said first portion of said base and a rearward portion connected to said second base portion;

(b) feed means connected to said forward portion of said frame for removable engagement with the coiled spring to controllably withdraw the coiled spring from the drum thereof, said feed means including hub engaging means for releasable engagement with the rearward hub of the drum; and

(c) frame supporting means for supporting said frame, said frame supporting means being movable about a fulcrum from a first position wherein said base of said frame extends substantially horizontally to a second position wherein said base extends angularly upwardly, said frame supporting means comprising a transport assembly having:

(i) an upper portion including hand engaging means for engagement by the hands of the operator of the tool, a pair of downwardly extending tubular members connected to said hand engaging means, and a spring mounted within each of said downwardly extending members; and

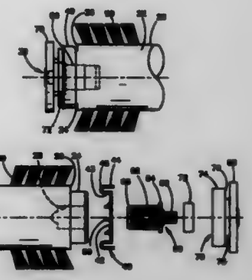
(ii) a lower portion including a pair of rearwardly extending legs, a pair of wheels rotatably carried by said rearwardly extending legs and a pair of upwardly extending legs telescopically receivable within said downwardly extending tubular members for engagement with said spring, whereby a downward pressure exerted on said hand engaging means will cause telescopic movement of said upwardly extending legs within said downwardly extending tubular member against the urging of said spring.

5,193,243

BRUSHROLL

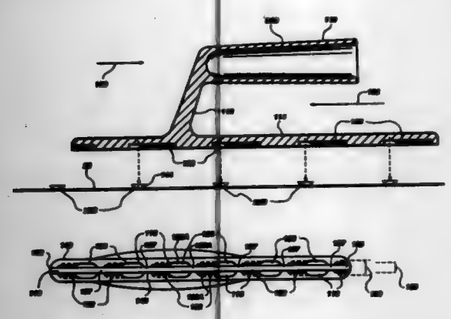
Alfred H. Stegens, Cleveland, Ohio, assignor to The Scott Fetzer Company, Westlake, Ohio

Continuation of Ser. No. 456,348, Dec. 26, 1989, abandoned. This application May 20, 1992, Ser. No. 887,420
Int. Cl.[5] A46B *13/02*
U.S. Cl. 15—179 **5 Claims**



3. The vacuum cleaner brushroll including a tufted spindle supported by end assemblies at opposite ends of said spindle having bearings that rotatably mount said spindle in a vacuum cleaner nozzle, whereby rotation of the spindle is effective to pick up dirt, lint, threads and the like that tend to move along said spindle toward said bearings at its end, the improvement wherein each of said end assemblies comprises a first member fixed to said brush roll so as to rotate therewith, a second member rotatable relative to said first member and having a portion that is adapted to mate with brushroll mounting structure of the vacuum cleaner nozzle, said members including wall portions that cooperate to define a labyrinth seal, a stub shaft having a portion fixed in an end of said spindle and a collar that engages said first member to hold it against said end of said spindle, and a bearing having one portion fixed to said stub shaft and a second portion fixed in said second member and rotatable with respect to the stub shaft, said bearing being surrounded by said labyrinth seal to protect it from material picked up by rotation of said spindle.

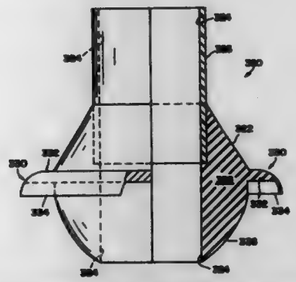
5,193,244
DETACHABLE HAND TROWEL
Lawrence G. Meyers, 1290 E. 1375 North, Layton, Utah 84040
Continuation-in-part of Ser. No. 321,193, Mar. 9, 1989, abandoned. This application Dec. 18, 1990, Ser. No. 629,388
Int. Cl.[5] E05C *17/10*
U.S. Cl. 15—235.4 10 Claims



1. A trowel comprising:
a flexible blade;
a plurality of upstanding tapered supports mounted centrally on said blade to extend longitudinally along said blade, each support having the shape of an inverted truncated cone, said blade and said supports forming a longitudinally flexible blade assembly; and
a rigid elongate handle defining a plurality of channels therein, each of said channels being interconnected to an adjacent said channel by means of a drain channel, each channel having tapered sidewalls and an inlet openings, each said channel being configured to slidably receive a respective said support through said inlet opening and form a detachable union therewith upon a longitudinal displacement of said handle along said blade, said channels each having sidewalls tapered along their length positioned to form a pressure fit with a respective support along a height of each said respective support;
wherein said rigid handle is positioned centrally on said blade to extend along a length thereof to longitudinally stiffen said flexibility blade assembly.

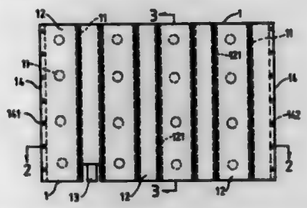
5,193,245
APPARATUS FOR OPENING DRAINS
Henry G. Brzoska, Stamford, Conn., assignor to Lemaks Industries, Inc., Stamford, Conn.
Continuation-in-part of Ser. No. 536,219, Jun. 11, 1990, Pat. No. 5,105,504, which is a continuation-in-part of Ser. No. 335,761, Apr. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 164,131, Mar. 4, 1988, Pat. No. 4,933,017, which is a continuation-in-part of Ser. No. 90,756, Aug. 28, 1987, abandoned. This application Mar. 3, 1992, Ser. No. 845,247
Int. Cl.[5] A47L *5/14*
U.S. Cl. 15—330 5 Claims

1. An apparatus for opening drains comprising an operating hose, a pressure source and a vacuum source, a control manifold having an interior chamber, a valve member and partition means located in the interior chamber and cooperating to divide the interior chamber into a pressure chamber and a vacuum chamber, means for connecting the pressure chamber to the pressure source, means for connecting the vacuum chamber to the vacuum source, the control manifold having an inlet/outlet port for connecting the interior chamber to one end of the operating hose and therethrough to a plugged drain, means for portion the interior chamber to atmosphere, the valve member having a first position in which the pressure source and pressure chamber are connected to the drain and in which the vacuum chamber is ported to atmosphere, the valve having a second position in which the vacuum source and the vacuum chamber are connected to the drain and in which the pressure chamber is ported to atmosphere, and means for moving the valve member between the first and second positions rapidly to apply pressure pulses and vacuum pulses through the inlet/outlet port and through the operating hose to the drain for dislodging and removing the drain blockage, a receptacle communicating with the drain through the vacuum chamber for receiving effluent of the drain when the drain is connected to the vacuum source, the manifold having an open



end communicating with the interior of the manifold for directing effluent into the receptacle, and a toilet fitting affixed to the other end of the operating hose, the fitting having a bulbous body with a generally cylindrical passage therethrough such that body wall thickness is greatest at the body midsection, and the fitting further having a sealing member encompassing its midsection in a plane generally normal to the central passage, and the sealing member comprising a annular disc affixed at its inner periphery to the body midsection and a skirt depending from the outer periphery of the disc.

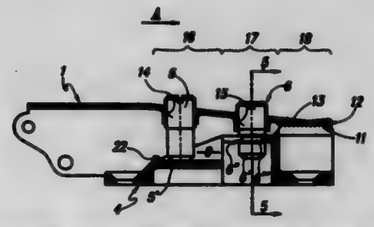
5,193,246
AIR CUSHION GRIP WITH A CUBIC SUPPORTING STRUCTURE AND SHOCK-ABSORBING FUNCTION
Ing-Chung Huang, No. 15 Reh-Her 1st street, Kaohsiung City, Taiwan
Filed Jul. 23, 1991, Ser. No. 734,487
Int. Cl.[5] A47B *95/02*; A47J *45/10*
U.S. Cl. 16—114 R 19 Claims



1. A cushion grip for attachment to a handle to absorb shock comprising:
a) at least one fluid cushion molded from flexible material and including a pair of opposed edges, means for joining the edges together for securing the cushion around the handle and a plurality of interconnected cubic fluid cells;
b) the fluid cells being partially defined by a plurality of first surfaces which collectively form a substantially flat and smooth outer surface of the cushion when the cushion is disposed in a planer configuration, a plurality of side walls and a plurality of second surfaces;
c) the side walls and second surfaces collectively form a substantially three-dimensional inner surface of the cushion, with the side walls being spaced to define a plurality of grooves extending between adjacent fluid cells; and

d) the second surfaces defining planes which correspond in angular orientation to exterior surface portions of the handle when the cushion grip is secured in engagement with the handle, so that the outer surface of the grip forms substantially the same cross-sectional configuration as that of the handle.

5,193,247
FURNITURE HINGE
Anton Placer; Mihajlo Marjanović, and Klavdij Kocjan, all of Koper, Yugoslavia, assignors to Mednarodno podjetje LAMA, d.d. okovje - montazni sistemi - orodja - trgovina, Dekani, Yugoslavia
Filed Oct. 24, 1991, Ser. No. 782,306
Claims priority, application Yugoslavia, Jan. 23, 1991, P-108/91
Int. Cl.[5] E05D *7/04, 7/12*
U.S. Cl. 16—236 6 Claims



1. Furniture hinge, comprising a dowel cup (2) of the hinge and a hinge arm (1), which are by means of suspended toggle joints (3) swingably connected to each other, the hinge arm (1) being dismountably and adjustably arranged on a base plate (4) of the hinge fastened to a side panel (7) of a unit of furniture, and at least on three points connected to the base plate (4), characterized in that the base plate (4) comprises, a lowest, first step (16), along a front edge of said first step an upright abutment (22) extends for stopping shifting of an adjusting threaded bolt (5), said first step (16) being followed by a higher, intermediate step (17), which has a longitudinal recess (10') open in the direction towards the first step (16) and terminated by a semicircular surface of shoulder sections (10) of said intermediate step, the recess (10') serving for cooperation with a neck (6"") of a tightening screw (6) and, finally, the intermediate step (17) of the base plate (4) being followed by a third, the highest step (18), which is hollow and open to the rear end of the base plate (4), the upper surfaces of sidewalls of said highest level step (18) having transversal ribs (11) to cooperate with respective ribs (12) of the hinge arm (1), the three steps (16, 17, 18) are interconnected by sidewalls (9), which in the transversal section form a box section of the base plate (4) of the hinge, the hinge arm (1) is ∩ shaped in transversal section and comprises a first female thread (14), into which an adjusting threaded bolt (5) is screwed having a bottom surface (5') resting on an upper surface section of the first step (16), and next to this female thread (14) in the hinge arm (1) is a further female thread (15), into which a tightening screw (6) is screwed extending into said recess of the base plate and, finally, a rear free end section of the hinge arm (1) is provided with an arcuate depression (13), below which on a lower side thereof are transversally oriented ribs (12) for mating with the ribs (11) of the base plate (4) of the hinge.

5,193,248
LATCHING ASSEMBLY FOR HINGEABLE PLATE MEMBERS
Peter Taylor, Pawtucket, R.I., and Victor Motyka, Attleboro, Mass., assignors to Precision Art Coordinators, Incorporated, East Providence, R.I.
Filed Nov. 1, 1991, Ser. No. 786,787
Int. Cl.[5] E05D *11/10*; E05C *17/18*
U.S. Cl. 16—335 5 Claims

1. A latching assembly for hingeable plate members and the like comprising:
first and second generally rectangular plate members having side and end edges;
hinge means interconnecting adjacent ends of said plates whereby said second plate is moveable between a first position wherein said plates are disposed in overlying face-to-face relation and a second position wherein said second plate is angularly disposed with respect to said first plate;
an elongated rod pivotally attached to said first plate adjacent a side edge thereof;
a bearing block pivotally attached to said second plate adjacent a side edge thereof adjacent to the aforesaid side edge of said first plate, said block having a bore extending therethrough;
a sleeve member comprising a tubular wall slidably received within said bore, said wall having an aperture therein, said rod slidably received within said sleeve such that said rod slides through said sleeve and said block when said second plate is moved between said first and second positions;
a resilient spring finger mounted on said block having a terminal end extending through said sleeve aperture and making pressurized engagement with said rod;
a notch in said rod adapted to receive said terminal spring end when said second plate is moved to said second position to latch said plates in said second position; and
means for shifting said sleeve relative to said block such that said spring end is forced out of alignment with said aperture and is received in pressurized engagement with said sleeve wall to permit closing movement of said second plate to said first position.

5,193,249
HARDWARE FITTING
Albert G. Bucher, Masterton, New Zealand, assignor to Interlock Industries Limited, Wellington, New Zealand
Continuation of Ser. No. 321,270, Mar. 9, 1989, abandoned. This application Dec. 5, 1991, Ser. No. 802,696
Claims priority, application Netherlands, Mar. 9, 1988, 223803; Sep. 30, 1988, 226410
Int. Cl.[5] E05D *11/06, 11/10*
U.S. Cl. 16—371 19 Claims

1. A hardware fitting which comprises:
a mounting,
a movable element operatively associated with said mounting and being movable along a line of movement relative to the mounting,
a component which is movable relative to the mounting, said movable component having engagement means which,

during part of the movement of said movable component relative to said mounting, is engageable with a part of said movable element to thereby cause movement of said movable element along said line of movement,

the movable element including means for cooperating with the movable component upon said movement of the movable element occurring so as to latch with said movable component,

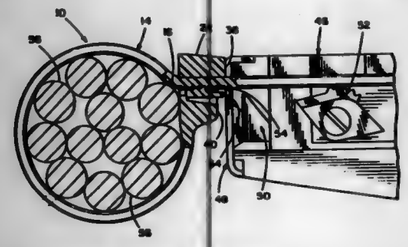
said cooperating means being spaced from said part of the movable element along said line of movement, said cooperating means unlatching the movable component upon reverse relative movement between the movable element and said mounting for causing said engagement means to impart a reverse movement of the movable element along said line of movement.

5,193,250

RELEASABLE CABLE TIE

Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corp., Tinley Park, Ill.

Filed Apr. 30, 1992, Ser. No. 876,655
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—16 PB 4 Claims



1. A releasable cable tie, comprising:

an elongate strap;

a locking head formed at a first end of the strap, the locking head including first and second side walls and first and second end walls that define therebetween a strap positioning channel having a strap entrance portion and a strap exit portion;

a locking pawl disposed in the channel in a position adapted to allow insertion of a free end of the strap through the strap entrance portion past the pawl while preventing withdrawal of the strap to lock the strap to the locking head, wherein the locking pawl includes an extension projecting through the strap positioning channel, past the strap exit portion of the strap positioning channel and out of the strap positioning channel, the extension being of sufficient length to allow engagement of a distal end of the extension to pivot the locking pawl and release the strap from the locking pawl;

a tool positioning surface formed on the locking head adjacent the strap exit portion of the strap positioning channel the tool positioning surface projecting beyond the distal end of the extension of the pawl such that a cable tie application tool can be positioned in abutment with the tool positioning surface without contacting the extension of the pawl; and

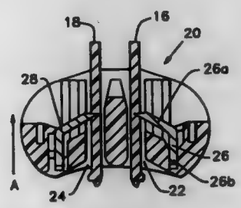
a second pawl access surface formed on the locking head adjacent the strap exit portion of the strap positioning channel where the second surface is disposed below the distal end of the extension of the pawl such that access to the extension is facilitated.

5,193,251

CABLE TIE HAVING IMPROVED LOCKING BARB

William Fortsch, Bernardsville, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Continuation of Ser. No. 562,310, Aug. 2, 1990, abandoned. This application Jul. 10, 1992, Ser. No. 911,603
Int. Cl.[5] B65D *63/14*
U.S. Cl. 24—16 PB 5 Claims



1. A bundling tie comprising:

an elongate bundling strap having a tail at one end thereof and a smooth planar surface;

a bundling head having an aperture therethrough for insertable receipt said tail of said strap; and

a metallic barb movably supported by said head having a strap engagement portion extending into said aperture for engagement with said strap upon said insertion of said tail into said aperture, said strap engagement portion including a pair of spaced apart piercing projections for piercing into said smooth planar surface of said strap and a blunt wall between said piercing projections for limiting the amount of piercing insertion of said projections into said strap, said blunt wall including a planar wall surface positioned substantially parallel to said smooth planar surface of said strap when said strap tail is inserted through said aperture.

5,193,252

QUICK-RELEASE CLEAT

Oswald C. Svehaug, 1010 San Ysidro Blvd., San Ysidro, Calif. 92073

Filed Apr. 20, 1992, Ser. No. 871,136
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—115 G 6 Claims

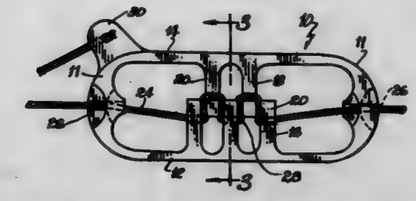
1. A quick-release cleat comprising

(a) a cleat body defining a passageway there through for a line to be cleated;

(b) said body defining at least one wedged slot defining at least one part of said passageway and having a converging end positioned in said body such that as said line is tensioned in said slots said lien wedges into said converging end;

(c) at least one release member movable from a locked position substantially clear of said wedged slot to a released

position urging a line wedged in said at least one wedged slot out of the converging end thereof, and



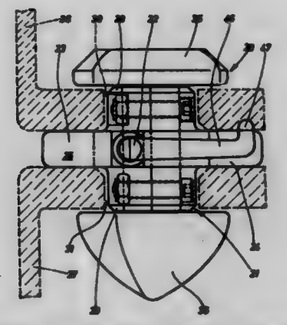
wherein said at least one wedged slot is plural to define a plurality of spaced wedged slots and said at least one release member is plural to define a plurality of release members movable between said spaced wedged slots.

5,193,253

COUPLING PIECE AND METHOD FOR CONNECTING CONTAINERS

Thomas Janke, Bremen, and Johannes Wielenberg, Oyten-Bassen, both of Fed. Rep. of Germany, assignors to Conver-OSR Ocean Service-Reparatur-Ingenieurtechnik GmbH, Fed. Rep. of Germany

Division of Ser. No. 321,150, Mar. 9, 1989, Pat. No. 5,012,560. This application Feb. 19, 1991, Ser. No. 656,749
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 8809688
Int. Cl.[5] B65D *21/02*
U.S. Cl. 24—287 6 Claims



1. A method for connecting two adjacent containers through use of a coupling piece which includes a locking bolt normally biased in a locking direction by a spring force, said locking bolt including a crossbar attached at each end thereof, said method comprising the steps of:

rotating one of the crossbars in a direction opposite to said locking direction to increase the normal biasing force of the spring;

inserting the one crossbar into an opening in one container;

at least partially reducing the normal biasing force of the spring to bring the one crossbar at least into a prelocking position;

rotating both crossbars in a direction opposite to the locking direction by inserting the other crossbar into an opening in an adjacent container; and

automatically rotating both crossbars to a locked position after the other crossbar has been inserted into the opening in the container as a result of the normal biasing spring force.

5,193,254

VERSATILE SELF-CLINCHING DISPOSABLE RESTRAINTS AND BUNDLING STRAPS

George H. Geisinger, 358 Summit Rd., Mountainside, N.J. 07092

Continuation of Ser. No. 754,056, Sep. 3, 1991, abandoned. This application Apr. 20, 1992, Ser. No. 870,751
Int. Cl.[5] E05B *75/00*
U.S. Cl. 24—484 8 Claims

1. A self-containing flexible tape of plastic or the like which comprises in combination:

an elongated tape portion having a pair of lateral ribs and a central rib each extending in a length direction along one surface of said tape, said tape including a principal axis along the length thereof;

two parallel series of ratchet teeth projecting upward from said one surface of said tape on opposite sides of said central rib along a length of said tape; said ratchet teeth having a perpendicular axis normal to said principal axis, said ratchet teeth including a front surface forming an acute angle with said perpendicular axis and a rear surface parallel to said perpendicular axis, a space formed between said front surface of a first one of said ratchet teeth and said rear surface of an adjacent one of said ratchet teeth;

said tape terminating at one end in a tip and at the other end in clinching means comprising a head formed integrally with said other end and having a primary bore and a secondary channel intersecting at an acute angle, said primary bore passing clear through said head in a direction which is substantially normal to said principal axis of said tape;

said head having a tape entrance face and a tape exit face, said tape entrance face disposed at a position adjacent said acute angle, the cross-section of said primary bore at said tape entrance face being shaped to just accommodate the thickness of said tape including said central rib and said lateral ribs;

said intersecting primary bore and secondary channel forming internal walls and an internal roof;

a pair of cantilever pawls disposed on opposite sides of said central rib and depending from said inner roof at positions spaced internally between said entrance face and said exit face; and

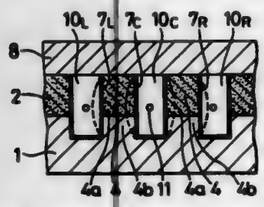
each of said cantilever pawls having a tip which is designed to successively engage each of said parallel series of said ratchet teeth as said tape is pulled in a forward direction through said intersecting primary bore and secondary channel which are angularly shaped to exactly fit said ratchet teeth and oppose movement of said tape in a reverse direction in said primary bore, thereby forming a lock between said tape and said head in a preselected position in said primary bore.

VOL 1148 ISS 3 MR 16 1993

5,193,255
CLIP MEANS FOR FASTENING OF DECORATIVE LAMP PARTS
Jeou N. Tzeng, No. 52-1, Alley 100, Lane 311 Nan Yen Street, and Jeng-chyong Wu, Fl. 4, No. 5, Hsing Shyue Road, both of Hsin-Chu City, Taiwan
Filed Oct. 4, 1991, Ser. No. 771,426
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—625 27 Claims

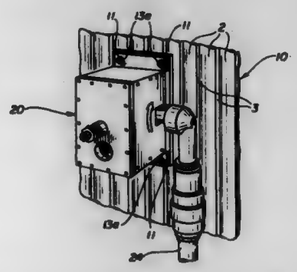
1. A decorative lamp for Christmas lights, comprising:
a lamp base, having a flange about an upper rim thereof;
a lamp holder having a flange; and
clip means comprising a male or caught member having a bulged head disposed on a stem located on one of said lamp base and said lamp holder, and a female or catch member defining a cavity serving as a retainer located on another one of said lamp base and said lamp holder, said clip means being so disposed that, upon fastening, the male or caught member is clipped into the female or catch member and is retained therein and said lamp base is seated in said lamp holder.

5,193,256
METHOD OF FABRICATING INK-JET TYPE PRINTER HEAD
Kunishi Ochiai, Mishima, and Tsutomu Satoh, Tagata, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Jul. 2, 1992, Ser. No. 907,589
Claims priority, application Japan, Jul. 8, 1991, 3-166631; Oct. 2, 1991, 3-255565
Int. Cl.[5] H01L *41/22*
U.S. Cl. 29—25.35 3 Claims



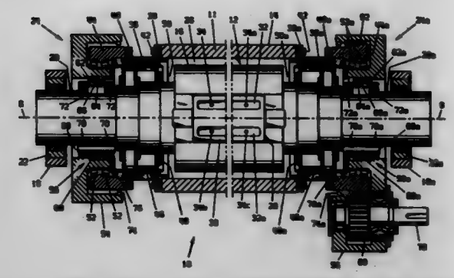
1. A method of fabricating an ink-jet type printer head, comprising the steps of:
sticking a plurality of plate-shaped piezoelectric members polarized in their thickness directions on the surface of a low-rigidity member having a non-conductive property and a non-electrostrictive property so that said piezoelectric members are disposed adjacent to said low-rigidity member;
defining a plurality of grooves extending from the surfaces of said piezoelectric members to the inside of said low-rigidity member by grinding in parallel at given intervals inclusive of positions at which said grooves extend through respective joints between said adjacent piezoelectric members;
forming posts on both sides of each of said grooves;
forming electrodes on two inner sides of each of said grooves;
sticking a roof on the surfaces of said piezoelectric members so as to close top opening surfaces of said grooves, thereby defining a plurality of pressure chambers coupled to an ink supply unit; and
forming a plurality of nozzles in one end of each of said pressure chambers, respectively.

5,193,257
BOILER TUBE REPAIR APPARATUS
Paul W. Bowman, Aberdeen, Ohio; Andrew F. Estill, Augusta, Ky.; Michael D. Gatherwright, Manchester, and Robert L. Smith, Winchester, both of Ohio, assignors to Dayton Power and Light Company, Aberdeen, Ohio
Division of Ser. No. 380,988, Jul. 17, 1989, Pat. No. 4,979,294.
This application Jul. 9, 1990, Ser. No. 549,958
Int. Cl.[5] B23P *6/00*; B23Q *39/02*
U.S. Cl. 29—33 T 9 Claims



1. A system for removing tube sections in boiler water walls comprising:
a plurality of mounting studs for attachment to a boiler water wall;
a template for aligning said plurality of mounting studs on a boiler water wall in a pattern;
a milling machine for milling elongated slots in boiler tube sections of boiler water walls, said milling machine including means for mounting said milling machine on ones of said plurality of mounting studs, whereby said milling machine may be secured on said mounting studs for operation;
a drill and drill fixture for drilling apertures in boiler water walls, said drill mounted on said drill fixture, and said drill fixture including means for mounting said drill fixture on one of said plurality of mounting studs, whereby said drill fixture may be secured on said mounting studs for operation of said drill; and
a saw and saw fixture for sawing boiler water walls between apertures drilled therein, said saw mounted on said saw fixture, and said saw fixture including means for mounting said saw fixture on ones of said plurality of mounting studs, whereby said saw fixture may be secured on said mounting studs for operation of said saw; and
wherein said milling machine, said drill fixture, and said saw fixture each include a like pattern of holes to receive said mounting studs attached to said boiler water wall in said like pattern.

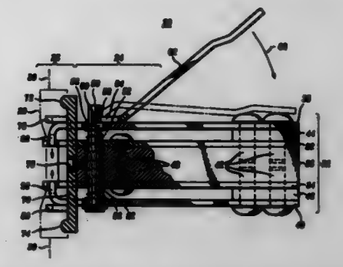
5,193,258
SELF-LOADING CONTROLLED DEFLECTION ROLL
Dale A. Brown, Milton, Wis., assignor to Beloit Technologies, Inc., Wilmington, Del.
Filed Nov. 15, 1991, Ser. No. 792,558
Int. Cl.[5] B21B *13/02*
U.S. Cl. 492—7 8 Claims



1. A self-loading type of controlled deflection roll comprising, in combination:
a support shaft having a longitudinal axis;
a roll shell having inner and outer surfaces disposed about the support shaft and defining, with the support shaft, a space therebetween;
support shoe means mounted against the support shaft and extending into the space to engage the inner surface of the roll shell to support the roll shell about the support shaft and to move the roll shell translationally relative to the support shaft;
roll shell extension means attached to the roll shell at either end thereof, extending axially outwardly from each end of the roll shell, and further extending the space between the support shaft and roll shell;
bearing means, including a bearing housing for mounting non-self aligned bearings, for rotatably supporting the roll shell extension means at either end of the roll shell;
pivot assembly means for supporting the bearing means near either end of the roll, and pivotally mounted to the support shaft for mounting the bearing means pivotally for translational movement relative to the longitudinal axis of the support shaft, said pivot assembly means including bushing means intermediate the bearing means and the support shaft for accommodating transaxial skewing of the roll shell relative to the support shaft;
heat barrier means disposed about the support shaft axially outside of the roll shell beneath the roll shell extension means and in the space between the support shaft and roll shell near either end of the roll shell, said heat barrier means defining, with the support shaft and roll shell, an interior cavity extending inwardly in the space from the heat barrier means at either end of the roll shell;
said heat barrier means disposed intermediate the cavity and the bearing means.

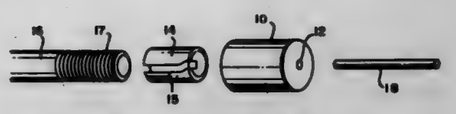
5,193,259
TOOL FOR MANIPULATING AN OPTICAL FIBER SPLICING DEVICE
Walter S. Konik, Lilburn, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 19, 1991, Ser. No. 811,152
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—267 5 Claims

1. A tool for manipulating a latching mechanism which is assembled to a housing of an optical fiber splicing device so as to disengage the latching mechanism from the end portions of two fibers which are spliced together in a capillary tube in the housing in a manner which allows reuse of the splicing device comprising:
a body portion;
means for holding the splicing device to the body portion;
means capable of being controllably moved between the housing and the latching mechanism for causing the latching mechanism within the splicing device to become disengaged from the spliced fiber end portions wherein such disengaging releases the optical fiber splice and for causing the latching mechanism to become disposed in a position so that the splicing device is capable of being reloaded



with two optical fibers and reused to secure a new splice between the optical fibers; and
wherein the disengaging means includes a series of tapered prongs including two pairs of prongs which are parallelly aligned with each other and wherein one prong of each pair of prongs is positioned adjacent to each end of the latching mechanism such that the narrow end of each tapered prong points toward the corresponding prong of that pair.

5,193,260
PIN EXTRACTING DEVICE
Edward C. Pierce, Swarthmore, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Oct. 31, 1991, Ser. No. 784,322
Int. Cl.[5] B25B *19/00*
U.S. Cl. 29—426.5 7 Claims



1. A pin extracting device comprising:
a housing, said housing having a central bore extending therethrough and a counterbore extending from one end nearly through said housing, said central bore terminating in a pin-receiving opening at the other end of said housing;
a swaging body inserted in the counterbore of said housing, said swaging body having an irregular opening extending from the center along the length of the swaging body;
handle means inserted in said housing for activating said swaging body and for applying an extraction force to the device, said handle means fastened to said housing by means of threads in said housing and on said handle, said handle means activating said swaging body by forcing said swaging body into the counterbore of the housing when threaded into said housing.

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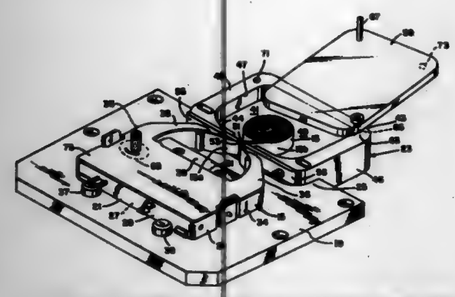
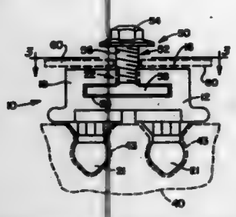
5,193,261
METHOD FOR STUFFING A SNAILED ENDLESS RIBBON INTO A RIBBON CARTRIDGE
Jeffrey D. Bell, Murfreesboro, Franklin K. Smith, Unionville, and Patrick D. Carter, Franklin, all of Tenn., assignors to Pelikan, Inc., Franklin, Tenn.
Division of Ser. No. 666,386, Mar. 8, 1991, Pat. No. 5,136,778.
This application May 20, 1992, Ser. No. 889,789
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—434 5 Claims



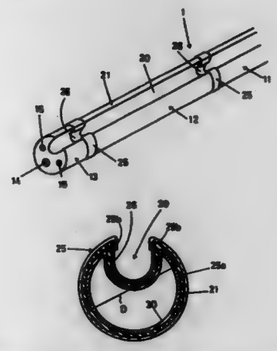
1. A method of stuffing an endless looped fabric ribbon into a ribbon cartridge which is used with a typewriter or a printer, comprising the steps of
placing a ribbon which has been wound into a snailed loop into a loop tray having an open top,
closing the top of the tray by placing a tray cover over it so that the ribbon cannot jump out of the tray while it is being rewound and stuffed into a ribbon cartridge bottom housing,
pressing a cartridge cover onto the cartridge housing,
and rewinding the ribbon thereby drawing it from the loop tray and stuffing it into the cartridge.

5,193,262
METHOD FOR FORMING A FUEL TANK ASSEMBLY
James P. Hyde, Saline, and Thomas J. Bryana, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 516,002, Apr. 16, 1990, Pat. No. 5,067,575.
This application Sep. 25, 1991, Ser. No. 765,637
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—447 12 Claims



1. A method for forming a fuel tank assembly comprising the steps of:
forming a fuel tank having at least one socket therein from heated polymeric material;
providing a heat shield;
providing retainer means for connecting said heat shield to said fuel tank, said retainer means including a retainer body having peg fastening means on a first side thereof for connecting said retainer body to said fuel tank;
connecting said retainer body to said fuel tank by inserting said peg fastening means into said at least one socket in said fuel tank after said tank has been formed and before said tank has cooled in order to permit said socket to contract about said peg fastening means as said tank cools; and
attaching said heat shield to said retainer body.

5,193,263
METHOD OF SECURING SKIN TUBE TO BENDABLE TUBE PORTION OF ENDOSCOPE
Nagashige Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 552,010, Jul. 13, 1990, Pat. No. 5,125,143.
This application Apr. 17, 1992, Ser. No. 870,278
Claims priority, application Japan, Jul. 19, 1989, 1-188414
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—447 10 Claims

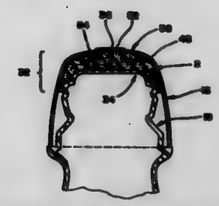


1. A method of securing a skin tube to a bendable tube portion of an endoscope which has a groove in the outer surface, comprising the steps of:
fitting a flexible skin tube over said bendable tube portion;
fitting a fitting member onto said flexible skin tube into said groove of said bendable tube portion of at at least one end portion of said skin tube, said fitting member having a shape which is fittable to said groove;
loosely fitting a securing means around said end portion of said skin tube, said securing means being formed from a shape memory material which has previously memorized a shape with which said securing means is capable of peripherally pressing said end portion of said skin tube and, at the same time, pressing said fitting member against the surface of said groove; and
restoring said securing means to said memorized shape, thereby securing said skin tube to said bendable tube portion.

5,193,264
IN SITU FOAM MOLDING PROCESS AND ARTICLES
Paul E. Brown, Midland, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Feb. 8, 1988, Ser. No. 153,355
Int. Cl.[5] B29C *67/22*
U.S. Cl. 29—458 23 Claims

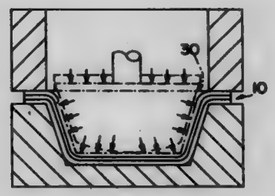
1. A method for forming a seal for dispensing containers and the like of the type having a body with a reservoir adapted to retain therein a product to be dispensed, a dispenser with an applicator surface adapted to dispense the product from the reservoir, and a cap detachably connected with the body, and selectively covering the applicator surface of the dispenser, said method comprising:
providing the cap;
providing a mandrel shaped geometrically similar to the dispenser;
assembling the cap on the mandrel, thereby forming a substantially closed cavity therebetween;

providing liquid foam of the type which expands when cured into a substantially closed cell construction;
after said assembling step, injecting the liquid foam into the cavity;
after said injecting step, curing the liquid foam in the cavity



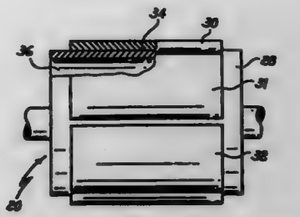
to the extent that the liquid foam expands to completely fill the cavity, and solidifies to create a foam seal formed in situ on the cap, which is adapted for positioning between the applicator surface of the dispenser and the cap to prevent the product from inadvertently leaking from the reservoir.

5,193,265
METHOD OF PRODUCING A CUP-SHAPED, STERILIZABLE CONTAINER
Olivier Y. Maggli, Neuhausen am Rheinfall, and Andreas Ziegler, Schaffhausen, both of Switzerland, assignors to Alusuisse-Lonza Services Ltd., Zurich, Switzerland
Filed Apr. 17, 1991, Ser. No. 686,693
Claims priority, application Switzerland, Apr. 26, 1990, 1437/90
Int. Cl.[5] B21B *1/46*
U.S. Cl. 29—527.4 9 Claims



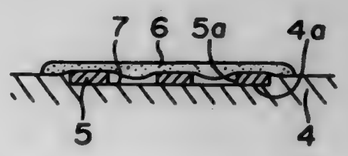
1. Method of producing a cup-shaped sterilizable container which comprises providing a stretch-drawable composite laminate of a total wall thickness between 30 and 200 microns, said laminate having an aluminum foil layer of a thickness less than 40 microns, a sealable plastic inner layer of high extensibility and a plastic outer layer of high extensibility and load-bearing capacity, drawing said laminate in a mold into a container with the side wall of the container running at a side wall angle (a) with respect to the direction perpendicular to the container bottom, wherein the composite material is combined deep and stretch drawn free from folds at a side wall angle (a) of essentially equal to or less than 30° using smooth-walled forming tools wherein at a side wall angle between about 15° and 30°, the combined deep drawing and stretch drawing takes place by means of a die, the composite material being deep drawn in a deep-drawing step to 30–70% of the depth (H) of the finished container and drawn in a following deep-drawing/stretch-drawing step to 75–95% of the depth (H) of the finished container and brought to the depth and width of the finished container in a stretch-drawing step following thereafter.

5,193,266
METHOD OF MAKING A BRUSHLESS ELECTRIC MOTOR AND ROTOR THEREFOR
Mike Caputo, Milan, Italy, assignor to SAES Getters SpA, Milan, Italy
Filed Oct. 3, 1991, Ser. No. 770,426
Claims priority, application Italy, Nov. 15, 1990, 22064 A/90
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—598 1 Claim



1. A process for producing a rotor for a brushless electric motor, said rotor comprising:
A. a soft-iron shaft; and
B. a plurality of porous metal permanent magnets of Sm_2Co_{17} bonded to the shaft by a thin layer of bonding metal between the magnets and the shaft; and
wherein the bonding metal is an alloy of 15 weight percent aluminum, balance essentially zinc;
said process comprising the steps of:
I. assembling a rotor assembly of:
A. the soft-iron shaft; and
B. one or more permanent magnets surrounding the shaft; and
C. a layer of unmelted bonding metal between the shaft and the permanent magnets to form a rotor assembly; and then
II. heating the rotor assembly to a temperature above the melting point of the bonding metal, thereby melting the unmelted bonding metal thereby causing the bonding metal to permeate the pores of the porous metal magnet an amount sufficient to bond the magnet to the shaft but insufficient to adversely affect the magnetism of the permanent magnet thereby producing said rotor.

5,193,267
METHOD OF MANUFACTURING MAGNETOSTRICTION STRESS DETECTORS
Hiroshi Satoh; Yoshihiko Utsui; Katsuhiko Honda, and Masahiko Hasegawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 527,805, May 24, 1990, Pat. No. 5,142,919.
This application Apr. 27, 1992, Ser. No. 873,765
Claims priority, application Japan, May 29, 1989, 1-135203; May 29, 1989, 1-135204; May 31, 1989, 1-137940; Dec. 22, 1989, 1-333924
Int. Cl.[5] H01F *41/02*
U.S. Cl. 29—606 7 Claims



1. A method of manufacturing a magnetostriction stress detector, comprising the steps of forming a passive shaft to which an external force is applied, from a magnetic material

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having a high magnetic permeability and a soft magnetism; forming a slit for allowing passage of a magnetic flux through a magnetic shielding plate formed of a nonmagnetic material having a high conductivity; winding said magnetic shielding plate around said passive shaft; fixing said magnetic shielding plate to said passive shaft to form a magnetic layer on a portion of said passive shaft corresponding to said slit; and locating around said magnetic layer a detection coil for detecting a change in magnetic permeability due to a stress in said magnetic layer to be generated by said external force.

5,193,268

PARTS FEEDING SYSTEM UTILIZING AN UNMANNED CONVEYING MACHINE

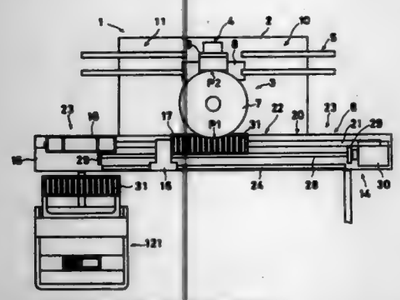
Michihiko Ono, Kohdera, and Syozo Kawashima, Ono, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 609,690, Nov. 6, 1990, abandoned. This application Jul. 10, 1992, Ser. No. 911,795

Claims priority, application Japan, Nov. 7, 1989, 1-289214; Nov. 10, 1989, 1-292813

Int. Cl.[5] B23P *19/00*

U.S. Cl. 29—739 14 Claims



1. A parts feeding system, comprising:

a plurality of cassette carriages each detachably combined with one of a plurality of parts mounters, each said cassette carriage holding one or more parts feeding cassettes loaded with parts to be used by said plurality of parts mounters;

an unmanned conveying machine for retrieving said cassette carriages from said plurality of parts mounters or for delivering said cassette carriages to said plurality of parts mounters;

at least one logistics base for said unmanned conveying machine; and

parts stocking means arranged in said logistics base for storing at least one parts feeding cassette, wherein

said unmanned conveying machine returns to said logistics base with at least one cassette carriage retrieved from one of said parts mounters, said unmanned conveying machine departs from said logistics base to deliver at least one cassette carriage to one of said plurality of said parts mounters,

wherein each said parts mounter is provided with a track for moving said cassette carriages thereon, a portion of said track being assigned as a work station where parts are taken out of said parts feeding cassettes, each end portion of said track being assigned as a carriage change station where each said cassette carriage is retrieved from said track by said unmanned conveying machine or delivered from said unmanned conveying machine to said track, and each of said parts mounters includes two carriage carriers movable on said track, each said cassette carriage being supported on one of said two carriage carriers, wherein one of said carriage carriers moves only between one end portion of said track and said work station and another of said carriage carriers moves only between another end portion of said track and said work station.

5,193,269

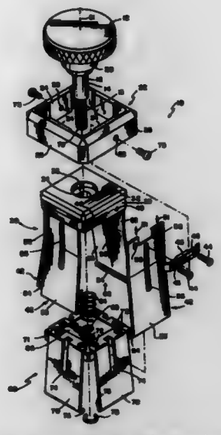
EXTRACTION TOOL FOR ELECTRONIC CIRCUIT COMPONENTS

Jerome P. Dattilo, Clarksville, Ind., assignor to Robinson Nugent, Inc., New Albany, Ind.

Filed Mar. 18, 1992, Ser. No. 853,091

Int. Cl.[5] H05K *13/04*

U.S. Cl. 29—764 30 Claims



1. An apparatus for extracting an electronic chip, the apparatus comprising:

an outer jaw assembly including a top plate and at least two outer legs coupled to the top plate defining an interior region therebetween;

an inner jaw assembly located in said interior region, the inner jaw assembly including a bottom plate and at least two inner legs coupled to the bottom plate for engaging the chip;

a collar coupled to the outer and inner jaw assemblies, the collar being movable between a first position to permit the outer and inner legs to be inserted over the chip and a second position to lock the outer and inner legs in a predetermined position relative to the chip; and

means for moving the inner jaw assembly relative to the outer jaw assembly when the collar is in its second position to extract the chip.

5,193,270

METHOD FOR JOINING A CONDUCTOR TRACK FOIL TO AN ELECTRICAL COMPONENT

Horst Stade, Blaichach, and Helmut Deringer, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 6, 1991, Ser. No. 788,383

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1990, 4041507

Int. Cl.[5] H05K *3/34*

U.S. Cl. 29—840 7 Claims

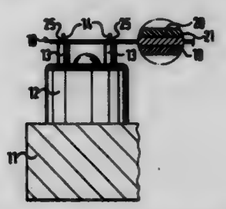
1. A method for joining a conductor track foil (18), comprising a conductor layer (21) embedded between insulating layers (19, 20), to at least one electrical component (12) having contact pins (14), wherein the contact pins (14), extending parallel to one another, extend at least approximately at right angles to the conductor track foil (18), terminate at least approximately in the same plane, and reach through the conductor track foil (18) inside soldering lands (23), which on their side facing toward the end of the contact pins (14) that is free of an insulating layer (20) are connected by solder (25) to the contact pins (14),

comprising the following method steps:

placing the conductor track foil (18) onto a mounting apparatus (31);

positioning and aligning the mounting apparatus with the conductor track foil thereon on an electrical component;

lowering the conductor track foil (18) and mounting apparatus correctly onto the electrical component (12) with the soldering lands in alignment with the contact pins of the electrical component until the bottom insulating layer (19)



and the conducting layer (21) of the soldering lands (23) are pierced by the contact pins (14) of the electrical component;

releasing the conductor track foil (18) from the mounting apparatus (31); and

soldering a connection between the soldering lands (23) of the conductor track (18) and the contact pins (14) of the electrical component.

5,193,271

MANUFACTURING PROCESS FOR PRESSURE CONNECTING TERMINAL

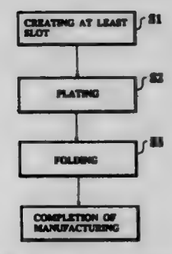
Tetsuo Kato, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed Jun. 25, 1992, Ser. No. 904,012

Claims priority, application Japan, Jun. 27, 1991, 3-156938

Int. Cl.[5] H01R *43/00*

U.S. Cl. 29—885 10 Claims



1. A manufacturing process for a pressure connecting terminal which includes an electrical wire connection portion having a slot for pressuring and electrically connecting an electrical wire therewith and which is manufactured by punching a blank out of a flat metal base plate in accordance with a predetermined pattern and folding said blank into a predetermined shape, said manufacturing process comprising the steps of:

punching said flat base plate so as to create at least said slot;

plating at least said slot which is created in said punching step; and

folding said blank into said predetermined shape after said plating step.

5,193,272

PROCESS FOR REPAIR OF DRIVE BLADES SUCH AS TURBINE BLADES

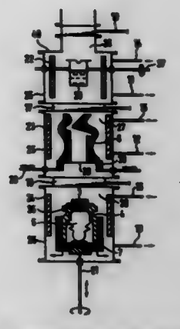
Jürgen Wortmann, Weiche, Fed. Rep. of Germany; Fritz Staub, Sevnach, and Bruno Walser, Schottiken, both of Switzerland, assignors to Sulzer-MTU Casting Technology GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 12, 1991, Ser. No. 806,877

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1990, 4039807

Int. Cl.[5] B23P *15/02*

U.S. Cl. 29—889.1 7 Claims



1. A process for repairing a single-crystal drive blade comprising:

providing a single crystal drive blade having a longitudinal axis and in which blade there is a defective region requiring replacement,

cutting the drive blade substantially perpendicularly to the longitudinal axis of the blade to remove the defective region and retain a remaining part of the blade;

removing a surface layer of a portion of the remaining part of the blade to leave a core region of the blade which is of single-crystal composition substantially free of stresses and defects;

providing a casting mold having an open bottom and a casting cavity for the drive blade;

inserting said portion of the blade into the casting cavity of the mold, and

casting molten metal into the casting cavity at a casting temperature to integrate said remaining part of the blade with the melt as a single crystal blade.

5,193,273

METHOD OF MAKING A SET BURNER CONSTUCTION

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 456,722, Dec. 26, 1989, Pat. No. 5,035,609.

This application May 13, 1991, Ser. No. 698,942

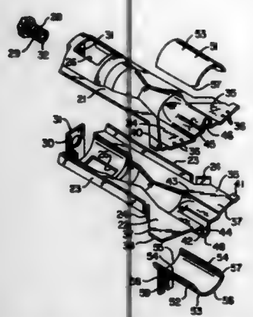
The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.

Int. Cl.[5] F23D *14/58*

U.S. Cl. 29—890.01 20 Claims

1. In a method of making a jet burner construction comprising a burner body means having a chamber means therein and having an inlet means leading to said chamber means for directing fuel from a fuel source therein and an outlet means leading from said chamber means and defining an outlet opening means through which said fuel is adapted to issue from said chamber means to burn externally to said burner body means, said outlet opening means having a central opening part and a plurality of spaced apart opening portions interconnected thereto and radiating outwardly therefrom whereby flows of fuel respectively issuing out of said portions and said central part of said outlet opening means merge together in a turbulent

manner externally of said outlet opening means, the improvement comprising the step of forming a flame retainer to be carried by said body means and have outer edge means extend-



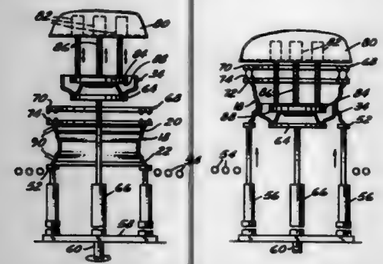
ing beyond said outlet opening means of said body means to restrict the flows of induced air between the flows of fuel issuing from said radiating portions of said outlet opening means.

5,193,274

METHOD AND APPARATUS FOR MANUFACTURE OF A VEHICLE WHEEL HAVING CONTROLLED LATERAL RUNOUT CHARACTERISTIC

Richard C. Ball, Perry; Anwar R. Dandi, East Lansing, and Elvin E. Tuttle, Lansing, all of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed Jan. 24, 1992, Ser. No. 825,579
Int. Cl.[5] B23P *19/00*; B21K *1/32*
U.S. Cl. 29—894.322 **17 Claims**



1. A method of manufacturing a vehicle wheel rim and disc assembly that includes an annular rim and a disc carried within said rim, said method comprising the steps of:

(a) providing a wheel rim having at least one bead seat and a separate disc having a disc surface that defines a wheel mounting plane,

(b) measuring lateral runout of said at least one bead seat and determining phase angle and amplitude of the first harmonic of lateral runout of said bead seat so as to identify a rim plane of substantially zero first harmonic of bead seat lateral runout, and then

(c) assembling said disc to said rim with said disc surface at predetermined orientation with respect to said rim plane.

7. Apparatus for constructing a vehicle wheel rim and disc assembly that includes a preformed annular rim having at least one rim bead seat and a preformed disc having a surface that defines a wheel mounting plane, said apparatus comprising:

first means including means forming a first surface for receiving and supporting a preformed rim,

sensing means for engaging the bead seat of the rim on said first means to provide an electrical sensor signal as a function of lateral runout of the rim bead seat,

means coupled to said sensing means and responsive to said signal for determining a rim bead seat plane of substantially zero first harmonic of lateral runout,

second means forming a second surface on a fixed axis,

means for clamping a preformed disc with said disc surface against said second surface,

one of said first and second means including means for adjusting orientation of one of said first and second surfaces with respect to said axis, and

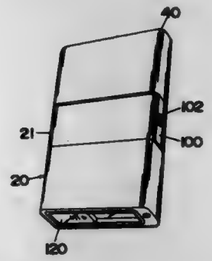
means for moving one of said first and second means with respect to the other so as to fit the disc clamped against said second surface within the rim carried by said first surface.

5,193,275

FLAT-SHAPED DRY SHAVER

Kato Hirokazu, and Yoshinobu Sakamura, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 745,743, Aug. 16, 1991, abandoned. This application Jun. 9, 1992, Ser. No. 896,785
Claims priority, application Japan, Aug. 28, 1990, 2-227331
Int. Cl.[5] B26B *19/20, 19/12, 19/00, 19/02*
U.S. Cl. 30—43 **17 Claims**



1. A dry shaver comprising:

a flat casing mounting a flat cutter head, said flat casing being of generally rectangular configuration with reduced thickness, said cutter head comprising an outer shear foil and an inner cutter assembly driven to reciprocate in hair shearing engagement with said outer shear foil;

a flat and elongated battery disposed within said casing to extend along one lateral side thereof over substantially the entire length of said casing;

a flat motor energized by said battery to drive said inner cutter assembly, said flat motor disposed within said casing in side-by-side relation to said battery to extend along the other lateral side thereof with the lower end of the motor substantially aligned with the lower end of said battery, said flat motor having a length shorter than said battery to form above said flat motor a space which extends transversely across said casing from the side of said casing which is adjacent said motor into an upper center portion of said casing, said flat motor having an output rotor shaft extending upwardly for coupling with an eccentric shaft within said space;

a pivot lever extending generally longitudinally of said casing and having a first end and a second end, means pivotally supporting said pivot lever at a portion intermediate said first and second ends to the upper center of said casing with said first end extending outwardly of said casing for coupling with said inner cutter assembly, said second end extending downwardly into a lower portion of said space; and

a drive arm extending generally transversely within said space from said eccentric shaft to the second end of said pivot lever and connected to reciprocate said pivot lever about a pivot axis upon rotation of said eccentric shaft, thereby driving to reciprocate said inner cutter assembly;

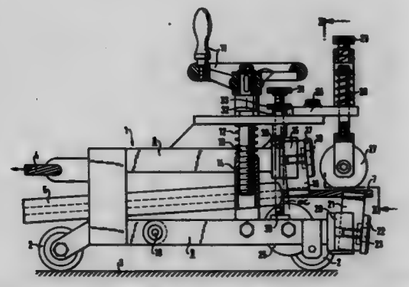
wherein said motor has a thickness greater than said battery, said casing comprising a housing and a sheath fitted closely over said housing, said housing comprising a pair of housing halves between which said battery is sandwiched, said housing halves formed respectively with opposed openings which cooperate to define a through-hole for receiving therein the entire thickness of said motor such that said housing has a minimum thickness substantially equal to that of said motor.

5,193,276

DEVICE FOR CUTTING OF REINFORCING ELEMENTS FROM A RUBBER OR PLASTIC MATRIX

Rudolf Kouig, Poing, and Jurgen Weisenbach, Munich, both of Fed. Rep. of Germany, assignors to Stahlgruber, Otto Bruber GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jun. 18, 1991, Ser. No. 717,145
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1990, 4019511
Int. Cl.[5] B21F *23/00, 13/00*; H02G *1/12*
U.S. Cl. 30—90.1 **12 Claims**



1. A device for longitudinal cutting out long-longitudinally extended reinforcing elements, such as steel cables, from a rubber or plastic matrix, such as a conveyor belt, said device comprising:

a) a support frame (1) movable in the longitudinal direction of the reinforcing elements (7);

b) a lower blade (21) mounted in the support frame (1) below the matrix with a contoured cutting edge (38) surrounding a lower circumferential portion of reinforcing element (7) at a discretionary intervening spacing therefrom and having said cutting edge facing in said longitudinal direction;

c) an upper blade (16) mounted in the support frame (1) above the matrix with a contoured cutting edge (38) surrounding an upper circumferential portion of an reinforcing element (7) at a discretionary intervening spacing therefrom and having said cutting edge facing in said longitudinal direction; and

d) counter brace means (25, 27) mounted in the support frame (1) below and above the matrix and in opposed relation to the upper blade (16) and the lower blade (21), respectively.

5,193,277

SCISSORS GUN

Harry H. Zmijewski, 5471 Beaver Dr., Mableton, Ga. 30059

Filed Dec. 26, 1991, Ser. No. 813,450
Int. Cl.[5] B26B *13/00*
U.S. Cl. 30—261 **7 Claims**

1. Scissors comprising:

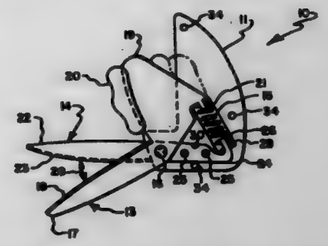
a. a handle comprising a solid body;

b. a stationary blade and a movable blade, said blades being pivotally interconnected and each of said blades having a forward end portion and a rear end portion;

c. the stationary blade and the movable blade each having a cutting edge portion at the forward end portion of each blade;

d. the rear end portion of the stationary blade joined to the handle and said handle extending substantially a right angle with respect to said stationary blade;

e. the rear end portion of the movable blade having a trigger comprising a solid body shaped for squeezing by the fingers of the user; and



f. an elastic member compressibly interposed between the rear end portion of the stationary blade and the rear end portion of the movable blade biasing the forward end of the movable blade in an open position;

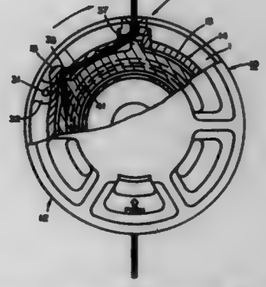
g. so that said scissors is operated by placing said handle in the palm of the hand of the user and squeezing said trigger with the fingers of the user so that the user's hand is in its natural position approximately in a straight line with the wrist.

5,193,278

ROTARY CUTTER

Mitsuo Osakabe; Minoru Shibasaki, both of Gunma; Toshimichi Kanemiwa, Tomioka, and Nobuyuki Sekikawa, Takasaki, all of Japan, assignors to Starting Industry Company Limited, Japan

Filed Apr. 2, 1992, Ser. No. 863,690
Claims priority, application Japan, Dec. 17, 1991, 3-353205
Int. Cl.[5] A01D *50/00*
U.S. Cl. 30—276 **8 Claims**



1. Apparatus for automatically dispensing line from a rotating cutter for cutting foliage that includes

a head connected to a drive means for rotating the head about a central axis,

an annular ring mounted in said head for independent rotation about said axis,

a spool means for storing a coil of line about said axis with at least one free end of the line passing outwardly through an opening formed in said ring,

a circumferential camming surface positioned in said head

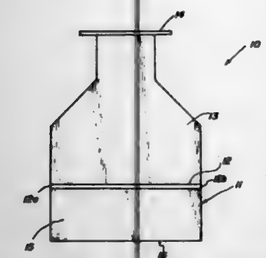
having radially-extended lobes spaced apart along said surface,
stop means located adjacent to each lobe,
a cam follower pivotally mounted in said ring and adapted to ride in contact with said camming surface, said follower being able to move in contact with said stop means as the follower enters each lobe,
said free end of the line arranged to move in sliding contact with the cam follower to hold the follower against the stop means when the free end of the line extends outwardly a predetermined distance from said head and to automatically release the follower from the stop when the line becomes foreshortened through wear or breakage whereby the follower is guided around the stop and allowed to pass to the next stop as the ring turns in the head thus dispensing additional line through said opening.

5,193,279

SHEETROCK CUTTING TOOL APPARATUS

Melvin Pierce, Rte. 4 Ridlerville Rd., Box 734, Sandersville, Ga. 31082

Filed Apr. 13, 1992, Ser. No. 867,501
Int. Cl.[5] B26B *3/00, 3/03*
U.S. Cl. 30—305 **1 Claim**



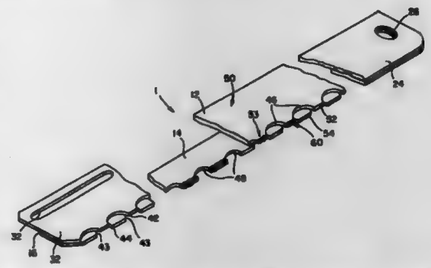
1. A sheetrock cutting tool apparatus, comprising,
a cutting tool housing, the cutting tool housing including a top wall and a continuous side wall orthogonally projecting downwardly relative to the top wall, wherein the continuous side wall includes a first side wall plate spaced from and parallel a second side wall plate in a coextensive parallel relationship, the continuous side wall includes a side wall lower edge, wherein the side wall lower edge includes a cutting edge, with the cutting edge arranged in a single plate, and
the top wall includes a top wall forward edge spaced from and parallel a top wall rear edge, and a projecting flange fixedly and orthogonally mounted to the top wall spaced medially of the first side wall and the second side wall, with the impact plate orthogonally and medially bisecting the top wall forward edge and the top wall rear edge extending from the top wall forward edge to the top wall rear edge, and an impact plate fixedly and orthogonally mounted to an upper distal end of the projecting flange, and
a plurality of projecting heads mounted between the projecting flange and the first side wall, and a plurality of second projecting heads mounted above the top wall between the projecting flange and the second side wall, and each projecting head includes a projecting rod slidably and orthogonally directed through the top wall, and a first ejector plate is mounted to a plurality of projecting rods below the first projecting heads, and a second ejector plate is mounted to a further plurality of projecting rods below the second projecting heads, wherein the first ejector plate and the second ejector plate is positioned within the housing below the top wall.

5,193,280

SAW BLADES AND METHOD OF MAKING SAME

Brian K. Jackson, Newton Aycliffe, England, assignor to Black & Decker, Inc., Newark, Del.

Filed Feb. 21, 1992, Ser. No. 839,589
Claims priority, application United Kingdom, Feb. 25, 1991, 9103883.6
Int. Cl.[5] B26B *9/02*
U.S. Cl. 30—350 **11 Claims**



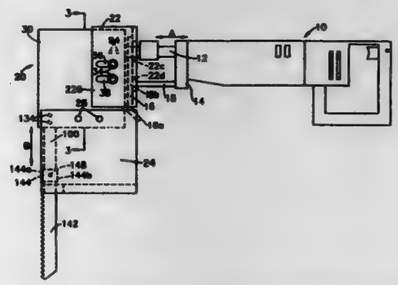
1. A blade for a contra-reciprocating two-blade saw including a support guide for the blades, the blade comprising:
first and second strips secured together to form a single unitary blade;
said first strip having teeth formed thereon;
grit particles adhered to the teeth on only one side of said first strip;
said second strip being secured to said one side of the first strip;
said second strip having teeth formed thereon in staggered relation to the teeth formed on said first strip;
the teeth on said second strip having grit particles adhered thereto;
said teeth comprising flat lands separated by curved scallops along an edge of each said strip; and
the teeth having a pitch which is the same on each strip, with the lands on the second strip being longer than the lands on the first strip.

5,193,281

APPARATUS FOR CHANGING THE CUTTING DIRECTION IN A RECIPROCATING SAW

Vincent A. Kastea, 295 Midway Ave., Fanwood, N.J. 07023

Filed Mar. 3, 1992, Ser. No. 845,278
Int. Cl.[5] B27B *19/00*
U.S. Cl. 30—394 **27 Claims**



1. An attachment for a power saw of a type having a reciprocating saw bar, comprising
a housing,
joining means for removably joining said housing to the saw,
a first push rod disposed in said housing for reciprocating movement in a first linear direction,

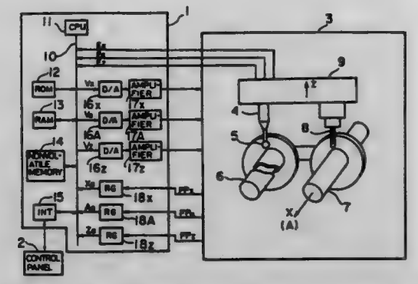
first connecting means for connecting said first push rod to said saw bar,
a second push rod disposed in said housing for reciprocating movement in a second linear direction oriented at an angle to said first linear direction,
second connecting means for connecting a saw blade to said push rod, and
transmission means disposed between said first and second push rods for transmitting the reciprocating movement of said first push rod to a corresponding movement of said second push rod.

5,193,282

ROTATING BODY TRACING CONTROL APPARATUS

Hitoshi Aramaki, and Tetsuji Okamoto, both of Minamitsuru, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP90/01604, § 371 Date Aug. 7, 1991, § 102(e) Date Aug. 7, 1991, PCT Pub. No. WO91/08862, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 7, 1990, Ser. No. 741,487
Claims priority, application Japan, Dec. 11, 1989, 1-320915
Int. Cl.[5] B43L *13/24*; B23Q *35/04*; G05B *19/35*
U.S. Cl. 33—23.01 **7 Claims**



1. A rotating body tracing control apparatus, comprising:
tracing means for tracing and machining a groove shape of a model and a workpiece while rotating the model and the workpiece, respectively; and
tracing control means for controlling said tracing means, including—
storage means for storing a plurality of point coordinates of an outer peripheral surface outside of the groove shape of the model, the point coordinates of each point representing a position along a central axis of rotation and an angle about the central axis of rotation, and
means for executing tracing bounded by at least one line connecting the plurality of point coordinates.

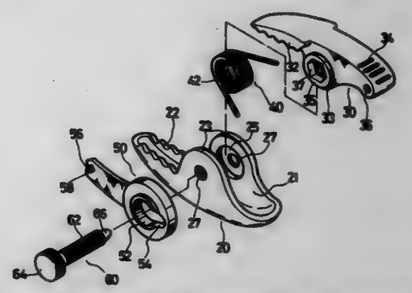
5,193,283

BICYCLE WHEEL SPIKE INPECTING AND ADJUSTING DEVICE

Alex Hsiao, 4, Lane 11, Tze Chiang St., Tu Cheng Shiang, Taipei Shien, Taiwan

Filed Jul. 27, 1992, Ser. No. 919,254
Int. Cl.[5] G01B *5/255, 5/28*
U.S. Cl. 33—203.19 **1 Claim**

1. A bicycle wheel spoke inspecting and adjusting device comprising:
a base plate having a receiving channel defined within two parallel side walls, the parallel side walls of said base plate being formed into a toothed jaw on one end and two parallel lugs on an opposite end, the two parallel lugs of said base plate having each a recessed hole on the inside and a bolt hole through the recessed hole;
a clamping plate having a receiving channel defined within two parallel side walls, the parallel side walls of said clamping plate being formed into a toothed jaw on one end and two parallel lugs on an opposite end, the two parallel lugs of said clamping plate having each a circular block raised on the outside engaged into the recessed hole on either lug of said base plate and a polygonal through hole through the circular block;
a torsional spring received in the receiving channel of said clamping plate and the receiving channel of said base plate and retained between the two parallel lugs of said clamping plate, said torsional spring having one end stopped against said base plate and an opposite end stopped against said clamping plate and a center hole aligned with the bolt hole on each lug of said base plate and the polygonal hole on each lug of said clamping plate;
a detecting bolt threaded into the bolt hole on each lug of said base plate and inserted through the center hole of said torsional spring and the polygonal through hole on each lug of said clamping plate to connect said base plate, said torsional spring and said clamping plate together, said



detecting bolt having a head on one end, a probe on an opposite end, and an outer thread between the probe and the head;
a spanner removably hung on the outer thread of said detecting bolt for adjusting the spokes of a bicycle wheel, said spanner having an axle hole and an elongated locating hole communicated on one end for hanging on the outer thread of said bolt, a square hole on an opposite end extended to the outside through an opening for turning the spoke tightening knob of a bicycle wheel spoke; and
wherein the bicycle wheel spoke inspecting and adjusting device is clamped on the brake on a bicycle wheel with the probe of said detecting bolt slightly made in contact with the rim of the bicycle wheel for inspecting the roundness of the rim; said spanner is removed from said detecting bolt for turning the spoke tightening knob of the spoke to be adjusted.

5,193,284

MULTI-PURPOSE DRAWING RULER

Chin-Hsiu Lin, 2F, No. 7, Alley 4, Lane 100, Ming Ii St., Chung ho City, Taipei Hsien, Taiwan

Filed Mar. 24, 1992, Ser. No. 856,731
Int. Cl.[5] B43L *13/02*
U.S. Cl. 33—449 **5 Claims**

1. A multi-purpoae drawing ruler comprising:
a ruler body in the form of a rectangular board having a straight edge with markings of length, a plurality of through holes at appropriate positions along the markings for passing through of a drawing pen, a knob at the left end of the markings and another knob at its right end, a rail along the front edge of the ruler body, a slot for placing of a direction wheel shaft assembly in a middle portion of the ruler body, a pair of rails and an elliptic hole formed in the body at a side of the slot, another pair of rails and another elliptic hole formed at the opposite side, and a reset indicator on the top of each of the opposite sides of the slot;
first and second brake assemblies each composed of a sliding

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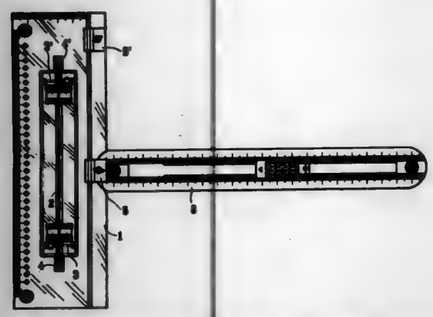
element and a spring with a round hole in the middle of each sliding element and a bore formed in a side of each sliding element for placing of the spring, said sliding elements being adapted to be inserted between a respective pair of rails;

a direction wheel shaft assembly including a shaft having a roller at each end of the shaft, a scale around each roller, and a screw hole at the center of each roller; and

two reset shafts each passing through a respective elliptic hole of said ruler body and a respective hole of an associated brake assembly and then being fixed in a respective one of said screw holes of said direction wheel shaft assembly;

whereby the rollers of said direction wheel shaft assembly of



said ruler body can freely roll upon a piece of drawing paper placed beneath said ruler body if the pressure applied to the ruler body is smaller than the tension of the springs in the brake assemblies which bias the rollers of the direction wheel shaft assembly outside the ruler body and then the ruler body can also be slid linearly on the drawing paper, and when the brakes are applied by exerting a pressure to the ruler body which is greater than the tension of the springs in the brake assemblies, the rollers retract into the ruler body thereby causing the ruler body to contact the drawing paper so as to prevent free rotation of the rollers and whereby the direction wheel shaft can be reset by turning the respective reset shafts so that the corresponding scale of the associated roller is aligned with its corresponding reset indicator on the ruler body.

5,193,285

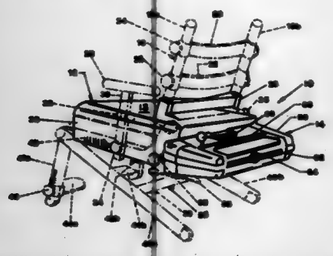
MECHANICAL SHAPE SENSOR AND DATA RECORDER

Michael Heinrich, Chicago, and Eric-Jan Ginder, Oak Park, both of Ill., assignors to Pit Dot Products, Niles, Ill.

Filed Aug. 1, 1991, Ser. No. 739,110

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—514.2 **37 Claims**



1. Apparatus for measuring and recording the contour of a person's seating support surface, said apparatus comprising:

a chair-like base having a seat portion and a back portion for respectively supporting a person's thighs and buttocks and a person's back when in a seated position;

deformable shape sensing means disposed on said seat portion of said chair-like base for measuring the three-dimensional contour of the seating support surface of a person seated thereon and for converting said three-dimensional contour to a two-dimensional format;

reference means disposed on said chair-like base for measuring the three-dimensional contour relative to said back portion of said chair-like base, said reference means including fixed cross-member means in said back portion for engaging and supporting only the lower back of a person seated on said chair-like base, said reference means further including means for measuring the relative positions of said seat and back portions of said base; and

recording means coupled to said shape sensing means for recording a person's contour on a two-dimensional medium.

5,193,286

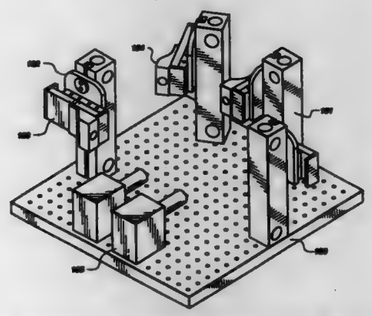
MODULAR GAGE

Kevin E. Collier, 675 S. 1350 East, Fruit Heights, Utah 84037

Filed Apr. 21, 1992, Ser. No. 871,898

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—551 **7 Claims**



1. An apparatus for measuring dimensional differences between a master part and reproduced production parts, comprising in combination:

a base plate having means for attaching component members thereto;

said component members including at least one vertical column member rotatably attached to said base plate around a vertical axis of said column;

at least one mounting plate rotatably attached to a vertical side of said column member around an axis perpendicular to said vertical axis;

at least one air side means attached to said mounting plate; and

at least one probe holder means attached to said air slide means for holding a probe and for linearly moving said probe holder with respect to said mounting plate.

5,193,287

APPARATUS FOR PERFORMING SCROTAL CIRCUMFERENCE MEASUREMENT ON BULLS

Glenn H. Coulter, Lethbridge; Del J. Buckley, Nepean, and Bruce S. Scobie, Ottawa, all of Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Apr. 30, 1992, Ser. No. 876,193

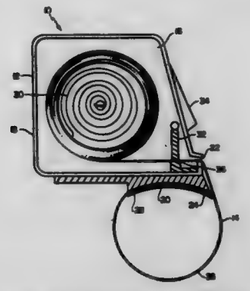
Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—555.4 **4 Claims**

1. An apparatus for performing scrotal circumference measurement on bulls, comprising:

a. a casing having an interior cavity, an exterior surface with a concave portion and an opening in the casing providing access to the interior cavity;

b. a graduated flexible tape coiled within the interior cavity of the casing, the graduated flexible tape extending through the opening and having an end secured to the exterior surface of the casing adjacent the concave portion such that the tape and the concave portion define a circu-



lar opening to accommodate a scrotal circumference, and the graduations on the tape assign a value to the concave portion thereby providing an accurate circumferential measurement; and

c. biasing means positioned within the interior cavity of the casing providing a biasing force of between 1.26 and 2.26 kilograms of tension to draw the tape into the interior cavity of the casing.

5,193,288

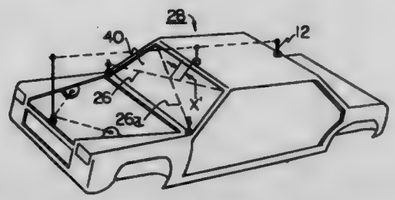
APPARATUS AND METHOD FOR MEASURING AUTOMOTIVE DAMAGE AND DISALIGNMENT

Lach W. Stifnell, 760 Hill Rd., R.D. #1, Green Lane, Pa. 18054

Filed Nov. 28, 1990, Ser. No. 619,148

Int. Cl.[5] G01B *5/25*

U.S. Cl. 33—608 **8 Claims**



8. An apparatus for gauging vehicle damage comprising:

a plurality of removable disk-shaped magnetic stop members for placement upon the undamaged portion of a vehicle and for determining a point of reference, each of said magnetic having an axial alignment pole for aligning said point of reference; and

a calibrated measurement chain attached to least one of said axial alignment poles for making a measurement of vehicle disalignment from said point of reference by measuring the distance from a point of vehicle damage to an undamaged point on said vehicle extending from said point of reference.

5,193,289

APPARATUS FOR MEASURING THE THICKNESS OF THIN LAYERS

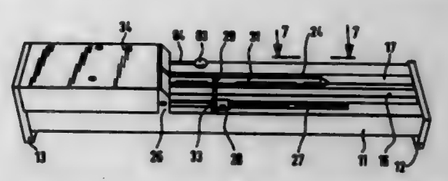
Helmut Fischer, Industriestrasse 21, 7032 Sindelfingen 6 - Maichingen, Fed. Rep. of Germany

Filed Apr. 23, 1992, Ser. No. 872,921

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1991, 4129687

Int. Cl.[5] G01B *5/12*

U.S. Cl. 33—834 **63 Claims**



1. Apparatus for measuring the thickness of thin layers comprising:

a probe,

guide means for gently setting down said probe perpendicularly on a layer,

an electric line connected to said probe,

a flexurally rigid base,

fastening means fixedly connected to said base,

said fastening means bearing a long protective means having an inside with a protective space,

resting means between said protective means and said base, an intermediate space being provided between said protective means and said resting means,

a balance beam having at least a first arm that runs at least partially in said protective means and bears said probe,

a balance beam bearing that bears said first arm,

lowering means operably connected to said balance beam for slowly lowering said probe out of said protective space, and

damping means operably connected to said balance beam for damping movement of said balance beam.

5,193,290

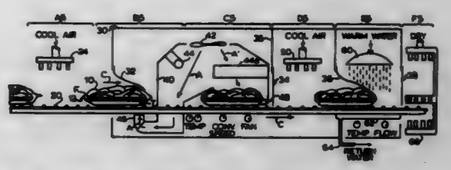
APPARATUS AND METHOD FOR SEQUENTIAL SHRINKING OF PACKAGING FILM

Sidney S. Tolson, Scotland Neck, N.C., assignor to Ould Corporation, Rocky Mount, N.C. and Ibaraki Seiki Machinery Company, Ltd., Osaka, Japan

Filed Sep. 14, 1992, Ser. No. 944,340

Int. Cl.[5] F26B *7/00*

U.S. Cl. 34—12 **16 Claims**



10. A method of shrinking a heat shrinkable film wrapped around a package, comprising:

(a) transporting a series of said film wrapped packages by a conveyor means through a series of operative stations;

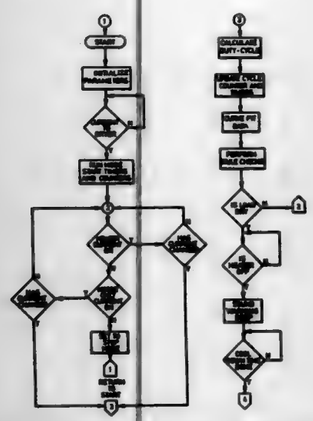
(b) directing a stream of hot air at one or more surfaces of said film on said package; and

(c) directing a stream of warm liquid at one or more surfaces other than those to which said hot air was directed.

5,193,291
SOIL REMEDIATION APPARATUS AND METHOD
David F. Brasboers, Belle Isle, Fla., assignor to Gencor Industries, Inc., Orlando, Fla.
Continuation of Ser. No. 609,620, Nov. 6, 1990, abandoned. This application Apr. 1, 1992, Ser. No. 863,134
Int. Cl.[5] F26B *7/00*
U.S. Cl. 34—12 22 Claims

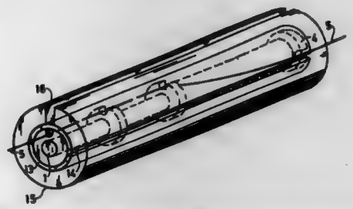
7. A method of remediating contaminated soil comprising the steps of:
heating the soil in a rotating drum by flowing hot gases of combustion through the soil to volatilize the contaminant;
flowing the remediated soil into a separator;
flowing the particulate-laden gases from the drum into the separator;
in the separator, separating the particulate-laden gases into clean exhaust gases and particles;
locating the particles in heat exchange relation with the remediated soil in the separator to release contaminants carried by the particles of the particulate-laden gases;
combining the particles and remediated soil in the separator; and
discharging the combined particles and remediated soil from the separator.

5,193,292
METHOD AND APPARATUS FOR AUTOMATICALLY TERMINATING THE CYCLE IN DRYERS
Douglas R. S. Hart, 94 Yarmouth Road, Toronto, Ontario, Canada M6G 1W9, and David M. Jones, 19 Brentwood Drive, Dundas, Ontario, Canada L9H 3N2
Filed Apr. 13, 1992, Ser. No. 867,532
Claims priority, application United Kingdom, Dec. 10, 1991, 9126200
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—30 39 Claims



1. A method of controlling a drying machine to which energy is fed along at least one conduit, the drying machine having means establishing a variable energy consumption, such that, as the contents of the drying machine approach a dry condition, the amount of energy consumed per unit time decreases in a pattern which depends upon the amount and nature of the contents and the characteristics of the drying machine, the method comprising the steps:
a) monitoring the said pattern of energy consumption, and
b) when the pattern of energy consumption with respect to time corresponds to a pattern which indicates a condition of dryness, reducing the flow of energy along said at least one conduit.

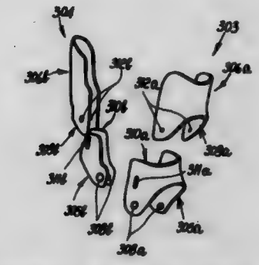
5,193,293
DEVICE FOR THE HEAT TREATMENT OF YARNS IN MOTION
Carlos M. Gabalda, Granges Les Valence, and Pierre Mirabel, Roanne, both of France, assignors to Pierre Mirabel, France
Filed Jun. 25, 1992, Ser. No. 904,029
Claims priority, application France, Jul. 18, 1991, 91 09314; Dec. 20, 1991, 91 16208
Int. Cl.[5] F26B *13/00, 19/00*
U.S. Cl. 34—68 11 Claims



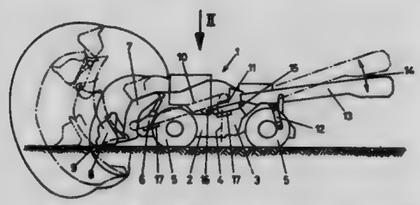
1. An apparatus for the heat treatment of yarns in motion during various operations which comprises:
a generally cylindrically shaped insulating enclosure having an inlet end and an outlet end, said inlet end for receiving the yarn to be treated;
a heating block including at least two cylindrical sections having different diameters and arranged in the extension of one another, said heating block positioned co-axially within said cylindrically shaped insulating enclosure with the cylinder of smaller diameter proximate to said inlet end thereby defining a lengthwise annular channel within the enclosure; and
means for guiding a continuously moving length of yarn through said annular channel from the inlet to the outlet keeping the yarn at a constant distance from the surface of the cylinder of smaller diameter with the yarn passing above the smaller cylinder being heated by radiation and said means for guiding acting to keep the yarn in contact with the surface of the cylinder of larger diameter with the yarn passing over the surface of the larger cylinder being heated by contact or conduction.

5,193,294
SKI BOOT WITH QUARTERS HAVING MULTIPLE SECTIONS
Alessandro Pozzobon, Paderno di Ponzano Veneto; Giancarlo Foscaro, Treviso, and Gianpaolo Marongiu, Rome, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy
Filed Apr. 15, 1991, Ser. No. 685,315
Claims priority, application Italy, May 4, 1990, 82562 A/90; May 4, 1990, 82563 A/90
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—120 6 Claims

1. Ski boot, comprising a front quarter and a rear quarter and a shell, each one of said front and rear quarters comprising at least two independent strip elements which are mutually connected, wherein said ski boot further comprises means for transversely pivoting a first strip element of said strip elements to said shell, and wherein said ski boot further comprises means for laterally and slidably connecting a second strip element of said strip elements to said first strip element along an axis which is longitudinal to said quarter.

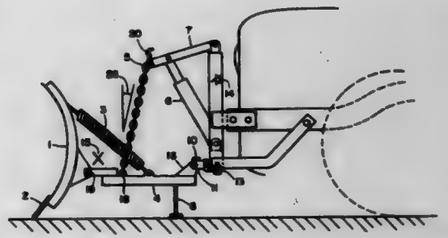


5,193,295
INSTALLATION FOR SHIFTING WON MINERALS
Helmut Gradenegger; Eduard Krivec, both of Zeltweg, and Egmont Lammer, Knittelfeld, all of Austria, assignors to Voest-Alpine Bergtechnik Gesellschaft m.b.H., Alpinestrasse, Austria
PCT No. PCT/AT90/00116, § 371 Date Oct. 2, 1991, § 102(e) Date Oct. 2, 1991, PCT Pub. No. WO91/08351, PCT Pub. Date Jun. 13, 1991
PCT Filed Dec. 4, 1990, Ser. No. 741,506
Claims priority, application Austria, Dec. 6, 1989, 2779/89
Int. Cl.[5] E02F *3/348*
U.S. Cl. 37—8 6 Claims



1. An apparatus for shifting won minerals for a continuous conveyor such as a belt or chain conveyor, said apparatus comprising:
a machine frame;
a plurality of rocker arms, each of said rocker arms being coupled in a vertically pivotable manner at a first end thereof to said machine frame;
a plurality of booms, each of said booms being pivotably coupled at a first end thereof to a corresponding one of said plurality of rocker arms at a second end of said rocker arms;
a shovel assembly pivotably coupled to each of said plurality of booms at a second end of each of said booms;
a plurality of rocker arm hydraulic cylinder units, each of said rocker arm hydraulic cylinder units being connected at a first end thereof to said machine frame and at a second end thereof to a corresponding one of said plurality of rocker arms, said first rocker arm connection being between said first rocker arm hydraulic cylinder unit connection and a front end of said machine frame, said second rocker arm hydraulic cylinder unit connection being proximate to said first boom connection;
a plurality of boom hydraulic cylinder units, each of said boom hydraulic cylinder units being connected at a first end thereof to said machine frame and at a second end thereof to a corresponding one of said plurality of booms;
a continuous conveyor disposed on a top surface of said machine frame;
a feed chute disposed above the continuous conveyor in a front end area of the machine frame, thereby facing the debris; wherein
each of said plurality of booms comprises a first portion proximate to said first end of each of said plurality of booms and a second portion proximate to said second end of each of said plurality of booms, said plurality of boom hydraulic cylinder units each being substantially parallel to said second portion of a corresponding one of said plurality of booms when said shovel assembly is in said first position;
the loading shovel is pivotable about at least one essentially horizontal axle that intersects an essentially vertical plane containing a longitudinal axis of the conveyor system; and
said plurality of rocker arms and said plurality of booms may be disposed to place said shovel assembly in a first position proximate to said front end of said machine frame and in a second position, said second position being above an opening of said loading chute so that material in said shovel assembly may be discharged into said feed chute from a surface of said shovel assembly most proximate to said plurality of booms.

5,193,296
SNOW PLOW ATTACHMENT
Peter V. Reilley, 19 Heritage Clr., Hudson, N.H. 03051
Filed Oct. 15, 1991, Ser. No. 775,565
Int. Cl.[5] E01H *5/04*
U.S. Cl. 37—231 4 Claims

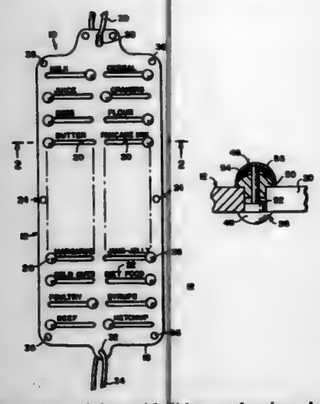


1. A coupling apparatus for removably mating a snow plow with a vehicle comprising:
a first ear with a coupling pin hole and having a specific radius from the coupling pin hole to a curved outer portion of the first ear, said first ear being attached to one of the snow plow and the vehicle;
a second pair of ears with coupling pin holes, said second pair of ears being attached to the other of the snow plow and vehicle; and
a stop and a frame bar attached to both ears of said second pair of ears for receiving said first ear, said stop and said frame bar being positioned at a distance equal to the specific radius from the center of the coupling pin holes, thereby allowing proper alignment of the coupling pin holes during mating.

5,193,297
SHOPPING GUIDE
Jesus A. De Fex, 2038 Bay Ridge Ave., Brooklyn, N.Y. 11201, and George Spector, 233 Broadway Rm 3815, New York, N.Y. 10007
Filed Oct. 23, 1991, Ser. No. 780,888
Int. Cl.[5] G09F *3/20*
U.S. Cl. 40—5 1 Claim

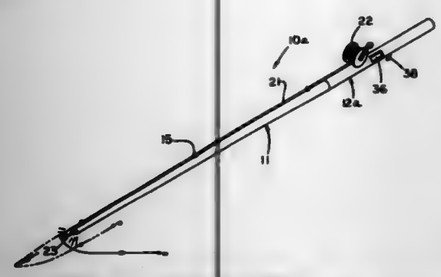
1. A shopping reminder device which comprises:
a) a pair of spaced plates, each said plate having a column of spaced apart slots and transversely projecting opposing

perimeter edges which engage to provide space between said plates;
b) a list of purchasable items is imprinted with each said item adjacent each said slot on each said plate;
c) means for securing said plates together along said perimeter; and
d) a plurality of slide members, each mounted slidingly on said slots on each of said plates, wherein each of said slide members has an indicator external of said plates and a portion between said plates whereby said indicator can be positioned to indicate an item to be purchased; wherein each said slide member includes adjustable means for



sliding and retaining said slide member in a desired position on said slot; wherein said adjustable means includes a pair of adjustable opposing buttons mounted on opposite sides of one of said plates including further means for retaining said buttons in tight frictional engagement with said plate for retaining said buttons at a desired position whereby pressure on one of said buttons releases said frictional engagement between said buttons and said plate whereby said slide member can be moved along said slot; wherein said further means comprises a shaft extending from one of said buttons through the other of said buttons including a spring biasing said shaft towards said other said button, said spring being external of said other button.

5,193,298
FISHING ROD APPARATUS
James A. O'Neill, P.O. Box 722, Honeybrook, Pa. 19344
Filed Jan. 27, 1992, Ser. No. 826,032
Int. Cl.[5] A01K *91/02*
U.S. Cl. 43—19 2 Claims



1. A fishing rod apparatus, comprising,
a first rod tube, with the first rod tube including a first tube forward end, and
a first tube bore directed coextensively through the first tube, and
a second rod tube, the second rod tube including a second tube bore extending from a forward end of the second tube coaxially aligned with the second tube, with the second rod tube terminating in a second rod tube rear wall, and
a plurality of first coaxially aligned tube guide loops mounted to an exterior surface of the first rod tube, and
a fishing reel mounted to the second rod tube aligned with the first tube guide loops, and
fishing line directed from the fishing reel through the guide loops, and
a ferrous float member, the ferrous float member including a positioning rod extending from the ferrous float member securing the fishing line, and
the ferrous float member arranged for reception within the first tube forward end, and
an ejector rod reciprocatably mounted within the first rod tube and the second rod tube, with control means mounted to the second rod tube for securing the ejector rod in a first position, with the first rod tube spaced from the first tube forward end and the control means arranged for releasing the ejector rod to a second position, wherein the ejector rod projects exteriorly of the first tube forward end for projecting the float member and the fishing line from the first rod tube, and
a magnetic ring mounted within the first tube forward end in surrounding relationship relative to the first tube bore, with the ejector rod slidably and reciprocatably mounted within the first tube bore and the second tube bore, and
the second rod tube includes a lug receiving groove directed through the second rod tube, and a trigger housing mounted below the groove, and a trigger pivotally mounted within the trigger housing, and a trigger pivot axle pivotally mounting the trigger to the trigger housing, and an abutment rod orthogonally oriented and slidably directed through the trigger housing and orthogonally oriented relative to the ejector rod, wherein the ejector rod includes a lug slidably received within the groove and the abutment rod is in confronting relationship relative to the lug in the first position and displaced below the lug in a second position, and wherein the abutment rod includes an abutment rod pivot axle pivotally mounting the lower distal end of the abutment rod to the trigger, and the abutment rod reciprocatably mounted within a receiving cavity, the receiving cavity including a cavity floor, and the abutment rod including an abutment rod plate, and an abutment rod spring captured between the plate and the cavity floor to bias the abutment rod into engagement with the lug.

5,193,299
REALISTIC SWIMMING FISH LURE
Robert P. Correll, P.O. Box 57 Benedict Ave., Benedict, Md. 20612, and Joseph H. Gribble, 13109 River Terr., Lusby, Md. 20657
Filed Apr. 9, 1991, Ser. No. 682,361
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.47 4 Claims

1. A lure for use with a fishing line, said lure resembling a fish, said lure comprising:
a flexible body having the shape of a fish, said body including a head region and a flexible tail region movable relative to said head region;
a rigid brace within said head region for stiffening said head region;
hook means;
fishing line attachment means; and
a pair of flexible thin wings extending from said body adjacent said head region, each of said wings having a leading edge facing said fishing line attachment means and a trailing edge facing said tail region, said wings lying generally

in a horizontal plane, said wings adapted to oscillate in a flow of water over said lure, said wings being movable relative to said body and also relative to and independently of said movable tail region;

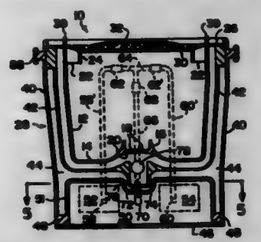
each of said wings having a convex leading edge and a concave trailing edge and said horizontal plane being inclined to the flow of water over said lure, to force said lure downward.

5,193,300
TRIPANEL HYDRODYNAMIC DEPRESSOR FOR FISHING LINES
Robert G. Johnson, P.O. Box 540, Seaview, Wash. 98644
Filed May 1, 1992, Ser. No. 877,676
Int. Cl.[5] A01K *95/00*
U.S. Cl. 43—43.13 7 Claims

1. A hydrodynamic tugger for a fishing line comprising a generally horizontal plate body, means for connecting said body to the fishing line including a guide rod carried by said plate body and extending fore and aft, a ring carried by the end of the fishing line adjacent to said body and having sliding engagement with said guide rod, and a rib carried by said body adjacent to said guide rod, elongated transversely of said guide rod and engageable by said ring sliding along said guide rod for deterring movement of said ring past said rib, but said guide rod being sufficiently yieldable relative to said rib to enable said ring to be forced along said guide rod past said rib.

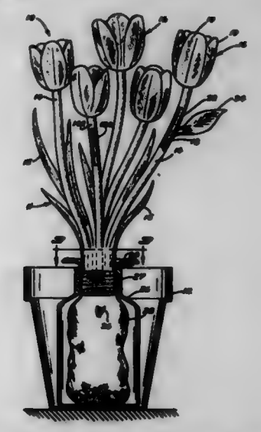
5,193,301
INSULATED FLOATING AC/DC POWER PUMP MINNOW BUCKET
James E. Figgins, 1278 Ellen Dr., Zanesville, Ohio 43701
Filed Sep. 10, 1992, Ser. No. 942,505
Int. Cl.[5] A01K *97/04*
U.S. Cl. 43—57 10 Claims

1. A bait bucket assembly comprising:
a) a bucket having a peripheral side wall and a bottom with a slightly concave center portion extending a short distance inwardly, said center portion having a plurality of openings therein;
b) floatation means attached to the side wall of said bucket at the top thereof;
c) a receptacle adapted to receive and support said bucket, said receptacle having a bottom, an exterior wall and an interior wall with insulation therebetween, said interior wall being shaped slightly larger than said bucket, the bottom of said interior wall having a recess in a center portion, said recess containing a nozzle;
d) the exterior wall of said receptacle extending a distance below the bottom of said interior wall with a bottom plate



attached thereto defining a water-tight enclosure containing air pump means;
e) a source of power for said air pump means; and
f) a conduit connecting said air pump means through the openings in the bottom of said bucket to aerate the water contained therein; whereby said bucket is removable from said receptacle.

5,193,302
BUG TRAP
Harvey H. Rusco, 308 Sixth Ave., Box 485, Ironton, Minn. 56455, and Donald J. Stealy, 1010 Birch St., Crosby, Minn. 56441
Filed Jan. 17, 1992, Ser. No. 822,073
Int. Cl.[5] A01M *1/10*
U.S. Cl. 43—107 10 Claims



1. A bug trap disguised as a plant comprising:
an artificial plant having at least one tubular artificial stem having a tubular passage between first end thereof and a second end;
a bug receptacle connected to one end of the stem;
an artificial blossom connected to the stem to attract bugs, said blossom having outwardly open interior surfaces;
a plurality of resilient filament type members located on the interior surfaces of the blossom connected at one end to the blossom and inwardly directed toward the tubular passage of the stem, said filament type members being sufficient in number and arranged in close proximity to one another to permit passage of a bug through the blossom into the tubular passage of the stem but prevent retreat of the bug from the blossom.

5,193,303

Patent Not Issued For This Number

5,193,304

PLANT POT CARRYING METHOD AND CARRIER

Anette G. Krueger, 199 King Street, St. Jacobs, Ontario, Canada N0B 2N0

Filed Sep. 28, 1990, Ser. No. 589,406
Int. Cl.[5] A01G 9/02
U.S. Cl. 47—67 18 Claims

1. For use with a plant pot of circular cross-section having a tapering upper rim area with upper and lower margins, said upper rim area of said lower margin thereof having a greater diameter than below said upper rim area, a plant pot carrier comprising a ring defined by a generally vertical but slightly tapered wall with upper and lower edges, said ring at said lower edge thereof having an inner diameter less than said diameter of said upper rim area of the plant pot above said lower margin and greater than said diameter of said plant pot below said upper rim area, said ring at said upper edge thereof having an inner diameter greater than said diameter of said lower margin of said upper rim area and not less than the diameter of said upper margin of said upper rim area, and at least one strap integral with said ring, said at least one strap being securable to define a single carrying handle looping from a first location on one side of said ring, thence upwardly, across and down to a second location 180° degrees from said first location, i.e. on the opposite side of said ring.

5,193,305

WICK INSERTION DEVICE FOR A PLANT POT

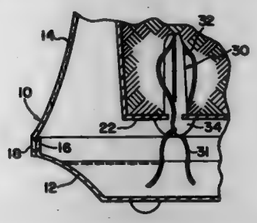
Reinhold Holtkamp, Jr., 1501 Lischey Ave., Nashville, Tenn. 37207-8565

Filed Oct. 29, 1991, Ser. No. 783,773
Int. Cl.[5] A01G 27/00
U.S. Cl. 47—81 7 Claims

1. A self-locking insertion device for a water-transmitting wick for a potted plant adapted to be watered by said wick through capillary action from a water supply, the pot having a bottom wall in which at least one opening is formed to receive the insertion device, said device comprising:

a) a generally flat, elongated, transversely flexible and resilient main body portion formed at its upper end with a slot having a width less than the diameter of the wick whereby said wick can be frictionally retained in said slot and extended therefrom into growing media in the pot, the dimension of said main body portion at the lower end thereof being slightly greater than the diameter of the opening in said pot;

b) a flexible, resilient base portion integrally formed coplangs with said main body portion, said base portion having a lateral dimension greater than the opening in the pot, and generally flat top flanges adapted to engage the bottom surface of the bottom wall of the pot around the opening in the pot when the device is mounted, said base being formed with an enlarged opening to receive said wick and a narrow slot extending from said opening to the exterior of said base at the bottom thereof, said narrow slot being of lesser width than the diameter of said wick whereby said wick can be forced through said narrow slot into said opening and retained in said opening, and



c) a pair of opposed grooves defining a neck at the juncture of said base portion and said main body portion, the width of said neck being less than the diameter of said opening in said pot,

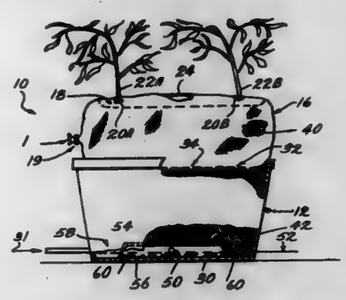
whereby said device with said wick in said upper slot and in said opening in said base can be extended upwardly through said opening in said pot, the lower end of said main body being transversely distorted to move through said pot opening, with the wall of the pot surrounding said pot opening thereafter being positioned in said grooves to lock said device in position, with one end of the wick in the growing media and the other end immersed in the water supply.

5,193,306

PLANT CULTIVATION APPARATUS AND METHOD

Blake Whisenant, P.O. Box 207 - Hwy. 62, Parrish, Fla. 34219

Filed Jul. 2, 1990, Ser. No. 546,448
Int. Cl.[5] A01G 27/00
U.S. Cl. 47—81 33 Claims



1. A reservoir container assembly for growing plants with a small amount of water, comprising:

a reservoir container means comprising a bottom, a sidewall, and an open top, the open top being disposed upwardly when the reservoir container is in use, the reservoir container means having a water permeable partition which separates the reservoir container means into a first volume and a second volume, the second volume being bounded on one side by the open top and containing a hydroscopic medium; and

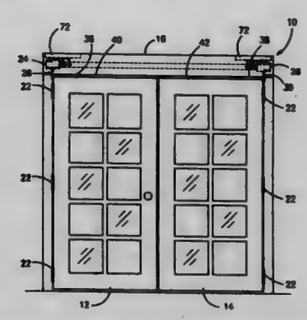
a bag container means for holding a plant growing medium, the bag container means having a bottom surface which rests on the hydroscopic medium in the second volume when the bag container means is disposed on top of said second volume of said reservoir container means, the bottom surface of the bag container means having perforations so that moisture from the hydroscopic medium can pass into the plant growing medium, the bag container means having at least one plant opening for allowing plant growth therethrough.

5,193,307

DOUBLE DOOR SWING CONTROL

Ernest W. Chupp, 7831 Chicago Ct., Omaha, Nebr. 68114

Filed Jan. 28, 1992, Ser. No. 826,593
Int. Cl.[5] E05C 7/06
U.S. Cl. 49—123 9 Claims



1. A double door swing control apparatus for facilitating the simultaneous opening of a pair of conventional separately hinged double swing doors having top, bottom, inner, and outer surfaces and having hinges attached externally to said outer surfaces such that the pivot axis of the door is external to the door itself comprising:

door control frame means adapted to be mounted in vertically spaced relation to said doors;

a pair of rotating members mounted on said door control frame means;

a pair of attachment means, each of said attachment means adapted for securement to one of said door surfaces;

a pair of shafts, each shaft connected between a rotating member and a respective one of said attachment means for rotation of said rotating member, shaft and attachment means in unison about the pivot axis of a respective door;

a tension member connected to and extending between said rotating members such that rotation of one rotating member causes an equal and opposite rotation of the other rotating member whereby a pair of double swing doors having said attachment means secured thereto are opened and closed in unison;

said attachment means further comprising a member extending generally outwardly of said door surface and to said pivot axis;

said rotating member comprising a spool;

said attachment means comprising a bracket operative to engage said shaft, such that pivoting of said door causes movement of said attachment means, causing rotation of said shaft, and rotation of said spool;

said tension member comprising a pair of cables and a plurality of shock absorbing members, said shock absorbing members being interconnected to said cables, said shock absorbing members being operative to absorb shock resulting from sudden opening of said door and operative to adjust the tension in said cables, and wherein said cables are secured to said spools; and

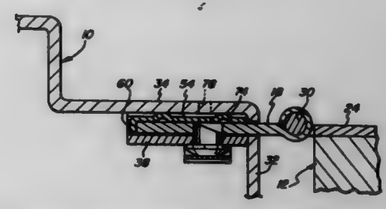
a raised member attached to each of said spools and having a plurality of recesses therein, a biasing member movably mounted on said frame means, a spring, said spring urging said biasing member against said raised member such that said spool is biased into positions corresponding to the positions of said recesses on said raised member and wherein said raised member has increased thickness at the ends thereof resulting in resistance to rotation of said spools in areas corresponding to said increased thickness the raised member between the recesses thereof being an area of decreased thickness.

5,193,308

SNAP-IN HINGE FOR DOORS WITH HOLLOW METAL FRAMES

Richard M. Davidian, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jul. 22, 1992, Ser. No. 918,587
Int. Cl.[5] E05D 15/01, 7/10
U.S. Cl. 49—381 25 Claims



1. A snap-in hinge assembly for mounting doors on door frames comprising:

(a) a hinge comprising a pair of leaves and pivot means coupling said leaves for pivotal movement, said leaves having recesses therein for fastening means to secure said leaves to an associated door and the door frame;

(b) a hinge leaf receiving receptacle adapted to be mounted in a recess and including:

(i) a reinforcing member having mounting portions adapted to be secured to the frame defining a recess and a seat portion defining a channel of a width dimensioned to receive the length of one of said hinge leaves, said seat portion having latch receiving recesses therein cooperatively positioned relative to said spaced recesses in said one hinge leaf;

(ii) a plurality of latch elements disposed in said latch receiving recesses; and

(iii) biasing means biasing said latch elements outwardly of said latch receiving recesses into said channel, said latch elements seating in said one hinge leaf recesses when said one hinge leaf is inserted into said channel, whereby the associated door may be mounted on the associated door frame by inserting said one hinge leaf into the receptacle and sliding said one hinge leaf into said channel of said receptacle to engage said latch elements in said recesses of said one hinge leaf.

5,193,309

AUTOMOTIVE WEATHERSTRIP

Masahiro Nozaki, and Masahiro Koide, both of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 21, 1992, Ser. No. 915,607
Claims priority, application Japan, Jul. 29, 1991, 3-212834
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—479.1 7 Claims

1. An automotive weatherstrip mounted along a peripheral flange of a door opening of an automobile comprising:

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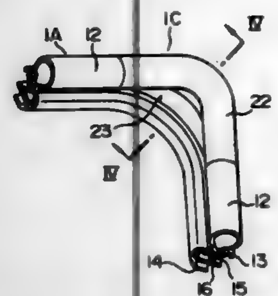
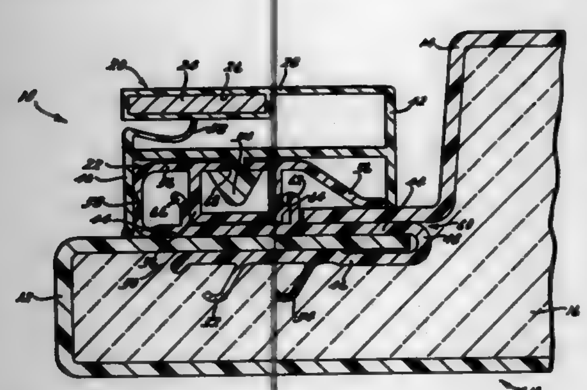
an extruded trim part having a generally U-shaped cross-section held by a peripheral flange of the door opening;
a hollow seal part protruding from one side of said trim part, contacting a peripheral edge of a door, said trim part being curvedly formed at a corner portion of said peripheral flange of said door opening, by cutting away a portion of said hollow seal part, said corner portion being held on a curved flange of said door opening;
a molded hollow seal part, being integrally molded with said



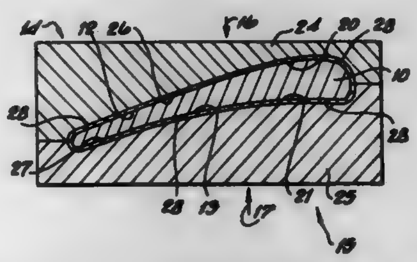
trim part defining said corner portion, said molded hollow seal part having an outer configuration substantially similar to that of said hollow seal part, said molded hollow seal part being circumferentially offset from said curved trim part so as to extend along an upper side and a vertical side of said door opening; and
a generally triangular part covering a side surface of said trim part from which said portion of said hollow seal part is cut away, said triangular part being integrally molded with said molded hollow seat part.

5,193,310
SNAP-LOCK SEAL RETAINER
Lowell M. Kiel, Seymour, Ind., assignor to The Standard Products Company, Cleveland, Ohio
Filed Sep. 26, 1991, Ser. No. 766,431
Int. Cl.[5] E06B *3/00*
U.S. Cl. 49—501 20 Claims



1. A retaining device, comprising:
an elongated base having longitudinal and lateral axes;
a first leg extending laterally substantially parallel to said base, said first leg connected to said base by a first web portion, an outer shell of a door, said base and said first leg forming a first channel for receiving the flange edge of said outer shell of said door;
a second leg connected to said base by a second web portion, a pan portion of a door, said second leg and said base forming a second channel for receiving the flange edge of said pan portion of said door, said second channel opening in a substantially opposite direction from said first channel;
said second web portion being formed with a hinge, said hinge allowing said second leg to rotate about said longitudinal axis with respect to said base and said first leg;
a door gasket, said second leg being formed with a fastening means for securing said door gasket to said retaining device; and
said base and said second leg having a locking means such the said base and said second leg secure said pan portion, said locking means adapted to prevent rotation of said second leg about said longitudinal axis.

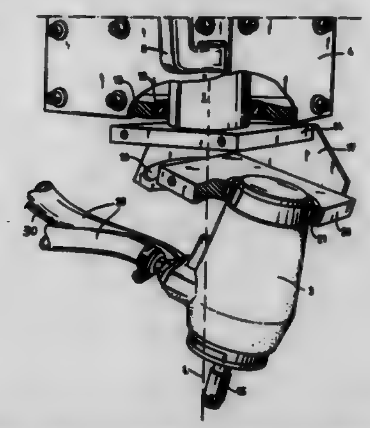
5,193,311
TOOLS FOR WORKING NON-METALLIC HARD MATERIALS
Derek J. Dawson, Shipley, United Kingdom, assignor to T&N Technology Limited, Warwickshire, England
Continuation of Ser. No. 539,156, Jun. 18, 1990, abandoned. This application Mar. 3, 1992, Ser. No. 845,002
Claims priority, application United Kingdom, Jun. 24, 1989, 8914567
Int. Cl.[5] B24B *19/00*
U.S. Cl. 51—59 SS 6 Claims



1. A tool of the type used for determining the action of an abrasive slurry on a surface of a non-metallic workpiece having a Vickers Hardness value up to 5000 to work said surface to a required three-dimensional shape, the tool having an irregular working surface which is formed by a layer of platelets of composite material mounted on a supporting substrate, the platelets adjoining one another and being shaped to give a substantially continuous working surface which is the inverse of the required three-dimensional shape, the composite material being a composition comprising silicon carbide, and a material selected from the group comprising gemstone powder and synthetic diamond powder.

5,193,312
NON-ROTATING GRINDING APPARATUS
Sören Gudmundsson, Vårsäddsvägen 2, S-444 95 Ödsmål; Dag M. Stenmark, Pl 6872B, S-444 91 Stenungsund, both of Sweden, and Robert Sjölander, 36 Cameo Street, Oakville, Ontario, Canada L6J 5Y1
Filed Jun. 25, 1991, Ser. No. 720,385
Claims priority, application Sweden, Aug. 17, 1990, 9002687
Int. Cl.[5] B24B *3/33*
U.S. Cl. 51—120 7 Claims

1. Grinding apparatus, for grinding buttons on a button bit, comprising:
a) a rotary device having a longitudinal axis, said rotary device bearing a downwardly extending first vertical output shaft, the rotary device being carried for adjustment by an arm system which is journalled on a stand, the vertical output shaft of the rotary device being connected via an attachment to a grinding machine;
b) a grinding machine having a longitudinal axis with a vertical upper end, said grinding machine being connected to the output shaft of the rotary device, said grinding machine likewise bearing an output shaft with a grinding pin thereon, a grinding surface of the pin lying on a point of intersection of respective longitudinal axes of the rotary device and the grinding machine, said grinding pin being self-centered on an object to be ground by means of the arm system, wherein the vertical upper end of the grinding machine beneath the rotary device is carried by a rotation compensating bearing arrangement;

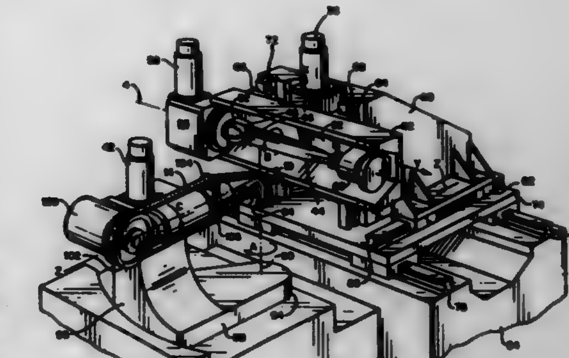


c) a compensating bearing arrangement including a corotating attachment thereon, said bearing arrangement enabling the grinding machine to execute a non-rotating rocking movement during operation of the rotary device.

5,193,313
VACUUM SANDER
Angelo Sanchez, New City; Michael J. Ferdinand, Pearl River, and Robert J. Buchalski, Jr., Washingtonville, all of N.Y., assignors to Partnership of Angelo Sanchez, et al., New City, N.Y.
Filed Dec. 23, 1991, Ser. No. 811,851
Int. Cl.[5] B24B *23/00*
U.S. Cl. 51—170 R 1 Claim

1. A vacuum sander for use in connection with a source of negative pressure comprising a flat chamberless base plate, the underside of which defines a plurality of buffer extensions and a central opening, an elongated handle pivotably coupled to said base plate, a vacuum hose leading to said source, means for providing a hose coupling to said central opening, and a plug for coupling said hose to said source, said plug having an adjustable plate defining means for adjusting airflow therethough.

5,193,314
COMPUTER CONTROLLED GRINDING MACHINE FOR PRODUCING OBJECTS WITH COMPLEX SHAPES
David Wormley, Newton, and Edward A. Agranat, Weston, both of Mass., assignors to General Electric Company, Schenectady, N.Y,
Continuation of Ser. No. 475,762, Feb. 6, 1990, abandoned. This application Feb. 21, 1992, Ser. No. 838,942
Int. Cl.[5] B24B *49/00*
U.S. Cl. 51—165.71 17 Claims

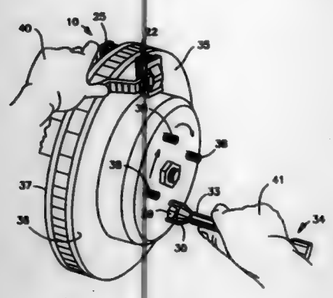


1. The method of finishing a workpiece to correspond to a predetermined complex shape comprising the steps of
providing a control computer having stored therein data representing the surface of a model of the object to be created,
positioning said workpiece for rotation about a stacking axis of said model,
positioning an abrasion tool having an abrasive belt to engage the surface of said workpiece along a linear contact line,
supporting said abrasion tool on a C axis passing through a fixed point on said contact line for relative movement between said abrasion tool and said workpiece along a Z axis extending perpendicular to said stacking axis,
angularly adjusting said abrasion tool about said C axis to maintain said contact line along a surface of said model,
angularly adjusting said C axis about an X axis perpendicular to said C axis and passing through said contact line to maintain said C axis in a plane perpendicular to the plane of a local normal of said model and passing through said contact line,
adjusting the translational position of said abrasion tool relative to said workpiece along said Z axis,
continually and automatically determining the position of the surface of said workpiece along said C axis,
continually and automatically determining the position of said belt at the point where said belt makes contact with said workpiece, thereby to determine the thickness of said belt, and
continually and automatically readjusting the translational position of said abrasion tool relative to said workpiece to compensate for changes in the thickness of said belt caused by wear during the finishing process.

5,193,315
METHOD FOR CLEANING A BRAKE ROTOR
Ruben E. Martinez, 14601 Mountain Spring, Hacienda Heights, Calif. 91745
Filed Dec. 9, 1991, Ser. No. 803,581
Int. Cl.[5] B24B *23/00, 1/00*
U.S. Cl. 51—281 SF 3 Claims

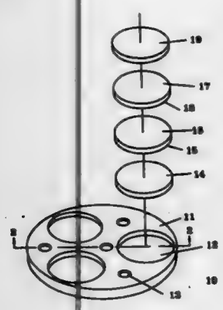
1. A method for cleaning a used brake rotor by hand, said brake rotor being of the type having a plurality of wheel lugs extending therefrom comprising:
placing a lug nut on one of the wheel lugs;

inserting a socket member having an elongated, cylindrical handle over the lug nut;
pressing a pair of abrasive means over said rotor; and



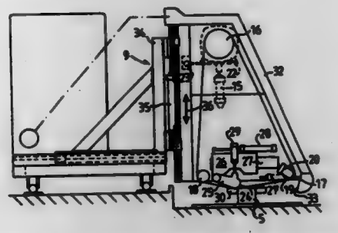
moving the socket member in a circular direction thereby turning the rotor and moving the abrasive means against the surfaces of the rotor.

5,193,316
SEMICONDUCTOR WAFER POLISHING USING A HYDROSTATIC MEDIUM
Dennis L. Olmstead, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 29, 1991, Ser. No. 784,491
Int. Cl.[5] B24B *7/10, 7/22*
U.S. Cl. 51—281 SF 13 Claims



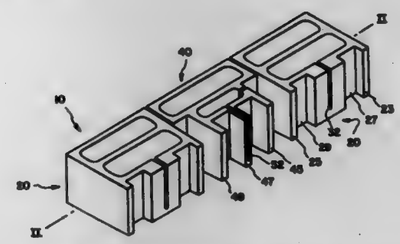
1. An apparatus for urging semiconductor wafers into contact with a polishing pad, comprising:
a movably supported piston means for providing a driving force to be applied to a wafer; and
a flexible linkage means contacting said wafer and operatively responsive to movement of said piston means for distributing the force from said piston means uniformly onto the wafer without using any rigid force transmitting components, said flexible linkage means including a hydrostatic means for effecting force transfer, said hydrostatic means including a fluid which is displaced toward the wafer in response to movement of said piston means.

5,193,317
METHOD FOR GRINDING METAL AND METAL-ALLOY STOCK
Tom Nordquist, Bågvägen 7, Västervik, Sweden S-593 41 , and Leo Malinen, Degerfors, Sweden, assignors to Tom Nordquist, Sweden
PCT No. PCT/SE89/00496, § 371 Date Apr. 12, 1991, § 102(e) Date Apr. 12, 1991, PCT Pub. No. WO90/02631, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 14, 1989, Ser. No. 659,399
Claims priority, application Sweden, Sep. 16, 1988, 8803281
Int. Cl.[5] B24B *21/08*
U.S. Cl. 51—322 31 Claims



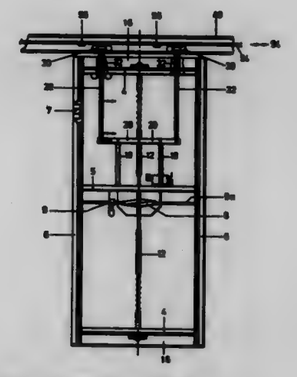
1. A method for treating surface faults and impurities on metal stock which has been subjected to hot working, comprising grinding said hot metal stock by applying an endless abrasive belt to said hot metal stock from said hot working while said hot metal stock remains at a temperature of between about 500° and 1500° C., and applying the desired grinding pressure to said hot metal stock during said grinding by means of a contact device in which the pressure applied by said contact device is created by a fluid, whereby said contact device maintains floating contact with said hot metal stock during said grinding.

5,193,318
ACOUSTICAL DIFFUSING AND ABSORBING CINDER BLOCKS
Peter D'Antonio, Largo, Md., and John H. Konnert, Reston, Va., assignors to RPG Diffusor Systems, Inc., Upper Marlboro, Md.
Filed Oct. 23, 1991, Ser. No. 780,955
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] E04B *1/82*
U.S. Cl. 52—144 17 Claims



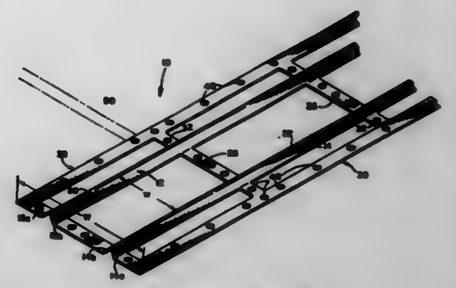
1. A cinder block comprising:
a) a block having a first face having a plurality of wells, said wells being of particular depths with respect to one another which are determined by use of a quadratic-residue number theory sequence, wherein each consecutive well is given a number from 0 to n, where n equals one less than a total number of wells, and wherein a depth of any particular well is determined by squaring said number for said particular well and dividing said squared number by a chosen modulus number resulting in a remainder, the remainder after said dividing being multiplied by a chosen constant to arrive at said depth of said particular well;
b) said block having a second face on an opposite side of said block from said first face, said second face enclosing at least a portion of a mortar chamber facilitating attachment of said block to an adjacent structure.

5,193,319
ROOM-SPACE PARTITION MADE OF DISPLACEABLE WALL ELEMENTS
Herbert Claassen, Barbel; Werner Klein, Wilhelmshaven, and Manfred Radmacher, Oldenburg-Metjendorf, all of Fed. Rep. of Germany, assignors to Huppe Form Sonnenschutz- und Raumtrennsysteme GmbH, Fed. Rep. of Germany
Filed Jul. 30, 1991, Ser. No. 738,107
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1990, 4026098
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—243.1 15 Claims



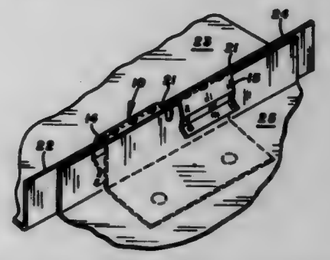
1. Room-space partition comprising:
(a) a guide rail;
(b) an endless element located within the guide rail;
(c) displaceable wall elements, having perpendicular end faces, wherein each wall element comprising two carrier studs, with one carrier stud being horizontally displaceable toward the other carrier stud such that the spacing between the two carrier studs is variable between a minimum interval and a maximum interval, and wherein the displaceable wall elements are suspended by carrier members that are attached to the carrier studs, the carrier members being displaceable in the guide rails and rotatable about the carrier studs, and wherein the wall elements are movable along their perpendicular end faces in sealing contact against one another;
(d) two followers, each follower fixed on the endless element at a spacing corresponding to a maximum interval between the carrier studs of the wall element; and
(e) two follower pins disposed on the carrier members and releasably engageable with the followers, which are vertically movable between a retracted position and an extended position, wherein the follower pins come into releasable engagement with the followers when in the extended position.

5,193,320
MASONRY LAYING DEVICE
Daniel T. Cocegna, 417 Jonathan Pl., Philadelphia, Pa. 19115
Filed Jan. 16, 1991, Ser. No. 642,108
Int. Cl.[5] E04B *2/00*
U.S. Cl. 52—442 44 Claims



1. A planar leveling device comprising:
first and second elongated, substantially rigid support members, each support member being about one foot or more in length, the first and second support members defining the plane of the device and having uniform equal maximum heights in directions perpendicular to the plane, the device having a maximum height in directions perpendicular to the plane equal to the equal heights of the first and second support members, each of the first and second support members being at least generally pointed along at least one side to provide only a thin edge along one planar side of the device, each of the first and second support members increasing in width between the thin edge on one side of the member and a side of the member opposite the one side, each support member at least maintaining the increase in width to the opposing side of the member; and
spacer means for coupling the first and second elongated members together in spaced, side-by-side relation.

5,193,321
STANDING SEAM PANELING SYSTEM
Arthur O. Edwards, Edina, Minn., assignor to Edco Products, Incorporated, Hopkins, Minn.
Filed Jan. 6, 1992, Ser. No. 817,080
Int. Cl.[5] E04C *3/00*
U.S. Cl. 52—466 10 Claims



1. A clip for use in installing standing seam paneling which comprises:
A. a generally rectangular upright body section,
B. a flange-like foot section integral with and extending outwardly from the bottom edge of the body section,
C. at least one hole in said foot section to permit fastening of the clip to an underlying support surface,
D. a pair of slightly spaced apart angularly contoured mem-

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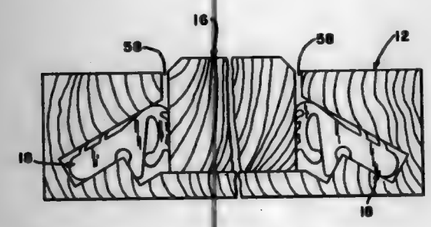
bers integral with the top edge of the body section, said members having:

1) a first section coextensive with the body section,
2) a second section extending angularly outward and upward from the first section on opposite sides of the body section, and
3) a third section extending angularly upward from the second section, and

E. a row of perforations adjacent to the top edge of the body section to facilitate bending of the contoured members in opposite directions on opposite sides of the body section.

5,193,322
MOLDING ASSEMBLY
James Wood, Williamsport, Pa., assignor to D/P, Inc., Williamsport, Pa.
Filed Feb. 14, 1991, Ser. No. 655,050
Int. Cl.[5] E04F *19/02*
U.S. Cl. 52—718.01 27 Claims



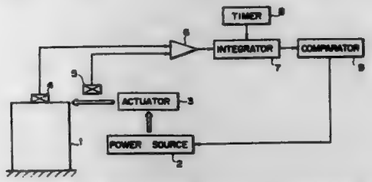
1. A retention insert comprising an elongate body formed from a resilient material, the insert including a nose at one end of the body, an arm support surface and a contact arm having a free end at the other end of the body, said arm extending across the width of the body and being bowed outwardly of the body, with the free end normally spaced a distance from the support surface, an insertion stop adjacent the arm projecting to one side of the nose and having a stop surface facing away from the arm and toward the nose end of the body, and a spring on the side of the nose away from the stop.

6. A molding assembly comprising an elongate base molding having a trim recess extending along the length of the base molding and defining a first sidewall, a first insert groove extending into the sidewall, the groove including a narrow slot away from the recess and a wide slot opening into the recess with a locating step facing the recess at the junction between the narrow and wide slots, a first retention insert as in claim 1 fitted within the insert groove with the nose extending into the narrow slot, the end of the nose spaced a distance from the bottom of the narrow slot, the stop positioned in the wide slot with the stop surface engaging the locating step and the contact arm extending into the recess, a trim molding in the trim recess, the contact arm engaging one side of the trim molding to form a frictional connection holding the trim molding within the recess.

5,193,323
SAFETY MONITORING METHOD FOR USE IN ACTIVE SEISMIC RESPONSE AND WIND CONTROL SYSTEM
Koji Ishii; Masao Iizuka; Jun Tagami, all of Chofu; Toshikazu Yamada, Tokyo; Katsuyasu Sasaki, Tokyo, and Yoshiki Ikeda, Tokyo, all of Japan, assignors to Kajima Corporation, Tokyo, Japan
Division of Ser. No. 481,979, Feb. 20, 1990, Pat. No. 5,016,290.
This application May 3, 1991, Ser. No. 695,095
Claims priority, application Japan, Feb. 23, 1989, 1-43563
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—741.3 4 Claims

1. In an active seismic induced vibration and/or wind control system for protecting a building, the method of protecting the said system from destructive overload and/or malfunction comprising the steps of:

(a) measuring the speed of movement of said building induced by seismic tremor and/or wind;
(b) measuring the load imposed on the said system during periods of seismic induced vibration and/or wind;



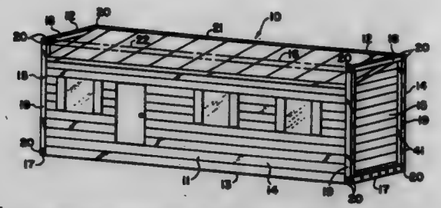
(c) comparing said measured speed of movement of said building with said measured imposed load to obtain a resultant numerical figure;
(d) determining whether said resultant numerical figure exceeds a predetermined numerical figure; and
(e) deactivating said system if said resultant numerical figure exceeds said predetermined numerical figure.

5,193,324
CONCRETE BEAM REINFORCEMENT SYSTEM
Richard R. Fellows, 1001 E. Mackinac Ave., Oak Creek, Wis. 53154
Filed Mar. 12, 1992, Ser. No. 850,476
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—743 9 Claims

1. A method of reinforcing existing conventional concrete block construction foundation walls resting on a concrete slab foundation; wherein, the method comprises the following steps

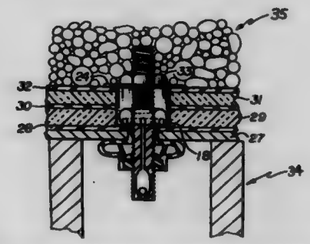
a) creating spaced openings in the exterior surface of the foundation walls at a selected depth below the final grade
b) inserting through each of the openings an elongated vertical steel rerod having: a generally straight lower portion which extends through hollow vertical passageways in the interior of the foundation walls, wherein the bottom of the vertical rerods rests on the foundation slab; and, also having a bent upper portion which projects outwardly from the respective openings in a generally horizontal fashion
c) operatively attaching a plurality of horizontal rerods to the generally horizontal portion of each of the vertical rerods
d) at least partially surrounding the horizontal rerods and the upper portion of the vertical rerods in a concrete form disposed in at least one plane relative to the exterior of the foundation walls
e) pouring concrete through said openings to surround the lower portions of the vertical rerods in a column of concrete; and
f) continuing to pour concrete into said concrete forms to surround the horizontal rerods and the upper portions of the vertical rerods in a finished concrete reinforced beam.

5,193,325
STANDARDIZED PORTABLE HOUSING UNIT
Robert S. Allison, 203 B Lentz Rd., Yulee, Fla. 32097
Filed Nov. 27, 1991, Ser. No. 799,561
Int. Cl.[5] E04H *5/06*
U.S. Cl. 52—745.02 7 Claims



1. A method for transforming a prefabricated housing unit having four vertical corners into a standardized transportable stackable housing unit which comprises attaching to each said corner of the prefabricated housing unit a, weight-supporting rigid beam having a plurality of lifting eyes at each end of said beam and being positioned such that the beam ends adjacent said eyes lie in three pairs of parallel planes defining a prismatic space which completely encloses said standardized housing unit and has outside dimensions identical to those of standard cargo containers.

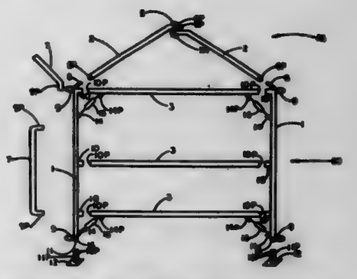
5,193,326
METHOD OF USING A FASTENER TO SECURE A MULTIPLE LAYERED ROOF, TO REPAIR A ROOF, AND TO DETECT LEAKS IN A ROOF
James P. Sheahan, Midland, Mich., assignor to J. P. Sheahan & Associates, Midland, Mich.
Division of Ser. No. 440,705, Nov. 24, 1989, Pat. No. 5,080,542.
This application Sep. 30, 1991, Ser. No. 767,675
Int. Cl.[5] E04B *1/38*; E04G *23/00*
U.S. Cl. 52—746 4 Claims



1. A method of securing a multiple layered roof, the method comprising the steps of

(I) providing a roof support means;
(II) surmounting the roof support means with a roof deck;
(III) surmounting the roof deck with a water impermeable membrane, said membrane having a generally flat surface coextensive with the roof deck;
(IV) securing to the roof deck, a fastener comprising in combination
a standpipe,
a free floating spherical ball,
a flexible catch.
an extension shaft, and
a means for stabilizing the extension shaft and holding the fastener in place, wherein the standpipe comprises a bolt threaded on its exterior surface, said bolt having an upper end and a lower end and having a small hollow bore throughout its entire length and having fixedly attached on its upper end, a hub, said hub having a threaded center bore, said hub having at least one small port running laterally through its wall at its base and each said small port aligning with a second small port running laterally through the bolt and joining with the small hollow bore of the bolt to form a continuous conduit running from the outside of the hub to the bottom end of the bolt and exiting therefrom, said hollow bore having an upper end and an exiting end and having a widened portion just prior to its exiting end to contain said free floating spherical ball, said widened portion having an upper end configured to accomodate and nest the free floating ball, said widened portion having a lower end configured to prohibit the accomodation and nesting of the the free floating ball;
the flexible catch comprising a lower base having a threaded center bore said base being surmounted by, and integrally molded with, a flexible hollow tube, said flexible hollow tube having at least two narrow, vertical openings in its wall, said hollow tube being layered by a thin gasket at its top end, which gasket is fixedly attached to the hollow tube, said gasket having a center hole having a diameter approximating the diameter of the bolt of the standpipe;
said flexible catch being movably mounted on the lower end of the bolt of the standpipe using the threaded center bore of its base such that turning the catch on the bolt compresses the flexible hollow tube;
an extension shaft, said extension shaft having a threaded diameter allowing insertion into, and threadable mating with, the hub of the standpipe and, the stabilizing means, by spacing a plurality of said fasteners over the area of the roof;
(V) surmounting the water impermeable membrane with planks of thermal insulation;
(VI) adjusting the fasteners downwardly to compress and secure the thermal insulating planks to hold them securely.

5,193,327
PORTABLE PAVILION
Lynn F. Goodenberger, Box 149, Cambridge, Nebr. 69022
Filed Aug. 26, 1991, Ser. No. 749,934
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—747 19 Claims



1. A method of assembling a portable pavilion;
said portable pavilion being easy to assemble, break down and transport, said portable pavilion being comprised of a framework, which framework is comprised of a multiplic-

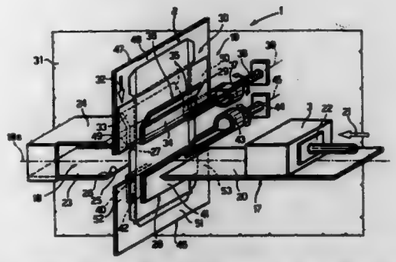
ity of each of a series of standardized relatively compact basic elements including:
side supports;
side spacers;
side support feet;
roof supports; and
side support interconnection elements;
the number of said side supports, side feet and rood supports being equal;
said side supports being elongated elements with a multiplicity of side spacer connection means thereon for connecting to said side spaces; on one end of each said side support there being a side support foot connection means for connecting to a complimentary connection means on a side support foot; and on the other end of each support there being a roof support connection means typically projecting at an angle to the longitudinal axis of said side support; said side supports further having eyelet element connection means at the ends thereof to allow interconnecting of adjacent side supports by side support interconnection elements;
said side spacers being elongated elements, with connection means in the longitudinally opposed ends thereof which are complimentary to the side spacer connection means on the side supports;
said roof supports being elongated elements with connection means on one end thereof which are complimentary to roof support connection means on one end of said side support, and which have means for pivotally interconnecting a multiplicity of said roof supports, at the longitudinally opposed end thereof, to one another to form a roof structure;
said side support feet being essentially flat relatively large surface area structures with a complimentary connection means on one relatively large surface area side thereof allowing connection to a side support foot connection means on one end of each side support, each of said side support feet being connected to a side support in one of a number of possible orientations;
said multiplicity of side supports being paired off and oriented with each side support projecting essentially vertically from its connection to its associated side support foot as said side support foot sets upon an essentially horizontal underlying surface, and with the side spacer connection means of one side support in each pair facing the side spacer connection means of the second side support thereof, between corresponding side spacer connection means there being connected side spacers; said upper and lower side spacers secured to the side supports to which they are connected by turnbuckles or equivalent, to form a side structure;
a multiplicity of which side structures are oriented with respect to one another in a fashion best described as tangential to a circumference of a circle which has its center at a point whereat projections which are simultaneously perpendicular to the longitudinal dimension of the side spacers in each side structure, and parallel to the underlying essentially horizontal surface, meet; and which projections are angularly offset with respect to one another as viewed from above said multiplicity of side structures;
adjacent side structures being interconnected by at least one side structure interconnection element which connects to side structure eyelet element connection means present on each side support;
said roof structure being connected to the interconnected side structures at each side support by connection means on each roof support which are complimentary to the roof support connection means on the side supports;
which method comprises the steps of:
a. assembling the side structures and interconnecting them, with side structure interconnection elements, at upper and lower ends thereof;
b. assembling the roof structure;
c. releasably attaching a telescoping center pole to the means for pivotally interconnecting the multiplicity of roof supports and lifting the roof structure vertically to a level which allows connection of each roof support to a side support;
d. operating the telescoping center pole so that the roof support interconnecting means are secured; and
e. removing the telescoping center pole and the lower side structure interconnecting elements.

5,193,328

METHOD AND DEVICE FOR FOLDING PACKING BLANKS ALONG PREFORMED BEND LINES

Silvano Borlani, and Antonio Gamberini, both of Bologna, Italy, assignors to G. D. Societa' per Azioni, Bologna, Italy

Filed Jul. 17, 1992, Ser. No. 914,420
Claims priority, application Italy, Jul. 19, 1991, B091A000266
Int. Cl.[5] B65B *11/08, 49/08;* B31B *3/44*
U.S. Cl. 53—466 **7 Claims**



1. A method of folding packing blanks (2) along reformed bend lines (9, 10, 13, 14) defining, on each blank (2), an intermediate portion (4) and two lateral portions (5, 6) on either side of the intermediate portion (4), and, on each lateral portion (5, 6), a lateral panel (7, 8) and at least one outer portion (11, 12) extending outwards from a respective outer edge of the respective lateral panel (7, 8); said method being characterized by the fact that it comprises stages consisting in positioning the blank (2) with the intermediate portion (4) facing the input opening (25) of a folding seat (18), and with each lateral portion (5, 6) in the same plane (30) as the intermediate portion (4) and engaged by respective gripping means (29, 28); strain-relieving the blank (2) by effecting at least one oscillation of a given angle of each said ripping means (28, 29) about a respective axis (45, 39) coaxial with the bend line (10, 9) connecting the respective lateral portion (6, 5) to the intermediate portion (4); feeding the product (3) into contact with said intermediate portion (4); and inserting the blank (2) and product (3) inside said folding seat (18), for finish folding said lateral portions (5, 6).

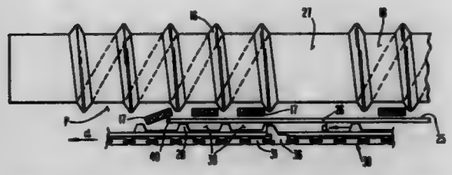
5,193,329

AUTOMATIC TRAY LOADING MECHANISM

Eugene J. Loffredo, Palmyra, and Vincent G. Pasquini, Hershey, both of Pa., assignors to Eastern Design & Development Company, Hershey, Pa.

Filed Sep. 10, 1991, Ser. No. 757,245
Int. Cl.[5] B65B *5/04, 35/26, 35/46*
U.S. Cl. 53—473 **11 Claims**

1. An automatic tray loading mechanism comprising:
a) a screw member having spiral having disposed circumferentially about its outer periphery;
b) means for rotating said screw member;
c) a shelf member disposed below and in fixed relation to said screw member and defining a path of article travel therebetween; and
d) tray transport means for serially conveying a row of tray members;
e) wherein said tray transport means is disposed in underlying relation to said shelf member and extends beyond said shelf member; and



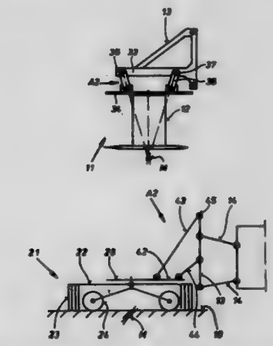
f) wherein said screw member is rotated to propel products along said shelf member along said path of article travel and dispense said products into a said tray member.

5,193,330

AGRICULTURAL REAPING OR HAYING MACHINE

Josef Nusser, 7963 Eichstegen, Fed. Rep. of Germany

PCT No. PCT/EP89/00268, § 371 Date Sep. 7, 1990, § 102(e) Date Sep. 7, 1990, PCT Pub. No. WO89/08380, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 14, 1989, Ser. No. 573,047
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808423; Mar. 29, 1988, 3810634; Oct. 18, 1988, 3835366; Oct. 18, 1988, 3835367
Int. Cl.[5] A01D *34/63, 78/12*
U.S. Cl. 56—6 **18 Claims**



1. Reaping or haying machine comprising at least one rotatingly drivable mowing or raking unit (12, 22) which is provided with implements constructed as mowing blades or raking tines and defining a working plane and by means of a compensating means (A1, A2, A3, A4) is supported on a support frame (13) connectable to a tractor pivotally about at least one pivot axis extending transversely of the travelling direction, characterized in that the compensating means (A1, A2, A3, A4) is constructed in such a manner that a pivot axis of the mowing or raking unit (12, 22) lying transversely of the travelling direction extends through an instantaneous center of rotation arranged beneath the working plane.

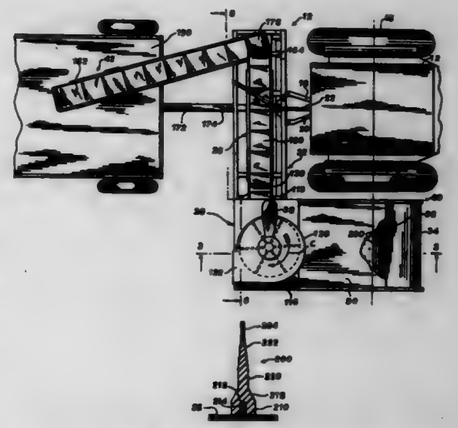
5,193,331

LEGUME HARVESTER

Robert J. Quandt, Hudson, Wis., assignor to Twin Technology Incorporated, Milwaukee, Wis.

Filed Sep. 18, 1991, Ser. No. 761,516
Int. Cl.[5] A01D *45/22, 45/24*
U.S. Cl. 56—12.8 **29 Claims**

1. A crop harvester of the type adapted to be releasably secured to and powered by a motive vehicle such as a tractor for machine harvesting crops, the harvester comprising:
a. a universal collector and transfer mechanism including means for collecting the harvested crop, means for separating trash therefrom and means for conveying the collected, separated crop to a remote receiving station, the universal collector and transfer mechanism adapted to be releasably secured to the vehicle; and
b. a harvesting implement releasably mounted on the universal collector and transfer mechanism and adapted for harvesting a predetermined crop from a plant and including means for delivering the crop to the collector and transfer mechanism.



24. A crop picking finger of the type adapted for mechanically harvesting "gourmet-type" leguminous vegetable crops from a plant, a plurality of fingers adapted to be placed on a moving web and brought into contact with the plant for combing the crops therefrom, each of said fingers comprising a cylindrical base, attached to said belt, a tapered transition section, a cylindrical shank coaxial with said base and of smaller outside diameter than the base and a cylindrical, flexible coaxial tip of an outside diameter smaller than the outside diameter of the shank.

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SPINNING OR TWISTING DEVICE WITH A PIPE SHAPED ELEMENT CAPABLE OF BEING SUBJECTED TO NEGATIVE PRESSURE

Albert Kriegler, Ziegeleistrasse 5, D-8069 Rottenegg; Rudolf Becker, Julius-Leber-Strasse 8; Rupert Karl, Thomastr. 13 a, both of D-8070 Ingolstadt, and Johann Halbritter, Ulmenstr. 14, D-8071 Wettstetten, all of Fed. Rep. of Germany

Continuation of Ser. No. 547,791, Jul. 2, 1990, abandoned. This application Oct. 18, 1991, Ser. No. 780,528
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, 3921911
Int. Cl.[5] D01H *4/00, 4/50*
U.S. Cl. 57—263 **27 Claims**

1. Means for recovering and back-feeding broken yarn on apparatus for producing yarn, which apparatus has a yarn-producing element, a pipe-shaped element having a bore for guiding yarn produced to and from said yarn-producing element, a mouth at an outer end of said pipe-shaped element having an axis and means for collecting yarn produced by said yarn-producing element, said recovering means comprising:
(a) means for recovering a broken yarn end from said yarn collecting means and for guiding said yarn end to a predetermined position;
(b) presenting means for gripping said recovered yarn end and presenting said yarn end by lateral movement to said outer end of said pipe-shaped element;
(c) means for cutting said yarn between said recovering

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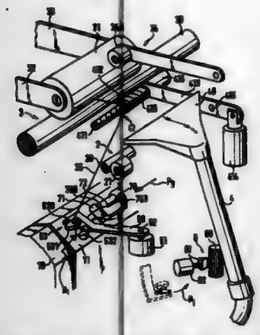
means and said preventing means a predetermined length from said presenting means;

(d) means for moving said presenting means along a predetermined path to adjacent the mouth of said pipe-shaped element, said predetermined path being perpendicular to said axis of said mouth of said pipe-shaped element;

(e) an elongated nozzle disposed on said outer end of said pipe-shaped element having an elongated groove in pneumatic communication with said pipe-shaped element, said elongated groove extending parallel to said predetermined path of said presenting means and perpendicular to the axis of said mouth of said pipe-shaped element so that said presenting means guides said predetermined length of



yarn end over and past said mouth of said pipe-shaped element with said length of yarn end initially entering said elongated groove and being oriented therein generally transversely to said axis of said mouth thereby ensuring said yarn end is positively guided to said mouth; and

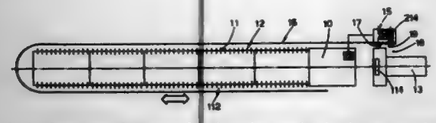
(f) means for creating a negative pressure within said pipe-shaped element and said nozzle for drawing said broken yarn end initially into and through said elongated groove and for drawing said yarn end into said pipe-shaped element and back to said yarn-producing element for piecing, said elongated groove providing a generally frictionless and unobstructed path for said yarn end into said pipe-shaped element.

5,193,333

INTEGRATED SYSTEM FOR DRAWING AND SPINNING OPERATIONS

Loredana Brovelli, Via Monte Rosa 21, 20149 Milano, Italy

Filed May 1, 1991, Ser. No. 694,377
Claims priority, application Italy, May 18, 1990, 83387 A/90
Int. Cl.[5] D01H *9/18*
U.S. Cl. 57—281 5 Claims



1. An integrated system for drawing and spinning operations in the processing of textiles, which carries out movement of sliver containers, comprising:

a spinning machine including a plurality of spinning units arranged along at least one side of the spinning machine;

a drawing unit positioned in line at an end of the spinning machine and having an output suitable to feed the spinning units of the spinning machine;

a plurality of sliver containers to be filled with sliver from the drawing unit and emptied of sliver by the spinning units of the spinning machine, the sliver containers consisting of cans having an elongate horizontal cross-section;

at least one movable unit movable to an fro along a path adjacent the at least one side of the spinning machine along which the spinning units are arranged, the movable unit suitable to accommodate full and empty sliver containers in preset positions such that a long axes of the cross-sections of the sliver containers are parallel to each other and orthogonal to at least one side of the spinning machine;

a zone positioned adjacent the drawing unit having at least one preset position for full sliver containers and at least one preset position for empty sliver containers, the preset positions of the zone being arranged such the sliver containers are positioned in the zone with the long axes of the cross-sections of the sliver containers parallel to each other and orthogonal to the path of the movable unit;

means for loading and discharging sliver containers from the movable unit;

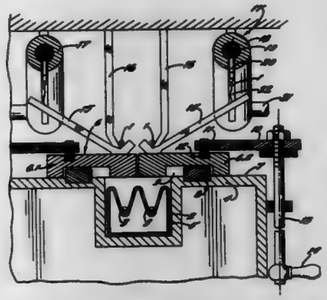
a computer system for controlling operation of the integrated system.

5,193,334

YARN FALSE TWIST CRIMPING APPARATUS AND METHOD OF THREADING SAME

Peter Dammann, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Nov. 30, 1990, Ser. No. 621,056
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1989, 3939726; Jun. 30, 1990, 4020957
Int. Cl.[5] D01H *13/28, 13/04*
U.S. Cl. 57—284 27 Claims



9. A yarn heating apparatus adapted for thermally processing an advancing yarn in a yarn false twisting machine, comprising:

an elongate yarn heating plate having a longitudinal yarn receiving groove therein,

at least one cover mounted for movement between a closed position overlying the heating plate and an open position wherein said plate is uncovered, and

first guide means mounted to said one cover, and second guide means mounted to be independent of said one cover movement, and with said first and second guide means being configured such that in said closed position of said one cover said first and second guide means define a temporary yarn path, and said second guide means includes an end disposed above said yarn receiving groove, and so that movement of said one cover to said open position causes said first guide means to move relative to said second guide means and to thereby release the yarn from said temporary yarn path and such that the yarn is guided by said second guide means into said groove.

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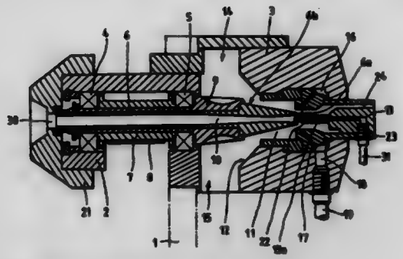
5,193,335

SPINNING APPARATUS

Shigeki Mori, Ohtsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 1, 1991, Ser. No. 723,802
Claims priority, application Japan, Jul. 4, 1990, 2-176736
Int. Cl.[5] D01H *13/30*; D02G *1/06, 1/16*
U.S. Cl. 57—296 8 Claims



1. A spinning apparatus, comprising:

a casing;

a rotatable spindle disposed substantially within the casing, the rotatable spindle defining an axis of rotation; and

a guide block disposed substantially within the casing, the guide block defining a guide path for introducing water to an interior portion of a yarn, the guide path defining an axis;

wherein the rotatable spindle and the guide path are arranged substantially coaxially.

5,193,336

TOOL AND METHOD FOR REMOVING A CLIP MEMBER FROM A MASTER LINK IN A CHAIN MEMBER

John W. King, Rte. 1, Mayfield, Kans. 67103

Filed Sep. 19, 1991, Ser. No. 762,480
Int. Cl.[5] B21L *9/06*
U.S. Cl. 59—7 5 Claims

1. A method for removing a clip member from a master link in a chain member comprising the steps of:

(a) providing a tool which comprises a first member pivotally secured to a second member with said first member including a first plier jaw having a structure defining a first first arcuate recess and a first second arcuate recess and with said second member including a second plier jaw having a structure defining a second first arcuate recess and a second second arcuate recess; said first plier jaw has a structure additionally defining a first front ridge and said second plier jaw has a structure additionally defining a second front ridge;

(b) providing a chain member comprising a master link with a clip member; and said clip member has a pair of clip elastic sides spaced from each other to define a longitudinal opening and a clip opening;

(c) disposing the first front ridge and the second front ridge on one of the clip elastic sides;

(d) lodging said one of the clip elastic sides in said first first arcuate recess and in said first second arcuate recess by moving the first member towards the second member to cause said one of the clip elastic sides to snap away from the master link; and

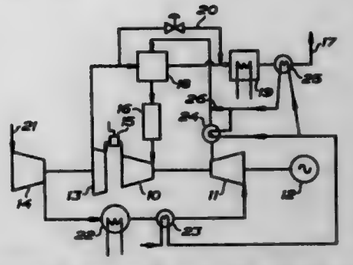
(e) removing said clip member from said master link.

5,193,337

METHOD FOR OPERATING GAS TURBINE UNIT FOR COMBINED PRODUCTION OF ELECTRICITY AND HEAT

Henrik Harboe, Copenhagen, Denmark, and Ben Kyrklund, Finspång, Sweden, assignors to ABB STAL AB, Finspång, Sweden

Continuation of Ser. No. 471,658, Jan. 23, 1990, abandoned. This application Jan. 15, 1992, Ser. No. 821,006
Int. Cl.[5] F02C *3/30, 7/10*
U.S. Cl. 60—39.03 3 Claims



1. Method in operating a gas turbine unit for combined production of electricity and heat comprising a combustion chamber, a high pressure turbine driven by gas from the combustion chamber, a low pressure turbine driven by the exhaust gas from the high pressure turbine, a low pressure compressor driven by the low pressure turbine, a high pressure compressor connected in series with the low pressure compressor and driven by the high pressure turbine for the supply of pressurized air to the combustion chamber, a generator driven by the high pressure turbine for producing electricity, a recuperator for heat exchange between exhaust gas and pressurized air from the compressors, an intermediate cooler for producing hot water between the low pressure and high pressure compressors and an exhaust gas heat exchanger for producing hot water, the method comprising the steps of adjusting the electric power to the desired value by changing the geometry of the low pressure turbine in order to change the rotational speed thereof while maintaining a constant temperature in the combustion chamber, adjusting the heat power to the desired value by controlling a flow bypassing the recuperator, and injecting water into the compressor air upstream the recuperator.

5,193,338

CYCLIC CHAR FUEL OXIDATION REACTORS WITH OPPOSED CROSS FLOW PRIMARY REACTORS

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Continuation-in-part of Ser. No. 731,208, Jul. 15, 1991. This application Mar. 9, 1992, Ser. No. 848,545
Int. Cl.[5] F02C *3/28*
U.S. Cl. 60—39.12 21 Claims

1. In a cyclic char fuel oxidation reactor plant comprising:

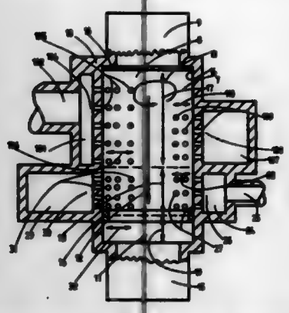
a separate compressor means for compressing reactant gases comprising at least one stage and each said stage comprising an outlet pipe for reactant gases being compressed therein;

drive means for driving said compressor;

at least one separate expander means for expanding reacted gases and each expander comprising at least one stage and each said stage comprising an inlet pipe for reacted gases to be expanded therein;

a source of reactant gas containing appreciable oxygen gas;

said compressor comprising an inlet to the lowest pressure stage thereof;
a fixed open gas flow connection from said compressor inlet to said source of reactant gas;
said expander comprising an outlet from the lowest pressure stage thereof;
at least one receiver of expanded reacted gas;
a fixed open gas flow connection from said expander outlet to said receiver of reacted gas;
means for absorbing any work output of said expander;
a number of primary reactor pressure vessel containers at least equal to the sum of the number of compressor stages plus the number of expander stages and each said primary reactor pressure vessel container comprising:
at least a primary char fuel reaction chamber within said primary reactor pressure vessel container;
an inlet to said primary reactor pressure vessel container;
at least one first outlet from said primary reactor pressure vessel container;
said primary char fuel reaction chamber comprising:
a refuel end and an ash collection end;
a refuel mechanism means for placing char fuel into said primary reactor via the refuel end thereof;
a direction of char fuel motion within said primary reactor from said refuel end toward said ash collection end;
a peripheral dimension around the outer surface of said primary reactor at right angles to said char fuel motion direction;



a volatile matter distillation and fuel preheat zone positioned toward said refuel end of said primary reactor;
an ash collection zone positioned toward said ash collection end of said primary reactor;
a rapid reaction zone positioned between said volatile matter distillation and fuel preheat zone and said ash collection zone;
at least one means for removing ashes from said primary reactor;
means for preheating said char fuel within said primary reactor to that temperature at which said char fuel reacts rapidly with oxygen in adjacent compressed reactant gases when said cyclic char fuel oxidation reactor plant is being started;
means for driving said compressor means when said cyclic char fuel oxidation reactor plant is being started;
several separate changeable gas flow connections, comprising means for opening and closing, from each compressor stage outlet pipe to each primary reactor pressure vessel container inlet and from each expander stage inlet of at least one expander to each primary reactor pressure vessel container first outlet;
control means for controlling said means for opening and closing said several separate changeable gas flow connections so that: each said primary reactor pressure vessel container is open gas flow connected, in a sequence of time periods, first to each compressor stage outlet in time order of increasing stage outlet pressure, then to each expander stage inlet in time order of decreasing stage inlet pressure; each compressor stage outlet is open gas flow connected to but one primary reactor pressure vessel container during any one time period of said sequence of time periods, and each expander stage inlet is open gas flow connected to but one primary reactor pressure vessel container during any one time period of said sequence of time periods, and each primary reactor pressure vessel container is open gas flow connected to but one stage during any one time period of said sequence of time periods; said sequence of time periods of open gas flow connections to compressor stage outlets and to expander stage inlets is repeated for each said primary reactor pressure vessel container;
an improvement comprising:
dividing said peripheral dimension of said primary reactor into separate inlet portions, separate outlet portions, and separate sealed portions;
adding to each said primary reactor:
two separate reactant gas manifolds and each said reactant gas manifold comprising an inlet and an outlet; a first reactant gas manifold whose outlet connects to first reactant gas inlet ports into said primary reaction chamber, and these first inlet ports being positioned along that portion of the length of said primary reaction chamber, in said direction of char fuel motion, which is adjacent to said rapid reaction zone, and these first inlet ports being positioned around a first said inlet portion of the periphery of said primary reaction chamber; a second reactant gas manifold whose outlet connects to second reactant gas inlet ports into said primary reaction chamber, and these second inlet ports being positioned along that portion of the length of said primary reaction chamber, in said direction of char fuel motion, which is adjacent to said volatile matter distillation zone, and these second inlet ports being positioned around a second said inlet portion of the periphery of said primary reaction chamber;
a producer gas reservoir comprising an inlet, said inlet connecting to producer gas outlet ports out of said primary reaction chamber, and these ports positioned along that portion of said length of said primary reaction chamber along said direction of char fuel motion which is adjacent to said rapid reaction zone,
and these ports positioned around a first outlet portion of the periphery of said primary reaction chamber, said first outlet portion of said periphery being on the opposite side of said primary reaction chamber from said first inlet portion of said periphery;
a volatile matter in air mixture reservoir comprising an inlet, said inlet connecting to volatile matter in air mixture outlet ports out of said primary reaction chamber, and these ports positioned along that portion of said length of said primary reaction chamber along said direction of char fuel motion which is adjacent to said volatile matter distillation zone, and these ports positioned around a second outlet portion of the periphery of said primary reaction chamber, said second outlet portion of the periphery being on the opposite side of said primary reaction chamber from said second inlet portion of said periphery;
wherein all of said reactant gas inlet ports and also all of said outlet ports are smaller in at least one area cross section dimension than the char fuel particles being refueled into said primary reaction chamber;
fixed open gas flow connections from said primary reactor pressure vessel container inlet to said first reactant gas manifold inlet, and to said inlet of said second reactant gas manifold;
wherein said primary reactor pressure vessel container inlet and outlet are combined.

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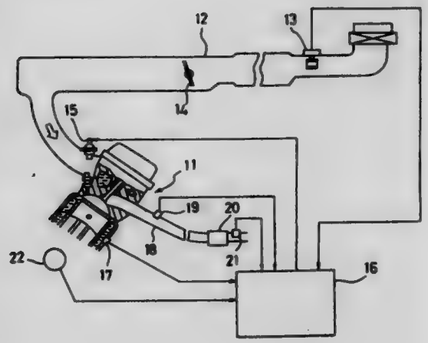
METHOD OF AND AN APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

Junichi Furuya, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

PCT No. PCT/JP91/00650, § 371 Date Dec. 31, 1991, § 102(e) Date Dec. 31, 1991
PCT Filed May 16, 1991, Ser. No. 784,395
Claims priority, application Japan, May 16, 1990, 2-124184
Int. Cl.[5] F01N *3/20*
U.S. Cl. 60—274 14 Claims



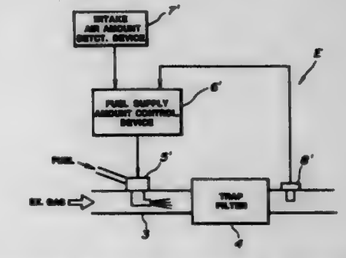
1. A method of controlling the air-fuel ratio of an internal combustion engine employing first and second air-fuel ratio sensors disposed on the upstream and downstream sides, respectively, of an exhaust purifying catalytic converter arranged in an exhaust path of the internal combustion engine, output values of the sensors changing in response to the concentration of a specific gaseous component contained in an exhaust from the engine, the concentration changing according to the air-fuel ratio, comprising:
a step of correcting and rewriting a learned regional correction quantity stored in one of a corresponding plurality of divided operation regions, according to the learned regional correction quantity and the output of the second air-fuel ratio sensor;
a step of adding a correction quantity corresponding to an average of the learned regional correction quantities to a stored learned collective correction quantity uniformly used for all operation regions, thereby updating the learned collective correction quantity;
a step of subtracting the correction quantity added to the learned collective correction quantity from each of the learned regional correction quantities for the operation regions, thereby correcting the learned regional correction quantities;
a step of calculating a first air-fuel ratio correction quantity according to the output of the first air-fuel ratio sensor;
a step of calculating a second air-fuel ratio correction quantity related to the output of the second air-fuel ratio sensor, according to the learned regional correction quantity of the corresponding operation region and the learned collective correction quantity;
a step of setting a final air-fuel ratio correction quantity according to the first and second air-fuel ratio correction quantities; and
a step of controlling the air-fuel ratio of an intake air-fuel mixture to the engine according to the final air-fuel ratio correction quantity.

5,193,340

EXHAUST GAS PURIFYING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Tetsuya Kamihara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 25, 1991, Ser. No. 690,783
Claims priority, application Japan, May 10, 1990, 2-120661
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—286 15 Claims



1. An exhaust gas purifying system for an internal combustion engine having an exhaust passageway, said system comprising:
a trap filter, disposed in the exhaust passageway, for trapping particulates discharged from the engine, said trap filter carrying an oxidation catalyst for assisting in the burning of the particulates;
means for supplying an amount of fuel into the exhaust passageway upstream of said trap filter to accomplish a regeneration operation of said trap filter in which the particulates are burned;
means for detecting a temperature value of exhaust gas downstream from said trap filter;
means for detecting an amount of intake air being supplied to the engine; and
means for controlling said amount of fuel being supplied by said fuel supplying means during the regeneration operation of said trap filter, said controlling means being arranged to increase said amount of fuel being supplied by said fuel supplying means as said intake air amount detected by said intake air amount detecting means increases and to decrease said amount of fuel being supplied by said fuel supplying means as said exhaust gas temperature value detected by said exhaust gas temperature detecting means increases.

5,193,341

ARRANGEMENT FOR REMOVING OXIDIZABLE OR COMBUSTIBLE PARTICLES FROM EXHAUST GASES

Walter Sibbertsen, and Karl-Heinz Flatow, both of Hamburg, Fed. Rep. of Germany, assignors to HKK Hanseatisches Kreativ Kontor Gesellschaft für Entwicklung und Vertrieb mbH, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP90/00864, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO90/15228, PCT Pub. Date Dec. 13, 1990
PCT Filed May 30, 1990, Ser. No. 646,603
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917888
Int. Cl.[5] F01N *3/26*
U.S. Cl. 60—299 7 Claims

1. An arrangement for removing oxidizable or combustible particles such as soot from an exhaust gas containing said particles, the arrangement comprising:
an exhaust-gas pipe for conducting said exhaust gas and said exhaust-gas pipe having an output;
a vortex tube having first and second ends and defining a longitudinal axis;
bore means receiving said exhaust gas from said output for

tangentially injecting said exhaust gas into said vortex tube so as to cause a first part of the gas to move in a helical flow along said tube and undergo an adiabatic compression thereby heating said first part as said first part moves along said tube;

diaphragm means defining a diaphragm opening and being mounted at said first end of said vortex tube for causing a second part of said exhaust gas to undergo an adiabatic expansion thereby cooling said second part and for conducting said second part in a direction away from said vortex tube through said diaphragm opening;

said diaphragm means being mounted at said first end of said tube so as to be at a first spacing from said bore means;

adjustable throttle means disposed at said second end of said vortex tube for adjustably throttling said first part of the exhaust gas flowing out of said vortex tube at said second end thereof; and,

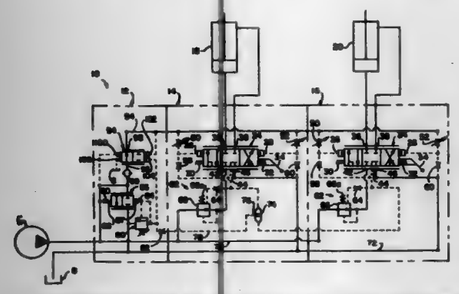
said adjustable throttle means being mounted at a second spacing from said bore means greater than said first spacing.

5,193,342

PROPORTIONAL SPEED CONTROL OF FLUID POWER DEVICES

Carl-Johan Ouberg, Eskilstuna, Sweden, and James P. Janecke, Waukesha, Wis., assignors to Applied Power Inc., Butler, Wis.

Filed Feb. 14, 1992, Ser. No. 837,296
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—426 **19 Claims**



1. A hydraulic circuit for supplying a flow of hydraulic fluid from a source of pressurized hydraulic fluid to multiple fluid power devices, comprising:

at least two work segments, each said work segment including:

a. a pressure operated proportional flow supply valve for controlling a flow of pressurized hydraulic fluid to a fluid power device;

b. at least one control pressure port in communication with said supply valve for operating said valve in proportional to a pressure at said control pressure port;

c. a pilot pressure port; and

d. a pressure control valve in communication with said pilot pressure port and said control pressure port for reducing a pressure at said pilot pressure port to a desired pressure at said control pressure port;

a proportional speed sensing valve;

means for providing communication between said proportional speed sensing valve and the pilot pressure ports of two or mroe work segments;

means for communicating a supplying pressure of pressurized hydraulic fluid to said proportional speed sensing valve; and

means for communicating a load sense pressure from at least one of said work segments to said proportional speed sensing valve, said load sense pressure being a measure of a pressure of fluid supplied by said work segment to a fluid power device controlled by said segment;

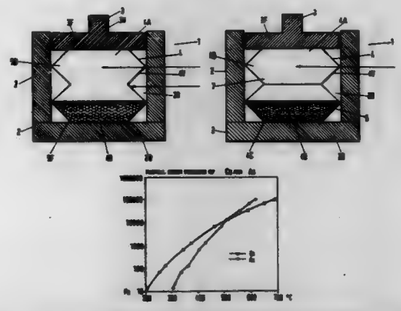
wherein said proportional speed sensign valve regulates the pressure at the pilot pressure ports of two or more work segments in response to a differential between said supply pressure and said load sense pressure.

5,193,343

PRESSURE ELEMENT

Hans-Peter Bossmann, Wiesloch, Fed. Rep. of Germany, assignor to ABB Patent GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 9, 1991, Ser. No. 756,905
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1990, 4028405
Int. Cl.[5] F01C *5/00*
U.S. Cl. 60—531 **5 Claims**



1. A pressure element for generating pressure forces, comprising a first movably mounted component, a second component in communication with said first component, said second component being in the form of a hollow body subdivided into at least two chambers, and means for varying the length of said second component in the form of cesium disposed in one of said chambers and arsenic disposed in another of said chambers for extending said hollow body.

4. A pressure element for generating pressure forces, comprising a first movably mounted component, a second component in the form of a hollow body subdivided into two chambers having a lateral boundary surface in the form of bellows in communication with said first component, and means in the form of two different substances in the form of cesium and arsenic each disposed in one of said chambers having two

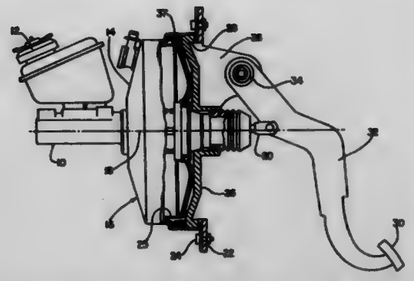
phases at a defined temperature for extending said lateral surfaces.

5,193,344

CONTROL ASSEMBLY FOR A HYDRAULIC CIRCUIT OF A VEHICLE

Guy Meynier, Aulnay-sous-Bois, France, assignor to Bendix Europe Services Techniques, Drancy, France

Filed Jun. 19, 1991, Ser. No. 717,565
Int. Cl.[5] B60T *13/00*; F15B *9/10*
U.S. Cl. 60—547.1 **7 Claims**



1. A control assembly for a hydraulic circuit of a vehicle having an engine compartment and a passenger compartment which are separated by an apron having an orifice closed by said assembly, comprising:

a vacuum booster having one axis including:

an actuating rod projecting into the passenger compartment,

a shell which is fastened by its periphery to said apron in the engine compartment and to which a master cylinder is fastened, and

a cover closing said shell and bearing circumferentially on the apron in the engine compartment,

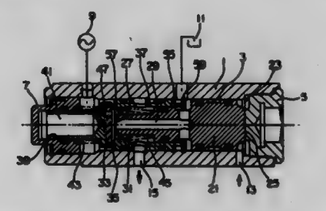
a pedal unit for actuating said booster, including at least one pedal mounted on a lever, the pivot of which is retained by a bearing piece fixed to said cover, a projection of said pivot toward said apron and parallel to said one axis being located within the perimeter of said orifice of the apron, so as to transmit substantially the entirety of the force exerted by the lever on said pivot in a direction substantially parallel to said axis of the booster in order to oppose a tearing force generated between said assembly and said apron during the actuation of said pedal unit.

5,193,345

DISTRIBUTOR OF A FLUID UNDER PRESSURE

Leonardo Cadeddu, Crema, Italy, assignor to Bendix Italia S.p.A., Crema, Italy

Filed Jun. 25, 1991, Ser. No. 720,289
Claims priority, application Italy, Jul. 17, 1990, 67550 A/90
Int. Cl.[5] F15B *13/02, 11/08*
U.S. Cl. 60—565 **7 Claims**



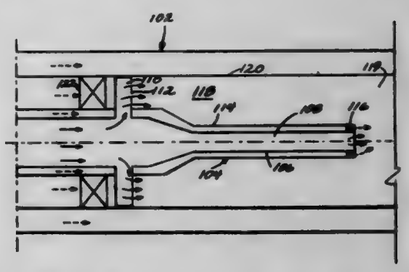
1. A distributor of a fluid coming from a source of fluid under pressure and under a pressure which is a function of the pressure of a control fluid, said distributor comprising, in a bore in a body, double valve means comprising a first piston one end of which defines with a first plug a control chamber receiving the control fluid while the other end of the first piston contains a conduit connected to a reservoir of fluid under low pressure, an annular chamber surrounding said first piston and being connected to a consumer circuit for distributed fluid, and a disk forming a shutter and resting on a circular seat by means of a return spring, said disk being opposite the other end of the first piston, said other end being capable, under the action of pressure prevailing in the control chamber, of coming up against said disk so as to close communication between said conduit and said annular chamber, and of displacing said disk so as to open communication between a conduit for an inlet of said fluid under pressure and said annular chamber, a second piston one face of which is fixed to a face of the disk opposite the circular seat and the other face of the second piston defining with a second plug closing said bore a balancing chamber communicating permanently with said annular chamber, a duct located in the disk and in the face of the second piston bearing on the disk in order to place said annular chamber and said balancing chamber in communication with one another, said annular chamber formed by a shoulder of said piston, said circular seat comprising a cylindrical sleeve located slidably around a small diameter part of said first piston and immobilized axially during normal operation, so that in the event of failure of the source of fluid under pressure the control fluid effects displacement of the first piston, cylindrical sleeve, disk and second piston such that the consumer circuit communicates with the reservoir.

5,193,346

PREMIXED SECONDARY FUEL NOZZLE WITH INTEGRAL SWIRLER

Masayoshi Kuwata, Ballston Lake; Cheryl Mele, Schenectady, and Richard J. Borkowicz, Ballston Spa, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 618,246, Nov. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 501,439, Mar. 22, 1990, Pat. No. 4,982,570, which is a continuation of Ser. No. 934,885, Nov. 25, 1986, abandoned. This application Jun. 18, 1992, Ser. No. 899,586
Int. Cl.[5] F23R *3/34*; F02C *7/22*
U.S. Cl. 60—737 **15 Claims**



1. A diffusion piloted premix nozzle comprising:

a sleeve;

a diffusion pilot within said sleeve and including a fuel delivery pipe having an inlet end and a discharge end, and an air delivery pipe;

said fuel delivery pipe further including a plurality of fuel distribution tubes;

a premix chamber surrounding the diffusion pilot and including an inlet end and a discharge end, the fuel distribution tubes extending into the premix chamber; and

a premix air swirler mounted in said premix chamber upstream of said fuel distribution tubes, and surrounding said fuel delivery pipe and said air delivery pipe, wherein said air swirler is adapted to receive and swirl air in said sleeve external of said diffusion pilot.

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5,193,347
HELMET-MOUNTED AIR SYSTEM FOR PERSONAL COMFORT

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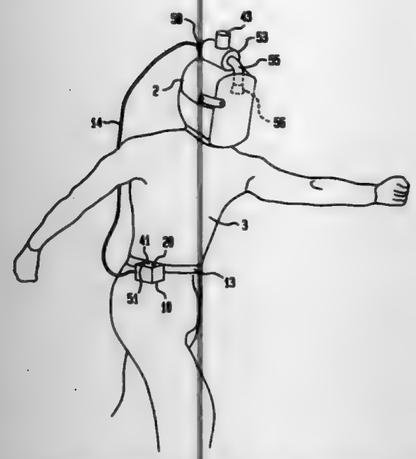
Filed Jun. 19, 1992, Ser. No. 901,394
Int. Cl.[5] F25B *21/02*
U.S. Cl. 62—3.7 14 Claims



1. A body-mountable apparatus for maintaining personal comfort of a person subjected to heat while wearing a helmet, by flowing cooled ambient air across said person's face only, said apparatus comprising,

battery means removably mounted on said body;

a housing mounted on the surface of said helmet, said housing having an intake end for ambient air, and a discharge end for cooled air;

fan means mounted within said housing, adjacent said intake end, and electrically connectable to said battery means for selective on/off operation;

thermoelectric module means mounted through the wall of said housing and electrically connectable to said battery means, said module having a heat dissipation side, and, a heat abstraction side disposed within said housing, said heat abstraction side being in heat-conducting association with air flowing through said housing;

a first thermistor, upstream of said heat abstraction side, in temperature sensing association with air flowing through said intake end of said housing;

a second thermistor, downstream of said heat abstraction side, in temperature sensing association with air flowing to said discharge end;

manual selection means for selecting the temperature of air discharged from said housing;

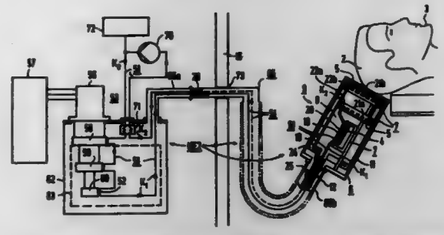
temperature control means in operative communication with said manual selection means and said first and second thermistor means, and adapted to maintain a predetermined temperature difference between said first and second thermistors by regulating current supplied to said module, wherein such regulation of current is responsive to said manual selection means and the temperatures sensed by said first and second thermistors;

air-duct means attached at its one end to said discharge end of said housing, its other end terminating in front of said person's face to flow cooled air across said face; whereby said person wearing said helmet has untethered mobility.

5,193,348
DEVICE FOR COOLING A SQUID MEASURING INSTRUMENT

Christoph Schnapper, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Jun. 24, 1991, Ser. No. 720,203
Claims priority, application European Pat. Off., Jun. 25, 1990, 90112052.7; Fed. Rep. of Germany, Dec. 7, 1990, 4039129
Int. Cl.[5] G01R *33/02*; F25B *19/00*
U.S. Cl. 62—51.1 30 Claims



1. A device for cooling a SQUID (superconducting quantum interferometer device) measuring instrument for measuring biomagnetic or other weak magnetic fields comprising:

a cryostat having a vacuum in an interior space;

at least one superconducting gradiometer and at least one associated SQUID disposed in the vacuum of said cryostat;

heat-conducting connections thermally coupling said at least one superconducting gradiometer and said at least one associated SQUID to a cryogen supplied from outside said cryostat;

a carrier structure supporting said at least one SQUID and said at least one gradiometer, said carrier structure including cooling channels through which the cryogen is forced for cooling said at least one SQUID and said at least one gradiometer;

a cryogen supply unit situated outside the cryostat; and

a cryogen transfer line coupling said cryogen supply unit to said cooling channels.

5,193,349
METHOD AND APPARATUS FOR COOLING HIGH TEMPERATURE SUPERCONDUCTORS WITH NEON-NITROGEN MIXTURES

Royce J. Laverman, South Holland, and Ban-Yen Lai, Hinsdale, both of Ill., assignors to Chicago Bridge & Iron Technical Services Company, Oak Brook, Ill.

Filed Aug. 5, 1991, Ser. No. 740,072
Int. Cl.[5] F25B *19/00*; F25D *17/02*
U.S. Cl. 62—64 38 Claims

1. A method of lowering the temperature of a high temperature superconducting material comprising:

positioning a high temperature superconducting (HTSC) material (26) in an enclosed chamber (20) capable of holding a cyrogenic liquid (22);

surrounding the HTSC material (26) with a pool of a cryogenic liquid (22) comprising a mixture of liquefied neon and liquefied nitrogen;

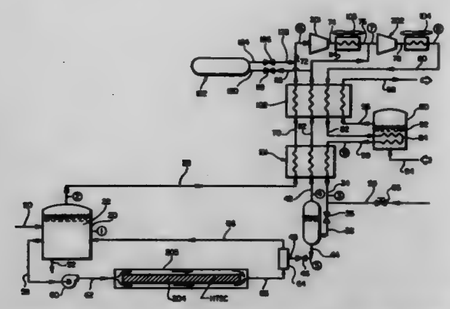
removing a gaseous neon-nitrogen stream having a composition which is at least 95% neon from the enclosed chamber (20);

reliquefying the gaseous stream removed from the enclosed chamber (20) to produce a partially liquefied neon-rich stream which is at least 95% neon;

feeding the partially liquefied neon-rich stream which is at least 95% neon into a separator vessel (40) at a high pressure of at least 100 psia and a low temperature at least as low as 35° K.;

withdrawing a liquefied neon-rich stream from the separator vessel (40) and feeding it to and through an expansion valve (46);

receiving a cold lower pressure neon-rich stream, which is at least 95% neon, expanded out of the expansion valve (46) and feeding it to a mixing container (64);



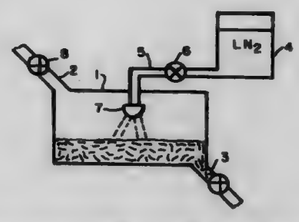
withdrawing a liquefied neon-nitrogen stream from the enclosed chamber (20) and feeding it to the mixing container (64) to form a composite liquefied gas stream of the liquefied neon-nitrogen stream and the cold neon-rich stream in the mixing container (64); and

feeding the composite liquefied gas stream from the mixing container (64) into contact with the cyrogenic liquid (22) in the enclosed chamber (20).

5,193,350
METHOD OF STERILIZING DRIED GOODS

Ottmar Tallafuss, Am Himmelreich 14, 6967 Buchen 1, Fed. Rep. of Germany

Filed Apr. 23, 1991, Ser. No. 690,107
Claims priority, application European Pat. Off., Apr. 24, 1990, 90107746.1
Int. Cl.[5] F25D *17/02*
U.S. Cl. 62—64 9 Claims

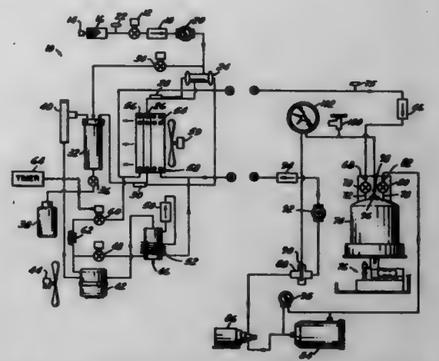


1. A method of sterilizing dried goods, such as dried herbs, spices, teas, and remedies, comprising the steps of introducing the goods into a container, and introducing into the container a refrigerant with a temperature of less than minus 20° C., retaining the dried goods in said container at least until the entire content of said container reaches a temperature of less than minus 20° C. thereby to destroy any adult organisms as well as the larvae and eggs thereof.

5,193,351
REFRIGERANT RECOVERY AND PURIFICATION SYSTEM

Gregg E. Laukhuf, Bryan; Walter D. Murray, Pioneer; Todd J. Arend, Defiance, and Gary P. Murray, Montpelier, all of Ohio, assignors to SPX Corporation, Muskegon, Mich.

Filed Feb. 28, 1992, Ser. No. 843,250
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—77 22 Claims

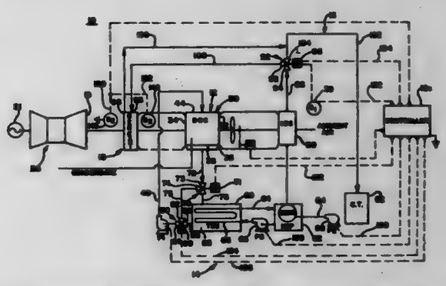


20. In a refrigerant recovery and purification system that includes a compressor and condenser for recovering refrigerant from refrigeration equipment under service and feeding such refrigerant to a storage vessel, and a liquid refrigerant pump for directing refrigerant in liquid phase from the vessel through a filter and back to the vessel in a closed path, a method of cooling refrigerant in the vessel comprising the step of directing the refrigerant in said closed path through said condenser.

5,193,352
AIR PRE-COOLER METHOD AND APPARATUS

Glenn W. Smith, Mt. Airy; William D. McCloskey, Baltimore, and Robert E. Caten, Arnold, all of Md., assignors to AMSTED Industries, Inc., Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,430
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—90 36 Claims



1. A precooling system for combustion air communicated to a gas turbine, said system operable to receive ambient air at a wet bulb and dry bulb temperature, an ambient relative humidity and an ambient air density, and to provide said combustion air at a second temperature lower than ambient temperature and a second density greater than ambient density, said system comprising:

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a direct-contact-air-chiller having a fluid-to-air exchange chilling media, an air inlet side, an air outlet side, a fluid inlet, a cooling fluid at a first temperature, and a sump for recovery of coolant fluid passing through said media from said fluid inlet passage, said direct-contact-air-chiller operable to receive air at an ambient temperature and density for reduction of said ambient air temperature and absolute humidity, and to increase said air density for communication to said gas turbine;

means for reducing said cooling fluid temperature below said ambient wet-bulb temperature, which reduced-temperature fluid in said direct-contact-air-chiller is operable to reduce said ambient air temperature below said ambient wet-bulb temperature and to reduce said air absolute humidity;

a pump,

a first conduit connected between said pump and said fluid inlet for communication of said coolant fluid to said fluid-temperature-reducing means, which coolant fluid passes through said chilling media to cool said ambient air communicating through said chilling media from said inlet side for discharge from said outlet side;

a first valve coupled to said sump and said fluid-temperature-reducing means, said first valve having a first servomechanism,

a second conduit connected between said first valve and said fluid-temperature-reducing means;

a second valve having a second servomechanism and coupled to said pump, said first valve and said fluid-temperature-reducing means,

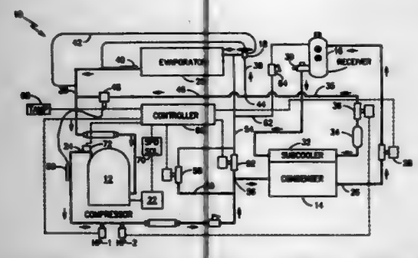
said first valve operable by said first servomechanism to communicate fluid from said sump to any of said second valve and said fluid-temperature reducing means, which second valve is operable by said second servomechanism to communicate said coolant fluid from any of said first valve and said fluid-temperature-reducing means to said pump for recirculating coolant fluid at a predetermined fluid temperature to said direct contact chiller for treating said ambient air.

5,193,353

HIGH CAPACITY HOT GAS HEATING SYSTEM FOR TRANSPORT REFRIGERATION SYSTEM

Thomas E. Brendel, Fayetteville, and L. Thomas Lane, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 5, 1991, Ser. No. 726,090
Int. Cl.[5] F25B 41/06; F25D 21/06
U.S. Cl. 62—196.4 **10 Claims**



1. In a transport refrigeration system of the type which holds a set point temperature via heating and cooling cycles, a refrigerant circuit which includes a compressor, condenser, receiver, evaporator, mode selection means for selectively directing hot compressed refrigerant gas to the condenser, or, through a hot gas conduit to the evaporator, the system further including an internal combustion engine for driving the compressor, the improvement comprising:

a first hot gas flow control means having a predetermined, limited, refrigerant flow capability for controlling the flow of refrigerant therethrough;

a second hot gas flow control mans having a refrigerant flow capability which is substantially greater than said predetermined limited refrigerant flow capability of said first hot gas flow control means, for controlling the flow of refrigerant therethrough;

said first and second hot gas flow control means being disposed in parallel fluid flow relationship in said hot gas conduit, each of said first and second hot gas flow control means being selectively operable to an open or closed condition, and, wherein;

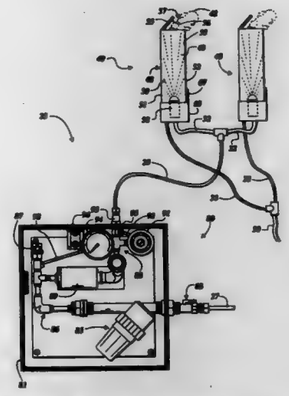
said predetermined limited refrigerant flow capability provides a flow rate, which, when said mode selection means initially shifts from directing hot gas to the condenser, to directing hot gas to the evaporator, will limit the suction pressure rise of the compressor to a level which will not overload said internal combustion engine.

5,193,354

HUMIDIFICATION SYSTEM WITH DROPLET DISCRIMINATION

Itamar Kleinberger, 4367 Dunmore Rd., Marietta, Ga. 30068, and John J. Hayman, Jr., 1882 Wicks Valley Dr., Marietta, Ga. 30062

Filed Jan. 31, 1992, Ser. No. 830,190
Int. Cl.[5] A47F 3/04
U.S. Cl. 62—247 **37 Claims**



1. A refrigeration apparatus comprising:

a refrigerated case means defining an enclosed refrigerated space for storing perishables;

a humidifier means for maintaining the refrigerated space at a selective humidity level, said humidifier means including, at least,

a control means connected to a water source for supplying water at a constant pressure for a selective amount of time,

a tubing means for transferring water from said control means,

a mist nozzle means located entirely within the refrigerated space and connected to said tubing means to receive water transferred from said control means for misting a spray of disconnected water droplets, and

a droplet discrimination means located adjacent said mist nozzle means and within the refrigerated space for collecting larger water droplets emitted from said mist nozzle means to release a very fine mist of water droplets into the refrigerated space outside said discrimination means,

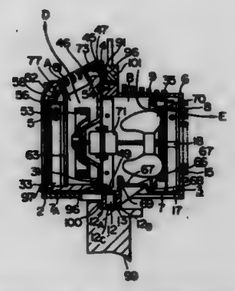
wherein said droplet discrimination means is so constructed that air within said droplet discrimination means moves primarily in response to the motion of the water droplets emitted from said mist nozzle means.

5,193,355

INTEGRATED TYPE AIR CONDITIONER

Hideki Matsumi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP90/01229, § 371 Date May 20, 1991, § 102(e) Date May 20, 1991
PCT Filed Sep. 25, 1990, Ser. No. 689,747
Claims priority, application Japan, Sep. 26, 1989, 1-249556
Int. Cl.[5] F25D 23/12
U.S. Cl. 62—262 **7 Claims**



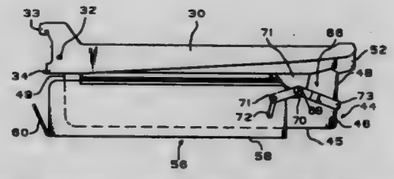
1. An integrated type air conditioner having an indoor side and an outdoor side and including a compressor, a condenser, an evaporator and other components, said air conditioner further comprising an outdoor side resin molding in which an outdoor base plate and an outer casing are integrally incorporated with one another and which has an opening part on an indoor side thereof; an indoor side resin molding in which an indoor base plate and an outer casing are integrally incorporated with each other and which has an opening part on the outdoor side; and a partition plate formed of sheet metal and fixed to said opening part of the outdoor side molding and the opening part of the indoor side molding at a plurality of positions therearound, whereby said outdoor side molding and said indoor side molding are completely supported by said partition plate.

5,193,356

HOUSEHOLD REFRIGERATOR ADJUSTABLE TEMPERATURE STORAGE SYSTEM

Thomas M. Ording, and John M. Mitchell, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Sep. 9, 1991, Ser. No. 756,431
Int. Cl.[5] F25D 23/02
U.S. Cl. 62—265 **6 Claims**



1. In a refrigerator having a fresh food compartment with a rear wall, an evaporator for refrigerating air in the refrigerator and means for providing a stream of refrigerated air flowing generally down the rear wall of the fresh food compartment; an adjustable temperature storage assembly, comprising:

a frame mountable adjacent to the fresh food compartment rear wall;

a storage pan slidably mounted on said frame and a cover for said pan supported by said frame;

a shroud for said pan including a bottom wall and a pair of side walls spaced from corresponding walls of said pan, an air deflector extending upwardly and rearwardly from the rear of said shroud bottom wall in a fixed relationship thereto, said shroud being slidably mounted to said frame; and

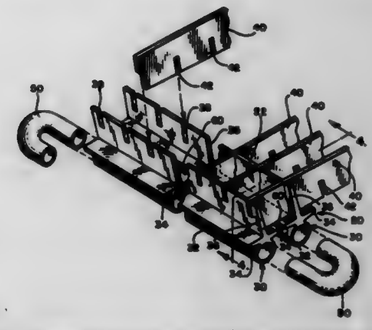
user adjustable positioning means operable to slide said shroud on said frame to alter the position of said air deflector in relation to the back wall of the fresh food compartment to vary the amount of refrigerated air flowing between said pan and said shroud.

5,193,357

ICE MACHINE WITH IMPROVED EVAPORATOR/ICE FORMING ASSEMBLY

Vance L. Kohl, Ladysmith, and Mark E. Federspiel, Manitowoc, both of Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 534,926, Jun. 7, 1990, abandoned. This application Jun. 26, 1991, Ser. No. 721,261
Int. Cl.[5] F25C 1/12
U.S. Cl. 62—347 **20 Claims**



15. A combined evaporator/ice forming assembly comprising:

a) evaporator tubing sections having one or more integrally formed fin elements,

b) evaporator system connectors adapted for connecting the tubing sections together to form a sealed evaporator section of a refrigeration system,

c) divider elements adapted to fit together with said one or more fin elements to form a plurality of ice formation pockets; and

d) weep holes comprising gaps between adjacent sections of the integrally formed tubing and fin sections in order to allow air to enter each of the ice formation pockets during the removal of ice from the pockets.

5,193,358

COMPRESSION COOLING PLANT PROVIDED WITH AN OIL SEPARATOR

Ange B. Winther, Quinta "Gi-Gi" cruce 9a transversal con 6a avenida, Altamira Norte, Caracas, Venezuela

PCT No. PCT/DK89/00179, § 371 Date Sep. 30, 1991, § 102(e) Date Sep. 30, 1991, PCT Pub. No. WO90/12263, PCT Pub. Date Oct. 18, 1990
PCT Filed Jul. 19, 1989, Ser. No. 768,589
Claims priority, application Denmark, Mar. 30, 1989, 156389
Int. Cl.[5] F25B 43/02
U.S. Cl. 62—470 **18 Claims**

1. A compression refrigerating system comprising:

a condenser;

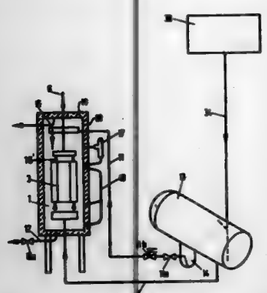
a refrigerant receiver for receiving refrigerant and having an oil sump;

a primary pipe for conducting the refrigerant;

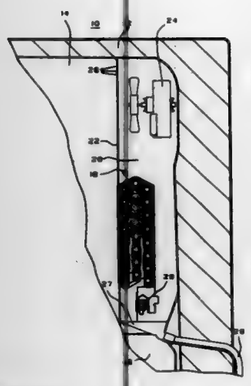
an oil sump pipe for conducting the refrigerant;

a suction pipe for conducting the refrigerant;

an oil discharge pipe having an oil discharge valve;
evaporators having a supply pipe;
a motor;
a compressor driven by the motor for compressing the refrigerant;
a condenser for cooling the refrigerant and collected in the refrigerant receiver, the refrigerant being conducted to the evaporators spaced in portions of the system to be cooled;
an oil separator including a heat exchanger vessel for separating oil from the refrigerant, said heat exchanger vessel including a primary heat exchanger having a supply side connected to an outlet of the refrigerant receiver through the primary pipe and having a discharge side connected to the supply pipe of the evaporators, the heat exchanger vessel being connected to the oil sump through the oil sump pipe, the oil sump being in an bottom part of the refrigerant receiver, the heat exchanger vessel being connected to a suction side of the compressor through the suction pipe, and wherein a lower part of the heat exchanger vessel is provided with the oil discharge pipe.

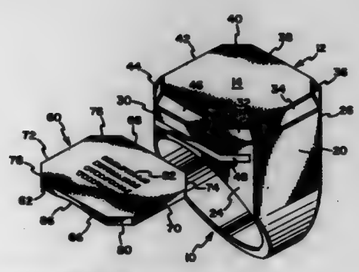


5,193,359
SPINE FIN REFRIGERATOR EVAPORATOR
Jerry C. Martin, Corydon, Ind., and Mark D. Wattley, Prospect, Ky., assignors to General Electric Company, Louisville, Ky.
Filed Jan. 8, 1992, Ser. No. 818,138
Int. Cl.[5] F25B *39/02*
U.S. Cl. 62—515 4 Claims



1. In a refrigerator:
wall means defining an evaporator chamber and means for causing air to flow through said chamber;
a refrigerant evaporator formed from an elongated tube with a ribbon of spine fin material wound about the outer surface of said tube so that individual fins of said ribbon extend generally perpendicularly outward of said tube, said tube being arranged in said chamber in a plurality of elongated tube passes extending substantially perpendicular to the direction of air flow through said chamber;
said tube passes being arranged in a plurality of elongated rows generally parallel to the direction of air flow, said rows being spaced apart less than twice the length of said fins and defining an elongated air flow channel between adjacent rows; and
at least some of the fins projecting into the portion of said channel first exposed to the air flow being bent from the perpendicular to provide an open channel portion with improved tolerance to frost build-up.

5,193,360
TABLET FINGER RING HAVING A REMOVABLE TABLET
Daniel C. Lovegrove, 4 Valley Forge Rd., Darien, Conn. 06820
Continuation-in-part of Ser. No. 767,891, Sep. 30, 1991, abandoned. This application Apr. 24, 1992, Ser. No. 873,144
Int. Cl.[5] A44C *9/00*
U.S. Cl. 63—15 18 Claims

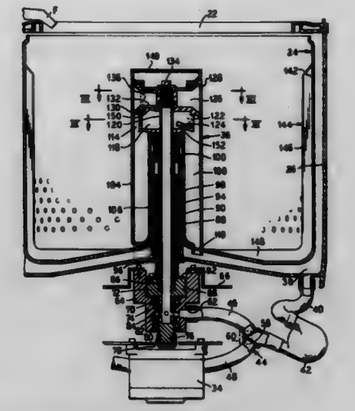


1. A tablet finger ring comprising:
a) an annular band portion;
b) a head portion connected to said annular band portion;
c) said head portion being provided with a slot extending transversely thereof;
d) said slot having an inner end;
e) a completely removable and detachable tablet having upper and lower surfaces insertable into the slot of said head portion;
f) said tablet bearing indicia on the upper surface thereof and being movable from a fully inserted position to normally conceal the surface from view, to a fully removed position distant and detached from said head portion for applying indicia thereto, and to examine the same; and
g) magnetic means for normally holding the tablet in the fully inserted position to prevent accidental disengagement.

5,193,361
AGIBASKET WASHER WITH CENTRALLY LOCATED PREMIXING CHAMBER
Devinder Singh, St. Joseph; Sheryl L. Farrington, Lincoln Township, Berrien County, and Kenneth B. Austin, Hartford, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jan. 2, 1992, Ser. No. 815,792
Int. Cl.[5] D06F *39/02*
U.S. Cl. 68—17 A 14 Claims

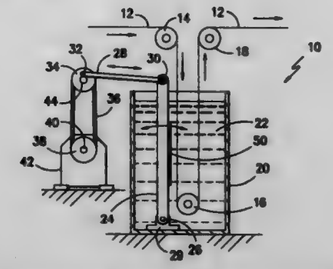
1. An apparatus for laundering a textile wash load, said apparatus comprising:
a perforate wash basket adapted to receive a wash load of textile materials to be laundered;
at least one vane disposed on an interior surface of said wash basket; and

a fluid-conducting tower fixed relative to said basket and disposed generally along a central longitudinal axis of said wash basket;
wherein said tower comprises:
a nozzle assembly adapted to spray liquid into said wash basket;
a mixing tank adapted to receive and hold a wash additive; and



a valve assembly disposed in said tower;
wherein said valve assembly comprises:
a first valve adapted to selectively control flow of fluid into said mixing tank; and
a second valve adapted to selectively control flow of fluid into said nozzle assembly.

5,193,362
APPARATUS FOR TEXTILE TREATMENT
Wolfgang K. F. Otto, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Aug. 1, 1991, Ser. No. 739,188
Int. Cl.[5] D06B *3/20*
U.S. Cl. 68—175 13 Claims



1. An apparatus for delivering a plane of liquid against a textile fabric having a face and interstices comprising:
(a) a tank for containing the liquid;
(b) means for transporting said textile fabric through said tank and liquid therein;
(c) a member including a first end portion and a second end portion positioned substantially within said tank; and
(d) a means for oscillating said member at a product of frequency and amplitude of 75 to 1500 inches×cycles per minute, thereby creating a plane of the liquid substantially perpendicular to said face of said textile fabric for achieving rapid and repeated penetration of liquid into said interstices and interchange between liquid in said tank and liquid trapped in said interstices.

5,193,363
CONVEYOR ASSEMBLY APPARATUS
Larry K. Petty, Gastonia, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 613,341, Nov. 14, 1990, abandoned. This application May 22, 1992, Ser. No. 888,244
Int. Cl.[5] D06B *1/00*
U.S. Cl. 68—205 R 21 Claims

1. An apparatus for applying liquids to a moving material comprising of a conveyor apparatus for conveying said material in a predetermined path of travel that includes a first planar portion having a longitudinal axis, a first endless flexible element adjacent said first planar portion and coplanar therewith and a second planar portion having a longitudinal axis and adjacent said first endless flexible element and coplanar therewith and at least one slat removedly attached upon said first endless flexible element for movement therewith and extending across said first planar portion and transverse to the longitudinal axis of said first planar portion as well as extending across said second planar portion and transverse to the longitudinal axis of said second planar portion for transporting said material which is supported by said first planar portion, said first endless flexible element, and said second planar portion and is in direct contact therewith, a liquid applicator means having a row of outlets extending across and positioned above the material path for discharging a corresponding row of generally parallel, undeflected primary streams of liquid on a trajectory of said primary streams of liquid directed toward the material path, a source of electrically encoded pattern data, gas passage means positioned adjacent to said row of outlets and aligned with the discharge axes of the outlets for selective deflecting, in accordance with pattern data from such data source, the trajectory of said primary stream streams of liquid emerging from said outlets with streams of gas from said gas passage means that intersects said primary streams of liquid, a liquid collection chamber positioned adjacent to said outlets and opposite from said gas passage means, said liquid collection chamber having an opening that extends along said row of outlets and that is positioned to receive said gas streams and primary liquid streams deflected by said gas streams.

5,193,364
CHAMOIS WRINGER
Russell A. Leenders, P.O. Box 84174, Lincoln, Nebr. 68501
Filed Feb. 28, 1992, Ser. No. 843,803
Int. Cl.[5] D06F *45/10*
U.S. Cl. 68—248 4 Claims

1. A chamois wringer, comprising:
a generally flat, planar base plate having forward and rearward ends and upper and lower surfaces;
an arm having forward and rearward ends, pivotally connected at its rearward end to the rearward end of said base plate;
a first roller rotatably mounted on said base plate with the rotational axis of said first roller parallel to the pivotal access of said arm;

5,193,367

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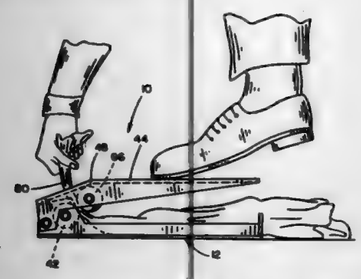
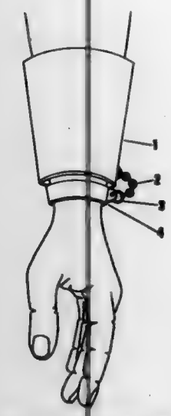
a second roller rotatably mounted on said arm for pivotal movement therewith;

said second roller mounted parallel to said first roller and located so as to move between an engaged position in rolling engagement with the first roller, and a disengaged position spaced away from the first roller, upon pivotal movement of said arm; and



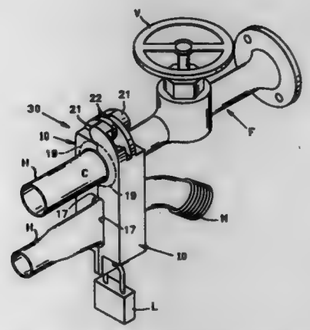
at least one foot member mounted on the forward end of said plate and projecting upwardly therefrom beyond the upper surface of said base plate, said foot member located in the pivotal path of said arm and projecting a height to prevent pivotal movement of said arm past the engaged position of said rollers.

5,193,365
PENALTY DEVICE FOR CRIMINAL OFFENDERS
Gary T. Nelson, 21080 S. Cascaberry Ct., Oregon City, Oreg. 97045
Filed Sep. 26, 1991, Ser. No. 765,985
Int. Cl.[5] E05B *75/00*
U.S. Cl. 70—16 **1 Claim**



1. A penalty device, an alternative to judicially directed incarceration or supervised parole/probation designed to temporarily identify criminal offenders, comprising a rigid, heavy gauge plastic or metal sheath or sleeve which is slipped over and past the hand and wrist, loosely fitted around the forearm, the sleeve of such length as to not restrict fundamental motion of the elbow, and prevented from removal by a clam shell type, flexible bracelet or locking band which is closely fitted around the wrist and locked in place using a tamper resistant seal designed to dissuade unauthorized or undetected removal of the locking band and sleeve, the sleeve and seal are linked by a short, permanently affixed cable or chain which prevents the sleeve from being slipped up the arm or down and over the locking band while the band is fastened in place.

5,193,366
HOSE SECURING DEVICE WITH DUAL LOCK FEATURE
Robert J. Brinkman, Rochester, N.Y., assignor to C. J. Winter Machine Works, Rochester, N.Y.
Filed Dec. 12, 1991, Ser. No. 806,235
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—18 **3 Claims**



1. A locking device for securing at two spaced points along its length a hose of the type having thereon a cylindrical coupling for attaching one end of the hose to a supply of fluid, comprising:

a pair of elongate locking members each having thereon an operating surface extending longitudinally thereof, and each of said members having in said operating surface thereof a pair of longitudinally spaced, transversely extending recesses,

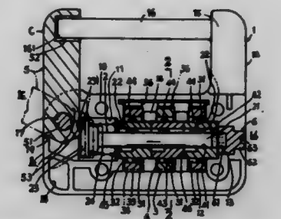
at least one of said recesses in each of said members having an arcuate bottom wall disposed coaxially of an axis that extends transversely of the associated operating surface, and each of said arcuate bottom walls having formed therein, and coaxially thereof, an arcuate groove disposed to encircle one diametral side of a cylindrical hose coupling,

hinge means adjacent one end of each of said members and operatively connecting said members together for pivotal movement relative to each other about a hinge axis that extends parallel to the transversely extending axes of said arcuate bottom walls, and selectively into and out of closed positions in which said operating surfaces are disposed in engagement with diametrally opposite sides of a hose adjacent opposite ends thereof, and with said arcuate grooves disposed coaxially and snugly about diametrally opposite sides of a cylindrical coupling on said hose, adjacent one of two ends thereof, thereby to secure said coupling against axial movement between said closed members,

the other of said recesses in each of said members being generally rectangular in configuration and having generally plane surfaces disposed to register with each other and frictionally to engage diametrally opposite sides of said hose to effect at least adjacent the other end thereof, when said members are closed thereover, and

means for releasably securing said members in their closed positions.

5,193,367
COMBINATION PADLOCK WITH SIDEWARDLY PIVOTED HASP
Chong-Kuan Ling, c/o Sinox Co., Ltd., P.O. Box 96-156, Taipei, Taiwan
Filed Jun. 3, 1992, Ser. No. 892,972
Int. Cl.[5] E05B *37/02*
U.S. Cl. 70—28 **2 Claims**



1. A combination padlock comprising:

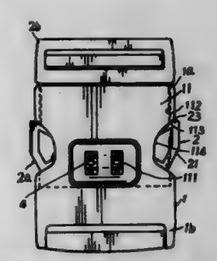
a lock body having a hasp fastening member fixedly secured on a fixed end portion of the lock body;

a hasp pivotally mounted on a pivotal end portion of said lock body opposite to said fixed end portion lockable with said hasp fastening member;

a locking bolt longitudinally held in said lock body having a plurality of sleeves and dials rotatably mounted on said bolt with each said sleeve coupled with each said dial, said locking bolt normally resiliently biasing an inner portion of said hasp to pivotally close an outer portion of said hasp with said hasp fastening member about a pivot secured in said lock body for locking a padlock when said locking bolt is locked by said sleeves;

said lock body including: an upper shell combined with a lower shell, a locking bolt chamber recessed in the lock body from the pivotal end portion of the lock body for holding the locking bolt therein, a plurality of dial slots longitudinally formed in the lock body for operatively rotating the dials protruding outwardly from the dial slots, a socket for mounting a combination-changing means in the socket at the fixed end portion of the lock body opposite to the pivotal end portion, a plurality of projection grooves longitudinally recessed in the lock body each said projection groove juxtapositionally adjacent to each said dial slot, said hasp fastening member having an elongate rod perpendicularly secured to a base portion perpendicularly protruding upwardly from the lock body for operatively fastening the hasp to form a D shape confined by the hasp, the hasp fastening member, the base portion and the lock body, said pivot secured at the pivotal end portion of the lock body for pivotally mounting the hasp on the pivot, a rope hole formed in the lock body for connecting a plurality of padlocks by passing a rope through the rope hole, and a hasp hole formed in the pivotal end portion of the lock body for the pivotal movement of the hasp; said locking bolt including: an elongate bolt longitudinally formed in the lock body having a plurality of protrusions longitudinally formed and equally spaced on the elongate bolt, a head portion formed on one end of the elongate bolt adjacent to the pivotal end portion of the lock body, and a bolt restoring spring retained in the locking bolt chamber formed in the lock body for normally urging the head portion sidewardly outwardly towards the pivotal end portion of the lock body for biasing the hasp inwardly to be locked with the hasp fastening member; and said hasp formed with a pivot hole in its inner end portion for pivotally mounting the hasp on the pivot of the lock body, a hasp socket recessed in an outer end of the hasp for engaging a rod end portion of the hasp fastening member for locking the hasp with the hasp fastening member, and an actuating recess portion recessed in an innermost end portion of the hasp to be engageable with an extension block protruding outwardly from the head portion of the locking bolt; the actuating recess portion being a force point of a lever acted by the extension block of the head portion of the locking bolt, the pivot for engaging the pivot hole of the hasp being a fulcrum of the lever; and the hasp socket of the hasp being a weight of the "lever", whereby upon an outward forcing on the actuating recess portion as urged by the locking bolt and the restoring spring, the hasp socket of the hasp will be biased inwardly to engage the rod end portion of the hasp fastening member about the pivot for closing the hasp on the fastening member.

5,193,368
COMBINATION LOCK OF STRAP BUCKLE
Chong-Kuan Ling, c/o Sinox Co., Ltd., P.O. Box 96-156, Taipei, Taiwan
Filed Jun. 10, 1992, Ser. No. 896,654
Int. Cl.[5] E05B *37/02*
U.S. Cl. 70—30 **4 Claims**



1. A combination lock of strap buckle comprising: a female lock body secured on a first end portion of a strap; a male buckle means secured on a second end portion of the strap having a pair of latch members engageable with two latch-member slots formed in said female lock body for fastening said first and said second end portions of said strap, said two latch members being depressible for disengaging from said latch member slots for unbuckling said buckle means from said lock body; and a pair of dials coupled with a pair of sleeves rotatably mounted in said female lock body; said pair of sleeves being separated by a partition plate formed in an intermediate block in said lock body, each said sleeve operatively retaining said latch member of said male buckle means in said female lock body for locking said buckle means in said lock body when said dials are rotated to a locking combination thereof, and each said sleeve having a sleeve slot recessed therein for retracting said latch member of said male buckle means therein when depressing said latch members of said buckle means thereby unbuckling and unlocking said male buckle means from said female lock body.

5,193,369
LUGGAGE LATCH
Klaus-Ulrich Röse, Iserlohn, and Waldemar Zieberth, Hemer, both of Fed. Rep. of Germany, assignors to Südhaus Schloss- und Beschlagtechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed Jan. 24, 1992, Ser. No. 826,902
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1991, 4102521
Int. Cl.[5] E05B *65/52; A45C 13/12*
U.S. Cl. 70—71 **7 Claims**

1. A latch for retaining together two parts of a piece of luggage, the latch comprising:

a latch element projecting from one of the parts;

a housing mounted on the other part and shaped to receive the latch element;

a latch dog movable in the housing between a retaining

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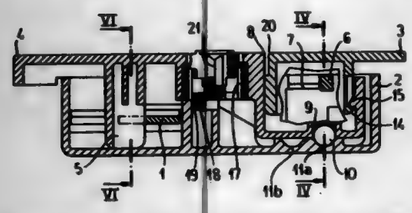
position preventing the latch element, when engaged in the housing, from withdrawing from the housing and a freeing position permitting the latch element to withdraw from the housing; and

operating means on the housing including

a depressible button displaceable in a first direction between an outer unactuated position and an inner actuated position, and

a slide displaceable between an actuated position and an



unactuated position in a second direction not parallel to the first direction and having an end exposed in the second direction in the outer position of the button and uncovered in the inner position of the button wherein upon displacement of the button from the respective unactuated position in the first direction and thereafter of the slide from the respective unactuated position in the second direction, the dog is displaced into the freeing position and wherein displacement in only one of the directions, leaves the dog in the retaining position.

5,193,370

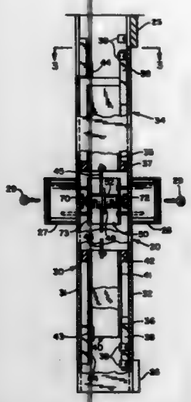
LOST MOTION DOOR LOCKING MECHANISM

Howard P. Nordes, 3 Crest Hill Pl., Smithtown, N.Y. 11787

Filed Mar. 30, 1992, Ser. No. 860,096

Int. Cl.[5] E05B *9/10*

U.S. Cl. 70—120 **3 Claims**



1. A door locking mechanism for a door assembly of the type having a door frame and a door mounted for pivotable movement between an opened and closed position with respect to said door frame, comprising:

a pair of key-operated cylinder lock means mountable on opposite sides of said door, said cylinder lock means each having a tailpiece rotatable between a locking and unlocking position via key operation of said lock means;

bolt means mountable on said door for locking said door in said frame when said door is in said closed position thereof, said bolt means being reciprocably movable between a locking and unlocking position;

lever means coupled to said bolt means for reciprocably moving said bolt means between said locking and unlocking position; and

a tumbler assembly including a generally cylindrical central tumbler coupled to said lever means and being reversely rotatable to effect movement of said lever means between said locking and unlocking positions, and a pair of stub shafts independently mounted for free limited rotation in opposite ends of said central tumbler, each of which is coupled to a tailpiece of one of said cylinder lock means and male-female interlock means associated with said central tumbler and stub shafts comprising pin and slot means including a pair of parallel, circumferentially-extending slots formed in said central tumbler and a pair of pins, each of which is mounted on one of said stub shafts and is received in one of said slots, with said slots extending approximately 190 degrees over the circumference of said central tumbler to permit said stub shafts to rotate said central tumbler to, in turn, effect movement of said lever means, said stub-shafts, in turn, being rotated independently and alternatively of one another via said tailpiece of the cylinder lock means coupled thereto upon key operation thereof, whereby said door may be unlocked and locked independently via either cylinder lock means without disturbing the position of or causing movement of the other cylinder lock means.

5,193,371

MAGNET CARD TYPE LOCK

Shinjiroh Yamane, Kawasaki, Japan, assignor to Kabushiki-Kaisha, Tokyo, Japan

Filed Dec. 24, 1991, Ser. No. 813,015

Int. Cl.[5] E05B *47/00*

U.S. Cl. 70—276 **4 Claims**

1. A magnet card type lock comprising

an outer case having a vertically extending opening formed therein;

a slider vertically slidably mounted in said outer case, said slider having a key hole slit formed therein for receipt of a key card;

first spring means for biasing said slider upwardly;

an engagement member fixed to said outer case for preventing upward movement of said slider beyond a predetermined location;

a projection plate vertically slidably mounted in said outer case between a vertical contact surface of said slider and a vertical contact surface of said outer case for vertical sliding movement relative to both said outer case and said slider;

a projection fixed to said projection plate and extending out of said outer case through said vertically extending opening;

wherein a plurality of substantially horizontal slider tumbler

holes are formed in said slider and open through said contact surface of said slider, a plurality of substantially horizontal projection plate tumbler holes are formed through said projection plate, and a plurality of substantially horizontal outer case tumbler holes are formed in said outer case and open through said contact surface of said outer case;

wherein said slider tumbler holes, said projection plate tumbler holes, and said outer case tumbler holes are respectively located in said slider, said projection plate, and said outer case such that, when said slider and said projection plate are in predetermined vertically aligned positions, said slider tumbler holes, said projection plate tumbler holes, and said outer case tumbler holes are in registry with one another;

wherein a plurality of magnet tumblers are respectively slidably mounted in at least some of said plurality of slider tumbler holes in a predetermined arrangement, said magnet tumblers having contact end surfaces which face toward said contact surface of said outer case;

wherein a plurality of pin tumblers are respectively slidably mounted in at least some of said plurality of outer case tumbler holes which correspond to said at least some of said plurality of slider tumbler holes, said pin tumblers having contact end surfaces which face toward said contact surface of said slider and which are adapted to contact said contact end surfaces of said magnet tumblers, respectively;

wherein second spring means are provided for biasing said pin tumblers and said magnet tumblers toward said key hole slit formed in said slider such that, when said slider tumbler holes, said projection plate tumbler holes, and said outer case tumbler holes are in registry with one another, said magnet tumblers are depressed into said slider tumbler holes, respectively, such that said contact end surfaces of said magnet tumblers are substantially vertically aligned with said contact surface of said slider, and said pin tumblers extend from within said outer case tumbler holes into said projection plate tumbler holes, respectively, such that said contact end surfaces of said pin tumblers are in contact with said contact end surfaces of said magnet tumblers, respectively, and are substantially vertically aligned with said contact surface of said slider, to thereby maintain said projection plate substantially immovable relative to said outer case and allow said slider to move downwardly relative to both said outer case and said projection plate; and

wherein said plurality of magnet tumblers in said predetermined arrangement comprise a means for sliding said magnet tumblers and said pin tumblers against a biasing force of said second spring means when a key card having a magnet arrangement corresponding to said predetermined arrangement of said magnet tumblers is inserted into said key hole slit, such that said contact end surfaces of said magnet tumblers and said contact end surfaces of said pin tumblers are moved into substantial alignment with said contact surface of said outer case, to thereby allow said slider to be moved downwardly against a biasing force of said first spring means and cause said projection plate to be moved downwardly along with said slider when said slider is moved downwardly.

5,193,372

LOCK CYLINDER

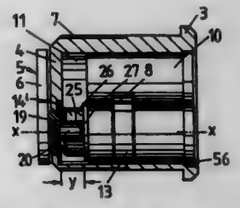
Giselher Sieg, Erftstadt, and Peter Wollweber, Wesseling, both of Fed. Rep. of Germany, assignors to DOM-Sicherheitstechnik GmbH & Co KG, Fed. Rep. of Germany

Filed Apr. 19, 1991, Ser. No. 687,794

Int. Cl.[5] E05B *15/00, 17/04*

U.S. Cl. 70—369 **1 Claim**

1. Lock cylinder with an external housing having a rear section which accommodates, on tis outer rear face, a closure element acting upon a mortise lock and with an exchangeably inserted core unit the casing of which contains housing pins as tumblers and a cylinder core formed with a key channel, said cylinder core also receiving core pins as tumblers, coupling pins extending from said closure element through said rear section of said external housing and into a rear region of said external housing, said cylinder core extending into said external housing outside of said rear region thereof, means extending from said cylinder core and into said rear region for receiv-



ing portions of said coupling pins located with in said rear region, wherein receipt by said receiving means of said coupling pins extends only over rear region which is spaced toward said rear section of said external housing from said key channel of said cylinder core and wherein said receiving means which is located within said rear region and is spaced from said key channel is formed with a transverse slot for receiving said coupling pins.

5,193,373

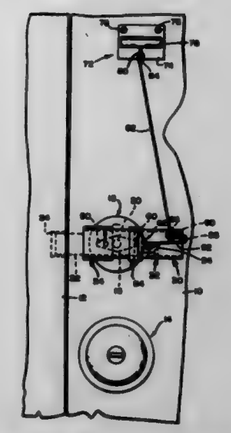
SECURITY DEVICE FOR DEADBOLT LOCK

Robert J. Hunt, 5009 Green Mountain Cir., Columbia, Md. 21044

Filed Mar. 16, 1992, Ser. No. 851,500

Int. Cl.[5] E05B *13/08*

U.S. Cl. 70—416 **14 Claims**



1. A security device for preventing unlocking of a deadbolt lock of a door including in combination, a door having inner and outer sides, a deadbolt lock supported on said door and having a handle spaced from the inner side of the door, said handle being movable between an unlocked position and a locked position, said security device comprising a body mounted in operative position on the handle, movable retaining means supported on said body for movement relative to the body between a release position for releasing the device from the handle and a retaining position for retaining the device in mounted operative position on the handle, means for maintaining said retaining means in said retaining position, anchor means attached to the inner side of said door, and flexible

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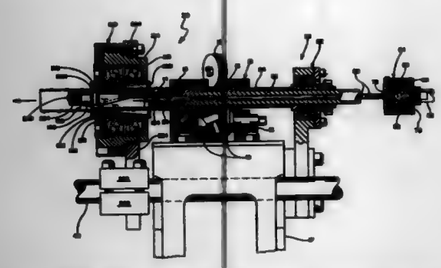
connecting means connected between said anchor means and said body, said anchor means and said connecting means comprising the sole means for preventing movement of said body in an unlocking direction, thereby preventing the handle from being moved from a locked position to an unlocked position.

5,193,374

APPARATUS FOR CUTTING SPIRAL PIPE

Wilhelmus P. H. Castricum, Rolling Meadows, Ill., assignor to Spiro America Inc., Buffalo Grove, Ill.

Filed Feb. 20, 1991, Ser. No. 658,056
Int. Cl.[5] B21C 37/12
U.S. Cl. 72—49 18 Claims



1. An apparatus for cutting continuously formed spiral pipe, wherein the pipe moves in an axial direction and rotates while it is being cut, comprising:

inner knife means positioned inside said pipe;

a rod adapted to move the inner knife means from an inner position within the pipe to an outer position where said knife contacts an interior surface of the pipe during a cutting operation;

a rotatable shaft adapted to revolve the inner knife means in an annular pattern about the centerline of the pipe such that a cutting edge of the inner knife means contacts the entire interior periphery of the pipe during the cutting operation;

an annular, outer knife positioned outside said pipe and having a cutting edge adjacent an exterior surface of the pipe, said cutting edge surrounding the pipe and being in a position to overlap the inner knife cutting edge;

axial motion means for moving said inner knife means, rod, shaft, and outer knife in the axial direction of the pipe at substantially the same speed as the pipe during the cutting operation; and

guide means for allowing the inner knife means, rod, shaft, and the outer knife to move in the axial direction of the pipe during the cutting operation, whereby the inner knife means cooperates with the outer knife to cut the pipe.

5,193,375

METHOD FOR ENHANCING THE WEAR PERFORMANCE AND LIFE CHARACTERISTICS OF A BRAKE DRUM

Thomas J. Meister, Richwood, Ohio, assignor to Metal Improvement Company, Inc., Paramus, N.J.

Filed Nov. 27, 1991, Ser. No. 800,550
Int. Cl.[5] C21D 9/06
U.S. Cl. 72—53 5 Claims

1. A method for enhancing the frictional wear properties, performance and life of a graphitic cast iron brake drum, comprising:

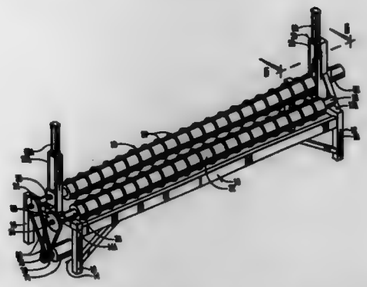
cold working the surfaces of said drum which are frictionally engaged by brake shoes, by subjecting said surfaces to shot peening at an intensity level sufficient to induce surface and near surface residual stress, to thereby increase the resistance of said graphitic cast iron to scuffing and heat checking under conditions of dry sliding contact and frictional loading; said shot peening being effected by impacting said surface with shot having a nominal diameter of from about 0.230 to 0.660 inch to achieve substantially 100% coverage.

5,193,376

MACHINE AND METHOD FOR REPAIRING DAMAGED GRAIN AERATION PIPES

Gary E. Weitl, Rte. 1, Box 122, Templeton, Iowa 51463

Filed Oct. 15, 1991, Ser. No. 775,915
Int. Cl.[5] B21D 3/02
U.S. Cl. 72—110 10 Claims



1. A method of straightening a hollow lightweight metal cylindrical deformed pipe, comprising,

positioning a first power roll having a diameter less than the diameter of said deformed pipe within said deformed pipe substantially along the length thereof,

positioning second and third power rolls in laterally close and overlapping aligned horizontal relation with said first power roll to frictionally bind a portion of the periphery of said deformed pipe between said first power roll and said second and third power rolls, and

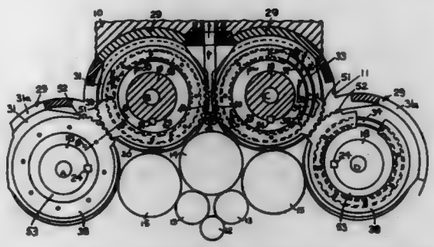
simultaneously applying rotational power to said first, second and third power rolls for rotating said first power roll in one direction and rotating said second and third power rolls in an opposite direction to rotate said deformed pipe and to cause deformation in said deformed pipe to be forced into a corrected cylindrical shape as the periphery of said deformed pipe passes between said first power roll and said second and third power rolls.

5,193,377

CROWN ADJUSTMENT SYSTEMS ON CLUSTER MILLS

Michael G. Sendzimir, Woodbury, and John W. Turley, Oxford, both of Conn., assignors to T. Sendzimir, Inc., Waterbury, Conn.

Filed Aug. 23, 1991, Ser. No. 748,962
Int. Cl.[5] B21B 13/14, 29/00
U.S. Cl. 72—241.4 9 Claims



1. A crown adjustment system for a 20-high (1-2-3-4) cluster mill having a mill housing with a roll cavity containing upper

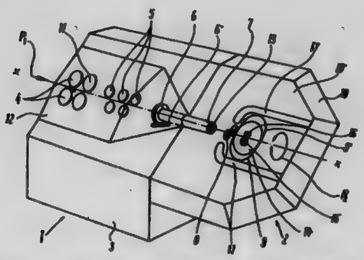
and lower clusters, each of said clusters comprising a work roll, two first intermediate rolls, three second intermediate rolls, and four backing bearing assemblies, each of said backing bearing assemblies of said upper cluster comprising a shaft supported against said mill housing at a plurality of locations along its length by saddles, said saddles of each of said shafts of said backing bearing assemblies of said upper cluster being equal in number and occupying the same saddle locations so that those saddles at corresponding saddle locations on adjacent ones of said shafts lie opposite each other; crown adjustment means being provided at each saddle of each of said backing bearing assemblies of said upper cluster, means operatively interconnecting said crown adjustment means of all four backing bearing assemblies of said upper cluster which occupy the same saddle location, a single drive means for each saddle location to simultaneously actuate said crown adjustment means occupying that saddle location in all four of said backing bearing assemblies of said upper cluster, whereby said single drive means at each saddle location can be used to effect the crown adjustment on all four of said backing bearing assemblies of said upper cluster.

5,193,378

DEVICE FOR BENDING ROD-LIKE MATERIAL TO FORM CONCRETE REINFORCEMENTS

Gerhard Ritter; Klaus Ritter, and Gerhard Schmidt, all of Graz, Austria, assignors to EVG Entwicklungs-u Verwertungs-Gesellschaft m.b.h, Graz, Austria

PCT No. PCT/AT90/00086, § 371 Date May 1, 1991, § 102(e) Date May 1, 1991, PCT Pub. No. WO91/04112, PCT Pub. Date Apr. 4, 1991
PCT Filed Aug. 30, 1990, Ser. No. 659,298
Claims priority, application Austria, Sep. 20, 1989, 2205/89
Int. Cl.[5] B21D 7/022
U.S. Cl. 72—294 4 Claims



1. Apparatus for bending rod-shaped material to form a concrete reinforcement stirrup, comprising

a frame (3) for supporting a material feed device (4, 5);

bending members (16);

a bearer element (10) retaining said bending members (16), said bearer element being secured on the frame to be rotatable about the axis of feed of said rod-shaped material and to be angularly adjustable relative to the frame,

said bearer element including a material supporting table (10) which has a table support surface (10') which is at least as large as the surface enclosed by the contour of a reinforcement stirrup limb to be bent by said bending members (15, 16) and supporting said bent limb;

a rotary bearing (7) rotatably supporting said material supporting table (10) with respect to the frame and providing for positioning said material supporting table in a predetermined angular position relative to the frame,

said rotary bearing including a tubular guide coaxial with the axis of feed of the rod-shaped material;

a material cutting device (8) located upstream of the bending members (16) on the material supporting table (10) in material feed direction, for cutting off said rod-shaped material from a line of material after the bending operation; and

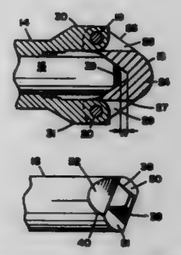
electrical connecting strip means (17) located on said support table (10) and having terminal ends positioned with clearance from said bending members (16), and located to form an electrical contact with material being bent, for control of the rotational movement of the table (10) in accordance with the position of said material on said table.

5,193,379

DIELESS COMPRESSION HEAD

Neil P. Ferraro, Merrimack, N.H., assignor to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 589,331, Sep. 27, 1990, abandoned. This application Jul. 26, 1991, Ser. No. 737,559
Int. Cl.[5] H01R 43/042
U.S. Cl. 72—412 11 Claims



1. An electrical connector crimping tool comprising:

a frame;

a ram movably mounted to said frame along an axis, said ram having a front with a first portion having a top section adapted to contact a connector and two angled sides obliquely oriented relative to said axis, the top section being substantially flat with each angled side being immediately adjacent said flat top section, and a second portion having an indenting extension, said second portion forming a leading edge of said ram and being located totally in front of said first portion;

an anvil connected to said frame, said anvil having two angled sides oriented obliquely to said axis and adapted to be matingly contacted by said ram first portion angled sides when said ram is advanced into contact with said anvil, aid flat top section being spaced from said anvil when said anvil angled sides contact said ram first portion angled sides; and

means for moving said ram relative to said anvil to crimp an electrical connector therebetween such that said ram second portion can indent into the connector and relative movement of said ram towards said anvil can be stopped by said ram first portion angled sides contacting said anvil angled sides and, said ram first portion top section can contact the connector to increase contact area between said ram and the connector without said ram first portion angled sides contacting said anvil angled sides.

5,193,380

HIGH FLOW-RATE LEAK DETECTOR HAVING THREE MOLECULAR FILTERS

Jacques Tallon, Annecy, France, assignor to Alcatel CIT, Paris, France

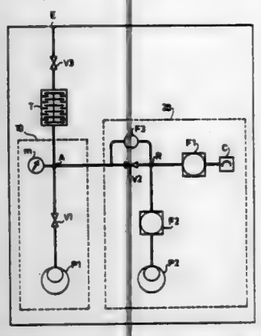
Filed Sep. 5, 1991, Ser. No. 755,243
Claims priority, application France, Sep. 5, 1990, 90 11027
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] G01M 3/02
U.S. Cl. 73—40.7 5 Claims

1. A helium leak detector comprising a first molecular pump (T) having a high pumping speed, having an low-pressure

outlet connected to an inlet (E) of the detector, and having a high-pressure outlet connected either to a pre-vacuum assembly (10) comprising a first valve (V1) and a first primary pump (P1), or to a measurement assembly (20) for measuring helium pressure and comprising:

a first selective filter (F1) constituted by a molecular pump having a low pumping speed and a low compression ratio;

a second selective filter (F2) constituted by a molecular



pump having a low pumping speed and a high compression ratio;

said first and second filters being connected to one end of a second valve (V2) having an other end connected between the molecular pump and the first valve (V1), and a third selective filter (F3) in parallel with said second valve (V2), said third filter allowing helium to pass therethrough and preventing air or vapor from passing therethrough.

5,193,381

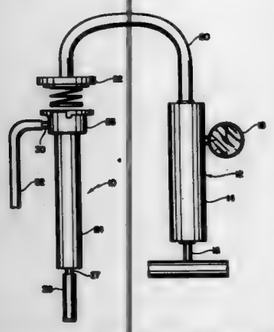
UNIVERSAL PRESSURIZING ADAPTOR FOR AUTOMOTIVE RADIATORS

Daniel E. Heimann, 252B Oliphant La., Middletown, R.I. 02840

Filed Mar. 16, 1992, Ser. No. 851,796

Int. Cl.[5] G01M *3/32*

U.S. Cl. 73—49.7 **6 Claims**



1. A universal pressurizing adaptor for use in combination with a conventional pressurizing device for pressurizing a vehicle engine cooling system in leak testing thereof, said pressurizing device comprising pump means and a conventional pressure cap attached to said pump means, said adaptor comprising a pressure chamber having an adaptor neck connected to a first end thereof and a flexible outlet conduit connected to a second end thereof, said adaptor neck being connectible to said conventional pressure cap, and said outlet conduit being connectible to a selected overflow pressure relief vent of the engine cooling system.

5,193,382

CLOGGING INDICATOR FOR CONTROLLING SODIUM QUALITY

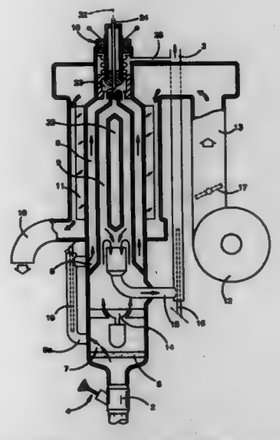
Christian Latge, Aix-en-Puce; Guy Lemercier, Le Puy Sainte Reparade; Bernard Puech, Pertuis, and Georges Jullien, Lyon, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jul. 25, 1991, Ser. No. 735,784

Claims priority, application France, Jul. 30, 1990, 90 09675

Int. Cl.[5] G01N *11/00*

U.S. Cl. 73—61.74 **7 Claims**



1. Clogging indicator for controlling the quality of sodium circulating in a main pipe and including :

means for diverting and measuring the flow of one portion of the sodium of the main pipe into a branch circuit connection pipe ;

means for cooling the branch circuit connection pipe and including a thermic exchanger to cool the sodium at a constant speed ;

a measuring head including at least two thermoelements for measuring the temperature of the sodium in a measuring section of the branch circuit connection pipe ;

adjustment, measuring and recording means for determining a clogging temperature, wherein the measuring head is able to move axially with respect to the branch circuit connection pipe inside a housing and includes one measuring chamber formed by one cylindrical wall comprising in its lower portion an annular grid able to be housed around a central tube of the branch circuit connection pipe and, in its upper portion, a seat on which a mobile hemispherical valve is able to be supported provided with measuring thermoelements and able to move axially inside a cylindrical bell rendered integral with the cylindrical wall of the measuring chamber and comprising holes for the passage of the gas or liquid sodium towards an evacuation pipe and one upper stop on which an annular shoulder of the valve takes support in an upper position, thus lifting up said valve so as to have the measuring chamber communicate with the evacuation pipe and then free the annular grid of the central tube of the branch circuit connection pipe.

5,193,383

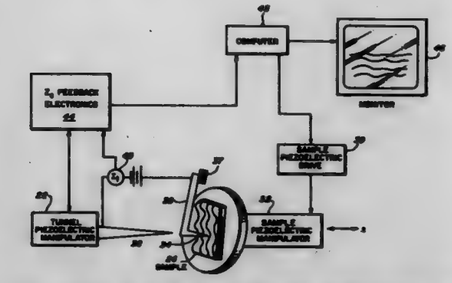
MECHANICAL AND SURFACE FORCE NANOPROBE

Nancy A. Burnham, Alexandria, and Richard J. Colton, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1990, Ser. No. 560,391

Int. Cl.[5] G01B *21/30, 7/34*; G01N *13/00, 3/40*

U.S. Cl. 73—105 **6 Claims**



1. A method for using an Atomic Force Microscope (AFM) to measure a surface property of a sample, comprising:

mounting a probe for said AFM on a cantilever whose deflection is a function of the force applied to said probe;

placing said probe and said sample at a separation greater than the zero deflection range of said surface property to be measured;

reducing said separation to zero by moving said sample towards said probe;

using a deflection measuring means to measure said deflection of said cantilever as a function of the position of said sample; and

determining said surface property of said sample from said displacement.

5,193,384

EDGE DETECTING SYSTEM AND METHOD

Michael F. Foley, Cambridge, and Kurt E. Guggenberger, Burlington, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 26, 1990, Ser. No. 589,086

Int. Cl.[5] G01B *5/28*

U.S. Cl. 73—105 **18 Claims**

1. An edge detecting system for detecting an edge on a wavy surface, comprising:

a stylus for tracking across the surface;

a transducer, responsive to said stylus, for producing a signal representative of surface transitions sensed by said stylus;

support means for suspending said stylus over said surface with said stylus contacting said surface, said support means having a natural frequency which isolates the stylus from the low-frequency wavy surface contours and compels the stylus to respond only to higher-frequency surface transitions; and

means, responsive to said transducer, for detecting a signal component representative of an edge within the higher-frequency surface transitions signal produced by said transducer, including means for moving said stylus across the surface where an edge detection is sought and means for halting said stylus motion across the surface when an edge is detected.

10. A fiber orientation detection system for detecting the orientation of the fibers of a material subject to wavy surface contours, comprising:

a stylus for tracking across the material;

a transducer, responsive to said stylus, for producing a high-frequency signal representative of surface irregularities produced by the fibers;

support means for suspending said stylus over said surface with said stylus contacting the material, said support means having a natural frequency which isolates the stylus from the low-frequency wavy surface contours and compels the stylus to respond only to high-frequency surface transitions;

means for averaging the high-frequency signal; and

means for comparing the averaged signal representative of surface irregularities with at least one reference level to determine the orientation of the fibers.

5,193,385

CANTILEVER FOR USE IN ATOMIC FORCE MICROSCOPE AND MANUFACTURING METHOD THEREFOR

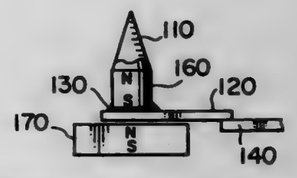
Tadashi Nishioka; Takao Yasue, and Hiroshi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1991, Ser. No. 685,644

Claims priority, application Japan, Aug. 28, 1990, 2-224473

Int. Cl.[5] G01B *5/28*; G01N *23/00*

U.S. Cl. 73—105 **14 Claims**



1. A cantilever for an atomic force microscope comprising:

a diamond stylus for opposing a sample for detecting an atomic force;

a stylus holding portion, at least a portion of which is a demagnetized magnetizable material, holding said diamond stylus; and

a lever having two opposed ends, one end being secured and another end to which said stylus holding portion is fastened being free, for deforming in response to an atomic force acting between said diamond stylus and the sample.

5,193,386

TAPERED ROLLER DYNAMOMETER

Jack E. Hesse, Jr., and Donald W. Blakarrow, both of Tucson, Ariz., assignors to Hamilton Test Systems, Inc., Tucson, Ariz.

Continuation of Ser. No. 586,232, Sep. 24, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 804,486

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117 **12 Claims**

1. In a vehicle diagnostic system having a control console, pairs of rollers for contact with the driven wheels of a vehicle, and electronic transducer means for interconnecting the rollers and said console, the improvement comprising:

at least one roller in each pair having a diameter which increases with distance from the centerline of said vehicle,

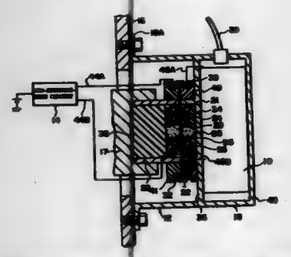
forming a taper along substantially the entire length of said at least one roller.

5,193,387

TIRE-INTERIOR MONITORING APPARATUS

Masato Hodate, Higashiyamato, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 13, 1991, Ser. No. 744,490
Claims priority, application Japan, Sep. 26, 1990, 2-256002
Int. Cl.[5] B60C *23/02*
U.S. Cl. 73—146.5 8 Claims



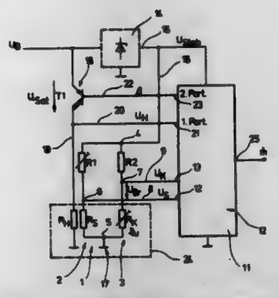
1. A tire-interior monitoring apparatus, comprising:
a detector for detecting a physical parameter of the interior of a tire;
a group of signal transmission coils including a signal-transmitting coil and a signal-receiving coil that are disposed in such a manner as to be rotatable relative to each other, said group of signal transmission coils being arranged such that a signal corresponding to the physical parameter detected by said detector is transmitted from said signal-transmitting coil to said signal-receiving coil through mutual induction; and
a group of power supply coils including a power-supplying coil and a power-receiving coil that are disposed in such a manner as to be rotatable relative to each other, said group of power supply coils being arranged such that an electromotive force is generated in said power-receiving coil through mutual induction so as to supply electric power to said detector,
wherein said signal-transmitting coil, said power-receiving coil, said signal-receiving coil, and said power-supplying coil are arranged to be substantially concentric in a substantially identical plane, said monitoring apparatus further comprising an electric conductor providing an electromagnetic shielding between said group of signal transmission coils and said group of power supply coils.

5,193,388

METHOD AND APPARATUS FOR DETERMINING THE FLOW RATE OF A FLOWING FLUID MASS

Josef Kleinhans, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 604,756
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1989, 3938286
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—204.14 12 Claims



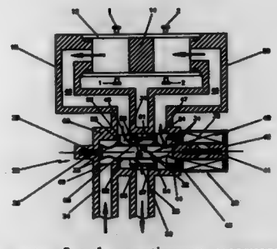
1. A method for controlling the temperature of a precision resistor for measuring the mass flow rate of air flowing around the precision resistor and entering an internal combustion engine, the temperature of the precision resistor being dependent upon the mass flow rate of air, comprising the following steps:
measuring a first voltage across the precision resistor, the first voltage being indicative of the temperature of the precision resistor and the mass flow rate of air;
measuring a second voltage across a heating resistor supported in thermal contact with the precision resistor;
generating a clock signal; and
controlling the duty cycle of the clock signal, the clock signal controlling the flow of electric current from a voltage supply to the heating resistor for controlling the temperature of the heating resistor and, in turn, for controlling the temperature of the precision resistor in thermal contact with the heating resistor, the duty cycle being based on the measured first voltage and the magnitude of the measured second voltage.

5,193,389

RECIPROCATING PISTON POSITIVE DISPLACEMENT FLOW METER

William T. Fleming, Jr., 139 Red Mill Rd., Glen Gardner, N.J. 08826

Filed May 29, 1991, Ser. No. 707,096
Int. Cl.[5] G01F *3/14*
U.S. Cl. 73—239 5 Claims



1. A flow meter for the continuous measurement of fluid flow comprising:

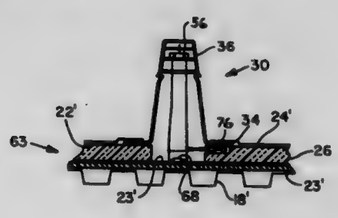
(a) a hollow open ended flow tube having a movable piston disposed therein for reciprocal movement between a first and second piston position corresponding to the opposite ends of the piston stroke;
(b) a first flow path connected to said flow tube at one open end thereof and a second flow path connected to said flow tube at the opposite end thereof;
(c) a solenoid-controlled valve assembly comprising a sliding valve member having opposite ends, a hollow interior extending between said opposite ends and an opening connected to said interior at each opposite end thereof; a valve body surrounding said sliding valve member, with said valve body having a first and second end, an inlet port located at said first end connected to said first flow path, and an outer port located at said second end connected to said second flow path, and a solenoid for reciprocating said sliding valve member between said first and second ends of said valve body, so as to align said inlet port with one opening of said sliding valve member at one end thereof, when said sliding valve member is adjacent the first end of said valve body, and for aligning said outlet port with the opening in said sliding valve member at its opposite end, when said sliding valve member is adjacent said second end of said valve body;
(d) inlet and outlet means connected to said valve body for directing and withdrawing a fluid stream through said valve body, with said inlet means being connected through said sliding valve means to said outlet port and said outlet means being connected to said inlet port when said sliding valve member is moved to said second end of said valve body, and with said inlet means being connected through said sliding valve means to said inlet port and said outlet means being connected to said outlet port when said sliding valve member is moved to said first end of said valve body;
(e) means for detecting the presence of said piston at each of said first and second positions, respectively; and
(f) means for activating and deactivating said solenoid to reverse the movement of said sliding valve member in response to the detection of said piston at each such piston position, respectively.

5,193,390

EARLY WARNING ROOF VENT

Andrew J. Nill, Jr., 84 W. Pulaski Rd., Huntington, N.Y. 11746

Filed May 20, 1991, Ser. No. 702,406
Int. Cl.[5] G01W *1/00*
U.S. Cl. 73—335.02 7 Claims



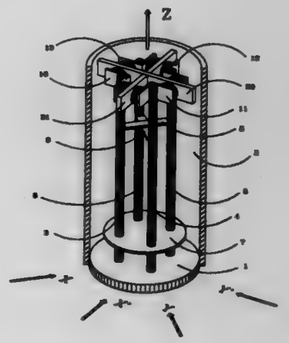
1. A vent for and in combination with a roof, said roof comprising deck means supporting layers of insulation, a waterproof membrane, and other roofing materials, said vent comprising a hollow member having a flange on the bottom thereof mounted on said roof covering an opening through said membrane, means sealing said flange on said roof to prevent leakage under said flange into said opening, removable cap means enclosing the top of said hollow member and including a lower platform having an opening therethrough, clamp means for releasable holding said cap means on said hollow member, said cap means including vent openings for air access into said hollow member for permitting unforced circulation of air into and out of said vent, said cap means further including a removable dust cover, an intermediate platform above and spaced from said lower platform, moisture indicating instrument means mounted on said intermediate platform, an upper platform spaced above said instrument means having means readable from outside of said roof vent when said dust cover is removed for indicating the presence of moisture and operably connected to said instrument means, first sensing means located within said roof placed below said waterproof membrane for sensing the presence of water, and electrical lead means for connecting said sensing means to said instrument means for delivering a signal to said readable means for indicating the presence of water below said membrane in said roof, said vent thereby simultaneously venting said roof through natural air circulation and detecting the presence of water below said membrane.

5,193,391

CONTROLLED VIBRATION ANGULAR RATE SENSOR

Donald R. Cage, 6 Placer Ave., Longmont, Colo. 80501

Filed Nov. 14, 1990, Ser. No. 613,162
Int. Cl.[5] G01P *9/04*
U.S. Cl. 73—505 43 Claims



1. A vibratory angular rate sensor for measuring the rate of turn of an object affixed to said sensor, said sensor comprising:
a plurality of elongated tynes with each tyne having an end affixed to a common base and arranged about a common axis;
drive means for vibrating said tynes with a first one of said tynes vibrating in opposition to a second one of tynes in a selected direction at a selected frequency,
a first coupling means affixed to each of said tynes at a first selected distance away from said common base for providing a predetermined amount of coupling between said tynes for a first in-phase mode of vibration of said tynes for separating by a selected amount the frequency of said first in-phase mode of vibration from the frequency of a first out-of-phase mode of vibration of said tynes, and
pickoff means associated with said second one of said tynes and responsive to said vibration of said second tyne for generating output signals, representing changes in the vibratory pattern of said tynes caused by the rotation of said object about said common axis.

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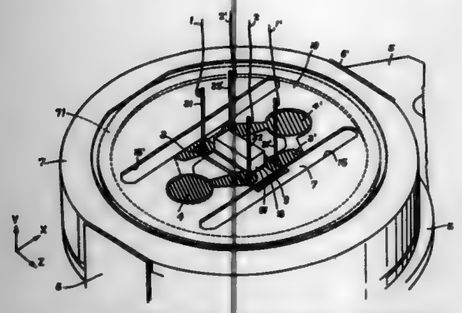
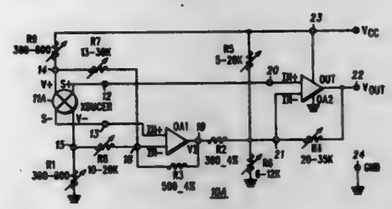
5,193,392
PIEZO ELECTRIC RESONATOR DIFFERENTIAL ACCELEROMETER
Raymond J. Besson; Roger F. Bourquin; Bernard M. Dulmet, and Pierre C. Maitre, all of Besancon, France, assignors to Etat Francais represented by the Delegue General pour l'Armement, Paris, France
Filed Jan. 8, 1991, Ser. No. 639,116
Claims priority, application France, Jan. 11, 1990, 90 00252
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—517 AV **10 Claims**



1. A monoaxial differential accelerometer, comprising:
a sensitive plate having a first principal face and a second principal face, said sensitive plate having a sensitive axis located within a plane of the sensitive plate, wherein said sensitive plate comprises a thin monolithic piezoelectric material;
a plurality of seismic masses, resting against said sensitive plate;
support means for supporting said sensitive plate;
two rectilinear slits formed in said sensitive plate, said slits being parallel to said sensitive axis;
a plurality of pairs of electrodes located between said rectilinear slits, wherein each said pair of electrodes defines a vibrating zone on thickness shearing mode, each said vibrating zone is aligned along said sensitive axis and each said vibrating zone is substantially identically sensitive to temperature variations;
wherein each said vibrating zone defines a resonator wherein frequencies of each resonator are added for an acceleration along said sensitive axis and said frequencies are substracted for an acceleration perpendicular to said sensitive axis;
a plurality of oscillators wherein each oscillator contains one said resonator, wherein beat frequencies of said resonators define an output signal of the accelerometer.

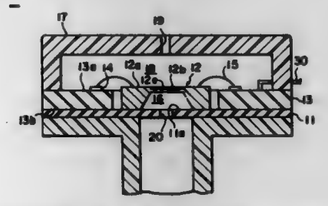
5,193,393
PRESSURE SENSOR CIRCUIT
Walter S. Czarnocki, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 4, 1991, Ser. No. 653,197
Int. Cl.[5] G01L *19/04*
U.S. Cl. 73—708 **24 Claims**

1. A pressure sensor circuit comprising:
a pressure resistive sensor means for sensing pressure and in response thereto providing first and second sensor signals at first and second sensor output terminals of said sensor means, the differential signal between said output terminals related to the magnitude of sensed pressure, and
adjustment circuit means for receiving said first and second sensor signals and providing in response thereto a pressure related output signal having a desired magnitude variation characteristic as a function of pressure and temperature,
said adjustment circuit means including resistive means for adjusting the span of said desired output signal as a function of pressure, the absolute offset of said output signal with respect to said first and second sensor signals, and the temperature coefficient of variation of both said offset and said span, said adjustment circuit means including at least and no more than two operational amplifiers with one of said first and second sensors signals coupled to an input of



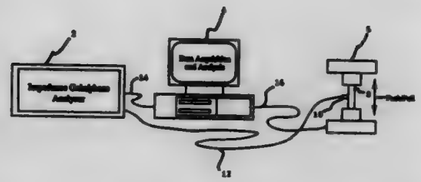
a first one of said two operational amplifiers which provides an output coupled to an input of a second one of said two operational amplifiers which provides an output corresponding to said pressure related output signal, said two operational amplifiers providing a common mode gain for said desired output signal with respect to said first and second sensor signals of less than five.

5,193,394
TRANSDUCING DEVICE FOR ACCURATELY TRANSDUCING A PHYSICAL QUANTITY INTO AN ELECTRIC SIGNAL
Masahiro Suda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 8, 1991, Ser. No. 652,824
Claims priority, application Japan, Feb. 8, 1990, 2-30139
Int. Cl.[5] G01B *7/16*
U.S. Cl. 73—766 **11 Claims**



1. A transducing device for transducing a physical quantity into an output electric signal, comprising:
a first dielectric substrate (11) having a substrate surface which has a predetermined portion (11*a*) and a peripheral portion surrounding said predetermined portion;
a physical quantity sensor (12) which has a predetermined height and which is mounted on said predetermined portion for sensing said physical quantity to produce a sensed signal representative of said physical quantity;
a second dielectric substrate (13) having an upper surface (13*a*) and a lower surface (13*b*) which is mounted on said peripheral portion of said substrate surface (11*a*);
an electric circuit (14) kept on said upper surface (13*a*) such that said electric circuit is substantially flush with said physical quantity sensor;
bonding wires (15) for electrically connecting said sensor (12) with said electric circuit (14); and
a housing which has a hollow space surrounding said physical quantity sensor, said electric circuit, and said bonding wires;
said electric circuit (14) receiving said sensed signal through said bonding wires and producing said output electric signal.

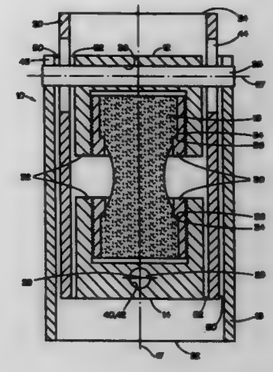
5,193,395
METHOD AND APPARATUS FOR DETERMINATION OF MATERIAL RESIDUAL STRESS
Eagain J. Chern, Columbia, and Yury Flom, Silver Spring, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Dec. 2, 1991, Ser. No. 801,141
Int. Cl.[5] G01N *3/32*
U.S. Cl. 73—779 **6 Claims**



1. A method for the determination of residual stress in a material sample comprising the steps of:
placing a sensing means whose resistance varies according to the amount of stress within said material sample adjacent said material sample;
imparting a gradually increasing compressional force on said material sample;
sending an input signal to and receiving an input signal from said sensing means;
measuring and recording the change in resistance of said sensing means and the corresponding amount of compressional strain of said sample;
imparting a gradually increasing tensional force on said material sample;
measuring and recording the change in resistance of said sensing means and the corresponding amount of tensional strain of said sample;
determining from said measurements of change of resistance and corresponding strain of said sample the point at which the resistance of said sensing means is at a minimum and the corresponding value and type of strain of said sample at that minimum resistance point thereby enabling a calculation of the residual stress in said sample.

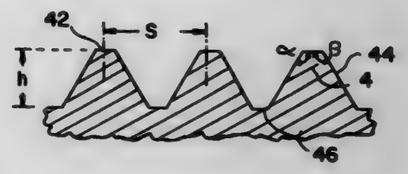
5,193,396
TENSILE TESTING APPARATUS
Bernard P. Gorski, Nepean, Canada, assignor to Her Majesty the Queen in right of Canada, Canada
Filed Sep. 25, 1991, Ser. No. 765,263
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—831 **22 Claims**

1. An apparatus for use in the tensile testing of a specimen comprising:
a first grip means for gripping one end of said specimen;
a second grip means for gripping the opposite end of said specimen;
a first intermediate member having a load bearing portion;
a second intermediate member having a load bearing portion, said first and second intermediate members being disposed such that said load bearing portions are generally outwardly opposed;
first means including a first resist pin receivable within a transversely extending bore within said first grip means, said first pin being of sufficient length so as to project radially outwardly when positioned within said first grip means bore to engage pin end accommodating means provided on said first intermediate member for pivotably connecting said first grip means with said first intermediate member; and
second means including a second resist pin receivable within a transversely extending bore within said second grip means, said second pin being of sufficient length so as to project radially outwardly when positioned within said second grip means bore to engage pin end accommodating means provided on said second intermediate member for pivotally connecting said second grip means with said second intermediate member, said first and second means being disposed substantially orthogonal to one another



and substantially transversely with respect to said specimen such that a compressive load, when applied to said load bearing portions of said first and second intermediate members, is transposed to a tensile load applied to said specimen.

5,193,397
GRIP FOR TENSILE TESTS
Luc Hugelier, Deerlijk, and Marc Devlaminck, Huisle, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium
Filed Sep. 25, 1991, Ser. No. 764,676
Claims priority, application Belgium, Oct. 11, 1990, 09000959
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—833 **10 Claims**



1. An apparatus comprising:
a grip for performing tensile tests on elongated specimens, said grip having at least one face for engaging said elongated specimens, said face having gripping projections which are arranged in a regular pattern of rows and columns and which have the form of truncated pyramids each having side faces and a flat upper surface, wherein the distance between center lines of adjacent rows columns of said gripping projections is less than 0.8 mm.

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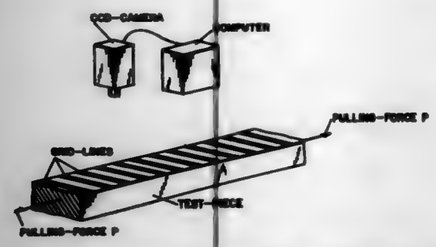
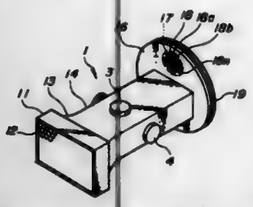
5,193,398
MEASURING METHOD FOR DETERMINING THE ELONGATION AFTER RUPTURE OF A TENSILE TEST PIECE
Jürgen Harder, Neukirchen/Vluyn; Günter Robiller, deceased, late of Mülheim-Ruhr, both of Fed. Rep. of Germany by Elisabeth Robiller, heiress , and Hans-Martin Sonne, Dinslaken, Fed. Rep. of Germany, assignors to Thyssen Stahl Aktiengesellschaft, Duisburg, Fed. Rep. of Germany
Filed Sep. 10, 1991, Ser. No. 757,427
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1990, 4029013
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—834 6 Claims



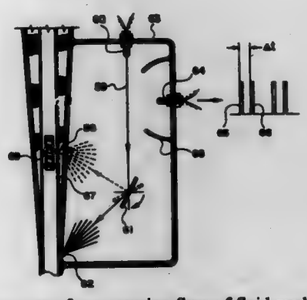
1. A measuring method for determining the elongation after fracture of a test piece in a tensile test, said method comprising the steps of scanning a measuring grid line, consisting of grid lines extending transversely of the pulling direction and applied to the tensile test piece, said scanning being effected by means of a line sensing camera; detecting the different brightness values as a result of such scanning; determining the measured values when the tensile force has exceeded its maximum and drops to zero; calculating from the measured values that time the distance is between adjacent grid lines and selecting therefrom the greatest distance between two adjacent grid lines as the place of the fracture and calculating the elongation after fracture utilizing the distance between the grid lines adjacent said place.

5,193,399
VORTEX FLOWMETER
Hideo Kamano; Hideo Murakami, and Masao Misumi, all of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,227
Int. Cl.[5] G01F *1/32*
U.S. Cl. 73—861.22 4 Claims



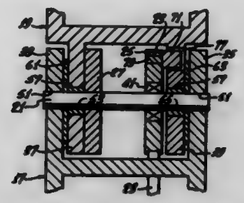
1. A vortex flowmeter unit comprising a main body having an inlet portion, a contraction portion following said inlet portion, an outlet portion following said contraction portion, and an integrally formed fitting plate following said outlet portion, said outlet portion having a substantially constant cross-sectional area, said inlet portion having a cross-sectional area greater than said cross-sectional area of said outlet portion, a flow rectifying device in said inlet portion, a vortex generator means in said outlet portion, said vortex generator means comprising a vortex generator and a vortex sensor for detecting a vortex signal from said vortex generator, said fitting plate having a cross-sectional area greater than said cross-sectional area of said outlet portion, and by-pass means on said fitting plate comprising a plurality of through holes arranged to form a generally circular section of said fitting plate.

5,193,400
UNIVERSAL ROTAMETER
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Continuation-in-part of Ser. No. 698,296, May 10, 1991. This application Aug. 26, 1991, Ser. No. 749,981
The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.
Int. Cl.[5] G01F *1/24*
U.S. Cl. 73—861.56 14 Claims



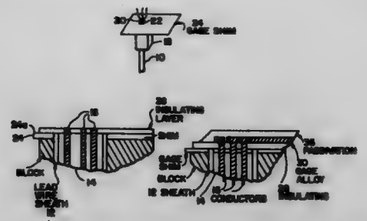
1. An apparatus for measuring flow of fluid media comprising in combination:
a) a body including a flow passage with cross sectional area progressively increasing from an inlet extremity to an outlet extremity of the flow passage, wherein the outlet extremity of the flow passage is disposed at a higher level than the inlet extremity of the flow passage;
b) a float including a magnetically reacting element disposed within the flow passage in an arrangement allowing movements in directions parallel to the central axis of the flow passage;
c) a plurality of float guides of elongated geometry with substantially straight guiding edge disposed parallel to and about the central axis of the flow passage, the guiding edges of the float guides distributed circumferentially about the central axis of the flow passage guiding movements of the float in directions generally parallel to the central axis of the flow passage, wherein at least one of the plurality of float guides has a ridge-like construction extending radially inward from a wall of the flow passage and includes an elongated cavity disposed parallel to the central axis of the flow passage following the guiding edge of the float guide;
d) a float follower of round geometry including a magnetically reacting element disposed within the elongated cavity included in said at least one float guide in a freely movable arrangement in directions parallel to the central axis of the flow passage, wherein at least one of the float and the float follower includes a magnetic element creating an attractive force between the float and the float follower, whereby the float follower follows movement of the float; and
e) an optoelectric means providing information on position of the float follower relative to a reference cross section of the flow passage as a measure of flow of fluid media moving through the flow passage.

5,193,401
MANIPULATOR INTEGRAL FORCE SENSOR
Robert H. Bridges, 28586 LaCumbre, Laguna Niguel, Calif. 92673
Filed Oct. 18, 1991, Ser. No. 780,742
Int. Cl.[5] G01L *3/02*
U.S. Cl. 73—862.195 23 Claims



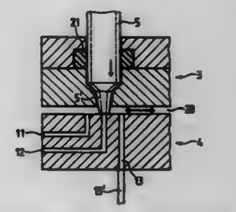
1. An apparatus for direct measurement of torque in an articulated joint responsive to movement of a remote actuator, said apparatus comprising:
a) a driver assembly;
b) a driven assembly;
c) means, mounting said driver assembly and driven assembly on a common shaft, for enabling angular displacement of the driven assembly relative to said driver assembly about said common shaft;
d) a driver collar disposed in a concentric relationship with the common shaft and interconnected to the remote actuator;
e) interlock means, responsive to the remote actuator, for rotating said driven assembly relative to said driver assembly;
f) at least one force sensor means, disposed in said interlock means in a position for transmitting rotational force from said interlock means to said driven assembly, for measuring said rotational force in order to provide a direct measurement of torque measurement.

5,193,402
LEADWIRE ATTACHMENT TECHNIQUE FOR MANUFACTURING A THIN FILM SENSOR AND A SENSOR MADE BY THAT TECHNIQUE
Stuart E. Reed, Homeworth, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Filed Jan. 21, 1992, Ser. No. 823,405
Int. Cl.[5] H01C *17/28*
U.S. Cl. 73—862.625 10 Claims



1. A method for manufacturing a sensor with an attached leadwire having a sheath and electrical leads, comprising the steps of:
fastening an adaptor block to the sheath of the leadwire with a portion of the leadwire extending beyond an edge of the adaptor block;
positioning the extended portion of the leadwire into an opening in a gage shim having top and bottom sides;
attaching the adaptor block to the bottom side of the gage shim such that the sheath of the leadwire is approximately flush with the top side of the gage shim and the electrical leads protrude therethrough;
covering the top side of the gage shim with an insulating layer such that the electrical leads are approximately flush therewith; and
depositing a sensor on the insulating layer and connecting the sensor to the electrical leads.
3. A sensor manufactured in accordance with the method of claim 1.

5,193,403
PIPETTING DEVICE
Ernst Bürgisser, Zeiningen, Switzerland, assignor to EPR Labautomation AG, Rheinfelden, Switzerland
PCT No. PCT/CH89/00033, § 371 Date Nov. 29, 1989, § 102(e) Date Nov. 29, 1989, PCT Pub. No. WO89/10191, PCT Pub. Date Nov. 2, 1989
PCT Filed Feb. 21, 1989, Ser. No. 455,468
Claims priority, application Switzerland, Apr. 18, 1988, 1419/88
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—864.17 10 Claims



1. An apparatus for dosing liquid comprising the combination of
a plurality of pipettes (5) each having a piston (6) and a piston rod (7) for operating said piston;
a first motor drive (1, 1', 8) coupled to said piston rods for reciprocally driving said rods parallel with a first axis (Z);
a carrier plate (3) supporting said plurality of pipettes with an outlet of each pipette exposed at a first surface of said carrier plate;
a stationary valve plate (4) having a second surface facing, generally parallel with and adjacent to said first surface of said carrier plate, said valve plate having channel means for conveying fluid to and from said pipette outlets, said channel means including a plurality of channel openings at said second surface;
a second motor drive coupled to said carrier plate for positioning said carrier plate relative to said valve plate; and
means for independently urging each said pipette outlet into sealing contact with said valve plate, whereby substantially leak-free connections are formed between said pipette outlets and said channel openings of said channel means.

5,193,404
LIQUIDS SAMPLER
Samantha S. H. Tan, Fremont, Calif., assignor to Bakaxs Analytical Laboratory, Sunnyvale, Calif.
Filed Feb. 12, 1991, Ser. No. 654,316
The portion of the term of this patent subsequent to Jan. 5, 2007, has been disclaimed.
Int. Cl.[5] G01N *1/20*
U.S. Cl. 73—864.34 4 Claims

1. An apparatus for removing a sample of a liquid for chemical analysis from a vessel containing said liquid and for delivering said sample into a sample bottle, comprising:
a hollow member having a wall structure partially defining an encloaed plenum;
a sample bottle attachment structure defining a passage

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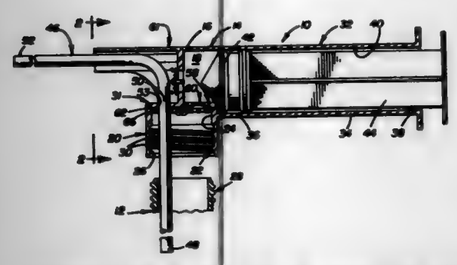
having a first end portion communicating with said plenum and a second end portion adapted for attachment to a top portion of said sample bottle;

a first partition structure partially defining said plenum and blocking off said passage other than where said first end portion communicates with said plenum;

hand pumping means for manually creating a partial vacuum in said plenum;

a longitudinally extending sample transport tube having a first end portion, a central portion and a second end portion, said first end portion of said tube extending through said passage into said bottle, said central portion passing through said first partition structure in substantially air tight relation thereto and said second end portion of said tube being adapted for positioning in said liquid in said vessel, said first partition structure holding said central portion of said transport tube and thereby supporting said first portion of said sample tube in said bottle; and



a first valve communicating with said plenum, said valve being adapted to allow flow of air therethrough from said plenum to a surrounding atmosphere and to prevent flow of air therethrough from the surrounding atmosphere into said plenum;

and wherein said communicating of said first end portion of said passage with said plenum is provided by a construction comprising:

a second partition structure blocking communication of said plenum with said passage other than via one or more openings through said second partition structure; and

a second valve communicating said plenum with said passage, said second valve being adapted to allow flow therethrough from said passage and through said one or more openings into said plenum only if the pressure in said passage exceeds that in said plenum by at least a selected amount.

5,193,405

UNDERWATER MOBILE TYPE INSPECTION SYSTEM

Takeo Oomichi; Yukio Hukagawa, both of Takasago; Kazuto Sawaragi, Kobe; Kyoichi Aizawa, Kobe; Kiyoshi Tachibana, Kobe; Junji Nakayama, Kobe; Tomio Aoyama, Kobe; Kyoichi Yoshioka, Kobe, and Mitsuhi Ideo, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

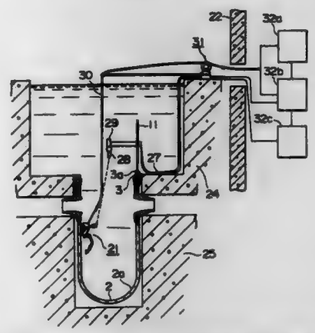
Filed May 31, 1991, Ser. No. 709,300

Claims priority, application Japan, Jun. 5, 1990, 2-58755[U]

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—865.8 **17 Claims**

1. An underwater mobile type inspection system comprising an articulated manipulator having a probe attached at its tip end thereof, a turning base which supports the proximal end of said manipulator for free rotation, said turning base having propulsion means for moving said turning base underwater without any external mechanical support, a mounting base attached to the bottom of said turning base via a pivot driving mechanism, adhesion means for temporarily securing said mounting base to a surface being inspected, and travelling means mounted on an outer periphery of said mounting base to



facilitate movement of said mounting base and the attached turning base along the surface being inspected.

5,193,406

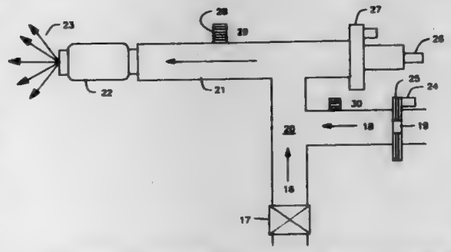
ON-STREAM METHOD FOR DETECTING EROSION OR PLUGGING FOR MANIFOLDED FEED NOZZLE SYSTEMS

Henry A. Wolf, Franklin Lakes; Richard J. Bellows, Hampton, and George D. Cody, Princeton, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 20, 1991, Ser. No. 718,047

Int. Cl.[5] G01N *19/000*

U.S. Cl. 73—865.9 **18 Claims**



1. An in-service method for determining erosion/plugging from each liquid commissioned nozzle in a plurality of nozzles in a manifolded system which carry two-phase liquid/gas flow comprising:

(a) interrupting the liquid flow through one of said liquid commissioned nozzles;

(b) measuring the total volume of the liquid flow to the manifolded system;

(c) measuring a liquid flow parameter for each of said liquid commissioned nozzles (including the one with temporarily interrupted liquid flow) where the parameter is functionally related to the volume of liquid flow;

(d) repeating steps (b) and (c) for each of said liquid commissioned nozzles in said manifold;

(e) determining a functional relationship, including calibration coefficients, between the nozzle liquid flow and the liquid flow parameter for each liquid commissioned nozzle;

(f) repeating steps (a) through (e) at a later time when it is desired to determine system plugging/erosion changes;

(g) comparing the change over the passage of time in the calibration coefficients of the functional relationship and correlating the change with two phase flow models for plugging/erosion.

5,193,407

SHOCK DETECTING DEVICE

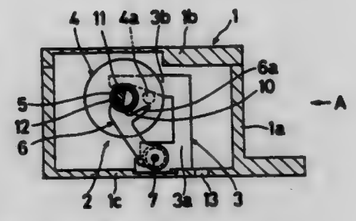
Kazunori Sakamoto, Chiryu; Masanobu Ishikawa, Nagoya, and Yutaka Kondoh, Toyota, all of Japan, assignors to Aisin Seiki Kabushi Kaisha, Aichi, Japan

Filed Dec. 5, 1991, Ser. No. 802,530

Claims priority, application Japan, Dec. 7, 1990, 2-400187; Mar. 29, 1991, 3-65942

Int. Cl.[5] B23Q *11/16*; F16H *5/40*

U.S. Cl. 74—2 **3 Claims**



1. A shock detecting device comprising:

a housing having a side wall for receiving an external shock and a bottom wall having a hole therethrough perpendicular to the side wall;

a bracket accommodated within the housing and secured thereto;

a weight having a first shaft secured coaxially thereto and supported on the bracket so as to be rotated at times when the external shock exceeds a set value;

a cam portion provided on the first shaft;

a second shaft connected to the housing and disposed substantially parallel to the first shaft;

a firing lever pivotally mounted within the housing on the second shaft;

a spring mounted on the second shaft and biasing the firing lever in one direction to engage the cam portion;

the weight having a stopper pin in engagement with the bracket by the biasing force of the spring applied to the cam portion of the first shaft; and

a firing pin provided on the firing lever and rotatable in one direction to project outside the housing through the hole upon release of the firing lever from the cam portion in response to the external shock.

5,193,408

ACTUATOR

Kiyozumi Fukui; Masami Okamoto, and Toshio Kamimura, all of Gifu, Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan

Continuation of Ser. No. 508,897, Apr. 12, 1990, Pat. No. 5,129,273. This application Apr. 30, 1992, Ser. No. 876,296

Claims priority, application Japan, Apr. 19, 1989, 1-99257; Apr. 19, 1989, 1-99258; Jun. 22, 1989, 1-159914

Int. Cl.[5] F16H *1/18*

U.S. Cl. 74—89.15 **3 Claims**

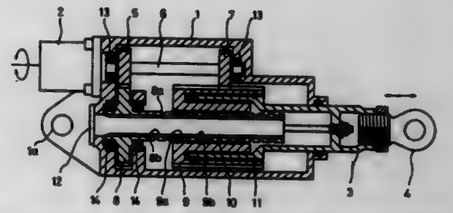
1. An actuator for transducing a rotational movement into a linear movement, which comprises:

a drive means generating said rotational movement;

a transducing means transducing said rotational movement into said linear movement;

an output means outputting said transduced linear movement; and

a reducing means disposed between said drive means and said transducing means and reducing said rotational movement and transmitting it to said transducing means wherein said reducing means comprises a first input gear and said drive means generates rotational movement through a second input gear; and



a control means controlling connection between said drive means and said reducing means.

5,193,409

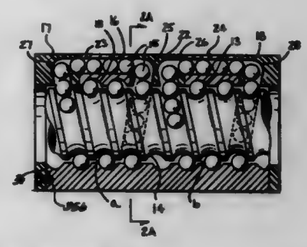
MULTIPLE CIRCUIT INTERNAL BALL NUT RETURN ASSEMBLY WITH RADIAL DROP-IN INSERT FOR BALL SCREW DEVICES

James A. Babinski, Saginaw, Mich., assignor to Thomson Saginaw Ball Screw Company, Inc., Saginaw, Mich.

Filed Mar. 31, 1992, Ser. No. 861,092

Int. Cl.[5] F16H *27/02*

U.S. Cl. 74—89.15 **11 Claims**



1. In a ball nut screw assembly:

a. a helically externally grooved screw providing a screw ball race;

b. a generally tubular nut with an exterior circumferential wall bounded by generally transversely extending ends received on said screw and having a complemental internal helical groove with outer ends providing a nut ball race corresponding to said screw ball race and extending substantially from one end of the nut to the other end of the nut, there being a plurality of balls received by and operative in said races to radially separate said nut and screw;

c. said nut having a first internal axial ball return passage within said wall leading endwisely outwardly in one direction from a location interjacent the ends of the nut ball race and a second internal axial ball return passage within said wall axially spaced from said first ball return passage and leading endwisely outwardly in the opposite direction from said location;

d. ball return members at the outer ends of the ball return passages configured for moving balls to and from said ball races from and to said first and second ball return passages;

e. said nut having a radially extending slot of limited circumferential extent at said location axially between said first and second ball return passages leading from the exterior circumferential surface of said nut through said nut to said nut ball race, said slot having generally axially extending marginal walls joined by generally transversely extending marginal walls;

f. radial drop-in insert means of limited circumferential extent with generally axially extending walls received by said generally axially extending walls of said slot and with

generally transversely extending marginal walls received by said generally transversely extending marginal walls of said slot, said insert means having a pair of adjacent end return elements, each element having a generally circumferentially extending tongue extending inwardly into the screw ball race and an adjacent generally radially directed channel leading to one of said ball return passages, said tongues extending radially in opposite directions to deflect the balls from said screw ball race into the adjacent channels and to said first and second ball return passages dependant on the direction of travel of the balls to provide independent circuits of recirculating balls in said ball race.

5,193,410

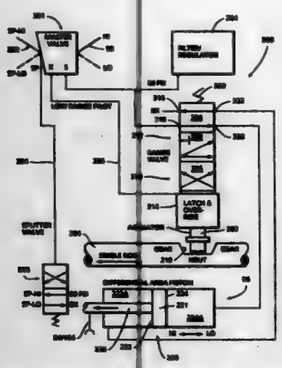
RANGE SECTION PROTECTION VALVE ASSEMBLY

Alan C. Stine, Kalamazoo, Mich.; Terry F. Terwilliger, Littleton, Colo.; Joseph D. Reynolds, Climax, Mich.; Michael J. Huggins, Kalamazoo, Mich., and Mark A. Hirsch, Vicksburg, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 23, 1992, Ser. No. 824,925

Int. Cl.[5] F16H *59/00*

U.S. Cl. 74—336 R **25 Claims**



1. A valve assembly (310) for use in a control system (300,400) for controlling a pressurized fluid operated shift actuator (220) for an auxiliary transmission section (14) of a compound transmission (10) including a main transmission section (12) having engaged and not-engaged positions connected in series with said auxiliary transmission section, said auxiliary transmission section including a selectable high speed ratio (direct) and a selectable low speed ratio (reduction), each of said ratios engageable by a synchronized jaw clutch assembly (92/128), said actuator (220) comprising a differential area piston (221) having a first piston surface (224) defining a first chamber (224A) and a second piston surface (222) defining a second chamber (222A), said first piston surface area being larger than an area (a_{222}) defined by said second piston surface, pressurization of said first chamber (224A) causing said actuator to urge said synchronized clutch assembly to engage said high-speed ratio and pressurization of said second chamber (222A) causing said actuator to urge said synchronized clutch assembly to engage said low-speed ratio said system including means (204, 210) for indicating the current engaged or not engaged condition of said main transmission section, selector means (96/98A/412) for selecting a desired auxiliary section ratio, a common source (234) of pressurized fluid and an exhaust (EX), said valve assembly including a three-position valve (312) having a first position (324) for pressurizing said first chamber and exhausting said second chamber, a second position (326) for pressurizing said second chamber and exhausting said first chamber and a third position (328) for pressurizing both said first and second chamber and override means (332) cooperative with said means for indicating the current engaged or not engaged condition of said main transmission section for urging said valve from the first to the third positions thereof when said main section is in the engaged condition thereof.

5,193,411

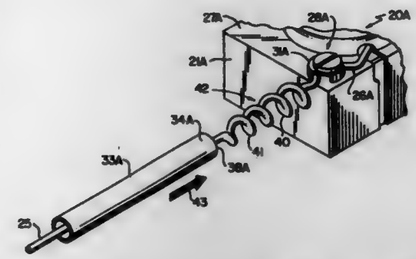
CONTROL DEVICE, PARTS THEREFOR AND METHODS OF MAKING THE SAME

Thomas M. Buckshaw, Indiana, and David D. Martin, Dunbar, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 8, 1991, Ser. No. 790,594

Int. Cl.[5] F16C *1/10*

U.S. Cl. 74—502.4 **15 Claims**



1. In a control device comprising a housing means having an external peripheral surface means, control means disposed in said housing means, a bulb means disposed external to said housing means and remote therefrom, a capillary tube interconnecting said bulb means to said control means, fastening means securing a part of said capillary tube to said external peripheral surface means of said housing means, and a sleeve of material telescoped on said capillary tube and having opposed ends one of which is disposed adjacent said fastening means and the other of which is located between said bulb means and said one of said ends thereof, the improvement wherein said capillary tube itself has been deformed to comprise an expanding means that outwardly expanded said one of said ends of said sleeve after said one of said ends of said sleeve had been forced onto at least part of said expanding means so that said one of said ends of said sleeve is held on said expanding means.

5,193,412

STEERING WHEEL

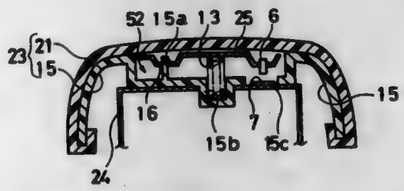
Takahiro Hashiba, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 23, 1991, Ser. No. 704,595

Claims priority, application Japan, Jun. 23, 1990, 2-165019

Int. Cl.[5] B62D *1/04*

U.S. Cl. 74—552 **7 Claims**



1. A steering wheel comprising:

a horn pad including a pad cover made of a soft synthetic resin and a unitary insert made of a hard electrical insulating material attached integrally to a backside of the pad cover, the insert having a peripheral area attached to a peripheral area of the back side of the pad cover so as to give rigidity to the peripheral area of the pad cover, while having a central area separated from a central area of the backside of the pad cover to establish a space therebetween;

a sheet member supported by the insert so as to be disposed in the space between the insert and the pad cover and to be contactable via the space by the pad cover;

a metal fixing frame securing immovably the central area of the insert on an upper surface of the fixing frame so that the insert is interposed between the sheet member and the fixing frame so as to insulate the sheet member and the fixing frame from each other; and

contact means for a switching operation, including a moving contact provided on the sheet member and a fixed contact provided on the fixing frame at a position opposite the moving contact.

5,193,413

CONNECTING ROD FOR PISTON ENGINES

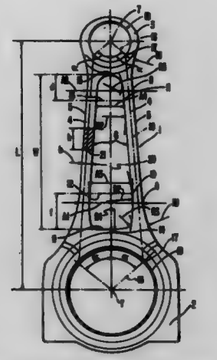
Wolfgang Kizler, Fellbach, and Michael Krämer, Notzingen, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed May 4, 1992, Ser. No. 877,726

Claims priority, application Fed. Rep. of Germany, May 3, 1991, 4114488

Int. Cl.[5] G05G *1/00*

U.S. Cl. 74—579 E **7 Claims**



1. Connecting rod for piston engines, made of sintered metal and having two individual booms which are separated from one another to form an interspace extending between connecting-rod eyes essentially over an entire length of a connecting-rod shank and which are connected respectively to a large and a small connecting-rod eye, the individual booms, which extend with their longitudinal mid-axes so as to approach one another at an acute angle in a direction of the small connecting-rod eye, outer wide sides of the individual booms adjoining outer contours of the connecting-rod eyes by means of radii and inner wide sides of the individual booms likewise being connected to the connecting-rod eyes by means of radii, at a height of a radius onsets form a straight region of the outer wide sides of the individual booms to a radius distance between the outer wide sides of the individual booms being smaller than outside diameters of the respective connecting-rod eye, and between imaginary straight lines, which connect intersection points between longitudinal mid-axes of the booms and bore walls of the connecting-rod eyes to the longitudinal mid-axis of the connecting rod, respective angles α of 45° to 50° being formed, wherein connection of inner longitudinal sides of the individual booms to the connecting-rod eyes is made in a form of double radii, substantially larger radii which adjoin the individual booms amounting to approximately 0.5 times to one times a length of the connecting rod and being continued into smaller radii for joining to the connecting-rod eyes, and wherein the larger radii adjoin the inner wide sides of the individual booms by means of respective radius onsets, and between a respective straight line intersecting two mutually opposite radius onsets and a vertex points of a respective connecting-rod side located between the individual booms and intersected by the longitudinal mid-axis of the connecting rod there is a distance between the inner longitudinal sides at the height of the respective radius onsets.

5,193,414

ASSEMBLED SHAFT

Helmut Swars, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

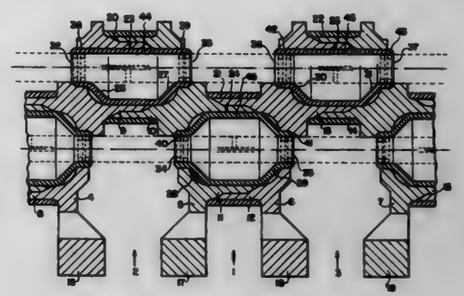
Filed Nov. 3, 1989, Ser. No. 431,647

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837291

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] F16C *3/04*

U.S. Cl. 74—595 **18 Claims**



1. An assembled shaft, comprising:

tubular members; and

sleeves inserted into the tubular members so as to connect adjoining tubular portions of said tubular members, the sleeves being radially deformed beyond their limit of elasticity by internal pressure application, the sleeves (23, 24, 25; 114, 118, 122; 215, 216, 217) each comprising a cylindrical central portion with an enlarged diameter (44, 45, 46; 115, 119, 123; 218) so as to rest against the adjoining tubular portion of the tubular member, the sleeves also having end faces (26–31; 116, 117, 120, 212, 124, 125; 219, 220) with round apertures having a smaller diameter (32–37; 132–137; 223, 224) forming sealing regions for sealing on a diameter which is reduced as compared to the central portion.

5,193,415

CONTINUOUS RADIAL SHIELD FOR AUTOMATIC TRANSMISSION

Bruno H. Massel, Bensenville, Ill., assignor to Bruno's Automotive Products Inc., Bensenville, Ill.

Filed Jun. 4, 1991, Ser. No. 710,148

Int. Cl.[5] F16H *57/02*

U.S. Cl. 74—606 R **5 Claims**

1. A shield in combination with an automatic transmission having a housing including a pan mounting section adjacent to transmission components rotating about a transmission axis comprising:

a fluid plan constructed to remain imperforate after impact by fragments created by failure of the rotating transmission components and being mounted to the pan mounting section;

a jacket constructed to remain imperforate after impact by

fragments created by failure of the rotating transmission components and formed to radially surround a section of the housing adjacent to the rotating transmission components and secured to the fluid pan; and

the jacket being fastened directly to the fluid pan to maintain attachment of the jacket to the fluid pan during and after impact of the shield by fragments created by failure of the rotating transmission components, the jackets being secured to the housing indirectly by attachment to the fluid

pan which fluid pan is then fixedly connected to the pan mounting section of the housing and thereby the jacket and fluid pan provide a continuous shield that radially surrounds the rotating transmission components that withstands penetration by fragments created by failure of the rotating transmission components, and withstand separation of the fluid pan and the jacket due to impact by fragments created by failure of the rotating transmission components.

5,193,416

MECHANICAL-HYDRAULIC TRANSMISSION GEAR SYSTEM AND METHOD OF CONTROLLING POWER TRANSMISSION USING THE SYSTEM

Noboru Kasayama, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

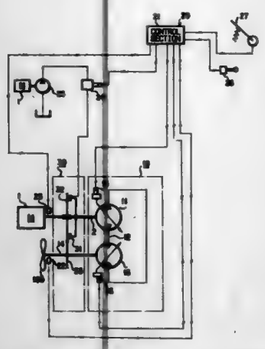
PCT No. PCT/JP89/00547, § 371 Date Nov. 29, 1990, § 102(e) Date Nov. 29, 1990, PCT Pub. No. WO89/12188, PCT Pub. Date Dec. 14, 1989

PCT Filed May 31, 1989, Ser. No. 613,706

Claims priority, application Japan, Jul. 28, 1988, 63-188626; Mar. 30, 1989, 1-079791; May 31, 1989, 63-133765

Int. Cl.[5] F16H *47/00*; F16D *39/00*

U.S. Cl. 74—733.1 22 Claims



1. A method for controlling power transmission using a mechanical-hydraulic transmission gear system including a prime mover having a speed control means; a hydraulic transmission gear operatively connectable to said prime mover and having a variable displacement hydraulic pump and a variable displacement hydraulic motor; a control unit; and a mechanical transmission gear having a clutch and being operatively connectable to said prime mover, said control unit being in communication with at least said clutch,

wherein when the rotational speed of an output shaft is lower than a predetermined value, the method includes the steps of disconnecting said clutch of the mechanical transmission gear fixedly secured to an input shaft and transmitting the power from the prime mover through the hydraulic transmission gear to the output shaft according to a signal transmitted by said control unit;

wherein when the rotational speed of the output shaft is higher than the predetermined value, the method includes the steps of connecting the clutch of said mechanical transmission gear to thereby transmit the power from the prime mover through the mechanical transmission gear to the output shaft according to a signal from said control unit, and minimizing the power required by the hydraulic transmission gear according to a command from said control unit.

5,193,417

TRANSMISSION WITH ONE-WAY CLUTCHES AND FAILSAFE METHOD OF AND APPARATUS FOR CONTROLLING THE TRANSMISSION

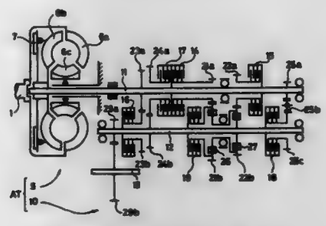
Tsunefumi Niiyama; Noboru Sekine, both of Saitama; Takamichi Shimada, Tokyo; Hiroyuki Shimada, Saitama, and Kaoru Kajikawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1990, Ser. No. 520,416

Claims priority, application Japan, May 8, 1989, 1-114571; May 18, 1989, 1-124687; May 26, 1989, 1-133380

Int. Cl.[5] F16H *59/00, 61/00*

U.S. Cl. 74—866 13 Claims



INT SOL 151	2nd SOL 152	D RANGE	3 RANGE	2 RANGE	1 RANGE	R RANGE
OFF	ON	LOW	LOW	(LOW)	(LOW)	—
ON	ON	2ND	2ND	(2ND)	(2ND)	(REV)
ON	OFF	(3RD)	(3RD)	(3RD)	(2ND)	(REV)
OFF	OFF	(4TH)	(3RD)	(2ND)	(2ND)	(REV)
SYSTEM DOWN		(4TH)	(3RD)	(2ND)	(2ND)	(REV)

1. An apparatus for controlling shifting operation of a transmission for selecting one, at a time, of a plurality of power transmitting paths having different speed reduction ratios, the power transmitting paths including at least one power transmitting path which has a one-way clutch for transmitting power only in a driving direction and an engine-brake clutch for bypassing said one-way clutch, said apparatus comprising:

an engine-brake clutch timing control valve for controlling said engine-brake clutch; and

two solenoid valves for simultaneously controlling said engine-brake clutch control valve;

the arrangement being such that, when one of said two solenoid valves fails and is inactivated, the other solenoid valve is used to cause said engine-brake clutch timing control valve to engage said engine-brake clutch.

5,193,418

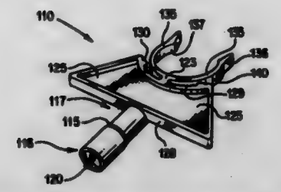
DRUM KEY

Eric J. Behrenfeld, 2450 N. Francisco, Chicago, Ill. 60647

Continuation-in-part of Ser. No. 514,699, Apr. 26, 1990. This application May 19, 1992, Ser. No. 885,526

Int. Cl.[5] B25B *13/06*

U.S. Cl. 81—121.1 12 Claims



1. A drum key for torquing tension rods or nuts of drum equipment, the drum key comprising:

a drum key shaft, a torquing wing, a pair of stops, a neck, and a pair of elongated arcuate prongs of the drum key being formed in one injection molded piece;

said drum key shaft having an open end and a wing end portion opposite of said open end, said open end having a bore with a non-circular cross section for engaging and rotating a fastener;

said torquing wing integrally formed with said wing end portion, said torquing wing having an upper wing surface, said neck integrally formed with said torquing wing, said neck extending outward from said upper wing surface;

said elongated arcuate prongs integrally formed with and extending outward from said neck, each said arcuate prong having a free end, said free ends spaced apart from each other, each said arcuate prong having an inner arcuate surface, said inner arcuate surfaces facing each other for grasping a tubular member;

said stops integrally formed with said torquing wing, each said stop extending from said upper wing surface toward a corresponding said arcuate prong, each said stop limiting outward deflection of each corresponding said arcuate prong; and

wherein said upper wing surface follows a contour of an external prong surface of each said arcuate prong for providing support to each said external prong surface during outward deflection of said arcuate prongs.

5,193,419

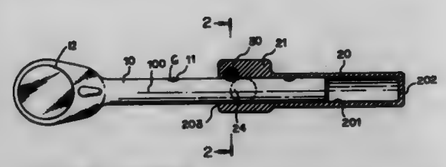
WRENCH WITH TELESCOPIC HANDLE

Chang-Chuan Lee, P.O. Box 55-1670, Taipei, Taiwan

Filed Jan. 15, 1992, Ser. No. 898,152

Int. Cl.[5] B25G *1/04*

U.S. Cl. 81—177.2 3 Claims



1. A wrench comprising:

a handle portion having a head portion formed on a first end portion of the handle portion selected from a socket, a pair of jaws and a ring socket, and a plurality of transverse grooves transversely recessed in the handle portion and equally spaced to be longitudinally distributed on the handle portion, and a longitudinal axis formed in a longitudinal center of the handle portion;

a handle sleeve telescopically receiving said handle portion within said sleeve, having a longitudinal hole longitudinally formed in the sleeve for telescopically holding a second end portion of the handle portion opposite to the head portion, a closed end portion formed on a bottom portion of the sleeve, and a flange portion formed on an open end portion of the sleeve opposite to the closed end portion for holding said locking bolt thereon; and

a locking bolt resiliently held in said handle sleeve normally engaging said handle portion for locking and positioning said handle portion in said handle sleeve, said locking bolt including: a bolt shank portion having a neck portion protruded linearly from the shank portion to be slidably held in a bolt hole transversely formed in the flange portion of the sleeve to be projectively perpendicular to said longitudinal axis centrally formed in the handle portion, a cap portion formed on an outer end portion of the neck portion of the bolt resiliently retained outwardly by a tensioning spring inserted in a spring socket recessed in the flange portion, and a retainer ring secured on an inner end portion of the bolt opposite to the cap portion for retaining the bolt on the flange portion of the sleeve; said tensioning spring normally urging the cap portion of the bolt outwardly to engage the bolt shank portion with a transverse groove formed in the handle portion for stably positioning and locking the handle portion in the sleeve, whereby upon a disengagement of said locking bolt from said handle portion, said handle portion can be telescopically adjusted for its length protruded outwardly from said handle sleeve and upon a further engagement of said handle portion with said locking bolt, said handle portion will be stably locked on said handle sleeve for operating purpose.

5,193,420

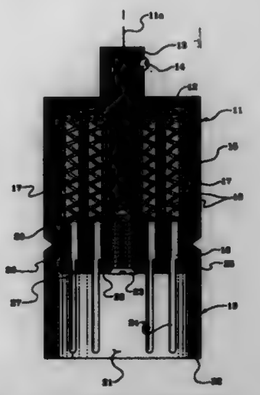
LOCKING LUG REMOVAL TOOL

Charles T. Smith, 2730 Fernwood St., Roseville, Minn. 55113

Filed Jan. 24, 1992, Ser. No. 825,566

Int. Cl.[5] B25B *23/10*

U.S. Cl. 81—442 5 Claims



1. A locking lug removal tool, comprising,

a first housing coaxially aligned about a predetermined axis with a second housing coaxially aligned about the predetermined axis fixedly mounted to the first housing, the first housing including a first housing top wall spaced from and parallel a first housing bottom wall, the second housing including a second housing top wall spaced from a second housing bottom wall, wherein the first housing top wall, the first housing bottom wall, the second housing top wall, and the second housing bottom wall are arranged in a parallel relationship, with the first housing bottom wall in

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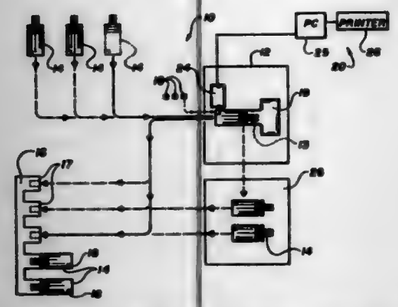
contiguous and coextensive relationship relative to the second housing top wall,
and
the second housing bottom wall including a second housing cavity extending into the second housing from the second housing bottom wall and terminating in a cavity floor, wherein the cavity floor is arranged in a spaced parallel relationship relative to the second housing bottom wall,
and
a matrix of engaging pins are telescopingly received within the first housing extending through the second housing cavity floor, wherein each engaging pin of the matrix of engaging pins is contained within the second housing cavity.

5,193,421

SYSTEM AND METHOD FOR PRESETTING TOOLING

Ronald A. Meisinger, Westlake, Ohio, assignor to Atwood Industries, Inc., Westlake, Ohio

Filed Jun. 16, 1992, Ser. No. 899,454
Int. Cl.[5] B23B *1/00*
U.S. Cl. 82—1.11 **16 Claims**



1. A machine tooling system, comprising:
a tooling machine having a plurality of adjustable cutting units installed therein at various locations on the tooling machine, each of said adjustable cutting units being positionable to contact a workpiece to be tooled and having an identification device attached thereto, each of said identification devices providing location information relating the adjustable cutting unit to which it is attached to a particular location on said tooling machine;
a collet for holding a workpiece to be tooled,
a presetter machine for adjusting said adjustable cutting units to within prescribed specifications when said adjustable cutting units are detached from said tooling machine; and
a cutting unit identification subsystem for storing said location information provided by said identification devices.

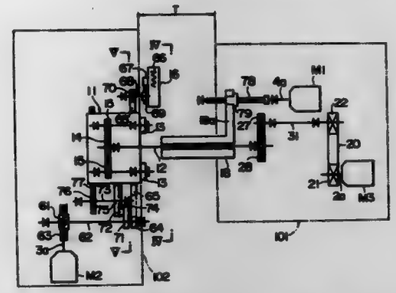
5,193,422

MULTISPINDLE AUTOMATIC LATHE

Yuuichi Mukai; Yoshitoshi Ito; Takayuki Nagato, and Tamotsu Tonomura, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1991, Ser. No. 786,070
Claims priority, application Japan, Nov. 16, 1990, 2-119348; May 14, 1991, 3-33680
Int. Cl.[5] B23B *9/04*
U.S. Cl. 82—129 **6 Claims**

1. In a multispindle automatic lathe including a headstock, a spindle carrier rotatably mounted for indexing around an indexing axis in relation to said headstock, a plurality of spindles rotatably mounted on said spindle carrier for rotation about respective spindle axes in circumferential spaced relationship around said indexing axis of said spindle carrier for supporting a workpiece on each spindle, a cross tool slide for each spindle mounted in circumferential spaced relationship in proximity to the periphery of said spindle carrier for reciprocating movement in a direction substantially transverse to a respective one of said spindle axes for supporting and moving a tool between a machining position for machining a respective workpiece and a retracted position displaced from said workpiece, and an end tool slide for each spindle supported and adapted for reciprocating movement in a direction substantially parallel to a respective one of said spindle axes for supporting a tool for machining a respective workpiece, the improvement comprising:
a spindle driving transmission system operatively connected to said spindles for driving said spindles and having a main shaft;
a first drive motor means connected to said spindle driving transmission system for driving said spindle driving transmission system and said spindles;
an end tool slide driving system operatively connected to said end tool slides for reciprocating said end tool slides;
a second drive motor means connected to said end tool slide driving system for operating said end tool slide driving system and reciprocating said end tool slides;



a cross tool slide driving system operatively connected to said cross tool slides for reciprocating said cross tool slides;
an indexing driving system operatively connected to said spindle carrier for rotatably indexing said spindle carrier; and
a third drive motor means connected to said cross tool slide driving system and said indexing driving system for reciprocating said cross tool slides and indexing said spindle carrier, so that during a low speed operation of said third drive motor means for a predetermined first period said cross tool slides are reciprocated in said transverse direction towards said spindle axes in said machining position and during a high speed operation of said third drive motor means for a predetermined second period said cross tool slides are reciprocated in said transverse direction in sequence towards said retracted position and towards said machining position and said spindle carrier is rotated a predetermined index angle to position said spindles for subsequent operations on workpieces held in said spindles.

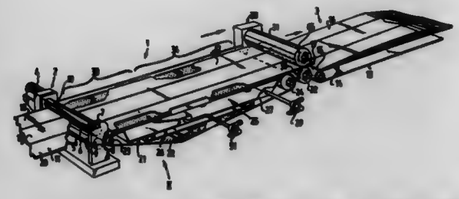
5,193,423

METHOD AND DEVICE FOR CONVEYING MATERIAL STRIP PORTIONS CUT FROM A MATERIAL STRIP

Rinze P. Bakker, Almelo, Netherlands, assignor to Universal Corrugated B.V., Almelo, Netherlands

Filed Nov. 5, 1990, Ser. No. 609,832
Claims priority, application Netherlands, Nov. 7, 1989, 8902753
Int. Cl.[5] B26D *7/32*; B65H *35/08*
U.S. Cl. 83—24 **24 Claims**

24. A method for cutting and conveying strip portions cut by a cutting device from a material strip in the transverse direction of the material strip, which strip portions are subsequently laid in a staggered, overlapping stack on a stacker, comprising:
(i) cutting a strip portion from the material strip with the cutting device;
(ii) conveying with a first conveyor disposed downstream from the cutting device the material strip for cutting and the cut strip portion at a first conveying speed V_1, wherein V_1 is equal to a supply conveying speed V_0 of the material strip to the cutting device plus from 0% to 5% V_0; and
(iii) conveying with a second conveyor the cut strip portion, after having been cut free of the material strip, at a second conveying speed V_2 which is greater than the first conveying speed V_1
wherein the second conveyor is disposed downstream from the first conveyor and upstream from the stacker.

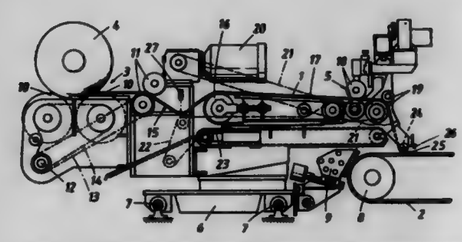


5,193,424

APPARATUS FOR APPLYING A NONWOVEN WEB TO A CARRIER WEB MOVING IN THE SAME DIRECTION

Klaus Minichshofer, Linz, and Hannes Pum, Alberndorf, both of Austria, assignors to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Jan. 18, 1991, Ser. No. 717,419
Claims priority, application Austria, Jun. 22, 1990, 1331/90
Int. Cl.[5] B26D *5/00*; B65H *23/192*
U.S. Cl. 83—75 **3 Claims**



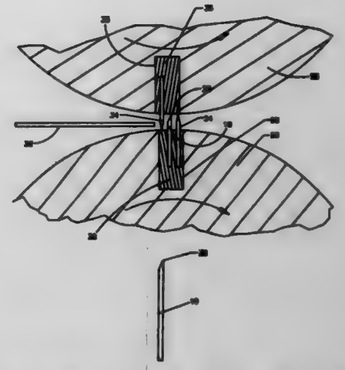
1. In an apparatus for applying a nonwoven web to a receiving surface of a carrier web moving in a predetermined direction for conveying the nonwoven web on said receiving surface, comprising
unwinding means for unwinding said nonwoven web from a roll thereof,
edge-trimming means for trimming said nonwoven web at its longitudinal edges, and
take-off rolls for pulling said nonwoven web from said edge-trimming means so as to tension said nonwoven web adjacent to said edge-trimming means and for delivering said nonwoven web to said receiving surface,
the improvement comprising
a feeding conveyor for receiving said nonwoven web from said unwinding means and for delivering said nonwoven web to said edge-trimming means,
said unwinding means and said feeding conveyor supporting therebetween respective ends of a slack loop permitting said nonwoven web to sag freely in said loop,
drive means for operating said feeding conveyor and said take-off rolls at respective velocities of conveyance having a predetermined ratio to each other, and
tension control means for controlling said drive means to operate in dependence on the velocity of said receiving surface, said feeding conveyor and said take-off rolls at such velocities of conveyance that said nonwoven web will be subjected to a tensile stress between said take-off rolls and said receiving surface.

5,193,425

CHIP IMPALEMENT SPEARS FOR ROTARY CUTTERS

Gaines P. Campbell, Jr., Lookout Mountain, and Blaine C. Stambaugh, Signal Mountain, both of Tenn., assignors to NWF Industries, Chattanooga, Tenn.

Filed May 14, 1991, Ser. No. 699,705
Int. Cl.[5] B26D *7/18*
U.S. Cl. 83—113 **9 Claims**



1. A chip-impalement spear for a rotary cutter having a pair of opposing rollers comprising:
a metal body adapted to have one end thereof secured within the surface of a roller, the opposite end having a generally rectangular cross section with a single bevelled, straight, sharp edge along the opposite end and adapted to be placed with the said edge parallel to the roller and positioned so that the edge will come into slight contact with an opposing roller; and
said metal body being elastically deformable such that said edge elastically deforms into a barb upon making contact with said opposing roller.

5,193,426

LINEAR TYPE PUNCH PRESS

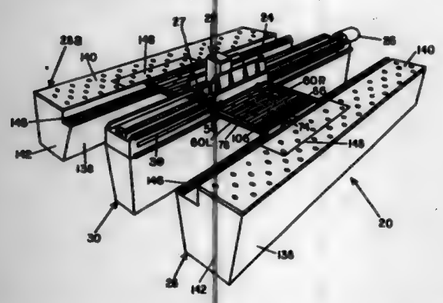
David C. Dunn, 410 E. Cleveland, Guthrie, Okla. 73044

Filed Aug. 19, 1991, Ser. No. 746,757
Int. Cl.[5] B26D *7/02*
U.S. Cl. 83—277 **4 Claims**

1. A linear punch press for processing a workpiece, comprising:
upright elongated central frame means having coextensive punch and die supports disposed in superposed spaced relation defining opposing side surfaces and having coextensive linear guides adjacent the upper limit of said side surfaces,
said punch and die supports including a plurality of fixed position punch and die adaptors cooperatively supported, respectively, in vertically spaced axial alignment by said punch and die supports intermediate their ends;

a workpiece support table having a linear guide coextensive with said central frame means disposed in lateral parallel spaced-apart relation on respective sides of said central frame means;

X and Y axes workpiece positioning frame means including workpiece supporting conveyor means extending transversely of and supported by said central frame means and said support table linear guides;



first and second motor means for moving said positioning frame means in an X axis direction and said conveyor means in a Y axis direction respectively;

punch driving head means slidably supported for movement in an X axis direction within said positioning frame means; and,

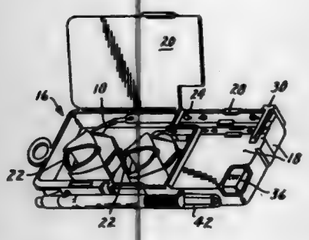
third motor means for aligning said punch driving head means with selected punch adaptors.

5,193,427

WIRE MARKER DISPENSER

Gerald W. Johannesen, Round Rock, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 30, 1992, Ser. No. 828,307
Int. Cl.[5] B26D *1/30*; G09F *3/00*
U.S. Cl. 83—607 **4 Claims**



1. A dispenser adapted to dispense in seriatim fashion wire markers from a series of joined wire markers each defined by a length of material including a hole at each end of the length of material, the dispenser comprising:

a housing of joined walls defining an open interior;

a door providing access to said interior of said housing;

a length of the joined wire markers disposed within said interior of said housing;

a slot communicating between said interior of said housing and the exterior of said housing and sized to permit passage of said wire markers from said housing interior to said housing exterior;

a track disposed on the exterior of said housing adjacent said slot for guiding said wire markers after said wire markers exit said housing interior through said slot;

means for cutting said length of wire markers into individual wire markers, said means for cutting disposed adjacent said track and opposite said slot; and

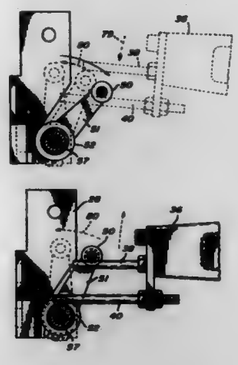
an advancement slot within said track in register with said holes of said wire markers when said wire markers are disposed within said track, said advancement slot terminating at a predetermined location spaced from said means for cutting such that insertion of a pointed object through one of said holes in one of said individual wire markers and into said advancement slot and movement of said pointed object along said advancement slot toward said means for cutting will advance said wire marker along said track toward said means for cutting until movement of said pointed object within said advancement slot is ended by said termination of said slot, thus positioning said individual wire marker at said predetermined position for cutting.

5,193,428

ASSEMBLY FOR CONVENTIONAL BENCH SAW

Michel Letendre, 2620 Croissant Berainl, Brossard, Québec, Canada

Filed Dec. 3, 1991, Ser. No. 801,886
Int. Cl.[5] B27B *5/06, 5/30*
U.S. Cl. 83—863 **6 Claims**



1. An attachment assembly for mounting to a conventional bench saw having: a base, a work-supporting table on said base displaying a longitudinal opening therethrough, a movable structure mounted in said base and carrying a power-operated main shaft, a cutting tool operatively connected to said shaft and partially protruding through said opening, and means in said base for causing vertical and angular displacements of said shaft relative to said table; said attachment assembly comprising:

a rigid member associated with said tool and rotatively mounted to said main shaft; said member extending longitudinally of said opening beneath said table; projection means at one end of said member; and

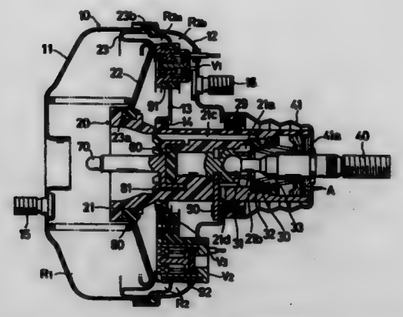
securing means mounted to said movable structure to engage and to disengage said projection means; said securing means being movable between a first position whereby said projection means are free from engagement with said securing means, and a second position whereby said member is fixedly connected to said movable structure when said tool is set for a cutting operation to thereby prevent vertical, lateral and angular movements of said member caused by forces exerted during the cutting operation.

5,193,429

VACUUM TYPE BRAKE BOOSTER

Yuzuru Sugiura, Anjo, and Satoshi Kawasumi, Takahama, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 13, 1991, Ser. No. 714,617
Claims priority, application Japan, Jan. 25, 1990, 2-67084
Int. Cl.[5] F01B *25/02*
U.S. Cl. 91—6 **2 Claims**



1. A vacuum type brake booster comprising:

a housing including a front shell and a rear shell in which a constant negative pressure chamber and a variable pressure chamber are defined by a power piston and a diaphragm;

a partition for dividing the variable pressure chamber into a first variable chamber next to the constant negative pressure chamber and a second variable chamber;

a normally opened valve mounted on the partition for establishing or interrupting fluid communication;

an output rod movable together with the power piston;

an input rod for urging the output rod;

a valve mechanism disposed with in the power piston to be operated by the input rod and used for controlling the differential pressure between the constant negative pressure chamber and the variable pressure chamber by controlling the fluid communication of the second variable chamber with the constant negative pressure chamber and the atmosphere;

a normally closed valve mounted on a rear shell and the partition and disposed between the first variable chamber and the atmosphere; and

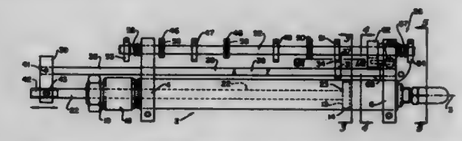
a check valve which permits the fluid flow from the second variable pressure chamber to the first variable pressure chamber.

5,193,430

AIR CYLINDER WITH INTERMEDIATE MECHANICAL DEAD-STOP

Adolf M. Ilgovsky, 587 Torland Ct., Sunnyvale, Calif. 94087

Filed Oct. 3, 1991, Ser. No. 770,591
Int. Cl.[5] F15B *15/24*
U.S. Cl. 92—13.1 **6 Claims**



5. In combination, a linear double-acting air cylinder apparatus including first and second axially spaced support blocks on which an air cylinder is fixedly mounted and a piston rod connected at one end to the piston and extending sealingly out of the air cylinder at its other end, and control means providing intermediate dead-stops to limit linear translation of the piston and piston rod in relation to the air cylinder, said control means including:

a) a dead-stop rod connected for translation with said piston rod and having on one end thereof a dead-stop plate;

b) a shaft parallel to said dead-stop rod mounted for movement relation to said air cylinder;

c) a multiplicity of adjustable abutment plates mounted on said shaft axially spaced therealong and against which said dead-stop plate may selectively abut to interrupt linear translation of said piston and piston rod; and

d) means operatively associated with said multiplicity of adjustable abutment plates selectively operable to move said shaft and the abutment plates mounted thereon to remove selected ones of said abutment plates from the translation path of said dead-stop plate;

e) wherein said means selectively operable to move said shaft and the abutment plates mounted thereon includes a crank mounted on said shaft, and means for selectively rotating said crank through a predetermined arc to effect selective rotation of said shaft and said abutment plates to place selected ones of said abutment plates in the path of said dead-stop plate or remove said selected ones of said abutment plates from the path of said dead-stop plate; and

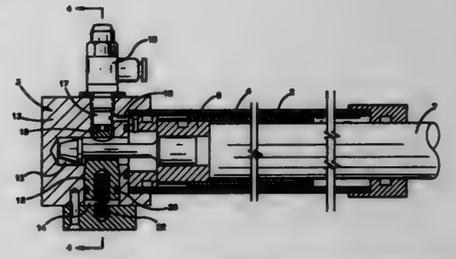
f) wherein said means for selectively rotating said crank includes an auxiliary air cylinder having a piston rod extending therefrom and selectively reciprocable in relation to said auxiliary air cylinder by selective admission of air to said auxiliary air cylinder, and a connecting rod mounted on said piston rod and engaging said crank to effect rotation of said crank upon reciprocation of said piston rod.

5,193,431

DEVICE FOR OPERATION OF A SLIDING DOOR MEMBER

John R. Propsting, Greenwich, and George D. Higgins, Beverly Hills, both of Australia, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 5, 1990, Ser. No. 609,279
Claims priority, application Australia, Nov. 3, 1989, PJ7228; Apr. 24, 1990, PJ9764
Int. Cl.[5] F15B *15/26*
U.S. Cl. 92—21 MR **9 Claims**



1. A device for operation of a sliding door member, the device being movable between a first position in which the door member is closed, and a second position in which the door member is open, the device comprising a pneumatic cylinder having an actuating piston and a rod assembly, means to reduce the force applied to the piston rod when approaching the first position, said means comprising a slidable cage sealingly sleeved between the cylinder and the piston, such that in use when moving towards the first position the force is provided initially by conjoined movement of the piston and said cage, and finally by the piston only; and including a first latch-

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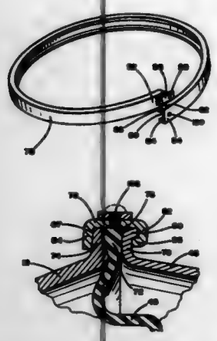
ing means for locking said device in said first position and an independently operable manual delatching means.

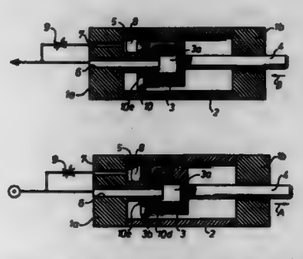
5,193,432
TAMPER-RESISTANT BRAKE ACTUATOR
John P. Smith, Grand Rapids, Mich., assignor to Anchorlok Corp., Muskegon, Mich.
Filed Apr. 29, 1992, Ser. No. 875,998
Int. Cl.[5] F01B 7/00
U.S. Cl. 92—63 18 Claims



1. In a fluid-operated brake actuator of the type having a head with a first annular flange, a flange case with a second annular flange, an annular retaining member circumferentially extending about an interface between the first annular flange and the second annular flange to clamp the first and second annular flanges tightly together and form a chamber, said annular retaining member having a pair of radially inwardly protruding portions to engage the first and second annular flanges, and a power spring compressed within the chamber, the force of said power spring tending to separate the head from the flange case, the improvement comprising:
an axial step on at least one of said first and second annular flanges extending away from said interface, said step being discontinuous around the circumference of said at least one of the first and second annular flanges,
an axial lip on at least one of said radially inwardly protruding portions of the annular retaining member, said lip extending toward the interface radially inwardly of the step in snug engagement therewith,
said annular retaining member being split and having a leading end and a trailing end,
whereby said annular retaining member is threaded onto said first and second annular flanges by introducing said lip on the leading end of the annular retaining member between portions of the step and drawing the annular retaining member circumferentially around the interface until the lip on the trailing end is in clamping engagement with the step on said first annular flange.

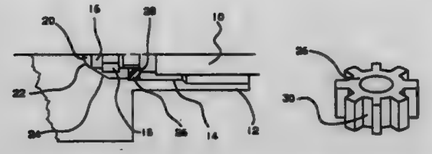
12. A method of joining a head to a flange case in a fluid-operated brake actuator with an elastomeric diaphragm interposed therebetween, said head having an annular rim, said flange case having an annular flange at an open end thereof, at least one of said annular rim and annular flange having an axial step, discontinuous around the circumference thereof and extending away from said diaphragm, and said diaphragm having a circumferential edge portion, comprising the steps of:
placing the circumferential edge portion against the annular rim in a circumferentially abutting relationship,
placing the annular flange against the circumferential edge in a circumferentially abutting relationship,
providing a retaining member having a channel defined by a first wall and a second wall, said first wall having a lip extending inwardly of the channel, said retaining member having a leading end and a trailing end,
introducing the leading end of the retaining member tangentially onto the annular rim and the annular flange at a discontinuity in the axial step, with the annular rim, the circumferential edge portion, and the annular flange being received in the channel and the lip positioned radially inwardly of and in engagement with the axial step, and
moving the leading end and the retaining member circumferentially about the annular rim and annular flange at least 360 degrees so that the lip captures the step in clamping engagement.

5,193,433
PISTON SEALING AND DAMPENING DEVICE
Jens Reimer, Stockholm, Sweden, assignor to AB Mecman, Stockholm, Sweden
PCT No. PCT/SE90/00278, § 371 Date Nov. 1, 1991, § 102(e) Date Nov. 1, 1991, PCT Pub. No. WO90/14520, PCT Pub. Date Nov. 29, 1990
PCT Filed Apr. 25, 1990, Ser. No. 775,926
Claims priority, application Sweden, May 24, 1989, 8901851
Int. Cl.[5] F01B 11/07
U.S. Cl. 92—85 B 10 Claims



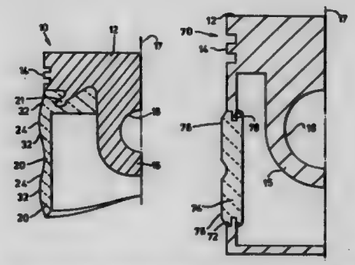
1. In the combination of a piston sealing and dampening device in a pressurized-fluid cylinder, having a cylinder tube, cylinder end caps situated at the ends of the cylinder tube, and a piston movable inside the cylinder tube between said end caps, at least one end cap having a central sleeve portion projecting into the cylinder chamber and being provided with an internal pressurized-fluid connection, the piston having a central recess facing towards said at least one end cap such that when the piston is in the vicinity of an end position adjacent said at least one end cap this recess accommodates said sleeve portion, the piston sealing and dampening device including radially inner and outer sealing ring lips adapted such that, during movement of the piston towards said end position under dampening action, these lips seal off an annular space between the cylinder tube and said sleeve portion, characterized in that the piston sealing and dampening device comprises an integrated sealing ring including:
a radially inner part with said inner sealing ring lip for sealing engagement against said sleeve portion under said dampening action;
an intermediate web portion situated in the region of an end surface of the piston facing towards said at least one end cap; and
a radially outer part with said outer sealing ring lip for sealing engagement against the inside of the cylinder tube; and,
the sealing ring being fastened to the piston at least in said radially outer part such that the inner sealing ring lip is at least partially displaceable from said sleeve portion during the initial stage of the piston movement away from said at least one end cap.

5,193,434
ACTUATING DEVICE FOR A MASTER CYLINDER
Jean-Pierre Gautier, Aulnay-sous-Bois; Miguel Perez, Argenteuil, and Ulysse Verbo, Aulnay-Sous-Bois, all of France, assignors to Bendix Europe Services Techniques, Drancy, France
Filed Oct. 25, 1991, Ser. No. 782,221
Claims priority, application France, Nov. 13, 1990, 90 14063
Int. Cl.[5] F01B 9/00
U.S. Cl. 92—140 6 Claims



1. An actuating device for a master cylinder constituted by an actuating rod acting on a piston of the master cylinder, the actuating rod penetrating into a housing provided in the piston of the master cylinder, the device comprising elastic centering means arranged about the actuating rod and in the interior of the housing of the piston of the master cylinder and compressed therebetween, the elastic means being constituted by a rubber ring presenting a polygonal axial cross-section and grooves formed on at least one of the interior and exterior surfaces of the ring.

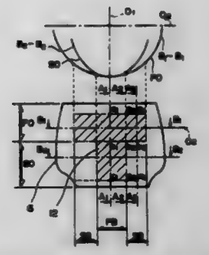
5,193,435
PISTON WITH CERAMIC LOAD-TRANSMITTING PADS
David A. Parker, Rugby, United Kingdom, assignor to T&N Technology Limited, Warwickshire, United Kingdom
Continuation of Ser. No. 713,308, Jun. 11, 1991, abandoned.
This application Jul. 27, 1992, Ser. No. 918,792
Claims priority, application United Kingdom, Jun. 23, 1990, 9014047; Jun. 23, 1990, 9014049
Int. Cl.[5] F16J 9/00
U.S. Cl. 92—212 10 Claims



1. A piston for an engine or a motor comprising a piston body comprising a crown and a skirt, wherein all of the skirt is formed of a ceramic material injection molded directly onto the crown, the skirt providing a plurality of pads which project from each of two thrust surfaces of the skirt to transmit lateral forces against a wall of an associated cylinder.

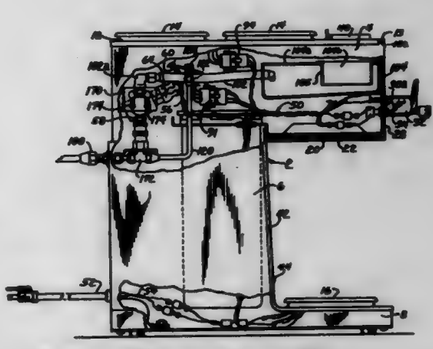
4. A piston for an engine or a motor comprising a piston body comprising a crown and a skirt, wherein portions of the skirt form thrust surfaces which are provided with a plurality of pads projecting therefrom to transmit lateral forces against a wall of an associated cylinder, said pads formed as inserts of a ceramic material, injection molded directly onto the piston body into apertures extending through the skirt.

5,193,436
ENGINE PISTON
Kyugo Hamai; Takayuki Arai; Takaharu Goto, and Hisafumi Usuki, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jan. 23, 1992, Ser. No. 824,850
Claims priority, application Japan, Jan. 25, 1991, 3-25455
Int. Cl.[5] F16J 1/04
U.S. Cl. 92—233 4 Claims



1. A piston adapted to slide in an engine cylinder having a piston head with a circular cross-section, a skirt formed below said piston head and continuous with it, a piston pin traversing said skirt and a connecting rod connected to this pin, wherein said skirt has a basic configuration comprising at least two types of elliptical horizontal cross-section with a short axis parallel to said piston pin, and a barrel-shaped vertical cross-section smaller at its top and bottom, said skirt has an approximately "T"-shaped projection on the lateral surfaces of said skirt corresponding to the two ends of the long axis of said ellipse, said projection consisting of a vertical piece and two side pieces situated on either side of said vertical piece, and a vertical section of the lower part of said skirt from below the lower edge of said two side pieces to the lower edge of said skirt is inclined toward the inside of said barrel-shaped vertical section so that said skirt is joined smoothly to said projection below said two side pieces.

5,193,437
BEVERAGE MAKING APPARATUS HAVING IMPROVED SERVICEABILITY
Melvin F. Roberts, Niles, and Raymond Blecharz, Berwyn, both of Ill., assignors to Specialty Equipment Companies, Inc., Chicago, Ill.
Filed Oct. 28, 1991, Ser. No. 783,379
Int. Cl.[5] A47J 31/44
U.S. Cl. 99—280 15 Claims



1. A beverage making apparatus comprising
housing means including an upper housing having an access opening and a lower housing, a cover member for enclose-

ing said opening and forming a compartment in said upper housing, means for removably attaching said cover to said upper housing,

water heater means being positioned in said housing means,

water circulation means mounted in said housing means for receiving cold water and directing the cold water to said water heater means for heating,

said water circulation means further distributing hot water from said water heater means to a hot water discharge means,

electric circuit means being operatively coupled to said water heater means and said water circulation means, said electric circuit having a plurality of components,

said water circulation means and said electric circuit means each having operative components in said compartment, said operative components being accessible from outside of said housing means through said opening, and

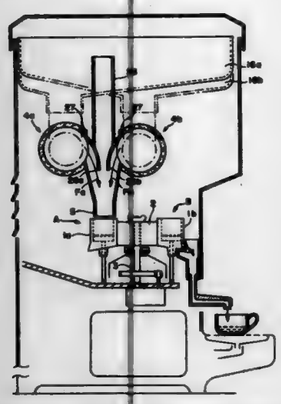
said opening is provided on the top of said upper housing, quick disconnect means for permitting separate removal of said water heater means, said water circulation means and said plurality of components of said electric circuit means through said opening for repair.

5,193,438

COFFEE MILL AND COFFEE MACHINE EQUIPPED WITH SAID MILL

Jean-Loup Courtois, Villefranche sur Saone, France, assignor to Bonnet S.A., Villefranche sur Saone, France

Filed Jan. 23, 1992, Ser. No. 824,360
Int. Cl.[5] A47J 31/42
U.S. Cl. 99—286 8 Claims



1. A coffee mill incorporated in a coffee-making machine of the type comprising:

at least one grinding unit having a horizontal axis and a casing provided with a lateral outlet;

a vertical discharge nozzle, wherein said lateral outlet is located;

a centrifugal turbine which projects coffee powder through said lateral outlet and into said vertical discharge nozzle;

a brewing receptacle into which a bottom orifice of the discharge nozzle opens directly;

said discharge nozzle having an upper portion on which at least one lateral inlet ear is placed opposite to the lateral outlet of the grinding unit;

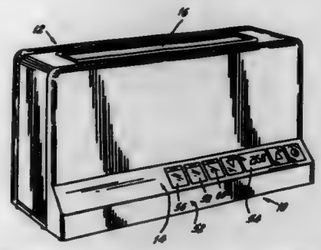
said discharge nozzle also being provided with a deflecting inner wall which is capable of downwardly directing the coffee powder delivered by the grinding unit.

5,193,439

PROGRAMMABLE ELECTRIC TOASTER

Alvin B. Fineman, deceased, late of New Canaan, Conn., by Marion A. Fineman, executrix, and Yosuke Shiotani, Komaki, Japan, assignors to Sanyei Corporation of Nagoya, Japan

Continuation-in-part of Ser. No. 297,687, Jan. 13, 1989, abandoned. This application Jan. 4, 1991, Ser. No. 637,449
Int. Cl.[5] A47J 37/08
U.S. Cl. 99—327 21 Claims



1. An automatic electric toaster for food products comprising:

a housing;

toasting means located within said housing for receiving and radiantly toasting food products;

automatic elevator means associated with said toasting means for lowering said food products from a first raised position to a second lowered position for toasting said food products;

memory means;

means for storing a plurality of toasting cycle programs in said memory means, each of said programs operatively controlling said toasting means and generating signals to raise said elevator means when said toasting cycle is completed;

control means for recalling one of said toasting cycle programs from said memory means and running said toasting cycle program; and

means enabling the user to reprogram the toasting cycle programs in said memory means.

5,193,440

PROCESS AND EQUIPMENT FOR PREPARATION AND COOKING OF EDIBLE MATERIALS

Peter A. Frank, London, Great Britain, assignor to Gooding International Limited, Cardiff, Wales

PCT No. PCT/GB88/00764, § 371 Date Jun. 7, 1990, § 102(e) Date Jun. 7, 1990, PCT Pub. No. WO89/03190, PCT Pub. Date Apr. 20, 1989
PCT Filed Sep. 16, 1988, Ser. No. 469,448
Claims priority, application United Kingdom, Oct. 7, 1987, 8723530; Oct. 8, 1987, 8723635; Feb. 18, 1988, 8803745; Apr. 5, 1988, 8807853
Int. Cl.[5] A47J 37/00, 37/12; A23L 1/01
U.S. Cl. 99—330 23 Claims

1. Equipment for the preparation and cooking of edible materials, comprising:

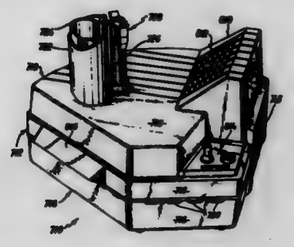
a bath for containing hot cooking oil,

heating means for maintaining cooking oil in said bath at a temperature not less than a predetermined minimum temperature but not greater than a predetermined maximum temperature,

slice feeding means,

control means to control said slice feeding means to drop feed individual unwashed and undried slices in batches of a limited number into said bath for freely floating said slices to the surface of the bath,

slice handling means for maintaining substantially continuous control of said slices during cooking, said control means controlling said slice handling means forcibly to submerge from the surface the freely floating slices in said bath, to maintain submersion of said slices for not less than



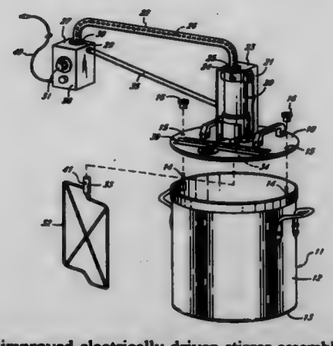
a predetermined period, and finally to remove cooked slices from the cooking oil.

5,193,441

ELECTRICALLY DRIVEN STIRRER FOR COMMERCIAL COOKING POTS

Bruce T. Hayashi, 13906 E. Walnut St., Whittier, Calif. 90602

Filed Mar. 6, 1992, Ser. No. 846,871
Int. Cl.[5] A47J 27/00; B01F 7/18
U.S. Cl. 99—348 10 Claims



1. An improved electrically driven stirrer assembly affixed to a commercial cooking pot supported in a portable manner on a cooking range, said cooking pot having a pot portion including a bottom and cylindrical sides, and a cover, said cover supporting a centrally located, electrically driven stirrer motor which, in turn, supports a stirrer shaft and paddle means wherein said improvement comprises:

a stirrer motor speed controller supported by a hollow shaft which is supported by said cover, said stirrer motor speed controller being electrically connected to the electrically driven stirrer motor by electrical conductors passing through the hollow shaft, said stirrer motor speed controller being contained in a box positioned at least about twelve inches away from the sides of said cooking pot whereby the controller is maintained away from the source of heat for said cooking pot.

5,193,442

USE OF FLUID TO AGITATE ARTICLES

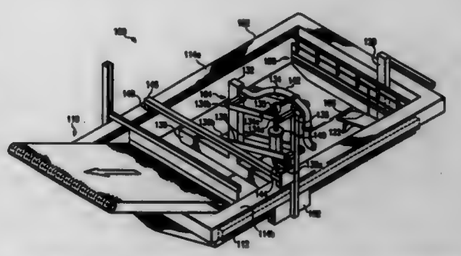
Charles M. Moscowitz; James Teng; John H. Dokos, all of St. Louis, Mo., and David E. Bishop, Dallas, Tex., assignors to Anheuser-Busch Companies, Inc.

Filed Jan. 16, 1991, Ser. No. 642,036
Int. Cl.[5] A47J 37/12
U.S. Cl. 99—348 20 Claims

1. An apparatus for dispersing objects and for agitating the objects while in a body of liquid in a container, the body of liquid having an upper surface, said apparatus comprising:

(a) at least one dispersal fluid jet to provide a dispersing fluid stream for causing motion of said objects, said at least one dispersal fluid jet being located in a dispersal manifold, said dispersal manifold being positionable with respect to said container so that said at least one dispersal fluid jet is covered by the liquid in the body of liquid in the container when said at least one dispersal fluid jet is in use, and wherein said dispersing fluid stream causes motion of the liquid in said container sufficient to move objects that have been introduced into the body of liquid away from the point of introduction of said objects into the body of liquid in the container; and

(b) at least one agitating fluid jet to direct at least one directed stream of an agitating fluid at the objects in the body of liquid in the container with sufficient force to



agitate the objects within the body liquid in the container, said at least one agitating fluid jet being part of a rake mechanism, said rake mechanism being adapted for relative movement with respect to the upper surface of the body of liquid in said container;

wherein said rake mechanism comprises:

a rake element with a plurality of said agitating fluid jets;

a source of pressurized fluid;

a central support attached to said rake element, said rake element and said central support forming a fluid passageway leading from said source of pressurized fluid to said plurality of agitating fluid jets in said rake element;

a support member;

support arms pivotally attached between said central support and said support member; and

an actuator attached between said support member and said support arms.

5,193,443

SKEWER FOR BARBECUING

Jeffrey A. Carney, 1865 E. Broadway #158, Tempe, Ariz. 85282

Filed Feb. 24, 1992, Ser. No. 840,136
Int. Cl.[5] A47J 37/04
U.S. Cl. 99—419 6 Claims

1. A cooking device for cooking food over a cooking surface comprising:

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(a) a skewer rod having elongated shaft of predetermined cross sectional configuration; and

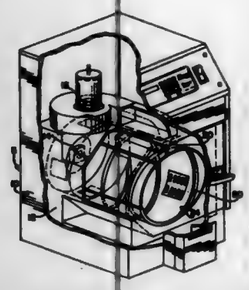
(b) a pair of support members, each having a body with a perimeter defining an aperture sized to loosely fit on said shaft whereby said pair of support members may be placed at spaced apart locations on said skewer rod with food items therebetween and said support members may be tilted relative to said skewer rod to frictionally engage same to secure said support members relative to said skewer rod said support members each having first and second opposite sides between which each respective aperture extends and said apertures are sized such that, when said support members are tilted, said skewer rod is adapted to contact a first edge on the first side of a respective support member located on top of the skewer and to contact a second edge on the second side of the same support member located below the skewer while there is no engagement between the skewer and the respective edges of the respective support member which are located on the first side of the respective support member and located below the skewer and on the second side of the respective support member located above the skewer.

5,193,444

APPARATUS FOR HEATING, COOKING AND ROASTING FOOD

Shlomo Ben-Shoshet, Wilmette, Ill., assignor to Rair Systems, Inc., Northbrook, Ill.

Filed Apr. 16, 1991, Ser. No. 686,426
Int. Cl.[5] A47J *27/026, 37/04*
U.S. Cl. 99—427 30 Claims



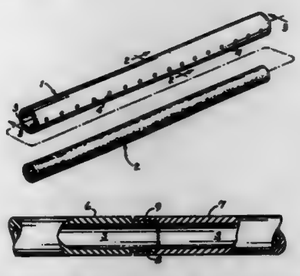
1. An apparatus for heating, cooking or roasting granules of a granular food, such as nuts, seeds or coffee beans, each of said granules having an outer surface, said apparatus comprising a housing enclosing an inner chamber; door means for allowing access to said inner chamber; a hollow drum rotatably mounted in said inner chamber, said drum having front and rear ends and a side wall; said front end being open and said side wall having supply and return perforations therein said supply perforations being located near said front end of said drum and said return perforations being located near said rear end of said drum, and; fan means for supplying a heated gaseous stream into and through said hollow drum, said heated a gaseous stream entering said hollow drum through said supply perforations and exiting said hollow drum through said return perforations, said heated gaseous stream being supplied to said hollow drum with sufficient velocity to blow said granules of food towards said rear end of said drum; means for moving a heated gaseous stream at a velocity sufficient to push said granules of food away from said wall of said drum, whereby said stream surrounds said outer surface of each of said granules; means for preventing said granules of food from passing through said perforation in said side wall of said hollow drum; and means for preventing said food from exiting through said open front end of said drum.

5,193,445

HEAT-ACTIVATED SMOKE GENERATING DEVICE

George E. Ferguson, 7740 East Gleneross, No. 112, Scottsdale, Ariz. 85251

Filed Nov. 4, 1991, Ser. No. 787,041
Int. Cl.[5] A23L *1/01*
U.S. Cl. 99—482 5 Claims



1. An apparatus for releasing a gas upon exposure to heat, comprising:

A. a housing comprising at least two linearly elongate open-ended tubular members, a continuous accessible interior cavity in each of said at least two linearly elongate open-ended tubular members, a plurality of openings located along a lengthwise aspect of each of said tubular members and passing through said housing, and means for co-axially coupling said at least two linearly elongate open-ended tubular members; and

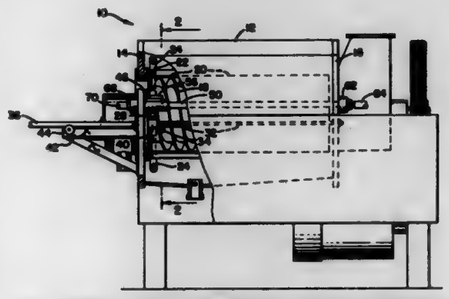
B. heat activated means for releasing at least one gaseous compound upon exposure to a heat source disposed within said interior cavity of said housing, said heat activated means comprising a removable cartridge which comprises a container that holds at least one of a compressed media or loose particulate matter.

5,193,446

AUTOMATIC SPRAY RING FOR USE IN A JUICE FINISHER

Gregory J. Olszczak, and Michael L. Suter, both of Lakeland, Fla., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 18, 1992, Ser. No. 837,223
Int. Cl.[5] A23N *1/00*; B30B *9/14*; B08B *3/02, 9/00*
U.S. Cl. 99—486 5 Claims



1. In a finisher, having an internal screen supported between end wall bulk heads, for separating pulp from a raw juice stream the improvement comprising:

a perforated spray ring mounted outboard of the screen of said finisher, said ring encircling said screen and capable of horizontally traversing said screen without contact with said screen;

a guide means extending horizontally from one of said bulkheads to a second of said bulkheads;

a fixture carried on said guide means and connected to said perforated spray ring, said fixture having a fluid inlet port and a fluid outlet port allowing fluid to flow from the interior of said fixture to the interior of said spray ring;

a linear rodless cylinder, having a piston carried in the cylinder, mounted between said end wall bulkheads, said rodless cylinder having a yoke portion supporting a bracket, said bracket connected to said perforated spray ring;

means for supplying low pressure fluid to said linear rodless cylinder to cause the piston to move linearly;

means for supplying fluid under high pressure to said spray ring;

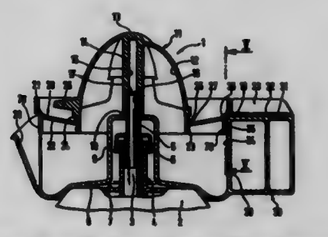
control means for cycling said perforated spray ring longitudinally along the length of said internal screen of said finisher and for supplying high pressure fluid to said spray ring.

5,193,447

CITRUS JUICER

Rafael P. Lacas, Barcelona; Jose C. Blasco, L'Hospitalet, and Antonio R. Rius, Maureza/Barcelona, all of Spain, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 580,662
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3931015; Sep. 16, 1989, 3931016
Int. Cl.[5] A47J *19/00*
U.S. Cl. 99—508 18 Claims



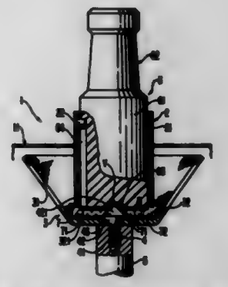
1. A citrus juicer for producing fruit juice comprising a cone, drive shaft structure coupled in driving relation to said cone for driving said cone in rotation, a strainer surrounding said cone, said cone and said strainer being vertically adjustable relative to one another, a collecting bowl under said strainer, said bowl having an inner wall and adapted to collect fruit juice, apertures in the readily extending area between said cone and the inner wall of said collecting bowl that define a plurality of passageways, the boundary area between said cone and the area of said strainer surrounding said cone being an annular gap, said apertures being in the circumferential surface of at least one of said cone and said strainer so that said circumferential surface varies in a radial direction in the area of said annular gap, the juice of a citrus fruit passing through said passageways of said strainer as said fruit is squeezed, while the pulp is largely retained by said strainer, and an adjusting device for moving said cone and said strainer relative to one another to vary the cross section passage areas of said passageway apertures.

5,193,448

CENTRIFUGAL MACHINE WITH CENTRAL FEED OF THE KIND UTILIZABLE PARTICULARLY ON THE ALIMENTARY FIELD FOR OBTAINING FRUIT OR VEGETABLES JUICES

Antonio Cimenti, Via Baron, 15 - 30027 San Dona'Di Piave, Venezia, Italy

Filed Oct. 16, 1990, Ser. No. 596,912
Int. Cl.[5] A23N *1/02*
U.S. Cl. 99—512 14 Claims



1. A centrifugal apparatus for obtaining fruit or vegetable juices, said apparatus comprising:

a rotating unit including a basket and a grater located on a bottom surface of said basket so as to define a working surface at the bottom of said basket;

a motor shaft supported for rotation in the apparatus;

a screw fixing said rotating unit to said motor shaft, said screw having a screw head and a cutting element projecting from said screw head centrally of the working surface defined by said grater, said cutting element having sides defining cutting edges;

a pestle having a terminal end surface provided with a plurality of sharp elements;

guide means for introducing food material to said grater and for receiving and slidably guiding said pestle in an insertion direction toward the working surface of said grater, said guide means comprising a feeding duct fixed in position in the apparatus coaxially to said rotating unit, and said feeding duct having one end open to the bottom of said basket whereat said working surface is defined such that food material fed into said feeding duct can be pushed toward said working surface by the terminal end surface of said pestle with the pestle being guided by said feeding duct in said insertion direction; and

stopping means for limiting the insertion of said pestle in said feeding duct to an inserted position at which the terminal end surface of said pestle is spaced over and adjacent the working surface defined by said grater.

5,193,449

HAY BALER

Woodbury S. Ransom, 14 Elm Rd., Bolinas, Calif. 94924

Filed Nov. 21, 1990, Ser. No. 616,545
Int. Cl.[5] A01D *39/00*
U.S. Cl. 100—5 17 Claims

1. A baling apparatus for forming fibrous material into rectangular bales comprising:

a bale chamber having a rectangular cross-section, an inlet and an outlet, top, bottom and sides;

delivery means disposed forwardly of the bale chamber for forming and delivering a mat of material to be baled to the bale chamber, the delivery means comprising conveyor means having a vertically reciprocating discharge chute for discharging the fibrous material in a vertical zig-zag pattern at the inlet of the bale chamber to form successive substantially vertical layers of folded material within the bale chamber;

compressing means for periodically alternately compressing the fibrous material with a flat surface in upper and lower portions of the bale chamber in a direction towards the rear of the bale chamber, the compressing means located forwardly of the bale chamber inlet and being periodically

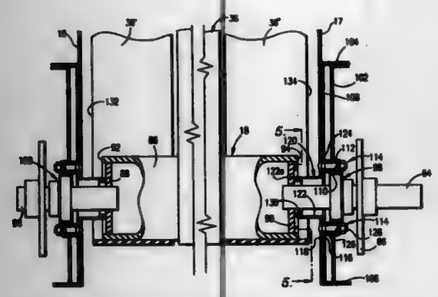
moveable through a compression stroke towards the bale chamber and through a retraction stroke away from the bale chamber inlet and synchronized with said discharge chute to permit delivery of fibrous material to the bale chamber inlet from the discharge chute where said compressing means is retracted.

5,193,450

RESIDUE REDUCING BELT ROLLER CONSTRUCTION FOR ROUND BALERS

J. Dale Anderson, Canton, Kans., assignor to Hay & Forage Industries, Hesston, Kans.

Filed Dec. 20, 1991, Ser. No. 811,017
Int. Cl.[5] B30B *5/06*
U.S. Cl. 100—88 **24 Claims**



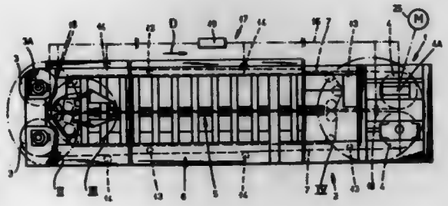
1. In a round baler, the improvement comprising:
at least one rotatable guide roll having a cylindrical body extending substantially across the full width of the baler and presenting a circumferentially extending, end edge extremity and a reduced diameter coaxial shaft portion projecting outwardly beyond said end edge extremity;
at least one flexible belt looped around said guide roll in engagement with the body and having a marginal edge; and
means for positioning the belt and roll in such a manner that a marginal edge portion of the belt overhangs said end edge extremity of the roll in the axial direction whereby to dispose said end edge extremity of the roll in recessed relationship to an outer edge of the belt, and to dispose said marginal edge portion of the belt in radially outwardly spaced relation to the shaft portion of the roll,
said positioning means including upright surface means spaced outwardly from said belt in an axial direction to dispose the outer edge of the belt between the upright surface means and said end edge extremity of the roll.

5,193,451

BELT PRESS FOR MAKING PANELS

Hans-Dietrich Sitzler, Nettetal 1-Hinsbeck, and Dieter Lagodka, Ratingen, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Sep. 17, 1991, Ser. No. 761,063
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1990, 4030228
Int. Cl.[5] B30B *5/06, 15/26*
U.S. Cl. 100—43 **5 Claims**



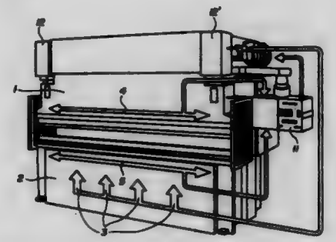
1. A continuous belt press comprising:
a frame having horizontally extending and vertically spaced upper and lower plates defining a horizontally extending gap having an upstream end and a downstream end;
vertically spaced upper and lower upstream drums rotatable on the frame about respective horizontal drum rotation axes at the upstream end;
vertically spaced upper and lower downstream drums rotatable on the frame about respective horizontal drum rotation axes at the downstream end;
mounting means supporting each of the downstream drums for at least limited pivoting of the respective drum on the frame about a respective vertical axis generally intersecting the respective drum rotation axis;
upper and lower endless belts spanned over the respective upper and lower drums and each having a working stretch lying in the gap between the plates and a mainly horizontal return stretch lying outside the gap;
upper and lower sets of rollers engaged between the working stretches and the respective plates;
means connected to the drums for advancing the belts to move the working stretches horizontally in a transport direction to displace a workpiece in the direction through the gap;
upper and lower pairs of horizontally spaced outer belt adjustment rollers rotatable about respective horizontal axes fixed on the frame and each engaging the respective return stretch in a predetermined vertical direction;
respective upper and lower central adjustment rollers positioned between the respective outer rollers and engaging the respective return stretch in a vertical direction opposite to the vertical direction of the respective outer rollers;
mounting means supporting each of the central adjustment rollers for pivoting of each central adjustment roller about a respective horizontal axis generally centrally passing perpendicularly through the respective central adjustment roller;
sensor means for detecting the position of the belt transversely of the direction and generally parallel to the drum rotation axes; and
respective control means connected to the sensor means for pivoting the drums and central adjustment rollers about the respective adjustment axes in response to the receptive detected belt position.

5,193,452

FOLDING PRESS WITH DEFLECTION COMPENSATING MEANS

Willem Dieperink, A l'Essert, Buchillon, Switzerland

PCT No. PCT/CH90/00217, § 371 Date May 10, 1991, § 102(e) Date May 10, 1991, PCT Pub. No. WO91/03371, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 11, 1990, Ser. No. 675,898
Claims priority, application Switzerland, Sep. 11, 1989, 3298/89
Int. Cl.[5] B30B *15/24*
U.S. Cl. 100—46 **6 Claims**



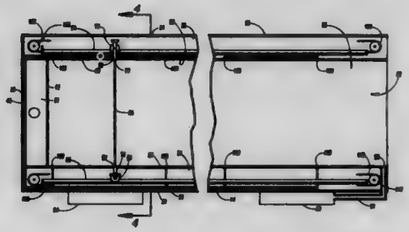
1. Folding press comprising:
an upper frame and a lower frame,
one of the upper and lower frames including at least one deflection means for remedying deficiencies of said upper and lower frames inherent to the folding process,
a comparison device for comparing a deflection of each of the frames, said comparison device controlling operation of said deflection means to compensate for a difference in the deflection of said frames,
the comparison device including two longitudinal bars arranged, respectively, in longitudinal housing of each of the upper and lower frames,
one of the ends of each of the bars being secured to its corresponding housing, the other ends of each bar being free to move longitudinally in their respective housings and being connected to measuring means respectively fixed to each of the upper and lower frames for measuring respective movements of said other ends of the bars in their respective housings for all deflections of the upper and lower frames.

5,193,453

RAILROAD CAR TRASH COMPACTOR

Paul A. Lundy, 4316 Phoenix, Ames, Iowa 50010

Filed Dec. 9, 1991, Ser. No. 804,800
Int. Cl.[5] B30B *15/00*
U.S. Cl. 100—100 **7 Claims**



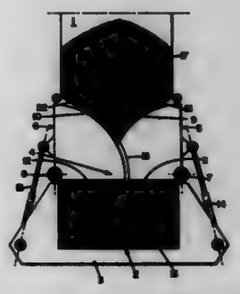
1. A railroad car trash compactor comprising:
a railroad car having a support frame, wheel assembly means mounted on said support frame and adapted to engage and roll upon a railroad track, and an elongated box mounted upon said support frame;
said elongated box having a substantially flat top wall, a floor, opposite first and second end walls, and opposite substantially straight first and second sidewalls defining an elongated trash compartment;
said first end wall being provided with door means movable from a closed position forming a closure for said end wall to an open position forming a discharge opening in said box for permitting the removal of trash within said trash compartment;
said top wall having at least one inlet opening therein for permitting the insertion of trash into said trash compartment and having a pair of elongated slots therein;
a compactor blade within said trash compartment having a top edge, a bottom edge, and first and second side edges positioned closely adjacent said top wall, said floor, and said first and second sidewalls respectively of said box;
said floor being substantially flat and free of protruding obstructions interfering with the movement of said trash and compactor blade;
a pair of elongated slots in said floor;
blade mounting means connected to said compactor blade and movably mounting said compactor blade within said trash compartment for movement along the length of said trash compartment from a fill position adjacent said second end wall of said box to a discharge position adjacent said first end of said box, said blade mounting means extending from within said trash compartment through said slots in said top wall to a position above said top wall, said blade mounting means also extending from within said compartment through said slots in said floor to a position below said floor; and
blade power means above said top wall and below said bottom wall connected to said blade mounting means for moving said compactor blade from said fill position to said discharge position.

5,193,454

BALING PRESS WITH PREPRESS VALVES

Heiman S. Bollegraaf, Appingedam, Netherlands, assignor to H.S. Bollegraaf-Holding, B.V., Netherlands

Filed Feb. 4, 1991, Ser. No. 650,039
Claims priority, application Netherlands, Mar. 20, 1990, 9000643
Int. Cl.[5] B30B *15/20*
U.S. Cl. 100—142 **5 Claims**



1. A baling press comprising a pressing box, a feed chute connected to the pressing box via a passage, and at least two prepress valves which are each pivotable about a pivotal axis between an open and a closed position, each prepress valve having a flat wall which in closed position closes off the passage from the feed chute to the pressing box and in opened position is disposed in the wall of the feed chute, and having a surface substantially curved around its corresponding pivotal axis, which surface in closed position closes off the passage from the feed chute to the pressing box, at least one of the prepress valves further having at least one connecting surface operatively connected and positioned between the curved

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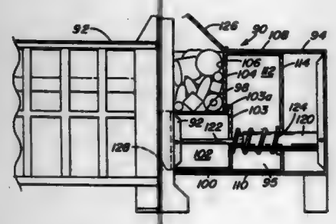
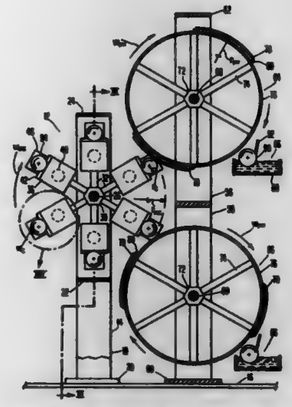
surface and the flat wall which in closed position is curved around the pivotal axis of one other of the prepress valves and is adapted to the curved surface of the one other of the prepress valves, and in operation, the at least one prepress valve with the connecting surface is closed before the one other of the prepress valves is pivoted to a closed position, in such a way that in the closed position the connecting surface of the at least one prepress valve and the curved surface of the one other of the prepress valves are disposed at a mutual distance that is at most minor and substantially constant.

5,193,455
TRASH COMPACTOR
Raymond F. Lackner, Pittsburgh, Pa., assignor to M. Glosser & Sons, Inc., Johnstown, Pa.
Division of Ser. No. 757,952, Sep. 12, 1991. This application Aug. 17, 1992, Ser. No. 931,055
Int. Cl.[5] B30B *15/06, 7/00*
U.S. Cl. 100—208 **5 Claims**



1. A trash compactor comprising:
a main compacting and storage chamber having an opening on one side to receive trash;
an auxiliary precompacting chamber proportioned to the side of said main chamber adjacent to said opening to receive trash in said main chamber, said auxiliary precompacting chamber selectively communicating with said main compacting and storage chamber;
a two-part ram having a first part that compacts material within said main compacting and storage chamber and a second part that compacts material within said auxiliary precompacting chamber, said ram first part having a third portion that blocks entry from said auxiliary precompacting chamber to said main compacting and storage chamber while said ram second part is compacting material in said auxiliary precompacting chamber;
a hydraulic piston and cylinder to reciprocate said two-part ram horizontally so that said ram moves toward said main compacting and storage chamber to precompact and to compact trash within said auxiliary and main chambers respectively with said ram first part third portion blocking ingress from said auxiliary precompacting chamber to said main compacting and storage chamber and so that said ram first part moves away from said main storage and compacting chamber opening to permit precompacted material to move in front of said main compacting and storage chamber opening from where it will be pushed into said main compacting and storage chamber by the following stroke of said ram first part;
said two-part ram having said ram first part retractable into said ram second part when said two-part ram is moved horizontally away from said main compacting and storage chamber.

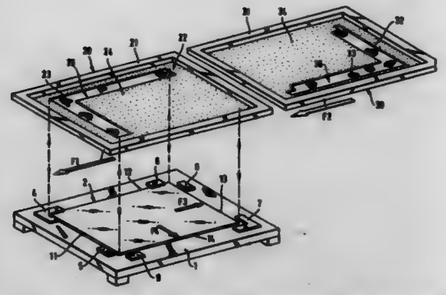
5,193,456
APPARATUS FOR DECORATING BEVERAGE CANS USING A FLEXOGRAPHIC PROCESS
Court L. Wolfe, Pittsburgh; Regis J. Leonard, Munhall; John M. Jourdain, Irwin; Edward W. Evans, Pittsburgh, and Justin R. DeCheck, Irwin, all of Pa., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.
Filed Dec. 4, 1991, Ser. No. 803,488
Int. Cl.[5] B41F *17/22*
U.S. Cl. 101—40 **23 Claims**



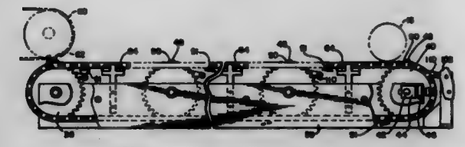
9. A decorator for applying an image to objects using a flexographic process, comprising:
a) a first printing plate mounted on a first support structure, at least a first portion of said image being formed on said first printing plate;
b) carrying means for carrying said objects into contact with said first printing plate; and
c) compliant support means for supporting said carrying means on a second support structure, said compliant support means having:
(i) pneumatic means for imparting compliancy thereto;
(ii) first and second spring rates each indicative of a different degree of compliancy of said compliant support means; and
(iii) means for switching between said first and second spring rates of said compliant support means.

5,193,457
PROCESS FOR PRINTING ON A GLASS SHEET WITH A DECORATIVE FRAME
Dieter Hahn, Uebach, and Manfred Boerger, Aachen-Kornelimuenster, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France
Filed Jun. 14, 1991, Ser. No. 715,765
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1990, 4020972
Int. Cl.[5] B41M *1/12*; B41F *15/00*
U.S. Cl. 101—129 **5 Claims**

1. Process for silk screen printing a closed border around the peripheral edges of a sheet of automotive glass, comprising the steps of:
a. providing a multi-side sheet of automotive glass;
b. providing a first stencil shaped to accommodate at least one side of the sheet of glass up to the peripheral edge thereof;
c. silk screening a first narrow printed area along at least one side of the sheet of glass up to the peripheral edge thereof with said first stencil;
d. providing at least one other stencil to accommodate at least one side of the sheet of glass up to the peripheral edge thereof, wherein said at least one other stencil at least partially overlaps the first narrow printed area;
e. silk screening at least one other narrow printed area along at least one remaining side of the sheet of glass up to the peripheral edge thereof with said at least one other stencil; and
f. repeating steps d and e above until all sides of the glass sheet are silk screened.

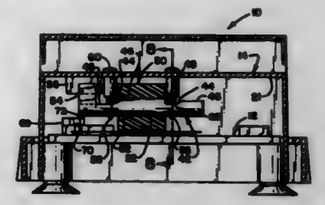


5,193,458
GRIPPER BAR CONVEYOR FOR MULTIPLE COLOR OFFSET ROTARY PRINTING PRESS
James J. Keller, 4023 Glenridge Rd., Dallas, Tex. 75220
Filed Jun. 23, 1992, Ser. No. 902,875
Int. Cl.[5] B41F *31/06*
U.S. Cl. 101—137 **18 Claims**



1. A gripper bar conveyor mechanism for transferring sheets to be printed from one rotating impression cylinder to another in an offset printer of the type having a plurality of sets of impression cylinders and corresponding blanket cylinders for rolling contact with the sheets to be printed therebetween, said gripper bar conveyor mechanism comprising:
a) a transferable gripper bar activatable for releasably securing sheets to be printed in a fixed orientation with respect to said transferable gripper bar;
b) a registration projection affixed to said transferable gripper bar;
c) a registration pocket affixed to each of said impression cylinders for temporarily receiving said registration projection and holding said affixed gripper bar in a desired position with respect to each of said impression cylinders while rolling contact of the sheet to be printed is initiated between each of said impression cylinders and said corresponding blanket cylinders; and
d) a conveyor band attached to said gripper bar and operably connected to said rotary offset press for transferring said transferable gripper bar from one impression cylinder to said another impression cylinder so that said registration projection is engaged in said registration pocket at each impression cylinder during a portion of the impression cylinder rotation sufficient to initialize rolling contact of said sheet to be printed in proper registration between each of said impression cylinders and said corresponding blanket cylinders.

5,193,459
IMPRINTER APPARATUS AND METHOD
William P. Barbour, Huddleston, Va., assignor to DataCard Corporation, Minnetonka, Minn.
Filed Dec. 4, 1991, Ser. No. 803,335
Int. Cl.[5] B41F *3/04*
U.S. Cl. 101—269 **16 Claims**



1. An imprinter apparatus for imprinting data from a source member onto a recording document, said imprinter apparatus comprising:
a base plate;
a print carriage; and
attachment means for attaching said print carriage to said base plate such that said print carriage is free to move in a linear direction with respect to said base plate, said attachment means including channel means formed in said base plate, first rolling means and second rolling means cooperating with said channel means for guiding said print carriage with respect to said base plate, first mounting means for rotatably mounting said first rolling means onto said print carriage such that said first rolling means is prevented from moving laterally relative to said print carriage, second mounting means for rotatably mounting said second rolling means onto said print carriage such that said second rolling means is allowed to move laterally relative to said print carriage, and biasing means for retaining said first rolling means and said second rolling means within said channel means such that said print carriage is prevented from moving vertically, laterally, and rotationally with respect to said base plate.

5,193,460
PUMP CONFIGURATION FOR AN INK SUPPLY TANK OF AN INKING SYSTEM IN FRANKING AND VALUE STAMPING MACHINES
Lothar Kleitz, Friedberg, and Ernst Prohaska, Dietzbach, both of Fed. Rep. of Germany, assignors to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany
Filed May 4, 1992, Ser. No. 877,857
Claims priority, application Fed. Rep. of Germany, May 4, 1991, 4114963
Int. Cl.[5] B41F *31/08*
U.S. Cl. 101—366 **9 Claims**

1. In a franking and value stamping machine having an inking system with a housing, inking rollers, and inlet and return necks, a pump assembly comprising tube or hose connections communicating with the inlet and return necks, an ink supply tank communicating with said tube or hose connections and having two ink containers, a guide tube through which

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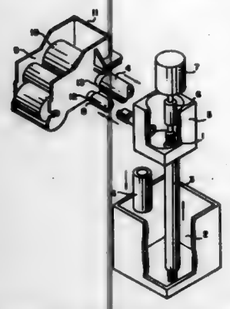
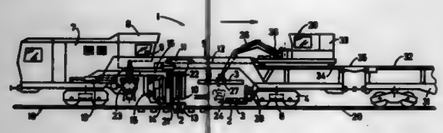
said ink containers communicate with each other, an electric motor, a coupling connected to said electric motor, and a



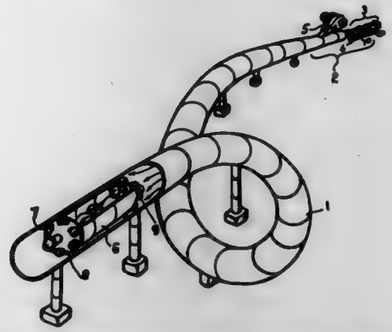
threaded spindle being supported in said guide tube and driven by said electric motor through said coupling as a pumping unit.

5,193,461
TIE EXCHANGE MACHINE WITH A TIE EXCHANGE DEVICE WHICH BOTH REMOVES OLD TIES AND INSERTS NEW TIES
Josef Theurer, Vienna, and Herbert Wörgötter, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria
Filed Jun. 24, 1991, Ser. No. 719,771
Claims priority, application Austria, Aug. 24, 1990, 1743/90
Int. Cl.[5] E01B *29/10*
U.S. Cl. 104—7.1 **14 Claims**



1. A machine for exchanging old ties of a railroad track for new ties, the track being comprised of two rails fastened to the ties defining cribs therebetween, which comprises
(a) a machine frame supported by undercarriages for mobility along the track,
(b) a longitudinally, vertically and transversely displaceable tie exchange device connected to the machine frame for laterally pulling the old ties out of the track and laterally inserting the new ties in the track at a tie exchange position.
(c) a ballast scarifying device longitudinally displaceable to the tie exchange position for clearing ballast at the tie exchange position after the old ties have been pulled out of the track and before the new ties are inserted,
(d) a tie depositing device arranged entirely below the machine frame for directly placing the old ties pulled out of the track by the tie exchange device parallel and adjacent to new ties to be inserted in the track, the tie exchange device having a side facing the tie depositing device and including clamping means for directly removing the new ties for insertion, and
(e) a mobile tie transporting crane mounted on the machine for movement along the track towards and away from the tie depositing device for depositing new ties on the tie depositing device and removing old ties therefrom.

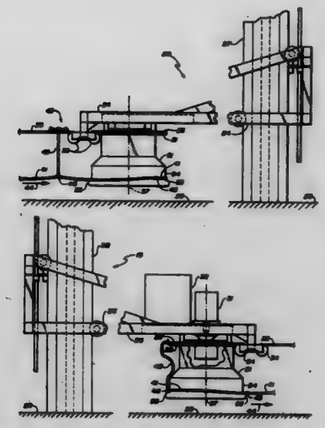
5,193,462
TUBULAR ROLLER COASTER
Mihail I. Marcu, 4364 Bennett Road, Burlington, Ontario, Canada L7L 1Y6
Filed Sep. 24, 1990, Ser. No. 587,757
Claims priority, application Canada, Sep. 26, 1989, 613083
Int. Cl.[5] B61D *13/10*
U.S. Cl. 104—138.1 **1 Claim**



1. A tubular roller coaster amusement system comprising:
a guide means having at least a linear tubular section connected to at least a spiral up and down tubular section to form a continuous tubular track having a circular cross-sectional interior surface;
at least a passenger vehicle being guided in said tubular track, said vehicle having a plurality of wheels at both ends of said vehicle for engaging the interior surface of the tubular track, all the wheels at each end of said vehicle being equally and symmetrically spaced in said circular cross-sectional interior surface;
at least an introducing means including chain conveyor means provided at an end of the tubular track for introducing the vehicle into the tubular track; and
at least a pneumatic propulsion unit arranging adjacent to said introducing means and including a blower means for propelling said vehicle after said vehicle has been introduced into the tubular track by said introducing means.

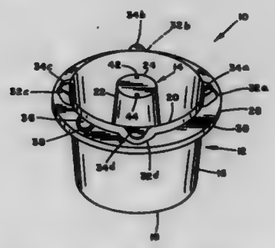
5,193,463
ROPE TOW APPARATUS AND METHOD
Jan K. Kunczynski, Glenbrook, Nev., assignor to Zygmunt Alexander Kunczynski and Alexander Jan Kunczynski, Carson City, Nev.
Filed Apr. 10, 1992, Ser. No. 866,457
Int. Cl.[5] B61B *11/00*
U.S. Cl. 104—173.2 **21 Claims**

1. A top tow comprising:
a haul rope extending along a two path;
haul rope mounting means mounting said haul rope for movement in spaced relation above said tow path;
haul rope driving means coupled to said haul rope for advancement of said haul rope;
a plurality of hanger arms coupled to said haul rope and depending downwardly therefrom, said hanger arms each being coupled by hanger arm mounting means formed to and substantially preventing deflection of said hanger arms relative to said haul rope in a direction along said haul rope opposed to the direction of advancement of said haul rope; and
a user-grippable tow rope coupled to said plurality of hanger arms, at positions below said haul rope and at a user level for users to directly grasp the tow rope, said hanger arm mounting means substantially preventing transfer of tension from a user grasped section of the two rope located between a pair of said hanger arms to an adjacent section of said tow rope located in advance of said user grasped



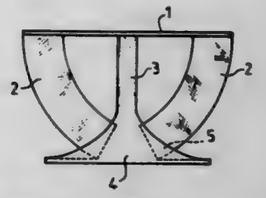
section, said two rope advancing users by means of the users directly grasping the tow tope in motion.

5,193,464
POLYMER PALLET LEG FOR A CARDBOARD PALLET BASE
Roy Morden, Orangeville, Canada, assignor to Plastic Pallet Systems, Inc., Minneapolis, Minn.
Filed Apr. 25, 1991, Ser. No. 691,449
Int. Cl.[5] B65D *19/18*
U.S. Cl. 108—56.3 **5 Claims**



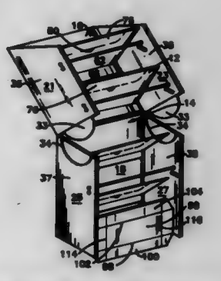
1. A leg of a plurality of legs for engaging with a cardboard base to form a pallet comprising:
a. a first truncated cone including a rim about said cone;
b. at least one locking tab ending outwardly from said truncated cone;
c. a second truncated cone within said first truncated cone having a top lying generally in a plane with the locking tab.

5,193,465
TABLE ASSEMBLY WITH CIRCUMFERENTIALLY DISPOSED RETRACTABLE EXTENSION MEMBERS
Régis Delaye, 12, avenue de Madrid, 92200 Neuilly, and Gaston Lapierre, Rue de l'Armée d'Afrique, 13830 Roquefort la Bedoule, both of France
Continuation of Ser. No. 493,741, Mar. 15, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 846,726
Claims priority, application France, Mar. 17, 1989, 89 03556
Int. Cl.[5] A47B *1/00*
U.S. Cl. 108—66 **12 Claims**



1. A table assembly comprising:
a substantially horizontally arranged table plate having an outer circumferential periphery and a lower surface;
supporting means for supporting the table plate;
a plurality of extension members mounted on said table plate, each of said extension members having side surfaces;
translating and pivoting means for permitting the extension members to be translated radially inwardly and outwardly with respect to a center of the table plate and pivoted from a first position in which they are substantially coplanar with the table plate so that the side surfaces of adjacent extension members face one another to a second position in which they are substantially vertically disposed relative to and underneath the horizontally disposed table plate so that one of said side surfaces of the extension member faces the lower surface of the table plate; and
holding means for holding the extension members in the first position.

5,193,466
CORRUGATED BOARD POP UP DISPLAY
John R. Eder, Prospect, Ky., assignor to Diversified Advertising, Inc., Louisville, Ky.
Filed Apr. 17, 1992, Ser. No. 870,391
Int. Cl.[5] A47B *3/00*
U.S. Cl. 108—111 **14 Claims**



1. A collapsible corrugated board display, comprising:
a vertically disposed folding back panel including a top back panel and a bottom back panel;
means for pivotally connecting said top back panel and said bottom back panel along a horizontal axis;
a plurality of spaced apart horizontal shelves;
means for hingesbly connecting said horizontal shelves to said folding back panel;

a top left side panel and a top right side panel pivotally connected to said top back panel, and a bottom left side panel and a bottom right side panel pivotally connected to said bottom back panel;

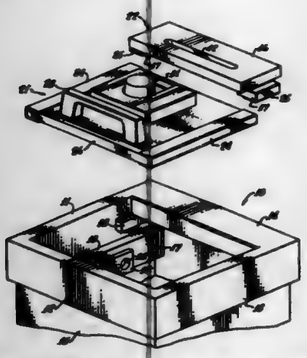
means for removably securing the bottom of said top left side panel to the top of said bottom left side panel, and the bottom of said top right side panel to the top of said bottom right side panel;

a collapsible reinforcement base member extending between and attached to said bottom side panels;

a flexible support means extending between and attached to said left and right top side panels, and extending between and attached to said left and right bottom side panels, said flexible support means being under tension when said shelf thereabove is extended to a horizontal position, the tension being created by contact of the lateral side edges of the shelf immediately above said flexible support means with said side panels, each said flexible support means serving to support a shelf thereabove and whatever may be on said shelf and serving to hold and support said side panels in position; and

said display being collapsible with each shelf pivoting upwardly to lie generally parallel to said top back panel and said bottom back panel, and with said top side panels pivoting inwardly to lie generally parallel to said top back panel, and said bottom side panels pivoting inwardly to lie generally parallel to said bottom back panel, sandwiching said shelves between said side panels and said back panels, and pivoting said top back panel with said top shelves and top side panels rearward adjacent said bottom back panel.

5,193,467
SAFE WITH MONEY SLOT
Robert J. Lichter, 15571 Placid Cir., Huntington Beach, Calif. 92647
Filed Feb. 21, 1992, Ser. No. 839,812
Int. Cl.[5] E06B *7/32*
U.S. Cl. 109—66 **11 Claims**



1. A valuables safe having a money-drop opening therein, said safe comprising:

(a) strong walls defining a valuables chamber,

said walls having an access-opening therein affording access to said valuables chamber,

(b) a strong door to cover and block said access-opening,

said door being movable to an open condition permitting access to said valuables chamber for introduction of valuables therein or for removal of valuables or money therefrom,

(c) lock means to lock said door in closed condition covering and blocking said access-opening,

said lock means preventing substantial movement of said door,

(d) a strong money-drop element mounted at said access-opening in association with said strong door,

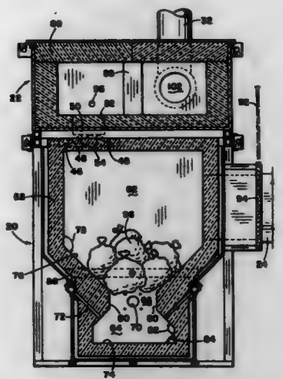
said money-drop element having a money-drop opening therein through which money may be inserted into said valuables chamber,

said money-drop element being adapted to be mounted in either a first orientation at said access-opening or a second orientation at said access-opening,

said money-drop element being so associated with said door that when said lock means is in locking condition said door holds said money-drop element in whichever of said first orientation or said second orientation said money-drop element is in, and

(e) means positioned to overlie and block said money-drop opening when said money-drop element is in said first orientation, and to not overlie and accordingly permit access to said money-drop opening when said money-drop element is in said second orientation.

5,193,468
MEDICAL WASTE INCINERATOR
Harrell J. McRae, Huffman, Tex., assignor to Texas Refractory Service, Inc., Huffman, Tex.
Filed Jan. 30, 1992, Ser. No. 828,343
Int. Cl.[5] F23G *7/06*
U.S. Cl. 110—235 **10 Claims**



1. A waste incinerator comprising:

(a) a primary incinerator with a chamber therein defined by insulated walls having an approximate hourglass shape with a dilated upper portion having a top and a bottom, a dilated lower portion having a roof and a floor, and a constricting portion of said insulated walls forming a division between said upper portion and said lower portion with a central passage therein which communicated between said upper portion and said lower portion; wherein said constriction is further comprised of:

(i) a top surface forming a downwardly sloping shelf constituting the bottom of said upper portion;

(ii) a upwardly sloping under surface forming the roof of said lower portion;

(b) means for feeding waste to be burned into said upper portion of said primary incinerator chamber;

(c) means for injecting and controlling a flow of fuel and air into said lower portion of said primary incinerator chamber and of igniting said fuel and air so as to burn said waste; wherein said means for injecting air comprises:

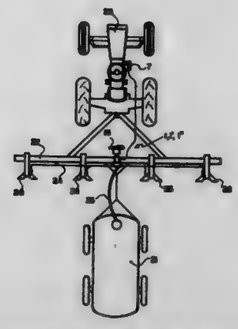
(i) a plurality of generally downwardly directed air conduits in the walls and constricting portion of said lower portion of said primary incineration chamber through which air flow is directed in a generally downward direction toward the floor of said lower portion;

(d) a secondary incinerator located above said primary incinerator with a secondary incinerator chamber therein and with the upper portion of the primary incinerator chamber connected thereto by a stepped pipe which passes through said top of said upper portion of said primary incineration chamber and thence into said secondary incinerator chamber and through which gases and residue from said burned waste in said primary chamber may rise and flow therethrough into said secondary incineration chamber;

(e) means for injecting and controlling a flow of fuel and air into said secondary incineration chamber so as to further burn said gases and residue passing through said stepped pipe into said secondary incineration chamber; and

(f) means for venting the burned contents of said secondary incineration chamber to the exterior.

5,193,469
VARIABLE RATE FERTILIZER CONTROLLER
Brian E. Tochor, Box 128, Yarbo, Saskatchewan, Canada S0A 4V0
Filed Mar. 2, 1992, Ser. No. 846,283
Int. Cl.[5] A01C *23/00*
U.S. Cl. 111—118 **20 Claims**



8. A variable rate fluid controller for use with an agricultural soil working implement for applying fertilizer to the soil comprising in combination, a fluid meter, a fluid meter supporting means for mounting said fluid meter on said soil working implement, motor supporting means on said fluid meter supporting means, valve means included in said fluid meter to increase or decrease the output thereof, a reversible motor means mounted on said motor supporting means, remote control means to selectively rotate said reversible motor in either direction of rotation to operate said valve means, connector means connecting said reversible motor means to said valve means for operation thereof, power take-off means receiving power from said connector means, indicating means operated by said power take-off means and calibrated to indicate the amount of fertilizer being applied to the soil.

5,193,470
CORDING AND WORKPIECE HOLDER FOR AUTOMATIC STITCHING MACHINES
Max Raines, Salem, Mass., assignor to British United Shoe Machinery Limited, Leicester, England
Filed Nov. 7, 1991, Ser. No. 790,202
Int. Cl.[5] D05B *31/00, 39/00*
U.S. Cl. 112—62 **11 Claims**

1. A workpiece holder attachable to a positioning apparatus co-acting with a sewing head of an automatic sewing machine, the workpiece holder being automatically positioned with respect to an automatic reciprocating needle in the sewing head so that a workpiece held within the workpiece holder is sewn, said workpiece holder having means for holding cording for forming part of a stitch pattern to thereby provide a corded effect to the stitch pattern, said workpiece holder comprising:

a base plate for holding said workpiece to be sewn, said base plate having at least one open stitch area, said stitch area being defined by edges within said base plate;

said cording holding means includes at least two rows of posts disposed on said base plate, each of said rows being disposed adjacent to opposite edges of said stitch area, the posts of one row being positioned relative to those in

another row so that a length of cord is held in parallel straight lines across said stitch area;

a cover plate pivotally attached to said base plate, said cover plate having at least one open stitch area corresponding in location to the open stitch area on said base plate;

openings disposed on said cover plate, for receiving said rows of posts whereby said cover plate is closable flatly upon the workpiece being worked upon;

means on said base plate for attaching said base plate to the positioning apparatus of the automatic sewing machine.

5,193,471
MATERIAL REMOVAL DEVICE USED WITH A SEWING MACHINE
Ralph Badillo, and Paul Badillo, both of Littleton, Colo., assignors to Ralph's Industrial Sewing Machine Company, Denver, Colo.
Continuation-in-part of Ser. No. 633,497, Dec. 26, 1990. This application Sep. 23, 1991, Ser. No. 764,332
Int. Cl.[5] D05B *3/10*; B26D *7/18*
U.S. Cl. 112—68 **3 Claims**

1. A device for removing and carrying away portions of material and used in conjunction with a sewing machine, comprising:

hollow means movable in two directions for moving through material to remove portions from the material;

first means for causing movement of said hollow means, said first means comprising:

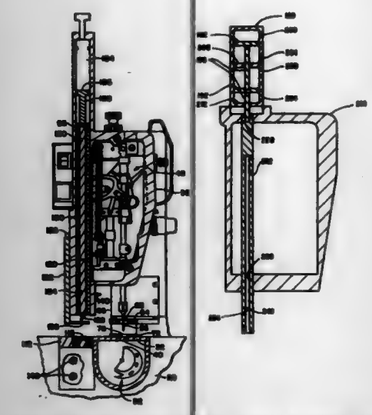
cylinder/piston means in which a piston moves relative to a cylinder using pressurized fluid;

first pressurized fluid inlet means provided adjacent to a first side of said piston for receiving pressurized fluid that is used in moving said hollow means in a first direction; and

second pressurized fluid inlet means provided adjacent to a second side of said piston for use in causing said piston to move in a second direction; and

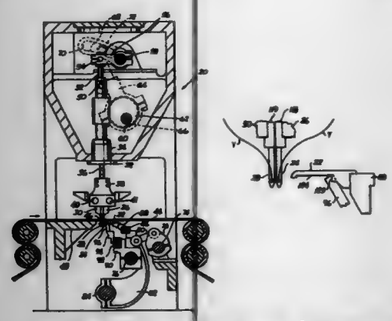
second means including force means movable relative to said hollow means for use in carrying away portions removed from the material, said force means being caused to move after said hollow means engages the material and comprising

pressurized fluid; and
third pressurized fluid inlet means provided adjacent to said hollow means for supplying said pressurized fluid



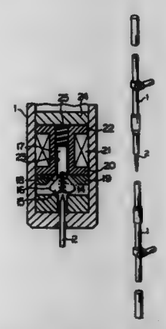
of said force means to carry away portions removed from the material, said pressurized fluid of said force means exiting said hollow means.

5,193,472
DUAL SLIDING NEEDLE BAR TUFTING APPARATUS
Philip H. Crossley, Blackburn, England, assignor to Spencer Wright Industries, Inc., Dalton, Ga.
Filed Feb. 20, 1992, Ser. No. 839,313
Claims priority, application United Kingdom, May 15, 1991, 9110506
Int. Cl.[5] D05B *15/30*
U.S. Cl. 112—80.41 11 Claims



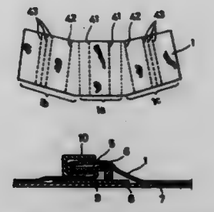
1. A tufting machine comprising means for transporting a backing material for movement in a free direction extending longitudinally through said machine, a first elongated needle bar extending transversely relative to said feed direction carrying a first plurality of needles spaced apart transversely by a first distance, a second elongated needle bar extending transversely relative to said feed direction substantially parallel to said first needle bar carrying a second plurality of needles spaced apart transversely by a second distance, said first plurality of needles being disposed closely adjacent and always spaced a fixed distance from said second plurality of needs in said feed direction and always staggered relative to said second plurality of needles in said transverse direction, means for reciprocating said needle bars toward and away from said backing material to penetrate said backing material from one side thereof by said needles cyclically, loop seizing means disposed adjacent said backing material at a side opposite said one side for seizing loops of yarn presented by said needles, said loop seizing means comprising a plurality of loop seizing members in a single row in said transverse direction having throats of the same length spaced apart transversely by a distance substantially equal to the transverse distance between needles in said first and second needle bars considered as a composite, pattern controlled means operatively connected to said first and second needle bars to shift said needle bars transversely independently of each other by multiples of the spacing between adjacent loop seizing members, and means for oscillating adjacent loop seizing members into and out of loop seizing disposition with selected needles in alternate needle bars.

5,193,473
NEEDLE RECEIVING AND TRANSFERRING APPARATUS FOR SEWING MACHINE
Hideo Asao, and Masato Takahashi, both of Chofu, Japan, assignors to Juki Corporation, Tokyo, Japan
Filed Oct. 28, 1991, Ser. No. 783,265
Claims priority, application Japan, Oct. 29, 1990, 2-288369
Int. Cl.[5] D05B *23/00, 69/00, 55/02*
U.S. Cl. 112—171 6 Claims



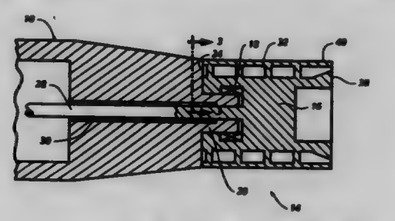
1. A sewing machine having a pair of needle bars disposed opposite to each other with a needle plate therebetween in the vertical axis and with opposed ends of the needle bars being cylindrical, a needle having pointed extremities at its opposite ends and a needle eye at its center for receiving a thread, and a needle receiving and transferring apparatus arranged in each of said opposed ends of said needle bars for reciprocating said needle, said needle receiving and transferring apparatus comprising:
an electromagnet disposed in each of said cylindrical opposed ends of said needle bars and said electromagnet having a coil in the form of a bobbin;
a clamp member formed of magnetic material having one end magnetically opposed to said coil in the form of a bobbin and an opposite end provided with a clamp portion for rendering said needle mountable and demountable, said clamp member being moved in said axial direction by way of electrical energization; and
actuating means relatively mounted on said clamp portion and on each of said needle bars for actuation of said clamp portion in such a manner that said clamp portion engages said needle in association with movement of said clamp member in one direction of said axial direction, and that said clamp portion disengages said needle therefrom in association with movement of said clamp member in the reverse direction of said axial direction.

5,193,474
METHOD OF FEEDING A UNITARY SHEET OF TRIM COVER ASSEMBLY TO MULTIPLE-NEEDLE SEWING MACHINE FOR CREATING PLURAL STITCHES THEREON
Munehara Urai; Kazuo Katsuta; Minoru Hosoya; Tadafumi Abe, and Ryosuke Wada, all of Akishima, Japan, assignors to Tachi-S Co., Ltd., Akishima, Japan
Filed Feb. 19, 1992, Ser. No. 838,367
Claims priority, application Japan, Feb. 21, 1991, 3-049052
Int. Cl.[5] D05B *27/00, 39/00*
U.S. Cl. 112—262.3 11 Claims



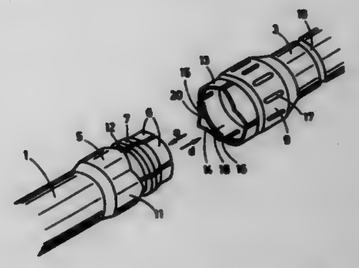
1. A method of feeding a unitary sheet of trim cover assembly to a multiple-needle sewing machine for creating plural stitches thereon, comprising the steps of pinching upwardly a part of said trim cover assembly such as to form a folded portion therein; causing said folded portion to be inclined at a certain inclination angle, thereby making its upper edge sloped at said inclination angle; retaining said folded portion upon a guide means; then feeding the thus-formed trim cover assembly with said sloped, folded portion defined therein towards said multiple-needle sewing machine; and, creating plural stitches on opposite sides of said folded portion of said trim cover assembly in a parallel relation with one another, whereby an expanded sheet of said trim cover assembly, after having undergone said stitching, contains some of said plural stitches which extend across said trim cover assembly in parallel with one another, whereas other of said plural stitches extend in a non-parallel manner relative to said some of said plural stitches.

5,193,475
THRUST EXPANSION ENGINE
Carl T. Zovko, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 1, 1992, Ser. No. 891,027
Int. Cl.[5] F42B *19/00*
U.S. Cl. 114—20.2 26 Claims



1. In combination with an engine for propelling a body through a surrounding medium, including a rotor having a plurality of channels formed therein through which the medium is conducted between inlet and outlet ends, a source of propellant gas, means for injection of the propellant gas under pressure into the medium at said inlet ends of said channels to accelerate flow therethrough, control means responsive to rotation of the rotor relative to the body for cyclically controlling said injection of the propellant gas and inflow of the medium into the channels at the inlet ends and means for suppressing foaming of the medium within the channels resulting from formation of cavitation bubbles to inhibit increase in rate of cooling of the propellant gas.

5,193,476
LENGTHWISE ADJUSTABLE WISHBONE FOR SAILBOARDS
Marc Nasser, Im Harras 10, D-6100 Darmstadt, Fed. Rep. of Germany
Filed Sep. 12, 1991, Ser. No. 758,007
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1990, 9013143
Int. Cl.[5] B63H *9/10*
U.S. Cl. 114—98 2 Claims



1. Lengthwise adjustable wishbone for sailboards comprising: two main spars connected by a wishbone head section and two extension spars adjustable in said main spars telescopically, said extension spars being joined on the stern line side by means of an elastic wishbone end section, means for locking the main spars to the extension spars, said locking means including respectively one inner sleeve fixedly connected to the ends of the main spars, and an outer sleeve seated loosely on the extension spars, said inner sleeve having locking tongues projecting axially beyond the ends of the main spar, radially outwardly protruding clamping beads, and radially inwardly projecting locking ring segments formed at the ends of said locking tongues, said locking ring segments extending in the peripheral direction, said outer sleeve having a placement end and adapted to be locked with the inner sleeve when pushed onto the inner sleeve by compressing the locking tongues so that the locking ring segments lock into one of several peripheral grooves arranged at spacings on the extension spars, said inner sleeve having a collar with a flat frontal serration, said placement end having a corresponding counter serration, said counter serration having teeth separated by axial slots, said placement end further including flat annular sections formed on the inside of the teeth which extend, in the locked position of inner sleeve and outer sleeve, behind the clamping beads, said clamping beads fashioned as annular bead segments and being formed on the inner end sections of the locking tongues at a spacing from the frontal serration, and being radially compressed when the inner sleeve and outer sleeve are in engagement.

5,193,477
METHOD OF SECURING A TIRE FENDER TO A QUAY SIDE OR A VESSEL
Anton van der Veen, 70 Lower Bridge Road, Durban North, Natal, South Africa 4051
Filed Dec. 28, 1990, Ser. No. 636,068
Int. Cl.[5] B63B *59/02*
U.S. Cl. 114—219 4 Claims

1. A method of securing a tire fender to a vessel or quay side, comprising the steps:
providing two fasteners, each said fastener including a fastener bolt having a head and a shank, the head comprising

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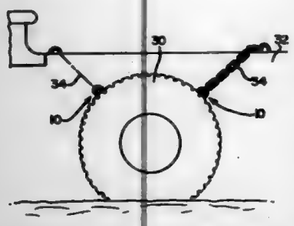
a cross bar forming a T-shaped configuration with the shank which is at least partially threaded and extends from the head, each said fastener having a fastener nut threadable onto the shank of said fastener bolt, and an engagement loop fixed to and projecting from said nut;

providing a vehicle tire having a generally cylindrical tread wall that defines an outer circular periphery of said tire fender;

forming a respective hole in said tread wall for the shank of each said fastener bolt to pass therethrough, said holes being at predetermined spaced locations;



passing said shank of a fastener bolt through each said hole from the interior side of said tire fender and orienting said cross bar in said tire as a chord of said circular periphery;

threading said nuts on respective fastener bolt shanks to fixedly position said fasteners on said tire fender;

providing a plurality of shackle means including chains for engaging each said engagement loop;

engaging one end of each of said chains with a respective engagement loop on said tire;

connecting the other end of each said chain to respective spaced locations on said vessel or quay side, whereby said tire fender is suspended from said vessel or quay side by said chains.

5,193,478

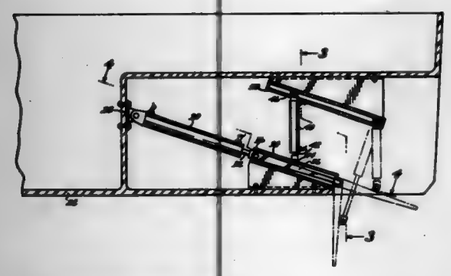
ADJUSTABLE BRAKE AND CONTROL FLAPS FOR WATERCRAFT

Albert Mardikian, Corona Del Mar, Calif., assignor to Mardikian 1991 Irrevocable Trust, Corona Del Mar, Calif.

Continuation-in-part of Ser. No. 582,523, Sep. 14, 1990, Pat. No. 5,092,260. This application Feb. 28, 1992, Ser. No. 843,502

Int. Cl.[5] B63B *1/22*

U.S. Cl. 114—286 **18 Claims**



1. A watercraft comprising:

a hull including a bottom section;

a compartment formed in the bottom section of the hull;

a flap operatively mounted in the compartment;

first means for extending the flap in a continuously adjustable manner from the compartment into positions wherein the flap acts as a hydrofoil, the first means also capable of retracting the flap into the compartment into a retracted position wherein the flap does not act as a hydrofoil, and

second means for continuously adjusting the angular positioning of the flap relative to the bottom of the hull whereby the angle at which the flap meets the water is adjusted, the flap acting as a brake for the watercraft in its substantially fully lowered position, said first and second means being controllable by the operator of the watercraft.

5,193,479

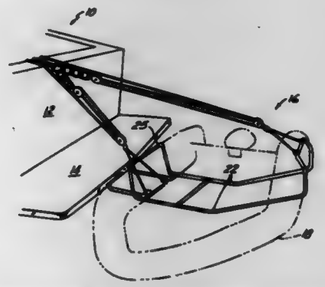
APPARATUS FOR LIFTING AND STORING A DINGHY OR THE LIKE

Rolf J. Bielefeld, 2715 Knight Dr., Troy, Mich. 48098

Filed May 13, 1991, Ser. No. 699,167

Int. Cl.[5] B63B *23/32*

U.S. Cl. 114—366 **13 Claims**



1. Apparatus for storing a dinghy on a transom-mounted swim platform of a boat, comprising:

a cradle for receiving and supporting said dinghy;

pivot arm means for pivotally mounting said cradle on said platform for movement between a generally horizontal dinghy launching position and a generally horizontal dinghy storage position, said pivot arm means extending between and being pivotally coupled with each of said cradle and said platform, said pivot arm means including an over-center pivot connection with said cradle and beneath said dinghy, said pivot arms configured to permit said dinghy to remain generally horizontal during the entire movement of said cradle between said dinghy launching position and said dinghy storage position.

5,193,480

HOISTING LINE FITTINGS WITH WORKING LOAD LIMIT INDICIA

Charles R. Garrett, Ramona, Okla., assignor to The Crosby Group, Inc., Tulsa, Okla.

Continuation of Ser. No. 643,774, Jan. 22, 1991, Pat. No. 5,103,755. This application Sep. 19, 1991, Ser. No. 762,599

The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.

Int. Cl.[5] G01D *1/00*

U.S. Cl. 116—200 **21 Claims**

1. A fitting for use with one or more loading bearing line or lines or chain or chains comprising:

an indicia markings on a working portion of said fitting, said indicia marking identifying at least one angular load posi-

tion of said line or lines or chain or chains relative to a normally inline load position for said fitting.

5,193,481

SPAR BUOY PEN SYSTEM

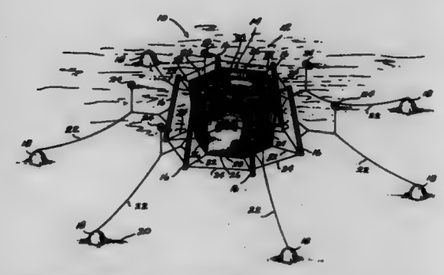
Gary F. Loverich, and Barry A. Griffin, both of Bainbridge Island, Wash., assignors to Nor'Eastern Trawl Systems, Inc., Bainbridge Island, Wash.

Continuation-in-part of Ser. No. 339,676, Apr. 18, 1989, Pat. No. 5,007,376. This application Oct. 23, 1990, Ser. No. 601,871

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] A01K *61/00*

U.S. Cl. 119—3 **16 Claims**



1. A spar buoy pen comprising:

a flexible net forming an enclosed pen;

at least three elongated spar buoys adapted to float substantially vertically whereby each said spar buoy is attached to said net at at least two vertically spaced-apart locations so as to maintain a portion of said net adjacent said spar buoy in a substantially vertical orientation, and whereby said spar buoys are attached to said net at locations spaced apart from each other so that each said spar buoy can float freely relative to said spar buoys adjacent thereto;

separate anchor means attached to each of said spar buoys, each said anchor means adapted to urge said spar buoy associated therewith outwards from said net so that said spar buoys are urged away from each other so as to maintain said pen in an open state; and

at least two vertically spaced-apart, generally parallel lines extending between adjacent ones of said spar buoys so as to maintain said spar buoys in a predetermined configuration upon removal of said net.

5,193,482

METHOD OF KEEPING CAPTIVE ZEBRA MUSSELS ALIVE

Frank C. McLaughlin, 1432 Duffield Rd., Lennon, Mich. 48449

Filed Sep. 4, 1992, Ser. No. 940,644

Int. Cl.[5] A01K *61/00*

U.S. Cl. 119—4 **13 Claims**

1. A process for sustaining a quantity of Zebra mussels submerged in a water-containing vessel comprising the steps of:

forming a ration of compressed brine shrimp appropriate for the quantity of Zebra mussels to be sustained;

combining said ration with at least ten times the volume of water to form a mixture;

agitating said mixture vigorously to form a suspension; and

adding said suspension to the water-containing vessel.

5,193,483

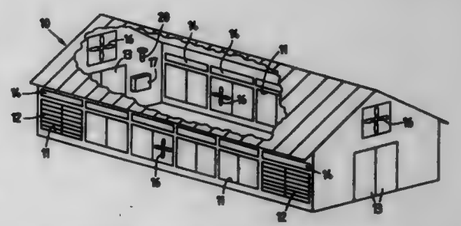
SECONDARY SENSING SYSTEM FOR CONTACTOR CONTROL SYSTEM

Grant W. Crider, Rte. 1, Box 17, Bremen, Ala. 35033, and Anthony L. Ellard, Rte. 8, Box 170, Cullman, Ala. 35055

Filed Sep. 28, 1992, Ser. No. 951,774

Int. Cl.[5] A01K *31/00*

U.S. Cl. 119—16 **16 Claims**



1. In a livestock confinement structure wherein the internal ambient temperature is controlled within a preselected range of temperature to prevent deleterious effects on the livestock by the use of temperature control apparatus including fans, heaters, drop curtains, cooling systems and electronic control devices wherein said temperature control apparatus are mutually controlled by a contactor control device in a power supply circuit thereto wherein the improvement comprises:

(a) means for independently sensing the ambient temperature for comparison to said preselected range;

(b) means for selecting whether said temperature control apparatus will apply heating or cooling to said structure responsive to a sensed ambient temperature; and

(c) means for independently actuating said temperature control apparatus responsive to said sensing means.

5,193,484

ELECTRODE STRUCTURE FOR COLLAR MOUNTED ANIMAL TRAINING APPARATUS

Gerald J. Gonda, Tucon, Ariz., assignor to Tri-Tronics, Inc., Tucson, Ariz.

Continuation of Ser. No. 578,562, Sep. 6, 1990, Pat. No. 5,099,797, which is a continuation of Ser. No. 463,359, Jan. 11, 1990, abandoned, which is a continuation of Ser. No. 235,784, Aug. 22, 1988, abandoned, which is a continuation of Ser. No. 935,501, Nov. 26, 1986, abandoned. This application Mar. 27, 1992, Ser. No. 859,080

The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.

Int. Cl.[5] A01K *15/00*

U.S. Cl. 119—29 **4 Claims**

1. In an electronic animal control apparatus including a strap adapted to be placed entirely around a portion of an animal's body and supporting circuitry producing an electroshock

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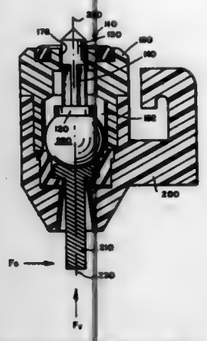
signal in response to a command signal, the improvement including means designed for providing a solution to the problem of avoiding inconsistent electrode contact and loss of electrode stimulus to the animal's skin under conditions of the animal's fur being wet, comprising: first and second electrodes attached to a receiver unit and extending through holes in the strap toward the animal's body, each of the first and second electrodes including an elongated conductive probe connected to the circuitry to receive the electroshock signal, and an insulator surrounding a portion of that electrode for the purpose of preventing shunting of the electroshock signal when the animal's fur is wet, an end portion means of each of the first

and second electrodes for extending only sufficiently far beyond the insulator to 1) ensure consistent electrical contact of the first and second electrodes with the animal's skin without overtightening the strap, and 2) avoid substantial shunting of electrical stimulus current between the first and second electrodes through wet fur, the diameter of the end portion means of each of the first and second electrodes having a value sufficient to 1) ensure consistent electrical contact of the first and second electrodes with the animal's skin without overtightening the strap, and 2) avoid substantial shunting of electrical stimulus current between the first and second electrodes through wet fur.

5,193,485
TWO-STAGE METERING PIN
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.
Filed Sep. 10, 1990, Ser. No. 580,443
Int. Cl.[5] A01K *7/06, 39/00*; F16K *31/00*
U.S. Cl. 119—72.5 **18 Claims**



1. A metering pin in combination with a nipple drinker for poultry having an inlet, an outlet, a valve chamber between said inlet and said outlet, a ball valve element and an actuating pin disposed within said valve chamber, said actuating pin extending through said outlet and being responsive to force from at least two different directions to actuate said ball valve element, said metering pin

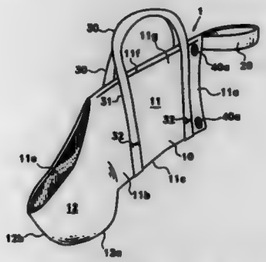
being disposed within said inlet and said valve chamber so as to be movable by said ball valve element during acutation of said ball valve element,

including a first portion and a second portion, each of said portions being dimensioned so as to be able to pass through said inlet and out of said nipple drinker,

said first portion serving to permit the flow of fluid at a first rate for poultry consumption through said valve chamber in response to actuation of said ball valve element by force applied to said actuating pin from one direction, and

said second portion serving to permit the flow of fluid at a second rate for poultry consumption through said valve chamber in response to actuating of said ball valve element by force applied to said actuating pin from another direction.

5,193,486
CONVERTIBLE PET CARRIER
Corliss A. Kitchens, 640 Ft. Washington Ave., #3C, New York, N.Y. 10040
Filed Mar. 23, 1992, Ser. No. 856,293
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—96 **13 Claims**



1. A convertible pet carrier selectively disposable in a pet carrier position and a pet jacket position, said pet carrier comprising

a flexible bag-like body member having an inside surface, an outside surface and an open forward end, said body member including a torso support portion which engages in peripheral support a pet torso, and a hind legs support portion integrally formed with a rearward portion of said torso support portion which engages in peripheral support the hind legs of a pet;

a neck brace attached to the open forward end of said body member; and

a pair of strap handles attached to respective sides of the outside surface of said body member.

5,193,487
PET BATHING APPARATUS
Russell L. Vogel, 1018 N. Westfield Rd., Madison, Wis. 53717
Filed Oct. 8, 1991, Ser. No. 773,196
Int. Cl.[5] A01K *29/00*; A47K *3/02*
U.S. Cl. 119—158 **4 Claims**

1. A pet bathing apparatus comprising:

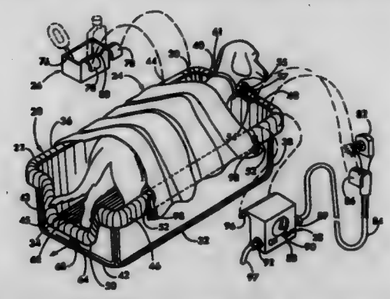
(a) a plastic tub having a bottom and a peripheral wall which extends upwardly from the bottom to form an enclosed cavity for retaining bathwater therein, the peripheral wall having an upper rim at a selected height, wherein portions of the peripheral wall define an entry passage through the peripheral wall having a lip which is beneath the peripheral wall rim, the entry passage adapted to facilitate the entrance of a pet into the tub;

(b) a valve housing;

(c) a valve located within the valve housing and being operable to selectively prevent or allow the flow of water through the valve;

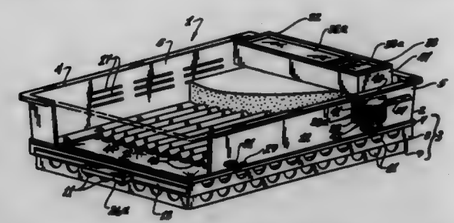
(d) a flexible hose extending from the valve housing, wherein the hose and valve housing are engaged with the tub rim;

(e) a water spray head connected to the flexible hose; and



(f) a pet restraint loop extending from the peripheral wall opposite the entry passage and adjacent the tub cavity, the loop being secured to the tub and adapted to engage a collar worn by a pet to restrain the pet within the tub cavity.

5,193,488
CAT WASTE ELIMINATION SYSTEM
Robert W. Walton, 150 Berryman Avenue, St. Catharines, Ontario, Canada L2R 3X1
Filed Nov. 18, 1991, Ser. No. 793,126
Int. Cl.[5] A01K *1/01*
U.S. Cl. 119—166 **14 Claims**



1. A cat waste elimination system comprising in combination:

a. a substantially rectangular top tray compartment;

b. a substantially rectangular bottom tray assembly; and

c. an aeration tablet interposed horizontally parallel between said top tray compartment and bottom tray assembly and extending longitudinally and transversely therebetween suspended on a slat drawer in the bottom tray assembly;

said top tray compartment also possessing a set of at least 60 elongated holes in the bottom thereof parallel to and above the aeration tablet for supporting a particulate material in which the cat's waste is deposited and through which holes and particulate material the cat's urine passes for deposit upon and absorption by the aeration tablet;

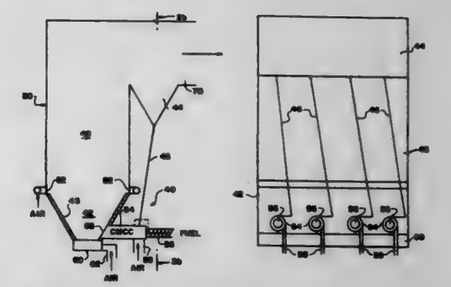
and said bottom tray assembly possessing aeration openings in its sides and in at least one of its ends to assist in evaporation of the cat's urine deposited upon and absorbed into the aeration tablet.

5,193,489
ANIMAL LITTER
John Hardin, La Grange, Ill., assignor to Laporte Inc, Rolling Meadow, Ill.
Filed Jul. 1, 1992, Ser. No. 907,381
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—173 **14 Claims**

1. An animal litter, which comprises;

a particulate earth substrate having at least poor clumping ability, in admixture with a water soluble or dispersible polysaccharide selected from the galactomannan gums, said polysaccharide being present in an amount sufficient to increase the clumping ability of the earth substrate.

5,193,490
CYCLONIC MIXING AND COMBUSTION CHAMBER FOR CIRCULATING FLUIDIZED BED BOILERS
Mark E. Peruski, Canton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 3, 1991, Ser. No. 753,509
Int. Cl.[5] F22B *1/00*
U.S. Cl. 122—4 D **8 Claims**



1. An apparatus for supplying fluidized bed material to a circulating fluidized bed boiler having a primary zone with a fuel feed point for the fluidized bed material, and a furnace zone above the primary zone, the apparatus comprising:

a mixing chamber in the form of a horizontally extending cylinder having a first inlet for receiving solid fuel at an axial end of the mixing chamber opposite from the fuel feed point, a second inlet for receiving fluidized bed solids connected for tangential feed into the mixing chamber at a location near the first inlet and spaced away from the fuel feed point, and an outlet connected to the fuel feed point;

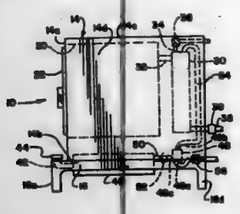
fuel feed means connected to the mixing chamber first inlet for feeding solid fuel to the mixing chamber;

first combustion air supply means connected to the primary zone of the boiler for supplying a portion of the total combustion air needed for combustion to the primary zone;

second combustion air supply means connected for tangential feed into the mixing chamber for supplying another portion of the total combustion air needed for combustion, directly to the mixing chamber for facilitating mixing between the combustion air, the fluidized bed solids and the solid fuel, in the mixing chamber, which mixture is supplied through the mixing chamber outlet and to the primary zone of the boiler; and

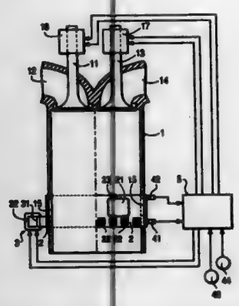
supplemental combustion air supply means connected to the mixing chamber for supplying additional combustion air around the fuel feed means into the chamber to initiate combustion in the mixing chamber.

5,193,491
CLEANING SYSTEM FOR BOILER
G. Robert Oslin, Chicago; James R. Buchler, Orland Park, and Robert E. Johnson, Oakbrook Ter., all of Ill., assignors to Delaware Capital Formation, Inc., Wilmington, Del.
Filed Apr. 1, 1991, Ser. No. 678,815
Int. Cl.[5] F22B 37/48; F28G 9/00
U.S. Cl. 122—401 14 Claims



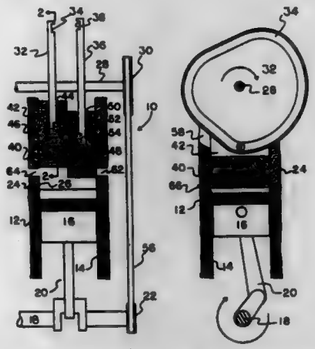
1. In a boiler apparatus having a generally upstanding cabinet, a boiler disposed within the cabinet and being of the type in which a residue may build up during use, the combination therewith comprising a cleaning system including:
a reservoir supported within the cabinet and adapted to receive a liquid cleaning agent;
educator means having a first inlet port adapted for connection to a water supply, a second inlet port, and an outlet port;
first fluid conduit means interconnecting said second inlet port to said reservoir; and
second fluid conduit means interconnecting said outlet port to said boiler;
said educator means being operable to draw cleaning liquid from said reservoir when water is introduced under pressure into said first inlet port, and effect flow of admixed cleaning liquid and water to the boiler, said reservoir having a fill tube accessible from externally of a side of the cabinet to enable filling of the reservoir with a cleaning agent.

5,193,492
2-4 CYCLE CHANGE-OVER ENGINE AND ITS CONTROL SYSTEM
Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Kanagawa, Japan
Filed Nov. 13, 1991, Ser. No. 791,141
Claims priority, application Japan, Nov. 13, 1990, 2-306727; Nov. 13, 1990, 2-306728
Int. Cl.[5] F02B 69/06
U.S. Cl. 123—21 3 Claims



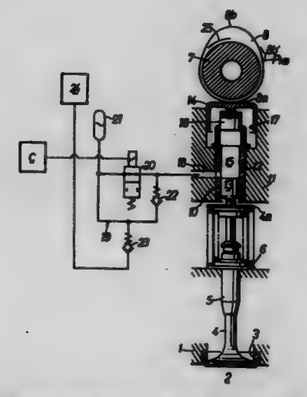
1. A sleeve valve system for a 2–4 cycle engine having a change-over between 2 cycle and 4 cycle operation, comprising:
a plurality of suction ports provided at a lower portion of a cylinder of the engine;
a cylindrical rotational sleeve having a suction window for opening one of said suction ports and provided with a plurality of permanent magnets at the periphery of said sleeve at equal intervals for rotatively driving said sleeve while held in contact with an outer cylindrical surface of said cylinder;
rotational driving means for causing said sleeve to rotate during revolution of the engine by means of mutual attraction and repulsion to said permanent magnets; and
driving control means for controlling a rotational position of said sleeve to prevent the suction window from coinciding with one of said suction ports during 4 cycle operation, and align the one of said suction ports with the suction window at a suction timing during 2 cycle operation.

5,193,493
INTERNAL COMBUSTION ENGINE WITH PISTON VALVING
Theodore P. Ickes, P.O. Box 37515, Albuquerque, N. Mex. 87176
Filed Jan. 10, 1992, Ser. No. 819,228
Int. Cl.[5] F02B 75/04
U.S. Cl. 123—48 R 4 Claims



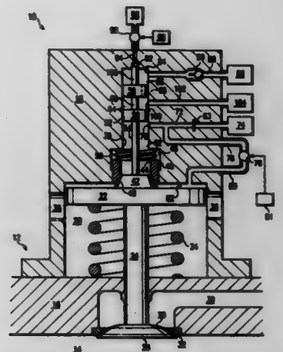
1. An internal combustion engine in which compression is prolonged and maximum combustion chamber pressure is delayed, said engine having a cylinder block with at least one cylinder bore formed therein, crankshaft means rotatably mounted in said cylinder block, reciprocating power piston means slidably mounted in the cylinder block bores and rotatably mounted on the crankshaft, and cylinder head means mounted on said cylinder block that includes valve means operatively connected to the crankshaft so as to be driven thereby, said valve means comprising:
at least one bore formed in said cylinder head having intake and exhaust ports in each cylinder head bore, said cylinder head bores having substantially the same diameter as said cylinder block bores and positioned so that the longitudinal axes of the cylinder head and block bores are aligned and the upper portions of the cylinder block bores and the lower portions of the cylinder head bores form the combustion chambers of the engine;
a pair of half round valving piston means slidably mounted in each cylinder head bore for adjusting the volume of the combustion chamber, and for filling the combustion chamber with a fuel/air charge and exhausting the combustion products therefrom;
camshaft means rotatably mounted on said cylinder head means and connected to said crankshaft means so as to be driven thereby, said camshaft means including cam disc means mounted thereon for rotation therewith and connected to each of said valving piston means whereby the rotation of said camshaft means will result in reciprocating motion of said half round valving pistons to cause a secondary compression that adds to the primary compression due to movement of the power piston and minimum combustion chamber volume occurs when the power piston is positioned between top dead center and 35 degrees after top dead center.

5,193,494
VALVE OPERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE
Hiroshi Sono; Yasuhiro Urata, and Masakazu Kinoshita, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 7, 1990, Ser. No. 579,743
Claims priority, application Japan, Sep. 8, 1989, 1-234289; Jul. 27, 1990, 2-199610
Int. Cl.[5] F01L 9/02
U.S. Cl. 123—90.12 6 Claims



1. A valve operating system for an internal combustion engine, comprising a valve-operating can having an arcuate base circle portion with a center thereof being aligned with a rotational axis of said cam and a raised portion projecting radially outwardly from said base circle portion, a cam-side piston operatively connected to said valve-operating cam, a valve-side piston operatively connected to an engine intake valve, a hydraulic pressure chamber provide between said cam-side piston and said valve-side piston, a hydraulic pressure releasing valve connected to said hydraulic pressure chamber by an oil passage, an oil pressure supply source connected to said hydraulic pressure chamber through a check valve and said oil passage, and a control means for controlling the operation of the hydraulic pressure releasing valve in order to control closing of the intake valve through opening of the hydraulic pressure releasing valve, wherein said control means selectively opens the hydraulic pressure releasing valve to release the hydraulic pressure in said hydraulic pressure chamber immediately after substantial closing of said intake valve should have occurred according to an operational mode defined by said cam and at least in an operational position corresponding to the base circle portion of the cam, even when an opening and closing operation of said intake valve required by the engine is in a mode defined by said cam, and wherein said control means closes said hydraulic pressure releasing valve prior to a following opening mode of said intake valve defined by said cam.

5,193,495
INTERNAL COMBUSTION ENGINE VALVE CONTROL DEVICE
Charles D. Wood, III, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.
Filed Jul. 16, 1991, Ser. No. 730,613
Int. Cl.[5] F01L 9/02, 1/34
U.S. Cl. 123—90.12 15 Claims

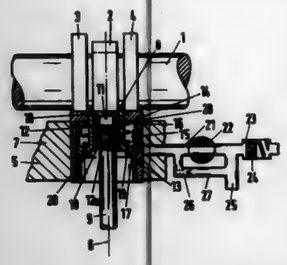


1. Valve control apparatus for use in an internal combustion engine for controlling intake and exhaust engine valves having valve stems, the apparatus comprising:
a housing having a multiple diameter bore extending therethrough;
a power piston mounted in a lower end of said bore for reciprocating movement therein, the lower surface of said power piston secured to one of the valve stems;
means biasing the engine valve toward a closed position;
a poppet valve portion formed on the upper surface of said power piston for engaging said housing encircling said bore to permit and prevent communication through said bore when said power piston is at its highest position;
first pressurized fluid supply means in communication with and providing a first fluid to said bore relatively above said poppet valve portion; and
a timing valve for controlling flow from said first pressurized fluid supply means and to said bore relatively below a part of said poppet valve portion and above said power piston for rapidly opening said engine valve.

5,193,496
VARIABLE ACTION ARRANGEMENT FOR A LIFT VALVE
Hermann Krüger, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Fed. Rep. of Germany
Filed Jan. 24, 1992, Ser. No. 825,526
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1991, 4104140
Int. Cl.[5] F01L 1/12, 1/24
U.S. Cl. 123—90.16 13 Claims

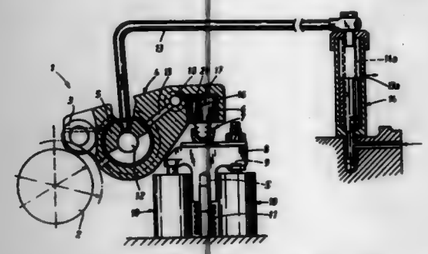
1. A variable valve action for a lift valve which is movable periodically between a closed position and an open position comprising main cam means and hydraulic force-transmitting means arranged between the main cam means and the lift valve, the hydraulic force-transmitting means including a first plunger responsive to the main cam means and a piston arranged to transmit force to the lift valve with the first plunger and the piston forming a first pressure chamber between them, hydraulic pressure control means including a control valve to control the pressure in the first pressure chamber and thereby adjust the axial length of the force-transmitting means in the direction of force transmission, a cup plunger surrounding the first plunger and displaceable with respect to the first plunger

and forming a second pressure chamber extending annularly about the first plunger, the second pressure chamber being bounded in the axial direction by a shoulder formed in the first



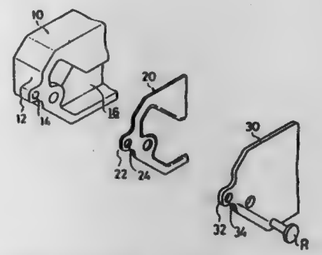
plunger and by a bottom end of the cup plunger, and further cam means including at least one additional cam synchronized with the main cam for applying force to the end of the cup plunger.

5,190,497
VALVE ARRANGEMENT
Olof Hakansson, Stenkullen, Sweden, assignor to AB Volvo, Sweden
PCT No. PCT/SE90/00784, § 371 Date Jun. 30, 1992, § 102(e) Date Jun. 30, 1992, PCT Pub. No. WO91/08381, PCT Pub. Date Jun. 13, 1991
PCT Filed Nov. 28, 1990, Ser. No. 852,247
Claims priority, application Sweden, Dec. 1, 1989, 8904060
Int. Cl.[5] F01L *1/24*
U.S. Cl. 123—90.16 **6 Claims**



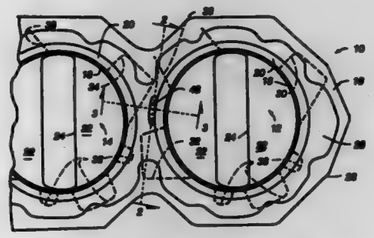
1. A device for controlling a take-up of valve clearance in a valve mechanism of an internal combustion engine, comprising a rocker arm system with at least one typically hollow-formed rocker arm shaft and a hydraulically operated take-up means arranged in connection with operating ends of valves whose valve clearances are to be taken up, whereby each rocker arm has a conduit for a supply of an oil to the take-up means, and a drainage of the oil fed to the rocker arm shaft and thence to the rocker arms and respective take-up means is arranged such that only a small quantity of the oil which is necessary for the bearing surfaces of the rocker arms, is drained via normal leakage flow between the rocker arms and their shaft, characterized in that a quantity of the oil fed to the rocker arm shaft is drained from the rocker arm shaft back to the engine oil reservoir via a specially arranged conduit having an outlet orifice, and in that a pneumatically or mechanically operable piston-cylinder unit is arranged close to said outlet orifice to effect closing of said orifice, thereby causing an increase in the pressure in the rocker arm shaft and associated rocker arms so that the take-up means extends.

5,193,498
HYDRAULIC TENSIONER HAVING INTEGRALLY FORMED MOUNTING PLATE AND GASKET
Yuichi Futami, Iruma, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan
Filed Jan. 31, 1992, Ser. No. 830,136
Claims priority, application Japan, Jan. 31, 1991, 3-8490
Int. Cl.[5] F16H *7/12, 7/08*
U.S. Cl. 123—90.31 **4 Claims**



1. A hydraulic tensioner for a flexible power transmission, said tensioner mountable on an engine structure, said tensioner comprising a housing element including a hydraulic fluid reservoir having an opening, means providing a mounting plate element for covering the opening of said reservoir and for at least partially supporting said housing element on said engine structure, a gasket for providing a seal at the periphery of said opening, between said mounting plate element and said housing element, and means temporarily securing said mounting plate element, said gasket and said housing element together in a predetermined relationship to one another while said tensioner is unmounted.

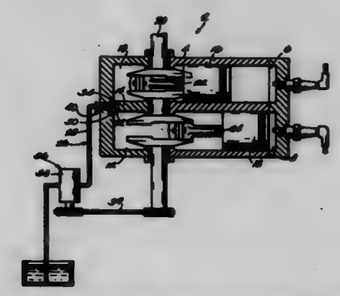
5,193,499
CAST INTER-CYLINDER COOLING PASSAGE FOR INTERNAL COMBUSTION MOTORS
Gregory J. Binversie, Grayslake, Ill., and Joseph E. Capodarco, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 5, 1992, Ser. No. 831,525
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 R **16 Claims**



1. A multiple cylinder motor block of the type which is used in marine and other internal combustion motors, said motor block comprising:
a unitary casting in which at least two cylinder bores of a predetermined depth are provided adjacent one another in at least one cylinder bank, with the casting defining cast cylinder walls around the bores;
each of the cylinder bores having at least one outwardly extending transfer passage located in its cylinder wall near the adjacent cylinder bore, each of said transfer passages having a helical relation to the axis of tis cylinder, the angular orientation of the transfer passage of one cylinder

bore being different than the angular orientation of the near transfer passage of the adjacent cylinder to result in a portion of the casting between the two transfer passages;
each of said cylinder bores having a head end portion and a bottom end portion, said casting having outer walls spaced from the cylinder walls in said head end portion thereof to define a first cooling passage that extends circumferentially around each cylinder wall for receiving cooling fluid for cooling the cylinder walls, said first cooling passage extending from the head end of the casting to a first predetermined depth of the cylinder bore;
said casting having a second cooling passage extending from said first cooling passage to the exterior of the casting substantially along the length of the remainder of the cylinder bore depth, said second cooling passage being located between said near transfer passages of each set of adjacent cylinder bores in said portion of the casting between said two near transfer passages.

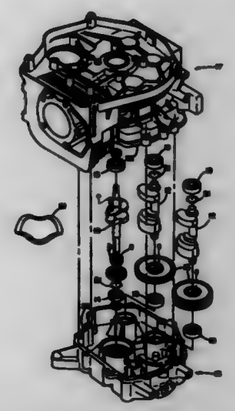
5,193,500
OILING SYSTEM FOR INTERNAL COMBUSTION ENGINE
Gerald Haft, Brookfield, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 11, 1991, Ser. No. 654,088
Int. Cl.[5] F01M *1/18*
U.S. Cl. 123—196 CP **9 Claims**



1. A two-stroke internal combustion engine comprising an engine block defining a cylinder and at least partially defining a crankcase associated with said cylinder, conduit means communicating with said crankcase, a pump exterior to said crankcase for pumping oil to said conduit means, and normally closed valve means located in said conduit means and downstream of said pump, said valve means normally preventing flow relative thereto and opening in response to operation of said oil pump.

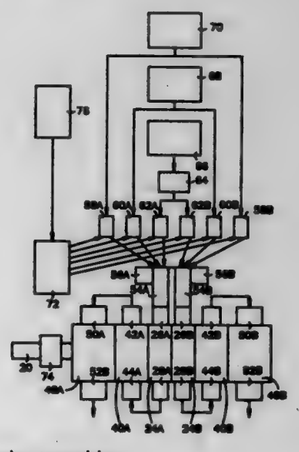
5,193,501
METHOD FOR ASSEMBLING AND PRELOADING SHAFT ASSEMBLIES IN RECIPROCATING INTERNAL COMBUSTION ENGINES
Anthony T. Klejeski, Bethel; Curtis D. Leaf, Blaine, and James I. R. Butcher, Anoka, all of Minn., assignors to Onan Corporation, Minneapolis, Minn.
Filed Jan. 31, 1992, Ser. No. 830,320
Int. Cl.[5] B23P *17/00*
U.S. Cl. 123—197.4 **6 Claims**

1. A method for assembling and preloading a shaft with first and second ends for use in a reciprocating internal combustion engine comprising the steps of:
a. placing a first bearing into an engine oil base that is arranged and configured for receiving said first bearing, said first bearing arranged and configured for receiving said first end of the shaft;
b. placing a second bearing into an engine cylinder block that is arranged and configured for receiving said second bearing, said second bearing arranged and configured for receiving said second end of the shaft;
c. placing a spring element on either said first or second end of the shaft, said spring element arranged and configured to fill any gap between the shaft and said first and second bearings arising due to the accumulation of design tolerances and arranged and configured to continually provide



a positive load on the shaft during engine operation to reduce axial movement of the shaft;
d. placing said first end of the shaft into said first bearing;
e. placing said cylinder block onto said oil base whereby said second end of the shaft is inserted into said second bearing; and
f. securing said cylinder block to said base.

5,193,502
SELF-STARTING MULTIFUEL ROTARY PISTON ENGINE
Joseph S. Lansing, 319 W. Valerio St. #4, Santa Barbara, Calif. 93101
Filed Jul. 17, 1991, Ser. No. 731,438
Int. Cl.[5] F02B *53/06*
U.S. Cl. 123—216 **6 Claims**



3. An engine comprising:
(a) a pair of substantially identical stationary housings, and

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(b) a pair of substantially identical, two sided rotary pistons slidably received within said housings at apices of said rotary pistons, and

(c) an output shaft rotatably supported by said housings, said output shaft having two eccentrics each rotatably receiving one of said rotary pistons so that two variable volume cavities are formed inside each said housing, said output shaft having a rotational velocity ratio to said rotary pistons of two to one and a single, arbitrary, correct direction of rotation, and

(d) said housings, rotary pistons and eccentrics oriented relative to each other so that when a major axis, or a line defined by said apices, of one of said rotary pistons is in a top dead center orientation relative to its said housing such that said two variable volume cavities are of minimal and maximal volume, other of said rotary pistons has its own said major axis at an angle of half of pi radians, or 90 degrees, relative to its own said top dead center orientation in its own said housing, and

(e) an inlet port and an exhaust port in each of said housings said inlet port opening into said cavity of minimal volume and located on one side of a plane and adjacent to an intersection of said plane with the inside of said housing, said exhaust port being on the other side of said plane and adjacent to a second intersection of said plane with said inside of said housing, said plane being defined by one position assumed by said major axis of said rotary piston contained by said housing and rotational axis of said rotary piston, said plane being rotated by a first angle in said correct direction of rotation from a reference plane defined by said rotary piston major axis in said top dead center orientation and said rotary piston rotational axis, said correct direction of rotation being defined as said apices moving away from adjacent said inlet port and adjacent said exhaust port when said rotary piston major axis is at said first angle, and

(f) a combustion chamber at each said inlet port that contains ignition means, and

(g) separate inlet valve means for each said combustion chamber for fuel and oxidizer, said valve means having a total of opening duration plus closing duration such that said total plus duration of traversal by said apex of said exhaust port plus said first angle plus a second angle is less than or equal to half of pi radians, or 90 degrees, the duration defined as the angle traversed by said rotary piston major axis during any other event, and

(h) engine control means that sense the angle of each said rotary piston major axis relative to said plane and open said valve means when said rotary piston major axis has rotated said second angle past said plane, the sum of said first angle and said second angle being more than zero and less than half pi radians, or 90 degrees, minus the sum of durations of said valve means opening and said valve means closing and traversal of said exhaust port by said apex, and that close said valve means in time for combustion to be completed before said apex enters said exhaust port.

5,193,503

LOAD ADJUSTMENT DEVICE

Gerd Bornmann, Hochheim, and Egon Bell, Florstadt, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 23, 1991, Ser. No. 763,517

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1990, 4033802

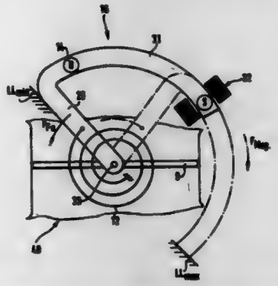
Int. Cl.[5] F02D *9/02, 9/10*

U.S. Cl. 123—339 **4 Claims**

1. A load adjustment device for an internal combustion engine comprising:

a throttle valve housing, a setting member, an electromagent, a throttle valve shaft, and a throttle valve which determines output power of an internal combustion engine, the throttle valve being connected and fixed for rotation with the throttle-valve shaft which is mounted in the throttle-valve housing; and

wherein the throttle-valve shaft has a mechanical linkage on an accelerator-pedal side of the shaft, and a setting-motor linkage side operatively coupled with the setting member for displacing the throttle-valve in idle operation;



the setting member has a magnet part which cooperates with the electromagnet, the electromagnet being actuatable with current;

the setting member comprises a setting lever, and the magnet part is supported on an outer end of the setting lever; and

the magnet part is formed as a circular-arc segment and is displaceable as a function of current applied to the electromagnet by the adjustment device.

5,193,504

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

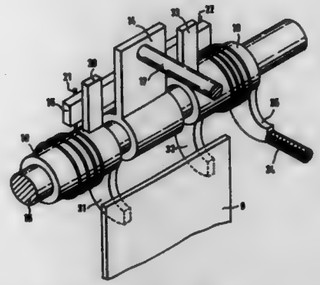
Karl Konrath, Freiberg/Neckar, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 8, 1992, Ser. No. 910,373

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1991, 4122879

Int. Cl.[5] F02D *31/00*

U.S. Cl. 123—357 **3 Claims**



1. A fuel injection pump for internal combustion engines having a fuel injection quantity adjusting device (2), which cooperates with a pump piston (1) and is actuatable by a governor lever (9, 10) that is adjustable counter to a force of a governor spring (6) by an rpm-dependent force (5), wherein the adjustment travel of the governor lever (9, 10) is limited by a stop lever assembly (13) that is adjustable by means of a stepping motor (8), the stop lever assembly comprises a first drag lever (18) and a lever (14), disposed parallel to said drag lever, said lever (14) is adjustable by the stepping motor, and said first drag lever is positively coupled to said lever (14) by means of a first spring (21).

5,193,505

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Max Straubel, Stuttgart; Klaus Krieger, Affalterbach; Karl Konrath, Freiberg, and Manfred Schwarz, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00661, § 371 Date Mar. 10, 1992, § 102(e) Date Mar. 10, 1992, PCT Pub. No. WO91/04409, PCT Pub. Date Apr. 4, 1991

PCT Filed Aug. 31, 1990, Ser. No. 838,262

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1989, 3931603

Int. Cl.[5] F02M *59/44*; F02D *31/00*

U.S. Cl. 123—366 **17 Claims**

1. A fuel injection pump for internal combustion engines with a supply volume adjusting mechanism which determines the amount of fuel to be injected, a starting lever that acts on the supply volume adjusting mechanism in order to adjust it, said starting lever being supported on a tensioning lever via a starting spring, with an adjusting lever which is arbitrarily operable via an accelerator pedal and which is coupled with the tensioning lever, and with an adjustable lever stop, against which the starting lever rests, under the action of the starting spring, when the engine is not operating, the lever stop (17) is forcibly coupled with the adjusting lever (20), such that said lever stop (17) is moved by the swivelling movement of the adjusting lever (20) from its first end position into a second end position, and that the end positions are determined in such a way that the lever stop (17) forces a starting lever position, which in the first end position, sets a fuel volume at the supply volume adjusting mechanism (11), as required for a hot start, and in the second end position, it sets a fuel volume as required for a cold start of the engine.

5,193,506

ENGINE THROTTLE CONTROL SYSTEM

John M. Ironside, Birmingham; Peter M. Fox, Hall Green; Alistair M. McQueen, West Midlands, and David R. Price, Birmingham, all of England, assignors to Lucas Industries public limited company, England

Division of Ser. No. 509,111, Apr. 13, 1990, Pat. No. 5,074,267.

This application Oct. 10, 1991, Ser. No. 775,643

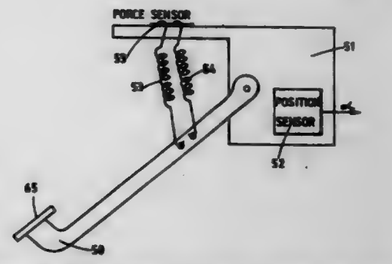
Claims priority, application United Kingdom, Apr. 17, 1989, 8908661

Int. Cl.[5] F02D *41/22*

U.S. Cl. 123—399 **4 Claims**

1. An engine throttle control system for controlling a motor for actuating an engine throttle, said system comprising detecting means for detecting when a signal of said control system is outside a range of acceptable values;

an accelerator pedal, at least one accelerator pedal return spring, and a sensor responsive to stress in said at least one accelerator pedal return spring for producing a stress signal irrespective of whether the accelerator pedal is actuated against the accelerator pedal return spring, said



detecting means being arranged to detect when the stress signal is less than an expected stress value.

5,193,507

FUEL INJECTION DEVICE FOR FUEL-INJECTED INTERNAL COMBUSTION ENGINES

Francois Rossignol, Mornant, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

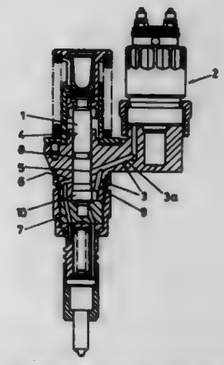
PCT No. PCT/DE91/00184, § 371 Date Nov. 22, 1991, § 102(e) Date Nov. 22, 1991, PCT Pub. No. WO91/15675, PCT Pub. Date Oct. 17, 1991

PCT Filed Mar. 1, 1991, Ser. No. 776,810

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010450

Int. Cl.[5] F02M *37/04, 57/02*

U.S. Cl. 123—446 **11 Claims**



1. A fuel injection device for fuel-injected internal combustion engines, in particular to a unit fuel injector, in which the control of the onset and end of supply is effected by means of a magnet valve (2) incorporated between a low-pressure circuit and a work chamber (10; 19) of a pump piston (1; 20), wherein a scavenging bore (6; 22), connectable to the work chamber (10; 19), of a scavenging line (7) that communicates with a low-pressure chamber or the fuel tank is provided, and wherein a delivery line (3; 18) for delivering the fuel from the magnet valve (2) to the work chamber (10; 19) of the pump piston (17; 20) discharges directly into the pump work chamber (10; 19) and communicates with the pump work chamber in a permanently open fashion, the mouth of the scavenging bore (6; 22) is located in a region of the guide bore (4; 23) of the pump piston (1; 11; 14; 20) which is overridden by the pump piston in all positions of the pump piston (1; 11' 14; 20), and this mouth is connectable at least indirectly to the delivery line (3; 17; 18) and the work chambers (10; 19) of the pump piston (1;

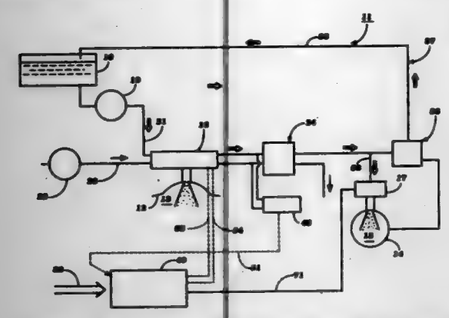
11; 14; 20) via a recess (8; 21) of the piston, in the region of the top dead center position of the piston (1; 11; 14; 20).

5,193,508

FUEL INJECTION SYSTEM

Yu Motoyama; Ryusuke Kato, and Yoshihiko Moriya, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 27, 1990, Ser. No. 515,205
Claims priority, application Japan, Apr. 28, 1989, 1-107598
Int. Cl.[5] F02M *23/06*
U.S. Cl. 123—460 11 Claims



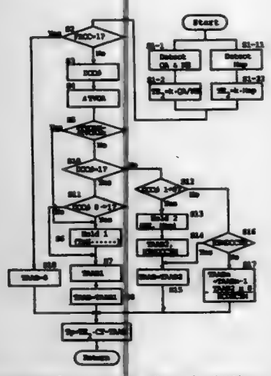
1. A fuel injection system for an internal combustion engine comprising a combustion chamber, a first fuel injector for injecting fuel directly into said combustion chamber for combustion in said combustion chamber, a second fuel injector for injecting fuel to said engine at a location other than directly into said combustion chamber for combustion in said combustion chamber, a fuel tank, fuel pump means for delivering fuel from said fuel tank to each of said fuel injectors under pressure, and pressuring regulating means for supplying said second fuel injector with fuel at a pressure lower than the pressure in which fuel is supplied to said first fuel injector.

5,193,509

FUEL CONTROL SYSTEM FOR AUTOMOTIVE POWER PLANT

Masashi Ohmori; Yasuhiro Harada; Shinichi Wakutani, and Hiroshi Ebino, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 9, 1992, Ser. No. 848,084
Claims priority, application Japan, Mar. 30, 1991, 3-67347
Int. Cl.[5] F02D *41/12*
U.S. Cl. 123—493 9 Claims



1. In an automotive power plant including a combustion engine having at least one combustion chamber, an intake passage means communicated with the combustion chamber through at least one valve-controlled intake port for an introduction of an air-fuel mixture into the combustion chamber, an exhaust passage means communicated with the combustion chamber through at least one valve-controlled exhaust port for a discharge of exhaust gases from the combustion chamber, a fuel injector for injecting a controlled amount of fuel into the combustion chamber together with air sucked through the intake passage means, and a throttle valve disposed in the intake passage means upstream of the fuel injector with respect to the direction of flow of the air towards the combustion chamber, said throttle valve being displaceable between a full open position and a substantially closed position for controlling the flow of the air through the intake passage means, a fuel control system for determining the amount of fuel to be injected into the combustion chamber in dependence on the amount of air being sucked towards the combustion chamber, said fuel control system comprising:

a throttle sensing means for detecting, and providing a throttle signal indicative of, the opening of the throttle valve; and

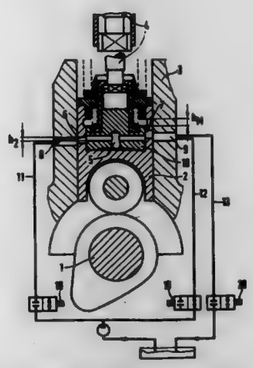
a control means operable to determine, and control the fuel injector so as to reduce the amount of fuel to be injected by, a first fuel decrement in dependence on the amount of fuel injected at the start of movement of the throttle valve towards the closed position during a deceleration of the engine when the throttle sensing means detects the movement of the throttle valve towards the closed position at a speed higher than a predetermined value and regardless of a speed of movement of the throttle valve; to interrupt the determination of the first fuel decrement when the rate of change of the throttle valve towards the closed position attains a zero value; and thereafter to determine, and control the fuel injector so as to reduce the fuel by a second fuel decrement in dependence on a change in load on the engine.

5,193,510

DEVICE FOR ADJUSTING THE ONSET OF SUPPLY FOR A FUEL INJECTION PUMP

Max Straubel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 8, 1992, Ser. No. 895,056
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1991, 4118555
Int. Cl.[5] F02M *37/04*
U.S. Cl. 123—502 19 Claims



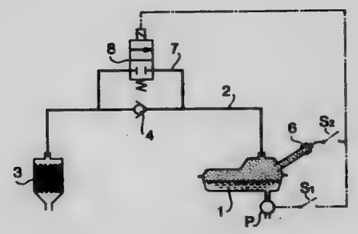
1. An adjusting device for the onset of the supply of a fuel injection pump, in particular an in-line injection pump or plug-in pump for internal combustion engines, in which a reciprocating motion of a pump piston (4), effected via a drive cam (1), is transmitted via a roller tappet (2) that is guided in a housing bore (3) and for varying the prestroke the roller tappet is provided with a hydraulic tappet chamber (5), said roller tappet being fixable in defined stroke positions by means of variable action of a control fluid, the improvement comprising the roller tapper (2) has at least one first control bore (6) and at least one second control bore (7), which bores communicate with the hydraulically controllable hydraulic tappet chamber (5) and respectively with means defining openings (8, 9) in the wall of the housing bore (3), the hydraulic tappet includes a control piston (10) said at least one first and second control bores (6, 7) are provided offset from one another with respect to the longitudinal piston axis, at least one of said at least one first and second control bores is closable by means of said control piston, and said openings (8, 0) in the wall of the housing bore (3) are supplied selectively as a function of at least one of the engine rpm, engine acceleration and engine temperature with the control fluid via hydraulic lines (11, 12, 13 or 11, 15).

5,193,511

EVAPORATED FUEL PROCESSING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Ryuji Fujino, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1991, Ser. No. 796,259
Claims priority, application Japan, Nov. 27, 1990, 2-123697[U]
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 6 Claims



1. An evaporated fuel processing apparatus for an internal combustion engine having a fuel pump, a connecting pipe for communicating a fuel tank and a canister filled with a fuel absorbent, and, a nonreturn valve which is provided in an intermediate portion of the connecting pipe and is openable in response to a pressure difference to allow vapor fuel to flow from the fuel tank to the canister only when a pressure within the fuel tank side of the connecting pump exceeds a pressure within the canister side of the connecting pipe, comprising:

a switching valve which is interposed between the fuel tank and the canister in parallel with the nonreturn valve; and

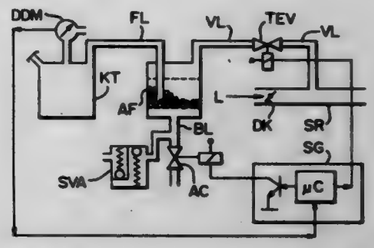
switching means for opening said switching valve when the fuel pump is in operation.

5,193,512

TANK-VENTING SYSTEM FOR A MOTOR VEHICLE AND METHOD FOR CHECKING THE OPERABILITY THEREOF

Ulrich Steinbrenner; Helmut Denz, both of Stuttgart; Ernst Wild, Oberriexingen, and Wolfgang Wagner, Korntal-Münchingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE91/00010, § 371 Date Oct. 8, 1991, § 102(e) Date Oct. 8, 1991, PCT Pub. No. WO91/12426, PCT Pub. Date Aug. 22, 1991
PCT Filed Jan. 9, 1991, Ser. No. 768,973
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1990, 4003751
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 5 Claims



1. A tank-venting arrangement for a motor vehicle having an internal combustion engine equipped with an intake pipe, the arrangement comprising:

a fuel tank;

an adsorption filter;

a filter line connecting said fuel tank to said adsorption filter;

a venting line connected to said adsorption filter;

a controllable shut-off valve arranged in said venting line;

a valve line connecting said adsorption filter to said intake pipe;

a tank-venting valve mounted in said valve line for closing and opening said valve line to said intake pipe;

control means for closing said shut-off valve and for opening said tank-venting valve; and,

measuring means for measuring whether underpressure builds up in said tank when said shut-off valve is closed and said tank-venting valve is opened thereby enabling a conclusion to be made that said arrangement is operative.

5,193,513

MISFIRE DETECTION IN AN INTERNAL COMBUSTION ENGINE USING EXHAUST PRESSURE

Kenneth A. Marko, Ann Arbor, and Bruce D. Bryant, Royal Oak, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 3, 1992, Ser. No. 892,883
Int. Cl.[5] F02M *25/07*; G01M *15/00*
U.S. Cl. 123—571 13 Claims

1. Apparatus for detecting individual misfires in an internal combustion engine having an exhaust manifold, comprising:

pressure transducer means in communication with said exhaust manifold for generating a pressure signal responsive to exhaust pressure within said exhaust manifold;

position means for generating a plurality of position signals indicative of predetermined rotational positions within a cycle of said internal combustion engine;

an analog-to-digital converter coupled to said pressure transducer means and said position means for generating digitized pressure data corresponding to said predetermined rotational positions; and

a trained classifier having a data input coupled to said ana-

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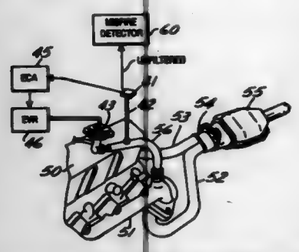
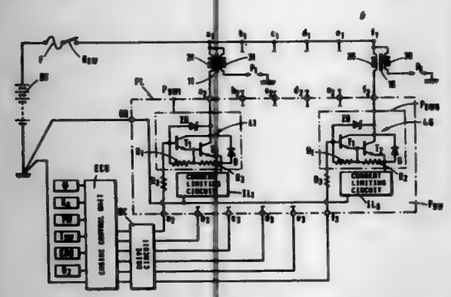
log-to-digital converter and having a set of predetermined internal coefficients for processing said digitized pressure



data to generate an output signal indicative of the detection of individual misfires.

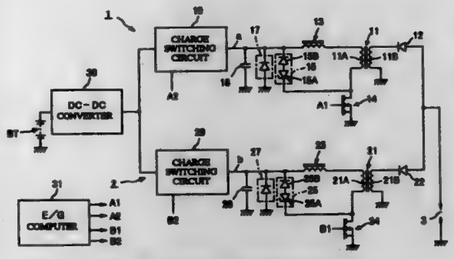
5,193,514
INDUCTION DISCHARGE TYPE IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Ryoichi Kobayashi, Tokai; Noboru Sugiura, Mito, and Noriyoshi Urushiwara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 8, 1991, Ser. No. 726,824
Int. Cl.[5] F02P *3/02*
U.S. Cl. 123—634 **12 Claims**



1. An induction discharge system ignition device for an internal combustion engine including means for producing a voltage to be applied to a coil primary winding, means for applying an output of said coil to a fuel ignition means, wherein said means for producing a voltage and said coil produce a voltage of at least 6.0 kV across the electrodes of the ignition means when said ignition means has a leakage resistance of 100 kΩ.

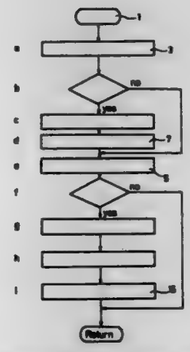
5,193,515
IGNITION SYSTEM FOR AN ENGINE
Nobuyuki Oota, Kariya, and Yasutoshi Yamada, Chita, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Mar. 12, 1992, Ser. No. 851,001
Claims priority, application Japan, Mar. 12, 1991, 3-70306
Int. Cl.[5] F02P *15/08, 3/08*
U.S. Cl. 123—637 **2 Claims**

1. An ignition system for an automobile comprising:
an ignition plug;
ignition timing means for providing an ignition timing signal;
a first ignition current supply means connected to said ignition plug including;
coil means having a primary coil connected to said ignition plug;
a condenser;
charge means for charging said condenser;
switching means for discharging said condenser;
a second ignition current supply means connected to said ignition plug including;
coil means having a primary coil connected to said ignition plug;
a condenser;



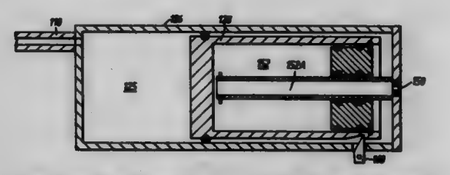
charge means for charging said condenser;
switching means for discharging said condenser; and
switching control means for switching said first and second current supply means alternately in response to said ignition timing signal.

5,193,516
METHOD OF AND DEVICE FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE
Jürgen Zimmermann, Schwieberdingen, and Bernard Bauer, Friolzheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE89/00714, § 371 Date Jun. 24, 1991, § 102(e) Date Jun. 24, 1991, PCT Pub. No. WO90/07057, PCT Pub. Date Jun. 28, 1990
PCT Filed Nov. 15, 1989, Ser. No. 687,921
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1988, 3841862
Int. Cl.[5] F02P *3/12*
U.S. Cl. 123—643 **7 Claims**



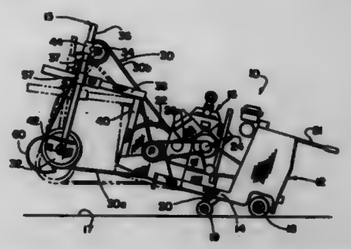
1. A method of controlling ignition of an internal combustion engine having a plurality of cylinders each provided with a spark plug, a plurality of ignition coils each connected to an assigned spark plug, means for determining individual spark plugs to be fired during an ignition cycle, means for charging individual ignition coils prior to firing the spark plugs assigned to them, means for generating a pulse-shaped timing signal whose pulse rate depends on angular velocity of the engine, and a first counting device for one of incrementing or decrementing the pulses of the timing signal until an ignition triggering count corresponding to a fixed angular interval of engine rotation is reached, the method comprising the steps of storing in a memory a set of starting values for defining the start of charging of consecutive ignition coils during an ignition cycle; loading a second counting device with a first initial count corresponding to the stored starting value for a first ignition coil to be triggered decrementing the first initial count by said timing signal until a given reference count value is reached whereupon the charging of the first ignition coil is initiated, loading the second counting device with a new initial count corresponding to the stored starting value for the next ignition coil and counting down the new initial count by the timing signal; firing via said first ignition coil the assigned spark plug as soon as the ignition triggering count is reached on said first counting device, restoring one of incrementing or decrementing of said first counting device and at the same time, calculating a new charge starting value for said first ignition coil and storing the calculated value for use in the next ignition cycle; and upon loading the second counting device with the stored charge starting value pertaining to the last ignition coil to be triggered and upon decrementing it to said given reference count value, repeating the above steps with the calculated new set of charge starting values retrieved from the memory.

5,193,517
GAS SPRING AIRGUN
Hugh F. Taylor, Sawston, and David R. Theobald, St. Ives, both of England, assignors to Utec B.V., Netherlands
Filed Jun. 10, 1991, Ser. No. 713,439
Int. Cl.[5] F41B *11/00*
U.S. Cl. 124—67 **19 Claims**



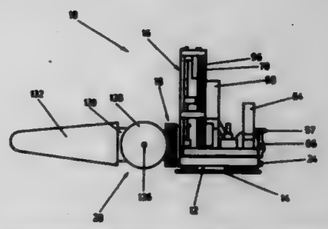
1. An airgun for launching a projectile from a barrel by means of a charge of compressed air, comprising: an outer cylinder having one end in communication with said barrel; an inner cylindrical member located within said outer cylinder to define a coaxial cylindrical clearance therebetween; a hollow piston axially movably located within said outer cylinder between a cocked and uncocked position, said piston having a crown and a cylindrical piston wall extending rearwardly from said piston crown into said cylindrical clearance, rapid movement of said piston from said cocked to said uncocked position being adapted to compress a charge of air to expel said projectile; a cocking mechanism for retracting said piston towards said inner cylindrical member into said cocked position thereby compressing gas within said hollow piston; and a trigger for releasing said piston from said cocked position, whereupon said compressed gas within said hollow piston acts as a gas spring to force said piston into said uncocked position, thereby compressing air before said piston crown to expel said projectile; first annular sealing means being located between an inner piston wall surface and an outer wall of said inner cylinder to provide a gas-tight expansion chamber behind said piston crown whereby retraction of said piston into said cocked position compresses gas within the entire expansion chamber and release of said piston allows energy stored in said compressed gas in said entire expansion chamber to force the piston rapidly forward and compress the air before the piston crown; said inner cylindrical member having an external diameter which is significantly smaller than the internal diameter of said piston wall, thereby achieving a compression ratio between said cocked and uncocked positions of between 1.05:1 and 1.25:1.

5,193,518
PORTABLE WIRE SAW
Karl H. Moller, Westlake; Andrew L. Jedick, Avon lake, and Brian S. Edwards, Lorain, all of Ohio, assignors to Diamond Products, Inc., Elyria, Ohio
Filed Nov. 13, 1991, Ser. No. 792,137
Int. Cl.[5] B28D *1/08*
U.S. Cl. 125—21 **16 Claims**



1. A portable wire saw apparatus for cutting materials such as stone, concrete and asphalt comprising:
a base;
a power source mounted on said base;
a height adjustment mechanism for pivoting said base about a first axis between a first position to a second position;
a drive wheel connected to said power source and rotated by said power source;
a first pulley supported by said base and spaced from said drive wheel along a second axis;
a second pulley supported by said base and located in a common plane with said first pulley and said drive wheel; and
a wire saw blade carried by said first and second pulleys and said drive wheel such that said wire saw blade presents a straight cutting surface between said drive wheel and said first pulley.

5,193,519
UNDERGROUND GALLERY SAW
David W. Elliot, P.O. Box 756, Bedford, Ind. 47421
Filed Mar. 6, 1992, Ser. No. 847,329
Int. Cl.[5] B28D *1/08*
U.S. Cl. 125—21 **20 Claims**



14. An underground gallery saw system comprised of
(a) a track system;
(b) a mainframe with means for powered movement of said mainframe along said track wherein said means for powered movement is secured to the mainframe;
(c) a height adjustment system secured to the mainframe comprised of a first means of vertical adjustment, a second means of vertical adjustment and a third means of vertical adjustment;
(d) a saw unit containing a saw blade system secured to the height adjustment system by a powered rotation means wherein said rotation means is comprised of a pair of plates secured together by a rotator means permitting one

plate to circumferentially rotate about the other plate through 90° of rotational adjustment; and

(e) a power drive unit secured to said mainframe.

5,193,520

COOKING APPARATUS

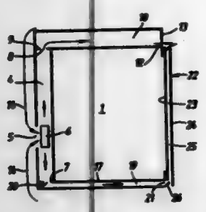
Benjamin F. Gostelow, Alltami, and Geoffrey J. E. Brown, Widnes, both of Great Britain, assignors to Stoves Limited, Merseyside, Great Britain

Filed Apr. 29, 1992, Ser. No. 875,281

Claims priority, application United Kingdom, May 1, 1991, 9109435

Int. Cl.[5] F24C *15/32*

U.S. Cl. 126—21 A 9 Claims



1. A cooker having two oven cavities each having heating means and a door of a composite construction including inner and outer door panels spaced apart by a passageway open at or adjacent the top and at or adjacent the bottom of the door, means forming a plenum chamber located at the rear of the cavities, the chamber having at least one air inlet connected to the ambient through which air enters the chamber and at least one air outlet through which air leaves the chamber, a fan for pumping air into the chamber through the or each air inlet, means forming a first air outlet duct directing the flow of air from an air outlet to the passageway of one of the doors and discharging said air from said door passage to the ambient, and means forming a second air outlet duct directing the flow of air from an air outlet to the passageway of the other door and discharging said air from said door passage to the ambient.

5,193,521

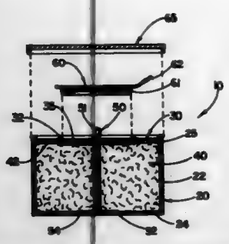
PORTABLE FUEL CANISTER

Benjamin Levinson, 7400 Radice Ct., #303, Lauderhill, Fla., and Leonard J. Scarnato, 12 Mabro Dr., Denville, N.J.

Filed Feb. 14, 1992, Ser. No. 836,124

Int. Cl.[5] F24C *5/04*

U.S. Cl. 126—45 10 Claims



1. A cooking apparatus adapted to burn liquid fuel comprising:

a container defining an outer housing and including a base, a surrounding side wall structure, and a top, said top including an opening therethrough in exposing relation to an interior chamber of said container,

fuel containing means disposed in substantially filling relation within said interior chamber and being structured to hold and regulate the movement of the liquid fuel therein so as to prevent spillage of the liquid fuel from within the container,

fuel delivery means for delivering the liquid fuel to an upper exposed surface of the fuel containing means adjacent to said opening of said top, and disposed to facilitate igniting and subsequent continuous burning of the fuel at said upper exposed surface, and

means to maintain said fuel containing means within said interior chamber.

5,193,522

ELECTRIC, GAS, COMBINATION OR SIMILAR OVEN PROVIDED WITH A DOOR, THE GLASS SURFACE OF WHICH IS KEPT AT A LOW TEMPERATURE

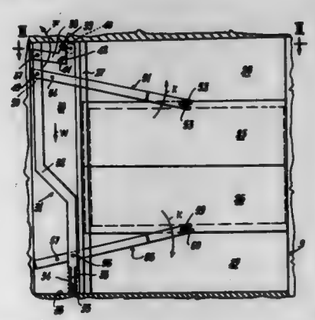
Johannes A. G. P. Damsteegt, Eindhoven, Netherlands; Mario Floroli, Brezzo di Bedero, Italy; Giovanni Franzetti, Ispra, and Francisco Kokkeler, Malnate, both of Italy, assignors to Whirlpool International B.V., Eindhoven, Netherlands

Continuation of Ser. No. 647,130, Jan. 29, 1991, abandoned. This application Mar. 2, 1992, Ser. No. 860,285

Claims priority, application Italy, Feb. 1, 1990, 20546/90[U]

Int. Cl.[5] F23M *7/00*

U.S. Cl. 126—200 9 Claims



1. An oven comprising a door provided with a window, said window having an outer and an inner surface and a panel interposed therebetween, the panel (9) comprising at least one mobile portion (25, 26) associated with means for moving said at least one mobile portion within the door to allow visual access to the interior of the cooking chamber (2) of the oven (1), the movement of said at least one mobile portion (25, 26) being controlled by lever means inside the oven comprising a member (38) and an element (32), said lever means being actuated by the action of a pushbutton (40) provided on the outside of the oven (1).

5,193,523

HEATED WORKSTATION

Michel J. Denber, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1991, Ser. No. 719,411

Int. Cl.[5] F24F *12/00*

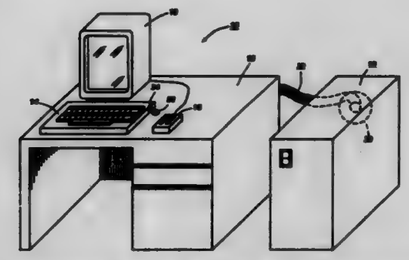
U.S. Cl. 126—204 1 Claim

1. A data processing system including, in combination:

a main processor incorporating means within the processor housing to vent air heated during operation,

an operator workstation for entering and viewing data transferred between said processor and workstation, and

air coupling means connected between said processor and said workstation to conduct vented, heated air into selected areas of said workstation, wherein said workstation includes a keyboard for entering data and wherein said coupling means introduces said vented, heated air into the interior of said keyboard, whereby the heated air circulates between and over said keys providing warmth to the fingers of an operator manipulating said keys.



5,193,524

OVERFLOW COOKING POT ASSEMBLY

Dennis G. Loyd, and Lois B. Loyd, both of R.R. #1, Box 97, Downs, Kans. 67437

Filed Nov. 4, 1991, Ser. No. 787,377

Int. Cl.[5] F24H *7/00*

U.S. Cl. 126—389 32 Claims

1. An overflow cooking pot assembly for heating fluids and food products operable to diminish the likelihood of overflow therefrom and release pressure on reaching a preset adjusted pressure condition, comprising:

a) a main support pan member including a main support section having a fluid overflow section connected to and extended upwardly and laterally of said main support section; and

b) a main trip lid assembly mounted on said main support section including a trip lid housing assembly, a lid support and actuator assembly secured to said main support pan member, and an actuator assembly mounted on said trip lid housing assembly and engagable with said lid support and actuator assembly for holding said trip lid housing assembly in a pressure trip release condition or a non-release pressurized condition in a position mounted on said main support section of said main support pan member;

whereby said fluid overflow section acts as a cooling area for any overheated fluid and food products to cool same and return to said main support section.

5,193,525

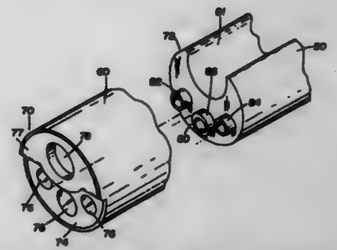
ANTIGLARE TIP IN A SHEATH FOR AN ENDOSCOPE

Fred E. Silverstein, Seattle, Wash.; Eric A. Opie, deceased, late of Brier, Wash. by Elizabeth J. O. Salamousen, Executrix; David R. Kreft, Seattle, Wash., and Bandula Wijay, Friendswood, Tex., assignors to Vision Sciences, Natick, Mass.

Filed Nov. 30, 1990, Ser. No. 620,488

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 31 Claims



1. In an endoscope having a light source and an image viewer at its distal end, a protective sheath covering the distal end of said endoscope, and a tip for said sheath having transparent windows positioned over the light source and the image viewer of said endoscope when said sheath is installed on said endoscope, the improvement comprising an interfitting region positioned between said light source and said image viewer, said interfitting region including a projection from one of said endoscope and said tip and a recess in the other of said tip and endoscope, respectively, mating with said projection, said interfitting region including a light-blocking member that prevents light emitted by said light source from reaching said image viewer, unless it is reflected from objects external to said tip.

5,193,526

LASER LIGHT IRRADIATION APPARATUS

Norio Daikuzono, Chiba, Japan, assignor to S.L.T. Japan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 575,905, Aug. 31, 1990, abandoned. This application Jan. 29, 1992, Ser. No. 905,235

Claims priority, application Japan, Sep. 5, 1989, 1-230195

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—7 17 Claims

1. A laser light irradiation apparatus comprising:

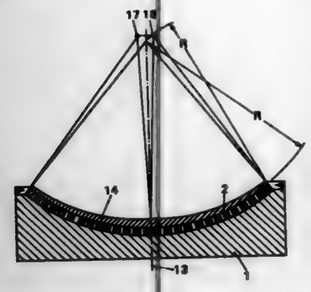
a laser light emitting member;

a plurality of laser light transmitting members, located around an axis of said emitting member, wherein a fore end portion of each of the transmitting members couples laser light to said emitting member; and

a lead wire for detecting a temperature, which extends through said light emitting member so as to project from a light emitting surface of the light emitting member.

VOL 1148 ISS 3 MR 16 1993

5,193,527
ULTRASONIC SHOCK WAVE TRANSDUCER
Dagobert Schäfer, Bretten, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany
Filed Sep. 10, 1990, Ser. No. 580,226
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1989, 3932967
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 EL 8 Claims

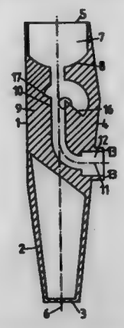


1. An ultrasonic shock wave transducer device for generating ultrasonic waves and transmitting them to an object to be destroyed, comprising a transducer having a cap-shaped radiating surface for generating ultrasonic shock waves and a main axis, and means located on said transducer for geometrically focussing the energy of said shock waves proportionately on at least two points disposed on a line which is arbitrarily curved about said main axis in three dimensions and is spaced from said radiating surface.

5,193,528
HAND-HELD VIBRATORY MASSAGER
Hironori Iwamoto, Oomi; Kuniharu Ichikawa, Kushiyama; Taro Mochida, Hirakata, and Teruhisa Innami, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jan. 7, 1991, Ser. No. 637,816
Claims priority, application Japan, Jan. 13, 1990, 2-5944
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—36 16 Claims

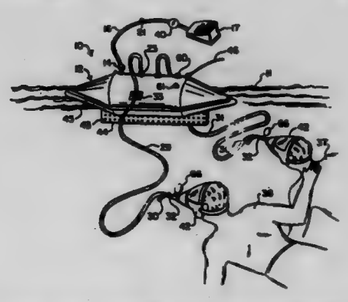
1. A hand-held extensible vibratory massager comprising:
a hand grip to be grasped by a hand of a user, the hand grip being a straight member having a longitudinal axis;
a vibration applicator containing a vibration source and having a center axis and an applicator portion projecting radially outwardly of said center axis;
an extensible arcuate arm interconnecting said hand grip and said vibration applicator along an arcuate path defined by said arm the arrangement being such that the projecting angle of the applicator portion with respect to the longitudinal axis of the hand grip varies as the arcuate arm is extended;
said extensible arcuate arm comprises an inner arcuately elongated tube and an outer arcuately elongated tube,
said inner tube being telescopically slidable within said outer arcuate tube so that said arcuate arm can vary its length along said arcuate path,
said outer tube carrying an adjustor which is engageable selectively with one of a plurality of indentations formed in the surface of one of said tubes and spaced longitudinally thereof for latching said outer tube into a selective longitudinal position relative to said inner tube,
said adjustor comprising a generally semi-circular member with an operator knob at its middle and opposed spring legs integrally extending from said operator knob in opposite directions, said spring legs disposed between said outer and inner tubes, said operator knob projecting outwardly through said outer tubes to be accessible by the hand of the user, said spring legs formed at their free ends respectively with shoes which are sprint biased into said indentations, each of said spring legs formed intermediate between said shoe and said operator knob with a fulcrum projection which abuts against the surface of one of said tubes such that, upon said operator knob being pushed inwardly, said spring legs are forced to pivot about said fulcrum projection to move away from the surface of the tube having said indentations, thus disengaging said shoes out of said indentations and, allowing the slidable movement of said outer tube relative to said inner tube.

5,193,529
APPLICANCE FOR USE IN INSPIRATION AND EXPIRATION TECHNIQUES AND EXERCISES
Emmanuel Labaere, Bruggestraat 133, B-8600 Menen, Belgium
Filed Aug. 3, 1990, Ser. No. 562,573
Claims priority, application Belgium, Aug. 3, 1989, 8900839
Int. Cl.[5] A63B *23/00*; A61M *15/00*; A62B *7/00*
U.S. Cl. 128—200.24 7 Claims



1. Inspiration and expiration apparatus for performing positive expiration pressure (PEP), pursed lips breathing (PLB), oscillating positive expiration pressure (OPEP), incentive inspiration (II) and incentive expiration (IE), comprising a handle, a hollow pipe and a channel connectable to a mouthpiece through said hollow pipe and means for periodically alternating expiration pressure with changeable course and, means for infinitely variably regulating inspiration or expiration pressure, wherein the means for periodically alternating expiration pressure comprises an element for shutting off a flow passage for the air through the channel, said element being acted on by a force of gravity in the direction of the flow passage and being acted on in an opposite direction by expiration pressure, said expiration pressure depending on the supply of air allowed through thereby being variable, said expiration pressure resulting in an up and down movement of the element so that the flow passage is shut off and re-opened in rapid succession during the same exhalation, and means for changing the course of the periodically alternating expiration pressure thus obtained, said changing means comprising the changing of the element and weight of the element and thus the force exhaled against.

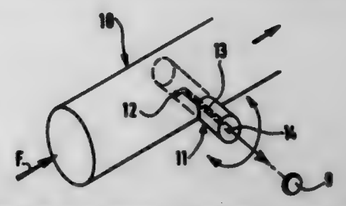
5,193,530
UNDERWATER BREATHING APPARATUS
Rustem I. Gamow, Boulder, Colo.; John L. Stevens, Sacramento, Calif., and Malcolm B. Obstfeld, Fort Collins, Colo., assignors to Undersea Technology, Inc., Fort Collins, Colo.
Continuation-in-part of Ser. No. 452,129, Dec. 15, 1989, abandoned. This application Dec. 7, 1990, Ser. No. 624,141
Int. Cl.[5] B63C *11/02*
U.S. Cl. 128—201.27 20 Claims



1. An underwater breathing apparatus for supplying air to a submerged diver, comprising:
a) a first reservoir bag at or above the surface of the water having an inlet and an outlet capable of maintaining a plurality of gauge pressures from about 1.7 psi up to about 6 psi;
b) a floatable variable-pressure second reservoir bag having an inlet and an outlet, said floatable variable-pressure reservoir bag connected by means of an air hose to said first reservoir bag whereby pressure is supplied to said second bag from said first reservoir bag;
c) breathing means worn by said diver for receiving air from said reservoir bag;
d) an air hose for delivering air from said second bag to said diver, said hose being connected at one end to said second bag outlet and at the other end to said diver breathing means;
e) pump means connected to said first reservoir bag inlet via an air hose for delivering air under pressure to said first reservoir bag whereby a gauge pressure between about 1.7 and about 6 psi may be maintained in said first reservoir bag; and
f) means for maintaining the air pressure in said first reservoir bag within a selected range.

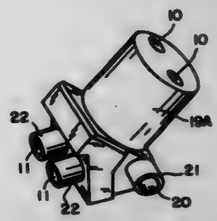
5,193,531
PROCESS AND APPARATUS FOR CONTROLLING A GAS PRESSURE AND SYSTEM FOR SUPPLYING GAS COMPRISING SUCH DEVICE
Richard Zapata, Sassenage, and Jean Arnault, Saint Nazaire les Eymes, both of France, assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Feb. 4, 1992, Ser. No. 830,880
Claims priority, application France, Feb. 14, 1991, 91 01737
Int. Cl.[5] A61M *16/00*; G01L *7/00*
U.S. Cl. 128—204.21 12 Claims

1. A device for controlling the pressure of a gas supplied to a user station from a source of gas via a gas supply line, comprising a control valve in the gas supply line connected to a control circuit means receiving signals from at least one pressure sensing orifice opening into the gas supply line downstream of the control valve, said pressure sensing orifice being formed in a pressure probe extending into a tubular line section



of the gas supply line having an axis, and means for adjusting the orientation of the pressure probe relative to the axis.

5,193,532
DEVICE FOR GENERATING BY MEANS OF EJECTOR ACTION A CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) DURING SPONTANEOUS BREATHING
Conny P. G. Mos, Stenåldersvägen 22, S-831 61 Östersund, and Kjell O. Nilsson, Bangårdsgatan 71, S-831 45 Östersund, both of Sweden
PCT No. PCT/SE89/00715, § 371 Date Jul. 23, 1991, § 102(e) Date Jul. 23, 1991, PCT Pub. No. WO90/06149, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 6, 1989, Ser. No. 687,923
Claims priority, application Sweden, Dec. 6, 1988, 8804404
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—204.25 2 Claims

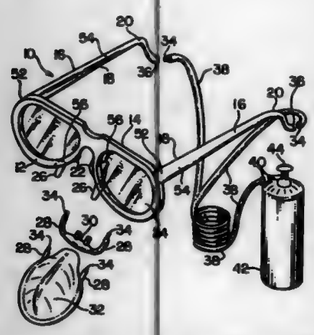


1. A device for generating by means of ejector action a continuous positive airway pressure (CPAP) comprising a breathing-channel which at one end opens into the atmosphere and at another end is adapted to be provided with an attachment device to the nose and/or mouth of the patient, and an inlet channel which is connected with the breathing-channel at a point between its ends for fresh gas, the flow of which may be adjusted to obtain an adjustable positive pressure within the breathing-channel, wherein the breathing channel (10) comprises a first branch-channel (11) which is connectable to the attachment device and a second branch-channel (12) which opens into the atmosphere, the two branch-channels together forming an acute angle (A) of 30°–50° with each other, the inlet channel (13) being situated substantially in the extension of the first branch-channel (11) and being connected to the second branch-channel (12) in such a manner that the stream of fresh gas is directed mainly co-axially into the first branch-channel, producing an ejector action, and the cross-sectional area of the respective branch-channel being several times greater than the smallest cross-sectional area of the inlet channel, the inlet channel (13) opening into said breathing channel (10) flush with the side walls of said breathing channel (10).

5,193,533
HIGH-PRESSURE JET VENTILATION CATHETER
Simon C. Body, Roxbury, and Stanley LeeSon, Newton, both of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.
Filed Jul. 9, 1990, Ser. No. 549,308
Int. Cl.[5] A61M *16/00, 29/00*
U.S. Cl. 128—207.14 10 Claims

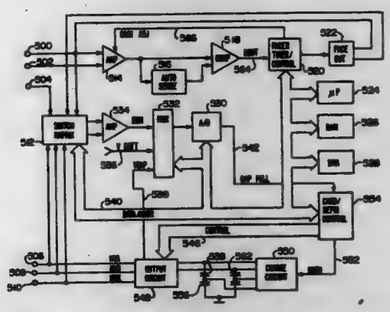
1. A ventilation system comprising:
(a) a hollow, flexible catheter having a distal end and a proximal end;
(b) a hollow, flexible stylette slidably disposed in said catheter;
(c) a plurality of retractable, flexible flanges integrally formed at the distal end of said catheter, said flanges being biased outwardly in their natural state and terminating at a distal tip formed at the extreme distal end of said catheter, said tip having an orifice large enough to allow a wire guide to pass through said tip but small enough to prevent said stylette from penetrating through the tip as the stylette is extended towards the distal end of the catheter along the axis of said catheter;
(d) a gas source capable of delivering gas of sufficiently high pressure for ventilation; and
(e) means for connecting the proximal end of said catheter to said gas source.

5,193,534
RESPIRATORY AID GLASSES
James H. Peppler, 13653 West Park Dr., Magalia, Calif. 95954
Filed Apr. 12, 1991, Ser. No. 684,292
Int. Cl.[5] A61M *15/08, 16/00*; A62B *7/00*
U.S. Cl. 128—207.18 3 Claims



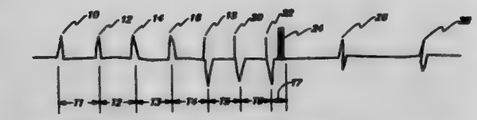
1. An oxygen delivery system comprising a delivery frame, means for delivering oxygen via the delivery frame such that oxygen tubing is not visible within said delivery frame, an oxygen source, oxygen tubing, connection means between said oxygen tubing and said delivery frame, means connecting said delivery frame to the nose of a wearer, wherein said delivery frame comprises two temple pieces each having an end, each temple end having a connector for connection with said means for connecting said oxygen tubing and said delivery frame, each temple piece completely enclosing a respective delivery conduit, said temple pieces each connected to a respective lense frame, each said lense frame enclosing a lense, a hollow passageway extending through each said lense frame completely around each lense, each delivery conduit extending through and completely enclosed by each of said respective lense frames and each said hollow passageway; said delivery frame further comprising a hollow nose bridge, two nose pads, and two oxygen supply members one adjacent each nose pad and in communication with each said lense frame hollow passageway via said hollow nose bridge, wherein said oxygen delivery conduits are completely enclosed within said delivery frame, and said oxygen supply members each being detachably connectable to a respective connection member on a nose piece delivery means.

5,193,535
METHOD AND APPARATUS FOR DISCRIMINATION OF VENTRICULAR TACHYCARDIA FROM VENTRICULAR FIBRILLATION AND FOR TREATMENT THEREOF
Gust H. Bardy, Seattle, Wash.; Walter H. Olson, North Oaks, Minn.; David K. Peterson, Mounds View, Minn., and Robert T. Taepke, Fridley, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Aug. 27, 1991, Ser. No. 750,679
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D 31 Claims



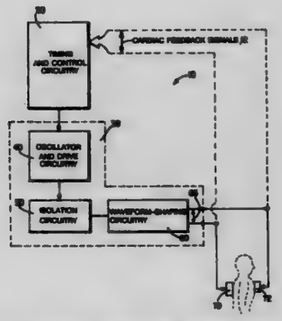
8. A cardioverter/defibrillator, comprising: treatment means for delivering a first therapy to a patient's heart to treat tachycardia and a second therapy to said patient's heart to treat fibrillation;
first means for sensing electrical signals from said patient's heart indicative of the depolarization of a chamber or chambers of said patient's heart and for issuing a first fiducial point signal indicative thereof, said first sensing means comprising a first electrode pair;
second means for sensing electrical signals from said patient's heart indicative of the depolarization of said chamber or chambers of said patient's heart and for issuing a second fiducial point signal indicative thereof, said second sensing means comprising a second electrode pair including at least one electrode not included in said first electrode pair;
tachycardia/fibrillation discriminator means responsive to said first and second fiducal point signals for cumulatively measuring the depolarization to depolarization variability of the direction of depolarization wavefront propagation within said chamber or chambers of said patient's heart over a series of depolarizations of said patient's heart and for selecting between said first and second therapies as a function of said measured variability.

5,193,536
PACED CARDIOVERSION
Rahul Mehra, Stillwater, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Dec. 20, 1990, Ser. No. 630,658
Int. Cl.[5] A61N *1/39*
U.S. Cl. 128—419 D 26 Claims



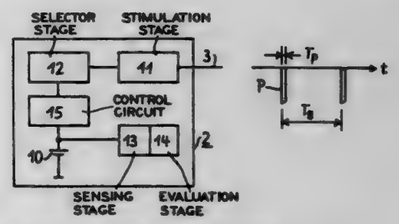
22. A cardioverter/pacemaker, comprising:
means for detecting an occurrence of a series of depolarizations of said chamber of the heart indicative of tachyarrhythmia;
means responsive to said detecting means for measuring the rate of said series of depolarizations;
means for generating a cardioversion pulse in response to the detection of said series of depolarizations, comprising means for generating a series of pacing pulses following said series of depolarizations for application to said chamber of the heart to trigger depolarizations of said chamber of the heart at a rate higher than the rate of said series of depolarizations and for generating a cardioversion pulse synchronized to the last of said series of pacing pulses.

5,193,537
METHOD AND APPARATUS FOR TRANSCUTANEOUS ELECTRICAL CARDIAC PACING
Gary A. Freeman, Newton Center, Mass., assignor to ZMD Corporation, Wilmington, Del.
Filed Jun. 12, 1990, Ser. No. 536,968
Int. Cl.[5] A61N *1/362*
U.S. Cl. 128—419 PG 30 Claims



1. Apparatus for transcutaneously pacing a heart at a pacing rate, the apparatus comprising
stimuli generating circuitry for generating electrical stimuli at an output, and
electrodes connected to the output of the stimuli generating circuitry and adapted for delivering the electrical stimuli to a patient's chest,
wherein said electrical stimuli include pacing stimuli delivered at the pacing rate, each pacing stimulus comprising a series of individual pulses,
wherein each series of pulses has a duration and amplitude making it capable, as a group, of causing a contraction of the heart, but each individual pulse has a duration and amplitude making it incapable, by itself, of causing such a contraction.

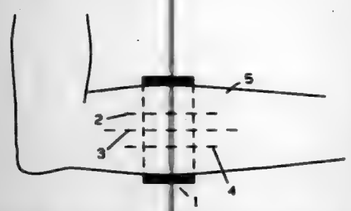
5,193,538
IN VIVO IMPLANTABLE MEDICAL DEVICE WITH BATTERY MONITORING CIRCUITRY
Christer Ekwall, Spånga, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
PCT No. PCT/FP90/00239, § 371 Date Jan. 9, 1992, § 102(e) Date Jan. 9, 1992, PCT Pub. No. WO90/09208, PCT Pub. Date Aug. 23, 1990
PCT Filed Feb. 14, 1990, Ser. No. 743,391
Claims priority, application Sweden, Feb. 14, 1989, 8900490-7; Feb. 14, 1989, 8900491-5; Feb. 14, 1989, 8900492-3; Feb. 14, 1989, 8900493-1
Int. Cl.[5] A61N *1/378*
U.S. Cl. 128—419 PT 13 Claims



1. An electromedical device comprising:
stimulation means, adapted for in vivo implantation in a patient for stimulating a physiological function in said patient,
mode selector means, connected to said stimulation means, for selecting one mode of stimulating said physiological function from a plurality of available stimulation modes;
memory means connected to said mode selector means for recording the number of times each stimulation mode is selected;
a battery connected by supplying power to said stimulation means and to said mode selector means, each of sid available stimulation modes having an energy consumption from said battery associated therewith;
sensing means connected to said battery for measuring an instantaneous battery capacity;
evaluation means, connected to said sensing meas, for determining whether said instantaneous battery capacity, as measured by said sensing meas, is above or below a predetermined first threshold value selected to insure standard operation of said stimulation means within a predetermined time interval during which said battery capacity shall exceed a second threshold value, said second threshold value being lower than said first threshold value; and
means for varying said first threshold value, dependent on which of said stimulation modes is currently selected, based on the energy consumption and number of times selected of the currently selected stimulation mode, by setting a higher first threshold value for a currently selected stimulation mode having a higher energy consumption and a higher number of times selected and setting a lower threshold value for a currently selected stimulation mode having a lower energy consumption and a lower number of times selected.

5,193,539
IMPLANTABLE MICROSTIMULATOR
Joseph H. Schulman, Santa Clarita, Calif.; Gerald E. Loeb, Kingston, Canada; John C. Gord, Venice, Calif., and Primoz Strojnik, Granada Hills, Calif., assignors to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.
Filed Dec. 18, 1991, Ser. No. 812,136
Int. Cl.[5] A01N *1/36*
U.S. Cl. 128—419 R 40 Claims
1. An implantable microstimulator substantially encapsu-

lated within a hermetically-sealed housing which is inert to body fluids, the improvement comprising said microstimulator being of a size and shape capable of implantation by expulsion through a hypodermic needle, said microstimulator having therein a coil adapted to function as the secondary winding of a transformer, said coil adapted to be disposed in a modulated, alternating magnetic field, at least two exposed electrodes for providing electrical stimulation, electronic control means, capacitor means for storing power for said electrical stimula-



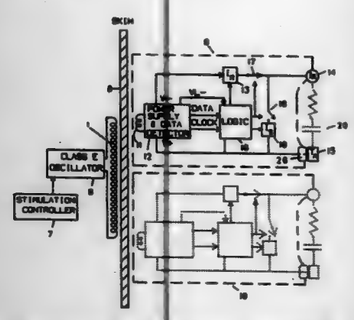
tion, and for said electronic control means, means for controllably charging said capacitor means from said alternating magnetic field, said electronic control means controlling discharge of said capacitor means to provide electrical stimulation through said exposed electrodes and the electric path provided by the body and said electronic control means further providing control of one or more of the duration, the current and the shape of said stimulus pulses in accordance with the modulation of said alternating magnetic field.

5,193,540

STRUCTURE AND METHOD OF MANUFACTURE OF AN IMPLANTABLE MICROSTIMULATOR

Joseph H. Schulman, Santa Clarita, Calif.; Gerald E. Loeb, Kingston, Canada; John C. Gord, Venice, and Primoz Strojnik, Sylmar, all of Calif., assignors to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.

Filed Dec. 18, 1991, Ser. No. 812,051
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 R **45 Claims**



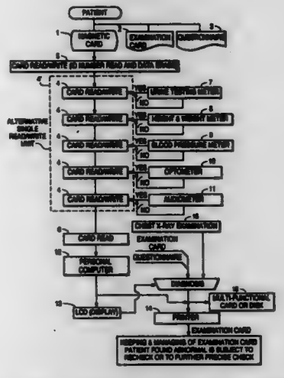
1. An implantable microstimulator substantially encapsulated within a hermetically-sealed housing which is inert to body fluids, said microstimulator being of a size approximately 2 mm in diameter and 10 mm in length and of longitudinal shape capable of implantation in the immediate vicinity of selected areas of the body by expulsion through a hypodermic needle, a first inert, metallic electrode hermetically sealed to said housing at or near one end thereof and a second inert, metallic electrode hermetically sealed to said housing at or near another end thereof, and a substantial portion of said electrodes being exposed outside said microstimulator so as to provide stimulation pulses, a coil having a multiplicity of turns of a fine, electrically-conductive wire adapted to act as the secondary of a transformer and receive a modulated, alternating magnetic field, said alternating magnetic field providing power for said microstimulator and said modulation providing control information for said microstimulator, capacitor means for storing power received from said magnetic field, electronic circuitry, means for electrically connecting said electronic circuitry in circuit with said coil, said capacitor means and said electrodes.

5,193,541

HEALTH EXAMINATION METHOD AND SYSTEM USING PLURAL SELF-TEST STATIONS AND A MAGNETIC CARD

Ryotaro Hatsuwi, 7, Nanasegawa-cho, Takeda, Fushimi-ku, Kyoto-shi, Japan

Filed Nov. 28, 1990, Ser. No. 618,508
Claims priority, application Japan, Dec. 5, 1989, 1-317040
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—630 **14 Claims**



1. A method of conducting and recording a health examination of a patient using a minimal number of staff members, comprising:

a step of issuing the patient a magnetic card and a questionnaire and having the patient complete the questionnaire;

a step of testing the patent by having the patient conduct a plurality of health related self-test measurements at respective automated test stations, wherein at each automated test station the patient conducts the corresponding self-test measurement without the aid of a staff member;

a step of recording data results of the plurality of self-test measurements on the magnetic card;

a step of reading the data results of the plurality of self-test measurements from the magnetic card;

a step of conducting a diagnosis of the patient based on the data results of the plurality of self-test measurements and information contained in the questionnaire which has been completed by the patient; and,

a step of creating a permanent record of the diagnosis and the data results of the plurality of self-test measurements.

5,193,542

PERIPARTUM OXIMETRIC MONITORING APPARATUS

John S. Missanelli, and Mearl Naposic, both of 8851 Center Dr., Ste. 301, La Mesa, Calif. 92042

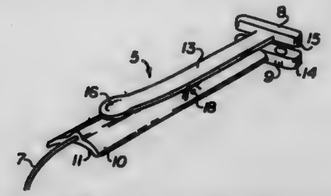
Continuation of Ser. No. 646,422, Jan. 28, 1991, abandoned. This application Mar. 25, 1992, Ser. No. 856,999
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—633 **2 Claims**

1. In combination with a blood oxygenation measurement

apparatus, a vaginal probe for attachment to a fetus in utero, said probe comprising:

a pair of resiliently openable, interfacing jaws, a first of said jaws having at least one light emitter and a second of said jaws having at least one light detector in line with said light emitter,

an elongated handle having an undersurface arcuate to an



axis substantially parallel to and spaced apart from the largest dimension of said handle sized and shaped to rest against the surface of an attending person's finger, said handle extending from one of said jaws,

an elongated lever extending from the other of said jaws parallely to said handle and having a fulcrum point on an upper surface portion of said handle; and

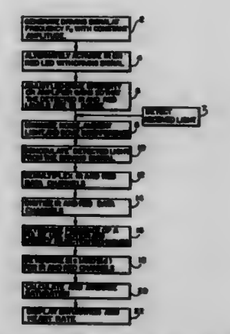
a resilient means for baising the jaws towards each other.

5,193,543

METHOD AND APPARATUS FOR MEASURING ARTERIAL BLOOD CONSTITUENTS

Mark Yelderman, Plano, Tex., assignor to Critikon, Inc., Tampa, Fla.

Continuation of Ser. No. 510,301, Apr. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 940,860, Dec. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 946,492, Dec. 24, 1986, abandoned. This application Apr. 6, 1992, Ser. No. 865,774
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—633 **43 Claims**



1. A device for non-invasive measurement of arterial blood constitutes for use in an environment generally illuminated by artificial light, comprising:

driver means for generating a driving signal at a driving signal frequency not substantially present in said artificial light;

light source means responsive to said driving signal for transmitting light, having respective predetermined wavelengths, at said driving signal frequency through a body tissue of a patient so as to detect said arterial blood constituents;

selecting means for selectively activating said light source means for predetermined time periods at each of said respective predetermined wavelengths, said predetermined time periods being defined by at least two successive cycles of said driving signal;

means for applying said driving signal to said light source means during said predetermined time periods so as to cause said light source means to transmit light having said respective predetermined wavelengths at said driving signal frequency through said body tissue of said patient for said at least two successive cycles of said driving signal;

detecting means for detecting at least said light transmitted through said body tissue of said patient at said driving signal frequency during said predetermined time periods and outputting a detection signal;

demodulating means tuned to a narrow band receiving frequency range including said driving signal frequency for demodulating said detection signal from said driving signal so as to get a demodulated output representing the concentration of said blood constituents detected by light at said respective predetermined wavelengths, said narrow band receiving frequency range excluding frequencies substantially present in said artificial light; and

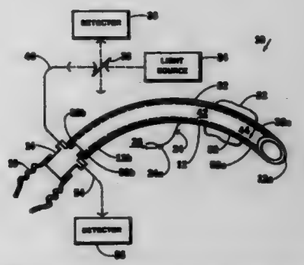
processing means for producing an output proportional to the concentration of said arterial blood constituents from said demodulated output.

5,193,544

SYSTEM FOR CONVEYING GASES FROM AND TO A SUBJECT'S TRACHEA AND FOR MEASURING PHYSIOLOGICAL PARAMETERS IN VIVO

Richard A. Jaffe, Palo Alto, Calif., assignor to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jan. 31, 1991, Ser. No. 650,824
Int. Cl.[5] A61B *5/00*; A61M *16/04*
U.S. Cl. 128—634 **15 Claims**



1. An apparatus for conveying gases from and to a subject's trachea and for enabling the measurement of a physiological parameter in vivo or the measurement of respired gas concentrations, comprising:

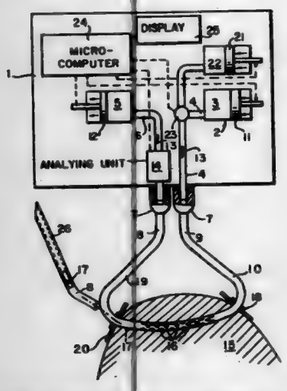
a tube suitable for insertion into the trachea and for conveying gases;

at least one light source;

at least one light detector; and

means for conveying light from the light source to the trachea or locations within the trachea and for conveying light to the light detector from the trachea or locations within the trachea, said light conveying means including at least one optical path having two ends along the tube for passage of light signals between the trachea or locations within the trachea at one end of the path, and the detector at the other end, the at least one optical path transmitting light from the trachea or locations within the trachea along the tube to the detector for enabling the measurement of the physiological parameter or the measurement of respired gas concentrations of the subject.

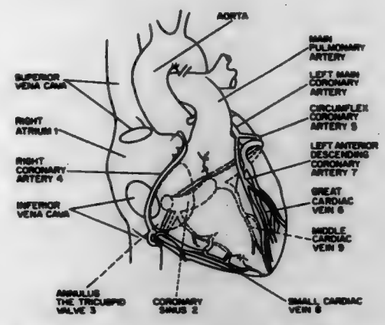
5,193,545
DEVICE FOR DETERMINING AT LEAST ONE MEDICAL VARIABLE
Hermann Marsoner, Steinberg; Falko Skrabal, and Helmut List, both of Graz, all of Austria, assignors to AVL Medical Instruments AG, Schaffhausen, Switzerland
Filed Feb. 7, 1990, Ser. No. 476,360
Claims priority, application Austria, Feb. 8, 1989, 271/89
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—635 **9 Claims**



1. A device for determining the concentration of at least one substance in organic tissue, comprising:
a flexible plastic cannula, for insertion into said organic tissue, said cannula having an exchange channel with perforations, a feeder end having a feeder end connection and a drainage end having a drainage end connection;
a delivery unit having a feeder tube comprising a connection which mates with the feeder end connection, said delivery unit providing a perfusion fluid which travels through said feeder end and into said exchange channel;
an analyzing unit having a drainage tube which comprises a connection mating with said drainage end connection; and
an evaluation unit connected to said delivery unit and said analyzing unit,
said plastic cannula having a puncturing needle connected to one of said feeder end and said drainage end.

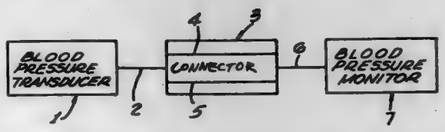
5,193,546
CORONARY INTRAVASCULAR ULTRASOUND IMAGING METHOD AND APPARATUS
Alexander Shaknovich, 510 E. 85th St., New York, N.Y. 10028
Filed May 15, 1991, Ser. No. 700,625
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **9 Claims**

1. A periarterial method of imaging a human artery comprising:
introducing means for imaging into a venous system of a human subject to be imaged;
guiding said means for imaging through said venous system to points in said venous system adjacent to an artery of said subject;



imaging said artery with said means for imaging from said adjacent points in said venous system.

5,193,547
UNIVERSAL CONNECTOR MEANS FOR TRANSDUCER/MONITOR SYSTEMS
George D. Evans, II, 9625 Wichita Dr., Arlington, Calif. 92503; Jacob J. Norman, 14331 Riverton Cir., Westminster, Calif. 92683, and H. Don Phillips, 1329 Crofton Ct., Upland, Calif. 91781
Continuation of Ser. No. 830,546, Feb. 18, 1986, abandoned, which is a continuation of Ser. No. 629,892, Jul. 16, 1984, abandoned. This application Dec. 22, 1986, Ser. No. 945,381
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—668 **6 Claims**

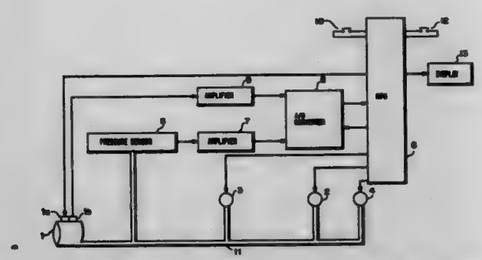


1. A system for use in environment having electromagnetic interference to monitor blood pressure in living tissue, comprising:
a transducer for converting a blood pressure into an electrical signal, said transducer exhibiting an electrical output impedance;
electrical signal monitoring means having an input electrical impedance different form said electrical output impedance; and
electrical amplifying means having an input connected to the transducer and an output connected to the monitoring means, said input of said amplifying means having an impedance acceptability range including the electrical output impedance of the transducer and said output of said amplifying means having an output impedance compatible with the input impedance of the monitoring means.

5,193,548
ELECTRONIC BLOOD PRESSURE METER
Yoshinori Miyawaki, Otsu, Japan, assignor to Omron Corporation, Kyoto, Japan
Filed Nov. 8, 1990, Ser. No. 610,208
Claims priority, application Japan, Nov. 8, 1989, 1-290654
Int. Cl.[5] A61B *5/022*
U.S. Cl. 128—680 **4 Claims**

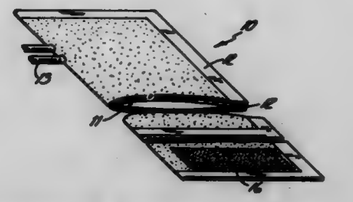
1. A blood pressure monitor, comprising:
a cuff;
pressurization means for pressurizing the cuff;

depressurization means for depressurizing the cuff;
pressure detection means for detecting pressure in the cuff over time and producing an output indicative of the pressure in the cuff;
pulse wave detection means for detecting pulse waves and for producing pulse wave data during the depressurization of the cuff;
flat portion detection means for detecting from the pulse wave data presence or disappearance of a flat portion in the pulse wave, wherein said flat portion detection means comprises:
differentiating means for differentiating the pulse wave



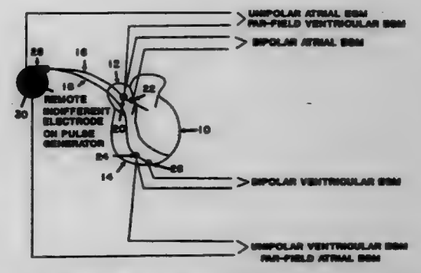
data to produce a differentiated pulse wave, time measurement means for measuring successive durations of time during which the differentiated pulse wave is between predetermined threshold values, and
flat portion disappearance detecting means for detecting a moment of disappearance of the flat portion by determining a moment at which said successive durations of time become less than a predetermined amount; and
diastolic blood pressure value determining means for determining a diastolic blood pressure value by obtaining the output of the pressure detection means at the moment of disappearance of the flat portion in the pulse wave.

5,193,549
INFLATABLE CUFF
Matthew Bellin, Burnsville; Susan Brunsvold, Minneapolis, and John Moberg, Plymouth, all of Minn., assignors to Biomedical Dynamics Corporation, Minneapolis, Minn.
Filed Jul. 11, 1990, Ser. No. 551,527
Int. Cl.[5] A61B *5/022, 17/12;* A61F *5/30*
U.S. Cl. 128—686 **14 Claims**



1. An inflatable cuff comprising:
an inner compartment being defined by an air-impermeable film and being closed except for an opening through which air may be caused to enter and exit the compartment;
an outer compartment being entirely defined by a loop fabric potion of a hook and loop fabric fastener, the loop fabric portion being a soft surface fabric for contacting a human body portion, and completely enclosing and containing the inner compartment to limit an amount of expansion of the inner compartment when the inner compartment is inflated; and
fastening means being defined by a hook fabric portion of the hook and loop fabric fastener, the hook fabric portion being mounted on the outer compartment and being selectively engageable to the loop fabric portion for fastening the cuff about a human body portion.

5,193,550
METHOD AND APPARATUS FOR DISCRIMINATING AMONG NORMAL AND PATHOLOGICAL TACHYARRHYTHMIAS
Edwin G. Duffin, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Nov. 30, 1990, Ser. No. 621,133
Int. Cl.[5] A61B *5/0464*
U.S. Cl. 128—697 **42 Claims**



1. A method for discriminating among various normal and pathologic tachycardias of the human heart and for providing an appropriate response thereto comprising the steps of:
sensing the near-field atrial P-wave electrograms from a first pair of electrodes situated in relation to the patient's atrium;
sensing the near-field ventricular R-wave electrograms from a second pair of electrodes situated in relation to the patient's ventricle;
measuring the atrial and ventricular cycle lengths of the patient's cardiac rhythm from the near-field atrial and ventricular electrocardiograms;
determining the existence of an atrial and ventricular tachycardia from said atrial and ventricular cycle lengths;
providing an indifferent electrode remotely spaced from said patient's heart;
sensing the far-field ventricular electrogram from one electrode of said atrial electrode pair and said indifferent electrode;
sensing the far-field atrial electrogram from one electrode of ventricular electrode pair and said indifferent electrode; and
examining the characteristics of the far-field atrial and ventricular electrograms of a series of one or more such electrograms to determine if they reflect a specific normal sinus tachycardia or a pathologic arrhythmia.

5,193,551
PHANTOM ASSEMBLY TO VERIFY ACCURACY OF A CARBON MONOXIDE DIFFUSING CAPACITY MEASURING DEVICE
Mark Pilipski, 45 Howard Ave., Passaic Park, N.J. 07055
Filed Jul. 27, 1990, Ser. No. 560,851
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—716 **9 Claims**

1. A phantom assembly adapted to simulate a human subject to verify the accuracy of a carbon monoxide diffusing capacity measuring device to test the functional capacity of the subject's alveolar-capillary membrane, said device including a mouth-

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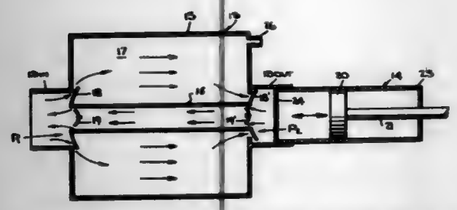
piece through which the subject inhales a mixture of carbon monoxide and an inert gas in a predetermined ratio, the subject after a breath holding interval exhaling into the mouthpiece an alveolar sample whose carbon monoxide content is analyzed, said assembly comprising:

(a) a phantom provided with a chamber having respective ports at opposing ends thereof, and a flow tube disposed within the chamber and extending between the ports, the tube being surrounded by a cavity having a predetermined volume of said inert gas injected therein;

(b) a calibration syringe having a negative pressure mode in which the pressure causes a gas to fill the syringe and a



positive pressure mode in which the pressure expels the gas, and

(c) means for coupling one of said ports to said device, and the other of said ports to said syringe whereby when said syringe is operated in the negative pressure mode, said tube is blocked and said gas mixture is drawn into said cavity and said syringe to intermingle with said inert gas to alter its ratio to a known degree to produce a test sample, and when said syringe is operated in the positive pressure mode, said cavity is then blocked and said test sample is forced through said tube into said device which will then yield a reading that deviates from a calculable and predictable value only if the device is malfunctioning.

5,193,552

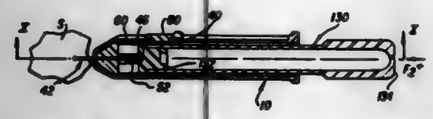
NEEDLE DEVICE FOR SAFELY COLLECTING BLOOD OR INJECTING DRUGS

Richard L. Columbus, Rochester; Johannes J. Porte, Webster, and Harvey J. Palmer, Lima, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 481,838, Feb. 20, 1990, Pat. No. 5,070,884, which is a continuation-in-part of Ser. No. 323,459, Mar. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 325,725, Mar. 20, 1989, Pat. No. 5,007,892, which is a continuation-in-part of Ser. No. 442,826, Nov. 29, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,107

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—760 **23 Claims**



1. A needle device for safely collecting blood or injecting drugs, said device comprising

a needle and a housing for said needle, said housing including an aperture at one end;

means slidably disposed within said housing for mounting said needle, said mounting means being shaped at one end to releasably mate with a container constructed to collect or deliver a liquid, said needle being capable of penetrating a mated container when sufficient force is applied,

means for releasably locking said mounting means in said housing in a least two positions, one of said positions being a withdrawn position locating said needle so as to be withdrawn into and surrounded by said housing prior to use, and the other position being an extended position in which said needle extends and projects through said aperture,

permanent locking means for locking said needle and said mounting means permanently against further movement in said housing when said mounting means is moved from said extended position to a third locked position beyond said withdrawn position,

means defining a slot in the side of said housing, and a button mounted in said housing slot for manual engagement by an operator,

means on said button for engaging said mounting means when said button is moved rearwardly towards said third locked position, said button being free of means for engaging said mounting means when said button is moved towards said extended position,

whereby said needle and said mounting means can be withdrawn into said housing by moving said button rearwardly,

and further including either a blood collection container or a drug-injecting container preloaded with a drug, said either container being releasably engagable with one of said needle ends within said mounting means and within said housing, said releasable locking means in said withdrawn position being effective to release said mounting means and said needle only as a result of a contact force between said needle and either of said containers that is insufficient to cause said needle to penetrate either of said containers.

5,193,553

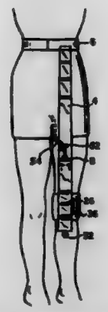
MEDICAL DRAINAGE BAG CARRIER

Victoria Kalinoski, 1389 Bluebell Way, El Cajon, Calif. 92021

Filed Apr. 22, 1991, Ser. No. 688,308

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—767 **20 Claims**



1. A carrier attached to a wearer for supporting drainage bag to collect body fluids from a catheter comprising:

a flattened fabric envelope having a top, a bottom, and two planar sides, a flat inner side for contacting said wearer's leg and a second outer side for facing outwardly from said wearer's leg, said bottom being substantially closed, said envelope being of a size to receive and retain therein a drainage bag;

a slot of appropriate size and shape in said outer side of said envelope through which said drainage bag can be inserted and removed;

a fastening means for supporting said drainage bag vertically within said envelope;

a releasable strap slightly above said slot for securing said catheter to said outer side of said envelope;

a releasable waistband from which said top of said envelope is suspended by a plurality attachment means;

a substantially wide support sleeve releasably attached to said inner side of said envelope, said support sleeve encircling said wearer's leg to hold said inner side of said envelope containing said drainage bag firmly against said wearer's leg.

5,193,554

STERILIZATION DEVICES

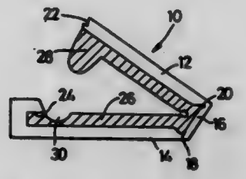
Peter H. McQuillkin, Kimberley, England, assignor to Femcare Limited, Nottingham, United Kingdom

Filed May 13, 1991, Ser. No. 699,482

Claims priority, application United Kingdom, May 12, 1990, 9010696

Int. Cl.[5] A61B *17/12*

U.S. Cl. 128—831 **3 Claims**



1. A sexual sterilisation clip having a lower jaw member and an upper jaw member hingedly connected at one end to the lower jaw member, both jaw members being of plastics material, the upper and lower jaw members being provided, at an opposite end thereof in relation to the hinge, with co-operating latch means to secure the clip in a closed position, the clip being provided in an open position with projection means to provide initial capture of a fallopian tube or vas deferens in which both the upper and lower jaw members are provided with a rubber lining, in which the rubber lining of the upper jaw is shaped to provide a bulge at the latch means end of the upper jaw, said bulge being formed by an area of increased thickness in the rubber lining of the upper jaw and projecting towards the bottom jaw and in which the rubber lining of the lower jaw is provided with a recessed area of reduced thickness at the latch means end of the lower jaw which is aligned with the bulge and co-operates therewith as the clip is closed to provide an area of initial contact between the lining of the upper jaw and the lining of the lower jaw without significantly increasing the compression forces required to close the clip.

5,193,555

BARRIER DEVICE

Margaret P. Richardson, and Philip Richardson, both of The Bungalow, Pilwriwyd Lane, Carmarthen, United Kingdom

PCT No. PCT/GB89/00726, § 371 Date Feb. 28, 1991, § 102(e) Date Feb. 28, 1991, PCT Pub. No. WO90/00038, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 29, 1989, Ser. No. 640,371

Claims priority, application United Kingdom, Jun. 29, 1988, 8815457; Jun. 29, 1988, 8815460; Nov. 21, 1988, 8827080

Int. Cl.[5] A61F *6/06*

U.S. Cl. 128—842 **17 Claims**

1. A barrier device comprising a continuous liquid-impermeable, flexible pouch having an open end and a closed end such that said pouch can form a liquid barrier membrane having a penis-contacting surface and vagina-contacting surface, and a soft resilient insert arranged for insertion in said pouch between the tip of the penis and said closed end, said insert comprising a generally central portion forming spacing member between the tip of the penis and said closed end and, radially spaced from said central portion, means for biasing said pouch in the vicinity of said closed end into contact with the walls of the vagina.

5,193,556

METHOD OF AND APPARATUS FOR BREAKING UP BALES OF CONDENSED TOBACCO

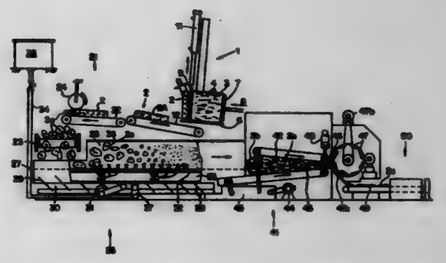
Manfred Lasch, Hamburg, and Reinhard Liebe, Börnsen, both of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 733,107

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1990, 4024009

Int. Cl.[5] A24B *7/12*

U.S. Cl. 131—322 **32 Claims**



1. A method of separating particles of relatively dry tobacco which are condensed into a bale having a plurality of substantially parallel layers of particles, comprising the steps of subdividing the bale into slabs including severing the bale substantially transversely of the layers; mechanically breaking up the slabs into fragments of coherent tobacco particles; heating and moisturizing the fragments; and transporting the fragments on a vibratory conveyor in the course of at least one of said heating and moisturizing steps to thereby separate the tobacco particles of the fragments from each other.

5,193,557

HAIR TREATMENT APPLIANCE

Gary L. Hogan, Rte. 2, Box 215A, Leesville, S.C. 29070

Filed Dec. 16, 1991, Ser. No. 808,433

Int. Cl.[5] A45D *24/22*

U.S. Cl. 132—112 **6 Claims**

1. A hair treatment appliance comprising:

an elongated body having a hollow chamber, said elongated body having a proximal and distal end, said body having a pair of oppositely positioned openings near said proximal end;

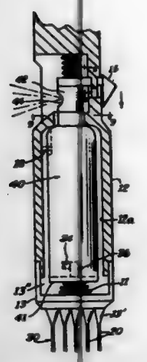
trigger means moving along said body, a portion of said trigger means extending outwardly through a first of said pair of openings in said body;

a closure cap securable at said distal end of said body;

an aerosol container receivable in said chamber, said container having a dispensing valve engageable with said trigger means, said valve being directed towards a second of said pair of openings in said body to expel an aerosol spray through said second opening when said trigger means is depressed;

means for securing said trigger means within said first of said

pair of openings in said body and for preventing said trigger means from pivoting when said trigger means is depressed;



means for preventing said valve from turning when said trigger means is depressed; and

comb means removably secured to said proximal end of said elongated body and extending outwardly therefrom.

5,193,558

SPIRAL ROD DEVICE FOR PERMANENT WAVE HAIRSTYLING

Joseph Squatrito, Staten Island, N.Y., assignor to Hair Odyssey Cushion Wraps, Inc., New York, N.Y.

Filed Jun. 29, 1992, Ser. No. 906,530

Int. Cl.[5] A45D *2/08*

U.S. Cl. 132—250 **14 Claims**

1. A spiral rod device for permanent wave hairstyling comprising:

an elongated rod having a top end and a bottom end, said rod including a top end stop flange disposed adjacent said top end and a bottom end stop flange member disposed adjacent said bottom end, said top end of said spiral rod being provided with an enlarged annular expansion bead, said rod having a plurality of spaced apart through slots disposed along the length of said rod intermediate said top end stop flange member and said bottom end stop flange member, said open slots extending through the cross-section of said rod;

an elongated top end cap having an open end and an opposed end wall, said end wall including a central hole therein, said top end cap being provided with an annular expansion groove in said inner diameter thereof and adapted for snap-fit interengagement with said annular expansion bead of said top end of said spiral rod, said top end cap further includes a stem connected to end wall and extending longitudinally of and within said top end cap, said top end cap being slidably receivable onto the top end of said spiral rod; and

an elongated bottom end cap including an open end and an opposed end wall, said end wall including a central hole therein, said bottom end cap further including a stem connected to said end wall and extending longitudinally of and within said bottom end cap, said bottom end cap being connectable to said bottom end of said spiral rod whereby strands of hair helically wound about the rod may be maintained in place by inserting a rubber band through said central hole on said top end cap and extending the rubber band about said stem of said top end cap, while the opposed length of said rubber band is inserted through said central hole of said bottom cap end and secured around said stem on said bottom end cap, and wherein when said top end cap is detachably engaged with said top end of said spiral rod and said bottom end cap is detachably engaged with said bottom end of said spiral rod, thereafter said rubber band extends along the longitudinal axis of said spiral rod and maintains the hair in place on the spiral rod device.

5,193,559

DENTAL CLEANING INSTRUMENT

Kiyoshi Maekawa, 1480 Greenbriar Dr., Mount Prospect, Ill. 60056, and Timothy D. Ladd, 219 Rose Arbor La., Matthews, N.C. 28105

Filed May 1, 1992, Ser. No. 877,694

Int. Cl.[5] A61C *15/00*

U.S. Cl. 132—321 **19 Claims**

1. A dental cleaning instrument for cleaning or flossing the interproximal area between closely spaced teeth comprising:

a first thread of predetermined length;

a second thread extending parallel to said first thread of the same predetermined length;

and a third thread interlaced around and between said first and second threads in a figure-8 pattern, said third thread interlaced along the entire length of said first and second threads to form a unitary construction of all three threads, said unitary construction having a denier in the range of 480–1240.

5,193,560

CLEANING SYSTEM USING A SOLVENT

Masato Tanaka, and Tadayoshi Ichikawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Tiyoda Seisakusho, Koushoku, Japan

Division of Ser. No. 412,271, Sep. 25, 1989, Pat. No. 5,051,135. This application Jun. 24, 1991, Ser. No. 719,776

Claims priority, application Japan, Jan. 30, 1989, 1-8302; Jan. 30, 1989, 1-17516; Apr. 20, 1989, 1-98910; Apr. 20, 1989, 1-98911; May 29, 1989, 1-132817

Int. Cl.[5] B08B *3/10, 3/12*

U.S. Cl. 134—56 R **10 Claims**

1. A cleaning system using solvent, comprising:

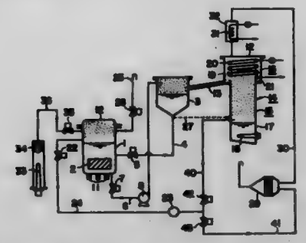
a cleaning tank including a cleaning tank body having an upper open end and a closed bottom, the cleaning tank body being adapted to receive an article to be cleaned, and a closure for sealingly closing the upper open end;

a storage tank for storing a solvent, the storage tank having an upper space filled with vapor of the solvent when the solvent is stored, said upper space being connected to a vapor supplying means for passing vapor of the solvent to the upper space, the vapor supplying means including a heater for heating and supplied vapor;

solvent supplying means connecting the storage tank to the cleaning tank for supplying the solvent from the storage tank to the cleaning tank for cleaning the article;

solvent discharging means for discharging the solvent in liquid state from the cleaning tank;

a solvent distiller, communicating with both the cleaning tank and the storage tank, for distilling the solvent from the cleaning tank and returning the distilled solvent to the storage tank;



a pressure sensor for sensing pressure in the cleaning tank to provide a pressure signal representing the pressure in the cleaning tank; and

a controller for controlling, in response to the pressure signal, the relative rates of the discharge of the liquid solvent and the supply of the solvent vapor for maintaining the pressure in the cleaning tank negative.

5,193,561

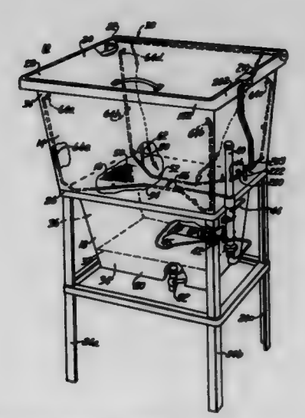
APPARATUS HAVING A FLUID TIMER FOR CLEANING PAINT FROM OBJECTS

Richard A. Robb; Lee S. Garretson, both of West Bloomfield, and Michael J. Grubb, Union Lake, all of Mich., assignors to Herkules Equipment Company, Walled lake, Mich.

Filed Nov. 29, 1990, Ser. No. 619,941

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—57 R **27 Claims**



25. An apparatus comprising:

a work chamber into which may be placed an object to be cleaned, and a cover to enclose the work chamber;

fluid transport means for carrying cleaning agent to the work chamber, including pump means for pressurizing the cleaning agent;

fluid timer means, in communication with the fluid transport means, for interrupting cleaning agent flow after a predetermined interval;

including a safety can remote from the work chamber and a check valve located upstream of the safety can, the pump means operative to develop a suction to draw cleaning agent from the safety can through a pipe connected thereto into the work chamber.

5,193,562

DISHWASHER

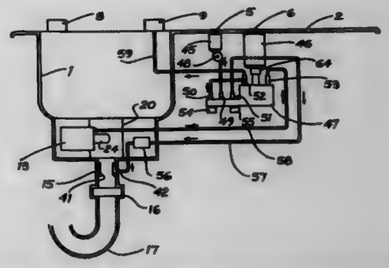
Ralph A. Rigby, East Lindfield; Bryan H. Marshall, Glebe; Peter K. Le Leivre, Dee Why, and Stuart A. Morley, Rydalmere, all of Australia, assignors to McIlwraith-Davey Pty Ltd., Revesby, Australia

Filed Oct. 25, 1990, Ser. No. 604,478

Claims priority, application Australia, Oct. 25, 1989, PJ7058

Int. Cl.[5] B08B *3/04*

U.S. Cl. 134—57 D **25 Claims**



23. A sink mounted dishwasher comprising a sink having a base and side walls, a drain located in said base, a spray arm removably and rotatably mounted in said sink and rotatable by water directed into said spray arm by a pump connected to said drain, wherein a drain closure member is mounted in said drain below the pump connection and is operable between a drain closed configuration in which water in said sink can be circulated by said pump through said spray arm, and a drain open configuration in which water in said sink is drained under gravity through said drain closure member, said dishwasher further comprising an hydraulically operated liquid detergent dispenser, an hydraulically operated drain closure member, and an hydraulic control system therefor, said system comprising a reservoir for liquid rinse aid, a rinse aid pump having an inlet connected to said reservoir and an outlet connected to three solenoid valves, a first one of said solenoid valves communicating said rinse aid to said detergent dispenser to hydraulically control the operation of same, a second one of said solenoid valves communicating said rinse aid to said drain closure member to hydraulically control the operation of same, and the third one of said solenoid valves connecting said rinse aid to said dishwasher to dispense same.

5,193,563

SURGICAL SUITE SCRUB STATION

Victor P. Meloch, Suite 1004, 12141 Jasper Avenue, Edmonton, Alberta, Canada T5N 3X7

Filed Apr. 26, 1991, Ser. No. 691,845

Claims priority, application United Kingdom, Apr. 30, 1990, 9009669

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—100.1 **4 Claims**

1. Hand and forearm cleansing device comprising, in combination:

a) cleansing mixture preparation means;

b) an elongated cleansing compartment for washing and rinsing forearms and hands of a person;

c) cleansing mixture spray means disposed in said cleansing compartment;

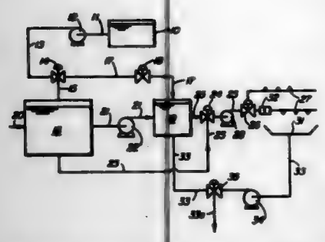
(1) said cleansing mixture preparation means includes a recirculation means which includes:

(A) catch basin means disposed in said cleansing com-

partment and disposed in a hydraulic communication with a recirculation conduit having downstream end connected to a recirculation tank, said recirculation conduit including a recirculation pump for drawing liquid from said catch basin means;

(B) water supply means hydraulically connected with the catch basin means for filling the catch basin with a predetermined volume of water;

(C) antimicrobial substance supply means hydraulically connected with the catch basin means for supplying



to the basin a predetermined volume of an antimicrobial substance;

(D) drain means adapted to selectively hydraulically connect the catch basin means with a drain;

d) conduit means hydraulically communicating said cleansing mixture preparation means with said spray means;

e) height adjustment power means for selectively modifying a vertical distance between said cleansing compartment and the standing ground of the person;

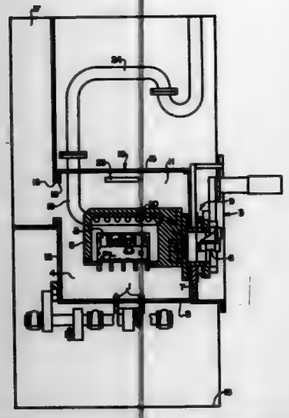
whereby the substance disposed within the basin can be selectively recirculated to or drained from the basin.

5,193,564

DIP WASHING MACHINE FOR MACHINED PARTS

Miguel Agulló-Negui, Barcelona, Spain, assignor to Ingeniería Agullo, S.A., Barcelona, Spain

Filed Sep. 18, 1991, Ser. No. 761,393
Claims priority, application Spain, Sep. 24, 1990, 90002440
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—155 4 Claims



1. A dip-washing machine for washing machined parts while the machined parts are supported on a bed, comprising:

a generally cubical casing having a top wall, a bottom wall, a left end wall, a right end wall, a front wall and a rear wall arranged so as to provide a first subassembly comprising said bottom wall, one of said end walls and a conduit for clean washing liquid having an outlet opening, and so as to provide a second subassembly comprising said top wall and the other of said end walls, said other of said end walls having a clean washing liquid inlet port formed therethrough; each of said front and rear walls being included in a respective one of said subassemblies;

a machine frame;

mounting means stationarily mounting said first subassembly of said casing on said machine frame;

sump means associated with said machine frame for effectively providing a sump under said bottom wall of said casing for catching spent washing liquid draining from said casing;

a support frame for parts to be washed, said support frame being disposed within said casing and including means for removably securely holding said parts which are to be washed;

a rotating shaft means penetrating into said casing through said one end wall and being connected to said support frame within said casing for rotating the parts to be cleaned; said rotating shaft means including housing means for isolating shaft drive mechanisms thereof from washing liquid within said casing;

said bottom wall of said casing having means defining a longitudinally extending opening therethrough; and

transfer bar means effectively supported on said machine frame by support means extending through said longitudinal opening, for movement between a retracted position, and an extended position for moving the parts to be washed stepwise along said support frame for parts to be washed;

said second subassembly being movable between an elevated position in which a portion of said other end wall effectively closes said outlet opening of said washing liquid conduit, and wash water within said casing is free to drain between said first and second subassemblies into said sump and said casing to completely empty of washing liquids into said sump and said transfer bar means are operable to said extended position thereof, and a lowered position in which said outlet opening of said wash water conduit opens through said inlet port of said other end wall into said casing, and said first and second subassemblies tend to confine wash water in said casing so that rotation of said support frame by said rotating shaft means effects dip washing of the parts to be washed.

5,193,565

RIB LINKAGE JOINT

Sheng F. Huang, Taipei, Taiwan, assignor to 'totes', Incorporated, Cincinnati, Ohio

Filed May 14, 1991, Ser. No. 699,751
Claims priority, application China, Jun. 19, 1990, 90209047
Int. Cl.[5] A45B *19/00*
U.S. Cl. 135—25.2 1 Claim

1. An improved rib linkage joint for an umbrella, said joint comprising

an inner rib and an inner linking spoke both hingedly connected to a middle joint, said inner linking spoke having opposed side walls,

a middle rib with one end, said middle joint being fixed to said one of said middle rib, each of said inner rib, inner linking spoke and middle joint having a U-shaped cross section with each said U-shaped cross section defining a slot that faces upward, said inner linking spoke being at least one of seated against and partially seated within said inner rib when said umbrella is opened, to linking spoke being at least one of seated against and partially seated within said inner rib when said umbrella is opened, to enhance wind resistance stability of said rib linkage joint, and

a flexible middle linking spoke having one end connected to a pin fixed between said side walls of said inner linking spoke adjacent said middle joint, said rib linkage joint

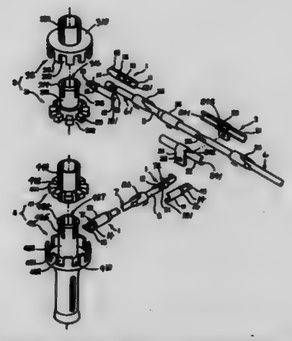
being of enhanced compact configuration because the slot of said inner linking spoke faces upward.

5,193,566

UMBRELLA FRAME

Wei-Kun Chen, Taoyuan, Taiwan, assignor to Ocean Import Export Inc., Richmond, Canada

Filed Feb. 28, 1992, Ser. No. 843,632
Int. Cl.[5] A45B *25/06*
U.S. Cl. 135—28 20 Claims



20. A pivotal joint assembly for an umbrella frame, comprising:

an elongated rod having a notch formed therein adjacent one of its ends;

a pair of connector halves surrounding the rod in opposition to one another, the connector halves including an inner boss fitting within the notch in the elongated rod; and

a collar mounted about the connector halves to clamp the connector halves together about the elongated rod and to retain the inner boss within the notch in the elongated rod;

each of the connector halves including an end section protruding beyond the one end of the rod and having a laterally extending pivot lug formed thereon;

an umbrella mounting ring which pivotally receives the laterally extending pivot lugs at the end sections of the connector halves; the mounting ring comprising:

a mounting base having a ring of spaced teeth, the end sections of the connector halves being received between the teeth, the teeth radially retaining the connecting halves within the mounting base by engaging the pivot lugs; and

a mounting cap which mates with the mounting base, the mounting cap having radially extending spaced teeth which fit between the teeth of the mounting base to retain the connecting halves and pivot lugs within the mounting base.

5,193,567

MOBILITY ENHANCEMENT DEVICE

Frank R. Razzy, Jr., 602H Jackson Rd., Shavertown, Pa. 18708

Filed Oct. 29, 1991, Ser. No. 783,981
Int. Cl.[5] A61H *3/02*
U.S. Cl. 135—68 10 Claims

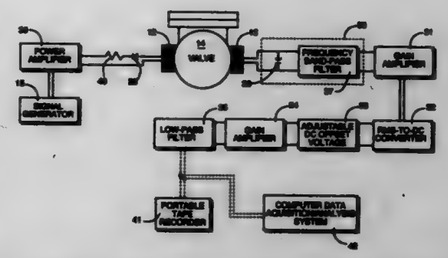
1. A crutch comprising a vertical shaft, a substantially horizontal hand support section having one end connected to said shaft and another end extending horizontally forwardly from said shaft, an upright intermediate section extending upwardly from said other end of said hand support section, a forearm support section connected to and extending substantially horizontally rearwardly from said intermediate section and including a terminal loop section which is open towards said intermediate section, whereby a person may use the crutch by placing his hand on said hand support section and engaging his forearm within and against said loop section for stable, dependable support.

5,193,568

NONINVASIVE VALVE MONITOR USING ALTERNATING ELECTROMAGNETIC FIELD

David M. Eissenberg, Oak Ridge; Howard D. Haynes, and Donald A. Canada, both of Knoxville, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Jun. 20, 1991, Ser. No. 718,453
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—1 36 Claims



1. A method for monitoring a valve having an obturator mounted within a valve housing and being movable therein between open and closed positions, the method comprising:

positioning at least one transmitter coil exterior of said valve housing;

providing an alternating current at a selected frequency to said transmitter coil so tat said transmitter coil produces an alternating electromagnetic field which penetrates into said valve housing; and

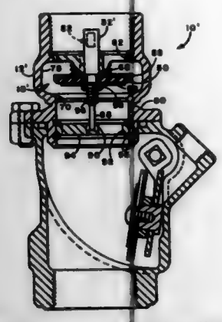
positioning at least one passive receiver coil exterior of said valve housing such that said receiver coil is within the influence of said alternating electromagnetic field, said alternating electromagnetic field inducing an electrical voltage in said receiver coil which varies in accordance with variations in the position of the obturator.

5,193,569

EMERGENCY SHUT-OFF VALVES

Glenn E. Moore; Paul B. Anderson, both of Cincinnati; Chester W. Wood, Milford, and Lawrence R. Blasch, Cincinnati, all of Ohio, assignors to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 478,247, Feb. 9, 1990, Pat. No. 5,099,870. This application Mar. 30, 1992, Ser. No. 860,441
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—71 15 Claims



4. An emergency valve adapted for installation at the base of a fuel dispensing unit with its lower end connected to a source of pressurized fuel and its upper end connected to conduit means extending, through the dispensing unit to a dispensing nozzle,

said emergency valve comprising

a lower housing adapted to be rigidly mounted and to which the pressurized fuel source is to be connected,

upper housing means mounted on the lower housing and adapted to be connected to the conduit means extending to the dispensing nozzle,

said upper housing means having a weakened portion defining a plane on which the upper portion thereof will separate when subjected to a predetermined lateral loading,

a main control valve mounted in the lower housing,

means for latching the main control valve in an open position, said latching means being connected to the upper portion of the upper housing means and releasing the main control valve for closure upon separation of the upper portion of the upper housing means,

characterized by

means, operative in response to separation of the upper portion of said upper housing means from the lower portion thereof, for retaining fuel in the dispensing unit conduit means.

5,193,570

ELECTRONIC CONTROL UNIT FOR AUTOMATIC SPRINKLING SYSTEM

Paul W. Mott, 2315 El Paseo, Las Cruces, N. Mex. 88001

Filed Mar. 16, 1992, Ser. No. 851,963
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—78.2 14 Claims

1. A method of automatically irrigating a plot of land utilizing at least one source of water, each of which is controlled by a solenoid valve including the steps of:

determining a schedule of irrigation events, during which the plot of land is provided with water;

providing a module including a counter between a source of power for activating the solenoid valves and the solenoid valves;

sensing the amount of precipitation which has fallen in a given area during a predetermined time period;

providing an output to said counter based upon a signal provided during said sensing step;

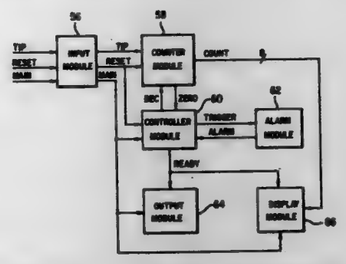
incrementing said counter based upon said signal provided during said sensing step;

determining a rate for decrementing said counter, said rate included in said module;

decrementing said counter only during a scheduled irrigation event, and only if the count in said counter equals said predetermined value; and

providing an output signal to activate each of said solenoid valves if, during the scheduled irrigation event, the count is said counter equals said predetermined value.

3. A system for automatically irrigating a plot of land by controlling the operation of one or more solenoid valves, each of which is associated with a source of water, and controlled by a source of power, comprising:



a precipitation sensor providing an output based upon the amount of precipitation which has fallen in a given area during a particular time period;

a module provided between the source of power and the one or more solenoid valves and connected to said precipitation sensor for initiating the activation of the solenoid valves at the appropriate time for irrigating the plot of land, said module provided with a counter which is incremented based upon the output of said precipitation sensor;

a scheduler associated with said module and the source of power for producing a signal indicating the presence of a scheduled irrigation event, indicating that the plot of land is scheduled to be irrigated at a particular time;

a means provided in said module for decrementing said counter only during the scheduled irrigation event, and only if the count in said counter exceeds a predetermined value; and

an output device provided in said module and connected to said counter for activating the solenoid valves if, during the scheduled irrigation event, the count in said counter equals said predetermined value.

5,193,571

VALVE FOR THE MAINTENANCE OF STERILE CONDITIONS IN A FILLER MACHINE

Ennio Levati, Parma, Italy, assignor to Feaco S.P.A., Parma, Italy

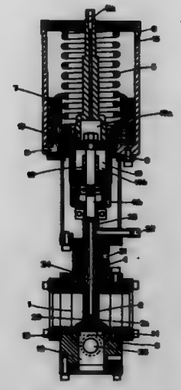
Filed Jan. 22, 1992, Ser. No. 824,802
Claims priority, application Italy, Feb. 19, 1991, PR91A000008
Int. Cl.[5] F16K *3/36*
U.S. Cl. 137—241 8 Claims

1. A valve for maintenance of sterile conditions in a filler machine having a header, said header, into which a branch of a product feeder conduit is inserted, being equipped with a

filler valve, said maintenance valve controlling flow of a product from said conduit to said header, comprising:

a first plug for closing a flow path from said conduit to said branch by sealing on a first surface of said branch, said first plug including a hollow shaft of extended length;

a second plug connected to a hollow stem, said second plug stem being slidable inside said first plug shaft between a first position where said second plug seals against a surface of said first plug, and a second position wherein said second plug seals on a second surface of said branch, said first and second plugs together forming an internal chamber between them, said chamber communicating with a space between said stem and said shaft, sealing on said first branch surface by said first plug and sealing by said second plug in said first and second positions maintaining said chamber continuously free of said product, said stem including passage means connecting said chamber and space to the interior of said hollow stem;



means for entrance of a sterilizing agent into said space between said stem and said shaft, and means for discharge of said agent from with said hollow stem, said means for entrance and discharge being at an end of said space and an end of said hollow stem away from said first and second plugs, a continuous flow path being provided for said agent from said entrance through said space between said shaft and said stem, through said chamber and into said hollow stem via said passage means, and through said hollow stem to said discharge means, said seals of said plugs isolating said branch from said conduit and isolating said sterilizing agent from said branch and conduit, conditions of sterility being maintainable in said conduit when said filler valve is out of order;

means for moving said first plug to open and close said product flow path; and

means for moving said second plug between said first and said second positions.

5,193,572

PIG-COMPATIBLE THREE-WAY BUTTERFLY VALVE

Eugene Le Devehat, Saligny, France, assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 26, 1992, Ser. No. 904,792
Claims priority, application France, Jun. 27, 1991, 91-07952
Int. Cl.[5] B08B *9/04*
U.S. Cl. 137—244 18 Claims

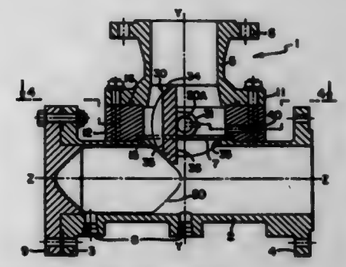
1. A tee-shaped three-way pig-compatible fluid control valve comprising:

a) a pig-compatible tubular main section having an axis, a longitudinal wall extending between two spaced ends, and an opening through said wall for passage of fluid controlled by the valve;

b) a tubular secondary section having an axis and a longitudinal wall extending between two spaced ends;

c) means interconnecting one end of the secondary section to the wall of the main section around the opening in said wall so that said secondary section extends laterally from said wall and said opening;

d) a control shaft rotatably mounted about an axis transverse to the secondary section and close to the opening in the main section; and



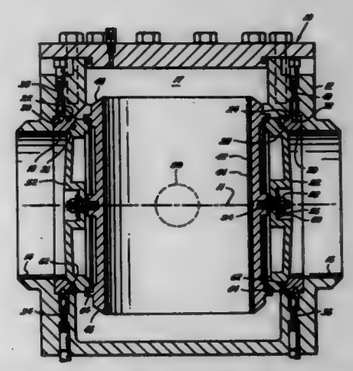
e) a valve closure element mounted on the control shaft for controlling fluid flow through the opening in the secondary section, said closure element having an outer face that corresponds in configuration to the configuration of the internal surface of the main section wall, said outer face being co-extensive with and locally completing said internal surface of said main section wall when said closure element is in its closed position.

5,193,573

BALL VALVE HAVING REPLACEABLE SEALS UNDER FULL SERVICE PRESSURE

Clyde H. Chronister, 6115 Bermuda Dunes, Houston, Tex. 77069

Filed Jun. 15, 1992, Ser. No. 898,367
Int. Cl.[5] F16K *5/06*
U.S. Cl. 137—315 8 Claims



1. A ball valve having replaceable seals comprising,

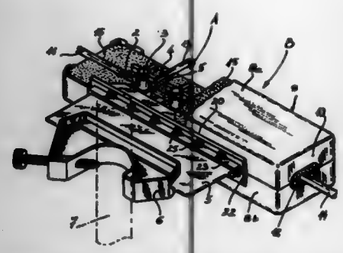
a housing having a longitudinal axis and having an inlet and an outlet and a seal ring sealably positioned in the housing adjacent each of the inlet and the outlet, said seal rings movable longitudinally in the housing and having a sealing surface, said housing including an openable closure flange,

means extending between said seal rings and the outside of the housing for longitudinally moving said seal rings,

a ball valve element positioned in the housing between the seal rings and includes a tubular member having a sealing

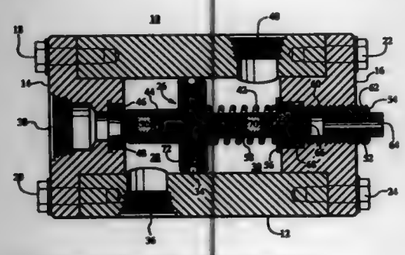
face on each end for providing flow-therethrough when the tubular member is aligned between the seal rings,
trunnions positioned on opposite sides of the tubular member perpendicular to the longitudinal axis for rotating the ball element, and
a movable seat ring connected to opposite sides of the tubular member by releasable fastening means inside of the seat ring, said seat rings removable through the open closure flange.

5,193,574
PROTECTIVE STRUCTURE FOR CONNECTION SITE FOR MEDICAL USE
Georges A. Lopez, Craponne, France, assignor to Laborstoire Cair L.G.L., Tarare, France
Filed Apr. 30, 1992, Ser. No. 876,432
Int. Cl.[5] F16K *37/28*
U.S. Cl. 137—382 3 Claims



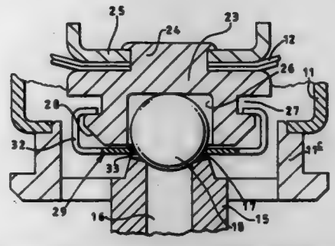
1. A protective structure for medical use having a connection site with at least one valve integral with an attachment panel, at least one tube being connected to the valve, and a housing slidably mounted on the panel, the housing including two half-shells made of a synthetic material, the half-shells being articulated by lengthwise rear walls, provided on lengthwise front walls with elastic closing means and provided with foam padding having depressions to accommodate the at least one valve and the at least one tube of the connection site, wherein the half-shells are articulated by independent, spaced hinges on thin lengthwise edges of a rear transverse wall integral with a slide and movably mounted on the panel, the length of the panel being at least equal to a distance that the slide must travel to achieve total clearance of the connection site by both half-shells in an open position.

5,193,575
ADJUSTABLE DIFFERENTIAL PRESSURE VALVE
Hung M. Do, Olean, N.Y., assignor to Dresser-Rand, Corning, N.Y.
Filed Mar. 13, 1992, Ser. No. 851,094
Int. Cl.[5] F16K *31/124*
U.S. Cl. 137—509 10 Claims



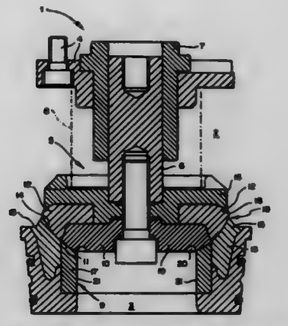
1. A pressure differential valve comprising:
a hollow enclosed valve housing;
a slidable piston in the housing separating the housing into first and second chambers, the piston having opposing faces;
only an input fluid pressure orifice and an output fluid pressure orifice in the first chamber of the housing;
an input fluid orifice engagement projection extending from one face of said piston into the first chamber for selectively sealing the input fluid orifice;
a variable reference fluid pressure orifice and an externally adjustable pressure spring in the second chamber of the housing such that the reference fluid pressure and the externally adjusted spring pressure forces the piston orifice engagement projection to close the output fluid pressure orifice until the input fluid pressure exceeds the sum of the reference fluid pressure and the externally adjusted spring pressure;
a second projection extending from the other face of the piston; and
a pressure inlet in the housing coupled only to the slidable piston second projection for providing variable pressure on the piston from a remote pressure source.

5,193,576
PRESSURE REGULATOR
Geoffrey R. Mosby, Sutton Coldfield, England, assignor to Lucas Industries public limited company, Solihull, England
Filed Jul. 24, 1992, Ser. No. 918,965
Claims priority, application United Kingdom, Jul. 25, 1991, 9116078
Int. Cl.[5] F16K *17/04, 25/00*
U.S. Cl. 137—510 8 Claims



1. A pressure regulator comprising a housing divided internally by a diaphragm to form first and second chambers, inlet and outlet passages in the wall of the first chamber, a valve seat forming part of the outlet passage of the first chamber, a valve closure ball engageable with the seat to close the outlet passage, a ball carrier moveable with the diaphragm and having therein a recess within which the ball is received with freedom for limited lateral movement relative to the direction of movement of the diaphragm and carrier, and a ball retainer engaged with the ball carrier to retain the ball relative to the carrier, said ball retainer comprises an annular disc lying across the valve seat end of the carrier and through which the ball protrudes to engage the valve seat in use, and engagement means extending externally of the carrier and defining a re-entrant recess within which the valve seat end portion of the carrier is received, the retainer being capable of limited movement in any direction laterally with respect to the direction of movement of the diaphragm and carrier.

5,193,577
SLUDGE PUMP VALVE
Cornelis J. de Kouing, Ed Velden, Netherlands, assignor to Holthuis B.V, Venlo, Netherlands
Continuation-in-part of Ser. No. 743,983, Aug. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 602,516, Oct. 24, 1990, abandoned. This application Jun. 9, 1992, Ser. No. 896,470
Claims priority, application Netherlands, Jun. 25, 1990, 9001445
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—516.29 6 Claims

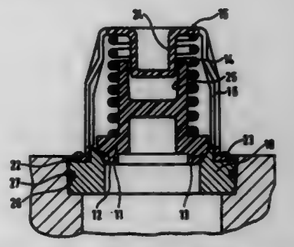


1. A valve suitable for use in a sludge system comprising,
a valve body,
guide means for guiding axial movement of the valve body,
an elastic sealing ring and a metal supporting element on the valve body, the supporting element and the elastic sealing ring each having a contact surface, and
a valve seat in the valve body, the valve seat including a metal part and an elastic part, the metal part and the elastic part each having a contact surface, the contact surface on the metal supporting element and that on the metal part, and the contact surface on the elastic sealing ring and that on the elastic part, respectively, being moved into contact with each other in a closing movement of the valve body against the valve seat,
the contact surface on the elastic sealing ring being convex and the contact surface on the elastic part being concave, the elastic sealing ring being carried on the valve body and the elastic part being carried on the valve seat such that during valve closing movement, the elastic sealing ring and the elastic part contact each other only along the respective contact surfaces of each, the radius of curvature of the elastic part concave surface being smaller than the radius of curvature of the elastic sealing ring convex surface whereby a first point of contact between the contact surfaces of the elastic sealing ring and the elastic part occurs at a radially outermost location of the said contact surfaces,
the metal supporting element and the metal part, respectively, being carried on the valve body and the valve seat, respectively such that during valve closure movement the two contact each other only and along the contact surfaces of each.

5,193,578
IRRIGATION LINE DRAIN VALVE
Steven W. Noriyuki, P.O. Box 754, Paul, Id. 83347
Filed Nov. 21, 1991, Ser. No. 795,817
Int. Cl.[5] F16K *15/03*
U.S. Cl. 137—521 3 Claims

1. An irrigation line drain valve comprising:
(a) an irrigation line with a side, elemental surface and an end, peripheral surface;
(b) a discharge opening in an end of said irrigation line, said discharge opening being adapted to receive a valve seat on its inside circumference;
(c) a valve seat disposed inside said irrigation line, said valve seat being adapted to cooperate with said inside circumference of said discharge opening;
(d) a valve stem connected on its one end to said valve seat, and being adapted to extend through said discharge opening into and out from said irrigation line, said valve stem being connected on its other end to the central portion of a pivoted lever;
(e) said pivoted lever connected at its central portion to said valve stem and pivotally attached at its first end to the end of said irrigation line, said lever extending diametrically across the centerline of said discharge opening and beyond the opposite peripheral edge of the end of said irrigation line, and said lever being attached on its second end to the first end of a spring;
(f) said spring attached on its first end to the second end of said pivoted lever, said spring being attached on its second end to said side, elemental surface of said irrigation line; so that said irrigation line drain valve automatically opens when the hydraulic pressure in the line drops below a predetermined amount.

5,193,579
INTERNAL COMBUSTION ENGINE LUBRICATING OIL FILTER VALVE
Sascha Bauer, Ascnwald; Heinz Habiger; Klaus Mack, both of Ludwigsburg, and Jaroslav Pavlis, Freiberg, all of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany
Filed Jun. 24, 1991, Ser. No. 718,418
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1990, 9007022[U]; Jul. 11, 1990, 9010495[U]; Jan. 9, 1991, 9100194[U]
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—540 8 Claims



1. A valve comprising a valve body having a valve opening therethrough and a valve plate having a valve seat thereon which cooperates with said valve body to close said valve opening, a valve hood secured to said valve body enclosing said valve plate, and a valve spring supported against said valve hood for urging said valve plate toward said valve body to seal said valve opening; wherein said valve body is a cylindrical body having at one end facing said valve seat a bead

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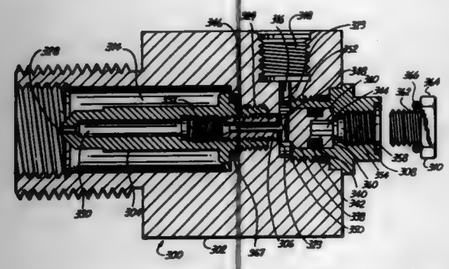
margin under which said valve hood is crimped to secure said valve hood to said valve body; wherein said valve hood has a circumferential flange which is crimped under said valve body bead margin to secure said valve hood to said valve body, a plurality of openings above said flange distributed around the circumference of said valve hood through which a fluid flowing through said valve can pass, and a cylindrical valve plate guide at the upper end of said hood; and wherein said valve plate is formed with a blind guide bore at one end facing said cylindrical valve plate guide for receiving said cylindrical guide in order to guide said valve plate.

5,193,580

CRASH PROOF SOLENOID CONTROLLED VALVE WITH MANUAL OVERRIDE VALVE

Lloyd G. Wass, 1670 Blackhawk Cove, Eagan, Minn. 55122, and Michael R. Baird, 54 New Market Dr., Delaware, Ohio 43015

Continuation-in-part of Ser. No. 707,584, May 30, 1991. This application May 8, 1992, Ser. No. 880,568
Int. Cl.[5] F16K *31/06, 11/24*
U.S. Cl. 137—613 **3 Claims**



1. A valve for controlling flow of compressed gas from a pressure vessel, the valve comprising:
- a valve body having a head and a neck; the head having an outlet port; the neck having external threads for engagement with the pressure vessel, having an inner end, and having a bore which extends from the inner end to the outlet port;
- a valve seat mounted in the bore and having an orifice at an inner end and a flow passage extending between the orifice and the outlet port;
- a manual override valve between the orifice and the outlet port for selectively sealing the flow passage; and
- a solenoid valve mounted to the inner end of the neck, the solenoid valve including a seal for closing the orifice.

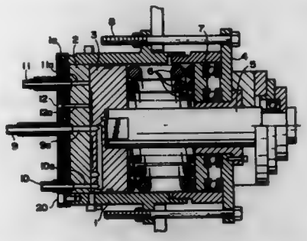
5,193,581

SELECTOR VALVE

Yoshimi Shiroto, Yokohama; Nobuhiro Onda, Hachioji; Yoshiharu Katsuka, Yokohama; Hirotoshi Koga, Kawasaki, and Akihiro Fujimori, Yokohama, all of Japan, assignors to NKK Corporation and Chiyoda Corporation, both of Japan

Filed Mar. 17, 1992, Ser. No. 853,072
Int. Cl.[5] F16K *11/02*
U.S. Cl. 137—625.11 **3 Claims**

1. A selector valve comprising:
- an open-ended cylindrical casing;
- a stator plate fixedly secured to said casing to close said open end thereof;
- an inlet hole extending coaxially with said casing through said stator plate;
- a plurality of outlet holes extending through said stator plate and arranged in a circle concentrical with said casing;
- a rotor fitted in said casing and having a cylindrical peripheral surface and a flat contact surface in contact with said stator plate and rotatable about an axis thereof extending coaxially with said casing;
- a radially-extending passage formed in said rotor such that one end of said passage is open at a position coinciding with said inlet hole of said stator plate and the other end of said passage is open at a position on said circle;
- means provided within said casing for urging said rotor toward said stator plate so that said rotor is maintained in pressure contact with said stator plate;
- means for rotating said rotor through a desired angle so that



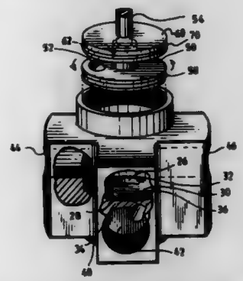
said inlet hole can be in fluid communication with a selected one of said outlet holes through said radially extending passage;
- collection means for collecting fluid leaking between said contact surface of said rotor and said stator plate, said collection means including an annular groove formed on said contact surface of said rotor to define an annular, closed space between said stator plate and said rotor at a position inside of said circle; and
- a discharge hole extending through said stator plate in fluid communication with said annular, closed space.

5,193,582

WATER DIVERTER VALVE

Frank Antoniello, 17 Wesmore Dr., Commack, N.Y. 11725, and Jerome Warshawsky, 1322 Everit Pl., Hewlett Harbor, N.Y. 11557

Filed Oct. 4, 1991, Ser. No. 770,906
Int. Cl.[5] F16K *11/074*
U.S. Cl. 137—625.14 **7 Claims**



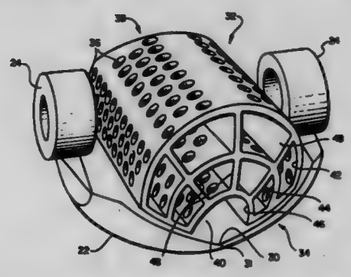
1. A diverter valve, comprising a body having an inlet port and and outlet port for fluid to pass through, with said fluid entering said body through said inlet port, a seal member being contained within said body, said seal member having a hole for accepting said fluid entering said body through said inlet port of said body, a valve spindle being contained within said body and being biased to urge said seal member upon a base of said body, upon which said base said seal member is capable of being rotated; said seal member comprising a movable closure element further including openings for receiving said inlet water from said inlet port and a spindle for rotating said sealing member, a spring member being activated by an application of vertical force upon said seal member biased to said base of said body;
- at least one outlet tube source connected to an intermediate outlet tube, said outlet source being communicated with an outlet port within said sealing member, said sealing member being rotatable in an open and closed position to permit a flow of fluid there through by rotating said sealing member, said sealing member being positioned within said body between said inlet port and said outlet port so as to direct said flow of fluid against a base of said body;
- a resilient means for biasing said valve sealing member toward said base of said body;
- said resilient means including a spring urging said sealing member against said base of said body.

5,193,583

ROTARY NOISE ATTENUATOR

Douglas P. Gothmann, Gladbrook; Allen C. Fagerlund; Charles R. Kuhlman, both of Marshalltown, all of Iowa; Ronnie L. Smith, Whitesboro; Alan D. Thomas, Sherman, both of Tex., and Larry J. Weber, Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Aug. 30, 1991, Ser. No. 753,648
Int. Cl.[5] F16K *47/02, 47/04*
U.S. Cl. 137—625.32 **13 Claims**



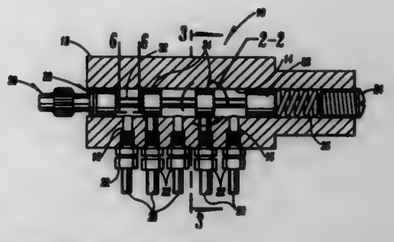
1. A rotary valve noise attenuator device for fluid valves having a passageway for communicating a fluid flow stream through said valve, and a sealing member in said passageway, said rotary valve noise attenuator device comprising:
- a rotary ball fluid control member for rotatable mounting in said passageway adjacent said sealing member to control the flow stream through said passageway, said rotary ball fluid control member comprising a segmented ball having a ball sealing portion sealingly engageable with said sealing member corresponding to closing of said valve, and an opposite ball gap portion for selective insertion into the flow stream corresponding to selective opening of said valve;
- a noise attenuator member mounted in said ball gap portion for rotation therewith to progressively insert said noise attenuator member into the flow stream during opening of said valve,
- said noise attenuator member formed with a plurality of elongated, perforated channels extending across substantially said entire ball gap portion and said sealing member during opening of said valve, each channel having a front end and a rear end with a longitudinal axis extending through said front and rear ends, and each channel formed with four side walls having perforations;
- said plurality of channels disposed and maintained in said ball gap portion with each of said longitudinal axes being parallel to each other and with said channel front ends rotatable into the flow stream during opening of said valve for initially receiving said flow stream;
- said channel front ends splitting said flow stream into several respective smaller flow streams and guiding said respective smaller flow streams into respective channels, and said smaller flow streams being dispersed through said perforated channels.

5,193,584

SPOOL VALVE AND METHOD OF MAKING THE SAME

Thomas A. Watts, Ames, Iowa, assignor to Sauer Inc., Wilmington, Del.

Filed Feb. 20, 1992, Ser. No. 839,358
Int. Cl.[5] F16K *3/24, 3/32*
U.S. Cl. 137—625.33 **2 Claims**



1. A spool valve, comprising,
- a valve body having an elongated cylindrical bore defining a cylindrical shape free from annular or longitudinal grooves,
- a hydraulic port in said valve body defined by a peripheral port edge existing at the intersection of said bore and a passageway extending radially through said valve body and communicating with said bore,
- a cylindrical valve spool slidably mounted in said bore and adapted to be slidably moved to close and open said port with respect to said bore,
- means on a said body for moving said valve spool in said bore,
- said valve spool having a cylindrical land surface, and at least one end planar circular surface, with a peripheral metering edge defined by the intersection of said cylindrical land surface and said end planar surface,
- said peripheral metering edge having a plurality of tapered notches therein, at least some of which always overlap a portion of said peripheral port edge regardless of the rotational position of said cylindrical and surface with respect to said hydraulic port wherein the flow of hydraulic fluid between said bore and said passageway will be only through the tapered notches that overlap said portion of said peripheral port edge.

5,193,585

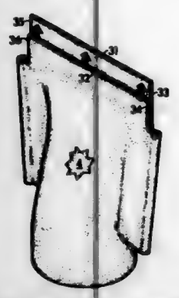
DUCKBILL CONSERVATION VENT VALVE

Arthur C. Proffitt, and William C. Barron, both of Cody, Wyo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Oct. 28, 1991, Ser. No. 783,474
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—846 **7 Claims**

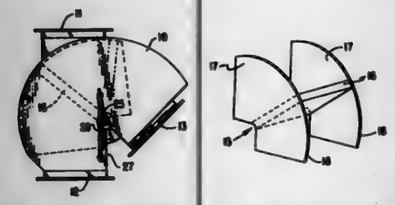
1. A duckbill valve comprising:
- a) a tubular body having an axial fluid passageway with an inlet and an outlet, said tubular body progressively narrowing in cross section from said inlet to said outlet, forming a long lip and a short lip, said short lip stretched to equal the length of said long lip, said long lip and said stretched short lip attached at their edges, said attached lips define therebetween a closed slit, and said lips being capable of spreading apart to open said slit in response to

pressure exerted from said inlet in the direction of said slit; and



b) a pair of opposing ribs extending along the length of said progressively narrowing tubular body.

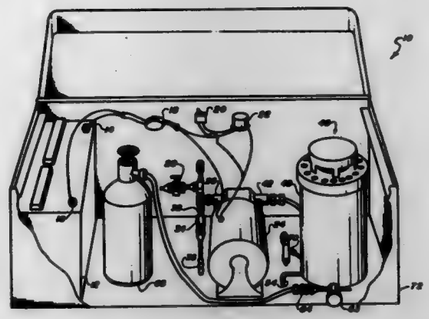
5,193,586
GRAIN CHUTE VALVE
Karl W. Nolin, Jr., 1510 Country Club La., Spencer, Iowa 51301
Filed Mar. 13, 1992, Ser. No. 851,062
Int. Cl.[5] F16K *11/00*
U.S. Cl. 137—875 1 Claim



1. A grain valve comprising a housing having side walls, an inlet formed in said housing adapted to receive grain from an outside source, two alternate outlets adapted to deliver said grain to alternate receiving devices, a valve member mounted in said housing, said valve member being in position to receive grain from said inlet and to direct said grain selectively to the alternate outlets, said valve member including means to enclose said grain to prevent contact of said grain with said side walls of the housing, and means to bias said valve member toward one of said outlets including spring means attached to said valve member, said spring means being arranged to provide biassing toward either outlet and away from an intermediate position.

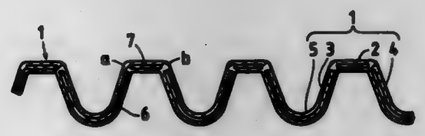
5,193,587
PIPE THAWING APPARATUS
Floyd Miller, Jr., 9576 S. Harrodsburg Rd., Harrodsburg, Ind. 47434
Filed May 20, 1991, Ser. No. 702,965
Int. Cl.[5] E03B *7/14*
U.S. Cl. 138—35 13 Claims

1. An apparatus for thawing pipe, comprising: means for heating water having an inlet and an outlet;
a flexible feed tube having an inlet coupled to the outlet of the water heating means and an outlet for insertion into the pipe;
means for providing a pulsating stream of heated water from the water heating means to the flexible feed tube, wherein



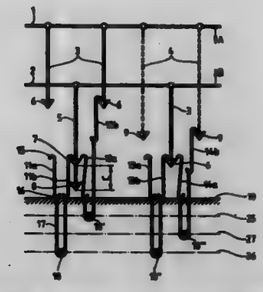
a pulsating stream of heated water is directed into the pipe through the flexible feed tube to melt the ice.

5,193,588
PRESSURE-RESISTANT HELICAL CORRUGATED PIPE
Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan
Division of Ser. No. 440,174, Nov. 22, 1989, Pat. No. 5,109,889.
This application Feb. 13, 1992, Ser. No. 834,874
Claims priority, application Japan, Dec. 27, 1988, 63-333132
Int. Cl.[5] F16L *9/16, 9/06*
U.S. Cl. 138—133 6 Claims



1. A pressure-resistant helical corrugated pipe, comprising:
a helical corrugated pipe wall having a top, crest portion, opposite side wall portions extending from said top, crest portion and a bottom, trough portion disposed close to an axis of the pipe so as to be situated between adjacent top, crest portions;
a continuous thin metal belt plate of a generally U-shaped transverse cross-section, said metal belt plate being disposed in said bottom, trough portion and also in substantially all of said opposite side wall portions that extend from said top, crest portion, said metal belt plate serving as a constituent element of said pipe wall;
another metal belt plate of a flat configuration being disposed in said top, crest portion so as to be situated between adjacent bottom, trough portions of said helical corrugated pipe wall and disposed out of contact with said thin metal belt plate, said flat metal belt plate having a width substantially equal to a width of said top, crest portion in a direction of the axis of the pipe, such that said flat metal belt plate is disposed in substantially the entire width of said top, crest portion; and
connective belt regions provided between said two metal belt plates in which said metal belt plates are absent, said connective belt regions being provided near connecting corner portions between said opposite side wall portions and said top, crest portion, said connective belt regions being made of a synthetic resin or rubber to interconnect said two metal belt plates.

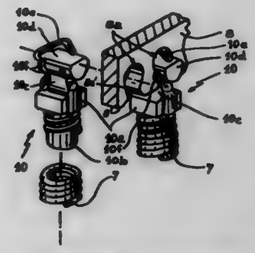
5,193,589
DOUBLE LIFT OPEN SHED JACQUARD MACHINE FOR PILE FABRIC
Wolfgang Seiler, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Firma Oskar Schleicher, Monchen-Gladbach, Fed. Rep. of Germany
Filed Jan. 10, 1992, Ser. No. 818,814
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1991, 4101778
Int. Cl.[5] D03C *3/12, 3/24*
U.S. Cl. 139—65 6 Claims



1. A double lift open shed Jacquard machine for a loom for the production of pile fabric, comprising: first and second blade carriers which are movable in opposite relationship to each other; lift blades carried by the first and second blade carriers; hooking engagement means on respective ones of the lift blades; and hooks adapted to be entrained by said lift blades in an engagement position with said hooking engagement means, wherein the first and second blade carriers have lift blades of a first blade kind with hooking engagement means disposed at substantially the same given height for the hooks, and at least one of said blade carriers having at least one lift blade of a second blade kind in which each lift blade of the second blade kind has at least two spaced-apart hooking engagement means and lift blades of a third blade kind in which the hooking engagement means are associated with an associated blade carrier in relatively movable relationship in such a transmission ratio that at one dead center point in the movement of the associated blade carrier the hooking engagement means of the lift blades of the third blade kind correspond to the position in respect of height of the hooking engagement means of the lift blades of the first blade kind and at an opposite dead center point in the movement of the associated blade carrier the hooking engagement means of the lift blades of the third blade kind assume a position in respect of height which is different from the position of the hooking engagement means of the first blade kind.

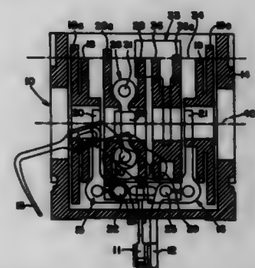
5,193,590
SPRING ATTACHMENT FOR NEGATIVE DOBBIES
Jean-Paul Fromont, and André Fumex, both of Faverges, France, assignors to S.A. des Etablissements Staubli, Faverges, France
Filed Jan. 8, 1992, Ser. No. 818,258
Claims priority, application France, Feb. 1, 1991, 91 01401
Int. Cl.[5] D03C *1/14*
U.S. Cl. 139—82 4 Claims

1. In a spring system for dobbies and other weaving mechanisms of the negative type which includes at least one hooking element on which are connected endpieces provided at the ends of a series of parallel springs and wherein the hooking element has lateral faces and an outer edge, the improvement comprising,
a series of openings of omega profile which open out through a narrowed passage to the outer edge of the hooking element and which are open on the lateral faces thereof so as to allow assembly and dismantling, by lateral access, of the endpieces provided at the ends of the



springs, and the endpieces being retained within said omega openings.

5,193,591
MECHANISM FOR FORMING A RECESSED SELVEDGE ON A SHUTTLELESS LOOM
Antonio Nicolini, Schio, Italy, assignor to Cem Italia S.r.l, Vicenza, Italy
Filed Apr. 22, 1991, Ser. No. 688,142
Claims priority, application Italy, Apr. 20, 1990, 20104 A/90
Int. Cl.[5] D03D *47/48*
U.S. Cl. 139—434 4 Claims



1. A mechanism for forming a recessed selvedge on fabric being manufactured on a shuttleless loom which is operable to produce a shed which opens and closes as the fabric is being woven by the loom,
said mechanism comprising:
means for gripping a thread inserted in the shed and means for cutting a thread inserted into the shed, so as to provide within the shed of a fabric being woven on a shuttleless loom, a cut pick having at a trailing end thereof a tail transversally protruding from the shed;
a needle arranged for capturing said tail and bending said cut pick back upon itself so that said tail is disposed with the shed; and
a kinematic drive means for said gripping cutting means and for said needle, comprising:
a first carriage supporting said gripping means for reciprocating movement longitudinally of the fabric being woven;
a second carriage supporting said cutting means for reciprocating movement longitudinally of the fabric being woven;
a third carriage supporting said needle for reciprocating movement longitudinally of the fabric being woven;
a case arranged to be supported on a shuttleless loom;
means mounting said first, second and third carriages on said case for reciprocating longitudinally of the fabric being woven, with said third carriage being flanked by said first and second carriages;

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a rotationally driven shaft journalled on said case and extending transversally of the fabric being woven;

first, second and third cam means mounted on said shaft for rotation therewith;

first rotary cam follower means journalled directly on said first carriage and operatively disposed in rotational, cam-following relation with said first cam means, for causing cyclical reversing reciprocation of said first carriage, and therefore of said gripping means longitudinally of the fabric being woven;

second rotary cam follower means journalled directly on said second carriage and operatively disposed in rotational, cam-following relation with said second cam means, for causing cyclical reversing reciprocation of said second carriage, and therefore of said cutting means longitudinally of the fabric being woven; and

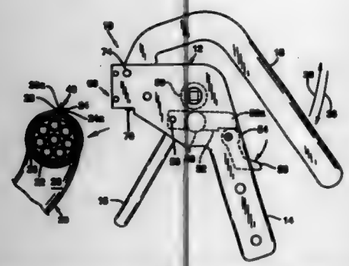
third rotary cam follower means journalled directly on said third carriage and operatively disposed in rotational, cam-following relation with said third cam means, for causing cyclical reversing reciprocation of said third carriage, and therefore of said needle longitudinally of the fabric being woven.

5,193,592

CONNECTOR BANDING TOOL

William H. Evilsizer, Hillsboro; James D. Scruggs, Beaverton, and Rodney L. Callister, Vernonia, all of Oreg., assignors to Astro Tool Corp., Beaverton, Oreg.

Filed Feb. 22, 1991, Ser. No. 659,841
Int. Cl.[5] B21F *9/02*
U.S. Cl. 140—93.2 13 Claims



1. A banding tool for mounting a band on a multi-conductor cable housing to capture a ground shield of the cable against the housing, the band comprising a first length portion surrounding the housing and passing through a band buckle and a second length portion extending from the band buckle, the tool comprising:

a rotary clutch tensioning arrangement for developing tension in the first length portion of the band by engaging the band buckle and the second length portion to draw the band through the band buckle, said rotary clutch tensioning arrangement including first and second band contacting rollers capturing said second length portion at a nip therebetween for advancing said second length portion in response to rotation of said rollers, said first and second rollers including a drive coupling therebetween for coordinated rotation thereof;

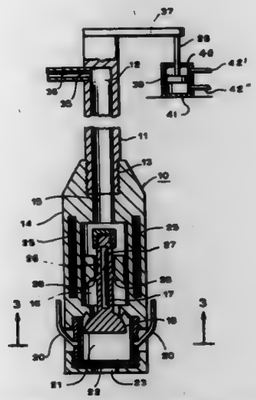
a bending and cutting arrangement for bending the second length portion at a point adjacent the band buckle whereby tension is maintained in the first length portion as said bending and cutting arrangement severs the second length portion to leave an upstanding portion of the band adjacent the buckle such that said upstanding portion is of sufficient length for further bending over the top of the buckle.

5,193,593

PACKAGE FILLING METHOD AND APPARATUS

Jean M. Denis, Pringy, and Patrick Devos, Le Vaudoue, both of France, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 566,903, Aug. 13, 1990, abandoned.
This application Feb. 27, 1992, Ser. No. 841,860
Int. Cl.[5] B67C *3/02*
U.S. Cl. 141—10 11 Claims



1. A method of filling a container with a liquid comprising:

(a) providing an elongated tubular nozzle having a channel therethrough for the delivery of a liquid to a container including a plurality of screens and suction means adjacent to said screens;

(b) moving said nozzle into a container to adjacent the bottom of said container;

(c) flowing a liquid through said nozzle and moving a exit end of said nozzle to maintain said nozzle exit end above the level of the liquid in the container;

(d) ceasing the flow of liquid from said nozzle; and

(e) activating said suction means to remove liquid from the region of said plurality of screens.

5,193,594

ARRANGEMENT FOR INJECTING ADDITIVES

Leif A. Johansson, Solenstuna, Sweden, and Tom M. Jacobsen, Oslo, Norway, assignors to Norapp-Jon H. Andresen, Oslo, Norway

Division of Ser. No. 648,831, Jan. 31, 1991, Pat. No. 5,133,391.
This application Apr. 6, 1992, Ser. No. 864,055
Claims priority, application Norway, Oct. 22, 1990, 904544
Int. Cl.[5] B65B *1/30*
U.S. Cl. 141—83 7 Claims

1. Apparatus for measured injection of additives in oil products and the like during successive and separate loading or unloading operations in tank farms, in particular for filling fuel to be transported by tank trucks, comprising:

at least two supply conduits (20B–D) for additives and each provided with a shut-off valve (29B–D), said at least two supply conduits (20B–D) being interconnected (200);

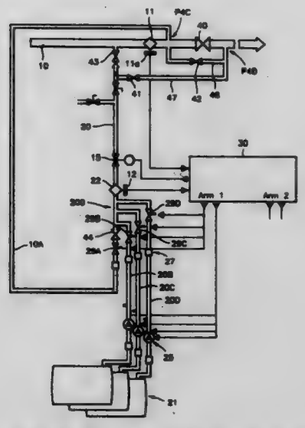
a common control valve (15) connected downstream from said at least two supply conduits (20B–D);

a subsequent common conduit (20) for additives, said subsequent common conduit (20) being connected to said common control valve (15) downstream from said common control valve (15);

a main conduit (10) for oil products and the like, said main conduit being connected downstream of said subsequent common conduit (20);

a connection (43) for connecting the main conduit (10) to the subsequent common conduit (20);

an additional supply conduit (10A) for said oil products and the like, said additional supply conduit (10A) being adapted to be temporarily put into fluid connection with a point of the common conduit (20) oppositely with respect to the connection (43) thereof to the main conduit (10); and



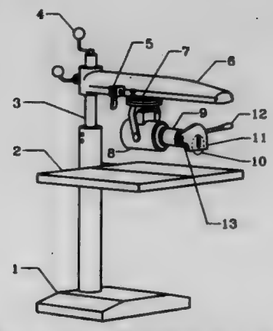
a control unit (30) which by means of one or more valves (29A, 41) establishes said fluid connection during a time interval which starts substantially simultaneously with or after closing of at least one of said shut-off valves (29B–D) for terminating an injection of additive before fulfilling a loading or unloading operation.

5,193,595

BISCUIT JOINER ATTACHMENT FOR RADIAL ARM SAW

Clyde R. Johnson, Box 6, Claysville, Pa. 15323; Jerry Katrencik, 632 W. Grant St., Houston, Pa. 15342, and Dennis W. Standiford, R.D. #8, Box 7D, Washington, Pa. 15301

Filed Mar. 16, 1992, Ser. No. 851,654
Int. Cl.[5] B27C *5/00, 9/00;* B26C *1/00*
U.S. Cl. 144—136 R 7 Claims



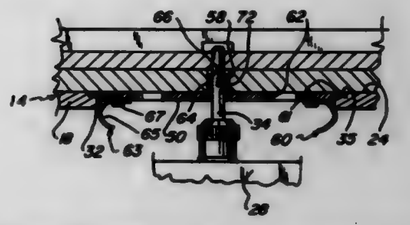
1. A biscuit slot cutter attachment for a radial arm saw having an electric motor saw blade drive in a frame suspended from a radial arm, said frame including means for manually maneuvering said frame together with said saw blade, said biscuit slot cutter attachment comprising a biscuit slot cutter attachment housing, a shaft therein, means for attaching a biscuit saw blade to said shaft, drive transmission means associated with said housing for receiving drive power from said electric motor power drive and transmitting drive power to said shaft, and means independent of said radial arm saw and said frame thereof for manually maneuvering said biscuit slot cutter attachment.

5,193,596

PATTERN CUTTING ASSEMBLY

Kanti P. Patel, 601 Grant, Atwood, Kans. 67730

Filed Dec. 31, 1991, Ser. No. 814,799
Int. Cl.[5] B27C *5/06*
U.S. Cl. 144—145 A 14 Claims



4. A pattern cutting assembly operable to cut a pre-selected pattern in a workpiece member, comprising:

a) a pattern guide member mounted on a cutting tool support plate about a cutting tool member;

b) a pattern and workpiece holding frame having a main support base member with a selected cut-out pattern section therein and operable to support the workpiece thereon;

c) said pattern and workpiece holding frame engages said pattern guide member and movable relative thereto to duplicate said cut-out pattern section in the workpiece member;

d) said pattern guide member includes a main support plate having a guide hub member extended therefrom; and

e) said guide hub member having a central tool opening to be placed about the cutting tool member and being engagable with said cut-out pattern section but allowing the cutting tool member to engage the workpiece member to produce said cut-out pattern section therein.

5,193,597

MATERIAL STRIPPER AND DEBRIS REMOVAL APPARATUS THEREFOR

Donald E. Strong, Remus, Mich., assignor to Strong Manufacturing Company, Remus, Mich.

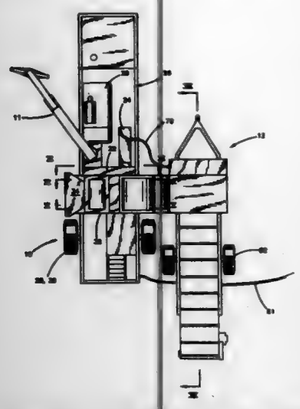
Filed Aug. 26, 1991, Ser. No. 750,182
Int. Cl.[5] B27L *7/00, 1/00*
U.S. Cl. 144—208 J 38 Claims

2. A debris removal apparatus for use in wood chip production, between a material stripping apparatus and a material chipping apparatus, comprising:

a housing defining a path for the movement of material from the stripper to the chipper; and

a debris conveyor located under the path and extending

away from the path, said debris conveyor having a first portion which moves debris from under the path to a



second portion of said debris conveyor which moves debris generally away from the path.

5,193,598
PORTABLE SUPPORT STAND ATTACHABLE TO A SAWHORSE
Jim J. Estrem, 751 Brom La., Big Lake, Minn. 55309
Filed Jun. 23, 1992, Ser. No. 902,946
Int. Cl.[5] B27C *9/02*; B27B *25/10*
U.S. Cl. 144—287 **18 Claims**

17. A portable support stand attachable to a saw horse for supporting a power tool and a workpiece, the saw horse having an elongated top member defining a first longitudinal axis, the portable support stand comprising:

a platform for supporting the power tool, the platform having a top surface and a bottom surface, and further including bracket means for releasably attaching the power tool to the top surface of the platform;

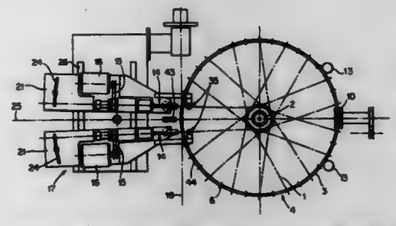
attachment means connected to the bottom surface of the platform for attaching the platform to the top member of the sawhorse, the attachment means further includes slide bracket means for slidably engaging with the top member of the sawhorse;

support arm bracket means for attaching at least one support arm to the platform, the support arm bracket means having a left and right end;

right support arm means for supporting the workpiece, the right support arm means having an inward and outward end, the inward end of the right support arm means being operatively engaged with the support arm bracket means proximate the right end thereof; and

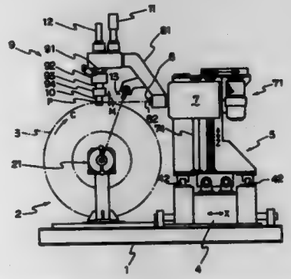
left support arm means for supporting the workpiece, the left support arm means having an inward and outward end, the inward end of the left support arm means being slidably engaged with the support arm bracket means so that the left support arm means can be moved between a extended position and a retracted position, the left and right support arm means defining a second longitudinal axis generally parallel to the first longitudinal axis.

5,193,599
APPARATUS FOR MOUNTING SPOKES BETWEEN A HUB AND RIM OF A SPOKE WHEEL
Jacob Plaatsman, Diemen, Netherlands, assignor to Holland Mechanics B.V., Netherlands
Filed Sep. 16, 1991, Ser. No. 760,867
Claims priority, application Netherlands, Sep. 18, 1990, 9002059
Int. Cl.[5] B21K *1/34*
U.S. Cl. 157—1.55 **20 Claims**



1. Apparatus for mounting spokes between a hub and a rim of a spoke wheel, comprising a hub support for rotatably supporting the hub, rim support rollers for supporting the rim concentrically around the hub, drive means for rotating the rim around the axis of the wheel, a rotatably drivable screw driver for screwing nipples onto respective spokes through nipple holes in the rim, means for determining positions of each of the nipple holes, and means for controlling said drive means in response to the means for determining to align the screw driver and each set of nipple, spoke and nipple hole.

5,193,600
TIRE GROOVING APPARATUS AND METHOD
Satoru Kinuhata, Kobe, and Seiki Yamada, Ibaraki, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Division of Ser. No. 474,760, Mar. 26, 1990, Pat. No. 5,144,996. This application Jun. 25, 1991, Ser. No. 720,685
Claims priority, application Japan, Jul. 28, 1988, 63-189952
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] B29D *30/68*
U.S. Cl. 157—13 **5 Claims**



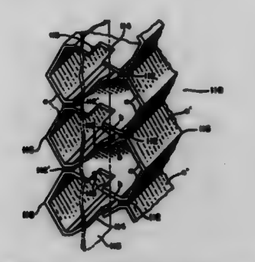
1. A tire grooving method of the present invention is for grooving a tire according to a standard program and is characterized by;

(a) a step of detecting lateral runout of the tire.

(b) a step of detecting center deviation of the tire.

(c) a step of correcting a grooving position of a cutter in accordance with the detected values of lateral runout and center deviation.

5,193,601
MULTI-CELLULAR COLLAPSIBLE SHADE
John A. Corey, Melrose, and John T. Schnebly, Rensselaer, both of N.Y., assignors to Comfortex Corporation, Cohoes, N.Y.
Division of Ser. No. 503,357, Apr. 2, 1990, Pat. No. 5,106,444, which is a division of Ser. No. 287,740, Dec. 22, 1988, Pat. No. 5,015,317. This application Dec. 13, 1991, Ser. No. 807,286
Int. Cl.[5] E06B *3/00*
U.S. Cl. 160—84.1 **4 Claims**



2. A multi-cellular collapsible shade having opposed front and back pleated surfaces comprising:

a single continuous web of flexible material provided with a plurality of parallel crisp creases extending transversely to the length of said web to define a series of pleats;

portions of said web being bonded to itself along longitudinally spaced bonding lines extending transversely to the length of the web;

said creases and said bonding lines being so sequenced relative to each other along the length of said web that, when said web has been folded upon itself in alternating directions at successive crease lines, the resulting structure presents outwardly projecting pleat crests on the oppositely facing front and back surfaces of the shade, said crests and said bonding lines defining an array of parallel transversely extending collapsible cells between the front and back surfaces;

whereby the flexibility of said web material and the functioning of said creases as permanent hinge lines permit said cells to be readily and non-destructively collapsed and expanded along an axis parallel to the length of the original web as the shade is raised and lowered, respectively, during use.

5,193,602
CANVAS COVER FOR WINDOW FRAMES
Teresa J. Morales, 235 SW. Le Jeune Rd., Miami, Fla. 33134
Filed Dec. 12, 1991, Ser. No. 806,233
Int. Cl.[5] E06B *9/32*
U.S. Cl. 160—89 **5 Claims**

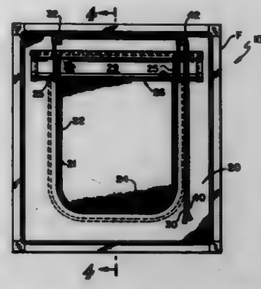
1. A cover in combination with a window frame with a peripheral slot and resilient cord means that is cooperatively received within said slot, and said window frames mounted to form an enclosure and said cover comprising:

A. a canvas sheet having dimensions that are slightly larger than the internal dimensions of said window frames and securely mounted within said slot of said window frame and kept inside by the compression force of said resilient cord means, and said canvas sheet including an opening with an upper edge and said canvas sheet further including an outside surface facing the outside of said enclosure and an inside surface facing the inside of said enclosure;

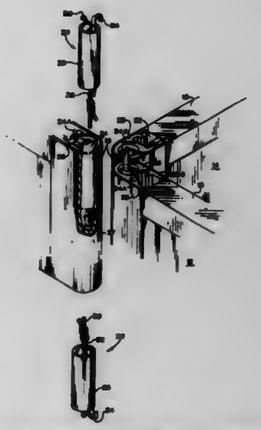
B. a screen member mounted to said canvas sheet so that said opening is covered;

C. a roll up sheet having dimensions larger than said opening, and said roll up sheet having uppermost and lowermost ends, and said uppermost end being mounted to said upper edge of said opening so that when said roll up sheet is rolled up said opening is exposed and conversely when said roll up sheet is distended said opening is covered and said roll up sheet has outer and inner surfaces; and

D. means for rolling up and down said roll up sheet.



5,193,603
DISPLAY FRAMING APPARATUS
Hubert E. Whisnant, Charlotte, N.C., assignor to Whisnant Displays, Inc., Charlotte, N.C.
Filed Dec. 12, 1991, Ser. No. 806,160
Int. Cl.[5] A47G *5/00*
U.S. Cl. 160—135 **21 Claims**



1. In a display framing apparatus for repeated temporary uses having a plurality of individual panels, each panel having a bordering frame with at least one side frame member, the at least one side frame member having at least one end and comprising:

means at said one end of said side frame member for defining a cavity;

assembly means located within said cavity for quick connection and disconnection of said side frame member to the frame of another panel, said assembly means having connection means selectively engageable with and disengageable from the frame of another panel, said assembly means

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being selectively movable between an engaged position wherein said connection means is exposed from said cavity for engagement with the frame of another individual panel and an inoperative storage position wherein said connection means is disposed substantially unexposed from said cavity to avoid interference of said connection means with other of said panels; and

an extensible member securing said connection means within said cavity for selective movement of said connection means by elongation of said extensible member between said inoperative position and said engaged position.

5,193,604

PROCESS FOR CENTRIFUGAL CASTING OF COPPER AND COPPER ALLOYS

Gottfried Brugger, A-5503 Mitterberghütten, Werksgelände 5, Austria

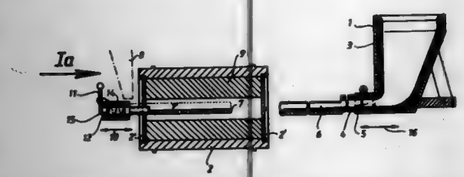
PCT No. PCT/AT89/00105, § 371 Date May 8, 1991, § 102(e) Date May 8, 1991, PCT Pub. No. WO90/06196, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 20, 1989, Ser. No. 659,302

Claims priority, application Austria, Nov. 28, 1988, 2915/88

Int. Cl.[5] B22D *13/02, 13/10*

U.S. Cl. 164—56.1 **4 Claims**



1. A process for reducing the formation of an oxide layer on an inner surface of a copper or copper alloy casting during the centrifugal casting thereof, said process comprising the steps of:

applying powdered borax as an additive onto a still liquid inner surface of said casting immediately after pouring said casting in a rotating casting mold, said borax being applied in a thickness of approximately 0.5 mm to 4.0 mm; and

further rotating said casting mold.

5,193,605

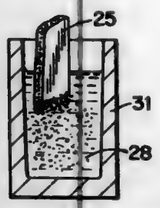
TECHNIQUES FOR PREPARATION OF INGOT METALLURGICAL DISCONTINUOUS COMPOSITES

Amarnath P. Divecha, Falls Church; Subhash D. Karmarkar, Great Falls; William A. Ferrando, Arlington, all of Va.; Scott M. Hoover, Burtonsville, and James M. Kerr, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1991, Ser. No. 787,807

Int. Cl.[5] B22D *19/14*

U.S. Cl. 164—97 **9 Claims**



1. A process for the production of ingots of discontinuous metal matrix composites comprising:

(a) encapsulating particulate refractory material selected from the group consisting of SiC and B_4C, by rolling the refractory particulate material between sheets of a matrix metal selected from the group consisting of Li and Al to form a solid master alloy,

(b) introducing the solid master alloy into another metal or alloy which is slightly above its melting point, mixing, and then cooling to solidify the resultant mixture and form an ingot with the refractory material uniformly dispersed in the ingot.

5,193,606

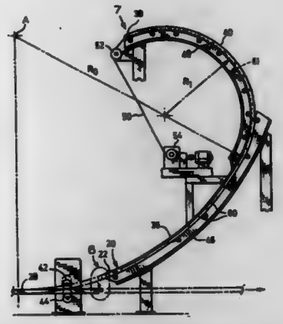
RIGID CONTINUOUS CASTING STARTER BAR WITH FLEXIBLE END FOR STORAGE

Gunther Behrends, 1 Birchcrest Ave., Danbury, Conn. 06811

Filed Feb. 10, 1992, Ser. No. 833,181

Int. Cl.[5] B22D *11/08*

U.S. Cl. 164—446 **6 Claims**



1. A starter bar for closing a mold in a continuous casting machine and for guiding the leading end of a casting from the mold in a curved casting path, the starter bar having a head at one end of the bar for attachment to the leading end of the casting, a tail at the other end of the bar for guiding the bar between rollers forming part of the continuous casting machine, and a body disposed between the head and the tail including a flexible first portion adjacent the tail and a substantially rigid second portion adjacent the head, the body comprising:

a spine disposed on an operatively inner side of the body and defining an inner radius of curvature for the starter bar lying in said curved casting path;

a series of blocks disposed on an operatively outer side of the body arranged end to end and attached on one side thereof to the operatively outer surface of the spine, the blocks thereby defining an outer radius of curvature for the starter bar lying in said curved casting path; and

a plurality of spacing means corresponding in number to the blocks disposed between respective pairs of blocks, the spacing means being arranged so that the blocks will lie in a self-supporting abutting relationship when the starter bar is in a curved configuration corresponding to said curved casting path and adapted to prevent the bar from flexing in a direction away from the spine, the spine in the flexible first portion of the starter bar being substantially more flexible than in the rigid second portion of the starter bar, the associated blocks being adapted to allow the first portion to be bent to a radius of curvature which is substantially less than the radius of curvature of said curved casting path.

5,193,607

METHOD FOR PRECISION CASTING OF TITANIUM OR TITANIUM ALLOY

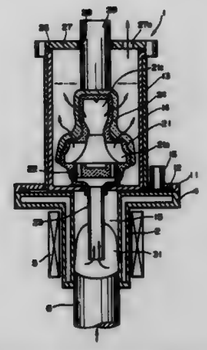
Noboru Demukai, Gifu, and Shingo Hitotsuyanagi, Nagoya, both of Japan, assignors to Daido Tokushuko K.K., Nagoya, Japan

Continuation of Ser. No. 699,834, May 14, 1991, abandoned. This application Aug. 26, 1992, Ser. No. 934,910

Claims priority, application Japan, May 15, 1990, 2-124383

Int. Cl.[5] B22D *18/06, 21/02*

U.S. Cl. 164—493 **4 Claims**



1. A method for precision casting of titanium or titanium alloy which comprises:

continuously feeding base metal of titanium or titanium alloy upwardly into an open bottom crucible formed from a plurality of water cooled copper segments disposed in a circle inwardly of an induction heating coil with said copper segments being insulated from each other;

inductively heating said base metal of titanium or titanium alloy in the crucible to provide molten base metal; and

casting said molten base metal into a permeable mold disposed above the molten base metal by vacuum casting.

5,193,608

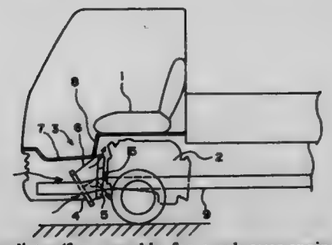
RADIATOR WITH FAN FOR MOTOR VEHICLES

Yoshikazu Sekine, Hadano, and Tadashi Mizuno, Niiza, both of Japan, assignors to Toyo Radiator co., Ltd., Tokyo, Japan

Filed Mar. 25, 1992, Ser. No. 857,342

Int. Cl.[5] F01P *7/02;* **F28F** *9/00;* **B60K** *11/08*

U.S. Cl. 165—41 **4 Claims**



1. A radiator/fan assembly for a cab-over-engine vehicle, said radiator/fan assembly comprising:

a radiator disposed with a forward tilt and including a radiator core;

an air cut duct, a central axis of which rises rearwardly, said air duct including one end with a first opening connected to an outer periphery of a back portion of said radiator core, an opposite end of said air duct including a second opening facing a front portion of an engine of said cab-over-engine vehicle; and

a fan provided between said second opening of said air duct and said front portion of the engine for generating an air flow through said radiator core toward the engine,

said fan including, at its center, a truncated, cone shaped boss and including a plurality of fan blades of equal length and fastened at their bases, respectively, to an outer periphery of said boss, a tip end of said fan blades, in a longitudinal direction, being parallel to a rotating shaft of said boss;

said second opening including a short cylindrical part slightly separated from said tip end of each of said fan blades in a radial direction but parallel to said tip end of each of said fan blades in the longitudinal direction, said cylindrical part partially covering said fan blades in the longitudinal direction such that the trailing edges of said fan blades are exposed, wherein an angle defined by the outer periphery of said boss and a central axis of the rotating shaft thereof ranges from 20 to 35.5 degrees, and a relation between a radius (Ro) from said central axis of the rotating shaft to said tip end of said fan blade, and a radius (Rb) from said central axis of the rotating shaft to the outer periphery of said boss at a midpoint of said fan blade, as measured in the longitudinal direction, is expressed as follows:

R_b/R_o=0.45 to 0.55.

5,193,609

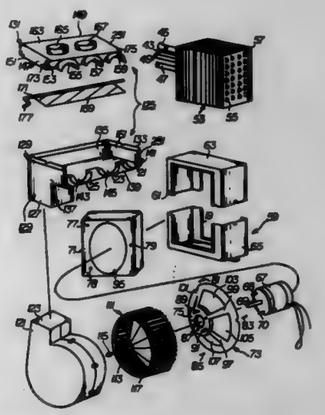
LOW PROFILE HEATING AND COLLING UNIT FOR VEHICLES

Darrow W. Cowart, 5702 Fireside, Arlington, Tex. 76016

Continuation of Ser. No. 707,239, May 22, 1990, abandoned, which is a continuation of Ser. No. 511,079, Apr. 19, 1990, abandoned. This application Nov. 8, 1991, Ser. No. 789,611

Int. Cl.[5] B60H *1/04*

U.S. Cl. 165—42 **10 Claims**



1. A vehicle air treatment unit adapted for use in a vehicle having a passenger compartment and an engine compartment which are separated at least in-part by a firewall which is located rearward and downward from a vehicle dashboard within said vehicle compartment, comprising:

temperature exchange assembly including cooling coils for receiving a cooling fluid from said engine compartment and heating coils for receiving a heating fluid from said engine compartment;

a coolant circulator, disposed within said engine compart-

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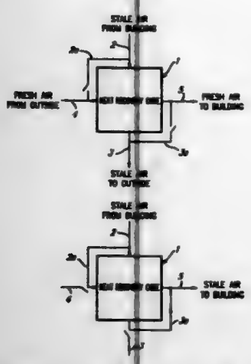
ment, for selectively circulating said cooling fluid through said cooling coils of said temperature exchange assembly;
a heating circulator, disposed within said engine compartment, for selectively circulating said heating fluid through said heating coils of said temperature exchange assembly;
a coil housing for said temperature exchange assembly, having an input port for receiving air and an exhaust port;
a plurality of intake and exhaust members, for said cooling and heating coils, extending generally rearward from said coil housing, passing through ports provided in said firewall for coupling with said heating and coolant circulators within said engine compartment;
a blower motor disposed at least in-part within said coil housing adjacent said temperature exchange coils, having a motor shaft extended outward from said exhaust port of said coil housing;
a motor mount coupled to said coil housing at said exhaust port for coupling said blower motor in a fixed position relative to said coil housing;
a blower wheel coupled to said motor shaft at said exhaust port of said coil housing;
a blower housing disposed about said blower wheel;
means for mounting at least said coil housing to said firewall of said vehicle within said passenger compartment and under said dashboard;
wherein said blower motor operates to pull air through said temperature exchange coils by rotating said blower wheel within said blower housing; and
means for selecting between a cooling mode of operation and a heating mode of operation, wherein during said cooling mode cooling fluid is circulated through said cooling coils and heating fluid is not circulated through said heating coils, and wherein during said heating mode of operation heating fluid is circulated through said heating coils and cooling fluid is not circulated through said cooling coils.

5,193,610
DEFROSTABLE VENTILATION SYSTEM

René Morissette, 270 Bord de L'Eau, St-Pie de Guire, Quebec, Canada J0G 1R0; Daniel Forest, 890 Victoria, St-Charles, Quebec, Canada J2C 6R5, and Michel Julien, 280 Benoit, St-Nicéphore, Quebec, Canada J2A 1A2

Filed Jan. 13, 1992, Ser. No. 819,865
Claims priority, application Canada, Jan. 10, 1992, 2059195
Int. Cl.[5] F24H *3/02*
U.S. Cl. 165—54 8 Claims



1. A defrostable ventilation apparatus, for exchanging air between the interior and exterior of a building, for transferring heat from exhaust air taken from the building to fresh air taken from the exterior ambient air for delivery to the building, and wherein air from the interior of the building is used as defrost air to defrost the ventilation apparatus, said ventilation apparatus having
a fresh air path means having a fresh air intake side and a fresh air discharge side,
an exhaust air path means having an exhaust air intake side and an exhaust air discharge side,
heat exchanger means consisting of heat recovery means for the transfer of heat between exhaust air and fresh air, said heat recovery means comprising one or more air-to-air heat exchanger elements,
each of said air-to-air heat exchanger elements comprising
a first air path defining a portion of said fresh air path means between the intake and discharges sides of said fresh air path means and
a second air path defining a portion of said exhaust air path means between the intake and discharge sides of said exhaust air path means,
each of said air-to-air heat exchanger elements having air-to-air heat exchanging walls between said first and second air paths,
a first defrost air path means for conveying defrost air to said fresh air intake side, and
a first defrost damper, said first defrost damper being displaceable between a ventilation configuration and a defrost configuration,
characterized in that said ventilation apparatus includes
a second defrost air path means for conveying defrost air from said exhaust air discharge side, and
a second defrost damper, said second defrost damper being displaceable between a ventilation configuration and a defrost configuration, and wherein
in said ventilation configuration,
said first and second defrost dampers respectively close off said first and second defrost air path means such that during a ventilation cycle fresh air flow is confined to said fresh air path means and exhaust air flow is confined to said exhaust air path means, and
in said defrost configuration,
said first defrost damper closes off said fresh air intake side and said second defrost damper closes off said exhaust air discharge side such that during a defrost cycle, defrost air taken from the building, is able to circulate, for delivery back into the building, through said exhaust air intake side, through said first defrost air path means, through the first and second air paths of said heat exchanger element, through said second defrost air path means and through said fresh air discharge side.

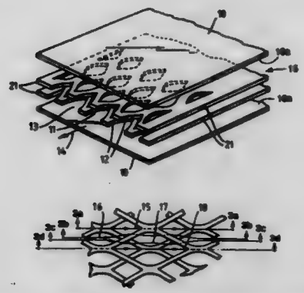
5,193,611
HEAT EXCHANGERS

John E. Hesselgreaves, Lanark, Scotland, assignor to The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB90/00675, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO90/13784, PCT Pub. Date Nov. 15, 1990
PCT Filed May 2, 1990, Ser. No. 773,932
Claims priority, application United Kingdom, May 4, 1989, 8910241
Int. Cl.[5] F28F *3/08*
U.S. Cl. 165—165 9 Claims

1. A heat exchanger including a series of fluid pathways, said heat exchanger comprising:
a plurality of primary surfaces, each fluid pathway being defined by primary surfaces in the form of surfaces of two parallel unperforated primary plates;
at least two secondary plates extending along the fluid pathway between each two primary plates, each secondary plate being flat and being unperforated edges, each secondary plate having their a plurality of perforations, the perforations in adjacent secondary plates being staggered but overlying such that each perforation, other than at

edges of the secondary plates, overlies two laterally and two longitudinally adjacent perforations in an adjacent secondary plate;
means for securing the primary plates to the secondary plates and for securing the secondary plates together at positions where the secondary plates contact one another to form heat conducting pathways between the two primary surfaces, area of secondary plates not in contact with



plates constituting secondary surfaces, said unperforated edges of the secondary sheets combining to form sealing strips;
the series of fluid pathways being stacked together such that adjacent fluid pathways have a common primary plate;
inlet and outlet means connected to said fluid pathways, whereby first and second fluids are supplied to the heat exchanger such that the first and second fluids flow through adjacent fluid pathways.

5,193,612
MULTIPLE-PLATE HEAT EXCHANGER FOR PRESSURIZED FLUIDS

Ulrich Stirnkorb, Bretten, Fed. Rep. of Germany, assignor to W. Schmidt-Bretten GmbH, Bretten, Fed. Rep. of Germany

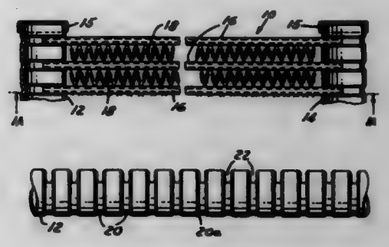
Filed Nov. 29, 1991, Ser. No. 800,486
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1990, 4037969
Int. Cl.[5] F28F *3/10*
U.S. Cl. 165—167 28 Claims

1. A multiple-plate heat capable of use for heat exchange between fluids that are under pressure, comprising:
substantially rectangular plates fitting closely to each other, each having stamped profiling of their surfaces, said plates being of the same material and of essentially the same configuration, stacked with said plates alternately rotated 180° with respect to each other, at least a part of the total number of said plates being compressed together into stack by means for compressibly but releasably stacking said plates together, respective profiled surfaces of successive plates facing each other, whereby flow spaces are formed between the plates;
sealing means respectively surrounding said flow spaces in respective regions of said plates adjacent to their perimeters, which are removable from those of said plates which are releasably stacked together and released;
positioning means, provided on at least half of said plates which are releasably stacked together, for assuring location of said sealing means in said region of said plates when said plates are stacked together;
each of said plates having perforations in their respective corner regions for serving as inlets and outlets for first and second fluids, a first pair of said perforations in corner regions separated from each other at least in the direction of a major dimension of the substantially rectangular plates serving respectively as inlet and outlet for leading a first fluid into and out of a said flow chamber on a first side of a said plate and equipped on a second side of said plate for a fluid-tight connection at said second side of said plate, and the remaining similarly separated pair of perforations of said plate serving respectively as inlet and outlet for leading a second fluid into and out of a said flow chamber on said second side of said plate and equipped for a fluid-tight connection at said first side of said plate, said fluid-tight connections in each case being connections to an adjacent perforation of an adjacent plate of said stack;
means, provided in said means for compressibly stacking said plates, for respectively permitting supply and removal of said first and second fluids to and from said stack of plates, and, in accordance with the invention;
said sealing means being constituted, at least over a major portion of their perimetric length, by a plurality of sealing profile members (15, 16) spaced from each other by a substantially constant spacing with; and
neighboring sealing profile members of each said sealing means being integrally connected to each other by transverse bridges (18) of the same material as the material of said sealing profile members.

5,193,613
HEAT EXCHANGER HEADER TUBE AND METHOD OF MAKING

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Filed Jan. 30, 1992, Ser. No. 906,553
Int. Cl.[5] F28F *9/02*; B21D *53/06*
U.S. Cl. 165—173 8 Claims



1.
A heat exchanger comprising
a pair of tubular opposed parallel header tubes,
a plurality of longitudinally spaced annular grooves around an outer surface of each said header tubes with inclined sides and a base on an external surface of the groove and spaced annular ribs on an inner surface opposite the grooves,

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a slot in the base of each said groove, said slots in one of said header tubes being in alignment with said slots in the other of said header tubes,

a plurality of elongated flat tubes with open ends extending between said headers wherein the open ends of said flat tubes are received within said slots, such that a leakfree braze bond can be obtained between the flat tubes and header tubes,

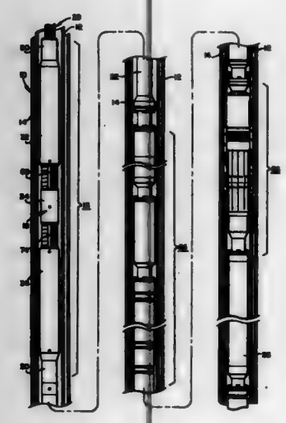
fins disposed between adjacent flat tubes, said header tubes, fins, and flat tubes being bonded to one another.

5,193,614

CABLE ANCHOR ASSEMBLY

Don C. Cox, Roanoke, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 26, 1991, Ser. No. 661,517
Int. Cl.[5] E21B *17/042*
U.S. Cl. 166—65.1 19 Claims



1. A cable anchor assembly adapted to support and protect a power cable delivering motive power to an inverted, cable deployed submersible pump system in a subterranean well, and power cable comprising at least one support cable and at least one motive power delivery means, said cable anchor assembly comprising:

a. threaded upper, middle and lower sleeves each having a longitudinal bore extending therethrough, the middle sleeve comprising one end having left hand threads and one end having right hand threads;

b. means for anchoring the power cable in the longitudinal bore of the upper sleeve;

c. means for anchoring the support cable in the longitudinal bore of the lower sleeve; and

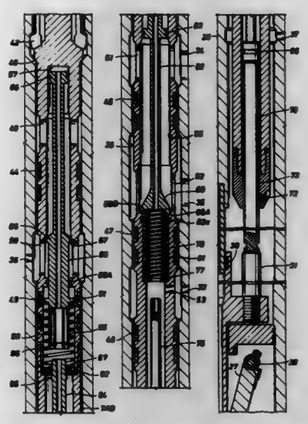
d. length adjustment means for selectively adjusting the spacing between the anchoring means in the upper sleeve and the anchoring means in the lower sleeve.

5,193,615

APPARATUS FOR USE IN CONTROLLING FLOW THROUGH A TUBING STRING SUSPENDED AND PACKED OFF WITHIN WELL BORE AS WELL AS WITHIN THE ANNULUS BETWEEN THE TUBING STRING AND WELL BORE ABOVE AND BELOW THE PACKER

Neil H. Akkerman, Houston, Tex., assignor to AVA International Corporation, Houston, Tex.

Continuation of Ser. No. 518,976, May 4, 1990, abandoned. This application Jan. 22, 1991, Ser. No. 644,244
Int. Cl.[5] E21B *34/10, 23/03*
U.S. Cl. 166—129 27 Claims



1. Apparatus for use in controlling flow within a tubing string suspended and packed off within a well bore as well as the annulus between the tubing string and well bore above and below the packer, comprising

a mandrel having a bore therethrough adapted to be connected as part of the tubing string and a pocket having an opening to one side of the bore,

a closure member movable within the bore of the mandrel between positions opening and closing the bore beneath the pocket opening,

means urging the closure member to the closed position,

a tool movable vertically through the tubing string into and out of a landed position within the pocket,

said mandrel and tool having means which, when the tool is landed in the pocket, forms first passageway means for connecting the annulus above and below the packer,

said tool having

an actuator movable between a first position permitting the closure member to move to the closed position and a second position in which it moves the closure member to the open position,

valve means movable from a first position closing the first passageway means to a second position opening the first passageway means, and

pressure responsive means for moving each of said actuator and valve means to its second position,

said mandrel and tool also having means which, when the tool is landed in the pocket, forms second passageway means therein through which control fluid may be supplied from a remote source to the pressure responsive means in order to move each of said actuator and valve means from its first to its second positions, and

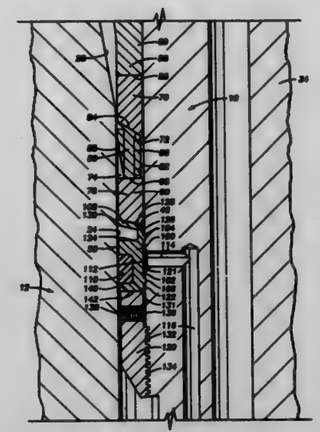
means by which said actuator and said valve means are returned to their first positions following loss of control pressure.

5,193,616

TUBING HANGER SEAL ASSEMBLY

Joseph H. Hynes, Houston, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 6, 1991, Ser. No. 740,801
Int. Cl.[5] E21B *33/04*
U.S. Cl. 166—208 15 Claims



1. A seal assembly for a hanger suspending a string of pipe into a well from an outer hanger, comprising:

a metal seal ring mounted on and extending around the hanger, said metal seal ring forming a static metal-to-metal seal with the hanger, said static metal-to-metal seal being formed by mounting the seal ring on the hanger;

a dynamic metal sealing lip on said metal seal ring and having a non-sealing position and a sealing position, said static metal-to-metal seal forming a metal-to-metal seal with the hanger in said non-sealing position, said dynamic metal sealing lip adapted to establish a metal-to-metal seal with the outer hanger in said sealing position; and

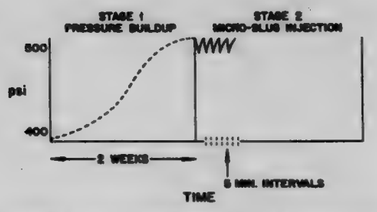
means for moving said dynamic metal sealing lip from said non-sealing position to said sealing position.

5,193,617

MICRO-SLUG INJECTION OF SURFACTANTS IN AN ENHANCED OIL RECOVERY PROCESS

Adrian D'Souza, Richmond, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Filed Jul. 22, 1991, Ser. No. 733,708
Int. Cl.[5] E21B *43/22, 43/24*
U.S. Cl. 166—263 16 Claims



1. A method for introducing a surfactant into an oil-bearing formation comprising a plurality of micro-slug injections of surfactant into the formation;

wherein each micro-slug injection comprises introducing a surfactant into the formation for a period of "on time" which is based upon the time needed for the surfactant to generate a desired foam in the formation, followed by stopping of the surfactant flow for a period of "off time" which is based upon the time period for the foam to degrade to a predetermined degree.

5,193,618

MULTIVALENT ION TOLERANT STEAM-FOAMING SURFACTANT COMPOSITION FOR USE IN ENHANCED OIL RECOVERY OPERATIONS

William Loh, and Rawls H. Frazier, Jr., both of Petaluma, Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Sep. 12, 1991, Ser. No. 758,556
Int. Cl.[5] E21B *43/22, 43/24*
U.S. Cl. 166—272 20 Claims

1. A method for recovering hydrocarbons from a reservoir during gas injection into said reservoir comprising:

at least periodically injecting gas comprising steam and a foam-forming composition including a steam foam diversion surfactant into the reservoir which contains at least one multivalent cation;

wherein the composition comprises water, an effective foam forming amount of the steam foam diversion surfactant, and an effective sequestering amount of at least one precipitation control additive which comprises an α-olefin sulfonate dimer (AOSD),

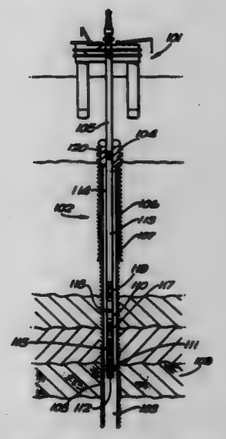
contacting the hydrocarbons in the reservoir with the foam and the gas so as to assist in the recovery of hydrocarbons from the reservoir.

5,193,619

WELL CONTROL APPARATUS

Jeffrey C. Edwards; Ray Johns, both of Aberdeen, and Robert D. Buchanan, Belhelvie, all of Scotland, assignors to Exploration and Production Services (North Sea) Ltd., Reading, England

PCT No. PCT/GB90/00606, § 371 Date Oct. 8, 1991, § 102(e) Date Oct. 8, 1991, PCT Pub. No. WO90/13731, PCT Pub. Date Nov. 15, 1990
PCT Filed Apr. 20, 1990, Ser. No. 768,856
Claims priority, application United Kingdom, Apr. 28, 1989, 8909892; Mar. 23, 1990, 9006586
Int. Cl.[5] E21B *34/08, 34/10*
U.S. Cl. 166—321 20 Claims



1. A pressure release apparatus for use in a well test pipe string consisting of a multiplicity of sections of elongate tubular pipe, or tubing, joined end to end, each section comprising a tubular wall with an axial bore, the string containing therein a reservoir in which may be stored a main source of reference

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pressure gas, tube-external pressure surrounding the pipe string in use in a well, comprising mounted within the pipe string tubing:

an elongate reference gas chamber for holding reference pressure gas from the reservoir, the chamber having two ends one of which is in use the upper end and the other of which is in use the lower end;

two spaced slidable pistons, positioned one at each end of said reference gas chamber, each piston having an inner face, or end, facing toward the other piston, and an outer face, or end, facing away from the other piston, each said piston having an elongate body extending between its two ends, and each piston being adapted to have tube-external pressure acting on its outer end face, shear pin means, said pistons being capable of relative movement along said gas chamber but which are normally secured together by said shear pin means;

a vent port connected in communication with said reference gas chamber, and operative to permit escape of the reference pressure gas out of the pipe string, said vent port normally blocked by one piston, or the other piston; and

a liquid chamber for holding hydraulic liquid, a passageway in said pipe string tubing, connection means between said liquid chamber and said passageway being normally blocked by one piston or the other piston;

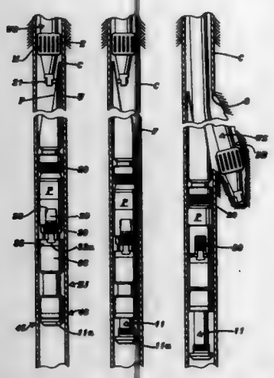
whereby application of sufficient predetermined externally-derived pressure to both pistons causes pin shearing relative movement of said two pistons thus permitting subsequent piston movement to open both said vent port for the reference gas and said passageway to said liquid chamber for hydraulic liquid.

5,193,620

WHIPSTOCK SETTING METHOD AND APPARATUS

Britt O. Braddick, Houston, Tex., assignor to TIW Corporation, Houston, Tex.

Filed Aug. 5, 1991, Ser. No. 740,458
Int. Cl.[5] E21B *7/08, 23/06, 23/00*
U.S. Cl. 166—382 **30 Claims**



1. A whipstock assembly and packer assembly for lowering together in a well bore on a work string for orienting and anchoring the whipstock assembly and packer assembly in a cased well bore in a single trip by manipulating the work string, comprising:

a whipstock assembly, said assembly including:

a whipstock for releasably connecting with the work string;

a mandrel secured to said whipstock and depending therefrom;

a packer assembly supported on said mandrel;

said packer assembly including a mechanical weight compression set packer; and

upper and lower slip and cone means above and below, respectively, said packer.

26. A method of orienting and anchoring a whipstock and for changing the direction of drilling through a cased well bore with a single trip of a work string, wherein the whipstock is releasably connected to a mill supported on the work string, and wherein the whipstock supports a packer and slip and cone means to set the packer in the cased well bore comprising the steps of:

lowering into the cased well bore the work string with the mill thereon releasably connected to the whipstock;

rotating the work string to release the work string for longitudinal movement relative to the packer;

rotating the work string to orient the whipstock in position in the cased well bore; and

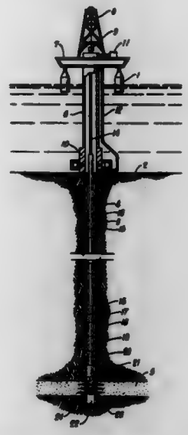
moving the work string longitudinally to engage the slip and cone means with the packer to anchor the whipstock in the oriented position in the cased well bore.

5,193,621

BYPASS VALVE

Kevin R. Manke, Flower Mound, and Paul D. Ringgenberg, Carrollton, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 30, 1991, Ser. No. 693,759
Int. Cl.[5] E21B *34/08*
U.S. Cl. 166—386 **19 Claims**



1. A well tool apparatus comprising:

a tubular housing having a portion defining at least one bypass port;

a power mandrel slidably disposed within said tubular housing;

an operating mandrel slidably disposed within said tubular housing;

means for axially urging said power mandrel into said operating mandrel;

an inner sleeve mandrel having a portion defining a bypass port, said inner mandrel being slidably disposed with said tubular housing, the bypass port in said inner sleeve mandrel being initially aligned with the bypass port in said tubular housing; and

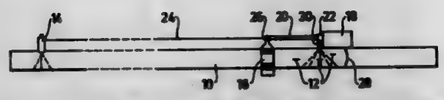
means for sliding said inner sleeve mandrel relative to said tubular housing so that the bypass port defined in said tubular housing and the bypass port on the inner sleeve mandrel are no longer aligned.

5,193,622

DEVICE FOR PREVENTING THE RISK OF FIRE DUE TO BURNING OR GLOWING PARTICLES IN A PIPELINE

Kurt Tibbling, Huddinge, Sweden, assignor to Firefly AB, Huddinge, Sweden

PCT No. PCT/SE86/00537, § 371 Date Jul. 2, 1987, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO87/03210, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 24, 1986, Ser. No. 74,488
Claims priority, application Sweden, Nov. 29, 1985, 8505637
Int. Cl.[5] A62C *35/10*
U.S. Cl. 169—54 **5 Claims**



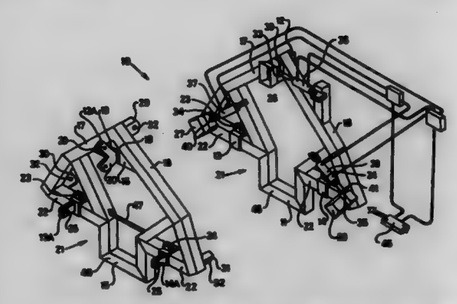
1. A device for eliminating the risk of fire due to hot particles being conveyed through a pipeline, said device comprising a pipeline; a heat sensitive detector in communication with said pipeline; a flap valve comprising a resilient deformable membrane which is pivotable between an open position, in which the membrane bears upon an inner surface of said pipeline, and a closing position in which said membrane is perpendicular to a longitudinal axis of said pipeline, and a pin release adapted to be actuated by an extinguishing agent, said flap valve being operably connected to said heat sensitive detector to block said pipeline when a risk of fire is detected in said pipeline; and a container comprising a compressed extinguishing agent adapted to be fed via a conduit for said compressed extinguishing agent into said pipeline when said pipeline is blocked by said flap valve, wherein said container is operably connected to said flap valve via said conduit so that, as said compressed extinguishing agent passes out of said container via said conduit, said extinguishing agent initiates a release of said flap valve to block said pipeline and extinguishes said hot particles within said pipeline.

5,193,623

HITCHING ASSEMBLIES

John Burette, 10 Bergman St., Samford, Queensland, Australia 4520

PCT No. PCT/AU88/00342, § 371 Date Jan. 16, 1991, § 102(e) Date Jan. 16, 1991, PCT Pub. No. WO90/02481, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 5, 1988, Ser. No. 646,767
Int. Cl.[5] A01B *59/043*
U.S. Cl. 172—47 **8 Claims**



1. A hitch assembly for coupling an implement to a prime mover, said hitch assembly comprising:

a first connector assembly having mounting means for mounting the first connector assembly on the prime mover;

a second connector assembly having mounting means for mounting the second connector assembly on the implement;

socket members disposed on one connector assembly at an upper medial location thereof and at lower outer locations at opposite sides of said medial location;

plug members disposed on the other said connector assembly at an upper medial location thereof and at lower outer locations at opposite sides of said medial location, said socket members and said plug members being complementary; and,

retaining means for operatively securing said connector assemblies together for hitching the implement to the prime mover, characterized in that:

said mounting means on said first connector assembly or on said second connector assembly includes a height adjustable, upper medial mounting means and two laterally adjustable, lower mounting means;

said socket members include a conical shaped throat portion having a substantially horizontal entry axis;

said plug members being conical in shape; and,

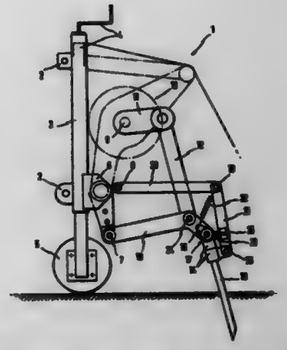
said retaining means for retaining said plug members engaged in said socket members.

5,193,624

DEVICE FOR LOOSENING SUB SOIL

Georg Wiedenmann, Ramsingen, Fed. Rep. of Germany, assignor to Wiedenmann GmbH, Ramsingen, Fed. Rep. of Germany

PCT No. PCT/DE90/00844, § 371 Date Aug. 7, 1991, § 102(e) Date Aug. 7, 1991, PCT Pub. No. WO91/07076, PCT Pub. Date May 30, 1991
PCT Filed Nov. 8, 1990, Ser. No. 721,504
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1989, 3937211
Int. Cl.[5] A01B *45/02*
U.S. Cl. 172—84 **12 Claims**



1. A self-powered arrangement connectable to a vehicle for loosening sub-soil, comprising: a plurality of piercing tools spaced along said arrangement; crank means; a linkage of connected elements driven by said crank means to reciprocatingly actuate said piercing tools for piercing the sub-soil; one of said connected elements being a working element connected to said crank through a crank rod and moving against a single spring to generate reciprocating motion of said piercing tools; a stop on said linkage for limiting said reciprocating motion; a chassis with a first mounted bearing for holding a first end of said working element, said working element having a second end connected to said piercing tools through tool mounting means; a second one of said connected elements being a guide lever having a first end held in a second mounted bearing on said chassis; a third one of said connected elements being a connecting lever having a first end connected to a second end

of said guide lever and having a second end connected to said piercing tools through said tool mounting means; said one end and said other end of said working element being spaced from each other by a distance substantially equal to the distance between said first end and said second end of said guide lever, said first mounted bearing being spaced from said second mounted bearing by a distance substantially equal to the distance between said second end of said guide lever and said second end of said working element, said linkage being formed as a parallelogram linkage by said distances; means for adjusting the distance between said first mounted bearing and said second mounted bearing during motion of said piercing tools and said working element against said spring and away from said stop for loosening the sub-soil; said second end of said working element being connected to said tool mounting means by a first pivot, said second end of said connecting lever being connected to said tool mounting means through a second pivot spaced from said first pivot.

5,193,625

TRACTOR DRAWBAR HITCH ADAPTOR

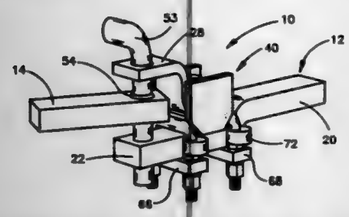
Charles J. Goll, 1902 Highway D, Marthasville, Mo. 63357

Continuation-in-part of Ser. No. 690,636, Apr. 24, 1991, Pat. No. 5,109,931. This application May 4, 1992, Ser. No. 877,859

The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.

Int. Cl.[5] B60D *1/00*

U.S. Cl. 172—248 **12 Claims**



1. A tractor drawbar and hitch for receiving a tongue of an implement, said implement being adapted to be connected to an implement connecting pin receiving hole in said drawbar, said hitch comprising a hitch member having adjustable connecting means for pivotally connecting it to said drawbar for rotary movement about a vertical axis between an engaged hitch position in which an implement connecting pin receiving hole in the hitch member is in registry with the pin receiving hole in said drawbar and a disengaged position to clear said hitch member hole from registry with said drawbar hole and a lock member pivotally connected to said hitch member for rotary movement about a horizontal axis, said lock member being moveable between a locked position in relation to said drawbar to lock said hitch member and an unlocked position in relation to the drawbar to free the hitch member for said rotary movement between said engaged and disengaged positions, said adjustable connecting means comprising a mounting member fitting upon said drawbar and being adjustable longitudinally upon said drawbar to present the implement connecting pin receiving hole in the hitch member in registry with the pin receiving hole in the drawbar.

5,193,626

DRILLING DEVICE

Wilhelm Jacob, Velbert, Fed. Rep. of Germany, assignor to Rudolf Hausherr & Sohne GmbH & Co. KG, Sprockhovel, Fed. Rep. of Germany

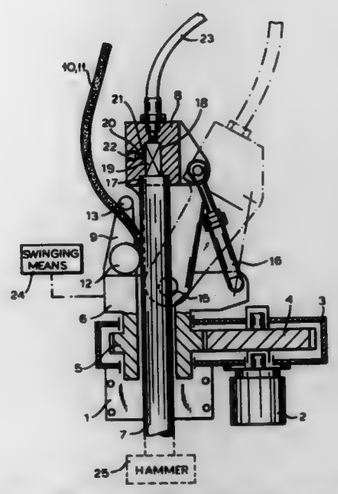
PCT No. PCT/EP90/01353, § 371 Date Apr. 23, 1991, § 102(e) Date Apr. 23, 1991, PCT Pub. No. WO91/02880, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 17, 1990, Ser. No. 681,497

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927952

Int. Cl.[5] E21C *1/06*; E21B *17/18*

U.S. Cl. 173—197 **6 Claims**



1. A drilling device for drilling shot holes, comprising:

a slide carriage slidable along a longitudinal axis;

a oscillation pressure-medium-actuated drive mounted on said slide; and

a drill-rod assembly mounted on said slide, said assembly comprising:

at least one drilling rod having front and plug-in ends and being provided with two outwardly opening longitudinal channels,

a hydraulically actuated in-hole hammer mounted on said front end of said drilling rod,

a pressure-operated drive system swingable about said longitudinal axis for transmitting a torque produced by said drive to said hammer, said drive system oscillating at an angle ranging between 180° to 360° and including:

a drive member operatively connected and driven by said oscillation drive,

retracting means operatively connecting with said drive member for inserting a pair of hoses into and out of said channels of the respective rod, said hoses conducting pressure oil to and from said in-hole hammer,

a flushing head oscillatory fixed with said drive member and retracting means, said head receiving a blast-air line and being provided with a recess receiving said plug-in end of the respective drilling rod, so that said flushing head is detachably connected with said rod, and

swivelling means for swiveling said flushing head about a swivel axis skewing said longitudinal axis out of an alignment with said slide for receiving the respective rod, said drive system transmitting said torque to said rod upon interlocking said head with said plug-in end of the rod.

5,193,627

APPARATUS FOR CONTROLLING A RAMMING DEVICE

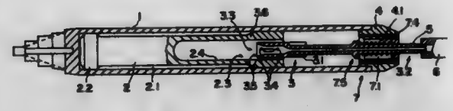
Dietmar Jeune, Strengelbach, Switzerland, assignor to Terra AG, Strengelbach, Switzerland

Filed Mar. 4, 1991, Ser. No. 664,325

Claims priority, application Switzerland, Mar. 9, 1990, 00774/90

Int. Cl.[5] E21B *11/02*

U.S. Cl. 175—19 **17 Claims**



1. A ramming device adapted for forward running and rearward running, comprising: a ram housing having a percussion head in which a percussion piston (2) can be moved axially back and forth by compressed air; a control device (3) for controlling the compressed air so that, during forward running of the ramming device the percussion piston (2) strikes a front side of the ram housing, and during rearward running the percussion piston strikes a rear side of the ram housing (1), said control device (3) protruding into a part of the percussion piston (2) away from a tip of the percussion piston and interacting with control openings in the percussion piston (2), which control advancing movement and returning movement of the percussion piston (2) said control device being seated displaceably in a cover (4) terminating the ram housing (1), and being connected to a house connection (5), led through said cover (4), for connection to an air supply hose (6); and an arresting device (7) for the control device (3), which fixes the control device temporarily relative to the cover (4) in individual switching positions, which are set by turning the air supply hose (6), wherein the arresting device (7) is at the same time designed as a damping device, at least one air chamber (7.1), variable in size, being provided as arresting and damping element and arranged essentially axially parallel to the control device (3), the air chamber (7.1) being bounded at end faces by a rear and a front terminating ring (7.2.1 and 7.3.1, respectively) which are axially displaceable with respect to each other, wherein the rear terminating ring (7.2.1) is connected to the control device (3) and the front terminating ring (7.3.1) is connected to the ram housing (1), wherein axial walls of the air chamber being formed by an outer convex surface (3.1) of the control device (3) and a cylinder-like inner surface (4.1) of the cover (4); at least two energy accumulating elements (7.4), provided between the terminating rings and pressing said rings apart; a positioning device for interacting with the front terminating ring (7.3.1) and with the control device (3), the air chamber (7.1) being connected by a connecting line to a space (9) containing compressed air said compressed air peventing reversing during forward or rearward running.

5,193,628

METHOD AND APPARATUS FOR DETERMINING PATH ORIENTATION OF A PASSAGEWAY

John L. Hill, III, Dale City; Eugene L. Foster, and William J. Hutzel, both of Alexandria, all of Va., assignors to UTD Incorporated, Newington, Va.

Filed Jun. 3, 1991, Ser. No. 709,293

Int. Cl.[5] E21B *7/04, 47/12*

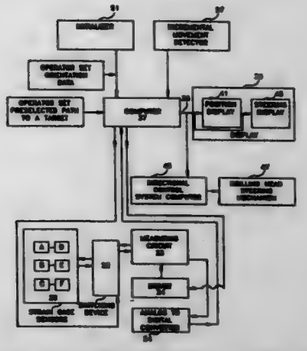
U.S. Cl. 175—45 **26 Claims**

1. A method for determining, in three dimensions, at least one of (a) the path of a passageway and (b) the location of a measuring instrument in the passageway, comprising the steps of:

moving a measuring instrument through said passageway;

determining the local radius of curvature of said measuring instrument and the associated azimuth of the plane of curvature with respect to said instrument at each of a plurality of measurement points as said measuring instrument moves through said passageway;

forming a circular arc segment in three dimensional space representing each determined local radius of curvature; and



constructing a three dimensional representation of at least one of (a) the path of said passageway and (b) the location of said measuring instrument, by sequentially connecting end-to-end the circular arc segments.

5,193,629

METHOD AND APPARATUS FOR DETERMINING THE NUMBER AND/OR VALUE OF WEIGHED ITEMS

Christopher Lare, Bridgend, United Kingdom, assignor to Percell Group Limited, Gwent, England

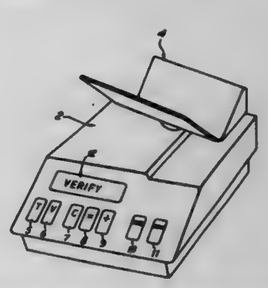
PCT No. PCT/GB89/00630, § 371 Date Jan. 16, 1991, § 102(e) Date Jan. 16, 1991, PCT Pub. No. WO89/12217, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 7, 1989, Ser. No. 623,441

Claims priority, application United Kingdom, Jun. 7, 1988, 8813399

Int. Cl.[5] G01G *19/42*

U.S. Cl. 177—25.17 **38 Claims**



1. An apparatus for determining the number and/or value of weighed items, said apparatus comprising:

storage means for storing calibrated values representative of parameters of weighed items and for storing tolerance limits for ensuring the accuracy of the determination to be carried out,

processor means for receiving a weight signal representative of the weight of items being weighed during a determination and for selecting a calibrated value,

wherein said processor means further comprises means for forming a quotient comprising means for dividing the weight signal received by the calibrated value selected, and means for comparing the quotient formed with said

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stored tolerance limits and determining if the quotient is within or outside the tolerance limits,

wherein said apparatus further comprises means for varying said stored tolerance limits for the determination being carried out, the variation of said stored tolerance limits being dependent upon parameters of the items being weighed or upon parameters of the determination being carried out, and

wherein said apparatus further comprises output means for signalling the result of the determination and signalling that the determination is acceptable when the quotient is within the varied tolerance limits and further signalling that the determination is unacceptable when the quotient is outside the varied tolerance limits.

5,193,630

DEVICE PARTICULARLY SUITABLE FOR THE AUTOMATIC CHECKING OF THE WEIGHT OF A PRODUCT PUT INTO BOTTLES BY HIGH-OUTPUT MICRO-FEEDERS

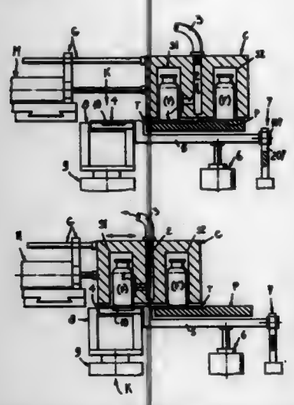
Alessandro Casé, Bologna, Italy, assignor to IMA Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Dec. 23, 1991, Ser. No. 811,668

Claims priority, application Italy, Jan. 23, 1991, GE91 A 000022

Int. Cl.[5] G01G *19/52*; B65G *47/26*; B07C *5/16*

U.S. Cl. 177—50 4 Claims



1. Improved device for weighing systems, particularly for micro-feeders, which carry out the extraction of a bottle (F) to be weighed from a conveyor line (T) on which bottles move in single file, the extraction being performed by a container (C) with a pair of portal type compartments arranged side by side (S1–S2), so that while one compartment extracts a bottle from said line, the other compartment inserts the bottle extracted in the preceding, cycle into the same line, characterized in that the improved device comprises an elevator comb (4) located laterally with respect to said conveyor line, normally coplanar with said line, and located above a complementary grid-shaped platform (8) connected to sensors of a weighing balance (9), the whole being done in such a way that the bottle to be weighed is initially transferred by container (C) to said comb which is subsequently lowered to deposit said bottle on the grid-shaped platform of the balance, without transmitting any appreciable vibration to the balance, in a similar way to what happens in the subsequent phases of the cycle when, on completion of weighing, the bottle is raised from the grid-shaped platform of the balance by the elevator comb which takes over the support of the bottle before it is traversed by container (C) and replaced on the conveyor line of the micro-feeder.

5,193,631

WEIGHING SCALES

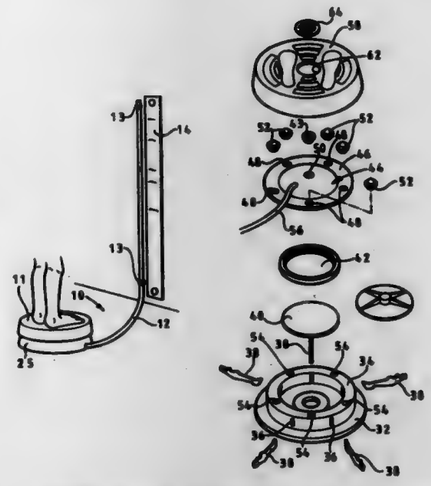
Michael G. Lannie, Kilworth Beauchamp, and Lewis W. Horton, Denbigh, both of Great Britain, assignors to Invicta Plastics Ltd, Leicester, England

Filed May 10, 1991, Ser. No. 698,121

Claims priority, application United Kingdom, May 11, 1990, 9010610; Mar. 26, 1991, 9106436

Int. Cl.[5] G01G *5/04, 23/38*

U.S. Cl. 177—208 3 Claims



1. A weighing scale for determining a weight of an article placed thereupon comprising:

a circular base;

an annular collar being integrally formed and coaxial with said circular base, said collar defining a recess and being formed with a plurality of equally angularly spaced slots;

a plurality of lever means being respectively received in said angularly spaced slots so as to project into said recess, each of said lever means adapted to pivot about a lower edge of its respective slot;

a plunger means received in said recess and contacting a radially inner end of said lever means;

a reservoir cover formed to cover said recess and adapted to be secured to said annular collar;

a diaphragm received in said recess and adapted to be sealed in place between said cover and said collar;

a platform contacting the radially outward ends of said lever means, said platform adapted to move relative to said base and said collar;

a deformable reservoir formed between said diaphragm and said cover, said deformable reservoir being compressible in response to said weight of said article on said platform and containing a displaceable fluid;

a display means in fluid communication with said deformable reservoir for displaying the volume of fluid displaced; and

a recording means for temporarily recording the position of a meniscus of the fluid displaced from said reservoir;

whereby in response to the weight being placed on said platform, said platform is translated relative to said collar, said lever means pivots about the lower end of it respective slot, said plunger is translated within said recess, said deformable reservoir is compressed, and said fluid is displaced from said deformable reservoir to said display means.

5,193,632

VEHICLE WITH MOTORIZED PROPULSION UNITS

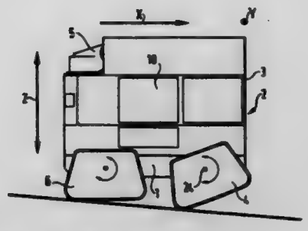
Georges Clar, Lyons; Olivier Carra, Peyrins, and Patrice Feuillet, Marcy l'Etoile, all of France, assignors to Framatome, Courbevoie, France

Filed Jul. 9, 1991, Ser. No. 727,045

Claims priority, application France, Jul. 9, 1990, 90 08692

Int. Cl.[5] B62D *55/00*; B25J *5/00*

U.S. Cl. 180—91 5 Claims



1. A vehicle comprising:

(a) a vehicle body; and

(b) a plurality of propulsion units for supporting and propelling said vehicle body, each of said propulsion units being elongated along a longitudinal direction thereof for propelling said vehicle body along said longitudinal direction, each of said propulsion units comprising:

(i) a coupling structure borne by said vehicle body and having a tubular shape around a transverse tilt axis of each of said propulsion units for coupling each of said propulsion units to said vehicle body while enabling each of said propulsion units to tilt about said transverse tilt axis;

(ii) a motorized tilt means mounted on each of said propulsion units and bearing on said coupling structure for tilting themselves and each of said propulsion units about said tilt axis; and

(iii) drive motor means located inside said coupling structure for driving each of said propulsion units.

5,193,633

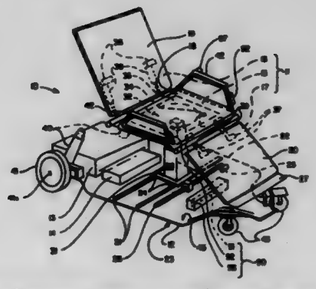
MOTORIZED TRANSFER AND TRANSPORT SYSTEM FOR THE DISABLED

Bertram N. Ezenwa, Centerville, Ohio, assignor to Wright State University, Dayton, Ohio

Filed Jun. 7, 1991, Ser. No. 712,266

Int. Cl.[5] B60K *1/00*

U.S. Cl. 180—65.1 34 Claims



1. A powered transfer and transport system for the disabled, said powered system comprising:

a wheeled frame;

a power source comprising one or more rechargeable batteries disposed on said wheeled frame;

a seating surface comprising one or more panels supported by said wheeled frame;

one or more arms disposed on at least one side of said seating surface;

powered means for laterally shifting said seating surface, said powered means for laterally shifting disposed on said wheeled frame and connected to said power source;

powered means for elevating said seating surface, said powered means for elevating disposed on said frame and connected to said power source;

powered means for rotating said seating surface, said powered means for rotating disposed on said means for elevating and connected to said power source;

control means for operating said powered means for laterally shifting, said powered means for elevating, and said powered means for rotating, said control means disposed on said frame and operable from said seating surface; and

means for recharging said rechargeable batteries, said means for recharging operable from said seating surface.

5,193,634

HYBRID PROPULSION SYSTEM FOR VEHICLES, IN PARTICULAR FOR ROAD VEHICLES

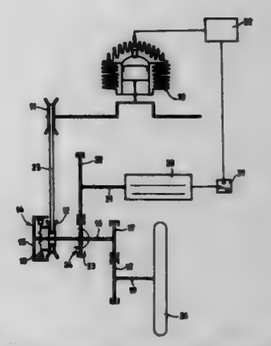
Lucio Masut, Biestina, Italy, assignor to Piaggio Veicoli Europei S.p.A., Milan, Italy

Continuation of Ser. No. 762,656, Mar. 1, 1991, abandoned. This application Aug. 11, 1992, Ser. No. 927,714

Claims priority, application Italy, Mar. 5, 1990, 19621 A/90

Int. Cl.[5] B60K *25/00*

U.S. Cl. 180—65.2 2 Claims



1. A hybrid propulsion system for vehicles comprising a vehicle having a drive wheel, a first propulsion unit for generating motion which is adapted to be transmitted to said drive wheel, said first propulsion unit being an internal combustion engine, a second propulsion unit for generating motion which is adapted to be transmitted to said drive wheel, said second propulsion unit being a battery powered electric motor, means for preventing the simultaneous operation of said internal combustion engine and said battery powered electric motor, first transmission means for transmitting motion generated by said internal combustion engine to said drive wheel, second transmission means for transmitting motion generated by said battery powered electric motor to said drive wheel; said first transmission means including a variable speed transmission defined by first and second frusto-conical pulleys and a pulley belt entrained thereabout, said first pulley being driven by said internal combustion engine, automatic engagement centrifugal clutch means associated with said second pulley for imparting rotation to an associated transmission shaft, said automatic engagement centrifugal clutch means includes centrifugal weights carried by said second pulley for effecting driving engagement with a driven element of said automatic engagement centrifugal clutch means which is in turn carried by said

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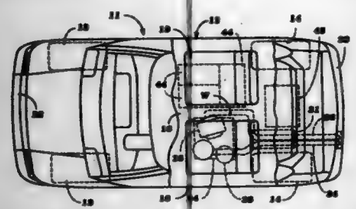
transmission shaft, a pair of meshed gear wheels between said transmission shaft and a shaft of said drive wheel; and said second transmission means including a first gear wheel driven by an output shaft of said battery powered electric motor in mesh with a second gear wheel which is in turn connected by a free wheel to said transmission shaft whereby motion will be imparted to said transmission shaft from said battery powered electric motor only if the speed of its said output shaft exceeds the speed of said transmission shaft.

5,193,635
VEHICLE WITH FUEL CELL SYSTEM

Yutaka Mizuno; Toshiharu Hasajima, and Hisayoshi Matsubara, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 21, 1990, Ser. No. 587,967
Claims priority, application Japan, Sep. 21, 1989, 1-247209
Int. Cl.[5] B60K *1/04*
U.S. Cl. 180—65.3 13 Claims



1. A fuel cell powered wheeled vehicle having a body assembly defining at least one passenger seat, a pair of wheels suspended by said body at one end thereof in transversely spaced apart relation, a wheel suspended by said body at the other end thereof, means for steering at least one of said wheels, an electric motor for driving at least one of said wheels, a fuel cell system comprising a fuel cell for generating electrical power for said electric motor for driving said at least one of said wheels and a reformer for supplying fuel to said fuel cell, said fuel cell being resiliently supported contiguous to the center of gravity of said vehicle system including said fuel cell and said reformer, said fuel cell system being positioned transversely between the pair of wheels and longitudinally between the pair of wheels and the wheel suspended by the body at the other end thereof for protection of said fuel cell system upon front and side impacts of said vehicle.

5,193,636
HOOD

David R. Holm, Oconomowoc, Wis., assignor to Deere & Company, Moline, Ill.

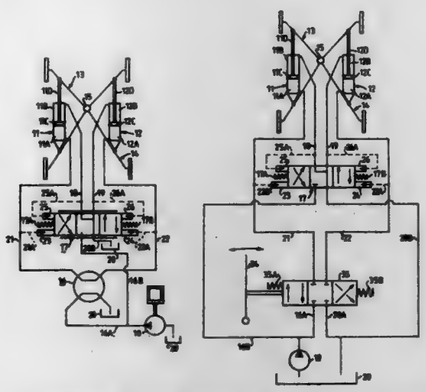
Filed Jul. 23, 1990, Ser. No. 557,297
Int. Cl.[5] B62D *25/10*
U.S. Cl. 180—68.1 2 Claims

1. A power source enclosure, as used on a vehicle having a power source cooling system, said enclosure comprising:
a bottom piece having side portions laterally spaced from the power source and extending generally vertically, and having a middle portion positioned above the power source, said middle and side portions being integral with each other, said middle portion defining an opening through which air may pass to the power source cooling system, said bottom piece being coupled with the vehicle for shifting to an open position whereat the power source is generally exposed;
a top piece received on the bottom piece to form a chamber between the top piece and the middle portion through which air may pass to the opening defined by the middle portion, said top piece being coupled with the bottom piece along an edge portion of the top piece for shifting motion with the bottom piece, a portion of said edge portion being spaced apart from the bottom piece to form an opening between the top and bottom piece and through which air may pass from outside of the enclosure into the chamber;
said top and bottom piece being formed of a plastic material; and
means for maintaining a portion of the edge portion spaced apart from the bottom piece to allow air to pass from outside of the enclosure into the chamber, said maintaining means including a laterally outwardly extending member integral with the bottom piece, said member having an upwardly extending side structure integral therewith, and said edge portion of the top piece defining an opening within which is received the upwardly extending side structure, said side structure being received within the opening for restricting lateral motion of the edge of the top piece relative to the bottom piece.

5,193,637
HYDRAULIC STEERING SYSTEM FOR ARTICULATED AUTOMOTIVE VEHICLE

Sture Lindblom, Eskilstuna, Sweden, assignor to VME Industries Sweden AB, Eskilstuna, Sweden

PCT No. PCT/SE89/00547, § 371 Date Mar. 26, 1991, § 102(e) Date Mar. 26, 1991, PCT Pub. No. WO90/03909, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 5, 1989, Ser. No. 668,507
Claims priority, application Sweden, Oct. 5, 1988, 8803534
Int. Cl.[5] B62D *5/12*
U.S. Cl. 180—139 3 Claims

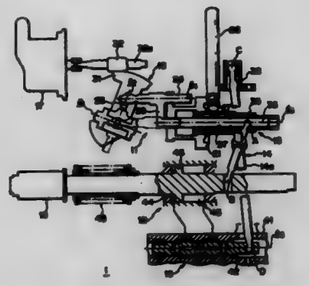


1. A hydraulic steering system for an automotive vehicle comprising two vehicle halves (11, 12) which are mutually articulated on a journal pivot (15) and can be swung by means of two hydraulic piston-cylinder devices each of which has a first chamber (11A, 12A) and a second chamber (11B, 12B) on respective sides of a piston connected to a piston rod (11D, 12D) in said piston-cylinder devices, and which is connected to a pressure-oil pump (10) via a control valve (16, 35) adjustable by means of vehicle steering means and a directional valve which can be adjusted to either one of its two terminal positions by means of said oil pressure, such as to effect desired swinging of the vehicle halves relative to one another, and in which system adjustment of the control valve, while maintaining the directional valve in its central position between said two terminal positions, from a central position causes the first chamber (11A or 12A) of one piston-cylinder device (11 or 12) to be connected to the oil pump, while the first chamber (12A or 11A) of the other piston-cylinder device is connected, at the same time, to a return tank (20), therewith causing the piston-cylinder devices to operate as a single-acting device, whereas simultaneous adjustment of the directional valve (17) to either of its two terminal positions under the influence of oil pressure in respective lines between the pump and the first chamber of the one or the other piston-cylinder device will also result in a connection between the pump and the second chamber (11B, 12B) of said other and said one piston-cylinder device respectively such as to cross-connect the two piston-cylinder devices, characterized in that the directional valve (17) steered by pressure oil in either direction is spring-biased (17A, 17B) in a manner such that the directional valve is held by spring forces in its central position until the oil pressure rises above a predetermined value, whereby at oil pressures beneath said predetermined oil pressure and at correspondingly low steering resistances the hydraulic piston-cylinder devices are coupled to function as single-acting piston-cylinder devices, whereas when the oil pressure rises as a result of a corresponding increase in steering resistance, the directional valve (17) is moved to either one of its terminal positions, such as to couple the hydraulic piston-cylinder devices in a manner to operate as double-acting piston-cylinder devices, and pressure lines (18, 19) extending between the directional valve (17) and the second chambers (11B, 12B) of the two piston-cylinder devices, said pressure lines (18, 19) being branched (25A, 26A) such as to balance pressure actuation (at 25, 26) of the directional valve (17) when adjusting the position of the valve to either one of its terminal positions.

5,193,638
REFERENCE POSITION DETECTION METHOD OF VEHICLE REAR WHEEL STEERING APPARATUS

Koji Fujio, Kure; Yutaka Tagashira, Hiroshima; Hiroshi Ogawa, Hiroshima; Hirotaka Kanazawa, Hiroshima, and Hiroki Yoshioka, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 18, 1991, Ser. No. 717,070
Claims priority, application Japan, Jun. 18, 1990, 2-160830; Jun. 18, 1990, 2-160831; Sep. 29, 1990, 2-260873
Int. Cl.[5] B62D *15/02*
U.S. Cl. 180—140 17 Claims



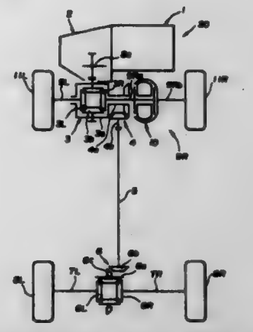
1. A reference position detection method of a vehicle rear wheel steering apparatus which includes:
an input shaft for inputting a steering angle of front wheels;
an output rod assembly which is stroked in an axial direction thereof upon reception of an input from said input shaft so as to steer the rear wheels; and
a yoke assembly coupled to and swingably supported by said output rod assembly, and
wherein a stroke amount of said output rod assembly upon rotation of said input shaft is changed in accordance with a swing angle of said yoke assembly, said method comprising:
a first step of setting said input shaft and the yoke assembly at arbitrary angular positions;
a second step of rotating said input shaft by an arbitrary angle to pass a neutral angular position in a state set in the first step;
a third step of measuring a rotational angle θ of said input shaft and a moving amount $\delta 1$ of said output rod assembly upon rotation in the second step;
a fourth step of rotating said yoke assembly to pass a neutral angular position so that said output rod assembly is stroke-moved by a moving amount $-\delta 1$ from a stroke position defined by the moving amount $\delta 1$ of said output rod assembly measured in the third step;
a fifth step of rotating said input shaft by an angle $-\theta$ after the fourth step, and measuring a moving amount $\delta 2$ of said output rod assembly; and
a sixth step of determining, as a reference position of said yoke assembly, an angular position obtained by rotating said yoke assembly from the rotated state in the fifth step so that said output rod assembly is displaced by:

$$-\delta\theta^2/(\delta 1+\delta 2)$$

5,193,639
FOUR WHEEL DRIVE POWER TRAIN FOR VEHICLE

Tomoyuki Hara, and Hideki Sado, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 29, 1991, Ser. No. 752,077
Claims priority, application Japan, Aug. 31, 1990, 2-230955
Int. Cl.[5] B60K *17/348*
U.S. Cl. 180—248 12 Claims



1. A four wheel drive system for a vehicle, comprising:
a transverse power unit comprising an engine and a transmission, said power unit being transversely mounted on the vehicle;
a first differential unit connected with an output member of said transmission, said first differential unit comprising a differential case, and first and second side gears;
an angular drive unit which comprises input and output members rotating on respective nonparallel axes and which transmits rotation from said input member to said output member of said angular drive unit, said input member of said angular drive unit being connected with said differential case of said first differential unit;

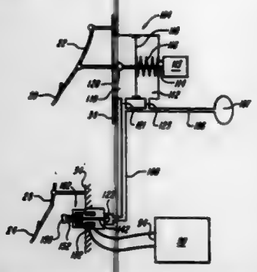
a propeller shaft connected with said output member of said angular drive unit;
first and second side permanent drive wheels of the vehicle;
a second differential assembly for dividing a driving torque transmitted through said propeller shaft between said first and second side permanent drive wheels;
first and second side nonpermanent drive wheels;
a first side nonpermanent drive axle shaft connecting said first nonpermanent drive wheel with said first side gear of said first differential unit; and
a second side nonpermanent drive axle assembly connecting said second side nonpermanent drive wheel with said second side gear of said first differential unit, and varying a driving torque transmitted from said second side gear of said first differential unit to said second side nonpermanent drive wheel, said second side nonpermanent drive axle assembly comprising an input shaft connected with said second side gear of said first differential unit, an output shaft connected with said second nonpermanent drive wheel, and an orifice coupling unit for connecting said input shaft of said second side axle assembly with said output shaft of said second side axle assembly, and varying a torque transmitted from said input shaft of said second side axle assembly to said output shaft of said second side axle assembly.

5,193,640

VEHICLE SAFETY SYSTEM FOR DRIVER PEDAL MISAPPLICATION

Hae-Seung Lee, 1 Watermill Pl., Apt. 215, Arlington, Mass. 02174

Filed Jan. 17, 1991, Ser. No. 642,665
Int. Cl.[5] F01N *1/16*; B60K *41/20*
U.S. Cl. 180—271 **17 Claims**



1. A safety system for use in a motor vehicle comprising:
an accelerator adapted to open a throttle valve in response to user preasure, the accelerator having a first position wherein the throttle is fully opened when the accelerator is depressed to the first position, and a second position wherein the accelerator is depressed beyond the first position,
a motor speed control device, and
motor speed control device actuation means interconnected to said accelerator and to said motor speed control device so as to actuate a reduction in motor speed when said accelerator is in said second position.

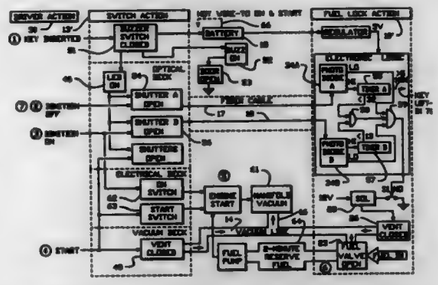
5,193,641

ANTI-THEFT VEHICLE SYSTEM AND METHOD

Robert R. Durrell, Redwood City, Calif., assignor to Quantic Industries, San Carlos, Calif.

Filed Aug. 30, 1991, Ser. No. 753,337
Int. Cl.[5] B60R *25/00*
U.S. Cl. 180—287 **9 Claims**

1. An anti-theft method for a vehicle having a internal combustion engine with a fuel tank and which disables the fuel supply of the tank to the engine, the engine having an ignition system with a normal start-up procedure including insertion of a key into an ignition switch (OFF condition), placing the ignition switch in a stable ON condition, and temporarily placing the ignition switch in a start condition to actuate a starting motor and then allowing the switch to resume its stable ON condition comprising the steps of:
sensing said insertion of said ignition switch key and timing such insertion;
starting said engine by temporarily placing said ignition system in said start condition;



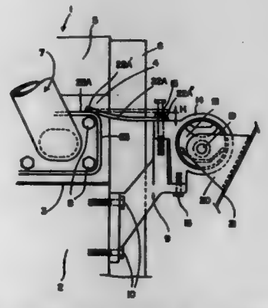
thereafter closing a first vacuum relief valve, which is connected to the intake manifold vacuum of the engine, if said timing indicates less than a predetermined duration, to allow the manifold vacuum of the engine to enable the fuel supply from the tank to the engine but allowing said relief valve to remain open to disable said fuel supply if said timing indicates greater than said predetermined duration.

5,193,642

ENGINE MOUNTING APPARATUS FOR VEHICLE

Hiroshi Miyake, Osaka, Japan, assignor to Daihatsu Motor Co., Ltd., Osaka, Japan

Filed Apr. 6, 1992, Ser. No. 863,959
Claims priority, application Japan, Jun. 5, 1991, 3-134123; Jan. 31, 1992, 4-16464
Int. Cl.[5] B60K *5/12*
U.S. Cl. 180—312 **7 Claims**



1. An engine mounting apparatus for a vehicle comprising:
an arm member projecting from an engine;
a shell member mounted to the arm member;
an insulator made of a relatively soft elastic material and received in the shell member; and
a pin inserted into the insulator and mounted to a vehicle body frame;
wherein one of the arm member and the shell member provides a first support portion while the engine provides a second support portion; and
wherein a resilient member is arranged to extend between the first and second support portions in an elastically deformed state, the resilient member having a base end fixed to one of the first and second support portions, the resilient member further having a free end slidably bearing against the other of the first and second support portions.

5,193,643

NUT AND RETAINER ASSEMBLY

Kenneth A. McIntyre, Culleoka, Tenn., assignor to Saturn Corporation, Troy, Mich.

Filed Jul. 25, 1991, Ser. No. 735,416
Int. Cl.[5] B60K *5/12*
U.S. Cl. 180—312 **2 Claims**

1. In an automotive vehicle having a hollow support frame including bottom and side walls, an engine and cradle assembly and a nut and retainer assembly carried by said bottom wall of said side frame and disposed above an opening therethrough, said cradle and engine assembly being connected to said frame via bolts inserted through said openings in said bottom wall and threadably engaging said nut, the improvement being that said nut and retainer assembly comprises a nut having a generally rectangular shaped planar base and an axially extending hub provided with a threaded opening therethrough,
a one piece, spring steel sheet metal retainer having a planar body portion provided with a hole therethrough which has a larger diameter than said threaded opening in said nut,
said sheet metal retainer being stamped and bent to provide a pair of generally U-shaped channels along its sides for loosely slidably receiving opposite sides of said planar base of said nut, a first upwardly extending tab at its forward end for engaging said planar base of said nut and a second upwardly extending tab for engaging said planar base at its rearward end, one of said first and second tabs being deflectable from its normal free state position toward the plane of said body portion to enable said planar base of said nut to be inserted between said side channels and being returnable toward its free state position upon the planar base of the nut being positioned between said first and second tabs whereby said nut is loosely retained between said side channels and said first and second tabs in a manner such that it has limited floating movement between the side channels and the first and second tabs,
a third upwardly and laterally outwardly extending, deflectable tab on one side of said body portion adjacent its forward end and a deflectable upwardly and laterally outwardly extending handle portion on said body portion adjacent its rearward end and its side opposite said one side, said handle portion having a lanced deflectable fourth tab,
said frame adjacent said through opening in its bottom wall having a first slot in one side wall for insertion of said nut and retainer assembly, said frame portion having a second slot in its opposite side wall whose side edges define first abutment surface for engaging said third tab, said frame having a second abutment means adjacent said slot along its bottom edge which is engageable by said fourth tab,
said nut and retainer assembly being connectable to said frame by inserting and longitudinally shifting the same through said slot, said third tab engaging said opposite side wall of said frame and being deflected when said nut and retainer assembly is inserted through and longitudinally shifted of said slot until said third tab snaps through and is engageable with a side edge of said second slot on said frame, said handle portion then being deflectable inwardly and downwardly of said frame until said fourth deflectable tab on said handle portion rides over said second abutment means and locks therebehind.

5,193,644

PIPELINE VIBRATION DAMPER

James D. Hart, Berkeley, Calif.; Richard Sause, Hellertown, Pa.; G. Wyche Ford, Anchorage, Ala., and Lloyd D. Brown, Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 12, 1991, Ser. No. 684,104
Int. Cl.[5] F16F *7/00*
U.S. Cl. 181—207 **16 Claims**

1. A vibration damper for damping vibratory motion of a section of pipeline and the like between support points of said pipeline, comprising:
support means for connecting said damper to a section of said pipeline between supports points;
a mass member having a predetermined weight; and
damper means interconnecting said support means and said mass member for suspending said mass member from said section of pipeline and characterized by at least one damper member comprising an elastomeric member having opposed spaced apart support parts for connecting said one damper member to said support means and in supporting relationship to said mass member, respectively, such that said one damper member is subjected primarily to shear stresses due to the weight of said mass member and the vibratory motion of said section of pipeline for damping such vibratory motion.

5,193,645

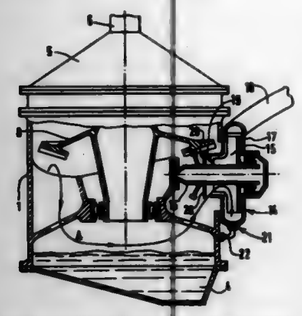
METHOD FOR COOLING REDUCTION GEARS LUBRICATED WITH SPRAYED OIL AND IMPLEMENTATION EQUIPMENT

Roland C. Francois, Cabries, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Feb. 25, 1992, Ser. No. 841,122
Claims priority, application France, Mar. 7, 1991, 91 02729
Int. Cl.[5] F16H *57/02*
U.S. Cl. 184—6.12 **7 Claims**

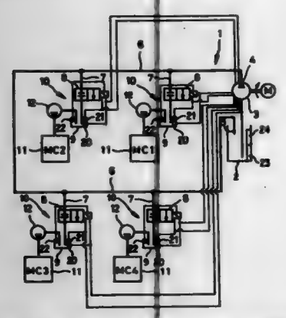
1. A method for cooling a mechanical reduction gear operatively connected within a gearbox which is connected to and openly communicating with an oil recovery tank whereby the reduction gear is lubricated by sprayed oil under pressure, the method comprising the steps of:
admitting into the reduction gear a flow of previously filtered fresh air at ambient temperature;
directing the air flow through the oil recovery tank and through the reduction gear in the gearbox so as to be mixed with the sprayed oil by being heated via direct

exchange with the oil and via direct contact with reduction gear components which are heat generators;
sucking up the air/oil mixture from outside of the gearbox and away from the reduction gear;



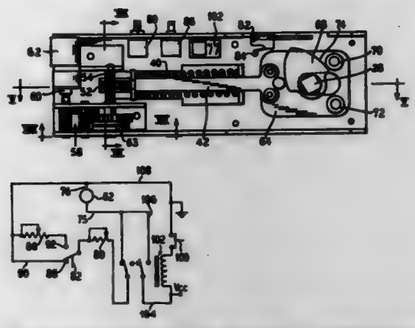
purifying the air from the air/oil mixture; and
rejecting the purified air away from the gearbox.

5,193,646
CENTRALIZED LUBRICATION APPARATUS
Yoshiharu Horikawa, Shimizu; Kazuya Kawada, Fukui, and Yoichi Yamada, Haruo, all of Japan, assignors to Matsuura Machinery Corporation, Fukui, Japan
Filed Aug. 9, 1991, Ser. No. 742,991
Claims priority, application Japan, Apr. 16, 1991, 3-84099
Int. Cl.[5] F16N *27/00*
U.S. Cl. 184—7.4 4 Claims



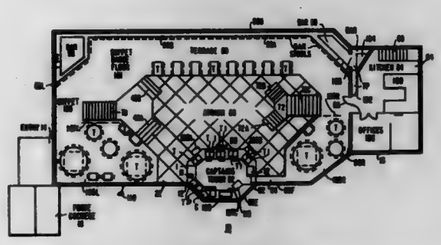
1. A centralized lubrication apparatus for supplying lubricant to a plurality of apparatuses to be lubricated, each apparatus to be lubricated having a lubricant supply device, comprising a lubricant circulation system having a storage tank including a return port, a lubricant supply pump connected to said storage tank and including a delivery port, and a supply conduit connecting the delivery port of said lubricant supply pump and the return port of said storage tank; and a lubricant supply system having a plurality of branch pipes provided at a plurality of suitable locations along said supply conduit and a plurality of lubricant supply tanks connected to respective branch pipes via a plurality of shut-off control valves, each lubricant supply tank being connected to a respective lubricant supply device of a separate one of said plurality of apparatuses to be lubricated.

5,193,647
EASY OPENING DOOR CONTROL DEVICE
James A. O'Brien, II, Burbank, Calif., assignor to Thomas Industries, Inc., Los Angeles, Calif.
Filed Mar. 23, 1992, Ser. No. 856,290
Int. Cl.[5] F03G *1/00*; E05F *3/00*; F16H *19/04*
U.S. Cl. 185—40 R 20 Claims



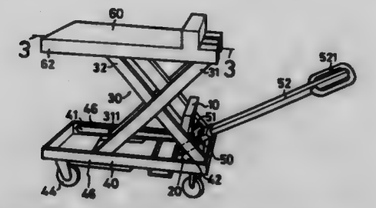
1. A door control device for use with a pivotable door and powered by an external electrical power supply comprising:
a rotatable spindle member for engagement with the door to rotate when said door is pivoted;
energy storage means operatively connected to said spindle member for releasing energy to close said door;
an electrical motor;
selective transmission means between said motor, energy storage means and spindle member, operable during an opening of said door, for causing energy transmission from said motor to said energy storage means, yet preventing energy transmission from said motor to said spindle member, and for disconnecting said spindle member from said energy storage means; and
circuit means for connecting said external electrical power supply to said motor to assist in said opening of said door.

5,193,648
RESTAURANT CONSTRUCTION SYSTEM
Seymour C. Yuter, 407 Cedar Dr. West, Briarcliff Manor, N.Y. 10510
Filed May 24, 1991, Ser. No. 705,126
Int. Cl.[5] E04H *3/04*
U.S. Cl. 186—38 44 Claims



43. A restaurant construction system comprising:
(A) a building having a first floor adapted to support tables and chairs;
(B) said building also having a second floor comprising a terrace adapted to support tables and chairs directly over a portion of said first floor and forming an atrium between said terrace and one side of said building; and
(C) an order-taking post extending into said atrium and supported above said first floor along said one side of said building at a height providing a direct view of tables and chairs on said terrace and a direct view of tables and chairs on said first floor which are beneath said terrace.

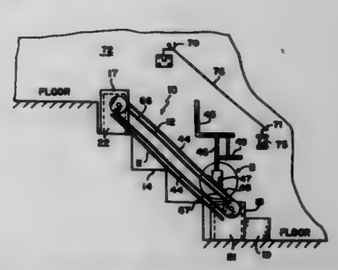
5,193,649
PLATFORM CAR
Steven Lee, 11th Fl., No. 603, Sec. 5, Chungshan N. Rd., Taipei, Taiwan
Filed Jun. 23, 1992, Ser. No. 902,965
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—9 R 2 Claims



1. A platform car comprising:
a base frame with a plurality of casters, comprising
two parallel longitudinal side plates each with a first groove extending along a longitudinal axis thereof; and
a base plate;
a platform above said base frame, comprising two second parallel longitudinal side plates each with a second groove extending along a longitudinal axis thereof;
two X-shaped members respectively disposed along both sides of said base frame, each said X-shaped member comprising
a first bar with a first end thereof pivotally attached to said base plate and a second end thereof slidably received in said second groove in said platform; and
a second bar pivotally connected to said first bar at a middle portion thereof with a first end thereof pivotally attached to said platform and a second end thereof slidably received in said first groove of said base plate;
a cylinder with a piston rod mounted on said base plate;
a handle with one end thereof attached to said base plate to operate said cylinder;
an actuating member securely attached to and actuatable by said piston rod;
a pair of connecting members each with a first end thereof pivotally attached to said actuating member and a second end thereof securely attached to a lower part of associated said first bar of said X-shaped member;
whereby a movement of said actuating member responsive to a manual operation of said handle urges said second ends of said first bars of said X-shaped members to pivot about said first ends of said first bars and to slide in said grooves of said platform, thereby controlling a height of said platform.

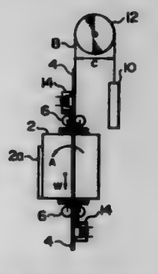
5,193,650
PORTABLE STAIR LIFT
George W. Kent, Jr., 3522 Hampton Hwy., Yorktown, Va. 23693
Filed May 6, 1992, Ser. No. 879,243
Int. Cl.[5] B66B *9/08*
U.S. Cl. 187—12 12 Claims

1. A portable stair lift system for transporting a passenger up or down an inclined stairway comprising:
a pair of spaced elongated metal plates of substantially the same length as the stairs over which a passenger is to be transported;
a support structure disposed at each end of the stairs;
a pair of spaced end bracket means secured to each said support structure;
said pair of spaced end bracket means being connected to and maintaining said pair of spaced elongated metal plates in parallel spaced relationship;
a rotatable axle extending through each of said pair of spaced end bracket means and disposed adjacent each end of said pair of spaced elongated metal plate members;
at least one roller member secured to and rotatable with each said rotatable axle;
bearing means disposed in each said end bracket means for rotatably supporting an end of each said axle;
an integral sprocket wheel secured to and rotatable with at least one of said axles;
an electric motor for said portable chair lift;
a drive shaft extending from and driven by said electric motor;



at least one chain drive pulley secured and driven by said drive shaft;
a drive chain connecting said at least one chain drive pulley to said sprocket wheel on said at least one axle;
a conveyor belt extending around and rotatably driven by at least one of said roller members;
a passenger support structure secured to and movable with said conveyor belt for transporting a passenger along the length of the inclined stairway; and
switch means leading to an electric power source and to said electric motor for enabling a passenger transported by said passenger support structure to reversibly control the direction of movement of said conveyor belt and said passenger support structure.

5,193,651
ELEVATOR APPARATUS
Masayuki Shigeta, Katsuta; Tadashi Shibata, Ibaraki; Jun Sugahara; Toshihiko Nara, both of Katsuta, and Kiyoyasu Mitsumori, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 10, 1991, Ser. No. 757,210
Claims priority, application Japan, Sep. 10, 1990, 2-237170
Int. Cl.[5] B66B *7/02*
U.S. Cl. 187—95 16 Claims



1. An elevator apparatus comprising a car, a pair of guide rails, and guide devices mounted respectively on upper and lower portions of said car, said guide devices having guide members engaged with said guide rails so as to guide said car

along said guide rails in a manner to hold said car in a proper position;

wherein each guide device of said guide devices comprises a resilient support member having a small spring constant supporting a guide member of said guide device in such a manner that said guide member is movable in a direction perpendicular to a plane of a guide rail engaged by said guide member;

wherein said elevator apparatus further comprises deflected load generating means for causing, independent of a bend in said guide rail, a guide load, acting on a side surface of said guide rail via said guide member in a direction perpendicular to the plane of said guide rail, to include a deflected load acting on said guide rail in only one direction at all times; and

wherein said guide device further comprises an anti-deflected load generating device for generating an anti-deflected load in a direction to reduce the deflected load of the guide load caused by said deflected load generating means, the anti-deflected load generating device being disposed between said car and said guide rail.

5,193,652

INWARDLY STRADDLING DISC BRAKE FOR AUTOMOTIVE VEHICLES

Rudolf Thiel, Frankfurt am Main; Ulrich Klimt, Gross-Umstadt; Helmut Kast, Frankfurt am Main; Hans Bungert, Geisenheim; Ludwig Dreilich, Kronberg/Ts., and Hinrich Hornbostel, Bad Camberg, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

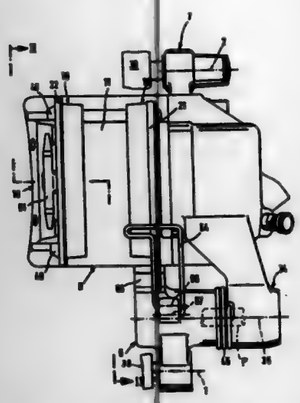
PCT No. PCT/EP90/00252, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO90/10162, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 16, 1990, Ser. No. 613,497

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1989, 3906713; Feb. 1, 1990, 4002955

Int. Cl.[5] F16D *55/00*

U.S. Cl. 188—73.31 15 Claims



1. A disc brake mounting arrangement for an automotive vehicle rotary wheel, said automotive vehicle having rotationally fixed wheel suspension structure,

said disc brake including an annular brake disc and a member mounting said annular brake disc to said wheel, said mounting arrangement comprising:

a brake housing including a cylinder section on one side of said brake disc and a bridge section extending within said brake disc including a lug support extending radially outward to lie opposite said other side of said brake disc, said brake housing thereby straddling said brake disc with said brake disc rotating from an entering side to a leaving side of said brake housing;

a cylinder bore formed in said cylinder section extending in an axial direction at said one side of said brake disc;

an actuator piston slidably disposed in said bore and having one end facing said brake disc one side;

an internal brake lining disposed between said piston one end and said brake disc to be able to be forced into engagement with said one side of said brake disc by said piston and means including a backing plate supporting said internal lining to resist tangential forces exerted by engagement of said lining with said brake disc;

an external brake lining disposed between said lug support and the other side of said brake disc to be able to be forced into engagement with the other side of said brake disc by axial shifting of said lug support and means including a backing plate supporting said external lining to resist circumferential forces exerted thereon upon engagement with said brake disc;

a holder and means for attaching said holder to said rotationally fixed wheel suspension structure, said holder disposed only on one side of said brake housing;

means rotationally mounting said brake housing to said holder at a single point on one side of said housing, said means allowing limited axial movement of said brake housing; and

means mounting said brake housing to said rotationally fixed wheel suspension structure at another point of said brake housing on the other side of said brake housing from said single point mount to said holder, said means allowing limited axial movement of said brake housing.

5,193,653

MECHANICALLY ACTUATED BRAKE WITH AUTOMATIC ADJUSTMENT

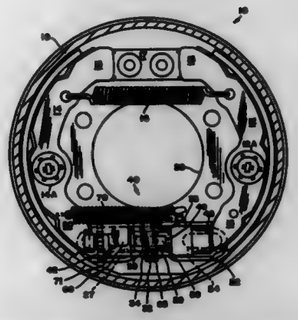
Clyde E. Carr, Galien, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 572,195, Aug. 23, 1990, Pat. No. 5,085,296. This application Aug. 27, 1991, Ser. No. 750,344

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] F16D *51/50*

U.S. Cl. 188—79.55 10 Claims



1. A mechanically actuated brake with automatic adjustment, comprising a support plate providing support for a pair of brake shoes disposed oppositely from one another, first and second pairs of brake shoe ends connected at the first pair of ends by spring means urging the first pair of brake shoe ends toward one another, a mechanical actuator and adjuster mechanism located between the second pair of brake shoe ends, the mechanism including an adjuster device comprising a laterally slidable housing having a longitudinal opening communicating with a transverse opening therethrough, an actuator lever extending to engage a part of the adjuster device by way of said transverse opening, the adjuster device having first, second and third parts, the first and second parts located within said longitudinal opening, the second part engaging said lever, abutting an end of said second pair of brake shoe ends, and slidably received in the longitudinal opening, the third part comprising a pawl engageable by the lever, means for connecting rotatably the lever and pawl with said housing, said pawl extending to engage said first part, a spring extending between and attached to said pawl and one brake shoe end of the second pair of brake shoe ends in order to actuate directly the adjuster device, and a second spring extending between and attached to the connecting means and the other brake shoe end of said second pair of brake shoe ends.

5,193,654

HYDRODYNAMIC RETARDER WITH SHIFTABLE STATOR BLADE WHEEL

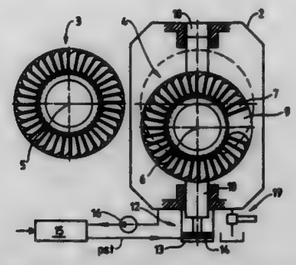
Klaus Vogelsang, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 5, 1991, Ser. No. 681,185

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1990, 4010970

Int. Cl.[5] F16D *57/04*; F03D *9/00*; B60T *1/087*

U.S. Cl. 188—296 20 Claims



1. A hydrodynamic retarder comprising a housing for containing operating liquid;

a rotor blade wheel supported for rotation in the housing and including rotor blading thereon;

a relatively non-rotating stator blade wheel supported in the housing and including stator blading thereon, the stator blading being opposite the rotor blading, such that the stator balding and the rotor blading may cooperate with the operating liquid for hydrodynamic retarding;

support means for supporting the stator blade wheel for being displaced eccentrically in position with respect to the rotor blade wheel between more and less aligned conditions thereof;

a pressurized fluid displacement device connected with the stator blade wheel for adjusting the eccentric position of the stator blade wheel with respect to the rotor blade wheel, and the stator blade wheel exerting a brake reaction force which moves the stator blade wheel eccentrically and the displacement exerting an opposed displacement force, the displacement device being adjustable to apply an adjusted displacement force on the stator blade wheel which is adjustable proportional to a desired braking moment.

5,193,655

VARIABLE DAMPING FORCE SHOCK ABSORBER WITH FEATURE OF LINEAR AND WIDE RANGE DAMPING FORCE VARIATION DEPENDING UPON PISTON STROKE SPEED

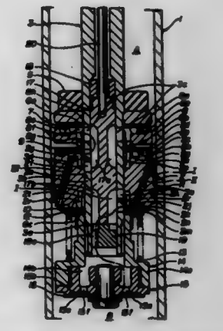
Mitsuo Sasaki; Shinobu Kakizaki; Fumiyuki Yamaoka, and Hiroyuki Shimizu, all of Kanagawa, Japan, assignors to Atsugia Unisia Corp., Japan

Continuation of Ser. No. 583,829, Sep. 13, 1990, abandoned. This application Jul. 13, 1992, Ser. No. 911,376

Claims priority, application Japan, Sep. 20, 1989, 1-109919[U]

Int. Cl.[5] F16F *9/46*

U.S. Cl. 188—299 2 Claims



1. A variable damping force shock absorber comprising:

a cylinder having an interior space containing working fluid;

a piston assembly disposed within said interior space of said cylinder and dividing said interior space into a first fluid chamber and a second fluid chamber which are filled with said working fluid;

a piston rod extending into said interior space and having a bore and a radial port communicating with said bore of said piston rod;

said piston rod having a first bushing and a second bushing within said bore thereof, said second bushing being spaced from said first bushing and disposed adjacent a hollow fastening, said first bushing closing one end of said bore of said piston rod and being formed with a groove having one end communicating said bore of said piston rod and an opposite end;

a rotary valve member rotatably disposed in said bore of said piston rod and supported between said first and second bushings, said rotary valve member having a first angular position in which said rotary valve member covers said radial port to block fluid communication between said radial port and said one end of said groove of said second bushing and a second angular position in which said rotary valve member uncovers said radial port to allow fluid communication between said radial port and said one end of said groove of said second bushing;

a hollow fastening nut fixedly coupled with said piston rod and having formed therein a bore having one end communicating with said opposite end of said groove of said second bushing;

a valve body fixedly secured to said hollow fastening nut to close an opposite end of said bore of said hollow fastening nut, said valve body being formed with an opening communicating with said bore of said hollow fastening nut;

a check valve mounted to said valve body and covering said opening to prevent a flow of fluid from said second fluid chamber to said bore of said hollow fastening nut through said opening;

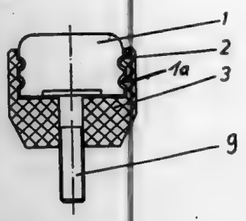
said piston assembly being assembled on said piston rod and fixed thereto, said piston assembly including a piston body having a first end surface adjacent to said first fluid cham-

ber and a second end surface adjacent to said second fluid chamber,
said piston body having a fluid path formed therein, said fluid path having one end communicating with said first fluid chamber and an opposite end,
said piston body having a central groove communicating with said radial port of said piston rod;
said piston body having said second end surface formed with an inner groove communicating with said opposite end of said fluid path, an outer groove disposed radially outward of said inner groove, and a radial groove communicating with said inner groove and said central groove; and
a damping valve mounted to said piston body and disposed on said second end surface for covering said inner, outer and radial grooves and said central groove.

5,193,656
COLLECTOR SHOE FOR COLLECTOR AND PROCESS FOR PRODUCING IT

Peter Hoffmann, Steeg; Johann Hoell, Hallstatt; Herbert Grabner, and Klaus Reiser, both of Bad Ischl, all of Austria, assignors to Hoffmann & Co. Elektrokohle Gesellschaft mbH, Steeg, Austria

Division of Ser. No. 634,158, filed as PCT/EP89/00710, Jun. 23, 1989, Pat. No. 5,152,380.
This application Jul. 1, 1992, Ser. No. 907,263
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3921254
Int. Cl.[5] B60L *5/08*
U.S. Cl. 191—49 1 Claim



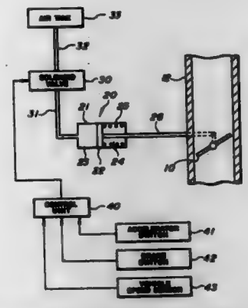
1. A collector comprising:
a support member,
an elongated carbon brush supported on said support member,
a layer of galvanically applied copper on an underside of the carbon brush facing the support member, and
at least one conductor member having a head portion and a shaft portion, said head portion being inserted in a recess in the underside of said carbon brush and anchored therein by means of said galvanically applied copper, and said shaft portion extending from the underside of said carbon brush and into said support member.

5,193,657
EXHAUST BRAKING CONTROL APPARATUS

Naonori Iizuka, Shizuoka, Japan, assignor to Jatco Corporation, Japan

Filed Feb. 24, 1992, Ser. No. 840,271
Claims priority, application Japan, Mar. 7, 1991, 3-067873; Mar. 25, 1991, 3-084787
Int. Cl.[5] B60K *41/20*
U.S. Cl. 192—1.23 10 Claims

1. An exhaust braking control apparatus for use with an automotive vehicle having an engine, and an exhaust passage through which exhaust gases are discharged from the engine to the atmosphere, comprising:
a control valve situated for movement between a fullyopen position and a fully-closed position within the exhaust passage to control exhaust gas flow through the exhaust passage;
sensor means, including sensors sensitive to vehicle operating conditions, for providing sensor signals indicative of sensed vehicle operating conditions; and
a control unit coupled to the sensor means for setting the control valve at a position to provide a continuously

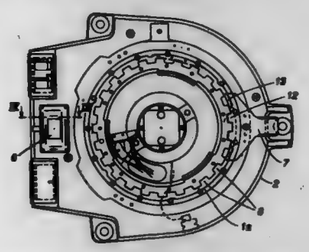


variable degree of exhaust braking effect based upon the sensed vehicle operating conditions, the control unit including means for setting the control valve at a position to provide a predetermined vehicle deceleration.

5,193,658
ADJUSTABLE MECHANICAL STOP OF AN INDUSTRIAL ROBOT

Leif Telldén, Västerås, Sweden, assignor to Asea Brown Boveri AB, Västerås, Sweden

Filed Jan. 29, 1992, Ser. No. 827,750
Claims priority, application Sweden, Feb. 11, 1991, 9100403
Int. Cl.[5] F16D *71/04;* B25J *19/00*
U.S. Cl. 192—138 10 Claims

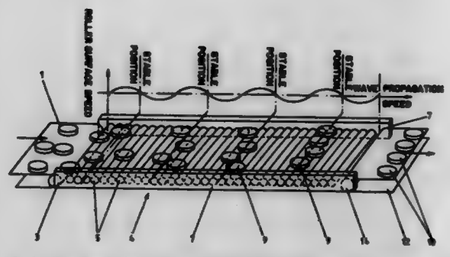


1. An industrial robot comprising a stand which is rotatably journalled in a base (2) and on which at least one stop arm (7) is fixed, said stop arm being adapted to cooperate with a stop dog (6), arranged on the base (2), for limiting the operating range of the robot, said stand (1) being provided with recesses (8, 10) in the form of open pockets arranged around the periphery of said stand and having an inlet opening tapering in an inward direction, said stop arm (7) being formed with at least one fixing projection (12, 13) engageable with the recesses and being provided with a wedge member (14) for fastening the stop arm with the fixing projection (12, 13) in one of the recesses at an optional location on the periphery of the stand.

5,193,659
CONVEYOR

Adrian R. Marshall, Chinnor, Great Britain, assignor to Ranks Hovis Mcdougall PLC, Berkshire, England

Filed Jan. 8, 1992, Ser. No. 894,261
Claims priority, application United Kingdom, Dec. 7, 1989, 8927692
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—419.2 14 Claims

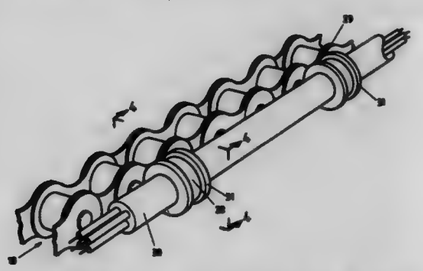


1. A conveyor for arranging articles, having an infeed end at which articles may be placed on the conveyor and an outfeed end from which articles may be removed from the conveyor, the conveyor comprising:
(a) a plurality of rollers arranged side-by-side;
(b) means for rotating the rollers so that each roller can be rotated at a rate which is different from the rate of rotation of adjacent rollers; and
(c) means for controlling the rates at which the rollers rotate so that a high rotational rate region of the conveyor, in which one or more rollers rotate at a higher rate than adjacent rollers, moves from a first end of the conveyor towards a second end.

5,193,660
EXTENSIBLE CONVEYORS

Gary M. McKernan, and Robert J. Tucker, both of P.O. Box 2288, Regency Park, Australia 5942

Filed Dec. 19, 1991, Ser. No. 810,488
Int. Cl.[5] B65G *15/26*
U.S. Cl. 198—594 4 Claims

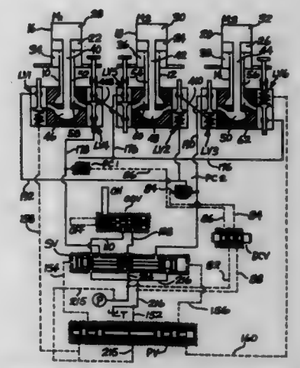


1. An extensible conveyor of the type having extension sections which are relatively movable and also movable in respect to a fixed section, and wherein there is a need to provide electrical power to an extension section, having a chain carried by spaced sprockets on a movable extension section, a plurality of saddles carried by respective links of the chain and extending laterally outwardly from the chain, and an electrical power cable carried alongside the chain by the saddles.

5,193,661
SYSTEM OF LINEAR HYDRAULIC MOTORS

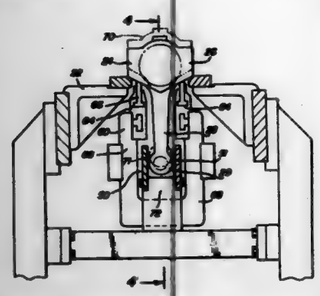
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Feb. 5, 1992, Ser. No. 831,173
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—750 4 Claims



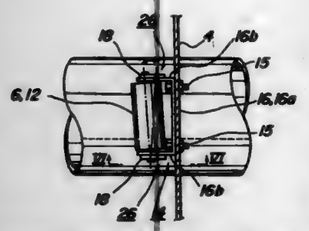
1. A reciprocating floor conveyor, comprising:
a plurality of floor members divided into sets and groups, with each set including at least two adjacent floor members, and with each group including one floor member from each set, said groups being side-by-side across the width of the conveyor;
a drive system for the floor members comprising a linear hydraulic motor for each set of floor members, each said linear hydraulic motor having a stationary portion and a movable portion, with the movable portion being connected to its set of floor members, said stationary and movable portions of the motors defining first and second working chambers on opposite sides of a piston wall;
a source of hydraulic pressure;
a return passageway;
a first fluid passageway leading to the first working chambers;
a second fluid passageway leading to the second working chambers;
a switching valve having a first port connected to the first passageway and a second port connected to the second passageway, said switching valve having first and second positions, first and second ends, a first pilot chamber at the first end and a second pilot chamber at the second end, and means responsive to the switching of pressure and return between the two pilot chambers of the switching valve to switch pressure and return between the first and second passageways;
a pilot valve for the switching valve, said pilot valve having first and second positions, first and second ends, a first pilot chamber at its first end and a second pilot chamber at its second end, and means movable to switch pressure and return between the first and second pilot chambers of the switching valve in response to switching of pressure and return between the first and second pilot chambers of the pilot valve;
a first limit valve means operable in response to a first linear hydraulic motor reaching its end of travel in a first direction, to connect the first pilot chamber of the pilot valve with return, while the second pilot chamber of the pilot valve is connected to pressure; and
a second limit valve associated with another linear hydraulic motor, operable when such linear hydraulic motor substantially reaches its end of travel in the opposite direction, to vent pressure from the second pilot chamber of the pilot valve, while the first pilot chamber of the pilot valve is connected to pressure.

5,193,662
GUIDE STRUCTURE FOR LIFT AND CARRY CONVEYORS
Charles E. McCulloch, and Michael J. Peabody, both of Bloomfield Hills, Mich., assignors to Durr Automation, Inc., Davisburg, Mich.
Filed Mar. 31, 1992, Ser. No. 861,086
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—774.1 10 Claims



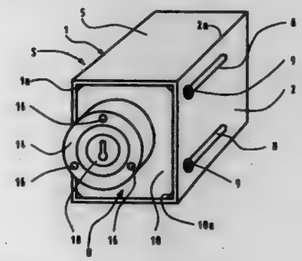
1. A conveyor system comprising:
at least one lift and carry member having laterally spaced lift surfaces which are alternately movable vertically upwardly from a starting position, longitudinally along a conveyor path at a vertically upper position, vertically downwardly, and longitudinally rearwardly at a vertically lowered position to said starting position;
a pair of laterally spaced fixed guide rails positioned laterally between said lift surfaces, said fixed guide rails remaining stationary during movement of said lift surfaces;
said fixed guide rails extend beyond both longitudinal ends of said lift and carry member throughout its movement; and
said fixed guide rails are supported on fixed blocks beyond said longitudinal ends of said lift and carry member.

5,193,663
CORRECTION ROLLER SUPPORT DEVICE OF PIPE CONVEYOR
Kimihide Kuroda, Kamakura, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Feb. 4, 1992, Ser. No. 831,049
Claims priority, application Japan, Feb. 8, 1991, 3-37809
Int. Cl.[5] B65G *15/08*
U.S. Cl. 198—819 3 Claims



1. A correction roller support device of a pipe conveyor having an endless transfer belt which is partly rounded off into a pipe shape to enclose therein a material to be transferred, said support device comprising; a plurality of correction rollers obliquely inclined relative to the transfer direction of the transfer belt and in pressure contact with the outer circumference of the pipe-shaped transfer belt to provide a correcting force to the belt for correcting twisting of the belt, and position adjusting means for each correction roller including a swing plate pivotally supported by a support plate of a bracket fixed to a support frame of the pipe conveyor and to be fixed to the support plate at a point remote from the pivoted point by means of fastening means and supporting the one end of the shaft of the correction roller at another point remote from the pivoted point to support one end of the shaft of the correction roller for holding the one end of the shaft of the correction roller positionally adjustably, thereby enabling inclined angles of the correction rollers to be adjustable, said support plate of the bracket being formed with an arcuate slit extending along an arcuate line having its center at the pivoted point of the swing plate, and the one end of the shaft of the correction roller held by the swing plate slidably fitting in the arcuate slit.

5,193,664
UNIVERSAL ACCESS SWITCH
Fredrick C. Ives, McSherrystown, Pa., assignor to Inventio AG, Hergiswil NW, Switzerland
Filed Dec. 9, 1991, Ser. No. 803,533
Int. Cl.[5] H01H *27/10*
U.S. Cl. 200—43.01 6 Claims

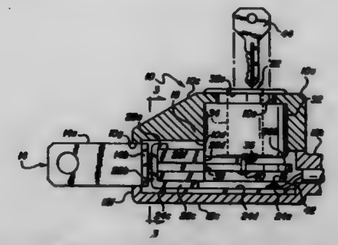


1. A key-operated switch comprising:
a housing having a housing opening and defining a housing depth;
the housing comprising side walls containing longitudinally extending slots, thereby defining a longitudinal direction;
a cover member provided for the housing, the cover member being inserted into the housing opening and being displaceabale in the longitudinal direction within the housing;
a switch insert member for performing a switch function positioned within the housing;
a cylinder lock for actuating the switch insert member;
a collar located on and supported by the cover member, said switch insert member and said cylinder lock being supported on said cover member by said collar;
the collar surrounding the cylinder lock;
angled flap members connected to the cover member for guiding the cover member within the housing;
the angled flap members being disposed substantially parallel to the side walls of the housing and containing bores for securing the cover member to the housing; and
fastening means guided in the longitudinal slots of the side walls of the housing and engaging with the bores of the angled flap members.

5,193,665
ELECTRIC PLUG WITH DISABLING MEANS
Robert A. Jaakow, 31505 Carlon, Warren, Mich. 48092
Filed Sep. 13, 1991, Ser. No. 759,663
Int. Cl.[5] H01H *27/06*
U.S. Cl. 200—43.8 9 Claims

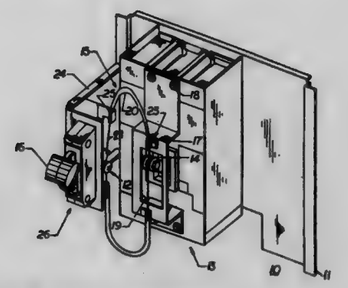
1. An electrical plug including prongs for insertion into an electrical outlet, terminal means for connection to an electrical cord and switch means, including a key cylinder lock assembly, operable upon rotation of the key cylinder lock assembly to make and break electrical connection between the prongs and the terminal means, characterized in that the switch means

includes a switch member mounted for sliding linear movement in response to rotation of the key cylinder between a closed position in which an electrical circuit is established between the prongs and the terminal means and an open position in which the circuit is broken; the switch means further includes conductive track members selectively connected to said terminal means and contact strips carried by said switch member which slidably engage said track members; said track members are connected to said terminal means; said contact



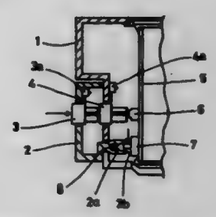
strips each include a portion slidably engaging a respective track member and a portion adapted to electrically engage a respective prong in the closed position of the switch member; said plug includes a hollow housing of insulative material; said switch member comprises a block of insulative material mounted for sliding movement in the hollow of the housing; and said key cylinder lock assembly includes a cam mounted within the hollow of the housing and operative to slidably move the block between its open and closed positions in response to rotation of the key cylinder.

5,193,666
HANDLE EXTENDER FOR MOLDED CASE CIRCUIT BREAKER ACTUATOR MECHANISM
Robert G. Markowski, East Haven; Dean A. Roberge, New Britain, both of Conn., and Jerome B. Tankersley, III, Fredericksburg, Va., assignors to General Electric Company, New York, N.Y.
Filed Aug. 28, 1991, Ser. No. 751,451
Int. Cl.[5] H01H *3/20*
U.S. Cl. 200—331 6 Claims



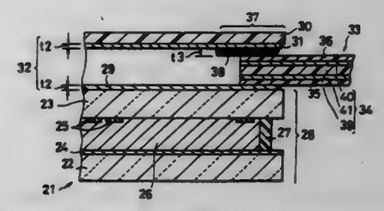
1. A handle extender comprising:
a housing;
an extender rail having opposite sides displacedly positioned within said housing on a roller guide and having a cable wire attached to one end;
an access handle on one end of said rail external said housing adapted for manually displacing said rail from said housing;
an extension spring connecting with said rail for returning said rail back within said housing;
said rail pivoting about said roller guide;
said rail including a longitudinal slot, said roller guide being arranged within said longitudinal slot; and
a linear guideway arranged on said opposite sides of said rail, said linear guideway providing outer support to said extender rails, an opposite end of said cable wire being attached to a circuit breaker or electric switch operating handle.

5,193,667
DOUBLE BUTTON SWITCH OF A VCR
Heun Chol, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Nov. 22, 1991, Ser. No. 796,188
Claims priority, application Rep. of Korea, Nov. 28, 1990, 90-18399
Int. Cl.[5] H01H *3/20*
U.S. Cl. 200—331 3 Claims



1. A double button switch device of a VCR comprising:
a front panel;
a cover door hinged to said front panel so as to be selectively opened;
an outer button arranged on said cover door;
an inner button arranged on said front panel inside said cover door;
a tact switch for sending a signal selected by one of said outer button and said inner button to a print circuit; and
a switching means for changing the functional mode of said tact switch selectively by opening and closing said cover door.

5,193,668
TOUCH-SENSITIVE PANEL AND DISPLAY APPARATUS USING THE TOUCH-SENSITIVE PANEL
Shunsei Fukuchi, Nara, and Nobuhiro Kami, Yamato-Koriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 22, 1991, Ser. No. 689,648
Claims priority, application Japan, Apr. 28, 1990, 2-113073
Int. Cl.[5] H01H *13/52*
U.S. Cl. 200—512 15 Claims



1. A touch-sensitive panel for outputting data corresponding to positions on a film plate where an operator presses his or her finger or the like, said film plate being included in said touch-sensitive panel and wherein said panel for sending said output data to a display device comprises:
a plurality of first electrodes arranged on said film plate;
a plurality of second electrodes being opposed to said plurality of first electrodes and being capable of conducting to

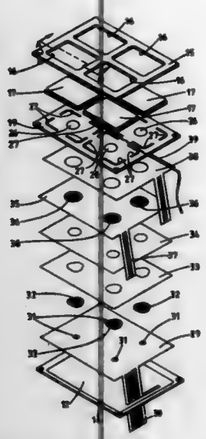
said plurality of first electrodes located at said pressed positions when said film plate is pressed;
a first anisotropic electrically conductive bonding layer for connecting said plurality of first electrodes to said display device, said first anisotropic electrically conductive bonding layer having a plurality of through holes;
a second anisotropic electrically conductive bonding layer for connecting said plurality of second electrodes to said display device; and
a conductive layer including conductive particles, said conductive layer being laid between said plurality of first electrodes and said first anisotropic electrically conductive bonding layer, said conductive particles being in said through holes.

5,193,669

SWITCH ASSEMBLY

Gregory B. Demeo, Lydeborough, N.H.; Henry E. Molvar, Chelmsford, Mass., and David R. Bergerson, Francestown, N.H., assignors to Lucas Industries, Inc., Reston, Va.

Filed Feb. 28, 1991, Ser. No. 661,375
Claims priority, application United Kingdom, Feb. 28, 1990, 9004532.9
Int. Cl.[5] H01H *1/10*
U.S. Cl. 200—512 6 Claims



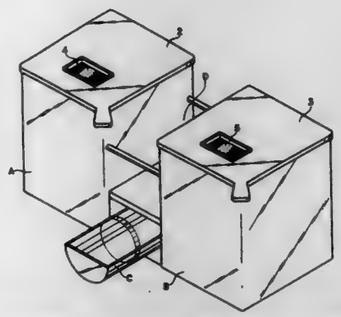
1. A switch assembly comprising:
a housing having a base plate;
a rigid operating member at least partially within said housing;
means for mounting said operating member for movement relative to the housing with said operating member being accessible to an operator;
electrical contact means, at least partially within said housing and being responsive to movement of the operating member relative to the housing, for changing from a non-conducting rest position to a conducting operative position,
flexible seal means positioned at least partially within said housing and being located between the operating member and the electrical contact means and capable of transmitting operative movement of the operating member to said contact means while preventing passage of moisture and other contaminants from the region of the operating member to the contact means, and,
limit means for preventing movement of the operating member relative to the contact means beyond said conducting operative position wherein said limit means comprises rigid spacer elements disposed between a peripheral region of the operating member and the base plate wherein said rigid spacer elements are bonded to said seal means.

5,193,670

LAUNDRY DETERGENT AND COIN DISPENSER

Mary W. G. Fong, 333 Aolea St. #232, Kailua, Hi. 96734

Filed Dec. 6, 1991, Ser. No. 802,827
Int. Cl.[5] A45C *1/00*; B67D *5/00*
U.S. Cl. 206—0.81 2 Claims



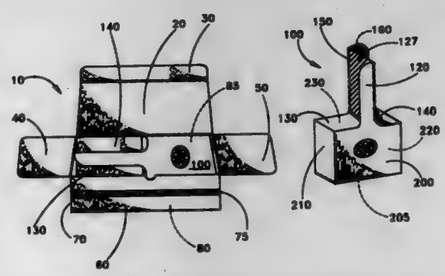
1. Container for holding laundry supplies comprising: left and right liquid-holding compartments, said compartments having reclosable lid portions for permitting the refilling of said compartments, said lid portions each having a pouring spout, a connecting portion in connection with each of said compartments to hold said compartments at a distance from one another to define a space located between said compartments, and means for holding coins in an upright position, said means comprising a slide-out drawer engaged with each of the compartments and located within said space.

5,193,671

SHOE STORAGE BOX WITH COMPLEMENTARY SUPPORTING BOX THAT ALSO FUNCTIONS AS A SHOE STORAGE CONTAINER AND A SHOE DISPLAY CONTAINER

Claire A. Patterson, National City, Calif., assignor to Chauvin International Ltd., Los Angeles, Calif.

Filed Jul. 27, 1992, Ser. No. 919,845
Int. Cl.[5] B65D *25/04*
U.S. Cl. 206—45.14 18 Claims



1. A multiple function shoe box for transportation, storage and display purposes, comprising:
a. an outer shoe storage box and a complementary inner shoe supporting box which can be conformably fitted inside the outer storage box;
b. said outer box being made of foldable and patterned cardboard material and having a rectangular shaped configuration with a top plate, a bottom plate, a front plate, a back plate and two opposite end plates, which plates define a rectangular shaped interior compartment, the top plate being openable for accessing the interior compartment;
c. said inner box being constructed from an integral piece of foldable and patterned cardboard material and having a lying-down position for holding a pair of shoes within said interior compartment of said outer box, and an upright position for supporting the pair of shoes vertically;
d. said inner box having an exposed upper portion and a rectangular shaped lower portion, the lower portion having an uncovered top which opens into the upper portion, the lower portion further having a base plate, a front plate, a back plate and two opposite end plates;
e. said inner box being conformable with said outer box, such that when said inner box is lying-down within said interior compartment of said outer box, said base plate of said lower portion of said inner box conforms with one of said two opposite end plates of said outer box, said front plate of said lower portion of said inner box conforms with said top plate of said outer box, said back plate of said lower portion of said inner box conforms with said bottom of said outer box, and said two end plates of said lower portion of said inner box conform respectively with said front and back plates of said outer box; and
f. said exposed upper portion of said inner box having a narrowly extended right plate and a narrowly extended left plate, the right and left narrow plates being offset and interconnected by a partition plate which provides said inner box with a right shoe compartment and a left shoe compartment;
g. whereby said pair of shoes can be placed respectively in said right shoe compartment and said left shoe compartment of said inner box, when said inner box is lying-down inside said outer box, it will help to keep said pair of shoes in stabilized positions for storage and transportation purposes, when said inner box is set upright, it will support said pair of shoes in vertical positions, where said exposed upper portion of said inner box makes said pair shoes visible for retaining and display purposes.

11. A multiple purpose shoe container, comprising:
a. an outer shoe storage box and a complementary inner shoe supporting box which can be conformably fitted inside the outer storage box, where the inner supporting box is made of a unitary piece of foldable and patterned cardboard material;
b. said outer box having a generally rectangular shaped configuration with a top plate, a bottom plate and four sidewall plates, which plates define a generally rectangular shaped interior compartment, the top plate being openable for accessing the interior compartment; and
c. said inner box having an exposed upper portion and a generally rectangular shaped lower portion, the lower portion having a base plate and four sidewall plates, and the exposed upper portion having a narrowly extended right supporting plate and a narrowly extended left supporting plate, the right and left narrow supporting plates being offset and interconnected by a partition plate which provides said inner box with a right shoe compartment and a left shoe compartment;
d. whereby said pair of shoes can be placed respectively in said right shoe compartment and said left shoe compartment of said inner box, when said inner box is placed inside said outer box, it will help to keep said pair of shoes in stabilized positions for storage and transportation purposes, when said inner box is set upright, it will support said pair of shoes in vertical positions, where said exposed upper portion of said inner box makes said pair shoes visible for retaining and display purposes.

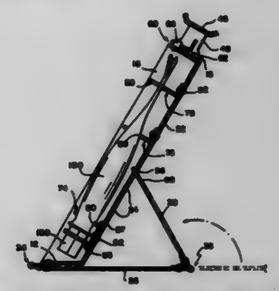
16. A multi-function shoe container, comprising:
a. an outer shoe storage container and a complementary inner shoe supporting container which can be conformably fitted inside the outer storage container, where the inner supporting container is made of a unitary piece of foldable and patterned cardboard material;
b. said inner container having an exposed upper portion and a lower portion, the lower portion having a bottom and circumscribing sidewalls; and
c. said inner container further divided into a right shoe compartment and a left shoe compartment by a partition plate, each shoe compartment having at least one stiff narrow plate upwardly stemming from said circumscribing sidewalls of said lower portion into said exposed upper portion for supporting a respective one of a pair of shoes in a vertical position;
d. whereby said pair of shoes can be placed respectively in said right shoe compartment and said left shoe compartment of said inner container, when said inner container is placed inside said outer container, it will help to keep said pair of shoes in stabilized positions for storage and transportation purposes, when said inner container is set upright, it will support said pair of shoes in vertical positions, where said exposed upper portion of said inner container makes said pair shoes visible for retaining and display purposes.

5,193,672

SURGICAL INSTRUMENT CASE

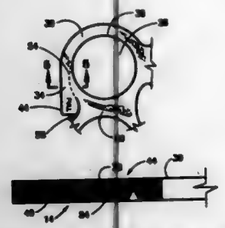
Jack F. Long, Warsaw, Ind., assignor to Depuy Inc., Warsaw, Ind.

Filed Jan. 28, 1992, Ser. No. 827,158
Int. Cl.[5] B65D *83/10, 5/52*; A61L *2/00, 9/00*
U.S. Cl. 206—45.2 15 Claims



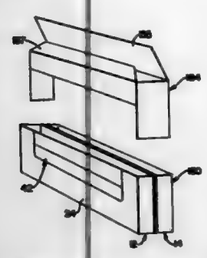
1. A surgical instrument case suitable for autoclaving and instrument presenting to the surgeon during surgery, the case comprising:
a container formed to include an interior region defined by a plurality of side walls, top and bottom, at least said top and bottom being perforated with apertures for passage of fluid through said interior region during autoclaving;
one of said side wall acutely angled with respect to the top wall to define an inclination angle for the surgical case;
cradle means for holding a variety of surgical instruments, said cradle means being attached to the bottom to be in said interior region; and
said top hingedly attached to said one acutely angle side wall for pivoting from its acute angle when closed to overlie and be in parallelism with the one said acutely angled wall, when it is open, for providing support for propping the instrument case at the acute inclination angle to the horizontal to provide easy access to the instruments by the surgeon while minimizing handling.

5,193,673
ENVIRONMENTALLY SAFE HOLDER DEVICE
Thomas Rathbone, 2695 Cottontail La., Lecsos, Calif. 93402, and Timothy J. Martin, 1888 S. Arbutus, Lakewood, Colo. 80228
Filed Apr. 12, 1991, Ser. No. 684,232
Int. Cl.[5] B65D *75/00, 65/00*
U.S. Cl. 206—150 18 Claims



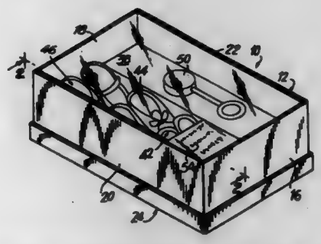
1. A holder adapted to releasably retain a plurality of objects each having a common geometric shape and adapted to permit release of each said object individually, comprising:
a central panel portion;
a plurality of retaining portions joined with said central portion, said retaining portions each having an upper surface and a lower surface and a thickness measured between said upper and lower surfaces, each said retaining portion having an opening sized to receive a respective one of said objects and having an outer peripheral edge portion with a peripheral margin of a selected width located between said opening and said peripheral edge portion, each retaining portion thereby defining a loop-shaped structure that acts to retain a respective said object in the opening thereof; and
a pull-tab structure corresponding to each of said retaining portions, each said pull-tab structure joined to its respective retaining portion along the margin thereof, each said margin having a score line having a variable depth across the width of said margin and having a selected length and extending at least partially across the width of said margin and proximate to the respective pull-tab whereby the respective pull-tab may be operated both to release the object and sever the loop-shaped structure.

5,193,674
CIGARETTE CARTON ASSEMBLY
Larry D. Cobler, and George A. Shouse, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Sep. 23, 1991, Ser. No. 764,259
Int. Cl.[5] B65D *85/10*
U.S. Cl. 206—256 4 Claims



1. A carton assembly for 10 packages of smoking articles which are arranged in the carton assembly for transport through and marking using a tax marking apparatus designed for tax marking packages arranged within a standard carton, the carton assembly comprising:
i) top, bottom, side and end portions;
ii) two half carton assemblies, each capable of containing 5 packages of cigarettes; and
iii) collar means for providing the top portion of the carton assembly.

5,193,675
BABY MERCHANDISE DISPLAY PACKAGE
Jon D. Otis, Long Branch, N.J., assignor to E.S. Originals, Inc., New York, N.Y.
Filed May 15, 1992, Ser. No. 883,947
Int. Cl.[5] B65D *85/18, 5/50*
U.S. Cl. 206—278 9 Claims



1. A baby merchandise package for shipment to, display at, and carrying from, a retail outlet, said package comprising:
(a) a shoe box having a bottom wall, a pair of end walls spaced apart along a longitudinal direction, a pair of side walls spaced apart along a transverse direction perpendicular to the longitudinal direction, and a lift-off lid overlying and spaced from the bottom wall;
(b) a display insert mounted within the box, including
(i) a base resting on the bottom wall,
(ii) a plurality of racks extending parallel to one another from one of the side walls along the transverse direction to, but terminating short of, the other side wall, each rack having a support wall inclined relative to the base, and
(iii) a raised shelf extending along the longitudinal direction and located between the racks and said other side wall of the box, said shelf being elevated above the base;
(c) a plurality of pairs of baby shoes, each pair resting on the inclined support wall of a respective rack; and
(d) a baby article resting on the shelf.

5,193,676
PACKAGING SYSTEM
Danny Gold, 27 Barker Road, Apt E-2, Hong Kong, Hong Kong
Filed Aug. 1, 1991, Ser. No. 739,085
Int. Cl.[5] B65D *73/00, 85/18*
U.S. Cl. 206—296 25 Claims

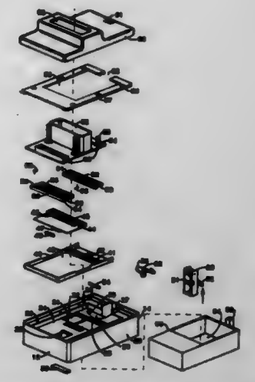
1. A packaging system for displaying merchandise on a rack system having a rack member, comprising:
at least two pieces of merchandise for display together on the rack system;
reinforcing means secured in each of the at least two pieces of merchandise and adapted to provide at least one reinforced opening through each piece of the merchandise;
coupling means extending through the reinforced opening in each piece of merchandise, for securing the pieces of merchandise to each other and supporting all of the pieces of merchandise below the rack member;
whereby the at least two pieces of merchandise can be displayed on the rack system by hanging the coupling means on the rack member and the at least two pieces of merchandise can be removed from the rack member and inspected and tested without affecting the attachment of the pieces of merchandise to each other.
10. A packaging system for displaying merchandise on a rack system having a rack member, comprising:
at least two pieces of merchandise for display together on the rack system wherein the merchandise is a pair of gloves;
reinforcing means secured in each of the at least two pieces of merchandise and adapted to provide at least one reinforced opening through each piece of the merchandise;
coupling means extending through the reinforced opening in each piece of merchandise, for securing the pieces of merchandise to each other and supporting the pieces of merchandise on the rack member;
whereby the at least two pieces of merchandise can be displayed on the rack system by hanging the coupling means on the rack member and the at least two pieces of merchandise can be removed from the rack member and inspected and tested without affecting the attachment of the pieces of merchandise to each other.
11. A packaging system for displaying merchandise on a rack system having a rack member, comprising:
at least two pieces of merchandise for display together on the rack system wherein the merchandise is a pair of socks;
reinforcing means secured in each of the at least two pieces of merchandise and adapted to provide at least one reinforced opening through each piece of the merchandise;
coupling means extending through the reinforced opening in

each piece of merchandise, for securing the pieces of merchandise to each other and supporting the pieces of merchandise on the rack member;
whereby the at least two pieces of merchandise can be displayed on the rack system by hanging the coupling means on the rack member and the at least two pieces of merchandise can be removed from the rack member and inspected and tested without affecting the attachment of the pieces of merchandise to each other.
13. A packaging system for displaying merchandise on a rack system having a rack member, comprising:
at least two pieces of merchandise for display together on the rack system;
first reinforcing means secured in each of the least two pieces of merchandise and adapted to provide at least one reinforced opening through each piece of the merchandise;
support means for coupling the pieces of merchandise to the rack and for supporting the pieces of merchandise;
second reenforcing means secured in the support means and adapted to provide to at least one reinforced opening through the support means;
coupling means extending through the reinforced opening in each piece of merchandise and the support means for securing the pieces of merchandise to each other and to the support means;
whereby the at least two pieces of merchandise can be displayed on the rack system by hanging the supporting means on the rack member and the at least two pieces can be removed from the rack member with the supporting means and inspected and that tested without affecting the attachments of the pieces of merchandise to each other or the supporting means;

5,193,677
SURFBOARD STORAGE AND CARRYING BAG WITH PNEUMATIC INFLATED GUARD RAIL
Richard Moreno, 21661 Brookhurst, #330, Huntington Beach, Calif. 92646
Filed Dec. 27, 1991, Ser. No. 813,790
Int. Cl.[5] B65D *85/00, 81/02, 65/02*
U.S. Cl. 206—315.1 6 Claims

1. An improved surfboard storage bag that comprises:
a. a bag that encloses a surfboard that is composed of two halves that are similar in shape to the surfboard and are attached to each other by an attachment means that attaches each half to the interior perimeter of each side of the bag.
b. three tubes capable of being inflated and able to maintain the interior pressure once inflated comprising one middle tube of sufficient length to fit circumferentially around the outer edge of the surfboard, one upper tube attached to the middle and a lower tube attached to the middle tubes each of a length that is shorter than the middle tube.
c. a means to allow inflating and deflating of the tubes.

5,193,678
APPARATUS FOR COUNTING AND DISPOSING OF EXPENDABLE MEDICAL ITEMS, INCLUDING SHARPS AND THE LIKE
Michael T. Janocik, and Larry D. Potts, both of Louisville, Ky., assignors to Packaging Service Corporation of Kentucky, Louisville, Ky.
Filed Mar. 12, 1992, Ser. No. 849,938
Int. Cl.[5] B65D *83/02, 83/10*
U.S. Cl. 206—363 23 Claims



1. An apparatus for counting and disposing of expendable medical items, including sharps and the like, comprising:

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a. a housing assembly, said housing assembly including a counter and a removable receptacle for depositing items for disposal, said housing assembly having a partial floor therein; said housing assembly having a front and a rear; said counter having engagement means to advance counter to the next number; and,

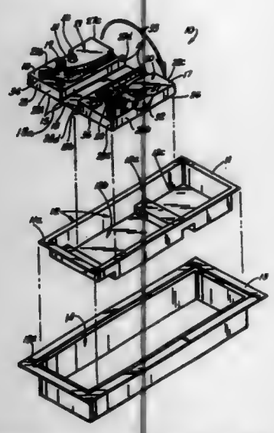
b. a movable shuttle assembly slidably received in and retained by said housing assembly, said shuttle assembly having a receiving opening therein, such that any item received into said receiving opening will be received on said partial floor of said housing assembly, whereby, when said shuttle assembly is slidably moved from a first position to a second position, any item on said partial floor is deposited in said removable receptacle and said counter advancer means is engaged to advance said counter to the next number.

5,193,679

PACKAGE FOR HIP PROSTHESIS

Mark White, Memphis, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.

Filed Jul. 10, 1991, Ser. No. 728,000
Int. Cl.[5] A61B *19/00*
U.S. Cl. 206—363 19 Claims



1. A container for carriage of a modular hip prosthesis having a lower stem, a proximal portion with anterior and posterior sides, a neck portion, modular pads attachable to the proximal portion, and a distal sleeve attachable to the stem comprising:

a) a cassette having a pair of halves of corresponding size, each having a face that abuts the face of the other upon closure, and each half having a recess that conforms generally to the outer surface of the prosthesis;

b) a bore of the cassette being formed by the recesses upon closure, the bore being sized and shaped to surround a contained hip prosthesis that is to be positioned to extend between the recesses;

c) the bore having a larger portion that closely conforms to a hip prosthesis proximal portion having anterior and posterior sides, and neck portion, and the bore having a smaller portion for accommodating the hip prosthesis stem; and

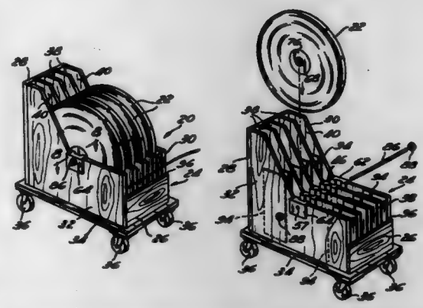
d) the recess having portions for receiving a modular pad of a prosthesis assembled thereto.

5,193,680

SLAT BOX FOR WINDOW BLIND STOCK

Arthur L. Schumann, Marina Del Rey, and Michael J. McCarty, Mission Viejo, both of Calif., assignors to 3 Day Blinds, Inc., Anaheim, Calif.

Filed Jun. 11, 1992, Ser. No. 897,251
Int. Cl.[5] B65D *85/66*
U.S. Cl. 206—394 20 Claims



1. A slat box for holding at least one slat stock roll during the fabrication of metal window blinds, comprising:

a housing having a front wall, a back wall, a right side wall and a left side wall;

at least one partition member disposed within said housing and extending between said front wall and said back wall in a manner forming first and second adjacent compartments within said housing, each of said compartments being sized and configured to receive a stock roll;

a right insert attached to said right side wall;

a left insert attached to said left side wall; and

a central insert attached to said partition member, said right, left and central inserts being horizontally aligned within the housing;

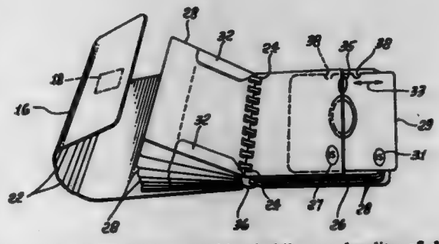
wherein a first stock roll is received into said first compartment and rotatably interfaced to said right and central inserts with a second stock roll being received into said second compartment and rotatabley interfaced to said left and central inserts.

5,193,681

BOOK-LIKE HOLDER AND ORGANIZER FOR SETS OF COMPUTER DISKETTES

Winslow R. Lievsay, 21795 Calatrava, Mission Viejo, Calif. 92692

Continuation of Ser. No. 746,287, Aug. 13, 1991, abandoned, which is a continuation of Ser. No. 586,567, Sep. 21, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 840,561
Int. Cl.[5] B65D *85/30*
U.S. Cl. 206—444 6 Claims



1. A computer diskette holder holding a plurality of diskettes, comprising:

a binding means;

a plurality of identical diskette receiving envelopes, each containing only a single one of said diskettes, each diskette having a label and an edge, each envelope including:

a front panel and a rear panel joined together except for a single peripheral opening at one side, said front panel being shorter than said rear panel such that said opening exposes said label and edge of a respective diskette, a bound edge margin of each envelope located opposite said opening being bound loosely by said binding means such that the envelope may rotate about said binding means, and such that one of said envelopes is immediately next in rotation to another of said envelopes, and said one and another envelopes may be positioned in opposite directions in generally a same plane;

said plurality of envelopes being oriented such that their front panels face in a same direction of rotation about said binding means while being identically aligned along said binding means, whereby said one envelope may be filled and rotated and said another envelope is most readily apparent to be the next envelope subsequently filled to avoid confusion during selective sequential filling of said diskettes in said envelopes;

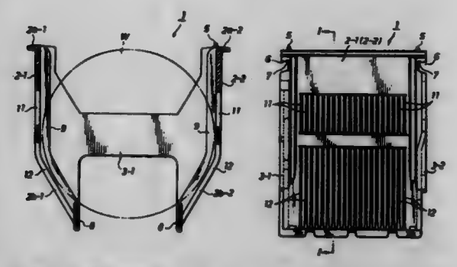
a front cover sheet, a back cover sheet being shorter than said front cover sheet, said cover sheets being attached to said binding means and being adapted together to close said holder.

5,193,682

WAFER BASKET

Naoki Naito; Naoyuki Takamatsu, both of Fukushima; Toshio Ishikawa, Saitama, and Kazunori Koshikawa, Miyagi, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 724,980
Int. Cl.[5] B65D *85/48;* B05C *13/02*
U.S. Cl. 206—454 2 Claims



1. In a wafer basket having a box-like configuration which consists mainly of two side walls facing each other, and a front wall and a rear wall facing and parallel to each other, wherein the lower portions of the side walls are bent inwardly and the inner walls of the side walls are formed with a plurality of ribs arranged at regular intervals to define grooves for reception of wafers, and wherein recesses for engagement with hook means are provided each at either end of the side walls, an improvement comprising:

each said recess being formed with a dent in its ceiling along the upper and innermost corner of said recess; and

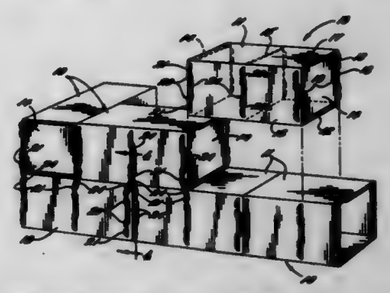
that a pair of stay means for checking the downward movement of wafers provided at the lower bent portions of the side walls in a manner such that said stay means extend in the direction normal to the front and rear walls and extending from the front wall to the rear wall and also such that the upper edges of the stay means are of the same height and elevated to the extent that the downward movement of the wafers is checked by the stay means and not by the ribs.

5,193,683

STACKABLE CONTAINER

Luther L. Key, Rte. 1, Box 131, Roaring River, N.C. 28669

Continuation of Ser. No. 686,813, Jan. 17, 1991, abandoned. This application Oct. 28, 1991, Ser. No. 784,647
Int. Cl.[5] B65D *21/00*
U.S. Cl. 206—503 20 Claims



1. A container for food service or the like which may also be used as a children's toy for erecting structures such as walls or the like comprising

a top wall and an opposing bottom wall;

two opposed side walls extending between said top and bottom walls, each said side wall having lateral edges perpendicular to said top and bottom walls;

paired collinear slits aligned adjacent each said lateral edge of each of said side walls and along a medial portion of each said side wall, said slits being parallel to said lateral edges; and

two opposed end walls and a partition, each said end wall and partition having parallel opposite edges and first and second pairs of tabs positioned on each of said opposite edges, said first and second pairs of tabs on each of said opposite edges of said end walls extending through and beyond respective ones of said paired collinear slits adjacent said lateral edges to retain said end walls between said top and bottom walls and generally perpendicular to said opposed side walls such that said top wall, bottom wall, side walls and end walls define an enclosure, and said first and second pairs of tabs on each of said opposite edges of said partition extending through and beyond respective ones of said slits in said medial portions to suspend said partition generally parallel to said end walls to divide the space within said enclosure,

each of said first pair of tabs being positioned adjacent each other and being adapted to be engaged by an elastic band to secure said tabs within said slits in said side walls, and each of said second pair of tabs being positioned outside the associated first pair of tabs and being adapted to be engaged by additional elastic bands for interconnecting adjacent stacked containers.

5,193,684

TAMPON DISPOSAL UNIT

Gary L. McDonald, 104 S. Ora, Pryor, Okla. 74361

Filed Jul. 20, 1992, Ser. No. 915,221
Int. Cl.[5] A61F *13/34*
U.S. Cl. 206—581 3 Claims

1. A device for the removal and disposal of a sanitary item having an attached string, comprising:

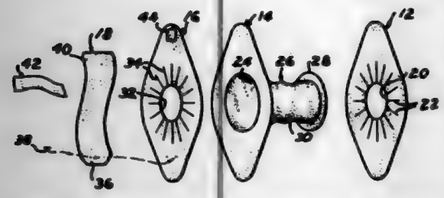
a front sheet and a back sheet respectively superposed on and bonded by their perimeter edge portions to opposite sides of a center sheet;

said sheets each having a centrally disposed aperture axially aligned with the apertures in the other sheets;

container means for containing the sanitary item including a bag having an accordion pleated longitudinally expandable and collapsible wall defining one open end,

the end portion of said wall adjacent the open end being secured to said center sheet around its central aperture; and,

a disk axially closing the other end of said bag and releasably interposed at its peripheral edge portion between said



front sheet and said center sheet around the apertures therein,

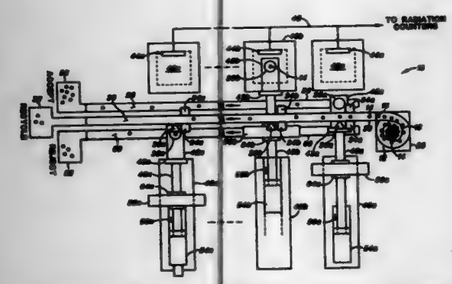
said disk having a plurality of radial slits angularly spaced about its center for manually extending one end portion of said string therethrough and withdrawing a sanitary item from a cavity into said bag.

5,193,685

GEMSTONE SORTING APPARATUS AND METHODS

William J. Trevithick, 1620 Crespo Dr., LA Jolla, Calif. 92037

Filed Jan. 20, 1991, Ser. No. 718,014
Int. Cl.[5] B07C 5/02
U.S. Cl. 209—3.1 8 Claims



1. Apparatus for automatically sorting previously irradiated gemstones, comprising:

(1) transport means for moving the gemstones from an initial location to classified final locations, said transport means including an input conveyor, an accept conveyor, and a reject conveyor;

(2) testing means for determining if the residual gamma radiation of the previously irradiated gemstones is within prescribed limits, said testing means including a multiplicity of isolated testing chambers located to the side of the input conveyor, each of said multiplicity of isolated testing chambers having radiation measurement apparatus associated therewith for generating test data, said test data providing an indication as to whether the residual gamma radiation of a particular gemstone placed within a given one of said isolated testing chambers is within prescribed limits;

(3) loading means for automatically loading the gemstones in an orderly fashion onto the input conveyor; and

(4) moving means for moving the gemstones off of the input conveyor into the testing means and for moving the gemstones out of the testing means onto one of either the accept conveyor or the reject conveyor as a function of the whether the residual gamma radiation of the gemstones is within the prescribed limits as determined by the testing means, said moving means including:

a multiplicity of individual robot stations located on the side of the input conveyor opposite said multiplicity of isolated testing chambers, a respective robot station being associated with each isolated testing chamber, each robot station having a probe arm with a receptacle at one end for holding a gemstone; said probe arm being responsive to control signals so as to selectively: (1) move said receptacle (a) into or out of the respective isolated testing chamber, (b) above said accept conveyor, or (c) above said reject conveyor, and (2) rotate said receptacle in order to dump a gemstone held therein to a location below said receptacle;

a multiplicity of sensors, each of said sensors being associated with a respective one of said robot stations and isolated testing chambers, each of said sensors including means for sensing the presence of a gemstone on said input conveyor adjacent its associated robot station;

transfer means responsive to said control signals for transferring a gemstone from said input conveyor into the first vacant receptacle of one of said probe arms, whereby gemstones are transferred from said input conveyor into the first available receptacle of a probe arm; and

control means responsive to preprogrammed data, test data from said testing means, and said sensors for generating said control signals so as to move a gemstone into a vacant test chamber, and thereafter transfer the gemstone from the test chamber to either the accept conveyor or the reject conveyor as a function of the test data.

7. A method of automatically sorting a batch of gemstones in accordance with the residual gamma radiation level of each gemstone within said batch of gemstones comprising the steps of:

(a) moving each gemstone in the batch of gemstones from an initial location to one of a multiplicity of testing stations by:

(1) loading the batch of gemstones into a feeder bowl, said feeder bowl having a spiralling path around an inside edge thereof;

(2) vibrating the feeder bowl at a preselected frequency, which vibrating causes the gemstones in said batch of gemstones to work their way up said spiralling path and exit said feeder bowl one at a time;

(3) loading the gemstones exiting said feeder bowl onto an input conveyor that carries the gemstones past said multiplicity of testing stations in series; and

(4) removing a given gemstone from the input conveyor at the first vacant testing station of said multiplicity of testing stations that said given gemstone passes, and inserting said gemstone into said vacant testing station by sensing when the given gemstone is adjacent a vacant testing station, blowing the given gemstone off of the input conveyor with a controlled puff of gas into a holding receptacle at the end of a probe arm, and longitudinally moving the probe arm so as to insert the gemstone inside of the vacant testing station;

(b) measuring the residual gamma radiation of each gemstone moved to one of said multiplicity of testing stations by:

(1) inserting each gemstone into a shielded chamber that prevents radioactive gamma particles from passing therethrough,

(2) closing said chamber, and

(3) detecting and counting the radioactive gamma particles emitted from said gemstone within a prescribed period of time,

(4) whereby radioactive gamma particles associated with background radiation are not included in the radiation measurement thus made;

(c) removing a gemstone from a given testing station after its residual radiation has been measured and moving it to one of a plurality of final locations as a function of the radiation measured for such gemstone at that given testing station;

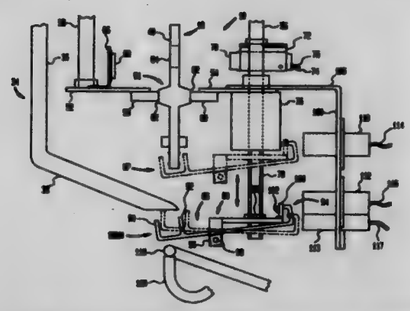
(d) automatically monitoring and controlling the movement, testing and removing of the gemstones performed in steps (a), (b) and (c) so as to move a new gemstone into a given testing station immediately after a previous gemstone has been removed therefrom, whereby all of the testing stations are continually being loaded with a gemstone, testing a gemstone, or having a gemstone removed therefrom, whereby the batch of gemstones are automatically sorted in as short of time as possible.

5,193,686

APPARATUS FOR LOADING ARTICLES

Bernard Speckhart, Short Hills; Paul M. Bersen, Mountain Lakes, and Garri Akopnik, Newark, all of N.J., assignors to White Conveyors, Inc., Kenilworth, N.J.

Filed Jan. 22, 1991, Ser. No. 643,857
Int. Cl.[5] B65G 29/00
U.S. Cl. 209—3.3 38 Claims



1. An apparatus for loading hooked members for supporting articles onto a conveyor, comprising:

a loading member supported adjacent to the conveyor and adapted to receive a hooked member;

a drive member coupled to the loading member and adapted to drive the loading member between a first position and a second position;

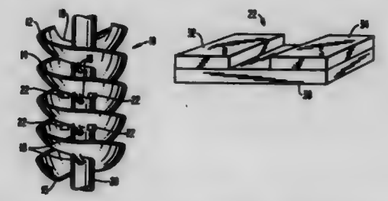
a first device for sensing the presence of the loading member in the first position with a hooked member received thereon and adapted to activate the drive member to drive the loading member into the second position from the first position.

5,193,687

GRAVITY SEPARATORS HAVING METALLIC TROUGHS, ESPECIALLY HUMPHREYS SPIRALS

Edward Martinez, 13 Bayswater Pl., Chapel Hill, N.C. 27514

Continuation of Ser. No. 798,037, Nov. 20, 1991, abandoned, which is a continuation of Ser. No. 606,547, Oct. 31, 1990, abandoned. This application Jul. 24, 1992, Ser. No. 919,497
Int. Cl.[5] B03C 1/30
U.S. Cl. 209—40 38 Claims



1. A method for separating magnetic material from a feed mixture also comprising non-magnetic material having a lower specific gravity than said magnetic material, said method comprising the steps of:

combining said mixture with a non-magnetic fluid thereby forming a pulp;

feeding said pulp onto the upper surface of a downwardly sloped passage means at the raised feed end thereof, said passage means comprising metal and being sufficiently long to achieve at least partial gravity separation of said magnetic material as said pulp flows downwardly over said surface;

applying a magnetic force beneath a metal portion of said passage means as said pulp flows down said surface, said magnetic force being sufficiently strong to overcome the shielding effect of said metallic passage means to thereby act on said pulp to produce a magnetic force at said surface for augmenting said gravity separation by attracting said magnetic material to said surface, said magnetic force not being so strong as to cause build up of said magnetic material on said surface; and

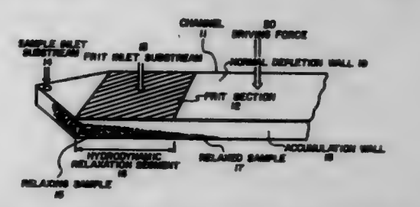
separating said magnetic material near said surface from said pulp.

5,193,688

METHOD AND APPARATUS FOR HYDRODYNAMIC RELAXATION AND SAMPLE CONCENTRATION NIN FIELD-FLOW FRACTION USING PERMEABLE WALL ELEMENTS

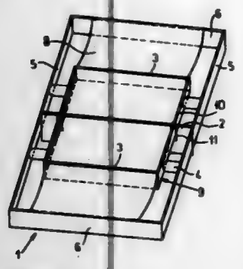
John C. Giddings, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 447,630, Dec. 8, 1989, abandoned. This application Jul. 5, 1991, Ser. No. 726,370
Int. Cl.[5] B03B 5/00
U.S. Cl. 209—155 27 Claims



1. In a field-flow fractionation process for the separation of particles and polymers wherein a carrier fluid containing the particles to be separated is forced through a thin elongated flow channel having an enclosing wall, an inlet end and an outlet end, and a field or gradient is used to induce a driving force on the particles acting across the thin dimension of the channel perpendicular to the direction of the main channel axis and the particles entering the channel at the inlet end undergo fractionation as they are carried through the channel by flow and emerge as particles fractions at the outlet end, the improvement which comprises feeding at least two independent substreams of carrier fluid into the channel through at least two inlets located at the inlet end, one being the sample inlet, introducing the sample particles into one substream called the sample inlet substream that is forced to enter the channel through the sample inlet, forcing the carrier fluid of the remaining substream or substreams to enter the channel through one or more permeable wall sections whose combined areas constitute less than 25% of the total enclosed wall area of the channel, adjusting the relative flowrates of the different substreams to such proportions that the sample experiences a substantial measure of hydrodynamic relaxation as the substreams merge near the sample inlet.

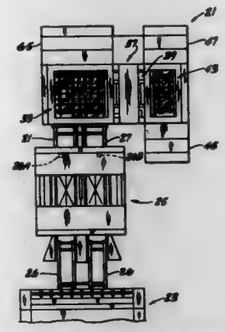
5,193,689
SIEVE
Kurt Hoppe, Hilden, Fed. Rep. of Germany, assignor to Hein, Lehmann Trenn- und Fördertechnik GmbH, Dusseldorf and Isenmann Siebe GmbH, Karlsruhe, both of Fed. Rep. of Germany
Filed Jan. 22, 1992, Ser. No. 823,566
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1991, 4101710
Int. Cl.[5] B07B *1/28*
U.S. Cl. 209—323 5 Claims



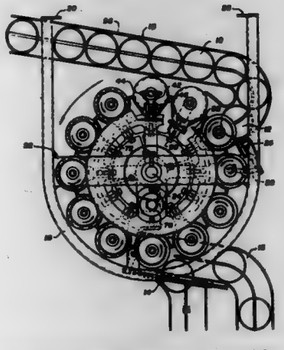
1. A sieve comprising:
a rigid outer frame having
longitudinally extending side beams,
transverse end beams bridging the side beams, and
a central cross beam parallel to and between the end beams;
an inner frame having
a pair of side bars extending generally parallel to but spaced transversely inward of the side beams of the outer frame, and
a pair of cross bars bridging the side bars and extending generally parallel to the end beams;
a mesh fixed to the cross bars and end beams;
spring elements resiliently supporting the side bars on the respective side beams for movement relative thereto; and
drive means for reciprocating the outer frame at least generally parallel to the side beams and thereby also moving the inner frame.

5,193,690
METHOD OF AND APPARATUS FOR AUTOMATICALLY INSPECTING AN EXPOSED AND BENT LITHOGRAPHIC PLATE
John W. Powers, Battlefield, Daniel G. Choate, Everton, and Kelly T. McMasters, Springfield, all of Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.
Filed Jan. 6, 1991, Ser. No. 711,655
Int. Cl.[5] B07C *5/00*
U.S. Cl. 209—558 29 Claims

1. A method of automatically inspecting an exposed and bent lithographic plate having an image thereon to determine whether the image is in proper registration relative to the plate, the plate having front, rear, and opposite side edges, said method comprising,
automatically conveying a lithographic plate from bending apparatus to an inspection station, the plate having been bent by the bending apparatus to form flanges along the front and rear edges of the plate to enable mounting of the plate on a press,
moving the lithographic plate into a fixed reference position at the inspection station and holding the plate in said position,
automatically inspecting the plate when it is in said fixed reference position to determine whether said image is in proper registration relative to the plate,
automatically conveying the plate from the inspection station to a first destination if the image is not in proper registration relative to the plate and to a second destination if the image is in proper registration relative to the plate.

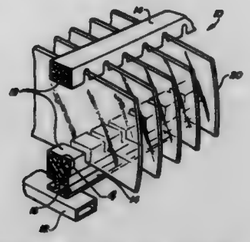


5,193,691
CAN SEAM INSPECTION APPARATUS
Wun C. Chong, 69 Wallace Place, Delta, B.C., Canada V4M 3S2
Filed Aug. 26, 1991, Ser. No. 750,162
Int. Cl.[5] B07C *5/00, 5/02*
U.S. Cl. 209—600 14 Claims



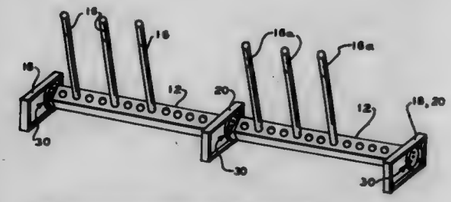
1. A can seam inspection apparatus comprising:
a pathway for a can, the pathway having an inlet and a pair of outlets comprising a first outlet for cans with a defective seam and a second outlet for acceptable cans;
a plurality of releasable holding means to hold cans as the cans move along the pathway;
means to rotate the holding means and thus the cans as they move along the pathway;
releasable means to release the holding means adjacent the inlet and adjacent the outlets;
means to assess the seam of a can as the can rotates comprising a roller to contact the seam as the can is rotated, a cam shaft mounting the roller, a lever contacting the cam shaft, a catch operable by longitudinal movement of the lever, a rod retained by the catch, whereby movement of the roller on contacting a seam defect operates the catch to release the rod, the rod acting to trigger a mechanism to open the first outlet.

5,193,692
RECYCLABLE DUNNAGE SUPPORT ASSEMBLY
Charles Farley, 3380 Breezewood Trail, Ortonville, Mich. 48462, and Lawrence E. Plawecki, 13735 Neal, Davisburg, Mich. 48350
Filed Apr. 13, 1992, Ser. No. 867,365
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—41 6 Claims



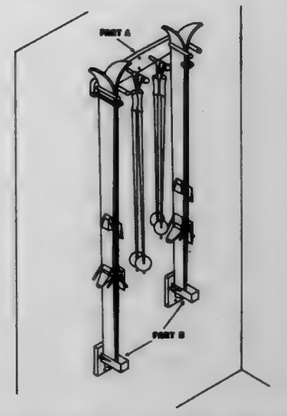
1. A recyclable dunnage support assembly comprising:
a frame,
a dunnage support member,
means for securing said frame to said dunnage support member,
wherein said dunnage support member includes at least one surface which is adapted to engage and support dunnage,
wherein said dunnage support member is formed from pulverized tire fragments held together by a binder.

5,193,693
ARTICLE SUPPORT STAND
Anthony Miragliotta, 452 Ridge Rd., Fredon Township, Newton, N.J. 07860
Filed Apr. 7, 1992, Ser. No. 864,576
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—69.5 6 Claims



1. An article support stand, comprising:
at least one article support member provided with means for receiving and retaining at least one article;
at least a pair of wall members;
interconnecting means for removably and rotatably interconnecting said article support member between said wall members, said interconnecting means including a generally semi-circular disc-like male portion and a generally cylindrical female portion;
said male portion including a generally semi-circular outer peripheral portion provided with an indentation approximately mid-point thereof;
said female portion including a bottom circumscribed by an outwardly extending cylindrical wall provided with at least one inwardly extending tab spaced from said bottom and complementary in shape to said indentation, said bottom, said cylindrical wall and said tab defining a recess for receiving said male portion, said tab for retaining said male portion within said recess upon said male portion being received within said recess and rotated with respect to said female portion; and
said indentation and said tab for aligning said male portion with said recess to facilitate entry of said male portion into said recess.

5,193,694
SKI AND SKI-POLE STORING RACK
Ian Wave, 8122 NE. 190th St., Bothell, Wash. 98011
Filed Dec. 23, 1991, Ser. No. 812,162
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.5 3 Claims



1. A storing rack a single or for double pairs of skis and ski poles, so designed to comfortably accommodate any two pairs of skis and ski poles, different or same in size and or type, grasping said skis at two extreme sections & across, utilizing gentle and mild substances, therefore eliminating any ski warpage or damage and providing maximum protection of said skis' manufactured camber and life, plus having means of securing said skis in place, comprising:
a) An upper base element formed of rigid and strong materials, peripherally defined by longer top and bottom and shorter sides, having means for fastening onto a studded or solid vertical wall, and
two fixed cylindrical elements projecting outwardly at each end of said base element spaced to define a slot, formed of same materials as said base element and covered with sleeves having spongy-rubber material for receiving two pairs of ski tips in bottom-to-bottom facing arrangement and partially supporting the weight of said skis, and
two cylindrical elements projecting outwardly at middle part of said base element, formed of same materials as said base element for receiving two pairs of ski poles of strapped or strapless, having caps at outward ends of said cylindrical elements to prevent unwanted release of said hanging ski poles.
b) two of a lower base element formed also of rigid and strong materials, peripherally defined by shorter top and bottom and longer sides, having means for fastening onto a studded or solid vertical wall directly below said defined slots of said upper base element, and
an open container element projecting outwardly at middle of said lower base element, formed of same materials as said lower base element, having openings at bottom of said container element and consisting of a lining made of rubbery substance having the same and aligned openings to release undesirable substance accumulation, for receiving a pair of ski ends in bottom-to-bottom facing arrangement and supporting the remainder of said skis' weight partially supported by said cylindrical elements above,

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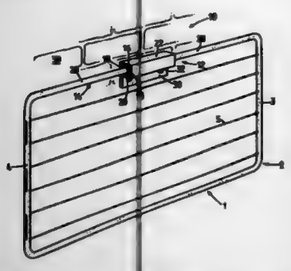
c) two elastic elements being attached to two ends of said upper base element near said slots, each to be pulled through its outer end and given opportunity for its specially designed slot gap to pull itself over said receiving skis along their edges to secure said skis in place.

5,191,695
LOCKING HINGE DEVICE

Peter L. Mann, Unit 1, 74 Stirling Highway, Nedlands, Western Australia, 6009, Australia

PCT No. PCT/AU89/00370, § 371 Date Feb. 25, 1991, § 102(e) Date Feb. 25, 1991, PCT Pub. No. WO90/02236, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 31, 1989, Ser. No. 656,090
Claims priority, application Australia, Aug. 31, 1988, 0168
Int. Cl.[5] E05D *7/04, 11/10*
U.S. Cl. 211—104 14 Claims

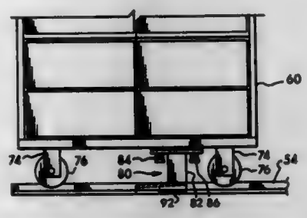


1. Locking hinge device comprising:
mounting means arranged to be attached to a support and including a first channel member;
a frame of a leaf member which is pivotable and lockable by way of said locking hinge device;
said frame including a frame member comprising a second member slidably arranged in said first channel member, said second member having a substantially longitudinal axis which extends substantially axially therethrough;
said second member comprising two first portions and a second portion, said second portion being disposed intermediate said two first portions and said first and second portions being arranged substantially colinearly;
said first channel member and said second portion of said second member having transverse cross-sectional shapes which are of mating non-circular configuration and said two first portions having cross-sectional dimensions which are less than the cross-sectional dimension of said second portion for allowing said second member to swivel about said substantially longitudinal axis when one of said first portions of said second member is located in said first channel member such that said leaf member is pivotable by way of said locking hinge device, and for preventing said second member from swivelling about said substantially longitudinal axis when at least a part of said second portion of said second member is located in said first channel member such that said leaf member is not pivotable and is locked in position by said locking hinge device, said leaf member being lockable in at least a first position and a second position, said first position being substantially vertical and said second position being substantially horizontal;
said frame further comprising side frame members extending from respective ends of said second member in an offset manner and arranged to delimit the slidable movement of said second member.

5,193,696
BRAKING MECHANISM FOR A SLIDING TAPE CARTRIDGE STORAGE SYSTEM

Macy J. Price, Jr., Louisville; Laurence G. Ball, Denver, and Andrew W. Wildhaber, Thornton, all of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.

Continuation-in-part of Ser. No. 679,796, Apr. 3, 1991, abandoned, and a continuation-in-part of Ser. No. 551,131, Jul. 6, 1990, Pat. No. 5,072,838, which is a continuation-in-part of Ser. No. 343,952, Apr. 26, 1989, abandoned. This application Oct. 31, 1991, Ser. No. 786,087
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—162 23 Claims



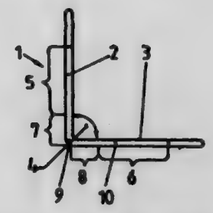
1. A storage rack system for storing tape cartridges, said storage rack system comprising:
at least one stationary rack;
a brake engaging member mounted on said at least one stationary rack;
an elongated flange on said brake engaging member extending angularly downward from a first end of said brake engaging member;
a first engaging surface on a lower surface of said flange;
at least one movable rack;
means for supporting said at least one movable rack for movement along a path relative to said at least one stationary rack;
a brake member;
means for mounting said brake member to said at least one movable rack, said brake member being movable relative to said at least one movable rack along an axis substantially perpendicular to said path of movement of said movable rack;
a lower portion of said brake member having a second engaging surface on the upper surface thereof for frictionally engaging said first engaging surface to brake the movement of said at least one movable rack along said path of movement; and
at least one spring element for biasing said brake member upward along said axis to progressively increase the frictional resistance between said first engaging surface and said second engaging surface as said at least one movable rack moves along said path of movement to gradually brake the movement of said at least one movable rack along said path of movement.

5,193,697
RAIL ELEMENT FOR THE RECEPTION OF ARTICLE SUPPORTS

Reinhold Lubczyk, Bördel, and Andreas Kranz, Göttingen, both of Fed. Rep. of Germany, assignors to Heinz Peter Adams, Gottingen, Fed. Rep. of Germany

Filed Jul. 25, 1991, Ser. No. 735,804
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1990, 4023685
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—183 13 Claims

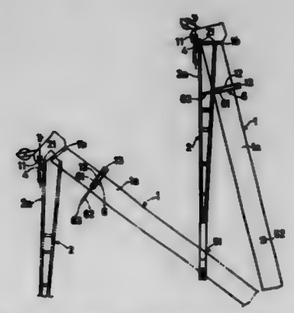
1. In a rail element of the type used for the reception of article supports with said rail element including a metallic elongated profile strip having a cross section with at least two legs oriented at a right angle with respect to each other, one of the legs having openings into which hook-formed brackets of article supports can be inserted, the openings being provided at an equal distance from each other in the main direction of extension of the rail element in a vertically aligned manner allowing a height-adjustable arrangement of the article support, the improvement therein comprising the other leg (3) being provided with openings as well which are arranged at the same height as the openings (5) in the first leg (2), the two openings (5, 6) in each leg corresponding to each other being connected with a clearance (7, 8) forming a continuous opening (10) which extends over the right angle.



5,193,698
JIB STRETCHING AND FOLDING DEVICE FOR USE IN A CRANE

Yukio Koizumi, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation-in-part of Ser. No. 758,586, Sep. 12, 1991. This application May 14, 1992, Ser. No. 883,194
Claims priority, application Japan, Sep. 13, 1990, 2-245069
Int. Cl.[5] B66C *23/42*
U.S. Cl. 212—168 5 Claims

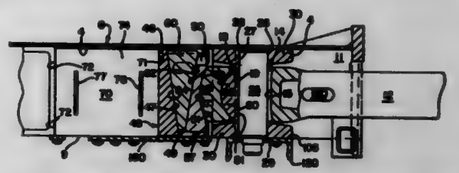


1. A jib stretching and folding device for use in a crane including:
a telescopic boom having a forward end portion:
a jib having a base end portion, the base end portion of the jib being connected to a forward end portion of the boom, the jib being movable between a stretched position where the jib is stretched out from the forward end portion of the boom and a folded position along a lower surface of the boom through an intermediate step of putting the jib into a vertically suspended position about a connection point of the base end portion of the jib and the forward end portion of the boom;
the jib stretching and folding device comprising:
(I) a jib maneuvering cylinder having an extendible actuating member, the cylinder being mounted on the boom in such a manner that the extendible actuating member projects outward from the lower surface of the boom when the extendible actuating member is extended;
(II) an engaging portion provided in the extendible actuating member of the jib maneuvering cylinder;
(III) an engaging member mounted to the jib so as to selectively engage with the engaging portion by movement of the engaging member in a lengthwise direction of the jib;
(IV) a guide surface formed in at least one of the engaging member and the engaging portion for guiding the engaging member in the lengthwise direction of the jib so as to engage with the engaging portion when the jib is in the vertically suspended position and the jib maneuvering cylinder is in an extended state in a jib folding operation.

5,193,699
CENTER SILL WITH SHORT YOKE MEMBER FOR CONVERTING FROM COUPLER TO DRAWBAR ARRANGEMENT WITHOUT MODIFYING CENTER SILL

Horst T. Kanfhold, and John J. Steffes, both of Aurora, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 16, 1991, Ser. No. 807,321
Int. Cl.[5] B61G *7/00*
U.S. Cl. 213—75 R 13 Claims



1. A center sill short yoke member for use with a slackless drawbar connection of a railway car, said short yoke member for laterally and vertically positioning a drawbar member evenly within a center sill without requiring modifications to the end sill, the improvement comprising:
a vertically disposed back wall and horizontally disposed top and bottom walls, said top and said bottom walls having front and back edges respectfully, said back wall having a top and bottom front face, a rear face, and a pair of side edges, said top and said bottom wall back edges being connected to said back wall top and bottom front faces respectfully;
said top and bottom walls being centered between said back wall side edges,
said back wall side edges contacting said inside surfaces of said center sill side walls,
said back wall having a substantial opening centered between said top and bottom walls and said side edges
said top and bottom walls having circular vertical openings, said openings being in alignment,
said back wall being greater in horizontal extent than said top and bottom walls,
said top, bottom and back walls defining a cavity.

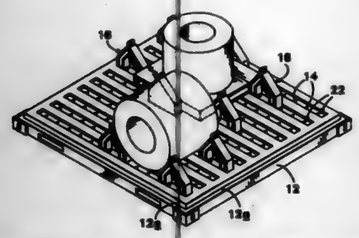
5,193,700
CARGO CONTAINER

H. Scott Lyman, 4300 Albert Cir., Lake Oswego, Oreg. 97035, and Masanori Tsuchiya, 915-123 Takano-cho, Chiba City, Chiba pref., Japan 280-01

Filed Sep. 13, 1991, Ser. No. 759,540
Int. Cl.[5] B65D *85/00*
U.S. Cl. 220—1.5 13 Claims

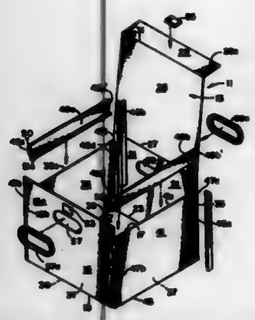
1. A cargo container comprising:
a generally planar base including plural openings arranged in a defined array, and
plural chocks each having a bottom surface for mating with said base in the vicinity of said plural openings and at least one working surface extending upwardly at an oblique angle to said bottom surface, each of said chocks being equipped with at least two projections receivable within

corresponding ones of said plural openings thereby securely to fix the location of each of said chocks relative to



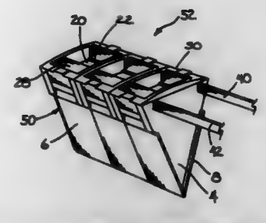
said base against lateral movement under the shiftable weight of cargo stored in said container.

5,193,701
BOX FOR STORING HANGING FILE FOLDERS
Thomas J. Bush, Canton Center, Conn., and Stephen A. Anderson, Murfreesboro, Tenn., assignors to Pelikan, Inc., Franklin, Tenn.
Filed Aug. 13, 1992, Ser. No. 929,793
Int. Cl.[5] B65D *6/12*
U.S. Cl. 220—4.33 7 Claims



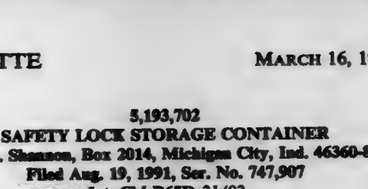
1. A storage box, of generally rectangular shape with four corners, for storing hanging file folders which comprises:
a first panel wall unit,
said first panel wall unit including a front panel and a rear panel,
a bottom panel connected to said front and said rear panels along score lines,
a top cover panel having a rear portion connected to said rear panel along a crease line,
a cover flap connecting a front portion of said top cover panel along a score line,
means mounted on said front panel for attaching the front panel to the cover flap,
means mounted on said cover flap for attaching the cover flap to the top portion of the front panel,
a second panel wall unit in contact with said first unit,
said second unit including side panels, and a bottom panel,
said side panels connected to said bottom panel along score lines,
corner posts engaged between the side panels and said front and rear panels of the corners of the box,
said side panels being of reduced height relative to said front and rear panels,
said side panels having top edges,
side rails engaged with and seated on said top edges, and
said side rails having end tabs that are engaged with said corner posts.

5,193,702
SAFETY LOCK STORAGE CONTAINER
Henry D. Shannon, Box 2014, Michigan City, Ind. 46360-8014
Filed Aug. 19, 1991, Ser. No. 747,907
Int. Cl.[5] B65D *21/02*
U.S. Cl. 220—23.4 7 Claims



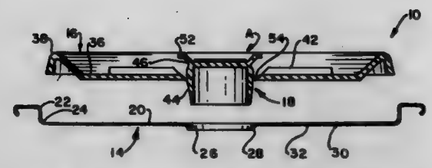
1. A container comprising a vessel having a base with two generally parallel V-shaped walls interconnected by two convergent rectangular side walls to define a storage area having an open top, and a lid pivotally connected to said base for covering said top, a second said vessel having a base with two generally parallel V-shaped end walls interconnected by two convergent rectangular side walls to define a storage area having an open top and a lid pivotally connected to said base for covering said top, each vessel including means for interlocking engagement with another said vessel, said vessels being interlocked by mutual engagement of said interlocking means, said vessels each have one of its side walls in substantially parallel face to face alignment with a side wall of another said vessel, said interlocking means including a pair of spaced inturned flanges adjacent one end wall and a pair of spaced notched ribs adjacent the other end wall of each vessel, the spaced flanges of one said vessel being slidably interlocked with the spaced ribs of another said vessel.

5,193,703
METHODS AND APPARATUS FOR FORMING AN INTEGRAL HIGH PRESSURE SEAL USING MECHANICAL ACTUATION
Louis T. Staats, III, Lincoln University, Pa.; James A. Bristow, Elkton, Md.; Anil P. F. Noronha, West Chester, Pa., and Gregory E. Murphy, Erial, N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 487,655, Mar. 2, 1990, abandoned. This application Jan. 22, 1992, Ser. No. 825,450
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—203 25 Claims



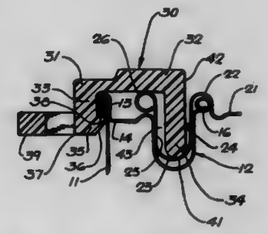
1. A cap for sealing a vessel having a shoulder for engaging sealing material comprising:
a body portion having a proximal end and a distal end, wherein the distal end extends into the vessel the body portion including details for engaging the vessel;
a sealing body comprised of sealing material disposed substantially within said body portion, the sealing body comprising: a distal portion that tapers from a first diameter to a second, smaller diameter at a distal end; and a proximal portion that is selectively engaged with an external force that urges the distal portion of the sealing body into sealing engagement with the shoulder by sliding the sealing body relative to the outer body.

5,193,704
END CLOSURE ASSEMBLY
James Kick, 210 Aspen Village, Ellisville, Mo. 63021
Filed Nov. 29, 1991, Ser. No. 800,258
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—253 12 Claims



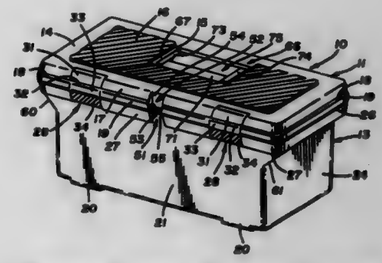
1. An end closure assembly for a container comprising:
a cover mountable on a container and having a cover dispensing passageway therethrough;
a rotor mounted over said cover for relative rotational movement therebetween about a pivot axis, said rotor having at least one rotor dispensing passageway therethrough which is radially spaced from said pivot axis and which may be brought into and out of registry with said cover dispensing passageway upon selective relative rotation between said cover and said rotor;
a hub separate from said cover for pivotally mounting said rotor on said cover, said hub including flange means extending radially outward with respect to said pivot axis, said flange means being circumferentially continuous and terminating in the radial outward direction short of said rotor dispensing passageway;
said rotor including an orifice, said hub extending through said orifice with said flange means overlying said rotor;
whereby when said assembly is tampered with and said rotor is at least partially pried form beneath said flange means, it will be difficult to replace said rotor to the position beneath said flange means without the assembly showing evidence of tempering.

5,193,705
TRANSPORTATION RING
Duncan J. McCallum, Hinsdale; John P. Williams, Geneva, and Robert C. Jack, Schaumburg, all of Ill., assignors to Armstrong Containers, Inc., Westchester, Ill.
Filed Apr. 1, 1992, Ser. No. 861,645
Int. Cl.[5] B65D *45/32*
U.S. Cl. 220—319 7 Claims



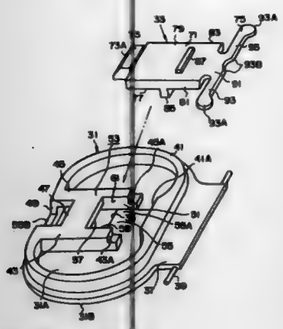
1. In combination a cylindrical container having an annular peripheral rim flange formed to define a generally U-shaped, annular locking channel about the container's open upper end, a disc-like lid for closing said container's open upper end formed with a marginal, U-shaped, annular recess having spaced walls adapted to frictionally fit into said channel to effect sealing engagement with opposing walls thereof, and a removeable transportation ring constructed to be mounted over the rim flange and outer margin of the mounted container lid to secure and retain the latter in sealed relation with the container, said ring comprising:
an uninterrupted, substantially rigid, unitary, annular ring of generally inverted U-shaped cross section formed with a generally planar annular body and a pair of parallel, continuous, uninterrupted, annular limbs depending from the outer and inner radial margins of said body;
the radially outer of said limbs having a radially inwardly extending, uninterrupted, single annular locking finger adjacent its outer end which is operable, when said ring is mounted on the container, to underengage the outer periphery of the container's rim flange and lock said ring thereto;
the radially inner of said limbs being dimensioned and disposed to depend freely into the lid's recess without engaging the walls thereof when said ring is mounted on the sealed container;
the container mounted ring, in the presence of pressures within the sealed container sufficient to bow and deflect the lid outwardly, being operable to distort axially upwardly without disruption, which activity causes the inner of said limbs to move radially against one wall of the lid's recess and thereby increase the latter's sealing engagement with an opposing wall of the container's locking channel; such activity also simultaneously causing said locking finger to increase its locking engagement with the container's rim flange.

5,193,706
TOOLBOX
Thomas E. Hanna, and Keith E. Brightbill, both of Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 26, 1990, Ser. No. 471,285
Int. Cl.[5] B65D *45/16*
U.S. Cl. 220—324 22 Claims



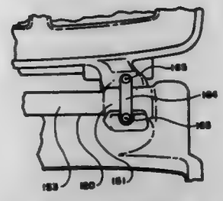
1. A utility box comprising a base portion forming a container with an open top, a cover portion hingedly attached to said base portion and having a top surface, said base portion and said cover portion having complementary mating surfaces, latch means recessed within and being flush with said mating surfaces to hold said cover portion closed on said base portion, a lock receiving area recessed within said mating surfaces, side handle means formed in said base portion and recessed beneath said cover portion, and top handle means recessed within said top surface of said cover portion.

5,190,707
LID STRUCTURE INCLUDING SLIDABLE LOCK MEMBER
Sadao Mizumura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 19, 1991, Ser. No. 733,145
Claims priority, application Japan, Aug. 7, 1990, 2-83690[U]; Mar. 20, 1991, 3-040976[U]
Int. Cl.[5] B65D *45/16*
U.S. Cl. 220—326 13 Claims



1. A lid structure comprising:
an article storage container having an opening and a retaining member;
a lid for openably closing said opening, said lid having an integral holder, said article storage container and said lid jointly defining an article storage chamber, said lid having an inner surface facing towards said article storage chamber, said holder being integrally formed on said inner surface;
a manually operable lock member slidably held by said holder and slidable into and out of locking engagement with said retaining member said manually operable lock member being slidable in a sliding direction, said holder having a first guide surface for guiding a portion of said manually operable lock member which faces toward said lid, a second guide surface for guiding a portion of said manually operable lock member which faces towards said article storage container, and third and fourth guide surfaces for guiding opposite portions of said manually operable lock member which lie along said sliding direction;
said lid defining a window, said manually operable lock member comprising a manipulating ridge on a portion of said lock member facing said lid, said manipulating ridge disposed in said window;
said holder being defined by said lid having a pair of side walls disposed on said inner surface, one of said pair of sidewalls being disposed on each side of said window and extending along said sliding direction, and a joint wall spaced from said inner surface toward said article storage container and interconnecting said sidewalls over said window, said first guide surface being disposed on said inner surface along said sliding direction, said second guide surface being disposed on said joint wall in facing relationship to said window and extending parallel to said first guide surface, said third and fourth guide surfaces being disposed on said side walls parallel to each other and in facing relationship to each other;
said manually operable lock member being formed of resilient synthetic resin, and comprising a spring member for normally urging said manually operable member in a direction engaging said retaining member, said manually operable lock member comprising an engaging finger on a longitudinal end of said manually operable lock member for engaging said retaining member, said spring member being disposed on another longitudinal end of said manually operable lock member, said manually operable lock member having a planar portion extending between said engaging member and said spring member and having surfaces slidable against said first, second, third and fourth guide surfaces; and
said window formed so as to enable insertion of said manually operable lock member into said holder.

5,193,708
REFUSE CONTAINER LID WITH SNAP-ON HINGES AND HINGE RETAINERS
J. Timothy Prout, 3021 Country Club Rd., Winston Salem, N.C. 27104, and Ronald K. Raboin, 409 Fox Croft Dr., De Pere, Wis. 54115
Filed Jan. 14, 1992, Ser. No. 820,538
Int. Cl.[5] B65D *43/14*
U.S. Cl. 220—338 12 Claims

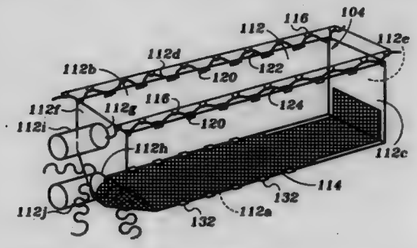


1. A lid for covering and enclosing the mouth of a refuse container, comprising:
(a) a lid panel for covering and enclosing the mouth of the container;
(b) hinge means integrally-formed with said lid panel for being received on a handle bar carried by said container adjacent the opening of said container, said hinge means comprising first and second laterally spaced-apart hinges extending outwardly from the perimeter of the lid panel for being received on adjacent opposing ends of said handle bar, each of said hinges including first and second opposed hinge claws defining an opening therebetween, the opening being sized to receive the handle bar of the container therein by means of a snap fit, wherein said handle bar is annular in cross-section, wherein the opening defined by said first and second opposed hinge claws is annular, and further wherein the space between free ends of said opposed hinge claws is sized to permit a snap fit of said opposed hinge claws over the annular shape of the handle bar whereby the lid is pivotable around the axis defined by the handle bar between open and closed positions; and
(c) retaining means for retaining the hinges on said handle bar, said retaining means comprising a strap sized to bridge the space defined by the opening between said first and second opposed hinge claws and including attachment means for attaching opposing ends of said strap to the ends of the hinge claws after assembly of the hinges onto the handle bar to prevent removal of the lid from the container.

5,193,709
FILTER FOR HAZARDOUS WASTE CONTAINERS
Gilbert W. Brassell, 13237 W. Eighth Ave., Golden, Colo. 80401
Filed Jan. 15, 1992, Ser. No. 820,833
Int. Cl.[5] B65D *51/16, 90/28;* B01D *46/24*
U.S. Cl. 220—371 16 Claims

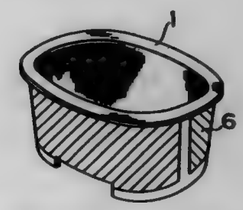
1. A filtered vent, useful for venting a container having a liquid phase and a gas phase to an atmosphere, the filtered vent comprising:
a housing having first and second ends with a vent disposed proximate the first end of the housing;
mounting means at the first end of the housing for closing an opening in the container, through which opening the housing projects;
a pressure relief valve having first and second ends, the pressure relief valve being in communication with the second end of the housing;
a tube having first and second ends, the first end of the tube being connected to the second end of the pressure relief valve and the second end of the tube being positioned approximate the first end of the housing; and
a filter in the housing disposed between the second end of the housing and the vent whereby gas under a predetermined pressure pressurizes gas within the tube which opens the relief valve allowing gas to flow through the filter and vent to the atmosphere.

5,193,710
FLOATING HANGING LINER SUPPORT
Victor T. Podd, Sr., 255 Beverly Avenue, Montreal, Quebec, Canada; Victor I. Podd, Jr., 1678 SW. 20th Ave., Boca Raton, Fla. 33486, and Stephen D. Podd, One Lincoln Blvd., Rouses Point, N.Y. 12979
Filed Sep. 12, 1991, Ser. No. 758,766
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—403 13 Claims



1. A cargo container comprising:
a container body defining an interior cargo space;
a flexible and expandable liner secured inside the container body, and including a top panel and left and right side panels, wherein the top and left side panels are connected together and form a top left edge, and the top and right side panels are connected together and form a top right edge;
a multitude of liner ties connected to and spaced along the liner adjacent the top left and top right edges thereof, each of the liner ties forming a channel;
a multitude of lashing members connected to and spaced along the container body adjacent the top left and top right edges of the liner; and
rope means connected to the container body and extending through the channels of the liner ties and through the lashing members to support the liner in an upright position in the container body while allowing limited sliding movement of the liner therein.

5,193,711
IN-MOLD LABELED CONTAINER AND METHOD FOR MAKING SUCH CONTAINER
Masanori Hirata, Tachikawa; Kohji Maekawa, Kawagoe; Ken Katayama, Tokyo, and Kouhu Mizukoshi, Kiyose, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido and Nippin Co., Ltd., Tokyo, both of Japan
PCT No. PCT/JP91/00596, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO91/17036, PCT Pub. Date Nov. 14, 1991
PCT Filed May 1, 1991, Ser. No. 776,280
Claims priority, application Japan, May 7, 1990, 2-117992
Int. Cl.[5] B29C *51/10*
U.S. Cl. 220—453 10 Claims



1. In-mold labeled container comprising a container and a label which is in-mold labeled on the outer side of the container's curved side wall, said label having a configuration comprising a bottom wall section, side wall sections, cuts formed into respective said side wall sections which extend from respective boundaries between said side and bottom wall sections along extensions of opposite side edges of said bottom wall section and folding lines extending between forward ends of the respectively paired cuts transversely thereof and/or cutouts intermittently arranged on imaginary lines corresponding to respective said folding lines, wherein a lower end of the label in-mold labeled on the outer side of the container's side wall along curved corners is at a level at least lower than the inner bottom surface of the container.

5,193,712
STACKABLE PACKING FOR BULK MATERIAL
Gerd Küppersbusch, Siemensstr. 34-36, D-5620 Velbert 1, Fed. Rep. of Germany
Filed Feb. 19, 1992, Ser. No. 838,060
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1990, 4020285; PCT Int'l Appl., Jun. 21, 1991, PCT/EP91/01149
Int. Cl.[5] B65D *5/60, 5/74*
U.S. Cl. 220—465 11 Claims

1. A stackable container for bulk material comprising an outer folding-box carton providing mechanical rigidity and a tight inner bag located within the folding-box carton for receiving the bulk material, the carton having a removable portion, the inner bag comprising a pouring spout having a nozzle-shaped projection and being located behind the removable portion of the folding-box carton, an opening providing access to the pouring spout being located in the folding-box carton after removing the removable portion, wherein the removable portion of the folding-box carton is located at an upper corner, and whrein the folding-box carton has overlapping bottom

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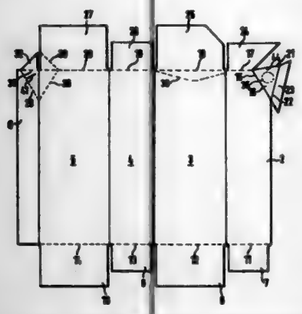
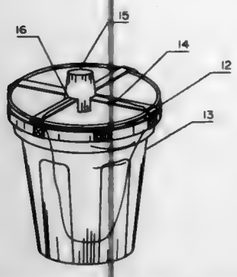
flaps at the bottom thereof for closing the bottom, the inner bag lying loosely within the folding-box carton, and an ear of



the inner bag being held between the overlapping bottom flaps in a closed state of the container.

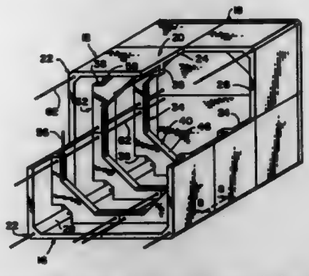
5,193,713
TRASH CAN CONVERSION KIT
Dan L. Greathouse, 1804 Casina Pl., and Thomas C. Street, 3104 Northridge, both of Farmington, N. Mex. 87401
Filed Aug. 21, 1990, Ser. No. 570,603
Int. Cl.[5] B65F *1/06*; B65D *90/04*
U.S. Cl. 220—528 **1 Claim**



1. A trash can conversion kit for use in converting a single bin trash container having an upper open end with an upper rim into a container capable of holding a plurality of trash bags comprising;
an elastically expandable circular ring device attached to the perimeter of said upper rim with at least one diametrical elastic strap extending over said upper open end which creates edges allowing attachment of said trash bags thereto.

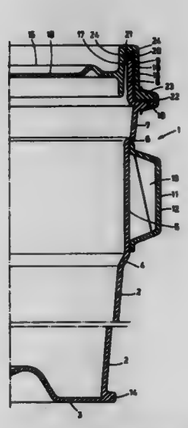
5,193,714
MODULAR VAULT FOR STORAGE TANKS
John M. Carey, Ashburn, Va., assignor to The Neel Company, Springfield, Va.
Filed Jun. 25, 1992, Ser. No. 903,743
Int. Cl.[5] B65D *45/02*
U.S. Cl. 220—592 **20 Claims**

1. For use in the construction of a containment vault for an above ground storage tank; the invention comprising multiple rigid modules adapted for assembly to form an internal chamber for the protective enclosure of a storage tank therein, each of said modules including a pair of panel segments extending at generally a right angle to each other and defining a corner therebetween, said panel segments terminating in free outer edges, said vault comprising at least one set of four of said modules positioned with said outer edges of each module sealingly engaging said outer edges of a pair of adjacent modules to encircle an area and form said internal chamber, each of said modules including an internal rib fixed to said panel segments and extending inwardly thereof, said internal rib including a brace portion extending obliquely between said panel segments across said corner defined therebetween, said brace portion including a substantially planar inner support edge within said chamber in inwardly spaced relation to and diagonally across said defined corner whereby four such support



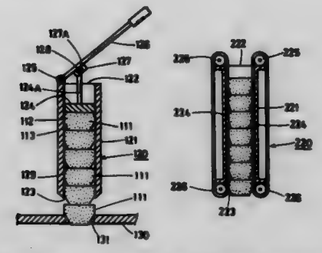
edges are provided about said formed internal chamber of said set of four modules for engagement with and support of a received storage tank, joinder means for fixing said modules relative to each other with said outer edges sealingly engaged, said modules including opposed substantially planar side edges defining, in said at least one set of four modules, opposed continuous side edges which in said vault define opposed ends, and bulkhead means adapted to overlie and mount to said opposed ends to enclose said formed internal chamber.

5,193,715
WIDEMOUTHED BARREL OF A SYNTHETIC RESIN
Udo Schultz, Ruckersteg 4, D-5418 Selters, Fed. Rep. of Germany
Filed Oct. 29, 1991, Ser. No. 783,922
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1990, 4034226
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—675 **4 Claims**



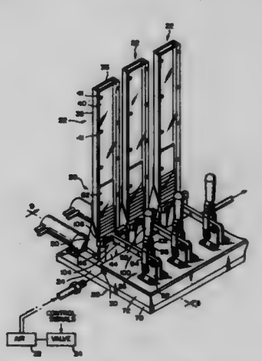
1. Widemouthed barrel of a thermoplastic synthetic resin, with a radially outwardly projecting flange formed below the barrel opening for the mounting of a clamping ring for the barrel lid, having
a sidewall section (2) which is conical for the stacking of several barrels (1) one inside the other, a reinforcing and load-securing ring (11) arranged at a spacing below the barrel flange (10) on a cylindrical sidewall section (5) and projecting radially outwardly beyond the barrel flange (10), and a base ring (14) molded on the barrel bottom (3) and oriented radially outwardly.

5,193,716
MASKING METHOD
Seinosuke Horiki, and Reiji Makino, both of Tokai, Japan, assignors to Nagoya Oilchemical Co., Ltd., Nagoya, Japan
Filed Jun. 1, 1990, Ser. No. 532,016
Claims priority, application Japan, Jun. 2, 1989, 1-64971[U]
Int. Cl.[5] B05D *1/32*
U.S. Cl. 221—1 **7 Claims**



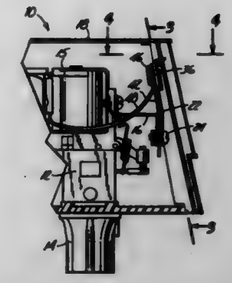
2. A method of masking holes of an article employing a mask tool comprising a cylinder having an inlet at one end and an outlet at the outer end wherein a plural number of plug shaped masking members positioned for fitting into said holes are inserted in said cylinder placed one upon the other and wherein said masking members within said cylinder are supported by a separate friction material positioned and extending along the entire length of the inside of said cylinder and employing transporting means to move said masking member from the inlet to the outlet of said cylinder into the holes of the article to be masked.

5,193,717
FASTENER FEED SYSTEM
Philip A. Rink, Everett, and Peter B. Zieve, Seattle, both of Wash., assignors to Electroimpact, Inc., Seattle, Wash.
Filed Apr. 30, 1991, Ser. No. 693,628
Int. Cl.[5] B65H *5/00*
U.S. Cl. 221—233 **12 Claims**



1. A fastener feed system for use with a fastener installation tool, comprising:
a base feeder assembly which includes a fastener passageway therein for receiving and moving fasteners endwise therealong to a fastener installation tool;
means for moving the fasteners endwise along the passageway by fluid pressure;
a plurality of means for storing fasteners, arranged sequentially along the base feeder assembly; and
a plurality of means for respectively receiving fasteners from an associated fastener storage means and for injecting fasteners into the fastener passageway, each of the receiving and injecting means being movable between first and second positions, wherein each receiving and injecting means includes an opening therethrough which i configured to permit fasteners to pass therethrough, wherein the opening forms part of the fastener passageway when said each receiving and injecting means is in its first position and into which a fastener is received from an associated fastener storage means when it is in its second position.

5,193,718
QUICK ELECTRONIC DISCONNECT FOR A BEVERAGE DISPENSING VALVE
David A. Hassell, Anoka, Minn., and Karl A. Senghaas, San Antonio, Tex., assignors to IMI Cornelius Inc., Anoka, Minn.
Filed Jun. 25, 1991, Ser. No. 720,346
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—129.1 **6 Claims**



1. A beverage dispensing valve having a quick electrical disconnect, the valve for providing dispensing of a fluid beverage into a suitable receptacle, the valve connected to a power supply means and having an electrical operating means for opening and closing the valve, the valve comprising:
a valve body, and the operating means secured to the valve body,
a valve cover for securing around the valve body and operating means,
an access plate portion of the valve cover, the access plate portion releasably secureable with the valve cover, the access plate portion having electronic control means secured to an inner surface thereof, the electronic control means controlling the operating means for regulating the opening and closing of the valve,
an electrical connecting means for providing a releasable electrical connection between the electronic control means, the operating means and the power supply means, the electrical connecting means including a first connecting portion secured to and electrically connected to the electronic control means and a second connecting portion secured to the valve body and electrically connected to the power supply means and the operating means, and the first and second connecting portions positioned on the access plate portion and valve body respectively for providing electrical connection there between when the access plate portion is secured to the valve cover.

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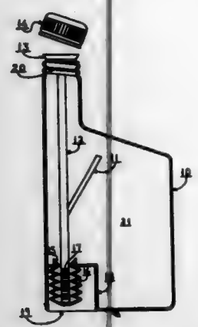
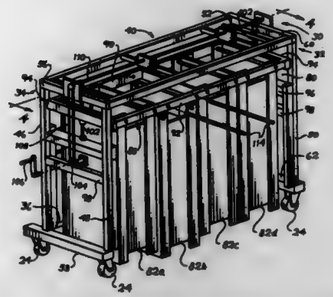
5,193,719
OIL CONTAINER HAVING A VALVED CONTROLLED OUTLET
Terry Huffman, 947 S. Oak St., Grand Island, Nebr. 68801, and Ange Nout, 4428 Center St., Omaha, Nebr. 68105
Filed Oct. 28, 1991, Ser. No. 783,385
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—153 **5 Claims**



1. A dispenser for dispensing liquids, comprising:
a) a container having a neck which terminates at an outlet opening, a top surface of the container with at least a portion thereof being upwardly tapered towards and joined to the neck;
b) a valve stem axially disposed in said container, said valve stem at a first end, having a valve which normally closes said outlet and at a second end, being flexibly connected to the bottom of the container;
c) means for flexibly connecting said second end to the container bottom, said means comprising a bellowed member disposed in an open cavity of the container bottom and having interior portions thereof which hold said second end of said valve stem, said bellowed member serving as an actuator, when depressed, for moving said valve by said valve stem, to a position in which the outlet opening is unobstructed by said valve to permit dispensing from the container; and
d) means for preventing said valve and valve stem from falling out of the container after the container has been opened and inverted, said means comprising a safety stem angularly disposed on said valve stem in a direction towards said upwardly tapered top wall of the container and spaced therefrom when the valve is in a closed position, such that upon moving the valve to an open position, the safety stem engages said tapered top wall and prevents said valve and stem from falling out of the container when the container is inverted.

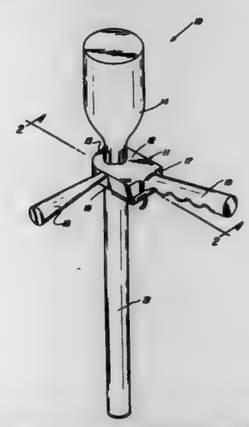
5,193,720
VEHICULAR DISPENSING APPARATUS
Charles C. Mayberry, Harvard, Ill., assignor to Fluid Management Limited Partnership, Wheeling, Ill.
Filed Sep. 19, 1991, Ser. No. 762,590
Int. Cl.[5] B67D *5/64*
U.S. Cl. 222—160 **11 Claims**

1. Liquid dispensing apparatus for transporting at least one liquid container having an upper end and means at the upper end for lifting the container and for dispensing the contents of the liquid container, comprising:
vehicular frame means rollable from place to place, having a pair of end walls, and a mounting wall and top wall between the end walls and cooperating therewith to define a partially enclosed cavity for receiving a container when the frame means is rolled over the container;
metering and dispensing means carried on said frame means including means for coupling to a container;
a lifting collar carried on said vehicular frame means so as to be raised and lowered toward and away from the container;



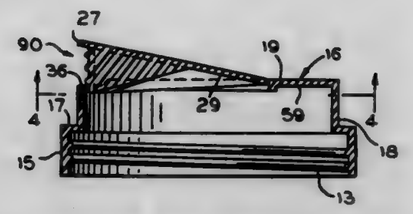
attaching means for releasably attaching the container to said lifting collar; and
lifting means associated with said vehicular frame means for selectively lowering said collar adjacent said container upper end and for raising said collar and container in preparation for transport of said container.

5,193,721
PESTICIDE DISPENSER APPARATUS
Richard N. Gryder, 3735 Dawnwood, Woodland, Tex. 77380
Filed Apr. 7, 1992, Ser. No. 864,587
Int. Cl.[5] G01F *11/16*
U.S. Cl. 222—341 **7 Claims**



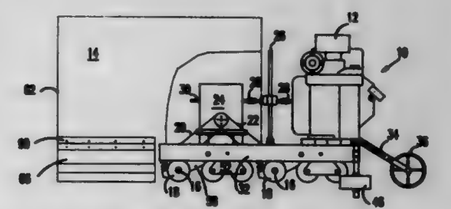
1. A pesticide dispenser apparatus, comprising,
a central housing, the central housing including a top wall, and
a continuous side wall, wherein the continuous side wall includes a first side wall orthogonally oriented relative to a second side wall, the first side wall including a first handle, with the first handle orthogonally oriented relative to the second handle for ease of manipulation and alignment of the organization, the top wall including a receiving tube, the receiving tube directed into the central housing through the top wall,
and
an outlet tube directed into the central housing, wherein the supply container includes a bottom wall, with the outlet tube directed through the bottom wall into the central housing in coaxial alignment and in communication with the receiving tube,
and
a reciprocating door plate reciprocatably mounted relative to the central housing received at an interface between the receiving tube and the outlet tube, wherein the door is arranged for selective reciprocation permitting selective granular flow from the receiving tube to the outlet tube,
and
an inverted supply container positioned within the receiving tube, wherein the supply container includes an outlet opening at a lower distal end projected into the receiving tube,
and
the central housing includes a trigger housing mounted to the central housing bottom wall, wherein the trigger housing includes a lower plate spaced from the housing bottom wall, the lower plate including a plate slot, and a trigger lever pivotally mounted within the plate slot, and a lever axle directed into the lower plate pivotally mounting the trigger lever, and the trigger lever including an arcuate toothed upper periphery, and a toothed linear rack in engagement with the toothed upper periphery, with the toothed linear rack orthogonally oriented relative to the outlet tube slidably mounted within the trigger housing, and an actuator lever, the linear rack including a linear rack forward distal end arranged for abutment with the actuator lever, the actuator lever including an actuator lever first pivot axle pivotally mounting the actuator lever within the trigger housing, and the actuator lever including an actuator lever second pivot axle, and a control rod, with the actuator lever second pivot axle mounted to the control rod, and the control rod including the door plate mounted to a forward distal end of the control rod whereupon pivotment of the trigger lever effects reciprocation of the control rod and the door plate.

5,193,722
SIDE DISPENSING CLOSURE
Robert J. Groya, Norridge, and Richard W. Hofmann, Chicago, both of Ill., assignors to Magenta Corporation, Chicago, Ill.
Continuation of Ser. No. 393,675, Aug. 14, 1989, Pat. No. 5,054,663, which is a continuation-in-part of Ser. No. 234,568, Aug. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 317,463, Mar. 1, 1989, Pat. No. 4,984,720. This application Jul. 29, 1991, Ser. No. 737,214
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] B67D *5/06*
U.S. Cl. 221—531 **4 Claims**



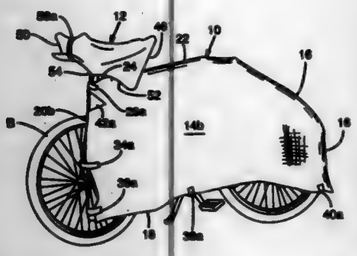
1. A one-piece molded plastic container closure having an open bottom and a closed top wall, comprising a peripheral skirt defining the open bottom, said skirt having internal means formed thereon for fixing the closure to a container, said top wall having an aperture therein of a predetermined size, said top wall having a lid with a lid rear hingedly connected to said top and being pivotable to and from a closed position to an open position, said lid having a lid front terminating adjacent a periphery of said top wall, side walls for said lid depending from an undersurface of said lid, at least one dividing wall depending from the lid undersurface and spaced from each of the side walls, said dividing wall having a front face extending from said lid to a reinforcing web and a portion extending towards said lid rear, said reinforcing web interconnecting said side walls at a forward end of said sidewalls remote from said hinge connection, said web being spaced from said lid undersurface, said lid undersurface and said side walls and said web defining at least two dispensing orifices when said lid is pivoted to an open position, said dispensing opening having an outermost edge adjacent the periphery and spaced from the periphery of the top only by a narrow inturned lip whereby the dispensing orifices are substantially at the periphery of the top, said web having latch means thereon projecting forwardly of said sidewalls, said latch means cooperating with said inturned lip extending inwardly of the periphery of said top wall to limit opening of said lid, and said side walls and lid undersurface and dividing wall defining at least two chute-like dispensing passages.

5,193,723
MORTAR APPLYING DEVICE
Alvin J. Everett, 1239 Wildwood Rd., Salem, Va. 24153, and Steven Wells, Norfolk, Va., assignors to A. J. Everett, Salem, Va.
Filed Oct. 28, 1991, Ser. No. 784,161
Int. Cl.[5] E04G *21/04*
U.S. Cl. 222—611.2 **16 Claims**



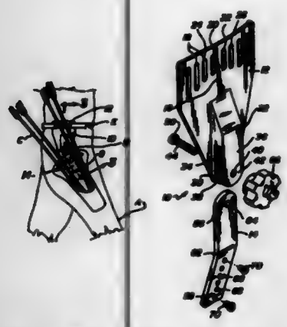
1. A mortar applying device, comprising:
a frame having top, bottom, left and right sides, as well as a front and rear end;
a hopper having four sidewalls and an open bottom and an open top connected to said frame;
a discharge element positioned under said open bottom of said hopper towards said rear end of said frame, said directing mortar to exit ports located towards said left and right sides of said frame;
a plurality of wheels connected to said frame, a first group of said wheels being positioned at said right side of said frame, a second group of said wheels being positioned at said left side of said frame, at least one of said wheels being a drive wheel;
a motor connected to said frame;
means for connecting said motor to said drive wheel for propelling said frame along a top surface of a wall under construction;
guide means positioned on said left and right sides of said frame for guiding said frame on said top surface of said wall under construction; and
means for automatically stopping forward progress of said frame at an end point of said wall under construction, said means for automatically stopping forward progress including
(i) a motor cut-off switch, and
(ii) a mans for sensing both a wall endpoint which abuts against a higher wall and a wall endpoint with no abutting wall.

5,193,724
BICYCLE COVER
Donald M. Robbins, P.O. Box 6144, Vancouver, Wash. 98662
Filed Sep. 27, 1991, Ser. No. 766,585
Int. Cl.[5] B62J *19/00*
U.S. Cl. 224—31 4 Claims



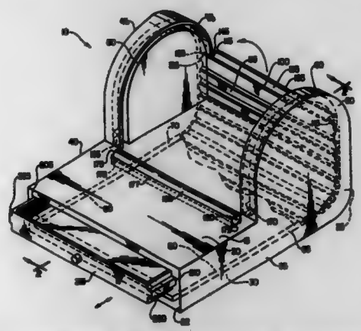
1. A bicycle cover comprising:
a bag-like member having a front portion, a rear portion, top and bottom portions, and side portions,
the side portions of said bag-like member including wall panels capable of covering sides of a bicycle,
the rear portion of said bag-like member being closed to cover a rear of the bicycle,
the bottom portion and front portion of said bag-like member being open to allow the cover to fit down over the bicycle,
the top portion of said bag-like member being closed from the rear portion thereof to a point short of the front portion, leaving open top edges to fit around an upright gooseneck of the bicycle,
securing means on the front portion of said bag-like member releasably securing said open top edges around an upright gooseneck of the bicycle,
and a hood-like member separate from said bag-like member and having front and rear wall panels closely fully across top and side edges thereof,
the said hood-like member having a bottom edge that is partly closed and partly open,
the open portion of said bottom edge allowing said hook-like member to be fitted over handlebars of the bicycle in enclosing relation.

5,193,725
ADJUSTABLE QUIVER MOUNT
Robert Radocy, 1280 28th St., Ste. 3, Boulder, Colo. 80303-1797
Filed May 30, 1991, Ser. No. 707,851
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—197 12 Claims



1. An archery quiver mounting device for positioning a quiver and arrows so as to allow freedom of movement to the archer, the mounting device comprising:
a) a base support means including a mean for attaching the mounting device to the clothing of the archer;
b) a quiver mounting means for attachment of a quiver coupler device for mounting an archery quiver to the mounting device, said quiver mounting means includes an elongated mounting arm having first and second ends, said mounting arm having a plurality of properly spaced mounting holes near the second end for attaching a quiver coupler device;
c) said base support means including means for pivotally connecting the mounting means to the base support means, said pivotally connecting means on said base support means including a clevis having first and second bifurcated legs forming a slot therebetween for pivotally receiving the first end of said mounting arm between said legs; and
d) said connecting means including adjusting means for adjusting the pivotal friction between the first and second legs and said mounting arm whereby the user can quickly position the quiver and arrows so as not to interfere with the archer's movements during use.

5,193,726
SHEET MATERIAL DISPENSING APPARATUS
Paula Humphrey, 3642 Anthony Dr. #1D, Mesquite, Tex. 75150
Filed Jan. 29, 1992, Ser. No. 827,286
Int. Cl.[5] B26F *3/02*
U.S. Cl. 225—4 19 Claims

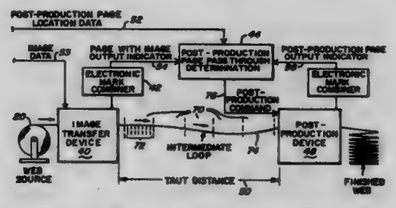


1. A sheet material dispensing apparatus comprising:
a frame,
an arched trackway supported by said frame;
a pliable cover movably disposed within said arched trackway between a first position enclosing a supply of sheet material, and a second position exposing said sheet material,
a constricting slot, between said frame and said pliable cover to guide passage of said sheet material, and
a fastener adjacent said pliable cover to hold said pliable cover in said first position and narrow said constricting slot to apply pressure to said sheet material when said sheet material is dispensed.

18. A method of dispensing connected trash can liners from a sheet material dispensing apparatus comprising a frame supporting an arched trackway, a pliable cover slidably disposed within said arched trackway between an open and closed position, a first roller pivotally attached to said pliable cover and a second roller pivotally attached to said frame, and a fastener adjacent said pliable cover to hold said pliable cover in said closed position, comprising the steps of:
sliding said pliable cover to said open position,
placing said trash can liners adjacent said arched trackway,
extending said trash can liners across the second roller,

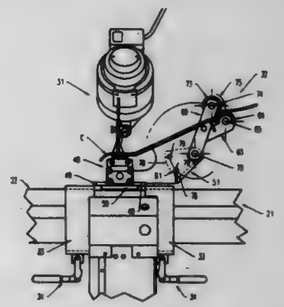
sliding said pliable cover to said closed position whereby said first roller is brought into contact with said trash can liners, and
locking said pliable cover into said closed position with said fastener whereby said fastener causes said trash can liners to be gripped by said first roller and said second roller.

5,193,727
SYSTEM FOR INCORPORATION OF POST-PRODUCTION OPERATIONS TO A WEB OUTPUT FROM AN IMAGE TRANSFER DEVICE
H. W. Crowley, Newton, Mass., assignor to Roll Systems, Inc., Burlington, Mass.
Filed Jul. 31, 1990, Ser. No. 560,127
Int. Cl.[5] B65H *9/00*
U.S. Cl. 226—24 8 Claims



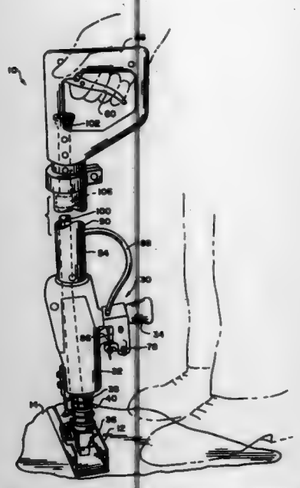
1. A system for incorporating, in the production of a stream of images by an image transfer device upon a moving web, post-production operations upon the web at various locations, said system comprising:
an image transfer device for applying images to a continuous web output therefrom, the image transfer device including means for generating electronic pulses as predetermined length increments of the web pass through the image transfer device;
first means for counting the electronic pulses from the first means for generating;
first means, responsive to the first means for counting, for indicating a page of the web having an image thereon based upon a predetermined number of pulses;
a post-production device positioned downstream of the image transfer device and receiving the web output from the image transfer device, the post-production device performing a post-production process on the web received thereby;
second means for generating electronic pulses as predetermined length increments of the web pass through the post-production device, the length increments of web passing through the post-production device being equal in length to the predetermined length increments passing through the image transfer device;
second means for counting the electronic pulses from the second means for generating;
second means, responsive to the second means for counting, for indicating a page of the web having an image thereon based upon a predetermined number of pulses;
a shift register having a plurality of blocks for storing values therein, a number of blocks in the shift register equal to a number of pages on the web positioned between the image transfer device and the post-production device, the values in each of the blocks of the shift register corresponding to one of a plurality of specific post-production operations and the blocks being arranged so that the values shift therealong from an upstream end to a downstream end of the shift register as pages pass from the image transfer device to the post-production device;
means from shifting the values in each of the blocks downstream by one block as each page passes through the post-production device;
means for adding a block to the upstream end of the shift register when a page is output from the image transfer device before a page is input to the post-production device;
means for removing a block from the upstream end of the shift register when a page is input to the post-production device and before a page is output from the image transfer device; and
means for reading the value of the downstream block and for instructing the post-production device to perform the post-production process corresponding to the value in the downstream block on the web as the page corresponding to the downstream block is input into the post-production device.

5,193,728
UNIDIRECTIONAL PINCH ROLLERS FOR A CLOTH SPREADING MACHINE
Robert J. Pieroni, Youngstown, N.Y., assignor to Eastman Machine Co., Buffalo, N.Y.
Filed Sep. 17, 1991, Ser. No. 761,327
Int. Cl.[5] G03B *1/56*; B65H *20/02*
U.S. Cl. 226—90 12 Claims



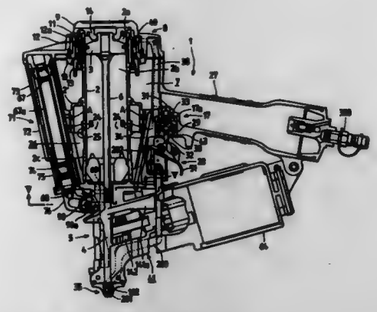
1. In cutting apparatus in which a length of flexible sheet material may be pulled from a roll, the improvement which comprises:
roller means mounted on said apparatus and operatively arranged to constrain said material to move unidirectionally when said length is pulled, said roller means including:
a first roller mounted for free rotation about a first axis;
a second roller mounted for unidirectional rotation about a second axis arranged substantially parallel to said first axis;
each of said rollers having an outer peripheral surface; and
a guide having an entrance end spaced from, but substantially aligned with, the nip between said rollers when said rollers are in said first position;
said first and second axes being mounted for selective relative movement toward and away from one another between a first position at which the outer peripheral surfaces of said rollers are biased to forcibly engage one another, and a second position at which said peripheral surfaces are spaced from one another;
said rollers being adapted to be selectively moved to a third relative position at which the outer peripheral surface of said second roller will forcibly engage said guide;
whereby, when said rollers are in said first position, material positioned between said rollers will be gripped by said outer peripheral surfaces, and will be constrained to move in only one direction, but when said second roller is in said third position, the length of material positioned between said second roller and guide will be gripped by the outer peripheral surface of said second roller and guide.

5,193,729
FASTENER-DRIVING TOOL ASSEMBLY WITH IMPROVED FASTENER-LOADING FEATURES
George G. Dewey, Prospect Heights, and Ronald J. Allen, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Sep. 26, 1991, Ser. No. 765,840
Int. Cl.[5] B25C *1/14*
U.S. Cl. 227—8 20 Claims



1. A tool assembly for driving a fastener toward and into a substrate, comprising:
a handle subassembly;
a nosepiece spaced from said handle subassembly and having an aperture defined therein for permitting said fastener to be axially driven through said nosepiece toward said substrate;
a shuttle moveable with respect to said nosepiece between a fastener-receiving position and a fastener-delivery position, and having a passageway defined therein for receiving said fastener with said fastener disposed axially within said passageway and for permitting said fastener to be axially driven through said shuttle and toward said substrate;
means comprising a flexible tube for guiding said fastener axially into said passageway of said shuttle when said shuttle is disposed at said receiving position;
means mounting said nosepiece for relative movement with respect to said handle subassembly, and means for causing resultant movement of said shuttle from said receiving position to said delivery position in response to said movement of said nosepiece with respect to said handle subassembly so as to transfer said fastener, disposed axially within said passageway of said shuttle, from said receiving position to said delivery position when said fastener is to be axially driven through said passageway of said shuttle and said aperture of said nosepiece toward said substrate; and
means comprising a driving ram, which is disposed so as to be axially driven through said passageway of said shuttle and into said aperture of said nosepiece when said shuttle is disposed at said delivery position, for engaging said fastener disposed within said passageway of said shuttle so as to drive said fastener axially from said passageway of said shuttle and through said aperture of said nosepiece into said substrate.

5,193,730
PNEUMATIC NAILING MACHINE
Hiroshi Tanaka, and Michiaki Adachi, both of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan
Filed May 27, 1992, Ser. No. 887,752
Claims priority, application Japan, Oct. 30, 1991, 3-53196[U]; Oct. 30, 1991, 3-113373[U]
Int. Cl.[5] B25C *1/04*
U.S. Cl. 227—8 8 Claims

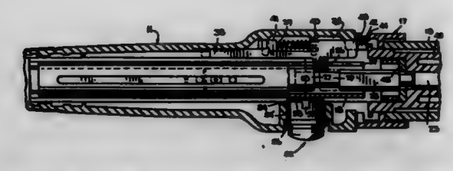


1. A nailing machine comprising:
a housing defining the contour of a nailing machine body;
a percussion cylinder disposed within the housing;
a percussion piston slidably disposed within the percussion cylinder and integrally coupled with a percussion driver for driving nails;
a nose member provided at one end of the housing, said nose member having a nail injection hole for slidably guiding the percussion driver;
nail supply means, supported by the nose member, for successively supplying connected nails to the nail injection hole through an opening formed in the side wall of the nail injection hole;
a main chamber provided within the housing and coupled with an air supply source;
a main valve, disposed at the upper end of the percussion cylinder, for introducing compressed air in the main chamber into the percussion cylinder or for discharging compressed air in the percussion cylinder to the air;
a trigger valve, manually operable, for supplying to the main valve an operation signal to operate the main valve;
nail protruding means for separating a nail from said connected nails supplied to the nail injection hole of the nose member by the nail supply means before the nail is driven by the percussion driver, and for pushing the nail to the front of the nail injection hole; and
nail holding means for holding the body part of the nail pushed to the fore side of the nose member by the nail push means in a state that the pointed end of the nail is protruded.

5,193,731
ANASTOMOSIS SURGICAL STAPLING INSTRUMENT
Ernest Aranyi, Easton, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Division of Ser. No. 214,289, Jul. 1, 1988, Pat. No. 5,005,749.
This application Sep. 18, 1990, Ser. No. 584,206
Int. Cl.[5] A61B *17/115*
U.S. Cl. 227—19 9 Claims

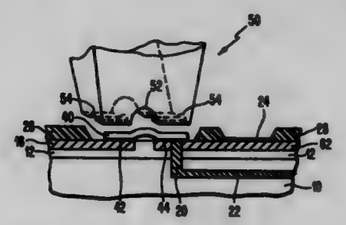
6. In a circular anastomosis surgical instrument having a fastener assembly containing an annular array of fasteners and a pusher tube slidably mounted in an instrument housing for engagement with said fastener assembly, the improvement comprising means for indicting the firing of the fasteners, said

indicting means mounted adjacent said pusher tube, said indicating means radially movable with respect to said pusher tube



between a first position and a second position to indicate firing of the fasteners.

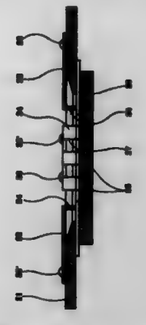
5,193,732
APPARATUS AND METHODS FOR MAKING SIMULTANEOUS ELECTRICAL CONNECTIONS
Mario J. Interrante, New Paltz; Michael Berger, Gardiner; Edward F. Hasdford, Wurtsboro, and Eugene Tas, Stanfordville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 4, 1991, Ser. No. 771,706
Int. Cl.[5] H01L *21/607;* B23K *20/10*
U.S. Cl. 228—1.1 13 Claims



1. A bonding tip for creating a simultaneous electrical connection across at least two terminals using a staple, wherein said bond tip has a bonding surface and an attachment surface, and wherein said attachment surface is secured to an ultrasonic horn, and wherein said bonding surface has at least two work grooves to hold at least a portion of said staple to form said simultaneous electrical connection across said at least two terminals, said bonding surface being divided by a tip gap between said at least two work grooves.

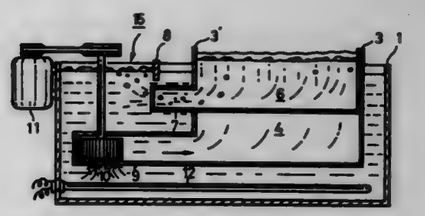
5,193,733
CLAMPING DEVICE FOR INNER LEADS OF LEAD FRAME
Joong H. You, Choongchungbook, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook, Rep. of Korea
Filed Nov. 21, 1991, Ser. No. 795,451
Claims priority, application Rep. of Korea, May 14, 1991, 6846/1991
Int. Cl.[5] B23K *37/04*
U.S. Cl. 228—4.5 5 Claims

1. A clamping device for clamping inner leads of a lead frame, comprising:
a clamp fixing plate having a working opening; and
a plurality of inner lead clamps each made of a plate spring and fixedly mounted to an upper surface of said clamp fixing plate, each of said inner lead clamps having at a respective inner end thereof a vertical pressing portion extending normal to said upper surface and downward



into said working opening of the clamp fixing plate for pressing a group of inner leads.

5,193,734
JET SOLDER BATH
Kiajiro Takayama; Kenichi Tomitsuka, both of Kanagawa; Tatsuo Fujita, Tokyo; Hisashi Suwa, Kanagawa; Mitsuo Zen, Saitama, and Hidetoshi Nakamura, Tokyo, all of Japan, assignors to Sony Corporation and Senju Metal Industry Co., Ltd., both of Japan
Filed Jan. 22, 1992, Ser. No. 823,964
Claims priority, application Japan, Jan. 28, 1991, 3-8336
Int. Cl.[5] B23K *3/00*
U.S. Cl. 228—37 10 Claims

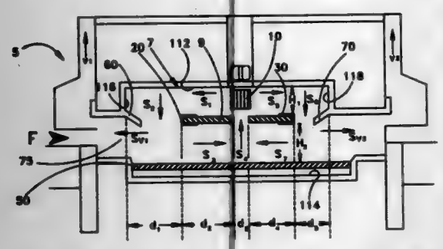


1. A jet solder bath comprising:
(a) a bath unit which contains a molten solder;
(b) a nozzle member provided within said bath unit and forming a nozzle mouth;
(c) a tank provided in at least one side of said nozzle mouth and temporarily accumulating solder jetted from said nozzle mouth;
(d) a molten solder outlet provided on a lower portion of said tank and communicating with said tank and a molten solder still area provided within said solder bath unit under the liquid level of the molten solder; and
(e) an upper partition installed above a mouth of said molten solder outlet.

5,193,735
SOLDER REFLOW OVEN
Isaac M. Knight, Lakeview Terrace, Calif., assignor to Knight Electronics, Inc., San Fernando, Calif.
Filed Jul. 13, 1992, Ser. No. 912,286
Int. Cl.[5] B23K *3/00*
U.S. Cl. 228—42 20 Claims

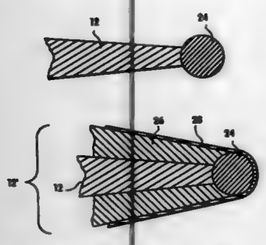
1. A solder reflow oven useful for annealing electronic parts through convective heating, comprising:

a. an enclosed chamber having an entrance and an exit, the chamber having an upper part and a lower part;
b. a conveyor located for transporting electronic parts from said entrance to said exit in said lower part of said chamber;
c. a diffuser plate suspended in said upper part of said chamber and having a central duct and a periphery edge;
d. at least two heater plates mounted on said periphery edge of said diffuser plate and located proximal to said entrance and said exit of said chamber respectively;
e. an impeller rotatably mounted above said central duct of said diffuser plate for forming in said chamber a multiplicity of circulatory airstreams which are originated from



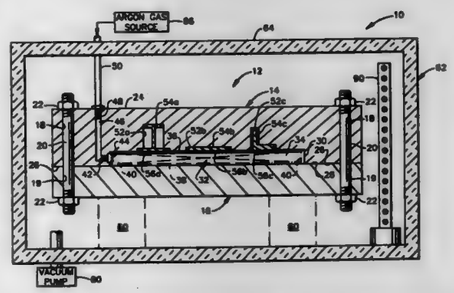
said impeller and circulating from above said diffuser plate, around said periphery edge of said diffuser plate, then between said diffuser plate and said conveyor and toward a lower central region below said central duct of said diffuser plate;
f. said diffuser plate positioned inside said chamber in a manner which causes said multiplicity of circulatory airstreams flow faster when above said diffuser plate but slower below said diffuser plate; and
g. whereby said solder reflow oven can anneal electronic parts through convective heating, where graduated temperature zones are established by causing air circulation in the manner described above, without having excessive airflow over the electronic parts being annealed.

5,193,736
METHOD FOR REPAIRING TURBINE VANES
Gillion H. Marijnissen, NC Beringe, Netherlands; Timothy P. Vastine, North Richland Hills, and Gerald T. Smith, Arlington, both of Tex., assignors to Interturbine Corporation, Grand Prairie, Tex.
Filed Mar. 1, 1991, Ser. No. 662,743
Int. Cl.[5] B23P *15/02*
U.S. Cl. 228—119 **16 Claims**



1. A method for repairing a trailing edge of a damaged jet engine turbine vane comprising the steps of:
(a) cleaning said vane, including removing coatings, so as to expose a base metal of said vane,
(b) milling said trailing edge of said vane to be repaired to form a milled edge having a suitable seat for accepting a length of wire of comparable length to that of said milled edge;
(c) positioning said length of wire against said milled edge to form a mated area, wherein said length of wire is of sufficient diameter to act as a dam or support for a brazing compound;
(d) tack welding said length of wire to said milled edge;
(e) cleaning said vane;
(f) applying sufficient amount of said brazing compound along substantially the entire length of said vane adjacent said length of wire to cover at least a portion of said length of wire, said vane and said mated area to exceed desired dimensions;
(g) vacuum furnace brazing said vane treated in accordance with preceding steps (a) through (f);
(h) performing a diffusion cycle; and
(i) refinishing said vane to obtain predetermined dimensions.

5,193,737
METHOD AND APPARATUS FOR DIFFUSION BONDING
John W. Carraher, Sardinia, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Oct. 12, 1989, Ser. No. 420,450
Int. Cl.[5] B21D *39/00*; B21K *28/00*
U.S. Cl. 228—157 **12 Claims**

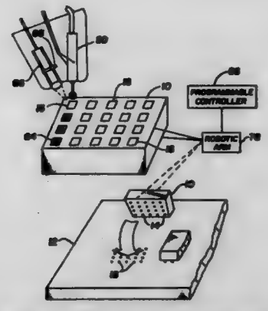


1. A method of diffusion bonding structural components to a honeycomb panel having an interior defined by spaced, outer face sheets which are connected to an inner core, comprising:
positioning the honeycomb panel between a first surface and a carrier which supports structural components so that at least one outer face sheet of the honeycomb panel faces the structural components;
drawing a vacuum at the interface between the honeycomb panel and the structural components supported in the carrier;
heating the honeycomb panel and structural components;
pressurizing the interior of the honeycomb panel to force said at least one outer face sheet into contact with the structural components with sufficient force to effect a diffusion bond therebetween.

5,193,738
METHODS AND APPARATUS FOR SOLDERING WITHOUT USING FLUX
Donald J. Hayes, Plano, Tex., assignor to MicroFab Technologies, Inc., Plano, Tex.
Filed Sep. 18, 1992, Ser. No. 946,665
Int. Cl.[5] B23K *3/08, 26/00*
U.S. Cl. 228—180.2 **20 Claims**

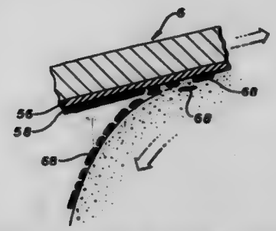
1. The method of joining metallic surfaces comprising the steps of:
(a) positioning and maintaining a first metallic surface and a second metallic surface in a relatively inert environment;

(b) cleaning said first and said second surfaces with laser energy;
(c) forming a deposit of solder on one of said first and second surfaces;



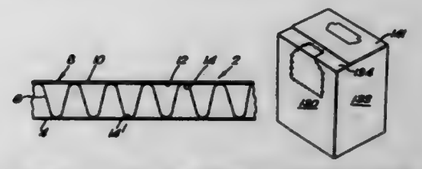
(d) moving said first and second surfaces with respect to each other to position said deposit of solder in contact with the other of said first and second surfaces; and
(e) heating said deposit of solder until it reflows and forms a solder bond between said first metallic surface and said second metallic surface.

5,193,739
PROCESS AND DEVICE FOR SOLDERING ELECTRONIC BOARDS, IN PARTICULAR, PRINTED CIRCUIT BOARDS WITH DEVICES INSTALLED ON THEM
Volker Liedke, Elsenfeld/Eichelsbach; Karl-Heinz Grasmann, Stadtprozelten; Hans-Jürgen Albrecht, Berlin; Harald Wittrich, Berlin; Wilfred John, Berlin, and Wolfgang Scheel, Berlin, all of Fed. Rep. of Germany, assignors to WLS Karl-Heinz Grasmann, Faulbach, Fed. Rep. of Germany
Filed Dec. 18, 1991, Ser. No. 810,708
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1990, 4041270
Int. Cl.[5] B23K *1/20*; B08B *7/00*
U.S. Cl. 228—205 **18 Claims**



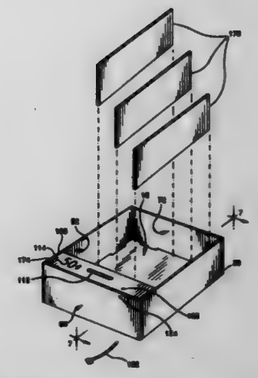
1. In a process for soldering electronic boards, which includes the steps of: subjecting the boards to a pickling process wherein oxide layers present on the soldering connection surfaces are largely removed; and soldering the boards by wetting metal soldering connection surfaces with molten solder, the improvement wherein, during the pickling process, the entire board is first exposed to a gas atmosphere containing a condensable process material in a gaseous phase, causing absorption of the gaseous process material into flaws in the oxide layers; at least partially condensing said gaseous process material in the flaws; and then heating the oxide layers to explosively vaporize the condensed process material in the flaws whereby the oxide layer breaks up and cracks off the metal basis material.

5,193,740
DISPOSABLE FOLD-UP CONTAINER FOR USED MEDICAL MATERIALS
Mark Newborough, Westhoughton, and Neil B. Whatmough, Oldham, both of United Kingdom, assignors to Cundell Decorprint Limited, United Kingdom
Filed Apr. 8, 1992, Ser. No. 865,696
Claims priority, application United Kingdom, Feb. 12, 1988, 8803288; May 25, 1988, 8812371
Int. Cl.[5] B65D *5/00*
U.S. Cl. 229—3.5 MF **4 Claims**



1. A fold-up container for holding and incinerating disposable syringes comprising:
a base panel, a top panel and a plurality of side panels hingably connected to one another along a plurality of fold lines to define a closed container having an internal chamber dimensioned to receive one or more disposable syringes,
an access opening into said chamber formed by a peripheral weakened line defining a tear strip, said weakened line located in at least one of said side panels and extending into a portion of said top panel,
said carton formed of a corrugated paper-based fluting having an inner metal foil layer, defining said chamber, secured to one side of said fluting and an outer paper-based layer secured to an opposite side fluting,
whereby said container resists puncturing by a syringe and maintains sufficient structural integrity to facilitate destruction of syringes by internal burning before the container itself is destroyed by burning.

5,193,741
UNISTRUCTURALLY FORMED MERCHANDISE DISPLAY CONTAINER AND COIN BOX
Mark Magruder, 1544 Becker Rd., Green Lane, Pa. 18054
Filed Mar. 2, 1992, Ser. No. 844,235
Int. Cl.[5] B65D *5/22*
U.S. Cl. 229—8.5 **19 Claims**



1. A box comprising:
a first open compartment and a coin compartment sharing at least one common wall, wherein said first compartment and said coin compartment are unistructurally formed

from a common folded blank of paper-based material, and wherein said second closed compartment is constructed of a plurality of interconnected folded panels that include at least a first panel and a second panel that separate when said second closed compartment is unfolded from a closed position, said first and second panels having apertures formed therethrough that align when said second closed compartment is in said closed position, and wherein a locking means joins said first and second panels through said apertures, preventing said second closed compartment from being unfolded from said closed position.

5,193,742

METHOD FOR CONTROLLING OPERATION OF AIR-CONDITIONER TO ADJUST ROOM TEMPERATURE AUTOMATICALLY

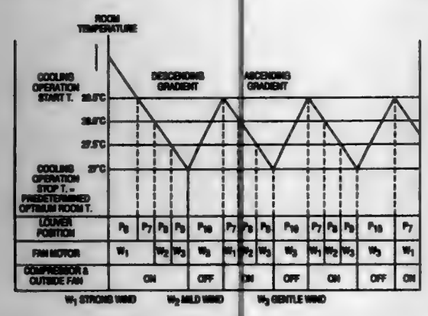
Il S. Byun, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 31, 1992, Ser. No. 828,452

Claims priority, application Rep. of Korea, Feb. 1, 1991, 1739/1991

Int. Cl.[5] F24F *13/00*

U.S. Cl. 236—49.3 6 Claims



1. A method for controlling the operation of an air-conditioner to adjust the temperature in a room in which the air-conditioner is installed, comprising the steps of:

(a) inputting an optimum room temperature selected by an operator;

(b) storing the value of the optimum room temperature as a cooling operation stop value and adding a predetermined temperature value to the cooling operation stop value to calculate the cooling operation start value, and then storing the calculated cooling operation start value;

(c) sensing and storing the current room temperature at a predetermined time interval;

(d) comparing the current room temperature sensed at the predetermined time interval with the stored cooling operation stop value and the stored cooling operation start value;

(e) determining whether the room temperature rises or drops, on the basis of the comparison, storing a room temperature ascending mode or a room temperature descending mode, according to the determination, and performing a cooling operation corresponding to the stored mode;

(f) controlling the flow amount and the flow direction of cool air supplied to the room, depending on the difference between the current room temperature and the optimum room temperature and the stored room temperature ascending or descending mode; and

(g) controlling the flow rate of cool air supplied to the room, depending on the difference between the current room temperature and the optimum room temperature and the stored room temperature ascending or descending mode.

5,193,743

DEVICE FOR INJECTING A FUEL-GAS MIXTURE

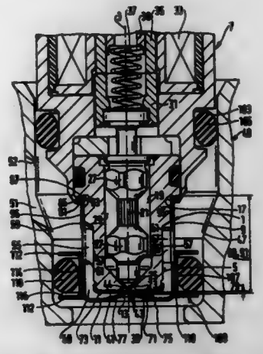
Peter Romann, Stuttgart, and Waldemar Hans, Bamberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1992, Ser. No. 883,329

Claims priority, application Fed. Rep. of Germany, May 31, 1991, 4117810; Jun. 28, 1991, 4121372

Int. Cl.[5] F02M *57/00, 43/00, 69/04*

U.S. Cl. 239—1 14 Claims



1. A device for injecting a fuel-gas mixture, having a fuel injection valve that has at least one injection port, a cup-shaped gas enveloping sleeve that surrounds a valve end having the at least one injection port of the fuel injection valve at least partially axially with a cylindrical part (9) and at least partially radially with a bottom part (11), said sleeve has at least one through opening in its bottom part, the cylindrical part (9) has at least three radially inwardly pointing guide strips (55, 123), which rest on the circumference of the valve end (5).

5,193,744

AUTOMATIC WATER-SPRAY FERTILIZING APPARATUS

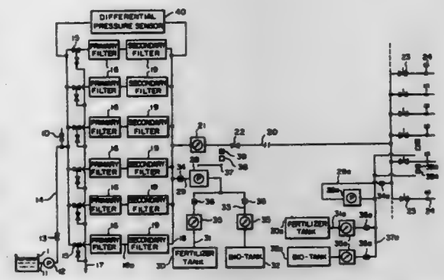
Gad Goldstein, Tokyo, Japan, assignor to Trans Global Incorporated, Tokyo, Japan

Filed Apr. 23, 1991, Ser. No. 689,561

Claims priority, application Japan, Jun. 22, 1990, 2-165354

Int. Cl.[5] B05B *7/26;* A01G *27/00*

U.S. Cl. 239—69 1 Claim



1. An automatic water-spray apparatus comprising a water source and a lift pump for pumping water from said water source;

filter devices for filtering the pumped water having an inlet pipe connected to said lift pump and an outlet pipe extending therefrom through a water metering device;

differential pressure sensing means connected to said inlet and said outlet pipes of said filter devices;

backwashing means connected to backwash said filter devices under control of said differential pressure sensing means;

a central computer for controlling the quantities and timing of spraying of fertilizers, agricultural chemicals and bacteria mixed with the water;

a pump computer connected to said central computer to control the operation of said lift pump

a weather station data collection means to collect and feed weather information to said central computer;

at least one area spray apparatus to spray at least one predetermined area with the water mixed with the fertilizers, agricultural chemicals, and bacteria including

injector devices for mixing the fertilizers, agricultural chemicals, and bacteria with the water;

said injector devices including

storage tanks for the fertilizers, agricultural chemicals, and bacteria;

a fertilizer pump operated by water from said outlet pipe passing through said fertilizer pump, having an inlet connected in the path of the water downstream of said filter devices and an outlet connected in the path of the water downstream of said water metering device and a second inlet connected to said storage tanks for the fertilizers, agricultural chemicals, and bacteria;

said at least one area spray apparatus further including a group of sprayers located in each of said at least one predetermined areas to be sprayed for spraying the fertilizers, agricultural chemicals, and bacteria mixed with the water from said injector devices and the water from said water metering device;

a water distribution slave computer for each of said area spray apparatus connected to said central computer for controlling the distribution of the water to said group of sprayers and controlling the amount of water spray from said group of sprayers in accordance with the area being sprayed by said group of sprayers.

5,193,745

ATOMIZING NOZZLE DEVICE FOR ATOMIZING A FLUID AND AN INHALER

Karl Holm, Hedevejen 8, Tranum 9460 Brovst, Denmark

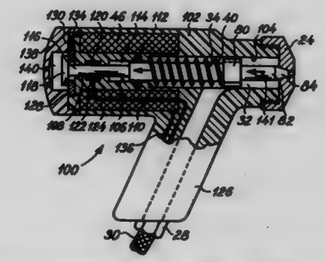
PCT No. PCT/DK90/00063, § 371 Date Oct. 12, 1990, § 102(e) Date Oct. 12, 1990, PCT Pub. No. WO90/10469, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 7, 1990, Ser. No. 585,055

Claims priority, application Denmark, Mar. 7, 1989, 1077/89; Mar. 17, 1989, 1295/89

Int. Cl.[5] B05B *1/08;* A61M *11/00*

U.S. Cl. 239—102.2 34 Claims



1. An atomizing nozzle device for atomizing a fluid supplied thereto and comprising:

a housing having an outer wall defining an inner chamber of said housing, an inlet for introducing said fluid into said chamber, and an orifice for discharging said fluid from said chamber.

a steam means comprising a closing element, said stem means being arranged within said housing so as to arrange said closing element juxtaposed said orifice for cooperating therewith,

a spring means acting on said stem means for forcing said closing element thereof into said orifice for closing said orifice,

an electro-magnetic driver means comprising a magnetic assembly and coil, said magnetic assembly defining a magnetic gap in which said coil is arranged, said magnetic assembly constituting a stationary component, and said coil constituting a movable component, said movable component being connected to said stem means and said stationary component being connected to said housing, and said electro-mechanical drive means comprising connector means for receiving an electrical signal for causing said movable component to move relative to said stationary component and furthermore causing said closing element of said stem means to move relative to said orifice for opening said orifice, and

a switch means including a first switch component and a second switch component, said first switch component being connected to said stem means and being movable therewith, said second switch component being connected to said stationary component, said first and second switch components being in contact with one another and establishing a current path to said connector means when said orifice is closed by said closing element, and said first and second switch components being out of contact with one another and interrupting said current path when said closing element is moved relative to said orifice.

5,193,746

SELF-CLEANING NOZZLE

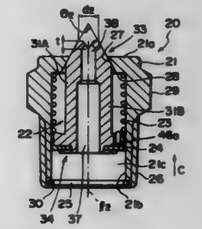
Yoshinari Iwamura, Kobe; Katsumori Okimoto, and Akio Shimizu, both of Hiroshima, all of Japan, assignors to H. Ikeuchi & Co., Ltd., Osaka, Japan

Filed Sep. 18, 1991, Ser. No. 761,450

Claims priority, application Japan, Oct. 26, 1990, 2-112951[U]

Int. Cl.[5] B05B *15/02*

U.S. Cl. 239—109 6 Claims



1. A nozzle comprising:

a cylindrical nozzle main body having a rear end with a fluid inlet formed therein, and a forward end with a tip engaging opening formed therein;

a substantially cylindrical nozzle tip formed of a subetantially cylindrical member divided along an axial direction thereof to form a plurality of nozzle tip members, said nozzle tip including, at a forward end thereof, a discharge section having an injection opening formed therein and, at a rearward end thereof, a radially outwardly projecting circumferential spring receiving section, nozzle tip having a fluid path extending axially therethrough and being accommodated in an interior of said nozzle main body with said discharge section being slidably engaged in said tip engaging opening such that an atomization operation is performed when fluid flows from said fluid inlet, through

said fluid path, and is injected through said injection opening;

a resilient spring, interposed between said spring receiving section of said nozzle tip and a wall at said forward end of said nozzle main body, for urging said nozzle tip rearwardly when atomization pressure is reduced, in order to perform a self-cleaning operation in which foreign matter in said fluid path is discharged;

wherein said discharge section of said nozzle tip has an outer peripheral surface, said tip engaging opening has an inner peripheral surface, and at least one of said outer peripheral surface and said inner peripheral surface is tapered; and

wherein a portion of said outer peripheral surface of said discharge section engages a portion of said inner peripheral surface of said tip engaging opening during said atomization operation and said self-cleaning operation.

5,193,747

PROTECTIVE CAP FOR A FUEL INJECTION VALVE

Christian Preussner, Bamberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

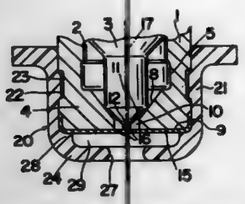
PCT No. PCT/DE90/00518, § 371 Date Mar. 19, 1991, § 102(e) Date Mar. 19, 1991, PCT Pub. No. WO91/02898, PCT Pub. Date Mar. 7, 1991

PCT Filed Jul. 11, 1990, Ser. No. 671,901

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1989, 3927390

Int. Cl.[5] F02M *61/18*

U.S. Cl. 239—288.5 **31 Claims**



23. A fuel injection valve including a fuel injection nozzle having a valve seat surface (8), at least one injection orifice (16), a cup-shaped protective cap attached to said fuel injection nozzle, said cup-shaped protective cap including a base which has a through flow passage open to said at least one injection orifice, said base extending radially inwardly as far as the through flow passage, said flow passage having a wall upon which injected fuel is deposited, at least one recess (29, 31) is provided in said cup-shaped protective cap in an immediate vicinity of said at least one injection orifice (16), said at least one recess having a capillary effect on the injected fuel deposited on said wall of said through flow passage, said capillary effect being of a magnitude such that fuel does not flow away from the through flow passage due to its weight.

5,193,748

SPRAY HEAD FOR SPRAY DEVICE

Adam Wittersheim, Ale Darmstadter Strasse 41, D-6109 Muhltal, and Georg W. Arras, Nibelungenstrasse 42, D-6101 Reichelsheim, both of Fed. Rep. of Germany

PCT No. PCT/EP90/01741, § 371 Date Aug. 23, 1991, § 102(e) Date Aug. 23, 1991, PCT Pub. No. WO91/06377, PCT Pub. Date May 16, 1991

PCT Filed Oct. 15, 1990, Ser. No. 720,439

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936365

Int. Cl.[5] B05B *9/04, 7/12, 15/02*; B65D *83/66*

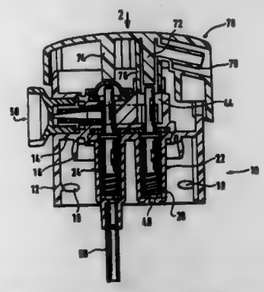
U.S. Cl. 239—337 **11 Claims**

1. A manually operated spray head for a spraying device comprising:

a spray head housing including a separating wall formed perpendicular to a longitudinal axis of the spray head housing, and at least portions of an air pressure canal and a product canal separately supplied to a spray nozzle and parallel to the longitudinal axis of the spraying device;

a valve housing positioned beneath the separating wall of said spray head housing, said valve housing including first and second valves operable with an initial tension in a closing position of which the first valve is positioned in a passage of the air pressure canal leading compressed air from a compressed air inlet to a product container interior, and the second valve is positioned inside a passage of the product canal transporting the product from a tube extending into the product container interior to the spray nozzle;

an actuating cap slidable in the longitudinal direction of said spraying device and fit on said spry head housing wherein the actuating cap includes two actuating taggets each allocated to one of the valves, respectively, which open the valves upon depression of the actuating cap; and



wherein the actuating taggets are so dimensioned that the actuating tagget allocated to the first valve, when pressing down the actuating cap, engages with the first valve before the actuating tagget allocated to the second valve engages with the second valve;

wherein each of the valves includes a valve shaft and a guide shaft in a linear arrangement and joined together by a flanged valve plate, the flanged valve plate of the first valve being arranged below the separating wall and in said passage of the air pressure canal and being slidably fit in the longitudinal direction therein, wherein said passage of the air pressure canal terminates above the product in the container, the flanged valve plate of the second valve being arranged below said separating wall and in the passage of the product canal and being slidably fit in the longitudinal direction therein.

5,193,749

FUEL INJECTION VALVE

Eiji Sakagami, Anjo, and Yoshiyuki Okamoto, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 30, 1991, Ser. No. 737,647

Claims priority, application Japan, Jul. 31, 1990, 2-203390

The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.

Int. Cl.[5] B05B *1/30*

U.S. Cl. 239—585.1 **3 Claims**

1. A fuel injection valve comprising;

an armature made of magnetic material and having a hole,

a coil placed around said armature,

a fuel supply port connected to said hole of said armature,

a first rod placed in said hole of said armature,

a core made of magnetic material and having a hole,

a control valve connected to said first rod and placed in said hole of said core,

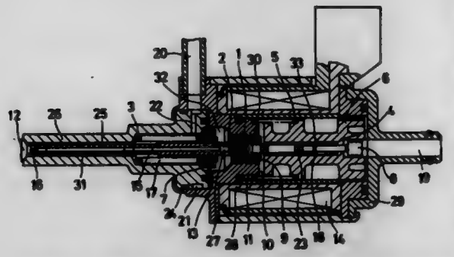
a nozzle connected to said core having an injection port,

a second rod placed in said nozzle and having a fuel passage which is opened and closed by said control valve,

a diaphragm attached to said second rod and dividing a room between said core and said nozzle into a fuel chamber and a mixture chamber,

a first spring between said nozzle and said diaphragm to push said diaphragm toward said control valve,

a second spring between said first rod and said armature to push said first rod toward the control valve,



a mixture passage in said nozzle connecting said mixture chamber and said fuel passage, and

a one way valve placed at said injection port of said nozzle,

wherein when said control valve closes said fuel passage of said second rod, a gap is made between said control valve and said armature to establish a passage to supply fuel into said fuel chamber from said fuel supply port.

5,193,750

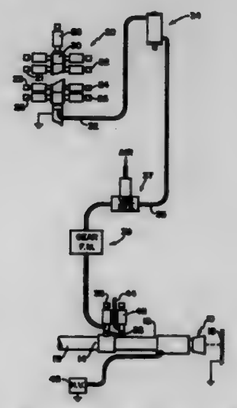
PERISTALTIC VOLTAGE BLOCK ROLLER ACTUATOR

Gregg S. LaMontagne, Austin, and Daniel C. Soper, Manchaca, both of Tex., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Mar. 22, 1991, Ser. No. 673,595

Int. Cl.[5] B05B *5/02*

U.S. Cl. 239—708 **5 Claims**



1. A coating material dispensing system comprising an electrostatic high potential supply having an output terminal on which the supply maintains a high electrostatic potential, a source of coating material, a dispenser for dispensing the coating material, the output terminal being coupled to the dispenser to supply potential to the coating material dispensed by the dispenser, and a peristaltic device for coupling the dispenser to the source of coating material, the peristaltic device having a length of resilient conduit formed into generally planar loops, a plurality of rollers for movably contacting the length of resilient conduit at multiple contact points for substantially dividing the coating material in the peristaltic device into discrete slugs of coating material substantially to interrupt the electrical path through the coating material from the terminal to the coating material supply, each roller having an axle for rotatably mounting the rollers, a first diameter in axially spaced multiple first regions of the roller where the roller contacts the resilient conduit, one said first region for each loop, and a second and larger diameter in axially spaced multiple second regions of the roller adjacent respective said first regions, the planes of the loops being generally transverse to the axle, a housing having a generally right circular cylindrical wall against which the resilient conduit lies in said generally planar loops, the planes of said loop being generally perpendicular to the axis of the wall, the rollers compressing the resilient conduit against the wall of the housing substantially to separate the coating material carried thereby into said slugs, and a rotor having an axle, means for rotatably mounting said axle of said rotor generally coaxially with said axis of said wall, said rotor defining pockets whose locations correspond to the location of each said roller, and a cradle selectively movable generally radially of said rotor axle in each said pocket, each said cradle rotatably receiving the axle of a said roller, a cap for retaining each said cradle in its respective pocket, each said cap including an opening through which a respective said rollers projects to contact said resilient conduit but through which said cradle will not pass, and a length of compliant material positioned between adjacent surfaces of each said cradle and its respective said cap to urge said cradle yieldably away from its respective said cap.

5,193,751

COLORING FINE PARTICLES AND TONER FOR DEVELOPING ELECTROSTATIC IMAGES USING THE SAME

Yoshikuni Mori; Hayato Ikeda, both of Takatsuki; Mitsuo Kushino, Minoo; Nobuaki Urashima, Takatsuki; Koichi Uehara, Saita; Masuji Izukayashi, Nishinomiya, and Yoshinori Sano, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 400,065, Aug. 29, 1989, Pat. No. 5,080,992. This application Jul. 30, 1991, Ser. No. 738,136

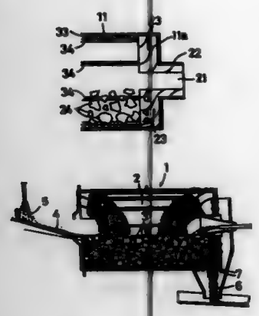
Claims priority, application Japan, Aug. 30, 1988, 63-213827; Apr. 17, 1989, 1-95419

Int. Cl.[5] B01J *13/00*

U.S. Cl. 241—3 **10 Claims**

1. A method for manufacturing coloring fine particles having fine unevenness on the surface comprising heating spheroidal coloring fine particles having an average particle diameter of 1 to 100 μm obtained by suspension polymerization to a temperature of 30° to 200° C., thereby causing the particles to fuse together in a block without completely destroying the particle interfaces, and the crushing the block to substantially the same average particle diameter of the spheroidal coloring fine particles before melting.

5,193,752
METHOD OF MAKING CONCRETE SAND
Osagwara Yakimi, Yazu, Japan, assignor to Nakaya Jitsugyo Co., Ltd., Tottori, Japan
Filed Dec. 27, 1991, Ser. No. 813,826
Int. Cl.[5] B02C *17/02*
U.S. Cl. 241—21 6 Claims



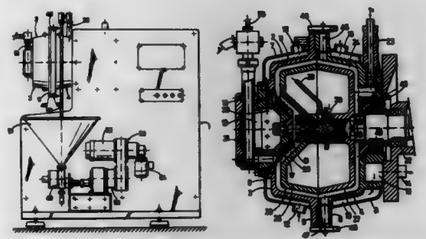
1. A method of making a concrete sand comprising the steps of:
subjecting a quantity of material stones to an alkali-silica reaction test to select desired material stones;
feeding said desired material stones in a second cylindrical drum;
rotating said second cylindrical drum in a forward direction to grind said desired material stones forming medium stones while preventing discharge of said desired material stones by means of a spiral blade which rotates in a forward direction;
rotating said second cylindrical drum in a backward direction to unload said medium stones by means of said spiral blade which now rotates in a backward direction;
loading a quantity of said medium stones in a first cylindrical drum;
feeding a quantity of material sand and a quantity of water into said first cylindrical drum;
rotating said first cylindrical drum to grind said material sand with said medium stones to form concrete sand; and
unloading said concrete sand together with used water.

5,193,753
APPARATUS FOR DISINTEGRATING FLEXIBLE PACKING MATERIALS
Wilhelm Menges, Brauneberg, Fed. Rep. of Germany, assignor to PWA Industriepapier GmbH, Fed. Rep. of Germany
Filed Dec. 27, 1991, Ser. No. 815,350
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1990, 4042227
Int. Cl.[5] B02C *11/08, 13/00*
U.S. Cl. 241—43 23 Claims

1. Apparatus for disintegrating flexible packing materials comprising
a through-forming substantially closed housing (2) adapted to contain a liquid suspension of partially comminuted packing materials,
at least one raw material supply wheel (10) communicating with the interior of said housing,
a first comminuting aggregate (14) disposed in said raw material supply well (10),
at least one exit well (16) communicating with the interior of said housing,
a second comminuting aggregate (18) disposed in said exit well (16), and
a driven conveying member (4, 6) disposed in the interior of said housing,

an overflow weir (20) being provided between the housing (2) and the exit well (16) and essentially governing the liquid level of said suspension in the housing (2).

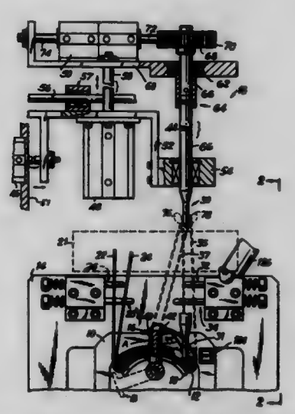
5,193,754
MILL FOR TRITURATING AND BREAKING UP SOLIDS PREDISPERSED IN LIQUIDS
Carlos O. Pujol, Badlona, Spain, assignor to Oliver Y Batlle S.A., Badalona, Spain
Filed Jun. 19, 1991, Ser. No. 718,338
Claims priority, application Spain, Oct. 31, 1990, 9002766
Int. Cl.[5] B02C *17/16*
U.S. Cl. 241—65 2 Claims



1. Mill for triturating and breaking up solids predispersed in liquids, of the type which comprises a frame on which is mounted a fixed element or stator, with a jacket for either cooling or heating the product being treated, in whose interior is disposed a rotating element or rotor fastened to a shaft disposed along the longitudinal axis of the mill and mounted overhung on corresponding supporting and bearing means attached to the frame of the mill, whose shaft has internal lines for cooling media and rotor heating media, and is made to rotate by actuating means through corresponding transmission and speed variation means attached to the frame, there being defined between said stator and rotor a grinding chamber in which grinding bodies are enclosed which are initially introduced into said chamber through a closable entrance of the stator, at the lower part of which is a likewise closable outlet for their evacuation, the grinding chamber being traversed by the product in treatment while the rotor rotates owing to impulsion means of said product, which are moved by actuating means and via transmission and speed variation means, the stator having an inlet for the product to be treated, communicating with the outlet of the impulsion means and an outlet of the ground product, in whose outlet zone are disposed separator means which prevent the grinding bodies from coming out but permit the passage of the ground product, there being disposed between the stator and the shaft seal means for preventing leakage of product which circulates in a continuous and forced manner through the grinding chamber; characterized in that the stator is composed of two hollow truncated cone-shaped halves, a front and a rear one, with their minor

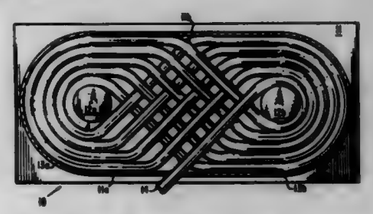
bases closed and joined together by their open major bases in a removable manner, which major bases have outer flanges between which seal means are disposed, and which halves are provided with outer envelopes defining respective cooling or heating chambers, each chamber having an inlet connection and an outlet connection for the respective cooling or heating liquid; in that said front half presents, centered on its minor base and in its interior, separating means for the grinding bodies and, on its exterior, the outlet of the ground product, which in turn has a cooling or heating chamber, communicating with the corresponding chamber of the front half and with an inlet connection for the corresponding cooling or heating liquid, while the rear half presents, centered on its minor base, a central orifice which is traversed by the shaft of the mill and by the inlet connection of the product to be ground; in that the rotor, attached to the free end of said shaft, situated inside the stator, consists of an element composed of two hollow truncated cones, a front and a rear one, joined together by their open major bases and the front truncated cone having its minor base closed and with a central recess of truncated cone-shaped but of inverted position and with its minor base toward the inside of the rotor and joined to the mill shaft end, which recess is disposed matching the aforesaid separator means, and the rear truncated cone has its minor base closed and traversed by said shaft to which it is joined; and in that the rotor has in its interior means for conducting the cooling or heating liquid, disposed around the shaft, joined to the latter and connected to the corresponding internal line thereof, which discharge said liquid in the vicinity of the inner walls of the rotor, and rotor also has collecting means of said liquid connected to the corresponding internal line of said mill shaft, for its return out of the rotor.

5,193,755
TWO-WIRE STATOR WINDING MACHINE
Sabatino Luciani, Florence, Italy, assignor to Axis USA, Inc., Del.
Filed Dec. 12, 1990, Ser. No. 626,196
Int. Cl.[5] B65H *81/06*
U.S. Cl. 242—1.1 R 11 Claims



1. Apparatus for winding a pole of a workpiece with a coil of wire made up of initially separate first and second wires wound on said pole simultaneously and in parallel with one another so that said first and second wires are intertwined with one another in said coil on said pole, said apparatus comprising:
wire dispensing means movable relative to said workpiece for dispensing said first and second wires and winding said coil on said pole, said wire dispensing means having a first outlet for dispensing said first wire to said coil, a separate second outlet for dispensing said second wire to said coil, said first and second outlets being laterally spaced from one another by a predetermined constant amount which is sufficient to cause said first wire to be laterally spaced from said second wire along part of the length of said first wire extending from said wire dispensing means to said pole;
first wire holding means;
second wire holding means spaced from said first wire holding means; and
a lead pull member for separately and sequentially engaging said first and second wires where said first wire is laterally spaced from said second wire and for enabling said first and second wire holding means to hold said first and second wires, respectively, said lead pull member making use of the lateral spacing between said first and second wires to separate said first and second wires for separate and sequential engagement by said lead pull member and thereby ensure that said first wire holding means is enabled to hold said first wire and said second wire holding means is enabled to hold said second wire.

5,193,756
FIGURE EIGHT LINEAR DISPENSER
Ronald B. Chesler, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 24, 1991, Ser. No. 720,057
Int. Cl.[5] B65H *75/02, 55/00*
U.S. Cl. 242—54 R 2 Claims



1. An optical fiber dispenser comprising:
a pair of bobbins having parallel longitudinal axes and separated from each other by a predetermined distance;
a housing comprising a pair of curved guides disposed distally from each other generally along a line drawn through the bobbins, each guide having a radius of curvature that is substantially centered on a respective bobbin;
an optical fiber waveguide having a plurality of relatively flat winding layers successively stacked on top of each other, each layer comprising an interlaced figure eight winding pattern, and wherein the optical fiber waveguide is wound around the pair of bobbins and inside the pair of half-circular guides to achieve the figure eight winding pattern said figure eight winding pattern having a crossover section with the crossover section of one winding layer nested within the crossover section of an adjacent winding layer.

5,193,757
AUTOMATIC ROLLED CONVOLUTION ACCUMULATOR
Lev Talanker, 2940 West 5th Street, 22A, Brooklyn, N.Y. 11224–3832
Filed May 6, 1985, Ser. No. 730,861
The portion of the term of this patent subsequent to Feb. 16, 2007, has been disclaimed.
Int. Cl.[5] B65H *45/02*
U.S. Cl. 242—55 1 Claim

1. A strip convolution accumulator for continuous discharge of strip material regardless of interruptions in input to the accumulator, the strip being wound into a coil having an innermost convolution and an outermost convolution, said strip material being fed into the accumulator at the innermost convolution and withdrawn from the outermost convolution, said

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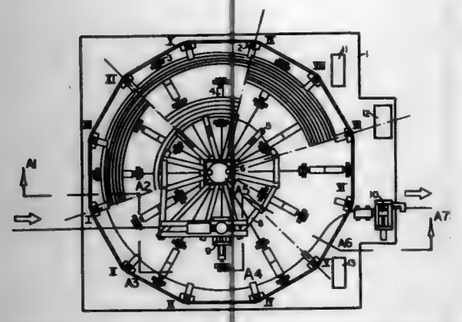
accumulator comprising a horizontally oriented base; a first set of vertically oriented equally circumferentially spaced rollers radially outside of and engaging the outermost convolution; a first set of horizontally oriented support rollers equally radially spaced and extending radially beyond the outermost convolution; a second set of vertically oriented equally circumferentially spaced rollers extending radially inwardly beyond the innermost convolution; a second set of horizontally oriented equally radially spaced support rollers extending radially inwardly beyond the innermost convolution, first and second



electric motors with transmissions to said first and second sets of horizontally oriented support rollers, respectively; an input pinch roller assembly hydraulically actuated into contact with the strip material to feed the strip material to the innermost convolution, said input pinch roller assembly having a third motor, an output pinch roller assembly hydraulically actuated into contact with said strip material to feed said strip from said outermost convolution, said output pinch roller assembly having a fourth motor; and an electrical power system to provide four independent drives for said motors.

5,193,758

APPARATUS FOR HOLDING AND FOR UNWINDING COILS

Georg Laager, Turbenthal, and Ingomar Summerauer, Arbon, both of Switzerland, assignors to Bruderer AG, Switzerland

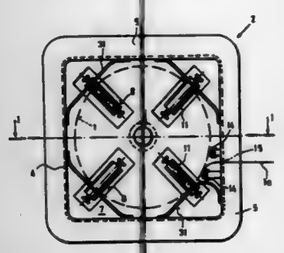
PCT No. PCT/CH90/00044, § 371 Date Oct. 29, 1990, § 102(e) Date Oct. 29, 1990, PCT Pub. No. WO90/09945, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 26, 1990, Ser. No. 613,778

Claims priority, application Switzerland, Feb. 27, 1989, 711/89

Int. Cl.[5] B65H *16/02*

U.S. Cl. 242—55 **34 Claims**



1. Apparatus for holding and unwinding a coil of an elongated material, comprising

a base element having a trough-like shape for holding the coil, said base element having a geometrical central axis and being open at its top to form an upper edge region;

a stiffening arrangement being provided at least at said edge region; and

at least one centering means for centering said coil within said base element;

wherein said centering means is radially displaceably secured for aligning it with the center of said coil.

5,193,759

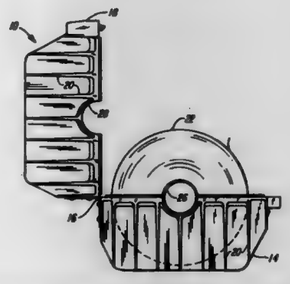
FILM OR PAPER CASSETTE

Donald O. Bigelow, Webster; Craig A. Caprio, Rochester, and John B. Chemelli, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1990, Ser. No. 633,506

Int. Cl.[5] B65H *16/06*; G03B *1/02*

U.S. Cl. 242—71.1 **22 Claims**



1. A cassette for containing a roll of web material comprising:

first and second cassette parts having open and closed conditions adapted to engage each other in said closed condition of the cassette, said first and second cassette parts defining a generally central circular opening when in engagement with each other; and

a circular core for supporting a roll of web material for reception within said opening, said first and second parts frictionally engaging and clamping said core in the closed condition of the cassette to present rotation of said core relative to said cassette parts.

5,193,760

SEAT BELT RETRACTOR WITH A STOPPER FOR A GRIPPING MEMBER

Yoshiichi Fujimura, and Shizutaka Matsuura, both of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,263

Claims priority, application Japan, Aug. 1, 1990, 2-204816

The portion of the term of this patent subsequent to Oct. 13, 2009, has been disclaimed.

Int. Cl.[5] B60R *22/40, 22/42*

U.S. Cl. 242—107.2 **4 Claims**

1. A seat belt retractor for withdrawing and retracting a seat belt comprising:

a frame including a pair of opposite side walls and a rear wall extending between the side walls;

a set belt take-up reel extending between the side walls of the frame;

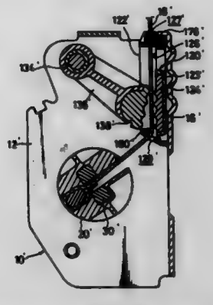
a first gripping member slidably mounted on the rear wall of the frame to grip the seat belt, said first gripping member being movable on the rear wall of said frame in a direction of withdrawing and retracting the seat belt;

a shaft extending between the side walls of the frame;

a second gripping member having a support hole at one end to receive the shaft such that the second gripping member is pivotally supported by the frame and a pusher at another end of the gripping member, said second gripping member being moved between a position where the pusher of the second gripping member is overlapped with

the first gripping member to hold the seat belt therebetween and a position situated away from the first gripping member;

operating means for moving the second gripping member to overlap with the first gripping member upon detection of a predetermined acceleration of a vehicle; and



a stopper formed at an upper end of the rear wall of the frame, said stopper being formed by a bent portion in the frame for limiting a range of motion of the first gripping member when the second gripping member is overlapped with the first gripping member and is moving together with said first gripping member while holding the seat belt between the first gripping member and the pusher.

5,193,761

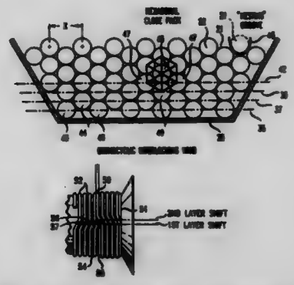
OPTICAL FIBER PACKAGE AND METHOD OF MAKING

Douglas E. Fritz, Lilburn; Clyde J. Lever, Jr., Buford, and Danny E. West, Norcross, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 708,414, May 31, 1991, abandoned. This application Dec. 11, 1991, Ser. No. 807,039

Int. Cl.[5] B65H *55/00, 55/04*

U.S. Cl. 242—159 **14 Claims**



1. A package of wound optical fiber, said package comprising:

a winding surface having a diameter which is equal to the product of at least 200 and an outer diameter of the optical fiber being wound thereon; and

a plurality of layers of optical fiber wound about said surface, each layer comprising a plurality of convolutions of optical fiber with each two adjacent convolutions in each layer being spaced apart such that convolutions of adjacent layers which are aligned with each other along a plane which is normal to the winding surface are in engagement with each other, each convolution in each layer after an innermost layer which engages the winding surface crossing transversely at least two convolutions of optical fiber of an immediately preceding layer in two relatively closely spaced locations in a single region of the convolutions of said immediately preceding layer and such that crossovers in successive layers are staggered circumferentially of the winding surface.

5,193,762

FISHLINE GUIDE MECHANISM IN SPINNING REEL FOR FISHING

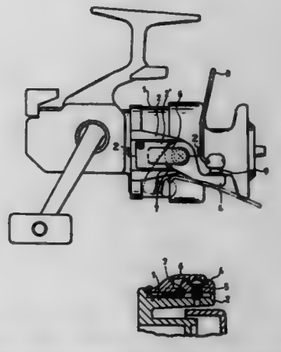
Shinji Takeuchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed May 9, 1991, Ser. No. 696,560

Claims priority, application Japan, May 11, 1990, 2-48589[U]; May 25, 1990, 2-54117[U]

Int. Cl.[5] A01K *89/01*

U.S. Cl. 242—232 **9 Claims**



1. A fishline guide mechanism in a spinning reel for fishing, comprising:

a bail attaching arm provided to a rotor, said rotor having an axis of rotation;

a bail supporting member pivotally coupled to an end portion of said bail attaching arm by an attaching shaft so as to invert from one of a fishline releasing position and a fishline winding position to the other of a fishline releasing position and a fishline winding position; and

an anti-tangling member provided proximate said bail supporting member and said bail attaching arm, wherein one end of said anti-tangling member directly overlies and covers an axial end of said attaching shaft.

5,193,763

TWO-SPEED FISHING REEL WITH AXIALLY MOVABLE CLUTCH

Noboru Sakaguchi, Tondabayashi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Jul. 5, 1990, Ser. No. 548,584

Claims priority, application Japan, Jul. 5, 1989, 1-79674[U]

Int. Cl.[5] A01K *89/015*

U.S. Cl. 242—255 **2 Claims**

1. A fishing reel comprising:

a reel body;

a handle shaft rotatably supported by said reel body;

first and second main gears rotatably mounted on said handle shaft;

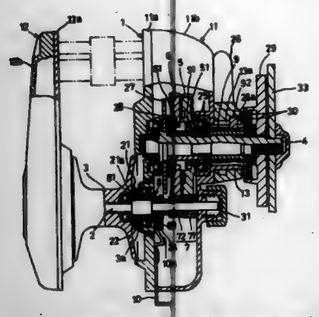
a shifter for selectively transmitting rotation of said handle shaft to one of said first and second main gears;

a spool shaft for rotatably supporting a spool, said spool shaft being supported by said reel body;

a gear element having first and second pinion gears, said gear element being mounted on said spool shaft, said gear element being rotatable relative to said spool shaft, and said gear element being axially unmovable relative to said spool shaft, said first and second pinion gears being constantly meshed with said first and second main gears, respectively;

a clutch means for selectively transmitting and breaking the transmission of rotational force from said gear element to said spool;

wherein said clutch means includes an engaging member which is peripherally rotatable relative to said spool shaft and which is axially movable relative to said spool shaft, said engaging member being axially movable relative to said gear element, and said engaging member being nonrotatable relative to said gear element such that said engaging member and said gear element rotate in unison, said clutch means further including an engaged member attached to said spool and engageable with said engaging member, and a clutch lever for axially moving said engaging member relative to said spool shaft;



said spool shaft including a large-diameter portion formed between a support portion for supporting said spool and a gear-element engaging portion on which said gear element is engaged, said large-diameter portion having a diameter larger than a diameter of said gear-element engaging portion, said engaging member comprising a tubular member axially slidably fitted on said large-diameter portion; and

an outer peripheral portion of said tubular member being supported by a bearing mounted on said reel body, said spool shaft being supported at said large-diameter portion by said bearing through said tubular member.

5,193,764

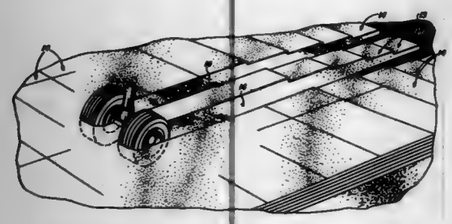
AIRCRAFT ARRESTING SYSTEM

Dennis R. Larratt, Littleton, Colo.; James F. Garrity, New Berlin; Thomas A. Dundas, Cudahy, both of Wis., and Jeffrey T. Kates, Littleton, Colo., assignors to Manville Corporation, Denver, Colo.

Filed Oct. 1, 1991, Ser. No. 769,899

Int. Cl.[5] B64C *25/68*

U.S. Cl. 244—110 R **13 Claims**



1. An aircraft arresting system, comprising:

an aircraft arresting area adjacent an end of an aircraft runway;

the aircraft arresting area being comprised of a plurality of vertically stacked layers of preformed rigid, friable, fire resistant foam; thereby permitting the height of the arresting area to be varied by removing or adding any number of the vertically stacked layers of foam;

the layers of foam being adhered to each other by adhesive, with the lowermost layer of foam being adhered to a support surface;

the compressive resistance of the combined layers of rigid foam being less than the force exerted by the landing gear of an aircraft of the type to be arrested when moving into the arresting area from the runway, and the layers of rigid foam being comprised of a plurality of unfaced rigid foam boards so that the foam is crushed when contacted by the landing gear.

5,193,765

SEATING

Leslie J. Simpson, Amersham, and Brian S. Bayliss, Peppard, both of United Kingdom, assignors to Magerik Ltd., Chinnor, United Kingdom

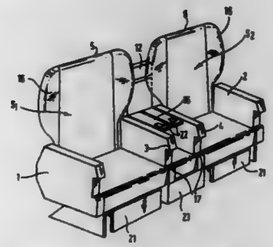
PCT No. PCT/GB90/00529, § 371 Date Oct. 7, 1991, § 102(e) Date Oct. 7, 1991, PCT Pub. No. WO90/11930, PCT Pub. Date Oct. 18, 1990

PCT Filed Apr. 6, 1990, Ser. No. 768,908

Claims priority, application United Kingdom, Apr. 6, 1989, 8907759

Int. Cl.[5] B64D *11/06*

U.S. Cl. 244—118.6 **12 Claims**



1. A convertible aircraft seat comprising a seat frame, a plurality of sitting positions providable on said frame, each of which includes a separate seat back portion attached to said frame, a pair of arm dividers mounted for adjustable movement on said frame from a first position whereat to define a middle sitting position in between two outer adjacent sitting positions and a second position whereat said arm dividers are closer together to eliminate said middle sitting position and increase the widths of said two outer adjacent sitting positions, and first means for adjusting the widths of the seat back portions of said outer adjacent sitting positions to correspond to the widths thereof determined by the position of said arm dividers on said frame; and second means for adjusting the seat back portion of said middle sitting position to permit said adjustment of the seat back portions of the outer adjacent sitting positions by said first means.

5,193,766

RETRY/RECOVERY METHOD IN RENDEZVOUS MANEUVER

Isao Kawano, Tsuchiura; Yasufumi Wakabayashi, Tsukuba; Hiroyuki Nakamura, Shirako, and Takahiro Suzaki, Tsukuba; all of Japan, assignors to National Space Development Agency of Japan, Tokyo, Japan

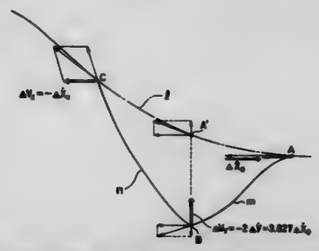
Filed Jul. 17, 1991, Ser. No. 731,242

Claims priority, application Japan, Jul. 18, 1990, 2-188062

Int. Cl.[5] B64G *1/24*

U.S. Cl. 244—161 **2 Claims**

1. In a rendezvous maneuver for approaching a rendezvous spacecraft to a target spacecraft through a reference trajectory for approach which is different in altitude and period from a trajectory of said target spacecraft, and wherein said rendezvous spacecraft deviates from the reference trajectory for approach as a result of a maneuver failure, the method for restoring said rendezvous spacecraft to the reference trajectory for approach comprises:



maneuvering said rendezvous spacecraft by a change in the velocity in the direction of altitude after 0.2 revolutions of said rendezvous spacecraft; and

maneuvering said rendezvous spacecraft by a change in the velocity in the direction of phase after another 0.2 revolutions of said rendezvous spacecraft.

5,193,767

GIRDER TYPE SWITCH TRACK

Kiyoshi Mihirogi, Odawara, Japan, assignor to HSST Corporation, Tokyo, Japan

Filed Aug. 22, 1991, Ser. No. 748,591

Claims priority, application Japan, Aug. 31, 1990, 2-230812

Int. Cl.[5] E01B *7/06*

U.S. Cl. 246—418 **7 Claims**

1. A track switching apparatus for a girder type track comprising a movable girder having upper and lower surfaces and being comprised of at least one girder portion horizontally shiftable between a plurality of positions on a fixed supporting member and at least one drive device for driving said movable girder, said drive device being mounted on a side surface of said movable girder and being substantially completely in a space between the upper and lower surfaces of said movable girder.

5,193,768

MOUNTING STRUCTURE FOR MOUNTING AN INSTRUMENT ON A SUPPORTING MEMBER OF A MOTOR VEHICLE

Katsumi Mita, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 1, 1992, Ser. No. 861,684

Claims priority, application Japan, May 29, 1991, 3-154084

Int. Cl.[5] G12B *9/00*

U.S. Cl. 248—27.1 **1 Claim**

1. A mounting structure for securing a casing of an instrument on a periphery of an opening formed in a board member of a motor vehicle, comprising:

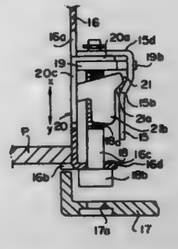
projections formed on the casing so as to abut on an outside of said periphery when the casing is inserted in an inside space behind the board member passing through the opening;

a front side supporting member and a rear side supporting member formed on the casing;

a screw rotatably supported in the casing by said supporting members;

a movable member engaged with the screw and provided to be moved along the screw by rotating the screw; and

a clamping member having an engaging portion disposed between said rear side supporting member and said movable member and axially slidably mounted on the screw and pivotably engaged thereon so that the clamping member may be pivoted in a plane including an axis of the screw, a clamping portion which is provided to be projected from the casing as the clamping member pivots in said plane, arms provided to be engaged with the movable member to cause an axial movement and pivoting of the clamping member, each arm having an engaging projection to be abutted on a side wall of the casing for preventing the clamping member from further pivoting, and the clamping portion being provided to be abutted on an inside wall of the board member when the clamping member is pivoted and axially moved, whereby clamping the board member together with said projections.



5,193,769

VERTICALLY ADJUSTABLE PIPE HANGER

Siegfried Höfle, Götzis, Austria, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Mar. 11, 1992, Ser. No. 850,398

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1991, 4108433

Int. Cl.[5] E21F *17/02*

U.S. Cl. 248—59 **7 Claims**

1. A vertically adjustable pipe hanger comprising an elongated strip-shaped member forming a retaining loop (1) including a loop section (1) for holding a pipe and said loop section having a first end section (1*b*) with a first free end and a second end section (1*c*) with a second free end, said first and second end sections are bent off relative to said loop section with one of said first and second end sections superimposed on the other and forming in combination a closure for said retaining loop, said first end section (1*b*) has an opening therethrough (5), said second end section has a slot-like opening (1*d*) extending in-

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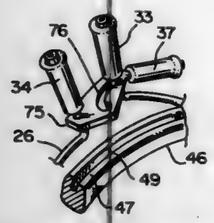
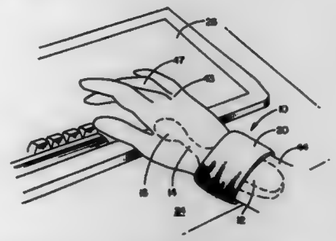
wardly from the second free end in the elongated direction of said strip-shaped member, said first end section has a projection (1*f*) and said projection cooperates with a stop section (1*e*) of said second end section (1*c*), wherein the improvement comprises that said first and second end sections one superposed on the other are arranged opposite and in parallel relation for portions thereof extending in the elongated direction, said projection (1*f*) extends in the elongated direction of said strip-shaped member from the first free end and is disposed approximately perpendicularly relative to said first end section portion arranged opposite and in parallel relation with said second end section, said portions contain the opening (5) and the slot-like opening (1*d*), and said stop section (1*e*) is formed by a folded section (1*g*) of said second end section spaced in the elongated direction of said top-shaped member from said second free end opposite said projection and out of the range of said portions of said first and second end sections whereby the projection extends into the folded section, wherein said strip-shaped member has a width extending transversely of the elongated direction thereof and said projection (1*f*) of the first end section (1*b*) has a width the same as the strip-shaped member, and the folded section (1*g*) of the second end section (1*c*) has a width the same as the width of the strip-shaped member.

5,193,770
BAG HOLDER
David N. Kildare, R.R. #2 - Site 13, Comp. 14, Westbank, British Columbia, Canada V0H 2A0
Division of Ser. No. 667,322, Mar. 11, 1991, abandoned. This application Mar. 19, 1992, Ser. No. 857,115
Claims priority, application Canada, Mar. 8, 1990, 2016971
Int. Cl.[5] A63B *55/04*
U.S. Cl. 248—97 3 Claims



1. A holder for a flexible bag comprising annular frame means for supporting the top end of the bag; leg means for holding said frame means in an elevated position; split ring means; hinge means pivotally connecting the center of said ring means to said frame means; handle means extending outwardly from each free end of said ring means for facilitating manual rotation of the ring means around the plane of said frame means between an open position in which only the center of said ring means overlaps one side of the frame means, and a closed position in which the entire ring means overlaps the peripheral outer side edge of said frame means; whereby, with the ring means in the open position, when a bag is placed in said frame means and the top of the bag is folded over the frame means, the ring means can be rotated to the closed position to engage the top of the bag around substantially the entire periphery of said frame means; and first latch means including a substantially triangular lever pivotally connected at one end to one said handle means; and arcuate slot means in said lever for slidably receiving the other said handle means, whereby when the lever is rotated, the other said handle means is moved towards said one handle means to press the ring means against the bag, and to releasably lock both said handle means together.

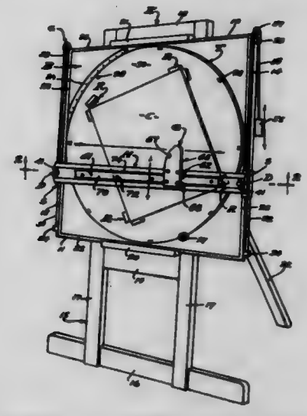
5,193,771
TYPIST'S WRIST SUPPORT
H. Charles Hassel, Los Angeles, and Neil Nagy, San Pedro, both of Calif., assignors to MicroComputer Accessories, Inc., Los Angeles, Calif.
Filed Aug. 27, 1991, Ser. No. 750,654
Int. Cl.[5] B43L *15/00*
U.S. Cl. 248—118 7 Claims



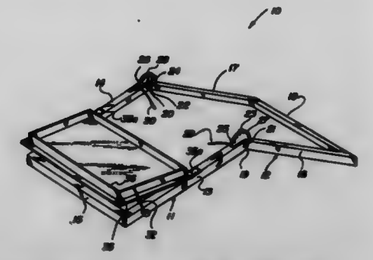
1. A wrist support for a typist comprising:
an elongated base member having substantially parallel upper and lower surfaces of curved cross section perpendicular to an elongate axis thereof such that the upper surface comfortably wraps partially around the typist's wrist and such that the typist may pivot the lower surface of the base member from side to side on a work surface, said lower surface being substantially flat along the elongate axis of the base member such that the typist is inhibited from pivoting the base member back and forth on the work surface;
an arm extending forward from a front edge of the base member;
a substantially hemispherical support member attached to a distal end of the arm and having an upper curved surface of a diameter that is large enough to comfortably support the typist's palm, but small enough so that the user may pivot his or her fingers up or down, backwards and forwards; and
means for detachably securing the base member to a user's wrist with the substantially hemispherical support member being positioned beneath the user's palm to thereby support the user's palm but not unduly restrict movement of the user's palm and fingers.

5,193,772
ARTIST'S HAND AND BRUSH GUIDE FOR ADJUSTABLE TRAVELING MAHL
Walter G. Johnston, 10618 Rountree Rd., Los Angeles, Calif. 90064
Filed Jan. 1, 1992, Ser. No. 818,519
Int. Cl.[5] A47B *19/00*
U.S. Cl. 248—118.5 17 Claims

1. A hand rest-guide in combination with a traveling mahl for steadying an artist's hand over a workpiece supported upon a planar base,
the traveling mahl being comprised of a rigid member extending horizontally between slide means at opposite side edges of the base and carried thereby to travel upwardly and downwardly in spaced relation to and over the workpiece, there being means to position said member on said slides,
the hand rest-guide being comprised of a track carried by the rigid member of the traveling mahl and extending transversely thereon between opposite side edges of the base, a hand support carried by transport means therefor engaged on the track to freely traverse between said opposite side edges of the base, and brake means comprising a brake block to position the hand support along the track.

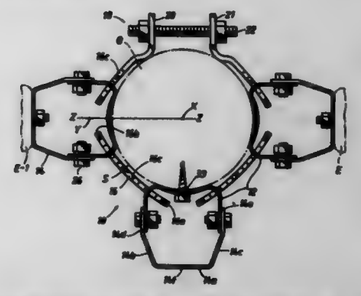


5,193,773
ROOF BUCKET HOLDER APPARATUS
Larry C. Middleton, 57 Puma Dr., Hendersonville, N.C. 28739
Filed Jan. 27, 1992, Ser. No. 826,421
Int. Cl.[5] A47G *23/02*
U.S. Cl. 248—148 5 Claims



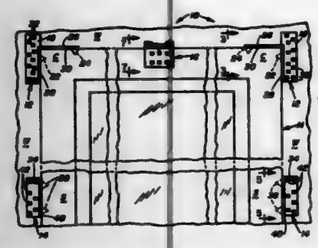
1. A roof bucket holder apparatus, comprising,
a first U-shaped frame pivotally mounted to a second U-shaped frame, wherein the first U-shaped frame includes a first frame first leg spaced from and parallel a first frame second leg, and the second frame including a second frame first leg spaced from and parallel a second frame second leg, the first frame first leg hingedly mounted to the second frame second leg about a first axle and the first frame second leg hinged mounted to the second frame first leg about a second axle, and
the second frame first leg includes a first bracket, including a first bracket bore fixedly mounted to the second frame first leg adjacent the first axle, and a second bracket including a second bracket bore fixedly mounted to the second frame second leg adjacent the second axle, and a first arcuate bracket positioned for sliding contiguously relative to the first bracket arranged fixedly to the first frame first leg, with the first arcuate bracket including a semi-circular array of first apertures, wherein one of said first apertures is arranged for alignment with said first bracket bore, and a second arcuate bracket fixedly mounted to the first frame second leg and includes a semi-circular array of second apertures, wherein one of said second apertures is arranged for alignment with said second bracket bore, and a first lock pin is arranged for projection through the first arcuate bracket and the first bracket and a second lock pin is arranged for projection through the second arcuate bracket and the second bracket.

5,193,774
MOUNTING BRACKET APPARATUS
John W. Rogers, 12667 Memorial Dr., #102, Houston, Tex. 77024
Filed May 26, 1992, Ser. No. 887,854
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—219.4 8 Claims



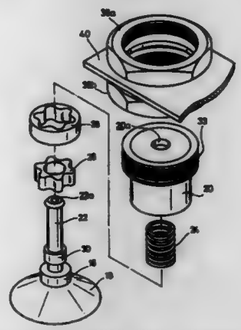
1. An equipment mounting assembly adapted for securing about a substantially vertically disposed object having a substantially circular outer cross-section to structurally support equipment carried by the equipment mounting assembly, including:
a plurality of longitudinally elongated object contacting members disposed in a predetermined circumferentially spaced pattern surrounding the object, each of said contacting members having a base portion and a pair of spaced apart parallel flange portions, each said base portion forming an object contact surface for operable holding engagement with the object to fixedly support said member on the object, said object contact surface formed on said base portion to position said flanges extending outwardly of said base portion when the object contact surface engages the object, each of said elongated object contacting members having a longitudinal center line axis, said longitudinal axis of each of said object contacting members and the center of the cross-section of the object defining a substantially vertical center line plane;
means for holding said object contact surface of each of said object contacting members in supporting contact with the object;
said means for holding having means for operably interconnecting said plurality of object contacting members to hold each of said object contacting members in the predetermined circumferentially spaced pattern surrounding the object;
said means for holding having adjustable tension means for radially constricting said plurality of object contact members in holding engagement with the object; and
each of said contact surface of each of said object contacting members formed with a radius of curvature to form parallel spaced engagement areas with the object, said engagement areas being disposed substantially symmetrically on opposite sides of said plane so each object contact member forms two contact angles with pole for optimizing the orientation of the force component vectors to ensure the holding of the object contact members in the predetermined circumferentially spaced pattern.

5,193,775
ASSORTMENT OF WINDOW ADORNMENT MOUNTING BRACKETS
Gerald E. Wagner, R.R. #1, Box 147, Great Bend, Kans. 67530
Filed Mar. 24, 1992, Ser. No. 856,467
Int. Cl.[5] A47H *1/10*
U.S. Cl. 248—262 11 Claims



1. An assortment of mounting brackets for supporting window adornment attaching hardware adjacent to opposite upper corner portions, opposite side portions and a top portion of a window molding attached on a wall, said assortment of mounting brackets comprising:
(a) a pair of corner brackets capable of being mounted against portions of the wall adjacent to opposite upper corner portions of the window molding and in frictionally fitted relationship between the wall portions and angularly spaced side and top edges of the respective upper corner portions of the window molding;
(b) a pair of side brackets capable of being mounted against portions of the wall adjacent to opposite side portions of the window molding and in frictionally fitted relationship between the wall portions and edges of the side portions of the window molding; and
(c) a top bracket capable of being mounted against a top portion of the window molding and in frictionally fitted relationship between the wall and an edge of the top portion of the window molding;
(d) said each corner bracket including
(i) a flat base plate having opposite front and rear faces and a pair of opposite side edges and being mountable adjacent to one of the corner portions of the window molding with one of said opposite side edges disposed adjacent the side edge of the one corner portion of the window molding and with said rear face disposed against the wall portion adjacent to the side edge of the one corner portion of the window molding,
(ii) means on said base plate for mounting window adornment attaching hardware to said front face of said base plate,
(iii) a pair of anchoring elements configured to insert and make frictionally fitted connections between the one corner portion of the window molding and the wall, one of said anchoring elements being rigidly connected to and projecting from said one side edge of said base plate,
(iv) an elongated arm rigidly connected to said one side edge of said base plate and projecting therefrom in a substantially coplanar relationship with said base plate, the other of said anchoring element being rigidly connected to and projecting from said elongated arm and and disposed in an angularly displaced relationship from said one anchoring element,
(v) first means connected to and extending along aid one side edge of said base plate and projecting in a substantially tranverse relationship to said base plate for defining a limit to which said one anchoring element can be inserted into said frictionally fitted connection between the side edge of the one corner portion of the window molding and the wall in order to thereby retain said base plate adjacent to the one corner portion of the window molding with said rear face thereof disposed against the wall portion adjacent to the one corner portion of the window molding, and
(vi) second means connected to and extending along said elongated arm and projecting in a substantially transverse relationship to said elongated arm for defining a limit to which said other anchoring element can be inserted into said frictionally fitted connection between the top edge of the one corner portion of the window molding and the all in order to thereby retain said base plate adjacent to the one corner portion of the window molding with said rear face thereof disposed against the wall portion adjacent to the one corner portion of the window molding.

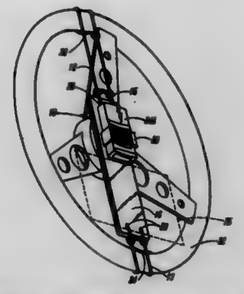
5,193,776
MECHANISM FOR LOCKING ANGULAR MOVEMENT OF SUCTION PAD
Shigekazu Nagai; Tadasu Kawamoto; Shauzou Sakurai, and Akio Saitoh, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 3, 1991, Ser. No. 770,350
Claims priority, application Japan, Oct. 5, 1990, 2-104997; Nov. 9, 1990, 2-118088
Int. Cl.[5] B65H *3/08*
U.S. Cl. 248—295.1 10 Claims



1. A mechanism for locking the angular movement of a suction pad, comprising:
a rod having a through hole along the central axis thereof, an end of said rod being fitted to a root part of the suction pad, said through hole leading to a cavity of the suction pad, said rod having a flange near said end and a stopper at another end;
a rod holder having a hole to receive said rod slidably in an axial direction of said rod between said flange and stopper and an inner surface facing an outer surface of said rod, said rod holder being attached to a moving means for displacing the suction pad;
rotation prohibiting means for prohibiting said rod from rotating around the central axis thereof, said rotation prohibiting means being provided on the outer surface of said rod and the inner surface of said rod holder so as to engage with each other; and
a cushioning member disposed around said rod and between said rod holder and flange.

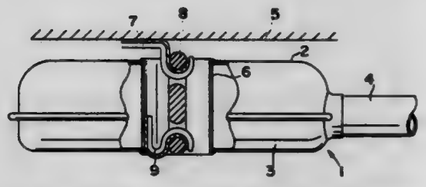
5,193,777
NOTE - MAP HOLDER
Eugene W. Faulstich, P.O. Box 248, Ruthven, Iowa 51358
Filed May 20, 1992, Ser. No. 886,423
Int. Cl.[5] A47B *19/00*
U.S. Cl. 248—441.1 5 Claims
1. A map holder for attachment to an automobile steering wheel, comprising:

(a) a map holder plate having opposite ends with strap fastener means associated with each end;
(b) a flexible, elastic support strap for use with each end of said map holder to removably attach said map holder plate to a steering wheel;



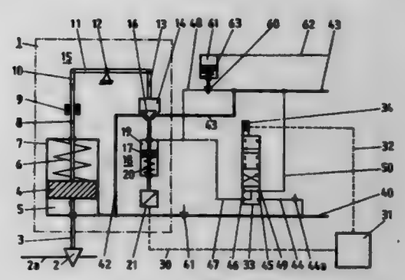
(c) a clip fastener for holding a light, pivotally attached to said map holder plate; and
(d) a base plate located between said map holder plate and said steering wheel having a fastener means associated therewith.

5,193,778
SUSPENSION ARRANGEMENT FOR EXHAUST INSTALLATIONS
Volker Uackrich, Plüderhausen, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Stuttgart, Fed. Rep. of Germany
Filed Feb. 24, 1992, Ser. No. 840,186
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1991, 4107185
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—610 7 Claims



1. A suspension arrangement for exhaust installations under a vehicle bottom of a motor vehicle, comprising:
at least one elastic suspension part;
at least one muffler which has wall parts and a hollow profile component passing through said wall parts substantially at right angles to the vehicle bottom, said hollow profile component being open at the ends and solidly connected to said wall parts, wherein said hollow profile component passes through the muffler at the center of gravity of said muffler and is positively connected with the elastic suspension part, said elastic suspension part being fastened to the vehicle bottom and having a longitudinal extension mainly located in an internal space of the hollow profile component.

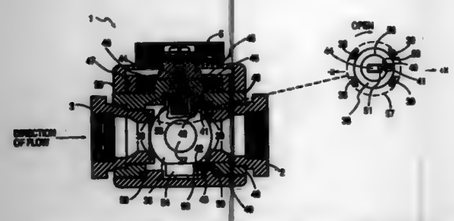
5,193,779
ACTUATING DRIVE
Heinz Frey, Meaziken, and Kamil Prochazka, Windisch, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Sep. 21, 1990, Ser. No. 586,227
Claims priority, application Switzerland, Sep. 28, 1989, 3518/89
Int. Cl.[5] F16K *31/02, 31/122*
U.S. Cl. 251—29 7 Claims



1. A drive for actuating a control valve comprising:
a hydraulic main piston rigidly connected to a control valve by a rod member;
pilot control means for adjusting a hydraulic pressure provided to an actuating chamber of said main piston and to thereby adjust said control valve;
said pilot control means including a control orifice in communication with said actuating chamber of said main piston;
said pilot control means including hydraulic piston means for varying the side of said control orifice and thereby adjust said hydraulic pressure in said actuating chamber of said main piston;
said pilot control means including an electrohydraulic valve in communication with said hydraulic piston means for controlling a position of said hydraulic piston means and thereby controlling said size of said control orifice in response to a control means;
said pilot control means including rod linkage connecting said main piston to said control orifice wherein said orifice size is varied according to movement of said main piston and said control orifice;
a first displacement measurement device disposed on said hydraulic piston for generating an electronic signal representative of a position of said hydraulic piston;
a second displacement measurement device disposed on said electrohydraulic valve for generating an electronic signal representative of a position of said electrohydraulic valve; and,
having a comparison means for comparing said electronic signals from said first and second displacement measurement devices to desired values and for changing a position of said electrohydraulic valve when said signals deviate from said desired values, and to thereby control the position of said main piston, said hydraulic means and said control orifice for controlling the size of said control orifice for adjusting said control view.

5,193,780
LOW FRICTION BALL VALVE
Robert C. Franklin, 914 Bicknell Rd., Los Gatos, Calif. 95030
Continuation-in-part of Ser. No. 771,452, Oct. 3, 1991. This application Jun. 30, 1992, Ser. No. 907,764
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—68 8 Claims
1. A low friction ball valve comprising:

a valve body defining an interior passage for fluid flow and having a seal disposed at least at one end of the passage;
at least two rollers each mounted on a pin fixed in the interior passage of the valve body;
a valve ball defining an interior passage and rotating within the valve body passage, closing the valve body passage in



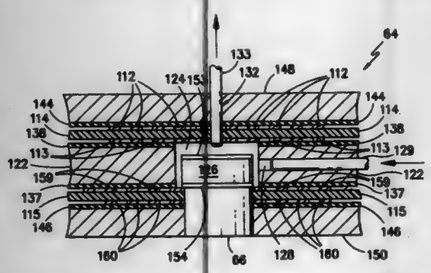
a first position by bearing against the seal, with the rollers each fitting within a detent in the valve ball in the first position, and the valve ball in a second position aligning its interior passage with that of the valve body, wherein in the second position the rollers each contact an outer surface of the valve ball, thereby reducing friction between the valve ball and the seal.

5,193,781

ELECTRO-PNEUMATIC VALVE CARD ASSEMBLIES

Charles E. Willbanks, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 819,599, Jan. 9, 1992, Pat. No. 5,144,982, which is a continuation of Ser. No. 596,803, Oct. 12, 1990, abandoned. This application Apr. 29, 1992, Ser. No. 875,971
Int. Cl.[5] F16K *31/08*
U.S. Cl. 251—129.1 **17 Claims**



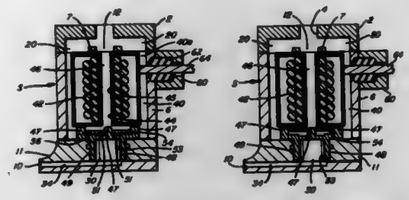
1. An electro-pneumatic valve assembly which comprises:
(a) an electrically conductive substantially flat spiral coil;
(b) a substantially flat substrate having a recess and an outer edge in which said substrate is positioned below said coil;
(c) a magnetic member located within said recess;
(d) a first passage means communicating between said recess and said outer edge;
(e) a second passage means communicating between said coil through to said recess;
(f) a magnetically conductive member positioned below said substantially flat substrate; and
(g) a means for applying a electric current to said coil to move said magnetic member toward said coil.

5,193,782

EJECTOR FOR SORTING MACHINE

Roger F. Bailey, Sugar Land, Tex., assignor to Delta Technology Corporation, Houston, Tex.

Filed Mar. 21, 1991, Ser. No. 672,964
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.21 **12 Claims**



1. A valve apparatus for an ejector for an object sorter, comprising
an inlet member having an inlet to receive pressurized gas and an outlet for transfer of the gas,
a housing having a housing inlet in fluid communication with said outlet of said inlet member and having a housing outlet from which gas flows out of the valve apparatus,
said housing having an inner cavity in fluid communication with said housing inlet,
an electromagnetic solenoid mounted in said inner cavity in said housing and responding to an eject signal from the sorter by generating an electromagnetic force, said solenoid having a central channel therethrough,
a valve seat having a seating portion and being mounted in said inner cavity of said housing between said solenoid and said housing outlet,
a nozzle having an inlet and an outlet located in planes at an angle to each other,
a magnetically responsive disc mounted above said valve seat and being not fixedly attached to other portions of the valve,
said disc normally resting on said seating portion of said valve seat and blocking gas flow through said valve seat in a closed position,
said disc moving freely off said valve seat to an open position in response to electromagnetic force from said solenoid, permitting pressurized gas to flow through said solenoid central channel and said valve seat to and through said housing outlet
said inlet of said nozzle being mounted to said housing outlet such that when said disc is in said open position, pressurized gas is received in an incoming direction from said housing to said nozzle inlet and such pressurized gas exits said outlet of said nozzle in an outgoing direction at an angle to the incoming direction.

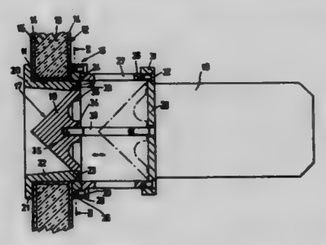
5,193,783

VALVE ARRANGEMENT FOR AIR REGULATION IN FOOD PRODUCT DRIERS

Andrea Capovilla, Isera, Italy, assignor to M.G. Braibanti S.p.A., Milan, Italy

Filed Jul. 3, 1991, Ser. No. 725,468
Claims priority, application Italy, Jul. 9, 1990, 21462/90[U]
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—144 **20 Claims**

1. An air regulation valve for installation in an aperture formed in a wall of a foodstuff drier, which wall has an inner surface and an outer surface, and which aperture is defined by a peripheral surface extending thicknesswise of said wall, between said inner surface and said outer surface,
said air regulation valve comprising:
an annular first closure component having a peripheral sidewall arranged to line said aperture of said wall of said drier, and radial flange means for mounting said first closure component to said wall of said drier with said peripheral sidewall lining said aperture;
said peripheral sidewall having means defining an internal peripheral surface including an axially outer, radially inner peripheral band which flares axially outwardly relative to a longitudinal axis of said valve;
an axially movable second closure component having an axially forwardly presented tapering peripheral surface arranged in one position of said second closure component to lie at least partially radially and axially within said first closure component and to have a said tapering peripheral surface thereof sealingly engaged with said inner peripheral band of said peripheral sidewall of said first closure component, and, in another position of said second closure component, to be withdrawn so that an annular ventilation gap exists between said inner peripheral band of said peripheral sidewall of said first closure component and said tapering peripheral surface of said second closure component; and
an actuator mounted to said first closure component, so as to be disposed outside of said foodstuff drier; said actuator including a shaft means connected with said second closure component and power-operated means for reversibly moving said shaft for selectively moving said second closure component relative to said first closure component along said longitudinal axis betwen said one and said other positions of said second closure component;
said actuator is mounted to said first closure component by being coaxially mounted to an axially outer end radial flange of said radial flange means, by a cylindrical tubular



part which is closed at an axially outer end thereof by closure means provided by an axially inner end of said actuator; and
said cylindrical tubular part having means defining at least one aperture extending radially therethrough;
there being only one said aperture extending radially through said cylindrical tubular part; and
further comprising an extractor mounted to said cylindrical tubular part, so as to extract moisture from within the drier through said aperture of said cylindrical tubular part.

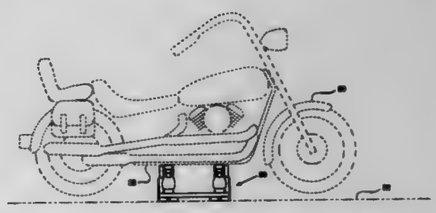
11. An air regulation valve for installation in an aperture formed in a wall of a foodstuff drier, which wall has an inner surface and an outer surface, and which aperture is defined by a peripheral surface extending thicknesswise of said wall, between said inner surface and said outer surface.
said air regulation valve comprising:
an annular first closure component having a peripheral sidewall arranged to line said aperture of said wall of said drier, and radial flange means for mounting said first closure component to said wall of said drier with said peripheral sidewall lining said aperture;
said peripheral sidewall having means defining an internal peripheral surface including an axially outer, radially inner peripheral band which flares axially outwardly relative to a longitudinal axis of said valve;
an axially movable second closure component having an axially forwardly presented tapering peripheral surface arranged in one position of said second closure component to lie at least partially radially and axially within said first closure component and to have a said tapering peripheral surface thereof sealingly engaged with said inner peripheral band of said peripheral sidewall of said first closure component, and, in another position of said second closure component, to be withdrawn so that an annular ventilation gap exists between said inner peripheral band of said peripheral sidewall of said first closure component and said tapering peripheral surface of said second closure component; and
an actuator mounted to said first closure component, so as to be disposed outside of said foodstuff drier; said actuator including a shaft means connected with said second closure component and power-operated means for reversibly moving said shaft for selectively moving said second closure component relative to said first closure component along said longitudinal axis between said one and said other positions of said second closure component;
said actuator is mounted to said first closure component by being coaxially mounted to an axially outer end radial flange of said radial flange means, by a cylindrical tubualr part which is closed at an axially outer end thereof by closure means provided by an axially inner end of said actuator; and
said cylindrical tubular part having means defining at least one aperture extending radially therethrough;
there being only one said aperture extending radially through said cylindrical tubular part; and
further comprising a ventilator mounted to said cylindrical tubular part, so as to ventilate moisture from within the drier through said aperture of said cylindrical tubular part.

5,193,784

METHOD AND APPARATUS FOR LIFTING

Donald J. Oberaberger, 733 Vista Pacifica Cir., Pismo Beach, Calif. 93449

Filed Mar. 11, 1991, Ser. No. 667,201
Int. Cl.[5] B66F *3/00*
U.S. Cl. 254—1 **7 Claims**



1. Apparatus suitable for lifting a motorcycle to independently selected wheel heights, comprising:
a base;
a pair of scissors jacks, each of said scissors jacks having a jack head coupled to said base through a set of scissors links and movable relative to said base by turning a jack screw, said scissors jacks coupled to said base in a spaced longitudinal relationship; and
a slidable guide means coupled to each of said jack heads and said base, each of said slidable guide means substantially prohibiting transverse movement of its jack head with respect to said base while permitting normal and longitudinal movement of its jack head relative to said base.

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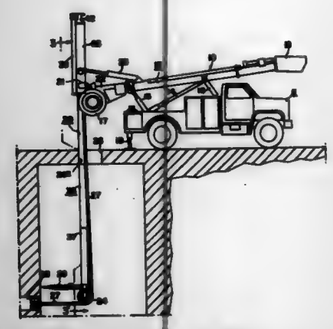
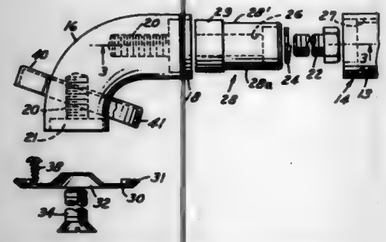
5,193,785
EXTENSIBLE BOOM MECHANISM FOR USE WITH MOBILE CABLE SALVAGE APPARATUS
Arthur K. McVaugh, 2009 Old Baumeystown Pike, P.O. Box 694, Green Lane, Pa. 18054
Filed Sep. 19, 1990, Ser. No. 584,906
Int. Cl.[5] B65H *59/00*
U.S. Cl. 254—134.3 R 4 Claims



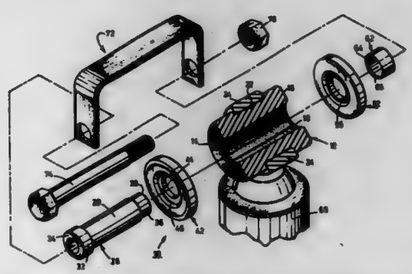
1. An extensible mechanism, comprising:
master cylinder means having a fixed reference for movement in an extension direction and a retraction direction;
first piston means in said master cylinder, having means for displacing oil in said master cylinder for movement in said extension direction and a first piston area for movement in said retraction direction;
an auxiliary cylinder on said fixed reference, including an auxiliary piston means having means for displacing oil in said auxiliary cylinder and an auxiliary piston area for movement in said retraction directions; and
hydraulic means for providing fluid to said master cylinder and said auxiliary cylinder in series, to permit sequential displacement first in said master cylinder and then in said auxiliary cylinder and wherein said auxiliary piston area is greater than said first piston area, whereby fluid pressure in the extension direction sequentially moves said first piston and thereafter said auxiliary piston and fluid pressure in the retraction direction reverses the sequential order of movement of said pistons.

5,193,786
MODULAR HAND RAIL
Torbett B. Guenther, Plymouth Twp., Wayne County, Mich., assignor to TPI of Alter Park, Plymouth, Mich.
Filed Oct. 15, 1991, Ser. No. 776,794
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—69 19 Claims



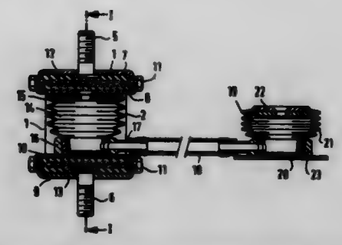
1. A tubular wall mounted support comprising:
a length of tubular material;
a plastic elbow;
a plastic insert having an axial opening;
intermediate mounting means for connecting said insert to said tubular length;
fastening means extending through said axial opening in said plastic insert to connect said tubular length to said elbow,
spacer means secured between said tubular length and said elbow, and
wall mounting means to connect said elbow and said tubular length to a wall.

5,193,787
SLEEVE AND BUSHING ASSEMBLY AND METHOD OF MANUFACTURING THE SAME
Alan F. Coopland, Jr., Streamwood, Ill., assignor to Maremont Corporation, Carol Stream, Ill.
Filed May 3, 1991, Ser. No. 695,419
Int. Cl.[5] B60G *13/00*
U.S. Cl. 267—220 7 Claims



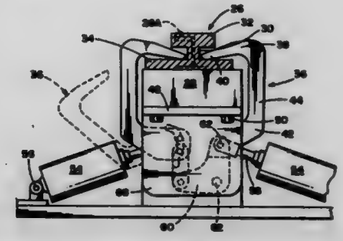
1. An improved shock absorber sleeve and bushing assembly for use in mounting a shock absorber, which has eye ring attached to one end thereof, to a motor vehicle comprising:
(a) an elastomeric, substantially cylindrical bushing having first and second ends, having an axial bore extending between the first and second ends of the bushing, and having an outer peripheral surface of a predetermined diameter such that said eye ring may coaxially encircle said bushing between the ends of the bushing;
(b) a cylindrical sleeve that extends through said axial bore of the bushing, and that has uniform diameter portion which has first and second ends, with the first end of the uniform diameter portion of said sleeve terminating in a first shoulder that has an outer diameter greater than the uniform diameter portion, and with the second end of said sleeve terminating in a second shoulder defined between the uniform diameter portion and a reduced diameter neck portion which extends axially between the second shoulder and a distal end of the sleeve;
(c) a first retaining washer mounted on the uniform diameter portion of said sleeve adjacent to and abutting said first shoulder and the first end of the bushing;
(d) a second retaining washer mounted on said sleeve and abutting the second end of the bushing; and
(e) a spacer ring that has first and second end surfaces and that is mounted on and circumferentially surrounding said neck portion, with the first end surface of the spacer ring abutting said second retaining washer; and
(f) means for exerting a predetermined, constant axial pressure on the second end of the bushing in an axial direction so as to thereby create a consistent axial deflection of the bushing.

5,193,788
DAMPING BEARING ASSEMBLY
Matthias Richter, Issing; Mathias Gegech, Munich, and Robert Grosslinger, Wurmannsquick, all of Fed. Rep. of Germany, assignors to Metzeler Gimetall AG, Munich, Fed. Rep. of Germany
Filed Mar. 4, 1992, Ser. No. 845,728
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1991, 4106838
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—227 14 Claims



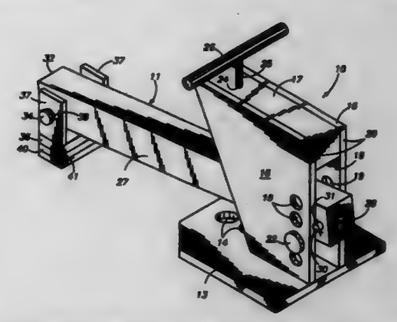
1. Damping bearing assembly, comprising an approximately annular spring body of fibrous composite materials, said spring body including a coil form of artificial resin impregnated fibers wound in several layers, force introducing elements clamping said coil form on mutually opposite sides, a working chamber for additional hydraulic damping disposed inside said spring body between said force-introducing elements, said working chamber being formed of elastically deformable material having a low degree of stiffness in an operating direction of the bearing assembly and a high degree of volume stiffness, a conduit hydraulically communicating with said working chamber and a compensating chamber hydraulically communicating with said conduit.

5,193,789
AUTOMATIC CLAMPING APPARATUS
Claybon R. Tucker, Lavergne, Tenn., assignor to Avco Corporation, Providence, R.I.
Filed Feb. 12, 1992, Ser. No. 836,056
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—32 11 Claims



1. Apparatus for releasably clamping one of a variety of sizes of complex shaped articles having an upright web and vertically spaced and laterally disposed upper and lower flanges projecting outwardly from the web, said apparatus comprising:
a work platform including an upper surface for supporting the article thereon, said upper surface extending to a peripheral edge;
support plate means having a shaped cam slot therein and extending downwardly from said platform;
a C-clamp lying generally in a clamping plane and including a distal member extending to a tip end, a proximal member, and a bight member interconnecting said distal member and said proximal member, said C-clamp including a pair of spaced cam followers on said proximal member slidably engaged with said cam slot for moving said C-clamp between an inactive position distant from said work platform and an active position whereat said bight member is proximate said peripheral edge and said tip end overlies said upper surface at a location distant from said peripheral edge;
actuating means operably connected to said proximal member for selectively drawing said cam followers along said cam slot and thereby moving said C-clamp between said inactive position and said active position;
said cam slot including a first run extending a substantially straight first distance, a second run extending a substantially straight second distance and angularly disposed relative to said first run and said first and second runs mutually subtending an obtuse angle, and a curved third run intermediate said first and second runs extending along an arc whose center is located outside of the region subtended by said obtuse angle, said first, second, and third runs being shaped such that operation of said actuating means to cause movement of said cam followers from said first run to said second run causes said tip end to move within said clamping plane along a predetermined path from an initial withdrawn position when said C-clamp is in said inactive position to a final position grippingly engaged with the lower flange of the article when said C-clamp is in said active position, said path being a continuous smooth first arc until said tip end is substantially adjacent an extremity of the upper flange of the article, whereupon said path changes direction into an oppositely curved second arc such that with continued advancement of said cam followers along said cam slot, said tip end avoids striking the upper flange on the article and continues along said path toward the web of the article and intermediate the upper and lower flange, then said path again changes direction into a substantially straight line such that with continued advancement of said cam followers along said cam slot, said tip end moves into gripping engagement with the lower flange of the article.

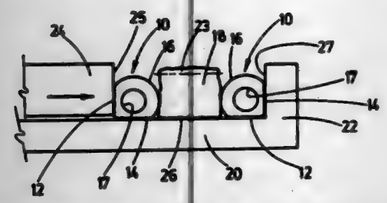
5,193,790
MOVABLE BEAM TYPE HOLD-DOWN CLAMP FOR MACHINE WORK TABLES
John T. Flaten, 207 Tailback Rd., Troy, Mont. 59935
Filed Jul. 18, 1991, Ser. No. 732,158
Int. Cl.[5] B23Q *3/02*
U.S. Cl. 269—91 4 Claims



1. An adjustable hold-down clamp, for use on a machine table having means to fasten the hold-down clamp thereto, comprising in combination:
a body having a base plate defining fastening means to aid releasable fastening to a machine table, said base plate structurally supporting an upstanding holding arm housing

defining a medial channel extending therethrough to movably carry a holding arm therein,
defining a plurality of cooperating pairs of vertically spaced holes to receive therebetween a support pin extending through said medial channel, and
threadedly carrying a vertically orientated fastening screw depending for vertical motion into the medial channel spacedly distant from the fastening pin holes; and
a rigid elongate holding arm having first and second end portions with a first end portion having an upper surface and a parallel under surface carried within the medial channel defined in the holding arm housing with the undersurface of the holding arm supported on a support pin carried in said channel, said holding arm extending spacedly from the holding arm housing and pivotally carrying inwardly adjacent its second end a depending workpiece holder arm to contact a workpiece supported on the machine table therebeneath and exert force on the workpiece when moved downwardly by the fastening screw.

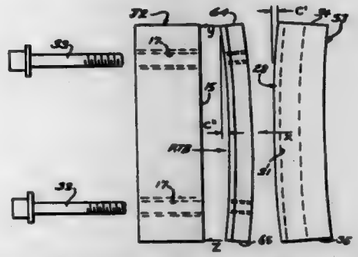
5,193,791
THREE POINT PARALLELS
Willi B. Schwarz, 14551 Manga, Irvine, Calif. 92714
Filed Jul. 20, 1992, Ser. No. 916,890
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—268 20 Claims



1. In combination with a vise having a fixed jaw and a movable jaw, a pair of workpiece holding devices adapted to be used together and loosely inserted in said vise to support and clamp a workpiece in said vise between said fixed jaw and said movable jaw; each of the workpiece holding devices comprising:
an elongated bar having a finished, exterior surface consisting of three distinct areas extending along the entire length thereof, two of said three distinct areas being finished, flat surface portions connected together at an angle to form a corner; and
the third of said three distinct areas being formed as a finished arcuate exterior surface connected to further ends of said finished, flat surface portions at corners, away from the corner formed where said two finished, flat surface portions are connected together at an angle.

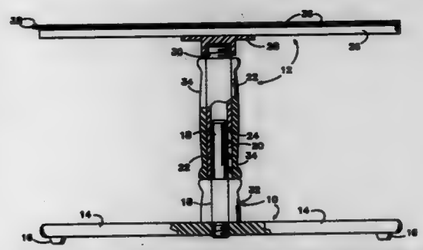
5,193,792
SOFT JAW ATTACHMENT SYSTEM FOR A VISE
Joel Di Marco, P.O. Box 1139, Littlerock, Calif. 93543
Filed Feb. 10, 1992, Ser. No. 836,216
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—282 9 Claims

1. A soft jaw attachment system for a machine tool vise having supporting ways and opposed flat transversely disposed vise jaw faces with widely spaced longitudinally disposed fastener means openings therethrough, and including;
a soft jaw member for interfaced engagement with the vise jaw faces and in the form of an elongated bar having an initially flat face disposed to interface with one of the aforesaid vise jaw faces and extending transversely with spaced end portions to overly said widely spaced fastener means openings,
spaced fastener members and each being in the form of an element engageable with an end portion of the soft jaw bar member to draw it to the vise jaw,
at least the jaw member or one of said fastener members being resilient and arcuately formed, such that when said soft jaw is drawn into contiguous interfaced engagement



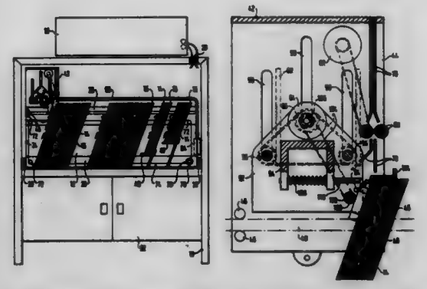
with said vise jaw face by said spaced fastener members, the resilient member is straightened, thereby stressing the soft jaw tightly to said vise jaw face,
and fastener means securing each of the spaced fastener members for drawing the soft jaw into interfaced engagement with said vise jaw face.

5,193,793
RE-USABLE COMBINATION MIXING BOARD AND CARRYING APPARATUS
Thomas R. Pollock, 41335 SE. Coalman Rd., Sandy, Oreg. 97055
Filed Mar. 31, 1992, Ser. No. 860,956
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 269—302.1 7 Claims



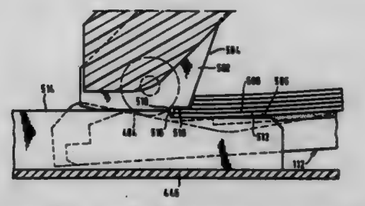
1. A reusable, combination mixing board and carrying apparatus comprising:
a) a base member configured for stable support on an underlying surface,
b) an upstanding support member mounted on the base member and configured to extend vertically upward a spaced distance therefrom,
c) a rigid mixing platform configured to support a quantity of material thereon, and
d) a vertically extending carrying handle member secured to the mixing platform and configured to extend downwardly therefrom, the carrying handle member including releasable mounting means configured to engage said upstanding support member to releasably secure said mixing platform-supporting carrying handle member against movement on said base member.

5,193,794
DEVICE FOR AUTOMATIC DISPENSING OF SINGLE SHEETS AND THE LIKE
Helmut Steinhilber, Sonnenbergstrasse 40, CH-6052 Hergiswil, Switzerland
Filed Dec. 27, 1990, Ser. No. 633,332
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1989, 3943136
Int. Cl.[5] B65H *3/44, 3/06, 1/22, 3/54*
U.S. Cl. 271—9 12 Claims



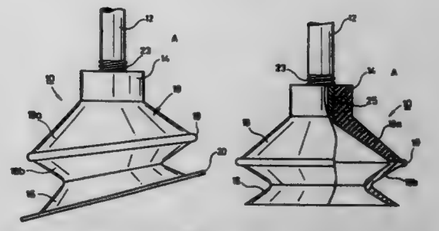
1. Apparatus for automatically withdrawing single sheets from plural stacks of sheets comprising:
a substantially horizontally extending magazine for receiving plural stacks of sheets,
a plurality of stack supports in said magazine, each for supporting a stack of sheets standing substantially vertically in said magazine,
a holder for plural stack supports for enabling at least one stack support to be positioned at any distance within said magazine from an adjacent stack support,
a housing having an open side, and
means for supporting said magazine for movement through said open side of said housing.

5,193,795
DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF SHEETS
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Landquart, Switzerland
Division of Ser. No. 381,662, Aug. 14, 1989, Pat. No. 5,060,408. This application Aug. 16, 1991, Ser. No. 746,401
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739500
Int. Cl.[5] G09F *11/30*
U.S. Cl. 271—42 6 Claims



1. A device for separating an individual sheet from a pile of sheets of substantially equal thickness, said individual sheet having a first side facing remaining sheets of said pile and a second side facing away from said remaining sheets, said device comprising:
a positioning member for said to-be-separated individual sheet defining a support plane for said second side of said individual sheet,
a transport member for displacing said sheets in a displacement direction along said positioning member, said transport member having faces engaging transverse edges of said sheets, said faces (1) being delimited by an end edge extending parallel to said support plane and (2) comprising a step portion adjacent said end edge, said step portion extending substantially orthogonally to said positioning member plane, said step portion being adapted to engage at least a particular sheet immediately adjacent said individual sheet and to displace said particular sheet relative to said individual sheet, and
means for guiding said transverse edge of said individual sheet past said end edge of said transport member faces onto said positioning member.

5,193,796
APPARATUS FOR HOLDING BY SUCTION AND CONVEYING A SUCTION PAD CONSTRUCTED OUT OF MATERIALS OF DIFFERING HARDNESSES
Shigekazu Nagai; Shuuzou Sakurai, and Tadasu Kawamoto, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1991, Ser. No. 757,044
Claims priority, application Japan, Sep. 11, 1990, 2-242019; Jun. 24, 1991, 3-047698
Int. Cl.[5] B65H *3/08*
U.S. Cl. 271—90 19 Claims



1. An apparatus for holding a work by suction and conveying the work, making use of a suction pad for holding the work by suction, wherein the suction pad comprises a root part connectable to a vacuum and suction source, a skirt part disposed integrally with the root part, and a cushioning part disposed integrally between the root part and the skirt part, said cushioning part further comprising an annular projection joining together an upper portion of the cushioning part and a lower portion of the cushioning part, wherein the hardness of the annular projection is higher than that of the lower portion of the cushioning part.

5,193,797
PAPER FEEDING SYSTEM AND PICKING SYSTEM USED THEREFOR
Hiroyuki Harada; Akio Tajima, and Fumio Otsuka, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Sep. 30, 1991, Ser. No. 769,096
Claims priority, application Japan, Oct. 5, 1990, 2-267848; May 21, 1991, 3-35932[U]
Int. Cl.[5] B65H *3/06*
U.S. Cl. 271—115 6 Claims

1. A picking system which contains picking rollers disposed facing against a paper holder and takes out a top paper from said paper holder by driving and rotating said picking rollers, comprising:
a lever that supports said picking rollers and is supported in a manner displacable;
a cam wheel which has cam means that engages with a cam follower provided on said lever and which displaces said lever so that said picking rollers are displaced to a first position where said picking rollers are separated from said paper and to a second position where said picking rollers abut to said paper;

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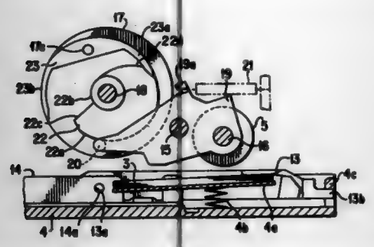
driving means rotatable normally and reversely that rotates and displaces said picking rollers; and

clutching means for transmitting the rotation of said driving means to said cam wheel by a certain rotation angle; and said cam means is comprised of;

a main cam comprising a cam surface for maintaining said picking rollers at said first position and a recess that allows



said picking rollers to be displaced to said second position, and

an auxiliary cam that allows said cam follower to fall from said cam surface to said recess when said driving means rotates normally, but blocks said cam follower from falling from said cam surface to said recess when said driving means rotates reversely.

5,193,798

AUTOMATIC PAPER FEEDER

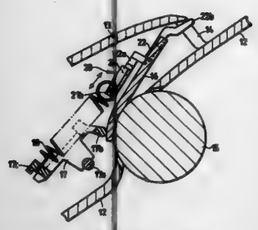
Hiroshi Okano, Yokohama, Japan, assignor to Matsushita Graphic Communications Systems, Inc., Tokyo, Japan

Filed Jun. 29, 1992, Ser. No. 905,987

Claims priority, application Japan, Sep. 30, 1991, 3-251097

Int. Cl.[5] B65H *3/52*

U.S. Cl. 271—124 **6 Claims**



1. An automatic paper feeder comprising:

a feed roller;

a paper-separating member in contact with the feed roller;

a push member for pressing the paper-separating member against the feed roller;

a spring for exerting a pressing force on the push member; and

means for adjusting the pressing force of the spring which is exerted on the push member;

wherein the spring-force adjusting means comprises a swingable adjustment plate connected to the spring, a cam, and a movable adjustment member connected to the adjustment plate via the cam, the adjustment member having a knob, wherein at least a part of the knob is exposed to be easily accessed, and wherein the pressing force of the spring which is exerted on the push member is varied in accordance with a position of the knob.

5,193,799

APPARATUS FOR DEPOSITING COPY SHEETS IN A STACKING BIN

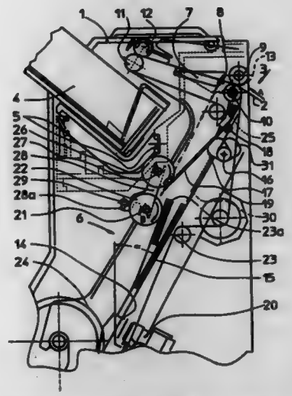
Gert Scheufler, Winnenden; Gert Haertwich, Esslingen, and Dietmar Blaettner, Schwaikheim, all of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 27, 1991, Ser. No. 799,227

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1991, 4101436

Int. Cl.[5] B65H *31/04, 31/20*

U.S. Cl. 271—213 **4 Claims**



1. In an apparatus for depositing sheets which are individually fed into a bin and collected there in stacked relation, said bin having a depositing surface and a stop means for registering the leading edge of the incoming sheets and at least first and second guide elements arranged opposite said stop means and directing the sheets fed to the bin onto those already deposited, and in which apparatus above the sheet stack to be formed and within the collecting bin at least one stationary roller is arranged which is associated with the trailing portion of the sheet stack facing the guide elements and is driven in sheet entry direction and whose surface facing the sheet stack lies beneath the entry plane of the sheet determined by the guide elements to the extent that it limits the top and trailing portion, respectively, of the sheet stack in a recessed position beneath the sheet entry plane, keeping the feed path open, apparatus for facilitating depositing of sheets in said bin, said facilitating apparatus comprising:

parallel to said stationary roller (**22**), at least one pivotable roller (**26**) of identical diameter arranged in spaced relation thereto, said pivotable roller (**26**) being positioned upstream of said stationary roller (**22**), as seen in feeding direction;

said stationary roller (**22**) being mounted on a shaft (**21**) and associated with said first guide element (**19**) and said pivotable roller (**26**) being associated with said second guide element (**30**);

said first and second guide elements (**19, 30**) selectively pivoted from the plane of the depositing surface (**15**) to a position in which said first and second guide elements extend upward beyond the sheet stack (**23, 23*a***) so as to form a ramp;

said pivotable roller (**26**) being arranged on at least one support (**28**) which can be pivoted about said shaft (**21**) of said stationary roller (**22**) and in the path of movement of said first guide element (**19**); and

said pivotable roller (**26**) being jointly driven with the stationary roller (**22**) in the same direction and at the same circumferential speed.

5,193,800

APPARATUS FOR CONVEYING PAPER IN A PRINTER

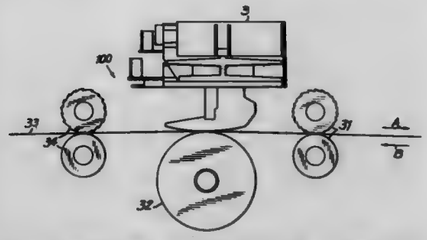
Kazutoshi Kashiwabara, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 7, 1992, Ser. No. 864,779

Claims priority, application Japan, Apr. 8, 1991, 3-75086

Int. Cl.[5] B65H *5/06*

U.S. Cl. 271—272 **22 Claims**



1. An apparatus for conveying paper in a printer along a paper path past a print head in a first direction and in a second direction opposite to the first direction, comprising first conveying means positioned upstream of the print head having a predetermined diameter for selectively conveying said paper along said print path and second conveying means positioned downstream of said print head having a predetermined diameter for selectively conveying said paper along the print path, said at least first conveying means having a diameter and including means for selectively changing the diameter of said first conveying means in response to whether said paper is being conveyed in the first direction or the second direction.

5,193,801

VARIABLE SPEED DRIVE FOR SORTER TRAY SHIFTING CAMS

Peter M. Coombs, Tustin, and Richard S. Howell, Jr., Rancho Santa Margarita, both of Calif., assignors to Gradco (Japan) Ltd., Tokyo, Japan

Filed Oct. 18, 1991, Ser. No. 779,557

Int. Cl.[5] B65H *39/10*

U.S. Cl. 271—293 **8 Claims**

1. In a sheet sorter of the moving tray type comprising: a frame structure, a plurality of trays supported by said frame structure to receive successive sheets from a sheet infeed location, tray shifting cam means including a rotating cam and follower means on said tray ends for moving ends of said trays at said sheet infeed location between closely spaced positions above and below the rotary shifting cam and spacing said ends apart to provide an enlarged sheet receiving space between adjacent tray ends located above and below the rotary cam, a reversible electric motor for driving said rotary cam, and means for controlling said motor, the improvement wherein said means for controlling said motor drives said motor selectively at a low speed and a high speed whereby said motor is driven at said low speed to effect engagement of said rotary cam with said follower means to initiate movement of said ends of said trays and at said high speed to move said ends of said trays to enlarge the space therebetween and to stop said motor when said adjacent trays are located by said cam to provide said enlarged space.

5,193,802

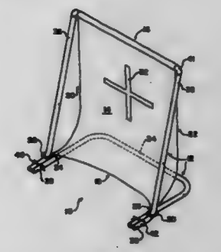
PORTABLE, ASYMMETRICALLY DISPLACED, SELF-CENTERING BALL CATCHING AND RETURN APPARATUS AND METHOD

James E. Saltus, 2637 Barton Hills Dr., Austin, Tex. 78704

Filed Jan. 24, 1992, Ser. No. 824,996

Int. Cl.[5] A63B *69/40*

U.S. Cl. 273—26 A **10 Claims**



1. A portable, asymmetrically displacable, self-centering ball catcher and return apparatus comprising:

a) a frame adapted to the supported upright on a support surface; and

b) a net means with a top bottom and two sides to define a pair of top corners and a pair of bottom corners, said net being attached to said frame at said top of said net means and slidably attached to said frame only at said bottom corners so that said corners and two sides are free to move asymmetrically and independently.

5,193,803

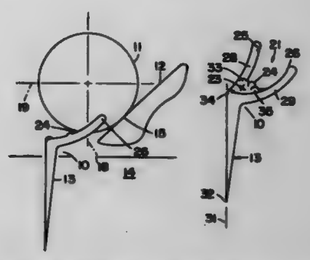
GOLF TEE

Conrad Flick III, 3715 ½State St., Bettendorf, Iowa 52722

Continuation of Ser. No. 482,701, Feb. 21, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 803,782

Int. Cl.[5] A63B *57/00*

U.S. Cl. 273—33 **5 Claims**



1. A golf tee for supporting a golf ball to be struck by a golf club which will ensure contact of the golf ball by the golf club prior to contact between the golf club and the golf tee, said golf tee comprising:

a golf tee body;

a triangulated stanchion having a continuous leading edge connected at one end to the golf tee body and converging to a tip at the other end to penetrate into a ground surface for support of the stanchion in an upright posture with respect to the ground surface;

a golf ball support connected to said golf tee body comprising at least three ball engaging members including a lead-

ing ball engaging member and a pair of spaced trailing ball engaging members,

said pair of spaced trailing ball engaging members include a pair of mirror image arms extending rearwardly away from said golf tee body in an arcuate, upward and outward posture,

said leading ball engaging member comprises a knob mounted upon said golf tee body, and

said pair of mirror image arms terminate in mutually opposing ball sopping knobs which cooperate with the knob of said leading ball engaging member to form a triangular three point bearing support for a golf ball; and

three additional ball engaging members extending upwardly from the golf tee body for temporarily receiving a golf ball and for permitting a vertical force to be applied by a person to a golf ball placed one said tee to facilitate penetration of said stanchion into a ground surface, wherein an imaginary line extending generally vertical to a ground surface and through the center of a golf ball resting upon golf balls support being laterally offset from an imaginary line extending through a central longitudinal axis of said stanchion such that a golf club face will strike the golf ball prior to making contact with the golf tee to thereby ensure unobstructed contact of the golf ball by the golf club without contact between the golf club and the golf tee prior to contact of the golf club with the golf ball.

5,193,804

AUTOMATIC PIN SETTING APPARATUS

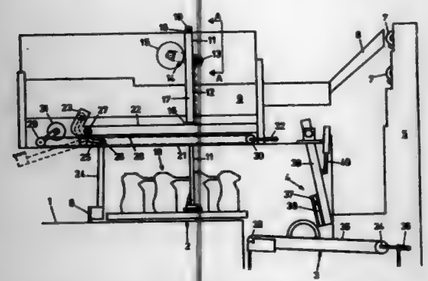
Jan W. Smit, Malden, Netherlands, assignor to Bowling- en Kegelcentrum Nijmegen B.V., Netherlands

Filed Oct. 9, 1990, Ser. No. 594,277

Claims priority, application Netherlands, Oct. 12, 1989, 8902532

Int. Cl.[5] A63D *5/08*

U.S. Cl. 273—42 R **3 Claims**



1. An automatic bowling pin setting apparatus for setting pins in a given pattern upon a pin deck at an end of a bowling lane, said apparatus comprising a set up frame adapted to be moved up and down above the pin deck and relative to a stationary machine frame by means of racks and pinion gears meshing therewith, said set up frame having opposing sides, said racks being mounted on vertically oriented columns mounted to said opposing sides of said set up frame and a plurality of frame pin bins are bearing mounted to said set up frame according to said pattern for tilting movement between a horizontal pin pick-up position and a vertical pin put-down position, said apparatus further comprising an elevator for supplying pins knocked down and removed from the pin deck by a sweep barrier to a pin distributor for routing to ones of said frame pin bins, characterized in that air ram cylinders (17) attached between said machine frame (16) and said set up frame (10) substantially support said set up frame (10)) during said set up frame movement, a set up frame motor (15) fixedly attached to said machine frame (16) drives the set-up frame pinion gears (13) to control the set up frame motion, and the sweep barrier (6) includes means for controlling said sweep arm horizontal movement whereby upward and downward movement of said set up frame (10) is provided at a reduced speed with respect to said horizontal movement of said sweep barrier (6), said sweep barrier is controlled using wheels running in side gutters, said wheels being mounted on a wagon on which the sweep barrier is mounted at a fixed angle, characterized by second guiding gutters (22) arranged on opposite sides of the machine frame (16) above said first gutters (21), said second guiding gutters having a vertical guiding bend (23) for receiving the wheels of the sweep barrier wagon (25–27), the sweep barrier (6) being connected to the wagon (25–27) at a fixed angle and the wagon being driven by a two-speed reversible motor (31).

5,193,805

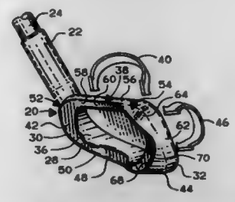
WEIGHTED CAVITY BACK GOLF CLUB SET

Karsten Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.

Filed Aug. 23, 1991, Ser. No. 749,553

Int. Cl.[5] A63B *53/00*

U.S. Cl. 273—77 A **17 Claims**



1. An improved correlated set of cavity-back iron-type golf clubs, each club having a head with a cavity formed in the back thereof and which includes a front face for impacting a golf ball, a back surface spaced rearwardly from the front face and disposed to circumscribe the opening of the cavity, a heel portion, a toe portion and a sole, the head having an elongated upper end extending between the heel and toe portions, the sole of the head having a trailing edge that extends between the heel and toe portions of the head, the trailing edge being indented centrally thereof toward the front face of the head and having the lower part of the back surface adjacent the indented trailing edge configured to conform to the indented trailing edge by sloping upwardly and inwardly therefrom toward the front face of the head, the improvement comprising:

a) a top ridge extending longitudinally along the upper end of the head between the heel portion and the toe portion thereof and having a longitudinal center intermediate the heel and toe portions of the head;

b) an upper heel protuberance located at a corner junction formed at the intersection of the heel end of said top ridge and the heel portion of the head, said upper heel protuberance being in the form of an enlarged mass concentration which protrudes rearwardly from the back surface of the head; and

c) an upper toe protuberance located at a corner junction formed at the intersection of the toe end of said top ridge and the toe portion of the head, said upper toe protuberance being in the form of an enlarged mass concentration which protrudes rearwardly from the back surface of the head.

5,193,806

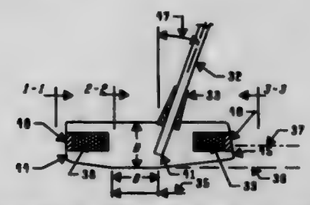
LOW-FLIGHT SPIN CONTROL CHIPPER-PUTTER GOLF CLUBHEAD

Alfred J. Barkly, P.O. Box 787, West Falmouth, Mass. 02574

Filed May 5, 1992, Ser. No. 878,534

Int. Cl.[5] A63B *53/04, 53/02*

U.S. Cl. 273—80.2 **2 Claims**



1. A golf clubhead assembly which, when provided with a shaft, a shaft ferrule and a gripping device, can be used for chipping and putting a golf ball, the golf club assembly comprising: a solid, truncated right circular cylindrical clubhead having toe and heel ends, a shaft having a lower tip end and an upper butt end and rigidly connected at the lower tip end to the clubhead, a ferrule interfacing with the shaft and the clubhead to seal the joint therebetween; said ferrule being bonded in place with an adhesive having the characteristics of an epoxy cement, and a gripping device fitted to the upper butt end of the shaft; said clubhead having a right circular cylindrical impact cylinder having an impact surface, heel and toe end swingweight ports, swingweighting material, a means for sealing and closure of the swingweight ports; said clubhead having a right face, a left face, a top face, a bottom face, a toe end face and a heel end face; said impact cylinder intended for striking a golf ball and being circular in section; the geometry of said clubhead being derived from the applications of multiples of a base diameter "D" to develop further defining dimensions, where "D" is less than the diameter of a U.S. Golf Association regulation golf ball; the diameter of the impact cylinder being $1\times D=1.3$ inches, the length of the impact cylinder being $1\times D=1.3$ inches, the length from the toe end face to the impact cylinder along the top face being $1\times D=1.3$ inches, the length from the heel end face to the impact cylinder along the top face being $1.5\times D=2.15$ inches and the overall length of the clubhead from the toe end face to the heel end face being $3.5\times D=4.55$ inches as measured along the top face of the clubhead; said right circular cylindrical clubhead being manufactured from a hardwood material having the properties of hardness and impact resilience of lignum vitae, purpleheart, pernambuca or bloodwood; said clubhead being provided with a hole for receiving the golf club shaft in the top face of the clubhead at a distance approximately two-thirds of the overall clubhead length along the top face toward the heel; said hole having a diameter and depth to accommodate said golf club shaft and drilled at a lie angle of approximately 70 degrees above the horizontal baseline of the clubhead and corresponding to 20 degrees from the upright vertical and inclined at the upper butt end toward the heel end of the clubhead; said shaft being fitted with said ferrule wherein the ferrule is made from molded plastic; said hole in the top face of the clubhead being provided with a spotface that is countersunk to receive said ferrule; said ferrule being interference force fitted to the shaft prior to the shaft being fitted to the clubhead; said clubhead being provided with a bottom face taper on the heel end, which taper slopes upward from the impact cylinder toward the heel end face and forms an angle of approximately eight degrees with the horizontal baseline; said clubhead being provided with a bottom face taper on the toe end, which tapers upward from the impact cylinder toward the toe end face and forms an angle of approximately eight degrees with the horizontal baseline; said clubhead being provided with a heel end face taper having an angle of approximately 20 degrees from the upright vertical and inclined toward the toe end; said clubhead being provided with a toe end swingweight port comprising a hole having a diameter of approximately $\frac{1}{4}$ inch in the toe end of the clubhead and drilled to a depth of approximately 1 inch; said clubhead being provided with a heel end swingweight port comprising a hole having a diameter of approximately $\frac{1}{4}$ inch in the heel end of the clubhead and drilled to a depth of approximately $\frac{1}{2}$ inch; said swingweight ports being filled with said swingweighting material having the characteristics of a mixture of lead and lead powder to swingweight and balance the clubhead assembly; said ports being closed and sealed with hardwood plugs bonded in place with a material having the properties of an epoxy cement in order to contain and seal said swingweighting material in place, said plugs conforming to the shape of the heel and toe end faces; said clubhead being provided with grooves extending longitudinally along the full length of the impact surface and transversely across approximately the upper and lower 120 degree arcs of girth of the top and bottom faces, the center of said 120 degree arcs of girth being coincident with the vertical centerline of the clubhead; said clubhead being devoid of grooving over approximately a 60 degree arc of girth centered on both the left face and the right face of the impact cylinder; said longitudinal grooves having dimensions of approximately 0.02 inches wide by 0.02 inches deep and spaced on centers of approximately 0.08 inches as measured along the circumference of the impact surface, all corners of root and crown of the grooves being rounded with a radius of approximately 0.01 inches.

5,193,807

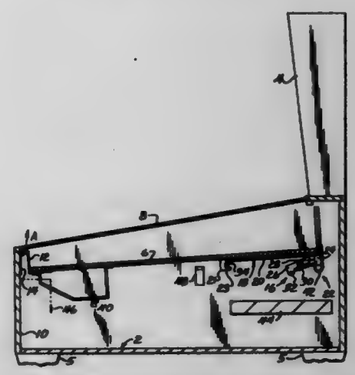
PINBALL GAME CABINET

Winston H. Schilling, Park Ridge, and John W. Skalon, Des Plaines, both of Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.

Filed Mar. 10, 1992, Ser. No. 848,752

Int. Cl.[5] A63F *7/22*; A47B *88/00*

U.S. Cl. 273—121 R **15 Claims**



9. In a rolling ball game, including a cabinet, a substantially horizontally disposed playfield having components requiring a periodic servicing on the underside thereof and a back box at one end of the playfield, the improvement comprising:

a) pivot means disposed on said cabinet on one end of the playfield for supporting said one end of the playfield thereon in the substantially horizontal position;

b) slide means disposed along the underside of the playfield for engaging said pivot means to permit (i) rotational movement of the playfield about the pivot means and (ii) translational movement toward and away from the back box;

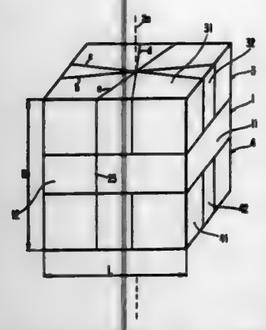
c) means for releasably securing said slide means to said pivot means to support the playfield thereon when the playfield is rotated to a substantially vertical position;

whereby, better access is provided to the components on the underside of the playfield.

5,193,808
TOY GAME APPARATUS
Sano Takashi, Yono, Japan, assignor to Asahi Corporation, Tokyo, Japan
Filed Mar. 26, 1992, Ser. No. 857,758
Claims priority, application Japan, Mar. 29, 1991, 3-827107[U]
Int. Cl.[5] A63F 9/00; A63H 3/36
U.S. Cl. 273—138 R 12 Claims

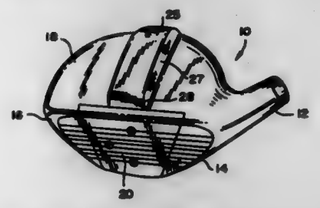
1. A toy game apparatus comprising:
a. a character figure having a mouth portion which is moveable between open and closed positions, said mouth portion having a plurality of game piece sockets therein;
b. a plurality of game pieces moveably received in said game piece sockets;
c. detecting means for detecting the movement of a game piece from a predetermined normal position in at least one of said game piece sockets;
d. means for releasably retaining said mouth portion in the open position thereof; and
e. means for automatically moving said mouth portion to the closed position thereof in response to the movement of a game piece from the normal position thereof in said at least one game piece receiving socket as detected by said detecting means.

5,193,809
THREE-DIMENSIONAL PUZZLE
Karel Hrsel, Nedvedovo Namesti 5, 147 00 Praha 4, and Vojtech Kopksy, Bajkalska 28, 100 00 Praha, both of Czechoslovakia
Filed Nov. 7, 1991, Ser. No. 788,751
Claims priority, application Czechoslovakia, Nov. 8, 1990, 5504-90
Int. Cl.[5] A63F 9/08
U.S. Cl. 273—153 S 11 Claims



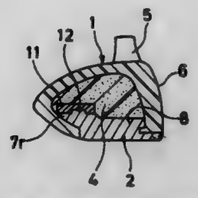
1. A three-dimensional puzzle prism comprising a plurality of exterior segments defining vertical and horizontal prism faces, and internal cylindrical means for mounting said exterior segments and for enabling permutation thereof, said exterior segments being grouped into three horizontally layered structures, and said internal cylindrical means including a vertical axis, connecting means for providing rotational movement about said axis of the peripheral ones of said layered structures relative to the middle one of said layered structures and also relative to each other, said internal cylindrical means also having interconnecting means for providing rotational movement in a vertical parting plane passing through said axis and about a radial direction, of those of said exterior segments on one side of said parting plane relative to the exterior segments on the other side of said parting plane, wherein said vertical parting plane forms a first oblique angle with a non-intersecting vertical prism face,
wherein said internal cylindrical means includes a cylindrical member disposed along said vertical axis and divided by said vertical parting plane, wherein said interconnecting means includes a radially disposed pivot means passing through the centers of said divided cylindrical member, and wherein said connecting means includes radial projection means disposed on the axial ends of said divided cylindrical member for engaging those of said exterior segments grouped in said peripheral layered structures for sliding rotation about said vertical axis.

5,193,810
WOOD TYPE AERODYNAMIC GOLF CLUB HEAD HAVING AN AIR FOIL MEMBER ON THE UPPER SURFACE
Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238
Filed Nov. 7, 1991, Ser. No. 788,926
Int. Cl.[5] A63B 53/04
U.S. Cl. 273—167 E 9 Claims



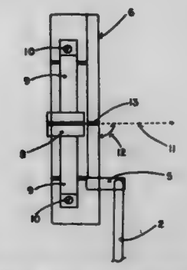
1. A wood type golf club head having a heel, a toe, a top surface, a bottom, a ball striking face and a rear surface, the improvement comprising:
means for reducing the aerodynamic drag on the club head and providing increased club head speed for a given force when swinging the club;
said means including at least one elongated, rectangularly shaped member having a height of at least ¼ inch extending above the top surface and a width of at least ¼ inch in the heel to toe direction, said member having a leading edge extending upwardly adjacent to and slightly behind said ball striking face and a trailing edge terminating adjacent said rear surface, said member including a planar upper surface and sides extending between said planar upper surface and said top surface of said golf club head, said sides defining the height of the member; and,
said member forming an air foil for creating air flow turbulence as the golf club is swung.

5,193,811
WOOD TYPE GOLF CLUB HEAD
Takaharu Okumoto, Chigasaki, and Atsushi Onozato, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Nov. 1, 1991, Ser. No. 786,747
Claims priority, application Japan, Nov. 9, 1990, 2-117200[U]; Nov. 9, 1990, 2-117201[U]; Nov. 9, 1990, 2-117202[U]
Int. Cl.[5] A63B 53/04
U.S. Cl. 273—167 F 8 Claims



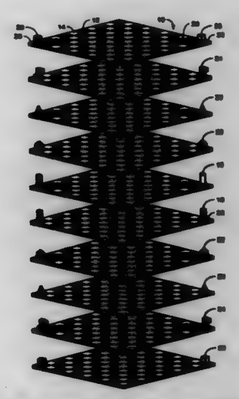
1. A wood type golf club head comprising a head body molded primarily of a synthetic resin and having a top and bottom side, a front and a rear side and a toe and a heel side, said head body having an interior hollow space having inner surfaces in which a core member is packed and a metallic sole plate having a side bonded to the bottom side of said head body, said sole plate having an outer circumference and on said side to be bonded to said head body, a hosel portion adapted to cooperate with the heel side of said head body, and weights adapted to cooperate with both the toe side and the rear side of the head body, said hosel portion and weights being integrally connected together by a beam to form a frame member, wherein said weights have overhanging portions that project beyond the outer circumference of said sole plate and that are bonded to an inner surface of said hollow space in the interior of said head body when said plate is bonded to said head body.

5,193,812
GOLF CLUB WITH LASER ALIGNMENT SYSTEM
Mark W. Hendrickson, E. 10805 22nd Ave., Spokane, Wash. 99206
Filed Apr. 15, 1992, Ser. No. 870,051
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—186.3 20 Claims



1. A golf club with a laser beam alignment system, comprising:
a. a shaft means 2;
b. a grip means 1 affixed to and around one end of said shaft means 2;
c. a clubhead 3 affixed to said shaft means 2 at the end of the shaft mans 2 opposite the grip means 1, and which includes a clubface 6;
d. a means to generate a laser beam;
e. a means to emit a laser beam which is communicatively connected to the means to generate the laser beam; and
f. a laser beam emission attachment means, which attaches the means to emit a laser beam to the clubhead 3, and which locates the emission of the laser beam in a direction perpendicular to and above the clubface 6 and above an approximate location on the clubface 6 where it is desired to strike a golf ball, and which results in the emission of the laser beam in a substantially horizontal plane over the top of the golf ball when the golf club is held for addressing the ball on a substantially horizontal surface.

5,193,813
METHOD OF PLAYING THREE-DIMENSIONAL CUBIC CHESS
Allan Goff, 8265 Central Ave., Orangevale, Calif. 95662
Filed May 8, 1991, Ser. No. 698,488
Int. Cl.[5] A63F 3/02
U.S. Cl. 273—241 11 Claims



1. A method of playing a three-dimensional chess game, comprising the steps of:
(a) providing a playing field, said playing field forming a cube divided into any array of cubic cells wherein a square set of cubic cells lies on any plane which slices through said cube and which cuts any face off said cube;
(b) arranging a plurality of playing pieces on said playing field, said playing pieces including a king, queen, bishop, duke, rook, knight, and pawn;
(c) movement of said playing pieces being generally confined to flat planes through said cubic cells;
(d) defining the position of any cubic cell as an intersection point of three intersecting orthogonal planes, each of which slices said cube cutting a face off said cube;
(e) movement of said rook playing piece defined as movement to any cubic cell of a square set of cubic cells lying on any one of the three orthogonal planes intersecting the cubic cell said rook playing piece is currently on, said square set of cubic cells being unoccupied by any other paying piece, said square set of cubic cells having a first corner coincident with the position of said rook playing piece prior to movement, said square set of cubic cells having a perimeter, the position of said rook playing piece after movement being coincident with a point on said perimeter, movement of said rook playing piece to cubic cells adjacent to said rook playing piece being generally confined to movement through adjoining faces of said adjacent cubic cells;
(f) defining the position of any cubic cell as an intersection point of four skew planes each of which slices said cube cutting at least one corner off said cube;
(g) movement of said bishop playing piece defined as movement to any cubic cell of a rhomboid set of cubic cells lying on any one of the four skew planes intersecting the cubic cell said bishop playing piece is currently on, said

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rhomboid set of cubic cells being unoccupied by any other playing piece, said rhomboid set of cubic cells having a first corner coincident with the position of said bishop playing piece prior to movement, said rhomboid set of cubic cells having a perimeter, the position of said bishop playing piece after movement being coincident with a point on said perimeter, movement of said bishop playing piece to cubic cells adjacent to said bishop playing piece being generally confined to movement through adjoining edges of said adjacent cubic cells;

(h) defining the position of any cubic cell as an intersection point of six slant planes each of which slices said cube cutting one full edge off said cube; and

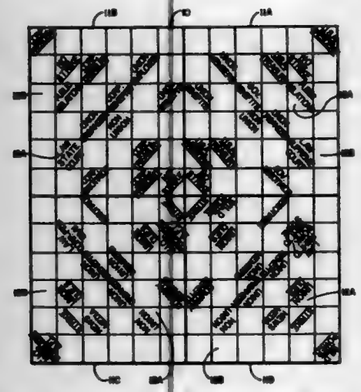
(i) movement of said duke playing piece defined as movement to any cubic cell of a square set of cubic cells lying on any one of the six slant planes intersecting the cubic cell the duke playing piece is currently on, said square set of cubic cells being unoccupied by any other playing piece, said square set of cubic cells having a first corner coincident with the position of said duke playing piece prior to movement, said square set of cubic cells having a perimeter, the position of said duke playing piece after movement being coincident with a point on said perimeter, movement of said duke playing piece to cubic cells adjacent to said duke playing piece being generally confined to movement through adjoining corners of said adjacent cubic cells.

5,193,814

GAME BOARD AND METHOD OF USING SAME

Grace Koch, 1000 SW. 128th Ter., Cambridge V, Apt. 304, Pembroke Pines, Fla. 33027

Filed Aug. 31, 1992, Ser. No. 938,393
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—242 **5 Claims**



1. A game apparatus, comprising, in combination,

a game board, said game board having four quadrant areas, each of said quadrant area comprising a plurality of squares of which said squares are blank and labeled such that the labeled squares number fourteen per quadrant and the blank squares number twenty two per quadrant,

playing chips, such that said chips correspond to the said labeled squares such that for each labeled square, there exists a playing chip identifying the same label as that on the said square, however, to the exclusion of three playing chips, namely, President, Money and Strike/No Strike, for which there are two labeled squares per chip; and a Government Arbitrator playing chip, for which there is no corresponding labeled square on said game board;

dice for initiating the selection and movement of the said playing chips, and;

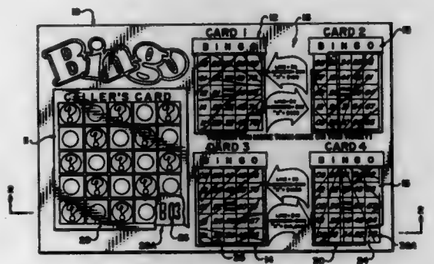
a victory sign to be awarded to the winner of said game apparatus.

5,193,815

INSTANT BINGO GAME AND GAME CARD THEREFOR

Gordon Pollard, Manitoba, Canada, assignor to Pollard Banknote Limited, Winnipeg, Canada

Filed Apr. 22, 1992, Ser. No. 872,002
Int. Cl.[5] A63F *3/06*
U.S. Cl. 273—269 **5 Claims**



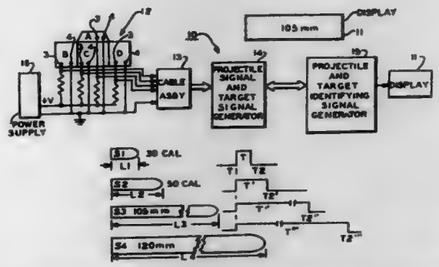
4. A game card comprising a substrate, a colored layer over the substrate, a plurality of symbols printed onto the colored layer, and a coating applied over the printed symbols and over the colored layer, the coating being translucent to allow viewing of the printed symbols and the colored layer therethrough, the coating being removable by scratching to expose the colored layer and the symbols, and the coating being colored such that those portions of the colored layer when viewed after removal of the coating are visually distinct from those portions of the colored layer when viewed through the coating.

5,193,816

PROJECTILE AND TARGET IDENTIFYING APPARATUS

Ejaz A. Ahmed, Edison, and Joseph L. La Mura, West Caldwell, both of N.J., assignors to Joanell Laboratories, Inc., Livingston, N.J.

Filed Apr. 1, 1992, Ser. No. 861,469
Int. Cl.[5] F41J *5/044*
U.S. Cl. 273—373 **20 Claims**



1. A projectile and target identifying apparatus comprising:

a target comprising two electrically conductive layers secured in electrically isolated spaced relation, said target having negligible effect on the velocity of a penetrating projectile, said spaced relation being such that projectiles of different types having given different lengths penetrating said target at the same given velocity are in concurrent ohmic contact with said conductive layers in corresponding time intervals of different durations, each time interval having a duration proportional to the length of the corresponding projectile type;

projectile signal generating means responsive to penetration of said target by any one of said projectiles of different types making simultaneous ohmic contact with both said conductive layers for generating a projectile signal manifesting only the time duration of the corresponding projectile type in said simultaneous contact; and

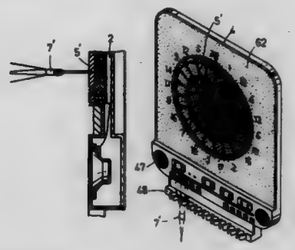
identifying means responsive to said projectile signal for generating a projectile identifying signal representing the corresponding penetrating projectile type.

5,193,817

DART GAME

Francis Pan, No. 7, Ta-Tun 15th St., Nan-Tun Dist., Taichung City, Taiwan

Filed Dec. 24, 1991, Ser. No. 812,806
Int. Cl.[5] F41J *5/04*
U.S. Cl. 273—376 **5 Claims**



1. A dart game comprising:

a dart; and

a dart board, said dart board including a base plate and a target frame fixed to said base plate to define a hollow space therebetween said target frame having :

a target portion including concentric annular ribs and angularly spaced radial ribs which intersect said annular ribs to form a plurality of spaced scoring areas with different score values, an innermost one of said annular ribs forming a central circular scoring area which defines a bull's-eye section,

a plurality of target plates of different shapes corresponding with and respectively disposed in scoring areas, mounted between said ribs, and shiftable toward said base plate; and

a plurality of high density polymer plates detachably provided on a front side of a respective one of said plurality of target plates;

said dart board further including:

an automatic scoring register, said automatic scoring register including a flat panel mounted in said hollow space and attached to said base plate, said flat panel having a plurality of touch-activated switches provided thereon which are arranged in accordance with said target plates,

a circuit means mounted in said hollow space which is electrically connected to said plurality of touch-activated switches, and

a display unit mounted on said target frame which is electrically connected to said circuit means;

a particular one of said plurality of target plates being urged to impact a corresponding one of said plurality of touch-activated switches so as to cause said circuit means to control said display unit to show a score which corresponds to said particular one of said plurality of target plates when said dart strikes said particular one of said plurality of target plates;

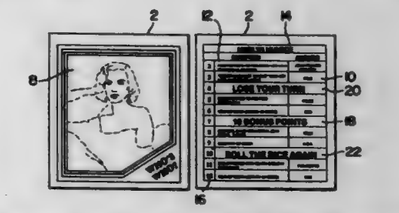
said target frame including an annular support member which is fixed to said target portion at said central circular scoring area and which defines an annular clearance with said innermost one of said annular ribs, an inner circular target plate mounted in said annular support member and which is shiftable toward said base plate, and an outer annular target plate mounted in said annular clearance and which is shiftable toward said base plate, said inner circular target plate and said outer annular target plate defining two different scoring areas in said bull's-eye section.

5,193,818

GAME

Garry Leeson, R.R. #5, Kingston, Nova Scotia, B0P 1R0, Canada

Filed Jan. 10, 1992, Ser. No. 818,913
Int. Cl.[5] A63F *1/00, 9/18, 9/22*
U.S. Cl. 273—430 **12 Claims**



1. A game comprising a plurality of distinct, arbitrarily selectable information units, each unit divided into two, independently viewable sub-units, the first sub-unit being a visual representation of a different, recognizable object and the second sub-unit being a visual representation of the identity of that object and questions and answers concerning that object, means for selection of a particular question by a player and means for accumulating the player's score based on proper answers to the questions, the information units comprising a plurality of two-sided cards, the first sub-units and second sub-units respectively being on first and second sides of the cards, the first side displaying a photograph of a different, recognizable object and the second side displaying the identity of the object, a plurality of questions concerning the object and the answers to those questions, and the game further comprising a random number-selection device for a range of numbers, a different one of the numbers in that range visually associated with each question on the second side of the card.

5,193,819

DOLL CATCHING TOY

Tsan-Ling Chen, No. 14, Hsin Ping Rd., An Ping Industrial Zone, Tainan, Taiwan

Filed Jan. 30, 1992, Ser. No. 828,119
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—448 **3 Claims**

1. A doll catching toy comprising:

a) a receptacle including a mechanism for rotating a turning disc, a bottom surface, and a plurality of sloped curved rails spaced apart on the bottom surface;

b) a turning disc placed in the receptacle for rotation by the rotating mechanism, the turning disc including a plurality of spaced large holes and a corresponding number of adjacent small holes;

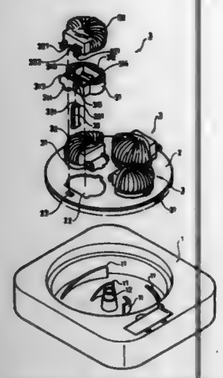
c) a plurality of doll containers, each container including a container body and a cap, the container body having a hook at one side for engaging one of the small holes in the turning disc and a projection at an opposite side for extending into one of the large holes in the turning disc for firmly securing the doll container to the turning disc, a horizontal shaft pivotally securing the cap to the container body to permit the cap to open up and close down, and each container body further including a chamber for receiving a doll therein and a vertical through hole;

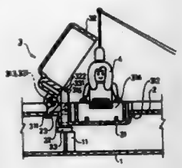
d) a slide rod received in each vertical through hole for up and down movement therein, the slide rod including a bottom end disposable in contact with the bottom surface

of the receptacle and an upper surface of one of the sloped curved rails

e) a doll disposed in the chamber of each doll container;

f) a fishing rod provided with a string and cooperating means carried by the string and each doll for permitting the fishing rod to catch the doll; and





g) wherein when the turning disc is rotated by the mechanism, each slide rod is caused to slide on a sloped curved rail and gradually open the cap of the doll container to expose the doll therein for catching by the fishing rod during the period of time when the cap is in the open position.

5,193,820

THREE-PIECE TYPE OIL RING ASSEMBLY

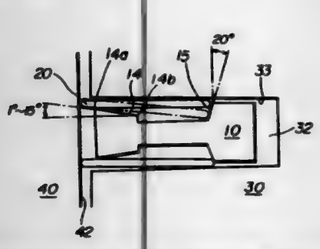
Takeji Tsuchiya; Yukio Tateishi; Akira Takahashi, and Katsushi Ishihara, all of Yono, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1991, Ser. No. 724,767

Claims priority, application Japan, Jul. 20, 1990, 2-190604

Int. Cl.[5] F16J *9/06*

U.S. Cl. 277—139 **9 Claims**



1. A three-piece type oil ring assembly adapted to be fitted in an oil ring groove of a piston disposed within a cylinder comprising:

a spacer expander in the form of a gapped annulus made of section steel having substantially H-shaped radial cross section, and a pair of upper and lower side rails, each in the form of a gapped flat annulus,

said spacer expander being adapted to be substantially held in between said upper and lower side rails,

said spacer expander comprising an axially protruding outer portion disposed on an outer circumference thereof and facing an inner surface of said cylinder, an axially protruding inner portion disposed on an inner circumference thereof and facing an innermost wall of said oil ring groove, and an axially flat connecting portion extending between said outer and inner protruding portions, said outer and inner protruding portions and said connecting portion being axially symmetrically aligned, said outer protruding portion being axially wider than said flat portion, said inner protruding portion being axially wider than said outer protruding portion,

said outer protruding portion having an upper side rail supporting surface and a lower side rail supporting surface respectively disposed on an upper end surface and a lower end surface thereof, said inner protruding portion having an upper side rail pressing surface and a lower side rail pressing surface respectively disposed on upper and lower halves of an outer circumferential surface thereof,

said spacer expander having a plurality of radial slits formed therein so as to be alternately extending inwardly from an outer circumference toward an inner circumference and outwardly from said inner circumference toward said outer circumference of said spacer expander, and

said outer protruding portion further having said side rail supporting surfaces formed so as to be respectively inclined toward the axially symmetrical centerline of the spacer expander along the radial direction from the outer circumference toward the inner circumference thereof at an acute angle with the radial direction,

said inner protruding portion having said upper and lower side rail pressing surfaces formed respectively inclined outwardly along an axial direction from upper and lower ends thereof toward an intersection thereof with said connecting portion at an acute angle with the axial direction.

5,193,821

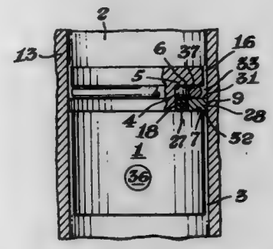
SUBSTANTIALLY ZERO LEAKAGE PATH SEALING ASSEMBLY WITH ZERO DEGREE BIAS ANGLE

Frederick L. J. Rehfeld, Saginaw, Mich., assignor to Leber Corporation, Midland, Mich.

Division of Ser. No. 331,303, Mar. 31, 1989. This application Jun. 18, 1990, Ser. No. 539,916

Int. Cl.[5] F16J *9/04*

U.S. Cl. 277—142 **2 Claims**



1. A sealing assembly for internal combustion engines and other high speed reciprocating devices such as compressors, fluid motors, fluid pumps, and other high speed devices which require sealing which comprises: an assembly of members to be sealed, one member axially centered over another member with a clearance passage between the assembled members, capable of allowing the assembly of members to move in relation to one and the other; said clearance passage being capable of transmitting a fluid under pressure; one of the members having one or more grooved openings to the clearance passage between the assembly of members, said groove openings having side walls and a bottom; positioned within and at the bottom of said groove openings is a continuous, resilient, elastomeric, expander seal; positioned within said groove openings and biased to said expander seal is a gapped sealing band having a circumference of greater than 360 degrees; the one gapped sealing band having a circumference of greater than 360 degrees has a flat surface that engages the expander seal and an axial (porous) biassing member which engages said gapped sealing band and engages a side wall of the groove

opening, said groove wall being in the direction of a fluid source, thus pushing said sealing band against the other groove wall; a means for actuating the fluid under pressure whereby the fluid under pressure engages the gapped sealing band and engages and activates the expander seal causing said expander seal to pressurize and expand against the flat surface of the gapped sealing bnand thereby forcing said gapped sealing band against the ungrooved member and against a side wall of said groove opening thereby causing a seal.

5,193,822

GASKET WITH REINFORCING CORE

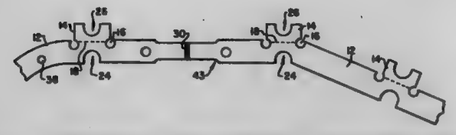
Gerard Bonell, Manchester, and Richard E. Arbuthnot, Solihill, both of England, assignors to Jamak Fabrication Europe, Ltd., Manchester, England

Filed Apr. 24, 1991, Ser. No. 690,707

Claims priority, application United Kingdom, Apr. 25, 1990, 9009227

Int. Cl.[5] F16J *15/12*

U.S. Cl. 277—180 **4 Claims**



1. A gasket having a peripheral length, comprising in combination:

a reinforcing core being made of a reinforcing material and being encased over a substantial portion of the peripheral length of the gasket by an elastomeric material;

the core being locally thickened at a plurality of thickened points along the peripheral length by portions made integrally and unitarily from the reinforcing material;

the core being a stamping from sheet metal which is of substantially uniform thickness, and which is locally thickened by a folding operation so that at least two thicknesses are present at the thickened points;

the locally thickened portions having apertures for receiving clamping screws; and

the apertures being open-ended slots in the thickened portions which have slot edges that are coined.

5,193,823

RESILIENT METALLIC SEALING MEMBER

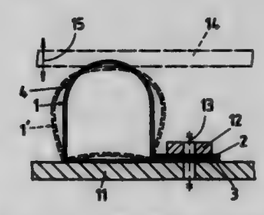
Hans-Jürgen Janich, Beckum, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 679,162, Mar. 26, 1991, which is a continuation of Ser. No. 337,388, Apr. 13, 1989, abandoned. This application Jun. 4, 1992, Ser. No. 893,902

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815402

Int. Cl.[5] F16J *15/08*

U.S. Cl. 277—189 **21 Claims**



1. A sealing device for use in effecting a hot gas seal between two relatively movable parts, said device comprising at least one springy, integral, resilient metal member having a pair of spaced apart side walls of uniform wall thickness joined at corresponding ends by a convexly domed top wall of corresponding wall thickness, at least one of said side walls being bent at its other end at an angle of substantially 90° and extending toward the other of said side walls to form a bottom wall of corresponding wall thickness underlying said top wall and spanning the space between said side walls thereby forming with said top wall and said side walls a hollow, deformable body, said bottom wall being free of said top wall and said other of said side walls and having an integral extension projecting beyond said body, said other of said side walls having at its other end an extension which extends beyond said body in overlying and confronting relation with said extension of said bottom wall, and means securing said extensions to one another, each of said top, bottom, and side walls being resiliently deformable from a non-deformed condition in response to the application of compressive force on said body in a direction to move said top wall toward said bottom wall, the movement of said top wall toward said bottom wall causing said side walls to bow outwardly of said body and said bottom wall to bow inwardly of said body, the resilience of said walls enabling them to return to their non-deformed condition in response to the removal of said compressive force.

5,193,824

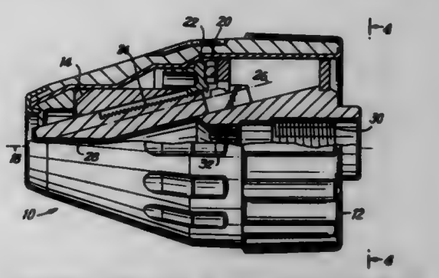
CHUCK HAVING A DRIVE BIT SOCKET

Glenn L. Salpaka, Salem, S.C., assignor to Jacobs Chuck Technology Corp., Wilmington, Del.

Filed Aug. 7, 1992, Ser. No. 927,070

Int. Cl.[5] B23B *31/12*

U.S. Cl. 279—60 **21 Claims**



1. A chuck that is adapted to fit onto a threaded spindle, the chuck comprising a body having portions that define a threaded axial bore, portions that define an axial entrance bore, and portions defining an axial socket, the socket being adapted to accept a drive bit such that the drive bit may be rotated so as to engage the socket and rotate the chuck so that the threaded axial bore is screwed onto the threaded spindle.

5,193,825

APPARATUS FOR ADJUSTING THE CENTER OF A COLLET

Roger J. Kanaan, Easley, and Paul T. Jordan, Seneca, both of S.C., assignors to Jacobs Chuck Technology Corporation, Wilmington, Del.

Filed Oct. 3, 1991, Ser. No. 770,355

Int. Cl.[5] B23B *31/20, 31/36*

U.S. Cl. 279—133 **22 Claims**

1. A collet chuck having a plurality of substantially rigid gripper members disposed in an annular array and circumferentially spaced from one another by resilient means, a frustoconical surface substantially concentric with said annular array, and means for forcing said annular array against said frustoconical surface substantially parallel to an axis concentric with said annular array so that said frustoconical surface changes the circumferential spacing between said gripper members, said collet further comprising means transversely moveable relative to said axis for displacing some of said grip-

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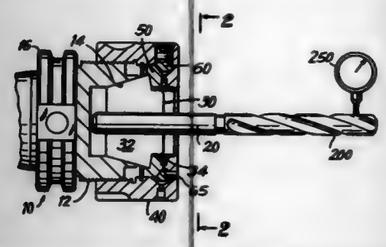
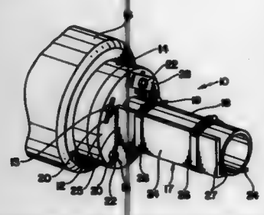
per members relative to others of said gripper members along said frustoconical surface in a direction generally parallel to



said axis in order to shift the center of said array in a direction transverse to said axis.

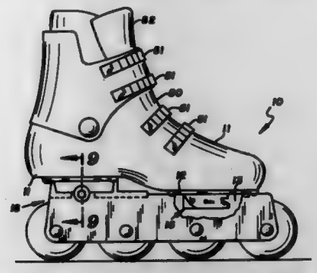
5,193,826
FACE PLATE ADAPTER FOR A MACHINE TOOL
Maurice A. Smith, Ledyard, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 24, 1992, Ser. No. 903,292
Int. Cl.[5] B23Q *3/06*
U.S. Cl. 279—145 **4 Claims**



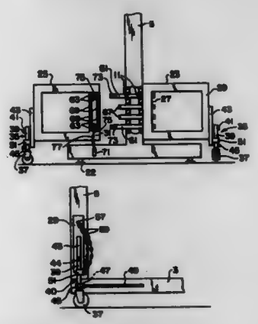
1. A face plate adapter for securing a tubular work piece to a machine tool for rotating said work piece about an axis comprising:
a face plate;
means for adjustably mounting said face plate to said machine tool for rotation therewith, said means including a plurality of substantially parallel, elongated mounting slots formed in said face plate and securing means extending through said slots for adjustably securing said face plate to said machine tool;
elongated nesting means extending outwardly from said face plate for receiving said work piece in a nesting relation therein so that said work piece extends outwardly from said face plate substantially along said axis; and
adjustable clamping means for securing said work piece in said nested relation in said nesting means.

5,193,827
CONVERTIBLE IN-LINE ROLLER SKATES
Scott B. Olson, Bloomington, Minn., assignor to O.S. Designs, Inc., Bloomington, Minn.
Filed Apr. 14, 1992, Ser. No. 868,457
Int. Cl.[5] A63C *1/20*
U.S. Cl. 280—7.13 **6 Claims**

1. In a skate assembly comprising a shoe having a sole plate, toe and heel attachment means secured to said sole plate, and coupling means for securing a wearer's surface blade support subassembly to said toe and heel attachment means; said skate assembly being further characterized in that:
(a) at least one of said toe and heel attachment means includes recessed blade receiving anchoring members with inwardly extending locking flanges defining a gap zone therebetween and adapted to receive a mating blade support rotatable anchoring cam therewithin;
(b) said blade support subassembly including frame means having a surface contact member secured thereto along the base surface thereof and a said rotatable blade support anchoring cam in opposed relationship to said surface contact member;
(c) said coupling means having attachment means receiving cavities formed therewithin and each cavity being arranged to firmly receive and retain one of said attachment means therewithin, said rotatable cam locking member being rotatable about a camming axis and with a radially extending web with laterally extending camming ramp flanges coupled to said web and being disposed radially outwardly of said camming axis; the arrangement being such that the outer surface of the camming ramp engages the inner surface of the ramp flanges, with said radially extending web passing between said inwardly extending locking flanges defining said cam ramp.



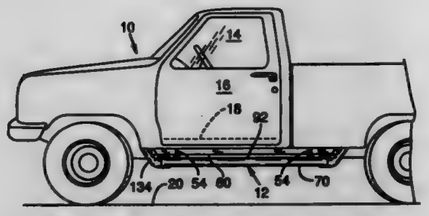
5,193,828
DOLLY STRUCTURE FOR MERCHANDISE DISPLAY RACKS
Frank Beavenuti, Ville Mercier, Canada, assignor to Knape & Vogt Canada Inc., Etobicoke, Canada
Filed Sep. 4, 1991, Ser. No. 754,956
Claims priority, application Canada, Aug. 5, 1991, 2048429
Int. Cl.[5] B62D *21/12*
U.S. Cl. 280—43.24 **12 Claims**



1. A dolly structure comprising:
a) a pair of essentially flat frames, each frame having an inner side member and an outer side member;
b) connection means for removably joining said inner side members together to hold said frames in alignment and in coplanar relationship in a plane; and
c) a pair of caster assemblies mounted on said outer frame members, respectively, said assemblies including casters movable between a low and a high position and so as to allow for vertically displacing said frames,

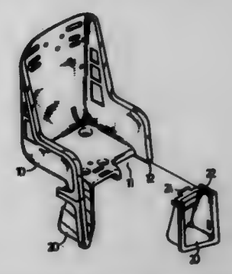
wherein each of said caster assemblies comprises:
a caster lifting device including a first arm and means pivoting one end of said first arm to the outer side member of a relevant one of said frames, and a second arm solid with an projecting laterally from the other end of said first arm, said second arm being formed at one end thereof, away from said first arm, with a level socket;
means mounting one of said casters on said second arm for swiveling motion;
a level insertable into said socket for pivoting said device between a vertical and an inclined position of said first arm whereby to displace said relevant frame vertically as said caster moves between said low and high positions; and
means releasably holding said device in said vertical position.
6. The combination of a display rack with a dolly structure, said display rack comprising a horizontal base and shelf post solid with and rising from said base, said post being formed with spaced first transverse apertures,
said dolly structure comprising:
a) a pair of essentially flat frames, each frame having an inner side member and an outer side member;
b) connection means for removably joining said inner side members together to hold said frames in alignment and in coplanar relationship in a plane;
c) a pair of caster assemblies mounted on said outer frame members respectively, said assemblies including casters movable between a low and a high position and so as to allow for vertically displacing said frames, and
d) at least one pair of spaced prongs solid with and projecting from the inner side member of one of said frames, said prong being coplanar with said one frame;
wherein the inner side member of the other of said frames is formed with second apertures spaced apart for registering with said first transverse apertures;
wherein said prongs extend through said first and second apertures and the length thereof is selected for them to project from said second apertures to define locking prong portions; and
wherein means are provided which cooperate with said locking prong portions to secure said frames to said shelf post.

5,193,829
SUB FRAME SUPPORT SYSTEM AND RUNNING BOARD FOR A VEHICLE
John O. Holloway, Portland, and Gary M. Scott, Milwaukie, both of Oreg., assignors to Warn Industries, Inc., Milwaukie, Oreg.
Filed Nov. 19, 1991, Ser. No. 796,063
Int. Cl.[5] B60R *3/00*
U.S. Cl. 280—163 **7 Claims**



1. A running board assembly for a vehicle, comprising:
brackets universally mountable to a vehicle frame of said vehicle;
an elongate receiving frame, said brackets attachable to said elongate receiving frame at selected positions along the length thereof to secure said receiving frame to said vehicle frame at a selected position relative to said vehicle frame;
a pair of releasable mounts provided on said receiving frame at fixed spaced positions along its length;
a running board;
a pair of support members positioned adjacent each end of said running board and releasably mountable to said releasable mounts of said receiving frame; and
quick release fasteners fastening the supporting members of the running board to the releasable mounts of the receiving frame.

5,193,830
CARRIER FOR A BICYCLE WITH REMOVABLE EXTENSIONS
Tarrasa Wang, 2nd Fl., No. 20-1, Alley 6, Lane 670, Taya Rd., Taichung, Taiwan
Filed Dec. 2, 1991, Ser. No. 801,440
Int. Cl.[5] B62J *7/00, 1/28*
U.S. Cl. 280—202 **3 Claims**



1. A carrier for a bicycle comprising a body including two pairs of dovetails formed on a lower and front portion thereof, and two extensions each having a pair of dovetail slots formed in an upper portion thereof for engagement with said dovetails of said body so that said extensions can be coupled to said body; and said extensions can be disengaged from said body so that volume of said carrier can be decreased.

5,193,831
BICYCLE POWERED GO-CART
Christopher A. Capitoli, 315 North Oak Ave., Clifton Heights, Pa. 19018
Filed Oct. 18, 1991, Ser. No. 779,350
Int. Cl.[5] B62K *5/08, 13/00*
U.S. Cl. 280—202 **12 Claims**

1. A recreational vehicle for transporting at least two riders comprising:
a) a propulsion device adapted for use by a first one of said riders and having a frame to which (i) at least one wheel, (ii) a pedalling mechanism for driving said wheel, (iii) a seat, and (iv) a front fork are attached;
b) a cart adapted for use by a second one of said riders and

having at lest one wheel having a steering mechanism coupled thereto; and

c) means for coupling said propulsion device to said cart, said coupling means being mounted on said cart and adapted to engage said front fork, whereby said first rider provides propulsion for said vehicle and said second rider provides steering for said vehicle.

5,193,832

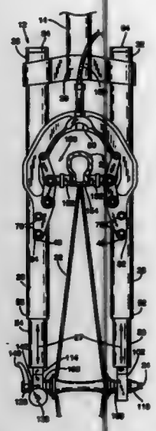
SUSPENSION FOR BICYLES

Stephen R. Wilson, 2092-8th Ave., and Douglas J. Halpin, 5070 Linn La., both of West Linn, Oreg. 97068

Filed Sep. 19, 1991, Ser. No. 762,576

Int. Cl.[5] B62K *25/08*

U.S. Cl. 280—276 **10 Claims**



1. In a bicycle, a front wheel fork, shock absorbing suspension system, said bicycle having front and rear wheels supporting a frame adapted to support a rider, the front wheel having an axle and the suspension system extending from the axle to handlebars pivotally mounted on the frame and rider controlled for turning the front wheel and thereby the direction of the bicycle, said shock absorbing suspension system comprising;

a strut on each side of the front wheel connected to the axle and extended upwardly, a tube slidably surrounding each strut, a member connecting both tubes to the handlebars, and a biasing member between the tubes and the struts whereby upon thrusting of the strut in the tube deforms the biasing member for absorbing the upward thrusting movement, said biasing member urging return downward movement of the strut in the tube, and

a rim actuating braking mechanism, and a by-pass connection connecting said braking mechanism to each of said struts while avoiding interference with the relative movement of said tubes.

5,193,833

BICYCLE FRONT SUSPENSION, STEERING & BRAKING SYSTEM

Robert Reisinger, 472-B Islay St., San Luis Obispo, Calif. 93401

Filed Aug. 24, 1990, Ser. No. 572,719

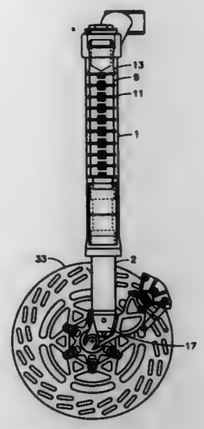
Int. Cl.[5] B62K *25/04*; B60T *11/16*; F16D *65/20*

U.S. Cl. 280—276 **13 Claims**

1. A bicycle front wheel assembly supporting a rotatable steer head of a bicycle frame with respect to a bicycle front wheel axle, said assembly comprising:

a pair of telescoping hollow tubes connected between said rotatable steer head and said front wheel axle;

a plurality of elastically compressible cells of different stiffness compressibly nested inside said hollow tubes, whereby to increase the force required to telescope said tubes together in stages corresponding to the different stiffnesses of said compressible cells; and



a plurality of solid disks between adjacent ones of said compressible cells, each of said disks having a top surface perpendicular to its rotational axis and a protrusion extending along said axis out from said top surface, whereby the protrusions of all of said disks limit ultimate compression of said compressible cells.

5,193,834

INTRAFRAME FOLDING BICYCLE

John S. Strozyk, Reinholdstrasse 11, Hannover, Fed. Rep. of Germany

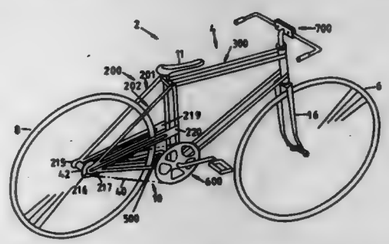
PCT No. PCT/EP89/01106, § 371 Date Mar. 19, 1991, § 102(e) Date Mar. 19, 1991, PCT Pub. No. WO90/03300, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 25, 1989, Ser. No. 663,831

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 3832687

Int. Cl.[5] B62K *15/00*

U.S. Cl. 280—278 **16 Claims**



1. A folding bicycle assembly comprising:

a front frame subassembly comprising a front fork hub which defines an upper end and a lower end, therein mounted as known in the prior art a front fork, and comprising further a pivot block, and thereto fastened a bicycle seat,

and laterally spaced and symetrically orientated to a vertical plane which longitudinally symetrically bisects the bicycle,

two upper frame members with their respective front ends fastened to the upper end of the front fork hub and their respective rearwardmost ends fastened to the pivot block, and

a right lower frame member and a left lower frame member, with their respective upper ends fastened to the lower end of the front fork hub and their lower ends fastened to a front chainwheel axle hub subassembly,

a rear frame subassembly comprising

a right triangle and a left triangle, laterally joined together at their uppermost point, and

lying axially perpendicular to the vertical plane of the bicycle and between the two said triangles at their uppermost point, a pivot bushing, serving as a pivot bearing and axle for the pivot block of the front frame subassembly,

and a rear frame connecting bolt, fastening, through an axial boring in the pivot bushing, laterally, the two said triangles together, with the pivot bushing as in between spacer,

where, the said right triangle and left triangle each comprises

a seat pillar with an upper end and lower end,

a rear fork member with a front end and rear end,

a seat strut with an upper end and lower end,

a rear wheel receiving means defining a slot for a rear wheel axle and its axis,

and an outer chainwheel axle hub element, this element being a member of the front chainwheel axle hub subassembly and

where, so forming a first corner of each triangle, to each respective outer chainwheel axle hub element the respective seat pillar lower end and the respective rear fork member front end are fastened, and

where, so forming a second corner of each triangle, to each respective rear wheel receiving means the respective rear fork member rear end and respective seat strut lower end are fastened, and

where, so forming a third corner, the uppermost corner of each triangle, each respective seat strut upper end is fastened to each respective seat pillar upper end,

and comprising further a rear wheel mounted between the two said triangles where, perpendicular to the vertical plane of the bicycle, the axis of the axle of the rear wheel lies inside of each rear frame triangle, and each slot of each respective rear wheel receiving means lies also inside of each respective rear frame triangle, so that the rear wheel can be moved forward between the two triangles,

the front chainwheel axle hub subassembly comprising coaxial mating members, where the lower frame members of the front frame subassembly, and the seat pillars and the rear fork members of the rear frame subassembly are connected, and

where the front chainwheel axle hub subassembly comprises a left outer chainwheel axle hub element that is fastened to the seat pillar and rear fork member of the left triangle of the rear frame subassembly and

a right outer chainwheel axle hub element that is fastened to the seat pillar and rear fork member of the right triangle of the rear frame subassembly,

a left inner element that is fastened to the lower end of the left lower frame member, and a right inner element that is fastened to the lower end of the right lower frame member, and

a middle element that is insertable between the right and left inner elements,

where, by means of a seat in each bore in an inner side of each outer element, and a corresponding mating annular protrusion on an outer side of each inner element, and by means of a seat in each bore on an inner side of each inner element mating with, the diameter of the middle element, each outer element, with the thereto fastened respective seat pillar and rear fork member, and each inner element, with the thereto fastened respective lower frame member of the front frame subassembly, and the middle element are coaxially assembled,

whereby a stable load carrying joint is created, that however is easy to assemble and disassemble, and where only a small axial force is needed to hold the subassembly together and,

where to fold the bicycle, the rear wheel is within the rear frame subassembly translated to a forward position, and then, the front frame subassembly and the rear frame subassembly are turned into each other about their common pivot bushing axis, whereby as the subassemblies are turned, the lower frame members of the front frame subassembly come between the two seat pillars and the two rear fork members, and the rear wheel comes between the two front frame lower frame members and then between the two front frame upper frame members, and whereby the inner elements of the lower frame members come approximately between the two rear wheel receiving means, until the rear wheel touches the lower end of the front fork hub,

where then, in this end position, the distance from the axis of the rear wheel axle to-the axis of the pivot block and to the axis through the rear wheel receiving means is each approximately that of the rear wheel radius, and to the axis through the front chainwheel axle hub approximately that of the rear wheel radius minus the front chainwheel radius.

5,193,835

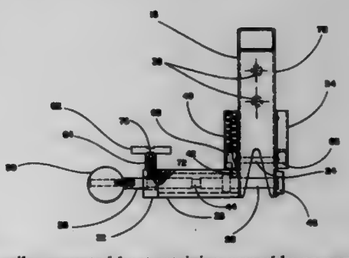
BOAT RETAINER

Orville G. Sheets, 30450 Hwy, 145, Madera, Calif. 93638

Continuation-in-part of Ser. No. 526,520, May 21, 1990, abandoned. This application Aug. 9, 1991, Ser. No. 746,791

Int. Cl.[5] B60P *3/10*

U.S. Cl. 280—414.1 **2 Claims**



1. A trailer-mounted boat retaining assembly comprising:

c. a Y-shaped support assembly having a rotatable roller mounted at the inside junction of said Y for receiving the pointed bow of a boat hull;

d. a locking assembly slidably mounted on said support assembly immediately below said roller for attachment to the eye bolt on the bow of said boat, said locking assembly comprising:

(1) a first hollow horizontal housing one end of which is slidably attached to said support assembly, the opposite end of which having a V-shaped opening therein immediately below the roller;

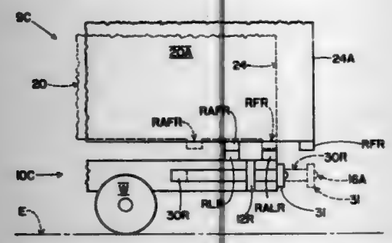
(2) a second hollow horizontal housing, one end of which is attached perpendicularly to the side of said first tube at the V-shaped end, both ends of which having openings therein;

(3) a movable rod extending into said second housing through the openings therein, said rod having a handle on the end thereof outside said housing, and a locking pin on the other end thereof which extends across said V-shaped opening of said first housing;

(4) spring means located within said second housing and attached to said rod for causing said rod to extend across said V-shaped opening;

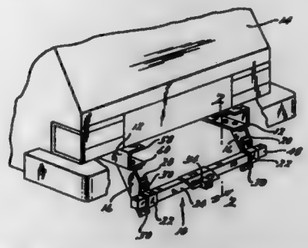
(5) a slidable trigger pin mounted within said first housing at the tip of said V-shaped opening;
(6) a pair of small housing mounted on opposite sides of said first housing adjacent to said trigger pin;
(7) a spring-loaded slidable block piece attached to one end of said trigger pin and located in the first of said pair of small housings which is adjacent to said second hollow horizontal housing, said block piece extending into said second horizontal housing and preventing said rod from passing into said V-shaped opening when said block piece is fully extended;
(8) a separate slidable piece attached to the opposite end of said trigger pin and located in the second of said pair of small housings; and
(9) a safety locking screw means attached to said second housing for holding said rod in place during transit.

5,193,836
INTERMODAL TRANSPORT
Thomas M. Hastings, 9708 Valaretta Dr., Gretna, Nebr. 68028
Continuation-in-part of Ser. No. 421,837, Oct. 16, 1989, abandoned. This application Aug. 1, 1990, Ser. No. 561,124
Int. Cl.[5] B60R *19/24, 19/38*
U.S. Cl. 280—418.1 **7 Claims**



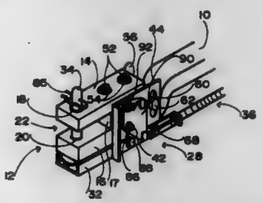
1. For providing an intermodal transport combination of a drayable chassis in removably attached condition with a cargo-carrying container, and said intermodal transport combination comprising:
(A) said drayable chassis from a front-end to a rearend extending directionally longitudinally and generally horizontally for a finite length, said chassis immediately forwardly of the rearend thereof being provided with at least two adjacent sets of longitudinally separated and directionally transversely extending rear-lock stations; and
(B) said container having a forward-end, a rearward-end, and a substantially horizontal floor that, from said forward-end to said rearward-end, extends directionally longitudinally for a constant container-length, said container adjacent its forward-end being removably attached to the chassis adjacent the chassis front-end, said container rearward-end being located at least some rearward-length from and unattached to any set of the chassis rear-lock stations, and said container at transversely aligned rearward portions thereof and spaced substantially said rearward-length forwardly of the container rearward-end being provided with intermediate fixtures that are removably attached to a longitudinally forward set of said chassis rear-lock stations, whereby the container rearward-length extends cantileverly rearwardly from the transversely aligned intermediate fixtures thereof and overlies at least one set of said transversely extending rear-lock stations.

5,193,837
UNIVERSALLY ADJUSTABLE TRAILER HITCH
Raymond W. Fink; Wayne E. Sousley, both of Elkhart, and Richard L. Fullhart, Goshen, all of Ind., assignors to Trimas Corporation, Ann Arbor, Mich.
Continuation of Ser. No. 570,336, Aug. 21, 1990, Pat. No. 5,102,156. This application Apr. 6, 1992, Ser. No. 863,818
Int. Cl.[5] B60D *1/00, 1/14*
U.S. Cl. 280—495 **20 Claims**



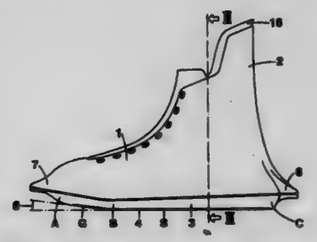
1. A trailer hitch for attachment to the underside of a vehicle at spaced apart locations of varying width comprising:
an elongated member provided with at least three outwardly disposed sides;
a trailer hitching member secured to one of the sides of the elongated member at a location generally centrally disposed between the ends of said elongated member;
a pair of brackets for attaching said elongated member to the underside of said vehicle at said spaced apart locations;
at least one of said brackets having a generally U-shaped central portion with ears projecting from opposite sides thereof and said central portion provided with three inwardly disposed surfaces complementary in configuration to said three corresponding outwardly disposed sides of said elongated member; and
means for securing said ears to the underside of the vehicle with said three inwardly disposed surfaces of the central portion of said bracket in intimate contact with the three corresponding outwardly disposed sides of said elongated member.

5,193,838
TRACTOR HITCH ASSEMBLY
Brian R. Olson, 3018 Gordon Rd., Regina, Saskatchewan, Canada S4S 2T8
Continuation of Ser. No. 365,702, Jun. 14, 1989, abandoned. This application May 8, 1991, Ser. No. 700,054
Claims priority, application United Kingdom, Jun. 20, 1988, 8814627
Int. Cl.[5] B60D *1/26*
U.S. Cl. 280—515 **9 Claims**



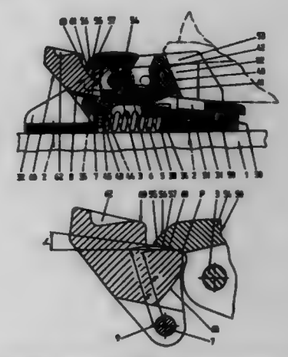
1. An attachment for coupling a towed vehicle tongue to a drawbar of a towing vehicle, the drawbar having spaced upper and lower arms with a tongue receiving space therebetween for receiving the tongue, the arms having aligned draw pin holes therein, alignable with a draw pin hole in the tongue, the attachment comprising:
a draw pin adapted to extend through the aligned draw pin holes in the upper and lower arms and the tongue to link the tongue to the arms;
pin mounting means mounting the draw pin for movement between a retracted position out of and extending below the tongue receiving space and a coupling position extending through the tongue receiving space and the draw pin holes in the upper and lower arms, the pin mounting means comprising:
a) a draw pin arm with a forward end and a rear end,
b) pivot means mounting the forward end of the draw pin arm on the drawbar below the lower arm thereof for pivotal movement about an axis transverse to the drawbar and spaced forwardly from the draw pin holes, the draw pin arm being pivotable between a retracted position sloping downwardly to the rear from the pivot means and a coupling position extending along the lower arm; and
c) means coupling a bottom end of the draw pin to the draw pin arm at the rear end thereof;
manual actuator means with engaged and release conditions;
actuator mounting means for mounting the manual actuator means in a cab of the towing vehicle;
power transmitting means coupling the manual actuator means and the pin mounting means for:
a) transmitting a coupling force from the manual actuator means to the draw pin arm, the coupling force acting on the draw pin arm to urge the draw pin arm from the retracted position to the coupling position and thereby moving the draw pin from the released position to the engaged position in response to movement of the manual actuator means from the engaged condition to the released condition; and
b) transmitting a releasing force from the manual actuator means to the draw pin arm, the releasing force acting on the draw pin arm to urge the draw pin arm from the coupling position to the retracted position and thereby moving the draw pin from the engaged position to the released position in response to the movement of the manual actuator means from the engaged condition to the released condition.

5,193,839
WINTER SPORT EQUIPMENT
Jacob Hannes, Köschenrütistrasse 77, CH-8052 Zurich, Switzerland
Continuation of Ser. No. 453,670, Dec. 20, 1989, abandoned. This application Aug. 26, 1991, Ser. No. 751,643
Claims priority, application Switzerland, Dec. 27, 1988, 4807/88
Int. Cl.[5] A63C *5/00*
U.S. Cl. 280—600 **16 Claims**



1. Winter sport equipment to be worn on the feet of a user which permits gliding or skating steps of varying degrees of complexity, said equipment comprising:
a pair of sole plates, each sole plate having two gliding edges along sides thereof, said gliding edges including hard-wearing material for maintaining said edges, each sole plate having a width which increases from a toe end to substantially a part for the ball of a foot and which width remains substantially the same from said ball part to a heel end, each sole plate having an underside which includes a walking surface which slopes upwardly from a generally flat standing surface substantially from the part for the ball of the foot to the toe end;
wherein each sole plate is constructed as a unitary plate, having virtually straight side edges along the flat standing surface, said side edges for providing control of said equipment during use, and wherein the entire portion of the sole plate behind the part of the region for the ball of the foot is generally flat; and
wherein means are included for removably connecting each sole plate with an upper portion of a boot, said sole plate and boot upper portion forming an integral structure for gliding and skating.

5,193,840
SKI BINDING FOR A CROSS COUNTRY SKI OR TOURING SKI
Engelbert Spitaler, Wr. Neudorf; Heinz Wittmann, Vienna, and Roland Erdei, Weigelsdorf, all of Austria, assignors to HTM Sport- und Freizeitgeraete Gesellschaft m.b.H., Schwechat, Austria
PCT No. PCT/EP91/00471, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO91/15274, PCT Pub. Date Oct. 17, 1991
PCT Filed Mar. 13, 1991, Ser. No. 777,280
Claims priority, application Austria, Mar. 30, 1990, 746/90
Int. Cl.[5] A63C *9/18*
U.S. Cl. 280—615 **4 Claims**



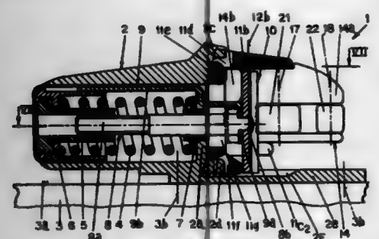
1. A ski binding for a cross country or touring ski comprising a bearing block adapted to be secured to a ski, said bearing block having a horizontally transversely extending first axle thereon, a holding cup and a two-arm swivel part pivotally supported for movement about said horizontally transversely extending first axle in unison as well as with respect to one another for the purpose of transitioning between a closed and an open position of the ski binding, a first lever arm of said swivel part carrying at least one locking pin, said holding cup having means defining an opening for receiving therein said at least one locking pin in the closed position of the ski binding, said locking pin being fixed by a yieldable lock, said holding cup being further adapted to grip over a front sole extension of a ski boot while said locking pin also extends through an opening in an extension of the front sole of the ski boot, whereas in the open position of the ski binding, said locking pin is removed from inside of said opening on said holding cup, an elastic element for resisting said pivoting of said holding cup and said swivel part about said transversely extending first axle, a second lever arm of said swivel part having a second axle thereon, said yieldable lock including a lock part pivotally mounted on said second axle for engaging said holding cup in the closed position of the ski binding and a spring for urging

said holding cup and said swivel part apart, wherein said holding cup has a transversely extending crossbar connecting its sidewalls in a front area thereof, wherein said crossbar has at a front facing end thereof a locking nose which has a first arcuate surface extending around said transversely extending first axle and a second arcuate surface contiguous with said first surface and extending generally in a direction of said transversely extending first axle and operating as a holding surface, wherein said lock part has an arcuate surface region arranged around said second axle, and wherein, when said ski binding is in the closed position, planes tangential to said arcuate holding surface and to said arcuate surface region define with one another an arcuate, forwardly open angle (α) in a range of 1° to 15°.

5,193,841
BEARING PART SUPPORT FOR TOGGLE LEVERS OF A FRONT JAW

Karl Strittal, Vienna; Andreas Jasisch, Oeyenhausen, and Hubert Wuerthner, Hainburg/Donau, all of Austria, assignors to HTM Sport- und Freizeitgeraete Gesellschaft m.b.H., Schwechat, Austria

Filed Jul. 23, 1990, Ser. No. 556,845
Claims priority, application Australia, Jul. 21, 1989, 1762/89; Dec. 11, 1989, 2790/89
The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.
Int. Cl.[5] A63C *9/08*
U.S. Cl. 280—625 **21 Claims**

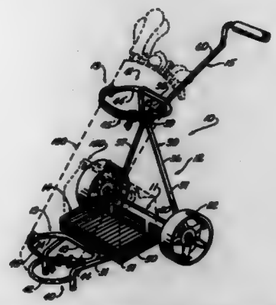


1. In a front jaw comprising a housing adapted to be fastened to a ski, a release spring housed in the housing, an elongated pull rod extending through the housing, the release spring being oriented to urge the pull rod along an axis thereof, the pull rod being operatively connected through a slide member guided in the housing to a shorter arm of a pair of two arm toggle levers, each pivotal about vertically upright axles, and a longer lever arm of each toggle lever engaging a front end of a sole or a ski boot, the improvement wherein a bearing part is provided for the toggle levers, wherein the housing has at least two bearing surfaces for the bearing part, the bearing surfaces being spaced vertically from one another and on opposite lateral sides of the pull rod, and wherein the vertically upright axles are supported on the bearing part, the bearing part having means defining a through opening therethrough through which the pull rod extends, wherein means are provided between the bearing part and the housing for allowing the bearing part to move freely vertically between defined limits on the housing in order to accommodate ski boots with varying sole thicknesses, wherein an upper one of the bearing surfaces is defined by a horizontal projection arranged symmetrically with respect to a central vertical longitudinal plane of the front jaw, wherein at least two of the bearings surfaces on the housing are both inclined at acute angles with respect to an upper side of the ski, a lower one of the angles being smaller than an upper one of the angles, wherein the projection is received in a recess in the bearing part, and wherein the projection defines an upper one of the limits for a path of movement of the bearing part in the vertical direction and, during a backward fall of a skier, a support for an upper boundary surface on the bearing part.

5,193,842
COMBINED GOLF BAG AND COOLER CART

Joel K. Fontenot, 3129 San Fernando NW., Albuquerque, N. Mex. 87104

Filed Mar. 18, 1992, Ser. No. 853,220
Int. Cl.[5] B62B *1/12*
U.S. Cl. 280—645 **4 Claims**



1. A collapsible cart apparatus for carrying both a golf bag and a cooler; wherein, the cart apparatus comprises:
a wheel assembly unit including an elongated main axle member
a pivoted frameword unit including: a lower framework member operatively connected to said main axle member; and, an upper framework member pivotally attached to the lower framework member;
a golf bag support unit including: a horizontally disposed shelf element provided on the lower framework member; and, at least one capture element mounted to said framework unit, and having arms that are dimensioned to partially surround the golf bag; and,
a cooler support unit including: a tray member attached to the lower framework member at a point intermediate said shelf element and the operative connection between the lower framework member and the main axle member; wherein, said tray member has raised walls including a rear wall and the rear wall of the tray member is provided with at least one slot for receiving a portion of the upper framework member when the upper framework member is pivoted downwardly relative to the lower framework member.

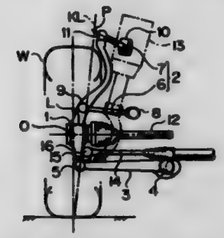
5,193,843
SUSPENSION SYSTEM OF A VEHICLE

Tadanobu Yamamoto, Higashi-Hiroshima, and Hiroyoshi Kumada, Hiroshima, both of Japan, assignors to Mazda Motor Corp., Hiroshima, Japan

Filed Mar. 25, 1991, Ser. No. 674,266
Claims priority, application Japan, Mar. 30, 1990, 2-91381
Int. Cl.[5] B60G *3/20*
U.S. Cl. 280—675 **17 Claims**

1. A suspension system for a vehicle comprising:
a steering knuckle for supporting a wheel which is used for steering and also for driving;
an upper arm for connecting an upper portion of the steering knuckle to a frame of the vehicle;
a lower arm for connecting a lower portion of the steering knuckle to a frame of the vehicle;
at least one of said arms comprising two link members, each of said link members being pivotally connected to the frame of the vehicle at one end thereof and to the steering knuckle at an opposite end thereof;
said link members being so disposed as to set a transverse

distance between a kingpin axis and a center of the wheel at a positive value wherein the kingpin axis is located inside of the center of the wheel in relation to a transverse direction of the vehicle, and reduce the distance as the

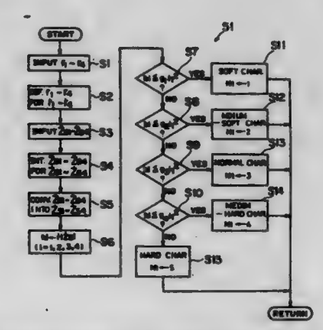


wheel is turned toward an inward direction wherein the wheel is located radially inwardly in relation to a turning circle as well as an outward direction wherein the wheel is located radially outwardly in relation to the turning circle.

5,193,844
SUSPENSION SYSTEM FOR A VEHICLE

Tetsuro Butsuen; Tohru Yoshioka; Hiroshi Uchida, and Yasunori Yamamoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed May 9, 1991, Ser. No. 697,883
Claims priority, application Japan, May 9, 1990, 2-120348; May 17, 1990, 2-128260
Int. Cl.[5] B60G *11/26*; F16F *9/46*
U.S. Cl. 280—707 **16 Claims**



1. A suspension system of a vehicle comprising:
a shock absorber, for changing damping force characteristic into three or more characteristics, provided between a sprung member and an unsprung member;
running state detecting means for detecting running state of a vehicle;
damping force characteristic limiting means for limiting more than three characteristics of said shock absorber to a lesser number which is greater than or equal to two characteristics, and changing the limited characteristics according to the running state of the vehicle; and
damping force characteristic changing means for changing the damping force characteristic of said shock absorber on the basis of a given control rule within the damping force characteristics limited by said damping force characteristic limiting means. i

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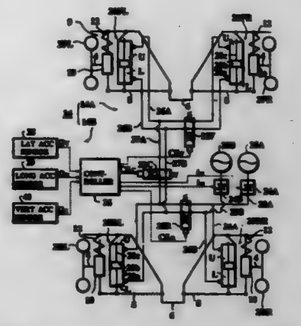
5,193,845
VEHICLE VIBRATION DAMPING FORCE CONTROL SYSTEM

Masatsugu Yokote; Fukashi Sugasawa, both of Yokohama, and Tomohiro Yamamura, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 24, 1991, Ser. No. 735,336
Claims priority, application Japan, Jul. 31, 1990, 2-202834
Int. Cl.[5] B60G *17/015*
U.S. Cl. 280—707 **8 Claims**



1. A vehicle vibration damping force control system, comprising:
(a) a plurality of double-acting cylinders each formed with two chambers and provided between a vehicle body and a vehicle wheel, respectively;
(b) a pipe arrangement for mutually connecting the two chambers of said plurality of double-acting cylinders, respectively, to feed operating fluid to said cylinders;
(c) at least one damping force generating mechanism communicating with said pipe arrangement, for generating a damping force when the operating fluid is passed therethrough;
(d) at least one switch valve disposed midway of said pipe arrangement, for switching operating fluid flow passage through said pipe arrangement;
(e) behavior detecting means for detecting vehicle behavior and generating a behavior signal corresponding to the detected behavior;
(f) behavior discriminating means for discriminating whether the detected behavior exceeds a predetermined level on the basis of the detected behavior signal; and
(g) switch valve control means for controlling said switch valve so that the operating fluid energized by said plurality of double-acting cylinders due to the detected vehicle behavior may pass through said damping force generating mechanism, when said behavior discriminating means discriminates that the detected vehicle behavior exceeds the predetermined level.

5,193,846
AIR BAG CLAMPING DEVICE

John E. Allard, North Ogden, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed Sep. 30, 1991, Ser. No. 769,032
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—728 **8 Claims**

1. A clamping device for holding an air bag onto an air bag inflator that is substantially circular in traverse cross section, comprising:
an annular retainer having an inner boundary, a body, an outer boundary with a plurality of first holes passing through the body of the annular retainer, and a first wall integral to said inner boundary edge of said annular re-

tainer, said first wall being substantially perpendicular to said body of said annular retainer;

a module housing having a mounting edge, a body, and an inflator-side edge with a plurality of second holes passing though the body of said module housing, and a second wall having a top and a bottom edge wherein said bottom edge is attached to said inflator-side edge of said module housing, said second wall being substantially perpendicular to said module housing and conforming to said first wall of said annular retainer such that a gap is formed;

an air bag having a substantially circular opening in a central region thereof and fastener holes radially outwardly of said opening wherein the diameter of the opening of the air bag is less than the outer diameter of the air bag inflator on which the air bag is to be held, an inner edge portion of

the bag surrounding said opening extending radially inwardly from said annular retainer when assembled thereto, and wherein the inwardly extending inner edge portion of said air bag surrounding said opening is placed between said first wall of said annular retainer and said second wall of said housing module, wherein said gap formed by said. first wall of said annular retainer and said second wall of said module housing is less than the thickness of the fabric of which said air bag is made such that an inner edge portion of said air bag is compressed between said first wall of said annular retainer and said second wall of said module housing; and a fastener means passed through said first, fastener and second holes to join said annular retainer, said air bag, and said module housing.

5,193,847

AIR BAG

Yoshikazu Nakayama, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Sep. 26, 1991, Ser. No. 765,813

Claims priority, application Japan, Oct. 22, 1990, 2-283730

Int. Cl.[5] B60R *21/30*

U.S. Cl. 280—738 **19 Claims**

1. An air bag for an air bag system to be mounted on a vehicle for protecting a passenger and having an inflator, comprising:

an air-impermeable cloth disposed at least at a side facing the passenger when inflated,

an air-permeable cloth disposed at least at a side of the vehicle when inflated, said air-permeable cloth being connected to the air-impermeable cloth to constitute the air bag with an inside portion, and

a free member made of a material to at least restrict air passing therethrough, said free member being connected to the air bag and located adjacent the air-permeable cloth at the inside portion of the air bag so that when the inflator is actuated upon detection of a predetermined acceleration, the air bag is inflated by gas ejected from the inflator and air inhaled through the air permeable cloth while the free member is moved away from the air-permeable cloth, and when the passenger hits the inflated air bag, the free member inside the air bag is disposed on the air-permeable cloth to partly prevent air and gas inside the air bag from escaping from the air bag to thereby control passage of air into and from the air bag.

5,193,848

ADJUSTABLE MOTOR VEHICLE SAFETY STEERING COLUMN

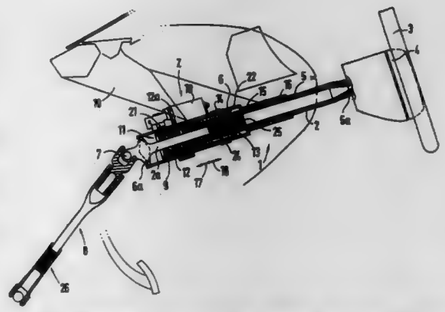
Hans-Joachim Faulstroh, Wimsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Sep. 24, 1991, Ser. No. 764,907

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1990, 4030405

Int. Cl.[5] B62D *1/19*

U.S. Cl. 280—775 **20 Claims**



1. An adjustable safety steering column for a motor vehicle, comprising a telescopable steering spindle disposed in outer casing tube parts and supported by a deformation element, wherein a first outer casing tue part comprising one of the outer casing tube parts is guided between a steering spindle and a second outer casing tube part comprising another of the outer casing tubing parts and, on a free end of the first outer casing tube part facing away from the steering wheel, the first outer casing tube part is connected with the deformation element which is supported at an end face of an inner casing tube surrounding the deformation element, said third casing tube having a toothed rack into which a pinion of an adjusting device is arranged to engage for axial displacement of the steering column.

5,193,849

KNEELING OMNIBUS

Stefan Holzmann, Grossnöbach, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,585

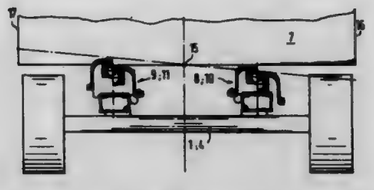
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013673

Int. Cl.[5] B60G *11/27*; G60P *1/16*

U.S. Cl. 280—840 **9 Claims**

1. An omnibus having an omnibus body that is supported on axles or wheel suspensions via respective pneumatic springs disposed at opposite ends of said axles, comprising:

a level control system having a compressed air system that is self-contained for each of said axles and operating such that said omnibus body is pivotable about a longitudinal median floor level axis, whereby means on a passenger boarding side of said omnibus body permit lowering of said omnibus body to a boarding level that is lower than a normal level and again raising of said omnibus body back to said normal level, while simultaneously means on an opposite side of said omnibus body permit raising and lowering of said omnibus body from and again back to said normal level, including means for effecting transfer of compressed air between said pneumatic springs disposed at opposite ends of respective ones of said axles such that compressed air is transferred from said pneumatic springs on said boarding side to said pneumatic springs on said opposite side for effecting said lowering of said boarding side and simultaneously said raising of said opposite side, and, subsequently, compressed air is transferred from said pneumatic springs on said opposite side to said pneumatic



springs on said boarding side for returning said omnibus body to said normal level;

further including a compressed air receiver and respective compressed air supply ducts leading from said compressed air receiver to respective ones of said pneumatic springs;

said lowering and raising means being respective electrically controlled level regulating valves, a respective one of which is disposed in each of said compressed air supply ducts; and

said means for effecting transfer of compressed air including: respective transfer lines extending between said pneumatic springs of a respective one of said axles, a respective shut off valve disposed in each of said transfer lines, and a respective electric motor-driven reversible pump disposed in each of said transfer lines.

5,193,850

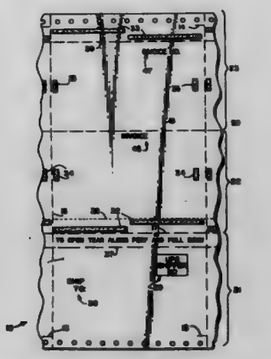
PRESSURE SEAL Z-FOLD WITH TRANSFER TAPE

Leo Lombardo, Manchester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jun. 19, 1992, Ser. No. 901,188

Int. Cl.[5] B42D *1/00*

U.S. Cl. 281—2 **20 Claims**



1. A business form intermediate for constructing suitable for use as a packing list or invoice, comprising:

a sheet of paper having a first face and a second face, first and second edges opposite and substantially parallel to each other, and third and fourth edges opposite to each other and substantially perpendicular to said first and second edges;

means defining first and second fold lines in said sheet extending parallel to said first and second edges, and dividing said sheet into first, second, and third panels roughly equal in size, said second panel being intermediate said first and third panels;

two or more strips of transfer tape disposed on said second face of said third panel, said strips extending substantially perpendicular to said third and fourth edges, and being spaced from each other in the dimension extending from said first to said second edges;

address indicia printed on said first panel first face;

first adhesive means disposed on said first face of said second and third panels for holding said second and third panel first faces in face-to-face contact in the business from constructed by said intermediate; and

second adhesive means disposed on said second face of said first and second panels for holding said first and second panel second faces in face-to-face contact in the business form constructed by said intermediate.

5,193,851

JOINING PRINTED PARTIAL PRODUCTS TOGETHER

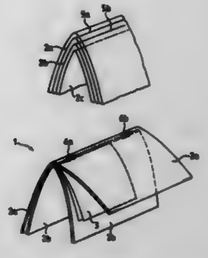
Werner Honegger, Taun Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 537,919, Jun. 13, 1990, Pat. No. 5,137,409. This application Mar. 18, 1992, Ser. No. 853,248

Claims priority, application Switzerland, Jul. 21, 1989, 02732/89

Int. Cl.[5] B42D *1/06*

U.S. Cl. 281—15.1 **2 Claims**



1. A printed product comprising

a plurality of partial printed products, each said partial printed product including

a plurality of folded pages each having a fold and each but one having a first adhesive along an outer surface of said fold, said folded pages being assembled one within the next and adhered together at the folds to form the partial printed product with said one page being outermost on said partial printed product

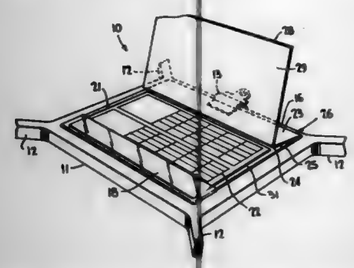
one of said partial printed products being identified as an outer partial printed product, and

each said partial printed product except said outer partial printed product further having a second adhesive along an outer surface of an outermost page of said partial printed product,

said partial printed products being assembled one within the next with said outer partial printed product on the outside of the others to form the final printed product.

VOL 1148 ISS 3 MR 16 1993 UMI

5,193,852
CARD OR SHEET FOLDED COVER
Stanley R. Bachmeyer, Traverse City, Mich., assignor to Score Caddy, Inc., Traverse City, Mich.
Filed Jul. 27, 1992, Ser. No. 918,707
Int. Cl.[5] B42D *1/00*
U.S. Cl. 281—15.1 5 Claims

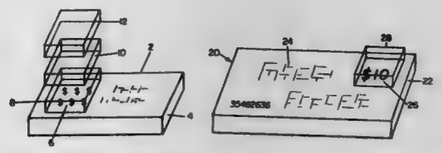


1. A cover for protecting and holding a card or sheet having upper and lower opposed side edges, comprising, a rectangular layer of material having opposed upper and lower side edges, said layer having a first foldline bisecting said layer to form front and back rectangular panels of equal size, said foldline lying parallel to said side edges of said layer to permit said layer to be folded so that said front panel overlies said back panel with said opposed side edges of said layer being coincident, only said back panel having a card or sheet holding means for holding a cover or sheet only on a first section of said back panel, said layer having a second foldline lying parallel to and spaced from said fist foldline and defining a front panel section between said foldlines, said front panel between said second foldline and said upper edge of said layer defining a front panel flap hinged to said front panel section, said second foldline being spaced a predetermined distance from said upper side edge which is greater than a spacing from said first foldlines, said front panel section overlying a second section of said back panel located adjacent said first section of said back panel, said front panel section and said second section of said back panel together defining an overlying portion of said layer to be grasped for attaching the cover to a support.

5,193,853
NONREPLICABLE DOCUMENT AND METHOD FOR MAKING SAME
Ralph C. Wicker, 24-26 Main St., West, Rochester, N.Y. 14614
Continuation of Ser. No. 679,117, Apr. 2, 1991, abandoned, which is a division of Ser. No. 293,020, Jan. 18, 1989, Pat. No. 5,018,767. This application Apr. 3, 1992, Ser. No. 864,202
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—85 9 Claims

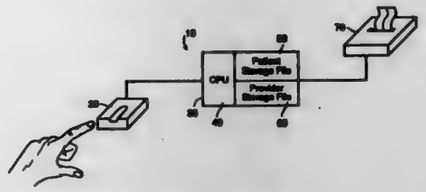
1. A press-printed document which is counterfeit-resistant with regard to a known electro-optical copy means which copy means has a predetermined scanning pitch, said document comprising; at least one image which is characterized by myriad visible and distinct press-printed lineations, said press-printed lineations comprising patterns of curvilinear lines, dots, or swirls, the lineations having a moire-producing pitch that is dissonant from said predetermined scanning pitch, whereby if said document is copied on said known copy means, the copy of he document so produced reveals image omissions and moire skewing which result from a misregistry between said predetermined-scanning pitch and the pitch of the press-printed lineations.

5,193,854
TAMPER-RESISTANT ARTICLE AND METHOD OF AUTHENTICATING THE SAME
Joseph C. Borowski, Jr., Hatfield, Pa.; Robert O. Fulton, Ontario, Canada, and Jacques Lavoie, Lansdale, Pa., assignors to BABN Technologies Inc., Quebec, Canada
Filed Feb. 28, 1992, Ser. No. 843,550
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—87 11 Claims



1. A printed document which is in the form of a lottery ticket comprising:
(a) a substrate;
(b) game data imaged on a portion of the substrate which when exposed determines if a prize has been won;
(c) a layer of a thermochromic material, capable of undergoing a reversible color change upon exposure to heat, placed over at least the game data portion of the substrate with said game data being visible therethrough; and
(d) a scratch-off layer placed upon the portion of the thermochromic layer which covers the game data and adapted to be removed by the user to reveal the game data.

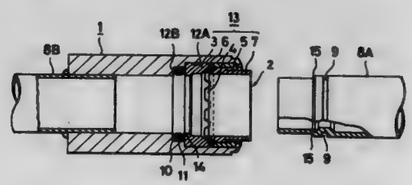
5,193,855
PATIENT AND HEALTHCARE PROVIDER IDENTIFICATION SYSTEM
Morris H. Shamos, 3515 Henry Hudson Pky., Bronx, N.Y. 10463
Continuation-in-part of Ser. No. 485,828, Feb. 27, 1990, Pat. No. 5,071,168, which is a continuation of Ser. No. 302,023, Jan. 25, 1989, abandoned. This application May 30, 1990, Ser. No. 530,222
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—117 14 Claims



1. An identification system, comprising:
first means for obtaining live print indicia from a patient and a second individual;
controller means for storing said live print indicia from said patient and said second individual;

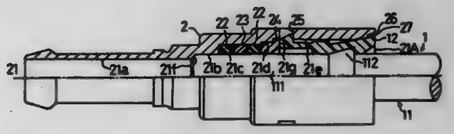
second means for obtaining live print indicia directly from a first person to receive treatment and a second person;
means for comparing said stored print indicia with said live print indicia taken by said second means; and
means responsive to said comparing means for producing a device comprising a dimensionally stable base member having affixed thereto identification information corresponding to the stored print indicia of said patient or said second individual identifying said patient or said second individual or both, said means for producing being operative to produce said device following a determination by said comparison means that (1) identity between said patient and the first person and between said second individual and the second person has been confirmed and (2) that a relationship exists between the first person and the second person.

5,193,856
PIPE CONNECTOR
Shigeru Suzuki, 745-3, Matsunaga, Numazu-ken, Shizuoka-ken 410, Japan
Filed May 22, 1991, Ser. No. 704,417
Claims priority, application Japan, May 24, 1990, 2-54261[U]; Sep. 6, 1990, 2-93742
Int. Cl.[5] F16L *37/00*
U.S. Cl. 285—308 4 Claims



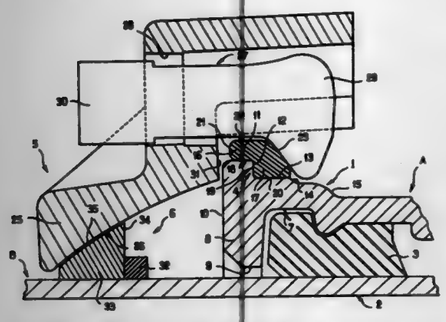
1. A pipe connector attached to a first pipe for connecting a second pipe having a peripheral step portion and a peripheral stopper groove on the exterior of a reduced diameter end thereof comprising:
a cylindrical pipe connector body fastened to said first pipe, said cylindrical pipe connector body including at one side thereof a mouth opening into a first portion of diametrically larger inner cross section for accommodating an annular pipe receiver body and a second portion of diametrically smaller inner cross section extending inwardly from said first portion for accommodating an O-ring through which said second pipe is inserted to maintain an airtight seal, at a predetermined depth from said mouth:
said annular pipe receiver body within said connector body first portion and provided at a leading end thereof with a diametrically smaller protrusion which will abut a step portion formed on the outer surface of said second pipe preventing said second pipe from being inserted beyond a predetermined distance in the connector body;
an annular plate spring within said pipe receiver body having resilient pawls around the inner periphery thereof, said pawls for fitting into the stopper groove of said second pipe
a cylindrical push member slidable within said pipe receiver body for securing the outer periphery of said annular plate spring, said push member having a front end to abut on said resilient pawls of the annular plate spring and a rear end extending out of the mouth of said pipe connector body;
an internal stop ring at the other end of second pipe receiver body for limiting within a predetermined length the sliding motion of said push member; a spring receiver in said pipe receiver body adjacent said annular plate spring with an inner edge that is beveled for easy buckling of the annular plate spring when pushed by the second pipe inserted into the connector; and a circular groove formed between said spring receiver and said stop ring for holding therein the outer periphery of said annular plate spring, the width of said circular groove being slightly larger than the thickness of said annular plate spring;
said pawls of the annular plate spring fitting into the second pipe stopper groove on said second pipe being inserted in said pipe receiver to thereby keep said first pipe connected in the connector body, said push member when moved toward said pawls bending them to permit removal of the pawls from the stopper groove and separation of the two pipes.

5,193,857
CONNECTOR
Hirokazu Kitamura, Kasugai, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan
Filed Nov. 27, 1990, Ser. No. 618,624
Claims priority, application Japan, Mar. 30, 1990, 2-86784
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—319 11 Claims



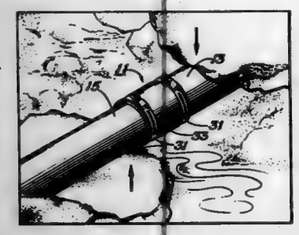
1. A connector comprising:
a first member, including a conduit and an elastic tubular body, and a second member;
said conduit including a pipe-shaped nipple formed at a front part of said conduit and a ring-shaped projection projecting radially outward at a rear end of said nipple;
said tubular body including a ring-shaped base having an axial hole therethrough for receiving said nipple, first stoppers elastically deformable in a radial direction projecting from a rear end of said ring-shaped base, said first stoppers including first engagers projecting radially inward of said stoppers and contacting a rear end surface of said ring-shaped projection for preventing relative movement between said conduit and said tubular body in a rearward axial direction, second stoppers including second engagers projecting radially outward from said second stoppers;
said second member having an axial hole for receiving said conduit and said tubular body, an engaging inner peripheral surface formed in said axial hole contacting an outer peripheral surface of a front end part of said nipple, a third engager formed in said axial hole and engaging with a surface of said second engager facing in the rear direction for preventing said tubular body from moving in a rearward axial direction relative to said second member;
said first engager of said first stoppers of said tubular body has a larger thickness in a radial direction than a radial direction between an inner peripheral surface of a rear end part of said second member and an outer peripheral surface of a rear end part of said conduit so that when said first member is pressed into said axial hold of said second member, said inner peripheral surface of said second member and said outer peripheral surface of said conduit compress said tubular body in a radial direction so that said first member and said second member are locked against movement in the radial direction.

5,193,858
MOUNTED FLANGE FOR PIPEWORK JOINTS
Alain Percebois, Blenod Les Pont-A-Mousson, France, assignor to Pont-A-Mousson S. A., Nancy, France
Filed Aug. 5, 1991, Ser. No. 740,233
Claims priority, application France, Aug. 6, 1990, 90 10033
Int. Cl.[5] F16L *17/06*
U.S. Cl. 285—368 8 Claims



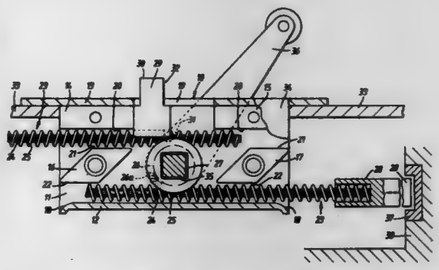
1. A flange ring (4; 4A; 4B, 4C) for joints coaxially connecting elongate pipework components (A, B), and designed to be mounted on an exterior end contour (1) of one (A) of said components, and to act as a support for a joint-locking device (5), wherein said flange ring defines, over at least one portion of its circumference, a radial L-shaped cross-section, a concavity (18, 19) of the cross-section defined by arms of the L-shape being oriented radially inwardly and mating with a complementary surface (11, 12) of the exterior end contour and wherein said flange ring has, on a convex outer side thereof, a support surface (23) inclined relative to the flange axis.

5,193,859
REINFORCED PIPE COUPLING MEMBER
Robert M. McKinnon, P.O. Box 648, Bedford, Tex. 76021-0648
Continuation-in-part of Ser. No. 413,827, Sep. 28, 1989, abandoned. This application May 6, 1991, Ser. No. 696,187
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—417 20 Claims



1. A coupling member for coupling together the ends of two pipes, comprising:
a) a hollow cylindrically shaped wall means having an outer surface, first and second ends, and
b) said wall means having an inner surface for contacting the outside surfaces of said pipes;
c) said wall means being made of an elastomeric material so as to be flexible;
d) a hollow cylindrically shaped band member with a passage extending therethrough between two ends, said band member having inner and outer surfaces and being embedded in said wall means between said first and second ends such that said wall means completely covers said inner and outer surfaces of said band member, said band member being concentric with said wall means;
e) said band member being made of a material selected from the group consisting of fiber glass and polycarbonate plastic blended with glass roving fibers;
f) said wall means having a first end portion located between one of said ends of said band member and said first end of said wall means and a second end portion located between the other of said ends of said band member and said second end of said wall means,
g) said outer surfaces of said first and second end portions of said wall means being adapted to receive first and second retaining means for retaining said coupling means to said pipe end portions.

5,193,860
CLOSURE LOCKING MECHANISMS
Terry J. Dolman, Walmley, England, assignor to Feneseal Limited, Tipton, England
Filed Jan. 31, 1992, Ser. No. 828,566
Claims priority, application United Kingdom, Feb. 1, 1991, 9102218; Mar. 8, 1991, 9104945
Int. Cl.[5] E05C *9/04*
U.S. Cl. 292—39 8 Claims

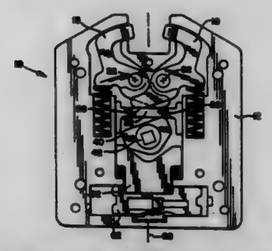


1. A window locking mechanism for a closure in which a panel member is movable into and out of a closed disposition relative to a frame member comprising a body for mounting on one member of the closure, a gear wheel mounted on the body for rotation by a handle, and an actuating member projecting from the body for connection to a bolt, the actuating member being elongated and including a helical thread extending around the member, the helical thread so meshing with the gear wheel that rotation of the gear wheel in one sense extends the actuating member out of the body and rotation of the gear wheel in a sense opposite to said one sense retracts the actuating member into the body so, in use, moving the bolt between locked and unlocked positions.

5,193,861
LATCH
Douglas Juga, and Gilbert Krahn, both of Kenosha, Wis., assignors to A. L. Hansen Mfg. Co., Waukegan, Ill.
Filed Jul. 24, 1992, Ser. No. 920,621
Int. Cl.[5] E05C *3/10*
U.S. Cl. 292—49 19 Claims

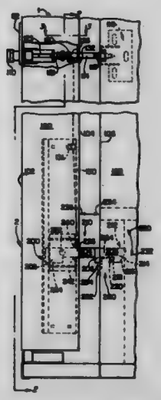
1. In a latch of the type comprising a housing; first and second latch arms, each mounted to pivot with respect to the housing; said latch arms each defining a latching end and pivotable between a latching position, in which the latching ends are positioned closer to one another to engage a striker, and a release position, in which the latching ends are positioned farther from one another to release the striker; the improvement comprising:
a manually rotatable cam;
a latch arm follower guided for movement in the housing and movable by the cam;

a pair of bearing surfaces, each defined by a respective one of the latch arms, said bearing surfaces positioned to engage the latch arm follower and configured such that



movement of the latch arm follower toward the latching ends moves the bearing surfaces in a direction tending to move the latch arms to the release position.

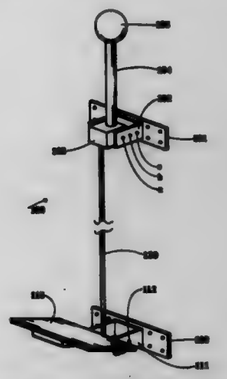
5,193,862
ANTI-THEFT LATCH MECHANISM ESPECIALLY SUITABLE FOR VENDING MACHINES
Kenneth W. Oden, Charles Town, W. Va., assignor to Royal Vendors, Inc., Kearneysville, W. Va.
Filed Feb. 6, 1992, Ser. No. 832,216
Int. Cl.[5] E05C *9/00*
U.S. Cl. 292—50 17 Claims



1. An anti-theft mechanism for a door of an enclosure such as a vending machine, the mechanism comprising:
a) a latch, coupled to the door and for controllable engagement with a catch portion of the enclosure, the latch including surfaces forming a cove, the cove-forming surfaces oriented and positioned for surrounding the catch portion on at least part of all four sides of the catch portion, when the door is closed; and
b) moveable means for moving the latch in first and second directions to allow the latch to surround the catch portion, or not to surround the catch portion, respectively.

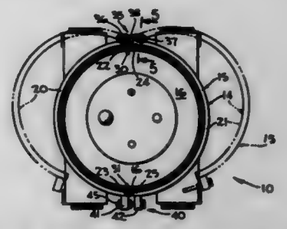
5,193,863
FOOT ACTIVATED DOOR OPENER
Theodore McBain, Tahoe City, Calif., assignor to Tahoe Bare Paw, Inc., Tahoe City, Calif.
Filed Mar. 12, 1992, Ser. No. 849,872
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—255 4 Claims

1. A foot activated door opener adapted for opening a door that is releasably locked by a locking mechanism that can be disengaged by the outward action of a horizontal latch comprising:
a pedal member positioned substantially directly below said latch, wherein said pedal is affixed to said door for reversible vertical movement;
fulcrum means positioned slightly below said latch and attached to said door for guiding a lever that is attached



thereto to move outward away from said door to engage said latch when said pedal member is pressed;
a vertical lever suitably attached to said fulcrum so that said lever is positioned between said latch and said door; and
means for connecting said pedal member to said fulcrum so that pressing said pedal member downward causes said lever to engage said latch.

5,193,864
SPLIT LOCK RING FOR BULK MATERIAL CONTAINER
Clarence B. Coleman, 2401 Merced St., San Leandro, Calif. 94577
Filed May 28, 1991, Ser. No. 705,953
Int. Cl.[5] B65D *7/02*
U.S. Cl. 292—256.67 11 Claims



1. A split lock ring for releasably securing a top plate, cover or stacking ring to the upper section of a bulk material container, said split lock ring comprising:
(a) a split lock ring body comprising a plurality of arcuate segments, each of said arcuate segments having opposite ends, confronting opposite ends of successive arcuate segments of said arcuate segments providing a plurality of pairs of confronting ends;
(b) a chain hinge fixedly secured to confronting ends of one pair of said pairs of confronting ends for providing a hinge for said split lock ring body at said one pair of confronting ends, said chain hinge comprising at least three successive links, each of said links having an endless configuration, said links having outer links respectively secured to said confronting ends of said one pair of confronting ends to provide multiple hinge action with reduced play in the

split lock ring locked state and increased play in the split lock ring unlocked state; and

(c) locking means fixedly secured to confronting ends of another pair of said pairs of confronting ends for releasably securing said split lock ring at said other pair of confronting ends.

5,193,865

SLIDING DOOR BAR LOCK

Howard M. Allenbaugh, Huntington Beach, Calif., assignor to M.A.G. Eng. & Mfg. Inc., Huntington Beach, Calif.

Filed Aug. 7, 1991, Ser. No. 741,761
Int. Cl.[5] E05C *17/34*
U.S. Cl. 292—262 9 Claims

1. A locking device for securing a sliding door with respect to a door frame, comprising:

a locking mechanism comprising a shaft rotatably mounted to the door, wherein the shaft is rotatable between a locked position and an unlocked position;

an elongated bar having one end connected to the door frame and a free end having a recess adapted to engage with and disengage from the shaft, such that rotation of the shaft to the locked position when engaged with the recess of the bar securely locks the free end of the bar to the door, while rotation of the shaft to the unlocked position enables free engagement or disengagement of the free end of the bar with respect to the shaft; and

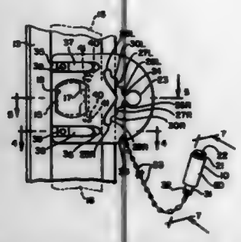
a turning handle connected to the shaft in such a way that the weight of the turning handle causes the shaft to normally be in the locked position.

5,193,866

TRANSPORTABLE POSITIVE DEAD BOLT LOCK FOR DOORS

Carl R. Driskill, Arlington, and Warren H. Kintzinger, Richardson, both of Tex., assignors to Electro II Energy Management Systems, Inc., Amarillo, Tex.

Filed Apr. 29, 1992, Ser. No. 872,989
Int. Cl.[5] E05B *17/36*
U.S. Cl. 292—292 6 Claims



1. A portable positive dead bolt lock, for use with doors having a latch receivable in a notch opening in the door frame, comprising: a planar lock plate adapted to be disposed between the door and the frame; tab flange means extended laterally from said planar lock plate adapted to be received in said notch when said planar lock plate is placed on said door frame and especially when said planar lock plate is placed between the door frame and the door; said planar lock plate having a pair of slot extensions therein in diverging relationship relative to a horizontal line passed through said planar lock plate when said tab flange means is received in said notch with one of the pair of slot extensions extending up and the other of said pair of slot extensiond extending down; each of said pair of slot extensions having at least one edge thereof presenting a plurality of seats each presenting a substantially vertical seat edge; and dead bolt means receivable in the lower of said slot extensions when said planar lock plate is in place between the door and the door frame with said dead bolt means positioned in the seat adjacent the door thereby presenting a dead bolt lock opposing opening of the door; said dead bolt means has a body; a head of less cross-sectional area of the body of said dead bolt; a groove between said head and the body of said dead bolt; said planar lock plate has an entrance opening large enough to permit passage therethrough of said head of the dead bolt; and entry slot passage means interconnecting said entrance opening and said pair of slot extensions; said entrance opening and said pair of slot extensions all narrow enough not to permit passage therethrough of said dead bolt body and said head; and wherein said planar lock plate mounts resilient spring means providing resilient spring force on said planar lock plate toward the door frame when said door is closed.

5,193,867

PORTABLE SECURITY DEVICE FOR A DOOR

Royce H. Husted, 711 Lakeside Dr., Wheaton, Ill. 60187

Filed Apr. 30, 1992, Ser. No. 876,333
Int. Cl.[5] E05C *19/18*
U.S. Cl. 292—292 9 Claims

1. A portable security device for use with a closure element and a mating frame comprising:

a strap-like retainer including a hook end for engaging a frame and an extension extending beyond the frame;

a plurality of apertures in said extension;

a generally U-shaped clamp adjustably positionable along said extension for engaging a closure element when in closed position relative to the frame, said clamp including a tang mating engageable with any of said apertures; and

spring means urging said tang into mating engagement with a selected one of said apertures when said security device is installed, said spring means including a spring-loaded plunger captivated between the legs of said U-shaped clamp, said plunger, when engaging said closure element, urging said tang toward said strap-like retainer.

5,193,868

FLOATING TAPPING PLATE ASSEMBLY

John T. O'Toole, 4803 Sherwell Dr., Waterford, Mich. 48327

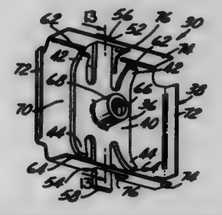
Filed Jun. 25, 1992, Ser. No. 904,092
Int. Cl.[5] E05B *15/02*
U.S. Cl. 292—341.15 3 Claims

1. An adjustable tapping plate and retention bracket assembly comprising:

a retention bracket disposed about longitudinal and transverse intersecting axes of symmetry, said retention bracket having a planar body portion defined in part by a pair of opposed transversely extending upstanding end flanges, each of said end flanges provided with a retention slot having longitudinal side edges equally spaced a predetermined dimension from said longitudinal axis, said body portion provided with an access aperture having its center located at the intersection of said axes;

a tapping plate member adapted to overlie said retention bracket body portion for controlled movement relative thereto, said tapping plate adapted for symmetrical disposition about said longitudinal and transverse intersecting axes of symmetry, said tapping plate member having a flat base portion providing first and second oppositely extending elongated tongues extending longitudinally therefrom so as to be symmetrically disposed about said longitudinal axis, said tapping plate base portion having a central internally threaded bore for receiving a threaded fastener therethrough;

said tapping plate provided with first and second pairs of elongated oppositely projecting prongs extending longitudinally from each end of said base portion, each said pair of prongs positioned in transverse spaced relationship on either side of their associated tongue, said prongs distal



ends initially preformed so as to extend upwardly from the plane of said base portion at a predetermined first acute angle;

each said tapping plate first and second tongue having a free end thereof spaced a predetermined longitudinal distance beyond the distal ends of their respective first and second pair of preformed prongs, thereby enabling said first tongue to be inserted through one end flange retention slot a sufficient distance until its associated one pair of preformed prong distal ends contact said one end flange opposed inner surface, whereby said second tongue being free to just clear the other end flange during downward movement of said tapping plate enabling flush contact of said tapping plate base portion on said retention bracket body portion, resulting in said tapping plate second tongue being free for insertion through the other end flange slot; and

whereby upon each of said pair of preformed prongs being bent downwardly toward said retention bracket planar portion to a second predetermined acute angle less than said first acute angle said tapping plate being captured on said retention bracket in a controlled slidably movable manner to vary the location of said tapping plate bore into alignment with said fastener when said fastener is inserted into said retention bracket access aperture.

5,193,869

BODY SIDE PROTECTOR FOR AN AUTOMOBILE

John F. Land, Rte. 5, Box 104, Neosho, Mo. 64850

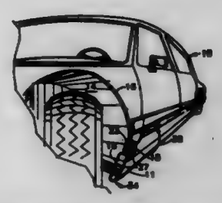
Filed Jun. 15, 1992, Ser. No. 899,089
Int. Cl.[5] B60R *19/42*
U.S. Cl. 293—128 9 Claims

1. A side protection device for a vehicle having a front and rear fender well and an under carriage and side panel means, said side protection device comprising:

a. first and second linkage means each having a first and second end;

b. first and second flexible attachment means for attachment at one end to said first end of said first and second linkage means and means at its remaining end for attachment to said front and rear fender well lips respectively;

c. first and second spring means including means for securing said spring means to each of said front and rear fender well lips respectively and first and second pivotal retainer means for securing each of said spring means to its respective first and second linkage means;



d. first and second curved linkage means secured at one end to said second end of said first and second linkage means respectively; and,

e. bar means for connecting each of said first and second curved linkage means together;

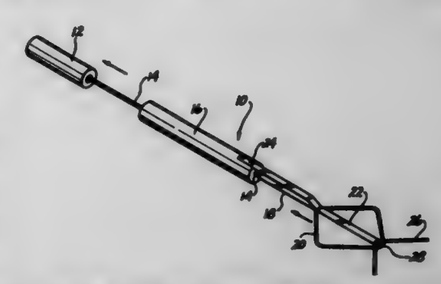
whereby said spring means will toggle said linkage means and said bar to a position under said vehicle in the "down" or stored position and will toggle said linkage means in the "up" or used position when said bar is in the protection position for said side panel means.

5,193,870

DEVICE FOR SANITARY HANDLING AND DISPOSAL OF PET DROPPINGS

Irene MacInnis, 3030 Steiner, Santa Monica, Calif. 90405; Richard M. Lienau, and Bonnie L. Lienau, both of 1236 Wellesley Ave., #1, Los Angeles, Calif. 90025

Filed Feb. 7, 1992, Ser. No. 832,705
Int. Cl.[5] A01K *29/00*; E01H *1/12*
U.S. Cl. 294—1.4 8 Claims



1. A device for wrapping pet droppings lying on a ground surface in a sheet previously placed over the droppings with sheet portions surrounding the droppings, comprising:

handle means, a loop element and a catch element supported on said handle means, said loop and catch elements each maintaining a planar configuration independently of the other, said handle means being actuable for linearly displacing said loop and catch elements relative to each other in mutually parallel closely adjacent relationship along a direction parallel to said elements, said loop element adapted to press the surrounding sheet portions against the underlying surface around the droppings, said loop and catch elements cooperating responsive to actuation of said handle means for gathering the sheet around and under said droppings along said direction and also transversely thereto, thereby wrapping the droppings in the

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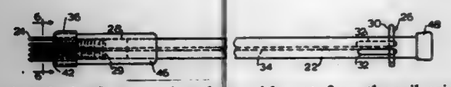
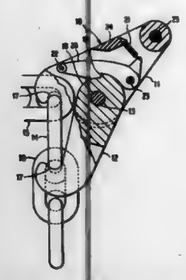
sheet and retaining the sheet to the handle means for sanitary disposal.

5,193,871
LAWN-CARE DEVICE FOR EXTRACTING WEEDS AND REMOVING DEBRIS
Donald E. Williams, 114 Palmer Pl., Washington, N.C. 27889
Filed May 4, 1992, Ser. No. 878,332
Int. Cl.[5] A01B *1/16*; A01D *9/06*
U.S. Cl. 294—61 5 Claims



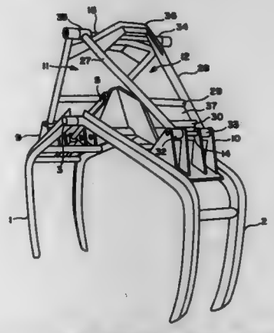
1. A device for removing plants with roots from the soil, said device having a distal end and a proximal end and comprising:
(a) a shaft having a linear axis and a central bore;
(b) a plurality of spikes attached near said distal end of said device and extending toward said distal end in parallel to said linear axis;
(c) a trigger mechanism near said proximal end of said device;
(d) a cover having holes alignable with said spikes, said cover having a distal inner surface;
(e) a spring mechanism contiguous with said inner surface; and
(f) an elongated rod extending axially in said central bore and attached at a first end to said trigger mechanism and at a second end to said cover;
wherein when said trigger mechanism is actuated, said cover is pulled toward said proximal end, said spring mechanism is compressed, and said spikes are exposed, and when said trigger mechanism is released, said spring mechanism pushes against said inner surface and said cover moves distally over said spikes.

5,193,872
LINE LAYING DEVICE FOR MOORING A PLATFORM
Tokume Fujita, Rio de Janeiro, Brazil, assignor to Petroleo Brasileiro S.A. Petrobras, Rio de Janeiro, Brazil
Filed Mar. 11, 1991, Ser. No. 666,952
Claims priority, application Brazil, Apr. 18, 1990, PI 9001801
Int. Cl.[5] B66C *1/36*
U.S. Cl. 294—82.11 3 Claims



1. A line laying device used for platform mooring systems comprising: a pair of claws, each pair of claws having twin hooks, one of said pair of claws being coupled to a first spindle of the other of said pair of claws for swiveling about said first spindle, said hooks of said one claw being joined at a part where said one claw swivels on said first spindle of said other claw and being fitted with a radial shoulder, a lock pivotally mounted at one end to the other claw by a second spindle, means biasing said lock against said shoulder of said one claw, said lock being provided with a small wheel at an end remote from the end pivotally mounted to said other claw by means of said second spindle, and said other claw being fitted with a stop to limit travel of said pivotal lock away from said shoulder, and a ring carried by said other claw for tying a wire rope thereto.

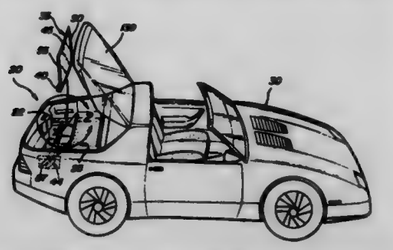
5,193,873
SUGAR CANE GRAB
Lewinski Juliusz; Sanchez C. Martin, and Serwatowski Ryszard, all of Querétaro, Mexico, assignors to Centro de Investigacion y. Asistencia Tecnica del Estado de Queretaro, A.C., Mexico
Continuation of Ser. No. 556,367, Jul. 24, 1990, abandoned. This application May 1, 1992, Ser. No. 879,446
Claims priority, application Mexico, Dec. 15, 1989, 18733
Int. Cl.[5] B66C *3/04*
U.S. Cl. 294—106 4 Claims



1. A sugar cane grab for lifting a bundle of cut cane off of a flat surface comprising a pair of tines, each of which is pivotally mounted at one end about a first common shaft and having a tip at the other end, a pair of hydraulic cylinders, each of which acts between one of said tines and a central support bar extending upwardly from and articulated about said first common shaft to pivot said tines about said first common shaft to thereby bring said tips toward and away from each other in a closing and opening movement, respectively, a linkage mechanism pivotally interconnected between said tines for causing the tips of said tines when they move toward and away from each other in said closing and opening movements to travel in a single plane parallel to and at a constant distance from said flat surface, said linkage mechanism comprising a pair of arms, each arm being pivotably mounted at one end to a tine intermediate its end and at the other end to a second common shaft, said second common shaft being spaced from and located above and in the same vertical plane as said first common shaft, and means for connecting said second common shaft of the linkage mechanism to a lifting boom for holding said second common shaft at a fixed distance above said flat surface during said movements of the tines, whereby closing and opening movement of said tines causes said first common shaft to move, respectively, toward and away from said second common shaft.

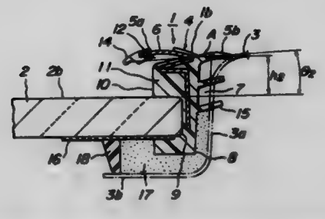
5,193,874
T-TOP INSERT STORAGE RACK WITH LOCKING MECHANISM
Laurence J. German, Huntington Woods, and Lawrence D. Rich, New Baltimore, both of Mich., assignors to LTC Roll & Engineering Company, Mt. Clemens, Mich.
Filed Sep. 5, 1991, Ser. No. 755,562
Int. Cl.[5] B60R *11/00*
U.S. Cl. 296—37.1 19 Claims

1. A storage device for vehicle roof inserts, comprising:
a pair of matched storage bodies, each storage body having two channels extending in parallel curved paths for receiving a pair of vehicle roof inserts; and
four pairs of opposed rollers, one pair of said rollers being mounted to the storage bodies in association with each of



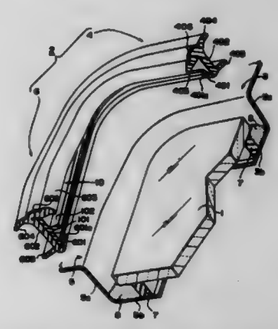
said channels, said rollers rotating about axes which are generally perpendicular to said paths of the channels, said rollers being received in said channels to contact and guide the vehicle roof inserts into said channels.

5,193,875
AUTOMOBILE WINDSHIELD MOLDING MEMBER AND METHOD OF MANUFACTURING THE SAME
Tatsuya Tamura, Yokohama, Japan, assignor to Hashimoto Forming Industry Co., Ltd., Japan
Filed Mar. 30, 1992, Ser. No. 859,804
Claims priority, application Japan, Mar. 29, 1991, 3-67078
Int. Cl.[5] B60J *10/02*
U.S. Cl. 296—93 5 Claims



1. A molding member, for an automobile windshield plate, comprising:
an elongate main body for covering a gap between the windshield plate and an adjacent automobile body panel, including upper and side portions to continuously extend along upper and side edges of the windshield plate, respectively, and a corner portion integrally and continuously connecting the upper and side portions with each other, said main body further including a first lip section to project toward a widthwise center region of the windshield plate, a second lip section extending toward the automobile body panel, and a leg section to project in a direction substantially perpendicular to a relevant outer surface of the windshield plate and having means for retaining the molding member in place;
said main body having a reference point to be located on said second lip section adjacent to said automobile body panel, said reference point being spaced from the outer surface of the windshield plate, when the molding member is in use, by a first distance along said upper portion and a second, relatively greater distance along said side portion;
said first lip section having a tip end which is situated close to the outer surface of the windshield plate along said upper portion and spaced therefrom along said side portion, when the molding member is in use;
said first lip section defining a first angle along said upper portion and a second, less steep angle along said side portion, relative to respectively opposite outer surface portions of the windshield plate when the molding member is in use; and
said leg section having means cooperating with said first lip section for defining a weir along said side portion, when the molding member is in use, between the outer surface of the windshield plate and the first lip section, said weir serving to prevent water from flowing across the molding member and to collect and guide the water along the weir.

5,193,876
AUTOMOBILE WINDSHIELD MOLDING
Yukihiko Yada, and Toshikazu Ito, both of Nagoya, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan
Filed Nov. 29, 1991, Ser. No. 799,957
Claims priority, application Japan, Nov. 30, 1990, 2-126582[U]; Dec. 7, 1990, 2-402128[U]
Int. Cl.[5] B60J *10/02*
U.S. Cl. 296—93 2 Claims



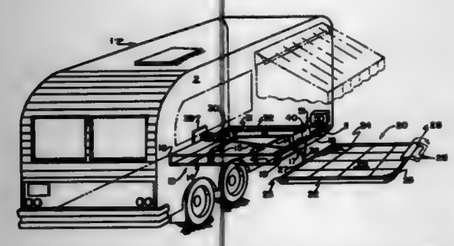
1. An automobile windshield molding for sealing a space between a windshield and a periphery of a window opening of automobile panels, said molding comprising:
(a) a molding body including an extruded side molding part and an extruded upper molding part integral with said side molding part, each said molding part having an inward wing for covering a peripheral edge of the windshield, an outward wing for covering edges of the automobile panels, and a leg portion extending downwardly from said inward and outward wings and to be inserted in the space between the windshield and the periphery of the window opening, said leg portion having a gradually increased height at said side molding part and having a foot extending therefrom at said side molding part such that a spacing between the inward wing of the side molding part and said foot gradually increases in said side molding part, and wherein a substantially constant spacing is provided between the inward wing in the upper molding part and a foot of the leg in the upper molding part; and
(b) a sub-molding member having an upright portion to be attached to said leg portion of said side molding part, and a shelf-like protector for covering a side edge of the peripheral edge of the windshield so that said shelf-like protector and said inward wing of said side molding part define a space for a water drain channel along the side edge of the windshield and wherein a spacing between the shelf-like protector and the foot of the leg in the side molding part is substantially constant along the side molding part, and wherein said sub-molding member does not extend along the upper molding part.

VOL 1148 ISS 3 MR 16 1993 UMI

5,193,877
PREFORM MASK FOR PAINTING VEHICLES
David L. George, Jr., 1372 Phoenixville Pike, West Chester, Pa. 19380
Continuation of Ser. No. 565,957, Aug. 9, 1990, abandoned, which is a continuation of Ser. No. 368,422, Jun. 19, 1989, Pat. No. 5,012,760, which is a continuation of Ser. No. 55,166, May 28, 1987, abandoned. This application Feb. 28, 1992, Ser. No. 845,098
The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.
Int. Cl.[5] B56C *11/00*
U.S. Cl. 296—136 8 Claims

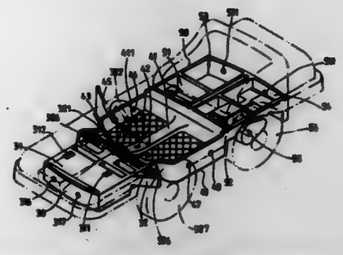
1. A disposable, flexible preform having sufficient flexibility to be planar when disposed on a completely flat surface and to cover and conform generally to the shape of a vehicle over which it is placed, said preform comprising a plurality of planar polygonal segments having shapes and sizes which cover surface segments of a vehicle and connected together alogn perforated fold lines to permit tearing to expose selected surface segments of a vehicle.

5,193,878
FOLDABLE VEHICLE PLATFORM
Michael N. Weaver, 371 Glen Rd., Hershey, Pa. 17033
Filed Jan. 30, 1992, Ser. No. 828,112
Int. Cl.[5] B60P *3/37*
U.S. Cl. 296—162 15 Claims



1. A wheeled land transport vehicle in combination with a deployable platform having a substantially planer bottom surface comprising;
storage bay means attached to the underside of said vehicle for storing and carrying said platform in a securely stowed position beneath said vehicle during transport of said vehicle;
power means for extending said platform for said stowed position to a fully deployed position with said planar bottom surface lying entirely below and beyond said storage bay means and flush upon the terrain adjacent said vehicle;
said power means also being operable in a reverse mode for retracting said platform from said fully deployed position to said stowed position.

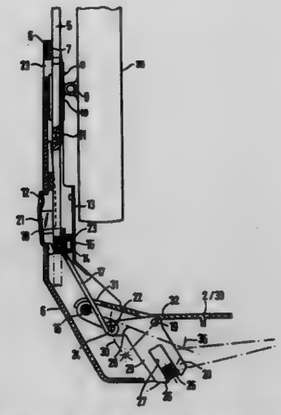
5,193,879
CHASSIS FOR CHILD'S ELECTRIC CARS
Yen R. Chen, No. 7, Alley 6, Lane 170, Chen Kang Street, Yung Kang Heiang, Tainan Hsien, Taiwan
Filed Dec. 10, 1991, Ser. No. 804,612
Int. Cl.[5] B62D *25/20*
U.S. Cl. 296—177 1 Claim



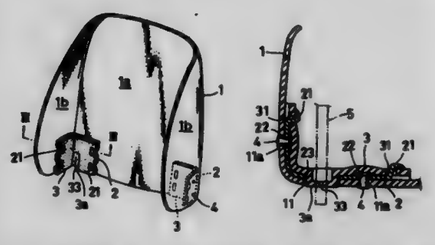
1. A chassis for a child's electric car comprising; a front portion having a rectangular plate extending to the front and a control plate behind the rectangular plate, said rectangular plate provided with two chambers for lodging a battery and a musical IC chip, at least one hole on each of the respective chambers, and two screw holes in a front vertical side of the rectangular plate for screws to combine the chassis with a body, said control plate having (1) a central round hole for a steering wheel unit to be fixed therein, (2) a triangular part projecting out from the opposite sides, (3) a lateral elongate groove under the central round hole for supporting a front wheel shaft, and (4) a round hole respectively in the top of the triangular part for the front wheel shaft to extend out for combining front wheels with the front wheel shaft;
a middle portion having a foot plate divided into two symmetrical halves by a lengthwise slightly-curved rod and strengthened with reinforcing ribs for supporting two legs of a child using this car, having a recessed cavity in the front portion for fixing an accelerator pedal, round holes in the two opposite sides for screwing the car body with the chassis, and said lengthwise rod having an empty interior for electric wires to extend therein; and
a rear portion having (1) four compartments, (2) an elongate lateral groove under the bottom of two of the compartments for placing a rear wheel shaft, (3) a lengthwise groove communicating with the interior of the lengthwise rod in the middle portion for placing electric wires, (4) a screw hole in a vertical rear side of the other two of said compartments for assembling the body with the chassis.

5,193,880
CHAIR, IN PARTICULAR WORK OR OFFICE CHAIR
Siegfried Keusch, Plochingen, and Gunter Kratz, Hochdorf, both of Fed. Rep. of Germany, assignors to Roeder GmbH, Fed. Rep. of Germany
PCT No. PCT/DE88/00757, § 371 Date Aug. 28, 1990, § 102(e) Date Aug. 28, 1990, PCT Pub. No. WO89/06100, PCT Pub. Date Jul. 13, 1989
PCT Filed Dec. 10, 1988, Ser. No. 536,626
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1987, 3744365
Int. Cl.[5] A47C *3/00*
U.S. Cl. 297—353 20 Claims

1. In a chair having a backrest rod adjusting in inclination with respect to a seat and a backrest slideable thereon, which can be displaced with an adjustment device, when the backrest rod is tilted backward, in a seat direction of the seat, the improvement comprising:
the adjustment device having a single knee lever (20) adjacent to said backrest rod, which is pivotally seated around a horizontal pivot axis (19) on one of a bracket (2) supporting the seat and a seat support (33) on the bracket (2), a tilt of which can be adjusted,
an extension (17) of the backrest (35) flexibly connected to a first end of a first lever arm (28) of said knee lever (20), and
a second end of a second lever arm (29) of said knee lever (20) is guided by a retaining bolt (25) seated on the backrest rod (6) in such a way, that during backward tilt of the backrest rod (6) said first lever arm (28) of said knee lever (20) displaces said extension (17) and the backrest (35) in a first direction toward said bracket (2) said retaining bolt (25) defines a path of movement (36) on a circular path around a pivot axis (16) of said backrest rod (6) at said bracket (2), and said retaining bolt (25) is adjustably guided in a guide slit (27) of said second lever arm (29) of said knee lever (20), compensating for a changing distance to said horizontal pivot axis (19) of said knee lever (20).

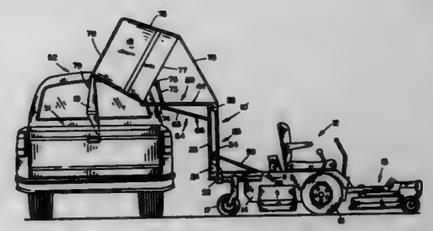


5,193,881
STRUCTURE OF BACK BOARD FOR VEHICLE SEAT
Masamitsu Minai, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan
Filed Oct. 22, 1991, Ser. No. 780,361
Int. Cl.[5] A47C *7/02*
U.S. Cl. 297—452 5 Claims



1. A structure of a back board for a vehicle seat, in which said seat is provided with a reclining device and said back board is attached over a back side of said seat, said back board being formed at its lower end part with a slit which permits a lower arm of said reclining device to be movable therethrough, said structure comprising:
a rigid bracket which is secured to an inner surface of said back board at a point adjacent to said slit, thereby reinforcing said back board adjacent to said slit;
said rigid bracket being formed with a projected engagement means; and
an elastic cover member which is secured to said rigid bracket by being engaged with said projected engagement means, such as to cover both said slit and said lower arm of said reclining device, whereby said slit is substantially closed to prevent an interior of back board from coming into view from the outside.

5,193,882
MECHANISM FOR RAISING AND TILTING A CONTAINER FOR DISCHARGE PURPOSES
Paul M. Gamaldi, 5100 Valley East Blvd., Arcata, Calif. 95521
Filed Oct. 1, 1991, Ser. No. 769,314
Int. Cl.[5] B60P *1/34*
U.S. Cl. 298—11 12 Claims

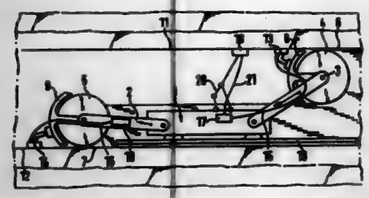


1. In a portable unit having a generally horizontal frame, a container normally resting on a subframe and pivotally connected to the subframe for tilting upwardly and rearwardly with respect to the subframe and the container having a door at its rear for unloading material from the container, the improvement being a lift-and-tilt mechanism for moving the container comprising:
a linkage having opposed ends, one end pivotally connected to the frame; and
the subframe supporting the container and having an inner end connected to the other end of said linkage, said subframe having an outer end pivotally connected to an outer end of the container whereby the container may be tilted with respect to the subframe;
wherein said linkage and said subframe are movable from a nested position substantially parallel to the frame to a raised position with said linkage disposed in a substantially vertical direction, and with said subframe disposed in a substantially horizontal direction in all positions;
and further wherein a lift arm is provided having one end connected to said linkage, an opposite end engageable with an underside of the container, and an intermediate portion pivotally connected to said subframe, whereby upon movement of said linkage toward said raised position, said lift arm automatically tilts the container upwardly and rearwardly toward a dump position.

5,193,883
PROCESS FOR CONTROLLING LONGWALL SHEARING AND HEADING MACHINES ALONG A CUTTING HORIZON BETWEEN COAL AND ROCK
Klaus Spies, Frennetstr. 49, 5100 Aachen, Fed. Rep. of Germany
PCT No. PCT/EP90/01587, § 371 Date Jul. 15, 1991, § 102(e) Date Jul. 15, 1991, PCT Pub. No. WO91/04392, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 19, 1990, Ser. No. 688,501
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1989, 3931915; Aug. 11, 1990, 4025551
Int. Cl.[5] E21B *49/08*; E21C *39/00*; G01N *1/04*
U.S. Cl. 299—1.1 26 Claims

1. A process for controlling reaming and advance machines along a cutting horizon between coal and rock, based on a cutting tool configuration affixed to a machine, fitted with a

sensor able to differentiate between coal and rock areas, whose measuring values are transformed into actuating impulses, which guide the cutting tools to the cutting horizon, comprising: taking mineral samples from behind the cutting tool at one



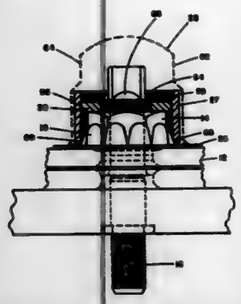
of a perpetual rate or short intervals; analyzing the mineral samples in the sensor; comparing the analysis to a standard value; and using deviations from the standard value as measured values for the actuating impulses.

5,193,884

DIRECT WHEEL TRIM ATTACHMENT SYSTEM

Long C. Shen, No. 39 Sha Lun, Chung Sha Tsun, An Ding Shiang, Tainan Hsien, Taiwan, and James P. Wright, 1060 Robin Ln., Cookeville, Tenn. 38501

Filed Jul. 26, 1991, Ser. No. 736,734
Int. Cl.[5] B60B 7/06
U.S. Cl. 301—37.37 5 Claims



1. A decorative trim member attachment system for direct attachment to a wheel having a lug nut and a wheel stud received by said lug nut, said trim member comprising:

a. a trim member having a hole for receiving said lug nut and said stud;

b. a disc having internal threads and external threads, said disc releasably attached to said stud by said internal threads; and

d. a disc cover having inner threads, said disc cover releasably attached to said disc by engagement of said inner threads by said external threads; and

e. said disc cover releasably attaching said trim member to said wheel proximate to said receiving hole.

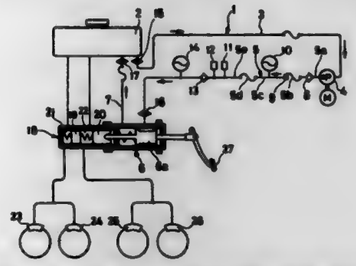
5,193,885

HYDRAULIC PRESSURE BOOSTER SYSTEM

Seiji Yamaguchi, and Hiroshi Yoshida, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,298
Claims priority, application Japan, May 1, 1990, 2-46706[U]; Jun. 21, 1990, 2-65742[U]
Int. Cl.[5] B60T 13/14
U.S. Cl. 303—87 4 Claims

1. A hydraulic pressure booster system comprising pump means for generating pressurized operating fluid, booster means for outputting a boosted force of brake pedal pressing force by said pressurized operating fluid, and a passage means for absorbing pulsations generated by said pump means in said pressurized operating fluid; said passage means including a passage interconnecting said pump means and said booster means, and an accumulator for continuously providing said



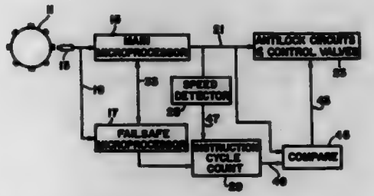
pressurized operating fluid to said booster means arranged in said passage; said passage including a first flexible hose arranged between said accumulator and said pump means, a second flexible hose arranged between said accumulator and said booster means, said second flexible hose being longer than said first flexible hose, and a restriction provided on one end of said first flexible hose closer to said accumulator.

5,193,886

WHEEL SPEED VERIFICATION SYSTEM

Gary J. Gloceri, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 23, 1991, Ser. No. 763,708
Int. Cl.[5] B60T 8/58
U.S. Cl. 303—92 2 Claims



1. An anti-skid control circuit for a wheeled vehicle comprising:

means for sensing rotation of at least one vehicle wheel and providing a pulse train the repetition rate of which is indicative of the vehicle speed;

a first processor for repetitively executing a predetermined sequence of program steps over a fixed time interval, the processor repeating the predetermined sequence of program steps during each successive fixed time interval;

a second processor responsive to the pulse train and for repetitively computing the speed of said at least one vehicle wheel;

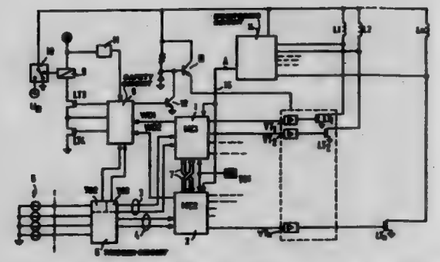
means responsive to computation of a specific wheel speed of said at least one vehicle wheel by the second processor and for comparing the specific wheel speed to said fixed time interval and for allowing the anti-skid control circuit to continue in operation only so long as the compared specific wheel speed and time interval are within predetermined limits of one another.

5,193,887

CIRCUIT CONFIGURATION FOR AN ANTI-LOCK-CONTROLLED BRAKE SYSTEM

Hans-Wilhelm Bleckmann, Bad Nauheim; Heinz Loreck, Frankfurt am Main; Michael Zydek, Langgoens/Cleeberg, and Hermann Esselbrugge, Welterstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 14, 1991, Ser. No. 655,515
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 4004782
Int. Cl.[5] B60T 8/32, 8/60
U.S. Cl. 303—92 10 Claims



1. A circuit for controlling a vehicle anti-lock system operative to receive wheel condition signals from a plurality of wheel condition sensors and generate brake pressure signals in response thereto to modulate vehicle brake line solenoid valves, said circuit comprising:

first microcontroller means and second microcontroller means interconnected by data exchange lines.

(a) said first microcontroller means for:

(1) receiving selected ones of said wheel condition signals,

(2) independently processing said wheel condition signals received by said first microcontroller means,

(3) generating said brake pressure signals in response to said wheel condition signals received by said first microcontroller means,

(b) said second microcontroller means for:

(1) receiving selected ones of said wheel condition signals,

(2) independently processing said wheel condition signals received by said second microcontroller means,

(3) generating said brake pressure signals in response to said wheel condition signals received by said second microcontroller means,

(c) said first microcontroller means also for:

(1) receiving from said second microcontroller means at least one of:

(i) said selected wheel condition signals received by said second microcontroller means, and

(ii) said brake pressure signals generated by said second microcontroller means, and

(2) comparing signals received from said second microcontroller means with corresponding signals received and generated by said first microcontroller means, and

(3) generating a first monitoring signal as a function of any difference between compared signals, said first monitoring signal being an alternating signal having a predetermined frequency and amplitude whenever the difference between compared signals falls below a predetermined threshold level, and

(d) said second microcontroller means also for:

(1) receiving from said first microcontroller means at least one of:

(i) said selected wheel condition signals received by said first microcontroller means, and

(ii) said brake pressure signals generated by said first microcontroller means, and

(2) comparing signals received from said first microcontroller means with corresponding signals received and generated by said second microcontroller means, and

(3) generating a second monitoring signal as a function of any difference between compared signals, said second monitoring signal being an alternating signal having a predetermined frequency and amplitude whenever the difference between compared signals falls below a predetermined threshold level, and

and safety circuit means for:

(a) comparing each of said first and said second monitoring signals with a time standard from at least one clock generator operating independently of an operating cycle of said first microcontroller means and said second microcontroller means, and

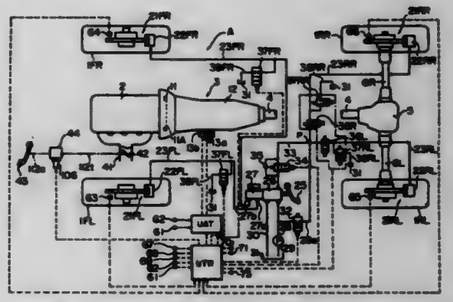
(b) disabling said solenoid valves whenever any of said first and said second monitoring signals exceeds said predetermined threshold level.

5,193,888

SLIP CONTROL SYSTEM FOR MOTOR VEHICLE

Haruki Okazaki; Toru Ouchi; Kazutoshi Nobumoto; Fumio Kagayama, and Makoto Kawamura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 21, 1991, Ser. No. 658,753
Claims priority, application Japan, Feb. 22, 1990, 2-41552
Int. Cl.[5] B60T 8/58
U.S. Cl. 303—93 9 Claims



1. A slip control system for controlling slippage of driving wheels of a motor vehicle comprising:

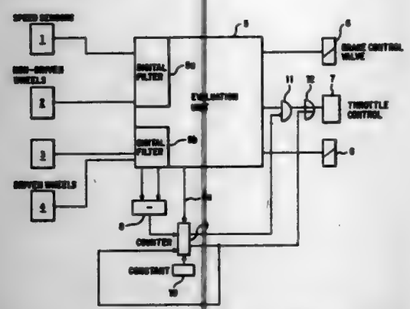
means for detecting a slip ratio of each driving wheel;

means for detecting a reduction speed of each wheel;

traction control means for decreasing a slip of each driving wheel by controlling brake fluid pressure in each driving wheel so that the slip ratio of each driving wheel becomes at least equal to a predetermined desired slip ratio; and

an antiskid brake system for controlling brake fluid pressure based on the reduction speed of each wheel so as to cancel a lock condition of the wheel, and antiskid brake system including first control means for controlling the brake fluid pressure in a condition in which a traction control operation is not carried out by the traction control means, and second control means for controlling the brake fluid pressure, in a different manner from that of the first control means, in a condition in which a traction control operation is carried out by the traction control means.

5,193,889
ANTILOCKING CONTROLLER OR DRIVE SLIP CONTROLLER
Jochen Schaefer, Bietigheim-Bissingen; Günter Drierzawa, Weinbingen-Hegnach, and Thomas Sauter, Remseck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/EP90/00759, § 371 Date Nov. 13, 1991, § 102(e) Date Nov. 13, 1991, PCT Pub. No. WO90/14256, PCT Pub. Date Nov. 29, 1990
PCT Filed May 11, 1990, Ser. No. 773,612
Claims priority, application Fed. Rep. of Germany, May 17, 1989, 3916046
Int. Cl.[5] B60T *8/32*; B60K *28/16*; G01P *3/48*
U.S. Cl. 303—100 12 Claims



1. Control system for reducing wheel slippage in a vehicle having wheels, each wheel having a speed, said system comprising

means for measuring the speed of at least one wheel and producing a corresponding digital wheel speed signal V_R,

means for digitally filtering said digital wheel speed signal V_R to produce a filtered wheel speed signal V_{RF},

means for taking the difference $|V_R - V_{RF}|$ of the two speed signals over time,

means for adding the differences $|V_R - V_{RF}|$ generated over time to produce a sum and substracting a fixed value from said sum each time a difference $|V_R - V_{RF}|$ is added, thereby producing a calculation result E,

means for producing a first signal indicative of wheel vibration when said result E exceeds a first threshold, and

means responsive to said first signal for taking a first action for suppressing said vibration.

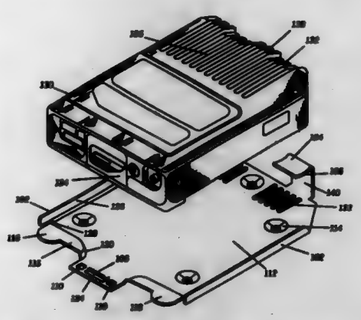
5,193,890
ELECTRONIC DEVICE MOUNTING TRAY AND RADIO ASSEMBLY
William H. Robertson, Jr., Plantation, and Donald F. Gatto, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 691,248, Apr. 25, 1992, abandoned.
This application Apr. 13, 1992, Ser. No. 869,076
Int. Cl.[5] A47B *81/06*
U.S. Cl. 312—7.1 10 Claims

1. A mounting tray for securing an electronic device, the electronic device having cavity areas, the mounting tray comprising:

a substantially planar surface for supporting the electronic device, the substantially planar surface including front, rear and opposed side margins;

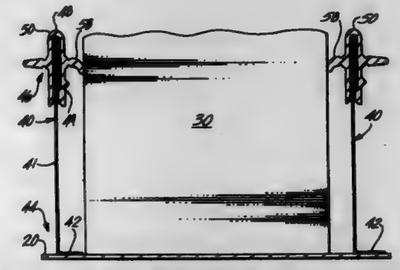
a pair of upstanding side supports one being located substantially at each of the side margins, each of the upstanding side supports including a first section which is directly attached to the substantially planar surface and a second section which is cantilevered with respect to the first section and is not directly attached to the substantially planar surface;

a rear support means including at least one cantilevered member secured to the substantially planar surface substantially at the rear margin; and



a latching means including front raised portions secured to said substantially planar surface at the front margin, the front raised portions having protruding tabs which extend beyond the front margin for engaging the electronic device cavity areas, the latching means further including a latching member having at least one aperture and an upturned latching bracket.

5,193,891
CARTRIDGE RETAINING MEANS
James E. Headley, Whittier, Calif., assignor to J. B. Engineering Co., Inc., Monrovia, Calif.
Filed Feb. 28, 1991, Ser. No. 662,211
Int. Cl.[5] A47B *81/06*
U.S. Cl. 312—348.3 14 Claims

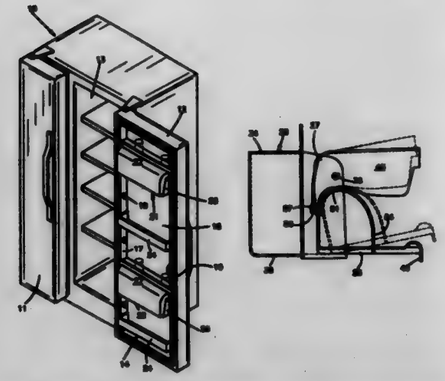


1. Means for retaining plural cartridges in a separated relationship, comprising a strip having an internal cavity defined by two spaced-apart horizontally elongated vertical walls and a top wall, and having a laterally protruding compressible rib attached perpendicular to each vertical wall;

wherein each rib further includes plural compression notches therein, the notches enabling the ribs to compress inwardly when contacted by the cartridges.

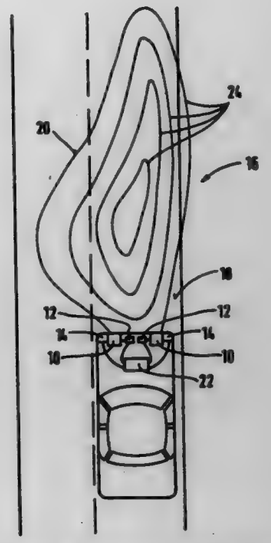
5,193,892
FOOD COMPARTMENT FOR REFRIGERATORS
Thomas R. Swindell, Sheridan, Mich., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed May 6, 1991, Ser. No. 695,938
Int. Cl.[5] F25D *11/00*
U.S. Cl. 312—405.1 10 Claims

1. A refrigerator food storage compartment mounted on a refrigerator door, said compartment comprising a housing, a support tray, and a compartment cover, said housing being mounted on said door, said cover being pivotally mounted on said housing for movement between a closed position and an open position, said tray being operable to support food stuff and being moveable relative to said housing between a storage position and an access position, said housing and cover cooperating to define a compartment for enclosing food stuff on said



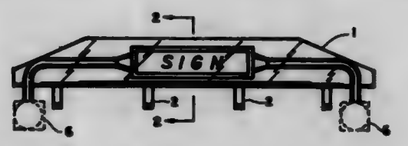
tray when said tray is in said storage position, and cam means for opening said cover in response to movement of said tray from said storage position to said access position, said cam means operating to move said tray from said access position to said storage position when said cover is moved to said closed position.

5,193,894
APPARATUS AND METHOD FOR CONTROLLING THE LIGHT-RANGE OF MOTOR VEHICLE HEADLIGHTS
Christian Lietar, Morges; Jean-Francois Longchamp, Lausanne, and Eladio Lopez, Renens, all of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jun. 25, 1992, Ser. No. 904,437
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1991, 4122531
Int. Cl.[5] B60Q *1/06*
U.S. Cl. 362—66 15 Claims



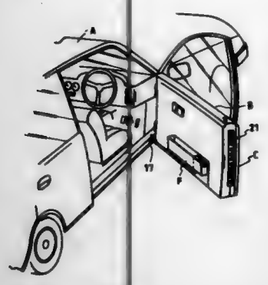
1. In an apparatus for control of a light-range of headlights of a motor vehicle on a road comprising at least one adjusting device connected with the headlights, said at least one adjusting device setting and adjusting an orientation of the headlights; at least one sensor, said at least one sensor detecting at least indirectly a load condition of the motor vehicle and producing a sensor signal depending on the load condition; and an analyzer/control unit connected to the at least one sensor and the at least one adjusting device, said analyzer/control unit receiving the sensor signal from the at least one sensor and controlling the adjusting device and thus the headlight orientation according to the sensor signal to maintain the light-range of the headlights substantially constant, the improvement wherein the at least one sensor is an electro-optic sensor such that the at least one sensor detects a state of light reflected from a portion of the road illuminated by the headlights in front of the motor vehicle and from obstacles located thereon; and the analyzer/control unit contains means for storing data including set values representing the state of the reflected light when the headlights are in a desired orientation, means for storing other data including actual values representing the state of the reflected light for an actual orientation of the headlights derived from the sensor signals from the at least one sensor when the headlights are set in the actual orientation; means for comparing the actual values and the set values and for forming differences therebetween; and means for controlling the at least one adjusting device to set the headlights in at least one other actual orientation until the differences between the set values and the actual values are minimized to determine the actual orientation of the headlights closest to the desired orientation.

5,193,893
ILLUMINATED VEHICLE HOOD DEFLECTOR
Michael A. Mitko, Rte. 4 Box 143B, Burgettstown, Pa. 15021
Filed Dec. 4, 1991, Ser. No. 802,205
Int. Cl.[5] F21V *8/00*; B60Q *1/00*
U.S. Cl. 362—32 1 Claim



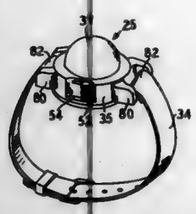
1. For use in combination with a vehicle having a front end, a pair of headlights illuminated by a vehicle battery, and a hood, a hood deflector mounted on and extending across the front of said vehicle beyond said headlights, a sign mounted centrally of said hood deflector, a pair of fibre-optic wire containing cables extending from both ends of said sign to said headlights, said fibre-optic wire containing cables having terminals extending to said headlights, so that when the headlights are illuminated, said fibre-optic wire containing cables will illuminate said sign.

5,193,895
WARNING LIGHT
Naoki Naruke; Nobuo Matsukawa, and Mitsuhiko Nakano, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1991, Ser. No. 642,738
Claims priority, application Japan, Jan. 18, 1990, 2-2690[U]; Dec. 13, 1990, 2-410461
Int. Cl.[5] B60Q *1/26*
U.S. Cl. 362—80 28 Claims



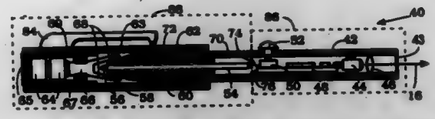
1. A warning light comprising:
a flexible printed circuit board;
a plurality of light-emitting elements arranged and mounted on the flexible printed circuit board;
a light-transmissive member provided at least in front of the light-emitting elements, said light-transmissive member being made of resin;
a body member for fixing said flexible printed circuit board within said body member and housing said light-transmissive member, said body member extending along the length of and retaining within a notch-like opening therein said flexible printed circuit board and said light transmissive member;
a fixing member provided on a back surface of said body member for fixing the warning light to a mounting surface with said warning light conforming to said mounting surface, said light-transmissive member having edge portions extending no further than corresponding outermost edge portions of said body member; and
a switch for turning on/off the light-emitting elements.

5,193,896
LIGHTING DEVICE FOR PERSONAL USE
Seymour Oberlander, 9226 Greenwood Ave., Munster, Ind. 46321
Filed Jan. 13, 1992, Ser. No. 820,192
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—103 21 Claims



1. A lighting device adapted for personal use, comprising:
a frame structure providing a platform having an upper side with a lamp socket opening upwardly thereon and also having a lower side with a battery cavity opening downwardly therein;
an electric lamp having a base in said lamp socket;
a battery in said battery cavity of said frame structure;
a switch mechanism carried on the upper side of said platform and having a movable switch arm attached to said lamp base and supporting contact means connected with the lamp and operable for selectively making and breaking a lamp energizing circuit between the battery and the lamp by movable operation of the arm;
means for attaching said frame structure in place for use;
said battery comprising a coin battery and means for mounting the battery in said cavity;
a translucent dome structure enclosing said lamp and means for securing the dome structure in place.

5,193,897
COMBINED PEN AND LIGHT POINTER APPARATUS
Keith D. Halsey, 2824 Second St., Santa Monica, Calif. 90405
Filed Jan. 7, 1992, Ser. No. 817,749
Int. Cl.[5] B43K *29/10*
U.S. Cl. 362—118 18 Claims

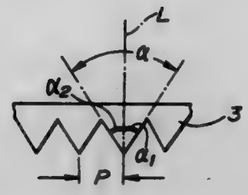


1. A combination light pointer and marker apparatus comprising, a first portion having therein a light source for forming an indicating light beam projecting from a first part of the first portion and a pen with a marking end projecting from a second part of the first portion, and a second portion removably covering the marking end of the pen, wherein the second portion comprises interlock circuit means for preventing actuation of the light source when the second portion is removed from the first portion and enabling actuation of the light source when the second portion covers the marking end of the pen.

5,193,898
RECHARGEABLE MINIATURE FLASHLIGHT
Anthony Maglica, Ontario; Ralph E. Johnson, Los Alamitos, and Armis L. Lewis, Cucamonga, all of Calif., assignors to Mag Instruments, Ontario, Calif.
Division of Ser. No. 632,128, Dec. 19, 1990, Pat. No. 5,121,308, which is a division of Ser. No. 111,538, Oct. 23, 1987, Pat. No. 5,008,785, which is a continuation-in-part of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Jun. 8, 1992, Ser. No. 895,087
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—183 1 Claim

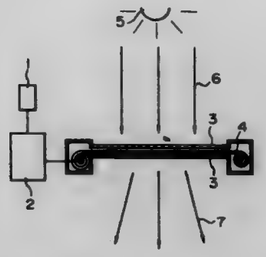
1. A rechargeable flashlight comprising
a body having a cavity for retaining one or more batteries and contacts for receiving a lamp bulb;
a first switch;
a tailcap on said body including a positive terminal and a negative terminal and a second switch coupled electrically to said first switch;
means to allow only one-way current flow through one of said terminals.

5,193,899
PLANAR LIGHT-SOURCE DEVICE AND ILLUMINATION APPARATUS USING THE SAME
Makoto Oe, and Isaei Chiba, both of Kawasaki, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Division of Ser. No. 652,070, Feb. 7, 1991, Pat. No. 5,089,944, which is a division of Ser. No. 512,447, Apr. 23, 1990, Pat. No. 5,034,864. This application Oct. 31, 1991, Ser. No. 786,005
Claims priority, application Japan, Apr. 25, 1989, 1-105524; Aug. 21, 1989, 1-213023; Aug. 30, 1989, 1-221652; Oct. 19, 1989, 1-270331; Jan. 9, 1990, 2-964
Int. Cl.[5] F21V *5/02, 13/04*
U.S. Cl. 362—224 3 Claims



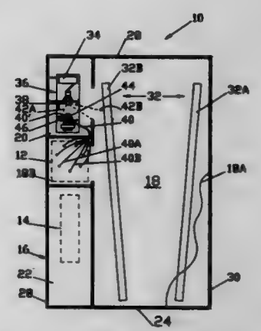
1. An illumination apparatus used for an internal-illumination type display device comprising a box-type housing provided with a display surface, a linear light source or a light source arranged linearly accommodated in said housing, a reflecting surface provided at a rear face of said light source, and a multi-prism sheet provided at an inner surface of said display surface,
wherein said reflecting surface has such function that a major portion of a light reflected by said reflecting surface is obliquely incident upon said multi-prism sheet, wherein said multi-prism sheet has an inner surface formed with a group of prisms so arranged as to extend in parallel relation to the light source and having such function that the light incident directly or obliquely in reflection outgoes in concentration toward a predetermined direction, and a non-directionally diffusing dark-portion removing sheet for eliminating a dark portion at a location immediately above the light source, arranged on an outer surface of said multi-prism sheet.

5,193,900
ILLUMINATION DEVICE
Tadashi Yano, and Kenjiro Hashimoto, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 28, 1992, Ser. No. 842,321
Claims priority, application Japan, Mar. 5, 1991, 3-038309
Int. Cl.[5] F21V *9/00*
U.S. Cl. 362—284 2 Claims



1. An illumination device comprising:
a first light detector portion having a correlated color temperature sensor for detecting a correlated color temperature from radiant flux in a visible wave-length range (380 nm–780 nm) of incident natural light;
a second light detector portion having a correlated color temperature sensor for detecting a correlated color temperature from radiant flux in a visible wave-length range (380 nm–780 nm) of artificial light;
an operation portion for comparing the correlated color temperature of said incident natural light detected by said correlated color temperature sensor of said first light detector portion with the correlated color temperature of said artificial light provided in each room and detected by said correlated color temperature sensor of said second light detector portion;
a control portion for controlling color temperature converting filter switching on the basis of a result of operation of said operation portion so that a difference between the correlated color temperature of the natural light subjected to color temperature conversion and the correlated color temperature of the artificial light is made equal to or smaller than 5.5 mired;
color temperature converting filters for converting the correlated color temperature of the natural light so that the difference between the correlated color temperature of the natural light subjected to color temperature conversion and the correlated color temperature of the artificial light is made equal to or smaller than 5.5 mired; and
a filter operating portion for carrying out the switching of said color temperature converting filters.

5,193,901
VENDING MACHINE BACK LIGHT ASSEMBLY AND METHOD
David H. Stone, Delavan, Wis., assignor to Glo-Max Fiber Optics Systems, Inc., Walworth, Wis.
Filed Oct. 4, 1991, Ser. No. 771,258
Int. Cl.[5] G09F *13/04*
U.S. Cl. 362—32 29 Claims



1. In a vending machine having a mechanism for dispensing a food item and a controller responsive to receipt of payment for actuating the dispensing mechanism, all contained within a common housing defined in part by a translucent sign panel, the improvement being an electrical back light assembly, comprising:
a source of electrical power;
a first back light subassembly including a first back light source connected with the ,source of electrical power to primarily light a first portion and to secondarily light a second portion of the translucent sign panel;
a second back light subassembly including a second back light source connected with said source of electrical power and including a fiber optic cable for conducting light from the second light source to primarily illuminate the second portion of the panel.

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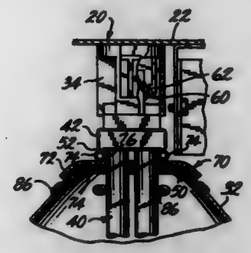
5,193,902
UNIVERSAL FOLDABLE LAMP SHADE COVER
Joseph F. Hyland, and Barbara B. Hyland, both of 3298 Casey Key Rd., Nokomis, Fla. 34275
Continuation-in-part of Ser. No. 621,394, Dec. 3, 1990, Pat. No. 5,121,312. This application May 5, 1992, Ser. No. 879,778
Int. Cl.[5] F21V *1/06*
U.S. Cl. 362—352 9 Claims

1. A universal foldable lamp shade cover comprising:
a uniformly pleated rectangular sheet of thin, bendable material;
said pleated sheet defined by a plurality of side-by-side slender elongated rectangular panels integrally connected one to another in accordion fashion along a fold line between each said pleated panel ending in an end panel at each end of said pleated sheet;
means for connecting said end panels together to form a generally tubular member;
said tubular member having a relaxed circumference sized to fit around a lamp shade;
a strip of double-sided adhesive tape adherable on one side thereof around and immediately adjacent an upper opening of the lamp shade whereby an exposed side of said adhesive tape is presented;
said tubular member, being manually reducible in circumference at its upper end so as to be adhesively connected to said adhesive tape exposed side by pressing there against, resting over and substantially covering the lamp shade, remaining thusly only by adhesion and gravity against said adhesive tape exposed side.

5,193,903
LAMP SAFETY RETAINER WITH SHEATHED SPRING RETAINERS
Richard C. Anisfield, Saddle River, N.J., assignor to Kurt Versen Company, Westwood, N.J.
Filed Sep. 11, 1992, Ser. No. 943,717
Int. Cl.[5] F21V *21/00*
U.S. Cl. 362—376 16 Claims

1. A safety retainer for a luminaire of the type including a lamp socket and a compact fluorescent lamp having a lamp base normally received within the lamp socket and a lamp envelope extending longitudinally downwardly from a near end at the lamp base to a far end away from the lamp base, the lamp base having an outer periphery including at least portions extending laterally outwardly beyond the lamp envelope adjacent the near end of the lamp envelope, the safety retainer comprising:
resiliently flexible retainer elements affixed to the luminaire and having spring wire retainer portions at retainer locations placed laterally inwardly beneath the lamp socket to establish an aperture through which the lamp envelope projects when the lamp is in the luminaire, at least portions of the aperture at the retainer locations being laterally smaller than corresponding portions of the outer periphery of the lamp base and placed beneath the corresponding portions of the outer periphery of the lamp base when the lamp is received within the lamp socket for interception of the lamp base by the retainer elements should the lamp base fall from the lamp socket;
the resilient flexibility of the spring wire retainer elements being such that the lamp will be supported by the retainer elements against falling downwardly through the safety retainer, and will enable deliberate resilient dilation of the aperture at the retainer locations to permit selective movement of the lamp base through the safety retainer for removal and replacement of the lamp in the luminaire.

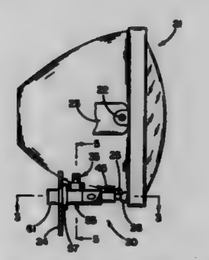
5,193,904
LAMP SAFETY RETAINER
Earl C. Rist, Bloomfield; Matthew P. Roy, Garfield, and Luis M. Guzman, North Bergen, all of N.J., assignors to Kurt Versen Company, Westwood, N.J.
Filed Sep. 11, 1992, Ser. No. 943,728
Int. Cl.[5] F21N *21/00*
U.S. Cl. 362—376 17 Claims



1. A safety retainer for a luminaire of the type including a lamp socket and a compact fluorescent lamp having a lamp base normally received within the lamp socket and a lamp envelope extending longitudinally downwardly from a near end at the lamp base to a far end away from the lamp base, the lamp base having an outer periphery including at least portions extending laterally outwardly beyond the lamp envelope adjacent the near end of the lamp envelope, the safety retainer comprising:
resiliently flexible retainer elements affixed to the luminaire and having retainer portions at retainer locations placed laterally inwardly beneath the lamp socket to establish an aperture through which the lamp envelope projects when the lamp is in the luminaire, at least portions of the aperture at the retainer locations being laterally smaller than

corresponding portions of the outer periphery of the lamp base and placed beneath the corresponding portions of the outer periphery of the lamp base when the lamp is received within the lamp socket for interception of the lamp base by the retainer elements should the lamp base fall from the lamp socket;
the resilient flexibility of the retainer elements being such that the lamp will be supported by the retainer elements against falling downwardly through the safety retainer, and will enable deliberate resilient dilation of the aperture at the retainer locations to permit selective movement of the lamp base through the safety retainer for removal and replacement of the lamp in the luminaire.

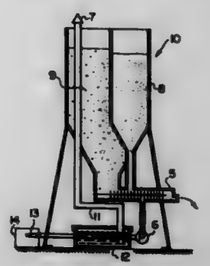
5,193,905
VEHICLE HEADLAMP ADJUSTER
Michael R. Edwards, Mishawaka, Ind., and Arthur R. Fry, Rockford, Ill., assignors to Elco Industries, Inc., Rockford, Ill.
Filed Dec. 13, 1991, Ser. No. 806,622
Int. Cl.[5] F21M *3/18*
U.S. Cl. 362—425 10 Claims



1. A mechanism for adjusting a vehicle headlamp relative to a frame, said mechanism comprising a housing adapted to be secured to said frame, a link adapted to be connected to said headlamp, said link being constrained against rotation, being constrained to move linearly in first and second opposite directions relative to the housing and being operable when moved linearly to adjust said headlamp with respect to said frame, said link comprising a rod-like end portion, a first thread form extending helically along and around said end portion, said first thread from being movable linearly with said link and being non-rotatable relative to said link, and selectively operable means for moving said link in either of said directions, said selectively operable means comprising a rod-like driver journaled by said housing to rotate about an axis extending generally perpendicular to the path of movement of said link, and a second thread form extending helically along and around said driver and directly engaging said first thread form to advance said link linearly in response to rotation of said driver.

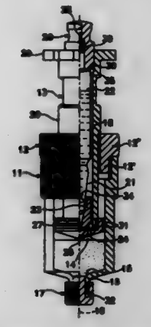
5,193,906
HEATER FOR A MORTAR PREPARATION SYSTEM
Allen A. Neufeldt, Willowdale, and Bryan Kieswetter, Waterloo, both of Canada, assignors to B & B Kieswetter, Kitchener, Canada
Filed Nov. 6, 1991, Ser. No. 788,448
Claims priority, application Canada, Nov. 13, 1990, 2029847
Int. Cl.[5] B28C *5/46;* B01F *15/06*
U.S. Cl. 366—24 4 Claims

1. A heating system for use with a mortar mixing unit, the mortar mixing unit comprising a silo having two sections, one for retaining an aggregate and the other for retaining a binder; and a mixing unit connected to the silo, wherein the aggregate, the binder and water are mixed in the mixing unit to produce mortar; said heating system comprising:
(a) heat energy producing means for producing a supply of heat energy, wherein said heat energy is comprised of products of combustion and air;
(b) water reservoir means connected to the mixing unit for retaining the water;
(c) a hollow pipe having a first end and a second end, the first end being connected to the heat energy producing means for heating the hollow pipe;
(d) a first heat exchanger comprising a first portion of the hollow pipe located within the water reservoir means, wherein the first portion of the hollow pipe heats the water prior to entering the mixing unit;



(e) a second heat exchanger comprising a second portion of the hollow pipe positioned proximate a substantial portion of the mixing unit, wherein the second portion of the hollow pipe heats the aggregate, binder and water contained in the mixing unit; and
(f) a third heat exchanger comprising a third portion of the hollow pipe located within the aggregate section of the silo, wherein the third portion of the hollow pipe heats the aggregate prior to entering the mixing unit.

5,193,907
PROCESS AND APPARATUS FOR THE MIXING AND DIRECT EMPLACEMENT OF A TWO-COMPONENT BONE CEMENT
Giovanni Faccioli, Mozzambano, and Soffiatti Renzo, Nogara, both of Italy, assignors to Tecres SpA, Verona, Italy
Filed Dec. 4, 1990, Ser. No. 621,847
Int. Cl.[5] B01F *15/02;* B65D *1/04*
U.S. Cl. 366—130 15 Claims



1. A process for mixing a bone cement formed from two components, one liquid and one powder, which components are kept separate until the cement is required for use, each component comprising a mixture of one or more components which are mutually compatible, and if required, for delivering it directly in situ, such process comprising the following steps:
separately storing the two components which are to be mixed, within a container comprising a plurality of chambers aseptically isolated from the outside atmosphere;

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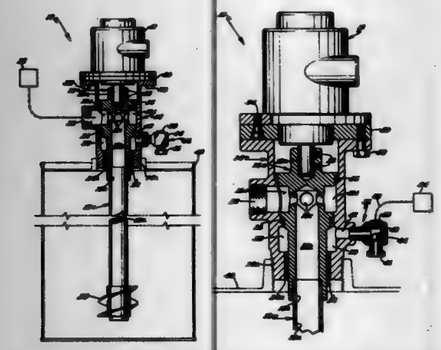
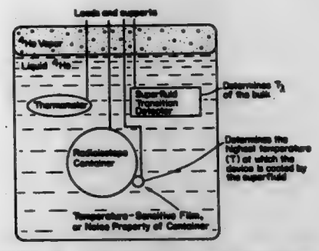
opening the container for the liquid component within one of the aforesaid chambers which does not communicate with the outside atmosphere;
creating a negative pressure in the chamber containing the powder component;
said negative pressure causing suction of the liquid component into the chamber containing the powder component, the two chambers being kept isolated from the outside atmosphere.
mixing the two components by agitation of the container;
compacting the cement paste obtained by compressing same;
inserting, if required, a flexible cannula so as to direct the outflow of paste; and
extruding the paste by action on a plunger, causing direct in situ emplacement of the cement.

5,193,908
AGITATOR SUCTION TUBE COMBINATION
Charles L. Rescorla, Plymouth, and Irving F. Sayder, Blaine, both of Minn., assignors to Graco Inc., Minneapolis, Minn.
Filed Dec. 31, 1991, Ser. No. 815,701
Int. Cl.[5] B01F *15/02, 7/16*
U.S. Cl. 366—163 **6 Claims**



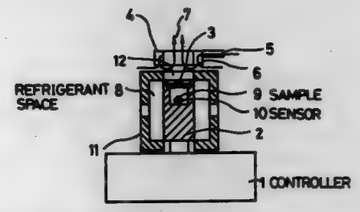
1. An agitator for use in a sealed container having material therein and a bung opening, said agitator comprising:
a housing having an interior bore and a port, said housing port being connected to a pump for withdrawing material from said container;
a generally cylindrical hollow agitator shaft in said container having first and second ends, an axial passage extending the length of said shaft and an opening in said shaft first end connected to said passage allowing material to be withdrawn from said container;
an agitator member located on said agitator shaft adjacent said shaft first end,
a transfer coupling having a circumference and a bore, said coupling being rotatably mounted in said housing bore, said coupling circumference and said housing bore forming a generally annular transfer passage therebetween, said transfer passage being connected to said port and said second end of said agitator shaft being located in said coupling bore, said shaft axial passage communicating with said annular transfer passage; and
a source of rotary motion connected to said coupling.

5,193,909
QUANTITATIVE METHOD FOR MEASURING HEAT FLUX EMITTED FROM A CRYOGENIC OBJECT
Robert V. Duncan, Tijeras, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 12, 1992, Ser. No. 881,980
Int. Cl.[5] G01K *17/00*
U.S. Cl. 374—29 **20 Claims**



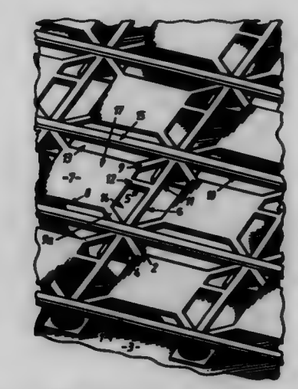
1. A method for measuring heat flux, comprising:
(a) placing an object whose heat flux is to be measured in a liquid helium bath;
(b) measuring the superfluid transition temperature of the bulk liquid helium bath;
(c) reducing the temperature of the bulk liquid helium bath until the superfluid helium comes in contact with, and cools the surface of, the object whose heat flux is to be measured;
(d) instantaneously measuring the temperature of the bulk liquid helium bath when the superfluid helium reaches the surface of the object whose heat flux is to be measured, the determination of which can be detected by a quietude of a measurable property of said object;
(e) determining the difference between the superfluid transition temperature of the bulk liquid helium bath as in step (b) above prior to temperature reduction and the temperature of the bulk liquid helium bath as in step (d) above when the superfluid helium first cools the surface of the heat fluxing object;
(f) determining the total heat flux emitted by the heat-fluxing object as a function of the difference determined in step (e) to thereby obtain a measurement of the total heat flux emitted by the object.

5,193,910
THERMAL ANALYSIS INSTRUMENT
Ryoichi Kinoshita, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan
Filed Nov. 4, 1991, Ser. No. 786,112
Claims priority, application Japan, Nov. 2, 1990, 2-298205
Int. Cl.[5] G01N *25/00*
U.S. Cl. 374—45 **13 Claims**



1. In a thermal analysis instrument comprising:
a heating furnace defining a heating enclosure having a sample introduction opening, the furnace being operative for heating a sample placed in the heating enclosure to a given temperature;
a cover for covering said sample introduction opening in order to close said heating enclosure;
a controller connected to control the temperature inside said heating furnace; and
a sensor for detecting the temperature of a sample inside said heating enclosure; the improvement comprising
blowing means for blowing a drying gas against said heating furnace in the vicinity of said sample introduction opening.

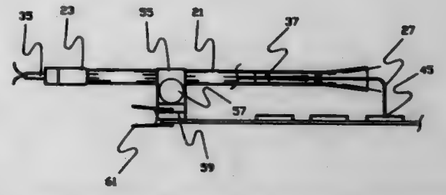
5,193,911
THERMAL DETECTOR DEVICE
Elvin L. Nix, Windsor; Brian Holcroft, High Wycombe, and Stephen D. Etienne, Hayes, all of England, assignors to Thorn Emi plc, London, England
Filed Apr. 24, 1991, Ser. No. 690,714
Claims priority, application United Kingdom, Apr. 24, 1990, 9009117
Int. Cl.[5] G01J *5/12*; H01L *27/16*
U.S. Cl. 374—121 **20 Claims**



1. A thermal imaging device comprising: a pyroelectric layer having an array of interconnected electrodes on one major surface of said layer and an array of discrete electrodes on an opposite major surface of said layer, thereby to form an array of pyroelectric detector elements; an electrical signal processing means; a plurality of pillars for supporting said layer and for enabling the passage of electrical signals between the discrete electrodes and said signal processing means; and a network of thermally conductive further electrodes interspersed between the detector elements and formed on said one major surface of said layer for reducing thermal cross-talk between adjacent detector elements.

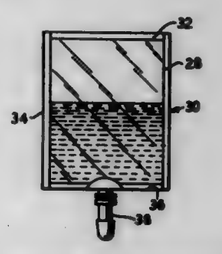
5,193,912
PROBE FOR SENSING AND MEASURING TEMPERATURE
Roger I. Saunders, 92 Van Dyke Rd., P.O. Box 31, Hollis, N.H. 03049
Filed Nov. 18, 1991, Ser. No. 793,197
Int. Cl.[5] G01K *7/04*; H01L *35/02*
U.S. Cl. 374—179 **17 Claims**

1. Probe apparatus for sensing the temperature of at least one electronic component positioned on the surface of a circuit board without causing appreciable relative motion between said component and said circuit board, said apparatus comprising:
(a) a thermocouple junction of dissimilar materials, said thermocouple junction having a protective sheath thereon,
(b) first and second electrical leads disposed axially inside said protective sheath and terminating at said thermocouple junction,
(c) tubular metallic means surrounding said protective sheath and said first and second electrical leads to a point substantially abreast of said thermocouple junction but spaced from said sheath and said junction,
(d) thermally-and-electrically-insulating means for rigidly



maintaining the position of said junction substantially centered within and radially spaced from an end of said tubular metallic means substantially abreast of said junction to prevent relative motion between said thermocouple junction and said tubular metallic means in an axial or radial direction, and
(e) means for causing said protective sheath and said thermocouple junction to make good thermal contact with said component without displacing said component on said circuit board in a direction either normal to or parallel to said circuit board.

5,193,913
RF ENERGY SEALABLE WEB OF FILM
Larry A. Rosenbaum, Gurnee, Ill., assignor to Baxter International Inc., Deerfield, Ill.
Continuation of Ser. No. 350,373, May 11, 1989, abandoned.
This application Feb. 4, 1992, Ser. No. 830,787
Int. Cl.[5] B65D *30/08*; B32B *27/06*
U.S. Cl. 383—113 **21 Claims**



1. A two-layer web of film for manufacturing flexible, autoclavable containers, said web of film comprising:
a first layer of polyester;
a second layer of polyvinyl chloride that does not include a diethylhexylphthalate plasticizer or epoxidized oil;
the second layer having a greater thickness than the first layer that when radio frequency energy is applied to the second layer, the first layer is sealed to a second layer surface.

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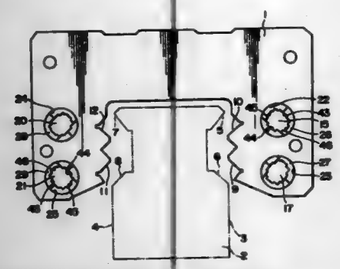
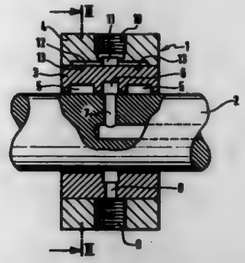
5,193,914
QUAD GUIDE WAY INDEFINITE LINEAR MOTION GUIDE UNIT
Kazuhiko Tanaka, Fuchu, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan
Filed Nov. 27, 1991, Ser. No. 800,805
Claims priority, application Japan, Nov. 27, 1990, 2-324967
Int. Cl.[5] F16C 29/06
U.S. Cl. 384—45 10 Claims



1. A linear motion guide unit, comprising:
a rail including an inner guiding means;
a slider including a center block and a pair of end blocks located on opposite ends of said center block, said center block including an outer guiding means located opposite to and spaced apart from said inner guiding means to thereby define a load path section, said center block including a sleeve fitted into a hole formed therein, said sleeve including a passage which defines a return path section, said sleeve having a first profiled structure at each end, and each of said pair of end blocks including a curved connecting path section having one end connected to one end of said load path section and another end, which has a second profiled structure complementary to said first profiled structure, connected to one end of said return path section to thereby define an endless circulating path; and
a plurality of rolling members filled said endless circulating path;
wherein one of said first and second profiled structures includes an elongated projection which defines a first part of said return path section and the other of said first and second profiled structures includes a recess which defines a second part of said return path section complementary to said first part in a circumferential direction for receiving said elongated projection to thereby define a mating connection therebetween.

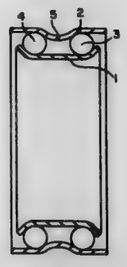
5,193,915
DEVICE FOR DELIVERING PRESSURIZED FLUID FROM A STATIONARY PART TO A ROTATABLE SHAFT
Reinhold Leidenfrost, Lerchenweg 1, 8439 Postbauer-Heng, Fed. Rep. of Germany
Filed Jun. 3, 1992, Ser. No. 893,126
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1991, 4119465
Int. Cl.[5] F16C 32/06
U.S. Cl. 384—118 14 Claims

1. A device for delivering a pressurized fluid from a stationary part to a rotating shaft, said device comprising:
a fixed housing having an inner ring and an outer sleeve securely fitted upon said ring to define adjoining cylindrical surfaces, said sleeve being provided with an inlet opening for introduction of pressurized fluid and a closable outlet opening for allowing discharge of pressurized fluid;
bearing means provided in said ring for supporting the shaft, said bearing means including two hydrostatic bearings spaced from each other in axial direction, with each hydrostatic bearing including circumferentially spaced recesses which are supplied with pressurized fluid from said inlet opening and communicate with outwardly extending radial bores, with a ring channel arranged between said hydrostatic bearings and communicating via leakage oil throttle gap with said recesses, wherein said ring channel is connected to a feed bore in the shaft for inflow of pressurized fluid and to said outlet opening of said sleeve; and



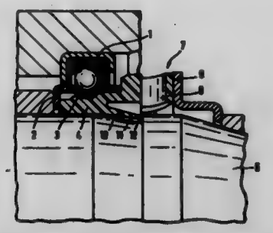
restriction means provided in one of said adjoining surfaces between said ring and said sleeve for creating a throttle effect, said restriction means communicating with said inlet opening in said sleeve and with said radial bores in said ring.

5,193,916
DOUBLE ROW ANGULAR CONTACT BALL BEARINGS AND A METHOD FOR THE MANUFACTURE THEREOF
Borje Andersson, Sandared, Sweden, assignor to SKF GmbH, Gothenburg, Sweden
Division of Ser. No. 574,742, Aug. 30, 1990, which is a continuation of Ser. No. 309,472, Feb. 10, 1989, abandoned. This application Sep. 18, 1991, Ser. No. 763,663
Claims priority, application Sweden, Feb. 11, 1988, 8800460
Int. Cl.[5] F16C 19/08
U.S. Cl. 384—512 14 Claims



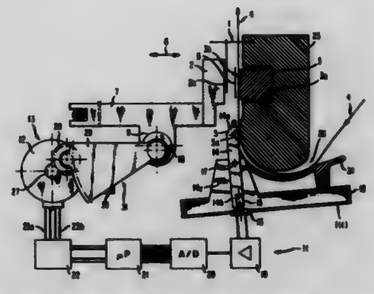
1. A double row, angular contact ball bearing including two rows of balls, comprising: a one-piece sheet metal inner race ring (1); a one-piece sheet metal outer race ring (2); means defining at least one circumferential depression (5) in one race ring between the rows of balls (3,4); the other race ring having circumferentially extending end members (7) axially outside each row of balls (3,4) and radially directed toward the balls (3,4); at least one of said end members (7) being shaped and finished by roll pressing so as to be deformed radially toward the balls (3,4), thereby controlling ball play and providing raceway surfaces almost as smooth as ground surfaces.

5,193,917
ROLLING BEARINGS FOR STEERING COLUMNS
Hellmut Adler, and Alexander Zernickel, both of Herzogenaurach, Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany
Filed Apr. 30, 1992, Ser. No. 876,477
Claims priority, application Fed. Rep. of Germany, May 4, 1991, 4114643
Int. Cl.[5] F16C 27/06
U.S. Cl. 384—517 4 Claims



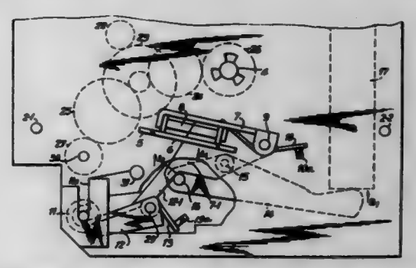
1. A rolling bearing, in particular for steering columns of automotive vehicles, comprising rolling elements in the form of balls (3) arranged between an inner ring (2,14) and an outer ring (1,13), and a tolerance ring (4,16) of a polymeric material which is at least partially surrounded by the inner ring (2,14) and is pressed axially against the inner ring (2,14) in the direction of the balls (3) by a spring (7,17) characterized in that the spring (7,17) is made of a polymeric material as a one-piece component with the tolerance ring (4,16).

5,193,918
PRINT-HEAD POSITIONING SYSTEM HAVING A PAPER SENSOR
Gerhard Lohrmann, Elchingen/Thalfingen, and Helmut Riesenegger, Elchingen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Filed Sep. 8, 1989, Ser. No. 404,893
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1988, 3830880
Int. Cl.[5] B41J 25/308
U.S. Cl. 400—56 21 Claims



1. A printer with a print-head distance-setting device comprising
a printer frame having side walls;
a print head;
a print-material counter support for a recording-material carrier selected from recording-material carriers of varying thicknesses, or for a changing number of superposed recording-material carriers forming a recording-material carrier surface disposed toward the print head;
a mechanical sensing member resting on the recording-material carrier surface;
a first guide axle; said first guide axle having two ends and a axis,
a second guide axle disposed parallel to the first guide axle;
a sensing member;
a longitudinally movable print-head slider carriage supporting the print head, which print-head slider carriage is guided on the first guide axle and on the second guide axle;
a pair of eccentrically disposed pins disposed at the two ends of the first guide axle and disposed eccentrically relative to the axis of the first guide axle for supporting the first guide axle;
wherein the second guide axle is supported movably in a direction perpendicular relative to an axis of the second guide axle in the printer side walls;
a step motor supported in the printer frame, wherein the step motor is a servo drive having means for pivoting the pair of eccentrically disposed pins of the guid axle and for adjusting a distance between the print head and the print-material counter support;
an electronic circuit having means for processing an electrical analog signal, derived from adjustment motions of the sensing member, to a converted configuration of an electronic digital signal for generating in the electrosic circuit an output signal for controlling the step motor, such that the sensing member controls the position of the print head;
means for adjusting the print-head perpendicular to a longitudinal direction defined by a direction of motion of the movable print-head slider carriage;
wherein the electronic circuit includes a sensor and wherein the mechanical sensing member includes a sensing lever having a first end, a second end and a pivot between the first end and the second end;
a sensing roller rotatably supported at the first end of the sensing lever;
spring means for subjecting the sensing roller to a spring force;
an indicator of soft iron material disposed at the second end of the sensing lever;
means for generating an analog signal in the sensor of the electronic circuit based on the motion of the indicator.

5,193,919
TAPE PRINTER
Hiroki Godo; Tsutomu Yamazaki, and Masaaki Ito, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 6, 1990, Ser. No. 609,501
Claims priority, application Japan, Nov. 9, 1989, 1-292855; Nov. 25, 1989, 1-136249[U]; Nov. 25, 1989, 1-305237
Int. Cl.[5] B41J 2/325
U.S. Cl. 400—120 46 Claims



1. A tape printer for printing on a tape comprising a housing, printing means for selectively printing on said tape, displacing means supporting said printing means on said housing for displacement between a first position where said printing means is adjacent said tape for printing thereon and a second

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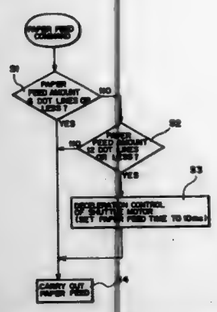
position where said printing means is disengaged from said tape, tape conveying means for conveying said tape across said printing means, said displacing means supporting said tape conveying means on said housing for displacement between a first position where said tape conveying means is engaged with said tape for conveying said tape and a second position where said tape conveying means is disengaged from said tape, over means pivotably supported on said housing for covering said tape printer and pivotable between a first open position and a second closed position, said displacing means being operatively coupled to said cover means for the displacement of said displacing means between said first and second positions of said printing means and tape conveying means in response to the pivoting of said cover means between said closed and open positions, whereby said cover means moves said printing means and said tape conveying means to their respective second disengaged positions when open and moves said printing means and said tape conveying means to their respective first engaged positions when closed.

5,193,920
DOT LINE PRINTER WITH PAPER FEED TIME CONTROLLING CAPABILITY

Yoshikane Matsumoto; Toshio Hiki; Toshiaki Fujieda; Shingo Nakahara; Shozo Ishii, and Hiroto Inagawa, all of Katsuta, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,534
Claims priority, application Japan, Aug. 4, 1989, 1-203046; Feb. 16, 1990, 2-36902
Int. Cl.[5] B41J *19/76*
U.S. Cl. 400—121 **5 Claims**



1. A dot line printer for carrying out printing on a sheet of paper upon making dot impressions thereon, comprising:

a hammer bank movably disposed along a line extending in a first direction and accommodating a plurality of print hammers divided into M groups, each groups containing N-number print hammers spacedly arranged in the first direction and displaced one dot line from one another in a second direction perpendicular to the first direction, wherein M and N are integers;

a shuttle mechanism including a rotary motor and a cam mechanism for shutting said hammer bank back and forth, at a first speed, along the line upon converting rotary motions of said motor to linear motions by means of said cam mechanism, said hammer bank reversing direction at first and second positions as said hammer bank shuttles, wherein N-dot lines are printed at a time during one print cycle of said hammer bank defined by a single movement of said hammer bank toward the first or second position after reversing direction at the second or the first position, respectively;

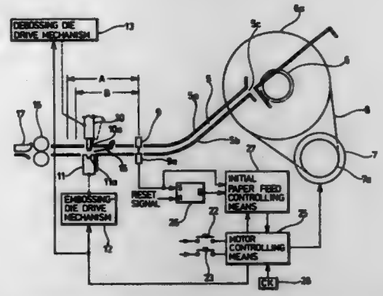
a sheet feeding mechanism for feeding the sheet of paper in the second direction during a hammer bank reversing time at which said hammer bank reverses direction at the first or second position, wherein said sheet feeding mechanism feeds the sheet of paper N-dot lines when the print cycle follows immediately thereafter; and

control means for controlling said shuttle mechanism to prolong the hammer bank reversing time by slowing down said hammer bank to a second speed, said second speed being varied so as to effect revering of said hammer bank and allowing performance of a amount of line space feeding greater than N-dot lines within the prolonged hammer bank reversing time when the printing of one line is finished after carrying out a predetermined number of print cycles, said second speed being less than a speed of said hammer bank at which said hammer bank reverses when feeding N-dot lines or less.

5,193,921
BRAILLE PRINTER

Yoshimi Tsukada, Chofu, and Isamu Goto, Musashino, both of Japan, assignors to Toyo Hybrid Co., Ltd., Mitaka, Japan

Filed Apr. 1, 1992, Ser. No. 861,638
Claims priority, application Japan, Jul. 26, 1991, 3-208943
Int. Cl.[5] B41J *2/22*
U.S. Cl. 400—122 **6 Claims**



1. A braille printer, comprising:

means defining a paper feed passage for passing paper therethrough, the paper feed passage being further defined with an entry and an exit;

a paper feed mechanism having a motor and being disposed in the entry of the paper feed passage;

motor controlling means for controlling said motor to feed paper onwhich braille characters are embossed to an embossing start position, according to one dot line spacing and character line spacing;

a plurality of embossing and debossing dies facing each other being arranged in the form of a line at an embossing position approximately midway down the paper feed passage, each embossing die having at least one of a recess and a projection, and each debossing die having at least one of a projection and a recess;

the projections and recesses of the embossing and debosing dies being pressed together in response to braille signals in synchronization with the paper feed controlled by said motor controlling means, whereby an embossing of braille characters is performed on the paper by the embossing and debossing dies;

at least oen leading-edge position sensor, disposed in the paper feed passage, for detecting the lead-edge position of the paper, the at least one leading-edge position sensor generating a detection signal;

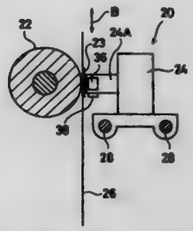
obverse-/reverse-surface indicating means for outputting an obverse-/reverse-surface indication signal indicating which one of either the obverse surface or reverse surface of the paper should be printed; and

initial paper-feed controlling means for, in response to the detection signal from the leading-edge position sensor and to the obverse-/reverse-surface indication signal, outputting an initial paper-feed termination signal to the motor controlling means when the paper is fed to an embodding position which is offset relative to the braille characters on the other side of the paper so that said characters will not overlap.

5,193,922
SERIAL PRINTER

Mikio Hayashi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1991, Ser. No. 688,010
Claims priority, application Japan, Apr. 24, 1990, 2-108068
Int. Cl.[5] B41J *9/02*
U.S. Cl. 400—157.1 **1 Claim**

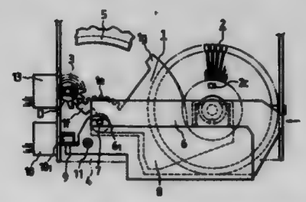


1. A serial printer comprising a printing head having a printing element and being movable at a right angle with respect to the feeding direction of a recording paper to be printed, means to move and impart kinetic energy to said printing element to cause said printing element to record on a recording paper, and means to increase the kinetic energy which is imparted to said printing element to increase the printing energy with which said printing element prints on said recording paper, said means to increase the kinetic energy including vibration applying means mounted on both a side and on the back of said printing head for vibrating said entire printing head during the printing operation.

5,193,923
AUTOMATICALLY INTERCHANGEABLE TYPE WHEEL TYPE PRINTING APPARATUS

Hirootsu Kondo, Zushi, and Hideo Saito, Mitsukaido, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 244,174, Sep. 14, 1988, abandoned. This application Jan. 11, 1990, Ser. No. 536,087
Claims priority, application Japan, Sep. 24, 1987, 62-240124
Int. Cl.[5] B41J *1/30*
U.S. Cl. 400—171 **11 Claims**



1. An automatically interchangeable type wheel printer including:

a platen; and

a carrier reciprocally movable along said platen; said carrier having:

a type wheel container for housing a plurality of type wheels, said type wheel container being movably provided in said carrier for a type wheel selecting operation;

type wheel moving members for raising the type wheels to a printing position, with one of said type wheel moving members each corresponding to one type wheel for pivotally moving a corresponding type wheel between the printing position for printing and a home position in said container, said type wheel moving members each having at one end thereof an engaging portion engaged with its corresponding type wheel and having at the other end thereof a center of rotation and a drive force transmitting portion;

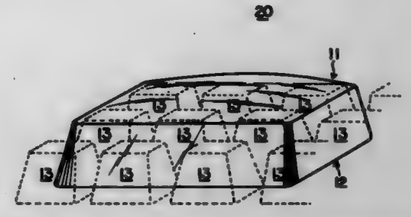
first drive means for rotating a selected type wheel moving member about its center of rotation, said first drive means having its drive force transmitted to said selected type wheel moving member through said drive force transmitting portion; and

second drive means for rotatively driving the type wheel in the printing position, said second drive means having a restraining portion for restraining the type wheels moved to the printing position by said corresponding type wheel moving member.

5,193,924
CAP COVER FOR KEYBOARD KEYS

Carlyn F. Larson, 3021 Moore St., Boise, Id. 83702

Filed Aug. 8, 1991, Ser. No. 742,371
Int. Cl.[5] B41J *5/16*
U.S. Cl. 400—472 **10 Claims**



1. The combination of a keyboard having a plurality of keys, a keyboard base plate and a keycap cover for said keyboard key which consists of a keyboard each of said keys consisting of a stem-like chimney on top of which a keycap is provided, said keyboard keys protruding upwardly from said keyboard base plate; and,

a keycap cover which can be selectively positioned on said keyboard base plate and removed from and replaced at a different position on said keyboard base plate, said keycap cover being

generally rectangular and consisting of side walls, a closed top end, and an open bottom end,

said keycap cover open bottom end being adapted to removably rest on said keyboard base plate at any one of a plurality of different positions; and,

said keycap cover open bottom end being adapted to removably receive a keyboard key, said keycap cover contacting only said keyboard base plate and contacting said keyboard base plate only at the bottom of said keycap cover's side walls.

5,193,925
FOAM KEYBOARD WRIST SUPPORT AND DUST COVER APPARATUS AND METHOD

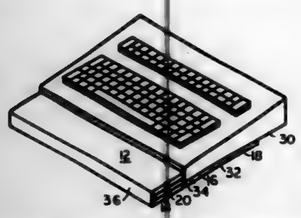
Robert W. Foulke, San Clemente, Calif., assignor to Packaging Industries Group, Inc., Hyannis, Mass.

Filed Jan. 27, 1992, Ser. No. 825,951
Int. Cl.[5] B41J *29/00*
U.S. Cl. 400—715 **14 Claims**

1. A foam wrist-support and dust-cover apparatus for use with a keyboard having a front section and a face surface to provide wrist support for a keyboard user in a wrist support

position and a dust cover for the keyboard in a protective dust cover position, which apparatus comprises:

a generally rectangular, foldable, flat sheet of flexible foam material composed of a plurality of separate, adjacent foam sections, each foam section separated by cut lines in the foam sheet material, to form a plurality of foam hinges in the sheet material between the foam sections, and to render the separate foam sections foldable, with respect to each other, the sheet of foam material having a width which extends substantially the length of the keyboard, and a length sufficient to extend from the front surface of the keyboard over the face of the keyboard, to serve as a



protective dust cover, the foam sheet material adapted to move between a wrist-support position in front of a keyboard, with a plurality of the foam sections stackably folded on top of each other, to form a wrist-support for the user of the keyboard, and with at least one end foam section secured beneath the front portion of the keyboard, to retain the foam sheet material in position, and a keyboard dust-cover position, wherein the foam sections are extended in sheet form over the face surface of the keyboard, to form a protective dust cover, and with at least one end foam section beneath the front section of the keyboard, to retain the protective dust cover in position.

5,193,926

APPARATUS FOR RECORDING IMAGE COVERED BY PROTECTIVE MEDIUM

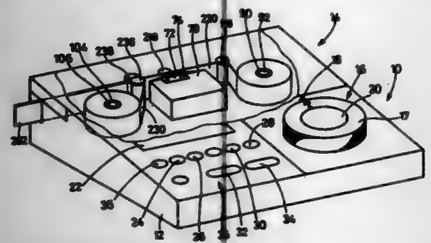
Susumu Kuzuya, Gifu; Seiji Shimizu; Mikio Kato, both of Nagoya; Yujiro Ishikawa, Toyota; Takashi Sakai, Nagoya, and Eiji Yuki, Owariasahi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 261,318, Oct. 24, 1988, Pat. No. 5,009,530. This application Nov. 29, 1990, Ser. No. 619,470

Claims priority, application Japan, Dec. 21, 1987, 62-323429; Oct. 31, 1989, 62-167673

Int. Cl.[5] B41J *2/325*

U.S. Cl. 400—719 24 Claims



1. A recording apparatus, comprising:

a recording tape having a first adhesive layer formed on one of opposite surfaces thereof, and a release layer covering said first adhesive layer;

a tape feeding device for feeding said recording tape in a longitudinal direction of said tape;

a recording head for recording an image including a plurality of characters on the other of said opposite surfaces of said recording tape, said recording head being disposed between said recording tape and a front portion of the recording apparatus, said recording head recording said plurality of characters in sequence in said longitudinal direction such that a vertical direction defined by each of said characters is substantially perpendicular to said longitudinal direction;

a substantially transparent covering tape for covering said other surface of said recording tape on which said image is recorded, said covering tape having a second adhesive layer; and

a pair of presser rollers disposed downstream of said recording head as viewed in a direction of feed of said recording tape by said tape feeding device, said presser rollers defining therebetween a pressure nip through which are passed a recorded portion of said recording tape having said image recorded thereon and said covering tape, so that said covering tape is bonded at said second adhesive layer to said other surface of said recorded portion of said recording tape.

5,193,927

MECHANICAL PENCIL HAVING PROPELLING DEVICE FOR A BAR SHAPED ARTICLE

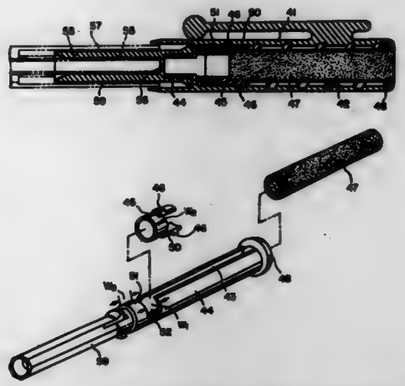
Shuchi Kageyama; Yoshihide Mitsuya, and Kazuo Gomi, all of Kawagoeshi, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Mar. 15, 1990, Ser. No. 494,095

Claims priority, application Japan, Mar. 24, 1989, 1-34009; Jun. 30, 1989, 1-77565; Sep. 18, 1989, 1-109296

Int. Cl.[5] B43K *29/02*

U.S. Cl. 401—52 3 Claims



1. A mechanical pencil having a container for extending or retracting a bar shaped article comprising; an outer sleeve having a helical groove on an internal surface; an inner sleeve having a longitudinal slit; holding means for holding said bar shaped article; said holding means having a projection slidably mounted in said longitudinal slit; said inner sleeve and holding means being mounted in said outer sleeve with said projection engaging said helical groove through said longitudinal slit; a bar shaped article being firmly held in said holding means for extension or retraction from a head by rotation of said outer sleeve relative to said inner sleeve; said inner sleeve having a radial recess at a forward end of said longitudinal slit; said holding means being mounted in said inner sleeve with said projection engaging said longitudinal slit by inserting said holding means through said radial recess.

5,193,928

FLUID APPLICATION DEVICE WITH SLIDING SLEEVE CUTTING MEMBER

Dieter Balzer, Wilen; Fabian Gysin, and Robert Schoenholzer, both of Wildenswil, all of Switzerland, assignors to Essex Specialty Products, Inc., Clifton, N.J.

Filed Jun. 22, 1992, Ser. No. 901,928

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1991, 4120634

Int. Cl.[5] B05C *17/00*

U.S. Cl. 401—132 11 Claims

1. A device for applying a fluid medium onto the surface of an article, particularly for applying a moisture-sensitive primer for adhesive joints, comprising:

a moisture- and air-tight container for receiving said fluid medium, said container having a central longitudinal axis and being provided with an application means;

said container comprising an outlet opening and a sealing diaphragm sealing said outlet opening of said container in an air- and moisture-tight manner;

said application means being fixed to said container at said outlet opening of said container and comprising a fluid application member which is immovable with regard to said container and which is laterally covered by a sleeve member;

said sleeve member being displaceable in the direction of said central longitudinal axis of said container whereby a locking member is provided to prevent an unintentional axial displacement of said sleeve member;

said sleeve member further comprising a cutting member displaceable together with said sleeve member and adapted to destroy said sealing diaphragm;

said fluid application member being exposed out of the interior of said sleeve member and said sealing diaphragm being destroyed upon removing or destroying said locking member and displacing said sleeve member along said central longitudinal axis towards said container.

5,193,929

METHOD AND APPARATUS FOR PRELOADING A JOINT BY REMOTELY OPERABLE MEANS

Jon B. Kahn, League City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 1, 1992, Ser. No. 892,072

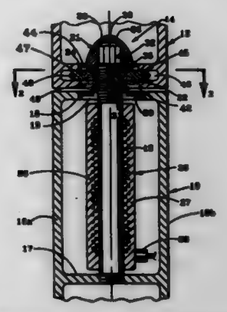
Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—14 9 Claims

1. Apparatus for joining a pair of structural elements and imposing a tensile preload on the structural joint, said apparatus comprising:

a probe including an elongated shaft of heat contractible material capable of changing from an expanded length to a contracted length upon an application of heat in a specific transition temperature range, said shaft being provided at one end with a probe head having an external latching shoulder formed thereabout;

means for mounting said shaft on a first of said structural elements with the probe head thereof projecting therefrom, the second of said structural elements being provided with a receptacle opening adapted to receive the probe head of said shaft when the first structural element is moved in proximity to the second structural element with said shaft in approximate alignment with the receptacle opening;



a latching system mounted on said second structural element adjacent to the receptacle opening for latchingly engaging said probe head when the probe is inserted a predetermined minimal distance into said receptacle opening and thereby forms a loose soft-capture joint between said first and second structural elements; and

means for heating said elongated shaft to said transition temperature range to cause said shaft to transform from said expanded length to said contracted length and said latching shoulder to engage with said latching mechanism and impose a tensile preload across said joint.

5,193,930

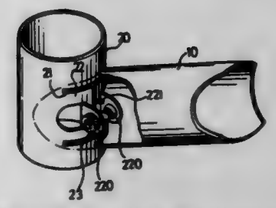
COUPLING FOR SECURING A HANDLEBAR STEM OF A BICYCLE

Yi C. Chi, No. 139-5, An Mei Rd., Mei Shan Village, Hou Li Hsiang Taichung Hsien, Taiwan

Filed Jun. 24, 1992, Ser. No. 903,995

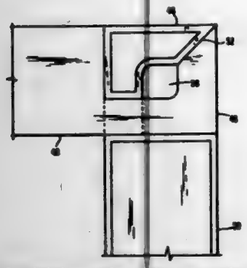
Int. Cl.[5] B62K *21/18;* F16D *1/06*

U.S. Cl. 403—24 4 Claims



1. A coupling for securing a handlebar stem on a front fork comprising a tube engaged on said front fork, a shank including a first end fixed on said tube and including an opening formed therein close to said tube, said tube including a pair of panels formed therein and located in said first end of said shank, a lug extended from each of said panels, and a bolt engaged between said lugs for coupling said lugs together in order to fix said tube on said front fork.

5,193,931
JOINTING SYSTEM
Paul T. Arato, Willowdale, Canada, assignor to Arato Design Associates, Inc., Canada
Filed Mar. 22, 1991, Ser. No. 673,839
Int. Cl.[5] F16B *9/02*
U.S. Cl. 403—231 12 Claims

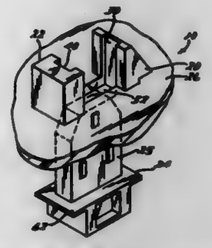


1. A system for joining at least three members by joint elements comprising:
first and second joint elements, each with opposed surfaces, at least one notch formed across a portion of the width of each said opposed surface, the notch on one opposed surface of said first element being complementary to a notch of said second element, said complementary notches inter-engaging to form a notch on notch joint between said first and second elements, the notch on the other opposed surface of said first element engaging a complementary notch on a third element to form a second notch on notch joint between said first and third elements;
each of said inter-engaging elements further including a longitudinal extension beyond said notch, each said extension including an abutment surface, said abutment surface of said first inter-engaging element being complementary to and engaging said abutment surface of said second inter-engaging element.

5,193,932
COUPLER FOR REINFORCING BARS
Tsung-Hwai Wu, 1st Fl., No. 3, Lane 464, Sec. 6, Yenping N. Rd., Taipei, Taiwan
Filed May 20, 1992, Ser. No. 886,412
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—307 3 Claims

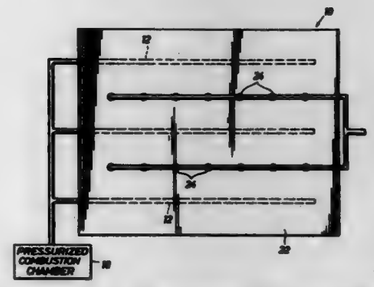
1. A coupler for reinforcing bars comprising:
an internally threaded sleeve means with a first and second internally threaded coupling portion respectively extending and tapering outward from two ends thereof, each said first and second coupling portion having a plurality of longitudinally formed slits; and
first and second clamping collars each having a conical hole which tapers outward with an inner diameter of an inner opening thereof greater than that of an outer opening thereof and with a slope slightly greater than that of associated first and second coupling portions, an outer diameter of each said first and second coupling portion being slightly less than said inner diameter of said inner opening of associated said first and second clamping collars;
whereby a threaded coupling end of said reinforcing bars is screwed into said coupler via said first and second coupling portions, and said first and second clamping collars are pushed inward along said outer periphery of associated said first and second coupling portions to securely clamp said reinforcing bars in said coupler.

5,193,933
IN SITU MODULAR FASTENING SYSTEM
John W. Mailey, 6114 Fountain Pt., Grand Blanc, Mich. 48439
Filed Jan. 31, 1992, Ser. No. 828,724
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—408.1 16 Claims



1. An integral modular fastening system for connecting a plastic member to a frame, said fastening system comprising:
a locking member integral with and extending generally perpendicular from said plastic member and forming a slot for engaging said frame between said locking member and said plastic member, said locking member having a first angular surface and being movable between a locked position and an unlocked position;
a support member extending parallel to and spaced apart from said locking member; and
means for positioning said locking member in said locked position and prohibiting said locking member from moving from said locked position towards said unlocked position; said positioning means disposed between said locking member and said support member.

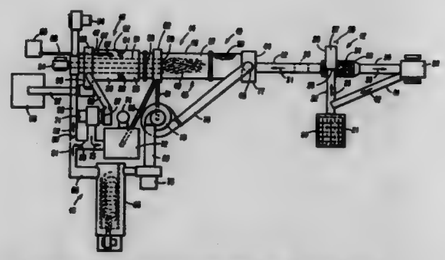
5,193,934
IN-SITU THERMAL DESORPTION OF CONTAMINATED SURFACE SOIL
Paul C. Johnson, Sugar Land, and David A. Weingaertner, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed May 23, 1991, Ser. No. 705,712
Int. Cl.[5] B09B *3/00*
U.S. Cl. 405—128 17 Claims



1. An apparatus for the remediation of soil contaminated with contaminants comprising:
vapor permeable insulating means placed on the surface of the contaminated soil;

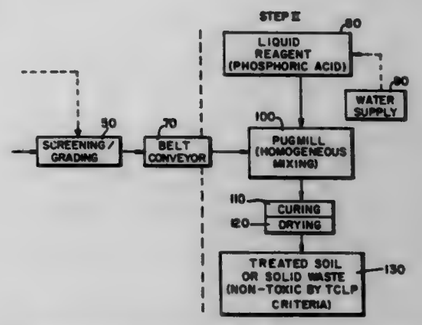
vapor impermeable means covering said insulating means, said vapor impermeable means having at least one opening therein;
hot vapor distribution means, comprising a pipe having openings along its length, said pipe being buried below and essentially horizontal to said contaminated soil;
means for forcing hot gaseous fluids through said pipe;
pressure reducing means connected to said opening in said vapor impermeable means and acting in cooperation with said distribution means to collect at reduced pressure and above the surface of said contaminated soil the vapors generated by said distribution means; and
separation means for removing from said collected vapors the environmentally undesirable portions thereof.

5,193,935
SOIL DECONTAMINATION APPARATUS AND METHODS OF DECONTAMINATING SOIL
Joseph E. Musil, Ely, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa
Continuation of Ser. No. 638,046, Jan. 7, 1991, abandoned. This application Jul. 2, 1992, Ser. No. 908,903
Int. Cl.[5] B09B *3/00*
U.S. Cl. 405—128 15 Claims



1. Apparatus for decontaminating soil comprising:
a drum drier including a heating and drying zone and a material combination zone;
means for heating soil, the soil including a base material and soil particles capable of becoming entrained in a gaseous flow, in a hot decontaminating gas stream to a temperature above the vaporization temperature of contaminants within the soil, the soil heating means comprising means for generating and passing a stream of hot gases through the heating and drying zone;
means for feeding soil at a predetermined rate into the heating and drying zone;
means for advancing the soil through the drum drier from heating and drying zone into the material combination zone out of exposure to said gas stream;
means for removing soil particles carried by said gas stream from said gas stream; and
means for combining such soil particles after removal from said gas stream within the material combination zone with the base material subsequent to the base material having been advanced to the material combination zone out of exposure to said gas stream and with substantially no gaseous movement.

5,193,936
FIXATION AND STABILIZATION OF LEAD IN CONTAMINATED SOIL AND SOLID WASTE
Dhiraj Pal, Chicago Heights, and Karl Yost, Crete, both of Ill., assignors to MAECORP Incorporated, Chicago, Ill.
Continuation-in-part of Ser. No. 494,774, Mar. 16, 1990, abandoned. This application Jul. 23, 1991, Ser. No. 721,935
Int. Cl.[5] B09B *3/00*; E02D *3/00*
U.S. Cl. 405—128 20 Claims



1. A treatment process for treating lead-toxic solid wastes to stabilize leachable lead contained therein, said process comprising the steps of:
mixing a solid waste containing leachable lead with a sulfate compound having at least one sulfate ion for reacting with said leachable lead to produce a first mixture, said first mixture containing a substantially insoluble lead compound or mineral species; and
mixing said first mixture with a phosphate reagent having at least one phosphate ion for reacting with leachable lead remaining said first mixture to produce a second mixture, said second mixture containing a substantially insoluble lead compound or mineral species;
curing said second mixture for a period
such that the material so treated is substantially solid in form at the end of curing, the material passes the paint filter test, TCLP lead levels are decreased below 5.0 mg/l, the volume of said solid waste is reduced as a result of treatment and curing, and no secondary waste streams are generated.

5,193,937
SEABED STABILIZATION MATTRESSES
Keith E. J. Miller, Maidenhead, England, assignor to SeaMark Systems Limited, Broxburn, England
PCT No. PCT/GB90/01720, § 371 Date Jul. 18, 1991, § 102(e) Date Jul. 18, 1991, PCT Pub. No. WO91/07544, PCT Pub. Date May 30, 1991
PCT Filed Nov. 8, 1990, Ser. No. 720,774
Claims priority, application United Kingdom, Nov. 10, 1989, 8925502
Int. Cl.[5] F16L *1/12*
U.S. Cl. 405—157 9 Claims

1. An articulated mattress for laying on a seabed to cover and insulate a pipeline, said mattress comprising a plurality of elongate concrete members which are articulated together for lying on a seabed in side-by-side and generally parallel relation, said mattress including a central member comprising a unitary rigid concrete block having first and second opposed side walls, and a generally planar undersurface for engagement with the seabed, an elongate tunnel in said undersurface extending lengthwise of said central member between said side walls, and a first insulate material installed in said tunnel prior

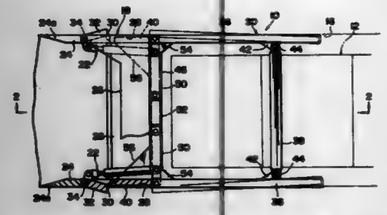
to deployment of said mattress over a pipeline, said insulant being constructed and arranged to cover and insulate a previously laid pipeline as said mattress is deployed over said pipeline.

5,193,938

METHOD AND APPARATUS FOR LAYING PIPE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

PCT No. PCT/JP91/00088, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO91/11563, PCT Pub. Date Aug. 8, 1991
PCT Filed Jan. 28, 1991, Ser. No. 721,449
Claims priority, application Japan, Jan. 29, 1990, 2-16204
Int. Cl.[5] E02D *11/00, 5/02*
U.S. Cl. 405—154 10 Claims



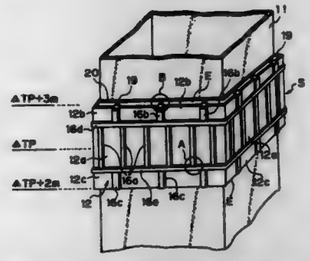
1. An apparatus for laying a pipe, comprising:
a first frame assembly provided with a pair of first plate-like earth-retainers placed to face each other at a horizontal interval and first connecting means for interconnecting both said first plate-like earth-retainers;
a second frame assembly disposed rearward of said first frame assembly and provided with a pair of second plate-like earth-retainers placed to face each other at a horizontal interval and second connecting means for interconnecting both said second plate-like earth-retainers;
drive means for relatively moving said first and second frame assemblies in forward or rearward directions;
first position maintaining means for unlockably preventing said first frame assembly from moving in forward or rearward directions relative to ground by causing a reaction force acting on said first frame assembly to act on said ground; and
second position maintaining means for unlockably preventing said second frame assembly from moving in the forward or rearward directions relative to said ground by causing a reaction force acting on said second frame assembly to act on said ground,
wherein said second frame assembly is further provided with a cylindrical member extending from one side of said second plate-like earth-retainers toward the other and a slider capable of protruding from and being contained within said cylindrical member and connected to a corresponding second plate-like earth-retainers, and wherein said jack is disposed within said cylindrical member such that said slider is displaced relative to said cylindrical member; and
wherein said second position maintaining means is provided with a jack for displacing both said second plate-like earth-retainers such that either of the forward and rearward ends of both said second plate-like earth-retainers are separated from each other.

5,193,939

MARINE STRUCTURE HAVING SUPERIOR CORROSION RESISTANCE

Taiji Nagatani, Futtsu; Seiichi Soeda, Tokyo; Kazuo Sakai, Tokyo, and Yasuo Takahashi, Tokyo, all of Japan, assignors to Nippon Steel Corporation and Trans-Tokyo Bay Highway Corporation, both of Tokyo, Japan

Filed Nov. 13, 1991, Ser. No. 791,913
Claims priority, application Japan, Nov. 16, 1990, 2-310822; Jun. 24, 1991, 3-152043
Int. Cl.[5] E02D *31/06*
U.S. Cl. 405—211 7 Claims



1. A marine structure having a surface splash zone that is to be in contact with splashing sea water, comprising:
a corrosion resistant covering material for covering the splash zone composed of rectangular titanium-clad steel plates that are continuously arranged in vertical and horizontal directions, long sides of the titanium-clad steel plates at the top and bottom steps of the anticorrosion covering arrangement are horizontally arranged, adjacent titanium-clad steel plates are joined together and integrated into the corrosion resistant covering material;
each of the titanium-clad steel plates is provided with grooves along each side thereof that face a corresponding side of an adjacent titanium-clad steel plate; the grooves formed at base layers of adjacent titanium-clad steel plates are welded; the grooves formed at titanium layers of adjacent titanium-clad steel plates are covered with and joined together through a patch plate made of the same material as that of the titanium layer; and a space formed at an exposed end face of each joint between adjacent titanium-clad steel plates at the top and bottom steps of the corrosion resistant covering material is sealed with a sealing cover.

5,193,940

MINE ROOF SUPPORT SYSTEM

Lawrence E. Long, Avon Lake, Ohio, assignor to Dyckerhoff & Widmann AG, Munich, Fed. Rep. of Germany

Filed Aug. 23, 1991, Ser. No. 749,323
Int. Cl.[5] E21D *21/00*
U.S. Cl. 405—259.1 15 Claims

1. A roof support system for supporting a roof of a mine, said roof having first and second bores extending into said roof, said roof support system comprising:
first rod means having a first rod portion secured within said first bore and a second rod portion extending into said mine;
second rod means having a first rod portion secured within said second bore and a second rod portion extending into said mine;
connector means having a connector body with first and second faces, said connector body having only two holes extending between said first and second faces, said second rod portion of said first rod means extending into a first of said holes through said first face and having an end exiting said first hole through said second face, and said second rod portion of said second rod means extending into the second of said holes through said second face and having an end exiting said second hole through said first face;

a first nut threaded over said end of said second portion of said first rod means; and,
a second nut threaded over said end of said second portion of said second rod means, wherein said connector means and said first and second nuts hold said first and second rod means together in roof supporting fashion.

5,193,941

GROUT AND METHOD OF DISTRIBUTING ALUMINUM THEREIN

Alfonzo L. Wilson, Cleveland Heights, Ohio, assignor to Specrete-IP Incorporated, Cleveland, Ohio

Continuation-in-part of Ser. No. 620,148, Nov. 30, 1990, Pat. No. 5,118,527, which is a continuation of Ser. No. 104,226, Oct. 5, 1987, abandoned. This application Jul. 26, 1991, Ser. No. 736,523
Int. Cl.[5] E02D *3/12;* C04B *22/04*
U.S. Cl. 405—266 2 Claims

1. A method of providing an alkaline neat cementitious wet grout slurry at a job site in an elevated ambient temperature environment, said method comprising the steps of providing at the job site: (1) water for forming a wet grout slurry, (2) cement, and (3) a blended fluidifier composition, the fluidifier being a blended composition which includes a high range water reducer as a retarder, particles functioning as dispersants, and aluminum flakes adhered to microspheres for distributing the aluminum flakes evenly throughout the grout slurry, the flakes having a protective coating thereon which adheres the flakes to the microspheres and which survives mixing of the fluidifier composition into the cement slurry and which reacts to the alkalinity of the grout to effectively expand the grout on placement, the fluidifier having a weight which is about 1% of the cement in the slurry, and mixing the cement and fluidifier in sequence into the slurry water to form the wet grout slurry and distribute the fluidifier evenly throughout the wet grout substantially free of aluminum concentration, and pumping the wet grout slurry under elevated ambient temperature conditions to place the grout slurry.

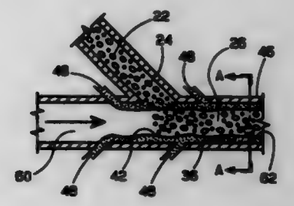
5,193,942

METHOD AND APPARATUS FOR TRANSPORTING LIQUID SLURRIES

Gregory F. Berry, Naperville; Robert W. Lyczkowski, Darien, and Chi-Sheng Wang, Woodridge, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1991, Ser. No. 642,270
Int. Cl.[5] B65G *53/04*
U.S. Cl. 406—47 10 Claims

6. A method of reducing erosion in a slurry conveying apparatus having an inner surface, said method comprising the steps of:
introducing a constant flow of slurry into said slurry conveying apparatus;
injecting a continuous annular stream of nonabrasive fluid into said conveying apparatus in the direction of flow of said slurry, wherein said fluid maintains intimate contact with the entire inner surface of said conveying apparatus;
adjusting the flow rate of said annular stream of non-abrasive fluid in order to control the thickness thereof in response to the physical properties of said slurry, thereby creating a fluid barrier between said slurry and said inner surface of said conveying apparatus;



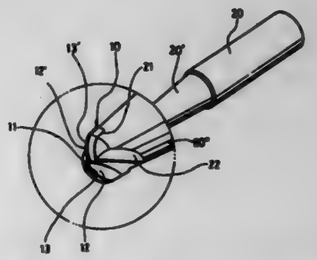
said annular stream of non-abrasive fluid minimizing erosion of said conveying apparatus by preventing contact of said slurry with said inner surface of said conveying apparatus;
wherein said slurry conveying apparatus comprises an atomizing nozzle;
wherein said slurry is comprised of a first fluid portion and a second particulate portion and wherein said first fluid portion is of the same composition as said non-abrasive fluid
and further comprising supplying said atomizing nozzle with atomizing fluid and injecting said atomizing fluid into said slurry.

5,193,943

CUTTING TOOL FOR USE IN A MILLING MACHINE

Jin Ki Kim, Ulsan, Rep. of Korea, assignor to Hyundai Motor Co., Seoul, Rep. of Korea

Filed Feb. 6, 1992, Ser. No. 831,950
Int. Cl.[5] B23C *5/18*
U.S. Cl. 407—42 3 Claims



1. A cutting tool for use in a machine tool, comprising:
a substantially cylindrical body having a cap disposed at a first end, a tool holder carrier disposed at a second end, and a tapered section disposed at the middle portion thereof, said cap including:
a fixing groove disposed therein,
a circular configured tip member welded to said fixing groove with silver, said tip member defining a pair of cutting edges disposed in a diagonal line with respect to each other, said pair of cutting edges being a composite unit and having a center point disposed at the center of said composite unit,
said center point having a first inclined angle of about

35°–45° disposed at both sides with respect to said center point,

a pair of chip guiding slots for receiving said tip member and guiding chips produced from the cutting operation, said pair of chip guiding slots disposed in a diagonal line with respect to each other,

a pair of sharp edge points disposed at both end edges thereof, each of said pair of sharp edge points having a second inclined angle of about 6°–8° with respect to a vertical line thereof, and

a pair of chip-outlet areas in the vicinity of said pair of chip guiding slots for delivering the chips therethrough,

whereby the cutting tool can improve cutting efficiency, reduce cutting stresses, and exhibit an extended life span.

5,193,944

NICKED CUTTING TOOL

Takayuki Nishimura, Nara, Japan, assignor to GN Tool Co., Ltd., Nara, Japan

Filed Jan. 3, 1992, Ser. No. 816,955
Claims priority, application Japan, Jun. 20, 1991, 3-148569
Int. Cl.[5] B23C *5/10, 5/18*
U.S. Cl. 407—53 **13 Claims**

1. A nicked cutting tool having a cylindrical main body with one end forming a cutting part and the other end a shank part to be mounted on a rotary driving means, its base body being of cemented carbide,

the cutting part comprising:

an even number of spiral twisted grooves formed on its circumferential face,

lands formed between the twisted grooves,

cutting edges along one edge of each land, being of sinter of high hardness and high wear resistance and fitted and unified by sintering with the base body,

plural nicks disposed on the lands, the nicks on one of any two lands circumferentially adjacent to each other being inclined by a specific angle with respect to the longitudinal axis, the nicks on the other land being inclined in the opposite direction thereto, and

sharp outer edges formed between the nicks on the lands substantially parallel to the nicks, the outer edges on one of any two lands facing the tip of the cutting part, the outer edges on the other land facing the shank part,

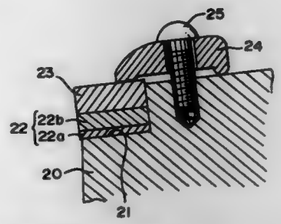
wherein the shank part is mounted to the rotary driving means and driven to only rotate without vertical reciprocation along the longitudinal axis of the means, thereby cutting-up performance being done by the sharp outer edges on one of any two lands and cutting-down performance being done by the sharp outer edges on the other land.

5,193,945

CUTTING TOOL

Masaaki Nakayama; Masayuki Okawa, and Junichi Saito, all of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 24, 1992, Ser. No. 840,086
Claims priority, application Japan, Feb. 25, 1991, 3-8879[U]; Feb. 25, 1991, 3-8880[U]
Int. Cl.[5] B23B *27/16*
U.S. Cl. 407—66 **10 Claims**



1. A cutting tool comprising:

(a) a tool body having a recess formed at a forward end thereof and defining an insert-receiving seat;

(b) a disposable cutting insert;

(c) a positioning block comprising a first layer to be placed between said cutting insert and said insert-receiving seat, having top and bottom faces and having a hardness thereof which is lower than a hardness of a surface of said insert-receiving seat and is lower than a hardness of a surface of said cutting insert said positioning block further comprises a second layer, in which a hardness of said second layer is higher than the hardness of the surface of the insert-receiving seat; and

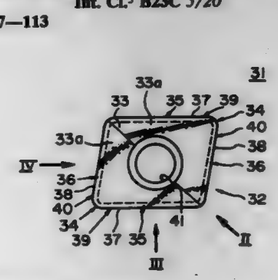
(d) clamp means for securing said cutting insert and said positioning block on said insert-receiving seat.

5,193,946

CUTTING INSERT

Tatsuo Arai, and Takehiro Takada, both of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Mar. 5, 1992, Ser. No. 846,609
Claims priority, application Japan, Mar. 7, 1991, 3-042052
Int. Cl.[5] B23C *5/20*
U.S. Cl. 407—113 **6 Claims**



1. A cutting insert comprising:

a tetragonal plate-like insert body defined by a front face, a flat rear face and two opposite pairs of side faces disposed between said front face and said rear face, said insert body including:

a pair of generally straight main cutting edges defined by the intersections of said front face with one opposite pair of said side faces,

a pair of auxiliary cutting edges defined by the intersections of said front face with the other opposite pair of said side faces, and

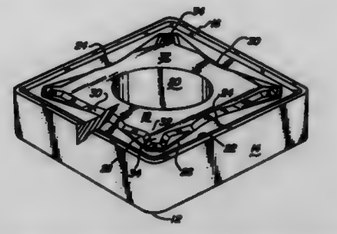
a pair of nose portions defined by an opposite pair of corners of said front face, each nose portion being disposed between a respective main cutting edge and a respective auxiliary cutting edge so as to intersect therewith, said front face having a pair of inclined surfaces each extending immediately from a respective nose portion and sloping toward said rear face in a direction toward a diagonal line of the front face which connects the corners of the front face other than the corners defining said nose portions.

5,193,947

HIGH DEPTH, LOW FORCE CUTTING INSERT

Thomas J. Bernadic, Madison Heights; Karl Kathi, and Sreedwaraka P. Boppana, both of Troy, all of Mich., assignors to GTE Valenite Corporation, Troy, Mich.

Filed Mar. 4, 1991, Ser. No. 664,016
Int. Cl.[5] B23B *27/22*
U.S. Cl. 407—114 **15 Claims**



1. A high depth, low force lay down indexable cutting insert, comprising:

(a) a polygonal body having a top and a bottom, cutting corners, flanks and a land along the top of the body;

(b) an entry angle surface proximal to said land and extending around the perimeter of the body adjacent to said land;

(c) a variable width groove proximal to said entry angle, said groove being progressively narrower toward the corners of the polygonal body and being lower than said land;

(d) a polygonal planar island supported on the insert body and raised above the variable width groove, said island having a central aperture therethrough to facilitate securing of the insert onto a tool, said island having a chip breaking angle around its periphery and a primary chip breaker at each of the corners of the polygonal island; and

(e) chip deceleration pads at each of said corners of the island, said chip deceleration pad being raised above the variable width groove and lower than said island, said chip deceleration pad abutting said chip breaking angle at the corners of the island on one side and joining the variable which groove by means of a chip deceleration angle on the other; whereby,

a chip is cut from work piece at the cutting corner of the insert, enters the insert along the entry angle, is forced against the chip deceleration angle and onto the chip deceleration pad and then onto the chip breaking angle of the island and then into the primary chip breaker area of the island, thereby breaking the chip.

5,193,948

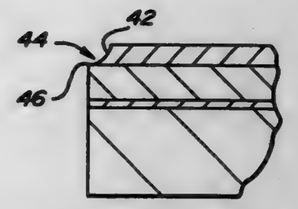
CHIP CONTROL INSERTS WITH DIAMOND SEGMENTS

Kenneth G. Noggle, West Bloomfield, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Dec. 16, 1991, Ser. No. 807,481
Int. Cl.[5] B23B *27/20, 27/22*
U.S. Cl. 407—116 **9 Claims**

1. An insert for cutting material, comprising:

a substrate having an upper surface, a lower surface, a forward end and means for defining a sidewall extending substantially therebetween to define the body of the insert, said upper surface having a polycrystalline cutting means segment bonded thereto wherein said polycrystalline material is interposed between two wafers of a material, at least one of said wafers being bondable to said upper



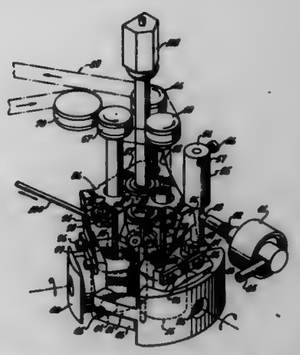
surface and said other wafer being machinable to form a chip breaker to expose the polycrystalline material to form a cutting edge and clearance surface.

5,193,949

ARRANGEMENT FOR DRIVING A ROTARY TOOL

William F. Marantette, 20624 Earl St., Torrance, Calif. 90503, and Roger Johnsrud, 4122 Emerald Ct., No. "H" , Torrance, Calif. 90502

Continuation-in-part of Ser. No. 660,149, Feb. 22, 1991, abandoned. This application Feb. 19, 1992, Ser. No. 838,499
Int. Cl.[5] B23B *47/04, 47/18, 39/08*
U.S. Cl. 408—3 **43 Claims**



1. The method of imparting movement to a rotary tool having a cylindrical shank comprising the steps of arranging a plurality of circular rollers in adjacency,

positioning the cylindrical shank of a rotary tool so that said shank is engaged by the circumferential peripheries of all of said rollers,

rotating said rollers so that said circumferential peripheries frictionally drive said shank and impart rotational movement thereto, and

tilting said rollers to impart axial movement to said rotary tool.

5,193,950

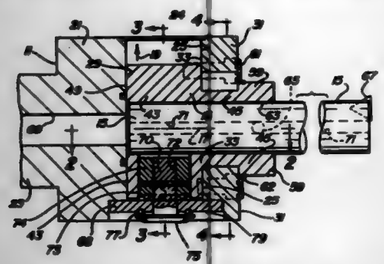
ADJUSTABLE BORING HEAD

Carl E. Hunt, White Lake, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Aug. 26, 1991, Ser. No. 749,735
Int. Cl.[5] B23B *29/08*
U.S. Cl. 408—153 **11 Claims**

1. A boring head comprising a body member having a longitudinal axis, and an end face extending normal to said axis; a transverse linear slot in said end face forming a slideway; a closure plate seated against said end face to form one wall of

the slideway; said closure plate having an L-shaped opening therethrough; one leg of said opening being aligned with said slot, the other leg of said L-shaped opening extending from said one leg to an edge of the plate; a boring bar holder having a straight slide portion slidably positioned in said slideway for adjusting movements transverse to the body member longitudinal axis, and a neck portion extending from said slide portion



through said one leg of the L-shaped opening; and a socket opening extending through the boring bar holder parallel to the aforementioned axis for receiving a boring bar therein; said other leg of the L-shaped opening being wide enough to permit the neck portion of the boring bar holder to pass transversely therethrough during assembly of the boring bar holder to the closure plate.

5,193,951

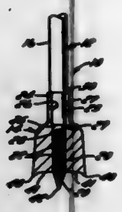
WOOD-DRILLING BIT

Thomas O. Schinke, Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Continuation of Ser. No. 450,858, Dec. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 236,017, Aug. 24, 1988, abandoned. This application May 17, 1991, Ser. No. 702,275

Int. Cl.[5] B23B *51/02*

U.S. Cl. 408—233 14 Claims



1. A drill bit, comprising:

an elongated shaft defining a driving end, a central portion, an extended bearing portion forming a cylindrical bearing neck along the longitudinal axis of said shaft, said bearing neck having a smaller cross-sectional diameter than the cross-sectional diameter of the lowermost part of said central portion, so as to define an upper shoulder portion therebetween, and, projecting downward from said bearing neck, a threaded male end having a smaller cross-sectional diameter than the cross-sectional diameter of said bearing neck, so as to define a lower shoulder portion therebetween, said threaded male end having a pointed tip to serve as a pilot; and

a cutting head defining an axially stepped through-bore comprising a threaded lower portion to receive said threaded male end of said elongated shaft in threaded engagement and an unthreaded upper sleeve portion which has the proper internal diameters and lengths to receive the bearing neck portion and lower shoulder portion of the shaft with a snug fit.

5,193,952

INNER CIRCLE CUTTING CONTROL APPARATUS FOR NUMERICALLY CONTROLLED MACHINE TOOL

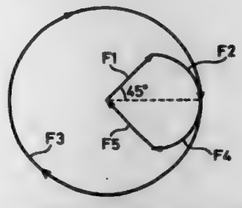
Hayashi Tomoo; Momochi Takeshi; Kato Kenji, and Matsumoto Michio, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1992, Ser. No. 838,686

Claims priority, application Japan, Feb. 21, 1991, 3-027584

Int. Cl.[5] B23C *9/00*; G05B *19/18*

U.S. Cl. 409—80 7 Claims



1. An apparatus for cutting an inner circle in a workpiece with a cutter of a numerically controlled machine tool, comprising:

means for supplying, as command parameters, an initially cut radius I, a finally cut radius J, a radial depth of cut K, and a cutter diameter D;

means for linearly moving the cutter from the center of an inner circle in the workpiece in a radial distance according to the initially cut radius I;

means for cutting an inner circle in the workpiece according to the radial depth of cut K until the finally cut radius J is reached;

means for supplying, as command parameters, an initial workpiece radius P which indicates the minimum distance from the center of the inner circle in the workpiece to the workpiece, and a cutting feed starting distance SN that the cutter starts to move at a cutting feed rate across the initial workpiece radius P before reaching the workpiece;

means for comparing the length of a linear path that the cutter linearly moves with the initial workpiece radius P; and

means for determining a feed rate at which the cutter is to move along said linear path, depending on the result of comparison between the length of the linear path and the initial workpiece radius P.

5,193,953

HIGH-SPEED DRILLING OR MILLING SPINDLE

Richard Jesinger, Esslingen, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Aug. 12, 1991, Ser. No. 744,084

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1990, 4025610

Int. Cl.[5] B23C *9/00*; F16C *230/00*

U.S. Cl. 409—231 6 Claims

1. A high-speed rotary spindle of a drilling or milling machine tool, comprising:

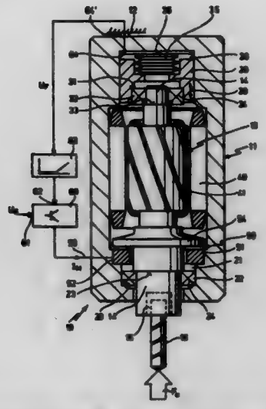
a stator fixedly attached to a stationary portion of said machine tool and having first drive means;

a rotor adapted to be rotated about an axis of rotation relative to said stator at high revolutional speeds, said rotor having second drive means cooperating with said first drive means on said stator for effecting rotation of said rotor, said rotor, further, having chucking means for chucking a milling or drilling tool therein;

a first roller bearing arranged between said rotor and said stator adjacent said chucking means, said first roller bearing having a very small thrust angle for making said first roller bearing acting essentially as a radial bearing during operation of said spindle;

a second roller bearing arranged between said rotor and said stator distant from said chucking means, said second roller bearing having a very small thrust angle for making said second roller bearing acting essentially as a radial bearing during operation of said spindle;

said first and second bearings allowing limited axial movement of said spindle and providing substantially all of the radial support for said spindle;



a magnetic bearing being arranged between said rotor and said stator, said magnetic bearing being adjustable with respect to an axial bearing force;

detector means for detecting axial force (F_a) exerted on said tool; and

control means for adjusting said axial bearing force as a function of the detected axial force (F_a).

5,193,954

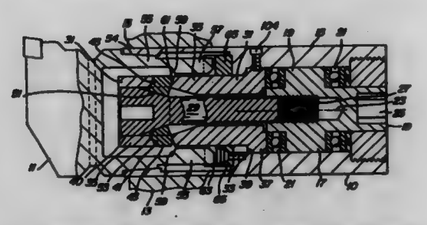
UNIVERSAL TOOL CONNECTION

Carl E. Hunt, White Lake, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Oct. 30, 1991, Ser. No. 784,845

Int. Cl.[5] B23C *5/26*; B23B *31/02*

U.S. Cl. 409—233 20 Claims



1. A mechanism for clamping a cutting tool holder in a machine, said mechanism comprising a clamping unit, a circular socket in the clamping unit; a tool holder having a tubular section adapted for insertion into the socket, and an inturned flange on the terminal end of said tubular section; a drawbar movable linearly within the clamping unit on the socket axis; a multiple number of individual wedge elements surrounding said drawbar for movements toward or away from the socket axis; cam connections between the drawbar and each wedge element for moving the wedge elements outwardly away from the socket in response to axial movement of the drawbar away from the tool holder; an annular drive key member removably mounted within the clamping unit for axial registration with the tubular section of the tool holder; said drive key member having multiple projections thereon for interlocking connection with the tool holder tubular section; and multiple bolts extending through said drive member into the clamping unit to removably fasten the drive key member to the clamping unit, and means enabling the wedge elements to be returned inwardly toward the socket axis in response to movement of the drawbar toward the tool holder; said wedge elements having wedge lock engagement with the tool holder flange when said wedge elements are displaced away from the socket axis by the drawbar.

5,193,955

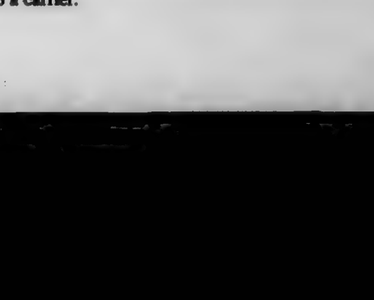
BINDING DEVICE FOR CARGOS

An-Chuan Chou, No. 212, Yung An Street, Taipan, Taiwan

Filed Dec. 6, 1991, Ser. No. 803,423

Int. Cl.[5] B65B *11/00*

U.S. Cl. 410—100 1 Claim



1. A cargo binding device comprising:

a net member, said net member formed by a plurality of longitudinally and transversely extending intersecting cargo straps secured to each other at intersecting areas thereof, each end portion of said longitudinally and transversely extending cargo straps being formed into a loop;

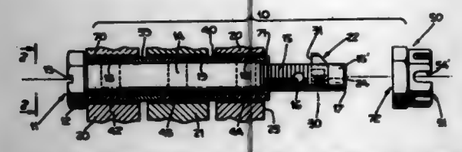
a plurality of intermediate cargo strap members, each of said intermediate cargo strap members associated with one of said plurality of said longitudinally or transversely extending cargo straps, each of said intermediate cargo strap members including a first end formed into a loop and a free second end, and a hook member fixedly attached to said loop formed on said first end of said intermediate cargo strap member;

a plurality of strap securing means for lengthening, shortening, and releasably securing said intermediate cargo strap members, each of said strap securing means associated with one of said plurality of said intermediate cargo strap members, each of said strap securing means including a strap tensioner having a base member, two spaced walls extending upwardly from opposed edges of said base member, a shaft disposed between said two spaced walls, and a spring loaded push plate member rotatably mounted on said shaft, said push plate having a front surface with a plurality of teeth provided on a front surface thereon, and an anchoring strap having a first end secured to said strap tensioner and a second end formed into a loop, and a hook member secured to said loop formed on said second end of said anchoring strap, wherein a hook member of each of said intermediate cargo strap member is releasably secured to said loop formed on each of said longitudinally and transversely extending cargo straps, said second free end of each of said intermediate cargo strap members is grippingly and releasably secured to a strap tensioner of each of said cargo strap securing means, and said hook member of each said anchoring strap is releasably secured to a carrier.

5,193,956
ADJUSTABLE DIAMETER BOLT WITH ADJUSTABLE NUT

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Filed Jan. 21, 1992, Ser. No. 823,172
Int. Cl.[5] F16B *13/04, 35/02*
U.S. Cl. 411—33 21 Claims



1. In a self-retaining bolt assembly including a bolt having an enlarged head at one end, a shank portion adjacent the head, a threaded section adjacent the shank portion, the bolt being adapted to be inserted through aligned apertures in a pair of abutting structures with the head on the access side of said structure, the bolt including a pawl disposed in a hole in the bolt movable from a first position into said hole to a second position extending out of the hole, the threaded section being adapted to be threaded to a nut assembly on the blind side of said structures, the improvements which comprises:
a plurality of bushing segments encircling the shank portion of said bolt; and
said nut assembly having a first main threaded body portion tightened onto the threaded section of said bolt forcing said segments toward said bolt head whereby said segments are adapted to fill the spacing between said bolt shank portion and the walls of said aligned apertures, and said nut assembly having a second portion rotatably and threadably mounted on a threaded portion on the exterior of the first portion tightening said nut assembly against said structure when said second portion is threadably rotated on said first portion and abuts against said structure.

5,193,957
FIXING ELEMENT WITH AN EXPANSIBLE SLEEVE

Artur Fischer, Waldachtal/Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co KG, Waldachtal/Tumlingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 353,074, May 15, 1989, abandoned. This application Sep. 9, 1991, Ser. No. 756,827
Claims priority, application Fed. Rep. of Germany, May 24, 1988, 3817512
Int. Cl.[5] F16B *13/06*
U.S. Cl. 411—55 2 Claims

1. A fixing element for fixing an article to a base, said fixing element comprising
a shank, said shank consisting of a shank portion for receiving an article to be fixed to a base, said shank portion having a shank portion diameter, a reduced diameter portion having opposite ends and a reduced diameter portion diameter, an expander cone located at one of said opposite ends, and a transition shoulder between the other of said opposite ends and the shank portion; and
an expansible resilient sleeve received on said reduced diameter portion, said expansible resilient sleeve having an end remote from the expander cone and lugs at said end remote from said expander cone, said lugs being inwardly bent at an obtuse angle and having end surfaces facing said transition shoulder, and said expansible resilient sleeve also having an outwardly projecting member formed integrally with said expansible resilient sleeve and extending beyond an outer diameter of the resilient sleeve and between said lugs;
wherein said expansible resilient sleeve has a length greater than a length of said reduced diameter portion and said expansible resilient sleeve also having in an unstressed condition said sleeve outer diameter larger than said shank portion diameter and a sleeve inner diameter larger than said reduced diameter portion diameter, such that, when said fixing element is inserted in a drilled hole having a hole diameter nearly equal but less than the shank portion diameter of the fixing element, said expansible sleeve is compressed, so that said fixing element is anchored in said drilled hole.

5,193,958
COATING OF SCREWS

Robert H. Day, Berkshire, England, assignor to ITW Ltd., Windsor, England

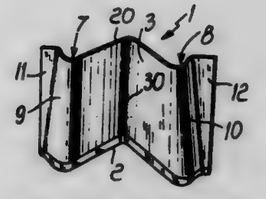
Filed Oct. 25, 1990, Ser. No. 603,071
Int. Cl.[5] F16B *39/02, 25/00*
U.S. Cl. 411—82 12 Claims

1. A screw threaded fastener, comprising:
a screw threaded portion defined upon a shank of said fastener;
an uncured, tacky mastic covering disposed around said screw threaded portion of said fastener for providing corrosion-prevention and sealant properties to said fastener when said fasten is threadedly engaged within a substrate; and
a waxy coating covering said uncured, tacky mastic disposed upon said screw threaded portion of said fastener so as to prevent said fastener from sticking to similar fasteners during handling and packaging of said fasteners by rendering outer peripheral portions of said fasteners non-tacky and for preventing deterioration of said uncured, tacky mastic covering.

5,193,959
METALLIC STAPLE PARTICULARLY FOR THE BUTT JOINING OF ELEMENTS MADE OF WOOD OR THE LIKE

Alfredo Motta, Pregnanziol, Italy, assignor to Brevetti M.A. S.r.l., Cecchini di Pasiano, Italy

Filed Sep. 26, 1991, Ser. No. 765,741
Claims priority, application Italy, Oct. 4, 1990, 41706 A/90
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—478 13 Claims

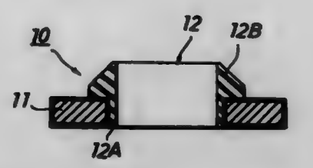


1. Metallic staple particularly for butt jointing elements made of wood comprising;
a substantially rectangular lamina (1) having a first edge (20), a cutting edge (2) and longitudinal shapings (3*a*, 3*b*, 7–12), wherein said longitudinal shapings comprise;
two interconnected central portions (3*a*, 3*b*) defined by said lamina (1);
a central V-shaped portion (3) defined by said interconnected central portions (3*a*, 3*b*);
two arcuately-shaped wings (7, 8) radiused to said interconnected central portions (3*a*, 3*b*);
inclined plane portions (9, 10) defined by said wings (7, 8), and;
flat lateral portions (11, 12) connected to said inclined plane portions (9, 10);
wherein said inclined plane portions (9, 10) diverge away from each other in a direction extending from said first edge (20) to said cutting edge (2), and
wherein said flat lateral portions (11, 12) are coplanar.

5,193,960
WASHER WITH ELASTIC WATER-SWELLABLE RUBBER

Takao Fukushima; Isamu Ichizuka; Hiroshi Inoue, and Tokio Ueno, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1991, Ser. No. 784,986
Claims priority, application Japan, Nov. 6, 1990, 2-116613[U]
Int. Cl.[5] F16B *33/00, 43/02*
U.S. Cl. 411—542 10 Claims

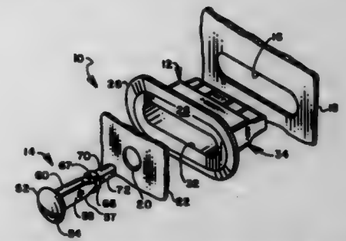


1. A washer system comprising:
an annular washer having a central opening;
an annular packing member which is coaxially arranged with said annular washer, at least a portion of said annular packing member being arranged within said central opening of said annular washer;
at least a portion of the outer surface of said annular washer being rust-proofed treated, wherein a substantial portion of a contacting surface between said annular washer and said annular packing member not being rust-proofed treated;
said annular packing member being made of an elastic water-swellable rubber;
said annular packing member having a portion which extends radially outwardly from a portion of said annular washer defining said central opening, and contacting a portion of a lower substantially flat surface of said annular washer radially outwardly of said annular opening;
said annular packing member having a portion extending below said lower substantially flat surface of said annular washer; and
said annular washer and said annular packing member being adhered together by a vulcanized adhesive.

5,193,961
PIN AND GROMMET

Christopher J. Hoyle, Chicago, and Brian R. Peek, Mokena, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 12, 1992, Ser. No. 834,404
Int. Cl.[5] F16B *21/00*
U.S. Cl. 411—553 12 Claims



1. A push-pin and grommet assembly used for retaining a mating panel having a throughhole to a supporting panel having an oblong fitting hole and adapted to absorb variations in the relative positions of the supporting panel and the mating panel, said assembly comprising in combination:
a push-pin including a head portion and a shank portion extending from the head portion;
said shank portion including an upper section, a small neck joined to the upper section, and an enlarged tip portion joined to the neck;
said neck having a pair of diametrically opposed semicylindrical-shaped portions, said tip portion being defined by opposed narrow U-shaped flat surfaces and opposed triangular-shaped surfaces joined between said opposed U-shaped flat surfaces;
a grommet including a relatively flat head flange and a main body portion, said head flange having a central opening therein and being formed of a front surface and a back surface, said main body portion being substantially of an ellipsoid for mating with the shape of the oblong fitting hole in said supporting panel and extending from the back surface of said head flange to a closed free end;
said main body portion being defined by a pair of opposed outer wall surfaces on the pair of longer sides of said ellipsoid and by a second pair of opposed outer wall surfaces on the pair of shorter sides of said ellipsoid, said first pair of opposed outer wall surfaces having outwardly extending projections to provide shoulders for engaging upper and lower edges of the oblong fitting hole;
said main body portion having cylindrical-shaped mating grooves formed on spaced opposed inner wall surfaces and extending between said second pair of opposed outer wall surfaces for retaining freely floating said pair of semicylindrical-shaped portions when said push-pin is pushed axially so as to permit lateral sliding engagement of said pair of semi-cylindrical-shaped portions between said second pair of opposed outer wall surfaces; and
said main body portion further including a substantially

U-shaped mating slot disposed co-axially with said mating grooves adjacent the closed end thereof for retaining slidably said enlarged tip portion.

5,193,962

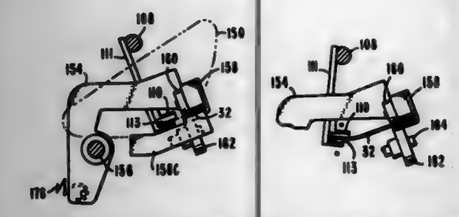
TAPE HANDLING MECHANISM AND METHOD FOR USE WITH BOOK BINDING MACHINE

Kevin P. Parker, 830 Isabella St., Oakland, Calif. 94607; Eugene E. Anderson, 100 Buckeye, Oakland, Calif. 94618, and Leo M. Feraskas, 110 W. 26th St., #712, New York, N.Y. 10001

Division of Ser. No. 756,307, Sep. 6, 1991, abandoned, which is a continuation of Ser. No. 509,037, May 10, 1990, Pat. No. 5,052,873, which is a continuation of Ser. No. 350,041, May 10, 1989, abandoned. This application Apr. 20, 1992, Ser. No. 871,308

Int. Cl.[5] B42C *13/04*

U.S. Cl. 412—8 28 Claims



1. A method of manipulating a tape in a bookbinding apparatus of the type which utilizes a binding tape which includes a flexible tape substrate which carries an adhesive, with the tape being bonded to first and second cover sheets of a stack to be bound and with the tape having one of a plurality of predetermined widths to accommodate stacks of varying thickness, said method comprising the following steps:

automatically measuring the thickness of the stack to be bound;

automatically adjusting the spacing between first and second tape guide surfaces based upon the measured thickness of the stack so as to accommodate one of the tapes having a particular one of the predetermined widths; and

supporting a first edge of the tape having the particular predetermined width utilizing the first tape guide surface which engages the first edge of the tape and a second edge of the tape, opposite the first edge, utilizing the second tape guide surface.

5. Apparatus for binding a plurality of sheets arranged in a stack utilizing a binding tape which includes a flexible substrate which carries an adhesive, with the tape being bonded to first and second cover sheets of the stack and engaging an edge of the stack so as to form a spine, said apparatus comprising:

stack support means for supporting the stack of sheets;

tape positioner means for positioning the tape with respect to the stack, with the positioner means being movable between a tape load position where tape is loaded into the positioner means and a tape seal position where the tape is applied to the stack;

platen means to be applied to the tape and the stack of sheets so as to form the spine and the first and second cover seals; and

a single drive motor for moving the tape positioner means between the tape load position and the tape seal position and for applying the platen to the tape.

5,193,963

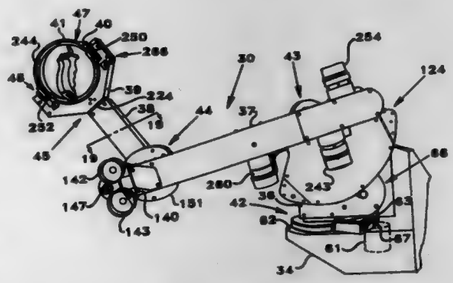
FORCE REFLECTING HAND CONTROLLER

Douglas A. McAffee, San Pedro, Calif.; Edward R. Snow, Sandy Hook, Conn., and William T. Townsend, Somerville, Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 31, 1990, Ser. No. 608,658

Int. Cl.[5] B25J *3/00*

U.S. Cl. 414—5 6 Claims



1. A universal hand controller device for interfacing a human operator with a slave machine such as a robot comprising:

a base;

a plurality of serially connected mechanical links extending from the base, the mechanical links being arranged into a first group of first, second, and third linear position links and a second group of first, second, and third angular position links;

a handgrip connected to the serially connected mechanical links distal from the base such that a human operator may grasp the handgrip and control the position of the handgrip relative to the base through the serially connected mechanical links;

a plurality of rotary joints arranged to connect the mechanical links together to provide at least three translational degrees of freedom and at least three rotational degrees of freedom of motion of the handgrip relative to the base, there being one rotary joint corresponding to each degree of freedom, each rotary joint having a drive mechanism comprising a drive motor, a drive pulley assembly and a drive cable connected between the drive motor and the drive pulley assembly such that each joint is cable driven;

means for mounting the drive motors for driving the rotary joints corresponding to the rotational degrees of freedom to one of the linear position links such that the drive cables in the drive mechanisms for the rotary joints corresponding to the rotational degrees of freedom pass through at least one rotary joint corresponding to the linear position link upon which the drive motors for driving the rotary joints are mounted; and

means for guiding the drive cable for the first, second, and third angular position links parallel to an axis of rotation of a third of the rotary joints.

5,193,964

SLEWING BRIDGE MATERIAL HANDLING APPARATUS CAPABLE OF CONTINUOUS MATERIAL FEEDING DURING MOVING AND SLEWING

Paul Soros, New Canaan, Conn., assignor to Soros International, New York, N.Y.

Continuation-in-part of Ser. No. 726,586, Jul. 8, 1991. This application Jul. 6, 1992, Ser. No. 909,046

Int. Cl.[5] B65G *67/60*

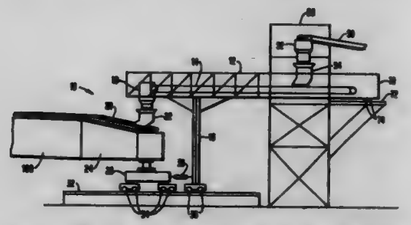
U.S. Cl. 414—140.9 18 Claims

1. An apparatus for loading bulk material from a supply area onto a carrier having a longitudinal axis, said carrier during loading being disposed in a substantially fixed predetermined orientation, said apparatus comprising:

a movable trestle having a longitudinal axis;

a first belt conveyor carried by said movable trestle and having a longitudinal axis in substantial alignment with said longitudinal axis of said trestle;

an elongated linear shiploader having a longitudinal axis, a front end disposed proximate said carrier, a rear end disposed at a distance from said carrier, a front end support connected to said shiploader front end for pivotal movement of said shiploader front end relative to said front end support and for linear movement in a direction substantially parallel to the longitudinal axis of said carrier so as to vary an operating position of said shiploader front end, a support for said shiploader rear end, means for pivotally connecting said rear end support to said shiploader rear end such that said shiploader rear end and said rear end support are movable together linearly in a direction substantially perpendicular to said longitudinal axis of said carrier while simultaneously said shiploader rear end pivots relative to said rear end support around a fixed



pivotal axis of rotation passing through said shiploader rear end and said rear end support, said simultaneous linear and pivotal movements being a function of said operating position of said shiploader front end;

a second belt conveyor carried on said linear shiploader in substantial alignment with said longitudinal axis thereof;

means for transferring material carried by said first belt conveyor to said second belt conveyor, said transfer means being mounted proximate said shiploader rear end on one of said trestle and said linear shiploader, said pivotal axis passing through said transfer means;

means for connecting said trestle to said rear end support so that said trestle moves in said direction substantially perpendicular to said longitudinal axis of said carrier concomitantly with and in a fixed position relative to said rear end support to maintain continuous positive registration between said transfer means and said pivotal axis; and

said second belt conveyor having a portion proximate said pivotal axis, said second belt conveyor portion sloping upwardly from said shiploader rear end in a direction away from said shiploader rear end.

5,193,965

SLEWING BRIDGE MATERIAL HANDLING APPARATUS CAPABLE OF CONTINUOUS MATERIAL FEEDING DURING MOVING AND SLEWING

Paul Soros, New York, N.Y., assignor to Soros International, Inc., New York, N.Y.

Filed Jul. 8, 1991, Ser. No. 726,586

Int. Cl.[5] B65G *67/60*

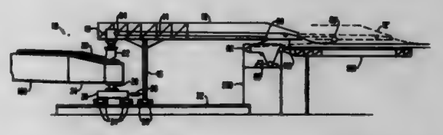
U.S. Cl. 414—140.9 9 Claims

1. An apparatus for loading bulk material from a supply area onto a carrier having a longitudinal axis, said carrier during loading being disposed in a substantially fixed predetermined orientation, said apparatus comprising:

a movable trestle extending in a fixed predetermined orientation and having a longitudinal axis;

a first belt conveyor carried by said movable trestle and having a longitudinal axis in substantial alignment with said longitudinal axis of said trestle;

an elongated linear shiploader having a longitudinal axis, a front end disposed proximate said carrier, a rear end disposed at a distance from said carrier, means for supporting said front end for pivotal movement and for linear movement parallel to the longitudinal axis of said carrier, means for supporting said rear end for linear movement in a direction substantially perpendicular to said longitudinal axis of said carrier, means for pivotally connecting said rear end to said rear end support means for pivotal movement of said rear end relative to said rear end support means around a fixed pivotal axis of rotation passing through said rear end and said rear end support means so as to permit simultaneous linear and pivotal movement of said rear end relative to said carrier, said simultaneous linear and pivotal movement being a function of the posi-



tion of said front end relative to the longitudinal axis of said carrier;

a second belt conveyor carried on said linear shiploader in substantial alignment with said longitudinal axis of said shiploader;

means for transferring material carried upon said first belt conveyor to said second belt conveyor, said transfer means being mounted proximate said rear end of said elongated linear shiploader on one of said trestle and said linear shiploader, said pivotal axis passing through said transfer means; and

means for connecting said trestle to said movable rear end support means so that said trestle moves in said direction substantially perpendicular to the longitudinal axis of said carrier concomitantly with and in a fixed position relative to said movable rear end support means to maintain continuous positive registration between said transfer means and said pivotal axis

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5,193,966

FEEDING DEVICE FOR BOLT BLANKS IN MACHINES FOR PROFILING BY MEANS OF ROLLING JAWS

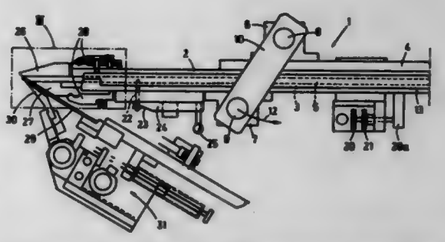
Clemens Jung, Hilchenbach, Fed. Rep. of Germany, assignor to E. W. Mess GmbH & Co. Maschinenfabrik, Hilchenbach, Fed. Rep. of Germany

Filed May 6, 1991, Ser. No. 695,872

Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014671

Int. Cl.[5] B23Q *7/08*

U.S. Cl. 414—224 2 Claims



1. Feeding device for bolt blanks in machines for profiling by means of rolling jaws, comprising: two sliding rails arranged in

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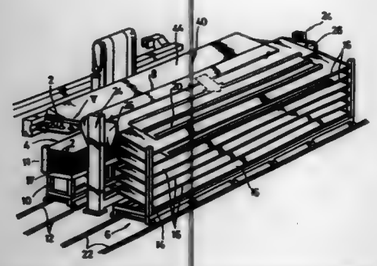
parallel to each other, one of said rails being fixedly mounted to a machine frame, while the other is movably adjustable for setting a gap between said sliding rails corresponding to the diameter of the bolt blanks, said movable sliding rail including an adjustable stop means for limiting the width of the gap, said sliding rails extending obliquely to the horizontal, and having rail end sections detachably mounted thereon, said sliding rails being vertically adjustable on a guide column by a spindle operable via bevel gears by means of a hand wheel, a cyclically controlled loading slide for inserting the individual bolt blanks in the rolling jaws being arranged in front of said end sections at an acute angle with respect to the sliding rails, a plurality of clamping sleeves attached to said one fixed sliding rail and to said other movable sliding rail, respectively, said clamping sleeves being distributed at mutual spacings over the length of the sliding rails and having rotatably adjustable bars seated therein, said bars being connected to upper traverses extending above the sliding rails and obliquely thereto, said clamping sleeves attached to the movable sliding rail being disposed in front of the clamping sleeves attached to the fixed sliding rail in such a manner that the traverses and the bars form, with the sliding rails, parallelogram-type linkages for adjusting the width of the gap between the sliding rails.

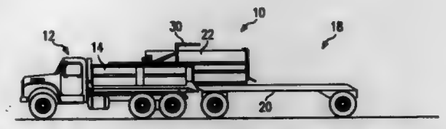
5,193,967
DEVICE FOR TRANSFERRING A WORKPIECE
Franco Sartorio, Turia, Italy, assignor to Amada Company, Limited, Japan
PCT No. PCT/JP90/01538, § 371 Date Apr. 24, 1991, § 102(e) Date Apr. 24, 1991, PCT Pub. No. WO91/08067, PCT Pub. Date Jun. 13, 1991
PCT Filed Nov. 28, 1990, Ser. No. 721,543
Claims priority, application Italy, Nov. 30, 1989, 68065 A/89
Int. Cl.[5] B65H *29/00*
U.S. Cl. 414—225 **11 Claims**



1. A device for transferring a workpiece to be presented for working, comprising:
support means; and
a carrying member mounted on the support means movable in a vertical direction and in a forward direction, the carrying member having a pick-up device at a lower portion for picking up a workpiece from a withdrawal station disposed in front of the support means, wherein a top surface of the carrying member is inclined backwardly so that the carrying member can discharge the workpiece to a collecting station disposed behind the support means, upon receiving the workpiece upon which working has been completed.

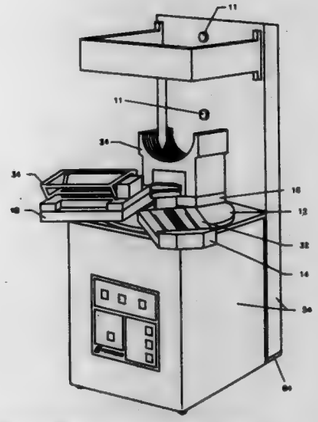
5,193,968
PULL TRAILER DUMP TRUCK
W. Glenn Hicks, 809 Kenson, Minden, La. 71055
Filed Feb. 15, 1990, Ser. No. 480,226
Int. Cl.[5] B60P *1/64*
U.S. Cl. 414—346 **10 Claims**

1. A dump truck pull trailer for hauling materials, the dump truck pull trailer having a trailer body to be moved into a tilting dump body on the dump truck, comprising:
a frame having a longitudinal axis;
a trailer body for holding materials, said trailer body supported on the frame for movement along the longitudinal axis of the frame between a secured position on the frame and a position substantially inside the dump body of the dump truck;
a first wedge member mounted on the frame;



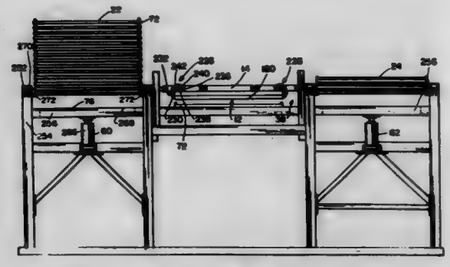
a second wedge member mounted on the trailer body;
the trailer body moveable relative to the frame along the longitudinal axis from the secured position, the first and second wedge members engaged in the secured position; and
means mounted on the frame and trailer body to lock the trailer body to the frame in cooperation with the first and second wedge members in the secured position.

5,193,969
WAFER TRANSFER MACHINE
John M. Rush, Mountain View; Torben Ulander, Sunnyvale, and Michael T. Verdon, San Jose, all of Calif., assignors to Fortrend Engineering Corporation, Sunnyvale, Calif.
Filed May 20, 1991, Ser. No. 703,011
Int. Cl.[5] B65G *65/04*
U.S. Cl. 414—404 **9 Claims**



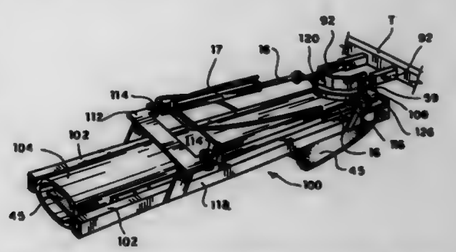
1. A wafer transfer machine comprising:
multiple stages for mass loading and unloading of wafers from boats in which the wafers are transported during processing, each stage including means to secure the boats and to align the wafers therein; and
a rotary turntable driven by a stepper motor controlled by a control logic of the machine to successively transfer the stages to an elevator area of the machine;
where elevator arms including elevator combs lift the wafers in mass from the boats to a retaining area where they are secured by retaining combs, the elevator arms then being lowered, the turntable rotating a stage with an empty receiving boat to the elevator area, the elevator arms being raised, the retaining combs being released, and the elevator being lowered so that the wafers are deposited in mass into the receiving boat.

5,193,970
HIGH SPEED/HIGH CAPACITY AUTOMATED WORKLOAD REGULATOR
Wayne T. Chiappe, Hinsdale, Ill., and Randy W. Gasquoine, Stockton, Calif., assignors to Sardee Industries Inc., Alsip, Ill.
Filed Mar. 11, 1991, Ser. No. 667,546
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—416 **2 Claims**



1. An apparatus for regulating the flow rate of an apparatus for articles moving between an upstream work station serving as a source of supply for such articles, and a downstream station having a demand for such articles, said apparatus having means for transiently accumulating inbound articles being fed in a continuous array, means for subdividing said continuous array of articles into individual groups, means for accumulating groups of articles intended to be fed downstream and means for advancing and consolidating said groups into at least one continuous array of articles destined for said downstream work station, article group transfer means adapted to engage and transport said individual inbound groups of articles to said area in which said articles are to be accumulated for advancement downstream, means for transferring selected groups of articles from said inbound accumulating area to a storage area in a storage container means and for removing groups of articles from a storage area in said storage container means and transferring them to said area in which said downstream bound articles are accumulating, at least one storage container means and means for positioning said storage container means within the operating range of said transfer means to a position generally coplanar with said inbound accumulator means and said outbound accumulator means and in laterally outwardly spaced adjacent relation to said inbound accumulator means or said outbound accumulator means or both, said storage container means including a plurality of elongate article group receptacle areas, and control means adapted to move said article group transfer means so as to supplement the number of groups of articles being fed to said downstream station by adding groups of articles taken from said storage container means to said groups being transferred from said area in which said inbound articles are accumulating, and for diminishing the supply of articles fed to said area in which said downstream bound articles are accumulating by transferring groups of articles from said area at which said inbound articles are accumulating to said storage area within said storage container means, said individual groups each having a generally linear configuration and each of said inbound accumulator means, said outbound accumulator means, said transfer means and said article group receptacle areas having a length dimension, extending parallel to each other and generally perpendicularly with respect to a longitudinal axis of said apparatus defining a transfer axis and a path of travel for said article group transfer means.

5,193,971
MOBILE HYDRAULIC CONVEYOR
Michael J. Pettijohn, 15111 Oak Rd., Carmel, Ind. 46032
Filed Feb. 28, 1992, Ser. No. 843,222
Int. Cl.[5] B60P *1/36*
U.S. Cl. 414—523 **8 Claims**



1. A mobile hydraulic conveyor apparatus pivotally attachable to a rear end of a truck and operable to convey material from said truck to a specific location, said conveyor apparatus being pivotally mounted for both vertical and lateral movement, said conveyor apparatus including a first and second tray, said first tray being fixed at one end to a turret holder, said turret holder being pivotally mounted by a pivot pin on bars extending from said rear end of said truck, said second tray being pivotally connected to said first tray at a second end of said first tray, hydraulic means for raising and holding said first and second trays in a vertical position adjacent said truck rear when transporting said first and second trays from one location to another, said hydraulic means enabling said trays to be straightened substantially parallel to ground so as to extend a free end of said second tray away from said truck rear end, and a conveyor belt mounted on an end roller and a hydraulically driven motorized roller, whereby material discharged from said truck is moved by said conveyor belt to said specific location, the improvement comprising:
a turret connected to said one end of said first tray and pivotally mounted in said turret holder;
a pair of hydraulic cylinders pivotally connected to a cross bar transverse to and integral with said first tray, said hydraulic cylinders being mounted one on each end of said cross bar;
said pair of hydraulic cylinders each having a piston pivotally connected to a respective ear extending transversely to an integral with said turret holder;
said hydraulic cylinders being connected to a hydraulic system on said truck;
whereby said hydraulic cylinders, when activated, act on said cross bar and said transverse ears on said turret holder to shift said free end laterally about a vertical pivot axis of said turret.

5,193,972
WAFER HANDLING SYSTEM
Orest Engelbrecht, Ridgefield, Conn., assignor to SVG Lithography Systems, Inc., Wilton, Conn.
Division of Ser. No. 577,209, Sep. 4, 1990, Pat. No. 5,085,558, which is a division of Ser. No. 351,741, Apr. 17, 1989, Pat. No. 4,973,217, which is a division of Ser. No. 12,538, Feb. 9, 1987, Pat. No. 4,846,626. This application Nov. 12, 1991, Ser. No. 790,427
Int. Cl.[5] B65G *47/24*
U.S. Cl. 414—754 **4 Claims**

1. A semiconductor wafer handling system for precisely positioning and orientating a wafer in a plane perpendicular to a starting position thereof comprising:
a wafer cassette having a plurality of semiconductor wafers horizontally stacked therein;
a load shuttle capable of moving in a horizontal plane in alignment with one of said plurality of wafers and having

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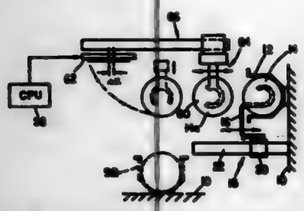
a vacuum groove whereby said one of said plurality of wafers can be attached to said load shuttle;

a prealigner means, positioned within the range of motion of said load shuttle, for receiving said one of said plurality of wafers;

detection means, associated with said prealigner, for determining X and Y offsets and angular orientation of said one of said plurality of wafers;



a vacuum chuck capable of being prepositioned associated with said detection means; and

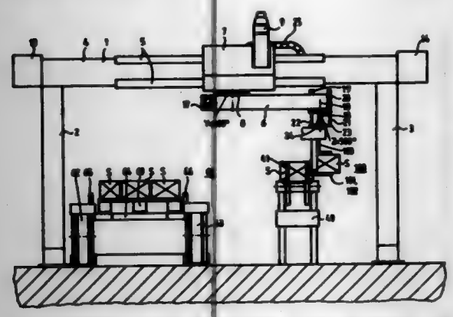
an input shuttle capable of moving between said prealigner and said vacuum chuck and pivoting through 90 degrees whereby said one of said plurality of wafers is accurately positioned on said vacuum chuck in a plane perpendicular to the original horizontal plane.

5,193,973

PALLETIZING SYSTEM

Axel B. Tibbe, Berlin, Fed. Rep. of Germany, assignor to System GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 456,583, Dec. 28, 1989, abandoned.
This application Oct. 4, 1991, Ser. No. 770,779
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1988, 3844594
Int. Cl.[5] B65G *59/02*
U.S. Cl. 414—796.9 8 Claims



1. A palletizing system for moving a stack of objects, said system comprising:

an arm;

a gripping device pivotally attached to said arm for rotation about a substantially vertical axis; said gripping device including a plurality of gripping tines having a predetermined spacing between one another; each said gripping tine having a height and a width; and

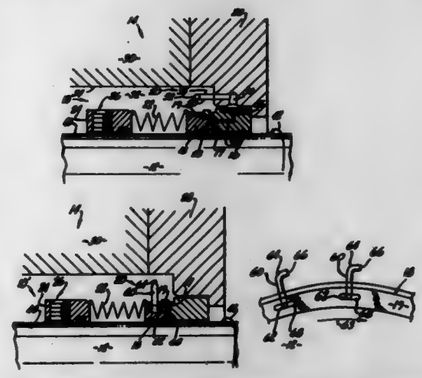
a flexible intermediate member for supporting a stack of objects, said intermediate member having more than two side edges and including a plurality of spaced, raised nubs for engaging a lowermost object of the stack; the nubs being arranged in rows and columns and together defining upwardly open, parallel first passages and upwardly open, parallel second passages extending transversely to the first passages; said first and second passages as viewed together, being accessible from more than two side edges of said intermediate member; each passage having a width at least as wide as said width of said gripping tines and having a height at least as high as said height of said tines when the intermediate member supports a stack, for allowing the tines to be unimpededly introduced into the upwardly open passages for directly engaging an underside of the lowermost object to lift the stack by the tines off the intermediate member.

5,193,974

DYNAMIC PRESSURE RECOVERY SEAL

Larry A. Hufford, Vista, Calif., assignor to BW/IP International, Inc., Long Beach, Calif.

Filed Jul. 1, 1991, Ser. No. 724,195
Int. Cl.[5] F01D *11/00*
U.S. Cl. 415—112 9 Claims



8. A system for providing a continuous flow of a process fluid located within a seal chamber of a mechanical seal assembly that seals a rotating shaft and that has a stationary seal and a rotary seal with adjacent seal faces that form a seal interface, the system comprising:

at least one pathway extending from the stationary seal/rotary seal interface through the stationary seal to the seal chamber; and

a pressure recovery tube extending from the end of the pathway at the seal chamber into the seal chamber with an open end facing against the direction of flow of the process fluid, wherein fluid that is flowing within the seal chamber due to rotation of the shaft flows into the pressure recovery tube, into the pathway, and to the stationary seal/rotary seal interface.

9. A system for providing a continuous flow of a process fluid located within a seal chamber of a mechanical seal assembly that seals a rotating shaft and that has a stationary seal and a rotary seal with adjacent seal faces that form a seal interface, the system comprising:

at least one pathway extending from the stationary seal/rotary seal interface through the rotating seal to the seal chamber; and

a pressure recovery tube extending from the end of the pathway at the seal chamber into the seal chamber with an open end disposed radially outwardly of the stationary seal/rotary seal interface and facing into the direction of flow of the process fluid, wherein fluid that is flowing within the seal chamber due to rotation of the shaft flows into the pressure recovery tube, into the pathway, and to the stationary seal/rotary seal interface.

5,193,975

COOLED GAS TURBINE ENGINE AEROFOIL

Jonathan G. Bird, Mickleover, and Brian G. Cooper, Repton, both of England, assignors to Rolls-Royce plc, England

Filed Feb. 4, 1991, Ser. No. 650,233
Claims priority, application United Kingdom, Apr. 11, 1990, 9008286
Int. Cl.[5] F01D *5/00*
U.S. Cl. 415—115 7 Claims

1. A cooled gas turbine engine aerofoil comprising a hollow interior arranged to be supplied with cooling air, the aerofoil having a leading edge region and a trailing edge, the leading edge region having a convex, curved exterior surface, the aerofoil having an exterior surface and a plurality of rows of cooling air passages extending through the leading edge region of the aerofoil to interconnect the hollow interior with the exterior surface of the aerofoil, each of the cooling air passages having an axis and a sidewall, the aerofoil being located in operation in a hot gas stream, the cooling air passages in each of the rows at the leading edge region of the aerofoil and in the adjacent rows at the leading region of the aerofoil being arranged such that their axes are substantially parallel, the cooling air passages having parallel axes arranged in operation to direct cooling air in the generally opposite direction to the local flow of the gas stream to minimize an area of the sidewall onto which debris entering the cooling air passages may adhere.

5,193,976

INJECTION DEVICE FOR THE ON-LINE WET CLEANING OF COMPRESSORS

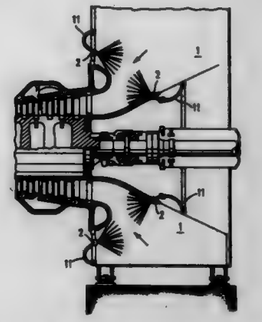
Sejko Kolev, Brugg, and Rudolf Robben, Wettingen, both of Switzerland, assignors to Turbotect Ag, Baden, Switzerland

PCT No. PCT/CH91/00035, § 371 Date Oct. 15, 1991, § 102(e) Date Oct. 15, 1991, PCT Pub. No. WO91/12433, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 8, 1991, Ser. No. 768,763
Claims priority, application Switzerland, Feb. 14, 1990, 490/90-3
Int. Cl.[5] F04D *29/70*
U.S. Cl. 415—116 1 Claim

1. An injection device for ON-LINE wet cleaning of compressors, comprising:

nozzle means for directing a liquid cleaning agent onto a flow passage located upstream of a compressor inlet, the compressor comprising a casing wall; and

ball joint means movably mounted in the casing wall of the compressor, said nozzle means being a molecular atomizer which is mounted in said ball joint means, said ball joint means being adjustable in a three dimensional manner for



permitting said nozzle means mounted therein to be adjustable in said three-dimensional manner.

5,193,977

FLEXIBLE MEMBRANE SEALLESS CENTRIFUGAL PUMP

Don Dame, 6740 Ashwood Rd. #203, Woodbury, Minn. 55125

Filed Nov. 22, 1991, Ser. No. 797,118
Int. Cl.[5] F04D *29/66*
U.S. Cl. 415—206 51 Claims

1. Pump for pumping fluid comprising, in combination: a pumping chamber to contain the fluid; a flexible membrane forming at least a portion of the pumping chamber; means located outside of the pumping chamber for deforming the flexible membrane to rotate the fluid in the pumping chamber about a center of fluid rotation to generate a centrifugal force to produce a pumping action; a fluid outlet extending into the pumping chamber spaced from the center of fluid rotation and providing a continuously open passage for the fluid when the flexible membrane is being deformed; and a fluid inlet extending into the pumping chamber radially inwardly from the fluid outlet and providing a continuously open passage for the fluid when the flexible membrane is being deformed.

5,193,978

ARTICULATED BLADE WITH AUTOMATIC PITCH AND CAMBER CONTROL

Bill Gutierrez, 3428 Belmont Ave., El Cerrito, Calif. 94530

Filed Sep. 23, 1991, Ser. No. 764,166
Int. Cl.[5] F03D *3/00*
U.S. Cl. 416—24 2 Claims

1. an articulated blade with automatic pitch and camber control comprising:

(a) a forward vane section of the blade, a vane axis about which the vane rotates by rotational means, and which is parallel to the blade's leading edge, said forward vane section pitched about the vane axis by the action of rela-

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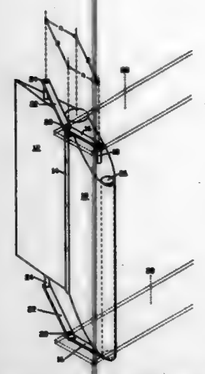
tive fluid flow, such that the blade's leading edge is pitched into the flow, thus reducing drag on the blade,

(b) a rear deflector section, of the blade, connected to the vane by hinge means,

(c) a control arm connected by pivoting means to the vane at the vane axis and connected by parallelogram linkage



means to the deflector, so that the deflector is free to translate with the vane but is constrained to remain always oriented parallel to the control arm, thus changing the camber of the blade, diverting fluid flow always parallel to the control arm, thereby enabling the blade to obtain a high lift in the direction pointed by the control arm, and at a low drag due to the pitching of the vane.

5,193,979

WIND FORCE-OPERATED CYCLING ORNAMENT

Hsang-Kuang Sun, 4Fl., 1-46, No. 1, Hsin Yi Road, Sec. 4, Taipei, Taiwan

Filed Dec. 2, 1991, Ser. No. 801,355

Int. Cl.[5] B63H *1/00*

U.S. Cl. 416—61 **1 Claim**

1. A wind force-operated cycling ornament, comprising:

a base, said base having a support upstanding from a bottom, said bottom having holes for fastening to a supporting surface by screws;

a body supported on said support of said base, said body comprising an upper part extending from a lower part, the upper part of said body being shaped like a cyclist and having two opposite pegs aligned at two opposite sides, the lower part of said body having a bearing holder to hold a bearing, and a wheel seat;

a fan mounted on said bearing holder, said fan having a shaft inserted through said bearing, said shaft having a rear end coupled with a worm and disposed in said wheel seat;

two transmission wheels mounted on said wheel seat at two opposite sides by a wheel axle, said transmission wheels including one wheel having a gear fixedly attached thereto at an inner side and disposed in mesh with said worm;

a pair of driven plates revolvably mounted on said pegs at two opposite sides, said driven plates being respectivley shaped like the upper part of the leg;

a pair of driving plates respectively connected between said pair of driven plates and said two transmission wheels, said driving plates each having one end fixedly respectively connected to said two transmission wheels and an opposite end revolvably respectively connected to said pair of driven plates; and

wherein rotating said fan causes said two transmission wheels to rotate simultaneously, so that said pair of driving plates and said pair of driven plates are simultaneously moved to alternatively rotate back and forth.

5,193,980

HOLLOW TURBINE BLADE WITH INTERNAL COOLING SYSTEM

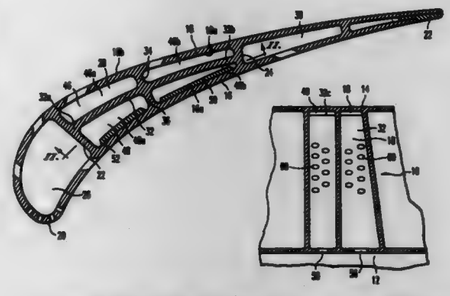
Christian Kainez, Le Mee sur Seine; Georges Mazeaud, Yerres; Carmen Mirancourt, Brie Comte Robert, and Didier M. Mortgat, Combs la Ville, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." , Paris, France

Filed Jan. 30, 1992, Ser. No. 828,104

Claims priority, application France, Feb. 6, 1991, 91 01305

Int. Cl.[5] F01D *5/18*

U.S. Cl. 416—97 R **10 Claims**



1. A hollow turbine blade equipped with a cooling system, said blade comprising an intrados wall, an extrados wall, first and second ends respectively defining a root and a tip of said blade, two internal partitions connected to said intrados and extrados walls and dividing the interior of said blade into at least one internal cavity extending from said root to said tip of said blade, a median partition connected to said two internal partitions to divide the internal cavity defined between said two internal partitions into two half-cavities, said median partition leaving an aperture in the proximity of one of said ends of said blade to establish communication between said two half-cavities separated by said median partition, air inlet holes opening into said half-cavity on the intrados side of said median partition in the proximity of the other of said ends of said blade, air flow disturbing means disposed on at least part of the internal face of said intrados wall opposite said median partition, and air outlet holes provided in said extrados wall opposite said median partition.

5,193,981

FAN WHEEL WITH CUP SHAPED HUB

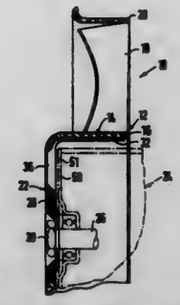
Wolfgang Scheidel, Buehl, and Reuben Agnon, Sasbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 12, 1991, Ser. No. 806,883

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1991, 4102161

Int. Cl.[5] F04D *29/38*

U.S. Cl. 416—179 **7 Claims**



1. A fan wheel, comprising a cup shaped hub having an outer cup wall with a plurality of vanes, and a cup bottom connectable with a shaft of a drive and provided at its inner side with a plurality of ribs defining a plurality of fields therebetween, said cup bottom in the region of said fields having a plurality of depressions extending from its inner side and having a width approximately 70% of a thickness of said cup bottom.

5,193,982

SEPARATE INTER-BLADE PLATFORM FOR A BLADED ROTOR DISK

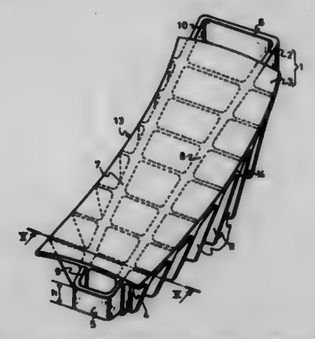
Gérard F. Inizan, Paris; Gérard E. A. Jourdain, Saintry sur Seine; Philippe Pabion, Dammarie les Lys; Jean-Michel Payen, Le Mee sur Seine, and Christine J. G. Ruffier, Vitry sur Seine, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation S.N.E.C.-M.A., Paris, France

Filed Jul. 16, 1992, Ser. No. 913,707

Claims priority, application France, Jul. 17, 1991, 91 09013

Int. Cl.[5] F01D *5/22*

U.S. Cl. 416—193 A **4 Claims**



1. A separate inter-blade platform for a bladed rotor disk of a turbo-machine, said rotor disk defining a circumferential direction and having upstream and downstream sides, said platform comprising a first part made of a laminated first material and defining a four-sided frame of generally trapezoidal shape, said frame having smaller and larger ends which, in use, are located on the upstream and downstream sides respectively of said rotor disk, and two lateral sides interconnecting said smaller and larger ends for location between successive blades of said rotor disk, and a second part made of a relatively flexible and self-adhesive second material of the polyurethane type attached to said first part, said second part defining a plate capping said frame over the greater part of the said two lateral sides and leaving said smaller and larger ends free, a plurality of evenly spaced ribs carried by said plate and oriented such that, in use, said ribs extend in said circumferential direction of said rotor disk from one of said blades of said disk to the next, and a layer of said second material covering said lateral sides of said frame in line with said plate.

5,193,983

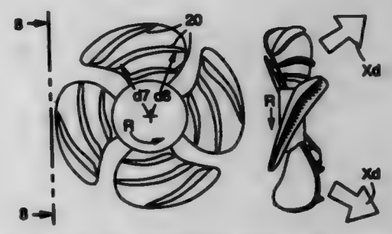
AXIAL-FLOW FAN-BLADE WITH PROFILED GUIDE FINS

Jin-Ming Shyu, Hsinchu City, Taiwan, assignor to Norm Pacific Automation Corp., Hsinchu City, Taiwan

Filed Aug. 5, 1991, Ser. No. 740,604

Int. Cl.[5] F04D *29/38, 29/58*

U.S. Cl. 416—236 A **16 Claims**



1. An axial-flow fan having a axial portion formed along an axis and several fan blades installed around said axial portion; each fan blade being defined as having two surfaces positioned relative to said axis;

the rotation of said fan blades causing fluid flow through said blades, said fluid flow causing centrifugal force; and

means for producing centripetal force to balance said centrifugal force;

said centripetal force producing means including at least one fin extending from at least one of said surfaces of said fan blade;

each fin having an inner surface and an outer surface relative to the axis; and

the length of the fin measured along the outer surface being shorter than the length of the fin measured along the inner surface for producing said centripetal force.

5,193,984

FAN ASSEMBLY

Kun-Yuan Lin, Taichung, Taiwan, assignor to Deng-Hsei Hsang, Taiwan

Filed Oct. 10, 1991, Ser. No. 774,336

Int. Cl.[5] B64C *11/00*

U.S. Cl. 416—247 R **8 Claims**

1. A fan assembly comprising:

a base;

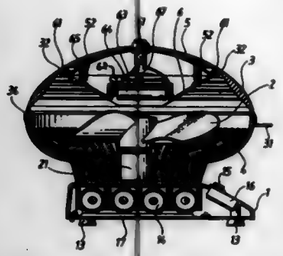
a lower protective cover carried by said base;

a fan;

a motor drivingly connected to said fan, said motor being carried by said lower protective cover;

an upper protective cover removably secured to said lower protective cover, said upper protective cover comprising

a grill composed on a a plurality of circular ribs of varying diameters, one of said ribs being formed with a plurality of inwardly projecting and annularly spaced fixing elements;
a conical-shaped guide member having a circumferential edge provided with a plurality of spaced hooking elements, each of said hooking elements being adapted to engage a respective one of said fixing elements for remov-

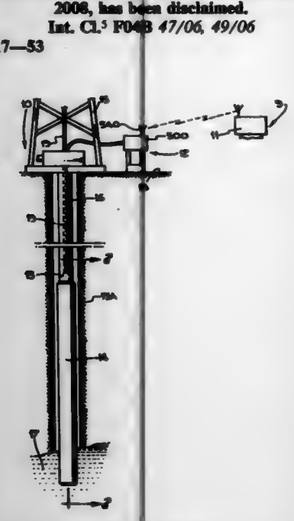


ably securing said guide member to said upper protective cover, said guide member being adapted to disperse air flow from said fan through said upper protective cover about 360 degrees thereof;
a lighting element carried by said guide member; and
means for selectively supplying power to said fan and said lighting element.

5,193,985
PUMP CONTROL SYSTEM FOR A DOWNHOLE MOTOR-PUMP ASSEMBLY AND METHOD OF USING SAME

Nelson Escue, La Mesa; Vance E. Bolding, Huntington Beach, both of Calif., and Howard C. Hornsby, West Palm Beach, Fla., assignors to UniFlo Oil Corp, Ltd., La Mesa, Calif.

Division of Ser. No. 462,833, Jan. 10, 1990, Pat. No. 5,049,046. This application Nov. 9, 1990, Ser. No. 611,186
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] F04B *47/06, 49/06*
U.S. Cl. 417—53 **5 Claims**

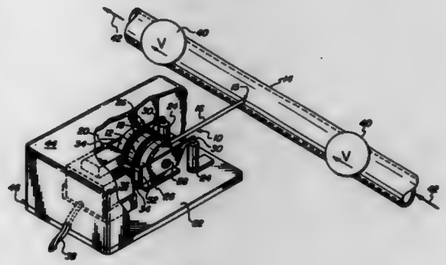


1. A method for pumping well fluids from downhole to the ground surface, comprising the steps of:
connecting a surface motor controller to a downhole motor-pump cartridge unit by a control cable, said unit having a pump and a linear direct current motor disposed therein;
energizing said control cable simultaneously with high voltage direct current pulses and a low voltage frequency modulated carrier signal;
causing a downhole motor controller disposed in said unit to respond to said low voltage frequency modulated carrier signal by coupling said high voltage pulses to selected ones of a plurality of stator pulse coils disposed in said downhole motor-pump cartridge unit; and
moving an armature assembly rectilinearly in said linear direct current motor for causing well fluids from downhole to be moved to the ground surface.

5,193,986
FLUID PUMP

Benton H. Grant, Stamford, Conn., and Robert R. Stein, Harrison, N.Y., assignors to Grant Manufacturing Corporation, Vanderbilt, Mich.

Filed Jan. 6, 1992, Ser. No. 817,340
Int. Cl.[5] F04B *9/08, 35/02;* F04F *11/00*
U.S. Cl. 417—98 **25 Claims**



1. A fluid pump comprising:
a substantially rigid tube;
a pair of spaced apart valves connected to said tube, said valves adapted to permit a flow of fluid through said tube substantially in a single direction;
a valveless pump chamber open to at least one side;
a diaphragm for sealing the open side of said pump chamber;
means for reciprocating said diaphragm; and
a conduit connected in fluid communication with both said pump chamber and said tube between said valves,
said tube having a diameter at least about three times larger than a diameter of said conduit, and having an inner surface contacted by the fluid as the flow passes through said tube.

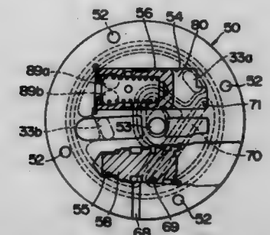
5,193,987
SCROLL TYPE COMPRESSOR

Takayuki Iio, Nishikasugai, and Yoshiharu Morita, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1991, Ser. No. 753,373
Claims priority, application Japan, Nov. 14, 1990, 2-308194
Int. Cl.[5] F04B *49/00*
U.S. Cl. 417—310 **6 Claims**

1. A scroll type compressor comprises a stationary scroll and a revolving scroll formed by setting up spiral wraps on an inner surface of an end plate, respectively, are made to engage with each other while shifting the angle so as to form a plurality of compression chambers point-symmetrically with respect to a center of a spiral, said stationary scroll is installed fixedly in a housing and said revolving scroll is made to revolve in a solar motion by means of a mechanism for driving revolution while checking rotation on its axis by a mechanism for checking rotation on its axis, thereby to move said compression chambers toward the center of the spiral while reducing volumes thereof so as to compress gas, thus discharging the compressed

gas into a discharge cavity formed in said housing from a discharge port provided in an end plate of said stationary scroll, the scroll type compressor further comprises a pair of bypass ports which communicate with said compression chambers, the bypass ports are bored in the end plate of said stationary scroll, an inner surface of a capacity control block which is separate from said stationary scroll is made to abut against the outer surface of the end plate of said stationary scroll, a first

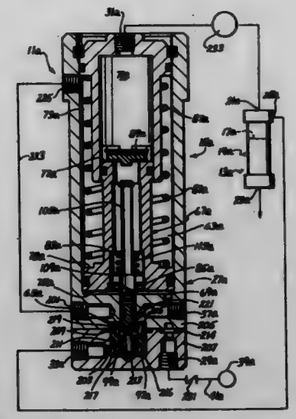


recessed portion communicating with said pair of bypass ports is formed therebetween on the side of said capacity control block, one cylinder communicating with a suction chamber formed in said housing is provided in said capacity control block, and a piston operating by a control pressure in accordance with the load of said compressor is inserted into the cylinder in a sealed and slidable manner, thus opening and closing a first communication hole communicating with said recessed chamber by means of said piston.

5,193,988
REVERSE OSMOSIS SYSTEM AND AUTOMATIC CYCLING BOOSTER PUMP THEREFOR

Donald F. Solomon, Hemet, Calif., assignor to Product Research And Development, Santa Ana, Calif.

Division of Ser. No. 350,521, May 11, 1989, Pat. No. 5,000,845, which is a continuation-in-part of Ser. No. 111,697, Oct. 21, 1987, Pat. No. 4,863,924. This application Dec. 14, 1990, Ser. No. 628,431
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—403 **8 Claims**

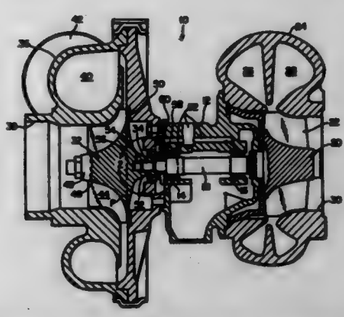


1. A fluid-driven pump comprising:
a housing having an inlet port, an outlet port and first, second and third ports, said housing having a first cavity and said inlet port, said outlet port and said first port communicating with said cavity;
a differential area piston reciprocable in said cavity and dividing the cavity into an inlet chamber communicating with the inlet port, an outlet chamber communicating with the outlet port, and a reversing chamber communicating with the first port;
said piston having a first relatively large area face in said inlet chamber, a second smaller area face in the outlet chamber and a reversing face in the reversing chamber;
said piston being movable on a pumping stroke during which the volume of the outlet chamber is reduced and a return stroke during which the volume of the outlet chamber is increased;
a first valve for providing communication between said inlet chamber and said outlet chamber during the return stroke;
said housing having a second cavity therein sealed from said inlet chamber and communicating with said first, second and third ports;
a second valve in said second cavity which provides communication between the first and third ports and blocks communication between the second and third ports during the pumping stroke and provides communication between the fist and second ports and blocks communication between the first and third ports during the return stroke; and
a drive connection between the piston and the second valve whereby movement of said piston operates said second valve.

5,193,989
COMPRESSOR WHEEL AND SHAFT ASSEMBLY FOR TURBOCHARGER

Jean-Luc P. Fleury, Manhattan Beach; Gerald D. LaRue, Torrance; Kaumal J. Silva, Gardena; Daniel A. Gutknecht, Torrance, and Martin D. Garcia, San Pedro, all of Calif., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 19, 1991, Ser. No. 732,857
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—407 **10 Claims**



1. Compressor wheel and shaft assembly comprising a rotatable shaft having threads comprising a shaft threaded section adjacent one end thereof, a pair of circumferentially extending, substantially smooth shaft pilot surfaces defined on said shaft, each of said shaft pilot surfaces being located adjacent a corresponding end of the shaft threaded section, and a compressor wheel rotatable about an axis, said compressor wheel having an axially extending bore receiving said shaft and threads comprising a bore threaded section within said bore for engagement with the threads of the shaft threaded section when the compressor wheel is installed on the shaft, said bore having a pair of circumferentially extending, substantially smooth bore pilot surfaces adjacent corresponding ends of said bore threaded section for engagement with a corresponding shaft pilot surface to define a pair of axially separated sets of mutually cooperating pilot surfaces, each of the pilot surfaces extending coaxially with respect to said bore, an annular thread engagement region defined between a minor diameter defined by the root diameter of the threads comprising said shaft

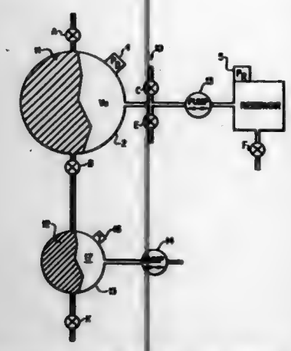
threaded section and a major diameter defined by the root diameter of the threads comprising said bore threaded section when the compressor wheel is installed on said shaft, each of said sets of cooperating pilot surfaces being displaced radially with respect to said thread engagement region, said shaft carrying a radially projecting, circumferentially extending stop surface cooperating with a corresponding radially projecting, circumferentially extending stop surface on said compressor wheel to thereby locate said compressor wheel axially relative to said shaft.

5,193,990

FLUID MANAGEMENT SYSTEM WITH AUXILIARY DISPENSING CHAMBER

Dean L. Kamen, Bedford, and Richard J. Lanigan, Concord, both of N.H., assignors to Deka Products Limited Partnership, Manchester, N.H.

Continuation-in-part of Ser. No. 615,612, Nov. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 614,806, Nov. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,801, May 15, 1990, Pat. No. 5,088,515, and a continuation-in-part of Ser. No. 345,387, May 1, 1989, Pat. No. 4,976,162, which is a continuation-in-part of Ser. No. 92,481, Sep. 3, 1987, Pat. No. 4,826,482, which is a continuation-in-part of Ser. No. 22,167, Mar. 5, 1987, Pat. No. 4,808,161, and a continuation-in-part of Ser. No. 836,023, Mar. 4, 1986, Pat. No. 4,778,451. This application Mar. 22, 1991, Ser. No. 674,818
Int. Cl.[5] F04B *43/08, 43/12*
U.S. Cl. 417—474 13 Claims



1. A system for controlling the flow of fluid through a line, comprising:

(a) first, second, and third valves in series in the line;

(b) a container having first and second regions of variable volume, the first region disposed in fluid communication between the first and second valves;

(d) dispensing chamber means for providing a first dispensing volume, variable between first fixed maximum and minimum limits, disposed in fluid communication between the second and third valves;

(e) volume determination means for determining the volume of fluid in the first region by means of a measurement gas in the second region;

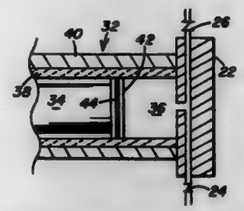
(f) control means, in communication with the volume determination means, the first, second and third valves, the pressure means, and the dispensing chamber means for directing the operation of the valves, the pressure means, and the dispensing means to produce the desired flow through the line.

5,193,991

LIQUEFIED CARBON DIOXIDE PUMP

Douglas J. Koehler, Irwin, and Glen P. Williams, Pittsburgh, both of Pa., assignors to Sugrex Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1991, Ser. No. 663,316
Int. Cl.[5] F04B *39/10*
U.S. Cl. 417—571 27 Claims



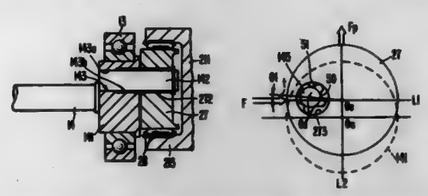
1. A piston pump for compressing liquefied gases comprising a pump cylinder having an inner portion formed from material of low thermal conductivity to limit the transfer of heat generated during compression of said liquefied gases from the compressed liquefied gases to said pump cylinder wherein said compressed liquefied gases retain said heat generated during compression of said liquefied gases, said inner portion having a cylindrical bore to slidingly receive the piston of said pump as said pump compresses said liquefied gases.

5,193,992

SCROLL TYPE FLUID DISPLACEMENT APPARATUS HAVING CONTROL OF THE LINE CONTACT URGING FORCE

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed May 20, 1991, Ser. No. 702,336
Claims priority, application Japan, May 18, 1990, 2-126908
Int. Cl.[5] F01C *1/04, 17/06*
U.S. Cl. 418—55.5 15 Claims



1. In a scroll type fluid displacement apparatus including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed in said housing and having first end plate from which a first wrap extends, an orbiting scroll having a second end plate from which a second wrap extends, said first and second wraps interfitting at an angular offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism including a drive shaft rotatably supported by said housing and a crank pin eccentrically extending from an inner end of said drive shaft, a bushing including a central axis offset from the central axes of said drive shaft and said crank pin, said bushing drivingly connecting said crank pin to said orbiting scroll, said orbiting scroll being moved by said bushing in orbital motion, rotation preventing means for preventing the rotation of said orbiting scroll during its orbital motion, said bushing being rotatable about said crank pin, wherein a first line is defined as passing through the central axis of said drive shaft and the central axis of said bushing, a second line is defined as passing through the central axis of said bushing and perpendicular to the first line, a third line is defined as passing through the central axis of said bushing and the central axis of said crank pin, and a radius of orbital motion is defined as the distance between the central axis of said bushing and the central axis of said drive shaft, the improvement comprising:

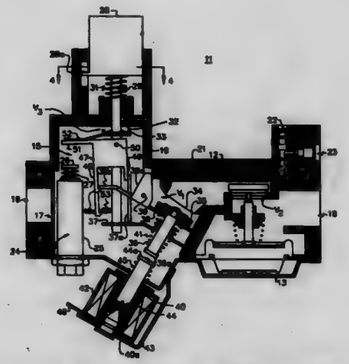
a control mechanism to reduce the angle between the second line and the third line when an abnormal reaction force due to compressed gas in the sealed off fluid pockets is exerted on the central axis of said bushing, said control mechanism further maintaining the radius of orbital motion as a constant distance upon the occurrence of such abnormal reaction forces.

5,193,993

SAFE GAS VALVE

Paul Dietiker, Redondo Beach, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 5, 1992, Ser. No. 831,785
Int. Cl.[5] F23Q *9/12*
U.S. Cl. 431—51 12 Claims



1. A gas valve for a gas burning appliance, comprising:

housing means defining an inlet adapted for connection to a source of gas, a main outlet adapted for connection to a gas burning appliance and a pilot outlet adapted for connection to a pilot burner in the appliance;

pilot valve means disposed between the inlet and pilot outlet for controlling the flow of gas therebetween;

manually operated control means operatively connected to the pilot valve means and movable between a first position in which the pilot valve means is closed and a second position in which the pilot valve means is open, said manually operated control means being normally biased to the first position;

main valve means disposed between the inlet and main outlet for controlling the flow of gas therebetween, said main valve means including a valve seat defined by said housing means, valve closure means mounted in said housing means and adapted for movement between a first position in which said main valve means is closed and a second position in which said main valve means is open, and a first spring biasing the valve closure means toward its first position;

lever means movably mounted in said housing and having an end biased to a first position toward the valve seat, said lever means being adapted to cooperate with the valve closure means such that the valve closure means is held in its second position when said end of said lever means is in its first position, the first biasing force at said end of said lever means being sufficient to overcome the force applied to the valve closure means by the first spring;

latch means mounted on said manually operated control means and alterably engageable with said lever means to move said end thereof away from the valve seat when said manually operated control means is in its second position;

pilot valve control means engageable with said latch means in the absence of a pilot flame at the pilot burner in the appliance, said pilot valve control means being adapted, when engaging said latch means, to cause said latch means to disengage from said lever means to close said main valve means; and

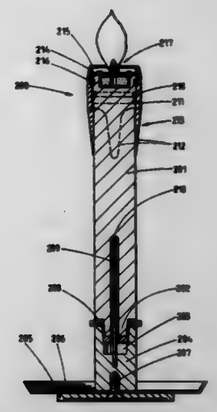
actuator means adapted to cooperate with the valve closure means, said actuator means being operable between demand and no demand states as a function of a controlled condition, said actuator means in its no demand state being effective to move the valve closure means to its second position against the bias of the first spring to close the main valve means.

5,193,994

CANDLE WITH A FLOATING WICK SUPPORT

Hans-Ludwig Schirneker, Engelslit 10, D-4773 Möhnesee-Völlinghausen, Fed. Rep. of Germany

Filed Feb. 5, 1991, Ser. No. 650,917
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1990, 9001271[U]; May 30, 1990, 4017383
Int. Cl.[5] F23D *3/16*
U.S. Cl. 431—293 3 Claims



1. A candle comprising:

a body composed of a combustible material which is solid at room temperature and liquid when burned, said body having a top portion and a bottom portion, said bottom portion having means for joining said body to an identical body;

a tubular headpiece surrounding said top portion, said headpiece having a lower portion which guides said headpiece downwardly on said body as said top portion of said body is burned and a heat-conducting ring with sealing means for preventing liquified combustible material from flowing down said body;

a floating wick support, said support located within said tubular headpiece, said support including a housing having a plurality of bendable tongues extending therefrom, a float contained within said housing, an absorbent layer of glass fiber or glass wool matting on said float, and an incombustible centering disk affixed to said support by said bendable tongues and spaced away from said matting, said disk having an opening therein; and

a porous cone wick on said matting, said wick extending through said disk opening and having a central longitudinal bore.

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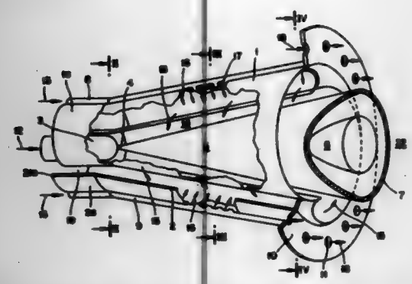
5,193,995
APPARATUS FOR PREMIXING-TYPE COMBUSTION OF LIQUID FUEL

Jakob Keller, Dottikon; Thomas Sattelmayer, Mandach, and Daniel Styner, Hallwil, all of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Division of Ser. No. 282,736, Dec. 12, 1988, Pat. No. 4,932,861. This application Mar. 20, 1990, Ser. No. 500,191
Claims priority, application Switzerland, Dec. 21, 1987, 4988/87
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] F23C 5/00
U.S. Cl. 431—351 4 Claims



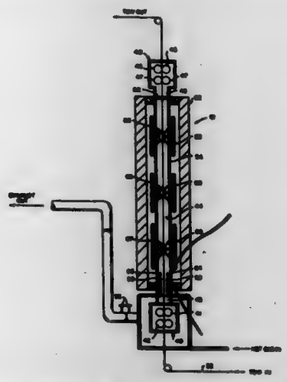
1. A burner for hot gas generation comprising:
at least two hollow part conical bodies mated together to form a burner body having a hollow, substantially conical interior that has a cone inclination increasing in a flow direction, said bodies mated together such that center longitudinal axes of said bodies are offset from each other;
tangential air inlet slots for introducing combustion air into the interior of said burner body, said air inlet slots extending substantially the length of said burner body;
a nozzle means for supplying a conical column of fuel within said burner body substantially along the length of said burner body, said nozzle means having a means for injecting fuel disposed at a burner at a burner inlet end of said burner inside said hollow conical interior at a location between said offset longitudinal axes.

5,193,996
METHOD AND SYSTEM FOR PRODUCING CARBON FIBERS

Charles K. Mullen, Anaheim Hills, Calif., assignor to BP Chemicals (HITCO) Inc., Gardena, Calif.

Continuation of Ser. No. 363,365, May 31, 1989, abandoned, which is a continuation of Ser. No. 147,105, Jan. 20, 1988, abandoned, which is a continuation of Ser. No. 865,165, May 20, 1986, abandoned, which is a division of Ser. No. 742,103, Jun. 5, 1985, Pat. No. 4,610,868, which is a continuation of Ser. No. 541,652, Oct. 13, 1983, abandoned. This application Nov. 12, 1991, Ser. No. 793,251
Int. Cl.[5] F27B 9/28
U.S. Cl. 432—59 27 Claims

1. A furnace system for partially carbonizing oxidized fibers, comprising:
a furnace having opposite ends thereof and including an interior heating enclosure, the furnace and enclosure being configured to pass a fiber tow therethrough along a generally planar fiber tow path, and including seal means at the opposite ends, the generally planar fiber tow path extending in a longitudinal direction along a length thereof between the opposite ends;
fiber tow tensioning apparatus with the generally planar fiber tow path;
hot gas source means for producing a thin flowing sheet of heated inert gas in the longitudinal direction along a portion of the length of the generally planar fiber tow path between the seal means, the hot gas source means introducing the inert gas into the generally planar fiber tow path adjacent one of the opposite ends and in the longitudinal direction so that the heated inert gas flows along a substantial portion of the length of the generally planar fiber tow path between the opposite ends with the thin flowing sheet of heated inert gas being generally parallel to the generally planar fiber tow path and the hot inert



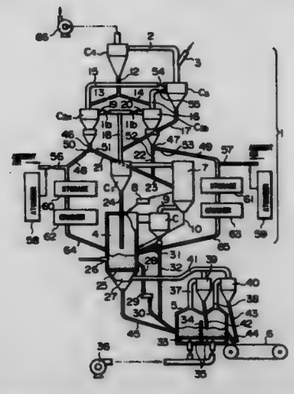
gases thereof impinging tangentially on the general planar fiber tow path;
means disposed between the furnace and heating enclosure for heating an interior of the heating enclosure to in the range of 300° C. to 700° C. in a midregion of the furnace between the opposite ends; and
means defining exit port means adjacent the midregion of the furnace in communication with the interior of the heating enclosure for withdrawing gases therefrom.

5,193,997
APPARATUS FOR PREHEATING GRANULAR MATERIAL

Mikio Aoyama; Isao Hashimoto, both of Akashi, and Jun Tatebayashi, Takarazuka, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Maruo Calcium Co., Ltd., Hyougo, both of Japan

Filed Jun. 24, 1991, Ser. No. 719,627
Claims priority, application Japan, Jun. 26, 1990, 2-169449
Int. Cl.[5] F27B 15/00
U.S. Cl. 432—106 10 Claims

1. An apparatus for preheating a granular material having a suspension preheater including a plurality of stages of cyclones arranged above a calcination furnace such that said granular material is preheated by waste gas from said calcination furnace as said granular material passes through said suspension preheater, said apparatus comprising: a precalcinator connected between a collecting cyclone directly connected to said calcination furnace and a first cyclone constituting the most downstream stage, and a chute connecting said precalcinator

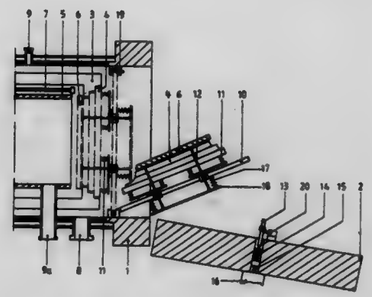


to said calcination furnace for supplying said granular material heated by said precalcinator to said calcinator furnace.

5,193,998
SEALING ARRANGEMENT FOR HEAT TREATMENT APPARATUS

Robert Hack, Lahnau; Jens Lindemann, Giessen, and Erhard Netz, Hohenahr, all of Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,672
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1990, 4017942
Int. Cl.[5] F23M 7/00
U.S. Cl. 432—250 7 Claims



1. A closure arrangement in a heat treatment device, comprising:
an outside vessel arranged for vacuum and higher pressure operation;
a container located within said vessel for receiving a charge to be treated;
a heating device located within said vessel and enclosing said container;
thermal insulation located within said vessel and surrounding said heating device and container, wherein said thermal insulation comprises a movable insulation door and a moveable door for sealing said container, wherein said vessel has an end with said vessel door located at the end, said insulation door and container door located inwardly of and adjacent the vessel door;
an openable pressure-tight door in said vessel for sealing the interior thereof;
means for moving said container door and insulation door between an open and a closed position independently of said vessel door, said means including a first device for opening and closing said container door, a second device for opening and closing said insulation door independently of one another and a frame supporting said devices and movable between an open position and a closed position;
a locking device, wherein said frame is pivotally mounted on said tank and is securable in the closed position by the locking device;
first spring elements mounted on said frame, wherein said first spring elements press said insulation door into the closed position when said frame is in the closed position;
a transverse connector extending in parallel relation with said frame and located between said frame and said vessel door;
second spring elements extending between said frame and said transverse connector;
displacement members connected to said transverse connection and said container door, and wherein said second spring elements are arranged to hold the container door in the open position;
a tappet arranged to contact said transverse connection and extending therefrom toward said vessel door;
a driving device located on the exterior of said vessel door;
a drive rod connected to said driving device and extending toward said tappet; and
a third spring element located between said drive rod and said tappet for absorbing thermal stress in said container, wherein said driving device and the tappet act on the transverse connector for moving said container and door into the closed position.

5,193,999
ABUTMENT SELECTOR

Peter E. Staubli, San Carlos, Calif., assignor to Attachments International, Inc., San Mateo, Calif.

Filed Nov. 14, 1991, Ser. No. 791,726
Int. Cl.[5] A61C 19/04
U.S. Cl. 433—72 13 Claims

1. A dental measurement instrument for measuring gum tissue height along a nonlinear surface, comprising:
an elongated member for providing a gripping surface, said elongated member having an axis; and
a first portion extending outwardly at an angle from said elongated member, said first portion having a probing member,
said probing member forming a tip whose perpendicular cross section to the longitudinal axis of said probing member forms a closed figure, said closed figure including at least one nonlinear indentation extending parallel to said longitudinal axis of said probing member, wherein said nonlinear indentation is for conforming to said nonlinear surface, said probing member having measurement segments for measuring said nonlinear surface.

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5,194,000
MANDIBULAR ENDOSTEAL IMPLANT
Georges E. Dury, Avenue Franklin Roosevelt 141, B-1050 Bruxelles, Belgium
Filed Feb. 1, 1991, Ser. No. 613,824
Claims priority, application Belgium, Aug. 2, 1988, 08800894
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 25 Claims

1. A mandibular endosteal implant for a mandible having blueberry tissue enclosed within an endosteum perimetrically defined by bone of a lower cortical area, a lingual cortical area, upper cortical area and a vestibular cortical area, mucosal tissue of a patient's gum intervening between the upper cortical area and a patient's oral cavity, and an opening having a given width and being formed along a generally vertical axis through said mucosal tissue and said upper cortical area into said endosteum,

said implant comprising:

a body having a lower portion of a first, larger transverse (relative to said axis) cross-sectional area and a width greater than said given width, said lower portion being arranged to be received in said endosteum and embedded in said blueberry tissue and said lower cortical area, and an upper portion of a second, smaller transverse cross-sectional area projecting upwardly from said lower portion, along said axis, and projecting upwards within said opening to at least a level of flushness with said oral cavity;

said upper portion terminating in an upper end which, when said lower portion is embedded in said lower cortical area, is arranged to be accessible from said oral cavity.

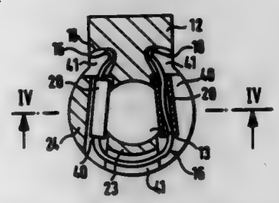
5,194,001
REINFORCED DENTAL BRIDGE
Christopher A. Salvo, 656 King St., Port Chester, N.Y. 10573
Filed Aug. 2, 1991, Ser. No. 738,963
Int. Cl.[5] A61C *13/12, 13/225, 5/00*
U.S. Cl. 433—180 40 Claims

1. A reinforcing frame for a dental bridge comprising:

a channel-shaped main support bar having sides and a base and end portions for mounting in dental preparations in abutment teeth and at least one central portion for mounting at least one dental prosthesis, the central portion being contained in a first plane and at least one end portion being contained in a second plane the first plane being parallel to and spaced a predetermined distance away from the second plane;

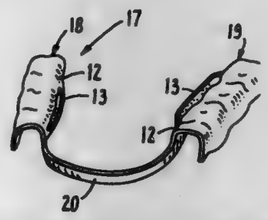
at least one cross support bar extending perpendicular to the longitudinal axis of said main support bar and mounted across the central portion of said main bar and extending equidistantly from each side thereof, the sides of said main support bar defining a notch with said cross bar being mounted therein, said bars being of the same material and having the same cross-sectional configuration.

5,194,002
ANCHOR FOR SECURING A DETACHABLE PART TO A FIXEDLY MOUNTED PART OF A DENTAL PROSTHESIS
Adam Oberst, Logenstrasse 4, D-6750 Kaiserslautern, Fed. Rep. of Germany
Filed Aug. 1, 1990, Ser. No. 561,311
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1989, 8909278[U]; Oct. 31, 1989, 8912852[U]
Int. Cl.[5] A61C *13/12, 13/225*
U.S. Cl. 433—182 13 Claims



1. An anchor for securing a detachable part to a fixedly mounted part of a dental prosthesis, comprising a first coupling member which is provided with an undercut and a second coupling member which annularly surrounds the first coupling member and has at least one resilient detent element which extends into the undercut, the detent element extending through the undercut tangentially of the first coupling member and being held in a flat recess of the second coupling member at both sides of the location where the detent element extends into the undercut of the first coupling member to resiliently yield in the recess substantially radially of the first coupling member during insertion of the first coupling member into and during extraction of the first coupling member from the second coupling member.

5,194,003
REMOVABLE DEVICE FOR DELIVERING BENEFICIAL AGENTS ORALLY
Gabriel L. Garay, Atherton; Robert Tacy, Los Altos Hills, and Anne-Ly Garay, Redwood City, all of Calif., assignors to Transpharm Group, Inc., San Francisco, Calif.
Continuation of Ser. No. 689,678, Apr. 23, 1991, abandoned, which is a continuation of Ser. No. 571,018, Aug. 22, 1990, abandoned, which is a continuation of Ser. No. 206,191, Jun. 13, 1988, abandoned. This application Jan. 3, 1992, Ser. No. 816,796
Int. Cl.[5] A61C *5/00*
U.S. Cl. 433—215 2 Claims



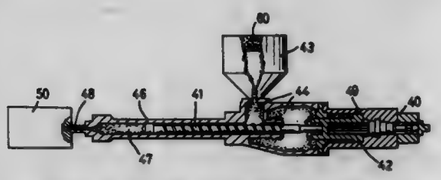
1. A device that is adapted to be suspended and held in place with an oral cavity including an upper jaw and lower jaw by a plurality of teeth of one of said jaws and/or tissues adjoining

the teeth and from which a beneficial agent is released into the oral cavity in a sustained manner comprising:

(a) a partial overlay comprising a first section that is form fitting to a first segment of teeth on one of said jaws, a second section that is form fitting to a second segment of teeth on said one of said jaws, said first segment being spaced from said second segment and an interconnecting middle section; and

(b) at least one beneficial agent reservoir that is carried on an exterior surface of the partial overlay, extends laterally of the labial, buccal or lingual surface of the teeth, is adapted to hold the beneficial agent and has a multiplicity of open-agent-release orifices that permit increase of saliva into the reservoir to dissolve the agent from the reservoir.

5,194,004
METHOD OF INJECTION-MOLDING SLOW RELEASE FLUORIDE
Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093
Continuation-in-part of Ser. No. 374,662, Jun. 30, 1989, Pat. No. 5,037,294. This application Aug. 6, 1991, Ser. No. 740,802
Int. Cl.[5] A61C *13/00*
U.S. Cl. 433—215 9 Claims



1. A method of molding an appliance for being received in the mouth, comprising the steps of:

mixing a fluoride material with a high-temperature solvent to form a mixture, the high-temperature solvent being heat-resistant up to 500° F.;

tumbling a charge of base material in the mixture to form a pre-fluoridated mixture, whereby the fluoride contained in the pre-fluoridated mixture is evenly distributed over the charge of base material;

melting the pre-fluoridated mixture at softening temperatures to form a melt, wherein melting the pre-fluoridated mixture occurs within a high-temperature limit of the high-temperature solvent to sufficiently soften and plasticize the charge of base material; and

molding said melt into a configuration to fit within a human mouth.

5,194,005
SURGICAL AND DENTAL PROCEDURES USING LASER RADIATION
Guy Levy, Marseille, France, assignor to Laser Medical Technology, Inc., San Clemente, Calif.
Continuation-in-part of Ser. No. 299,472, Jan. 18, 1989, Pat. No. 5,020,995, and Ser. No. 335,245, Apr. 10, 1989, abandoned. This application May 15, 1989, Ser. No. 351,203
Claims priority, application France, Dec. 21, 1988, 88 17549
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—215 16 Claims

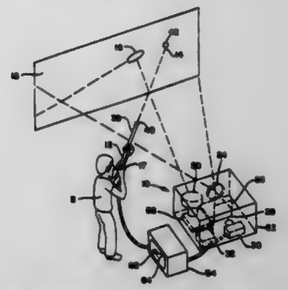
1. A method of treating a cyst or adjacent the apex of a tooth canal, comprising:

opening the canal to the vicinity of the apex;

inserting an optical fiber having an output end into the canal so that the output end is located at the apex; and

conducting a succession of pulses of radiation through the fiber so that the radiation exits from the output end, impinges on and opens the foramen, and then impinges on and at least reduces the cyst or granuloma.

5,194,006
SHOOTING SIMULATING PROCESS AND TRAINING DEVICE
William Zaenglein, Jr., 1235 Skyline Dr., Laguna Beach, Calif. 92651
Filed May 15, 1991, Ser. No. 700,269
Int. Cl.[5] F41G *3/00*; G09B *9/00*
U.S. Cl. 434—19 6 Claims



1. A ballistic simulating and training system, comprising:

a screen for viewing a simulated moving target and a simulated projectile shot towards said target;

a weapon selected from the group consisting of a shotgun, rifle and a pistol, said weapon having a trigger with a sear and a barrel providing a muzzle;

a projectile simulating light projector mounted about said barrel of said weapon for optically projecting a simulated image and aiming point of said projectile upon said screen when said projectile exits said weapon;

an internal delay circuit operatively connected to said light projector for providing a delay between the time the sear of the trigger slips to the time when the projectile leaves said muzzle;

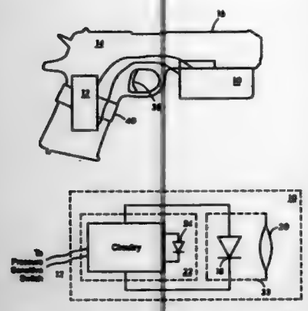
a target projector for optically displaying said moving target on said screen;

a lens and light sensing device for sensing the positions of said projectile on said screen;

a central processing unit operatively connected to said light sensing device for automatically calculating the positions of said projectile and said target when the trajectory of said projectile intersects with the path of movement of said target to indicate whether the said target has been hit or missed by said projectile, said calculating commencing when said target is activated, said central processing unit automatically determining the position of the target at the time the projectile leaves the muzzle as specified by said internal delay circuit, said central processing unit calculating the external delay time required for the projectile after leaving the muzzle to intersect the simulated plane of the target based on the point on the screen on which the light representing such projectile is sensed, said calculating being based upon the velocity and time of travel of said projectile to said point of intersection, said calculating further including calculating the distance said target will travel during said external delay time to determine the position of said target at the conclusion of said external delay time, said central processing unit automatically determining the relative position of such target and projectile at the conclusion of said external delay time; and

a display coupled to said central processing unit for indicating and displaying said positions calculated by said central processing unit including a display of the relative positions of said projectile and said target at the time said projectile intersects a substantially vertical plane of the target, said display comprising at least one member selected from the group consisting of a monitor, television receiver, a substantially flat television screen, and display screen.

5,194,007
SEMICONDUCTOR LASER WEAPON TRAINER AND TARGET DESIGNATOR FOR LIVE FIRE
Albert H. Marshall, Orlando, and Ronald S. Wolff, Cocoa, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 20, 1991, Ser. No. 703,322
Int. Cl.[5] F41G *3/26*
U.S. Cl. 434—21 6 Claims

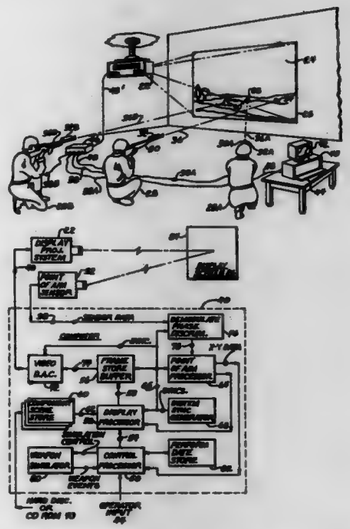


1. Apparatus adapted for use in conjunction with an operational firearm having a bore, handle and trigger to both expand on the capabilities of the firearm and enhance the operator's effectiveness when the firearm is used as a weapon, wherein the apparatus provides a narrow column of visible light that can be used to illuminate the spot that the firearm's bullet will hit if the firearm is fired, and can be used to illuminate and thereby designate a proposed target for other weapons to be fired at by their operators, comprising;
- a heat sink;
- a laser diode source of visible light having a beam with a cross-section that is elliptical in shape, mounted on said heat sink;
- optical means fixedly placed in the path of said light to collimate said beam, having a gradient refractive index lens mounted on said heat sink;
- means adapted for removably attaching said source of visible light and said optical means to said firearm such that said collimated beam has a predictable relationship to the boresight of the firearm; and,
- circuitry means coupled to said source of visible light for powering said laser diode and automatically adjusting the driving current to the laser diode to maintain its output of light substantially constant;
- wherein said circuitry means includes a photodiode fixedly mounted adjacent said source of visible light to detect light from said laser diode and provide an output responsive thereto.

5,194,008
SUBLIMINAL IMAGE MODULATION PROJECTION AND DETECTION SYSTEM AND METHOD
William L. Mohan; Samuel P. Willits, both of Barrington, and Steven V. Pawlowski, Hanover Park, all of Ill., assignors to Spartanics, Ltd., Rolling Meadows, Ill.
Filed Mar. 26, 1992, Ser. No. 858,196
Int. Cl.[5] F41G *3/76*
U.S. Cl. 434—22 36 Claims

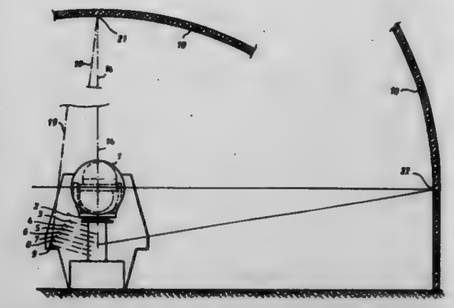
1. A simulator system for training weapon operators in use of their weapons without the need for actual firing of the weapons comprising
- background display means for displaying upon a target screen a stored visual image target scene,
- generating means for generating upon said visual image target scene one or more visual targets, either stationary or moving, with controllable visual contrast between said one or more visual targets and said visual image target scene,
- said generating means further comprising means for displaying one or more non-visible modulated areas, one for each of said one or more visual targets,
- sensor means aimable at said target scene and at said one or more targets and sensitive to said one or more non-visible modulated areas and operable to generate output signals indicative of the location of one of said one or more non-visible modulated areas with respect to said sensor means,
- computing means connected to said background display means to control said visual image target scene and said one or more targets generated thereon so as to provide said controllable contrast therebetween, and
- said computing means connected to said sensor means effective to utilize said sensor means output signals to compute the location of the image of said one of said one or more visual targets with respect to said sensor means.

34. A method of generating target scenes for use in a weapon training simulator where the overall target scene is variable in contrast and contains one or more individual targets whose



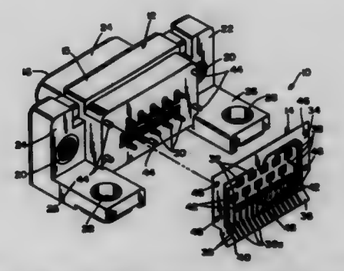
apparent contrast with respect to the target scene can be controlled and includes invisible target enhancement contrast; comprising the steps of
- providing a stored visual image target scene which is generated by background display means,
- generating at least one visual target for showing upon said visual image target scene, with controllable visual contrast between said at least one visual target and said visual image target scene,
- simultaneously generating for each said visual target a non-visible modulated area associated therewith,
- providing sensor means aimable at said visual target and sensitive to said non-visible modulated area,
- generating output signals from said sensor means to indicate location of said non-visible modulated area with respect to said sensor means, and
- processing data from said output signals from said sensor means for determining the location of said visual target with respect to said sensor means and for spectrally selective brightness among said at least one visual targets and said visual image target scene.

5,194,009
PROJECTION APPARATUS FOR PLANETARIUMS
Herbert Bertsche, Heidenheim, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
Filed Jan. 23, 1992, Ser. No. 824,550
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1991, 4103845
Int. Cl.[5] G09B *27/00*
U.S. Cl. 434—286 12 Claims



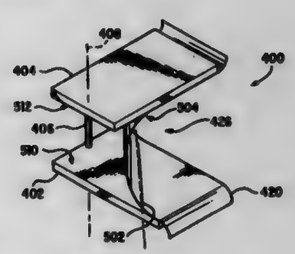
1. Apparatus for projection in planetariums, which includes in combination with a main instrument for fixed star projection, a plurality of projection devices arranged in different planes beneath said main instrument,
- wherein several of said projection devices are mounted for rotation independently of each other around a common vertical axis in a respective plane of rotation,
- each of said projection devices is connected to and positionable independently by a respective drive, wherein each of said drives is arranged in relation to said common vertical axis providing a symmetric weight distribution about said common vertical axis,
- each of said projection devices includes a projection unit and at least one deflecting mirror that is rotatable relative to said projection unit, and
- said deflecting mirrors are spaced increasingly from said common vertical axis in the direction from above to below said apparatus.

5,194,010
SURFACE MOUNT ELECTRICAL CONNECTOR ASSEMBLY
Philip J. Dambach, Naperville; Jerry A. Long, Elgin; Joseph W. Nelligan, Jr., LaGrange Park; Irvin R. Triner, Willowsprings, and Henry Zielke, Hoffman Estates, all of Ill., assignors to Molex Incorporated, Lisle, Ill.
Filed Jan. 22, 1992, Ser. No. 823,793
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—79 14 Claims



1. In a surface mount electrical connector assembly for electrically connecting a plurality of terminals of an electrical connector to circuit traces on a printed circuit board, the terminals being mounted on a dielectric housing of the electrical connector and having contact ends exposed exteriorly on one side of the housing, the improvement comprising a flexible circuit sheet mounted on the housing with conductive circuit paths on the flexible circuit sheet being electrically terminated to the contact ends of the terminals, the flexible circuit sheet having an edge for surface engaging the printed circuit board with contact pads at least near the edge for electrical termination to the circuit traces on the printed circuit board and wherein said flexible circuit sheet includes a plurality of locating holes receiving locating pins projecting from the side of the housing.

5,194,011
ROTATING FLEXIBLE INTERCONNECT
Lester M. Yeakley, Estes Park, and Clark M. Janssen, Boulder, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed Jan. 24, 1992, Ser. No. 825,122
Int. Cl.[5] H01R *35/00*
U.S. Cl. 439—162 15 Claims



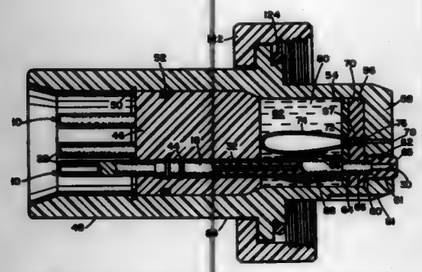
1. A mechanical system comprising:
- a first member defining a first surface;
- a second member defining a second surface, said first and second members being coupled for relative rotation about an axis, said first and second surfaces being separated in a juxtaposed relationship by a distance d; and
- an electrical interconnection which allows electrical signals to pass between a first point on said first surface to a second point on said second surface, the interconnection including a flexible cable fixedly attached to said first surface at said first point and said second surface at said second point and forming a "U" shaped portion therebetween, said "U" shaped portion being disposed between said first and second surfaces such that said axis is adjacent to an apex of said "U" shaped portion and such that said "U" shaped portion opens away from said axis.

5,194,012
SPARK-PROOF HOSTILE ENVIRONMENT CONNECTOR
James L. Cairns, 1689 State Ave., Holly Hill, Fla. 32017
Filed Jul. 30, 1991, Ser. No. 737,710
Int. Cl.[5] H01R *4/60*
U.S. Cl. 439—201 16 Claims

1. In an electrical connection assembly,
- a male connector comprising probes that project from a first surface,
- a female connector comprising a front end surface with openings through said surface,
- sockets connected to said openings to receive said probes,
- each said socket having a conductive contact, each said socket, except for said conductive contact, being coated with a polymer based upon poly-p-xylylene, said coating being free of pin-holes and having a thickness of about 0.001 to 0.005 of an inch,
- means that move said first surface toward said front end

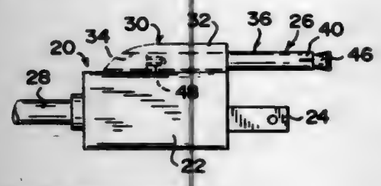
surface, moving said probes into said sockets to make electrical connections,

resilient seals for sealing said openings through said front end surface around said probes, and



said resilient seals having end tips that protrude out of said openings to contact said first surface enclosing and sealing the outer surface of said probes.

5,194,013
LOCK PLUG
Morris Propp, 33 E. End Ave., New York, N.Y. 10028
Filed Feb. 11, 1992, Ser. No. 833,947
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—265 3 Claims



1. A lock plug which comprises:

a) a housing;

b) a pair of contact blades extending from said housing sized for insertion in a mating electrical grounding receptacle;

c) a ground prong extending from said housing sized for insertion in the electrical grounding receptacle;

d) an electric cord extending from said housing and electrically connected to said contact blades and ground prong; and

e) means for securing said ground prong within the electrical grounding receptacle, wherein said securing means includes:

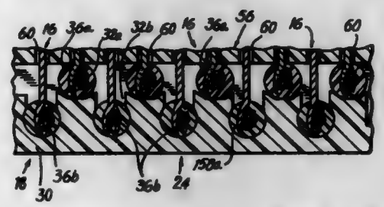
i) a casing formed on said housing having a bore therethrough;

ii) said ground prong being a cylindrical shaped hollow sleeve having internal threads and a split end, said ground prong mounted within the bore of said casing, so that the split end extends therefrom;

iii) a shaft having external threads, an enlarged tapered head on a first end and a mechanical key shape on a second end, with said shaft rotatively installed into said cylindrical shaped hollow sleeve, so that the external threads can engage with the internal threads and the enlarged tapered head can engage with the split end; and

iv) a tool/key which cooperates with said mechanical key shape on the second end of said shaft to rotate and cause said shaft to be drawn into said cylindrical shaped hollow sleeve for spreading the split end and tightening the fit of said hollow sleeve in a mating female receptacle thereby locking said ground prong within the electrical grounding receptacle.

5,194,014
CABLE CONNECTOR AND CONTACT TERMINAL THEREFOR
Don McClune, York; Mervin Fair, Glen Rock; James Lawrence, McSherrystown; David Hatch, Seven Valleys, and Justin Wagner, York, all of Pa., assignors to Stewart Connector Systems, Inc., Glenrock, Pa.
Filed May 20, 1992, Ser. No. 886,638
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—404 30 Claims

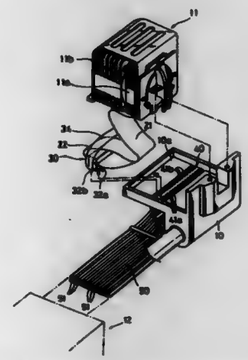


1. A connector for a cable having a plurality of longitudinally extending conductors, comprising:

a housing, including means for holding a portion of the length of each of said cable conductors in a fixed position within said housing; and

a plurality of contact terminals mounted in said housing, each for insulation displacement engagement with a respective one of said conductors within said housing at a region of said fixed conductor length portion, and each of said contact terminals including at least first and second insulation displacement sections, said first insulation displacement section capable of effecting insulation displacement engagement with conductors having diameters within a first range and said second insulation displacement section capable of effecting insulation displacement engagement with conductors having diameters within a second range.

5,194,015
DEVICE FOR ELECTRICAL CONNECTION BETWEEN PRINTING HEAD AND DRIVE CIRCUIT THEREFOR
Tetsuya Yamamoto, Tanashi, and Yukihisa Kato, Higashikurume, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1990, Ser. No. 570,466
Claims priority, application Japan, Aug. 25, 1989, 1-98426
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—484 1 Claim



1. An electrical connection device for connecting a printing head, carried by a carriage arranged to be movable along a printer body of a dot printer, with a drive circuit for the printing head, fixed to the printer body, said electrical connection device comprising:

a flexible printed circuit including a plurality of conductors each having one end electrically connected to the printing head;

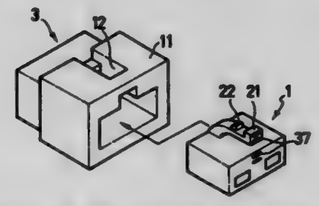
a first connector member electrically connected to the other ends of said plurality of conductors of said flexible printed circuit, said first connector member comprising a male connector having a plurality of electrically conductive pins respectively connected to said plurality of conductors of said flexible printed circuit, said male connector having a body supporting said plurality of electrically conductive pins, which are also connected to the conductors of said printed circuit inside a cover member of the connector body;

a second connector member disposed within and fixed to a section of the carriage such that the flexible printed circuit can be collapsibly stored within said section of the carriage, said first connector member being arranged to be removably engaged with said second connector member, said second connector member comprising a female connector having a plurality of socket terminals;

a flat cable including a plurality of conductors and electrically connecting said second connector member to said drive circuit for the printer head, wherein the plurality of socket terminals connect to said plurality of conductors of said flat cable; and

a flexible hook member which extends along a face of said connector body at a side thereof remote from said plurality of electrically conductive pins, said hook member having opposite end portions thereof formed with holes through which are inserted corresponding ones of said plurality of electrically conductive pins which are disposed at opposite end portions of said connector body, to thereby fix said hook member to said connector body.

5,194,016
CONNECTION-CONDITION CHECKABLE CONNECTORS
Yuji Hatagishi, and Naoto Taguchi, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Oct. 4, 1991, Ser. No. 770,937
Claims priority, application Japan, Oct. 4, 1990, 2-104011[U]
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—489 3 Claims



1. Connection-condition checkable connectors to be electrically interconnected, comprising:

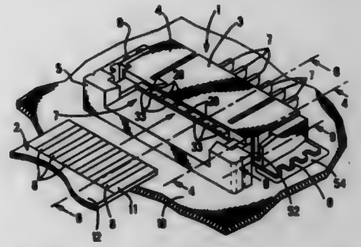
a pair of connector members for being interconnected;

a cantilever-like resilient detection arm provided for one of said connector members, extending along a longitudinal axis which is coincident with a line along which said connector members are moved to be interconnected;

abutting means for resiliently deforming said detection arm in connecting operation so as to move said detection arm temporarily in a direction substantially perpendicular to said line, and then permitting said detection arm to return to its original position; and

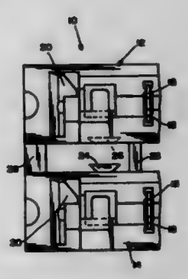
a plurality of detection marks being provided for said detection arm and said one of said connector members so as to be arranged in a row that extends in a direction substantially perpendicular to said line at an end of one of said connector members opposite to an insertion end thereof.

5,194,017
CONNECTOR FOR A FLEXIBLE CIRCUIT
John J. Consoli, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 24, 1992, Ser. No. 846,296
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—492 18 Claims



1. An electrical connector for a flexible circuit comprising: a housing including a first housing part, a circuit receiving opening in the housing for receiving a flexible circuit against a row of conductive electrical contacts spaced apart on centerlines corresponding to circuit traces on a flexible circuit, mounting feet received in respective slit like receptacles of the first housing part, the respective slit like receptacles having feet receiving openings facing in opposite directions from which to project the mounting feet for obstructing the first housing part from movement in opposite directions, and broad portions on the mounting feet, each of the broad portions having an edge with recesses therein to collect solder for attachment to a circuit board.

5,194,018
ELECTRICAL CONNECTOR ASSEMBLY AND METHOD OF FABRICATING SAME
John E. Lopata, Naperville, Ill., and Christophe Bouchan, Longjumeau, France, assignors to Molex Incorporated, Lisle, Ill.
Filed Jan. 22, 1992, Ser. No. 823,904
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—540 5 Claims



1. In an electrical connector assembly comprising a pair of card edge connector housings, each having a plurality of spring contacts connected thereto and each having a card edge receiving slot therein, the housings including complementary interengaging locking means for interlocking the connector housings in a first arrangement in a side-by-side parallel relationship with their card edge receiving slots parallel to each other and spaced apart a first predetermined distance, a frangible means for interconnecting the connector housings in a

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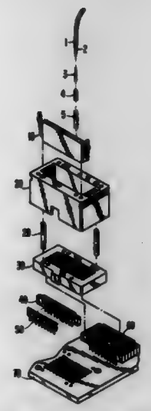
second arrangement in a side-by-side parallel relationship with the card edge receiving slots parallel to each other and spaced a second predetermined distance apart, whereby the connector housings can be used in conjunction with each other in said second arrangement and the frangible means can be broken to allow interlocking of the connector housings for use in conjunction with each other in said first arrangement.

5,194,019
MULTIPLY ORIENTABLE MOUNTING ARRANGEMENT
Howard W. Rose, Boiling Springs, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 23, 1992, Ser. No. 872,487
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—569 **5 Claims**

1. An arrangement for securing a body (10) to a support in a selected one of two orientations which are angularly displaced by a first angle relative to each other about an axis of rotation (12), the arrangement comprising:
a mounting ear (14) secured to said body (10), said mounting ear (14) comprising a block extending away from said body (10) and along said axis of rotation (12), said block being formed with a cavity (24) comprising first and second portions (26, 28), the first cavity portion (26) being open to the exterior of said block (14) in a first region, the second cavity portion (28) being open to the exterior of said block (14) in a second region across the axis of rotation (12) from said first region, said first and second cavity portions (26, 28) each having a pair of sides (42, 44; 46, 48) extending to the exterior of said block (14), said pair of sides of each cavity portion being angularly displaced relative to each other within said plane by said first angle, each of said sides (42, 44) of said first cavity portion (26) being parallel to a respective side (46, 48) of said second cavity portion (28), said first and second cavity portions (26, 28) being connected so that said cavity (24) formed by said first and second cavity portions (26, 28) provides a pair of elongated intersecting channels each defined by a respective pair of parallel sides (42, 46; 44, 48) of said first and second cavity portions (26, 28), said channels being angularly displaced by said first angle relative to each other and orthogonal to said axis of rotation (12) and each extending through said axis of rotation (12) to the exterior of said block (14) along a respective channel longitudinal axis.

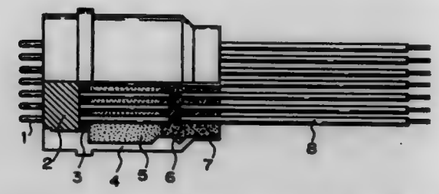
5,194,020
HIGH-DENSITY COAXIAL INTERCONNECT SYSTEM
John A. Veltz, Hockessin, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.
Continuation-in-part of Ser. No. 716,079, Jun. 17, 1991. This application Oct. 25, 1991, Ser. No. 782,950
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—579 **11 Claims**

1. An high-density coaxial interconnect system comprising the integral components:
(a) a grouper frame configured to hold at least one linear grouper;
(b) at least one linear grouper positioned in said grouper frame, said linear grouper configured with means on its inner surface to matingly engage and hold in place an array of coaxial connectors in said linear grouper;
(c) an array of coaxial connectors contained in the linear groupers comprising a coaxial signal cable terminated to a signal contact, an insulator surrounding the terminated cable and contact, and a conductive ground shell surrounding said insulator and contact.,
(d) said grouper frame attached to a header frame configured to house an array of juxtaposed header chutes and means to attach said header frame to header chutes housed therein.,
(e) header chutes comprising elongated molded plastic components, including cylindrical parallel bores configured to receive the protruding ends of the conductive ground shells of the coaxial connectors housed within said linear groupers; said header chutes having signal contact pins affixed in the bottom surfaces of each cylindrical bore therein, which houses each said conductive ground shell in alignment to form a terminating electrical contact with each said signal contact of each said coaxial signal cable when said system is assembled, each said signal contact pin being supported in said cylindrical aperture of said header chute by a protruding cone of molded plastic integral with the bottom surface of each header chute and



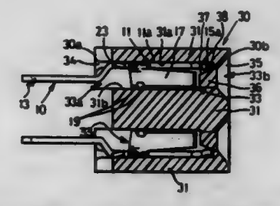
extending both above and below the bottom surface of each said cylindrical bore of said header chute, each cylindrical bore of each header chute including a vertical slot in an outer wall parallel to the length of said bore which houses a resilient leaf contact extending from an elongated perforated conductive ground plane affixed juxtaposed to the outside surface adjacent the slots in said header chute wall by fitting the perforations therethrough over cooperating protruding bottoms of plastic molded therefor into the wall of said header chute, said ground plane also including signal contact pins integrally formed thereon extending below said ground plane, and means to attach said header chutes to said header frame;
(f) said pins of said ground plane and said signal pins housed within said cylindrical bores of said header chute being aligned for termination in the signal and ground contact receptacles of an electrical signal transmission system;
(g) said grouper frame and said header frame having an array of commonly aligned bores passing through the top and bottom surfaces thereof; and
(h) a multiplicity of alignment pins housed in, passing through, and joining said frames in juxtaposition for completion of the assembly of said frames into said system and termination of said system in signal and ground receptacles of an electrical signal transmission system.

5,194,021
CONNECTOR
Toshikiro Obe; Mutsuo Kikuchi, and Isamu Taka, all of Tokai, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan
Filed Oct. 8, 1991, Ser. No. 772,880
Claims priority, application Japan, Oct. 12, 1990, 2-272182
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—589 **2 Claims**



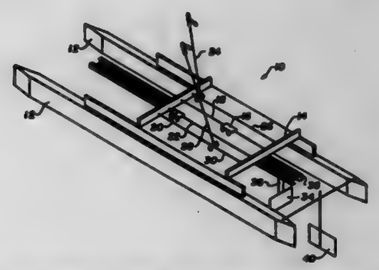
1. A connector for providing an exit interface for a plurality of wires in which the wires pass from a first environment through said connector to a second environment, the connector comprising:
a housing through which a plurality of wires pass;
at least a portion of said housing being entirely filled with resinous adhesive sections except for portions allowing the plurality of wires to pass therethrough; and
wherein said resinous adhesive sections comprise a laminate structure which includes a connector pin-fixing layer, a sealing layer immediately adjacent to said connector pin-fixing layer, and a lead wire fixing layer immediately adjacent to said sealing layer, wherein said connector pin-fixing layer, sealing layer and lead wire fixing layer together form a resinous adhesive laminate within said housing.

5,194,022
ELECRICAL CONNECTOR
Ikuo Enomoto, Machida, Japan, assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 571,959, Aug. 23, 1990, abandoned. This application Jul. 17, 1991, Ser. No. 739,713
Claims priority, application Japan, Dec. 30, 1988, 63-332574
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—851 **19 Claims**



1. An electrical connector comprising an insulation housing (30) having a plurality of electrical contact-receiving cavities (33) with first and second openings (33*a*,33*b*) between first and second ends (30*a*,30*b*), and electrical contacts (10,10') to be inserted in said cavities (33) through the first openings (33*a*), each of said contacts including a base section (11) having first and second surfaces (11*a*,11*b*) and first and second ends (11*c*,11*d*), and electrical contact-receiving section (12), a conductor-engaging section (13), and an engaging section (14,14') for engaging opposing walls (32*a*,32*b*) of a respective cavity (33), characterized in that said base section (11) extends in an axial direction of said female electrical contact (10,10') with the first surface (11*a*) of said base section (11) engaging a first wall (31*a*) of the cavity (33), a pair of resilient contact arms (17) of said contact-receiving section (12) extending forwardly from opposed support sections (16) adjacent said first end (11*c*) of said bas section (11), and engaging members (22) defining said engaging section (14) extending beyond both sides of said base section (11) in substantially the same plane of said base section adjacent said first end (11*c*) and being pressed into channels (34) of predetermined length in third and fourth walls (32*a*,32*b*) of said cavity (33), said engaging members having a height greater than the width of said channels.

5,194,023
INDIVIDUAL PROPELLED WATER CRAFT
Edward Stone, 105-3150 Gladwin Rd., Abbotsford, B.C., Canada V2S 6W8
Filed Jan. 24, 1992, Ser. No. 824,972
Int. Cl.[5] B63H *1/32, 16/16*
U.S. Cl. 440—20 **13 Claims**



1. An individual propelled water craft comprising:
two longitudinal floats adapted to float on water;
connecting frame means supporting the two floats in a spaced apart and parallel configuration;
first guide means mounted on the frame means having a first foot supporting trolley constrained to move backwards and forwards within the first guide means, the first guide means having a first locking position in a forward location;
second guide means substantially parallel to the first guide means, mounted on the frame means having a second foot supporting trolley constrained to move backwards and forwards within the second guide means, the second guide means having a second locking position in a forward location;
interchanging means to lock the first trolley in the first locking position when the second trolley is moved backwards within the second guide means, and interchanging means to lock the second trolley in the second locking position when the first trolley is moved backwards within the first guide means;
propulsion means for moving the craft on water when the first trolley or second trolley are moved backwards and forwards in the first guide means or the second guide means, and
steering means to direct direction of movement of the craft on water.

5,194,024
PROPELLER DRIVEN SURFBOARD
Wilton F. Shiraki, 115 Maile Lau Li'i Pl., Hilo, Hi. 96720
Filed Dec. 2, 1991, Ser. No. 801,426
Int. Cl.[5] B63H *16/20*
U.S. Cl. 440—29 **7 Claims**

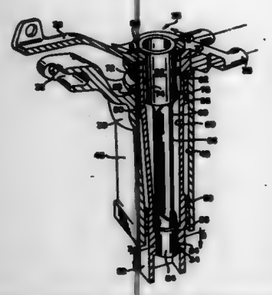
1. A propeller driven surfboard which comprises:
a) a hull having a nose at the bow and a tail at the stern;
b) a skeg mounted to the underside of said hull;
c) a seat having a support structure mounted onto said hull between the nose and tail thereof for a person to sit on;
d) means mounted in said hull in front of said seat for propel-

ling said hull along a body of water, said propelling means including an elongated shaft extending angularly through said hull and said skeg, a propeller mounted onto a lower end of said elongated shaft within the body of water, and means mounted on said hull in front of said seat for manually rotating said elongated shaft by the person sitting on said seat so that said propeller will turn within the body of water, said manually rotating means including a frame member having a plurality of legs mounted onto said hull in front of said seat, said plurality of legs including forward legs and rearward legs, each of said legs of said frame member being mounted onto said hull by a fastener, said fastener being a screw, said frame member including

a bearing supported between said forward legs so that said elongated shaft can extend through said bearing and be rotatably supported therein while said bearing also transfers the forward thrust of said propeller to said frame member, said manually rotating means further including a crankset assembly rotatably mounted to said frame member, and a rope pulley assembly connected between one end of said crankset assembly and an upper end of said elongated shaft so that the legs of the person sitting in said seat can operate said crankset assembly to operate said rope pulley assembly to turn said elongated shaft; and

e) means mounted in said hull in back of said seat for steering said hull along the body of water.

5,194,025
VIBRATION ABSORBING STEERING DEVICE FOR OUTBOARD MOTOR
Clarence E. Blanchard, Kenosha, Wis., and Edward K. Lam, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Mar. 6, 1992, Ser. No. 847,928
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—52 **20 Claims**



1. A vibration absorbing steering device for an outboard motor having a transom bracket, an engine, and a swivel bracket constructed for mounting to the transom bracket and defining a vertical passageway, said device comprising:

a tubular pivot shaft having an upper end and a lower end and being dimensioned to be pivotally engaged in the passageway;

engine mount means for mounting the engine for rotation about a vertical axis and relative to said swivel bracket;

a tiller arm having a pivot end; and

absorbing means for absorbing vibrations generated by the engine, said absorbing means including a torque tube having first and second ends, said first end of said torque tube being immovably fastened to said pivot shaft, and said second end being immovably fastened to said pivot end of said tiller arm, said torque tube being vertically disposed in said tubular pivot shaft and positioned relative to said tiller arm and said engine mount means so that vibrations generated by the engine are transmitted to said engine mount means and absorbed by said absorbing means prior to reaching said tiller arm, while providing positive steering control of the motor by manipulation of said tiller arm.

5,194,026
SURF BOARD LEASH DEVICE AND METHOD THEREFOR
Karl B. Corwin, 61-147 Ikuwai Pl., Haleiwa, Hi. 96712, and Douglas B. Ekdahl, 1815 S. Parkside Dr., Tempe, Ariz. 85281
Filed Jun. 5, 1992, Ser. No. 894,467
Int. Cl.[5] B63B *35/79*
U.S. Cl. 441—75 **14 Claims**

1. A leash type device for a surfer to hold onto a surf board comprising, in combination:

an elongated leash member having one end thereof adapted to be connected to a surf board and the other end thereof adapted to be attached to the ankle of the surfer;

clip means attachably and detachably coupled to a portion of said elongated leash member for attaching said portion of said elongated leash member to the waist of said surfer; and

ankle attachment means coupled to said other end of said elongated leash member for connecting the surfer to the surf board to prevent separation of the surfer from the surf board.

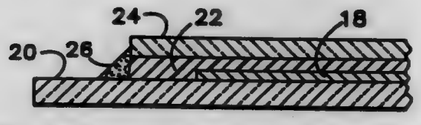
5,194,027
SOLID SEAL FOR THIN FILM ELECTROLUMINESCENT DISPLAY PANELS
Mark S. Kruskopf, Portland, and Kunnith Ping, Beaverton, both of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.
Filed Sep. 9, 1991, Ser. No. 756,815
Int. Cl.[5] H01J *9/24*
U.S. Cl. 445—24 **2 Claims**

1. A method of encapsulating the active area of a TFEL panel comprising the steps of:

(a) depositing a gel material over the active area of the TFEL panel;

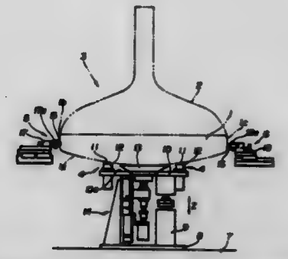
(b) placing a protective cover atop the gel material and depressing the protective cover so as to squeeze excess material out from underneath the protective cover along the edges thereof;

(c) curing the gel material to a predetermined degree of hardness whereby the gel material enters a solid state; and



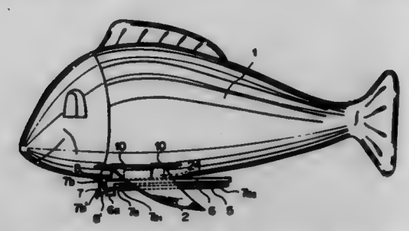
(d) sealing the protective cover against the panel with an adhesive vapor barrier.

5,194,028
CATHODE RAY TUBE POSITIONING DEVICE
Kikuichi Onishi, Aichi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 22, 1992, Ser. No. 872,122
Claims priority, application Japan, Apr. 23, 1991, 3-117841
Int. Cl.[5] H01J *9/22*
U.S. Cl. 445—66 **4 Claims**



1. A cathode ray tube positioning apparatus comprising ball castor means and roll means for supporting a front panel surface and lateral panel sides of a cathode ray tube, respectively.

5,194,029
FLOATABLE STRUCTURE PROPELLING MECHANISM
Koichi Kinoshita, Tokyo, Japan, assignor to Jal Data Communications & Systems Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 819,207, Jan. 10, 1992, which is a continuation of Ser. No. 658,608, Feb. 21, 1991, abandoned.
This application Jun. 30, 1992, Ser. No. 906,848
Claims priority, application Japan, Sep. 5, 1990, 2-233301; Oct. 19, 1990, 2-112103
Int. Cl.[5] A63H *27/00*
U.S. Cl. 446—35 **16 Claims**



1. A floatable structure propelling mechanism for propelling a floatable structure in a rearward-to-forward direction, comprising:

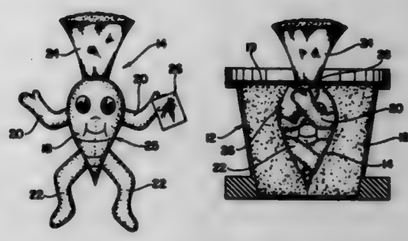
a pair of lateral fins provided on respective lateral sides of said floatable structure and extending laterally outward away from the floatable structure;

hinge means secured to said lateral sides of the floatable structure for pivotally mounting said lateral fins to the lateral sides, respectively, each of said hinge means extending along each of said lateral sides in a direction parallel to said rearward-to-forward direction in a manner to allow each lateral fin to swing up and down about each hinge means;

each of said lateral fins having a forward frame extending laterally outward from each of said hinge means so as to be curved rearwardly as it extends outward, and a flexible film spread between each hinge means and the forward frame said forward frame including means to angle said forward frame during upward motion of each said lateral fin and relax said flexible film and to straighten said forward frame during downward motion of each said lateral fin and tension said flexible fin, such that each said lateral fin produces a lift and a propulsion thrust as each lateral fin is swung downwardly and upwardly; and

rotative driving means mounted on said floatable structure, said driving means having a rotative drive source and connecting means operatively coupling said drive source to said lateral fins such that said drive source causes the lateral fins to swing about respective said hinge means.

5,194,030
TOY VEGETABLE DOLL AND SEEDS
Raymond T. LeBoeuf, and Paula A. LeBoeuf, both of 1090 Mineral Spring Ave., North Providence, R.I. 02904
Filed Apr. 13, 1992, Ser. No. 867,334
Int. Cl.[5] A63H *3/00*
U.S. Cl. 446—72 **9 Claims**



1. An educational toy comprising:

a simulated flower pot packed with a granular material simulating potting soil;

a toy doll comprising a body portion in the shape of a vegetable, said doll being substantially embedded in said granular material such that the identity of said vegetable is hidden;

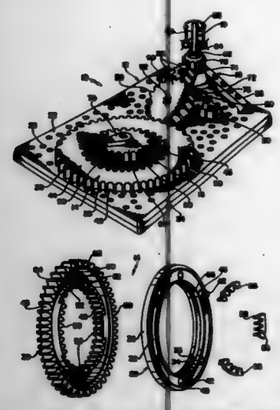
an exposed portion of said doll extending above the top surface of said granular material; and

a package of vegetable seeds for growing the vegetable characterized by said doll, said package being releasably secured to said doll body portion, said doll being removable from said flower pot by grasping said exposed portion and pulling upwardly, whereby said doll is extricated from said simulated soil, and said seeds become available for planting.

5,194,031
TOY GEAR ASSEMBLY
John T. Sahler, Riverside, R.I., assignor to Playskool, Inc., Pawtucket, R.I.
Filed Mar. 7, 1991, Ser. No. 666,199
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—103 **14 Claims**

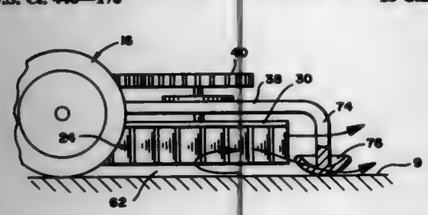
1. A toy gear assembly comprising a base adapted to be received on supporting surface and having a plurality of upwardly opening receiving sockets therein, and a ring gear assembly releasably receivable on said base, said ring gear

assembly including a mounting ring having a plurality of downwardly extending plugs thereon which are releasably receivable in a portion of said sockets for releasably securing said mounting ring on said base and a gear ring of ring-like configuration received and secured in coaxial relation on said



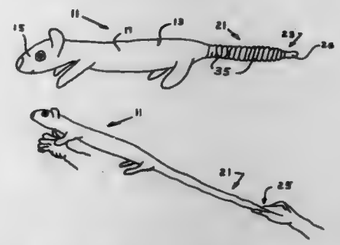
mounting ring so that said gear ring is axially rotatable relative to said mounting ring, said gear ring having inwardly and outwardly facing annular gear ring surfaces thereon, at least one of said annular gear ring surfaces having a plurality of gear teeth thereon.

5,194,002
MOBILE TOY WITH ZERO-GRAVITY SYSTEM
Henry A. Garfinkel, 31 Dogwood Rd., Searingtown, N.Y. 11507
Filed May 3, 1991, Ser. No. 695,467
Int. Cl.[5] A63H *33/40, 17/00;* B60B *39/00*
U.S. Cl. 446—178 25 Claims



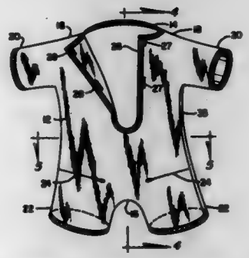
1. A mobile toy adapted to be retained against and move along a movement surface, said toy including a gravity-independent retention system for adherence of said toy to the surface, said toy comprising outer and inner sides relative to the movement surface and including inwardly extending support means engageable with the surface for support of the toy thereon and for movement of the toy therealong, and means for propelling said toy along the surface, said retention system including vacuum generating means which in turn includes means for producing a forced fluid flow outwardly away from a central defined area immediately inward of said toy to create an area of negative pressure at the surface, said support means extending inwardly beyond said vacuum generating means for positioning said vacuum generating means in closely spaced relation to the movement surface, said vacuum generating means further including guide means for directing said forced fluid flow along two flow paths, a first flow path outwardly directed through said toy and discharging to said outer side thereof away from the defined area, and a second flow path circumferentially about said defined area and radially outwardly directed relative to said central defined area at the movement surface to form a dynamic fluid seal at said inner side of said toy about said central defined area restricting an inflow of fluid to said central defined area.

5,194,033
PROJECTABLE TOY STUFFED ANIMAL
Joel R. Wright, 6850 S. Depew St., Littleton, Colo. 80123
Filed Mar. 2, 1992, Ser. No. 847,606
Int. Cl.[5] A63H *3/02*
U.S. Cl. 446—311 10 Claims



1. Toy animal adapted for being projected through air, including:
a) flexible body comprising an outer skin and loose filler material encased by said skin, said body including a head, neck region, trunk, and an elongate tail having a tip region and having a retracted position and a first length, and said tail adapted for being extended rearwardly to an extended position and to a second length substantially greater than said first length, and said tail having a tip region adapted for being grasped by hand;
b) elongate elastic element mounted within said body, and secured at one end to the tip region of said tail, said element having an unstretched condition and in its unstretched condition extending through said body from said tail to said neck region where the other end of said elastic element is affixed to said skin at said neck region;
c) thumb-grasp affixed to said neck region and adapted to be grasped by hand; and
d) whereby movement of said thumb-grasp away from said tail tip will resiliently stretch said elastic element and said tail will move from its retracted position to said extended position.

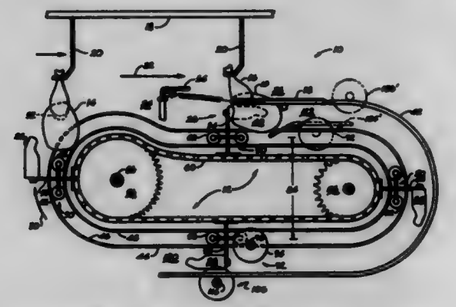
5,194,034
STRETCHABLE BODYSUIT FOR PRESERVING AND PROTECTING DOLLS
Lucy Heppenstall, 480 S. Marion Pkwy., No. 705, Denver, Colo. 80209
Filed Jul. 19, 1991, Ser. No. 732,666
Int. Cl.[5] A63H *3/02, 3/00, 3/46*
U.S. Cl. 446—369 11 Claims



1. A body covering combination with a doll of the type having a torso, head, arms and legs, said arms and legs having

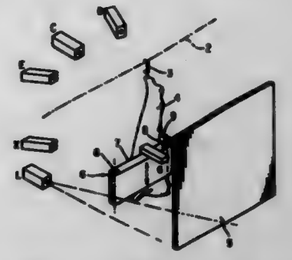
arm and leg joints, respectively at their connection to said torso, said covering comprising:
a torso-covering portion open at one end and having a crotch area at its opposite end, sleeves extending from opposite sides of said torso-covering portion and leg covers extending from said opposite end and flanking said crotch area, separable closure means extending from said one end through which said doll is inserted with said legs extending through said leg covers and said arms extending through said sleeves, said sleeves and said leg covers each defining retention means for engaging said arms and legs, respectively, whereby to retain said arms and legs in unitary relation to said torso; and
said covering composed of a four-way stretch material, said covering dimensioned for snugfitting insertion of said doll whereby to stretch said material when said doll is inserted into said covering and said separable closure means is closed.

5,194,035
AUTOMATIC POULTRY PROCESSOR AND METHOD
Kenneth D. Dillard, Canton, Ga., assignor to MEYN USA, Inc., Gainesville, Ga.
Filed Jan. 17, 1992, Ser. No. 822,962
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—165 40 Claims



1. An automatic poultry processing apparatus, comprising:
carriage means for advancing poultry through said apparatus for processing;
poultry engagement means, carried on said carriage means, for being received in the body cavity of a bird so as to effect a positive driving force thereto during operation of said carriage means; and
loading means for automatically seating said poultry engagement means into the body cavity of a bird as said poultry engagement means is carried and advanced by said carriage means, so that processing of poultry may be automatically continued without manual intervention as to birds received from processing equipment relatively upstream from said apparatus.

5,194,036
METHOD FOR GRADING CARCASSES OF LARGE CATTLE, CALVES, HOGS, OR SHEEP AND DEVICE FOR IMPLEMENTATION THEREOF
Patrick Chevalier, Olle; Michele Villemin, Ormesson Sur Marne; James Plass, Sucy En Brie, and Jean Leclere, Creteil, all of France, assignors to Normaclass, Paris, France
Filed Feb. 13, 1992, Ser. No. 834,836
Claims priority, application France, Feb. 14, 1991, 91 02297
Int. Cl.[5] B07C *3/18;* A22C *18/00*
U.S. Cl. 452—198 18 Claims
1. A method for grading livestock carcasses comprising the steps of: resting a carcass on a lengthwise face thereof and on a dorsal face thereof, near the lower part located toward a neck of the carcass, on positioning surfaces; moving the positioning surfaces to position the carcass angularly to record images of the carcass from several angles of portions of the carcass; recording image information from the carcass; storing the image information in the memory of a computer; storing



information relating to the weight and length measurements of the carcass in the computer; removing the carcass from the positioning surfaces on which the carcass rests; and processing the recorded information in the computer to grade the carcass.

5,194,037
DISC-TYPE COIN SORTING MECHANISM FOR SORTING COINS BY RADIAL LOCATIONS OF THE INNER EDGES OF THE COINS
John E. Jones, Wauseka, and James M. Rasmussen, Chicago, both of Ill., assignors to Cummins-Allison Corp., Mount Prospect, Ill.
Continuation-in-part of Ser. No. 34,271, Apr. 1, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 248,277
The portion of the term of this patent subsequent to Sep. 16, 2008, has been disclaimed.
Int. Cl.[5] G07D *3/16*
U.S. Cl. 453—10 11 Claims

15. A coin sorter, comprising:
a rotatably mounted coin-carrying disc having a resilient top surface onto which coins may be fed;
means for rotating said disc;
a guide plate having a surface positioned over and closely adjacent said disc, wherein said surface includes an inner recess within which coins are able to move radially in response to rotation of said disc;
means for allowing coins to enter between said disc and said plate;
referencing means configured in said surface for engaging the edges of coins as the coins are moved circumferentially between said disc and said plate to position the radially outer edges of coins of a first denomination at a common radial location;
sorting means including an ejection recess formed in said

VOL 1148 ISS 3 MR 16 1993

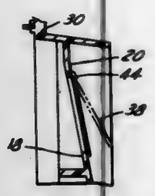
guide plate with the radially inner edge of said ejection recess located at a radial location for receiving the radially inner portion of coins of said first denomination, the width of said ejection recess initially being smaller than the diameter of the coin to be received and the surface of the guide plate adjacent the radially outer edge of said ejection recess pressing the outer portions of the coins into said resilient top surface of said disc so that the inner edges of the coins received by said ejection recess are tilted upwardly into said recess, said ejection recess extending outwardly to the periphery of said guide plate so that the inner edge of the recess guides the coins outwardly and ejects the coins from being said disc and said guide plate, the radially outer edge of said ejection recess sloping upwardly to gradually release the coins of said first denomination from the pressure of said resilient top surface of said disc.

5,194,038

ONE-WAY AIR VALVE

Jaime L. Klomhaus, Shelby Township; Macomb County; Scott M. Bell, St. Clair, and Richard J. Barton, Port Huron, all of Mich., assignors to Huron Plastics Group, Inc., St. Clair, Mich.

Filed Jun. 29, 1992, Ser. No. 905,769
Int. Cl.[5] B60H 1/26
U.S. Cl. 454—162 **5 Claims**



1. A one-way air valve for relieving pressure within an automobile compartment when a door is closed rapidly comprising, in combination:

a molded plastic frame for mounting at an aperture of a compartment wall and having an inside face and an outside face with at least one air passageway extending therethrough between the faces;

a plastic flap overlying the outside face of the frame and covering the air passageway to block air flow into the automobile and swingable away from the frame to open the passageway upon air pressure build-up in the compartment;

said flap having a plastic connecting portion molded in situ integrally with the frame and being formed of a more elastic plastic than the plastic of the frame and resistingly bendable to permit the flap to be swung from an initial molded position projecting through the air passageway and beyond the inside face of the frame to an operative position overlying the outside face of the frame and covering the air passageway, said flap portion being elastically loaded by the aforesaid swinging of the flap from said initial position to said operative position to urge the flap yieldingly against the outside of the frame covering the air passageway; and

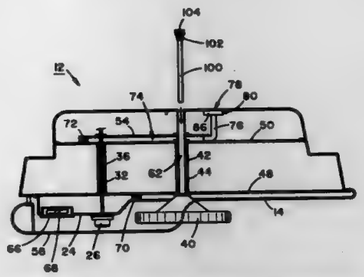
said flap portion, when the flap is in said operative position, blocking air flow through the air passageway in a direction to enter an automobile compartment and yielding to an increase in air pressure in such compartment to open and allow air flow through the passageway out of the compartment.

5,194,039

PERSONNEL SAFETY SYSTEM FOR VAULTS

Robert R. Hellman, Jr., 865 George's Hill Rd., Southbury, Conn. 06488

Continuation of Ser. No. 597,209, Oct. 11, 1990, abandoned. This application Jul. 18, 1991, Ser. No. 732,735
Int. Cl.[5] F24F 7/00
U.S. Cl. 454—195 **7 Claims**



1. A personnel safety system for vaults, including a passageway for the passage of air, food, and/or water from the front of a vault door to the inside of a vault on which said vault door is mounted, comprising:

(a) a hollow tube employed as the door wheel spindle for a locking mechanism mounted in said door; and

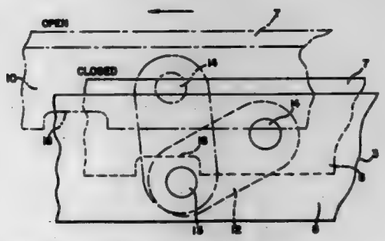
(b) means to access the interior of said hollow tube from the interior of said vault for the passage through said tube of said air, food, and/or water, without disassembly of said locking mechanism.

5,194,040

SLOT VENTILATORS

Arthur Stoney, 10 Fleece Yard, Halstead, Essex C0J 2DA, England

PCT No. PCT/GB89/00917, § 371 Date Apr. 16, 1991, § 102(e) Date Apr. 16, 1991, PCT Pub. No. WO90/02298, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 10, 1989, Ser. No. 678,946
Claims priority, application United Kingdom, Aug. 26, 1988, 8820336
Int. Cl.[5] E06B 7/02
U.S. Cl. 454—222 **7 Claims**



1. A slot ventilator comprising:

an elongate backing member having rearwardly-extending first and second flanges and a slot therebetween with side edges therein;

an elongate facing strip movable between an open position and a closed position,

said closed position being when said facing strip obstructs said slot and said open, forward position being when said facing strip is forward from said side edges of said slot in said backing member;

a rib extending rearwardly from said facing strip into said slot,

said rib comprising a generally flat plate having a longitudinal rear edge spaced from said facing strip and said rear edge having spaced cut-outs passing entirely through said rib; and,

a linkage including

at least two links, each of which has two ends, said links being spaced from one another,

a first link being pivotally connected at one end to said rib and connected by a pivotal connection at the other end to said first and said second flanges,

a second link being pivotally connected at one end to said rib and connected by a pivotal connection at the other end to said first and second flanges;

said pivotal connections extending between said first and said second flanges,

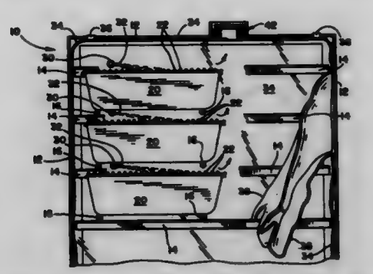
said cut-outs being positioned and sized to accommodate only said pivotal connections between said first and said second flanges when said facing strip is in said closed position.

5,194,041

VENTILATION SYSTEM FOR ISOLATORS

Philip C. Trexler, Palatine, Ill., assignor to Standard Safety Equipment Co., Palatine, Ill.

Filed Aug. 5, 1991, Ser. No. 740,058
Int. Cl.[5] F24F 7/06
U.S. Cl. 454—251 **15 Claims**



1. A cage ventilation system for use in isolating a plurality of cages from an uncontrolled environment, comprising:

a frame adapted to support cages in a plurality of vertically spaced shelves;

an enclosure isolating all supported cages from the uncontrolled environment;

means for generating a flow of air from the uncontrolled environment;

tubes supported above each shelf in the frame, each of said tubes having an axially disposed opening for outletting air over substantially the entire length of the associated shelf therebeneath;

means for connecting the flow from the generating means to the interior of the tubes; and

means for allowing air to outlet from the enclosure.

5,194,042

LINEAR SLOT DIFFUSER

Shenandoah S. Clark, Sanford, Fla., assignor to Metal Manufacturing Co., Sanford, Fla.

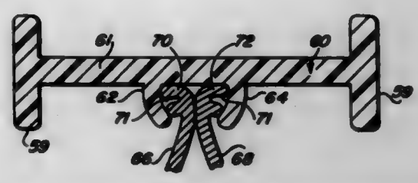
Filed May 13, 1991, Ser. No. 698,995
Int. Cl.[5] F24F 13/072
U.S. Cl. 454—304 **13 Claims**

1. A linear slot diffuser for controlling flow of air in a room, the diffuser comprising:

a frame having opposingly facing, longitudinally extending parallel walls forming a channel therebetween, said frame having an opening at one end in which air enters or exits said channel and a slot at the other end in which air exits or enters said channel and flows into or out of the room;

means including a flexible plastic vane support member extending between said walls and being disposed within said channel;

a structural web rigidly fixed to the walls and extending across the channel and spaced from the vane support member; and



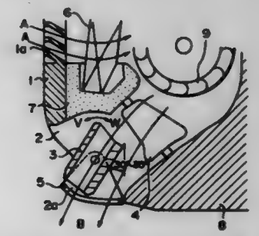
a deflector vane disposed within said channel and extending along said slot such that air in said channel flows across said vane, said deflector vane being hingedly supported on one of its ends by said flexible material on said support member to change the orientation of said deflector vane to alter the direction of air exiting said channel and reduce rattle due to air in said channel flowing across said vane.

5,194,043

AIR CONDITIONER AIR DEFLECTOR ARRANGEMENT

Norio Takahashi; Masato Sagita; Seimei Okabe, all of Tochigi; Kuniyuki Yamada; Kazunari Minami, both of Kashiwa; Yoshimi Inoue, Ibaraki, and Yasuyuki Sakamoto, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 523,570, May 15, 1990, abandoned. This application Dec. 17, 1991, Ser. No. 808,765
Claims priority, application Japan, May 25, 1989, 1-132227; Jul. 7, 1989, 1-174011; Aug. 4, 1989, 1-201236
Int. Cl.[5] F24F 13/08
U.S. Cl. 454—316 **12 Claims**



1. An air conditioner including an outlet for discharging a conditioned air flow and air deflector means associated with said outlet, wherein said air deflector means include:

first deflector means rotatable about a substantially horizontal axis to variably deflect air through said outlet in vertical directions; and

second deflector means rotatable to block a predetermined breadthwise portion of said outlet while forming an air passage in at least one other breadthwise portion of said outlet to thereby concentrate the air flow to said at least one other breadthwise portion of said outlet;

wherein said first deflector means comprise a single horizontal vane and wherein said second deflector means comprise a single movable vane which is rotatable about a substantially horizontal axis and capable of blocking one of left and right half portions of said outlet while forming

said air passage in the other of said left and right half portions of said outlet.

5,194,044

TORSIONAL VIBRATION DAMPING APPARATUS

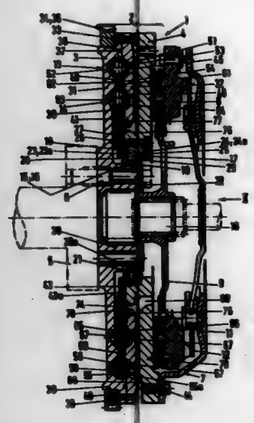
Johann Jäckel, and Wolfgang Reik, both of Bühl, Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 69,708, Jul. 2, 1987, abandoned. This application Nov. 21, 1990, Ser. No. 617,918

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622697; Oct. 4, 1986, 3633828; Dec. 13, 1986, 3642716

Int. Cl.[5] F16D *3/14, 3/80*

U.S. Cl. 464—24 59 Claims



1. Apparatus for damping vibrations between an engine and a clutch in a power train, comprising a first flywheel connectable with the engine; a second flywheel rotatable relative to the first flywheel and having a friction surface engageable with a clutch plate of the clutch; and a damper device including an input component constituted by said first flywheel, an output component constituted by said second flywheel, an annular chamber including a radially outer portion constituting an annular compartment, a supply of viscous fluid medium which at least partially fills said compartment, a plurality of energy storing elements which are disposed and supported in said compartment, said chamber having internal surfaces bounding said compartment and including radially outer portions, at least said radially outer portions of said internal surfaces conforming to the energy storing elements in said compartment to oppose radially outward movements of the energy storing elements under the action of centrifugal force when said flywheels rotate and to thus produce a frictional damping action between said energy storing elements and said radially outer portions of said internal surfaces, said flywheels being rotatable relative to each other against the resistance of said energy storing elements through at least 25 degrees in clockwise and counterclockwise directions starting from a neutral position, said energy storing elements including at least one elongated helical coil spring and said energy storing elements jointly extending along an arc which approximates between 70 and 96 percent of a complete circle, and a flange rotatable with said second flywheel and extending into said compartment and engaging said elements.

5,194,045

RESILIENT DAMPING COUPLING FOR INSTALLATION IN A DRIVE LINE OF A MOTOR VEHICLE

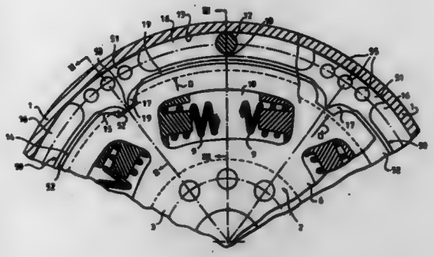
Wolfgang Hanke, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 17, 1990, Ser. No. 554,335

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1989, 3923749

Int. Cl.[5] F16D *3/80, 3/12*

U.S. Cl. 464—24 14 Claims



1. A resilient coupling for installation in a drive line of a motor vehicle, comprising:

a) two lateral discs (7,8) connected at their outer circumference in order to rotate together, the two lateral discs define a first coupling half (1) that encloses a second coupling half (2), the second coupling half having at least one central disc (6) associated with a hub (3);

b) the first coupling half (1) and the second coupling half (2) connected to one another by resilient coupling elements (9) and adapted to rotate a restricted amount relative to one another;

c) the lateral discs (7,8) define a fluid-tight inner chamber (11) that contains the at least one central disc (6) and is filled with a damping medium;

d) wherein the inner chamber (11) has a radially outer region and a radially inner region located between the lateral disc (7,8), and wherein the outer region has at least one first displacement chamber (16) and the inner region has at least one second displacement chamber (17) such that both chambers can be filled with the damping medium and both chambers along with their damping medium serve to dampen, and wherein the volume of the chambers can be varied during the reciprocal rotation of the first and second coupling halves (1,2);

e) a suspended damping ring disposed in the inner chamber (11), the suspended damping ring (50) rotatable by a restricted amount relative to the coupling halves (1,2) during operation;

f) wherein the suspended damping ring (50) forms the at least one first displacement chamber (16) with the first coupling half (1) and the at least one second displacement chamber (17) with the second coupling half (2), and wherein the at least one first displacement chamber (16) has first throttle gaps (19) for displacing the damping medium; and

g) wherein the at least one second displacement chamber (17) and the fluid medium therein are the primary means used to dampen when there are small amplitudes of oscillation that occur during normal operation of the motor vehicle.

5,194,046

DAMPER TYPE FLYWHEEL ASSEMBLY WITH AT LEAST ONE SUBSTANTIALLY SEGMENT-SHAPED MEMBER

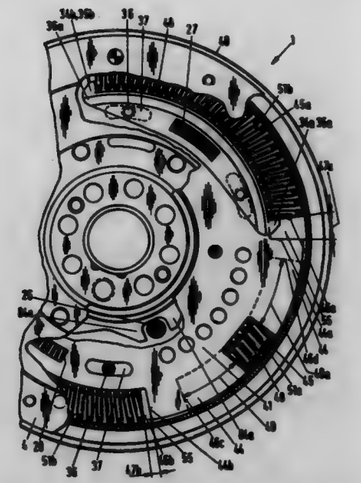
Johann Jäckel, Baden-Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 289,917, Dec. 23, 1988, abandoned. This application Aug. 19, 1991, Ser. No. 750,213

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802581; Sep. 6, 1988, 3830219

Int. Cl.[5] F16D *3/14*; F16F *15/12*

U.S. Cl. 464—67 28 Claims



1. A flywheel assembly for compensation of fluctuations of torque which is transmitted between an output member of a combustion engine and an input member of a transmission, comprising a first flywheel connectable with the output member of the engine; a second flywheel connectable with the input member of the transmission, said flywheels being rotatable relative to each other to and from a neutral position in at least one direction; a substantially flange-like member coupled with said second flywheel; a component rotatable relative to said flange-like member; and damper means operative to oppose rotation of said flywheels from said neutral position, said damper means including a first damper for substantially unassistedly opposing a first stage of rotation of said flywheels from said neutral position with a first force, and at least one second damper for opposing a second stage of rotation of said flywheels from said neutral position with a second force greater than said first force, said second stage following said first stage and said at least one second damper comprising a plurality of energy storing elements borne by said first flywheel in the neutral position of said flywheels, at least one of said energy storing elements being flanked by said component in the circumferential direction of said flywheels and said first damper comprising energy storing means borne by said flange-like member and arranged to store energy under the action of said component, said component comprising at least one substantially segment-shaped member disposed substantially radially inwardly of said at least one energy storing element, said at least one energy storing element having end portions spaced apart from each other in the circumferential direction of said flywheels and said segment-shaped member having radially disposed extensions adjacent the end portions of said at least one energy storing element.

5,194,047

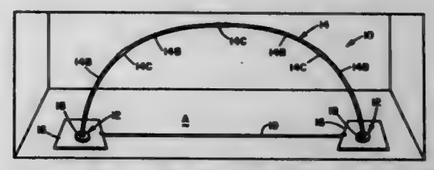
PORTABLE SCENE STORING, SETTING, AND RAPID CHANGE ASSEMBLY

William D. Cabell, P.O. Box 43, South Tamworth, N.H. 03883

Filed May 23, 1991, Ser. No. 704,801

Int. Cl.[5] A63J *1/02*

U.S. Cl. 472—75 20 Claims



1. A portable assembly for storing, setting up, and rapidly changing elements of different theatrical scenes, said portable assembly comprising:

(a) a pair of anchoring means locatable at respective opposite ends of a stage area; and

(b) an elongated stationary track mountable solely at its opposite ends by said anchoring means so as to extend in an arched configuration over the stage area;

(c) each of said anchoring means including an end platform being a generally planar structure adapted to lie flat on the stage area and support one of said opposite ends of said track by extending laterally from and 360° about said one end of said track.

5,194,048

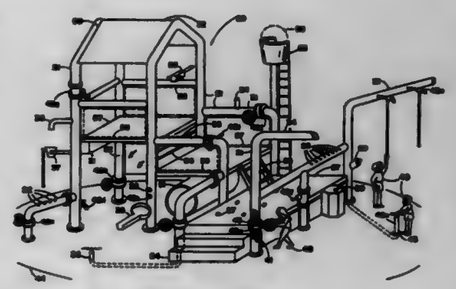
PARTICIPATORY WATER PLAY APPARATUS

Rick A. Briggs, P.O. Box 215, Oceanside, Oreg. 97134

Continuation-in-part of Ser. No. 438,220, Nov. 20, 1989, Pat. No. D. 330,579. This application Oct. 29, 1990, Ser. No. 604,946

Int. Cl.[5] A63G *21/00*

U.S. Cl. 472—128 21 Claims



1. A water play apparatus comprising:

a frame;

a first nozzle mounted on said frame at a first elevation for directing a spray of water into the air in a first direction, said nozzle forming said spray into a first spray pattern;

means for circulating water to said first nozzle;

a first valve mounted on said frame for controlling the flow of water circuitlated to said first nozzle;

a second nozzle mounted on said frame at a second elevation different from said first elevation for directing a spray of water into the air in a second direction different from said first direction, said nozzle forming said spray into a second spray pattern different from said first spray pattern;

means for circulating water to said second nozzle;

a second valve mounted on said frame for controlling the flow of water circulated to said second nozzle;

first means mounted on said frame for supporting a user of said apparatus at a third elevation, said first supporting means being positioned adjacent said first valve to permit

a user of said apparatus on said supporting means to adjust said first valve;

second means mounted on said frame for supporting a user of said apparent at a fourth elevation, said second supporting means being positioned adjacent said second valve to permit a user of said apparatus on said second supporting means to adjust said second valve;

a basin for collecting water sprayed from said nozzles; and

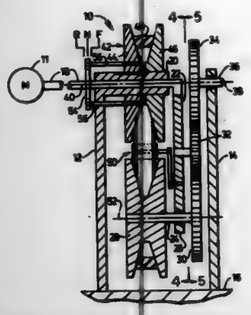
a pump for recirculating such collected water to said nozzles.

5,194,049

COMBINED DIRECTIONAL AND INFINITELY VARIABLE-SPEED TRANSMISSION

Fred L. Knop, Jr., 124 E. Oakwood Rd., East Peoria, Ill. 61611

Filed Jan. 27, 1992, Ser. No. 826,097
Int. Cl.[5] F16H 7/00
U.S. Cl. 474—69 6 Claims



1. A combined directional and infinitely variable speed transmission comprising;

a stationary first V-belt pulley;

an input drive shaft rotatably, coaxially extended through said first pulley and having an elongated crank arm radially extended therefrom;

a second V-belt pulley freely rotatably mounted on said crank arm for orbiting movement about said first pulley; and

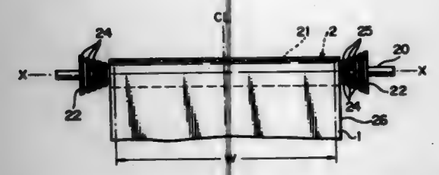
an endless V-belt trained around said first and second pulleys in interconnecting driving relation therebetween as the V-belt is walked around said stationary first pulley to cause positive driven rotation of said second pulley.

5,194,050

POSITIONING DEVICE FOR AN ENDLESS BELT

Takaya Murashi, Yokohama, and Mitsuru Satoh, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 25, 1991, Ser. No. 782,126
Claims priority, application Japan, Oct. 25, 1990, 2-287841
Int. Cl.[5] F16H 7/00
U.S. Cl. 474—101 6 Claims



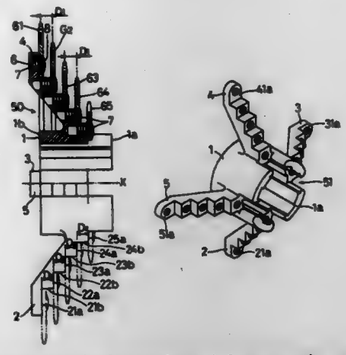
1. In a positioning device for preventing an endless belt passed over a plurality of support rollers from being shifted to one side in an axial direction of said support rollers while in operation, a pair of forcing means are located at both ends of at least one of said support rollers for forcing back, when said belt is shifted to either of opposite ends of said support roller to contact said end, said belt toward the center of said roller in the axial direction of said roller.

5,194,051

SPROCKET WHEEL MOUNTING UNIT FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Mar. 20, 1992, Ser. No. 854,865
Claims priority, application Japan, Mar. 27, 1991, 3-062286
Int. Cl.[5] F16H 9/06
U.S. Cl. 474—160 8 Claims



1. A sprocket wheel mounting unit for supporting a plurality of sprocket wheels in ring form for use on a bicycle, particularly on a rear wheel of a bicycle, comprising:

a boss having an axis, a front end face and a rear end face;

a plurality of support arms extending radially outwardly from outer peripheries of said boss and inclined toward said rear end face with respect to said axis, said support arms being arranged around said boss; and

a plurality of stepped surfaces formed on an inclined portion of each of said support arms opposed to said front end face, said stepped surfaces including vertical surfaces substantially perpendicular to said axis and horizontal surfaces substantially parallel to said axis;

adjacent ones of said vertical surfaces being formed with a predetermined pitch for use as sprocket wheel positioning surfaces;

said inclined portion of each of said support arms opposed to said front end face and an inclined portion of each of said support arms opposed to said rear end face being substantially parallel to each other, a space being formed between said inclined portion opposed to said rear end face and said boss.

5,194,052

STEPLESS TRANSMISSION FOR VEHICLES

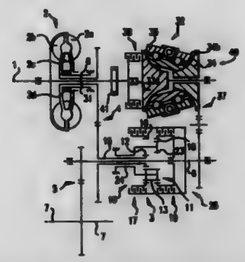
Kazuhiko Ueda, Hatsukaichi; Seiji Esaki, Hiroshima, and Osamu Sado, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 30, 1992, Ser. No. 859,013
Claims priority, application Japan, Mar. 29, 1991, 3-067124
Int. Cl.[5] F16H 3/44
U.S. Cl. 475—66 7 Claims

1. A stepless transmission having a torque converter fastened to an engine output shaft, a stepless transmission gear connected to the engine output shaft and a reverse and reduction gear operationally coupled to the torque converter for an automotive vehicle, comprising:

first means for establishing a first power flow path, including the torque converter and the reverse and reduction gear, through which engine output is transmitted to an output shaft of the stepless transmission;

second means for establishing a second power flow path, including the stepless transmission gear, through which engine output is transmitted to said output shaft of the stepless transmission; and



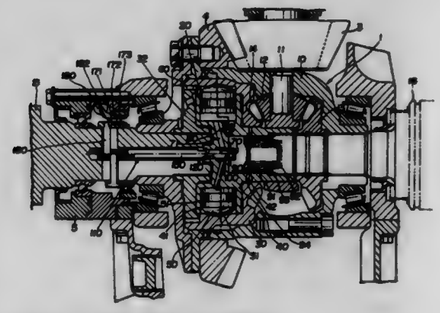
oil control means, including at least one oil pump, for causing a decrease in quantity of a lubrication oil delivered to the stepless transmission gear while said first means establishes said first power flow path, and causing a decrease in quantity of a working oil delivered to the torque converter while said second means establishes said second power flow path.

5,194,053

ROTATIONAL SPEED DIFFERENTIAL RESPONSIVE TYPE CONTROL COUPLING WITH VARIABLE TRANSFER TORQUE CONTROL MEANS

Akihiko Sano; Yasuhiro Nikura, and Tokiyoshi Yasui, all of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 27, 1991, Ser. No. 719,704
Claims priority, application Japan, Jun. 29, 1990, 2-173490
Int. Cl.[5] F16H 1/44, 1/455; F16D 31/02
U.S. Cl. 475—89 5 Claims



2. A control coupling, comprising:

a first rotary member;

a second rotary member rotatable relative to said first rotary member;

hydraulic fluid discharge means responsive to a rotational speed differential between said first and second rotary members for discharging a quantity of hydraulic fluid proportional to said rotational speed differential;

orifice means for restricting discharge of hydraulic fluid by said oil discharge means to produce a transfer torque between said first and second rotary members;

orifice opening changing means for changing an opening of said orifice means in response to an orifice opening control signal supplied thereto; and

control means for supplying said orifice opening control signal to said orifice opening changing means to control said opening of said orifice means in correspondence with variations of a rotational speed differential between said first and second rotary members to generate a desired torque transfer characteristic, wherein said control means includes

first detecting means for detecting a rotational speed of said first rotary member and for producing a first rotational speed detecting signal representative thereof,

second detecting means for detecting a rotational speed of said second rotary member and for producing a second rotational speed detecting signal representative thereof,

rotational speed differential operating means for performing arithmetic operations to determine said rotational speed differential between said first and second rotary members from said first and second rotational speed detecting signals,

target transfer torque setting means for setting a target transfer torque based on said rotational speed differential,

actual orifice opening coefficient operating means for performing arithmetic operations on an actual orifice opening based on said target transfer torque set by said target transfer torque setting means and said rotational speed differential,

map means for looking up an orifice opening corresponding to said actual orifice opening coefficient,

target orifice opening determining means for determining a target orifice opening on the basis of said map means and said actual orifice opening coefficient, and

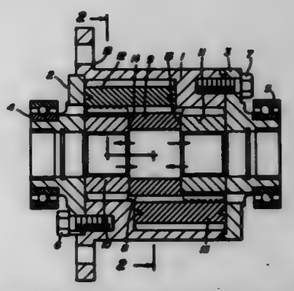
output means for supplying said orifice opening control signal to generate said target orifice opening.

5,194,054

DIFFERENTIAL DRIVE

Peter Ambora, Neunkirchen-Seelscheid, and Wolfgang Hildebrandt, Lohmar, both of Fed. Rep. of Germany, assignors to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany

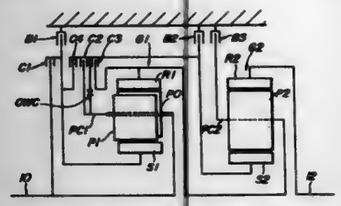
Filed Apr. 23, 1991, Ser. No. 690,536
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1990, 4013202
Int. Cl.[5] F16H 1/42
U.S. Cl. 475—249 7 Claims



1. A differential gear system for use in the driveline of a motor vehicle, comprising a differential carrier that rotates in bearings of a differential housing and is driven via a drive gear tooth configuration; two axle shaft gears rotate in the differential carrier and are coaxial relative to each other; and at least two compensating gears are eccentrically supported in, and rotating with, the differential carrier, one of the compensating gears is meshed with one of said axle shaft gears, and the other compensating gear of the compensating gears is meshed with the other axle shaft gear, while engaging each other at least indirectly, and where the axle shaft gears have a tooth design which, when under torque, generates an axial thrust, said axle shaft gears being supported inside a clear passage of the differ-

ential carrier; surfaces of the axle shaft gears which are subjected to loads with transmission of torque from the wheels to the driveline are arranged toward the center of the differential cage; and the axle shaft gears surfaces and/or surfaces in contact with said axle shaft gears which are subjected to loads with transmission of torque from the wheels to the driveline are provided with passive free floating first friction-reducing means positioned between said axle shaft gears and said surfaces in contact with said axle shaft gears, while the axle shaft gears are mutually supportive, either directly, or by means of intermediate elements.

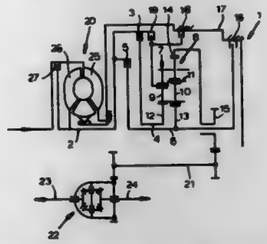
5,194,055
PLANETARY GEAR TYPE TRANSMISSION MECHANISM
Toshikazu Oshidari, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed Mar. 18, 1992, Ser. No. 853,191
Claims priority, application Japan, Mar. 19, 1991, 3-80664
Int. Cl.[5] F16H *57/10*
U.S. Cl. 475—281 **14 Claims**



1. A planetary gear type transmission mechanism comprising:
(a) an input member to be supplied rotation from a power supply;
(b) an output member for delivering rotation changed in speed at an selected speed ratio;
(c) a first gear set including a gear element constantly coupled with said input member for rotation therewith;
(d) a second gear set including a gear element constantly coupled with said output member for rotation therewith; and
(e) friction means including a plurality of friction elements for determining power transmission route through at least one of said first and second gear sets for establishing a plurality of speed ratios between the input and output members;
other gear elements of the first and second gear sets being coupled with each other and the friction elements being arranged, in such manner that all gear elements of the first and second gear sets except for said gear element constantly coupled with the output member rotates in the same direction as that of the input member at speed less than the input member upon selection of any forward speed ratio.

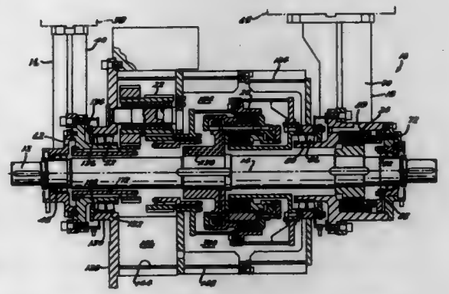
5,194,056
AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES
Michael Schiffhauer, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany
PCT No. PCT/EP89/01532, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO90/07072, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 13, 1989, Ser. No. 687,937
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842188
Int. Cl.[5] F16H *57/10*
U.S. Cl. 475—325 **9 Claims**

1. An automatic transmission for a motor vehicle, said transmission comprising a reduction planetary gearing device having an input side and an output side, said planetary gearing device having a first planetary gear set and a second planetary gear set, said first and second planetary gear sets having planet gears that mesh with each other and share a common carrier, said first planetary gear set having a sun gear being fixedly secured to a rotatable hollow shaft, said hollow shaft being selectively secured by a first clutch member to an input shaft, said second planetary gear set having a sun gear being fixedly secured to an intermediate shaft for continuous rotation therewith, said intermediate shaft being selectively secured by a second clutch member to said input shaft, a first friction brake means being secured to said intermediate shaft for braking said intermediate shaft, said common carrier member of said first



and second planetary gear sets having a second friction brake means connected to its transmission-input side end, and said second planetary gear set having a ring gear being connected with a driven wheel of the automatic transmission, the intermediate shaft being formed as a solid shaft in cross-section and passing through the driven gear, wherein the first friction brake means engages a segment of said intermediate shaft which extends axially beyond the driven gear on the transmission output-side end, and said common carrier member being selectively connected with the input shaft via a third clutch member which is located axially after the first and the second clutch members in the direction of the transmission-output side.

5,194,057
TWO SPEED PRESS DRIVE
Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to Sommer Company, Warren, Mich.
Filed Jan. 24, 1992, Ser. No. 825,550
Int. Cl.[5] F16D *67/04*
U.S. Cl. 475—339 **9 Claims**



1. A two speed drive for an apparatus comprising:
a stationary support means for mounting said two speed drive;
input drive means for transmitting rotational movement into said two speed drive, said input drive means rotatably mounted on said stationary support means;
output drive means for transmitting rotational movement

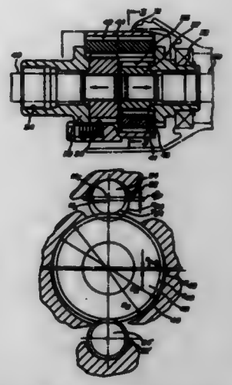
from said two speed drive, said output drive means rotatably mounted in said stationary support means;
planetary gear means for providing speed reduction between said input drive means and said output drive means;
selectively operable first clutch means for locking said output drive means to said input drive means;
selectively operable second clutch means for locking said output drive means to said planetary gear means; said first clutch means mounted inwardly of and in coaxial nested relation to said second clutch means;
first engagement means for engaging said first clutch means, said first engagement means including first spring means for urging said first clutch means into an engaged condition and locking said output drive means to said input drive means;
second engagement means for engaging said second clutch means, said second engagement means including second spring means for urging said second clutch means into an engaged condition and locking said output shaft to said planetary gear means;
actuating means connecting said first and second engagement means together such that said first spring means cooperates with said second spring means to disengage both of said first and second clutch means; said actuating means operable such that when said first engagement means engages said first clutch means said second engagement means releases said second clutch means wherein rotation is transmitted from said input means to said output means, and when said second engagement means engages said second clutch means, said first engagement means releases said first clutch means wherein rotation is transmitted from said planetary gear means to said output means;
selectively operable brake means for prohibiting rotation of said output drive means in relation to said stationary support means;
third means for engaging said brake means, said third engagement means including third spring means for urging said brake means into an applied condition to prohibit rotation of said output drive means.

5,194,058
DIFFERENTIAL DRIVE
Peter Ambern, Neunkirchen; Wolfgang Hildebrandt, Lohmar, and Klaus Greulich, Hellig, all of Fed. Rep. of Germany, assignors to Viscodrive GMBH, Lohmar, Fed. Rep. of Germany
Filed Jun. 11, 1992, Ser. No. 897,367
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1991, 4119314
Int. Cl.[5] F16H *1/36, 1/45, 55/17*
U.S. Cl. 475—344 **3 Claims**

1. A differential drive comprising:
a differential carrier rotatably supported in a differential housing;
two toothed axle shaft gears rotatably held in cylindrical bores in the differential carrier and coaxially arranged relative to each other;
two groups of toothed differential gears supported in bores in the differential carrier, said differential gears each having a respective axis and being arranged such that said axes are substantially/parallel with one group of the differential gears engaging one of the axle shaft gears and another group engaging the other axle shaft gear, the one group of the differential gears engaging the other group of differential gears;
at least one of the axle shaft gears or at least one of the therewith engaged differential gears, on at least part of a width of a tooth engagement between the axle shaft gear and the differential gear, having centers of local pitch circles of the teeth, which deviate radially from a straight connecting line between centers of two end addendum circle of the teeth, said gears and said axes being formed such that

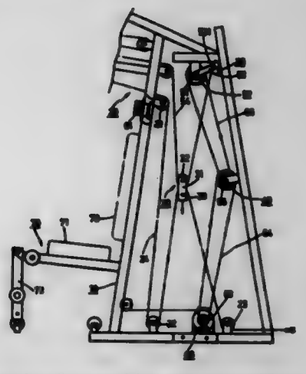
$$D_B - D_E < 2e_a + e_p,$$

where



D_B=a diameter of said axle shaft gear bore,
D_E=a diameter of said axle shaft gear addendum circle,
e_a=a maximal radial deviation of said axle shaft local pitch circle centers
and e_p=a maximal radial deviation of said differential gear local pitch circles.

5,194,059
MAGNETICALLY CONTROLLED EXERCISER FOR EXERCISING ARMS
Hong-Chi Wu, No. 523, Ta-Hsiang St., Chung-Li City, Taoyuan Hsien, Taiwan
Filed Jan. 7, 1992, Ser. No. 817,744
Int. Cl.[5] A63B *21/00*
U.S. Cl. 482—92 **9 Claims**



1. An exerciser for exercising arms, comprising:
a frame assembly;
an input mechanism including an input pulley mounted on a front upper portion of said frame assembly, a front guide pulley mounted on a lower end portion of said frame assembly, and a pull rope extending around a lower portion of said front guide pulley and around an upper portion of said input pulley, said pull rope having a fixed end secured to a rear portion of said frame assembly and a

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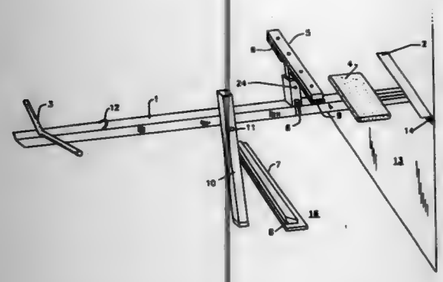
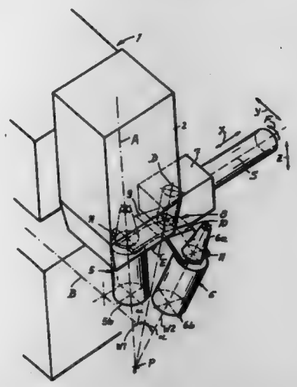
front end adapted to be connected to an arm exercising mechanism;
a suspended pulley set including a pulley seat, an upper pulley mounted rotatably on said pulley seat, and a lower pulley mounted rotatably on said pulley seat under said upper pulley, said pull rope extending around an upper portion of said lower pulley;
an intermediate drive wheel mounted rotatably on said frame assembly;
a drive mechanism interconnecting said suspended pulley set and said intermediate drive wheel and including a guide rope extending around a lower portion of said upper pulley of said suspended pulley set, said guide rope having a movable end and a fixed end secured to an upper end portion of said frame assembly so as to move said suspended pulley set upward and downward, thereby rotating said intermediate drive wheel; and
a resistance generating device including a resistance setting unit disposed on said frame assembly, a rotating shaft journalled on said frame assembly, a driven wheel sleeved rigidly on said rotating shaft, an endless driving element trained between said intermediate drive wheel and said driven wheel so as to transfer rotation of said intermediate drive wheel to said driven wheel, a magnetic controller connected functionally to said rotating shaft and said resistance setting device so as to create a predetermined magnetic resistance to rotation of said rotating shaft during reciprocal movement of said pull rope, and a spiral spring connecting said rotating shaft to said frame assembly so as to bias said rotating shaft to rotate to a normal position, thereby moving said suspended pulley set to an upper limit position.

5,194,060
FOLD-AWAY, MULTI-CALF EXERCISE DEVICE
Thomas M. Marchetti, 1040 Wayside Rd., Wayside, N.J. 07712
Filed Mar. 5, 1992, Ser. No. 846,033
Int. Cl.[5] A63B *21/06*
U.S. Cl. 482—97 6 Claims



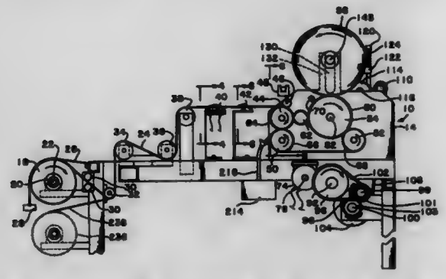
1. A foldable, multicalf exercise device comprising:
a longitudinal shaft having a first end, a second end, a top surface and a bottom surface;
a hinge element mount on said first end and configured to be mounted to an upright, supporting surface;
a seat means mounted on said top surface of said longitudinal shaft, proximate to said first end;
a foldable bar means being located on the top surface of said longitudinal shaft, positioned and configured to allow a user to lift said longitudinal shaft by using their knees while being seated on said seat means in a forward direction facing the second end of said longitudinal shaft;
a foot rest positionable under said longitudinal shaft;
a pivotable, foldable foot element positioned between said first and said second ends of said longitudinal shaft adapted to support said longitudinal shaft in a parallel position with respect to a horizontal surface;
a means to hold a plurality of weighted elements located on said second end of said longitudinal shaft; and,
an attachment means configured to aid in securing said longitudinal shaft against said upright supporting surface.

5,194,061
TOOL CHANGER
Karl Lechleiter, Oy-Mittelberg; Thomas Heinl, Kempten, and Helmut Heel, Lengenwang, all of Fed. Rep. of Germany, assignors to Ott Maschinentechnik GmbH, Kempten, Fed. Rep. of Germany
Claims priority, application Fed. Rep. Germany, Apr. 8, 1991, 4111307
Filed Mar. 16, 1992, Ser. No. 851,625
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 483—41 4 Claims



1. Tool changer for changing tools in at least one tool holder of a machine tool, especially a machine tool spindle, with a support movable parallel to the axis of the tool holder, a changer head rotatably mounted in the support about an axis of rotation, with two gripper arms on the changer head arranged substantially radially with respect to the axis of rotation, their free ends each carrying a gripper and being so inclined relative to the axis of rotation that the tool axes of the tools engaged by the grippers diverge towards their holding ends relative to the axis of rotation, the axis of rotation in the support in the change operation being aligned at an acute angle to the axis (spindle axis) of the tool holder, characterized in that the free ends (9*a*, 10*a*) of the gripper arms (9, 10) are so inclined relative to the axis of rotation (D) that the two tool axes (W1, W2) of the tools (5, 6) engaged by the grippers (11) and the axis of rotation (D) intersect in a single point (P) each of the tool axes (W1, W2) including an acute angle (α) of substantially 10° to 30° with the axis of rotation (D), and in that the axis of rotation (D) in the support (7) is so arranged that the point (P) lies during changing in front of the tool holder (spindle nose) on the axis (A or B) of the tool holder (4) and the axis of rotation (D) includes a angle (α) with this axis which corresponds to the acute angle (α) which the tool axes (W1, W2) include with the axis of rotation (D).

5,194,062
MACHINE FOR PRE-FORMING AND REWINDING FILM FOR SIDE WELDED BAGS
Hercules Membrino, 280 Paoli State Road, Malvern, Pa. 19355
Continuation-in-part of Ser. No. 539,129, Jun. 18, 1990, abandoned. This application Oct. 18, 1991, Ser. No. 779,105
Int. Cl.[5] B65H *18/00*; B31B *1/74*
U.S. Cl. 493—203 12 Claims

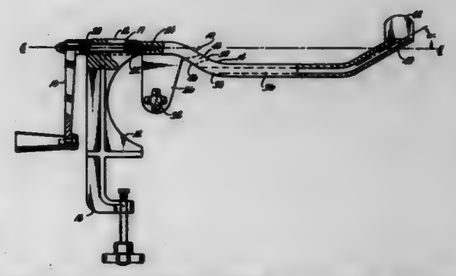


1. An apparatus for processing and rewinding an easily stretchably deformable web made of thin plastic comprising:
(a) a series of synchronously, positively driven draw and transfer rolls for drawing the web from a supply roll and transporting it at a uniform speed and tension through at least one processing area, said series having a positively driven last roll; and
(b) a center-driven rewind roll in moving peripheral contact with said last roll such that the moving web is directly delivered to said rewind roll by said last roll and transferred at a transfer point provided at the peripheral contact between the last roll and the rewind roll from contact with said last roll into contact with said rewind roll, said last roll exerting a drag on said rewind roll for controlling the speed of the rewind roll so that the web is rewound onto the rewind roll under constant tension without stretching.

11. A method for processing and rewinding an easily stretchable plastic web comprising:
(a) driving a series of rolls to draw the web from a supply roll assembly under constant tension and to move the web at a selected speed, said series of rolls having a driven last roll;
(b) transferring the moving web from the driven last roll directly onto a rewind roll which is in peripheral contact with said last roll; and
(c) center driving said rewind roll at a speed greater than the speed of the moving web, said peripheral contact between the last roll and the rewind roll creating a drag on said rewind roll for controlling the rewind speed of the rewind roll to match the speed of the moving web.

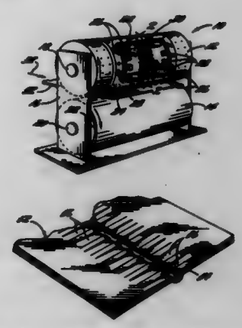
5,194,063
GARLAND MAKER
Celia Kalm, and Owen McKimm, both of Arcadia, Calif., assignors to Classico Manufacturing Company, Arcadia, Calif.
Filed Aug. 9, 1991, Ser. No. 743,016
Int. Cl.[5] B65H *49/18*, *51/02*
U.S. Cl. 493—381 10 Claims

1. A garland maker comprising:
a) an elongated rotatable longitudinal arm having a longitudinal axis providing:
i) first conduit means for directing a first line from a first source of line securable to and rotatable with said arm at a maximal end of the arm for providing a core of a garland undergoing assembly;
ii) second conduit means for directing a second line from a second source of line securable to and rotatable with said arm at said proximal end of the arm for spirally wrapping said second line around bunches of foliage placed on the line forming the core by rotation of said elongated rotatable arm and said second conduit means extending longitudinally through substantially the entire length of the arm, said second conduit means having an opening approximate the proximal end of the arm for receiving said second line, and having an opening of a distal end of the arm for discharging the second line from the second conduit means;
b) support means for to securing the garland marker to a work surface, said support means receiving said arm at a junction and in rotatable relation thereto;



c) means at said proximal end of the arm to rotate said rotatable arm about an axis of rotation spaced from the longitudinal axis of said rotatable arm, said axis of rotation defined by said support and a portion of said rotatable arm whereby when said first line and second line are respectively simultaneously dispensed through the first and second conduits in said arm, said first line forms the core line of a garland and said second line binds foliage to said core line by rotation about the core line to form a continuous length of garland.

5,194,064
CREASING RULE FOR ROTARY DIE APPARATUS
Jack R. Simpson, Raleigh, and Jeffrey A. Geer, Apex, both of N.C., assignors to Container Graphics Corporation, Cary, N.C.
Filed Jul. 27, 1992, Ser. No. 920,253
Int. Cl.[5] B31B *1/25*
U.S. Cl. 493—402 15 Claims



1. A rotary die apparatus for processing corrugated paperboard, comprising:
a die roll and an anvil roll mounted in generally parallel relationship to each other for rotation in opposite directions and defining a nip therebetween;
an arcuate die board upon the outer surface of said die roll;

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a layer of resilient deformable material upon the outer surface of said anvil roll;

a creasing rule mounted upon said die board of said die roll, said creasing rule having an elongate central axis and including a plurality of elongate creasing members extending laterally from said axis at spaced locations along the length thereof, each of said creasing members having a relatively tall head section adjacent said axis and an outer end section distal from said axis, said head section section of said creasing member having a greater height than said outer end section of said creasing member;

first ones of said creasing members being predominantly upon a first side of said axis and being spaced laterally from each other along said axis;

second ones of said creasing members being predominantly upon a second side of said axis and being spaced laterally from each other along the length of said axis; and

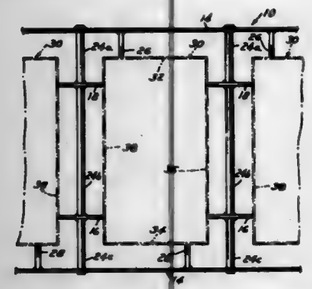
said first ones of said creasing members being in staggered relationship with said second ones of said creasing members.

5,194,065

CARTON SQUARING MECHANISM

Frank D. Risko, Livonia, and Barry C. Owen, Southfield, both of Mich., assignors to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Dec. 13, 1991, Ser. No. 806,623
Int. Cl.[5] B31B *1/74, 1/78*
U.S. Cl. 493—465 13 Claims



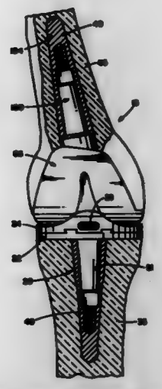
12. A carrier for receiving a four-sided carton therein, said carrier including a plurality of compartments each having four sides for receiving one said four-sided carton, at least one said compartment being characterized by a plurality of thin longitudinally oriented guides provided on all of said four sides sides, at least one of said sides having a single off-center one of said guides, said guides being adapted to bear thinly on said carton to urge said carton into a squared configuration as it is longitudinally received in said compartment.

5,194,066

MODULAR JOINT PROSTHESIS

Richard R. Van Zile, Warsaw, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Division of Ser. No. 142,146, Jan. 11, 1988, Pat. No. 4,834,081.
This application Feb. 27, 1989, Ser. No. 316,039
Int. Cl.[5] A61F *2/18*
U.S. Cl. 623—20 6 Claims



1. A modular joint prosthesis for implantation in a body comprising:

a component adapted to be affixed within an intramedullary canal of a long bone, said component including a support plate, said support plate having a lower surface adapted to engage and bear against and be substantially coextensive with a complementary resected surface of the long bone and an elongated male stem integral with and extending transversely away from said support shelf, said male stem having a longitudinal axis and an outer surface which is uniformly tapered relative to the longitudinal axis and having a maximum outer diameter at a proximal end adjacent the lower surface and a minimum outer diameter at a distal end distant from the lower surface; and

a female stem having a longitudinal axis and extending between a closed distal end and an open proximal end, a portion of said female stem having a bore extending from the open proximal end a predetermined distance distally thereof, said bore defining an inner surface which is uniformly tapered relative to the longitudinal axis and having a maximum inner diameter at said proximal end and a minimum inner diameter distant therefrom, said inner surface of said female stem and said outer surface of said male stem generally forming an angular divergence within the range of +/−3 minutes of arc;

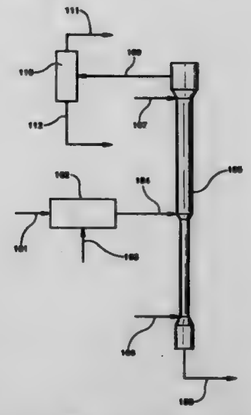
whereby said male stem and said female stem are configured to be locked together upon engagement of said inner surface of the female stem and said outer surface of the male stem enabling said male stem and said female stem to be received as a unit in the intramedullary canal of the long bone for fixation thereto to a depth at which said support shelf bears against the resected surface of the long bone.

5,194,067

RECOVERY OF HYDROGEN PEROXIDE

Rajendra S. Albal; Robert N. Cochran; David W. Leyshon, all of West Chester, and Lawrence M. Candela, Philadelphia, all of Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Jun. 29, 1992, Ser. No. 905,979
Int. Cl.[5] B01D *12/00;* C01B *15/026;* C07C *45/00*
U.S. Cl. 23—293 R 2 Claims



1. In a process for the extraction in an extraction zone of hydrogen peroxide from a methyl benzyl alcohol oxidate mixture containing methyl benzyl alcohol, acetophenone and hydrogen peroxide wherein ethyl benzene and water are employed as extractive solvents, water being introduced in the upper section of the extraction zone, the improvement which comprises introducing ethyl benzene solvent into the extraction zone at a point below the point of introduction of the oxidate mixture.

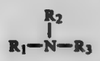
5,194,068

ESTER-CONTAINING FUEL FOR GASOLINE ENGINES AND DIESEL ENGINES

Juergen Mohr, Gruenstadt; Knut Oppenlaender, Ludwigshafen; Roland Schwen, Friedelsheim; Hans P. Rath, Gruenstadt; Juergen Thomas, Frankenthal; Hans-Joachim Vogel, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

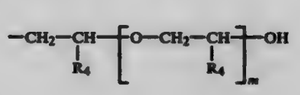
Filed Jan. 24, 1991, Ser. No. 720,066
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1990, 4020664
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—391 8 Claims

1. A fuel for gasoline engines and diesel engines, containing small amounts of an ester which is the reaction product of a polycarboxylic acid and an alkyl alkanolamine or alkyl aminopolyalkylene glycol of the formula I



I

in which R_1 and R_2 are C_6–C_{30}-alkyl radicals and R_3 is a hydroxyalkyl radical of formula II,



II

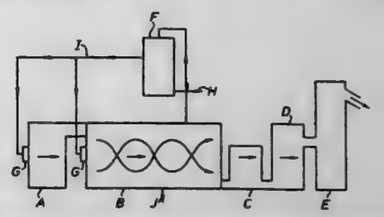
in which R_4 is hydrogen or a C_1–C_6-alkyl radical and m is an integer of from 0 to 100.

5,194,069

METHOD AND APPARATUS FOR REFINEMENT OF ORGANIC MATERIAL

George E. Somèus, Guernsey, Channel Islands, assignor to Productcontrol Limited, Guernsey, Channel Islands

PCT No. PCT/SE89/00206, § 371 Date Oct. 3, 1990, § 102(e) Date Oct. 3, 1990, PCT Pub. No. WO89/09809, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 14, 1989, Ser. No. 576,486
Claims priority, application Sweden, Apr. 14, 1988, 8801377
Int. Cl.[5] C10B *39/02*
U.S. Cl. 44—500 9 Claims



1. Method of refinement of organic material including the steps of:

a) continuously feeding finely divided base material of organic origin into a reactor of a closed dynamic system under low pressure of 0.05 atm;

b) rotating the reactor and heating it to a temperature of 800°–900° C.;

c) decomposing the base material into carbon powder and reaction fluids by carbonization in said reactor and separating the gaseous phase in one step;

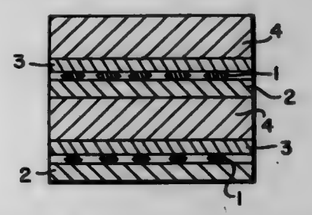
d) cooling the carbon powder in a cooling unit comprised in the closed dynamic system with indirect contact only with a cooling medium.

5,194,070

PROCESS FOR PRODUCTION OF DIAMOND ABRASIVE GRAINS

Hitoshi Sumiya, and Kazuwo Tsuji, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 21, 1992, Ser. No. 915,614
Claims priority, application Japan, Jul. 22, 1991, 3-205442
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 6 Claims



1. A process for the production of diamond abrasive grains comprising steps of:

regularly arranging a plurality of diamond crystal seeds on a first solvent metal plate, stacking a second solvent metal plate on the first solvent metal plate so that the diamond crystal seeds are sandwiched by the first solvent metal plate and the second solvent metal plate wherein said plate is providing a source of carbon and stacking a graphite

raw plate on the second solvent metal plate to construct a production system for the diamond abrasive grains,
heating the system or heating the system with pressurizing to a temperature above a solvent metal-graphite eutectic point through a temperature and pressure condition in which diamond is thermodynamically unstable to establish a temperature and pressure condition in which diamond is thermodynamically unstable,
heating the system or heating the system with pressurizing to establish a temperature and pressure condition in which diamond is thermodynamically stable and maintaining said condition, and
recovering said diamond abrasive grain.

5,194,071

CUBIC BORON NITRIDE ABRASIVE AND PROCESS FOR PREPARING SAME

Francis R. Corrigan, Westerville; Barbara R. Sweeting, Powell, and Samuel A. Anthony, III, Westerville, all of Ohio, assignors to General Electric Company Inc., New York, N.Y.

Filed Jul. 25, 1991, Ser. No. 735,503
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 13 Claims

1. A method for forming cubic boron nitride, which comprises subjecting ideal structure hexagonal boron nitride particles having an average particle size of 10–50 microns to simultaneous pressure and temperature conditions for a time sufficient to convert the ideal structure hexagonal boron nitride particles to cubic boron nitride and recovering the cubic boron nitride formed.

5,194,072

SINTERED SOL GEL ALUMINA ABRASIVE FILAMENTS

Charles V. Rue, Petersham; Ronald H. van de Merwe, Northborough, both of Mass.; Ralph Baser, Niagara Falls, Canada; Scott W. Pellow, Niagara Falls, Canada; Thomas E. Cottringer, Niagara Falls, Canada, and Richard J. Klok, Niagara Falls, Canada, assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 345,139, Apr. 28, 1990, Pat. No. 5,009,676. This application May 2, 1990, Ser. No. 517,914
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.
Int. Cl.[5] C09C *1/68*
U.S. Cl. 51—309 24 Claims

1. A sintered sol gel alumina based filament comprised of sintered alpha alumina crystals having a size no greater than 1 micron, said particles having a substantially uniform cross-section, a diameter not greater than 2 mm, an average aspect ratio of at least about 1.0 and a hardness of at least 16 Gpa.

5,194,073

SINTERED COMPOSITE ABRASIVE MATERIALS, A PROCESS FOR ITS PRODUCTION AND ITS USE

Gerhard Winter, Viersenburg; Paul Möltgen, Laufenburg, and Dietmar Fister, Murg, all of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin GmbH & Co. KG, Berlin, Fed. Rep. of Germany

Filed Nov. 8, 1991, Ser. No. 789,759
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1990, 4039021; Jun. 11, 1991, 4119183
Int. Cl.[5] B24D *3/02*
U.S. Cl. 51—309 11 Claims

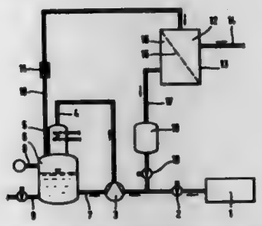
1. Sintered composite abrasive product based on an alpha Al_2O_3 matrix and at least one mechanically resistant material selected from the class of compounds consisting of carbides, silicides, oxides, borides, nitrides and mix phases of these mechanically resistant materials, namely oxycarbides, oxynitrides, carbonitrides or other combinations thereof, wherein said mechanically resistant material is composed of isometric grains with grain sizes from about 1 μm to about 70 μm, and wherein said composite abrasive product is characterized in that the primary crystalline size of the alpha Al_2O_3 is in the range of from about 0.1 to about 1.0 μm, and where said alpha Al_2O_3 matrix is obtained by the sol gel process.

5,194,074

DEVICE FOR CONTINUOUSLY PURIFYING THE WASTE GASES FROM A VACUUM UNIT

Gerhard Hauk, Bad Krozingen, Fed. Rep. of Germany, assignor to Sihl GmbH & Co. KG, Itzehoe, Fed. Rep. of Germany

PCT No. PCT/EP90/02081, § 371 Date Aug. 5, 1991, § 102(e) Date Aug. 6, 1991, PCT Pub. No. WO91/06825, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 3, 1990, Ser. No. 743,411
Claims priority, application Switzerland, Dec. 9, 1989, 4651/89 8
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—158 14 Claims



1. An apparatus for continuously purifying waste gas emitted from a vacuum unit, comprising:
a gas permeation membrane module for separating the waste gas into a permeate gas and a non-permeate gas, the membrane module including an inlet side having a waste gas inlet and a non-permeate gas outlet, and a permeate side having a permeate gas outlet,
vacuum pump means for removing the waste gas from the vacuum unit, delivering the waste gas to the membrane module, and separating the waste gas in the gas permeation membrane module, the vacuum pump means consisting of a single vacuum pump, the vacuum pump having a compression side fluidly connected to the inlet side of the membrane module, and a suction side fluidly connected to the permeate side of the membrane module and fluidly connectable to a subatmospheric outlet of the vacuum unit, and
permeate outlet means disposed between the gas permeation membrane module and the vacuum pump.

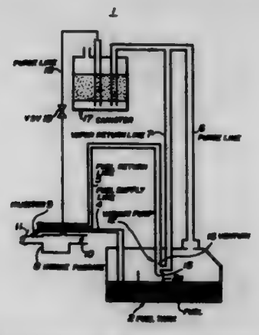
5,194,075

EVAPORATIVE FUEL RECOVERY APPARATUS

Hiroki Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 30, 1992, Ser. No. 860,318
Claims priority, application Japan, Apr. 1, 1991, 3-68619
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—195 8 Claims

1. An evaporative fuel recovery apparatus comprising:
purge passage means, coupled to a canister and a fuel tank, for feeding fuel vapor, evaporated in the fuel tank, into the canister, said canister containing an adsorbent for storing the fuel vapor from the fuel tank therein;
fuel return passage means, coupled to an intake passage and the fuel tank, for feeding excess fuel, remaining in the fuel return passage means and not injected into the intake passage, back to the fuel tank;
a vacuum pump provided in said fuel return passage means, said vacuum pump generating vacuum pressure due to a flow of the excess fuel being fed back to the fuel tank through the fuel return passage means; and
vapor return passage means, coupled to the vacuum pump and the purge passage means, for forcedly returning fuel vapor fed through the purge passage means back to the



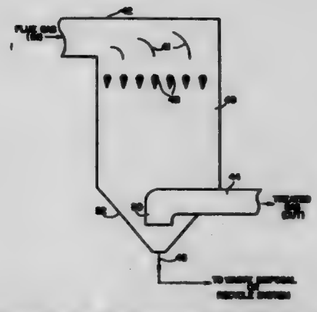
fuel tank by means of the vacuum pressure generated by the vacuum pump.

5,194,076

LOW PRESSURE DROP DRY SCRUBBER

Robert B. Myers, Copley; Dennis W. Johnson, Barberton, and Gerald T. Amrhein, Louisville, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 23, 1991, Ser. No. 781,465
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—220 3 Claims



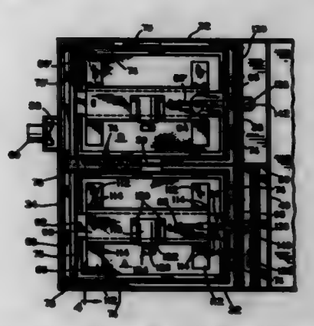
1. A co-current dry scrubber for discharging a solution or slurry containing a gas treatment composition into waste gas, comprising:
a housing defining a chamber having a waste gas inlet for receiving waste gas and a treated gas outlet for discharging treated gas from the chamber, said chamber extending vertically with said waste gas inlet being above said treated gas outlet, said treated gas outlet having a conduit extending at an angle of about 90° to a major axis of the chamber and having a downwardly facing inlet for receiving gas plus dried slurry from the chamber; and
at least one airfoil lance atomizer array extending across the chamber and in the housing, the array including an airfoil lance member having a large radius leading edge for facing oncoming gas entering through the waste gas inlet, and a small radius trailing edge facing oppositely to said leading edge, and at least one atomizer spaced along said airfoil lance for discharging slurry from the trailing edge.

5,194,077

DUAL CHAMBER FILTER ASSEMBLY WITH SHAKER

Douglas A. Bargiel, Bowling Green; Jack L. Burgess, Toledo; Anthony P. DiGiovanni, Maumee, and Norbert H. Hineburg, Milton Center, all of Ohio, assignors to Clarke Industries, Inc., Bowling Green, Ohio

Continuation of Ser. No. 496,229, Mar. 20, 1990, abandoned. This application Oct. 21, 1991, Ser. No. 779,905
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—300 9 Claims



1. A sweeper hopper and filter assembly including:
a) a main housing defining a hopper, said housing including a particulate contaminate inlet, a clear air outlet, means providing communication between the inlet and the outlet, and means for maintaining a decreased pressure at the outlet compared to the pressure at the inlet, and
b) a filter assembly disposed within the means providing communication between the inlet and outlet of said housing, said filter assembly including a removable filter media for militating against the flow of particulate contaminates therethrough, the filter media having a first surface facing upstream toward the inlet of said housing and a second surface facing downstream toward the clean air outlet of said housing, and means to dislodge particulate contaminates from the filter media, said means to dislodge including frame means having a hingedly mounted peripheral framing element for holding said filter media surrounding the removable filter media and an air permeable member extending across the second surface of the filter media, and means for intermittently impacting the air permeable member.

5,194,078

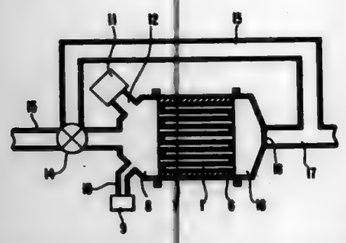
EXHAUST FILTER ELEMENT AND EXHAUST GAS-TREATING APPARATUS

Masaaki Yonemura, Nara, and Takao Kuzuda, Ashiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 658,126, Feb. 22, 1991, abandoned. This application Mar. 19, 1992, Ser. No. 853,899
Claims priority, application Japan, Feb. 23, 1990, 2-43022; Mar. 23, 1990, 2-73739
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—466 15 Claims

1. An exhaust filter element having a ceramic honeycomb structure with layers of elongated cells, the layers extending from an outer portion to an inner portion and the cells extending from an inlet end to an outlet end, adjacent cell ends of the honeycomb structure in alternate layers having plugs therein formed of a plug material, said honeycomb structure being made of a material having a higher dielectric constant at st

least a portion of the outer portion than at the inner portion, and the higher dielectric constant being sufficient to cause



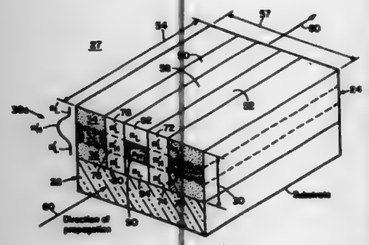
generation of heat in said honeycomb structure material when irradiated with microwaves.

5,194,079

METHOD OF FORMING AN OPTICAL CHANNEL WAVEGUIDE BY THERMAL DIFFUSION

Richard P. Tumminelli, Ashland; Farhad Hakimi, Watertown, and John R. Hauvisto, Marshfield Hills, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 761,416, Sep. 17, 1991. This application Feb. 4, 1992, Ser. No. 830,932
Int. Cl.[5] C03C *25/02, 21/00*
U.S. Cl. 65—3.110 8 Claims



1. A method of forming an optical channel waveguide comprising:

forming on a substrate a waveguide layer of silica doped with an index of refraction raising dopant whose concentration profile in a first dimension includes a higher concentration region and an adjacent lower concentration region; and

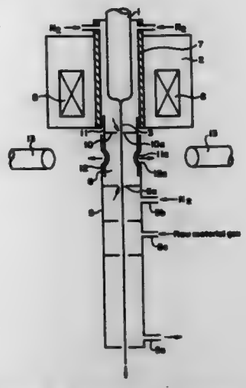
heating said waveguide layer along two areas, defined in a second and third dimension, spaced to define a path between them, said heat diffusing said dopant along the first dimension from the higher concentration region to the lower concentration region to reduce the index of refraction of the higher concentration region in portions of said higher concentration region beneath said spaced areas and create a waveguide along said path.

5,194,080

APPARATUS FOR PRODUCING HERMETIC COATED OPTICAL FIBER

Haruhiko Aikawa; Yoichi Ishigure; Katsuya Nagayama; Ichiro Yoshimura, all of Yokohama; Yutaka Katsuyama, and Nobuyuki Yoshizawa, both of Mito, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 1, 1991, Ser. No. 739,145
Claims priority, application Japan, Aug. 1, 1990, 2-202527
Int. Cl.[5] G02B *6/02;* C03B *37/025*
U.S. Cl. 65—13 6 Claims



1. An apparatus for producing a hermetic coated optical fiber comprising:

a fiber drawing furnace;

a reactor for hermetic coating of an optical fiber drawn from said fiber drawing furnace; and

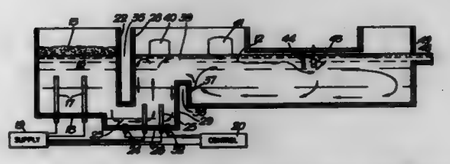
a gas shielding member provided between said drawing furnace and said reactor, said gas shielding member having at least one gas outlet.

5,194,081

GLASS MELTING PROCESS

Robert E. Trevelyan, Lancashire, and Peter J. Whitfield, Merseyside, both of United Kingdom, assignors to Pilkington plc, Merseyside, England

Continuation of Ser. No. 536,750, Jun. 12, 1990, abandoned. This application Sep. 11, 1991, Ser. No. 758,250
Claims priority, application United Kingdom, Jun. 13, 1989, 8913539
Int. Cl.[5] C03B *5/183, 5/185*
U.S. Cl. 65—29 19 Claims



1. A method of forming molten glass in a glass melting tank comprising heating batch material in a melting chamber to produce molten glass, and supplying heat in a riser chamber that is provided downstream of the melting chamber and which riser chamber has walls and a bottom, wherein refining takes place in a refining chamber to reduce impurities and release bubbles, and conditioning then takes place by cooling in a conditioning chamber connected to an outlet from the glass melting tank, which method further comprises:

(a) passing the molten glass from the melting chamber through a throat outlet into the bottom of the riser chamber which is provided with an upstream cooling wall adjacent the outlet of the throat to the riser chamber, a downstream cooling wall remote from the melting chamber and facing said upstream cooling wall, and two side walls connecting the bottom, the upstream cooling wall, and the downstream cooling wall;

(b) flowing the molten glass through the riser chamber before entering the refining chamber, while inputting heat to the molten glass in the riser chamber, by use of electrodes located in a lower part of the riser chamber in a central zone spaced from said walls of the riser chamber, to raise the temperature of the forward flowing glass leaving the riser chamber to an elevated, maximum, temperature which is greater than the temperature of the forward flowing glass entering the riser chamber and which is suitable for refining;

(c) cooling both said upstream and downstream cooling walls of the riser chamber whereby an inhomogeneous temperature distribution is formed in the molten glass and an upward central flow of molten glass from said electrodes is caused in said central zone of the riser chamber, well spaced from said walls of the riser chamber, with a cooler downward outer glass flow adjacent the walls of the riser chamber, so that glass entering the riser chamber through the throat may rise in the central flow together with recirculated glass that has descended in the downward outer glass flow;

(d) effecting a first temperature detection of molten glass on the side of said central zone which is adjacent said downstream cooling wall at the bottom of the riser chamber downstream of the central zone, and effecting a second temperature detection of molten glass flowing into the riser chamber from the throat;

(e) controlling the heat input from the electrodes in the riser chamber in dependence on both said first and second temperature detections (i) to raise the temperature of the molten glass in the riser chamber to said elevated, maximum, temperature, and (ii) to maintain a molten glass temperature at the bottom of the riser chamber downstream of the said central zone which is above the temperature of molten glass entering the riser chamber through the throat, thereby preventing a build-up of cold molten glass at the bottom of the riser chamber; and

(f) passing the molten glass after leaving the riser chamber to the refining chamber and then from the refining chamber to the conditioning chamber, where the molten glass is cooled to a desired thermal condition prior to flowing continuously through the outlet from the glass melting tank.

5,194,082

METHOD OF MANUFACTURING GLASS MOLDING ARTICLES

Shinichiro Hirota, Hachioji, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Feb. 11, 1991, Ser. No. 653,065
Claims priority, application Japan, Feb. 28, 1990, 2-48662
Int. Cl.[5] C03B *23/00*
U.S. Cl. 65—102 4 Claims

1. A method of simultaneously molding first and second glass preforms, having different thermal characteristics comprising the steps of:

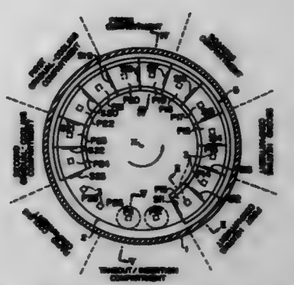
(i) providing a plurality of molds with glass preforms;

(ii) positioning multiple processing compartments along a predetermined path with discrete first and second treatment chambers in each compartment for processing the respective first and second glass preforms, respectively, having different thermal characteristics, each compartment being formed to provide a single treatment step using temperature as a common process parameter for each treatment chamber associated therewith;

(iii) disposing at least a pair of said molds with said first and second preforms into said first and second treatment chambers, respectively, of a first compartment;

(iv) moving said pair of molds with preforms to treatment chambers, respectively, of a processing compartment subsequent to said first compartment along said predetermined path of said compartments with only said first glass preform being processed in said first treatment chamber of each compartment and only said second glass preform being processed in said second treatment chamber of each compartment;

(v) treating said pair of molds with the respective first and second preforms in the respective first and second chambers in each processing compartment so that each said glass preform in each first chamber is treated in an associated compartment by a different temperature than the



temperature used for treatment of the other of said glass preforms in the second chamber of said associated compartment; and

(vi) upon completion of treatment in said first compartment, simultaneously transferring the pair of molds with said first and second glass preforms to the first and second treatment chambers in said subsequent processing compartment, wherein said first compartment is a heating compartment for heating said first and second preforms to different temperatures in said first and second chambers thereof, and one of said multiple processing compartments subsequent to said first compartment is a press molding compartment having first and second press molds in the first and second treatment chambers thereof for molding said first and second preforms, respectively, at different temperatures.

5,194,083

METHOD AND APPARATUS FOR BENDING A GLASS SHEET

Esko O. Lehto, Kangasala, Finland, assignor to Tamglass Engineering Oy, Tampere, Finland

Filed Sep. 18, 1991, Ser. No. 761,471
Claims priority, application Finland, Sep. 21, 1990, 904653
Int. Cl.[5] C03B *23/025*
U.S. Cl. 65—107 17 Claims

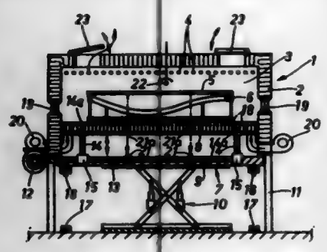
6. A method for bending a glass sheet comprising the steps of:

supporting a glass sheet on a bending mould in a heating furnace;

heating said glass sheet to a softening temperature with a heating field generated by heating elements, said field being adjustable to provide a desired energy flux distribution over said heating field; and,

adjusting an energy flux distribution at localized regions of said heating field during bending of said glass sheet and adjusting a distance between said glass sheet and said heating field during bending according to a predetermined

program such that, during bending, a heat-transfer effect between said heating field and said glass sheet is different



at a localized region on said glass sheet that at other regions on said glass sheet.

5,194,084

HERBICIDAL SUBSTITUTED TRIAZOLONES

Kurt Findeisen, Odenthal; Markus Lindig, Hilden; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

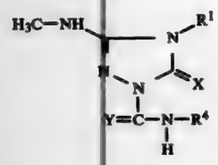
Continuation of Ser. No. 696,241, May 6, 1991, abandoned, which is a continuation of Ser. No. 514,785, Apr. 25, 1990, abandoned. This application Jul. 15, 1992, Ser. No. 915,037

Claims priority, application Fed. Rep. of Germany, May 18, 1989, 3916208

Int. Cl.[5] A01N *43/653*; C07D *249/12*

U.S. Cl. 504—273 14 Claims

1. A substituted triazolone of the formula



in which

R^1 represents hydrogen, or represents in each case straight-chain or branched alkyl having 1 to 8 carbon atoms, alkenyl having 2 to 8 carbon atoms, alkynyl having 2 to 8 carbon atoms, halogenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms, halogenoalkenyl having 2 to 8 carbon atoms and 1 to 15 identical or different halogen atoms, halogenoalkynyl having 2 to 8 carbon atoms and 1 to 13 identical or different halogen atoms, alkoxyalkyl or alkoxy each of which has 1 to 6 carbon atoms in the individual alkyl moieties, or represents cycloalkylalkyl or cycloalkyl each of which has 3 to 7 carbon atoms in the cycloalkyl moiety and, if appropriate, 1 to 6 carbon atoms in the straight-chain or branched alkyl moiety, or represents aralkyl or aryl each of which has 6 to 10 carbon atoms in the aryl moiety and, if appropriate, 1 to 6 carbon atoms in the straight-chain or branched alkyl moiety and each of which is optionally monosubstituted or polysubstituted on the aryl by identical or different substituents selected from the group consisting of halogen, cyano, nitro, straight-chain or branched alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy and halogenoalkylthio each of which has 1 to 4 carbon atoms and, if appropriate, 1 to 9 identical or different halogen atoms, and

R^4 represents alkyl having 1 to 18 carbon atoms, alkenyl having 2 to 8 carbon atoms, alkynyl having 2 to 8 carbon atoms, halogenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms, halogenoalkenyl or halogenoalkynyl each of which has 2 to 8 carbon atoms and 1 to 15 identical or different halogen atoms, alkoximinoalkyl each of which has 1 to 8 carbon atoms in the individual alkyl moieties, or represent cycloalkyl or cycloalkylalkyl, each of which has 3 to 8 carbon atoms in the cycloalkyl moiety and 1 to 6 carbon atoms in the alkyl moiety and each of which is optionally monosubstituted or polysubstituted by halogen.

5,194,085

HERBICIDAL SUBSTITUTED TRIAZOLINONES

Markus Lindig, Kansas City, Mo.; Kurt Findeisen, Leverkusen, Fed. Rep. of Germany; Klaus-Helmut Müller, Duesseldorf, Fed. Rep. of Germany; Hans-Joachim Santel, Leverkusen, Fed. Rep. of Germany; Robert R. Schmidt, Bergisch-Gladbach, Fed. Rep. of Germany; Harry Strang, Kansas City, Mo.; Dieter Feucht, Monheim, Fed. Rep. of Germany; Klaus König, Odenthal, Fed. Rep. of Germany, and Klaus Lürssen, Bergisch Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

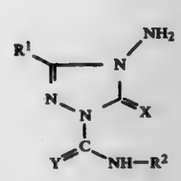
Continuation-in-part of Ser. No. 409,175, Sep. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 200,995, May 31, 1988, abandoned, and a continuation-in-part of Ser. No. 433,650, Nov. 8, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 660,321

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719575; Feb. 5, 1988, 3803523; Nov. 19, 1988, 3839206

Int. Cl.[5] A01N *43/653*; C07D *249/12*

U.S. Cl. 504—273 19 Claims

1. A substituted triazolinone of the formula



(I)

in which

R^1 represents hydrogen, methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, n- or i-pentyl, n- or i-hexyl, cyclopropyl, methoxymethyl, ethoxymethyl or propoxymethyl,

R^2 represents hydrogen, or represents methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, allyl, propargyl, straight-chain or branched pentyl, hexyl, heptyl, octyl, butenyl, pentenyl, hexenyl, butynyl, pentynyl or hexynyl each of which is optionally monosubstituted, disubstituted or trisubstituted by halogen; or additionally represents cyclopropyl, cyclopentyl, cyclohexyl, cyclohexenyl, cyclopropylmethyl, cyclopropylethyl, cyclohexylmethyl, cyclohexylethyl or cycloheptyl which are in each case optionally monosubstituted, disubstituted or trisubstituted by identical or different substituents from the group consisting of fluorine, chlorine, methyl, ethyl and cyano; or represents benzyl, phenylethyl or phenyl,

X represents oxygen or sulphur and

Y represent oxygen or sulphur.

5,194,086

PROCESS FOR THE RECOVERY OF VALUABLE MATERIALS FROM SLAGS OF METALLOTHERMIC PROCESSES

Hartmut Pungs, Laufenburg, Fed. Rep. of Germany, assignor to Hermann C. Starck GmbH & Co. KG, Berlin, Fed. Rep. of Germany

Filed May 20, 1992, Ser. No. 886,681

Claims priority, application Fed. Rep. of Germany, May 24, 1991, 4116949

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.35 10 Claims

1. A process for the recovery of valuable materials from slags which accumulate in exothermic metallothermic processes for the production of metals of ferro alloys, in which a mixture of metal oxides, reducing agents or, additionally, metals is ignited and a metal melt and a slag melt are formed, characterized in that (a) the slag is separated from the metal phase and (b) in a following separate step the slag with alloying additions is fully reduced electrothermally with carbon to form a new metal alloy melt.

5,194,087

FIREPROOF, WATERPROOF AND ACIDPROOF BINDER

Johannes G. Berg, Hovik, Norway, assignor to Norsk Proco A/S, Hovik, Norway

Filed May 17, 1991, Ser. No. 701,734

Claims priority, application Norway, May 18, 1990, 902203; Aug. 13, 1990, 903549; Nov. 28, 1990, 904639

Int. Cl.[5] C09D *5/16*

U.S. Cl. 106—18.12 30 Claims

1. A fireproof, waterproof and acidproof binder consisting essentially of a hardened mixture of about 10–90% by weight of an alkali silicate about 1–40% by weight of a reactive metal oxide of magnesium or titanium; and about 1–70% by weight of a carbonate compound.

5,194,088

PROCESS FOR CONDITIONING ORGANIC PIGMENTS

Fridolin Bäbler, Hockessin, and Edward E. Jaffe, Wilmington, both of Del., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 8, 1991, Ser. No. 726,612

Int. Cl.[5] C09B *56/00, 48/00, 7/00*

U.S. Cl. 106—412 14 Claims

1. A process for converting a crude organic pigment into pigmentary form consisting essentially of premilling the crude pigment, contacting the premilled pigment with a polar organic solvent at a temperature below about 50° C. for a period of time sufficient to obtain pigmentary particle size and isolating the pigmentary form.

5,194,089

COATED SPINEL COLOR PIGMENTS, PROCESS FOR THEIR PRODUCTION AND USE

Dietrich Speer, Hanau; Akos Kiss, Alzenau-Wasserlos; Peter Kleinschmit, Hanau, and Jenny Horst, Gelnhausen, all of Fed. Rep. of Germany, assignors to Degussa AG, Hanau, Fed. Rep. of Germany

Filed May 9, 1991, Ser. No. 697,343

Claims priority, application Fed. Rep. of Germany, May 10, 1990, 4014928

Int. Cl.[5] C09C *3/06*

U.S. Cl. 106—426 33 Claims

1. A coated spinel color pigment, comprising a core of colored spinel and a glassy coating layer which at least partially coats said core and which includes a silicate material consisting essentially of silicon dioxide and one or more oxides chosen from the group of alkali metals, alkaline earth metals, earth metals and mixtures thereof, wherein when the silicate coating material consists essentially of silicon dioxide and alkali metal oxides, the atomic ratio of silicon to alkali metal ranges from

6:1 to 60:1, and which may additionally contain one or more ions originating from the coated spinel.

5,194,090

LIQUID PIGMENT COMPOSITION, AND MASTER-COLORED POLYAMIDE YARN MADE BY USING SAME

Koji Tajiri; Hiroyoshi Minematsu, and Teruhiko Adachi, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 19, 1991, Ser. No. 717,574

Claims priority, application Japan, Jun. 20, 1990, 2-159646

Int. Cl.[5] D01F *1/04*

U.S. Cl. 106—499 5 Claims

1. A master-colored polyamide yarn containing, based on the weight of the yarn, 0.01 to 2% by weight of a pigment ingredient and up to 6% by weight of a pigment dispersant, said pigment dispersant comprising at least one polymeric material selected from the group consisting of polyesters and polyether esters, which have a hydroxyl value of 30 to 120 mg.KOH/g.

5,194,091

GEOPOLYMER-MODIFIED, GYPSUM-BASED CONSTRUCTION MATERIALS

Bill E. Laney, Albuquerque, N. Mex., assignor to The Hera Corporation, Albuquerque, N. Mex.

Filed Dec. 26, 1990, Ser. No. 635,735

Int. Cl.[5] C04B *11/28, 12/04*

U.S. Cl. 106—611 24 Claims

1. Gypsum wallboard materials having improved fire and water resistance produced from combining a self-hardening mixture comprising a geopolymer adhesive with a gypsum wallboard slurry, wherein said geopolymer adhesive comprises 43%–65% of soluble alkali metal silicate solution, 0.0%–0.4% of a pH-lowering and buffering agent, 1.3%–15.7% of a chemical setting agent for said soluble alkali metal silicate, 5.2%–23.6% of a strengthening agent, 11%–16% water, and 0.0%–16% of a thickening agent.

5,194,092

ELECTROSTATIC COATING APPARATUS FOR FLAT-PLATE TYPE OBJECTS

Hideo Teraswa, and Thoru Takeuchi, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Jul. 18, 1991, Ser. No. 732,124

Claims priority, application Japan, Jul. 19, 1990, 2-189413

Int. Cl.[5] B05B *5/00*

U.S. Cl. 118—632 2 Claims

1. An electrostatic coating apparatus for flat-plate type objects to be coated, comprising a conveyor carrying flat-plate type objects to be coated and having two linear portions which are parallel to each other, which carry said objects in opposite directions and which are each L in length and are spaced 2R apart, said L and R having the relationship $L \geqq 2R$; a reversing

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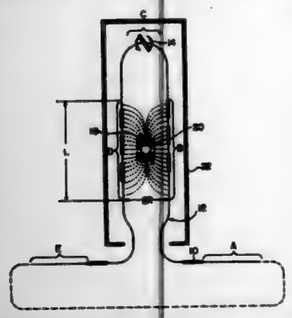
device which receives coated objects carried from one linear portion and which rotates said objects before feeding them to the other linear portion such that the opposite face of the object is presented for electrostatic coating; a rotary spray



head of which the axis of rotation is centrally situated between said linear portions of the conveyor and extends in a vertical direction; and a supporting device which subjects the rotary spray head to reciprocation along said axis of rotation.

5,194,093

PROCESS FOR THE DECOLORATION OF SUGAR LIQUOR

Jean-Francois Boussely, Saint-Denis, and Michel Pouillot, Ville d'Avray, both of France, assignors to Atochem, Puteaux, France

Continuation of Ser. No. 586,199, Sep. 21, 1990, abandoned. This application Aug. 5, 1991, Ser. No. 745,981
Claims priority, application France, Sep. 21, 1989, 89 12615
Int. Cl.[5] C13D *1/14*
U.S. Cl. 127—34 25 Claims

1. A process for the decolorization and extraction of sugar from a plant material selected from the group consisting of sugar cane and sugar beet, in the absence of a sulfiting agent, comprising:

(a) adding to a dilute plant liquor comprising sugar an amount of hydrogen peroxide which is sufficient for decolorization and extraction of said sugar;

(b) adjusting the pH of said plant liquor to which hydrogen peroxide has been added, using a non-toxic non-sulfur containing acid, such that it is between 8 and 9.5; and

(c) concentrating the resulting plant liquor by evaporation.

5,194,094

FRACTIONATING STARCH HYDROLYSATES

Robert Ammeraal, Worth, Ill., and Gregory Delgado, E. Chicago, Ind., assignors to American Maize-Products Company, Stamford, Conn.

Filed Jun. 12, 1991, Ser. No. 713,807
Int. Cl.[5] C08B *30/00*
U.S. Cl. 127—69 17 Claims

10. A process for fractionating acyclic dextrins only comprising the steps of:

(a) forming a slurry comprising acyclic dextrins wherein said slurry is an aqueous slurry of starch hydrolysates having a DE between about 1 to about 20 and said slurry has been obtained from the treatment of an acid and/or an enzyme on the starch;

(b) passing said slurry of acyclic dextrins through a matrix of a strong base ion exchange resin in hydrophobic anion form to fractionate the acyclic dextrins into different molecular weight fractions; and

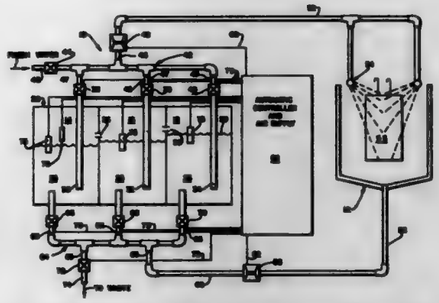
(c) eluting the fractionated acyclic dextrins and recovering the fractionated acyclic dextrins only by different molecular weights.

5,194,095

ENVIRONMENTAL WASTE-CONTROL PROCESS FOR SPRAY RINSING CHEMICALLY TREATED ARTICLES

William Yates, 847 S. Sapphire Ln., Anaheim Hills, Calif. 92807

Division of Ser. No. 525,998, May 21, 1990, Pat. No. 5,063,949.
This application Sep. 16, 1991, Ser. No. 760,712
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—10 14 Claims



1. A process of providing multiple counterflow rinsing of chemically treated workpieces employing a single on-line rinse tank together with at least one reservoir, comprising the steps of:

providing at least one reservoir;

storing rinse solution in said reservoir;

providing a single on-line rinse tank connected by rinse lines to said reservoir to receive rinse solution therefrom;

positioning a workpieces or a multiplicity of workpieces in said on-line rinse tank;

pumping the rinse solution sequentially from said reservoir to said on-line rinse tank;

providing at least three spray-rinse cycles wherein the first rinse cycle includes:

spraying a first rinse solution on said workpiece or workpieces with said rinse solution from said reservoir and returning said rinse solution to a discard station;

spraying a second rinse solution on said workpieces or workpieces with said rinse solution from said reservoir and returning said rinse solution to said reservoir;

spraying fresh water from a water supply means into said single on-line rinse tank; and

returning said fresh water to said reservoir purging said rinse lines of remaining rinse solution prior to each succeeding rinse cycle.

5,194,096

CARBURIZING TREATMENT OF A STEEL WITH REDUCTION OF THE HYDROGEN CONTENT IN THE CARBURIZED LAYER

Torsten Holm, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

PCT No. PCT/SE90/00409, § 371 Date Dec. 24, 1991, § 102(e) Date Dec. 24, 1991, PCT Pub. No. WO91/00367, PCT Pub. Date Jan. 10, 1991
PCT Filed Jun. 13, 1990, Ser. No. 781,146
Claims priority, application Sweden, Jun. 30, 1989, 8902365
Int. Cl.[5] C21D *1/06*
U.S. Cl. 148—233 4 Claims

1. A method for carburizing steel at a temperature within the austenitic range, comprising the steps of:

exposing the steel to a treatment atmosphere comprising nitrogen, hydrogen and carbon monoxide,

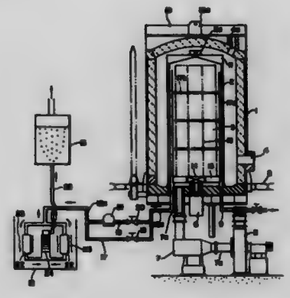
substituting said treatment atmosphere with nitrogen prior to cooling or quenching the steel in oil, salt or water in order to reduce the hydrogen concentration in a carburization layer of the steel by outward diffusion of hydrogen from said carburized layer.

5,194,097

METHOD OF NITRIDING STEEL AND HEAT TREAT FURNACES USED THEREIN

Masaki Tahara; Haruo Senbokuya; Kenzo Kitano, all of Osaka, and Teruo Minato, Wakayama, all of Japan, assignors to Daidousanso Co., Ltd. and Maizuru Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 590,825, Oct. 1, 1990, Pat. No. 5,112,030.
This application Jan. 17, 1992, Ser. No. 822,229
Int. Cl.[5] C21D *1/06*
U.S. Cl. 148—234 1 Claim



1. In a method for nitriding steel comprising holding steel material for a first period of time in a first heat treat furnace in a heated state and in an atmosphere of fluorine- or fluoride-containing gas to fluorinate the steel material, and then holding the fluorinated steel material for a second period of time in a second heat treat furnace in a heated state and in an atmosphere of nitriding gas to nitride the fluorinated steel material, the improvement comprising providing a plurality of second heat treatment furnaces, the number of which is at least equal to said second period of time divided by said first period of time, and introducing the fluorinated steel material from the first heat treat furnace one after another into the plurality of the second heat treatment furnaces so as to nitride the fluorinated steel material.

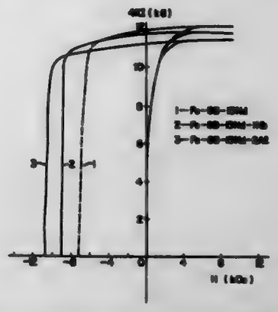
5,194,098

MAGNETIC MATERIALS

Masato Sagawa, Ibaraki; Setsuo Fujimura, Kyoto, and Yutaka Matsuura, Hyogo, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Continuation of Ser. No. 725,612, Jul. 3, 1991, abandoned, which is a continuation of Ser. No. 224,411, Jul. 26, 1988, Pat. No. 5,096,512, which is a division of Ser. No. 13,165, Feb. 10, 1987, Pat. No. 4,770,723, which is a continuation of Ser. No. 510,234, Jul. 1, 1983, abandoned. This application Apr. 30, 1992, Ser. No. 876,902
Claims priority, application Japan, Aug. 21, 1982, 57-145072; Nov. 15, 1982, 57-200204; Mar. 8, 1983, 58-5814; Mar. 8, 1983, 58-37896; Mar. 8, 1983, 58-37898; May 14, 1983, 58-84859; May 31, 1983, 58-94876
Int. Cl.[5] C22C *38/05*
U.S. Cl. 148—302 3 Claims

1. A crystalline precursor material for making permanent magnets comprising a major phase of an Fe-B-R compound wherein R is at least one selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y, said Fe-B-R compound being stable at room temperature or above, having a Curie temperature higher than room temperature and having magnetic anisotropy, wherein crystal grains of said Fe-B-R compound are isolated by a nonmagnetic boundary phase,



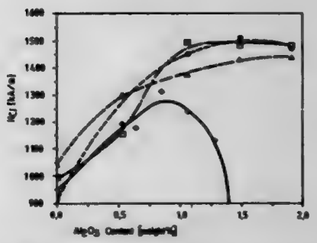
the precursor material consisting essentially of, by atomic percent of the entire precursor material, 8–30 percent R, 2–28 percent B and the balance being Fe, provided that at least 42 percent of the entire precursor material is Fe.

5,194,099

SINTER MAGNET BASED ON FE-ND-B

Friedrich Esper, Leonberg; Waldemar Draxler, Korntal; Günter Petzow, Leinfelden; Andreas Büchel; Klaus-Dieter Durst, both of Stuttgart; Ernst-Theo Henig, Leonberg; Gerhard Schneider, Stuttgart, and Helmut Kronmüller, Korb, all of Fed. Rep. of Germany, assignors to 501 Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V., Gottingen and 502 Robert Bosch GmbH, Stuttgart, both of Fed. Rep. of Germany

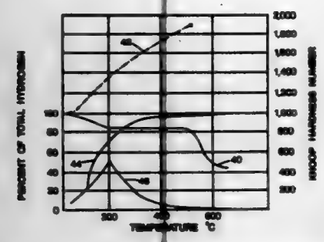
PCT No. PCT/EP88/00978, § 371 Date May 23, 1990, § 102(e) Date May 23, 1990, PCT Pub. No. WO89/05031, PCT Pub. Date Jun. 1, 1989
PCT Filed Oct. 28, 1988, Ser. No. 466,457
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1987, 3740157
Int. Cl.[5] H01F *1/053*
U.S. Cl. 148—302 8 Claims



1. An Fe-Nd-B sintered magnet having improved coercive field strength and decreased temperature dependency of the coercive field strength, said magnet consisting of the following components by weight percent: 38 to 50% Nd, 0.9 to 1.1% B, 0 to 5% Al, 0.5 to 3% O, 48–60% Fe and the remainder impurities;

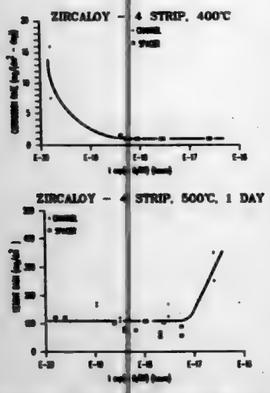
wherein the magnet is produced from an Fe-Nd-B pre-alloy which, after being formed, is subjected to grinding and dense sintering and wherein the content of the oxygen component is adjusted by the addition of elemental oxygen during grinding and/or sintering of the pre-alloy or by the addition of 0.1 to 2 wt. % Al_2O_3, during formation of the pre-alloy and/or grinding of the pre-alloy.

5,194,100
HEAT TREATABLE CHROMIUM
John DeHaven, Aiabe, and John Dash, Portland, both of Oreg., assignors to Blount, Inc., Montgomery, Ala.
Filed Feb. 8, 1991, Ser. No. 653,022
Int. Cl.[5] C25D *3/06, 5/50*
U.S. Cl. 148—518 7 Claims



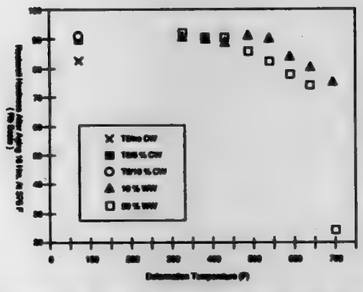
1. A method of making cutter elements, comprising:
forming a substrate in the shape of a cutter element;
providing a plating bath comprising water soluble trivalent chromium, a sulfate catalyst, and a water soluble metal ion buffer that maintains the pH of the bath between 0.5 and 2.0, substantially all Cr(VI) in the bath being reduced to Cr(III) by addition of sufficient amounts of methanol or formic acid;
providing an anode in the bath, and placing the substrate in the bath to act as a cathode;
electroplating chromium metal onto the substrate by providing a current density of 0.4 to 6.5 amperes per square inch; and
heating the electroplated substrate to about 600°–1675° F. for a sufficient period of time to harden the substrate while retaining or increasing hardness of the plated chromium metal.

5,194,101
ZIRCALOY-4 PROCESSING FOR UNIFORM AND NODULAR CORROSION RESISTANCE
Samuel A. Worcester, Butte, Mont.; James P. Dougherty, Hooper, Utah, and John P. Foster, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 16, 1990, Ser. No. 494,638
Int. Cl.[5] C22F *1/00;* C22C *16/00*
U.S. Cl. 148—671 4 Claims



1. In an improved method of fabricating Zircaloy-4 strip, said method being of the type wherein Zircaloy-4 material is vacuum melted, forged, hot reduced beta-annealed, quenched, hot rolled, subjected to a post hot-roll anneal and the reduced by at least two cold rolling steps, including a final cold rolling to final size, with intermediate annealing between the cold rolling steps and with a final anneal after the last cold rolling step, the improvement comprising:
a. hot-rolling, post-hot rolling annealing and cold rolling the Zircaloy-4 material at a maximum processing temperature of 620° C. between said quenching and said final cold rolling to final size;
b. stress relief annealing the cold rolled Zircaloy-4 material between the cold rolling steps at a maximum intermediate annealing temperature of 520° C.; and
c. hot rolling, post-hot-roll annealing, intermediate annealing and final annealing the Zircaloy-4 material at time-temperature combinations to give an A parameter of between 4×10^{-19} and 7×10^{-18} hour, where segment parameters are calculated for the hot rolling step and each annealing step said segment parameters being calculated by taking the time, in hours, for which that step is performed, times the exponent of (−40,000/T), in which T is the temperature, in degrees K, at which the step is performed, and where the A parameter is the sum of the segment parameters.

5,194,102
METHOD FOR INCREASING THE STRENGTH OF ALUMINUM ALLOY PRODUCTS THROUGH WARM WORKING
Rebecca K. Wyss, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Jun. 20, 1991, Ser. No. 718,392
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—695 23 Claims



1. A method for improving the strength of an age-hardenable aluminum alloy product, said method comprising the steps of:
(a) solution heat treating the alloy product;
(b) quenching the alloy product;
(c) deforming the alloy product in one of more deformation steps by up to about 50% total deformation at one or more deformation temperatures between about 300° F. and 600° F.; and
(d) aging the alloy product at one or more temperatures above said 250° F., wherein said method proceeds without preaging prior to said deforming step (c).

5,194,103
HIGH DENSITY ENERGETIC MATERIALS
Michael E. Sitzmann, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 30, 1991, Ser. No. 695,144
Int. Cl.[5] C06B *45/10;* C07C *257/06*
U.S. Cl. 149—19.1 18 Claims

1. A compound of the formula $SF_5N{=}C(Cl)R$ wherein R is $-OCH_2CH_2C(NO_2)_3$, $-OCH_2C(NO_2)_2CH_3$, $-OCH_2C$-

$(NO_2)_3$, $-OCH_2CF(NO_2)_2$, $-OCH_2CF_2(NO_2)$, or $-OCH_2CF_3$.

4. A compound of the formula

$$SF_5N{=}C(R_1)R_2$$

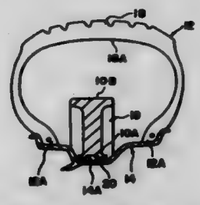
wherein R_1 is $-OCH_2CH_2C(NO_2)_3$, $-OCH_2C(NO_2)_2CH_3$, $-OCH_2C(NO_2)_3$, $-OCH_2CF(NO_2)_2$, $-OCH_2CF_2(NO_2)$, or OCH_2CF_3, and wherein R_2 is $-OCH_2CH_2C(NO_2)_3$, $CH_2CF(NO_2)_2$, $-OCH_2CF_2(NO_2)$, OCH_2CF_3, $-NH_2$, $-NHCH_2CH_2ONO_2$ or $-N(NO_2)CH_2CH_2ONO_2$, provided that if R_1 is $-OCH_2CF(NO_2)_2$then R_2 is not $-OCH_2CF$-$(NO_2)_2$.

11. A plastic bonded explosive wherein the improvement comprises using an energetic plasticizer of the formula

$$SF_5N{=}C(R)OCH_2CF(NO_2)_2$$

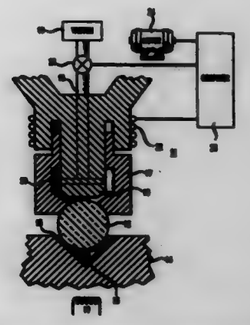
wherein R is $-OCH_2CH_2C(NO_2)_3$, $-NH_2$, $-NHCH_2C$-H_2ONO_2, or mixtures thereof.

5,194,104
CORE ASSEMBLY FOR PNEUMATIC TIRE
Mitsunori Wada, and Shungo Ito, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jul. 16, 1991, Ser. No. 730,681
Claims priority, application Japan, Jul. 23, 1990, 2-194392
Int. Cl.[5] B60C *17/04*
U.S. Cl. 152—152 9 Claims



1. A core assembly for a pneumatic tire, which is assembled into an annular configuration by connecting opposite ends of two or more arcuate members, capable of being fitted annularly to with an outer peripheral surface of a well portion of a rim with said pneumatic tire mounted thereon, and is adapted to rotate as an outer surface of said core assembly comes into contact with an inner peripheral surface of a crown portion of said pneumatic tire and an inner peripheral surface of said core assembly slides over said outer peripheral surface of said well portion of said rim if said pneumatic tire collapses owing to a decline in internal pressure thereof, the core assembly further comprising:
a sliding portion encompassing at least a portion of said inner peripheral surface of said core assembly and formed of a resin material having a good sliding property and a high heat resistance, said sliding portion being capable of sliding over said outer peripheral surface of said well portion; and
the entire remaining portion, excluding said sliding portion, formed of a light metal material having a high rigidity and a low specific gravity.

5,194,105
PLACEMENT AND BONDING TECHNIQUE FOR OPTICAL ELEMENTS
Hung N. Nguyen, Bensalem, Pa., assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed Aug. 29, 1991, Ser. No. 752,140
Int. Cl.[5] H01L *21/603;* H05K *13/04;* B25J *15/06*
U.S. Cl. 156—293 11 Claims



1. A method for bonding a curved optical element to slanted opposing sidewalls of a substrate comprising the steps of:
providing a retracting element holder surrounding a bonding tool;
providing a vacuum channel communicating with the holder;
contacting the holder to the element and applying a vacuum to the vacuum channel to cause the element to adhere to the holder;
moving the element to a location above the slanted opposing sidewalls of the substrate;
releasing the vacuum, thereby to allow the element to nest between opposing sidewalls;
causing the holder to retract vertically upwardly so as to expose a bonding surface of the bonding tool;
and lowering the bonding tool to contact the element and force it against the opposing sidewalls.

5,194,106
METHOD OF MAKING FIBER REINFORCED POROUS SHEETS
James E. Geary, Jr., Boothwyn, Pa., and Gregory P. Weeks, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 606,651, Oct. 31, 1990, Pat. No. 5,134,016.
This application Feb. 10, 1992, Ser. No. 833,040
Int. Cl.[5] B32B *5/16*
U.S. Cl. 156—62.6 4 Claims

1. A process for preparing a web of randomly dispersed fibers comprising: blending 20–60% by weight of discrete high modulus fibers between 1–8 cm in length and 40–80% by weight of thermoplastic resin matrix forming fibers greater than 0.5 denier and between 1 and 50 mm in length; forming a web of said blend, said web having a basis weight of from about 0.05 to about 0.2 pound per square foot; heating said web

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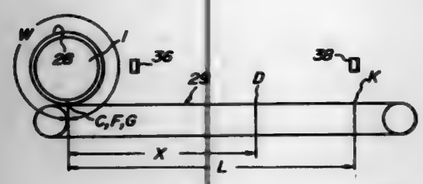
in a first heating step to melt said thermoplastic resin matrix forming fibers; forming molten globules of thermoplastic polymer, said globules enveloping said high modulus fibers at fiber crossover locations and adhering to said high modulus fibers along their length; and cooling said web to bond said high modulus fibers into an air permeable structure.

5,193,107
BELT-LIKE MEMBER ATTACHING METHOD AND APPARATUS

Koji Okuyama, and Makoto Yamamoto, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 481,554, Feb. 14, 1990, abandoned, which is a continuation of Ser. No. 238,443, Aug. 31, 1988, abandoned. This application Apr. 2, 1991, Ser. No. 680,014
Claims priority, application Japan, Sep. 3, 1987, 62-221059; Sep. 3, 1987, 62-221060
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—64 2 Claims



1. A method of attaching a belt-like member being transferred by a conveyor to a circumference of a drum, comprising steps of; detecting a trailing end of the belt-like member at a trailing end reference point (K), moving said belt-like member on said conveyor and detecting a leading end thereof at a leading end reference point (E), storing the distance (B) the belt-like member travels once said trailing end has been detected at the point (K) until the leading end has been detected at point (E), transferring the belt-like member by the conveyor until the leading end of the member arrives at a predetermined leading end set position (C) spaced a predetermined distance (A) from said leading end reference point (E), the leading end set position being in the proximity of a position on said drum where attaching of the leading end is to start, adding the distance (A) to the distance (B), thereby determining a trailing end point (D) and a distance (X), wherein point (D) is spaced from point (K) by the distance (A)+(B) and distance (X) is the distance from point (D) to a trailing end set position (G), which is coincident with set position (C), regulating the speed of said conveyor and said drum as a function of point (D) and distance (X), such that the belt-like member is transferred and the drum is rotated, whereby the belt-like member is attached to the circumference of the drum in a manner so that at the same time when the leading end attached to the drum arrives at a predetermined set rotated position which is coincident with position, the trailing end of the belt-like member arrives a said trailing end set position (G), wherein said regulating absorbs excess and shortage in length of the member and joins the leading and trailing ends without any prior arithmetic operation for excess and shortage of the length relative to a circumferential length of the drum.

5,194,108
ADHESIVE BACKED MOUNT INSTALLATION TOOL

Frederick E. White, Jr., Marietta, Ga., and John J. Bulanda, New Lenox, Ill., assignors to Panduit Corp., Tinley Park, Ill.

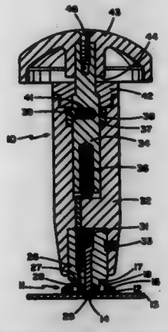
Filed May 15, 1991, Ser. No. 701,399
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—71 2 Claims

1. The method of applying an adhesive backed mount to a surface comprising the following steps:

positioning a mount on an application tool having a housing and a handle movable relative to said housing, wherein said handle has a stop surface positioned for preventing movement of said handle relative to said housing;

positioning said mount in its desired location on a surface;

applying a lateral force to said handle sufficient to overcome



a predetermined force required to move said handle relative to said housing until said stop surface prevents further movement of said handle relative to said housing, thereby indicating that said predetermined lateral force has been applied to said mount; and

ceasing application of the lateral force to said handle.

5,194,109
METHOD FOR RECOVERING SCRAPS OF MULTI-LAYER PLASTIC SHEET OR FILM

Toyokazu Yamada, Himeji, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

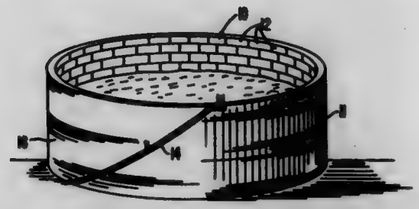
Continuation of Ser. No. 426,968, Oct. 25, 1989. This application May 22, 1992, Ser. No. 890,358
Claims priority, application Japan, Nov. 14, 1988, 63-285704
Int. Cl.[5] B32B *35/00*; B29B *17/00*
U.S. Cl. 156—94 21 Claims

1. A method for recovering and reusing a scrap multilayer sheet or film comprising at least a plastic base material layer and laminated with an adhesive resin comprising at least one resin selected from the group consisting of an ethylene-vinyl acetate copolymer, a styrene-isoprene copolymer, a styrene-butadiene copolymer, a styrene-methyl methacrylate copolymer and an ethylene-acrylic acid ester-maleic anhydride copolymer, said method comprising heating said scrap multilayer sheet or film to a temperature lower than the softening point of said base material layer to make the peeling strength of said adhesive resin lower than the strength at break of a layer having the lowest strength at break, except for said adhesive layer, said temperature being 30° C. to 70° C., wherein the adhesive resin does not adhere to the base material layer and separating said multilayer scrap into at least two scrap layers, whereby the adhesive resin is separated from the base material layer and recovering and reusing at least one of said scrap layers in sheet or film form.

5,194,110
METHOD OF PREVENTING RUPTURE OF STORAGE TANKS

Norman C. Fawley, 5701 Seaside Walk, Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 274,278, Nov. 21, 1988, abandoned. This application Jan. 3, 1991, Ser. No. 708,012
Int. Cl.[5] B32B *35/00*; B65H *81/00*
U.S. Cl. 156—94 13 Claims



1. A method of reinforcing an existing fluid storage tank having a cylindrical shell normally strong enough to withstand the stresses imposed on the shell by the fluid stored in the tank, wherein said shell includes a plurality of metal plates welded together and has a vertical axis, an exterior surface, a top end and a bottom end, said shell being supported at its bottom end and being subject to bursting by a rapidly propagating fracture from increased stresses in the shell above the stresses imposed by the fluid, comprising:

forming a reinforcing jacket around said shell and in contact with said plates by

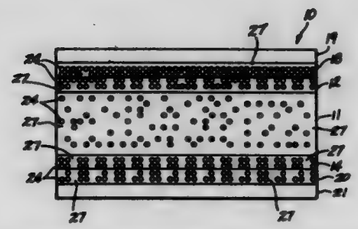
a) winding a plurality of continuous, high tensile strength, nonmetallic filaments around and in contact with substantially the entire exterior surface of the shell; and

b) applying a resin to the filaments to define a composite material of filaments in a resin matrix.

5,194,111
COMPOSITE CONSTANT STRESS BEAM WITH GRADIENT FIBER DISTRIBUTION

Franklin D. Meatte, Cromwell, Conn., assignor to Pacific Coast Composites, Inc., San Marcos, Calif.

Division of Ser. No. 407,877, Sep. 14, 1989, Pat. No. 5,087,503. This application Dec. 17, 1991, Ser. No. 809,290
Int. Cl.[5] B32B *31/06*
U.S. Cl. 156—166 12 Claims



1. A method of manufacturing a constant stress composite beam comprising the steps of:

(a) pulforming an elongated central core portion from fiber impregnated resin having a cross section with a first fiber content and at least a first surface normal to a direction of deflection in response to a force applied in the given direction causing compressive stress and a second opposing surface normal to the direction of deflection;

(b) adhesively fastening a plurality of facing layers of fiber impregnated resin to the first and second opposing surfaces, each of the facing layers normal to the direction of deflection having a higher fiber content than the fiber content of the core portion to produce a composite beam with a cross section having a varying fiber content through the composite beam cross section so that the highest fiber content of between greater than 63 to about 78% by weight is adjacent the surface of the core portion on the side of the compressive stress in at least one facing layer that is normal to the direction of deflection where the highest stress normal to the direction of loading is located and the compressive stress is a minimum; and

(c) shaping the beam by contouring.

5,194,112
METHOD OF APPLYING A FIBER OPTIC ADHESIVE TO A FIBER OPTIC MATERIAL

Barry D. Allen, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 584,664, Sep. 14, 1990. This application Jul. 20, 1992, Ser. No. 915,566
Int. Cl.[5] B65H *54/04*, *55/04*; G02B *6/16*
U.S. Cl. 156—169 3 Claims

1. A method of applying a fiber optic adhesive to a fiber optic material prior to its being wound on a bobbin to achieve even payout of the fiber optic as it is being employed to transmit a signal to a missile in flight, said method comprising:

(i) providing a fiber optic material to which said fiber optic adhesive is to be applied which comprises a glass fiber produced from a high purity silica preform rod by being drawing from said high purity silica preform rod which is heated to its yield point at about 2000° C., said fiber optic material prior to having said fiber optic adhesive applied being said drawn fiber optic material having a diameter from about 80 to about 125 micrometer, said drawn fiber optic material being coated with a buffer coating selected from an organic compound or an inorganic compound, said buffer coating when selected from an organic compound being selected from the organic compounds consisting of methyl methacrylate, epoxy acrylates, polyimides, polyquinolines, and polysilazanes, said buffer coating when selected from an inorganic compound being Si_3N_4, said drawn fiber optic material plus buffer coating of an organic compound having a diameter up to about 250 micrometers and said drawn fiber optic material plus buffer coating of an inorganic compound having a diameter up to about 145 micrometers;

(ii) applying a fiber optic adhesive to said provided fiber optic material, said fiber optic adhesive when applied to said provided fiber optic material consisting of:

(a) hydroxyterminated polybutadiene from about 88.14 to about 92.48 weight percent;

(b) isophorone diisocyanate to provide an NCO to OH ratio from about 7.07 parts to about 7.28 isophorone diisocyanate per 100 parts of hydroxyterminated polybutadiene;

(c) a catalyst selected from ferric acetylacetonate or dibutyltin dilaurate in an amount of about 0.89 and 1.15 weight percent respectively; and,

(d) a thixotropic agent of a hydrogenated castor oil of 4.48 weight percent when said dibutyltin dilaurate is 1.15 weight percent and of 4.49 weight percent when said ferric acetylacetonate is 0.89 weight percent;

(iii) winding on a bobbin said fiber optic material having said applied fiber optic adhesive; and,

(iv) curing said fiber optic adhesive for a time period from about 30 to 40 minutes at a temperature from about 58° C. to 60° C. to produce a cured adhesive having a tacky outer surface to achieve even payout of said fiber optic as it is being employed to transmit a signal to a missile in flight.

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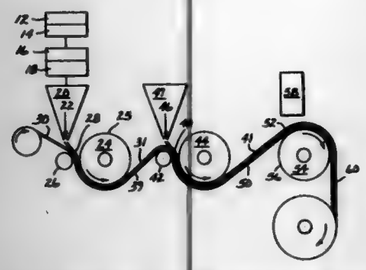
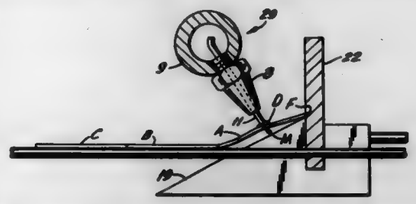
5,194,113
PROCESS FOR MAKING CONFORMABLE THERMOPLASTIC MARKING SHEET
James E. Lasch, Oakdale; Gregory F. Jacobs; Terry R. Bailey, both of Woodbury; Louis C. Belisle, Oakdale; Roger R. Kult, Maplewood; Robert A. Hasenzi, Woodbury, and Michael P. Daniels, Hastings, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Division of Ser. No. 632,976, Dec. 24, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 829,222
Int. Cl.[5] B29C *47/06*
U.S. Cl. 156—243 5 Claims



1. A process for making a conformable marking sheet comprising the steps of:
A. providing a sheet comprising 50–85 volume percent thermoplastic polymer selected from the group consisting of polyethylene, polypropylene, polybutylene, ethylene copolymers, ethylene-propylene-diene terpolymers, polyvinylidene fluoride, polytetrafluoroethylene, polyvinyl-containing polymers, polyamides, and polyurethanes; and 15–50 volume percent inorganic particulate filler having a mean particle size of at least 1 micrometer said sheet having a thickness of 75 to 1250 micrometers and a top surface and a bottom surface, the sheet being characterized by exhibiting, when tested at 25° C. using standard tensile strength apparatus, not more than 35 NT force per cm width to deform a sample to 115% of original sample length when tested at a strain rate of 0.05 sec^{-1}; and
B. bonding the top surface of the sheet to a top layer comprising a flexible thermoplastic polymer useful as a marking indicium and selected from the group consisting of ethylene acrylic acid (EAA) copolymers, ethylene methacrylic acid (EMAA) copolymers, polyethylene (PE), ethylene copolymers, polypropylene (PP), ethylene-propylene-diene terpolymers (EPDM), polybutylene, ionically cross-linked ethylene methacrylic acid copolymer, ethylene n-butyl acrylate (EnBA), ethylene vinyl acetate (EVA), ethylene ethyl acrylate (EEA) copolymer and ethylene methyl acrylate (EMA) copolymer.

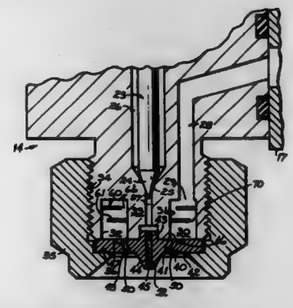
5,194,114
MEANS FOR MAKING A SEALED ENVELOPE
Bernd H. Walter, Naples, Fla., assignor to GBR Systems Corporation, Naples, Fla.
Filed Jan. 5, 1991, Ser. No. 710,543
Int. Cl.[5] B43M *5/04*
U.S. Cl. 156—442.1 36 Claims

1. A mechanism for applying adhesive to an article having a plane comprising means for forming a charge of adhesive, means for moving the article in a path, means for moving the charge-forming means and at least a portion of the article relative to each other to cause the charge of adhesive to be deposited on said article, means for deactivation and reactivation of said charge-forming means, means for maintaining the adhesive in said charge-forming means in usable condition during deactivation of said charge-forming means whereby the adhesive charge may be immediately deposited on an article immediately upon reactivation of said charge-forming means, means for moving the portion of the article away form said charge-forming means after the charge of adhesive is deposited on the article, said maintaining means and said charge-forming means being movable relative to each other to come in contact



with each other, said charge-forming means being adapted to be embedded in said maintaining means, and means for forming a bow in the article to move it toward the charge-forming means.

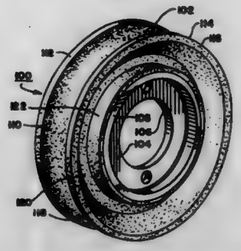
5,194,115
LOOP PRODUCING APPARATUS
Alan R. Ramspeck, Cumming, and Scott R. Miller, Roswell, both of Ga., assignors to Nordson Corporation, Westlake, Ohio
Filed Oct. 29, 1991, Ser. No. 783,989
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—578 31 Claims



1. Apparatus for depositing a filament in a series of overlapping loops on a substrate with said loops having a consistent width, said apparatus comprising:
means for producing a filament;
means for forming a spiral in said filament through the application of a fluid thereto including a nozzle member having a plurality of fluid bores oriented to direct fluid streams toward said filament to form it into a spiral;
a plenum chamber on an upstream side of said bores;
a fluid supply passageway having a port opening into said chamber; and
means in said chamber for diffusing said fluid in said chamber and thereby minimizing variation of the width of said loops irrespective of the angular orientation of said nozzle member with respect to said filament.

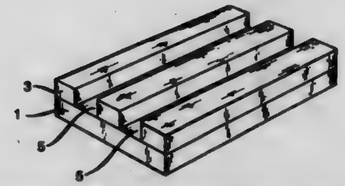
5,194,116
ASSEMBLY WITH FLEXIBLE GLUE WHEEL FOR APPLICATION OF ADHESIVE OF BOOK BLOCK
Charles E. Davis, Crawfordsville, and David A. Stephens, Waynetown, both of Ind., assignors to R.R. Donnelley & Sons, Chicago, Ill.
Filed Jan. 6, 1992, Ser. No. 817,854
Int. Cl.[5] B05C *1/08*; B42C *9/00*
U.S. Cl. 156—578 19 Claims

1. An assembly for applying adhesive to book blocks, comprising:
a bath of adhesive,
a rigid application wheel mounted at least partially in said bath of adhesive,
a flexible glue wheel engaging at least a portion of said rigid application wheel, said flexible glue wheel including a rigid hub, said hub including a support flange, a flexible wheel body mounted on said rigid hub, said wheel body



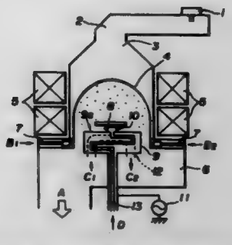
including a first side and a second side, and a rim, said first side and said second side each having a concave contour defined by a sharp cutout to provide flexibility to said rim, and
a transport member for moving backbones of book blocks into engagement with said flexible glue wheel to apply said adhesive to each said backbone.

5,194,117
LITHIUM NIOBATE ETCHANT
Jeffrey B. Bindell, South Whitehall Township, Lehigh County; James T. Cargo, Bethlehem; Ronald J. A. Holmes, Greenwich Township, Berks County, and Michael C. Hughes, Lehigh Township, Northampton County, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 485,689, Feb. 27, 1990, abandoned. This application Jan. 7, 1991, Ser. No. 712,234
Int. Cl.[5] C03C *15/00, 21/00*
U.S. Cl. 156—628 12 Claims



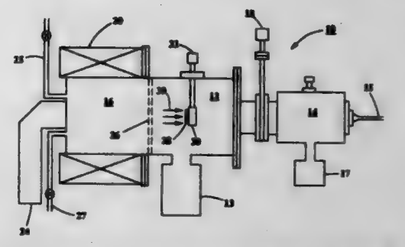
1. A method of making a device comprising a substrate, said substrate comprising at least one composition selected from the group consisting of tantalum and niobium oxides, said method comprising:
depositing a mask material on said substrate;
patterning said mask material to expose selected portions of said substrate;
exposing said exposed portions, at a temperature of approximately 400° C. or less, to a liquid fluxing compound comprising at least one Group IA or Group IIA compound or ammonium ions to yield material which can be removed, said fluxing compound comprises at least one member selected from the group consisting of sulfate, acid sulfate, carbonate, and ammonium salts;
and removing said material which can be removed.

5,194,118
DRY ETCHING METHOD
Keiji Shinohara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 27, 1991, Ser. No. 816,383
Claims priority, application Japan, Dec. 28, 1990, 2-416336
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 6 Claims



1. A method for dry etching comprising providing a wafer having a layer of material to be etched, maintaining the wafer at a temperature not higher than 0° C., introducing a gas mixture including a compound containing oxygen as a component element and a compound containing H as a component element, with the amount of water vapor being present being greater than the dew point for the temperature of the wafer being etched so as to form ice on side walls of the component and a mask of the component to reduce etching of the side walls and material of the mask.

5,194,119
METHOD OF ANISOTROPIC DRY ETCHING OF THIN FILM SEMICONDUCTORS
Hideaki Iwano, and Tetsuya Seki, both of Suwa, Japan, assignors to Seiko Epson Corporation, Japan
Filed Feb. 22, 1990, Ser. No. 485,058
Claims priority, application Japan, May 15, 1989, 1-120714; May 15, 1989, 1-120715; May 15, 1989, 1-120716; May 15, 1989, 1-120717; May 15, 1989, 1-120718
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 8 Claims



1. In a method of reactive ion beam etching of Group II–VI compound semiconductors comprising the steps of
employing a combination reactive gas medium supplied to a microwave excitation ECR plasma chamber coupled to a treatment chamber containing a Group II–VI sample to be etched,
forming a reactive gas plasma containing reactive species in said plasma chamber and
irradiating said sample with a beam of reactive species formed from said reactive gas plasma, said combination reactive gas medium selected from the group consisting of a mixture of a halogen gas other than fluoride in combina-

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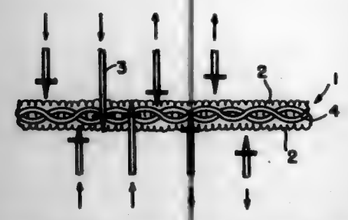
tion with a gas selected from the group consisting of an inert gas, hydrogen gas, nitrogen gas, and a combination of an inert and hydrogen gas.

5,194,120
PRODUCTION OF PAPER AND PAPER PRODUCTS
Stephen Pauls, Camden, and Harris J. Bixler, Belfast, both of Me., assignors to Delta Chemicals, Searsport, Me.
Continuation of Ser. No. 701,152, May 17, 1991, abandoned. This application Sep. 18, 1992, Ser. No. 947,082
Int. Cl.[5] D21H *17/45*
U.S. Cl. 162—168.3 9 Claims

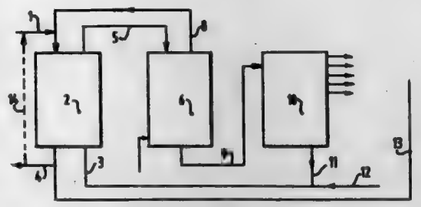
1. A process for making paper from a furnish, said process comprising introducing said furnish to the headbox of a paper making apparatus, wherein a cationic polymer and an amorphous metal silicate material are added to said furnish prior to introducing said furnish to said headbox, wherein said furnish is not subjected to any substantial shearing after addition of said cationic polymer and said amorphous metal silicate material to said furnish, wherein the predominant cation of said amorphous metal silicate material is magnesium, wherein said amorphous metal silicate material is present in an amount of from about 0.2 to about 6 lbs./ton dry sheet, wherein said cationic polymer has an intrinsic viscosity of about 5 to about 25 dl/g and a charge density of from about 0.01 to about 5 equivalents of nitrogen per kg polymer, and wherein said cationic polymer and said amorphous metal silicate material are added in a weight ratio of from about 0.03:1 to about 30:1.

5,194,121
NEEDLED FELT FOR PAPERMAKING USE
Hiroshi Taguchi, Osaka; Masayuki Ito, Narashino, and Junichi Kaneko, Warabi, all of Japan, assignors to Nippon Felt Co. Ltd. and Dainippon Ink & Chemicals, Inc., both of Tokyo, Japan
PCT No. PCT/JP89/01202, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO90/06398, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 29, 1989, Ser. No. 689,946
Claims priority, application Japan, Nov. 30, 1988, 63-154834; Nov. 29, 1989, 1-137345
Int. Cl.[5] D21F *3/00*
U.S. Cl. 162—358.1 3 Claims



1. A needled felt for papermaking use having a base fabric and fibrous batt layer overlaid on one surface or both surfaces of said base fabric, said base fabric and said fibrous batt layer being unified by needling, wherein said fibrous batt layer and/or said base fabric mainly comprises fibers formed of a polyamide block copolymer having polyamide segments composed of at least one member selected from the group consisting of polycondensation products of dicarboxylic acids, polycondensation products of dicarboxylic acid and diamines, polymerization products of cyclic lactams, polycondensation products of aminocarboxylic acids, and copolymerization products of cyclic lactams, dicarboxylic acids, and diamines, and said polyamide block copolymer having polyether components composed of at least one member selected from the group consisting of diamines represented by the formula $H_2N\{(CH_2)_a O\}_b\{(CH_2)_d O\}_e\{(CH_2)_f O\}_g(H_2)_c NH_2$ where a, b, d, and f are integers of at least 2, e is an integer of from 2 to 30, and c is 0 or an integer of from 2 to 30, and polyether glycols, said fibers comprised in said fibrous batt layer being fibers of 4 to 50 denier, and said fibers comprised in said base fabric being woolen yarns composed of fibers of 4 to 50 denier, multifilament yarns each filament of which has a fineness of 4 to 50 denier or monofilament yarns having a diameter of 0.1 to 0.8 mm.

5,194,122
METHOD FOR RECOVERING VOLATILE, ORGANIC COMPOUNDS FROM MANURE
Erik D. J. Bleeker, Epe, Netherlands, assignor to MeMon B.V., Netherlands
Filed Apr. 20, 1990, Ser. No. 511,553
Claims priority, application Netherlands, Mar. 16, 1990, 9000618
Int. Cl.[5] B01D *3/34*
U.S. Cl. 203—34 13 Claims



1. Method for recovering volatile, organic compounds from manure, consisting essentially of:
i) acidifying the manure;
ii) concentrating by evaporation the acidified manure;
iii) condensing the formed vapor; and
iv) separating the volatile, organic compounds from the condensate; wherein the steps of concentrating by evaporation and condensing are carried out prior to fermentation of the manure.

5,194,123
SEPARATION OF 4-METHYL-2-PENTANONE FROM ACETIC ACID BY EXTRACTIVE DISTILLATION WITH DMSO
Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715, and Marc W. Paffhausen, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.
Filed Jul. 6, 1992, Ser. No. 909,175
Int. Cl.[5] B01D *3/40*; C07C *45/83*, *51/44*
U.S. Cl. 203—51 1 Claim

1. A method for recovering 4-methyl-2-pentanone from mixtures of 4-methyl-2-pentanone and acetic acid which comprises distilling a mixture of 4-methyl-2-pentanone and acetic acid in a rectification column in the presence of about one part of an extractive agent per part of 4-methyl-2-pentanone-acetic acid mixture, recovering the 4-methyl-2-pentanone as overhead product and obtaining the acetic acid and the extractive agent from the stillpot, wherein said extractive agent comprises dimethyl sulfoxide and at least one material selected from the group consisting of p-nitrobenzoic acid, succinic acid, 3,4,5-trimethoxybenzoic acid, diisobutyl ketone, hexyl acetate, diethylene glycol dibenzoate, isobutyl heptyl ketone, ethyl butyl ketone and 2-undecanone.

5,194,124
MOLTEN SALT ELECTROLYTIC BENEFICIATION OF IRON OXIDE-CONTAINING TITANIFEROUS ORES TO PRODUCE IRON AND HIGH-GRADE TiO_2
Kevin J. Leary, Waverly, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 26, 1991, Ser. No. 798,608
Int. Cl.[5] C25C *3/34*
U.S. Cl. 204—64 R 19 Claims

1. A process for beneficiating titaniferous material containing iron oxide comprising:
(a) mixing said material with a molten salt or mixture of molten salts in which iron oxide dissolves to produce iron ions and oxyanions,
(b) electrolytically reducing the iron ions to iron at the cathode to deposit high purity iron on the cathode and reacting the oxyanions with a carbonaceous anode to generate CO and/or CO_2, and
(c) recovering a beneficiated TiO_2 product from the molten salt or mixture of molten salts.

5,194,125
PROCESS FOR THE ELECTROEXTRACTION OF ZINC
Chantal Cachet; Valerie Mariotte, both of Paris, and Robert Wiart, Champs-sur-Marne, all of France, assignors to Elf Atochem S.A., Puteaux, France
Filed Jan. 2, 1992, Ser. No. 814,895
Claims priority, application France, Jan. 7, 1991, 91 00110
Int. Cl.[5] C25C *1/16*
U.S. Cl. 204—119 8 Claims

1. Process for electroextraction of zinc in an acidic medium, comprising adding to electrolyte a fluorinated surface-active compound selected from the group consisting of the compounds of formulae:

$$R_F{-}CH_2CH_2O(CH_2CH_2O)_mH \quad (I)$$

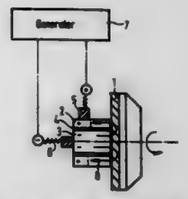
$$R_F(CH_2)_n{-}X{-}\underset{R}{N}{-}(CH_2)_p{-}\underset{R''}{\overset{R'}{N}}{-}O \quad (II)$$

$$R_F(CH_2)_n{-}X{-}\underset{R}{N}{-}(CH_2)_p{-}\overset{R'}{\underset{R''}{+N}}{-}(CH_2)_q{-}COO^- \quad (III)$$

wherein R_F denotes a perfluoroalkyl radical containing from 4 to 20 carbon atoms, m is a number ranging from 6 to 18, n is equal to 0 or 2, p is equal to 2 or 3, q is equal to 1 or 2, X denotes a CO or SO_2 group, R denotes a hydrogen atom or an alkyl radical containing from 1 to 4 carbon atoms, and R′ and R″, which may be identical or different, each represents an alkyl radical containing from 1 to 4 carbon atoms.

5,194,126
METHOD AND DEVICE FOR DRESSING GRINDING WHEELS
Juri A. Packalin, Penza, U.S.S.R., assignor to Wendt GmbH, Meerbusch, Fed. Rep. of Germany
Filed Oct. 17, 1991, Ser. No. 778,800
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1990, 4033137
Int. Cl.[5] B23H *7/12*, *5/08*
U.S. Cl. 204—129.46 4 Claims

1. Method for the electroerosive dressing of grinding wheels having an electrically conductive bond, the dressing tool and the grinding wheel being brought into mechanical contact and a voltage being applied, wherein the dressing tool is an electrode pair divided into two, the electrodes (2, 3) of which have a different polarity and are separated from one another by

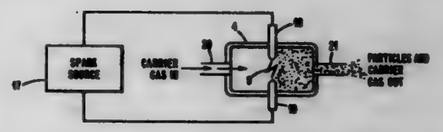


insulation (4), a voltage circuit being directed via the two electrodes, and wherein the dressing tool rotates.

5,194,127
METHOD FOR ETCHING AN ALUMINUM FOIL FOR AN ELECTROLYTIC CAPACITOR
Eiji Endoh, Yokohama, and Haruo Jinbo, Fujisawa, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo and Elna Company Ltd., Fujisawa, both of Japan
Continuation-in-part of Ser. No. 825,092, Jan. 24, 1992, Pat. No. 5,143,587. This application Jun. 30, 1992, Ser. No. 906,495
Int. Cl.[5] C25F *3/04*
U.S. Cl. 204—129.85 24 Claims

1. A method for chemically etching an aluminum foil for an aluminum electrolytic capacitor, which comprises immersing the aluminum foil in an etching solution containing a polymer electrolyte having cation exchange groups dissociable in the etching solution without applying an electric current thereto.

5,194,128
METHOD FOR MANUFACTURING ULTRAFINE PARTICLES
John S. Beaty, Belmont, and Jonathan L. Rolfe, North Easton, both of Mass., assignors to Thermo Electron Technologies Corporation, Waltham, Mass.
Continuation of Ser. No. 378,845, Jul. 12, 1989, Pat. No. 5,062,936. This application Aug. 2, 1991, Ser. No. 739,894
The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.
Int. Cl.[5] H05A *3/00*
U.S. Cl. 204—164 14 Claims



1. A method of manufacturing non-vaporized ultrafine particles comprising:
providing two electrodes each containing a conductive material;
mounting said electrodes in spaced-apart relationship in a reaction chamber;
repetitively producing a spark between the electrodes to cause non-vaporizing ablation of at least one of the electrodes and formation of ultrafine particles; and
carrying said ablated material away from the reaction chamber in a carrier gas.

5,194,129
MANUFACTURE OF OPTICAL FERRULES BY ELECTROPHORETIC DEPOSITION

Awdhoot V. Kerkar, Columbia, Md.; Roy W. Rice, Alexandria, Va., and Robert M. Spotnitz, Baltimore, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

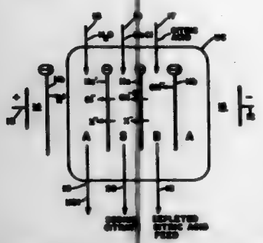
Filed Jan. 18, 1991, Ser. No. 643,888
Int. Cl.[5] C25D *13/02*
U.S. Cl. 204—181.5 18 Claims

1. A method of forming a densified ceramic part comprising the steps:
a) forming an aqueous colloidal suspension of ceramic particles wherein the particles have a net positive surface charge;
b) placing electrodes in said suspension, at least one of said electrodes being a cathode adapted to receive a deposit of said ceramic particles, said cathode being further adapted to absorb any electrolysis products evolving at its surface; wherein said cathode is a wire containing palladium;
c) placing a D.C. voltage across said electrodes whereby at least some of said ceramic particles are deposited on said cathode thereby coating said cathode;
d) removing said deposited coating from said cathode as a unitary piece; and
e) sintering said piece to form a densified ceramic part.

5,194,130
METHOD TO PRODUCE SODIUM CITRATE USING ELECTRODIALYSIS

Carolyn Byszewski, Whippany, and Yu-Chih Chiao, Bridgewater, both of N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 21, 1990, Ser. No. 631,551
Int. Cl.[5] B01D *61/44, 63/00*
U.S. Cl. 204—182.4 14 Claims

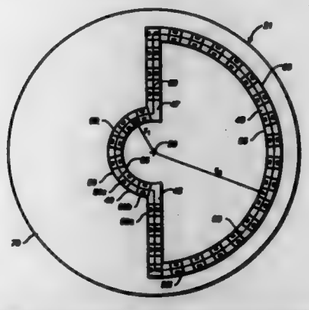


1. An electrodialysis apparatus comprising at least two unit cells, each unit cell comprising:
at least one water splitter means to convert water to H^+ and OH^-;
a first anion selective membrane adjacent to the water splitter means selective to anions having a negative valence of at least 1, there being a first base compartment between the anion selective membrane and water splitter means located to receive OH^- from the water splitter means; and
a second anion selective membrane adjacent to the first anion selective membrane, the second anion selective membrane selective to anions having a negative valence of less than the valence of anions to which the first anion membrane is selective, there being a salt compartment between the first and second anion selective membranes and an acid compartment on the opposite side of the second anion membrane from the salt compartment, the acid compartment adjacent to and disposed to receive H^+ from a water splitting means serially aligned with the second anion membrane of the unit cell.

5,194,131
APPARATUS AND METHOD FOR MULTIPLE RING SPUTTERING FROM A SINGLE TARGET

Robert L. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 16, 1991, Ser. No. 746,448
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.12 17 Claims

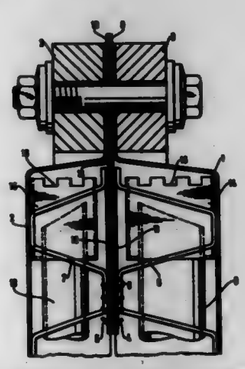


1. A magnetron sputtering apparatus for depositing a material on a substrate, comprising:
a target cathode having a front surface generally facing said substrate and comprising said material to be deposited; and,
rotatable magnet means adjacent to said target cathode and generally behind said front surface, said rotatable magnet means being configured such that sputtering from said target occurs primarily in a plurality of distinct concentric areas of said front surface, said concentric areas being separated by regions in which there is no substantial erosion of the target cathode.

5,194,132
ELECTROLYSIS APPARATUS

Manfred Hartmann, Bad Camberg; Dieter Berger, and Kurt Hannesen, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 14, 1992, Ser. No. 913,149
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1991, 4123514
Int. Cl.[5] C25B *9/00, 11/03, 15/08*
U.S. Cl. 204—257 8 Claims



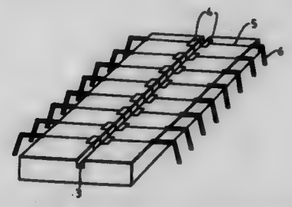
1. An electrolysis apparatus for the production of chlorine, sodium hydroxide solution and hydrogen from aqueous alkali-metal halide solutions, which electrolysis apparatus comprises

at least one electrolysis cell whose anode and cathode, which are separated from one another by a partition, are disposed in a housing composed of two half-shells separated by an insulating seal and in which electrolysis apparatus the housing is provided with devices for supplying the electrolysis starting substances and for removing the electrolysis products, the latter comprising at least one discharge pipe which extends in the vertical direction in the interior of the half-shells, passes through the half-shell in the vicinity of the lower edge and extends up to the upper edge, wherein the discharge pipe (9, 10) terminates in a separating chamber (14, 15) which is disposed in a stilling zone formed by a plate (11, 12) attached to the electrode (4, 5) and to the associated half-shell (1, 2).

5,194,133
SENSOR DEVICES

Michael G. Clark, Buckinghamshire; Rosemary A. Lee, Middlesex; Christopher R. Lowe, Essex; Philip Maynard, Cambridgeshire; Rajinder S. Sethi, Northampton, and Donald J. Weir, London, all of England, assignors to The General Electric Company, p.l.c., England

Filed May 3, 1991, Ser. No. 695,429
Claims priority, application United Kingdom, May 4, 1990, 9010072
Int. Cl.[5] G01N *27/26, 27/30, 27/447*; B01D *57/02*
U.S. Cl. 204—299 R 24 Claims



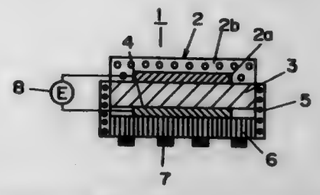
1. A sensor device for analysis of a sample fluid, the device comprising: a substrate having a surface; at least one elongate channel micromachined in the surface of the substrate for carrying said sample fluid, the channel having a length and opposed side walls; separation means, including a material in the channel, for causing separation of said sample fluid carried by the channel; a plurality of sensing electrode pairs spaced apart along the length of the channel, the electrodes of each pair being located opposite each other across the channel, and each electrode having a portion within the channel at one of said side walls; and means coupled to the electrodes for processing signals dependent upon conditions existing between the electrodes of each pair.

5,194,134
GASEOUS CARBON DIOXIDE DETECTION SENSOR

Hozumi Futata; Takayuki Suzuki; Hironori Hadano; Hiromasa Takashima, all of Shimoda; Noboru Yamamoto, and Norio Miura, both of Fukuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 8, 1991, Ser. No. 741,907
Claims priority, application Japan, Aug. 9, 1990, 2-209220; Dec. 6, 1990, 2-405324; Feb. 6, 1991, 3-35082; Mar. 28, 1991, 3-64652
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—421 4 Claims

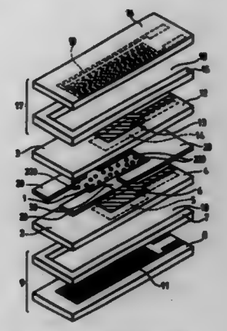
1. A gaseous carbon dioxide detection sensor comprising a solid ionic conductor having two sides, a detection electrode and a reference electrode positioned on opposite sides of said solid ionic conductor, said detection electrode comprising detection material, said detection material comprising an amount of alkali metal carbonate, and an amount of alkaline earth metal carbonate which is greater than said amount of alkali metal carbonate and which is effective to provide detection material which is effective in said detection electrode to provide a gaseous carbon dioxide detection sensor.



5,194,135
AIR/FUEL RATIO SENSOR

Nobuhiro Hayakawa; Ken Minobe; Yutaka Adachi, and Harukiss Shiomi, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi and Mitsubishi Denki K.K., Tokyo, both of Japan

Continuation of Ser. No. 832,800, Feb. 25, 1986. This application Jul. 29, 1988, Ser. No. 228,808
Claims priority, application Japan, Feb. 25, 1985, 60-36032
Int. Cl.[5] G01N *27/41, 27/409*
U.S. Cl. 204—425 2 Claims



1. An air/fuel ratio sensor, comprising:
an oxygen concentration electrochemical cell;
an oxygen pump disposed in face-to-face relationship with said oxygen concentration electrochemical cell to form a gap therebetween; and
diffusion limiting means for enclosing a substantial portion of the periphery of said gap except for at least one aperture to thereby form a gas diffusion compartment which is surrounded by said diffusion limiting means and which communicates with a gas to be analyzed through said aperture; and
a plurality of support members other than said diffusion limiting means disposed within said diffusion compartment, wherein said support member comprise granulated particles each having a diameter substantially the same as the width of said gap.

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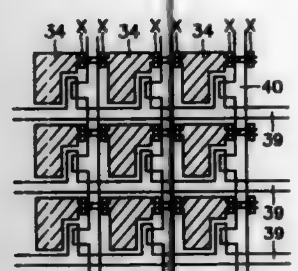
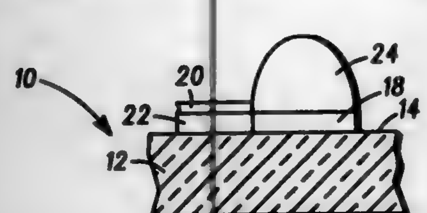
5,194,136
PROCESS FOR MAKING A DISPLAY PANEL
Sahun Jeung, and Byungseong Bae, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jun. 17, 1992, Ser. No. 899,967
Claims priority, application Rep. of Korea, Jun. 17, 1991, 91-10009
Int. Cl.[5] C25D *5/02*
U.S. Cl. 205—122 **20 Claims**



1. A method for fabricating a display panel, comprising the steps of:
forming a transparent, electrically conductive layer on a major surface of an electrically insulating substrate;
patterning said electrically conductive layer in such a manner as to form a matrix of pixel electrodes;
forming an anodizable metal layer on said major surface of said insulating substrate and said matrix of pixel electrodes;
performing a first anodization step to thereby form an oxidized insulating layer on said anodizable metal layer;
forming a patterned mask on said oxidized insulating layer to provide coverage only over regions of said oxidized insulating layer corresponding to the desired location of gate electrodes/wiring structures; and,
performing a second anodization step to anodize all portions of said metal layer except portions thereof disposed beneath said patterned mask, which portions remain intact to serve as said gate electrodes/wiring structures of the display panel.

5,194,137
SOLDER PLATE REFLOW METHOD FOR FORMING SOLDER-BUMPED TERMINALS
Kevin D. Moore, Schaumburg; John W. Stafford, St. Charles; William M. Beckenbaugh, Barrington, and Ken Cholewczynski, Streamwood, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.
Filed Aug. 5, 1991, Ser. No. 740,272
Int. Cl.[5] C25D *5/02, 5/50*
U.S. Cl. 205—125 **19 Claims**



1. A method for forming a solder bumped terminal on a planar dielectric substrate comprising
fabricating a terminal on the substrate, said terminal comprising a terminal pad adapted for receiving a solder bump and a linear runner section connected to the pad, said runner section having a predetermined width adjacent the pad, said terminal pad having a width parallel to the section width that is greater than the section width, said terminal comprising a solder-wettable metal layer adjacent the substrate and an outer plate composed of a solder alloy and having a uniform thickness, and
heating the terminal at a temperature effective to melt the solder alloy and to draw the molten solder alloy onto the terminal pad from the adjacent runner section to form a solder bump.

5,194,138
METHOD FOR CREATING A CORROSION-RESISTANT ALUMINUM SURFACE
Florian B. Mansfeld, Westlake Village, Calif.; Hong Shih, Qingdao, and You Wang, Jingshou, both of China, assignors to The University of Southern California, Los Angeles, Calif.
Filed Jul. 20, 1990, Ser. No. 556,109
Int. Cl.[5] C23C *22/56*
U.S. Cl. 205—183 **42 Claims**

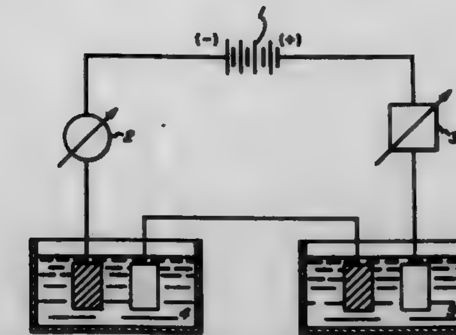
22. A method for treating a surface of an aluminum-based material so as to make the surface resistant to corrosion, comprising the steps of:
(a) contacting the surface with an aqueous cerium non-halide solution for at least about 1 hours, the cerium non-halide solution having a pH of between about 4 and about 7 and being at a temperature of at least about 80° C.;
(b) contacting the surface from step (a) with an aqueous solution consisting essentially of a cerium halide for at least about 1 hour, the cerium halide solution having a pH of between about 4 and about 7 and being at a temperature of at least about 80° C.; and
(c) positively charging the metal surface from step (b) while contacting the surface with an aqueous molybdenum solution.

5,194,139
PRETREATING SOLUTION FOR SILVER PLATING AND SILVER PLATING TREATING PROCESS USING THE SOLUTION
Takashi Kinase, and Yoshiyuki Hisumi, both of Ibaragi, Japan, assignors to Nippon Mining Company Limited, Tokyo, Japan
Filed Mar. 8, 1991, Ser. No. 666,731
Int. Cl.[5] C25D *5/34, 3/41*
U.S. Cl. 205—210 **9 Claims**

1. An acidic pretreating solution for silver plating, said solution comprised of:
(1) at least one agent for preventing the deposition of silver, said agent being selected from the group consisting of;
(a) cyclic compounds whose ring includes a thioureylene radical and derivatives thereof,
(b) heterocyclic compounds containing a nitrogen atom and derivatives thereof composed of purine, adenine, 1,10-phenanthroline, 2,2'-dipyridyl benzotriazole, 8-quinolinol 2,4,6-tri-2-pyridyl-1,3,5-trazine,
(c) rhodanine and derivatives thereof, and
(d) heterocyclic thione compounds and derivatives thereof, composed of 3-thiourazole,2-thiourasil,2-6-dioxo-4-thiohexahydropyrimidine; and
(2) at least one acid selected from the group consisting of an inorganic acid, an organic acid and mixtures thereof, wherein the pretreating solution has a pH of from 1 to 6.

5,194,140
ELECTROPLATING COMPOSITION AND PROCESS
Pranas Dobrovolskis; Nina Kashtalyanova; Gytis-Kazimeras Kupetis, and Budilovskil Julius, all of Vilnius, U.S.S.R., assignors to MacDermid, Incorporated, Waterbury, Conn.
Filed Nov. 27, 1991, Ser. No. 800,144
Int. Cl.[5] C25D *3/56, 3/12*
U.S. Cl. 205—245 **20 Claims**

14. A process for producing a zinc-cobalt electrodeposit on a conductive surface, which comprises:
a. immersing an anode and a substrate containing a conductive surface in a bath comprising a soluble source of zinc, a soluble source of cobalt, a soluble electrolyte, and a brightening agent, wherein said soluble source of cobalt is a complex of a cobalt salt with a copolymer of maleic anhydride, ethylenediamine, and epichlorohydrin; and



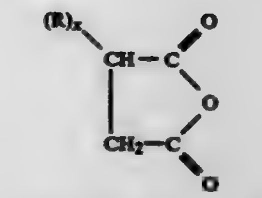
b. applying a voltage across said anode and said substrate for a period of time sufficient to deposit a zinc-cobalt alloy on said substrate.

5,194,141
METHOD FOR ELECTROLYTIC TIN PLATING OF STEEL PLATE
Yoshiaki Suganuma, Kanagawa; Yasuo Nakajima, Tokyo, and Yukiei Matsumoto, Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan
Filed Apr. 25, 1991, Ser. No. 691,292
Claims priority, application Japan, Apr. 27, 1990, 2-110228
Int. Cl.[5] C25D *3/30, 17/10*
U.S. Cl. 205—300 **4 Claims**

1. A method for the electrolytic tin plating of a steel plate using a steel plate as a cathode to be plated, a cathode plating bath containing Sn^{+2}, and an insoluble anode separated from said cathode plating bath, said anode being an insoluble electrode comprising a corrosion-resistant metal substrate having provided thereon a coating containing a platinum group metal or an oxide thereof, and said anode being enclosed with a diaphragm which prevents the transport of Sn(II) ions and ingredients in the plating solution to the anode chamber, whereby the formation of tin oxide sludges and deposition thereof on the anode surface are effectively prevented and the consumption of ingredients added to the plating bath is decreased.

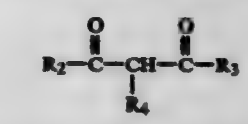
5,194,142
METHOD FOR CONTROLLING FOULING DEPOSIT FORMATION IN A LIQUID HYDROCARBONACEOUS MEDIUM
David R. Forester, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed Aug. 26, 1991, Ser. No. 750,118
Int. Cl.[5] C10G *9/12, 9/16*
U.S. Cl. 208—48 AA **8 Claims**

1. A method of inhibiting fouling deposit formation in a liquid hydrocarbonaceous medium during heat treatment processing thereof at temperatures of from about 200° C.–550° C., wherein, in the absence of such antifouling treatment, fouling deposits are normally formed as a separate phase within said heated liquid hydrocarbonaceous medium impeding process throughput and thermal transfer, said method comprising adding to said liquid hydrocarbonaceous medium, an antifouling amount of from about 0.5–10,000 parts by weight of an enaminone of a polyalkenylsuccinimide based upon one million parts of said hydrocarbonaceous medium, said enaminone of a polyalkenylsuccinimide being formed by a first reaction of a polyalkenylsuccinic anhydride having the formula



(I)

wherein R is an aliphatic alkenyl or alkyl moiety having at least 50 carbon atoms and less than about 200 carbon atoms, with a polyamine, said polyalkenylsuccinimide then being reacted with a dicarbonyl compound having the formula



(III)

wherein R_2 is C_1–C_{20} alkyl or substituted C_1–C_{20} alkyl, R_3 is C_1–C_5 alkyl, oxy-C_1–C_5 alkyl, or OH and R_4 is H or phenyl; to form said enaminone.

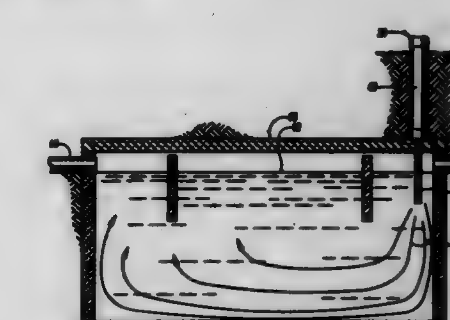
5,194,143
METHOD FOR INHIBITING FOULING IN CAUSTIC SCRUBBER SYSTEMS
Paul V. Roling, Spring, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed Nov. 18, 1991, Ser. No. 793,754
Int. Cl.[5] C10G *21/16, 21/12, 29/22, 29/20*
U.S. Cl. 208—291 **13 Claims**

1. A method for inhibiting the formation of polymeric based fouling deposits during the basic washings of olefin-containing hydrocarbons contaminated with oxygenated compounds comprising adding about 1 to about 10,000 parts per million parts wash to the wash acetoacetate ester compound having the formula

$$CH_3COCH_2CO_2C_xH_y$$

wherein x is an integer from about 1 to about 8 and y is an integer from about 3 to about 17.

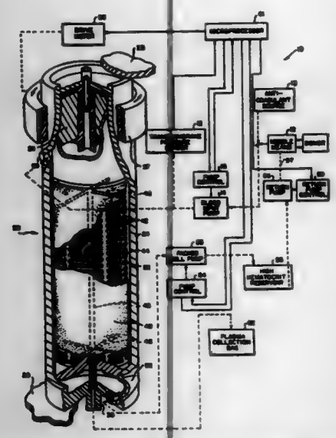
5,194,144
APPARATUS FOR AERATION OF SEPTIC TANKS
Ronald S. Blough, Fairfield, Iowa, assignor to Sewage Aeration Systems, Inc., Lockridge, Iowa
Filed Apr. 18, 1991, Ser. No. 687,373
Int. Cl.[5] B01F *3/04*
U.S. Cl. 210—85 **8 Claims**



1. An improved aeration device for septic tanks and the like, comprising:
an elongated shaft having upper and lower ends;
power means associated with the upper end of said shaft for rotating said shaft;

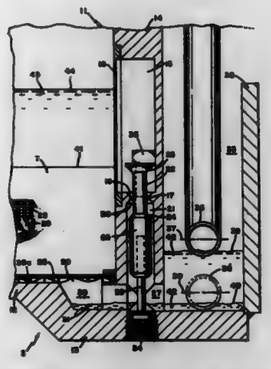
an axial thrust propeller rigidly attached to said shaft for rotation therewith;
an air tube surrounding said shaft for drawing ambient air from around the upper end of said shaft downwardly around said propeller when said propeller rotates in septic waste material to provide fine air bubbles;
a guard bushing concentrically positioned in said air tube to allow free escape of air bubbles into agitated septic waste material to aerate the same, but to also prevent non-organic waste adulterants such as non-biodegradable plastic and rubber materials from being drawn into said propeller.

5,194,145
METHOD AND APPARATUS FOR SEPARATION OF MATTER FROM SUSPENSION
Donald W. Schoendorfer, Santa Ana, Calif., assignor to William F. McLaughlin
Continuation of Ser. No. 591,925, Mar. 21, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 73,378
Int. Cl.[5] B01D *61/22*
U.S. Cl. 210—90 **35 Claims**



2. A system for filtering a cellular suspension, comprising:
a housing body having a hollow interior and an inner surface;
rotor means rotatable within the housing body, the rotor means having an outer surface space from the inner surface of the housing body;
means for feeding the cellular suspension into the space between the rotor means and the inner surface of the housing body;
filter membrane means on at least one of the inner surface of the housing body and the outer surface of the rotor means;
conduit means in communication with the filter membrane means for collecting filtrate passing therethrough;
means for driving the rotor means at a rate selected to establish annular vortices within the space between the rotor means and the housing body substantially filling the space between the rotor means and the housing body;
means for sensing the transmembrane pressure;
controllable means for maintaining a desired filtrate extraction rate through the membrane means; and
means responsive to the sensed transmembrane pressure for reducing the extraction rate of filtrate while maintaining the vortex action when the transmembrane pressure rises above a calculated value to clean the filter membrane means by action of the annular vortices.

5,194,146
CENRIFUGE FILTER WITH CLOSABLE BYPASS
Guntram Krettek, Viersen, Fed. Rep. of Germany, assignor to Dorr-Oliver Incorporated, Milford, Conn.
Filed Jan. 13, 1992, Ser. No. 820,106
Int. Cl.[5] B01D *33/11*
U.S. Cl. 210—119 **6 Claims**

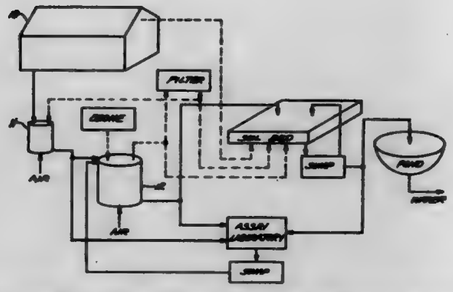


1. A bypass-type drum centrifuge comprising:
a housing;
a drum in the housing centered on and rotatable about a drum axis and having an interior;
an axially extending outer foraminous side wall in the interior of the drum forming an outer chamber;
a transversely extending foraminous end wall in the drum forming a bypass chamber radially inward of the outer chamber;
means for feeding a suspension to the interior of the drum while same is rotating so that the suspension is thrown centrifugally against the outer wall and separates into a radially outer body of filter cake having an inner surface and a radially inner body of liquid sitting on the inner surface;
structure in the drum forming a drainage chamber at the end wall and a drain passage between the drainage chamber and the outer chamber;
means including a bypass passage extending between the drain chamber and the bypass chamber and a float valve in the bypass passage radially displaceable when a liquid level in the passage rises radially inward above a predetermined level between a radially outer position blocking flow through the passage and a radially inner position permitting flow through the passage; and
means including a dip tube radially displaceable in the drain chamber between a radially outer position maintaining the liquid level in the drainage chamber and in the passage radially outward of and below the predetermined level and a radially inner position allowing the liquid level in the drainage chamber and passage to rise radially inward above the predetermined level and thereby open the float valve.

5,194,147
DECONTAMINATION SYSTEM
Margret Augustine, Oracle, Ark.; Carl N. Hodges, Tucson, Ariz., and Linda S. Leigh, Oracle, Ark., assignors to Space Biospheres Ventures, Oracle, Ariz.
Division of Ser. No. 430,801, Nov. 2, 1989, Pat. No. 5,078,881. This application Aug. 6, 1991, Ser. No. 741,084
Int. Cl.[5] C02F *3/32*
U.S. Cl. 210—151 **11 Claims**

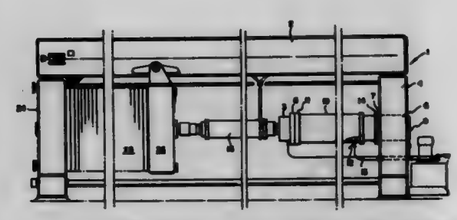
1. A system for decontaminating effluents from a greenhouse comprising:

a soil bed reactor comprising a layer of permeable soil having means for introducing or discharging fluid from the bottom of the layer;
means for passing air withdrawn from the greenhouse through the soil bed reactor for microbial degradation of organic material in the air;



holding tank means for temporarily storing waste water effluent from the greenhouse; and
means for passing waste water from the holding tank means through the soil bed reactor for microbial degradation of organic material in the waste water.

5,194,148
HYDRAULIC CYLINDER EXTENSION DEVICE FOR A FILTER PRESS
Jurgen Fresenius, Bad Schwalbach, Fed. Rep. of Germany, assignor to Passavant-Werke AG, Fed. Rep. of Germany
Filed Apr. 26, 1991, Ser. No. 691,800
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 9004766
Int. Cl.[5] B01D *25/19*
U.S. Cl. 210—230 **3 Claims**



1. A chamber filter press for dewatering of sludge, said filter press comprising:
an overhead beam, first and second end stands connected to respective ends of said beam, a plurality of filter plates movably suspended from said overhead beam between said end stands, and a follower movably mounted and suspended from said overhead beam, said follower being provided to press said plurality of filter plates between said follower and said first end stand, said second end stand including guide bush means for removably attaching a hydraulic cylinder thereto;
a hydraulic cylinder located between said second end stand and said follower, said hydraulic cylinder being receivable within said guide bush means and including a flange extending thereabout to bear against a flange attached about said guide bush to axially fix said hydraulic cylinder with respect to said second end stand, said hydraulic cylinder including piston means extending from one end thereof, said piston means being arranged to contact said follower for moving said follower to close said filter plates between said follower and said first end stand and to exert a closing force on said filter plates; and
means for extending the range of the hydraulic cylinder with respect to the second end stand, said means for extending including a tube dimensioned to receive said hydraulic cylinder therein, said tube including shaft means at one end thereof receivable in said guide bush means for removably attaching said tube to said second end stand, said shaft means including flange means extending thereabout to bear against the flange of said guide bush for axially fixing said tube with respect to said second end stand, and flange means extending about the other end of said tube to bear against the flange of said hydraulic cylinder to axially fix the hydraulic cylinder with respect to said tube;
whereby when said means for extending is included, it extends an operable distance of said hydraulic cylinder between said follower and said second end stand, and when said means for extending is removed, said operable distance of said hydraulic cylinder between said follower and said second end stand is reduced.

5,194,149
FILTER CARTRIDGE MANIFOLD
Michael R. L. Selbie, and Bruce G. Bilttaft, both of New South Wales, Australia, assignors to Memtec Limited, Australia
PCT No. PCT/AU90/00470, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO91/04783, PCT Pub. Date Apr. 18, 1991
PCT Filed Sep. 28, 1990, Ser. No. 700,128
Claims priority, application Australia, Sep. 29, 1989, PJ6651
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—232 **27 Claims**

1. Filter cartridge connector means for a filter installation of the type in which a plurality of filter cartridges are assembled into rows joined at their ends with a plurality of said connector means to form a plurality of rows of interconnected filter cartridges, characterized in that said connector means comprises a manifold having a body having planar faces at opposite ends to facilitate connection to similar adjacent manifolds, a first fluid passageway through the body providing communication from one end of the body to the other so as to permit fluid connection with adjacent manifolds, a second fluid passageway adapted to be coupled to a filter cartridge to provide fluid communication between the cartridge and the first passageway when so assembled; said manifold further including a third fluid passageway adapted to be coupled to the filter cartridge to provide fluid communication between the cartridge and the first fluid passageway independently of said second fluid passageway.

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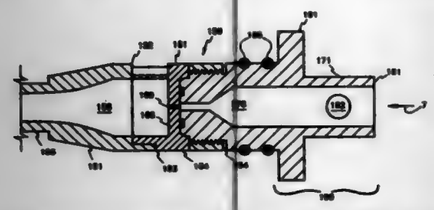
5,194,150
THREE CHAMBER VESSEL FOR HYDROCYCLONE SEPARATOR

Kevin J. O'Brien, Houston, Tex.; Pete A. Thompson, Gloucester, England, and Stephen T. McCoy, Missouri City, Tex., assignors to Conoco Specialty Products Inc., Houston, Tex.

Filed Aug. 1, 1991, Ser. No. 739,282
Int. Cl.[5] B01D *21/26*
U.S. Cl. 210—233 19 Claims

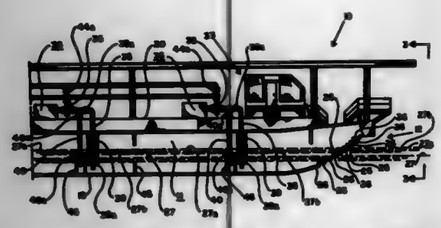


1. A hydrocyclone apparatus for separating a fluid mixture into at least two constituent parts by density, said apparatus comprising:
an elongate tube having a peripheral wall enclosing a hollow interior, a first header end, an opposite open tail end for discharging the heavier density liquid, and a breech opening in said peripheral wall; and
an inlet block generally radially received into said hollow interior of said elongate tube through said breech opening;
a generally tangentially oriented inlet opening through said inlet block within said breech opening and defined predominantly by said inlet block for admitting the fluid mixture into said hollow interior of said elongate tube with a swirling motion.

5,194,151
OIL SKIMMER

David G. Broussard, 675 Woodlake Blvd., Apt. #135, Baton Rouge, La. 70816

Filed Oct. 15, 1991, Ser. No. 775,532
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—242.3 1 Claim

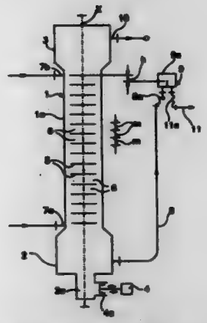


1. An apparatus for removing oil or other floating pollutants from the surface of a body of water, the apparatus comprising:
a. a barge having a bow, a stern, and an interior cavity for containing the oil or other floating pollutants and residual entrained water, the bow having an opening therein for admitting the oil or other floating pollutants and residual entrained water into the interior cavity of the barge; and
b. a plurality of individually-controlled overlapping substantially-rectangular members for controlling the depth below the surface of the water for admitting the oil or other floating pollutants and residual entrained water into the bow; the rectangular members having upper and lower sides, being vertically stacked, and being constructed and arranged so that each individual member can be independently opened and closed by rotation about a horizontal axis, the member when open admitting and when closed excluding the oil or other floating pollutants and residual entrained water into and from the opening in the bow, the member when fully open defining a substantially horizontal plane and being vertically displaced from a vertically-adjacent member, and when completely closed defining an oblique plane, with the upper side of a lower member contiguously overlapping the lower side of an upper member.

5,194,152
APPARATUS TO CONTACT LIQUIDS OF DIFFERENT DENSITY

István Takács; Gyula Bezsedics; György Fábry, and Péter Rudolf, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Hungary

PCT No. PCT/HU90/00048, § 371 Date Mar. 18, 1991, § 102(e) Date Mar. 18, 1991, PCT Pub. No. WO91/01170, PCT Pub. Date Feb. 7, 1991
PCT Filed Jul. 18, 1990, Ser. No. 671,904
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—255 6 Claims



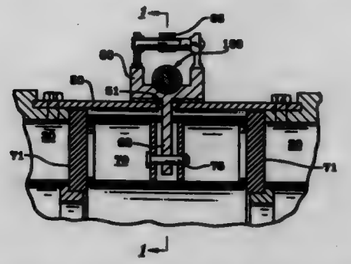
1. In a device for extracting liquids, an apparatus for contacting liquids of different densities, the apparatus comprising:
a column having a closed interior, a lower part and an upper part, with a first conduit coupled to the upper part to supply a liquid of higher density and a second conduit coupled to the lower part to supply liquid of a lower density;
a level control and propelling force adjusting mechanism coupled to the lower part of the column through a third conduit to discharge the liquid of higher density from the column;
a fourth conduit coupled to the upper part of the column to discharge the liquid of lower density;
dispersing and mixing means having a plurality of discs vertically arranged in the column to define a plurality of cells, the discs each having at least one elastic tongue and a gap along a periphery of the elastic tongue, the tongue capable of vibrating in and out of a plane defined by the surface of the disc; and
pulsating means for causing the discs to vibrate coupled to the lower part of the column.

5,194,153
APPARATUS FOR SEALING A CENTER VALVE VACUUM FILTER

Donald E. Bardsley, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 6, 1991, Ser. No. 802,919
Int. Cl.[5] B01D *33/067*
U.S. Cl. 210—392 10 Claims

1. In a center valve vacuum filter having a vat; a rotatably mounted drum having a perforated circumferential deck surface within said vat; a plurality of axially extending filtrate channels beneath each cylindrical deck surface of said drum; each said channel being closed at remote ends of said drum and open at at least one generally central location on said drum, said open ends being arrayed entirely around the circumference of the drum and generally defining a filtrate draining annular passageway therebetween; and a stationary valve means for cooperating with said open ends of said channels to sequentially interrupt extraction of filtrate from said channels

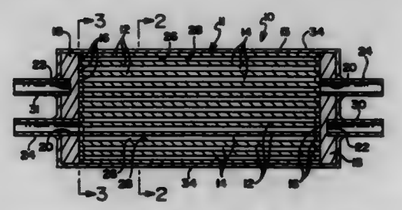


by interruption of a continuous partial vacuum thereto; the improvement, in combination with said vacuum filter and cylindrically positioned cover plates around and covering the periphery of said annular passageway and forming a circumferential slot therebetween, comprising:
a single piece circumferential seal means having a non-flat sealing surface for maintaining sealing contact with opposing edges of said rotating drum cover plates at said circumferential slot therebetween and sliding contact over said stationary valve means.

5,194,154
STRUCTURE FOR FILTER OR HEAT EXCHANGER, COMPOSED OF A FUSED SINGLE CRYSTAL ACICULAR CERAMIC

John R. Moyer, and Neal N. Hughes, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1991, Ser. No. 803,296
Int. Cl.[5] B01D *29/00*
U.S. Cl. 210—510.1 15 Claims

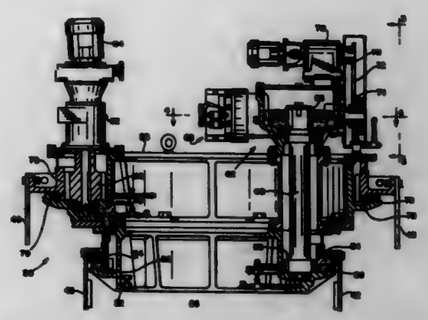


1. A structure for filtering a fluid or for exchanging a constituent between two fluids, comprising means for providing cross-flow including:
a body composed of a fused, interlocked, single crystal acicular ceramic material, said body having porous partition walls defining at least one open channel extending entirely through said body; and
means for collecting fluid exiting said body through said partition walls.

5,194,155
CONCENTRIC DUAL DRIVE SYSTEM FOR A FLOCCULATING CLARIFIER

Robert E. Schwartz, Montgomery, Ill., assignor to McNish Corporation, West Chicago, Ill.

Filed Jun. 20, 1990, Ser. No. 541,049
Int. Cl.[5] B01D *21/20*
U.S. Cl. 210—519 5 Claims



1. In a clarifier of the type comprising: a peripheral wall and a base which define a liquid containing volume; a column mounted within the peripheral wall to extend upwardly from the base; a flocculation well mounted in the volume; an influent conduit for conducting influent into the flocculation well; sludge collection means comprising at least one arm mounted for rotation to sweep the base and collect sludge therefrom; an effluent removal conduit for removing clarified effluent from the volume; and means for driving the arm in rotation across the base, said driving means comprising a first output gear coupled to the arm outside the column, a first drive gear in meshing engagement with the first output gear, a first speed reduction unit coupled to the first drive gear and situated above the first output gear, and a first motor coupled to drive the first speed reduction unit; the improvement comprising:
a set of stirring blades in the flocculation well;
a second output gear coupled to the blades outside the column and mounted below the first speed reduction unit;
a second drive gear in meshing engagement with the second output gear;
a second speed reduction unit coupled to the second drive gear and situated above the second output gear such that both of the speed reduction units are positioned above both of the output gears; and
a second motor coupled to drive the second speed reduction unit;
wherein both of the output gears are toothed on a respective interior annular surface, and wherein both of the drive gears are positioned within the respective interior annular surface;
wherein the first and second output gears are rotatably mounted in a housing which defines an upper surface, wherein the first and second drive gears are rotatably mounted in the housing, wherein the first and second speed reduction units are mounted on the upper surface of the housing, and wherein the housing is supported on the column.

5,194,156
WATER PURIFIER FAUCET FITTING

Sigfrid A. Tomchak, 15235 Weststate St., Westminster, Calif. 92683

Filed Oct. 18, 1991, Ser. No. 678,313
Int. Cl.[5] B01D *61/08*
U.S. Cl. 210—541 13 Claims

5. An improved reverse osmosis water purifier faucet fitting

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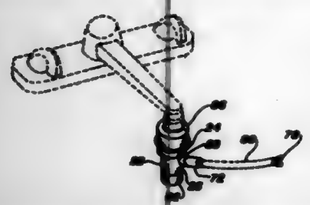
for connecting to a faucet equipped with a male coupling adapter comprising means for cooperating with a reverse osmosis purifier, including:

a) a body, having a top, a bottom and a split barbed side connector, the top having a plurality of upwardly extending fingers each containing an inward indentation of an outer boundary, said body further having a hollow chamber on the inside, the side connector, formed in triangle shape, further having three tapered bores each having a plurality of splits and internal pointed projections, for receiving and retaining matched unitedly sheathed resilient tubes, the body also having three fluid passageways terminating at the side connector providing fluid communication with the bores, the bottom of the body having partial turn ramped external threads and a centrally located valve seat in alignment with one of the passageways in the body,

b) a cylindrical jaw keeper sleeve having a plurality of cavities positioned peripherically therethrough snappingly engaging the body upstanding fingers permitting the sleeve to be retainably positioned on the top of the body and held in place by the fingers, further said sleeve having a plurality of slots through the sleeve between the notches, and a circular groove in the sleeve above the cavities,

c) a plurality of inwardly facing locking jaws, having a bevel on one side, slideably positioned within the slots of the keeper sleeve lockingly embracing the faucet adapter when the fitting is placed thereupon,

d) an enclosing ring pressed into the circular groove in the keeper sleeve covering and enclosing the cavities,



e) a compression spring contiguous with the top of the body, sleeve and retaining ring for maintaining a locked position of the fitting to the faucet adapter,

f) a retracting collar passing over the sleeve maintaining the jaws in an outward position when urged away from the body by the spring thus permitting the jaws to retract when manually forcing the fitting to be removed from the faucet in a quick-disconnect fashion,

g) a resilient double lip seal disposed within the cavity of the body providing a hermetic seal between the fitting and the adapter when the fitting is engaged thereupon,

h) a hollow tube retainer having internal indentations snappingly disposed over the split side connector adjacent to the tube receiving tapered bores with the indentations locking into the side connector barbs maintaining a fluid tight tube seal therewith,

i) a hollow cap-like two-position valve having a plurality of inwardly projecting teeth in mating relationship with the partial turn external thread of the body allowing free but limited rotation, the valve also having a centrally located cone shaped needle with vents aligned with the seat in the body maintaining a close space relationship therebetween in a first position and a spaced open relationship when rotated to a second position permitting a small amount of fluid to pass through the vents in a first position for metering and a large amount to pass in a second position for flushing deposits from the purifier exiting the valve through the vent, the valve also having a plurality of overflow openings on a bottom surface adjacent to the needle, and

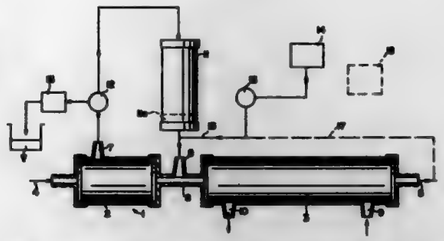
j) a diffuser attached to the valve beneath the vents for diffusing water when flushing deposits from the purifier, the faucet fitting providing a conduit for water from the faucet to the purifier and a path to eject overflow water also to meter flow of rejected concentrates with a high pressure drop or flushing deposits depending upon the position of the valve.

5,194,157

BLOOD PURIFYING EQUIPMENT PARTICULARLY FOR THE TREATMENT OF PATIENTS SUFFERING FROM RENAL INSUFFICIENCY, AND A METHOD OF PRODUCING A REINFUSION LIQUID FOR HAEMODIAFILTRATION (HDF)

Paolo Ghezzi, Peveragno, and Renzo Gervasio, Turino, both of Italy, assignors to Soria Biomedica Emodialisi SRL, Leggia, Italy

Continuation of Ser. No. 640,262, Jan. 11, 1991, abandoned. This application May 18, 1992, Ser. No. 884,879
Claims priority, application Italy, Mar. 9, 1990, 67168 A/90
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—646 27 Claims



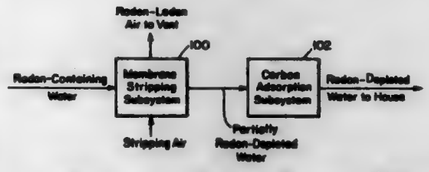
16. A method of producing a quantity of an infusion for compensating, at least partially, for a quantity of ultrafiltrate obtained from a quantity of blood by a haemofiltration purification step, in which the ultrafiltrate transports harmful substances to the removed from the blood, wherein the method includes the step of subjecting the ultrafiltrate to regeneration to remove the substances therefrom so that, after the removal of the substances, at least some of the ultrafiltrate can be used to make up an infusion solution, and a haemodialysis purification step is effected on the blood after compensation by the infusion solution.

5,194,158

RADON REMOVAL SYSTEM AND PROCESS

Stephen L. Mateen, 15 Withington La., Harvard, Mass. 01451

Continuation-in-part of Ser. No. 539,005, Jun. 15, 1990, Pat. No. 5,100,555. This application Mar. 31, 1992, Ser. No. 861,422
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—651 6 Claims



4. A method of reducing the naturally-occuring dissolved radon content of radon-containing water supplied from a groundwater source, comprising the steps of:

a) passing the radon-containing water from a water inlet to a water outlet of a first chamber, which is defined by a housing and a first surface of a radon-permeable membrane disposed within the housing, the first chamber providing fluid communication between the water inlet and the water outlet, whereby the radon-containing water passes over the first surface of the radon-permeable membrane;

b) passing stripping air from a stripping-air inlet to a stripping-air outlet of a second chamber, which is defined by the housing and second surface of the radon-permeable membrane and which provides fluid communication between the stripping-air inlet and the stripping-air outlet, the radon-permeable membrane maintaining separation between the radon-containing water passing through the first chamber and the stripping air passing through the second chamber, while allowing naturally-occuring dissolved radon to migrate from the water through the radon-permeable membrane to the stripping air;

c) recirculating said membrane treated water through a recirculation conduit in fluid communication with both the water inlet and the water outlet of the housing by means of a water recirculation pump disposed at the recirculation conduit, whereby activation of said water recirculation pump causes at least a portion of the water passing out of the first chamber through the water outlet to be directed through the recirculation conduit and to the water inlet for recirculation of the water through the first chamber;

whereby the stripping air passes over the second surface of the radon-permeable membrane and transports radon through the stripping-air outlet for discharge of the radon to the atmosphere, thereby reducing the naturally occuring dissolved radon content of the water.

5,194,159

TREATMENT OF LOWER GLYCOL-CONTAINING OPERATIVE FLUIDS

Kathleen F. George, Cross Lanes; Lise Dahuron; John H. Robson, both of Charleston; George E. Keller, II, So. Charleston, all of W. Va., and Benjamin Bikson, Brookline, Mass., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 654,121, Feb. 14, 1991, Pat. No. 5,102,549, which is a continuation-in-part of Ser. No. 457,923, Dec. 27, 1989, Pat. No. 5,034,134. This application Dec. 18, 1991, Ser. No. 809,158
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—654 20 Claims

1. A process comprising reclaiming lower glycol consisting essentially of one or more of monoethylene glycol, 1,2-propylene glycol and 1,3-propanediol, from fluid containing the lower glycol and at least one dissolved component by contacting the fluid with a feed side of a semi-permeable membrane under reverse osmosis conditions sufficient to permeate lower glycol to a permeate side of said membrane wherein the permeated lower glycol has a reduced concentration of said at least one dissolved component as compared to the concentration in the fluid contacted with the feed side of the membrane, said membrane

(a) having properties for rejecting at least about 70 percent of sodium chloride contained in a 3.5 weight percent aqueous solution at Standard Conditions,

(b) having properties for rejecting less than about 30 percent of monoethylene glycol contained in a 10 weight percent aqueous solution at Standard Conditions, and

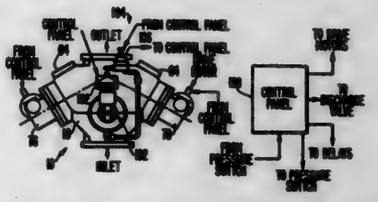
(c) having properties for rejecting at least about 90 weight percent of an eight mole ethoxylate of nonylphenol having an average molecular weight of about 570 contained in a 1.0 weight percent aqueous solution at Standard Conditions.

5,194,160

FLUID STRAINER AND METHOD OF CONVERTING THE SAME BETWEEN MOTORIZED AND MANUAL MODES WITH PRESSURE-SENSITIVE SWITCH

James K. Simonelli, Brecksville, and Alan J. Kantz, Valleyview, both of Ohio, assignors to Vosper Corporation, Cleveland, Ohio

Filed Aug. 16, 1991, Ser. No. 745,875
Int. Cl.[5] B01D *46/46*; B23P *6/00*; F16H *1/16*
U.S. Cl. 210—741 9 Claims



9. In a method of automatically flushing a fluid strainer having a pressure sensitive switch operable for monitoring pressure differentials between a fluid inlet and a fluid outlet, wherein the strainer has a motorized rotatable screen and a scraping blade in close proximity therewith, and a motorized discharge valve operable for opening and closing a discharge outlet comprising the steps of:

rotating the screen substantially throughout the opening and closing of the discharge valve;

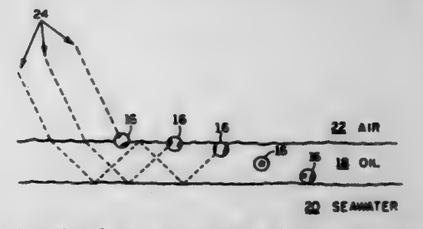
and rendering inoperative the pressure sensitive switch during opening and closing of the discharge valve as well as for a preselected time period after closing of the discharge valve so that the switch does not operate to restart another discharge valve opening.

5,194,161

MATERIALS AND METHODS FOR ENHANCED PHOTOCATALYZATION OF ORGANIC COMPOUNDS WITH PALLADIUM

Adam Heller, Austin, Tex., and Heinz Gerischer, Berlin, Fed. Rep. of Germany, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 629,664, Dec. 14, 1990, which is a division of Ser. No. 412,317, Sep. 25, 1989, Pat. No. 4,997,576. This application Mar. 5, 1992, Ser. No. 846,348
Int. Cl.[5] C02F *1/30*, *1/32*
U.S. Cl. 210—748 4 Claims



1. A method for treating an oil film floating on a body of water, comprising the steps of:

dispersing a plurality of water floatable particles on the oil film, wherein at least part of each particles, exterior surface is coated with a coating material that comprises palladium and an oxidation material that under illumination and in the presence of air is capable of accelerating the oxidation of organic compounds in the oil film; and

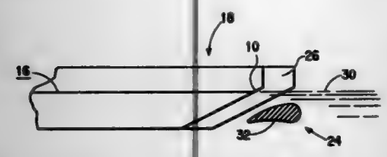
allowing the particles to be exposed to solar illumination and ambient air such that the particles accelerate the oxidation of at least one organic compound in the oil film.

5,194,162
METHOD FOR TREATING SWIMMING POOL WATER
Frank J. Hodak, E. Crulkshank Rd., Valencia, Pa. 16059
Filed Jul. 5, 1991, Ser. No. 726,299
Int. Cl.[5] C02F *1/50*
U.S. Cl. 210—755 7 Claims

1. A method for treating swimming pool water containing an excess concentration of isocyanuric acid therein, the method comprising the steps of adding an effective amount of sodium hydroxide to the pool water and reacting the sodium hydroxide with the isocyanuric acid to thereby reduce the isocyanuric acid to a desired concentration.

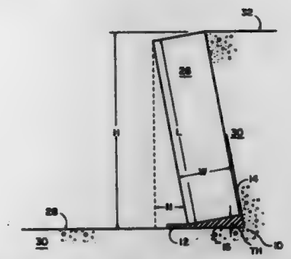
5,194,163
PURIFICATION OF WASTE STREAMS
R. Kent Saugier, Katy, Tex., assignor to FMC Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 666,751, Mar. 8, 1991, abandoned. This application Dec. 16, 1991, Ser. No. 807,326
Int. Cl.[5] C02F *1/72*
U.S. Cl. 210—759 6 Claims

1. A process for decolorizing an aqueous lignin-containing system comprising the steps of
a. adjusting the aqueous system to between pH of 2 and 10, and
b. incorporating a decolorizing amount of a peroxygen composition selected from the group consisting of peracetic acid, and monoperoxysulfuric acid.

5,194,164
INCLINED-PLANE OIL SKIMMERS
George W. Adams, 23 Huntingtown Road, Newtown, Conn. 06470-2626
Filed Mar. 4, 1991, Ser. No. 664,384
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—776 14 Claims

1. In an oil skimmer comprising a hull for floating on a water surface and comprising a bow, a stern, and a hold within said hull for containing oil, said bow comprising an inclined surface extending from above said water surface downwardly and rearwardly through said water surface toward said stern and terminating in an opening into said hold, the improvement comprising:
a foil lifting body under said water surface, ahead of said inclined surface, extending transverse to a center line of said skimmer drawn from bow to stern,
the direction of lift of said body being directed toward said water surface and said foil lifting body being shaped such that in crossection it is thinner in the vertical direction than in the horizontal direction and oriented such that the drag of said foil lifting body is minimized.

5,194,165
FINISHING CAPS FOR CONCRETE FORMWORK
Dennis Rattigan, 3295 Maplewood Road, Victoria, British Columbia, Canada V8P 3M4
Filed Feb. 11, 1991, Ser. No. 653,366
Int. Cl.[5] E04G *9/00*
U.S. Cl. 249—188 12 Claims

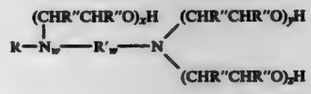
12. An apparatus for forming concrete for providing a smooth, finished concrete corner or joint, comprising:
a finishing cap and concrete formwork;
said finishing cap including a body formed from two non-parallel edges joined at a corner and forming an angle, each edge extending essentially the entire length of the corner, whereby said concrete formwork is adapted to be fitted into said corner formed by said two edges,
wherein said body is formed from a substantially rigid but deformable material,
said angle of said corner being small than a desired angle of the finished concrete corner or joint, so as to pinch the formwork firmly into said corner, thereby providing a smooth corner or joint along which concrete may be poured, and



wherein an upper surface of one of said edges includes a means for placing the formwork at a position which deviates from a direction perpendicular to an underside of said one edge, and
wherein said formwork comprises a stair riser form adapted to fit into said corner such that the cap is secured to the form, wherein the upper surface of said one edge which includes the placing means abuts a bottom end of the form, and the other edge abuts a face of the form.

5,194,166
PHOSPHOROUS AMINE LUBRICANT ADDITIVES
Gerald D. Burt, Moreland Hills, and Randolph A. McDonald, Berea, both of Ohio, assignors to The Elco Corporation, Cleveland, Ohio
Division of Ser. No. 526,080, May 18, 1990, Pat. No. 5,130,036. This application Jul. 10, 1992, Ser. No. 911,839
Int. Cl.[5] C10M *137/02, 139/00;* C07F *9/02*
U.S. Cl. 252—32.5 12 Claims

1. A lubricant additive comprising the reaction product of
(a) an alkoxylated amine of the formula



(I)

wherein R is a C_6 to C_{30} hydrocarbon group or an alkoxylated C_6 to C_{30} hydrocarbon group, R′ is a C_1 to C_5 alkylene group and R″ is individually hydrogen or a C_1 to C_6 hydrocarbon group, w is 0 or 1 and x, y and z are each integers of from 0 to 10, at least one of which is not 0,
(b) phosphorous acid; wherein said reaction is carried out at a temperature of about 50° to 250° C. and the molar ratio of alkoxylated amine to phosphorous acid is about 0.1:1 to about 10:1, and
(c) a compound selected from the group consisting of a boron compound which is selected from the group consisting of boric oxide, a metaborate, and a compound of the formula

$$(R^3O)_mB(OH)_n \quad \text{(II)}$$

wherein R^3 is a C_1 to C_6 alkyl group, and m and n are 0 to 3, there sum being 3;
an alcohol of the formula

R^4OH (III)

wherein R^4 is a C_1 C_{30} hydrocarbon group; and
a long-chain aliphatic carboxylic acid of the formula

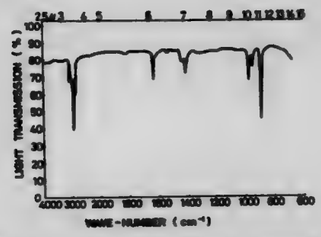
R^5COH (IV)
‖
O

wherein R^5 is a C_1 to C_{30} hydrocarbon group.

5,194,167
QUATERNARY AMMONIUM SALTS OF MERCAPTOTHIADIAZOLES AND RELATED HETEROCYCLIC DERIVATIVES AS ANTIOXIDANT AND ANTIWEAR ADDITIVES
Shih-Ying Hsu, Morrisville, Pa., and Andrew G. Horodysky, Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed May 8, 1991, Ser. No. 697,039
Int. Cl.[5] C10M *133/38*
U.S. Cl. 252—34 23 Claims

1. An improved lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared there from and a minor amount of from about 0.001 to about 10 wt % of a multifunctional antiwear, antioxidant additive product of reaction prepared by reacting a heterocyclic compound selected from the group consisting of mercaptothiadiazoles or dimercaptothiadiazole with a quaternary ammonium salt and a carboxylic acid anhydride in substantially molar, less than molar or more than molar amounts at temperatures varying from ambient to about 150° C. under pressures varying from ambient to slightly higher for a time sufficient to obtain the desired additive product of reaction.

5,194,168
LUBRICANT COMPOSITIONS
Nobuo Aoki, and Shinichiro Suzuki, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Japan
Filed Jan. 28, 1991, Ser. No. 646,655
Claims priority, application Japan, Jan. 29, 1990, 2-18496
Int. Cl.[5] C10M *143/12, 143/00*
U.S. Cl. 252—50 7 Claims



1. A lubricant composition comprising a base oil of mineral or synthetic origin and a hardened compound resulting from crosslinking more than 10% of vinyl double bonds in a polybutadiene having more than 20 mol % of vinyl double bonds in terms of its monomer unit, said hardened compound being added in an amount of 0.01–50 parts by weight per 100 parts by weight of said base oil.

5,194,169
AZEOTROPE-LIKE REFRIGERANT MIXTURES OF 1,1-DICHLORO-2,2,2-TRIFLUOROETHANE AND 1,1-DICHLORO-1-FLUOROETHANE
Vinci M. Felix, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 335,946, Apr. 10, 1989. This application Mar. 4, 1991, Ser. No. 664,532
Int. Cl.[5] C09K *5/04*
U.S. Cl. 252—67 2 Claims

1. A process for heating or cooling comprising the use of an azeotrope-like composition consisting essentially of effective amounts of 1,1-dichloro-2,2,2-trifluoroethane and 1,1-dichloro-1-fluoroethane as a refrigerant.

5,194,170
BINARY AZEOTROPIC COMPOSITIONS OF 1,1,2,2,3,3,4,4-OCTAFLUOROBUTANE AND EITHER TRAN-1,2-DICHLOROETHYLENE, CIS 1,2-DICHLOROETHYLENE, OR 1-1 DICHLOROETHANE
Abid N. Merchant, and Janet C. Sung, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 2, 1992, Ser. No. 864,811
Int. Cl.[5] B08B *3/00;* C09K *5/04;* C23G *5/028;* C11D *7/30*
U.S. Cl. 252—67 5 Claims

1. An azeotropic or azeotrope-like composition, consisting essentially of 59.7 to 72.7 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 27.3 to 40.3 weight percent trans-1,2-dichloroethylene wherein said composition boils at about 36.2° C. when the pressure has been adjusted to substantially atmospheric pressure; 77.2 to 89.2 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 10.8 to 22.8 weight percent cis-1,2-dichloroethylene wherein said composition boils at about 41.0° C. when the pressure has been adjusted to substantially atmospheric pressure; or 79.3 to 86.3 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 13.7 to 20.7 weight percent 1,1-dichloroethane wherein said composition boils at about 42.3° C. when the pressure has been adjusted to substantially atmospheric pressure.

5,194,171
TERTIARY AMIDE-CONTAINING COMPOSITIONS FOR REFRIGERATION SYSTEMS
Scott T. Jolley, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
Division of Ser. No. 522,610, Mar. 30, 1990, Pat. No. 4,992,188. This application Jan. 10, 1991, Ser. No. 639,620
Int. Cl.[5] C09K *5/04*
U.S. Cl. 252—67 24 Claims

1. A composition, comprising:
(A) a major amount of a fluorine-containing hydrocarbon containing one or two carbon atoms; and
(B) a minor amount of a tertiary amide which is the reaction product of at least one secondary amine and at least one carboxylic acid or anhydride wherein the acid is represented by the formula $R_5—(C(O)OH)_a$ wherein a is one or two and provided that when a is one, R_5 is a hydrocarbyl group or a hydrocarbylpolyoxyalkylene alkyl group, and when a is two, R_5 is a hydrocarbylene group, provided that when a is one, R_5 has one carbon atom and, secondary amine is a dialkylamine, then the dialkylamine has alkyl groups having at least eight carbon atoms.

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5,194,172
AERATED AND FREEZER BAR SOAP COMPOSITIONS CONTAINING SUCROSE AS A MILDNESS AID AND A PROCESSING AID

James E. Tanori, West Chester, and Natalie M. Moroney, Loveland, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 13, 1990, Ser. No. 582,270
Int. Cl.[5] C11D *9/20, 9/26, 9/48, 13/16*
U.S. Cl. 252—130 5 Claims

1. A process for making an aerated freezer soap bar comprising the steps of:

I. Mixing a soap bar composition comprising:

(A) from about 25 wt. % to about 70 wt. % of alkali metal fatty acid soap in which said fatty acids contain from about 8 to about 18 carbon atoms;

(B) from about 5 wt. % to about 35 wt. % of sucrose;

(C) from about 3 wt. % to about 20 wt. % of a hydrophobic material selected from waxes, free fatty acids and fatty alcohols containing from about 8 to about 18 carbon atoms and wherein said composition contains at least about 3 wt. % of said wax; and

(D) from about 10 wt. % to about 30 wt. % water; wherein said composition does not contain an effective amount of water-soluble organic non-soap synthetic detergent; at a temperature of from about 82° C. to about 100° C. (from about 180° F. to about 212° F.); said mix being fluid, substantially homogeneous, and pumpable;

II. Aerating said mix;

III. Cooling said mix to a temperature of from about 49° C. to about 66° C. (from about 120° F. to about 160° F.); and

IV. Forming aerated bars from said aerated and cooled mix, wherein said process does not include a moisture reduction drying step.

4. A process for making a non-aerated soap bar from the composition of comprising:

(A) from about 25 wt. % to about 70 wt. % of alkali metal fatty acid soap in which said fatty acids contain from about 8 to about 18 carbon atoms;

(B) from about 5 wt. % to about 35 wt. % of a nonreducing sugar;

(C) from about 3 wt. % to about 30 wt. % of hydrophobic material selected from the group consisting of waxes; free fatty acids containing from about 0 to about 10 carbon atoms; mono-, di-, and triglycerides; fatty alcohols containing from about 8 to about 18 carbon atoms and wherein said composition contains at least about 3 wt. % of said wax; and mixtures thereof; and

(D) from about 15 wt. % to about 25 wt. % water; wherein said composition does not contain an effective amount of water-soluble organic non-soap synthetic detergent;

wherein said process comprises the steps of:

1. Mixing said (A), (B), (C), and (D) at a temperature of from about 82° C. to about 102° C. (180° F. to about 215° F.);

2. Cooling said mix of Step I. to a temperature of from about 49° C. to about 60° C. (120° F. to about 160° F.); and

3. Forming said non-aerated bars from said cooled mix, wherein said process does not include a moisture reduction drying step.

5,194,173
METHOD OF RECOVERING OILY CONTAMINANTS FROM PRINTING MACHINES, PLATES AND RELATED EQUIPMENT

Christopher W. Folkard, and Gary A. J. Goddard, both of Leeds, United Kingdom, assignors to DuPont (UK) Ltd., Leeds, United Kingdom

Filed Jan. 22, 1992, Ser. No. 824,801
Claims priority, application United Kingdom, Jan. 29, 1991, 9101850
Int. Cl.[5] B08B *3/08;* C11D *7/26, 7/50;* C23G *5/032*
U.S. Cl. 252—170 8 Claims

1. A method of removing oil contaminants formed on surfaces of printing machines, printing plates and associated equipment which comprises the step of contacting the surface with a liquid cleaning aid comprising at least one C_8 or higher alkyl ester of a fatty acid in an amount of at least 30% by volume of the cleaning aid, said cleaning aid being characterized by exhibiting a substantially reduced tendency to degrade images on printing plates as compared to similar compositions containing similar amounts of C_1 to C_5 alkyl esters of fatty acids.

5,194,174
METHODS FOR SUPPRESSING FUGITIVE DUST EMISSIONS

Donald C. Roe, Tabernacle, N.J., and David M. Polizzotti, Yardley, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 539,757, Jun. 18, 1990, abandoned. This application Aug. 19, 1991, Ser. No. 746,828
Int. Cl.[5] C09K *3/22;* C11D *3/37, 1/02, 1/66*
U.S. Cl. 252—173 41 Claims

1. A method of suppressing dust comprising contacting a solid particulate dust producing material with a dust inhibiting amount of a non-viscous, aqueous solution comprising boric acid and up to about 0.25% by weight a polyvinyl alcohol.

5,194,175
RIGID FOAMS, METHODS FOR PREPARATION THEREOF AND COMPOSITIONS USEFUL IN METHODS AND PREPARATIONS THEREOF

David G. Keske, Glencoe, and Mark S. Schulte, St. Charles, both of Mo., assignors to Foam Supplies, Inc., St. Louis, Mo.

Division of Ser. No. 384,643, Jul. 24, 1989, Pat. No. 5,032,623. This application Apr. 11, 1991, Ser. No. 684,008
Int. Cl.[5] C08J *9/06;* C08G *18/14*
U.S. Cl. 252—182.25 4 Claims

1. A blend suitable for use as a component in a two-component method for preparation of rigid foam, the blend comprising

(a) from about 65% by weight to about 95% by weight, based on the total weight of the blend, of a combination of polyols comprising a first polyol constituent, which comprises a polyalkoxylated amine having an average OH number of from about 500 to about 700 and in which the alkoxy groups each have from two to three carbon atoms, a second polyol constituent, which comprises a sucrose-based polyol having an average OH number of from about 300 to about 400 and an average functionality of at least about 3, and a third polyol constituent, which comprises polyalkoxylated glycerin having an average OH number of from about 200 to about 300 and in which the alkoxy groups each have from two to three carbon atoms;

(b) from about 0.5% by weight to about 3% by weight of water, based on total blend;

(c) up to about 5% by weight of water/isocyanate reaction catalyst, based on total blend; and

(d) from about 1% by weight to about 15% by weight of $CHClF_2$, based on total blend.

5,194,176
PEROXYGEN LAUNDRY BLEACH

William Copenhafer, Yardley, Pa.; Basil A. Guiliano; William A. Hills, both of Lawrenceville; Charles V. Jaekle, Belle Mead, N.J., and Stephen Tomko, Trenton, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 505,800, Apr. 6, 1990, abandoned. This application Apr. 2, 1991, Ser. No. 679,366
Int. Cl.[5] C01B *15/10*
U.S. Cl. 252—186.27 4 Claims

1. A process for preparing a storage-stable compound characterized by:

a) suspending substantially dry particles comprising sodium carbonate perhydrate containing 0.1% to 3% by weight of a diphosphonic acid or salt and between 1 and 5 moles of anhydrous sodium carbonate for each mole of available water contained therein sufficiently to substantially eliminate solid-solid contact between particles,

b) contacting said dry particles with a plurality of fine drops of an aqueous solution consisting essentially of 10% to 90% by weight sodium silicate and 90% to 10% by weight sodium metaborate (sodium borosilicate),

c) concomitantly maintaining dry particles at a temperature of from 38° C. to 71° C., thereby evaporating water at a sufficient rate to avoid moistening or hydrating said dry particles thereby coating the particles with from 2% to 10% by weight of the sodium borosilicate, and

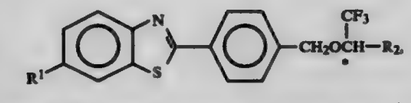
d) collecting the coated dry particles as a freeflowing peroxygen compound which is stable when incorporated into a solid detergent formulation.

5,194,177
OPTICALLY ACTIVE COMPOUND, LIQUID CRYSTAL COMPOSITION, LIQUID CRYSTAL DEVICE, DISPLAY APPARATUS AND DISPLAY METHOD

Hiroyuki Nohira, Urawa; Takao Takiguchi, Tokyo; Takashi Iwaki, Machida; Takeshi Togano, Yokohama; Yoko Yamada, and Shinichi Nakamura, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1992, Ser. No. 822,675
Claims priority, application Japan, Jan. 30, 1991, 3-009834
Int. Cl.[5] C09K *19/34;* C07D *277/62;* G02F *1/13*
U.S. Cl. 252—299.61 28 Claims

1. An optically active compound represented by the following formula (I):



(I)

wherein R_1 denotes a linear or branched alkyl group having 1–18 carbon atoms optionally including one or non-neighboring two or more methylene groups which can be replaced with —X— or

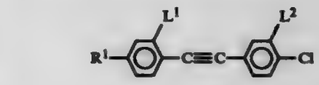
with the proviso that X denotes O or S and Y denotes halogen; R_2 denotes a linear alkyl group having 4–8 carbon atoms: and C* denotes an optically active asymmetric carbon atom.

5,194,178
CHLORO TOLANES

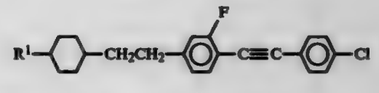
David Coates, Wimborne; Simon Greenfield, Crockmoor, and Mark Goulding, Lower Parkstone, all of Great Britain, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jan. 28, 1991, Ser. No. 646,118
Claims priority, application United Kingdom, Jan. 29, 1990, 9001945
Int. Cl.[5] C09K *19/30, 19/54, 19/52;* C07C *19/08*
U.S. Cl. 252—299.63 5 Claims

1. A chloro tolane of the formulae I or Ij



I



II

wherein

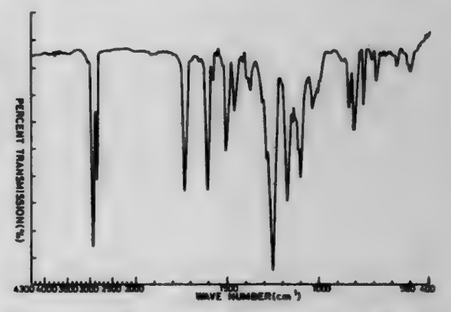
R^1 is C_{2-12}-alkyl, and

L^1 and L^2 are H or F, with the proviso that one of L^1 or L^2 is F.

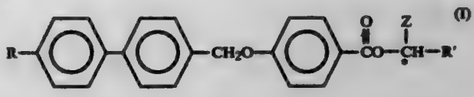
5,194,179
LIQUID CRYSTAL COMPOUNDS

Yoshiichi Suzuki; Ichiro Kawamura, and Hiroyuki Moganiya, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 316,195
Claims priority, application Japan, Feb. 26, 1988, 63-42215
Int. Cl.[5] C09K *19/12, 19/06, 19/52*
U.S. Cl. 252—299.66 5 Claims



1. A liquid crystal compound represented by formula (I):



(I)

wherein R represents an alkyl or alkoxy group having 1–20 carbon atoms, R' represents an alkyl group of 1–20 carbon atoms and Z represents CF_3, CHF_2, CH_2F, $CClF_2$, CCl_2F, CHClF, CCl_3 or C_2F_5.

399-699 O-93-12

VOL 1148 ISS 3 MR 16 1993 UMI

5,194,180
IONICALLY CONDUCTIVE MATERIAL AND METHOD FOR ITS PREPARATION
Takashi Nakamura, Chiba, and Masaki Okuyanagi, Shiga, both of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan
Filed Sep. 8, 1989, Ser. No. 404,706
Claims priority, application Japan, Sep. 16, 1988, 63-231956
Int. Cl.[5] H01B *1/00*
U.S. Cl. 252—500 5 Claims

1. Method for the preparation of ionically conductive material having the characteristic that a mixture composed of the following is heated to an effective temperature to effect cross-linking in the presence of an esterification reaction catalyst:
(A) organopolysiloxane having at least two carboxyl group-containing hydrocarbon groups in each molecule;
(B) polyoxyalkylene having at least two hydroxyl groups in each molecule, as represented by the general formula

$$HO-(R_1O)_x-H$$

(wherein R_1 is an alkylene group containing 1 to 8 carbon atoms and x is an integer with a value of 1 to 100) such that the ratio between the number of moles of hydroxyl groups in the instant component and the number of moles of carboxyl groups in component (A) has a value of (1:10) to (10:1); and
(C) salt of a metal form Group IA or Group IIA of the Periodic Table at 0.5 to 20 weight parts for each weight 100 weight parts of the total quantity of components (A) plus (B).

5,194,181
PROCESS FOR SHAPING ARTICLES FROM ELECTROSETTING COMPOSITIONS
Ronald P. Rafitz, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Continuation-in-part of Ser. No. 219,522, Jul. 15, 1988, and a continuation-in-part of Ser. No. 219,523, Jul. 15, 1988, abandoned. This application Sep. 11, 1989, Ser. No. 405,178
Int. Cl.[5] B29C *35/00, 39/00*
U.S. Cl. 252—500 19 Claims

1. A process for shaping articles, comprising:
providing a quantity of fluid electrosetting composition;
positioning a first portion of said electrosetting composition between at least two electrically conductive surfaces, said electrosetting composition comprising a phase changing vehicle which is both a dielectric and a polymer and an aggregate comprising particles which will polarize in an electric field;
electrically charging said conductive surfaces such that said first portion of said electrosetting composition solidifies electrically in the manner of an electrorheological fluid;
maintaining said charging such that the cure of said first portion of said electrosetting composition is accelerated;
wherein the part of said quantity of said electrosetting composition which was not placed between said electrically conductive surfaces remains fluid; and
separating said fluid portion from the solidified first portion of said electrosetting composition.

5,194,182
SALT-CONTAINING POLYMER COMPOSITIONS
Charles L. Kissel, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Division of Ser. No. 305,451, Feb. 1, 1989, Pat. No. 5,004,562. This application Feb. 22, 1991, Ser. No. 660,784
Int. Cl.[5] H01B *1/00*; C08K *3/00*; C08J *3/03*
U.S. Cl. 252—518 42 Claims

1. An electrically conductive polymer composition comprising a nonconjugated latex polymer and a salt in the form of a salt colloidal.

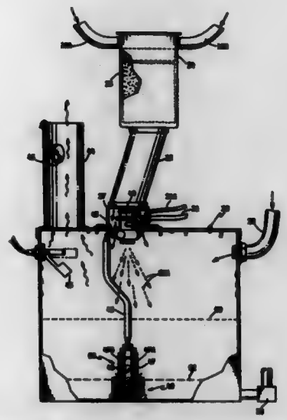
5,194,183
THERMOCHROMIC EFFECT COATING
Jürgen Münch, Sachsenheim; Karl-Heinz Frosse, Stuttgart, and Carl W. Metzger, Denkendorf, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands
Filed Aug. 28, 1989, Ser. No. 399,634
Claims priority, application European Pat. Off., Sep. 9, 1988, 88201966.4
Int. Cl.[5] G02B *5/23*; C09K *19/00*; B32B *5/16*
U.S. Cl. 252—586 20 Claims

1. A thermochromic effect coating composition comprising an aqueous binder component including a flop effect pigment and an encapsulated thermochromic liquid crystal pigment, said aqueous binder component comprising an aqueous dispersion binder.

5,194,184
FLAME-RETARDANT RESIN COMPOSITION
Yoshiharu Takeyama, and Shuichi Yamagami, both of Tokyo, Japan, assignors to Idemitsu N.S.G. Co., Ltd., Yokkaichi, Japan
Filed Feb. 24, 1992, Ser. No. 840,409
Claims priority, application Japan, Mar. 5, 1991, 3-62372
Int. Cl.[5] C09K *21/00*
U.S. Cl. 252—609 18 Claims

1. A flame-retardant resin composition comprising
(i) a mixture comprising (A) 50 to 90% by weight of a polyolefin resin, (B) 10 to 50% by weight of a polyamide resin, (C) 1 to 5% by weight of a polyolefin resin modified by an unsaturated carboxylic acid or a derivative thereof, (D) 25 to 55% by weight of a hydrated metal oxide and (E) 0 to 10% by weight of antimony trioxide; the total of said polyolefin resin (A) and said polyamide resin (B) being from 30 to 74% by weight of said mixture (i); and
(ii) glass fibers (F) in an amount of 18 to 70 parts by weight to 100 parts by weight of said mixture (i).

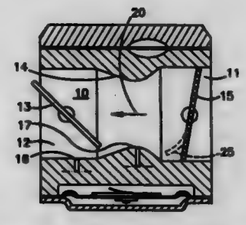
5,194,185
ATOMIZATION OF CONDENSATE WATER
Thomas E. Cannon, Minneapolis; Stephen L. Harris, Anoka; Robert J. Kendig, Coon Rapids, and Ward D. Komoroske, Champlin, all of Minn., assignors to VIC Manufacturing, Minneapolis, Minn.
Filed Jun. 21, 1991, Ser. No. 719,269
Int. Cl.[5] B01F *3/04, 5/18*
U.S. Cl. 261—7 7 Claims



1. Apparatus for dispersing into the atmosphere water con-

taining an amount of a solvent which is heavier than said water, said apparatus comprising:
(a) reservoir means for receiving and holding said water;
(b) atomizer means operatively associated with said reservoir for atomizing said water;
(c) said reservoir including a container having air inlet means for carrying air into said container, an inlet port for receiving said water and an outlet port for venting air and atomized water;
(d) feed means for feeding said water to said atomizer means, said feed means including aspirator means to draw said water into said atomizer; and
(e) said aspirator means including an elongated tube having upper and lower ends, wherein said upper end is operably connected to said atomizer means; wherein said aspirator means further includes valve means attached to said lower end of said tube; wherein said valve means is adapted to allow water to flow into said tube and is further adapted to prevent solvent which has separated from said water from being drawn into said tube.

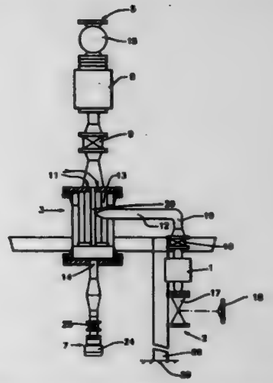
5,194,186
AUTOMATIC CHOKE
Deg H. Edlund, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Dec. 13, 1991, Ser. No. 807,253
Claims priority, application Sweden, Jan. 29, 1991, 9100275
Int. Cl.[5] F02M *1/14*
U.S. Cl. 261—64.4 3 Claims



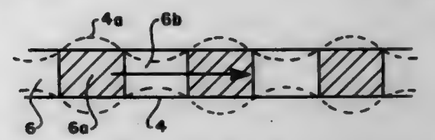
1. A carburetor, comprising an induction passage including a choke valve on the air inlet, said choke valve being a one-piece, flexible disc journalled by means of a shaft in the carburetor and adapted to bend partially open when the engine begins to ignite.

5,194,187
STEAM/WATER MIXER
Dietrich Fegin, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
PCT No. PCT/EP90/01488, § 371 Date Mar. 12, 1992, § 102(e) Date Mar. 12, 1992, PCT Pub. No. WO91/04523, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 5, 1990, Ser. No. 838,704
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1989, 3930579
Int. Cl.[5] B01F *3/04, 5/04*
U.S. Cl. 261—96 5 Claims

1. A steam/water mixer comprising an inlet for steam and an inlet for water; a vessel for mixing steam and water; an outlet for the heated water from the mixing vessel; a porous unit which is disposed in the mixing vessel between the steam inlet and the water inlet, and which is arranged in such a way that the steam entering the mixing vessel only passes to the water inlet or to the outlet of the mixing vessel through the unit, wherein said porous unit includes sintered material; and packings are arranged in a space formed between the porous unit and the inner wall of the mixing vessel.



5,194,188
PROCESS AND A DEVICE FOR THE DIRECT PRODUCTION OF LIPOSOMES
Gilles Gaitlerrez, Lyons, France, assignor to Patrinove, Lyons, France
Filed Mar. 4, 1991, Ser. No. 656,141
Claims priority, application France, Jul. 5, 1989, 89/09275
Int. Cl.[5] B01J *13/04*; A61K *9/127*
U.S. Cl. 264—4.1 7 Claims



1. A process for direct preparation of lipsomes incorporating an active substance, characterized in that a preparatory liquid is obtained by mixing together at least one amphiphilic compound, an aqueous medium and the active substance, dissolved or dispersed in the amphiphilic compound or in the aqueous medium, in that the preparatory liquid is set into motion as a stream of liquid having no inside bulges were a cavitation phenomenon is generated by alternatively pressurizing and depressurizing the stream of liquid.

5,194,189
PROCESS FOR MANUFACTURING CONTINUOUS, SUPPORTED POLYMERIC SHEET FROM POLYMERIZABLE LIQUID STARTING MATERIALS
Theodore G. Papastavros, Weston; Samuel A. Alexander, Concord; Michael D. Benedict, Quincy; Vincent Cioffi, Braintree; Russell B. Hodgdon, Sudbury; Emery Richard, Lynn, all of Mass., and Winslow Tinkham, Ocala, Fla., assignors to Ionics, Incorporated, Watertown, Mass.
Division of Ser. No. 660,124, Feb. 25, 1991, Pat. No. 5,056,996, which is a continuation of Ser. No. 404,939, Sep. 8, 1989, abandoned. This application Jun. 28, 1991, Ser. No. 722,748
Int. Cl.[5] B29C *39/18*
U.S. Cl. 264—22 7 Claims

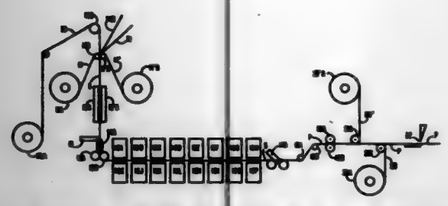
1. A process for manufacturing a sheet of solid polymer having support substrate imbedded therein from: (I) liquid having a viscosity less than about 10 poise at shear rates in

excess of about 1 cm/sec and comprising at least in part components reactable to form said polymer; and from (II) at least one pliable, support substrate having a multiplicity of apertures extending through said substrate from one face thereof to the other, said substrate being substantially insoluble in said liquid during said manufacturing, said process comprising:

a) forming a sandwich comprising said support substrate or a pack of facially contiguous support substrates and also comprising juxtaposed on each face of said substrate or pack, pliable foil extending beyond the lateral edges of said support substrate or pack, said foil not being substantially swollen by nor substantially permeable to said liquid;

b) maintaining the average plane of said sandwich within an angle of not more than about 45 degrees from the vertical direction;

c) passing said sandwich through a pair of substantially horizontal, rotatable squeeze rolls;



d) joining the juxtaposed lateral edges of said pliable foil before passing through said squeeze rolls thereby forming a pocket in said sandwich bounded on the bottom thereof by said squeeze rolls;

e) controlling the aperture between said squeeze rolls to approximately the thickness of the sum of the nominal thickness of the said foils and support substrate or pack of support substrates;

f) introducing said liquid into said pocket to form a laterally extending shallow pool of said liquid on at least one side of said support substrate;

g) controlling the level of liquid in said pool;

h) pulling said sandwich between squeeze rolls thereby at least partially filling with said liquid substantially all the apertures of said support substrate or pack passing between said rolls;

i) thereafter reacting said components reactable to form said polymer thereby resulting in the formation of said sheet of solid polymer having said support imbedded therein.

5,194,190

PROCESS FOR IMPREGANTION OF GLASS FIBER REINFORCEMENT WITH THERMOPLASTIC RESINS

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1989, Ser. No. 331,199
Int. Cl.[5] B29C *43/52*
U.S. Cl. 264—25 **25 Claims**

1. A process for forming a glass fiber composite, comprising the steps of:

disposing a resin susceptible of being heated in a radio frequency electromagnetic filed in contact with a glass fiber mat;

sealing the resin and the glass fiber mat within a film which has a glass transition temperature and a melting point higher than the resin;

removing air form a space within the film to create a vacuum condition in said space; and

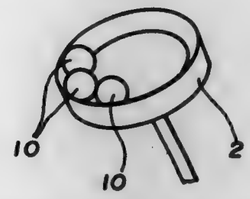
exposing the resin and glass fiber mat to a radio frequency electromagnetic field for a predetermined period of time sufficient to heat the resin to its melting or glass transition temperature wherein the glass fiber mat is impregnated with the resin.

5,194,191

PREPARATION OF THREAD-WOUND GOLF BALLS

Jun Nomura, and Junei Harada, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 31, 1991, Ser. No. 707,864
Claims priority, application Japan, Jun. 1, 1990, 2-144023
Int. Cl.[5] B29C *63/04, 71/04*
U.S. Cl. 264—25 **4 Claims**



1. A method for preparing a thread-wound golf ball, comprising the steps of: continuously winding a length of rubber thread around a frozen core to form a core ball;

immediately after formation of the core ball, causing the core ball to thaw by exposing the core ball to microwave radiation for heat thawing, thus eliminating the possibility of moisture condensation on the core ball, the core being thawed without substantial heating of the rubber thread; and

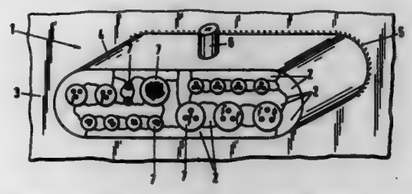
enclosing the core ball in a cover.

5,194,192

METHOD FOR PREPARING WATERTIGHT AND FIREPROOF CABLE DUCTS THROUGH CEILINGS AND WALLS

Heinrich Seebode, Hamburg, Fed. Rep. of Germany, assignor to STN Systemtechnik Nord GmbH, Bremen, Fed. Rep. of Germany

Filed Oct. 30, 1991, Ser. No. 784,694
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1990, 4036792
Int. Cl.[5] B32B *31/04;* E04B *1/16;* F16L *5/02;* H02G *3/04*
U.S. Cl. 264—35 **3 Claims**



1. A method of preparing a watertight and fireproof cable duct through ceilings and walls, the cable duct including a hollow body of specified length having an interior wall and

frontal areas, through which cable duct cables are pulled, the method of comprising the steps of:

(a) inserting the cables into the hollowing body of the cable duct;

(b) providing shaped parts for spacing the cables in a plane of at least one of the frontal areas of the hollow body and for filling all spaces and openings between the spaced cables, and between the spaced cables and the interior wall of the hollow body, wherein the shaped parts are modules made of compressed fibrous insulating material, such that a pretreating of the modules in a step of applying a liquid sealant thereto is not performed because the modules of compressed fibrous insulating material prevent a pourable compound from leaking out of the cable duct when filled into the cable duct;

(c) spacing the cables inserted into the hollow body in the plane of the at least one of the frontal areas with the modules of compressed fibrous insulating material;

(d) filling the spaces and openings between the spaced cables and between the spaced cables and the interior wall of the hollow body with the modules of compressed fibrous insulating material;

(e) filling an age-hardenable, pourable compound comprising two components into the cable duct such that the pourable compound penetrates the modules of compressed fibrous insulating material and forms therewith the watertight and fireproof cable duct upon hardening of the compound; and

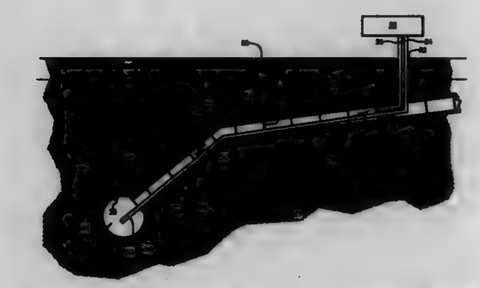
(f) allowing the pourable compound to harden and form the watertight and fireproof cable duct with the modules of compressed fibrous insulating material.

5,194,193

METHOD OF REPAIRING UNDERGROUND PIPE

Edward G. Humphreys, 8165 Oak Moss Dr., Cordova, Tenn. 38018, and Robert D. Rice, 1629 Kimbrough Rd., Germantown, Tenn. 38138

Filed Apr. 16, 1992, Ser. No. 869,763
Int. Cl.[5] B22D *19/10;* B29B *17/00;* B32B *35/00;* E04B *1/16*
U.S. Cl. 264—35 **21 Claims**



1. A method of repairing defects in underground gravity flow sewer pipe systems comprising the steps of:

providing a material having predetermined physical and thermal properties, said properties including a capacity repeatedly to be converted from a solid state to a liquid state by application of heat and a capacity repeatedly to be reconverted from said liquid state to said solid state by removal of heat;

isolating a section of pipe to be repaired;

heating said material to a liquid state;

flooding said isolated section of pipe with said liquid material;

forcing said liquid material into and through said defects and into contact with soil surrounding said pipe, whereby said liquid material in said defects and in contact with said soil loses heat to said soil and is cooled and is solidified to form seals in said defects;

maintaining said liquid material in said isolated section of pipe in said liquid state while said liquid material forced into and through said defects and into contact with said soil is cooled and is solidified;

removing unused liquid material from said isolated section of pipe; and

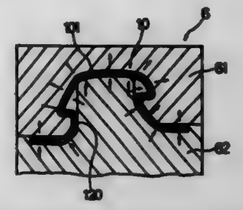
storing said unused liquid material for reuse.

5,194,194

METHOD FOR MOLDING SOFT SHEET MATERIAL

Takashi Kato; Keiso Ito; Hikaru Andoh, and Shoji Sakaida, all of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 27, 1991, Ser. No. 766,083
Claims priority, application Japan, Sep. 28, 1990, 2-261988; Feb. 18, 1991, 3-46080
Int. Cl.[5] B29C *51/10, 51/14*
U.S. Cl. 264—37 **9 Claims**



1. A method of molding soft sheet material comprising the steps of:

cutting a foam sheet into a shape necessary for forming a molded product;

sprinkling a skin powder onto a surface of said foam sheet;

heating said foam sheet sprinkled with skin powder to melt said skin powder on said foam sheet to form a skin layer and soften said foam sheet;

placing said softened foam sheet with said skin layer in a vacuum mold;

vacuum molding said foam sheet with said skin layer into a predetermined configuration corresponding to said molded product using a vacuum mold;

drawing the vacuum molded, foam sheet with said skin layer out of said vacuum mold; and

removing waste material to obtain said molded product; said waste material composed of foam sheet with no skin layer;

said sprinkling step including limiting said sprinkling to a predetermined area which covers said foam sheet surface only to an extent that corresponds to an entire surface of the molded product so that when the skin layer is formed, the skin layer will not cover portions of the foam sheet surface removed as waste in the formation of the molded product.

5,194,195

METHOD OF CONTROLLING INJECTION MOLDING MACHINE BY USE OF NOZZLE RESIN PRESSURES

Yoshikatsu Okushima, Chiba, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

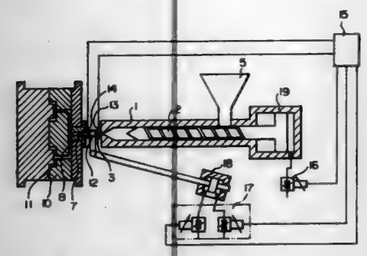
Filed May 12, 1992, Ser. No. 882,162
Claims priority, application Japan, May 14, 1991, 3-109049
Int. Cl.[5] B29C *45/77*
U.S. Cl. 264—40.1 **1 Claim**

1. A method of controlling an injection molding machine by use of nozzle resin pressures comprising the steps of:

metering a dose of resin by moving a screw feeder backwardly while rotating it;

detecting a resin pressure at the upstream side of a nozzle switching valve provided on the distal end of an injection nozzle while keeping said nozzle switching valve closed, and applying a pre-load on the resin at the front end of

said screw feeder by controlling an injection cylinder so that a transition of the detected resin pressure will have substantially the same wave form as a predetermined one;
opening said nozzle switching valve and advancing said screw feeder so as to press and inject the resin into a mold, and applying a dwell pressure on the resin in the mold after the injection;
controlling said injection cylinder and said nozzle switching valve during the injection and dwell pressure application steps so that a transition of a resin pressure at the downstream side of the nozzle switching valve will have substantially the same wave form as a predetermined one;
closing said nozzle switching valve after the dwell pressure application step; and
detecting the resin pressure at the upstream side of said nozzle switching valve while keeping the nozzle switching valve closed, and applying a back pressure on the resin at the front end of said screw feeder by controlling the injection cylinder so that a transition of the detected resin pressure will have substantially the same wave form as a predetermined one.

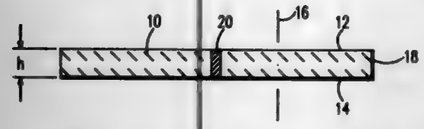


5,194,196

HERMETIC PACKAGE FOR AN ELECTRONIC DEVICE AND METHOD OF MANUFACTURING SAME

Dudley A. Chance, Newtown, Conn.; David B. Goland, Bedford Hills, and Ho-Ming Tong, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1989, Ser. No. 418,435
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—40.1 12 Claims



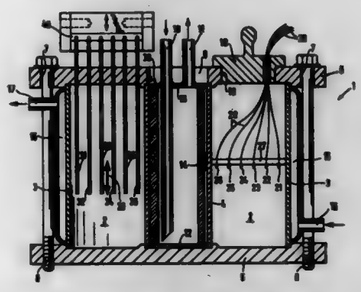
1. A method of manufacturing a hermetic package for an electronic device, said method comprising the steps of:
providing a green glass ceramic body, wherein the glass is a crystallizable glass, having first and second opposite surface and an axis extending from the first surface to the second surface, said green glass ceramic body having a thickness in the direction of the axis, said green glass ceramic body having an edge connecting the first and second opposite surfaces, said green glass ceramic body being substantially electrically insulating;
providing a green via in the green glass ceramic body, said green via extending from the first surface to the second surface, said green via comprising a mixture of an electrically conductive material and a glass ceramic material, said green glass ceramic body and green via forming a workpiece;
sintering the workpiece at a temperature at or above 500° C.; and
compressing the workpiece at a pressure at or above 100 pounds per square inch while sintering the workpiece, so as to obtain a hermetic package.

5,194,197

METHOD OF CHECKING THE GELLING PROCESS AFTER POURING A REACTIVE RESIN SYSTEM INTO A PRODUCTION MOULD

Kurt Musk, Grenzach, Fed. Rep. of Germany, and Jürg Heizler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 10, 1991, Ser. No. 712,851
Claims priority, application Switzerland, Jun. 13, 1990, 1986/90; Aug. 27, 1990, 2764/90
Int. Cl.[5] B29C *45/00*; G01N *25/02*
U.S. Cl. 264—40.1 7 Claims



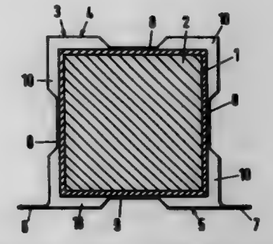
1. A method of determining a gelling process of a reactive resin system poured into a production mould for manufacture of a casting, which comprises:
(i) ascertaining in calibration measurements a gelling behavior of said resin system provided for the manufacture of said casting prior to pouring it into said production mould,
by pouring an amount of said resin system into a calibrating mould which is heatable to various predetermined calibrating mould temperatures:
by detecting at various of said calibrating mould temperatures, using gelling point probes, moments of gelling of several volume elements which display different gelling behaviors and are located inside said calibrating mould;
by detecting, using temperature sensors, associated first temperature versus time curves at various of said calibrating mould temperatures from a moment at which said resin system is introduced into said calibrating mould up to a maximum temperature occuring at a peak of an exothermic reaction after said moments of gelling;
by storing said first temperature versus time curves measured and respective temperatures associated with said moments of gelling and by determining and storing an associated calibration volume of a first comparison body associated with each of said first temperature versus time curves,
wherein each of said associated calibration volumes is defined as a product of a base area and a height of said first comparison body, said base area being an area between said respective first temperature versus time curve and a parallel to a time axis through a minimum temperature, within boundaries of said minimum temperature and said maximum temperature of said respective first temperature versus time curve, and said height corresponds to a gelling factor that changes in a direction of a temperature axis of said first temperature versus time curve, said gelling factor corresponding to a reciprocal of a gelling time at a temperature concerned;
(ii) pouring said resin system with thus ascertained gelling behavior into said production mould for the manufacture of said casting;
(iii) accomplishing a checking measurement during a hardening reaction of said resin system within said production mould while manufacturing said casting,
by detecting at several different measuring sites inside said production mould, under production conditions and using embeddable temperature sensors, second temperature versus time curves of said resin system poured into said production mould;
by storing said second temperature versus time curves measured and by determining and storing for each of said second temperature versus time curves determined at said several measuring sites within said production mould a measured volume of a second comparison body associated with said second temperature versus time curve,
wherein each of said measured volumes is defined as a product of a base area and a height of said second comparison body, said base area being an area between said respective second temperature versus time curve and a parallel to a time axis through a minimum temperature within boundaries of said minimum temperature and a maximum temperature of said respective second temperature versus time curve, and said height corresponds to a gelling factor that changes in a direction of a temperature axis of said second temperature versus time curve, said gelling factor corresponding to a reciprocal of a gelling time at a temperature concerned;
(iiii) comparing and determined and stored measured volumes of said second comparison bodies, said measured volumes being determined for said different measuring sites inside said production mould, with said calibration volumes of said first comparison bodies, said calibration volumes being stored together with said gelling moment temperatures, and determining for said different measuring sites within said production mould, by interpolating said measured volumes between said stored calibration volumes, associated interpolated individual gelling moment temperatures, from which, on the basis of said stored second temperature versus time curves detected in a spatially distributed manner, and on the basis of a pattern of isotherms resulting therefrom, the progress in time of a gelling front of said hardening resin system and its special progress within said production mould, said gelling front intersecting said isotherms, is deduced for each point in time during the manufacture of said casting.

5,194,199

METHOD OF PRODUCING A BEAM-LIKE STRUCTURAL PART HAVING A CORE OF LIGHT-WEIGHT MATERIAL

Holger M. Thum, Brunswick, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 7, 1992, Ser. No. 832,353
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1991, 4105302
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.6 2 Claims



1. A method for producing a longitudinal beam containing a reinforcing core of light-weight material and a hollow metal member consisting of profiled members engaging portions projecting away from the core and forming a longitudinally extending joint connected by application of heat comprising inserting in the hollow member a core of lightweight material having a shell of material which is expandable by heating, providing local projections extending between the core and the hollow member to produce open spaces between them, completing the hollow member by applying heat to said engaging portions projecting away from the core to form said longitudinally extending joint during which the open spaces provide thermal insulation for the core, and immersion-coating the longitudinal beam with heating to produce foaming of the shell material so as to fill the open spaces.

5,194,198

PROCESS FOR THE PRODUCTION OF MOULDED ARTICLES OF EXPANDED GRAPHITE

Wulf von Bonin, Odenthal; Ulrich von Gizycki, Leverkusen, and Klaus Krüger, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 14, 1991, Ser. No. 699,871
Claims priority, application Fed. Rep. of Germany, May 24, 1990, 4016710
Int. Cl.[5] B29C *67/20, 67/24*
U.S. Cl. 264—42 8 Claims

1. A process for the production of moulded articles having substantially homogeneous density and compressive strength by heating expandable graphite powder in moulds, in which process first the expandable graphite powder is pre-expanded outside the moulds by controlled heating at temperatures between 140° and 450° C. until a bulk density of 30 to 500 g/l has been reached, second at least 50% by volume of the moulds are filled with the graphite powder which was pre-expanded in this manner, and third the expansion of the pre-expanded graphite powder is then completed in the moulds by heating at temperatures in a range of from 300° to 700° C. to cause the pre-expanded graphite powder to uniformly fill the moulds and thus produce the moulded articles having the substantially homogeneous density and compressive strength.

5,194,200

METHOD OF CREATING SILICA CERAMIC MEMBRANES

Marc A. Anderson, and Lixin Cao, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 8, 1991, Ser. No. 773,058
Int. Cl.[5] C04B *33/32, 35/46*
U.S. Cl. 264—56 21 Claims

1. A method comprising creating a ceramic silica membrane with a range of porosity as low as less than 20 Angstroms by:
(a) hydrolyzing a silicon alkoxide with ammonia until a sol is formed;
(b) dialyzing the sol to a basic solution;
(c) acidifying the sol to below a pH of 7
(d) forming a xerogel by solvent evaporation in a controlled humidity environment; and
(e) sintering the xerogel until a membrane is formed.

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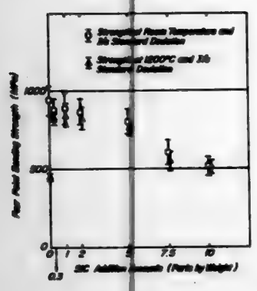
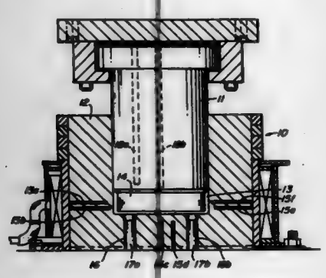
5,194,201
METHOD OF MANUFACTURING HIGH DENSITY SILICON NITRIDE SINTERED BODIES
Shinichi Miwa, Nagoya; Seiichi Asami, Okazaki, and Takehiro Kajihara, Komaki, all of Japan, assignors to NGK Insulators, Ltd., Japan
Continuation of Ser. No. 457,191, Dec. 26, 1989, abandoned. This application Aug. 14, 1991, Ser. No. 747,439
Claims priority, application Japan, Dec. 27, 1988, 63-327988
Int. Cl.[5] C04B *35/58*
U.S. Cl. 264—56 3 Claims



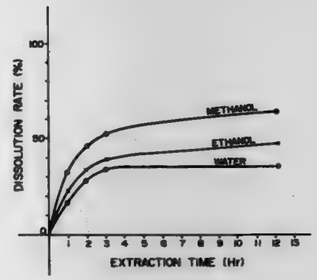
1. A method of manufacturing a silicon nitride sintered body comprising the steps of:
preparing a powder of powdery raw materials consisting of 100 parts by weight of silicon nitride, 2–15 parts by weight of a rare earth element, 0.5–15 parts by weight of an Mg compound, 0.5–13 parts by weight of a Zr compound, 0.3–5 parts by weight of SiC having an average particle size of 0.2–0.5 μm, and a forming aid, each amount of the powdery raw materials being designated by converted oxide amounts;
molding the prepared powder; and
firing the resulting molding at atmospheric pressure.

5,194,202
FORMATION OF CERAMIC-METAL COMPOSITE BY PRESSURE CASTING AND OXIDATION SINTERING
David I. Yun, Murrysville; Robert A. Marra, Penn Hills; Thomas B. Gurganus, New Kensington, all of Pa., and P. Victor Kelsey, Jr., Wilmington, Del., assignors to Aluminum Company of America, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 563,046, Aug. 3, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 757,932
Int. Cl.[5] C04B *40/00*; B22D *19/00*
U.S. Cl. 264—60 20 Claims



1. A method of forming a ceramic-metal composite comprising the steps of:
(a) providing a body of ceramic reinforcing material, said body comprising a substrate defining a network of open spaces;
(b) infiltrating a molten metal into said open spaces of the body at an elevated pressure greater than about 1000 psi;
(c) cooling said metal, thereby to form a solid ceramic-metal composite; and then
(d) reacting about 5–50 wt.% of said metal in the composite at an elevated temperature with an oxidizing gas comprising O_2 to convert said metal to a ceramic material containing oxygen.

5,194,203
METHODS OF REMOVING BINDER FROM POWDER MOLDINGS
Yoshimitsu Kankawa; Yasunari Kaneko, both of Otsu, and Norio Kanehara, Niraaaki, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed Dec. 31, 1991, Ser. No. 815,428
Claims priority, application Japan, Feb. 28, 1991, 3-055676; Mar. 29, 1991, 3-089133
Int. Cl.[5] C04B *41/91*
U.S. Cl. 264—63 8 Claims

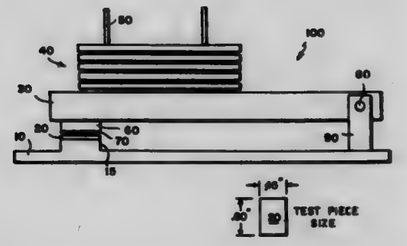


1. In a method which comprises mixing a powder material and a binder in a predetermined ratio and kneading the mixture so that substantially the entire surfaces of the powder particles are covered by the binder, molding the kneaded mixture into the shape of a desired product, then removing the binder from the molding without causing expansion or cracks in the molding before sintering, wherein the improvement comprises:
(a) said binder comprises a mixture of (1) one or more first organic binding substances soluble in an alcohol and in a non-alcohol organic solvent selected from the group consisting of benzene, xylene, toluene, ketones and mixtures thereof, and (2) one or more second organic binding substances insoluble in said alcohol and said non-alcohol organic solvent;
(b) said molding is contacted with a mixture of said alcohol and said non-alcohol organic solvent to extract from said molding said organic binding substances soluble in said mixed solvent, the mixture ratio of said mixed solvent being determined so as to control the dissolution of the organic binding substances to an appropriate rate so as to prevent cracking and collapsing of said molding; and
(c) then removing said organic binding substances insoluble in said mixed solvent and remaining in said molding by heat-decomposition.

5,194,204
PROCESS FOR PRODUCING A SILICIZED SILICON CARBIDE DIPPING FORMER
Gunter Adasch, Marktredwitz, and Jürgen Huber, Selb, both of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany
Filed Jan. 30, 1990, Ser. No. 472,250
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902936
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—63 3 Claims

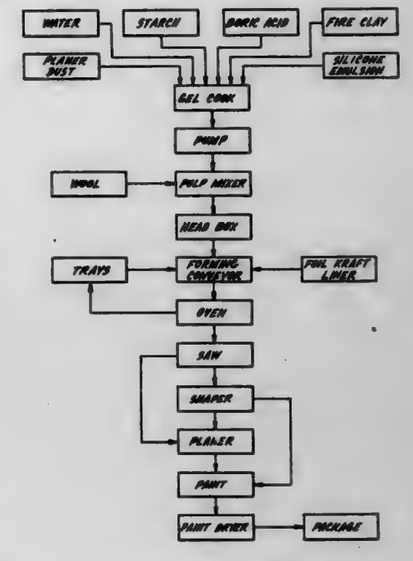
1. A process for making a ceramic dipping former from silicized silicon carbide, comprising:
making an absorbent negative mold of the ceramic dipping former;
preparing a suspension containing at least two particle size fractions of silicon carbide, a binder and water;
pouring said suspension into said absorbent negative mold;
drying said suspension in said absorbent negative mold to make a silicon carbide green body;
opening said absorbent negative mold and removing said silicon carbide green body;
spraying said silicon carbide green body with a slip using said suspension;
further drying said silicone carbide green body in a drying oven; and
silicizing said silicon carbide green body at a temperature between approximately 1400° C. to 1750° C. under reduced pressure.

5,194,205
PROCESS FOR FORMING A FORCE SENSOR
John Ehrreich, Maynard, Mass., assignor to Ercon, Inc., Waltham, Mass.
Continuation of Ser. No. 323,283, Mar. 14, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 599,277
Int. Cl.[5] B29C *59/02*
U.S. Cl. 264—104 20 Claims



1. A process for forming a force sensor component having a surface topography which comprises a plurality of adjoining ridges, comprising:
selecting a conductive material formable into a dimensionally stable body;
selecting a mold having an inverse surface impression comprising pluralities of adjoining ridges; and
molding the conductive body into a dimensionally stable body having the pluralities of adjoining ridges thereon.

5,194,206
PROCESS FOR THE MANUFACTURE OF CEILING TILE
John D. Koch, Greenwood; Mark R. Glassley, Greensburg; Richard N. Cunningham, Greenwood, and C. F. Owen, Mendowview, all of Ind., assignors to Knauf Fiber Glass, GmbH, Shelbeyville, Ind.
Filed Oct. 2, 1989, Ser. No. 415,588
Int. Cl.[5] B27N *3/18*; B28B *5/04*; B29C *43/06*; D21B *1/04*
U.S. Cl. 264—115 6 Claims



1. A process for manufacturing ceiling tiles comprising the steps of:
preparing a mixture which includes water, starch, boric acid and fire clay,
heating said mixture to form a gel,
shredding scrap fiber glass prior to its addition to said gel to form shredded fiber glass,
adding fibrous material comprising said shredded fiber glass to said gel to form a pulp,
wherein said pulp comprises the following components:

COMPONENT	PER CENT BY WEIGHT
Water	about 80 to about 85
Starch	about 2 to about 5
Boric Acid	about 0.15 to about 0.35
Fire Clay	about 0.7 to about 0.95
Planer Dust	about 0 to about 8
Silicone Emulsion	about 0 to about 0.1
Scrap Fiber glass	about 5 to about 15

feeding said pulp into trays to form slabs,
drying said slabs in an oven to form dried slabs in accordance with a temperature schedule as follows:
a. raise to about 250° F. in about ½ hour
b. hold at about 250° F. for about 2 hours
c. hold at about 275° F. in about ½ hour
d. hold at about 375° F. for about 4 hours
e. reduce to about 350° F. and hold for about 2 hours
f. reduce to about 325° F. and hold for about 2 hours
g. reduce to about 300° F. and hold for about 2 hours
h. reduce to about 250° F. and hold for about 3 hours, and
finishing said dried slabs to form said ceiling tiles.

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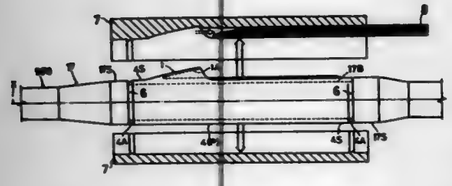
5,194,207
FISHING ROD MANUFACTURING METHOD
Izumi Takada; Kiyohiko Matsumoto, and Jun Saeki, all of Sakai, Japan, assignors to Shimano, Inc., Osaka, Japan
Filed Jan. 7, 1991, Ser. No. 711,873
Claims priority, application Japan, Jan. 14, 1990, 2-156469; Sep. 28, 1990, 2-262355
Int. Cl.[5] B29C *45/14*; A01K *87/06*
U.S. Cl. 264—129 6 Claims

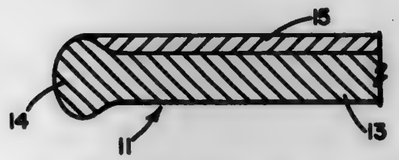


1. A method of manufacturing a fishing rod, the method comprising the steps of:
forming on a rod material a resin layer having reinforcing fibers extending substantially circumferentially of said rod material;
baking said rod material with said resin layer;
forming substantially flat side portions of an outer surface of said resin layer to contact a die so as not to form any gaps when said side portions come into contact with said die;
forming an annular small diameter portion by thinning a central portion of said outer surface of said resin layer between said side portions, said small diameter portion being continuous with and between a pair of walls in said resin layer substantially perpendicular to an axis of said rod material;
placing a pair of mating dies respectively on said side portions to form a cavity surrounding said small diameter portion; and
forming a seat base between said pair of walls to act as a reel seat by pressure-injecting a heated thermoplastic resin into said cavity.

5,194,208
PROCESS OF CURING A FLEXIBLE HOSE
Steven F. Monthey, Candler; Charles S. Pearson, Waynesville, and Randall E. Sellers, Sylva, all of N.C., assignors to Dayco Products, Inc., Dayton, Ohio
Filed May 10, 1989, Ser. No. 349,605
Int. Cl.[5] B29C *71/02*
U.S. Cl. 264—130 11 Claims

1. In a method for curing a tubular member on a mandrel which comprises:
applying a polyoxyalkylene based lubricant to the inside surface of an uncured length of a tubular member or to the surface of said mandrel;
sliding said uncured length of said tubular member onto said mandrel;
heating said tubular member, and
sliding said cured tubular member from said mandrel, the improvement wherein said lubricant exhibits a pH greater than 8.0.

5,194,209
MAKING OPACIFIED PEARLESCENT MULTILAYER LOUVER FOR VERTICAL BLINDS
Paul R. Schwaegerle, Oberlin, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio
Division of Ser. No. 505,374, Apr. 4, 1990, Pat. No. 5,119,871.
This application Mar. 25, 1992, Ser. No. 858,385
Int. Cl.[5] B29C *47/04*
U.S. Cl. 264—132 6 Claims



1. A process for making a multilayer louver slat wherein one or more outer opacified pearlescent layers are combined with a base layer, which is a substrate for said outer layer(s), said outer layer(s) comprising a polymer matrix, pearlescent pigmentation, and opacifying pigment such that a 4 mil thickness of said layer(s) not in combination with said base layer, has a percent reflectance ratio according to TAPPI method T 425 om-86 of between about 60% and about 90%, so as to provide a pearlescent appearance and light blocking features in one louver.

5,194,210
PROCESS FOR MAKING POLYKETONE FIBERS
Bert J. Lommerts, MD Dieren; Jan Smook, DH Dieren; Bastiaan Krins, Westervoort, all of Netherlands; Andrzej M. Pietrowski, Peekskill, and Elliot I. Band, North Tarrytown, both of N.Y., assignors to Akzo NV, Arnhem, Netherlands
Filed May 2, 1991, Ser. No. 694,630
Claims priority, application European Pat. Off., May 9, 1990, 90201174; Jul. 9, 1990, 90201827.4
Int. Cl.[5] D01F *6/00*
U.S. Cl. 264—184 28 Claims

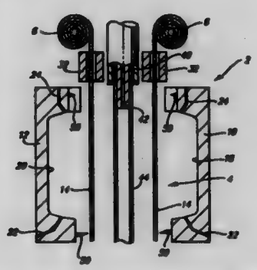
1. A process for making a high tensile strength and high modulus fiber from a linear alternating polymer of carbon monoxide and ethylene having an estimated molecular weight of at least 100,000 g/mol, which process comprises extruding a solution of the polymer in a mixture of solvents, at least one of which is an aromatic alcohol being free of alkyl radical substituents on the aromatic nucleus and another of which is a liquid other than an aromatic alcohol, into a shaped solvent-containing article at an extrusion rate of at least 1 m/min, the article solidifying by cooling or coagulating in a non-solvent for the polymer, and the solvent being removed from it by extraction with a non-solvent for the polymer which is soluble in the mixture of solvents, whereupon the article is drawn at a temperature of at least 180° C.

5,194,211
BAR STAMPING
Michael J. Adams, and Brian Edmondson, both of South Wirral, England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Oct. 9, 1991, Ser. No. 773,470
Claims priority, application United Kingdom, Oct. 10, 1990, 9022027
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—320 8 Claims

1. In a process for stamping bars of a material selected from the group consisting of soap, non-soap detergent and mixtures thereof in which a billet of said material is located between a pair of opposing die members which are urged together to stamp the billet into a bar, the improvement wherein for at least part of the travel of the dies from initial contact with the billet to their point of closest approach, their relative velocity (V) decreases at a rate which is more than proportional to the change in the distance (h) between the dies so that the velocity V_a at a distance h_a and the velocity V_b at a later distance h_b are related by the inequality

$$\frac{V_b}{V_a} < \frac{h_b}{h_a}.$$

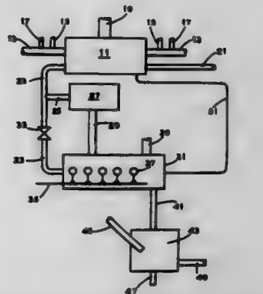
5,194,212
METHOD OF MANUFACTURING A FIBER-REINFORCED STRUCTURE HAVING A HOLLOW BLOW-MOLDING CORE
Roy E. Bonnett, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 18, 1990, Ser. No. 629,773
Int. Cl.[5] B29C *49/04*, *49/18*, *49/20*
U.S. Cl. 264—513 13 Claims



1. A method of manufacturing a hollow fiber reinforced structure, using a mold having interior walls defining said structure, said mold having an inlet port communicating with said interior walls for the injection of resin, said method comprising the steps of:
dispensing a fibrous material along said interior walls;
extending a blow-moldable parison in said mold and applying pressure to inflate said parison, wherein said parison forces said fibrous material against said interior walls of said mold;
injecting resin through said inlet port to impregnate said fibrous material with resin; and
curing said resin to form said hollow fiber reinforced structure.

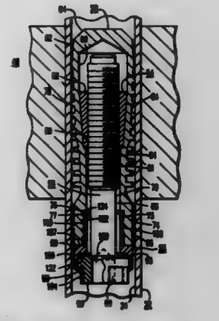
5,194,213
COPPER SMELTING SYSTEM
Carlos M. Diaz, Mississauga, and Malcolm C. E. Bell, Oakville, both of Canada, assignors to Inco Limited, Toronto, Canada
Continuation-in-part of Ser. No. 737,217, Jul. 29, 1991. This application Apr. 28, 1992, Ser. No. 875,063
Int. Cl.[5] C21B *7/00*
U.S. Cl. 266—142 5 Claims

1. A copper smelting system comprising:
a) an oxygen flash furnace for oxidizing copper sulfide concentrates in the presence of silica flux to form molten copper matte and a discardable molten silicate slag;
b) a converter vessel fitted with oxidant gas injectors and containing molten siliceous slag, molten white metal and molten semi-blister copper said oxidant gas injectors being positioned below the level of white metal and semi-blister copper during operation;
c) a finishing furnace fitted with lance means for oxidant or reductant gas and containing molten copper richer in grade than semi-blister copper stirred from the bottom by an inert gas;
d) first transfer means for transferring matte from said oxygen flash furnace to said converter vessel;
e) second transfer means for transferring molten semi-blister copper from said converter vessel to said finishing furnace;
f) third transfer means for transferring copper product from said finishing furnace;



g) fourth means for transferring siliceous slag from said converter vessel to said oxygen flash furnace;
h) fifth means for balancing the rates of transfer of said first, second and third transfer means to maintain the copper content of said converter vessel at a steady state; and
i) an oxidant gas supply for said converter vessel and said finishing furnace.

5,194,214
TUBE PLUG AND METHOD FOR PLUGGING A TUBE
David A. Snyder, North Huntingdon; Eric R. Habermann, White Oak; James W. Everett, Hempfield Township, Westmoreland County, and John D. Nee, Level Green, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 13, 1991, Ser. No. 699,406
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—203 19 Claims



1. A tube plugging device, comprising:
a first member having a bore at least partially therethrough, said bore having a portion with inside diameter threads;
a second member disposed in said bore of said first member;
an annular locking cup, disposed in said bore of said first member, having an inward open end portion and an outward open end portion, said inward open end portion having outside diameter threads corresponding to said inside diameter threads of said first member for threaded engagement of said locking cup and said first member;
at least one of said second member and said locking cup having at least one recess therein, the other of said second member and said locking cup deformable to engage said

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recess for securing said first member, said second member, and said locking cup together; and

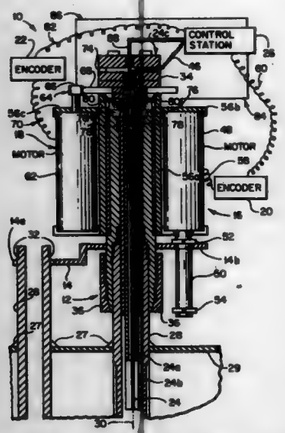
said outside diameter threads of said locking cup having a deformed portion, said deformed portion including at least two segments of said outside diameter threads having at least one protuberance positioned between a crest and a root of said outside diameter threads and having at least one portion of a root of said deformed portion offset from a root of the remainder of said deformed portion, said offset of said root being axially aligned with said protuberance for resisting the threading of said locking cup into and out of said first member for preventing the inadvertent separation of said first member, said second member, and said locking cup.

5,194,215

AUTOMATED ROBOTIC EQUIPMENT FOR ULTRASONIC INSPECTION OF PRESSURIZER HEATER WELLS

Henry D. Nachber, Ballston Lake; Raymond S. DeRossi, Amsterdam, and Lawrence E. Mullins, Middle Grove, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 20, 1991, Ser. No. 762,967
Int. Cl.[5] G21C *17/017*
U.S. Cl. 376—249 16 Claims



1. An automated robotic device which can be used in a horizontal or vertical position for providing inspection of pressurizer heater wells, said device comprising:

a removable probe assembly, liftable from a mounting means, including probe means for entering a heater well, for gathering data regarding the condition of the heater well and transmitting a signal carrying said data;

a mounting means for mounting said probe assembly at the opening of the heater well so that the probe means can enter the heater well, wherein said mounting means includes a hollow mounting shaft into which said probe assembly extends and a clamping sleeve for securing said shaft in place on the exterior of the heater well;

a first motor subassembly mounted on said mounting means exterior to said mounting shaft for providing movement of said probe assembly in an axial direction; and

a second motor subassembly mounted on said mounting means exterior to said mounting shaft for providing movement of said probe assembly in an axial direction; and

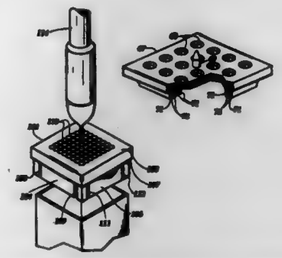
a second motor subassembly mounted on said mounting means exterior to said mounting shaft for providing rotation of said probe assembly.

5,194,216

GUIDE PLATE FOR LOCATING RODS IN AN ARRAY

John D. McDaniels, Jr., Duluth, Ga., assignor to Nuclear Assurance Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 570,812, Aug. 22, 1990, Pat. No. 5,098,644. This application Feb. 5, 1992, Ser. No. 831,404
Int. Cl.[5] G21C *19/32*
U.S. Cl. 376—261 14 Claims



1. A tool guiding means for use in a rod consolidation system where individual rods are withdrawn from an array of rods in a first fuel rod holder having a plurality of rod locations by means of a pulling tool having a distal, rod grasping end and are transferred to a second rod holder having a plurality of rod locations, said tool guiding means comprising;

access means for providing access to a plurality of discrete rod locations simultaneously, said access means comprising;

apertures guide means having a plurality of apertures for guiding the distal end of the tool to a position directly over any one of the plurality of rod locations accessed by said access means,

said apertures being shaped to receive the distal, rod grasping end of the pulling tool, and

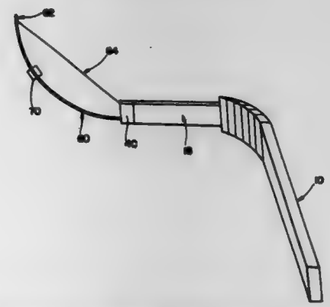
said guide means having locating means thereon for positioning said guide means in any one of a plurality of discrete locations relative to the rod holder.

5,194,217

ARTICULATED SLUDGE LANCE WITH A MOVABLE EXTENSION NOZZLE

Daniel M. St. Louis, Plymouth, Mich., and William G. Schneider, Branchton, Canada, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 10, 1992, Ser. No. 819,249
Int. Cl.[5] G21F *9/00*
U.S. Cl. 376—316 9 Claims



1. An improved articulated sludge lance having a manipulator member, a plurality of block members attached to one end of the manipulator member and being actuatable to form an arc, and a fluid distribution member situated within the manipulator member for passing fluid therethrough, the improvement comprising:

a flexible conduit constructed to extend out from an outer most end of the fluid distribution member;

means for translating said flexible conduit from a first position where said flexible conduit is substantially situated inside the fluid distribution member for facilitating movement through a tube lane in a steam generator to a second position wherein said flexible conduit extends out of the fluid distribution member for cleaning; and

means for positioning said flexible conduit in a preset direction for directing the fluid in close proximity to a support plate for cleaning the steam generator.

5,194,218

TUNGSTEN-YTTRIA CARBIDE COATING FOR CONVEYING COPPER

Albert J. Rothman, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 18, 1988, Ser. No. 241,234
Int. Cl.[5] B22F *7/00*
U.S. Cl. 419—1 15 Claims

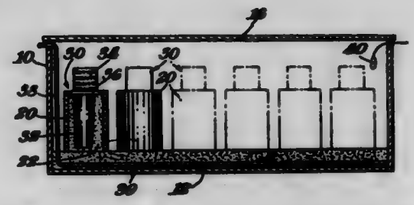
1. A method for forming a copper-wettable carbided tungsten-yttria inner surface of a laser housing comprising alumina, comprising the steps of applying to the alumina surface to be exposed to copper vapor a coating of a suspension comprising tungsten and yttria in volatilizable solvent; drying said coating; sintering the dried coating at a temperature in the range of about 1500°–1700° C.; carbiding the sintered surface by heating said surface while in contact with a carbon source at a temperature of at least 1400° C.

5,194,219

METAL DIFFUSION AND AFTER-TREATMENT

Alfonso L. Baldi, Sea Isle City, N.J., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Division of Ser. No. 905,247, Sep. 8, 1986, Pat. No. 5,128,179, and a continuation-in-part of Ser. No. 862,712, May 13, 1986, Pat. No. 4,871,708, and a continuation-in-part of Ser. No. 830,767, Feb. 19, 1986, Pat. No. 4,799,979, and a continuation-in-part of Ser. No. 777,755, Sep. 19, 1985, abandoned, and a continuation-in-part of Ser. No. 707,656, Mar. 4, 1985, Pat. No. 4,824,482, and a continuation-in-part of Ser. No. 685,910, Dec. 27, 1984, Pat. No. 4,820,362, and a continuation-in-part of Ser. No. 643,781, Jul. 17, 1984, abandoned, and a continuation-in-part of Ser. No. 584,538, Feb. 28, 1984, Pat. No. 4,845,139, and a continuation-in-part of Ser. No. 559,334, Dec. 8, 1983, abandoned, and a continuation-in-part of Ser. No. 538,541, Oct. 3, 1983, Pat. No. 4,830,931, and a continuation-in-part of Ser. No. 507,174, Jun. 23, 1983, Pat. No. 4,694,036, and a continuation-in-part of Ser. No. 488,103, Apr. 25, 1983, Pat. No. 4,615,920, and a continuation-in-part of Ser. No. 310,085, Oct. 9, 1981, Pat. No. 4,617,202, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913. This application Jul. 7, 1992, Ser. No. 909,723
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[5] B22F *9/20*; C06B *45/32*
U.S. Cl. 419—37 7 Claims



1. The process of preparing pyrophoric powder, which process is characterized by the steps of mixing a quantity of iron powder with a larger quantity of aluminum powder and with a diffusion activator but without a solid diluent, heating the mixture in a retort to a temperature below 1200° F. to cause the aluminum to diffuse into the iron particles and at least partially sinter particles together, cooling the resulting produce and grinding it to produce very fine aluminized iron particles, and then subjecting the very fine particles to caustic leach to pyrophorically activate them.

5,194,220

AUSTENITIC CAST STEEL AND ARTICLES MADE THEREOF

Norio Takahashi, Oomiya, and Toshio Fujita, Tokyo, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Aug. 1, 1991, Ser. No. 739,823
Claims priority, application Japan, Aug. 2, 1990, 2-205461; Jul. 29, 1991, 3-188457
Int. Cl.[5] C22C *38/44*
U.S. Cl. 420—53 29 Claims

1. An austenitic cast steel having a composition consisting essentially, by weight, of:

C: 0.20–0.60%,
Si: 2.0% or less,
Mn: 1.0% or less,
Ni: 8.0–20.0%,
Cr: 15.0–30.0%,
W: 2.0–6.0%,
Nb: 0.2–1.0%,
B: 0.001–0.01%,

the balance being Fe and inevitable impurities, said steel having a high resistance to thermal fatigue.

5,194,221

HIGH-CARBON LOW-NICKEL HEAT-RESISTANT ALLOYS

John H. Calling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Jan. 7, 1992, Ser. No. 817,751
Int. Cl.[5] C22C *38/44*
U.S. Cl. 420—53 15 Claims

1. A nickel-chromium-iron alloy consisting essentially of about:

Nickel	7.5–18% by weight
Chromium	23.5–35
Carbon	0.85–1.4
Molybdenum	0.2–1.8
Tungsten	0.2–1.6
Columbium	0.1–1.6
Manganese	0.2–4

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-continued

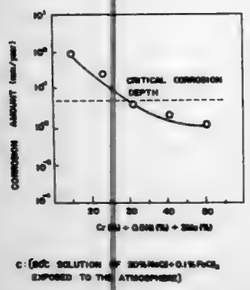
Silicon	0.2–2.5
Cobalt	up to about 1.5
Titanium	up to about 0.6
Zirconium	up to about 0.4
Boron	up to about 0.1
Nitrogen	up to about 0.7
Rare earth elements	up to about 0.4
Iron	essentially the balance

5,194,222

ALLOY AND COMPOSITE STEEL TUBE WITH CORROSION RESISTANCE IN COMBUSTION ENVIRONMENT WHERE V, NA, S AND C1 ARE PRESENT

Hiroyuki Ogawa; Tetsuo Ishitsuka; Kozo Deapo; Akihiro Miyasaka; Michihisa Ito, all of Kasagawaken, and Mizuo Sakakibara, Yamaguchiken, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 810,882
Claims priority, application Japan, Dec. 21, 1990, 2-405284
Int. Cl.[5] C22C *19/05, 30/00*
U.S. Cl. 420—585 2 Claims



C: (80C SOLUTION OF 30%NaCl+0.1%HCl, EXPOSED TO THE ATMOSPHERE)

1. An alloy exhibiting corrosion resistance in a combustion environment where V, Na, S and Cl are present consisting essentially of, in weight percent, not more than 0.05% C, 0.02–0.5% Si, 0.02–0.5% Mn, 15–35% Cr, 0.5–4% Mo, 10–40% Co, 5–15% Fe, 0.5–5% W, 0.0003–0.005% Ca and the remainder of Ni at a content of not less than 4% and unavoidable impurities, provided that Cr (%)+0.5 Ni (%)+3 Mo (%)≧30 (%) and Ni (%)+0.5 Co (%)>Cr (%)+Mo (%)+Mo (%)+W (%).

5,194,223

METHODS FOR INHIBITING THE CORROSION OF IRON-CONTAINING AND COPPER-CONTAINING METALS IN BOILER FEEDWATER SYSTEMS

Roger D. Moulton, The Woodlands, Tex., and Paul R. Burgmayer, Wayne, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Nov. 19, 1991, Ser. No. 794,532
Int. Cl.[5] C23F *11/08*
U.S. Cl. 422—16 8 Claims

1. A method for simultaneously inhibiting the corrosion of copper-containing and iron-containing metals in contact with feedwaters of a steam generating system comprising adding to said feedwaters an effective amount of 1,10-phenanthroline for the purpose of inhibiting corrosion.

5,194,224

MOISTURE INDICATOR FOR A RESPIRATORY PROTECTION DEVICE

Claus-Bernd Plötz, Stockelsdorf; Horst Wezarek, Ratzeurg, and Gunther Kolbe, Mölln, all of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany

Filed Oct. 10, 1991, Ser. No. 776,823
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1990, 4035493
Int. Cl.[5] A62B *7/08;* G01N *21/75*
U.S. Cl. 422—55 15 Claims

15. A moisture detector indicating a presence of water by a change of visible reflective light, the detector comprising:
a cartridge means containing alkali metal ozonide.

5,194,225

CHROMATOGRAPHY COLUMN CARTRIDGE SYSTEM

Werner Müller, Heppenheim; Friedhelm Eisenbeiss, Weiterstadt; Jochen Kinkel, Guldental, and Helmut Kohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschraukter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,087
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1987, 3729002
Int. Cl.[5] G01N *30/02;* B01D *15/08*
U.S. Cl. 422—70 3 Claims

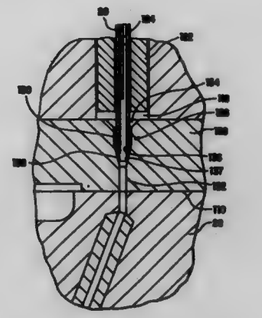
1. A chromatography column and cartridge system for analyzing material in a solution comprising:
a glass tube for containing an adsorbent, the glass tube having a selected external diameter;
a transparent jacket having an internal diameter greater than the external diameter of the glass tube and having threaded end portions;
a union nut threaded to at least one of the threaded end portions of the transparent cylindrical jacket, the union nut having first and second ends and an internal cylindrical opening therethough which contains a shoulder in juxtaposition with the end of the glass tube, the internal cylindrical opening having threads disposed between the shoulder and the first end of the union nut;
a milled nut having a central bore, the milled nut being screwed into the internal cylindrical opening outboard of the shoulder and having an end surface in engagement with the shoulder;
a plunger having a bore therethrough and being made of a resilient material, the plunger having first and second portions, being received in both the glass tube and the bore of the milled nut and having a frusto-conical end disposed for sealing against the glass tube;
means for retaining the plunger in the glass tube, the retaining means comprising a first tube in threaded engagement with the bore of the milled nut and receiving the first portion of the plunger therein, the first tube having an end portion for applying an axial force against the second portion of the plunger to urge the second portion of the plunger radially against the inner wall of the glass tube, the retaining means further including a second tube slidably received within the first tube, the second tube having first and second threaded ends with the first end being in threaded engagement with a threaded bore within the plunger;
a locking nut threadably engaged with the second end of the second tube and abutting the end of the first tube to lock the second tube in place, and
tube means passing through the plunger and in communication with the adsorbent in the glass tube for transporting the material to be analyzed by the chromatography system.

5,194,226

DOSING DEVICE FOR ANALYZING APPARATUS

Toma Tomoff; Wolfgang Chlosta; Viktor Löchle, and Henry Klemm, all of Überlingen, Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Filed Oct. 16, 1990, Ser. No. 598,492
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 3934699
Int. Cl.[5] B01L *3/02;* G01N *33/00, 35/06*
U.S. Cl. 422—100 11 Claims



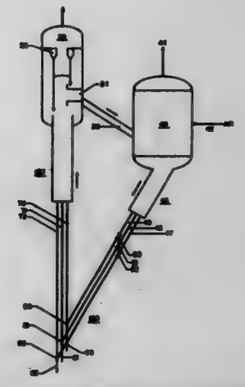
1. Dosing device for analyzing apparatus, comprising:
a dosing loop (22) having a first end and a second end;
a change-over valve (24) connected to said dosing loop (22) and containing a stationary member (28) and a movable member (26) which is movable between a first and a second position relative to the stationary member (28);
said movable member (26) of said change-over valve (24) containing a sample inlet (56) and a sealing body (108) interposed between said movable member and said stationary member;
said change-over valve (24) assuming a first position in which the sample inlet (56) is connected to the first end of the dosing loop (22) and the second end of the dosing loop (22) is connected to a waste port (42) of the stationary member (28);
said change-over valve (24) assuming a second position in which the second end of the dosing loop (22) is connected to a carrier liquid port of the stationary member and the first end of the dosing loop (22) is connected to an analyzing apparatus port of the stationary member;
a dosing needle (20) having a front end and a rear end;
an actuating mechanism (141) coupled to said dosing needle (20) for selectively introducing the front end of the dosing needle into either one of a sample vessel (10) or the sample inlet (56) of the change-over valve (24);
a sample pump (66) connected to the rear end of the dosing needle (20) for aspirating sample liquid from the sample vessel (10) into the dosing needle (20) when the front end of the dosing needle (20) is placed in the sample vessel (10);
wherein said sample pump (66) transfers aspirated sample liquid from the dosing needle (20) into the dosing loop (22) when the first end of the dosing loop (22) is connected to the sample inlet (56) of the change-over valve (24) in the first position of the change-over valve;
the dosing needle (20) having formed at its front end (137) a tapered sealing surface (138);
the sample inlet (56) of said movable member (26) of the change-over valve (24) comprising a sample inlet passage (128) extending through the sealing body (108) of the change-over valve (24);
said sample inlet passage (128) having a straight first section (130) for receiving the front end (137) of the dosing needle (20) in a spaced relationship;
said sample inlet passage having a second section (132) having a smaller cross-section than said straight first section;
said sealing body (108) interposed between said movable member (26) and said stationary member (28) of said change-over valve (24), defining a control surface (110) which engages said stationary member and into which opens said second section (130) of said sample inlet passage (128);
an annular shoulder (136) defined between the straight first section (130) and the second section (132) of said sample inlet passage (128) within said sealing body (108) of said movable member (26) of the change-over valve (24); and
said annular shoulder (136) having a tapered configuration substantially complementary to said tapered sealing surface (138) formed at the front end (137) of said dosing needle (20) for sealing engagement with said front end (137) of said dosing needle (20).

5,194,227

MULTIPLE WYE CATALYTIC CRACKER AND PROCESS FOR USE

Charles B. Miller, Ashland, and Howard F. Moore, Catlettsburg, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 2, 1991, Ser. No. 770,205
Int. Cl.[5] B01J *8/26*
U.S. Cl. 422—140 9 Claims



1. In a hydrocarbon cracking process comprising cracking in a cracking riser in which catalyst and hydrocarbon feed are intermixed under cracking conditions, separating in a separator cracked products from catalyst which has become coked dur-

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ing the cracking step, and removing said coke from said catalyst by oxidation in a regenerator, transporting said catalyst from said regenerator to said riser, contacting said hydrocarbon in said riser, thereafter separating said catalyst from cracked products in said separator and recycling to said regenerator, the improvement comprising in combination:

a. providing a cracking common riser in communication with a separator, and in communication with a regenerator by means of a plurality of parallel catalyst return lines connected to respective individual parallel cracking risers which are connected to said regenerator, said plurality of parallel cracking risers being connected to said common cracking riser, and said separator being in fluid communication with said regenerator,

b. injecting into each of said individual risers a respective hydrocarbon feed at a point between said regenerator and said common riser;

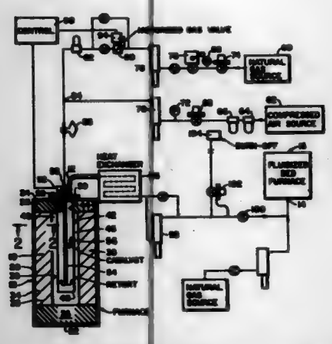
whereby each of said hydrocarbon feeds is intermixed with freshly regenerated catalyst from said regenerator; and wherein at least some of said feeds are different in composition from other of said feeds, and wherein substantial cracking takes place in said individual parallel cracking risers prior to each individual mixture of oil and catalyst entering said common riser.

5,194,228

FLUIDIZED BED APPARATUS FOR CHEMICALLY TREATING WORKPIECES

Roger F. Carlson, Dousman, and Jeffrey P. Weiss, Milwaukee, both of Wis., assignors to General Signal Corporation, Stamford, Conn.

Filed Oct. 12, 1990, Ser. No. 596,997
Int. Cl.[5] B01J *8/18*; C21D *1/48*
U.S. Cl. 422—143 7 Claims



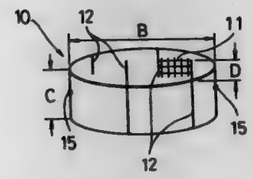
1. A combination fluidized bed reactor and endothermic generator comprising, a fluid tight reaction vessel, said reaction vessel having a central axis of elongation and a top end and a bottom end, said reaction vessel being vertically disposed, means defining a plenum chamber mounted in fluid tight engagement on the reaction vessel at the bottom end thereof, said plenum chamber means having a base plate with means defining an inlet orifice disposed at the bottom end of the reaction vessel, a collar having one end mounted on the base plate, and a flat top plate mounted on the collar and disposed normal to the axis of elongation of the reaction vessel, the base plate, collar and top plate being sealed to each other against fluid leakage, and the top plate having means defining a plurality of apertures for distributing gas evolving from the plenum chamber, a porous ceramic layer having parallel opposite sides disposed with one side abutting the top plate of the plenum chamber means and extending across the reaction vessel, a bed of heat resistant granules and granulated activator disposed within the reaction vessel between the porous ceramic layer and the top of the reaction vessel, means disposed exteriorly of the reaction vessel for heating the granules in the reaction vessel to establish and maintain a reaction temperature with the reaction vessel, and means for providing a source of endothermic gas connected to the plenum chamber, an endothermic gas generator disposed external to said fluidized bed reactor and having means for providing a source of oxygen at a pressure above the pressure of the endothermic gas to be produced by the generator, a first pressure reduction valve having an inlet connected to the means for providing a source of oxygen and an outlet, means for providing a source of hydrocarbon gas at a pressure above the pressure of the endothermic gas to be produced by the generator, a second pressure reduction valve having an inlet connected to the source of hydrocarbon gas, means having an outlet opening interconnecting the outlets of the first and second pressure reduction valves including an adjustable valve connected between the outlet of the second pressure reduction valve and the opening of the interconnecting means, means responsive to the carbon concentration in the gas at the outlet opening of the interconnecting means for adjusting the adjustable valve, a furnace having a gas tight reaction chamber therein, the chamber having an inlet port connected to the outlet opening of the interconnecting means, and an outlet port being connected to the inlet orifice of the plenum chamber means of the reaction vessel, a plurality of bodies of material forming a catalyst to the reaction between carbon atoms from the gas from the hydrocarbon gas source and the oxygen atoms from the gas from the source of oxygen disposed within the reaction chamber, and the furnace having means to heat the gas from the hydrocarbon gas source and from the oxygen gas source in the reaction chamber to support the reaction between carbon atoms from the gas from the hydrocarbon gas source and the oxygen atoms from the gas from the source of oxygen, and the pressure of the endothermic gas from the endothermic gas generator being sufficient to fluidize the bed of granules in the reaction vessel.

5,194,229

RESISTANCE HEATER, CATALYTIC CONVERTER AND METHOD OF OPERATING CATALYTIC CONVERTER

Fumio Abe, Handa; Takashi Harada, Nagoya, and Hiroshige Mizuno, Tajimi, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 14, 1990, Ser. No. 581,988
Claims priority, application Japan, Jul. 4, 1990, 2-176942
The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.
Int. Cl.[5] F01N *3/10*; B01D *53/36*; H05B *3/10*
U.S. Cl. 422—174 10 Claims



1. A resistance heater, comprising:

an electrically conductive monolithic honeycomb structure having a radial periphery and two ends, including a plurality of passages which are defined by partition walls and extend in an axial direction between the ends, and at least one slit which is formed through said partition walls, said slit being open and unfilled in the area through which a fluid stream may pass through the honeycomb structure, and being substantially planar and extending through the axial length of said honeycomb structure and substantially parallel to said axial direction and crossing the planes of a plurality of partition walls of the honeycomb structure;

and at least two electrodes in electrical contact with said honeycomb structure;

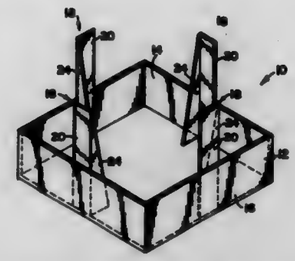
wherein said honeycomb structure has a resistance corresponding to a current density of not less than 5 A/mm^2 between the electrodes.

5,194,230

SOLID PRODUCT STATIC BRAKE FOR SOLID BLOCK CHEMICAL DISPENSERS

Matthew D. PeKarna, Plymouth; Greg M. Grandprey, Circle Pines; John M. Laverata, Burnsville, and Daniel K. Boche, Eagan, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Dec. 2, 1991, Ser. No. 801,693
Int. Cl.[5] B01D *12/00*
U.S. Cl. 422—263 37 Claims



1. A static brake for slowing the generally downward gravitationally driven movement of a solid chemical block composition when placed in a dispenser, said static brake comprising:

(a) a horizontal base frame defining a perimeter and a central opening therein;

(b) a plurality of rigid blade members extending from said horizontal base frame in a generally perpendicular direction to said horizontal base frame, said blade members rigidly attached to said horizontal base frame;

wherein said blade members have an inwardly directed tapered edge extending from said perimeter of said horizontal base frame into said opening.

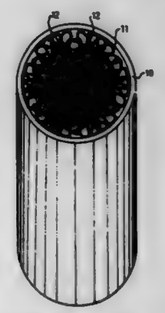
5,194,231

PACKING IN OR FOR A VESSEL

Martin J. Gough, Harborne; Stephen R. M. Ellis, Selby, and John V. Rogers, Solihull, all of United Kingdom, assignors to Citten Fluid Technology Limited, United Kingdom

PCT No. PCT/GB89/01419, § 371 Date Jul. 12, 1991, § 102(e) Date Jul. 12, 1991, PCT Pub. No. WO90/06175, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 28, 1989, Ser. No. 689,853
Claims priority, application United Kingdom, Nov. 28, 1988, 8827731
Int. Cl.[5] B01J *32/00*; B01D *47/16*
U.S. Cl. 422—312 20 Claims

1. A packing for a vessel wherein the packing comprises a plurality of insert units, each insert unit comprising an elongate core having a plurality of transversely extending elements disposed at different longitudinal positions along the elongate core and at different angular orientations about the elongate core, wherein the plurality of insert units are disposed in side by side relationship in a regular manner with the elongate core of each insert unit being disposed externally of each adjacent insert unit and at least one transversely extending element of



each insert unit is interstitially disposed relative to transversely extending elements of an adjacent insert unit.

5,194,232

PROCESS FOR THE PREPARATION OF TANTALUM/NIOBIUM HYDROXIDES AND OXIDES WITH A LOW FLUORIDE CONTENT

Walter Bludssus, Vienenburg; Erk-Rüdiger Feuerhahn, Osterode, and Horst Zimmermann, Bad Harzburg, all of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin GmbH & Co. KG, Berlin, Fed. Rep. of Germany

Filed Aug. 27, 1991, Ser. No. 750,519
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1990, 4030707
Int. Cl.[5] C01G *33/00*, *35/00*
U.S. Cl. 423—65 10 Claims

1. Process for extraction of metal hydroxide, where the metal is selected from the class consisting of tantalum and niobium, from an aqueous, acidic fluoro-solution of such metal in a neutralization-precipitation process utilizing a two component system consisting essentially of said fluoro-solution and aqueous ammonia solution and comprising the steps of:

(a) mixing such fluoro-solution with a first ammoniacal solution to obtain a first mixture,

(b) mixing the first mixture with a second ammoniacal solution of higher ammonia concentration than said first ammoniacal solution and stirring to form a second mixture until a pH effective to induce precipitation is obtained in the second mixture,

(c) filtering the second mixture to obtain a filter residue comprising metal hydroxide,

(d) washing the filter residue with a first washing solution which has a 1–10% ammoniacal content in a first washing stage,

(e) further washing the filter residue with pure water in a second washing stage and drying the filter residue, wherein a dried filter cake comprising the metal hydroxide of less than 0.5% fluoride content is obtained, and further comprising:

(f) conducting the steps (a)–(e), above, repeatedly to process successive batches of starting fluoro-solution,

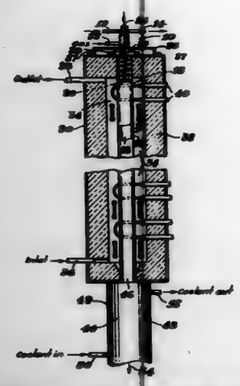
(f1) with feeding of wash fluid from the said first washing stage in a first batch processing into the said first mixing step of a second later batch processing, and

(f2) with feeding of wash fluid from the said second washing stage in a first batch processing into the said first washing stage in a second later batch processing.

5,194,233
PROCESS FOR PURIFICATION OF RARE GAS
Koichi Kitahara; Kenji Ohtsuka; Noboru Takemasa, and Shinobu Kamiyama, all of Hiratsuka, Japan, assignors to Japan Pionics Co., Ltd., Tokyo, Japan
Filed Sep. 3, 1991, Ser. No. 754,462
Claims priority, application Japan, Sep. 14, 1990, 2-242586; Nov. 29, 1990, 2-325484; May 17, 1991, 3-210523
Int. Cl.[5] B01D *53/04*
U.S. Cl. 423—210 **4 Claims**

3. A process for purifying a rare gas containing impurities which comprises contacting the rare gas at a temperature of 350° C. to 700° C. with an alloy getter which consists essentially of vanadium, zirconium, chromium and cobalt and the zirconium is in an amount of 75 parts by weight, the vanadium is in an amount of 20 parts by weight, the chromium is in an amount of 2 parts by weight and the cobalt is in an amount of 3 parts by weight, to remove at least one of nitrogen, hydrocarbons, carbon monoxide, carbon dioxide, oxygen, hydrogen and water, as impurities contained in the rare gas.

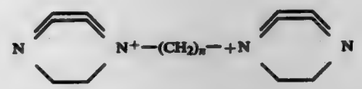
5,194,234
METHOD FOR PRODUCING UNIFORM, FINE BORON-CONTAINING CERAMIC POWDERS
Alan W. Weimer; William G. Moore, and Raymond P. Roach, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 152,613, Feb. 5, 1988, Pat. No. 5,110,565. This application Sep. 12, 1991, Ser. No. 758,029
Int. Cl.[5] C01B *35/00*
U.S. Cl. 423—297 **20 Claims**



1. A method of preparing uniform, fine boron-containing ceramic powder by carbothermal reduction comprising:
(1) feeding boric oxide or a hydrate thereof and a carbon source as reactants into a reactor comprising
(a) a cooled reactant transport member;
(b) a reactor chamber;
(c) a heating means; and
(d) a cooling chamber;
the cooled reactant transport member comprising a wall defining a conduit that communicates with the reactor chamber, with a gas-flow space being defined along the perimeter of the reactant transport member and in communication with the reactor chamber
the reactor chamber comprising a wall defining a reaction zone:
the heating means being associated with the reaction zone, and adapted for heating reactants in the reaction zone: and
the cooling chamber comprising a wall defining a cooling zone that communicates with the reactor chamber:
the temperatures of the reactant transport member, the reactor chamber, and the cooling chamber being independently controllable;
such that reactants can be fed through the reactant transport member into the reaction zone, reacted to form products, and the products then fed into the cooling zone to produce uniform, fine ceramic powders;
the boric oxide or hydrate thereof and the carbon source being fed through the cooled reactant transport member, the reactant transport member being maintained at a temperature below the melt temperature of the reactants;
(2) reacting the reactants at a temperature above about 1400° C. in the reaction zone under reaction conditions sufficient to form a uniform, fine boron-containing ceramic powder; and
(3) cooling the ceramic powder in the cooling zone.

5,194,235
SYNTHESIS OF SSZ-16 ZEOLITE CATALYST
Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.
Filed Aug. 27, 1992, Ser. No. 936,691
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—704 **6 Claims**

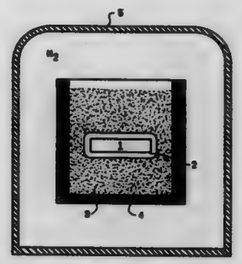
1. A method for preparing crystalline SSZ-16 zeolite material comprising:
(a) mixing in water a source of an organonitrogen compound, an oxide selected from the group consisting of aluminum oxide, gallium oxide, ferric oxide, and mixtures thereof, and an oxide selected from the group consisting of silicon oxide, germanium oxide, and mixtures thereof, the aqueous mixture having the following composition in terms of mole ratio of oxides:
YO_2/W_2O_3 = 5–350
M_2O/W_2O_3 = 0.5–20
RO/W_2O_3 = 0.5–40
OH^-/dYO_2 = 0.65
wherein Y is silicon, germanium or mixtures thereof, W is aluminum gallium, iron and mixtures thereof, M is an alkali metal, and R is DABCO-C_n-diquat having the formula:



and wherein n is 3, 4, or 5;
(b) maintaining the mixture of step "a" at a temperature of at least 100° C. until the crystals of said zeolite form; and
(c) recovering said zeolite crystals.

5,194,236
PROCESS FOR PREPARING NBN SUPERCONDUCTING MATERIAL
Mitsue Koizumi, 6-22, Tamaicho 3-chome, Toyonaka-shi, Osaka; Yoshinori Miyamoto, 8-37, Midoridai 1-chome, Kawanishi-shi, Hyogo; Masaki Ooyanagi, Ootsu; Kimiaki Tanihata, Hyogo; Osamu Yamada, Takatsuki; Ichiro Matsubara, Ikeda, and Hiroshi Yamashita, Kawanishi, all of Japan, assignors to Mitsue Koizumi, Toyonaka; Yoshinori Miyamoto, Kawanishi and Sumitomo Electric Industries, Ltd., Osaka, all of Japan
Filed Jul. 16, 1991, Ser. No. 730,410
Claims priority, application Japan, Jul. 16, 1990, 2-187727
Int. Cl.[5] C01B *21/06*
U.S. Cl. 423—409 **8 Claims**

1. Process for preparing NbN superconducting material, characterized in that a bulk Nb is placed in powder including at least one metal which can be nitride-burned, and then said powder is nitride-burned in pressurized N_2 atmosphere so that



said bulk Nb is nitrided rapidly by heat supply of said nitriding-burning of said powder.

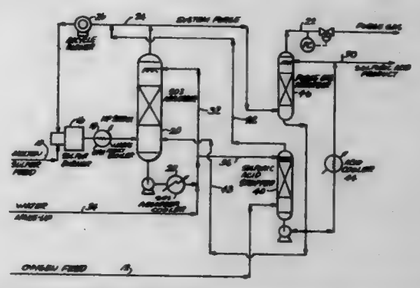
5,194,237
TIC BASED MATERIALS AND PROCESS FOR PRODUCING SAME
Gilles Cliche, Boucherville, and Serge Dallaire, Longueuil, both of Canada, assignors to National Research Council of Canada, Ottawa, Canada
Filed May 20, 1991, Ser. No. 686,936
Claims priority, application Canada, Apr. 23, 1990, 2015213
Int. Cl.[5] C01B *31/34*
U.S. Cl. 423—440 **15 Claims**

1. A process for producing TiC-based composite materials consisting of fine TiC crystals less than about 20 μm in diameter evenly dispersed in a metallic phase, which comprises, providing a mixture of a titanium bearing alloy with carbon, the alloy comprising at least one auxiliary metal selected from the group consisting of Al, Co, Cr, Cu, Fe, Mo and Ni, and heating the mixture rapidly at a rate of at least about 100° C./second above the melting point of the solution formed by titanium and the auxiliary metal at a temperature sufficient to synthesize TiC.

5,194,238
PROCESS FOR THE PRODUCTION OF HIGHLY PURE CONCENTRATED SLURRIES OF SODIUM HYPOCHLORITE
Budd L. Duncan, Athens, and Richard C. Ness, Cleveland, both of Tenn., assignors to Olin Corporation, Cheshire, Conn.
Continuation of Ser. No. 675,373, Mar. 26, 1991, abandoned. This application Apr. 8, 1992, Ser. No. 865,725
Int. Cl.[5] C01B *11/06*
U.S. Cl. 423—473 **9 Claims**

1. A process for producing sodium hypochlorite pentahydrate which comprises admixing a hypochlorous acid solution having a concentration of 35 percent or greater by weight of HOCl with sodium hydroxide at a temperature from about 15° C. to about 23° C. to produce a slurry of sodium hypochlorite pentahydrate in an aqueous solution of sodium hypochlorite, the sodium hypochlorite being present in a concentration of at least 35 percent by weight of NaOCl.

5,194,239
OXYGEN-BASED NONCATALYTIC SULFURIC ACID PROCESS
Jacobus J. H. Masseling, Arcadia, and David Netzer, Pasadena, both of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.
Continuation-in-part of Ser. No. 785,271, Oct. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 661,847, Feb. 26, 1991, abandoned. This application Nov. 15, 1991, Ser. No. 793,100
Int. Cl.[5] C01B *17/69, 17/74*
U.S. Cl. 423—522 **31 Claims**



1. A noncatalytic method of production of sulfuric acid from sulfur and oxygen comprising:
a) combusting in a sulfur-combustion zone sulfur and a feed of oxygen-rich make-up gas stream containing at least 75% by volume oxygen and a feed of recycle sulfur dioxide gas stream comprising at least 50% by volume sulfur dioxide at a temperature of from about 700° to about 1000° C. and at a pressure up to about 35 kg/cm^2 gauge in which the instantaneous molar ratio of sulfur dioxide to oxygen in the combined gas feeds to the combustion zone, is at least 3:1 to form a first gas stream containing about 5% to about 15% by volume sulfur trioxide and at least 50% by volume sulfur dioxide, the balance of the gas comprising inert gases and nonreacted oxygen;
b) passing said first gas stream and make-up water to a sulfur trioxide absorption zone to remove substantially all of the sulfur trioxide to form sulfuric acid and to produce a second gas stream comprising sulfur dioxide and substantially free of sulfur trioxide;
c) compressing said second gas stream to at least the pressure of the sulfur-combustion zone to form the recycle sulfur dioxide rich gas stream;
d) passing said recycle sulfur dioxide rich gas stream to the sulfur-combustion zone; and
e) removing at least a portion of the formed sulfuric acid as product.

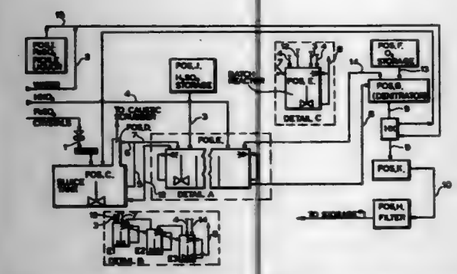
5,194,240
MANUFACTURE OF FERRIC SULPHATE
Jaroslav R. Derka, West Hill, Canada, assignor to Eaglebrook International, Inc., Mississauga, Canada
Continuation of Ser. No. 623,264, Dec. 6, 1990, abandoned, which is a continuation of Ser. No. 494,808, Mar. 14, 1990, abandoned, which is a continuation of Ser. No. 281,332, Dec. 8, 1988, abandoned. This application Sep. 26, 1991, Ser. No. 765,498
Int. Cl.[5] C01G *49/00, 49/14*
U.S. Cl. 423—558 **10 Claims**

1. A process for the manufacture of ferric sulphate from ferrous sulphate in a closed vessel containing a liquid phase and a vapour phase, wherein the vapour phase is essentially a closed system, the process comprising the oxidation between about 70° C. to about 150° C. of Fe^{++} to Fe^{+++} under pressure utilizing commercial oxygen in the closed vessel using NO_x as a catalyst where x is a number between 1 and 2 inclu-

sive of 1 and 2, and wherein the process comprises the following reactions:

$$NO+\tfrac{1}{2}O_2 \rightarrow NO_2, \text{ and} \quad (1)$$

$$2FeSO_4+H_2SO_4NO_2 \rightarrow Fe_2(SO_4)_3+H_2O+NO. \quad (2)$$



and wherein the oxidation of Fe^{++} is affected by spraying a reacting solution containing Fe^{++} introduced to the closed vessel, through a reacting cloud in the vapour phase comprising NO, NO_2 and O_2 enclosed in the vapour phase of the closed vessel and wherein the liquid phase fills at least ½ of the vessel and substantially only $Fe_2(SO_4)_3$ is present in the liquid phase in the closed vessel prior to the addition of $FeSO_4$ through the reacting cloud in the vapour phase and wherein the liquid phase is also sprayed through the vapour phase.

5,194,241

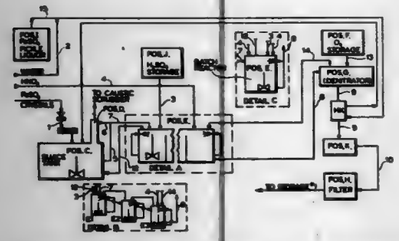
MANUFACTURE OF HYDROXYLATED FERRIC SULPHATE COMPOUND

Jaroslav R. Derka, West Hill, Canada, assignor to Eaglebrook International, Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 623,264, Dec. 6, 1990, abandoned, which is a continuation of Ser. No. 494,808, Mar. 14, 1990, abandoned, which is a continuation of Ser. No. 281,332, Dec. 8, 1988, abandoned. This application Jun. 21, 1991, Ser. No. 718,780

Int. Cl.[5] C01G *49/14, 49/02*

U.S. Cl. 423—558 **21 Claims**



1. A process for the manufacture of ferric sulphate compounds from ferrous sulphate in a closed vessel containing a liquid phase and a vapour phase, the process comprising the oxidation between about 70° C. to about 150° C. of Fe^{++} to Fe^{+++} under pressure utilizing commercial oxygen in the closed vessel using NOx as a catalyst where x is a number between 1 and 2 inclusive of 1 and 2 and wherein the process comprises the following reactions:

$$NO + \tfrac{1}{2}O_2 \rightarrow NO_2, \text{ and} \quad 1)$$

-continued

$$nFeSO_4 + \left(\frac{n-y}{2}\right)H_2SO_4 + \frac{n}{2}NO_2 \rightarrow \quad 2)$$

$$Fe_n(SO_4)_{\left(\frac{3n-y}{2}\right)}(OH)_y + \left(\frac{n-2y}{2}\right)(H_2O) + \frac{n}{2}NO$$

wherein n is any integer greater than or equal to two (2) and y is any integer which is equal to, or greater than zero (0) and less than 3n and wherein the oxidation of Fe^{++} is affected by spraying a solution containing Fe^{++} introduced to the closed vessel through a reacting cloud comprising NO, NO_2 and O_2 enclosed in the vapour space of the closed vessel and wherein the liquid phase fills at least ½ of the vessel and substantially only

$$Fe_n(SO_4)_{\left(\frac{3n-y}{2}\right)}(OH)_y$$

is present in the liquid phase in the closed vessel prior to the addition of $FeSO_4$ through the reacting cloud in the vapour phase and wherein the liquid phase is also sprayed through the vapour phase.

5,194,242

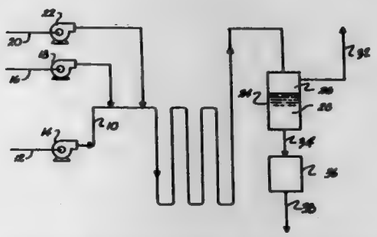
PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE FROM HYDROGEN AND OXYGEN

Michael A. Paoli, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 11, 1990, Ser. No. 580,523

Int. Cl.[5] C01B *15/01*

U.S. Cl. 423—584 **19 Claims**



1. A process for preparing hydrogen perioxide by reaction of hydrogen and oxygen in the presence of catalyst, comprising the steps of:

a) establishing an elongated reaction zone for effecting reaction of hydrogen and oxygen to form hydrogen peroxide;

b) substantially completely filling said reaction zone with an acidic aqueous solution suitable for affecting said reaction of hydrogen and oxygen;

c) providing in said reaction zone in contact with the aqueous solution a catalytically effective amount of a catalyst for the hydrogen-oxygen reaction and forming a reaction mixture by dispersing hydrogen gas and oxygen gas in the acidic aqueous solution in proportions that are above the lower flammability limit for hydrogen and oxygen at a temperature and pressure sufficient to result in the formation of hydrogen peroxide;

d) maintaining said reaction mixture at said temperature and pressure until the concentration of hydrogen in the reaction mixture has decreased to below the lower flammability limit for a hydrogen and oxygen mixture;

e) removing the resulting reaction mixture from said reaction zone; and

f) separating the resulting reaction mixture into a spent gas phase containing hydrogen and oxygen in a proportion below the lower flammability limit thereof and an aqueous solution phase containing hydrogen peroxide.

5,194,243

PRODUCTION OF ALUMINUM COMPOUND

Alan Pearson, Murrysville, Pa., and James R. Wall, deceased, late of Edwardsville, Tex. by Alberta C. Wall, executrix, assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 534,665, Sep. 22, 1983, abandoned. This application Sep. 30, 1985, Ser. No. 781,208

Int. Cl.[5] C01F *7/02*

U.S. Cl. 423—625 **22 Claims**

1. A method of manufacture, comprising the steps of:

(1) bringing

(a) aluminum hydroxide selected from the group consisting of gibbsite, bayerite, and norstrandite, and

(b) seed effective for boehmite growth,

together in a liquid aqueous medium to form a mixture comprising aluminum hydroxide, seed and liquid aqueous medium and

(2) hydrothermally digesting the mixture in a pressure vessel for producing colloidal boehmite at the expense of the aluminum hydroxide.

5,194,244

BASIC ALKALI METAL-ZEOLITE COMPOSITIONS

Thomas F. Browniscombe, Houston, and Lynn H. Slaugh, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 275,169, Nov. 23, 1988, abandoned. This application May 22, 1989, Ser. No. 354,586

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—700 **8 Claims**

2. A process for preparing a composition-of-matter comprising a zeolite and an alkali metal compound which comprises impregnating a zeolite with an aqueous solution of an alkali metal salt other than a hydroxide wherein said alkali metal salt is thermally decomposable upon calcination in the presence of said zeolite to provide an alkali metal-oxygen-containing moiety at a temperature which is less than that at which the zeolite crystallinity is lost and wherein the sum of said alkali metal impregnated into the zeolite and any metal cation exchanged into the zeolite is in excess of that required to provide a fully metal cation-exchanged zeolite, drying the thus impregnated zeolite and calcining the zeolite at a temperature in excess of the temperature at which the alkali metal salt decomposes and at a temperature which is less than that at which the zeolite crystallinity is lost to decompose said alkali metal salt to provide the alkali metal-oxygen-containing moiety.

5,194,245

DIAGNOSIS OF VIRAL HEPATITIS

William A. Carter, Birchrunville, Pa., assignor to Hem Research Inc., Rockville, Md.

Division of Ser. No. 528,962, May 25, 1990, Pat. No. 5,132,292. This application Jan. 16, 1992, Ser. No. 821,874

Int. Cl.[5] A61K *49/00, 31/70*

U.S. Cl. 424—9 **2 Claims**

1. A method of diagnosing hepatitis virus infections in a patient comprising determining the level of intracellular 2'-5'A oligoadenylate synthetase in a patient suspected of having a hepatitis virus infection and comparing it with 2'-5'A synthetase levels in healthy individuals, an aberrant 2'-5'A synthetase level indicating the presence of a hepatitis virus infection.

5,194,246

ANTICALCULUS ORAL COMPOSITIONS CONTAINING COMBINATIONS OF POLYMERS

Carol K. Vincent, Wanaque; David L. Elliott, Hawthorne, and Catherine L. Howie-Meyers, Bloomingdale, all of N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Apr. 16, 1991, Ser. No. 686,106

Int. Cl.[5] A61K *7/16*

U.S. Cl. 424—57 **19 Claims**

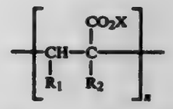
1. An oral composition comprising:

(i) a first synthetic anionic polymer having a molecular weight from greater than about 4,000 to about 1,000,000.

(ii) a second polymer having the formula I:

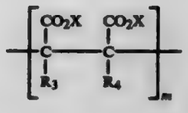
(I)

wherein A is a random polymeric residue comprising at least one unit of structure II,



(II)

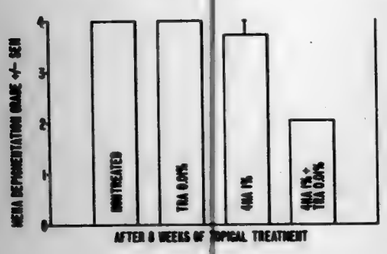
and at least one unit of structure III, different from a unit of structure II,



(III)

and B is hydrogen or a residue A; m and n are integers sufficient to provide polymer of weight averaged molecular weight ranging from about 400 to about 2500; m and n in residue A may each be the same or different from respective m and n in residue B; R is an —OX, where X is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, transition metal, ammonium, alkyl amine, alkanolammonium residues and mixtures thereof; R_1, R_2, R_3 and R_4 are hydrogen, methyl, ethyl radicals or combinations thereof, and the first synthetic anionic polycarboxylic polymer relative to the second polymer I being present in a weight ratio from about 10:1 to about 1:10 and together the first anionic polymer and second polymer providing a more than additive increase in anticalculus activity.

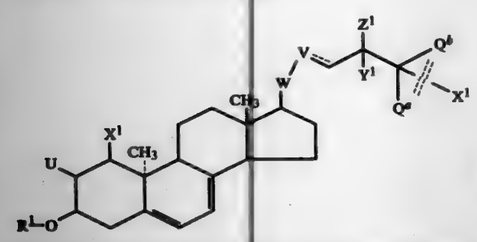
5,194,247
SYNERGISTIC SKIN DEPIGMENTATION COMPOSITION
Xiao Nair, 100 Rolling Meadow, E. Amherst, N.Y. 14051, and Kenneth M. Trumpesch, 46 Cimarron Dr., Williamsville, N.Y. 14221
Continuation-in-part of Ser. No. 397,921, Aug. 24, 1989, abandoned. This application Jul. 24, 1990, Ser. No. 554,904
Int. Cl.[5] A61K *9/00, 31/215*
U.S. Cl. 424—59 18 Claims



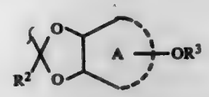
1. A synergistic composition for skin depigmentation which does not contain a corticosteroid and which consists essentially of from 0.1% to 5% by weight of 4-hydroxyanisole and from 0.001% to 1% by weight at least one retinoid selected from the group consisting of all-trans retinoic acid, (N-acetyl-4-aminophenyl) retinoate and 11-cis, 13-cis-12-hydroxymethyl retinoic acid δ-lactone in a pharmaceutically acceptable topical vehicle.

5,194,248
COMPOSITIONS COMPRISING VITAMIN D ANALOG PRECURSORS AND THE USE THEREOF
Michael F. Holick, Sudbury, Mass., assignor to Trustees of Boston University, Boston, Mass.
Filed Jun. 21, 1990, Ser. No. 541,813
The portion of the term of this patent subsequent to Dec. 1, 2009, has been disclaimed.
Int. Cl.[5] A61K *7/42, 31/59*
U.S. Cl. 424—59 12 Claims

1. A method for providing a vitamin D analog to an individual which comprises administering topically to said individual an effective amount of a composition formulated for topical administration comprising a pharmaceutically acceptable carrier and a compound of the formula



wherein the bond between carbons C-22 and C-23 is single or double bond;
Y^1 is hydrogen, F, CH_3, CH_2CH_3 or X^1;
U is hydrogen, —OH, or —O—(C_2–C_4 alkyl)—OH;
Z^1 is F, H or X^1;
Q^a is CF_3 or CH_2X^1;
Q^b is CF_3 or CH_3;
wherein X^1 is selected from the group consisting of hydrogen, —OH and OR^1;
wherein R^1 is hydrogen or a straight or branched chain glycosidic residue containing 1–20 glycosidic units per residue, or R^1 is an orthoester glycoside moiety of the formula:



wherein A represents a glucofuranosyl or glucopyranosyl ring;
R^2 is hydrogen, lower alkyl or aryl, with the proviso that aryl is phenyl or phenyl substituted by chloro, fluoro, bromo, iodo, lower C_1–C_4 alkyl, C_1–C_4 alkoxy; or naphthyl; and
R^3 is hydrogen or a straight or branched chain glycosidic residue containing 1–20 glycosidic units per residue;
W is CH—CH_3 or O;
V is CH_2 or O;
with the proviso that both W and V are not both O and that said compound is not lumisterol; and
"= = =" is either a single bond between Q^a and Q^b or a hydrogen atom on Q^a and Q^b; and
exposing said individual to UV radiation.

5,194,249
NON-WHITENING ANTIPERSPIRANT COMPOSITIONS
Jacob Drucker, Holmdel, and Gianluigi Soldati, Edison, both of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.
Filed Oct. 19, 1990, Ser. No. 601,167
Int. Cl.[5] A61K *7/34, 7/38*
U.S. Cl. 424—68 5 Claims

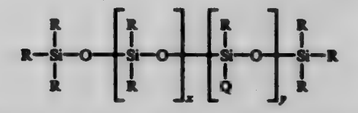
1. Aqueous non-whitening, non-staining antiperspirant composition consisting essentially of:
(a) from about 1% to about 30% by weight of an emulsifier selected from the group consisting of propylene glycol stearates and ethoxylated stearyl alcohol;
(b) from about 2% to about 20% by weight of linear non-volatile dimethicone;
(c) from about 10% to about 60% by weight of a water soluble antiperspirant salt; and
(d) up to about 70% by weight water.

5,194,250
COMPOSITIONS
Edgar Fairhurst; Helen Sayers, and Steven Polle, all of Weybridge, England, assignors to Beecham Group p.l.c., England
Continuation of Ser. No. 371,432, Jun. 26, 1989, abandoned. This application Jun. 26, 1991, Ser. No. 724,462
Claims priority, application United Kingdom, Jun. 25, 1988, 8815180
Int. Cl.[5] A61K *7/06, 7/48*
U.S. Cl. 424—70 4 Claims

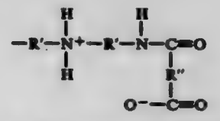
1. A skin or hair-care composition for the treatment of sebhorrea, comprising from 0.5 to 10% w/w of a silanised silica gel as an anti-sebhorreic agent and from 1 to 20% w/w of a liquid ester selected from the group consisting of triethyl citrate, acetyl triethyl citrate, tributyl citrate, acetyl tributyl citrate, diethyl tartrate and diethyl succinate, dispersed in an aqueous solvent system as carrier.

5,194,251
HAIR TREATMENT WITH ZWITTERIONOMERIC SILOXANES
Daniel J. Halloran, Midland, and Terence J. Swihart, Essexville, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Feb. 10, 1992, Ser. No. 833,252
Int. Cl.[5] A61K *7/08, 7/11*
U.S. Cl. 424—70 20 Claims

1. In a method of treating hair in which a formulation is applied to the hair which includes an organosilicon compound, the improvement which comprises incorporating into the formulation as the organosilicon compound an amine carboxylate zwitterionomeric polysiloxane having the formula



in which R is an alkyl radical having from one to six carbon atoms or a phenyl radical; x is an integer having a value of from forty to four hundred; y is an integer having a value of from one to twenty; and Q is



in which R' is an alkylene radical of from one to twelve carbon atoms; R" is ethylene, vinylidene or phenylene; the polysiloxane having a degree of polymerization of at least about one hundred.

5,194,252
MOISTURE RETAINING AFTERSHAVE
William H. Hofmann, St. Louis, Mo., assignor to ViJon Laboratories, Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 555,786, Jul. 19, 1990, Pat. No. 5,077,038, and a continuation-in-part of Ser. No. 306,304, Jul. 27, 1989, abandoned. This application Dec. 31, 1991, Ser. No. 819,369
Int. Cl.[5] A61K *7/06, 7/15*
U.S. Cl. 424—73 5 Claims

5. An aftershave lotion for conditioning and cleansing the skin, the lotion containing skin cleansing agents normally capable of drying oil and moisture from the matrix of the skin, including alcohol, the lotion active ingredients including those selected from the group consisting of ethanol, isopropyl alcohol, water, and mixtures thereof, the preparation also containing from about 0.05 to about 0.25% by weight of a cosmetically acceptable salt of a hydrolyzed soy protein having a molecular weight of between about 1000–4000, and from about 0.1 to 0.5% by weight of a cocoamidopropyl dimethylamine propionate, the combination of hydrolyzed soy protein and cocoamidopropyl dimethylamine propionate being between about 0.1 and 0.5% by weight, the aftershave lotion further containing up to about 1% germicides, up to 1% skin conditioners and up to about 10% of a film plasticizer selected from the group consisting of glycerin, propylene glycol, and cosmetically acceptable glycerides, the combination being effective to form a moisture and oil retaining film on the skin surface to retain moisture and oil in the skin matrix without inhibiting the cleansing function of the preparation.

5,194,253
AQUEOUS GEL, USABLE IN COSMETICS, BASED ON HYALURONIC ACID AND DEOXYRIBONUCLEIC ACID, AND A PREPARATION PROCESS
Ricardo Garrido, Chateauroux, France, assignor to Pier Ange (Societe Anonyme), Chateauroux, France
PCT No. PCT/FR89/00452, § 371 Date May 9, 1990, § 102(e) Date May 9, 1990, PCT Pub. No. WO90/02774, PCT Pub. Date Mar. 22, 1990
PCT Filed Sep. 8, 1989, Ser. No. 477,914
Claims priority, application France, Sep. 9, 1988, 88 11787
Int. Cl.[5] A61K *7/02, 7/48, 37/10, 31/725*
U.S. Cl. 424—78.03 3 Claims

1. A method of forming a cosmetic treatment mask comprising:
i) applying to skin to be treated at least one layer of an aqueous gel which comprises a homogenous mixture of:
a) 0.1–1% by weight of an alkaline salt or an ammonium salt of hyaluronic acid;
b) 1–3% by weight of a mineral or organic salt of deoxyribonucleic acid in the form of an aqueous gel, wherein said aqueous gel of a mineral or organic salt of deoxyribonucleic acid behaves as a non-Newtonian liquid having pseudo-plastic flow;
c) 1–3% by weight of at least one hydrophilic polymer having the property of forming aqueous film-forming gels; and
d) a sufficient quantity of water to make the percentage of ingredients up to 100%;
ii) covering said layer of aqueous gel with gauze;
iii) applying a second layer of said aqueous gel to said gauze;
iv) transforming said second layer of aqueous gel into a plastic film; and
v) removing said plastic film;
wherein said layer according to step i) remains on the skin.

5,194,254
ENHANCEMENT OF ANTIGEN IMMUNOGENICITY
Brian H. Barber, Mississauga, and George Caravanatis, Toronto, both of Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada
Continuation-in-part of Ser. No. 046,895, May 8, 1987, Pat. No. 4,950,480. This application Oct. 13, 1989, Ser. No. 421,188
Claims priority, application United Kingdom, May 6, 1986, 8610983
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] A61K *39/00*; C07K *3/00*
U.S. Cl. 424—85.8 19 Claims

1. A novel conjugate physiologically suitable for administration to a mammal to elicit an immune response, comprising at least one antigen which is a peptide or protein against which an immune response is to be elicited conjugated to a monoclonal antibody specific for a surface structure of antigen-presenting cells of the mammal.

5,194,255
ANTIHYPERTENSIVE HYPERIMMUNE MILK, PRODUCTION, COMPOSITION, AND USE
Lee R. Beck, and Ralph J. Stolle, both of Lebanon, Ohio, assignors to Stolle Research & Development Corporation, Cincinnati, Ohio
Continuation of Ser. No. 161,839, Feb. 26, 1988, Pat. No. 4,879,118, which is a continuation-in-part of Ser. No. 1,048, Jan. 9, 1987, Pat. No. 4,897,265, which is a division of Ser. No. 546,162, Oct. 27, 1983, Pat. No. 4,636,384, which is a continuation-in-part of Ser. No. 384,625, Jun. 3, 1982, abandoned. This application Nov. 6, 1989, Ser. No. 431,773
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] A61K *35/20*
U.S. Cl. 424—87 2 Claims

1. A composition for reducing elevated arterial blood pres-

sure in an animal, wherein said composition is capable of reducing blood pressure in an animal, and wherein said composition comprises an anti-hypertensive factor from hyperimmune milk, wherein said anti-hypertensive factor has a molecular weight of less than 10,000 daltons and is negatively charged at pH 7.0, wherein said anti-hypertensive factor elutes in the third eluting peak of a Sephadex G10 column as shown in FIG. 4 of Applicants' specification, wherein said anti-hypertensive factor does not aggregate in distilled water, and wherein said composition is free of anti-inflammatory factor eluting in the first and second eluting peaks of a Sephadex G10 column as shown in FIG. 4 of Applicants' specification.

5,194,256

PURIFIED HUMAN CYTOMEGALOVIRUS PROTEIN

Lucy E. Rasmussen, Menlo Park, and Thomas C. Merigan, Portola Valley, both of Calif., assignors to The Board of Trustees of the Leland Sanford Junior University, Stanford, Calif.

Continuation of Ser. No. 642,878, Aug. 21, 1984, Pat. No. 4,743,562. This application Oct. 2, 1987, Ser. No. 104,392

Int. Cl.[5] A61K *39/12*; C07K *15/04*; C12N *7/04*

U.S. Cl. 424—89 3 Claims

1. An immunopurified human CMV virion protein having:

(a) a molecular weight of approximately 86,000 daltons as measured by SDS-PAGE; and

(b) an epitope recognized by monoclonal antibody IG6 and capable of eliciting in vivo immunizing activity, said protein being substantially free of other CMV proteins.

5,194,257

KIT AND METHOD FOR ADMINISTRATION OF BACILLUS CALMETTE-GUERIN FOR THE TREATMENT OF SUPERFICIAL BLADDER TUMORS

Timothy L. Ratliff; M'Lies A. Hudson, and Julie K. Ritchey, all of St. Louis, Mo., assignors to The Jewish Hospital of St. Louis, St. Louis, Mo.

Filed Nov. 28, 1990, Ser. No. 619,222

Int. Cl.[5] C12N *1/20*; A61K *35/74*

U.S. Cl. 424—93 K 7 Claims

1. A kit for use in the in vivo treatment of superficial bladder tumors through the administration by intravesical instillation of bacillus Calmette-Guerin comprising:

(a) a dosage amount of bacillus Calmette-Guerin in lyophilized form; and

(b) a 0.15 M sodium chloride solution containing a buffer to maintain the pH of said solution within the range 6.6 to 7.4.

5,194,258

PRODUCTION OF ENHANCED BIOCONTROL AGENTS

Alan S. Paau, Middleton; Mari L. Bennett, Stoughton, and Lori L. Graham, Madison, all of Wis., assignors to W. R. Grace & Co. - Conn., New York, N.Y.

Filed Nov. 13, 1990, Ser. No. 612,944

Int. Cl.[5] A01N *63/00*; A61K *37/00*; C12N *1/38, 1/14*

U.S. Cl. 424—93 Q 7 Claims

1. A method of protecting crop plants from damping off or root rot caused by *Pythium ultimum* and *Rhizoctonia solani*, comprising:

(a) growing a culture of a biocontrol fungus which is capable of protecting the crop plants from root rot or damping off, the biocontrol fungus selected from the group consisting of Trichoderma, *Gliocladium virens* and a mixture thereof;

(b) culturing the biocontrol fungus with an effective amount of deactivated pathogen incapable of pathogenic activity selected from the group consisting of *Pythium ultimum, Rhizoctonia solani*, and a mixture thereof to enhance the biocontrol activity of the biocontrol fungus; and

(c) applying the enhanced fungus to the cultivated plant to be protected or the locus thereof.

5,194,259

SLIMMING COMPOSITION BASED ON *GINKGO BILOBA* AS AN ALPHA-2-BLOCKER

Etienne Soudant, Fresnes, and Jean-François Nadaud, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Nov. 27, 1991, Ser. No. 798,329

Claims priority, application France, Nov. 28, 1990, 90 14864

Int. Cl.[5] A61K *9/107*

U.S. Cl. 424—401 10 Claims

1. A cosmetic slimming composition for topical application to the skin comprising in a cosmetic vehicle suitable for topical application to the skin, in combination, ginkgo biloba as an alpha-2-blocker present in an amount ranging from 0.2 to 5 weight percent based on the total weight of said composition and at least one other alpha-2-blocker selected from the group consisting of ivy present in an amount ranging from 0.01 to 15 weight percent based on the total weight of said composition and escine present in an amount ranging from 0.05 to 4 weight percent based on the total weight of said composition, or both.

5,194,260

COSMETIC COMPOSITION FOR THE HAIR CONTAINS A FILM FORMING POLYMER AND A SILICONE INCORPORATED IN A WAX MICRODISPERSION AND A COSMETIC TREATMENT USING THE SAME

Jean-François Grollier; Isabelle Rellet, both of Paris, and Lyonel Peritz, Saint-Cloud, all of France, assignors to L'Oreal, Paris, France

Filed Aug. 22, 1991, Ser. No. 748,650

Claims priority, application France, Aug. 23, 1990, 90 10602

Int. Cl.[5] A61K *7/11*

U.S. Cl. 424—401 13 Claims

1. A cosmetic composition for the hair comprising at least one film forming polymer present in an amount ranging from 0.1 to 2 weight percent and at least one silicone present in an amount ranging from 0.01 to 1 weight percent incorporated into a support consisting essentially of a wax microdispersion in an aqueous liquid vehicle of which the dispersed phase is a stable microdispersion of particles having a size lower than 500 nm, the said particles consisting essentially of a wax or mixture of waxes, the said wax or mixtures of waxes having a final melting point greater than 60° C. and lower than 100° C. and being capable of forming a microdispersion as defined above, the said composition containing, by weight, from 0.1 to 40 percent of wax and at least one emulsifying agent present in an amount ranging from 0.01 to 25 weight percent and wherein the wax/emulsifying agent weight ratio is in the range of 1 to 20 and wherein the film forming polymer/silicone weight ratio is greater than 0.25 and lower than 8.

5,194,261

DIAPER RASH TREATMENT

Virgil Pichierri, 50 Brigham Hill Rd., Grafton, Mass. 01519

Continuation of Ser. No. 618,395, Nov. 27, 1990, abandoned. This application May 4, 1992, Ser. No. 879,533

Int. Cl.[5] A61K *7/40*

U.S. Cl. 424—401 11 Claims

11. A composition suitable for use in treating a diaper rash, comprising:

about 30.75% of a calcium, sodium partial mixed salt of a copolymer of vinyl methyl ether and maleic acid;

about 15.4% of cellulose gum;

about 5% of mineral oil; and

a petrolatum base;

wherein the copolymer reacts with waste by-products during use to become partially hydrated to thereby adhere to the skin and to form a barrier against diaper rash causative and irritant agents.

5,194,262

ENCAPSULATED ANTIPERSPIRANT SALTS AND DEODORANT/ANTIPERSPIRANTS

Marvin E. Goldberg, Marlboro, N.J.; David M. Kellner, Hollis, N.Y.; Chei W. Low, and Cathy S. Lamb, both of San Antonio, Tex., assignors to Revlon Consumer Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 601,440, Oct. 22, 1990, abandoned. This application Aug. 6, 1991, Ser. No. 740,831

Int. Cl.[5] A61K *7/32, 9/50*

U.S. Cl. 424—401 31 Claims

1. An antiperspirant/deodorant composition containing microcapsules comprising 1–50% by weight of the microcapsule of one or more antiperspirant salts encapsulated within a shell wall comprising 50–95% by weight of the microcapsule of a water soluble shell wall material which is susceptible to osmotic, enzymatic, or electrolytic degradation, and 1–30% by weight of the microcapsule of a bioadhesive which is either a component of the shell wall or is coated on the surface thereof and causes the microcapsule to adhere to the skin surface.

5,194,263

PARTICULATE MATERIALS, THEIR PRODUCTION AND USE

Peter Chamberlain, and John G. Langley, both of West Yorkshire, England, assignors to Allied Colloids Limited, England

Continuation-in-part of Ser. No. 467,668, Jan. 19, 1990, abandoned. This application Aug. 26, 1991, Ser. No. 749,695

Claims priority, application United Kingdom, Jan. 20, 1989, 8901254

Int. Cl.[5] A01N *25/00*

U.S. Cl. 504—347 41 Claims

1. An agricultural composition that comprises particles that are substantially all below 100 μm in size and that each comprise a core enclosed within a polymeric coacervate shell formed from at least two coacervating polymers, in which the core is a solid, non-crystalline, core comprising a polymeric matrix containing a crystallizable water insoluble agrochemical selected from the group consisting of herbicides, pesticides, semiochemicals, plant growth regulators and nutrients and the amount of polymeric matrix is at least 20% by weight based on the weight of agrochemical and such that crystallization of the agrochemical in the core is substantially prevented.

5,194,264

PESTICIDAL FORMULATION

Stephanus J. Van Tonder, Johannesburg, South Africa, assignor to Scientific Chemicals (Proprietary) Limited, Johannesburg, South Africa

Filed Mar. 13, 1990, Ser. No. 492,791

Claims priority, application South Africa, Mar. 13, 1989, 89/1896; Mar. 13, 1989, 89/1897; Aug. 18, 1989, 89/6323

Int. Cl.[5] A01N *25/00*

U.S. Cl. 424—405 9 Claims

1. A method of making a pesticidal formulation for external application with the following percentages of ingredients, which comprises

dissolving 0.001–30.000% of a pesticide and mixtures thereof selected from the group consisting of a synthetic pyrethroid, an amidine, chlormethiuron, cyromazine, and s-methoprene, effective against ectoparasites in a polar solvent of 0.050–49.000% selected from the group consisting of alcohols, ketones, lactones, keto-alcohols, glycols, glycolethers, amides, alkanolamines, sulfoxides and pyrolidones, to form a pesticidal component comprising a solution of the pesticide in said polar solvent; and

admixing the pesticidal components with an aqueous component of 31.000–99.990% to form a pesticidal formulation, in which the pesticidal component is wholly miscible in the aqueous component, with the formulation being in the form of a solution containing substantially no suspended solids and not being in the form of an emulsion, with the provisos that water constitutes at least 30% m/v of the pesticidal formulation and that no solvent having a solubility in water of 15 gm/l or less at ambient temperature, is present.

5,194,265

INSECTICIDE DEVICES

Thomas E. Boettcher, and Byron D. Fair, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 329,531, Mar. 28, 1989, abandoned. This application Jul. 1, 1991, Ser. No. 725,418

Int. Cl.[5] A01N *25/34*

U.S. Cl. 424—411 18 Claims

1. An article for dispensing an agent having anti-ectoparasitic activity comprising

(1) a thermoset resin matrix comprising one or more aliphatic or cycloaliphatic monomers or one or more oligomers, or both, said monomers and oligomers having at least one terminal or pendant acrylate or methacrylate moiety cured by free radical polymerization, and

(2) said agent dispersed in said resin matrix, said article being substantially flexible and said agent being present in an amount and of a type which provides for release of said agent in an anti-ectoparasitically effective amount over a prolonged period.

5,194,266

AMPHOTERICIN B/CHOLESTEROL SULFATE COMPOSITION AND METHOD

Robert Abra, San Francisco, and Luke S. S. Guo, Lafeyette, both of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 391,207, Aug. 8, 1989, abandoned. This application Dec. 19, 1991, Ser. No. 812,075

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[5] A61K *9/127, 31/70*

U.S. Cl. 424—450 4 Claims

1. An amphotericin B composition comprising particles of amphotericin B containing cholesterol sulfate in a mole ratio of amphotericin B to cholesterol sulfate of between about 1:1 to 2:1.

5,194,267

TIRE VULCANIZING PRESS

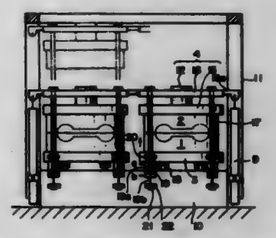
Senzo Funakoshi, and Yasuhiko Fujieda, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 8, 1992, Ser. No. 879,950

Claims priority, application Japan, May 8, 1991, 3-133425; May 8, 1991, 3-133426; May 8, 1991, 3-133427

Int. Cl.[5] B29C *35/00*

U.S. Cl. 425—47 3 Claims

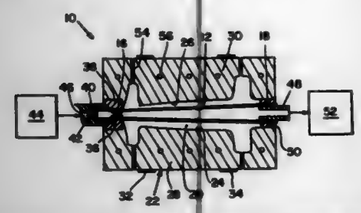


1. A tire vulcanizing press comprising: an upper mold installation member supported to be raised or lowered along a stand frame; a lower mold installation member mounted on a base frame to be slightly shiftable in an up-and-down direction; a plurality of tie rods hung from the upper mold installation

VOL 1148 ISS 3 MR 16 1993 UMI

member; a plurality of fastening cylinders fixed on the lower mold installation member and having cylinder rods facing to the tie rods; and a lock device for connecting or disconnecting between a tip end of the cylinder rod and a tip end of the tie rod.

5,194,268
APPARATUS FOR INJECTION MOLDING A CERAMIC GREENWARE COMPOSITE WITHOUT KNIT LINES
Norbert L. Bradley, Sanford, and Virgil W. Coomer, Shepherd, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 534,821, Jun. 7, 1990, Pat. No. 5,098,620. This application Nov. 12, 1991, Ser. No. 790,932
Int. Cl.[5] B28B *1/24, 1/26*
U.S. Cl. 425—84 22 Claims



1. An apparatus for injection molding a ceramic suspension to form a molded ceramic greenware composite, comprising:
a) a mold defining a mold cavity;
b) an elastomeric bladder disposed within the mold cavity, the elastomeric bladder having an inlet end for receiving the ceramic suspension and an outlet end for evacuating said elastomeric bladder and for limiting force applied to the ceramic suspension by said elastomeric bladder;
c) means for injecting the ceramic suspension into said elastomeric bladder, whereby the elastomeric bladder is distended, said distention of the elastomeric bladder causing the elastomeric bladder to apply sufficient force to the ceramic suspension to substantially prevent jetting of the ceramic suspension and formation of knit lines within the ceramic suspension during injection of the ceramic suspension into the elastomeric bladder; and
d) means for exposing the injected ceramic suspension to conditions which are sufficient to form the molded ceramic greenware composite.

5,194,269
PRODUCTION OF FROZEN FOODS AND OTHER PRODUCTS
Tung-Ching Lee, 64 Higgins Dr., Kingston, R.I. 02881
Division of Ser. No. 146,206, Jan. 20, 1988, Pat. No. 4,978,540. This application Aug. 31, 1990, Ser. No. 576,230
Int. Cl.[5] A23L *1/28*
U.S. Cl. 426—61 43 Claims

1. A process for freezing foodstuffs which comprises mixing foodstuffs that have been separated from a growing environment, with a non-toxic microorganism having an INA^+ phenotype or an ice nucleating agent derived from such an organism or a functionally equivalent protein thereto, said microorganism, ice nucleating agent or protein being capable of inducing ice nucleation and freezing said foodstuffs at a temperature below −5° C. so as to produce a non-textured frozen product and thereafter storing said frozen foodstuff in cold storage.

5,194,270
CALCIUM CITRATE-VEGETABLE OIL COMPOSITIONS
Charles J. Cante, Pleasantville; Emmanuel O. Gbogi, Tarrytown, and Fouad Z. Saleeb, Pleasantville, all of N.Y., assignors to Kraft General Foods, Inc., Northfield, Ill.
Filed Dec. 20, 1991, Ser. No. 811,193
The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.
Int. Cl.[5] A23D *9/00*; A23L *1/304*
U.S. Cl. 426—74 36 Claims

1. A vegetable oil based composition comprising from about 0.5% to about 35% by weight of a finely divided calcium citrate salt, said salt being a reaction product of a calcium compound selected from the group consisting of calcium compound selected from the group consisting of calcium hydroxide, calcium oxide and calcium carbonate with citric acid wherein said reaction product has a mole ratio of calcium to citric acid from 2.5:2 to 2.95:2 and a pH value in a 1% water slurry of said reaction product from about 4 to below 7 %at 25° C.

5,194,271
MICROWAVEABLE BATTER-COATED, DOUGH-ENROBED FOODSTUFF
John J. Yasosky, Maple Grove, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.
Continuation of Ser. No. 556,653, Jul. 20, 1990, abandoned. This application Sep. 5, 1991, Ser. No. 759,045
Int. Cl.[5] A23L *1/31*; A21D *13/00*
U.S. Cl. 426—92 20 Claims

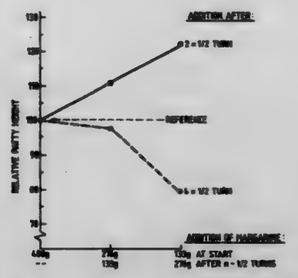
1. A dry batter mixture, comprising:
(a) about 30–70 wt-% high amylose flour of at least about 50% amylose based on starch content;
(b) about 30–70 wt-% wheat flour;
(c) about 1–16 wt-% chemical leavening agent comprising sodium bicarbonate and a baking acid; and
(d) at least about 0.8 wt-% of cellulose derivative wherein the cellulose derivative increases batter viscosity with increasing pH; the weight percentages being based on the total weight of the dry mixture;
said dry mixture, in combination with an effective amount of liquid, being capable of producing a wet slurry mixture which is tolerant to shear thinning with mixing over time; said slurry mixture being a pH of at least about 6.4 effective to provide a film of batter which will adhere to and uniformly coat the surface of a dough-enrobed foodstuff wherein said dough comprises less than about 10 wt-% fat and from about 24 wt-% to 32 wt-% added water, and capable of providing an outer crust layer on the surface of the batter-coated, dough-enrobed foodstuff when the foodstuff is pre-fried in hot oil or fat and cooked by microwave radiation, the crust layer being crisp-textured, porous, toast-colored and otherwise not gummy.

5,194,272
PACK FOR FOODS AND PROCESS FOR THE PRODUCTION THEREOF
Werner G. Munk, Vogt ueber Ravensburg; Manfred Klecker, Knonzelsau-Morsbach, both of Fed. Rep. of Germany, and Franz Haas, Leobendorf, Austria, assignors to Sudmilch Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Division of Ser. No. 134,175, Dec. 17, 1987, Pat. No. 4,957,754. This application Jul. 3, 1990, Ser. No. 547,938
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643199
The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.
Int. Cl.[5] A21D *13/00*; A23P *1/08*
U.S. Cl. 426—94 31 Claims

1. Pack or container for containing foods made from a porous material, and having for sealing purposes on at least one part of an inner wall of the container for the food pack at least two different fat-based impregnations, at least one of which is

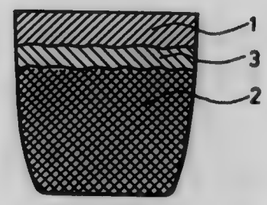
a first or prime coat and at least one other is a cover glaze or impermeable top glaze, characterized in that at least said cover glaze or impermeable top glaze is free from saccharose.

5,194,273
LAMINATED DOUGHS
Dirk W. de Bruijne, Vlaardingen; Theodorus J. Liefkens, Maasluis, and Aleksander A. Reszka, Ridderkerk, all of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco Inc., Lisle, Ill.
Filed Mar. 5, 1991, Ser. No. 665,207
Claims priority, application European Pat. Off., Mar. 5, 1990, 90200502.4
Int. Cl.[5] A21D *13/08*
U.S. Cl. 426—94 13 Claims



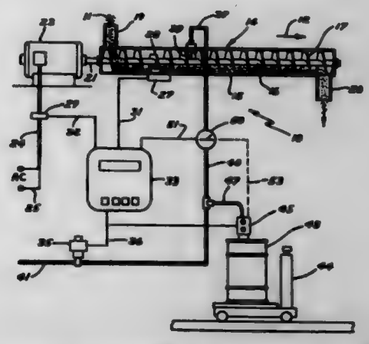
1. Process for the preparation of a laminated dough, suitable for puffed pastries, Danish pastries, and croissants, the process comprising laminating a normal dough and a fat composition in a number of lamination steps, each comprising a number of half turns, the steps comprising using 20–50 wt% of the total amount of fat that is normally used in the process in a first lamination step and using 80–50 wt. of the total fat in at least one lamination step later in the process so that in the laminated dough a number of fat layers are formed having a thickness that differs from a number of other layers.

5,194,274
ICE CONFECTIONERY
Koji Oda, Gamagori, Japan, assignor to Mermaid Co., Ltd., Japan
Filed Oct. 30, 1991, Ser. No. 785,083
Claims priority, application Japan, May 16, 1991, 3-139515
Int. Cl.[5] A23G *9/02*
U.S. Cl. 426—101 7 Claims



1. An ice confectionery comprising a first layer of only crushed ice particles, a second layer including crushed ice particles and impregnated with a syrup, and a third layer of ice cream disposed between the first and second layers, wherein aid third layer serves as a barrier for preventing the syrup from moving from the second layer to the first layer.

5,194,275
GRAIN PROCESSING APPARATUS
David G. Greer, Anoka, Minn., assignor to AgriChem, Inc., Anoka, Minn.
Filed Aug. 13, 1992, Ser. No. 928,734
Int. Cl.[5] A23N *17/00*
U.S. Cl. 426—231 18 Claims



16. A method of processing grain as it is moved through a grain processing area from an upstream location along a path toward a downstream location, through regulated addition of moisture derived at least in part from a water supply, in order to regulate the moisture content of the grain relative to an approximate target moisture content, comprising the steps of:
providing a moisture sensor specifically calibrated to measure moisture content of the type of grain to be conditioned and adapted to generate a first electronic signal proportional to the moisture content
moving the grain on electrically operated conveying means;
measuring the moisture content of a sample of the moving grain at a first station on the path of travel of the grain, using the moisture sensor to substantially continuously monitor the moisture content of moving grain and translate the measurement into a substantially continuously generated first electronic signal;
providing an electric current sensor to measure the electric current drawn by the grain conveying means adapted to generate a second electronic signal proportioned to the mass flow of the grain;
measuring the mass flow of the grain using the electric current sensor to continuously measure the electric current drawn by the grain conveying means and translate the measurement into a substantially continuously generated second electronic signal;
providing a programmable controller and connecting the moisture sensor and electric current sensor to the programmable controller for receipt of the first and second electronic signals and blending of the signals to produce an output control signal;
providing moisture to the passing grain using a liquid applicator apparatus at a second station located downstream of the first station with respect to the direction of grain movement;
providing liquid to the liquid applicator apparatus through a liquid line extended from a water supply;
providing a proportional flow control valve in the liquid line of the type having an electronic valve control for regulating the opening and closing of the valve to regulate water flow through the valve by an electronic signal;
controlling the valve control of the automatic valve with the output control signal generated by the programmable controller to modulate the flow of water to the liquid applicator apparatus.

5,194,276
METHOD FOR RAPIDLY PRODUCING STABLE FLOUR FROM NEWLY HARVESTED WHEAT
R. Carl Hoseney; Jon M. Faubion, and Kantha Shelke, all of Manhattan, Kans., assignors to The Pillsbury Company, Minneapolis, Minn.
Filed Oct. 4, 1991, Ser. No. 771,341
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—242 17 Claims

1. A method for rapidly converting newly harvested wheat grain to millable grain, comprising:
treating the newly harvested wheat grain with moisture at a temperature of about 0° to 60° C. until the moisture content of the newly harvested wheat grain including the endosperm is at least about 3 to 5 wt-% higher than its original moisture content, to produce hydrated grain; and
rapidly drying the hydrated grain to produce the millable grain;
the weight percents being relative to the total weight of the grain.

5,194,277
PROCESS FOR PREPARING LOW FAT POTATO CHIPS AND SHOESTRING POTATOES
Stephen Lauder, 917 ½ Douglas St., Los Angeles, Calif. 90026
Filed Jun. 10, 1991, Ser. No. 712,943
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—243 5 Claims

1. A method for preparing a potato product having a low fat content in which none of the natural foodstuffs of the potato are removed, said method consisting of the following steps: cutting a potato to produce a plurality of potato slices; steaming the slices for a period of about two to five minutes; and microwave heating the steamed slices for a period of about three to six minutes to produce a product having a substantially the same flavor, color and crispness as deep-fried potato chips and having no added fat content.

5,194,278
FRUIT-FLAVORED, ROASTED NUTS
David R. Strong, Denville, N.J., assignor to Nabisco, Inc., Parsippany, N.J.
Filed Oct. 25, 1991, Ser. No. 782,689
Int. Cl.[5] A23L *1/36*
U.S. Cl. 426—293 22 Claims

1. A process for preparing fruit-flavored, roasted nuts which comprises: coating raw nuts with an adhesive mixture comprising a mixture of fruit juice solids and water; coating the adhesive coated nuts with a dry coating of a carbohydrate material; and subjecting the thusly coated nuts to roasting.

5,194,279
GLUCOAMYLASE REMOVAL USING NITROGEN-FUNCTIONALIZED AMORPHOUS PRECIPITATED SILICA
Timothy A. Okel, Trafford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jun. 20, 1991, Ser. No. 718,499
Int. Cl.[5] A23L *2/00*; C12H *1/02*
U.S. Cl. 426—330 26 Claims

1. In a process for removing glucoamylase from an aqueous medium in which said glucoamylase is dissolved, the improvement comprising contacting said aqueous medium with nitrogen-functionalized amorphous precipitated silica, wherein said nitrogen-functionalized amorphous precipitated silica is amorphous precipitated silica having associated therewith at least one organic surface modifier having at least one nitrogen-containing group selected from the class consisting of amino, quaternary ammonium, and diazonium, and wherein said nitrogen-functionalized amorphous precipitated silica has a pore diameter at the maximum of the volume pore size distribution function of from about 7 to about 100 nanometers.

5,194,280
METHOD OF MANUFACTURING A JUICE CONCENTRATE
Frank M. Palermiti, Indialantic, Fla., assignor to F & MP Research & Development Laboratories, Inc., Indialantic, Fla.
Continuation-in-part of Ser. No. 729,599, Jul. 15, 1991, Pat. No. 5,118,517. This application Nov. 18, 1991, Ser. No. 793,159
The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.
Int. Cl.[5] A23L *2/08*
U.S. Cl. 426—330.5 31 Claims

1. A method of preparing a juice concentrate comprising the steps of:
a. filtering a juice to remove seeds and heavy pulp;
b. drying the filtered juice to form a concentrate; and
c. adding a predetermined amount of a lubricant selected from the group of stearates comprising zinc stearate and calcium stearate to reduce the adhesiveness of the concentrate.

5,194,281
POLYOL FATTY ACID POLYESTERS WITH REDUCED TRANS DOUBLE BOND LEVELS AND PROCESS FOR MAKING
Robert W. Johnston, Sharonville; Josephine L. Kong-Chan, Cincinnati; Richard G. Schafermeyer, Cincinnati, and Paul Seiden, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 590,023, Oct. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 421,867, Oct. 16, 1989, abandoned. This application May 21, 1992, Ser. No. 887,426
Int. Cl.[5] A23D *7/00*; C07H *13/02*
U.S. Cl. 426—531 51 Claims

1. A composition of matter comprising a polyol fatty acid polyester fat substitute, wherein the polyol contains at least 4 hydroxyl groups and wherein the polyol polyester contains at least 4 fatty acid groups, each fatty acid group having from about 2 to about 24 carbon atoms, wherein:
(a) not more than about 0.6% of the fatty acids contain three or more double bonds, not more than about 20% of the fatty acids contain two or more double bonds, and not more than about 35% of the fatty acid double bonds are trans double bonds;
(b) the polyesters have an iodine value between about 15 and about 60; and
(c) the ratio of solid fat content at 98.6° F. to liquid solid stability is less than 0.25.

5,194,282
FOOD PRODUCTS HAVING A REDUCED FAT CONTENT
Shlomo Grossman, Ramat Gan; Margalit Bergman, Holon, both of Israel; Abraham I. Bakal, Parsippany, and Penny A. Cash, Denville, both of N.J., assignors to Bar Ilan University, Ramat Gan, Israel
Continuation-in-part of Ser. No. 337,008, Apr. 12, 1987, abandoned. This application Nov. 26, 1990, Ser. No. 617,555
Int. Cl.[5] A23L *1/0562*
U.S. Cl. 426—549 21 Claims

1. A normally fat-containing manufactured food product, wherein at least part of the fat content therein has been replaced by gelatin in an amount by weight which is no more than 10% of the weight of the original fat content which has been replaced, and wherein the gelatin is a fish-derived gelatin made from fish waste comprising fish skins by a stepwise process including the following steps (i), (ii), (iii) and (iv) carried out in the recited sequence, namely:
(i) treating said fish waste with dilute aqueous alkali, followed by washing with water until the washing water is substantially neutral;
(ii) treating the alkali-treated and washed fish waste from step (i) with dilute aqueous mineral acid, followed by washing with water until the washing water is substantially neutral;
(iii) treating the mineral acid-treated and washed fish waste from step (ii) with dilute aqueous organic acid, followed by washing with water until the washing water is substantially neutral; and
(iv) extracting with water at elevated temperatures not above about 55° C., the organic acid-treated and washed fish waste from step (iii).

5,194,283
PROCESS FOR THE MANUFACTURE OF COMPOSITE CHEESE AND PRODUCT THEREOF
Christian Dupas, Saint-Lo, and Claude Parmentier, Pont-Hebert, both of France, assignors to Nestec S.A., Vevey, Switzerland
Filed Aug. 21, 1989, Ser. No. 396,936
Claims priority, application European Pat. Off., Sep. 15, 1988, 88115060
Int. Cl.[5] A23C *19/06*
U.S. Cl. 426—582 18 Claims

1. A process for the production of a composite cheese product comprising co-extruding materials consisting essentially of two differing unripened drained curds at a temperature of from 0° C. to 30° C. into a form of a strand such that one extruded curd forms a core of the strand and such that one extruded curd forms a layer about the core.

5,194,284
FOODS OPACIFIED WITH DEBRANCHED STARCH
Chung-Wai Chiu, Westfield, and Matthew Healey, Somerset, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.
Continuation-in-part of Ser. No. 350,057, May 10, 1989, Pat. No. 5,089,171, which is a continuation-in-part of Ser. No. 258,231, Oct. 14, 1988, Pat. No. 4,971,723. This application Feb. 14, 1992, Ser. No. 837,443
Int. Cl.[5] A23L *1/0522, 1/307*
U.S. Cl. 426—589 17 Claims

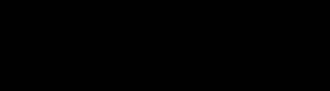
1. A method for opacifying reduced-fat foods comprising formulating the reduced-fat food with an effective amount, up to 50%, by weight of the food, of a starch which starch has been fully debranched by treatment with an alpha-1,6-D-glucanohydrolase.

5,194,285
PROCESS FOR PREPARING A WATER-IN-OIL DISPERSION HAVING A DISPERSED GELLED AQUEOUS PHASE
Ian T. Norton, Rushden, Great Britain, assignor to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.
Division of Ser. No. 521,518, May 10, 1990, abandoned. This application May 20, 1991, Ser. No. 703,062
Claims priority, application European Pat. Off., May 16, 1989, 89201210.5
The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.
Int. Cl.[5] A23D *7/00*
U.S. Cl. 426—603 7 Claims

1. A process for preparing a dispersion having a continuous fat phase and a dispersed gelled aqueous phase comprising the steps of:
(a) cooling a water-continuous composition having, calculated on the water, (i) more than 200 ppm amino acid residues and (ii) more than a critical concentration of 1 or more gelling polysaccharides capable of forming a reversible gel, from a temperature above a gel setting temperature of the water-continuous composition to a temperature below the gel setting temperature to form a cooled water continuous composition;
(b) subjecting the cooled water-continuous composition to such conditions of shear that the water-continuous composition is converted into small gelled aqueous beads; and
(c) forming a fat-continuous dispersion from the water-continuous composition or the cooled water-continuous composition while maintaining the temperature at below a gelled melting temperature.

5,194,286
POLYBASIC ACID AMIDES AND THEIR USE AS DIGESTIVELY HYDROLYZABLE OIL SUBSTITUTES
Stephen B. Christensen; Attila G. Relenyi; Robert G. LaBarge, and Bassam S. Nader, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 671,242, Mar. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 464,814, Jan. 16, 1990, abandoned. This application May 4, 1992, Ser. No. 879,540
Int. Cl.[5] A23D *5/00*; C09E *5/00*
U.S. Cl. 426—612 11 Claims

1. A digestively hydrolyzable compound corresponding to the formula:



where the compound is derived from a polybasic acid of the formula

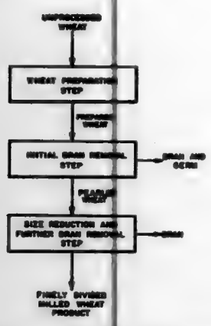
wherein R_1 is a hydrocarbon radical, the sum of the atomic weights of all atoms in R_1 being greater than 200, n is 2 or 3, and R_2 is

and R_3 is a C_1 to C_{22} straight or branched chain alkyl radical.

5,194,287
WHEAT MILLING PROCESS AND MILLED WHEAT PRODUCT
Warner Wellman, Omaha, Nebr., assignor to ConAgra, Inc., Omaha, Nebr.
Division of Ser. No. 610,819, Nov. 8, 1990, Pat. No. 5,104,671, which is a continuation-in-part of Ser. No. 557,631, Jul. 24, 1990, Pat. No. 5,089,282. This application Feb. 10, 1992, Ser. No. 833,016
Int. Cl.[5] A23L *1/10*
U.S. Cl. 426—622 6 Claims

1. A finely divided food grade wheat product made from milling quality hard wheat, said product having an ash content

no greater than about 0.47 wt %, a ratio of (1) measured aleurone fluorescence area to (2) ash content (wt %) of at least



about 3.2, and an average particle size no greater than that of farina.

5,194,288

SYRUP FOR CONFECTIONS AND METHOD FOR USING SAME

Benjamin R. Peterson, West Chicago, Ill., assignor to Universal Foods Corporation, Milwaukee, Wis.

Filed May 23, 1991, Ser. No. 704,829
Int. Cl.[5] A23L *1/09*
U.S. Cl. 426—658 19 Claims

1. A syrup that increases in viscosity upon contact with a calcium-containing frozen confection, consisting essentially of
a. an amount of at least one sweetener contributing from about 25 to about 60 percent sugar solids, in water;
b. an amount of at least one sequestrant sufficient to complex substantially all the hardness present in the syrup wherein the sequestrant is a combination of a first type and a second type, the first type being optional and selected from the group consisting of sodium citrate, potassium citrate, disodium phosphate and mixtures thereof, the second type being selected from the group consisting of phosphate, polyphosphate, and carbonate compounds; and
c. an amount of at least one low viscosity alginate sufficient to thicken the syrup upon contact with the calcium-containing frozen confection, the alginate being selected from the group consisting of sodium, potassium, and ammonium salts and mixtures thereof.

5,194,289

METHOD FOR LABELING AN OBJECT FOR ITS VERIFICATION

Charles L. Butland, Playa de Rey, Calif., assignor to Butland Trust Organization, Los Angeles, Calif.

Continuation-in-part of Ser. No. 263,058, Oct. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 868,955, May 30, 1986, Pat. No. 4,882,195, which is a continuation-in-part of Ser. No. 857,929, Apr. 30, 1986, abandoned. This application Oct. 15, 1990, Ser. No. 597,859
Int. Cl.[5] B05D *5/00*; A61B *5/117*
U.S. Cl. 427—1 6 Claims

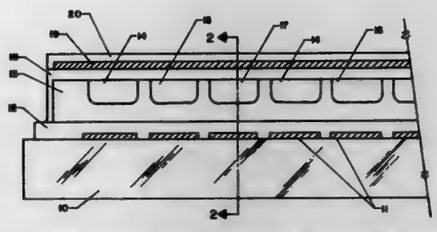
1. Method for labeling an object for identification which comprises the steps of:
(a) preparing a substrate to contain a binder bearing an ultra-violet (UV) radiation sensitive dye and an amino acid or protein fragment from the hair of an individual;
(b) contacting a marker with said substrate; and
(c) applying said contacted marker to an object at a location thereupon to create a permanent impression on said object, which impression is perceptible only in the presence of UV radiation.

5,194,290

METHOD OF MAKING A SINGLE LAYER MULTI-COLOR LUMINESCENT DISPLAY

James B. Robertson, Grafton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 693,049, Apr. 30, 1991, Pat. No. 5,104,683, which is a continuation of Ser. No. 337,768, Apr. 13, 1989, abandoned, which is a division of Ser. No. 140,185, Dec. 31, 1987, Pat. No. 5,047,686. This application Mar. 24, 1992, Ser. No. 858,176
The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.
Int. Cl.[5] B05D *3/06, 5/06*
U.S. Cl. 427—526 20 Claims



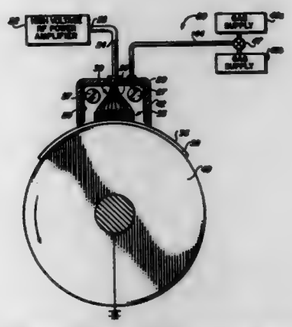
1. A method of forming a multi-color electroluminescent surface on a substrate comprising the steps of:
depositing a single layer of host material formed of ZnS having a smooth top surface on said substrate; and
introducing sufficient quantities of impurities selected from the group consisting of Sm, SmF_3, Eu and EuF_3 within selected areas of said single layer of ZnS host material via an appropriately positioned mask to form a pattern of red phosphors, namely ZnS:Sm, ZnS:SmF_3, ZnS:Eu and ZnS:EuF_3, within said single layer of ZnS host material such that the top surface of said single layer of host material remains smooth.

5,194,291

CORONA DISCHARGE TREATMENT

James R. D'Aoust, San Diego, and Tihiro Ohkawa, La Jolla, both of Calif., assignors to General Atomics, San Diego, Calif.

Filed Apr. 22, 1991, Ser. No. 689,295
Int. Cl.[5] C23C *16/48*
U.S. Cl. 148—276 20 Claims



1. Corona discharge treatment apparatus for treating a surface of a conductive substrate, said apparatus comprising:
a high voltage, radio frequency power supply;
a cable including a plurality of flexible conductors and other components, said cable having a first end connected to said power supply, said cable having a second end wherein said other components of said cable have been removed with said conductors depending from the remainder of said cable, the free ends of said conductors at said second cable end being disposed in general non-parallel arrangement, and the free end of each conductor being held in a separate insulator which extends beyond the free end which it holds, each free end being movable independently of the other free ends;
means for holding the conductive substrate beneath said cable second end so that the upper surface of said substrate is engaged by said insulators;
means for connecting said conductive substrate to ground; and
means for effecting relative movement between said cable second end and said conductive substrate.

17. A cable for use in corona discharge treatment apparatus, said cable comprising:
a plurality of discrete flexible electrical conductors and other components;
said cable having a first end for connection to a source of high voltage, radio frequency power;
said cable having a second end wherein said other components have been removed and said conductors depend from the remainder of said cable, said conductors having free ends at said second end with said free ends being disposed in a transposed arrangement, each of said free ends being held in an insulator which extends beyond the free end it holds, all of said insulators extending substantially the same distance from the corresponding free ends, whereby with said dielectrics engaging the upper surface of a conductive substrate to be treated, said free ends of the conductors are spaced substantially uniformly from said upper surface.

18. A method of treating the upper surface of a length of conductive material, such as a strip or plate of steel, to improve characteristics of said material by causing the formation of a diffusion layer of an element at or adjacent said upper surface, said method comprising the following steps:
providing a cable having at one end thereof a plurality of flexible conductors depending from the remainder of said cable, said conductors having free ends with each free end held in an insulator which extends beyond its free end away from the remainder of said cable, each said insulator extending substantially the same distance beyond the free end it holds;
connecting the other end of said cable to a source of high voltage, radio frequency power;
causing the insulators to engage said upper surface of said length of material;
grounding said length of material so that a corona discharge will be formed between said conductor free ends and said upper surface;
introducing into the area of said corona discharge a gas mixture comprising a halide gas containing the element of which said diffusion layer is to be formed and a reducing gas, such as hydrogen; and
effecting relative movement between the insulators and said upper surface so that said insulators are maintained in substantially continuous engagement with said upper surface.

5,194,292

METHOD OF DRYING AND BONDING NAIL POLISH

Calvert W. Billings, 23221 Peralta, Suite H, Laguna Hills, Calif. 92653

Filed Dec. 13, 1991, Ser. No. 806,360
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—493 5 Claims

1. A method for drying and bonding nail polish to a fingernail, wherein the steps thereof comprises:
cleaning the surface of a fingernail to be coated with nail polish;
applying at least one coat of nail polish to the surface to the fingernail;
applying a final top coat of photo-sensitive material;
drying the nail polish by means of applying heat thereto so as to release any remaining solvents therein; and
exposing the photo-sensitive material to a respective photo-active light source so as to activate the material, whereby the photo-sensitive material is polymerized, thereby bonding the nail polish to the surface of the fingernail so as to prevent chipping, scratching and smudging.

5,194,293

PROCESS FOR FINISHING A PLASTIC SURFACE

Brian C. Foster, 2973 Corte Portofino, Newport Beach, Calif. 92660

Filed Dec. 3, 1991, Ser. No. 801,054
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—512 7 Claims

1. A method for treating weathered plastic surfaces of an article to enhance the resistance of said treated surface to weathering due primarily to the harmful effects of ultra violet radiation, said method comprising the steps of:
a. cleaning said surface with a cleaning agent;
b. polishing said surface with a abrasive to remove major imperfections in the surface;
c. applying a layer of an uncured UV curable material over said cleaned and polished surface, said first layer defining an adhesive layer;
d. applying a coat of a curable material over said UV curable adhesive layer to form a protective coating over said uncured layer, said curable material being compatible with said adhesive layer and held thereby on said plastic surface;
whereby as said treated surface is exposed to ultra violet radiation curing of said layer is initiated.

5,194,294

PROCESS FOR PREPARING ELECTRICAL CONNECTION MEANS, IN PARTICULAR INTERCONNECTION SUBSTANCES OF HYBRID CIRCUITS

Frédéric Retnaa, Tokyo, Japan; Dominique Navarro, Pont de la Maye, and Sylvie Maillal, Vitry-sur-Seine, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 482,114, Feb. 20, 1990, abandoned.
This application Apr. 11, 1991, Ser. No. 684,434
Claims priority, application France, Feb. 20, 1989, 89 02172
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—96 18 Claims

1. A process of manufacturing electrical connection components on a substrate, which comprises the preliminary step of depositing on the substrate a non-noble metal-base plate, and wherein the substrate and the deposited paste are subject to the following successive steps:
drying at a first temperature lower than 150° C. under a first atmosphere;
firing by raising the temperature from said first temperature to a second temperature lower than 600° C. under a second atmosphere consisting essentially of an inert gas selected from the group consisting of nitrogen, argon, helium, and mixtures thereof, oxygen and including a first amount of water vapor at a content greater than 50 ppm and lower than 20,000 ppm;
sintering at a third temperature between 600° C. and 1,000° C. under a third atmosphere consisting essentially of an inert gas selected from the group consisting of nitrogen, argon, helium, and mixtures thereof, and including a sec-

VOL 1148 ISS 3 MR 16 1993 UMI

ond amount of water vapor at a content less than said first amount and lower than 1,000 ppm, and
cooling progressively under a fourth atmosphere.

5,194,295
CERAMIC ARTICLES HAVING HEAT-SEALABLE METALLIC COATINGS AND METHOD OF PREPARATION
Charles D. Iacovangelo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 718,698, Jun. 21, 1991, Pat. No. 5,132,185. This application Feb. 19, 1992, Ser. No. 836,896
Int. Cl.[5] B05D *5/12, 1/18;* C25D *11/34*
U.S. Cl. 427—98 **10 Claims**

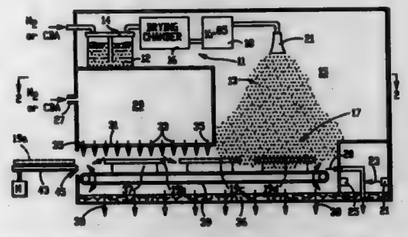
1. A method for preparing a heat-sealable metal coating on a ceramic article having a nickel or cobalt underlayer and a metallic gold overlayer on at least a portion of its surface, said method comprising the steps of heat-treating said layers in a reducing atmosphere at a temperature of at least about 650° C., thereby causing diffusion of nickel or cobalt into a sintering of said gold overlayer and decreasing the nickel or cobalt activity therein, and subsequently depositing a final layer of metallic gold directly on said overlayer.

5,194,296
METHOD OF PRODUCING A COILABLE CERAMIC VENEER IN UNFIRED CONDITION
Josef Hammer, Kronberg; Werner Voelker, Bad Vilbel, and Paul F. Hakmann, Wertheim am Main, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt and Glaswerk Schuller GmbH, Wertheim am Main, both of Fed. Rep. of Germany
Filed Oct. 26, 1990, Ser. No. 604,001
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1989, 3936561
Int. Cl.[5] B05D *3/12, 1/00;* B29D *7/00*
U.S. Cl. 427—177 **13 Claims**

1. A method of producing a ceramic veneer which is coilable in unfired condition, comprising: coating a base material of inorganic fibers with an aqueous slip containing a particle-shaped ceramic material, said coating being formed by one or more slip layers applied on both sides of said base material, said coating applied to the base material without the use of an additional support, after coating of one side, intermediate drying then coating an opposite side, drying the base material coated on both sides to a residual moisture concentration of maximally 10% by weight in a self-supporting state, said base material consisting of inorganic fibers with a weight per unit area of 30 to 200 g/m^2, said coating is at least 500 g/m^2 of ceramic material, said slip containing at least one organic binder in an amount of 3 to 20% by weight relative to the solids that essentially decompose uniformly and without residue, during heating from 250° to 600° C.; and
the unfired veneer is coiled without damage, wherein the unfired veneer may be decorated prior to coiling.

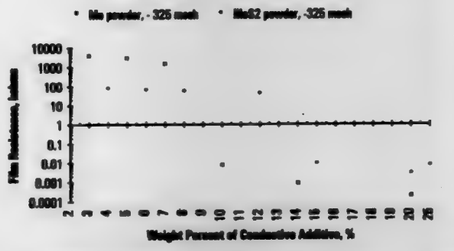
5,194,297
SYSTEM AND METHOD FOR ACCURATELY DEPOSITING PARTICLES ON A SURFACE
Bradley W. Scheer, San Jose, and Paul A. Konicek, Santa Clara, both of Calif., assignors to VLSI Standards, Inc., Mountain View, Calif.
Filed Mar. 4, 1992, Ser. No. 846,202
Int. Cl.[5] B05D *1/12*
U.S. Cl. 427—180 **14 Claims**

10. A method of depositing particles on a surface of an article comprising
(a) receiving information specified by a user, said information including at least a specified particle density P for particles to be deposited onto a surface,
(b) receiving an article having a surface to be deposited with particles and conveying said article to a clean area of a deposition chamber,
(c) providing a clean gas sheath flow over said surface of said article,
(d) discharging particulate material into a top portion of said deposition chamber in the form of a mist of separate particles suspended in a gaseous stream, said particles in said mist falling with a substantially uniform distribution over an extended application area near the bottom of said deposition chamber, said clean gas sheath flow over said surface of said article at said clean area of said deposition chamber preventing deposition of said particles onto said surface,
(e) continuously measuring particle flux in the mist of particles in said deposition chamber by means of a particle counter,



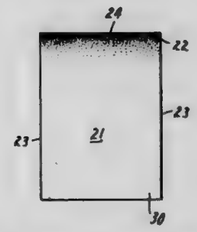
(f) calculating from said measured particle flux a time rate of change of said particle flux and determining a time t_0 when said time rate of change is substantially zero,
(g) conveying said article out of said sheath flow at said clean area into said mist of falling particles at said application area at said time t_0, particles in said mist thereby being deposited onto said surface,
(h) calculating, from said measured particle flux Q_0 and said specified particle density specified by said user, a deposition time T needed to obtain said specified particle density, and
(i) conveying said article out of said mist of falling particles at said application area back into said sheath flow at said clean area at a time $t_1=t_0+T$.

5,194,298
METHOD OF PREPARING CORROSION RESISTANT COMPOSITE MATERIALS
Thomas D. Kaun, 320 Willow St., New Lenox, Ill. 60451
Filed Sep. 14, 1990, Ser. No. 582,525
Int. Cl.[5] B05D *5/10, 3/02, 5/00;* C04B *35/60*
U.S. Cl. 427—207.1 **12 Claims**



1. A method of preparing a nonaqueous corrosion resistant composite material, comprising the steps of:
(a) preparing a ceramic material selected from the group consisting of sulfides, selenides and combinations thereof and said ceramic material including at least two chemical elements;
(b) melting said ceramic material;
(c) wetting a surface with said melted ceramic material wherein said surface is selected from the group consisting of a metallic material, a second ceramic material and combinations thereof; and
(d) reacting said surface with said ceramic material to form said corrosion resistant composite material.

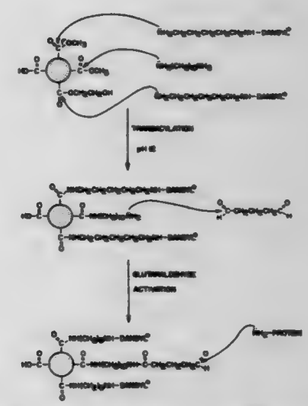
5,194,299
REPOSITIONABLE PRESSURE-SENSITIVE ADHESIVE SHEET MATERIAL
Arthur L. Fry, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 662,605, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 662,605, Oct. 19, 1984, abandoned. This application Dec. 31, 1986, Ser. No. 948,095
Int. Cl.[5] B32B *31/00*
U.S. Cl. 427—208.6 **5 Claims**



1. A method of making a removable and repositionable adhesive sheet product comprising spraying onto a sheet backing material a solution or dispersion of a normally tacky and pressure-sensitive adhesive in a liquid carrier and thereafter evaporating the liquid carrier, leaving a non-repetitive discontinuous pattern of spaced islands of adhesive, the pressure-sensitive adhesive being sufficiently adherent that, if sheet material having a continuous coating of said adhesive is applied to newsprint, it cannot be peeled away at normal removal rates without tearing or delaminating said newsprint, the adhesive islands being on the order of 0.01 to 0.15 millimeter thick, having at least one other dimension no greater than 0.02–1.5 millimeters, and occupying from about 10–85% of the area over which adhesive is applied, so as to achieve an adhesion to polyester film on the order of 8–80 grams per centimeter width, whereby said adhesive product can be adhered to newsprint, allowed to remain in contact therewith for two weeks at room temperature and then removed without visibly damaging the newsprint.

5,194,300
METHODS OF MAKING FLUORESCENT MICROSPHERES
Sau W. Cheung, 8528 Douglas Ct., St. Louis, Mo. 63144
Division of Ser. No. 73,770, Jul. 15, 1987, abandoned. This application Nov. 8, 1989, Ser. No. 433,677
Int. Cl.[5] G01N *33/547;* C08F *8/10*
U.S. Cl. 427—213.31 **20 Claims**

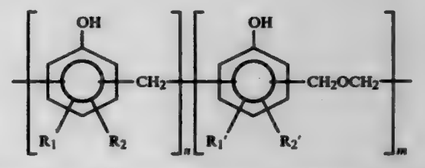
1. A method of forming a dyed microsphere comprising a first step of forming an acrylic latex bead having on its surface at least five thousand ester terminations, and thereafter a second step of simultaneously reacting said ester terminations on said acrylic latex bead with an amine-terminated dye and with



a diamine to form by transacylation a conjugate of said amine-terminated dye and said diamine with said bead.

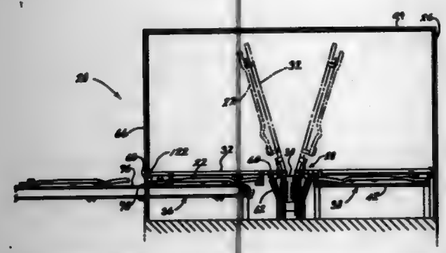
5,194,301
PROCESS FOR REDUCING SCALE FORMATION IN VINYL POLYMERIZATION REACTORS
Neida C. Boscan-Romero; Jose L. Corcuera-Casas; Edgar R. Gonzalez-Acevedo; Enrique J. Millan-Barrios, and Rafael A. Quintero-Arcaya, all of Maracaibo, Venezuela, assignors to Investigacion y Desarrollo, C.A., El Tablazo, Venezuela
Continuation-in-part of Ser. No. 565,075, Aug. 9, 1990, Pat. No. 5,139,823. This application Nov. 20, 1991, Ser. No. 795,160
Int. Cl.[5] B01J *1/20;* B05D *7/22;* C08F *2/00*
U.S. Cl. 427—237 **20 Claims**

1. A process for preventing or substantially reducing the formation of scale on the inner surfaces of a polymerization reactor which comprises coating the inner surfaces of the reactor with an aqueous alkali metal hydroxide solution containing a) an electrolyte of an alkali metal halide and b) a linear or branched oligomer of a poly(hydroxybenzyl) compound, a poly(hydroxybenzylether) compound, or a copolymer or blend thereof having the following chemical structure:



wherein $0 \leqq (n+m) \leqq 50$ and wherein R1, R1′, R2 and R2′ are each, a hydrogen, a substituted benzyl, an aryl, an alkane of up to 8 carbon atoms, an alcohol of up to 4 carbon atoms, an ester of up to 8 carbon atoms, an acid or aldehyde, a polyoxymethylene oligomer, or a combination thereof.

5,194,302
MANUFACTURING METHOD FOR COATING VEHICLE STRUCTURAL FRAMES
Phillip C. Rudd, Elm Grove, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Division of Ser. No. 389,346, Aug. 3, 1989, Pat. No. 5,061,529.
This application Oct. 9, 1991, Ser. No. 774,703
Int. Cl.[5] B05D *3/12, 1/18*
U.S. Cl. 427—346 11 Claims

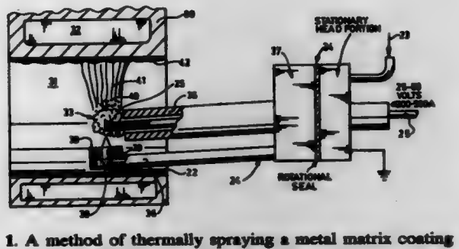


1. A manufacturing method for applying a coating to vehicle structural frames, each frame being a generally flat longitudinal member and of a size extending substantially the length and width of a vehicle and supporting the vehicle, the frame having a height, a width substantially greater than said height, and a longitudinal extent of a length substantially greater than said width, comprising transporting said vehicle structural frame through a coating station and coating said frame in a position such that said longitudinal extent of said vehicle structural frame is substantially horizontal, and raising said vehicle structural frame to a tilted position such that said longitudinal extent of said vehicle structural frame is tilted at an angle relative to horizontal.

5,194,303
ADDITIVES FOR LEAD- AND CADMIUM-FREE GLAZES
Jaroslava M. Nigrin; Kathleen A. Wexell, and Dale R. Wexell, all of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Jul. 1, 1991, Ser. No. 724,125
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—376.2 3 Claims

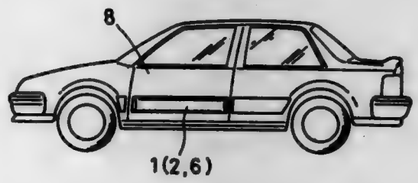
1. A method for eliminating the grayish discoloration which develops when lead-free and cadmium-free glass frit particles are applied to a substrate by means of an organic vehicle and fused to form a glaze, which discoloration is the result of a carbonaceous residue, comprising the steps of:
(a) preparing lead-free and cadmium-free glass frit particles of a desired composition;
(b) adsorbing a coating of a strongly oxidizing metal ion species onto the surface of said frit particles in an amount of at least about 0.5% by weight, which metal ion species is strongly oxidizing over the range of room temperature to 550° C., which, expressed in terms of metal oxide, is selected from the group consisting of Mn_2O_3, SnO_2, TiO_2, and reduced ZnO, and which has an anion associated therewith that decomposes over the range between room temperature and 400° C.;
(c) mixing said coated frit particles with an organic vehicle;
(d) applying said mixture onto a substrate; and
(e) firing said mixture to eliminate said organic vehicle and to oxidize said carbonaceous residue while fusing said frit particles into a glaze essentially free from grayish discoloration.

5,194,304
THERMALLY SPRAYING METAL/SOLID LIBRICANT COMPOSITES USING WIRE FEEDSTOCK
Robert C. McCune, Jr., Birmingham; Larry V. Rotherford, Warren, and Matthew J. Zaluzec, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jul. 7, 1992, Ser. No. 909,832
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—449 19 Claims



1. A method of thermally spraying a metal matrix coating containing solid lubricant particles, comprising:
(a) creating a flame or electrical arc into which a consummable strand is fed to produce a melt, the strand being constituted as a hollow sheath of metal meltable by said flame or arc and in which is disposed a core containing solid lubricant melt-resistant particles;
(b) applying a pressurized jet of propellant gas to said melt and particles to project a spray thereof while protecting said particles against ablation during transfer of said spray to a target to deposit a coating thereon; and
(c) heat treating said coating to (i) precipitate additional solid lubricant particles that increase scuff resistance, (ii) control microstructure, and (iii) densify the metal without heat treating the target.

5,194,305
MOLDINGS AND PROCESS FOR MANUFACTURING THE SAME
Itaru Shirahata, and Nobuyuki Sawaki, both of Obu, Japan, assignors to Tokai Kogyo Kaisha, Obu, Japan
Filed Sep. 30, 1991, Ser. No. 767,658
Claims priority, application Japan, Oct. 11, 1990, 2-274286
Int. Cl.[5] B60R *13/04*
U.S. Cl. 428—31 9 Claims



1. A molding for use with an automobile comprising a hollow molding body formed by blow molding and including external top, side and bottom surfaces, and an ornamental film layer adhered to the external upper and side surfaces of said hollow molding body, the ornamental film layer being adhered during blow molding of the hollow molding body.

5,194,306
BARRIER BLENDS BASED ON AMORPHOUS POLYAMIDE AND ETHYLENE/VINYL ALCOHOL, UNAFFECTED BY HUMIDITY
Philip S. Blatz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 511,177, Apr. 17, 1990, Pat. No. 5,110,855, which is a division of Ser. No. 206,025, Jun. 17, 1988, Pat. No. 4,952,628, which is a continuation-in-part of Ser. No. 88,260, Aug. 24, 1987, abandoned. This application Jan. 29, 1992, Ser. No. 827,428
Int. Cl.[5] B32B *1/08*
U.S. Cl. 428—354 8 Claims

1. A laminate comprising at least one layer of substantially uniform composition consisting essentially of an amorphous polyamide having a glass transition temperature of about 90° C. to about 200° C.; and at least one layer of substantially uniform composition consisting essentially of a vinyl alcohol polymer having a copolymerized ethylene content of 0 to about 60 mole percent and a degree of saponification of at least about 90 percent; wherein said laminate comprises about 5–45 weight percent said ethylene vinyl alcohol copolymer and about 50–95 weight percent said amorphous polyamide, based on the total of said vinyl alcohol polymer and said amorphous polyamide.

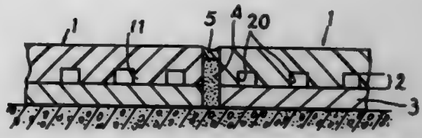
5,194,307
HIGH PERFORMANCE EPOXY BASED COVERLAY AND BOND FLY ADHESIVE WITH HEAT ACTIVATED CURE MECHANISM
Thomas F. Gardeski, Tempe, Ariz., assignor to Martin Processing, Inc., Martinsville, Va.
Division of Ser. No. 618,525, Nov. 26, 1990, Pat. No. 5,095,077, which is a continuation of Ser. No. 481,794, Feb. 15, 1990, abandoned, which is a continuation of Ser. No. 153,140, Feb. 8, 1988, abandoned. This application Mar. 6, 1992, Ser. No. 846,693
Int. Cl.[5] B32B *7/12, 15/04;* C09J *4/00*
U.S. Cl. 428—40 16 Claims

1. The composite structure comprising a first construction material; a second construction material; and an adhesive material between a first surface of said first construction material and a first surface of said second construction material, said adhesive material including:
(a) the reaction product of an aziridine with at least one polyester compound having a melting point of at least about 150 degrees C. and being the reaction product of at least one aromatic diacid, at least one aliphatic diacid, at least one diol and at least one triol or higher polyhydric alcohol; and
(b) an epoxy component selected from the family of electronic grade resin epoxy components.

6. The composite structure of claim 1 wherein said first and said second construction material are release substrates; wherein a combination of said aziridine component, said polyester component and said epoxy component have not been heated.

5,194,308
TILE WITH MULTIPLE LAYERS
Che-Yuan Chang, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei (10477), Taiwan
Filed Jul. 8, 1992, Ser. No. 910,516
Int. Cl.[5] B32B *3/00, 3/30*
U.S. Cl. 428—44 9 Claims

1. A tile comprising: a rigid outer layer having a decorative surface portion formed on an outermost surface of the outer layer made of rigid material, an air-chamber layer formed on a bottom portion of the outer layer defining an air chamber in the bottom portion of the outer layer, a plurality of supporting stems protruding inwardly from the outer layer to be distributed in the air chamber, and a soft substrate layer secured to each bottom surface of the supporting stem for sealing the air chamber and made of soft material softer than that of the outer layer and coated on a floor surface, thereby providing a cushioning and thermal resistant tile as effected by the air-chamber layer.



5,194,309
METHOD AND BLANK FOR PRODUCING A SUBSTANTIALLY U-SHAPED GUIDE RAIL IN A WINDOW FRAME GROOVE
Rolf Knudsen, Vatne, Norway, assignor to A/S Spilka Inco Ltd., Alesund, Norway
Filed Nov. 20, 1989, Ser. No. 439,196
Claims priority, application Norway, Nov. 23, 1988, 885205
Int. Cl.[5] B32B *3/02;* E04C *3/00*
U.S. Cl. 428—83 6 Claims

1. A blank for forming a U-shaped guide rail, said blank being made of elastic material and having an elongated flat web-shape of uniform width along the length thereof with a longitudinal central section, a pair of side sections parallel to and extending from opposite sides of said central section, and a pair of recesses parallel to said central section, each said recess being disposed between said central section and a respective side section to permit pivoting of said respective side section into perpendicular relation to said central section to form one wall of a U-shaped guide rail, each recess having lateral faces defining an angle of less than 90° therebetween to permit said faces to press against each other when said side sections are pivotal into a U-shaped guide rail to thereby increase the resiliency of said side sections in a direction away from each other.

4. In combination,
a window frame including a pair of vertical portions, each said vertical portion having a longitudinal groove therein;
a casement pivotally mounted in said frame and having a pair of slide pins, each said pin projecting into a respective groove of said frame; and
a pair of U-shaped guide rails of elastic material, each guide rail being disposed in a respective groove of said frame to slidably receive a respective pin therein and including a central section extending along said respective groove and a pair of side sections parallel to and extending along said central section, each said section extending perpendicularly of said central section and being biased outwardly of the other side section against a wall of said respective groove, each rail having a pair of recesses parallel to said central section, each said recess being disposed between said central section and a respective side section to permit pivoting of said respective side section into perpendicular relation to said central section, each recess having lateral faces pressing against each other to bias said side sections away from each other.

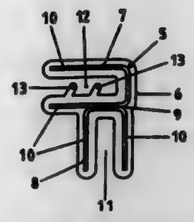
5,194,310
WOOD SURFACED FOLDABLE FLEXIBLE SHEET
Thomas A. Lenderink, 1271 House St., N.E., Belmont, Mich. 49306
Filed Feb. 20, 1990, Ser. No. 481,584
Int. Cl.[5] B32G *3/00*
U.S. Cl. 428—90 14 Claims

1. A flexible foldable natural wood faced laminated sheet material comprising a lamina of natural wood veneer having a thickness in the range of 0.003 to 0.0055 inch and a lamina of a tear resistant flexible and foldable backing material having a thickness of 0.001 to 0.0025 inch, said wood lamina being bonded to one face of said backing lamina, the resulting laminated sheet material being capable of being folded at spaced intervals through a 180° arc about a radius of approximately 0.006 inch without a rupture of the wood lamina when the fold line lies in the same general direction as the grain of the wood.

5,194,311
CUSHIONING CORE AND SEAT CONSTRUCTION ESPECIALLY FOR AN AIRCRAFT SEAT
Faruk Baymak, Hamburg; Helmut Stneben, Grossendeich, and Uwe Moog, Hamburg, all of Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany
Continuation of Ser. No. 446,206, Dec. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 6,556, Feb. 2, 1987, abandoned. This application Mar. 3, 1992, Ser. No. 845,005
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1985, 8510425; Apr. 15, 1985, 3513414
Int. Cl.[5] B32B *3/12, 3/26*
U.S. Cl. 428—116 10 Claims

1. A seat structure for a vehicle seat, comprising in combination an elastically deformable cushion forming a seat surface and a plastically deformable shock absorber arranged under and in contact with said plastically deformable cushion, said plastically deformable shock absorber comprising a plurality of plastically deformable sheet metal column means each having a longitudinal axis extending substantially perpendicularly to said seat surface for absorbing an impact force, said plastically deformable column means comprising predeformed portions (32*a*) for avoiding exposing a passenger to power peaks that are required to initially plastically deform said column means, whereby said plastically deformable column means absorb energy by being permanently deformed by a crash impact.

5,194,312
PROFILED SEALING STRIP WITH TWO REINFORCING BANDS
Heinz Verig, Schweim, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany
Filed Aug. 30, 1990, Ser. No. 575,339
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929159
Int. Cl.[5] E06B *7/16*
U.S. Cl. 428—122 10 Claims

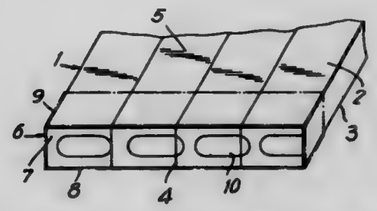


1. A profiled sealing strip, for automotive vehicles, comprising elastomeric material and a reinforcing insert within the elastomeric material; the strip having a length direction;
the insert comprising:
two profiled, stiff but bendable bands extending along the length of the strip and being disposed next to each other, each of the bands including a respective side surface which rests against the respective side surface of the other band in a region along the length of the strip, and each of the bands including respective sections which do not contact the other band and which are adapted to engage different parts of a vehicle body; means elastomerically bonding respective surfaces of the bands together at the region;
each of the bands having a respective continuous web extending along the length of the insert and each of the bands comprising a plurality of rungs arranged alongside each other without spacing between adjacent rungs and the rungs extending transverse to the length of the strip and to the web, and being integral with the web.

5,194,313
THROUGH-HOLE PLATED PRINTED CIRCUIT BOARD AND PROCESS FOR MANUFACTURING SAME
Jurgen Hupe, Langenfeld, and Walter Kronenberg, Cologne, both of Fed. Rep. of Germany, assignors to Blas-Berg-Oberflachentechnik GmbH, Solingen, Fed. Rep. of Germany
PCT No. PCT/EP89/00204, § 371 Date Aug. 17, 1990, § 102(e) Date Aug. 17, 1990, PCT Pub. No. WO89/08375, PCT Pub. Date Sep. 8, 1989
PCT Filed Mar. 1, 1989, Ser. No. 573,042
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806884; Sep. 24, 1988, 3832507
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—137 15 Claims

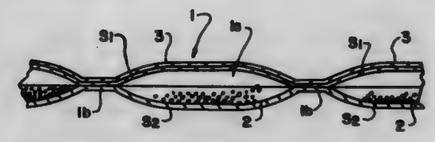
1. A through-hole plated single-layer or multi-layer printed circuit board based on a polymeric substrate or ceramic material provided on one or both sides with an electroconductive layer, characterized in that a layer of electroconductive synthetic polymer is present between the metal layer of the area enclosing the bore hole and the polymeric substrate or ceramic material, said metal layer being formed by a process of electrolytic metallization.

5,194,314
LAYERED SYNTHETIC MATERIAL SEALED WITH A FOIL HAVING APERTURES AND A FABRIC BACKING
Johannes W. G. Hooft, Hagestein, Netherlands, assignor to Multifoil B.V., Netherlands
Division of Ser. No. 454,701, Dec. 21, 1989, abandoned. This application Sep. 25, 1991, Ser. No. 765,572
Claims priority, application Netherlands, Dec. 29, 1988, 8803915
Int. Cl.[5] E06B *3/24;* B32B *3/00*
U.S. Cl. 428—138 7 Claims



1. A synthetic sheet material comprising substantially light-permeable parallel plates separated by longitudinally extending walls defining parallel channels forming openings at the sheet ends, and a composite foil attached to the sheet ends and sealing off the end openings, said composite foil comprising a relatively-weak first foil strip and a relatively strong second foil strip, said second foil strip overlapping the parallel plates and being secured thereto and having apertures overlying the end openings, said first foil strip being attached to the second foil strip and overlying its apertures and being constituted of dust-proof, water-vapor-permeable and ventilating material wherein said material has pore openings of less than 80 μm such that it is sufficiently dust-proof.

5,194,315
PACKING SHEET
Shinji Itoh, Kuwana, Japan, assignor to Kabushiki-Kaisha Taihei-Sansho, Kuwana, Japan
Filed Sep. 18, 1990, Ser. No. 584,072
Claims priority, application Japan, Feb. 15, 1990, 2-13934[U]
Int. Cl.[5] B32B *3/12;* B65D *21/00*
U.S. Cl. 428—178 9 Claims



1. A packing sheet comprising:
a central partition sheet having first and second surfaces;
a water permeable sheet having portions of a surface thereof sealed to said first surface so as to create at least one closed pouch between said water permeable sheet and said central partition sheet;
water absorptive resin contained within said at least one closed pouch;
an air permeable sheet having portions of a surface thereof sealed to said second surface, so as to create at least one opposite closed pouch between said air permeable sheet and said central partition sheet; and
a marginal portion for attachment to a transport case.

5,194,316
LAMINAR POLYMERIC SHEET
Patrick J. Horner; Michael J. Ludlow; Peter Nyholm, all of Swindon; Nicholas J. G. Smith, Cricklade, and Richard J. Peacock, Lechlade, all of England, assignors to Raychem Limited, United Kingdom
PCT No. PCT/GB89/00108, § 371 Date Feb. 26, 1991, § 102(e) Date Feb. 26, 1991, PCT Pub. No. WO89/07336, PCT Pub. Date Aug. 10, 1989
PCT Filed Feb. 3, 1989, Ser. No. 548,961
Claims priority, application United Kingdom, Feb. 5, 1988, 8802566; Dec. 2, 1988, 8828245
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 24 Claims

1. A laminar sheet comprising a layer of polyimide material laminated in direct contact with a layer of amorphous polyamide material.

5,194,317
INK JET RECORDING SHEET
Kazuo Sato, and Minoru Sone, both of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Nihonbashi, Japan
Filed Jul. 29, 1991, Ser. No. 736,777
Claims priority, application Japan, Aug. 3, 1990, 2-205183; Apr. 12, 1991, 3-106429
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 8 Claims

1. An ink jet recording sheet comprising a base material made of transparent plastic film and an ink fixing layer having a pigment fixed by a binder so that an image formed on said ink fixing layer is seen from the side of said base material, wherein said pigment in said ink fixing layer comprises beads of polystyrene or copolymers of styrene and carboxylated vinyl monomers, said beads having a weight that is between about four and seven times the weight of said binder, a size between about 0.1 μm and 100 μm and a refractive index of about 1.59 to 1.6 so that said recording sheet is not transparent.

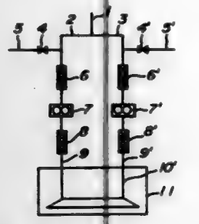
5,194,318
MULTILAYER FILM WITH METALLIZED SURFACE
Robert A. Migliorini, and Eldridge M. Mount, III, both of Fairport, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Oct. 25, 1991, Ser. No. 782,855
Int. Cl.[5] B32B *15/08, 27/08*
U.S. Cl. 428—215 5 Claims

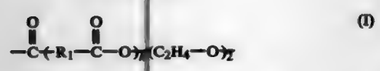
1. A metallized oriented film combination comprising a propylene homopolymer or copolymer substrate (B) having a high density polyethylene skin layer (A) on at least one side thereof, said polyethylene having a thin metal layer deposited thereon, said polyethylene having a density of about 0.960 or greater, said total film thickness is from about 50 to about 150 gauge units and said polyethylene layer (A) is from about 3 gauge units or less.

5,194,319
SHAPED POLYAMIDE ARTICLES AND PROCESS FOR MANUFACTURING THE SAME
Hidenitsu Osaka, Hofu; Hitoshi Tatsuno, Nishinomiya; Kazuyuki Fukazawa, and Masahiro Yamabe, both of Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 295,977, Jan. 11, 1989, abandoned. This application Nov. 13, 1991, Ser. No. 791,947
Claims priority, application Japan, Mar. 7, 1988, 63-52931; Dec. 23, 1988, 63-327465
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—224 6 Claims

1. A polyamide article selected from the group consisting of fibers, yarns and fabrics comprising a polyamide, a coloring agent selected from the group consisting of dyes, pigments and mixtures thereof, and a vehicle comprising a polymer consti-

tuted by a main component having recurring unit represented by formula (I):





(I)

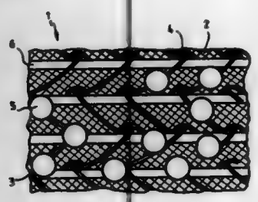
Wherein k is a positive integer, R_1 is $-C_mH_{2m}-$, with m being an integer from 2 to 12.

5,194,320

HEAT BONDING TEXTILE FOR LININGS AND A METHOD OF MANUFACTURING SAME

Pierre Groshens, Peronne, France, assignor to Lainiere de Picardie, Perrone, France

Filed Feb. 28, 1990, Ser. No. 486,321
Claims priority, application France, Mar. 8, 1989, 89 030045
Int. Cl.[5] B32B *7/00*; A41D *27/02*
U.S. Cl. 428—230 15 Claims



1. A heat-bonding lining textile comprising:
a non-woven textile layer having first and second faces, said non-woven textile layer comprising a layer of uncompacted fibers;
a weft on said first face of said non-woven textile layer;
a knitted thread connecting said weft and said non-woven textile layer; and
a heat-bonding adhesive layer on said first face of said non-woven textile layer;
wherein said weft is formed of threads capable of high shrinkage under the effect of heat;
wherein after said weft is connected to said non-woven textile layer by said knitted thread, said weft is subjected to shrinkage treatment conditions to undergo high shrinkage;
wherein said non-woven textile layer has a reduced width and increased mean thickness and volume as a result of said high shrinkage of said weft;
wherein said lining textile has elasticity controlled in a direction perpendicular to said weft and good pliancy in the direction of said weft as a result of said high shrinkage of said weft; and
wherein said lining textile has a stretchability determined by said shrinkage treatment conditions.

5,194,321

REINFORCED VENEER LAMINATE CONSISTING OF AT LEAST ONE LAYER OF VENEER AND AT LEAST ONE LAYER COMPRISING POLYETHYLENE FIBRES

Eduard A. Blanker, Oirsbeek, and Jacob Van der Stad, Eysden, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 12, 1991, Ser. No. 683,955
Claims priority, application Netherlands, Apr. 14, 1990, 9000892
Int. Cl.[5] B32B *5/06, 5/22*
U.S. Cl. 428—252 8 Claims

1. Reinforced veneer laminate having a high tensile strength and being load bearing beyond the cracking limit consisting essentially of:
at least one layer of veneer; and
at least one layer of polyethylene filaments enveloped by resin, said polyethylene filaments having a tensile strength of at least 1.2 GPa and a modulus of at least 30 GPa.

5,194,322

COATED TEXTILE MATERIALS

Frederick Doran, Haslingden, United Kingdom, assignor to Scapa Group Plc, Blackburn, England

PCT No. PCT/GB89/00621, § 371 Date Dec. 3, 1990, § 102(e) Date Dec. 3, 1990, PCT Pub. No. WO89/12135, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 5, 1989, Ser. No. 613,588
Claims priority, application United Kingdom, Jun. 4, 1988, 8813250
Int. Cl.[5] B32B *3/26*; B05D *3/12*
U.S. Cl. 428—267 12 Claims

1. A coated textile material comprising a textile substrate having applied thereto a microporous coating of an elastomeric copolymer wherein at least one component thereof is a fluorocarbon, wherein the coating is formed as a compressed foam layer at the surface of the textile substrate, said layer being compressed on the said surface and being set to form a coherent porous membrane.

5,194,323

BUILDING MATERIAL WITH PROTECTION FROM INSECTS, MOLDS, AND FUNGI

Thomas L. Savoy, Prior Lake, Minn., assignor to AFM Corporation, Excelsior, Minn.

Division of Ser. No. 458,168, Dec. 28, 1989, abandoned. This application Jan. 30, 1991, Ser. No. 847,995
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—305.5 12 Claims

1. A building panel comprising:
(a) a pair of spaced apart wood-based skins;
(b) a core of firm solid insulating material between and bonded to said skins; and

(c) a borate having insecticidal and fungicidal properties diffused in at least some portions of said core.

5,194,324

HIGH GLOSS LABEL FACE STOCK

Robert V. Poirier, Fairport, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 16, 1991, Ser. No. 808,787
Int. Cl.[5] A61F *3/02*; B32B *3/26*
U.S. Cl. 428—315.5 10 Claims

1. An opaque, biaxially oriented polymeric label stock structure, comprising:
(a) a thermoplastic polymer matrix core layer having a first surface and a second surface, within said core is located a strata of voids; positioned at least substantially within a substantial number of said voids is at least one spherical void-initiating particle which is phase distinct and incompatible with said matrix material, the void space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void; the population of said voids in said core being such as to cause a significant degree of opacity;
(b) a first high gloss medium density polyethylene skin layer adhering to said first surface of said core layer;
(c) a second thermoplastic polymer skin layer adhering to said second surface of said core layer; and
(d) an adhesive on the second surface of said thermoplastic skin layer.

5,194,325

MOLDED POLYURETHANE FOAM SYSTEM UTILIZING HFC BLOWING AGENTS

Thomas N. Jones, Pinckney, Mich., assignor to Resocol Corporation, Ann Arbor, Mich.

Filed Feb. 25, 1992, Ser. No. 841,098
Int. Cl.[5] B32B *3/26, 27/40*; C08J *9/34*
U.S. Cl. 428—318.6 2 Claims

2. A foamed article, comprising:
(a) a foam core having a first density; and
(b) a skin having a second density, said skin being integrally connected to said foam core, said second density being greater than said first density, said article being made by reacting:
(i) an admixture containing a polyol and an isocyanate; and
(ii) about 1 to about 15%, by weight of the final composition, of a blowing agent system containing about 50 to about 99 parts, by weight of the total blowing agent system, of tetrafluoroethane and about 1 to about 50 parts, by weight of the total blowing agent system, of pentane; and molding the product of said reaction.

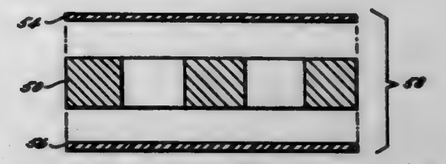
5,194,326

CERAMIC FILLED FLUOROPOLYMERIC COMPOSITE MATERIAL

David J. Arthur, Norwood; Gwo S. Swei, Northboro, both of Mass., and Allen F. Horn, III, Danielson, Conn., assignors to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 367,241, Jun. 16, 1989, Pat. No. 5,061,548, which is a continuation-in-part of Ser. No. 15,191, Feb. 17, 1987, Pat. No. 4,849,284, which is a continuation-in-part of Ser. No. 279,474, Dec. 2, 1988. This application May 22, 1991, Ser. No. 704,320
Int. Cl.[5] B32B *9/06*
U.S. Cl. 428—325 23 Claims

1. An electrical substrate material comprising: fluoropolymeric material;
ceramic filler material, said filler material being in an amount of at least about 45 to less than 50 volume percent of the total substrate material; and



said ceramic filler being coated with a fluorinated silane coating or a coating containing a mixture of a fluorinated silane and a non-fluorinated silane.

5,194,327

ANTISTATIC POLYESTER FILM

Teruo Takahashi, Hachioji, and Sadayoshi Miura, Yamato, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 22, 1991, Ser. No. 688,425
Claims priority, application Japan, Apr. 20, 1990, 2-103133
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—327 12 Claims

1. An antistatic polyester film comprising a polyester film having provided on one or both surfaces thereof a layer of a mixed composition, wherein
(1) said mixed composition is composed essentially of
(A) a polyester polyacrylic copolymer;
(B) an anionic antistatic agent having a weight average molecular weight of about 5000 to 500,000;
(C) particles having an average particle diameter of no greater than about 0.5 μm and being formed by at least one organic polymer selected from the group consisting of polymethyl methacrylate, methyl methacrylate copolymers and cross-linked methyl methacrylate copolymers;
(D) a wetting agent; and wherein
(2) said components A, B, C, and D are present in amounts of about 20 to about 80 parts by weight, about 15 to about 70 parts by weights, about 5 to about 40 parts by weight, and 0 to about 30 parts by weight, respectively, per 100 parts by weight in total of said components A, B and C.

5,194,328

PROCESS FOR THE ELECTROSTATIC COATING OF COMPOSITION AND COATED PLASTIC MOLDING

Yoshiharu Suzuki; Tomoyuki Aketa, and Koichi Satoh, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Continuation of Ser. No. 380,462, Jul. 17, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 774,145
Claims priority, application Japan, Aug. 3, 1988, 63-194234
Int. Cl.[5] B32B *5/16, 27/08, 27/40*; B05D *1/04*
U.S. Cl. 428—328 4 Claims

1. A process for the electrostatic coating of crystalline thermoplastic resin, which process comprises the steps of:
electrostatically applying a curable polymer which consists essentially of (i) between 50 to 98% by weight of a polyurethane resin, and (ii) between 2 and 50% by weight of a spiro orthoester or a spiro orthocarbonate to a molding of a resin composition comprising 100 parts by weight of a crystalline thermoplastic polyacetal, polyester or polyphenylene sulfide resin and 2 to 100 parts by weight of a conductive filler and having a surface resistivity of $10^9\Omega$ or below,
curing the electrostatically applied primer,
electrostatically applying a curable top coat to the resulting molding over said cured primer, and then subsequently curing the top coat by baking.

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5,194,329

PROCESS FOR MAKING TACKY ACRYLATE MICROPARTICLES AND USE THEREFOR

Hsieh-Chang Hsieh; I-Chien Wei, and Tsung-Tien Kuo, all of Kaohsiung, Taiwan, assignors to Taiwan Hopax Chemicals Mfg. Co. Ltd., Kaohsiung, Taiwan

Division of Ser. No. 636,230, Dec. 31, 1990, Pat. No. 5,109,083. This application Apr. 24, 1992, Ser. No. 874,059

Int. Cl.[5] B32B *7/12*

U.S. Cl. 428—332 19 Claims

1. A process for producing a repeatedly reusable self-adhesive sheet material, comprising coating infusible, solvent-insoluble, solvent-dispersible inherently tacky elastomeric microparticles onto a surface to produce a self-adhesive sheet material, wherein the elastomeric microparticles are produced by aqueous emulsion polymerization of monomers having at least one substantially water-insoluble ester of alkyl acrylate or methacrylate in the presence of a water-soluble redox initiator, at least one stabilizer, at least one crosslinking agent and at least one emulsifier in an amount sufficient to produce monomer droplets having a particle size capable, upon polymerization, of forming microparticles individually being of from about 5 to about 200 microns in diameter.

5,194,330

METHOD OF PROVIDING ANTI-OXIDATION PROTECTION FOR A COMPOSITE MATERIAL CONTAINING CARBON, AND A MATERIAL PROTECTED THEREBY

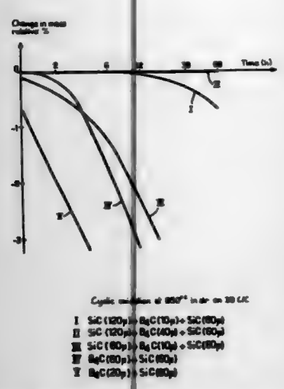
Lionel Vandenbulcke, Saint Jean le Blanc; Stephane Goujard, Merignac; Henri Tawil, Le Bouscat, and Jean-Claude Cavalier, Le Pain Medoc, all of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

Filed Oct. 25, 1991, Ser. No. 782,585

Claims priority, application France, Oct. 26, 1990, 90 13319

Int. Cl.[5] B32B *18/00*

U.S. Cl. 428—336 4 Claims



Cyclic oxidation at 850°C in air on 2D C/C

I SiC (120μ) + B_4C (10μ) + SiC (60μ)
II SiC (120μ) + B_4C (40μ) + SiC (60μ)
III SiC (60μ) + B_4C (10μ) + SiC (60μ)
IV B_4C (60μ) + SiC (60μ)
V B_4C (20μ) + SiC (60μ)

1. A composite material containing carbon and provided with an anti-oxidation protective coating, the coating comprising:

an outer layer of silicon carbide,

an intermediate layer containing boron or a boron compound, and

an inner layer comprised of a refractory carbide that does not contain boron and that is at least 60 microns thick, the inner layer insulating the intermediate layer containing boron or a compound of boron from the carbon contained in the composite material.

5,194,331

FIBERS MADE FROM CYANATO GROUP CONTAINING PHENOLIC RESINS AND PHENOLIC TRIAZINES RESINS

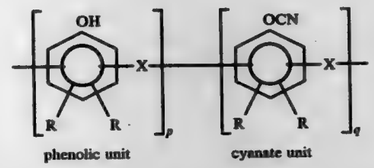
Sajal Das, Parsippany, and Duane C. Prevorsek, Morristown, both of N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation of Ser. No. 388,204, Aug. 1, 1989, abandoned, which is a division of Ser. No. 135,946, Dec. 21, 1987, Pat. No. 4,851,279. This application Sep. 16, 1991, Ser. No. 776,649

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—364 11 Claims

1. A composition comprising polymeric material selected from thermosetting resins and thermoplastic polymers and fibers which comprises a cyanato group containing phenolic resin comprising repeating units of the formula:

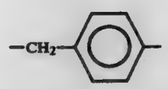


phenolic unit cyanate unit

wherein p is 0 or an integer of 1 or more, q is 0 or an integer of 1 or more, —X— is a radical selected from the group consisting of:

$—CH_2—$, —CO—, $—SO_2—$,

CH— and



$CH_2—$; and

R is the same or different and is selected from hydrogen and methyl groups there being from 10 to 100 mole percent cyanato units.

5,194,332

EUROPIUM-ACTIVATED BARIUM MAGNESIUM SILICATE PHOSPHOR

Anthony F. Kasenga, Towanda, and Tuan A. Dang, Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 386,757, Jul. 31, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 614,465

Int. Cl.[5] C09K *11/59*

U.S. Cl. 428—402 1 Claim

1. A europium-activated barium magnesium silicate phosphor of the general formula $BaMg_2Si_2O_7$:Eu having an atomic concentration of component elements at its surface of about 10% europium, about 4.6% barium, about 17% magnesium, about 11% silicon, and the balance oxygen, and when incorporated into a fluorescent lamp, exhibiting a higher initial power output and a higher percent maintenance at 100 hours, than a europium-activated barium magnesium silicate phosphor of said general formula having an atomic concentration of component elements at its surface of 1.4% europium, 2.3% barium, 25% magnesium, 15% silicon, and the balance oxygen.

5,194,333

PACKING MATERIAL FOR REVERSED PHASE CHROMATOGRAPHY AND PROCESS FOR ITS PREPARATION

Tadao Ohnaka; Katsuo Komiya, and Hiroyuki Moriyama, all of Shinnanyo, Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

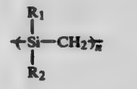
Filed Dec. 18, 1990, Ser. No. 629,625

Claims priority, application Japan, Dec. 18, 1989, 1-326172; Jul. 17, 1990, 2-187282

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—405 6 Claims

1. A packing material for reversed phase chromatography, which comprises silica gel with its surface coated with repeating units of a polycarbosilane of the formula (I):



(I)

wherein R_1 is an octyl group, an octadecyl group or a phenyl group, R_2 is a methyl group or a methylene group, and n is a positive integer, wherein the silica gel has pores having a pore size of from 20 to 10,000 Å.

5,194,334

PROCESS FOR THE PRODUCTION OF SHEET METAL/DUROPLAST COMPOSITE ELEMENTS

Walter Uerdingen, Leverkusen; Bert Brassat, Krefeld; Karl-Ludwig Noble, Cologne; Bernhard Hess, Moers; Heino Müller, Leverkusen, and Heinz Eichner, Moenchen-Gladbach, all of Fed. Rep. of Germany, assignors to DSM N.V., Heerlen

Continuation of Ser. No. 208,675, Jun. 20, 1988, abandoned. This application Oct. 25, 1990, Ser. No. 603,264

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721849

Int. Cl.[5] B32B *15/08*; C09J *5/04*

U.S. Cl. 428—416 12 Claims

1. A process for the production of sheet metal/duroplast composites comprising corrosion-proofed sheet metal and a molding composition applied to the sheet metal after forming thereof by compression molding and curing at elevated temperature is a single operation wherein

said molding composition comprises an unsaturated polyester resin and: i) polyepoxides in a quantity corresponding to 5–200 mmol epoxide groups per 100 g organic binder of the molding composition; ii) reaction products of said polyepoxides with alpha, beta-ethylenically unsaturated mono- or dicarboxylic acids copolymerizable under the curing conditions, the mono- or dicarboxylic acids having molecule weights below 800; or iii) mixtures of polyepoxides and said production products and

said metal sheet is pre-treated with a stoving lacquer based on a binder component composed of alkyl resins, oil-free polyesters, epoxy resins, acrylate resins, or polyurethane resins and the stoving lacquer is further coated on the side to which the polyester resin molding composition is applied with a primer composition based on a binder component composed of alkyl resins, oil-free polyesters, epoxy resins, acrylate resins, or polyurethane resins and additionally containing at least one of the following:

a) polyepoxides in a quantity of 5–200 mval epoxide groups per 100 g organic binder of said primer composition and/or

b) reaction products of the polyepoxides a) with alpha, beta-ethylenically unsaturated mono- or dicarboxylic acids copolymerizable under hardening conditions, the mono- or dicarboxylic acids having molecular weights below 800, and /or

c) 2.5–50% by weight, based on the organic binder of said primer composition of unsaturated polyester containing 0.1–0.6 equivalents of copolymerizable ethylenic double bonds per 100 g of unsaturated polyester c), or mixtures a), b) and c)

wherein the binder components of the stoving lacquer and the primer composition are selected such that the binder component of the stoving lacquer differs from the binder component of the primer composition and wherein the stoving lacquer does not contain a), b) or c).

5,194,335

FLUOROPOLYMER COATING AND CASTING COMPOSITIONS AND FILMS DERIVED THEREFROM

John A. Effenberger, Bedford, and Frank M. Keese, Amherst, both of N.H., assignors to Chemical Fabrics Corporation, Merrimack, N.H.

Continuation-in-part of Ser. No. 599,764, Apr. 13, 1984, Pat. No. 4,555,543. This application Nov. 26, 1985, Ser. No. 801,779

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.[5] B32B *27/00*

U.S. Cl. 428—421 23 Claims

1. An unsupported film comprising one or more resinous components derived from a fluid coating or casting composition comprising a blend of fluoroplastic and a fluoroelastomer, wherein the fluoroplastic component comprises up to about 95% by weight of the composition, and wherein said blend has been coated or cast upon a support substrate and heated to a temperature sufficient to fuse the blend prior to separation from the said support substrate.

5,194,336

CHROMATICALLY COLORED FLUORORESIN-COATED MATERIAL

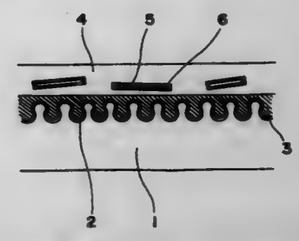
Katsuya Yamada, Osaka, Japan, assignor to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Dec. 12, 1990, Ser. No. 626,592

Claims priority, application Japan, Dec. 16, 1989, 1-326682

Int. Cl.[5] B32B *27/00, 5/16, 15/08*; B60R *13/00*

U.S. Cl. 428—421 6 Claims



1. A chromatically colored fluororesin-coated material comprising a metallic substrate having thereon (1) a first layer comprising a first fluororesin composition containing from 10 to 40% by weight, based on the total solid amount of said first fluororesin composition, of a heat-resistant high-molecular weight material; and having further thereon (2) a second layer comprising a second fluororesin composition containing from 1 to 7% by weight, based on the total solid amount of said second fluororesin composition, of mica having a particle size of from 5 to 200 μm and having an inorganic pigment-coated surface, and containing neither any inorganic pigment having a particle size of smaller than 5 μm or larger than 200 μm nor any heat-resistant high-molecular material,

said inorganic pigment with which the surface of said mica is coated being at least one member selected from the group consisting of the following members (a) to (d):

(a) a transparent inorganic pigment which is coated with an optical thickness of from 0.2 to 0.4 μm,

(b) an opaque inorganic pigment,

(c) a mixture of a transparent inorganic pigment and an opaque inorganic pigment, and
(d) a laminate of a transparent inorganic pigment and an opaque inorganic pigment.

5,194,337
GLASS JOINT BODY AND METHOD OF MANUFACTURING THE SAME
Akihiko Yoshida, Iwakura; Tomonori Takahashi, Chita, and Makoto Murai, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan
Filed May 14, 1991, Ser. No. 699,735
Claims priority, application Japan, May 18, 1990, 2-126895; Jul. 4, 1990, 2-175380; Nov. 16, 1990, 2-308762; Nov. 22, 1990, 2-315866
Int. Cl.[5] B32B *17/06*
U.S. Cl. 428—426 4 Claims

1. A glass joint body comprising a first ceramic member and a second ceramic member connected by a glass consisting of 10~64 wt % of SiO_2, 3~30 wt % of Na_2O, at least 2 wt % Al_2O_3 and the balance of B_2O_3.

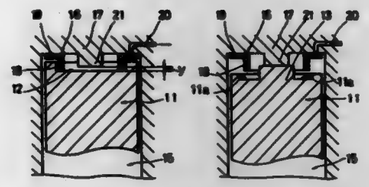
5,194,338
PRECERAMIC COMPOSITION CONTAINING SILICON BASED POWDER
Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 164,012, Mar. 4, 1988, and a continuation-in-part of Ser. No. 272,258, Nov. 17, 1988, abandoned. This application Jan. 24, 1991, Ser. No. 660,182
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—446 13 Claims

1. An intimate dispersion of (A) about 0.4–3.0 parts by weight of a ceramic powder selected from silicon carbide, silicon nitride, and mixtures thereof with one another and/or with up to about 90% by weight of (1) a metal boride or (2) a mixture of a metal boride and zirconium metal in (B) one part by weight of a polysilazane.

5,194,339
DISCONTINUOUS CASTING MOLD
Nobuhiro Sugitani, Tokyo, Japan, assignor to Sugitani Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 523,223, May 14, 1990, Pat. No. 5,039,477. This application May 31, 1991, Ser. No. 708,763
Claims priority, application Japan, Jun. 2, 1989, 1-139228; Sep. 5, 1989, 1-228343
Int. Cl.[5] B22F *7/04*
U.S. Cl. 428—552 3 Claims

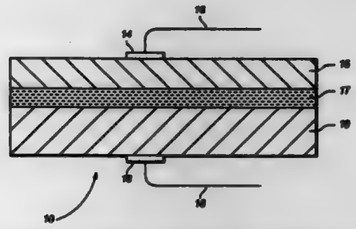
1. A discontinuously casting copper alloy mold, comprising an Ni-plating layer formed on an inner surface of a copper or copper alloy mold blank, a coating layer formed as an intermediate layer by spray coating of a powdered metal spray coating material consisting of two or more of Ni, Cr and Co, and 0.1 to 1.0% by weight of Y based on the total weight of the spray coating material, wherein if Co is present, the content of Co is in a range of 20 to 40% by weight, and the balance selected from the group consisting of Ni and Cr, and if Cr is present, the content of Cr is in a range of 15 to 30% by weight, and the balance is selected from the group consisting of Ni and Co and a porous ZrO_2/Y_2O_3 ceramic coating as a top coating layer, the composition of said porous ceramic layer comprising 98 to 85% by weight of ZrO_2 and 2 to 15% by weight of Y_2O_3.

5,194,340
POLARIZED BATTERY TERMINAL CONTACT DEVICE
Kosui Kosuko, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 2, 1991, Ser. No. 771,401
Claims priority, application Japan, Oct. 5, 1990, 2-104983[U]
Int. Cl.[5] H01M *2/00, 2/10*
U.S. Cl. 429—1 38 Claims



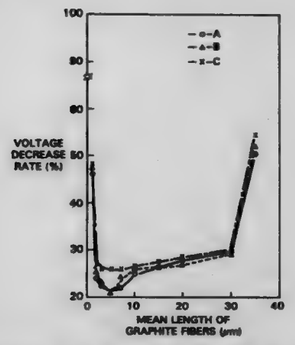
1. In a contact device including a cylindrical battery having a recessed circular terminal and a projecting terminal centered on opposite end faces, the projecting terminal having a diameter smaller than that of the circular terminal and having a polarity opposite to that of the circular terminal, and a battery receptacle having a pair of electrodes to which the respective terminals of the battery are connected when the battery is loaded in the battery receptacle the improvement comprising a raised portion of one of said electrodes of the battery receptacle providing means for permitting said one of the electrodes of the battery receptacle to be electrically connected only to the recessed circular terminal of the battery and for preventing said one electrode of the battery receptacle from being electrically connected to the projecting terminal of the battery.

5,194,341
SILICA ELECTROLYTE ELEMENT FOR SECONDARY LITHIUM BATTERY
Brian G. Begley, Warren, and Jean-Marie Tarascon, Martinsville, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.
Filed Dec. 3, 1991, Ser. No. 801,038
Int. Cl.[5] H01M *2/16*
U.S. Cl. 429—189 10 Claims



9. A secondary battery comprising a positive electrode and a negative electrode, one of said electrodes providing a source of lithium ions, and an electrolyte element separating said electrodes and providing a medium for migration of said lithium ions between said electrodes characterized in that said electrolyte element comprises:
a) a silica layer having dispersed therein a network of minute voids; and
b) a fluid electrolyte contained within said voids network.

5,194,342
SOLID-STATE VOLTAGE STORAGE CELL
Yasuhiko Bito, Yao; Shuji Ito, Kadoma; Kanji Takata, Neyagawa; Shigeko Takahashi, Nara, and Yoshinori Toyoguchi, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 29, 1991, Ser. No. 706,815
Claims priority, application Japan, May 29, 1990, 2-141052
Int. Cl.[5] H01M *4/54, 6/18*
U.S. Cl. 429—191 4 Claims



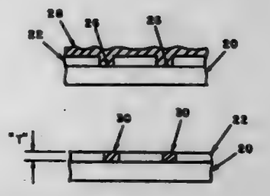
1. A solid-state voltage storage cell comprising a pair of electrodes and a silver-ion conductive solid electrolyte layer disposed therebetween, each of the electrodes containing a silver-ion conductive solid electrolyte, a compound oxide of the formula $Ag_xV_2O_5$ ($0.6 \leqq x \leqq 0.8$) as an electrode active material, and graphite fibers as electron conductive materials, the graphite fibers having a mean diameter in the range of 0.1 to 0.5 μm and having a mean length in the range of 2 to 30 μm.

3. A solid-state voltage storage cell comprising a pair of electrodes and a silver-ion conductive solid electrolyte layer disposed therebetween, each of the electrodes containing a silver-ion conductive solid electrolyte, a compound oxide of the formula $Ag_xV_2O_5$ ($0.6 \leqq x \leqq 0.8$) as an electrode active material, and graphite scales as electron conductive materials, the graphite scales having a mean diameter in the range of 1 to 15 μm.

5,194,343
METHOD OF ELECTRODE FABRICATION AND AN ELECTRODE FOR METAL CHLORIDE BATTERY
Ira D. Bloom, Bolingbrook; Paul A. Nelson, Wheaton, and Donald R. Vissers, Naperville, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Oct. 9, 1990, Ser. No. 594,485
Int. Cl.[5] H01M *4/00*
U.S. Cl. 429—218 16 Claims

1. A method of fabricating a positive electrode for a metal chloride battery comprising the steps of:
selecting sodium chloride particles from a classified size range of 149–250 microns;
mixing said sodium chloride particles with metal particles selected from a classified size range to create a mixture, said mixture of sodium chloride particles and metal particles comprising a capacity ratio of 1:2 to 1:4 and
rigidifying the mixture.

5,194,344
METHOD OF FABRICATING PHASE SHIFT RETICLES INCLUDING CHEMICALLY MECHANICALLY PLANARIZING
David A. Cathey, Jr., and J. Brett Rolfson, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Mar. 26, 1991, Ser. No. 675,405
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 18 Claims

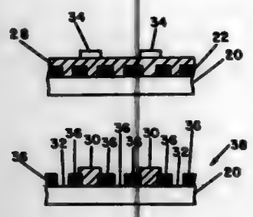


1. A method of forming a phase shifting reticle for semiconductor manufacture comprising:
depositing an opaque material on a transparent substrate to a thickness of "T";
forming a first repetitive pattern of openings through the opaque material to the substrate;
blanket depositing a phase shift material over the opaque material and into the openings;
polishing and planarizing the phase shift material to an endpoint of the opaque material and to a thickness "T" to form phase shift sections;
forming a second repetitive pattern of openings through the opaque material to the substrate to form light apertures having opaque light blocker sections on either side, such that an alternating repetitive pattern of light blocker section, light aperture, light blocker section, and phase shift section is formed.

5,194,345
METHOD OF FABRICATING PHASE SHIFT RETICLES
J. Brett Rolfson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed May 14, 1991, Ser. No. 699,752
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 19 Claims

1. A method for forming a phase shifting reticle for semiconductor manufacture comprising:
depositing an opaque material on a transparent substrate to a predetermined thickness of "t";
forming a first pattern of opening through the opaque material to the substrate to form a pattern of opaque light blockers on the substrate having generally vertical sidewalls with light transmission openings therebetween; and
conformably depositing a phase shifter material over the opaque light blockers and into the light transmission openings to form self aligned rim phase shifters on the sidewalls of the opaque light blockers on either side of each light transmission opening such that light passed through a phase shifter is shifted with respect to light passed through a light transmission opening with a phase shift determined by an index of refraction of the phase shift material and by the thickness "t".

5,194,346
METHOD OF FABRICATING PHASE SHIFTING RETICLES WITH AN ACCURATE PHASE SHIFT LAYER
J. Brett Rolfson, and David A. Cathey, Jr., both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Apr. 15, 1991, Ser. No. 687,036
Int. Cl.[5] G03F 9/00
U.S. Cl. 430—5 16 Claims



1. A method of forming a phase shifting reticle for semiconductor manufacture comprising:
depositing an opaque material on a transparent substrate;
forming a repetitive pattern of openings through the opaque material to the substrate;
blanket depositing a phase shifter material over the opaque material and into the openings;
polishing and planarizing the phase shift material to a thickness "T"; and
patterning the layer of phase shifter material and selectively etching the phase shifter material to provide a phase shifter in every other opening previously formed in the opaque material so that a repetitive pattern of phase shifters and light transmission openings having opaque light blockers on either side is formed on the substrate.

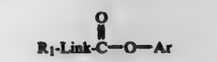
5,194,347
IMAGE-RECEIVING MATERIAL COMPRISING SUBBED POLYCARBONATE OR POLYPROPYLENE
Leon L. Vermeulen, Herenthout, and Robert S. Pauwels, Braschaat, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium
Filed Nov. 26, 1991, Ser. No. 798,003
Claims priority, application European Pat. Off., Nov. 30, 1990, 90203164.0
Int. Cl.[5] G03C 5/54, 1/80
U.S. Cl. 430—14 12 Claims

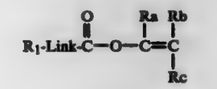
1. A sheet, ribbon or web material comprising a support made of a synthetic resin or a paper support coated with a layer of said resin, wherein a resin surface of said support is coated with a subbing layer and the subbing layer itself is coated with a hydrophilic colloid image-receiving layer containing development nuclei for silver image formation by DTR-processing, characterized in that the synthetic resin of said support is a polycarbonate or polypropylene resin, and said subbing layer contains in percent by weight on its total weight following ingredients: 1.3% to 80% of proteinaceous colloid,
0% to 85% of colloidal silica,
10% to 70% of an ionogenic polyester-polyurethane applied from an aqueous dispersion wherein isocyanate groups still present in its structure have reacted with an ionomeric compound containing at least one active hydrogen atom and a carboxylate or sulphonate salt group, the number of said salt groups being sufficient to render said polyester-polyurethane dispersible in an aqueous medium, and 0% to 30% of a siloxane capable of forming a reaction product with said colloidal silica, the dry coverage of the image receiving layer being in the range of 0.2 g to 16 g per m^2.

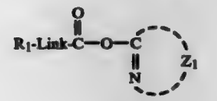
11. Sheet material according to claim 1, wherein said image receiving material contains a black-and-white photograph and is present in a laminar article containing said image-receiving layer sandwiched between a clear protective resin cover sheet and said support.

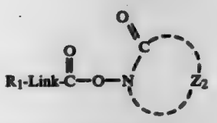
5,194,348
COLOR PHOTOGRAPHS AND METHOD FOR PREPARATION OF THE SAME
Masakazu Morigaki; Nobuo Seto; Osamu Takahashi, and Hideaki Naruse, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 82,253, Aug. 5, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 462,930
Claims priority, application Japan, Aug. 5, 1986, 61-183919
Int. Cl.[5] G03C 7/26, 7/32
U.S. Cl. 430—17 23 Claims

1. A color photograph containing in at least one photographic layer on a support a storability-improving compound selected from compounds of general formulae (I-a), (I-b), (I-c) and (I-d) and having a secondary reaction rate constant k_2 (80° C.) with p-anisidine in the range of from 1×10^{-1} liter/mol.sec to 1×10^{-5} liner/mol.sec.


(I-a)


(I-b)


(I-c)

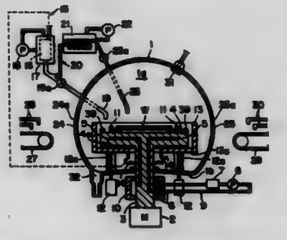

(I-d)

where R_1 represents an aliphatic group, an aromatic group or a heterocyclic group; Link is a single bond or —O—; Ar denotes an aromatic group, except that no group useful as a photographic reducing agent is released as a result of a result of reaction with an aromatic amine series developing agent, Ra, Rb and Rc, which may be the same or different, each represents a hydrogen atom, or an aliphatic group or a heterocyclic group; Ra, Rb and Rc may further represent an alkoxy group, an aryloxy group, a heterocyclic oxy group, an alkylthio group, an arylthio group, an heterocyclic thio group, an amino group, an alkylamino group, an acyl group, an amino group, a sulfonamido group, a sulfonyl group, an alkoxycarbonyl group, a sulfo group, a carboxyl group, a hydroxyl group, an acyloxy group, a ureido group, a urethane group, a carboamoyl group or a sulfamoyl group, provided that Ra and Rb, or Rb and Rc, may combine to form a 5- to 7-membered hetero ring, which hetero ring may be further substituted by a substituent, or form a spiro ring, a bicyclo ring, or may be fused with an aromatic ring; Z_1 and Z_2 denote the non-metallic atomic group necessary for forming a 5- to 7-membered hetero ring, which hetero ring may be further substituted by a substituent, or form a spiro ring, a bicyclo ring, or may be fused with an aromatic ring, except that Z_1 is not such a group that it releases a 1-phenyl-3-pyrazolide, as a result of reaction with an aromatic amine series developing agent.

5,194,349
ERASABLE, MULTIPLE LEVEL LOGIC OPTICAL MEMORY DISK
Y. Simon Tsao, Golden, and Jack L. Stone, Lakewood, both of Colo., assignors to Midwest Research Institute, Kansas City, Mo.
Filed Feb. 7, 1992, Ser. No. 832,387
Int. Cl.[5] G11B 7/24
U.S. Cl. 430—21 28 Claims

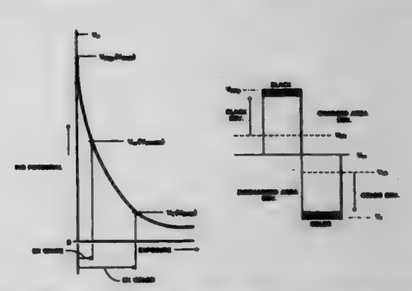
1. A process for preparing a multiple level logic optical memory disk which is erasable upon heating, comprising:
depositing an amorphous film selected from the group consisting of silicon hydride, silicon carbon hydride and silicon nitrogen hydride on a glass substrate using plasma enhanced chemical vapor deposition at temperatures sufficient to ensure good adhesion, high film quality and an optical bandgap of between about 1.55 and about 2.0 eV;
preferentially exposing said film to a hydrogen ion source of low implantation energy;
writing information on said disk by using a laser beam to selectively heat some spots of said film to expel hydrogen and change the bandgap and optical absorption of said film, said bandgap being changed to several different bandgaps;
and using a laser beam at sufficient wavelength to detect information stored on said disk.

5,194,350
METHOD AND APPARATUS FOR CREATION OF RESIST PATTERNS BY CHEMICAL DEVELOPMENT
Yasuo Matsuoka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 400,713, Aug. 30, 1989, Pat. No. 4,982,215. This application Nov. 26, 1990, Ser. No. 617,797
Claims priority, application Japan, Aug. 31, 1988, 63-217607
Int. Cl.[5] G03C 5/00; G03F 7/30
U.S. Cl. 430—30 5 Claims



1. A method of creating a resist pattern by chemically developing a resist layer which has been subjected to a patternmaking operation such as selective exposure or drawing, which method comprises:
providing a workpiece having a resist layer formed on an electroconductive surface;
dipping the workpiece in a developing liquid within a developing vessel, the developing liquid having a first predetermined temperature;
establishing an electric current between the electroconductive surface of the workpiece and an electrode immersed in the developing liquid within the vessel;
constantly monitoring, during the progress of development, the magnitude of the electric current flowing between the electroconductive surface of the workpiece and the electrode immersed in the developing liquid within the vessel;
commencing withdrawal of the developing liquid from the developing vessel when the electric current reaches a predefined magnitude during the progress of developing operation; and
retarding the progress of further development to assure a sufficient length of time for the complete withdrawal of the liquid from the developing vessel by, substantially concurrently with withdrawal of the developing liquid, introducing an additional amount of developing liquid into the developing vessel, the additional amount of developing liquid having the same composition as the developing liquid that has been received in the developing vessel, but having a second predetermined temperature which is less than the first predetermined temperature.

5,194,351
SINGLE PASS DIGITAL XEROGRAPHIC PROCESS COLOR REPRODUCTION
George J. Roller, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 21, 1990, Ser. No. 632,298
Int. Cl.[5] G03G 13/01
U.S. Cl. 430—45 2 Claims

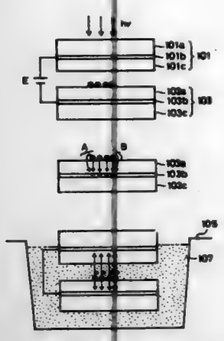


1. The method of forming color images including the steps of:
uniformly charging a charge retentive surface to a predetermined charge level;
forming a first plurality of tri-level images on said charge retentive surface;
moving said first plurality of tri-level images past a development station comprising a pair of developer systems for developing said first plurality of tri-level images, each of said developer systems containing toners of different colors rendering different portions of said first plurality of tri-level images different colors;
recharging said charge retentive surface to said predetermined level;
forming a second plurality of tri-level images on said charge retentive surface; and
developing said second plurality of tri-level images with developer materials having toners that are different in color from each other and from the toners used to develop said first plurality of tri-level images.

5,194,352
METHOD FOR TONER DEVELOPMENT OF ELECTROSTATIC LATENT IMAGE AND FOR FORMATION OF TONER IMAGE IN WHICH A SPECIFIED GAP IS MAINTAINED BETWEEN A PHOTOSENSITIVE MEMBER AND AN ELECTROSTATIC INFORMATION RECORDING MEDIUM

Hiroyuki Obata, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,357
Claims priority, application Japan, Mar. 17, 1989, 1-65468
Int. Cl.[5] G03G *13/044*
U.S. Cl. 430—48 6 Claims



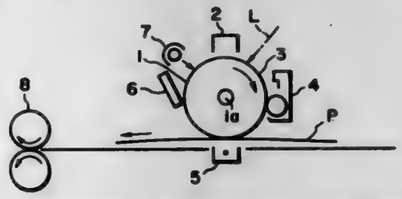
1. A method for toner development of an electrostatic latent image, comprising the steps of:
providing a photosensitive member consisting of a photoconductive layer formed on a transparent electrode and a transparent support member supporting said transparent electrode;
providing an electrostatic information recording medium consisting of an insulating layer formed on a support member with a conductive layer therebetween;
placing said photosensitive member face-to-face with said electrostatic information recording medium with a predetermined gap therebetween;
applying a voltage between the conductive layers of said photosensitive member and said electrostatic information recording medium;
performing image exposure through said transparent support member, said transparent electrode, and said photosensitive member onto said electrostatic information recording medium to accumulate electric charge in the shape of an image on a surface of said electrostatic information recording medium;
removing the voltage applied between the conductive layers of said photosensitive member and said electrostatic information recording medium and electrically connecting said photosensitive member and said electrostatic information recording medium; immersing at least the surfaces of said electrostatic information recording medium and said photosensitive member in the toner; and
performing toner development on the immersed surfaces of said electrostatic information recording medium and/or said photosensitive member.

3. A method for toner development of an electrostatic latent image, comprising the steps of:
providing a photosensitive member consisting of a photoconductive layer formed on a transparent electrode and a transparent support member supporting said transparent electrode;
providing an electrostatic information recording medium consisting of an insulating layer formed on a support member with a conductive layer therebetween;
placing said photosensitive member face-to-face with said electrostatic information recording medium with a predetermined gap therebetween;
applying a voltage between the conductive layers of said photosensitive member and said electrostatic information recording medium;
performing image exposure through said transparent support member, said transparent electrode, and said photosensitive member onto said electrostatic information recording medium to accumulate electric charge in the shape of an image on a surface of said electrostatic information recording medium;
applying a bias voltage between the conductive layers of said photosensitive member and said electrostatic information recording medium; and
immersing at least the surfaces of said electrostatic information recording medium and said photosensitive member in the toner.

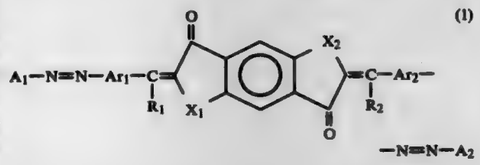
5,194,353
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, AND ELECTROPHOTOGRAPHIC APPARATUS AND FACSIMILE EMPLOYING THE SAME

Masato Tanaka, Kawasaki, and Yoshio Kashizaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1991, Ser. No. 737,039
Claims priority, application Japan, Jul. 30, 1990, 2-199307
Int. Cl.[5] G03G *15/02, 5/00, 15/06*
U.S. Cl. 430—57 12 Claims



1. An electrophotographic photosensitive member comprising an electroconductive support and a photosensitive layer formed thereon, the photosensitive layer containing a compound represented by the general formula (1) below:



(1)

wherein Ar_1 and Ar_2 are each independently a substituted or unsubstituted carbocyclic aromatic group or a substituted or unsubstituted heterocyclic aromatic group; X_1 and X_2 are each independently a sulfur atom, a sulfoxide group, a sulfone group, or a dicyanomethylene group; R_1 and R_2 are each independently a hydrogen atom, a substituted or unsubstituted alkyl group, or a cyano group: and A_1 and A_2 are each a coupler residue having a phenolic hydroxyl group, which may be the same or different.

5,194,354
LOW CRYSTALLINE OXYTITANIUM PHTHALOCYANINE, PROCESS FOR PRODUCING CRYSTALLINE OXYTITANIUM PHTHALOCYANINES USING THE SAME, OXYTITANIUM PHTHALOCYANINE OF A NOVEL CRYSTAL FORM AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING THE SAME

Hideyuki Takai; Kazushi Iuchi; Itaru Yamazaki, and Hajime Miyazaki, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 555,763
Claims priority, application Japan, Jul. 21, 1989, 1-189199
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—58 29 Claims

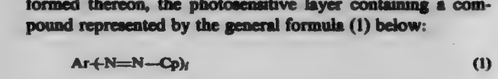
6. An electrophotographic photosensitive member, which comprises an electroconductive support and a photosensitive layer laid on the support, the photosensitive layer containing an oxytitanium phthalocyanine of crystal form having strong peaks at Bragg angles $2\theta \pm 0.2°$ of 7.4°, 10.9° and 17.9° in the X-ray diffraction of CuKα.

5,194,355
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Satomi Ohmura, Kawasaki, and Toshihiro Kikuchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

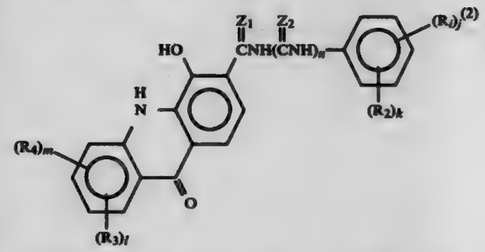
Continuation of Ser. No. 682,366, Apr. 9, 1991, abandoned. This application Mar. 13, 1992, Ser. No. 851,244
Claims priority, application Japan, Apr. 10, 1990, 2-93072
Int. Cl.[5] G03G *5/047, 5/06*
U.S. Cl. 430—58 13 Claims

1. An electrophotographic photosensitive member comprising an electroconductive support and a photosensitive layer formed thereon, the photosensitive layer containing a compound represented by the general formula (1) below:



(1)

wherein Ar is (a) a substituted or unsubstituted aromatic hydrocarbon radical which may be linked through a linking group or (b) a substituted or unsubstituted aromatic heterocyclic radical which may be linked through a linking group; Cp is a coupler radical having a phenolic hydroxyl radical; and i is 1, 2, 3 or 4; at least one of Cp is a coupler radical represented by the formula (2) below:



(2)

wherein R_1, R_2, R_3 and R_4 are the same or different, and are each hydrogen, alkoxy, disubstituted amino, halogen, nitro, cyano, trifluoromethyl, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted aralkyl; Z_1 and Z_2 are the same or different, and are each oxygen or sulfur; j and k are each 1, 2, 3, 4 or 5; l and m are each an 1, 2, 3, or 4; and n is 0 or 1.

5,194,356
TONER COMPOSITIONS

Guerino Sacripante, Cambridge; Beng S. Ong, Mississauga, both of Canada; Michael J. Levy, Webster, and Richard B. Lewis, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1990, Ser. No. 609,316
Int. Cl.[5] G03G *9/083*
U.S. Cl. 430—106.6 51 Claims

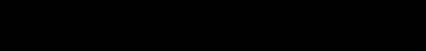
1. A colored magnetic toner composition consisting essentially of a polymer resin or resins, a waxy, lubricating or low surface energy substance, a colorless or lightly colored magnetic material, a color pigment, excluding black, and a whitening agent; and wherein the surface of the toner contains a conductive metal oxide which oxide has been surface treated with a silane component; and wherein said metal oxide has an average particle diameter of from between about 10 to about 1,000 Angstroms, and said metal oxide is selected from the group consisting of the oxides of aluminum, antimony, barium, bismuth, cadmium, chromium, germanium, indium, lithium, magnesium, molybdenum, nickel, niobium, ruthenium, silicon, tantalum, titanium, tin, vanadium, zinc, and zirconium; and which toner has a volume resistivity of from about 10^3 to about 10^8 ohm-cm.

5,194,357
DEVELOPER COMPOSITIONS WITH CARRIER PARTICLES COMPRISING POLYMERIC ALCOHOL WAXES

Richard J. Hodgson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1991, Ser. No. 753,249
Int. Cl.[5] G03G *9/113*
U.S. Cl. 430—108 20 Claims

1. A developer consisting essentially of a toner composition comprised of resin particles and pigment particles, and carrier particles comprised of a metal core with a coating comprised of a polymeric alcohol wax of the formula



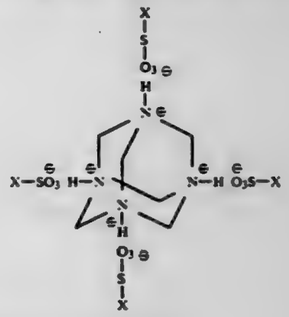
wherein n is a number of from about 30 to about 300.

5,194,358
TONER AND DEVELOPER COMPOSITIONS WITH CHARGE ENHANCING ADDITIVES

Robert D. Bayley, Fairport; Thomas R. Hoffend, Webster, and Edward J. Radigan, Hamlin, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1991, Ser. No. 737,288
Int. Cl.[5] B03G *9/097*
U.S. Cl. 430—110 30 Claims

1. A dry positively charged toner composition consisting essentially of resin particles, pigment particles, and a polysalt charge enhancing additive of the following formula



wherein X is an aromatic substituent.

5,194,359
DEVELOPING METHOD FOR ONE COMPONENT DEVELOPER

Junichiro Kanbe; Tsutomu Toyono; Nagao Hosono, and Tohru Takahashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 671,019, Mar. 13, 1991, Pat. No. 5,096,798, which is a continuation of Ser. No. 545,134, Jun. 27, 1990, Pat. No. 5,032,485, which is a continuation of Ser. No. 455,133, Dec. 22, 1989, abandoned, which is a continuation of Ser. No. 22,598, Mar. 4, 1987, Pat. No. 4,913,088, which is a division of Ser. No. 745,994, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 492,440, May 6, 1983, abandoned, which is a division of Ser. No. 264,516, May 18, 1981, Pat. No. 4,395,476, which is a continuation of Ser. No. 58,434, Jul. 18, 1979, abandoned. This application Aug. 6, 1991, Ser. No. 741,077
Claims priority, application Japan, Jul. 28, 1978, 53-92105; Jul. 28, 1978, 53-92106; Jul. 28, 1978, 53-92107; Apr. 28, 1979, 54-52641; Jun. 1, 1979, 54-68564
Int. Cl.[5] G03G *13/08*
U.S. Cl. 430—120 16 Claims

1. A method of developing an electrostatic latent image formed on an image bearing member, comprising:
supplying to a developer carrying member a one-component developer to which silica particles are added;
triboelectrically charging the one-component developer to a polarity for developing the electrostatic latent image;
forming a layer of the one-component developer on the developer carrying member;
facing, at a developing position, the developer carrying member carrying the layer of the one-component developer toward the image bearing member; and
applying a bias voltage in which a maximum voltage and a minimum voltage appear periodically, to the developer carrying member facing the image bearing member to develop the electrostatic latent image.

5,194,360
METHOD OF PRODUCING A CARRIER FOR ELECTROSTATIC IMAGE DEVELOPER

Ken Ohmura, Hachioji; Kenji Tsujita, Fujino, and Shigenori Kouno, Tachikawa, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 675,275
Claims priority, application Japan, Apr. 17, 1990, 2-99385
Int. Cl.[5] G03G *9/00*
U.S. Cl. 430—137 6 Claims

1. A method for producing a carrier for an electrostatic image developer comprising:
stirring a mixture of core particles, styrene-acryl polymer resin particles having an average primary particle size of not more than 1 μm, and carbon fluoride particles having an average particle size not more than 10 μm, in the presence of no liquid, to form a resin coating layer on the surface of each core particle,
wherein said resin coating layer contains said carbon fluoride dispersed therein, in a ratio of from 5% to 45% by weight of said resin coat layer.

5,194,361
DIFFUSION TRANSFER COLOR PHOTOSENSITIVE MATERIAL WITH QUATERNARY AMMONIUM MORDANT AND COUNTER ION

Toshiki Taguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1991, Ser. No. 700,984
Claims priority, application Japan, May 16, 1990, 2-125849
Int. Cl.[5] G03C *5/54*
U.S. Cl. 430—203 3 Claims

1. A diffusion transfer color photosensitive material comprising a support having thereon at least light-sensitive silver halides, binders and nondiffusible dye-providing compounds capable of releasing or forming a diffusible dye, corresponding to or counter-corresponding to the progress of conversion of the silver halides into silver through reductive reaction, said material further containing at least one compound represented by the following formula (I):

$$-(A)_p-(B)_q- \quad (I)$$

wherein A represents at least one vinyl monomer unit containing a quaternary ammonia ion having associated therewith a counter ion at least 50 mol % of which is constituted by an anion represented by the following formula (II):

$$R-X^- \quad (II)$$

wherein X^- represents SO_3^- and/or COO^-, and R contains at least 10 carbon atoms and represents a substituted or unsubstituted alkyl, aryl, alkoxy, aryloxy or heterocyclyl group; B represents at least one vinyl monomer unit containing no quaternary ammonium salt moiety; p amounts to 2 to 100 mol % in all; and q amounts to 0 to 98 mol % in all.

5,194,362
SUBBED PAPER SUPPORT FOR HEAT DEVELOPMENT DYE DIFFUSION TRANSFER

Keiko Nakabayashi, Hino; Keiji Ohbayashi, Hachioji, and Masaru Tsuchiya, Hidaka, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 30, 1991, Ser. No. 814,445
Claims priority, application Japan, Jan. 17, 1991, 3-3840
Int. Cl.[5] G03C *5/54, 1/87*
U.S. Cl. 430—203 11 Claims

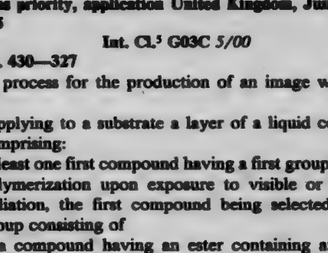
1. An image forming method comprising steps of
imagewise exposing to light a heat developable light-sensitive material comprising a paper support having thereon a subbing layer comprising a hydrophobic resin having a glass transition point of from 30° C. to 250° C. and a light-sensitive layer being provided on said subbing layer, in which said light-sensitive layer comprises a hydrophilic binder, light-sensitive silver halide grains and a dye providing substance,
developing said light-sensitive material by heating,
contacting said light-sensitive material with a dye-receiving material, and
transferring a diffusible dye formed in said light-sensitive material to said dye-receiving material in the presence of a solvent capable of dissolving said diffusible dye.

5,194,363
OPTICAL RECORDING MEDIUM AND PRODUCTION PROCESS FOR THE MEDIUM

Kazumi Yoshioka, Kyoto; Takeo Ohta, Nara; Masami Uchida; Katsumi Kawahara, both of Osaka, and Shigeaki Furukawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1990, Ser. No. 559,166
Claims priority, application Japan, Apr. 27, 1990, 2-113380; Apr. 27, 1990, 2-113382; Apr. 27, 1990, 2-113383; May 10, 1990, 2-121481; Jun. 19, 1990, 2-160735; Jun. 19, 1990, 2-160736
Int. Cl.[5] G03C *1/00*; G11B *7/24, 11/12*
U.S. Cl. 430—271 15 Claims

2. An optical recording medium comprising:
a) a substrate;
b) a first dielectric layer formed on one surface of said substrate;
c) a recording layer formed on said first dielectric layer, said recording layer capable of absorbing energy and being converted between a substantially non-crystalline state and a substantially crystalline state, wherein said recording layer includes a ternary alloy of Te-Ge-Sb and at least one nitride of Te, Ge, or Sb;



d) a second dielectric layer formed on said recording layer having a thickness substantially less than the thickness of said first dielectric layer; and
e) a reflecting layer formed on said second dielectric layer.

5,194,364
PROCESS FOR FORMATION OF RESIST PATTERNS

Naomichi Abe, Tokyo, and Takashi Motoyama, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 323,710, Mar. 15, 1990, abandoned. This application Aug. 8, 1991, Ser. No. 746,071
Claims priority, application Japan, Mar. 16, 1988, 63-060218; Jan. 20, 1989, 1-12445
Int. Cl.[5] G03C *5/00, 5/16*
U.S. Cl. 430—325 25 Claims

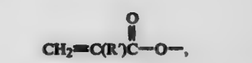
1. A process for the formation of resist patterns consisting of essentially of preparing a resist material by mixing a silicon-containing polymer, which contains at least one unsaturated bond in a backbone chain of the recurring unit thereof as the main resist material, with an addition agent which can bond to said polymer by an addition reaction when a mixture of said polymer and said addition agent is exposed to radiation, coating said resist material on a substrate to form a resist layer, exposing said resist layer to a pattern of said radiation, and dry developing said exposed resist layer with an oxygen-containing etching gas in the absence of plasma of said gas in an etching chamber positioned apart from a plasma generation chamber to form said resist patterns on said substrate.

5,194,365
METHOD FOR FORMING IMAGES

Jonathan W. Goodin, Neu-Isenburg, Fed. Rep. of Germany; Edward Irving, Burwell, and Christopher P. Banks, Saffron Walden, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 136,531, Dec. 12, 1987, abandoned, which is a continuation of Ser. No. 876,040, Jun. 19, 1986, abandoned. This application Jun. 14, 1989, Ser. No. 369,000
Claims priority, application United Kingdom, Jun. 19, 1985, 8515475
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—327 17 Claims

1. A process for the production of an image which comprises:
(1) applying to a substrate a layer of a liquid composition comprising:
at least one first compound having a first group capable of polymerization upon exposure to visible or ultraviolet radiation, the first compound being selected from the group consisting of
i) a compound having an ester containing at least one group of the formula



where R' is hydrogen, chlorine, bromine, or alkyl of 1 to 4 carbon atoms,
ii) an allyl group-containing compound, and
iii) a polymerizable mixture of at least one polyene-containing compound and at least one polythiol-containing compound;
a first polymerization initiator which generates free radicals upon exposure to radiation at wavelengths selected from the visible region and ultraviolet region, the polymerization of the first groups being initiated by the free radicals generated from the first polymerization initiator;
at least one second compound having a second group capable of polymerization upon exposure to actinic light having a wavelength shorter than required to initiate polymerization of said first group, the second compound selected from the group consisting of an epoxide resin, cyclic ether, vinyl ether, cyclic ester, cyclic sulfide, cyclic amine, and cyclic organosilicone; and
a second polymerization radiation activatable catalyst selected from the group consisting of aromatic diazonium, sulfonium, iodonium, sulfoxonium salts and aromatic iodosyl salt;
(2) irradiating the layer at wavelengths in the visible to ultraviolet region to effect solidification of said layer by the action of said first polymerization initiator on said first polymerizable groups without effecting polymerization of said second polymerizable groups;
(3) thereafter irradiating the layer in a predetermined pattern with actinic radiation at said shorter wavelengths to effect polymerization of said second polymerizable groups in areas of the pattern so irradiated; and
(4) removing those areas of the layer not so irradiated by said shorter wavelengths and in which said second polymerizable system has not been polymerized.

5,194,366
PEARLESCENT TONERS HAVING REDUCED STAIN CHARACTERISTICS

Eugene L. Grubb, Colts Neck, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1991, Ser. No. 695,825
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—331 11 Claims

1. A nonelectroscopic pearlescent toner having a stain value less than approximately 0.5, said toner consisting essentially of a mixture containing:
(a) up to approximately 99.9% of pearlescent pigment particles surface-coated with a slip agent, and
(b) approximately 0.1% to 10% of inert, substantially spherical particles having a particle size of approximately 0.3 to 42 microns.

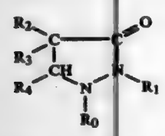
5,194,367
METHOD FOR PROCESSING A SILVER HALIDE PHOTOGRAPHIC MATERIAL

Minoru Yamada; Takashi Toyoda, and Naoki Arai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 125,047, Nov. 25, 1987, abandoned. This application Jul. 25, 1989, Ser. No. 384,913
Claims priority, application Japan, Nov. 28, 1986, 61-281865
Int. Cl.[5] G03C *5/00, 5/31*
U.S. Cl. 430—363 8 Claims

1. A method for processing a silver halide photographic material for infrared laser scanner comprising developing said silver halide photographic material which comprises a support having thereon at least one hydrophilic colloidal layer includ-

ing at least one silver halide emulsion layer which is spectrally sensitized to infrared rays with an automatic developing machine, wherein said silver halide emulsion layer contains silver chloroiodobromide grains having a silver iodide content of 0 to 2 mol %, a silver chloride content of 0 to 30 mol %, an average grain diameter of 0.2 to 0.7 μm, and a ratio of the 100 plane to the 111 plane of 4 or more, said hydrophilic colloidal layer has a swelling percentage of 200% or less, as a developing solution for the development step in said automatic developing machine, a single developing solution containing a 3-pyrazolidone developing agent represented by formula (I) is used therein, and the developing solution and the replenishing solution thereof contain no glutaraldehyde hardening agent:



(I)

wherein R_0 represents a substituted or unsubstituted aryl group; and R_1, R_2, R_3 and R_4, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted aralkyl group, with the proviso that when R_0 represents an unsubstituted phenyl group, at least one of R_1, R_2, R_3 and R_4 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted aralkyl group.

8. A method for processing a silver halide photographic material as claimed in claim 1, wherein prior to developing the silver halide photographic material the same is imagewise scanned with an infrared laser scanner.

5,194,368

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

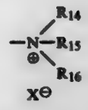
Shinji Ueda; Tetsuro Kojima; Tohru Kitahara; Tomokazu Yasuda; Yoshihiro Fujita, and Takatoshi Ishikawa, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

PCT No. PCT/JP89/00012, § 371 Date Sep. 6, 1989, § 102(e) Date Sep. 6, 1989
PCT Filed Jan. 6, 1989, Ser. No. 427,831
Claims priority, application Japan, Jan. 6, 1988, 63-10631; May 31, 1988, 63-133734; May 31, 1988, 63-133735
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] G03C *5/395, 5/38*
U.S. Cl. 430—400 9 Claims

1. A method for processing silver halide photographic light sensitive materials which comprises developing an image-wise exposed silver halide photographic light sensitive material composed of a substrate provided thereon with at least one light-sensitive silver halide emulsion layer containing silver iodide and then processing the material with a processing solution having fixing ability, wherein the processing with the processing solution having fixing ability is performed while a part of the processing solution having fixing ability is taken out of a bath containing the processing solution, brought into contact with a basic anion-exchange resin and returned to the bath, wherein the anion-exchange resin is represented by the following general formula (VIII):

(VIII)

wherein A represents a monomer unit obtained by copolymerizing copolymerizable monomers having at least two copolymerizable ethylenically unsaturated groups at least one of which is included in the side chain; B represents a monomer unit obtained by copolymerizing copolymerizable ethylenically unsaturated monomers; R_{13} represents a hydrogen atom or a lower alkyl or aralkyl group; Q represents a single bond or an alkylene, phenylene or aralkylene group or a group —CO—O—L, —CO—NH—L— or —CO—NR—L— wherein L is an alkylene; arylene or aralkylene group and R is an alkyl group; G represents



wherein R_{14}, R_{15}, and R_{16} may be the same or different or may be substituted and each represents a hydrogen atom or an alkyl, aryl or aralkyl group where the total number of carbon atoms of R_{14}, R_{15} and R_{16} is not less than 12; X represents an anion; and x, y and z represent molar percentages, x ranges from 1 to 60, y from 0 to 60 and z from 30 to 100; and further wherein 20 to 2,000 l of the processing solution having fixing ability per liter of the anion-exchange resin is brought into contact with the resin.

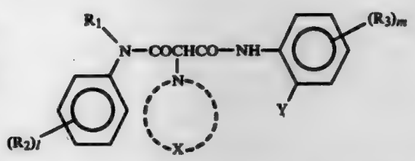
5,194,369

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Keiji Mihayashi; Seiji Ichijima; Toshio Kawagishi; Naoki Saito, and Masuji Motoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 12, 1991, Ser. No. 668,120
Claims priority, application Japan, Mar. 12, 1990, 2-60735; Jul. 19, 1990, 2-191580; Sep. 30, 1990, 2-232857
Int. Cl.[5] G03C *7/305, 7/36*
U.S. Cl. 430—544 20 Claims

1. A silver halide color light-sensitive material containing a coupler represented by formula (I):



(I)

wherein R_1 is a substituted or unsubstituted alkyl group; R_2 and R_3, same or different, each represent a group capable of substituting a benzene ring; Y is a halogen atom, an alkoxy group, an alkoxycarbonyl group, a substituted or unsubstituted alkyl group, an alkylthio group, an aryloxy group, an alkylsulfonyl group, an arylthio group, or a carbamoyl group; X is an organic residue necessary to form a substituted or unsubstituted 5- or 6-membered nitrogen-containing heterocyclic ring together with the nitrogen atom; represents 0 or an integer of from 1 to 5; and m represents 0 or an integer of from 1 to 4.

5,194,370

PROMOTER LIGATION ACTIVATED TRANSCRIPTION AMPLIFICATION OF NUCLEIC ACID SEQUENCES

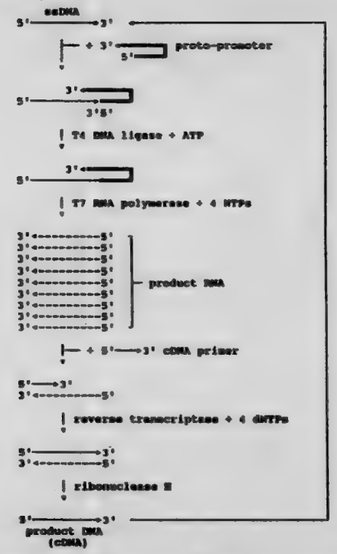
Mark S. Berninger, Gaithersburg; David M. Schuster, Poolesville, and Ayoub Rashtchian, Gaithersburg, all of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Filed May 16, 1990, Ser. No. 524,306
Int. Cl.[5] C12Q *1/68;* C12P *19/34;* G01N *33/566, 33/48*
U.S. Cl. 435—6 19 Claims

1. A method for amplifying and detecting a target DNA

sequence present, or possibly present, in a nucleic acid sample in a reaction volume under incubation conditions, comprising:

(a) adding under hybridizing conditions to said sample the following components:
  (1) a primer,
  (2) a proto-promoter comprising
    (a) a double-stranded segment which encodes a promoter for a DNA dependent RNA polymerase, and
    (b) a single-stranded segment which is complementary to the 3' end of the target DNA and which is a 3' overhand;
  (3) ribonucleotide triphosphates,
  (4) deoxyribonucleotide triphosphates,
  (5) RNA-dependent DNA polymerase,
  (6) an enzyme capable of releasing single-stranded DNA from RNA-DNA heteroduplexes,
  (7) DNA ligase,
  (8) DNA-dependent RNA polymerase, and
  (9) buffer solution;
(b) annealing together said proto-promoter and target DNA, thereby forming a target DNA/proto-promoter complex;



(c) ligating together the target DNA/photo-promoter complex, thereby forming a covalently-bound target DNA/-proto-promoter combination;
(d) transcribing the covalently-bound target DNA/proto-promoter combination with DNA-dependent RNA polymerase, thereby forming transcribed RNA;
(e) annealing the primer to the transcribed RNA, thereby forming a reverse transcription initiation complex;
(f) reverse transcribing the RNA with RNA-dependent DNA polymerase by extension of the primer of the reverse transcription initiation complex to form additional DNA, thereby forming a DNA-RNA heteroduplex;
(g) releasing the DNA strand of the DNA-RNA heteroduplex, thereby liberating the additional DNA;
(h) repeating step (b) through (g), thereby providing a cyclical process; and
(i) detecting nucleic acids synthesized from said cyclical process steps (b) through (h);

wherein said steps (b) through (h) are carried out without temperature cycling.

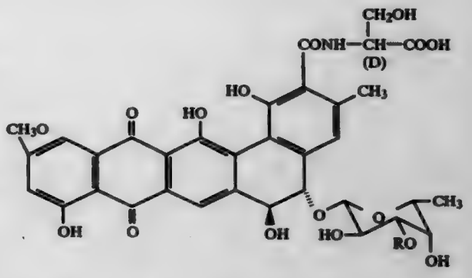
5,194,371

PRODUCTION OF PRADIMICIN ANTIBIOTICS

Tamotsu Furumai, Yokohama; Masami Hatori, Yokosuka; Masatoshi Kakushima, Inchara; Chiharu Ikeda, Tokyo; Kyeichiro Saitoh, Zushi, and Seiichi Kobaru, Chiba, all of Japan, assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Jul. 31, 1991, Ser. No. 739,019
Int. Cl.[5] C07H *15/244;* A61K *31/71;* C12P *19/56;* C12R *1/03*
U.S. Cl. 435—78 3 Claims

1. A process for the preparation of an antibiotic of the formula



(D)

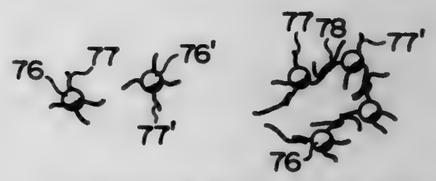
wherein R is hydrogen or β-D-xylosyl, which comprises cultivating a strain of Actinomadura capable of producing said antibiotic in an aqueous medium containing an assimilable source of carbon, nitrogen, and D-serine under aerobic condition, and recovering said antibiotic from the cultured broth; said Actinomadura strain being the strain designated AB 1236 and deposited with the American Type Culture Collection under the Accession No. ATCC 55208.

5,194,372

METHOD AND APPARATUS FOR DETECTING DISORDERS IN GENOMIC SUBSTANCES

Keiichi Nagai, Higashiyamato, and Jiro Tokita, Fuchu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 548,796
Claims priority, application Japan, Jul. 10, 1989, 1-175465; Sep. 1, 1989, 1-224419
Int. Cl.[5] C12Q *1/68, 1/34;* G01N *25/18;* C07H *15/12*
U.S. Cl. 435—6 4 Claims



1. A method for detecting disorders in genomic substances comprising the steps of:
preparing a solution containing first particles each having plural pieces of a first single-stranded nucleic acid probe attached thereto and a large number of second particles each having plural pieces of a second single-stranded nucleic acid probe attached thereto, said first and second single-stranded nucleic acid probes being complementary to a first region and a second region, respectively, on an objective genomic substance, which are exclusive of each other and contiguous to each other;
adding a single-stranded denatured product of the target nucleic acid to the solution;
forming aggregations of the first and second particles in the solution by hybridization of the denatured target nucleic

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acid added with particles with attached first and second single-stranded nucleic acid probes;

digesting the solution containing the aggregations with a nuclease which cleave the non-complementary-mismatch-containing portion of the double strand of each hybrid which had permitted the formation of the aggregations, in the vicinity of a mismatch-localized region;

measuring the size of the aggregations in the digested solution; and

determining the degree of mismatching between the complementary base sequences of the target nucleic acid and the first or second single-stranded nucleic acid probe using the size information of the aggregations in the digested solution.

5,194,373

METHOD OF DETERMINING ENDOTHELIAL CELL COVERAGE OF A PROSTHETIC SURFACE

Stuart K. Williams, Wilmington, Del., and Bruce E. Jarrell, Philadelphia, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 927,745, Nov. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 848,453, Apr. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 742,886, Jun. 6, 1985, Pat. No. 4,820,626. This application Nov. 20, 1990, Ser. No. 615,985

Int. Cl.[5] C12Q *1/06, 1/04;* C12N *5/00, 5/08*

U.S. Cl. 435—34 **14 Claims**

1. A method of determining uncultured microvascular endothelial cell coverage and cell-to-cell interactions on a prosthetic surface, which is performed prior to implantation of a prosthesis, comprising

(a) providing a prosthetic surface which is at least translucent to light in a selected wavelength range;

(b) applying uncultured microvascular endothelial cells to at least 50% confluence to said surface;

(c) staining said uncultured microvascular endothelial cells with a selected non-toxic fluorescent dye capable of exhibiting fluorescent emission in said selected wavelength range; and

(d) illuminating said uncultured microvascular endothelial cells with a light to excite said emission to permit observation of the cell coverage of said prosthetic surface, and

(e) observing said prosthetic surface to determine that a monolayer of said uncultured microvascular endothelial cells has formed before said prosthesis is implanted.

5,194,374

ISOLATING MEDIUM FOR IDENTIFYING THE SALMONELLA BACTERIUM

Alain Rambach, Paris, France, assignor to EUREC, France

Division of Ser. No. 510,903, Apr. 19, 1990, Pat. No. 5,098,832. This application Jan. 10, 1992, Ser. No. 819,478

Int. Cl.[5] C12Q *1/04, 1/02;* C12N *1/00, 5/00*

U.S. Cl. 435—34 **9 Claims**

1. An isolating medium for the identification of the Salmonella bacterium, wherein 1,2-propanediol metabolizable by Salmonella and a pH indicator reacting to acidification are added to a culture support containing peptones.

5,194,375

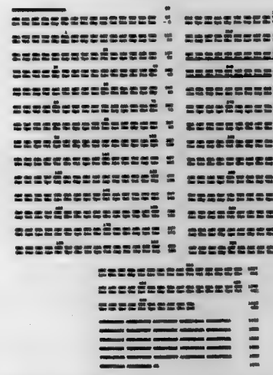
DNA ENCODING INTERLEUKIN-7 RECEPTORS AND METHODS OF USE

Linda S. Park, and Raymond G. Goodwin, both of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 421,201, Oct. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 366,910, Jun. 15, 1989, abandoned. This application May 21, 1990, Ser. No. 493,588

Int. Cl.[5] C07K *13/00;* C17N *15/12, 15/63*

U.S. Cl. 435—69.1 **16 Claims**



1. An isolated DNA selected from the group consisting of:

(a) a cDNA encoding a biologically active IL-7 receptor (IL-7R) protein and having a nucleotide sequence derived form the coding region of a sequence selected from the group consisting of the sequences of FIGS. 2A–2C, 3A–3B, and 4A–4C;

(b) a DNA capable of hybridizing to the cDNA of (a) under moderately stringent conditions (50° C., 2×SSC) and which encodes biologically active IL-7R protein; and

(c) a DNA which is degenerate as a result of the genetic code to the DNA defined in (a) or (b) and which encodes biologically active IL-7R protein.

5,194,376

BACULOVIRUS EXPRESSION SYSTEM CAPABLE OF PRODUCING FOREIGN GENE PROTEINS AT HIGH LEVELS

C. Yong Kang, Gloucester, Canada, assignor to University of Ottawa, Ottawa, Canada

Filed Feb. 28, 1989, Ser. No. 316,768

Int. Cl.[5] C12N *15/00, 15/86;* C12P *21/02*

U.S. Cl. 435—69.1 **23 Claims**

1. A process for expressing foreign gene proteins at a high level in a baculovirus expression system, which process comprises:

infecting selected organisms selected from the group consisting of insect cells and insects with autographa californica baculovirus containing: an intact polyhedrin gene promoter region including a final -CCTATAAAT sequence; a transcription termination sequence of a polyhedrin structural gene; a foreign structural gene having a translation start codon followed by coding sequences and a translation stop codon, said foreign gene being located between said promoter region and said termination sequence; immediately upstream of said start codon, a part of the polyhedrin putative ribosome binding site comprising at least the final four nucleotides of the series -ACCTATAAAT- effective for enabling said foreign gene to be expressed at a high level in insect cells; a restriction site upstream of said putative insect cell ribosome binding site but downstream of said polyhedrin gene promoter region; and a further restriction site downstream of said foreign gene; and

extracting said foreign gene protein from said cells or associated fluid after a suitable period of time following said infection.

13. A recombinant *Autographa californica* nuclear polyhedrosis virus comprising an expression cassette consisting of the following elements, operably linked, 5' to 3'; the polyhedrin gene promoter region including a final -CCTATAAAT-, a restriction site, a part of the polyhedrin putative ribosome binding site comprising at least the final four nucleotides of the series -ACCTATAAAT-, a foreign structural gene having a translation start codon followed by coding sequences and a translation stop codon, a restriction site, and a transcription termination sequence of a polyhedrin structural gene.

5,194,377

ANTIBIOTIC AGENT

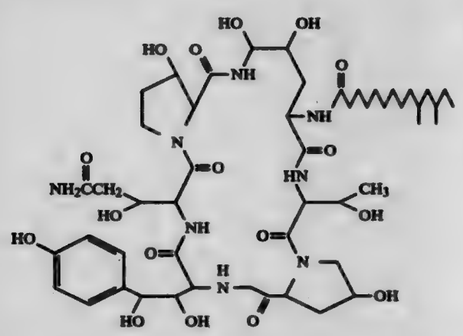
Robert E. Schwartz, Westfield, and Raymond F. White, Englishtown, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 492,025, Mar. 12, 1990, which is a continuation-in-part of Ser. No. 374,416, Jun. 30, 1989, abandoned. This application Aug. 9, 1991, Ser. No. 742,968

Int. Cl.[5] C12P *21/04;* C12N *1/00, 1/14;* C12R *1/645*

U.S. Cl. 435—71.1 **2 Claims**

1. A method for producing the compound having the formula



which comprises cultivating *Zalerion arboricola* ATCC 20868 in a nutrient medium in which an unnatural amino acid selected from the group consisting of 3,4-dehydroproline, L-azetidine-2-carboxylic acid, L-proline or a mixture thereof is present as the primary source of nitrogen and recovering the said compound.

5,194,378

PROCESS FOR PRODUCING FK-506

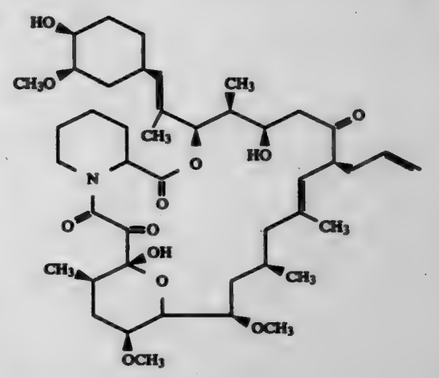
Gino M. Salituro, Fanwood; Francis Dumont, Rahway; George M. Garrity, Westfield; Leeyuan Huang, Watchung; E. Tracy T. Jones, Edison; Mary N. Omstead, Westfield, all of N.J.; Isabel M. Fernandez, and Teresa D. Matas, both of Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 646,555, Jan. 28, 1991, Pat. No. 5,116,756. This application Oct. 7, 1991, Ser. No. 772,520

Int. Cl.[5] C12P *17/16, 1/465*

U.S. Cl. 435—118 **5 Claims**

1. A process for producing the immunosuppressant, FK-506, comprising the step of culturing a strain of Streptomyces sp., ATCC No. 55098 under submerged aerobic fermentation conditions in an aqueous carbohydrate fermentation medium containing a nitrogen nutrient for a sufficient time to produce FK-506 and isolating and recovering said FK-506 from said fermentation medium.



5,194,379

MICROBIAL TRANSFORMATION PROCESS FOR THE PREPARATION OF HYDROXYLANOL IMIDAZO (4,5-B) PYRIDINES USEFUL AS ANGIOTENSIN II RECEPTOR ANTAGONISTS

Sheh-Shang T. Chen, Morganville, and George Doss, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

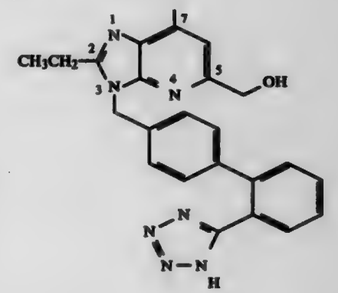
Division of Ser. No. 539,941, Jun. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 521,970, May 11, 1990, abandoned. This application Apr. 29, 1991, Ser. No. 675,844

Int. Cl.[5] C12P *17/18*

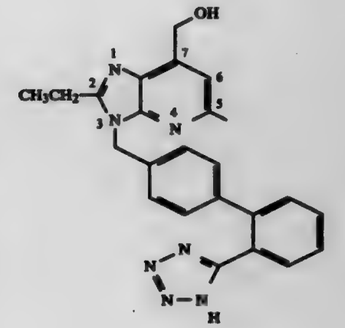
U.S. Cl. 435—119 **3 Claims**

1. A process for the preparation of a compound represented by formula (I) or (II)

(I)



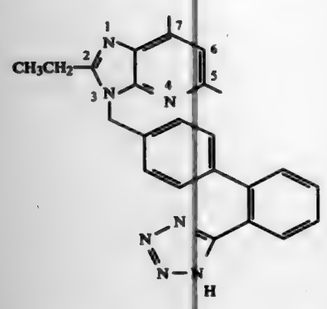
(II)



-continued

comprising the steps of culturing a microorganism Actinoplanacete sp. (MA 6559) (ATCC 53771) in a nutrient medium containing assimilable sources of nitrogen and carbon and substrate compound (III)

(III)



under aerobic conditions until a substantial amount of the compounds are produced and isolating the compounds so produced.

5,194,380

PROCESS FOR THE PRODUCTION OF OPTICALLY ACTIVE 2-HYDROXY-4-PHENYL-3-BUTENOIC ACID

Akinobu Matsuyama, Niigata; Ichiro Takase; Yoichiro Ueda, both of Hyogo, and Yoshinori Kobayashi, Niigata, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

PCT No. PCT/JP89/00698, § 371 Date Mar. 1, 1990, § 102(e) Date Mar. 1, 1990, PCT Pub. No. WO90/00613, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 11, 1989, Ser. No. 459,787

Claims priority, application Japan, Jul. 12, 1988, 63-173469; Jul. 12, 1988, 63-173470; Oct. 7, 1988, 63-253020

Int. Cl.[5] C12P *7/42*; C12R *1/22, 1/01, 1/645*

U.S. Cl. 435—146 3 Claims

1. A process for the production of optically active 2-hydroxy-4-phenyl butenoic acid, which comprises:

a) treating 2-oxo-4-phenyl-3-butenoic acid with a microorganism capable of symmetrically reducing said 2-oxo-4-phenyl-3-butenoic acid into (R)-2-hydroxy-4-phenyl-3-butenoic acid or (S)-2-hydroxy-4-phenyl-3-butenoic acid, wherein said microorganism is a viable cell, or wherein said microoganism has been ground, treated with acetone, or lyophilized;

wherein said microorganism capable of asymmetrically reducing 2-oxo-4-phenyl-3-butenoic acid into (R)-2-hydroxy-4-phenyl-3-butenoic acid is selected from among those belonging to the genera Lactobacillus, Streptococcus, Sporolactobacillus, Pediococcus, Arthrobacter, Agrobacterium, Ambrosiozyma, Achromobacter, Arthroascus, Aureobacterium, Bacillus, Botryoascus, Brevibacterium, Candida, Clavispora, Corynebacterium, Flavobacterium, Geotrichum, Hansenula, Kluyveromyces, Lipomyces, Lodderomyces, Proteus, Pseudomonas, Saccharomycopsis, Schizosaccharomyces, Stephanoascus, Torulaspora, Trigonopsis, Wickerhamiella, Enterobacter, Klebsiella and Xanthomonas; and

b) recovering said (R)-2-hydroxy-4-phenyl-3-butenoic acid or (S)-2-hydroxy-4-phenyl-3-butenoic acid.

5,194,381

FELINE INTERFERON AND PROCESS FOR PRODUCTION THEREOF

Akira Yanai; Yoshizumi Ueda; Toru Sakurai, and Masahiro Satoh, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,504

Claims priority, application Japan, Jun. 29, 1989, 1-167415

Int. Cl.[5] C12N *15/20, 15/86*

U.S. Cl. 435—172.3 16 Claims

1. A process for production of a recombinant silkworm nuclear polyhedrosis virus constructed by a gene recombination of DNA coding for a protein of feline interferon and a silkworm polyhedrosis virus, comprising the steps of:

cotransfecting a recombinant plasmid having a gene coding for a protein of feline interferon and a silkworm nuclear polyhedrosis virus DNA into established silkworm cells; and

cloning the desired recombinant virus.

5,194,382

METHOD FOR INCREASING THE ENZYMATIC REACTIVITY OF β-GALACTOSIDASE BY ADDITION OF A CYANATE, THIOCYANATE, AZIDE, OR THIOSULFATE COMPOUND

Rupert Herrmann; Hans-Joachim Guder, both of Wellheim, and Martina Junius-Comer, Iffeldorf, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Nov. 5, 1990, Ser. No. 609,242

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1989, 3937880; Mar. 12, 1990, 4007836

Int. Cl.[5] C12N *9/38*

U.S. Cl. 435—207 17 Claims

1. A method for accelerating reaction between β-galactosidase and a β-galactosidase substrate comprising adding an amount of a compound selected from the group consisting of an azide containing compound, thiocyanate containing compound, a cyanate containing compound, and a thiosulphate containing compound to a reaction mixture containing β-galactosidase and a β-galactosidase substrate sufficient to accelerate the reaction therebetween as compared to reaction between β-galactosidase and said β-galactosidase in the absence of said compound.

5,194,383

PROCESS FOR MAKING L-AMINOACYLASE

Tsai, Ying C.; Hsiang L. Hu, and Yuan B. Yang, all of Taipei, Taiwan, assignors to National Science Council of Republic of China, Taipei, Taiwan

Filed Nov. 21, 1991, Ser. No. 795,504

Int. Cl.[5] C12N *9/84, 9/48, 9/78*; C12R *1/05*

U.S. Cl. 435—230 3 Claims

1. A process for making L-aminoacylase comprising:

culturing *Alcaligenes denitrificans* DA181 in a culturing medium for growing cells for forming L-aminoacylase enzyme; and isolating said L-aminoacylase enzyme from the cells of the culturing medium.

5,194,384

METHOD FOR PREPARING HUMAN MELANOMA VACCINE

Jean-Claude Bystryn, Department of Dermatology, New York University Medical Center, 560 First Ave., New York, N.Y. 10016

Division of Ser. No. 41,864, Apr. 23, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 298,992

Int. Cl.[5] C12N *5/06*; A61K *37/02, 39/00*; A23J *3/04*

U.S. Cl. 435—240.2 5 Claims

1. A method for preparing a polyvalent human melanoma vaccine comprising:

(a) culturing over a period of about 3 hours in serum free medium a pool of human melanoma cell lines, wherein said cell lines are selected based on the shedding of different molecular weight cell surface melanoma associated antigens, said melanoma cells prior to culturing having been adapted to and maintained in serum free culture medium,

(b) subjecting the culture medium, after culturing the melanoma cells therein, to a particle separation operation for the removal of melanoma cells from said culture medium,

(c) concentrating the resulting melanoma cell free medium which contains shed melanoma associated cell surface material therein shed from said melanoma cell lines during culturing; and

(d) utilizing said recovered shed antigen material in the preparation of said vaccine comprising said shed melanoma associated cell surface antigens.

5,194,385

HYBRIDOMA AND MONOCLONAL ANTIBODY MLS102 WHICH RECOGNIZES A NEUACα2→6GALNAC SUGAR CHAIN PRESENT ON HUMAN INTESTINAL CANCER CELLS

Ikuo Yamashina, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Continuation of Ser. No. 75,847, Jul. 20, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 613,943

Claims priority, application Japan, Jul. 29, 1986, 61-179757

Int. Cl.[5] C12N *5/20, 15/02*; C07K *15/28*; C12P *21/08*

U.S. Cl. 435—240.27 2 Claims

1. A hybridoma having the designation MLS 102 (ECACC 86070307).

5,194,386

***XANTHOMONAS CAMPESTRIS* STRAIN EXPRESSING XANTHAN GUM**

Thomas J. Pollock, and Linda Thorne, both of San Diego, Calif., assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan and Shin-Etsu Bio, Inc., San Diego, Calif.

Continuation of Ser. No. 38,302, Apr. 14, 1987, abandoned. This application Feb. 13, 1990, Ser. No. 479,196

Int. Cl.[5] C12P *19/06*; C12N *1/21*

U.S. Cl. 435—252.3 1 Claim

1. Strain ATCC 55298.

5,194,387

PROCESS FOR THE INCORPORATION OF DNA MOLECULES INTO MICROORGANISMS WITH METHYL-SPECIFIC RESTRICTION SYSTEMS

Douglas J. MacNeil, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 192,035, May 9, 1988, abandoned. This application Nov. 15, 1991, Ser. No. 792,996

Int. Cl.[5] C12N *15/70*

U.S. Cl. 435—320.1 1 Claim

1. Plasmid pVE328.

5,194,388

"KAPPA" NUMBER CALIBRATION STANDARD

James J. Foster, Clifton Forge, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Jul. 10, 1989, Ser. No. 377,278

Int. Cl.[5] G01N *31/00*; D21C *3/20*

U.S. Cl. 436—8 2 Claims

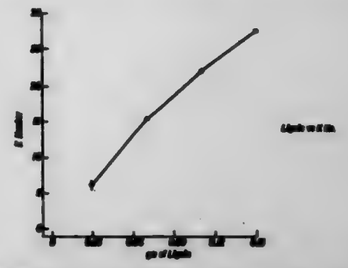
1. A method of calibrating instruments designed to directly measure the relative quantity of residual lignin intimately associated with a digested cellulosic pulp comprising the steps of:

a) determining the quantity of digested and washed cellulose pulp appropriate for an instrument test sequence;

b) determining the quantity of refined lignin corresponding to said quantity of pulp having a predetermined residual lignin index value;

c) charging a residual lignin measuring instrument sample vessel with said quantity of refined lignin;

d) cycling an instrument test sequence of said solution; and



e) adjusting said instrument to report a test value corresponding to said predetermined residual lignin index value;

said quantity of refined lignin is dissolved in solution with a lignin solvent; said solution of lignin and said solvent is aged by about five weeks.

5,194,389

NAPHTHOL DERIVATIVES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE

Walter Ritterdorf; Werner Guethlein, both of Mannheim; Peter Vogel, Hemsbach, and Detlef Thym, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

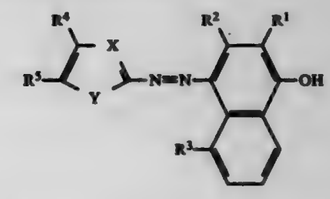
Filed May 10, 1991, Ser. No. 698,447

Claims priority, application Fed. Rep. of Germany, May 15, 1990, 4015591

Int. Cl.[5] G01N *33/20*

U.S. Cl. 436—79 26 Claims

1. Compound of the formula



wherein

R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen, an alkyl group and an alkoxy group, with the proviso that at least one of R^1, R^2 and R^3 is C_8–C_{30} alkyl group or a C_8–C_{30} alkoxy group;

R^4 is hydrogen or an alkyl group

R^5 is a nitro group, an alkyl group substituted by halogen, a cyano group, a sulfonamido group or an alkylsulfonyl group;

X is nitrogen or CR^6,

Y is sulphur or $CR^7{=}CR^8$,

wherein R^6, R^7 and R^8 are the same or different and are selected from the group consisting of hydrogen, halogen, a nitro group, a cyano group, an alkyl group, a halogen substituted alkyl group and an alkylsulphonyl group.

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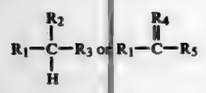
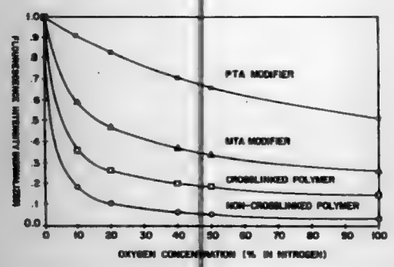
5,194,390
COMPOSITION FOR THE ASSAY OF ALBUMIN
Arthur L. Y. Lau, Sharon, Mass., assignor to Miles Inc., Elkhart, Ind.
Filed Jul. 5, 1988, Ser. No. 215,275
Int. Cl.[5] G01N *33/68*
U.S. Cl. 436—88 **4 Claims**

1. A composition capable of exhibiting a detectable color transition upon contact with an albumin-containing liquid test sample in the pH range of about 6 to about 8 to show the presence or concentration of albumin in the test sample, said composition comprising a dye having the formula:



wherein R_1, R_2 and R_3 are aromatic moieties having one or more electron-withdrawing functionalities present on each R_1, R_2 and R_3 aromatic moiety; R_4 is a quasi-aromatic moiety having one or more electron-withdrawing functionalities present on the quasi-aromatic ring; and R_5 is an aromatic moiety having one or more electron-withdrawing functionalities, including at least one hydroxy functionality, present on the aromatic ring, wherein the aromatic moieties R_1, R_2, R_3 and R_5 are selected, independently, from the group consisting of benzene, naphthalene, pyrrole, furan, thiophene, pyridine, pyrazine, indole, quinoline, carbazole and purine, and wherien the electron-withdrawing functionalities present on the R_1, R_2, R_3, R_4 and R_5 moieties are selected, independently, from the group consisting of ammonium, aryl-substituted ammonium, nitro, cyano, halo, halo-substituted methyl, hydroxy, alkoxy, aryloxy, formyl, carboxyl, alkoxycarbonyl, aryloxycarbonyl, carbamoyl, alkyl-substituted carbamoyl, aryl-substituted carbamoyl, aryl carbonyl, alkyl carbonyl, 2-nitrovinyl, alkyl sulfonyl, aryl sulfonyl, sulfo, phosphonium, alkyl-substituted phosphonium, aryl-substituted phosphonium, sulfonium, alkyl-substituted sulfonium and aryl-substituted sulfonium, wherein an alkyl group contains from one to about twenty carbon atoms and an aryl group is an aromatic ring; and a buffer to maintain the composition at a pH in the range of about 6 to about 8.

5,194,391
CHEMICALLY SENSITIVE, DIMENSIONALLY-STABLE ORGANOSILICON MATERIAL COMPOSITION AND TECHNIQUES
Ganapati R. Nauze, Sunnyvale; Robert R. Holloway, Montara, and Darlene J. Spira-Solomon, Stanford, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 259,015, Oct. 17, 1988, Pat. No. 5,057,277.
This application Jun. 25, 1991, Ser. No. 720,983
Int. Cl.[5] G01N *21/64, 31/22*
U.S. Cl. 436—166 **11 Claims**

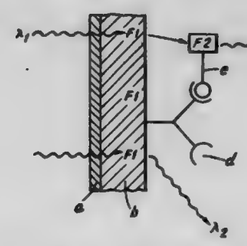


1. A method of preparing a material composition having a sensing ability for analytes permeable to the material composition, said sensing ability dependent upon a concentration of the analytes, comprising the steps of:
preparing a solution of a solvent vehicle;
adding a variably radiative material to said solution effective for radiating in relationship to the concentration of the analytes;
adding modifier material for effecting a desired modification in the relationship of said variably radiative material to the concentration of the analytes;
adding silicone to said solution, wherein said silicone is not reactive to and does not crosslink with said modifier material; and
adding silica to said solution to establish dimensional stability for said material composition upon removal from solution.

5,194,392
METHOD OF DETERMINING MIMOTOPES
Hendrik M. Geysen, Knoxfield, Australia, assignor to Commonwealth Serum Labortories, Commission, Australia
Coutinuation of Ser. No. 864,341, May 22, 1986, abandoned.
This application Jun. 21, 1990, Ser. No. 541,169
Claims priority, application Australia, Jul. 24, 1984, PG6188/84
Int. Cl.[5] G01N *33/543, 33/531*; C07K *1/04*
U.S. Cl. 436—518 **6 Claims**

1. A method of determining the sequences of amino acids which is a conformational equivalent of an epitope which is complementary to a particular paratope of an antibody of interest, the method comprising the steps of:
a. synthesizing a plurality of catamer preparations; each catamer having at least four positions; each of said catamer preparations consisting of a plurality of catamers made of a defined set of at least four amino acids and in which:
(i) a residue at two or more designated positions in each catamer are known and are constant for each catamer in the catamer preparation ("constant positions"),
(ii) the residue at each of the remaining positions is randomly made up from members selected from said defined set of amino acids ("random positions"); wherein at least two of the positions of said catamer are random; and
(iii) said plurality of catamer preparations comprising preparations in which the residue at the designated positions is systematically varied to contain members from said defined set of amino acids, wherein the number of catamers in said catamer preparation is the product of the number of amino acids selected for each random position;
b. contacting each of said plurality of catamer preparations with the antibody of interest;
c. detecting the presence or absence of binding between each of said plurality of catamer preparations and said given antibody;
d. determining a partial sequence of amino acids for the conformational equivalent of an epitope which is complementary to the particular paratope of said antibody from the known residue at two or more designated positions in each of said plurality of catamer preparations that bind to said antibody;
e. synthesizing a further plurality of catamer preparations as defined in step a and which include the composition of the partial sequence as determined in said step d as initial designation positions, each of said further plurality of catamer preparations having at least one additional position in each catamer as a designated position; and
f. repeating steps b, c and d with said further plurality of catamer preparations.

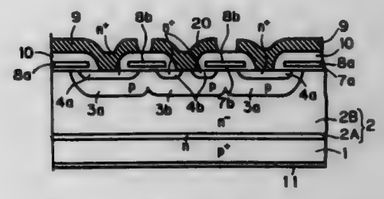
5,194,393
OPTICAL BIOSENSOR AND METHOD OF USE
Herbert Hugl, Bergisch Gladbach, Fed. Rep. of Germany; Eberhard Kuckert, West Haven, Conn.; Dietmar Möbius, Wuppertal, Fed. Rep. of Germany; Holger Ohst, Odenthal, Fed. Rep. of Germany; Meinhard Rolf, Charleston, S.C.; Hans J. Rosenkranz, Krefeld, Fed. Rep. of Germany; Heinrich C. Schopper, Krefeld, Fed. Rep. of Germany; Hans-Ulrich Siegmund, Krefeld, Fed. Rep. of Germany; Klaus Sommer, Cologne, Fed. Rep. of Germany, and Rolf Wehrmann, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 8, 1990, Ser. No. 611,197
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1989, 3938598; Apr. 28, 1990, 4013713
Int. Cl.[5] G01N *33/553*
U.S. Cl. 436—525 **12 Claims**



1. A process for the detection of analyte molecules in a sample comprising providing a sensor consisting of
a) a solid support,
b) a single layer or multi-layer Langmuir-Blodgett (LB) film attached to the surface of said support a),
c) at least one fluorescent dye F_1 which is located in the top layer or in case of a multi-layer Langmuir-Blodgett film, in at least one of the top four layers of the Langmuir-Blodgett film,
d) a first receptor molecule which is capable of specific binding with said analyte molecule and which is bonded covalently or by absorption in or on the topmost layer of the Langmuir-Blodgett film, and
e) exposing said sensor to said sample and a mobil fluorescent dye F_2 whose excitation band overlaps sufficiently for an energy transfer with the emission band of said dye F_1 and which
e1) is covalently bonded to a second receptor molecule which competes with said analyte molecules for specifically binding to said first receptor molecule d) or which
e2) is covalently bonded to a third receptor molecule which is able to bind to a complex composed of the first receptor molecule d) and said analyte molecule,
where the second molecule or the complex of the analyte molecule and the third receptor molecule are initially not bound to the Langmuir-Blodgett film,
and detecting a change in the level of fluorescence energy transfer in response the said exposing step.

2. A sensor for the detection of analyte molecules based on fluorescence energy transfer (Forster transfer) consisting of
a) a solid support,
b) a single layer or multi-layer Langmuir-Blodgett film (LB) attached to the surface of said support a),
c) at least one fluorescent dye F_1 which is located in the top layer or in case of a multi-layer Langmuir-Blodgett film, in at least one of the top four layers of the Langmuir-Blodgett film,
d) a receptor molecule which is capable of specific interaction with a ligand molecule and which is bonded covalently or by adsorption in or on the topmost layer of the Langmuir-Blodgett film.

5,194,394
THYRISTOR AND METHOD OF MANUFACTURING THE SAME
Tomohide Terashima, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 573,776, Aug. 28, 1990, Pat. No. 5,091,766.
This application Jan. 30, 1992, Ser. No. 828,204
Claims priority, application Japan, Oct. 23, 1989, 1-275412
Int. Cl.[5] H01L *21/332*
U.S. Cl. 437—6 **4 Claims**

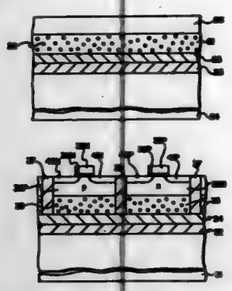


1. A method of manufacturing a thyristor, comprising the steps of:
(a) preparing a first semiconductor layer of a first conductivity type, having first and second major surfaces;
(b) forming a second semiconductor layer of a second conductivity type on said first major surface of said first semiconductor layer;
(c) selectively forming a first semiconductor region of the first conductivity type on a surface of said second semiconductor layer;
(d) selectively forming second and third semiconductor regions of the second conductivity type on a surface of said first semiconductor region separately from each other;
(e) forming a first insulating film on the surface of said first semiconductor region between said second semiconductor layer and said second semiconductor region;
(f) forming a second insulating film on the surface of said first semiconductor region between said second semiconductor region and said third semiconductor region;
(g) forming first and second control electrodes on said first and second insulating films, respectively;
(h) forming a first main electrode on said second semiconductor region;
(i) forming a conductive layer on said first semiconductor region and said third semiconductor region; and
(j) forming a second main electrode on said second major surface of said first semiconductor layer;
wherein said second semiconductor region is composed of a plurality of regions discretely formed, and
said conductive layer is formed on the surface of said first semiconductor region between said plurality of regions.

5,194,395
METHOD OF PRODUCING A SUBSTRATE HAVING SEMICONDUCTOR-ON-INSULATOR STRUCTURE WITH GETTERING SITES
Kunihiko Wada, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Division of Ser. No. 382,937, Jul. 21, 1989, Pat. No. 5,063,113.
This application Aug. 2, 1991, Ser. No. 739,540
Claims priority, application Japan, Jul. 28, 1988, 63-186872
Int. Cl.[5] H01L *21/306*
U.S. Cl. 437—10 **12 Claims**

1. A method of producing a substrate having a semiconductor-on-insulator structure comprising the steps of:
preparing a stacked structure having a base substrate and an insulator layer formed thereon;
forming an active substrate on the insulator layer of said

stacked structure, said active substrate having gettering sites; and

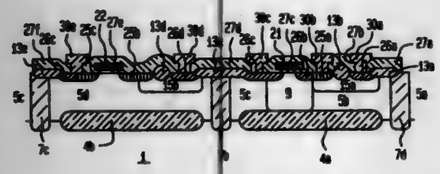


forming an active layer on said active substrate, said active layer being made of a semiconductor.

5,194,396
METHOD OF FABRICATING BICMOS FIELD EFFECT TRANSISTORS

Young M. Kim, Kwangju-shi; Seong J. Kang, and Jong S. Lyu, both of Daejeon-shi, all of Rep. of Korea, assignors to Korea Electronics and Telecommunications Research, Rep. of Korea

Filed Sep. 20, 1991, Ser. No. 763,171
Claims priority, application Rep. of Korea, Sep. 20, 1990, 90-14891
Int. Cl.[5] H01L *21/70, 27/00*
U.S. Cl. 437—31 6 Claims



1. A method of fabricating BiCMOS field effect transistors (FETs) comprising the steps of:

(a) selectively forming an oxide layer on a P-type silicon substrate and thereafter forming a layer of photosensitive material on said oxide layer, thereby obtained a mask pattern through which an embedded layer of arsenic ions is to be introduced into said P-type silicon substrate;

(b) introducing arsenic ions into said P-type silicon substrate by way of the mask pattern obtained in step (a), so as to form an embedded layer of arsenic ions in the surface of said P-type silicon substrate;

(c) forming an epitaxial semiconductor layer on the structure obtained in step (b);

(d) forming a mask layer on said epitaxial semiconductor layer and introducing P-type impurities into said epitaxial layer by way of the mask layer formed thereon, so as to form a P-type isolation region in a surface portion of said epitaxial semiconductor layer;

(e) forming a patterned photoresist layer on the surface of the epitaxial layer in which said P-type isolation region has been formed in step (d) and implanting boron ions into said P-type epitaxial layer at a dose of $5\times10^{12}/cm^2$ and an implant energy of 60 KeV and heating the resulting structure at a high temperature, so as to define a P-type well in said epitaxial layer;

(f) removing the patterned photoresist layer and depositing a thin film of silicon nitride on the surface of said epitaxial layer, said thin film of silicon nitride serving to prevent escape of boron ions implanted in step (e);

(g) forming a patterned photoresist layer on the surface of said thin film of silicon nitride, and removing an exposed portion of the thin film of silicon nitride deposited in step (f);

(h) implanting boron ions into that portion of said P-type epitaxial layer exposed by the patterned photoresist layer and the removed exposed portion of the thin film of silicon nitride at a dose of $1\times10^{13}/cm^2$ and an implant energy of 60 KeV, so as to form a field region in said epitaxial layer;

(i) removing the photoresist layer formed in step (g) and the thin film of silicon nitride and forming a silicon oxide region only on the field region;

(j) forming a patterned photoresist layer on the surface of the structure resulting from step (i), and implanting boron ions by way of the patterned photoresist layer, so as to define P-type base regions in said epitaxial layer;

(k) forming a patterned photoresist layer on the surface of the structure resulting from step (j) and implanting boron ions into one of said P-type base regions to form a base region of an NMOS device at a dose of $5–7\times10^{11}$-cm^2 and an implant energy of 45 KeV, so as to adjust a threshold voltage of said NMOS device;

(l) removing the patterned photoresist layer formed in step (k) and forming a patterned photoresist layer on the surface of the resulting structure and implanting boron ions into another of said P-type base regions to form a base region of a PMOS device at a dose of $3–5\times10^{11}/cm^2$ and an implant energy of 45 KeV, so as to adjust a threshold voltage of said PMOS device;

(m) removing the patterned photoresist layer formed in step (l) and growing, by thermal oxidation of said epitaxial layer in an ambient of trichloroethylene and oxygen, a gate oxide layer to a thickness of 400 Angstoms on said epitaxial layer;

(n) depositing a polycrystalline silicon layer on the structure resulting from step (m) to a thickness of 3800 Angstoms by low pressure chemical vapor deposition;

(o) forming an etch mask on the deposited polycrystalline silicon layer and etching back a portion of the gate oxide layer and the polycrystalline silicon layer exposed by the etch mask, so as to define an MOS gate region and a polycrystalline silicon resistor region;

(p) forming a patterned photoresist layer on the surface of the structure resulting from step (o) and implanting boron ions into the epitaxial layer exposed thereby at a dose of $5\times10^{15}/cm^2$ and an implant energy of 45 KeV, so as to form a P-type source/drain of an MOS device;

(q) removing the patterned photoresist layer of step (p) and forming a patterned photoresist layer on the surface of the structure resulting from step (q) and implanting arsenic ions into the epitaxial layer exposed thereby at a dose of $4\times10^{15}/cm^2$ and an implant energy of 45 KeV, so as to form an N-type source/drain of an MOS device;

(r) removing the patterned photoresist layer of step (q) and heating the resulting structure at 950° C. in an ambient of nitrogen for 30 minutes, so as to activate the boron and arsenic ions respectively implanted in steps (o) and (q);

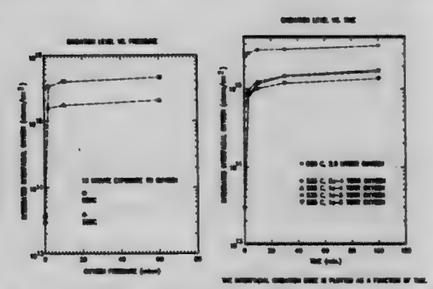
(s) depositing an oxide layer to a thickness of 7000 Angstroms and selectively etching portions of the deposited oxide layer by using a contact mask, so as to form ohmic contact apertures in the deposited oxide layer; and

(t) selectively depositing an aluminum layer to a thickness of one micron so as to form a metallic wiring layer which extends into the ohmic contact apertures formed in step (s).

5,194,397
METHOD FOR CONTROLLING INTERFACIAL OXIDE AT A POLYCRYSTALLINE/MONOCRYSTALLINE SILICON INTERFACE

Robert K. Cook, Poughkeepsie; Ronald W. Knepper, Lagrangeville; Subodh K. Kulkarni, Fishkill; Russell C. Lange, Newburgh; Paul A. Rousheim, Wappingers Falls; Seshadri Subbanna, Hopewell Junction; Mazen J. Tejwani, Yorktown Height, and Bob H. Yun, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1991, Ser. No. 710,498
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 23 Claims



8. A method of forming a device onto a monocrystalline silicon substrate comprising the steps of:

a) passivating the monocrystalline silicon with hydrogen;

b) heating the substrate to a first specified temperature;

c) keeping the substrate at said first specified temperature for a specified length of time in order to oxidize a portion of the substrate, wherein said specified amount of time is between 15 and 300 seconds;

d) evacuating the atmosphere around the substrate to a specified partial pressure;

e) heating the substrate to a second specified temperature; and,

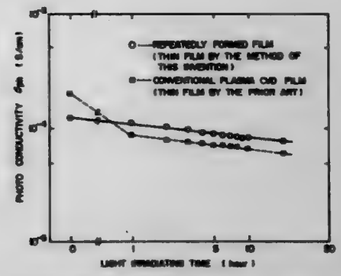
f) depositing polycrystalline silicon onto the substrate.

5,194,398
SEMICONDUCTOR FILM AND PROCESS FOR ITS PRODUCTION

Kenji Miyachi; Nobuhiro Fukuda; Yoshinori Ashida, all of Yokohama, and Masato Koyama, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 545,176, Jun. 28, 1990, abandoned.
This application Feb. 6, 1992, Ser. No. 830,967
Claims priority, application Japan, Jun. 28, 1989, 1-163710; Jun. 29, 1989, 1-165402; Jun. 29, 1989, 1-165403; Aug. 2, 1989, 1-199258; Aug. 2, 1989, 1-199259; Aug. 2, 1989, 1-199260; Aug. 3, 1989, 1-200834; Jan. 23, 1990, 2-11803
Int. Cl.[5] H01L *21/20, 21/203, 21/205*
U.S. Cl. 437—108 30 Claims

1. A method for forming an amorphous semiconductor film, which comprises the sequential steps of: (a) forming a silicon or silicon alloy semiconductor film having not more than 20 atomic percent of bound hydrogen, and then (b) modifying the formed film by exposing said film to a discharge atmosphere containing a non-film-forming reactive gas or a monovalent ion or atomic hydrogen, the sequence of steps being repeated multiple times, the thickness of the semiconductor film formed by one formation/modification cycle being in the range of from 10 to 1000 A.

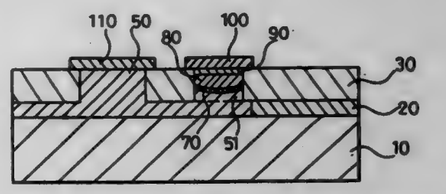


24. A semiconductor film formed by the method of claim 1 on a substrate.

5,194,399
METHOD OF PRODUCING A SEMICONDUCTOR LIGHT EMITTING DEVICE DISPOSED IN AN INSULATING SUBSTRATE

Shogo Takahashi, and Etsuji Omura, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 607,044, Oct. 31, 1990, Pat. No. 5,108,833, which is a division of Ser. No. 227,124, Aug. 2, 1988, Pat. No. 5,003,358. This application Sep. 30, 1991, Ser. No. 767,685
Claims priority, application Japan, Aug. 5, 1987, 62-196821
Int. Cl.[5] H01L *21/18*
U.S. Cl. 437—129 3 Claims



1. A method of producing a semiconductor light emitting device comprising the steps of:

growing a semiconductor layer and a semi-insulating or insulating growth layer on a semi-insulating or insulating substrate;

depositing photoresist and patterning said photoresist on said semi-insulating or insulating growth layer;

etching said growth layer and said semiconductor layer, producing a first aperture in said growth layer extending to said substrate and a transverse aperture communicating with and transverse to said first aperture in said semiconductor layer;

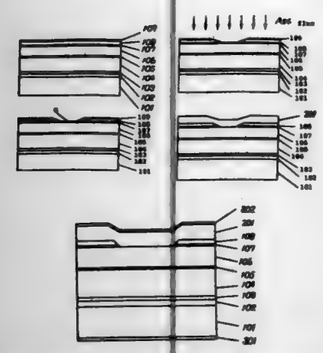
growing a conducting semiconductor layer in said first aperture and in said transverse aperture;

etching said growth layer to expose said conducting semiconductor layer in said transverse aperture, producing a groove;

growing semiconductor layers functioning as a light emitting element and including a light emitting region in said groove; and

depositing electrodes on the surface of said semiconductor layer grown in said first aperture and on the surface of said semiconductor layers in said groove, respectively.

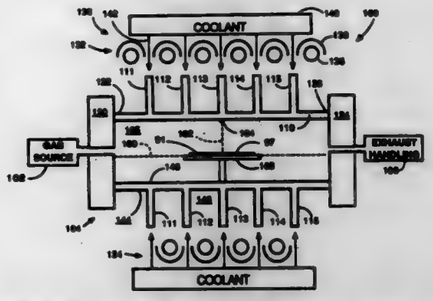
5,194,400
METHOD FOR FABRICATING A SEMICONDUCTOR LASER DEVICE USING $(AL_xGA_{1-x})_yIN_{1-y}P$ SEMICONDUCTOR CLAD LAYERS
Akira Takamori, Atsugi; Kei Idota, Kawasaki; Kiyoshi Uchiyama, Kawasaki, and Masato Nakajima, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 29, 1991, Ser. No. 800,376
Claims priority, application Japan, Nov. 28, 1990, 2-332398; Sep. 25, 1991, 3-245604
Int. Cl.[5] H01L *21/20, 21/203, 21/205*
U.S. Cl. 437—129 **9 Claims**



1. A method for fabricating a visible light semiconductor laser device by molecular beam epitaxy, the method comprising:
subjecting a semiconductor substrate of one conductivity type to a first growth procedure to built up on the substrate a lower clad layer made of a semiconductor of the one conductivity type of the formula, $(Al_xGa_{1-x})_yIn_{1-y}P$, wherein x is in the range of from 0.5 to 1 and y is in the range of from 0.47 to 0.53, an active layer, an upper clad layer made of a semiconductor of the other conductivity type of the formula, $(Al_xGa_{1-x})_yIn_{1-y}P$, wherein x and y have, respectively, the same meanings as defined above, a protective layer, and a current blocking layer in this order, wherein the protective layer is made of a semiconductor which is more unlikely to be etched than a semiconductor of the current blocking layer, thereby obtaining a built-up structure on the substrate;
etching the current blocking layer to a level of the protective layer to make a stripe groove with a predetermined width with which current passage is narrowed;
removing the protective layer on the stripe groove; and
subjecting the thus removed built-up structure to a second growth procedure to form a cap layer on the built-up structure.

5,194,401
THERMALLY PROCESSING SEMICONDUCTOR WAFERS AT NON-AMBIENT PRESSURES
David V. Adams, San Jose; Roger N. Anderson, Santa Clara, and Thomas E. Deacon, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Continuation of Ser. No. 436,838, Nov. 15, 1989, abandoned, which is a division of Ser. No. 339,784, Apr. 18, 1989, Pat. No. 4,920,918. This application Apr. 22, 1992, Ser. No. 873,483
Int. Cl.[5] H01L *21/26*
U.S. Cl. 437—173 **7 Claims**

1. A method for processing semiconductor wafers comprising:
positioning a wafer within an elongated quartz tube having a non-circular cross section;
flowing reactant gas longitudinally through said tube under non-ambient pressure;
heating said wafer by radiating energy through a wall of said tube; and

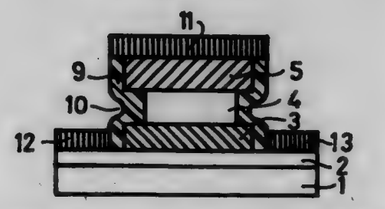


reinforcing said tube against the differential between the respective gas pressures inside and outside the tube by applying external reinforcement members to the tube, said members being positioned so as to permit most of said radiated energy to pass through said wall of the tube without being obstructed by said members.

5,194,402
METHOD OF PRODUCING MICROSENSORS WITH INTEGRATED SIGNAL PROCESSING
Wolfgang Ehrfeld; Friedrich Götz, both of Karlsruhe; Werner Scheib, Pfinztal, and Dirk Schmidt, Stutensee, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany
PCT No. PCT/DE88/00488, § 371 Date Apr. 10, 1989, § 102(e) Date Apr. 10, 1989, PCT Pub. No. WO89/01632, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 8, 1988, Ser. No. 340,175
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727142
Int. Cl.[5] H01L *21/44, 21/60*
U.S. Cl. 437—180 **12 Claims**

1. A method of producing electrical component microsensors with integrated signal processing wherein semiconductor electronic circuits for the signal processing and sensor structures coupled therewith are produced on a common substrate immediately adjacent one another in space, comprising the following steps:
producing the semiconductor electronic circuits on the substrate;
forming an insulating protective layer, including contact openings for coupling the sensor structures with the circuits, on the substrate;
applying a conductive layer to the insulating protective layer to serve as a galvanic electrode layer;
configuring the conductive layer to follow in its surface structure the layer out of the sensor structures and the necessary conductive paths and connections;
applying a layer of an X-ray resist material on the substrate surface which has been provided with the galvanic electrode, with the thickness of the resist layer corresponding to a height of the sensor structures to be produced;
producing negatives of the sensor structures in said X-ray resist layer by means of X-ray lithography;
electromechanically depositing a metal or a metal alloy in the negative of the sensor structures with the use of the galvanic electrode layer to form the sensor structures; and
separating the substrate including the sensor structures applied thereto into individual functional units.

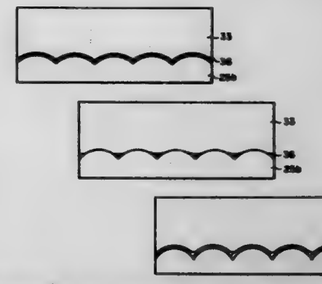
5,194,403
METHOD FOR THE MAKING OF THE ELECTRODE METALLIZATIONS OF A TRANSISTOR
Sylvain Delage, Paris; Philippe Collot, Orsay, and Marie-Antoinette Poisson, Paris, all of France, assignors to Thomson-CSF, Puteaux, France
Filed Oct. 2, 1991, Ser. No. 769,837
Claims priority, application France, Oct. 9, 1990, 90 12442
Int. Cl.[5] H01L *21/285, 21/308*
U.S. Cl. 437—184 **3 Claims**



1. A method for the making of the electrode metallizations of a transistor, self-aligned by a raised pattern, wherein said raised pattern is comprised of first and second semiconductor materials, said first and second semiconductor materials reacting in different ways with respect to a pair of etching methods, so that a first semiconductor layer, composed of said first semiconductor material, located between a first metallization and a second semiconductor layer, composed of said second semiconductor material, is etched to a greater extent than said second semiconductor layer, the overhanging feature thus formed participating in the insulation between the first metallization located on the raised pattern and at least one second metallization located at the foot of the pattern.

5,194,404
METHOD OF MANUFACTURING A CONTACT STRUCTURE FOR A SEMICONDUCTOR DEVICE
Yoshiki Nagatomo, Tokyo, Japan, assignor to Oki Electric Industry Co. Ltd., Tokyo, Japan
Filed Mar. 19, 1991, Ser. No. 671,525
Claims priority, application Japan, Mar. 22, 1990, 2-69679
Int. Cl.[5] H01L *29/46*
U.S. Cl. 437—192 **17 Claims**

1. A method of manufacturing a contact structure for a semiconductor device comprising the steps of:
providing a semiconductor substrate;
forming a silicide layer on a surface of the semiconductor substrate;
forming a thin oxide layer on the silicide layer incidentally;
forming a polycrystalline silicon layer on the thin oxide layer;
introducing an impurity into the polycrystalline silicon layer; and

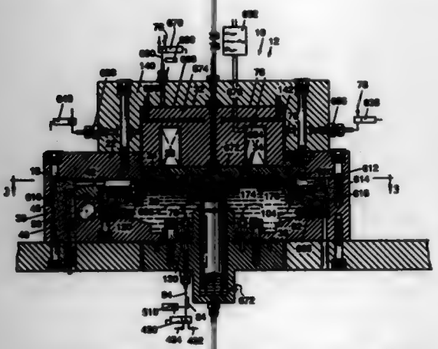


subjecting the structure obtained by the above steps to a rapid annealing heat treatment at a temperature above about 900° C. to cause the thin oxide layer to flow viscously into valley portions of grain boundaries of the silicide layer so that the silicide layer forms an ohmic contact with the polycrystalline silicon layer.

5,194,405
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A SILICIDE LAYER
Hirofumi Sumi, and Toshiyuki Nishihara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 549,142, Jul. 6, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 830,555
Claims priority, application Japan, Jul. 6, 1989, 1-175105
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—200 **4 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of: forming a film of a silicon dioxide on a silicon substrate, the silicon dioxide film having a thickness of 20 to 50Å; forming a titanium metal film on said silicon dioxide film; annealing the substrate, the silicon dioxide film and the titanium metal film at a temperature to form a silicide layer on said silicon substrate; wherein, said annealing is comprised of a first substantially low temperature annealing and a second annealing, said first and second annealings forming a silicide layer on said silicon substrate, wherein, said first annealing is carried out at a temperature of 650° C. in argon gas by rapid thermal annealing wherein, said second annealing is carried out at a temperature of 900° C. by rapid thermal annealing and wherein, said silicide layer has a resistance value of substantially 40Ω/□.

5,194,406
INSTALLATION FOR TRANSPORT AND PROCESSING UNDER A PULSATING DOUBLE-FLOATING CONDITION
Edward Bok, 1171 DR, Bedhoevedorp, and Ronald J. W. Barlag, NL-1314 KW, Almerstad, both of Netherlands
PCT No. PCT/NL89/00092, § 371 Date Jul. 24, 1990, § 102(e) Date Jul. 24, 1990, PCT Pub. No. WO90/06590, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 30, 1989, Ser. No. 474,818
Claims priority, application Netherlands, Dec. 1, 1988, 8802963
Int. Cl.[5] H01L *21/00, 21/02;* B08B *5/04*
U.S. Cl. 437—225 27 Claims



1. Apparatus in the form of a module for transfer and processing of wafers comprising:
a. a supporting base;
b. a combination of lower chamber block and upper chamber block, superposed upon said base so as to define a wafer processing chamber between the chamber blocks;
c. a reciprocal wall defined in at least one of said chamber blocks so as to abut a portion of said processing chamber;
d. a circumferential membrane arranged along the periphery of said wafer processing chamber, so as to at least temporarily seal said processing chamber circumference; and
e. a pulsator attached to said reciprocal wall so as to at least temporarily reciprocate a portion of said reciprocal wall and thereby vary the height of said processing chamber during processing.

5,194,407
MOLTEN METAL-RESISTANT CERAMIC FIBER-CONTAINING COMPOSITION
Steven J. Waisala, Aurora, and Ajit Y. Sane, Medina, both of Ohio, assignors to Stemcor Corporation, Cleveland, Ohio
Division of Ser. No. 133,898, Dec. 16, 1987, Pat. No. 4,868,142. This application Aug. 28, 1989, Ser. No. 379,342
Int. Cl.[5] C04B *35/80*
U.S. Cl. 501—32 24 Claims

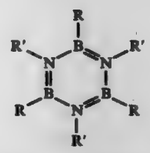
1. A molten metal-resistant ceramic fiber containing composition of a density less than or equal to about 45 lb/ft^3 produced by the steps of:
providing a frit of CaQ, Al_2O_3, and B_2O_3
providing a low temperature organic binder;
mixing the low temperature organic binder with the frit;
providing alumino-silicate ceramic fibers;
mixing the binder-frit mixture with the fibers;
adding water to the binder-frit-fiber mixture;
forming the binder-frit-fiber mixture into a shape;
drying the binder-frit-fiber mixture; and
firing the binder-frit-fiber mixture to oxidize the binder and melt the frit.

5,194,408
SINTERED CERAMIC MICROWAVE HEATING SUSCEPTOR
Jeffrey A. Stamp, Coppell, Tex., and Jeffrey D. Meister, Crystal, Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 313,930, Feb. 22, 1989. This application Sep. 27, 1991, Ser. No. 766,532
Int. Cl.[5] C04B *35/52*
U.S. Cl. 501—88 29 Claims

1. In a ceramic composition capable of absorbing microwave energy comprising a ceramic binder and a ceramic susceptor material which absorbs microwave energy, the improvement wherein said composition is sintered and said sintered composition comprises a microwave susceptor material that is a compound selected from a carbide, nitride, boride and mixture thereof, and
wherein the composition is sintered at 800° F. for a time sufficient to increase the density of the composition to about 50% of the theoretical density but below the vitrification density.

5,194,409
PROCESS FOR PRODUCING BN-COATED SIC WHISKER AND PROCESS FOR PRODUCING CERAMIC COMPRISING SAID BN-COATED SIC WHISKER AS REINFORCEMENT
Takaomi Sugihara, Gotenba, Japan, assignor to Tokai Carbon Co., Ltd., Tokyo, Japan
Filed Jun. 14, 1991, Ser. No. 715,254
Claims priority, application Japan, Jul. 23, 1990, 2-194401
Int. Cl.[5] C04B *35/52, 35/56*
U.S. Cl. 501—92 7 Claims

1. A process for producing a boron nitri-decoated SiC whisker, comprising dissolving a borazine represented by the following formula (I) in hexane, dispersing a SiC whisker in the resultant solution, collecting the SiC whisker thus treated by filtration, drying and baking it in a non-oxidizing atmosphere at to 1800° C. to form a boron nitride coating on the surface of the SiC whisker:



(I)

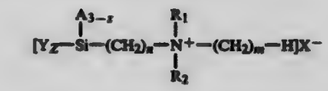
wherein R is an atom or a group selected from the group consisting of Cl, $N(C_2H_5)_2$, NH_2, $NHCH_3$ and CH_3, and R′ is an atom or a group selected from the group consisting of H and CH_3.

5,194,410
CRYSTALLINE MOLECULAR SIEVE SYNTHESIS USING QUATERNARY AMMONIUM-FUNCTIONALIZED ORGANOSILICONATE
David C. Calabro, Somerset, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 15, 1991, Ser. No. 792,572
Int. Cl.[5] B01J *29/28;* C01B *33/28*
U.S. Cl. 502—62 15 Claims

14. A synthetic crystalline ZSM-48 zeolite material having the characteristic X-ray diffraction lines of Table 1 and the formula, in terms of mole ratios of oxides, in the anhydrous state as follows:

$$(0.05 \text{ to } 5)R'_2O:(0.1 \text{ to } 10)M_{2/n}O:(0 \text{ to } 4)Al_2O_3:(100)Si_2$$

wherein R′ is represented by the formula



wherein
Y is a hydrolyzable radical selected from hydroxy, alkoxy and aryloxy;
X is a halide, or anion selected from sulfate, phosphate and carbonate;
R_1 is an alkyl radical of 1 to 4 carbon atoms such as methyl, ethyl, propyl, isopropyl, butyl or isobutyl, and preferably methyl;
R_2 is an aliphatic radical of 1 to 4 carbon atoms such as methyl, ethyl, propyl, isopropyl, butyl or isobutyl, or an aromatic radical of 6 to 8 carbons such as benzyl or ethyl benzyl;
A is an aliphatic radical of 1 to 4 carbons or an aromatic radical of 6 to 8 carbons;
n is 1 to 6;
m is 1 to 18; and
z is 2 to 3.

5,194,411
CATALYST COMPOSITIONS AND PROCESS FOR MAKING THE SAME
Tatsuo Masuda; Morio Fukuda, and Masahiro Nishi, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan
Filed Nov. 21, 1991, Ser. No. 795,587
Claims priority, application Japan, Nov. 30, 1990, 2-336409
Int. Cl.[5] B01J *29/06, 27/18*
U.S. Cl. 502—64 11 Claims

1. A catalyst composition for hydrocarbon cracking which comprises:
(1) a crystalline aluminosilicate zeolite;
(2) a metal trapping agent comprising a mixture of an alkaline earth metal oxide and a refractory oxide excluding a combination of magnesia and alumina, said metal trapping agent being treated with an aqueous solution comprising phosphoric ions; and
(3) an inorganic oxide matrix excluding alumina-magnesia matrix; said catalyst composition, when dipped in Hcl solution having a pH of 3.0 at 30° C. for 20 minutes, having an alkaline earth metal eluted in an amount of less than 6.0 percent by weight in terms of oxide based on the weight of total alkaline earth metal component present in said catalyst composition.

3. A catalyst composition according to claim 1 wherein said metal trapping agent is at least one member of the group consisting of $MgO-SiO_2$, $CaO-SiO_2$, $SrO-SiO_2$, $BaO-SiO_2$, $CaO-Al_2O_3$, $SrO-TiO_2$, $BaO-ZrO_2$, $MgO-SiO_2-Al_2O_3$, $CaO-SiO_2-TiO_2$, $SrO-Al_2O_3$, $BaO-Al_2O_3$, $MgO-TiO_2$, $CaO-TiO_2$, $BaO-TiO_2$, $MgO-ZrO_2$, $CaO-ZrO_2$, $CaO-SiO_2-Al_2O_3$, $MgO-CaO-SiO_2$, $MgO-CaO-Al_2O_3$, and $MgO-CaO-Al_2O_3-TiO_2$.

5. A catalyst composition according to claim 1 wherein said inorganic oxide matrix is a matrix component selected from the group of silica, silica-alumina, alumina, phosphorus-alumina and silica-zirconia.

5,194,412
CATALYTIC COMPOSITIONS
Terry G. Roberie, Ellicott City, and John F. Torbot, II, Abingdon, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Jan. 22, 1991, Ser. No. 643,900
Int. Cl.[5] B01J *29/04, 27/14*
U.S. Cl. 502—64 19 Claims

1. A catalyst composition comprising a zeolite/molecular sieve, and crystalline aluminum phosphate binder, said binder having a surface area of less than 20 m_2/g.

5,194,413
CATALYTIC CRACKING CATALYSTS AND ADDITIVES
Ranjit Kumar, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Apr. 27, 1992, Ser. No. 874,451
Int. Cl.[5] B01J *21/16, 23/10, 29/04*
U.S. Cl. 502—65 11 Claims

1. A composition comprising discrete particles of a rare-earth compound selected from the group consisting of rare-earth oxalate, oxide, oxychloride and mixtures thereof dispersed in a clay/alumina matrix.

2. The composition of claim 1 wherein the matrix comprises clay and alumina derived from aluminum hydrochloride sol.

5,194,414
METHOD OF MANUFACTURING A GAS ABSORBING ELEMENT OR A CATALYST CARRIER HAVING A HONEYCOMB STRUCTURE
Toshimi Kuma, 25-8, 3-chome Matsunohara, Higashi-ku, Fukuoka-shi, Fukuoka-ken, Japan, assignor to Toshimi Kuma and Kabushiki Kaisha Seibu Giken, both of Fukuoka, Japan
Filed Jan. 21, 1992, Ser. No. 824,181
Claims priority, application Japan, Jan. 21, 1991, 82069
Int. Cl.[5] B01D *39/20;* B01J *32/00, 35/04*
U.S. Cl. 502—80 17 Claims

1. A method of manufacturing a honeycomb-shaped gas adsorbing element comprising the steps of:
a) forming a honeycomb laminate of papers prepared from a mixture consisting of one or more of ceramic fiber, ceramic powder and/or glass fiber, and mountain leather and binder as main components and a small amount of pulp;
b) heat-treating the honeycomb laminate with one of superheated steam, hot air with decreased oxygen content, and heated inactive gases containing no oxygen;
c) impregnating the honeycomb laminate with a mixed dispersion of gas adsorbent particles and an inorganic binder; and
d) drying the honeycomb laminate to fix and combine the gas adsorbent particles to fiber gaps and on the surface of the papers after heat-treating with the inorganic binder.

10. A method of manufacturing a honeycomb-shaped catalyst carrier, comprising:
a) forming a honeycomb laminate of papers prepared from a mixture consisting of one or more of ceramic fiber, ceramic powder and glass fiber, and mountain leather and binder as main components and a small amount of pulp;
b) heat-treating the honeycomb laminate with one of superheated steam, hot air with decreased oxygen content and heated inactive gases containing no oxygen;
c) impregnating the honeycomb laminate with a mixed dispersion of catalyst particles and an inorganic binder; and
d) drying the honeycomb laminate to fix and combine the

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catalyst particles to fiber gaps and on the surface of the papers together with the inorganic binder.

5,194,415
CATALYSTS CONTAINING POLY(3-ETHYL-1-HEXENE) AND USES THEREOF

Phil M. Strickler; Francis X. Mueller, Jr.; Kenneth W. Willcox, and Joyce K. Snow, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 597,458, Oct. 2, 1990, Pat. No. 5,115,054. This application Dec. 12, 1991, Ser. No. 805,675
Int. Cl.[5] C08F *4/64*
U.S. Cl. 502—108 6 Claims

1. A prepolymer-containing catalyst composition comprising poly(3-ethyl-1-hexene) and unsupported titanium trichloride.

3. A process of making the prepolymer-containing catalyst composition of claim 1 comprising contacting under polymerization conditions 3-ethyl-1-hexane monomer, unsupported titanium trichloride, an organoaluminum compound, a hydrocarbon solvent, and a chain transfer agent.

5,194,416
MANGANESE CATALYST FOR ACTIVATING HYDROGEN PEROXIDE BLEACHING

Sharon H. Jureller, Haworth, and Judith L. Kerschner, Ridgewood, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Nov. 26, 1991, Ser. No. 798,396
Int. Cl.[5] B01J *31/00*
U.S. Cl. 502—167 19 Claims

1. A catalyst having the formula:

$$[LMn^{IV}(OR)_3]Y,$$

wherein
Mn is manganese in the +4 oxidation state;
R is a C_1–C_{20} radical selected from the group consisting of alkyl, cycloalkyl, aryl, benzyl and radical combinations thereof;
at least two R radicals may also be connected to one another so as to form a bridging unit between two oxygens that coordinate with the manganese;
L is a ligand selected from a C_3–C_{60} radical having at least 3 nitrogen atoms coordinating with the manganese; and
Y is an oxidatively-stable counterion dependent.

5,194,417
PRETREATMENT OF PALLADIUM-GOLD CATALYSTS USEFUL IN VINYL ACETATE SYNTHESIS

David W. Smith, Cincinnati; Ronnie M. Hanes, Loveland, both of Ohio; John A. Scheben, Erlanger, Ky., and Steve M. Augustine, Cincinnati, Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Dec. 5, 1991, Ser. No. 802,653
Int. Cl.[5] B01J *23/52, 23/44*
U.S. Cl. 502—330 13 Claims

1. A method for the pretreatment of a catalyst, the method comprising in sequence:
heating a virgin catalysts comprising metallic palladium and gold, for at least 15 minutes at a temperature at least sufficient to partially oxidize the palladium, in the presence of an oxidizing agent selected from the group consisting of oxygen, nitrogen oxides, nitrate salts, and hydrogen peroxide;
withdrawing the oxidizing agent and introducing an inert gas, and
heating the catalyst at a temperature up to 500° C. for at least 15 minutes in the presence of a reducing agent selected from the group consisting of ammonia, carbon monoxide, aldehydes, alcohols, olefins, primary amines, and formic acid or salts thereof.

5,194,418
THERMOSENSITIVE RECORDING MATERIAL

Shinobu Miyauchi, Numazu, and Norio Kurisu, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

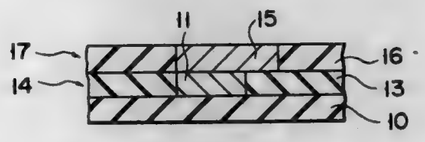
Filed Aug. 23, 1991, Ser. No. 749,185
Claims priority, application Japan, Aug. 25, 1990, 2-223802
Int. Cl.[5] B41M *5/40*
U.S. Cl. 503—226 10 Claims

1. A thermosensitive recording material comprising:
(a) a support,
(b) a thermosensitive coloring layer, formed on said support, which comprises a leuco dye and a color developer capable of inducing color formation in said leuco dye upon application of heat thereto,
(c) an overcoat layer, formed on said thermosensitive coloring layer, which comprises a first resin component crosslinked by a first crosslinking agent, and
(d) a backcoat layer, formed on the back side of said support opposite to said thermosensitive coloring layer, which comprises a second resin component crosslinked by a second crosslinking agent,
at least said first resin component being different from said second resin component or said first crosslinking agent being different from said second crosslinking agent.

5,194,419
METHOD FOR MANUFACTURING AN OXIDE SUPERCONDUCTIVE MULTILAYER CIRCUIT

Shoji Shiga; Nakahiro Harada; Kiyoshi Yamamoto, and Koki Sato, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1990, Ser. No. 555,061
Claims priority, application Japan, Jul. 25, 1989, 1-191956
Int. Cl.[5] B05D *5/12, 3/06*; H01L *39/24*
U.S. Cl. 505—1 13 Claims

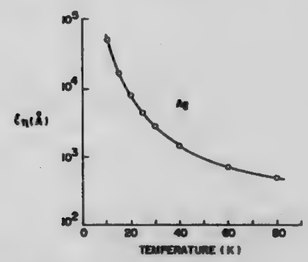


1. A method for manufacturing an oxide superconductive multilayer circuit, comprising the steps of:
(a) forming a first thin film, which comprises a first oxide superconductive material or a simulant thereof, on a substrate having crystal conformity with the first oxide superconductive material or simulant thereof;
(b) forming a first circuit layer, which constitutes a first oxide superconductive circuit, by denaturing a part of the first thin film; and
(c) forming a second thin film, which comprises a second oxide superconductive material or a simulant thereof, on the first thin film such that the crystal orientation of the second oxide superconductive material or the simulant thereof conforms with that of the first oxide superconductive material or the simulant thereof; and
(d) forming a second circuit layer, which constitutes a second oxide superconductive circuit, by denaturing a part of the second thin film to connect the first and second oxide superconductive circuits.

5,194,420
OXIDE SUPER CONDUCTORS

Ryozo Akihama, Kumagaya, Japan, assignor to Chichibu Cement Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 288,831, Dec. 23, 1988, abandoned. This application May 7, 1990, Ser. No. 520,326
Claims priority, application Japan, Dec. 25, 1987, 62-328879
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 6 Claims

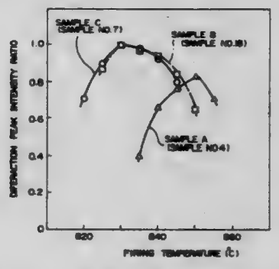


1. A shaped article having overall superconductivity comprising two distinct phases comprising: first a multiplicity of separate and distinct flat crystallite platelets of a high temperature superconductive oxide material, and second a normally conductive material interposed between and in conductive contact with said platelets; wherein the average separation spacing between the closest adjacent points of said platelets in which said normally conductive material exists is less than about 1000 Å under the conditions at which said crystallite platelets exhibit superconductivity.

5,194,421
BI-PB-SR-MG-BA-CA-CU-O OXIDE SUPERCONDUCTORS AND PRODUCTION THEREOF

Shuichiro Shimoda; Toranosuke Ashizawa; Keiji Sumiya; Hideji Kuwajima; Minoru Ishihara, all of Katsuta, and Shozo Yamana, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Tokyo, Japan

Continuation of Ser. No. 556,448, Jul. 24, 1990, abandoned. This application Nov. 20, 1991, Ser. No. 794,694
Claims priority, application Japan, Mar. 26, 1990, 2-76141
Int. Cl.[5] C01F *11/02*; C01G *3/02, 29/00*; H01L *39/02*
U.S. Cl. 505—1 4 Claims



1. An oxide superconductor which comprises bismuth, lead, strontium, calcium, magnesium, barium and copper and has the composition represented by the formula:

$$Bi_{1-A}Pb_ASr_{1-(B+C)}(Mg_BBa_C)Ca_1CU_{1.7\pm0.3}Ox$$

wherein A=0.15–0.35, B=0.05–0.3, and C=0.02–0.2 and x is the amount of oxygen depending on the amount of Pb and the amount and oxidation state of Cu, in which numerals represent atomic ratio.

5,194,422
USE OF SELECTED OLEOPHILIC ALCOHOLS IN WATER-BASED DRILLING FLUIDS OF THE O/W-EMULSION TYPE AND CORRESPONDING DRILLING FLUIDS WITH IMPROVED ECOLOGICAL ACCEPTABILITY

Heinz Mueller, Monheim; Klaus-Peter Herold, Mettmann; Stephan von Tapavicza, Erkrath, and Johann F. Fues, Grevenbroich, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP90/00735, § 371 Date Nov. 15, 1991, § 102(e) Date Nov. 15, 1991, PCT Pub. No. WO90/14401, PCT Pub. Date Nov. 29, 1990
PCT Filed May 7, 1990, Ser. No. 773,631
Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915875
Int. Cl.[5] C09K *7/02*
U.S. Cl. 507—136 32 Claims

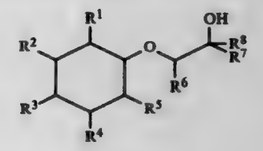
1. A water-based, oil-in-water emulsion drilling fluid suitable for the ecologically-acceptable development of geological formations comprising
A. a continuous aqueous phase containing from about 5 to about 50% by weight of an oil phase dispersed in said aqueous phase, based on the weight of said oil phase and said aqueous phase, said oil phase comprising a substantially water-insoluble, oleophilic mono- or polyfunctional alcohol which has a flash point of above about 80° C.,
B. an emulsifier,
C. a fluid-loss additive,
D. a weighting agent,
E. a viscosifier, and
F. an alkali reserve component.

5,194,423
ALPHA-(ALKYLCYCLOHEXYLOXY)-BETA-ALKANOLS AND PERFUME COMPOSITIONS CONTAINING THE SAME

Junji Koshino, Wakayama; Yoshiaki Fujikura, Utsunomiya; Nao Toi, Sakura; Rieko Yuki, Tokyo, and Hajime Miyabe, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,400
Claims priority, application Japan, Jul. 18, 1990, 2-187853; Apr. 5, 1991, 3-72648
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—23 4 Claims

1. An α-(alkylcyclohexyloxy)-β-alkanol of formula (I):



wherein at least one of substituents R^1, R^2, R^3, R^4 and R^5 is a tertiary alkyl group of 4–8 carbon atoms, and the remaining R^1, R^2, R^3, R^4 and R^5 groups are hydrogen atoms or methyl groups, and wherein R^6, R^7 and R^8 are hydrogen atoms or the same or different alkyl groups having 1–6 carbon atoms, with the proviso that R^6, R^7 and R^8 are not all hydrogen atoms at the same time.

3. A perfume composition containing the α-(alkylcyclohexyloxy)-β-alkanol of claim 1 in combination with perfume composition auxiliaries.

5,194,424

C^{63}-AMIDE DERIVATIVES OF 34-DE(ACETYLGLUCOSAMINYL)-34-DEOXY-TEICOPLANIN AND THEIR USE AS MEDICAMENTS AGAINST BACTERIA RESISTANT TO GLYCOPEPTIDE ANTIBIOTICS

Adriano Malabarba, Bitonto, and Jürgen K. Kettenring, Varese, both of Italy, assignors to Gruppo Lepetit SpA, Milan, Italy

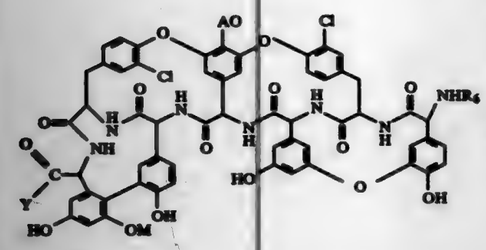
Continuation of Ser. No. 544,719, Jun. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 453,649, Dec. 20, 1989, abandoned. This application May 20, 1992, Ser. No. 887,121

Claims priority, application European Pat. Off., Dec. 27, 1988, 88121788.7; May 28, 1990, 90110162.2

Int. Cl.[5] A61K *37/02*; C07K *7/50, 9/00*

U.S. Cl. 514—8 13 Claims

1. A teicoplanin derivative of the formula I:



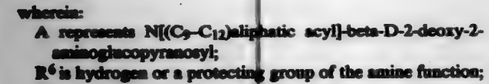
wherein:

A represents N[(C_9–C_{12})aliphatic acyl]-beta-D-2-deoxy-2-aminoglucopyranosyl;

R^6 is hydrogen or a protecting group of the amine function;

M represents alpha-D-mannopyranosyl;

Y represents a di- or poly-amine group of the formula



wherein

R is hydrogen or linear or branched (C_1–C_6)alkyl;

R^1 is hydrogen or linear or branched (C_1–C_6)alkyl;

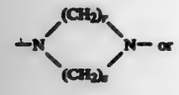
R^2 is hydrogen or linear or branched (C_1–C_6)alkyl;

R^3 and R^4 are each independently hydrogen, linear or branched (C_1–C_6)alkyl optionally bearing a NH_2, OH or SH substituent or taken together with the adjacent nitrogen atom form a 5 to 7 membered saturated heterocyclic ring optionally containing a further —S—, —O— or —NR^5— heteroatom selected from pyrrolidine, piperidine, oxazolidine, thiazolidine, isoxazolidine, isothiazolidine, morpholine, piperazine, thiomorpholine, hexahydroazepine, hexahydro-1,5-diazepine and hexahydro-1,4-diazepine wherein the further nitrogen in piperazine, hexahydro-1,5-diazepine and hexahydro-1,4-diazepine is represented by NR^5 is hydrogen or C_1–C_4 alkyl,

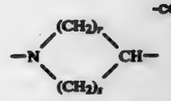
m, k and p each independently represent an integer from 2 to 8;

n and h, each independently, represent an integer from 0 to 4;

X represents a single bond, or when n is 1, taken together with the adjacent group NR^1, it represents a bifunctional radical of the formula:



-continued



wherein r and s each independently represent an integer from 1 to 6, with the proviso that their sum is an integer from 3 to 8; or an acid addition salt thereof.

5,194,425

MHC-MEDIATED TOXIC CONJUGATES USEFUL IN AMELIORATING AUTOIMMUNITY

Somesh D. Sharma, Los Altos; L. Bernard Larch, Menlo Park, and Brian R. Clark, Redwood City, all of Calif., assignors to Anergen, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 210,594, Jun. 23, 1988. This application Jun. 21, 1989, Ser. No. 367,751

The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.

Int. Cl.[5] A61K *37/02, 35/28*

U.S. Cl. 514—8 6 Claims

1. A composition comprising an MHC Class II complex capable of binding a T cell receptor, the complex consisting essentially of:

an MHC class II component comprising extracellular domains of an MHC Class II molecule sufficient to form an antigen binding pocket, said component being encoded by an allele associated with an autoimmune disease, which component is soluble under physiological conditions in the absence of detergent or lipid;

an autoantigenic peptide of between about 8 to about 15 amino acids, the autoantigenic peptide being bound to the antigen binding pocket; and

an effector component.

5,194,426

METHOD FOR NERVE GROWTH INDUCTION

John P. DeVanzo, Greenville, and Joseph W. Paul, Jr., Ayden, both of N.C., assignors to East Carolina University, Greenville, N.C.

Division of Ser. No. 253,167, Oct. 4, 1988, Pat. No. 5,023,238. This application Apr. 8, 1991, Ser. No. 681,310

Int. Cl.[5] A61K *37/02, 37/36*

U.S. Cl. 514—21 11 Claims

1. A method of inducing nerve growth in a host requiring nerve growth induction comprising administering a nerve growth inducing effective amount of a composition consisting essentially of nerve growth factor and 2-amino-1,1,3-tricyano-1-propene.

5,194,427

ANTIMYCOTIC COMPOSITIONS OF NIKKOMYCIN COMPOUNDS AND AZOLE ANTIMYCOTICS

Richard F. Hector, Dublin, Calif.; Klaus Schaller, Wuppertal, Fed. Rep. of Germany; Heinrich F. Mosscher, Leverkusen, Fed. Rep. of Germany, and Manfred Plempel, Leverkusen, Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 822,451, Jan. 17, 1992, Pat. No. 5,134,126, which is a continuation of Ser. No. 640,769, Jan. 14, 1991, Pat. No. 5,096,889, which is a continuation of Ser. No. 442,970, Nov. 29, 1989, Pat. No. 5,006,513, which is a continuation of Ser. No. 118,078, Nov. 9, 1987, abandoned. This application Apr. 29, 1992, Ser. No. 876,541

Int. Cl.[5] A61K *31/50, 31/70, 31/495*

U.S. Cl. 514—43 2 Claims

1. A synergistically, fungicidally effective antimycotic composition comprising fungicidally effective amount of nikkomycin X or nikkomycin Z, and ketoconazole the weight of the nikkomycin X or Z to ketoconazole ranging from about 1:1 to about 30:1.

5,194,428

INHIBITION OF INFLUENZA VIRUS REPLICATION BY OLIGONUCLEOTIDE PHOSPHOROTHIOATES

Sudhir Agrawal, Shrewsbury, Mass.; Josef M. E. Leiter, Brooklyn, N.Y.; Peter Palese, Leonia, N.J., and Paul C. Zamecnik, Shrewsbury, Mass., assignors to Worcester Foundation for Experimental Biology, Worcester, Mass. and Mt. Sinai School of Medicine, New York, N.Y.

Continuation-in-part of Ser. No. 160,574, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 71,894, Jul. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 867,231, May 23, 1986, Pat. No. 4,806,463. This application Apr. 30, 1990, Ser. No. 516,275

Int. Cl.[5] A61K *31/70*; C07H *21/00*

U.S. Cl. 514—44 4 Claims

1. A pharmaceutical composition comprising a phosphorothioate oligonucleotide which is 17 to 25 nucleotides in length and which has antiviral activity against influenza virus effected by hybridization with a portion of the RNA of said virus which is essential to influenza growth within the polymerase PB 1 gene together with a pharmaceutically acceptable carrier.

2. A pharmaceutical composition of claim 1 for administration to an individual for inhibiting influenza virus replication in cells, comprising a phosphorothioate oligodeoxynucleotide which has antiviral activity against influenza virus and a pharmaceutically acceptable carrier, the nucleotide sequence of the phosphorothioate oligodeoxynucleotide selected from the group consisting of:

1	5'-CATTCAAATGGTTTGCCTGC-3'
2	5'-GCAGGCAAACCATTTGAATG-3'
3	5'-CCATAATCCCCTGCTTCTGC-3'
4	5'-GCAGAAGCAGGGGATTATGG-3'
5	5'-GCAGAAGCAGAGGATTATGG-3'
6	5'-GCATAAGCAGAGGATCATGG-3'
7	5'-GGCAAGCTTTATTGAGGCTT-3'
8	5'-ATCTTCATCATCTGAGAGAT-3'
9	5'-CGTAAGCAACAGTAGTCCTA-3'.

5,194,429

OCULAR HYPOTENSIVE AGENTS

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya, and Tomio Oda, Sanda, all of Japan, assignors to K.K. Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

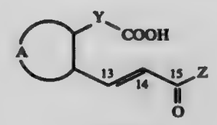
Division of Ser. No. 414,331, Sep. 29, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,515

Claims priority, application Japan, Oct. 1, 1988, 63-248720; Oct. 1, 1988, 63-248721

Int. Cl.[5] A61K *31/695, 31/35, 31/215, 31/19*

U.S. Cl. 514—63 13 Claims

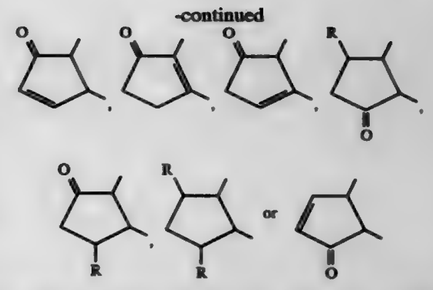
1. A method for treating ocular hypertension in a patient needing such treating which comprises administering to said patient an amount of a prostaglandin effective to treat ocular hypertension, wherein the prostaglandin is represented by formula (I):



(I)

wherein, A is

-continued



(in which R is hydroxy, hydroxy C_1–C_3 alkyl or C_1–C_2 alkyl); Y is a saturated or unsaturated C_{2-6} hydrocarbon chain; Z is a saturated or unsaturated C_{7-9} (aliphatic) hydrocarbon straight chain; or a physiologically acceptable salt or esterified carboxyl group derivative selected from the group consisting of C_{1-8} alkyl, C_{3-6} cycloalkyl, benzyl, phenyl, C_{1-3} hydroxyalkyl, C_{1-2} alkoxy C_{1-3} alkyl, tri C_{1-2} alkylsilyl, and tetrahydropyranyl.

5,194,430

HETEROCYCLIC-NMDA ANTAGONISTS

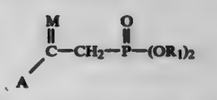
Jeffrey P. Whitten, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 525,290, May 17, 1990, abandoned. This application Mar. 28, 1991, Ser. No. 675,156

Int. Cl.[5] C07F *9/06*; A61K *31/675*

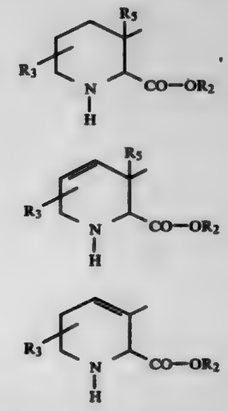
U.S. Cl. 514—89 46 Claims

1. A compound of the formula:



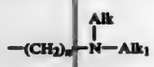
in which R_1 is represented by hydrogen, C_{1-4} alkyl or CF_3; M is represented by O, N—O—R_4, or N—NH—R_4

A is represented by one of the following substituents:



R_2 is represented by hydrogen, C_{1-4} alkyl, cyclopentyl, cyclohexyl, trialkylamino, phenyl, substituted phenyl in which the phenyl moiety is substituted with up to 3 substituents with each substituent being independently selected from the group consisting of halogens, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, OCF_3, OH, CN, $COOR_6$, and $CONR_6R_7$, phenyl(C_{1-3} alkyl) in which

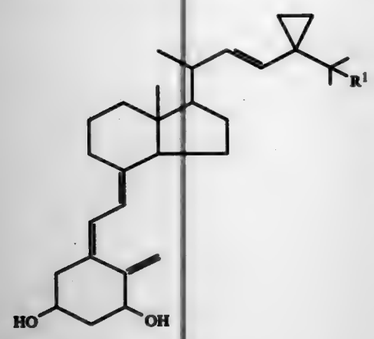
the phenyl moiety may be optionally substituted as immediately described above, or trifluoromethyl; R_3 is represented by hydrogen, C_{1-4} alkyl, phenyl, phenyl(C_{1-3} alkyl), or cyclohexylmethyl; R_4 is represented by hydrogen, C_{1-4} alkyl or phenyl(C_{1-3} alkyl); R_5 is represented by hydrogen, linear C_{1-4} alkyl, or phenyl(C_{1-3} alkyl); R_6 and R_7 are each represented by hydrogen or a C_1–C_4 alkyl; trialkylamino is represented by



in which n is represented by an integer from 2–4 and Alk and Alk_1 are each independently represented by a C_1–C_4 alkyl; or a pharmaceutically acceptable salt thereof.

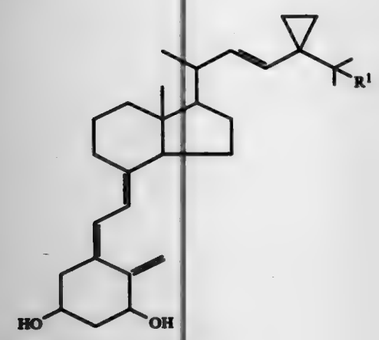
5,194,431
24-CYCLOPROPANE VITAMIN D DERIVATIVES
Hector F. DeLuca, Deerfield, and Naoshi Nakagawa, Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed Jul. 8, 1991, Ser. No. 910,423
Int. Cl.[5] C01J *172/00, 9/00;* A61K *31/59*
U.S. Cl. 514—167 16 Claims

1. A compound having the formula



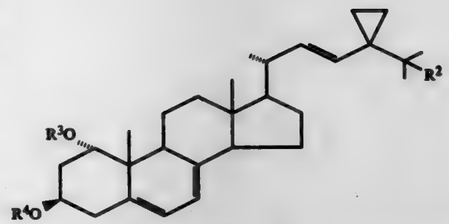
where R^1 is hydrogen or hydroxy.

4. A method of treating metabolic bone disease where it is desired to maintain or increase bone mass comprising administering to a patient with said disease a compound having the formula



where R^1 is hydrogen or hydroxy.

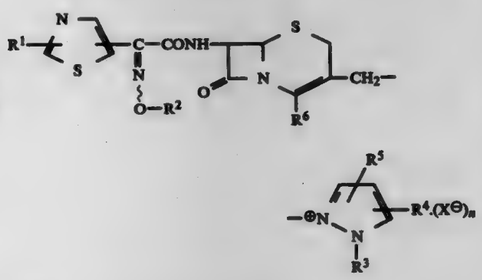
12. A compound having the formula



where R^2 is hydrogen or hydroxy, R^3 is a hydroxy-protecting group and R^4 is hydrogen or a hydroxy-protecting group.

5,194,432
CEPHEM COMPOUNDS
Takao Takaya; Kazuo Sakane; Kenzi Miyai, all of Kawanishi, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan
Division of Ser. No. 930,427, Nov. 14, 1986, Pat. No. 4,960,766.
This application Jul. 17, 1990, Ser. No. 553,371
Claims priority, application United Kingdom, Nov. 22, 1985, 8528803; May 1, 1986, 8610720
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] C07D *501/46;* A61K *31/545*
U.S. Cl. 514—202 7 Claims

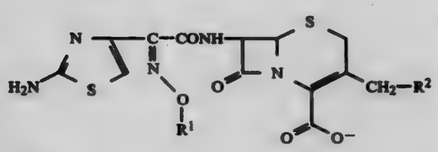
1. A new cephem compound of the formula:



wherein
R^1 is amino or protected amino,
R^2 is hydrogen, hydroxy protective group, cyclo(lower-)alkenyl or thietanyl,
R^3 is lower alkyl,
R^4 and R^5 are each hydrogen, lower alkyl, hydroxy(lower) alkyl, lower alkoxy, amino or protected amino,
R^6 is $COO^{\ominus}$, carboxy or protected carboxy,
$X^{\ominus}$ is an anion, and
n is 0 or 1, with proviso that
(i) when R^6 is $COO^{\ominus}$, then n is 0, and
(ii) when R^6 is carboxy or protected carboxy, then n is 1,
and a pharmaceutically acceptable salt thereof.

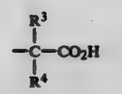
5,194,433
ANTIBIOTIC C-3 CATECHOL-SUBSTITUTED CEPHALOSPORIN COMPOUNDS, COMPOSITIONS AND METHOD OF USE THEREOF
Hajime Kamachi, Urayasu, and Seiji Iimura, Tokyo, both of Japan, assignors to Bristol-Myers Squibb Company, New York, N.Y.
Filed Nov. 13, 1990, Ser. No. 612,339
Int. Cl.[5] C07D *501/38;* A61K *31/545*
U.S. Cl. 514—202 6 Claims

1. A compound of the formula

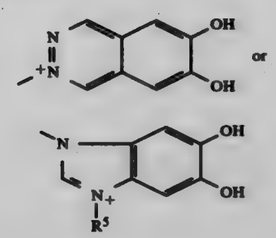


(I)

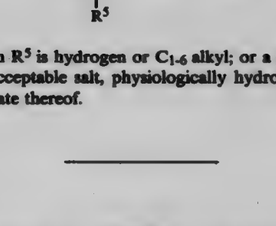
wherein
R^1 is hydrogen, C_{1-6} alkyl, C_{3-6} cycloalkyl, or a radical of the formula



in which R^3 and R^4 are independently hydrogen, methyl or ethyl, or R^3 and R^4, taken together with the carbon atom to which they are attached, may be a cycloalkylidene ring containing from 3 to 6 carbon atoms;
R^2 is a radical of the formula



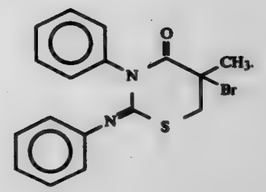
or



wherein R^5 is hydrogen or C_{1-6} alkyl; or a pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

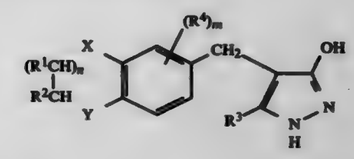
5,194,434
USE OF OB-101 TO TREAT OCULAR INFLAMMATION
George C. Y. Chiou, College Station, Tex., assignor to Texas A&M University System, College Station, Tex.
Filed Dec. 3, 1991, Ser. No. 801,891
Int. Cl.[5] A61K *31/535*
U.S. Cl. 514—227.2 11 Claims

1. A method for the treatment and prevention of ocular inflammation in an animal subject, which method comprises administering topically, orally, or parenterally to said animal subject an inflammation controlling effective amount of a pharmaceutical composition comprising a pharmaceutically acceptable vehicle in admixture with a compound having the formula:



5,194,435
4-ARYLMETHYL-5-ALKYL-3H-PYRAZOL-3-ONES
Kenneth L. Kees, Plainsboro, N.J., assignor to American Home Products Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 864,986, Apr. 7, 1992. This application Aug. 19, 1992, Ser. No. 932,139
Int. Cl.[5] A61K *31/415, 31/495;* C07D *403/02, 405/02*
U.S. Cl. 514—249 7 Claims

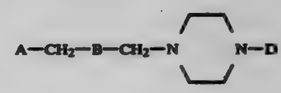
1. A compound of the formula:



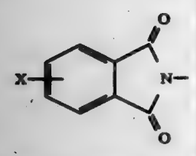
in which
X is CR^5, O, S or N, where R^5 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;
Y is O, S or N;
n is one of the integers 0, 1 or 2; with the provisos that:
a) when n is 0, X is CR^5, O or S and Y is O or S, and when X is CR^5, the dotted line to X represents unsaturation, and when X and Y are O, R^3 is other than alkyl; and
b) when n is 1 or 2 and X is CR^5 or N the dotted line to X represents unsaturation and when Y is N the dotted line to Y represents unsaturation;
m is one of the integers 0, 1, 2 or 3;
R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms or arylalkyl of 7 to 12 carbon atoms;
R^2 is hydrogen, alkyl or 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms or arylalkyl of 7 to 12 carbon atoms;
R^3 is alkyl of 1 to 3 carbon atoms, perfluoromethyl or alkoxy of 1 to 6 carbon atoms;
R^4 is halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;
or a pharmaceutically acceptable salt thereof.

5,194,436
1-PIPERAZINYL-2-BUTENES AND -2-BUTYNES
Helen H. Ong, Whippany; Nicholas J. Hrib, Somerville, both of N.J.; Joseph Perez, Amherst, N.H., and John G. Jurcak, Somerset, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.
Division of Ser. No. 639,639, Jan. 10, 1991, Pat. No. 5,130,315.
This application Apr. 29, 1992, Ser. No. 875,477
Int. Cl.[5] A61K *31/495, 31/445;* C07D *417/06, 417/14*
U.S. Cl. 514—253 12 Claims

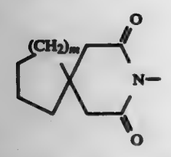
1. A compound of the formula



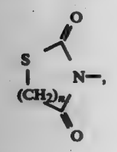
wherein A is a group of the formula



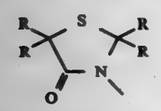
wherein X is hydrogen, halogen, loweralkyl, loweralkoxy, or trifluoromethyl; a group of the formula



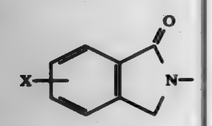
wherein m is 1 or 2; a group of the formula



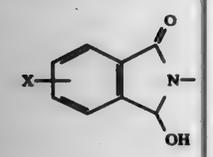
wherein n is 1 or 2; a group of the formula



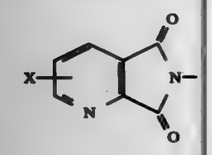
wherein R is hydrogen or loweralkyl; a group of the formula



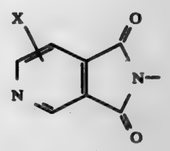
wherein X is as above; a group of the formula



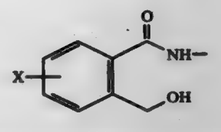
wherein X is as above; a group of the formula



wherein X is as above; a group of the formula

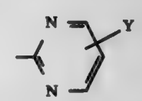


wherein X is as above; or a group of the formula

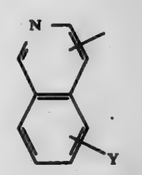


wherein X is as above; D is a group of the formula

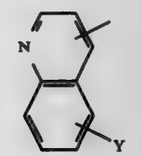
wherein Y is hydrogen, loweralkyl, loweralkoxy, halogen, or trifluoromethyl; a group of the formula



wherein Y is as above; a group of the formula

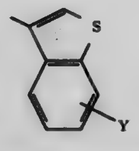


wherein Y is as above; a group of the formula

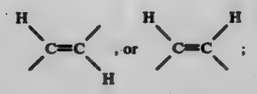


wherein Y is as above; a group of the formula

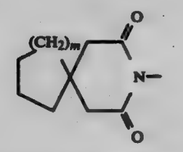
wherein Y is as above; a group of the formula



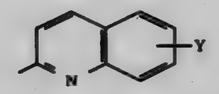
wherein Y is as above; B is C≡C,



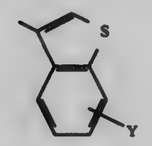
the solid line (—) refers to the point of attachment of the group to the indicated member of the formula; with the provisos that (a) when A is a group of the formula



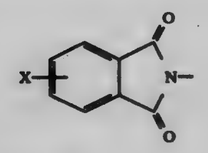
wherein m is 1 and B is C≡C, D is not a group of the formula



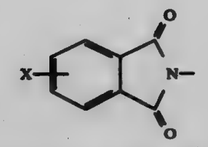
wherein Y is as above or a group of the formula



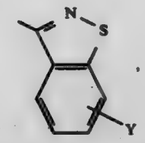
wherein Y is as above, (b) when A is a group of the formula



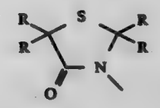
and B is C≡C,



D is not a group of the formula



and (c) when A is a group of the formula



wherein R is as above and B is C≡C, D is not a group of the formula

wherein Y is as above, the optical isomers thereof; of the pharmaceutically acceptable salts thereof.

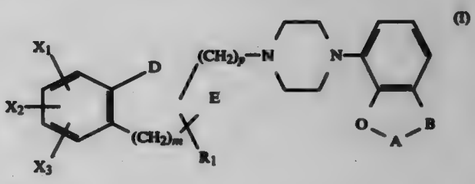
5,194,437

1,4-DISUBSTITUTED PIPERAZINES

Jean-Louis Peglion, Le Vesinet; Mark Millan, Paris, and Jean-Michel Rivet, Nanterre, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Dec. 13, 1991, Ser. No. 807,106
Claims priority, application France, Dec. 14, 1990, 90 15631
Int. Cl.[5] A61K *31/495*; C07D *407/04, 321/08, 319/16*
U.S. Cl. 514—254 14 Claims

1. A 1,4-disubstituted piperazine selected from those of formula I:



(I)

in which:

X_1, X_2 and X_3,

which are the same or different, each represent: hydrogen, halogen, straight-chained or branched-chained alkyl having 1 to 5 carbon atoms inclusive, hydroxy, straight-chained or branched-chained alkoxy or alkylthio each having 1 to 5 carbon atoms inclusive, trifluoromethyl, nitro, amino, or acetamido, or

two of them in adjacent positions together form methylenedioxy or ethylenedioxy;

R_1 represents hydrogen or straight-chained or branched-chained alkyl having 1 to 5 carbon atoms inclusive;

-D=E- represents: —$(CH_2)_n$—(CH_2)— or —CH=CH—

wherein each of m and n represents 0, 1, 2 or 3, provided than m+n is at least 1;

p represents 0 or 1 to 6 inclusive; and

-A-B-represents: —$(CH_2)_2$—O—; —$(CH_2)_3$—O—; —CH=CH—; —CH_2—CH_2—; or

in racemic and optically active forms, and physiologically-tolerable acid addition salts thereof.

10. A method for treating a mammal afflicted with a condition requiring a 5-HT1A receptor antagonist for its treatment, comprising the step of administering to the said mammal an amount of a compound of claim 1 which is effective for alleviation of said condition.

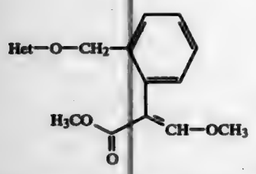
5,194,438

α-ARYLACRYLATES SUBSTITUTED BY A TRIFLUOROMETHYLPYRIMIDINYLOXY RADICAL, FUNGICIDAL COMPOSITIONS AND METHODS

Franz Schuetz, Ludwigshafen; Thomas Knekenhochner, Frankenthal; Jochen Wild, Deidesheim; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 376,999, Jul. 7, 1989, Pat. No. 5,157,037.
This application Jan. 25, 1991, Ser. No. 645,604
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3823991
Int. Cl.[5] A61K *31/505*; C07D *239/02*
U.S. Cl. 514—269 33 Claims

1. A compound selected from the group consisting of those of the formula



wherein Het is pyrimidin-4-yl substituted by a trifluoromethyl group and one or two additional groups selected from the group consisting of C_1–C_4 alkyl, trifluoromethyl, phenyl, methylthio and chloro, and their plant-tolerated acid addition salts.

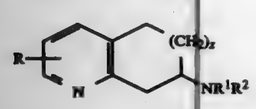
5,194,439

N-(2,3-DIHYDRO-1,4-BENZODIOXINYL)-N-SUBSTITUTED AMINOPYRIDO-FUSED CYCLOALKANES

Ian A. Cliffe, Slough; Howard L. Mansell; Richard S. Todd, both of Burnham, and Alan C. White, Englefield Green, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 505,957, Apr. 6, 1990, Pat. No. 5,075,303.
This application Sep. 25, 1991, Ser. No. 765,282
Int. Cl.[5] A61K *31/47*; C07D *513/04*
U.S. Cl. 514—299 3 Claims

1. A compound of formula



or the heteroaromatic N-oxide thereof or a pharmaceutically acceptable acid addition salt thereof, in which

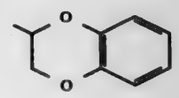
z is 0, 1 or 2;

R is hydrogen, hydroxy, lower alkyl, lower alkoxy, halogen, trifluoromethyl, nitro, amino, (lower)alkylamino or di(lower)alkylamino;

R^1 is hydrogen or lower alkyl and

R^2 is $-(CH_2)_n-R^3$ or $-CH_2-CH=CH-(CH_2)_m-R^3$ or $-CH_2.C\equiv C.(CH_2)_m-R^3$ where n is 1 to 6, and m is 0 to 3 and

R^3 is a ring of formula



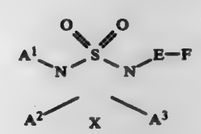
5,194,440

SUBSTITUTED CYCLIC SULPHAMIDE DERIVATIVES

Jose L. C. Pineiro, Harlow, England, assignor to Merck Sharp & Dohme Ltd., Hertfordshire, England

Filed Feb. 20, 1992, Ser. No. 839,660
Claims priority, application United Kingdom, Feb. 27, 1991, 9104136
Int. Cl.[5] A61K *31/445*; C07D *417/02, 285/16, 285/10*
U.S. Cl. 514—320 8 Claims

1. A compound of formula I or pharmaceutically acceptable salt thereof:



(I)

wherein

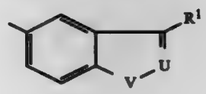
—X— represents $-(CH_2)_m-$ in which m is 2 ;

A^1 represents hydrogen, hydrocarbon or a heterocyclic selected from the group consisting of C_{3-7} heterocycloalkyl, C_{3-7} heterocycloalkyl (C_{1-6}) alkyl, heteroaryl and heteroaryl (C_{1-6}) alkyl;

A^2 and A^3 independently represent hydrogen or C_{1-6} alkyl;

E represents a bond or a straight or branched alkylene chain containing from 1 to 4 carbon atoms; and

F represents a group of formula

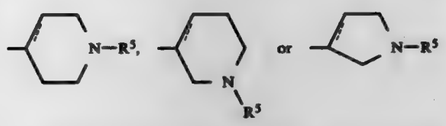


in which

U represents nitrogen or $C—R^2$;

V represents oxygen, sulphur or $N—R^3$

R^1 represents $-(CH_2)_pCHR^4.NR^6R^7$ or a group of formula



in which the broken line represents an optional chemical bond;

p is 1 or 2; and

R^2, R^3, R^4, R^5, R^6 and R^7 independently represent hydrogen or C_{1-6} alkyl.

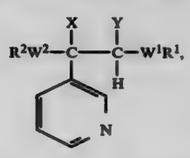
5,194,441

3-SUBSTITUTED PYRIDINES

Thomas Zierke, Boehl-Iggelheim; Bernhard Zipperer, Dirmstein; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 633,773
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1989, 3943277; Aug. 28, 1990, 4027139
Int. Cl.[5] C07D *405/06*; A61K *31/44*
U.S. Cl. 514—336 5 Claims

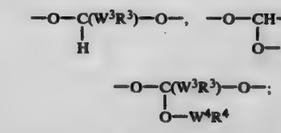
1. Substituted pyridine of the formula I



I

where the variables have the following meanings:

X and Y together are group



or

W^1–W^4 are each a direct bond or a group $—CH_2—$, $—CH_2—CH_2—$, $—CH(CH_3)—$, $—CH_2O—$ or $—CH_2S—$, where the bond between the last two groups and the radicals R^1 to R^4 is via the oxygen or sulfur atom;

R^1–R^4 are each C_1–C_6-alkyl which may carry a C_3–C_8-cycloalkyl radical, or are each partially or completely halogenated C_1–C_6-alkyl, or are each C_3–C_8-cycloalkyl which may furthermore carry up to 3 C_1–C_6-alkyl groups, or are each C_1–C_4-alkoxy-C_1–C_4-alkyl, C_1–C_4-alkylthio-C_1–C_4-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, phenyl or naphthyl, both of which may furthermore carry 1 or 2 of the following radicals: nitro, cyano, halogen, C_1–C_4-alkyl, partially or completely halogenated C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxyimino, phenyl or phenoxy each of which may, if desired, have from 1 to 5 halogen atoms on the aromatic moiety and the phenyl or naphthyl group may carry a number of halogen atoms, C_1–C_4-alkyl radicals, partially or completely halogenated C_1–C_4-alkyl radicals and/or C_1–C_4-alkoxy radicals such that the total number of radicals is 5;

the N-oxide and the plant-tolerated mineral acid salt and metal complex of I.

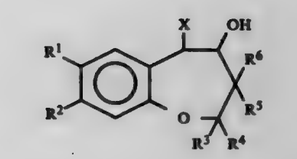
5,194,442

2,3,4,5-TETRAHYDRO-1-BENZOXEPINS, THE USE THEREOF AND PHARMACEUTICAL PRODUCTS BASED ON THESE COMPOUNDS

Roland Utz, Messel; Heinrich C. Englert, Hofheim am Taunus; Bernward Schölkens, and Erik Klaus, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 407,618, Sep. 15, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 606,132
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831697
Int. Cl.[5] A61K *31/44*; C07D *405/04*
U.S. Cl. 514—337 10 Claims

1. A 2,3,4,5-tetrahydro-1-benzoxepin of the formula I



(I)

in which

R^1 represents H, $(C_1$–$C_4)$-alkyl, OH, $(C_1$–$C_4)$-alkoxy, halogen, CN, NO_2, CO-$(C_1$–$C_4)$-alkyl,

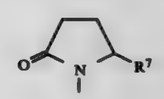
COOH, carboxy-$(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkyl-SO_r— or $ArSO_r$—, where r represents 0, 1 or 2 and Ar represents phenyl, naphthyl or biphenylyl which is unsubstituted or substituted by 1 to 3 identical or different $(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkoxy, halogen, CN or NO_2 radicals,

R^2 represents H, OH, $(C_1$–$C_4)$-alkoxy or $(C_1$–$C_4)$-alkyl,

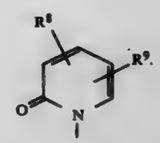
R^3, R^4, R^5 and R^6 are identical or different and represent H or $(C_1$–$C_4)$-alkyl, and

X has the meaning of α) or β),

α)



β)



where R^7 is H or methyl, R^8 and R^9 are identical or different and represent H, $(C_1$–$C_2)$-alkyl, halogen, nitro or CN.

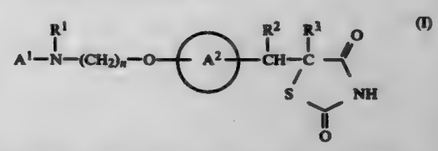
5,194,443

COMPOUNDS

Richard M. Hindley, Epsom, England, assignor to Beecham Group p.l.c., Brentford, England

Continuation-in-part of Ser. No. 457,272, Dec. 27, 1989, Pat. No. 5,002,953, which is a continuation-in-part of Ser. No. 238,764, Aug. 30, 1988, abandoned. This application Jan. 24, 1991, Ser. No. 645,092
Claims priority, application United Kingdom, Sep. 4, 1987, 8720825; Nov. 30, 1987, 8727987; Feb. 4, 1988, 8802454
Int. Cl.[5] C07O *417/12*; A61K *31/425*
U.S. Cl. 514—367 4 Claims

1. A compound of formula (I):



(I)

or a tautomeric form thereof and/or a pharmaceutically acceptable salt thereof and or a pharmaceutically acceptable solvate thereof, wherein:

A^1 represents a substituted or unsubstituted fused ring aro-

VOL 1148 ISS 3 MR 16 1993 UMI

matic heterocyclyl groups wherein each ring comprises 4 to 7 ring atoms and each ring comprises 1, 2 or 3 hetero atoms selected from oxygen, sulphur or nitrogen and wherein the substituents for each ring include up to 4 substituents selected from the group consisting of: C_{1-12}-alkyl, C_{1-12}-alkoxy, phenyl or naphthyl and halogen or any two substituents on adjacent carbon atoms, together with the carbon atoms to which they are attached, form a benzene ring, and wherein the carbon atoms of the benzene ring represented by the said two substituents may themselves be substituted or unsubstituted optional substituents for the benzene ring being up to three groups selected from halogen, C_{1-12} alkyl, phenyl, C_{1-12} alkoxy, halo C_{1-12} alkyl, hydroxy, amino, nitro, carboxy, C_{1-12} alkoxycarbonyl, C_{1-12} alkoxycarbonyl C_{1-12} alkyl, C_{1-12} alkylcarbonyloxy and C_{1-12} alkylcarbonyl groups;

R^1 represents a hydrogen atom, a C_{1-12} alkyl group, a C_{1-12} alkyl carbonyl group, an aryl C_{1-12} alkyl group, wherein the aryl moiety may be substituted or unsubstituted, or a substituted or unsubstituted aryl group, any aryl group being phenyl or naphthyl, optionally substituted with up to five groups selected from halogen, C_{1-12} alkyl, phenyl, C_{1-12} alkoxy, halo C_{1-12} alkyl, hydroxy, amino, nitro, carboxy, C_{1-12} alkoxycarbonyl, C_{1-12} alkoxycarbonyl C_{1-12} alkyl, C_{1-12} alkylcarbonyloxy and C_{1-12} alkylcarbonyl groups;

R^2 and R^3 each represent hydrogen, or R^2 and R^3 together represent a bond;

A^2 represents a benzene ring having three optional substituents which may be selected from halogen, substituted or unsubstituted C_{1-12}-alkyl or C_{1-12}-alkoxy, optional substituents for any alkyl group being up to five groups selected from halogen, C_{1-12} alkyl, phenyl, C_{1-12} alkoxy, halo C_{1-12} alkyl, hydroxy, amino, nitro, carboxy, C_{1-12} alkoxycarbonyl, C_{1-12} alkoxycarbonyl C_{1-12} alkyl, C_{1-12} alkylcarbonyloxy and C_{1-12} alkylcarbonyl groups; and n represents an integer in the range of from 2 to 6.

5,194,444

AZOLYLMETHYLCYCLOALKYLOXIRANES AND THEIR USE AS CROP PROTECTION AGENTS

Rainer Seele, Frankenthal; Stefan Karbach, Neustadt; Thomas Kuekenbeckmer, Frankenthal; Hubert Sauter, Mannheim; Gisela Lorenz, Neustadt, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

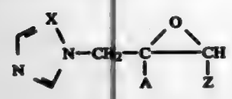
Division of Ser. No. 483,279, Feb. 20, 1990, Pat. No. 5,132,318, which is a continuation of Ser. No. 313,947, Feb. 23, 1989, abandoned. This application Feb. 11, 1992, Ser. No. 833,726

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805684

Int. Cl.[5] A01N *43/653*; C07D *249/08*

U.S. Cl. 514—383 8 Claims

1. An azolylmethyloxirane of the formula:



wherein A and Z are identical or different and each denotes C_3-C_6-cycloalkyl, tetrahydropyranyl, tetrahydrofuranyl, norbornyl or C_5-C_8-cycloalkenyl, each of these radicals being unsubstituted or substituted by halogen, nitro, phenoxy, amino, alkyl, alkoxy or haloalkyl, each of 1 to 4 carbon atoms, and A further denotes halophenyl or a plant-tolerated acid addition salt or metal complex thereof.

5,194,445

ASCORBIC ACID DERIVATIVE

Toshio Satoh; Yasunori Nitto; Hisao Kakegawa, and Hitoshi Matsumoto, all of Tokushima, Japan, assignors to Nippon Hypox Laboratories Incorporated, Tokyo, Japan

PCT No. PCT/JP90/01157, § 371 Date May 20, 1991, § 102(e) Date May 20, 1991, PCT Pub. No. WO90/03471, PCT Pub. Date Mar. 21, 1991

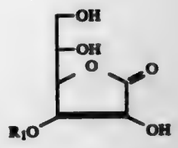
PCT Filed Sep. 11, 1990, Ser. No. 700,176

Claims priority, application Japan, Sep. 11, 1989, 1-234871

Int. Cl.[5] A61K *43/455*; C07D *307/62*

U.S. Cl. 514—474 7 Claims

1. An ascorbic acid derivative of the formula (Ia)



(Ia)

wherein R_1 is an alkylcarbonyl lower alkyl group of which the terminal alkyl group has 7 inclusive to 15 inclusive carbon atoms.

5,194,446

COMPOUNDS HAVING ONE OR MORE AMINOSULFAONYLOXY RADICALS USEFUL AS PHARMACEUTICALS

Yeung S. Lo, Hockessin, Del.; Joseph C. Nolan, Midlothian; William J. Welstead, Jr., Richmond, both of Va.; David A. Walsh, Augusta, Ga.; Dwight A. Shumaker, and Ibrahim M. Uwaydah, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 365,212, Jun. 12, 1989, abandoned. This application Jul. 24, 1991, Ser. No. 734,846

Int. Cl.[5] C07C *309/63*; A61K *31/18*, *31/315*

U.S. Cl. 514—494 14 Claims

1. A method for treating chronic arthritis in a mammal, comprising administering to said mammal an effective antiarthritic amount of a compound having the formula:

$$(HO)_y—A—[—OSO_2NR^1R^2]_z$$

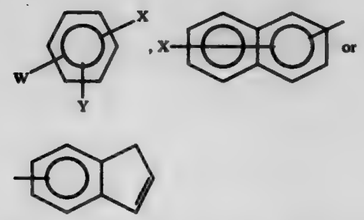
wherein A is substituted on one or more carbon atoms by an aminosulfonyloxy radical, said A being selected from the group consisting of:

aryl,
alkyl,
cycloalkyl,
aryl-alkyl,
arylalkanoic acid,
haloalkyl,
cycloalkyl-alkyl,
aryloxy-alkyl,
loweralkoxy-alkyl,
(aryl)(loweralkyl)aminoalkyl,
aryl-thio alkyl,
aryl-sulfinyl-alkyl,
aryl-sulfonyl-alkyl,
arylaminocarbonylalkyl,
alkylaminocarbonylalkyl,
aryloxycarbonylalkyl,
loweralkoxycarbonylalkyl,
alkylcarbonylalkyl,
arylcarbonylalkyl,
arylcarboxyalkyl,
arylhalogen substituted alkyl,
arylalkyloxyalkyl,

and where an alkyl moiety is present in the above definitions of

A, the alkyl group must be substituted by at least one aminosulfonyloxy group;

Aryl or aryl moieties are selected from:



wherein

X is selected from hydrogen, halo, CF_3, nitro, $—SO_2NR^1R^2$, $—OSO_2NR^1R^2$, $—OCH_2CH_2OSO_2NR^1R^2$, loweralkoxy, hydroxy, amino, methylcarbonylamino, loweralkyl, methyloxycarbonyl, phenyl, loweralkylamino, diloweralkylamino, cyano, benzyloxy, —COOH, —COOM wherein M is a pharmaceutically acceptable metal cation, aryloxy or arylcarbonyl where the aryl moiety is as defined under A;

Y is selected from hydrogen, halo, loweralkoxy, hydroxy or loweralkyl;

W is selected from hydrogen, loweralkoxy or loweralkyl;

p=number of unreacted hydroxyl groups, including zero;

z=number of $—OSO_2NR^1R^2$ groups and is always at least one;

m=0–4;

n=p+z=1–8;

R^1=H or loweralkyl;

R^2=H, loweralkyl, $—CO_2R^1$, or $—CO_2^{-}M^{+}$ wherein M is defined above;

R^3, R^4=H, loweralkyl or R^3 and R^4 together form an alicyclic ring;

an optical isomer,

or a pharmaceutically acceptable salt thereof when one can be formed.

5,194,447

SULFONYLCARBAMATES OF RAPAMYCIN

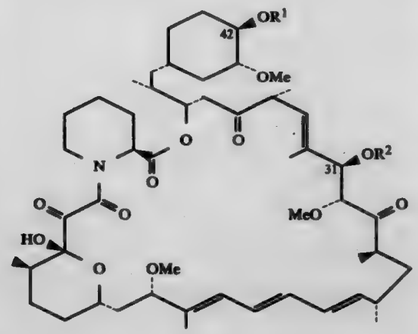
Wealing Kao, Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 18, 1992, Ser. No. 837,048

Int. Cl.[5] C07D *491/16*; A61K *31/395*, *31/685*; C07F *7/04*

U.S. Cl. 514—542 7 Claims

1. A compound of the formula



wherein

R^1 and R^2 are each, independently, hydrogen or —CONH-SO_2-Ar; and Ar is phenyl, naphthyl, pyridyl, quinolyl, isoquinolyl, quinoxalyl, thienyl, thionaphthyl, furyl, benzofuryl, benzodioxyl, benzoxazolyl, benzoisoxazolyl, or benzodioxolyl; wherein the Ar group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, phenylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, alkylthio of 1–6 carbon atoms, $—SO_3H$, $—PO_3H$, and $—CO_2H$;

with the proviso that R^1 and R^2 are not both hydrogen; or a pharmaceutically acceptable salt thereof when the Ar group contains a basic nitrogen or when the Ar group is substituted by dialklyamino of 1–6 carbon atoms per alkyl group, $—SO_3H$, $—PO_3H$, or $—CO_2H$.

7. A compound which is rapamycin 42-tertbutyldimethylsilyl ether-31-ester with phenylsulfonylcarbamic acid.

5,194,448

USE OF NERVONIC ACID AND LONG CHAIN FATTY ACIDS FOR THE TREATMENT OF DEMYELINATING DISORDERS

Keith Coupland, Hotham, and Nigel A. Langley, Wilberfoss, both of Great Britain, assignors to Croda International PLC, North Humberside, Great Britain

PCT No. PCT/GB90/01870, § 371 Date Aug. 6, 1991, § 102(e) Date Aug. 6, 1991, PCT Pub. No. WO91/07955, PCT Pub. Date Jun. 13, 1991

PCT Filed Nov. 30, 1990, Ser. No. 730,916

Claims priority, application United Kingdom, Nov. 30, 1989, 8927109; Jul. 30, 1990, 9016660

Int. Cl.[5] A61K *31/20*

U.S. Cl. 514—558 14 Claims

1. A pharmaceutical composition for use in the treatment of demyelinating diseases such as multiple sclerosis by oral ingestion, said composition consisting essentially of nervonic acid (cis-tetracos-15-enoic acid) in physiologically acceptable form.

5,194,449

USE OF PROSTAGLANDIN $F_{3\alpha}$ AS AN OCULAR HYPOTENSIVE AGENT

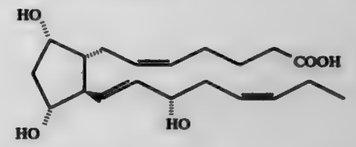
David A. Woodward, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 491,546, Mar. 12, 1990, Pat. No. 5,011,856. This application Apr. 12, 1991, Ser. No. 684,709

Int. Cl.[5] A61K *31/19*, *31/215*

U.S. Cl. 514—573 3 Claims

1. Pharmaceutical composition for reducing or maintaining intraocular pressure, comprising a therapeutically effective amount of $PGF_{3\alpha}$ of formula (I)



or a pharmaceutically acceptable salt thereof, in admixture with a non-toxic, ophthalmically acceptable vehicle, in unit dosage form suitable for topical ocular use.

5,194,450

ANTI-HYPERTENSIVE SULFONANILIDES

John D. McDermed, Chapel Hill; Anjaneyulu S. Tadepalli, Durham, both of N.C.; Vincent H. Chang, Freeport, The Bahamas; Kevin P. Hurley, Durham, and Harold S. Freeman, Raleigh, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

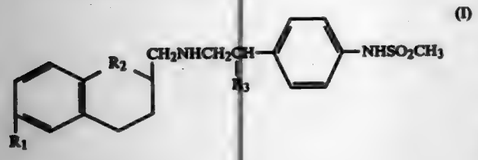
Continuation of Ser. No. 577,057, Aug. 31, 1990, abandoned, which is a continuation of Ser. No. 479,181, Feb. 12, 1990, abandoned, which is a continuation of Ser. No. 340,437, Apr. 19, 1989, abandoned. This application Oct. 28, 1991, Ser. No. 783,589

Claims priority, application United Kingdom, Apr. 20, 1988, 8809314

Int. Cl.[5] A61K *31/18*; C07C *311/13*

U.S. Cl. 514—605 5 Claims

1. A compound of formula (I)



(I)

wherein

R_1 is hydrogen or C_{1-4} alkoxy;

R_2 is carbonyl, hydroxymethylene, or methylene; and

R_3 is hydrogen or hydroxy;

or a salt thereof, provided that when R_1 is hydrogen and R_2 is carbonyl, R_3 is not hydroxy.

5,194,451

SYSTEMIC ANTI-INFLAMMATORY TREATMENT

David H. Katz, 1775 La Jolla Rancho Rd., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 431,304, Nov. 2, 1989, Pat. No. 5,071,879. This application Jul. 23, 1991, Ser. No. 734,508

The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.

Int. Cl.[5] A61U *31/045*

U.S. Cl. 514—724 16 Claims

1. A method of treating inflammatory disease in humans or other mammals, comprising injecting into the circulatory system of the human or other mammal to be treated a composition consisting essentially of at least one C-20 to C-26 aliphatic alcohol in a physiologically compatible carrier.

5,194,452

ACYLOXY ENDBLOCKED POLYETHERS HAVING IMPROVED HYDROLYTIC STABILITY

Andrew H. Ward, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 26, 1992, Ser. No. 888,061

Int. Cl.[5] C08J *9/00*; C08G *77/60*

U.S. Cl. 521—112 4 Claims

1. A process of preparing polyurethane foams said method comprising:

(I) mixing a formulation comprising:

(a) at least one reactive diisocyanate;

(b) at least one reactive polyol;

(c) at least one catalyst;

(d) an organic blowing agent, and

(e) a polysiloxane-polyoxyalkylene copolymer selected from the group having the following general formula

$$(CH_3)_3SiO\{SiO(CH_3)_2\}_x\{SiO(CH_3)R\}_ySi(CH_3)_3 \quad (i)$$

and

-continued

$$(CH_3)_3SiO\{SiO(CH_3)R\}_zSi(CH_3)_3 \quad (ii)$$

wherein R is a random copolymer comprising polyoxyethylene units and polyoxypropylene units and having the general formula $-(C_nH_{2n})O\{CH_2(CH_3)CHO\}_z(CH_2CH_2O)_w(C{=}O)R''$, wherein R'' is selected from a group consisting of alkyl radicals having from 1 to 6 carbon atoms,

n has a value of 2 to 4,

x has a value of 1 to 500,

y has a value of 1 to 500,

z has a value of 1 to 50, and

w has a value of 1 to 50;

wherein the ratio of x to y is in the range of 0.1 to 10:1 and the ratio of z to w is in the range of 0.1 to 10:1, there being at least 40 mole percent of the molecules having $-(C{=}O)R''$ bonded directly to primary carbon atoms in the polyoxyethylene units in the molecule;

(II) allowing the mixture to react and cure whereby a polyurethane foam is obtained.

5,194,453

METHOD FOR THE MANUFACTURE OF FLEXIBLE POLYURETHANE FOAM

Lucien Jourquin, Wetteren; Eddie DuPrez, Brakel, and Rudi Mortelmans, Ghent, all of Belgium, assignors to Recticel, Belgium

Filed Sep. 9, 1991, Ser. No. 756,709

Claims priority, application Belgium, Sep. 14, 1990, 09000877

Int. Cl.[5] C08J *9/08*, *9/12*; C08G *18/48*

U.S. Cl. 521—131 16 Claims

1. A method for the manufacture of flexible polyurethane foam having improved comfort properties and having a density between 35 and 70 kg/m^3 comprising:

preparing a reaction mixture containing a polyether polyol of equivalent weight between 1400 to 2800 and having a primary hydroxyl group content of more than 50%, an organic polyisocyanate, a blowing agent and at least one catalyst; and

allowing said reaction mixture to react so as to form said polyurethane foam;

wherein said blowing agent comprises (1) water in an amount of 0.5 to 1% by weight with respect to total foam weight, and (2) a physical blowing agent in an amount of up to 1.5 moles per mole of said polyether polyol;

and wherein said density between 35 and 70 kg/m^3 if provided by applying at least one density reducing technique selected from (1) forming a mechanically frothed reaction mixture of a reduced density when preparing said reaction mixture, or (2) allowing said reaction mixture to expand under a pressure lower than the atmospheric pressure.

5,194,454

ANTISEPTIC MATERIAL WITH GRAFTS COMPLEXED BY METAL IONS AND PROCESS FOR ITS PREPARATION

Roger Chatelin, Lisieux; Louis Gavet; Michel Bourgeois, both of Lyons, and Christine Darroux, Ecully, all of France, assignors to Centre Technique Industriel dit: Institut Textile De France, France

Filed Jan. 29, 1991, Ser. No. 647,147

Claims priority, application France, Feb. 5, 1990, 90 01621

Int. Cl.[5] C08F *283/01*, *2/46*, *255/02*; C08L *23/12*

U.S. Cl. 522—88 2 Claims

1. A grafted polymeric material having antiseptic properties wherein at least some of the grafts are obtained from acryl 8-hydroxy quinoline and said material contains at least one complexing function which forms complexes with at least one metal ion having antiseptic activity.

5,194,455

ACRYLATE-BASED HOT-MELT PRESSURE-SENSITIVE ADHESIVES

Klaus Massow; Werner Karmann, and Günther Kiessling, Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Dec. 14, 1990, Ser. No. 628,239

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942232

Int. Cl.[5] C08F *2/48*, *20/56*, *220/56*; C08L *15/00*

U.S. Cl. 522—152 11 Claims

1. Process for the preparation of acrylate-based hot-melt pressure-sensitive adhesives by irradiation on a substrate, characterised in that

a) at least one acrylic monomer is copolymerised with N-tert.-butylacrylamide (TBA), wherein

b) the reaction mixture (of a) to be polymerised can additionally contain one or more ethylenically unsaturated compounds which do not belong to the group of acrylic monomers of a),

c) the resulting solid polymer is heated and is applied in a form which is capable of flowing or a liquid form to a substrate, it being possible for the compositions of steps a) to c) to contain additives and auxiliaries if appropriate, and

d) the coated substrate is irradiated with high-energy radiation.

5,194,456

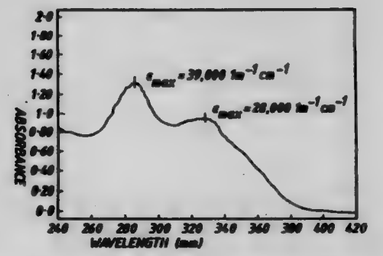
UV ABSORBERS AND PMMA MATERIAL CONTAINING SUCH ABSORBERS

Amitava Gupta, San Marino, Calif., assignor to Ioptex Research, Inc., Irwingdale, Calif.

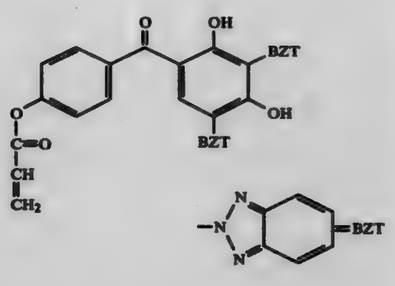
Continuation-in-part of Ser. No. 445,277, Dec. 4, 1989, abandoned. This application May 22, 1990, Ser. No. 527,019

Int. Cl.[5] C08F *232/08*, *120/36*; C07D *249/20*

U.S. Cl. 523—106 6 Claims



5. A contact lens comprising a PMMA material having incorporated therein a UV absorbing amount of the compound of the formula



5,194,457

ZEOLITIC NUCLEANTS FOR CRYSTALLINE POLYOLEFINES MODIFIED BY MEANS OF MACRORADICALIC DEGRADATION

Corrado Brichta; Giancarlo Brenna; Claudio Troglia, all of Milan, and Giancarlo Barbero, Arona, all of Italy, assignors to Enimont Augusta Industriale S.r.l, Milan, Italy

Continuation of Ser. No. 644,598, Jan. 23, 1991, abandoned. This application Jan. 10, 1992, Ser. No. 819,631

Claims priority, application Italy, Jan. 24, 1990, 19142 A/90

Int. Cl.[5] C08K *9/04*, *3/34*

U.S. Cl. 523—200 3 Claims

1. A process for nucleating polyolefines during thermodegradation processes carried out at temperatures between 250° and 300° C. and in the presence of radicalic initiators of the C-C type, comprising:

contacting polyolefines with 0.5–15% b.w., based on the total mixture, of at least one zeolitic molecular sieve having a water content that is equal to or less than 5% by weight, based on the weight of the total zeolitic molecular sieve, said zeolitic molecular sieve being modified with 8–20 parts by weight of at least one aromatic monocarboxylic acid having the formula:

Ar—COOH

wherein Ar stands for an aromatic radical, having two or three aromatic rings which can be condensed, and optionally substituted with C_1–C_2 alkyl or alkoxyl radicals.

5,194,458

SURFACE MODIFIED FILLERS AND COMPOSITIONS CONTAINING THE SAME

Michael E. Tarquini, Havre de Grace, Md., assignor to J. M. Huber Corporation, Rumson, N.J.

Continuation of Ser. No. 611,553, Nov. 13, 1990, abandoned, which is a continuation of Ser. No. 191,763, May 3, 1988, abandoned, which is a continuation of Ser. No. 129,755, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 95,456, Sep. 11, 1987, Pat. No. 5,055,284, which is a continuation-in-part of Ser. No. 811,230, Dec. 20, 1985, abandoned. This application Jul. 9, 1991, Ser. No. 727,294

Int. Cl.[5] C08K *9/06*

U.S. Cl. 523—212 2 Claims

1. A surface modified filler, comprising sodium magnesium aluminocarbonate particles having a surface coating theron, said sodium magnesium aluminocarbonate particles being substantially amorphous and said surface coating comprising an organofunctional silane or an organofunctional titanate said filler giving an UL 94 O.V. rating at 50% loading for thermosetting resins and an UL 94 O.V. rating at 55% for thermoplastic resins.

5,194,459

FLUOROPOLYMER INSULATING MATERIAL CONTAINING HOLLOW MICROSPHERES

Yoshiaki Sato, Saitama, and Sakuko Kaneda, Tokyo, both of Japan, assignors to Junkosha Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1991, Ser. No. 650,335

Claims priority, application Japan, Feb. 5, 1990, 2-24445

Int. Cl.[5] C08J *9/32*

U.S. Cl. 523—219 11 Claims

1. A network comprising hollow microspheres in a matrix, said matrix comprising a mixture of:

(a) an amorphous fluorinated ring oxygen-containing copolymer coating on and adhering to said microspheres;

(b) a fluorinated organic solvent;

(c) a fluorinated cross-linkable monomer; and

(d) a cross-linking means.

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5,194,460

STORAGE STABLE HEAT CURABLE ORGANOSILOXANE COMPOSITIONS CONTAINING A MICROENCAPSULATED CATALYST AND METHOD FOR PREPARING SAID CATALYST

Steven M. Evans, Saginaw; Chi-Long Lee, and Ming-Hsiung Yeh, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 2, 1992, Ser. No. 815,780
Int. Cl.[5] C08K 9/10
U.S. Cl. 523—211 6 Claims

1. A one-part, storage stable, heat curable organosiloxane composition comprising

A. a liquid or gum polyorganosiloxane containing an average of at east two ethylenically unsaturated hydrocarbon radicals per molecule;

B. as a curing agent for said composition, an organohydrogensiloxane containing an average of at least two silicon-bonded hydrogen atoms per molecule, and

C. an amount of a microencapsulated hydrosilylation catalyst sufficient to promote curing of said composition at temperatures above 100° C. or in the presence of ultraviolet radiation having a wavelength in the range from 200 to 260 nanometers,

where the concentration of said curing agent is sufficient to cure said composition, the sum of the average number of ethylenically unsaturated hydrocarbon radicals per molecule of polyorganosiloxane (A) and the average number of silicon-bonded hydrogen atoms in each molecule of said curing agent (B) is greater than 4, said catalyst is microencapsulated within a matrix or layer of at least one crosslinked organosiloxane compound, the non-crosslinked organosiloxane compound component used to make the crosslinked organosiloxane, comprises at least two units of the formula

$$R^2(CH{=}CH)_n{-}CH{=}CR^3C(O)OCH_2CH{=}CH{-}SiR^1_aO_{(3-a/2)}$$

where each R^1 is individually selected from the group consisting of unsubstituted and substituted monovalent hydrocarbon radicals, R^2 represents an aryl, alkoxyaryl or alkaryl radical, R^3 is —C≡N or —C(O)OR[4] where R^4 is hydrogen or an unsubstituted monovalent hydrocarbon radical, a is 0, 1 or 2 and n is 0 or a positive integer, with the proviso that n can be 0 only when R^2 represents a naphthyl radical, and said organosiloxane compound has been crosslinked by exposure to ultraviolet radiation in the wavelength range of from 300 to 400 nm.

5,194,461

STRUCTURAL MATERIALS FROM RECYCLED HIGH DENSITY POLYETHYLENE AND HERBACEOUS FIBERS, AND METHOD FOR PRODUCTION

Barton L. Bergquist, and Mohammed F. Fahmy, both of Cedar Falls, Iowa, assignors to University of Northern Iowa Foundation, Cedar Falls, Iowa

Filed Jun. 26, 1991, Ser. No. 721,153
Int. Cl.[5] C08L 97/02, 1/02; C08J 11/04
U.S. Cl. 524—13 19 Claims

1. A polymeric composition comprising an intimate mixture of chopped herbaceous fibers and granulated, previously-used high density polyethylene, heated to a moldable state and shaped into structural components, said herbaceous fibers being from the group consisting of oat straw, soybean straw and corn stalk fibers.

5,194,462

FIBER REINFORCED PLASTIC SHEET AND PRODUCING THE SAME

Masato Hirasaka, and Yoshiaki Fujiwara, both of Tokyo, Japan, assignors to Nkk Corporation, Tokyo, Japan

Division of Ser. No. 515,383, Apr. 27, 1990, Pat. No. 5,108,678.
This application Jan. 17, 1992, Ser. No. 822,008
Claims priority, application Japan, Apr. 27, 1989, 1-105798; Mar. 27, 1990, 2-75454
Int. Cl.[5] C08J 5/04; D04H 1/42; C08K 7/04
U.S. Cl. 524—13 5 Claims

1. A fiber reinforced plastic sheet which comprises discontinuous reinforcing glass fibers which have a length of 3 to 50 mm, differ in the number of filaments, and of which 1 to 70% is monofilament, dispersed in a thermoplastic resin selected from the group consisting of polyethylene resin, polypropylene resin, ethylene-propylene copolymer resin, polyethylene terephthalate resin, polystyrene resin, polycarbonate resin, polyamide resin, polyacetal resin and methacrylic resin in a ratio of the resin to the fiber being 100 parts by weight of the resin to 5 to 200 parts by weight of the fiber, said fibers being arranged in parallel to the surface of the sheet and being arranged in a gradient layer structure which continuously varies form a layer of the fibers having a greater number of lighter filaments to a layer of the fibers having a lesser number of heavier filaments, said lesser number of heavier filaments being as compared to said greater number of lighter filaments, wherein said fiber reinforced plastic sheet has a thickness of 1 to 10 mm and a width, wherein in the thickness direction at a first side of said fiber reinforced plastic sheet the lesser number of said heavier filaments are present and at the side of said fiber reinforced plastic sheet opposite said first side the greater number of said lighter filaments are present, and wherein in the width direction of said fiber reinforced plastic sheet, the layer structure at any plane thereacross is the same.

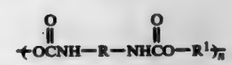
5,194,463

LIGHT-ABSORBING POLYURETHANE COMPOSITIONS AND THERMOPLASTIC POLYMERS COLORED THEREWITH

James J. Krutak; Max A. Weaver; William W. Parham, and Wayne P. Pruett, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 27, 1991, Ser. No. 766,538
Int. Cl.[5] C08L 2/14
U.S. Cl. 524—35 33 Claims

1. A light-absorbing polyurethane composition comprising repeating units of Formula (I)



(I)

wherein

R is a divalent radical selected from C_2–C_{10}-alkylene, C_3–C_8-cycloalkylene, arylene, C_1–C_4-alkylene-arylene-C_1–C_4-alkylene, C_1–C_4-alkylene-C_3–C_8-cycloalkylene-C_1–C_4-alkylene or C_1–C_4-alkylene-1,2,3,4,5,6,7-octahydronaphthalene-2,6-diyl-C_1–C_4-alkylene, and such radicals substitued by one or more groups selected from C_1–C_4 alkoxy, halogen, aryl, cyano, C_1–C_4 alkanoyloxy, C_1–C_4 alkoxycarbonyl, or hydroxy;

R^1 is a divalent organic radical comprised of about 1 to about 75 mole percent of the residue of one or more light-absorbing organic diols,

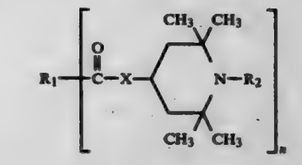
wherein the light-absorbing diol is selected from the following chromophoric types: azo, metallized azo, disazo, methine, or arylidene, polymethine, azo-methine, anthraquinone, azamethine, anthrapyridone (3H-dibenz [f,ij] isoquinoline-2,7-dione, anthrapyridine (7H-dibenz [f,ij] isoquinoline-7-one), phthaloylphenothiazine (14H-naphtho [2,3-a] phenothiazine-8,13-dione, benzanthrone (7H(de)anthracene-7-one), anthrapyrimidine (7H-benzo [e] perimidine-7-one), anthrapyrazole, anthrasothiazole, triphenodioxazine, thiaxanthene-9-one, flourindine (5, 12-dihydroquinoxaline [2,3-b] phenazine), quinophthalone, phthalocyanine, naphthalocyanine, nickel dithiolenes, coumarin (2H-1-benzopyran-2-one), coumarin imine (2H-1-benzopyran-2-imine), indophenol, perinone, nitroarylamine, benzodifuran, phthaloylphenoxazine (14H-naphtho[2,3-a]phenoxazine-8,13-dione), phthaloylacridone (13H-naphtho[2,3-c] acridine 5,8,14-trione), anthraquinonethioxanthone (8H-naphtho[2,3-c]thioxanthene-5,8,13-trione), anthrapyridazone, naphtho[1',2',3':4,5]quino[2,1-b] quinazoline-5,10-dione, 1H-anthra(2,1-b)(1, 4) thiazin-7,12-dione, indigo, thioindigo, xanthene, acridine, azine, oxazine, 1,4- and 1,5-naphthoquinones, pyromellitic acid diimide, naphthalene-1,4,5,8-tetracarboxylic acid diimide, 3,4,9,10-perylenetetracarboxylic acid diimide, naphthoquinone, diminoisoindoline, naphthopyran (3H-naphtho[2,1-b]pyran-3-ones and 3-imines) and aminonaphthalimide;

wherein the hydroxy groups of said diols are bonded via alkylene moieties to the remainder of the light-absorbing organic compound, with any remainder of R^1 comprised of the residue of organic diols of the formula HO—R-[2]—OH;

wherein R^2 is a divalent radical selected from C_2–C_{18} alkylene, C_3–C_8-cycloalkylene, C_1–C_4 alkylene-1,2,3,4,5,6,7,8-octahydronaphthalen-2,6-diyl-C_1–C_4 alkylene, C_1–C_4-alkylene-C_3–C_8-cycloalkylene-C_1–C_4-alkylene, C_1–C_4 alkylene-arylene-C_1–C_4-alkylene, C_2–C_4 alkylene-O—C-2–C_4 alkylene, C_2–C_4 alkylene-S—C_2–C_4 alkylene or C_2–C_4 alkylene-O—C_2–C_4 alkylene-O—C_2–C_4 alkylene; and

n is equal to or greater than 2.

derivative of a sterically hindered amine of formula I or formula II

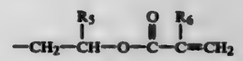


I

wherein n is 1 or 2 and X is —O— or —N(R_3)—,

R_1 if n = 1, is C_1–C_{18}alkyl, C_2–C_{20}alkenyl, C_5–C_8cycloalkyl, C_7–C_9phenylalkyl, phenyl, phenyl which is substituted by halogen, C_1–C_4alkyl or C_1–C_4alkoxy, or is a R_6OO-C—CH=CH— group and, if n = 2, is C_2–C_{10}alkylene, vinylene, C_6–C_{12}arylene or cyclohexylene,

R_2 is hydrogen, O., C_1–C_{12}alkyl, C_3–C_5alkenyl, C_7–C_9phenylalkyl, C_1–C_{18}alkoxy, C_5–C_8cycloalkoxy, C_7–C_9-phenylalkoxy, C_2–C_{10}alkanoyl, C_3–C_5alkenoyl or a group of formula Ia



Ia

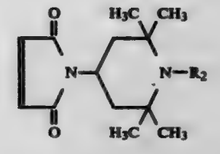
R_3 is hydrogen, C_1–C_{12}alkyl or C_5–C_8cycloalkyl,

R_4 is hydrogen or C_1–C_{12}alkyl,

R_5 is hydrogen, CH_3 or CN, and

R_6 is hydrogen, C_1–C_{12}alkyl or phenyl,

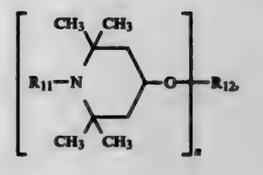
with the proviso that at least one of the substituents R_1 and R_2 contains an ethylenic double bond; or



II

wherein R_2 is hydrogen, C_1–C_{12}alkyl, C_3–C_5alkenyl, C_7–C_9-phenylalkyl, C_1–C_{18}alkoxy, C_5–C_8cycloalkoxy, C_7–C_9-phenylalkoxy or C_2–C_{10}alkanoyl; and

which copolymer additionally contains a sterically hindered amine, which is not unsaturated and which is a derivative of 2,2,6,6-tetramethylpiperidine, having formula IV



(IV)

wherein

n is an integer from 1 to 4,

R_{11} is H, C_1–C_4alkyl, benzyl, acetyl, C_1–C_{12}alkoxy, C_7–C_9-phenylalkoxy or cyclohexyloxy, and R_{12}, if n is 1, is the radical of a saturated aliphatic carboxylic acid of 2 to 18 carbon atoms, of a saturated cycloaliphatic carboxylic acid of 7 to 15 carbon atoms, or of an aromatic carboxylic acid of 7 to 15 carbon atoms, and, if n is 2, is the divalent radical of a saturated aliphatic dicarboxylic acid of 2 to 12 carbon atoms, of a saturated cycloaliphatic or aromatic dicarboxylic acid of 8 to 14 carbon atoms, or of a saturated aliphatic, cycloaliphatic or aromatic dicarbamic acid of 8 to 14 carbon atoms, and, if n is 3, is the trivalent radical of

5,194,464

ENTERIC FILM AND PREPARATION THEREOF

Shunichi Itoh, Saita; Hiroyoshi Koyama, Mishima; Toshio Kashihara, Saita, and Shin-ichiro Hirai, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 412,439, Sep. 26, 1989, abandoned. This application Mar. 23, 1990, Ser. No. 497,655
Claims priority, application Japan, Sep. 27, 1988, 63-243542
Int. Cl.[5] C08L 1/26, 1/08; B05D 7/00
U.S. Cl. 524—42 17 Claims

1. An enteric film which comprises

(a) hydroxypropylmethylcellulose phthalate exhibiting a viscosity of about 136 to 204 centistokes as 10% methanol/dichloromethane (1 : 1 by weight) solution at 20° C.,

(b) polyethylene glycol presenting solid state at ambient temperature and

(c) shellac, the ratios of (b) and (c) to (a) being 0.1 to 20 weight percent and 5 to 40 weight percent, respectively.

5,194,465

STABILIZED STYRENE COPOLYMERS CONTAINING ELASTOMER PARTICLES MODIFIED WITH A HINDERED AMINE

Bernard Gilg, St. Louis-la-Chaussée, France; Gerhard Rytz, Schwarzenburg; Werner Stauffer, Fribourg, both of Switzerland, and Margot Clauss, Riedisheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1991, Ser. No. 769,916
Claims priority, application Switzerland, Oct. 4, 1990, 3200/90
Int. Cl.[5] C08K 5/3415, 5/3432; C08L 39/04
U.S. Cl. 524—99 12 Claims

1. A light-stabilized copolymer of styrene or α-methylstyrene and at least one ethylenically unsaturated comonomer, which copolymer contains crosslinked elastomer particles which are modified by copolymerization with an unsaturated

a saturated aliphatic tricarboxylic acid of 6 to 12 carbon atoms or of an aromatic tricarboxylic acid of 9 to 15 carbon atoms, and, if n is 4, is the tetravalent radical of a saturated aliphatic tetracarboxylic acid of 8 to 12 carbon atoms or of an aromatic tetracarboxylic acid of 10 to 16 carbon atoms.

5,194,466

PIPERIDINE-TRIAZINE COMPOUNDS FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

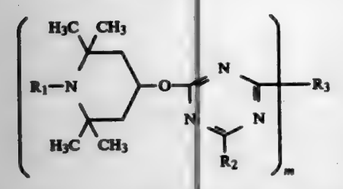
Valerio Borzatta, Bologna, and Franco Masina, Anzola Emilia, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 511,143, Apr. 19, 1990. This application Dec. 19, 1991, Ser. No. 810,658
Claims priority, application Italy, Jul. 27, 1989, 20285 A/89
Int. Cl.[5] C08K 5/34
U.S. Cl. 524—101 13 Claims

1. A stabilized composition which comprises

(a) an organic material susceptible to degradation induced by light, heat or oxidation, and

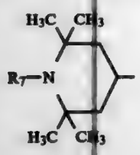
(b) an effective stabilizing amount of a compound of formula I



(I)

in which R_1 is hydrogen, C_1–C_8alkyl, O°, OH, NO, CH_2CN, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkoxy, C_3–C_6alkenyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C_1–C_4alkyl, C_1–C_4acyl or C_2–C_4alkyl substituted by OH in the 2-, 3- or 4-position, R_2 is a group —OR_4, —SR_4 or

wherein R_4 is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, phenyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di or tri-substituted on the phenyl by C_1–C_{18}alkyl, C_3–C_{18}alkyl interrupted by 1, 2 or 3 oxygen atoms, C_2–C_4alkyl substituted in the 2-, 3- or 4-position by di-(C_1–C_4alkyl)-amino, or a group of the formula (II)

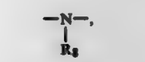


(II)

where R_7 is as defined for R_1, and R_5 and R_6 which can be identical or different are hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C_1–C_4alkyl, C_2–C_4alkyl substituted in the 2-, 3- or 4-position by C_1–C_8alkoxy or by di-(C_1–C_4alkyl)-amino, or a group of the formula (II), or the group

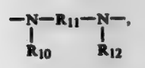
is a heterocyclic ring having 5–7 members, m is an integer from 2 to 6, and, if

m is 2, R_3 is one of the groups of the formula (IIIa)–(IIIe)

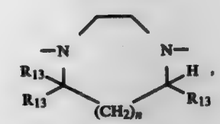


(IIIa)

(IIIb)



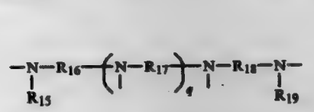
(IIIc)



(IIId)

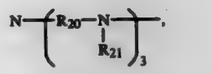
in which R_8, R_{10}, R_{12} and R_{14} which can be identical or different are hydrogen C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C_1–C_4-alkyl, or a group of the formula (II), R_9 is C_2–C_{12}alkylene, cyclohexylene, cyclohexylenedimethylene, methylenedicyclohexylene, isopropylidenedicyclohexylene, phenylene or xylylene, R_{11} is as defined for R_9 or is C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms, R_{13} is hydrogen or methyl,

n is zero or 1 and, if m is 3, 4, 5 or 6, R_3 is a group of the formula (IV)

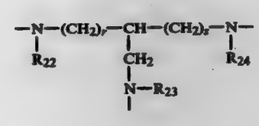


(IV)

in which R_{15} and R_{19} which can be identical or different are as defined for R_8, and R_{16}, R_{17} and R_{18} which can be identical or different are C_2–C_6alkylene and q is zero, 1, 2 or 3, and if m is 3, R_3 is also a group of the formula (Va) or (Vb)



(Va)



(Vb)

in which R_{20} is C_2–C_6alkylene, R_{21}, R_{22}, R_{23} and R_{24} which can be identical or different are as defined for R_8, and r and s which can be identical or different are integers from 2 to 6.

5,194,467

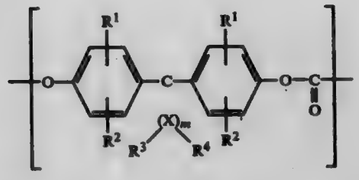
STABILIZATION OF HIGHLY HEAT DISTORTION RESISTANT POLYCARBONATES

Helmut-Martin Meier, Ratingen; Uwe Westeppe, Mettmann; Rolf Dhein; Dieter Freitag, both of Krefeld; Martin Wandel, Dormagen, and Axel Sendquist, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 642,489, Jan. 17, 1991, abandoned. This application Jan. 3, 1992, Ser. No. 816,918
Int. Cl.[5] C08K 5/06
U.S. Cl. 524—107 4 Claims

1. A thermoplastic molding composition characterized by its high heat distortion resistance comprising

(i) an aromatic polycarbonate resin having a weight average molecular weight of at least 10,000, containing bifunctional carbonate structural units corresponding to formula (Ia)



(Ia)

wherein

R^1 and R^2 denote, independently of one another a member selected from the group consisting of hydrogen, halogen, C_1–C_8-alkyl, C_5–C_6-cycloalkyl, C_6–C_{10}-aryl and C_7–C_{12}-aralkyl,

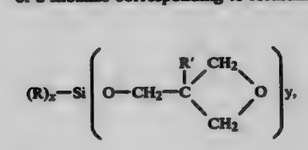
m is an integer from 4 to 7,

R^3 and R^4, which are selected individually for each X, denote independently of one another, hydrogen or C_1–C_6-alkyl, and

X denotes carbon,

under the condition that R^3 and R^4 are both alkyl on at least one X atom, and

(ii) as the only thermo stabilizer about 0,001 to 1% by weight of a siloxane corresponding to formula (II)



(II)

wherein

R and R' denote, independently of one another C_1–C_4-alkyl or aryl and

x and y denote the numbers 1, 2 or 3 and the sum x+y is 4.

5,194,468

HIGH DENSITY POLYETHYLENE POLYBLENDS

Ismat A. Abu-Isa, Rochester Hills, and Pamela M. Graham, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1992, Ser. No. 900,997
Int. Cl.[5] C08K 5/526
U.S. Cl. 524—128 6 Claims

1. A high impact strength thermoplastic polyblend of high density polyethylene and polyethylene terephthalate comprising:

(a) 50 to 90 percent by weight of total polyblend of a high density polyethylene,

(b) 10 to 30 percent by weight of total polyblend of a polyethylene terephthalate,

(c) 5 to 30 percent by weight of total polyblend of a thermoplastic elastomer, and

(d) 1 to 5 percent by weight of total polyblend of at least one of poly(dipropylene glycol) phenyl phosphite and tris nonyl phenyl phosphite,

whereby said phosphites improve the compatibility between said high density polyethylene and said polyethylene terephthalate and thus producing a polyblend having improved impact strength and reduced gasoline permeability.

5,194,469

LATEX FOR COATINGS HAVING IMPROVED FLEXIBILITY

Richard E. Srail, Cuyahoga Falls, and Gary L. Burroway, Doylestown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1991, Ser. No. 662,091
Int. Cl.[5] C08L 9/08
U.S. Cl. 524—166 20 Claims

1. A process for producing a neutralized latex that is useful in the manufacture of water reducible coatings with comprises:

(1) free radical aqueous emulsion polymerizing, at a pH of less than about 3.5, a monomer mixture which comprises, based on 100 weight percent monomers; (a) from about 30 to abut 70 weight percent of a vinyl aromatic monomer selected from the group consisting of styrene, α-methyl styrene, and vinyl toluene, (b) from about 25 to about 65 weight percent of at least one alkyl acrylate monomer having an alkyl group which contains from 2 to about 10 carbon atoms, and (c) from about 1 to about 5 weight percent of acrylic acid, and (d) about 0.4 to about 3 weight percent methacrylic acid; in the presence of about 0.2 to about 0.4 phm at least one sulfonate surfactant and in the presence of about 4 to 8 phm of at least one nonionic surface active agent having a hydrophile-lipophile balance number which is within the range of about 14 to about 18 to produce a latex; and

(2) neutralizing the latex with ammonia to a pH which is within the range of about 7 to about 10.5 to produce the neutralized latex.

5,194,470

COMPOSITIONS FOR STABILIZING CHLORINATED POLYMERS

Louis Carette, Issy les Moulineaux; Michel Gay, Villeurbanne, and Gerard Velleret, Paris, all of France, assignors to Rhone-Poulenc Chimie, Cedex, France

Filed Apr. 19, 1991, Ser. No. 687,953
Claims priority, application France, Apr. 20, 1990, 90 05296
Int. Cl.[5] C08K 5/57, 3/34; C09K 15/32
U.S. Cl. 524—178 20 Claims

1. A composition for stabilizing a chlorinated polymer, copolymer or homopolymer comprising:

a) dawsonite,

b) an organotin β-diketonate,

c) an organic zinc compound, and

d) an organic calcium, magnesium, barium or lanthanide compound or a mixture thereof.

5,194,471

RIGID CHLORINATED POLYVINYL CHLORIDE COMPOUND AND ARTICLES DERIVED THEREFROM

Joachim E. Hartitz, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

Filed Feb. 15, 1991, Ser. No. 656,538
Int. Cl.[5] C08K 5/58
U.S. Cl. 524—180 11 Claims

1. A composition, comprising: chlorinated polyvinyl chloride containing from about 63% by weight to about 70% by weight chlorine, said chlorinated polyvinyl chloride polymer is derived from a polyvinyl chloride polymer having an inher-

ent viscosity between about 0.4 and about 1.6, from about 5 to about 15 weight parts per 100 weight parts of chlorinated polyvinyl chloride, a graft copolymer containing more than 50 weight percent of a polydiene and one or more hardening monomers, said graft copolymer selected from at least one of the group consisting of a ABS graft copolymer having a Shore D hardness of from 35 to less than 64, and a non-ABS polydiene containing graft copolymer having a Shore D hardness of from 35 to less than 42; from about 1 to about 5 weight parts per 100 weight parts of chlorinated polyvinyl chloride of a chlorinated polyethylene containing from about 5% to about 50% by weight chlorine, and a stabilizer for said chlorinated polyvinyl chloride.

5,194,472

ESTER-CONTAINING QUATERNARY AMMONIUM SALTS AS ADHESION IMPROVING TONER CHARGE AGENTS

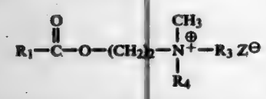
John C. Wilson; Lawrence P. DeMejo, both of Rochester, and Alexandra D. Bermel, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 479,774, Feb. 14, 1990, Pat. No. 5,110,977. This application Apr. 24, 1992, Ser. No. 873,303

Int. Cl.[5] C07C *69/75, 69/76*; G03G *9/06, 9/08*

U.S. Cl. 524—238 **10 Claims**

1. A quaternary salt of the formula:



wherein R_1 is methyl, cyclohexyl, phenyl, or 4-[2-(N-benzyl-N,N-dimethylammonium)ethoxycarbonyl]phenyl associated with one of m-nitrobenzenesulfonate and tetraphenylborate, or 4-[2-(N-(2-benzoyloxy)ethyl)-N,N-dimethylammonium)ethoxycarbonyl]phenyl associated with one of m-nitrobenzenesulfonate and tetraphenylborate;

R_3 is C_1–C_{18} alkyl, benzyl, 2-(cyclohexanoyloxy)ethyl or 2-(benzoyloxy)ethyl;

R_4 is methyl or benzyl; and

$Z^{\ominus}$ is m-nitrobenzenesulfonate or tetraphenylborate;

provided that R_1 is not cyclohexyl or phenyl when R_3 is methyl, R_4 is benzyl, and $Z^{\ominus}$ is m-nitrobenzenesulfonate.

5,194,473

MODIFIED POLYESTER COMPOSITION AND PREFARATION PROCESS AND USE THEREOF

Hozai Shinoda, Aichi; Masumi Ohtaguro, and Shigeru Iinuro, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

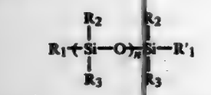
Filed May 21, 1990, Ser. No. 525,729

Claims priority, application Japan, May 26, 1989, 1-131480; Jun. 29, 1989, 1-165400; Jul. 3, 1989, 1-169984

Int. Cl.[5] C08S *3/18*

U.S. Cl. 524—263 **6 Claims**

1. A bioabsorbable polyester composition obtaining by mixing a polyester containing at least a glycolic acid unit and/or a lactic acid unit with a polyether modified siloxane represented by the formula (I)



(I)

wherein R_1 and R_1' are a hydrogen, an alkyl group, a hydrogen terminated polyoxyalkylene group having a polymerization degree of 200 or less, a hydroxyl group, a hydroxyalkyl group or a hydroxy terminated polyoxyalkylene group having a polymerization degree of 200 or less, and at least one of R_1 and R_1' is a hydroxy terminated polyoxyalkylene group having a polymerization degree of 200 or less, or a hydroxy terminated polyoxyalkylene group having a polymerization degree of 200 or less; R_2 and R_3 are alkyl groups, phenyl groups or halogen atoms, and may be the same or different; and n is an integer of 1 to 4000, wherein the content of the polyether modified siloxane is in the range of 0.1 to 30% by weight in the composition.

5,194,474

COMPOSITION

Akimasa Aoyama; Tetsuya Katayama; Takeshi Moritani; Junnosuke Yamauchi, and Satoshi Hirofuji, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 27, 1990, Ser. No. 486,560

Claims priority, application Japan, Mar. 8, 1989, 1-57581

Int. Cl.[5] C08K *5/09*

U.S. Cl. 524—300 **5 Claims**

1. A composition comprising a saponified product of an ethylene-vinyl acetate copolymer having an ethylene content of 20 to 80 mol % and a saponification degree of vinyl acetate component of at least 95 mol %, said composition containing 20 to 200 ppm as converted to alkali metal of an alkali metal acetate, not more than 10 ppm of alkaline earth metals, 30 to 250 ppm of acetic acid, and 5 to 500 ppm as converted to phosphate ion of phosphoric acid or an alkali metal hydrogenphosphate, and having a content ratio of acetic acid/alkali metal acetate of 0.1 to 1 and the flow characteristic that the extrusion rate does not substantially increase for at least 10 hours in the relationship between the heating time and the extrusion rate with a capillary rheometer (Koka Flow Tester) at at least one temperature 10° to 80° C. above the melting point.

5,194,475

ROOM TEMPERATURE JET PRINTING INK AND METHOD

Jurgen M. Kruse, Clinton, and Donald B. Kimball, Jr., Guilford, both of Conn., assignors to Xaar Limited, England

Continuation-in-part of Ser. No. 379,595, Jul. 14, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 605,560

Claims priority, application European Pat. Off., Jul. 11, 1990, 90307571; Japan, Jul. 13, 1990, 2-184399

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] C08K *5/10*

U.S. Cl. 524—308 **36 Claims**

1. An ink jet ink composition comprising a colloidal solution of:

(a) a non-aqueous solvent; and

(b) a disperse phase comprising a resin which is soluble in said solvent at room temperature and a dyestuff which is soluble in said resin at room temperature but substantially insoluble in said solvent at room temperature, said disperse phase being in the form of colloidal size particles and the proportions of said solvent, resin, and dyestuff being selected to provide a fluid ink composition at room temperature.

5,194,476

COMPOSITIONS OF POLYPHENYLENE OXIDE OR MIXTURES OF POLYPHENYLENE OXIDE WITH BETA-DIKETONES

Andrea Casarini, Paullo; Giorgio della Fortuna, Milan, and Aurelio De Chirico, San Donato Milanese, all of Italy, assignors to ECP Enichem Polimeri s.r.l., Milan, Italy

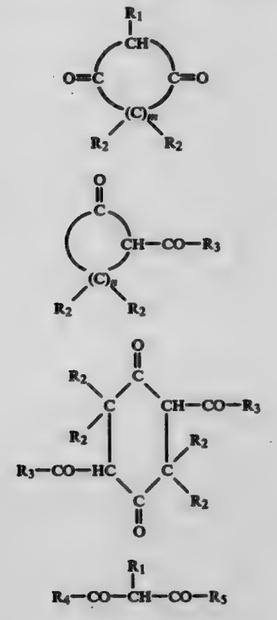
Filed Oct. 8, 1991, Ser. No. 774,514

Claims priority, application Italy, Oct. 10, 1990, 21699 A/90

Int. Cl.[5] C08K *5/20, 5/10, 5/08, 5/07*

U.S. Cl. 524—360 **20 Claims**

1. Polymeric compositions based on at least one polyphenylene ether (PPE) obtained from the (co)polymerization by oxidative coupling of one or more substituted phenols, either alone or together with at least one (co)polymer of styrene, characterized by the fact that they contain a stabilizing additive in a stabilizing amount of at least one compound having at least one ketone selected from the group consisting of the following structural formulae:



(I)

(II)

(IIIa)

(III)

where m is an integer ranging from 2 to 5, and n is an integer ranging from 3 to 6, R_1 and R_2, which can be independently either the same or different are selected from the group consisting of hydrogen, alkyl, cycloalkyl, arylalkyl, aryl haloalkyl, acyl, a chlorine atom, a bromine atom and a $-(CH_2)_x-COOR_6$ radical where x is an integer ranging from 1 to 5, and R_6 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, arylalkyl, aryl, alkylaryl, haloalkyl, haloaryl and haloarylalkyl, R_3, R_4 and R_5, which can be independently either the same or different, are selected from the group consisting of:

hydrogen

alkyl, cycloalkyl, arylalkyl, haloalkyl;

aryl alkylaryl, haloaryl, haloalkylaryl;

OR_7, CH_2R_7, $CH_2—COR_7$ and $CH_2—COOR_7$

wherein R_7 independently is selected from the group consisting of hydrogen, alkyl, cycloalkyl, arylalkyl, haloalkyl, aryl, alkylaryl, haloaryl and haloalkylaryl.

16. Composition according to any one of claims 1 to 3, where the stabilizing additive is 5,5-dimethyl-1,3-cyclohexanedione.

5,194,477

FLAME RETARDANT COMPOSITIONS

Ping Y. Liu, Naperville, Ill., and Linda McIntosh, Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 16, 1990, Ser. No. 614,515

Int. Cl.[5] C08L *67/02, 69/00, 79/08*; C08K *3/22*

U.S. Cl. 524—382 **26 Claims**

26. A flame retardant additive which is comprised of (a) a halogenated polycarbonate resin; (b) an antimony compound; and (c) a polyetherimide ester elastomer resin carrier, wherein the halogenated polycarbonate resin is present in amounts ranging from about 60 weight percent to about 70 weight percent based on the total weight of the additive, the antimony compound is present in amounts ranging from about 20 weight percent to about 30 weight percent based on the total weight of the additive and the polyetherimide ester elastomer resin carrier is present in amounts ranging from about 15 weight percent to about 20 weight percent based on the total weight of the additive.

5,194,478

POLYMER COMPOSITION FOR SCAVENGING OXYGEN

Erik Frandsen, Odense, and Rolando Mazzone, Asperup, both of Denmark, assignors to A/S Haustrup Plastic, Langeskov and A/S Haustrup PLM Holding, Odense, both of Denmark

PCT No. PCT/SE89/00387, § 371 Date Jan. 8, 1991, § 102(e) Date Jan. 8, 1991, PCT Pub. No. WO90/00578, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 6, 1989, Ser. No. 634,872

Claims priority, application Sweden, Nov. 7, 1988, 8802609

Int. Cl.[5] C08K *5/56*; C09C *19/42*; C02F *1/70*

U.S. Cl. 524—398 **10 Claims**

1. A method of producing a polymer composition adapted to be added to a sealed volume to increase the durability of goods contained in said volume comprising treating a polyamide or copolyamide with a metal compound contained in a volatile solvent composition during refluxing conditions to obtain an active component having capacity to consume oxygen, the metal of said compound being iron, nickel, cobalt, copper or manganese, said active component being a metal complex.

5,194,479

SILICONE RUBBER COMPOSITION AND ITS MANUFACTURE

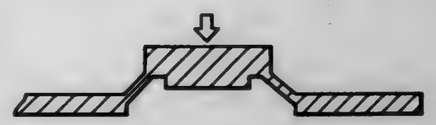
Masaharu Takahashi; Tsutomu Nakamura, and Naoki Omura, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,437

Claims priority, application Japan, Mar. 29, 1990, 2-81831

Int. Cl.[5] C08K *3/00*

U.S. Cl. 524—401 **9 Claims**



1. A silicone rubber composition comprising:

(A) a diorganopolysiloxane having the following average composition formula [I]:

$$R_aSiO_{\frac{4-a}{2}} \quad [I]$$

wherein R's which may be the same or different, each represent an unsubstituted or substituted monovalent hydrocarbon group having 1 to 10 carbon atoms and a is a number of from 1.95 to 2.05,

and possessing an average degree of polymerization in the range of 3,000 to 30,000,

(B) a reinforcing filler,

(C) hydrochloric acid or sulfuric acid as an acid strength adjustor, and

(D) a curing agent,

said silicone rubber composition is further characterized such that when 50 g of a tolune solution containing 5.0% by weight of said rubber composition is extracted with 10 g of deionized water forming an organic phase and a water phase, the pH of the water phase thus extracted is in the range of 3.0 to 5.5.

VOL 1148 ISS 3 MR 16 1993 UMI

5,194,480
THERMALLY CONDUCTIVE ELASTOMER
Jacob Block, Rockville, Md.; Roy W. Rice, Alexandria, Va., and Charles R. Morgan, Brookeville, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Filed May 24, 1991, Ser. No. 705,482
Int. Cl.[5] C08K *3/38, 3/28, 3/22*
U.S. Cl. 524—404 5 Claims

1. A thermally conductive electrically insulating filled elastomer composition comprising:
a) a styrene-ethylene-butylene-styrene block copolymer thermoplastic elastomer, and
b) about 45–70 vol. % thermally conductive electrically insulating filler particles.

5,194,481
FLAME-RETARDANT POLYESTER RESIN COMPOSITIONS
Tatsuaki Takagi, and Hiroyuki Amano, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan
Filed Nov. 25, 1991, Ser. No. 796,934
Claims priority, application Japan, Nov. 30, 1990, 2-334469
Int. Cl.[5] C08K *330*
U.S. Cl. 524—410 7 Claims

1. A flame-retardant polyester molding composition comprising a thermoplastic polyester base resin, and a flame-retardant effective amount of (i) an organohalogen flame retardant, and (ii) between 1 to 30 parts by weight, per 100 parts by weight of the polyester base resin, of a low sulfate-containing antimony trioxide as an auxiliary flame retardant, wherein the sulfate content of the antimony trioxide is 0.05% or less.

5,194,482
FLAME RETARDANT RESIN COMPOSITION CONTAINING STYRENIC POLYMERS
Devanadevalu Chaudury, North Royalton, and Neil A. Burditt, Shaker Heights, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio
Continuation of Ser. No. 571,938, Aug. 23, 1990, abandoned.
This application Jul. 30, 1991, Ser. No. 741,199
Int. Cl.[5] C08K *3/10*
U.S. Cl. 524—412 13 Claims

1. A flame retardant composition comprising:
about 10 to about 25 parts by weight of a flame retardant comprising brominated polystyrene;
about 1 to about 8 parts by weight of one or more of antimony oxide and sodium antimonate;
about 2 to about 18 parts by weight of a compatibilizing agent comprising a styrene-butadiene copolymer having from about 40 to about 60 percent styrene; and
about 100 parts by weight of a styrene polymer selected from the group consisting of high impact polystyrene, polystyrene, poly-α-methylstyene, polyvinylnaphthalene, styrene-acrylonitrile copolymer, styrene maleic anhydride copolymer, EPDM modified styrene acrylonitrile copolymer, acrylic-styrene-acrylic copolymer and acrylonitrile-butadiene-sytrene copolymer.

5,194,483
WATER-BASED PROTECTIVE COMPOSITIONS FOR COATING FILMS AND PREPARATION PROCESSES THEREOF
Nobuaki Kawabata, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan
Division of Ser. No. 533,398, Jun. 5, 1990, Pat. No. 5,098,948.
This application Nov. 20, 1991, Ser. No. 794,972
Claims priority, application Japan, Jun. 6, 1989, 1-42059
Int. Cl.[5] C09D *5/00*
U.S. Cl. 524—462 9 Claims

1. A water-based protective composition for coating films, comprising:
(a) a water-based dispersion of copolymer particles having a number average molecular weight of from 2,000 to 20,000 and a glass transition point of from −10° C. to +40° C. and obtained by emulsion-polymerizing 100 parts by weight of a monomer mixture consisting substantially of (X) 7–12 parts by weight of an α,β-monoethylenically-unsaturated carboxylic acid and (Y) 88–93 parts by weight of at least one ester selected from the group consisting of C_{1-4}-alkyl acrylates and C_{1-4}-alkyl methacrylates;
(b) 0.1–5 parts by weight of an ultraviolet absorber, per 100 parts by weight of the monomer mixture employed for the preparation of the water-based dispersion (a);
(c) 0.1–5 parts by weight of an antioxidant, per 100 parts by weight of the monomer mixture employed for the preparation of the water-based dispersion (a);
(d) 0.1–2 parts by weight of at least one compound selected from the group consisting of acrylic thickening agents and natural gums, per 100 parts by weight of the total amount of the water-based dispersion (a); and
(e) 0.01–6 parts by weight of at least one surface active agent selected from fluorocarbon-type surface active agents and acetylenic nonionic surface active agents, per 100 parts by weight of the total amount of the water-based dispersion (a).

5,194,484
PROCESS FOR MAKING FLUOROPOLYMER COMPOSITES
Anestis L. Logothetis, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 25, 1991, Ser. No. 765,634
Int. Cl.[5] C08K *3/40, 3/04;* B32B *27/00*
U.S. Cl. 524—494 21 Claims

1. A process for the production of a fluoropolymer-fiber composite, comprising:
contacting a fibrous material with an aqueous fluoropolymer dispersion;
precipitating the fluoropolymer from said dispersion to form a structure of fluoropolymer particles dispersed on said fibrous material;
drying said structure; and
consolidating said structure by heating to a high enough temperature and applying sufficient pressure for a sufficient amount of time to form said structure into a solid shaped article.

5,194,485
RUBBER COMPOSITION FOR TIRE TREAD
Yasushi Kikuchi, Odawara; Masayoshi Dalo, Hiratsuka; Kazuyoshi Kayama, Yokohama; Hideyuki Oishi, Hiratsuka; Shuichi Akita, Yokohama, and Fumitoshi Suzuki, Yokohama, all of Japan, assignors to The Yokohama Rubber Co., Ltd. and Nippon Zeon Co., Ltd., both of Tokyo, Japan
Continuation of Ser. No. 471,443, Jan. 29, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 770,033
Claims priority, application Japan, Jan. 30, 1989, 1-17525
Int. Cl.[5] C08K *3/04;* C08L *9/06*
U.S. Cl. 524—526 5 Claims

1. A rubber composition for tire treads, which comprises 100 parts by weight of a rubber component comprising 10 to less than 100 parts by weight of a styrene-butadiene copolymer rubber (A) produced by solution polymerization and up to 90 parts by weight of a styrene-butadiene copolymer rubber (B) produced by an emulsion polymerization, and at least 70 parts by weight of a carbon black mixed in the rubber component, said styrene-butadiene copolymer rubber (A) consisting essentially of a styrene content of 45 to 65% by weight, a content of butadiene-derived vinyl groups of 20 to 70% by weight, and a content of a styrene sequence consisting of not less than 8 bonded styrene monomer units of up to 10% by weight of the above styrene content, said styrene-butadiene copolymer rubber (B) having a glass transition temperature of −60° C or above and a styrene content of 20 to 65% by weight.

5,194,486
ADHESIVE
Eli Levine, Union; Herbert L. Wolfson, Baldwin, and Alvin H. Silverberg, East Brunswick, all of N.J., assignors to H & N Chemical Company, N.J.
Continuation-in-part of Ser. No. 562,435, Aug. 2, 1990, abandoned, which is a continuation of Ser. No. 364,006, Jun. 9, 1989, abandoned. This application Nov. 6, 1990, Ser. No. 609,591
Int. Cl.[5] C08L *33/08, 61/20;* C08J *3/24;* C08F *2/06*
U.S. Cl. 524—556 25 Claims

1. A pressure sensitive adhesive composition comprising:
(a) an organic solvent; and
(b) interpolymers having a glass transition temperature of less than −10° C. comprising at least 40% (by weight of the interpolymer) of alkyl acrylate monomers, at least some of said interpolymers having had polymerized into their molecules an internal crosslinking monomer having an ethylenically unsaturated group and a functionality which subsequently forms a direct covalent bond to an adjacent polymeric segment;
wherein solids of said adhesive composition have a Williams Plasticity Number (measured in the absence of external crosslinking agents) of less than 1.2;
wherein said interpolymers result from a polymerization reaction which includes addition of a delayed reactant mixture after initiation of polymerization, said mixture comprising additional acrylic monomers and more than 7% of a chain transfer solvent (by weight of polymerizable materials in said mixture), said delayed reactant mixture being present, in whole or in part, for a period greater than 20% of the total reaction time, and wherein the total amount of chain transfer solvent charged before polymerization is terminated exceeds 7% (by total weight of polymerizable material charged during polymerization).

5,194,487
TWO-COMPONENT AQUEOUS POLYURETHANE DISPERSIONS WITH REDUCED SOLVENT CONTENT AND COATINGS PREPARED THEREFROM WITH IMPROVED GLOSS
Patricia B. Jacobs, Pittsburgh, Pa., assignor to Miles Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 643,615, Jan. 22, 1991, abandoned. This application Aug. 14, 1992, Ser. No. 930,099
Int. Cl.[5] C08L *75/12;* C08G *18/64*
U.S. Cl. 524—591 20 Claims

1. A two-component, aqueous polyurethane coating composition which may be cured at ambient temperature and which contains
I) an isocyanate-reactive component comprising
A) an aqueously dispersed polyurethane wherein said polyurethane has
a) an average hydroxy functionality of at least 1.8,
b) a total content of urethane and urea groups, calculated as —NH—CO—, of 9 to 20% by weight, based on the weight of said polyurethane,
c) 0 to 200 milliequivalents of chemically incorporated anionic groups per 100 g of polyurethane and
d) 0 to 25% by weight, based on the weight of said polyurethane, of ethylene oxide units incorporated within terminal and/or lateral polyether chains,
wherein c) and d) are present in an amount which is sufficient to maintain the polyurethane stably dispersed in water, and
B) 2 to 20%, based on the weight of components I and II, of a polyol which has a molecular weight of 62 to 1000 and may contain ether groups and
II) a water dispersible polyisocyanate wherein said polyisocyanate has
a) an isocyanate content of 2 to 30% by weight, based on the weight of the polyisocyanate,
b) an average functionality of at least 1.8,
c) 0 to 200 milliequivalents of chemically incorporated anionic groups per 100 g of polyisocyanate and
d) 0 to 25% by weight, based on the weight of said polyisocyanate, of ethylene oxide units incorporated within terminal and/or lateral polyether chains,
wherein c) and d) are present in an amount which is sufficient to maintain said polyisocyanate stably dispersed in water, and
components I and II are present in an amount sufficient to provide an equivalent ratio of isocyanate groups to hydroxyl groups of 0.8:1 to 6:1.

5,194,488
TWO COMPONENT POLYURETHANE SEALANT
Gerhard Piestert, Schwetzingen, and Bodo Müller, Würzburg, both of Fed. Rep. of Germany, assignors to Bostik, Inc., Middleton, Mass.
Filed Sep. 10, 1991, Ser. No. 758,876
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1990, 4028704
Int. Cl.[5] C08L *1/02, 3/02, 99/00;* C08G *18/28*
U.S. Cl. 524—703 13 Claims

1. A two-component polyurethane sealant for the direct glazing of motor vehicles, comprising (A) a pasty polyurethane component comprising a polyurethane prepolymer having free isocyanate groups, and a curing agent, and (B) a pasty water-containing component, wherein component (A) contains a blocked curing agent which can be liberated by water, and component (B) contains water, reversibly bonded to a carrier substance which liberates the water in a delayed manner after components (A) and (B) have been mixed, and wherein said carrier substance of component (B) is selected from the group consisting of ground cellulose, starch and cork.

5,194,489
ORGANOPOLYSILOXANE COMPOSITION CONTAINING A CYCLOPENTENYL RADICAL AND CROSSLINKABLE TO GIVE AN ELASTOMER
Jean-Marc Frances, Villeurbanne, and Frederic Loising, Meyrant, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Nov. 21, 1990, Ser. No. 616,920
Claims priority, application France, Nov. 21, 1989, 89 15528
Int. Cl.[5] C08K *5/24*
U.S. Cl. 524—731 11 Claims

1. An organopolysiloxane composition which is stable on storage in the absence of gaseous oxygen and is crosslinkable to an elastomer in the presence of gaseous oxygen comprising:
(A) 100 parts of at least one diorganopolysiloxane containing at least 3 cyclopentenyl radicals per molecule, each of these radicals being directly linked to a different silicon atom,
(B) a catalytically effective amount of a metallic hardening catalyst capable of crosslinking said diorganopolysiloxane (A), and
(C) 0 to 250 parts of an inorganic filler
said organopolysiloxane composition including no hydrogen atoms linked to silicon atoms.

5,194,490
PREPARATION PROCESS OF POLYMERIC SOLID ELECTROLYTE
Masanobu Sugo; Hiroshi Kobayashi; Nobuyuki Kuroda, all of Yokohama; Kazuo Matsuura, Ota, and Seiichi Akita, Fujisawa, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1991, Ser. No. 668,889
Claims priority, application Japan, Mar. 15, 1990, 2-062685; Jan. 18, 1991, 3-016893; Jan. 21, 1991, 3-019158
Int. Cl.[5] C08K *5/06;* H01M *6/18*
U.S. Cl. 524—755 24 Claims

1. A process of preparing a polymeric solid electrolyte com-

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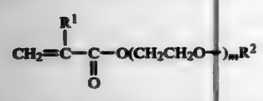
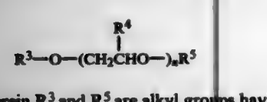
prising polymerizing a mixture of component A and component B, at least one of which contains an alkali metal salt and/or an ammonium salt; the component A being a solution obtained by dissolving a radical polymerization promotor in a compound represented by the formula (1)



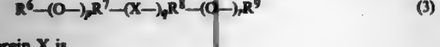
(1)

wherein R^1 is a hydrogen atom or an alkyl group having from 1 to 5 carbon atoms, R^2 is a alkyl group having from 1 to 5 carbon toms, and m is an integer of $2 \leqq m \leqq 30$; the component B being a solution obtained by dissolving a radical polymerization initiator in a compound represented by the formula (2):



(2)

wherein R^3 and R^5 are alkyl groups having from 1 to 5 carbon atoms, R^4 is a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms, and n is an integer of $2 \leqq n \leqq 30$, and/or in a compound represented by the formula (3):



(3)

wherein X is

R^6 is a hydrocarbon group having from 1 to 6 carbon atoms, R^7 and R^8 are single bonds or divalent hydrocarbon groups having from 1 to 3 carbon atoms, R^9 is a hydrocarbon group having from 1 to 6 carbon atoms or a cyano group, R^6 and R^9 may be connected with each other from a ring, and p, q and r are individually 0 or 1 $p+q+r>0$, R^9 is cyano exclusive.

5,194,491

PROCESS FOR PRODUCING RUBBER-MODIFIED STYRENE RESIN, AND RESIN COMPOSITION

Takaaki Sakita; Minoru Uchida; Tetsuo Hayase, and Hiromitsu Hatakeyama, all of Yokkaichi, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed May 24, 1990, Ser. No. 527,947

Claims priority, application Japan, May 30, 1989, 1-134756; May 30, 1989, 1-134757

Int. Cl.[5] C08L 51/04; B01J 8/10

U.S. Cl. 525—53 7 Claims

1. A process for continuously producing a rubber-modified styrene resin containing substantially no rubber polymer having a density of not higher than 0.96 gm/cm^3 at 25° C., which comprises continuously supplying a feed solution composed of 80 to 97% by weight of a styrene monomer and 3 to 20% by weight of a rubber polymer to a first perfect mixing reactor and subjecting it to a polymerization, while continuously supplying a feed composed mainly of a styrene monomer to a second reactor useful for a polymerization reaction and subjecting it to a polymerization reaction, introducing the products continuously withdrawn from the first and second reactors, respectively, into a mixer and mixing them, introducing the product continuously withdrawn from the mixer into a plug-flow reactor to increase the conversion by polymerization, and then devolatilizing unreacted monomers from the reaction product, wherein the rubber polymer in the product withdrawn from the mixer is already in a particulate form, but up to the exit of the mixer, the polymerization proceeds only to such an extent that the conversion by polymerization of monomers to polymer does not exceed 30% as measured at the exit of the mixer, said plug-flow reactor consisting of a single reactor or a plurality of reactors connected in series and having a plug-flow characteristic corresponding to at least 15 vessels in a model series of perfect mixing vessels, and in this plug-flow reactor, the polymerization proceeds to conversion to polymer within a range of from 85–95%, with the provisos that:

(a) the first perfect mixing reactor permits the feed solution to be maintained in a substantially uniform mixed state in the reactor,

(b) the residence time in the mixer is adjusted to be shorter than the residence time of the reaction solution in the first reactor,

(c) the ratio of the flows from the two reactors is within a range of from 3:1 to 1:3, and

(d) the polymerization solutions from the first and second reactors are thoroughly mixed in the mixer, whereby uniform rubber particles will finally be formed under a stabilized condition.

5,194,492

TWO-PHASE PROCESS FOR PREPARING POLY(VINYL ALCOHOL)-CO-POLY(VINYLAMINE)

Robert K. Pinschmidt, Jr., and Ta-Wang Lai, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 181,887, Apr. 15, 1988. This application Jan. 2, 1992, Ser. No. 816,196

Int. Cl.[5] C08F 8/00

U.S. Cl. 525—60 9 Claims

1. A method for making a poly(vinyl alcohol)-co-poly(-vinylamine) which comprises

(a) continuously feeding vinyl acetate monomer and N-vinyl formamide monomer into a reaction mixture in a reaction vessel,

(b) copolymerizing the vinyl acetate and N-vinyl formamide monomers to yield poly(vinyl acetate)-co-poly(N-vinyl formamide) in the reaction mixture,

(c) continuously withdrawing from the reaction vessel reaction mixture containing the poly(vinyl acetate)-co-poly(N-vinyl formamide),

(d) hydrolyzing the acetate functionality of the poly(vinyl acetate)-co-poly(N-vinyl formamide) in a methanolic medium to yield poly(vinyl alcohol)-co-poly(N-vinyl formamide) as a gel swollen with methanol and methyl acetate,

(e) comminuting the gel to a particulate copolymer product, and

(f) hydrolyzing the copolymer particles as a slurry in methanol under acid or base conditions to yield poly(vinyl alcohol)-co-poly(vinylamine) particles.

5,194,493

POLYMER POLYOL COMPOSITION CONTAINING A GRAFTED POLYOL-POLYACRYLATE DISPERSANT

John E. Hayes, 1102 S. Dolton Crt., Wilmington, Del. 19810, and Robert G. Gastinger, 904 Thistle La., West Chester, Pa. 19380

Continuation of Ser. No. 366,997, Jun. 16, 1989, abandoned. This application Nov. 7, 1991, Ser. No. 789,215

Int. Cl.[5] C08L 25/06, 25/12, 75/08, 71/02

U.S. Cl. 525—63 14 Claims

1. A sable polymer polyol composition comprising a continuous phase, a disperse phase within the continuous phase, and a grafted polyol-polyacrylate dispersant wherein:

(A) the disperse phase is a plurality of vinyl polymer particles;

(B) the continuous phase is a first polyoxyalkylene polyol; and

(C) the grafted polyol-polyacrylate dispersant is comprised of

(a) a random copolymer soluble in the continuous phase, of

(i) an isocyanate vinyl monomer; and

(ii) an acrylate monomer; and

(b) a second polyoxyalkylen polyol; wherein the random copolymer and the second polyoxyalkylene polyol are connected through at least one urethane graft site and wherein the grafted polyol-polyacrylate dispersant is employed in an amount effective to enhance the stability of the resulting polymer polyol composition as compared to the stability of the polymer polyol composition in the absence of the grafted polyol-polyacrylate dispersant.

5,194,494

HEAT RESISTANT THERMOPLASTIC POLYMER BLENDS

David E. Henton; Duane M. Nosger; F. Michael Plaver, all of Midland, Mich., and Robert S. Dzal, Naugatuck, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 23, 1990, Ser. No. 484,152

Int. Cl.[5] C08L 75/06

U.S. Cl. 525—66 19 Claims

1. A polymer blend composition comprising (A) from about 20 to about 65 weight percent of a rubber modified monovinylidene aromatic/ethylenically unsaturated nitrile/N-arylmaleimide copolymer which contains, on a rubber modified copolymer weight basis, from about 3 to about 40 weight percent of dispersed rubbery polymer particles and (B) from about 35 to about 80 weight percent of an elastomeric polyester-based thermoplastic polyurethane having a polycaprolactone or polybutylene adipate-based soft segment content of at least about 50 weight percent on an elastomeric thermoplastic polyurethane weight basis and having a Shore Hardness rating of less than 90 on the A scale.

5,194,495

PIGMENTED POLYCARBONATE COMPOSITION HAVING HIGH IMPACT STRENGTH AND GOOD COSMETICS

Charles E. Lundy, Krefeld-Uerdingen, Fed. Rep. of Germany; Douglas G. Powell, Carnegie, and Sivaram Krishnan, Pittsburgh, both of Pa., assignors to Miles Inc., Pittsburgh, Pa.

Continuation of Ser. No. 638,464, Jan. 7, 1991, abandoned. This application Jul. 24, 1992, Ser. No. 919,617

Int. Cl.[5] C08L 69/00, 55/02, 23/26

U.S. Cl. 525—67 10 Claims

1. A pigmented thermoplastic molding composition comprising

(i) about 94 to 98 percent of an aromatic polycarbonate,

(ii) about 2 to 6 percent of ABS resin having

a) a butadiene-based backbone characterized in having a butadiene content of about 35 and 85 percent relative to the weight of said ABS and wherein backbone has a particle size of about 0.05 to 5 microns and

b) a grafted phase polymerized in the presence of said backbone, said phase containing a first group of monomers which comprise monovinyl aromatic hydrocarbon and a second group of monomers comprising acrylonitrile and/or acrylic acid esters, and

(iii) about 2 to 6 percent of a grafted olefinic copolymer, wherein said grafted olefinic copolymer is a graft polymer of one or more unsaturated dicarboxylic acid or the anhydride of said acid on an olefinic copolymer backbone having a weight average molecular weight of about 25,000 to 500,000, and a glass transition temperature below −30° C., and

(iv) at least one member selected from the group consisting of pigments and dyes.

5,194,496

COMPOSITIONS OF POLYPHENYLENE OXIDE OR MIXTURES OF POLYPHENYLENE OXIDE STABILIZED WITH COMPOUNDS CONTAINING A TRIPLE ACETYLENIC BOND

Andrea Canavesi, Paullo; Giorgio D. Fortuna, Milan, and Giovanni Zannetti, San Giuliano Milanese, all of Italy, assignors to ECP Enichem Polimeri S.r.l., Milan, Italy

Filed Oct. 8, 1991, Ser. No. 774,515

Claims priority, application Italy, Oct. 10, 1990, 21698 A/90

Int. Cl.[5] C08L 71/12

U.S. Cl. 525—68 13 Claims

1. Polymeric compositions based on at least one polyphenylene ether (PPE) obtained from the (co)polymerization by oxidative coupling of one or more substituted phenols, either alone or blended with at least one (co)polymer of styrene, characterized by the fact that they contain at least one compound having the structural formula

R—C≡C—COOH (I)

where R is respectively, an alkylic radical containing from 1 to 6 carbon atoms, an arylic radical, an alkylarylic radical a cycloalkylic radical containing from 5 to 7 carbon atoms in the ring a haloalkylic or a haloarylic radical.

5,194,497

ALLOYS OF THERMOPLASTIC POLYMERS CONTAINING OXETANYL GROUPS

Karl-Erwin Piejko, Bergisch Gladbach; Gerd Fengler, Krefeld; Holger Lütjens, Cologne; Hans-Eberhard Braese, Cologne; Christian Lindner, Cologne, and Jürgen Kirsch, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 489,988, Jan. 2, 1990, abandoned. This application Mar. 15, 1991, Ser. No. 670,045

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1989, 3901030

Int. Cl.[5] C08L 37/00

U.S. Cl. 525—75 3 Claims

1. A thermoplastic molding composition of:

1) 1–99% by weight of resin-like copolymer containing 1 to 50% by weight of monomers corresponding to the formula (I)

(I)

in which

R^1=H, CH_3

R^2=C_{1-6} alkylene

R^3=C_{1-4} alkyl

and vinyl monomers selected from the group consisting of styrene, α-methylstyrene, acrylonitrile, methacrylonitrile, carboxylic acid C_{1-4} vinyl esters, acrylates, methacrylates, maleic acid derivatives, vinyl chloride, vinylidene chloride, and mixtures thereof, and

2) 99-1% by weight of a thermoplastic polymer selected from the group consisting of polystyrene, polymethyl methacrylate, polyvinyl chloride, styrene/acrylonitrile copolymers, α-methylstyrene/acrylonitrile copolymers, α-methylstyrene/acrylonitrile/methyl methacrylate copolymers, graft polymers of vinyl monomers on a rubber base, natural rubber, olefin rubbers, ethylene vinyl acetate

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copolymers, acrylate rubber, and diene/styrene block polymers and hydrogenation products thereof.

5,194,498

POLY(VINYL CHLORIDE) BLENDS AND ADDITIVES THEREFOR

Janis C. Stevenson, Langhorne, and Hsing-Yeh Parker, Holland, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 9, 1991, Ser. No. 756,733
Int. Cl.[5] C08L *27/06*
U.S. Cl. 525—81 **19 Claims**

1. A core/shell polymer comprising:

A) a core of a polymer containing at least about 80 weight percent of units derived from a higher alkyl (meth)acrylate, the higher alkyl group containing from four to twelve carbon atoms, the core polymer not containing units derived from a graft linking or crosslinking monomer, and the core polymer not being deliberately crosslinked;

B) an intermediate stage of a crosslinked polymer, the crosslinked polymer containing:

1) at least about 90 weight percent of units derived one or more of vinyl aromatic monomers or alkyl esters of (meth)acrylic acid, wherein the alkyl esters are derived from alcohols of from one to four carbon atoms,

2) from about 0.5 to about 10 weight percent of units derived from at least one of:

a) a multifunctional monomer containing two or more copolymerizable double bonds; or

b) an alkali, alkaline earth, or transition metal salt of a copolymerizable unsaturated acid;

C) a final shell stage of a polymer containing at least about 70 weight percent of units derived from one or more of vinyl aromatic monomers or lower alkyl esters of methacrylic acid, wherein the lower alkyl esters are derived from alcohols of from one to four carbon atoms.

5,194,499

POLYMERIZING DIENE BLOCK COPOLYMER IN PRESENCE OF RUBBER

William L. Hergenrother, Akron, Ohio, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 242,028, Sep. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 36,768, Apr. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 766,329, Aug. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 527,055, Aug. 29, 1983, abandoned. This application Jul. 11, 1990, Ser. No. 551,547
Int. Cl.[5] C08L *53/00, 53/02*
U.S. Cl. 525—91 **12 Claims**

1. A process for preparing free flowing pellets of thermosetting resin comprising the steps of:

polymerizing in the presence of a polymerization solvent the A forming component of a peroxide curable, tacky, cold flowing block copolymer AB, selected from the group consisting of conjugated dienes and mixtures thereof with monomers selected from the group consisting of vinyl substituted aromatic monomers, aliphatic, aromatic and cycloaliphatic oxide and sulfide monomers, to form an active block;

end capping said active block with a polyisocyanate compound;

forming a solution of a non-cold flowing rubber selected from the group consisting of ethylene-propylene-hexadiene copolymers, natural rubber, styrene-butadiene rubber, other than thermoplastic elastomers of styrene and conjugated dienes butyl rubber, branched high molecular weight high vinyl butadiene rubber, polynorbornene, polypentamer and thermoplastic elastomers of styrene and conjugated dienes;

charging said solution simultaneously with the addition of the B forming component of said block copolymer AB with heat to form a thermosetting resin, said B component being selected from the group consisting of polyamides, polyimides, polyureas, polyurethanes, polyureaurethanes and polyphenolformaldehydes;

removing the polymerization solvent;

forming pellets of said resin, free from cold flow;

subjecting said pellets to a surface treatment whereby a coating is provided to remove tack; and

thereafter separating sid pellets to yield a free flowing thermosetting resin comprising from about 55 to 95 parts by weight of said tacky, cold flowing block copolymer and from about 5 to 45 parts by weight of said non-cold flowing rubber and which upon cure has a flexural modulus of from about 1.7 GPa to about 4.4 GPa.

5,194,500

STYRENE-ISOPRENE THREE-ARMED HIGH LOAD BEARING CAPACITY BLOCK COPOLYMER COMPOSITION FOR ADHESIVES

Steven S. Chin; David J. St. Clair, both of Houston, Tex., and Richard L. Talbott, White Bear Township, Ramsey County, Minn., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 28, 1992, Ser. No. 843,884
Int. Cl.[5] C08L *53/02*
U.S. Cl. 525—97 **6 Claims**

1. A branched three-armed S—I—S block copolymer composition, where S is an alkenyl aromatic hydrocarbon and I is isoprene, comprised of polymeric blocks for use in pressure sensitive adhesives, said block copolymer composition characterized in that

(a) the molecular weight (as polystyrene equivalent) is from 180,000 to 250,000,

(b) the polystyrene content is from 17 to 23% by weight of the block copolymer composition and

(c) the percentage of S—I arms which are load bearing by weight of the block copolymer composition is greater than 85%.

5,194,501

PRESSURE-SENSITIVE ADHESIVE BASED ON ETHYLENICALLY-UNSATURATED α-OLEFIN POLYMER CURED WITH HYDROSILANE

Gaddam N. Babu, Woodbury, and Larry D. Boardman, Shoreview, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 30, 1990, Ser. No. 605,653
Int. Cl.[5] C09J *147/00*
U.S. Cl. 525—103 **24 Claims**

1. A pressure-sensitive adhesive comprising a curable blend of an ethylenically-unsaturated α-olefin polymer, a crosslinker having at least 2 hydrosilyl groups, and hydrosilation catalyst, wherein said ethylenically-unsaturated α-olefin polymer has the formula:

$$-(M^1)_x-(M^2)_y-(M^3)_z-$$

wherein:

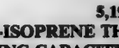
x, y, and z are numbers designating the relative molar amounts of M^1, M^2, and M^3 units that are randomly located in the backbone chain of the polymer such that the polymer has a weight average molecular weight in the range of 30,000 to 3.5 million, x is at least 60 mole % of x+y wherein y can be zero, and z is 0.1 to 10 mole % of x+y+z;

M^1 is an ethanediyl repeat unit of the polymer each having at least one pendant alkyl group having 4 to 12 carbon atoms;

M^2, when present, is different from M^1, and is an ethanediyl repeat unit selected from 1) ethylene, 2) units having a pendant hydrocarbyl group selected from linear or branched alkyl groups having 1 to 18 carbon atoms, and

cyclic and aryl pendant groups having 5 to 18 carbon atoms, and 3) 1,2-cyclopentylene and 1,2-cyclohexylene groups having 5 to 18 carbon atoms; and

M^3 is an ethanediyl repeat unit having a pendant ethylenically unsaturated aliphatic or aryl group selected from the group consisting of 1) linear and branched mono- and polyethylenically unsaturated hydrocarbyl groups having 3 to 18 carbon atoms, 2) cyclic mono- and polyethylenically-unsaturated aliphatic groups having 5 to 18 carbon atoms, 3) aryl groups substituted by mono- or polyethylenically-unsaturated groups having a total of 7 to 18 carbon atoms, and 4) cycloalkenylene groups having 6 to 18 carbon atoms, wherein the cyclic group has at least 6 carbon atoms in the ring, provided that the ethylenically-unsaturated moiety



is not bonded directly to a backbone carbon atom.

5,194,502

EPOXY RESIN, URETHANE-MODIFIED EPOXY RESIN AND CARBOXYLATED POLYESTER

Atsushi Saito, Nishinomiya, and Yoshiya Hattori, Kyoto, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Nov. 20, 1991, Ser. No. 794,886
Claims priority, application Japan, Nov. 20, 1990, 2-317192
Int. Cl.[5] C08L *63/02, 9/02*
U.S. Cl. 525—111 **4 Claims**

1. A one-pack epoxy structural adhesive for automobiles which comprises

100 parts by weight of a mixture of a bisphenol epoxy resin and an urethane-modified epoxy resin as an epoxy resin component,

10 to 300 parts by weight of a polyester resin having carboxyl groups at its termini, and

0.1 to 30 parts by weight of a latent curing agent.

5,194,503

NON-ISOCYANATE FLEXIBILIZER FOR COATINGS

Gerald L. Baje, Perrysburg; Thomas E. Noseworthy, Waterville, and James M. Cameron, Toledo, all of Ohio, assignors to BASF Corporation, Parsippany, N.J.

Filed Jul. 7, 1992, Ser. No. 909,894
Int. Cl.[5] C08L *75/00*
U.S. Cl. 525—123 **9 Claims**

1. A non-isocyanate functional flexibilizer having the formula: ps

B-C(O)-NW-A-NX-C(O)-K

wherein A is selected from the group consisting of polyesters, polyamides, polyureas, polyurethanes, acrylics; biuret, allophonate and urethane extended polyesters; wherein B and K are selected from the group consisting of —OR and —Z—R'-SiOR''$_{(3-n)}$ R''''$_n$ wherein R' is a divalent lower alkyl radical of from 1 to 18 carbon atoms, R is a lower alkyl radical of from 1 to 18 carbon atoms, Z is a member selected from the group consisting of S and NR'', w and x are selected from H, and lower alkyl radicals of from 1 to 10 carbon atoms wherein R'', R'' and R'''' are H or a lower alkyl radical of from 1–18 carbon atoms, and wherein n is 0, 1 or 2.

5,194,504

ANTI-FOULING CASTABLE POLYMERS AND ANTI-FOULING POLYURETHANES AND SIMILAR MATERIALS

Alexander Lebovits, Baltimore; William L. Yonger, Queen Anne; William B. Mercer, Annapolis, and Timothy L. Dapp, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 239,351, Sep. 1, 1988, Pat. No. 4,996,261. This application Jan. 16, 1991, Ser. No. 641,836
Int. Cl.[5] C08L *75/04*
U.S. Cl. 525—131 **16 Claims**

1. A process for preparing a structural antifouling polymeric composition consisting of:

(a) purifying an organotin compound selected from the group consisting of bis (tri-alkyltin) oxide, bis (tri-aryltin) oxide, bis (tri-cycloalkyltin) oxide, and tri-cycloalkyltin hydroxide by distillation or other suitable process to at least about 98% purity,

(b) synthesizing a copolymer by the copolymerization of monomers selected from the group consisting of esters of acrylic acid and esters of methacrylic acid with monomers selected from the group consisting of acrylic acid and methacrylic acid,

(c) reacting said organotin compound of (a) with said copolymer of (b) to form a polymeric tin-containing ester and choosing the proportions of (a) and (b) so that less than about 4% of the carboxyl groups of (b) remain unreacted, and

(d) mixing the reaction product of (c) with

(1) isocyanates selected from the group consisting of polyisocyanates of from about 500 to about 5000 molecular weight, and mixtures thereof, and polythioisocyanates of from about 500 to about 5000 molecular weight, and mixtures thereof, wherein said polyisocyanates and polythioisocyanates are reactive with more than one group selected from the group consisting of hydroxyl groups, amino groups and a combination thereof, and

(2) active hydrogen containing compounds having in the same molecule more than one functional group selected from the group consisting of hydroxyl, amino, carboxyl, water and mixtures thereof, wherein said active hydrogen containing compounds are reactive with isocyanates and thioisocyanates, and said mixture being done with an amount of reaction product of (c) to impart antifouling properties to the final composition.

5,194,505

CHLOROSULFONATED POLYOLEFIN-MODIFIED POLYURETHANE AND POLYUREA COMPOSITIONS AND PROCESS FOR MAKING SAME

Edward G. Brugel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 415,163, Sep. 29, 1989, abandoned. This application Nov. 8, 1991, Ser. No. 789,686
Int. Cl.[5] C08F *8/20, 259/02, 273/00*; C08L *75/00*
U.S. Cl. 525—131 **12 Claims**

1. A substantially hydrophobic chlorosulfonated olefin polymer resin composition comprising the reaction product of:

a) 10–80% by weight, based on the weight of the resin, of a chlorosulfonated olefin polymer having a chlorine content of about 20–60% by weight and a sulfur content of 0.5–10% by weight;

b) 5–90% by weight, based on the weight of the resin, of a compound selected from the group consisting of polyols, hydrocarbon primary or secondary polyamines, and condensation products of said polyamines with aliphatic, cycloaliphatic, or aromatic polycarboxylic acids, and mixtures thereof, wherein the equivalent ratio of the compound to sulfur present in the chlorosulfonated olefin polymer is greater than 1:1, and the compound has an equivalent weight up to 5,000; and with

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c) at least 5% by weight, based on the weight of the resin, of a polyisocyanate.

5,194,506

POLYETHYLENE TEREPHTHALATE COMPOSITIONS WITH ARYLENE SULFIDE RANDOM COPOLYMERS

Howard F. Efner; Michael C. Yu, and Ray D. Ramsay, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1990, Ser. No. 630,920
Int. Cl.[5] C08L 67/02
U.S. Cl. 525—166 7 Claims

1. A composition comprising:
(a) polyethylene terephthalate;
(b) filler;
(c) an arylene sulfide copolymer having from about 1 to about 25 mole percent of at least one meta-substituted dihalo-aromatic comonomer;
(d) an aliphatic polyester having a number average molecular weight in the range from about 7,500 to about 20,000 and which is a condensation product of an alkanedioic acid containing from 8 to about 12 carbon atoms per molecule and an alkanediol containing from 2 to about 5 carbon atoms per molecule;
(e) a metal salt of an ionic hydrocarbon copolymer of an alpha-olefin containing from 2 to about 5 carbon atoms per molecule and an alpha,beta-ethylenically unsaturated carboxylic acid containing from 3 to about 5 carbon atoms per molecule in which copolymer the neutralized anionic carboxyl groups are associated with cations of said metal, said copolymer having a number average molecular weight in excess of about 3,000 prior to neutralization, said metal being selected from the group consisting of sodium and potassium; and
(f) an antioxidant.

5,194,507

Patent Not Issued For This Number

5,194,508

MACROMERS OF VINYLIDENE FLUORIDE. ACRYLATE-TERMINATED POLY(VINYLIDENE FLUORIDE) AND ITS COPOLYMERIC THERMOPLASTIC ELASTOMERS

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

Filed Apr. 7, 1992, Ser. No. 864,753
Int. Cl.[5] C08F 259/08
U.S. Cl. 525—276 6 Claims

1. A macromolecular monomer of poly(vinylidene fluoride) having the formula

wherein said A represents the repeat unit (CH_2CF_2), which is present in any orientation within the chain, either head to tail, head to head, or both; wherein R^1 represents H or CH_3; and wherein n is from about 8 to about 300.

5,194,509

PEROXIDE-FREE GRAFTING OF HOMOPOLYMERS AND COPOLYMERS OF ETHYLENE HAVING DENSITIES EQUAL TO OR GREATER THAN 0.930 G/CM3, AND USE OF THE GRAFT COPOLYMERS FOR THE PREPARATION OF IONOMERS OF ADHESION PROMOTERS

Norbert Hasenbein, Dirnstein; Peter Bauer, Ludwigshafen; Lothar Schlemmer, Maxdorf; Alfred F. Haase; Hans Gropper, both of Ludwigshafen, and Rainer Ohlinger, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 384,905, Jul. 25, 1989, abandoned, which is a continuation of Ser. No. 116,864, Nov. 5, 1987, abandoned. This application Oct. 30, 1990, Ser. No. 605,134
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639564
The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.
Int. Cl.[5] C08F 267/04
U.S. Cl. 525—285 4 Claims

1. A process for grafting monomeric compounds selected from the group consisting of ethylenically unsaturated carboxylic acids having from 3 to 6 carbon atoms and anhydrides thereof onto a homopolymer or copolymer of ethylene having a density equal to or greater than 0.930 g/cm^3 in a conventional extruder under from 1 to 500 bar in the absence of a free radical catalyst or any other graft-initiating additive, wherein the monomer to be grafted is mixed, in a concentration of from 0.01 to 0.20% by weight, based on the ethylene polymer, with the ethylene polymer which has been melted at 140° C. or higher, and wherein the grafting reaction is carried out at a temperature of from 210° to 300° C. and the monomer is essentially completely converted to grafted polymer product.

5,194,510

THERMOPLASTIC ELASTOMERS

Doan A. DuBois, and Carl L. Willis, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 21, 1990, Ser. No. 525,812
Int. Cl.[5] C08F 297/02
U.S. Cl. 525—299 2 Claims

1. A block polymer comprising (1) two blocks of at least 80% by mole polymerized styrene, (2) an internal block of at least 90% by mole hydrogenated butadiene having at least some 1,2-configuration, and (3) a terminal block of polymerized t-butyl methacrylate polymerized through the ethylenic unsaturation thereof, wherein the block copolymer has the formula

A—B—A—C

wherein each A is one of the blocks of the polymerized aromatic styrene, B is the internal block of the hydrogenated, polymerized butadiene, and C is the terminal block of the polymerized t-butyl methacrylate, and wherein each block of the polymerized styrene has a number average molecular weight from about 5,000 to about 50,000, the internal block of the hydrogenated, polymerized butadiene has a number average molecular weight from about 20,000 to about 500,000, and block polymer has a stress at break at 100° C. of 180 psi.

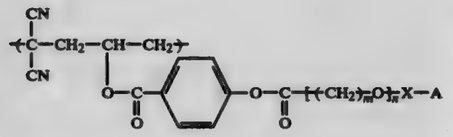
5,194,511

ORGANIC NONLINEAR OPTICAL MATERIALS DERIVED FROM VINYLIDENE CYANIDE-VINYL-P-ACETOXY-BENZOATE COPOLYMERS

Iwao Seo; Masaku Kishimoto; Atsushi Oda, and Kenji Nakajima, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

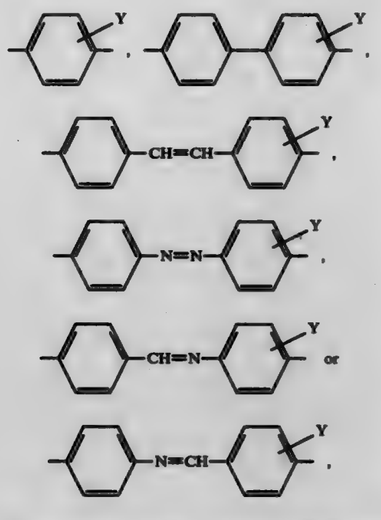
Filed Jan. 31, 1992, Ser. No. 828,575
Claims priority, application Japan, Feb. 6, 1991, 3-035008; Aug. 23, 1991, 3-235627
Int. Cl.[5] C08F 222/34
U.S. Cl. 525—328.4 8 Claims

1. An organic nonlinear optical material which comprises a polymer having the following constitutional units, in amounts of 5 to 100 mole % of (I) and 0 to 95 mole % of (II), and a weight average molecular weight (Mw) of the polymer being 10,000 to 2,000,000

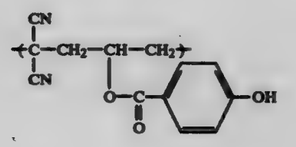


(I)

wherein m represents an integer of 1 to 10, n represents 0 or 1, X represents



where Y represents hydrogen, fluorine, chlorine, bromine, iodine, $—NO_2$, —CN, $—CF_3$ or $—SO_2—C_pH_{2p+1}$, and A represents $—NO_2$, —CN, $—CF_3$ or $—SO_2—C_pH_{2p+1}$ where p represents an integer of 1 to 10,



(II)

5,194,512

SURFACE-MODIFIED POLYACRYLONITRILE SUBSTRATES

Laurence Wu-Kwang Chang, Orange; Larry S. Anderson, Bethel, and David A. Ley, New Canaan, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 507,586, Apr. 13, 1990, which is a continuation-in-part of Ser. No. 349,569, May 8, 1989, abandoned. This application Jul. 1, 1991, Ser. No. 738,986
Int. Cl.[5] C08F 8/22
U.S. Cl. 525—329.1 11 Claims

2. A composition of matter comprising:
a) a core comprising polyacrylonitrile or a copolymer of acrylonitrile and at least one comonomer, and
b) a surface having evenly distributed thereon N-haloamide groups and, optionally, nitrile and amide groups.

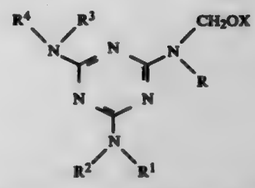
5,194,513

RUBBER COMPOSITIONS CONTAINING A HYDROXY ARYL SUBSTITUTED MALEAMIC ACID

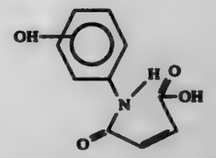
Lawson G. Wideman; Paul H. Sandstrom, both of Tallmadge; George F. Balogh, N. Canton, and Denise J. Keith, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 573,619, Aug. 28, 1990, abandoned. This application Oct. 24, 1991, Ser. No. 783,451
Int. Cl.[5] C08C 19/20, 19/22
U.S. Cl. 525—329.3 11 Claims

1. A vulcanizable rubber composition comprising a sulfur vulcanizable rubber, a vulcanizing agent and a methylene donor selected from the group consisting of (1) hexmethylene teramine, hexamethoxymethyl melamine, lauryloxymethyl pyridinium chloride, ethyloxymethyl pyridinium chloride, trioxan hexamethylolmelamine and paraformaldehyde (2) from the general formula:



where X is an alkyl having from 1 to 8 carbon atoms, R, R^1, R^2, R^3, and R^4 and individually selected from the group consisting of hydrogen, an alkyl having from 1 to 8 carbon atoms, the group $—CH_2OX$ or their condensation products; and (3) hexakis(methoxymethyl)melamine,N,N',N''-trismethyi/N,N',N''-trimethylolmelamine, hexamethylolmelamine,N,N',N''-dimethylolmelamine, N-methylolmelamine, N,N'-dimethylolmelamine, N,N',N''tris(methoxymethyl)melamine and N,N'N''tributyl-N,N',N''tributyl-N,N',N''-trimethylolmelamine; and (b) from about 0.1 to about 10 phr of a methylene acceptor which is a maleamic acid of the formula:



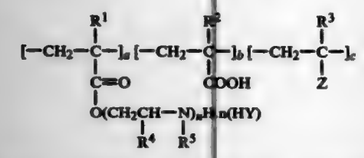
and the weight ratio of methylene donor to the maleamic acid ranges from 1:10 to 10:1.

5,194,514
MICROWAVE TREATMENT OF POLYMER
Jeffrey K. Wan; Mary C. Depew, and Howard C. Ng, all of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada
Filed Aug. 10, 1990, Ser. No. 565,125
Int. Cl.[5] C08F 8/00
U.S. Cl. 525—371 **5 Claims**

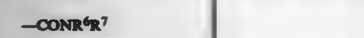
1. A process for increasing the molecular weight of a polyamide or polyolefin polymer having at least one unsubstituted methylene group in the repeating unit thereof, comprising subjecting said polymer to electromagnetic radiation in the presence of a paramagnetic metallic catalyst selected from the group consisting of nickel, iron, and cobalt for a sufficient period of time to increase the molecular weight of the polymer by at least 15%, said polymer being either in solution or in a molten state and said radiation having a frequency in the range of about 0.9 to 10 GHz.

5,194,515
AMPHOTERIC POLYELECTROLITE, METHOD FOR PRODUCTION THEREOF, AND ORGANIC SLUDGE DEHYDRATER
Kazutomo Takahashi, Yokohama; Koichi Yamamoto, Tokyo; Kazuo Kodama, Yokohama; Soiichi Suzuki, Yokohama; Takashi Tazaki, Yokohama; Yutaka Morimoto, Yokohama, and Hideyuki Nishibayashi, Ibaraki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
Filed Feb. 23, 1990, Ser. No. 483,830
Claims priority, application Japan, Feb. 23, 1989, 1-41647; Mar. 2, 1989, 1-48629; Aug. 23, 1989, 1-214941; Aug. 24, 1989, 1-216044; Oct. 3, 1989, 1-257087; Oct. 5, 1989, 1-258732; Jan. 9, 1990, 2-1036; Jan. 12, 1990, 2-3435
Int. Cl.[5] C08F 8/30
U.S. Cl. 525—375 **12 Claims**

1. The method for the production of an amphoteric polyelectrolite represented by the general formula I:


(I)

wherein n is an integer in the range of 1 to 5, providing that the average value of n is not less than 2, a, b, and c stand for proportions such that the sum, a+b+c, is 1 or the sum, a+b, is 1, R^1, R^2, R^3, and R^4 are independently a hydrogen atom or an alkyl group, R^5 is a hydrogen atom, an alkyl group, or an alkyl group substituted with a ω-hydroxy group, HY is a monobasic acid, Z is an amide group represented by the general formula II:


(II)

wherein R^6 and R^7 are independently a hydrogen atom or an alkyl group, a hydroxyalkyl group represented by the general formula III:

(III)

wherein R^8 and R^9 are independently a hydrogen atom or an alkyl group, or a nitrile group represented by the general formula IV:

(IV)

possessing an aminoalkyl group and a carboxyl group, which method comprises either polymerizing in water at least one anionic monomer (i) selected from the group consisting of acrylic acid and methacrylic acid or copolymerizing said anionic monomer (i) with a nonionic monomer (ii), allowing the resultant vinylic carboxylic acid polymer (iii) to be reacted upon by not less than 2 mols, per mol of said anionic monomer (i), or an alkylene imine thereby aminoalkylating said vinylic polymer (iii), and subsequently acidifying the aminoalkylated vinylic carboxylic acid polymer (iii) with a dibasic acid wherein said reaction with said resultant vinylic carboxylic acid polymer occurs at a temperature not exceeding 65° C.

5,194,516
PROCESS FOR MODIFYING VISOSITY OF ETHYLENE COPOLYMERS
John R. Fisher, Hockessin; Jerald R. Harrell; Wolfgang Hoseberg, both of Wilmington, all of Del., and John W. Paul, Beaumont, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 1, 1991, Ser. No. 769,603
Int. Cl.[5] C08F 220/12, 6/26
U.S. Cl. 525—387 **12 Claims**

1. A process for increasing the viscosity of a copolymer selected from the group consisting of copolymers of

a) ethylene and a comonomer selected from the group consisting of C_1–C_8 alkyl esters of acrylic acid and C_1–C_8 alkyl esters of methacrylic acid, and

b) ethylene, a vinyl ester of a C_2–C_4 carboxylic acid, and another comonomer, wherein the other comonomer is carbon monoxide, acrylic acid, methacrylic acid, or a glycidyl ester of acrylic or methacrylic acid,

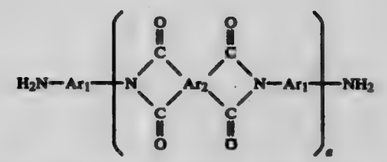
said copolymer having a melt index of 20–150 g/10 minutes, which comprises treating said copolymer with a free radical generating agent in an amount sufficient to decrease the melt index of the copolymer to 0.1–15 g/10 minutes while producing a copolymer product having a gel content of less than 3% as determined by measurement of % insolubles in boiling xylene.

5,194,517
CAPPED POLYPHENYLENE ETHER FOR HIGH IMPACT BLENDS AND METHOD OF PREPARATION
James C. Blubaugh, Albany; Sterling B. Brown, Schenectady; Patrick R. Dudley, Clifton Park, and John B. Yates, III, Glenmont, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.
Filed Dec. 27, 1990, Ser. No. 634,578
Int. Cl.[5] C08L 71/12; C08F 6/08
U.S. Cl. 525—396 **4 Claims**

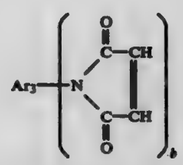
1. A capped polyphenylene ether having a level of materials, selected from the group consisting of alkali metal ions and ammonium ions each no higher than about 150 ppm.

5,194,518
THERMOSETTING RESIN COMPOSITION COMPRISING PERFLUORO CONTAINING AMINE TERMINATED OLIGOMER AND POLYMALEIMIDE
Mitsuyoshi Shirai; Yasuo Kihara; Michiharu Yamamoto, and Tadashi Nishikimi, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan
Continuation of Ser. No. 574,973, Aug. 30, 1990, abandoned. This application May 18, 1992, Ser. No. 884,892
Claims priority, application Japan, Sep. 1, 1989, 1-227750; Jun. 11, 1990, 2-153492
Int. Cl.[5] C08G 73/10
U.S. Cl. 525—426 **5 Claims**

1. A thermosetting resin composition comprising (A) an amine-terminated oligomer represented by formula (I):


(I)

wherein Ar_1 represents a divalent aromatic group, Ar_2 represents a tetravalent aliphatic or aromatic group and a represents an integer of at least 1; and (B) a polymaleimide represented by formula (II):


(II)

wherein Ar_3 represents an aliphatic group having two or more carbon atoms or an aromatic group and b represents an integer of at least 2, provided that at least one group of Ar_1, Ar_2 and Ar_3 in formulae (I) and (II) is a perfluorogroup.

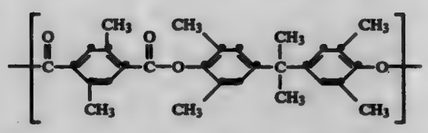
5,194,519
RIGID-ROD GRAFT POLYMERS AND COPOLYMERS
My Dotrong; Robert C. Evers, and George J. Moore, all of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Dec. 6, 1991, Ser. No. 802,928
Int. Cl.[5] C08L 77/00, 77/06
U.S. Cl. 525—434 **14 Claims**

1. A method for preparing 2-(2,6-dimethylphenoxy)terephthalic acid which comprises reacting 2,6-dimethylphenol with potassium t-butoxide in a suitable solvent, reacting the resulting intermediate with 2-nitrodimethylterephthalate and recovering said 2-(2,6-dimethylphenoxy)terephthalic acid.

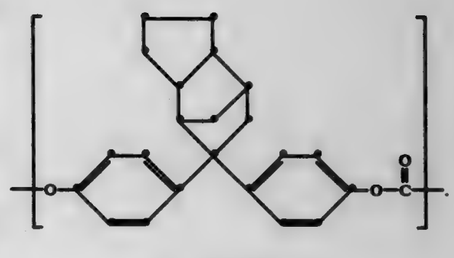
5,194,520
BLEND OF A POLYESTER AND A POLYCARBONATE
Hsiujin Yang, Fairport, and Paul D. Yacobucci, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 22, 1991, Ser. No. 748,367
Int. Cl.[5] C08L 69/00, 67/03
U.S. Cl. 525—439 **3 Claims**

1. A polymeric blend comprising a polyester and a polycarbonate, wherein:

the polyester contains recurring units having the structure



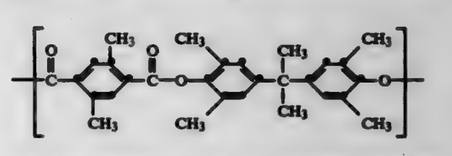
and the polycarbonate contains recurring units having the structure



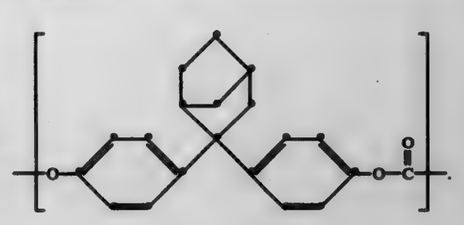
5,194,521
BLEND OF A POLYESTER AND A POLYCARBONATE
Hsiujin Yang, Fairport, and Daniel Y. Paul, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 22, 1991, Ser. No. 748,488
Int. Cl.[5] C08L 69/00, 67/03
U.S. Cl. 525—439 **3 Claims**

1. A polymeric blend comprising a polyester and a polycarbonate, wherein:

the polyester contains recurring units having the structure



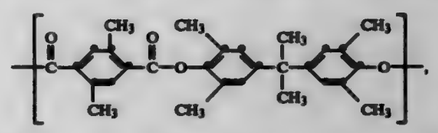
and the polycarbonate contains recurring units having the structure



5,194,522
BLEND OF A POLYESTER AND A POLYCARBONATE
Hsiujin Yang, Fairport, and Paul D. Yacobucci, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 22, 1991, Ser. No. 748,370
Int. Cl.[5] C08L 69/00, 67/03
U.S. Cl. 525—439 **3 Claims**

1. A polymeric blend comprising a polyester and a polycarbonate, wherein:

the polyester contains recurring units having the structure



and the polycarbonate contains recurring units having the structure

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5,194,523
POLYESTER/POLYCARBONATE BLENDS HAVING IMPROVED CLARITY AND IMPACT STRENGTH
James D. Small, Jr., Blountville; Robert W. Seymour, and Thomas E. Flora, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 458,016, Dec. 28, 1989, abandoned. This application May 30, 1991, Ser. No. 707,474
Int. Cl.[5] C08L 67/02, 69/00
U.S. Cl. 525—439 5 Claims

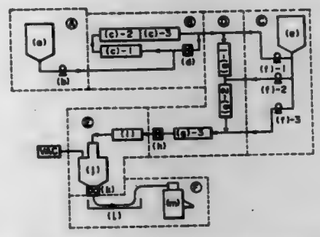
1. A thermoplastic molding composition comprising a compatible blend of
(a) about 10–90% by weight aromatic polycarbonate,
(b) about 10–90% by weight polyester consisting essentially of repeat units from terephthalic acid and 1,4-cyclohexanedimethanol, and
(c) about 1–50% by weight of the copolymeric reaction products of (a) and (b) wherein (a), (b) and (c) total 100% of the blend,
the composition when consisting only of (a), (b) and (c) being clear.

5,194,524
PROCESS FOR MAKING POLY(CARBONATE-SILOXANES) VIA ALKYL AMINO TERMINATED SILICONES
Edward N. Peters, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.
Filed Oct. 5, 1990, Ser. No. 593,704
Int. Cl.[5] C08L 69/00, 83/08
U.S. Cl. 525—464 12 Claims

1. A process for producing a poly(carbonate-siloxane), said process comprising reacting secondary amine functional siloxane with aromatic carbonate polymer.

5,194,525
CONTINUOUS MASS POLYMERIZATION PROCESS FOR MAKING STYRENE COPOLYMERS
Yoshikiyo Miura, and Kyotaro Shimazu, both of Chiba, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Continuation-in-part of Ser. No. 448,627, Dec. 11, 1989, abandoned. This application Aug. 6, 1991, Ser. No. 740,900
Claims priority, application Japan, Dec. 12, 1988, 63-312112
Int. Cl.[5] C08F 2/02, 220/06
U.S. Cl. 526—64 11 Claims

1. A process for producing a styrenic copolymer for injection molding or extrusion molding by continuous mass polymerization comprising the steps of continuously
(A) polymerizing a styrenic monomer and a polymerizable unsaturated fatty acid by feeding them into a polymerization line (I) comprising a tubular reactor (c) with plural mixing elements, said mixing elements having no mobile parts,
(B) refluxing a major part of polymerization liquid which flows out of the polymerization line (I) to an inlet of a non-circulation polymerization line (II), provided in succession to polymerization line (I), having a tubular reactor (g) with plural mixing elements fixed therein and at least two feed openings (f) provided before said tubular reactor (g), said mixing elements having no mobile parts, and
(C) adding to the remainder of the polymerization liquid which is not refluxed about 0.1–7.5 parts by weight of a



solution containing polymerizable unsaturated fatty acid based on 100 parts by weight of the polymerization liquid per each one of said at least two feed openings (f), and
(D) conducting polymerization in the polymerization line (II).

5,194,526
PROCESS FOR PRODUCING STICKY POLYMERS
Fathi D. Hussein, Cross Lanes, and Kin H. Lee, So. Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Jul. 30, 1992, Ser. No. 921,944
Int. Cl.[5] C08F 2/34
U.S. Cl. 526—74 9 Claims

1. In a process for producing sticky polymers in a fluidized bed reactor in which comonomers are polymerized by a transition metal catalyst in the presence of an inert particulate material prone to generate excessive negative charges in said reactor, the improvement comprising conducting said process in the presence of a composition comprising a mixture of an alcohol phosphate salt and a quarternary ammonium salt, said mixture being dissolved in a suitable solvent, said mixture being employed in an amount sufficient to substantially neutralize said negative static charge in said reactor.

5,194,527
PREPARATION OF KETONE CONTAINING PHOTODEGRADABLE POLYMERS
James J. O'Brien; Kevin D. Sikkema, and Duane B. Priddy, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Oct. 31, 1989, Ser. No. 429,575
Int. Cl.[5] C08F 2/00, 216/36
U.S. Cl. 526—75 17 Claims

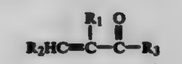
1. A process for preparing polymers comprising pendant ketone functional moieties, the steps of the process comprising exposing a mixture comprising an ethylenically unsaturated addition polymerizable monomer and a β-substituted ketone compound corresponding to the formula:

$$XCH_2—CHR'—C(O)R$$

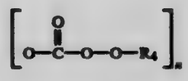
wherein
X is a suitable leaving group,
R' is hydrogen or R; and
R is alkyl or aryl of up to 12 carbons
to vinyl ketone monomer formation conditions to prepare the corresponding vinyl ketone monomer from the β-substituted ketone compound and exposing the resultant mixture to addition polymerization conditions to prepare the polymer.

5,194,528
DIMER REDUCTION
Brian H. A. Smith, Sarnia, and Melvin K. Allison, Wyoming, both of Canada, assignors to Polysar Limited, Sarnia, Canada
Filed Jun. 20, 1989, Ser. No. 369,068
Int. Cl.[5] C08F 4/34, 16/36
U.S. Cl. 526—77 19 Claims

1. A method for reducing the dimer content in a liquid mixture consisting essentially of:
one or more monomers of the formula



wherein
R_1 is a hydrogen atom or a C_{1-4} alkyl radical;
R_2 is a hydrogen atom or a C_{1-4} alkyl radical; and
R_3 is a C_{1-4} alkyl radical or a C_{6-10} aromatic radical; and
dimers thereof;
which comprises contacting said mixture with at least one or more peroxides selected from the group consisting of:
(i) benzoyl peroxide; and
(ii) peroxides of the formula



wherein R_4 is a C_{1-6} branched or straight chain alkyl radical or a C_{6-10} aromatic radical and n is 1 or 2; at a temperature from 0° C. to 45° C. and for a period of time so that the weight percent of residual dimer in said mixture is reduced by at least 20 percent.

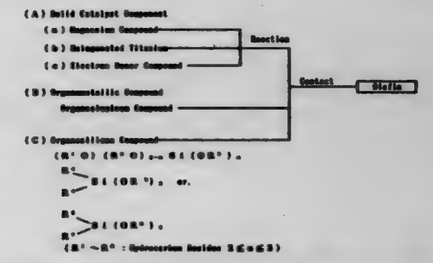
5,194,529
POLYMERIZATION PROCESS
James D. McCullough, Jr., and Isreal G. Borstein, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Oct. 28, 1991, Ser. No. 783,733
Int. Cl.[5] C08F 2/00
U.S. Cl. 526—78 5 Claims

1. In the process of making a change of polymer product type in an ongoing lower α-olefin polymerization process wherein olefin feed, olefin polymerization catalyst and optionally molecular hydrogen are introduced to a polymerization reactor and maintained under polymerization conditions, thereby producing a polymerization product mixture including polymer product, and the polymerization mixture is removed from the reactor and separated to polymer product and other polymerization mixture components which are recycled, the improvement of adding hydrogenation catalyst and molecular hydrogen to the reactor to provide sufficient hydrogen to hydrogenate the major proportion of the unreacted olefin present in the presence of the hydrogenation catalyst, thereby terminating the polymerization process, terminating the activity of the hydrogenation catalyst and producing polymer of changed type upon provision to the reactor of olefin feed appropriate for production of polymer product of changed type.

5,194,530
TERMINATION OF ANIONIC POLYMERIZATION USING HYDROCARBON TERMINATING AGENTS
Craig A. Stevens; Carma J. Gibler, both of Houston; Linda R. Chamberlain, Richmond, and Thomas F. Brownscombe, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 685,111, Apr. 15, 1991, Pat. No. 5,151,475. This application Aug. 17, 1992, Ser. No. 929,747
Int. Cl.[5] C08F 6/06
U.S. Cl. 526—82 18 Claims

1. In a process for anionically polymerizing monomers with an anionic polymerization initiator in a suitable solvent thereby creating a living polymer, the improvement which comprises terminating the polymerization by the addition of a terminating agent selected from the group consisting of hydrocarbons containing a C—H group where the carbon is connected directly to a triply-bound carbon, hydrocarbons containing a C—H group where the carbon is connected directly to two doubly-bound carbons and hydrocarbons containing a C—H group where the carbon is connected directly to at least 2 aromatic rings, wherein none of said hydrocarbons contain additional aliphatic unsaturation.

5,194,531
PROCESS FOR PRODUCING POLYOLEFINS
Masatoshi Toda; Hideo Funabashi; Ryo Aburatani, and Akinobu Sugahara, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan
Filed Apr. 22, 1991, Ser. No. 688,286
Claims priority, application Japan, Apr. 28, 1990, 2-102813
Int. Cl.[5] C08F 4/44
U.S. Cl. 526—125 6 Claims



2. A process for producing a polyolefin which comprises contacting an olefin with a catalyst comprising:
(A) a solid catalyst component comprising, as essential components, (a) a magnesium compound, (b) halogenated titanium and (c) an electron donor compound;
(B) an organoaluminum compound; and
(C) an organosilicon compound having the general formula:

$$R^6R^7Si(OR^8)_2 \quad \text{(III)}$$

wherein R^6 is a branched hydrocarbon residue; R^7 is a cyclic saturated hydrocarbon residue; and R8 is a linear or branched hydrocarbon residue.

5,194,532
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,744
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

5,194,533
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,743
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

5,194,534
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,745
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

5,194,535
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,746
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

5,194,536
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,747
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

5,194,537
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,748
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

5,194,538
PROCESS FOR PREPARING POLYMERS HAVING IMPROVED COLOR
Ronald J. Ehrig, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jul. 31, 1991, Ser. No. 738,749
Int. Cl.[5] C08F 2/00, 4/00
U.S. Cl. 526—88 10 Claims

1. A process for preparing polymers having improved color comprising polymerizing a monomer in the presence of a catalyst system comprising a transition metal catalyst component and a cocatalyst component, wherein the cocatalyst component is a mixture of a trialkylaluminum compound and a dialkylaluminum halide compound.

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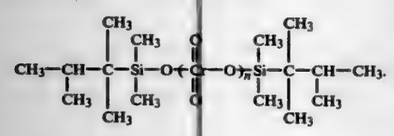
5,194,532
HOMOGENEOUS CATALYSTS AND OLEFIN POLYMERIZATION PROCESS
John G. Hefner; Brian W. S. Kolthammer, both of Lake Jackson, and Dennis R. Gifford, West Columbia, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 586,629, Sep. 20, 1990, abandoned. This application Jun. 12, 1992, Ser. No. 898,046
Int. Cl.[5] C08F 4/42
U.S. Cl. 526—126 **6 Claims**

1. A process for polymerizing one or more monomers comprising one or more α-olefins or one or more α-olefins and one or more polymerizable ethylenically unsaturated monomers which process comprises subjecting said monomers to polymerization in the presence of a homogeneous catalyst compound represented by the formula $LTi(NR^1_2)_3$ wherein L is a π-bonded ligand selected from the group consisting of indenyl, C_1–C_4 alkyl substituted indenyl, —$OSiR_3$ substituted indenyl; and each R^1 group attached to the same nitrogen atom is the same, however, the R^1 groups attached to different nitrogen atoms can be the same or different from those attached to other nitrogen atoms and are C_1–C_4 alkyl groups.

5,194,533
TRANSITION-METAL BASED CATALYST FOR THE POLYMERIZATION AND COPOLYMERIZATION OF OLEFINS, ITS PREPARATION AND USE
Aimo Sakila, Kerava; Hilkka Knuuttila, and Bill Gustafsson, both of Porvoo, all of Finland, assignors to Neste Oy, Espoo, Finland
Filed Apr. 23, 1991, Ser. No. 689,956
Claims priority, application Finland, Apr. 26, 1990, 902123
Int. Cl.[5] C08F 4/69
U.S. Cl. 526—129 **6 Claims**

1. A process for polymerizing a olefin by contacting the olefin under polymerization conditions with a catalyst which is a bis(trialkylsilyl) chromate of a formula


(I)

where n is approximately 1–2.

5,194,534
TUNGSTEN-IMIDO CATALYSTS FOR RING-OPENING METATHESIS POLYMERIZATION OF CYCLOOLEFINS
Andrew Bell, West Grove, Pa., assignor to Hercules Incorporated, Wilmington, Del.
Filed Sep. 24, 1991, Ser. No. 764,657
Int. Cl.[5] C08G 61/08; B01J 31/00
U.S. Cl. 526—161 **24 Claims**

1. A catalyst composition for the preparation of a polymer of at least one strained ring non-conjugated polycyclic cycloolefin monomer which comprises

a) a tungsten-imido compound having the formula

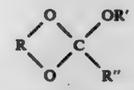
$$W(NR^1)X_{4-x}(OR^2)_x.L_y$$

wherein x is 0, 1, 2, 3 or 4; y is 0 or 1; R^1 and R^2 are selected from alkyl, phenyl, phenyl-substituted phenyl, phenylalkyl and halogen-substituted derivatives of alkyl, phenyl, phenyl-substituted phenyl and phenyl alkyl groups; X is Br or Cl; and L is a donor ligand; said alkyl groups contain 1 to 8 carbon atoms; said phenyl-substituted phenyl groups contain 12 to 18 carbon atoms; and said phenylalkyl groups contain 7 to 20 carbon atoms; and

b) at least one a activator selected from organometals, organometal hydrides and alkylsilanes.

5,194,535
PROCESS FOR PRODUCTION OF ALKADIENE-BASED POLYMER OF INCREASED VINYL CONTENT
Margaretha J. C. M. Koppes, and Johannes C. M. van der Arend, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed Jun. 4, 1992, Ser. No. 894,137
Claims priority, application United Kingdom, Jun. 10, 1991, 9112419
Int. Cl.[5] C08F 4/46
U.S. Cl. 526—181 **14 Claims**

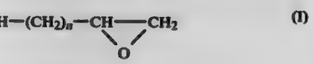
1. In the process for the production of a conjugated alkadiene-based polymer of increased vinyl content by polymerizing conjugated alkadiene under polymerization conditions in the presence of a hydrocarbon reaction diluent, an organoalkali metal polymerization initiator and a structure modifier, the improvement of using as the structure modifier a compound of the formula



wherein R is an alkylene bridging group of up to 10 carbon atoms inclusive with from 2 to 4 carbon atoms inclusive in the bridge, R″ is alkyl of up to 10 carbon atoms inclusive, and R″ is hydrogen or hydrocarbyl of up to 10 carbon atoms inclusive.

5,194,536
PROCESS OF PREPARING LOWER VINYL CHLORIDE POLYMER BY SUSPENSION POLYMERIZATION
Makoto Fujiwara; Toshimichi Koga, and Toshikatsu Yamamuro, all of Ibaraki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Aug. 2, 1991, Ser. No. 739,431
Claims priority, application Japan, Aug. 3, 1990, 2-206047
Int. Cl.[5] C08F 14/06, 2/20
U.S. Cl. 526—204 **3 Claims**

1. A process of preparing a lower vinyl chloride polymer having an average polymerization degree of 700 or lower which comprises suspension polymerization of a vinyl chloride monomer or a mixture of unsaturated monomers consisting essentially of vinyl chloride, in an aqueous solvent, in the presence of a straight chain alkyl vinyl compound having an epoxy end terminal group represented by the formula,


(I)

wherein n is an integer of 2–20; and said straight chain alkyl vinyl compound being present in an amount of 2.5–7 weight parts per 100 weight parts of the vinyl chloride monomer or a mixture of unsaturated monomers.

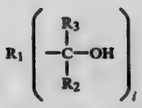
5,194,537
PROCESS FOR THE PREPARATION OF NITRILE GROUP CONTAINING POLYMERS
Durairaj Bhaskaran; Pradeep K. Dhal; Sanjay P. Kashikar; Ratnaprabha S. Khisti; Babanrao M. Shinde, and Swaminathan Sivaram, all of Pune, India, assignors to Council of Scientific & Industrial Research, New Delhi, India
Filed Sep. 19, 1990, Ser. No. 585,689
Int. Cl.[5] C08F 4/00, 120/42, 120/44
U.S. Cl. 526—204 **8 Claims**

1. A process for the preparation of nitrile group containing polymers, which comprises reacting a nitrile group containing vinyl monomers with an initiator of the general formula $[ArCR_1R_2]^{\ominus}[N(R_3R_4R_5R_6)]^{\oplus}$, wherein Ar=phenyl, substituted phenyl or a heterocyclic compound, R_1=R_2=H, ester, cyano, alkyl, aryl, 1,3-oxazoline, N,N-dimethyl amide and other similar alpha activating groups, or combination of them, or one of R_1 to R_2 together with Ar, where Ar is a phenyl or substituted phenyl, is a nitrogen atom containing heterocyclic compound and the other being a nitrile group, R_3, R_4, R_5 and R_6 may be same or different and are selected from hydrocarbyl groups of 3–16 carbon atoms and represent substituted alkyl, cycloalkyl, arylalkyl or aryl or two of the R_3, R_4, R_5 and R_6 together with nitrogen atom form a heterocycle of from 5 to 7 atoms with the condition that the sum of all carbon atoms of all R_3, R_4, R_5 and R_6 is from 12 to 50 and only one of the R_3, R_4, R_5 and R_6 is an aryl derivative, in an inert atmosphere at a temperature below +60° C.

5,194,538
PREPARATION OF BUTYL RUBBER WITH BIMODAL MOLECULAR WEIGHT DISTRIBUTION
Judit E. Puskas, and Gabor Kaszas, both of Corunna, Canada, assignors to Polysar Corporation, Sarnia, Canada
Filed Jul. 15, 1992, Ser. No. 914,368
Int. Cl.[5] C08F 4/14, 210/12
U.S. Cl. 526—206 **12 Claims**

1. A process for the preparation of a butyl rubber having a bimodal molecular weight distribution which comprises the steps:

(A) introducing into a suitable reaction vessel a monomer charge comprising from about 95 to about 99.5 weight percent of isobutylene and from about 5 to about 0.5 weight percent of a conjugated diolefin monomer having from 4 to 8 carbon atoms based on a total of 100 weight percent of said isobutylene and conjugated diolefin, from about 1×10^{-5} to about 1×10^{-3} moles of an initiator component per mole of isobutylene, said initiator component selected from the group consisting of an initiator component having the formula:



in which R_1, R_2 and R_3 are selected from the group consisting of alkyl, aryl and aralkyl groups and can be the same or different and i is a positive whole number from 2 to 6 and an initiator component having an adamantyl nucleus bearing from 2 to 4 hydroxyl groups, an inert organic solvent for said monomers and said initiator component and from about 1×10^{-4} to about 1×10^{-3} moles of water per liter of inert organic solvent, at a temperature of from about −120° C. to about −50° C.,

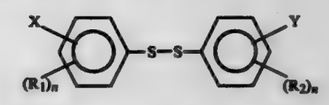
(B) adding to the solution of step (A) from about 5×10^{-5} to about 1×10^{2} moles of a Lewis acid per mole of isobutylene in an organic solvent selected from the group consisting of C_1 to C_4 halogenated hydrocarbons,

(C) polymerizing the monomers at a temperature of from about −120° C. to about −50° C. to form said butyl rubber, and

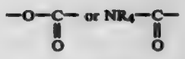
(D) recovering the butyl rubber.

5,194,539
ORGANOSULFUR CHAIN TRANSFER AGENTS FOR EMULSION COPOLYMERIZATION
Dominique Charmot, Paris, and Nicole Oger, Nanterre, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Aug. 1, 1991, Ser. No. 738,919
Claims priority, application France, Aug. 1, 1990, 90 09816
Int. Cl.[5] C08F 2/38
U.S. Cl. 526—220 **10 Claims**

1. A process for the production of an aqueous copolymer dispersion, comprising an emulsion copolymerizing comonomer mixture which comprises at least 60% by weight of a styrene and/or a butadiene and/or an acrylic ester and/or a vinyl nitrile in an aqueous medium of copolymerization, in the presence of a substituted diphenyl disulfide chain transfer agent having the formula (I):



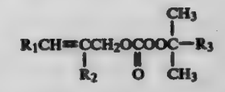
in which X and Y, independently, are each a group -ZR_3 wherein Z is —O—,



and R_3 is a straight or branched chain alkyl radical or an aryl, aralkyl or cycloaliphatic radical, R_1 and R_2, which may be identical or different, are each a straight or branched chain C_1–C_{12} alkyl radical, R_4 is a hydrogen atom or a C_1–C_4 alkyl radical and n is an integer ranging from 0 to 4, wherein said dispersion is free from xanthogen disulfide chain transfer agents.

5,194,540
PROCESS FOR PRODUCING ACRYLIC ELASTOMER
Yuichi Yamamoto, Kitaibaraki; Kazuma Yokoi, Takahagi, and Haruyoshi Tatsu, Hitachi, all of Japan, assignors to Nippon Mektron Limited, Tokyo, Japan
Continuation of Ser. No. 489,975, Mar. 7, 1990, abandoned. This application Jul. 11, 1991, Ser. No. 728,892
Claims priority, application Japan, Apr. 11, 1989, 1-91083
Int. Cl.[5] C08F 2/38, 4/34
U.S. Cl. 526—222 **10 Claims**

1. A process which comprises polymerizing an alkyl acrylate having an alkyl group of 1 to 8 carbon atoms and an alkoxyalkyl acrylate having an alkoxylalkyl group of 2 to 8 carbon atoms as polymerizable monomers with an organic peroxide having a non-conjugated double bond as a polymerization initiator, which peroxide is a compound represented by the following formula



wherein R_1 and R_2 are a hydrogen atom or a methyl group and R_3 is a hydrogen atom or an alkyl group having 1 to 12 carbon atoms.

5,194,541
ACRYLIC COPOLYMERS AND THEIR APPLICATION TO THE COATING OF BITUMINOUS MATERIALS
Robert Legros, Claqueux; Bernard Wiegert, Bernouville, and Claude Tripette, Nogent S/Oise, all of France, assignors to Societe Anonyme Dite Norsolor, Paris la Defense, France
PCT No. PCT/FR90/00504, § 371 Date May 6, 1991, § 102(e) Date May 6, 1991, PCT Pub. No. WO91/00881, PCT Pub. Date Jan. 24, 1991
PCT Filed Jul. 3, 1990, Ser. No. 675,927
Claims priority, application France, Jul. 6, 1989, 89 09141; Apr. 9, 1990, 90 04505
Int. Cl.[5] C08F 220/22, 222/06, 220/18, 8/00
U.S. Cl. 526—245 **17 Claims**

1. An acrylic copolymer comprising, per 100 parts by weight:

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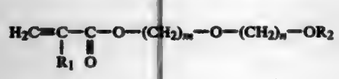
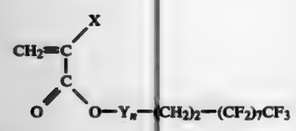
(A) from B 2 to 65 parts by weight of at least one polyoxyether acrylate or methacrylate of the formula:



wherein:
R_1 is methyl or a hydrogen atom,
R_2 is a hydrocarbon radical containing from 1 to 18 carbon atoms,
$1 \leq m \leq 20$ and $1 \leq n \leq 20$,
(B) from 1 to 6 parts by weight of methacrylic anhydride,
(C) from above 0 to 65 parts by weight of at least one fluoroalkyl (meth)acrylate, and
(D) from above 0 to 97 parts by weight of at least one alkoxyalky (meth)acrylate.

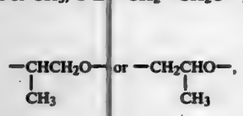
5,194,542
CONTACT LENS
Hidetoshi Iwamoto, Kamisato; Yuuichi Yokoyama, Kounosu, and Makoto Tsuchiya, Honjo, all of Japan, assignors to Hoya Corporation, Tokyo, Japan
PCT No. PCT/JP90/01263, § 371 Date May 29, 1991, § 102(e) Date May 29, 1991, PCT Pub. No. WO91/05285, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 1, 1990, Ser. No. 689,885
Claims priority, application Japan, Sep. 30, 1989, 1-256521
Int. Cl.[5] C08F *18/20, 20/24, 30/08*
U.S. Cl. 526—246 **17 Claims**

1. A contact lens formed of a copolymer obtained by copolymerizing a monomer mixture containing, as essential components, a fluorine-containing monomer of the general formula (I),



(I)

wherein X is H or CH_3, Y is —CH_2—CH_2O—, —$CH_2CH_2CH_2O$—,

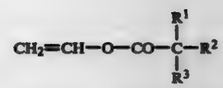


and n is 1, 2 or 3,

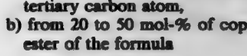
siloxanyl (meth)acrylate, alkyl (meth)acrylate, a hydrophilic monomer and a crosslinking agent.

5,194,543
CROSSLINKABLE FLUORINE-CONTAINING COPOLYMERS, AND SURFACE COATINGS BASED ON THESE COPOLYMERS
Michael Schlipf, Burgkirchen, and Gerhard Merten, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 12, 1991, Ser. No. 806,038
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1990, 4040130
Int. Cl.[5] C08F *14/26*
U.S. Cl. 526—255 **7 Claims**

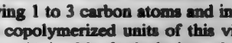
1. A crosslinkable, fluorine-containing copolymer which comprises
a) from 10 to 60 mol-% of copolymerized units of a vinyl ester of the formula



in which R^1, R^2 and R^3 are alkyl radicals and in which the entire acyl radical contains 9 carbon atoms and comprises at least one isomer which contains two quaternary carbon atoms in admixture with 0 to 80 mol-% of isomer containing one quaternary carbon atom together with at least one tertiary carbon atom,
b) from 20 to 50 mol-% of copolymerized units of a vinyl ester of the formula



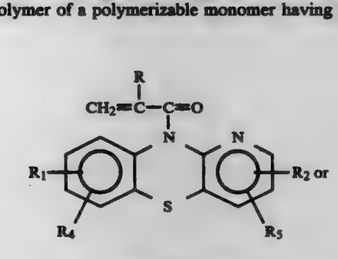
in which R^4 is an unsubstituted straight-chain alkyl radical having 1 to 3 carbon atoms and in which from 50 to 100% of the copolymerized units of this vinyl ester b) are in the OH form obtained by hydrolysis, and
c) copolymerized units of a perfluoroolefin of the formula



in which R_f is F or a perfluoroalkyl radical having 1 to 8 carbon atoms, in an amount which makes the sum of components a)+b)+c) up to 100 mol-%, but with the proviso that at least 10 mol-% of the perfluoroolefin are present in the copolymer.

5,194,544
UV ABSORBING VINYL MONOMERS AND POLYMERS AND OCULAR IMPLANTS PREPARED THEREFROM
Eugene P. Goldberg, Gainesville, Fla.; Fu-Mian Li, Beijing, China, and Ching-Wang Lao, Plantation, Fla., assignors to University of Florida, Gainesville, Fla.
Division of Ser. No. 239,424, Sep. 1, 1988, Pat. No. 4,985,559, which is a continuation-in-part of Ser. No. 108,690, Oct. 15, 1987, abandoned. This application Jun. 25, 1990, Ser. No. 542,932
Int. Cl.[5] C08F *28/06*; C07D *513/00, 279/18, 279/22*
U.S. Cl. 526—257 **20 Claims**

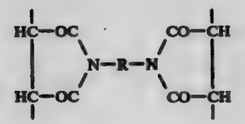
1. An ultraviolet light absorbing polymer which comprises a homopolymer of a polymerizable monomer having the structure:



wherein:
Z is N or —CH—,
R is H or CH_3,
R_1 and R_2 may be the same or different and are H, alkyl or alkyloxy having from 1 to 20 carbon atoms, alkylcarboxy having from 2 to 20 carbon atoms, arylcarboxy having from 7 to 25 carbon atoms or hydroxyl;
R_3 is H, hydroxyl, hydroxyalkyl having from 1 to 20 carbon atoms or siloxy;
R_4, R_5, R_6 and R_7 may be the same or different and are H or halogen;
x is an integer from 1 to 20; or
a copolymer thereof with an ethylenically unsaturated comonomer, said copolymer comprising an ultraviolet light absorbing effective amount of said ultraviolet light absorbing polymerizable monomer.

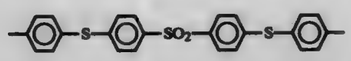
5,194,545
BISMALEIMIDES AND POLYIMIDES PREPARED THEREFROM
Heinz Horacek, Linz, and Gerd Greber, Bad Vöslau, both of Austria, assignors to Petrochemie Danubia Gesellschaft m.b.H., Schwechat-Mannswerth, Austria
Division of Ser. No. 466,385, Apr. 24, 1990, Pat. No. 5,130,444. This application Nov. 6, 1991, Ser. No. 788,464
Claims priority, application Austria, Nov. 18, 1987, 3039/87
Int. Cl.[5] C08F *26/06*; C07D *207/452*
U.S. Cl. 526—262 **3 Claims**

1. A polyimide consisting of recurring monomeric units of a bismaleimide of the formula IV



IV

wherein R denotes a radical of the formula



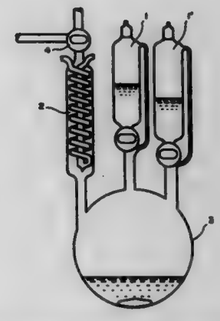
II

in which 0 to 1 mol of an aromatic diamine is additionally added onto the maleimide groups, and the polyimide, if appropriate, is not completely hardened and if appropriate is reinforced with fibers, fiber mats, linings or rovings.

5,194,546
PROCESS FOR PREPARING FUNCTIONAL COPOLYMERS OF A VINYL LACTAM AND AN AMINO ALKENE OR HYDROXY ALKENE IN WATER SOLUTION
Robert B. Login, Oakland; Jean S. Shih, Paramus, and Jui-Chang Chuang, Wayne, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.
Filed May 6, 1992, Ser. No. 879,411
Int. Cl.[5] C08L *29/02*
U.S. Cl. 526—263 **6 Claims**

1. A process for preparing functional copolymers of a vinyl lactam monomer and an amino alkene or hydroxy alkene monomer which comprises reacting a vinyl lactam and a polymerizable functional monomer selected from amino alkene or hydroxy alkene monomers in a weight ratio of about 99/1 to 1/1, respectively, in water solution at about a 5–50% solids content, at a temperature of about 20° to 130° C., in the presence of about 0.2–10% by weight based on total monomers of a free radical initiator, and at a pressure of about 1–5 atmospheres.

5,194,547
ANIONIC LIVING POLYMERS, THEIR DERIVATIVES AND COMPOSITION COMPRISING THEM
Yuji Ohashi, Sakura, and Masataka Oaka, Sakai, both of Japan, assignors to Dainippon Ink & Chemicals, Inc., Itabashi, Japan
Filed Jan. 7, 1991, Ser. No. 711,780
Claims priority, application Japan, Jan. 8, 1990, 2-1662
Int. Cl.[5] C08F *124/00, 120/26*
U.S. Cl. 526—266 **9 Claims**



1. An anionic living polymer of a methacrylic acid ester having at least one acetal or ketal group.

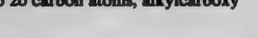
5,194,548
ORGANIC NONLINEAR OPTICAL MATERIAL
Tetsuzo Yoshimura, Machida, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Jan. 26, 1990, Ser. No. 470,477
Claims priority, application Japan, Jan. 27, 1989, 1-016352; Mar. 20, 1989, 1-066022; Mar. 20, 1989, 1-066042; Mar. 20, 1989, 1-066048
Int. Cl.[5] C08F *38/02, 238/02*
U.S. Cl. 526—285 **33 Claims**

1. An organic nonlinear optical material comprising a compound having a conjugate main chain in the molecule and having donor groups D and acceptor groups A attached to the conjugate main chain in the sequence of . . . , D, D, A, A, D, D, . . . , in which the distance between adjacent D's and the distance between adjacent A's are shorter than the distance between adjacent D and A with respect to the distance between the atoms on the main chain to which the respective groups are bonded.

5,194,549
COATING COMPOSITION AND POLYMER FOR USE THEREIN
Peter Lear, Amsterdam, and Gerardus C. Overbeek, Sprang-Capelle, both of Netherlands, assignors to ICI Resins BV, Waalwijk, Netherlands
Filed Jul. 8, 1991, Ser. No. 725,321
Claims priority, application United Kingdom, Jul. 11, 1990, 9015254; May 29, 1991, 9111558
Int. Cl.[5] C08F *120/54, 120/10*; C08G *18/00, 63/02, 69/26*
U.S. Cl. 526—303.1 **49 Claims**

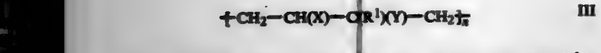
1. Film-forming coating composition for application to a polypropylene based substrate, which coating composition comprises at least one polypropylene-adherable polymer P which has a polymer backbone having pendant groups which comprise a moiety selected from those of formula

I



II

-continued



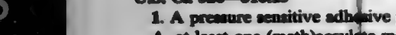
III

where n is an integer within the range of from 2 to 500, R^1 is an alkyl group of 1 to 3 carbon atoms, R^2 is H or an alkyl or alkenyl group of 1 to 3 carbon atoms, X is H, and Y is H.

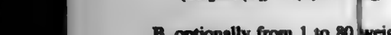
5,194,550
ACRYLATE-BASED ADHESIVE POLYMER
Robert W. Rance, Bühl, Fed. Rep. of Germany, and Etienne R. D. A. Lazarus, Hagneneau, France, assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 208,955, Jun. 17, 1988. This application Apr. 7, 1992, Ser. No. 864,783
Int. Cl.[5] C08F 222/02
U.S. Cl. 526—318.25 18 Claims

1. A pressure sensitive adhesive polymer consisting of

A. at least one (meth)acrylate monomer represented by the formula



B. optionally from 1 to 80 weight percent of a conjugated diene represented by the formula



C. optionally from 1 to 50 weight percent of a monovinylidene aromatic monomer according to the formula

D. from 1.5 to 17 weight percent of a hydroxyalkyl (meth)acrylate is represented by the formula

and

E. from 1 to 5 percent by weight of itaconic acid;

R_1 is —H or a methyl radical;

R_2 is a straight or branched chain alkyl radical having from 2 to 8 carbon atoms;

R_3, R_4, R_5 and R_6 are independently —H, halogen, or 1- or 20- carbon hydrocarbon radicals;

R_7 is —H or a 1- to 4-carbon hydrocarbon alkyl group;

R_8 is —H or methyl radical; and

R_9 is a straight or branched chain hydrocarbon radical having 1 to 10 carbon atoms.

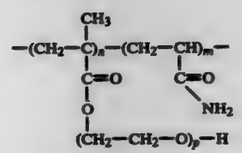
5,194,551
PROCESS FOR MANUFACTURING THERMOSETTING RESINS RESISTANT TO BOILING WATER AND CAPABLE OF BEING SUBSTITUTED FOR PHENOL-FORMOL RESINS, AND RESULTING RESINS
Philippe A. Clavier, 27 Avenue de St Germain, 78160 Marly le Roi, France
Filed Dec. 28, 1989, Ser. No. 453,906
Claims priority, application France, Dec. 29, 1988, 88 17413
Int. Cl.[5] C08G 8/04
U.S. Cl. 527—300 15 Claims

14. Thermosetting resins capable of being substituted for phenol-formaldehyde resins, obtained by mixing at about ambient temperature, a carbohydrate or a compound containing a useful amount of a carbohydrate having at least two methylol groups per molecule with another organic chemical compound having per molecule at least two hydrogen groups which are each directly bonded to a carbon atom, said thermosetting resins having polymerization links of the type

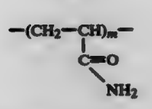
and being resistant to boiling water.

5,194,552
SOLUBLE, SOLID OR CROSSLINKED GRAFT COPOLYMERS OF LIGNIN (2-PROPENAMIDE)-(2-METHYL-3-OXO-4-OXYBUT-1-ENE-(P-ETHOXY-(3*P+3)-OL), METHODS OF MAKING THE SAME AND USES THEREFORE
John J. Meister, 31675 Westlady Rd., Beverly Hills, Mich. 48010-5624; Amit Lathia, 2379 Mt. Hope, Okemos, Mich. 48864, and Fu-Fong Chang, 147-45 84th Ave., Kew Gardens, N.Y. 11435
Division of Ser. No. 601,198, Oct. 22, 1990, Pat. No. 5,116,904. This application Mar. 27, 1992, Ser. No. 859,157
Int. Cl.[5] C08H 5/02; C08G 63/91
U.S. Cl. 527—400 11 Claims

1. A graft copolymer of lignin-(2-propenamide)-(2-methyl-3-oxo-4-oxybut-1-ene-(p-ethoxy-(3*p+3)-ol) having a central lignin network and at least one grafted side chain, R, having randomly repeating units of the formulas:



and

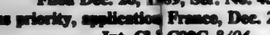


where the number of ethoxyl repeat units, p, in the polyol repeat unit is greater than one and up to about 300,000, such that the central lignin network has a molecular weight of about 1,000 to 150,000 and the total number of randomly repeating units in the grafted side chain or chains is up to about 300,000 units, such that the total graft copolymer molecular weight is in the range of 15,000 to 300,000,000 where m and n are each integers with a value greater than zero and not more than 300,000, and the symbol * stands for multiplying.

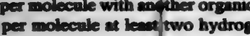
5,194,553
PROCESS FOR PREPARATION OF ORGANOFUNCTIONAL SILOXANES
Steven K. Freeburne, Edgewood, Ky.; Charles E. Neal, Jr., Midland, Mich.; David E. Puckett, Taylor Mill, and Larry H. Wood, Campbellsburg, both of Ky., assignors to Dow Corning Corporation, Midland, Mich.
Filed May 7, 1992, Ser. No. 879,400
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—12 31 Claims

1. A process for preparation of organofunctional terminated polydiorganosiloxane polymers, the process comprising:

(A) forming a mixture comprising a chlorine-terminated polydiorganosiloxane polymer of formula



where each R is a radical independently selected from a group consisting of alkyls of one to 20 carbon atoms, cycloalkyls of 4 to 20 carbon atoms, and aryls, and n is an integer from one to 1,000; and an organofunctional chlorosilane end-blocker of formula



where R^1 is an organofunctional radical selected from the group consisting of alkenyls of two to 20 carbon atoms and haloalkyl radicals of one to 20 carbon atoms, R is as previously described, a=1, 2, or 3, b=0, 1, or 2, and $a+b=3$;

(B) contacting the mixture with a stoichiometric excess of water containing 5 to 36 weight percent hydrogen chloride; and

(C) isolating organofunctional-terminated polydiorganosiloxane polymers of formula

where R, R^1, a, and b are as previously described and x is an integer from n+1 to 1,000.

5,194,554
METHOD OF PRODUCING ONE PART ORGANOPOLYSILOXANE COMPOSITION
Masayuki Ikeno, Annaka, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Dec. 23, 1991, Ser. No. 812,282
Claims priority, application Japan, Dec. 27, 1990, 2-414598
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—15 9 Claims

1. A method of producing a one part organopolysiloxane composition by mixing uniformly:

(a) an organopolysiloxane having 0.1 or more silicon-bonded alkenyl groups in the molecule on average,

(b) an organohydrogenpolysiloxane having two or more silicon-bonded hydrogen atoms in the molecule,

(c) an addition reaction catalyst, and hydroperoxy group in the molecule,

comprising the steps of mixing the organohydrogenpolysiloxane (b), the addition reaction catalyst (c), and the retarding compound (d), maturing the mixture thus obtained at least for 10 hours under conditions having a temperature of 0° to 60° C., and then adding the organopolysiloxane (a).

5,194,555
AMINOPYRIDYL SILOXANES
Martel Zeldin; Wilmer E. Fife, both of Indianapolis, and Slawomir Rubinsztajn, Carmel, all of Ind., assignors to Indiana University Foundation, Ind.
Division of Ser. No. 467,053, Jan. 18, 1990, Pat. No. 4,997,944. This application Mar. 5, 1991, Ser. No. 664,871
Int. Cl.[5] C08C 77/04, 77/06, 77/12
U.S. Cl. 528—21 41 Claims

1. A nucleophilic and basic composition comprising a siloxane polymer incorporating 4-dialkylaminopyridine functionality.

5,194,556
RIGID CONTACT LENSES WITH IMPROVED OXYGEN PERMEABILITY
Karl F. Mueller, New York, N.Y.; Bernhard Seiferling, Goldbach, Fed. Rep. of Germany, and Michael C. Bochnik, Yonkers, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 9, 1991, Ser. No. 638,949
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—28 3 Claims

1. A process for making a poly(siloxane)-polyvinyl macromer with a molecular weight dispersity D identical or lower than that of the hydroxy or amino functional poly(siloxane), which consists of reacting an hydroxy- or amino functional poly(dimethylsiloxane) with an aliphatic or cycloaliphatic diisocyanate in a molar ratio of 1 mol functional poly(dimethylsiloxane) to at least 4 moles of the diisocyanate, followed by reaction of the remaining isocyanate groups with equivalent amounts of an active hydrogen containing vinyl monomer.

5,194,557
POLYORGANOOXOTHIAZENES AND METHOD FOR PREPARING SAME
Aroop K. Roy, and Gary T. Burns, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Jan. 23, 1991, Ser. No. 644,761
Int. Cl.[5] C08G 77/22
U.S. Cl. 528—30 12 Claims

1. An organooxothiazene polymer consisting essentially of repeating units of the general formula

where R^1 of each repeating unit is individually selected from the group consisting of monovalent unsubstituted and substituted hydrocarbon radicals exclusive of unsubstituted aromatic hydrocarbon radicals wherein a cyclic carbon atom, of said aromatic hydrocarbon radicals is bonded to sulfur atom of said formula, and heterocyclic radicals where the hetero atom is oxygen, sulfur or tertiary nitrogen, and where said polymer contains an average of at least 25 of said units per molecule.

5,194,558
DISK STACKER WITH NOVEL PADDLE WHEEL WIPER MADE OF POLYETHER URETHANE
Richard L. Carlstoe; Edward L. Schlueter, Jr., both of Rochester, and Lucille M. Sharf, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Sep. 30, 1991, Ser. No. 767,441
Int. Cl.[5] C08G 18/10
U.S. Cl. 528—60 28 Claims

1. A paddle wheel wiper to transport sheets having a plurality of individual blades adapted to stroke the top sheet in a stack one at a time to inertially transport the sheet, each of said blades being semi-circular in shape with respect to an axis running orthogonal to the axis of rotation of said paddle wheel wiper and being made of a polyurethane elastomer obtained by the reaction of a polytetramethylene ether glycol having the formula HO_nH where n is from 10 to 60, and from about 20 to about 95 parts by weight per 100 parts by weight of said glycol of a diisocyanate selected from the group consisting of diphenylmethane diisocyanates, toluene diisocyanates, naphthalene diisocyanates and blends thereof and a sufficient amount of cross linking agents to provide a crosslinked elastomer, said cross linking agents comprising a mixture of from about 75 to 60% weight of a diol having the formula $HO(R_1)$ OH where R_1 is a straight or branched chain alkyl group having from 2 to 12 carbon atoms and from about 25 to 40% of a triol having the formula: R'-C-[$(OH)_a(CH_2OH)_b$] where R' is H, CH_3 or C_2H_5, a is 0 or 1, b is 2 or 3 and a+b=3.

5,194,559
OPTICAL URETHANE RESINS AND PLASTIC LENSES COMPRISING THE SAME
Koju Okazaki; Masahiko Kusumoto; Hiroyuki Yamashita, and Teruyuki Nagata, all of Fukuoka, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Mar. 20, 1992, Ser. No. 854,583
Claims priority, application Japan, Mar. 25, 1991, 3-60080
Int. Cl.[5] C08L 75/04
U.S. Cl. 528—49 12 Claims

1. A process for producing an optical urethane resin of

improved hue, total light transmittance and optical strain by reacting at least one isocyanate compound selected from the group consisting of polyisocyanate compounds and isothiocyanato-containing isocyanate compound with at least one active hydrogen compound selected from the group consisting of polyol compounds, polythiol compounds and hydroxythiol compounds at an (NCO+NCS)/(OH+SH) functional group molar ratio of from 0.5 to 3.0, which comprises using an isocyanate compound with 10–5,000 ppm of a phenolic compound added therein upon production of the optical urethane resin.

5,194,560

FLEXIBLE ARYL ALKYL EPOXY RESINS, THEIR AMINE RESIN DERIVATIVES AND THEIR USE IN ELECTRODEPOSITION COATINGS

James A. Laugal, Union Lake; Glenn E. Martin, Farmington Hills; Donald L. St. Aubin, Westland, and Gerald G. Wold, Brighton, all of Mich., assignors to BASF Corporation

Division of Ser. No. 327,751, Mar. 23, 1989, Pat. No. 5,021,470, which is a division of Ser. No. 77,492, Jul. 24, 1987, Pat. No. 4,857,567. This application Mar. 21, 1991, Ser. No. 672,975
Int. Cl.[5] C08G 59/00
U.S. Cl. 528—97 17 Claims

1. A 2DE epoxide compound comprising the addition reaction oligomer of monomers Diol D1, Diol D2 and Diepoxide E2 wherein:

Diol D1 has at least two aryl groups between the hydroxyls,

Diol D2 has only one aryl group between the hydroxyls, and

Diepoxide E2 is a bis(glycidyl either) of a bis(labile hydrogen functionalized alkoxy) arylene.

5,194,561

PROCESS FOR THE PREPARATION OF AN AROMATIC POLYETHER IN THE PRESENCE OF FINELY DIVIDED CONDENSATION AUXILIARIES

Hartmut Fischer, Hofheim am Taunus, and Arnold Schneller, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 7, 1990, Ser. No. 563,498
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1989, 3926262
Int. Cl.[5] C08G 8/02, 14/00, 65/38, 75/00
U.S. Cl. 528—125 17 Claims

1. A process for the preparation of an aromatic polyether by condensation of the reactants in the presence of carbonates of metals from Group I of the Periodic Table as condensation auxiliaries, which comprises using metal carbonates in the form of very finely ground salts as condensation auxiliaries.

5,194,562

NUCLEOPHILIC DISPLACEMENT METHOD FOR SYNTHESIS OF NON-RIGID PBZ POLYMERS

Muthiah N. Inbasekaran, and Michael J. Mullins, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 313,936, Feb. 22, 1989, Pat. No. 5,104,960. This application Jan. 10, 1992, Ser. No. 819,419
Int. Cl.[5] C08G 8/02, 69/26, 75/00; C07D 235/04
U.S. Cl. 528—125 30 Claims

1. A process for synthesizing non-rigid-rod PBZ polymer comprising polymerizing, under conditions suitable for nucleophilic substitution reactions, one or more difunctional monomers, each said monomer independently containing:

(1) an organic moiety which is inert with respect to all reagents under reaction conditions; and

(2) two reactive groups selected, such that a polymer is formed, from the class consisting of:

(a) azole-containing groups having: an azole ring bonded to said organic moiety, an aromatic group bonded to the 2-carbon of said azole ring, and a leaving group bonded to said aromatic ring in a position where it is activated by said azole ring, wherein the leaving group is a halogen atom, an alkoxy group, an aryloxy group or a nitro group; and

(b) displacing groups having: a nucleophilic moiety, which nucleophilic moiety is a nitrogen atom having a hydrogen atom or inert organic substituent or an oxygen atom or a sulfur atom, bonded to said organic moiety; and a counter-moiety bonded to said nucleophilic moiety that can dissociate from the nucleophilic moiety under reaction conditions,

whereby a non-rigid-rod PBZ polymer is formed.

5,194,563

POLYMERIC SPECIES PRODUCTION

Allan S. Hay, 5015 Glencairn Ave., Montreal, Quebec, Canada H3W 2B3

Continuation-in-part of Ser. No. 514,955, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 223,389, Jul. 25, 1988, abandoned. This application Apr. 2, 1991, Ser. No. 679,104
Int. Cl.[5] C08G 8/02, 8/26, 10/02
U.S. Cl. 528—126 24 Claims

1. A process for producing a linear aromatic polymeric species comprising:

reacting an at least binuclear non-phenolic aromatic compound with a source of aralkyl carbonium ion in the presence of a molar excess of a non C-alkylatable phenol effective to stabilize the aralkyl carbonium ion, at a temperature of 20° C. to 100° C.

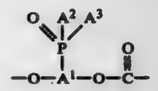
5,194,564

PHOSPHINE OXIDE SUBSTITUTED POLYCARBONATE

Gary C. Davis, Albany, N.Y.; Christianus A. A. Claesen, and Erwin M. A. Gijsen, both of Bergen op Zoom, Netherlands, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1992, Ser. No. 900,355
Int. Cl.[5] C08G 64/08
U.S. Cl. 528—167 8 Claims

1. A polycarbonate polymer comprising the structural units of the formula



wherein A^1 is a trivalent substituted or unsubstituted aromatic radical; and A^2 and A^3 each are independently selected from aromatic radicals.

5,194,565

POLY(AMIDE-ACID) COMPOSITIONS DERIVED FROM TETRACARBOXYLIC ACID DIANHYRIDES CAPABLE OF SOLUTION IMIDIZATION

James E. McGrath, Blacksburg, Va., and Attila Gungor, Göstepe-Istanbul, Turkey, assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Jul. 25, 1991, Ser. No. 735,488
Int. Cl.[5] C08G 79/02
U.S. Cl. 528—167 4 Claims

1. A poly(amide-acid) composition of lowered imidization temperature which comprises a tetracarboxylic acid dianhydride and an effective amount of a bis(aminophenoxyphenyl) phosphine oxide for such lowered imidization temperature.

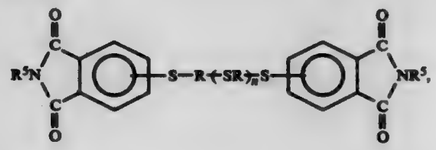
5,194,566

POLYARYLENE SULFIDE BLOCK COPOLYMERS, METHOD FOR MAKING, AND USE

Tohru Takekoshi, Scotia, and Patricia P. Anderson, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 399,045, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 194,653, May 16, 1988, abandoned, which is a division of Ser. No. 56,198, Jun. 1, 1987, Pat. No. 4,769,424. This application Aug. 12, 1991, Ser. No. 744,044
Int. Cl.[5] C08G 75/12
U.S. Cl. 528—170 3 Claims

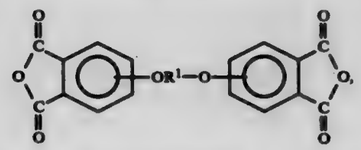
1. A method for making polyarylene sulfide-polyetherimide block copolymer which comprises, effecting an imide-amine exchange reaction between a polyarylene sulfide oligomer of the formula,



and an aryldiamine,

$$H_2N—R^2NH_2,$$

in the presence of aromatic bisetheranhydride of the formula,



where R is a $C_{(6-14)}$ arylene radical, R^1 is a $C_{(6-30)}$ divalent aromatic radical, R^2 is a $C_{(6-30)}$ divalent aromatic radical, R^5 is a $C_{(1-14)}$ aromatic organo radical, and n is an integer having a value of from 1 to 50 inclusive.

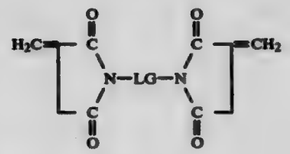
5,194,567

REACTION INJECTION MOLDABLE (RIM) THERMOSET POLYIMIDE ELASTOMERS

Charles M. Lewis, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Apr. 8, 1991, Ser. No. 681,741
Int. Cl.[5] C08G 73/10; C08F 222/40
U.S. Cl. 528—170 11 Claims

1. A prepolymer of the formula:



where LG is a linking group.

5,194,568

STAGED POLYMERIZATION OF POLYBENZAZOLE POLYMERS

Thomas Gregory, Midland, Mich.; Carl W. Hartig, Stade, Fed. Rep. of Germany; Harvey D. Ledbetter, Midland; Kenneth J. Quackenbush, Saginaw; Steven Rosenberg, and Ying H. So, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 19, 1990, Ser. No. 600,551
Int. Cl.[5] C08G 63/00, 69/26, 63/68, 69/42
U.S. Cl. 528—184 14 Claims

1. A process for synthesizing a polybenzazole polymer comprising the steps of:

(1) contacting a selected amount of AA-PBZ monomer with a selected amount of BB-PBZ monomer in a dehydrating solvent acid under conditions such that a mixture containing a polybenzazole oligomer is formed;

(2) contacting a portion of the mixture resulting from Step (1) with a selected amount of chain extender or chain terminator in a continuous reactor with a residence time of no more than about one hour under conditions such that a dope containing higher molecular weight polybenzazole polymers is formed;

(3) measuring the viscosity of the dope or the molecular weight of the polymer resulting from step (2); and

(4) adjusting the selected amount of chain extender or chain terminator added to the remaining portions of the mixture in step (2) to obtain a dope or polymer in which the measured viscosity or molecular weight meets a selected value.

5,194,569

SYNTHESIS OF BLOCK LIQUID CRYSTAL COPOLYMER

Ki-Soo Kim, Katonah, N.Y.; Sophia Dashevsky, Fair Lawn, N.J., and Stanley W. Palanska, Yonkers, N.Y., assignors to Akzo nv, Arnhem, Netherlands

Filed Oct. 18, 1991, Ser. No. 779,477
Int. Cl.[5] C08G 63/06, 63/02, 63/18; C08F 20/00
U.S. Cl. 528—206 10 Claims

1. A single reactor process for formation of block copolymers comprising aromatic ester mesogenic units containing flexible alkane spacers and polyester flexible coil units in the main chain thereof which comprises:

(a) reacting an α,ω-bis(hydroxybenzoyloxy) alkane monomer with an aromatic acid chloride in a reactor to form a functionalized liquid crystal oligomer containing such mesogenic units; and

(b) thereafter reacting the oligomer from (a) in the same reactor with either (i) a polyester oligomer; or (ii) the reagents for synthesizing the polyester oligomer (i).

5,194,570

POLY(N-SUBSTITUTED IMINOCARBONATE)

Joachim B. Kohn, Highland Park, and Chun Liz, Piscataway, both of N.J., assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.

Filed Nov. 5, 1990, Ser. No. 609,204
Int. Cl.[5] C08G 67/00
U.S. Cl. 528—211 21 Claims

1. A poly(N-substituted iminocarbonate), wherein the imide nitrogens are substantially free of hydrogen.

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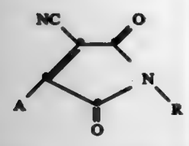
5,194,571

COLORED POLYESTER COMPOSITIONS

Max A. Weaver; Clarence A. Coates; William W. Parham, all of Kingsport; Samuel D. Hilbert, Jonesborough; James J. Krutak, and Wayne P. Pruett, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1991, Ser. No. 746,832
Int. Cl.[5] C08G 63/00
U.S. Cl. 528—272 14 Claims

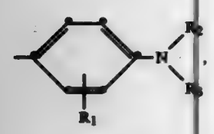
1. A polyester composition having copolymerized therein or reacted therewith 0.001 to 50 weight percent of a residue of Formula (I):

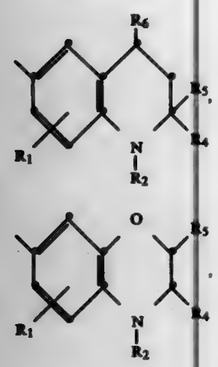


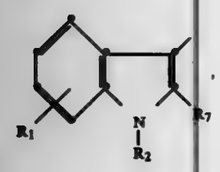
(I)

wherein R is hydrogen, unsubstituted or substituted C_1–C_{10} alkyl; unsubstituted or substituted C_3–C_8 cycloalkyl; C_3–C_8 alkenyl; C_3–C_8 alkynyl; phenyl and substituted phenyl;

A is represented by one of the following formulae:







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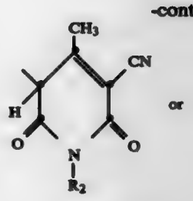
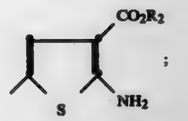


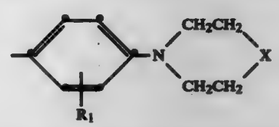
or



;

wherein R_1 is hydrogen or 1 or 2 groups selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, O—C_1–C_4 alkylene—OH, O—C_1—C_4 alkylene—C_1–C_4 alkanoyloxy, C_1–C_4 alkylene—OH, $C_{14}C_4$ alkylene—C_1–C_4 alkanoyloxy, halogen, C_1–C_4 alkanoylamino, C_3–C_8 cycloalkylcarbonylamino, C_1–C_4 alkylsulfonylamino, arylsulfonylamino, arylaminocarbonylamino or arylcarbonylamino;

R_2 and R_3 are independently selected from unsubstituted or substituted C_1–C_{10} alkyl; unsubstituted or substituted C_3–C_8 cycloalkyl; C_3–C_8 alkenyl; C_3–C_8 alkynyl; unsubstituted or substituted phenyl; or R_2 and R_3 may be combined with the nitrogen to which they are attached to form an A radical having the formula



wherein X is selected from a covalent bond, —CH_2—, —O—, —S—, —SO_2—, —C(O)—, —CO_2—, —NH—, —N(COC_1–C_4 alkyl)—, —N(SO_2C_1–C_4 alkyl)—, —N(—CO—aryl)—, —N(SO_2—aryl)—, or —N(R_2)—;

R_4, R_5, and R_6 are hydrogen, C_1–C_4 alkyl or unsubstituted or substituted phenyl; with the provision that the compound of Formula (I) contains at least one polyester-reactive group.

5,194,572

STABILIZED NAPHTHALENEDICARBOXYLIC ACID DIESTERS

Allen B. Mossman, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 575,068, Aug. 30, 1990, Pat. No. 5,138,025. This application Aug. 3, 1992, Ser. No. 924,305
Int. Cl.[5] C08G 63/189
U.S. Cl. 528—272 20 Claims

1. A method for preparing polyester materials comprising polymerizing in a suitable reaction zone a mixture comprising a diol and a stabilized diester of a naphthalenedicarboxylic acid wherein the stabilized diester of the naphthalenedicarboxylic acid has a RYIE value of no more than about 0.8.

5,194,573

DISCONTINUOUS PROCESS FOR POLYCONDENSATION OF TEREPHTHALIC ACID AND 1,4-BIS(HYDROXYMETHYL)CYCLOHEXANE

Wolfgang Schmidt, Rodenbach, and Ulrich Thiele, Bruchkoebel, both of Fed. Rep. of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 20, 1992, Ser. No. 853,984
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1991, 4137841
Int. Cl.[5] C08G 63/78, 63/02
U.S. Cl. 528—279 10 Claims

1. Discontinuous process for producing polyesters with at least 80 mol % (1,4-cyclohexanedimethylene) terephthalate units, an intrinsic viscosity of at least 0.60 dL/g, less than 200 meq/kg bromine-titratable double bonds and less than 40 meq/kg free COOH groups, comprising:

a) esterifying terephthalic acid (diacid) and 1,4-bis(hydroxymethyl)cyclohexane (diol) in a molar ratio of diol to diacid based on the diacid, of 1.2–2.5:1 in the presence of 10–300 ppm Ti as an organic titanium compound, at an increasing temperature t_a between 180°–300° C. and a pressure p_a of 0.8–1.5 bar, to achieve a conversion of 98.0 to 99.6%,

b) precondensing the mixture of step a) by adding 10–300 ppm more Ti, based on the diacid, in the form of an organic titanium compound, raising the temperature to a value t_b between 270° and 300° C. and lowering the pressure to a value p_b between 500 and 5 mbar, during a residence time of 20 to 70 minutes, to achieve a conversion of 99.5 to 99.9%, and

c) polycondensing the product of step b) at a temperature of $t_c \geqq t_b$ in the range of 295°–310° C. in the absence of local temperature fluctuations of more than 5° C., and at a pressure p_c of less than 1.5 mbar for a residence time sufficient to achieve a conversion corresponding to 40–95% of the maximum possible viscosity.

5,194,574

THERMALLY STABLE POLYESTERS CONTAINING TRANS-4,4'-STILBENEDICARBOXYLIC ACID

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1991, Ser. No. 787,360
Int. Cl.[5] C08G 63/52, 63/02, 63/54
U.S. Cl. 528—306 22 Claims

1. An isetropic copolyester having improved thermal stability comprising:

(A) acid repeating units from

(1) a major poriton of an acid component selected from the group consisting of terephthalic acid, isophthalic acid, and mixtures thereof, and

(2) greater than zero but less than 20 mol % acid component of trans-4,4'-stilbenedicarboxylic acid; and

(B) glycol repeating units of at least 90 mol % 1,4-butanediol,

wherein the total mol % of acid repeating units and glycol repeating units are each 100 mol %; said isotropic copolyester having an inherent viscosity greater than 0.2, determined at 25° C. in 25/35/40 (wt./wt./wt.) phenol, tetrachloroethane/p-chlorophenol at a concentration of 0.1 g/100 mL and a melting point of at least 200° C.

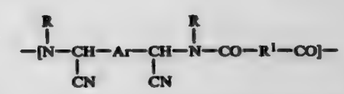
5,194,575

POLYAMIDE CONTAINING REISSERT UNIT(S)

Harry W. Gibson, and Yajnasarayana H. R. Jois, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Apr. 22, 1991, Ser. No. 689,418
Int. Cl.[5] C08G 69/36
U.S. Cl. 528—328 6 Claims

1. A modified polyamide composition which comprises: polyamide units of the formula —[NH—R^2—NH—CO—R^1—CO]-where R^1 and R^2 are alkylene; and at least one open chain Reissert unit of either the formula



where Ar is phenylene, R is alkyl and R^1 is alkylene or the formula

where R^3 and R^4 are alkyl therein.

5,194,576

MELT PRODUCTION OF A THERMOPLASTICALLY PROCESSIBLE AROMATIC POLYAMIDE WITH PHOSPHORUS COMPOUND CATALYST AND METAL SALT CATALYST

Günter Poll; Jürgen Finke, both of Marl, and Horst Heuer, Haltern, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 31, 1992, Ser. No. 828,619
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1991, 4103210
Int. Cl.[5] C08G 69/28
U.S. Cl. 528—336 11 Claims

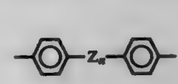
1. A process for the production of a thermoplastically processible aromatic polyamide comprising melt polycondensing the following starting monomers:

(A) HOOC—Ar—COOH

(B) H_2N—Ar'—NH_2

wherein:

Ar is 1,3 or 1,4-phenylene; 1,4-, 1,5-, 2,6- or 2,7-naphthalene,



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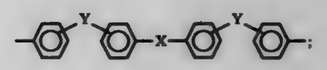
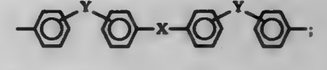


;

Ar':



;

X: —SO_2—; —CO—;

Y: —O—; —S—;

Z: —O—; —S—; —SO_2—; —CO—; —CR_2—;

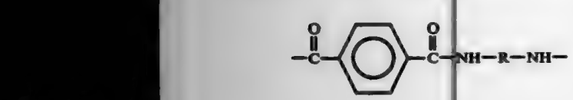
R: —H; C_1–C_4-Alkyl;

n: 0; 1;

in the presence of a catalyst at temperatures in the range of 200° to 400° C., wherein the catalyst comprises at least one phosphorus compound and at least one metal salt, other than a tin(II) salt, said catalyst containing at least 0.025 mol % of said phosphorous compound and at least 0.025 mol % of said metal salt, each relative to the sum of components A and B.

5,194,577
COMPOSITION COMPRISING CRYSTALLIZABLE POLYAMIDE FROM TEREPHTHALIC ACID, ADIPIC ACID, ALIPHATIC DIAMINE AND M-XYLYLENE DIAMINE
Ya-Tsai Chen, Glen Ellyn, Ill., assignor to Amoco Corporation, Chicago, Ill.
Filed Dec. 10, 1991, Ser. No. 805,456
Int. Cl.[5] C08G 69/26
U.S. Cl. 528—338 19 Claims

1. A crystallizable resinous polymer comprising recurring aliphatic and aromatic moieties of:



(A)

(B)

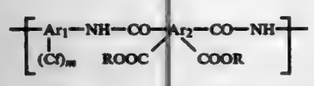
wherein R comprises diamine radicals derived from meta-xylylene diamine and an aliphatic diamine having 4 to 20 carbon atoms with the proviso that the mole ratio of meta-xylylene radicals:aliphatic radicals of 4 to 20 carbon atoms is 10–30:-90-70 and the molar ratio of terephthalic acid:adipic acid moieties in the A:B moieties is 90–70:10–30.

5,194,578
FIBER-FORMING COPOLYAMIDE FROM 2-METHYL-PENTAMETHYLENE DIAMINE
Anthony Anton, Wilmington, Del., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 21, 1992, Ser. No. 541,696
Int. Cl.[5] C08G 69/26
U.S. Cl. 528—349 7 Claims

1. A copolyamide consisting essentially of between about 60 and about 99.5 mole percent hexamethylene adipamide units and between about 0.5 and 40 mole percent 2-methyl-pentamethylene adipamide units, said copolyamide having a relative viscosity greater than about 25, and a melting point of greater than about 220° C., said relative viscosity being measured at 25° C. in a solution of 8.4% by weight polyamide polymer in 90% formic acid.

5,194,579
FLUORINE-CONTAINING POLYAMIDE ACID AND POLYAMIDE
Shunichi Numata; Kooji Fujisaki, and Noriyuki Kinjo, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan
Continuation of Ser. No. 410,499, Sep. 21, 1989, abandoned, which is a continuation of Ser. No. 131,712, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 26,214, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 688,050, Dec. 11, 1984, abandoned. This application Nov. 5, 1990, Ser. No. 609,103
Claims priority, application Japan, Apr. 11, 1983, 58-62080
Int. Cl.[5] C08G 69/26
U.S. Cl. 528—353 9 Claims

1. A polyamide acid characterized by containing repetition units represented by the following general formula I:



[I]

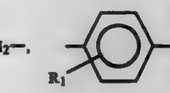
wherein Ar_1 and Ar_2 are groups containing aromatic hydrocarbon rings; R is hydrogen, or alkyl group having 1 to 4 carbon atoms; Cf is a fluorinated alkyl group directly bonded to a hydrocarbon ring as a pendent radical; and m≧1.

5,194,580
PROCESS FOR PREPARING POLYARYLENE SULFIDES UNDER REDUCED PRESSURE
Yoshinari Koyama; Daigo Shiroto; Masao Ohmori, all of Ichihara, and Minoru Senga, Sodegaura, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan
Filed Aug. 1, 1989, Ser. No. 387,920
Claims priority, application Japan, Aug. 5, 1988, 63-195844; Dec. 2, 1988, 63-305310
Int. Cl.[5] C08G 75/16
U.S. Cl. 528—388 19 Claims

1. A process for preparing a polyarylene sulfide comprising:
the step of dehydrating, in a rectification tower, a mixture of a hydrous sulfur source and an organic polar solvent at a reduced pressure of up to 200 Torr at the top of said rectification tower; and
the step of contacting a dihalogen aromatic compound with said dehydrated sulfur source in said organic polar solvent.

5,194,581
BIODEGRADABLE POLY(PHOSPHOESTERS)
Kam W. Leong, 8525 E. Heathrow Ct., Perry Hall, Md.
Filed Mar. 9, 1989, Ser. No. 321,360
Int. Cl.[5] C08G 29/02
U.S. Cl. 528—398 6 Claims

1. A polymer represented by the formula:



wherein n ranges from about 10 to about 10^5, R is a therapeutic agent capable of being released in a physiological environment, and R' is selected from the group consisting of:

5,194,582
PROCESS TO DEODORIZE AN ODOROUS POLY(MONO-1-OLEFIN)
Robert B. Eldridge; Francis X. Mueller, Jr.; Ralph C. Farrar, Jr.; Kenneth W. Willcox; Kiplin D. Cowan, and David R. Battiste, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 21, 1992, Ser. No. 933,140
Int. Cl.[5] C08F 6/00
U.S. Cl. 528—480 33 Claims

1. A process to deodorize an odorous solid poly(mono-1-olefin) said process comprising:
contacting, under deodorizing conditions, at least one deodorizing composition with at least one poly(mono-1-olefin); wherein said deodorizing conditions comprise
a standard pressure from about 1 to about 5 and
a standard temperature from about 0.5 to about 2.5; wherein said poly(mono-1-olefin) is substantially in the solid state.

5,194,583
METHOD FOR NEUTRALIZING AN ALKALINE SOLUTION OF AN ORGANIC RESIN
Gerald A. Krulik, El Toro, Calif., assignor to Morton International, Inc., Chicago, Ill.
Filed Apr. 26, 1991, Ser. No. 692,101
Int. Cl.[5] C08F 6/06, 6/12
U.S. Cl. 528—485 4 Claims

1. A method for separating an acidic organic resin from an aqueous alkaline solution of the resin, the method consisting essentially of introducing a mixture of water soluble salts of aluminum and magnesium into the alkaline solution whereby insoluble hydroxides and the resin are co-precipitated, and separating the precipitates from the aqueous solution.

5,194,584
BIODEGRADABLE CONCRETE FORM RELEASE AGENT
Kenneth C. Leaky, Franklin Park, Ill., assignor to Leaky-Wolf Co., Franklin Park, Ill.
Filed Feb. 11, 1992, Ser. No. 833,913
Int. Cl.[5] C09D 5/20; C09K 3/18; B28B 7/36, 7/38
U.S. Cl. 530—210 5 Claims

1. A concrete form release agent free from any petroleum hydrocarbon liquid comprising a vegetable oil carrier which contains dispersed uniformly therein from 1% to 8% by weight of tall oil.

5,194,585
INHIBITORS OF CATALYTIC ANTIBODIES
Sudhir Paul, Omaha, Nebr.; Michael J. Powell, Gaithersberg, and Richard J. Massey, Rockville, both of Md., assignors to IGEN, Inc., Rockville, Md.
Continuation-in-part of Ser. No. 343,081, Apr. 25, 1989. This application Feb. 28, 1990, Ser. No. 486,594
Int. Cl.[5] C07K 7/32, 7/06, 7/08; A61K 37/02
U.S. Cl. 530—309 10 Claims

1. An inhibitor which inhibits a catalytic autoantibody from catalyzing a chemical reaction of a substrate, wherein the substrate is vasoactive intestinal peptide and the chemical reaction is cleavage of a peptide bond in said vasoactive intestinal peptide, said inhibitor comprising a fragment of the substrate, and said inhibitor was not used to elicit said catalytic autoantibody.

5,194,586
ANTI-ATLA ANTIBODY BINDING PEPTIDES
Yoshiaki Maeda, Fukuoka; Hiroshi Shiraki, Osaka; Yukiko Washitani, Fukuoka; Naotaka Kuroda, Osaka; Kyoko Yamada, Kurashiki; Kiichiro Oka, Kurashiki, and Toshihiko Namba, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan
Filed Oct. 11, 1990, Ser. No. 596,081
Claims priority, application Japan, Oct. 13, 1989, 1-266983
Int. Cl.[5] A61K 37/02; C07K 5/00, 7/00; C12Q 1/00
U.S. Cl. 530—324 4 Claims

1. A peptide of the general formula:

H-X-A-Y

wherein A is a peptide fragment comprising 6 to 50 amino acids, X is a peptide fragment comprising 1 to 10 Lys, and Y is hydroxy or amino group, said peptide being capable of specifically binding to an antibody having a specificity against an adult T cell leukemia associated antigen, A being selected from the group consisting of:
(a) -Pro-Pro-Pro-Pro-Ser-Ser-Pro-Thr-His-Asp-Pro-Pro-Asp-Ser-Asp-Pro-Gln-Ile-Pro-Pro-Pro-Tyr-Val-Glu-Pro-Thr-Ala-Pro-Gln-Val-Leu- (SEQ ID NO: 1),
(b) -Pro-Pro-Pro-Pro-Ser-Ser-Pro-Thr-His-Asp-Pro-Pro-Asp-Ser-Asp-Pro-Gln-Ile-Pro- (SEQ ID NO: 28),
(c) -Pro-Tyr-Val-Glu-Pro-Thr-Ala-Pro-Gln-Val-Leu- (SEQ ID NO: 29),
(d) -Pro-Val-Met-His-Pro-His-Gly-Ala-Pro-Pro-Asn-His-Arg-Pro-Trp-Gln-Met-Lys-Asp-Leu-Gln-Ala-Ile-Lys-Gln-Glu-Val-Ser-Gln-Ala-(SEQ ID NO: 30),
(e) -Gly-Leu-Pro-Glu-Gly-Thr-Pro-Lys-Asp-Pro-Ile-Leu-Arg-Ser-Leu-Ala-Tyr-Ser-Asn-Ala-Asn-Lys-Glu-Cys-Gln-Lys-Leu-Leu-Gln-Ala-(SEQ ID NO: 31),
(f) -Asp-Pro-Ile-Leu-Arg-Ser-Leu-Ala-Tyr-Ser-Asn-Ala-Asn-Lys-Glu-Cys-Gln-Lys-Leu- (SEQ ID NO: 32),
(g) -Gly-Asp-Tyr-Ser-Pro-Ser-Cys-Cys-Thr-Leu-Thr-Ile-Gly-Val-Ser-Ser-Tyr-His-Ser-Lys-Pro-Cys-Asn-Pro-Ala-Gln-Pro-Val-Cys-Ser-(SEQ ID NO: 33),
(h) -Thr-Lys-Lys-Pro-Asn-Arg-Asn-Gly-Gly-Gly-Tyr-Tyr-Ser-Ala-Ser-Tyr-Ser-Asp-Pro-Cys-Ser-Leu-Lys-Cys-Pro-Tyr-Leu- (SEQ ID NO: 34),
(i) -Phe-Leu-Asn-Thr-Glu-Pro-Ser-Gln-Leu-Pro-Pro-Thr-Ala-Pro-Pro-Leu-Leu-Pro-His-Ser-Asn-Leu-Asp-His-Ile-(SEQ ID NO: 3),
(j) -Thr-Pro-Leu-Leu-Tyr-Pro-Ser-Leu-Ala-Leu-Pro-Ala-Pro-His-Leu-Thr-Leu-Pro-Phe-Asn-Trp-Thr-His-Cys-Phe-Asp-Pro-Gln-Ile-Gln-(SEQ ID NO: 35),
(k) -Thr-Pro-Cys-His-Asn-Ser-Leu-Ile-Leu-Pro-Pro-Phe-Ser-Leu-Ser-Pro-Val-Pro-Thr-Leu-Gly-Ser-Arg-Arg-Ala-Val-Pro-Val-Ala- (SEQ ID NO: 36),
(l) -Val-Asp-Lys-Asp-Ile-Ser-Gln-Leu-Thr-Gln-Ala-Ile-Val-Lys-Asn-His-Lys-Asn-Leu-Leu-Lys-Ile-Ala-Gln-Tyr-Ala-Ala-Gln-Asn-Arg-Arg-Gly-Leu-Asp-Leu-Leu-Phe- (SEQ ID NO: 37),
(m) -Cys-Arg-Phe-Pro-Asn-Ile-Thr-Asn-Ser-His-Val-Pro-Ile-Leu-Gln-Glu-Arg-Pro-Pro-Leu-Glu-Asn-Arg-Val-Leu-Thr-Gly-Trp-Gly-Leu- (SEQ ID NO: 38),
(n) -Leu-Ala-Gly-Pro-Cys-Ile-Leu-Arg-Gln-Leu-Arg-His-Leu-Pro-Ser-Arg-Val-Arg-Tyr-Pro-His-Tyr-Ser-Leu-Ile-Lys-Pro-Glu-Ser-Ser-Leu- (SEQ ID NO: 39),
(o) -Tyr-Ala-Ala-Gln-Asn-Arg-Arg-Gly-Leu-Asp-Leu-Leu-Phe-Trp-Glu-Gln-Gly-Gly-Leu- (SEQ ID NO: 2), and
(p) -Leu-Leu-Pro-His-Ser-Asn-Leu-Asp-His-Ile-Leu-Glu-Pro-Ser-Ile-Pro-Trp-Lys-Ser-Lys- (SEQ ID NO: 40).

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5,194,587

MALARIA-SPECIFIC DNA SEQUENCES, EXPRESSION PRODUCTS THEREOF, AND THE USE THEREOF

Bernhard Knapp, Marburg-Schröck; Erika Hundt, Marburg-Wehrshausen; Burkhard Enders, and Hans Küpper, both of Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 290,942, Dec. 28, 1988, abandoned. This application Jun. 27, 1991, Ser. No. 723,668

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1987, 3744495; Sep. 15, 1988, 3831351

Int. Cl.[5] C07K *13/00, 15/04;* A61K *39/015*

U.S. Cl. 530—324 3 Claims

1. An isolated polypeptide with the amino acid sequence:

ValLysIleLeuLysLysLysLysAsnLeuArgLysIleLys-GluThrThrAspGlu GluLysThrSerAspAsnValSerGlnMetTyrGluArgLysGlyGlyProLeuProPro ProGluLeuArgLys

and partial sequences thereof, said polypeptide and partial sequences thereof being cross-reactive with an antiserum directed to the 41 kD *Plasmodium falciparum* band and capable of providing protection against *Plasmodium falciparum.*

5,194,588

AMINOALCOHOL INTERMEDIATES FOR PEPTIDE DERIVATIVES

Philip D. Edwards, Claymont; John A. Schwartz; Mark M. Stein, both of Wilmington, all of Del.; Diane A. Trainor, Glen Mills, Pa., and Richard A. Wildonger, Newark, Del., assignors to ICI Americas Inc., Wilmington, Del.

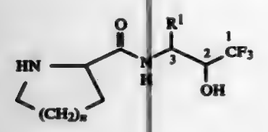
Division of Ser. No. 5,538, Jan. 20, 1987, Pat. No. 4,910,190, which is a continuation-in-part of Ser. No. 821,150, Jan. 21, 1986, abandoned. This application Mar. 9, 1990, Ser. No. 491,757

Claims priority, application United Kingdom, Jan. 22, 1985, 8501522; Jan. 22, 1985, 8501523; Jan. 22, 1985, 8501524

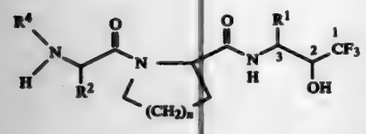
Int. Cl.[5] A61K *37/02;* C07K *5/06, 5/08, 5/10*

U.S. Cl. 530—331 7 Claims

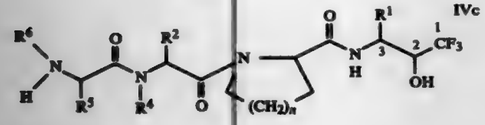
1. A compound of formula IVa, IVb or IVc:



IVa



IVb



IVc

wherein

R^1 is an alkyl group containing from 1 to 5 carbon atoms;

R^2 and R^5 are each selected independently from the group consisting of:

(I) an alkyl group containing from 1 to 10 carbons; and

(II) an alkyl group containing from 1 to 6 carbon atoms substituted by at least one member selected from the group consisting of:

(a) hydroxy;

(b) amino;

(c) alkylamino containing from 1 to 6 carbons;

(d) dialkylamino wherein each alkyl group contains from 1 to 6 carbons;

(e) alkanoyl containing from 1 to 6 carbons;

(f) arylcarbonyl wherein the aryl contains 6, 10 or 12 carbons;

(g) aralkanoyl containing 8 to 13 carbons;

(h) amido which may be attached to the alkyl group via either a nitrogen or carbon of said amido;

(i) alkylcarbonylamino wherein the alkyl group contains from 1 to 6 carbons;

(j) alkylaminocarbonyl wherein the alkyl group contains from 1 to 6 carbons;

(k) arylcarbonylamino wherein the aryl group contains 6, 10 or 12 carbons;

(l) aralkylcarbonylamino wherein the aralkyl group contains from 7 to 13 carbons;

(m) arylaminocarbonyl wherein the aryl group contains 6, 10 or 12 carbons;

(n) aralkylaminocarbonyl wherein the aralkyl group contains from 7 to 13 carbons;

(o) carboxy;

(p) aryloxycarbonyl wherein the aryl group contains 6, 10 or 12 carbons;

(q) aralkoxycarbonyl wherein the aralkoxy group contains from 7 to 13 carbons;

(r) alkanoyloxy containing from 1 to 6 carbons;

(s) aroyloxy wherein the aryl portion contains 6, 10 or 12 carbons;

(t) aralkanoyloxy containing from 8 to 14 carbons;

(u) alkylsulfonamido wherein the alkyl group contains from 1 to 6 carbons;

(v) aralkylsulfonamido wherein the aralkyl group contains from 7 to 13 carbons;

(w) arylsulfonamido wherein the aryl group contains 6, 10 or 12 carbons;

(x) acylsulfonamido (i.e. acylaminosulfonyl and sulfonylaminocarbonyl) including acylsulfonamido wherein the acyl group contains 1 to 7 carbons when it is the terminal portion of the acylsulfonamide and provided that when the acylsulfonamido contains an aryl the aryl may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;

(y) alkoxycarbonyl wherein the alkoxy group contains from 1 to 6 carbons;

(z) aralkoxycarbonylamino wherein the aralkoxy group contains from 8 to 13 carbons;

(aa) aryloxycarbonylamino wherein the aryloxy group contains 6, 10 or 12;

(bb) alkoxycarbonylamino wherein the alkyloxy group contains from 1 to 6 carbons;

(cc) aryl containing 6, 10 or 12 carbons;

(dd) aryl containing 6, 10 or 12 carbons and substituted by 1 to 3 members selected from the group consisting of chloro, bromo, iodo, fluoro, trifluoromethyl, hydroxy, alkyl (1 to 6 carbons), alkoxy (1 to 6 carbons), alkoxycarbonyl (1 to 6 carbons), carboxy, 5-tetrazolo, and acylsufamido (i.e. acylaminosulfonyl and sulfonylaminocarbonyl) (1 to 15 carbons) and provided that when the acylsulfonamido contains an aryl the aryl may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;

(ee) cycloalkyl containing from 3 to 15 carbons;

(ff) alkylureido wherein the alkyl group contains from 1 to 6 carbons;

(gg) aralkylureido wherein the aralkyl group contains from 8 to 13 carbons; and

(hh) arylureido wherein the aryl group contains 6, 10 or 12 carbons;

R^4 and R^6 are independently selected from hydrogen or methyl; and

n is 0, 1 or 2; and

where appropriate, the acid- and base-addition salts thereof; and provided that:

(1) alkyls may be straight or branched chain; and

(2) no carbon of an alkyl may be directly bonded to two heteroatoms.

5,194,589

LEECH PROTEIN HAVING ANTICOAGULANT AND ANTIMETASTATIC PROPERTIES

John A. Bott, Grosse Pointe Shores, Mich., assignor to Pennsylvania Hospital, Philadelphia, Pa.

Continuation of Ser. No. 144,453, Jan. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 88,432, Aug. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 908,581, Sep. 18, 1986, abandoned. This application Feb. 15, 1991, Ser. No. 657,356

Int. Cl.[5] C07K *13/00, 3/02, 3/28*

U.S. Cl. 530—350 14 Claims

1. A biochemically pure protein antistasin having a molecular weight of about 17,000 and an iso-electric point of 9.5, and a capacity to inhibit or delay blood coagulation by selective inhibition of coagulation factor Xa, as indicated by inhibition of coagulation factor Xa and non-inhibition of thrombin-induced coagulation, said protein having the amino acid sequence of antistasin from salivary glands of the leech *Haementeria officinalis.*

5,194,590

ACELLULAR RED BLOOD CELL SUBSTITUTE

Lakshman R. Sehgal; Richard E. De Woskin, both of Cook County; Gerald S. Moss; Steven A. Gould, both of Lake County; Arthur L. Rosen, and Hansa Sehgal, both of Cook County, all of Ill., assignors to Northfield Laboratories, Inc., Evanston, Ill.

Continuation of Ser. No. 315,130, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 876,689, Jun. 20, 1989, Pat. No. 4,826,811. This application Nov. 21, 1990, Ser. No. 616,727

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] C07K *13/00;* A61K *37/02*

U.S. Cl. 530—385 1 Claim

1. Essentially tetramer free, cross linked, polymerized hemoglobin wherein the hemoglobin is from human blood.

5,194,591

ISOLATION OF AN IMMUNOGLOBULIN RICH FRACTON FROM WHEY

Robin C. Bottomley, High Wycombe, England, assignor to Express Foods Europe Limited, South Ruislip, England

Filed Dec. 5, 1988, Ser. No. 279,917

Claims priority, application United Kingdom, Dec. 11, 1987, 8729031

Int. Cl.[5] C07K *3/02, 3/26, 3/28*

U.S. Cl. 530—387.1 17 Claims

1. A method of producing a whey protein concentrate rich in immunoglobulins which comprises fractionating whey proteins into an immunoglobulin rich fraction and an immunoglobulin depleted fraction and concentrating at least the immunoglobulin rich fraction, in which a protein containing liquid selected from the group consisting of a whey, a liquid whey protein concentrate or a reconstituted whey protein concentrate powder is subjected to ultrafiltration through a membrane having a molecular weight cut-off of about 500,000 whereby to directly produce an immunoglobulin enriched concentrate together with fat.

12. A method of producing a whey protein concentrate rich in immunoglobulins which comprises fractionating whey proteins into an immunoglobulin rich fraction and an immunoglobulin depleted fraction and concentrating at least the immunoglobulin rich fraction, in which a protein containing liquid selected from the group consisting of a whey, a liquid whey protein concentrate and a reconstituted whey protein concentrate powder is subjected to the action of an anion-exchange resin at a pH of about 2.0–6.5 to produce an effluent, the whey proteins in which contain a higher proportion of immunoglobulins relative to said protein-containing liquid and an eluate the whey protein content of which contains a depleted proportion of immunoglobulins relative to said protein containing liquid and subjecting at least the effluent to concentration by ultrafiltration through a membrane having a molecular weight cut-off of about 500,000.

5,194,592

MONOCLONAL ANTIBODIES TO NOVEL POLYPEPTIDE DERIVATIVES OF HUMAN GRANULOCYTE COLONY STIMULATING FACTOR

Hajime Yoshida, Kanagawa, Japan, assignor to Kyowa Hakko Kogyo Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 136,647, Dec. 22, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 318,527

Claims priority, application Japan, Dec. 23, 1986, 61-306799; Mar. 31, 1988, 63-80088; May 4, 1988, 63-51357

Int. Cl.[5] C07K *15/28*

U.S. Cl. 530—388.23 1 Claim

1. A monoclonal antibody of the IgG_1 isotype which specifically binds to a derivative of human granulocyte colony stimulating factor having the amino acid sequence as shown in Table 3, but does not bind to a natural human granulocyte colony stimulating factor, said monoclonal antibody being secreted by hybridoma cell line FERM Deposit No. BP-1665.

5,194,593

ANTIBODIES TO NATURAL KILLER CELL AND NON-SPECIFIC CYTOTOXIC CELL RECEPTOR AND TARGET CELL ANTIGENS

Donald L. Evans, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 109,730, Oct. 16, 1987. This application Oct. 3, 1990, Ser. No. 592,685

Int. Cl.[5] C07K *15/28;* A61K *39/395*

U.S. Cl. 530—388.73 14 Claims

1. An antibody to a receptor found as a dimer in the presence of a reducing agent having a subunit with a molecular weight of about 38,000 daltons and a subunit with a molecular weight of about 43,000 daltons, on the surface of natural killer cells of mammalian and fish origin that is recognized by an antibody produced by a hybridoma selected from the group consisting of the hybridomas deposited with ATCC on Oct. 16, 1987 and designated HB9572 and HB9573, wherein the receptor is involved in non-MHC restricted, non-antigen specific cytolysis of target cells.

5,194,594

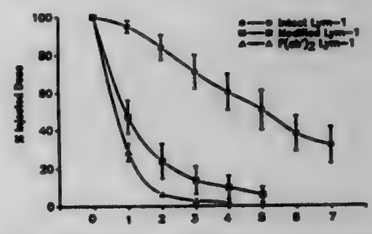
MODIFIED ANTIBODIES

Leslie A. Khawli, Diamond Bar, and Alan L. Epstein, La Canada, both of Calif., assignors to Techniclone, Inc., Tustin, Calif.

Filed Sep. 7, 1990, Ser. No. 579,375

Int. Cl.[5] C07K *15/28, 17/06;* A61K *49/02*

U.S. Cl. 530—391.5 13 Claims



1. An antibody having a first moiety attached thereto at a first attachment site, said first moiety being a heterobifunctional reagent, said antibody also having a radionuclide at-

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tached at a second attachment site, said second attachment site being a different site on said antibody than said first attachment site, and said second attachment site not having an attached heterobifunctional reagent of the same type as said first moiety.

5,194,595
CHIMERIC GLYCOPROTEINS CONTAINING IMMUNOGENIC SEGMENTS OF THE GLYCOPROTEINS OF HUMAN RESPIRATORY SYNCYTIAL VIRUS

Michael W. Wathen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

PCT No. PCT/US89/03784, § 371 Date Jun. 20, 1990, § 102(e) Date Jun. 20, 1990, PCT Pub. No. WO87/04185, PCT Pub. Date Jul. 16, 1987
Continuation-in-part of Ser. No. 137,387, Dec. 23, 1987, abandoned. This PCT application Oct. 31, 1988, Ser. No. 543,780
Int. Cl.[5] C07K *13/00*; C12N *15/45*; C12P *21/02*; A61K *37/02*
U.S. Cl. 530—395 4 Claims

1. A polypeptide comprising at least one immunogenic fragment from both human respiratory syncytial virus glycoproteins F and G.

5,194,596
PRODUCTION OF VASCULAR ENDOTHELIAL CELL GROWTH FACTOR

Edmund G. Tischer, Palo Alto; Judith A. Abraham, Sunnyvale; John C. Fiddes, Palo Alto, and Richard L. Mitchell, Sunnyvale, all of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 387,545, Jul. 27, 1989, abandoned. This application Dec. 14, 1989, Ser. No. 450,883
Int. Cl.[5] C07K *3/00*; A61K *37/36*
U.S. Cl. 530—399 2 Claims

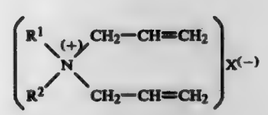
1. Isolated vascular endothelial cell growth factor selected from the group consisting of bovine vascular endothelial cell growth factor of 120 amino acids and human vascular endothelial cell growth factor of 121 amino acids.

5,194,597
PREPARATION OF A COUPLING PRODUCT OF BISIAZOTIZED 2,2',5,5'-TETRACHLORO-4,4'-DIAMINOBIPHENYL WITH TWO EQUIVALENTS OF N-ACETOACETYL-2,4-DIMETHYLANILIDE

Wolfgang Rieper, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 30, 1991, Ser. No. 693,395
Claims priority, application Fed. Rep. of Germany, May 2, 1990, 4014022
Int. Cl.[5] C09B *35/035, 67/20*; C09D *11/62*; D06P *1/44*
U.S. Cl. 534—579 4 Claims

1. A process for preparing the coupling product of bisdiazotized 2,2',5,5'-tetrachloro-4,4'-diaminobiphenyl with two equivalents of N-acetoacetyl-2,4-dimethylanilide which contains not more than 25 μg of polychlorinated biphenyls (PCBs) per gram of pigment, in which the azo coupling is brought about in aqueous medium at a pH of within a pH range of less than pH 7 either by addition of the diazonium salt solution to a suspension of the coupling component or by the simultaneous addition of the two reactants to a reaction vessel, which comprises effecting the coupling operation in the presence of at least one quaternary ammonium salt of the structural formula



(I)

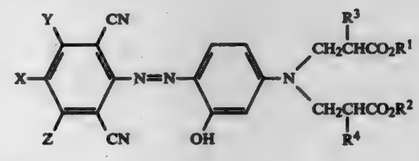
where R^1 and R^2 are each independently of the other C_1–C_3-alkyl and X is chlorine, bromine or iodine.

5,194,598
AZO DYESTUFFS IN WHICH THE COUPLING COMPONENT CONTAINS AN N,N-BIS(ALKOXY CARBONYLALKYL) SUBSTITUENT

Rainer Hamprecht, Odenthal-Blecher, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 256,826, Oct. 12, 1988, abandoned. This application Feb. 20, 1991, Ser. No. 657,617
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736088
Int. Cl.[5] C09B *29/085*; D06P *1/18*
U.S. Cl. 534—852 2 Claims

1. An azo dyestuff of the formula



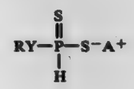
wherein
X denotes Cl, Br or CO_2R,
R denotes C_{1-4}-alkyl or C_{5-6} cycloalkyl,
Y denotes H,
Z denotes H,
R^1/R^2 denotes CH_3 or C_2H_5 and
R^3/R^4 denotes H.

5,194,599
HYDROGEN PHOSPHONODITHIOATE COMPOSITIONS

Brian C. Froehler, Belmont, and Chris A. Buhr, Daly City, both of Calif., assignors to Gilead Sciences, Inc., Foster City, Calif.

Filed Sep. 23, 1988, Ser. No. 248,517
Int. Cl.[5] C07H *19/067, 19/073, 19/167, 19/173*
U.S. Cl. 536—26.72 10 Claims

1. A compound of the formula



wherein Y is O;
A^+ is a cation; and R is a protected or unprotected nucleoside, nucleotide, modified nucleoside or modified nucleotide, or R is a protected or unprotected deoxynucleoside, deoxynucleotide, modified deoxynucleoside or modified deoxynucleotide.

5,194,600
GENES WHICH PARTICIPATE IN β-GLUCAN ASSEMBLY AND USE THEREOF

Howard Bussey, Westmount; Charles Boone, London, both of Canada; Steve S. Sommer, Rochester, Minn.; Kathryn Hill, Montreal, Canada, and Philip Meaden, Horsham, England, assignors to Royal Institute for the Advancement of Learning, Montreal, Canada

Filed Mar. 5, 1990, Ser. No. 488,316
Int. Cl.[5] C12Q *1/68, 1/02*; C12P *21/04*; C07H *19/06*
U.S. Cl. 536—23.74 1 Claim

1. Isolated DNA which codes for a gene which participates in a yeast cell wall β-glucan assembly pathway, of Saccharomyces cerevisiae, wherein the sequence of said DNA is selected from the group consisting of:

KRE1

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      NheI
      GCTAGCAGTTATTTCACTTTCATT

TACAGCATCCCTCATGTTTATTATCTTCTT

TATCTAATATAAATTAGGAACTAAATAAT   -360

CCCCTCACCGTATAAAGCGACAGTTCCGTG

ACGGTTACTATTATGAATATCTCAACGGAA

AGAGGGCATTAAAAGATCATAATAGTTGGT

ACTCTCGTATTTTATATATATATATCACT   -240

ATATTTTAACACTTTTACTGCTCAATTGTG

CCATATACTTCGCCTTATTGCGTACATTCT

TCACCTTGTATCCCCCTACCTCAGCGTGTA

    EcoRV
TGGTGATATCGCGTTTTTTCATAAACTGA   -120

GAATGGGGCTTTTTCTATAACGTGTATTAT

GAAAAAAAGAAAATAAAAATCAAGAATTAA

GCACTTGTATATGCTACAGTAAAGACCTCT

TCAACTTCTGCAAGACAATCAAAAAAAAA    -1

ATG ATG CGT CGC ACG CTA TTA CAT
Met Met Arg Arg Thr Leu Leu His

TCA TTC GCT ACG CTG CTA CTT TCT
Ser Phe Ala Thr Leu Leu Leu Ser

                                  ∇   •
TTG TCG TTG TGG TCA GCT GCG GTC
Leu Ser Leu Trp Ser Ala Ala Val

          ∇
ATG GCA GCT GTG ACA ACT     90
Met Ala Ala Val Thr Thr     30

CAG GTT ACA GTG GTA ACA AAT GTC
Gln Val Thr Val Val Thr Asn Val

ACC GCT CAA ACA GGT TTC TTC ACT
Thr Ala Gln Thr Gly Phe Phe Thr

ACG GTA TTC ACT ACC ACT AAC GAT
Thr Val Phe Thr Thr Thr Asn Asp
                ----- --------- ------

GTC GGA ACC ACC GTC ACT CTT ACT
Val Gly Thr Thr Val Thr Leu Thr
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          HincII
CAG ACA GTC AAC AGA GCC    270
Gln Thr Val Asn Arg Ala     90
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ACT ATG CTA CCA ACC ACG ACG ACT
Thr Met Leu Pro Thr Thr Thr Thr

TCT ACC TCA TCT ACT GGT AAG ACA
Ser Thr Ser Ser Thr Gly Lys Thr

ACC ACC ACT GTT CCT ACC GCA ACT
Thr Thr Thr Val Pro Thr Ala Thr

TCA TCG TTG TCT TCG GGA    360
Ser Ser Leu Ser Ser Gly    120

CTG TAT TTA TCT ACA GTT ACC ACG
Leu Tyr Leu Ser Thr Val Thr Thr
                           -------

                    KpnI
ACA AAC GAT TTG GGT ACC ACA GTT
Thr Asn Asp Leu Gly Thr Thr Val
------------------------------

ACA TTG ACT CAA ACG TTC ACA CAT
Thr Leu Thr Gln Thr Phe Thr His
------------------

TCT AGC ACC AGT GCT ACT    450
Ser Ser Thr Ser Ala Thr    150

TCA TCC GCC TCC TCG TCT GTG TCC
Ser Ser Ala Ser Ser Ser Val Ser

TCG TCT GTA TCT TCG TCT GGT TCA
Ser Ser Val Ser Ser Ser Gly Ser

TCC TCC AGT GTA AAG ACG ACC ACA
Ser Ser Ser Val Lys Thr Thr Thr

TCG ACA GGG AGC GCA GTA    540
Ser Thr Gly Ser Ala Val    180

GCT GAA ACA GGC ACC AGG CCA GAC
Ala Glu Thr Gly Thr Arg Pro Asp

CCC TCC ACA GAC TTC ACA GAA CCT
Pro Ser Thr Asp Phe Thr Glu Pro

                        SpeI
CCT GTG TCT GCT GTC ACT AGT CTA
Pro Val Ser Ala Val Thr Ser Leu

TCT ATT GAC TCA TAC ATT    630
Ser Ile Asp Ser Tyr Ile    210

ACC ATC ACT GAA GGT ACA ACC TCC
Thr Ile Thr Glu Gly Thr Thr Ser

ACT TAC ACA ACC ACA CGT GCG CCA
Thr Tyr Thr Thr Thr Arg Ala Pro

ACG TCC ATG TGG GTC ACT GTT GTT
Thr Ser Met Trp Val Thr Val Val

AGA CAG GGC AAC ACT ATC    720
Arg Gln Gly Asn Thr Ile    240

ACT GTG CAA ACT ACT TTT GTC CAG
Thr Val Gln Thr Thr Phe Val Gln
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                                  SnaBI
CGT TTC TCC TCC CAG TAC GTA ACA   CTAACTTCCAATGTATTAAGGGAGCGATAC
Arg Phe Ser Ser Gln Tyr Val Thr    L  T  S  N  V  L  R  E  R  Y

GTC GCT TCT CCC TCC GTG GGG TCT
Val Ala Ser Pro Ser Val Gly Ser    241  GATAAAGAGGATGTGGCTGATTTATT
                                    81   D  K  E  D  V  A  D  L  L

ATT GGG ATG GGT ACT TTA    810     GGAACTGTATGCTAGTCTTTACCCTATGGGTA
Ile Gly Met Gly Thr Leu    270      E  L  Y  A  S  L  Y  P  M  G

ACC GGT ACT GTA GGC GTT ATT AAA   TGATACAGCACGATATCAGTTCCAATGCAGAA
Thr Gly Thr Val Gly Val Ile Lys    M  I  Q  H  D  I  S  S  N  A  E

TCT GCA ATA AAG AAA ACA GTT TCG   CAAGACGATGCAAATAGTAGCTATTTCGTT
Ser Ala Ile Lys Lys Thr Val Ser    Q  D  D  A  N  S  S  Y  F  V

CAT AAT GAG GCC CAG CAT CTA GGT
His Asn Glu Ala Gln His Leu Gly    361  TTGAATGGTAATAGGTACGAAAAGCC
                                   121   L  N  G  N  R  Y  E  K  P
                                   -------

ATG AGT TCG TTT ACT TCA    900     CGACGACGTGTTCTACTTGAAATCTAAGGATT
Met Ser Ser Phe Thr Ser    300      D  D  V  F  Y  L  K  S  K  D
-------------------------

                                   TAACAATTCAACAGAAAGTCCCAGATGTTGAT
                                   L  T  I  Q  Q  K  V  P  D  V  D

ATT TTG GGT GGG CTA TTA ACG GTT
Ile Leu Gly Gly Leu Leu Thr Val    GTTATACAACCTTACGATGTTGTCATTGGT
---------------------------------   V  I  Q  P  Y  D  V  V  I  G

                                   481  ACTAACTCAGAAGCGCCGATATTGAT
TTA ATT TGG TTC TTA TAA ATTTTTA    161   T  N  S  E  A  P  I  L  I
Leu Ile Trp Phe Leu
-------------------

                                   CTTGTACGGTTGTCCTACCGTTATTGACTCCG
TTCAGAAATAAACACAAACATATACATATAT     L  Y  G  C  P  T  V  I  D  S

AAGAGTAAAAATAAAAAAATAAAAA  1005   ACTTCGAAGAATTCAATAGGAATTTATTTATG
                           313    D  F  E  E  F  N  R  N  L  F  H

                                   GAAGCAATGAATGGAGAGGGAAAATTTAGA
AATTTTACAGGGTTAAAAATAAAGAAAACCA     E  A  M  N  G  E  G  K  F  R

TCACTCCTTTTCTATTTCATAATCCATGACA
                                   601  TTTATTTGGAGATCCACATGTTCCCT
     NsiI                          201   F  I  W  R  S  T  C  S  L
AACTTGATGCAT               1079;
                                   TGATGGGAAAAGCGTGGAGTATCCCTTAACTC
and                                 D  G  K  S  V  E  Y  P  L  T

          KRE5                     ATCCGCTTGAAATTACTTTAGAAAATGGTTCT
                                   H  P  L  E  I  T  L  Q  N  G  S
 -77                 TATATAACGTGGCA
                                   AGAATGAGCTCCATACCTCAATTAAAAAAA
TATTAAAGATTAATTGTCCTGGTAGAATATAG    R  M  S  S  I  P  Q  L  K  K

ACGTATCAGTGTGAGTGCCTCTGTTGATTA     721  ATACTATATACTGTACCCAAAGAAAT
                                   241   I  L  Y  T  V  P  K  E  I

   1  ATGAGACTACTTGCGTTGGTATTGTT     ATTGGTTGGAGCAGACAACGATGATCAGCTCC
   1  M  R  L  L  A  L  V  L  L      L  V  G  A  D  N  K  K  Q  L

ATTGTTGTGTGCGCCGCTTCGTGCATGGACTT   ATGATCTAGAACCAGAAGAATTACGTGAACTT
  L  L  C  A  P  L  R  A  W  T      H  D  L  E  P  E  E  L  R  E  L

ATAGCTTACGATATGGCATACCCGAATCTGCT   GATTTGAGAGTAACATCGTTAATCTCAGAA
Y  S  L  R  Y  G  I  P  E  S  A      K  L  R  V  T  S  L  I  S  E

CAGGTCTGGTCTATTTTAGTTCATTTACTG
  Q  V  W  S  I  L  V  H  L  L    841  TTTTACCAATATAAAAAGGATATCAC
                                   281   F  Y  Q  Y  K  K  D  I  T

 121  GGCGATGTTGATAATCAGCTGTTAAC     AGCCACTCTAAATTTCACCAAAAGTATTGTTA
  41   G  D  V  D  N  Q  L  L  T      A  T  L  N  F  T  K  S  I  V

TAATTTATATCCTTTGGTTACCGGTTTGGATG   ACAACTTTCCACTAATCTCTAAACAACTGATT
  N  L  Y  P  L  V  T  G  L  D      N  N  F  P  L  I  S  K  Q  L  I

ACGAGATTGATATTCAAGAAAATCTTGTGGCG   AAGGTTTCATCTGTTAACAAGGATATAATA
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K  V  S  S  V  N  K  D  I  I      1681  GAACTTCAAATTGACGAAACATCAAT
                                   561   E  L  Q  I  D  E  T  S  I

 961  ACAAGTAATGAAGAACTCAATAGTAA    TATAATCAATGGAGAGATTTACCCATTTAGAA
 321   T  S  N  E  E  L  N  S  K     I  I  N  G  E  I  Y  P  F  R

AGGCTTCGATTACAAGATGCTAGGTCTCTATA   AAAATTGGAATTATTTAATTGCAAAAGTTATC
  G  F  D  Y  N  M  L  G  L  Y      K  N  W  N  Y  L  I  A  K  V  I

TTAATGGACAGAATTGGAAAATTACCTCACTG   AAAAAGGACACTGAATTTATTCGTAAAGAA
I  N  G  Q  N  W  K  I  T  S  L      K  K  D  T  E  F  I  R  K  E

ACTCCGTACAATTTGCTTACTGCTTTAAAA
  T  P  Y  N  L  L  T  A  L  K    1801  TTGAGCAATTCTTCTCCGAAAAACAA
                                   601   L  S  N  S  S  P  K  N  K

1081  ACTGAATACCAAAGTTTACTGAAAAT    ACAAATTAGCGTAAGGGACTTATTGCATTACA
 361   T  E  Y  Q  S  L  L  K  I      Q  I  S  V  R  D  L  L  H  Y

TACGAACCTTTTGCAAGAACTCGAGCCATCGA   AATCTGCAAATCTGAGACATAATAAATATACA
  T  N  L  L  Q  E  L  E  P  S      K  S  A  N  L  R  H  N  K  Y  T

AATGCATACTAGATTCCAAGTTTTTACTCAAT   CCAAATTATTTTGCTGATTCGGTATATTCT
K  C  I  L  D  S  K  F  L  L  N      P  N  Y  F  A  D  S  V  Y  S

AAGTTTTCTCAATTTTCATTGGGGAAGTTG
  K  F  S  Q  F  S  L  G  K  L    1921  TCGGTCAACAATACTGCATTGGAAAG
                                   641   S  V  N  N  T  A  L  E  S

1201  CAAAACTTACAACCAATCAAAATGGA    CGTATGCTCAGAAAGAATAGGCTACTATACTA
 401   Q  N  L  Q  P  I  K  M  D      V  C  S  E  R  I  G  Y  Y  T

TCTCCACACAATTCCAGGGTTCTCAGAATCAG   AAAATGAAGAATACAATTTATTACACACAATC
  L  H  T  I  P  G  F  S  E  S      K  N  E  E  Y  N  L  L  H  T  I

TAATATACTTCAATGATATCGAAAGCGACCCG   ACATTAGTGGATGATTTTGGCTCTATTCAT
V  I  Y  F  N  D  I  E  S  D  P      T  L  V  D  D  F  G  S  I  H

CAATATGACGAATTAGTAAATAGTGTTCAA
  Q  Y  D  E  L  V  N  S  V  Q    2041  GCTTTGAAAAGATTGAGAAACTTGTT
                                   681   A  L  K  R  L  R  N  L  L

1321  GCATTTTTTGATAAATCGAAATTCGG    GCATACTTCCTTTGTTGGTGTTAGGATCAGAA
 441   A  F  F  D  K  S  K  F  G      H  T  S  F  V  G  V  R  I  R

AGAGTTGCCTGAAATAAAGCAAAACTGGTCAG   TCATTCACGTAGGTGATATTTCTGATATTTGG
  E  L  P  E  I  K  Q  N  W  S      I  I  H  V  G  D  I  S  D  I  W

AGATCATATTCGTTATAGATTTCGCCCGTTTA   TATCAATTGCGTGGAAGTCTTTCCCAAAAA
E  I  I  F  V  I  D  F  A  R  L      Y  Q  L  R  G  S  L  S  Q  K

GAAGATAGTGAGGTGAAGGAGGCATTGGGT
  E  D  S  E  V  K  E  A  L  G    2161  GATCCAATAGGCTCAATAAATACATT
                                   721   D  P  I  G  S  I  N  T  F

1441  GGGTTGGTTCGTGCCGTTAATGTTGT    TATTGATGCTTTGAAACTTAAAAAGGTAAAAA
 481   G  L  V  R  A  V  N  V  V      I  D  A  L  K  L  K  K  V  K

CTCCCAGGGATATCCGCAAAGAGTCGGACTAT   GTCACACGTACAAAAAAAGCGGCTTAAACCAG
  S  Q  G  Y  P  Q  R  V  G  L      S  H  T  Y  K  K  S  G  L  N  Q

TGCCATTTAGTTCAGATAGTGACAAGTCCGTT   TTAGGCCTTCATAAATGGCTTCCTGACATT
L  P  F  S  S  D  S  D  K  S  V      L  G  L  H  K  W  L  P  D  I

GTTAATAAAATTTACGAGCTGAAGAACTCA
  V  N  K  I  Y  E  L  K  N  S    2281  CCATTATTTGAATTGCAAAAGGGTTC
                                   761   P  L  F  E  L  Q  K  G  S

1561  ACTGACAATTTAACAGAATTAAAAAG    ATTTATTGCTTTGAACGGTAGATTTATCATCT
 521   T  D  N  L  T  E  L  K  S      F  I  A  L  N  G  R  F  I  I

TTTTTTGGAGACAATGCTGCTTGCAGATGGCC   TGATCAAAATGAAGTGCCAGAAACAGAACATT
  F  L  E  T  M  L  L  A  D  G      L  I  K  M  K  C  Q  K  Q  N  I

TTTCCGCGAATGCAAAACATTCAAAACACATA   TCGAAGGCCAAAATCATAAAGAGAGAAGCT
L  S  A  N  A  K  H  S  K  H  I      S  K  A  K  I  I  K  R  E  A

CCAGTTCCAGATGTTTTCCATCTACTTGAT
  P  V  P  D  V  F  H  L  L  D    2401  CTAAGAACGATCGATTCAGTTTTCGC
                                   801   L  R  T  I  D  S  V  F  A
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D  E  I  D  I  Q  E  N  L  V  A
                                  SnaBI
CGT TTC TCC TCC CAG TAC GTA ACA   CTAACTTCCAATGTATTAAGGGAGCGATAC
Arg Phe Ser Ser Gln Tyr Val Thr    L  T  S  N  V  L  R  E  R  Y

GTC GCT TCT CCC TCC GTG GGG TCT
Val Ala Ser Pro Ser Val Gly Ser    241  GATAAAGAGGATGTGGCTGATTTATT
                                    81   D  K  E  D  V  A  D  L  L

ATT GGG ATG GGT ACT TTA    810     GGAACTGTATGCTAGTCTTTACCCTATGGGTA
Ile Gly Met Gly Thr Leu    270      E  L  Y  A  S  L  Y  P  M  G

ACC GGT ACT GTA GGC GTT ATT AAA   TGATACAGCACGATATCAGTTCCAATGCAGAA
Thr Gly Thr Val Gly Val Ile Lys    M  I  Q  H  D  I  S  S  N  A  E

TCT GCA ATA AAG AAA ACA GTT TCG   CAAGACGATGCAAATAGTAGCTATTTCGTT
Ser Ala Ile Lys Lys Thr Val Ser    Q  D  D  A  N  S  S  Y  F  V

CAT AAT GAG GCC CAG CAT CTA GGT
His Asn Glu Ala Gln His Leu Gly    361  TTGAATGGTAATAGGTACGAAAAGCC
                                   121   L  N  G  N  R  Y  E  K  P
                                   -------

ATG AGT TCG TTT ACT TCA    900     CGACGACGTGTTCTACTTGAAATCTAAGGATT
Met Ser Ser Phe Thr Ser    300      D  D  V  F  Y  L  K  S  K  D
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                                   TAACAATTCAACAGAAAGTCCCAGATGTTGAT
                                   L  T  I  Q  Q  K  V  P  D  V  D

ATT TTG GGT GGG CTA TTA ACG GTT
Ile Leu Gly Gly Leu Leu Thr Val    GTTATACAACCTTACGATGTTGTCATTGGT
---------------------------------   V  I  Q  P  Y  D  V  V  I  G

                                   481  ACTAACTCAGAAGCGCCGATATTGAT
TTA ATT TGG TTC TTA TAA ATTTTTA    161   T  N  S  E  A  P  I  L  I
Leu Ile Trp Phe Leu
-------------------

                                   CTTGTACGGTTGTCCTACCGTTATTGACTCCG
TTCAGAAATAAACACAAACATATACATATAT     L  Y  G  C  P  T  V  I  D  S

AAGAGTAAAAATAAAAAAATAAAAA  1005   ACTTCGAAGAATTCAATAGGAATTTATTTATG
                           313    D  F  E  E  F  N  R  N  L  F  H

                                   GAAGCAATGAATGGAGAGGGAAAATTTAGA
AATTTTACAGGGTTAAAAATAAAGAAAACCA     E  A  M  N  G  E  G  K  F  R

TCACTCCTTTTCTATTTCATAATCCATGACA
                                   601  TTTATTTGGAGATCCACATGTTCCCT
     NsiI                          201   F  I  W  R  S  T  C  S  L
AACTTGATGCAT               1079;
                                   TGATGGGAAAAGCGTGGAGTATCCCTTAACTC
and                                 D  G  K  S  V  E  Y  P  L  T

          KRE5                     ATCCGCTTGAAATTACTTTAGAAAATGGTTCT
                                   H  P  L  E  I  T  L  Q  N  G  S
 -77                 TATATAACGTGGCA
                                   AGAATGAGCTCCATACCTCAATTAAAAAAA
TATTAAAGATTAATTGTCCTGGTAGAATATAG    R  M  S  S  I  P  Q  L  K  K

ACGTATCAGTGTGAGTGCCTCTGTTGATTA     721  ATACTATATACTGTACCCAAAGAAAT
                                   241   I  L  Y  T  V  P  K  E  I

   1  ATGAGACTACTTGCGTTGGTATTGTT     ATTGGTTGGAGCAGACAACGATGATCAGCTCC
   1  M  R  L  L  A  L  V  L  L      L  V  G  A  D  N  K  K  Q  L

ATTGTTGTGTGCGCCGCTTCGTGCATGGACTT   ATGATCTAGAACCAGAAGAATTACGTGAACTT
  L  L  C  A  P  L  R  A  W  T      H  D  L  E  P  E  E  L  R  E  L

ATAGCTTACGATATGGCATACCCGAATCTGCT   GATTTGAGAGTAACATCGTTAATCTCAGAA
Y  S  L  R  Y  G  I  P  E  S  A      K  L  R  V  T  S  L  I  S  E

CAGGTCTGGTCTATTTTAGTTCATTTACTG
  Q  V  W  S  I  L  V  H  L  L    841  TTTTACCAATATAAAAAGGATATCAC
                                   281   F  Y  Q  Y  K  K  D  I  T

 121  GGCGATGTTGATAATCAGCTGTTAAC     AGCCACTCTAAATTTCACCAAAAGTATTGTTA
  41   G  D  V  D  N  Q  L  L  T      A  T  L  N  F  T  K  S  I  V

TAATTTATATCCTTTGGTTACCGGTTTGGATG   ACAACTTTCCACTAATCTCTAAACAACTGATT
  N  L  Y  P  L  V  T  G  L  D      N  N  F  P  L  I  S  K  Q  L  I

ACGAGATTGATATTCAAGAAAATCTTGTGGCG   AAGGTTTCATCTGTTAACAAGGATATAATA
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K  V  S  S  V  N  K  D  I  I      1681  GAACTTCAAATTGACGAAACATCAAT
                                   561   E  L  Q  I  D  E  T  S  I

 961  ACAAGTAATGAAGAACTCAATAGTAA    TATAATCAATGGAGAGATTTACCCATTTAGAA
 321   T  S  N  E  E  L  N  S  K     I  I  N  G  E  I  Y  P  F  R

AGGCTTCGATTACAAGATGCTAGGTCTCTATA   AAAATTGGAATTATTTAATTGCAAAAGTTATC
  G  F  D  Y  N  M  L  G  L  Y      K  N  W  N  Y  L  I  A  K  V  I

TTAATGGACAGAATTGGAAAATTACCTCACTG   AAAAAGGACACTGAATTTATTCGTAAAGAA
I  N  G  Q  N  W  K  I  T  S  L      K  K  D  T  E  F  I  R  K  E

ACTCCGTACAATTTGCTTACTGCTTTAAAA
  T  P  Y  N  L  L  T  A  L  K    1801  TTGAGCAATTCTTCTCCGAAAAACAA
                                   601   L  S  N  S  S  P  K  N  K

1081  ACTGAATACCAAAGTTTACTGAAAAT    ACAAATTAGCGTAAGGGACTTATTGCATTACA
 361   T  E  Y  Q  S  L  L  K  I      Q  I  S  V  R  D  L  L  H  Y

TACGAACCTTTTGCAAGAACTCGAGCCATCGA   AATCTGCAAATCTGAGACATAATAAATATACA
  T  N  L  L  Q  E  L  E  P  S      K  S  A  N  L  R  H  N  K  Y  T

AATGCATACTAGATTCCAAGTTTTTACTCAAT   CCAAATTATTTTGCTGATTCGGTATATTCT
K  C  I  L  D  S  K  F  L  L  N      P  N  Y  F  A  D  S  V  Y  S

AAGTTTTCTCAATTTTCATTGGGGAAGTTG
  K  F  S  Q  F  S  L  G  K  L    1921  TCGGTCAACAATACTGCATTGGAAAG
                                   641   S  V  N  N  T  A  L  E  S

1201  CAAAACTTACAACCAATCAAAATGGA    CGTATGCTCAGAAAGAATAGGCTACTATACTA
 401   Q  N  L  Q  P  I  K  M  D      V  C  S  E  R  I  G  Y  Y  T

TCTCCACACAATTCCAGGGTTCTCAGAATCAG   AAAATGAAGAATACAATTTATTACACACAATC
  L  H  T  I  P  G  F  S  E  S      K  N  E  E  Y  N  L  L  H  T  I

TAATATACTTCAATGATATCGAAAGCGACCCG   ACATTAGTGGATGATTTTGGCTCTATTCAT
V  I  Y  F  N  D  I  E  S  D  P      T  L  V  D  D  F  G  S  I  H

CAATATGACGAATTAGTAAATAGTGTTCAA
  Q  Y  D  E  L  V  N  S  V  Q    2041  GCTTTGAAAAGATTGAGAAACTTGTT
                                   681   A  L  K  R  L  R  N  L  L

1321  GCATTTTTTGATAAATCGAAATTCGG    GCATACTTCCTTTGTTGGTGTTAGGATCAGAA
 441   A  F  F  D  K  S  K  F  G      H  T  S  F  V  G  V  R  I  R

AGAGTTGCCTGAAATAAAGCAAAACTGGTCAG   TCATTCACGTAGGTGATATTTCTGATATTTGG
  E  L  P  E  I  K  Q  N  W  S      I  I  H  V  G  D  I  S  D  I  W

AGATCATATTCGTTATAGATTTCGCCCGTTTA   TATCAATTGCGTGGAAGTCTTTCCCAAAAA
E  I  I  F  V  I  D  F  A  R  L      Y  Q  L  R  G  S  L  S  Q  K

GAAGATAGTGAGGTGAAGGAGGCATTGGGT
  E  D  S  E  V  K  E  A  L  G    2161  GATCCAATAGGCTCAATAAATACATT
                                   721   D  P  I  G  S  I  N  T  F

1441  GGGTTGGTTCGTGCCGTTAATGTTGT    TATTGATGCTTTGAAACTTAAAAAGGTAAAAA
 481   G  L  V  R  A  V  N  V  V      I  D  A  L  K  L  K  K  V  K

CTCCCAGGGATATCCGCAAAGAGTCGGACTAT   GTCACACGTACAAAAAAAGCGGCTTAAACCAG
  S  Q  G  Y  P  Q  R  V  G  L      S  H  T  Y  K  K  S  G  L  N  Q

TGCCATTTAGTTCAGATAGTGACAAGTCCGTT   TTAGGCCTTCATAAATGGCTTCCTGACATT
L  P  F  S  S  D  S  D  K  S  V      L  G  L  H  K  W  L  P  D  I

GTTAATAAAATTTACGAGCTGAAGAACTCA
  V  N  K  I  Y  E  L  K  N  S    2281  CCATTATTTGAATTGCAAAAGGGTTC
                                   761   P  L  F  E  L  Q  K  G  S

1561  ACTGACAATTTAACAGAATTAAAAAG    ATTTATTGCTTTGAACGGTAGATTTATCATCT
 521   T  D  N  L  T  E  L  K  S      F  I  A  L  N  G  R  F  I  I

TTTTTTGGAGACAATGCTGCTTGCAGATGGCC   TGATCAAAATGAAGTGCCAGAAACAGAACATT
  F  L  E  T  M  L  L  A  D  G      L  I  K  M  K  C  Q  K  Q  N  I

TTTCCGCGAATGCAAAACATTCAAAACACATA   TCGAAGGCCAAAATCATAAAGAGAGAAGCT
L  S  A  N  A  K  H  S  K  H  I      S  K  A  K  I  I  K  R  E  A

CCAGTTCCAGATGTTTTCCATCTACTTGAT
  P  V  P  D  V  F  H  L  L  D    2401  CTAAGAACGATCGATTCAGTTTTCGC
                                   801   L  R  T  I  D  S  V  F  A
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VOL 1148 ISS 3 MR 16 1993 UMI

VOL 1148 ISS 3 MR 16 1993 UMI

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CCTAGATTTACTTTTTCCAGGTTTCTCACAGG
  L  D  L  L  F  P  G  F  S  Q

AAATAATCAATCCTGATTTGATAGAAATGATC
E  I  I  N  P  D  L  I  E  M  I

TCCTCCATTTTAACTAGGTTGTTTTACCAA
 S  S  I  L  T  R  L  F  Y  Q

2521   GGTACACATATATACAATAATGGTAT
 842    G  T  H  I  Y  N  N  G  I

TGATTATACCACTGAAAGTAGCTTACCAAGAA
  D  Y  T  T  E  S  S  L  P  R

TGGATTTGAGCGAGTTTTTTAGACCTAATAAT
M  D  L  S  E  F  F  R  P  N  N

TTAACGATGTTTGAAGATGGAAAATCAGCT
 L  T  M  F  E  D  G  K  S  A

2641   TCTATTGATTTACTACTAATTTTAGA
 881    S  I  D  L  L  L  I  L  D

TCCACTTGAAGAGAGAACGCAAATGATTCTTT
  P  L  E  E  R  T  Q  M  I  L

CTCTTGTTGAGCAATTCAGGCCTTTGAAATTT
S  L  V  E  Q  F  E  P  L  K  F

GTTAATATTCAGGTAATTTTAATGCCGACA
 V  N  I  Q  V  I  L  M  P  T

2761   CTGGAATTAAACATTGTCCCTATTAG
 921    L  E  L  N  I  V  P  I  R

AAGAATATACGTTGATGACGCAGATATTGTCA
  R  I  Y  V  D  D  A  D  I  V

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K  S  I  T  S  E  D  S  R  S  D

CCAGAAGTAGATATTGAAATGGATGTTCCT
  P  E  V  D  I  E  M  D  V  P

2881   AATTCTTTCATTGTAGATAATAATTA
 961    M  S  F  I  V  D  N  N  Y

TCGGATAAAAAAATTGCTCATAGAATTACATT
  R  I  K  K  L  L  I  E  L  H

CCTTCTCTAGCAAAACAGTCCTTTCAACTGGC
S  F  S  S  K  T  V  L  S  T  G

AATATTGATGGTATGGGGGGTGTATGCCTA
 N  I  D  G  M  G  G  V  C  L

3001   GCACTTGTCGATTCTGCAGGGAACAT
1001    A  L  V  D  S  A  G  N  I

TATTGACAAAACTACAACAATGAAAACCTTTG
  I  D  K  T  T  T  M  K  T  F

GCTATGGACAATTTCATACCGACAAATTTTTA
G  Y  G  Q  F  H  T  D  K  F  L

AAGGGTTGCTATATAAAAAGTTGTGATTCA
 K  G  C  Y  I  K  S  C  D  S

3121   AGATATACCGTTCAGTCATTTTCTAC
1041    R  Y  T  V  Q  S  F  S  T

TGACGGGCATCCCGACTTTATACCATCAGATT
  D  G  H  P  D  F  I  P  S  D
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CCTTGGATATACTGTCGTACAATCCACAAAAA
S  L  D  I  L  S  Y  N  P  Q  K

ATCGCTGTAAAAATTTCAGAAGAGCCTACA
 I  A  V  K  I  S  E  E  P  T

3241   CACGAGGAAGAATACGAGGAAGGTCG
1081    H  E  E  E  Y  E  E  G  R

CAACAATGATACAATAATCAATATTTTTACTA
  N  N  D  T  I  I  N  I  F  T

TTTTAGAGTCCGGGCCAGATGAGGAAGAGAGG
I  L  E  S  G  P  D  E  E  E  R

TACATGCAAATGATTTTATCCATTTTGTCA
 Y  M  Q  M  I  L  S  I  L  S

3361   AAGTGTCCCGAAACGCAAAAGGTGAA
1121    K  C  P  E  T  Q  K  V  N

TTTTTTCATTTTAGATCAGCCGTTTATCTCCG
  F  F  I  L  D  Q  P  F  I  S

ACACTTTAAGGAAATCATGTGAGTATATAAAT
D  T  L  R  K  S  C  E  Y  I  N

TCCTCTGATGAAATGAGAGGCAATGTCATT
 S  S  D  E  M  R  G  N  V  I

3481   TTTTTGAATTATGAATGGCCTCAATG
1161    F  L  N  Y  E  W  P  Q  W

GTTAAGACCGCAAAGATTTTCTTCAAGGAGAA
  L  R  P  Q  R  F  S  S  R  R

GGGATGTCTCTAGATTTCTGTTCTTGGATGTC
R  D  V  S  R  F  L  F  L  D  V

CTTTTACCTCAAAACATCTCCAAAGTGTTA
 L  L  P  Q  N  I  S  K  V  L

3601   TATATGAGTCCAACTGAAGTACCGCT
1201    Y  M  S  P  T  E  V  P  L

GGATCCTTTTGACATTTTTCAATTTCAAGGCC
  D  P  F  D  I  F  Q  F  Q  G

TCAAACGTGCACCTCTAGGACTATTCCGAATG
L  K  R  A  P  L  G  L  F  R  M

AGTGGTGATGGTTATTGGAAAGAAGGATAC
 S  G  D  G  Y  W  K  E  F  Y

3720   TGGGAAAAAAATGTTAAGGGAGAATAA
1241    W  E  K  M  L  R  E  N  N

TTTAGAATTTTATTCTACCGAACCGGCCTTTT
  L  E  F  Y  S  T  E  P  A  F

TAGTAAACTTAGAGAGGTTTCGGGAGTTAGAT
L  V  N  L  E  R  F  R  E  L  D

GCTGGTGATAAATACAGGATTCACTATCAA
 A  G  D  K  Y  R  I  H  Y  Q

3841   CGTATTTCTACAGACGCCATGTCTCT
1281    R  I  S  T  D  A  M  S  L
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GGATCGTATAAGAAGAAATTAGTTATTAAT
 G  S  Y  K  K  K  L  V  I  N

3961   GATGAATGTGTTTCTGAATGGAAGAA
1321    D  E  C  V  S  E  W  K  K

AAAAATAAATAAGTTCGCATCCTCTCCTGGCG
  K  I  N  K  F  A  S  S  P  G

ATGAAGACGTACCTGGAGAAAGTGTTAGCAGC
D  E  D  V  P  G  E  S  V  S  S

AAATACCAAGATTCCGACAATGCCGCTCCT
 K  Y  Q  D  S  D  N  A  A  P

4081   CTGCATGACGAATTATAACTACTCCA
1361    L  H  D  E  L  STOP

GAAGAGTTCATTACGCGACTGTCCAAGAGCGT

GAAGAATTGCTTCTGCGCATAAGTCTTCTTCC

ATAATAGATTTTTATATCATTTTTAGAACA

4201   TAAAATTTCTCGCCAAGCTAGTTTTT

TAGCTAAAAGCAGATATCCAGTAACATGGGTT

CCGCTTTTTGCAGCGAATACTATGAAGAGTTT

TGCCCGACTGGCTCCCC.
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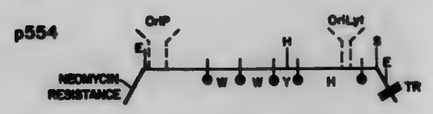
5,194,601

LYTIC ORIGIN OF REPLICATION FOR EPSTEIN-BARR VIRUS (EBV)

William M. Sugden, and Wolfgang Hammerschmidt, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 18, 1989, Ser. No. 409,843
Int. Cl.[5] C12N *15/38, 15/64, 7/00*
U.S. Cl. 435—320.1 1 Claim



1. A recombinant plasmid vector comprising:
a first segment from a lymphotrophic herpes virus, the segment having a function of mediating viral lytic phase replication;
a foreign expressible gene component from other than a lymphotrophic herpes virus; and
a second segment from a lymphotrophic herpes virus, the second segment having a function of mediating latent phase plasmid replication if the recombinant plasmid is inserted into a eukaryotic host that has been transformed by the lymphotrophic herpes virus.

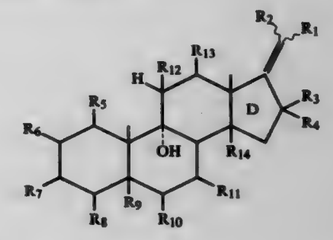
5,194,602

9α-HYDROXY-17-METHYLENE STEROIDS, PROCESS FOR THEIR PREPARATION AND THEIR USE IN THE PREPARATION OF CORTICOSTEROIDS

Jacobus N. M. Batist, Kwintsheul, and Arthur F. Marx, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

PCT No. PCT/NL89/00020, § 371 Date Dec. 12, 1990, § 102(e) Date Dec. 12, 1990, PCT Pub. No. WO89/09781, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 7, 1989, Ser. No. 474,852
Claims priority, application Netherlands, Apr. 8, 1988, 88200675.2
Int. Cl.[5] C07J *13/00, 41/00, 5/00*
U.S. Cl. 540—29 7 Claims

1. A 9α-Hydroxy-17-methylene steroid containing a D-ring according to formula I



I

where
R_1 is hydrogen, halogen, cyano, isocyano, formamido, (1–6C) alkoxy,
R_2 is nitro, methyl, (1–6C) alkoxycarbonyl, hydroxymethyl, (1–6C) alkylcarbonyloxymethyl the 20-carbon atom being either in the Z- or in the E- configuration,
R_3 is hydrogen
R_4 is hydrogen, hydroxy, methyl or R_3 and R_4 together form methylene,
R_5 is hydrogen, alkyl or with R_6 is a double bond, epoxy, methylene, 3,3-alkylenedioxy, 3,3-alkylenedithio or 3,3-alkyleneoxythio group, the alkylene group containing 2 or 3 carbon atoms,
R_6 is hydrogen, alkyl or with R_5 is a double bond, epoxy, methylene, 3,3-alkylenedioxy, 3,3-alkylenedithio or 3,3-alkyleneoxythio group, the alkylene group containing 2 or 3 carbon atoms,
R_7 is hydrogen, hydroxy, oxo, (1–4C) alkoxy, (1–6C) alkylcarbonyloxy, alkoxyalkoxy, tetrahydropyranyloxy, amino, 3-alkylamino containing 1 through 4 carbon atoms, 3-dialkylamino wherein the alkyl groups are the same or different, each alkyl group containing 1 through 4 carbon atoms, or 3-dialkylamino groups in which the nitrogen atom together with the alkyl groups forms a heterocyclic ring having 3 through 6 ring atoms, or 3-morpholino imino, 3-hydroxyimino, 3-(1–6C) alkoxyimino, 3,3-alkylenedioxy, 3,3-alkylenedithio, 3,3-alkyleneoxythio, the alkylene group containing 2 or 3 carbon atoms, or with R_8 is a double bond,
R_8 is hydrogen or with R_7 or R_9 is a double bond,
R_9 is hydrogen or with R_8 or R_{10} is a double bond,
R_{10} is hydrogen, halogen or alkyl or with R_9 or R_{11} is a double bond,
R_{11} is hydrogen, hydroxy or alkyl or with R_9 or R_{11} is a double bond,
R_{12} is hydrogen, hydroxy, halogen, alkoxy, alkoxyalkoxy, tetrahydropyranyloxy or with R_{13} is a double bond,
R_{13} is hydrogen, hydroxy, oxo, (1–4C) alkoxy or with R_{12} is a double bond,
R_{14} is hydrogen or hydroxy,
with the exception of 9α,21-dihydroxypregna-4,17-(20)-diene-3,11-dione and the corresponding 21-acetate.

5,194,603

5,10,15,20-TETRA(2',6'-DIPIVALOYLOXYPHENYL)PORPHINATO METAL COMPLEX

Eishun Tsuchida, Tokyo; Teruyuki Komatsu, Tachikawa; Etsuo Hasegawa, Omiya, and Hiroyuki Nishide, Tokyo, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00321, § 371 Date Oct. 29, 1990, § 102(e) Date Oct. 29, 1990, PCT Pub. No. WO90/15803, PCT Pub. Date Dec. 27, 1990

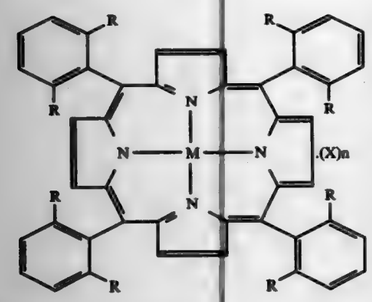
PCT Filed Mar. 13, 1990, Ser. No. 601,715

Claims priority, application Japan, Jun. 19, 1989, 1-156331

Int. Cl.[5] C07D *487/22*

U.S. Cl. 540—145 **3 Claims**

1. A porphyrin metal complex represented by the formula (1):



(1)

wherein R is a pivaloyloxy group, M is a transition metal ion of the group IV and the group V metals, X is a halogen ion, and n is 0 or 1.

5,194,604

PROCESS AND INTERMEDIATES FOR BETA-LACTAMS HAVING AMINOTHIAZOLE(IMINOOXYACETIC ACID)ACETIC ACID SIDECHAINS

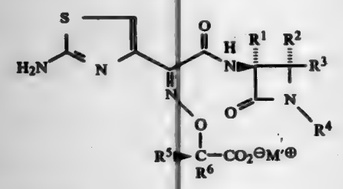
Theodor Denzel, Regensburg, Fed. Rep. of Germany; Christopher M. Cimarusti, Millstone, N.J.; Janak Singh, Lawrenceville, N.J., and Richard H. Mueller, Ringoes, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 29, 1990, Ser. No. 546,622

Int. Cl.[5] C07D *417/14, 501/38*

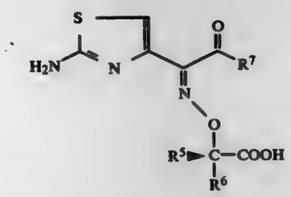
U.S. Cl. 540—222 **37 Claims**

1. A process for preparing a product of the formula

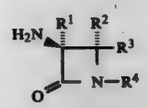


which comprises:

(a) reacting a substrate of the formula



or an acid or amine salt thereof with a beta-lactam of the formula



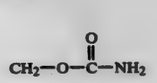
or a salt or inner salt thereof by treatment with a base; and

(b) recovering the product therefrom; wherein:

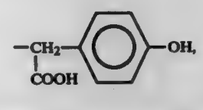
R^1 is hydrogen or alkoxy of 1 to 4 carbons;

R^2 is hydrogen or alkyl;

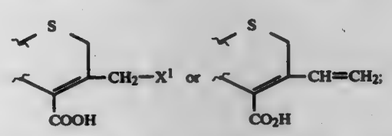
R^3 is hydrogen, alkyl, or



and R^4 is hydrogen,



$-SO_3^{\ominus}M^{\oplus}$, $-OSO_3^{\ominus}M^{\oplus}$ or R^3 and R^4 together are



R^5 and R^6 are the same or different and each is hydrogen or alkyl or R^5 and R^6 together with the carbon atom to which they are attached are cycloalkyl;

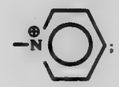
R^7 is

wherein

is a 4, 5, 6 or 7-membered heterocyclic ring having at least one nitrogen atom in the ring or such a group fused to a phenyl or substituted phenyl ring;

$M'^{\oplus}$ and $M^{\oplus}$ are either or both hydrogen or a cation; and

X^1 is —OH, —OAc, —Br, —Cl or



and wherein:

"substituted phenyl" refers to a phenyl group substituted with 1, 2, or 3 amino, halogen, hydroxy, trifluoromethyl, alkyl (of 1 to 4 carbon atoms), or alkoxy (of 1 to 4 carbon atoms) groups.

5,194,605

CYCLIC RENIN INHIBITORS CONTAINING 2-SUBSTITUTED (3S,4S)-4-AMINO-5-CYCLOHEXYL-3-HYDROXY PENTANOIC ACID, 2-SUBSTITUTED (3S,4S)-5-CYCLOHEXYL-3,4-DI-HYDROXY PENTANOIC ACID OR 2-SUBSTITUTED (4S,5S)-5-AMINO-6-CYCLOHEXYL-4-HYDROXYHEXANOIC ACID OR ITS ANALOGS

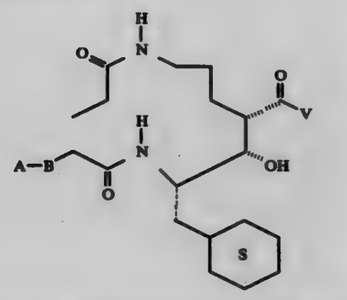
William J. Greenlee, Teaneck; Ralph A. Rivero, Estontown; Ann E. Weber, Scotch Plains, and Libu Yang, Woodbridge, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 618,602, Nov. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 559,866, Jul. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 448,175, Dec. 8, 1989, abandoned. This application Jun. 11, 1991, Ser. No. 714,115

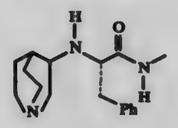
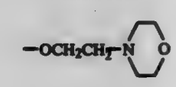
Int. Cl.[5] A61K *31/395*; C07D *245/02*

U.S. Cl. 540—460 **4 Claims**

1. A compound of the formula:



wherein A-B and V are selected from the group consisting of:

Number	A—B	V
11-1	Boc—Phe—NH—	—NH-2(S)-methylbutyl
11-2	Boc—Phe—NH—	—OEt
11-3	Boc—Phe—NH—	—O-isobutyl
11-4		
11-5	Boc—Phe—NH—	

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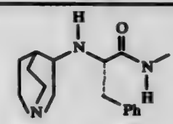
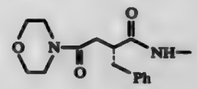
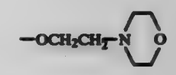
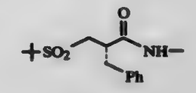
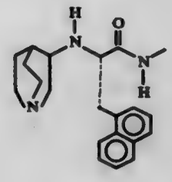
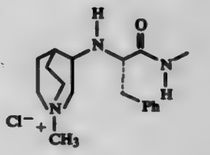
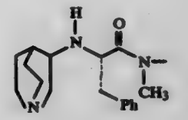
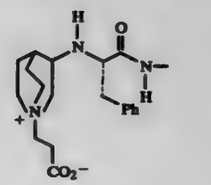
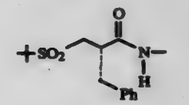
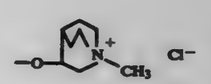
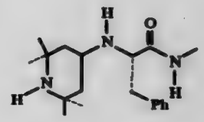
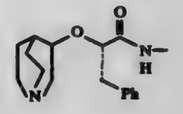
Number	A—B	V
11-6		—O-isobutyl
11-7		
11-8		—O-i-Pr
11-9		—O-i-Pr
11-10		—O-i-Pr
11-11		—O-i-Pr
11-12		—O-i-Pr
11-13		
11-14		—O-i-Pr
11-15		—O-i-Pr

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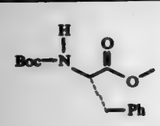
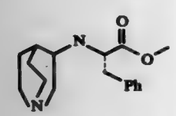
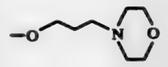
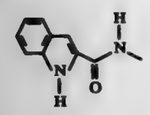
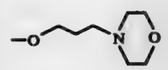
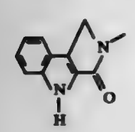
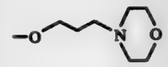
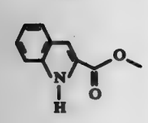
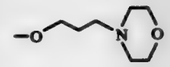
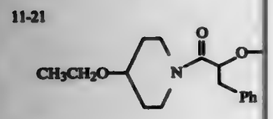
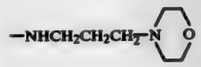
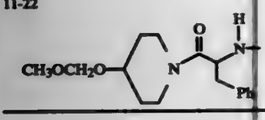
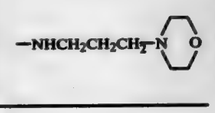
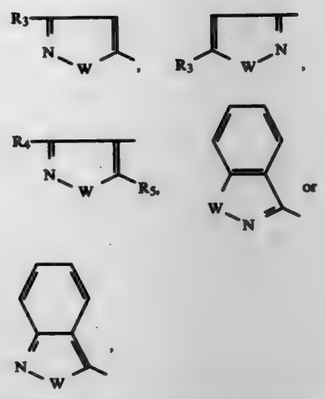
Number	A—B	V
11-16		—O-i-Pr
11-17		
11-18		
11-19		
11-20		
11-21		
11-22		

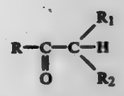


R_3 being a halogen atom, a lower alkyl group, a benzyl group, a benzoyl group, a pyridyl group, a furyl group which may be substituted by one or more lower alkyl groups, a thienyl group which may be substituted by one or more lower alkyl groups, a phenyl group which may be substituted by one or more halogen atoms or lower alkoxy, lower alkyl, trifluoromethyl, cyano, nitro, amino, dimethylamino, acetamido, methanesulfonylamido, acetyl or lower alkoxycarbonyl groups, or a naphthyl group, R_4 and R_5 independently representing a phenyl or lower alkyl group, and W standing for an oxygen or sulfur atom, R_1 denotes a hydrogen atom, a lower alkyl group, a benzyl group, a methoxy group, a phenyl group, an allyl group, a lower alkyl group substituted by one or more trifluoromethyl or lower alkoxy groups, or a cyclopropylmethyl group, R_2 means a hydrogen atom or a lower alkyl group, or R_1 and R_2 being coupled together to form an alicyclic five- or six-membered ring, and R_6 and R_7 mean lower alkyl groups which may be the same or different, or R_6 and R_7 may be coupled together to form together with the adjacent nitrogen atom a five- to eight-membered ring which may have one or methyl substituents, which comprises:

reacting an amine represented by the following formula [V]:

[V]

wherein R_6 and R_7 have the same meanings as defined above, with a ketone represented by the following formula [IV]:



[IV]

wherein R, R_1 and R_2 have the same meanings as defined above, in the presence of an aqueous solution of formaldehyde.

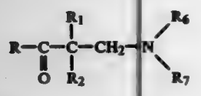
5,194,606

PREPARATION PROCESS OF AMINOKETONES

Akira Matsubara, Yokohama; Kazuya Sakai, Mobara; Hideki Tanada, Mobara, and Hironori Komatsu, Mobara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 647,633, Jan. 31, 1991, Pat. No. 5,055,585.
This application Jul. 23, 1991, Ser. No. 734,490
Claims priority, application Japan, Feb. 8, 1990, 2-27119
Int. Cl.[5] C07D 403/06, 401/06, 275/04, 261/20
U.S. Cl. 540—480 7 Claims

1. A process for the preparation of an aminoketone represented by the following formula [VI]:



[VI]

wherein R means

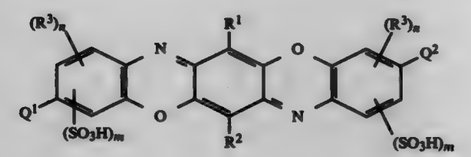
5,194,607

REACTIVE DYES WITH A TRIPHENDIOXAZINE CHROMOPHORE

Manfred Patsch, Wachenheim; Claus Marschner, Speyer, and Claus-Ulrich Priester, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 27, 1991, Ser. No. 722,108
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020422
Int. Cl.[5] C07D 285/34, 273/04, 498/02
U.S. Cl. 544—8 3 Claims

1. A triphendioxazine dye of the formula I



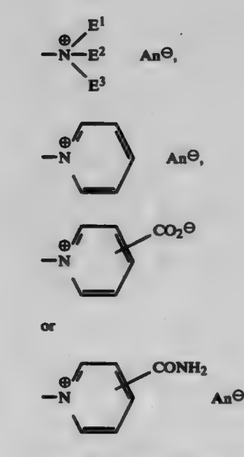
where

n is 0 or 1,

m is 1 or 2,

R^1 and R^2 are identical or different and each is independently of the other hydrogen, chlorine, bromine, hydroxysulfonyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl or phenoxy, wherein phenyl or phenoxy may be substituted by a substituent selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, hydroxysulfonyl, and carboxy,

R^3 is halogen, carboxyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, vinylsulfonyl or the radical $—SO_2—CH_2CH_2—Z$, where Z is a leaving group selected from the group consisting of Cl, OSO_3H, SSO_3H, $OP(O)(OH)_2$, C_1–C_4-alkylsulfonyloxy, substituted or unsubstituted phenylsulfonyloxy, C_1–C_4-alkanoyloxy, C_1–C_4-dialkylamino and radicals of formulas (i)–(iv)



(i)

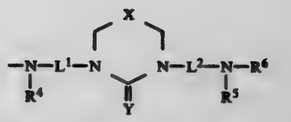
(ii)

or

(iv)

where E^1, R^2 and R^3 are identical or different and each is independently of the others C_1–C_4-alkyl or benzyl and An is an anion selected from the group consisting of halogen, mono- di- or trichloroacetate, methylsulfonate, phenylsulfonate and tolylsulfonate, and

Q^1 and Q^2 are identical or different and each is independently of the other a radical of the formula



where

R^4 and R^5 are identical or different and each is independently of the other hydrogen, C_1–C_4-alkyl or phenyl,

R^6 is hydrogen or a fiber-reactive radical selected from the group consisting of aliphatic hydrocarbons, halogen-substituted 1,3,5-triazine, halogen-substituted quinoxaline, halogen substituted phthalazine, halogen substituted pyrimidine, halogen substituted pyridazone, and 2-alkysulfonyl benzothiazole,

L^1 and L^2 are identical or different and each is independently of the other C_2–C_6-alkylene, which may be interrupted by one or more oxygen atoms in ether function or by one or more imino, C_1–C_4-alkylimino or acetylimino groups, or is phenylene,

X is a chemical bond, oxygen, sulfur, imino, C_1–C_4-alkylimino, carbonyl or methylene, and

Y is oxygen or sulfur,

with the proviso that if n is 0, R^6 is a fiber-reactive radical, and that the hydroxysulfonyl groups are each ortho to the substituents Q^1 and Q^2.

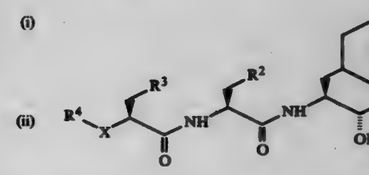
5,194,608

DIPEPTIDE DERIVATIVES

Tatsuo Toyoda, Kawanishi; Toshihiro Fujioka, Kitakatsuragi; Kuzio Hayashi, Kadoma; Masahisa Nakamura, Takarazuka, and Naofumi Hashimoto, Daito, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jun. 24, 1991, Ser. No. 719,492
Claims priority, application Japan, Jun. 28, 1990, 2-172050
Int. Cl.[5] C07D 413/12, 265/30
U.S. Cl. 544—122 2 Claims

1. A dipeptide derivative of formula (I):



(I)

wherein:

(iii) R^1 is C_1–C_{12} alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_3–C_{10} cycloalkyl, aryl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, 2-imidazolyl, 1-pyrazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidyl, 3-pyridazinyl, 2-pyrazinyl, 3-triazolyl, 2-thiazolyl, 4-thiazolyl, 5-tetrazolyl, 3-isothiazolyl, 2-pyrrolidinyl, 2-imidazolidinyl, 4-pyrazolidinyl, 4-piperidyl, 2-piperadinyl, 4-indolyl, 7-indolyl, 5-quinolyl, 8-quinolyl, 8-isoquinolyl, or morpholino;

R^2 is carbamoyl, aryl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, 2-imidazolyl, 1-pyrazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidyl, 3-pyridazinyl, 2-pyrazinyl, 3-triazolyl, 2-thiazolyl, 4-thiazolyl, 5-tetrazolyl, 3-isothiazolyl, 2-pyrrolidinyl, 2-imidazolidinyl, 4-pyrazolidinyl, 4-piperidyl, 2-piperadinyl, morpholino, C_1–C_{12} alkyl-S—, C_1–C_{12} alkyl-S—CH_2—, or C_3–C_{10} cycloalkyl-S—;

R^3 is aryl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, 2-imidazolyl, 1-pyrazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidyl, 3-pyridazinyl, 2-pyrazinyl, 3-triazolyl, 2-thiazolyl, 4-thiazolyl, 5-tetrazolyl, 3-isothiazo-

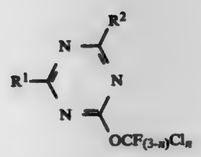
lyl, 2-pyrrolidinyl, 2-imidazolidinyl, 4-pyrazolidinyl, 4-piperidyl, 2-piperadinyl, or morpholino;
R^4 is $R^{4'}$-SO_2 or $R^{4'}$-CO;
$R^{4'}$ is aryl, C_1–C_{12} alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl; C_3–C_{10} cycloalkyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl, 3-pyrrolyl, 2-imidazolyl, 1-pyrazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidyl, 3-pyridazinyl, 2-pyrazinyl, 3-triazolyl, 2-thiazolyl, 4-thiazolyl, 5-tetrazolyl, 3-isothiazolyl, 2-pyrrolidinyl, 2-imidazolidinyl, 4-pyrazolidinyl, 4-piperidyl, 2-piperadinyl, 4-indolyl, 7-indolyl, 5-quinolyl, 8-quinolyl, 8-isoquinolyl, or morpholino;
X is CH_2, NH, O, or S; and
Y is CO or $NHSO_2$, wherein R^1, R^2, R^3 and $R^{4'}$ each may be substituted with one to three substituents selected independently from the group consisting of hydroxy; halogen; trifluoromethyl; —CN; 2-thienyl; 3-thienyl; 2-furyl; 3-furyl; 2-pyrrolyl; 3-pyrrolyl; 2-imidazolyl; 1-pyrazolyl; 2-pyridyl; 3-pyridyl; 4-pyridyl; 2-pyrimidyl; 3-pyridazinyl; 2-pyrazinyl; 3-triazolyl 3-thiazolyl; 4-thiazolyl; 5-tetrazolyl; 3-isothiazolyl; 2-pyrrolidinyl; 2-imidazolidinyl; 4-pyrazolidinyl; 4-piperidyl; 2-piperadinyl; 4-indolyl; 7-indolyl; 5-quinolyl; 8-quinolyl; 8-isoquinolyl; morpholino; C_1–C_6 alkyl; C_3–C_{10} cycloalkyl; —O—C_1–C_6 alkyl; —S—C_1–C_6 alkyl; —SO—C_1–C_6 alkyl; —SO_2—C_1–C_6 alkyl; C_1–C_6 alkylenedioxy; —CO—O—C_1–C_6 alkyl; —NHCO—C_1–C_6 alkyl; —$NHSO_2$—C_1–C_6 alkyl; —NR^5R^6; —O—CO—NR^5R^6; —CO—NR^5R^6; —O—C_1–C_6 alkyl NR^5R^6; R^5 and R^6 are independently hydrogen, formyl or C_1–C_6 alkyl, or R^5 and R^6, when taken together with the nitrogen to which they are attached, form a cyclic amino group,
with the proviso that the dipeptide derivative has at least one morpholino radical,
or an acid addition salt thereof.

5,194,609
3-QUINUCLIDINOL CATALYST COMPOSITIONS FOR MAKING POLYURETHANE FOAMS
Ann C. L. Savoca, Sinking Spring, and Mark L. Listemann, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Division of Ser. No. 828,433, Jan. 30, 1992, Pat. No. 5,143,944. This application Jul. 21, 1992, Ser. No. 918,185
Int. Cl.[5] C07D *251/34*; C08G *18/18*
U.S. Cl. 544—193 **1 Claim**

1. In a method for catalyzing the trimerization of an isocyanate and/or its reaction with an active hydrogen-containing compound, the improvement which comprises using as a catalyst 3-quinuclidinol.

5,194,610
TRIFLUORO- AND CHLORODIFLUOROMETHOXY-1,3,5-TRIAZINES AND THE PREPARATION THEREOF
Gerhard Hamprecht, Weinheim; Horst Mayer, Ludwigshafen, and Hans-Josef Wolf, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jul. 26, 1991, Ser. No. 736,229
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1990, 4024755
Int. Cl.[5] C07D *251/20, 251/26*
U.S. Cl. 544—218 **5 Claims**

1. A substituted trifluoro- or chlorodifluoro-methoxy-1,3,5-triazine of the formula I

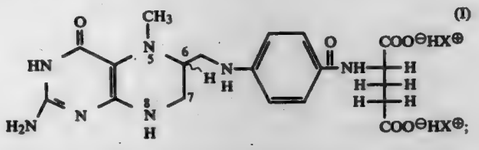


I

where R^1 and R^2 are each, independently of one another, hydrogen or C_1–C_4-haloalkyl, and R^1 is also trifluoro- or chlorodifluoromethoxy, and is 0 or 1, with the proviso that when n is 1, R^1 and R^2 are also halogen, and when n is 0, R^1 and R^2 are also fluorine.

5,194,611
SEPARATION TECHNIQUE FOR A MIXTURE OF (6RS)-DIASTEREOISOMERS OF AN AMMONIUM SALT OF N[5]-METHYL-5,6,7,8-TETRAHYDROFOLIC ACID INTO SINGLE (6R) AND (6S)-DIASTEREOISOMERS
Fabrizio Marazza, Vico Morcote, Switzerland, and Jean Jacques, Paris, France, assignors to Sapec S.A. fine chemicals, Lugano, Switzerland
Filed Apr. 11, 1991, Ser. No. 683,772
Claims priority, application Switzerland, Apr. 12, 1990, 01255/90
Int. Cl.[5] C07D *475/04*
U.S. Cl. 544—258 **15 Claims**

1. A process for the separation of mixture of (6RS)-diastereoisomers of an ammonium salt of N^5-methyl-5,6,7,8-tetrahydrofolic acid of the formula (I):

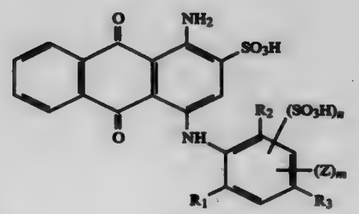


(I)

wherein X is a nitrogen containing base selected from primary, secondary and tertiary amines, ammonia and basic amino carboxylic acids,
into single (6R) and (6S)-diastereoisomers,
wherein said process comprises forming a mixture of said mixture of (6RS)-diastereoisomers with a mixture of solvents, the solvent mixture containing water and at least one totally water miscible solvent,
transforming the so prepared mixture into a clear solution,
allowing one diastereoisomer to crystallize and separating the crystallized diastereoisomer from the clear solution,
diluting the mother liquid with the with totally water miscible solvent(s), and allowing the other diastereoisomer to crystallize and separating it from the diluted solution.

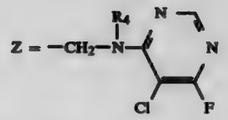
5,194,612
REACTIVE DYESTUFFS
Wolfgang Harms; Frank-Michael Stöhr, both of Odenthal, and Karl-Heinz Schündehütte, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 657,925, Feb. 20, 1991, abandoned. This application Mar. 23, 1992, Ser. No. 859,641
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1990, 4006792
Int. Cl.[5] C07D *239/24*
U.S. Cl. 544—327 **6 Claims**

1. A dyestuffs of the formula



(I)

in which



R_1=C_1–C_2-alkyl, SO_3H
R_2=C_1–c_2-alkyl, Z
R_3—H, C_1–C_4-alkyl, SO_3H
r_4=H, substituted or unsubstituted C_1–c_4-alkyl
m=0 or 1
n=0 or 1
with the proviso that m is 0, if R_2 is Z, and n is 0, if R_1 and/or R_3 is SO_3H.

5,194,613
CATALYTIC PROCESSES FOR THE PREPARATION OF BRIDGED NITROGEN-CONTAINING COMPOUNDS
Stephen W. King, Scott Depot, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Sep. 20, 1990, Ser. No. 585,565
Int. Cl.[5] C07D *241/00, 487/08*
U.S. Cl. 544—352 **21 Claims**

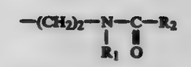
1. A process for preparing triethylenediamine which comprises contacting a carboxylated cyclic nitrogen-containing compound selected from the group consisting of bis(methyl 2-piperazinoethyl)carbonate, methyl 2-piperazinoethyl carbonate and phenyl 2-piperazinoethyl carbonate, with a mixed metal oxide catalyst under conditions effective to produce triethylenediamine.

5,194,614
COMPOUNDS HAVING A NAPHTHALENE STRUCTURE
Jean Andrieux, Antony; Raymond Houssin, Marcq en Barœul; Said Yous, Lille; Béatrice Guardiola, Neuilly sur Seine, and Daniel Lesieur, Gondecourt, all of France, assignors to Adir et Compagnie, Courbevoie, France
Filed Feb. 26, 1991, Ser. No. 661,425
Claims priority, application France, Feb. 27, 1990, 90 02393
Int. Cl.[5] C07D *24/04, 265/28, 241/46*; A61K *31/495, 31/40*
U.S. Cl. 544—400 **11 Claims**

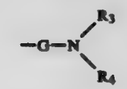
1. A compound selected from those of general formula (I):

(I)

in which:
A represents a



group,
R represents linear or branched lower alkyl,
R_1 represents hydrogen or linear or branched lower alkyl, and
R_2 represents
heteroaryl or lower selected from pyridyl, thienyl, quinoxalyl, and indolyl, or
a group of formula:



where G represents linear or branched lower alkyl, and R_3 and R_4 each form, with the nitrogen atom to which they are attached, a heterocyclic system selected from oxopyrrolidinyl, morpholinyl, oxopiperidinyl, piperazinyl, 4-(substituted phenyl)piperazinyl, and 4-(substituted benzyl)piperazinyl. which it being understood that the term substituted R_3 means that the group is substituted by one to three inclusive radicals chosen from among lower alkyl, lower alkoxy, trifluoromethyl and halogen or R_1 forms with R_2 and the N-CO group a heterocyclic system of formula:

A being linear or branched alkyl having 2 to 8 carbon atoms, inclusive, and forming a ring having not more than six atoms. as well as, any isomers, epimers and diastereoisomers thereof and addition salts thereof with a pharmaceutically-acceptable acid, it being understood that the terms lower alkyl and lower alkoxy as used herein mean such as group comprising 1 to 6 carbon atoms.

5,194,615
SYNTHETIC GTF CHROMIUM NICOTINATE MATERIAL AND ITS PREPARATION
Ned L. Jensen, Martinez, Calif., assignor to The William Seroy Group, Concord, Calif.
Division of Ser. No. 416,371, Nov. 14, 1989, Pat. No. 4,954,492, which is a division of Ser. No. 186,149, Apr. 26, 1988, Pat. No. 4,923,855, which is a continuation-in-part of Ser. No. 512,111, Jul. 8, 1983, abandoned. This application Sep. 4, 1990, Ser. No. 577,500
Int. Cl.[5] A61K *31/555*; C07D *213/80*
U.S. Cl. 546—5 **15 Claims**

1. A chromium-nicotinic acid complex reaction product which comprises the product obtained by mixing together in solution an alkali metal salt of nicotinic acid and a trivalent chromium salt under conditions which permit the formation of a chromium-nicotinate complex having glucose tolerance factor activity.

4. A process for producing a synthetic chromium complex of nicotinic acid for providing chromium supplementation to mammals which comprises:
contacting an alkali metal salt of nicotinic acid with a solution of a trivalent chromium salt under conditions which permit the formation of a chromium-nicotinate complex reaction product having glucose tolerance factor activity.

5. A chromium-nicotinic acid complex having the following objective characteristics:
(a) decreases blood lipid levels in mammals;
(b) decreases blood glucose levels in mammals;
(c) is substantially insoluble in water and alcohol solvents;
(d) displays a purplish color when precipitated from solution;
(e) has a UV absorbance spectrum with two major peaks at approximately 574 mμ and 414 mμ; and
(f) has an IR spectrum with one asymmetric stretch peak at approximately 1630 cm^{-1} at three percent concentration in potassium bromide.

5,194,616
PREPARATION OF 2-(PYRIDYL)ETHYL BIS-(TRIALKYLSILYL)PHOSPHONATE DERIVATIVES
David L. Thorn, West Chester, Pa.; Owen W. Webster, and Robert C. Wheland, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 24, 1991, Ser. No. 649,542
Int. Cl.[5] C07F *7/08, 9/58*
U.S. Cl. 546—14 75 Claims

1. A process for the production of 2-(pyridyl)ethyl substituted phosphorous compounds, comprising, contacting (1) a first compound selected from the group consisting of $P(OR^2)_3$ and $HP(O)(OR^1)_2$, wherein each R^1 is independently alkyl, alkyl substituted with groups that do not interfere with the process, silyl, or silyl substituted with groups that do not interfere with the process with (2) a vinylpyridine, and (3) a third compound selected from the group consisting of
(a) a silane of the formula $R^2_nSIX_{4-n}$ wherein each R^2 is independently hydrocarbyl or hydrocarbyl substituted with groups that do not interfere with the process, each X is independently chlorine, bromine, or an oxyanion whose conjugate acid has a pKa, when measured in water, of less than about 2, and n is 0, 1, 2, or 3;
(b) a protic acid of the formula HpY wherein Y is an anion and p is the valence of Y, provided said protic acid has a pKa of about pb 6 or less in water; and
(c) a Lewis acid of the formula MZq, wherein M is a metal or metalloid atom, Z is hydrocarbyl, chlorine or bromine, and q is the valence of M;
and provided that when said third compound is (a) or (c) said first compound is $Hp(O)(OR^1)_2$, and further provided that when said third compound is (b) said first compound is $P(OR^1)_3$.

5,194,617
2,3-DISUBSTITUTED-4-HYDROXYQUINOLINE DERIVATIVES
Nobuto Minowa; Tomoya Machinami; Takashi Shomura; Masaji Suzuki; Toru Sasaki; Seiji Shibahara, and Shigeharu Inouye, all of Yokohama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan
Continuation of Ser. No. 449,012, Dec. 11, 1989, abandoned. This application Dec. 10, 1991, Ser. No. 807,946
Claims priority, application Japan, Dec. 17, 1988, 63-319231
Int. Cl.[5] C07D *215/22*
U.S. Cl. 546—153 1 Claim

1. A 2,3-disubstituted-4-hydroxyquinoline compound, which is 2-(cis-1-nonenyl)-3-methyl-4-quinolinol.

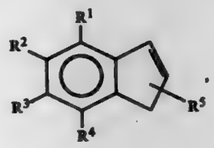
5,194,618
N-(PYRROL-1-YL)PYRIDINAMINES
Richard C. Effland; Joseph T. Klein, and Kevin J. Kapples, all of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.
Division of Ser. No. 245,252, Sep. 16, 1988, Pat. No. 5,032,599, which is a division of Ser. No. 926,593, Nov. 12, 1986, Pat. No. 4,792,562, which is a continuation-in-part of Ser. No. 804,430, Dec. 4, 1985, Pat. No. 4,752,610. This application May 23, 1991, Ser. No. 748,474
Int. Cl.[5] C07D *401/12, 401/14, 211/84*
U.S. Cl. 546—193 7 Claims

1. The compound, which is N-(4-pyridinyl)-N-(1H-pyrrol-1-yl)-phenylacetamide.

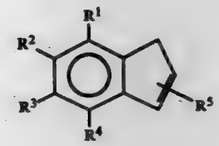
5,194,619
PROCESS FOR THE PREPARATION OF SUBSTITUTED INDENES
Dieter Reuschling, Butzbach; Jürgen Rohrmann, Kelkheim; Gerhard Erker, Münster; Reiner Nolte, Ludwigshafen; Michael Aulbach, Senden-Bösensell, and Astrid Weiss, Münster, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 14, 1992, Ser. No. 837,367
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1991, 4104931
Int. Cl.[5] C07D *213/24, 333/06*
U.S. Cl. 546—348 5 Claims

1. A process for the preparation of a compound of the formula I or an isomer thereof of the formula Ia

(I)

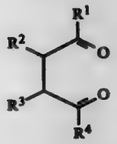


(Ia)



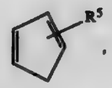
in which
R^1 is $(C_1–C_{20})$alkyl, $(C_6–C_{14})$aryl, $(C_1–C_{10})$alkyoxy, $(C_2–C_{10})$alkenyl, $(C_7–C_{20})$arylalkyl, $(C_7–C_{20})$alkylaryl, $(C_6–C_{10})$aryloxy, $(C_1–C_{10})$-fluoroalkyl, $(C_6–C_{10})$halogenoaryl, $(C_2–C_{10})$-alkynyl, a radical $—SiR^6_3$ or a heteroaromatic radical having 5 or 6 ring members, which can contain one or more hetero atoms,
R^2, R^3 and R^4 are identical or different and, in addition to hydrogen, have the meanings given for R^1,
R^5 is hydrogen, $(C_1–C_{10})$alkyl, $(C_1–C_{10})$fluoroalkyl or $(C_2–C_{10})$alkenyl and
R^6 is $(C_1–C_{10})$alkyl,
which comprises reacting a compound of the formula II

(II)



with a compound of the formula III

(III)

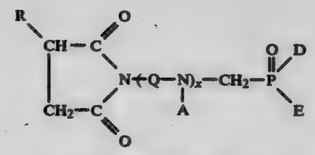


the substituents R^1-R^5 having the meanings given, in the presence of a base.

5,194,620
COMPOSITIONS OF PHOSPHORUS DERIVATIVES OF POLYALKENYLSUCCINIMIDES
Paul V. Roling, Spring; David R. Foresteer, Conroe, and Bruce E. Wright, The Woodlands, all of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.
Division of Ser. No. 668,548, Mar. 13, 1991, Pat. No. 5,139,643. This application Apr. 20, 1992, Ser. No. 871,372
Int. Cl.[5] C07F *9/06, 9/12;* C10G *9/12, 9/16*
U.S. Cl. 548—112 9 Claims

1. Composition for inhibiting fouling deposits in liquid hydrocarbonaceous mediums consisting essentially of a phosphorus containing compound having the structure

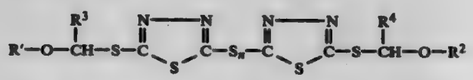
(V)



wherein R is an aliphatic alkyl or alkenyl moiety having from about 30–200 carbon atoms, Q is selected from ethylene, trimethylene, tetramethylene or pentamethylene, x is a positive integer, A is chosen from hydrocarbyl, hydrogen, or hydroxy alkyl, D is selected from H, OH, and OR_1, wherein R_1 is C_1–C_8 alkyl, and E is selected from H, OH, and OR_2 wherein R_2 is C_1–C_8 alkyl.

5,194,621
ETHER DERIVATIVES OF 2,5-DIMERCAPTO-1,3,4-THIADIAZOLES
Thomas J. Karol, and Robert J. Lee, both of Norwalk, Conn., assignors to R. T. Vanderbilt Company, Inc., Norwalk, Conn.
Filed May 20, 1991, Ser. No. 702,578
Int. Cl.[5] C07D *417/12;* C10M *1/38*
U.S. Cl. 548—142 7 Claims

1. A thiadiazole compound selected from the group of compounds having the structural formula

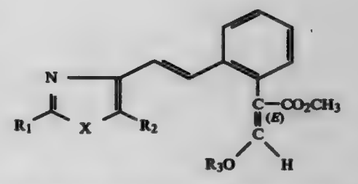


wherein n = 1, R' represents alkyl having 1 to 20 carbon atoms, phenyl and alkyl substituted phenyl, R^2, R^3 and R^4 may be same or different and represent hydrogen, alkyl having 1 to 20 carbon atoms, phenyl and alkyl substituted phenyl, and mixture thereof.

5,194,622
PROCESS FOR PREPARATION OF THIAZOLYLALKOXY ACRYLATES
Jean-Louis Brayer, Nanteuil le Haudoin, and Jean-Pierre Demoute, Neuilly Plaisance, both of France, assignors to Roussel Uclaf, Paris, France
Filed Nov. 18, 1991, Ser. No. 793,862
Claims priority, application France, Nov. 21, 1990, 90 14496
Int. Cl.[5] C07D *277/20*
U.S. Cl. 548—204 6 Claims

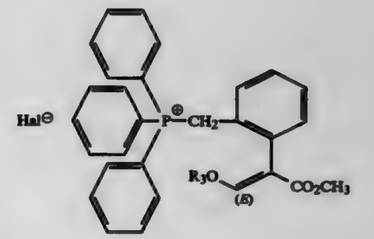
1. A process for the preparation of a compound of the formula

I

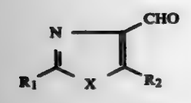


wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, halogen, $—CF_3$, alkyl, alkoxy and alkylthio of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, $—SO_2$alk and alk is alkyl of 1 to 8 carbon atoms, optionally substituted aryl, aryloxy and arylthio of 6 to 18 carbon atoms and optionally substituted heteroaryl and heteroaryloxy wherein the heteroaryl is selected from the group consisting of furyl, pyridinyl, benzofuranyl, isobenzofuranyl, oxazolyl, isoxazolyl, and thiazolyl and heterocyclic selected from the group consisting of piperazinyl morpholinyl, pyranyl and pyridazinyl, R_3 is selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, aryl of 6 to 18 carbon atoms and alkoxyalkoxyalkyl of 3 to 14 carbon atoms, X is selected from the group consisting of —O—, —S— and $—NR_4—$, R_4 is selected from the group consisting of hydrogen, alkyl, alkenyl and alkynyl of up to 8 carbon atoms, $—SO_2$ alkyl, $—SO_2$ alkenyl and $—SO_2$ alkynyl of up to 8 carbon atoms and optionally substituted aryl and $—SO_2$ aryl of 6 to 18 carbon atoms, the optional substituents being selected from the group consisting of free, esterified or etherified hydroxyl in which the ester or ether part has 1 to 18 carbon atoms, ketone and oxime functions, saturated or unsaturated, linear, branched or cyclized alkyls of up to 18 carbon atoms, halogen, $—CF_3$, $—SCF_3$, $—OCF_3$, $—NO_2$, $—NH_2$ and —C═N the double bond between the heterocycle of 5 member ring and the aromatic nucleus is of E and/or Z geometry comprising reacting a halide of the formula

II



wherein R_3 is as defined above and Hal is halogen with a compound of the formula



III

wherein X, R_1 and R_2 have the above definitions in the presence of a base selected from the group consisting of sodium hydride, alkali metal or alkaline earth metal alcoholate, an alkali metal amide or a secondary or tertiary amine in the presence of lithium bromide to obtain the corresponding product of formula I in the form of a mixture of isomers and optionally separating the isomers.

5,194,623

AZLACTONE BASED PHOTOGRAPHIC REAGENTS

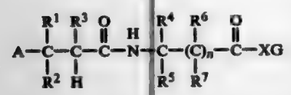
Larry R. Krepski, White Bear Lake, and Sharon M. Simpson, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1990, Ser. No. 575,835

Int. Cl.[5] C07D *249/18, 249/04, 257/04, 235/28, 233/00*

U.S. Cl. 548—261 **15 Claims**

1. An omega-substituted-2-propioamidoacetyl or omega-substituted-3-propioamidopropionyl compound of the formula:



wherein

A represents a residue of a photographically useful stabilizer in which a hydrogen atom of the stabilizer selected from the group consisting of benzotriazoles, benzimidazoles, triazoles, tetrazoles, imidazoles, mercaptotetrazoles and mercaptotriazoles heterocyclics has been replaced by the remainder of the structure shown in the formula;

R^1, R^2 and R^3 are independently hydrogen or lower alkyl of 1 to 4 carbon atoms, with the proviso that R^1 can also represent a phenyl group when R^2 and R^3 are hydrogen;

R^4 and R^5 independently represent an alkyl group of 1 to 14 carbon atoms, a cycloalkyl group of 3 to 12 carbon atoms, a phenyl group or R^1 and R^2 taken together with the carbon atom to which they are joined form a carbocyclic ring of 4 to 12 ring atoms;

R^6 and R^7 independently are hydrogen or methyl;

n is 0 or 1;

X represents an oxygen, nitrogen or sulfur atom, or NH or NR where R is an alkyl or phenyl group; and

G represents an organic ballasting group selected from the class consisting of alkyl, cycloalkyl, aryl, alkaryl and polymeric groups.

5,194,624

INTERMEDIATES FOR THE PREPARATION OF COMPOUNDS OF ANTIMICROBIAL ACTIVITY

Masayoshi Murata, Osaka; Hideo Tsutsumi, Toyonaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

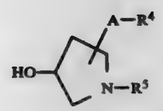
Division of Ser. No. 347,579, May 5, 1989, Pat. No. 4,963,544. This application May 9, 1990, Ser. No. 520,814

Claims priority, application United Kingdom, May 23, 1988, 8812160; Mar. 22, 1989, 8906576

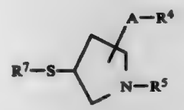
Int. Cl.[5] C07D *487/04, 403/06*

U.S. Cl. 548—314.7 **6 Claims**

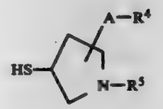
1. A compound of the formula which is selected from the group consisting of the formula:



the formula:



and the formula:



in which

R^4 is a heterocyclic group selected from the group consisting of pyrrolyl, pyrrolinyl, imidazolyl, imidazolinyl, pyrazolyl, pyrazolinyl, pyridyl, pyridyl N-oxide, pyridinio, dihydropyridyl, tetrahydropyridyl, pyrimidinyl, pyrimidinio, pyrazinyl, pyrazinio, pyridazinyl, pyridazinio, triazinyl, tetrahydrotriazinyl, triazinio, triazolyl, triazolio, tetrazinyl, tetrazinio, tetrazolyl and tetrazolio wherein said heterocyclic group may be substituted by one to three substituent(s) selected from a group consisting of oxo, carboxy(lower)alkyl, protected carboxy(lower)alkyl, amino protected amino, lower alkylamino, ureido(lower-)alkyl, carbamoyl, carbamoyl(lower)alkyl, lower alkyl, lower alkanoyl(lower)alkyl, amino(lower)alkyl, protected amino(lower)alkyl, hydroxy(lower)alkyl, protected hydroxy(lower)alkyl, azido(lower)alkyl, halo(lower)alkyl and imino-protective group,

R^5 is hydrogen, lower alkanimidoyl or imino-protective group,

R^7 is ar(lower)alkyl or acyl derived from a carboxylic, carbonic, sulfonic or carbamic acid, and

A is lower alkylene, or a salt thereof.

5,194,625

PROCESS FOR PRODUCTION OF ALPHA-KETO ACID/AMINO ACID SALT COMPOUNDS

Toshiya Tanabe, and Shin-ichi Kishimoto, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 13, 1989, Ser. No. 450,089

Claims priority, application Japan, Dec. 27, 1988, 63-330688

Int. Cl.[5] C07C *233/64, 277/08, 59/185, 229/26*

U.S. Cl. 548—544 **3 Claims**

1. A process for production of an α-keto acid/amino acid salt compound, which consists essentially of:

transforming crystals of a compound of the formula:

AN/xS

wherein A represents an amino acid selected from the group consisting of histidine, ornithine, lysine and arginine,

N represents an α-keto acid selected from the group consisting of α-keto-isocaproic acid, α-keto isovaleric acid, α-keto-β-methylvaleric acid, pyruvic acid and phenylpyruvic acid,

S represents a lower alcohol or acetone, and

x is 0.1 to 3,

to desolvated salt compounds by placing the crystals of the formula

AN/zS

under an atmosphere of air having a humidity of 0.003 to 17.0 kg-H_2O/kg-dry air.

5,194,626

METAL COMPLEX PIGMENTS OF AZINES

Meinhard Rolf, Leverkusen, and Bernd Kaletta, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

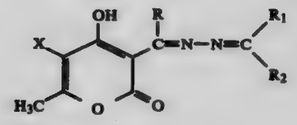
Continuation of Ser. No. 367,396, Jun. 16, 1989, abandoned. This application Jan. 17, 1992, Ser. No. 824,760

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1988, 3822491; Jul. 19, 1988, 3824454

Int. Cl.[5] C07B *26/02*; C07D *7/12*

U.S. Cl. 548—402 **6 Claims**

1. Metal complexes of azines of the formula

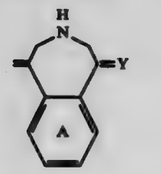


in which

X denotes hydrogen or halogen,

R denotes hydrogen or methyl, and

R^1 and R^2 together with the carbon atom to which they are bonded form



in which

ring A is unsubstituted or substituted by 1–4 substituents independently selected from the group consisting of alkyl, alkoxy, alkylthio, halogenoalkyl, hyroxy, halogen, nitro, amino, monoalkylamino, dialkylamino, carboxy, carbalkoxy, sulpho, alkylsulphonyl, and

Y denotes an active methylene radical of the formula

in which

R^6 denotes a carbamoyl radical of the formula

where

R^7 denotes hydrogen, C_{1-4}-alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted by a substituent selected from the group consisting of halogen, NO_2, C_{1-6}-alkyl, C_{1-6}-alkoxy, carbamoyl, N-alkylcarbamoyl, N-phenylcarbamoyl, acetylamido, formaido, phthalimidyl, tetrachlorophthalimidyl, benzoylamido, C_{1-4}-alkylsulphonyl, and CN.

5,194,627

N-TERT-BUTYLDIALKYLSILYLMALEIMIDE AND ITS MANUFACTURE

Toshio Shinohara, Takaaki, and Motoaki Iwabuchi, Annaka, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

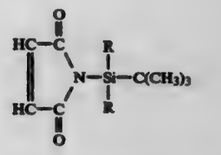
Filed May 14, 1992, Ser. No. 882,899

Claims priority, application Japan, May 14, 1991, 3-138477

Int. Cl.[5] C07F *7/10*

U.S. Cl. 548—406 **7 Claims**

1. An N-tert-butyldialkylsilylmaleimide represented by the following general formula:



(I)

wherein R's, which may be the same or different, each represent an alkyl group having 1 to 5 carbon atoms.

5,194,628

PROCESS FOR THE PREPARATION OF SUBSTITUTED DIFLUOROBENZO-1,3-DIOXOLES

Peter Ackermann, Pfeffingen; Hans-Ruedi Kinzel, Bubendorf, and Bruno Schaub, Courroux, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

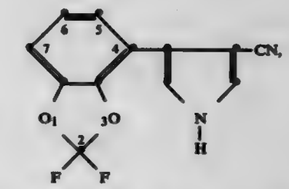
Continuation-in-part of Ser. No. 321,939, Mar. 10, 1989, abandoned, and Ser. No. 319,030, Mar. 6, 1989, abandoned. This application Sep. 14, 1990, Ser. No. 583,787

Claims priority, application Switzerland, Mar. 18, 1988, 1044/88; Mar. 18, 1988, 1052/88

Int. Cl.[5] C07D *405/04, 323/02*

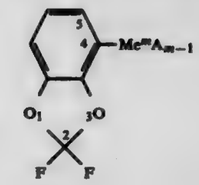
U.S. Cl. 548—526 **1 Claim**

1. A process for the preparation of 3-(2,2-difluorobenzodioxol-4-yl)-4-cyanopyrrole of formula V



(V)

wherein a 4-metallo-2,2-difluorobenzodioxole of formula VII, wherein Me is a metal, m is the valency of that metal and A is an anionic radical, is reacted in a suitable solvent phase, in the presence or absence of a complex-forming compound, first with an unsaturated nitrile of formula VIII



VII

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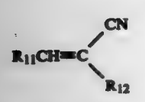


VIII

wherein

R_{11} is halogen, C_1–C_4alkoxy, C_6–C_{10}aryloxy, di-C_1–C_4alkylamino, C_1–C_4alkylsulfonyloxy, C_6–C_{10}arylsulfonyloxy or C_1–C_4alkylcarbonyloxy and

R_{12} is a C_1–C_4alkoxycarbonyl radical, and then with an isocyanide of formula IX

$$R_{13}—SO_2CH_2NC, \quad (IX),$$

wherein R_{13} is an open-chain or cyclic, unsubstituted or substituted C_1–C_{10}hydrocarbon.

5,194,629

PROCESS FOR PRODUCING N-TERTIARY BUTOXYCARBONYL-MALEINIMIDE

Eberhard Kuehn, Hemhofen; Juergen Beck, Erlangen; Helmut Ahne, Roettenbach; Siegfried Birkle, Hoechstadt A/Aisch; Rainer Leuschner, Erlangen; Michael Sebald, Heusdorf-Hausberg; Recai Sezi, Roettenbach, and Hans-Juergen Bestmann, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Dec. 20, 1991, Ser. No. 812,582

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1990, 4040999

Int. Cl.[5] C07D *207/24*

U.S. Cl. 548—531 **8 Claims**

1. A process for producing N-tertiary butoxycarbonyl-maleinimide, comprising the step of reacting maleinimide in the presence of a base, which is a heterocyclic nitrogen compound having at least one tertiary nitrogen atom, with about an equimolar quantity of di-tertiary butyl-dicarbonate in a solvent at temperatures of up to about 80° C. for a duration grater than one minute, wherein the reaction is carried out by first combining the di-tertiary butyl-dicarbonate with the maleinimide followed by addition of the base.

5,194,630

PROCESS FOR THE MANUFACTURE OF INSECTICIDAL 2-ARYL-1-(ALKOXYMETHYL)-4-HALO-5-(TRIFLUOROMETHYL)PYRROLES

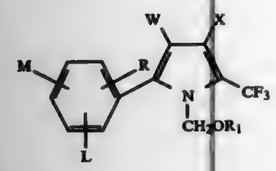
Venkataraman Kameswaran, Princeton Junction, and Robert F. Doehner, Jr., East Windsor, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 26, 1990, Ser. No. 634,288

Int. Cl.[5] C07D *207/34, 207/42*; C07B *39/00*; A01N *43/36*

U.S. Cl. 548—561 **9 Claims**

1. A process for the manufacture of a compound of formula I



(I)

wherein

R_1 is C_1–C_6 alkyl;

W is CN, NO_2 or CO_2R_2;

X is Br, Cl or I;

L is hydrogen or halogen;

M and R are each independently hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylsulfonyl, CN, NO_2, Cl, Br, F, I, CF_3, R_3CF_2Z or R_4CO and when M and R are on adjacent positions they may be taken together with the carbon atoms to which they are attached to form a ring in which MR represents the structure

$$—OCH_2O—, —OCF_2O— \text{ or } —CH=CH—CH=CH—;$$

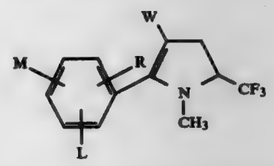
R_2 is C_1–C_6 alkyl, C_3–C_6 cycloalkyl or phenyl;

R_3 is hydrogen, F, CHF_2, CHFCl or CF_3;

R_4 is C_1–C_4 alkyl or C_1–C_4 alkoxy;

Z is $S(O)_n$ or O and

n is an integer of 0, 1 or 2 which comprises reacting a compound of formula II



(II)

wherein W, L, M and R are as described hereinabove with at least 1 equivalent of a halogen, wherein said halogen is bromine, chlorine or iodine, in the presence of a solvent to obtain a 2-aryl-1-methylpyrrole intermediate, reacting said 1-methylpyrrole intermediate with at least one additional molar equivalent of said halogen to form a 2-aryl-4-halo-1-methylpyrrole intermediate, reacting said 4-halo-1-methylpyrrole intermediate further with at least one molar equivalent of said halogen in the presence of a radical initiator to form a 2-aryl-4-halo-1-(halomethyl)-pyrrole intermediate and reacting said 4-halo-1-(halomethyl)pyrrole intermediate with at least one molar equivalent of an alkali metal C_1–C_6-alkoxide to give the compound of formula I.

5,194,631

PROCESS FOR PRODUCING CARBOXYLIC ACIDS

Keiji Suto, Nishinomiya; Koji Nakaza, Osaka; Masaaki Kudo, Kadoma, and Moriharu Yamamoto, Kobe, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 166,544, Mar. 10, 1988, abandoned. This application Jul. 11, 1989, Ser. No. 378,284

Claims priority, application Japan, Mar. 14, 1987, 62-59686; Feb. 13, 1988, 63-31140

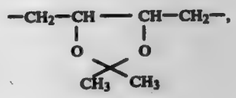
Int. Cl.[5] C07D *333/38, 307/78, 453/02*; C07C *51/10*

U.S. Cl. 549—71 **12 Claims**

1. A process for producing a carboxylic acid which comprises reacting an organic chloride having at least one chlorine atom on its ring of a substituted or unsubstituted, aromatic or heterocyclic hydrocarbon with carbon monoxide in the presence of an inorganic base at a reaction temperature of 160° to 300° C. by using as catalysts a palladium compound and a phosphine compound represented by the general formula (III):

$$(R)_2P—X—P(R)_2 \quad (III)$$

wherein R is an alkyl group or a substituted or unsubstituted phenyl group, and X is an alkylene group having 1 to 6 carbon atoms,



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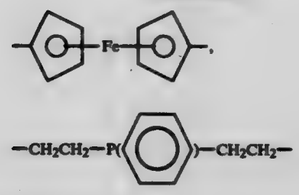


or a binaphthyl group.

5,194,632

FLUORAN COMPOUND, USEFUL IN HEAT SENSITIVE RECORDING MATERIALS

Masakatsu Nakatsuka, Yokohama; Atsuo Otsuji, Kamakura; Kiyoharu Hasegawa, Yokohama; Masatoshi Takagi, and Akihiro Yamaguchi, both of Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

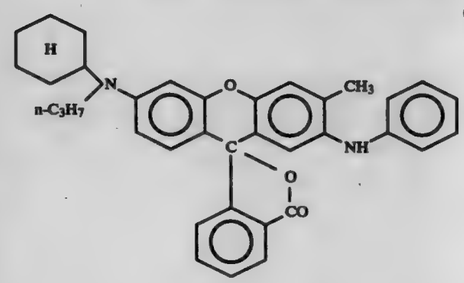
Filed Jul. 31, 1990, Ser. No. 560,909

Claims priority, application Japan, Aug. 1, 1989, 1-197948

Int. Cl.[5] C07D *311/78, 311/80*

U.S. Cl. 549—224 **1 Claim**

1. A fluoran compound represented by the formula (I):



(I)

5,194,633

PREPARATION OF 1,1,1,3,3,3-HEXAFLUORO-2,2-DI(3,4-DICARBOXYPHENYL)PROPANE ANHYDRIDE

Walter Parteanheimer; Douglas E. Fjare, both of Naperville, and Gayle G. Chany, Bolingbrook, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 530,642, May 30, 1990, abandoned. This application Nov. 26, 1991, Ser. No. 798,171

Int. Cl.[5] C07D *307/77*

U.S. Cl. 549—241 **7 Claims**

1. A process for preparing 1,1,1,3,3,3-hexafluoro-2,2-di(3,4-dicarboxyphenyl) propane anhydride (6-FDA) by the liquid phase oxidation of 1,1,1,3,3,3-hexafluoro-2,2-di(3,4-dimethylphenyl) propane (6-FXP), which process comprises:

(a) introducing into an oxidation reactor a mixture comprising 6-FXP, an oxidation solvent comprising an aliphatic acid having 2 to 6 carbon atoms per molecule, an oxygen-containing gas, and an oxidation catalyst comprising cobalt, manganese and bromine components;

(b) maintaining said mixture at a reaction temperature in the range of about 100° F. to about 500° F., at a reaction pressure sufficient to maintain at least a portion of said mixture in the liquid phase, and for a time sufficient to oxidize at least a portion of the 6-FXP and form a first product mixture comprising 1,1,1,3,3,3-hexafluoro-2,2-di(3,4-dicarboxyphenyl) propane (6-FTA);

(c) forming a second product mixture comprising 6-FDA by treating said first product mixture with an amount of aliphatic anhydride sufficient to convert at least a portion of said 6-FTA to 6-FDA, said aliphatic anhydride having 4 to 12 carbon atoms per molecule;

(d) precipitating said 6-FDA from said second product mixture;

(e) recovering precipitated 6-FDA; and

(f) heating recovered precipitated 6-FDA to remove aliphatic carboxylic acid.

5,194,634

DIHYDROXYHEPTANOIC ACIDS CONTAINING AN OXABICYCLOHEPTANE NUCLEUS USEFUL AS ANTIHYPERCHOLESTEROLEMIC AGENTS

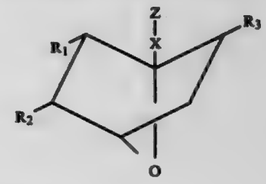
Donald S. Karanewsky, Robbinsville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 851,386, Mar. 12, 1992, Pat. No. 5,157,134. This application Jul. 30, 1992, Ser. No. 921,781

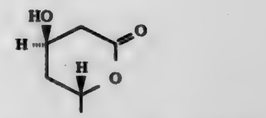
Int. Cl.[5] C07D *309/12*

U.S. Cl. 549—292 **12 Claims**

1. A compound having the structure



wherein Z is



X is $—CH_2CH_2—$ or —CH=CH—;

R_1 is alkyl, arylalkyl, alkanoyloxyalkyl, arylalkyloxyalkyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkanoylaminoalkyl, alkanoyl(alkyl)aminoalkyl, or aralkyl-(alkyl)aminocarbonyl;

R_2 is H, alkyl, aralkyl, alkoxyalkyl, aralkoxyalkyl, hydroxyalkyl, or alkanoyloxyalkyl; and

R_3 is H, alkyl or aralkyl.

5,194,635

REARRANGED TAXOL COMPOUNDS AND METHOD OF USING IN TESTING OF IN VIVO ACTIVITY

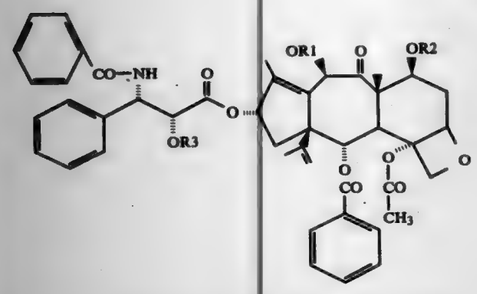
David G. I. Kingston, and Gamini Samaranyake, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation of Ser. No. 670,432, Mar. 18, 1991, abandoned. This application Feb. 24, 1992, Ser. No. 839,082

Int. Cl.[5] C07C *305/14*

U.S. Cl. 549—430 **11 Claims**

1. A rearranged taxol compound having the following structure:



wherein R1 is $C(O)CH_3$, R2 is H or $Si(CH_2CH_3)_3$, and R3 is H or $Si(CH_2CH_3)_3$.

5,194,636

PREPARATION OF BENZYL KETONES AND AN OXIRANE

Thomas Himmler, Cologne; Udo Kraatz, Leverkusen; Wolfgang Krämer, Bruscheid, and Klaus Stroech, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

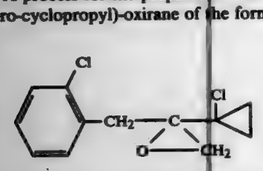
Division of Ser. No. 709,679, Jun. 3, 1991, Pat. No. 5,146,001. This application Mar. 3, 1992, Ser. No. 845,072

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018926; Sep. 22, 1990, 4030061

Int. Cl.[5] C07D *301/02, 303/08*

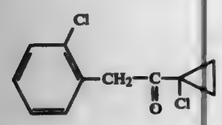
U.S. Cl. 549—519 **1 Claim**

1. A process for the preparation of 2-(2-chlorobenzyl)-2-(1-chloro-cyclopropyl)-oxirane of the formula



(IX-1)

which comprises reacting 2-chlorobenzyl 1-cyclopropyl ketone of the formula



(I-1)

with trimethylsulphoxonium chloride of the formula

$$(CH_3)_3{}^{\oplus}SO\ Cl^{\ominus}$$ (XI)

either

γ) in the presence of an alcohol and in the presence of an alkali metal hydroxide or an alkali metal alcoholate,

or

δ) in the presence of toluene or xylene and in the presence of aqueous sodium hydroxide solution or potassium hydroxide solution

at a temperature between 10° C. and 60° C.

5,194,637

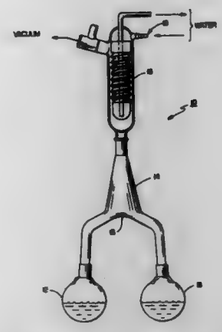
METHOD AND APPARATUS FOR SYNTHESIS OF HIGHLY ISOMERICALLY PURE STEREOISOMERS OF GLYCIDOL DERIVATIVES

Roger C. Hahn, Syracuse, N.Y., assignor to Syracuse University, Syracuse, N.Y.

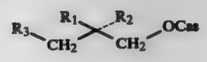
Filed Aug. 22, 1991, Ser. No. 748,672

Int. Cl.[5] C07D *301/00, 301/32*

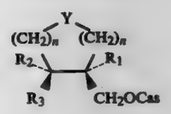
U.S. Cl. 549—559 **5 Claims**



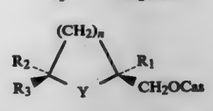
1. A casylate of formula (11), wherein R_1, R_2, and R_3 are bromide, bromomethyl, ethyl, methyl, or hydrogen, provided that R_1, R_2, and R_3 are each different, or formulas (12) or 13), wherein R_1, R_2, and R_3 independently of one another are bromomethyl, ethyl, methyl, or hydrogen, n is 0, 1, or 2, and Y is oxygen, C═O, or —CH_2—, produced by the steps of



(11)



(12)



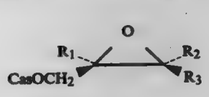
(13)

reacting at least 1.0 equivalents of a racemic or achiral bromide analog thereof, with an alkyl casylate in the presence of a quaternary salt catalyst at a temperature of about 115° to 125° C. to yield a mixture; and

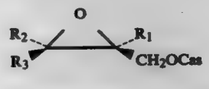
thereafter distilling away excess of said bromide from said mixture.

3. A stereoisomer of a glycidyl casylate of formula (8a) or (8b), wherein R_1, R_2, and R_3 are each hydrogen, and said glycidyl casylate has an isomeric purity exceeding 98%, produced by the steps of

reacting about 1.5 to 3.0 equivalents of a racemic



(8a)



(8b)

or achiral bromide analog thereof, wherein R_1, R_2, and R_3 independently of one another are bromomethyl, ethyl,

methyl, or hydrogen, with about 1.0 equivalents of an alkyl casylate in the presence of a salt catalyst selected from the group of a quaternary ammonium casylate salt and a quaternary ammonium bromide salt at a temperature of about 115° to 125° C. to yield a mixture; and

thereafter distilling away an excess of said bromide analog from said mixture under reduced pressure.

5,194,638

RESINOUS BINDERS FOR USE IN INK COMPOSITIONS FOR INK JET PRINTING

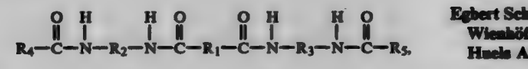
Charles R. Frihart, and Mark S. Pavlin, both of Lawrenceville, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 325,332, Feb. 17, 1989, abandoned, which is a division of Ser. No. 98,447, Sep. 18, 1987, Pat. No. 4,830,671. This application Apr. 23, 1991, Ser. No. 690,037

Int. Cl.[5] C09F *5/00*; C07C *233/00*

U.S. Cl. 554—47 **7 Claims**

1. A resinous binder for use in hot melt ink compositions, comprising:



wherein R_1 represent a polymerized fatty acid residue with the hydroxyl moieties of two carboxylic acid groups removed; R_2 and R_3 are the same or different and each represents an alkylene with up to 6 carbon atoms, a cycloalkylene with 6 to 12 carbon atoms, or an arylene with 6 to 12 carbon atoms; and R_4 and R_5 are the same or different and each represents an alkyl having up to 36 carbon atoms, wherein said resinous binder has a melt viscosity of about 250 cps or less at 150° C., is sufficiently transparent to allow a colorant to be distributed through the resinous binder in an amount effective to impart a pre-determined color to the resulting hot melt ink composition, and has a blocking temperature greater than 100° C.

5,194,639

PREPARATION OF POLYHYDROXY FATTY ACID AMIDES IN THE PRESENCE OF SOLVENTS

Daniel S. Connor; Jeffrey J. Scheibel, and Roland G. Severson, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 590,391, Sep. 28, 1990. This application Sep. 6, 1991, Ser. No. 756,093

Int. Cl.[5] C07C *231/02*; C11C *3/00*

U.S. Cl. 554—66 **6 Claims**

1. A process for preparing polyhydroxy fatty acid amides, in purified substantially uncyclized form, by reacting a fatty acid ester and an N-alkyl polyhydroxy amine in one or more hydroxy or alkoxylated solvents in the presence of a base catalyst, said process being characterized by the following parameters:

(a) said base catalyst is an alkoxide catalyst;

(b) said process is carried out at a temperature of from about 25° C. to about 130° C.;

(c) said process is carried out at a weight ratio of fatty acid ester:N-alkyl polyhydroxy amine of at least about 1:1,

(d) said fatty acid ester is a C_{12}–C_{20} a fatty acid ester; and

(e) said solvent is a C_1–C_4 alcohol, ethylene glycol, propylene glycol, glycerol, alkoxylated alcohol, or mixtures thereof.

5,194,640

PROCESS FOR MAKING HIGH-PURITY OLEIC ACID

John P. Cosgrove, Charleston; J. George Hayden, Awendaw, and Phillip L. Robinson, Isle of Palms, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jun. 10, 1991, Ser. No. 712,717

Int. Cl.[5] C11C *3/14*

U.S. Cl. 554—126 **4 Claims**

1. A process for the production of oleic acid, comprising:

(a) reacting in a cycloaddition reaction 100 parts by weight of a tall oil fatty acid mixture containing conjugated linoleic acid, in the absence of a catalyst, with

(b) from 1 to 26 parts by weight of a dienophile,

(c) at a temperature between 180° C. to 300° C. for a period of 0.5 to 12.0 hours to produce a linoleic acid containing adduct, and

(d) distilling and recovering the oleic acid fraction from the said adduct.

5,194,641

METHOD OF MANUFACTURING NONIONIC SURFACTANTS LOW IN ALKYLENE OXIDES AND LOW IN 1,4-DIOXANE, USING ALKALI METAL ALKOXIDES AS CATALYSTS

Egbert Schröer, Dorsten; Klaus Schulze, Haltern, and Ekkehard Wienhöfer, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 9, 1991, Ser. No. 697,423

Int. Cl.[5] C07C *51/00*

U.S. Cl. 554—149 **14 Claims**

1. A method of producing alkoxidation products from amines, fatty ac-ids, and oils, which products are low in alkylene oxides and low in 1,4-dioxane, comprising:

reacting an amine, fatty acid or oil with an alkylene oxide in the presence of an alkali fatty alkoxide catalyst obtained by direct action of an alkali hydroxide with a fatty alcohol at elevated temperature in the absence of a solvent.

5,194,642

METALLO-ORGANIC PRECURSORS TO TITANIUM NITRIDE

Charles H. Winter, Grosse Pointe Park; Tilak S. Lewkebandara, Detroit; James W. Proscia, Dearborn, and Phillip H. Sheridan, Madison Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 24, 1992, Ser. No. 825,235

Int. Cl.[5] C07F *7/28*

U.S. Cl. 556—51 **13 Claims**

1. A metallo-organic precursor of the formula:

$$[Cl_2TiNR]_2,$$

wherein R is a monovalent alkyl or aryl radical having from 1 to about 12 carbon atoms.

3. A process for preparing a metallo-organic precursor, comprising the steps of:

A) contacting a titanium tetrahalide with a primary alkyl or aryl amine to prepare an intermediate metallo-organic compound; and

B) heating the intermediate metallo-organic compound to a temperature and for a period of time sufficient to prepare a compound of the formula:

$$[Cl_2TiNR]_2,$$

wherein R is a monovalent alkyl or aryl radical having from 1 to about 12 carbon atoms.

339–699 O.G.–93–16

5,194,643
GOLD CARBOXYLATES AND PROCESS FOR PREPARING THE SAME
Thomas E. Nappier, Parma, Ohio, assignor to Mecoxy Chemicals, Inc., Cleveland, Ohio
Filed Dec. 10, 1990, Ser. No. 624,652
Int. Cl.[5] C07F 1/12
U.S. Cl. 556—115 5 Claims

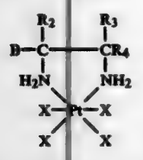
1. A gold carboxylate having the formula

$$Au_z(R(COO)_y)_z \quad (I)$$

wherein R represents an aliphatic group having from 1 to 9 carbon atoms, or an alicyclic group having from 4 to 29 carbon atoms, y is the number of COO groups attached to the R, z is equal to the valence of the Au and x equal y.z/3.

5,194,644
ETHYLENE-SUBSTITUTED PHENYLALKYLETHYLENE-DIAMINE-PLATINUM (II OR IV) DERIVATIVES AND PHENYLALKYLETHYLENEDIAMINES
Henri Brunner, Lappersdorf; Peter Hankofer, Cologne; Friedrich Maierth, Hagelstadt; Jürgen Engel, Alzenau; Wolfgang Schumacher, Langau; Peter Hilgard, Bielefeld, and Rainer Voegeli, Bielefeld, all of Fed. Rep. of Germany, assignors to Asta Pharma AG, Fed. Rep. of Germany
Filed Apr. 10, 1991, Ser. No. 683,431
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1990, 4011520
Int. Cl.[5] C07F 15/00
U.S. Cl. 556—137 3 Claims

1. Platinum (II or IV) complexes of the general formula



where B represents a phenyl-C_1–C_4-alkyl radical which is optionally substituted in the phenyl nucleus by the radical R_1 and R_1 is hydrogen, halogen, trihalogen methyl, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy or C_2–C_6-alkanoyloxy or where B together with the structural part H_2N—$CR_2<$ forms a tetrahydroisoquinoline radical, if B contains benzyl and R_2 hydrogen and the benzyl radical in the 2-position contains the CH_2-radical or where B together with the structural part —$CR_2<$ represents a tetrahydronaphthyl radical in which one CH_2 group is optionally replaced by oxygen, or where B together with the structural part —$CR_2<$ represents a decahydronaphthyl radical or an indanyl radical; R_2 represents hydrogen, C_1–C_6-alkyl, phenyl or phenyl-C_1–C_4-alkyl, it also being possible for the phenyl ring of this group R_2 to be substituted by hydroxy, C_1–C_4-alkoxy, C_1–C_4-alkyl, C_2–C_6-alkanoyloxy or halogen;

the radicals R_3 and R_4 are the same or different and represent hydrogen, C_1–C_{12}-alkyl, C_3–C_8-cycloalkyl, phenyl which is optionally substituted by C_1–C_6-alkoxy and, if B is a benzyl radical (optionally substituted as stated), at least one of the radicals R_2, R_3 and R_4 is not hydrogen and X stands for the equivalent of a physiologically acceptable anion or X can also be a water molecule, where in the latter case the missing negative charge is saturated by a corresponding physiologically acceptable acid anion, where in the case of platinum((II) complexes, two of the groups X are absent.

5,194,645
TRANS-PT (IV) COMPOUNDS
Christopher F. J. Barnard, Reading, United Kingdom, assignor to Johnson Matthey Public Limited Company, London, England
Filed Mar. 9, 1992, Ser. No. 848,681
Claims priority, application United Kingdom, Mar. 9, 1991, 9105037
Int. Cl.[5] C07F 15/00
U.S. Cl. 556—137 14 Claims

1. A trans-Pt(IV) compound of general formula I

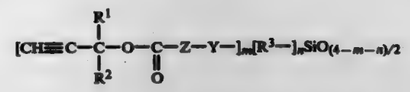
$$PtX_2Y_2L^1L^2 \quad I$$

in which each of L^1 and L^2 is an amine ligand, provided that L^1 and L^2 are not both NH_3, and

each of X and Y is a halogen, hydroxyl, or a carboxylate, or both Y's together form a dicarboxylate or both X's and both Y's together form dicarboxylates in which the ligands L^1 and L^2 are in mutually trans co-ordination sites on the platinum atom.

5,194,646
POLYMERIZABLE SILICONES HAVING ACETYLENIC UNSATURATION
Mitsuo Yamada, B-714, 48 Yamadaminami, Suita-shi, Osaka-fu; Hiroharu Ohsugi, 4-1-1-111 Nishimakino, Hirakata-shi, Osaka-fu, and Ryuzo Mizuguchi, 42-6-301 Kurigatsui Hashimoto, Yahata-shi, Kyoto-fu, all of Japan
Filed Jan. 15, 1992, Ser. No. 820,834
Claims priority, application Japan, Jan. 16, 1991, 3-17004
Int. Cl.[5] C07F 7/08, 7/10
U.S. Cl. 556—420 9 Claims

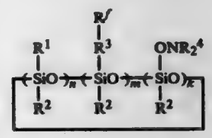
1. A compound of the rational formula:



wherein R^1 and R^2 are independently a hydrogen atom or a hydrocarbon radical free from acetylenic unsaturation; Z is —O—, —S—, or —NH—; Y is a divalent organic group; R^3 is a hydrogen atom, or an alkyl, alkenyl, alkoxy or phenyl group; and m and n are rational numbers satisfying the relation of $4>m+n\geq 2$.

5,194,647
ORGANIC SILICON COMPOUNDS AND METHOD FOR MAKING
Shinichi Sato; Hirofumi Kishita; Hitoshi Kinami, and Hideki Fujii, all of Annaka, Japan, assignors to Shin-Etsu Chemical Company, Ltd., Tokyo, Japan
Filed May 29, 1992, Ser. No. 889,698
Claims priority, application Japan, May 29, 1991, 3-153945
Int. Cl.[5] C07F 7/10
U.S. Cl. 556—422 13 Claims

1. An organic silicon compound of the following formula (1):



(1)

wherein

R^1 and R^2 are independently selected from monovalent hydrocarbon groups having 1 to 8 carbon atoms,

R^3 is an alkylene group having 2 to 6 carbon atoms or an alkylene group having 2 to 6 carbon atoms and containing at least one —C—O—C— linkage,

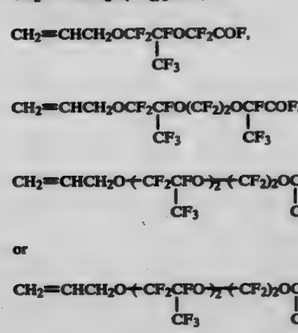
R^4 is an alkyl group having 1 to 6 carbon atoms,

Rf is selected from the group consisting of perfluoroalkyl and perfluorocycloalkyl groups having 1 to 15 carbon atoms and perfluoroalkyl and perfluorocycloalkyl groups having 1 to 20 carbon atoms and containing at least one —C—O—C— linkage, and

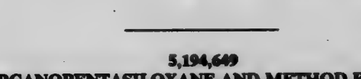
letter n is equal to 0, 1 or 2, m is equal to 1 or 2, and k is equal to 2, 3 or 4.

5,194,648
FLUORINATED CARBOXYLIC ACID DERIVATIVES AND METHODS FOR MAKING
Shinichi Satoh, Annaka; Noriyuki Koike, Gunma, and Hideki Fujii, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Aug. 3, 1990, Ser. No. 562,321
Claims priority, application Japan, Aug. 2, 1989, 1-202114
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—442 7 Claims

1. A fluorinated carboxylic acid derivative of the formula:

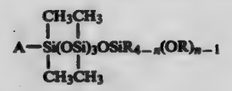


or



5,194,649
ORGANOPENTASILOXANE AND METHOD FOR ITS PREPARATION
Tadashi Okawa, Ichihara, Japan, assignor to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan
Filed Jan. 27, 1992, Ser. No. 825,906
Claims priority, application Japan, Jan. 29, 1991, 3-27920
Int. Cl.[5] C07F 7/18
U.S. Cl. 556—451 3 Claims

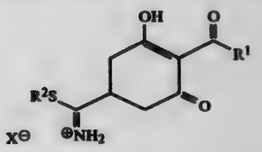
1. Organopolysiloxane with the formula



wherein A is the hydrogen atom or an aliphatically unsaturated monovalent hydrocarbon group selected from the group consisting of the norborneyl group and alkenyl group, R is selected from the group consisting of methyl, ethyl, propyl, butyl, pentyl, hexyl, vinyl, allyl, betenyl, hexenyl, isopropenyl, phenyl, tolyl, xylyl, benzyl, phenethyl, chloroethyl, nd 3,3,3-trifuloropropyl, wherein the groups R may be identical or may differ, and n is an integer with a value of 2 through 4.

5,194,650
ACYLCYCLOHEXADIONETHIOCARBOXIMIDIC S-ESTER SALTS
Juergen Kast, Bochl-Iggelheim; Juergen Schubert, Mannheim, and Reinhard Kaczmarek, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Division of Ser. No. 592,296, Oct. 3, 1990, Pat. No. 5,130,453. This application Feb. 10, 1992, Ser. No. 833,178
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934205
Int. Cl.[5] C07C 331/00, 381/00
U.S. Cl. 558—1 2 Claims

1. An acylcyclohexadione of the formula



V

where

R^1 is C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl, C_2–C_{20}-alkynyl or C_3–C_6-cycloalkyl, each of which is unsubstituted or substituted by halogen, C_1–C_4-alkoxy or C_1–C_4-alkylthio, or is benzyl or phenyl, each of which is unsubstituted or substituted by halogen, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl or nitro; is hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or C_3–C_6-cycloalkyl, each of which is unsubstituted or substituted by C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-dialkylamino, hydroxyl or halogen; benzyl or phenyl, each of which is unsubstituted or substituted by halogen, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy or nitro, and

X is a chloride, bromide, sulfate, phosphate, tetrafluoroborate, perchlorate or trifluoroacetate ion.

5,194,651
TOSYLATION OF ALCOHOLS
Merrikh Ramezanian, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Continuation of Ser. No. 640,845, Jan. 14, 1991, abandoned. This application Jan. 29, 1992, Ser. No. 827,586
Int. Cl.[5] C07C 303/00, 307/00, 311/00
U.S. Cl. 558—46 8 Claims

1. In a process for preparing aliphatic toluenesulfonates by the reaction of a toluenesulfonyl chloride with an aliphatic alcohol and an alkali metal hydroxide in a solution of an aprotic solvent, the improvement consisting of separating the aliphatic toluenesulfonate from said solution and then purifying the aliphatic toluenesulfonate, the separating and purifying carried out in the absence of water.

5,194,652
OXIDATION-RESISTANT CYCLOPHOSPHAZENE FLUID INCLUDING TRIARYLPHOSPHINE OR PHOSPHINE OXIDE
Bassam S. Nader, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed May 29, 1992, Ser. No. 891,378
Int. Cl.[5] C07F 9/6593, 9/6581
U.S. Cl. 558—80 11 Claims

1. An oxidation-resistant cyclophosphazene fluid composition, comprising:

a cyclophosphazene fluid component; and

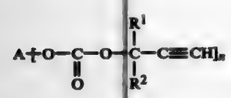
an oxidation-inhibiting amount of an aryl phosphine or phosphine oxide selected from the group consisting of:

(a) symmetric triarylphosphines of formula R_3P, wherein R is selected from the group consisting of 4-trifluoromethyl phenyl, 3-trifluoromethyl phenyl, 3-tri-

fluoromethoxy phenyl, 3-(3-trifluoromethylphenoxy) phenyl, 3-(perfluoro-2, 5-dimethyl-3, 6-dioxanonyl) phenyl, and 1-naphthyl;
(b) oxides of said symmetric triarylphosphines; and
(c) 1,3-bis(diphenylphosphino)benzene.

5,194,653
CARBONATES OF ACETYLENIC ALCOHOLS
Mitsuo Yamada, Osaka; Kei Aoki, Nara; Satoshi Urano, and Ryuzo Mizuguchi, both of Kyoto, all of Japan, assignors to Nippon Paint Company, Limited, Osaka, Japan
Division of Ser. No. 699,395, May 14, 1991. This application Aug. 3, 1992, Ser. No. 923,435
Claims priority, application Japan, May 17, 1990, 2-127781; May 17, 1990, 2-127785
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—268 8 Claims

1. A compound of the formula:



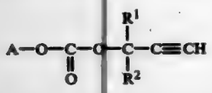
wherein
A is a system having two benzene rings linked together with —S—, —O— or —SO_2—, said benzene rings optionally having up to four substituents thereon selected from the group consisting of a C_1–C_{12} alkyl, a C_1–C_{12} alkoxy, halo, nitro and cyano;
R^1 and R^2 are independently a hydrogen atom or C_1–C_{12} alkyl; and
n is an integer of 1, 2 or 3.

5,194,654
LIPID DERIVATIVES OF PHOSPHONOACIDS FOR LIPOSOMAL INCORPORATION AND METHOD OF USE
Karl Y. Hostetler, Del Mar, and Raj Kumar, San Diego, both of Calif., assignors to Vical, Inc., San Diego, Calif.
Filed Nov. 22, 1989, Ser. No. 440,898
Int. Cl.[5] C07F 9/40
U.S. Cl. 558—152 13 Claims

1. A compound having antiviral activity, comprising:
a phosphonoacid selected from the group consisting of phosphonoformic acid and phosphonoacetic acid; and
a lipid selected from the group consisting of sphingolipids, phospholipids, glycerolipids, and fatty acids.

5,194,655
POLYMERIZABLE CARBONATES HAVING ETHYLENIC AND ACETYLENIC FUNCTIONS
Mitsuo Yamada, Osaka; Kei Aoki, Nara; Satoshi Urano, and Ryuzo Mizuguchi, both of Kyoto, all of Japan, assignors to Nippon Paint Company, Limited, Osaka, Japan
Filed May 14, 1991, Ser. No. 699,376
Claims priority, application Japan, May 17, 1990, 2-127784
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—276 9 Claims

1. A carbonate compound of the formula:



wherein A is the residue of a hydroxyl group-containing ethylenically unsaturated monomer selected from a group consisting of, hydroxyl group-containing acrylates and hydroxyl group-containing methacrylates, and R^1 and R^2 are independently a hydrogen atom or C_1–C_{20} alkyl.

5,194,656
CONTINUOUS INTEGRATED PROCESS FOR PRODUCING DIMETHYL CARBONATE AND METHYL TERT-BUTYL ETHER
Francesco Ancillotti, San Donato Milanese, and Ermanno Pescarollo, Milan, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy
Filed Apr. 13, 1992, Ser. No. 867,329
Claims priority, application Italy, May 8, 1991, 001258 A/91
Int. Cl.[5] C07C 69/96
U.S. Cl. 558—277 9 Claims

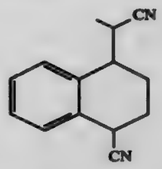
1. A continuous integrated process for producing dimethyl carbonate and methyl tert-butyl ether, comprising the steps of:
a) feeding a liquid methanol stream and a gaseous carbon monoxide and oxygen stream into a liquid reaction mixture of constant or essentially constant composition, in which a copper catalyst is suspended and which contains 35–70 wt. % of methanol and 2–8 wt. % of water, the remainder consisting essentially of dimethyl carbonate and inevitable impurities, the operating temperature being 70°–150° C. and the operating pressure being such as to maintain the reaction mixture in the liquid phase, to form a liquid reaction mixture containing dimethyl carbonate and unaltered methanol;
b) at least partly eliminating the water from the reaction mixture of stage a);
c) feeding the dehydrated mixture of stage b) and isobutene, or a hydrocarbon fraction containing isobutene, into a cationic ion exchange resin arranged in the form of a fixed bed, the etherification reaction being conducted in the liquid phase at a temperature of 40°–100° C., under a pressure of 10–40 kg/cm^2 and with a space velocity of about 7 hr^{-1}, to form a liquid reaction mixture containing dimethyl carbonate and methyl tert-butyl ether; and
d) recovering the dimethyl carbonate and methyl tert-butyl ether from the reaction mixture of stage c).

5,194,657
PROCESS FOR THE PREPARATION OF AMINONITRILES
Ronald J. McKinney, Wilmington, Del., and Robert N. McGill, Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 637,640, Jan. 4, 1991, abandoned. This application Dec. 9, 1991, Ser. No. 803,923
Int. Cl.[5] C07C 253/30
U.S. Cl. 558—346 10 Claims

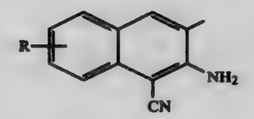
1. An improved process for the preparation of an alpha aminonitrile by providing a ketone in a reactor, adding ammonia to the reactor, and adding hydrogen cyanide to the reactor to convert the hydrogen cyanide to an alpha aminonitrile, said process taking place in the liquid phase, wherein the improvement comprises
the ketone in the reactor being acetone or methylethylketone,
providing an amount of hydrogen cyanide to be added to the ketone such that the molar ratio of hydrogen cyanide to ketone is from 0.9:1 to 0.99:1,
adding the hydrogen cyanide to the reactor over a period of time greater than one hour, and
maintaining an excess of ammonia in the reactor during the conversion of the hydrogen cyanide to the alpha aminonitrile.

5,194,658
PROCESS FOR MAKING 2-AMINO-3-METHYL-1-NAPHTHALENECARBONITRILE
Edmund J. Stark, and Duane B. Priddy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Mar. 20, 1992, Ser. No. 844,370
Int. Cl.[5] C07C 255/00; G01N 33/00
U.S. Cl. 558—418 5 Claims

1. A process for producing 2-amino-3-methyl-1-naphthalenecarbonitrile) or substituted 2-amino-3-methyl-1-naphthalenecarbonitrile, comprising heating 4-cyano-1,2,3,4-tetrahydro-α-methyl-napthaleneacetonitrile or substituted 4-cyano-1,2,3,4-tetrahydro-α-methyl-1-napthaleneacetonitrile represented by the formula:



wherein R is alkyl of from 1 to 6 carbon atoms, halogen, cyano, or hydrogen under conditions effective to produce an 2-amino-3-methyl-1-naphthalenecarbonitrile or substituted 2-amino-3-methyl-1-naphthalenecarbonitrile and ethylene wherein 2-amino-3-methyl-1-naphthalenecarbonitrile or substituted 2-amino-3-methyl-1-naphthalenecarbonitrile is represented by the formula:



wherein R is alkyl of from 1 to 6 carbon atoms, halogen, cyano, or hydrogen.

5,194,659
HIGH MELTING AMINO AROMATIC NITRATE ESTERS
Michael E. Sitzmann, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 15, 1992, Ser. No. 901,618
Int. Cl.[5] C07C 203/10
U.S. Cl. 558—482 2 Claims

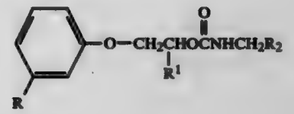
1. 1,3-diamino-5-(hydroxyethylaminonitrate)-2,4,6-trinitrobenzene.

5,194,660
PROCESSES FOR PRODUCING CARBAMATES AND ISOCYANATES
Tak W. Leung, and Bernard D. Dombek, both of Charleston, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Dec. 21, 1990, Ser. No. 631,962
Int. Cl.[5] C07C 269/04
U.S. Cl. 560—24 7 Claims

1. In a process for producing a carbamate which comprises contacting a first reactant selected from the group consisting of primary amine components, secondary amine components, urea components and mixtures thereof; carbon monoxide; at least one organic hydroxyl component and at least one oxygen-containing oxidizing agent at conditions effective to form a carbamate including the presence of a catalyst composition in an amount effective to promote the formation of a carbamate, the improvement wherein the catalyst composition comprises at least one redox cyclable metal macrocyclic complex selected from the group consisting of metal porphyrin or metal phthalocyanine including a metal selected from the metals of Group IIIa to Va and Group VIII of the Periodic Table and at least one iodine component is present in an amount effective to facilitate the formation of the carbamate.

5,194,661
SUBSTITUTED BENZYL CARBAMATES AND THEIR USE AS HERBICIDES
Don R. Baker, Orinda, Calif., assignor to ICI Americas Inc., Wilmington, Del.
Filed Aug. 20, 1990, Ser. No. 569,686
Int. Cl.[5] C07C 271/10, 271/14, 271/16, 271/20
U.S. Cl. 504—303 10 Claims

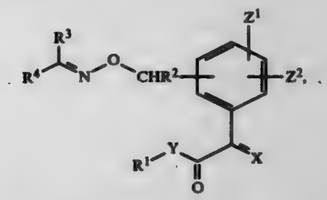
1. A compound having the formula



in which:
R is a member selected from the group consisting of trifluoromethyl, NO_2, C_1–C_3 haloalkyloxy, phenoxy, and substituted phenoxy substituted with one or more members of the group consisting of halogen and trifluoromethyl;
R_1 is C_1–C_4 alkyl; and
R_2 is a member selected from the group consisting of phenyl and substituted phenyl substituted with one or more of the group consisting of H, cyano, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and C_1–C_4 haloalkyl.

5,194,662
O-BENZYLOXIME ETHERS AND CROP PROTECTION AGENTS CONTAINING THESE COMPOUNDS
Siegbert Brand, Birkenheide; Uwe Kardorff, Mannheim; Reinhard Kirstgen, Neustadt; Bernd Mueller, Frankenthal; Klaus Oberdorf, Eppelheim; Hubert Sauter, Mannheim; Gisela Lorenz, Neustadt; Eberhard Ammermann, Ludwigshafen; Christoph Kuenast, Otterstadt, and Albrecht Harreus, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jan. 27, 1991, Ser. No. 722,209
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020384; Jun. 27, 1990, 4020388
Int. Cl.[5] C07C 229/10, 233/00
U.S. Cl. 560—35 9 Claims

1. O-benzyloxime ether of the formula I



(I)

where
X is N—C_1-C_4alkoxy,
Y is O or NR^5,
R^1, R^2 and R^5 are H or C_1–C_4-alkyl,
Z^1 and Z^2 are identical or different and each is H, halogen, methyl, methoxy or cyano,
R^3 and R^4 are identical or different and each is hydrogen,

cyano, straight-chain or branched C_1–C_{10}-alkyl, C_1–C_4-haloalkyl, C_3–C_6-cycloalkyl, C_3–C_6-halocycloalkyl, C_3–C_6-cycloalkyl-C_1–C_4-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, C_1–C_6-alkylthio-C_1–C_4-alkyl, arylthio-C_1–C_4-alkyl, C_2–C_6-alkenyl, C_2–C_5-haloalkenyl, C_3–C_6-cycloalkenyl, C_3–C_6-halocycloalkenyl, C_2–C_6-alkynyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_4-alkylthio, benzylthio, C_1–C_4-alkylcarbonyl, substituted or unsubstituted phenylcarbonyl, substituted or unsubstituted benzylcarbonyl, C_1–C_4-alkoxycarbonyl, substituted or unsubstituted phenoxycarbonyl, substituted or unsubstituted benzyloxycarbonyl, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, substituted or unsubstituted arylthio, substituted or unsubstituted aryl-C_1–C_4-alkyl, substituted or unsubstituted aryl-C_2–C_4-alkenyl, substituted or unsubstituted aryloxy-C_1–C_4-alkyl, or substituted or unsubstituted arylthio-C_1–C_4-alkyl,

$N(R^6)_2$, where the radicals R^6 are identical or different and each is H, C_1–C_6-alkyl or substituted or unsubstituted phenyl,

—CO—$N(R^7)_2$, where the radicals R^7 are identical or different and each is H or C_1–C_4-alkyl, substituted or unsubstituted meaning, in addition to hydrogen, the radicals halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_1–C_{10}-alkoximino-C_1–C_2-alkyl, aryl, aryloxy, benzyloxy, or C_3–C_6-cycloalkyl, or

R^3 and R^4 together with the carbon atom to which they are attached form cyclopentyl, cyclohexyl, cycloheptyl, adamantyl, camphenyl, tetralyl, idanyl or fluorenyl, each of which may be substituted by the radicals stated above under substituted or unsubstituted, or

R^3 and R^4 may be halogen;

and "aryl", alone or as part of another radical, is phenyl, naphthyl, or anthryl.

5,194,663

AROMATIC DERIVATIVES OF BUTYRIC ACID, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN COSMETICS AND IN HUMAN AND VETERINARY MEDICINE

Jean Maignan, Tremblay les Gonesse; Gérard Malle, Villiers sur Morin, and Gérard Lang, Saint Gratien, all of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

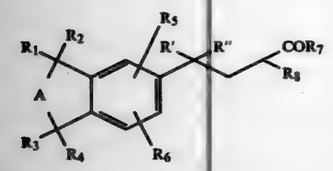
Division of Ser. No. 181,017, Apr. 4, 1988, Pat. No. 5,068,393. This application Aug. 9, 1991, Ser. No. 743,213

Claims priority, application France, Apr. 3, 1987, 87 04711

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—51 6 Claims

1. An aromatic derivative of butyric acid having the formula



(I)

wherein

R_1, R_2, R_3 and R_4, each independently, represent hydrogen or lower alkyl, with at least two of radicals R_1–R_4 being other than hydrogen,

A represents methylene or dimethylene, substituted or not by lower alkyl; when A represents dimethylene, R_1 and R_3 can form together a methylene or dimethylene radical,

R_5 and R_6 represent hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy,

R′ represents hydrogen, hydroxyl, lower alkoxy or C_1–C_4 acyloxy,

R″ represents hydrogen or lower alkoxy, or R′ and R″ taken together form a oxo radical (=O) when R_1 and R_3 together form a methylene or dimethylene radical, or R′ and R″ taken together form a hydroxyimino radical (=N—OH),

R_8 represents hydrogen or lower alkyl,

R_7 represents —OR_9 or

R_9 represents hydrogen or alkyl having 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl, aryl or aralkyl, optionally substituted, a sugar residue, carboxyalkyl or alkoxycarbonyl alkyl,

r′ and r″ represent hydrogen, lower alkyl, monohydroxyalkyl optionally interrupted by a heteroatom, polyhydroxyalkyl, aryl or benzyl optionally substituted, an amino acid residue or aminated sugar residue or, taken together, form a heterocycle optionally substituted by a C_1–C_3 hydroxyalkyl, and

the salts of said compound of formula I and their optical isomers, as well as the tautomeric forms of the compounds of formula I.

5,194,664

AROMATIC KETO COMPOUNDS, THE PREPARATION THEREOF, AND DRUGS AND COSMETICS CONTAINING THESE

Hans-Heiner Wuest, Donnersheim, and Bernd Janssen, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

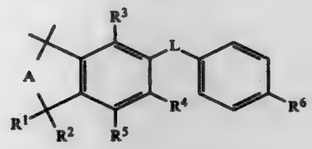
Division of Ser. No. 467,193, Jan. 18, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 790,452

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903992

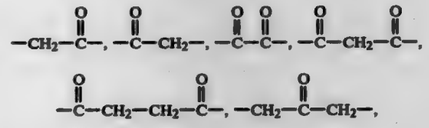
Int. Cl.[5] C07L *69/76*

U.S. Cl. 560—53 2 Claims

1. A compound of the formula I



where A is ethylene or methylene which can be substituted by methyl, hydroxyl or oxo, L is one of the following:



R^1 and R^2 are hydrogen or methyl, R^3 is hydrogen, hydroxyl or C_1–C_6-alkoxy, R^4 is hydrogen, C_1–C_4-alkyl, hydrogen or methoxy, R^5 is hydrogen or methoxy, R^6 is COR^{11} wherein R^{11} is OR^{13}, and R^{13} is hydrogen, C_1–C_8-alkyl which can contain one or two hydroxyl, aryl or aralkyl substituents.

5,194,665

SURFACTANTS BASED ON HYDROXYNAPHTHOIC ESTERS AND PREPARATION AND USE THEREOF

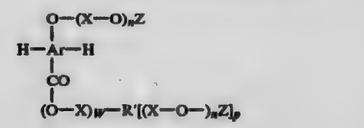
Heinz Uhrig, Steinbach; Erich Ackermann, Kelkheim, and Alexander Sieber, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 372,311, Jun. 28, 1989, Pat. No. 4,980,425. This application Sep. 11, 1990, Ser. No. 581,515

Int. Cl.[5] C07C *69/76;* C08F *232/00*

U.S. Cl. 560—56 17 Claims

1. A compound of the general formula (I)



(I)

where

Ar is naphthalene,

each X is independently of the others 1,2-ethylene or 1,2-propylene, or a combination thereof,

n and w are each independently of the others a number from 0 to 150 with at least one of the numbers n and w being different from 0, and the total number (n+w) of all alkyleneoxy units amounts from 2 to 150,

each z is independently of the other z radicals a hydrogen atom or an anionic, nonionic or cationic aliphatic, alicyclic, aromatic, araliphatic or aralicyclic acyl radical of 1 to 60 carbon atoms or a group of the formula —SO_3M, where M is a cation,

each R′ is independently of the other R′ radicals an amine or amide nitrogen atom or an aliphatic, alicyclic or aromatic radical or a combination of two or more such hydrocarbon radicals, the radical R′ having a total of 1 to 60 carbon atoms and being boned to the adjacent X radicals and, if w=0, to the CO group either via an oxygen atom or via an amine or amide nitrogen atom, and

each p is independently of the other p indices a number from 0 to 6.

5,194,666

PROCESS FOR PREPARING ESTERS OF 3,5,6-TRICHLOROSALICYCLIC ACID

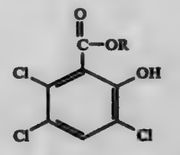
John A. Sedlak, Stamford; Mark A. Higgins, New Haven, and Amy P. Essenfeld, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 30, 1992, Ser. No. 921,785

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—62 17 Claims

1. A process for preparing esters of 3,5,6-trichlorosalicylic acid represented by the formula



(I)

in which R represents alkyl (C_1–C_{20}) comprising:

(1) preparing a reaction mixture comprising 3,5,6-trichlorosalicylic acid, a solvent, and, from about 100 mol % to about 175 mol % based on said 3,5,6-trichlorosalicylic acid, of an alcohol having 1 to 20 carbon atoms,

(2) adding a catalytic amount of a tetraalkyl titanate or a titanium chelate to the mixture of step (1) and,

(3) heating the mixture and distilling until removal of water from the mixture is substantially complete, leaving a solution containing the compound of formula (I), trace amounts or less of by-product ether of the formula R_2O, wherein R is as above defined, and tolerable amounts of unreacted 3,5,6-trichlorosalicylic acid.

5,194,667

FIBER SURFACE MODIFIERS

Bryce C. Oxenrider, Florham Park, N.J., and David J. Long, Amherst, N.Y., assignors to Allied-Signal Inc., Morristown, N.J.

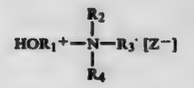
Division of Ser. No. 190,987, May 6, 1988, Pat. No. 4,939,289, which is a continuation-in-part of Ser. No. 756,629, Aug. 15, 1985, abandoned. This application Mar. 5, 1990, Ser. No. 488,201

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—87 9 Claims

1. An oligomeric composition prepared by:

(a) reacting pyromellitic dianhydride with a quaternary ammonium alcohol of the formula:



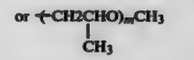
wherein

R_1 is alkylene having from 1 to about 4 carbon atoms;

Z is chloride, bromide or iodide;

R_2 and R_3 are the same or different and are alkyl having from 1 to about 3 carbon atoms;

R_4 is alkyl having from 1 to about 20 carbon atoms,



wherein n and m are 1 to about 10, at a mole ratio of about two moles of quaternary ammonium alcohol per mole of pyromellitic dianhydride to produce a pyromellitate having two quaternary ammonium ester moieties and two carboxylic acid moieties; and

(b) reacting said pyromellitate of step (a) with an excess of an oxirane compound selected from the group consisting of epichlorohydrin, epibromohydrin and propylene oxide in the presence of additional pyromellitic dianhydride to produce an organic mixture comprising said oligomeric compounds; wherein said oxirane compounds react with said carboxylic acid moieties to produce an ester having a primary or secondary alcohol group, and wherein said alcohol group reacts with said additional pyromellitic dianhydride to produce ester linking moieties and carboxylic acid moieties capable of reacting with said oxirane compound to produce additional esters having primary and secondary alcohol groups.

5,194,668

PROCESS FOR PRODUCTION OF CARBOXYLIC ACID ESTERS AND FORMAMIDE

Hideo Ikarashi; Hirofumi Higuchi, and Koichi Kida, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 8, 1990, Ser. No. 535,751

Claims priority, application Japan, Jul. 18, 1989, 1-184948

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—103 24 Claims

1. A process for the production of carboxylic acid ester and formamide which comprises reacting carboxylic acid amide and formic acid ester at a pressure of atmospheric pressure to 300 atmospheres, at a temperature of 0° to 150° C. and for a period of time of 0.1 to 20 hours in the presence of (a) dehydrated condensates of carboxylic acid amide and (b) an alkali

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metal hydroxide or an alkaline earth metal hydroxide, said formic acid ester being in an amount of 0.5 to 20 mol per mol of the carboxylic acid amide.

5,194,669
PREPARATION OF ALKYL (ALKOXYCARBONYLCYCLOHEXYL) CYCLOHEXENECARBOXYLATES AND DIALKYL BIPHENYLDICARBOXYLATES

J. Adrian Hawkins, Johnson City; Patricia N. Mercer, and Michael Bolles, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 13, 1991, Ser. No. 759,385
Int. Cl.[5] C07C *69/74, 69/76, 67/00*
U.S. Cl. 560—118 11 Claims

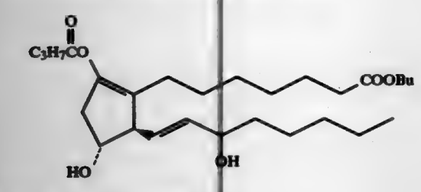
1. Process for the preparation of alkyl (alkoxycarbonylcyclohexyl)cyclohexenecarboxylates by contacting an alkyl 3-cyclohexenecarboxylate with an acidic dimerization catalyst selected from the group consisting of sulfuric acid, sulfonic acids, boron trifluoride, aluminum chloride and acidic silica-alumina at a temperature of about 60° to 300° C.

5,194,670
EMULSION OF LIPID CONTAINING A PROSTAGLANDIN ANALOGUE

Yutaka Mizushima, Tokyo; Toshihide Inomata, Tokyo; Arata Yasuda, Kanagawa; all of Japan, assignors to Yutaka Mizushima, Asahi Glass Company Ltd. and Seikagaku Corporation, Tokyo, Japan

Division of Ser. No. 597,870, Oct. 12, 1990, Pat. No. 5,120,870.
This application Mar. 24, 1992, Ser. No. 841,572
Claims priority, application Japan, Oct. 16, 1989, 1-266230
Int. Cl.[5] C07C *177/00*
U.S. Cl. 560—121 6 Claims

1. A prostaglandin analogue of the formula:



wherein Bu is a butyl group.

5,194,671
PROCESS FOR THE PREPARATION OF β-KETOCARBOXYLIC ACID ESTERS

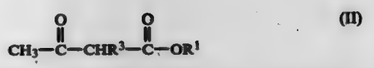
Josef Meier, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1992, Ser. No. 849,534
Claims priority, application Fed. Rep. of Germany, May 23, 1991, 4116906
Int. Cl.[5] C07C *69/74*
U.S. Cl. 560—126 15 Claims

1. A process for the preparation of β-ketocarboxylic acid esters of the general formula

(I)

in which R^1 is an alkyl radical having 1 to 4 C atoms, R^2 is an alkyl radical or alkenyl radical having 2 to 15 C atoms or a phenyl radical and R^3 is hydrogen or an alkyl or alkenyl radical having 1 to 6 C atoms, which comprises reacting acetocarboxylic acid esters of the general formula



(II)

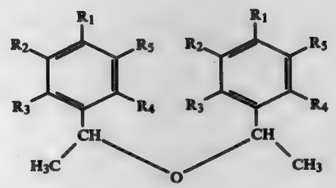
in which R^1 and R^3 are as defined, with calcium hydroxide or calcium oxide in the presence of an organic solvent and in the absence of water, the calcium chelate complexes formed are acylated with carboxylic acid chloride and the products are then cleaved with aqueous ammonium salt solution to form the β-ketocarboxylic acid esters of formula (I).

5,194,672
PROCESS FOR THE PREPARATION OF SUBSTITUTED STYRENES

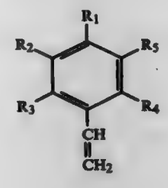
Mohammad Aslam, Corpus Christi, Tex.; Brad L. Smith, Matthews, N.C., and George Kvakovszky, Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 14, 1991, Ser. No. 701,407
Int. Cl.[5] C07C *67/00, 41/01, 17/00, 201/06*
U.S. Cl. 560—130 28 Claims

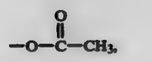
1. A process, comprising the steps of:
subjecting a bisarylalkyl ether of the formula



to an acid catalyst at a temperature of about 120° C. to about 230° C.; and
converting the bisarylalkyl ether to a substituted styrene of the formula



wherein R_1 is



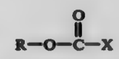
—O—CH_3, —O—CH_2—CH_3, halogen or NO_2; and R_2, R3, R4 and R_5 are independently hydrogen, halogen or C_1–C_4 alkyl.

5,194,673
PROCESS OF ALKOXY AND ARYLOXY ISOTHIOCYANATE PREPARATION

Samuel S. Wang, New Haven, and Lino G. Magliocco, Fairfield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 27, 1992, Ser. No. 923,765
Int. Cl.[5] C07C *125/04*
U.S. Cl. 560—137 11 Claims

1. A process for the production of a alkoxy or aryloxy isothiocyanate which comprises contacting a haloformate having the formula



wherein R is an alkyl radical, an alkene radical, or an aryl radical and X is a halogen, with an alkali or alkaline earth metal thiocyanate under an appropriate rate of addition of haloformate such as to prevent a run-away reaction, in the presence of water,

(i) from about 0.1% to about 10.0% by weight, based on the weight of haloformate, of a catalyst comprising a six membered mononuclear or ten membered fused polynuclear aromatic, heterocyclic compound having 1 or 2 nitrogen atoms as the only hetero atoms in the ring; and

(ii) from about 0.1% to about 15.0% by weight, based on the weight of thiocyanate of a co-catalyst comprising an alkali metal or alkaline earth metal salt of an acid having a pKa of about 10^{-3} or below,

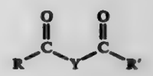
and at a temperature ranging from about −10° C. to about 40° C. for up to about 16 hours.

5,194,674
WATER-SOLUBLE ACTIVE METHYLENE AS FORMALDEHYDE SCAVENGER

Joseph A. Pacific, La Grange, Ga., assignor to West Point Pepperell, West Point, Ga.

Continuation of Ser. No. 186,304, May 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 53,606, May 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 52,846, May 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 71,032, Jul. 8, 1987, abandoned, which is a division of Ser. No. 902,750, Sep. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 188,643, May 2, 1988, abandoned, which is a continuation of Ser. No. 71,033, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 902,750, Sep. 2, 1986, abandoned. This application Jun. 7, 1991, Ser. No. 713,546
Int. Cl.[5] C07C *69/66*
U.S. Cl. 560—178 4 Claims

1. A composition for a formaldehyde scavenger consisting of a water-soluble active methylene compound of the formula



wherein R is —CH_3 or —H[O(CH_2)$_m$]$_n$—O—, and R' is —CH_3 or —H[O(CH_2)$_m$]$_n$—o— and m is 1–3, n is 1–19, Y is —CH_2 or —CH_2—CO—CH_2 with the proviso that when Y is —CH_2 and m is 2, n is not 1.

5,194,675
PREPARATION OF METHYL FORMATE

Klaus Joerg, Limburgerhof; Franz-Josef Mueller, Wachenheim; Matthias Irgang, Heidelberg; Laszlo Marosi, and Gerhard Borchert, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 606,324, Oct. 31, 1990, abandoned.
This application Jan. 9, 1992, Ser. No. 819,590
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1989, 3926854
Int. Cl.[5] C07C *67/00*
U.S. Cl. 560—239 4 Claims

1. A process for the preparation of methyl formate by dehydrogenating methanol over a copper-containing catalyst at elevated temperatures and in the gas phase, wherein the catalyst used contains from 30 to 80% by weight of copper, calculated as CuO, as well as from 20 to 70% by weight of a magnesium silicate, calculated as MgO plus SiO_2, which has a molar ratio of MgO/SiO_2 of from 0.3 to 1.5, and may additionally be doped with the metals zinc, chromium and/or barium, each in an amount of not more than 1.5% by weight, calculated as ZnO, Cr_2O_3 and BaO.

5,194,676
CATALYST AND PROCESS FOR THE SYNTHESIS OF SATURATED CARBOXYLIC ESTERS

Yves Castanet, Hem; Christophe Legrand, Mons en Baroeul; Andre Mortreux, and Francis Petit, Villeneuve D'Ascq, all of France, assignors to Atochem, Puteaux, France

Filed Mar. 26, 1991, Ser. No. 674,745
Claims priority, application France, Mar. 26, 1990, 90 03805
Int. Cl.[5] C07C *67/38*
U.S. Cl. 560—241 20 Claims

1. A process for the synthesis of saturated carboxylic esters comprising reacting alkyl formate and an olefin, in the presence of up to 10% by volume of carbon monoxide, at a temperature of 120° to 280° C., under a pressure of 1 to 3,000 bars, in the presence of a catalytic amount of a catalyst based on ruthenium coordinated by ligands selected from carbon monoxide, halogen atoms and amines, and in the presence of an amide as a solvent.

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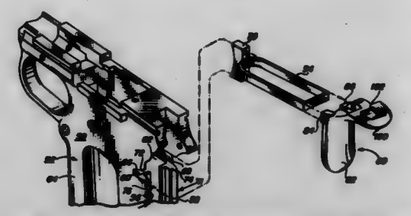
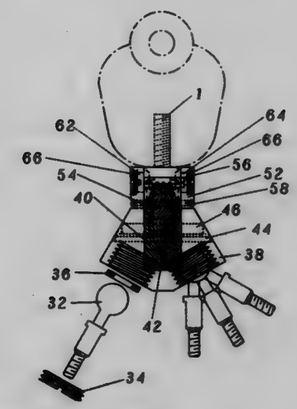
5,194,677
HANDGUN GRIP SAFETY
Wilfred C. Schuemann, 705 Wagner Dr., Carson City, Nev. 89703
Filed Jan. 7, 1992, Ser. No. 817,669
Int. Cl.[5] F41C *23/10*
U.S. Cl. 42—71.02 21 Claims



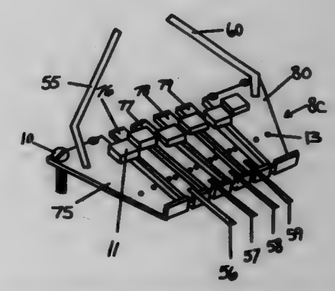
1. A grip safety for protecting the hand of a user of a semiautomatic handgun having a grip handle and a trigger bow extending from a trigger body, which trigger bow is slidably located within opposing facing slots disposed within the grip handle and extending to the posterior of the grip handle and defining slot openings disposed on opposed sides of a central opening at the rear of the grip handle, said grip safety comprising in combination:
a) a body for closing the central opening in the grip handle;
b) a first extension extending from one side of said body for penetrable mating with the slot opening disposed at the posterior end of one of the slots; and
c) a second extension extending from the other side of said body for penetrable mating with the slot opening disposed at the posterior end of the other of the slots.

5,194,678
FIREARM REST
Terry Kramer, 302 Lump Gulch, Clancy, Mont. 59634
Filed Jan. 27, 1992, Ser. No. 827,703
Int. Cl.[5] F41A *23/10, 35/00*
U.S. Cl. 42—94 17 Claims



13. A firearm rest comprising:
(a) two legs connected to a common leg junction means;
(b) said leg junction means coupled to a firearm mounting means, and;
(c) said firearm mounting means statically attachable to a firearm;
said leg junction means being so constructed and arranged with respect to said two legs and with respect to said firearm mounting means that a firearm attached to said firearm mounting means may be horizontally panned, vertically panned, and canted as a result of movement occurring within said leg junction means relative to said two legs whereby said firearm rest, when attached to a firearm and having said legs placed on a supporting surface, said firearm has the ability to concurrently rotate about an axis extending from the center of the earth to said firearm mounting means, rotate about an axis that is parallel to the longitudinal axis of the firearm and rotate about an axis that is perpendicular to both the longitudinal axis of the firearm as well as the axis extending from the center of the earth to said firearm mounting means, as a result of relative movement of said leg junction means with respect to said two legs.

5,194,679
MULTIPLE GUITAR TREMELO METHOD AND APPARATUS
Ian G. Cohen, 247 Pinehurst Ave., Los Gatos, Calif. 95032
Filed Aug. 6, 1991, Ser. No. 741,095
Int. Cl.[5] G10D *3/12*
U.S. Cl. 84—313 2 Claims

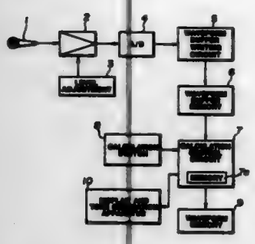


1. A tremelo system for use on a stringed instrument having a body portion and a neck portion with the strings thereon connected between a bridge affixed to the body portion and thumbscrews at a distal end of the neck, said system comprising:
anchor means mounted to the body portion of said stringed instrument;
at least three tremelo base plate means each tiltably associated with separate portions of said anchor means;
resilient connection means between each of said tremelo base plates and the body of said stringed instrument for separately maintaining each tremelo base plate in a fixed position with relation to the body of the stringed instrument except when the individual tremelo base plate is activated;
bridge means for receiving at least one string mounted on each of said base plates;
a separate tremelo activation lever associated with each of said tremelo base plates;
nut means mounted on the distal end of the neck of said stringed instrument between said thumbscrews and the said bridge;
first string restraining means for adjustably clamping the strings to each of said bridge means;
second string retaining means for adjustably clamping the strings to said nut means; and
joiner means for selective rigid connection of at least two of said tremelo base plates having at least one other tremelo base plate therebetween so that the joined tremelo base plates function as a single tremelo unit when activated by any one of their activation levers.

5,194,680
STRINGED INSTRUMENT PLECTRUM
Robert W. Reinsch, 10651 Johnson St., NE., Blaine, Minn. 55434
Filed Sep. 17, 1991, Ser. No. 761,415
Int. Cl.[5] G10D 3/16
U.S. Cl. 84—320 4 Claims

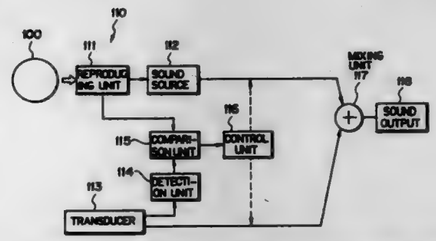
1. A plectrum for stringed instruments, comprising:
a generally planar upper surface and an opposed, generally planar lower surface oriented generally parallel to said upper surface, said surfaces defining a tip portion and a gripping portion; and
a peripheral edge extending between said upper and lower surfaces,
said peripheral edge presenting a gripping portion edge and a tip portion edge comprised of right and left tip portion edges, said right and left tip portion edges presenting right and left, generally linear margins, said right and left linear margins intersecting to present a plectrum tip apex, and each of said right and left tip portion edges presenting a generally planar upper bevelled surface and a generally planar lower bevelled surface extending from said upper surface and said lower surface respectively and intersecting along said right and left linear margins respectively, said plectrum tip portion being rounded along said tip apex to present a radiused transverse tip margin, the radius of said transverse tip margin being not more than about 0.05 mm and not less than about 0.01 mm.

5,194,681
MUSICAL TONE GENERATING APPARATUS
Masaki Kudo, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Sep. 20, 1990, Ser. No. 585,381
Claims priority, application Japan, Sep. 22, 1989, 1-247665; Oct. 4, 1989, 1-259734
Int. Cl.[5] G10H 7/12
U.S. Cl. 84—603 9 Claims



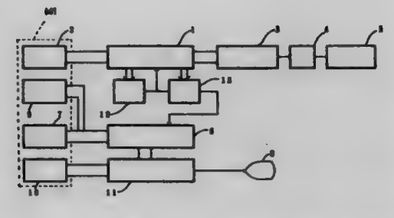
3. A musical tone generating apparatus comprising:
storing means for storing sample values of at least one musical tone waveform successively corresponding to a plurality of integer addresses;
command generating means for generating commands;
reading means for reading out said sample values successively from said storing means until a first predetermined address is reached, the reading means then successively reading out said sample values beginning from a second predetermined address in response to said commands; and
determining means for determining said first and second predetermined addresses, wherein said determining means determines said first and second predetermined addresses including a fractional part as at least one of said first predetermined address and said second predetermined address in order to connect a waveform before the first predetermined address with a waveform after the second predetermined address, wherein the first predetermined address represents a loop end position and the second predetermined address represents a loop start position.

5,194,682
MUSICAL ACCOMPANIMENT PLAYING APPARATUS
Masahiro Okamura; Masahiro Sato; Naoto Inaba; Yoshiyuki Akiba, and Toshiki Nakai, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 25, 1991, Ser. No. 797,542
Claims priority, application Japan, Nov. 29, 1990, 2-332838
Int. Cl.[5] G10H 1/08, 1/36, 1/46
U.S. Cl. 84—625 44 Claims



1. A musical accompaniment playing apparatus comprising:
musical accompaniment information reproducing means for reproducing MIDI sound source control information from a musical accompaniment information recording medium on which the MIDI sound source control information for controlling MIDI sound source means to generate musical accompaniment information in conformity with a MIDI standard is recorded;
said MIDI sound source means for generating the musical accompaniment information by the MIDI sound source control information reproduced by said musical accompaniment information reproducing means;
an acoustoelectric transducer for transforming a voice sung by a singer to an electric signal to output it as voice information;
sound interval comparing means for comparing a sound interval of the voice information with a sound interval of the musical accompaniment information to output a comparison result signal;
sound volume control means for controlling a sound volume level of the musical accompaniment information in accordance with said comparison result signal;
mixing means for mixing the musical accompaniment information and the voice information to output it as mixed sound information, and
sound output means for transforming the mixed sound information to sound to output it.

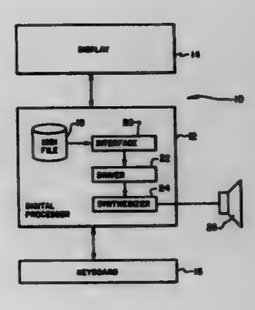
5,194,683
KARAOKE LYRIC POSITION DISPLAY DEVICE
Mihoji Tsumura, and Shinnosuke Taniguchi, both of Osaka, Japan, assignors to Ricos Co., Ltd., Japan
Filed Jan. 12, 1991, Ser. No. 714,279
Claims priority, application Japan, Jan. 1, 1991, 3-10019
Int. Cl.[5] G10H 7/00
U.S. Cl. 84—645 3 Claims



1. A karaoke lyric position display device of the type displaying lyrics in synchronization with the reproduction of music associated with the lyrics in response to composition data representing the music in MIDI format, control data representing tempo, blocks of lyric data and coordinate data indicating a display position of the lyric data and having predetermined values representing a page of lyric data, the karaoke lyric position display device comparing:
memory means for storing the composition data, the lyric data, the coordinate data and the control data;
first microprocessor means having a clock signal and connected to the memory means for reading the composition data from said memory means, said first microprocessor means including frequency divider means responsive to the clock signal and the control data for producing composition control signals, said first microprocessor means responding to the composition controls signals as interrupt signals for producing an output of the composition data as a function of the tempo;
MIDI sound source means responsive to the output of composition data by the first microprocessor means for converting the composition data into audio signals;
second microprocessor means connected to the memory means for reading the blocks of lyric data and the coordinate data, said second microprocessor means including frequency multiplier means responsive to the composition control signals for providing lyric control signals, said second microprocessor means responding to the lyric control signals as interrupt signals for generating outputs signals representing a current lyric position within a block of lyric data and said second microprocessor means executing a page feed of lyric data in response to the coordinate data exceeding the predetermined values; and
visual display means connected to the second microprocessor means for simultaneously displaying the blocks of lyric data and the current lyric position within a block of lyric data.

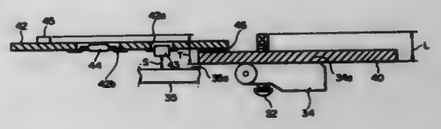
5,194,684
METHOD AND APPARATUS FOR SELECTIVE REDUCTION OF UPPER HARMONIC CONTENT IN DIGITAL SYNTHESIZER EXCITATION SIGNALS
Ronald J. Lisle, Cedar Park, and B. Scott McDonald, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 1, 1990, Ser. No. 608,105
Int. Cl.[5] G10H 7/00; H03K 4/08
U.S. Cl. 84—659 12 Claims

1. A conversion circuit for selectively reducing the upper harmonic content of a variable frequency sawtooth waveform, said conversion circuit comprising:
offset generation means for generating a variable selectable offset in response to said frequency of said variable frequency sawtooth waveform;
summation means for summing said variable selectable offset and a sawtooth waveform to create a resultant waveform;



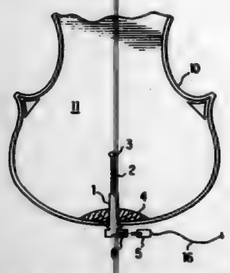
absolute value conversion means for taking the absolute value of said resultant waveform to create a converted resultant waveform; and
offset restoration means for restoring said converted resultant waveform to a zero offset waveform having less upper harmonic content than said sawtooth waveform.

5,194,685
KEYBOARD MUSICAL INSTRUMENT HAMMER MOVEMENT DETECTION APPARATUS
Kiyoshi Kawamura, and Shigeru Maramatsu, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Jun. 27, 1991, Ser. No. 722,001
Claims priority, application Japan, Jun. 28, 1990, 2-170591
Int. Cl.[5] G01H 1/34, 3/00; G10F 1/02
U.S. Cl. 84—670 13 Claims



1. A hammer movement detection apparatus for keyboard musical instruments comprising:
movement detection means for continuously detecting at least a displacement of a hammer shank which moves with a hammer of a keyboard musical instrument based on reflected light from said hammer shank; and
a fixed member which is attached to a shank rail which supports a hammer shank in a freely rotatable manner, the fixed member supporting the movement detection means above the hammer shank and below a pin board which is connected to a frame which supports strings which are struck by means of the hammer.

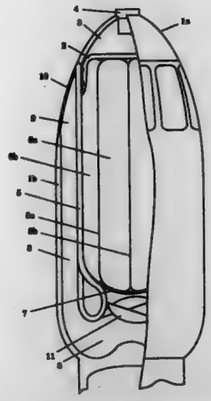
5,194,686
DEVICE FOR ELECTROACOUSTIC AMPLIFICATION OF A STRINGED INSTRUMENT WITH A TAILPIECE
Klaus Winkler, Trettnachstr. 6, D-8901 Stadtbergen, Fed. Rep. of Germany
PCT No. PCT/EP90/00875, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO90/15406, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 1, 1990, Ser. No. 777,247
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917912; Jun. 26, 1989, 3920865
Int. Cl.[5] C10H *3/00, 1/32*
U.S. Cl. 84—743 11 Claims



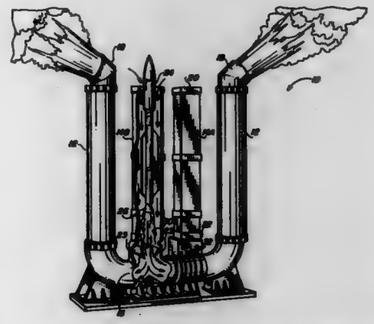
1. A device for electoracoustically amplifying a stringed instrument, comprising:
- a hollow tailpiece button;
- a mounting support; and
- a microphone for attachment to a stringed instrument by means of the mounting support, said microphone including lead wires to enable the connection of the microphone with an amplifier via lead wires that run through the hollow tailpiece button, said microphone operating as a sound pick-up device with respect to the stringed instrument;
- wherein the microphone is arranged to be supported by the hollow tailpiece button inside the body of the stringed instrument and is configured to be easily removed from the stringed instrument by the translation of the microphone through the hollow tailpiece button from the interior of the stringed instrument to the exterior of the stringed instrument.

5,194,687
MEANS OF DISABLING TACTICAL ARMORED VEHICLES
Moishe Garfinkle, P.O. Box 15855, Philadelphia, Pa. 19103
Filed Mar. 5, 1992, Ser. No. 846,020
Int. Cl.[5] F42B *13/00, 23/04*
U.S. Cl. 89—1.11 1 Claim

1. A warhead directed towards a preselected target comprising
- (a) a pyrotechnic gas generator to generate a gas,
- (b) a chamber separated from said pyrotechnic generator by a piston, said chamber containing polymeric components within which are suspended metallic flakes,
- (c) said polymeric components comprising either a one-component system maintained under pressure wherein the release of said pressure results in foam formation or a two-component system wherein the two components on contact react to form a foam, said one component system comprises a foaming component desolved in a volatile solvent under said pressure, the expulsion of said component from said chamber releasing said pressure; and said two-component system comprises components that on contact react to form a foam, said components contained within separate plastic film bags, the expulsion of said components from said chamber through a static mixer shreds said bags permitting said components to contact,
- (d) a proximity fusing device to ignite said pyrotechnic generator, said gas generated driving said piston into said chamber, expelling said foam-forming polymeric components from said chamber to passages wherein foam formation initiates, said foam thence passing from said passages to orifices to impinge upon said target, thereby blanketing a portion of said target with said foam, rendering said target ineffectual as a weapons system.

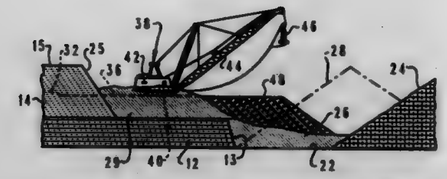


5,194,688
APPARATUS FOR LIMITING RECIRCULATION OF ROCKET EXHAUST GASES DURING MISSILE LAUNCH
Edward T. Plesik, Pomona, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.
Filed Jan. 31, 1992, Ser. No. 828,439
Int. Cl.[5] F41F *3/077*
U.S. Cl. 89—1.816 11 Claims



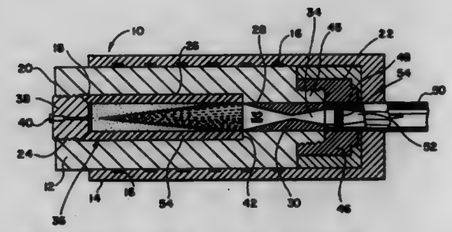
1. Apparatus for limiting recirculation of rocket exhaust gases from an associated plenum chamber into a missile canister through gaps in an aft closure of the canister situated radially outward of the missile rocket exhaust plume, the aft closure having a plurality of pivotable portions which are movable in response to impinging rocket exhaust gases, said apparatus comprising:
- a folded fan structure extending between adjacent pivotable portions of the aft closure and having at least one folded segment capable of unfolding to expand in extent as the aft closure portions pivot toward an open position, said fan structure extending across said gaps to block the openings therein.

5,194,689
EARTH EXCAVATION USING BLAST CASTING AND EXCAVATING APPARATUS
Monica S. Cummins, Gillette, Wyo., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Nov. 25, 1991, Ser. No. 797,603
Int. Cl.[5] F42D *3/00;* E21C *41/28*
U.S. Cl. 102—302 13 Claims



1. A method for removing overburden from a mineral seam in the earth comprising the steps of:
- determining a portion of said seam to a width to be uncovered;
- placing explosive charges in a portion of overburden above said portion of said seam and blast casting overburden above said portion of said seam to a place adjacent to said portion of said seam while leaving a key portion of overburden resting on said portion of said seam;
- providing an excavating apparatus;
- excavating overburden from above said portion of said seam and building an extended bench portion of said overburden generally above said place adjacent to said portion of said seam to form a support for said excavating apparatus;
- moving said excavating apparatus onto said extended bench portion; and
- excavating said overburden including said key portion of overburden to uncover said portion of said seam.

5,194,690
SHOCK COMPRESSION JET GUN
Michael J. Guthrie, Huntsville, Ala.; Thomas C. Powell, Tullahoma, Tenn., and Loren G. Mooney, Huntsville, Ala., assignors to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Feb. 21, 1990, Ser. No. 482,498
Int. Cl.[5] F42B *1/02, 3/08*
U.S. Cl. 102—440 19 Claims

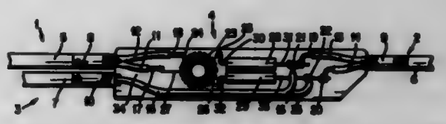


18. An explosive charge assembly, comprising:
- a casing having an open forward end and a hollow interior;
- an explosive charge positioned within the hollow interior of said casing, and said explosive charge having a recess formed therein;
- a membrane positioned at the forward end of said casing;
- a compressible medium adapted to dissociate upon detonation of said explosive charge assembly, said compressible medium including liquid ammonia and said compressible medium being positioned between said membrane and explosive charge and within the recess formed in said explosive charge.

5,194,691
GASKET AND CABINET FOR PROVIDING EMI/RFI SHIELDING
George McIlwraith, Stone Mountain, Ga., assignor to Gichner Systems Group, Inc., Dallastown, Pa.
Division of Ser. No. 434,323, Nov. 10, 1989, Pat. No. 5,020,866.
This application Nov. 9, 1990, Ser. No. 612,586
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 GC 20 Claims

1. A device for providing an EMI/RFI seal along a joint between a first surface and an abutting second surface, said device comprising:
- a compressible, resilient sealing member comprising a tubular sealing member having an interior and an exterior surface and an ear formed on said exterior surface of said tubular sealing member and disposed to engage said second surface;
- means for mounting said sealing member to said first surface;
- a conductive shielding element bonded to said exterior surface of said tubular sealing member on only one side of said ear;
- said sealing member being configured such that when said sealing member is mounted to said first surface, said sealing member directly contacts said second surface to seal said joint against the passage of moisture and debris through said joint; and
- said shielding element being configured such that when said sealing member is mounted to said first surface, said shielding element directly contacts said first surface and said second surface to shield against the passage of RF waves through said joint.

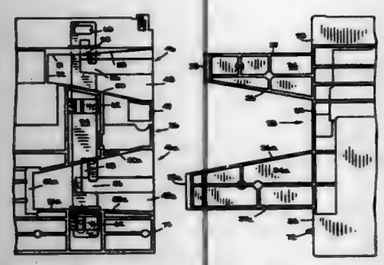
5,194,692
UNCASED DATA BUS COUPLER
David O. Gallusser, Oneonta, and James B. LeBaron, Sidney, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.
Continuation of Ser. No. 588,728, Sep. 27, 1990, abandoned. This application Jun. 12, 1992, Ser. No. 898,178
Int. Cl.[5] H01B *7/34;* H02G *15/18*
U.S. Cl. 174—36 18 Claims



1. An uncased cable coupling arrangement for electrically coupling at least two cables, comprising:
- at least two cables each including at least two wires coupled via at least one electrical component;
- a member of shrinkable material enclosing said at least one component and ends of said wires, said ends of said wires being electrically connected to said component; and
- an encapsulant surrounding said component and said ends of said wires and enclosed within said shrinkable material.

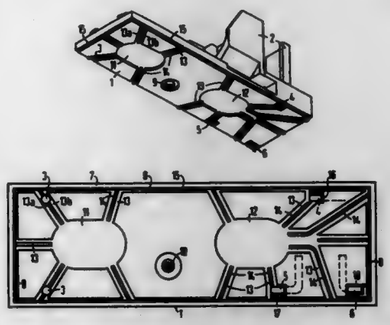
6. A method of assembling a data bus coupling, comprising the steps of:
(a) providing at least two cables, each including individual wires enclosed by shielding material;
(b) electrically connecting the wires together via at least one electrical component;
(c) enclosing the ends of the individual wires and said component within a shrinkable tubing material;
(d) filling the tubing material with a liquid encapsulant;
(e) shrinking the tubing material to cause the encapsulant to completely fill all voids within the tubing material; and
(f) curing the encapsulant to provide structural support, vibration and shock dampening, and electrical isolation of said at least one component.

5,194,693
MACHIEN MODULE CONNECTING MECHANISM
Joseph C. Brzozowski, Fairfield; Russell W. Holbrook, Middlebury; Valdimir V. Pirc, Norwalk, and Derek S. Scholefield, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Oct. 21, 1991, Ser. No. 779,776
Int. Cl.[5] H05K 5/02
U.S. Cl. 174—50 10 Claims



1. In a mailing machine having a pair of modules, each of said modules having means for performing discrete operations on mail pieces fed seriatim therethrough, said modules normally being connected together in abutting face to face relationship for forming an integral mailing machine for performing a series of operations of the mail pieces as they are fed through said modules sequentially, connecting means for connecting said modules together in locked relationship and for permitting said modules to be separated, said connecting means comprising:
A. means mounted on one of said modules adjacent the face thereof adapted to abut the corresponding face of the other module, said means projecting outwardly therefrom,
B. securing means mounted on said outwardly projecting means,
C. means mounted on said other module adjacent said corresponding face of said other module for receiving said outwardly projecting means of said one module in interfitting relationship therewith, and
D. locking means movably mounted on said other module between a locked position and an unlocked position for engaging said securing means in locking engagement therewith when said locking means is in said locked position and for releasing said securing means when said movable means is in said unlocked position,
whereby said modules are securely and rigidly connected together when said movable means is in said locked position but can be separated when said movable means is in said unlocked position.

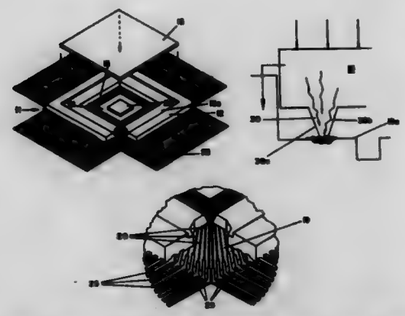
5,194,694
BASE TO A HOUSING FOR AN ELECTRICAL COMPONENT
Horst Hendel, Berlin; Herbert Mitschik, Geretsried, and Dietrich Schwarz, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jun. 10, 1991, Ser. No. 712,467
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1990, 9011111[U]
Int. Cl.[5] H05K 5/06; B32B 31/06
U.S. Cl. 174—52.3 15 Claims



1. A base for an electric component housing, comprising: a generally planar base member having sealing locations, an inside surface and
an outside surface; at least one filling reservoir adapted to receive a casting compound, said at
least one filling reservoir being formed in said outside surface of said
base member; at least one distribution channel leading from said at least one filling reservoir to
at least one of said sealing locations, said at least one distribution
channel including side walls and a channel floor; a distribution rib proceeding along said at least one distribution channel
substantially in a center of said at least one distribution channel, said
distribution rib being substantially parallel to said side walls of said at
least one distribution channel; and a sharp inside edge defined by said channel floor and one of said distribution rib and said side walls.

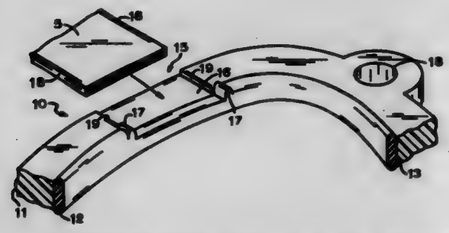
5,194,695
THERMOPLASTIC SEMICONDUCTOR PACKAGE
William H. Maslakow, Lewisville, Tex., assignor to AK Technology, Inc., Dallas, Tex.
Filed Nov. 2, 1990, Ser. No. 609,163
Int. Cl.[5] H01L 23/02, 21/60; B32B 31/16
U.S. Cl. 174—52.4 12 Claims

1. A semiconductor package comprising
a thermoplastic body having an open cavity formed therein,
a lead frame having a die pad mounted in the cavity,
a die mounted on the die pad of the lead frame,
connecting means connecting the die to the lead frame,
a thermoplastic lid attached to the body and covering the cavity,
integral energy directing ridge means comprising a ridge mounted on the lid for directing ultrasonic energy when it is applied to the lid to melt a contact area between the lid and the body when the lid is being ultrasonically welded to the body, and



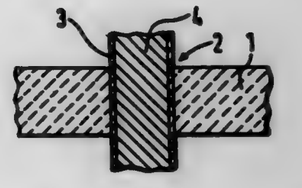
a flash chamber in the body positioned near the ridges for collecting any flash material produced when the contact area is melted.

5,194,696
GASKET FOR SEALING A FLAT CABLE
John D. Read, Monument, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Sep. 27, 1991, Ser. No. 766,941
Int. Cl.[5] H02G 3/02, 3/08
U.S. Cl. 174—65 R 7 Claims



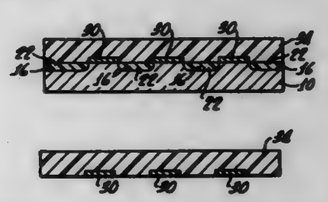
1. A compressible gasket adapted to be used with a flat wiring cable, wherein the width of a flat surface of said cable is substantially greater than the thickness of said cable comprising:
a relief formed on one surface of said gasket for receiving said cable, said relief including a groove and a first ridge at a first end of said groove, and a second ridge formed at a second end of said groove;
said groove having a depth essentially the same as said thickness of said cable, a width slightly larger than said width of said cable to form a void between an edge of said cable and said end of said groove; and
said first and said second ridge each having a cross-sectional area sufficient to fill said void formed between said end of said groove and said edge of said cable.

5,194,697
ELECTRICALLY CONDUCTIVE FEEDTHROUGH CONNECTION AND METHODS OF MANUFACTURING SAME
Frank Hegner, Maulburg, and Thomas Kilbe, Freiburg, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany
Filed Mar. 28, 1990, Ser. No. 496,460
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909186
Int. Cl.[5] H01B 17/26
U.S. Cl. 174—151 4 Claims



1. An electrically conductive feedthrough connection comprising:
an insulating member formed to include an aperture extending therethrough, the insulating member having a coefficient of thermal expansion; and
a terminal lead covered with an active solder and soldered into the aperture, the terminal lead having a coefficient of thermal expansion less than the coefficient of thermal expansion of the insulating member, and the active solder having a coefficient of thermal expansion greater than the coefficient of thermal expansion of the insulating member.

5,194,698
APPARATUS AND METHOD USING A PERMANENT MANDREL FOR MANUFACTURE OF ELECTRICAL CIRCUITRY
Mark A. Souto, Huntington Beach, and Christopher M. Schreiber, Newport Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Sep. 11, 1990, Ser. No. 580,748
Int. Cl.[5] H05K 1/00
U.S. Cl. 174—250 21 Claims



1. A method of additively forming electrical circuitry without employing circuit etching processes, said method comprising the steps of:
providing a mandrel having an electrically conductive pattern on a surface thereof defining configuration of an electrical circuit,
wherein said step of providing a mandrel comprises forming a pattern of grooves on a conductive mandrel substrate having a working surface, and filling said grooves with a nonconductive material having a surface coplanar with said working surface,
electrodepositing circuit components on said pattern to define an electrically conductive circuit configured in said pattern,

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laminating a dielectric substrate upon said mandrel and circuit components, and

separating said substrate and circuit components from said mandrel to provide a dielectric substrate having a pattern of circuit components thereon.

5,194,699

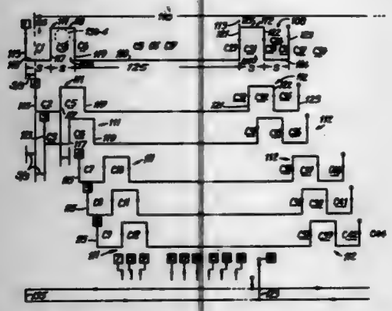
DIGITIZER TABLET WITH FIXED INCREMENTED GRID PORTIONS

Thomas C. Zalenski, Prospect, Conn., assignor to Summagraphics Corporation, Seymour, Conn.

Continuation-in-part of Ser. No. 503,537, Apr. 3, 1990, Pat. No. 4,996,393, and Ser. No. 612,530, Nov. 13, 1990, Pat. No. 5,306,833. This application Feb. 1, 1991, Ser. No. 649,435

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—19 **29 Claims**



1. A digitizer tablet having a conductor array under an active tablet area and a pointing device, the combination when energized with the pointing device over the conductor array generating electrical signals representative of the pointing device location over the array with respect to at least one tablet coordinate,

said conductor array comprising a plurality of individual elongated conductors capable of selective excitation or selective signal detection, each conductor comprising a plurality of sections each including at least three active parallel conductor portions, spaced from one another and distributed under the active tablet area,

means serially interconnecting the active parallel conductor portions of each conductor such that the current flowing in any one of the parallel conductor portions is the same as in any other parallel conductor portion, and

means selectively connectable to each conductor such that excitation or induced currents flow simultaneously in all its parallel portions.

5,194,700

LOUVER STRUCTURE WITH MOVABLE SLATS FOR A LOUDSPEAKER BOX

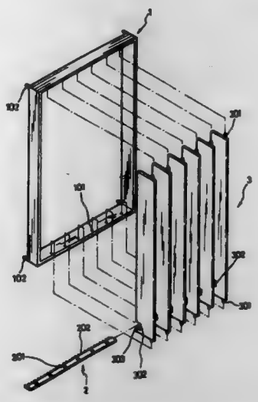
Jen-Hung Lin, No. 69, Ta Tung Rd, San shan Jen, Taipei Hsien, Taiwan

Filed Sep. 19, 1991, Ser. No. 762,890

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—155 **3 Claims**

1. A loudspeaker cabinet having a front face through which sounds are broadcast; an annular frame secured to the cabinet front face, said frame having two opposed spaced-apart louver support walls and two connector walls extending therebetween; each louver support wall having a plurality of round holes spaced therealong; a plural number of louvers extending between said louver support walls; each louver having end edges thereof located in near proximity to the associated support walls, and pivot pins extending from said louver end edges into said round holes, whereby said louvers are pivotably mounted within said annular frame; each louver having a front edge facing away from the loudspeaker cabinet, and a rear edge presented toward the cabinet; each louver having a cut out in its rear edge, the cut outs in said louvers being aligned to form a free space extending transversely through the louvers;



a stud located within each cut out; and a louver coupling arm having openings spaced therealong; said louver coupling arm being located within the free space defined by the cut outs, with the openings in said arm fitting on the studs so that the arm forms a connecting link between the louvers.

5,194,701

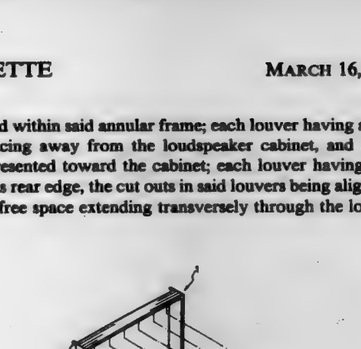
SPEAKER STRUCTURE

Teppi Yamada-Scriba, Tokyo, Japan, assignor to N.P.L. Ltd., Tokyo, Japan

Filed Sep. 11, 1991, Ser. No. 757,765

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—151 **7 Claims**



1. Speaker structure comprising:

a speaker unit;

a unit-support member of a relatively highly rigid material to which said speaker unit is fixed, said unit-support member being a plane baffle type, and having a reverse-T shape in lateral view; and

a sound-intercepting wall to shield resonant sound caused by the unit-support member, wherein said sound-intercepting wall is composed of a layer of sound-absorbent material which is applied at least to an outer surface of said unit-support member and a soundproof sheet of an acoustic energy-absorbent material which covers the layer of sound-absorbent material.

5,194,702

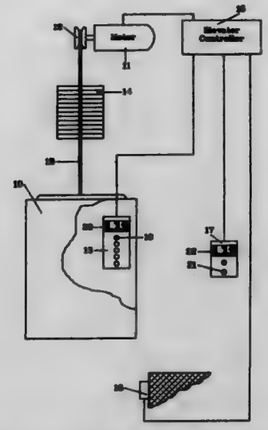
VERTICALLY SCROLLED ELEVATOR POSITION INDICATOR

Karl W. Swonger, Jr., 2806 Merrimac Blvd., Toledo, Ohio 43606

Filed Sep. 17, 1991, Ser. No. 761,273

Int. Cl.[5] B66B *3/00*

U.S. Cl. 187—139 **14 Claims**



1. A display for indicating the position of an elevator car which is vertically moveable in either an upward or downward direction between a plurality of stops, said display comprising:

means for storing a plurality of position indicating characters, each of said position indicating characters being unique and corresponding to a particular one of the plurality of stops;

screen means connected to said storage means and responsive to the position of the elevator car for displaying a selected one of said plurality of position indicating characters when the elevator car is located at a selected one of the plurality of stops, said selected position indicating character corresponding to said selected stop; and

control means connected to said storage means and said screen means, said control means responsive to movement of the elevator car from said selected one stop in an upward direction for vertically scrolling said selected one character in one direction on said screen means and responsive to movement of the elevator car in a downward direction for vertically scrolling said selected one character in an opposite direction on said screen means.

5,194,703

PUSH-BUTTON ARRANGEMENT

Reinhard Deeg, Kelters, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 17, 1990, Ser. No. 628,689

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1989, 3941712

Int. Cl.[5] H01H *9/22*

U.S. Cl. 200—5 A **7 Claims**

7. A push-button device comprising:

a plurality of keys;

an elastic switching pad having a plurality of domes, each dome being arranged adjacent to and being engageable by a respective one of said plurality of keys;

a dome contact disposed on each dome;

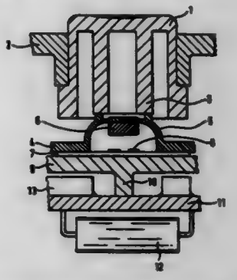
a conductor foil having a plurality of contacts arranged for being contacted by one of said dome contacts when one of said keys engages a respective dome;

a printed circuit board having opposite faces one of which is arranged near but spaced from said conductor foil;

a spacer means disposed between said one face of said printed circuit board and said conductor foil; and

electrical components disposed on at least said one face of said printed circuit board;

wherein said electrical components are disposed on each of said opposite faces of said printed circuit board;



wherein said spacer means comprises a lattice having a plurality of lattice nodes, each said lattice node being arranged adjacent one of the conductor foil contacts, and a spacer pin extending toward said one face is disposed on each said node;

wherein said printed circuit board and said conductor foil each comprises means defining openings therein, said lattice has opposite sides, and detent pins extending through and engaging with said openings are disposed on each said side; and

wherein said spacer means comprises a lattice and said electrical components extend therethrough.

5,194,704

MECHANICALLY OPERATING ELECTRICAL PULSE GENERATOR

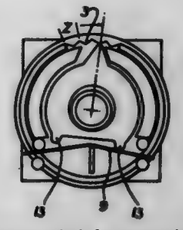
Dieter Michalski; Alfred Hoeh, and Hans-Georg Jost, all of Berlin, Fed. Rep. of Germany, assignors to Rudolf Schadow GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 000,528 filed as PCT/EP88/00528 on Jun. 14, 1988. This application Dec. 11, 1990, Ser. No. 626,081

Claims priority, application European Pat. Off., Jun. 14, 1988, EP88/00528

Int. Cl.[5] H01H *21/80*

U.S. Cl. 200—11 R **14 Claims**



11. A pulse generator switch for generating electrical pulses when coupled to a source of electrical energy in a response to the rotation of a rotary shaft, said generator switch comprising:

(a) a member concentrically disposed about said shaft;

(b) means for radially and tangentially deflecting said member in response to rotation of said shaft;

(c) a spring member for supporting said member in engagement with said shaft;

(d) first and second electrical contact means disposed adja-

cent an end of said spring member, said spring member contacting said first electrical contact mean when said member is in an at rest position and contacting said second electrical contact means when said member is radially and tangentially deflected by said deflecting means in response to rotation of said shaft in a first direction; and

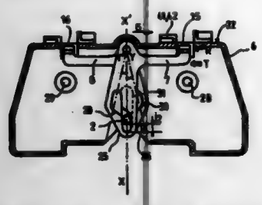
(e) a third contact means in contact with said spring member whereby ohmic contact is made alternatingly between said third contact means and said first and second contact means in response to rotation of said rotary shaft.

5,194,705

ADAPTATION DEVICE EFFECTING MECHANICAL COUPLING BETWEEN A CONTACTOR AND AUXILIARY SWITCHES HAVING DIFFERENT WORKING STROKES

Jean Cassuit, Orvaux, France, assignor to Telemecanique, France

Filed Nov. 29, 1990, Ser. No. 619,549
Claims priority, application France, Dec. 8, 1989, 89 17013
Int. Cl.[5] H01H *9/20*
U.S. Cl. 200—50 C 5 Claims



1. An adaptation device effecting mechanical coupling between a contactor having movable contacts and a first control member simultaneously displaced with said movable contacts, and a switching apparatus comprising a case housing a second control member, and auxiliary switches having movable contacts, said adaptation device further having a housing provided with fixing means so as to be removably fixed in a determined position on said contactor and enclosing a pivotable transmission lever, said lever having an arm provided with an S-shaped groove through which said control member of said contactor is projecting, and a claw projecting from said housing and coupled with the control member of said auxiliary switches, said groove comprising two non aligned endmost portions and an intermediate connecting portion, which forms a ramp on which, when displaced, said control element of the contactor is bearing so as to impart to said lever a rocking movement and hence a predetermined movement of said claw.

5,194,706

SHOCK SENSOR WITH A MAGNETICALLY OPERATED REED SWITCH

Daniel R. Reseau, Madison, Wis., assignor to Hamlin, Inc., Lake Mills, Wis.

Filed Aug. 14, 1991, Ser. No. 745,070
Int. Cl.[5] H01H *35/14*
U.S. Cl. 200—61.45 R 19 Claims

1. A shock sensor comprising

a) a housing;

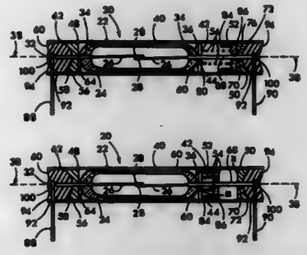
b) a reed switch having a glass capsule defining an axis with at least one reed disposed along the axis and the capsule having a first end and a second end, wherein the reed switch is mounted within the housing;

c) a first abutment fixed to the housing in proximity to the capsule first end and facing away from the capsule;

d) a second abutment spaced axially away from the capsule, and spaced from the first abutment;

e) a magnet slidably mounted within the housing between the first and second abutments;

f) a load-responsive means for biasing the magnet, said means being mounted between the first abutment and the magnet and adapted to bias the magnet away from the first end of the reed switch while the shock sensor is not subjected to a selected accelerative force; and to allow the magnet to approach the first end of the reed switch when the sensor is subjected to a selected accelerative force.

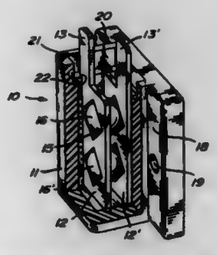


5,194,707

INERTIA SWITCH

Mark Wallach, Markham, Canada, assignor to Wallach Manufacturing Ltd., Markham, Canada

Filed Oct. 4, 1991, Ser. No. 770,914
Int. Cl.[5] H01H *35/14*
U.S. Cl. 200—61.45 R 9 Claims



1. A normally closed inertia switch for sensing shock or vibrations imparted to an object, said switch comprising housing means for retaining a pair of spaced-apart electrically-conductive contact plates, each plate having at least one cavity therein, said plates being held in fixed spaced parallel facial relationship to one another with said cavities facing and aligned with each other to constitute at least one opposed pair of cavities, a metal ball loosely captive between said at least one opposed pair of cavities, said ball when in a condition of rest establishing four conductive contact points, two with each of said plates to form a closed circuit between said plates, said cavities being dimensioned to define a space beyond said contact points to permit said ball to be displaced in one of said cavities sufficiently to move out of contact with the other of said cavities, and attachment means to secure said inertia switch with said plates having there planes upright and positioned at any angle along a 360° vertical plane.

5,194,708

TRANSVERSE ELECTRIC HEATER

Philip S. Carter, Jr., Palo Alto, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

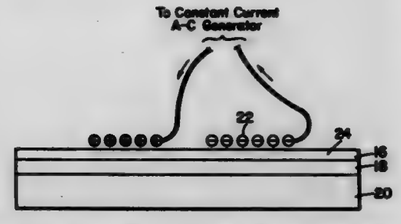
Filed Aug. 24, 1990, Ser. No. 571,787
Int. Cl.[5] H05B *6/12*
U.S. Cl. 219—10.493 20 Claims

1. A temperature self-regulating heater comprising

a layer of high permeability material,

a layer of non-magnetic, electrically conductive material,

a heat conductive dielectric disposed between and in contact with said layers,



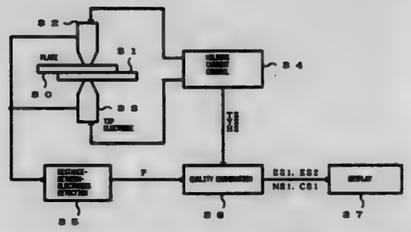
a coil for producing a varying magnetic field of sufficient intensity to heat said high permeability material to a temperature approaching its Curie temperature.

5,194,709

METHOD FOR CHECKING A SPOT WELDED PORTION AND SPOT WELDING MACHINE

Wataru Ichikawa, Tokyo; Yuji Matsuki, Sayama; Seiji Hirohashi, Tokyo; Masaru Ohara, Suzaka; Yasuyuki Mizutani, Suzaka; Yuji Taya, Suzaka; Toshiharu Nakagima, Yokkaichi, and Shingi Hoshino, Suzaka, all of Japan, assignors to Kabushiki Kaisha SG and Honda Motor Co., Ltd., both of Tokyo, Japan

Filed Oct. 3, 1991, Ser. No. 770,419
Claims priority, application Japan, Oct. 8, 1990, 2-270013; Oct. 8, 1990, 2-270014; Jun. 28, 1991, 3-185630
Int. Cl.[5] B23K *11/25*
U.S. Cl. 219—109 46 Claims



1. A method for checking the quality of spot welding performed for fixedly attaching at least two plates together by placing the plates on each other, holding the plates between two electrodes, and supplying power to the electrodes while applying pressure thereto, comprising the steps of:

(a) detecting a decrease in thickness of the plates at the spot welded portion thereof at a predetermined time period while application of pressure is still maintained and after termination of power supply;

(b) obtaining a value by integrating, during the predetermined time period, the thickness of the plates at the spot welded portion, the thickness changing during the predetermined time period; and

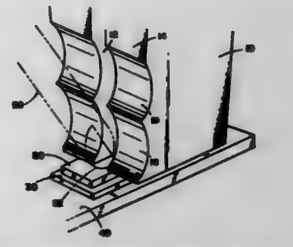
(c) examining the quality of a joint at the spot welded portion on the basis of an amount of detected decrease and the integrated value.

5,194,710

METHOD AND APPARATUS FOR LASER MASKING OF LEAD BONDING

Kent T. McDaniel, Eau Claire; David J. Johnson; Nicholas J. Krajewski, both of Chippewa Falls, and David W. LeMay, Eau Claire, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Filed May 22, 1991, Ser. No. 704,067
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.63 33 Claims



1. A masking tool for masking a substrate from energy directed at electrical conductors to bond the conductors to bonding surfaces located on the substrate, the masking tool comprising;

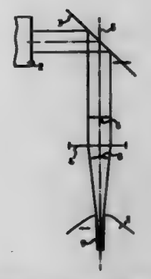
holding means for holding at least one electrical conductor stationary against a bonding surface, said holding means having an end adapted for holding at least one electrical conductor stationary against a bonding surface; and a slot formed through the masking tool, the slot originating from the holding means end, the slot also adapted to cooperate with the directed energy to allow a sufficient amount of the directed energy to reach the masked electrical conductor to bond it with the bonding surface while protecting the substrate from the directed energy.

5,194,711

CUTTING USING HIGH ENERGY RADIATION

Michael P. Gaukroger, Hampshire, England, assignor to Austalt Gersau, Vaduz, Liechtenstein

PCT No. PCT/GB89/00941, § 371 Date Apr. 10, 1991, § 102(e) Date Apr. 10, 1991, PCT Pub. No. WO90/01391, PCT Pub. Date Feb. 22, 1990
PCT Filed Aug. 15, 1989, Ser. No. 655,400
Claims priority, application United Kingdom, Aug. 15, 1988, 8819349; Aug. 15, 1988, 8819351
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.67 11 Claims



1. A method of making a cut using high energy radiation, wherein the incident radiation is focussed substantially on the base of the cut and the focus is altered as the cut deepens to keep the incident radiation focussed substantially on the base of the cut, wherein the axis of the incident radiation relative to

the cut is moved repeatedly from a position in which it is directed towards a first side of the cut and is inclined towards the other, second side of the cut to a position in which it is directed towards the second side of the cut and is inclined towards the first side of the cut, and back again.

5,194,712

CUTTING TOOL USING A DIAMOND WINDOW

Barbara L. Jones, 80 Chisbury Close, Forest Park, Bracknell, RG12 3TX, England

Filed Apr. 22, 1991, Ser. No. 689,199
Claims priority, application United Kingdom, Apr. 23, 1990, 9009059
Int. Cl.[5] B23K *26/16*
U.S. Cl. 219—121.67 16 Claims

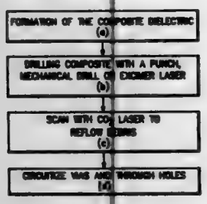
1. A cutting tool comprising a passage for a beam of light, a layer of single crystal diamond located in the passage to intercept light passing down the passage, the diamond layer presenting a surface for the incoming light and a surface for the outgoing light, and an anti-reflective coating bonded to at least one of the surfaces.

5,194,713

REMOVAL OF EXCIMER LASER DEBRIS USING CARBON DIOXIDE LASER

Frank D. Egitto; Cynthia J. Moring, both of Binghamton, and Daniel C. Van Hart, Conklin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1991, Ser. No. 777,057
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.71 2 Claims



1. A method of fabricating a microelectronic circuit package having a glass fiber reinforced perfluorocarbon polymer dielectric, comprising the steps of:

a. excimer laser drilling vias or through holes in the glass fiber reinforced perfluorocarbon polymer dielectric, said vias or through holes containing fibril debris;

b. carbon dioxide laser reflowing the fibril debris in the formed vias or through holes to smooth the walls thereof; and

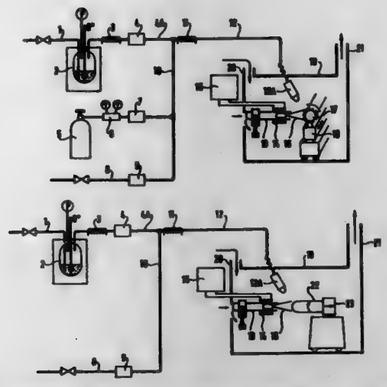
c. applying an electrically conductive material to the smoothed walls.

5,194,714

METHOD AND DEVICE FOR OUTSIDE PLASMA DEPOSITION OF HYDROXYL ION-FREE SILICA

Christian Le Sergent, Marcoussis, France, assignor to Compagnie Generale D'Electricite, Paris Cedex, France

Filed Jan. 5, 1990, Ser. No. 533,557
Claims priority, application France, Jan. 5, 1989, 89 07391
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.360 9 Claims



1. A method for plasma deposition of substantially hydroxyl ion-free silica onto the outer surface of a silica rod, comprising the steps of providing a sealed enclosure containing a rod, which sealed enclosure is separated from the surrounding atmosphere, reacting in the sealed chamber a silicon compound with oxygen in the presence of a plasma generated by induction with a high frequency generator to deposit silica onto the rod, wherein said enclosure is supplied with atmospheric air which has successively been subjected to filtering, compression and cooling, draining of condensation water and a final desiccation by adsorption.

5,194,715

PLASMA ARC TORCH USED IN UNDERWATER CUTTING

Wayne S. Severance, Jr., and David G. Anderson, both of Florence, S.C., assignors to ESAB Welding Products, Inc., Florence, S.C.

Filed Nov. 27, 1991, Ser. No. 799,369
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.48 36 Claims

1. A plasma arc torch used in underwater cutting comprising

a torch body having a front end of substantially cylindrical configuration,

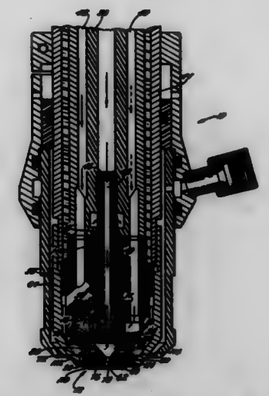
an electrode supported by the torch body and defining a longitudinal axis and a discharge end extending toward the front end,

a nozzle mounted on the front end of the torch body adjacent the front discharge end of the electrode, and having a bore through which plasma is ejected,

means mounted on the outer surface of the torch body and extending in spaced relation along the front end of the torch body to define an annular air chamber extending along the front end and forming an annular outlet opening positioned adjacent the nozzle and radially spaced outwardly from said bore, and

means for injecting a high velocity gas into the annular air

chamber in swirling relation downward along the front end of the torch body, through the outlet opening for



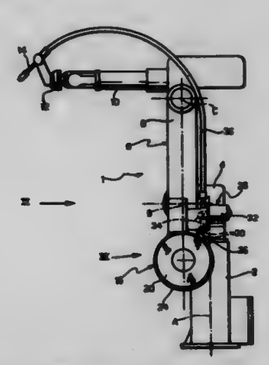
generating an evenly formed and swirling protective air curtain for the plasma during underwater torch operation.

5,194,716

ROBOTIC WELDING DEVICE WITH COUNTERWEIGHT

Domenico Appendino, Turin, Italy, assignor to Sepri SpA, Bologna, Italy

Filed Sep. 30, 1991, Ser. No. 767,710
Claims priority, application Italy, Sep. 28, 1990, 67734 A/90
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—137.2 4 Claims



1. Automatic welding equipment including:

a fixed support base,

a motor-driven articulated arm rotatable on the support base about a horizontal axis and having first and second ends,

a welding gun carried by the first end of the arm,

a counterweight carried by the second end of the arm on the opposite side of the axis of rotation from the first end, and

a device for supplying welding wire to the welding zone, including a structure for rotatably supporting a reel of welding wire, a drive unit for entraining the wire, and guide means for guiding the wire from the drive unit to the welding zone,

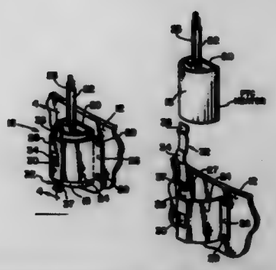
wherein the structure for carrying the reel is disposed offset from the horizontal axis and fixed at the second end of the arm so that, in use, the mass of the reel is fixed relative to the horizontal axis and constituted part of the overall mass of the counterweight.

5,194,717

BRACKET FOR MOUNTING A CRANKCASE HEATER

Russell A. Cowan, Brooklyn, Mich., and Herbert G. Stewart, Sylvania, Ohio, assignors to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 599,486, Oct. 18, 1990, abandoned.
This application Jan. 24, 1992, Ser. No. 905,071
Int. Cl.[5] B60L *1/02*
U.S. Cl. 219—208 17 Claims



1. The process of mounting a crankcase heater assembly to the housing of a compressor, comprising the steps of:

fastening a one-piece bracket to the compressor housing, said bracket and said housing forming an enclosed channel open on at least one end;

placing a spring clip, having at least one resilient end portion, through the open end of the enclosed channel formed by said bracket and housing; and

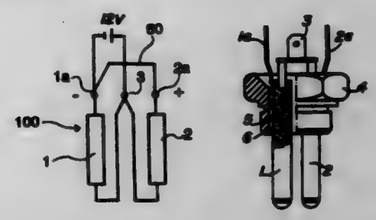
while holding said clip in said enclosed channel, sliding a heater through the open end of the enclosed channel in said bracket until held by said resilient end portion of said spring clip.

5,194,718

METHOD FOR CONNECTING A GLOW PLUG FOR OPERATION AT TWO DIFFERENT VOLTAGES

Peter Reiser, Esslingen; Herbert Langen, Altbach, and Peter Steiner, Esslingen, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 358,548, May 25, 1989, abandoned.
This application Jul. 24, 1990, Ser. No. 559,387
Claims priority, application Fed. Rep. of Germany, May 25, 1988, 3817723
Int. Cl.[5] F23Q *7/22*; H05B *3/48*; F02P *19/02*
U.S. Cl. 219—270 1 Claim



1. A method for connecting glow plugs for heaters which are selectively capable of being operable on electrical sources of two different voltages wherein the second voltage is twice that of the first, the method comprising the steps in the sequence of:

providing a glow plug structure with a base having a first side and an opposite second side, first and second heating rods projecting from said second side, first, second and third terminals projecting from said first side, said first heating rod having a resistance element with a first end

permanently electrically connected to said first terminal and a second end permanently electrically connected to said second terminal, said second heating rod having a resistance element substantially equal to said resistance element of said first heating rod, said resistance element of said second heating rod having a first end permanently electrically connected to said second terminal and a second end permanently electrically connected to said third terminal;

providing an electrical source having either the first lower or the second higher voltage, said higher voltage being twice that of said second voltage, and said electrical source having a pair of terminals;

determining the voltage of the source;

if the source is of the first lower voltage, then electrically connecting the first terminal of the glow plug to the first terminal of the electrical source, electrically connecting said second terminal of the glow plug to the second terminal of the electrical source and electrically connecting said first terminal of the glow plug to said third terminal of the glow plug externally, whereby the heating elements are connected parallel with each other;

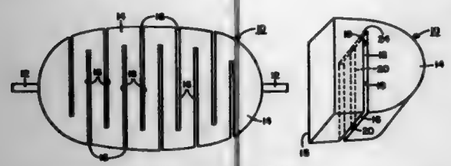
if the source is of the second higher voltage, then electrically connecting the first terminal of the glow plug to the first terminal of the source and electrically connecting said third terminal of the glow plug to the second terminal of the source whereby the heating elements being connected in series while leaving the second terminal of the plug unconnected.

5,194,719

STRENGTHENING AND MOUNTING SLOTTED METAL HONEYCOMB STRUCTURES

Gregory A. Merkel, Big Flats; Lawrence S. Rajnik, Corning; David F. Thompson, Painted Post, and David S. Weiss, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Apr. 13, 1992, Ser. No. 868,032
Int. Cl.[5] H05B *3/10*; F01N *3/10*; B01D *53/36*
U.S. Cl. 219—552 **18 Claims**



1. A honeycomb structure comprising:

a honeycomb body having a front face, a back face and a plurality of cells extending therethrough between said front face and said back face,

said honeycomb body having a plurality of slots formed therein between said front face and said back face and extending from at least one edge of said honeycomb body inwardly of said body and terminating inwardly of an opposite edge of the body, and

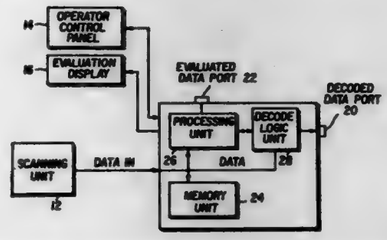
rod means positioned within at least one of said slots for strengthening said slotted honeycomb body by inhibiting the deformation of said slot due to thermal and mechanical stresses and for preventing such slot from flexing and closing.

5,194,720

METHOD AND APPARATUS FOR PERFORMING ON-LINE INTEGRATED DECODING AND EVALUATION OF BAR CODE DATA

Alan R. Reinnagel, Henrietta, and Lucas P. Curtis, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1991, Ser. No. 691,278
Int. Cl.[5] G06K *5/00, 7/10*
U.S. Cl. 235—437 **4 Claims**



1. A method of decoding and evaluating a bar code symbol comprising the steps of:

scanning the bar code symbol with a bar code scanning unit to generate digitized bar code symbol data;

supplying the digitized bar code symbol data to a decode logic unit;

decoding the digitized bar code symbol data with the decode logic unit;

generating an error signal when the digitized bar code symbol data cannot be decoded;

displaying an error message on a display unit in response to the generation of an error signal;

supplying the digitized bar code symbol data to an evaluation processing unit in response to the error message;

performing an evaluation routine on the digitized bar code symbol data with the evaluation processing unit to compare preselected parameters of the bar code symbol data to prespecified grading criteria in order to determine and grade the quality of the bar code symbol; and

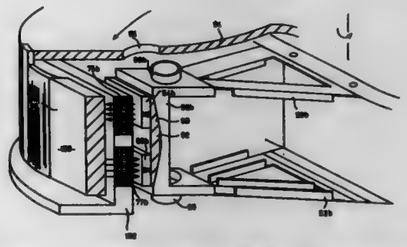
displaying the results of the evaluation routine on the display unit.

5,194,721

OPTICAL SCANNER

Ching Chu, Mississauga, Canada, assignor to Optical Recording Corporation, Toronto, Canada

Continuation-in-part of Ser. No. 440,695, Nov. 24, 1989, abandoned. This application Apr. 20, 1990, Ser. No. 512,185
Int. Cl.[5] G06K *7/00, 7/10*
U.S. Cl. 235—454 **28 Claims**



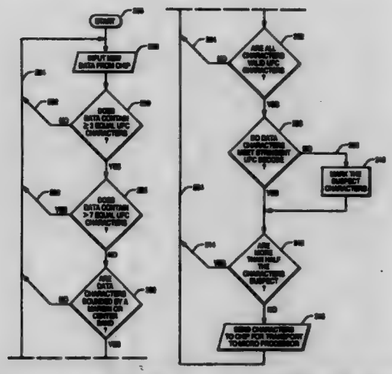
1. An optical scanner having a housing, a scanner assembly rotatable in said housing and having a mounting member carrying an optical element at a location spaced from the rotational axis of said assembly to cause said element to move in an arcuate path and scan a record, said mounting member being flexible to permit movement of said optical element in a direction parallel to the axis of rotation and electromagnetic drive means acting between said housing and said mounting member to control flexure thereof over at least a portion of the path of said element, said electromagnetic drive means comprising a coil including first and second portions each having a plurality of turns with the turns in the first of said portions being wound in an opposite direction to the turns in the second portion, said electromagnetic drive means further comprising a current supply connected to said coil and operable to produce an electromagnetic field by regulating current flowing in said coil and thereby control flexure of said mounting member, the direction of current flow in said first and second portions of said coil being opposite to one another so that the inductance of the coil is mitigated.

5,194,722

ENHANCED UPC BAR CODE DECODING SYSTEM RECONSTRUCTING COMPLETE BAR CODE SIGNALS FROM PARTIAL BAR CODE SCANS

Barry M. Mergenthaler, Cambridge, Ohio; Marlon Tapu, West Lebanon, N.H.; Denis M. Blanford, and Gene L. Amacher, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 517,910, May 2, 1990, abandoned. This application Jul. 24, 1992, Ser. No. 919,701
Int. Cl.[5] G06K *7/10, 7/01*
U.S. Cl. 235—463 **20 Claims**



1. A system for decoding a coded symbol having a plurality of consecutively positioned bars and spaces representing characters, wherein each of said characters consists of two bars and two spaces in which the total combined width of said bars and spaces equals seven equal-width modules, the symbol also having a center delimiting character and a margin delimiting character for delimiting numerical characters and for detecting the width of consecutive bars and spaces comprising:

means for scanning the coded symbol in any direction across the coded symbol in which each scan generates data representing a plurality of consecutive bars and spaces of the symbol comprising a minimum of three numerical characters and which includes one of said delimiting characters;

circuit means coupled to said scanning means for applying first predetermined relationships to said data to detect the width of consecutive bars and spaces for generating signals representing four consecutive characters of equal width in response to receiving the data representing each consecutive bar and space whenever the relationships are satisfied;

first means for applying second predetermined relationships to said signals to detect first and second limits, in modules, on the total width of a predetermined number of consecutive bars and spaces and third predetermined relationships to detect the number of modules for each bar-space combination, both the second and third predetermined relationships being applied for detecting valid characters, whose width meets the first and second limits and which contain a number of modules equal to +/— 33% of an integer for each bar-space combination, for detecting invalid characters whose width does not meet said first limit, and for detecting suspect characters whose width meets only the first limit;

memory means for storing and accumulating signals representing valid characters from a plurality of scans;

control means coupled to said memory means for detecting when the memory means is at a predetermined capacity for enabling said second means to retrieve the valid characters from said memory means; and

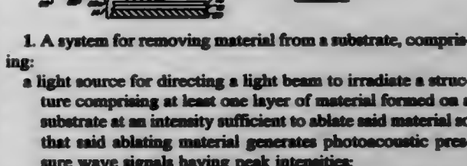
second means for applying fourth predetermined relationships to said accumulated valid characters for assembling the valid characters to represent a coded symbol whenever the first, second, and third predetermined relationships are satisfied, said second means being capable of assembling the characters of a coded symbol even when characters from one scan do not overlap the characters of another scan.

5,194,723

PHOTOACOUSTIC CONTROL OF A PULSED LIGHT MATERIAL REMOVAL PROCESS

Michael C. Cates, Solana Beach, and Richard R. Hamm, San Diego, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Dec. 24, 1991, Ser. No. 813,866
Int. Cl.[5] G01J *1/32*
U.S. Cl. 250—205 **33 Claims**



1. A system for removing material from a substrate, comprising:

a light source for directing a light beam to irradiate a structure comprising at least one layer of material formed on a substrate at an intensity sufficient to ablate said material so that said ablating material generates photoacoustic pressure wave signals having peak intensities;

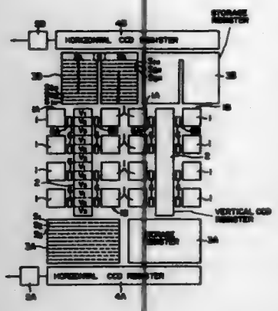
a fast pressure transducer positioned to detect said photoacoustic pressure wave signals and provide a first output signal corresponding to said photoacoustic pressure wave signals having peak intensities;

control means coupled to receive said first output from said fast pressure transducer for providing a speed control signal where said speed control signal is functionally related to said photoacoustic pressure wave signal peak intensities; and

means coupled to receive said speed control signal for conveying said light source and said fast pressure transducer along a predetermined path so that said light source irradiates said structure at a scan speed controlled by said speed control signal.

VOL 1148 ISS 3 MR 16 1993 UMI

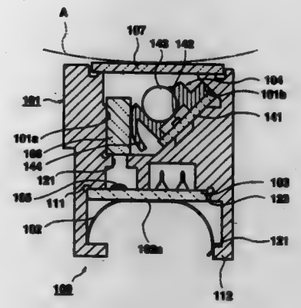
5,194,724
SOLID-STATE IMAGING DEVICE HAVING SIGNAL TRANSFERRING GROUPS FORMED OF A CCD REGISTER AND TWO PIXEL TRAINS
Hirokazu Sekine, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 15, 1992, Ser. No. 883,373
Claims priority, application Japan, May 17, 1991, 1-113108
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 7 Claims



1. A solid-state imaging device having a high resolution, comprising
a plurality of pixels disposed in rows and columns each converting optical signals into signal charges;
a vertical charge coupled device (CCD) register disposed between two pixel trains forming one group for transferring said signal charges;
first charge read-out means for reading out signal charges of each pixel disposed in one pixel train of said two pixel trains and for transferring the signal charges to said vertical CCD register;
second charge read-out means for reading out signal charges of each pixel disposed in another pixel train of said two pixel trains and for transferring the signal charges to said vertical CCD register;
charge storage means for separately storing signal charges which are separately transferred from respective pixel of each train of said two pixel trains through said vertical CCD register; and
a horizontal CCD register for transferring signal charges as one line unit, which are sequentially read out from said charge storage means in the order.

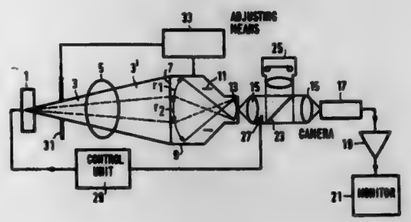
5,194,725
IMAGE SENSOR INCLUDING RESILIENT PRESSING MEANS FOR PRESSING A LIGHT RECEIVING SENSOR SUBSTRATE AGAINST AN IMAGE SENSOR FRAME
Kousuke Sawase, and Masaya Imamura, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan
Filed Jan. 15, 1992, Ser. No. 820,796
Claims priority, application Japan, Jan. 17, 1991, 3-016974
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 13 Claims

1. An image sensor comprising a light source for irradiating light onto an original to be read and a light receiving element for receiving the light reflected by said original, the pattern on said original being detected by detecting the light reflected from said original, said image sensor further comprising:
(1) a light receiving sensor substrate including a light receiving element for receiving the light reflected by said original;
(2) pressing menas including a resilient member; and
(3) a frame in which said light receiving sensor substrate and pressing means are mounted, said frame including
(a) first engaging portion for engaging said light receiving sensor substrate; and



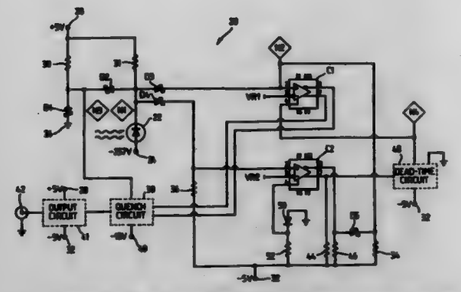
(b) second engaging portion engaged by said pressing means.

5,194,726
X-RAY IMAGING SYSTEM WITH OBSERVABLE IMAGE DURING CHANGE OF IMAGE SIZE
Rudi Jonkman, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Jun. 9, 1992, Ser. No. 898,765
Claims priority, application European Pat. Off., Jun. 17, 1991, 91201514.6
Int. Cl.[5] H01J *31/50*; H05G *1/64*
U.S. Cl. 250—214 VT 13 Claims



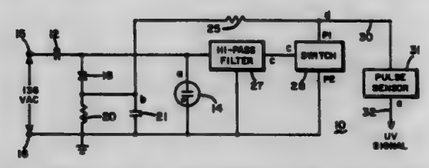
13. An X-ray device comprising an X-ray image intensifier tube (9), having an entrance screen (7) for detecting X-ray image and emitting electrons in response thereto, an exit screen (13), and an adjusting means (33) for adjusting the electron-optical system (11) so as to image surface portions (r_1, r_2) of different sizes of the entrance screen onto the exit screen, characterized in that the adjusting means (33) are arranged to image, when a setting of the image of a first surface portion is changed to a setting of an image of a second surface portion, at least a third surface portion, having a size between that of the dimensions of the first and the second suffface portions, onto the exit screen (13).

5,194,727
AVALANCHE PHOTODIODE QUENCHING CIRCUIT WTIH RESETTING MEANS HAVING A SECOND AMPLIFIER
Martin Johnson, and Robin Jones, both of Worcs, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
PCT No. PCT/GB90/01012, § 371 Date Feb. 20, 1992, § 102(e) Date Feb. 20, 1992, PCT Pub. No. WO91/00502, PCT Pub. Date Jan. 10, 1991
PCT Filed Jul. 2, 1990, Ser. No. 834,287
Claims priority, application United Kingdom, Jul. 3, 1989, 8915245
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 R 5 Claims



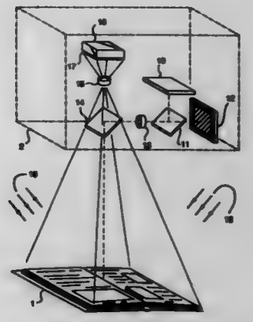
1. An avalanche photodiode quenching circuit including an avalanche photodiode (22) rechargeable through a ballast resistor (31), an avalanche detection amplifier (C1) having an input ($C1_2$) connected to receive a signal from the photodiode (22) and arranged to respond to a photodiode avalanche by activating quenching means (38), resetting means (C2, D5, 34, 46) arranged to reset the amplifier (C1) subsequent to avalanche detection, and means for introducing a circuit dead-time (48), characterised in that the resetting means (C2, D5, 34, 46) includes a second amplifier (C2) arranged to respond to photodiode bias voltage reduction caused by initiation of quenching.

5,194,728
CIRCUIT FOR DETECTING FIRING OF AN ULTRAVIOLET RADIATION DETECTOR TUBE
Scott M. Peterson, Eden Praire, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 5, 1991, Ser. No. 803,238
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 R 12 Claims



1. A UV tube driver circuit powered by an AC voltage source, for providing a UV signal varying with presence and absence of ultraviolet radiation impinging on a UV discharge tube having first and second terminals, said UV signal having a first predetermined form responsive to presence of ultraviolet radiation impinging on the UV tube and a second predetermined form responsive to absence of ultraviolet radiation impinging on the UV tube, comprising
a) a tube driver capacitor having a first terminal forming one connection for the AC voltage source, and a second terminal for connection to the first terminal of the UV tube;
b) a tube driver diode having a first terminal connected to the second terminal of the tube driver capacitor and a second terminal;
c) a tube driver resistor having a first terminal connected to the second terminal of the tube driver diode and a second terminal for connection to the second terminal of the UV tube and to the second terminal of the AC voltage source;
d) an output driver capacitor in parallel with the tube driver resistor;
e) a high pass filter having an input terminal connected to the tube driver capacitor's second terminal, a common terminal connected to the UV tube's second terminal, and an output terminal;
f) a switch element having a control terminal connected to the high pass filter's output terminal, a first power terminal, and a second power terminal connected to the UV tube's second terminal; and
g) an output driver resistor connecting the second terminal of the tube driver diode to the first power terminal of the switch element,
wherein when a UV tube having ultraviolet radiation impinging on it is connected between the second terminal of the tube driver capacitor and the second terminal of the AC voltage source and an AC voltage source of predetermined characteristics is connected to the AC power terminals, the UV signal with the first predetermined form is present at the first power terminal of the switch element.

5,194,729
DOCUMENT READING APPARATUS WITH AREA RECOGNIZING SENSOR AND OBSTACLE DETECTION
Noriyuki Okisu, Amagasaki; Shinya Matsuda, Kyoto, and Toshihiko Karasaki, Kawachinagano, all of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan
Filed Sep. 26, 1990, Ser. No. 588,651
Claims priority, application Japan, Sep. 29, 1989, 1-256095; Sep. 29, 1989, 1-256096; Sep. 29, 1989, 1-256097
Int. Cl.[5] G01V *9/04*; G06K *9/20*
U.S. Cl. 250—222.1 19 Claims



1. A reading apparatus comprising:
reading means for reading an original placed at a predetermined distance therefrom;
detecting means for detecting whether an obstacle enters into a reading area to be read by said reading means, the detecting means being inoperative except during a period of operation of the reading means; and
alarm means for providing an alarm in response to said detecting means.

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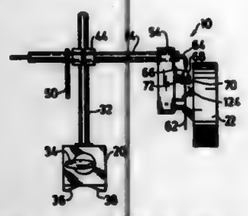
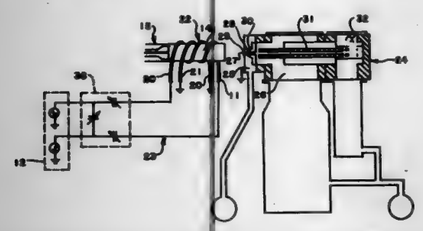
5,194,730
MOBILE ELECTRONIC LINEAL MEASUREMENT DEVICE WITH SWITCHABLE MAGNETIC MOUNT
Thomas J. Herberger, 7526 E. Tonawanda Creek Rd., Lockport, N.Y. 14094, and Mark A. Herberger, 18 Albert Ct., Depew, N.Y. 14043
Filed May 21, 1992, Ser. No. 887,160
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.13 18 Claims



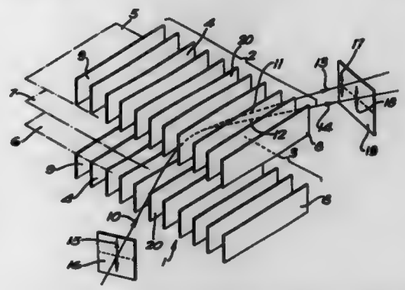
1. An apparatus for measuring the lineal movement of a product, wherein said apparatus is comprised of a wheel, means for moving said wheel in the X axis, means for moving said wheel in the Y axis, means for producing at least one electrical signal every time said wheel is rotated, a display unit, means for transmitting said electrical signal to said display unit, and mounting means for supporting said wheel, wherein:
(a) said mounting means is comprised of a support surface, switching means for making said support surface magnetic, and switching means for making said support surface nonmagnetic; and
(b) said apparatus is comprised of means for contacting said wheel with the surface of said product and maintaining said wheel in contact with said surface.

5,194,731
INDUCTIVELY COUPLED PLASMA SPECTROSCOPY
Ian L. Turner, Reservoir, Australia, assignor to Varian Associates, Inc., Palo Alto, Calif.
Filed Jul. 23, 1991, Ser. No. 734,852
Claims priority, application Australia, Jul. 24, 1990, PK1341
Int. Cl.[5] B01D *59/44*; H01J *49/00, 17/00*
U.S. Cl. 250—281 22 Claims



1. An induction coil assembly for use in an inductively coupled plasma spectrometer, including at least two helical coils which are relatively arranged so as to be in at least partial overlap, one end of each said coil being connectable to a high frequency energy source, and the other end of each said coil being connectable to ground.

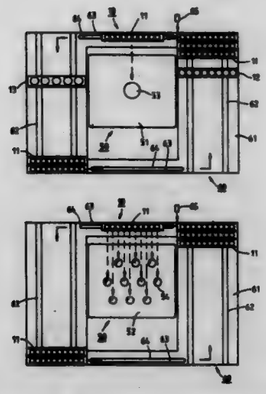
5,194,732
CHARGED-PARTICLE ENERGY ANALYZER AND MASS SPECTROMETER INCORPORATING IT
Robert H. Bateman, 15 Lynton Close, Knutsford, Cheshire WA16 8BH, England
PCT No. PCT/GB90/00845, § 371 Date Dec. 2, 1991, § 102(e) Date Dec. 2, 1991, PCT Pub. No. WO90/15434, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 1, 1990, Ser. No. 777,304
Claims priority, application United Kingdom, Jun. 1, 1989, 8912580
Int. Cl.[5] H01J *49/48, 49/32*
U.S. Cl. 250—294 21 Claims



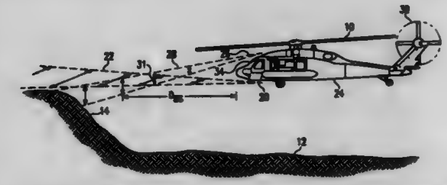
1. An electrostatic analyzer for dispersing a beam of charged particles according to their energy, said analyzer comprising an upper and a lower group of spaced apart linear electrodes respectively disposed above and below said beam, and means for applying electrical potentials to said electrodes, each said group comprising a pair of electrodes between which one or more central electrodes are disposed, the potential of one electrode of the pair being more positive and the potential of the other electrode of the pair being more negative than the potential at which ions comprised in said beam enter the analyzer, and the potentials of all the electrodes comprising each said group progressively increasing from one electrode to the next, thereby providing in a central plane between said groups of electrodes an electrostatic field which is capable of deflecting said charged particles along different curved trajectories according to their energies.

5,194,733
MULTIPURPOSE GAMMA COUNTER AND METHOD FOR SAMPLE HANDLING IN GAMMA MEASUREMENT
Juhani Aalto, Turku, Finland, assignor to Wallac OY, Turku, Finland
PCT No. PCT/FI90/00069, § 371 Date Sep. 23, 1991, § 102(e) Date Sep. 23, 1991, PCT Pub. No. WO90/11534, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 21, 1990, Ser. No. 761,941
Claims priority, application Finland, Mar. 22, 1989, 891350
Int. Cl.[5] G01T *7/08*
U.S. Cl. 250—328 10 Claims

1. A multipurpose gamma counter enabling measurement of one sample at a time or alternatively two or more samples at a time, the counter comprising a measuring unit and a grip unit for sample containers, at least one of the measuring unit and the grip unit of the sample containers being at least partly formed of replaceable modules so that one or more necessary modular units can be fitted on the gamma counter depending on the measuring method in use at each time.



5,194,734
APPARATUS AND METHOD FOR INDICATING A CONTOUR OF A SURFACE RELATIVE TO A VEHICLE
Thomas F. Whittaker, Colleyville, and Robert E. Wallace, Garland, both of Tex., assignors to Varo Inc., Garland, Tex.
Filed May 30, 1991, Ser. No. 707,853
Int. Cl.[5] G01C *7/04*
U.S. Cl. 250—338.1 23 Claims



1. Apparatus for indicating a contour of a surface relative to a vehicle, comprising:
a first electromagnetic radiation source operable to project a first beam creating a first reflection pattern on the surface, wherein said first reflection pattern has a first shape substantially elongated in a first direction relative to the vehicle;
a second electromagnetic radiation source operable to project a second beam creating a second reflection pattern on the surface, wherein said second reflection pattern has a second shape substantially elongated in a second direction relative to the vehicle; and
apparatus for coupling said first and second electromagnetic radiation sources to the vehicle, such that a movement of the vehicle results in a movement of said first and second reflection patterns on the surface in a manner indicative of the contour of the surface.

5,194,735
METHOD FOR EVALUATING SAMPLE ACTIVITIES IN A MULTIDETECTOR LIQUID SCINTILLATION COUNTER
Tapio Yrjönen, Turku, and Heikki Kouru, Raisio, both of Finland, assignors to Wallac Oy, Turku, Finland
Filed Sep. 9, 1991, Ser. No. 756,685
Int. Cl.[5] G01T *1/204*
U.S. Cl. 250—362 3 Claims

1. A method for evaluating activity of samples in a multidetector liquid scintillation counter, comprising the steps of:
providing a memory of the apparatus with a theoretical model between quench levels and counting efficiencies;
measuring at least one standard in each detector whereby a relationship between quench levels of the theoretical model and each detector is established;
storing said relationship between said theoretical model and each detector in the memory of said multidetector liquid scintillation counter;
measuring a quench level and a count rate of an unknown sample with any detector of the multidetector liquid scintillation counter;
converting the quench level of the unknown sample to correspond to the quench level of the theoretical model by using the relationship of the quench levels of the actual detector and the theoretical model;
using said converted quench level to read the corresponding counting efficiency of the theoretical model by using said relationship of the counting efficiencies and the quench levels in the theoretical model; and
dividing the measured count rate in the actual detector by the efficiency to obtain the activity of the sample.

5,194,736
X-RAY EXAMINATION APPARATUS INCLUDING A MATRIX OF SENSORS AND DEVICE MEASURING EXPOSURE OF GROUPS OF SENSORS DURING EXECUTION OF AN X-RAY EXPOSURE
Hendrik J. Meulenbrugge, Veldhoven, Netherlands; Ulrich Schiebel, and Hertfried Wieczorek, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.
Filed Nov. 7, 1991, Ser. No. 789,221
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1990, 4036163
Int. Cl.[5] G01T *1/02, 1/24*
U.S. Cl. 250—370.07 15 Claims

1. An X-ray examination apparatus, comprising a sensor matrix with sensors that are arranged in rows and columns, each sensor being connected between a read line and a counter-electrode and comprising an electric switch in series with a parallel combination of an X-ray sensitive photosensor element and a storage capacitance, means for selectively switching the switch of a sensor from a non-conductive state to a conductive state to complete a circuit path including the read line, the storage capacitance of the sensor, the counter-electrode and a D.C. source for a time interval after the execution of an X-ray exposure of said sensor matrix, said circuit path including read means connected to said read line for forming a first signal, responsive to a current flow in said read line during said time

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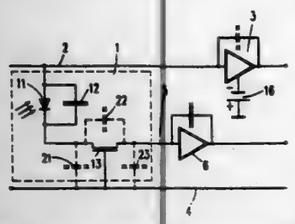
interval, indicating a change in a charge of the storage capacitance of the sensor after the execution of said X-ray exposure and an exposure measuring device coupled to one of the counter-electrode and the read line of a plurality of said sensors for

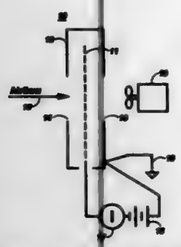


in response to current flowing in the one of the read line and the counter-electrode during the execution of said X-ray exposure forming a second signal comprising an exposure measurement of a plurality of said sensors.

5,194,737
SINGLE AND DOUBLE GRID LONG-RANGE ALPHA DETECTORS

Duncan W. MacArthur, Los Alamos, and Krag S. Allander, Ojo Caliente, both of N. Mex., assignors to University of California Patent, Trademark & Copyright Office, Alameda, Calif.

Filed Oct. 8, 1991, Ser. No. 773,002
Int. Cl.[5] G01T *1/18*; H01J *47/02*
U.S. Cl. 250—382 11 Claims

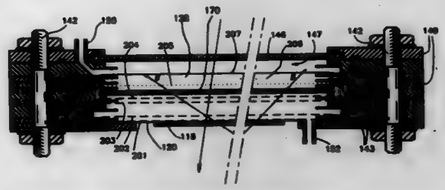


1. An alpha particle, detector that operates by detecting air ions created by collisions with alpha particles emitted from a distant alpha particle source comprising:
an electrically conductive enclosure defining first and second openings for admitting and exhausting air;
one electrically conductive grid insulatively mounted inside said enclosure;
means for generating a voltage in said one electrically conductive grid, creating an electric field between said one electrically conductive grid and said electrically conductive enclosure;
fan means mounted outside said enclosure adjacent to said second opening for drawing air containing said air ions through said first opening in said enclosure and across said electric field between said one electrically conductive grid and said electrically conductive enclosure; and
detecting means connected to said one electrically conductive grid for indicating a current through said one electrically conductive grid produced by said air ions.

5,194,738
APPARATUS FOR DIGITAL IMAGING

Amos Breskin, Rehovot; Rachel Chechik, Moshav Bet Hanan, and Ehud Dafni, Rehovot, all of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Jul. 3, 1991, Ser. No. 725,618
Claims priority, application Israel, Jul. 10, 1990, 95033
Int. Cl.[5] G01T *1/185*
U.S. Cl. 250—385.1 15 Claims

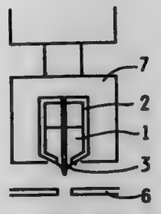


1. Apparatus for digital imaging comprising:
at least one electron multiplier arranged to receive beta radiation from a sample;
means for collimating the beta radiation without totally blocking all radiation from any location within a given region of interest on the sample and without requiring scanning; and
readout electrodes operative in response to electrons from the at least one electron multiplier to provide a first output indication of the incidence and location of beta radiation from the sample.

5,194,739
LIQUID METAL ION SOURCE

Keiji Sato; Yoshie Kitamura, and Hiroyuki Suzuki, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Mar. 20, 1992, Ser. No. 854,710
Claims priority, application Japan, Mar. 22, 1991, 3-58996
Int. Cl.[5] H01J *27/00*
U.S. Cl. 250—423 R 6 Claims



1. A liquid metal ion source comprising a reservoir, a liquid metal contained in the reservoir, and an emitter of a needle type immersed at least partly in the liquid metal within the reservoir and provided with a sharp tip end which protrudes from the reservoir, wherein said liquid metal is composed of cesium and oxygen.

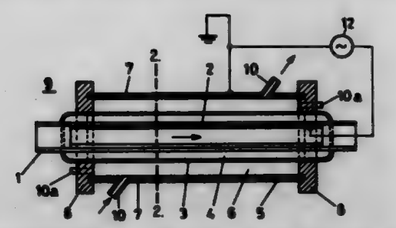
5,194,740
IRRADIATION DEVICE

Ulrich Kogelschatz, Hausen, and Christoph von Arx, Olten, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Mar. 30, 1992, Ser. No. 859,912
Claims priority, application European Pat. Off., Apr. 15, 1991, 91106025.9
Int. Cl.[5] G21K *5/08*; H01J *37/00*
U.S. Cl. 250—492.1 8 Claims

1. An irradiation device having at least one high-power

radiator with a discharge chamber filled with filling gas, the filling gas emitting radiation under the influence of quiet electrical discharges, the discharge chamber being bounded by walls of which at least one wall consists of dielectric material and is transparent to the radiation generated in the discharge chamber, a treatment chamber immediately adjoining one wall of the discharge chamber, having an electrode pair outside the

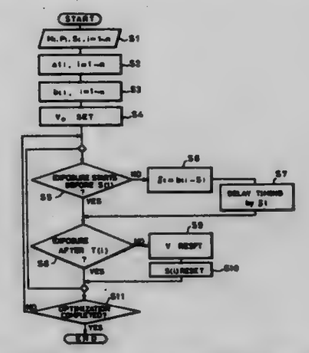


discharge chamber, and having an ac source, connected to the two electrodes, for feeding the discharge, the coupling of the electrical energy into the discharge chamber being performed essentially capacitively by the substance to be treated in the treatment chamber, wherein the treatment chamber is sealed on all sides by walls made from non-metallic material or from material coated completely with non-metallic material.

5,194,741
METHOD FOR WRITING A PATTERN ON AN OBJECT BY A FOCUSED ELECTRON BEAM WITH AN IMPROVED EFFICIENCY

Kiichi Sakamoto; Yoshihisa Ono; Junko Hatta, and Yasushi Takahashi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1992, Ser. No. 855,108
Claims priority, application Japan, Mar. 20, 1991, 3-57423
Int. Cl.[5] H01J *37/302*
U.S. Cl. 250—492.2 8 Claims

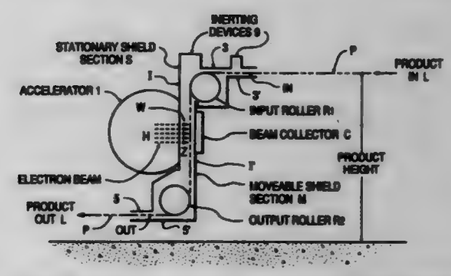


1. A method for writing a pattern on a surface of an object by a focused electron beam with a minimized distortion of the electron beam, comprising the steps of:
dividing the surface of the object into a plurality of parallel bands extending in a predetermined direction;
moving the object in a direction perpendicular to the extending direction of the bands, with a predetermined speed and from a first band to a last band of the plurality of parallel bands;
achieving an exposure of the device pattern, one band by one band, while moving the object in said direction with said predetermined speed;
said predetermined speed being optimized with respect to an exposure interval representing a time interval in which the exposure of each parallel band is possible, said exposure interval having a timing which is determined for each band and is shifted with time consecutively and in correspondence to said predetermined speed of the movement of the object, said predetermined speed being optimized such that each of the plurality of parallel bands, beginning from the first band and ending with the last band, can be exposed in said exposure interval and is determined by a critical timing pattern, said critical timing pattern representing the timing of the exposure of a critical band or the timing of the exposure of a succession of critical bands and extending from the beginning of the exposure interval to the end of the exposure interval without substantial interruption of the exposure, said critical band setting the highest possible limit of the moving speed of the object which still permits the completion of the exposure of all of the plurality of parallel bands; and
adjusting the timing of exposure of each parallel band in each exposure interval, said step of adjusting comprising the steps of:
(a) detecting said critical timing pattern;
(b) shifting the respective timing of exposure for each parallel band, starting from the band immediately before the critical timing pattern and proceeding in a direction to the first band, such that the respective timing of exposure of each parallel band is shifted toward the center of the corresponding exposure interval therefore, to the extent that the exposure of each parallel band does not overlap the exposure of the respective, next previous parallel band; and
(c) repeating said step (b) in consecutive sequence for each of the plurality of parallel bands until the respective timing of exposure of each parallel band reaches the center of the corresponding exposure interval.

5,194,742
METHOD OF AND APPARATUS FOR SHIELDING ELECTRON AND OTHER PARTICLE BEAM ACCELERATORS

Tzvi Avnery, Winchester, and Michael R. Fishel, Canton, both of Mass., assignors to Energy Sciences Inc., Wilmington, Mass.

Filed Jan. 21, 1992, Ser. No. 823,672
Int. Cl.[5] H01J *37/30*; G21F *7/00*
U.S. Cl. 250—492.3 17 Claims



1. In an electron beam accelerator having a substantially planar window through which electrons are passed in a first direction normal to the plane of the window to impinge upon a surface-to-be-irradiated moved in a zone past the window in a plane parallel thereto and extending in a second direction normal to the first direction, apparatus for shielding the zone having, in combination, a stationary half of a housing of shielding material of generally zig-zag cross-sectional configuration extending along a third direction orthogonal to both the first and second directions and having an intermediate substantially planar wall portion exposing the window to the zone and enveloping surface-moving inlet and outlet rolls on opposite sides of the window to move the surface through the zone

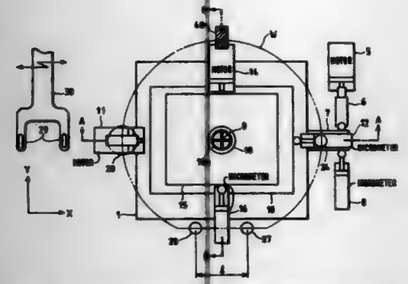
across the window in said plane; a second half of a housing of shielding material of generally mating zig-zag cross-sectional configuration closing off said zone with its intermediate substantially planar portion carrying a beam collector surface on the opposite side of said surface from the window and enclosing said rolls to provide staggered surface inlet and outlet passages, each extending substantially parallel to said first direction; and means for enabling sliding of the second housing half along said third direction to open the said zone while maintaining a constant zone separation distance in the first direction between the first and second housing halves, including with the surface in place, and to permit sliding back to zone-closing position to enable open access to said zone.

5,194,743

DEVICE FOR POSITIONING CIRCULAR SEMICONDUCTOR WAFERS

Masaaki Aoyama, Yokohama; Naomasa Shiraishi, Urawa; Ken Hattori, Hara; Atsushi Yamaguchi, Fujisawa, and Kenyoshi Amano, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 2, 1991, Ser. No. 679,251
Claims priority, application Japan, Apr. 6, 1990, 2-91448
Int. Cl.[5] G01N *21/86*; G01B *11/00*
U.S. Cl. 250—548 16 Claims



1. A device for positioning a circular substrate having a cut portion with respect to a rectangular coordinate system; comprising:

a first rotational stage capable of rotating substantially around the coordinate origin of said rectangular coordinate system;

an X-Y stage disposed on said first rotational stage and capable of two-dimensionally moving in said rectangular coordinate system;

a second rotational stage disposed on said X-Y stage and capable of rotating while holding said circular substrate;

a first detecting device for detecting information about a change in the quantity of displacement of the periphery of said circular substrate from the rotational center during the rotation of said second rotational stage;

first positioning controlling means for controlling the rotation of said second rotational stage in accordance with information detected by said first detecting device in such a manner that said cut portion of said circular substrate is placed in a predetermined direction on said rectangular coordinate system;

a second detecting device having at least three predetermined detecting points in said rectangular coordinate system so as to be capable of detecting at least three positions of said periphery of said circular substrate, said second detecting device generating information about a detection at each of said at least three detecting points; and

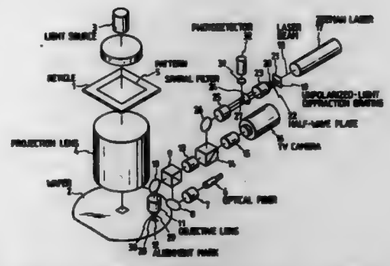
second positioning controlling means for controlling said X-Y stage and said first rotational stage in accordance with said detection information supplied from said second detecting device after said cut portion has been placed in said predetermined direction by said first positioning controlling means.

5,194,744

COMPACT RETICLE/WAFER ALIGNMENT SYSTEM

Shinichiro Aoki; Takeo Sato, both of Kawasaki; Masaki Yamamoto, Tokyo; Hiroyuki Takeuchi, Kawasaki; Nobuhiro Araki, Yokohama, and Yoshiyuki Sugiyama, Ayase, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 23, 1991, Ser. No. 704,406
Claims priority, application Japan, May 25, 1990, 2-135919
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 8 Claims



1. A system for alignment of a substrate, comprising:

(a) a common optical system portion for receiving light input thereto, for projecting the received light onto an alignment mark made up of a diffraction grating formed on the substrate, and for outputting light diffracted by the alignment mark;

(b) a first optical system portion for fine substrate alignment having:

a laser source for emitting a laser beam;

a first optical sub-system for receiving the laser beam from the laser source and outputting the received laser beam to the common optical system portion as a first input light thereto;

a second optical sub-system for receiving a laser beam diffracted by the alignment mark and outputted from the common optical system portion as a first output light thereof; and

a photoelectric detection portion for performing a photoelectric conversion of the laser beam outputted from the second optical sub-system;

(c) a position detecting portion for measuring the position of the substrate based on a signal outputted from the photoelectric detection portion; and

(d) a second optical system portion for coarse substrate alignment having:

a light source for emitting an illumination light to illuminate the alignment mark;

a third optical sub-system for transmitting the illumination light to the common optical system portion as a second input light thereto;

a fourth optical sub-system for receiving the illumination light from the alignment mark outputted from the common optical system portion as a second output light thereof to form an image of the alignment mark; and

a fifth optical sub-system having a camera for observing the image of the alignment mark; and

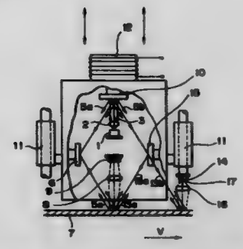
(e) an image processing portion for performing image processing of video signals outputted from the camera.

5,194,745

DOPPLER VELOCIMETER

Makoto Takamiya, Kawasaki; Yasuhiko Ishida, Tokyo; Hidejiro Kadowaki; Hiroshi Sugiyama, both of Yokohama; Ken Tsuchii, Tokyo, and Kosuke Yamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 702,386, May 20, 1991, abandoned.
This application Jun. 23, 1992, Ser. No. 905,147
Claims priority, application Japan, May 21, 1990, 2-130588; May 21, 1990, 2-130589; May 21, 1990, 2-130620
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 27 Claims



1. An apparatus for detecting velocity information of an object, including:

irradiating means for performing an irradiation of two beams substantially having coherency to almost same positions on the object;

photo-detection means, for detecting an interfering light from the irradiated positions by said irradiating means, thereby to obtain the velocity information of said object;

means for detecting a condition of the irradiation to detect positional deviating information between the two beams on said object; and

means for adjusting the condition of the irradiation to adjust the irradiating positions of said two beams on the object based on a detection result by said means for detecting the condition of the irradiation.

5,194,746

METHOD AND DEVICE FOR EXAMINING COMPONENTS WITH DATA DIGITIZED INTO A LARGE NUMBER OF GRAY LEVELS

Günther Coen, Gerresheimer Landstr. 167, 4000 Düsseldorf; Rudolf Kretschmer, Bebelstr. 33, 4200 Oberhausen; Friedhelm Niehues, Walder Str. 17, 4010 Hilden, and Roland Keck, Brend'amourstr. 78, 4000 Düsseldorf, all of Fed. Rep. of Germany

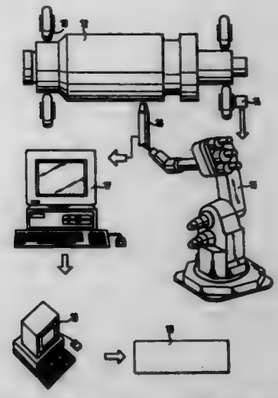
Continuation of Ser. No. 540,226, Jun. 19, 1990, abandoned.
This application Sep. 30, 1991, Ser. No. 767,561
Int. Cl.[5] G01N *21/88*
U.S. Cl. 250—563 19 Claims

1. A method of displaying an image corresponding to an original picture, said image comprising a plurality of pixels corresponding to image points in said original picture and a gray level value for each said pixel indicating intensity at the location in said original picture corresponding to the pixel, said method comprising

if each said gray level value of said original picture is not in digital form, but rather in analog form, digitizing each said analog gray level value according to a predetermined set of steps of gray level within a range of gray levels corresponding to brightness of said original picture, to have available in either case a corresponding digitized gray level signal value of a corresponding number of bits for each said pixel for further processing, each said digitized gray level signal value having more than eight bits in a binary representation, and

displaying said image of said pixels with said digitized gray level signal values in a data representation system in a manner allowing an observer to distinguish between different ones of said gray level signal values of respective pixels and to perceive the direction of change in said gray level signal values in said image, wherein said data representation system comprises a monochrome display for said displaying, said monochrome display being capable of simultaneously displaying a predetermined number of levels of gray that is less than the number of said gray levels of said digitization of the gray level signal values of said pixels of said image,

performing said displaying of said image over one display cycle, wherein:



at any one time said monochrome display distinguishably displays a limited number of said gray level signal values of said pixels of said image, namely those having their gray level signal values in a subrange within said range of said gray levels, said limited number of gray level signal values being simultaneously displayed corresponding to said predetermined number of gray levels that said monochrome monitor is capable of displaying;

at different times within said one display cycle different ones of said subranges of said gray level signal values of said pixels are distinguishably displayed; and

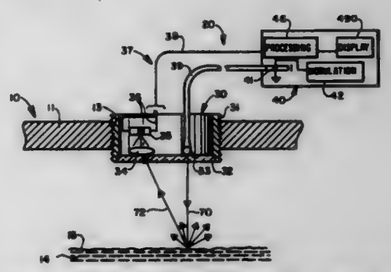
within said display cycle all of said pixels with all of said gray level signal values are distinguishably displayed.

5,194,747

LIQUID LEVEL GAUGE COMPARING MODULATION OF INCIDENT AND REFLECTED LASER BEAMS

William X. Culpepper, and Richard G. Fenner, both of Houston, Tex., assignors to Midland Manufacturing Corp., Skokie, Ill.

Filed Oct. 21, 1991, Ser. No. 779,951
Int. Cl.[5] G01N *15/06*; G01C *3/08*
U.S. Cl. 250—577 12 Claims



1. Apparatus for measuring the level of a light-reflective

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fluid boundary in a vessel relative to a reference level, wherein the vessel has an aperture in the top thereof, said apparatus comprising: an optical unit mountable in the top of the vessel at the reference level; a control unit remote from said optical unit; and transmission means interconnecting said control unit and said optical unit; said control unit including modulation means for generating an output signal containing incident modulation information, said modulation means being coupled to said transmission means for applying said output signal to said optical unit; said optical unit including a housing having a window therein, and means fixedly securing said housing to the top of the vessel with said window in alignment with the aperture; said optical unit further including transmitter means disposed in said housing and coupled to said transmission means and responsive to said output signal for directing to the fluid boundary an incident light beam containing said incident modulation information, and receiver means disposed in said housing for receiving from the fluid boundary reflections of said incident beam and producing an input signal containing reflected modulation information, said receiver means being coupled to said transmission means for applying said input signal to said control unit; said control unit including processing means coupled to said transmission means and to said modulation means for comparing the incident modulation information to the reflected modulation information to produce a level signal indicative of the distance between the reference level and the fluid boundary.

5,194,748

METHOD AND APPARATUS RELATING TO ION IMPLANTATION

Derek Aitken, Surbiton, England, assignor to Superion Limited, Surbiton, England

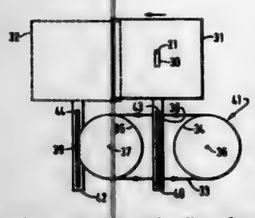
PCT No. PCT/GB90/01653, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO91/06972, PCT Pub. Date May 16, 1991

PCT Filed Oct. 26, 1990, Ser. No. 720,522

Claims priority, application United Kingdom, Oct. 27, 1989, 8924223

Int. Cl.[5] H01J *37/317*; G21K *5/10*

U.S. Cl. 250—442.11 18 Claims



5. Apparatus for presenting a plurality of targets to an ion beam comprising a plurality of supports each for supporting a target, and drive means for moving the target supports back and forth in reciprocatory motion through an ion beam target region in a sequence of movements such that the target supports are reversed in direction of movement while outside the target region, and such that at least part of the reversal of a target support takes place while another support or supports is or are passing through the target region.

5,194,749

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

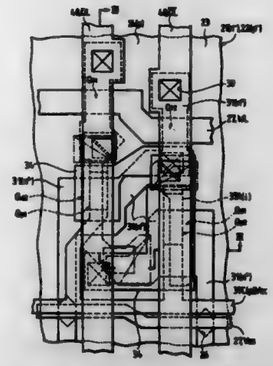
Satoshi Megaro, Hinode; Kiyofumi Uchibori, Hachioji; Norio Suzuki, Koganei; Makoto Motoyoshi, Hachioji; Atsuyoshi Koike, Kokubunji; Toshiaki Yamanaka, Houya; Yoshio Sakai, Shiroyama; Toru Kaga, Urawa; Naotaka Hashimoto; Takashi Hashimoto, both of Hachioji; Shigeru Honjou, Kodaira, and Osamu Minato, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 625,682, Dec. 12, 1990, abandoned, which is a continuation of Ser. No. 274,490, Nov. 22, 1988, abandoned. This application Feb. 19, 1992, Ser. No. 837,689

Claims priority, application Japan, Nov. 30, 1987, 62-305465; Dec. 23, 1987, 62-324094; Feb. 9, 1988, 63-26641

Int. Cl.[5] H01L *27/11*

U.S. Cl. 257—69 37 Claims



1. A semiconductor integrated circuit device comprising:

a semiconductor substrate;

a plurality of memory cells, each of which includes cross-coupled first and second inverter circuits and a pair of transfer MISFETs, each of said first and second inverter circuits having an n-channel drive MISFET and a p-channel load MISFET coupled in series, each drive MISFET comprising a first insulation film on said semiconductor substrate, a gate electrode on said first insulation film, and source and drain areas in said semiconductor substrate;

first conductive strips disposed over said semiconductor substrate, wherein a part of the first conductive strips serve as gate electrodes of the drive MISFETs;

a second insulation film disposed over said drive MISFETs and over said first conductive strips;

second conductive strips disposed on said second insulation film, wherein each second conductive strip serves as a gate electrode of a load MISFET and extends above the gate electrode of the drive MISFET, wherein the second conductive strip which serves as the gate electrode of the load MISFET of said first inverter circuit is electrically connected to the drain area of the drive MISFET of said second inverter circuit, and wherein the second conductive strip which serves as the gate electrode of the load MISFET of said second inverter circuit is electrically connected to the drain area of the drive MISFET of said first inverter circuit;

a third insulation film disposed on said second conductive strips and on said second insulation film; and

first semiconductor strips disposed on said third insulation film and extending over said second conductive strips, wherein each first semiconductor strip serves as source and drain areas and as a channel area of a load MISFET, and wherein said first semiconductor strips are electrically connected to the drain areas of said drive MISFETs.

5,194,750

HIGH PRECISION CCD MAGNETIC FIELD SENSOR

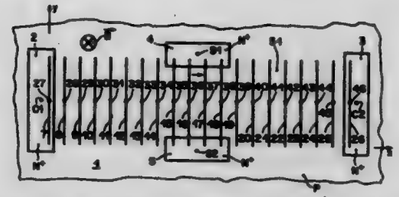
Radivoje Popovic, Zug, Switzerland, assignor to Landis & Gyr Betriebs AG, Zug, Switzerland

Filed Mar. 16, 1992, Ser. No. 851,633

Claims priority, application Switzerland, Apr. 11, 1991, 01086/91

Int. Cl.[5] H01L *29/78*; G11C *19/28*

U.S. Cl. 257—225 14 Claims



1. A magnetic field sensor, having a charge-coupled device formed in a semiconductor region, comprising:

first and second contact zones, comprising a semiconductor material of a first conductivity type, heavily doped with impurity atoms, located on an outer surface of said semiconductor region which has a second conductivity type, each contact zone having a respective sensor connection; and

an insulating layer, located on said outer surface of said semiconductor region, having passages for said sensor connections associated with said first and second contact zones;

wherein said charge-coupled device comprises a plurality of oblong gate electrodes located on said insulation layer, said gate electrodes being arranged perpendicularly to a direction of charge propagation through said charge-coupled device,

wherein one end of at least one centrally located gate electrode of said charge-coupled device at least partially overlaps said first contact zone and another end at least partially overlaps said second contact zone,

wherein one of said contact zones is centrally located,

wherein the other contact zone surrounds said centrally located contact zone,

wherein said gate electrodes are arranged between said contact zones perpendicularly to the boundary of said contact zone which surrounds said centrally located contact zone, and

wherein one end of each of said gate electrodes at least partially overlaps said first contact zone and another end at least partially overlaps said second contact zone.

5,194,751

STRUCTURE OF SOLID-STATE IMAGE SENSING DEVICES

Kazuya Yonemoto, Tokyo; Tetsuya Iizuka, Kanagawa; Kazushi Wada, Kanagawa; Koichi Harada, Kanagawa, and Michio Yamamura, Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 552,540, Jul. 16, 1990, abandoned. This application Jan. 27, 1992, Ser. No. 825,333

Claims priority, application Japan, Jul. 17, 1989, 1-185045; Jul. 20, 1989, 1-188558

Int. Cl.[5] H01L *29/78, 27/02, 27/14*

U.S. Cl. 257—229 11 Claims

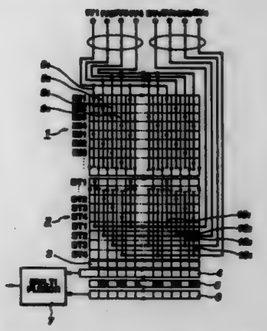
1. A solid-state frame interline type imager comprising:

(a) an image portion comprising a plurality of photo receiving elements arranged in a matrix form and a plurality of first vertical registers having first transfer electrodes for transferring in the vertical direction signal charges read out from the plurality of photo receiving elements;

(b) a storage portion comprising a plurality of second vertical registers having second transfer electrodes for temporarily storing the signal charges transferred from the image portion;

(c) at least one horizontal register having third transfer electrodes for transferring the signals charges from said storage portion in the horizontal direction;

(d) first shunt wirings formed independently on the first transfer electrodes in an orthogonal direction to said first transfer electrodes and connected to said first transfer electrodes through a plurality of first contact regions through which said first transfer electrodes are partially exposed and said first shunt wirings are connected to each



other so that first drive pulses are applied to the first transfer electrodes; and

(e) second shunt wirings provided separately from said first shunt wirings and formed independently on the second transfer electrodes in an orthogonal direction to said second transfer electrodes and connected to said second transfer electrodes through a plurality of second contact regions through which said second transfer electrodes are partially exposed and said second shunt wirings are connected to each other so that second drive pulses are applied to the second transfer electrodes.

5,194,752

SEMICONDUCTOR MEMORY DEVICE

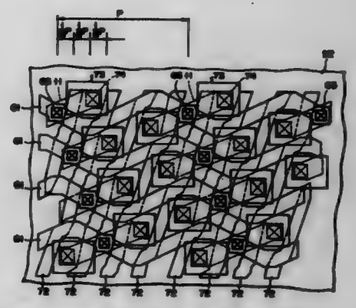
Jumpei Kumagai, and Shizuo Sawada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 527,377, May 23, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 813,049

Claims priority, application Japan, May 23, 1989, 1-129916

Int. Cl.[5] H01L *27/10, 23/48*

U.S. Cl. 257—390 39 Claims



1. A semiconductor memory device comprising:

a semiconductor substrate;

a plurality of bit lines arranged on said semiconductor substrate and extending generally in a first direction;

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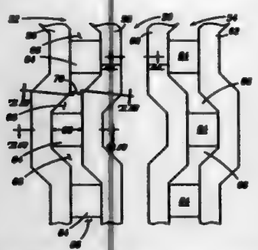
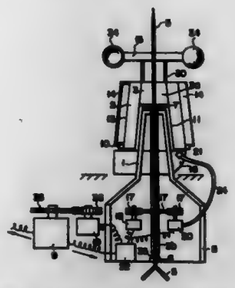
a plurality of word lines arranged on said semiconductor substrate and extending so as to intersect said bit lines;
a plurality of cell regions formed on said semiconductor substrate, each of said cell regions extending so as to be crossed by one of said bit lines and at least two adjacent word lines, and wherein each cell region on a portion of said substrate is respectively arranged to extend in a same direction; and
a plurality of memory cell pairs respectively formed in each of said cell regions, each of said memory cell pairs including first and second stacked capacitors having respective storage electrodes,
wherein each of said memory cell pairs includes a first contact coupled to said storage electrode of said first capacitor, a second contact coupled to the bit line crossing the associated cell region and a third contact coupled to said storage electrode of said second capacitor, said first and third contacts each being disposed at a region on said semiconductor substrate surrounded by two adjacent bit lines and two adjacent word lines, wherein successive of said second contacts of any one of said bit lines are separated by a predetermined pitch and the contacts of a first bit line are shifted by approximately $\frac{1}{n}$ pitch along said first direction from said contacts of a second adjacent bit line, and wherein n is a natural number greater than or equal to 2.

5,194,753
METHOD OF PREVENTING STORAGE NODE TO STORAGE NODE SHORTS IN FABRICATION OF MEMORY INTEGRATED CIRCUITRY HAVING STACKED CAPACITORS AND STACKED CAPACITOR MEMORY INTEGRATED CIRCUITS
Howard E. Rhodes, and Tyler A. Lowrey, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Division of Ser. No. 795,338, Nov. 19, 1991, Pat. No. 5,149,668. This application Mar. 11, 1992, Ser. No. 849,774
Int. Cl.[5] H01L *29/44, 29/78*
U.S. Cl. 257—775 18 Claims



1. Integrated circuitry formed according to a method comprising the following steps:
fabricating a semiconductor wafer to provide a pair of adjacent, substantially parallel and spaced word lines and to define regions for formation of stacked storage node capacitors and buried contacts therefor, the individual stacked capacitors overlapping the pair of adjacent word lines;
the pair of adjacent word lines including first separation regions therebetween within which storage node capacitors and respective buried contacts are provided, the pair of adjacent word lines including second separation regions therebetween, the first and second separation regions alternating relative to one another between and along the substantially parallel and separated word lines, the first separation regions having a first separation distance which defines the spacing between the pair of word lines in the first separation regions, the second separation regions having a second separation distance which defines the spacing between the pair of word lines in the second separation regions, the second separation distance being less than the first separation distance;
providing an insulating layer to a first selected thickness atop the wafer and between the pair of word lines, the first selected thickness being greater than one-half the second separation distance to fill the second separation regions between the pair of word lines with insulating material, the first selected thickness being less than one-half the first separation distance to provide a space within the first separation regions between the pair of word lines, the space having a width;
selectively removing portions of the insulating layer within the first separation regions to define buried contacts to underlying substrate;
depositing a layer of conductive material to a second selected thickness atop the wafer and within the space;
patterning the layer of conductive material to define lower storage node capacitor plates; and
providing a capacitor dielectric and upper storage node capacitor plates above the lower storage node capacitor plates.

5,194,754
HEIGHT DIFFERENCE TYPE AEROGENERATOR
Tatuya Mikami, 302 Crest-Suehiro, 2-13-20, Suehiro, Ichikawa-shi, Chiba-ken, Japan
Filed Oct. 16, 1991, Ser. No. 777,620
Claims priority, application Japan, Oct. 26, 1990, 2-287131; Aug. 12, 1991, 3-225292
Int. Cl.[5] F03D *5/00*
U.S. Cl. 290—55 6 Claims

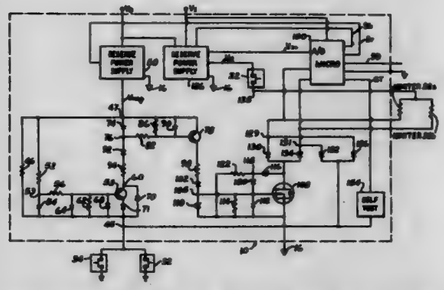


1. A height difference type aerogenerator comprising:
a structure;
a vertical rotary shaft having an axis and supported by said structure for rotation about said axis;
an electric power generating device directly or indirectly connected to said rotary shaft;
annular concentrically arranged floating chimneys rotatable together with said rotary shaft about said axis; and
blades fixed to each of said floating chimneys and extending radially of said rotary shaft for rotation with said chimneys and said shaft in response to wind rising within said chimneys.

5,194,755
AIRBAG TRIGGERING SYSTEM
Dennis W. Rhee, Bloomfield Hills; Colm P. Boran, Northville; David J. Banch, Dearborn, and Michael J. Lynch, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Mar. 4, 1991, Ser. No. 665,199
Int. Cl.[5] B60R *21/32*
U.S. Cl. 307—10.1 12 Claims

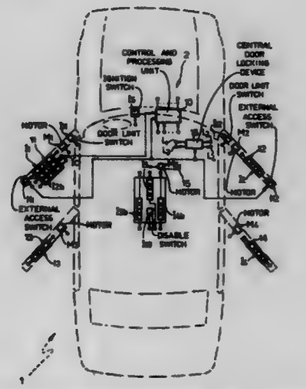
1. A triggering system responsive to a vehicular crash for actuating a safety device ignitor which is in a passenger compartment of the vehicle, comprising:

a plurality of first detection means each providing a first triggering on state in response to a deceleration force;
circuitry means responsive to each first triggering on states for providing a second triggering on state having a predetermined time duration;
at least one second detection means for providing at least one third triggering on state in response to said deceleration force; and



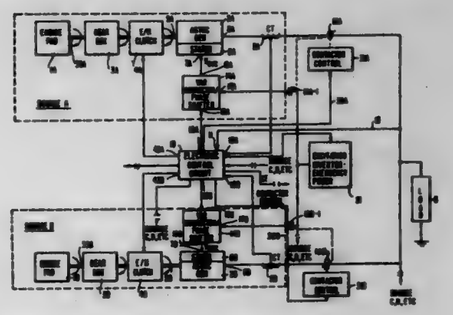
redundancy means for activating the safety device during a simultaneous occurrence of both said second triggering on state and any of said third triggering on states, said redundancy means also activating the safety device during a simultaneous occurrence of any of said first triggering ion states and any of said third triggering on states independently of said second triggering on state thereby providing a redundant actuation of the safety device ignitor.

5,194,756
VEHICLE PROVIDED WITH AN IMPROVED SYSTEM FOR CONTROLLING THE WINDOW AND SUNROOF MOVEMENT AND DOOR LOCKS
Luigi Darbesio, Orbassano, Italy, assignor to Fiat Auto S.p.A., Turin, Italy
Continuation of Ser. No. 433,570, Nov. 8, 1989, abandoned. This application Jun. 19, 1992, Ser. No. 902,408
Claims priority, application Italy, Nov. 11, 1988, 67994 A/88
Int. Cl.[5] B60R *25/00*
U.S. Cl. 307—10.2 10 Claims



1. A vehicle having doors provided with a control system comprising:
an ignition switch having on and off positions;
a plurality of operating elements, each of which is associated with a respective mobile closure element;
a central controller connected to said operating elements, said central controller being able to simultaneously control the movement of all said operating elements;
a central door locking command device for the centralized locking of the doors of said vehicle, said central door locking command device being operable from outside the vehicle and including first switch elements installed in the front doors of said vehicle, said first switch elements connected to said central door locking command device and to said central controller;
said central controller being provided with processing means for comparing the duration of operation of said first switch elements with a first predetermined time period, and for causing said mobile closure elements to close by means of said operating elements each time said duration of operation exceeds said first predetermined time period, if the ignition switch is not in the on position;
a plurality of second switch elements installed in the front doors of said vehicle, said second switch elements connected to said central controller;
said central controller being provided with processing means for comparing the duration of operation of each of said second switch elements with a second predetermined time period if the ignition switch is in the on position, and for causing at least a portion of said mobile closure elements to either
(a) automatically open or close if the duration of operation of one of the second switch elements fails to exceed the second predetermined time period, or
(b) open or close under manual control if the duration of operation of one of the second switch elements exceeds the second predetermined time period;
said central controller further controlling at least a portion of said mobile closure elements as they automatically open or close as each of the mobile closure elements continues to open or close until it reaches its end travel, unless an associated second switch element is actuated in a direction opposite to the then occurring movement of the mobile closure elements, wherein:
(a) the mobile closure elements stop movement at mid-travel if the duration of operation in the opposite direction of the associated second switch element fails to exceed a third predetermined time period; and
(b) the mobile closure elements reverse direction of movement if the duration of operation in the opposite direction of the associated second switch element exceeds said third predetermined time period.

5,194,757
UNINTERRUPTIBLE POWER SUPPLY
Max M. Wertheim, Huntington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Nov. 20, 1990, Ser. No. 616,269
Int. Cl.[5] H02J *3/38, 9/06*
U.S. Cl. 307—87 10 Claims



1. An uninterruptible power supply comprising

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n asynchronous generators, each having an input terminal, a stator, a shaft and an output terminal connected to a common electrical load, wherein n is a whole integer equal to at least two and wherein a change in load demand results in a change in the slip fraction of each of said generators;

n drive means, each driving a corresponding one of said generators, whereby when one of said generators is driven above synchronous speed by a slip fraction while its stator is electrically excited its shaft mechanical power is converted to electrical output power at its output terminal;

contact means connected between said load and each of said generators; and

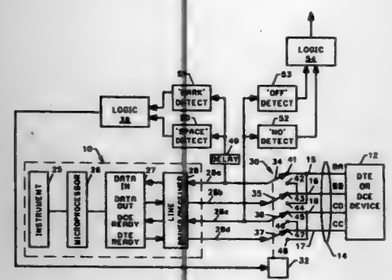
control means coupled to said load, coupled to said contact means for disconnecting failed one or more of said generators from said load and connected to the input terminals of said generators for providing an excitation voltage to each of said generators and controlling the phase of the excitation voltage of each of said generators with respect to the load voltage, said excitation voltage controlling the slip fraction of each of said generators whereby load current from any of said generators is completely controlled, said control means including electronic control means having a first input terminal connected to said load, n inputs each coupled to the output terminal of a corresponding one of said generators for sensing the output current of each of said generators and a first plurality of n output terminals, n VAR correctors/phase shifting means each having an output terminal connected to the input terminal of a corresponding one of said generators, a first input terminal connected to a corresponding one of said first plurality of output terminals of said electronic control means and a second input terminal and excitation inverter means providing an excitation voltage for each of said generators, said excitation inverter means being connected to the second input terminal of each of said VAR correctors/phase shifting means for controlling the relative phase of the excitation voltage of each of said generators, the output power of each of said generators having a voltage and frequency determined by parameters of said excitation inverter means.

5,194,758

AUTOMATIC SWITCHING CIRCUIT

James V. Ver Meer, 1700 Sylvan Cir., Brandon, S. Dak. 57005

Filed May 14, 1990, Ser. No. 522,643
Int. Cl.[5] H01H *9/00*
U.S. Cl. 307—112 7 Claims



1. An automatic switching system for use with an RS232 type interface between digital devices utilizing serial transmission of information via a plurality of data carrying signal lines connected between said devices comprising in combination

first means for sensing a negative voltage on one of said lines,

second means for sensing a positive voltage on said one of said lines,

switching means connected in said one and said another of said lines, and

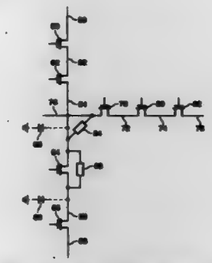
means responsive to said first and second means for enabling said switching means to reverse the connections of said data carrying signal lines to one of said devices.

5,194,759

METHODS FOR PREVENTING DISTURBANCE OF ANTIFUSES DURING PROGRAMMING

Khaled A. El-Ayat, Palo Alto; Kenneth D. Hayes, San Jose; Theodore M. Speers, San Leandro, and Gregory W. Bakker, Sunnyvale, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 525,763, May 18, 1990, abandoned.
This application Feb. 13, 1992, Ser. No. 835,221
Int. Cl.[5] H01H *37/76*; H03K *19/173*
U.S. Cl. 307—202.1 1 Claim



1. A method for minimizing disturbance to a first already programmed antifuse programmed at a programming voltage having a first magnitude developed between an ungrounded potential and a grounded potential caused by the subsequent programming of a second antifuse, including the steps of:

reducing the magnitude of said programming voltage to said second antifuse from said first magnitude to a second, lower magnitude when a condition exists that said first antifuse is electrically connected to a circuit node which will be at said ungrounded potential of said programming voltage to be applied during the programming of said second antifuse and further if said first antifuse is not in the path of programming current through said second antifuse;

applying said programming voltage of said second magnitude to said second antifuse;

increasing said programming voltage to said first magnitude when said second antifuse begins to draw current; and

applying a programming voltage having one of said first and said second magnitudes to said second antifuse when said condition does not exist.

5,194,760

SLEW RATE LIMITED INDUCTIVE LOAD DRIVER

Jeffrey J. Braun, Mesa, and Randall C. Gray, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Dec. 23, 1991, Ser. No. 812,444
Int. Cl.[5] H03K *4/08*, *6/04*
U.S. Cl. 307—263 9 Claims

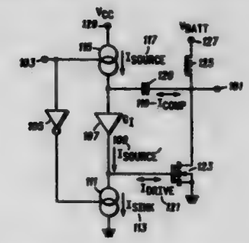
1. A slew rate limited driver for driving a load comprising:

a switch having a control input and an output, the output being coupled to the load and, responsive to the control input, for applying a voltage having transitions to the load;

a source of compensating current, responsive to the voltage applied to the load, for developing a compensating current in response to the transitions of the voltage applied to the load;

a current source, for supplying a turn on current; and

a current amplifier for summing and amplifying the compensating current and the turn on current, and for driving the control input of said switch to control the transitions of the voltage applied to the load.

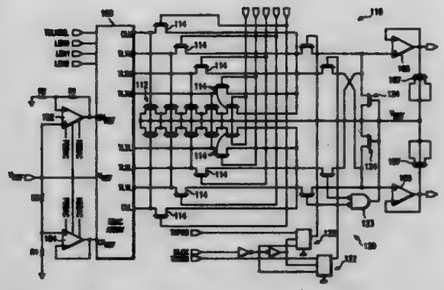


5,194,761

WAVESHAPING SUBSYSTEM USING CONVERTER AND DELAY LINES

Michael D. Smith, Lewisville, Tex., assignor to Dallas Semiconductor Corp., Dallas, Tex.

Continuation of Ser. No. 696,470, May 6, 1991, which is a continuation of Ser. No. 371,465, Jun. 26, 1989, Pat. No. 5,013,932. This application May 11, 1992, Ser. No. 882,742
Int. Cl.[5] H03L *7/00*; H03K *5/01*
U.S. Cl. 307—264 13 Claims



1. A waveform generator, comprising:

(a) a multiplexer with N level inputs, N control inputs, and a waveform output;

(b) a voltage level generator with N level outputs with the voltage at each of said level outputs differing from the voltages at the remainder of said level outputs and with each of said level outputs connected to one of said N level inputs;

(c) a plurality of timing pulse generators, each of said timing pulse generators with a plurality of output lines and generating a sequence of abutting-in-time pulses with successive pulses on differing ones of said output lines and with each of said output lines connected to one of said N control inputs;

(d) a timing pulse generator selection input and a start waveform input, where signal(s) at said selection input selecting one of said timing pulse generators, and a signal at said start waveform input activates said selected timing pulse generator;

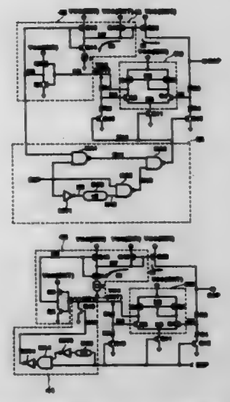
(e) whereby the voltage at said waveform output is a sequence of voltages from said N level outputs with duration as determined by said selected timing pulse generator.

5,194,762

MOS-TYPE CHARGING CIRCUIT

Takahiko Hara; Syuso Fujii, both of Kawasaki, and Shigeyoshi Watanabe, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 26, 1990, Ser. No. 498,622
Claims priority, application Japan, Mar. 30, 1989, 1-79406
Int. Cl.[5] H03K *3/01*, *3/26*, *17/687*; G05F *3/16*
U.S. Cl. 307—296.8 19 Claims



1. A MOS-type charging circuit including:

a MOS transistor having a source terminal, a drain terminal and a gate terminal, one of the source and drain terminals connected to a power supply for supplying a first potential and another one of the source and drain terminals connected to a load circuit,

a control circuit connected to said another terminal and the gate terminal of the MOS transistor and activated by an input of a control signal thereto for comparing a potential at said another terminal of said MOS transistor with a second potential which is lower than the first potential of said power supply, and said control circuit for allowing said MOS transistor to be conductive so as to effect a charging of the load circuit when the potential at said another terminal is lower than said second potential, and

a deactivating circuit for deactivating said control circuit when the potential at said another terminal of said MOS transistor becomes higher than said second potential even when the control signal is being input to said control circuit so as to allow to hold said MOS transistor to be non-conductive.

5,194,763

OUTPUT CIRCUIT HAVING LARGE CURRENT DRIVING CAPABILITY WITHOUT PRODUCING UNDESIRABLE VOLTAGE FLUCTUATIONS

Kenichi Suzuki, and Miwo Hagiwara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 4, 1990, Ser. No. 622,069
Claims priority, application Japan, Dec. 4, 1989, 1-319871
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 13 Claims

11. An output circuit comprising:

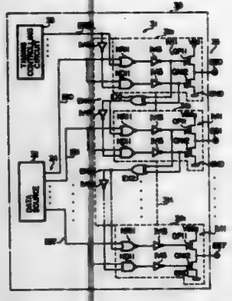
a) a plurality of output units respectively coupled between first output data signal lines and second output data signal lines and including first and second output units, each of said first and second output units having

a-1) a driving circuit operative to drive said associated second output data signal line by providing a current path between said associated second output data signal

line and one of first and second sources of voltage level, and

a-2) a controlling circuit responsive to an output data signal on said associated first output data signal line and allowing said driving circuit to drive said associated second output data signal line; and

b) a supervising circuit responsive to an output enable signal for causing said controlling circuit incorporated in said first output unit to allow said driving circuit incorporated



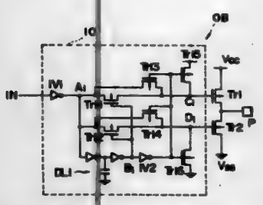
in said first output unit to drive said associated second output data signal line, said supervising circuit being further operative to cause said controlling circuit incorporated in said second output unit to allow said driving circuit incorporated in said second output unit to drive said associated second output data signal line after said controlling circuit incorporated in said first output unit allows said driving circuit incorporated in said first output unit to drive said associated second output data signal line.

5,194,764

DATA OUTPUT BUFFER CIRCUIT FOR SEMICONDUCTOR INTEGRATED CIRCUIT HAVING OUTPUT BUFFERS WITH DIFFERENT DELAYS

Junji Yano, Yokohama; Tsukasa Miyawaki, Fujisawa; Masami Atoh, Yokohama; Masakazu Gotou, Kawasaki; Masakazu Iwashita, Tokyo, and Michio Kaji, Machida, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1990, Ser. No. 627,058
Claims priority, application Japan, Dec. 14, 1989, 1-324754
Int. Cl.[5] H03K *19/094*
U.S. Cl. 307—443 8 Claims



1. A data output buffer circuit for a semiconductor integrated circuit having a plurality of output buffer circuits, each output buffer circuit comprising:

input means including an input terminal for receiving input data, and an input buffer stage coupled to said input terminal;

an output buffer having first and second switching means serially connected between two high and low power source terminals, each of said first and second switching means having a control terminal for turning on and off each of said first and second switching means upon reception of a control signal to said control terminal;

timing switch means connected between said input terminal and said output buffer and having a timing signal input terminal for receiving a timing signal for turning on said timing switch means;

a delay circuit connected between said timing switch means and said control terminals of said first and second switching means, for delaying said input data to said input terminal and transmitting said delayed input data to said control terminals of said first and second switching means, the delay time of said delay circuit of one of said output buffer circuits being different from the delay time of another of said output buffer circuits; and

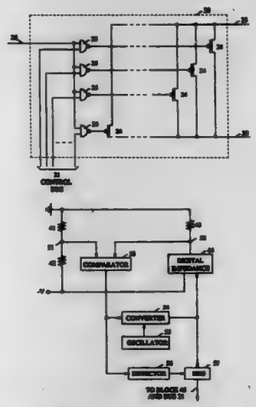
an output terminal connected to an interconnection between said first and second switching means.

5,194,765

DIGITALLY CONTROLLED ELEMENT SIZING

Alfred E. Dunlop, Murray Hill, N.J.; Thaddeus J. Gabara, North Whitehall Township, Lehigh County, Pa., and Scott C. Knauer, Mountainside, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1991, Ser. No. 724,560
Int. Cl.[5] H03K *1/02, 17/30*
U.S. Cl. 307—443 7 Claims



1. A circuit comprising:

a digitally controlled module constructed on an integrated circuit substrate having of a pair of terminals and a digital signals port for affecting the electrical characteristics of said module between said pair of terminals, and

a reference source connected between a first port of said circuit and a second port of said circuit;

a digitally controlled reference module connected between said second port of said circuit and a third terminal of said circuit;

a first element connected between said first port of said circuit and a balance terminal;

a second element connected between said third terminal of said circuit and said balance terminal; and

a comparator module connected between said balance terminal and said second port for developing digital signals for controlling said digitally controlled reference module and for developing the digital signals applied to said digital signals port;

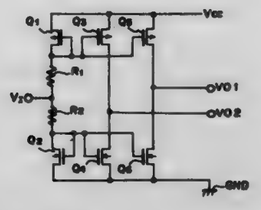
wherein said digitally controlled reference module is constructed on said integrated circuit substrate, and said reference source is constructed on other than said integrated circuit substrate.

5,194,766

MULTI-LEVEL LOGIC INPUT CIRCUIT

Mitsutoshi Sugawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 13, 1991, Ser. No. 791,243
Claims priority, application Japan, Nov. 14, 1990, 2-307692
Int. Cl.[5] H03K *19/00, 19/094*
U.S. Cl. 307—473 5 Claims



1. A multi-level logic input circuit comprising:

a first resistor whose one end is connected to an input terminal;

a second resistor whose one end is connected to said input terminal;

a first polarity current mirror circuit whose input is connected to the other end of said first resistor and which has an n number of first output nodes; and

a second polarity current mirror circuit whose input is connected to the other end of said second resistor and which has an n number of second output nodes in common with that of said first output nodes;

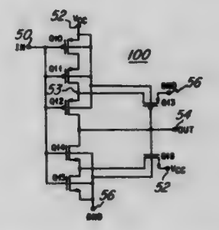
said first output nodes of the first polarity current mirror circuit being connected correspondingly with said second output nodes of the second polarity current mirror circuit, all of said output nodes being led out as a plurality of output terminals, and at least one of said output nodes of each of said current mirror circuits having a current ratio different from that in all the remaining output nodes thereof.

5,194,767

TTL COMPATIBLE HYSTERESIS INPUT BUFFER WITH IMPROVABLE AC MARGIN

Chai-Chin Chao, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1990, Ser. No. 630,093
Int. Cl.[5] H03K *19/092, 19/088*
U.S. Cl. 307—475 10 Claims



6. An inverter having an output which changes logic levels at different speeds depending on said output's starting logic state, wherein said inverter comprises:

a P-channel transistor having a gate operatively coupled to an input terminal, a source operatively coupled to a first voltage source, and a drain operatively coupled to an output terminal; and

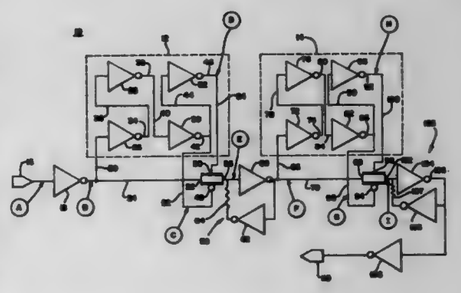
a plurality of N-channel transistors connected in series, source to drain, having gates operatively coupled to said input terminal wherein one of said plurality of N-channel transistors has a source operatively coupled to a second voltage source and another of said plurality of N-channel transistors has a drain operatively coupled to said output terminal.

5,194,768

APPARATUS FOR FILTERING NOISE FROM A PERIODIC SIGNAL

Leo Lozano, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 27, 1992, Ser. No. 858,892
Int. Cl.[5] H03K *17/16, 17/687*
U.S. Cl. 307—520 11 Claims



1. An apparatus for filtering noise from a periodic signal, said signal effecting a first deviation from a first signal level to a second signal level at a first time, and effecting a second deviation from aid second signal level to said first signal level at a second time; successive occurrences of said first deviation and said second deviation defining a signal period; the apparatus comprising:

a first delay means or imposing a predetermined delay period;

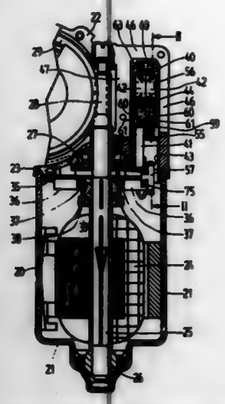
a first gate means for controlling transmission of said signal; said first gate means being operatively connected with said first delay means and cooperating with said first delay means to delay one of said first deviation and said second deviation by said delay period to produce a once-delayed signal;

a second delay means for imposing said predetermined delay; and

a second gate means for controlling transmission of said once-delayed signal; said second gate means being operatively connected with said first gate means and with said second delay means and cooperating with said second delay means to delay the other of said first deviation and said second deviation by said delay period to produce a twice-delayed signal;

said first delay means being operatively connected to receive said signal and said cooperation between said first delay means and said first gate means being effected by a first delay control signal generated by said first delay means; said first gate means being responsive to said first delay control signal; said first delay control signal being a derivative of said signal.

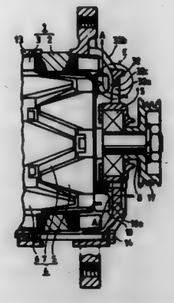
5,194,769
ELECTRIC MOTOR, IN PARTICULAR ELECTRIC SMALL-SIZE MOTOR FOR DRIVING WINDSHIELD WIPERS ON MOTOR VEHICLES
Rolf Ade, Bietigheim-Bissingen; Harro Buhl, Kirchheim, and Theodor Schneider, Freudental, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Fed. Rep. of Germany
PCT No. PCT/EP90/01467, § 371 Date May 28, 1991, § 102(e) Date May 28, 1991, PCT Pub. No. WO91/03856, PCT Pub. Date Mar. 21, 1991
PCT Filed Jan. 9, 1990, Ser. No. 688,933
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930144
Int. Cl.[5] H02K *5/10, 11/00*
U.S. Cl. 310—51 25 Claims



1. An electric motor drive unit for motor vehicle windshield wipers comprising:
a generally cup-shaped motor housing;
a gear housing defining an end shield mating with said motor housing to define a substantially closed cavity, the end shield having no passage towards the outside, a cup-shaped section for receiving gearing elements, and a pocket opening into said closed cavity through said end shield;
a cover closing said cup-shaped section and the pocket of said gear housing;
a holding device for retaining at least one associated noise-suppressing electric component within said pocket, the pocket protecting the component, in circuit with motor current commuting means within said closed cavity through said pocket opening.

5,194,770
VEHICULAR A.C. GENERATOR
Nobuatsu Yoshioka, and Keiichi Komurasaki, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Sep. 10, 1991, Ser. No. 757,407
Claims priority, application Japan, Sep. 28, 1990, 2-261280; Sep. 28, 1990, 2-261281
Int. Cl.[5] H02K *5/24, 9/00, 9.06*
U.S. Cl. 310—51 4 Claims

1. A vehicular a.c. generator, comprising:
a stator coupled to a pair of brackets;
a rotor secured to a rotary shaft supported with said brackets via respective bearings, said rotor having core portions;
a pair of fans fitted to said core portions on both sides of said rotor, wherein each bracket has a plurality of suction ports at one end and a plurality of exhaust ports in the outer peripheral portion thereof, wherein the inner edge face of one bracket axially faces vanes of said fan with a small clearance therebetween and wherein said generator is ventilated and cooled by said fans as said rotor rotates, wherein a gently-sloping annular depression is provided in the inner edge face of said one bracket axially facing the vanes of said fan at a position defined by a radial distance

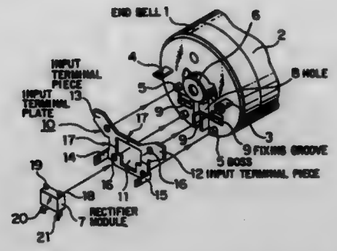


from the center of said one bracket through said suction port to the outer portion of said suction port which is perpendicular to a line representing said radial distance, said depression forming a clearance that gradually becomes larger from the center of said suction port toward said outer portion of said suction port.

5,194,771
BRUSHLESS CORE MOTOR
Noboru Otsuki, and Hajime Masuya, both of Komagane, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan
Continuation of Ser. No. 580,805, Sep. 11, 1990, abandoned. This application Jan. 24, 1992, Ser. No. 825,538
Claims priority, application Japan, Sep. 14, 1989, 1-107799[U]; Jul. 30, 1990, 2-79799[U]
Int. Cl.[5] H02K *11/00, 1/24*
U.S. Cl. 310—68 B 12 Claims

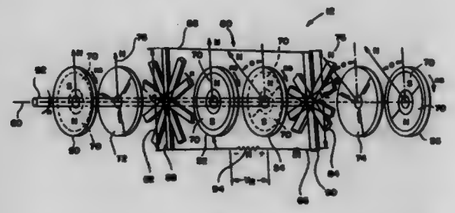
1. A brushless core motor comprising:
an armature core having the product m·k salient poles where k is an integer≧2, said core having a plurality of salient poles with windings in m phases where m is an integer≧2;
a rotor magnet rotatable about said salient poles;
n magneto-sensitive elements where n is an integer and m≧n≧1, said elements adapted for detecting magnetic poles of said rotor magnet for controlling current into said windings;
wherein at least one salient pole has no windings, and said magneto-sensitive elements are adjacent to said winding-devoid salient pole.

5,194,772
A-C DRIVEN MOTOR AND METHOD FOR FORMING INPUT TERMINALS THEREOF
Ikuo Matsushita, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Chiba, Japan
Filed Jul. 10, 1991, Ser. No. 728,118
Claims priority, application Japan, Jul. 13, 1990, 2-75126[U]
Int. Cl.[5] H02K *11/00*
U.S. Cl. 310—71 7 Claims



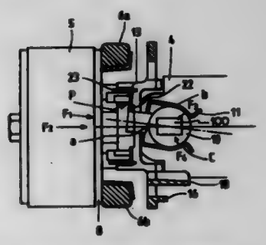
1. An ac-driven motor construction in the form of a micromotor having at least two terminal portions passed through an insulating end bell with an end surface, the motor being energized upon feeding dc current to said terminal portions, the motor arrangement further comprising:
a rectifier module for converting ac power into dc power;
fixing grooves and a hole defined by said end surface of said end bell, said rectifying module being fitted in said hole, and at least four positioning and fixing bosses provided on said end surface of said end bell;
an input terminal plate defining holes for engaging said bosses, said input terminal plate being formed with cut grooves dividing said input terminal plate into four input terminal portions, said input terminal plate having a hole for accomodating said rectifier module in a middle of said input terminal plate, said input terminal plate being pressed into engagement with said four bosses and being partitioned with said input terminal portions forming separate input terminal pieces bent into corresponding ones of said fixing grooves and said input terminal pieces being bent into said hole to fixedly fit said input terminal pieces to said end bell, terminals of said rectifier module being electrically and mechanically connected to be held by said input terminal pieces.

5,194,773
ADJUSTABLE SPEED SPLIT STATOR ROTARY MACHINE
Patrick W. Clarke, 244 Saganore Dr., Murray Hill, N.J. 07974
Continuation-in-part of Ser. No. 763,955, Sep. 23, 1991, which is a continuation-in-part of Ser. No. 462,059, Jan. 8, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 763,983
Int. Cl.[5] H02K *21/04, 23/02, 01/12*
U.S. Cl. 310—112 3 Claims



1. An electric rotating machine providing an electrical characteristic that is determinable by mechanical adjustment, said machine comprising:
a rotor assembly mounted on a shaft having a long axis and rotatable with the shaft;
a first stator assembly having a stator winding;
a second stator assembly having a stator winding;
each said first and second stator assembly disposed about different portions of said rotor assembly;
each said stator assembly including plural permanent magnets providing an axially-directed field through respective ones of said different rotor portions, which axially-directed fields are substantially parallel to said long axis of said shaft;
wherein at least one of the first and second stator assemblies is angularly mechanically rotatable about said axis of said shaft to provide an intended phase offset between the axially-directed fields of the first stator assembly with respect to the axiallydirected fields of the second stator assembly;
wherein said windings of said first and second stator assemblies are adapted for external connection;
said electrical characteristic of said electric rotating machine is determined by the particular angular orientation of said first stator relative to said second stator about the long axis of the shaft.

5,194,774
ELECTRIC-POWERED TOOL
Kimitaka Abe, Mito; Junichi Kikuchi, and Yoshio Onda, both of Katsuta, all of Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan
Filed Jun. 25, 1991, Ser. No. 720,665
Claims priority, application Japan, Jun. 29, 1990, 2-70057[U]
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—239 3 Claims



1. An electric-powered tool comprising:
(a) a housing; and
(b) a brush motor contained in said housing, having:
(I) brush holders, each of the brush holders holding a corresponding one of brushes; and
(II) brush terminals, each of the brush terminals being made of an electrical conductive and elastic material having at least one blade portion, a palm portion, and an arm portion, for providing electrical connection to the corresponding, one of said brushes by catching and gripping one of said brush holders by said blade and said palm portions, said arm portion extending from said palm portion to an end where a supporting portion is provided, each of said brush terminals being supported by said supporting portion with a positional offset to develop a contact pressure between said palm portion and one said brush holders.

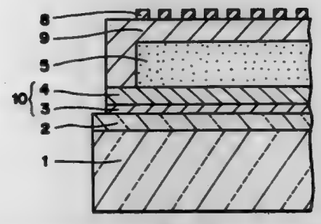
5,194,775
ELECTRIC MOTOR STATOR TABS
Charles R. Cooper, Uniced, Tenn., assignor to Morrill Electric, Inc., Erwin, Tenn.
Filed Mar. 9, 1992, Ser. No. 848,701
Int. Cl.[5] H02K 3/46
U.S. Cl. 310—260 13 Claims

1. An electric motor comprising:
a circular stator having a plurality of angularly spaced radially inwardly extending teeth defining winding slots therebetween, said teeth having inner ends defining a bore and a plurality of wire coils wrapped on said teeth;
a rotor in said bore;
said stator made of a plurality of bound laminations including an end lamination;
said end lamination including a tab bent to extend away from said stator; and,
wherein wire extending between said coils extends over said tab and is retained away from said rotor.

5,194,776
ELECTRON BEAM DEFLECTOR WITH MAGNETIC CORRECTION FIELD AND INCORPORATED AUXILIARY MAGNETIC SHIELDING
Jacques Chevallier, Jarrie, France, assignor to Thomson Tubes Electroniques, Boulogne-Billancourt, France
Continuation of Ser. No. 576,132, Aug. 29, 1990, abandoned. This application Nov. 7, 1991, Ser. No. 789,453
Claims priority, application France, Sep. 12, 1989, 8911891
Int. Cl.[5] H01J 29/70
U.S. Cl. 313—431 5 Claims

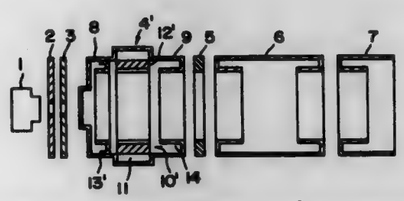
1. An electron beam deflector for use in a CRT device having picture correction capability comprising:
a main shielding surrounding said deflector;
permanent magnets disposed within said deflector for providing picture correction;
means for isolating magnetic fields generated by said permanent magnets from influences external to said deflector caused by the interaction of said magnetic fields with said main shielding surrounding said deflector,
wherein said means for isolating magnetic fields forms one piece with said deflector, and is assembled on a surface of said deflector, between said permanent magnets and said main shielding, and positioned with high geometrical precision with respect to said permanent magnets.

5,194,777
METHOD FOR FABRICATING ELECTROLUMINESCENCE DISPLAY DEVICE AND ELECTROLUMINESCENCE DISPLAY DEVICE
Hiroaki Nakaya; Takao Yamashita; Takashi Ogura, and Masaru Yoshida, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jan. 17, 1990, Ser. No. 466,649
Claims priority, application Japan, Jan. 18, 1989, 1-10732
Int. Cl.[5] H05B 33/22; B05D 5/06
U.S. Cl. 313—509 11 Claims



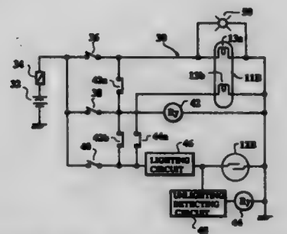
3. An electroluminescence display device comprising:
at least one transparent front electrode;
a lower electrically insulating layer formed on said at least one transparent front electrode;
a light emitting layer of an electroluminescent material formed on said lower electrically insulating layer;
an upper electrically insulating layer formed on said light emitting layer; and
at least one rear electrode formed on said upper electrically insulating layer and which are formed as to be stacked on a transparent substrate;
wherein said lower or upper electrically insulating layer is composed of plural $Si_xN_yO_z$:H films, which are formed to be stacked by a plasma chemical vapor deposition method so that the composition ratio z/y of O to N falls within the range from 0 to 3.0, and the composition ratio x/y of Si to N falls within the range from 0.7 to 3.0.

5,194,778
ELECTRON GUN FOR COLOR CATHODE RAY TUBE
Nam J. Koh, Gumi, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea
Filed Jul. 23, 1990, Ser. No. 557,393
Claims priority, application Rep. of Korea, Jul. 31, 1989, 10919/1989
Int. Cl.[5] H01J 29/46, 29/56
U.S. Cl. 315—15 3 Claims



1. An electron gun for color cathode ray tube comprising: a triode section having first and second grid electrodes for forming thermionic electrons from the cathode into electron beams in a successive manner, a multi-step focusing type electrostatic lens means for focusing the electron beams from said triode section,
characterized in that an electrostatic lens is formed through the combination of a UPF (uni-potential focus) type electrostatic lens and a BPF (bi-potential focus) type electrostatic lens; and another UPF electrostatic lens is formed by a third grid electrode assembly comprising a lower grid electrode in close proximity to the triode, an upper grid electrode substantially adjacent the lower grid electrode, a metallic connecting portion welded intermediate the upper and lower grid electrodes, an insulating member mounted to the metallic connecting portion and an inter grid electrode mounted to the insulating member within the third grid electrode assembly and electrically independent from the upper and lower electrodes, portions of said lower electrode in proximity to the inter grid electrode being free of recesses on portions thereof in proximity to the upper grid electrode and the inter grid electrode for reducing diverging angles of electron beams emitted from the triode section, and whereby the disposition of the inter grid electrode within the third grid electrode assembly achieves a simple efficient structure.

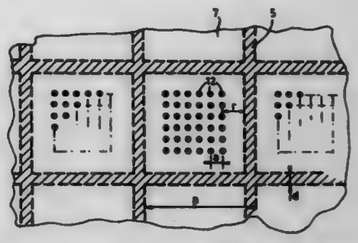
5,194,779
HEADLIGHT ASSEMBLY FOR A VEHICLE
Tohru Segoshi, Yokohama, and Takashi Ashida, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jul. 29, 1991, Ser. No. 737,012
Claims priority, application Japan, Jul. 31, 1990, 2-202786
Int. Cl.[5] B60Q 1/02; B60L 1/14
U.S. Cl. 315—82 8 Claims



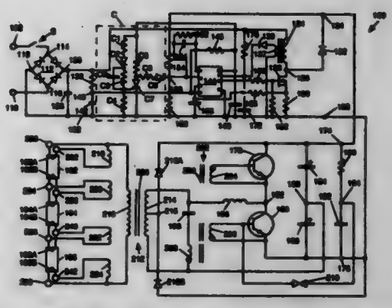
1. A headlight assembly for a vehicle, comprising:
a pair of headlight units each including a first headlight having a halogen bulb with a high-beam filament for illuminating a range faraway from the vehicle, and a second headlight having a discharge bulb for a low-beam for illuminating a range in the vicinity of the vehicle; and
means for controlling lighting of the headlights such that both bulbs of the first and second headlights are lighted during main lighting which illuminates the range faraway from the vehicle with a high-beam and the range close to the vehicle with a low-beam, such that the bulbs of the second headlights are lighted during dimmer lighting which illuminates the range in the vicinity of the vehicle with a low-beam, and such that only the bulbs of the first headlights are lighted during passing.

5,194,780
ELECTRON SOURCE WITH MICROTIP EMISSIVE CATHODES
Robert Meyer, St Nazaire Les Eymes, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed May 31, 1991, Ser. No. 703,684
Claims priority, application France, Jun. 13, 1990, 90 07347
Int. Cl.[5] G09G 3/10
U.S. Cl. 315—169.3 17 Claims

1. An electron source comprising, on an insulating support (2, 4), a first series of parallel electrodes serving as cathode conductors and carrying a plurality of microtips (12) made from an electron emitting material and a second series of parallel electrodes (10) serving as grids and which are electrically insulated from the cathode conductors (5) and forming an angle therewith, an area of overlap between said first and second series of electrodes defining an intersection zone of the cathode conductors (5) and the grids (10), the latter having openings (14) respectively facing the microtips (12), wherein the cathode conductors (5) have a grating structure, said grating structure being in contact with a resistive coating (7) and defining grating meshes, said microtips (12) occupying central regions of said grating meshes.



5,194,781
CONTROL CIRCUIT
John G. Konopka, Barrington, Ill., assignor to Motorola Lighting, Inc., Buffalo Grove, Ill.
Filed Jul. 31, 1991, Ser. No. 739,048
Int. Cl.[5] H05B 41/36; H01H 43/00
U.S. Cl. 315—291 15 Claims



1. A control circuit for producing a first output signal, a second output signal or a third output signal in response to operation of a switch having a first state or a second state, the control circuit comprising:
capacitance means arranged to become charged when the switch is in its second state and to become discharged when the switch is int its first state;
sensing means for sensing whether the level of charge of the capacitance means is less than a predetermined level when the switch changes to its second state; and
signal producing means for producing the first output signal when the switch is in its first state, the second output signal if the level of charge of the capacitance means is less than the predetermined level when the switch changes to its second state and for producing the third output signal if the level of charge of the capacitance means is greater than the predetermined level when the switch changes to its second state.

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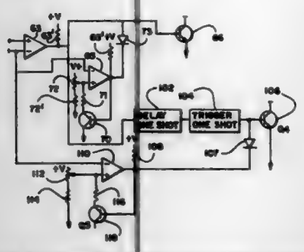
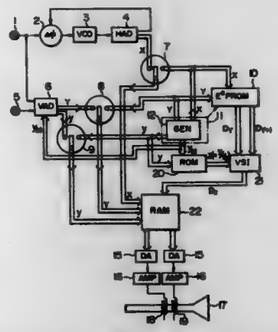
5,194,782
DIMMER FOR FLUORESCENT LAMP
Robert H. Richardson, Rt. #1, Box 12A, Hayesville, N.C. 28904, and Lee R. Webster, 7 Shoreview Cir., Indialantic, Fla. 32903
Filed Jul. 19, 1991, Ser. No. 732,915
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—291 **11 Claims**



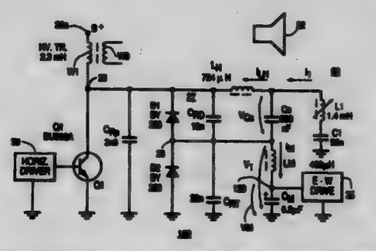
4. A circuit for dimming a fluorescent lamp powered by ac line voltage comprising:
means for receiving an input dc voltage signal in the range from 0 to 5 vdc which said input dc voltage signal is linearly related to the level of dimming to be achieved;
means for combining said input dc voltage signal with a dc voltage reference signal sampled from the ac line voltage, to compensate for ac line voltage fluctuations, for biasing the circuit at +5 vdc, and for transmitting said input dc voltage signal which has been summed, connected to said means for receiving an input dc voltage signal;
a first operational amplifier having an inverting terminal, a noninverting terminal and an output terminal;
means for connecting said noninverting output of said first operational amplifier and said means for combining, biasing and transmitting;
a metal-oxide-semiconductor field-effect-transistor having a gate, a drain and a source;
means for connecting said gate of said metal-oxide-semiconductor field-effect-transistor and said output of said operational amplifier;
a first resistor having a resistance of about 10 megohms;
means connecting said first resistor between a point of positive circuit bias and said drain of said metal-oxide-semiconductor field-effect-transistor;
a polarized capacitor having a positive terminal and a negative terminal and having a capacitance of about 22 micro-Farads;
means for connecting said positive terminal of said polarized capacitor to said inverting terminal of said first operational amplifier;
means for connecting said negative terminal of said polarized capacitor to a point of negative circuit bias;
a second resistor having a resistance of about 10 megohms;
means for connecting said second resistor between said inverting terminal of said first operational amplifier and a point of negative circuit bias;
a second operational amplifier having a noninverting terminal, an inverting terminal and an output terminal;
means for connecting said positive terminal of said polarized capacitor and said inverting terminal of said second operational amplifier;
means for connecting said noninverting terminal of said second operational amplifier and an output of a linear ramp generator which generates a linear ramp per one-half cycle of ac line voltage;
an NPN bipolar transistor having a gate, a collector and an emitter;
means for connecting said gate of said NPN bipolar transistor and said output of said second operational amplifier;
means for connecting said emitter of said NPN bipolar transistor to a point of ground circuit bias;
an optical coupler having a light-emitting diode and phototriac;
means for connecting a cathode of said light-emitting diode and said collector of said NPN bipolar transistor;
a third resistor;
means for connecting said third resistor between a point of positive circuit bias and an anode of said light-emitting diode;
a triac;
means for connecting said phototriac and said triac; and
means for connecting said triac to a ballast of a fluorescent lamp and the ac line voltage;
said resistors, operational amplifiers, transistors, light-emitting diode and capacitor having parameters selected so that said input dc voltage signal causes said triac to energize and apply voltage across terminals of the ballast of the fluorescent lamp for a duration of time during a half-cycle of ac voltage application, and wherein said duration of time during a half-cycle of ac voltage application decreases proportionally with an increase in voltage of said input dc voltage signal.

5,194,783
DISPLAY APPARATUS BASED ON A DIGITAL CONVERGENCE SCHEME
Masanori Ogino; Takeo Yamada; Miyuki Ikeda; Takashi Azuma, all of Yokohama, and Satoshi Ootomo, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 825,138, Jan. 24, 1992, abandoned. This application Jun. 4, 1992, Ser. No. 893,944
Claims priority, application Japan, Jan. 25, 1991, 3-023899
Int. Cl.[5] G09G *1/04*
U.S. Cl. 315—368.13 **19 Claims**



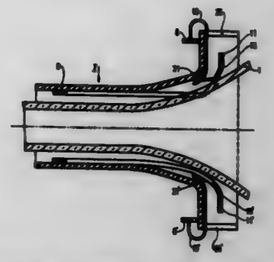
1. A cathode ray tube display apparatus of the projection type or direct-view type based on a digital convergence scheme comprising:
a first memory for storing convergence correction data for predetermined lattice points on the CRT screen;
calculation means for implementing a calculation of interpolation for convergence correction data of each scanning line in a region between adjacent lattice points based on the convergence correction data read out of said first memory;
a second memory for storing the convergence correction data of each scanning line between said lattice points resulting from the calculation of interpolation; and
blanking means for cutting off the cathode ray tube temporarily at a switching of the display format in compliance with the alteration of the scanning format of a video signal to be displayed, said apparatus implementing the convergence correction of the display screen by using the convergence correction data read out of said second memory and completing the interpolation calculation of convergence correction data of each region between said lattice points implemented by said calculation means and the transfer of the calculated convergence correction data to said second memory within the cutoff period produced by said blanking means.

5,194,784
RASTER CORRECTION CIRCUIT
Luc Tripod, Zurich, Switzerland, assignor to RCA Thomson Licensing Corporation, Princeton, N.J.
Filed Apr. 23, 1992, Ser. No. 872,383
Claims priority, application United Kingdom, Nov. 21, 1991, 9124745
Int. Cl.[5] H01J *29/56*
U.S. Cl. 315—371 **12 Claims**



1. A deflection apparatus with inside geometry distortion correction, comprising:
a deflection winding;
a retrace capacitance;
a source of an input signal at a frequency that is related to a deflection frequency;
first switching means coupled to said deflection winding and to said retrace capacitance and responsive to said input signal for generating a deflection current in said deflection winding at said deflection frequency and a retrace pulse in said retrace capacitance;
a source of a modulation signal at a frequency that is related to a second deflection frequency;
means responsive to said modulation and input signals and coupled to said deflection winding and to said retrace capacitance for modulating, in accordance with said modulation signal, said retrace pulse, the modulation of said retrace pulse modulating said deflection current in a manner to correct for an outside geometry distortion of a first type; and
a modulation capacitance coupled to a modulation inductance to form a first trace resonant circuit, during a trace interval, said first trace resonant circuit being responsive to said modulated retrace pulse for generating a resonant modulation current in said trace resonant circuit that is modulated in accordance with said modulated retrace pulse and that varies in accordance with a resonance frequency of said first trace resonant circuit, said modulation current being coupled to said deflection winding, during said trace interval, to modulate said deflection current in a manner to reduce an inside geometry distortion of a second type that is an opposite geometry distortion type with respect to said first type.

5,194,785
CATHODE RAY TUBE AND DEFLECTION UNIT SUITABLE FOR USE IN SUCH A CATHODE RAY TUBE
Antonius P. M. Grubben; Johannes T. F. van Kemenade, and Jacobus J. M. van de Meerakker, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 3, 1991, Ser. No. 801,245
Claims priority, application Netherlands, Dec. 10, 1990, 9002702
Int. Cl.[5] G01S *1/44*; H01F *7/00*
U.S. Cl. 315—399 **8 Claims**

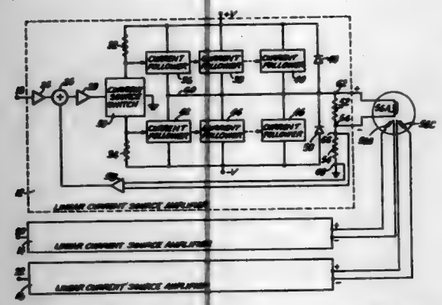


1. A cathode ray tube apparatus including an envelope containing a luminescent screen and an electron gun for producing a plurality of electron beams directed toward the screen, and a deflection unit mounted exteriorly of a flared portion of the envelope for deflecting the beams across the screen in convergence, said deflection unit comprising a flared coil support having an inner surface and an outer surface, a first deflection coil system disposed adjacent the outer surface of the coil support, and a second deflection coil system disposed substantially between the inner surface of the coil support and the envelope, said second deflection coil system comprising first and second coils disposed on opposite sides of an axis of the tube, each of said coils including a front flange-shaped portion extending away from the axis and being formed by a packet of conductors running transversely of the axis at a wider end of the flared coil support, at least one of said coils having an end conductor comprising one of said conductors which is disposed away from an outer periphery of the respective flange, characterized in that:
a. the deflection unit includes electrical connection means disposed at the outer surface of the coil support; and
b. the coil support includes conductor-receiving means for routing said at least one coil end conductor to said electrical connection means without said conductor occupying substantial space between the inner surface of said coil support and the flange-shaped portion of the respective coil.

5,194,786
LINEAR CURRENT SOURCE AMPLIFIER FOR BRUSHLESS DC MOTOR
David R. Smith, Salem, and Robert Villamil, Roanoke, both of Va., assignors to Kollmorgen Corporation, Simsbury, Conn.
Filed Feb. 27, 1991, Ser. No. 661,676
Int. Cl.[5] H02K *29/00*
U.S. Cl. 318—254 **18 Claims**

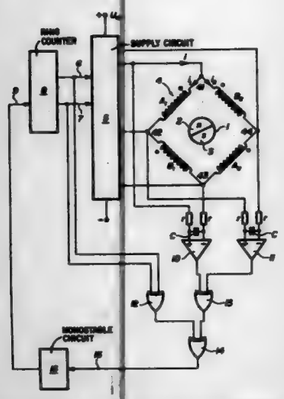
1. A linear current source amplifier for providing current to a motor winding in a brushless D.C. motor having a plurality of motor windings, said linear current source amplifier comprising:
a servo current loop for comparing a desired current command with the actual winding current in said winding to produce a current loop error signal for said winding; and
a plurality of linear current sources connected in parallel each current source operating in its linear region and

having a local feedback for providing a current to said winding said current being substantially equal to currents



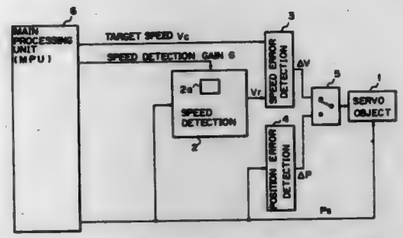
provided by other current sources connected in parallel and being proportional to said current loop error signal.

5,194,787
CONTROL CIRCUIT FOR AN ELECTRIC MOTOR WITHOUT A COLLECTOR
Luciano Antognini, Corcelles, Switzerland, assignor to Portescap, La Chaux-de-Fonds, Switzerland
Filed Nov. 13, 1990, Ser. No. 612,209
Claims priority, application Switzerland, Nov. 10, 1989, 4059/89-0
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—254 **7 Claims**



1. A control circuit for an electric motor without a collector, of the type comprising a rotor having at least one pair of magnetic poles, and a stator provided with a polyphase winding comprising several elementary coils of the same impedance, said control circuit comprising electronic commutation means arranged for connecting selectively the elementary coils of the different phases, according to a cycle of successive supply states, to the terminals of a current source, under the effect of a commutation control signal, means for detecting the voltages appearing at the terminals of elementary coils, and means for generating, from said detected voltages, said commutation control signal, wherein, the elementary coils of the winding being connected together in series, the control circuit comprises comparator means for generating, in each supply state, a detection signal at the passage through a reference value of the potential of the common connection point, non-connected to the current source, of two consecutive elementary coils belonging to different phases, the means for generating said commutation control signal being controlled by said detection signal.

5,194,788
SERVO CIRCUIT
Shuichi Hashimoto, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 3, 1990, Ser. No. 460,525
Claims priority, application Japan, Jan. 10, 1989, 1-003191
Int. Cl.[5] G05B *13/00*
U.S. Cl. 318—561 **10 Claims**



1. A servo circuit for controlling the positioning of a servo object under servo control to a target position by switching from speed control to position control in the vicinity of the target position, comprising:

speed detection means for detecting a real speed based on position signals transferred from a servo head, said speed detection means including a speed detection gain adjustment unit;

speed error detection means for generating an error between a target speed and the real speed;

position error detection means for generating a position error signal based on the position signals;

switching means for switching the connection of the servo object between said speed error detection means and said position means; and

main processing means for generating the target speed in accordance with the position signals from the servo object and controlling the switching of said switching means, said main processing means measuring the intervals between the position signals, and changing the detection gain of said speed detection gain adjustment unit in accordance with the measured value of the intervals.

5,194,789
AUTOMATIC MIRROR REPOSITIONING SYSTEM DIAGNOSTICS
John A. Barrs, Clawson, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.
Filed Aug. 2, 1991, Ser. No. 739,534
Int. Cl.[5] G05B *23/02*
U.S. Cl. 318—565 **10 Claims**

1. A diagnostic system for an automatic mirror repositioning system, comprising:

mirror positioning drive means, responsive to mirror positioning drive signals, for driving the mirror in a direction related to said mirror positioning drive signals;

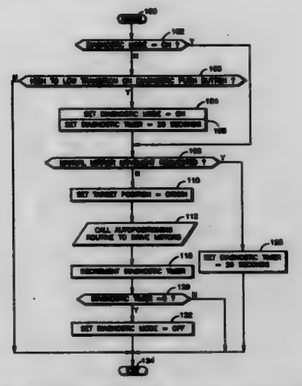
mirror position feedback means, responsive to the position of the mirror, for providing position feedback signals related to the position of the mirror;

diagnostic initiation means for selectively providing a diagnostic initiation signal; and

signal processing means, responsive to said position feedback signals and said diagnostic initiation signal, for providing signals indicative of a predetermined target position of the mirror, and for providing said mirror positioning drive signals to said mirror positioning drive means to cause said position feedback signals to indicate the mirror position is equal to said predetermined target position after said diagnostic initiation signal has appeared at least once.

6. A method of diagnosing a failure in an automatic mirror repositioning system having a predetermined target position, comprising the steps of:

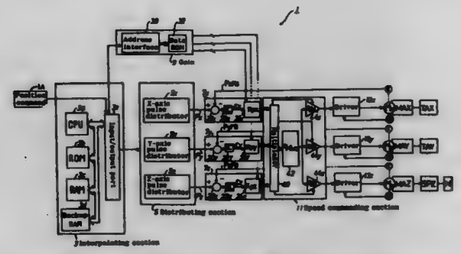
manual positioning the mirror to a test position away from said predetermined target position;



automatically repositioning the mirror to said predetermined target position when said step of manual positioning is not being performed; and

monitoring the mirror movement from said test position to said predetermined target position to determine the failure in said mirror repositioning system.

5,194,790
CONTROL DEVICE FOR CONTROLLING A SERVO MOTOR
Yoshihiro Niimi, Toyata, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 13, 1991, Ser. No. 668,618
Claims priority, application Japan, May 14, 1990, 2-63598
Int. Cl.[5] G05D *3/00*; G05B *19/24*
U.S. Cl. 318—567 **16 Claims**



1. A control device for controlling a plurality of servo motors to move an object to a predetermined position in a mechanical coordinate system having a plurality of coordinate axes based on an externally supplied move command, said control device comprising:

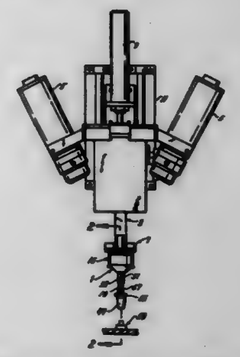
position detecting means for detecting a current position of said object on each of the coordinate axes of said mechanical coordinate system;

interpolating means for setting a target position on each of said coordinate axes by interpolating the externally supplied move command;

revolution control means for controlling a number of revolutions of each of said servo motors using a prescribed control gain individually set for each of said coordinate axes and in accordance with a difference between the detected current position of said object and the target position thereof on each of said coordinate axes; and

control gain controlling means for controlling the control gain individually set for each of said coordinate axes based on control response delays which occur in said revolution control means relative to each axis.

5,194,791
COMPLIANT STEREO VISION TARGET
Laurence J. Cull, Chesterfield, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Jul. 19, 1990, Ser. No. 554,568
Int. Cl.[5] B25J *15/00*
U.S. Cl. 318—568.1 **31 Claims**



1. A compliant apparatus for use in touch-up programming of an industrial robot which uses a stereo vision system, the apparatus automatically compensating for a positional misalignment in the x, y, z, pitch and yaw directions between the robot arm and a workpiece mounted bushing, the apparatus comprising:

a stereo vision target;

a taper member dimensioned to mate with the bushing;

a rod having fist and second ends, said stereo vision target being mounted to said first end and said taper member being connected to said second end;

compliant means coupled to said rod between said first and second ends for allowing said rod to move in x, y, z, yaw and pitch directions relative to the robot arm, and including:

rod recentering means coupled to said rod for restoring said rod to an initial rest position upon disengaging said taper member from the bushing, and for compensating for misalignment error between the robot arm and the bushing in the z direction;

Y-compliant means coupled to said rod for allowing said rod to move in a y plane, and rotate in a yaw and a pitch direction to compensate for misalignment error relative to the robot arm; and

X-compliant means coupled to said rod for allowing said rod to move in an x plane to compensate for misalignment error relative to the robot arm; and

connection means coupled to said compliant means for attaching said compliant means to the robot arm.

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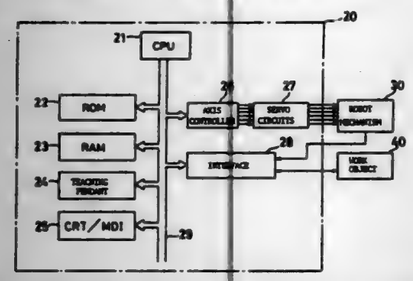
5,194,792

TOOL CENTER POINT SETTING METHOD IN A ROBOT

Ryuichi Hara, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP90/00439, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO90/11872, PCT Pub. Date Oct. 18, 1990
PCT Filed Mar. 30, 1990, Ser. No. 613,713
Claims priority, application Japan, Mar. 31, 1989, 1-78393
Int. Cl.[5] B25J *9/10, 9/22;* G05B *19/18*
U.S. Cl. 318—568.13 13 Claims

1. A tool center point setting method for deriving a transformation matrix for coordinate conversion from a tool mounting surface coordinate system to a tool coordinate system in a robot having a control unit, comprising the steps of:



(a) providing in a robot a set point whose position and direction relative to a center of a tool mounting surface are known;
(b) providing a reference point in a robot installation space;
(c) setting, in the control unit, a tool center point at the center of the tool mounting surface, positioning the tool center point at the reference point, and teaching, to the control unit, a first position and orientation of the tool center point when the tool center point is positioned at the reference point;
(d) setting, in the control unit, the tool center point at the set point, positioning the set point at the reference point, and teaching, to the control unit, a second position and orientation of the tool center point when the set point is positioned at the reference point; and
(e) deriving, in the control unit, the transformation matrix on the basis of an inverse matrix of a matrix representing the first position and orientation, and a matrix representing the second position and orientation.

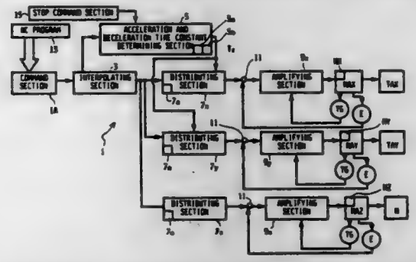
5,194,793

CONTROL DEVICE FOR CONTROLLING A PLURALITY OF SERVO MOTORS AND SERVO MOTOR CONTROLLING METHOD

Yoshihiro Niimi, Toyota, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 19, 1991, Ser. No. 671,973
Claims priority, application Japan, Apr. 11, 1990, 2-95384
Int. Cl.[5] G05B *19/407*
U.S. Cl. 318—568.15 13 Claims

11. A control device for controlling a plurality of servo motors comprising:
commanding means for outputting a move command signal to drive and control a plurality of servo motors;
interpolating means for performing interpolation based on the move command signal output by said commanding means, and for outputting an interpolating signal based on the interpolation, said interpolating means being capable of performing circular arc interpolation when said commanding means outputs a circular arc move command signal;
distributing means for outputting a distribution pulse train into each of the servo motors based on the interpolating signal output by said interpolating means and an acceleration and deceleration time period received by said distributing means; and
acceleration and deceleration time period determining means for determining and changing the acceleration and deceleration time period at least at the start of said circular arc interpolation and at an end of said circular



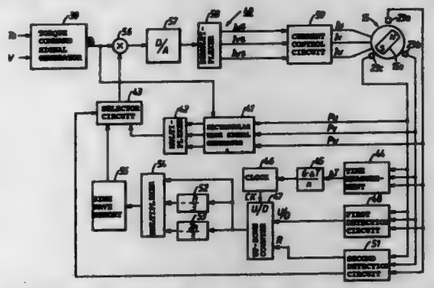
arc interpolation by said interpolating means so that upon the start of said circular arc interpolation, a value of said acceleration and deceleration time period decreases from a predetermined initial value to a predetermined minimal value during said circular arc interpolation, and said value of said acceleration and deceleration time period returns to said predetermined initial value when said circular arc interpolation is completed and, alternatively, when a command-designated stop occurs during said circular arc interpolation.

5,194,794

ELECTRIC CONTROL APPARATUS FOR BRUSHLESS MOTOR

Sumikazu Shamoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 10, 1992, Ser. No. 819,292
Claims priority, application Japan, Jan. 11, 1991, 3-13752
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—603 9 Claims



1. A control apparatus for controlling an output torque of a brushless electric motor based on a torque command signal received from a torque command signal generator, said control apparatus comprising:
magnetic pole position detecting means for producing position signals indicative of a rotational position of a rotor of said motor;
address output means for outputting an address signal based on said position signals;
sine wave memory means for storing plural sine waves and for outputting a sine wave signal based on said address signal;
control means for linearly controlling an amplitude of said sine wave signal based on said torque command signal;
current control means for applying stator current to stator

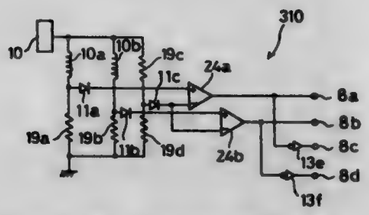
windings of said motor based on said linearly controlled sine wave signal.

5,194,795

DRIVE SYSTEM AND A CONTROL UNIT THEREFOR

Itsuki Baba, Tokyo, and Jiro Chiba, Yokohama, both of Japan, assignors to Sekogiken, Japan

PCT No. PCT/JP90/00692, § 371 Date Feb. 11, 1991, § 102(e) Date Feb. 11, 1991, PCT Pub. No. WO90/15476, PCT Pub. Date Dec. 13, 1990
PCT Filed May 29, 1990, Ser. No. 635,610
Claims priority, application Japan, May 29, 1989, 1-132746
Int. Cl.[5] G05B *19/40;* H02P *8/00*
U.S. Cl. 318—685 14 Claims



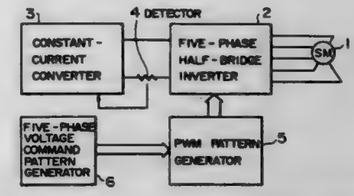
1. A control unit for controlling exciting coils of an electric motor having a rotor, comprising:
a position detector for sequentially generating a series of position detection signals upon rotation of the rotor of the electric motor;
a stepping signal generator for sequentially generating a series of stepping signals;
an energization control circuit operatively connected to the electric motor to energize and de-energize the exciting coils of the electric motor in response to the series of position detection signals and the series of stepping signals;
a counter circuit of a driving mode switching circuit operatively connected to said energization control circuit to command operation of the electric motor from a normal driving mode to a deceleration driving mode and then from the deceleration driving mode to a stepping driving mode in response to values indicative of the series of position detection signals;
a position signal switching circuit operatively connected to said counter circuit of said driving mode switching circuit and said position detector to supply the series of position detection signals to said energization control circuit when said counter circuit of said driving mode switching circuit commands a normal driving mode and to alter a sequence of the series of position detection signals to supply an altered series of position detection signals to said energization control circuit when said counter circuit of said driving mode switching circuit commands the deceleration driving mode; and
a driving signal switching circuit of said driving mode switching circuit operatively connected to said position signal switching circuit, said counter circuit, said stepping signal generator and said energization control circuit to interrupt supply of the altered series of position detection signals to said energization control circuit and to supply the series of stepping signals to said energization control circuit when said counter circuit of said driving mode switching circuit commands the stepping driving mode.

5,194,796

MICRO-STEP DRIVE SYSTEM OF A FIVE-PHASE STEPPING MOTOR

Hideo Domeki, and Hirofumi Nagasawa, both of Kashiwa, Japan, assignors to Oriental Motor Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 549,296
Claims priority, application Japan, Sep. 4, 1989, 1-228676; Sep. 13, 1989, 1-237719
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 8 Claims



1. A micro-step drive system for a five-phase stepping motor having five-phase windings and salient poles, comprising:
means for applying a current to each of the five-phase windings;
pattern generating means coupled to said current supplying means for causing said current supplying means to supply each of said windings with a current I_k having a waveform expressed by

$$I_k = f(t - 2k + a)$$

$$f(t) = I_o \qquad 0 \leq t \leq 3$$
$$f(t) = I_o\{1 - (t - 3)\} \qquad 3 \leq t \leq 5$$
$$f(t) = -I_o \qquad 5 \leq t \leq 8$$
$$f(t) = I_o\{1 + (t - 8)\} \qquad 8 \leq t \leq 10$$

where:
k=0, 1, 2, 3, and 4 and represents the phases of the windings,
I_o is the value of a selected constant current,
t is one tenth of a time variable,
a is a constant ($0 \leq a \leq 10$).

5,194,797

PROCEDURE FOR THE REGULATION OF AN ASYNCHRONOUS MOTOR

Matti Kahkipuro, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland and Montgomery Elevator Company, Moline, Ill.

Filed Jan. 10, 1991, Ser. No. 712,832
Claims priority, application Finland, Jan. 12, 1990, 902932
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—727 10 Claims

1. A method for regulating a stator flux and torque of an asynchronous motor by vector control in an imaginary space vector coordinate system, having a real and an imaginary axis, said method comprising the steps:
a) selecting said imaginary space vector coordinate system to have a relative position such that a rotor flux vector (Ψ_r) is at least close to the real axis;
b) generating a simulated absolute value of a stator flux ($|\Psi_s|$) and torque (T) determined in said coordinate system and processing said simulated stator flux and said torque for obtaining a real (u_{sr}) and an imaginary (u_{si}) part of a stator voltage and stator frequency (fs);
c) regulating the absolute value of the stator flux ($|\Psi_s|$) by means of the real part (u_{sr}) of the stator voltage vector and

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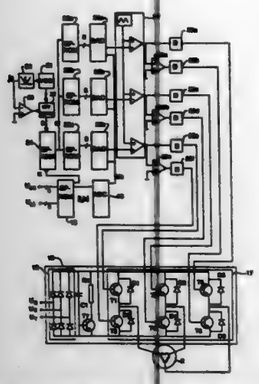
regulating the torque (T) by means of the stator frequency (fs); and



d) holding said coordinate system in said relative position by adjusting the imaginary part (u_{sy}) of the stator voltage vector.

5,194,798

SERVO CIRCUIT CONTROL METHOD AND SYSTEM

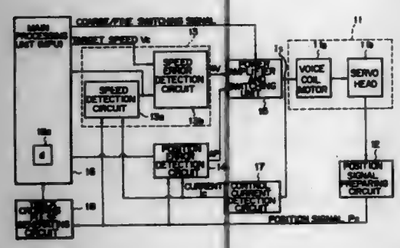
Shuichi Hashimoto, Tokyo, and Tohru Shinohara, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 3, 1990, Ser. No. 460,668

Claims priority, application Japan, Jan. 10, 1989, 1-003188; Jan. 10, 1989, 1-003190; Mar. 17, 1989, 1-065756

Int. Cl.[5] G05B *11/18*

U.S. Cl. 318—594 14 Claims



1. A control system of a servo circuit for performing speed control and then position control based on a difference representing a change in an amount of movement of an object under servo control, said control system comprising:

speed control means for controlling the speed of the servo object based on an error between a target speed and a real speed obtained from a position signal indicating the present position of the object;

position control means for controlling the position of the object to a target position;

switching means for switching the connection of the object between said speed control means and said position control means; and

main processing means for revising the difference based on the position signal from the object and generating first and second target speeds in accordance with the difference, the first target speed being generated for a first difference (X) and, after generating the first target speed for the first difference (X), generating a second target speed having a constant speed for a second difference (Y), where, X+Y=d, d being the difference.

5,194,799

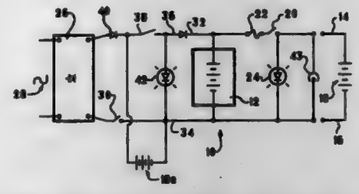
BOOSTER BATTERY ASSEMBLY

Klaus Tomantschger, Mississauga, Canada, assignor to Battery Technologies Inc., Mississauga, Canada

Filed Mar. 11, 1991, Ser. No. 667,478

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—2 11 Claims



1. A light weight, easily portably booster battery assembly for vehicle battery boosting to provide additional starting energy when connected in parallel with a vehicle battery, comprising:

a booster battery having positive and negative terminals, and being of substantially equal terminal voltage to the rated voltage of the vehicle battery to be boosted;

cables for connected of said booster battery to said vehicle battery;

switch means in series with said cable means so as to provide electrical connection between said booster battery and said vehicle battery; and

fuse means in series with said switch means;

wherein the capacity of said booster battery is in the range of from 1% to less than 25% of the ampere-hour rated capacity of the vehicle battery; and

wherein said booster battery and said vehicle battery, in parallel combination, may be used to provide starting energy for a vehicle substantially as soon as said electrical connection is made between said booster battery and said vehicle battery.

5,194,800

POWER SUPPLY SYSTEM

Gerhard Conzelmann, Leinfelden-Oberaichen; Karl Nagel, Gomaringen, and Andreas Junger, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

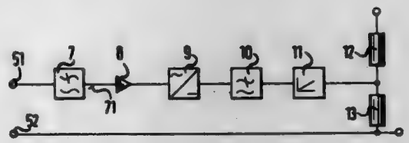
PCT No. PCT/DE90/00213, § 371 Date Nov. 16, 1990, § 102(e) Date Nov. 16, 1990, PCT Pub. No. WO90/12449, PCT Pub. Date Oct. 18, 1990

PCT Filed Mar. 21, 1990, Ser. No. 602,292

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 3910510

Int. Cl.[5] H02P *9/30*; H02J *7/16*

U.S. Cl. 322—21 17 Claims



1. A power supply system for a motor vehicle, comprising a battery; a three-phase generator operable at a generator speed; a rectifier connected electrically to said generator; a voltage regulator for switching an exciter field of said generator on and off to control a voltage of said rectifier, said voltage regulator determining a voltage actual value at generator terminals of the generator and producing an average field current in the exciter field of said generator to maintain a power supply voltage substantially constant regardless of load and speed; and

means for determining and for at least approximately compensating an undesirable direct voltage drop at the generator terminals resulting from a voltage drop in a connecting line connecting said generator with said battery and caused by load current therein, wherein said means are structured to determine an alternating voltage at the generator terminals, said alternating voltage being produced by an alternating current component in said connecting line, said connecting line having an inductance being approximately proportional to a length of said connecting line, said alternating current component being part of a rectified three-phase current produced by the generator and being proportional to a direct current.

5,194,801

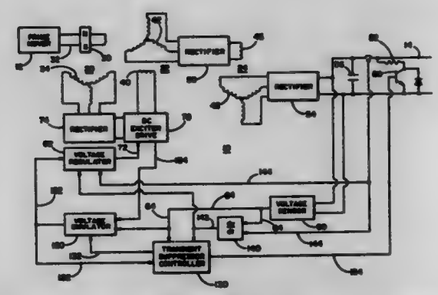
POWER GENERATION SYSTEM WITH TRANSIENT SUPPRESSOR

Gregory L. Rozman, 1112 Nassau Pkwy., Rockford, Ill. 61107

Filed Apr. 2, 1991, Ser. No. 679,248

Int. Cl.[5] H02H *7/06*

U.S. Cl. 322—28 31 Claims



1. An apparatus for generating DC power and suppressing overvoltage transients in said DC power, comprising:

means for generating DC power having a Dc voltage;

means coupled to said generating means for sensing the magnitude of said Dc voltage;

means for determining when the magnitude of said DC voltage increases to a first predetermined magnitude;

means coupled to said determining means for limiting said DC voltage to said first predetermined magnitude; and

means coupled to said sensing means for controlling the magnitude of said DC voltage including means for comparing the magnitude of said DC voltage with reference voltage during a first period of time and for comparing the magnitude of a control voltage with said reference voltage during a second period of time.

5,194,802

TRANSCONDUCTANCE CURRENT REGULATOR USING PRECISELY SAMPLED CHARGES FOR CURRENT CONTROL

Kevin E. Hill, Vestal, and Gary A. Stefura, Endicott, both of N.Y., assignors to General Electric Company, Johnson City, N.Y.

Filed Oct. 25, 1991, Ser. No. 782,139

Int. Cl.[5] G05F *1/575*

U.S. Cl. 323—280 10 Claims

1. A transconductance current regulator using precisely sampled charges for current control comprising

A) means for connecting said regulator to a source of operating potentials, to a load, to a source of control potentials (V_l) referenced to ground for establishing a desired load current, and to a clock providing first and second alternate clocking intervals,

B) means to obtain a voltage (V_F) proportional to load current free of common mode voltage for subsequent charge sampling including

(1) a precision resistor serially connected with said load to produce a voltage drop proportional to load current,

(2) a capacitor for storing a voltage equal to said voltage drop and for sustaining said stored voltage drop when charge is being sampled, and

(3) first clocked switching means for connecting said capacitor to said resistor for charging during said second clocking interval and disconnecting said capacitor from said resistor and applying said stored voltage to a first node referenced to ground for sampling during said first clocking interval,

C) first clocked switching/capacitive means having a capacitance (C_l) for charging to said control potential and during said first clocking interval discharging into a second node to transfer a sample charge precisely ratioed to said control potential,

D) second clocked switching/capacitive means having a capacitance (C_F) which is small in relation to that of said storage capacitor connected to said first node for charging to said voltage drop, and during said first clocking interval discharging into said second node to transfer a sample charge precisely ratioed to said voltage drop,

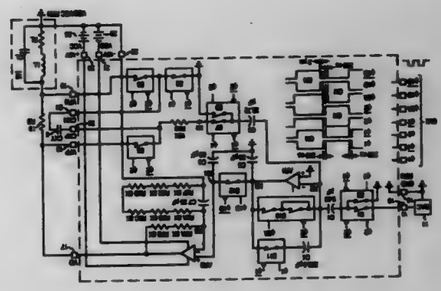
E) means for obtaining an error charge representing the difference between said ratioed charge samples at said second node during said first clocking interval,

F) a negative feedback loop for bringing said load current into equality with said desired current comprising

(1) a clocked integrator including a second capacitor for integrating the error charge at said second node to provide an output voltage at a third node during said first clocking interval, and

(2) a driver stage connected between said source of operating potentials and said series connected precision resistor and load, whose conductance responds to the voltage at said third node in a sense to bring said error charge to zero and equalize the product of said control voltage (V_l) and the capacitance (C_l) of said first switching/capacitive means with the product of said voltage drop (V_F) and the capacitance (C_F) of said second switching/capacitive means:

$(V_F C_F = V_l C_l)$

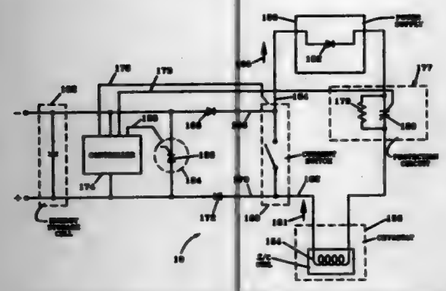


5,194,803

SUPERCONDUCTIVE VOLTAGE STABILIZER HAVING IMPROVED CURRENT SWITCH

Age T. Visser, Geneva, Ill., and Carel C. DeWinkel, Madison, Wis., assignors to Superconductivity, Inc., Middleton, Wis.

Continuation-in-part of Ser. No. 385,014, Jul. 25, 1989, Pat. No. 4,962,354. This application Oct. 9, 1990, Ser. No. 594,273
The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.
Int. Cl.[5] H01F *36/00*
U.S. Cl. 323—360 12 Claims



1. A superconductive voltage stabilizer for storing energy in a superconducting inductive energy storage device and for releasing the stored energy to a load, said superconductive voltage stabilizer comprising:
- a first output line and a second output line, said first and said second output lines coupled to the load and cooperating to provide an output current path to the load;
- a controller connected in parallel with said first output line and said second output line;
- a current switch connected in parallel with said controller; and
- a power supply producing a direct current output, said power supply including a first DC terminal and a second DC terminal, said first DC terminal coupled to one side of said current switch through the superconducting inductive energy storage device, and said second DC terminal coupled to the other side of said current switch, whereby said current switch under the control of said controller either directs the current produced by said power supply to be stored in said superconducting inductive energy storage device or directs the current stored in said superconducting energy storage device for delivery to the load through said first and said second output lines.

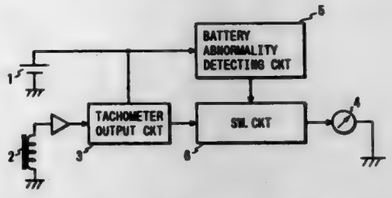
5,194,804

APPARATUS FOR DETECTING THE VOLTAGE LEVEL OF A POWER SOURCE FOR A SPEED INDICATION DEVICE

Hideki Umemoto, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jan. 11, 1991, Ser. No. 640,455
Claims priority, application Japan, Jan. 12, 1990, 2-3371
Int. Cl.[5] G01P *3/42;* G01N *27/416*
U.S. Cl. 324—160 1 Claim

1. An apparatus for detecting malfunction of a speed indication device comprising:
- a generator for generating a signal corresponding to engine speed;
- an output circuit for receiving a battery voltage and said signal from said generator and for applying an output signal to said speed indication device in accordance with said battery voltage and said signal from said generator, to activate said speed indication device;
- a battery abnormality detecting circuit for detecting an abnormal condition in an output voltage of said battery to provide a detection signal; and
- a switch circuit for suspending, in response to said detection signal, the application of said output signal from said output circuit to said speed indication device, to indicate



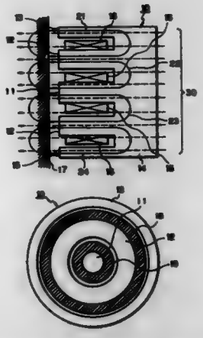
an abnormal condition of said battery and to prevent an erroneous indication of engine speed by said speed indication device.

5,194,805

INDUCTANCE-TYPE DISPLACEMENT SENSOR FOR ELIMINATING INACCURACIES DUE TO EXTERNAL MAGNETIC FIELDS

Atsushi Nakajima; Minoru Takizawa; Chikara Murakami, all of Tokyo; Yoichi Kanemitsu, and Yuji Shirao, both of Kanagawa, all of Japan, assignors to National Aerospace Laboratory, Ebara Research Co., Ltd. and Ebara Corporation, both of Tokyo, Japan

Filed Dec. 26, 1990, Ser. No. 633,849
Claims priority, application Japan, Dec. 29, 1989, 1-342773; Dec. 29, 1989, 1-342774
Int. Cl.[5] G01B *7/14;* G01R *33/02*
U.S. Cl. 324—207.16 10 Claims



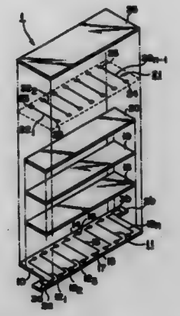
1. An inductance-type displacement detecting system having an inductance-type displacement sensor for measuring a displacement of an object of magnetic material without any contact with said object, the displacement sensor comprising:
- a pair of coils connected in series with each other and provided adjacent to said object wherein the inductance, the number of windings and the direction of the windings are so set that the magnetic flux produced by one of the coils runs in a direction opposite to that of the magnetic flux produced by the other coil, the densities of the respective magnetic fluxes being equal to each other;
- a third coil connected in series with said pair of coils;
- carrier wave generating means connected in series with said pair of coils and said third coil;
- detecting means for detecting a change in electric potential across said third coil due to a change in inductance of said pair of coils in response to the displacement of said object from a predetermined position.

5,194,806

STRAIN SENSOR INCLUDING AN AMORPHOUS MAGNETIC METAL MEMBER, AND A METHOD OF PRODUCING THE STRAIN SENSOR

Masao Obama, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 7, 1991, Ser. No. 712,061
Claims priority, application Japan, Jun. 7, 1990, 2-147474
Int. Cl.[5] G01B *7/24;* G01L *1/12;* H01C *17/28*
U.S. Cl. 324—209 5 Claims



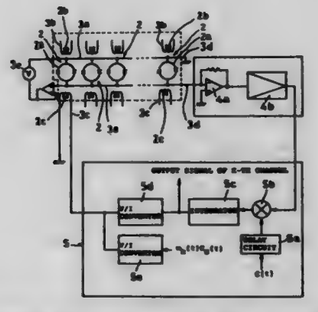
1. A strain sensor comprising:
- an amorphous magnetic metal layer having reverse magnetostriction effect;
- a plurality of insulating layers arranged on upper and lower surfaces of said amorphous magnetic metal layer; and
- a coil arranged through said insulating layers, wherein said elements are integrated;
- wherein said amorphous magnetic metal layer defines a longitudinal axis and has magnetic characteristics represented by a fringe-like distribution along the longitudinal axis and a magnetic anisotropy in a direction perpendicular to the longitudinal axis.

5,194,807

METHOD AND APPARATUS FOR COMPENSATING FOR VARIATIONS IN MAGNETIC FLUX SUPPLIED TO A SQUID SUPERCONDUCTING LOOP INPUT COIL BY APPLYING A MODULATED SIGNAL TO A MODULATION COIL THEREOF

Tomoaki Ueda, Kyoto, Japan, assignor to Daikin Industries, Ltd., Japan

Filed Sep. 5, 1991, Ser. No. 755,572
Claims priority, application Japan, Sep. 7, 1990, 2-237958
Int. Cl.[5] G01R *33/035*
U.S. Cl. 324—248 8 Claims



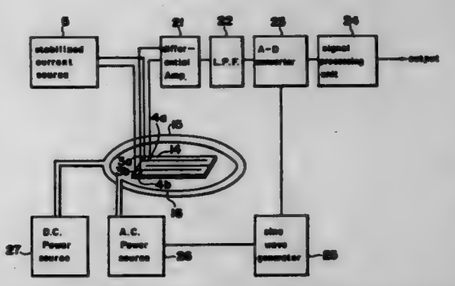
1. A magnetic flux locking method which maintains a magnetic flux at a superconducting loop of at least one SQUID to a constant magnetic flux by supplying a modulation signal to a modulation coil of said at least one SQUID for compensation for variations in the magnetic flux at said at least one SQUID, said at least one SQUID being housed in a casing which is refrigerated to a temperature below a critical temperature for superconduction, said method comprising the steps of;
- (A) applying a same constant-voltage to superconducting loops of plural SQUIDs;
- (B) modulating a first pseudo noise for all said plural SQUIDs to compensate for variations in the magnetic flux at said superconducting loop of said at least one SQUID to provide modulated pseudo noise, said first pseudo noise having significant auto-correlation characteristics and being phase shifted by a predetermined quantity;
- (C) supplying said modulated pseudo noise to said modulation coil of said at least one SQUID as said modulation signal;
- (D) adding output signals from said plural SQUIDs to obtain an added output signal; and
- (E) demodulating said added output signal for all said plural SQUIDs based on a second pseudo noise which is phase shifted by the same quantity as said first pseudo noise so as to extract the output signal of said at least one SQUID from said added output signal.

5,194,808

MAGNETIC FIELD DETECTOR USING A SUPERCONDUCTOR MAGNETORESISTIVE ELEMENT WITH AC AND DC BIASING AND A SIGNAL PROCESSOR USING FOURIER TRANSFORM

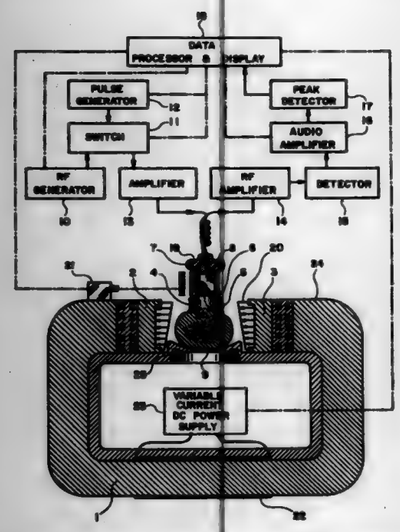
Hidetaka Shintaku, and Masayoshi Kobe, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1991, Ser. No. 703,671
Claims priority, application Japan, May 21, 1990, 2-130481
Int. Cl.[5] H01B *12/02;* G01R *33/035;* H01L *39/16, 39/12*
U.S. Cl. 324—248 5 Claims



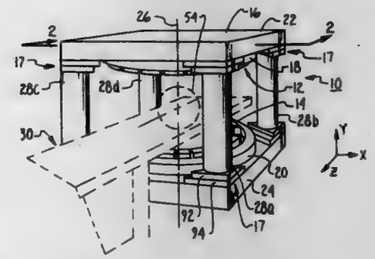
1. A magnetic field sensor system for sensing an external magnetic field using a superconductor magneto-resistive element composed of a superconductor member having weak coupling grain boundaries, said system comprising:
- means for applying an A.C. bias magnetic field to said element and generating an output signal of said element including a noise inherent in said element;
- means for taking out two kinds of frequency components from the output signal of said element, one of said frequency components corresponding to the fundamental component of the applied A.C. bias magnetic field and the other frequency component corresponding to the quadratic harmonic component of the applied A.C. bias magnetic field; and
- calculation means for comparing both of the two frequency components taken out from the output signal of said element and dividing the fundamental component by the quadratic harmonic component, thereby obtaining a signal for measuring the intensity of the external magnetic field reducing the noise generated by said element.

5,194,809
NMR-SCOPE
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Filed Jun. 30, 1990, Ser. No. 574,766
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 9 Claims



1. A method for determining time rate of fluid change taking place in a test mass, comprising in combination:
a) placing a test mass within a nonalternating magnetic field encompassing and including a region occupied by the test mass, and aligning nuclear magnetic moments of atomic species contained in the fluid parallel to the nonalternating magnetic field;
b) imposing a series of pulses of alternating magnetic field oscillating at nuclear magnetic resonance frequency of the atomic species and oriented in directions substantially perpendicular to the nonalternating magnetic field in such a way that nuclear magnetic resonance phenomena created by said alternating magnetic field is substantially limited to a region substantially occupied by the test mass wherein each of said pulses of alternating magnetic field tilts the aligned nuclear magnetic moments over a sizable angle between 0 and 180 degrees, wherein the series of pulses of alternating magnetic field are imposed with a pause cycle period substantially smaller than magnetic relaxation time of molecular species making up the fluid, whereby said series of pulses of alternating magnetic field with said pause cycle period generates nuclear magnetic resonance emission from moving fluid with an intensity monotonically increasing with time rate of fluid change taking place in the test mass;
c) measuring intensity V_T of the nuclear magnetic resonance emission from the test mass generated by the series of pulses of alternating magnetic field with said pause cycle period;
d) determining intensity V_B of nuclear magnetic resonance emission from molecular species other than the moving fluid contained in the test mass generated by the series of pulses of alternating magnetic field with said pause cycle period; and
e) determining the time rate of fluid change from a differential combination of V_T and V_B.

5,194,810
SUPERCONDUCTING MRI MAGNET WITH MAGNETIC FLUX FIELD HOMOGENEITY CONTROL
Bruce C. Breneman; Raymond E. Sarwinski, both of San Diego, and Yen-Hwa L. Hsu, Solana Beach, all of Calif., assignors to Applied Superconetics, Inc., San Diego, Calif.
Continuation-in-part of Ser. No. 555,269, Jul. 18, 1990, Pat. No. 5,134,374, which is a continuation of Ser. No. 360,028, Jun. 1, 1989, Pat. No. 4,943,774. This application Dec. 26, 1991, Ser. No. 813,981
Int. Cl.[5] G01V *3/00*; H01F *7/00*
U.S. Cl. 324—319 22 Claims

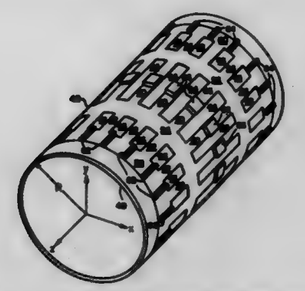


1. An open access magnet for magnetic resonance imaging (MRI) comprising:
(a) a substantially open ferromagnetic frame including an upper end plate and a lower end plate spaced apart from one another and mounted generally parallel to one another on a support column to define a patient receiving area therebetween accessible to additional medical equipment and personnel;
(b) a toroidal shaped coil of superconducting wire mounted to the frame and cryogenic means for maintaining the coil of superconducting wire at a temperature below a superconducting transition temperature for generating a magnetic flux field between the end plates along a vertical polar axis with a return path for the magnetic flux field provided by the support column and the upper and lower end plate; and
(c) magnetic flux field shaping means mounted to an end plate for shaping the magnetic flux field to provide generally parallel lines of magnetic flux in a (DSV) within the patient receiving area and including:
(i) a rose shim mounted to an end plate;
(ii) a plurality of segments removably mounted to the rose shim.

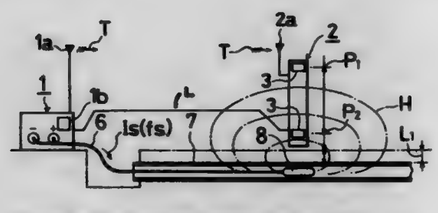
5,194,811
RADIO FREQUENCY VOLUME RESONATOR FOR NUCLEAR MAGNETIC RESONANCE
Joseph Murphy-Boesch, Lafayette Hill, and Ravi Srinivasan, Philadelphia, both of Pa., assignors to Fox Chase Cancer Center, Philadelphia, Pa.
Filed Aug. 2, 1990, Ser. No. 561,898
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 51 Claims

1. An RF resonator for use in NMR comprising:
at least four axially distributed coaxial high frequency ring current paths;
at least four high frequency current paths interconnecting at least three paris of ring paths, adjacent interconnecting paths forming current loops with connecting segments of ring current paths; and

at least one discrete capacitor interposed in and interrupting each current loop, whereby in combination with the inductance in each loop, including inherent inductance in the conductors, each loop is resonant.

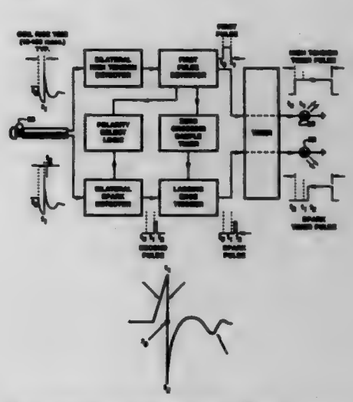


5,194,812
DEVICE FOR DETERMINING DEPTH AND DIRECTION OF BURIED OBJECTS
Shin Yokoi, Osaka, Japan, assignor to Yokoi Manufacturing Co., Ltd., Osaka, Japan
Filed Sep. 19, 1991, Ser. No. 762,603
Claims priority, application Japan, May 16, 1991, 3-141329
Int. Cl.[5] G01V *3/08, 3/10*; G01R *19/00*
U.S. Cl. 324—326 7 Claims



1. Buried object locating apparatus comprising:
a transmitter for supplying a location current having a selected frequency and phase for forming an alternating field around the buried object,
a receiver for detecting the position of the buried object on the basis of the detected value of said alternating field,
a reference signal transmitter for transmitting a reference signal having the same frequency and phase as that of said location current, and
a means for receiving said reference signal,
said receiver including:
a detection unit equipped with a first detection coil located in a first, upper, position and a second detection coil located in a second, lower position,
an analog signal processor unit equipped with a multiplier for the output signal transmitted from said detection unit and the reference signal transmitted from said reference signal transmitter, and a filter for the output from the multipler,
a calculation processing unit equipped with a n A/D converter for converting the output signal transmitted from the analog signal processing unit into a digital signal, and
a microprocessor for calculating the position of the buried object by using the difference between the output signals of said detection coil located in said first, upper position and that of said detection coil located in said second, lower position, and
a display unit for displaying the results of said calculation by said microprocessor.

5,194,813
SPARK IGNITION ANALYZER
Kenneth H. Hannah, Box 48, Chelmsford, Ontario, Canada P0M 1L0, and Ronald R. Plante, 98 Hardwood St., Soo, Ontario, Canada P6A 5W4
Filed Sep. 16, 1991, Ser. No. 760,544
Int. Cl.[5] G01M *15/00*
U.S. Cl. 324—379 12 Claims



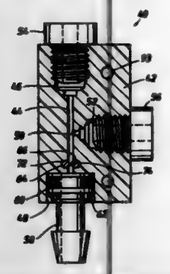
1. A spark ignition analyzer comprising,
a probe having a first and second pick-up responsive to a voltages from an ignition wire of an engine, said second pick-up sensitive to high frequencies,
a high tension detector means for detecting an absolute voltage increase and a zero voltage from the first pick-up and after detecting the voltage increase generating a first pulse with a first period,
a first signal means responsive to the first pulse and adapted to signal for a predetermined time period, and
a spark detector means for detecting a high frequency voltage fluctuation from the second pick-up within a second period and after detecting the voltage fluctuation generating a second pulse, the second period initiating when the high tension detector means detects the zero voltage, the second period being shorter in duration than the first period,
a second signal means responsive to said second pulse and adapted to signal to the end of the predetermined time period,
whereby the combination of signals provides analytical information of the state of operation of the engine.

5,194,814
ELECTROLYTIC CONDUCTIVITY DETECTOR
Silvester D'Couto, Austin, Tex., assignor to Transtrics, Inc., Austin, Tex.
Filed May 22, 1991, Ser. No. 703,881
Int. Cl.[5] G01N *27/02*
U.S. Cl. 324—446 12 Claims

1. An electrolytic conductivity detector cell comprising:
a. a cell block, at least in part of electrically insulating material;
b. a flow bore extending through the block and ending in an outlet;
c. a first inlet whereby liquid may enter the flow bore and move therealong to the outlet;
d. a second inlet whereby gas may enter the flow bore and intersect the liquid therein at an intersection location, and move along the flow bore to the outlet;
e. a first elongate electrode intersecting the flow bore and extending sideways partially therein to provide with a portion of the side surface of the first electrode, a first

surface of intersection with the interior of the flow bore at a first axial location along the flow bore;

f. a second elongate electrode intersecting the flow bore and extending sideways partically therein to provide with a portion of the side surface of the second electrode, a



second surface of intersection with the interior of the flow bore at a second axial location along the flow bore; and

g. the first and second axial locations are between the outlet and the location of intersection for gas and liquid in the flow bore.

5,194,815

DETECTING APPARATUS OF CONDUCTIVE MATERIAL CONTAINED IN STRINGY MATERIAL

Yoshiko Masuo, Tokyo, Japan, assignor to Dipole Electronics Co., Ltd., Tokyo, Japan

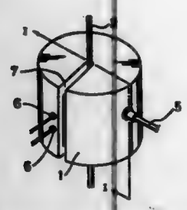
PCT No. PCT/JP91/00107, § 371 Date Sep. 27, 1991, § 102(e) Date Sep. 27, 1991, PCT Pub. No. WO91/11706, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 30, 1991, Ser. No. 768,913

Claims priority, application Japan, Feb. 5, 1990, 2-25563

Int. Cl.[5] G01N *22/00*

U.S. Cl. 324—501 10 Claims



1. A detecting apparatus for detecting conductive materials contained in a stringy material, comprising:

a cylindrical microwave cavity resonator having a vertical center axis, said microwave cavity resonator including:

at least one antenna for generating microwaves, positioned on a circumferential portion of said microwave cavity resonator;

first and second disks for respectively covering first and second end portions of said circumferential portion of said microwave cavity resonator, at least one of said first and second disks having a cylindrical protrusion on a center portion thereof; and

discharge detecting means for detecting a discharge in said microwave cavity resonator induced by a conductive material contained in the stringy material received in said microwave cavity resonator, when said at least one antenna generates microwaves in said microwave cavity resonator;

a vertical notch formed in said microwave cavity resonator, said vertical notch extending from said vertical center axis of said microwave cavity resonator to said circumferential portion of said microwave cavity resonator, said stringy material being insertable into said vertical notch from said circumferential portion of said microwave cavity resonator and being directed by said vertical notch into a central area of the microwave cavity resonator where a high electric field is generated by said protrusion on said at least one of said first and second disks when said antenna generates said microwaves.

5,194,816

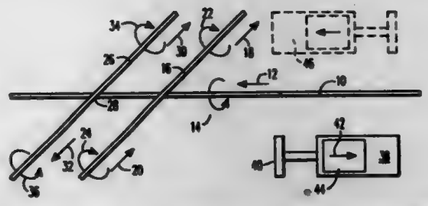
METHOD AND APPARATUS FOR LOCATING ELECTRICAL SHORTS BETWEEN CONCEALED CONDUCTIVE OBJECTS

David S. Steele, Wyoming, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1990, Ser. No. 600,464

Int. Cl.[5] G01R *31/08*

U.S. Cl. 324—529 19 Claims



1. A method of determining the spacial relationship between concealed conductors, said method comprising the steps of:

coupling a first signal to a first elongated concealed conductor, said first signal being coupled to a second elongated concealed conductor;

measuring the relative direction of current of said first signal on said second conductor on opposite sides of said first conductor; and

displaying the relative directions of current of said first signal to indicate that said first and second conductors are in contact with each other if the relative directions of current are opposite or that said first and second conductors are separated from each other if the relative directions of current are the same.

5,194,817

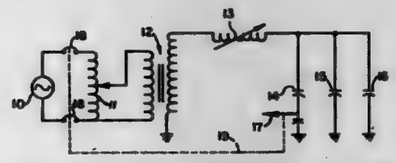
APPARATUS AND METHOD FOR TESTING INSULATION USING A PULSED RESONANT POWER SUPPLY

Barry H. Ward, Lansdale, Pa., assignor to James G. Biddle Co., Blue Bell, Pa.

Filed Jul. 18, 1991, Ser. No. 732,072

Int. Cl.[5] G01R *27/00*

U.S. Cl. 324—544 20 Claims



1. A pulsed resonant test apparatus for the testing of electrical insulation of electrical power apparatus comprising:

a source of ac voltage;

a terminal to be connected to a specimen under test; and

a time variant inductor connected in series between the source of voltage and the test specimen terminal, the inductance of the inductor being selected such that at the selected frequency of operation with anticipated capacitance of the test load and such known auxiliary capacitance as is supplied across the load terminal, as inductance is varied, the system will pass in and out of resonance.

5,194,818

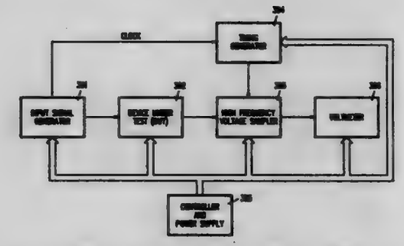
RISETIME AND FALLTIME TEST SYSTEM AND METHOD

Harry J. Scheibner, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 27, 1991, Ser. No. 661,826

Int. Cl.[5] G01R *27/00*

U.S. Cl. 324—617 7 Claims



1. A system for measuring an electronic signal from a device under test (DUT) comprising:

a generator for generating a repetitive input signal of a desired frequency;

means for applying said input signal to one or more input leads of said DUT;

a timing generator comprising:

an input port for receiving said repetitive input signal;

a pulse generator having an input lead connected to said input port of said timing generator and an output lead for providing a repetitive pulse signal in response to said repetitive input signal;

a precision coarse delay circuit having an input lead connected to said output lead of said pulse generator, a digital control port for receiving a coarse delay control signal, and an output lead for providing a coarse delayed pulse signal as a function of said repetitive pulse signal and said coarse delay control signal;

a precision fine delay circuit having an input lead connected to said output lead of said precision coarse delay circuit, additional control port for receiving a fine delay control signal, and an output lead for providing a fine delayed pulse signal as a function of said coarse delayed pulse signal and said fine delay control signal; and

an output port connected to said output lead of said precision fine delay circuit for providing timing signals as a function of said input signal and said coarse and fine delay control signals;

a high frequency voltage sampler having a signal input port coupled to an output lead of said DUT for receiving an output signal of said DUT which is to be measured, a timing signal input port coupled to said output port of said timing generator, and an output port for providing an output signal indicative of the level of said DUT output signal at a sampling time defined by said timing signals from said timing generator; and

means for measuring said output signal of said high frequency voltage sampler.

5,194,819

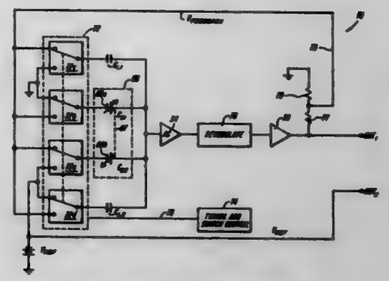
LINEARIZED CAPACITANCE SENSOR SYSTEM

Dennis K. Briefer, Berlin, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Filed Aug. 10, 1990, Ser. No. 565,929

Int. Cl.[5] G01N *27/26*; G01L *9/12*

U.S. Cl. 324—684 12 Claims



1. A capacitive sensing circuit comprising

a first and a second capacitor with one end of each capacitor connected to a junction, at least said second capacitor being a sensing capacitor having a capacitance which varies in accordance with physically-induced change in plate position and which has a non-linear capacitance characteristic,

first switching means for applying signals to non-common ends of said first and second capacitors in alternate switching cycles for developing a flow of charge through said capacitors such that the voltage present at the junction varies in functional dependence on the capacitance values of said first and second capacitors,

a third capacitor having one end coupled to said junction,

second switching means for coupling a signal to the non-common end of said third capacitor to develop a charge effective to substantially null the charge variation due to said non-linear capacitance characteristic of the sensing capacitor, and

feedback means responsive to the voltage at said junction for providing a feedback signal to said first switching means to charge at least said second capacitor and maintain stationary the voltage present at the junction.

5,194,820

FREQUENCY DOUBLING DEVICE

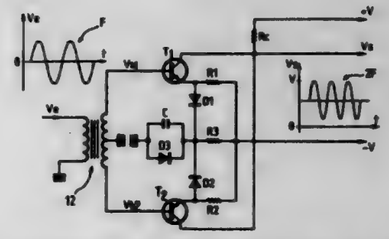
Yves Besson, Paris, and Sylviane Gingasme, Sainte Genevieve des Bois, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Nov. 21, 1991, Ser. No. 795,673

Claims priority, application France, Nov. 23, 1990, 90 14619

Int. Cl.[5] H03B *19/00*; H03L *7/00*

U.S. Cl. 328—20 9 Claims



1. A frequency doubler operating in particular in the microwave range, receiving a periodic input signal V_e of frequency

VOL 1148 ISS 3 MR 16 1993 UMI

F and generating an output signal V_s of frequency 2F, twice that of the input signal, of a type including means for phase shifting two signals V_{b1} and V_{b2} of frequency F to be generated from the input signal V_e, the two signals having a phase difference of 180° between them, characterized by the fact that the frequency doubler includes two amplifiers, T_1 and T_2, both connected to the same output supplying the output signal V_s, each amplifier having zero gain during one half-cycle of the periodic input signal and having means connected to said amplifiers for varying the gain in proportion to the input signal during the other half-cycle of the periodic input signal, the amplifier T_1 receiving the first signal V_{b1} and the amplifier T_2 receiving the second signal V_{b2};

wherein said means for varying the gain include diodes whose dynamic resistance varies in response to the input signal applied to the diodes.

5,194,821

HIGH EFFICIENCY POWER AUDIO AMPLIFIERS COMPRISING TWO AMPLIFIER WITH A SINGLE FEED

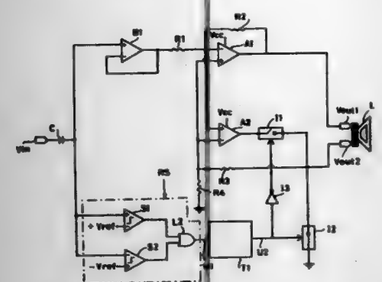
Davide Brambilla, Milan; Guido Brasca, Varese, and Edoardo Botti, Vigevano, all of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Milan, Italy

Filed Nov. 18, 1991, Ser. No. 793,628

Claims priority, application Italy, Nov. 20, 1990, 22114 A/90

Int. Cl.[5] H03F *1/14*

U.S. Cl. 330—51 **18 Claims**



1. A high efficiency power audio amplifier with a single feed, comprising:

a first and a second amplifier block that operate out of phase driven by a single input signal and having their outputs connected to two terminals of a load;

circuit means to disable one of said amplifier blocks when the absolute value of the input signal is below a predetermined threshold level; and

a passive feedback system capable of maintaining the amplifier gain constant when either one or two amplifier blocks are in operation located between said terminals of the load and the inputs of the first and second amplifier blocks.

5,194,822

AUTOMATIC GAIN CONTROL METHOD AND DEVICE FOR A VARIABLE GAIN AMPLIFIER AND APPLICATION THEREOF TO CONTROLLING THE GAIN OF A TUNER, IN PARTICULAR FOR A VIDEOCOMMUNICATION NETWORK

Christophe Barens, Bagneux, and Stéphane Ruggeri, Magny Les Hameaux, both of France, assignors to Alcatel Cit, Paris, France

Filed Aug. 14, 1991, Ser. No. 744,721

Claims priority, application France, Aug. 14, 1990, 90 10331

Int. Cl.[5] H03G *3/30*; H04N *5/52*

U.S. Cl. 330—129 **12 Claims**

1. Automatic gain control method for a variable gain amplifier adapted to maintain the amplifier output level equal to a required value, comprising the steps of:

establishing a relationship in a preliminary calibration phase representing variations in an amplifier gain control signal as a function of variations in input signal levels with a constant output signal level equal to the required value or as a function of variations in output signal levels for a constant input signal level,

performing an operative phase by repeating the following operations:

applying a particular value of the gain control signal to said amplifier,

measuring a corresponding output level, detecting any offset between a result of measuring the corresponding output level and the required value,

determining a corresponding control signal value conditioned by said relationship if any offset is detected and, depending on the mode whereby the relationship is established, either an input level whose offset relative to the corresponding input signal levels given by said relationship at said particular value of the control signal is opposite to said detected offset, or an output level whose offset relative to the required value is opposite to said detected offset,

selectively updating said particular value, according to whether an offset has been detected or not, so that when an offset has been detected, the particular value becomes equal to a value obtained by said determining of said corresponding control signal value, and

said measuring being effected by measurement means that have a non-linear transfer function, said preliminary calibration phase also comprising a step of establishing another relationship representing measured output level variations as a function of the variations of the output signal levels within a predetermined range of variation in the output signal levels about the required value and in that, during the operative phase, said measuring of a corresponding output level comprises determination of measured output level related by said another relationship to the output level.

5,194,823

MODULATION MEANS FOR AN RF POWER AMPLIFIER

Peter Wendt, Augsburg, and Gerold Friedrich, Neufahrn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 3, 1991, Ser. No. 802,047

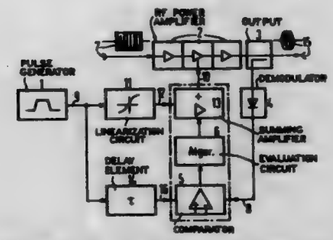
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1990, 4038534

Int. Cl.[5] H03G *3/20*

U.S. Cl. 330—137 **10 Claims**

1. A modulation apparatus for an RF power amplifier having at least one RF power transistor, a small part of an amplified and modulated RF output signal of said RF power amplifier being coupled out and, as a demodulated envelope actual pulse, being compared in a comparator to a rated modulation pulse output by a pulse generator, the comparison result of said comparator used as a modulation control pulse, comprising:

the pulse generator connected to a linearization circuit wherein the rated modulation pulse output by the pulse generator is corrected in accordance with a control characteristic of the RF power amplifier; the rated modulation pulse corrected in the linearization circuit supplied as a control pulse to a first input of a summing amplifier, a second input of the summing amplifier receiving the comparison result from the comparator via a weighting circuit that implements a weighting with a



control algorithm; the rated modulation pulse output by the pulse generator conducted across a delay element to the comparator, the delay time of said delay element corresponding to a signal delay time from the modulation control pulse to the demodulated envelope actual pulse of the RF power amplifier caused substantially by the at least one RF power transistor in the RF power amplifier; and an output signal of the summing amplifier supplied to the RF power amplifier as a modulation control pulse.

5,194,824

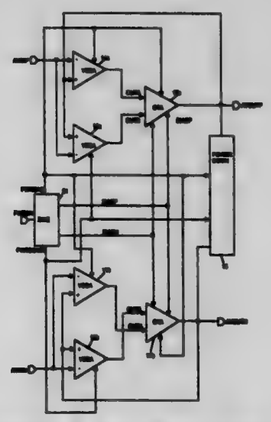
5V RAIL-RAIL UNITY GAIN AMPLIFIER DRIVING HIGH CAPACITIVE LOAD

Jack C. H. Wu, Tempe, and David G. England, Phoenix, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 23, 1992, Ser. No. 824,338

Int. Cl.[5] H03F *3/45, 3/68*

U.S. Cl. 330—255 **3 Claims**



1. A differential unity gain amplifier adapted to be implemented within an application specific integrated circuit having the capability of driving a capacitive load of up to approximately 200 nanofarads comprising:

a) a first pair of very wide common mode range differential amplifier means for coupling to a first component of an input differential analog signal;

b) a second pair of very wide common mode range differential amplifier means for coupling to a second component of said input differential analog signal;

c) a first operational transconductance amplifier means coupled to respective outputs of said first pair of very wide common mode range differential amplifier means;

d) a second operational transconductance amplifier means coupled to respective outputs of said second pair of very wide common mode range differential amplifier means, said first and second operational transconductance amplifier means for amplifying said respective outputs producing an output current for driving a capacitive load;

e) biasing means for generating positive and negative biasing signals as inputs to said first and second operational transconductance amplifier means, said positive and negative biasing signals adapted to minimize output variations of said first and second operational transconductance amplifier means due to power supply variations and process variations.

5,194,825

PROTECTIVE CIRCUIT FOR THE INPUT TRANSISTOR OF A RECEPTION AMPLIFIER IN NUCLEAR MAGNETIC RESONANCE SYSTEMS

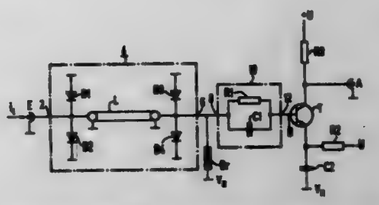
Klaus Zametzer, Forchheim, and Markus Vester, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,645

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1990, 4024165

Int. Cl.[5] H03F *1/52*

U.S. Cl. 330—298 **6 Claims**



1. A reception amplifier in a nuclear magnetic resonance system, comprising:

a high-frequency input amplifying and rectifying element having a control input and a controlled path; and

protective circuit means, connected to said control input of said high-frequency input amplifying and rectifying element by said controlled path, for shifting a voltage across said controlled path of said high-frequency input amplifying and rectifying element into an inhibit range for said amplifying and rectifying element only during a high-frequency transmission pulse, wherein said voltage is produced by rectifying a portion of said high-frequency transmission pulse.

5,194,826

CIRCUITRY ARRANGEMENT FOR THE ELIMINATION OF SPURIOUS RESPONSE IN A RADIO TELEPHONE RECEIVER

Risto Huuska, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Apr. 12, 1991, Ser. No. 699,302

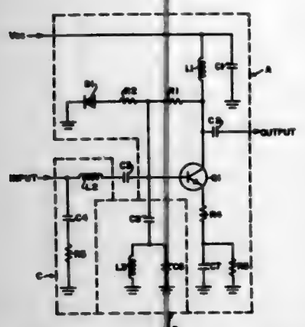
Claims priority, application Finland, Apr. 27, 1990, 902149

Int. Cl.[5] H03F *3/191*

U.S. Cl. 330—302 **4 Claims**

1. A circuit arrangement for suppressing frequency components causing spurious response in an intermediate-frequency amplifier, the amplifier producing not only an input signal frequency but also harmonic frequencies of this frequency, in which case some harmonic frequency of a frequency compo-

nent causing spurious response is the same as the intermediate frequency, comprising a filter circuit in front of the amplifier between a signal path and a circuit ground, said filter circuit including components selected to be in series resonance at the

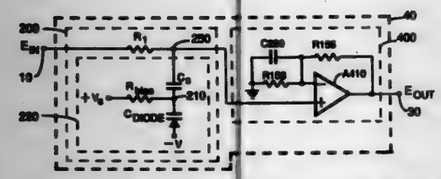


frequency which causes spurious response so that such signal is strongly attenuated, and components selected to be in parallel resonance at the intermediate frequency so the attenuation of a signal of this intermediate frequency is slight.

5,194,827
VOLTAGE CONTROLLED HIGH FREQUENCY EQUALIZATION

Jason A. Kowalik, Broomfield, and Michael C. Ward, Lakewood, both of Colo., assignors to Ampex Systems Corporation, Redwood City, Calif.

Filed Apr. 10, 1991, Ser. No. 683,224
Int. Cl.[5] H03F *3/191*
U.S. Cl. 330—304 **2 Claims**

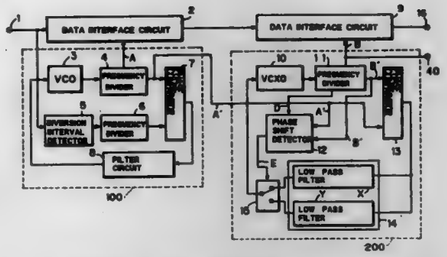


1. Apparatus for equalizing high frequency video signals, the apparatus comprising:
an input terminal adapted to receive a video signal to be equalized;
an output terminal adapted to provide an equalized video signal;
a resistor-capacitor network for feeding back the equalized video signal to one input of an operational amplifier;
a voltage controlled network responsive to the video signal to be equalized (a) for changing the frequency response characteristic of the apparatus and (b) for equalizing the video signal to be equalized by algebraically adding the video signal to be equalized with a bias voltage signal and by adjusting an impedance of the voltage controlled network in response to the algebraically added video and bias voltage signals and (c) for coupling the received video signal to be equalized to a second input of the operational amplifier and
wherein the voltage controlled network comprises circuit impedance means responsive to the video signal to be equalized for mitigating distortions to the frequency response characteristic of the video signal to be equalized and
wherein the circuit impedance means comprises a plurality of varactor diode circuit elements whose circuit impedance is altered in response to the video signal to be equalized when the video signal to be equalized is applied thereto.

5,194,828
DOUBLE PLL DEVICE

Hisao Kato, and Kanji Mizuno, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1991, Ser. No. 788,276
Claims priority, application Japan, Mar. 29, 1991, 3-65769
Int. Cl.[5] H03L *7/095, 7/107, 7/07;* H03D *3/24*
U.S. Cl. 331—1 A **9 Claims**



1. A double PLL device comprising:
a first PLL circuit receiving an input signal and producing a first signal in synchronism with the input signal; and
a second PLL circuit receiving said first signal and producing a second signal in synchronism with the first signal,
said second PLL circuit including:
a first phase comparator for comparing a phase of said first signal with a phase of said second signal;
a first filter for passing only a predetermined frequency component included in a comparison result outputted from said first phase comparator through;
a phase shift detector for detecting a phase shift between said first signal and said second signal and outputting a detection result corresponding to the phase shift;
cut-off frequency variation means for varying a cut-off frequency of said first filter in response to the detection result of said phase shift detector; and
first signal production means receiving an output of said first filter as a control signal and producing said second signal.

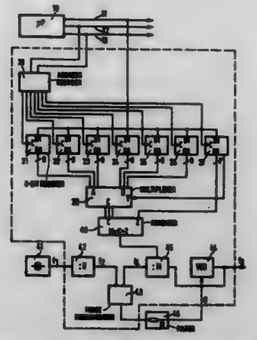
5,194,829
RADIO SET WITH EASILY SELECTED OSCILLATOR FREQUENCY

Peter Schöffel, Kirchrüsselbach, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 5, 1991, Ser. No. 755,386
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1990, 4028565
Int. Cl.[5] H03L *7/18;* H04B *1/06*
U.S. Cl. 331—1 A **10 Claims**

1. A radio set comprising an oscillator with a phase-locked loop, and at least one divider incorporated in said loop, said divider comprising means for applying a binary value for setting a variable division ratio, said ratio being selectable as a value requiring a given number of binary digits to represent said value,
characterized in that said means for applying consists of:
a bank of binary registers each having a length less than said given number,
means for storing respective binary numbers in each of said registers,
a concatenator, having an output, for selectively combining the binary numbers stored in a plurality of said registers,

an adder having an output, for adding at least a first portion of the binary number in a first of said registers to said

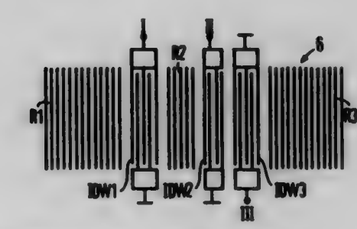


concatenator output, said adder output being said division ratio, and
a multiplexer controlling said concatenator.

5,194,830
SURFACE WAVE RESONATOR SYSTEM HAVING ADDITIONAL TRANSDUCER BETWEEN REFLECTORS

Bernd Fleischmann, Munich, Fed. Rep. of Germany, assignor to Siemens Matsushita Comp. GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 15, 1991, Ser. No. 792,377
Claims priority, application European Pat. Off., Nov. 30, 1990, 90123007.8
Int. Cl.[5] H03B *5/00*
U.S. Cl. 331—107 A **8 Claims**

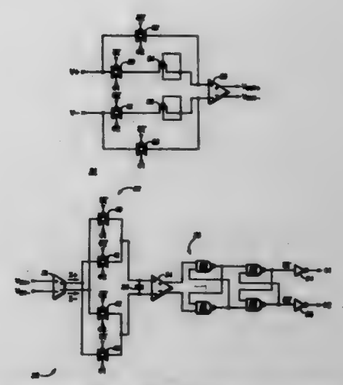


1. A surface wave resonator, comprising:
a substrate of piezoelectric material;
two reflectors on one substrate side and input and output transducers situated between the reflectors;
the surface wave resonator being expanded to form a surface wave resonator having three electrical gates by providing an additional transducer between the two reflectors, the additional being positioned directly adjacent the output transducer without a reflector therebetween; and
at least one additional reflector means for reflecting only a fraction of incident surface waves being arranged between two the transducers.

5,194,831
FULLY-DIFFERENTIAL RELAXATION-TYPE VOLTAGE CONTROLLED OSCILLATOR AND METHOD THEREFOR

H. Spence Jackson, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

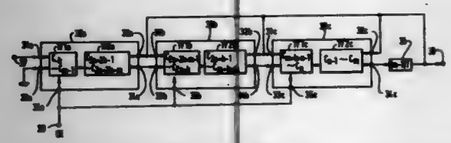
Filed Feb. 18, 1992, Ser. No. 835,835
Int. Cl.[5] H03B *5/24, 3/023*
U.S. Cl. 331—111 **11 Claims**



1. A relaxation-type voltage controlled oscillator comprising:
an operational transconductance amplifier for receiving an input voltage and for providing first and second differential currents respectively to first and second output terminals in response thereto;
a charging capacitor having first and second terminals;
means for coupling either, said first output terminal of said operational transconductance amplifier to said first terminal of said charging capacitor and said second output terminal of said operational transconductance amplifier to said second terminal of said charging capacitor, or said first output terminal of said operational transconductance amplifier to said second terminal of said charging capacitor and said second output terminal of said operational transconductance amplifier to said first terminal of said charging capacitor, selectively in response to first and second output signals of the relaxation-type voltage controlled oscillator,
a comparator having first and second inputs respectively coupled to said first and second terminals of said charging capacitor, for providing third and fourth output signals in response thereto, said comparator characterized as having a predetermined hysteresis; and
means for latching said third and fourth output signals to provide said first and second output signals of the relaxation-type voltage controlled oscillator.
10. A comparator with hysteresis, comprising:
a first transmission gate having a first terminal for providing a positive input terminal of the comparator, a second terminal, and operative in response to a first output signal;
a second transmission gate having a first terminal for providing a negative input terminal of the comparator, a second terminal, and operative in response to a second output signal;
a third transmission gate having a first terminal coupled to said first terminal of said first transmission gate, a second terminal, and operative in response to said second output signal;
a fourth transmission gate having a first terminal coupled to said first terminal of said second transmission gate, a second terminal, and operative in response to said first output signal;

a first P-channel transistor having a source coupled to said second terminal of said first transmission gate, a gate, a drain coupled to said gate, and a bulk coupled to said drain;
a second P-channel transistor having a source coupled to said second terminal of said second transmission gate, a gate, a drain coupled to said gate, and a bulk coupled to said drain; and
a comparator having a positive input terminal coupled to said drain of said first P-channel transistor, a negative input terminal coupled to said drain of said second P-channel transistor, a positive output terminal for providing a third output signal, and a negative output terminal for providing a fourth output signal,
said first and second output signals respectively proportional to said third and fourth output signals.

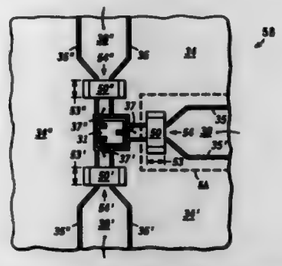
5,194,832
TRANSVERSAL EQUALIZER
Hiroyuki Iga, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 16, 1991, Ser. No. 745,712
Claims priority, application Japan, Aug. 17, 1990, 2-216643
Int. Cl.[5] H03G *11/04*; H04B *3/04*
U.S. Cl. 333—18 **3 Claims**



1. A transversal equalizer comprising:
a first transversal equalizer unit which has a specified number of rear taps and receives first input signals through a first input terminal and outputs these signals as cascaded signals after equalizing their waveforms;
a second transversal equalizer unit which receives the output signals from the first transversal equalizer unit and also receives second input signals through a second input terminal, and outputs an equalized signal derived from the second input signals;
delay means which receives output signals from the second transversal equalizer unit and delays them based on the specified number of rear taps; and
selecting means which selectively outputs the output from either the second transversal equalizer unit or the delay means via an output terminal.

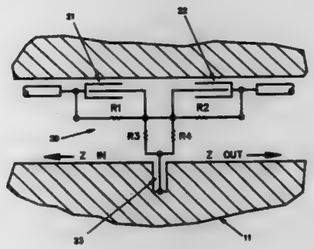
5,194,833
AIRBRIDGE COMPENSATED MICROWAVE CONDUCTORS
Richard M. Dougherty, Scottsdale; Ronald F. Kielmeyer, Jr., Tempe; Michael Dydyk, and Lyle A. Fajen, both of Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 15, 1991, Ser. No. 792,568
Int. Cl.[5] H01P *5/08*
U.S. Cl. 333—33 **14 Claims**

1. A microwave apparatus for more efficiently coupling signals to a semiconductor device, comprising:
a substrate having an insulating surface;
first, second and third conductors disposed on the surface to form a first microwave transmission line, wherein the first conductor lies between and is laterally spaced apart from the second and third conductors, and wherein the first conductor has a first region of a first width and a first characteristic impedance extending from a first end of the first conductor toward a second region of the first conductor of a second width greater than the first width and a second characteristic impedance;
a semiconductor device proximate to the first end of the first conductor and having a terminal presenting a predetermined input impedance electrically connected thereto; and
a fourth conductor forming an airbridge extending between the second and third conductors over the first region of



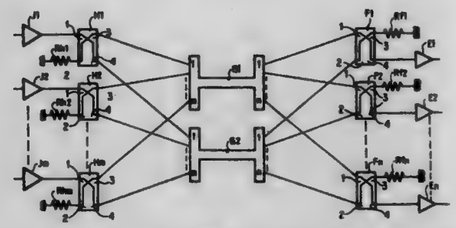
the first conductor, wherein the fourth conductor has a length in a direction of propagation of signals along the first conductor sufficient to reduce the first characteristic impedance to more closely match the predetermined input impedance of the semiconductor device, thereby reducing insertion loss when coupling signals thereto.

5,194,834
APPARATUS FOR A MATCHED AND ADJUSTABLE MICROWAVE FREQUENCY SELECTIVE ATTENUATOR UNIT
Helmut Bacher, Newark, Calif.; Clyfton W. Bourne, Jr., Mesa, and Bradley Knott, Phoenix, both of Ariz., assignors to Semflex, Inc., Mesa, Ariz.
Filed Jun. 13, 1991, Ser. No. 714,888
Int. Cl.[5] H03H *7/24*; H01P *1/22*
U.S. Cl. 333—81 A **18 Claims**



1. A carry through attenuator unit for use in a microwave transmission line, said attenuator unit comprising:
a fixed attenuator component coupled between portions of a center conductor of said transmission line, said fixed attenuator component including a resistive attenuator element, said fixed component having at least one open circuit transmission line resonator unit and at least one short circuited transmission line resonator unit coupled thereto, said fixed attenuator component determining a frequency response of said attenuator unit; and
at least one adjustable attenuator component having replaceable resistive elements, said adjustable component detachably coupled to said transmission line, said adjustable attenuator component providing incremental adjustment to said frequency response. r

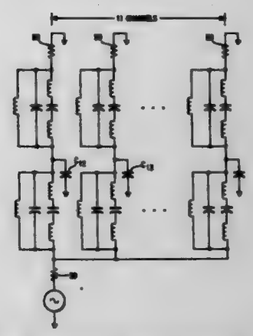
5,194,835
ENERGY COUPLING DEVICE
Michel Destrade, Domont, France, assignor to Thomson-LGT Laboratoire General des Telecommunications, Conflans Ste Honorine, France
Continuation of Ser. No. 549,242, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 284,612, Dec. 15, 1988, abandoned.
This application Dec. 31, 1991, Ser. No. 815,849
Claims priority, application France, Dec. 18, 1987, 62-17710
Int. Cl.[5] H01P *5/18*
U.S. Cl. 333—109 **1 Claim**



1. A device for the coupling of energies, between m energy sources, wherein the m energy sources are equipotential and in equiphase and where m is a positive whole-number value, and n users, where n is a positive whole-number value, and where m+n is greater than 2, for delivering equipotential and equiphase energy to the n users, comprising:
m first and n second 90-degree, 3 dB hybrid circuits, each having a respective first, a second, a third and a fourth port, the first and the second ports as well as the third and the fourth ports of each hybrid circuit forming pairs of conjugated ports;
m+n balancing loads respectively associated with the m+n hybrid circuits;
a first and a second distributor each with m inputs and n outputs, the two distributors being equipotential and in equiphase, and having the same inputs/outputs phase shift;
the m first circuits having their m first ports coupled respectively to the m sources, their m second ports connected respectively to the m loads, their m third ports connected respectively to the m inputs of the first distributor, their m fourth ports connected respectively to the m inputs of the second distributor; and
the n second circuits having their n first ports respectively connected to the n outputs of the first distributor, their n second ports respectively directly connected to the n outputs of the second distributor, their n third ports respectively connected to the n loads and their n fourth ports respectively connected to the n users.

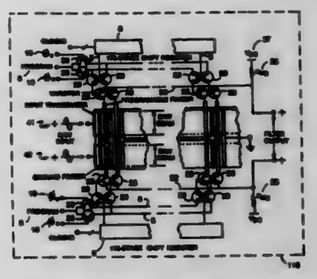
5,194,836
THIN FILM, MICROWAVE FREQUENCY MANIFOLDED FILTER BANK
Christopher R. Vale, Elk Ridge; Dale E. Dawson, and David M. Krafcsik, both of Glen Burnie, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 499,865, Mar. 26, 1990, abandoned.
This application Aug. 20, 1991, Ser. No. 750,694
Int. Cl.[5] H03H *9/205, 9/70, 9/56*
U.S. Cl. 333—133 **5 Claims**

1. A thin film, microwave frequency manifolded filter bank comprising:
a semiconductor substrate having a plurality of holes disposed therein;
a dielectric membrane positioned on said substrate and over the holes; and
a plurality of resonators respectively disposed on a portion of said dielectric membrane over corresponding ones of the holes, each of said resonators comprising
a first electrode disposed on said dielectric membrane;
a piezoelectric film disposed on said first electrode; and
a second electrode disposed on said piezoelectric film;
a corresponding compensating inductor connected in parallel between the first and second electrodes of each said resonator;



said plurality of resonators being arranged in a plurality of rows such that resonators in each row have said first and second electrodes electrically connected such that resonators of each row are in cascade, and such that adjacent rows of cascaded resonators are electrically connected in parallel such as to realize said manifold filter bank.

5,194,837
MULTI-TAP PROGRAMMING CIRCUIT FOR TRANSVERSAL FILTERS
Daniel L. Smythe, Jr., Carlisle, and Jonathan B. Green, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 324,307, Mar. 16, 1989, abandoned.
This application Nov. 20, 1991, Ser. No. 795,301
Int. Cl.[5] H03H *15/00*
U.S. Cl. 333—166 **17 Claims**



1. A first programmable tap-weighting apparatus which is an integrated circuit in a monolithic substrate, said substrate being at a datum voltage, for weighting and summing the outputs of a first tapped delay line, said first delay line accepting a time-varying voltage at a delay line input terminal and producing time-delayed replicas of said input terminal voltage at a plurality of delay line output terminals, comprising:
a plurality of single-gate field effect transistors, each field effect transistor comprising first and second terminals and only one gate terminal, wherein:
the first terminal of each respective field effect transistor is connected to a respective delay line output,
the second terminal of each respective field effect transistor is connected to a respective electrical summing input terminal of a first electrical summing mechanism, said summing mechanism generating an output on a summing

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output terminal proportional to the sum of the voltages on all of said summing input terminals measured relative to said datum voltage, and

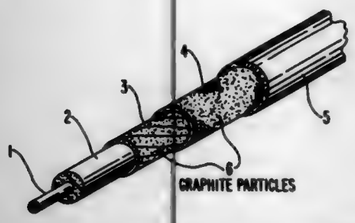
the gate terminal of each respective field effect transistor is connected to a respective programming output terminal of a programming means, said programming means generating a plurality of variable weighting voltages on said programming output terminals relative to said datum voltage.

5,194,838

LOW-TORQUE MICROWAVE COAXIAL CABLE WITH GRAPHITE DISPOSED BETWEEN SHIELDING LAYERS

Bruce R. Cobb, Phoenix, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 26, 1991, Ser. No. 797,851
Int. Cl.[5] H01P *3/06*
U.S. Cl. 333—243 **7 Claims**



1. A microwave coaxial cable having low resistance to torque comprising:

(a) a metal center conductor surrounded by a polymeric dielectric insulation;

(b) a layer of conductive metal shielding surround said dielectric insulation;

(c) a layer of braided metal shielding surrounding said conductive shielding; and

(d) a layer of protective polymeric jacketing surrounding said braided shielding;

(e) particles of graphite being positioned between the conductive metal shielding layer and the braided shielding layer on metal surfaces thereof.

5,194,839

ELECTROMAGNETIC RELAY ASSEMBLY WITH TEST ACTUATOR

Katsumi Tanaka, Yamaga, Japan, assignor to Omron Corporation, Kyoto, Japan

Filed May 21, 1992, Ser. No. 886,244
Claims priority, application Japan, May 21, 1991, 3-35809[U]
Int. Cl.[5] H01H *51/22*
U.S. Cl. 335—78 **4 Claims**

1. An electromagnetic relay assembly which comprises:

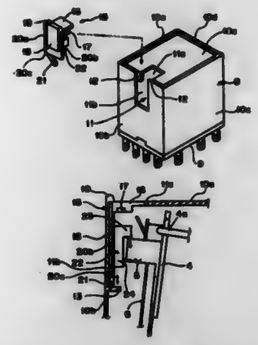
a relay unit having a generally elongated contact carrier member supported for pivotal movement about a point of pivot and normally biased in one direction;

a casing encloseing the relay unit and including at least first and second wall members angled relative to each other, said casing having a corner opening defined at a corner region between the first and second wall members, said corner opening being delimited by a first open area of defined in the first wall member and a second open area defined in the second wall member;

a covering adapted to close the corner opening in the casing and including first and second lids angled relative to each other at an angle equal to the angle delimited between the first and second wall members, said first and second lids covering the first and second open areas, respectively, when the covering is mounted on the casing to close the corner opening, at least said second lid being deformable;

either of said first and second wall members having guide members for slidably receiving the second lid in a first direction generally parallel to the second wall member; and

actuating means secured to the second lid of the covering for driving the contact carrier member in a direction counter



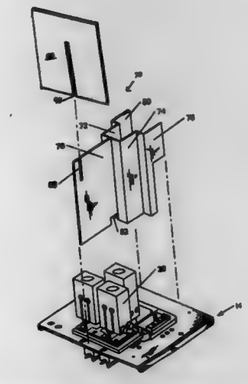
to said one direction when an external pushing force is applied to the second lid to deform said second lid and also for driving the contact carrier member in said direction counter to said one direction when an application of an external pushing force is applied to said first lid.

5,194,840

CIRCUIT BREAKER PHASE CURRENT BARRIER

Louis M. Frutnoso, Newington; Louis A. Rosen, Hartford, and Timothy W. Webber, Bristol, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 22, 1992, Ser. No. 872,195
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 **9 Claims**



1. A phase current barrier for molded case circuit breakers comprising in combination:

an electrically-insulated base;

a pair of electrically-insulated walls joined to said base and extending co-planar therewith; and

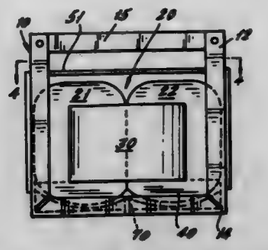
a pair of off-set flanges extending from said walls, said flanges adapted for attachment to one end of a molded case circuit breaker, said base, walls and flanges being integrally-formed in a single unit, said flanges comprising edges coextensive with corresponding slots formed within outer extensions of a molded case circuit breaker enclosure, said edges being arranged for press-fit attachment within said coextensive slots.

5,194,841

SUPPORT STRUCTURE FOR WOUND TRANSFORMER CORE

Dudley L. Galloway, and Stanley B. Linzenbardt, both of Jefferson City, Mo., assignors to ABB Power T&D Company, Inc., Blue Bell, Pa.

Filed Dec. 19, 1990, Ser. No. 629,830
Int. Cl.[5] H01F *27/26, 27/30*
U.S. Cl. 336—92 **29 Claims**



1. A support structure for and including a power transformer; said power transformer comprising, at least one ring-shaped magnetic core having at least one elongated leg portion for receiving at least one transformer coil; a transformer coil structure encircling said at least one elongated leg portion of said at least one magnetic core; a support frame for supporting said magnetic core and said transformer coil; said support frame having a horizontal section and having first and second vertically upstanding sections disposed in a common plane and extending from the ends of said horizontal section; said at least one magnetic core being disposed between said vertically extending sections in said support frame, the axis of said at least one core being generally perpendicular to said plane of said support frame; at least one pressure plate extending from said horizontal section of said support frame and engaging the bottom of said transformer coil and supporting said transformer coil away from the bottom interior surface of said at least one ring shaped magnetic core, thereby to reduce internal stress in said magnetic core due to the weight of said transformer coil; the improvement which comprises at least one elongated flexible banding strap which is fixed relative to respective upper portions of said first and second vertically extending sections and which extends under the bottom of said at least one magnetic core with a sufficient tension to at least partly support the weight of said at least one magnetic core and to remove at least a portion of the weight of said at least one magnetic core from the top of said transformer coil.

5,194,842

THERMOSTAT DEVICE

Eric F. Lee, Granada Hills; Benjamin A. Hensley, deceased, late of Sun Valley, and by Lawrence S. Cohen, legal representative, Los Angeles, all of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 18, 1989, Ser. No. 452,537
Int. Cl.[5] H01H *37/52, 37/64*
U.S. Cl. 337—373 **6 Claims**

1. A thermostat device comprising;

a base of insulating material;

a post secured in said base;

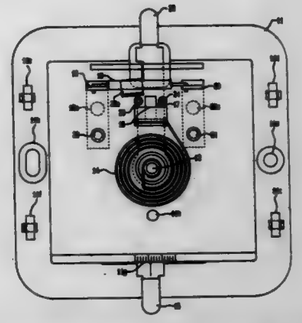
a spiral bimetal, one end mounted on said post and the other end movable between two fixed points in response to ambient temperature;

a magnet mounted on said other end and movable between said two fixed points;

electrical terminals mounted in said base;

a reed switch mounted in said terminals, said reed switch being positioned to be activated by said magnet when said magnet is at one of said two fixed points;

an adjusting lever secured to said post for adjusting the temperature response of said bimetal; and



an off lever being mounted on said base and having a magnetic shunt portion movable to prevent activation of said reed switch by said magnet.

5,194,843

AUTOMATIC VEHICULAR TIMING AND SCORING SYSTEM

R. David Jones, Fort Worth, and Arthur F. Sweeney, Dallas, both of Tex., assignors to Progressive Concepts, Inc., Fort Worth, Tex.

Filed Jun. 24, 1991, Ser. No. 719,850
Int. Cl.[5] G08B *23/00*; A63F *9/14*
U.S. Cl. 340—323 R **13 Claims**

13. A method for tracking plural vehicles traversing a track, comprising the steps of:

a) providing a transmitter means on each vehicle, and a receiving antenna on said track;

b) transmitting a signal with each transmitter means, each transmitted signal having a unique frequency with respect to said other transmitted signals;

c) driving said vehicles around said track so as to pass adjacent to said receiving antenna, wherein a received signal is produced in said receiving antenna by each of said transmitter means passing adjacent to said receiving antenna;

d) filtering each of said received signals so as to remove those frequencies that are different from said respective received signal

e) filtering each of said received signal so as to remove noise signals having the same frequency as said respective received signal by rejecting those signals having a temporal

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duration that is less than a predetermined minimum temporal duration and passing those signals having a temporal duration that is more than said predetermine duration;

f) recording the occurrence of said respective passed signals so as to track the lap number of said respective vehicles and recording the time of occurrence of said respective passed signals so as to track the elapsed time of said respective vehicles.

5,194,844

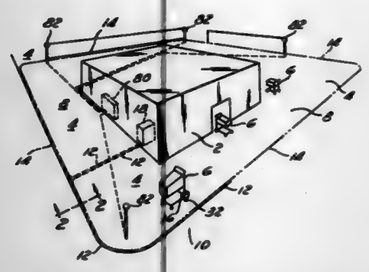
VEHICLE THEFT PROTECTION DEVICE

Arthur W. Zelda, P.O. Box 2291, Valley Center, Calif. 92082

Continuation-in-part of Ser. No. 254,545, Oct. 6, 1988, abandoned. This application Sep. 19, 1991, Ser. No. 762,902

Int. Cl.[5] B60T *7/16*

U.S. Cl. 340—426 19 Claims



1. A system for preventing theft of a vehicle intended to be moved about freely within a prescribed area but not to be removed from the prescribed area, comprising:

(a) means for producing a magnetic field along perimeter of the prescribed area, wherein said vehicle is capable of movement throughout the prescribed area, the field being polarized in a direction locally parallel to the perimeter and having an asymmetric time-variant waveform;

(b) means on the vehicle for detecting a received magnetic field, comprising:

(i) sensor means;

(ii) amplifier means interconnected to the sensor means for producing a time-variant signal proportional to the received magnetic field; and

(iii) signal generator means for receiving the time variant signal and for producing a control signal in response to the time-variant signal, the control signal having a first level when the vehicle is located within the prescribed area, and a second level when the vehicle is located outside the prescribed area, the first level and the second level being on opposite sides of a control threshold level; and

(c) means for inhibiting movement of the vehicle when the control signal is at the second level.

5,194,845

COMBINATION U-LOCK AND SECURITY LOOP WITH TAMPER ALARM

James B. Sirmon, Surbiton, and Ivan F. S. Foti, Hounslow, both of England, assignors to Malcolm I. Weaver, Middlesex, Great Britain

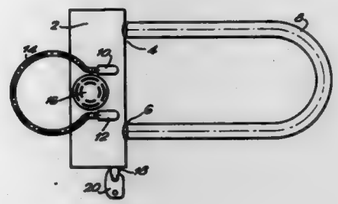
Filed Aug. 13, 1990, Ser. No. 566,542

Claims priority, application European Pat. Off., Aug. 16, 1989, 89308298.2

Int. Cl.[5] G08B *13/12*; B62H *5/20*

U.S. Cl. 340—427 11 Claims

1. A portable security lock of the "U-bar" type, comprising a rigid "U" or "C" shaped security bar; a flexible security loop; and a generally tubular cross member having pairs of apertures adapted to receive the ends of the security bar and security loop; the cross member also comprising a rotatable barrel member having a plurality of keyhole shaped cut-outs adapted to cooperate with suitable shaped ends of the security bar and security loop, each said cut-out being adapted to receive a correspondingly shaped end in a first position of the barrel member, and the barrel member then being rotatable to a



second position in which the shaped end is locked into the cross member; battery housing means in said cross member; and retaining means being arranged beneath one of said apertures so as to be inaccessible while said security bar or loop is mounted in said cross member.

5,194,846

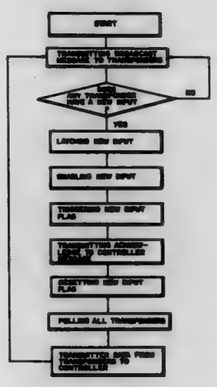
COMMUNICATION SYSTEM CAPABLE OF BROADCAST MESSAGING AND TRANSPONDER POLLING

Tim Lee, Owen Sound; Don Becker, Tara; Cathy Robins; Leo Mullins, both of Owen Sound; Bill Oliver, Tara, and Mike Slack, Owen Sound, all of Canada, assignors to General Signal Corporation, Stamford, Conn.

Filed May 7, 1991, Ser. No. 696,497

Int. Cl.[5] G08G *26/00*

U.S. Cl. 340—505 8 Claims



1. A communication system in which a controller, which provides timing, is coupled over a communication path with

two or more transponders, at least two of which transponders have different addresses, said system comprising:

means for periodically transmitting a broadcast message simultaneously to all of said transponders;

means for transmitting an acknowledge message, responsive to receipt of said broadcast message, from one of said transponders; to said controller responsive to a new input existing at said one of said transponders;

means for polling said transponders by sequentially transmitting signals corresponding to their individual addresses using a polling technique which incorporates time periods to allow communication between the controller and a selected transponder, wherein said means for polling is activated to poll all of the transponders only if at least said one of the transponders has acknowledge the broadcast message by transmitting an acknowledge message to said controller; and

means for polling high priority transponders first by starting the polling at address zero, said high priority transponders having addresses, which are the lowest of addresses assigned to transponders.

5,194,847

APPARATUS AND METHOD FOR FIBER OPTIC INTRUSION SENSING

Henry F. Taylor, and Chung E. Lee, both of College Station, Tex., assignors to Texas A & M University System, College Station, Tex.

Filed Jul. 29, 1991, Ser. No. 737,449

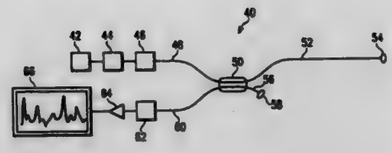
Int. Cl.[5] G08B *13/10, 13/18*

U.S. Cl. 340—557 35 Claims

1. Apparatus for sensing intrusion into a predefined perimeter, comprising:

means for producing a plurality of coherent light pulses having a spectral width less than $0.1T_1$, where T_1 is the width of each coherent light pulse;

an optical sensing fiber having a first predetermined length receiving at least a portion of said plurality of coherent light pulses and being positioned along said predefined



perimeter, said optical sensing fiber producing a backscattered light in response to receiving said plurality of coherent light pulses;

an optical receiving fiber arranged to receive said backscattered light from said optical sensing fiber; and

detecting means coupled to said optical receiving fiber for receiving said backscattered light and producing a signal indicative of an intrusion in response to a perturbation in said backscattered light.

5,194,848

INTRUSION DETECTION APPARATUS HAVING MULTIPLE CHANNEL SIGNAL PROCESSING

Reginald J. Kerr, British Columbia, Canada, assignor to Hitek-Protek Systems Inc., Delta, Canada

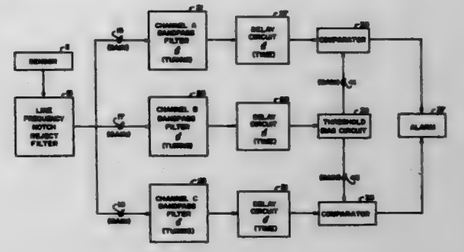
Filed Sep. 9, 1991, Ser. No. 756,210

Int. Cl.[5] G08B *13/00*; H04B *1/06*

U.S. Cl. 340—566 7 Claims

1. An improvement in intrusion detection apparatus having at least one sensor for sensing movement, each sensor producing a vibration-sensitive output signal representing such movement, the improvement comprising:

a plurality of bandpass filters each receiving at least one such vibration-sensitive output signal and passing signal components thereof within a selected discrete frequency range;



a comparator for comparing the amplitude of the signal components passed by and received from at least one of said bandpass filters against a threshold amplitude; and

a threshold bias adjustment means for adjusting said threshold amplitude, said adjustment means connected to and receiving the signal components passed by at least another of said bandpass filters whose output amplitude is used by said adjustment means to adjust the threshold amplitude;

said comparator providing an affirmative output signal when the amplitude of the signal components received exceeds the threshold amplitude.

5,194,849

Patent Not Issued For This Number

5,194,850

PROCESS FOR METERING ELECTRICAL ENERGY AND DEVICE FOR CARRYING OUT THE PROCESS

Pierre Bourrieres, Cahors, and Jean-Paul Berry, Toulouse, both of France, assignors to Manufacture d'Appareillage Electrique de Cahors, Cahors, France

PCT No. PCT/FR90/00571, § 371 Date Apr. 3, 1991, § 102(e) Date Apr. 3, 1991, PCT Pub. No. WO91/02255, PCT Pub. Date Feb. 21, 1991

PCT Filed Jul. 27, 1990, Ser. No. 671,703

Claims priority, application France, Aug. 4, 1989, 89 10549

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—660 21 Claims

1. A process for metering electrical energy passing at a specific point of a single-phase network, comprising acquiring

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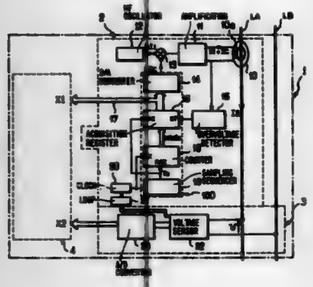
current and voltage information at the said network point and processing the said information in order to generate an information item on the measurement of electrical energy, wherein the acquisition of the current information comprises the following steps:

A/ the introduction into a winding (10*a*) of a magnetic circuit (10) surrounding one (LA) of the lines (LA, LB) of the network of a current (I1+Ic) substantially proportional to the sum of a modulating current (kI1) of a predetermined high frequency and of a compensating current (kIc),



B/ the detection at said winding (10*a*) of an overvoltage at the said predetermined high frequency, the detection of an overvoltage leading to an immediate acquisition of the said compensating current (kIc) as a measure of the current in the said line, the said compensating current (kIc) being controlled in such a way that the current introduction step A/leads systematically to an overvoltage detection.

5,194,851
STEERING CONTROLLER

Calvin J. Krasing, Valley City, and Jeffrey S. Milender, Jamestown, both of N. Dak., assignors to Case Corporation, Racine, Wis.

Filed Feb. 21, 1991, Ser. No. 658,962
Int. Cl.[5] G08B *21/00*; B62D *5/06*; B60Q *1/00*
U.S. Cl. 340—686 **16 Claims**

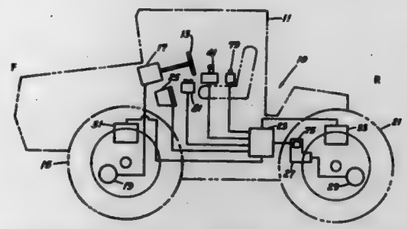
1. An improved vehicular steering controller for controlling the angular position of a first set of vehicle wheels as a function of the angular position of a second set of wheels and including:

a computing section having embedded therein reference data representing the centered position of the first set of wheels;

a visual display coupled to the computing section, said display being of the alpha-numeric type for displaying a signal representing one of at least two operational modes, one of which is for calibrating the controller; and,

a visual indicator coupled to the computing section, said indicator being of the "stepped" quasi-analog type for indicating the approximate magnitude of angular displacement of the first set of wheels from the centered position, and wherein:

the first set of wheels is angularly positioned by at least one hydraulic cylinder coupled to a control valve operable over an input power range; and,



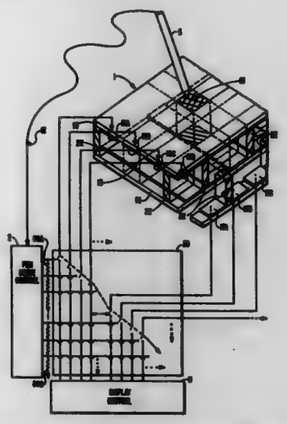
the controller incorporates a setup sequence to operate the control valve in sequential increments of increasing input power until a wheel movement signal is produced;

whereby an operator of the vehicle is apprised of the approximate angular position of the first set of wheels and of the operational mode selected.

5,194,852
ELECTRO-OPTIC SLATE FOR DIRECT ENTRY AND DISPLAY AND/OR STORAGE OF HAND-ENTERED TEXTUAL AND GRAPHIC INFORMATION

Edward S. More, 201 Ocean Ave., #PH16P, Santa Monica, Calif. 90402, and John C. Aiken, 1389 E. 11400 S., Sandy, Utah 84092

Continuation-in-part of Ser. No. 936,567, Dec. 1, 1986, Pat. No. 4,839,634. This application Jun. 16, 1989, Ser. No. 368,241
Int. Cl.[5] G09G *3/00*
U.S. Cl. 340—712 **20 Claims**



1. A portable interactive electronic device for performing at least one of the functions of writing and graphics, comprising:

input pen means configured to be held in the hand of a user;

non-mechanical, non-emissive display means comprising a plurality of display elements including display electrode means for operating electro-optic material located between the display electrode means, the display means being operable in two modes, including a first mode in which the display electrode means is activated to excite the electro-optic material therebetween for displaying textual and/or graphical information and a second mode in which the display electrode means is electrically coupled with the input pen means manipulated by the user

proximate the display means along a path to form information in one of the forms of text characters and graphics;

means for applying a display drive signal to the display electrode means in the first mode and for applying a relatively high-frequency signal to the display electrode means in the second mode;

pen sense control means associated with the display means and responsive to electrical coupling of the display electrode means with the input pen means in the second mode for producing position signals corresponding to positions of the input pen means with respect to the display means as the user manipulates the input pen means along the path; and

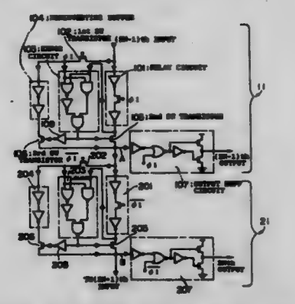
display control means connected to the pen sense control means and display means and responsive to the position signals for energizing selected display electrode means of the display elements to display at least one of the text characters and graphics corresponding to the path followed by the input pen means;

whereby information in one of the forms of text characters and graphics is hand-entered by the user directly onto the display means.

5,194,853
SCANNING CIRCUIT

Hideki Asada, Tokyo, Japan, assignor to GTC Corporation, Tokyo, Japan

Filed Dec. 19, 1991, Ser. No. 810,484
Claims priority, application Japan, Mar. 22, 1991, 3-83499
Int. Cl.[5] G09G *3/18*; H03K *19/096*
U.S. Cl. 340—784 **10 Claims**



1. A scanning circuit for successively scanning a plural number of capacitive loads comprising:

a delay circuit for delaying a supplied pulse signal from a previous stage circuit in accordance with a first clock signal;

a first switching transistor which receives said pulse signal and is controlled by said first clock signal;

an exclusive OR circuit which receives a signal generated by said delay circuit and a signal generated by said first switching transistor;

a first non-inverting buffer circuit which receives said signal generated by said first switching transistor;

a second switching transistor which receives said signal generated by said delay circuit and is controlled in accordance with an inverted signal of said signal generated by said exclusive OR circuit;

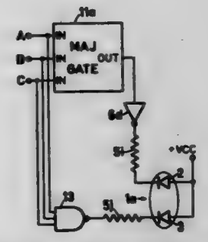
a third switching transistor which receives a signal generated by said first non-inverting buffer circuit and is controlled in accordance with said signal generated by said exclusive OR circuit; and

an output buffer circuit which receives signals respectively generated by said second switching transistor and said third switching transistor and is controlled in accordance with said first clock signal.

5,194,854
MULTICOLOR LOGIC DEVICE

Karel Havel, 15 Kensington Road, Apt. #704, Bramalea, Ontario, Canada L6T 3W2

Continuation-in-part of Ser. No. 197,322, May 13, 1988, abandoned, which is a division of Ser. No. 819,111, Jan. 15, 1986, Pat. No. 4,794,383. This application Sep. 10, 1990, Ser. No. 579,858
Claims priority, application Canada, Jan. 15, 1987, 527374; May 20, 1988, 567323
Int. Cl.[5] G09G *3/14*
U.S. Cl. 340—815.1 **14 Claims**



1. A method of simultaneously indicating, on a single multicolor optical output, a majority logical function and a Boolean logical function, the method comprising:

developing a majority logical signal in accordance with said majority logical function;

developing a Boolean logical signal in accordance with said Boolean logical function;

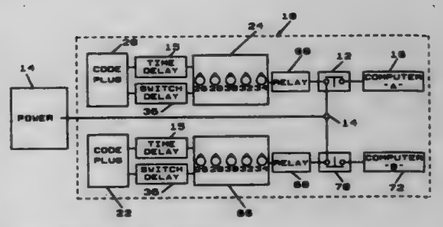
illuminating said optical output in accordance with said majority logical signal;

controlling color of said optical output, when said optical output is illuminated, in accordance with said Boolean logical signal.

5,194,855
SECURITY DEVICE

Max W. McCaslin, 8640 Medford St., Ventura, Calif. 93004, and Thurel E. Morse, 312 Lemar Ave., Oxnard, Calif. 93030

Filed Apr. 11, 1991, Ser. No. 681,355
Int. Cl.[5] H04B *1/00*
U.S. Cl. 340—825.31 **5 Claims**



1. A security system comprising:

an electrically operated device to be protected,

a relay selectably operable to pass electrical power to said protected device,

a code plug having a base portion containing a plurality of pairs of electrical contacts,

a plurality of wires interconnecting selected ones of said contact pairs to define an electrically conductive path through said base portion,

a key portion mateable with said base portion and containing a plurality of conductive means for connecting together

the contacts of selected ones of said contact pairs to complete said conductial path,

a switch box connected in series between said base portion of said code plug and said relay containing a plurality of multiposition switches each having a plurality of contacts selectably connectable by a person seeking to limit access to said protected device in a manner to define a desired combination in which said switches must be set to allow said switch box to pass said current to said relay, and

means supplying electrical current to said base portion of said code plug for actuating said relay.

5,194,856

SYSTEM FOR DETECTING THE PRESENCE IN A RACK OF A PORTABLE UNIT SUITABLE FOR TRANSMITTING OR RECEIVING A SIGNAL CONTAINING AN IDENTIFICATION NUMBER ASSIGNED THERETO

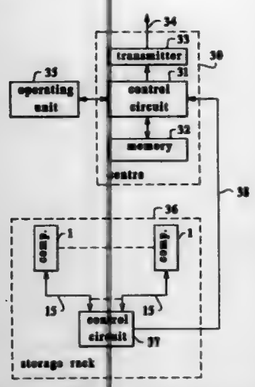
Gouke K. Zijlstra, Emmen, Netherlands, assignor to Ericsson Radio Systems B.V., Va Emmen, Netherlands

Filed Jun. 7, 1991, Ser. No. 711,904

Claims priority, application Netherlands, Jun. 11, 1990, 9001318

Int. Cl.[5] H04B *7/00*

U.S. Cl. 340—825.35 **15 Claims**



1. A portable transmission unit detection system comprising:

a rack having a plurality of compartments;

a plurality of portable transmission units (PTU), each portable unit having:

a PTU control circuit;

communication means connected to the control circuit for performing at least one of wireless transmission and wireless reception of a signal containing an identification number assigned to the unit;

a register for storing the assigned identification number;

a PTU reception means for receiving a scanning signal from outside the unit; and

a PTU transmission means for transmitting a response signal containing the identification number of the portable unit in response to a received scanning signal; and

a detection unit associated with said rack and having;

a plurality of individual detection unit transmission means each assigned to one of said compartments and paired, when one of said portable units is placed in said one of said compartments, with said PTU reception means of said one of said portable units so that the PTU reception means of the pair is only sensitive to a scanning signal transmitted by the individual detection unit transmission means of the pair, all of said individual detection unit transmission means transmitting a scanning signal identical for all of said compartments;

a detection unit reception means for receiving a response signal;

a memory having a location for each portable unit for storing therein a datum which indicates the presence of the portable unit in the rack; and

a rack control circuit connected to said plurality of individual detection unit transmission means, said detection unit reception means for receiving a response signal, and said memory, for selectively choosing an individual detection unit transmission means to transmit said scanning signal and for monitoring whether or not a response signal is received, said rack control circuit altering the contents of a memory location associated with the identification number of the response signal to indicate presence of the associated portable unit in the rack when a response signal is received, and, when no response signal is received in response to a last scanning signal transmitted via a particular individual detection unit transmission means but a response signal has been received in response to a next-to-last scanning signal transmitted via said particular detection unit individual transmission means, said rack control circuit altering the contents of an associated memory location to indicate the absence of the portable unit in the rack.

5,194,857

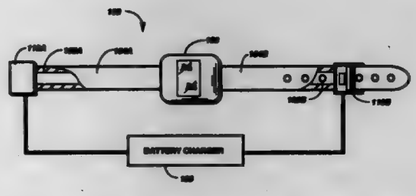
PAGER WITH RECHARGEABLE BATTERY AND METHOD FOR CHARGING SAME

Fernando A. Gomez, West Palm Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 23, 1991, Ser. No. 734,715

Int. Cl.[5] G08B *5/22*; H04B *1/18*; H01Q *1/12, 1/44*

U.S. Cl. 340—825.44 **5 Claims**



1. A selective call receiver powered by a rechargeable battery, comprising:

an antenna having first and second antenna portions for receiving paging signals when the first and second portions are coupled together to form a loop antenna, said first and second antenna portions capable of receiving a charging voltage from a batter charger directly coupled to said first and second antenna portions when said first and second antenna portions are uncoupled thereby disabling the loop antenna;

receiving means coupled to the loop antenna for presenting an alert in response to the paging signals;

means coupled between the loop antenna and the receiving means for blocking the charging voltage from the receiving means; and

means coupled between the loop antenna and the rechargeable battery for blocking the received paging signal from the rechargeable battery.

5,194,858

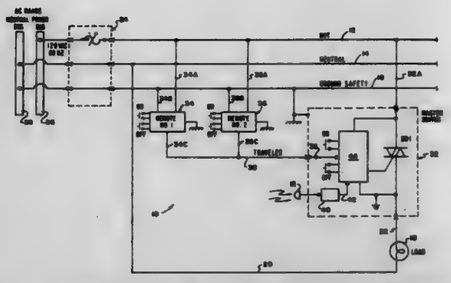
LIGHTING CONTROL SYSTEM WITH SET/RESET GROUND REMOTE

William R. Erwin, Rowlett, Tex., assignor to The Genlyte Group Incorporated, Secaucus, N.J.

Filed Aug. 29, 1991, Ser. No. 752,004

Int. Cl.[5] G08C *19/12*; H01H *47/00*; H05B *37/02*

U.S. Cl. 340—825.7 **19 Claims**



1. A control system for selectively applying alternating current electrical power to a load from a power distribution circuit of the type having a hot power conductor, a neutral power conductor, a ground safety conductor and an auxiliary power conductor extending from a remote switch station to a main switch station, in which the load has a switched terminal and an unswitched terminal, and the unswitched terminal of the load is connectable to the neutral power conductor and its switched terminal is connectable to the hot power conductor through a gate controlled switch, said control system comprising, in combination:

a remote switch circuit adapted for installation at the remote station, said remote switch circuit having first and second input means adapted for connection to the hot power conductor and to the ground safety conductor, respectively, for selectively establishing a positive phase input signal and a negative phase input signal on the auxiliary power conductor;

a master switch controller adapted for installation at the main switch station, said master switch controller including

(a) a gate controlled power switch having an input terminal adapted for connection to the hot power conductor, an output terminal adapted for connection to the switched terminal of said load, and a gate terminal for receiving a turn-on signal;

(b) a switch logic circuit having input means connectable to the auxiliary power conductor for generating a first control signal on a first output terminal in response to the positive phase input signal and for generating a second control signal on a second output terminal in response to the negative phase input signal; and,

(c) a gate control circuit having first and second input means connected to first and second output terminals of the switch logic circuit, respectively, and having an output means connected to the power switch gate in response to a selected one of the first and second control signals, and for applying a gate turn-off signal to the power switch gate in response to the other one of the first and second control signals.

5,194,859

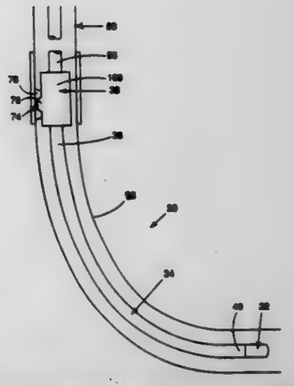
APPARATUS AND METHOD FOR POSITIONING A TOOL IN A DEVIATED SECTION OF A BOREHOLE

Tommy M. Warren, Coweta, Okla., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 538,793, Jun. 15, 1990, abandoned. This application Feb. 8, 1991, Ser. No. 642,487

Int. Cl.[5] G01V *1/00*

U.S. Cl. 340—853.4 **6 Claims**



1. A method of determining inclination and compass direction of a deviated section of a subteranean wellbore without removing a drillstring disposed therein, the method comprising the steps:

(a) positioning an inclinometer portion of a wellbore examination tool at a known rotational orientation within a drillstring in a deviated section of a subterranean wellbore, said wellbore examination tool comprising an electronics housing connected to an uphole end of torsionally rigid positioning means, said inclinometer portion being connected to a downhole end of said torsionally rigid positioning means, said electronics housing being rotationally oriented within the drillstring above said deviated section of said subterranean wellbore at a mule shoe sub having a known compass heading, said downhole end of said torsionally rigid positioning means and said inclinometer portion extending into said deviated section of said subterranean wellbore; and

(b) using said known rotational orientation of said inclinometer portion of said wellbore examination tool and output from said inclinometer portion for calculating inclination and compass direction of said deviated section of said subterranean wellbore.

5,194,860

RADIO TELEMETRY SYSTEMS WITH CHANNEL SELECTION

Alan J. Jones, Newcastle; Andrew H. J. Larkins, Harrow; Trevor W. Booth, Crawley; Frederick M. Clayton, Leighton Buzzard, and Gary J. Marshall, Harrow, all of United Kingdom, assignors to The General Electric Company, p.l.c., England

Filed Nov. 15, 1990, Ser. No. 613,319

Claims priority, application United Kingdom, Nov. 16, 1989, 8925907

Int. Cl.[5] G08C *17/00*

U.S. Cl. 340—370.02 **12 Claims**

1. A radio telemetry system comprising: a master station; and a plurality of transponders, each transponder having a stand-by state in which it listens on each of a number of channels in turn, the master station listening on each of said number of channels in turn to establish a relatively quiet channel and

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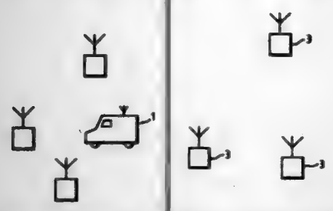
then transmitting a wake-up signal on said relatively quiet channel, each transponder listening on said relatively quiet channel at the time the master station transmits said wake-up signal responding to receipt of said wake-up signal by transmitting an acknowledgement signal on said relatively quiet channel, the master station responding to receipt of one of the



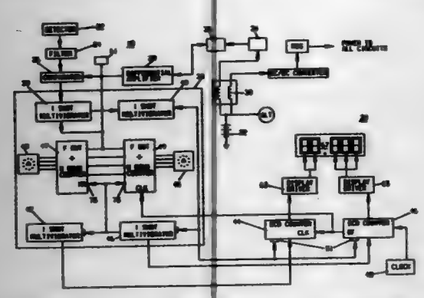
acknowledgement signals transmitted to receive data from the transponder which transmitted that one acknowledgement signal, thereafter that transponder ignoring further wake-up signals for a predetermined time, and the master station transmits a further wake-up signal after receipt of data from the transponder which transmitted said one acknowledgement signal.

5,194,861

ON BOARD TIMER SYSTEM FOR A RACING VEHICLE

Raymond E. St. Clair, Huntsville, Ala., assignor to Scientific Racing Equipment, Inc., Huntsville, Ala.

Continuation-in-part of Ser. No. 482,339, Feb. 20, 1990, abandoned. This application Jan. 7, 1991, Ser. No. 711,962
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—870.28 14 Claims



1. A system for on-board timing for a race vehicle traversing a race course having indicator means thereon for indicating predetermined points along said course, including a start and stop indicator, said indicator means including undesirable extraneous markers placed between said start and stop indicators, said system comprising

sensing means disposed on said vehicle for producing an electrical actuation signal in response to sensing each said indicator means;

on board timing circuit means responsive to said sensing means to record the time interval said start and stop indicators produced by said sensing means as said vehicle passes said start and stop indicators, said on-board timing means including presettable countdown circuit means for counting down from an initial preset time, which is slightly less than an estimated time for traversing said course, to a final actual time that it takes to traverse said course, said countdown circuit means further including circuit means responsive to sensor signals generated at said start indicator to actuate said countdown circuit means and to prevent stimuli from said extraneous markers from reaching said timing circuit means until said preset countdown time has elapsed, said preset time period being on-board, operator adjustable to accommodate tracker having different distances between start and stop indicators; and

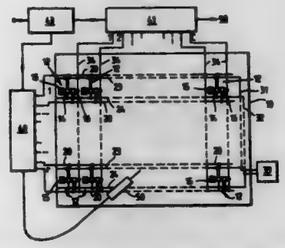
on board display means responsive to said timing means for displaying the elapsed time between said start and stop indicators of the immediate preceding lap simultaneously while said timing means is recording the time it is taking to traverse the lap being traversed.

5,194,862

TOUCH SENSOR ARRAY SYSTEMS AND DISPLAY SYSTEMS INCORPORATING SUCH

Martin J. Edwards, Crawley, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1991, Ser. No. 713,237
Claims priority, application United Kingdom, Jan. 29, 1990, 9014529
Int. Cl.[5] H03M *11/00*; G09G *3/00*
U.S. Cl. 341—20 20 Claims



1. A touch sensor array system including an array of sensing elements arranged according to rows and columns, and addressing means comprising row and column conductors for selectively addressing a particular one of said sensing elements at an intersection of a selected row conductor and a selected column conductor, characterised in that:

each sensing element comprises an electronic bistable circuit at the sensing element's location in the array, said bistable circuit being responsive to a presence or absence of a touch input at the location of the sensing element so as to adopt a first or a second stable state, respectively, that remains continuously addressable, and which upon addressing by said addressing means provides an output in accordance with its actual state, said system further comprising reset means for periodically resetting said bistable circuits of said sensing elements.

5,194,863

TOUCH PANEL DISPLAY

John H. Barker, Delray Beach; Ernesto LeFranc, and Donald D. Williams, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 335,265, Apr. 10, 1989, abandoned.
This application Nov. 6, 1991, Ser. No. 789,384
Int. Cl.[5] G08C *21/00*; G01V *9/04*
U.S. Cl. 341—31 8 Claims

1. An opto-matrix input device with a reduced number of driver components for detecting and communicating to a computer the position of an opaque point within a predetermined field, the apparatus comprising:

a frame, the frame having a first vertical side, a second vertical side, a first horizontal side and a second horizontal side;

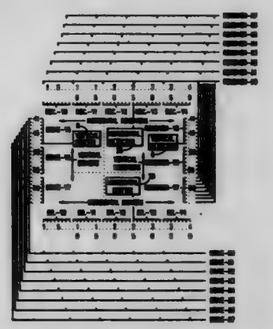
a plurality of Y emitter drivers for activating preselected groups of emitters;

a plurality of X emitter drivers for activating preselected groups of emitters;

a plurality of emitters, each requiring input from an active Y emitter driver and an active X emitter driver to emit energy, the emitters attached to the first horizontal side and the first vertical side such that energy beams from the emitters form a matrix;

a plurality of detectors, each of the detectors corresponding to and paired with one of the plurality of emitters, the detectors attached to the second horizontal side and the second vertical side such that an energy beam from each of the corresponding emitters is detected by the detector which is paired with the corresponding emitter;

emitter multiplexing means, the emitter multiplexing means having means to receive emitter selection control signals input to the emitter multiplexing means by the computer, the emitter multiplexing means electrically interconnected to the Y emitter drivers and X emitter drivers for selective activation of energy emission from the emitters under control of the emitter selection control signals, the emitter multiplexing means further including Y emitter multi-



plexor means and X emitter multiplexing means for selecting Y emitter drivers and X emitter drivers interconnected to the emitters such that each emitter in the group selected by the Y emitter driver has a different X emitter driver associated with it;

detector multiplexing means, the detector multiplexing means having means to receive detector selection control signals input to the detector multiplexing means by the computer, the detector multiplexing means electrically interconnected to the detectors for selective activation of energy detection under control of the detector selection control signals; and

the detector multiplexing means further having means to output analog signals produced by the selected detectors to the computer;

whereby a reduced number of drivers can control the activation of a larger number of emitters in an opto-matrix input device.

5,194,864

VECTOR QUANTIZATION METHOD AND APPARATUS

Keiichi Nakano, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

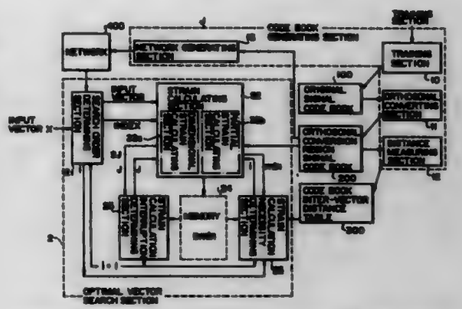
Filed Oct. 1, 1991, Ser. No. 770,987
Claims priority, application Japan, Oct. 3, 1990, 2-267000; Oct. 19, 1990, 2-280968; Jun. 27, 1991, 3-156815
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—106 14 Claims

1. A vector quantization method comprising the steps of:

generating a network for performing a learning operation on the basis of a code book, in which specific representative vectors respectively having indexes assigned thereto are stored, such that output units for outputting in accordance with indexes of code book vectors Yi are caused to output larger outputs as said output units are located nearer to an input vector input to one of said output units;

causing said output units to output in accordance with an input vector X input to said network, and determining a search order to search the code book vectors Yi in the order of the indexes corresponding to decreasing change amounts in output;

performing strain calculation by sequentially calculating strains between the code book vectors Yi selected in the search order and the input vector X in units of dimensions;



comparing a partial sum of strains obtained by the strain calculation step with a minimum strain; and

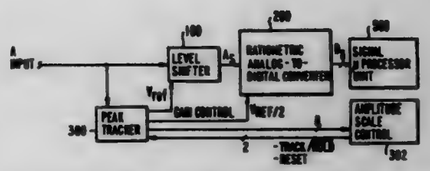
interrupting the strain calculation when the partial sum becomes larger than the minimum strain.

5,194,865

ANALOG-TO-DIGITAL CONVERTER CIRCUIT HAVING AUTOMATIC RANGE CONTROL

Thomas S. Mason, Canton, and Rodney D. Beaber, North Canton, both of Ohio, assignors to Interbold, North Canton, Ohio

Filed Dec. 6, 1991, Ser. No. 804,089
Int. Cl.[5] H03M *1/18*
U.S. Cl. 341—132 61 Claims



1. An apparatus for converting a sensed analog signal having a time varying amplitude within a dynamic range to a corresponding digital signal, comprising:

a peak tracker circuit for monitoring the sensed analog signal and providing a reference potential with an amplitude corresponding to a sensed peak amplitude of the sensed analog signal;

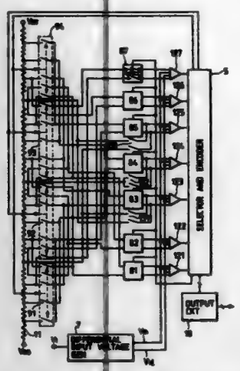
an analog to digital converter having an analog signal input and a reference input for receiving a signal corresponding to the reference potential and a digital output for converting the analog signal to a digital signal based on a relationship between the analog signal and the reference input signal; and

a control circuit, responsive to the occurrence of a preselected event, for causing the peak tracker circuit to provide the reference potential with an amplitude corresponding to a sensed first peak amplitude of the sensed analog signal, the sensed first peak amplitude being the peak amplitude sensed first in time following each preselected event so that the analog to digital converter converts the input analog signals sensed following each sensed first peak amplitude relative to the provided reference potential corresponding to the said sensed first peak amplitude.

5,194,866
HALF-FLASH ANALOG-TO-DIGITAL CONVERTER USING DIFFERENTIAL COMPARATORS AND CROSSOVER SWITCHING

Eiki Imaizumi, Akishima; Kunihiko Usui, Asaka, and Tatsuji Matsuura, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi VLSI Engineering Corporation, Kodaira, both of, Japan

Filed Nov. 18, 1991, Ser. No. 793,574
Claims priority, application Japan, Nov. 16, 1990, 2-308737; Nov. 12, 1991, 3-295458
Int. Cl.[5] H03M *1/14*
U.S. Cl. 341—156 12 Claims

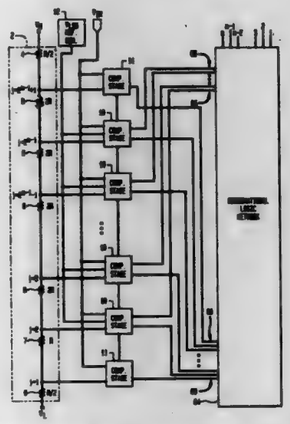


1. An analog-to-digital converter comprising:
a resistor-string comprised of a plurality of serially-connected resistors, both ends of said resistor-string being respectively connected to voltage sources with different predetermined voltages, said resistor-string generating a plurality of partial voltages at positions where said resistor-string is divided into a plurality of sets in the manner that the same predetermined number of resistors are included in each set, as a plurality of reference voltages for upper bits, each of the divided sets generating a plurality of partial voltages on resistors in said each of sets as a plurality of reference voltages for lower bits;
means for generating a first differential input voltage which increases in proportion to the increase in an analog input voltage to be converted into digital value, and a second differential input voltage which decreases in inverse proportion to the increase in the analog input voltage;
at least one voltage comparator for upper bits which compares a differential voltage between two reference voltages for upper bits with a differential voltage between the first and second differential input voltages;
means for obtaining upper bit digital value from the result of comparison by said voltage comparator for upper bits;
means for selecting two sets from said divided sets according to the obtained upper bit digital value;
at least one voltage comparator for lower bits, said voltage comparator for lower bits having a pair of reference voltage input terminals and a pair of signal input terminals, one of the reference voltages for lower bits generated in one of the selected two sets and one of the reference voltages for lower bits generated in the other set being supplied to said pair of reference voltage input terminals as first and second reference voltages for lower bits, respectively, the first and second differential input voltages being supplied to said pair of signal input terminals, respectively, so that said voltage comparator for lower bits compares a differential voltage between said first and second reference voltages for lower bits with a differential voltage between said first and second differential input voltages;
switching means for interchanging said first and second reference voltages for lower bits that are supplied to said pair of reference voltage input terminals of said voltage comparator for lower bits with each other according to the obtained upper bit digital value;
means for obtaining lower bit digital value from the result of comparison by said voltage comparator for lower bits; and
means for obtaining digital value corresponding to the analog input voltage from the upper bit digital value and the lower bit digital value that have been obtained.

5,194,867
FLASH ANALOG-TO-DIGITAL CONVERTER EMPLOYING LEAST SIGNIFICANT BIT-REPRESENTATIVE COMPARATIVE REFERENCE VOLTAGE

Gregory J. Fisher, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 696,241, May 6, 1991, abandoned. This application Dec. 30, 1991, Ser. No. 816,321
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 22 Claims



1. A resistor network for a circuit which produces an n-bit binary output code, the value of which is representative of an input voltage applied to an input terminal in accordance with a comparison of the input voltage with intermediate reference voltages between high and low reference voltages, said resistor network having a plurality of nodes from which respective ones of said intermediate voltages that fall between said high and low reference voltages are obtained, said intermediate reference voltages differing from one another by multiples of two least significant bit voltages, and wherein said resistor network is configured such that the voltage difference between intermediate reference voltages provided at a prescribed two of said nodes is equal to a least significant bit voltage.

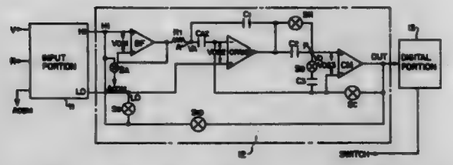
5,194,868
DUAL SLOPE INTEGRATING A/C CONVERTER

Sam-Yong Bahng, and Suk-Ki Kim, both of Buchun, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Aug. 2, 1991, Ser. No. 739,674
Claims priority, application Rep. of Korea, Apr. 13, 1991, 91-5945
Int. Cl.[5] H03M *1/52, 1/06*
U.S. Cl. 341—167 4 Claims

1. A dual slope integrating analog-to-digital converter for

cancelling an offset error signal during an auto zero phase of a conversion cycle of operation, said converter comprising:
input means for receiving a measurable input signal and generating a voltage signal in response thereto;
analog-to digital core means coupled to said input means and comprising:
a plurality of selectively disposed switching means responsive to a series of switching control signals, each set of switching control signals in said series corresponding to each of a plurality of phases in said conversion cycle, said analog-to-digital core means generating a zero-crossing signal upon completion of the auto phase of said conversion cycle;

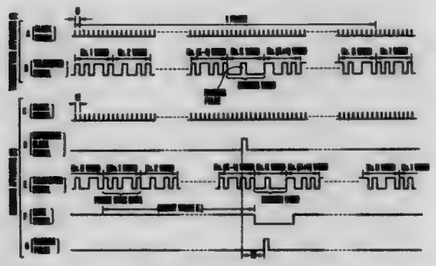


a first capacitor for transferring a residual charge to a second capacitor in response to said offset error signal to multiply said residual charge with a voltage at a reference node disposed between said first and second capacitors, after said zero-crossing signal is detected, to generate a reference signal; and
a comparator coupled to said reference signal for generating an output signal in response thereto;
digital output means for generating said series of switching control signals and for receiving the output signal from said analog-to-digital core means to generate a displayed output in response thereto.

5,194,869
RANGING METHOD USING TELEMETERING AND APPARATUS EMPLOYING SAID METHOD

Jiro Kochiyama, Saitama; Makoto Miwada; Toshiaki Sato, both of Tokyo; Takuji Morita, Saitama; Teruo Fujiwara, Tokyo; Shoji Kaneda, Tokyo; Kazutaka Maruta, Tokyo, and Hajime Ogawa, Tokyo, all of Japan, assignors to National Space Development Agency of Japan, Tokyo; Nissan Motor Co., Ltd., Yokohama and Meisei Electric Co., Ltd., Tokyo, all of Japan

Filed Jul. 20, 1992, Ser. No. 916,943
Claims priority, application Japan, Jul. 30, 1991, 3-190300
Int. Cl.[5] G01S *13/10*
U.S. Cl. 342—125 5 Claims

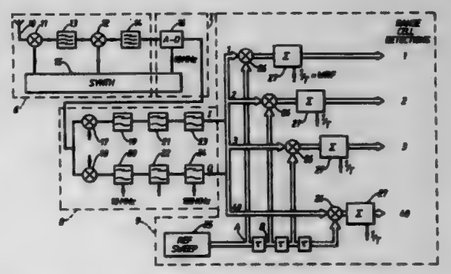


1. A ranging method for measuring a flight distance of a flight object, comprising the steps of:
preparing a telemeter transmitting apparatus and a telemeter receiving apparatus, the telemeter transmitting apparatus being provided on the flight object and the telemeter receiving apparatus being provided on the ground, the telemeter transmitting apparatus and the telemeter receiving apparatus being operative on the basis of time references of their own;
causing the telemeter transmitting apparatus to transmit a telemeter signal which is formed on the basis of its own time reference, which is composed of a serial data sequence having a frame construction made up of a plurality of words, and which has ranging words inserted at intervals of a predetermined number of words, each of the ranging words containing a ranging signal only;
causing the telemeter receiving apparatus to generate ranging reference clock signals on the basis of the time reference at intervals equivalent to the periods of insertion of the respective ranging words in the telemeter signal;
causing the time reference of the telemeter transmitting apparatus and the time reference of the telemeter receiving apparatus to agree with each other prior to flight of the flight object; and
causing the telemeter receiving apparatus to identify each of the ranging words from the telemeter signal received from the telemeter transmitting apparatus provided on the flight object in flight, separate and extract the ranging signal from the identified ranging word, find a time difference between the obtained ranging signal and a corresponding ranging reference clock signal, and calculate the flight distance of the flight object.

5,194,870
RADAR RECEIVER

Timothy H. B. Pearce, Chelmsford, and Brent Summers, Hatfield Peveral, both of United Kingdom, assignors to The Marconi Company Limited, Middlesex, United Kingdom

Filed Aug. 7, 1990, Ser. No. 564,020
Claims priority, application United Kingdom, Aug. 25, 1989, 8919423
Int. Cl.[5] G01S *13/32*
U.S. Cl. 342—128 8 Claims



1. A radar receiver for a frequency modulated continuous wave radar signal, comprising:
digitising means for producing digitised radar return signals from received radar return signals, said digitised radar return signals being directly representative of said received radar return signals;
means for digitally filtering the digitised radar return signals; and
means for correlating the filtered digitised radar return signals corresponding to a modulation period with each of a series of digitised reference modulation signals which are delayed by predetermined periods with respect to each other, to produce outputs corresponding to respective range cells, wherein the means for correlating is arranged to perform complex multiplication of the filtered digitised radar return signals with the digitised reference signals, and wherein the means for correlating is arranged

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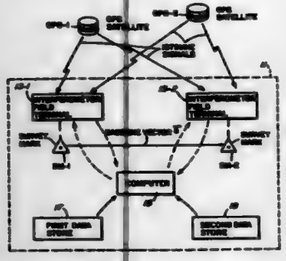
to perform a complex summation of the results of the complex multiplication over a modulation period.

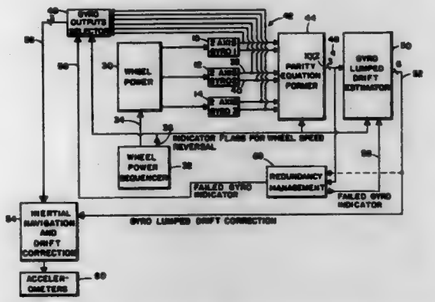
5,194,871
SYSTEM FOR SIMULTANEOUSLY DERIVING POSITION INFORMATION FROM A PLURALITY OF SATELLITE TRANSMISSIONS
Charles C. Counselman, III, Belmont, Mass., assignor to Western Atlas International, Inc., Houston, Tex.
Continuation of Ser. No. 392,291, Jul. 20, 1989, Pat. No. 5,014,066, which is a continuation of Ser. No. 895,148, Aug. 11, 1986, Pat. No. 4,870,422, which is a continuation of Ser. No. 353,331, Mar. 1, 1982, Pat. No. 4,667,203. This application Jan. 22, 1991, Ser. No. 643,771
Int. Cl.[5] G01S *5/08*; H04B *7/185*
U.S. Cl. 342—357 **16 Claims**



1. The method of determining position information from suppressed-carrier radio signals modulated by an unknown pseudo-random code, transmitted by earth-orbiting satellites, comprising:
(a) receiving the signals from a plurality of satellites simultaneously with an omni-directional antenna;
(b) generating predictions of the Doppler shifts of the signals received by said antenna;
(c) correlating the signals received by said antenna with the predictions to cancel the Doppler shifts and correlating the signals received by said antenna with themselves to square the unknown pseudo-random code modulation so that the resulting correlation products have slowly varying phase angles related to the phases of carrier waves implicit in the received signals;
(d) time-averaging said correlation products to obtain data indicating the phase of a carrier wave implicit in the signal received from each satellite, for a plurality of satellites simultaneously; and
(e) processing said data indicating the phase of a carrier implicit in the signal received from each satellite to obtain position information.

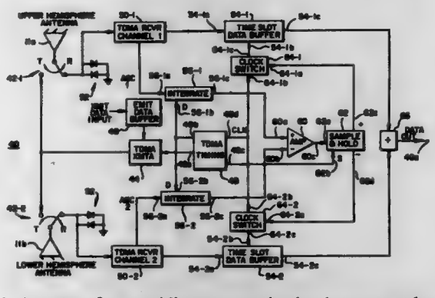
5,194,872
INERTIAL NAVIGATION SYSTEM WITH AUTOMATIC REDUNDANCY AND DYNAMIC COMPENSATION OF GYROSCOPE DRIFT ERROR
Howard Musoff, Brookline, and Jerold P. Gilmore, Newtonville, both of Mass., assignors to Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Nov. 14, 1990, Ser. No. 612,788
Int. Cl.[5] H04B *7/185*
U.S. Cl. 342—358 **16 Claims**

1. An inertial navigation system, with inherent redundancy comprising:
three, two-input axis wheel-reversable rotor gyroscopes, each of said gyroscopes disposed whereby any two of said gyroscopes provide three orthogonal sense axes, each of said gyroscopes including at least two outputs for providing first and second output signals corresponding to sensed angular rates along said two input axes, and wherein said input axes of said three gyroscopes form three pairs of parallel input axes, each pair of parallel input axes corresponding to one of said orthogonal sense axes;
means for selecting at least three gyroscope output signals, each of said selected gyroscope output signals corresponding to one gyroscope output from one associated



gyroscope input axis selected from each of said three pairs of parallel input axes; and
inertial navigation means, responsive to at least said three selected gyroscope output signals, for computing the relative position of a vehicle with reference to a predetermined coordinate system.

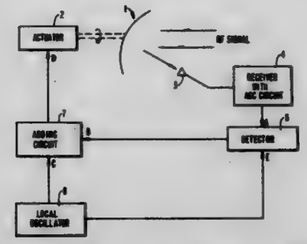
5,194,873
ANTENNA SYSTEM PROVIDING A SPHERICAL RADIATION PATTERN
Louis Sickles, II, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.
Filed Oct. 11, 1991, Ser. No. 775,037
Int. Cl.[5] H01Q *3/02*; H04B *7/185*
U.S. Cl. 342—374 **16 Claims**



1. A system for providing communication between at least one remote location positioned anywhere within a full sphere enclosing a master location above ground level, comprising in combination:
a master station affixed to a structure at said master location;
at least one remote station, each at a different one of the at least one remote location;
each of said master and remote stations operating with time domain multiple access (TDMA) operation; and
a master station antenna system providing a substantially spherical radiation pattern about the structure located above ground level and upon which said master station is located, comprising: a plurality N of individual antennae, each having an individual radiation pattern covering only a portion of the desired sphere; means for locating each of the N different antennae at a different location on said structure, to generate an associated desired portion of the

spherical pattern; and means, at said master station, for combining the plurality N of associated pattern portions into the desired substantially-spherical pattern to facilitate transmission of identical information through each one of said N antennae in each of a group of like plurality N of different time slots.

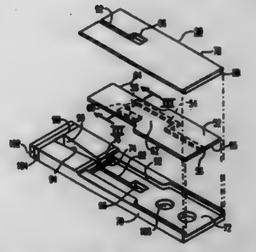
5,194,874
SATELLITE ANTENNA TRACKING SYSTEM
Giorgio Perrotta, Rome, Italy, assignor to Selenia Spazio S.p.A., L'Aquila, Italy
Filed Mar. 28, 1991, Ser. No. 677,623
Claims priority, application Italy, Mar. 28, 1990, 47798 A/90
Int. Cl.[5] H01Q *3/00*
U.S. Cl. 343—757 **9 Claims**



1. An integrated antenna system for the control of antenna tracking comprising:
a movable antenna for receiving radio frequency (RF) signals having a signal strength, said antenna being mechanically movable for variable nutative movement in a variable conic pattern of a mechanical conical scan;
an actuator connected to said antenna for imparting said variable nutative movement to said antenna;
a receiver connected to said antenna for receiving said RF signal from said antenna, said receiver comprising means for generating an Automatic Gain Control (AGC) signal related to the signal strength of an RF signal received by said antenna;
a local oscillator for supplying a sinusoidal reference signal;
an error detector connected to said receiver and said local oscillator, said error detector comprising means for comparing the AGC signal from the receiver and the sinusoidal reference signal from the local oscillator and for generating an error signal in response to the comparing of the AGC signal from the receiver and the sinusoidal reference signal from the local oscillator; and
an adding circuit connected to said actuator and said local oscillator and said error detector, said adding circuit comprising means for adding said sinusoidal reference signal from said local oscillator and said error signal from said error detector and for generating therefrom an actuating signal that varies in direct relation to said error signal, said actuating signal being supplied to said actuator for controlling said nutative movement of said antenna.

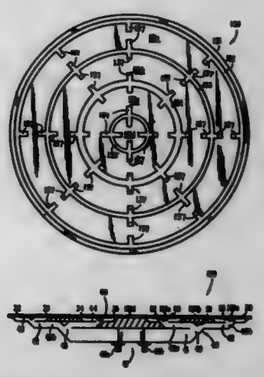
5,194,875
NOTCH RADIATOR ELEMENTS
Eric W. Lucas, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 7, 1991, Ser. No. 711,846
Int. Cl.[5] H01Q *13/10*
U.S. Cl. 343—767 **13 Claims**

1. A broad band radiator for high frequency signals comprising:
a planar dielectric substrate;
at least one conductive strip having a low impedance open circuit termination supported within the dielectric substrate;
a planar housing member formed of a rigid self supporting conductor having a recess for receiving the dielectric substrate therein, said conductor having a solid portion with an aperture therein and extending from one end thereof radiating signals in free space; and
a rigid conductive cover mounted in the recess and over the dielectric substrate in contact with the housing member for enclosing and isolating the dielectric substrate and the conductive strip, said housing and cover each having formed therein a feed slot and a high impedance termination coupled thereto, said feed slot being in communication with the recess and extending over the dielectric



substrate into the solid aperture portion, the feed slot disposed proximate to the conductive strip on the opposite sides of the dielectric substrate in a direction transverse thereto forming a transition representing a discontinuity with respect to the conductive strip and the feed slot for coupling broad band signals between the conductor and the aperture portion by electromagnetic proximity coupling of a field induced in the transition, said low impedance termination reflecting as a broad band short circuit at the transition and the high impedance termination reflecting as a broad band open circuit at the transition.

5,194,876
DUAL POLARIZATION SLOTTED ANTENNA
Michel W. Schnetzer, Longmont, and Steven C. Olson, Broomfield, both of Colo., assignors to Ball Corporation, Muncie, Ind.
Continuation-in-part of Ser. No. 383,785, Jul. 24, 1989, Pat. No. 4,994,817. This application Feb. 8, 1991, Ser. No. 652,783
Int. Cl.[5] H01Q *1/12*, *1/10*
U.S. Cl. 343—769 **27 Claims**



1. An annular slot antenna, comprising:
means forming at least two concentric, generally coplanar, annular slots, including an outer annular slot and an inner annular slot, each annular slot having at least one edge, said annular slot-forming means further forming a plural-

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ity of openings at the at least one edge of the outer and inner annular slots;

antenna connection means including non-resonant cavity-forming means providing an unobstructed path for interconnecting said at least two concentric, generally coplanar, annular slots with a connection for electromagnetic energy;

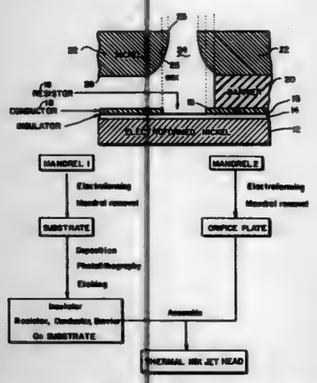
said cavity-forming means forming a lower circular cavity, expanding radially from said connection for electromagnetic energy to a peripheral annular opening, and an upper annular cavity expanding radially outwardly from the peripheral annular opening and terminating at said outer annular slot and contracting radially inwardly from the peripheral annular opening and terminating at said inner annular slot, said cavity-forming means being further shaped and dimensioned about the peripheral annular opening to divide electromagnetic energy between the inner annular slot and the outer annular slot and to combine generally in phase electromagnetic energy received at said concentric annular slots.

5,194,877

PROCESS FOR MANUFACTURING THERMAL INK JET PRINTHEADS HAVING METAL SUBSTRATES AND PRINTHEADS MANUFACTURED THEREBY

Si-Ty Lam, Pleasanton, and Howard H. Taub, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 24, 1991, Ser. No. 705,218
Int. Cl.[5] B41J *2/05*; C25D *1/00*
U.S. Cl. 346—1.1 **20 Claims**



1. A method of making an ink jet printhead which includes the steps of:

a. forming individual metal substrates on exposed metal areas of a mandrel by electroplating thereon,

b. forming thin film resistor pattern defining layers on said metal substrates, and then

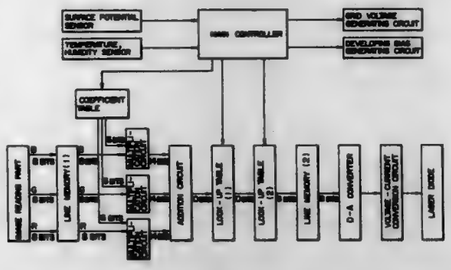
c. forming metal orifice plates of the same material as that of said metal substrates above said thin film resistor pattern defining layers, whereby said metal substrates may be easily stripped away from said mandrel after formation of said orifice plates thereover, and said metal substrates and metal orifice plates are chosen from the same metal so as to exhibit thermal matching characteristics and minimize stresses in said printhead during operation thereof.

5,194,878

COLOR ELECTROPHOTOGRAPHIC METHOD

Hajime Murakami, Kusatsu, and Yoshimasa Kumashiro, Moriyama, both of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Continuation of Ser. No. 440,384, Nov. 22, 1989, abandoned. This application Aug. 21, 1991, Ser. No. 752,213
Claims priority, application Japan, Nov. 25, 1988, 63-297950
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 **9 Claims**



1. A multicolor electrophotographic method of producing an electrophotographic image by subjecting a photoreceptor to a repeated process of charging, exposing and developing, comprising:

(a) converting an image signal read from an original image to a digital signal;

(b) subjecting the digital signal to an electrical signal correction process wherein the electrical signal correction process includes tone correction of the photoreceptor and tone correction of toner color density and said two tone corrections are independently carried out;

(c) converting the signal to a light which is modulated in light intensity according to the signal which is subjected to the signal processing;

(d) exposing the charged photoreceptor to said light to form an electrostatic latent image; and

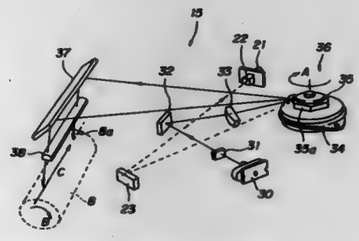
(e) developing the latent image.

5,194,879

IMAGE FORMING APPARATUS CAPABLE OF CHANGING DOTTING DENSITY

Hiroaki Kotabe, Funabashi; Shigeru Yamazaki; Kouji Yamanobe, both of Tokyo; Masaru Kaneko, Yokohama; Yasushi Nakazato, Tokyo; Masahiko Banno; Shinichiro Wada, both of Yokohama; Akihiko Motegi, Kawasaki; Kazuya Iwasaki, Tokoroszwa, and Takashi Nishizawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,780
Claims priority, application Japan, Feb. 23, 1990, 2-40987
Int. Cl.[5] G01D *9/42*
U.S. Cl. 346—108 **15 Claims**



1. An image forming apparatus comprising:

scanning means for scanning a recording medium in synchronism with a writing clock signal so that a dotted image is formed on the recording medium, said writing clock signal corresponding to an arrangement of dots in a dotted image which should be formed on the recording medium;

counter means for carrying out a count operation in synchronism with the writing clock signal so that one count value or a plurality of count values for determining a scanning area where said scanning means scans the recording medium are obtained;

first control means for controlling said scanning means based on said one or said plurality of count values obtained by said counter means so that said scanning means is activated or inactivated;

specifying means for specifying a dotting density, said dotting density being the number of dots in a unit length in a dotted image which should be formed on the recording medium;

second control means for controlling the frequency of the writing clock signal and/or a speed at which said scanning means scans the recording medium, based on the dotting density specified by said specifying means; and

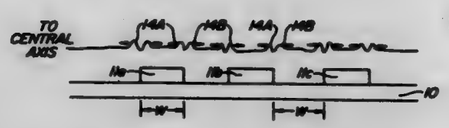
changing means, coupled to said counter means and said specifying means, for changing said one count value or said plurality of count values, which should be obtained by said counter means, based on the dotting density specified by said specifying means, so that a position of the scanning area with respect to said recording medium is constant even if the frequency of the writing clock signal and/or the speed at which said scanning means scans the recording medium are changed by said second control means.

5,194,880

MULTI-ELECTRODE, FOCUSED CAPILLARY WAVE ENERGY GENERATOR

Scott A. Elrod; Butrus T. Khuri-Yakub, both of Palo Alto, and Calvin F. Quate, Stanford, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1990, Ser. No. 632,260
Int. Cl.[5] B41J *21/04*
U.S. Cl. 346—140 R **11 Claims**



1. An ejector for ejecting droplets from a liquid-filled reservoir, said ejector comprising

a substrate having a generally planar surface, said substrate submerged in said reservoir so that said surface is parallel to a reservoir surface at a shallow predetermined depth;

concentric, circular, electrodes at said substrate surface around a center, said electrodes spaced apart by a predetermined distance and numbering more than two; and

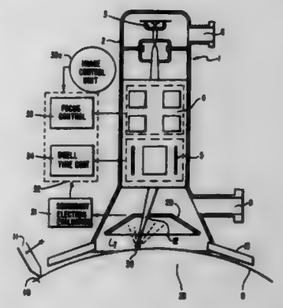
an oscillator circuit coupled to said electrodes for exciting said electrodes at a predetermined frequency, said predetermined frequency and said predetermined distance of said spaced electrodes related to each other such that capillary waves generated on said reservoir surface by said excited electrodes reinforce each other for the ejection of droplets from said reservoir at said center.

5,194,881

SYSTEM AND METHOD TO PROGRAM A PRINTING FORM

Alfred Hirt, Munich, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 15, 1991, Ser. No. 776,623
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1990, 4039105
Int. Cl.[5] G01D *15/06*; B41M *5/00*
U.S. Cl. 346—158 **18 Claims**



1. A system for selectively forming and erasing an image on a printing form (9) of ferroelectric material, forming a surface layer on a rotatable printing cylinder (10) of a printing machine,

wherein said printing cylinder (10) and said ferro-electric layer (9) thereon are at ambient air pressure,

comprising

electron beam generating means (1, 3) for generating an electron beam (12) of sufficient intensity to control the polarization of discrete areas of said ferroelectric material of the form (9);

means (32a) for controlling said electron beam generating means (1, 3) and coupled to said electron beam generating means in accordance with image information;

means (4, 5, 33, 34) for directing said beam onto said ferroelectric material of the printing form for controlling the polarization of said discrete areas thereof;

means for defining an imaging space (7, 17) positioned between an exit region of said electron beam generating means (1, 3) and said printing form (9); and

means (14, 15, 18, 25, 27) for pneumatically separating the printing cylinder (10) and said ferroelectric surface layer (9) thereon remote from or outside of said imaging space (7, 17) from the electron beam generating means (1, 3).

5,194,882

KERATOGRAPHIC INSTRUMENT USING HOLOGRAPHIC PLACIDO ILLUMINATOR TO REDUCE ALIGNMENT SENSITIVITY

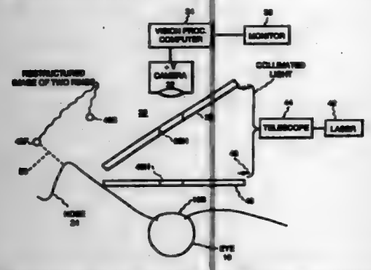
Carl M. Penney, Saratoga Springs, N.Y., assignee to General Electric Company, Schenectady, N.Y.

Filed Jun. 3, 1991, Ser. No. 709,544
Int. Cl.[5] A61B *3/107*; G03H *1/00*
U.S. Cl. 351—212 **20 Claims**

1. A system for measuring the curvature of a cornea comprising:

a hologram means functioning to provide a cornea measurement pattern image such that a reflection of the pattern image on the cornea of the subject's eye is established,

wherein the hologram means is between the pattern image and the subject's eye; and



a light source for applying light to said hologram means so as to cause it to provide said pattern image.

5,194,883

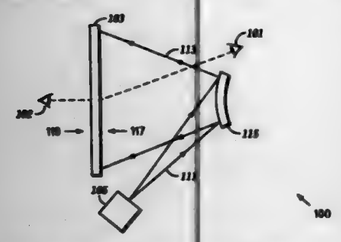
Patent Not Issued For This Number

5,194,884

IMAGE PROJECTION SYSTEM EMPLOYING A COLD CATHODE FIELD-EMISSION IMAGE SOURCE

Norman W. Parker, 1302 Scott St., Wheaton, Ill. 60187, and Robert C. Kane, 15412 St. Patrick Rd., Woodstock, Ill. 60098

Continuation-in-part of Ser. No. 682,504, Apr. 8, 1991, abandoned. This application Jan. 13, 1992, Ser. No. 819,752
Int. Cl.[5] G03D *21/00*
U.S. Cl. 353—122 **10 Claims**



1. An image projection system comprising:
source means for providing an image, said source means including a cold cathode field emission device that sources a non-scanning stream of electrons,
a plurality of electron emitters for emitting electrons,
a faceplate on which is disposed a layer of cathodoluminescent material distally disposed with respect to the electron emitters by an interelectrode spacing of at least 2 millimeters,
a voltage source operable coupled to the faceplate and providing a voltage of at least 10,000 volts,
projection means for projecting said image on a display device.

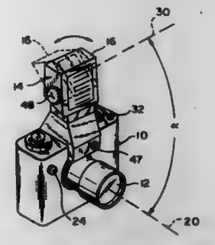
5,194,885

METHODS OF, APPARATUS FOR, AND A CAMERA CAPABLE OF AUTOMATICALLY SELECTING AN OPTIMAL ANGLE FOR BOUNCE ILLUMINATION

John E. Spencer, Geneseo, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1991, Ser. No. 716,141
Int. Cl.[5] G03B *15/03*
U.S. Cl. 354—132 **15 Claims**

1. A method of illuminating a subject when recording an image of the subject under a ceiling with a camera having a lens establishing an optical axis for alignment with the subject, wherein the camera includes an illuminator pivotally mounted on the camera for projecting a beam of light along an illumination axis, the method comprising the steps of:
determining a value for a distance "D" between the lens and the subject;
determining a value for a distance "H" between the camera and ceiling;
determining a value for an angle "α" between the optical



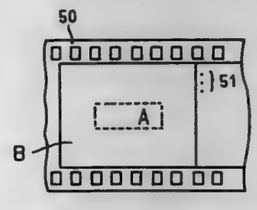
axis and illumination axis as a function of the value of D and the value of H; and
adjusting the angular orientation of the illuminator with respect to the camera by automatically pivoting the illuminator until the angle between the illumination axis and optical axis is substantially equal to α, whereby the subject is illuminated by the beam of light after the beam of light bounces from the ceiling.

5,194,886

FINDER OPTICAL SYSTEM

Hiromu Mukai, Kawachinagano; Kohtaro Hayashi, Hirakata; Ichiro Kasai, Sakai; Jun Ishihara, Sakai, and Yasumasa Sugihara, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1991, Ser. No. 679,562
Claims priority, application Japan, Apr. 3, 1990, 2-89711; Apr. 4, 1990, 2-89816; Apr. 5, 1990, 2-90623
Int. Cl.[5] G03B *13/10*
U.S. Cl. 354—222 **17 Claims**



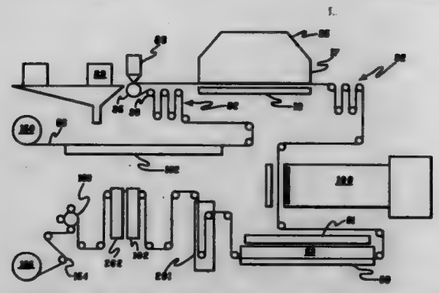
1. A finder optical system provided separately from a taking lens system, comprising:
an objective lens system for forming a primary image which is an inverted image of a subject;
a relay lend system for erecting the primary image formed by the objective lens system to form a secondary image which is an erecting image of the subject, said relay lens system having a plurality of positions where the relay lens system forms different sizes of the secondary image from one another; and
an ocular for enlargeing the secondary image formed by the relay len system, said ocular sequentially changing an enlargement ration by a sequentially movement of a lens unit of the ocular on an optical axis.

5,194,887

APPARATUS FOR TESTING PHOTOGRAPHIC EMULSIONS

Duane J. Farling, Webster, and James E. Novak, Greece, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 22, 1992, Ser. No. 823,920
Int. Cl.[5] G03D *13/00*
U.S. Cl. 354—297 **16 Claims**



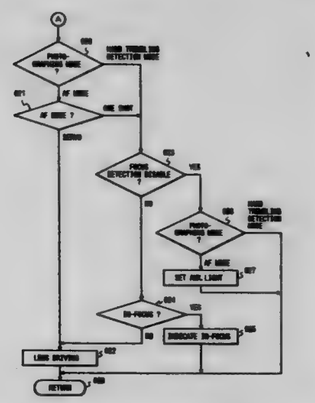
1. An apparatus for sensitometric testing of a photographic emulsion comprising:
(a) means for exposing a known image on a web coated with said emulsion;
(b) means for developing said emulsion on said web, said developing means being capable of control as to developer chemical composition, time and temperature;
(c) densitometer means for measuring the optical density of a developed, known image on said web;
(d) transport means for transporting said web coated with said emulsion from said exposing means to said densitometer means through said developing means;
(e) first control means for controlling the time, temperature and chemical composition of said developing means; and
(f) second control means for regulating transport of said web from said exposing means to said densitometer means.

5,194,888

CAMERA WITH FOCUS AND HAND TREMBLING DETECTING APPARATUS

Akira Akashi, and Yukio Odaka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,543
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—402 **13 Claims**



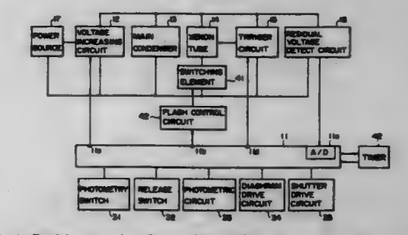
1. A camera with focus detecting device, ϕcomprising:
a) a sensor circuit for receiving the light from an object;
b) a focus detecting circuit for effecting focus detection based on the output of said sensor circuit;
c) an auxiliary light control circuit for controlling an auxiliary light source, when the focus detection by said focus detecting circuit is impossible, to cause light emission to said object;
d) a drive circuit for driving an imaging optical system according to a focus state detected by said focus detecting circuit;
e) a hand trembling detection circuit for detecting the hand trembling state based on the output of said sensor circuit;
f) a selection circuit for selecting the activation or deactivation of said hand trembling detection circuit; and
g) an inhibition circuit for deactivating said auxiliary light control circuit when said hand trembling detection circuit is activated by said selection circuit.

5,194,889

FLASHING DEVICE

Kimiaki Ogawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1992, Ser. No. 832,037
Claims priority, application Japan, Feb. 7, 1991, 3-102199
Int. Cl.[5] G03B *15/05*; H05B *41/32*
U.S. Cl. 354—418 **18 Claims**



1. A flashing device for emitting light, comprising means for emitting light, a condenser that is charged and supplies electricity to said means for emitting light, and means for charging said condenser, said flashing device further comprising:
means for detecting a residual voltage of said condenser after said emitting means emits light;
means for determining a charging prohibit period in accordance with said detected residual voltage of said condenser; and
means for prohibiting said charging of said condenser for said charging prohibit period which is determined by said determining means after said emitting means emits light.

5,194,890

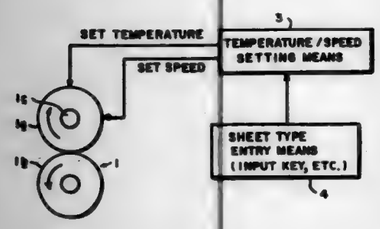
IMAGING APPARATUS EQUIPPED WITH AN IMAGE GLOSSING

Akira Haruna, Nara, and Iwakazu Houda, Kitakatsuragi, both of Japan, assignors to Sharp Kabushiki Kaisha, Abeno, Japan

Filed May 15, 1990, Ser. No. 523,591
Claims priority, application Japan, May 16, 1989, 1-124041
Int. Cl.[5] G03B *27/52*
U.S. Cl. 355—77 **9 Claims**

1. An imaging apparatus in which, after a development process, a receiver sheet is transferred through an image glossing device and is heated to promote color formation of a chromogenic material and to fuse thermoplastic resin, and in which a high gloss image is formed on the receiver sheet, wherein the improvement comprises:
means for inputting a receiver sheet for transfer through said image glossing device;
means for detecting a type of the inputted receiver sheet; and
means for determining a transfer speed, corresponding to the type of the receiver sheet, at which to transfer the receiver

sheet through the image glossing device and a temperature, corresponding to the type of the receiver sheet, at



which to heat the receiver sheet in the image glossing device.

5,194,891

COLOR IMAGE PRODUCTION CONTROL

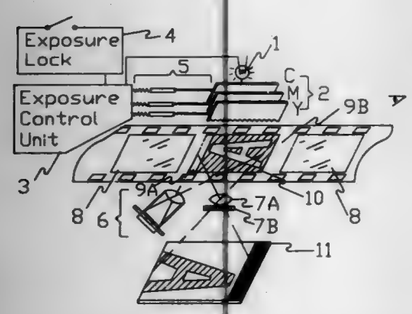
Chin L. Gan, Blk 220, Jurong East St 21, Unit 16-623, Singapore 2260, Singapore

Filed Jun. 11, 1991, Ser. No. 713,712

Claims priority, application United Kingdom, Jun. 12, 1990, 9013087

Int. Cl.[5] G03B *27/80*

U.S. Cl. 355—38 **15 Claims**



1. A method of exposure color printing including the steps of exposing a color emulsion film with an image and printing the image by means of a printing machine having an automatic metering system for determining color settings, the method including the following step previous the step of printing the image:

providing a balancing zone adjacent the image on the film, the balancing zone having a bias generally complementary to a bias of the image of the film, so that a correct exposure for printing the biased image of the film is determined by the automatic metering system on the basis of measurements integrated over both the biased image of the film and the balancing zone.

5,194,892

FILM INFORMATION EXCHANGE SYSTEM WITH VIRTUAL IDENTIFICATION CODES

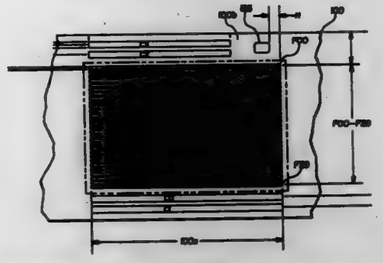
Gary L. Robison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 488,496, Mar. 2, 1990, Pat. No. 5,021,820, which is a continuation of Ser. No. 391,695, Aug. 10, 1989, abandoned, which is a continuation of Ser. No. 255,006, Oct. 7, 1988, abandoned. This application Apr. 16, 1991, Ser. No. 686,635

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] G03B *17/24*; G03D *27/52*

U.S. Cl. 355—40 **10 Claims**



1. In an elongate photographic film strip having successive frames, the improvement comprising:

a magnetic layer; and

a magnetic track recorded in said magnetic layer, said track comprising at least one field, said field comprising a virtual identification code and a plurality of sub-fields comprising magnetically recorded data representive of different parameters, the virtual identification code serving as an address to corresponding stored instructions which identify and interpret data in said sub-fields.

5,194,893

EXPOSURE METHOD AND PROJECTION EXPOSURE APPARATUS

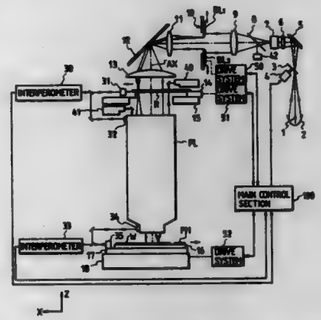
Kenji Nishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 3, 1992, Ser. No. 845,065

Claims priority, application Japan, Mar. 6, 1991, 3-39874

Int. Cl.[5] G03B *27/42*

U.S. Cl. 355—53 **5 Claims**



1. A method for exposure in which a pattern formed in a transfer region on a mask is subject to projection exposure through a projection optical system to be led onto an area to be exposed on a photosensitive substrate, and said mask and photosensitive substrate are at least one-dimensionally, relatively scanned with respect to a projection field of said projection optical system: comprising,

limiting a width of said area of pattern image projected on said photosensitive substrate through the projection optical system to an approximately constant value in a direction of one-dimensional scan; and

inclining a local surface on said photosensitive substrate on which said pattern image is formed, relative to a best focal plane of said projection optical system in the direction of one-dimensional scan.

5,194,894

COPYING APPARATUS

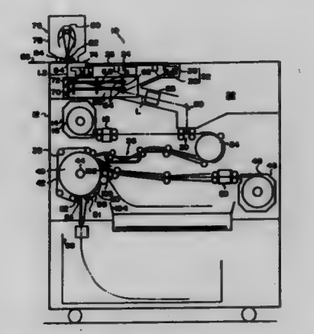
Tomonori Nishio, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 20, 1991, Ser. No. 794,921

Claims priority, application Japan, Nov. 22, 1990, 2-318347; Nov. 22, 1990, 2-318348; Nov. 22, 1990, 2-318349

Int. Cl.[5] G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 **26 Claims**



1. A copying apparatus comprising:

first scanning means having scanning mirror means shiftable over a predetermined range to scan an image recorded on a first document which is disposed at a predetermined position and to expose a photosensitive material;

second scanning means for shifting a second document which requires high magnification, to scan an image recorded thereon and to expose a photosensitive material; and

a zoom lens, for changing a magnification, disposed on a common optical path set downstream of said scanning mirror means, a scanning path for said first scanning means and a scanning path for said second scanning means coinciding with each other.

5,194,895

PRINTING MACHINE ADAPTIVE SETUP

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1991, Ser. No. 760,035

Int. Cl.[5] G03G *21/00*

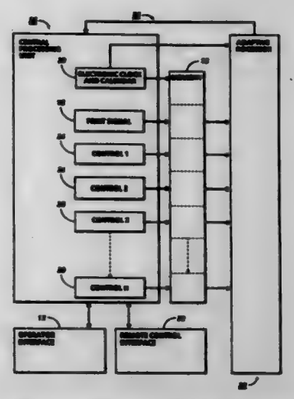
U.S. Cl. 355—208 **22 Claims**

1. An electrophotographic printing machine, comprising:

means for storing at least time and date data of each printing machine usage;

means, in communication with said storing means, for calculating a pattern of usage as a function of the data from said storing means;

means, in communication with said calculating means, for setting the printing machine in response to the pattern of usage from said calculating means to define an adaptive mode of operation; and



operator selectable means for operating the printing machine in the adaptive mode or a non-adaptive mode with the choice of mode being operator selectable.

5,194,896

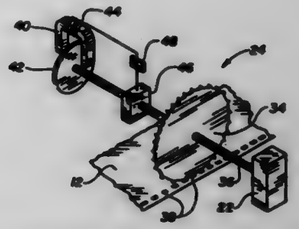
MAGNETIC BRAKE FOR PIVOTAL DEVICE

Donald C. Buch, Penfield, and John P. Marcelletti, Hilton, both of N.Y., assignors to Eastman Kodak Company, N.Y.

Filed Jan. 29, 1992, Ser. No. 827,298

Int. Cl.[5] G03G *5/00*

U.S. Cl. 355—212 **9 Claims**



1. An electrophotographic copying machine comprising:

a photoconductor film belt having a series of perforations;

drive means for driving said film belt;

a writing device for dissipating an electrical charge on said film belt corresponding to a pattern;

an optical encoder operatively connected to said film belt;

rollers in guiding contact with said film belt, and

a sprocket brake assembly comprising:

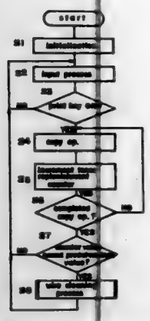
a sprocket spaced from said rollers, but operatively associated with said film belt and having radially extending teeth, the teeth being serially engaged by the perforations of the film belt as the belt moves past said sprocket to rotate said sprocket;

shaft means operatively connected to and rotated by said sprocket;

electrically conductive means rotatable by said shaft means; and

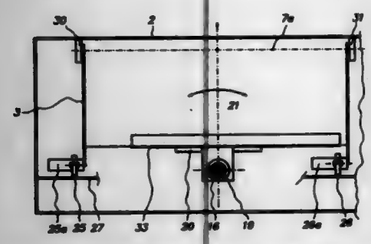
electromagnetic means for generating a magnetic force in the path of rotation of said electrically conductive means for generating eddy currents to brake the movement of said electrically conductive means and said sprocket to maintain proper engagement of a rear wall of said perforations with a rear side of said sprocket teeth.

5,194,897
IMAGE FORMING APPARATUS WITH CHARGE WIRE CLEANERS
Tsuguhito Yoshiyama, Toyohashi; Tadafumi Shimizu, Kurume; Hiroyuki Ideyama; Yoshihiko Hatta, both of Toyokawa, and Masazumi Ito, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 22, 1991, Ser. No. 795,982
Claims priority, application Japan, Nov. 27, 1990, 2-326984
Int. Cl.[5] G03G *21/00, 15/00*
U.S. Cl. 355—215 12 Claims



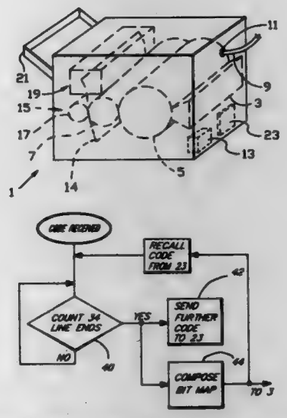
1. An image forming apparatus for forming images comprising:
developing means for developing latent images;
charging means for charging and discharging by corona discharge;
cleaning means for removing toner adhering to said charging means; and
control means for controlling to operate said cleaning means in accordance with the consumption of toner.

5,194,898
OPTICAL SCANNING APPARATUS HAVING MEANS TO STABILIZE OPTICAL UNIT AGAINST THE PLATEN
Dirk L. Costrop, Duffel, and Frank C. Trouillard, Lint, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium
Filed Mar. 2, 1992, Ser. No. 844,290
Claims priority, application European Pat. Off., Mar. 12, 1991, 91200531.1
Int. Cl.[5] G03G *15/28*
U.S. Cl. 355—236 14 Claims



1. Optical scanning apparatus wherein there is a document (D) support (2,53,58), a light source (7) for irradiating a document located against said support (2, 53, 58), a scanning unit (3,50), means (16,19) for positively guiding said unit along a predetermined scanning path relative to said document support, and means (44,45) for driving said unit along said path; said scanning unit comprising light-sensitive means (14). and focusing means (10) which during a scanning movement of the unit successively exposes said light-sensitive means to light images of successive lines of information displayed by said document; characterised in that said scanning unit has bearing members (30–31,50–51,56–57) for making bearing contact with a face of said document (D) or document support (2,53,58) and thereby determining the optical distance between that face and said focusing means (10), and in that said unit (3,50) is mounted so that it is under (a) biasing force(s) which maintain(s) its said bearing members (30–31,50–51,56–57) in running contact with said document or document support during a scanning movement of the unit.

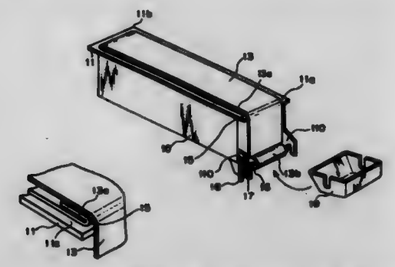
5,194,899
COMPLEX PAGE BIT MAP COMPOSITION
James C. Buchanan, Lexington, Ky., assignor to Lexmark International, Inc., Greenwich, Conn.
Filed Mar. 24, 1992, Ser. No. 856,614
Int. Cl.[5] G03G *15/04*
U.S. Cl. 355—244 2 Claims



1. A printer comprising data processing apparatus to compose bit mapped images of segments of a page to be printed received by said printer in electronic code, said data processing apparatus creating said composed segments as information received between codes in said page image which are characteristic of line endings image forming means to form a final-size image of each of said segments from each said bit mapped images of said segments, an image receiving member, means to transfer said final-sized image of each of said segments to said image receiving member sequentially as said segments are composed in registration to form an unfixed, final-size image of said page on said image receiving member, and means to transfer said page image from said image receiving member to a surface in visual form.

5,194,900
DEVELOPER CARTRIDGE HAVING EASILY REMOVABLE SEALING MATERIAL
Hideaki Hagihara, Nara, and Hiroshi Kinashi, Tsuzuki, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 16, 1991, Ser. No. 779,068
Claims priority, application Japan, Oct. 22, 1990, 2-285564
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—260 5 Claims

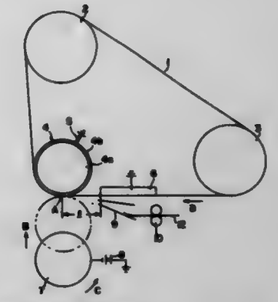
1. A developer cartridge used for replenishing a developer to a developing device comprising:
a container containing said developer and having an opening for supplying said developer; and
a sealing material having a first portion adhered to a peripheral portion of said opening to seal said opening, a second portion turned down at one end of said first portion to extend along and to cover said first portion, and a free end portion turned down at the other end of said first portion and sandwiched between said first portion and said second portion.



5,194,901
IMAGE FORMING APPARATUS HAVING MEANS FOR PREVENTING TONER DEPOSIT ON PHOTOSENSITIVE MEMBER
Satoru Fukushima, Tokyo, and Kenichi Takeda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 20, 1991, Ser. No. 718,287
Claims priority, application Japan, Jun. 21, 1990, 2-163395
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—273 26 Claims

1. An image forming apparatus, comprising:
a movable photosensitive member;
toner image forming means for forming a toner image on said photosensitive member;
transfer means for electrostatically transferring the toner image from said photosensitive member to a transfer material at a transfer position;
transfer material carrying means for carrying the transfer material to feed the transfer material to the transfer position, wherein said transfer means transfers the image while the transfer material is on said transfer material carrying means and while the transfer material is in first contact with said photosensitive member, and wherein after the image is transferred, the transfer material having the toner image transferred thereon and carried on the transfer material carrying means makes a second contact with said photosensitive member; and
charging means for charging said photosensitive member, wherein at least a part of said photosensitive member having made the first contact is charged by said charging means before said at least a part makes the second contact, so as to be given an electric potential at which said toner image forming means does not deposit toner to said photosensitive member.

5,194,902
TRANSFER UNIT
Taisuke Kamimura, Nara; Yasutaka Maeda, Ikoma; Hideyuki Nishimura, Yamatokoriyama; Tsuyoshi Miyamoto, Osaka, and Yukihiko Ueno, Hirakata, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed May 10, 1989, Ser. No. 349,994
Claims priority, application Japan, May 16, 1988, 63-119003; May 16, 1988, 63-119006
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—277 2 Claims

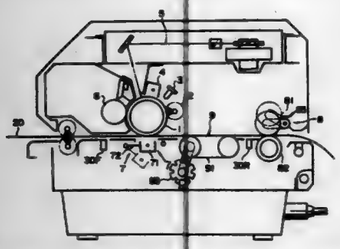


1. A transfer unit comprising:
a transfer belt onto which toner images are transferred from a photosensitive means; a backup roller on which said transfer belt is applied, said backup roller having a metallic surface coated with dielectric film;
a metallic transfer roller disposed opposite to said backup roller across said transfer bolt and to which a transfer voltage is applied, said transfer roller pressing copy paper against said backup roller with said transfer belt placed therebetween so that said toner images carried on said transfer belt are transferred onto said copy paper running between said transfer roller and said transfer belt;
a back plate located adjacent said backup roller and kept in contact with the back surface of said transfer belt; and
wherein said dielectric film is made of polyethylene terephthalate and said transfer voltage applied to said transfer roller is in the range of about 1.5 to 3.5 kV.

5,194,903
ELECTROPHOTOGRAPHIC PRINTER FOR A CONTINUOUS RECORDING FORM
Kiyoshi Negishi, and Yoshimi Saito, both of Tsurugashima, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 3, 1991, Ser. No. 770,449
Claims priority, application Japan, Oct. 3, 1990, 2-265979
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—316 10 Claims

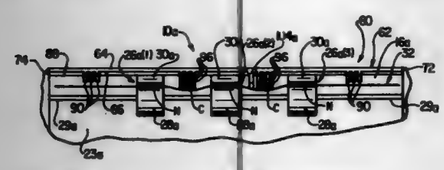
1. An electrophotographic printer using a plurality of types of continuous recording forms having different page lengths, respectively, perforations being provided between pages of said continuous recording forms, a toner image being transferred onto the continuous recording form at a transfer position and fixed at a fixing position, said printer being operated at least in a standby state and in a printing state, said printer comprising:
feed means for feeding said continuous recording from loaded into said printer;
control means for controlling said feed means such that the perforations of said loaded continuous recording form are located at a predetermined position when said printer is in

said standby state, regardless of the page length of said continuous recording form loaded into said printer;
input means for inputting a data representing the page length of said continuous recording form loaded into said printer; and
memory means for storing a plurality of sets of control data used for feeding said continuous recording form, one set



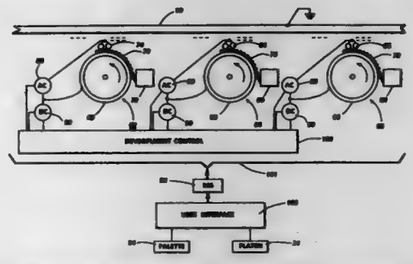
of said control data corresponding to respective page-lengths of said continuous recording forms;
wherein said control means controls said printer in accordance with one set of said control data corresponding to the data inputted by said input means, such that either one of an exposure operation or a feeding operation starts prior to the other, based upon said data inputted by said input means.

5,194,904
EXITING PAPER DEFLECTOR APPARATUS FOR AN IMAGE REPRODUCTION MACHINE
Mark H. Ruch, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Filed Apr. 15, 1992, Ser. No. 870,053
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—321 **21 Claims**



1. An image reproduction machine comprising:
a housing having a horizontally elongated outlet opening, and a well area for receiving and stacking therein cut paper sheets successively discharged in a forward direction from said outlet opening;
feed means for successively feeding cut paper sheets through said housing and then discharging the sheets outwardly through said outlet opening into said well area, said feed means including a horizontally spaced series of rotationally drivable exit roller sets each positioned adjacent said outlet opening and including a duality of rollers bearing against one another along a nip area;
means for reproducing a predetermined image on the sheets as they are fed through said housing; and
paper deflector apparatus including a plurality of deflector means transversely extending generally centrally between adjacent pairs of said exit roller sets to a level vertically past said nip area, said deflector means being operative to contact and bend spaced portions of each discharging sheet being forwardly passed through said nip area in a manner temporarily corrugating and stiffening the discharging sheet without permanently creasing or crinkling it,
said image reproduction machine having an elongated, plate-like support member positioned above said exit roller sets and generally parallel to their axes,
said paper deflector apparatus including an elongated, plate-like base portion having a plurality of clip means for releasably attaching said base portion to and in a longitudinally parallel relationship with said support member, and
said plurality of deflector means projecting downwardly beyond an underside of said base portion and are longitudinally spaced along and transverse to the length of said base portion.

5,194,905
COLOR PRINTER APPARATUS FOR PRINTING SELECTED PORTIONS OF LATENT IMAGES IN VARIOUS COLORS
Grace T. Brewington, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 29, 1990, Ser. No. 619,649
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **2 Claims**

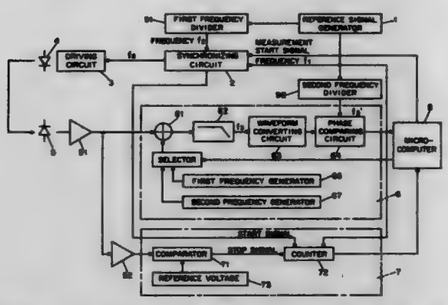


1. Apparatus for creating color images in a single pass of a charge retentive surface past a plurality of process stations, said apparatus comprising:
a charge retentive surface;
means for forming latent electrostatic images on said charge retentive surface;
a plurality of developer structures, each containing a different color toner for selective toner deposition on said latent electrostatic images, each of said developer structures being positioned in a development nip between it and said charge retentive surface;
means for electrically biasing each of said developer structures for a period of time;
means for selectively modifying said period of time for each developer structure whereby the quantity of toner deposited on said latent electrostatic images by each developer structure can be varied;
said means for selectively modifying said period of time being capable of modifying it from a time of zero to a maximum time, said maximum time corresponding to the time for an image on said charge retentive surface to move through a development nip; and
said means for selectively modifying comprising a user selectable color palette.

5,194,906
DISTANCE MEASURING DEVICE
Kazuaki Kimura, and Kaoru Kumagai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Japan
Filed Sep. 5, 1991, Ser. No. 755,575
Claims priority, application Japan, Sep. 10, 1990, 2-240369; Sep. 21, 1990, 2-253802; Sep. 21, 1990, 2-253803
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—5 **5 Claims**

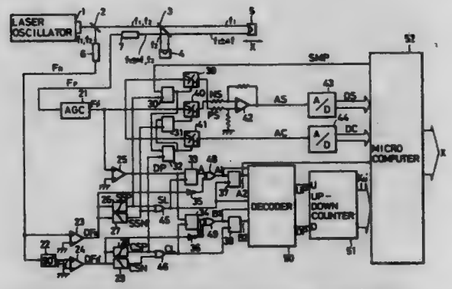
1. A distance measuring device for measuring a distance by detecting a reflected light from reflecting means located at a measuring point; said distance measuring means comprising

signal generating means for generating a multiplex modulation signal; light emitting means for generating a multiplex modulation light according to said modulation signal generated from said signal generating means; light receiving means for receiving said multiplex modulation light generated from said light emitting means and reflected by said reflecting means to form a reflected multiplex modulation signal; first phase signal forming means for forming a first phase signal containing a phase component of a first modulation signal from said reflected



multiplex modulation signal; second phase signal forming means for forming a second phase signal containing a phase component of a second modulation signal, which is different in frequency from said first modulation signal, from said reflected multiplex modulation signal; and distance measuring means for measuring said distance to said measuring point with use of a phase difference between said first phase signal and a reference signal corresponding to said multiplex modulation signal and with use of a phase difference between said second phase signal and said reference signal.

5,194,907
DISPLACEMENT DETECTING APPARATUS
Yasukazu Hayashi, Niwa, Japan, assignor to Okuma Corporation, Aichi, Japan
Filed Jul. 25, 1991, Ser. No. 735,909
Claims priority, application Japan, Jul. 31, 1990, 2-202971
Int. Cl.[5] G01C *3/08*; G01S *13/08*
U.S. Cl. 356—5 **5 Claims**



1. A displacement detecting apparatus comprising:
means for receiving a reference periodic signal and a phase modulated signal from a detector device, said phase modulated signal denoting a reflected wave which is phase modulated by a displacement of a reflector;
a first sample-hold means for sampling said phase modulated signal at a first timing corresponding to at least one of each rising transition and each falling transition of said reference periodic signal to obtain first sampled signals;
a second sample-hold means for sampling said phase modulated signal at a second timing corresponding to a quarter cycle delay of said periodic reference signal relative to said first timing to obtain second sampled signals;
an A/D converting means for converting said first and second sampled signals into first and second digital values; and
a numeral converting means for converting said first and second digital values into a displacement value.

5,194,908
DETECTING TARGET MOVEMENT
James H. Lougheed, Kinburn, and Mark Wardell, Nepean, both of Canada, assignors to Computing Devices Canada Ltd., Nepean, Canada
Filed Nov. 29, 1991, Ser. No. 799,969
Int. Cl.[5] G01P *3/36*
U.S. Cl. 356—28 **48 Claims**

1. Apparatus for determining the speed of an object moving relative to a scene comprising:
means (20, 21, 22) for providing a plurality of frames of data representing successive images of at least a portion of the scene, each frame comprising an object segment, in which features of the object predominate, and at least one background segment comprising part of the frame excluding the object segment;
means (23; 8.3) for effecting registration of features in a background segment of one of said plurality of frames with corresponding features in a background segment of a reference frame comprising a different one of said plurality of frames;
means (23; 8.5, 8.7) for determining displacement of features in said object segment of said one of said plurality of frames relative to the registered background segment features; and
means (23; 8.14) for computing from the displacement of the object features over a predetermined number of frames, the speed of movement of the object relative to the background features.

5,194,909
APPARATUS AND METHOD FOR MEASURING VOLUME AND HEMOGLOBIN CONCENTRATION OF RED BLOOD CELLS
Daniel H. Tycko, P.O. Box 1033, Stony Brook, N.Y. 11790
Filed Dec. 4, 1990, Ser. No. 621,899
Int. Cl.[5] G01N *33/48*
U.S. Cl. 356—40 **18 Claims**

1. An apparatus for measuring the volume and hemoglobin concentration of individual red blood cells in a blood sample comprising:
means for isovolumetrically sphering the red blood cells of the sample;
means for entraining the sphered red blood cells of the sample into a stream of spaced-apart, individual, sphered red blood cells sheathed in an electrolytic liquid;
light source means for illuminating each of the red blood cells in the stream with light of predetermined spectral characteristics incident from a predefined direction;
optical detection means for measuring within a preselected

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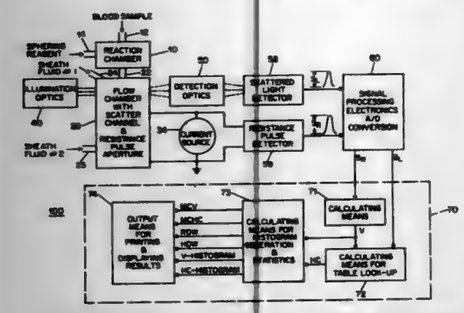
angular interval the intensity of light scattered in the predefined direction by each of the red blood cells illuminated by the light source means and providing a corresponding first pulse signal having an amplitude representative of the measured intensity of the light scattered by the red blood cell, the preselected angular interval being chosen to permit the calculation of a unique value for the hemoglobin concentration of each red blood cell in the stream from the measured intensity of the light scattered by the cell and the volume of the cell;

an aperture of specified cross section and length positioned to pass each of the red blood cells in the stream and the electrolytic liquid by which the stream is sheathed;

resistance measuring means for measuring the electrical



resistance of the electrolytic liquid within the aperture, including a change in the electrical resistance caused by the passing of each of the red blood cells in the stream through the aperture, and providing a corresponding second pulse signal having an amplitude representative of the change in the electrical resistance caused by the passing of the cell through the aperture;

first calculating means for determining the volume of each of the red blood cells in the stream passing through the aperture from the corresponding second pulse signal; and

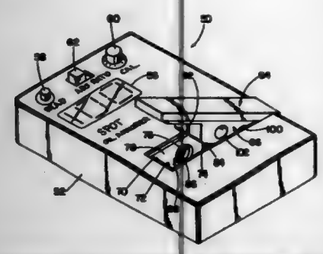
second calculating means for determining the hemoglobin concentration of each of the red blood cells of the stream from the corresponding first pulse signal and the volume of the cell determined by the first calculating means from the corresponding second pulse signal.

5,194,910

USE OF OPTICAL SPECTROMETRY TO EVALUATE THE CONDITION OF USED MOTOR OIL

James F. Kirkpatrick, Jr., and James R. Stevenson, both of Oak Ridge, Tenn., assignors to Gas Research Institute, Chicago, Ill.

Filed Jul. 31, 1990, Ser. No. 561,452
Int. Cl.[5] G01N 33/28, 21/88
U.S. Cl. 356—70 25 Claims



1. An instrument for determining lubricating characteristics of oil, said instrument comprising measuring elements for optically measuring variation in transmittance as a function of wavelength as an indicator of oil lubricating characteristics, said measuring elements comprising light source means adapted to produce light at two predetermined wavelengths such that the intensity of said light at least one of predetermined wavelengths is adjustable with respect to the other and sensor means for detecting said light, said light source means and sensor means operable to optically measure variation in transmittance as a function of wavelength within an approximate wavelength range of from 300 nm to 1300 nm and said light source means and sensor means further operable to optically measure transmittance at two distinct wavelengths within the approximate wavelength range;

a calculating element connected to said measuring elements and operable to calculate the ratio of transmittance at the shorter of the two distinct wavelengths to transmittance at the longer of two distinct wavelengths as an indication of oil lubricating characteristics, decreases in the ratio from a ratio of unity indicating decreasing oil lubricating quality; and

a sample delivery device for presenting a sample of oil to be measured between said light source means and said sensor means such that the amount of light reaching said sensor means depends upon the transmittance of the oil sample at a corresponding one of the wavelengths.

5,194,911

METHOD AND APPARATUS FOR DETERMINING THE QUANTITY OF MATERIAL TRANSPORTED WITHIN A FIBRE BAND OR SLIVER

Hansruedi Stutz, Dietlikon, Switzerland, assignor to Gebruder Loepfe AG, Kempten, Switzerland

Filed Mar. 6, 1991, Ser. No. 665,764
Claims priority, application Switzerland, Mar. 8, 1990, 741/90
Int. Cl.[5] D01G 15/46
U.S. Cl. 356—242 7 Claims

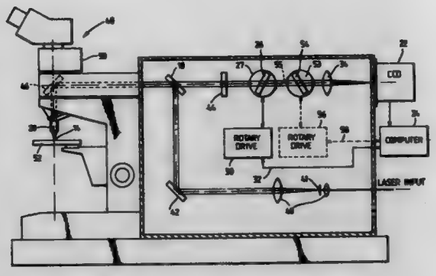
1. A method for determining the quantity of fibre material transported in a fibre band or sliver, wherein the fibre band or sliver is passed through an opening of a measuring station defined by walls, said opening having a cross section smaller than a diameter of the fibre band or sliver so that it contacts said walls of the opening which thereby defines a measuring cross section, wherein the fibre band while passing said opening is transilluminated between said walls by means of a plurality of light emitters and a plurality of light receivers arranged at said opening and operated so that each transmitted light intensity value received by a light receiver corresponds to a defined path of the light through said measuring cross section, wherein a plurality of such defined light paths is provided between said light emitters and said light receivers, said paths being distributed over said measuring cross section, wherein the light emitters and/or light receivers during a measuring cycle are operated sequentially so that the transmitted light intensity values along each of said plurality of paths are measured successively during a measuring cycle, and wherein during a measuring cycle a mean value or added value of the light intensity values received by said light receivers is formed as a measured for the quantity of fibre material present in said measuring cross section during the measuring cycle.

5,194,912

RAMAN ANALYSIS APPARATUS

David N. Batchelder; Chunwei Cheng, and Brian J. E. Smith, all of London, England, assignors to Renishaw plc, Gloucestershire, United Kingdom

PCT No. PCT/GB89/01532, § 371 Date Aug. 6, 1990, § 102(e) Date Aug. 6, 1990, PCT Pub. No. WO90/07108, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 22, 1989, Ser. No. 543,729
Claims priority, application United Kingdom, Dec. 22, 1988, 8830039
Int. Cl.[5] G01J 3/44
U.S. Cl. 356—301 25 Claims



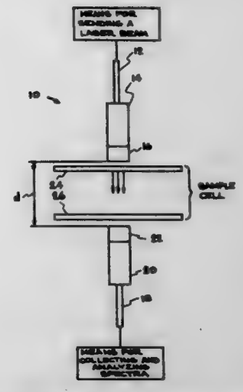
1. Raman analysis apparatus comprising:

means for illuminating a sample so as to produce therefrom a Raman spectrum,

non-dispersive tunable filter means for selecting a desired frequency of said Raman spectrum received from the sample without splitting differing frequencies into a range of angles, said tunable filter means being continuously tunable over at least a band of said spectrum including a plurality of Raman lines, and

a detector for detecting the light selected by the tunable filter means.

c. means for sending a laser beam through said exciting fiber, and



d. means for collecting and analyzing the spectra received through said collecting fiber.

5,194,913

FIBER-OPTIC APPARATUS AND METHOD FOR MEASUREMENT OF LUMINESCENCE AND RAMAN SCATTERING

Michael L. Myrick, and Stanley M. Angel, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 20, 1991, Ser. No. 672,335
Int. Cl.[5] G01N 21/64, 21/65
U.S. Cl. 356—301 15 Claims

1. Apparatus for creating and sensing light spectra at remote locations which comprises:

a. an exciting optical fiber having a collimating micro-lens and an optical filter for rejecting light other than at desired wavelengths positioned on the distal end thereof,

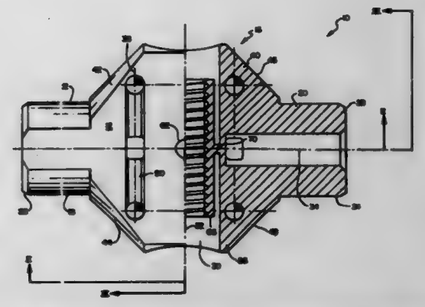
b. a collecting optical fiber having a collimating micro-lens and an optical filter for rejecting a laser beam mounted on the distal end thereof, the distal ends of each of said exciting optical fiber and said collecting optical fiber being in opposition to each other and positioned a pre-determined distance apart, and optionally

5,194,914

FURNACE FOR THE ELECTROTHERMAL ATOMIZATION OF SAMPLES IN ATOMIC ABSORPTION SPECTROSCOPY

Rolf Tamm, Salem, and Gunther Rodel, Owingen, both of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Filed Feb. 6, 1990, Ser. No. 475,585
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 8901529[U]
Int. Cl.[5] G01N 21/74
U.S. Cl. 356—312 11 Claims



1. A furnace for the electrothermal atomization of samples in atomic absorption spectroscopy comprising:

a tubular, electrically conductive furnace body having a lateral inlet port;

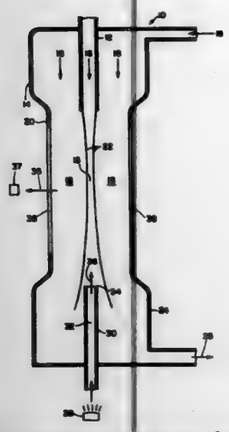
an inner body formed from a portion of a tube having an opening facing the inlet port, said inner body positioned within and integral with said furnace body; and

a single web holding said inner body within said furnace spaced from the wall of said furnace body, said web extending in a direction substantially perpendicular to the longitudinal axis of said inner body, being narrow in its axial direction and arranged non-symmetrically on said inner body such that the axis of the inlet port does not extend therethrough.

5,194,915
PHOTOMETRIC APPARATUS AND PROCESS

Anthony C. Gilby, Foxborough, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Sep. 20, 1990, Ser. No. 585,465
Int. Cl.[5] G01J *3/30*; F21V *9/16*
U.S. Cl. 356—318 8 Claims



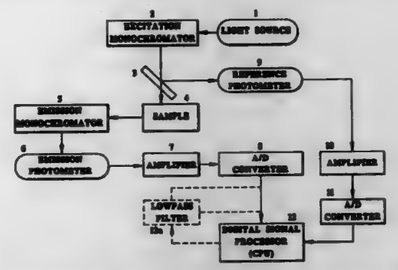
1. Apparatus for measuring fluorescence from a liquid sample which comprises
a dual conduit means having a central conduit positioned within an outer conduit,
said outer conduit having an inlet and an outlet,
at least a portion of a wall of said outer conduit being transparent to fluorescent radiation,
means for introducing a first liquid through said outer conduit,
means for introducing a liquid sample through said central conduit and into contact with said first liquid within said outer conduit,
means for effecting laminar flow of said first liquid and said liquid sample through said outer conduit so that said first liquid forms a flowing sheath around said liquid sample,
means for continuously removing said flowing sheath and said liquid sample from said outer conduit under conditions of laminar flow thereby to prevent contamination of said liquid sample,
a light source means to direct excitation from said light source axially into said outer conduit and into said liquid sample,
and means for detecting fluorescence from said sample,
said liquid sample stream having a refractive index higher than the refractive index of the first liquid at the wavelength of the excitation light.

5,194,916
FLUORESCENCE SPECTROPHOTOMETER

Tsutomu Hayashi, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Sep. 6, 1991, Ser. No. 755,732
Claims priority, application Japan, Sep. 28, 1990, 2-262003
Int. Cl.[5] G01J *3/443*; G01N *21/64*
U.S. Cl. 356—318 10 Claims

1. A fluorescence spectrophotometer comprising:
a) excitation monochromatic light generating means for irradiating excitation monochromatic light onto a sample to be measured;
b) emission monochromator for selecting monochromatic light from fluorescent light emitted from the sample;
c) emission photometer for generating a primary output signal corresponding to the strength of the monochromatic light selected by the emission monochromator;
d) filtering means for eliminating noises from the primary output and for generating a secondary output, the filtering means being characterized by a response value;

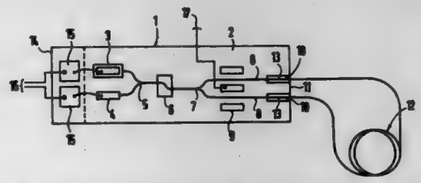


e) determination means for determining a content of the sample based on the secondary output; and
f) response setting means for setting the response value of the filtering means based on the primary output.

5,194,917
FIBER-OPTIC GYROSCOPE INTEGRATED ON A SILICON SUBSTRATE

Rolf Regener, Schorndorf, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 22, 1991, Ser. No. 734,145
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1990, 4027024006
Int. Cl.[5] G01C *19/72*
U.S. Cl. 356—350 19 Claims



1. In a fiber-optic gyroscope for measuring rotation rates which includes electrical, optical, and electro-optical functional units and at least one fiber coil, the improvement wherein at least the optical and electro-optical functional units are integrated on a silicon substrate.

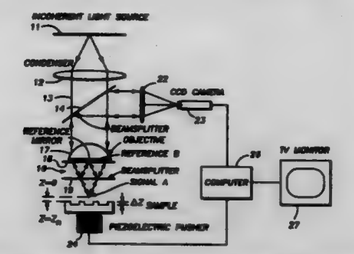
5,194,918
METHOD OF PROVIDING IMAGES OF SURFACES WITH A CORRELATION MICROSCOPE BY TRANSFORMING INTERFERENCE SIGNALS

Gordon S. Kino, and Stanley S. C. Chim, both of Santa Clara County, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed May 14, 1991, Ser. No. 700,525
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—359 9 Claims

1. The method of providing images of a surface of a sample using a correlation microscope comprising the steps of
at each of a plurality of x,y locations of said sample, focusing an illumination beam at a multiplicity of distinct z positions ranging from a position above the sample to a position below the sample;
generating interference signals for each x,y,z location at which said illumination beam is focused by said focusing step;

storing the interference signals for each of said x,y,z locations as the object is moved in the z plane, and

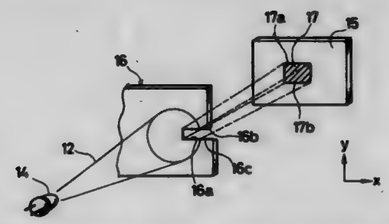


transforming the stored interference signals at each x,y location in the z direction to obtain an intensity envelope of interfering signals in the z direction for each x,y location.

5,194,919
OPTICAL TYPE POSITION DETECTING DEVICE

Hiroshi Katayama, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1991, Ser. No. 749,663
Claims priority, application Japan, Aug. 28, 1990, 2-227621
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—375 13 Claims

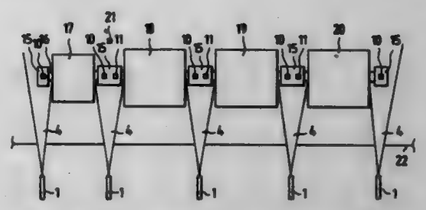


1. An optical type position detecting device comprising:
a light source; and
a light-receiving element for detecting a light beam emitted by said light source;
said light-receiving element including a light-receiving section;
said light-receiving section having parallel sides, said sides being set to extend in directions substantially corresponding to directions of relative displacement of said light-receiving element and a region on the light-receiving element whereon the light beam is incident, a distance between said sides being set to be smaller than a size of a cross section of said light-receiving element of the light beam incident thereon so that boundaries of the region are formed by parts of said sides, a relative displacement being detected by using said light-receiving element to detect a change in area of the region, the change in the area accompanying the relative displacement.

5,194,920
METHOD AND APPARATUS FOR MEASURING ALIGNMENT STATUS

Raimo Mattila, Rajamäki, Finland, assignor to Imatran Voima Oy, Helsinki, Finland

Division of Ser. No. 534,245, Jun. 7, 1990, Pat. No. 5,127,738.
This application Jan. 10, 1992, Ser. No. 819,173
Claims priority, application Finland, Jun. 26, 1989, 893106
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—400 4 Claims

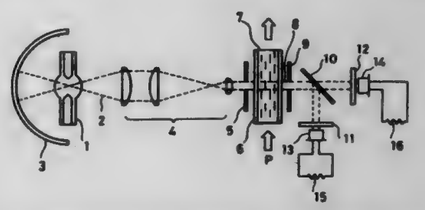


1. A measurement apparatus for measurement of alignment status of vibrating machinery comprising at least one laser (1) incorporating a telescope (2) and a lens (3), which elements serve for the expansion of the beam of the laser (1) into a stationary horizontally fanned beam (4), and means or positioning said laser (1) outside the measured line,
at least one sensor unit assembly comprising at least two measurement sensor units (10, 11) onto which the fan-shaped beam (4) of the laser (1) can be directed simultaneously, the sensor units being positioned on the measured line during the measurement, and
first data processing means operatively connected to each of said sensor units (10, 11) for reading the measurement information from units and for processing said information, and second data processing means for further reading the measurement information from sensor unit assemblies and for processing said information.

5,194,921
METHOD AND APPARATUS FOR DETECTING FLOCCULATION PROCESS OF COMPONENTS IN LIQUID

Norihito Tambo; Yoshihiko Matsui, both of Hokkaido; Tokio Ohto, Kawasaki; Yasushi Zaitsu, Kawasaki; Mutsuhisa Hiraoka, Kawasaki; Hiroshi Hoshikawa, Kawasaki, and Haruo Ito, Kawasaki, all of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1991, Ser. No. 658,635
Claims priority, application Japan, Feb. 23, 1990, 2-43064; Sep. 29, 1990, 2-261771
Int. Cl.[5] G01N *21/00*, *15/06*
U.S. Cl. 356—432 3 Claims



1. A method for detecting progress of a flocculation process of a plurality of components in a sample liquid, the flocculation process being produced by adding a flocculant into the sample liquid including at least a suspended component and a dissolved component, comprising the steps of:

simultaneously irradiating on a single optical axis a flow of the sample liquid with a beam including at least a first wavelength component and a second wavelength component, the first wavelength component having a different wavelength than the second wavelength component;

converting said beam after transmission through said sample liquid into electric signals corresponding to the first and second wavelength components;

calculating from said electric signals the intensities, mean values, standard deviations and coefficients of variation of absorbances of the first and second wavelength components;

calculating correlation coefficients between the intensities of the first and second wavelength components of the transmitted beam;

selecting the wavelength of the first wavelength component so as to be absorbed only by the suspended component and selecting the wavelength of the second wavelength component so as to be absorbed by both the suspended component and the dissolved component including the flocculant; and said calculating step further comprising the sub-steps of:

calculating a mean value $\overline{E_1}$ of absorbance of the first wavelength component;

calculating a standard deviation E_{r1} of the absorbance of the first wavelength component;

calculating a mean value $\overline{E_2}$ of absorbance of the second wavelength component;

calculating a standard deviation E_{r2} of the absorbance of the second wavelength component;

calculating a time serial correlation coefficient ρ_{12} between the absorbances of the first and second wavelength components; and

calculating absorbance E_2' corresponding to an amount of uncoagulated dissolved component which is uniformly contained in the sample liquid without having been adsorbed by particles in the sample liquid and consequently corresponding to progress of the flocculation process, by using the following equation and the values $\overline{E_1}$, E_{r1}, $\overline{E_2}$, E_{r2}, and ρ_{12}

$$E_2' = E_2 - \frac{E_1}{\rho 12} \cdot \frac{E_{r2}}{E_{r1}}.$$

5,194,922

LUMINESCENT SEMICONDUCTOR ELEMENT

Karl Moser, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 28, 1991, Ser. No. 676,311

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011145

Int. Cl.[5] H01L *33/00*

U.S. Cl. 257—79 **4 Claims**

1. A luminescent semiconductor element for emitting radiation of a desired wavelength, comprising:

a) a first thick compound semiconductor layer of uniform material composition and transparent to the desired wavelength;

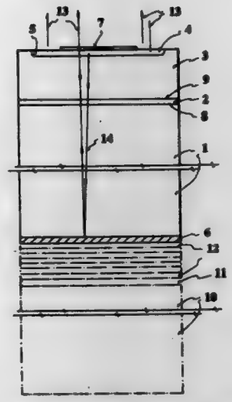
b) a thin graded layer arranged on said first semiconductor layer and comprising compound semiconductor material whose composition has a linear gradient;

a further compound semiconductor layer arranged on said graded layer and having a uniform material composition that determines the wavelength of the radiation emitted by the luminescent semiconductor element;

an active layer arranged in a surface area of said further compound semiconductor layer and having a conductivity opposite to that of said further compound semiconductor layer to form a p-n junction;

a rear contact arranged on said first compound semiconductor layer; and

a front contact arranged on a surface of said active layer; and



wherein the compound semiconductor material is gallium-arsenide-phosphide having the composition $GaAs_xP_{1-x}$ with $x=0.52$ in the first semiconductor layer, with $x=0.6$ in the further semiconductor layer, and with the value for x changing from 0.52 to 0.6 in the graded layer.

5,194,923

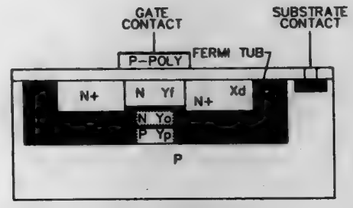
FERMI THRESHOLD FIELD EFFECT TRANSISTOR WITH REDUCED GATE AND DIFFUSION CAPACITANCE

Albert W. Vinal, Cary, N.C., assignor to Thunderbird Technologies, Inc., Research Triangle Park, N.C.

Filed Jan. 28, 1992, Ser. No. 826,939

Int. Cl.[5] H01L *29/78*

U.S. Cl. 257—268 **1 Claim**



1. A field effect transistor comprising:

a semiconductor substrate of first conductivity type having a first surface and being doped at a first dopant density;

source and drain regions of second conductivity type in said substrate at said first surface;

a channel of said second conductivity type in said substrate at said first surface, between said source and drain regions, said channel being doped at a second dopant density and having a first predetermined depth from said first surface;

a Tub region of said second conductivity type in said substrate adjacent said channel and opposite said first surface, said Tub having a second predetermined depth from said channel;

a gate insulating layer on said substrate at said first surface adjacent said channel, at least said first and second dopant densities and said first and second predetermined depths being selected to allow conduction carriers to flow within said channel beneath first surface; and

source, drain and gate contacts for electrically contacting said source and drain regions and on said gate insulating layer, respectively.

5,194,924

SEMICONDUCTOR DEVICE OF AN LDD STRUCTURE HAVING A FLOATING GATE

Kazuhiro Komori, Kodaira; Kenichi Kuroda, Tachikawa, both of Japan, and June Sugiura, Troy, N.Y., assignors to Hitachi, Ltd., Tokyo, Japan

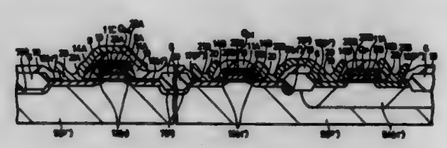
Division of Ser. No. 479,151, Mar. 28, 1990, Pat. No. 5,098,855, which is a division of Ser. No. 291,647, Dec. 29, 1988, Pat. No. 4,918,501, which is a continuation of Ser. No. 10,998, Feb. 5, 1987, abandoned, which is a division of Ser. No. 736,770, May 22, 1985, Pat. No. 4,663,645. This application Oct. 23, 1991, Ser. No. 781,592

Claims priority, application Japan, May 23, 1984, 59-102555; Aug. 13, 1984, 59-167825

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[5] H01L *29/68, 29/06, 27/02*

U.S. Cl. 257—316 **27 Claims**



1. A semiconductor device comprising:

at least one first MISFET, each first MISFET including (1) a control gate electrode, (2) a floating gate electrode disposed under said control gate electrode, (3) a first gate insulating film disposed between a semiconductor substrate and said floating gate electrode, (4) a second gate insulating film disposed between said floating gate electrode and said control gate electrode, and (5) source and drain regions of a first conductivity type provided in said semiconductor substrate, a channel region of a second conductivity type provided in said semiconductor substrate beneath said floating gate electrode and being provided between said source and drain regions, said drain region including a first region which is provided substantially in self-alignment with said floating and control gate electrodes and which is in contact with said channel region; and

at least one second MISFET, each second MISFET including (a) a first gate electrode over said semiconductor substrate, (b) a third gate insulating film disposed between a semiconductor substrate and said first gate electrode, and (c) source and drain regions of said first conductivity type provided in said semiconductor substrate, a channel region of the second conductivity type being provided in said semiconductor substrate beneath said first gate electrode and being provided between said source and drain regions, said drain region including a second region and a third region, said second region being provided substantially in self-alignment with said first gate electrode and disposed between said third region and said channel region, said third region having an impurity concentration higher than that of said second region, wherein said first region of said first MISFET has an impurity concentration higher than that of said second region of said second MISFET.

5,194,925

ELECTRICALLY PROGRAMMABLE NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

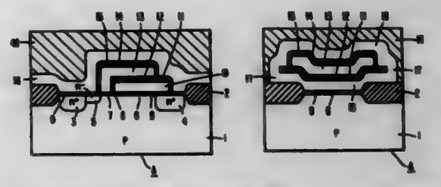
Natsuo Ajika, and Hideaki Arima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 657,766

Claims priority, application Japan, Feb. 22, 1990, 2-43224

Int. Cl.[5] H01L *29/68*

U.S. Cl. 257—314 **12 Claims**



1. A programmable non-volatile semiconductor memory device comprising:

a semiconductor substrate of first conduction type and having a main surface;

source and drain regions of second conduction type respectively formed on said main surface of the semiconductor substrate in such a manner as to be separated from each other by first and second channel regions;

a first control gate disposed on said first channel region between said source region and said drain region and separated therefrom by a first insulating film;

a floating gate disposed on said second channel region and separated therefrom by a second insulating film, said floating gate disposed on said first control gate and separated therefrom by a first interlayer insulating film;

a second control gate disposed on a surface of said floating gate and separated therefrom by a second interlayer insulating film; and

a third control gate including a first portion connected to one end of said second control gate, said first portion orthogonally disposed relative to said first and second channel regions, and a second portion connected to one end of said first control gate, said second portion having a length orthogonal to said first and second channel regions, said second control gate separated by a third insulating film from one end of the floating gate, said third insulating film from one end of the floating gate, said third insulating film orthogonal to said first and second channel regions,

further comprising a second drain region of second conduction type on said main surface between said drain region and said second channel region,

said first mentioned drain region having a higher impurity concentration of said second conduction type than said second drain region,

said second control gate disposed on said first and second drain regions and separated therefrom by said first insulating film,

wherein said second control gate is further disposed on said source region and is separated therefrom by said first insulating film.

5,194,926

SEMICONDUCTOR DEVICE HAVING AN INVERSE-T BIPOLAR TRANSISTOR

James D. Hayden, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 3, 1991, Ser. No. 770,219

Int. Cl.[5] H01L *21/263, 21/265, 29/72*

U.S. Cl. 257—565 **14 Claims**

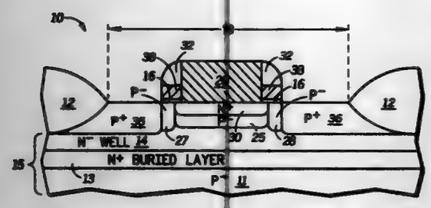
1. A semiconductor device having an inverse-T bipolar transistor comprising:

a semiconductor substrate of a first conductivity;

an inverse-T emitter electrode overlying the substrate, the

inverse-T emitter electrode having a body portion and first and second shelf portions, the body portion being formed on the substrate and the first and second shelf portions being formed on opposing sides of the body portion and being separated from the substrate by a dielectric, wherein a portion of the body portion of the emitter electrode extends above the first and second shelf portions such as that the emitter electrode has an inverted "T" shape;

an emitter region of the first conductivity formed in the substrate beneath the body portion of the inverse-T emitter electrode;



an active base region of a second conductivity formed in the substrate beneath the emitter region;

first and second lightly doped link regions of the second conductivity formed in the substrate on opposing sides of the body portion of the inverse-T emitter electrode beneath the first and second shelf portions, respectively; and

first and second extrinsic base regions of the second conductivity formed in the substrate on opposing sides of the first and second shelf portions of the inverse-T emitter electrode and adjacent the first and second link portions, respectively.

5,194,927

SEMICONDUCTOR DEVICE

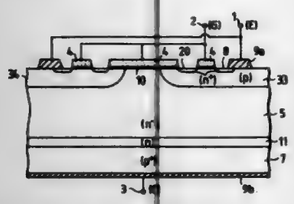
Katsunori Ueno, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 6, 1991, Ser. No. 740,896

Claims priority, application Japan, Aug. 16, 1990, 2-216407; Nov. 30, 1990, 2-339249

Int. Cl.[5] H01L *29/74*

U.S. Cl. 257—565 **2 Claims**



1. A semiconductor device comprising:

a substrate of a silicon thin plate having a first conductivity type collector region and a second conductivity type base region formed on said first conductivity type collector region;

a plurality of wide and narrow gate polysilicon layers selectively laminated with different widths on said substrate through gate insulating films respectively;

first conductivity type base regions formed by thermal diffusion by using said wide gate polysilicon layer as a mask;

second conductivity type drain and source regions respectively formed so as to be shallower than said first conductivity type base regions by using said plurality of gate polysilicon layers as masks; and

emitter electrodes provided respectively on said source regions which are farther from said wide polysilicon layer than said corresponding drain regions so as to contact with said first conductivity type base regions respectively so that said source region and said base region are short circuited;

wherein said second conductivity type base region being electrically connected to said drain and source regions through a plurality of channels formed in the surfaces of said first conductivity type base regions respectively when a gate voltage is applied to said gate polysilicon layers.

5,194,928

PASSIVATION OF METAL IN METAL/POLYIMIDE STRUCTURE

John E. Cronin, Milton; Paul A. Farrar, Sr., South Burlington; Harold G. Linde, and Rosemary A. Previti-Kelly, both of Richmond, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 641,036, Jan. 14, 1991, Pat. No. 5,114,754. This application Feb. 26, 1992, Ser. No. 842,307

Int. Cl.[5] H01L *29/34*

U.S. Cl. 257—629 **7 Claims**

3. A semiconductor structure, comprising a substrate containing a pattern of metallization, a polyimide layer, and a layer of silsesquioxane polymer intermediate said substrate and said polyimide layer, said polymer containing reactive amino groups which coordinate to said metal, so as to passivate said metal and inhibit interaction between said meal and a polyimide precursor material to be applied in the formation of said polyimide layer, said structure being produced by:

applying to said substrate an organic solution, prepared by reacting;

an aminoalkoxysilane monomer and water in a solvent, wherein said aminoalkoxysilane monomer is represented by the formula:

$$HN(R_1)-R_2-Si-(OR_3)_3$$

wherein:

R_1 is a hydrogen atom or a saturated hydrocarbon residue or an amino-substituted, saturated hydrocarbon residue, having 2 or 3 carbon atoms;

R_2 is a saturated hydrocarbon residue having 3 to 6 carbon atoms; and

R_3 is a saturated hydrocarbon residue having 1 to 4 carbon atoms;

or a mixture thereof; and

said reaction is carried out by employing a mole ratio of water/monomer in the range from about 1.2:1 to about 1.4:1; or by reacting:

an aminoalkoxysilane monomer, an arylalkoxysilane or arylsilazane monomer and water in a solvent, wherein said aminoalkoxysilane monomer is represented by the formula above;

said arylalkoxysilane or arylsilazane monomer is represented by the formula, R_4-Si-$(Y)_3$, wherein R_4 is an unsubstituted or substituted phenyl group and Y is OR_6 or $(R_7)_2$, wherein R_6 is a saturated hydrocarbon residue having 1 to 4 carbon atoms, and R_7 is a hydrogen atom or a saturated hydrocarbon residue having 1 to 4 carbon atoms; and

said reaction is carried out by employing a mole ration of arylalkoxysilane or arylsilazane monomer to aminoalkoxysilane monomer in the range from about 2:3 to about 2.5:1, and a mole ratio of water/total monomer in the range from about 0.9:1 to about 1.7:1;

heating said substrate at a temperature in excess of about 2090° C. for a period from about 15 to about 60 minutes to form said layer of silsesquioxane polymer;

applying to said layer a solution comprising a polyimide precursor material; and

heating said substrate at a temperature in excess of about 200° C. for a period from about 15 to about 60 minutes to imidize said polyimide precursor material.

5,194,929

NONVOLATILE SEMICONDUCTOR MEMORY AND A MEMORY OF MANUFACTURING THE SAME

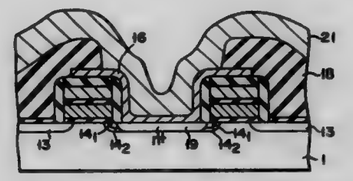
Yoichi Ohshima, Yokohama, and Masaki Sato, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 611,482, Nov. 9, 1990, abandoned, which is a continuation of Ser. No. 330,659, Mar. 30, 1989, abandoned. This application Feb. 10, 1992, Ser. No. 837,087

Claims priority, application Japan, Mar. 31, 1988, 63-78980

Int. Cl.[5] H01L *29/68, 29/78, 29/06, 23/48*

U.S. Cl. 257—326 **3 Claims**



1. A semiconductor integrated circuit having memory cells constructed with floating gate type MOS transistors formed on a semiconductor substrate, comprising:

a semiconductor substrate;

adjacent laminated gate electrodes of adjacent floating gate type MOS transistors, each including a floating gate electrode and a control gate electrode formed on said semiconductor substrate;

a first insulating film having a first portion and a second portion formed on a top surface and a side wall of each of said adjacent laminated gate electrodes, respectively, the second portion of the first insulating film being provided by patterning and made of silicate glass containing phosphorus;

an insulating film formed over the semiconductor substrate to provide between said adjacent laminated gate electrodes a contact hole which leads to a portion of said semiconductor substrate in which a drain region is to be formed, said contact hole being between said adjacent laminated gate electrodes, defined by said second portion of said first insulating film of each adjacent laminated gate electrode;

a conductive film covering said portion of said semiconductor substrate and said first and second portions of said first insulating films;

source regions and a drain region formed in said semiconductor substrate in self alignment with said adjacent laminated gate electrodes, said drain region being common with said adjacent floating gate type MOS transistors, wherein said second portion of said first insulating film serves as an offset of said drain region, so that an impurity concentration of a first portion of said drain region adjacent to a channel region of one of said MOS transistors is lower than that in a second portion of said drain region;

a second insulating film formed on said conductive film, having a contact hole formed by an etching process using said conductive film as a stopper film; and

a metal interconnection pattern formed on said conductive film via said contact hole of the second insulating film.

5,194,930

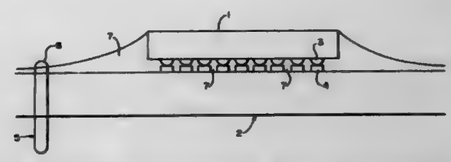
DIELECTRIC COMPOSITION AND SOLDER INTERCONNECTION STRUCTURE FOR ITS USE

Kostas Papathomas, Endicott; Mark D. Polikz; David W. Wang, both of Vestal, and Frederick R. Christie, Endicott, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Sep. 16, 1991, Ser. No. 760,654

Int. Cl.[5] H01L *29/167*

U.S. Cl. 257—773 **8 Claims**



1. A solder interconnection for forming connections between a circuitized device and a carrier substrate comprising a plurality of solder connections that extend from the carrier substrate to electrodes on the circuitized device to form a gap between carrier substrate and the circuitized device, wherein the gap is filled with a composition obtained from curing a composition containing:

A. a cycloaliphatic polyepoxide binder having a viscosity at room temperature of no greater than about 1,000 centipoise;

B. an organic carboxylic acid anhydride hardener, said hardener being present in an amount of 20 to 120 carboxylic equivalents per 100 epoxide equivalents;

C. a glycol source of hydroxyls to promote reaction between the cycloaliphatic polyepoxide and the organic carboxylic acid anhdyride, said glycol being present in an amount of 0.7 to 2 parts per 100 parts of cycloaliphatic polyepoxide;

D. a filler having a maximum particle size of about 49 microns and being substantially free of alpha particle emissions, said filler being present in an amount of 40 to 75 weight percent basis total filler and cycloaliphatic polyepoxide binder;

E. a surfactant in an amount between about 1% and about 1.4%; and

F. a polyol flexibilizer, said polyol flexibilizer being present in amount from 5 to 30 weight percent of the cycloaliphatic epoxide binder.

5,194,931

MASTER SLICE SEMICONDUCTOR DEVICE

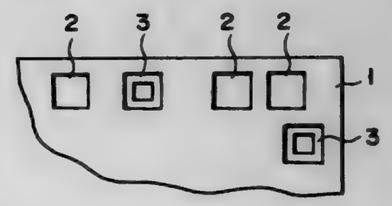
Tomokazu Araki, Ooita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 505,424, Apr. 5, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 819,666

Claims priority, application Japan, Jun. 13, 1989, 1-150190

Int. Cl.[5] H01L *23/48, 21/60*

U.S. Cl. 257—734 **10 Claims**



1. A method of forming a master slice semiconductor device including the steps of:

forming bonding pads, on a surface of the semiconductor

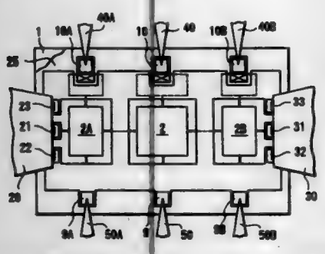
device at predetermined positions which fit different types of packages;
depositing a surface protective film on the surface of the semiconductor device;
forming openings for bonding in said surface protective film at the predetermined positions using a common mask which fits the different types of packages; and
bonding only certain of the bonding pads, when said semiconductor device is contained in a specific type of package, to corresponding lead electrodes of the specific type of package, wherein
the step of forming bonding pads includes the steps of:
shaping the certain bonding pads to be bonded to the corresponding lead electrodes with an opening in said surface protective film;
notching the remaining bonding pads which are not to be bonded to the corresponding lead electrodes with an opening in the center of said bonding pads having a surrounding continuous planar notched portion; and
exposing the insulating interlayer film through the continuous planar notched portion of the bonding pads which are not to be bonded to the lead electrodes.

5,194,932

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Masakazu Kurisu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,659
Claims priority, application Japan, May 30, 1990, 2-140431
Int. Cl.[5] H01L *27/04*; G01R *1/06*; H01P *3/08*
U.S. Cl. 257—773 **8 Claims**



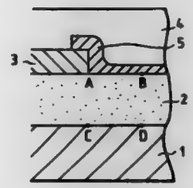
1. A semiconductor integrated circuit device comprising:
a semiconductor substrate;
an internal circuit formed on said semiconductor substrate in a predetermined region of the circuit device;
input and output signal pads arranged on a semiconductor substrate surface and connected to said internal circuit;
a power source pad and a plurality of ground pads, arranged on said semiconductor substrate surface, for supplying a power source to said internal circuit;
a ground pattern, arranged in a region of the of the circuit device different from said region in which said internal circuit is formed, for connecting said plurality of ground pads to each other;
a power source pattern formed on said substrate below said ground pattern and connected to said power source pad to connect said power source pad to said internal circuit; and
an insulating interlayer positioned below said ground pattern and above said power source pattern so as to cover and separate said power source pattern from said ground pattern;
said ground patter, said insulating interlayer, and said power source pattern forming an MIM capacitor.

5,194,933

SEMICONDUCTOR DEVICE USING INSULATION COATED METAL SUBSTRATE

Masahide Miyagi, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 20, 1991, Ser. No. 767,801
Claims priority, application Japan, Oct. 5, 1990, 2-267961
Int. Cl.[5] H05K *3/28*
U.S. Cl. 257—753 **5 Claims**



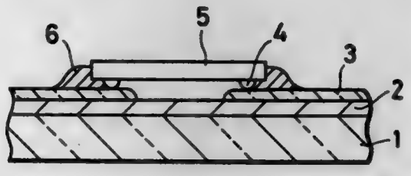
1. A semiconductor device using an insulation coated metal substrate, comprising:
an insulation coated metal substrate formed of a metal substrate and an insulation layer disposed on said metal substrate;
a wiring pattern of metallic foil formed on a surface of said insulation layer;
semiconductor elements supported on said insulation coated metal substrate and connected to wiring pattern of said metallic foil;
an insulating sealing material covering said semiconductor elements and said wiring pattern; and
a solid insulation having a larger specific inductive capacity than that of said sealing material, said solid insulation being interposed between an edge part of said wiring pattern of metallic foil and said sealing material.

5,194,934

MOUNTING STRUCTURE FOR A SEMICONDUCTOR CHIP HAVING A BUFFER LAYER

Shunpei Yamazaki, Tokyo; Takeshi Oka, Takatsuki, and Akira Mase, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 384,697, Jul. 26, 1989, abandoned. This application Mar. 23, 1992, Ser. No. 855,481
Claims priority, application Japan, Jul. 27, 1988, 63-189316
Int. Cl.[5] H01L *23/12, 23/14*
U.S. Cl. 257—782 **8 Claims**



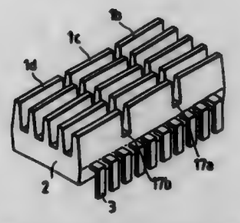
1. A mounting structure for a semiconductor chip comprising:
a glass substrate;
a conductive pattern comprising conductive particles formed on said substrate; and
a buffer film interposed between said substrate and said conductive pattern, wherein the coefficient of thermal expansion of said buffer film is larger than that of the substrate and less than that of the conductive pattern;
wherein one side of said buffer film is in direct contact with the conductive pattern and the other side thereof is in direct contact with the substrate.

5,194,935

PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE AND STRUCTURE FOR MOUNTING THE SAME DEVICES HAVING PARTICULAR RADIATING FIN STRUCTURE

Makoto Kitano, Tsuchiura; Anao Nishimura, Ushiku; Akihiro Yaguchi; Nae Yoneda, both of Ibaraki; Ryuji Kohno, Ibaraki; Saeo Kawai, Ibaraki; Gen Murakami, Tama, and Ichio Shimizu, Gunma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,416
Claims priority, application Japan, Jan. 29, 1990, 2-16027
Int. Cl.[5] H01L *23/30, 23/34, 23/36*
U.S. Cl. 257—706 **29 Claims**



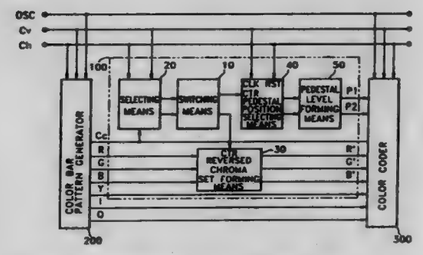
1. An encapsulated semiconductor device which includes an semiconductor chip, leads, and members for electrically connecting said semiconductor chip to said leads, and in which a part of said leads, said semiconductor chip and said connecting members are sealed with a plastic resin to form a package, is characterized in that parallel plate fins integrally formed with the sealing plastic resin are provided on at least one surface of said package, wherein said fins are disposed as an arrangement of plural groups of aligned fin segments, each group of fin segments is separated from an adjacent group of fin segments by a spacing.

5,194,936

CIRCUIT FOR SELECTIVELY CONVERTING A COLOR BAR PATTERN

Dae-su Jeon, Kyunggi, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 4, 1990, Ser. No. 519,445
Claims priority, application Rep. of Korea, May 13, 1989, 89-6434; Dec. 31, 1989, 89-21323
Int. Cl.[5] H04N *17/02*
U.S. Cl. 358—10 **18 Claims**



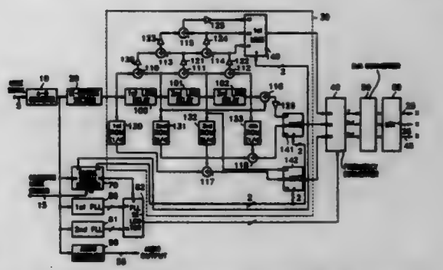
7. A color bar pattern converter, comprising:
means for receiving a plurality of synchronizing signals;
color pattern generator means for generating a chrominance control signal and a first color pattern comprising a plurality of colored line segments in a first sequence in dependence upon reception of said plurality of synchronizing signals;
converter means for selectively either providing said first color pattern received from said color pattern generator means or converting said first color pattern into a second color pattern and providing said second color pattern in dependence upon reception of said plurality of synchronizing signals, said second color pattern comprising a plurality of colored line segments in a second sequence; and
color coder means for color encoding one of said first color pattern and said second color pattern provided by said converter means.

5,194,937

TELEVISION SIGNAL CONVERTING APPARATUS AND METHOD

Chang-jun Lee, Kyunggi, and Seok-yun Jeong, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Nov. 27, 1991, Ser. No. 798,813
Claims priority, application Rep. of Korea, Sep. 30, 1991, 91-17342
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—11 **8 Claims**



1. A television signal conversion method for converting a MUSE television signal having 1,125 scanning lines into another television signal having a different scanning line number according to a picture screen mode, said method comprising the steps of:
vertically filtering said MUSE television signal for generating at least two sets of luminance and color difference signals having a different vertical correlation from said MUSE television signal;
selecting one luminance signal and two color difference signals among said at least two luminance and color difference signals generated in said vertical filtering step according to said picture screen mode; and
frequency-converting to sample said one luminance signal and two color difference signals selected in said selecting step into a luminance signal and two color difference signals having the scanning line number corresponding to said picture screen mode, and to horizontally lengthen said sampled luminance and color difference signals.

5,194,938

SECAM DECODER WITH PHASE-LOCKED LOOP DEMODULATORS

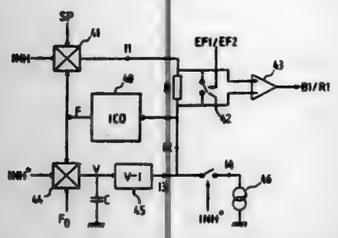
Michel Imbert, Voiron, and Gérard Bret, Echirolles, both of France, assignors to SGS-Thomson Microelectronics, S.A., Gentilly, France

Filed Sep. 17, 1991, Ser. No. 760,532
Claims priority, application France, Sep. 18, 1990, 90 11826
Int. Cl.[5] H04N *11/18*
U.S. Cl. 358—14 **8 Claims**

1. A SECAM decoder comprising two demodulators receiving a chrominance subcarrier carrying lines of information corresponding alternately to a blue color line and a red color line, the outputs of which are each connected directly to an input and through a delay-line to another input of adder, each

demodulator being a Phase-Locked-Loop demodulator comprising:

a phase comparator receiving at an input the subcarrier, delivering a control current to a current controlled oscillator and receiving at another input the output signal of the oscillator;



a resistive means placed in the control current path, across which a voltage representative of the demodulated subcarrier is tapped; and

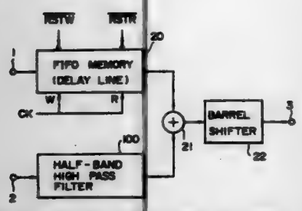
a switch connected in parallel to the resistive means, this switch being opened only during lines of a first color.

5,194,939

DIGITAL VIDEO SIGNAL PROCESSING APPARATUS FOR DATA RATE DOWN-CONVERSION WITH HALF-BAND FILTERING

Nobuyoshi Kobayashi, Tokyo, and Hisanori Kominami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1991, Ser. No. 796,378
Claims priority, application Japan, Nov. 30, 1990, 2-338349
Int. Cl.[5] H04N 9/64
U.S. Cl. 358—21 R 14 Claims



1. A digital video signal processing apparatus receiving an input signal which has a predetermined data rate and is composed of a pair of multiplexed signals each of which includes a first video signal component and a second video signal component, said apparatus comprising:

a half-band high pass filter having a coefficient profile equivalent to that obtained by setting a center coefficient of a half-band low pass filter to zero, and which is supplied with one of said pair of multiplexed signals;

delay means supplied with the other of said pair of multiplexed signals, for delaying said other signal by a predetermined delay time corresponding to a delay provided by said half-band high pass filter; and

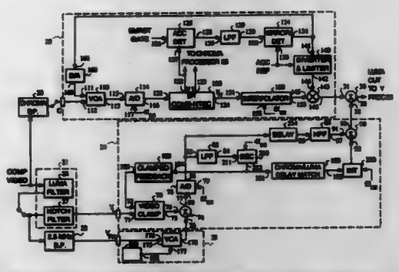
addition means for adding the output of said half-band high pass filter to the output of said delay means and outputting a multiplexed signal which includes said first and second video signal components and which has a data rate that is lower than said data rate of said input signal.

5,194,940

FREQUENCY MULTIPLEXED DIGITAL VIDEO PROCESSOR

Gopal K. Srivastava, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 3, 1991, Ser. No. 771,278
Int. Cl.[5] H04N 9/77, 9/78
U.S. Cl. 358—21.R 19 Claims



1. For use in an image display system responsive to a composite video signal having luminance information, chrominance information and display synchronization signals, video processing means comprising:

means for receiving said composite video signal;

means for frequency dividing said composite video signal into a chrominance band signal, a luminance band signal and a luminance peaking band signal;

first processor means for processing said chrominance band signal to separate luminance and chrominance information within said chrominance band signal;

second processor means for processing said luminance band signal to establish a predetermined luminance delay in the low frequency portion of said luminance band signal;

third processor means for processing said luminance peaking band signal to adjust the amplitude of said luminance peaking band signal with respect to said luminance band signal; and

means for combining said luminance information within said chrominance band signal, said luminance band signal, and said luminance peaking band signal to form a full spectrum luminance signal having enhanced response to said luminance peaking band signal.

5,194,941

SELF-ADAPTING METHOD AND DEVICE FOR THE INLAYING OF COLOR VIDEO IMAGES

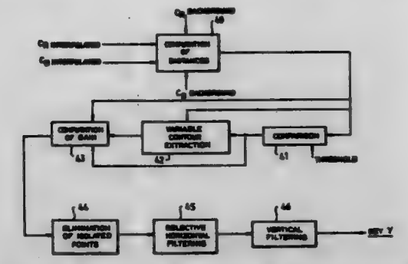
Jean-Luc Grimaldi, Ermont, and Sylvie Galichet, Compiegne, both of France, assignors to Thomson Video Equipment, Cergy Saint Christophe, France

PCT No. PCT/FR90/00697, § 371 Date Jun. 6, 1991, § 102(e) Date Jun. 6, 1991, PCT Pub. No. WO91/05443, PCT Pub. Date Apr. 18, 1991
PCT Filed Sep. 28, 1990, Ser. No. 700,200
Claims priority, application France, Oct. 6, 1989, 89 13085
Int. Cl.[5] H04N 9/75
U.S. Cl. 358—22 11 Claims

1. A method for inlaying color video images, including the generation of a switching signal, or dividing key signal, to which a gain is applied in order to extract from a source image a subject placed in front of an original background of uniform color, and carrying out a mixing of the subject with a new background image, comprising the steps of:

detecting background/subject and subject/background transitions dynamically in the source image according to distance values between points of the subject and points of the background,

defining a contour of the subject as an outer perimeter edge region around the subject and having a variable width depending upon determined characteristics of the detected transition, said width being calculated, at each transition, from the evolution of the distance values of localized points around the transition, and



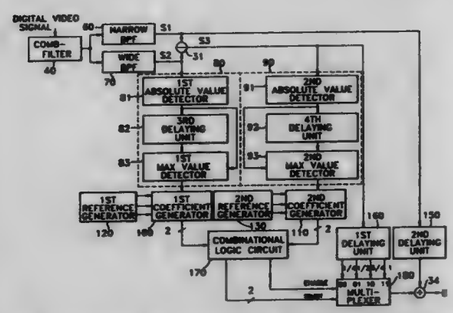
applying the gain only to selected points of the source image belonging to the contour of the subject, and in proportion to the distance value between said selected points and points of said original background.

5,194,942

VARIABLE BANDWIDTH CONTROL APPARATUS FOR SEPARATING LUMINANCE AND CHROMINANCE SIGNALS AND THE METHOD THEREOF

Dae-yun Sim, Seoul, and Jun-mo Jeong, Kyunggi, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 22, 1991, Ser. No. 704,377
Claims priority, application Rep. of Korea, Jun. 30, 1990, 90-9874
Int. Cl.[5] H04N 9/78
U.S. Cl. 358—31 22 Claims



22. An apparatus for separating chrominance signals from composite video signals, comprising:

means for receiving composite video signals;

comb-filter means for comb-filtering said composite video signals to provide comb-filtered signals;

first filter means having a narrow frequency bandwidth, for filtering said comb-filtered signals to provide first filtered chrominance signals;

second filter means having a wide frequency bandwidth, for filtering said comb-filtered signals to provide second filtered chrominance signals;

subtractor means for subtracting said first filtered chrominance signals from said second filtered chrominance signals to provide transition chrominance signals;

first detector means for detecting amplitude levels of said second filtered chrominance signals to provide a first detected maximum value corresponding to the detected amplitude levels of said second filtered chrominance signals;

second detector means for detecting degrees of color change of said transition chrominance signals to provide a second detected maximum value corresponding to the detected degrees of color change of said transition chrominance signals;

first generator means coupled to receive said first maximum value corresponding to the detected amplitude levels of said second filtered chrominance signals, for comparing said first maximum value with first reference values to provide a first coefficient;

second generator means coupled to receive said second maximum value corresponding to the detected degrees of color change of said transition chrominance signals, for comparing said second maximum value with second reference values to provide a second coefficient;

delay means for delaying said first filtered chrominance signals for a predetermine time period to provide delayed filtered chrominance signals;

means for multiplying said transition chrominance signals by a plurality of multiplication factors representative by 1, ¼, ½ and ¾ to provide a plurality of multiplied chrominance signals;

logic means coupled to receive said first and second coefficients, for logically enabling transmission of a selection signal and an enable signal;

multiplexer means for enabling a selection of one of said plurality of multiplied chrominance signals in response to said selection signal and said enable signal to provide selected multiplied chrominance signals; and

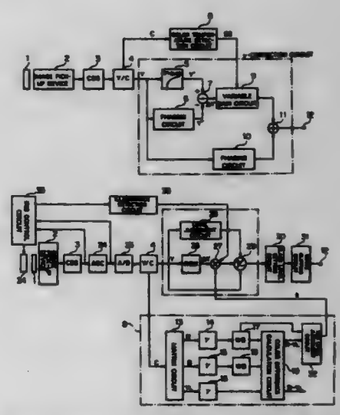
adder means for adding said selected multiplied chrominance signals to said delayed filtered chrominance signals to provide chrominance signals.

5,194,943

VIDEO CAMERA HAVING A γ-CORRECTION CIRCUIT FOR CORRECTING LEVEL CHARACTERISTICS OF A LUMINANCE SIGNAL INCLUDED IN A VIDEO SIGNAL

Tsutomu Tomita, Katsuta, and Hiroyasu Otsubo, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1991, Ser. No. 788,236
Claims priority, application Japan, Nov. 6, 1990, 2-298808
Int. Cl.[5] H04N 9/69, 9/73 C
U.S. Cl. 358—32 9 Claims



6. A video camera provided with a γ-correction circuit for subjecting an original luminance signal, which is obtained from an output signal of a solid-state imaging device, to γ-correction with a fixed gamma coefficient, said video camera comprising:

color temperature detection means for detecting a color temperature of the ambient light of an object to judge whether or not the color temperature is a low color tem-

perature which is not higher than a predetermined color temperature; and

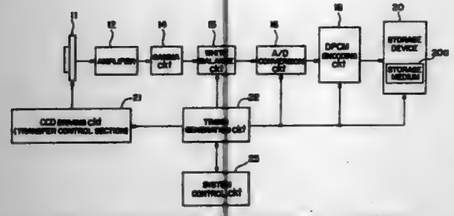
processing means for being controlled in accordance with the judgement result of said color temperature detection means in such a way that said processing means receives the luminance signal subjected to the γ-correction as the input thereof to directly output the γ-corrected luminance signal when the color temperature is an arbitrary color temperature other than the low color temperature, and processes the γ-corrected luminance signal so as to subject the γ-corrected luminance signal to a γ-correction with a gamma coefficient smaller than the gamma coefficient thereby to output the resultant signal when the color temperature is the low color temperature.

5,194,944

IMAGE SIGNAL PROCESSING APPARATUS FOR SUCCESSIVELY TRANSFERRING A SERIES OF COLOR SIGNALS OBTAINED AS IMAGE SIGNALS

Masayuki Uchiyama, and Fumiyoshi Itoh, both of Nagano, Japan, assignors to Chinon Kabushiki Kaisha, Nagano, Japan

Filed Apr. 26, 1991, Ser. No. 691,729
Claims priority, application Japan, May 1, 1990, 2-115523
Int. Cl.[5] H04N *9/07, 9/73*
U.S. Cl. 358—41 **5 Claims**



1. An image signal processing apparatus, comprising:

vertical register means for storing and transferring color signals obtained as image signals related to at least three primary colors;

horizontal register means for receiving said color signals transferred from said vertical register means;

timing generation means for generating a transferring and outputting clock pulse frequency which corresponds to a lower one of a processing rate of an encoder for encoding image data on the basis of transferred and outputted signals and a storing rate of a storage medium for storing the encoded image data; and

transfer control means for successively transferring a series of color signals in response to said timing generation means for every color composed of a series of data of one and the same color for one line related to said three primary colors, to said horizontal register means in every horizontal blanking period, and for successively transferring and outputting said series of color signals transferred to said horizontal register means.

5,194,945

COLOR IMAGE PROCESSING APPARATUS

Toshikiro Kadowaki; Tetsuya Ohnishi, both of Yokohama, and Yoshinori Ikeda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

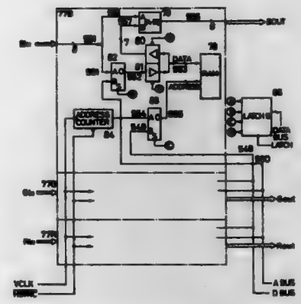
Filed Aug. 10, 1988, Ser. No. 230,741
Claims priority, application Japan, Aug. 11, 1987, 62-200592; Dec. 28, 1987, 62-334976
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **24 Claims**

1. A color image processing apparatus comprising:

information extracting means for extracting density information and hue information from given color image data;

discriminating means for discriminating whether both said density information and said hue information, extracted by said information extracting means from said color image data information, meet respective predetermined conditions; and

converting means for converting said color image data, from



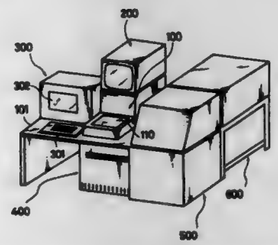
which said density information and said hue information has been extracted by said extracting means, into predetermined converted color image data when said discriminating means discriminates that said density information and said hue information meet said respective predetermined conditions.

5,194,946

COLOR SCANNER AND AUTOMATIC SETTING METHOD OF SIGNAL PROCESSING CONDITIONS

Seiichiro Morikawa, and Fumito Takemoto, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1989, Ser. No. 421,436
Claims priority, application Japan, Oct. 13, 1988, 63-258227; Oct. 13, 1988, 63-258228; Dec. 22, 1988, 63-324424; Dec. 28, 1988, 63-333836
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 **12 Claims**



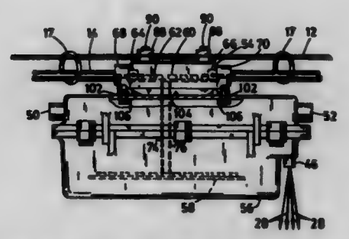
1. A color scanner comprising: an image reading means for reading an original stored in an original cassette by carrying out of rough-scanning or main scanning; a signal processing means for signal-processing or main scan data of said original, the main scan data being obtained by said image reading means; an automatic operating setting means or automatically obtaining characteristic values of said original on the basis of rough-scan data obtained by said rough-scanning and automatically setting signal processing conditions, said automatic operating setting means providing fully automated set-up of said signal processing means; an instruction input means for inputting necessary instructive informations to said signal processing means; and a recording means for recording the image on the basis of the output of said signal processing means.

5,194,947

APPARATUS FOR TAPPING CATV SIGNALS FROM A CABLE AND FOR CONTROLLING THE DISTRIBUTION

Roy L. Lowcock, Orangeville, and Thomas H. Williams, Doraville, both of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed May 7, 1990, Ser. No. 521,220
Int. Cl.[5] H04N *7/10*; H04L *17/02*
U.S. Cl. 358—86 **9 Claims**



1. An off-premises CATV signal distribution apparatus for a CATV signal distribution system which delivers CATV signals to subscribers from a cable, said CATV signal distribution apparatus for tapping signals from said cable, for processing said signals, and for selectively controlling the distribution of said signals to different subscribers, said apparatus comprising:

a first housing containing circuitry for tapping said CATV signals from said cable;

a second housing containing circuitry for processing and selectively controlling the distribution of said CATV signals to said subecribers, said second housing having connectors for feeder cables which extend to the premises of said subscribers;

means for permanently mounting said first housing at a location along said cable, said first housing having terminals connected to ends of said cable on opposite sides of a gap in said cable;

means for connecting said circuitry in said first housing to said circuitry in said second housing and for applying signals tapped from said cable by said circuitry in said first housing to said circuitry in said second housing;

wherein said second housing has a top portion and a bottom portion which are fastened together;

wherein said first housing has a top portion; and

wherein the top portion of said first housing can be fastened to the top portion of said second housing so that a bottom portion of said first housing is constituted by said second housing.

5,194,948

ARTICLE ALIGNMENT METHOD AND APPARATUS

Leroy D. L'Esperance, III, Blackwood, N.J.; Hung N. Nguyen, Bensalem, and Yiu-Man Wong, Wescosville, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 691,658, Apr. 26, 1991, Pat. No. 5,152,055. This application Jun. 1, 1992, Ser. No. 891,089
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—106 **4 Claims**

1. Apparatus for registering an article with a substrate such that each of a plurality of first conductive members depending from the article in an array of orthogonal rows and columns is aligned with a separate one of a plurality of second conductive members in a like array on the substrate, comprising:

a substrate holder for holding the substrate;

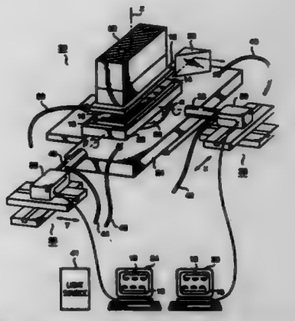
means for laterally translating the substrate holder along each of a pair of orthogonal axes;

means for holding the article in spaced relationship from the substrate such that each one of said first conductive members is proximate to a corresponding one of said second conductive members;

a first television camera trained at a first end of the article and substrate for capturing the image of at least a portion of a first column of said first and second conductive members, on the article and substrate, respectively, at a first end;

a second television camera trained at a first side of the article and substrate orthogonal to the first end thereof for capturing the image of at least a portion of a first row of said first and second conductive members on the article and substrate, respectively;

a mirror positioned proximate a second end of the article and the substrate, opposite the first end thereof, for reflecting



an image of a portion of a second column of said first and second conductive members on the article and substrate, respectively, at said second end thereof;

means for displacing the second camera along an axis parallel to the first side of the article for positioning the second camera at a location at which it can capture the image reflected by the mirror;

a first monitor coupled to, for displaying the image captured by, the first camera; and

a second monitor coupled to, for displaying the image captured by, the second camera.

5,194,949

VIDEO DENSITOMETER

Lawrence L. Poulsen, and Daniel M. Ziegler, both of Austin, Tex., assignors to Research Development Foundation, Carson City, Nev.

Continuation of Ser. No. 465,870, Jan. 16, 1990. This application Sep. 13, 1991, Ser. No. 759,270
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—107 **13 Claims**

1. An apparatus for determining an integrated density of irregularly shaped light absorbing areas of a subject specimen, comprising:

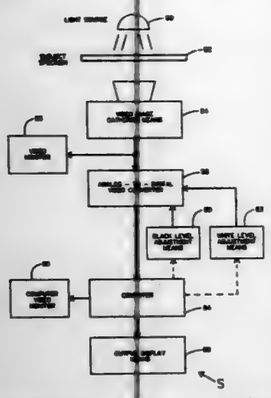
means for deriving an analog video image signal with a video camera representative of the optical intensity of light associated with the specimen;

means for calibrating the video image dark intensity to a black level by repetitively counting the number of digital density values equal to zero while adjusting an analog voltage means for changing the video image dark intensity threshold bias until the preferred number of digital density values is equal to zero;

means for calibrating the video image right intensity to a white level by repetitively counting the number of digital density values equal to a maximum digital value while adjusting an analog voltage means for changing the video image bright intensity threshold bias until the preferred number of digital density values is equal to the maximum digital value, wherein the video signal bright and dark intensity references define a calibrated analog video image signal intensity range;

means for converting the calibrated analog video image

signal into a set of digital values by using a high speed analog-to-digital converter;
storing the digital values;
sending the stored digital values to a computer at a slower rate than the analog-to-digital conversion;
means for converting the digital values representing intensity to digital values representing density by calculating a reciprocal value of the intensity and calculating the $\log_{10}$ of the reciprocal value;
means for displaying a digital format image of the specimen based upon the digital density values;

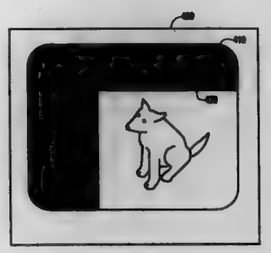


means for selecting one or more areas of the displayed digital format image for calculation of one or more spot densities;
means for calculating one or more background density values each associated with a selected area of the digital format image;
means for calculating one or more spot density values each associated with a selected area of the digital format image; and
means for displaying each of the one or more calculated spot density values.

5,194,950
VECTOR QUANTIZER
Tokumichi Murakami; Koh Kamizawa; Atsushi Itoh; Yoshiaki Kato; Yuri Hasegawa; Kazuhiro Matsuzaki, and Takahiro Fukuhara, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 27, 1989, Ser. No. 316,020
Claims priority, application Japan, Feb. 29, 1988, 63-46391; Mar. 14, 1988, 63-61415; Apr. 28, 1988, 63-108145; May 11, 1988, 63-112602; Jun. 6, 1988, 63-139655; Jul. 27, 1988, 63-188801; Nov. 26, 1988, 63-298724; Jan. 13, 1989, 1-6801; Jan. 13, 1989, 1-6807
Int. Cl.[5] H04N 7/137
U.S. Cl. 358—133 17 Claims

1. An input vector quantizer for encoding digital signals with high efficiency for transmission between transmitting and receiving sides and wherein a first codebook of fixed contents is included at each of said transmitting and receiving sides, said vector quantizer comprising one or more random access second codebooks having a learning function and being connected to the intermediate hierarchy of said first codebook, means for transmitting input vector and deciding information for matching of codebooks in the transmitting and receiving sides, and a means for executing, at a high speed, vector quantization through parallel use of said first codebook and said random access one or more second codebooks in a tree-searched minimum distortion process for sequentially storing said input vectors, as the new quantizing representative vectors into said one or more second codebooks when the minimum distortion in the tree-searched vector quantization is larger than a threshold value, and for simultaneously erasing the old quantizing representative vectors previously stored in said one or more second codebooks.

5,194,951
SLEEP TIMER ARRANGEMENT FOR A TELEVISION RECEIVER
James E. Hailey, and John W. Chaney, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Dec. 16, 1991, Ser. No. 809,711
Int. Cl.[5] H04N 9/74, 5/44, 3/223
U.S. Cl. 358—182 3 Claims

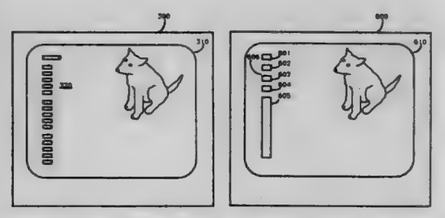


1. Apparatus for automatically removing operating power from a television receiver, comprising:
a source of standby power;
a source of operating power having a control input;
remote control receiver means for receiving a remote control signal modulated with data;
control means coupled to said source of standby power, to said source of operating power, and to said remote control receiver means for decoding said data from said modulated remote control signal;
timer means, coupled to said control means, for timing a predetermined time interval and generating a signal indicative of the expiration of said predetermined time interval;
video signal processing means coupled to said control means, for processing television video signals;
display means coupled to said video signal processing means for displaying said television video signals as a video image; and
on-screen display and graphics generator means for producing text character and graphic signals and applying said text character and graphic signals to said video signal processing means for display on said display means in combination with said television video signals; wherein
said control means, during a portion of said predetermined time interval, causes said on-screen display and graphics generator means to produce a graphics signal which when displayed on said display means produces a graphics image which obscures a portion of said video image, said control means causing said on-screen display and graphics generator means to gradually increase the size of said graphics image to obscure more of said video image, said timer means, at the expiration of said predetermined time interval, applies said signal indicative of the expiration of said predetermined time interval to said control means, and said control means, in response thereto, causes said source of operating power to cease supplying power to said signal processing means.

5,194,952
VIDEO PROCESSING SYSTEM HAVING IMPROVED TRANSITION CONTROL AND DISPLAY
Allan M. Pelley, Milpitas, Calif., assignor to Abekas Video Systems, Inc., Redwood City, Calif.
Filed Mar. 28, 1991, Ser. No. 678,011
Int. Cl.[5] H04N 5/262, 5/265
U.S. Cl. 358—183 4 Claims
MICROFICHE APPENDIX INCLUDED
(1576 Microfiche, 20 Pages)

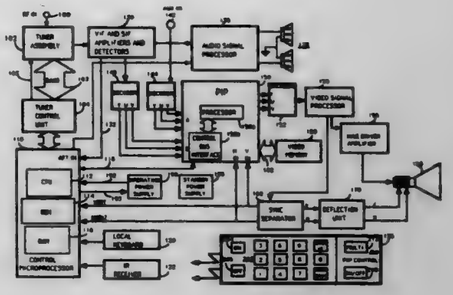
1. A digital video processing system for processing a first and a second digital video signal, said system comprising:
means for generating a linear input signal; representative of a profile of a linear transition from said first digital video signal to said second digital video signal;
means for receiving said linear input signal and for generating a non-linear signal, representative of a profile of a non-linear transition from said first digital video signal to said second digital video signal;
displaying means for displaying said non-linear signal; and
means for processing said first and second digital video signals in accordance with said non-linear signal to effectuate said non-linear transition, in response to said linear input signal generating means.

5,194,953
SEGMENTED BAR DISPLAY FOR A PROGRAMMABLE TUNER
Choon M. Chan, Singapore, Singapore; Jean C. Favreau, Tannheim, Fed. Rep. of Germany, and Doo L. Tay, Singapore, Singapore, assignors to Thomson Consumer Electronics, S.A., Courbevoie, France
Filed Sep. 4, 1990, Ser. No. 577,168
Claims priority, application United Kingdom, Dec. 18, 1989, 8928539
Int. Cl.[5] H04N 5/50
U.S. Cl. 358—192.1 2 Claims



1. A tuning system for a television receiver, comprising:
tuning means for selecting a particular RF signal from a plurality of RF signals;
control means including programming means coupled to said tuning means for storing tuning data corresponding to selected ones of said plurality of RF signals, said tuning data being associated with respective programming positions;
said control means also including on-screen display generation means for generating a video signal corresponding to a plurality of vertical aligned illuminated areas, said illuminated areas being separated by a space;
wherein, each of said illuminated areas is indicative of one of said respective programming positions of said programming means, and a selected programming position is indicated by the illumination of a second area adjacent to only one of said plurality of vertically aligned illuminated areas.

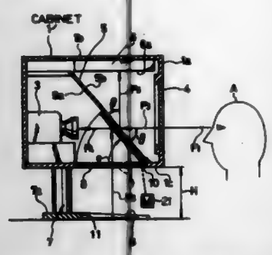
5,194,954
AUTOMATIC CHANNEL SAMPLING PICTURE-IN-PICTURE CIRCUITRY
David J. Duffield, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Jun. 29, 1990, Ser. No. 547,089
Int. Cl.[5] H04N 5/50
U.S. Cl. 358—193.1 11 Claims



1. A system for a television receiver, comprising:
tuner demodulator means having an input for receiving a plurality of radio frequency signals, and having a control input for receiving a first control signal, said tuner demodulator means tuning one of said radio frequency signals in response to said first control signal and producing a detected video signal therefrom at an output;
memory means having data representing a list of television channels stored therein;
processing means coupled to said output of said tuner demodulator means for receiving said detected video signal, for storing a predetermined amount of said video signal, and for producing a display signal which when displayed on a display screen produces a display comprising an inset-image displayed in one of a plurality of inset-image locations, said inset-image being related to said stored video signal,
control means for controlling said tuner demodulator means and for controlling said processing means, said control means having an output for developing said first control signal;
said control means in response to the turning-on of said television receiver automatically causes said tuner-demodulator means to tune a first television channel from said list of television channels, automatically causes said processing means to store said predetermined amount of signal, and automatically causes said display of said inset-image;
said control means repeating said tuning, storing, and displaying functions for each of a predetermined number of television channels from said list of channels, and upon completing said functions for said predetermined number of television channels displays a multi-image display for a predetermined time period to allow a user to enter a channel selection;
said control means, in the absence of a user-entered channel selection within said predetermined time period, causes said tuner means to select the last channel viewed by said user before said receiver was turned off.

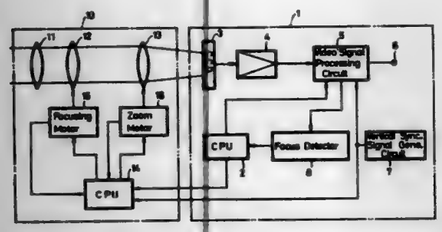
VOL 1148 ISS 3 MR 16 1993

5,194,955
VIDEO TELEPHONE
Hajime Yonezu, Tokyo; Toshio Suzuki, and Yasushi Ogino, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 17, 1991, Ser. No. 701,847
Claims priority, application Japan, May 19, 1990, 2-052351[U]
Int. Cl.[5] H04N 5/30
U.S. Cl. 358—209 3 Claims



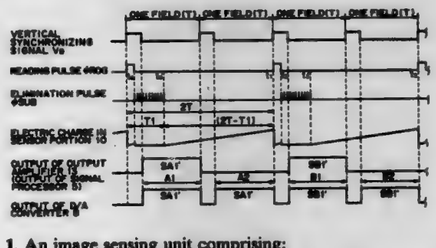
1. A video system for use with a telephone comprising, a hollow cabinet, a transparent glass plate mounted in the front vertical side of said cabinet, a beam splitter such as a half mirror mounted in said cabinet behind said transparent glass plate, a video camera mounted in said cabinet so as to receive light rays on a straight path from scenes outside said cabinet through said transparent glass plate and said beam splitter, a liquid crystal display mounted in said cabinet so that it can be viewed through said transparent glass plate and said beam splitter by reflecting images from the display, an opening formed in the bottom of said cabinet below said beam splitter, said cabinet supported on a stand, a document holder formed on said stand below said opening formed in the bottom of said cabinet, and a mirror pivotally connected to said cabinet and manually or automatically moveable to a first position so that it forms a cover for said opening and manually or automatically moveable to a second position such that it uncovers said opening and reflects an image of a document on said document holder to said video camera so only the document or the face is detected.

5,194,956
LENS AND APERTURE CONTROL APPARATUS
Koji Iwamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 17, 1990, Ser. No. 599,025
Claims priority, application Japan, Oct. 24, 1989, 1-276536; Oct. 30, 1989, 1-282605
Int. Cl.[5] H04N 5/232, 5/238
U.S. Cl. 358—209 16 Claims



1. A video camera comprising:
a camera housing containing image pickup means for providing a video signal corresponding to an image projected onto said image pickup means, and means for generating a vertical synchronizing signal to be included in said video signal;
exchangeable lens devices interchangeably mountable on said camera housing and each including respective adjustable lens means through which said image is projected onto said image pickup means, motor means operable for adjusting said respective lens means, said lens means presenting a load to said motor means that is different from the load presented by said lens means of at least one other of said exchangeable lens devices, means for generating pulses at a frequency corresponding to a rate of adjustment of said respective lens means, and processor means responsive to said vertical synchronizing signal and said pulses for providing a lens drive signal controlling said motor means so that said rate of adjustment of said respective lens means is substantially uniformly determined as a function of said vertical synchronizing signal irrespective of said load presented by said respective lens means.

5,194,957
IMAGE SENSING METHOD AND APPARATUS IN WHICH THE EXPOSURE TIME MAY BE VARIED
Kenji Kyuma, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 28, 1991, Ser. No. 783,214
Claims priority, application Japan, Nov. 2, 1990, 2-295202
Int. Cl.[5] H04N 3/14, 5/335
U.S. Cl. 358—213.19 28 Claims

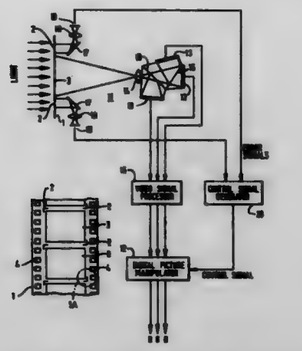


1. An image sensing unit comprising:
sensing means for receiving a light signal, performing a photoelectric conversion, and storing information;
reading means for reading the information from said sensing means once each reading period nT (wherein n is an integer equal to or greater than 2 and T is a field period of a standard television signal);
eliminating means for eliminating information from the sensing means, the eliminated information corresponding to a partial interval T1 within the reading period nT; and
altering means for altering the width of the partial interval T1.

5,194,958
MOVIE FILM TO VIDEO CONVERSION WITH CORRECTION OF FRAME MISALIGNMENT
James B. Pearman; John Galt, both of Glendale, Calif., and Yoshio Ozaki, Tokyo, Japan, assignors to Sony Broadcast & Communications Limited, Basingstoke, England
Filed Jul. 22, 1991, Ser. No. 733,875
Claims priority, application United Kingdom, Aug. 31, 1990, 9019004
Int. Cl.[5] H04N 5/253
U.S. Cl. 358—214 15 Claims

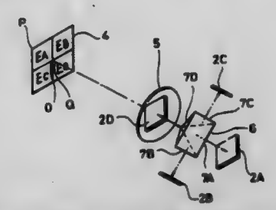
1. A method of forming a video signal having a plurality of pixels representing a video image from a film having a plurality of frames with respective registration features associated therewith, said method comprising the steps of:
generating said video signal from said film on a frame by frame basis;

providing fixed reference features in a CCD detector;
detecting misalignment between the respective registration features associated with each of said frames and reference features;



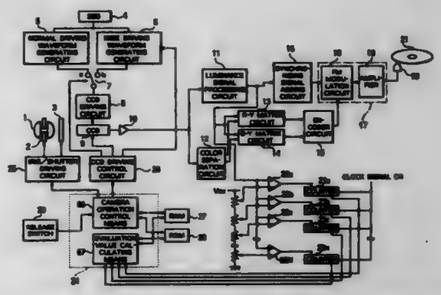
deriving error signals in accordance with the detected misalignment between the respective registration features and the reference features; and
processing said video signal in accordance with said error signals so as to produce a corrected video signal in which said image has been manipulated by rotating said image.

5,194,959
IMAGE FORMING APPARATUS FOR FORMING IMAGE CORRESPONDING TO SUBJECT, BY DIVIDING OPTICAL IMAGE CORRESPONDING TO THE SUBJECT INTO PLURAL ADJACENT OPTICAL IMAGE PARTS
Yutaka Kaneko, Yokohama; Masanori Saitoh, Komae; Iwao Hamaguchi, Yamato; Kazutake Uehira, Yokosuka, and Kazumi Komiya, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd. and Nippon Telegraph and Telephone Corporation, Tokyo, Japan
Filed Dec. 18, 1990, Ser. No. 628,860
Claims priority, application Japan, Dec. 21, 1989, 1-331971; Sep. 4, 1990, 2-235134; Sep. 4, 1990, 2-235135
Int. Cl.[5] H04N 5/225; G02B 13/16
U.S. Cl. 358—225 17 Claims



1. An image forming apparatus for forming an image corresponding to a subject, comprising:
a) a taking lens for making an optical image corresponding to the subject;
b) dividing means for dividing the optical image transmitted via said taking lens into a plurality of adjacent optical image parts;
c) a plurality of solid-state image sensors corresponding to the number of the optical image parts, each of said solid-state image sensors receiving a corresponding optical image part from among the plurality of optical image parts from said dividing means and outputting an image signal corresponding to the optical image part, the optical image parts received by said solid-state image sensors being adjacent to each other; and
d) image forming means, coupled to said solid-state image sensors, for forming an image part corresponding to the respective optical image part based on the image signal transmitted from one of said solid-state image sensors, and for composing each image part to form the image corresponding to the subject by arranging the image parts to be adjacent to each other like the optical image parts;
wherein:
said dividing means includes a reflector having a plurality of reflecting surfaces for reflecting the optical image transmitted via said taking lens while dividing the optical image into a plurality of adjacent optical image parts corresponding to the number of the reflecting surfaces;
said image forming apparatus uses an optical system having an optical axis;
said subject and said taking lens are aligned with the optical axis;
said reflector has a top which is aligned with the optical axis;
said reflector has a bottom surface vertical to the optical axis and opposite to the top thereof; and
the reflectance of each of the reflecting surfaces of said reflector is gradually higher from the bottom surface of the reflector to the top thereof.

5,194,960
OPTICAL IMAGE SIGNAL CONTROL DEVICE
Yoshitaka Ota, Tokyo, Japan, assignor to Konica Corporation, Tokyo, Japan
Filed Feb. 26, 1991, Ser. No. 660,867
Claims priority, application Japan, Mar. 5, 1990, 2-52992; Mar. 5, 1990, 2-52993; Mar. 5, 1990, 2-52995
Int. Cl.[5] H04H 5/238
U.S. Cl. 358—228 5 Claims



1. An exposure control mechanism for a camera, comprising:
(a) an image sensor which outputs a luminance signal having a signal level and comprising pixels each having a luminance value within one of a plurality of sequential elemental luminance regions, a plurality of said elemental luminance regions adjacent to each other comprising an evaluation region;
(b) an exposure regulating means for regulating the exposure of said sensor;
(c) a driving means for driving said exposure regulating means;
(d) a luminance information obtaining means for obtaining luminance information from said luminance signal outputted from said image sensor, said luminance information obtaining means firstly counting the number of pixels within each elemental luminance region, secondly obtaining an evaluation value of each said evaluation region by multiplying the number of said pixels belonging to an evaluation region by a weighting value in accordance with the sequential position of said elemental luminance region in said evaluation region, and finally for outputting said obtained evaluation values;
(e) an exposure control means for controlling said driving

means to provide an exposure condition in which said signal level is maximized at the highest value of luminance of said evaluation region in which said evaluation value is maximum; and

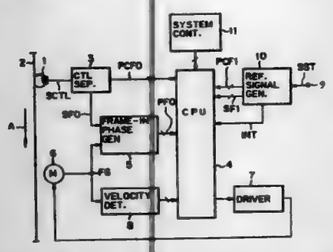
wherein, within a given one of said evaluation regions, the number of pixels within an elemental luminance region containing pixels with a higher luminance value is multiplied by a larger weighted value than is the number of pixels within an elemental luminance region containing pixels with a lower luminance value, and said evaluation value is computed by totaling the number of said pixels in each said elemental luminance region multiplied by said weighted value.

5,194,961

APPARATUS FOR LOCKING A REPRODUCED COLOR VIDEO SIGNAL TO A REFERENCE COLOR FRAME SIGNAL

Yasuo Nagai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1991, Ser. No. 795,791
Claims priority, application Japan, Nov. 27, 1990, 2-323728
Int. Cl.[5] H04N 9/79
U.S. Cl. 358—310 4 Claims



1. Apparatus for indicating a color frame of a color video signal and a control signal reproduced from a record medium, comprising:

means for generating a reference color frame signal and a signal having a frequency that is an integer multiple of the frequency of the reference color frame signal;

means for separating a reproduced color frame phase and a reproduced frame signal from said reproduced control signal;

means for generating a phase signal indicating where intervals of said reproduced frame signal are divided comprising means for detecting the rotation of a capstan motor driving said record medium and generating a detection signal and means for counting pulses in said detection signal from said rotation detection means, said means for counting being reset with said reproduced frame signal from said means for separating;

means for determining a start reference signal phase by using said separated reproduced color frame phase and said phase signal indicating where intervals of said reproduced frame signal are divided; and

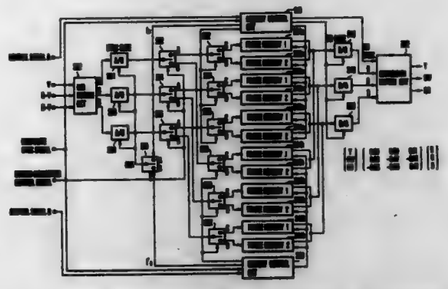
means for controlling movement of said record medium in accordance with said start reference signal phase and a predetermined acceleration duration of said record medium, so that said reproduced color frame signal from said record medium is matched with said reference color frame signal after a start up time.

5,194,962

STILL IMAGE RECORDING AND REPRODUCING APPARATUS

Tsuguhide Sakata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1990, Ser. No. 527,093
Claims priority, application Japan, May 25, 1989, 1-133286
Int. Cl.[5] H04N 9/79, 5/92
U.S. Cl. 358—310 4 Claims



1. A recording and reproducing apparatus for recording a still image signal for one picture comprising a luminance signal and a chrominance signal on a recording medium and for reproducing the still image signal from said recording medium on which said still image signal is recorded, comprising:

a) recording means for recording the still image signal for the one picture on the recording medium, said recording means being arranged to separate said luminance signal and said chrominance signal which constitute said still image signal for said one picture and to record said signals on a plurality of recording tracks, respectively;

b) reproducing means for reproducing the luminance signal for the one picture from the recording track on which at least the luminance signal is recorded among the plurality of recording tracks on said recording medium in which the still image signal has been recorded by said recording means;

c) sampling means for sampling the luminance signal reproduced by said reproducing means in synchronism with a first clock signal or a second clock signal having a frequency lower than that of said first clock signal, thereby forming a sampling signal;

d) storing means for temporarily storing the sampling signal formed by said sampling means; and

e) still image signal output control means for selectively reading out and outputting, from said storing means, either one of the sampling signal which has been sampled in synchronism with said first clock signal by said sampling means and has been temporarily stored in said storing means or the sampling signal which has been sampled in synchronism with said second clock signal and has been stored in said storing means, in synchronism with a third clock signal having a frequency equal to that of said first clock signal.

5,194,963

DUAL DECK VIDEOCASSETTE RECORDER SYSTEM

R. Terren Dunlap, Scottsdale; John B. Berkheimer, Tempe, both of Ariz., and C. Duane Woodman, Emporia, Kans., assignors to Go-Video, Inc., Scottsdale, Ariz.

Filed Aug. 9, 1988, Ser. No. 230,181
Int. Cl.[5] H04N 9/80, 9/88
U.S. Cl. 358—314 2 Claims

1. A dual deck VCR system including two videocassette decks, each including playback electronics to effect playback of audio/video/control information from a videocassette therein using read heads and associated frequency modulation

and at least one of said decks including means for recording such information to a videocassette therein,

(a) means for selectively providing a playback output of one or the other of said decks of the system,

(b) means for receiving and providing a broadcast signal to the system,

(c) user controlled switching means to effect selective coupling of the broadcast signal to one of said decks, one of said decks to the output and one deck to the other,

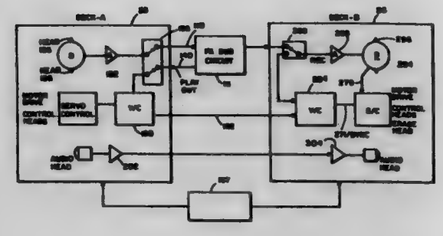
(d) means for receiving the frequency modulated signal from a read head within a first deck's playback electronics;

(e) means for storing part of said received signal, said part being at least equivalent to one complete television horizontal line,

(f) means for detecting when any part of said received signal has been lost, and for replacing said lost signal with a corresponding signal from an adjacent previous television line from said stored signal, resulting in a signal with no drop outs;

(g) means for receiving said resulting signal and for separating the chrominance signal from the luminance signal;

(h) means for adjusting the relative amplitudes of said chrominance and luminance signals to compensate for tape read head output versus frequency characteristics,



(i) means for combining said chrominance and luminance signals;

(j) means for providing said combined signal to record structure within a second deck's recording electronics via said switching means,

(k) means for extracting synchronization information from said frequency modulated source;

(l) means for forming from said synchronization information synchronized drive signals for the first deck's mechanical drive mechanisms and for maintaining synchronization of the record heads, capstan motor, control head and drum motor with the information recorded on the tracks of said videocassette tape;

(m) means for synchronously recording audio from said first deck onto said cassette in said second deck, so that resulting audio and associated video information is synchronized as on said first videocassette; resulting in a duplicate of said first videocassette from said first deck on said cassette in said second deck;

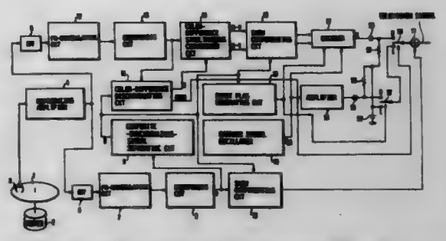
(n) means for azimuth video information recording in the second deck; and (o) speed control means and a related miniaturized recording head gap of said second deck to establish guard bands between adjacent tracks.

5,194,964

APPARATUS FOR PROCESSING COLOR OR BLACK AND WHITE VIDEO SIGNALS

Hisashi Kawai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 390,175, Aug. 7, 1989, abandoned. This application May 6, 1992, Ser. No. 879,715
Claims priority, application Japan, Sep. 15, 1988, 63-230869
Int. Cl.[5] H04N 9/79
U.S. Cl. 358—316 6 Claims



1. A video signal output apparatus for outputting a color video signal or a black-and-white video signal, comprising:

A) video-signal generating means for generating a color video signal or a black-and-white video signal;

B) discriminating means for receiving the video signal generated by said video-signal generating means and determining whether the received signal is a color video signal or a black-and-white signal and providing an output signal indicative of the determination; and

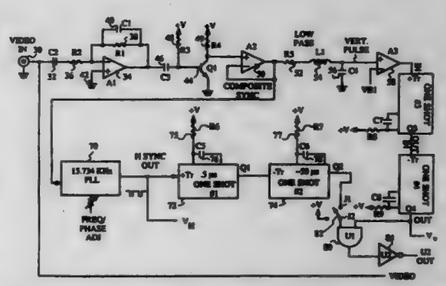
C) color burst-signal adding means for adding respective first or second color burst signals to the video signal generated by said video-signal generating means responsively to said discriminating means output signal.

5,194,965

METHOD AND APPARATUS FOR DISABLING ANTI-COPY PROTECTION SYSTEM IN VIDEO SIGNALS

Ronald Quan, Cupertino, and John F. Peruzzi, Redwood City, both of Calif., assignors to Macrovision Corporation, Mountain View, Calif.

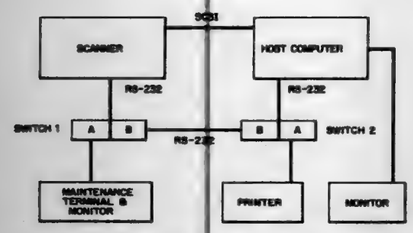
Continuation-in-part of Ser. No. 935,055, Nov. 21, 1989, Pat. No. 5,130,810, which is a continuation of Ser. No. 554,695, Nov. 23, 1983, abandoned. This application Nov. 13, 1990, Ser. No. 614,185
Int. Cl.[5] H04N 5/76
U.S. Cl. 358—335 17 Claims



1. A method for disabling the effects of copy-protect signals added to blanking intervals of a video signal having normal sync pulses, said copy-protect signals including at least one added AGC pulse, said method comprising the steps of:

providing the video signal having said copy-protect signals added thereto;
detecting said blank interval of said video signal;
identifying the position of said at least one added AGC pulse; and
developing altered video signals in response to said detecting and identifying steps in a manner so as to alter the copy-protect signals to reduce their effectiveness in copy-prevention;
wherein said developing step comprises generating a pulse of a predetermined width during said blanking interval and combining said generating pulse with copy-protect signals thereat so as to shift a DC level of at least a part of the copy-protect signals in a manner to disable copy protection.

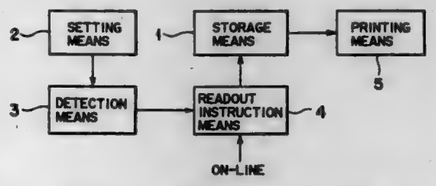
5,194,966
OPTICAL SCANNER THRESHOLD SETTING METHOD AND SHEET
Dennis Quardt, Morris County, and Ker-Ming Chang, Mercer County, both of N.J., assignors to Educational Testing Service, Princeton, N.J.
Filed Nov. 20, 1990, Ser. No. 616,134
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—406 **3 Claims**



1. A method for optimizing the threshold settings of an optical scanner using a calibration sheet and a host computer connected to the scanner to establish threshold values and automatically set the scanner to the established threshold values, wherein the method comprises:
(a) providing the calibration sheet wherein the sheet has a multiplicity of straight lines substantially at an angle of forty five degrees to the direction of travel of the sheet through the scanner;
(b) determining a tolerance dot count ("TDC") for the calibration sheet, wherein for equivalent settings of the scanner dot counts from consecutive scans of the calibration sheet differ by no more than the tolerance dot count;
(c) calculating maximum and minimum dot counts for the calibration sheet;
(d) setting an upper threshold target dot count ("UTDC") for the calibration sheet at about the maximum dot count minus the tolerance dot count;
(e) setting a lower threshold target dot count ("LTDC") for the calibration sheet at about the minimum dot count plus the tolerance dot count;
(f) determining a processed video threshold target dot count ("PTDC") by repetitively comparing the results of several consecutive scans of the calibration sheet for different processed video thresholds until the image obtained by the scanner is consistently of the required quality;
(g) establishing lower, upper and processed threshold final values by using the host computer,
wherein the method further comprises:
(i) determining the lower threshold final value by varying the lower threshold ("LTH") and upper threshold ("UTH"), scanning the calibration sheet to obtain a scan dot count, calculating the difference between the scan dot count and the LTDC, continuing to vary LTH and UTH until the difference is less than the tolerance plus one at which point the LTH final value is established;
(ii) determining the upper threshold final value by varying the upper and lower thresholds, scanning the calibration sheet to obtain a scan dot count, calculating the difference between the scan dot count and the UTDC, continuing to vary UTH and LTH until the difference is less than the tolerance plus one at which point the UTH final value is established;
(iii) determining the processed video threshold ("PTH") final value by varying the processed video threshold, wherein the upper and lower thresholds ar set to and maintained at their respective final values, scanning the calibration sheet to obtain a scan dot count, calculating the difference between the scan dot count and the PTDC, continuing to vary the PTH until the difference is less than the tolerance plus on for two successive scans at a particular PTH value and the scan dot count for the two successive scans differs by no more than a predetermined amount which is less than the tolerance dot count at which point the current PTH is stored as the PTH final value.

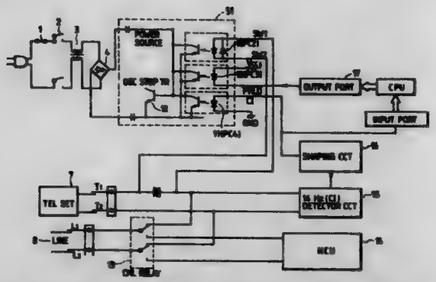
2. A method for optimizing the use of multiple optical scanners comprising the steps of:
(a) providing a calibration sheet wherein the sheet has a multiplicity of straight lines substantially at an angle of forty five degrees to the direction of travel of the sheet through the scanner;
(b) scanning the calibration sheet on a first scanner to obtain a dot count for the calibration sheet; and
(c) scanning the calibration sheet on the other scanners and adjusting said other scanners so that the dot count obtained by these other scanners is about equal to the dot count of the first scanner.

5,194,967
COMMUNICATION MANAGING DATA PROCESSING DEVICE IN FACSIMILE MACHINE
Yutaka Nonomura, Iwakura, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Jul. 20, 1990, Ser. No. 554,871
Claims priority, application Japan, Jul. 21, 1989, 1-187569
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—434 **7 Claims**



1. A communication managing data processing device for use in combination with a facsimile machine, comprising:
storage means for storing facsimile communication managing data whenever a facsimile communication is made;
setting means for setting a period of time defining an interval at which the facsimile communication managing data stored in said storage means is output;
detection means for detecting an elapse of the period of time set by said setting means and outputting a detection signal indicative of the elapse of the period of time; and
readout instructing means for instructing to read the facsimile communication managing data out of said storage means, wherein if the detection signal is output during a non-busy state of the facsimile machine, the facsimile communication managing data is read out thereof immediately after the occurrence of the detection signal and if the detection signal is output during a busy state of the facsimile machine, the facsimile communication managing data is read out thereof after the facsimile machine is turned to the non-busy state.

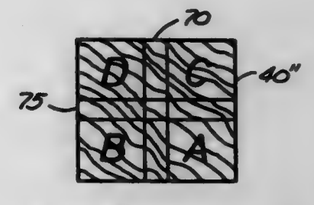
5,194,968
COMMUNICATION APPARATUS
Toshifumi Nakajima, Tokyo; Shigeru Koizumi, Saitama; Kenji Kurita, Tokyo, and Yuji Kurosawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 402,897, Sep. 5, 1989, abandoned. This application Aug. 20, 1991, Ser. No. 750,697
Claims priority, application Japan, Sep. 6, 1988, 63-223902
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—438 **6 Claims**



1. An image data communication apparatus comprising:
first detection means for detecting an original sheet;
second detection means for detecting a calling signal;
control means for receiving detection signals from said first detection means and/or said second detection means to control communication of image data accordingly;
switching power source means for supplying electric power to the apparatus including said control means which is required for image communication; and
start means for starting an oscillation operation of said switching power source means in response to a detection by said first or second detection means,
wherein said switching power source means starts supply of power to the apparatus in accordance with the start of the oscillation operation, and
wherein said control means starts a control operation in response to the supply of power by said switching power source means, outputs a hold signal to said switching power source means to continue the oscillation operation and inhibits the outputting of the hold signal at the end of image communication to suspend the supply of power.

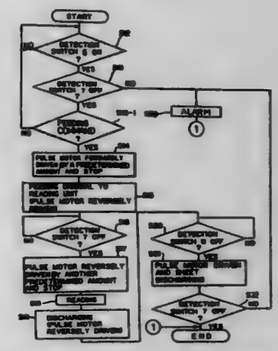
5,194,969
METHOD FOR BORDERLESS MAPPING OF TEXTURE IMAGES
David DiFrancesco, San Francisco, Calif., assignor to Pixar, Richmond, Calif.
Filed Dec. 4, 1990, Ser. No. 622,712
Int. Cl.[5] H04N *1/38, 1/387, 1/40*
U.S. Cl. 358—463 **22 Claims**

1. A method of transforming a first tessellatable surface having a finite number of original interior surface elements and having a border comprised of original peripheral surface elements such that a borderless tesselation of said first tessellatable surface can be accomplished, said method comprising the steps of:
performing a transformation of an original position of each surface element of said first tessellatable surface to a new position, said new position displaced from said original position along a displacement vector having a predetermined length, a predetermined direction, a first end and a second end, said first end being disposed at said original position of said surface element, said transformation such that said original peripheral surface elements are transformed to new interior surface elements and certain of said original interior surface elements are transformed to new peripheral surface elements;



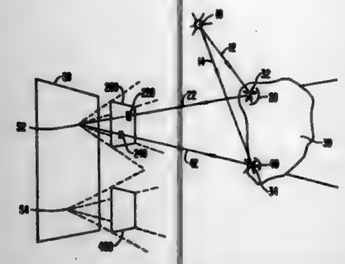
removing discontinuities in said new interior surface elements, resulting in a transformed tessellatable surface; and,
tessellating said transformed tessellatable surface.

5,194,970
AUTOMATIC ORIGINAL FEEDING DEVICE
Hisao Iwasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 5, 1990, Ser. No. 608,796
Claims priority, application Japan, Nov. 6, 1989, 1-289675
Int. Cl.[5] H04N *1/08*
U.S. Cl. 358—498 **8 Claims**



1. A sheet feeding device for feeding a plurality of cut-type sheets, having been stacked in an accommodating member, one by one towards a predetermined position, said sheet feeding device further comprising:
a sensor for detecting the presence of a sheet at an upstream side of said predetermined position;
first feeding means for feeding individual cut sheets of said plurality of stacked sheets to another predetermined position when said sensor detects the absence of a sheet;
second feeding means for feeding the sheet, having been fed by said first feeding means, towards said predetermined position after a feeding operation executed by said first feeding means and while said sensor detects the presence of the sheet, said second feeding means further feeding the sheet by a predetermined amount to said predetermined position after said sensor detects the absence of the sheet; and
controlling means for controlling said first feeding means so as not to be operated during a feeding operation executed by said second feeding means.

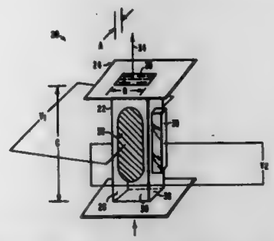
5,194,971
COMPUTER AIDED HOLOGRAPHY AND HOLOGRAPHIC COMPUTER GRAPHICS
Kenneth A. Haines, Kentfield, Calif., assignor to American Bank Note Holographics, Inc., Elmsford, N.Y.
Continuation of Ser. No. 257,705, Oct. 14, 1988, Pat. No. 4,969,700, which is a continuation-in-part of Ser. No. 137,179, Dec. 23, 1987, Pat. No. 4,778,262, which is a continuation of Ser. No. 918,362, Oct. 14, 1986, abandoned. This application Nov. 6, 1990, Ser. No. 609,813
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[5] G03H *1/26, 1/08*
U.S. Cl. 359—9 **22 Claims**



2. A hologram constructed by a method comprising the steps of:
providing a computer database of information of at least a portion of an object scene and its illumination,
defining as computer data a hologram surface with respect to said object scene,
dividing the hologram surface into a plurality of elemental areas by means of computer specified boundaries,
determining for each of at least some of said plurality of hologram surface areas, by means of a computer, the amplitude and direction of a selected sample of a plurality of rays emanating from an illuminated object that lie only along straight line paths that pass through the given surface area, and
constructing a plurality of holograms on a common holographic detector, each of said holograms being formed by redirecting onto the holographic detector the determined amplitude and direction of the sample of rays associated with a corresponding one of the plurality of hologram surface contiguous elemental areas,
whereby a completed hologram is formed that is capable of reconstructing an image of said object scene.

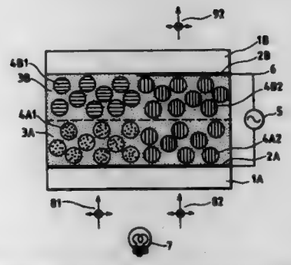
5,194,972
MICROWAVE PHASE MODULATION WITH LIQUID CRYSTALS
Khoon C. Lim, Agoura; J. David Margerum, Woodland Hills; Anne M. Lackner, Los Angeles, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Continuation of Ser. No. 573,504, Aug. 24, 1990, abandoned. This application Feb. 18, 1992, Ser. No. 837,571
The portion of the term of this patent subsequent to Feb. 2, 2010, has been disclaimed.
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—46 **25 Claims**

1. A method for modulating a phase of a microwave, comprising the steps of:
providing a microwave phase modulating cell comprising
a phase modulating medium comprising an anisotropic liquid crystal, and
means for controlling an alignment of the liquid crystal in the phase modulating medium, the means for controlling including means for applying a magnetic field for to the liquid crystal;
directing a beam of microwave energy through the cell in a microwave wave path propagation direction; and



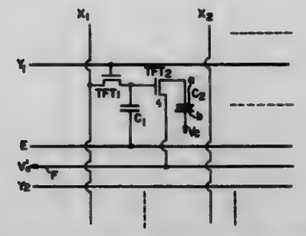
applying the magnetic field to the liquid crystal to change an effective microwave index of refraction of the phase modulating medium.

5,194,973
LIQUID CRYSTAL DISPLAY DEVICE AND DISPLAY APPARATUS USING SAME
Masato Isogai, Mito; Teruo Kitamura; Katsumi Kondo, both of Katsuta; Junichi Hirakata, and Shinichi Komura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 27, 1991, Ser. No. 799,275
Claims priority, application Japan, Nov. 29, 1990, 2-332196
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—53 **19 Claims**



1. A liquid crystal display device characterized in: comprising;
a set of substrates faced each other at least one of which is transparent,
transparent electrodes provided respectively to each facing plane of said substrates,
a light absorbing layer held between said transparent electrodes, and
an electric power source for applying electric field to said light absorbing layer through said transparent electrodes, and that;
said light absorbing layer is composed of two layers,
each of the layers has dichroism,
average light absorbing axis of the each layers without electric field is approximately parallel to the substrate plane and crossing each other almost orthogonally, and
said average light absorbing axis of the each layers changes the axis direction by applying of electric field.

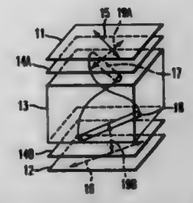
5,194,974
NON-FLICKER LIQUID CRYSTAL DISPLAY WITH CAPACITIVE CHARGE STORAGE
Hiroshi Hamada, Nara, and Fumiaki Funada, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 569,022, Aug. 17, 1990, abandoned. This application Jun. 4, 1992, Ser. No. 893,892
Claims priority, application Japan, Aug. 21, 1989, 1-215785; Aug. 21, 1989, 1-215786
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—59 **19 Claims**



1. A liquid crystal display apparatus comprising a plurality of unit circuit area formed with electrode lines X and Y crossing each other in an electrically isolated state, said plurality of unit circuit areas being arranged to provide a matrix comprising rows and columns of display elements, said display apparatus further including first and second counter electrodes and an a.c. voltage source for delivering an a.c. voltage to the first and second counter electrodes, each of said plurality of unit circuit areas comprising:
a pair of picture element electrodes each of which opposes one of said first and second counter electrodes,
a first switching three-terminal element having a source connected to the line X and a gate connected to the line Y near a crossover of the lines X and Y,
a liquid crystal layer being disposed between the picture element electrodes and counter electrodes,
a second switching three-terminal element having its gate connected to a drain of the first switching three-terminal element, and having its source and drain connected to the picture element electrodes, and
a signal storing capacitor being disposed between an earth line and the drain of the first switching three-terminal element,
wherein said first counter electrode opposes plural picture element electrodes corresponding to plural rows of said matrix, and also opposes plural picture element electrodes corresponding to plural columns of said matrix.

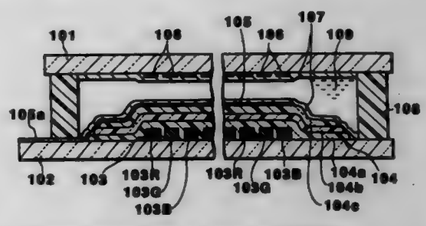
5,194,975
LIQUID CRYSTAL DISPLAY DEVICE HAVING BIAXIAL BIREFRINGENT PLATES AT EACH SIDE OF THE LIQUID CRYSTAL LAYER
Minoru Akatsuka; Yuji Sohda, both of Yokohama, and Kazutoshi Sawada, Nishinomiya, all of Japan, assignors to Asahi Glass Company Ltd., Tokye, Japan
PCT No. PCT/JP90/00394, § 371 Date Nov. 16, 1990, § 102(e) Date Nov. 16, 1990, PCT Pub. No. WO90/11546, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 26, 1990, Ser. No. 613,558
Claims priority, application Japan, Mar. 28, 1989, 1-73952; Apr. 6, 1989, 1-85741; Apr. 27, 1989, 1-105865; May 1, 1989, 1-109188; May 23, 1989, 1-127870; Jul. 12, 1989, 1-177964
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—73 **5 Claims**

1. A liquid crystal display device comprising a liquid crystal layer of a nematic liquid crystal having positive dielectric anisotropy and including a chiral material, said liquid crystal layer being interposed between a pair of substrates with transparent electrodes each having an aligning layer which are arranged substantially in parallel to provide a twist angle of 160°–300°, a driving means to apply a voltage across the electrodes attached to the substrates which interpose the liquid crystal layer, a pair of polarizing plates arranged outside the liquid crystal layer, and at least one biaxial birefringent plate provided between the liquid crystal layer and the polarizing plate at each side of said liquid crystal layer, characterized in



that the product $\Delta n_1 \cdot d_1$ of the anisotropy of refractive index Δn_1 of liquid crystal molecules in the liquid crystal layer and the thickness d_1 of the liquid crystal layer is in a range of 0.4–1.5 μm, and three main refractive indices n_x, n_y and n_z of the birefringent plate are in a relation of $n_x > n_z > n_y$ where n_x and n_y respectively represent the refractive indices in the direction of film plane of the birefringent plate (provided $n_x > n_y$) and n_z represents the refractive index in the direction of film thickness of the birefringent plate.

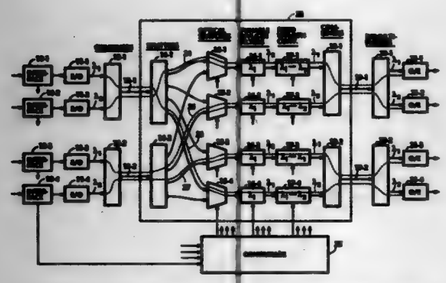
5,194,976
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD OF MANUFACTURING THE SAME
Minoru Nakano, and Toshiaki Niitsu, both of Hachioji, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 23, 1990, Ser. No. 556,910
Claims priority, application Japan, Jul. 25, 1989, 1-87300[U]; Dec. 28, 1989, 1-341247; Dec. 28, 1989, 1-341248; Feb. 27, 1990, 2-44570
Int. Cl.[5] G02F *4/43*
U.S. Cl. 359—79 **16 Claims**



1. A liquid crystal display device comprising:
a pair of substrates arranged to be opposed to each other;
at least one first electrode mounted on one of said substrates;
a plurality of second electrodes mounted on the other of said substrates so as to oppose the at least one first electrode;
a thin film member mounted on an opposing surface of said other substrates which is opposing said one of said substrates;
an insulating film formed above a predetermined area of said other substrate to cover said thin film member and said insulating film comprising a plurality of insulation layers arranged one on the other, said plurality of insulation layers each including respective outer peripheries which have sub-areas being different from each other in their area so that a peripheral surface of said insulating film is formed to be shaped as a staircase including a plurality of steps, the sub-areas of said insulation layers of said insulat-

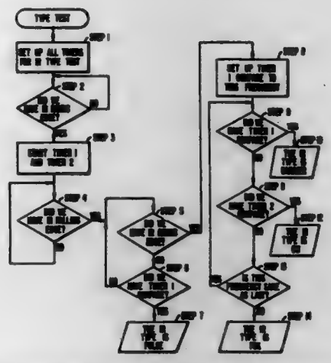
ing film successively changing in area from said other substrate toward said one of said substrates;
a liquid crystal material interposed between said first and second electrodes; and
a sealing member for hermetically binding together said pair of substrates with a predetermined gap interposed between said substrates.

5,194,977
WAVELENGTH DIVISION SWITCHING SYSTEM WITH REDUCED OPTICAL COMPONENTS USING OPTICAL SWITCHES
Makoto Nishio, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Nov. 20, 1990, Ser. No. 616,046
Claims priority, application Japan, Nov. 20, 1989, 1-302703; Dec. 21, 1989, 1-334343
Int. Cl.[5] H04J *14/02*
U.S. Cl. 359—128 6 Claims



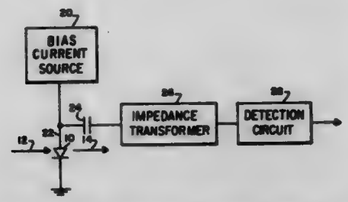
1. A wavelength division switching system comprising:
m_1 inlet highways and m_2 outlet highways;
m_1 splitter means respectively associated with said inlet highways, each of said splitter means having $m_2 \times n$ outputs for coupling the associated inlet highway to the outputs of the splitter means, where n represents the number of wavelengths multiplexed into a input signal;
$m_2 \times n$ optical switches each having m_1 inputs coupled to respective outputs of different ones of said m_1 splitter means, and responsive to a switching control signal for coupling one of said m_1 inputs of the optical switch to an output of the optical switch;
$m_2 \times n$ tunable wavelength filters respectively associated with said optical switches, each of the tunable wavelength filters having an input coupled to the output of the associated optical switch for passing one of n different wavelengths through the filter to an output of the filter in response to a wavelength selecting signal;
$m_2 \times n$ fixed wavelength converters respectively associated with said tunable wavelength filters and organized into m_2 groups, each of the fixed wavelength filters being coupled to the output of the associated tunable wavelength filter for converting the wavelength of a signal from the associated filter to one of said wavelengths so that the converted wavelength is unique in each of said m_2 groups; and
m_2 combiners respectively associated with the groups of said fixed wavelength converters and with said outlet highways, each of said combiners having n inputs coupled to respective outputs of the fixed wavelength converters of the associated group and multiplexing signals appearing at said n inputs of the combiner into a wavelength multiplexed output signal for coupling to the associated outlet highway.

5,194,978
TIMER SYSTEM FOR LEARNING AND REPLAYING OF INFRARED SIGNALS
Jerry J. Heep, Weatherford, Tex., assignor to Tandy Corporation, Fort Worth, Tex.
Division of Ser. No. 377,966, Jul. 11, 1989. This application Nov. 18, 1991, Ser. No. 793,973
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—148 16 Claims



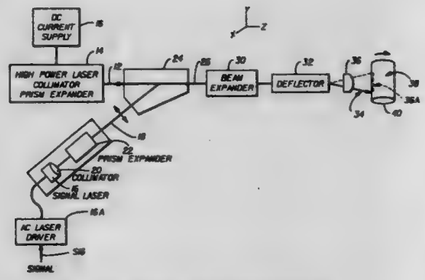
1. A method for determining the mode of transmission of an infrared signal composed of a series of pulses of varying widths interspersed between idle periods of varying widths, each pulse including an initial portion, an active state, and a passive state, the method comprising the steps of:
(a) commencing measurement of the period of a received pulse signal upon receipt of an initial portion;
(b) comparing the measured value from step (a) with a first limit value;
(c) identifying the mode as the pulse mode if the measured value matches the limit value before receipt of the next initial portion;
if the measured value does not match the limit value before receipt of the next initial portion, continuing the method by:
(d) commencing measurement of ht period of the next pulse signal upon receipt of the next initial portion;
(e) comparing the measured value form step (d) with a second limit value;
(f) identifying the mode as the carrier mode if the measured value in step (d) matches the limit value before receipt of the next succeeding initial portion,
if the measured value in step (d) does not match the second limit value before receipt of the next succeeding initial portion, continuing the method by:
(g) comparing the total elapsed time since receipt of the initial portion in step (a) with a third limit value;
(h) identifying the mode as the continuous wave (CW) mode if the elapsed time matches the third limit value;
if the elapsed time does not match the third limit value, continuing the method by:
(i) determining the period of the last received complete pulse signal;
(j) comparing the period determined in step (i) with a fourth limit value;
(k) identifying the mode as the frequency shift key (FSK) mode when the period differs from the fourth limit value by a predetermined amount; and
f the period determined in step (i) does not differ form the fourth limit value by a predetermined amount, continuing the method by returning to step (d) and repeating steps (d) through (k) until one of the three modes is identified.

5,194,979
WIDEBAND OPTICAL AMPLIFIER-RECEIVER SYSTEM
Kwang-Tsai Koai, Acton, and Robert Olshansky, Wayland, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Jun. 7, 1991, Ser. No. 712,213
Int. Cl.[5] H04B *10/06*
U.S. Cl. 359—189 27 Claims



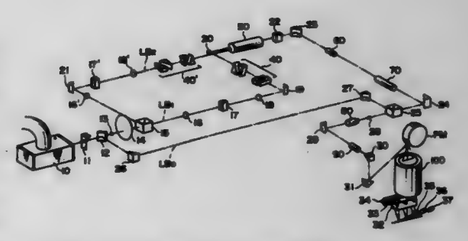
1. An optical amplifier receiver system comprising:
a semiconductor optical amplifier including an optical input for receiving an optical signal comprising an optical carrier modulated with a modulation signal, an optical output for providing an amplified optical signal, and a current injection electrode;
a bias current source connected to the current injection electrode of said optical amplifier for supplying a bias current to said optical amplifier;
a detection circuit for receiving said modulation signal, said detection circuit having a characteristic input impedance; and
an impedance transformer for coupling said modulation signal from the current injection electrode of said optical amplifier to the input of said detection circuit, said impedance transformer having an input impedance that is lower than the characteristic input impedance of said detection circuit.

5,194,980
THRESHOLDED, HIGH POWER LASER BEAM SCANNING SYSTEM
James E. Roddy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 29, 1992, Ser. No. 890,452
Int. Cl.[5] G02B *26/08, 27/10*
U.S. Cl. 359—204 11 Claims



1. A light beam scanning system comprising:
multiple light beam sources for providing respective input beams;
first control means for maintaining a first of said input light beams at a predetermined constant level of intensity;
second control means, responsive to an information signal, for varying a second of said input light beams at a selectable level of intensity corresponding to the signal;
a Thompson prism, locatable for receiving the input beams and for combining the input beams to form therefrom an output beam;
means for deflecting the output beam to provide a scanning beam; and
means for focussing the scanning beam to an exposure plane for effecting scan exposure thereon.

5,194,981
LIGHT SCANNING APPARATUS
Akira Morimoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 23, 1989, Ser. No. 424,942
Claims priority, application Japan, Oct. 21, 1988, 63-265811; Nov. 1, 1988, 63-276965
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—212 32 Claims

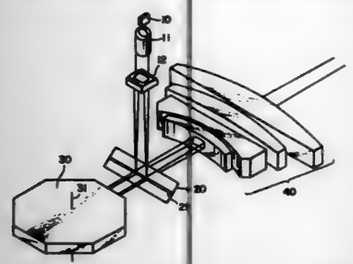


1. A light scanning apparatus comprising:
a light source portion;
a correction deflecting element for finely deflecting a light beam emitted by said light source portion in an auxiliary scanning direction;
a scan deflector having at least two surfaces for deflecting a light beam from said correction deflecting element in a principal scanning direction, wherein said correction deflecting element deflects a light beam in order to eliminate an effect of inclination error of said at least two surfaces of said scan deflector;
a lens system disposed between said light source portion and said scan deflector and adapted to bring said correction deflecting element and said scan deflector in an optically conjugate relation; and
a scanning lens for imaging said light beam deflected by said scan deflector onto a scanning surface.

5,194,982
SCANNING OPTICAL SYSTEM
Akira Morimoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 494,326, Mar. 16, 1990. This application Mar. 18, 1992, Ser. No. 853,043
Claims priority, application Japan, Mar. 17, 1989, 1-63934; Sep. 14, 1989, 1-239153
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—216 15 Claims

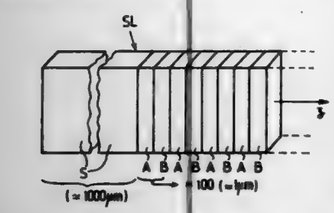
1. A scanning optical system comprising:
a light source for emitting a light beam;
a scanning deflector for deflecting and scanning said light beam from said light source;
a scanning lens which focuses the deflected beam on a scanning surface to form a spot thereon;
a focusing point changing element disposed between said scanning deflector and said scanning lens and adapted to change a focusing point in an auxiliary scanning plane in a

peripheral portion of said scanning surface so that said focusing point approaches said scanning lens from said



focusing point in said auxiliary scanning plane in the central portion of said scanning surface.

5,194,983
SUPERLATTICE OPTICAL MONITOR
Paul Voisin, Paris, France, assignor to Centre National de la Recherche Scientifique (C.N.R.S.), Paris, France
Continuation of Ser. No. 427,330, Oct. 25, 1989, abandoned, which is a division of Ser. No. 128,456, Nov. 24, 1987, abandoned. This application Nov. 1, 1991, Ser. No. 789,407
Claims priority, application France, Nov. 27, 1986, 86 16576
Int. Cl.[5] G02F *1/03*; H01L *29/161, 27/14*
U.S. Cl. 359—245 23 Claims

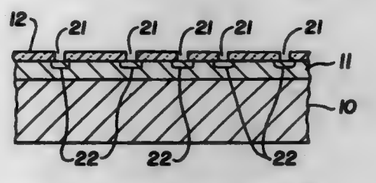


1. An electro-optical method, comprising the steps of:
a) providing a superlattice comprising a periodic stack of semi-conductor layers extending along a growth axis thereof, each period of said stack comprising a group of adjacent layers, the layers in each said semi-conductor layer group having materials and thicknesses selected together so that adjacent semi-conductor layer groups are mutually coupled by resonant tunnel effect, with said resonant tunnel effect resulting in said superlattice having progressive optical absorption properties in a given photo energy band having a significant width which is related to the optical transition between authorized valence and conduction sub-bands of energy for electrons;
b) applying a working light to said superlattice, said working light having a wavelength about said given band;
c) applying a control electric field to said superlattice parallel to said growth axis thereof, to alter said resonant coupling for varying the width of said given band of progressive optical absorption properties, without substantially changing the center position thereof, thereby influencing cooperation of said working light with said superlattice.

5,194,984
STILBAZOLIUM SALT AND OPTICALLY NON-LINEAR DEVICES INCORPORATING SAME
Eugene P. Boden, Scotia; Peter D. Phelps, Schenectady; Christopher P. Yakymyshyn, Saratoga Springs, and Kevin R. Stewart, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jun. 10, 1991, Ser. No. 712,282
Int. Cl.[5] G02F *1/00, 1/35*; G02B *6/00*; C07D *211/70*
U.S. Cl. 359—321 6 Claims

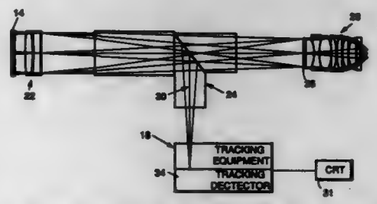
1. The compound 4'-dimethylamino-4-methylstilbazolium methanesulfonate in optically second order non-centrosymmetric hydrated form.

5,194,985
PROTECTED AIRBORNE WINDOW FOR INFRARED RADIATION AND METHOD OF MAKING SAME
Albert R. Hilton, Sr., Richardson, Tex., assignor to Amorphous Materials, Inc., Garland, Tex.
Continuation of Ser. No. 545,548, Jun. 29, 1990, abandoned.
This application Aug. 13, 1992, Ser. No. 928,749
Int. Cl.[5] G02B *1/10, 5/20*
U.S. Cl. 359—350 10 Claims



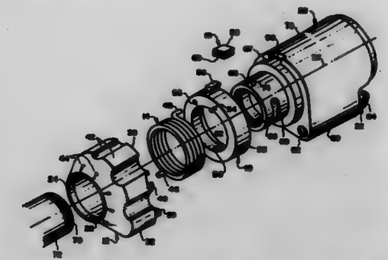
1. A window for infrared radiation comprising:
(a) a body of gallium arsenide having first and second opposite major faces;
(b) a layer of undoped silicon formed on said first major face; and
(c) a pattern of relatively low resistivity lines formed in said layer of undoped silicon.

5,194,986
OBJECTIVE LENS ASSEMBLY FOR A PORTABLE MISSILE LAUNCHER
James J. Carlson, Woodland Hills, and Gary R. Noyes, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Mar. 23, 1992, Ser. No. 856,429
Int. Cl.[5] G02B *13/14, 23/04*
U.S. Cl. 359—353 3 Claims



3. A single aperture missile launcher optical system for receiving infrared energy components from a missile carried source and visible light components from a target and transmitting the same to an eyepiece for visual examination and to means for displaying the infrared light components, comprising:
a single doublet objective lens for receiving both the visible and infrared light components from the target including a front lens constructed of an anomalous dispersion glass and a rear lens constructed of a flint glass; said front lens having a front surface radius of curvature of 8.52429 inches, a back radius of curvature of −5.22041 inches, and thickness along a central axis of 0.600000 inches; and said rear lens having a front radius of curvature of −5.22467 inches, a back surface radius of curvature of −20.2942 inches, and a thickness along a central axis of 0.250000 inches.

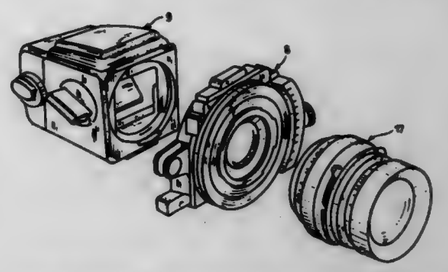
5,194,987
AUTOMATIC POWER CHANGE MECHANISM FOR RIFLESCOPES OR THE LIKE
Sidney D. Moore, Claremont, and Hans A. Jorgensen, Placentia, both of Calif., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sep. 3, 1991, Ser. No. 753,528
Int. Cl.[5] G02B *7/04, 15/00*
U.S. Cl. 359—422 10 Claims



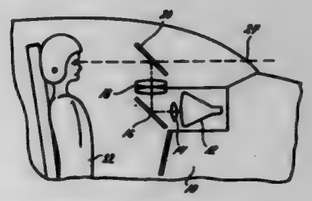
1. Apparatus for automatically accomplishing power changes in a variable power riflescope having an objective lens, an erector lens assembly, an eyepiece lens assembly, supported within a housing, and a power change ring rotatably fixed to and about said housing and in communication with said erector lens assembly, said power change ring having a first defined power setting and being rotatable therefrom to at least a second defined power setting; said apparatus comprising:
a) latch means disposed on said housing for engagement with said power change ring for maintaining said power change ring at said first defined power setting and for releasing said power change ring for rotation to said at least second defined power setting; and
b) means fixed between said housing and said power change ring for automatically rotating said power change ring from said first defined power setting to said at least second defined power setting upon release of said latch means from engagement with said power change ring.

5,194,988
DEVICE FOR CORRECTING PERSPECTIVE DISTORTIONS
Werner Flöther, and Winfried M. Kaiser, both of Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 505,173, Apr. 5, 1990, Pat. No. 5,044,728. This application Aug. 30, 1991, Ser. No. 752,822
Int. Cl.[5] G02B *7/02, 27/64*
U.S. Cl. 359—554 3 Claims

3. A device for correcting perspective distortions in an arrangement which includes an apparatus having a beam pass-through opening and which includes an imaging optical system defining a first optical axis and a first image plane, the apparatus defining a second optical axis and having an image carrier defining a second image plane, the device comprising:
a holding structure mounted on said apparatus and being disposed outside of said beam pass-through opening;
displacement means for effecting a displacement of said first optical axis and said second optical axis relative to each other to correct said distortions;
said displacement means being mounted on said structure to permit said displacement to occur in a displacement plane transverse to said first optical axis and said second optical axis;
said optical system being mounted on said displacement means so as to be displaceable therewith in said displacement plane and relative to said apparatus and said second optical axis thereof;
said optical system including a lens assembly having an image field;
said displacement means including an intermediate opening between said lens assembly and said second image plane; and,
an adapter lens unit mounted in said intermediate opening for increasing said image field.



5,194,989
DIELECTRIC COMBINER INCLUDING FIRST AND SECOND DIELECTRIC MATERIALS HAVING INDICES OF REFRACTION GREATER THAN 2.0
Ronald A. Ferrante, St. Charles, and Rex G. Carnes, Hazelwood, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Continuation-in-part of Ser. No. 519,896, May 7, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 793,529
Int. Cl.[5] G02B *1/00, 5/28, 27/14*
U.S. Cl. 359—583 8 Claims



1. A dielectric combiner, comprising:
a) a substrate for transmitting light therethrough; and
b) a plurality of dielectric layers comprised of alternating layers of a first dielectric material and a second dielectric material, each layer having a high index of refraction, deposited upon the substrate for reflecting a predetermined spectrum of light and otherwise transmitting light therethrough wherein the index of refraction of both the first dielectric material and the second dielectric material is greater than 2.0.

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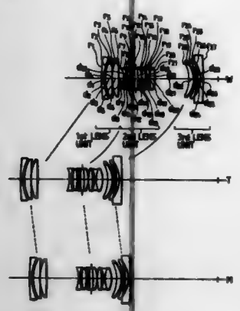
5,194,990
LOW COLOR PURITY, ANTI-REFLECTION COATINGS FOR TRANSPARENT GLAZINGS ORIENTED AT HIGH ANGLES OF INCIDENCE
Edward N. Boulos, Troy, and Mark F. Best, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 7, 1991, Ser. No. 772,397
Int. Cl.[5] G02B *1/10*
U.S. Cl. 359—587 11 Claims

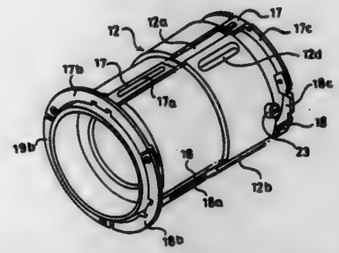
1. A low color purity, anti-reflection coating comprising:
A) a first layer of dielectric material, having a refractive index from about 1.60 to about 1.75 and a thickness from about 750 Angstroms to about 950 Angstroms;
B) a second layer of dielectric material, having a refractive index from about 1.95 to about 2.35 and a thickness from about 1,050 Angstroms to about 1,350 Angstroms, adhered to the first layer; and
C) a third layer of dielectric material, having a refractive index from about 1.38 to about 1.44 and a thickness from about 1,100 Angstroms to about 1,200 Angstroms, adhered to the second layer opposite the first layer.

5,194,991
ZOOM LENS SYSTEM
Takanori Yamanashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 14, 1990, Ser. No. 566,825
Claims priority, application Japan, Aug. 15, 1989, 1-209589
Int. Cl.[5] G02B *15/22*
U.S. Cl. 359—693 11 Claims



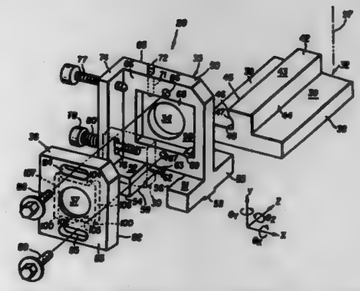
1. A zoom lens system comprising:
a plurality of lens units, including at least a lens unit having a positive refractive power for varying the focal length of the zoom lens system as a whole by movement of said lens unit, which has said positive refractive power, along a first locus including an optical axis; and
a second locus different than said first locus for bringing objects located at exceptionally short distances into focus by movement of said lens unit, which has said positive refractive power, along said second locus;
wherein said plurality of lens units includes a first lens unit having a positive refractive power, a second lens unit having a positive refractive power and a third lens unit having a negative refractive power, all of these lens units being movable along the optical axis for varying the focal length of the zoom lens system as a whole;
wherein focal length of the zoom lens system as a whole is varied by varying the airspaces reserved between the lens units; and
wherein said zoom lens system is focused for photographing objects located at exceptionally short distances by moving at least one of said lens units along a locus different from the locus thereof for varying the focal length.

5,194,992
LENS MOUNT ASSEMBLY
Toshikatsu Atsuta, Tokyo, and Hidetoshi Yanagidaira, Nagano, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan
Filed Sep. 7, 1990, Ser. No. 578,871
Claims priority, application Japan, Sep. 28, 1989, 1-250487
Int. Cl.[5] G02B *7/02, 15/14*
U.S. Cl. 359—704 17 Claims



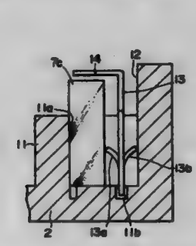
9. A zoom lens mount assembly for an optical apparatus comprising:
an optical system having an optical axis;
a plurality of movable frames adapted to support said optical system;
said plurality of movable frames including a first movable frame, said first movable frame having an outer peripheral surface and a plurality of grooves formed in said outer surface;
a cam sleeve rotatable about said optical axis for moving said plurality of movable frames in operative association with rotation of said cam sleeve to achieve an optically variable magnification; and
a plurality of key members engaging with said grooves, said key members movably supporting said cam sleeve and said movable frames.

5,194,993
ADJUSTABLE MOUNT FOR CYLINDRICAL LENS
Mark Bedzyk, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 24, 1991, Ser. No. 765,161
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—813 14 Claims



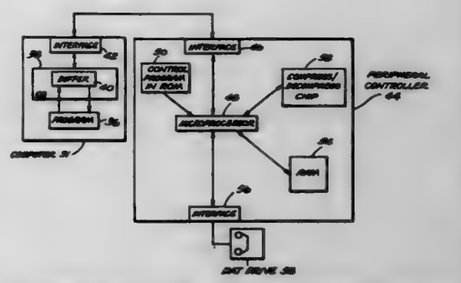
1. A device for positioning a cylindrical lens or the like translationally with respect to x, y, z orthogonal axes directions and rotationally with respect to θ_x, θ_y, θ_z directions respectively dangularly about said x, y, z axes directions in an optical system having a source for projecting a beam of light along a path in said z axis direction, onto said lens positioned by said device, and onto a receiving medium; said lens including a curved cylindrical surface for providing magnification in one of said x and y axes directions; said device including means for angularly positioning said lens relative to said θ_x and θ_y directions; means for translationally positioning said lens relative to said other of said x and y axes directions; means for translationally positioning said lens relative to said z axis direction; means for adjustably translationally positioning said lens relative to said one of said x and y directions; and means for adjustably angularly positioning said lens relative to said θ_z direction; said device being characterized in that:
said device further comprises means for applying a biasing torque on said lens in said θ_z direction; and
said means for adjustably angularly positioning said lens relative to said θ_z direction comprises means for moving said lens rotationally in said θ_z direction against said biasing torque applied on said lens by said biasing torque means;
wherein said device further comprises a lens carrier having a first cavity for receiving a portion of said lens; and a lens retainer having a second cavity, axially-spaced in said z axis direction from said first cavity, for receiving a different portion of said lens; and
wherein said means for applying a biasing torque on said lens in said θ_z direction comprises means for applying a biasing torque on one of said lens carrier and retainer relative to the other of said lens carrier and retainer.

5,194,994
MIRROR INSTALLATION IN AN OPTICAL DEVICE
Yasuo Takizawa, Saitama; Shinya Ikeda, Tokyo; Masataka Nishikyama, Tokyo; Takaaki Yoshinari, Tokyo, and Masakazu Suwashita, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 4, 1991, Ser. No. 755,012
Claims priority, application Japan, Sep. 10, 1990, 2-95484[U]
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—871 17 Claims



1. A mirror installation structure in an optical device comprising:
a mirror;
a front installation wall provided at a predetermined position, said front installation wall having a front surface facing an optical path of said optical device and a reverse surface formed opposite to the front surface, said reverse surface being finished as an installation reference surface;
a rear support wall provided spaced apart from and facing to the installation reference surface, said mirror being installed in such a manner that a reflection surface of the mirror is located to contact said installation reference surface of said front installation wall; and
an elastic element inserted and press-fitted between the mirror and the rear support wall so as to securely hold and bias the mirror in the direction of said optical path toward said installation reference surface.

5,194,995
METHOD AND APPARATUS FOR RECORDING COMPRESSED DATA ON DAT MEDIA
Eric L. Severtson, Trabuco Canyon, and Roger G. Mintzlaff, Santa Ana, both of Calif., assignors to WangDAT, Inc., Irvine, Calif.
Filed Jan. 9, 1991, Ser. No. 639,017
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—48 1 Claim



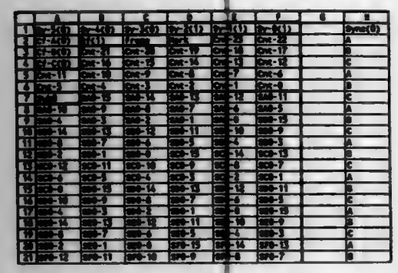
1. A method of operating a data system including a standard format tape drive to enhance the storage capacity of magnetic media used therewith beyond the capacity of the magnetic media when formatted in said standard format in which record groups each have a fixed, predetermined number of frames of fixed data size, the method comprising the steps of:
operating a standard format tape drive to exchange data in media record groups with a buffer, each such media record group including frames of fixed data size;
operating a data utilization device to exchange data in standard format record groups with the buffer, each such standard format record group including a fixed, predetermined number of frames of data of said fixed data size;
operating a data record group compression device associated with the buffer to form compressed record groups from standard format record groups transferred to the buffer from the data utilization device, each compressed record group being associated with a particular standard record group and including frames of data of said fixed data size;
substituting a compressed record group for the standard format record group associated therewith to form a media record group when the data in said standard record group is to be written to the tape drive if the number of frames of data in the compressed record group is less than said fixed, predetermined number;
operating a data record group decompression device associated with the buffer to form standard record groups from compressed record groups transferred to the buffer from the tape drive; and
substituting a standard record group so formed for the compressed record group associated therewith when the data in the compressed record group is to be read by the data utilization device.

5,194,996
DIGITAL AUDIO RECORDING FORMAT FOR MOTION PICTURE FILM
Kenneth D. Shores, Los Angeles, Calif., assignor to Optical Radiation Corporation, Azusa, Calif.
Filed Apr. 16, 1990, Ser. No. 510,288
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—48 5 Claims

1. A digitally-sound-encoded filmstrip having digital data recorded thereon representative of a data format wherein the format comprises:
a plurality of data fields, each field having recorded therein interleaved digital data representative of sampled audio

signals wherein adjacent samples are recorded in mutually remote data fields, and each field further having recorded therein digital data representative of first level error corrective checkwords for attempted correction of errors in the field; and

a plurality of data blocks, each block having a plurality of



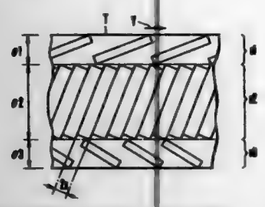
data fields, wherein mutually remote fields are located in different blocks, and at least one data field in each block has digital data representative of second level error detecting checkwords redundant to data throughout the data block for invalidating the data from the block upon error detection, thereby allowing invalidation of a block without loss of adjacent samples.

5,194,997

DATA RECORDING APPARATUS HAVING SUB-CODE RECORDING FUNCTION

Susumu Kozuki, Tokyo; Katsuji Yoshimura, and Toshiyuki Masui, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 253,065, Oct. 10, 1988, abandoned.
This application Feb. 15, 1991, Ser. No. 657,873
Claims priority, application Japan, Oct. 6, 1987, 62-252824; Oct. 6, 1987, 62-252825; Oct. 6, 1987, 62-252826; Oct. 6, 1987, 62-252827
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—48 **23 Claims**



1. A data recording apparatus comprising:

a) a cylinder member provided with a rotary head;

b) transport means for transporting a tape-shaped recording medium in the lengthwise direction thereof, said tape-shaped recording medium being wrapped round said cylinder member;

c) means for generating main data related to main information;

d) means for generating sub-code data related to sub-information which is other than said main information; and

e) mode changeover means for changing over said apparatus between a plurality of modes thereof, said plurality of modes including:

a first recording mode in which said main data is recorded in many parallel tracks formed by said rotary head at a first area extending in the lengthwise direction of said tape-shaped recording medium; and

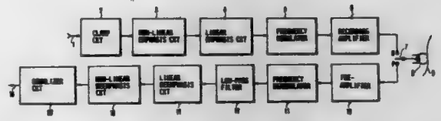
a second recording mode in which said sub-code data is repeatedly recorded a plurality of times in each of many parallel tracks formed by said rotary head at a second area extending in the lengthwise direction of said tape-shaped recording medium and in parallel to said first area.

5,194,998

SIGNAL PROCESSING APPARATUS INCLUDING DEEMPHASIS PROCESSING

Somei Kawasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1989, Ser. No. 417,240
Claims priority, application Japan, Oct. 11, 1988, 63-256315
Int. Cl.[5] G11B *5/035*; H04N *5/78*
U.S. Cl. 360—65 **2 Claims**



1. A signal processing apparatus in which a first frequency-modulated signal, which has been formed by applying an emphasis-processing to a signal on the basis of a predetermined emphasis characteristic at the time of sending out said signal and then frequency-modulating said emphasis-processed signal in a first deviation, and a second frequency-modulated signal, which has been formed by frequency-modulating the emphasis-processed signal in a second deviation different from said first deviation, are selectively received and an original signal is restored from said received first or second frequency-modulated signal, comprising:

(A) frequency demodulating means for demodulating the received first or second frequency-modulated signal and outputting the demodulated signal;

(B) separating means for separating and outputting a signal of a predetermined frequency band from the signal outputted from said frequency demodulating means;

(C) first phase compensating means arranged to input the signal outputted from said separating means and to apply phase compensating processing to said inputted signal and then output the phase-compensated signal in the case where the inputted signal is a signal which has been separated by said separating means from the demodulated signal demodulated from said first frequency-modulated signal by said frequency-modulating means or to output the signal, without applying the phase compensating processing to said inputted signal, in the case where the inputted signal is a signal which has been separated by said separating means from the demodulated signal demodulated from said second frequency-modulated signal by said frequency demodulating means;

D) deemphasis means arranged to input the signal outputted from said first phase compensating means, to apply deemphasis-processing to the inputted signal on the basis of a predetermined deemphasis characteristic corresponding to said emphasis characteristic, and to output the deemphasis-processed signal; and

(E) second phase compensating means arranged to input the signal outputted from said deemphasis means, and to apply the phase compensating processing to said inputted signal and output the phase compensated signal in the case where the inputted signal is a signal which has been separated by said separating means from the signal which is demodulated from said second frequency-modulated signal by said frequency modulating means or to output the inputted signal, without applying the phase compensating processing to said inputted signal, in the case where said inputted signal is a signal which has been separated by said separating means from the signal which is demodulated

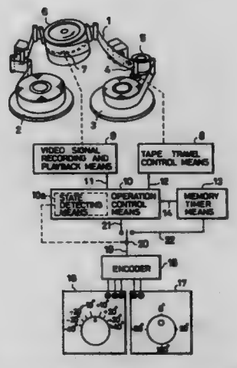
from said first frequency-modulated signal by said frequency-modulating means.

5,194,999

VIDEO RECORDING AND PLAYBACK APPARATUS WITH AUTOMATIC NORMAL AND PREPROGRAMMED MODE DATA ENTRY SELECTION

Katsumi Nakajima, and Yutaka Suzuki, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,529
Claims priority, application Japan, Sep. 8, 1989, 1-234445
Int. Cl.[5] G11B *33/00*
U.S. Cl. 360—69 **14 Claims**



1. A video magnetic recording and playback device comprising:

video signal recording and playback means for recording video signals on a magnetic tape and for playing back video signals from the magnetic tape;

tape travel control means for controlling travel speed of the magnetic tape;

manual input means for manually inputting data;

memory timer means for storing the manually input data as preset data;

operation control means, responsive to the manually input data, for controlling said video signal recording and playback means and said tape travel control means,

said operation control means being responsive to said preset data for controlling the operation of said video signal recording and playback means and said tape travel control means during present recording;

state detecting means for detecting whether the device is in a playback state or in a stop state; and

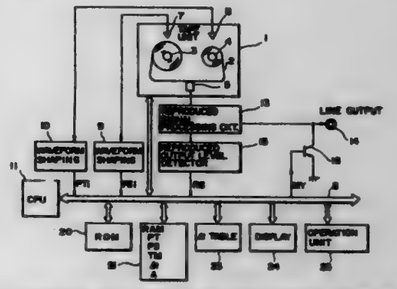
switch means, responsive to said state detecting means, for directing the manually input data to said operation control means when the device is in the playback state so that the manually input data is used to control said video signal recording and playback means and said travel speed control means and for directing the manually input data to said memory timer means when the device is in the stop state so that the manually input data is stored in said memory timer means as said preset data.

5,195,000

SEARCHING DEVICE FOR A TAPE REPRODUCING APPARATUS

Kenji Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 6, 1990, Ser. No. 579,062
Claims priority, application Japan, Sep. 8, 1989, 1-234235
Int. Cl.[5] G11B *27/10, 27/13*
U.S. Cl. 360—72.3 **2 Claims**



1. A searching device for a tape reproducing apparatus for reproducing signals recorded on a tape wound on first and second reels comprising:

first pulse generation means for generating a first pulse signal each time the first reel is rotated by predetermined angle;

second pulse generating means for generating a second pulse signal each time the second reel is rotated by a predetermined angle;

first counter means for counting the first pulse signals generated by the first pulse generation means;

second counter means for counting the second pulse signals generated by the second pulse generation means;

memory means for prestoring a plurality of different time data Δt corresponding to different ratios of counts;

reading means for calculating a ratio of counts of the first and second counter means for a predetermined period of time and reading out time data Δt corresponding to the calculated ratio of counts from the memory means;

accumulation means for accumulating the time data Δt read from the memory means each time a pulse signal is generated by the first or second pulse generation means;

detecting means for detecting a running distance of the tape in correspondence to output data of the accumulation means;

reproduced signal level detection means for detecting whether the level of a reproduced signal from the tape is larger or smaller than a predetermined level; and

searching means for searching a head portion of a selected music piece in response to output data of the detecting means and a level detection signal from the reproduced signal level detection means.

5,195,001

ROTARY HEAD TYPE TAPE RECORDING AND/OR REPRODUCING APPARATUS

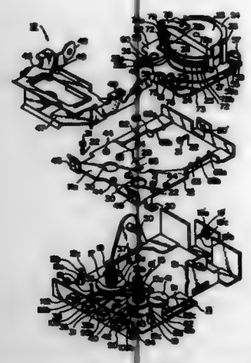
Atsushi Murakami, and Kiyotaka Yanaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 620,077
Claims priority, application Japan, Dec. 6, 1989, 1-317021
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 **6 Claims**

1. A rotary head type tape recording and/or reproducing apparatus comprising:

rotary head drum means having a rotary head for recording and/or reproducing information signals onto/from a magnetic tape helically wrapped around said rotary head drum means with a predetermined wrap angle and an outer peripheral surface of the rotary head drum means

being free of leads for restricting the movement of the wrapped magnetic tape in the width direction of the tape;
a pair of tape guide means having flange portions for restricting the movement of the magnetic tape in the width direction; and
head drum supporting and moving means for fixing said rotary head drum means and said pair of tape guide means and for moving the rotary head drum means and said pair of tape guide means between a first position in contact

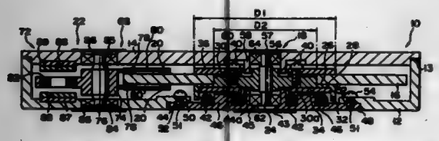


with a cassette loading means for loading and supporting a tape cassette in which the magnetic tape is enclosed and a second position away from said cassette loading means, said head drum supporting and moving means including a base member, said pair of tape guide means being fixedly mounted on said base member in spaced positions and said rotary head drum means being mounted on the base member between said pair of tape guide means so that the tape is guided by the guide means onto said rotary head.

5,195,002
APPARATUS FOR DRIVING INFORMATION RECORD MEDIUM

Yoshiki Sakurai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 27, 1991, Ser. No. 722,139
Claims priority, application Japan, Jun. 29, 1990, 2-173062
Int. Cl.[5] G11B *17/02*
U.S. Cl. 360—99.08 18 Claims

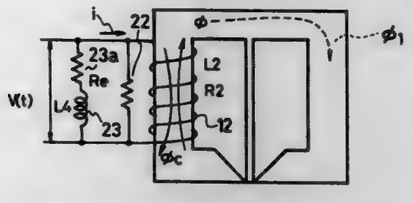


1. An apparatus for driving a disk-shaped record medium, comprising:
a housing including first and second walls facing each other;
means attached to the first wall, for generating an alternating magnetic field;
first and second bearings provided on the generating means and the second wall, respectively;
a rotating shaft having one end rotatably supported by the first bearing and the other end rotatably supported by the second bearing;
supporting means fixed to the rotating shaft and having first and second surfaces facing the generating means and the second wall, respectively, for supporting the record medium on the second surface, the supporting means being formed of a magnetic material; and
a magnet fixed to the first surface of the supporting means so as to face the generating means.

5,195,003
MAGNETIC HEAD DEVICE INCLUDING CROSSTALK PREVENTION CIRCUIT

Masaru Nishimura, Hyogo; Yasuhide Kasagi, and Naoto Sugawara, both of Fukushima, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 18, 1990, Ser. No. 629,422
Claims priority, application Japan, Dec. 18, 1989, 1-327696; Feb. 23, 1990, 2-41211
Int. Cl.[5] G11B *5/17*
U.S. Cl. 360—124 13 Claims

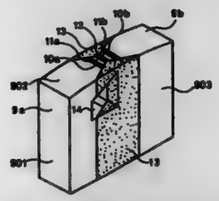


1. A magnetic head device comprising:
(a) a magnetic head including a core with a plurality of coils wound therearound, said core including means forming a plurality of gaps corresponding to the plurality of coils; and
(b) crosstalk prevention means, comprising an inductance and a resistance both connected electrically in parallel with at least one of the coils of said magnetic head for generating a cancelling magnetic flux in response to a crosstalk magnetic flux in the coil with which the means is connected in parallel, to cancel the crosstalk magnetic flux and to prevent crosstalk.

5,195,004
METHOD OF MANUFACTURING A MAGNETIC CORE HALF

Hiroyuki Okuda, Daitoh; Yoshiaki Shimizu, Minoh; Kazuo Ino, Matsubara; Kousou Ishihara, and Takashi Ogura, both of Daitoh, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 540,534, Jun. 19, 1990, abandoned, which is a division of Ser. No. 218,018, Jul. 12, 1988, Pat. No. 4,953,049. This application Jan. 21, 1992, Ser. No. 826,192
Claims priority, application Japan, Jul. 14, 1987, 62-175157; Aug. 4, 1987, 62-194893
Int. Cl.[5] G11B *5/147, 5/42*
U.S. Cl. 360—126 8 Claims

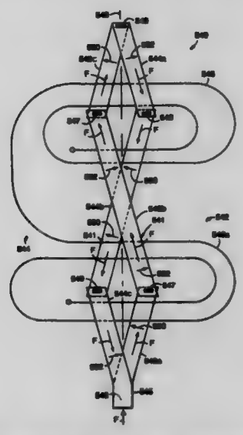


2. A method of manufacturing a magnetic core half in a magnetic head having a magnetic gap between a pair of said magnetic core halves opposed to each other through a non-magnetic material, a vicinity of said magnetic gap including ferromagnetic metal material, said method comprising the steps of:
preparing a magnetic core half member made of a ferromagnetic oxide and having a gap forming face to be opposed to form said magnetic gap;
treating said gap forming face to cause said gap forming face to have an appearance exposing a grown crystal of said ferromagnetic oxide;
forming a heat-resistance thin film of a heat-resistant material on said treated gap forming face; and
forming a ferromagnetic thin film of a ferromagnetic metal material on said heat-resistant thin film.

5,195,005
TRANDUCER WITH IMPROVED INDUCTIVE COUPLING

Michael L. Mallary, Berlin, and Harold B. Shukovsky, Framingham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 721,117, Jun. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 603,162, Oct. 25, 1990, which is a continuation-in-part of Ser. No. 360,334, Jun. 2, 1989, abandoned. This application May 26, 1992, Ser. No. 890,372
Int. Cl.[5] G11B *5/147, 5/17;* H01F *7/06*
U.S. Cl. 360—126 22 Claims

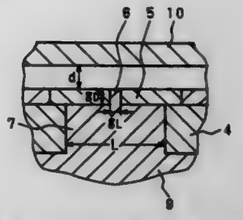


1. A thin film magnetic transducer comprising
a yoke having a plurality of arms each of which has at least one easy axis of magnetization, and
a plurality of coils, each one of said coils having at least one turn, said yoke and said coils being intertwined to provide multiple flux interactions between said yoke and said at least one turn of at least one of said coils,
each one of said arms having a plurality of elongated segments each of which is disposed generally along a longitudinal axis of the transducer, said segments being oriented obliquely to each other, each one of said segments having an easy axis of magnetization oriented transverse to the direction of flux conduction through said segment and at an oblique angle with respect to said longitudinal axis,
said segments of said arms being joined together to direct said flux through said plurality of coils.

5,195,006
THIN-FILM MAGNETIC HEAD ELEMENT HAVING HIGH RECORDING/REPRODUCING CHARACTERISTICS

Kazutoshi Morikawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 6, 1991, Ser. No. 711,154
Claims priority, application Japan, Jun. 7, 1990, 2-149244
Int. Cl.[5] G11B *5/23*
U.S. Cl. 360—126 8 Claims

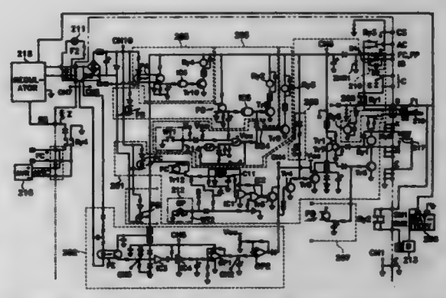


1. A thin-film magnetic head element which generates a magnetic pole for detecting the surface flux of a moving recording medium after being magnetized comprising:
an insulative substrate;
a core having a first magnetic film formed on said insulative substrate and a second magnetic film laminated on said first magnetic film and having means defining a head gap for forming a magnetic pole for generating a recording magnetic field; and
a conductive film forming a coil crossing with said core through an insulator;
said second magnetic film further having means defining a void with a substantially rectangular-shaped cross section contiguous with said head gap so that the shape of the magnetic pole in the vicinity of said head gap is made concave at the surface of said insulative substrate side of said second magnetic film.

5,195,007
ENGINE-DRIVEN POWER GENERATING SYSTEM

Shinji Kikuchi; Toshihiko Tsuzuna, and Yasuyuki Saito, all of Gunma, Japan, assignors to Daihatsu Motor Co., Ltd., Osaka, Japan

Filed May 29, 1991, Ser. No. 706,966
Claims priority, application Japan, May 29, 1990, 2-139282
Int. Cl.[5] H02H *7/06*
U.S. Cl. 361—21 6 Claims



1. An engine-driven power generating system comprising:
an emergency relay circuit means connected to generator windings of the system and for controlling operation of the engine, said emergency relay circuit means including abnormal hydraulic pressure/water temperature engine

stop control means for stopping the engine when one of abnormal hydraulic pressure or water temperature is detected, an excess revolution engine-stop control means for stopping the engine when engine revolutions exceed a predetermined value, and a stator disengagement control means for preventing the engine from being re-engaged at the time of engine start, said emergency relay circuit means and the generator windings of the system being combined together into a unit for undergoing a dielectric strength test;

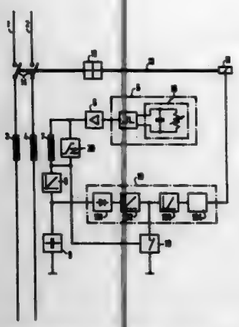
isolating means for isolating each of said control circuits from electric currents and voltages present in the generating windings during said dielectric strength test, said isolating means passing signals from the generator windings to each of said control circuits during normal operation of the engine-driven power generating system.

5,195,008

DIFFERENTIAL CURRENT CIRCUIT BREAKER AND A METHOD OF SETTING THE TRIPPING RANGES

Dieter Harr, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Apr. 23, 1990, Ser. No. 512,964
Claims priority, application European Pat. Off., Apr. 24, 1989, 89107388
Int. Cl.[5] H02H *3/26*
U.S. Cl. 361—42 3 Claims



1. A differential current circuit breaker operating with a transductor circuit monitoring a plurality of conductors, comprising:

a transformer having a primary winding in series with all of said plurality of conductors to be monitored and a secondary winding;

a measuring impedance in series with said secondary winding;

a voltage generator providing an alternating output signal, wherein a frequency of said alternating output signal is adjustable over a frequency range larger than a frequency range required to compensate for tolerance in said voltage generator, said voltage generator coupled to and supplying said output signal through said secondary winding and said measuring impedance;

an evaluation circuit having an input coupled to a tap located between said secondary winding and said measuring impedance;

a tripping mechanism responsive to said evaluation circuit;

switching contacts in said conductors to be monitored; and

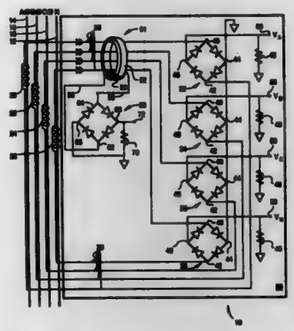
a breaker mechanism coupled to open and close said contacts of said breaker mechanism responsive to said tripping mechanism to open said contacts.

5,195,009

CURRENT SUMMING ARRANGEMENT FOR GROUND FAULT DETECTION

William E. May, Lawrenceville, Ga., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Aug. 27, 1991, Ser. No. 750,353
Int. Cl.[5] H02H *3/16, 3/347*
U.S. Cl. 361—44 13 Claims



8. In an electrical power system of the type including at least a first electrical conductor and a second electrical conductor, an arrangement for producing a signal representative of the sum of currents in the electrical conductors, the arrangement comprising:

an annular transformer core;

a first winding including a first winding conductor and magnetically linked to the first electrical conductor to produce a first current in the first winding conductor, where the first current is representative of a current in the first electrical conductor and the first winding conductor passes through the core;

a second winding including a second winding conductor and magnetically linked to the second electrical conductor to produce a second current in the second winding, where the second current is representative of a current in the second electrical conductor and the second winding conductor passes through the core;

a third winding disposed about the core such that a third current is produced in the third winding of the sum of the currents in the first and second electrical conductors; and

where the first and second winding conductors each include a conductive pin which passes through the core.

5,195,010

ELECTROSTATIC DISCHARGE VOLTAGE PROTECTION CIRCUIT FOR A SOLID STATE INSTRUMENT

Joseph Dresner, Princeton, N.J., assignor to Thomson, S.A., Courbevoie, France

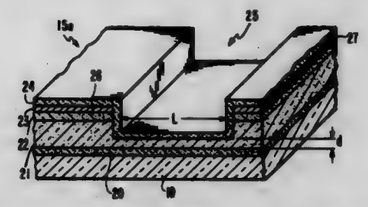
Filed Jan. 23, 1990, Ser. No. 468,510
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—56 16 Claims

1. A protection circuit having an input line and a ground line for protecting a solid state instrument from electrostatic discharges comprising:

a plurality of solid state fusing devices arranged in parallel between said input line and said ground line, the input capacitance of said solid state instrument also being arranged between said input line and said ground line, said fusing devices protecting said instrument from electrostatic discharges above a minimum voltage;

a solid state switching device arranged in parallel with said input capacitance for shunting currents produced by electrostatic discharges below said minimum voltage; and

a resistor in combination with said input capacitance, said resistor having a value whereby the RC time constant of



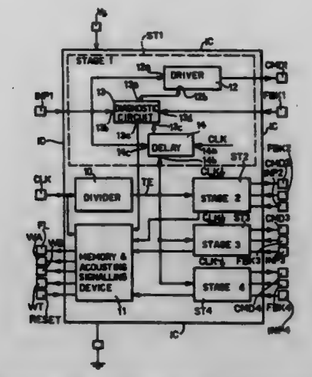
said resistor and said input capacitance is higher than the switching time of said fusing devices and said switching device.

5,195,011

CIRCUIT FOR INTERFACING BETWEEN A MICROPROCESSOR AND A PLURALITY OF POWER STAGES, PARTICULARLY FOR CONTROLLING ELECTRO-INJECTORS

Valerio Giorgetti; Yves LeGrand, both of Turin; Franco Selerno, Alpignano, and Gianluigi Morello, Turin, all of Italy, assignors to Marelli Autronica SpA, Milan, Italy

Filed Nov. 7, 1990, Ser. No. 609,846
Claims priority, application Italy, Nov. 7, 1989, 67969 A/89
Int. Cl.[5] H02H *3/14*
U.S. Cl. 361—87 5 Claims



1. A circuit for interfacing between a microprocessor and a plurality of transistors, particularly MOSFET power transistors for driving a corresponding plurality of loads, particularly electrical injectors, each of which is connected to the drain-source path of one of the transistors through a feedback terminal and between the positive and negative terminals of a direct-current voltage supply; the circuit including a plurality of control stages each of which is associated with one of the transistors and compriaes

a first input terminal for receiving a control logic signal,

a first output terminal for connection to the gate of the associated power transistor,

a driver circuit, connected between the first input terminal and the first output terminal and adapted to make the transistor conductive when an enabling signal is present at its enabling input and the control logic signal is applied to the first input terminal, and

a diagnostic logic circuit, connected to said first terminal and said feedback terminal and to the enabling input of the driver circuit the diagnostic circuit being arranged

to detect a short-circuit condition between the drain of the transistor and the positive terminal of the voltage supply;

to apply a disabling signal to the control circuit for a period of temporary disablement when a first short-circuit condition occurs between the drain of the transistor and the positive terminal of the supply;

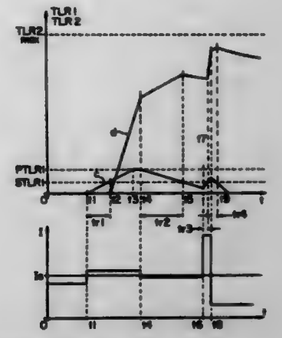
to output a first breakdown signal and to apply a permanent disablement signal to the control circuit when a short-circuit condition is again detected between the drain of the transistor and the positive terminal of the supply after the temporary disablement period has elapsed.

5,195,012

ELECTRONIC TRIP DEVICE COMPRISING AN IMPROVED LONG DELAY FUNCTION

Paul Tripodi, Eybens, France, assignor to Merlin Gerin, Meylan, France

Filed Jan. 21, 1991, Ser. No. 719,186
Claims priority, application France, Jul. 3, 1990, 90 08527
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—94 7 Claims



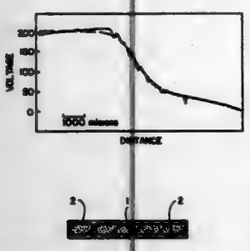
1. An electronic trip device comprising:

detection means for detecting a current flowing in a conductor protected by an electrical circuit breaker and generating an output signal indicative thereof;

an electronic processing unit for performing at least a long delay type tripping function coupled to the detection means, wherein the electronic processing unit produces a value representative of the current in response to the output signal generated by the detection means, produces a first quantity, representative of the thermal state of the circuit breaker, the variations of which are proportional to the difference between the square of the value representative of the current and the square of a preset current threshold, and compares the first quantity to a preset first threshold, and wherein the electronic processing unit increments a second quantity representative of the thermal state of the circuit breaker when the first quantity is greater than the first threshold, decrements the second quantity when the first quantity is lower than the first threshold, compares the second quantity to a second, preset threshold, and produces a tripping signal when the second quantity is greater than the second threshold; and

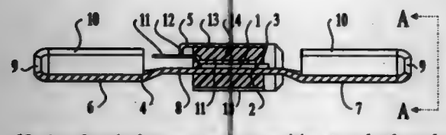
tripping means for causing the circuit breaker to trip to an open circuit condition in response to the tripping signal generated by the electronic processing unit.

5,195,013
PTC CONDUCTIVE POLYMER COMPOSITIONS
Stephen M. Jacobs, Cupertino; Mary S. McTavish, Fremont, and Frank A. Doljack, Pleasanton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 531,557, Jun. 1, 1990, abandoned, which is a division of Ser. No. 146,653, Jan. 21, 1988, Pat. No. 4,951,382, which is a continuation of Ser. No. 656,046, Sep. 28, 1984, abandoned, which is a continuation of Ser. No. 364,179, Apr. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 250,491, Apr. 2, 1981, abandoned. This application Apr. 13, 1992, Ser. No. 870,206
Int. Cl.[5] H05B *1/02*
U.S. Cl. 361—106 11 Claims



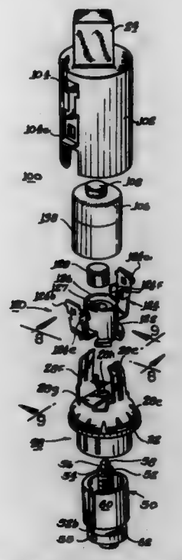
1. An electrical circuit which comprises
(a) a power source having a voltage V which is at least 200 volts;
(b) an electrical load; and
(c) a circuit protection device which comprises
(i) a radiation cross-linked PTC conductive polymer element, and
(ii) two electrodes which are connected to the power source so that current passes through the PTC element;
said device when subjected to SEM scanning, showing a maximum difference in voltage between two points separated by 10 microns of less than 3 volts.

5,195,014
TRANSIENT SUPPRESSION COMPONENT
Leonard A. Krantz, Jr., Sidney; Gary C. Toombs, Oneonta, and Douglas M. Johnescu, Gilbertsville, all of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.
Continuation-in-part of Ser. No. 709,152, Jun. 3, 1991. This application Feb. 12, 1992, Ser. No. 834,344
Int. Cl.[5] H02H *9/00*; H01R *19/04*
U.S. Cl. 361—111 37 Claims



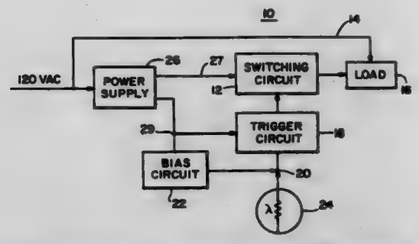
33. An electrical component comprising two leads and an electrical component body, said component body being electrically connected between and attached to two leads, wherein one of the two leads includes a component mounting section on which the component body is mounted and a second of said two leads substantially surrounds the first of said two leads and at least a portion of said component mounting section, and wherein said first lead includes a chamber which at least partially surrounds said component on at least five sides.

5,195,015
LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT
Richard T. Kaczmarek, Chicago, Ill., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.
Filed Mar. 7, 1991, Ser. No. 665,660
Int. Cl.[5] H02H *3/22, 9/06*
U.S. Cl. 361—119 17 Claims



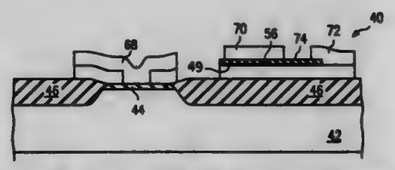
16. A line protector for a communications circuit, said line protector being configured to interfit in a receptacle in a protector block of the type wherein one receptacle and one protector are provided for each of the conductors of a telephone line pair to be protected, and for interfitting in said receptacles in a spring loaded fashion for making electrical contact respectively with one line of a subscriber's line pair and a corresponding line of a corresponding central office line pair and also for contacting an electrical ground circuit provided in said protector block and within said receptacle, said line protector comprising: a housing; over-voltage arrester means received in said housing and having respective ground and line electrodes; means for coupling said ground electrode to electrical ground; first contact means for electrically contacting a first communications line; second contact means for electrically contacting a second communications line to be joined with said first communications line; means for joining said first and second contact means; one of said first and second contact means also being connected in electrical circuit with said line electrode of said over-voltage arrester for grounding said communications lines upon occurrence of an over-voltage condition; and a fail safe means comprising a meltable element, grounding contactor means, and means for mounting said meltable element in thermal contact with said over-voltage arrester means, but out of any current path in series with said first or second communications lines or with said over-voltage arrester means, such that said grounding contactor means will short across said over-voltage arrester means to connect said communications lines to ground upon melting of said meltable element due to an over-voltage or an over-current condition on said communications lines and consequent heating of said over-voltage arrester means and upon application of an axial force to said grounding contactor means.

5,195,016
PHOTOELECTRIC LOAD CONTROL SYSTEM
John J. Powers, East Weymouth, Mass., assignor to Dark to Light, Inc., Pembroke, Mass.
Continuation of Ser. No. 808,079, Dec. 11, 1991, abandoned, which is a continuation of Ser. No. 688,371, Apr. 19, 1991, abandoned, which is a continuation of Ser. No. 416,359, Oct. 3, 1989, abandoned. This application Jun. 25, 1992, Ser. No. 905,153
Int. Cl.[5] H01H *47/24*
U.S. Cl. 361—175 13 Claims



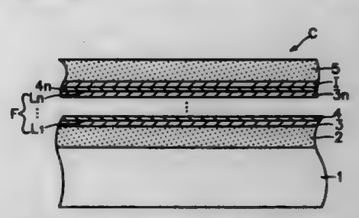
1. A photoelectric load control system for applying a.c. power to a street light as a function of ambient light level, comprising:
electromagnetically-activated switching means for selectively applying a.c. power to a street light for turning the street light on and off;
a Schmitt trigger circuit having two states, a first state which actuates said switching means to turn on the street light, and a second state which actuates said switching means to turn off the street light;
said trigger circuit further including a suppression circuit for suppressing regenerative oscillations caused by the operation of said switching means;
means for biasing said trigger circuit into one of said states; and
a photoelectric cell for varying the bias on said trigger circuit to bias it into the other state in response to the ambient light level sensed by said photoelectric cell wherein said trigger circuit and said photoelectric cell are commonly interconnected to a bias point of said means for biasing.

5,195,017
METHOD FOR FORMING A POLYSILICON TO POLYSILICON CAPACITOR AND APPARATUS FORMED THEREFROM
William K. McDonald, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 695,832, May 6, 1991, abandoned, which is a division of Ser. No. 450,334, Dec. 13, 1989, Pat. No. 5,037,772. This application Dec. 16, 1991, Ser. No. 808,964
Int. Cl.[5] H01G *4/10, 7/00*; H01L *21/22*
U.S. Cl. 361—313 9 Claims



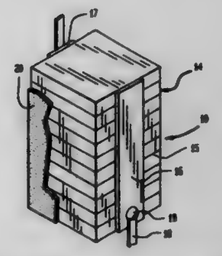
1. A polysilicon to polysilicon capacitor, which comprising:
a first polysilicon layer deposited on a substrate;
an interlevel dielectric pattern formed on a portion of said first polysilicon layer; and
a second polysilicon layer having two portions selectively formed on said first polysilicon layer and said interlevel dielectric pattern to form a polysilicon to polysilicon capacitor and a contact for the capacitor.

5,195,018
HIGH DIELECTRIC CONSTANT CAPACITOR AND METHOD FOR MANUFACTURING THE SAME
Kocwon Kwon, and Youngwug Kim, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jun. 17, 1992, Ser. No. 899,973
Claims priority, application Rep. of Korea, Jul. 3, 1991, 91-11272
Int. Cl.[5] H01G *7/00, 9/00, 4/06*
U.S. Cl. 361—313 30 Claims



1. A high dielectric constant capacitor, including:
a substrate;
a first electrode film formed on said substrate;
a first tantalum oxide film formed on said first electrode film;
a first metal oxide film formed on said first tantalum oxide film, wherein said first metal oxide film is made of a metal oxide whose valence is smaller than that of tantalum, and whose dielectric constant is equal to or greater than that of tantalum oxide;
wherein said first tantalum oxide film and said first metal oxide film together comprise a high dielectric constant film; and
a second electrode film formed on said high dielectric constant film.

5,195,019
BONDING FIRED MULTILAYER CAPACITORS INTO A STACK
Jerome J. Hertz, 451 Monument Dr., Apt. 1113, Jacksonville, Fla. 32225
Filed Feb. 10, 1992, Ser. No. 832,881
Int. Cl.[5] H01G *4/38, 7/00*
U.S. Cl. 361—328 10 Claims



1. A multiple capacitor assembly comprising:
a multiplicity of multilayer capacitors;
each of said capacitors having a prefired ceramic body with flat opposite sides;
each of said ceramic bodies containing a plurality of spaced electrode plates;

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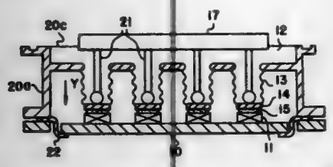
an adhesive layer coating on one side of each of said ceramic bodies;
said ceramic bodies being superimposed on one another with said adhesive layers disposed therebetween to form a stack; and
said adhesive layers being composed of a mixture of glass frit and a metal silicate, to bond said ceramic bodies together at room temperature to form a monolithic stack of said capacitors.

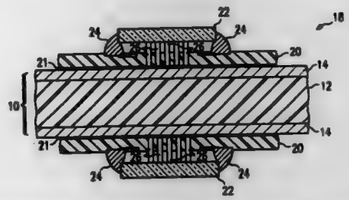
5,195,020
COOLING SYSTEM USED WITH AN ELECTRONIC CIRCUIT DEVICE FOR COOLING CIRCUIT COMPONENTS INCLUDED THEREIN HAVING A THERMALLY CONDUCTIVE COMPOUND LAYER AND METHOD FOR FORMING THE LAYER
Masahiro Suzuki, Inagi; Haruhiko Yamamoto, Yokohama, and Yoshiaki Udagawa, Tokyo, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Continuation of Ser. No. 535,230, Jun. 8, 1990, abandoned, which is a continuation of Ser. No. 197,258, May 23, 1988, abandoned. This application Nov. 1, 1991, Ser. No. 785,198
Claims priority, application Japan, May 25, 1987, 62-125732; Jun. 23, 1987, 62-96288[U]
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—385 15 Claims



1. A cooling system used with a printed circuit board having at least one solid circuit component, said cooling system comprising:
a cooling header having a coolant passage disposed therein-side;
a heat transfer means, being exposed to a liquid coolant flowing through said coolant passage, for transferring heat from said heat transfer means to said liquid coolant;
an elastic means, connected to said heat transfer means and said coolant header, for biasing said heat transfer means against said solid circuit component with a working pressure higher than a zero pressure;
a semi-flowable thermally conductive compound means, disposed between said heat transfer means and said solid circuit component, for establishing a liquid thermal contact between said heat transfer means and said solid circuit component; and
over-pressure means associated with said cooling header for releasably exerting a pressure on said semi-flowable thermally conductive compound mean prior to operation of said cooling system to reduce and stabilize the thermal contact resistance between said heat transfer means and said solid circuit component.

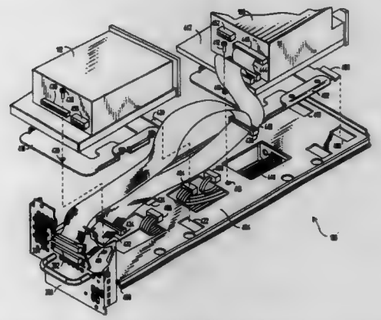
5,195,021
CONSTRAINING CORE FOR SURFACE MOUNT TECHNOLOGY
Burhan Ozmat, Dallas, and Robert J. Gordon, Coppell, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 397,060, Aug. 21, 1989, abandoned.
This application May 17, 1991, Ser. No. 704,690
Int. Cl.[5] H02B *1/00*
U.S. Cl. 361—386 37 Claims

1. A composite core, comprising:
(a) a graphite layer;
(b) a layer of material disposed on each opposing side of said graphite layer having approximately the same coefficient of thermal expansion as said graphite layer and greater stiffness than said graphite layer; and



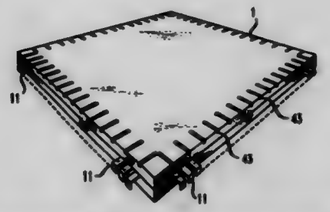
(c) a bonding layer positioned between each of said layers of material and said graphite layer bonding said layers of material and said graphite layer together to form an integral composite core.

5,195,022
REMOVABLE MASS STORAGE MODULE FOR COMPUTER SYSTEMS
John P. Hoppal, and Arlen L. Roesner, both of Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 1, 1991, Ser. No. 786,443
Int. Cl.[5] H05K *7/14, 7/12*
U.S. Cl. 361—391 4 Claims



1. In a computer system having a plurality of internal mass storage device means for storing data, a modular apparatus for mounting said mass storage device means within said computer, the modular apparatus comprising:
tray means for mounting said mass storage device means, said tray means inserted into said computer system through a first opening in a first side of said computer system;
mounting bracket means, attached to said mass storage device means and to said tray means, for attaching said mass storage device means to said tray means;
tray power connector means, mechanically attached to said tray and electrically mating with a corresponding computer power connector in said computer system, for supplying electrical power from said computer system to said modular apparatus;
power distribution cable means, electrically connected to said tray power connector means and to said mass storage device means, for distributing power from said tray power connector means to said mass storage device means;
cover plate means, attached to said tray means and substantially filling said first opening whenever said tray means is fully inserted into said computer system, for providing mechanical support for said tray means;
first external signal connector means, mechanically attached to said power plate means, for electrically connecting to mass storage control and data signals external to said modular apparatus;
second external signal connector means, mechanically attached to said cover plate means, for electrically connecting to mass storage control and data signals external to said modular apparatus;
internal signal distribution cable means, electrically connected to said first external signal connector, to said mass storage device means and to said second external signal connector means, for supplying control and data signals between said mass storage device means and said first and second external signal connector means;
wherein said computer system has a second opening in a second surface and wherein said plurality of mass storage device means comprises:
first disk drive means with non-removable media; and
second disk drive means with removable media, a face of said second disk drive means substantially filling said second opening and said removable media accessible through said second opening.

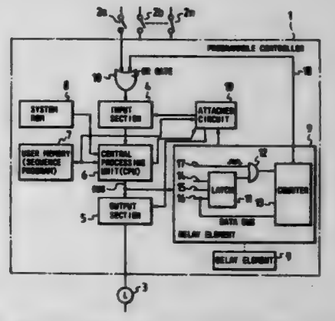
5,195,023
INTEGRATED CIRCUIT PACKAGE WITH STRAIN RELIEF GROOVES
Louis T. Manzione, and C. Kumar Patel, both of Summit, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 23, 1991, Ser. No. 812,555
Int. Cl.[5] H05K *7/00;* H01L *23/28*
U.S. Cl. 361—392 2 Claims



1. An improved plastic integrated circuit package comprising an integrated circuit chip encapsulated in a plastic encapsulant to form an integrated circuit package, the package formed with top and bottom major surfaces and having the integrated circuit chip centered within the edges of the encapsulant and approximately centered between the top and bottom major surfaces, wherein the improvement comprises a plurality of grooves formed in at least one of said major surfaces, said grooves extending from at least one of said edges of said package only part of the way across the major surface toward an edge opposite said at least one of said edges of the package leaving the central portion of the surface free of grooves, said grooves having a depth of at least 20% of the distance measured from the major surface in which the grooves are formed to the integrated circuit chip.

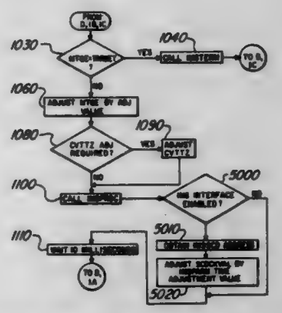
5,195,024
PROGRAMMABLE CONTROLLER
Naohiro Kurokawa, Shibata, and Yasusuke Sakurai, Nakajou, both of Japan, assignors to Hitachi, Ltd. and Hitachi Techno Engineering Co., Ltd., both of Tokyo, Japan
Filed May 31, 1990, Ser. No. 531,153
Claims priority, application Japan, Jun. 2, 1989, 1-139037
Int. Cl.[5] G05B *19/05*
U.S. Cl. 364—140 7 Claims

1. A programmable controller comprising:
an input section for receiving input information from an object to be controlled;
a first memory for storing a system program;
a second memory for storing a sequence program and a simulated input program having delay time data set thereto;
a central processing unit connected to said input section, said first memory and said second memory for selectively performing an operation in accordance with either one of said sequence program and said simulated input program;
an output section connected to an output of said central processing unit for outputting a result of an operation performed by said central processing unit when said sequence program is performed;



a delay element connected to an output of said central processing unit for causing a time delay in outputting said result by said output section in accordance with said delay time data when said simulated input program is performed; and
an OR gate disposed between said object and said input section for ORing said input information from said object and an output of said delay element and outputting a result of said ORing as input information to said input section.

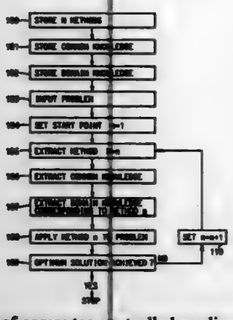
5,195,025
SYSTEM AND METHOD FOR DYNAMIC CHANGE OF COMPUTER SYSTEM AND SUBSYSTEM TIME-OF-DAY CLOCKS
Mark S. Boecker, and John J. Ganci, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 21, 1991, Ser. No. 659,589
Int. Cl.[5] G06F *1/14*
U.S. Cl. 364—145 15 Claims



1. A system to dynamically change a computer system's time services control blocks to coincide with seasonal time-of-day changes, comprising:
a first module for modifying said time services control blocks of said computer such that application programs executing in said computer system will still perceive ascending time-of-day values to internal requests for time of day; and

a second module connected to said first module for transferring of control of said time services control blocks between said computer and said first module.

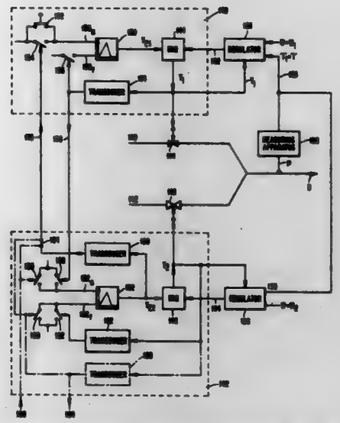
5,195,026
METHOD AND APPARATUS FOR COMPUTER CONTROLLED NONLINEAR OPTIMIZATION
Hisanori Nosaka, Hitachi, and Yasuhiro Kobayashi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 7, 1990, Ser. No. 579,476
Claims priority, application Japan, Sep. 12, 1989, 1-236514
Int. Cl.[5] G05B *13/02*
U.S. Cl. 364—148 17 Claims



1. A method of computer controlled nonlinear optimization comprising the steps of:
a) storing a plurality of nonlinear optimization methods in a first memory area of a computer;
b) storing in a second memory area of said computer, separately from said methods, a plurality of techniques for controlling said methods, said techniques being applicable to all said methods;
c) inputting to said computer a problem for which an optimum solution is sought;
d) extracting a selected method from said first memory area;
e) extracting one or more of said plurality of techniques from said second memory area;
f) applying, by means of said computer said selected methods to sad problem to obtain a possible solution, the application of said selected method in said computer being controlled by said extracted one or more of said plurality of techniques; and
g) repeating steps (d) to (f) in said computer for successive ones of said methods until an optimum one of said possible solutions is obtained.

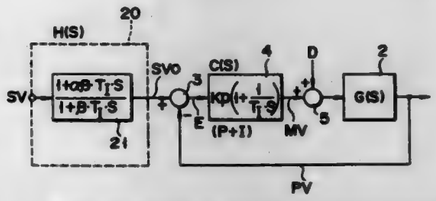
5,195,027
CONTROL CIRCUIT LAYOUT FOR A TECHNOLOGICAL PROCESS WITH A LARGE CONTROL RANGE
Kurt Brockner, Waiblingen, Fed. Rep. of Germany, assignor to Eckardt AG, Stuttgart, Fed. Rep. of Germany
Filed May 17, 1991, Ser. No. 701,762
Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4016017
Int. Cl.[5] G05B *13/02*
U.S. Cl. 364—160 12 Claims

1. Control circuit layout divided into adjacent parallel partial strands, comprising:
a first control element located in a first partial strand for controlling, in accordance with a control signal, a technological process over a partial control range of a first interval of the entire control range;
a first regulator for supplying the control signal to the first control element;
at least one adjacent control element located in an adjacent partial strand for controlling, in accordance with a control signal, a technological process over a partial control range of a second interval coordinated with the entire control range, said second interval containing at least one interval boundary value of an adjacent control element;
at least one adjacent regulator for supplying the control signal to said at least one second control element;
a first and at least one adjacent supplemental controls for automatically switching between the control circuits of adjacent strands in a manner such that
if a control variable value D is in a range of $D_{i-1} \leq D \leq D_i$ (where i=1, 2 . . . n and n=the total number of strands), the i-th control element is maintained in operation, while the adjacent control elements remains in an off posture, and



if an interval boundary value located within the i-th control range is crossed by the control variable value during a transfer period, the i-th control element heretofore maintained in controlling operation is transferred steadily from its control function posture to its off posture and simultaneously an adjacent control element entering the control function is transferred steadily from its off posture to a control function posture determined by the set value, wherein a ratio of adjusting velocities of the control elements during the transition period equals the inverse ratio of interval lengths of the control range intervals assigned to the control elements.

5,195,028
TWO DEGREE OF FREEDOM CONTROLLER
Kazuo Hirai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 12, 1991, Ser. No. 684,181
Claims priority, application Japan, Apr. 18, 1990, 2-102632
Int. Cl.[5] G05B *13/00*
U.S. Cl. 364—161 14 Claims

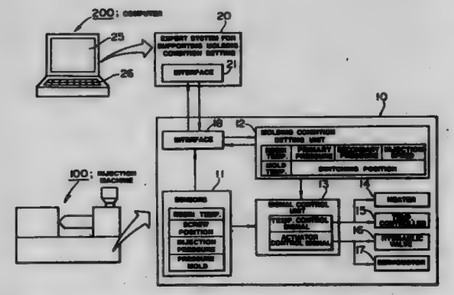


1. A PI type two degrees of freedom controller comprising:
setpoint filter means for receiving a setpoint value, and outputting a control setpoint value, said setpoint filter means having a transfer function which follows the setpoint value, and is expressed by the following formula:

$$\frac{1+\alpha\beta T_I \cdot S}{1+\beta T_I \cdot S} \quad (a)$$

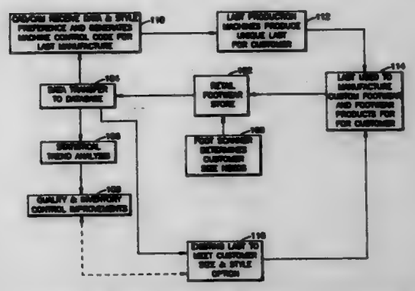
where T_I : an integral time, S : a Laplace operator, α : a constant which can be set between 0 and 1, and β : a constant which can be set between 0 and about 10;
deviation-calculating means for calculating a deviation between the control setpoint value and a control value fed back from a controlled system;
control operation means for receiving the deviation, executing at least a PI (P : proportional, I : integral) control operation, and outputting a manipulative variable; and
means for applying the manipulative variable to the controlled system.

5,195,029
CONTROL UNIT HAVING AN INFERENCE FUNCTION
Shuji Murai; Hiroyoshi Yamaguchi, and Naoto Otsuka, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan
PCT No. PCT/JP88/00726, § 371 Date Jan. 16, 1990, § 102(e) Date Jan. 16, 1990, PCT Pub. No. WO89/00726, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 20, 1988, Ser. No. 459,820
Claims priority, application Japan, Jul. 20, 1987, 62-180764
Int. Cl.[5] G06F *15/46, 15/18*
U.S. Cl. 364—184 17 Claims



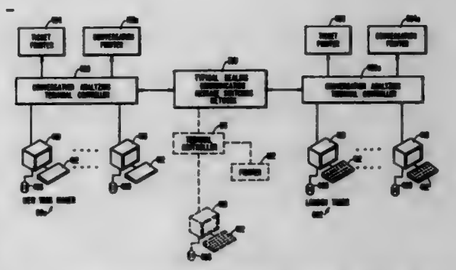
1. A control and problem solving apparatus having an inference function comprising:
a plurality of sensor means for detecting the status of respective units of a machine;
input means for inputting situations of problems when the problems occur in said machine or a product produced by said machine;
inference means including storage means storing information relating to situations of various kinds of operations of said machine and a plurality of countermeasures for said problems, said inference means prioritizing said problems and causes for said problems, and prioritizing the countermeasures for said causes according to the situations of the problems input by said input means;
said sensor means detecting the status of respective units of said machine detected by said sensor means, the status information being stored in said storage means, said inference means inferring a countermeasure which is most suitable;
displaying means for displaying said prioritized countermeasures; and
control means for outputting various kinds of control signals to said machine in accordance with the countermeasures inferred by said inference means.

5,195,030
SYSTEM AND METHOD OF FOOT SHAPE IMAGING AND OVERLAY
Jay P. White, Bend, Oreg., assignor to Foot Image Technology, Inc., Bend, Oreg.
Filed May 11, 1990, Ser. No. 520,591
Int. Cl.[5] G06F *15/24*
U.S. Cl. 364—401 6 Claims



1. A system for video display of images in overlaying relation, comprising:
a) video display means for displaying a measured foot image and an image of a selected footwear; and
b) input means for providing relative movement between the image of the selected footwear and the measured foot image to electronically determine actual fit of the selected footwear with the measured foot.

5,195,031
TRADING SYSTEM FOR PROVIDING REAL TIME CONTEXT SENSITIVE TRADING MESSAGES BASED ON CONVERSATION ANALYSIS
Christopher J. Ordish, Surrey, England, assignor to Reuters Limited, England
Filed Oct. 24, 1988, Ser. No. 261,984
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—403 39 Claims



1. In a video communication trading system network capable of providing textual data messages to a plurality of subscriber terminals throughout said network for selectively conducting trading conversations therebetween, at least a portion of said plurality of subscriber terminals comprising subscriber keystations, each of said subscriber keystations comprising a video display means for providing a textual video display of trading data input to said network, said trading system network including a message switching interface network for routing video conversational textual data trading messages throughout said trading system network; the improvement comprising at least one conversation analyzing keystation terminal controller interface means operatively connected between at least one of said subscriber keystations and said message switching inter-

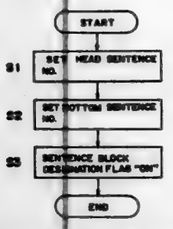
face network for routing trading data input by said one subscriber keystation to at least another designated subscriber keystation through said message switching interface network and for receiving trading data input to said message switching interface network by said designated other subscriber keystation for controlling communication of said trading conversation between said one subscriber keystation and said designated other subscriber keystation, said conversation keystation terminal controller means comprising means for analyzing said trading conversation substantially in real time for automatically providing trading conversation context sensitive trading data messages in conjunction with said trading conversation based on said read time trading conversation analysis, said trading conversation analyzing means further comprising means for parsing said trading conversation for automatically providing said trading conversation context sensitive trading data messages.

5,195,032

DEVICE FOR DESIGNATING A PROCESSING AREA FOR USE IN A TRANSLATION MACHINE

Takashi Matsui, Tondabayashi; Yoji Fukumochi, Nara; Shuzo Kugimiya, Nara; Ichiko Nakamura, Nara; Tokuyuki Hirai, Yamatokooriyama, and Hitoshi Suzuki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 288,439, Dec. 22, 1988, abandoned.
This application Jan. 22, 1991, Ser. No. 643,699
Claims priority, application Japan, Dec. 24, 1987, 62-333573
Int. Cl.[5] G06F *15/28*; G06G *7/60*
U.S. Cl. 364—419 16 Claims



12. A designated block processing apparatus for use in a translation machine, comprising:

means for designating at least one block defined by a plurality of numbered sentences by designating a head sentence of the block by a number and an end sentence of the block by a number;

judging means for judging whether or not a block to be translated has been designated; an

means for consecutively processing for translations all of the sentences included in the block designated by the means for designating when the judging means judges that the block is designated.

5,195,033

TESTING SYSTEM INCLUDING REMOVABLE STORAGE MEANS FOR TRANSFER OF TEST RELATED DATA AND MEANS FOR ISSUING A CERTIFICATION UPON SUCCESSFUL COMPLETION OF THE TEST

Thomas Samph, Philadelphia, Pa.; Metro Sauper; Edwin J. Price, both of Sewell, N.J., and Kevin Light, Myerstown, Pa., assignors to Assessment Systems, Inc., Philadelphia, Pa.

Filed Jun. 8, 1990, Ser. No. 535,326
Int. Cl.[5] G09B *7/00*
U.S. Cl. 364—419 18 Claims

1. A computer-controlled testing system for administering a test to a plurality of users at a testing center, said system comprising a plurality of portable computer-controlled user testing devices for processing and displaying information, each testing device including:

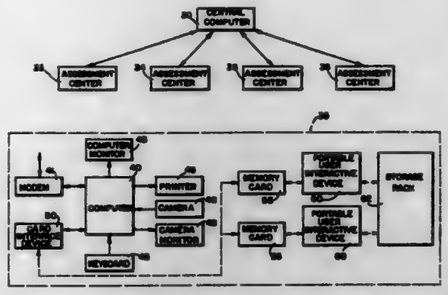
A. an information storage medium for storing information including test questions and answers to the test questions by a respective user, the test including a plurality of questions in a selected order and at least two answer-options associated with each of the questions stored in a test file on the information storage medium;

B. a display for displaying output information to the user, said output information including the test questions from the information storage medium, and for displaying user entry pads at predetermined locations on the display to enable the user to input predetermined items of information, the user entry pads including:

(i) information entry pads for use in permitting the user to input predetermined items of response information to the information storage medium, said predetermined items of response information including user-selectable answers to a displayed test question, each information entry pad corresponding to respective predetermined items of response information, said information entry pads including answer entry pads; and

(ii) function entry pads for use in permitting the user to input predetermined items of control information to the testing device for selectively controlling the output information displayed to the user, each function entry pad corresponding to respective predetermined items of control information;

C. a touch screen on the display to enable the user to select



an item of predetermined control information for input to the testing device and to select an item of predetermined response information for input to the information storage medium by touching the screen at any selected corresponding user entry pad while such user entry pad is displayed on the display;

D. a microprocessor for controlling the transfer of information relative to the information storage medium, the display and the touch screen;

E. an internal power source for supplying power for the testing device;

F. means for effecting the display of a test item on the display, said test item including a test question, the associated answer-options, and the answer entry pads corresponding to the answer-options;

G. means for generating a random sequence for displaying test items different from the selected order in which said test items are stored in the test file in the information storage medium;

H. means for retrieving each test item from said information storage medium for display in the generated random sequence;

I. means for determining whether one of the answer entry pads was touched on the touch screen; and

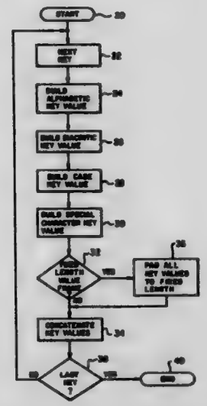
J. means for storing a response code corresponding the answer entry pad which has been touched in a response file stored in said information storage medium.

5,195,034

METHOD FOR QUASI-KEY SEARCH WITHIN A NATIONAL LANGUAGE SUPPORT (NLS) DATA PROCESSING SYSTEM

Denis Garneau, Toronto, Canada, and Wen-Hsin Sears, Fort Worth, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 458,046, Dec. 27, 1989, Pat. No. 5,077,669. This application Oct. 21, 1991, Ser. No. 779,693
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 3 Claims



1. A data processing system for performing a search within a national language support data processing system having a plurality of sortable keys, said data processing system comprising:

means for assigning a selected alphabetic key value for each of said plurality of sortable keys;

means for assigning a selected diacritic key value for each of said plurality of sortable keys;

means for assigning a selected case key value for each of said plurality of sortable keys; and

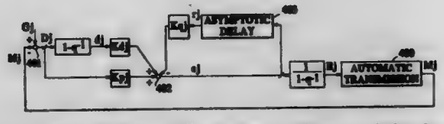
means for selectively searching said plurality of sortable keys to locate each key having a particular alphabetic key value and a particular value for a selected one of either said diacritic key values or said case key values.

5,195,035

METHOD OF CONTROLLING AUTOMATIC TRANSMISSION WITH COMPENSATION FOR DELAY IN RESPONSE OF HYDRAULIC ACTUATION SYSTEM

Norimi Asahara, Toyota; Yasuo Hojo, and Hideo Tomomatsu, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 4, 1990, Ser. No. 621,974
Claims priority, application Japan, Dec. 6, 1989, 1-317005
Int. Cl.[5] B60K *41/04*
U.S. Cl. 364—424.1 11 Claims



1. A method of controlling an automatic transmission in a vehicle using a combination of an electronic computer system and a hydraulic actuation system with feedback control, the method comprising the cyclic repetition of each of the steps of:

determining a current control state of the automatic transmission by said electronic computer system;

computing a target control state for the automatic transmission by said electronic computer system;

calculating a difference between said target control state and said current control state by said electronic computer system;

modifying said difference by said electronic computer system by a factor that is asymptotically decreased as an amount of elapsed control time increases to compensate for a delay in the operation of the hydraulic actuation system relative to operation of the electronic computer system to generate a control signal;

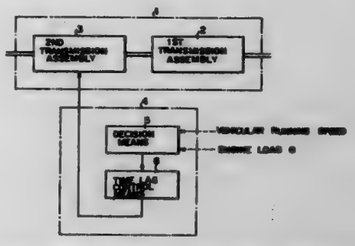
operating said hydraulic actuation system based upon said control signal, wherein all the steps are executed cyclically at a predetermined interval until control is complete.

5,195,036

SHIFT CONTROL SYSTEM AND METHOD FOR AUTOMATIC TRANSMISSION, INCLUDING ENGAGEMENT TIME LAG CONTROL

Hiromichi Kimura; Kunihiro Iwatsuki; Hideaki Otsubo, all of Toyota; Yukihiro Kobayashi, Obu; Kazunori Ishikawa, Toyota, and Takuji Taniguchi, Okazaki, all of Japan, assignors to Aisin AW Co., Ltd., Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Sep. 5, 1990, Ser. No. 577,742
Claims priority, application Japan, Sep. 6, 1989, 1-231084
Int. Cl.[5] B60K *41/06*
U.S. Cl. 364—424.1 13 Claims



1. A shift control system for an automatic transmission comprising:

a first transmission assembly comprising means for changing gear ratios therein in accordance with a release or engagement of a first frictional engagement means;

a second transmission assembly connected in series to said first transmission assembly and comprising means for changing gear ratios therein in accordance with an engagement or release of a second frictional engagement means such that intervals of said gear ratios of said second transmission assembly are narrower than those of the gear ratios of said first transmission assembly, so that a change in the gear ratios of said first transmission assembly by the release of said first frictional engagement means and a change in the gear ratios of said second transmission assembly in an opposite direction to that of said first transmission assembly by the engagement of said second frictional engagement means are simultaneously accomplished to execute a predetermined shift in which the gear ratio of the transmission as a whole is changed in a direction identical to said change in the gear ratios of said first transmission assembly;

decision means for deciding whether or not said automatic transmission should execute said predetermined shift and for commanding said second transmission assembly to begin changing gear ratios therein, wherein there exists a time lag between the command for said second frictional

engagement means to begin changing gear ratios and the engagement of said second frictional engagement means; and

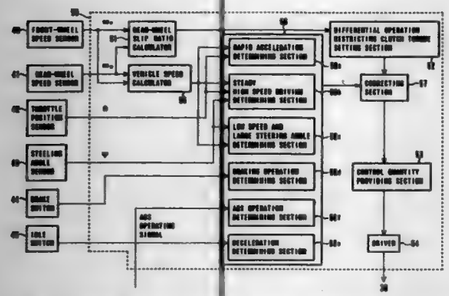
time lag control means for making a time lag for said second frictional engagement means to be engaged shorter for said predetermined shift than a time lag for said second frictional engagement means to be engaged for another gear change when said automatic transmission is to execute said gear changes.

5,195,037

TORQUE DISTRIBUTION CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR

Kazunari Tezuka, Niiza, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,489
Claims priority, application Japan, Aug. 28, 1989, 1-222366
Int. Cl.[5] B60K *17/346*
U.S. Cl. 364—426.02 **4 Claims**



1. In a system for controlling torque distribution to front wheels and rear wheels of a motor vehicle having a transmission, a central differential for distributing output torque of said transmission to the front wheels and the rear wheels, the system comprising wheel speed sensing means for sensing front and rear wheel speeds for producing front and rear wheel speed signals respectively, an idle switch for producing an idle signal when an engine of the vehicle is idling, a brake switch for detecting a braking operation of said vehicle and producing a braking signal, and a fluid-operated restricting device for restricting differential operation of said central differential so as to change torque distribution ratio of the front wheels to the rear wheels, the improvement in the system wherein:

said central differential is arranged to distribute a larger torque to the rear wheels than to the front wheels;

the system further comprising:

first calculator means responsive to said front and rear wheel speed signals for calculating a slip ratio of the rear wheels;

torque setting means for setting a restricting torque of said fluid-operated restricting device to a value which increases with an increase of said slip ratio, said fluid-operated restricting device restricting said differential operation of said central differential in dependency on said restricting torque;

braking operation determining means responsive to said braking signal for producing a first positive condition signal to reset said restricting torque to a first predetermined value when a braking operation is detected, and for producing a first negative condition signal and maintaining said restricting torque if said first positive condition signal is absent respectively;

deceleration determining means responsive to said idle signal for determining deceleration of said vehicle and for, only when said first negative condition signal is produced, producing a second positive condition signal to reset said restricting torque to a second predetermined value if a deceleration is determined, and maintaining said restricting torque if said second positive condition signal is absent;

torque resetting means responsive to a respective one of said first and second positive condition signals for resetting said restricting torque to said predetermined values of reset restricting torque for various vehicle conditions; and

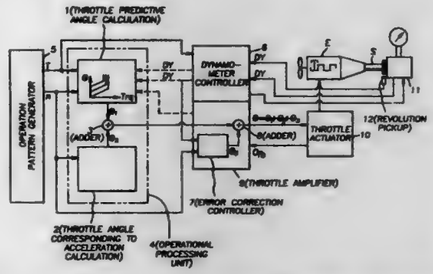
control means responsive to said reset restricting torque for operating said fluid-operated restricting device so as to enhance stability and steerability of the vehicle.

5,195,038

THROTTLE PREDICTIVE CONTROLLER IN AUTOMATIC ENGINE TESTER

Hiroyuki Yagi, Yokohama; Youshi Ishii, Tokyo, and Takashi Hashizume, Yokohama, all of Japan, assignors to Ono Sokki Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1990, Ser. No. 533,404
Claims priority, application Japan, Jun. 7, 1989, 1-143009
Int. Cl.[5] G01L *3/22*, *3/14*
U.S. Cl. 364—431.05 **8 Claims**



1. A throttle predictive controller in an engine tester, comprising:

an operation pattern generator;

an operational processing unit equipped with a throttle predictive angle calculation part;

a dynamometer controller;

a throttle amplifier;

a throttle actuator;

a dynamometer; and

a revolution pickup for detecting the speed of revolution of an output shaft on an engine being tested and emitting a signal in response to said speed;

said operation pattern generator being connected to input a set revolution speed signal to said throttle predictive angle calculation part and to said throttle amplifier, and to input a set torque signal to said throttle predictive angle calculation part and to said dynamometer controller;

said dynamometer controller being connected to said dynamometer for controlling a dynamometer torque for said dynamometer coupled to said output shaft of said engine, and said dynamometer controller being connected to said revolution pickup to receive a dynamometer actual revolution speed signal from said pickup at the time of operation of said engine;

said dynamometer controller being further connected to input an actual dynamometer torque signal and a dynamometer actual revolution speed signal at the time of operation of said engine to said throttle predictive angle calculation part;

said throttle amplifier being connected to input an actual throttle angle signal to said throttle predictive angle calculation part;

said throttle predictive angle calculation part preparing and storing a map based on said actual revolution speed, said actual torque and said actual throttle angle, and being further connected to input a throttle angle signal calculated from said map to said throttle amplifier;

said throttle amplifier being connected to input an amplification signal to said throttle actuator for actuating a throttle of said engine to an angle based on said inputted throttle angle signal from said throttle predictive angle calculation part; and

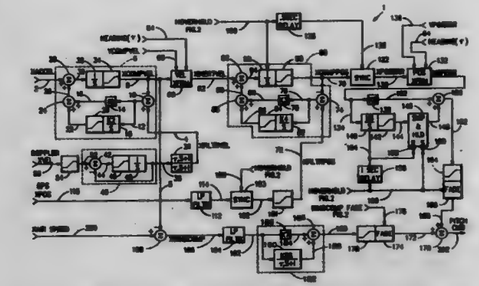
said throttle actuator being connected to said throttle of said engine.

5,195,039

HOVER POSITION HOLD SYSTEM FOR ROTARY WINGED AIRCRAFT

Phillip J. Gold, Shelton, Conn., and Joseph A. Post, Burke, Va., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 3, 1990, Ser. No. 518,593
Int. Cl.[5] B64C *13/16*
U.S. Cl. 364—434 **8 Claims**



1. A helicopter position hold control system for providing pitch and roll command signals during a hover comprising:

acceleration sensing means for providing ground-plane-referenced acceleration signals indicative of the longitudinal and lateral accelerations of the helicopter;

velocity sensing means for providing ground-plane-referenced velocity signals indicative of the longitudinal and lateral velocities of the helicopter;

position sensing means for providing ground-plane-referenced longitudinal and lateral position error signals indicative of the difference between the position of the aircraft and a predetermined position;

longitudinal and lateral air speed sensing means for providing longitudinal and lateral air speed signals indicative of the longitudinal and lateral air speed of the helicopter;

heading sensing means for providing a heading signal the magnitude (Ψ) of which is indicative of the heading of the helicopter with reference to a point;

velocity complementary filter means responsive to said acceleration signals and said velocity signals for providing ground-plane-referenced complementary longitudinal and lateral velocity signals the magnitudes (XCOMPVEL, YCOMPVEL) of which are indicative of the high frequency portion of the integral of said ground-plane-referenced acceleration signals and the low frequency portion of said ground-plane-referenced velocity signals respectively;

velocity transformation means responsive to said complementary velocity signals and said heading signal for transforming said complementary velocity signals into inertial-coordinate-referenced complementary velocity signals (XINERTVEL, YINERTVEL) according to the equations:

$$XINERTVEL = XCOMPVEL*COS(\Psi) - YCOMPVEL*SIN(\Psi)$$

$$YINERTVEL = XCOMPVEL*SIN(\Psi) + YCOMPVEL*COS(\Psi);$$

position complementary filter means responsive to said inertial-coordinate-referenced, complementary velocity signals and said position error signals for providing inertial-coordinate-referenced, complementary longitudinal and lateral position signals indicative of the high frequency portion of the integral of said inertial-coordinate-referenced complementary velocity signals and the low frequency portion of said position error signals;

synchronization means responsive to said complementary longitudinal and lateral position signals for providing complementary longitudinal and lateral position error signals the magnitudes (XPOSERR, YPOSERR) of which are indicative of the difference between the actual longitudinal and lateral complementary position and a predetermined longitudinal and lateral complementary position;

position transformation means responsive to said complementary position error signals and said heading signal for transforming said complementary position error signals to ground-plane-referenced complementary longitudinal and lateral position error signals (XGPERR, YGPERR) according to the equations:

$$XGPERR = XPOSERR*COS(\Psi) + YPOSERR*SIN(\Psi)$$

$$XGPERR = XPOSERR*SIN(\Psi) + YPOSERR*COS(\Psi);$$

and

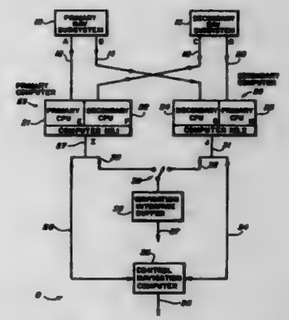
pitch and roll command signal means responsive to said ground-plane-referenced complementary position error signals for providing the pitch and roll command signals to control said helicopter position hold during said hover.

5,195,040

BACKUP NAVIGATION SYSTEM

Martin L. Goldsmith, Placentia, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1990, Ser. No. 503,553
Int. Cl.[5] G01C *21/00*; G05B *9/02*; G06F *11/00*
U.S. Cl. 364—443 **6 Claims**



2. A backup navigation system for use on a vehicle comprising:

(a) a first plurality of navigation subsystems on the vehicle, each navigation subsystem having a second plurality of outputs, the second plurality being equal to the first plurality; and

(b) a third plurality of computers, said third plurality being equal to said second plurality, each computer having a fourth plurality of computer processors, the fourth plural-

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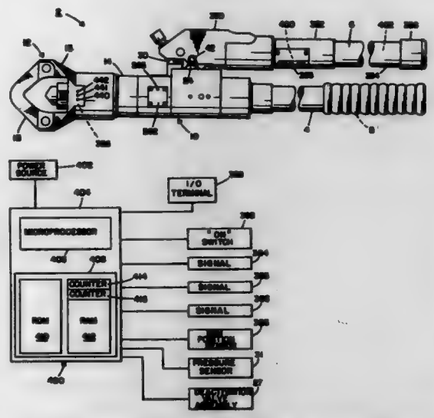
ity being equal to said first plurality, each computer processor having an input, each said computer having an output, each navigation subsystem being connected to only one computer processor of each computer, each computer selecting data from one of its processors in preference to data from any other of its processors to provide processed navigation information of the vehicle through its output.

5,195,041
METHOD AND APPARATUS FOR IMPROVING MANUFACTURING PROCESSES
Michael L. George, Dallas, and Mark A. Sherman, Richardson, both of Tex., assignors to Institute of Business Technology, Dallas, Tex.
Filed Jul. 24, 1989, Ser. No. 384,292
Int. Cl.[5] G06F *15/46, 15/24*
U.S. Cl. 364—468 24 Claims

1. A method of scheduling and operating production of a factory having a plurality of work stations, each work station performing one or more processes, in order to meet a predetermined shipping schedule, comprising the steps of:
(a) determining the rate of material flow out (FLOWOUT$_{ij}$) of each process within each workstation of a factory necessary for the factory to meet a predetermined shipping schedule;
(b) determining the size of the batch of material for each process of each workstation necessary to meet each material flow rate determined in step (a) for the workstation; and
(c) operating each process at each workstation with the batch sizes determined in step (b).

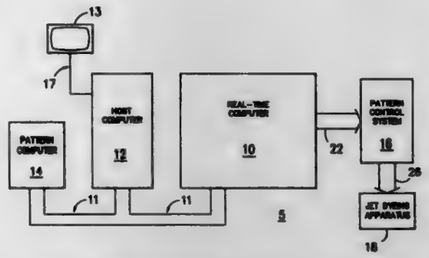
5,195,042
APPARATUS AND METHOD FOR CONTROLLING CRIMPING OF ARTICLES
Neil P. Ferraro, Merrimack; Urs F. Nager, Jr., Hudson, both of N.H.; Raymond C. Logue, Somers, N.Y.; Edward J. Chen; Patrick S. Lee, both of Poughkeepsie, N.Y., and Howard D. Delano, Kingston, N.Y., assignors to Burndy Corporation, Norwalk, Conn.
Filed Jun. 27, 1990, Ser. No. 545,484
Int. Cl.[5] G06F *15/46*; H01R *43/04*
U.S. Cl. 364—468 30 Claims

8. An apparatus for crimping an article, the apparatus having a frame, a movable indentor, means for moving said indentor including a hydraulic system, and an indentor movement control, said control comprising:
means for sensing the location of said indentor;
means for automatically determining a minimum distance of indentor movement for producing a good crimp, said determination being dependent, at least partially, upon the size of an article to be crimped;
means for sensing hydraulic pressure in said hydraulic system; and
means for preventing further advancement of said indentor upon the occurrence of a predetermined hydraulic system



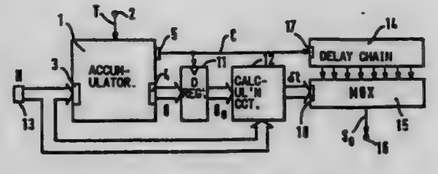
pressure before the occurrence of said indentor reaching said minimum distance of indentor movement.

5,195,043
AUTOMATIC GENERATION OF LOOK-UP TABLES FOR REQUESTED PATTERNS AND COLORS
George C. Varner, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Mar. 2, 1990, Ser. No. 488,564
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—410 29 Claims



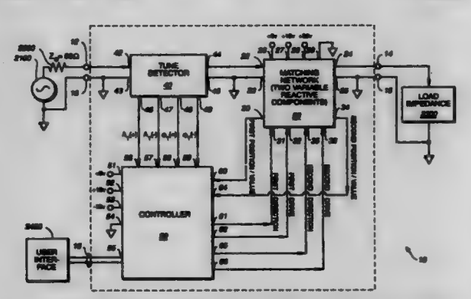
1. A method for automatically loading at least one look-up table in a textile dyeing system with firing time data, the method comprising the steps of:
a) entering a list of entries including entry, machine color loading entries and a stock entry into the system;
b) generating a firing time table of firing times, for each of a plurality of color bars with respect to a given base, from the base entry;
c) generating a machine color table of color data for each of the plurality of color bars from the machine color loading entries;
d) generating a pattern color table of pixel codes and their associated colors with respect to a given pattern from the stock entry;
e) correlating said firing times, color data and pixel codes to obtain a modified firing time for each pixel code for each color bar; and
f) loading said look-up table with the modified firing time data for each pixel code for each color bar.

5,195,044
DIGITAL OSCILLATOR FOR GENERATING A SIGNAL OF CONTROLLABLE FREQUENCY
Gerhard Wischermann, Welterstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany
Filed Jan. 11, 1991, Ser. No. 639,965
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001555
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—480 10 Claims



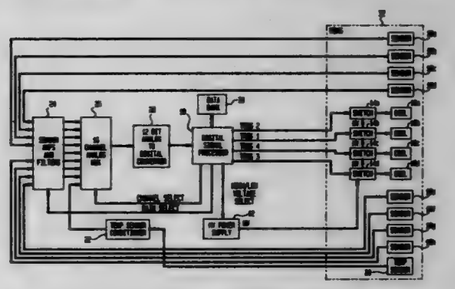
1. A digital oscillator for generating a signal of controllable frequency comprising a source of reference frequency pulses, an accumulator having a timing input connected to said pulse source and connected for being incremented at each pulse from said pulse source by a predetermined number of count unit values and having a count value output and also a carry output for providing carry signals on a predetermined content magnitude being reached by the content of said accumulator, and further comprising circuit means connected for response to said count value and carry outputs of said accumulator for cyclically delaying a sequence of said carry signals respectively by a sequence of time intervals at least approximately equal to a value calculable from the magnitude of the content of the accumulator during the presence of the carry signal and from the maximum count content magnitude thereof.

5,195,045
AUTOMATIC IMPEDANCE MATCHING APPARATUS AND METHOD
Anthony R. A. Keane, Webster, N.Y., and Steven E. Hauer, Berlin, N.J., assignors to ASTEC America, Inc., Oceanside, Calif.
Filed Feb. 27, 1991, Ser. No. 661,813
Int. Cl.[5] H03H *7/40*
U.S. Cl. 364—482 43 Claims



1. An automatic impedance matching apparatus having an input port coupled to a signal generator and an output port coupled to a load, said input and output ports each having a signal line and a ground line, said signal generator having a predetermined characteristic impedance, said apparatus comprising:
matching means coupled between said input port and output port for matching the impedance of said load to the impedance of said signal generator, said matching means including a first variable reactive component and a second variable reactive component;
a detection means for generating an amplitude tune signal related to the difference of the voltage waveform amplitude at said input port and the product of said predetermined characteristic impedance and the current waveform amplitude at said input port and for generating a phase tune signal related to the phase difference between the voltage and current waveforms at said input port, said amplitude tune signal increasing as said voltage amplitude increases and decreasing as said current amplitude increases, said phase tune signal being substantially equal to zero when said input voltage and input current waveforms are in phase, said phase tune signal increasing as said input voltage waveform leads said input current waveform and decreasing as said input voltage waveform lags said input current waveform; and
control means responsive to said amplitude and phase tune signals for adjusting the values of said first and second variable reactive components to provide a tuned condition at said input port, said control means including a first adjustment for modifying the value of said first variable reactive component as a function of said amplitude tune signal, a second adjustment means for modifying the value of said second variable reactive component as a function of said phase tune signal, reset means for setting the value of said first variable reactive component to a first predetermined reset value and for setting the value of said second variable reactive component to a second predetermined reset value when either said first variable reactive component reaches a first predetermined end value or said second variable reactive component reaches a second predetermined end value, and convergence means for directing the adjustments of said first and second variable components, said convergence means comprising means for generating a first tolerance standard signal when the magnitude of said amplitude tune signal is less than a predetermined first amplitude tolerance value and the magnitude of said phase tune signal is less than a predetermined first phase tolerance value and means responsive to said first tolerance standard signal for disabling said first and second adjustment means.

5,195,046
METHOD AND APPARATUS FOR STRUCTURAL INTEGRITY MONITORING
Joseph J. Gerardi, and Gail A. Hickman, both of 81 Crystal Dr., Dryden, N.Y. 13053
Continuation-in-part of Ser. No. 295,722, Jan. 10, 1989, Continuation-in-part of Ser. No. 518,043, May 4, 1990. This application Jul. 30, 1990, Ser. No. 559,482
Int. Cl.[5] G06F *15/20*; G01H *1/00*
U.S. Cl. 364—506 36 Claims



1. An apparatus for monitoring and identifying disturbances to a structure comprising:
a) first processing means for processing signals so as to monitor and identify disturbances to said structure;
b) switch means controlled by said first processing means for gating a voltage signal;

c) actuation means for applying a physical impulse to said structure upon receiving said voltage signal gated by said switch means, wherein the application of said physical impulse to said structure by said actuation means results in said structure experiencing an initial force of magnitude "F" in a first direction followed by a plurality of reactive forces in a direction opposite said first direction and having a total magnitude of "F" wherein said plurality of forces are applied to said structure at positions away from where said force of magnitude "F" was applied;

d) sensor means for detecting the effects of said physical impulse on said structure and outputting an analog signal, said effects of said physical impulse indicative of said disturbances on said structure;

e) second processing means for converting said analog signal into a digital signal; and

f) means for providing said digital signal to said first processing means so as to monitor and identify disturbances to said structure.

5,195,047

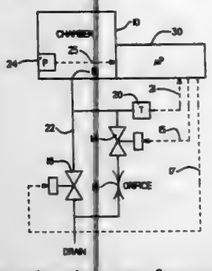
Patent Not Issued For This Number

5,195,048

SYSTEM AND METHOD FOR EXHAUSTING VAPOR FROM A HEATED PRESSURE CHAMBER

Mark E. Chiffon, Erie; Thomas G. Cook, Fairview, and Conrad J. Geibel, Erie, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Feb. 26, 1991, Ser. No. 662,138
Int. Cl.[5] A61L *2/06*
U.S. Cl. 364—551.01 **10 Claims**



6. A system for exhausting vapor from a pressure chamber for processing loads following a vapor exposure period under superatmospheric pressure conditions, comprising:

(a) first means for measuring chamber pressure at the conclusion of the exposure period to determine an initial chamber pressure;

(b) second means for exhausting vapor from the chamber for a predetermined first period of time to lower the chamber pressure;

(c) third means for measuring chamber pressure at the conclusion of said first period of time to determine a second chamber pressure;

(d) fourth means for calculating a difference between said initial chamber pressure and said second chamber pressure to determine an optimal pressure differential;

(e) fifth means for calculating a difference between said second chamber pressure and said optimal pressure differential to predetermine a target chamber pressure to be reached at the conclusion of one interval of a predetermined second period of time;

(f) sixth means for exhausting vapor from the chamber for said one interval of said second period of time to lower the chamber pressure to said target chamber pressure;

(g) seventh means for measuring chamber pressure during said one interval of said second period of time to determine whether said target chamber pressure has been reached;

(h) eighth means for discontinuing the exhaustion of vapor from the chamber when said target chamber pressure has been reached;

(i) ninth means for calculating a difference between the chamber pressure measured during said one interval of said second period of time and said optimal pressure differential, if said target chamber pressure has not been reached by the conclusion of said one interval of said second period of time, to predetermine a further target chamber pressure to be reached at the conclusion of an additional interval of said second period of time; and

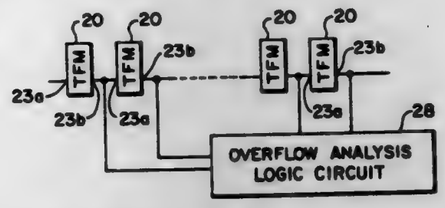
(j) tenth means for calculating a difference between said target chamber pressure and said optimal pressure differential, if said target chamber pressure has been reached by the conclusion of said one interval of said second period of time, to predetermine a further target chamber pressure to be reached at the conclusion of an additional interval of said second period of time.

5,195,049

DIGITAL FILTER SYSTEM WITH ANOMALY DETECTION AND INDICATION

Tetsuro Kontani, Yokohama, and Yutaka Miki, Hirakata, both of Japan, assignors to LSI Logic Corp., Milpitas, Calif.

Filed Feb. 22, 1990, Ser. No. 483,584
Claims priority, application Japan, Feb. 23, 1989, 1-41894
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—724.03 **3 Claims**



1. A digital filter system comprising:

a series of transversal filter modules, each transversal filter module comprising:

a plurality of multipliers;

a plurality of adders, each adder having an overflow output;

a plurality of delay elements;

a plurality of filter coefficient inputs;

a signal input;

a signal output;

an overflow signal input; and

means for indicating anomalies, having a plurality of inputs and an output;

wherein:

the multipliers, adders, delay elements, filter coefficient inputs, signal input, and signal outputs are interconnected as a transversal digital filter circuit; and

the means for indicating anomalies receives at its inputs the overflow outputs of the adders and provides at its output a signal indicating whether any of the adder overflow outputs is active; and

wherein, for the system:

the outputs of the means for indicating anomalies of each module are connected to the signal input of the next module in the series; and

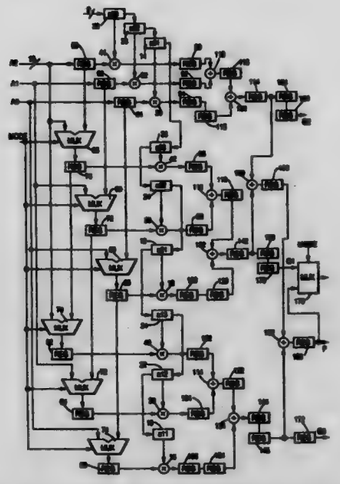
the output of the means for indicating anomalies for the last module in the series indicates the overflow status of the entire filter system.

5,195,050

SINGLE CHIP, MODE SWITCHABLE, MATRIX MULTIPLIER AND CONVOLVER SUITABLE FOR COLOR IMAGE PROCESSING

Ken W. Hsu, Pittsford; Lionel J. D'Luna, Rochester; Hur Jay Yeh, Rochester, and Glen W. Brown, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1990, Ser. No. 570,187
Int. Cl.[5] G06F *15/336*
U.S. Cl. 364—728.01 **3 Claims**



1. A circuit for selectable matrix multiplication and convolution operations and receiving parallel inputs at a data rate at data inputs and having a mode selection input, comprising:

input routing means for routing the parallel inputs at the data rate responsive to selection of one of a matrix multiplication mode and a convolution mode, and said input routing means comprising:

input buffer registers connected to the data inputs and to said operation means;

first multiplexers connected to the data and mode selection inputs and to said input buffer registers;

first storage buffer registers connected to said first multiplexers;

second multiplexers connected to the data and mode selection inputs and to said first storage buffer registers; and

second storage buffer register connected to said second multiplexers;

operation means for performing, at the data rate, one of a matrix multiplication and a convolution operation using the routed inputs responsive to the selection and producing parallel outputs at the data rate during matrix multiplication and a convolution output at the data rate during convolution, said operation means comprising:

coefficient register storing coefficient;

first multipliers connected to said input buffer registers and said coefficient registers;

second multipliers connected to said first storage buffer registers and said coefficient registers;

third multipliers connected to said second storage buffer register and said coefficient registers;

a first adder connected to said first multipliers;

a second adder connected to said second multiplies;

a third adder connected to said third multipliers; and

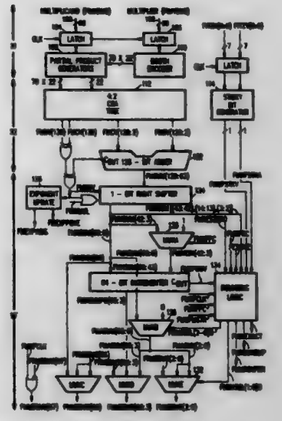
a fourth adder connected to said first, second and third adders.

5,195,051

COMPUTATION OF SIGN BIT AND SIGN EXTENSION IN THE PARTIAL PRODUCTS IN A FLOATING POINT MULTIPLIER UNIT

Krishnan J. Palaniswami, Austin, Tex., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1992, Ser. No. 861,078
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **1 Claim**



1. An arithmetic logic comprising:

a signed integer request signal having a first state indicating a floating point or unsigned integer operation and a second state indicating a signed integer operation;

first means for receiving a multiplicand operand including a most significant bit (MSB) of said multiplicand;

second means for receiving a multiplier operand;

a decoder connected to said second means for providing at an output of said decoder a decoded set having a plurality of bits, including a most significant bit (MSB) of said decoded set;

a partial product generator connected to said first means and to said decoder output for generating a plurality of partial products;

a carry save adder (CSA) connected to said partial product generator for generating a sum vector and a carry vector;

an exclusive OR gate having a first input, a second input and an output, said first input being connected to said MSB of said decoded set and said second input being connected to said MSB of said multiplicand; and,

third means including an output, said third means being connected to said first means, to said output of said decoder, to said output of said exclusive OR gate, and to said signed integer request signal for placing at said output of said third means said MSB of said decoded set in response to said signed integer request signal being in said first state and for placing at said output of said third means said output of said exclusive OR in response to said signed integer request signal being in said second state.

5,195,052

CIRCUIT AND METHOD FOR PERFORMING INTEGER POWER OPERATIONS

Faraydon O. Karim, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1991, Ser. No. 807,305
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—753 **11 Claims**

1. An arithmetic circuit for performing an integer power operation comprising:

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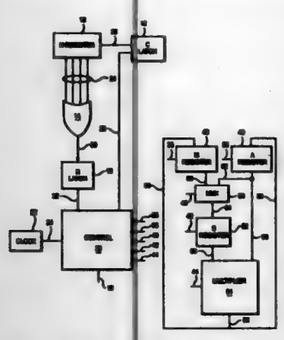
first register means for storing exponent data;
second register means for storing base data;
multiplier means for multiplying data in said second register means and a third register means; and
control means for iteratively shifting first register means data, and for each iteration, (1) selectively multiplying, according to data shifted from said first register means,



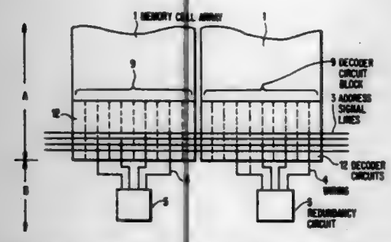
said second register means data by said third register means data storing results in the third register means, and (2) multiplying said second register means data by itself storing results in said second register means, until remaining data in said first register means indicates arithmetic operation completion and providing a completion signal thereupon.

5,195,053

SEMICONDUCTOR MEMORY DEVICE WIRED TO ACCOMMODATE INCREASED CAPACITY WITHOUT INCREASING THE SIZE OF THE SEMICONDUCTOR MEMORY DEVICE

Kiminori Hayano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 573,749, Aug. 28, 1990, abandoned. This application May 22, 1991, Ser. No. 704,916
Claims priority, application Japan, Aug. 30, 1989, 1-223719
Int. Cl.[5] G11C *5/06*
U.S. Cl. 365—51 **15 Claims**



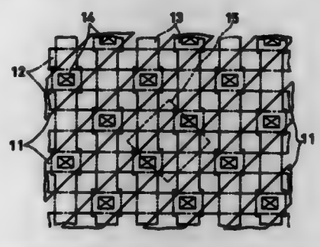
1. A semiconductor memory device including at least one memory cell array formed on a semiconductor substrate, said semiconductor memory device comprising:
a decoder circuit block being provided for each of said at least one memory cell array, wherein said decoder circuit block includes a plurality of decoder circuits;
a plurality of address signal lines extending over said plurality of decoder circuits in a direction traversing said plurality of decoder circuits;
said plurality of decoder circuits each being constituted by an identical arrangement of circuit elements where said plurality of decoder circuits are interconnected by a wiring layer arranged below a wiring layer of said plurality of address signal lines;
a peripheral circuit arranged independently of said decoder circuit block in said semiconductor memory device in said layer below said plurality of address signal lines;
a first boundary region having a predetermined width defined between two opposing sides of a first and a second decoder circuit;
a second boundary region having a predetermined width greater than said predetermined width of said first boundary region, said second boundary region being defined by an outer side of said first decoder circuit which is parallel to the side of said first decoder circuit opposing said second decoder circuit and an opposing side of a third decoder circuit; and
wiring for connecting said plurality of address signal lines of said decoder circuit block to said peripheral circuit, said wiring being arranged in said second boundary region in said layer below said plurality of address signal lines.

5,195,054

SEMICONDUCTOR MEMORY

Masanori Noda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,631
Claims priority, application Japan, Nov. 27, 1989, 1-306821
Int. Cl.[5] G11C *5/06*; H01L *27/10*
U.S. Cl. 365—63 **6 Claims**



1. A semiconductor memory wherein contact holes which connect active regions of a semiconductor substrate and power source lines on said semiconductor substrate are staggered from each other in two adjacent power source lines, and
two word lines extending on both sides of each contact hole of one of said two adjacent power source lines extend between two adjacent contact holes of the other power source line, which are staggered from the contact hole of the one power source line.

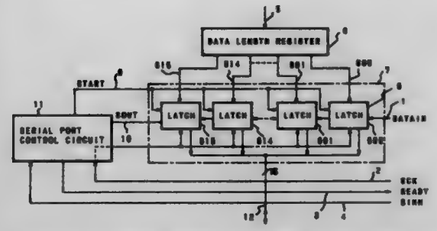
5,195,055

SERIAL DATA INPUT CIRCUIT FOR THE SHIFTING-IN OF VARIABLE LENGTH DATA

Hisako Mizuoka, and Yukihiko Shimazu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 492,278, Mar. 6, 1990, abandoned, which is a continuation of Ser. No. 159,865, Feb. 24, 1988, abandoned. This application Feb. 6, 1992, Ser. No. 833,562
Claims priority, application Japan, Nov. 30, 1987, 62-303682
Int. Cl.[5] G11C *7/00*; G06F *5/04*
U.S. Cl. 365—78 **10 Claims**

1. A serial data input circuit having a shift register including a set of serially connected unit latches where data of variable bit lengths are shifted into an input side first unit latch, said data of variable bit lengths including at least input serial data having a first data length and where the shifting of data is synchronizing to a shift clock signal comprising:
a data length register for receiving and storing a data length digital word having sequential bit positions corresponding to the positions of the unit latches in the shift register, where a position indicating bit at a predetermined bit position in said data length word is set to a first binary state and all other bit positions in said data length word are set to a second binary state;
means for transferring said data length word from said data length register to said shift register prior to shifting said input serial data into the shift register, with bits in corresponding bit positions of said data length digital word transferred to corresponding unit latches of said shift register;



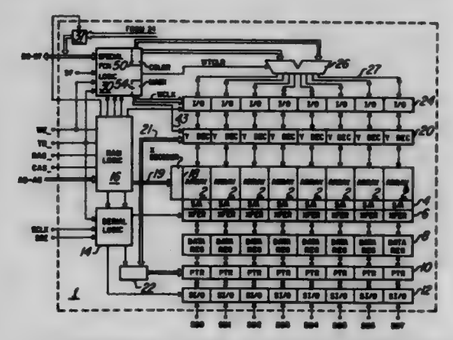
a circuit for serially shifting said data length digital word and said input serial data a number of bits equal to said first data length through said shift register toward an output side unit latch of said shift register, said input serial data and said data length digital word are shifted simultaneously and in synchronism with said shift clock signal; and
a circuit for detecting the completion of the input serial data inputted into said shift register by the outputting of said position indicating bit by said output side unit latch, said position indicating bit being outputted by said output side unit latch at a time when none of said input serial data has been serially outputted through said output side unit latch.

5,195,056

READ/WRITE MEMORY HAVING AN ON-CHIP INPUT DATA REGISTER, HAVING POINTER CIRCUITS BETWEEN A SERIAL DATA REGISTER AND INPUT/OUTPUT BUFFER CIRCUITS

Raymond Pinkham, Missouri City, and Anthony M. Ballistreri, Houston, both of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Continuation of Ser. No. 388,783, Aug. 2, 1989, abandoned, which is a continuation of Ser. No. 81,926, Aug. 5, 1987, Pat. No. 4,961,171, which is a continuation-in-part of Ser. No. 53,200, May 21, 1987, Pat. No. 4,817,058. This application Jul. 22, 1991, Ser. No. 734,028
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—189.05 **11 Claims**



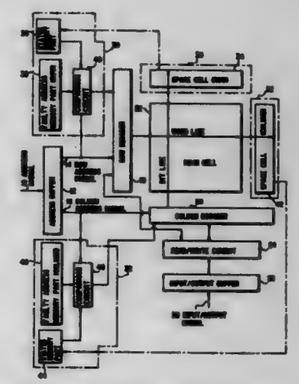
1. A memory device, of the type having a random access input for storing data in an array of memory cells arranged in rows and columns, comprising:
a first data path extending from a plurality of data input terminals to columns of memory cells;
a second data path extending from the plurality of data input terminals to the columns of memory cells;
a first data register, interposed in the first data path, for storing selected data received on the first data path and providing the data stored therein to memory cells in some or all of the columns; and
logic circuitry for effecting connection of either the first data path or the second data path to the memory cells based on an input control signal provided to the device during each write cycle of operation.

5,195,057

SEMICONDUCTOR MEMORY DEVICE HAVING A REDUNDANT MEMORY WHICH CAN BE SELECTIVELY PLACED IN A NOT-IN-USE STATUS

Yasushi Kasa; Yuji Arayama, and Seiji Hirayama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 18, 1990, Ser. No. 584,311
Claims priority, application Japan, Sep. 18, 1989, 1-240957
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—200 **7 Claims**



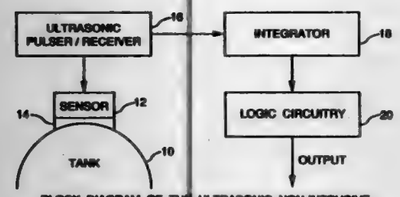
1. A semiconductor memory device, comprising:
a first memory part, and
a plurality of redundant circuit means used when said first memory part is faulty;
each said redundant circuit means comprising
a second memory part,
a status memory part means for storing first data indicating whether said memory part is in a not-in-use status or in an in-use status, and for storing said second data indicating an out-of-use status when said second memory part has a failure,
a faulty address memory part means for storing a faulty address of said first memory part, and
a comparison circuit means responsive to said status memory part means, for comparing an input address and a memory address from said faulty address memory part when said status memory part is in the in-use status, and outputting a match signal enabling said second memory part to be accessed only when said input address and said memory address from said faulty address memory part both match, and for prohibiting said second memory part from being accessed regardless of a match or a mismatch between the input address and the memory address from said faulty address memory part when said

second data stored in said status memory part indicates the out-of-use status.

5,195,058
ULTRASONIC METHOD FOR NON-INTRUSIVE LOW LIQUID LEVEL SENSING

Wayne E. Simon, Evergreen, Colo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 30, 1992, Ser. No. 876,246
Int. Cl.[5] G01S *15/02*
U.S. Cl. 367—87 **2 Claims**



BLOCK DIAGRAM OF THE ULTRASONIC NON-INTRUSIVE LOW-LIQUID LEVEL SENSING SYSTEM

1. A non-intrusive ultrasonic sensing system for determining the presence or absence of a liquid in a container, the combination comprising:
a container having walls for containing a liquid;
a transducer adhered to a wall of said container;
means for transmitting an ultrasonic pulse from said transducer through said wall and for receiving the reflections of said transmitted pulse;
means for integrating said reflections over a given period of time, said reflections being integrated in accordance with the following equation:

$$\int_0^{6\omega/kc} f(u)du \approx m\frac{\tau}{k}$$

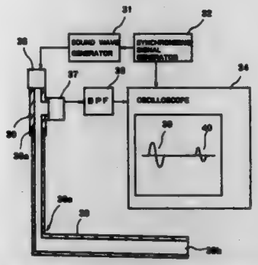
where
m equals the magnitude of the transmitted pulse
τ equals the duration of the ultrasonic pulse
k equals the log decrement in magnitude for each return of the pulse
w equals wall thickness
c equals the speed of sound in the wall; and
means for indicating when said integrated reflections exceed a predetermined threshold.

5,195,059
ACOUSTIC PIPE LENGTH MEASURING APPARATUS

Nakamura Hiroshi; Itoh Takanori, both of Tokyo, and Natori Masaki, Koganei, all of Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1992, Ser. No. 857,026
Claims priority, application Japan, Mar. 27, 1991, 3-87921; Mar. 27, 1991, 3-89723
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—99 **16 Claims**

1. An acoustic pipe length measuring apparatus comprising:
a sound emitting means for emitting a pulse-like sound wave in a pipe-like member having a length at one end of the latter;
a sound collecting means for collecting, at the one end of said pipe-like member, sound waves reflected at another end of said pipe-like member;
a temperature detecting means for detecting a temperature in said pipe-like member;
a memory means for storing a sonic velocity value at a reference temperature for a plurality of gases which may be present in said pipe-like member;
means for selecting a sonic velocity reference value for the gas which is present in said pipe-like member; and

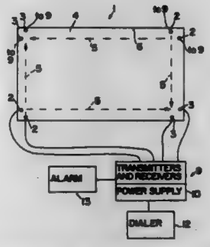


a calculating means for calculating the length of said pipe-like member from a time between emission of said pulse-like sound waves and collection of the sound waves and a sonic velocity value which has been selected.

5,195,060
SECURITY SYSTEM FOR SWIMMING POOLS AND LIKE BODIES OF WATER

Kenneth A. Roll, Kirtland, Ohio, assignor to Marcorp Inc., Fairfax, Va.

Filed Dec. 10, 1991, Ser. No. 804,338
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—118 **28 Claims**

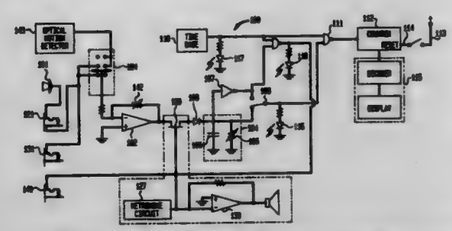


1. An apparatus for detecting a person in a body of water comprising:
means for generating an electrical swept frequency signal having a frequency that continuously varies between upper and lower limits;
at least one pair of transducers disposed in a body of water including a transmitting transducer connected to receive the swept frequency signal for launching a beam of acoustical waves in response to the swept frequency signal in the body of water and a receiving transducer disposed opposite the transmitting transducer for receiving the acoustical waves and for converting received acoustical waves into an electrical received signal; and
means connected to the receiving transducer for producing a detected signal in response to the received signal and for initiating an alarm when the detected signal falls below a threshold for at least a predetermined length of time.

5,195,061
PRACTICE TIMER

Erin M. Curtis, and Marshall M. Curtis, both of 9506 Arnon Chapel Rd., Great Falls, Va. 22066

Filed Apr. 12, 1991, Ser. No. 684,572
Int. Cl.[5] G04F *8/00*; G04B *47/06*; G08B *13/18*
U.S. Cl. 368—9 **10 Claims**

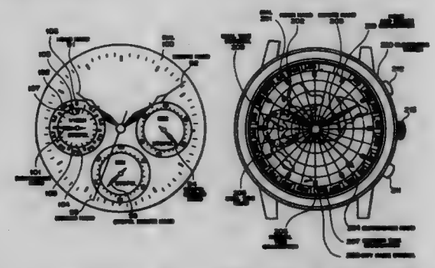


9. A method of measuring time duration of productive effort during an activity including the steps of
sensing a predetermined form of energy produced by said productive effort of said activity,
establishing a predetermined time period during which productive effort will not produce said predetermined form of energy, and
accumulating elapsed time during the sum of a duration of said sensing step and said predetermined time period.

5,195,062
DISPLAY DEVICE

Masahiro Sase; Igarashi Takashi Kiyotaka; Osa, all of Tokyo, and Noritoshi Suzuki, Saitama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00358, § 371 Date Nov. 16, 1989, § 102(e) Date Nov. 16, 1989, PCT Pub. No. WO89/09950, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 4, 1989, Ser. No. 445,640
Claims priority, application Japan, Apr. 5, 1988, 63-82318
Int. Cl.[5] G04B *19/26*; G04C *19/00*
U.S. Cl. 368—21 **6 Claims**

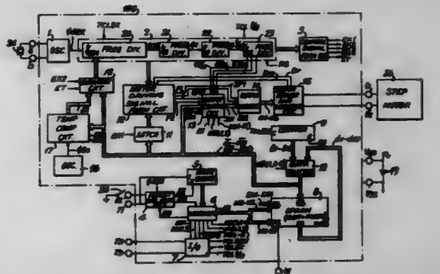


1. A hand display device with a hand for changeably displaying one display value of a first function and another display value of a second function, a dial having said hand attached thereto and graduations or symbols for said first function and second fucntion, respectively, and a driving means for said hand, said driving means comprising a first function signal generating circuit for generating a first function signal, and a second function signal generating circuit for generating a second function signal, a mode control circuit for generating a mode switching signal for changing from one display value of said first function to another display value of said second function, a drive control circuit for selectively producing mutually different drive control signals under a first function signal when said mode switching signal is in a first state and under a second function signal when said mode switching signal is in a second state, a drive circuit for producing a drive signal under said drive control signal, and a pulse motor for receiving said drive signal from said drive circuit and interlocking with said hand, said graduations or symbols for said first function and said graduations or symbols for said second function on said dial being arranged substantially not to occupy the same positions, and an occurrence time interval of said drive signal being controlled so that said hand stays at a position of a graduation or symbol corresponding to a selected function among said graduations or symbols for a relatively longer time than at a position of a graduation or symbol corresponding to an unselected function and so that said hand passes a position of a graduation or symbol corresponding to an unselected function in a relatively shorter time than a position of a graduation or symbol corresponding to a selected function.

5,195,063
ELECTRONIC TIMEPIECE INCLUDING INTEGRATED CIRCUITRY

Tatsuo Moriya, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 5, 1989, Ser. No. 333,512
Claims priority, application Japan, Apr. 6, 1988, 63-46520[U]
Int. Cl.[5] G04C *19/00*; G04F *5/00*; G04B *18/00*
U.S. Cl. 368—85 **54 Claims**



1. An integrated circuit for an electronic timepiece, comprising:
reference data holding means for holding reference data for use in controlling at least one function of said timepiece;
memory means for storing control data for use in controlling said at lest one function of said timepiece;
output means for receiving at least the reference data to confirm its acceptability for use in driving the timepiece; and
transfer means for transferring the reference data to the memory means for storage in the memory means as the control data, said transfer means being operable for transferring the reference data to the memory means concurrent with and after said reference data is received by said output means.

5,195,064
SOUND SUPPLEMENTED CLOCK SYSTEM

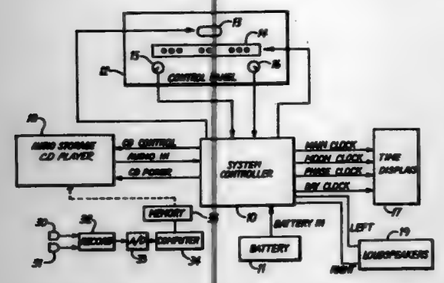
Brian A. Hegarty, 1420 Constellation Dr., Colorado Springs, Colo. 80906, and David J. Fairfield, Colorado Springs, Colo., assignors to Brian A. Hegarty, Colorado Springs, Colo.

Filed Oct. 15, 1991, Ser. No. 776,736
Int. Cl.[5] G04B *19/00, 21/00*
U.S. Cl. 368—272 **7 Claims**

1. A timekeeping system for providing selected ones of a plurality of audio signal selections, based on stored audio information, synchronized with selected time events, said plurality of audio signal selections differing in time duration from one another, said system comprising:

a timing signal generating means having an output and capable of providing a timing signal at said output thereof containing repeated cycles at a fundamental frequency;

a memory means having a control input and an output and capable of storing therein a plurality of audio data assemblages from which can be provided corresponding ones of said audio signal selections, said plurality of audio data assemblages each being stored with a corresponding blank data assemblage such that together they form a corresponding duration data assemblage resulting in a plurality of duration data assemblages each corresponding to one of said audio signal selections and each of which require a predetermined passage time duration to be entirely provided at said memory means output which is equal to or greater than that required to so provide just that said audio data assemblage contained therein, said memory



means providing being capable of providing a selected one of said plurality of duration data assemblages at said output thereof in response to corresponding selection signals being provided at said control input thereof; and

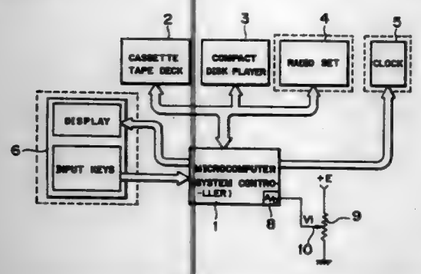
a controller means having a first input electrically connected to said timing signal generator means output and a first output electrically connected to said memory means control input, said controller means being capable of receiving said timing signal and of determining occurrences of said time events based on numbers of said cycles having occurred in said timing signal, said controller means being further capable of providing memory direction signals at said first output thereof to direct said memory means to provide a selected duration data assemblage at said output thereof beginning at a time fixed with respect to a selected said time event.

5,195,065

FUNCTION SETTING METHOD FOR AUDIO SYSTEM

Seiji Kato, and Akio Namiki, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 624,869
Claims priority, application Japan, Mar. 30, 1990, 2-081010
Int. Cl.[5] H04B *1/20*; H03K *17/94*
U.S. Cl. 369—2 **8 Claims**



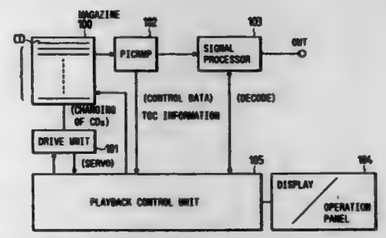
2. A function setting method for an audio system which is constructed such that functions incorporated therein are controlled in a concentrated manner by a system controller, comprising the steps of preparing, as said system controller, a microcomputer which has an analog/digital conversion input port and has built therein control programs for all of a plurality of functions which are to be incorporated in said audio system, and applying a selected one of a plurality of analog voltages which individually represent possible combinations of said functions including the individual functions to said analog/-digital conversion input port of said microcomputer to cause said microcomputer to be prepared for a combination of said functions represented by the analog voltage.

5,195,066

INFORMATION REPRODUCING SYSTEM FOR REPRODUCING A GROUP OF RECORDING MEDIUMS IN ACCORDANCE WITH STORED PROGRAM INFORMATION

Naomi Amemiya; Koji Yamagishi; Kunio Matsumoto, and Naoki Masaki, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 479,125
Claims priority, application Japan, Feb. 13, 1989, 1-34298
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 **3 Claims**



1. An information reproducing system for playing back a group of recording mediums each having recorded information to be reproduced and Table of Contents (TOC) information with respect to the recorded, information, said information reproducing system comprising:

means for reading the TOC information of the recording mediums before the recorded information is reproduced and for controlling playback operation of the recording mediums based on the read TOC information;

storing means having a series of storage areas for storing TOC information and programmed information of the group of recording mediums, said programmed information indicating a sequence according to which the recorded information of the recorded mediums is to be reproduced; and

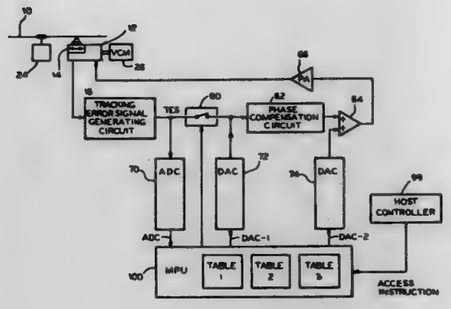
data transfer means for shifting information of a new group of recording mediums successively throughout said series of storage areas of said storing means, wherein said data transfer means comprises transfer means for shifting information of said storing means which is newer than information to be used again successively throughout said series of storage areas, and for transferring the information to be used again to the beginning of said series of storage areas, when the information of the group of recording mediums which is stored in said storing means is to be used during playback.

5,195,067

TRACK ACCESS CONTROL SYSTEM FOR A DISK STORAGE SYSTEM

Shigenori Yanagi, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Oct. 26, 1990, Ser. No. 604,780
Claims priority, application Japan, Nov. 8, 1989, 1-290713
Int. Cl.[5] G11B *7/085*
U.S. Cl. 369—32 **14 Claims**



1. A track access control system for a disk storage system, the disk storage system including a rotatable recording disk on which a plurality of tracks are formed along a rotation direction of the rotatable disk, a head which can move in the radial direction of the disk to read data, means for moving the head to a target track depending on an access instruction which includes the target track, and a sensor for detecting crossing of the head over the tracks, the track access control system comprising:

real tracking error signal generating means for generating a real tracking error signal on the basis of an output of the sensor as the head crosses over the tracks;

analog/digital converting means for converting, at least some non-zero crossing signal values of said real tracking error signal, to a digital value of said real tracking error signal during track seek operation prior to fine position control of the head;

target tracking error signal generating means for generating a target tracking error signal depending on an access instruction from a host controller, said target tracking error signal generating means generating a digital value of said target tracking error signal depending on the access instruction from the host controller;

error detecting means for detecting a difference between said real tracking error signal and said target tracking error signal wherein said error detecting means includes subtracting means for computing a difference value between said digital value of said real tracking error signal and said digital value of said target tracing error signal;

digital/analog converting means for converting said difference value to a second analog signal; and

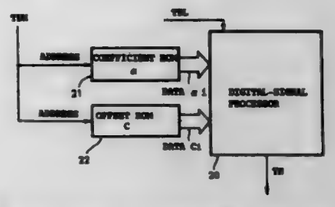
head drive means for driving said head in response to an output of said error detecting means to reduce said difference wherein said head drive means drives said head in response to an output of said digital/analog converting means to reduce said second analog signal.

5,195,068

TRACK-NUMBER COMPUTING EQUIPMENT FOR CLV DISK DRIVES

Morito Morishima, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 7, 1989, Ser. No. 403,827
Claims priority, application Japan, Sep. 22, 1988, 63-238106
Int. Cl.[5] G11B *17/22, 7/00*
U.S. Cl. 369—32 **11 Claims**



7. A disc drive device for positioning a pick-up on a target track of a disc, said disc drive device comprising:

an input for receiving time data from a disc pick-up;

a memory for storing parameters which define a plurality of linear segments, said linear segments collectively approximating a relationship between the time data associated with a target track recorded on the disc and a number of tracks from a reference track to the target track;

an address terminal for selected stored parameters from said memory which define one so said plurality of linear segments in response to a first portion of said time data; and

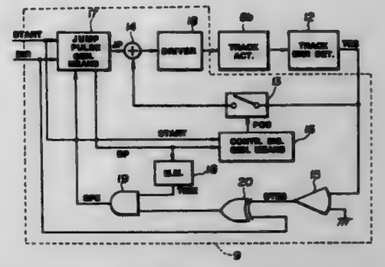
a processor for receiving said selected stored parameters from said memory and for receiving a second portion of said time data to control movement of said pick-up to said target track in response to a selected number of tracks from said reference track to said target track said processor computing the selected number of tracks from said reference track to said target track by applying said second portion of said time data to a linear segment defined by said selected stored parameters.

5,195,069

TRACK JUMP CONTROLLING APPARATUS WHICH CAN OUTPUT DECELERATING PULSES BY SWITCHING A SERVO ON AFTER A FIXED TIME

Junichi Nakano, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1991, Ser. No. 684,722
Claims priority, application Japan, Apr. 19, 1990, 2-103979
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 **13 Claims**



1. A track jump controlling apparatus comprising:

an optical head including a light beam generating means for radiating a light beam to an optical recording medium, an optical system condensing said light beam, radiating said light beam onto an optical recording medium and forming

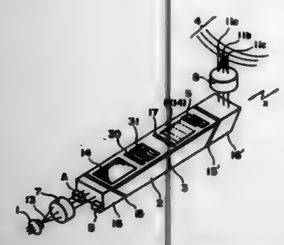
a minute light spot on said optical recording medium and a photodetector receiving a reflected light from said optical recording medium through said optical system;
a track error signal detecting means for detecting a track error signal representing a displacement in the track crossing direction crossing tracks from the central position of the tracks formed on said recording medium from a signal photoelectrically converted by said photodetector;
an actuator provided in said optical head, driving at least a part of said optical system and moving said light spot in said track crossing direction;
a switching means for switching on/off a tracking servo feeding back the output signal of said track error signal detecting means for driving said actuator and switching on/off said tracking servo driving said actuator;
a track crossing signal generating means for generating one of an accelerating signal at the time of accelerating said light spot in said track crossing direction and a decelerating signal at the time of decelerating said light spot in said track crossing direction;
a controlling means for outputting to said switching means a control signal controlling said switching means to be off as synchronized with the start of the output of said track crossing signal and controlling said switching means to be on as synchronized with the end of the output of said track crossing signal;
a time measuring means for measuring a predetermined time from a timing when said track crossing signal is output;
a judging means for monitoring said track error signal for a predetermined time measured by said time measuring means and judging whether said light spot is to be decelerated or not; and
a movement suppressing signal outputting means for feeding said actuator with a movement suppressing signal for suppressing the movement of said light spot after said switching means is controlled to be on for turning on said tracking servo only when a judging signal judged by said judging means to be decelerated is outputted.

5,195,070

OPTICAL INFORMATION PROCESSING APPARATUS AND OPTICAL PICKUP THEREFOR

Masataka Shiba; Kazumi Kawamoto; Yasuo Hira; Akira Inagaki; Hideaki Sato; Koichi Ito; Atsuko Fukushima, and Ryuichi Funatsu, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,794
Claims priority, application Japan, Jul. 12, 1989, 1-177935; Jul. 12, 1989, 1-177936
Int. Cl.[5] G11B *11/14*
U.S. Cl. 369—44.12 **48 Claims**



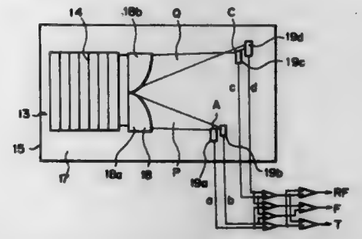
1. An optical information processing apparatus for performing information process on an optical recording medium having tracks on which information is to be recorded, said apparatus comprising:
(a) an optical pickup for irradiating plural light beams to the recording medium and for detecting reflected light of the light beams;
(b) a recording medium drive means for moving the recording medium relative to said optical pickup; and
(c) a signal processing means for controlling the light beams of said optical pickup and for performing information process on the recording medium;
(d) said optical pickup including at least one light source, an optical waveguide for guiding the light beams from said light source, a light deflecting element disposed in said optical waveguide for controllaby deflecting the light beams running in said optical waveguide, within a plane formed by a vector in that running direction and a vector perpendicular to a plane of said optical waveguide, based on a control signal from said signal processing means, an optical system for focusing the light beams, which are outputted from said light deflecting element, on the recording medium to form light spots, and sensor elements for detecting the reflected light from the recording medium.

5,195,071

FOCUS DETECTING OPTICAL HEAD

Hiroyoshi Funato, Chigasaki, and Shigeyoshi Misawa, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 13, 1990, Ser. No. 479,455
Claims priority, application Japan, Feb. 14, 1989, 1-34615; Mar. 15, 1989, 1-63344
Int. Cl.[5] C11B *7/00*
U.S. Cl. 369—44.37 **4 Claims**



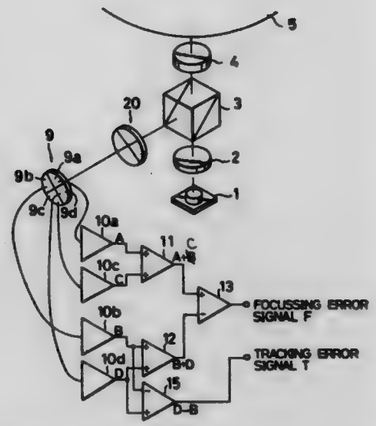
1. An optical head for detecting defocuses of a target, comprising:
a substrate;
a waveguide layer formed integrally on the substrate;
a coupling means integrated with the waveguide layer for coupling light reflected from the target to the waveguide layer thereby to converge and waveguide the reflected light within the waveguide layer;
two pairs of photodetectors integrated with the waveguide layer and spaced apart from each other, the photodetectors each for detecting the waveguided light; and
a calculating means connected to the two pairs of photodetectors for calculating a focusing error signal from outputs of the two pairs of photodetectors;
one photodetector of each pair of photodetectors being arranged in front of the other photodetector of each pair of photodetectors in a propagating direction of the waveguided light in such a manner that the one photodetector blocks off part of the waveguided light from the other photodetector when a surface of the target is in focus.

5,195,072

ERROR DETECTING DEVICE FOR OPTICAL HEAD

Kenji Fukui, Fujisawa, and Akira Kawai, Yokohama, both of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Mar. 23, 1989, Ser. No. 327,820
Claims priority, application Japan, Mar. 25, 1988, 63-69867; Apr. 13, 1988, 63-89268; Jun. 27, 1988, 63-156852
Int. Cl.[5] G11B *7/085*
U.S. Cl. 369—44.23 **8 Claims**



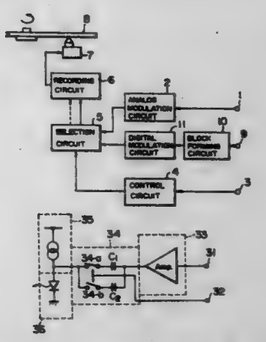
1. An error detecting device for an optical head, comprising:
optical means for converting a reflected light of a light irradiating a surface to be irradiated into an astigmatic pencil of rays having a first focal point and a second focal point, said optical means having a first focusing means for focusing said reflected light on said first focal point of said astigmatic pencil of rays, and a second focusing member for focusing said reflected light on said second focal point of said astigmatic pencil of rays, said first and second focusing members being made integral; and
means for detecting errors of said light irradiating the surface to be irradiated, based on a detecting signal of a spot of said reflected light formed by said first focusing member, and a detecting signal of a spot of said reflected formed by said second focusing member, wherein said optical means is provided by a Fresnel zone plate, said zone plate including;
a first, second, third and a fourth Fresnel zone plate member divided in four by two parting lines passing the center of said Fresnel zone plate,
said first and said third Fresnel zone plate members opposed to each other across said center has said first focal point, and
said second and said fourth Fresnel zone plate members opposed to each other across said center has said second focal point; and
said detecting means having:
a first, a second, a third and a fourth detecting section for respectively detecting a spot of said reflected light formed by said first, said second, said third and said fourth Fresnel zone plate members,
a focusing error computing unit for computing a focusing error signal, based on detecting signals from said first, said second, said third and said fourth detecting sections, and
a tracking error computing unit for computing a tracking error signal, based on detecting signals from at least said second and said fourth detecting sections.

5,195,073

APPARATUS FOR SELECTIVELY RECORDING ANALOG AND DIGITAL DATA ON AN OPTICAL DISC

Mineo Kato, Katano; Yoshinori Amano, Takatsuki; Yoshio Hiranchi, Osaka; Mari Kimura, Kishiwada, and Kunihiko Hontani, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 7, 1990, Ser. No. 623,506
Claims priority, application Japan, Dec. 14, 1989, 1-325070
Int. Cl.[5] G11B *5/09, 15/52, 20/10, 27/22*
U.S. Cl. 369—47 **7 Claims**



1. An optical disc recording apparatus for selectively recording on an optical disc analog and digital signals, comprising:
an analog modulation circuit for receiving and modulating an analog input signal to produce first modulated signals for optical disc recording;
a block forming circuit for receiving and dividing a digital input signal into sector blocks;
a digital modulation circuit for suppressing low-frequency components of said sector blocks from the block forming circuit and modulating the low-frequency suppressed sector blocks to produce second modulated signals for optical disc recording;
a control circuit for producing a recording control signal for designating one of analog signal recording and digital signal recording in response to the received analog and the received digital input signals, respectively;
a selection circuit connected to said analog modulation circuit, said digital modulation circuit and said control circuit, said selection circuit for selecting and passing therethrough one of said first and said second modulated signals and to produce a selection signal representing the selected one of the modulated signals, in response to said recording control signal form said control circuit; and
a recording circuit including a laser drive circuit, for selectively limiting the frequency band of the selected and passed modulated signals in accordance with the selection signal produced by the selection circuit, the limited frequency band modulated signals being recorded on said optical disc by the laser drive circuit;
wherein said recording circuit comprises an amplifying circuit for amplifying said modulated signals;
a band limiting circuit for selectively limiting the frequency band of said modulated signals in response to the selection signal; and
a laser drive circuit for driving a laser with the output of said band limiting circuit; and
wherein said band limiting circuit has at least one capacitor for receiving the modulated signals and wherein a frequency response characteristic of the band limiting circuit is dependent on the capacitance of the at least one capacitor and the input impedance of said laser drive circuit.

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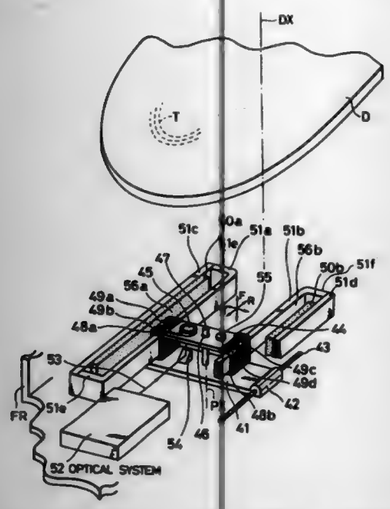
5,195,074

ROTATABLE READ/WRITE OPTICAL HEAD APPARATUS

Katsuhide Tanoshima; Minoru Ohtsuka; Shizuo Nagata; Masahiro Takahashi, and Yasuo Shimizu, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 373,816, Jun. 30, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 740,379
Claims priority, application Japan, Jul. 7, 1988, 63-169400
Int. Cl.[5] G11B *7/085, 21/00*
U.S. Cl. 369—48 14 Claims



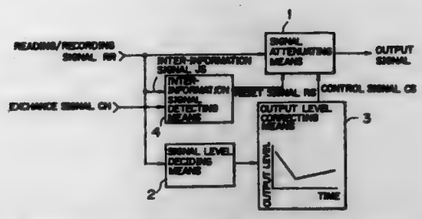
1. Optical head apparatus for recording or reproducing information onto or from tracks of an optical disc, comprising:
- a guide member extending in a direction parallel with a radial direction of the optical disc;
- a carriage movable along said guide member;
- an armature mounted on said carriage, said armature being rotatable about a pivotal axis perpendicular to a surface of said optical disc;
- an objective lens fixed to said armature at a distance from said axis and positioned to traverse the tracks on said optical disc when said armature rotates, said objective lens moving in a substantially radial direction of the disc when the carriage moves along said guide member;
- a pair of guide yokes fixed relative to said guide member and extending in parallel with the member; and
- a pair of tracking and carriage-servo coils surrounding said guide yokes and not fixed thereto said tracking and carriage-servo coils being fixed to said armature and having a hollow interior through which said guide yokes loosely extend;
- a magnetic field means for creating magnetic lines of force perpendicular to the guide yokes and parallel with the surface of said optical disc, an electromagnetic force being created in the direction parallel with the guide yokes when a current flows through said coils; and
- a drive circuit for supplying currents to said tracking and carriage-servo coils in such directions as to apply, to said tracking and carriage-servo coils, electromagnetic forces in parallel with each other thereby driving the armature along said guide yokes or in such directions as to apply, to said tracking and carriage-servo coils, electromagnetic forces in antiparallel with each other thereby rotating the armature about said pivotal axis.

5,195,075

OUTPUT LEVEL CONTROLLING APPARATUS

Takahumi Saiba; Hirokazu Inotani; Fumihiro Nakajima, and Seiichi Hasebe, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 30, 1991, Ser. No. 693,866
Claims priority, application Japan, Oct. 9, 1990, 2-270710
Int. Cl.[5] G11B *20/00*; H03G *3/00*
U.S. Cl. 369—53 12 Claims



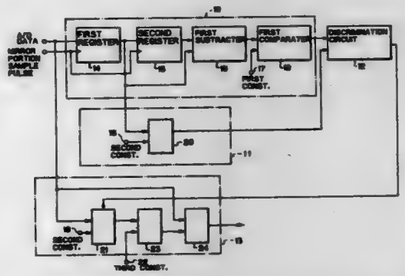
1. An output level controlling apparatus comprising:
- signal attenuating means for attenuating a reproduced output level of a reading/recording signal read from a record medium with an attenuation amount which is controlled to be increased and decreased at a different rate versus time according to a control signal input into said signal attenuating means;
- signal level deciding means for comparing said reproduced output level of said reading/recording signal with a reference signal level previously set; and
- output level correcting means, to which first information prescribing an increasing rate to increase said attenuation amount and second information prescribing a decreasing rate to decrease said attenuation amount are set, for sending the control signal to said signal attenuating means on the basis of results of the comparison made by said signal level deciding means so as to increase the attenuation amount at a prescribed increasing rate when said reproduced output level is higher than said reference signal level and so as to decrease the attenuation amount at a prescribed decreasing rate when said reproduced output signal level is lower than said reference signal level.

5,195,076

DEFECT DETECTION CIRCUIT FOR OPTICAL PICK UP DEVICE

Ikuo Aoki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1991, Ser. No. 721,707
Claims priority, application Japan, Jul. 4, 1990, 2-176977
Int. Cl.[5] G11B *7/00, 7/095*
U.S. Cl. 369—58 6 Claims



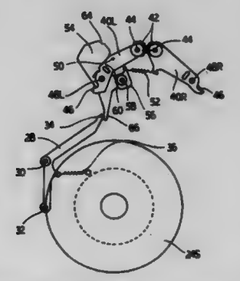
1. A defect detection circuit for an optical pick up device having a record medium on which a track is formed and which has a plurality of segments formed in series along the track, said defect detection circuit comprising:
- a pick up element generating a refresh signal by sampling segments of said track, said refresh signal including current segment data derived by sampling a current segment and preceding segment data derived by sampling a segment preceding the current segment;
- a source of a first predetermined value and a second predetermined value;
- a first detection circuit for detecting a defect of said current segment by comparing difference between said current segment data and said preceding segment data with said first predetermined value and for providing a first output related to said comparing with the first predetermined value;
- a second detection circuit for detecting a defect of said current segment by comparing said current segment data with said second predetermined value and for providing a second output related to said comparing with the second predetermined value; and
- a discrimination circuit coupled with said first and second detection circuits for determining whether said current segment is defective or not on the basis at least of said first and second outputs, and for providing a discrimination output and for providing a corresponding discrimination output.

5,195,077

DISC LOADING MECHANISM FOR LARGE AND SMALL DISKS

Hideyo Ishikawa; Hidenori Muramatsu, and Kazuki Takai, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1991, Ser. No. 648,579
Claims priority, application Japan, Jan. 31, 1990, 2-18952; Mar. 23, 1990, 2-71951
Int. Cl.[5] G11B *33/02, 3/00*
U.S. Cl. 369—75.2 4 Claims



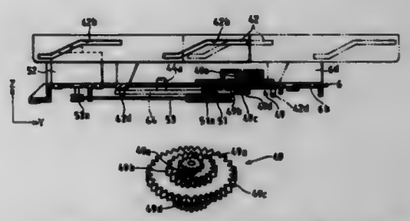
1. A disc loading mechanism comprising:
- a single mechanical sensor link arm pivotally arranged so as to be pivotally movable to a pivot position due to engagement with a disc being transferred, said pivot position determined by the size of said disc;
- a pair of stopper arms pivotally arranged and operatively connected to each other so as to be pivotally moved in association with each other;
- said stopper arms each including a stopper against which the disc is abutted for determining positions of the disc;
- a single lock member pivotally arranged so as to be pivotally movable when contacted by said sensor link arm and operatively connected to one of said stopper arms;
- a large-diameter disc regulating means for holding said stopper arms in an open position;
- a small-diameter disc regulating means for holding said stopper arms in a closed position;
- said large-diameter disc regulating means and small-diameter disc regulating means being provided on said lock member, and locking of said stopper arms by said lock member being carried out through said large-diameter disc regulating means and small-diameter disc regulating means;
- a spring means for connecting said lock member and one of said stopper arms so as to hold said stopper arms in the closed position by said small-disc regulating means;
- said lock member moving said stopper arm from the closed position against the force of said spring means and locking said stopper arm in the open position, when said sensor link arm pivotally moves in response to an insertion of a large disc.

5,195,078

RECORDING MEDIUM CONVEYING DEVICE INCLUDING A PAIR OF CIRCULAR COAXIAL GEARS

Yuji Ikeda; Katsumi Sawada, and Shogo Sato, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 11, 1991, Ser. No. 808,791
Claims priority, application Japan, May 24, 1991, 3-120479
Int. Cl.[5] G11B *25/04, 33/04, 17/04*
U.S. Cl. 369—75.2 4 Claims

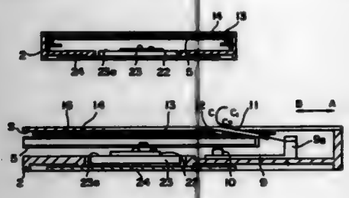


1. A recording medium conveying device for conveying a recording medium to a playing position through an inserting opening formed in a player housing, the recording medium conveying device comprising:
- a base body provided in said player housing;
- a movable recording medium bearing member for bearing said recording medium, said movable recording medium bearing member being provided on said base body so that said movable recording medium bearing member is movable between a protruding position outside said player housing and an accommodating position inside said player housing;
- driving means for moving said movable recording medium bearing member,
- said driving means comprising:
  - a rack provided on one of said base body and said movable recording medium bearing member, so that said rack is extended in a direction of movement of said movable recording medium bearing member;
  - a gear unit provided on the other of said base body and said movable recording medium bearing member, and engaged with said rack; and
  - torque applying means for applying torque to said gear unit,
  - said gear unit including a pair of circular gears different in diameter from each other and which are stacked coaxially as a single unit; and
  - an arcuate relay gear having a pitch circle which internally touches a pitch circle of one of said pair of circular gears having a larger diameter and externally touches the other of said pair of circular gears, and connecting said pair of circular gears to each other,
  - said rack having straight portions engageable with said pair of circular gears, and a curved portion engageable with said arcuate relay gear.

5,195,079
DISK DRIVER IN WHICH THE DISK HOLDER IS LOCATED BELOW A SLIDER

Kunihiko Inoue, Hoya; Takashi Watanabe, Ichikawa, and Yoshio Hirose, Urawa, all of Japan, assignors to TEAC Corporation, Japan

Filed Jun. 18, 1991, Ser. No. 717,019
Claims priority, application Japan, Aug. 20, 1990, 2-218489; Sep. 10, 1990, 2-239445; Nov. 26, 1990, 2-321628
Int. Cl.[5] G11B *17/032*
U.S. Cl. 369—77.2 19 Claims

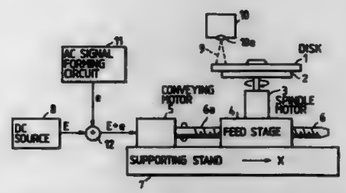


1. A disk driver comprising:
a frame;
a holder into which a disk is inserted from a first direction and from which the disk is ejected in a second direction opposite to the first direction, said holder being located at a first position when the disk is inserted or ejected and being located at a second position when information is recorded on the disk and/or reproduced therefrom, and said holder being mounted on said frame movably between the first and second positions in a state where the disk is accommodated in the holder;
a holding member, mounted on said frame, for holding said holder at the second position when said holder is moved to the second position;
a head for recording the information on one side of the disk and/or reproducing the information therefrom, said head being located at a third position to avoid contact with the disk when said holder is located at the first position and being located at a fourth position where said head can record the information on the disk and/or reproduce the information therefrom when said holder is located at the second position, and said head being mounted on said frame movably between the third and fourth positions;
a slider, located above said holder at the first position, which is engaged with said holder and engagable with said holding member, said slider having a groove through which said head passes when said head moves between the third and fourth positions;
an ejector, engaged with said slider, which is manipulated when ejecting the disk in order to push said slider approximately parallel to the first direction, said slider sliding approximately parallel to the first direction to release said holder from being held by said holding member when said ejector is manipulated in a state where said holder is located at the second position, said slider moving said holder from the first position to the second position in response to the disk being inserted into said holder, and said slider moving said holder from the second position to the first position in response to the releasing of said holder from being held;
moving means for moving said head between the third and fourth positions, said moving means moving said head from the third position to the fourth position responsive to the moving of said holder from the first position to the second position and moving said head from the fourth position to the third position responsive to the moving of said holder from the second position to the first position; and
an arm having a lower surface opposite to the disk and an upper surface opposite to the lower surface, said head being supported by said arm at the lower surface thereof and mounted on said frame via said arm, said slider being located under the upper surface of the arm.

5,195,080
OPTICAL RECORDING MEDIUM INITIALIZING METHOD AND APPARATUS

Toshihiro Komaki, and Masahiro Katsumura, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 21, 1991, Ser. No. 779,860
Claims priority, application Japan, Mar. 1, 1991, 3-36191
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—100 6 Claims



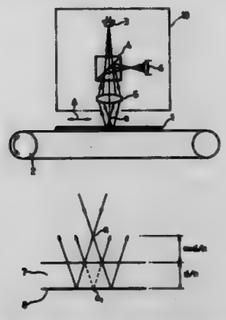
1. An optical recording medium initializing apparatus comprising:
rotating means for rotating an optical recording medium;
bearing means which supports said rotating means;
conveying signal forming means for forming a conveying signal;
irradiating means for applying an initializing light beam to said optical recording medium in such a manner that said light beam goes across said optical recording medium in parallel with the direction of movement of said bearing means in accordance with a control signal;
AC signal forming means for producing an AC signal; and
composing means for superimposing said AC signal on said conveying signal to form said control signal.

5,195,081
OPTICAL APPARATUS FOR EFFECTING RECORDING AND/OR REPRODUCING OF INFORMATION ON/FROM AND OPTICAL INFORMATION RECORDING MEDIUM

Masayuki Usui, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 340,785, Apr. 20, 1989, abandoned. This application May 11, 1992, Ser. No. 884,237
Claims priority, application Japan, Apr. 22, 1988, 63-098395; Apr. 22, 1988, 63-098397
Int. Cl.[5] G11B *7/00*; G01J *1/20*
U.S. Cl. 369—112 9 Claims

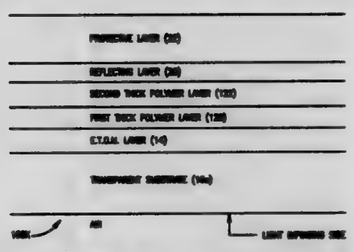
1. An apparatus for reproducing information from an information recording medium having an information recording surface and a surface layer on the recording surface for transmitting light therethrough, said apparatus comprising:
a light source for generating a light beam to illuminate the recording medium;
photodetector means for receiving light from the information recording medium illuminated by the light beam generated by said light source, and for reproducing information on the basis of detection of light received by said photodetector means, said photodetector means comprising a detecting optical system and a photodetector, said detecting optical system directing the light beam received from the information recording medium onto said photodetector and said photodetector having a light-receiving surface disposed on a surface conjugate to the information recording surface of the information recording medium through said detecting optical system for receiving the light beam directed from said detecting optical system; and
an illuminating optical system for condensing the light beam generated by said light source to a condensing point and for directing the condensed light beam onto the information recording medium, said illuminating optical system maintaining the position of the condensing point spaced apart from the information recording surface of the information recording medium during reproducing of information by detection of the light received by said photodetector means.



5,195,082
OPTICAL DISK STRUCTURES FOR ELECTRON TRAPPING OPTICAL MEMORY MEDIA

Robert E. Revay, Washington, D.C., and Daniel T. Brower, Bowie, Md.; Gregg D. Espin, Hopewell Junction, N.Y. assignors to Optex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 449,005, Dec. 12, 1989, Pat. No. 5,128,849. This application Apr. 22, 1992, Ser. No. 871,812
Int. Cl.[5] G11B *3/70*; G11C *13/04*; G03C *1/00*
U.S. Cl. 369—275.2 12 Claims

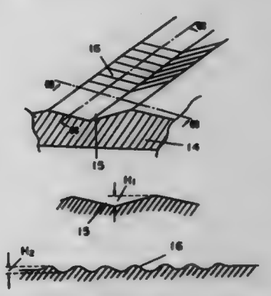


1. An erasable optical disk for use with an erasable optical disk drive system, having a readout stimulation laser and a recording laser, which utilizes electron trapping optical memory material as the storage medium comprising:
a. a disk substrate;
b. a layer of electron trapping optical memory material coated on said disk substrate;
c. a first light absorbing layer coated on said layer of electron trapping optical memory material, said first light absorbing layer attenuating a first wavelength of light;
d. a second light absorbing layer coated on said first absorbing layer, said second light absorbing layer attenuating a second wavelength of light; and
e. a reflective layer coated on said second absorbing layer.

5,195,083
DISC-SHAPED RECORDING MEDIUM CAPABLE OF RECORDING DATA SIGNALS BY MEANS OF LIGHT BEAM

Ryoichi Imanaka, Hirakata, and Akira Kagata, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP84/00288, § 371 Date Feb. 7, 1985, § 102(e) Date Feb. 7, 1985, PCT Pub. No. WO84/04992, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 5, 1984, Ser. No. 708,929
Claims priority, application Japan, Jun. 7, 1983, 58-102068
Int. Cl.[5] G11B *7/24*, *7/007*
U.S. Cl. 369—275.4 1 Claim

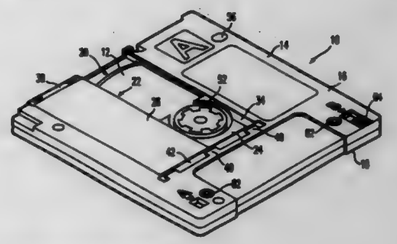


1. A disc-shaped recording medium capable of having a data signal recorded thereon by using a light beam, said recording medium comprising:
a substrate having a concentric or spiral groove having a V-shaped cross-section preformed thereon which defines a recording track on which a data signal is recorded by irradiating said light beam onto the recording track, and having address data prerecorded on the surface of said groove for identifying a position of the recording track, said address data being on only a part of the length of said groove and being in the form of surface irregularities of a substantially sinusoidal waveform along the walls of said groove with an amplitude smaller than the depth of said groove, the walls of said groove other than where the address data is prerecorded having no sinusoidal surface irregularities; and
a recording medium layer formed on said substrate.

5,195,084
DISC CARTRIDGE

Haruo Shiba, and Masaru Ikebe, both of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 319,709, Mar. 7, 1989, abandoned. This application May 14, 1991, Ser. No. 700,951
Claims priority, application Japan, Mar. 7, 1988, 63-29218[U]
Int. Cl.[5] G11B *23/02*
U.S. Cl. 369—291 6 Claims



1. A disc cartridge comprising:

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a casing having means for rotatably supporting a disc received therein, said casing having at least one surface including a recessed guide surface with an opening therethrough for providing access to the disc;

a shutter slidably mounted on said casing and movable on said guide surface from an open position in which said opening is uncovered to a closed position in which a leading edge of said shutter traverses said opening so that said opening is covered; and

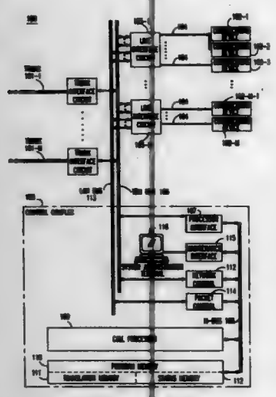
means for ensuring smooth sliding movement of said shutter to said closed position, said ensuring means comprising a depression formed in said guide surface, said depression intersecting said opening at a side of said opening closet to said leading edge when said shutter is in the closed position, said depression extending from said opening towards said leading edge in the closed position.

5,195,085

COMMUNICATION LINK IDENTIFIER

Charles J. Bertsch, Howell, and John T. Biggs, Brick Town, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 11, 1990, Ser. No. 580,728
Int. Cl.[5] H04J *1/16*
U.S. Cl. 370—13 **19 Claims**



1. A private branch exchange having a control module which selectively interconnects a trunk extending from a trunk side of said control module to at least one of a plurality of communications links, said plurality of communications links extending from a line side of said control module to communications devices, said private branch exchange comprising

means in said control module for receiving a predetermined test signal which has been applied to a communications link, said predetermined test signal is distributed over a plurality of recurring frames in a time-division-multiplexed signal format and said receiving means assembles said predetermined test signal from these frames; and

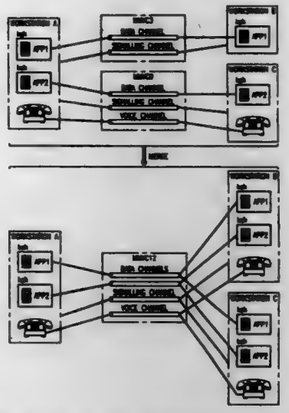
means in said control module responsive to said predetermined test signal for providing to said communications link information which identifies said communications link.

5,195,086

MULTIPLE CALL CONTROL METHOD IN A MULTIMEDIA CONFERENCING SYSTEM

Thomas J. Baumgartner, St. Charles; Yeou H. Hwang, Naperville; Edith H. Jones, Lisle; Wu-Hon F. Leung, Downers Grove; Lara F. Morgan, Warrenville, and Shi-Chuan Tu, Lisle, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 12, 1990, Ser. No. 509,010
Int. Cl.[5] H04M *3/56*
U.S. Cl. 370—62 **34 Claims**



1. A method for use in an arrangement comprising a communication network interconnecting a plurality of user stations, said method comprising

providing a first call among a first set of said user stations,

providing a second call among a second set of said user stations and

merging said first and second calls into a single call, comprising plurality of channels comprising virtual channels of a multicast connection, among at least three user stations from said first and second sets of said user stations, said plurality of channels corresponding to a combination of channels of said first and second calls.

5,195,087

TELEPHONE SYSTEM WITH MONITOR ON HOLD FEATURE

Raymond W. Bennett, Naperville, and Joseph G. Klinger, Waterman, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 576,541, Aug. 31, 1990, abandoned. This application Jul. 7, 1992, Ser. No. 912,064
Int. Cl.[5] H04J *3/12*; H04M *3/42*
U.S. Cl. 370—62 **21 Claims**

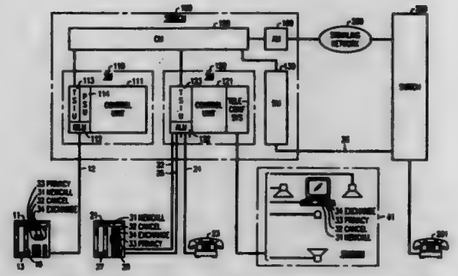
17. A method of controlling the selective interconnection of a plurality of communication channels to a handset and a speaker in a telephone station set, said method comprising

in response to a NEWCALL signal from a user, connecting said handset to an idle one of said channels,

in response to a PRIVACY signal from said user, moving, to said speaker, the connection of said channels that are connected to said handset,

in response to an EXCHANGE signal from said user, exchanging connections such that said channels connected to said handset prior to receipt of said EXCHANGE signal are thereafter connected to said speaker, and such that said channels that are connected to said speaker are thereafter connected to said handset; and

in response to a CANCEL signal from said user, disconnecting said handset from at least one of said channels that are



connected to said handset prior to receipt of said CANCEL signal.

5,195,088

CIRCUIT ARRANGEMENT FOR BIT RATE ADAPTATION

Ralph Urbansky, Schwaig, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 17, 1990, Ser. No. 628,799
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942883
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—84 **8 Claims**

1. A circuit arrangement for converting the bit rate of a frame structured input signal to a predetermined nominal bit rate, each frame of said signal including data bits and auxiliary bits; said circuit arrangement comprising:

an elastic store for receiving and storing data bits of the input signal;

a write address counter for writing data bits of said signal into said store at the bit rate of said signal, keeping count of the data bits written therein;

a read address counter for reading-out the stored data bits and keeping count thereof, read-out being at a bit rate in accordance with a read clock supplied to said read address counter;

a phase comparator for determining the distance between the counts of said write address counter and said read address counter, and producing a control error signal corresponding to such distance;

a control circuit responsive to said control error signal to produce a frequency control signal; and

a read clock generating circuit for supplying said read clock to said read address counter substantially at said predetermined nominal bit rate, said generating circuit comprising an oscillator for receiving said frequency control signal and being controlled thereby to vary the bit rate of the read clock relative to said predetermined nominal bit rate in accordance with said frequency control signal;

said phase comparator, control circuit, read clock generating circuit and write address circuit constituting a control loop whereby the bit rate of the read clock is controlled so as to rapidly restore the distance between the counts of said write address counter and said read address counter to a desired value in the event of abrupt departures from such desired value due to abrupt changes in the bit rate of said input signal.

5,195,089

APPARATUS AND METHOD FOR A SYNCHRONOUS, HIGH SPEED, PACKET-SWITCHED BUS

Pradeep S. Sindhu, Mountain View; Bjorn Liencres, Palo Alto; Jorge Cruz-Rios, Mountain View; Douglas B. Lee, San Francisco; Jung-Herng Chang, Saratoga, and Jean-Marc Frailong, Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 31, 1990, Ser. No. 636,446
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.1 **15 Claims**

1. A packet-switched bus for transferring data between a plurality of system buses and a cache controller of a cache for storing data, said cache controller being coupled to a processor, comprising:

data lines coupled to said system buses and said cache controller for transmitting data and command information between said system buses and said cache controller;

control lines coupled to said system buses and said cache controller for transmitting a plurality of clock signals, said clock signals being coupled to said system buses and said cache controller;

sending and receiving means for transferring data and command information between one of said system buses and said data and control lines, said sending and receiving means being coupled to said system buses and said data and control lines, said sending and receiving means including:

at least one input FIFO buffer coupled to each of said system buses for buffering data and command information to be transferred to said data and control lines;

at least one output FIFO buffer coupled to each of said system buses for transferring data and command information from said data and control lines to its system bus; and

storage means for storing and monitoring a disjointed set of cache tags for said cache for each of said system buses;

priority arbitration means coupled to said sending and receiving means and said cache controller for receiving and granting requests for control of said data and control lines, each sending and receiving means for each system bus

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transmitting a bus request for control of said data and control lines to said priority arbitration means a predetermined delay after receiving said data and command information from its system bus such that the bus requests are received by said priority arbitration means in the same order as each input FIFO buffer receives its data and command information from its system bus, said priority arbitration means receiving and granting each request through point-to-point request and grant lines coupling to each sending and receiving means of each system bus, each of said grant lines being continuously asserted while the data and command information is transferred onto said data and control lines; and

overflow control means coupled to said priority arbitration means, to said cache controller and to said sending and receiving means for preventing overflow, said overflow control means controlling the flow to said priority arbitration means by causing said system buses not to transfer data and command information to each of said sending and receiving means such that no bus request is sent from each sending and receiving means, said overflow control means controlling the flow into said cache controller by causing said priority arbitration means not to grant bus requests to said sending and receiving means, said overflow control means controlling the flow to said sending and receiving means from said data and control lines by causing said cache controller not to transfer to said sending and receiving means,

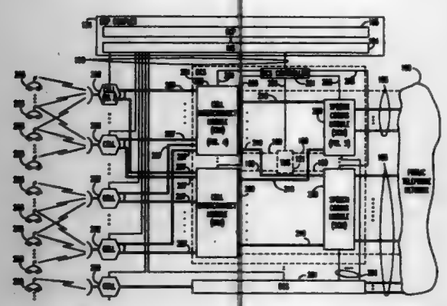
whereby data is transferred between said cache controller and said system buses.

5,195,090

WIRELESS ACCESS TELEPHONE-TO-TELEPHONE NETWORK INTERFACE ARCHITECTURE

Brian D. Bolliger, Winfield, Ill.; Talmage P. Bursh, Jr., South Orange; Marc K. Dennison, Berkeley Heights, both of N.J.; Michael J. English, Aurora, Colo.; Charles Y. Farwell, Denver, Colo.; Michel L. Hearn, Broomfield, Colo.; Richard M. Heidebrecht, Boulder, Colo.; Kelvin K. Ho, Somerset, N.J.; Kenneth Y. Ho, Syosset, N.Y.; David M. Kissel, Boulder, Colo.; Paul E. Miller; Richard D. Miller, both of Northglenn, Colo.; Alan S. Mulberg, Boulder, Colo.; LaJeana N. Roberts, Bedminster, N.J.; Michael A. Smith, Westminster, Colo.; Kenneth F. Smolik, Naperville, Ill.; Douglas A. Spencer, Boulder, Colo.; Kenneth W. Strom, Naperville, Ill.; John S. Thompson, Boulder, and Richard A. Windhausen, Westminster, both of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 9, 1991, Ser. No. 727,498
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—94.1 **57 Claims**



1. A wireless-access communications system comprising:

a plurality of service nodes each providing wireless-call services to user terminals located in a vicinity of the service node;

a plurality of communications links connected to the plurality of service nodes, at least one link connected to each service node;

at least one switching system connected to the plurality of links for conveying wireless-call traffic to and from the service nodes over the links;

each service node including first means responsive to wireless reception of deterministic incoming call traffic from user terminals, for transmitting packets carrying the incoming traffic of individual calls on the connected at least one link in non-deterministic, statistically-multiplexed form, and further for receiving packets carrying outgoing traffic of the individual calls on the connected at least one link in non-deterministic, statistically-multiplexed form for deterministic wireless transmission of the outgoing traffic to the user terminals; and

each switching system including second means responsive to receipt of deterministic outgoing call traffic destined for user terminals served by a service node, for transmitting packets carrying the outgoing traffic of the individual calls in non-deterministic, statistically-multiplexed form on the at least one link connected to the service node, and further for receiving packets carrying incoming traffic of the individual calls in non-deterministic, statistically-multiplexed form on the at least one link connected to the service node for deterministic transmission of the incoming traffic to destinations of the incoming traffic,

the second means including

means for controlling time instants of switching system transmission from the switching system of the packets carrying the outgoing traffic to ensure receipt of the transmitted packets, at a service node serving a user terminal for which the transmitted packets are destined, within predetermined windows of time, and

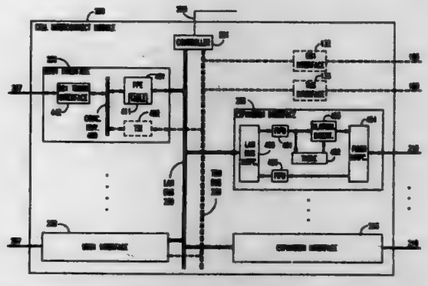
means for controlling time instants of switching system transmission from the switching system of the incoming traffic to ensure that the packets carrying the incoming traffic will have been received at the switching system within predetermined windows of time prior to the time instants of their transmission from the switching system.

5,195,091

ADAPTIVE SYNCHRONIZATION ARRANGEMENT

Charles Y. Farwell, Denver; Michel L. Hearn, Broomfield; Richard M. Heidebrecht, Boulder, all of Colo.; Kelvin K. Ho, Somerset, N.J., and Douglas A. Spencer, Boulder, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 9, 1991, Ser. No. 727,492
Int. Cl.[5] H04L *7/00*
U.S. Cl. 370—94.1 **42 Claims**



1. A communications system comprising:

a first unit for receiving incoming communication traffic at times dictated by first clock signals having a nominal frequency and a first phase;

a second unit for transmitting incoming communication traffic at times dictated by clock signals having the nominal frequency;

a third unit for interfacing communications between the first and the second units by transmitting to the first unit incoming communication traffic received from the second unit at times dictated by clock signals having the nominal frequency and having a second phase that is offset by an adjustably fixed amount from the first phase;

a communications medium connecting the second unit with the third unit and conveying communication traffic transmitted by the second unit to the third unit for reception, the communications medium having a fluctuating transmission delay;

first means for determining whether the third unit receives incoming communication traffic from the second unit within predetermined windows of time prior to the times of transmission by the third unit of the received incoming communication traffic; and

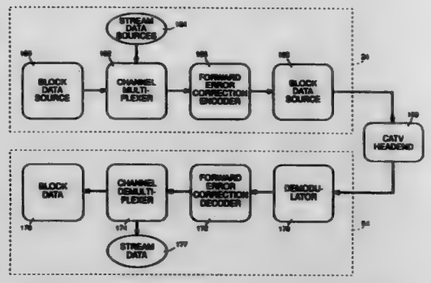
second means responsive to a determination that receptions of the incoming communication traffic at the third unit fall outside of the windows for either increasing or decreasing the amount of the offset of the second phase from the first phase to move the receptions into the windows.

5,195,092

INTERACTIVE MULTIMEDIA PRESENTATION & COMMUNICATION SYSTEM

Steven D. Wilson, Chicago, and Karl W. McCalley, South Barrington, both of Ill., assignors to Telaction Corporation, Schaumburg, Ill.

Continuation of Ser. No. 662,378, Feb. 26, 1991, abandoned, which is a continuation of Ser. No. 566,990, Aug. 14, 1990, abandoned, which is a continuation of Ser. No. 295,765, Jan. 11, 1989, abandoned, which is a division of Ser. No. 271,086, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 81,189, Aug. 4, 1987, Pat. No. 4,792,849. This application Aug. 30, 1991, Ser. No. 754,290
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—94.2 **24 Claims**



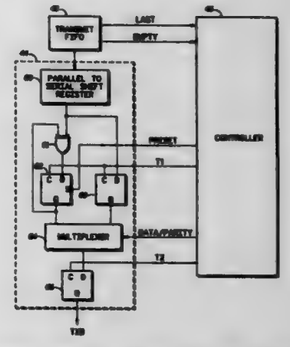
1. A distribution system for distributing digital data to a receiver wherein said digital data comprises block data which includes blocks of data corresponding to predetermined amounts of information, stream data corresponding to a continuous flow of information obtained from a plurality of stream data sources and control data, said distribution system comprising means for preferentially multiplexing and distributing said stream data from selected ones of said stream data sources onto frames of a single distribution channel along with said block data and means for multiplexing and sequentially distributing bytes of control data along said frames of said single distribution channel, said bytes of said control data being concatenated at said receiver to form a control channel of information for identifying said plurality of stream data sources.

5,195,093

METHOD AND APPARATUS FOR ENSURING CRC ERROR GENERATION BY A DATA COMMUNICATION STATION EXPERIENCING TRANSMITTER EXCEPTIONS

Moshe Tarrab, Holon; Yehuda Shalk, Ramat Gan, and Eliezer Weitz, Holon, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1991, Ser. No. 655,884
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—3 **8 Claims**



5. A communication controller of a data communication station, implementing a predetermined protocol, comprising:

a first-in, first-out memory having a data input for receiving input data, a data output, and a control output port for indicating an underrun condition;

a parallel-to-serial shift register having an input coupled to said data output of said first-in, first-out memory, and an output;

a parity bit generator having a data input coupled to said output of said parallel-to-serial shift register, a preset input for receiving a preset signal, and an output;

a multiplexer having a first input coupled to said output of said parity bit generator, a second input coupled to said output of said parallel-to-serial shift register, a control input terminal for receiving a data/parity signal, and an output for providing a transmit data output signal; and

a controller coupled to said first-in, first-out memory, to said parity bit generator, and to said multiplexer, for providing said preset signal to said parity bit generator as a beginning of a predetermined portion of a frame, and for providing said data/parity signal to select said first input of said multiplexer during an eighth bit of a byte in response to said first-in, first-out memory indicating said underrun condition.

5,195,094

OPTICAL DISK APPARATUS

Yoshiyuki Miyazaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1990, Ser. No. 586,299
Claims priority, application Japan, Sep. 29, 1989, 1-253957
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—13 **10 Claims**

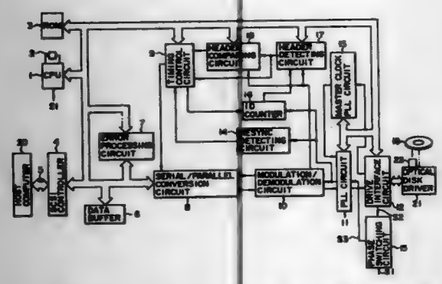
1. An optical disk apparatus comprising:

means for generating data to be recorded on a recording medium; the data including user's data and a RESYNC code used for compensating a sync offset of data occurring during reproduction;

recording/reproducing means connected to said data generating means, for optically recording the data generated by said data generating means on said recording medium and optically reproducing recorded data;

RESYNC detecting means for detecting the RESYNC code included in the data reproduced by said recording/reproducing means;

detecting means connected to said recording/reproducing means, for detecting an error in the data reproduced by said recording/reproducing means and permitting said recording/reproducing means to re-reproduce the recorded data in response to the detection of the error;



inverting means connected to said recording/reproducing means, for inverting the phase of the re-reproduced data and outputting phase-inverted re-reproduced data to said RESYNC detecting means so that said RESYNC detecting means re-detects a RESYNC code in the phase-inverted re-reproduced data; and

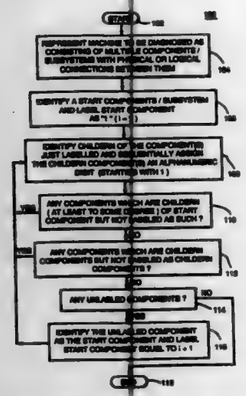
means for compensating a sync offset of data occurring during reproduction in response to the RESYNC code detected by said RESYNC detecting means.

5,195,095

ALGORITHM FOR IDENTIFYING TESTS TO PERFORM FOR FAULT ISOLATION

Rasiklal P. Shah, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1990, Ser. No. 635,442
Int. Cl.[5] G01R *31/28*; G06F *11/00*
U.S. Cl. 371—15.1 **14 Claims**



1. A method for identifying a test to perform for fault isolation, said method comprising the steps of:

(a) creating a diagram composed of blocks representing components of the system;

(b) representing connectivity of the components on the diagram;

(c) selecting a first start component;

(d) assigning a first label to the start component;

(e) identifying respective children components of the start component;

(f) assigning the respective children components of the start component respective labels, the respective labels being unique for each component and representing the component connectivity;

(g) selecting another start component if any component connectivity represented in the diagram is not represented by a label subsequent to performance of step (f) and, after selecting a second start component returning to step (e);

(h) storing the assigned component labels:

(i) upon generation of an error code, determining the component label of the component which generated the error code as a loop/string component;

(j) identifying upstream components of the loop/string component by sequentially deleting the right-most alphanumeric digit of the loop/string component label thereby generating a match label, and matching the match label with the labels of other components, any component label which matches the match label being tagged as an upstream component; and

(k) identifying downstream components of the loop/string component by comparing the left-most alphanumeric digits of labels of other components with the alphanumeric digits of the loop/string component label, any component label whose left-most alphanumeric digits match with the alphanumeric digits of the loop/string component label being tagged as a downstream component;

(l) identifying a test from a listing of tests, which satisfies predetermined conditions, and

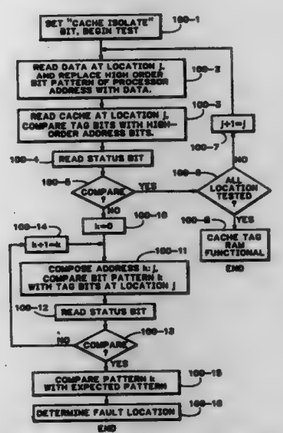
(m) selecting the identified test for performance.

5,195,096

METHOD OF FUNCTIONALLY TESTING CACHE TAG RAMS IN LIMITED-ACCESS PROCESSOR SYSTEMS

Matthew P. Moore, Bellevue, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation of Ser. No. 494,677, Mar. 16, 1990, abandoned. This application Mar. 9, 1992, Ser. No. 849,652
Int. Cl.[5] G11C *29/00*
U.S. Cl. 371—21.1 **1 Claim**



1. A method of functionally testing cache tag RAMs in systems having limited access to information contained in said cache tap RAMs, each of said cache tag RAMs corresponding to a cache data RAM having a series of address locations which are identical to a corresponding series of address locations of said cache tag RAM, comprising the steps of:

(a) loading said series of address locations of said cache tag RAMs and said corresponding series of address locations of said corresponding cache data RAMs with a sequence of test patterns such that identical address locations of said tag and data RAMs are loaded with identical test patterns;

(b) sequentially retrieving test patterns from each of said series of address locations of said tag RAMs and from each of said corresponding series of address locations of said data RAMs;

(c) comparing said test patterns retrieved from said series of address locations of said tag RAMs with test patterns retrieved from said corresponding series of address locations of said data RAMs at said corresponding identical address locations to determine existence of a fault at a faulty tag RAM address location having an unknown pattern of logic bits as indicated by a mismatch of said test patterns;

(d) applying a sequence of predetermined patterns of logic bits to a data RAM address location corresponding to said faulty tag RAM address location;

(e) iteratively comparing said unknown pattern of logic bits contained in said faulty tag RAM location with said sequence of predetermined patterns of logic bits until one of said predetermined patterns of logic bits matches said unknown pattern of logic bits contained in said faulty tag RAM address location; and

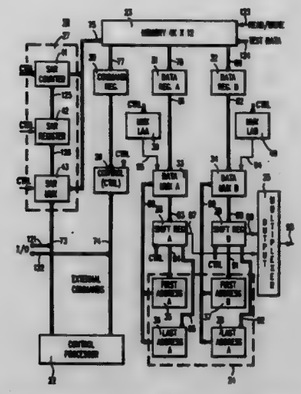
(f) comparing said one of said predetermined patterns of logic bits with a known pattern of logic bits for said faulty tag RAM location to determine from the mismatch therebetween the location of the fault.

5,195,097

HIGH SPEED TESTER

Richard Bogholtz, Jr., Mahopac; Louis J. Bosch, Hopewell Junction, and Thomas H. Mitchell, Jr., Cornwall, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1990, Ser. No. 602,433
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—27 **36 Claims**



1. A data processing apparatus comprising: memory means for storing and supplying data signals and codes;

cache means for storing a predetermined set of the data signals;

at least first and second shift registers connected to the memory means and the cache means, the shift registers operative to selectively receive the data signals and operative to shift the stored data signals onto first and second output lines at a predetermined clock cycle rate in response to first and second clock pulses, the second clock pulses being delayed with respect to the first clock pulses;

control means for providing operational control to the apparatus, the control means responsive to the data signals and codes stored in the memory means for controlling shift register data signals input from the memory means and the cache means, and further for controlling the storing of a predetermined set of data signals in the cache means; and

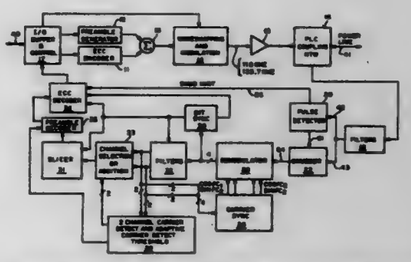
an output multiplexer connected to receive the data signals on the first and second output lines and operative to provide an output having recurrent groups of signals from the first and second registers.

5,195,098

BINARY DATA ERROR CORRECTION USING HINT SIGNAL

Howard W. Johnson, Sunnyvale; Philip H. Satterlin, San Jose, and Amy O. Hurlbut, San Francisco, all of Calif., assignors to Echelon Corporation, Palo Alto, Calif.

Filed May 10, 1991, Ser. No. 698,602
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—37.2 **12 Claims**



1. In an apparatus for handling a signal representing binary data, an improved method for correcting errors in said binary data comprising the steps of:

examining said signal for noise pulses which exceed certain limits;

determining which datum was present in said binary data at the point in said signal where said noise pulse occurred;

verifying the correctness of a predetermined group of data which includes said datum; and,

changing the state of said datum if said data was found to be incorrect by said verifying step.

5,195,099

SEMICONDUCTOR MEMORY DEVICE HAVING IMPROVED ERROR CORRECTING CIRCUIT

Osamu Ueda, and Tsuyoshi Toyama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 461,968, Jan. 8, 1990, abandoned. This application Jul. 7, 1992, Ser. No. 908,898
Claims priority, application Japan, Apr. 11, 1989, 1-92532
Int. Cl.[5] H03M *13/00*
U.S. Cl. 371—40.4 **9 Claims**

1. A semiconductor memory device having an error correcting function, comprising, on a chip:

means for inputting first data:

means for converting said first data into second data including error correction data;

first memory cells for storing said first data therein;

second memory cells for storing said second data including error correction data;

error detecting means responsive to said data stored in said first and second memory cells for detecting a data error of said data stored in said first memory cells;

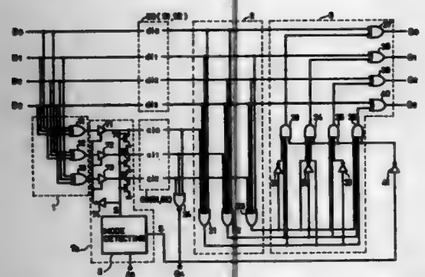
error correcting means connected to said first memory cells and responsive to said error detecting means for correcting an error of data supplied by said first memory cells;

test data generating means connected between said means

for converting said first data into second data including error correction data and said second memory cells, and including

mode detecting means outputting a signal of either a first and second level in response to a test mode signal, and

a plurality of common type field effect transistors, each having its gate electrode connected to the output of said mode detecting means, for providing predetermined patterns of test data; and



test data validation means responsive to said test data stored in said second memory means for supplying a memory data fault signal, wherein

said second data including error correction data are stored to said second memory cells in response to said first level of said signal output from said mode detecting means, and

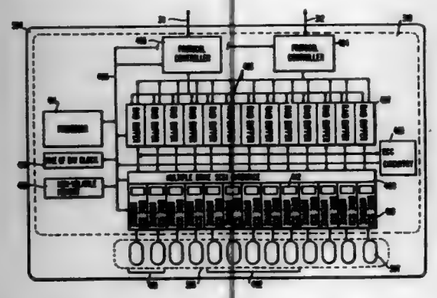
said predetermined patterns of test data are stored to said second memory cells in response to said second level of said signal output from said mode detecting means.

5,195,100

NON-VOLATILE MEMORY STORAGE OF WRITE OPERATION IDENTIFIER IN DATA STORAGE DEVICE

Randy H. Katz, Berkeley; David T. Powers, Morgan Hill; David H. Jaffe, Belmont; Joseph S. Glider, Mountain View, and Thomas E. Idleman, Santa Clara, all of Calif., assignors to Micro Technology, Inc., Anaheim, Calif.

Filed Mar. 2, 1990, Ser. No. 487,648
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—66 2 Claims



1. A memory for a computer system having a central processing unit, the memory comprising:

a plurality of physical blocks of memory for storing data, said physical blocks being distributed among a set of physical devices operable as one or more logical units;

multiple storage device controller means connected to the set of physical devices for routing data to said physical blocks of memory in response to a write request from the central processing unit, said multiple storage device controller means including processor means for controlling the routing of data to said physical blocks;

nonvolatile storage means, including a programmable semiconductor memory circuit coupled to said processor means in the multiple storage device controller means, for retaining programmed information in the absence of power to the multiple storage device controller means;

first means for programming the nonvolatile storage means with information indicating that a write operation involving the plurality of blocks of data is in progress and information uniquely identifying the write operation;

second means for storing with each of the plurality of blocks of data information uniquely identifying the most recent write operation involving the block of data;

means, responsive to the completion of a write operation, for erasing from the nonvolatile storage means the information that indicates that the write operation was in progress;

means, responsive to a power failure in the multiple storage device controller means which interrupts execution of a write request by said processor means, for checking whether the information in the nonvolatile storage means that indicates that the write operation was in progress has been erased; and

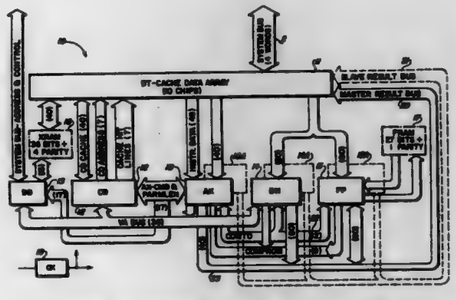
means for checking, for each block of data involved in a write operation in progress at the time of a power failure in the multiple storage device controller means, the information stored by said fist storing means uniquely identifying the write operation with the information stored with the block in memory by said second storing means uniquely identifying the most recent write operation involving the block of data to determine if there is a disparity indicating that the block in memory was not stored during the power failure interrupted write operation.

5,195,101

EFFICIENT ERROR DETECTION IN A VLSI CENTRAL PROCESSING UNIT

Russell W. Guenthner; Bruce E. Flocken, and Ronald E. Lange, all of Glendale, Ariz., assignors to Bull HN Information Systems Inc., Phoenix, Ariz.

Filed Jun. 28, 1990, Ser. No. 546,204
Int. Cl.[5] G06F *15/40*
U.S. Cl. 371—68.3 9 Claims



1. A central processing unit of a data processing system comprising:

first basic processing unit means for executing computer instructions and producing a result for each computer instruction executed;

second basic processing unit means for executing computer instructions and producing a result for each computer instruction executed; the first and second basic processing unit means concurrently executing the same computer instruction and producing the result of the execution of the same computer instruction concurrently;

a cache unit, said cache unit including random access memory means for storing one of the two concurrently produced results produced by the basic processing unit means as a result of the execution of the same computer instruction by the first and second basic processing unit means;

first result bus means for transmitting the result of the execution of each computer instruction by the first basic processing unit means to the cache unit;

second result bus means for transmitting the result of the execution of each computer instruction by the second basic processing unit means to the cache unit; the first and second result bus means transmitting the results of the execution of the same computer instruction by the first and second basic processing unit means to the cache unit concurrently;

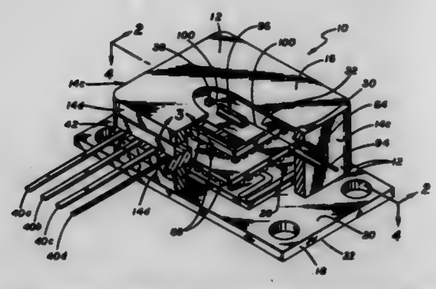
the cache unit further including buffer means for temporarily storing the results of the concurrent execution of the same instruction by the first and second basic processing unit means transmitted to the cache unit by the first and second result bus means; and means for comparing the results temporarily stored in the buffer means at the same time and for producing an error signal if the results stored in the buffer means at the same time do not compare; the result of one of the basic processing unit means stored in the buffer means at the same time being stored into the random access memory means of the cache unit if no error signal is produced by the means for comparing.

5,195,102

TEMPERATURE CONTROLLED LASER DIODE PACKAGE

Thomas McLean, and Gregory S. Moore, both of Los Angeles County, Calif., assignors to Litton Systems Inc., Beverly Hills, Calif.

Filed Sep. 13, 1991, Ser. No. 760,036
Int. Cl.[5] H01S *3/04*
U.S. Cl. 372—34 13 Claims



1. A temperature controlled package for enclosing at least one component operating at a temperature, said temperature controlled package being coupled to receive an input signal from an external input signal source and to receive a thermoelectric control signal from an external thermoelectric control signal source, said temperature controlled package comprising:

a case having sidewalls characterizing a closed perimeter, a cover and a base having an input surface and an output surface, the sidewalls being integrally coupled to the base input surface to define an interior region;

a heatsink having a top surface and a bottom surface;

at least one component coupled to the heatsink top surface, said component dissipating power into said heatsink top surface in response to the input signal to provide an output signal;

a thermoelectric cooler means having an input surface coupled to the heatsink bottom surface and an output surface coupled to the base input surfaced, the control signal delivering an amount of power to the thermoelectric cooler means for moving heat from the thermoelectric cooler input surface to the thermoelectric cooler output surface, the cover being coupled to the sidewalls to form a sealed interior region, the cover and sidewalls having an outer and inner surface; the thermoelectric cooler means with heatsink and component thereon extending into the sealed interior region and having a plurality of exposed surfaces;

heat moving from the cover and sidewalls inner surface to the exposed surfaces in response to a temperature gradient between the cover and sidewalls inner surface and the exposed surfaces;

insulation gas means filling the sealed interior region between the sidewall and cover inner surface and the exposed surfaces for limiting the movement of heat from the sidewalls and cover inner surface to the exposed surfaces of the thermoelectric cooler means with heatsink and component thereon extending into the sealed interior region;

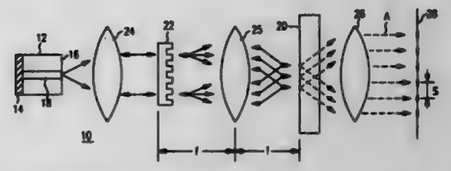
whereby the amount of power expended by the thermoelectric cooler control signal in driving the thermoelectric cooler to obtain a change in the temperature of the component is reduced.

5,195,103

EXTERNALLY MODULATED LASER SOURCE FOR ARRAY ILLUMINATION

Harvard S. Hinton, Batavia, and Rick L. Morrison, Naperville, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 21, 1991, Ser. No. 703,538
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—96 17 Claims



1. An optical source comprising

a semiconductor optical gain medium including a reflective rear facet and a transmissive front facet for generating a coherent optical signal;

a partially reflecting mirror element aligned with the transmissive front facet of said optical gain medium and physically separated therefrom to form an externally modulated laser which includes an optical cavity;

a diffraction grating transversely disposed to receive the optical signal from the transmissive front facet of said gain medium and optically aligned with the partially reflecting mirror so as to form a plurality of diffracted optical beams as an output of the optical source;

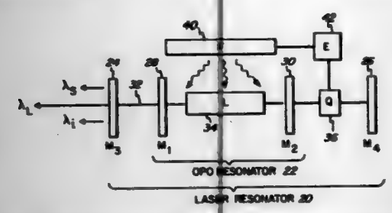
first collimating lensing means disposed between the optical gain medium and the diffraction grating for collimating the coherent optical signal generated by said gain medium;

Fourier transform lensing means disposed between the diffraction grating and the partially reflecting mirror for providing optical signal coupling therebetween; and

second collimating lensing means disposed beyond the partially reflecting mirror element for collimating the optical signal generated by said partially reflecting mirror element.

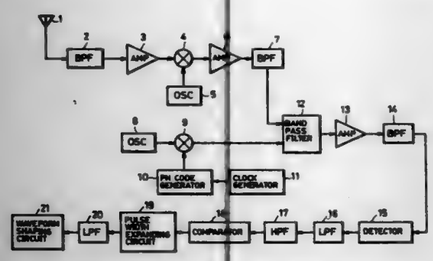
VOL 1148 ISS 3 MR 16 1993 UMI

5,195,104
INTERNALLY STIMULATED OPTICAL PARAMETRIC OSCILLATOR/LASER
Allen R. Geiger, and Narasimha S. Prasad, both of Las Cruces, N. Mex., assignors to Lasen, Inc., Las Cruces, N. Mex.
Filed Oct. 15, 1991, Ser. No. 777,705
Int. Cl.[5] H01S *3/081*; H03F *7/00*
U.S. Cl. 372—97 34 Claims



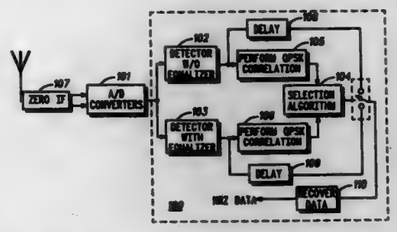
1. An optical parametric oscillator/laser system comprising:
an optical pump source for generating pump radiation;
an embedded dual optical resonator comprising a laser resonator and an optical parametric oscillator resonator, said laser resonator and said optical parametric oscillator resonator being coaxial and having a common cavity region; and
an optical parametric oscillator/laser material coaxially disposed within the common cavity region of said laser resonator and said optical parametric oscillator resonator, and responsive to said pump radiation to generate laser radiation and responsive to said laser radiation to generate parametric optical radiation.

5,195,105
SPREAD SPECTRUM RECEIVER
Takeshi Hashimoto, and Yoshitaka Uchida, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1991, Ser. No. 720,723
Claims priority, application Japan, Jun. 26, 1990, 2-167933
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 4 Claims



1. A spread spectrum receiver comprising:
a reference signal source for generating a reference signal;
a correlator, in which a received signal and a reference signal are inputted to obtain a correlation output;
detecting means coupled to said correlator for converting an output of said correlator into base band information which includes frequency components; and
a high pass filter coupled to said detecting means for removing from said base band information at least the frequency components thereof which are in a frequency range bounded by frequencies of zero and approximately $1/\tau$, τ being a gate delay time of said correlator.

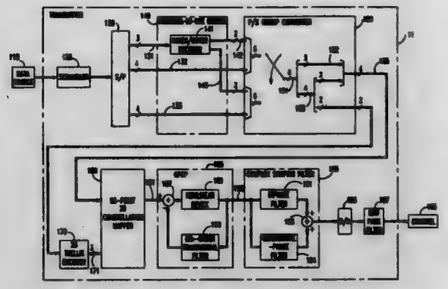
5,195,106
METHOD FOR CHANNEL ADAPTIVE DETECTING/EQUALIZE
Henry L. Kazecki, Arlington Heights; Steven H. Goode, Barrington; Donald W. Dennis, Schaumburg; James C. Baker, Hanover Park; Kevin L. Baum, Hoffman Estates, and Bruce D. Mueller, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 14, 1990, Ser. No. 612,656
Int. Cl.[5] H03H *7/30*
U.S. Cl. 375—12 20 Claims



1. A method for adaptive detection/equalization of radio frequency communication channels, over which a plurality of symbols are transmitted, in a communication device having a detection algorithm without an equalizer and a detection algorithm with an equalizer, the detection algorithms generating data for use by the communication device, the method comprising the steps of:
a) measuring a first correlation history for the detection algorithm without the equalizer;
b) measuring a second correlation history for the detection algorithm with the equalizer;
c) if the first correlation history is greater than a predetermined threshold, using the data from the detection algorithm without the equalizer;
d) if the first correlation history is less than or equal to the predetermined threshold and less than the second correlation history, using the data from the detection algorithm with the equalizer; and
e) if the first correlation history is less than or equal to the predetermined threshold and greater than or equal to the second correlation history, using the data from the detection algorithm without the equalizer.

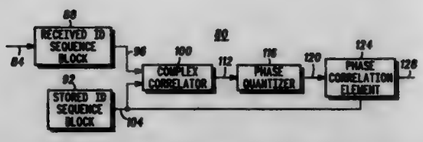
5,195,107
TECHNIQUE FOR COMPENSATING FOR INTERSYMBOL INTERFERENCE
Lee-Fang Wei, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 11, 1990, Ser. No. 625,406
Int. Cl.[5] H04L *25/34*
U.S. Cl. 375—18 18 Claims

1. Data transmission apparatus comprising
means for selecting signal points from a signal constellation derived from a rectangular lattice which includes a plurality of signal points within a polygonal region having more than four sides, each of said plurality of signal points being representative of data;
means for processing the selected signal points using a generalized partial response signaling (GPRS) technique such that subsequent distortion affecting accurate recovery of said selected signal points is reduced, the processed signal points occupying a region substantially identical to said polygonal region; and



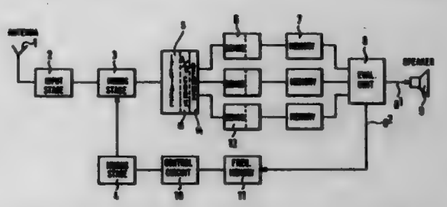
means for transmitting a signal representing said processed signal points.

5,195,108
SYSTEM AND METHOD FOR DETERMINING ABSOLUTE PHASE OF A DIFFERENTIALLY-ENCODED, PHASE-MODULATED SIGNAL
Kevin L. Baum, Hoffman Estates, and Bruce D. Mueller, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 30, 1991, Ser. No. 767,963
Int. Cl.[5] H04L *27/22*
U.S. Cl. 375—84 30 Claims



1. A method for determining an absolute phase value of at least one symbol of a differentially-encoded, phase-modulated signal comprised of sequences of symbols transmitted to a receiver, said method comprising the steps of:
storing values, to form thereby a stored set of values, representative of absolute phase values of a predetermined sequence of symbols of a portion of a desired, phase-modulated signal;
comparing the values of the stored set of values representative of the absolute phase values of the predetermined sequence of symbols with a sequence of symbols of the differentially-encoded, phase-modulated signal transmitted to the receiver, thereby forming a comparison value comprised of at least one component portion wherein said comparison value is indicative of differences between the values of the stored set of values and the sequence of symbols transmitted to the receiver associated therewith;
determining an absolute phase value of the at least one symbol of the sequence of symbols of the differentially-encoded, phase-modulated signal transmitted to the receiver responsive to values of said at least one component portion of the comparison value formed during said step of comparing.

5,195,109
DIGITAL RADIO RECEIVER WITH PROGRAM-CONTROLLED MIXING OSCILLATOR FREQUENCY
Harald Bochmann, Hannover; Henrik Schulze, Peine; Joachim Hagenauer, and Peter Höher, both of Seefeld, all of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Fed. Rep. of Germany
Filed Feb. 4, 1991, Ser. No. 650,042
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1990, 4003082
Int. Cl.[5] H04B *7/10*; H04L *1/02*
U.S. Cl. 375—100 2 Claims

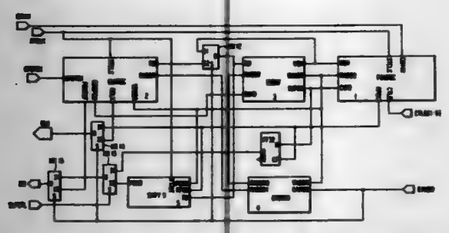


1. A frequency division multiplex receiver for radio broadcast signals transmitted digitally over a frequency-hopping carrier signal whose frequency remains constant during a time slot between each two hops, comprising
a control circuit (10), which controls which frequency is tuned for reception, during each time slot, by means of an output;
a mixing oscillator (4) having an input, connected to said output of said control circuit (10), and an output;
an input stage (2) with an input adapted for connection to an antenna (1);
a mixing stage (3) having two inputs, a first one of which is connected to an output of the input stage (2);
an intermediate frequency filter stage (5) operating at a constant intermediate frequency, and including a demultiplexer (14) having a plurality of outputs;
a plurality of demodulators (6), each connected to a respective one of said outputs of said demultiplexer (14);
a plurality of memories (7), each connected to a respective output of one of said demodulators (6); and
an evaluation unit (8), having a plurality of inputs, each connected to a respective output of one of said memories, and a data output (82) coupled to an input of said control unit (10); wherein
said output of said mixing oscillator (4) is connected to a second input of said mixing stage (3), said oscillator being cyclically variable in its characteristic frequency by predetermined frequency differences, and thereby translating a plurality of sequentially different carrier signal frequencies to said constant intermediate frequency;
said demodulators (6) each process a respective multiplex subcarrier modulated upon the carrier signal and derive therefrom binary signals demodulated from the subcarriers;
said memories (7) temporarily store said binary signals;
said evaluation unit (8) reads said binary signals and synchronously tracks changes in said carrier signal frequency and signals, on its data output, to said control unit to perform a frequency hop;
whereupon said control circuit (10) retrieves a next frequency, to be used during the time slot after the hop, from a frequency memory (11) and directs said mixing oscillator (4) to change its characteristic frequency to provide, to said mixing stage (3), a signal which will translate said next frequency to said constant intermediate frequency; and
wherein the duration of each time slot is long compared with the duration of a binary signal period.

339-699 O.G.-93-21

VOL 1148 ISS 3 MR 16 1993 UMI

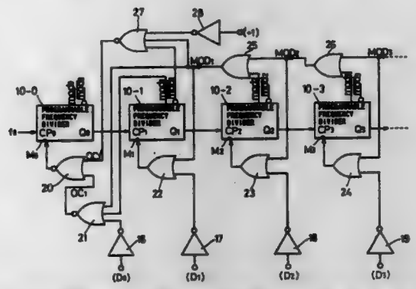
5,195,110
CLOCK RECOVERY AND DECODER CIRCUIT FOR A CMI-ENCODED SIGNAL
Steven S. Gorshe, Beaverton, Oreg., assignor to NEC America, Inc., Melville, N.Y.
Filed Apr. 1, 1991, Ser. No. 678,400
Int. Cl.[5] H04L 7/02
U.S. Cl. 375—110 25 Claims



1. A circuit for recovering a data clock, said circuit receiving at a transfer rate (1/N) a signal containing coded marked inversion (CMI)-encoded data bits, each bit of an original data signal being encoded into a pair of data bits, said pair of data bits being transmitted within a data period (N), comprising:
sampling means for sampling a received CMI-encoded signal at a predetermined rate and outputting samples of said CMI-encoded signal;
edge detection means responsive to said samples for detecting the occurrence of at least every third boundary separating each pair of data bits and outputting an edge detection signal;
first clock recovery means, including means for generating a guardband range signal, for extracting a timing signal from said CMI-encoded signal and generating an initial clock signal which is resynchronized on each occurrence of said edge detection signal occurring outside of said guardband range signal;
second clock recovery means responsive to at least one phase control signal, said second clock recovery means including means for phase-locking said data clock to said initial clock signal and means for de-jittering said data clock so as to produce a de-jittered representation of said initial clock signal; and
phase control means for producing said at least one phase control signal.

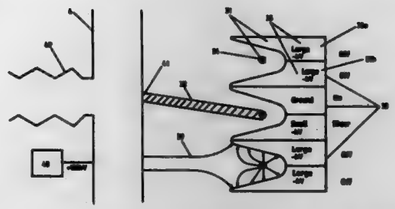
5,195,111
PROGRAMMABLE FREQUENCY DIVIDING APPARATUS
Nobuyuki Adachi; Kazuo Yamashita, and Akiharu Inoue, all of Mitaka, Japan, assignors to Nihon Musen Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 13, 1991, Ser. No. 744,448
Claims priority, application Japan, Sep. 7, 1990, 2-237386; Sep. 7, 1990, 2-237387
Int. Cl.[5] H03K 21/38
U.S. Cl. 377—52 15 Claims

1. A programmable frequency dividing apparatus comprising:
a programmable frequency dividing network comprising a plurality of cascade-connected programmable frequency dividing stages each of which divides a frequency of an input clock pulse by two or three based on a logic level of a preset input signal supplied thereto for changing a division ratio; and
means for incrementing a division ratio of said programmable frequency dividing network by +1, said incrementing means comprising gating means for detecting whether or not each of outputs of programmable frequency dividing stages of said programmable frequency dividing network subsequent to a second stage of said programmable frequency dividing network assumes a predetermined pattern, and for setting a preset input signal applied to a first stage of said programmable frequency dividing network to a changeover level for causing the first stage of said



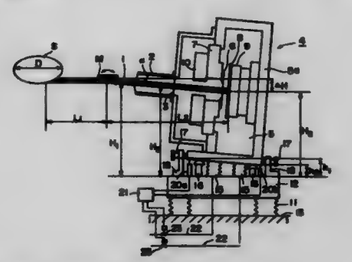
programmable frequency dividing network to divide the frequency of the clock pulse by three when an instruction signal for incrementing a division ratio by +1 is inputted to said gating means.

5,195,112
X-RAY COMPUTER TOMOGRAPHY SYSTEM
Paul Vincent, Karlsruhe; Günther Laukien, Rheinstetten, and Arne Kasten, Karlsruhe, all of Fed. Rep. of Germany, assignors to Bruker Analytic, Fed. Rep. of Germany
Filed May 3, 1991, Ser. No. 695,517
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015105
The portion of the term of this patent subsequent to Mar. 2, 2010, has been disclaimed.
Int. Cl.[5] A61B 6/00
U.S. Cl. 378—10 35 Claims



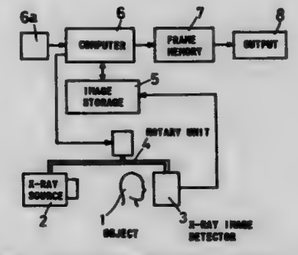
1. In an X-ray computer tomography system for generating an image of an object, the system having a plurality of stationary electron sources, each of the plurality of electron sources having means for emitting electrons and being arranged in proximity to a stationary anode, means for applying an electric potential between each of the plurality of electron sources and the anode to accelerate the electrons from each of the plurality of electron sources to the anode so that the electrons collide with the anode at focal spots and generate X-ray radiation, a detector responsive to the X-ray radiation for generating image signals, and means responsive to the image signals for generating an image, the improvement comprising means located proximal to the electron emitting means in each of the plurality of electron sources for directing electrons moving from the electron emitting means to the anode and means for generating a steering field between the directing means and the electron emitting means so that the focal spots are swept over predetermined portions of the anode before any substantial acceleration of the electrons takes place.

5,195,113
X-RAY EXPOSURE APPARATUS AND METHOD OF POSITIONING THE SAME
Osamu Kuwabara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 27, 1991, Ser. No. 766,175
Claims priority, application Japan, Sep. 28, 1990, 2-259646
Int. Cl.[5] G21K 5/00
U.S. Cl. 378—34 9 Claims



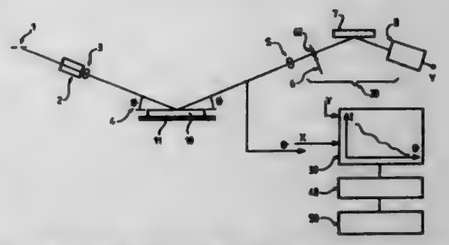
1. An X-ray exposure apparatus comprising:
an X-ray beam generating source;
an exposure apparatus body disposed
independently from the X-ray beam generating source, said exposure apparatus body including an outer casing defining an exposure chamber;
an alignment optical system accommodated in the exposure chamber;
supporting means disposed on a base for supporting the exposure apparatus body to be swingable thereto;
raising means mounted on the supporting means for raising the exposure apparatus body in a floating manner and adjusting a height position and an inclination thereof so that an optical axis of the alignment optical system substantially coincides with an axis of an irradiated X-ray beam; and
securing means for securing the exposure apparatus body after adjusting the height position and the inclination thereof.

5,195,114
DIGITAL PANORAMIC RADIOGRAPHIC APPARATUS
Eiko Saireaji, and Yoshisori Arai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed Oct. 1, 1991, Ser. No. 769,862
Claims priority, application Japan, Oct. 5, 1990, 2-269212
Int. Cl.[5] A61B 6/14
U.S. Cl. 378—40 5 Claims



1. A digital panoramic radiographic apparatus, comprising:
a rotary means having an X-ray source disposed opposite to an X-ray image detection section for detecting the image of the X-ray which penetrated an object to be photographed, with said object positioned therebetween, and rotating said X-ray source and said X-ray image detection section as an integrated unit around said object,
an image storage means which sequentially stores image information obtained by said X-ray image detection system, and
an image processing means which sequentially derives electric data of image information which corresponds to each frame of the X-ray image from said image storage means at predetermined time intervals, electrically adds each electric data while shifting the position of each electric data by a predetermined distance in the image movement direction along a series of frames of X-ray image to digitally form an image on a specific tomographic image layer as a first panoramic original image, and also to form an image on a given tomographic image layer other than said specific tomographic image layer as a second panoramic original image depending on the interval for deriving said electric data of each frame of the X-ray image and the shift amount, then converts said second panoramic original image to a projected panoramic image generated when said second panoramic original image is projected to said specific tomographic image layer and subtracts said projected panoramic image from said first panoramic original image to digitally form the panoramic image of said specific tomographic image layer.

5,195,115
X-RAY DIFFRACTOMETER DEVICE AND USE OF THIS DEVICE
Claude Schiller, Savigny-Sur-Orge, and Jean-Pierre Weber, Saint-Maur, both of France, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jul. 22, 1991, Ser. No. 733,925
Claims priority, application France, Jul. 24, 1990, 90 09443
Int. Cl.[5] G01N 23/207
U.S. Cl. 378—73 10 Claims



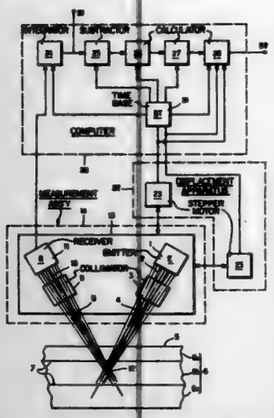
1. An X-ray diffractometer device, comprising an X-ray source generating a beam of X-rays, a collimator device for the source, a sample support, a collimator device for the beam reflected by the sample and a counter producing an output signal in the form of a voltage which is proportional to the number of photons reflected by the sample, characterized, in that, it furthermore includes:
a motor drive for the sample support;
means for recording the signal Y supplied by the proportional counter as a function of the angle e between the plane of incident of the sample and the incident beam, denoted X;
mechanical means having a support for a plurality of filters having different absorption coefficients and including a motor drive for this filter support;
data processing means including means for:
measuring the value of the signal Y originating from the proportional counter relative to ranges whose boundaries are predetermined; and if a boundary has been reached, for:
causing a recording interrupt and an interruptor of the sample motor drive to stop;
selecting a filter from the plurality of filters;

causing the start of an interruptor of the filter support motor drive in such a manner as to move the selected filter into the path of the X-ray beam reflected by the sample;
causing the start of the recording interrupt and the interruptor of the sample motor drive.

5,195,116
COMPTON-EFFECT METHOD AND SYSTEM FOR LOCATING A PLANE SEPARATING TWO MEDIA OF DIFFERENT DENSITIES

Christian M. Le Floc'h, Blanquefort; Pierre Sarrazin, Bordeaux; Daniel M. Babot, and Gilles G. Peix, both of Villeurbanne, all of France, assignors to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jan. 22, 1992, Ser. No. 823,818
Claims priority, application France, Jan. 30, 1991, 91 01051
Int. Cl.[5] G01B *15/02*
U.S. Cl. 378—89 6 Claims



5. A method of localizing the separation plane between two media of different densities, relative to a reference plane parallel to said separation plane and at a fixed distance therefrom, said media being suitable for being irradiated by a beam of X-rays or of gamma rays from an emitter and producing Compton effect scattering that is detected by a receiver which responds thereto by providing a first signal, said receiver being carried by a support, wherein the method comprises a sequence of cycles corresponding to measurements relating to a sequence of analyzed volumes spaced apart along a line substantially perpendicular to said reference plane, each of said cycles including the following steps:
controlling a displacement apparatus to obtain controlled displacement of said support relative to said reference plane in a direction substantially perpendicular thereto;
emitting a beam of X-rays or of gamma rays at regulated intensity from an emitter fixed on said support;
spatially filtering said beam by passing it through a first collimator that includes at least one slot, the collimator being fixed on said support and the elementary beam passing through said slot being directed towards an elementary volume of elongate shape extending parallel to the looked-for separation plane between the media, which elementary volume is capable of being occupied by said media, said first collimator being situated at the outlet from the emitter;
spatially filtering the Compton effect radiation emitted by said elementary volume by passing the radiation through a second collimator that includes a plurality of slots, the second collimator being fixed on said support, the slots converging on said elementary volume such that the elementary beams passing through the slots are concentrated in said elementary volume, the collimator being situated in front of the detector of the receiver, said support, said emitter, said first and second collimators and said receiver constituting a measurement assembly whose position relative to the said reference plane is identical to that of said support;
integrating said first signal relative to time in an integrator for performing integration relative to time under the control of the time base, which integrator receives said first signal and provides a second signal representative of the time integral of said first signal over a time period defined by the time base;
subtracting the second signal relating to the preceding cycle from said second signal relating to the current cycle in a subtractor controlled by said time base and receiving said second signal, thereby obtaining a third signal;
differentiating said third signal relative to the relative displacement distance between the measurement assembly and the reference plane in a first calculation means controlled by said time base and receiving said third signal, thereby obtaining a fourth signal;
calculating a number in a second calculation means controlled by said time base and receiving said fourth signal the sign of said number being identical to that of the fourth signal, and its absolute value being equal either to the difference obtained by subtracting a predetermined positive number from said fourth signal, when the result of the subtraction is positive, or else is equal to zero when said result is negative or zero, thereby obtaining a fifth signal;
calculating a sixth signal in a third calculation means controlled by said time base and having a first input receiving said fifth signal and a second input receiving the command issued by the time base to cause relative displacement of said support relative to the reference plane and substantially perpendicular thereto, the third calculation means storing said fifth signal and generating said sixth signal when said fifth signal is zero or of opposite sign to the fifth signal generated during the preceding cycle, said sixth signal being representative of a displacement distance of the measurement assembly relative to its initial position at the beginning of said sequence of cycles, which distance corresponds to the relative position of the barycentre of successive distances relating to the most recent sequence of non-zero fifth signals of the same sign calculated during the preceding cycles, the value of each such fifth signal of such a sequence weighting the displacement distance at which the measurement assembly is to be found from its initial position during the cycle in which said fifth signal is generated, said barycentre being situated in a separation plane between two adjacent media.

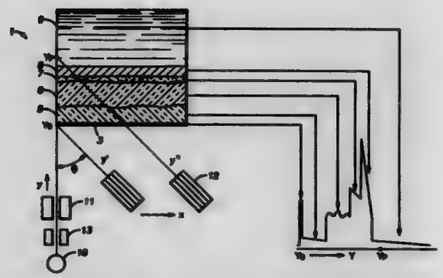
5,195,117
METHOD FOR USING SECONDARY RADIATION SCATTERING TO EVALUATE THE THICKNESS OF MATERIALS

Poen S. Ong, Houston, Tex., assignor to University of Houston, Houston, Tex.

Filed Apr. 24, 1992, Ser. No. 874,274
Int. Cl.[5] G01N *23/201*
U.S. Cl. 378—89 3 Claims

1. A method of evaluating the thickness of a first material having first and second sides, the second side adjacent to a second material of suitably low photoelectric absorption, comprising the steps of:
bombarding the first side of the first material with a primary radiation selected from the group consisting of X-rays and gamma rays wherein the primary radiation is both scattered and absorbed by the first and second materials;
measuring the intensity of the radiation incident to the first side of the first material;

detecting the intensity of the radiation scattered from the second material; and

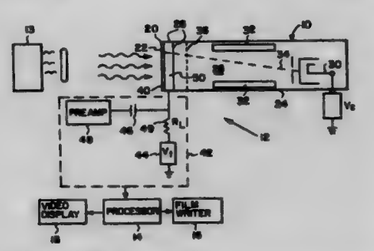


evaluating the thickness of the first material by comparing the incident radiation to the radiation scattered from the second material.

5,195,118
X-RAY AND GAMMA RAY ELECTRON BEAM IMAGING TUBE

Sol Nudelman, Avon, and Donald R. Ouimette, Plantsville, both of Conn., assignors to The University of Connecticut, Farmington, Conn.

Filed Jul. 11, 1991, Ser. No. 728,652
Int. Cl.[5] H05G *1/64*
U.S. Cl. 378—99 23 Claims

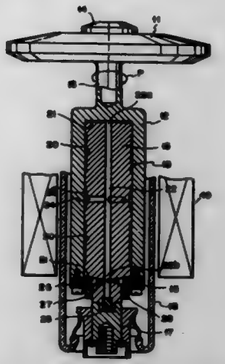


1. An imaging tube comprising:
sensor-target means comprising signal plate means for detecting irradiating photons and providing sufficient storage capacity to hold electrons on the surface of said sensor-target means, said target means comprising:
scintillator means for absorbing high energy radiation and generating a photon output proportional to the absorbed radiation, said scintillator means comprising a layer substantially composed of CsI;
photoconductor means responsive to said photon output for producing a charge distribution to form an electronic image of the radiation incident to said scintillator means, said photoconductor means comprising means for preventing saturation by said photon output comprising a layer substantially composed of a material selected from the group consisting of amorphous silicon, amorphous selenium, cadmium sulphide, antimony trisulphide and antimony sulphide oxysulphide; and
electron optics means for generating a low velocity electron beam and directing said beam in raster fashion at said photoconductor means,
so that an electronic image from high energy radiation directed at said target means is acquired at said signal plate means for transmittal to a video readout circuit.

5,195,119
ROTARY-ANODE TYPE X-RAY TUBE

Katsuhiro Ono, Utsunomiya; Hidero Anno; Hiroyuki Sugiura, both of Ootawara; Takayuki Kitami, Tochigi, and Hiroaki Tazawa, Ootawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1991, Ser. No. 766,275
Claims priority, application Japan, Oct. 5, 1990, 2-266269; Oct. 5, 1990, 2-266272
Int. Cl.[5] H01J *35/26*
U.S. Cl. 378—133 14 Claims



1. A rotary-anode type X-ray tube comprising:
an anode target;
a rotary structure which has a rotation center axis and to which said anode target is fixed;
a stationary structure, coaxially arranged with said rotary structure, for rotatably supporting said rotary structure, said stationary structure having an opening on its outer surface where a low pressure is generated; and
a hydrodynamic bearing formed between said rotary structure and said stationary structure at a portion other than where said opening on the outer surface of said stationary structure is located, said hydrodynamic bearing having a gap in which a metal lubricant is applied, the metal lubricant being in liquid state during rotation of said rotary structure,
a vacuum envelope in which said rotary and stationary structures and said hydrodynamic bearing are installed,
a lubricant storage chamber for receiving the metal lubricant, said lubricant storage chamber formed in said stationary structure, said stationary structure being arranged on the rotation center axis, said lubricant storage chamber communicating with the gap in said hydrodynamic bearing via said opening in the outer surface of said stationary structure.

5,195,120
METHOD, TUBE AND SYSTEM FOR ELIMINATING A FIXED ANTISCATTER GRID IN A RADIOLOGICAL IMAGE

Bernard Evain, Issy les Moulineaux; Olivier Peyret, Grenoble, and Horia Dumitrescu, Guyancourt, all of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France

Filed Dec. 23, 1991, Ser. No. 811,649
Claims priority, application France, Dec. 28, 1990, 90 16464
Int. Cl.[5] G21K *1/00*
U.S. Cl. 378—154 2 Claims

1. In a radiological apparatus comprising at least one X-ray source irradiating an object to be examined that is located at a distance c from said source, and an antiscatter grid with a spatial frequency F_g placed between said object and a receiver

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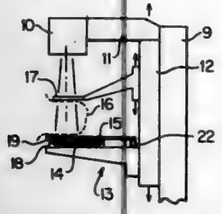
located at a distance d from said object, a method enabling the elimination of the image of said antiscatter grid that consists in:

keeping the antiscatter grid fixed,



simultaneously irradiating said object by a second source of X-rays having a spatial energy distribution that is substantially identical to that of the first source, and

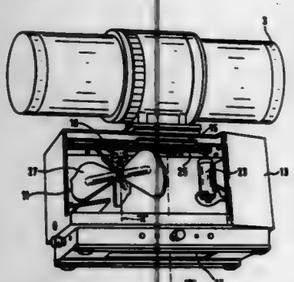
choosing the distance b between the two X-ray sources so that:

$$b = \frac{G}{G-1} \cdot \frac{1}{2F_g} \quad (1)$$

with a magnification

$$G = \frac{c+d}{c} \quad (2)$$

5,195,121
X-RAY BEAM MODULATOR
Pierre Charrier, St-Hubert, Canada, assignor to B.C. Medical Ltd., St-Hubert, Canada
Filed Jan. 22, 1992, Ser. No. 823,466
Int. Cl.[5] G21K *5/10*
U.S. Cl. 378—160 **10 Claims**



1. An apparatus for modulating the intensity of an X-ray beam generated in a given direction by an X-ray tube, said apparatus comprising:

a rotor having a rotation axis parallel to said given direction, said rotor being positioned adjacent said X-ray beam;

means to drive said rotor about its rotation axis at variable speeds;

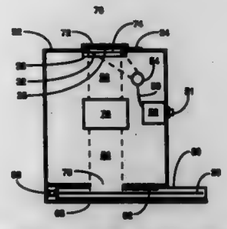
a set of at least three blades made of a material opaque to X-ray, each of said blades comprising a central hub and a pair of symmetrical wings extending away from said hub, the blades of said set having their hubs slidably mounted on a corresponding set of radially projecting shafts symmetrically positioned about said rotor;

return spring means to urge each of said blades radially inwardly towards said rotor along their respective shafts; and

guiding means on each pair of hub and shaft to cause the corresponding blade to pivot about the shaft on which it is mounted when the speed of the rotor increases and the blades are then moved in unison radially outwardly against the action of the return spring means as a result of the centrifugal force;

wherein said blades and their shafts are sized to cause said blades to intersect said X-ray beam when said rotor is driven and thus to modulate the intensity of said X-ray beam as a function of the annular position of the blades about their shafts, which allow more or less radiation to pass therebetween.

5,195,122
MARKER FOR EXPOSURE SIDE OF MEDICAL RADIOGRAPH INCLUDED WITH PATIENT IDENTIFICATION DATA
Carl E. Fabian, 577 NE. 96th St., Miami Shores, Dade County, Fla. 33138
Continuation-in-part of Ser. No. 655,804, Feb. 13, 1991, abandoned. This application Jan. 24, 1992, Ser. No. 825,530
Int. Cl.[5] H05G *1/28*
U.S. Cl. 378—165 **17 Claims**



1. Apparatus for marking an undeveloped sheet of radiographic film, comprising:

(a) projection means including a light source for generating a light path, said light source emitting light having a wavelength that ranges from 1×10^{-7} meters to 1×10^{-6} meters included therewithin;

(b) mean for controlling the time and intensity of light reaching said sheet of radiographic film;

(c) means defining a recess for receiving said film sheet;

(d) a card bearing patient identification data;

(e) means for positioning a chirally asymmetric symbol in said light path between said card and said sheet of radiographic film;

(f) means for defining a recess for receiving said card; and

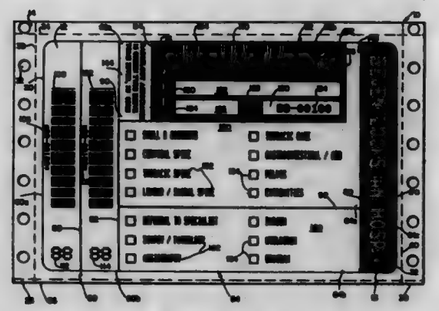
(g) projection means for projecting said patient identification data and said symbol onto said undeveloped sheet of radiographic film,

whereby said light source illuminates said card and said projection means projects each of said chirally asymmetric symbol and said patient identification data onto said film sheet to form thereon said marker and said patient identification data that become permanently recorded upon development of said film.

5,195,123
RADIOGRAPH IDENTIFICATION METHOD AND DEVICE
Richard J. Clement, 7817 Tuckerman La., Potomac, Md. 20854
Continuation-in-part of Ser. No. 275,163, Nov. 23, 1988, abandoned. This application Jul. 12, 1990, Ser. No. 551,661
Int. Cl.[5] H05G *1/28*
U.S. Cl. 378—166 **22 Claims**

16. A radiograph identification device for photographically imprinting information onto radiographic film, comprising:

an adhesive label, said label being made of a photo-opaque material and having an adhesive backing, said label having an imprint field for photographing by a radiograph ID camera, at least a portion of said imprint field having a black background, said black background having at least



one blank formed therein for the entry of variable information; and

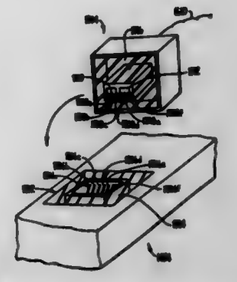
a release liner to which said label is releasably adhered.

5,195,124
TESTING SYSTEM FOR LOCAL SUBSCRIBERS
Yasuro Ishioka, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Oct. 24, 1991, Ser. No. 781,857
Claims priority, application Japan, Oct. 26, 1990, 2-289172
Int. Cl.[5] H04M *1/24, 3/30*
U.S. Cl. 379—27 **8 Claims**

1. A test system for local subscriber lines connected to a central office exchange via a subscriber side remote terminal, a central office terminal at the central office site and a two-way transmission line connected between the above terminals, the subscriber side remote terminal including remote test switches for carrying out a remote test for each local subscriber line by using a common test line distributed between each said remote test switch and remote test equipment at the central office site, each of said remote test switches being connected, at a common terminal thereof, to a link means for selectively connecting one end of each local subscriber line to a measuring apparatus, to thereby carry out a local test, wherein

said subscriber side remote terminal is further provided with a local test switching means for automatically stopping said remote test conducted by said remote test equipment for said local subscriber line for which said local test is to be carried out.

5,195,125
GEL FILLED RJ11 CONNECTOR
David C. Bliven, San Jose; Anthony Vranicar, Santa Clara; Philip B. Vail, San Leandro; Gerald L. Shimirak, Danville, all of Calif., and Julian S. Mullaney, Raleigh, N.C., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 584,325, Sep. 17, 1990, Pat. No. 5,111,497. This application Nov. 12, 1991, Ser. No. 791,749
Int. Cl.[5] H04M *1/24*
U.S. Cl. 379—29 **13 Claims**



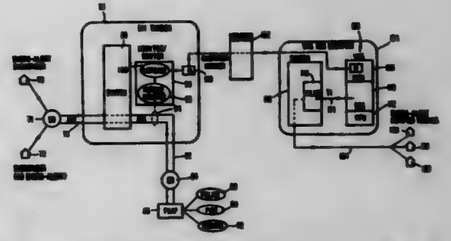
1. Telephone line connection apparatus comprising:

a) an RJ11 socket comprising at least two conductors for transmitting telephone signals;

b) a connection means shaped in the form of an RJ11 plug; and

c) a sealing means for environmentally protecting said RJ11 socket, said sealing means comprising a gel disposed in said RJ11 socket, said gel at least partially filling said RJ11 socket.

5,195,126
EMERGENCY ALERT AND SECURITY APPARATUS AND METHOD
Brian Carrier, Mechanicsville, Va., and Kathleen A. Maier, Rockville, Md., assignors to Bell Atlantic Network Services, Inc., Alexandria, Va.
Filed May 9, 1991, Ser. No. 697,380
Int. Cl.[5] H04M *11/04*
U.S. Cl. 379—45 **18 Claims**



1. In a telecommunications system having a plurality of switch means interconnected by trunk means; a public service answering (PSA) node connected to a first of said switch means by PSA trunk means; subscriber telephone station (STS) means connected to said first switch means and connectable through said first switch means to said PSA node; voice message service (VMS) platform means including voice processing unit (VPU) means having first data storage means connected to said telecommunications system; the improvement comprising:

monitor/router (MR) means having means for detecting telephone station number identification signals coupled to said PSA trunk means to detect number identification

signals carried thereby; second data storage means associated with said MR means and having data identifying said STS means stored therein;

said MR means being connectable to said VMS platform means;

said MR means detecting data identifying said STS means carried by said PSA trunk means and transmitting to said VMS platform means signals identifying said STS means;

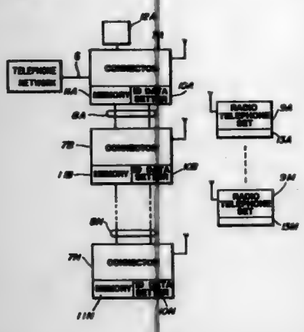
said VPU means including third data storage means for storing data responsive to signals from said STS means, said data including the identity of destination telephone station (DTS) means to be provided with voice message data stored in said third data storage means;

and second switch means connected to said VMS platform means for receiving said voice message data from said third data storage means and delivering said voice message data to DTS means predetermined by data stored in said third data storage means by said STS means.

5,195,127
RADIO TELEPHONE SYSTEM AND ITS CONTROL METHOD

Tomohiro Ichikawa, Fuchu, and Koichi Ito, Hino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 408,249, Sep. 18, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 724,470
Claims priority, application Japan, Sep. 19, 1988, 63-234029
Int. Cl.[5] H04M *11/00*; H04B *1/00*
U.S. Cl. 379—58 10 Claims



6. A radio telephone system comprising:

a plurality of base stations, one of which being connected to one wired line which is connected between the radio telephone system and a telephone network, each of said base stations covering a different radio zone respectively, and being sequentially connected to a preceding base station such that a communication path is provided from each base station to said one wired line through said preceding base station;

at least one radio telephone set;

position registering means for registering a position of said at least one radio telephone set with respect to one of said plurality of base stations to establish a position-registered base station for said at least one radio telephone set;

incoming-call-signal transmitting means for transmitting an incoming call signal to said at least one radio telephone set through said position-registered base station when said system receives an incoming call from said wired line;

radio communication linking means for establishing a radio communications link between said position-registered base station and said at least one radio telephone set;

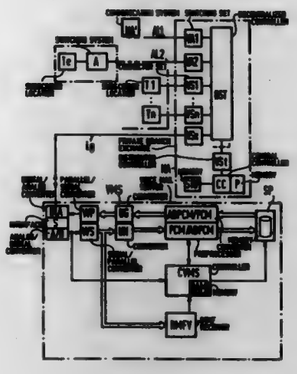
calling means for calling said at least one radio telephone set sequentially from the other base stations when failing to receive said incoming-call answering signal from said at least one radio telephone set a predetermined time after sending of said incoming call signal from said position-registered base station; and

voice responding means for sending to said wired line a voice signal indicative of a state in which said at least one radio telephone set is being called, simultaneously with said transmission of said incoming call signal from said incoming-call-signal transmitting means.

5,195,128
COMMUNICATION SYSTEM, PARTICULARLY A TELEPHONE COMMUNICATION SYSTEM

Reinhard Kuiti, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1991, Ser. No. 802,829
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1990, 4041273
Int. Cl.[5] H04M *3/50*
U.S. Cl. 379—67 11 Claims

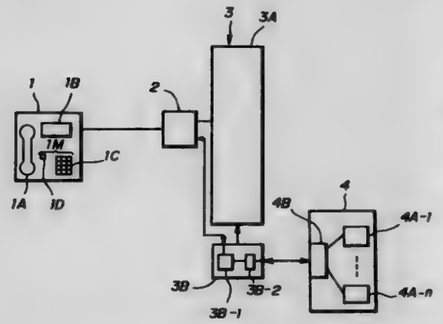


1. A communication system having at least one controller with at least one first central memory for storing communicated messages, the communication system also having at least one of internal terminal equipment, of at least one connection to external terminal equipment and of at least one connection to central equipment of another communication system, comprising: tone means that forms at least one of user prompting-/alerting tone signals and control information signals for message exchange protocols that the controller calls in from the tone means for transmission to the at least one of the internal terminal equipment of the communication system, the external terminal equipment and the central equipment of another communication system, the tone means being formed in the at least one first central memory that stores at least one of the alerting tone signals and control information signals for message exchange protocols, the tone signals and control information signals being stored in the first central memory along with the messages and being called in by the controller in the same manner as the messages are called in by the controller.

5,195,129
SWITCHING SYSTEM FOR APPLICATION SERVICES

Shigehiko Yazawa; Tsuyoshi Kasai; Hideo Tachieda; Naoto Tada, all of Kawasaki; Norihiro Aritaka, Yokohama, and Masatomo Yazaki, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP90/00344, § 371 Date Nov. 20, 1990, § 102(e) Date Nov. 20, 1990, PCT Pub. No. WO90/11660, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 15, 1990, Ser. No. 613,690
Claims priority, application Japan, Mar. 20, 1989, 1-67859; Mar. 20, 1989, 1-67860; Jun. 30, 1989, 1-170769
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—96 11 Claims



1. A switching system for application services, comprising:

at least one application processor which stores a plurality of application programs for providing a plurality of application services,

a telephone terminal comprising

specifying means for specifying one arbitrary application service out of the plurality of application services by providing specifying information,

a display,

a first memory area for storing display information for an application service,

a second memory area for storing display information for call control,

display switching means operatively coupled to said first and second memory areas and said display for switching between the display for application service and the display for call control, and

selective storage means operatively coupled to said display switching means and said display for storing display information for an application service in said first memory area and for storing display information for call control in said second memory area based on display identification information transmitted from said switching equipment to identify whether the display information is for an application service or call control, and

switching equipment for coupling said terminal and said application processor comprising

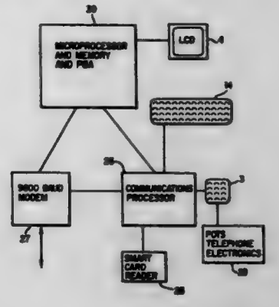
receiving means for receiving specifying information from said specifying means indicative of the one arbitrary application service, and

transferring means for transferring to said application processor the specifying information and for transferring to said selective storage means of said telephone terminal the display identification information to identify whether the display information to be displayed on said display is for an application service or call control.

5,195,130
COMPUTER AND TELEPHONE APPARATUS WITH USER FRIENDLY COMPUTER INTERFACE AND ENHANCED INTEGRITY FEATURES

Lawrence D. Weiss, New York, N.Y.; Joseph C. Kawas, Hollywood, Calif.; Leslie Roth, Plainview, N.Y.; Jim R. Vollmer, Los Angeles, Calif.; Morris L. Tucci, Van Nuys, Calif.; Melvin M. Takata, Hermosa Beach, Calif.; Alfred S. Samulon, Malibu, Calif.; Dilip J. Parekh, Los Angeles, Calif.; Serkis A. Megnerdijian, Glendale, Calif.; Harvey Marks, Canoga Park, Calif.; Shan Lee, Hacienda Heights, Calif.; Douglas W. Carothers, Redondo, Calif.; Leo Ahlin, Rexdale, Canada; Leslie Moss, Los Angeles, Calif.; Kenneth Krieger, Northport, N.Y.; Carol A. Medina, Los Angeles, Calif.; Truc Nguyen, Cerritos, Calif.; Marjorie Engber, New York, N.Y.; Edward Chin, Dix Hills, N.Y.; Lucilla K. Warren, Los Angeles, Calif.; Joseph P. Randolph, Winchester, Mass., and Robert Haddock, New York, N.Y., assignors to Transaction Technology, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 260,832, Oct. 21, 1988, Pat. No. 5,008,927, which is a continuation-in-part of Ser. No. 190,440, May 5, 1988, Pat. No. 4,991,199, and Ser. No. 433,825, Nov. 9, 1989, and Ser. No. 439,739, Nov. 21, 1989. This application Oct. 5, 1990, Ser. No. 593,921
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—98 92 Claims



1. A telephone with a remotely programmable memory and computing ability and having a simplified user interface comprising:

a microprocessor means having a remotely programmable logic means defining interconnections among the components of the microprocessor means and associated memory, said microprocessor means being responsive to inputs from a standard telephone keypad and instructions maintained in said memory to perform computing and control functions, said telephone incorporating electronics for a telephone dialer, and said keypad also providing output to said telephone dialer.

5,195,131
PRIVATE BRANCH EXCHANGE SYSTEM

Toshiyuki Sano, Musashi-murayama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 4, 1991, Ser. No. 650,612
Claims priority, application Japan, Feb. 6, 1990, 2-26654
Int. Cl.[5] H04M *3/46, 3/54*
U.S. Cl. 379—211 20 Claims

1. A private branch exchange system having a private branch exchange, the exchange comprising:

an incoming call destination terminal for receiving a new incoming call;

memory means for storing data identifying at least one forwarding destination terminal to which a new incoming call for a busy incoming-call destination terminal is to be forwarded;

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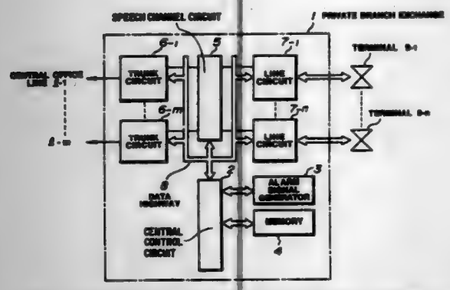
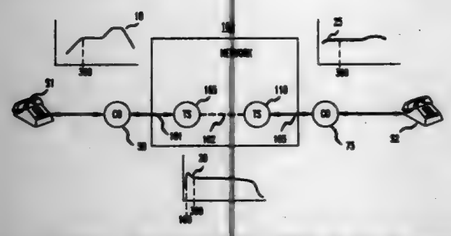
judgement means for judging whether or not at least one forwarding destination terminal is set for the busy incoming-call destination terminal when the busy incoming-call destination terminal receives the new incoming call;
forwarding means for forwarding the new incoming call for the busy incoming-call designation terminal to the forwarding destination terminal when the forwarding destination terminal is previously set for the busy incoming-call destination terminal;
alarming means for generating an alarm at the busy incoming-call destination terminal to indicate the presence of the new incoming call simultaneously with the forwarding of



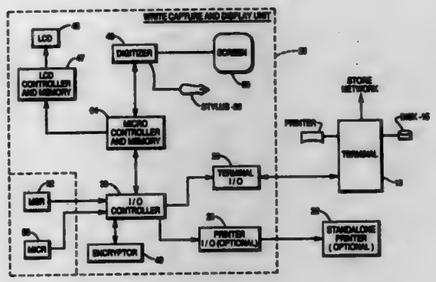
the new incoming call to the forwarding designation terminal by the forwarding means;
response recognition means for recognizing a response of the incoming-call destination terminal or the forwarding destination terminal to the alarm issued from the alarming means or the call forwarded to the forwarding destination terminal; and
response control means for connecting the terminal responding to the forwarded call or the alarm to an extension line or a central office line associated with the incoming call and for immediately stopping forwarding of the incoming call to or generating the alarm from the terminal not responding thereto.

5,195,132
TELEPHONE NETWORK SPEECH SIGNAL ENHANCEMENT
Duane O. Bowker, Neptune City; John T. Ganley, Milford, and J. H. James, Farmingdale, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 3, 1990, Ser. No. 620,997
Int. Cl.[5] H04M *1/76*
U.S. Cl. 379—410 **24 Claims**



1. A method of enhancing the quality of speech signals exchanged between first and second telephone station sets, said method comprising the steps of
responding to receipt of a request originated by either one of said first or second telephone station sets, wherein at least one of said first and second telephone station sets is arranged to attenuate by a predetermined attenuation rate those of said speech signals having frequencies below a predetermined frequency and to transmit said speech signals over said communications path, and
responding to receipt of said speech signals transmitted by said one of said first and second telephone station sets by selectively increasing the amplitude level of said attenuated speech signals and then supplying to the other one of said first and second telephone sets via said communication path the resulting speech signals.

5,195,133
APPARATUS AND METHOD FOR PRODUCING A DIGITIZED TRANSACTION RECORD INCLUDING AN ENCRYPTED SIGNATURE
Michael A. Kapp, New Philadelphia; Robert L. Protheroe, Cambridge, and Albert Onega, Lore City, all of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Jan. 11, 1991, Ser. No. 640,199
Int. Cl.[5] H04L *9/32*
U.S. Cl. 380—9 **17 Claims**

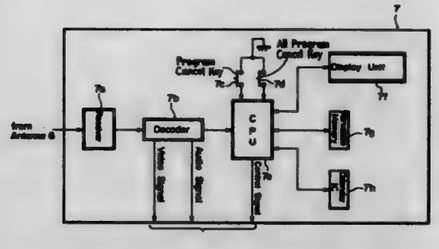


17. Transaction recording apparatus comprising:
transaction input means for creating a digitized transaction record including information defining a business transaction;
stylus means for manual movement corresponding to the writing of an approving signature for said transaction;
liquid crystal display means for presenting a visual image of said signature;
capture means including a transparent reference surface connected for generating position signals in response to moving contact by said stylus and mounted on said display means for causing said visual image to be written in registration with the moving point of contact between said surface and said stylus means;
controller means connected to said transaction input means and to said capture means for associating said transaction record with said signature record; and
encryption means connected to said controller means for encrypting said signature record.

5,195,134
TRANSMITTING, RECEIVING, AND AUTOMATIC RECORDING SYSTEM FOR PROGRAMS WITH TIME AND CHANNEL INFORMATION
Hitoshi Inoue, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 25, 1991, Ser. No. 673,528
Claims priority, application Japan, Mar. 27, 1990, 2-77977
Int. Cl.[5] H04N *7/167, 7/00*
U.S. Cl. 380—20 **8 Claims**

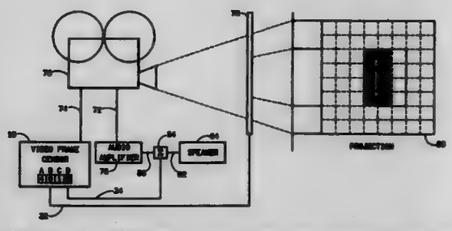
1. A transmitting system, comprising:
means for transmitting video program information to a receiver system having a calendar;
means for adding time information indicative of times at which a program starts and ends to said program information;

means for adding standard time information to the program information to correct a time indicated by the calendar of the receiving system; and
said means for transmitting comprising a first active control system and a second auxiliary control system, each of said



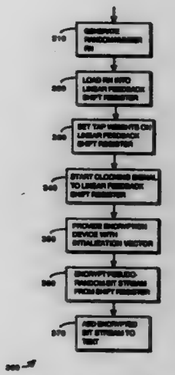
first and second control systems having their own controller controlling their own scrambler means, each of said scrambler means scrambling the video program information and the added time information and standard time information.

5,195,135
AUTOMATIC MULTIVARIATE CENSORSHIP OF AUDIO-VIDEO PROGRAMMING BY USER-SELECTABLE OBSCURATION
Douglas A. Palmer, 1229 Trieste Dr., San Diego, Calif. 92107
Filed Aug. 12, 1991, Ser. No. 745,056
Int. Cl.[5] H04N *7/16*
U.S. Cl. 380—20 **24 Claims**



24. A method for automatic multivariate censorship of audio-video programming having a series of audio-video frames, each said frame having a plurality of cells, said audio-video programming in each said cell being associated with one or more multivariate censorship classification data, said method comprising the following steps:
evaluating said audio-video programming to determine said multivariate censorship classification data for every said cell within each said video frame and for each audio frame interval of said audio-video programming;
encoding said audio-video programming by adding said censorship classification data to the end of each said audio-video frame;
obscuring said audio-video programming in a predetermined number of cells less than said plurality of said audio-video frame cells for each frame for which said censorship classification data specifies any censorship;
transmitting said encoded and obscured audio-video programming to at least one receiving user;
receiving said transmitted audio-video programming;
decoding said received audio-video programming by recovering said censorship classification data for each said audio-video frame;
comparing said censorship classification data to user-selected censorship thresholds; and
deobscuring the obscured portions of the reproduction of said audio-video programming in a predetermined number of cells less than said plurality of said audio-video frame cells for each frame for which said censorship classification fails to meet or exceed said user-selected censorship mode.

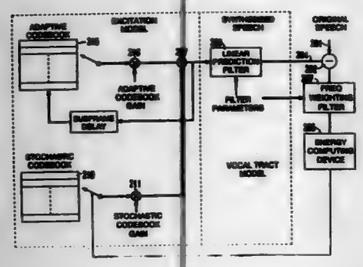
5,195,136
METHOD AND APPARATUS FOR DATA ENCRYPTION OR DECRYPTION
Douglas A. Hardy, Mesa, and Edward C. Meinelt, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 30, 1991, Ser. No. 767,706
Int. Cl.[5] H04K *1/02*
U.S. Cl. 380—43 **19 Claims**



6. A cryptographic communications system comprising one or more combinations of:
at least a first cryptographic communications terminal, comprising:
a first linear feedback shift register which is externally programmable at arbitrary intervals to change a particular pseudo-random code generated thereby and having a seed input for accepting a random number and a weighting input for accepting tap weights;
a first ciphering device, said first ciphering device coupled to said linear feedback shift register, said first ciphering device comprising a first Data Encryption Standard ciphering device operating in Cipher Feedback Mode;
a data input;
a first data output; and
a first adder circuit, one input of said first adder circuit coupled to said first ciphering device, another input of said first adder circuit coupled to said data input, and an output of said first adder circuit coupled to said first data output; and
at least a second cryptographic communications terminal comprising:
a second linear feedback shift register which is externally programmable at arbitrary intervals coinciding with said arbitrary intervals at which said first linear feedback shift register is externally programmed to change a particular pseudo-random code generated thereby and having a seed input for accepting a random number and a weighting input for accepting tap weights, said first and second linear feedback shift registers operating to generate the same pseudo-random code;
a second ciphering device, said second ciphering device coupled to said second linear feedback shift register, said second ciphering device comprising a second Data En-

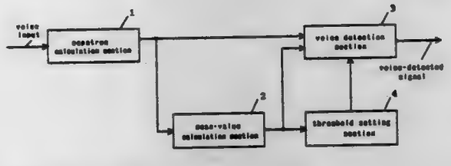
cryption Standard ciphering device operating in Cipher Feedback Mode;
a second data output; and
a second adder circuit, one input of said second adder circuit coupled to said second ciphering device, another input of said second adder circuit coupled to said first data output, and an output of said second adder circuit coupled to said second data output.

5,195,137
METHOD OF AND APPARATUS FOR GENERATING AUXILIARY INFORMATION FOR EXPEDITING SPARSE CODEBOOK SEARCH
Kumar Swaminathan, Mine Hill, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jan. 28, 1991, Ser. No. 646,122
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—32 **13 Claims**



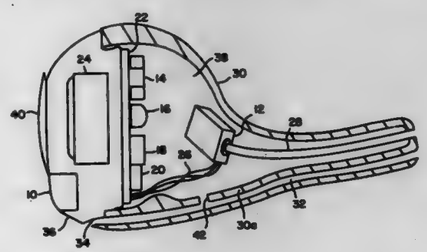
5. A method for encoding speech signals for radio transmission comprising the steps of:
converting analog speech into a digital speech signal;
encoding the digital speech signals for radio transmission by the steps of:
converting the speech signal into a target vector quantity;
storing a plurality of random vectors into a codebook having a spare nature in that at least a majority of the entries have a zero value;
searching the codebook for selecting one of the random vectors which most nearly matches the target vector;
the step of searching including the steps of:
generating auxiliary information to facilitate codebook searching by:
determining the number of non-zero elements in each codebook vector, and
determining the successive offsets of the non-zero elements of each codebook vector;
computing correlation and energy terms of the codebook matrix from the auxiliary information;
searching the codebook for the random vector which most nearly matches the target vector by utilizing the correlation and energy terms to determine a distance between the codebook vectors and the target vector;
selecting the vector closest to the target vector to encode the digital speech signal;
transmitting the encoded speech signal by radio signals.

5,195,138
VOICE SIGNAL PROCESSING DEVICE
Joji Kane, Nara, and Akira Nohara, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Jan. 3, 1991, Ser. No. 637,203
Claims priority, application Japan, Jan. 18, 1990, 2-008592; Jan. 18, 1990, 2-008595; Jan. 26, 1990, 2-017348; Feb. 6, 1990, 2-026506; Feb. 6, 1990, 2-026507; Feb. 14, 1990, 3-034297
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—46 **11 Claims**



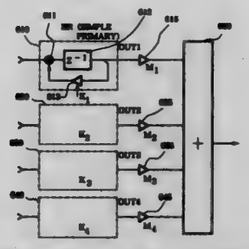
1. A signal detection device comprising:
cepstrum calculating means for obtaining a cepstrum of a voice signal,
mean-value calculation means for making equal the cepstrum output from said cepstrum calculating means;
threshold setting means for setting a voice detection threshold level on the basis of cepstrum mean-value output from said mean-value calculation means,
voice detection means to which the cepstrum mean-value output from said mean-value calculation means, cepstrum output from said cepstrum calculating means and a threshold output signal from said threshold setting means are supplied and which detects a voice.

5,195,139
HEARING AID
Edouard A. Gauthier, West Chester, Pa., assignor to Ensoniq Corporation, Malvern, Pa.
Filed May 15, 1991, Ser. No. 700,581
Int. Cl.[5] H04R *25/00, 25/02*; A61B *7/02*
U.S. Cl. 381—69 **7 Claims**



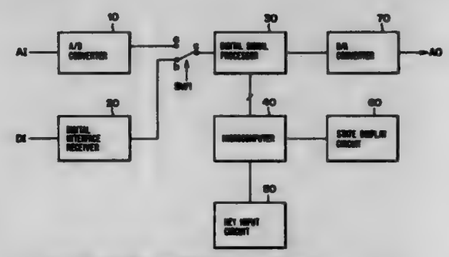
1. A hearing aid comprising:
transmitter means, including a microphone, responsive to external sounds for developing electrical signals representative of said external sounds;
receiver means, including a speaker, responsive to said electrical signals for producing amplified versions of said external sounds;
and a housing having:
(a) an air vent passage extending along the length of said housing for conducting sound from the ear canal of a user of said hearing aid to outside the ear,
(b) an isolation wall extending across said housing forming within said housing a cavity acoustically isolated from outside the ear of the user of said hearing aid and the ear canal of the user of said hearing aid, and
(c) a tuned passage extending from said air vent passage and opening into said cavity.

5,195,140
ACOUSTIC SIGNAL PROCESSING APPARATUS
Masaki Kudo; Hideaki Shimaya, and Tokio Ogi, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Dec. 28, 1990, Ser. No. 635,288
Claims priority, application Japan, Jan. 5, 1990, 2-307
Int. Cl.[5] A61F *11/06*; H03G *3/00*; G06F *7/38*
U.S. Cl. 381—71 **10 Claims**



1. An acoustic signal processing apparatus comprising:
a plurality of infinite impulse response type digital filters for filtering an acoustic signal, each of said plurality of infinite impulse response type digital filters having an input for receiving said acoustic signal and an output for generating a filtered output signal in response to said acoustic signal;
phase control means for controlling relative phases of said filtered output signals to provide phase controlled output signals from said infinite impulse response type digital filters; and
mixing means for respectively mixing said phase controlled output signals to substantially cancel a limit cycle noise component generated by said plurality of infinite impulse response type digital filters.

5,195,141
DIGITAL AUDIO EQUALIZER
Seong-Cheol Jang, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 14, 1991, Ser. No. 715,647
Claims priority, application Rep. of Korea, Aug. 9, 1990, 90-12211
Int. Cl.[5] H03G *5/00, 3/00*
U.S. Cl. 381—103 **10 Claims**



1. A digital audio equalizer, comprising:
means for providing a first digital audio signal;
digital interface receiver means for demodulating an input digital audio signal into a second digital audio signal;
signal input select switch means for selecting one of said first digital audio signal and said second digital audio signal to generate a selected digital audio signal;
digital signal processor means for digitally equalizing said selected digital audio signal to generate a equalized digital audio signal, comprising a dampening multiplier for dampening said selected digital audio signal to generate a dampened digital audio signal, and a plurality of cascaded secondary infinite impulse response filters for filtering said dampened digital audio signal, each said cascaded secondary infinite impulse response filters being programmed to filter with a chosen gain, a chosen quality factor, and a chosen center frequency in response to a first value, a second value, a third value, a fourth value, and a fifth value as a function of a sampling frequency, said chosen center frequency, said chosen gain, and said chosen quality factor, each of said cascaded secondary infinite impulse response filters comprising:
first multiplier means for multiplying said dampened digital audio signal by said first value to generate a first multiplier signal,
first delay means for delaying said dampened digital audio signal by one sample to generate a first delay signal,
second multiplier means for multiplying said first delay signal by said second value to generate a second multiplier signal,
second delay means for delaying said dampened digital audio signal by two samples to generate a second delay signal,
third multiplier means for multiplying said second delay signal by said third value to generate a third multiplier signal,
Adder means for generating an adder signal,
third delay means for delaying said adder signal by one sample to generate a third delay signal,
fourth multiplier means for multiplying said third delay signal by a fourth value to generate a fourth multiplier signal,
fourth delay means for delaying said adder signal by two samples to generate a fourth delay signal,
fifth multiplier means for multiplying said fourth delay signal by a fifth value to generate a fifth multiplier signal, and
said adder means for adding said first multiplier signal, said second multiplier signal, said third multiplier signal, said fourth multiplier signal, said fifth multiplier signal to generate said adder signal; and
microcomputer means for controlling said digital signal processor means;
wherein said first value, said second value, said third value, said fourth value, and said fifth value are determined for each of said cascaded secondary infinite impulse response filters by the following equations if said chosen gain is greater than zero:

$$D_x = 1 + T_x/Q + T_x^2,$$

wherein:
said first value $= (1 + K \cdot T_x/Q + T_x^2)/D_x$,
said second value $= (2 \cdot T_x^2 - 2)/D_x$,
said third value $= (1 - K \cdot T_x/Q + T_x^2)/D_x$,
said fourth value $= -(2 \cdot T_x^2 - 2)/D_x$,
said fifth value $= (-1 + T_x/Q - T_x^2)/D_x$, and wherein:
T_x is the TAN (π·(chosen center frequency/sampling frequency));
K is said chosen gain expressed in decibels; and
Q is said chosen quality factor.

5,195,142
PIEZOELECTRIC TRANSDUCER
Antonio D'Avolio, Magliano Dei Marsi, and Luigi Pescetti, Milan, both of Italy, assignors to Alcatel Dial Face S.p.A., Milan, Italy
Filed Apr. 16, 1991, Ser. No. 685,957
Claims priority, application Italy, May 14, 1990, 21175/90[U]; May 14, 1990, 21176/90[U]
Int. Cl.[5] H04R *25/00*; H04M *1/00*; H01L *41/04*
U.S. Cl. 381—173 **11 Claims**

1. A piezoelectric transducer assembly comprising:
a piezoceramic transducing diaphragm including a support plate, a piezoceramic element, and two contact areas forming two poles of said diaphragm, said contact areas

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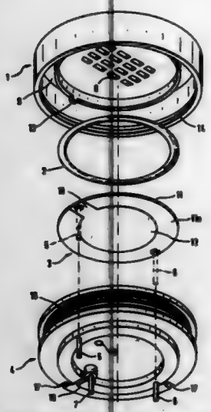
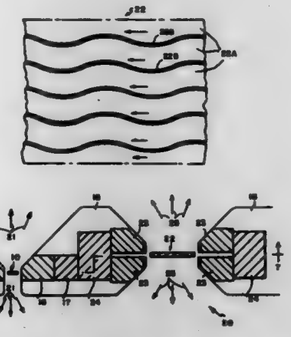
being situated on the same side of the diaphragm, one of said contact areas formed on the support plate;
an elastic element;
a perforated case; and
a bottom base, said diaphragm being maintained peripherally between the perforated case and the bottom base by the elastic element, said bottom base carrying a pair of contacts accessible from outside of the transducer assembly, the diaphragm being oriented so that the contact areas of the diaphragm face said contacts;
wherein said contacts include feedthrough terminals each having a respective end abutting a respective contact area



of said diaphragm when the transducer assembly is assembled, electric connections between the contact areas of the diaphragm and the contacts being established by pressure produced by action of said elastic element; and
wherein said feedthrough terminals comprise nail-shaped metallic pins forced into respective through-holes axially extending in said bottom base, so that a first surface of a nail-head of each of said pins abutting an inner surface of the bottom base and a second surface of the nail-head abutting a respective contact area of said diaphragm at a peripheral position with respect to the diaphragm when the transducer assembly is assembled.

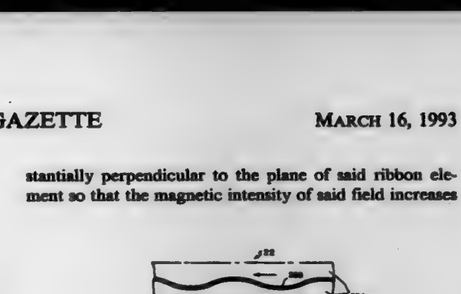
5,195,143
ACOUSTICAL RIBBON TRANSDUCER LOUDSPEAKER SYSTEM
Leo Spiegel, Sharon, and Mark B. Nazar, Bellingham, both of Mass., assignors to Apogee Acoustics, Inc., Randolph, Mass.
Filed May 31, 1991, Ser. No. 708,919
Int. Cl.[5] H04R 25/00, 31/00, 7/00
U.S. Cl. 381—201 **6 Claims**

1. An electromagnetic transducer unit for reproducing and transmitting acoustic signals along a transmission path therefrom comprising
a supporting frame;
an elongated, flexible conductive ribbon element being supported by said supporting frame and having a plurality of separate electrically conductive circuits, said circuits being separated by a space therebetween having a substantially smooth, undulating shape;
magnetic circuit means including magnet means for generating a magnetic field passing through said ribbon element; and
means for shaping said magnetic field in the direction substantially perpendicular to the plane of said ribbon element so that the magnetic intensity of said field increases



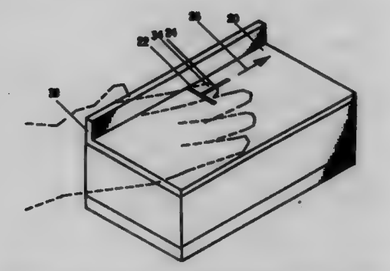
in a direction perpendicular to the plane of said ribbon element on either side of a center region thereof.

5,195,144
PROCESS FOR ESTIMATING THE DISTANCE BETWEEN A STATIONARY OBJECT AND A MOVING VEHICLE AND DEVICE FOR USING THIS PROCESS
Guy Le Parquier, Versailles, and Henri Fousse, Nogent sur Marne, both of France, assignors to Thomson-CSF, Puteaux, France
Continuation of Ser. No. 724,481, Jun. 28, 1991, abandoned, which is a continuation of Ser. No. 435,982, Nov. 13, 1989, abandoned. This application Feb. 12, 1992, Ser. No. 832,629
Claims priority, application France, Nov. 15, 1988, 88 14804
Int. Cl.[5] G06K 9/00; G01C 3/00
U.S. Cl. 382—1 **5 Claims**



1. A process for estimating the distance between a stationary object and moving vehicle according to a given speed vector, comprising the steps of:
mounting an image sensor on said vehicle and analyzing images of said object received by said image sensors;
centering said analyzed images relative to the speed vector of said vehicle;
integrating, in a plurality of image memories, wherein said image memories correspond respectively to a plurality of predetermined values for distance, the luminance values of pixels of images which are analyzed successively by said sensor, and the luminance values of pixels of a series of predicted images to provide integrated luminance values for pixels of each of said image memories, wherein the luminance values of each pixel of one of said predicted images is determined, as a function of the integrated luminance value for a considered pixel and, as a function of the speed of the vehicle, as a function of the position of said considered pixel in said one predicted image, and as a function of the predetermined distance value of a corresponding image memory considered, in such a way that said one predicted image is generally affected by an enlargement increasing as a function of time; and
searching, among a plurality of contrasts exhibited by the integrated luminance values of plurality of memories for the one of said memories wherein the integrated luminance values exhibit the greatest contrast corresponding to a sharply focused image of the object, and deducing from said one memory as estimate of distance.

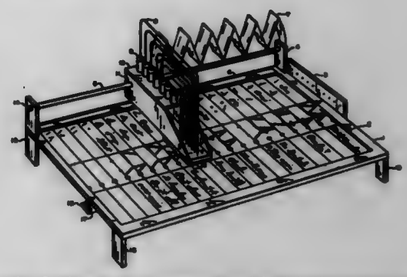
5,195,145
APPARATUS TO RECORD EPIDERMAL TOPOGRAPHY
Alan L. Backus, Los Angeles, and Ronald M. Popell, Beverly Hills, both of Calif., assignors to Identity Technologies Incorporated, Beverly Hills, Calif.
Continuation of Ser. No. 435,186, Nov. 13, 1989, abandoned. This application Feb. 26, 1991, Ser. No. 660,967
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—4 **2 Claims**



1. Apparatus for surveying skin surface features, comprising:
a first surface penetrated by a first orifice,
means to facilitate and control movement on said first surface of skin surfaces across said first orifice,
said means to facilitate and control movement comprising a straight linear guide disposed above and traversing said first surface,
a first sensor surveying skin surface features through said first orifice,
a second sensor tracking skin surface movement relative to said first orifice,
whereby a representation of two dimensional skin surfaces is composed by combining signals from said first sensor and said second sensor.

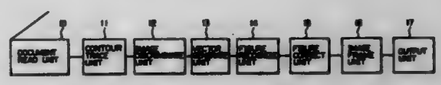
5,195,146
PHOTOELECTRIC READER FOR COMPUTER COMPATIBLE CHARACTERS
Ranald O. Whitaker, 128 St. Kitts Way, Apollo Beach, Fla. 33572
Filed Dec. 15, 1983, Ser. No. 561,946
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—11 **12 Claims**

1. In a system for machine reading a set of computer compatible characters;
each of said characters comprising a respective subset of the elements of a master character, said master character comprising a set of elements;
said characters being divided into character subsets of one or more characters each, each of said subsets being termed an entry;
a medium on which said entries are entered in an array suitable for being scanned by a set of sensors;
each of said sensors scanning along a respective path;
space occupied by each of said entries being divided into a set of zones;
intersections of said paths and said zones being termed blocks;
the arrangement of said zones and said paths being such that for each element of said characters there is a respective block of said blocks through which said element passes and no other of said elements passes;
each of said zones bearing a respective set of indicia;
each indicium of said sets of indicia delineating the extent of its respective zone;
the combination of said indicia appearing in (a zone) each of said zones associated with the reading of (one) each of said entries being different from the combination appearing in any other zone associated with the reading of said entry;
each of said combinations constituting a zone code identifying its respective zone;
said sets of indicia being positioned in an orderly manner to facilitate scanning;



each of said entries plus associated indicia (associated with the reading of said entry) constituting an (expanded) extended entry;
(elements of said characters) character elements and said indicia constituting items to be sensed;
a scanner having a set of sensors;
said scanner being adapted for causing each of said sensors to scan along a respective (paths) path of said paths;
said scanner being further adapted for developing a reader (ord) word indicating at any instant of time which items of said items to be sensed are sensed;
an output register adapted for storing a processor word composed of bits; each of said bits having a respective element in the entry being scanned; and
a processor adapted in response to (said) each reader (words) word generated during scan of (one) each of said (expanded) extended entries, for causing each bit in said output register to assume its HI state if and only if said respective element of said bit is present in said entry.

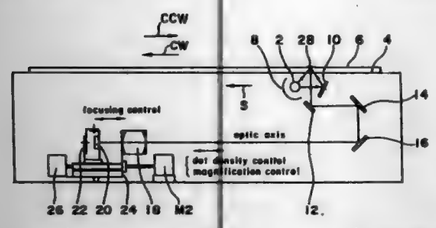
5,195,147
IMAGE FORMING APPARATUS
Junichi Ohta, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 30, 1990, Ser. No. 516,924
Claims priority, application Japan, May 2, 1989, 1-112203; May 2, 1989, 1-112204; Dec. 28, 1989, 1-338153
Int. Cl.[5] G06K 9/48
U.S. Cl. 382—21 **10 Claims**



1. An image forming apparatus comprising:
a) document reading means for optically reading a document

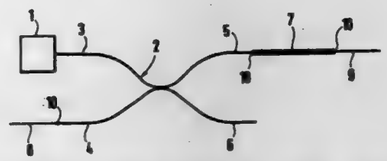
to photoelectrically convert the document into two-level image data;
b) contour tracing means for tracing a contour of an assembly of black pixels included in the image data and which are contiguous with one another;
c) image discriminating means for classifying the assembly of black pixels into one of:
1) a figure,
2) a character, and
3) noise
based on a size of the contour of the assembly of black pixels which is determined by said contour tracing means;
d) vector generating means for extracting figure images based on discrimination data produced by said image discriminating means and transforming said figure images into vectors;
e) figure recognizing means for:
1) recognizing figure elements based on vector data produced by said vector generating means and
2) recognizing a connective relationship of said figure elements to one another;
f) figure correcting means for correcting, among the figure elements recognized by said figure recognizing means, straight line elements in a particular direction, the particular direction being smaller in difference in angle than other directions for arranging straight lines, the straight lines being selected at the beginning of a copying operation, while preserving any connections of said straight line elements to the other figure elements;
g) image framing means for framing the figure elements corrected by said figure correcting means; and
h) outputting means for reading the corrected images and forming said images on a paper sheet.

5,195,148
IMAGE READER HAVING ELECTRICAL AND OPTICAL MEANS FOR VARYING MAGNIFICATION
Masamichi Sugiura, Toyoka-we, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 481,399, Feb. 16, 1990, abandoned, which is a division of Ser. No. 173,986, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 865,894, May 21, 1986, Pat. No. 4,771,473. This application Jul. 18, 1991, Ser. No. 732,730
Claims priority, application Japan, May 22, 1985, 60-110827
The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.
Int. Cl.[5] G06K *9/42*; G03B *27/34, 27/40*; G02B *7/02*
U.S. Cl. 382—47 7 Claims



1. An image reader for reading an image of a document comprising:
a platen glass on which a document is placed;
optical projection means, having a projection lens and at least one scanning mirror which is movable along the platen glass, for scanning and projecting an image of a document placed on the platen glass through the scanning mirror and the projection lens;
an image reading device for receiving the projected image and transforming optical signals into electrical signals;
focusing means for independently moving the image reading device relative to said projection lens to adjust a focusing state of an image on the document to be projected thereon;
designation means for designating a magnification of an image to be projected;
first control means for controlling said optical projection means to change an optical distance defined between said projection lens and said platen glass according to the magnification designated by said designation means, and
second control means for controlling said focusing means for adjusting a focusing state according to a change in the optical distance defined between said projection lens and said platen glass.

5,195,149
FIBER OPTIC AMPLIFIER
Thomas Pfeiffer, Stuttgart; Rolf Rossberg, Schwieberdingen, and Henning Bülow, Leonberg, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands
Filed Feb. 13, 1992, Ser. No. 835,291
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1991, 4104268
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—28 9 Claims

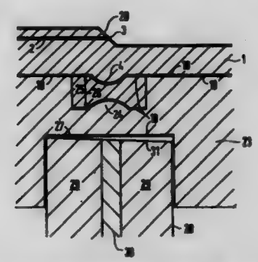


1. Fiber-optic amplifier comprising a multiport pump coupler (2), a pump source (1) connected to a first port (3) of the pump coupler, and a doped length of fiber (7) connected to a second port (5) of the pump coupler, a free end of the doped length of fiber and a third port (4) of the pump coupler serving to connect the coupler to optical transmission lines (9, 8) formed of standard optical fibers, characterized in that, at least between the first and second ports (3, 5), the pump coupler (2) is fabricated from a fiber whose mode field diameter for the pump light is adjusted to be substantially equal to the mode field diameter of the doped length of fiber (7).

5,195,150
OPTOELECTRONIC DEVICE FOR OUTFEED AND INFEED OF RADIATION
Bernhard Stegmueller, Augsburg; Gerhard Franz, Munich, and Jochen Heinen, Haar, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jan. 27, 1992, Ser. No. 826,433
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1991, 4103930
Int. Cl.[5] G02B *6/00*
U.S. Cl. 385—33 20 Claims

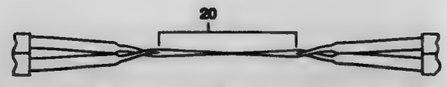
1. An optoelectronic device comprising a substrate having a first and second surface, a waveguide being disposed on a first surface of the substrate, said waveguide including an active zone for generating a laser emission, said substrate having contacts for applying a current to the active zone, said active zone including a grating selected from a DBR grating and a DFB grating, a planar mirror limiting the waveguide in one direction and being inclined at 45° relative to the waveguide so

that radiation guided in the waveguide is reflected into the substrate perpendicular to one surface of the substrate, and a



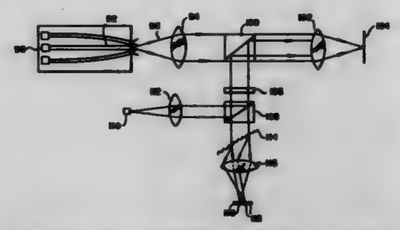
plano-convex lens being integrated onto the second surface of the substrate, which faces away from said waveguide.

5,195,151
OPTICAL FIBER COUPLERS AND METHODS OF THEIR MANUFACTURE
Daniel R. Campbell, Jr., and David W. Stowe, both of Medfield, Mass., assignors to Aster Corporation, Milford, Mass.
Filed Dec. 17, 1990, Ser. No. 628,597
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—43 16 Claims



1. A fiber optic coupler for single mode fibers comprised of fibers of differing propagation constants selected to limit the degree of excitation of the antisymmetric mode to a value ranging from 1% to 40% of the light energy, said fibers being laterally fused together and drawn over a length exceeding the antisymmetric cut off, said coupler having substantially constant coupling ratio with excess loss substantially corresponding to the energy excited in the antisymmetric mode.

5,195,152
MULTICHANNEL OPTICAL RECORDING APPARATUS EMPLOYING LASER DIODES
Mool C. Gupta, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 4, 1991, Ser. No. 787,159
Int. Cl.[5] G02B *6/30*
U.S. Cl. 385—49 26 Claims



1. A multisource array for directing light to an optical disk for optical recording and receiving reflected light from said optical disk for reading said optical disk, comprising:
means for multichannel recording, including:
a plurality of laser diodes with each diode spaced a preselected distance from adjacent diodes; and
a plurality of channel waveguides coupled to said plurality of laser diodes with each channel waveguide being associated with a respective laser diode so that light emitted by said plurality of laser diodes is channeled for convergence at a point outside of said waveguides.

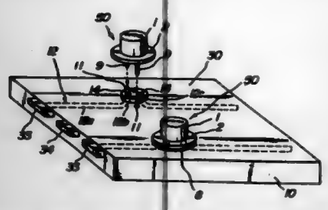
5,195,153
CRIMP SPLICE
Lothar Finzel, Unterschleissheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Dec. 18, 1991, Ser. No. 809,671
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1990, 4041030
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—70 20 Claims

1. A crimp splice for splicing ends of fibers of two light waveguides together, comprising:
an oblong U-shaped cross-section outer part that has a base portion with an inner surface and having two legs angled with respect to the base portion and which are formed by a bendable material means for allowing the legs to maintain a bent together position after they have been bent together from a spread apart position;
an inner U-shaped cross-section part fitted into said outer part, said inner part having a base portion with an outer surface, said inner and outer parts each having said U-shaped cross-section but with the legs bent together in a position which causes the respective light waveguide fibers to be clamped between the base portions of the inner and outer parts;
guide channel means for acceptance of the respective light waveguide fibers between the respective base portions of the inner and outer parts, said guide channel means proceeding in a direction of a longitudinal axis in at least one of said outer part base portion inner surface or said inner part base portion outer surface; and
ends of said guide channel means at opposite ends of the crimp splice being expanded so as to accept portions of the respective light waveguide fibers which are coated.

5,195,154
OPTICAL SURFACE MOUNT TECHNOLOGY (O-SMT), OPTICAL SURFACE MOUNT CIRCUIT (O-SMC), OPTO-ELECTRONIC PRINTED WIRING BOARD (OE-PWB), OPTO-ELECTRONIC SURFACE MOUNT DEVICE (OE-SMD), AND METHODS OF FABRICATING OPTO-ELECTRONIC PRINTED WIRING BOARD
Teiji Uchida, 7-6, Chiyogaoka 4-Chome, Asao-Ku, Kawasaki City, Kanagawa Pref., Japan, assignor to NGK Insulators, Ltd. and Teiji Uchida, both of Japan
Filed Apr. 23, 1991, Ser. No. 689,326
Claims priority, application Japan, Apr. 27, 1990, 2-113962; Apr. 27, 1990, 2-113963; Apr. 27, 1990, 2-113964; Jul. 5, 1990, 2-176526
Int. Cl.[5] G02B *6/42*
U.S. Cl. 385—88 15 Claims

5. A substrate for optical surface mounting circuits, comprising a plate-shaped transparent dielectric body having at least

one optical wave guide formed in an interior portion thereof, at least one end surface of each optical wave guide being exposed to an upper surface of said substrate, wherein said plate-shaped dielectric body contains a plurality of different metallic cations, and the content of said plurality of metallic cations is

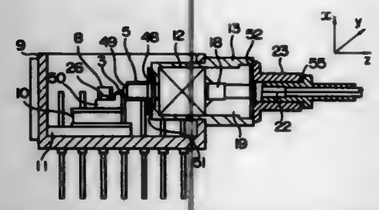


varied from a central axis of each optical wave guide towards the surrounding portion of each optical wave guide in such a fashion that each optical wave guide has a zone of refraction gradient wherein the refraction is decreased from said central axis of each optical wave guide towards the surrounding portion thereof.

5,196,155
OPTICAL COUPLING APPARATUS AND MANUFACTURING METHOD OF THE SAME, AND LENS HOLDER

Makoto Shimaoka, Ushiku; Tetsuo Kumazawa; Yasutoshi Yagiu, both of Ibaraki, and Atsushi Sasayama, Komoro, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1990, Ser. No. 525,675
Claims priority, application Japan, May 24, 1989, 1-128855; Sep. 13, 1989, 1-235671
Int. Cl.[5] G02B 6/42
U.S. Cl. 385—90 2 Claims



1. A method of aligning an optical axis of an optical module comprising a plurality of optical parts including at least a first lens and a second lens and an optical isolator disposed on said optical axis interconnecting an optical coupling end of an optical fiber and a light emitting diode, said first lens being mounted in a first lens fixing pipe, said first lens, said second lens, and said optical isolator being mounted in a package, said method including the steps of

provisionally aligning the first lens with respect to said optical axis

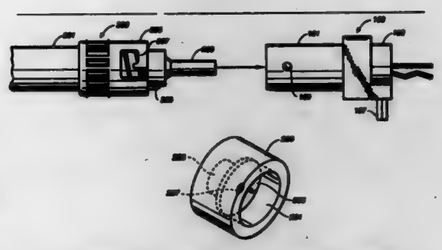
fixing the first lens to the package;

and subsequently readjusting the first lens located remotely from said optical coupling end of the optical fiber by an adjustment of said fixing pipe.

5,195,156
OPTICAL FIBER CONNECTOR ASSEMBLY

William R. Freeman, Richmond; Phillip Steward, Saratoga, and Robert Naidoff, Portola Valley, all of Calif., assignors to Raylan Corporation, Menlo Park, Calif.

Filed Oct. 28, 1991, Ser. No. 783,262
Int. Cl.[5] G02B 6/42
U.S. Cl. 385—92 14 Claims



1. An optical fiber connector assembly comprising:

a housing having a front and rear barrel portions;

laser means disposed in the rear barrel portion of the housing for directing laser light in a direction toward the front barrel portion;

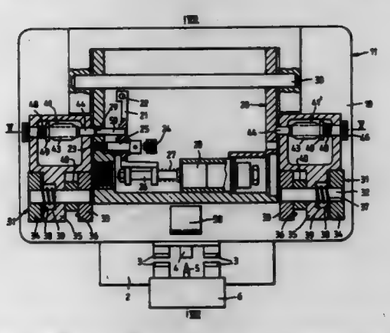
optical fiber ferrule means for receiving laser light from the laser means, the ferrule means being insertable into the front barrel portion of the housing; and

longitudinally movable insert member means for positioning the ferrule means in proper proximity to the laser means substantially independent of the longitudinal dimension of the laser means, the insert member being movably mounted in the rear barrel portion forward of the laser means toward the front barrel portion.

5,195,157
OPTICAL FIBRE SPLICING

Max Penfold, Cambridge, England, assignor to Bicc plc, England

Filed Aug. 12, 1992, Ser. No. 929,768
Claims priority, application United Kingdom, Aug. 16, 1991, 9117761
Int. Cl.[5] G02B 6/00, 6/36
U.S. Cl. 385—96 15 Claims

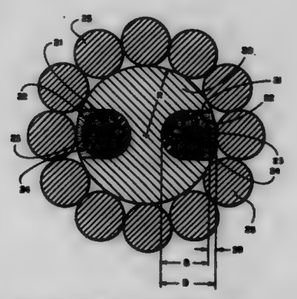


1. Composite apparatus for preparing and positioning tails of two optical fibres for fusion splicing and for effecting a fusion splice between said prepared and appropriately positioned tails, which composite apparatus comprises optical fibre cleaving apparatus comprising an elongate table for supporting a tail of an optical fibre, a blade having a scoring edge which extends in a rectilinear direction transverse with respect to the elongate table and, disposed beyond each end of the elongate table, a device for so holding an optical fibre whilst it is being cleaved that the tail of the optical fibre is substantially normal to the scoring edge of the blade; splicing apparatus transversely spaced from and with respect to the elongate table of the cleaving apparatus and comprising an elongate table for supporting prepared and axially aligned tails of two optical fibres and a pair of fusion electrodes transversely spaced on opposite sides of said elongate table intermediate of its ends with their axes in axial alignment and lying in a plane containing the scoring edge of the blade of the cleaving apparatus; and means for transferring each of said optical fibre holding devices between two operating stations, in the first of which operating stations the holding device is disposed beyond the adjacent end of the elongate table of the cleaving apparatus and in the second of which operating stations said holding device is disposed beyond the adjacent end of the elongate table of the splicing apparatus, said transfer means being constrained to move the holding devices between said two operating stations in directions lying in planes substantially parallel to the plane containing the scoring edge of the blade and the axes of the fusion electrodes.

5,195,158
TIGHT BUFFERED FIBER OPTIC GROUNDWIRE CABLE

Jack Bottoms, Jr., 12090 Lonsdale Ln., Roswell, Ga. 30075, and Charles L. Carter, 350 Singletree Trace, Alpharetta, both of Ga. 30201

Filed Feb. 6, 1991, Ser. No. 649,612
Int. Cl.[5] G02B 6/00, 6/36
U.S. Cl. 385—105 37 Claims



1. A fiber optic groundwire, comprising:

a central core including at least one helical channel along the length of said core;

at least one strain jacket firmly affixed within said channel, said strain jacket is affixed within a grooved channel by completely filling said grooved channel containing said strain jacket with a filling compound comprising a fixing mastic sealent;

a plurality of optical fibers tightly bound within each said at least one strain jacket; and

at least one layer of stranded strength members wound about said core.

5,195,159
OPTICAL WAVELENGTH CONVERTER DEVICE

Naota Uenishi, and Takafumi Uemiya, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

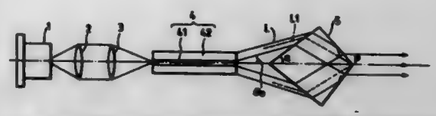
Filed Dec. 10, 1991, Ser. No. 805,327
Claims priority, application Japan, Dec. 14, 1990, 2-402385
Int. Cl.[5] G02B 6/00, 6/36
U.S. Cl. 385—122 8 Claims

1. An optical wavelength converter device comprising:

a laser light source;

a second-harmonic generating means for generating a second-harmonic of laser light from said laser light source incident thereupon; and

lens means for converting a beam of light radiated from said second-harmonic generating means to a parallel beam of light filled with a bundle of rays up to a central portion of

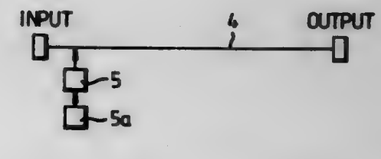


the parallel beam, said lens means comprising at least one conical surface having an apex, said lens means being arranged in such a manner that at least a portion of the beam of light radiated from said second-harmonic generating means passes through said apex.

5,195,160
AMPLIFIED OPTICAL FIBRE SYSTEMS

Kevin C. Byron, Bishop's Stortford, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1991, Ser. No. 783,881
Claims priority, application United Kingdom, Nov. 9, 1990, 9024392
Int. Cl.[5] G02B 6/18
U.S. Cl. 385—123 8 Claims



1. An optical fibre telecommunications system comprising a rare earth doped optical fibre capable of transmitting soliton pulses and optical pumping means for the doped fibre, the fibre comprising a distributed amplifier for the soliton pulses, and wherein the concentration of the rare earth is graded along the fibre length and the optical pumping means is arranged to provide pumping appropriate to the grading variations whereby the fibre appears substantially lossless to an input soliton pulse.

5,195,161
OPTICAL WAVEGUIDE COMPRISING BRAGG GRATING COUPLING MEANS

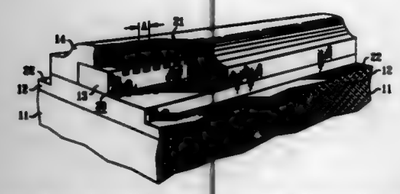
Renen Adar, Westfield; Charles H. Henry, Skillman; Rudolf F. Kazarinov, Martinsville, all of N.J., and Rodney C. Kistler, Easton, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 11, 1991, Ser. No. 806,941
Int. Cl.[5] G02B 6/10
U.S. Cl. 385—129 10 Claims

1. An article comprising a body having a major surface and a planar waveguide on the major surface, the article being adapted for coupling electromagnetic radiation into the waveguide, and comprising means for receiving radiation that was coupled into the waveguide and propagated through at least a portion thereof; wherein

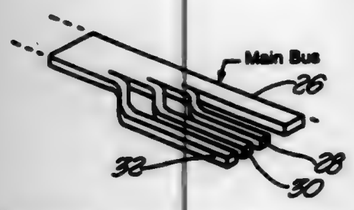
a) the waveguide comprises a doped silica core disposed on the body, and an upper cladding at least partially surrounding the core, the core dopant selected from the group consisting of phosphorus, Ti, and Ge;

b) the waveguide comprises a first portion wherein the core comprises a periodic multiplicity of spaced apart recessed features that form a Bragg grating for at least some of the radiation; associated with the Bragg grating being a center wavelength λ_o for each of the TE and TM polarizations of the radiation, a bandwidth, and an amplitude at λ_o;
CHARACTERIZED IN THAT



c) the upper cladding comprises phosphorus-doped silica having a refractive index that is lower than that of the core, the refractive index difference Δn between core and upper cladding being in the range 0.35×10^{-2}–1.45×10^{-2}, selected such that the bandwidth and amplitude at λ_o are substantially independent of the polarization of the radiation.

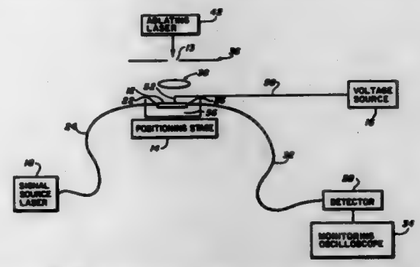
5,195,162
PLANAR POLYMER LIGHT GUIDE METHODS AND APPARATUS
Michel F. Sultan, Troy, and Mark K. Krage, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 133,509, Dec. 16, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 232,077
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—130 **38 Claims**



2. An integral light guide network comprising a film of plastic light guiding material which has been cut to form an integral coupling between N number of light guiding strips on one side of the coupling and M number of light guiding strips on the other side of the coupling in which the light intensity splitting ratio across the coupling between any one of the N number of light guiding strips and any one of the M number of light guiding strips is determined by the ratio of the widths of the individual light guiding strips.

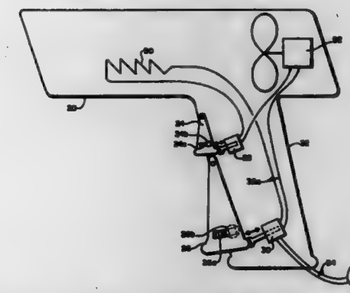
5,195,163
FABRICATION AND PHASE TUNING OF AN OPTICAL WAVEGUIDE DEVICE
William K. Burns, Alexandria; Catherine H. Bulmer, Springfield, both of Va., and Arthur S. Greenblatt, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 27, 1991, Ser. No. 766,939
Int. Cl.[5] G02B *6/00*; H01S *3/00*; H01L *21/306*; B44C *1/22*
U.S. Cl. 385—132 **8 Claims**

1. A optical waveguide device having one or more optical channels, at least one of said channels produced utilizing a method comprising a step for achieving a predetermined phase angle adjustment of said device, said step for achieving comprising;
measuring the phase angle at a predetermined point on the optical waveguide in said device;
ablating material from said waveguide device by a laser;



remeasuring of the phase angle at said predetermined point of said waveguide device to ascertain a phase angle shift of said device in response to said ablating; and
repeating said steps of ablating and remeasuring of said device.

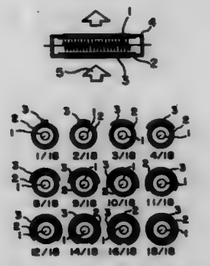
5,195,164
ELECTRIC HEATER/BLOWERS WITH SELECTIVELY-LOCKED OUTPUT VARIABLE HEAT AND BLOWER CONTROLS
William S. Lambert, 52 Tokalon Pl., Metairie, La. 70001
Filed May 17, 1990, Ser. No. 525,194
Int. Cl.[5] H05B *1/02*; F24H *3/04*; A45D *20/10*; H01H *9/06*
U.S. Cl. 392—385 **1 Claim**



1. In a hot air blower having a discharge portion containing an electric heating element and a variable speed motor driven air blower arranged to direct air over the heating element to be heated, and a pistol handle grip for manipulating the hot air blower during use, the improvement comprising means for simultaneous regulation of the heat output intensity of the heating element and the speed of the air blown over the heating element by the air blower, said means comprising,
a pair of pivotally mounted triggers frontally positioned in the center of the pistol handle grip in vertically spaced relationship, a pair of incremented, spring-biased open switches disposed in said pistol handle grip and each positioned so as to be actuable by respective ones of said triggers, said triggers being biased to the off position of the switches by the spring-bias of the switches, said switches being arranged respectively to energize and variably control the air blower motor speed in concert with the intensity of the heating element,
means for selectively locking each of the triggers in an selected position between a off and the maximum position

of the incremental switch actuated by the trigger, said locking means comprising a pair of spring-biased locking buttons on the side of the handle grip and each arranged to interact with a selected one of a plurality of respective ones of teeth provided in the side of the trigger to releasably lock the trigger operative in a selected position until manually released by further movement of the trigger.

5,195,165
QUARTZ TUBE HEAT GENERATOR WITH CATALYTIC COATING
Yukiyoshi Ono, Hirakata; Atsushi Nishino, Neyagawa, and Hironao Numoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 15, 1990, Ser. No. 523,423
Claims priority, application Japan, May 18, 1989, 1-124853
Int. Cl.[5] F26B *3/30*; F24C *7/00*
U.S. Cl. 392—407 **16 Claims**

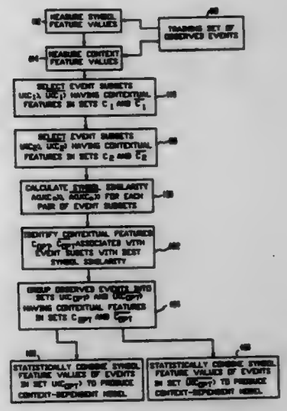


1. A quartz tube heat generator, comprising: a quartz tube, an electric resistor provided along a center line of the quartz tube, and a catalyst coating layer provided on an outer surface of the quartz tube, the catalyst coating layer being formed from a slurry containing colloidal silica, at least one member selected from the group consisting of active alumina and aluminum hydroxide, and a platinum group metal salt, the colloidal silica being present in an amount of 6 to 40% by weight in dried solid matters of the slurry after firing and particles of the slurry having a main particle size distribution of 1 to 9 μm, by applying the slurry to the outer surface of the quartz tube, followed by drying and firing.

5,195,166
METHODS FOR GENERATING THE VOICED PORTION OF SPEECH SIGNALS
John C. Hardwick, Cambridge, and Jae S. Lim, Winchester, both of Mass., assignors to Digital Voice Systems, Inc., Cambridge, Mass.
Division of Ser. No. 585,830, Sep. 20, 1990. This application Nov. 21, 1991, Ser. No. 795,963
Int. Cl.[5] G10L *9/00*
U.S. Cl. 395—2 **9 Claims**

1. A method for generating the voiced portion of a speech signal of the type generated by synthesis from voiced harmonics, the method comprising the steps of:
receiving a signal containing information on a plurality of voiced harmonics, including information on first and second groups of said voiced harmonics;
generating said first group of voiced harmonics using a time domain synthesis method;
generating said second group of voiced harmonics using a frequency domain synthesis method; and
combining said generated first and second groups of voiced harmonics to produce said voiced portion of a speech signal.

5,195,167
APPARATUS AND METHOD OF GROUPING UTTERANCES OF A PHONEME INTO CONTEXT-DEPENDENT CATEGORIES BASED ON SOUND-SIMILARITY FOR AUTOMATIC SPEECH RECOGNITION
Lalit R. Bahl, Amawalk; Peter V. De Souza, Yorktown Heights; Ponani S. Gopalakrishnan, Croton-on-Hudson; David Nahamoo, and Michael A. Picheny, both of White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 468,546, Jan. 23, 1990, abandoned. This application Apr. 17, 1992, Ser. No. 871,600
Int. Cl.[5] G10L *9/00, 9/06*
U.S. Cl. 395—2 **10 Claims**



1. A method of automatically grouping utterances of a phoneme into similar categories and correlating the groups of utterances with different contexts, said method comprising the steps of:
providing a training script comprising a series of phonemes, said training script comprising a plurality of occurrences of a selected phoneme, each occurrence of the selected phoneme having a context of one or more other phonemes preceding or following the selected phoneme in the training script;
measuring the value of an acoustic feature of an utterance of the phonemes in the training script during each of a series of time intervals to produce a series of acoustic feature vector signals representing the acoustic feature values of the utterance, each acoustic feature vector signal corresponding to an occurrence of a phoneme in the training script;
selecting a pair of first and second subsets of the set of occurrences of the selected phoneme in the training script, each occurrence of the selected phoneme in the first subset having a first context, each occurrence of the selected phoneme in the second subset having a second context different from the first context;
selecting a pair of third and fourth subsets of the set of occurrences of the selected phoneme in the training script, each occurrence of the selected phoneme in the third

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subset having a third context different from the first and second contexts, each occurrence of the selected phoneme in the fourth subset having a fourth context different from the first, second, and third contexts;

for each pair of subsets, determining the similarity of the acoustic feature values of the acoustic feature vector signals corresponding to the occurrences of the selected phoneme in one subset of the pair, and determining the similarity of the acoustic feature values of the acoustic feature vector signals corresponding to the occurrences of the selected phoneme in the other subset of the pair, the combined similarities for both subsets in the pair being a "goodness of fit" which estimates how well the contexts of the selected phoneme explain variations in the acoustic feature values of the utterances of the selected phoneme;

identifying first and second best contexts associated with the pair of subsets having the best "goodness of fit"; and

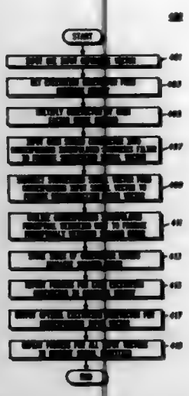
grouping the utterances of the selected phoneme into a first output set of utterances of the selected phoneme having the first best context, and grouping the utterances of the selected phoneme into a second output set of utterances of the selected phoneme having the second best context.

5,195,168

SPEECH CODER AND METHOD HAVING SPECTRAL INTERPOLATION AND FAST CODEBOOK SEARCH

Mei Yong, Stoughton, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Mar. 15, 1991, Ser. No. 669,831
Int. Cl.[5] G10L *9/04*
U.S. Cl. 395—2 75 Claims



17. A method for reconstructing a speech signal pattern in a digital speech coder, the signal being partitioned into successive time intervals, each time interval signal partition having a representative input reference signal with a set of vectors, and having at least a first representative electrical signal for each representative input reference signal of each time interval signal partition, the method utilizing at least a codebook unit having at least a codebook memory, a gain adjuster where selected, a synthesis unit having at least a first synthesis filter, a combiner, and a perceptual weighting unit having at least a first perceptual weighting filter, for utilizing the electrical signals of the representative input reference signals to at least generate a related set of synthesized signal vectors for reconstructing the signal, the method comprising the steps of:

(17A) utilizing the at least first representative electrical signal for each representative input reference signal for a time signal partition to obtain a set of uninterpolated parameters for the at least first synthesis filter;

(17B) utilizing the at least first synthesis filter to obtain the corresponding impulse response representation, and interpolating the impulse responses of each adjacent time signal partition and of a time signal partition immediately thereafter to provide a set of interpolated synthesis filters for desired subpartitions; and utilizing the interpolated synthesis filters to provide a corresponding set of interpolated perceptual weighting filters for desired subpartitions; such that smooth transitions of the synthesis filter and the perceptual weighting filter between each pair of adjacent partitions are obtained;

(17C) utilizing the set of input reference signal vectors, the related set of interpolated synthesis filters and the related set of interpolated perceptual weighting filters for the current time signal partition to select the corresponding set of optimal excitation codevectors from the at least first codebook memory, further implementing the following steps for each desired input reference signal vector:

(17C1) providing a particular excitation codevector which is associated with a particular index from the at least first codebook memory, the codebook memory having a set of excitation codevectors stored therein responsive to the representative input vectors;

(17C2) inputting the particular excitation codevector into the corresponding interpolated synthesis filter to produce the synthesized signal vector;

(17C3) subtracting the synthesized signal vector from the input reference signal vector related thereto to obtain a corresponding reconstruction error vector;

(17C4) inputting the reconstruction error vector into the corresponding interpolated perceptual weighting unit to determine a corresponding perceptually weighted squared error;

(17C5) determining and storing index of codevector having the perceptually weighted squared error smaller than all other errors produced by other codevectors;

(17C6) repeating the steps (17C1), (17C2), (17C3), (17C4), and (17C5), for every excitation codevector in the codebook memory and implementing these steps utilizing a fast codebook search method, to determine an optimal excitation codevector for producing the minimum weighted squared error among all excitation codevectors for the related input reference signal vector; and

(D) successively inputting the set of optimal excitation codevectors into the corresponding set of interpolated synthesis filters to produce the related set of synthesized signal vectors for the given input reference signal for reconstructing the input signal.

5,195,169

CONTROL DEVICE FOR CONTROLLING LEARNING OF A NEURAL NETWORK

Shin Kamiya, and Fumio Togawa, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 486,165, Feb. 28, 1990, abandoned.
This application Jan. 30, 1992, Ser. No. 827,494
Claims priority, application Japan, Mar. 3, 1989, 1-52684
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—23 6 Claims

1. A system for supporting a learning process, comprising:

a neural network having a plurality of layers, each layer having a plurality of units, units of one layer being connected to units of another layer by synapse connections, each synapse connection having a weight value associated therewith; and

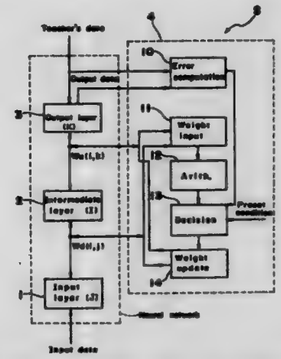
a control device, connected to said neural network, for controlling a learning function of said neural network;

said control device including,

weight input means for receiving said weight values of said synapse connections;

arithmetic means, operatively connected to said weight input means, for calculating an average value for each unit of a layer, said average value being an average of said weight values of synapse connections associated with one side of said unit,

decision means, operatively connected to said arithmetic means, for determining if an average value of an unit calculated by said arithmetic means is smaller than a first threshold value, for determining if a difference between target data and output data from said neural network is smaller than a second threshold value, and



for outputting a signal when both determinations are affirmative, and

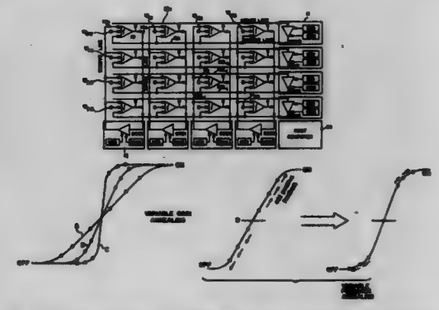
weight update means, in response to said signal, for setting the weight values associated with the unit having an average weight value less than said first threshold value to zero.

5,195,170

NEURAL-NETWORK DEDICATED PROCESSOR FOR SOLVING ASSIGNMENT PROBLEMS

Silvio P. Eberhardt, Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 12, 1991, Ser. No. 744,042
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—24 10 Claims



1. A neural-network dedicated processor for solving first-order assignment problems by allocating a matrix of NxM processing units, wherein assignment is of one or several elements of a first set $\{R_i\}$ of elements which correspond to one of N rows in said matrix, to one or several elements of a second set $\{C_j\}$ which corresponds to one of M columns in said matrix,

each processing unit PU_{ij} at an intersection ij of a set $\{R_i\}$ in a row and of a set $\{C_j\}$ in a column having an output current conducting line connected to a row sense line RSL_i and a column sense line CSL_j, a first input terminal connected to a row excitation line REL_i and a column excitation line CEL_j and a unit output terminal,

each of said processing units corresponding to the pairing of one of said first set of elements $\{R_i\}$ with one of said second set of elements $\{C_j\}$,

means for initially programming a separate weight of said pairing into each of said processing units as a cost factor W_{ij},

a set $\{RCS_i\}$ of N row control superneurons associated with said N rows of processing units, each row control superneuron having an input terminal and an output terminal,

a set $\{CCS_j\}$ of M column control superneurons associated with said M columns of processing units, each column control superneuron having an input terminal and an output terminal, and

means for initially programming a separate minimum and maximum number of processing units of the first set $\{R_i\}$ that may be conducting a current onto said row sense line RSL_i, and initially programming a separate minimum and maximum number of processing units of the second set $\{C_j\}$ that may be conducting a current onto said column sense line CSL_j,

each row sense line RSL_i connected to sum output currents of each processing unit in row i being connected to said input terminal of a row control superneuron associated with row i, and

each column sense line CSL_j connected to sum output currents of each processing unit in a column j connected to said input terminal of a column control superneuron associated with column j,

each row control superneuron having said output terminal connected to each processing unit of an associated row of units through a row excitation line for voltage feedback, and

each column control superneuron having said output terminal connected to each processing unit of an associated column of units through a column excitation line for voltage feedback,

means within each processing unit PU_{ij} for summing excitation signals on said row and column excitation lines which are connected thereto with a signal representing said programmed cost factor W_{ij},

means for coupling said summing means within each processing unit PU_{ij} onto a row sense line RSL_i, a column sense line CSL_j, and said output terminal of said processing unit PU_{ij}, and

means for probing said unit output terminal of each processing unit PU_{ij} to determine which processing units are conducting current onto associated row and column sense lines, thereby to determine the solution of said problem after all processing units have been driven to a stable pattern of conducting and not conducting a current onto said row and column sense lines.

5,195,171

DATA PROCESSING SYSTEM

Sunao Takatori; Ryohei Kumagai; Makoto Yamamoto, and Koji Matsumoto, all of Tokyo, Japan, assignors to Yozan, Inc., Tokyo, Japan

Continuation of Ser. No. 504,809, Apr. 5, 1990, abandoned. This application Sep. 30, 1991, Ser. No. 767,565
Claims priority, application Japan, Apr. 5, 1989, 1-84783; Apr. 28, 1989, 1-107150
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—24 3 Claims

1. A network for detecting a pattern of image pixel densities comprising:

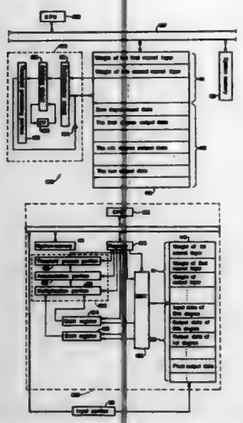
i) a first layer of neurons receiving image pixel densities as input signals, each neuron of the first layer comprising an electronic apparatus producing an affirmative output signal when a sum of input signals exceeds a threshold;

ii) a second layer of neurons receiving outputs from neurons of the first neural layer as inputs, each neuron of the second layer comprising an electronic apparatus producing an affirmative output signal when a sum of adaptably weighted input signals exceeds a threshold; and

iii) at least one subsequent layer of neurons receiving outputs from neurons of a preceding layer as inputs, each neuron of each subsequent layer comprising an electronic apparatus producing an affirmative output signal when a sum of adaptably weighted input signals exceeds a threshold;

wherein the number of layers equals an abstraction degree of the pattern of image pixel densities, when:

the pattern of image pixel densities is characterized as terms of pixel values combined by operations including AND, OR and equivalents thereof;



a combination of pixel values by AND and OR operations is characterized as an intermediate term having an abstraction level of one;

the combination of first and second intermediate terms by AND and OR operations is characterized as a third intermediate term having an abstraction level which is one greater than the highest abstraction level of the first and second intermediate terms; and

the abstraction level of the pattern of pixel densities is the abstraction level of a term characterizing the pattern.

5,195,172

SYSTEM AND METHOD FOR REPRESENTING AND SOLVING NUMERIC AND SYMBOLIC PROBLEMS

Joseph B. Elad, Claymont; Apperson H. Johnson, Wilmington, both of Del.; Laurence A. Kramer, North East, Md.; Jeffrey C. Kirk, Newtown Square, Pa.; Irene H. Philips, New Castle, Del.; Susan M. Zickus, Wilmington, Del.; Daniel L. Chester, Newark, Del., and Erwin M. Saniga, Little Britain, Pa., assignors to Quantum Development Corporation, Claymont, Del.

Filed Jul. 2, 1990, Ser. No. 546,447
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—50 22 Claims

22. A machine system for representing and solving problems, comprising:

an I/O device for entering information into the machine system in the form of objects, attributes, and constructs including formulas, triggers and rules;

a digital computer for receiving and manipulating said constructs, objects and attributes from said I/O device, said digital computer comprising:

an electronic memory device for storing said constructs, objects and attributes;

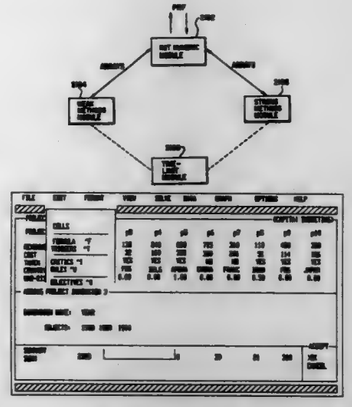
a first module for parsing and translating said constructs entered by said first means into a machine evaluable form;

a second module for automatically defining a tabular representation where said tabular representation contains cells corresponding to object-attribute pairs;

a third module for automatically defining dependencies form said machine evaluable form;

a fourth module for automatically attaching said constructs to object-attribute pairs and for attaching said dependencies of said fourth means;

a fifth module for allowing said object-attribute pairs to inherit said constructs from other object-attribute pairs;



a sixth module for automatically operating on related object-attribute pairs as a function of said defined constructs and dependencies;

a seventh module for automatically utilizing weak and strong problem solving methods in conjunction with said dependencies and chosen values of said object-attribute pairs to find at least a best balanced solution to the problem; and

an eighth module for using heuristics for dynamically interleaving said weak and strong methods.

5,195,173

INTEGRATED MULTI-VISUAL EXPERT SYSTEM MAINTENANCE ADVISOR

Ira R. Gordon, Farmingdale; Donald A. Franklin, Sound Beach, and Brian P. Ford, Port Jefferson Station, all of N.Y., assignors to AIL Systems, Inc., Deer Park, N.Y.

Continuation of Ser. No. 458,776, Dec. 29, 1989, abandoned.
This application Feb. 7, 1992, Ser. No. 833,623
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—60 4 Claims

1. An integrated multivisual expert system maintenance advisor system, which comprises:

an expert system module;

a photo-library module operatively linked to the expert system module;

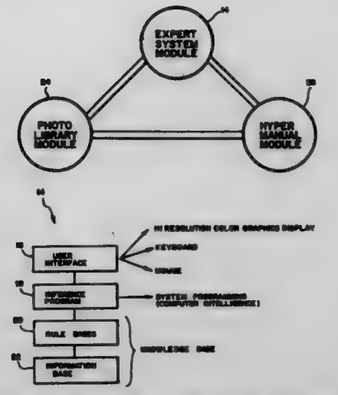
a hypermanual module operatively linked to the photo-library module and the expert system module;

a computer having a computer memory, the expert system module, photo-library module and hypermanual module forming at least portions of the computer memory;

a keyboard operatively linked to the computer;

a visual display screen operatively linked to the computer; and

a printer operatively linked to the computer, the computer memory portion of which the hypermanual module is



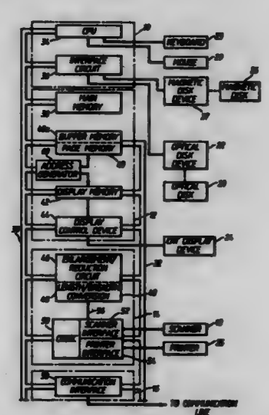
formed having stored therein repair and replacement information.

5,195,174

IMAGE DATA PROCESSING APPARATUS CAPABLE OF COMPOSING ONE IMAGE FROM A PLURALITY OF IMAGES

Hideaki Kagawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 25, 1990, Ser. No. 557,001
Claims priority, application Japan, Jul. 28, 1989, 1-195689
Int. Cl.[5] G06F *15/62*
U.S. Cl. 395—102 6 Claims



1. An image data processing apparatus for composing an image from a plurality of document images, comprising:

means for separately scanning a first document image with a first size and for scanning a second document image with a second size smaller than the first size, and for obtaining first and second image information corresponding to the first and second document images, respectively;

storage means including a first storage area having at least a storage capacity corresponding to the first size for storing the first image information obtained by the scanning means;

first writing means for writing the first image information obtained by the scanning means into the first storage area of the storage means;

display means for displaying the stored first image information in the first storage area of the storage means;

defining means for defining a prescribed range within the displayed first document image, the prescribed range having a third size smaller than the first size;

determining means for determining a magnifying ratio for magnifying the second document image from the second size to the third size;

magnifying means for magnifying the second document image obtained by the scanning means by the magnifying ratio determined by the determining means; and

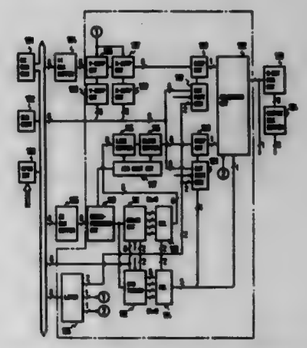
second writing means for writing the magnified second document image into a second storage area of the storage means corresponding to the prescribed range defined by the defining means.

5,195,175

IMAGE SYNTHESIZING SYSTEM

Yoshinitsu Kanno, Sagamihara; Shin Yamada, and Teruo Fumoto, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1991, Ser. No. 710,481
Claims priority, application Japan, Jun. 5, 1990, 2-148277
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—106 9 Claims



1. An image synthesizing system for inputting data representing a multi-level picture and data representing bi-level characters and graphic forms and synthesizing the multi-level picture and the characters and graphic forms, comprising:

an interpolation circuit for interpolating data of neighboring pixels of the multi-level picture;

a first pattern memory for storing first dot pattern data representing dot patterns which correspond to the multi-level picture;

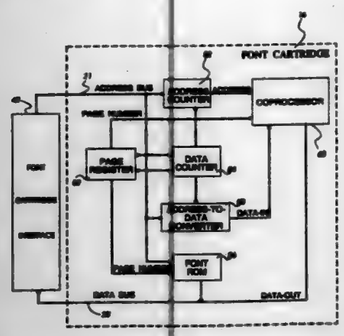
a first bi-level data comparison circuit for receiving interpolation data representing the result of an interpolation from the interpolation circuit and the first dot pattern data from the first pattern memory, for comparing the interpolation data with the first dot pattern data and for outputting first bi-level dot pattern data corresponding to the inputted picture;

a decompression circuit for converting data, which is obtained by a run-length encoding, representing the characters and graphic forms into region discriminating code data indicating whether each pixel thereof belongs to the character and graphic forms,

a first look-up table unit for storing gradation levels of four color halftones, for receiving the region discriminating code data and for outputting data representing gradation levels of four color halftones in accordance with the received region discriminating code data;

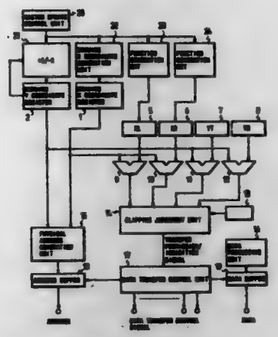
a second look-up table unit for receiving the region discriminating code data and outputting synthesis control data to be used for controlling the extraction of the characters and graphic forms to be inserted into the multi-level picture and the synthesizing of the extracted characters and graphic forms and the multi-level picture;
a second pattern memory for storing second dot pattern data representing dot patterns which correspond to the characters and graphic forms;
a second bi-level data comparison circuit for receiving data representing the gradation levels, which is outputted from the first look-up table unit, and the second dot pattern data from the second pattern memory, for comparing the data representing the gradation levels with the second dot pattern data and for outputting second bi-level dot pattern data corresponding to the characters and graphic forms; and
a selecting circuit for selectively outputting the bi-level dot pattern data corresponding to the inputted picture or the bi-level dot pattern data corresponding to the characters and graphic forms.

5,194,176
METHOD AND APPARATUS TO ENHANCE LASER PRINTER SPEED AND FUNCTIONALITY
James C. Y. Lung, San Jose, Calif., assignor to Destiny Technology Corporation, Milpitas, Calif.
Filed Sep. 9, 1991, Ser. No. 758,984
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—115 32 Claims



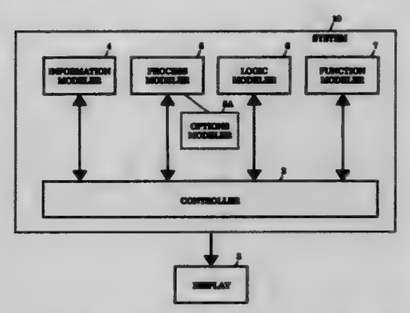
27. A method of increasing the quantity of memory addresses accessible in a font cartridge and for emulating a write cycle to said font cartridge, comprising the steps of:
(1) providing an intelligent font cartridge adapted to connect to a laser printer font cartridge interface and including an input bus, an output bus, an address counter, an address-to-data converter, a page register, a data counter, a font memory having a predetermined quantity of accessible memory addresses, and a co-processor;
(2) generating a communication word having a first portion of bits, at least one data bit of which constitutes a signal flag the state of which determines whether said communication word corresponds to a write-emulation cycle instruction or a read cycle instruction, and having a second portion including a plurality of data bits which
(a) comprise page register information, data counter information, and address counter information when said signal flag is the first occurrence, in a sequence, of a first data state, and
(b) comprise transferred data information when said signal flag is of said first data state and the current communication word immediately follows a communication word the signal flag of which is of said first data state;
(3) inputting a first write-emulation cycle communication word to said input bus to load said page register information into said page register, said data counter information into said data counter, said address counter information into said address counter, thereby setting up said address counter, said data counter, and said page register for the next cycle;
(4) inputting a subsequent write-emulation cycle communication word, or a second write-emulation cycle communication word to said input bus;
(5) determining if the communication word input to said input bus is a first write-emulation cycle communication word, or a second write-emulation cycle communication word;
(6) performing a reset operation, or a write operation depending upon the type of communication word input in the preceding step.

5,195,177
CLIPPING PROCESSOR
Hiroshi Kamiyama, and Koichi Horiuchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 10, 1990, Ser. No. 565,393
Claims priority, application Japan, Sep. 8, 1989, 1-233235
Int. Cl.[5] G06F *15/72*
U.S. Cl. 395—134 3 Claims



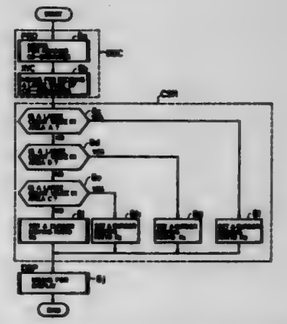
1. A clipping processor comprising:
a raster update control unit for controlling update of a raster on which the processing of drawing a part of a graphic form on each raster is performed;
a drawing X coordinate register for storing an X coordinate of the graphic form to be drawn;
a drawing Y coordinate register for storing a Y coordinate of the graphic form to be drawn;
an incrementer/decrementer for incrementing or decrementing the contents of said drawing Y coordinate register in accordance with a control signal outputted from said raster update control unit;
a drawing X coordinate generation unit for generating a new X coordinate at the time of updating a raster in accordance with the control signal outputted from said raster update control unit and updating an X coordinate of a part of the graphic form to be currently drawn during the same raster and outputting the updated X coordinate to said drawing X coordinate register;
a first and second clipping Y coordinate registers for storing two Y coordinates defining an area to be clipped;
a first and second clipping X coordinate registers for storing two X coordinates defining a part of the area to be clipped during a raster;
a first and second function generation circuits for generating two new X coordinates at the time of updating a raster in accordance with the control signal outputted from said raster update control unit and outputting the two generated X coordinates to said first and second clipping X coordinate registers respectively;
a first comparator for comparing the contents of said drawing X coordinate register with the contents of said first clipping X coordinate register;
a second comparator for comparing the contents of said drawing X coordinate register with the contents of said second clipping X coordinate register;
a third comparator for comparing the contents of said drawing Y coordinate register with the contents of said first clipping Y coordinate register;
a fourth comparator for comparing the contents of said drawing Y coordinate register with the contents of said second clipping Y coordinate register;
a drawing area definition flag setting device for setting a drawing area definition flag indicating that an area to be drawn is inside or outside an area to be clipped; and
a clipping judgment unit for judging from the results of the comparisons made by said first, second, third and fourth comparators and the contents of the drawing area definition flag whether drawing of a graphic form with respect to X coordinates determined by the contents of said drawing X coordinate register and Y coordinates determined by the contents of said drawing Y coordinate register should be permitted or inhibited.

5,195,178
ADAPTIVE WINDOW SYSTEM FOR DYNAMICALLY MODELING INFORMATION SYSTEMS
David A. Krieger, Cambridge, and John T. Micco, Waltham, both of Mass., assignors to Bachman Information Systems, Inc., Burlington, Mass.
Filed Apr. 27, 1990, Ser. No. 516,250
Int. Cl.[5] G06F *3/14*
U.S. Cl. 395—157 13 Claims



1. A computer system for establishing an adaptive window system in a dynamic model of information systems of organizations comprising:
A. one or more modeler subsystems including at least one modeler means for performing a selected operation on one or more models associated with said modeler subsystems, said operation selected from the group consisting of creating, analyzing, and modifying one or more of said models, each of said models having design data associated therewith, said design data being representative of elements including any of attribute; attribute method; entity and attribute; entity method; entity and relationship; entity and entity method; entity, relationship and partnership set; process; view; process local store; information store; information flow; message; source; and destination;
B. at least one of said modeler subsystems including at least one Logic Modeler Subsystem (LMS), including process Description Language (PDL) means for defining logical operations on said design data, said logical operations being defined by PDL design data, said PDL design data corresponding to any one or more of insert, retrieve, update, delete, send, receive, signal, when, and reference to an entity method;
C. means for establishing an option modeler, having selectively operative Option Modeler (OM) means, coupled to said modeler subsystems, and for creating, analyzing, and modifying syntactically permitted options associated with said PDL design data, said OM means including:
(i) means for storing predetermined option criteria, each of said predetermined option criteria being representative of at least one from the group consisting of semantic rules, logical relationships, expert rules, and heuristics;
(ii) means for comparing said PDL design data with said predetermined option criteria; and
(iii) means for identifying correlated PDL design data, said correlated PDL design data being ones of said PDL design data which substantially match one of said predetermined criteria, said correlated PDL design data being representative of said syntactically permitted options;
D. window subsystem, coupled to said OM means, said window subsystem including means for establishing an options window having operator selectable option objects representative of said syntactically permitted options, whereby said syntactically permitted options are only ones of said PDL design data syntactically permitted at the time of establishment of said options window; and
E. operator means coupled to said window subsystem, and including means for allowing said operator to select any of said permitted options by externally applying signals to said option modelers and wherein selection of at least one of said option objects affects said PDL design data,
wherein said modeler subsystems further comprise at least one information modeler subsystem (IMS) including Information Model (IM) means for creating, analyzing and modifying an entity relationship information model, said information model having IM design data representative of elements including any of attribute, entity method, attribute method, partnership set, and partnership set method, said attribute being independent of an entity.

5,195,179
COORDINATE INPUT APPARATUS
Hiroshi Tokunaga, Narashino, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Keiyo Engineering Co., Ltd., Narashino, both of Japan
Continuation of Ser. No. 8,336, Jan. 29, 1987, abandoned. This application May 21, 1990, Ser. No. 526,533
Claims priority, application Japan, Jan. 29, 1986, 61-15723
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—161 34 Claims



1. A method of moving and displaying a cursor on a display screen in response to physical movement of an operation section comprising the steps of:

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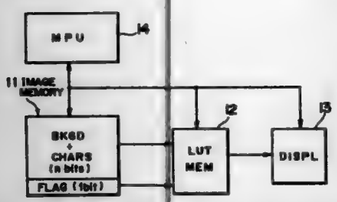
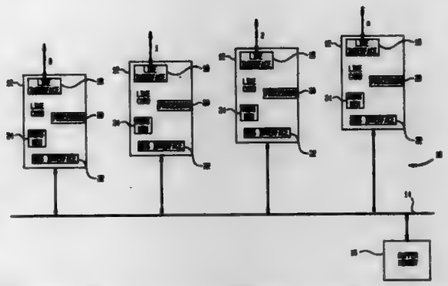
detecting an amount of physical movement of the operation section during a predetermined period of time;
calculating an amount of physical movement per unit time of the operation section from the detected amount of physical movement of the operation section and said predetermined period of time;
deciding a ratio of an amount of movement of the cursor on the screen to a predetermined amount of physical movement of the operation section according to the calculated amount of physical movement of the operation section per unit time; and
moving and displaying the cursor on the display screen corresponding to the amount of physical movement of the operation section on the basis of the decided ratio of the movement of the cursor.

5,195,180
METHOD FOR DISPLAYING AN IMAGE INCLUDING CHARACTERS AND A BACKGROUND
Masaki Takakura, Higashiosaka; Yasukuni Yamane, and Noritoshi Kako, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 21, 1989, Ser. No. 369,125
Claims priority, application Japan, Jun. 23, 1988, 63-157538
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—164 13 Claims



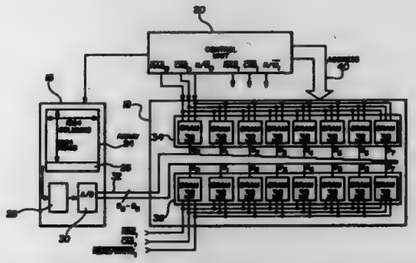
1. A method for displaying an image, wherein the iamge is divided into a first iamge area including a character and a second image area including background, an image processing device for performing the method including a data setting device for setting image data corresponding to the character and the background, an image memory for storing the image data set by the setting device, a synthesizing device for synthesizing the image data of the character and the background, and a display unit for displaying the character synthesized with the background, comprising the steps of:
setting the image data corresponding to pixels of the image using a fixed number of bits in a first memory area of the image memory such that
(a) when a flag is set to a first value and stored in a second memory area of the image memory, predetermined ones of the fixed number of bits are used to represent color information of the background and predetermined remaining ones of the fixed number of bits are used to represent grey scale values of the character, and
(b) when the flag is set to a second value and stored in the second memory area of the image memory, all of the fixed number of bits are used to represent the color information of the background;
synthesizing color information of the character based on the color information of the background and the grey scale values of the character when the flag is set to the first value to thereby gradually deemphasize and blend the color information of the character into the color information of the background; and
displaying the synthesized image on the display unit.

5,195,181
MESSAGE PROCESSING SYSTEM HAVING SEPARATE MESSAGE RECEIVING AND TRANSMITTING PROCESSORS WITH MESSAGE PROCESSING BEING DISTRIBUTED BETWEEN THE SEPARATE PROCESSORS
Stewart F. Bryant, Redhill, England, and Michael J. Seaman, San Jose, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jan. 10, 1992, Ser. No. 820,299
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—200 8 Claims



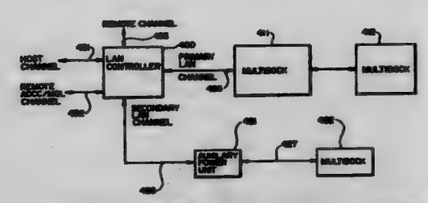
1. A computer system for transmitting messages in a computer network, which comprises:
a message receiving processor adapted to receive messages from the computer network;
a separate message transmitting processor coupled to the message receiving processor;
the message receiving processor operating to perform first preselected processing of a message received by the message receiving processor and to generate a digest of information relating to the message, the digest containing network protocol processing information for message transmit processing;
the message receiving processor transmitting the message and the digest o the message transmitting processor;
the message transmitting processor operation to perform second preselected processing of the message using the network protocol processing information in the digest.

5,195,182
FRAME BUFFER ARCHITECTURE FOR STORING SEQUENTIAL DATA IN ALTERNATING MEMORY BANKS
Steven J. Sasson, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 3, 1989, Ser. No. 331,918
Int. Cl.[5] H04N *5/225*; G06F *3/00*
U.S. Cl. 395—250 7 Claims



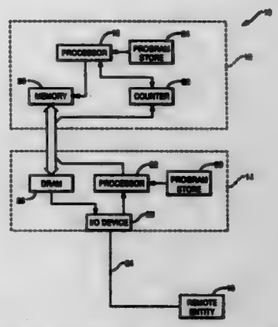
1. A digital buffer for storing data words of a sequential data stream, said digital buffer comprising: at least two data banks, each data bank including a plurality of memory devices coupled to an input data buss and each memory device having a write cycle time greater than the data rate of the data words of the sequential data stream, that are received from the input data buss and are each representative of a single image pixel, and less than the data rate multiplied by the number of data banks provided in the digital buffer; and a control means coupled to each data bank via control lines and an address buss for controlling the storage of the data words received directly in the memory banks from the input data buss wherein successive data words are stored in alternating data banks.

5,195,183
DATA COMMUNICATION SYSTEM WITH COMMUNICATING AND RECHARGING DOCKING APPARATUS FOR HAND-HELD DATA TERMINAL
Phillip Miller; Robert J. Traeger, both of Cedar Rapids, Iowa; Joseph J. Kubler, Nederland, Colo.; Keith K. Cargin, Jr., Cedar Rapids, Iowa; George E. Hanson, Cedar Rapids, Iowa; Patrick H. Davis, Cedar Rapids, Iowa, and Darald R. Schultz, Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa
Continuation of Ser. No. 347,849, May 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 305,302, Jan. 31, 1989. This application Oct. 28, 1991, Ser. No. 784,748
Int. Cl.[5] G06F *15/21*
U.S. Cl. 395—275 15 Claims



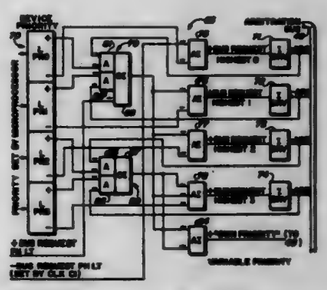
1. A system for transmitting data to and from a plurality of portable data entry terminals, said system comprising:
a) local area network including control means and a common data communication link interconnecting a plurality of data transfer points for transmitting data between each of said plurality of data transfer points and said local area network over shared portions of said common data communication links, each data transfer point adapted to be coupled to any one of the plurality of portable data entry terminals for data transfer via said common data communication link;
b) a plurality of docking units, one for each of said plurality of data transfer points, each one of said plurality of docking units having receptacle means constructed to receive and retain therein any one of the plurality of portable data entry terminals and data coupling means connected to that one data transfer point corresponding to said one docking unit and arranged for coupling with any one of the plurality of portable data entry terminals upon being received therein such that data transfer with said local area network is carried out via said coupled data transfer point and said common signal communication link; and
c) said control means coupled with said common signal communication link for controlling data transfer between said local area network and any one of the plurality of portable data entry terminals when received by said corresponding one docking unit and one data transfer point.

5,195,184
METHOD AND SYSTEM FOR HIGH SPEED DATA TRANSFER
Paul A. Peterson, Dayton, and Samir J. Nanavaty, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 15, 1989, Ser. No. 450,972
Int. Cl.[5] G06F *13/38*
U.S. Cl. 395—325 22 Claims



1. A method of transferring data from a computer to a remote entity comprising:
a. storing a predetermined data block count in said computer;
b. moving one or more data blocks from said computer to one or more buffers, respectively, in an interfacing device;
c. decrementing said data block count for each of said data blocks so moved;
d. serially transmitting one or more of said data blocks from said interfacing device to said remote entity;
e. receiving an acknowledge signal from said remote entity for each data block received by said remote entity; and
f. incrementing said data block count for each acknowledge signal so received.

5,195,185
DYNAMIC BUS ARBITRATION WITH CONCURRENT SAME BUS GRANTING EVERY CYCLE
George B. Marenin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 586,349, Sep. 21, 1990, abandoned. This application Feb. 21, 1992, Ser. No. 841,227
Int. Cl.[5] G06F *13/18, 13/28*
U.S. Cl. 395—325 17 Claims



1. Apparatus for optimizing, without requiring data latency buffers, but arbitration during direct memory access (DMA) data transfers across a nondedicated bus (12) interconnecting a memory (11) and a plurality of external devices (13, 14) each having an arbitration priority, comprising:

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a single arbitration bus (40) connected to each of the external devices;

clock generating means connected to the nondedicated bus for providing successive sequences of two nonoverlapping clock signals (C1, C2) per clock cycle, and data transfer cycles equal to the number of clock cycles required for a responding one of the devices to acknowledge completion of a data transfer, and an arbitration cycle equal to preselected number of clock cycles;

means, operatively connected to the clock generating means and arbitration bus, responsive to only the beginning edge of the first of said clock signals in one sequence for transmitting arbitration priority bus requests from each external device to the arbitration bus;

means, operatively connected to the clock generating means and each device, responsive to the ending edge of the last of said clock signals of an arbitration cycle in that same said one sequence for dynamically conditioning the external device having the highest bus priority to designate itself as the next external device which is to become bus master; and

transferring means including first latch means (49, 59), operatively connected to the clock generating means and nondedicated bus, responsive to the beginning of the first clock signal of a cycle during said one sequence for transferring addresses and responsive to the beginning of the first clock signal during the next cycle following said one sequence for transferring data for a single data transfer or variable burst length data transfer between the designated bus master and the memory or another of the external devices via the nondedicated bus starting on the next clock cycle, after which a then active bus master relinquishes control.

5,195,186

CONDITION CONNECTION FOR A PARALLEL COMPONENT PROCESSOR AND METHOD

Neil F. Trevitt, Kingston upon Thames, and Malcolm E. Wilson, Dorset, both of England, assignors to Du Pont Pixel Systems Limited, England

Continuation of Ser. No. 307,842, Feb. 8, 1989, abandoned. This application Apr. 10, 1991, Ser. No. 683,574

Claims priority, application United Kingdom, Mar. 23, 1988, 8806835

Int. Cl.[5] **G06F** *15/16*

U.S. Cl. 395—325 **6 Claims**

1. A system for passing status information between multiple graphics processors comprising:

(A) a global status line;

(B) a master graphics processor comprising:

(i) first processing circuitry for generating a first internal processor status signal, a first input invert signal, a first output invert signal, a first output enable signal, and a first global/local select signal;

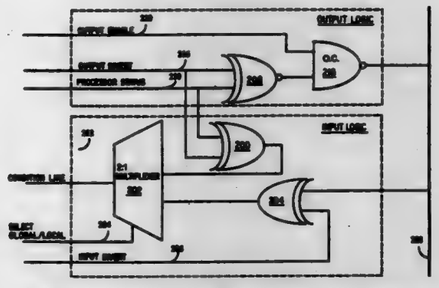
(ii) a clock generator circuit connected to said first processing circuitry for generating a system clock signal and for transmitting said system clock signal to said first processing circuitry;

(iii) first output logic means connected to said first processing circuitry and to said global status line for performing Boolean operations on the first internal processor status signal to produce a first external processor status signal and for making said first external processor status signal available on the global status line; and

(iv) first input logic means connected to said first processing circuitry and to said global status line for receiving a global status signal from the global status line, for receiving said first internal processor status signal and said first global/local select signal from said first processing circuitry, and for transmitting one of said global status signal and said internal processor status signal to said first processing circuitry in response to the first global/local select signal; and

(C) a slave graphics processor comprising,

(i) second processing circuitry for generating a second internal processor status signal, a second input invert signal, a second output invert signal, a second output enable signal, and a second global/local select signal;



(ii) synchronization logic connected to said second processing circuitry for receiving said system clock signal and for synchronizing operation of said second processing circuitry with operation of said first processing circuitry;

(iii) second output logic means connected to said second processing circuitry and to said global status line for performing Boolean operations on the second internal processor status signal to produce a second external processor status signal and for making said second processor status signal available on the global status line; and

(iv) second input logic means connected to said second processing circuitry and to said global status line for receiving a global status signal from the global status line, for receiving said second internal processor status signal and said global/local select signal from said second processing circuitry, and for transmitting one of said global status signal and said second internal processor status signal to said second processing circuitry in response to the second global/local select signal.

DESIGN PATENTS

GRANTED Mar. 16, 1993

ERRATA

For CLASS	See PATENT NO.
D08-331	334,009
D22-129	334,041

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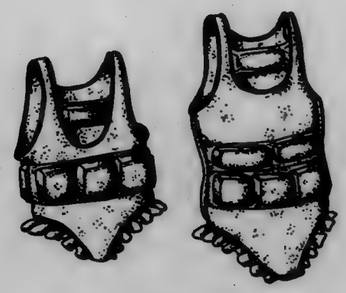
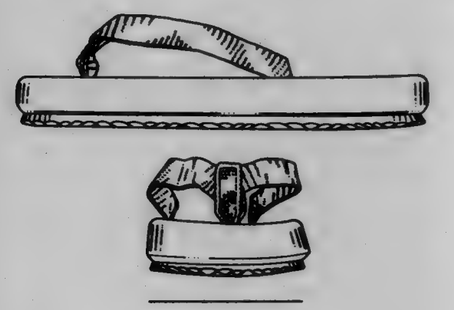
DESIGNS

MARCH 16, 1993

333,903
FLOTATION SWIMSUIT
Jerry R. Meredith, 5121 Camelia Rd., Knoxville, Tenn. 37912
Filed Mar. 1, 1989, Ser. No. 317,334
Term of patent 14 years
U.S. Cl. D2—40

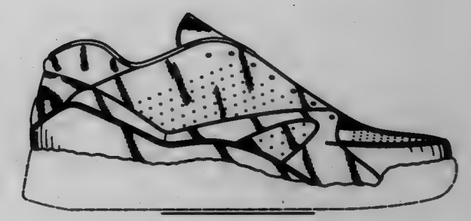


333,904
SPORT SANDAL
Charles R. Eninger, P.O. Box 19816, Amarillo, Tex. 79114
Filed Jul. 27, 1990, Ser. No. 560,977
Term of patent 14 years
U.S. Cl. D2—270

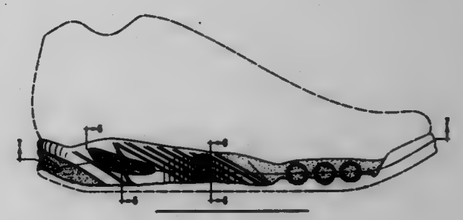


333,905
SHOE UPPER
Judith R. Close, Dedham, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 22, 1992, Ser. No. 873,277
Term of patent 14 years
U.S. Cl. D2—314

333,906
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,718
Term of patent 14 years
U.S. Cl. D2—314

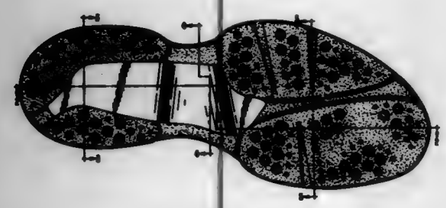


333,907
SHOE SOLE FOOT FRAME
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 4, 1992, Ser. No. 877,775
Term of patent 14 years
U.S. Cl. D2—314

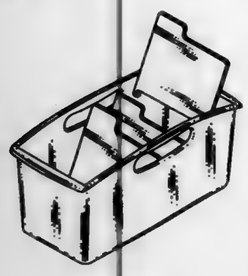


333,908
SHOE OUTSOLE BOTTOM
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,720
Term of patent 14 years
U.S. Cl. D2—320

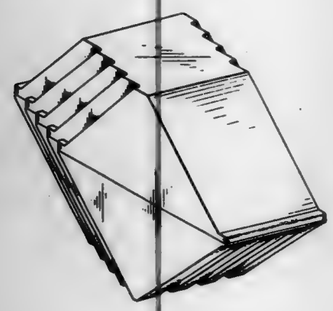
333,909
SHOE OUTSOLE
Thaker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 12, 1992, Ser. No. 897,533
Term of patent 14 years
U.S. Cl. D2—320



333,910
PORTABLE DISK STORAGE CONTAINER OR SIMILAR ARTICLE
Brooks Rorke, Fairfield, Conn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 12, 1990, Ser. No. 536,459
The portion of the term of this patent subsequent to Jul. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—35

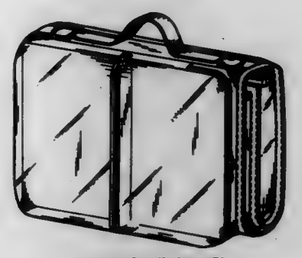


333,911
RECEPTACLE FOR FLOPPY DISKS
Louis A. Scotti, Eden Prairie, Minn., assignor to Disk Management Systems, Eden Prairie, Minn.
Filed Oct. 3, 1991, Ser. No. 770,099
Term of patent 14 years
U.S. Cl. D3—35

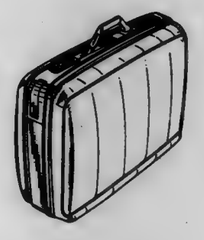


333,912
SUITCASE
Tzu-Keng Cheng, 197 Shin Sheng St., Chung-Ho City, Taipei, Taiwan
Filed Feb. 19, 1991, Ser. No. 656,627
Term of patent 14 years
U.S. Cl. D3—73

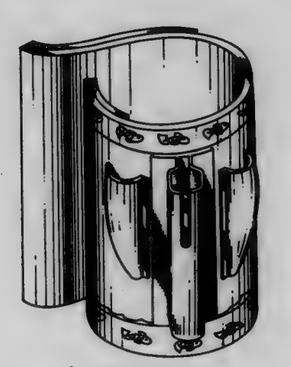
333,913
FOLDABLE CARRYING CASE
David H. Tuman, 5001 Miners Ranch Rd., Oroville, Calif. 95966
Filed Apr. 8, 1991, Ser. No. 682,025
Term of patent 14 years
U.S. Cl. D3—74



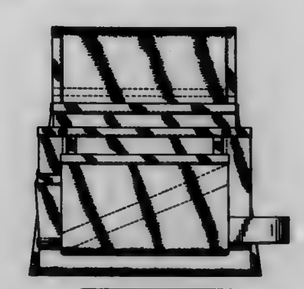
333,914
LUGGAGE CASE
Wilfried Van Hove, Oudenaarde, Belgium, and Giorgetto Giugiaro, Turin, Italy, assignors to Samsonite Corporation, Denver, Colo.
Filed May 17, 1990, Ser. No. 525,432
Claims priority, application Benelux, Nov. 17, 1989, 04748-01
Term of patent 14 years
U.S. Cl. D3—76



333,915
BODY WORN FISHING ROD HOLDER
Donald Clark, 60 Lockwood Rd., Milan, Ohio 44846-9734
Filed Apr. 19, 1990, Ser. No. 509,867
Term of patent 14 years
U.S. Cl. D3—104



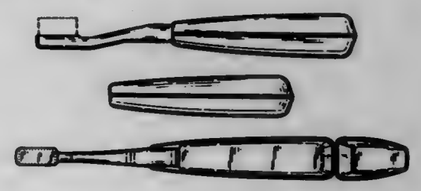
333,916
FOURTEEN POCKET NAIL AND TOOL CARRIER
Brett P. Seber, Escondido, and Steve Leiserson, LaMesa, both of Calif., assignors to Buck Knives, Inc., El Cajon, Calif.
Filed Aug. 9, 1991, Ser. No. 742,931
Term of patent 14 years
U.S. Cl. D3—105



333,917
EARPHONE CASE
Takefumi Daido, and Kazue Kato, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jan. 12, 1989, Ser. No. 296,040
Claims priority, application Japan, Jul. 12, 1988, 63-27843
The portion of the term of this patent subsequent to Mar. 2, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—30.1

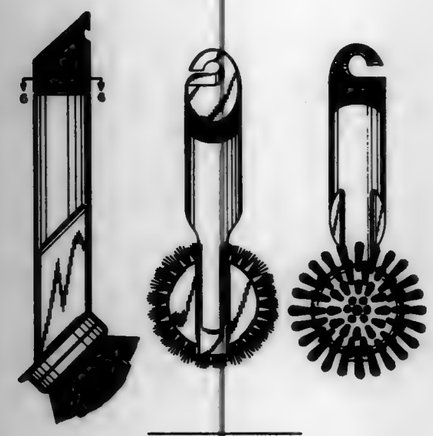
333,918
TOOTHBRUSH
John P. Curtis, Bloomsbury; Kedar N. Rustogi, Kendall Park, both of N.J.; John C. Crawford, Lake Mahopac, N.Y.; James H. Kemp, Piscataway, N.J.; Thomas E. Mistel, Rahway, N.J., and Bert D. Heinzelmann, Tenafly, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 29, 1990, Ser. No. 502,136
Term of patent 14 years
U.S. Cl. D4—104

333,919
COMBINED TOOTHBRUSH HANDLE AND CASE THEREFOR
George B. Perry, Herfordshire, United Kingdom, assignor to Block Drug Company, Inc., Jersey City, N.J.
Filed Nov. 26, 1990, Ser. No. 617,856
Claims priority, application United Kingdom, May 25, 1990, 2007152
Term of patent 14 years
U.S. Cl. D4—108

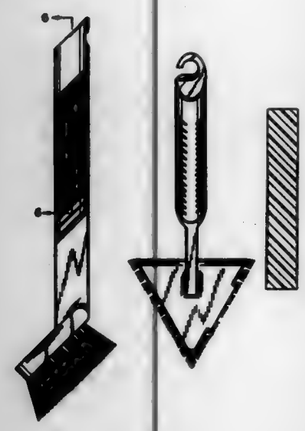


VOL. 1148 ISS. 3 MR. 16 1993 UMI

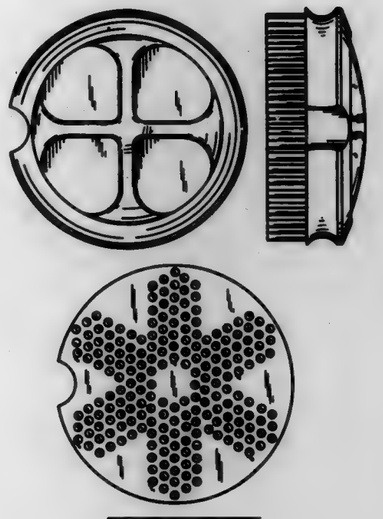
333,920
COMBINED DISHWASHING BRUSH, SCRAPER, AND LIQUID DISPENSER
Roland Vetter, Giengen-Scachenhausen, Fed. Rep. of Germany, assignor to Schwaebische Borstenfabrik Hans Haug KG, Koenigsbrunn, Fed. Rep. of Germany
Division of Ser. No. 376,806, Jul. 7, 1989, Pat. No. D. 326,778. This application May 29, 1992, Ser. No. 891,465
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1989, M8900362.4
Term of patent 14 years
U.S. Cl. D4—114



333,921
COMBINED DISHWASHING BRUSH AND SCRAPER
Roland Vetter, Giengen-Scachenhausen, Fed. Rep. of Germany, assignor to Schwaebische Borstenfabrik Hans Haug KG, Koenigsbrunn, Fed. Rep. of Germany
Division of Ser. No. 376,806, Jul. 7, 1989, Pat. No. Des. 326,778. This application May 29, 1992, Ser. No. 891,462
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1989, 8900362
Term of patent 14 years
U.S. Cl. D4—118

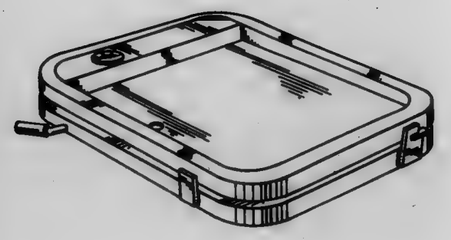


333,922
BRUSH FOR GROOMING ANIMALS
Wayne T. Strickler, and Fletcher C. Strickler, both of Louisville, Ky., assignors to White Horse Trading Co., Inc., Louisville, Ky.
Continuation-in-part of Ser. No. 450,845, Dec. 14, 1989, Pat. No. Des. 321,434, which is a continuation-in-part of Ser. No. 403,156, Sep. 5, 1989, Pat. No. Des. 315,038. This application Nov. 27, 1990, Ser. No. 619,324
Term of patent 14 years
U.S. Cl. D4—136

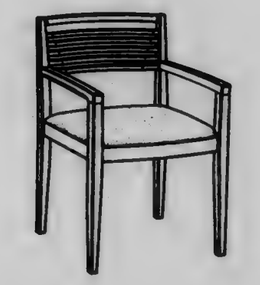


333,923
WALL MOUNTED INFANT SEAT
Robert L. Dainty, Minneapolis, Minn., assignor to JBJ Industries, Inc., Vadnais Heights, Minn.
Filed Feb. 23, 1990, Ser. No. 484,615
Term of patent 14 years
U.S. Cl. D6—333

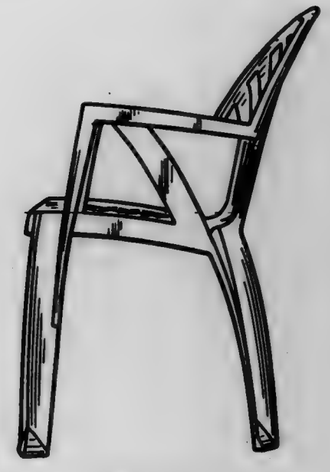
333,924
VEHICLE SEAT MOUNTING MECHANISM
Michael J. Parfitt, and Frank Parfitt, both of Acacia Ridge, Australia, assignors to Transaid Pty. Ltd., Acacia Ridge, Australia
Filed Nov. 29, 1989, Ser. No. 442,683
Claims priority, application Australia, May 30, 1989, 1721/89
Term of patent 14 years
U.S. Cl. D6—356



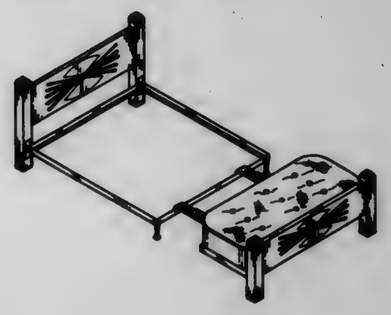
333,925
CHAIR
Joseph D. Ricchio, Jr., and Linda J. Ricchio, both of Temecula, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 16, 1990, Ser. No. 494,486
Term of patent 14 years
U.S. Cl. D6—370



333,926
ARMCHAIR
Manfred Hubert, Meylan, France, assignor to Allibert S.A., Grenoble, France
Filed Feb. 16, 1990, Ser. No. 481,108
Claims priority, application Hague, Aug. 18, 1989, DM/014375
Term of patent 14 years
U.S. Cl. D6—374



333,927
COMBINATION BED AND OTTOMAN
Ralph E. Bello, 9916 Dixie Hwy., Louisville, Ky. 40272
Filed Feb. 1, 1990, Ser. No. 473,389
Term of patent 14 years
U.S. Cl. D6—383



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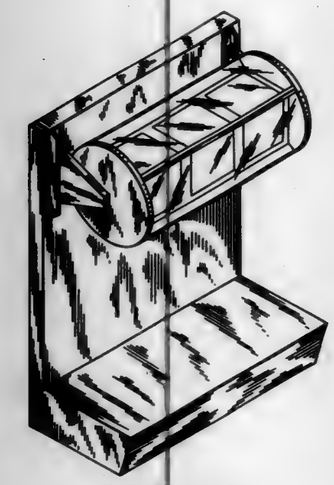
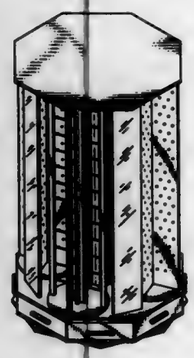
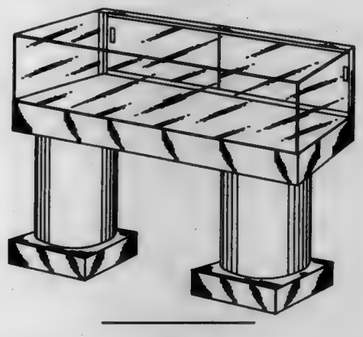
333,928
POINT OF SALE MERCHANDISE STAND HAVING ROTATING DISPLAY
Jerome G. Santowski, Mequon; Sue Lugviel, Hubertus; Evariet R. Henke, Hartford; William A. Kaepernick, Horicon, and Gregory G. Hug, Allenton, all of Wis., assignors to Broan Mfg. Co., Inc., Hartford, Wis.
Filed Dec. 19, 1989, Ser. No. 452,946
Term of patent 14 years
U.S. Cl. D6—456



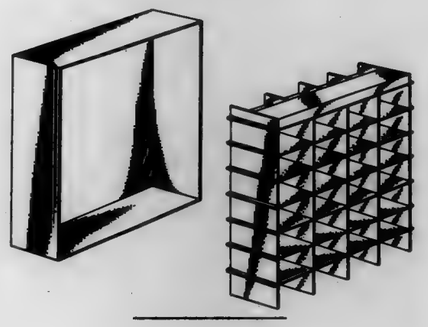
333,929
JEWELRY STORAGE RACK
Joyce Sandor, 208-90 Chandos Avenue, Winnipeg, Manitoba, Canada R2H 1Y2
Division of Ser. No. 213,353, Jun. 30, 1988, Pat. No. 4,850,658. This application May 26, 1989, Ser. No. 357,216
Term of patent 14 years
U.S. Cl. D6—457



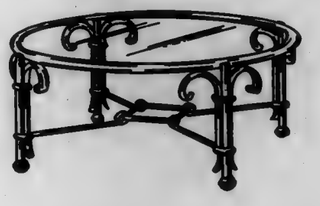
333,930
DISPLAY CASE
Nancy A. Olsen, Hillsborough, Calif., assignor to American Fashion Jewels, Inc., So. San Francisco, Calif.
Filed Mar. 5, 1991, Ser. No. 665,005
Term of patent 14 years
U.S. Cl. D6—470



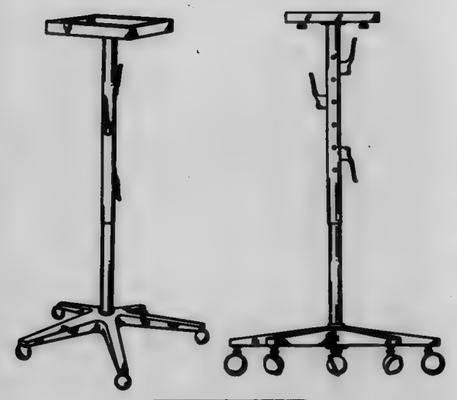
333,931
COMBINED SHIPPING BOX AND DISPLAY STAND FOR SHIRTS
Marc S. Wein, Cos Cob, Conn., assignor to Wilk Shirt Corporation, New York, N.Y.
Filed Apr. 22, 1991, Ser. No. 689,605
Term of patent 14 years
U.S. Cl. D6—478



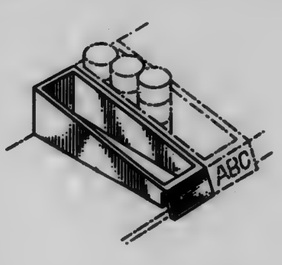
333,932
COCKTAIL TABLE
Leo Martin, Coconut Grove, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.
Filed Feb. 19, 1991, Ser. No. 657,183
Term of patent 14 years
U.S. Cl. D6—484



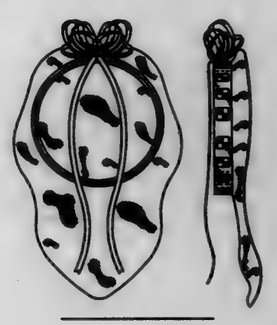
333,933
SUPPORT STAND ASSEMBLY FOR A LIGHT SOURCE
Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonkoma, N.Y.
Filed May 21, 1990, Ser. No. 525,742
Term of patent 14 years
U.S. Cl. D6—486



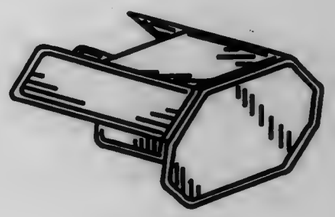
333,934
DISPLAY HOLDER FOR A SHELF
Kenzo Ozawa, 1-4-15-714 Seishin-cho, Edogawa-ku, Tokyo, Japan
Filed Dec. 7, 1989, Ser. No. 447,500
Claims priority, application Japan, Jun. 7, 1989, 1-20783
Term of patent 14 years
U.S. Cl. D6—491



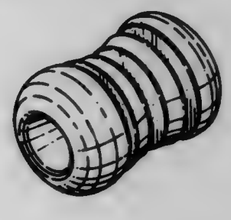
333,935
HANGING JEWELRY SUPPORT
Beryl Holmes, 317 A Rte. 55, LaGrangeville, N.Y. 12540
Filed Mar. 7, 1991, Ser. No. 665,726
Term of patent 14 years
U.S. Cl. D6—567



333,936
BOTTOMRAIL ENDCAP FOR VENETIAN BLINDS
George C. van der Zanden, Delft, Netherlands, assignor to Hunter Douglas International N.V., Caracas, Netherlands Antilles
Filed Feb. 22, 1990, Ser. No. 484,733
Claims priority, application United Kingdom, Aug. 23, 1989, 2000569; Oct. 30, 1989, 2002029
Term of patent 14 years
U.S. Cl. D6—580



333,937
PULL CORD GRIP
Darren M. Prosser, Portsmouth, England, assignor to ITW Ltd., Windsor, England
Filed May 24, 1991, Ser. No. 705,272
Term of patent 14 years
U.S. Cl. D6—581



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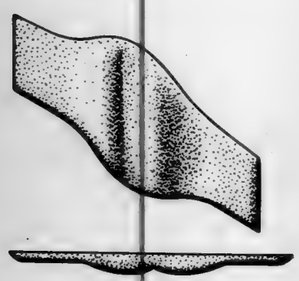
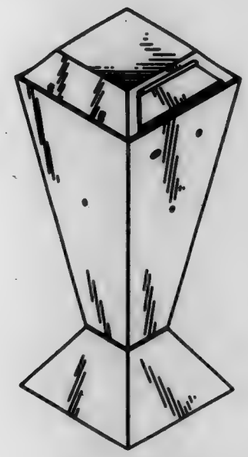
333,938
MATERNITY PILLOW
Lisa D. Watson, 704 N. Barbara St., Waco, Tex. 76705, and Kevin D. White, 740 E. Hovey St., Muskegon Heights, Mich. 49444
Filed Jun. 15, 1990, Ser. No. 538,475
Term of patent 14 years
U.S. Cl. D6—601

333,939
BACK SUPPORT CUSHION
Yoko C. Gates, San Mateo, Calif., assignor to M.Y. Enterprises, San Francisco, Calif.
Filed Jan. 21, 1992, Ser. No. 823,644
Term of patent 14 years
U.S. Cl. D6—601

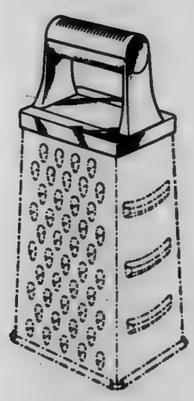


333,940
DRINKING STRAW
Mark M. McNerney, Fort Mitchell, Ky., and Janet B. Reid, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 28, 1991, Ser. No. 724,322
Term of patent 14 years
U.S. Cl. D7—300.2

333,941
OUTDOOR COOKING GRILL
Paul W. Hait, Sun River, Oreg., assignor to Pyromid, Inc., Redmond, Oreg.
Filed Sep. 28, 1990, Ser. No. 589,208
Term of patent 14 years
U.S. Cl. D7—335

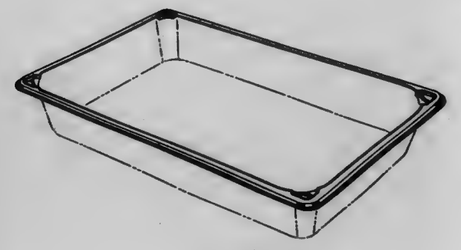


333,942
GRATER HANDLE
Shun So, Kowloon, Hong Kong, assignor to Ki Mee Metal & Plastic Factory Limited, Hong Kong
Filed Jan. 9, 1991, Ser. No. 639,156
Claims priority, application United Kingdom, Jul. 30, 1990, 2008628
Term of patent 14 years
U.S. Cl. D7—394



333,943
STOVE TOP HEATING ELEMENT
Kevin R. McWilliams, Stratford-Upon-Avon, England, assignor to Ceramaspeed Limited, Droitwich, United Kingdom
Filed Sep. 12, 1990, Ser. No. 582,026
Claims priority, application United Kingdom, Mar. 21, 1990, 2005569
Term of patent 14 years
U.S. Cl. D7—407

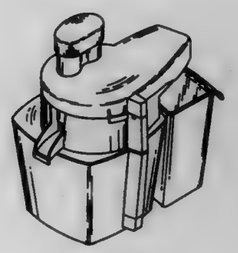
333,944
RIM FOR A FOOD RECEPTACLE
Dirk Denzin, West Bend, and Alan Schommer, Fredonia, both of Wis., assignors to The Vollrath Company, Inc., Sheboygan, Wis.
Filed May 24, 1990, Ser. No. 528,175
Term of patent 14 years
U.S. Cl. D7—554



333,945
WOOD GADGET ORGANIZER
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 15, 1991, Ser. No. 638,543
Term of patent 14 years
U.S. Cl. D7—641

333,946
SPOON
Colin B. Richmond, Vernon Center, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 22, 1991, Ser. No. 643,825
Term of patent 14 years
U.S. Cl. D7—653

333,947
JUICER
Brent Markee; Harold Kawaguchi, and Robert D. Lamson, all of c/o Trillium Health Products, Inc., 655 S. Orcas, Suite 220, Seattle, Wash. 98108
Filed Dec. 20, 1991, Ser. No. 812,212
Term of patent 14 years
U.S. Cl. D7—665



333,948
CONFECTION MOLD
Jerrilyn C. Kiyokane, Torrance, Calif., assignor to Nanakuag Promotions Inc., Costa Mesa, Calif.
Filed Jan. 2, 1991, Ser. No. 636,959
Term of patent 14 years
U.S. Cl. D7—676

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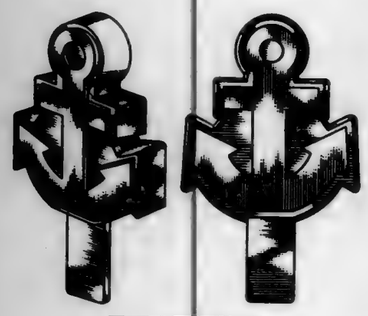
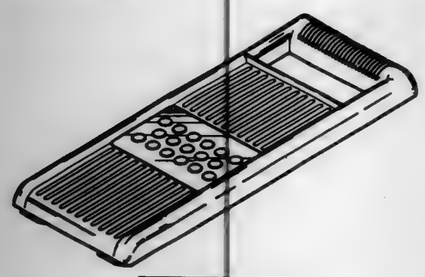
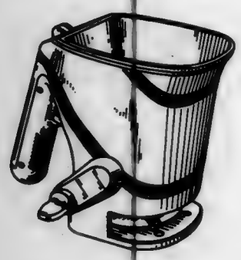
333,949
CONFECTION MOLD
Jerrilyn C. Kiyokane, Torrance, Calif., assignor to Nanakang Promotions Inc., Costa Mesa, Calif.
Filed Jan. 2, 1991, Ser. No. 636,954
Term of patent 14 years
U.S. Cl. D7—676



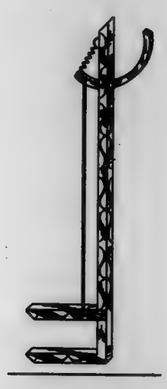
333,950
GRATER
Sham So, Hong Kong, Hong Kong, assignor to Ki Mee Metal & Plastic Factory Limited, Hong Kong
Filed Nov. 27, 1991, Ser. No. 800,397
Term of patent 14 years
U.S. Cl. D7—678



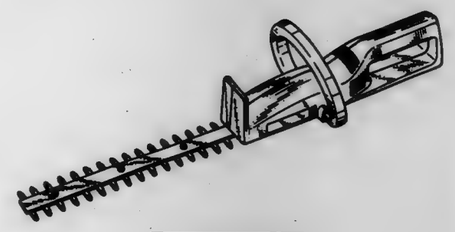
333,951
PORTABLE SPREADER
Steve P. Courtney, Westerville, and James D. Amerine, Marysville, both of Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio
Filed Aug. 7, 1990, Ser. No. 564,981
Term of patent 14 years
U.S. Cl. D8—2



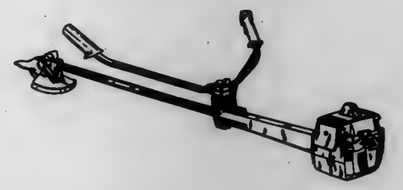
333,952
TOOL FOR PICKING UP DEBRIS
Jesse L. Wolf, Rte. 1, Box 81-8, Forest, Miss. 39074
Filed Feb. 15, 1991, Ser. No. 655,972
Term of patent 14 years
U.S. Cl. D8—4



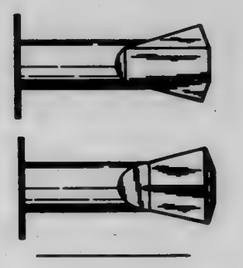
333,953
PORTABLE ELECTRIC TRIMMER
Hiroaki Miyoshi, and Masakazu Sakamoto, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed May 17, 1991, Ser. No. 702,204
Claims priority, application Japan, Dec. 24, 1990, 2-42911
Term of patent 14 years
U.S. Cl. D8—8



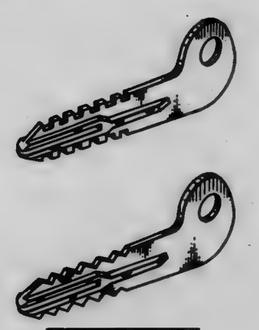
333,954
WEED CUTTER
Kenneth Karlsson, Strandvägen; Bengt Arvidsson, Rimshult; Mikael Norsa, Gångliten, and Mats Svensson, Gillesgatan, all of Sweden, assignors to Husqvarna Forest & Garden AB, Huskvarna, Sweden
Filed Jul. 9, 1991, Ser. No. 727,140
Claims priority, application Sweden, Jan. 17, 1991, 910088
Term of patent 14 years
U.S. Cl. D8—8



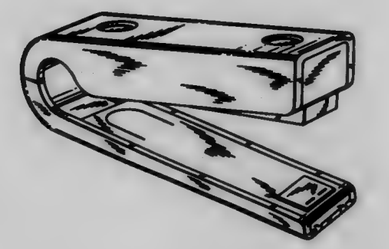
333,955
TIP FOR A DISPENSER OF CAULKING, ADHESIVE OR SEALANT
David J. Hatgas, Carmel, Ind.; David N. Perosie, Ashland, Ohio; Thomas P. Semanas, Ashland, Ohio, and Roger L. Streets, Ashland, Ohio, assignors to Ashland Oil, Inc., Russell, Ky.
Filed Mar. 28, 1991, Ser. No. 677,271
Term of patent 14 years
U.S. Cl. D8—14.1



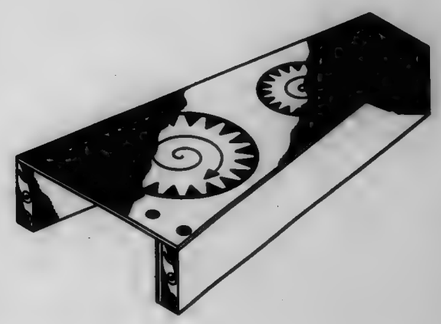
333,956
CAN OPENING TOOL
Per E. Osmar, and Frances L. Osmar, both of Box 38, Clam Gulch, Ak. 99568
Filed May 30, 1991, Ser. No. 707,384
Term of patent 14 years
U.S. Cl. D8—18



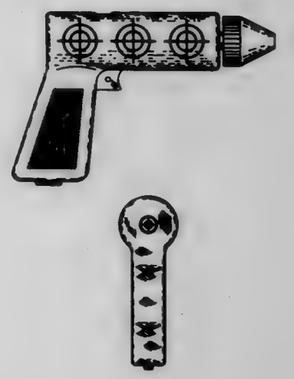
333,957
STAPLER
Eric Chan, 506 E. 82nd St., New York, N.Y. 10028
Filed Jun. 28, 1990, Ser. No. 545,537
Term of patent 14 years
U.S. Cl. D8—50



333,958
JAR OPENER
Serge Demers, P.O. Box 166, St. Basile, New Brunswick, Canada E0L7170
Filed Sep. 16, 1991, Ser. No. 760,249
Term of patent 14 years
U.S. Cl. D8—40



333,959
BULLS EYE DRILL MOTOR
Joseph B. MacWalters, 510 Parkway Dr., Fairless Hills, Pa. 19030
Filed Mar. 22, 1991, Ser. No. 673,487
Term of patent 14 years
U.S. Cl. D8—68



333,960
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,139
Term of patent 14 years
U.S. Cl. D7—667

333,961
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,140
Term of patent 14 years
U.S. Cl. D7—667

333,962
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,141
Term of patent 14 years
U.S. Cl. D7—667

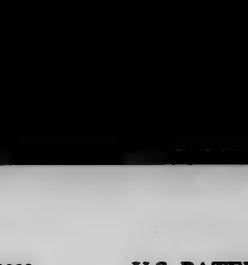
333,963
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,142
Term of patent 14 years
U.S. Cl. D7—667

333,964
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,143
Term of patent 14 years
U.S. Cl. D7—667

333,965
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,144
Term of patent 14 years
U.S. Cl. D7—667

333,966
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,145
Term of patent 14 years
U.S. Cl. D7—667

333,967
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,146
Term of patent 14 years
U.S. Cl. D7—667



333,968
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,147
Term of patent 14 years
U.S. Cl. D7—667

333,969
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,148
Term of patent 14 years
U.S. Cl. D7—667

333,970
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,149
Term of patent 14 years
U.S. Cl. D7—667

333,971
SPOON
Jeffrey Alan Scott, 1 Bridge Rd., Hampton Court, Surrey, England KT8 9EU
Filed Jul. 31, 1991, Ser. No. 732,150
Term of patent 14 years
U.S. Cl. D7—667

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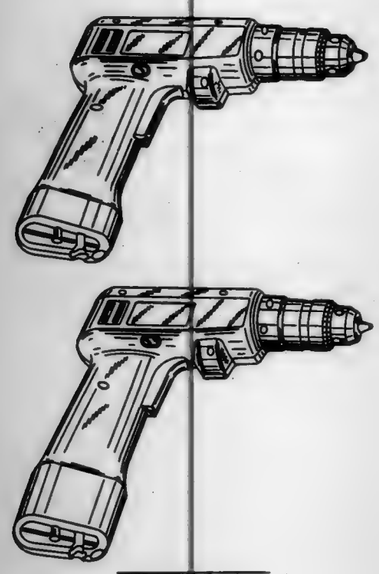
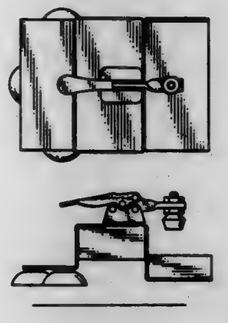
333,960
DRILL
Robert I. Somers, Reisterstown, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jan. 17, 1991, Ser. No. 716,591
Term of patent 14 years
U.S. Cl. D8—68

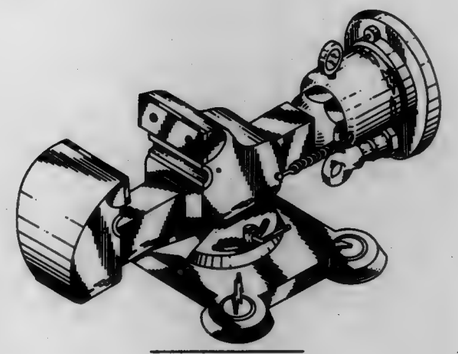


333,961
SUPPORT STAND
Bruce Briscoe, Lake Worth, Fla., assignor to Roja, Inc., Lake Worth, Fla.
Filed Aug. 1, 1990, Ser. No. 561,513
Term of patent 14 years
U.S. Cl. D8—71

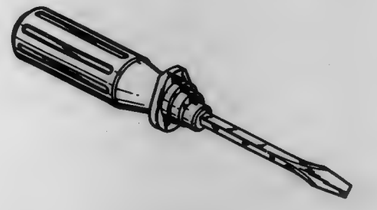
333,962
CORNER CLAMP FOR A WINDOW PRINTER
James R. Davis, 527 Beckus Rd., West Webster, N.Y. 14580
Filed Aug. 31, 1990, Ser. No. 575,890
Term of patent 14 years
U.S. Cl. D8—71



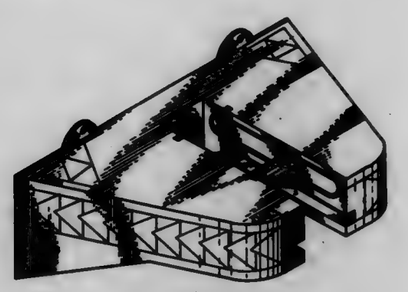
333,963
HYDRAULIC VISE
Robert Goodman, 17 Redfox Dr., Albany, N.Y. 12205
Filed Jul. 18, 1990, Ser. No. 553,629
Term of patent 14 years
U.S. Cl. D8—74



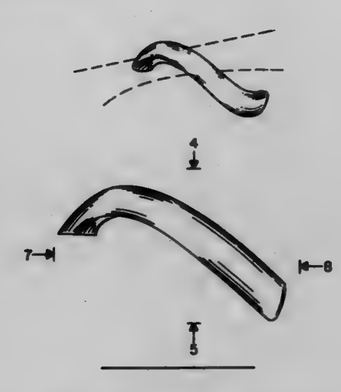
333,964
COMBINED CONDUIT REAMER AND SCREWDRIVER
Dean R. Alexander, 9635 Elm, Taylor, Mich. 48180
Filed Jun. 1, 1990, Ser. No. 531,546
Term of patent 14 years
U.S. Cl. D8—82



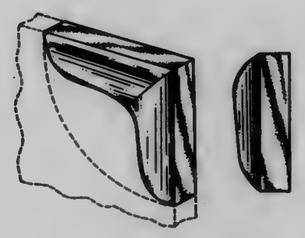
333,965
SHARPENER FOR DISPOSABLE RAZORS
John Wood, 735 Chain St., Norristown, Pa. 19401
Filed Nov. 8, 1990, Ser. No. 611,133
Term of patent 14 years
U.S. Cl. D8—92



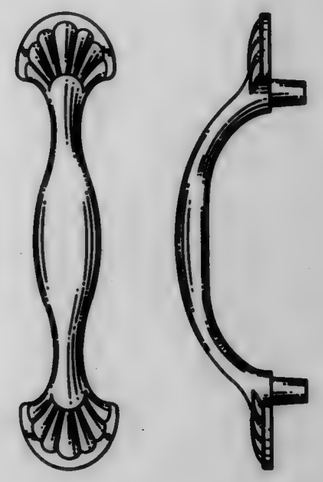
333,966
GRAB BAR
Robin H. Levien, London, England, assignor to American Standard Inc., New York, N.Y.
Filed Oct. 16, 1990, Ser. No. 598,861
Term of patent 14 years
U.S. Cl. D8—315



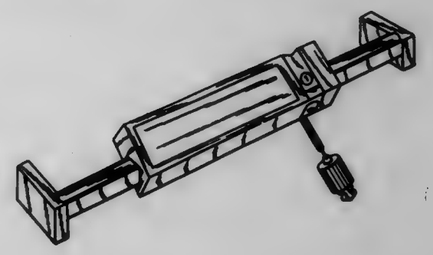
333,967
PULL FOR DRAWERS OR DOORS
Donald A. Shepherd, Spring Lake, Mich., assignor to Helikon Furniture Company, Taftville, Conn.
Filed Mar. 29, 1990, Ser. No. 501,659
Term of patent 14 years
U.S. Cl. D8—313



333,968
PULL
Deborah Mattson, Plainwell, and Doyle Watt, Grand Rapids, both of Mich., assignors to Kesler Brass Company, Grand Rapids, Mich.
Filed Mar. 8, 1990, Ser. No. 491,129
Term of patent 14 years
U.S. Cl. D8—317



333,969
LOCK FOR SECURING SHOPPING CARTS WHEN NESTED TOGETHER
Horst Merchel, Bietigheim, Fed. Rep. of Germany, assignor to Vendoret Holding S.A., Luxembourg-Hesperange, Luxembourg
Filed Mar. 29, 1990, Ser. No. 502,426
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 8905424
Term of patent 14 years
U.S. Cl. D8—331



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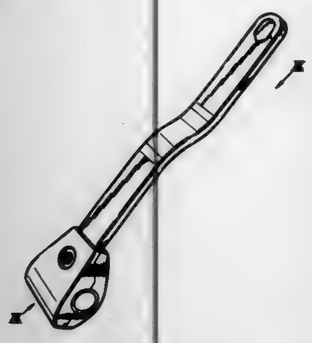
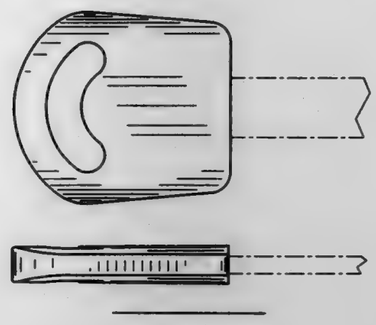
333,970
ANTI-THEFT VEHICLE STEERING WHEEL LOCK
John E. Starmer, Sussex, United Kingdom, assignor to Metro Products (Accessories & Leisure) Ltd., Oxted, England
Filed Jun. 5, 1991, Ser. No. 710,907
Claims priority, application United Kingdom, Dec. 18, 1990, 2011814
Term of patent 14 years
U.S. Cl. D8—331



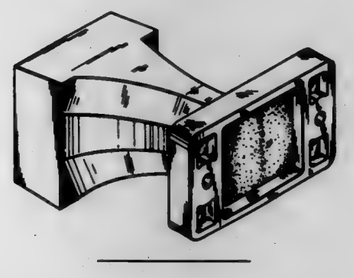
333,971
HOUSING FOR A WINDOW OPENING OPERATOR
Donald T. Kaplan, Janesville; Anthony W. Merchlewitz, Fairbault, and Louis G. Lieske, Belle Plaine, all of Minn., assignors to Lake Country Sales, Inc., Elysian, Minn.
Filed Feb. 13, 1991, Ser. No. 654,918
Term of patent 14 years
U.S. Cl. D8—337

333,972
HOUSING FOR AN ELECTRONIC KEY READER
Richard G. Hyatt, Jr., and Charles E. Hall, both of Salem, Va., assignors to Medeco Security Locks, Inc., Salem, Va.
Filed May 31, 1990, Ser. No. 531,812
Term of patent 14 years
U.S. Cl. D8—353

333,973
KEY BOW
Noach Eizen, Rishon Lezion, Israel, assignor to Mul-T-Lock Ltd., Yavne, Israel
Filed Oct. 4, 1990, Ser. No. 592,904
Claims priority, application Israel, Apr. 4, 1990, 16406
Term of patent 14 years
U.S. Cl. D8—347



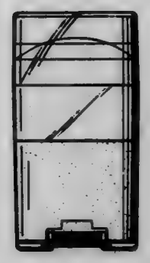
333,974
DOOR STOP
Gregory L. Zechiel, 316 W. Victory Way, Craig, Colo. 81625
Filed Jun. 18, 1991, Ser. No. 717,121
Term of patent 14 years
U.S. Cl. D8—402



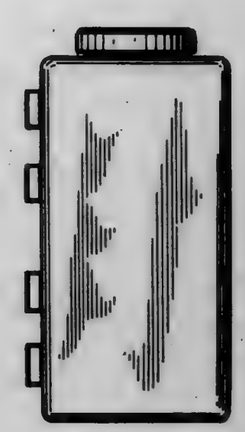
333,975
CONTAINER
Kenneth S. Moore, London, England, assignor to Precise Plastics, Ltd., London, England
Filed Jul. 24, 1991, Ser. No. 734,866
Term of patent 14 years
U.S. Cl. D9—300

333,976
CONTAINER FOR CONFECTIONERY PRODUCTS
Libero Gozzini, Milan, Italy, assignor to Ferrero Ardennes S.A., Arlon, Belgium
Filed Jan. 18, 1991, Ser. No. 643,643
Claims priority, application World Int. Prop. O., Jul. 19, 1990, 001287
Term of patent 14 years
U.S. Cl. D9—310

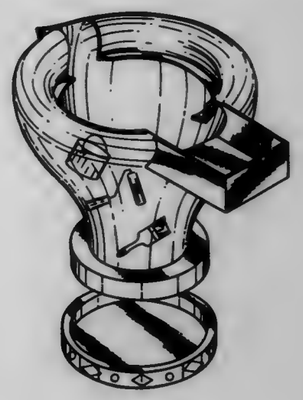
333,977
COMBINED DEODORANT DISPENSING CONTAINER AND CAP
Thomas Gatrost, Randolph, and Natalie Pyden, New Providence, both of N.J., assignors to Bristol-Myers Squibb Company, New York, N.Y.
Filed Nov. 29, 1990, Ser. No. 620,589
Term of patent 14 years
U.S. Cl. D9—337



333,978
STACKING CONTAINER
Aaron Zatler, Woodbury, N.Y., assignor to Marketing Congress, Inc., Plainview, N.Y.
Continuation-in-part of Ser. No. 503,363, Mar. 22, 1990. This application Aug. 30, 1990, Ser. No. 574,930
Term of patent 14 years
U.S. Cl. D9—424



333,979
PAINT CAN FUNNEL
Lionel M. Cloutier, 15 Preble St., Groveton, N.H. 03582
Filed Oct. 30, 1990, Ser. No. 614,101
Term of patent 14 years
U.S. Cl. D9—447



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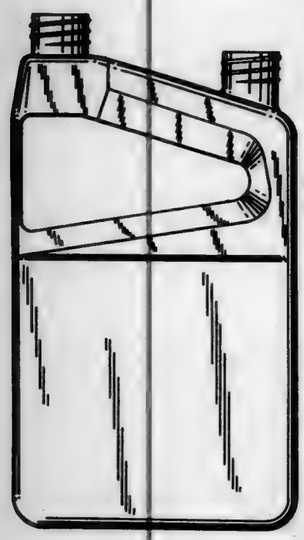
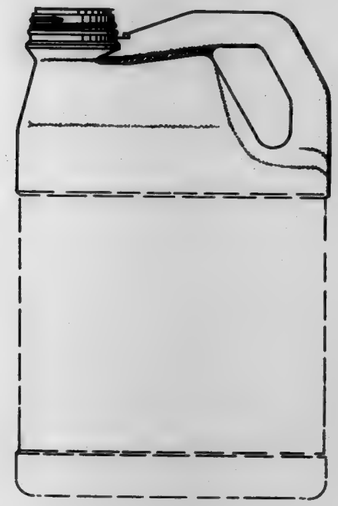
333,980
BOTTLE
Donald H. Schmitt, 25830 80th Ave., St. Cloud, Minn. 56301
Filed Dec. 2, 1991, Ser. No. 801,116
Term of patent 14 years
U.S. Cl. D9—524



333,982
UPPER PORTION OF A BOTTLE
William A. Levy, Raleigh, and Horace Johnson, Jr., Apex, both of N.C., assignors to Rhône-Poulenc AG Company, Research Triangle Park, N.C.
The portion of the term of this patent subsequent to Feb. 9, 2007, has been disclaimed.
Filed Feb. 20, 1990, Ser. No. 482,681
Term of patent 14 years
U.S. Cl. D9—528



333,981
BOTTLE FOR OIL
Ian M. Brown, Austra, and William Robertson, Kent, both of England, assignors to Texaco Inc., White Plains, N.Y.
Filed Sep. 26, 1991, Ser. No. 765,779
Term of patent 14 years
U.S. Cl. D9—531

333,983
BOTTLE
Yves Guisiain, Les Molieres, France, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Dec. 16, 1991, Ser. No. 808,355
Term of patent 14 years
U.S. Cl. D9—543

333,984
BOTTLE
William S. Maginnis, Jr., Fullerton, Calif., assignor to Hunt-Wesson, Inc., Fullerton, Calif.
Filed Apr. 16, 1990, Ser. No. 506,765
Term of patent 14 years
U.S. Cl. D9—569

333,985
BOTTLE
William S. Maginnis, Jr., Fullerton, Calif., assignor to Hunt-Wesson, Inc., Fullerton, Calif.
Filed Apr. 16, 1990, Ser. No. 506,766
Term of patent 14 years
U.S. Cl. D9—569

333,986
BOTTLE
William S. Maginnis, Jr., Fullerton, Calif., assignor to Hunt-Wesson, Inc., Fullerton, Calif.
Filed Jul. 23, 1990, Ser. No. 556,808
Term of patent 14 years
U.S. Cl. D9—569

333,987
WATCHCASE
Koichi Sugiyama, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed Sep. 21, 1990, Ser. No. 586,021
Claims priority, application Japan, Apr. 10, 1990, 2-12203
Term of patent 14 years
U.S. Cl. D10—30

333,988
WRISTWATCH CASE
Jean-Louis Dumas, Paris, France, assignor to La Montre Hermes, Switzerland
Filed Nov. 29, 1990, Ser. No. 628,992
Claims priority, application World Int. Prop. O., May 30, 1990, DM/016775
Term of patent 14 years
U.S. Cl. D10—30

333,989
WRISTWATCH
Koichi Sugiyama, and Keizo Kusano, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan
Filed Sep. 21, 1990, Ser. No. 586,022
Claims priority, application Japan, Apr. 10, 1990, 2-12204
Term of patent 14 years
U.S. Cl. D10—39

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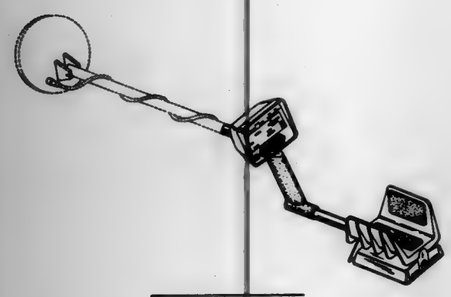
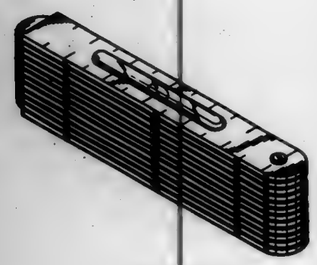
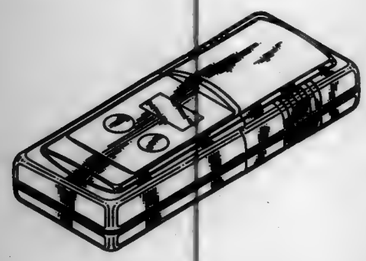
333,990
METAL DETECTOR
Gerald L. Johnson, Garland, and Robert J. Podhrasky, Dallas, both of Tex., assignors to Garrett Electronics, Inc., Garland, Tex.
Filed Jun. 20, 1990, Ser. No. 541,294
Term of patent 14 years
U.S. Cl. D10—46



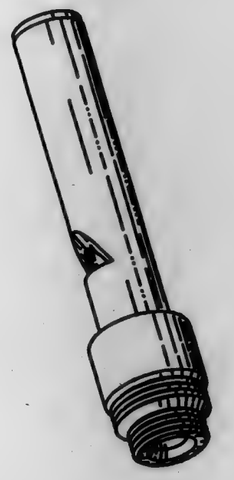
333,991
COMBINATION FOLDABLE RULER AND LEVEL
David B. Lee, 6619 Hillbrook La., Hixson, Tenn. 37343
Filed Jul. 1, 1991, Ser. No. 724,947
Term of patent 14 years
U.S. Cl. D10—62



333,992
POCKET COLORIMETER
Mark E. Anderson, Loveland, Colo., assignor to Hach Company, Loveland, Colo.
Filed Jan. 7, 1991, Ser. No. 637,760
Term of patent 14 years
U.S. Cl. D10—81

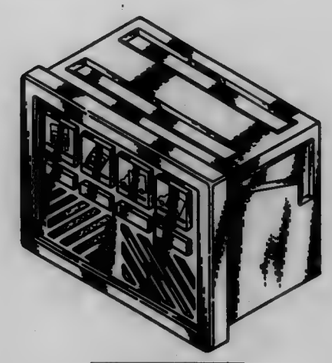


333,993
PISTON COMPRESSION PRESSURE SENSOR
Marc J. Chauvette, 46 Sebbins Pond Dr., Bedford, N.H. 03102
Filed Aug. 31, 1990, Ser. No. 576,002
Term of patent 14 years
U.S. Cl. D10—85

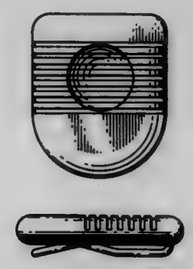


333,994
PITOT TUBE TYPE SENSOR
David R. Mesnard, Boulder, Colo., assignor to Delaware Capital Formation, Inc., Boulder, Colo.
Filed Sep. 18, 1990, Ser. No. 584,872
Term of patent 14 years
U.S. Cl. D10—96

333,995
COMBINED TILT MONITOR AND SIGNAL FOR VEHICLE
Danny Potts, and Kurt Mullins, both of 3400 LaMesa Way, South Sioux City, Nebr. 68776
Filed Jul. 25, 1990, Ser. No. 556,987
Term of patent 14 years
U.S. Cl. D10—104



333,996
PERSONAL SECURITY ALARM
Brian J. Matt, Boston; David J. Privitera, Georgetown, and Vincent J. Savio, Roslindale, all of Mass., assignors to Life-line Systems, Inc., Watertown, Mass.
Filed Aug. 13, 1991, Ser. No. 744,224
Term of patent 14 years
U.S. Cl. D10—106



333,997
BELL
Chung-Shyan Huang, No. 1-1, Changma St., Hsiushui Hsiang, Changhua Hsien, Taiwan
Filed Dec. 4, 1991, Ser. No. 802,429
Term of patent 14 years
U.S. Cl. D10—116

333,998
CLOCK MOVEMENT
Takumi Matsuda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Feb. 20, 1990, Ser. No. 482,354
Term of patent 14 years
U.S. Cl. D10—129

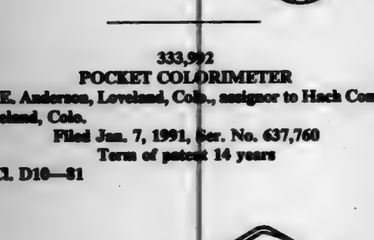
333,999
CLOCK MOVEMENT
Katsuhiro Hatano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 18, 1990, Ser. No. 539,674
Claims priority, application Japan, Dec. 20, 1989, 1-46567
Term of patent 14 years
U.S. Cl. D10—129

334,000
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,000
Term of patent 14 years
U.S. Cl. D14—99

334,001
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,001
Term of patent 14 years
U.S. Cl. D14—99

334,002
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,002
Term of patent 14 years
U.S. Cl. D14—99

334,003
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,003
Term of patent 14 years
U.S. Cl. D14—99

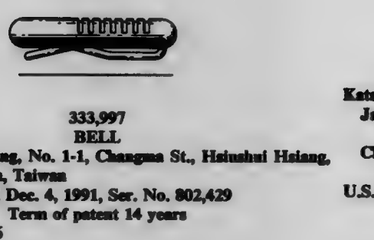


334,004
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,004
Term of patent 14 years
U.S. Cl. D14—99

334,005
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,005
Term of patent 14 years
U.S. Cl. D14—99

334,006
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,006
Term of patent 14 years
U.S. Cl. D14—99

334,007
SPEAKER
Kenneth Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 724,007
Term of patent 14 years
U.S. Cl. D14—99



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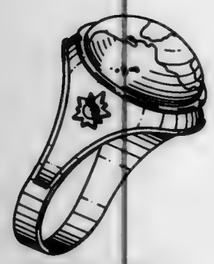
334,000
WATCH BAND
Ryuichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 6, 1991, Ser. No. 711,436
Term of patent 14 years
U.S. Cl. D11—3

334,001
FINGER RING
Curtis Muse, 1150 Freedom Way, Wasilla, Ak. 99654
Filed Aug. 7, 1991, Ser. No. 741,172
Term of patent 14 years
U.S. Cl. D11—30

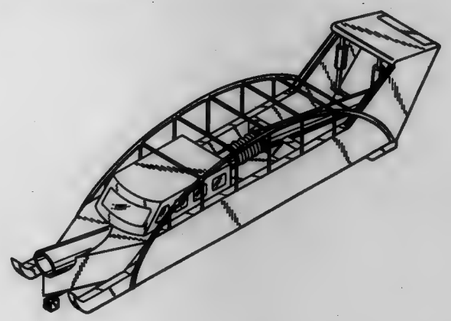


334,002
NOSE RING
Dorothy L. Petchalis, 403 Chestnut St., Marlin, Pa. 17951
Filed May 1, 1991, Ser. No. 694,051
Term of patent 14 years
U.S. Cl. D11—40

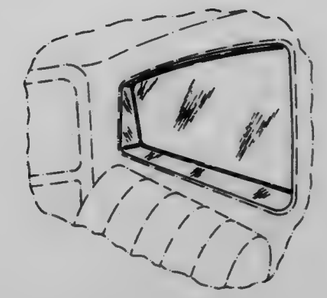
334,003
EARRING
Brian L. Vogelsang, 137 Conger Ave., Akron, Ohio 44303
Filed Jul. 26, 1990, Ser. No. 558,833
Term of patent 14 years
U.S. Cl. D11—43

334,004
EARRING
Jonathan Mandelbaum, Forest Hills, N.Y., assignor to Almond Jewelers Inc., Westbury, N.Y.
Filed Jul. 23, 1992, Ser. No. 919,148
Term of patent 14 years
U.S. Cl. D11—76

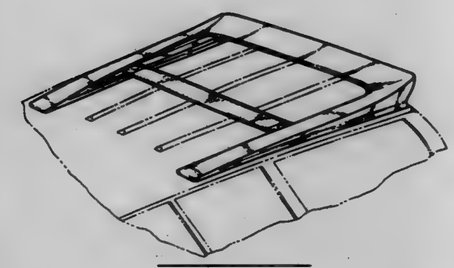
334,005
HIGH SPEED WATERCRAFT
Johnithan R. Guild, P.O. Box 504, Sonoma, Calif. 95476
Filed Apr. 8, 1991, Ser. No. 681,393
Term of patent 14 years
U.S. Cl. D12—300



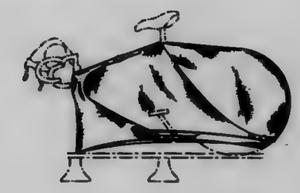
334,006
VEHICULAR WINDOW
Terry R. Austin, 541 W. Main St., Yukon, Okla. 73099
Filed May 18, 1990, Ser. No. 526,153
Term of patent 14 years
U.S. Cl. D12—183



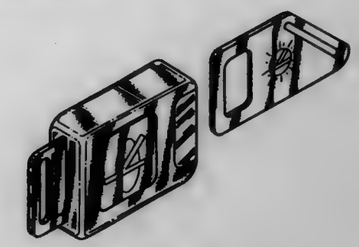
334,007
VEHICLE LUGGAGE CARRIER
John S. Cacheran, late Orion, and Jon D. Sparham, Waterford, both of Mich., assignors to John A. Bott
Filed Apr. 19, 1991, Ser. No. 687,538
Term of patent 14 years
U.S. Cl. D12—157



334,008
PROTECTIVE COVER FOR BICYCLES
C. Douglas Beall, Denver, and Marilyn B. Beall, Englewood, both of Colo., assignors to Undercover Sports, Inc., Denver, Colo.
Filed Nov. 1, 1991, Ser. No. 786,357
Term of patent 14 years
U.S. Cl. D12—156

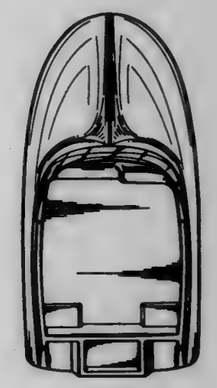


334,009
ILLUMINATED SEAT BELT LATCH ASSEMBLY
Mary Irving, and David Irving, both of P.O. Box 295, 1452 Peake St., Holly Hill, S.C. 29059
Filed Mar. 27, 1991, Ser. No. 675,708
Term of patent 14 years
U.S. Cl. D6—331



334,010
EARRING
Jonathan Mandelbaum, Forest Hills, N.Y., assignor to Almond Jewelers Inc., Westbury, N.Y.
Filed Jul. 23, 1992, Ser. No. 919,149
Term of patent 14 years
U.S. Cl. D11—76

334,011
TUNNEL-HULLED BOAT
Michael J. Biel, P.O. Box 5085, Vashon Island, Wash. 98070; Ted O. Jones, Vashon Island, Wash.; Ronald O. Jones, Sr., Kent, Wash., and Gary Ebert, Port Orchard, Wash., assignors to Michael J. Biel, Vashon Island, Wash.
Filed Dec. 18, 1991, Ser. No. 809,976
Term of patent 14 years
U.S. Cl. D12—310



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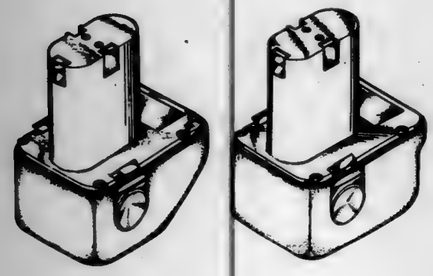
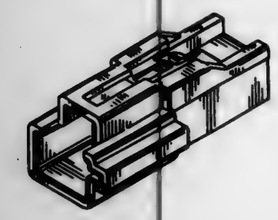
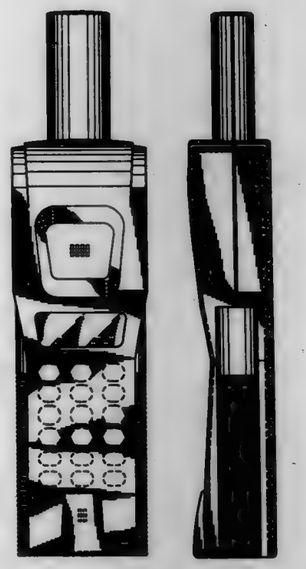
334,012
BATTERY PACK
Benjamin Chen, Tai-Chung Hsien, Taiwan, assignor to Regitar Power Tools Co., Ltd., Tai-Chung Hsien, Taiwan
Filed Dec. 4, 1991, Ser. No. 802,428
Term of patent 14 years
U.S. Cl. D13—103



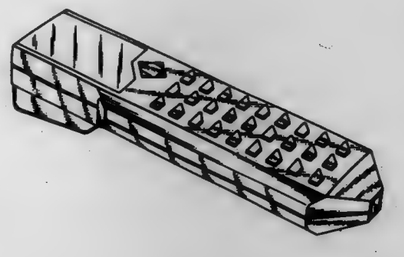
334,013
ELECTRICAL CONNECTOR HOUSING
Yasuhiro Nagasaka; Yasuo Hirayama, both of Toyota; Yoshitsugu Sawada, and Yukio Okta, both of Shizuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Aug. 17, 1989, Ser. No. 394,977
Claims priority, application Japan, Feb. 23, 1989, 1-006434
Term of patent 14 years
U.S. Cl. D13—133



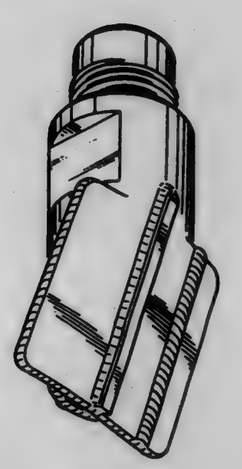
334,014
HOUSING FOR A PORTABLE HANDSET TELEPHONE
Shrirang Jambhekar, Villa Park, and Rudolph Krolopp, Elk Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 4, 1991, Ser. No. 710,295
Term of patent 14 years
U.S. Cl. D14—138



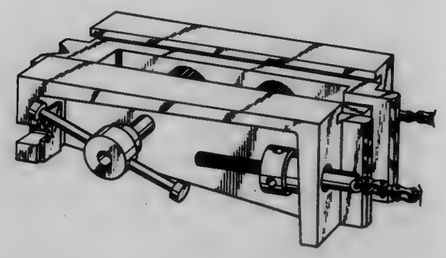
334,015
AUTOMOTIVE TELEPHONE HANDSET
Michael Paton, Herts, United Kingdom; Chusei Takahashi, and Katsuhiko Watanabe, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Feb. 11, 1992, Ser. No. 833,720
Claims priority, application United Kingdom, Sep. 26, 1991, 2017756
Term of patent 14 years
U.S. Cl. D14—138



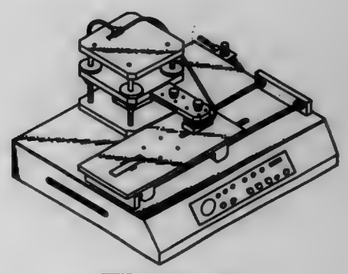
334,016
DRILLING HEAD
Gunnar Jonsson, Tiby, and Leo Holmsten, Knivsta, both of Sweden, assignors to Diamant Boart Craelius AB, Marsta, Sweden
Filed Oct. 22, 1990, Ser. No. 601,326
Claims priority, application Sweden, Apr. 23, 1990, 90-0920
Term of patent 14 years
U.S. Cl. D15—139



334,017
DRILL BASE FOR DETACHABLY SECURING TO VARIOUS SIZE PIPES
Richard A. Mummaw, and Carl E. Wise, both of Jacksonville, Fla., assignors to Triple "R" Specialty of Jax., Inc., Jacksonville, Fla.
Filed Sep. 9, 1991, Ser. No. 756,754
Term of patent 14 years
U.S. Cl. D15—140

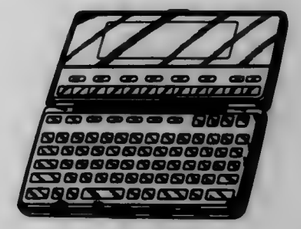


334,018
COMPONENT MOUNTING INSTRUMENT FOR MEMORY BOARD
Jung C. Hoon, 7-1107 Shindongo Apt., 988-1 Pangbae Dong Socho Ku, Seoul, Rep. of Korea
Filed Feb. 14, 1991, Ser. No. 655,897
Claims priority, application Rep. of Korea, Nov. 7, 1990, 90-15595
Term of patent 14 years
U.S. Cl. D15—199



334,019
SHOULDER REST FOR A VIOLIN OR VIOLA
Joseph Kan, 200 MacLaren St., Ottawa, Ontario, Canada K2P 0L6
Filed Jul. 25, 1990, Ser. No. 557,485
Claims priority, application Canada, Jan. 29, 1990, 29-01-90-3
Term of patent 14 years
U.S. Cl. D17—20

334,020
MULTI-FUNCTION PROGRAMMABLE ELECTRONIC CALCULATOR
Kenji Takahata, Hino, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed May 30, 1990, Ser. No. 530,723
The portion of the term of this patent subsequent to Jun. 22, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7



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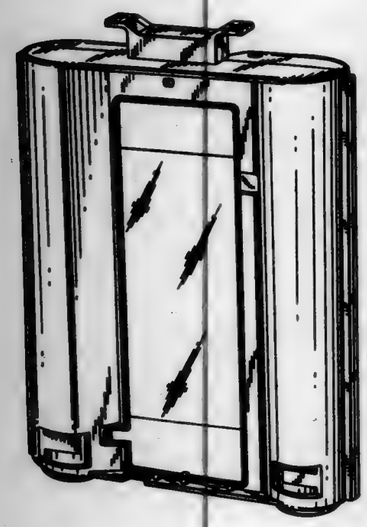
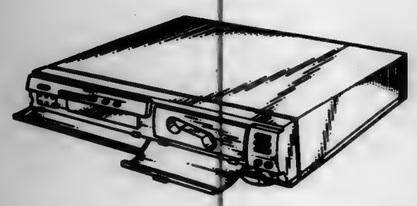
334,021
INK RIBBON CASSETTE FOR VIDEO PRINTER
Atsuo Nagai, Hokya, and Jun Uchiyama, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 506,369
Claims priority, application Japan, Oct. 18, 1989, 1-38018
The portion of the term of this patent subsequent to Jan. 5, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—12

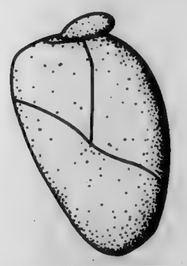


334,022
COLOR VIDEO PRINTER
Hee Y. Byun, Seoul, Rep. of Korea, assignor to Gold Star, Ltd., Seoul, Rep. of Korea
Filed Apr. 11, 1991, Ser. No. 684,344
Claims priority, application Rep. of Korea, Nov. 6, 1990, 15528/1990
Term of patent 14 years
U.S. Cl. D18—50



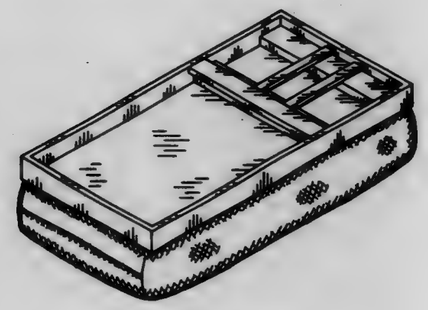
334,023
MARKING INSTRUMENT
Giorgetto Giugiaro, Turin, Italy, assignor to The Gillette Company, Boston, Mass.
Filed Mar. 15, 1991, Ser. No. 670,213
Claims priority, application Argentina, Sep. 17, 1990, 056877
The portion of the term of this patent subsequent to Feb. 2, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—49

334,024
MODEL OF A PROSTATE GLAND
Michel Ganassia, 8, Allee des Pecheurs, 91120 - Palaiseau, France
Filed Sep. 10, 1990, Ser. No. 579,636
Claims priority, application France, Mar. 9, 1990, 901606
Term of patent 14 years
U.S. Cl. D19—62



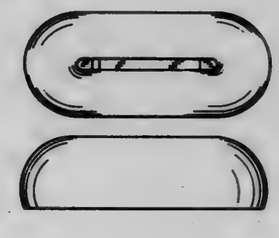
334,025
PAPER CLIP
Charles T. Link, 6227 Pattypeart Way, Carmichael, Calif. 95608
Filed Oct. 26, 1990, Ser. No. 605,180
Term of patent 14 years
U.S. Cl. D19—65

334,026
COMBINED HOLDER FOR WRITING TABLET AND INDEX CARD FILE
Dana Polansky, 9522 Cloverdale, San Antonio, Tex. 78250
Filed Aug. 3, 1989, Ser. No. 388,906
Term of patent 14 years
U.S. Cl. D19—75

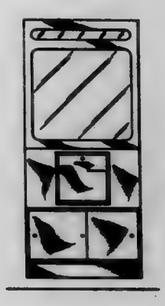


334,027
DESKTOP CONTAINER
Lawrence H. Turner, P.O. Box 2612, Fair Oaks, Calif. 95628
Filed Feb. 10, 1992, Ser. No. 832,505
Term of patent 14 years
U.S. Cl. D19—82

334,028
MEMO DISPENSER
Sai Y. Tam, G.P.O. Box 11071, Hong Kong, Hong Kong
Filed Aug. 15, 1990, Ser. No. 568,312
Term of patent 14 years
U.S. Cl. D19—86



334,029
COMBINED DISPLAY CABINET AND INFORMATION DISPENSING VENDING MACHINE
Richard G. Reising, 10A Lilac Dr., Seymour, Conn. 06483
Filed Dec. 3, 1990, Ser. No. 620,923
Term of patent 14 years
U.S. Cl. D20—1



334,030
NEWSPAPER VENDING MACHINE
Sigifredo Souchet, Wolf Rd. unit 1C, Hillside, Ill. 60162
Filed Feb. 22, 1991, Ser. No. 659,068
Term of patent 14 years
U.S. Cl. D20—6

334,031
INFLATABLE SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,389
Term of patent 14 years
U.S. Cl. D20—10

334,032
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,390
Term of patent 14 years
U.S. Cl. D20—10

334,033
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,391
Term of patent 14 years
U.S. Cl. D20—10

334,034
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,392
Term of patent 14 years
U.S. Cl. D20—10

334,035
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,393
Term of patent 14 years
U.S. Cl. D20—10

334,036
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,394
Term of patent 14 years
U.S. Cl. D20—10

334,037
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,395
Term of patent 14 years
U.S. Cl. D20—10

334,038
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,396
Term of patent 14 years
U.S. Cl. D20—10

334,039
SIGN
Edward M. Berwert, 18160 Amberly Ln., South Bend, Ind. 46637
Filed Jul. 27, 1990, Ser. No. 558,397
Term of patent 14 years
U.S. Cl. D20—10

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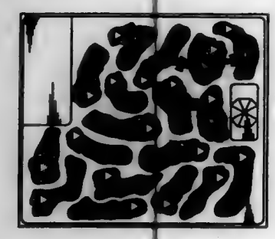
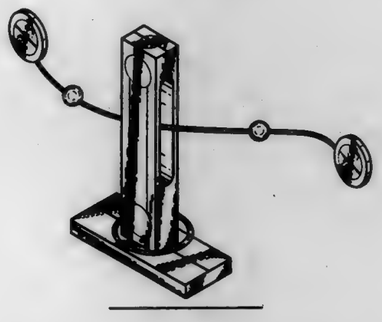
334,032
DECAL
Susan C. Hacking, Edina; Janice B. Kiefer, Plymouth, and Cheryl A. Nobens, Fridley, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed May 28, 1991, Ser. No. 705,795
Term of patent 14 years
U.S. Cl. D20—11

334,033
DART BOARD
Russell T. Mobley, 11219 Reed Rd., Huntley, Ill. 60142
Filed Dec. 3, 1990, Ser. No. 624,273
Term of patent 14 years
U.S. Cl. D21—6

334,034
DART BOARD
Perry Larsen, 847 Whitehill Way, N.E., Calgary, Alberta, Canada T1Y 3E8
Filed Nov. 8, 1990, Ser. No. 611,349
Term of patent 14 years
U.S. Cl. D21—6

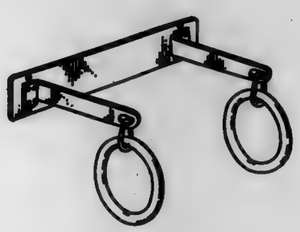


334,035
RING POST PUZZLE
Sam H. Doyal, P.O. Box 108 Rte. 6 Hulsey Dr., Ringgold, Ga. 30736
Filed Jun. 21, 1991, Ser. No. 718,824
Term of patent 14 years
U.S. Cl. D21—104

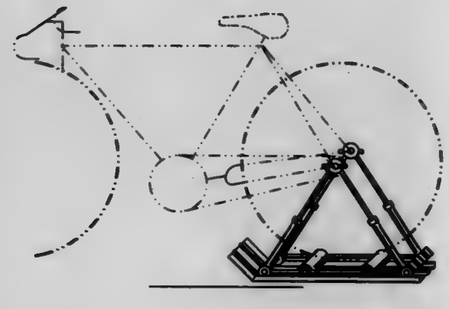


334,036
ELEMENT FOR A TOY BUILDING SET
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,121
Term of patent 14 years
U.S. Cl. D21—108

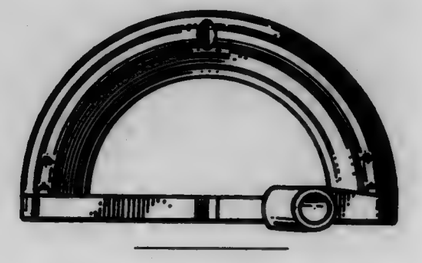
334,037
PHYSICAL EXERCISER
Andranik Demirjian, 1301 N. Tamarind St., Hollywood, Calif. 90028
Filed Oct. 22, 1990, Ser. No. 601,061
Term of patent 14 years
U.S. Cl. D21—191



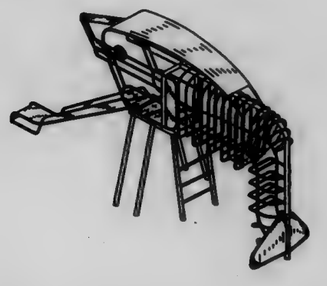
334,038
BICYCLE EXERCISE STAND
Robert A. Case, 654 N. Main St., Palmer, Mass. 01069
Filed Nov. 29, 1990, Ser. No. 619,687
Term of patent 14 years
U.S. Cl. D21—194



334,039
GOLF CLUB HEAD
Aki Tanaka, 21200 Nordhoff St., Chatsworth, Calif. 91311
Filed Sep. 14, 1990, Ser. No. 582,532
Term of patent 14 years
U.S. Cl. D21—219

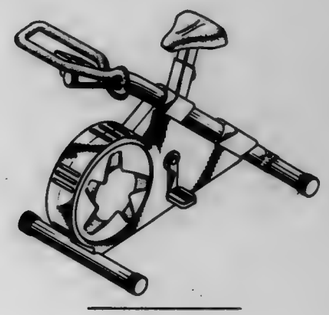


334,040
COMBINED CLIMBER AND SLIDING
Fa-Chai Chou, and Cheng-Jong Lin, both of c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan
Filed Sep. 16, 1991, Ser. No. 760,241
Term of patent 14 years
U.S. Cl. D21—244

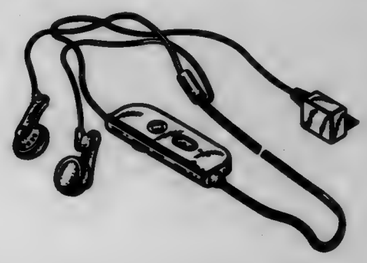


334,041
FISHING JIG
Daniel Falcon, 2300 Paris Rd. #34, Columbia, Mo. 65202
Filed Mar. 29, 1990, Ser. No. 501,179
Term of patent 14 years
U.S. Cl. D22—129

334,042
EXERCISE BICYCLE
Leao Wang, No. 1, Lane 154, Chung Long Rd., Toupienkeng, Taiping Hsiang, Taichung Hsien, Taiwan
Filed Mar. 28, 1991, Ser. No. 676,247
Term of patent 14 years
U.S. Cl. D21—194



334,043
COMBINED EARPHONE AND REMOTE CONTROLLER
Shuhei Tsuiguchi, Yokohama; Kazuo Katoh, and Takefumi Daidoh, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 1, 1990, Ser. No. 517,229
Claims priority, application Japan, Nov. 2, 1989, 1-40180
Term of patent 14 years
U.S. Cl. D21—205



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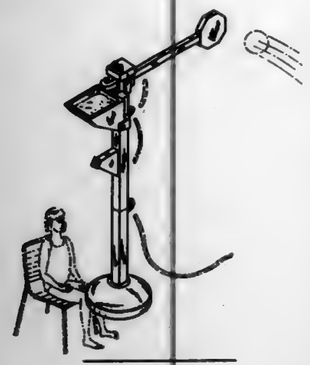
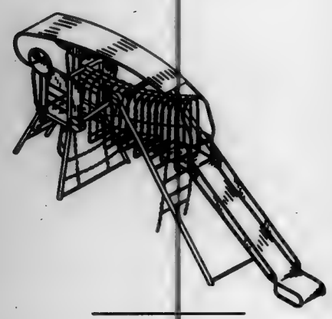
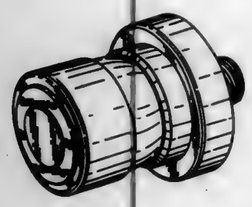
334,044
WATER GAME
Michael A. Lopatin, 514 Hamilton Rd., Merion Park, Pa. 19066
Filed Jul. 22, 1991, Ser. No. 733,250
Term of patent 14 years
U.S. Cl. D21—249



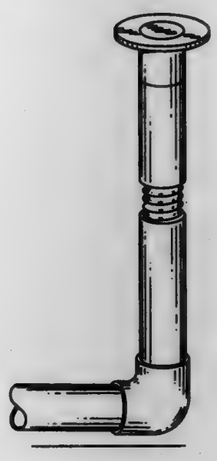
334,045
COMBINED CLIMBER AND SLIDING
Fu-Chai Chou, and Cheng-Jong Lin, both c/o Hung Hsing Patent Service Center P.O. Box 85-1670, Taipei, Taiwan
Filed Sep. 16, 1991, Ser. No. 760,243
Term of patent 14 years
U.S. Cl. D21—244



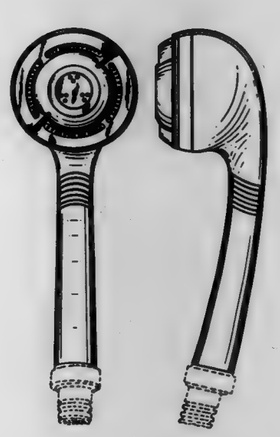
334,046
COMBINED SHOWER AND SPRINKLER HEAD
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,220
Term of patent 14 years
U.S. Cl. D23—213



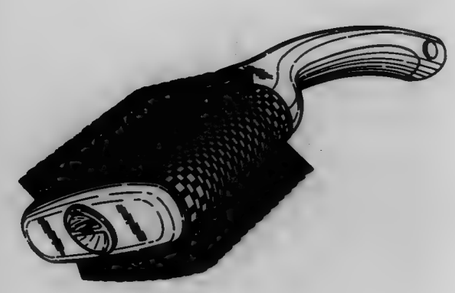
334,047
ADJUSTABLE SPRINKLER
James Oddo, 14428 Corte Lampara, San Diego, Calif. 92129, and John A. Medcalf, 2541 Glebe Rd., Lemon Grove, Calif. 92045
Filed Feb. 15, 1990, Ser. No. 480,512
Term of patent 14 years
U.S. Cl. D23—218



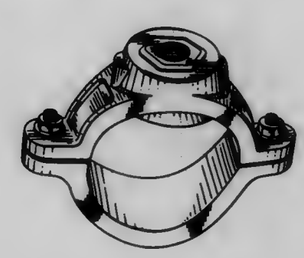
334,048
SHOWER HEAD
Gilad Ben-Zur, Kibbitzz Kfar Hachoresh, Israel, assignor to Unitrol Amcor Ltd., Tel Aviv, Israel
Filed Nov. 4, 1991, Ser. No. 786,948
Term of patent 14 years
U.S. Cl. D23—223



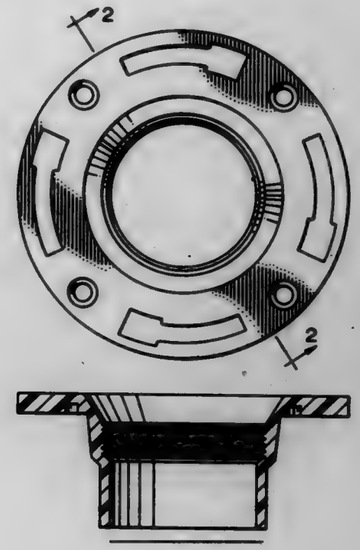
334,049
COMBINED SHOWER HEAD AND BRUSH
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 750,900
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1991, M9101317.8
Term of patent 14 years
U.S. Cl. D23—223



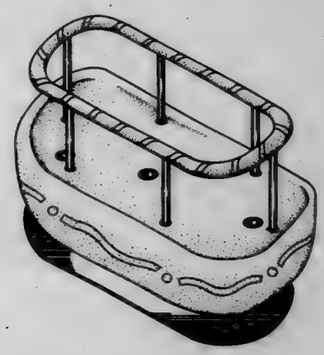
334,050
COMBINED PIPE TAPPING SADDLE AND SEAL
Herbert Foxlee, Wangan, Australia, assignor to HB Schmidt & BG Schmidt Pty. Ltd. and Northern Iron and Brass Foundry, Queensland, Australia
Filed Jun. 12, 1990, Ser. No. 537,518
Claims priority, application Australia, Dec. 12, 1989, 4054/89
Term of patent 14 years
U.S. Cl. D23—263



334,051
CLOSET FLANGE
Donnie R. Fell, Sr., 3500 Tates Creek Rd., Lexington, Ky. 40517
Filed Dec. 19, 1990, Ser. No. 631,076
Term of patent 14 years
U.S. Cl. D23—262



334,052
BATHTUB INSERT SEAT FOR A CHILD
Jerry Haran, P.O. Box 925, Midlothian, Ill. 60445
Filed Aug. 7, 1990, Ser. No. 563,334
Term of patent 14 years
U.S. Cl. D23—304



334,053
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,221
Term of patent 14 years
U.S. Cl. D23—213

334,054
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,222
Term of patent 14 years
U.S. Cl. D23—213

334,055
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,223
Term of patent 14 years
U.S. Cl. D23—213

334,056
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,224
Term of patent 14 years
U.S. Cl. D23—213

334,057
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,225
Term of patent 14 years
U.S. Cl. D23—213

334,058
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,226
Term of patent 14 years
U.S. Cl. D23—213

334,059
COMBINED SHOWER HEAD AND SPRINKLER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 751,227
Term of patent 14 years
U.S. Cl. D23—213

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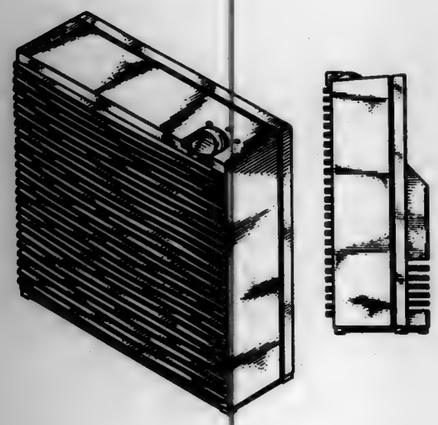
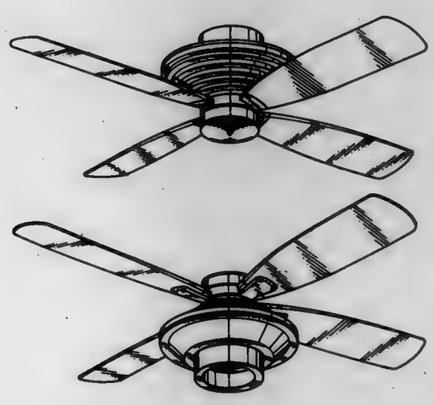
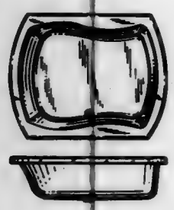
334,053
FLOOR FAN
Robynn M. Cook, Long Beach, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.
Filed Apr. 9, 1992, Ser. No. 866,525
Term of patent 14 years
U.S. Cl. D23—370



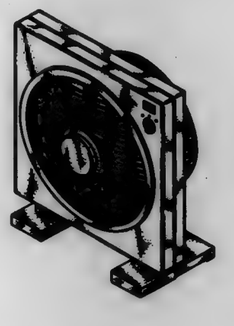
334,055
COMBINED CEILING FAN AND LIGHT
Shigemichi Oyama, Kyoto, and Mutsumi Sawanishi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Seiko Co., Ltd., both of Osaka, Japan
Filed Feb. 14, 1992, Ser. No. 835,677
Claims priority, application Japan, Aug. 22, 1991, 3-25279
Term of patent 14 years
U.S. Cl. D23—377



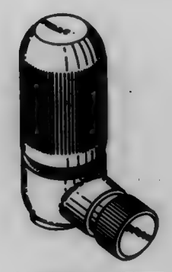
334,054
BATHTUBS
Robin H. Levien, London, England, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 554,031, Jul. 17, 1990, Pat. No. Des. 330,934. This application Jul. 30, 1992, Ser. No. 921,263
Claims priority, application World Int. Prop. O., Jan. 23, 1990, DM/015663
Term of patent 14 years
U.S. Cl. D23—277



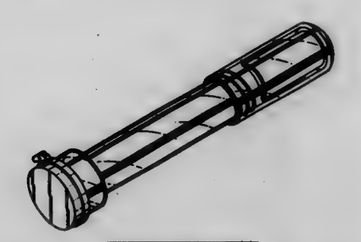
334,056
FAN FOR USE ON TABLES AND FLOORS
Robynn M. Cook, Long Beach, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.
Filed Apr. 9, 1992, Ser. No. 866,527
Term of patent 14 years
U.S. Cl. D23—382



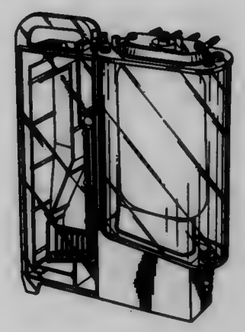
334,057
AEROSOL ACTUATOR
David C. Byram, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 27, 1991, Ser. No. 722,246
Term of patent 14 years
U.S. Cl. D24—110



334,058
COMBINED DOSAGE SPOON AND CONTAINER
Terrance O. Noble, Rosemount, Minn., assignor to Apothecary Products, Inc., Burnsville, Minn.
Filed Jun. 7, 1991, Ser. No. 638,414
Term of patent 14 years
U.S. Cl. D24—116

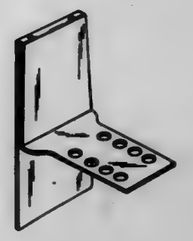


334,059
DRAINAGE INSTRUMENT FOR DRAINING BODILY FLUIDS
Bruce C. Cathcart, Lincoln, R.I., and Quinton J. Farrar, Lakeville, Mass., assignors to Deknatel Technology Corporation, Wilmington, Del.
Filed Sep. 27, 1991, Ser. No. 770,761
Term of patent 14 years
U.S. Cl. D24—118

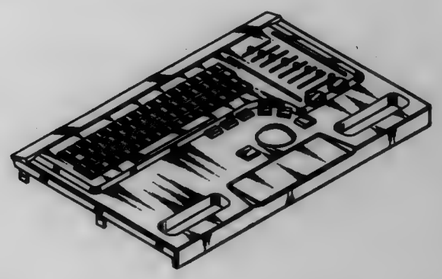


334,060
DIAPER
Dyann E. Hoffman, 19120 Four Seasons Pl., Hayward, Calif. 94541
Filed May 25, 1990, Ser. No. 528,782
Term of patent 14 years
U.S. Cl. D24—126

334,061
HOLDER FOR DENTAL X-RAY FILMS
Ingrid Kamlin, Postgatan 5 S–392 33, Kalmar, Sweden
Filed Nov. 2, 1989, Ser. No. 430,980
Claims priority, application Sweden, May 11, 1989, 89-1162
Term of patent 14 years
U.S. Cl. D24—156



334,062
CONTROL CONSOLE FOR ULTRASOUND IMAGING APPARATUS
Bradley C. Davis, Scottsdale; William G. Shumate, Tempe; Roy Fischer, Phoenix, and Randall Teitzman, Scottsdale, all of Ariz., assignors to Acoustic Imaging Technologies Corporation, Phoenix, Ariz.
Filed Nov. 13, 1989, Ser. No. 434,838
Term of patent 14 years
U.S. Cl. D24—160



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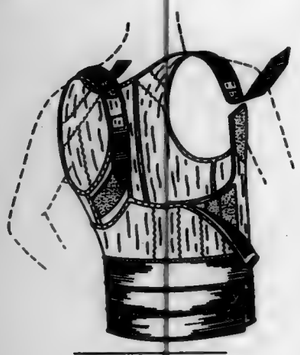
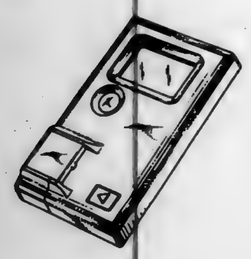
334,063
OSTEOPOROSIS VEST
Terry L. DeWall, 6110 N. 100th Plz., Omaha, Nebr. 68134
Filed Oct. 22, 1990, Ser. No. 602,978
Term of patent 14 years
U.S. Cl. D24—190

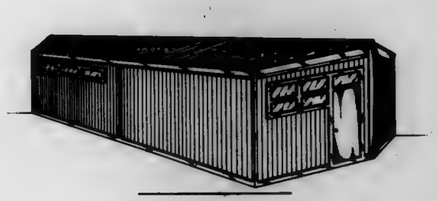


334,064
PACIFIER
William E. Fitzpatrick, Wyckoff, N.J., assignor to Playtex Family Products Corporation, Stamford, Conn.
Filed Jan. 4, 1991, Ser. No. 639,173
Term of patent 14 years
U.S. Cl. D24—194

334,065
DIAGNOSTIC REFLECTANCE PHOTOMETER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Dec. 5, 1991, Ser. No. 803,407
Term of patent 14 years
U.S. Cl. D24—232



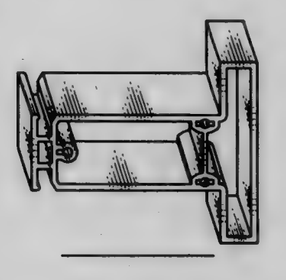
334,066
MODULAR BUILDING
Robert P. McGrath, San Francisco, Calif., assignor to McGrath Rentcorp, San Lorenzo, Calif.
Filed Aug. 23, 1990, Ser. No. 571,430
Term of patent 14 years
U.S. Cl. D25—1



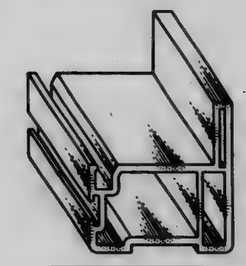
334,067
COMBINED FRAME AND SCREEN FOR A GARAGE DOOR
David J. Heika, 7154 Sigler, South Rockwood, Mich. 48179
Filed Jan. 24, 1991, Ser. No. 645,672
Term of patent 14 years
U.S. Cl. D25—53

334,068
PEDIMENT FOR MOUNTING OVER WINDOWS
Bonnie K. Poole, 22 W. Pennsylvania Ave., Stewartstown, Pa. 17363
Filed Jan. 29, 1991, Ser. No. 646,996
Term of patent 14 years
U.S. Cl. D25—60

334,069
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,217
Term of patent 14 years
U.S. Cl. D25—122

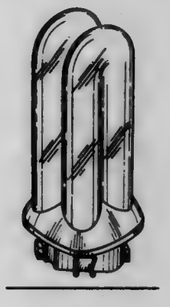


334,070
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,216
Term of patent 14 years
U.S. Cl. D25—124

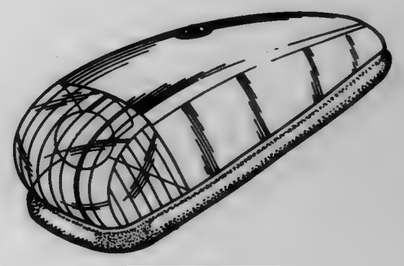


334,071
SODIUM LAMP
Akira Itoh; Kazuyoshi Okamura, both of Yokohama, and Kazuiki Uchida, Kanagawa, all of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan
Filed Nov. 15, 1991, Ser. No. 792,739
Claims priority, application Japan, May 21, 1991, 3-14711
Term of patent 14 years
U.S. Cl. D26—2

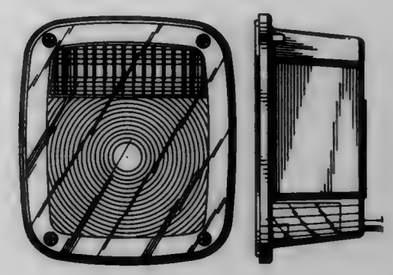
334,072
FLUORESCENT LAMP
Kazuo Egawa, Tokyo, Japan, assignor to Toshiba Lighting & Technology Corporation, Tokyo, Japan
Filed Jan. 29, 1991, Ser. No. 647,013
Claims priority, application Japan, Jul. 31, 1990, 2-25799
Term of patent 14 years
U.S. Cl. D26—3



334,073
EXTERIOR VEHICLE LIGHT
Norman Wishoff, 9345 San Fernando Rd., West, Los Angeles, Calif. 90039
Filed Jan. 14, 1991, Ser. No. 641,094
Term of patent 14 years
U.S. Cl. D26—28



334,074
TRUCK BRAKE LIGHT
Carl W. Lee, Miami, Fla., assignor to Poli-Auto, Inc., Miami, Fla.
Filed Jan. 17, 1991, Ser. No. 716,359
Term of patent 14 years
U.S. Cl. D26—35



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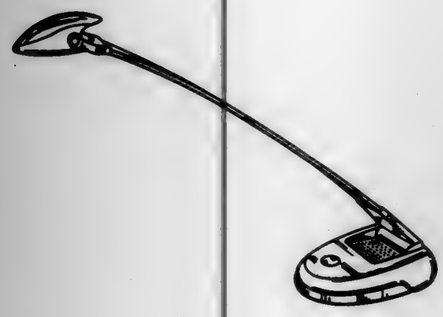
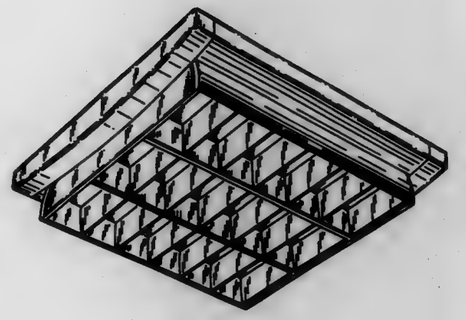
334,075
TABLE LAMP
Antonio Bianchi, Via Salaroano, 41, 20136 Milan, Italy
Filed Jul. 24, 1990, Ser. No. 557,495
Claims priority, application Int'l Pat. Institute, Mar. 16, 1990, DM/016204
Term of patent 14 years
U.S. Cl. D26—68

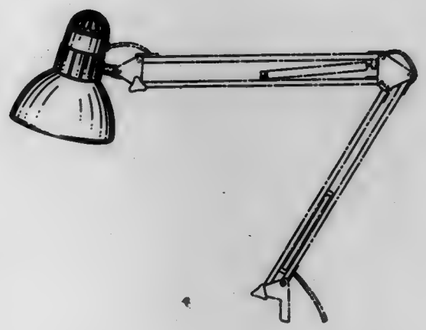


334,077
LUMINAIRE
Menno Diepenink, Amsterdam, and Stefanus F. W. Joosten, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 13, 1990, Ser. No. 509,546
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014,914
Term of patent 14 years
U.S. Cl. D26—77

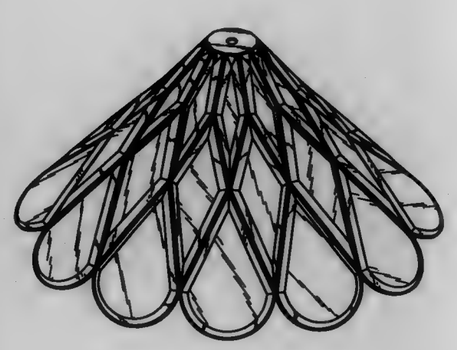


334,076
LUMINAIRE
Menno Diepenink, Amsterdam, and Stefanus F. W. Joosten, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 9, 1990, Ser. No. 506,660
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014,914
Term of patent 14 years
U.S. Cl. D26—77

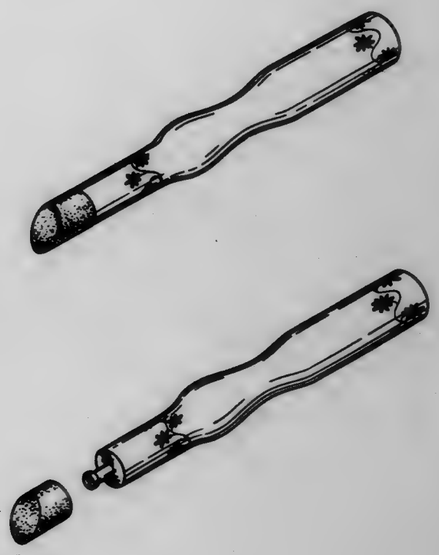
334,078
LAMP REFLECTOR
John Stromberg, 9 Clover Dr., Wilton, Conn. 06897
Filed Mar. 17, 1989, Ser. No. 318,108
Term of patent 14 years
U.S. Cl. D26—131



334,079
GLASS LAMP SHADE
David Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Jan. 27, 1991, Ser. No. 719,291
Term of patent 14 years
U.S. Cl. D26—136



334,081
NAIL BUFFING DEVICE
Lougene T. Lampasona, 2 Malton Rd., Plainview, N.Y. 11803-6102
Filed Jul. 12, 1990, Ser. No. 551,608
Term of patent 14 years
U.S. Cl. D28—59



334,080
POCKET LIGHTER
Takeso Miyamoto, Tokyo, Japan, assignor to Miyamoto Mfg. Co., Ltd., Japan
Filed May 15, 1991, Ser. No. 700,639
Term of patent 14 years
U.S. Cl. D27—157

334,082
RAZOR CASE
Paolo Tiramani, Greenwich, Conn., and Thomas Van Dyk, Prospect Park, N.J., assignors to Goody Products, Inc., Kearney, N.J.
Continuation-in-part of Ser. No. 558,083, Jul. 24, 1990, Pat. No. 5,042,658. This application Jan. 31, 1991, Ser. No. 648,356
Term of patent 14 years
U.S. Cl. D28—73

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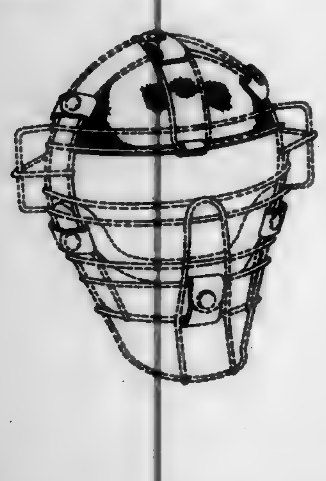
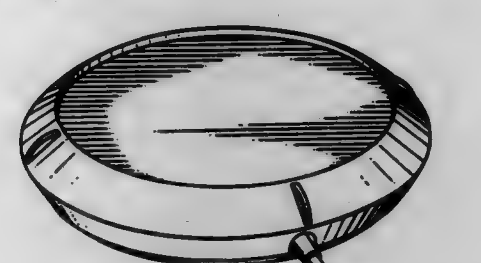
334,083
LIPSTICK CASE
Neil Davis, New York, N.Y., assignor to L'Oreal S.A., Paris, France
Filed Feb. 6, 1991, Ser. No. 651,483
Term of patent 14 years
U.S. Cl. D28—85

334,084
SUN VISOR FOR A CATCHER'S MASK
Shannon L. Hunt, 4430 Angus Ct., Chico, Calif. 95926, and Raymond Domecq, 3925 Scenic DR. #54, Moodesto, Calif. 95355
Filed May 7, 1990, Ser. No. 519,665
Term of patent 14 years
U.S. Cl. D29—18

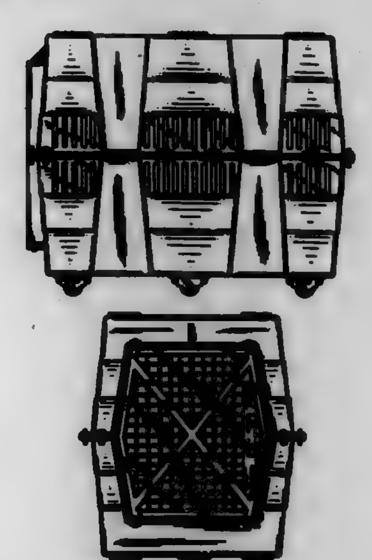


334,085
FINGER AND HAND PROTECTOR
James J. Niemann, 311 W. Kroke, Effingham, Ill. 62401
Filed Feb. 2, 1990, Ser. No. 473,718
Term of patent 14 years
U.S. Cl. D29—20

334,086
AIR STONE
Tony T. W. Ng, Hong Kong, Hong Kong, assignor to Very Plastic Co., Limited, Hong Kong
Filed Apr. 24, 1991, Ser. No. 690,798
Claims priority, application United Kingdom, Nov. 20, 1990, 20111577
Term of patent 14 years
U.S. Cl. D30—106



334,087
PET CARRIER OR SIMILAR ARTICLE
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Jan. 5, 1990, Ser. No. 461,453
Term of patent 14 years
U.S. Cl. D30—108



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TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF MARCH, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Lo, Young S.; Nolan, Joseph C.; Welstead, William J., Jr.; Walsh, David A.; Shamblee, Dwight A.; and Uwaydah, Ibrahim M., 5,194,446, Cl. 514-494.000.
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A/S Haustrup PLM Holding: *See*—
Frandsen, Erik; and Mazzone, Rolando, 5,194,478, Cl. 524-398.000.
A/S Spilka Inco Ltd.: *See*—
Knudsen, Rolf, 5,194,309, Cl. 428-83.000.
Aalto, Juhani, to Wallac OY. Multipurpose gamma counter and method for sample handling in gamma measurement. 5,194,733, Cl. 250-328.000.
AB Mecman: *See*—
Reimer, Jens, 5,193,433, Cl. 92-85.00B.
AB Volvo: *See*—
Hakansson, Olof, 5,193,497, Cl. 123-90.160.
ABB Patent GmbH: *See*—
Bossmann, Hans-Peter, 5,193,343, Cl. 60-531.000.
ABB Power T&D Company, Inc.: *See*—
Galloway, Dudley L.; and Linsenbardt, Stanley B., 5,194,841, Cl. 336-92.000.
ABB STAL AB: *See*—
Harboe, Henrik; and Kyrklund, Ben, 5,193,337, Cl. 60-39.030.
Abe, Fumio; Harada, Takashi; and Mizuno, Hiroshige, to NGK Insulators, Ltd. Resistance heater, catalytic converter and method of operating catalytic converter. 5,194,229, Cl. 422-174.000.
Abe, Naomichi; and Motoyama, Takushi, to Fujitsu Limited. Process for formation of resist patterns. 5,194,364, Cl. 430-325.000.
Abe, Tadafumi: *See*—
Urai, Muneharu; Katsuta, Kazuo; Hosoya, Minoru; Abe, Tadafumi; and Wada, Ryosuke, 5,193,474, Cl. 112-262.300.
Abekas Video Systems, Inc.: *See*—
Pelley, Allan M., 5,194,952, Cl. 358-183.000.
Abo, Kimitaka; Kikuchi, Junichi; and Osada, Yoshio, to Hitachi Koki Company Limited. Electric-powered tool. 5,194,774, Cl. 310-239.000.
Abra, Robert; and Guo, Luke S. S., to Liposome Technology, Inc. Amphotericin B/cholesterol sulfate composition and method. 5,194,266, Cl. 424-450.000.
Abraham, Judith A.: *See*—
Tischer, Edmund G.; Abraham, Judith A.; Fiddes, John C.; and Mitchell, Richard L., 5,194,596, Cl. 530-399.000.
Abu-Isa, Ismat A.; and Graham, Pamela M., to General Motors Corporation. High density polyethylene polyblends. 5,194,468, Cl. 524-128.000.
Aburatani, Ryo: *See*—
Toda, Masatoshi; Funabashi, Hideo; Aburatani, Ryo; and Sugahara, Akinobu, 5,194,531, Cl. 526-125.000.
Ackeret, Peter, to Licinvest AG. Device for the cyclic rearrangement of a pile of sheets. 5,193,795, Cl. 271-42.000.
Ackermann, Erich: *See*—
Uhrig, Heinz; Ackermann, Erich; and Sieber, Alexander, 5,194,665, Cl. 560-56.000.
Ackermann, Peter; Kanel, Hans-Ruedi; and Schaub, Bruno, to Ciba-Geigy Corporation. Process for the preparation of substituted difluorobenzo-1,3-dioxoles. 5,194,628, Cl. 548-526.000.
Actel Corporation: *See*—
El-Ayat, Khaled A.; Hayes, Kenneth D.; Speers, Theodore M.; and Bakker, Gregory W., 5,194,759, Cl. 307-202.100.
Actron Entwicklungs AG: *See*—
Rehder, Jurgen, 5,194,849, Cl. 340-572.000.
Adachi, Michiaki: *See*—
Tanaka, Hiroshi; and Adachi, Michiaki, 5,193,730, Cl. 227-8.000.
Adachi, Nobuyuki; Yamashita, Kazuo; and Inoue, Akiharu, to Nihon Musen Kabushiki Kaisha. Programmable frequency dividing apparatus. 5,195,111, Cl. 377-52.000.
Adachi, Teruhiko: *See*—
Tajiri, Koji; Minematsu, Hiroyoshi; and Adachi, Teruhiko, 5,194,090, Cl. 106-499.000.
Adachi, Yutaka: *See*—
Hayakawa, Nobuhiro; Minoha, Ken; Adachi, Yutaka; and Shiomi, Haruhisa, 5,194,135, Cl. 204-425.000.
Adams, David V.; Anderson, Roger N.; and Deacon, Thomas E., to Applied Materials, Inc. Thermally processing semiconductor wafers at non-ambient pressures. 5,194,401, Cl. 437-173.000.
Adams, George W. Inclined-plane oil skimmers. 5,194,164, Cl. 210-776.000.
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Adar, Renen; Henry, Charles H.; Kazarinov, Rudolf F.; and Kistler, Rodney C., to AT&T Bell Laboratories. Optical waveguide comprising Bragg grating coupling means. 5,195,161, Cl. 385-129.000.
Adasch, Gunter; and Huber, Jurgen, to Hoechst CeramTec Aktiengesellschaft. Process for producing a silicized silicon carbide dipping former. 5,194,204, Cl. 264-63.000.
Ade, Rolf; Buhl, Harro; and Schneider, Theodor, to SWF Auto-Electric GmbH. Electric motor, in particular electric small-size motor for driving windshield wipers on motor vehicles. 5,194,769, Cl. 310-51.000.
Adir et Compagnie: *See*—
Andrieux, Jean; Houssin, Raymond; Yous, Said; Guardiola, Beatrice; and Lesieur, Daniel, 5,194,614, Cl. 544-400.000.
Peglion, Jean-Louis; Millan, Mark; and Rivet, Jean-Michel, 5,194,437, Cl. 514-254.000.
Adler, Hellmut; and Zernickel, Alexander, to INA Walzlager Schaeffler KG, DEX. Rolling bearings for steering columns. 5,193,917, Cl. 384-517.000.
Advanced Micro Devices, Inc.: *See*—
Lozano, Leo, 5,194,768, Cl. 307-520.000.
Aerospatiale Societe Nationale Industrielle: *See*—
Francois, Roland C., 5,193,645, Cl. 184-6.120.
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Costrop, Dirk L.; and Trouillard, Frank C., 5,194,898, Cl. 355-236.000.
Vermeulen, Leon L.; and Pauwels, Robert S., 5,194,347, Cl. 430-14.000.
Agnon, Reuben: *See*—
Scheidel, Wolfgang; and Agnon, Reuben, 5,193,981, Cl. 416-179.000.
Agranat, Edward A.: *See*—
Wormley, David; and Agranat, Edward A., 5,193,314, Cl. 51-165.710.
Agrawal, Sudhir; Leiter, Josef M. E.; Palese, Peter; and Zamecnik, Paul C., to Worcester Foundation for Experimental Biology; and Mt. Sinai School of Medicine. Inhibition of influenza virus replication by oligonucleotide phosphorothioates. 5,194,428, Cl. 514-44.000.
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Greer, David G., 5,194,275, Cl. 426-231.000.
Agulloo-Negui, Miguel, to Ingenieria Agullo, S.A. Dip washing machine for machined parts. 5,193,564, Cl. 134-155.000.
Ahlin, Leo: *See*—
Weiss, Lawrence D.; Kawan, Joseph C.; Roth, Leslie; Vollmer, Jim R.; Tucci, Morris L.; Takata, Melvin M.; Samulon, Alfred S.; Parekh, Dilip J.; Meguerdijian, Sarkis A.; Marks, Harvey; Lee, Shan; Caruthers, Douglas W.; Ahlin, Leo; Moss, Leslie; Krieger, Kenneth; Medine, Carol A.; Nguyen, Truc; Engber, Marjorie; Chin, Edward; Warren, Lucilla K.; Randolph, Joseph P.; and Haddock, Robert, 5,195,130, Cl. 379-98.000.
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Ahne, Hellmut: *See*—
Kuehn, Eberhard; Beck, Juergen; Ahne, Hellmut; Birkle, Siegfried; Leuschner, Rainer; Sebald, Michael; Sezi, Recai; and Bestmann, Hans-Juergen, 5,194,629, Cl. 548-531.000.
Aikawa, Haruhiko; Ishiguro, Yoichi; Nagayama, Katsuya; Yoshimura, Ichiro; Katsuyama, Yutaka; and Yoshizawa, Nobuyuki, to Sumitomo Electric Industries, Ltd. Apparatus for producing hermetic coated optical fiber. 5,194,080, Cl. 65-13.000.
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Gordon, Ira R.; Franklin, Donald A.; and Ford, Brian P., 5,195,173, Cl. 395-60.000.
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Aisin AW Co., Ltd.: *See*—
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Aisin Seiki Kabushi Kaisha: *See*—
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Sakagami, Eiji; and Okamoto, Yoshiyuki, 5,193,749, Cl. 239-585.100.
Sugiura, Yuzuru; and Kawasumi, Satoshi, 5,193,429, Cl. 91-6.000.

Aitken, Derek, to Superion Limited. Method and apparatus relating to ion implantation. 5,194,748, Cl. 250-442.110.

Aizawa, Kyoichi: *See*—
Oomichi, Takeo; Hukagawa, Yukio; Sawaragi, Kazuto; Aizawa, Kyoichi; Tachibana, Kiyoshi; Nakayama, Junji; Aoyama, Tomio; Yoshioka, Kyoichi; and Ideo, Mitsuhi, 5,193,405, Cl. 73-865.800.

Ajika, Natsuo; and Arima, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Electrically programmable non-volatie semiconductor memory device. 5,194,925, Cl. 257-314.000.

Ajinomoto Co., Inc.: *See*—
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AK Technology, Inc.: *See*—
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Akashi, Akira; and Odaka, Yukio, to Canon Kabushiki Kaisha. Camera with focus and hand trembling detecting apparatus. 5,194,888, Cl. 354-402.000.

Akatsuka, Mizoru; Sohda, Yuji; and Sawada, Kazutoshi, to Asahi Glass Company Ltd. Liquid crystal display device having biaxial birefringent plates at each side of the liquid crystal layer. 5,194,975, Cl. 359-73.000.

Akesaka, Toshio, to Kabushiki Kaisha Iseki Kaihatsu Koki. Method and apparatus for laying pipe. 5,193,938, Cl. 405-154.000.

Aketa, Tomoyuki: *See*—
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Akiba, Yoshiyuki: *See*—
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Akihama, Ryozo, to Chichibu Cement Co., Ltd. Oxide super conductors. 5,194,420, Cl. 505-1.000.

Akita, Seiichi: *See*—
Suga, Masanobu; Kobayashi, Hiroshi; Kuroda, Nobuyuki; Matsuura, Kazuo; and Akita, Seiichi, 5,194,490, Cl. 524-755.000.

Akita, Shuichi: *See*—
Kikuchi, Yasushi; Daio, Masayoshi; Kayama, Kazuyoshi; Oishi, Hideyuki; Akita, Shuichi; and Suzuki, Fumitoshi, 5,194,485, Cl. 524-526.000.

Akkerman, Neil H., to AVA International Corporation. Apparatus for use in controlling flow through a tubing string suspended and packed off within well bore as well as within the annulus between the tubing string and well bore above and below the packer. 5,193,615, Cl. 166-129.000.

Akopnik, Garri: *See*—
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Munch, Jurgen; Freese, Karl-Heinz; and Metzger, Carl W., 5,194,183, Cl. 252-586.000.

Albal, Rajendra S.; Cochran, Robert N.; Leyshon, David W.; and Candela, Lawrence M., to Arco Chemical Technology, L.P. Recovery of hydrogen peroxide. 5,194,067, Cl. 23-293.00R.

Albrecht, Hans-Jurgen: *See*—
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Allan, Barry D., to United States of America, Army. Method of applying a fiber optic adhesive to a fiber optic material. 5,194,112, Cl. 156-169.000.

Allander, Krag S.: *See*—
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Allison, Robert S. Standardized portable housing unit. 5,193,325, Cl. 52-745.020.

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Soros International, Inc.: *See*—
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Soros, Paul, to Soros International, Inc. Slewing bridge material handling apparatus capable of continuous material feeding during moving and slewing. 5,193,965, Cl. 414-140.900.

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Specrete-IP Incorporated: *See*—
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Spector, George: *See*—
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Speer, Dietrich; Kiss, Akos; Kleinschmit, Peter; and Horst, Jenny, to Degussa AG. Coated spinel color pigments, process for their production and use. 5,194,089, Cl. 106-426.000.

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Spencer, Douglas A.: *See*—
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Spencer Wright Industries, Inc.: *See*—
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Spies, Klaus. Process for controlling longwall shearing and heading machines along a cutting horizon between coal and rock. 5,193,883, Cl. 299-1.100.

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Srivastava, Gopal K., to Zenith Electronics Corporation. Frequency multiplexed digital video processor. 5,194,940, Cl. 358-21.00R.

Staats, Louis T., III; Bristow, James A.; Noronha, Anil P. F.; and Murphy, Gregory E., to Hewlett-Packard Company. Methods and apparatus for forming an integral high pressure seal using mechanical actuation. 5,193,703, Cl. 220-203.000.

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Staub, Fritz: *See*—
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Stegmueller, Bernhard; Franz, Gerhard; and Heinen, Jochen, to Siemens Aktiengeselschaft. Optoelectronic device for outfeed and infeed of radiation. 5,195,150, Cl. 385-33.000.

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Stender, Elisabeth. Lavatory having a dispenser for excrement bags and control and excrement bag for this purpose. 5,193,231, Cl. 4-449.000.

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Suzuki, Kenichi; and Hagiwara, Misao, to NEC Corporation. Output circuit having large current driving capability without producing undesirable voltage fluctuations. 5,194,763, Cl. 307-443.000.

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78.2 5,193,570
241 5,193,571
244 5,193,572
315 5,193,573
382 5,193,574
509 5,193,575
510 5,193,576
516.29 5,193,577
521 5,193,578
540 5,193,579
613 5,193,580
625.11 5,193,581
625.14 5,193,582
625.32 5,193,583
625.33 5,193,584
846 5,193,585
875 5,193,586

CLASS 138
35 5,193,587
133 5,193,588

CLASS 139
65 5,193,589
82 5,193,590
434 5,193,591

CLASS 140
93.2 5,193,592

CLASS 141
10 5,193,593

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CLASS 144

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145 A 5,193,596
208 J 5,193,597
287 5,193,598

CLASS 148

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234 5,194,097
276 5,194,291
302 5,194,098
5,194,099
518 5,194,100
671 5,194,101
695 5,194,102

CLASS 149

19.1 5,194,103

CLASS 152

152 5,194,104

CLASS 156

62.6 5,194,106
64 5,194,107
71 5,194,108
94 5,194,109
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166 5,194,111
169 5,194,112
243 5,194,113
293 5,194,105
442.1 5,194,114
578 5,194,115
5,194,116
628 5,194,117
643 5,194,118
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CLASS 157

1.55 5,193,599
13 5,193,600

CLASS 160

84.1 5,193,601
89 5,193,602
135 5,193,603

CLASS 162

168.3 5,194,120
358.1 5,194,121

CLASS 164

56.1 5,193,604
97 5,193,605
446 5,193,606
493 5,193,607

CLASS 165

41 5,193,608
42 5,193,609
54 5,193,610
165 5,193,611
167 5,193,612
173 5,193,613

CLASS 166

65.1 5,193,614
129 5,193,615
208 5,193,616
263 5,193,617
272 5,193,618
321 5,193,619
382 5,193,620
386 5,193,621

CLASS 169

54 5,193,622

CLASS 172

47 5,193,623
84 5,193,624
248 5,193,625

CLASS 173

197 5,193,626

CLASS 174

35 GC 5,194,691
36 5,194,692
50 5,194,693
52.3 5,194,694
52.4 5,194,695
65 R 5,194,696
151 5,194,697
250 5,194,698

CLASS 175

19 5,193,627
45 5,193,628

CLASS 177

25.17 5,193,629
50 5,193,630
208 5,193,631

CLASS 178

19 5,194,699

CLASS 180

65.1 5,193,633
65.2 5,193,634
65.3 5,193,635
68.1 5,193,636
91 5,193,632
139 5,193,637
140 5,193,638
248 5,193,639
271 5,193,640
287 5,193,641
312 5,193,642
5,193,643

CLASS 181

131 5,194,701
155 5,194,700
207 5,193,644

CLASS 184

6.12 5,193,645
7.4 5,193,646

CLASS 185

40 R 5,193,647

CLASS 186

38 5,193,648

CLASS 187

9 R 5,193,649
12 5,193,650
95 5,193,651
139 5,194,702

CLASS 188

73.31 5,193,652
79.55 5,193,653
296 5,193,654
299 5,193,655

CLASS 191

49 5,193,656

CLASS 192

1.23 5,193,657
138 5,193,658

CLASS 198

419.2 5,193,659
594 5,193,660
750 5,193,661
774.1 5,193,662
805 D1 4,805,764
819 5,193,663

CLASS 200

5 A 5,194,703
11 R 5,194,704
43.01 5,193,664
43.8 5,193,665
50 C 5,194,705
61.45 R 5,194,706
5,194,707
331 5,193,666
5,193,667
512 5,193,668
5,193,669

CLASS 203

34 5,194,122
51 5,194,123

CLASS 204

64 R 5,194,124
119 5,194,125
129.46 5,194,126
129.85 5,194,127
164 5,194,128
181.5 5,194,129
182.4 5,194,130
192.12 5,194,131
257 5,194,132
299 R 5,194,133
421 5,194,134
425 5,194,135

CLASS 205

122 5,194,136
125 5,194,137
183 5,194,138
210 5,194,139
245 5,194,140
300 5,194,141

CLASS 206

0.81 5,193,670
45.14 5,193,671
45.2 5,193,672
150 5,193,673
223 B1 4,844,252
256 5,193,674
278 5,193,675
296 5,193,676
315.1 5,193,677
363 5,193,678
5,193,679
394 5,193,680
444 5,193,681
454 5,193,682
503 5,193,683
581 5,193,684

CLASS 208

48 AA 5,194,142
291 5,194,143

CLASS 209

3.1 5,193,685
3.3 5,193,686
40 5,193,687
155 5,193,688
323 5,193,689
558 5,193,690
600 5,193,691

CLASS 210

85 5,194,144
90 5,194,145
119 5,194,146
151 5,194,147
230 5,194,148
232 5,194,149
233 5,194,150
242.3 5,194,151
255 5,194,152
392 5,194,153
510.1 5,194,154
519 5,194,155
541 5,194,156
646 5,194,157
651 5,194,158
654 5,194,159
741 5,194,160
748 5,194,161
755 5,194,162
759 5,194,163
776 5,194,164

CLASS 211

41 5,193,692
69.5 5,193,693
70.5 5,193,694
104 5,193,695
162 5,193,696
183 5,193,697

CLASS 212

168 5,193,698

CLASS 213

75 R 5,193,699

CLASS 219

10.493 5,194,708
109 5,194,709
121.360 5,194,714
121.48 5,194,715
121.63 5,194,710
121.67 5,194,711
5,194,712
121.71 5,194,713
137.2 5,194,716
205 5,194,717
270 5,194,718
552 5,194,719

CLASS 220

1.5 5,193,700
4.33 5,193,701
23.4 5,193,702
203 5,193,703
253 5,193,704
319 5,193,705
324 5,193,706
326 5,193,707
338 5,193,708
371 5,193,709
403 5,193,710
453 5,193,711
465 5,193,712
528 5,193,713
592 5,193,714
675 5,193,715

CLASS 221

1 5,193,716
233 5,193,717
531 5,193,722

CLASS 222

129.1 5,193,718
153 5,193,719
160 5,193,720
341 5,193,721
611.2 5,193,723

CLASS 224

31 5,193,724
197 5,193,725

CLASS 225

4 5,193,726

CLASS 226

24 5,193,727
90 5,193,728

CLASS 227

8 5,193,729
5,193,730
19 5,193,731

CLASS 228

1.1 5,193,732
4.5 5,193,733
37 5,193,734
42 5,193,735
119 5,193,736
157 5,193,737
180.2 5,193,738
205 5,193,739

CLASS 229

3.5 MF 5,193,740
8.5 5,193,741

CLASS 235

437 5,193,720
454 5,193,721
463 5,193,722

CLASS 236

49.3 5,193,742

CLASS 239

1 5,193,743
69 5,193,744
102.2 5,193,745
109 5,193,746
288.5 5,193,747
337 5,193,748
585.1 5,193,749
708 5,193,750

CLASS 241

3 5,193,751
21 5,193,752
43 5,193,753
65 5,193,754

CLASS 242

1.1 R 5,193,755
54 R 5,193,756
55 5,193,757
5,193,758
71.1 5,193,759
107.2 5,193,760
159 5,193,761
232 5,193,762
255 5,193,763

CLASS 244

110 R 5,193,764
118.6 5,193,765
161 5,193,766

CLASS 246

418 5,193,767

CLASS 248

27.1 5,193,768
59 5,193,769
97 5,193,770
118 5,193,771
118.5 5,193,772
148 5,193,773
219.4 5,193,774
262 5,193,775
295.1 5,193,776
441.1 5,193,777
610 5,193,778

CLASS 249

188 5,194,165

CLASS 250

205 5,194,723
208.1 5,194,724
5,194,725
214 R 5,194,727
5,194,728
214 VT 5,194,726
222.1 5,194,729
231.13 5,194,730
281 5,194,731
294 5,194,732
328 5,194,733
338.1 5,194,734
362 5,194,735
370.07 5,194,736
382 5,194,737
385.1 5,194,738
423 R 5,194,739
442.11 5,194,748
492.1 5,194,740
492.2 5,194,741
492.3 5,194,742
548 5,194,743
5,194,744
561 5,194,745
563 5,194,746
577 5,194,747

CLASS 251

29 5,193,779
68 5,193,780
129.1 5,193,781
129.21 5,193,782
144 5,193,783

CLASS 252

32.5 5,194,166
34 5,194,167
50 5,194,168
67 5,194,169
5,194,170
5,194,171
130 5,194,172
170 5,194,173
173 5,194,174
182.25 5,194,175
186.27 5,194,176
299.61 5,194,177
299.63 5,194,178
299.66 5,194,179
500 5,194,180
5,194,181
518 5,194,182
586 5,194,183
609 5,194,184

CLASS 254

1 5,193,784
134.3 R 5,193,785

CLASS 256

69 5,193,786

CLASS 257

5,194,749
79 5,194,922
225 5,194,750
229 5,194,751
268 5,194,923
314 5,194,925
316 5,194,924
326 5,194,929
390 5,194,752
565 5,194,926
5,194,927
629 5,194,928
706 5,194,935
734 5,194,931
753 5,194,933
773 5,194,930
5,194,932
775 5,194,753
782 5,194,934

CLASS 261

7 5,194,185
64.4 5,194,186
96 5,194,187

CLASS 264

4.1 5,194,188
22 5,194,189
25 5,194,190
5,194,191
35 5,194,192
5,194,193
37 5,194,194
40.1 5,194,195
5,194,196
5,194,197
42 5,194,198
46.6 5,194,199
56 5,194,200
5,194,201
60 5,194,202
63 5,194,203
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104 5,194,205
115 5,194,206
129 5,194,207
130 5,194,208
132 5,194,209
184 5,194,210
320 5,194,211
513 5,194,212

CLASS 266

142 5,194,213

CLASS 267

220 5,193,787
227 5,193,788

CLASS 269

32 5,193,789
91 5,193,790
268 5,193,791
282 5,193,792
302.1 5,193,793

CLASS 271

9 5,193,794
42 5,193,795
90 5,193,796
115 5,193,797
124 5,193,798
213 5,193,799
272 5,193,800
293 5,193,801

CLASS 273

26 A 5,193,802
33 5,193,803
42 R 5,193,804
77 A 5,193,805
80.2 5,193,806
121 R 5,193,807
138 R 5,193,808
153 S 5,193,809
167 E 5,193,810
167 F 5,193,811
186.3 5,193,812
241 5,193,813
242 5,193,814
269 5,193,815
373 5,193,816
376 5,193,817
430 5,193,818
448 5,193,819

CLASS 277

139 5,193,820
142 5,193,821
180 5,193,822
189 5,193,823

CLASS 279

60 5,193,824
133 5,193,825
145 5,193,826

CLASS 280

7.13 5,193,827
43.24 5,193,828
163 5,193,829
202 5,193,830
5,193,831
276 5,193,832
5,193,833
278 5,193,834
414.1 5,193,835
418.1 5,193,836
495 5,193,837
515 5,193,838
600 5,193,839
615 5,193,840
625 5,193,841
645 5,193,842
675 5,193,843
707 5,193,844
5,193,845
728 5,193,846
738 5,193,847
775 5,193,848
840 5,193,849

CLASS 281

2 5,193,850
13.1 5,193,851
5,193,852

CLASS 283

85 5,193,853
87 5,193,854
117 5,193,855

CLASS 285

308 5,193,856
319 5,193,857
368 5,193,858
417 5,193,859

CLASS 290

55 5,194,754

CLASS 292

39 5,193,860
49 5,193,861
50 5,193,862
255 5,193,863
256.67 5,193,864
262 5,193,865
292 5,193,866
5,193,867
341.15 5,193,868

CLASS 293

128 5,193,869

CLASS 294

1.4 5,193,870
61 5,193,871
82.11 5,193,872
106 5,193,873

CLASS 296

37.1 5,193,874

93 5,193,875
5,193,876
136 5,193,877
162 5,193,878
177 5,193,879

CLASS 297

353 5,193,880
452 5,193,881

CLASS 298

11 5,193,882

CLASS 299

1.1 5,193,883

CLASS 301

37.37 5,193,884

CLASS 303

87 5,193,885
92 5,193,886
5,193,887
93 5,193,888
100 5,193,889

CLASS 307

10.1 5,194,755
10.2 5,194,756
87 5,194,757
112 5,194,758
202.1 5,194,759
263 5,194,760
264 5,194,761
296.8 5,194,762
443 5,194,763
5,194,764
5,194,765
B1 4,882,507
473 5,194,766
475 5,194,767
520 5,194,768
565 B1 5,029,278

CLASS 310

51 5,194,769
5,194,770
68 B 5,194,771
71 5,194,772
112 5,194,773
239 5,194,774
260 5,194,775

CLASS 312

7.1 5,193,890
348.3 5,193,891
405.1 5,193,892

CLASS 313

431 5,194,776
509 5,194,777

CLASS 315

15 5,194,778
82 5,194,779
169.3 5,194,780
291 5,194,781
5,194,782
368.13 5,194,783
371 5,194,784
399 5,194,785

CLASS 318

254 5,194,786
5,194,787
561 5,194,788
565 5,194,789
567 5,194,790
568.1 5,194,791
568.13 5,194,792
568.15 5,194,793
594 5,194,794
603 5,194,795
685 5,194,796
696 5,194,797
727

CLASS 320

2 5,194,799

CLASS 322

21 5,194,800
28 5,194,801

CLASS 323

280 5,194,802
360 5,194,803

CLASS 324

160 5,194,804
207.16 5,194,805
209 5,194,806
248 5,194,807
5,194,808
309 5,194,809
319 5,194,810
322 5,194,811
326 5,194,812
379 5,194,813
446 5,194,814
501 5,194,815
529 5,194,816
544 5,194,817
617 5,194,818
684 5,194,819

CLASS 328

20 5,194,820

CLASS 330

51 5,194,821
129 5,194,822
137 5,194,823
255 5,194,824
298 5,194,825
302 5,194,826
304 5,194,827

CLASS 331

1 A 5,194,828
5,194,829
107 A 5,194,830
111 5,194,831

CLASS 333

18 5,194,832
33 5,194,833
81 A 5,194,834
109 5,194,835
133 5,194,836
166 5,194,837
243 5,194,838

CLASS 335

78 5,194,839
202 5,194,840

CLASS 336

92 5,194,841

CLASS 337

373 5,194,842

CLASS 340

323 R 5,194,843
370.02 5,194,860
426 5,194,844
427 5,194,845
505 5,194,846
557 5,194,847
566 5,194,848
572 5,194,849
660 5,194,850
686 5,194,851
712 5,194,852
784 5,194,853
815.1 5,194,854
825.31 5,194,855
825.35 5,194,856
825.44 5,194,857
825.7 5,194,858
853.4 5,194,859
870.28 5,194,861

CLASS 341

20 5,194,862
31 5,194,863
106 5,194,864
132 5,194,865
156 5,194,866
159 5,194,867
167 5,194,868

CLASS 342

125 5,194,869
128 5,194,870
357 5,194,871
358 5,194,872
374 5,194,873

CLASS 343

757 5,194,874
767 5,194,875
769 5,194,876

CLASS 346

1.1 5,194,877
108 5,194,878
5,194,879
140 R 5,194,880
158 5,194,881

CLASS 351

212 5,194,882

CLASS 353

122 5,194,884

CLASS 354

132 5,194,885
222 5,194,886
297 5,194,887
402 5,194,888
418 5,194,889

CLASS 355

38 5,194,891
40 5,194,892
53 5,194,893
57 5,194,894
77 5,194,890
208 5,194,895
212 5,194,896
215 5,194,897
236 5,194,898
244 5,194,899
260 5,194,900
273 5,194,901
277 5,194,902
316 5,194,903
321 5,194,904
326 5,194,905

CLASS 356

5 5,194,906
5,194,907
28 5,194,908
40 5,194,909
70 5,194,910
242 5,194,911
301 5,194,912
5,194,913
312 5,194,914
318 5,194,915
5,194,916
5,194,917
350 5,194,918
359 5,194,919
375 5,194,920
400 5,194,921
432

CLASS 358

10 5,194,936
11 5,194,937
14 5,194,938
75 5,194,939
5,194,940
86 5,194,941
106 5,194,948
107 5,194,949
133 5,194,950
182 5,194,951
183 5,194,952
192.1 5,194,953
193.1 5,194,954
209 5,194,955
5,194,956
213.19 5,194,957
214 5,194,958
225 5,194,959
228 5,194,960
310 5,194,961
5,194,962
314 5,194,963
316 5,194,964
335 5,194,965
406 5,194,966
434 5,194,967
438 5,194,968
463 5,194,969
498 5,194,970

CLASS 359

9 5,194,971
46 5,194,972
53 5,194,973
59 5,194,974
73 5,194,975
79 5,194,976
128 5,194,977
148 5,194,978
189 5,194,979
204 5,194,980
212 5,194,981
216 5,194,982
245 5,194,983
321 5,194,984
350 5,194,985
353 5,194,986
422 5,194,987
554 5,194,988
583 5,194,989
587 5,194,990
693 5,194,991
704 5,194,992
813 5,194,993
871 5,194,994

CLASS 360

48 5,194,995
5,194,996
5,194,997
48 5,195,074
53 5,195,075
58 5,195,076
72.3 5,195,000
85 5,195,001
99.08 5,195,002
124 5,195,003
126 5,195,004
5,195,005
5,195,006

CLASS 361

21 5,195,007
42 5,195,008
44 5,195,009
56 5,195,010
87 5,195,011
94 5,195,012
106 5,195,013
111 5,195,014
119 5,195,015
175 5,195,016
313 5,195,017
5,195,018
328 5,195,019
385 5,195,020
386 5,195,021
391 5,195,022
392 5,195,023

CLASS 362

32 5,193,893
5,193,901
66 5,193,894
80 5,193,895
103 5,193,896
118 5,193,897
183 5,193,898
224 5,193,899
284 5,193,900
352 5,193,902
376 5,193,903
5,193,904
425 5,193,905

CLASS 364

140 5,195,024
145 5,195,025
148 5,195,026
160 5,195,027
161 5,195,028
184 5,195,029
401 5,195,030
403 5,195,031
410 5,195,043
419 5,195,032
5,195,033
5,195,034
424.1 5,195,035
5,195,036
426.02 5,195,037
431.05 5,195,038
434 5,195,039
443 5,195,040
468 5,195,041
5,195,042
480 5,195,044
482 5,195,045
506 5,195,046
551.01 5,195,048
724.03 5,195,049
728.01 5,195,050
748 5,195,051
753 5,195,052

CLASS 365

51 5,195,053
63 5,195,054
78 5,195,055
189.05 5,195,056
200 5,195,057

CLASS 366

24 5,193,906
130 5,193,907
163 5,193,908

CLASS 367

87 5,195,058
99 5,195,059
118 5,195,060

CLASS 368

9 5,195,061
21 5,195,062
85 5,195,063
272 5,195,064

CLASS 369

2 5,195,065
32 5,195,066
5,195,067
5,195,068
5,195,069
44.12 5,195,070
44.23 5,195,072
44.37 5,195,071
47 5,195,073
48 5,195,074
53 5,195,075
58 5,195,076
75.2 5,195,077
77.2 5,195,079
100 5,195,080
112 5,195,081
275.2 5,195,082
275.4 5,195,083
291 5,195,084

CLASS 370

13 5,195,085
62 5,195,086
5,195,087
84 5,195,088
85.1 5,195,089
94.1 5,195,090
5,195,091
94.2 5,195,092

CLASS 371

3 5,195,093
13 5,195,094
15.1 5,195,095
21.1 5,195,096
27 5,195,097
37.2 5,195,098
40.4 5,195,099
66 5,195,100
68.3 5,195,101

CLASS 372

34 5,195,102
96 5,195,103
97 5,195,104

CLASS 374

29 5,193,909
45 5,193,910
121 5,193,911
179 5,193,912

CLASS 375

1 5,195,105
12 5,195,106
18 5,195,107
84 5,195,108
100 5,195,109
110 5,195,110

CLASS 376

203 5,194,214
249 5,194,215
261 5,194,216
316 5,194,217

CLASS 377

52 5,195,111

CLASS 378

10 5,195,112
34 5,195,113
40 5,195,114
73 5,195,115
89 5,195,116
5,195,117
99 5,195,118
133 5,195,119
154 5,195,120
160 5,195,121
165 5,195,122
166 5,195,123

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29 5,195,125
45 5,195,126
58 5,195,127
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98 5,195,130
211 5,195,131
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46 5,195,138
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103 5,195,141
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201 5,195,143

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4 5,195,145
11 5,195,146
21 5,195,147
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CLASS 384

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118 5,193,915
512 5,193,916
517 5,193,917

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33 5,195,150
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120 5,193,919
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113 5,193,946
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153 5,193,950
233 5,193,951

CLASS 409

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231 5,193,953
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247 R 5,193,984

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98 5,193,986
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160 5,194,051

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281 5,194,055
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344 5,194,058

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97 5,194,060

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41 5,194,061

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381 5,194,063
402 5,194,064
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92 5,194,409

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64 5,194,411
5,194,412
65 5,194,413
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5,194,433
227.2 5,194,434
249 5,194,435
253 5,194,436
254 5,194,437
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320 5,194,440
336 5,194,441
337 5,194,442
367 5,194,443
383 5,194,444
474 5,194,445
494 5,194,446
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558 5,194,448
573 5,194,449
605 5,194,450
724 5,194,451

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131 5,194,453

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97 5,194,500
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5,194,537
206 5,194,538
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262 5,194,545
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318.25 5,194,550

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30 5,194,557
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60 5,194,558
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211 5,194,570
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5,194,572
279 5,194,573
306 5,194,574
328 5,194,575
336 5,194,576
338 5,194,577
349 5,194,578
353 5,194,579
388 5,194,580
398 5,194,581
480 5,194,582
485 5,194,583

CLASS 530
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309 5,194,585
324 5,194,586
5,194,587
331 5,194,588
350 5,194,589
385 5,194,590
387.1 5,194,591
388.23 5,194,592
388.73 5,194,593
391.5 5,194,594
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204 5,194,622
261 5,194,623
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526 5,194,628
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35 5,194,662
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83 5,194,664
56 5,194,665
62 5,194,666
87 5,194,667
103 5,194,668
118 5,194,669
121 5,194,670
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CLASSIFICATION OF DESIGNS

D2—	40	333,903		491	333,934		92	333,965		104	333,995		82	334,027		116	334,058
	270	333,904		567	333,935		313	333,967		106	333,996		86	334,028		118	334,059
	314	333,905		580	333,936		315	333,966		116	333,997	D20—	1	334,029		126	334,060
		333,906		581	333,937		317	333,968		129	333,998		6	334,030		156	334,061
		333,907		601	333,938		331	333,969			333,999		10	334,031		160	334,062
	320	333,908			333,939			333,970	D11—	3	334,000		11	334,032		190	334,063
		333,909	D7—	300.2	333,940			334,009		30	334,001	D21—	6	334,033		194	334,064
D3—	30.1	333,917		335	333,941		337	333,971		40	334,002			334,034		232	334,065
	35	333,910		394	333,942		347	333,973		43	334,003		104	334,035	D25—	1	334,066
		333,911		407	333,943		353	333,972		76	334,004		108	334,036		53	334,067
	73	333,912		554	333,944		402	333,974			334,010		191	334,037		60	334,068
	74	333,913		641	333,945	D9—	300	333,975	D12—	156	334,008		194	334,038		122	334,069
	76	333,914		653	333,946		310	333,976		157	334,007			334,042		124	334,070
	104	333,915		665	333,947		337	333,977		183	334,006		205	334,043	D26—	2	334,071
	105	333,916		676	333,948		424	333,978		300	334,005		219	334,039		3	334,072
D4—	104	333,918			333,949		447	333,979		310	334,011		240	334,044		28	334,073
	108	333,919		678	333,950		524	333,980	D13—	103	334,012		244	334,040		35	334,074
	114	333,920	D8—	2	333,951		528	333,982		133	334,013			334,045		65	334,075
	118	333,921		4	333,952		531	333,981	D14—	138	334,014	D22—	129	334,041		77	334,076
	136	333,922		8	333,953		543	333,983			334,015	D23—	213	334,046			334,077
D6—	333	333,923			333,954		569	333,984	D15—	139	334,016		218	334,047		131	334,078
	356	333,924		14.1	333,955			333,985		140	334,017		223	334,048		136	334,079
	370	333,925		18	333,956			333,986		199	334,018			334,049	D27—	157	334,080
	374	333,926		40	333,958	D10—	30	333,987	D17—	20	334,019		262	334,051	D28—	59	334,081
	383	333,927		50	333,957			333,988	D18—	7	334,020		263	334,050		73	334,082
	456	333,928		68	333,959		39	333,989		12	334,021		277	334,054		85	334,083
	457	333,929			333,960		46	333,990		50	334,022		304	334,052	D29—	18	334,084
	470	333,930		71	333,961		62	333,991	D19—	49	334,023		370	334,053		20	334,085
	478	333,931			333,962		81	333,992		62	334,024		377	334,055	D30—	106	334,086
	484	333,932		74	333,963		85	333,993		65	334,025		382	334,056		108	334,087
	486	333,933		82	333,964		96	333,994		75	334,026	D24—	110	334,057			

CLASSIFICATION OF PLANTS

P.—	7.1	8,175		8,176		39	8,177		74.1	8,179		79	8,178		82.4	8,180	

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PATENTS

01 :	5,193,483		5,193,685		5,194,292		5,195,135		5,195,118	15 :	5,193,670
	5,194,112		5,193,735		5,194,293		5,195,145	10 :	5,194,020		5,194,024
	5,194,690		5,193,756		5,194,297		5,195,156		5,194,088		5,194,026
	5,194,861		5,193,771		5,194,386		5,195,170		5,194,170	16 :	5,193,578
04 :	5,193,233		5,193,772		5,194,391		5,195,176		5,194,306		5,193,924
	5,193,386		5,193,780		5,194,401		5,195,185		5,194,373		5,194,344
	5,193,443		5,193,784		5,194,425		4,844,252		5,194,446		5,194,345
	5,193,445		5,193,791		5,194,427	08 :	5,193,391		5,194,484		5,194,346
	5,193,484		5,193,792		5,194,449		5,193,400		5,194,493		5,194,753
	5,193,805		5,193,801		5,194,451		5,193,471		5,194,505	17 :	5,193,250
	5,194,307		5,193,813		5,194,456		5,193,530		5,194,516		5,193,285
	5,194,760		5,193,833		5,194,583		5,193,696		5,194,578		5,193,349
	5,194,824		5,193,835		5,194,594		5,193,709		5,194,588		5,193,374
	5,194,833		5,193,863		5,194,596		5,193,725		5,194,657		5,193,393
	5,194,838		5,193,864		5,194,599		5,193,764		5,195,172		5,193,415
	5,194,963		5,193,865		5,194,615		5,194,011	11 :	5,195,082		5,193,418
	5,195,101		5,193,870		5,194,654		5,194,033	12 :	5,193,230		5,193,437
	5,195,136		5,193,882		5,194,661		5,194,034		5,193,291		5,193,444
05 :	5,194,147		5,193,891		5,194,679		5,194,349		5,193,306		5,193,489
06 :	Re.34,197		5,193,897		5,194,688		5,194,696		5,193,325		5,193,491
	5,193,229		5,193,898		5,194,698		5,194,809		5,193,446		5,193,499
	5,193,232		5,193,925		5,194,708		5,194,827		5,193,521		5,193,559
	5,193,235		5,193,949		5,194,723		5,194,876		5,193,602		5,193,699
	5,193,238		5,193,956		5,194,759		5,195,022		5,193,810		5,193,705
	5,193,239		5,193,962		5,194,810		5,195,058		5,193,814		5,193,720
	5,193,242		5,193,963		5,194,818		5,195,064		5,193,890		5,193,722
	5,193,252		5,193,969		5,194,834		5,195,091		5,193,902		5,193,729
	5,193,315		5,193,974		5,194,842	09 :	5,193,245		5,194,007		5,193,787
	5,193,401		5,193,978		5,194,844		5,193,308		5,194,012		5,193,807
	5,193,404		5,193,985		5,194,852		5,193,360		5,194,042		5,193,867
	5,193,430		5,193,988		5,194,855		5,193,377		5,194,114		5,193,913
	5,193,441		5,193,989		5,194,877		5,193,439		5,194,280		5,193,936
	5,193,449		5,193,993		5,194,880		5,193,606		5,194,544		5,193,942
	5,193,467		5,193,996		5,194,913		5,193,666		5,194,857		5,193,961
	5,193,478		5,193,999		5,194,918		5,193,701		5,194,863		5,193,970
	5,193,502		5,194,003		5,194,932		5,193,731		5,194,867		5,194,004
	5,193,534		5,194,006		5,194,938		5,193,826		5,195,019		5,194,008
	5,193,539		5,194,063		5,194,965		5,193,964		5,195,122		5,194,010
	5,193,540		5,194,095		5,194,969		5,193,972	13 :	5,193,259		5,194,018
	5,193,542		5,194,110		5,194,971		5,193,986		5,193,277		5,194,037
	5,193,544		5,194,131		5,194,972		5,194,039		5,193,279		5,194,041
	5,193,547		5,194,138		5,194,986		5,194,111		5,193,354		5,194,049
	5,193,553		5,194,145		5,194,987		5,194,164		5,193,761		5,194,094
	5,193,617		5,194,156		5,194,995		5,194,196		5,194,035		5,194,137
	5,193,618		5,194,182		5,194,996		5,194,475		5,194,108		5,194,155
	5,193,641		5,194,218		5,195,013		5,194,512		5,194,115		5,194,288
	5,193,644		5,194,235		5,195,040		5,194,621		5,194,216		5,194,298
	5,193,647		5,194,239		5,195,056		5,194,666		5,194,593		5,194,343
	5,193,671		5,194,256		5,195,089		5,194,673		5,194,674		5,194,477
	5,193,673		5,194,266		5,195,098		5,194,623		5,194,691		5,194,572
	5,193,677		5,194,277		5,195,100		5,194,699		5,194,947		5,194,577
	5,193,680		5,194,289		5,195,102		5,194,840		5,195,009		5,194,584
	5,193,681		5,194,291		5,195,125		5,195,039		5,195,158		5,194,590

	5,194,633		5,194,819		5,194,085		5,193,552		5,194,077		5,193,237
	5,194,781		5,194,837		5,194,175		5,193,558		5,194,160		5,193,362
	5,194,801		5,194,871		5,194,221		5,193,575		5,194,166		5,193,557
	5,194,803		5,194,872		5,194,252		5,193,582		5,194,171		5,193,781
	5,194,884		5,194,915		5,194,257		5,193,601		5,194,172		5,193,824
	5,194,940		5,194,979		5,194,300		5,193,648		5,194,209		5,193,825
	5,195,015		5,195,005		5,194,567		5,193,728		5,194,255		5,194,640
	5,195,086		5,195,016		5,194,791		5,193,732		5,194,281		5,194,715
	5,195,087		5,195,143		5,194,841		5,193,757		5,194,407		5,195,043
	5,195,090		5,195,151		5,194,989		5,193,759		5,194,417		4,396,391
	5,195,092		5,195,166	30 :	5,193,790		5,193,853		5,194,430	46 :	5,194,758
	5,195,103		5,195,168		5,194,101		5,193,855		5,194,469	47 :	Re.34,196
	5,195,106		5,195,178		5,194,123		5,193,965		5,194,471		5,193,261
	5,195,108	26 :	5,193,262		5,194,678		5,194,001		5,194,482		5,193,305
18 :	5,193,269		5,193,264	31 :	5,193,307		5,194,013		5,194,499		5,193,425
	5,193,310		5,193,274		5,193,327		5,194,032		5,194,503		5,193,568
	5,193,359		5,193,326		5,193,364		5,194,190		5,194,508		5,193,643
	5,193,485		5,193,361		5,193,719		5,194,215		5,194,513		5,193,679
	5,193,519		5,193,409		5,193,836		5,194,247		5,194,519		5,193,789
	5,193,587		5,193,410		5,194,287		5,194,270		5,194,639		5,194,124
	5,193,672		5,193,432		5,194,585		5,194,295		5,194,643		5,194,193
	5,193,702		5,193,479	32 :	5,193,463		5,194,303		5,194,702		5,194,238
	5,193,837		5,193,482		5,194,677		5,194,318		5,194,816		5,194,242
	5,193,886		5,193,513	33 :	5,193,226		5,194,324		5,194,865		5,194,463
	5,193,896		5,193,561		5,193,296		5,194,351		5,195,060		5,194,523
	5,193,905		5,193,597		5,193,379		5,194,357		5,195,133		5,194,571
	5,193,971		5,193,613		5,193,669		5,194,358		5,195,184		5,194,574
	5,194,066		5,193,653		5,193,850		5,194,384	40 :	5,193,426		5,194,669
	5,194,116		5,193,662		5,193,912		5,194,397		5,193,480		5,194,775
	5,194,206		5,193,665		5,193,990		5,194,472		5,193,684		5,194,910
	5,194,390		5,193,692		5,194,047		5,194,517		5,194,415	48 :	5,193,316
	5,194,555		5,193,786		5,194,153		5,194,520		5,194,506		5,193,427
	5,194,951		5,193,821		5,194,335		5,194,521		5,194,582		5,193,458
	5,194,954		5,193,852		5,195,042		5,194,522		5,194,859		5,193,468
	5,195,146		5,193,868	34 :	5,193,251		5,194,556	41 :	5,193,365		5,193,495
19 :	5,193,376		5,193,874		5,193,254		5,194,558		5,193,592		5,193,543
	5,193,453		5,193,892		5,193,281		5,194,564		5,193,661		5,193,573
	5,193,583		5,193,933		5,193,389		5,194,566		5,193,700		5,193,609
	5,193,584		5,193,947		5,193,406		5,194,569		5,193,793		5,193,614
	5,193,586		5,193,948		5,193,551		5,194,637		5,193,829		5,193,615
	5,193,777		5,193,950		5,193,675		5,196,692		5,193,832		5,193,616
	5,193,803		5,193,954		5,193,686		5,194,713		5,194,027		5,193,620
	5,193,935		5,194,038		5,193,693		5,194,719		5,194,048		5,193,621
	5,194,144		5,194,057		5,193,816		5,194,720		5,194,100		5,193,721
	5,194,461		5,194,065		5,193,903		5,194,722		5,195,030		5,193,726
	5,195,183		5,194,154		5,193,904		5,194,730		5,195,110		5,193,738
20 :	5,193,336		5,194,212		5,194,060		5,194,757	42 :	5,193,260		5,193,750
	5,193,450		5,194,217		5,194,130		5,194,802		5,193,273		5,193,774
	5,193,524		5,194,234		5,194,174		5,194,882		5,193,288		5,193,782
	5,193,596		5,194,251		5,194,219		5,194,885		5,193,298		5,193,802
	5,193,775		5,194,268		5,194,246		5,194,887		5,193,320		5,193,859
	5,194,276		5,194,286		5,194,249		5,194,892		5,193,322		5,193,866
21 :	5,193,356		5,194,304		5,194,262		5,194,895		5,193,329		5,193,929
	5,193,466		5,194,310		5,194,278		5,194,896		5,193,411		5,193,934
	5,193,678		5,194,325		5,194,284		5,194,905		5,193,455		5,194,142
	5,193,951		5,194,338		5,194,331		5,194,909		5,193,456		5,194,143
	5,194,227		5,194,452		5,194,341		5,194,930		5,193,567		5,194,150
	5,194,553		5,194,460		5,194,366		5,194,980		5,193,595		5,194,161
	5,194,899		5,194,468		5,194,377		5,194,984		5,193,664		5,194,163
	5,029,278		5,194,494		5,194,378		5,194,993		5,193,703		5,194,223
22 :	5,193,968		5,194,527		5,194,379		5,195,014		5,193,741		5,194,244
	5,194,151		5,194,552		5,194,387		5,195,045		5,193,785		5,194,408
	5,194,651		5,194,557		5,194,410		5,195,046		5,193,831		5,194,434
	5,195,164		5,194,560		5,194,416		5,195,050		5,193,854		5,194,500
23 :	5,194,120		5,194,562		5,194,435		5,195,095		5,193,877		5,194,510
24 :	5,193,299		5,194,568		5,194,436		5,195,097		5,193,878		5,194,529
	5,193,318		5,194,589		5,194,486		5,195,130		5,193,893		5,194,530
	5,193,352		5,194,595		5,194,546		5,195,152		5,193,991		5,194,532
	5,193,373		5,194,642		5,194,570		5,195,167		5,194,014		5,194,620
	5,193,395		5,194,652		5,194,605		5,195,173		5,194,017		5,194,672
	5,193,475		5,194,658		5,194,618		5,195,182		5,194,019		5,194,684
	5,194,103		5,194,717		5,194,630	37 :	5,193,290		5,194,062		5,194,695
	5,194,129		5,194,755		5,194,634		5,193,363		5,194,067		5,194,734
	5,194,181		5,194,789		5,194,638		5,193,603		5,194,102		5,194,747
	5,194,370		5,194,990		5,194,667		5,193,674		5,194,105		5,194,761
	5,194,412		5,195,162		5,194,765		5,193,683		5,194,106		5,194,767
	5,194,413	27 :	5,193,302		5,194,773		5,193,687		5,194,117		5,194,768
	5,194,458		5,193,321		5,194,873		5,193,708		5,194,162		5,194,814
	5,194,480		5,193,420		5,194,948		5,193,773		5,194,167		5,194,831
	5,194,504		5,193,501		5,194,966		5,193,871		5,194,169		5,194,843
	5,194,581		5,193,536		5,195,010		5,194,064		5,194,176		5,194,847
	5,194,659		5,193,549		5,195,023		5,194,208		5,194,202		5,194,858
	5,194,836		5,193,550		5,195,085		5,194,426		5,194,214		5,194,904
	5,194,875		5,193,580		5,195,107		5,194,450		5,194,243		5,194,926
	5,195,123		5,193,598		5,195,132		5,194,782		5,194,245		5,194,949
25 :	5,193,225		5,193,718		5,195,137		5,194,923		5,194,279		5,194,978
	5,193,314		5,193,827		5,195,161		4,917,706		5,194,332		5,194,985
	5,193,384		5,193,908	35 :	5,193,493	38 :	5,194,851		5,194,447		5,195,017
	5,193,470		5,193,977		5,193,570	39 :	5,193,243		5,194,487		5,195,021
	5,193,533		5,194,113		5,193,713		5,193,257		5,194,492		5,195,025
	5,193,537		5,194,185		5,193,842		5,193,301		5,194,498		5,195,041
	5,193,640		5,194,230		5,193,909		5,193,347		5,194,534		5,195,051
	5,193,727		5,194,265		5,194,091		5,193,351		5,194,609		5,195,052
	5,193,806		5,194,271		5,194,737		5,193,375		5,194,616		5,195,117
	5,194,072		5,194,275		5,195,104		5,193,402		5,194,687	49 :	5,193,244
	5,194,079		5,194,299	36 :	Re.34,194		5,193,421		5,194,811		5,193,286
	5,194,128		5,194,323		5,193,297		5,193,490		5,194,817		5,193,688
	5,194,158		5,194,501		5,193,313		5,193,518		5,195,033		5,193,846
	5,194,189		5,194,623		5,193,346		5,193,569		5,195,048	50 :	5,194,928
	5,194,205		5,194,680		5,193,353		5,193,633		5,195,139	51 :	5,193,383
	5,194,248		5,194,728		5,193,366		5,193,706	44 :	5,193,248		5,193,459
	5,194,261	29 :	5,193,442		5,193,370		5,193,737		5,193,381		5,193,605
	5,194,326		5,193,625		5,193,390		5,193,940		5,194,030		5,193,628
	5,194,428		5,193,690		5,193,486		5,193,941		5,194,031		5,193,650
	5,194,524		5,193,704		5,193,523		5,194,071		5,194,269		5,193,714
	5,194,742		5,193,869		5,193,546		5,194,076	45 :	5,193,227		5,193,723

	5,194,290		5,195,163		5,193,724		5,194,660		5,193,636		5,194,302
	5,194,388	53 :	5,193,300		5,193,812	55 :	5,193,258		5,193,861		5,194,431
	5,194,565		5,193,338		5,194,375		5,193,324		5,193,901		5,194,601
	5,194,575		5,193,481		5,195,096		5,193,331		5,194,025		5,194,706
	5,194,635		5,193,525	54 :	5,193,862		5,194,199		5,193,357		5,194,710
	5,194,786		5,193,535		5,194,199		5,193,487		5,194,200		5,194,712
	5,195,061		5,193,694		5,194,526		5,193,500		5,194,228	56 :	5,193,585
	5,195,126		5,193,717		5,194,613				5,194,258		5,194,689

DESIGN PATENTS

02 :	333,956		334,056		334,030		334,067		333,957		333,965
	334,001		334,060		334,033	27 :	333,911		333,962		334,002
04 :	334,062		334,066		334,052		333,923		333,963		334,044
06 :	333,913		334,073		334,085		333,971		333,978		334,068
	333,916		334,084	18 :	333,955		333,980		334,004		334,087
	333,925	08 :	333,974		334,031		334,032		334,010	45 :	334,009
	333,930		333,992		334,065		334,058		334,081	47 :	333,903
	333,939		333,994	21 :	333,922	28 :	333,952		334,083		333,991
	333,948		334,008		333,927	29 :	334,041	37 :	333,982	48 :	333,904
	333,949	09 :	333,910		333,940	31 :	333,995	39 :	333,915		333,938
	333,984		333,931		334,051		334,063		333,951		333,990
	333,985		334,029	24 :	333,960	33 :	333,979		334,003		334,026
	333,986		334,078	25 :	333,905		333,993		334,079	51 :	333,972
	334,005		334,082		333,996	34 :	333,918	40 :	334,006	53 :	333,967
	334,019	12 :	333,932		334,038		333,977	41 :	333,906		334,011
	334,025		333,961		334,059		334,064		333,907		334,069
	334,027		334,017	26 :	333,964	36 :	333,933		333,908		334,070
	334,037		334,074		333,967		333,935		333,909	55 :	333,928
	334,039	13 :	334,035		333,968		333,945		333,941		333,944
	334,047	17 :	334,014		334,007		333,946	42 :	333,959		334,057
	334,053										

PLANT PATENTS

06 :	8,177		8,178		8,179		8,180	25 :	8,175		8,176

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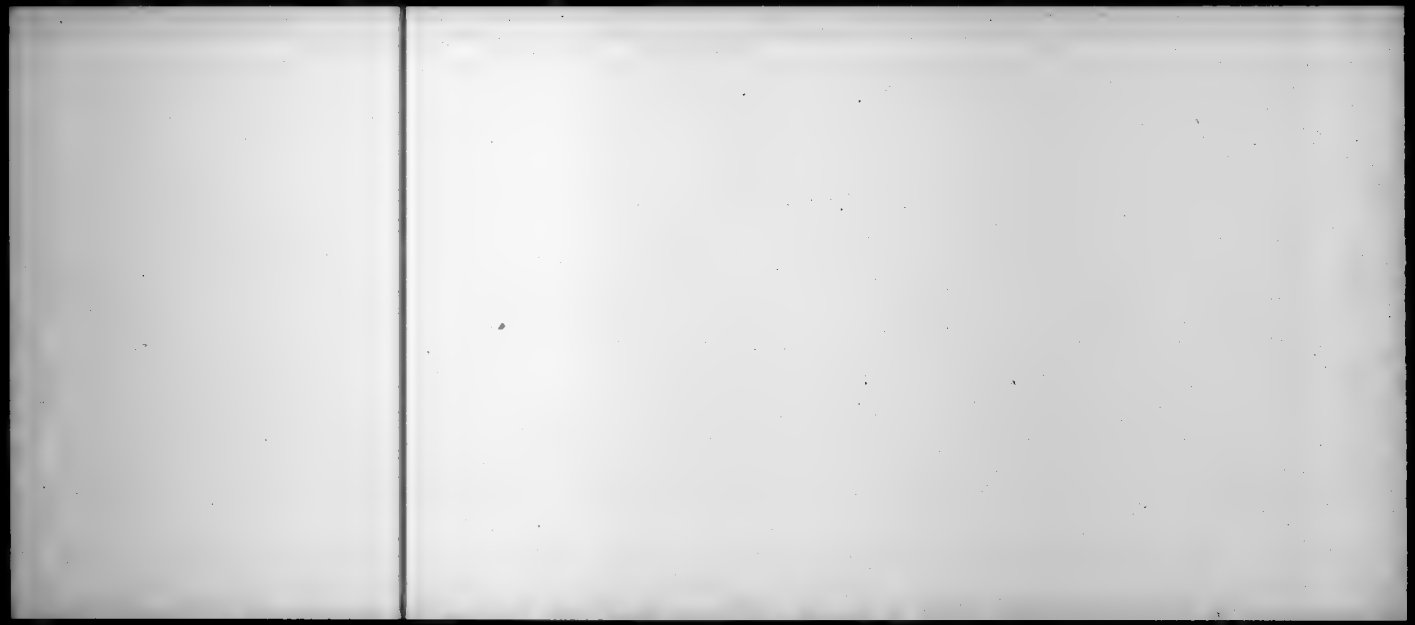

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Vol. 1148 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

March 23, 1993

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 20, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,908,877 through 4,910,801
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 18, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,575,871 through 4,577,345
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 10, 1993 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,491,985	06/427,592	1/08/85
4,491,989	06/595,688	1/08/85
4,491,990	06/252,868	1/08/85
4,491,991	06/507,725	1/08/85
4,491,992	06/548,281	1/08/85
4,491,993	06/450,021	1/08/85
4,491,995	06/473,757	1/08/85
4,491,996	06/315,404	1/08/85
4,491,999	06/399,470	1/08/85
4,492,000	06/379,487	1/08/85
4,492,003	06/516,527	1/08/85
4,492,006	06/483,756	1/08/85
4,492,007	06/484,513	1/08/85
4,492,010	06/513,758	1/08/85
4,492,011	06/339,650	1/08/85
4,492,013	06/236,195	1/08/85
4,492,014	06/483,458	1/08/85
4,492,015	06/391,980	1/08/85
4,492,018	06/407,992	1/08/85
4,492,022	06/406,280	1/08/85
4,492,031	06/370,152	1/08/85
4,492,035	06/467,629	1/08/85
4,492,038	06/482,873	1/08/85
4,492,040	06/322,707	1/08/85
4,492,043	06/394,213	1/08/85
4,492,046	06/500,242	1/08/85
4,492,047	06/465,843	1/08/85
4,492,048	06/502,333	1/08/85
4,492,051	06/533,236	1/08/85
4,492,058	06/417,554	1/08/85
4,492,059	06/560,262	1/08/85
4,492,062	06/387,589	1/08/85
4,492,074	06/564,892	1/08/85
4,492,075	06/458,701	1/08/85
4,492,080	06/590,675	1/08/85
4,492,081	06/591,895	1/08/85
4,492,084	06/413,385	1/08/85
4,492,088	06/499,627	1/08/85
4,492,090	06/533,336	1/08/85
4,492,091	06/459,296	1/08/85
4,492,092	06/394,575	1/08/85
4,492,093	06/516,135	1/08/85
4,492,098	06/282,075	1/08/85
4,492,105	06/358,242	1/08/85
4,492,106	06/453,188	1/08/85
4,492,107	06/360,623	1/08/85
4,492,109	06/433,878	1/08/85
4,492,111	06/309,403	1/08/85
4,492,113	06/448,459	1/08/85
4,492,114	06/496,656	1/08/85
4,492,118	06/415,830	1/08/85
4,492,121	06/429,692	1/08/85
4,492,124	06/404,201	1/08/85
4,492,125	06/371,508	1/08/85
4,492,128	06/370,203	1/08/85
4,492,129	06/372,390	1/08/85
4,492,130	06/408,121	1/08/85
4,492,131	06/597,216	1/08/85
4,492,132	06/500,929	1/08/85
4,492,135	06/426,750	1/08/85
4,492,143	06/499,629	1/08/85
4,492,146	06/401,906	1/08/85
4,492,147	06/567,164	1/08/85
4,492,150	06/509,994	1/08/85
4,492,151	06/471,826	1/08/85
4,492,152	06/481,374	1/08/85
4,492,156	06/456,574	1/08/85
4,492,173	06/524,159	1/08/85
4,492,177	06/498,160	1/08/85
4,492,182	06/464,512	1/08/85
4,492,186	06/410,562	1/08/85
4,492,191	06/468,397	1/08/85
4,492,198	06/583,272	1/08/85
4,492,199	06/417,853	1/08/85
4,492,202	06/460,856	1/08/85
4,492,204	06/411,228	1/08/85
4,492,206	06/442,614	1/08/85
4,492,209	06/386,209	1/08/85
4,492,219	06/481,564	1/08/85
4,492,221	06/467,735	1/08/85
4,492,222	06/473,541	1/08/85
4,492,224	06/465,456	1/08/85
4,492,227	06/496,851	1/08/85
4,492,228	06/449,888	1/08/85
4,492,231	06/419,400	1/08/85
4,492,242	06/530,744	1/08/85

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4,492,243	06/424,603	1/08/85
4,492,244	06/479,847	1/08/85
4,492,247	06/469,204	1/08/85
4,492,261	06/515,322	1/08/85
4,492,262	06/376,203	1/08/85
4,492,265	06/283,004	1/08/85
4,492,269	06/450,705	1/08/85
4,492,271	06/397,479	1/08/85
4,492,277	06/468,655	1/08/85
4,492,286	06/379,270	1/08/85
4,492,287	06/396,475	1/08/85
4,492,290	06/457,437	1/08/85
4,492,296	06/326,920	1/08/85
4,492,299	06/398,135	1/08/85
4,492,300	06/267,468	1/08/85
4,492,301	06/390,560	1/08/85
4,492,304	06/330,649	1/08/85
4,492,305	06/511,851	1/08/85
4,492,309	06/386,925	1/08/85
4,492,314	06/594,058	1/08/85
4,492,324	06/358,048	1/08/85
4,492,325	06/396,022	1/08/85
4,492,327	06/303,796	1/08/85
4,492,333	06/572,618	1/08/85
4,492,344	06/424,991	1/08/85
4,492,346	06/470,143	1/08/85
4,492,351	06/562,467	1/08/85
4,492,364	06/523,838	1/08/85
4,492,366	06/417,533	1/08/85
4,492,369	06/464,308	1/08/85
4,492,370	06/440,503	1/08/85
4,492,378	06/346,361	1/08/85
4,492,386	06/563,301	1/08/85
4,492,387	06/370,028	1/08/85
4,492,389	06/341,509	1/08/85
4,492,393	06/297,574	1/08/85
4,492,396	06/315,773	1/08/85
4,492,398	06/371,205	1/08/85
4,492,402	06/479,697	1/08/85
4,492,403	06/394,450	1/08/85
4,492,407	06/399,561	1/08/85
4,492,408	06/340,681	1/08/85
4,492,410	06/373,548	1/08/85
4,492,413	06/315,820	1/08/85
4,492,426	06/372,358	1/08/85
4,492,429	06/380,872	1/08/85
4,492,434	06/337,659	1/08/85
4,492,435	06/394,604	1/08/85
4,492,446	06/486,397	1/08/85
4,492,447	06/426,198	1/08/85
4,492,449	06/409,491	1/08/85
4,492,454	06/449,251	1/08/85
4,492,465	06/217,733	1/08/85
4,492,467	06/381,855	1/08/85
4,492,470	06/353,207	1/08/85
4,492,477	06/349,621	1/08/85
4,492,479	06/489,266	1/08/85
4,492,487	06/364,504	1/08/85
4,492,488	06/434,614	1/08/85
4,492,490	06/392,276	1/08/85
4,492,493	06/408,665	1/08/85
4,492,494	06/290,315	1/08/85
4,492,497	06/355,148	1/08/85
4,492,498	06/409,125	1/08/85
4,492,509	06/257,653	1/08/85
4,492,512	06/326,552	1/08/85
4,492,513	06/385,835	1/08/85
4,492,518	06/457,234	1/08/85
4,492,520	06/376,327	1/08/85
4,492,522	06/448,706	1/08/85
4,492,523	06/579,045	1/08/85
4,492,527	06/467,413	1/08/85
4,492,529	06/390,385	1/08/85
4,492,530	06/379,444	1/08/85
4,492,533	06/608,537	1/08/85
4,492,534	06/538,994	1/08/85
4,492,540	06/500,624	1/08/85
4,492,550	06/558,289	1/08/85
4,492,552	06/373,800	1/08/85
4,492,558	06/494,941	1/08/85
4,492,560	06/551,751	1/08/85
4,492,566	06/477,066	1/08/85
4,492,569	06/470,182	1/08/85
4,492,570	06/528,970	1/08/85
4,492,571	06/403,359	1/08/85
4,492,572	06/366,987	1/08/85
4,492,577	06/436,618	1/08/85
4,492,580	06/594,744	1/08/85
4,492,582	06/222,847	1/08/85
4,492,583	06/480,371	1/08/85
4,492,586	06/277,225	1/08/85
4,492,599	06/424,478	1/08/85
4,492,600	06/398,226	1/08/85
4,492,607	06/468,101	1/08/85
4,492,609	06/356,650	1/08/85
4,492,611	06/510,877	1/08/85
4,492,612	06/266,108	1/08/85
4,492,617	06/569,898	1/08/85
4,492,618	06/580,067	1/08/85
4,492,619	06/575,799	1/08/85
4,492,621	06/427,849	1/08/85
4,492,623	06/403,651	1/08/85
4,492,626	06/619,661	1/08/85
4,492,627	06/387,911	1/08/85
4,492,633	06/488,998	1/08/85
4,492,637	06/554,947	1/08/85
4,492,640	06/463,223	1/08/85
4,496,643	06/438,349	1/08/85
4,492,645	06/505,423	1/08/85
4,492,649	06/422,479	1/08/85
4,492,650	06/423,948	1/08/85
4,492,653	06/410,621	1/08/85
4,492,656	06/430,167	1/08/85
4,492,667	06/381,894	1/08/85
4,492,668	06/366,819	1/08/85
4,492,672	06/369,880	1/08/85
4,492,675	06/316,446	1/08/85
4,492,677	06/611,243	1/08/85
4,492,681	06/505,250	1/08/85
4,492,683	06/406,007	1/08/85
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4,492,698	06/354,088	1/08/85
4,492,701	06/427,924	1/08/85
4,492,708	06/424,784	1/08/85
4,492,713	06/422,570	1/08/85
4,492,719	06/555,006	1/08/85
4,492,721	06/512,518	1/08/85
4,492,726	06/504,869	1/08/85
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4,492,741	06/563,464	1/08/85
4,492,743	06/489,815	1/08/85
4,492,744	06/479,802	1/08/85
4,492,746	06/403,855	1/08/85
4,492,750	06/541,592	1/08/85
4,492,753	06/433,153	1/08/85
4,492,756	06/445,783	1/08/85
4,492,761	06/365,334	1/08/85
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4,492,772	06/434,055	1/08/85
4,492,778	06/533,126	1/08/85
4,492,784	06/523,531	1/08/85
4,492,786	06/527,298	1/08/85
4,492,789	06/481,359	1/08/85
4,492,790	06/339,943	1/08/85
4,492,795	06/438,087	1/08/85
4,492,798	06/457,520	1/08/85
4,492,804	06/524,318	1/08/85
4,492,811	06/518,814	1/08/85
4,492,815	06/525,643	1/08/85
4,492,821	06/404,710	1/08/85
4,492,824	06/522,106	1/08/85
4,492,825	06/402,613	1/08/85

Patent Number	Serial Number	Issue Date
4,492,832	06/452,450	1/08/85
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4,492,840	06/392,150	1/08/85
4,492,841	06/485,804	1/08/85
4,492,845	06/416,310	1/08/85
4,492,848	06/480,228	1/08/85
4,492,849	06/267,176	1/08/85
4,492,851	06/411,219	1/08/85
4,492,853	06/502,314	1/08/85
4,492,854	06/552,170	1/08/85
4,492,855	06/396,936	1/08/85
4,492,862	06/290,824	1/08/85
4,492,864	06/288,441	1/08/85
4,492,866	06/490,994	1/08/85
4,492,875	06/446,284	1/08/85
4,492,878	06/498,020	1/08/85
4,492,880	06/520,412	1/08/85
4,492,881	06/472,681	1/08/85
4,492,882	06/402,171	1/08/85
4,492,890	06/495,809	1/08/85
4,492,891	06/477,031	1/08/85
4,492,895	06/422,005	1/08/85
4,492,906	06/309,734	1/08/85
4,492,908	06/467,521	1/08/85
4,492,911	06/517,506	1/08/85
4,492,913	06/411,713	1/08/85
4,492,917	06/412,970	1/08/85
4,492,918	06/411,378	1/08/85
4,492,921	06/482,453	1/08/85
4,492,923	06/390,461	1/08/85
4,492,925	06/352,804	1/08/85
4,492,944	06/540,455	1/08/85
4,492,949	06/476,685	1/08/85
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4,492,962	06/297,598	1/08/85
4,492,963	06/538,822	1/08/85
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4,492,972	06/293,436	1/08/85
4,492,977	06/399,525	1/08/85
4,493,004	06/470,709	1/08/85
4,493,005	06/444,089	1/08/85
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4,493,012	06/414,322	1/08/85
4,493,015	06/449,833	1/08/85
4,493,018	06/430,865	1/08/85
4,493,021	06/250,585	1/08/85
4,493,032	06/415,745	1/08/85
4,493,041	06/347,201	1/08/85
4,493,047	06/365,816	1/08/85
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4,797,142	07/143,132	1/10/89
4,797,146	06/937,940	1/10/89
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4,797,788	07/057,844	1/10/89
4,797,818	07/030,878	1/10/89
4,797,821	07/034,441	1/10/89
4,797,823	06/921,138	1/10/89
4,797,833	06/913,765	1/10/89
4,797,844	06/870,890	1/10/89
4,797,860	07/125,903	1/10/89
4,797,875	06/883,375	1/10/89
4,797,883	06/840,366	1/10/89
4,797,885	06/940,495	1/10/89
4,797,889	07/065,844	1/10/89
4,797,891	06/941,842	1/10/89
4,797,892	07/048,544	1/10/89
4,797,901	06/898,994	1/10/89
4,797,906	07/101,880	1/10/89
4,797,909	06/836,768	1/10/89
4,797,919	06/934,872	1/10/89
4,797,922	06/791,715	1/10/89
4,797,923	06/802,980	1/10/89
4,797,933	07/020,437	1/10/89
4,797,934	07/090,122	1/10/89
4,797,941	06/880,995	1/10/89
4,797,949	06/857,943	1/10/89

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,442,661	06/412,642	4/17/84	8/30/8	12/30/92
4,475,577	06/567,134	10/09/84	12/30/83	12/30/92

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Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,626,142	06/712,668	12/02/86	3/18/85	1/29/93
4,744,083	06/650,493	5/10/88	9/14/84	2/03/93
4,745,056	06/663,842	5/17/88	10/23/84	1/13/93

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,962,562, Re. S.N. 07/962,311, Filed Oct. 16, 1992, Cl. 15/230.16, COMPOUNDING, GLAZING OR POLISHING PAD, Richard L. Englund, et. al., Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: William L. Huebsch, Ex. Gp.: 2402

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,916,750, Reexam. No. 90/002,959, Requested Jan. 29, 1993, Cl. 073/067.005, ULTRASONIC IMAGING METHOD AND APPARATUS, Philip S. Green, Owner of Record: *Stanford Research Institute, Menlo Park, Calif.*, Attorney or Agent: Morrison & Foerster, Palo Alto, Calif., Ex. Gp.: 2600, Requester: Acoustic Imaging Technologies Corp., Phoenix, Ariz.

4,575,742, Reexam. No. 90/002,918, Requested Dec. 16, 1992, Cl. 257/017, EPITAXIAL WAFER FOR USE IN THE PRODUCTION OF AN INFARED LED, Yosuji Kohashi, et. al., Owner of Record: *Mitsubishi Kasei Polytech Co., Tokyo, Japan*, Attorney or Agent: Burgess, Ryan & Wayne, New York, N.Y., Ex. Gp.: 2503, Requester: Armstrong, Westerman, Hattori, McLeland & Naughton, Washington, D.C.

4,933,514, Reexam. No. 90/002,954, Requested Feb. 1, 1993, Cl. 178/018, INTERACTIVE TEMPLATE, Harold L. Bowers, Owner of Record: *Inventor, Troutville, Va.*, Attorney or Agent: Robert E. Strauss, Plante Strauss & Vanderburgh, Santa Ana, Calif., Ex. Gp.: 2601, Requester: Owner

5,011,342, Reexam. No. 90/002,955, Requested Feb. 9, 1993, Cl. 408/224, TWIST DOLL, George Hsu, Owner of Record: *Greenfield Industries, Inc., Evans, Ga.*, Attorney or Agent: Dickstein, Shapiro & Morin, Vienna, Va., Ex. Gp.: 3202, Requester: Richard H. Evans, Wood, Herron & Evans, Cincinnati, Ohio

5,026,566, Reexam. No. 90/002,960, Requested Feb. 8, 1993, Cl. 426/443, DRIED FOOD CONTAINING TREHALOSE AND METHOD FOR PREPARING SAME, Bruce J. Roser, Owner of Record: *Quadrant Bioresources Ltd., Cambridge, Great Britain*, Attorney or Agent: Coleman & Sudol, New York, N.Y., Ex. Gp.: 1302, Requester: Osmotica Foods, Inc., Davis, Calif.

5,035,730, Reexam. No. 90/002,962, Requested Jan. 25, 1993, Cl. 055/269, MIST RECOVERY APPARATUS WITH TWISTED STRIP INSERTED PIPES, Takayasu Kisaragi, et. al., Owner of Record: *Sumitomo Light Metal Industries, Ltd., Tokyo, Japan*, Attorney or Agent: Terryence F. Chapman, Flynn, Thiel, Boutell & Tanis, Kalamazoo, Mich., Ex. Gp.: 1305, Requester: Patterson & Keough, Minneapolis, Minn.

5,085,365, Reexam. No. 90/002,963, Requested Feb. 3, 1993, Cl. 228/223, WATER SOLUBLE SOLDERING FLUX, Raymond L. Turner, Owner of Record: *Hughes Aircraft Co., Los Angeles, Calif.*, Attorney or Agent: William C. Daubenspeck, Los Angeles, Calif., Ex. Gp.: 3205, Requester: Owner

5,116,441, Reexam. No. 90/002,958, Requested Jan. 27, 1993, Cl. 156/094, GLASS REPAIR KIT AND METHOD OF USE, Richard A. Campfield, Jr., Owner of Record: *Inventor, Riverside, Calif.*, Attorney or Agent: Lawrence S. Cohen, Freilich, Hornbaker & Rosen, Los Angeles, Calif., Ex. Gp.: 1301, Requester: Owner

5,147,300, Reexam. No. 90/002,951, Requested Feb. 10, 1993, Cl. 604/097, BALLOON CATHETER INFLATION DEVICE, David B. Robinson, et. al., Owner of Record: *SCI Med Life Systems, Inc., Minneapolis, Minn.*, Attorney or Agent: James L. Young, Kinney & Lange, Minneapolis, Minn., Ex. GP.: 3306, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADMARK REGISTRATIONS
WHICH EXPIRED FEB. 08, 1993
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
86,408	71/058,821	5/07/1912
86,411	71/048,164	5/07/1912
86,422	71/060,225	5/07/1912
86,437	71/059,630	5/07/1912
86,439	71/056,872	5/07/1912
86,440	71/059,320	5/07/1912
86,449	71/058,872	5/07/1912
86,481	71/059,069	5/07/1912
86,499	71/014,613	5/07/1912
293,596	71/322,118	5/03/1932
293,614	71/322,733	5/03/1932
293,621	71/321,394	5/03/1932
293,657	71/322,587	5/03/1932
293,658	71/322,470	5/03/1932
293,670	71/321,669	5/03/1932
293,696	71/322,011	5/03/1932
293,701	71/322,580	5/03/1932
293,715	71/322,594	5/03/1932
293,734	71/322,037	5/03/1932
293,741	71/322,583	5/03/1932
293,760	71/322,159	5/03/1932
293,783	71/291,170	5/03/1932
293,788	71/321,851	5/03/1932
444,687	71/500,370	5/06/1952
529,296	71/530,384	8/22/1950
558,407	71/536,609	5/06/1952
558,418	71/562,289	5/06/1952
558,427	71/572,257	5/06/1952
558,429	71/572,824	5/06/1952

Reg. Number	Serial Number	Reg. Date
558,430	71/572,853	5/06/1952
558,439	71/581,110	5/06/1952
558,440	71/585,070	5/06/1952
558,442	71/586,257	5/06/1952
558,445	71/590,168	5/06/1952
558,446	71/590,183	5/06/1952
558,450	71/591,586	5/06/1952
558,451	71/591,641	5/06/1952
558,452	71/593,156	5/06/1952
558,466	71/598,495	5/06/1952
558,468	71/600,495	5/06/1952
558,470	71/601,284	5/06/1952
558,472	71/601,926	5/06/1952
558,486	71/604,415	5/06/1952
558,487	71/604,552	5/06/1952
558,492	71/606,350	5/06/1952
558,502	71/609,794	5/06/1952
558,503	71/610,001	5/06/1952
558,504	71/610,384	5/06/1952
558,506	71/610,530	5/06/1952
558,510	71/611,137	5/06/1952
558,522	71/611,564	5/06/1952
558,528	71/612,570	5/06/1952
558,530	71/612,723	5/06/1952
558,532	71/612,971	5/06/1952
558,534	71/613,223	5/06/1952
558,537	71/613,609	5/06/1952
558,553	71/595,285	5/06/1952
558,562	71/578,951	5/06/1952
558,563	71/580,749	5/06/1952
558,564	71/581,212	5/06/1952
563,195	71/577,512	8/19/1952
897,720	72/343,746	9/01/1970
922,483	72/367,266	10/19/1971
926,365	72/368,104	1/04/1972
933,045	72/385,446	5/02/1972
933,049	72/386,080	5/02/1972
933,053	72/388,340	5/02/1972
933,057	72/372,672	5/02/1972
933,058	72/378,751	5/02/1972
933,061	72/354,454	5/02/1972
933,066	72/389,322	5/02/1972
933,070	72/343,092	5/02/1972
933,074	72/387,206	5/02/1972
933,075	72/389,045	5/02/1972
933,086	72/385,104	5/02/1972
933,088	72/394,254	5/02/1972
933,091	72/377,263	5/02/1972
933,093	72/384,875	5/02/1972
933,096	72/368,016	5/02/1972
933,100	72/380,829	5/02/1972
933,101	72/359,102	5/02/1972
933,108	72/394,944	5/02/1972
933,116	72/400,932	5/02/1972
933,117	72/400,952	5/02/1972
933,119	72/359,256	5/02/1972
933,122	72/363,152	5/02/1972
933,123	72/363,238	5/02/1972
933,124	72/374,785	5/02/1972
933,125	72/375,715	5/02/1972
933,128	72/378,329	5/02/1972
933,129	72/378,408	5/02/1972
933,134	72/355,994	5/02/1972
933,139	72/368,377	5/02/1972
933,140	72/368,378	5/02/1972
933,144	72/382,795	5/02/1972
933,147	72/385,038	5/02/1972
933,154	72/393,545	5/02/1972
933,157	72/345,509	5/02/1972
933,161	72/366,921	5/02/1972
933,167	72/383,644	5/02/1972
933,168	72/384,484	5/02/1972
933,170	72/387,636	5/02/1972
933,176	72/347,600	5/02/1972
933,177	72/352,139	5/02/1972
933,178	72/366,359	5/02/1972
933,179	72/373,553	5/02/1972
933,184	72/379,262	5/02/1972
933,187	72/384,163	5/02/1972
933,192	72/377,285	5/02/1972
933,193	72/378,519	5/02/1972
933,195	72/382,626	5/02/1972
933,200	72/370,895	5/02/1972
933,207	72/363,318	5/02/1972
933,208	72/387,633	5/02/1972
933,219	72/379,832	5/02/1972
933,222	72/375,191	5/02/1972
933,223	72/375,903	5/02/1972
933,226	72/323,409	5/02/1972
933,227	72/342,059	5/02/1972
933,232	72/363,120	5/02/1972
933,233	72/363,989	5/02/1972
933,246	72/382,012	5/02/1972
933,247	72/382,427	5/02/1972
933,248	72/382,429	5/02/1972
933,249	72/386,265	5/02/1972
933,251	72/391,869	5/02/1972
933,252	72/391,992	5/02/1972
933,254	72/314,244	5/02/1972
933,255	72/330,904	5/02/1972
933,256	72/350,472	5/02/1972
933,258	72/368,819	5/02/1972
933,263	72/371,899	5/02/1972
933,267	72/379,427	5/02/1972
933,268	72/379,717	5/02/1972
933,273	72/387,973	5/02/1972
933,274	72/388,185	5/02/1972
933,276	72/388,547	5/02/1972
933,279	72/363,382	5/02/1972
933,281	72/386,284	5/02/1972
933,285	72/377,489	5/02/1972
933,289	72/347,886	5/02/1972
933,294	72/377,202	5/02/1972
933,301	72/387,557	5/02/1972
933,302	72/360,272	5/02/1972
933,303	72/363,458	5/02/1972
933,304	72/375,953	5/02/1972
933,308	72/317,398	5/02/1972
933,309	72/345,535	5/02/1972
933,311	72/358,632	5/02/1972
933,313	72/364,412	5/02/1972
933,316	72/369,356	5/02/1972
933,319	72/375,420	5/02/1972
933,322	72/381,684	5/02/1972
933,323	72/381,685	5/02/1972
933,324	72/381,686	5/02/1972
933,325	72/383,559	5/02/1972
933,326	72/383,940	5/02/1972
933,328	72/386,124	5/02/1972
933,329	72/386,466	5/02/1972
933,330	72/386,893	5/02/1972
933,331	72/386,894	5/02/1972
933,332	72/393,541	5/02/1972
933,335	72/375,287	5/02/1972
933,338	72/374,145	5/02/1972
933,342	72/342,403	5/02/1972
933,343	72/369,872	5/02/1972
933,345	72/384,829	5/02/1972
933,347	72/371,806	5/02/1972
933,348	72/375,285	5/02/1972
933,350	72/379,981	5/02/1972
933,355	72/349,300	5/02/1972
933,356	72/349,301	5/02/1972
933,357	72/349,303	5/02/1972
933,358	72/349,304	5/02/1972
933,359	72/349,305	5/02/1972
933,360	72/349,311	5/02/1972
933,361	72/362,888	5/02/1972
933,365	72/374,859	5/02/1972
933,369	72/379,758	5/02/1972
933,370	72/389,214	5/02/1972
933,372	72/337,102	5/02/1972
933,383	72/378,802	5/02/1972
933,386	72/389,461	5/02/1972
933,387	72/393,256	5/02/1972
933,388	72/388,421	5/02/1972

Patent Number	Serial Number	Issue Date
4,424,059	06/356,865	1/03/84

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Reg. Number	Serial Number	Issue Date
933,396	72/382,368	5/02/1972
933,401	72/389,073	5/02/1972
933,407	72/387,634	5/02/1972
933,413	72/365,690	5/02/1972
933,416	72/362,894	5/02/1972
933,417	72/370,915	5/02/1972
933,426	72/383,850	5/02/1972
933,429	72/387,999	5/02/1972
933,431	72/386,962	5/02/1972
933,433	72/358,726	5/02/1972
933,434	72/371,651	5/02/1972
933,435	72/388,000	5/02/1972
933,436	72/349,757	5/02/1972
933,439	72/358,631	5/02/1972
933,440	72/369,953	5/02/1972
935,427	72/370,049	6/06/1972

Erratum

The following registration numbers were inadvertently listed as cancelled in the "Trademark Registration Cancelled, Section 8" section of the *Official Gazette* of February 9, 1993:

TM 269	1,375,488
TM 274	1,402,458

Consequently, the above-identified registrations are still active.

Feb. 17, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration numbers were inadvertently listed as cancelled in the "Trademark Registration Cancelled, Section 18" and "Index of Registrants" sections of the *Official Gazette:*

TM 315, TMI 13	1,447,682	Mar. 17, 1992
TM 264, TMI 27	1,453,262	Nov. 13, 1990

Consequently, the above-identified registrations are still active.

Feb. 17, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration numbers listed in the "Trademark Registrations Issued" and "Index of Registrants" sections of the *Official Gazette* was listed inadvertently:

TM 391, TMI 76	1,740,672	Dec. 15, 1992
TM 207, TMI 17	1,751,377	Feb. 9, 1993
TM 200, TMI 3	1,751,036	Feb. 9, 1993

Consequently, the certificate of registrations bearing the above identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

Feb. 17, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

The following registration number was inadvertently listed as cancelled in the "Trademark Registration Cancelled, Section 18" section of the *Offical Gazette:*

647,887	Aug. 8, 1990

Consequently, the above-identified registration is still active.

Feb. 17, 1993

DAVID E. BUCHER
Director of Trademark Examining Groups

YEARLY PATENTS WHICH EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEES

(JAN.—DEC. 1992)

The following is a compilation of the NOTICE OF EXPIRATION OF PATENTS DUE TO FAILURE TO PAY MAINTENANCE FEES which have been published in the Official Gazette from March 10, 1992 through March 9, 1993.

The patents have issue dates in the range of Jan. 3, 1984 through Dec. 5, 1984 and Jan. 5, 1988 through Dec. 7, 1988.

Patent Number	Serial Number	Issue Date
Re. 32,223	06/699,655	8/12/86
(4,423,813)	(06/381,072)	(1/03/84)
Re. 32,453	06/773,561	7/07/87
(4,423,882)	(06/376,593)	(1/03/84)
4,423,524	06/238,230	1/03/84
4,423,527	06/428,405	1/03/84
4.423.531	06/425,063	1/03/84
4,423,537	06/322,233	1/03/84
4,423,539	06/336,940	1/03/84
4,423,544	06/318,947	1/03/84
4,423,549	06/253,793	1/03/84
4,423,552	06/378,760	1/03/84
4,423,553	06/332,455	1/03/84
4,423,557	06/275,312	1/03/84
4,423,559	06/398,583	1/03/84
4,423,568	06/308,395	1/03/84
4,423,570	06/362,874	1/03/84
4,423,574	06/304,688	1/03/84
4,423,577	06/281,360	1/03/84
4,423,579	06/374,319	1/03/84
4,423,580	06/374,320	1/03/84
4,423,581	06/215,837	1/03/84
4,423,590	06/289,904	1/03/84
4,423,600	06/448,467	1/03/84
4,423,601	06/283,969	1/03/84
4,423,604	06/418,007	1/03/84
4,423,605	06/284,289	1/03/84
4,423,614	06/286,620	1/03/84
4,423,618	06/302,098	1/03/84
4,423,627	06/310,634	1/03/84
4,423,633	06/335,569	1/03/84
4,423,635	06/379,984	1/03/84
4,423,641	06/310,877	1/03/84
4,423,644	06/248,743	1/03/84
4,423,647	06/232,144	1/03/84
4,423,648	06/246,674	1/03/84
4,423,650	06/303,450	1/03/84
4,423,654	06/384,177	1/03/84
4,423,657	06/308,135	1/03/84
4,423,664	06/253,014	1/03/84
4,423,669	06/354,216	1/03/84
4,423,671	06/491,938	1/03/84
4,423,672	06/358,802	1/03/84
4,423,673	06/384,218	1/03/84
4,423,676	06/325,093	1/03/84
4,423,679	06/294,437	1/03/84
4,423,688	06/370,456	1/03/84
4,423,690	06/328,504	1/03/84
4,423,692	06/283,809	1/03/84
4,423,700	06/343,078	1/03/84
4,423,704	06/302,495	1/03/84
4,423,710	06/319,731	1/03/84
4,423,724	06/270,237	1/03/84
4,423,726	06/313,195	1/03/84
4,423,730	06/353,343	1/03/84
4,423,733	06/294,914	1/03/84

Patent Number	Serial Number	Issue Date
4,423,741	06/360,409	1/03/84
4,423,743	06/278,048	1/03/84
4,423,746	06/291,508	1/03/84
4,423,752	06/218,484	1/03/84
4,423,754	06/350,930	1/03/84
4,423,756	06/368,978	1/03/84
4,423,758	06/352,246	1/03/84
4,423,759	06/316,885	1/03/84
4,423,760	06/384,496	1/03/84
4,423,764	06/342,314	1/03/84
4,423,766	06/320,511	1/03/84
4,423,768	06/370,027	1/03/84
4,423,769	06/356,476	1/03/84
4,423,770	06/268,869	1/03/84
4,423,771	06/228,252	1/03/84
4,423,775	06/270,252	1/03/84
4,423,779	06/318,177	1/03/84
4,423,791	06/341,279	1/03/84
4,423,794	06/243,134	1/03/84
4,423,797	06/344,767	1/03/84
4,423,804	06/279,651	1/03/84
4,423,809	06/400,664	1/03/84
4,423,820	06/353,401	1/03/84
4,423,821	06/304,834	1/03/84
4,423,827	06/252,988	1/03/84
4,423,831	06/283,498	1/03/84
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4,424,497	06/259,020	1/03/84
4,424,498	06/325,446	1/03/84

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4,425,831	06/356,946	1/17/84
4,425,848	06/392,651	1/17/84
4,425,849	06/379,007	1/17/84
4,425,854	06/393,588	1/17/84
4,425,855	06/471,975	1/17/84
4,425,856	06/272,280	1/17/84
4,425,863	06/240,118	1/17/84
4,425,868	06/335,086	1/17/84
4,425,880	06/283,854	1/17/84
4,425,881	06/307,855	1/17/84
4,425,885	06/284,466	1/17/84
4,425,887	06/364,112	1/17/84
4,425,894	06/421,496	1/17/84
4,425,909	06/336,697	1/17/84
4,425,912	06/387,757	1/17/84
4,425,917	06/261,460	1/17/84
4,425,926	06/313,935	1/17/84
4,425,927	06/418,609	1/17/84
4,425,933	06/259,235	1/17/84
4,425,937	06/269,677	1/17/84
4,425,939	06/328,509	1/17/84
4,425,940	06/250,340	1/17/84
4,425,942	06/328,756	1/17/84

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4,425,957	06/341,011	1/17/84
4,425,969	06/284,170	1/17/84
4,425,971	06/320,607	1/17/84
4,425,978	06/302,171	1/17/84
4,425,979	06/331,086	1/17/84
4,425,981	06/322,275	1/17/84
4,425,989	06/247,821	1/17/84
4,425,992	06/290,986	1/17/84
4,425,994	06/251,787	1/17/84
4,425,997	06/430,526	1/17/84
4,425,999	06/422,709	1/17/84
4,426,005	06/283,817	1/17/84
4,426,007	06/295,997	1/17/84
4,426,009	06/224,373	1/17/84
4,426,010	06/321,267	1/17/84
4,426,011	06/243,086	1/17/84
4,426,012	06/323,529	1/17/84
4,426,014	06/427,560	1/17/84
4,426,015	06/263,735	1/17/84
4,426,016	06/290,091	1/17/84
4,426,020	06/288,416	1/17/84
4,426,032	06/300,767	1/17/84
4,426,034	06/408,222	1/17/84
4,426,035	06/242,321	1/17/84
4,426,037	06/377,930	1/17/84
4,426,040	06/270,376	1/17/84
4,426,049	06/284,733	1/17/84
4,426,055	06/356,568	1/17/84
4,426,058	06/234,596	1/17/84
4,426,060	06/269,323	1/17/84
4,426,070	06/297,772	1/17/84
4,426,077	06/246,468	1/17/84
4,426,085	06/396,140	1/17/84
4,426,101	06/301,069	1/17/84
4,426,108	06/434,550	1/17/84
4,426,115	06/288,732	1/17/84
4,426,116	06/407,126	1/17/84
4,426,121	06/267,848	1/17/84
4,426,122	06/246,640	1/17/84
4,426,123	06/240,525	1/17/84
4,426,131	06/339,206	1/17/84
4,426,141	06/256,754	1/17/84
4,426,166	06/434,289	1/17/84
4,426,170	06/378,513	1/17/84
4,426,172	06/384,225	1/17/84
4,426,173	06/296,712	1/17/84
4,426,174	06/428,757	1/17/84
4,426,175	06/333,688	1/17/84
4,426,180	06/292,274	1/17/84
4,426,186	06/395,732	1/17/84
4,426,187	06/424,415	1/17/84
4,426,193	06/227,319	1/17/84
4,426,200	06/423,670	1/17/84
4,426,219	06/410,836	1/17/84
4,426,221	06/425,812	1/17/84
4,426,231	06/407,644	1/17/84
4,426,236	06/340,335	1/17/84
4,426,241	06/409,075	1/17/84
4,426,255	06/353,666	1/17/84
4,426,256	06/396,465	1/17/84
4,426,257	06/315,172	1/17/84
4,426,260	06/405,668	1/17/84
4,426,261	06/332,756	1/17/84
4,426,262	06/372,906	1/17/84
4,426,268	06/513,195	1/17/84
4,426,270	06/402,313	1/17/84
4,426,273	06/289,937	1/17/84
4,426,282	06/348,102	1/17/84
4,426,287	06/332,094	1/17/84
4,426,302	06/423,415	1/17/84
4,426,308	06/476,702	1/17/84
4,426,312	06/330,631	1/17/84
4,426,315	06/338,812	1/17/84
4,426,320	06/394,220	1/17/84
4,426,343	06/397,624	1/17/84
4,426,347	06/251,581	1/17/84
4,426,358	06/372,773	1/17/84
4,426,364	06/311,521	1/17/84
4,426,367	06/368,049	1/17/84
4,426,369	06/343,662	1/17/84
4,426,383	06/298,227	1/17/84
4,426,385	06/305,951	1/17/84
4,426,388	06/364,953	1/17/84
4,426,391	06/418,326	1/17/84
4,426,393	06/306,730	1/17/84
4,426,394	06/316,972	1/17/84
4,426,397	06/329,692	1/17/84
4,426,399	06/331,297	1/17/84
4,426,400	06/512,597	1/17/84
4,426,402	06/407,057	1/17/84
4,426,406	06/335,003	1/17/84
4,426,410	06/438,988	1/17/84
4,426,415	06/329,828	1/17/84
4,426,419	06/407,395	1/17/84
4,426,424	06/379,858	1/17/84
4,426,426	06/400,671	1/17/84
4,426,427	06/505,886	1/17/84
4,426,433	06/281,205	1/17/84
4,426,446	06/231,063	1/17/84
4,426,449	06/330,157	1/17/84
4,426,455	06/300,979	1/17/84
4,426,461	06/398,369	1/17/84
4,426,463	06/485,264	1/17/84
4,426,464	06/393,486	1/17/84
4,426,487	06/424,924	1/17/84
4,426,488	06/380,367	1/17/84
4,426,492	06/298,865	1/17/84
4,426,494	06/289,253	1/17/84
4,426,498	06/359,399	1/17/84
4,426,504	06/385,515	1/17/84
4,426,508	06/377,589	1/17/84
4,426,509	06/411,750	1/17/84
4,426,517	06/295,420	1/17/84
4,426,519	06/343,349	1/17/84
4,426,524	06/341,361	1/17/84
4,426,525	06/311,876	1/17/84
4,426,528	06/364,356	1/17/84
4,426,532	06/381,876	1/17/84
4,426,535	06/312,988	1/17/84
4,426,537	06/260,811	1/17/84
4,426,541	06/358,644	1/17/84
4,426,550	06/358,085	1/17/84
4,426,557	06/340,353	1/17/84
4,426,563	06/475,254	1/17/84
4,426,564	06/323,610	1/17/84
4,426,566	06/269,183	1/17/84
4,426,567	06/294,491	1/17/84
4,426,568	06/378,391	1/17/84
4,426,574	06/329,724	1/17/84
4,426,579	06/330,427	1/17/84
4,426,580	06/494,500	1/17/84
4,426,585	06/362,254	1/17/84
4,426,598	06/344,890	1/17/84
4,426,608	06/253,035	1/17/84
4,426,609	06/259,726	1/17/84
4,426,615	06/300,489	1/17/84
4,426,620	06/304,737	1/17/84
4,426,621	06/278,801	1/17/84
4,426,622	06/296,026	1/17/84
4,426,628	06/246,511	1/17/84
4,426,648	06/271,753	1/17/84
4,426,653	06/304,141	1/17/84
4,426,660	06/235,713	1/17/84
4,426,664	06/368,451	1/17/84
4,426,671	06/414,933	1/17/84
4,426,672	06/429,112	1/17/84
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4,426,675	06/365,443	1/17/84
4,426,678	06/383,083	1/17/84
4,426,705	06/308,975	1/17/84
4,426,708	06/298,798	1/17/84
4,426,709	06/450,007	1/17/84
4,426,711	06/318,797	1/17/84
4,426,723	06/332,508	1/17/84

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4,426,732	06/385,361	1/17/84
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4,426,745	06/380,396	1/24/84
4,426,746	06/285,458	1/24/84
4,426,751	06/341,581	1/24/84
4,426,752	06/273,835	1/24/84
4,426,753	06/343,292	1/24/84
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4,426,757	06/290,738	1/24/84
4,426,759	06/333,268	1/24/84
4,426,761	06/265,901	1/24/84
4,426,763	06/297,333	1/24/84
4,426,766	06/313,395	1/24/84
4,426,775	06/278,247	1/24/84
4,426,784	06/397,088	1/24/84
4,426,788	06/469,380	1/24/84
4,426,789	06/448,800	1/24/84
4,426,807	06/386,634	1/24/84
4,426,809	06/349,875	1/24/84
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4,426,813	06/402,141	1/24/84
4,426,814	06/315,352	1/24/84
4,426,816	06/294,467	1/24/84
4,426,819	06/374,473	1/24/84
4,426,820	06/235,316	1/24/84
4,426,837	06/413,177	1/24/84
4,426,839	06/413,179	1/24/84
4,426,842	06/237,651	1/24/84
4,426,848	06/323,167	1/24/84
4,426,853	06/341,065	1/24/84
4,426,857	06/352,697	1/24/84
4,426,858	06/269,378	1/24/84
4,426,861	06/292,588	1/24/84
4,426,864	06/310,366	1/24/84
4,426,866	06/230,728	1/24/84
4,426,869	06/383,477	1/24/84
4,426,873	06/369,183	1/24/84
4,426,874	06/372,279	1/24/84
4,426,895	06/352,182	1/24/84
4,426,896	06/328,684	1/24/84
4,426,909	06/313,227	1/24/84
4,426,913	06/244,549	1/24/84
4,426,915	06/261,292	1/24/84
4,426,921	06/227,744	1/24/84
4,426,923	06/424,152	1/24/84
4,426,924	06/438,621	1/24/84
4,426,927	06/383,531	1/24/84
4,426,933	06/334,890	1/24/84
4,426,936	06/370,458	1/24/84
4,426,938	06/348,251	1/24/84
4,426,940	06/338,293	1/24/84
4,426,948	06/265,083	1/24/84
4,426,949	06/330,764	1/24/84
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4,426,954	06/423,718	1/24/84
4,426,962	06/367,355	1/24/84
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4,427,018	06/365,490	1/24/84
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4,427,034	06/296,962	1/24/84
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4,427,163	06/396,857	1/24/84
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4,427,187	06/391,862	1/24/84
4,427,191	06/391,493	1/24/84
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4,427,234	06/251,898	1/24/84
4,427,235	06/226,122	1/24/84
4,427,236	06/293,785	1/24/84
4,427,237	06/369,801	1/24/84
4,427,245	06/223,532	1/24/84
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4,427,283	06/265,755	1/24/84
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4,427,296	06/299,209	1/24/84
4,427,298	06/430,837	1/24/84
4,427,300	06/317,877	1/24/84
4,427,307	06/308,893	1/24/84
4,427,316	06/397,948	1/24/84
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4,427,321	06/305,977	1/24/84
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4,427,337	06/235,209	1/24/84
4,427,341	06/222,930	1/24/84
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4,427,346	06/356,838	1/24/84
4,427,348	06/264,450	1/24/84
4,427,356	06/292,684	1/24/84
4,427,363	06/239,291	1/24/84

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4,427,373	06/347,652	1/24/84
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4,427,387	06/413,468	1/24/84
4,427,388	06/407,220	1/24/84
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4,427,402	06/246,582	1/24/84
4,427,409	06/348,254	1/24/84
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4,427,422	06/430,062	1/24/84
4,427,425	06/436,724	1/24/84
4,427,428	06/378,050	1/24/84
4,427,432	06/407,526	1/24/84
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4,427,483	06/371,550	1/24/84
4,427,484	06/402,992	1/24/84
4,427,490	06/253,294	1/24/84
4,427,491	06/379,520	1/24/84
4,427,495	06/394,561	1/24/84
4,427,503	06/328,668	1/24/84
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4,427,506	06/422,931	1/24/84
4,427,508	06/374,445	1/24/84
4,427,509	06/374,446	1/24/84
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4,427,512	06/404,407	1/24/84
4,427,513	06/336,448	1/24/84
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4,427,560	06/329,384	1/24/84
4,427,562	06/375,413	1/24/84
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4,427,581	06/341,058	1/24/84
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4,427,583	06/308,033	1/24/84
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4,427,591	06/298,985	1/24/84
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4,427,624	06/239,787	1/24/84
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4,427,677	06/332,830	1/24/84
4,427,684	06/423,233	1/24/84

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4,427,717	06/425,994	1/24/84
4,427,723	06/347,741	1/24/84
4,427,724	06/426,790	1/24/84
4,427,725	06/347,828	1/24/84
4,427,729	06/366,933	1/24/84
4,427,730	06/371,600	1/24/84
4,427,733	06/303,018	1/24/84
4,427,735	06/267,612	1/24/84
4,427,738	06/274,565	1/24/84
4,427,745	06/404,916	1/24/84
4,427,762	06/450,047	1/24/84
4,427,771	06/311,263	1/24/84
4,427,773	06/255,169	1/24/84
4,427,783	06/330,402	1/24/84
4,427,792	06/291,603	1/24/84
4,427,796	06/402,721	1/24/84
4,427,799	06/304,647	1/24/84
4,427,800	06/348,554	1/24/84
4,427,808	06/283,424	1/24/84
4,427,809	06/330,085	1/24/84
4,427,840	06/335,994	1/24/84
4,427,842	06/357,463	1/24/84
4,427,851	06/384,938	1/24/84
4,427,856	06/325,666	1/24/84
4,427,858	06/317,859	1/24/84
4,427,860	06/350,526	1/24/84
4,427,867	06/446,553	1/24/84
4,427,868	06/344,828	1/24/84
4,427,877	06/306,265	1/24/84
4,427,880	06/278,518	1/24/84
4,427,881	06/241,632	1/24/84
4,427,884	06/342,147	1/24/84
4,427,886	06/404,398	1/24/84
4,427,898	06/447,160	1/24/84
4,427,899	06/363,935	1/24/84
4,427,907	06/324,295	1/24/84
4,427,917	06/416,916	1/24/84
4,427,935	06/310,543	1/24/84
4,427,952	06/221,384	1/24/84
4,427,953	06/321,359	1/24/84
4,427,957	06/339,292	1/24/84
4,427,958	06/417,952	1/24/84
4,427,964	06/306,161	1/24/84
4,427,971	06/324,717	1/24/84
4,427,975	06/258,621	1/24/84
4,427,977	06/290,552	1/24/84
4,427,978	06/297,636	1/24/84
4,427,979	06/313,156	1/24/84
4,427,984	06/288,092	1/24/84
4,428,011	06/369,205	1/24/84
4,428,013	06/280,879	1/24/84
4,428,015	06/333,356	1/24/84
4,428,019	06/260,511	1/24/84
4,428,020	06/311,225	1/24/84
4,428,023	06/438,242	1/24/84
4,428,028	06/320,637	1/24/84
4,428,031	06/335,625	1/24/84
4,428,032	06/336,698	1/24/84
4,428,033	06/398,388	1/24/84
4,428,035	06/444,763	1/24/84
4,428,037	06/433,978	1/24/84
4,428,039	06/360,833	1/24/84
4,428,048	06/229,269	1/24/84
4,428,056	06/266,071	1/24/84
4,428,059	06/411,398	1/24/84
4,428,062	06/291,753	1/24/84
4,428,068	06/320,541	1/24/84
4,428,071	06/321,829	1/24/84
4,428,073	06/317,028	1/24/84
4,428,076	06/330,719	1/24/84
Re. 32,600	06/816,000	2/16/88
(4,428,759)	(06/458,047)	(1/31/84)
Re. 32,756	06/610,511	9/27/88
(4,428,714)	(06/293,869)	(1/31/84)

Patent Number	Serial Number	Issue Date
4,428,082	06/318,582	1/31/84
4,428,090	06/353,901	1/31/84
4,428,097	06/470,771	1/31/84
4,428,100	06/369,053	1/31/84
4,428,106	06/371,919	1/31/84
4,428,118	06/368,292	1/31/84
4,428,122	06/352,831	1/31/84
4,428,129	06/383,671	1/31/84
4,428,133	06/422,985	1/31/84
4,428,137	06/311,089	1/31/84
4,428,140	06/233,133	1/31/84
4,428,141	06/347,718	1/31/84
4,428,144	06/375,958	1/31/84
4,428,145	06/291,317	1/31/84
4,428,146	06/405,298	1/31/84
4,428,153	06/355,667	1/31/84
4,428,156	06/307,897	1/31/84
4,428,157	06/334,640	1/31/84
4,428,164	06/217,384	1/31/84
4,428,165	06/292,284	1/31/84
4,428,168	06/326,382	1/31/84
4,428,171	06/357,407	1/31/84
4,428,175	06/388,895	1/31/84
4,428,176	06/292,086	1/31/84
4,428,178	06/384,956	1/31/84
4,428,181	06/389,036	1/31/84
4,428,192	06/368,642	1/31/84
4,428,197	06/322,361	1/31/84
4,428,207	06/307,430	1/31/84
4,428,218	06/324,543	1/31/84
4,428,226	06/350,473	1/31/84
4,428,227	06/379,750	1/31/84
4,428,229	06/383,821	1/31/84
4,428,230	06/258,307	1/31/84
4,428,235	06/274,428	1/31/84
4,428,236	06/305,512	1/31/84
4,428,238	06/308,735	1/31/84
4,428,242	06/357,261	1/31/84
4,428,249	06/327,520	1/31/84
4,428,253	06/297,887	1/31/84
4,428,262	06/396,803	1/31/84
4,428,267	06/277,892	1/31/84
4,428,270	06/321,733	1/31/84
4,428,273	06/340,871	1/31/84
4,428,281	06/376,643	1/31/84
4,428,285	06/378,557	1/31/84
4,428,288	06/371,721	1/31/84
4,428,296	06/289,902	1/31/84
4,428,302	06/347,495	1/31/84
4,428,304	06/273,682	1/31/84
4,428,307	06/317,145	1/31/84
4,428,308	06/326,046	1/31/84
4,428,309	06/501,547	1/31/84
4,428,313	06/342,111	1/31/84
4,428,314	06/281,002	1/31/84
4,428,317	06/295,534	1/31/84
4,428,323	06/443,859	1/31/84
4,428,333	06/394,197	1/31/84
4,428,334	06/323,188	1/31/84
4,428,335	06/332,170	1/31/84
4,428,338	06/372,549	1/31/84
4,428,339	06/308,515	1/31/84
4,428,354	06/390,787	1/31/84
4,428,356	06/421,177	1/31/84
4,428,359	06/345,930	1/31/84
4,428,362	06/224,141	1/31/84
4,428,369	06/284,674	1/31/84
4,428,375	06/348,976	1/31/84
4,428,377	06/240,129	1/31/84
4,428,386	06/411,143	1/31/84
4,428,390	06/338,588	1/31/84
4,428,391	06/265,704	1/31/84
4,428,399	06/284,144	1/31/84
4,428,410	06/394,928	1/31/84
4,428,411	06/410,583	1/31/84
4,428,418	06/378,727	1/31/84
4,428,421	06/301,772	1/31/84

4,428,424	06/387,326	1/31/84
4,428,429	06/267,123	1/31/84
4,428,439	06/340,190	1/31/84
4,428,447	06/368,901	1/31/84
4,428,452	06/249,419	1/31/84
4,428,455	06/370,613	1/31/84
4,428,456	06/464,034	1/31/84
4,428,461	06/353,530	1/31/84
4,428,471	06/362,403	1/31/84
4,428,472	06/233,452	1/31/84
4,428,475	06/326,566	1/31/84
4,428,480	06/367,074	1/31/84
4,428,481	06/462,981	1/31/84
4,428,483	06/276,667	1/31/84
4,428,487	06/368,704	1/31/84
4,428,495	06/459,800	1/31/84
4,428,496	06/410,400	1/31/84
4,428,497	06/374,613	1/31/84
4,428,504	06/326,669	1/31/84
4,428,506	06/325,984	1/31/84
4,428,507	06/390,554	1/31/84
4,428,512	06/398,675	1/31/84
4,428,513	06/444,694	1/31/84
4,428,514	06/330,124	1/31/84
4,428,519	06/396,020	1/31/84
4,428,524	06/378,150	1/31/84
4,428,525	06/406,748	1/31/84
4,428,527	06/416,142	1/31/84
4,428,532	06/328,614	1/31/84
4,428,533	06/333,191	1/31/84
4,428,534	06/317,642	1/31/84
4,428,537	06/298,278	1/31/84
4,428,541	06/405,563	1/31/84
4,428,545	06/252,070	1/31/84
4,428,552	06/260,110	1/31/84
4,428,556	06/376,608	1/31/84
4,428,563	06/460,971	1/31/84
4,428,566	06/323,890	1/31/84
4,428,573	06/272,955	1/31/84
4,428,581	06/274,169	1/31/84
4,428,591	06/379,001	1/31/84
4,428,592	06/385,563	1/31/84
4,428,597	06/318,243	1/31/84
4,428,598	06/398,667	1/31/84
4,428,607	06/220,088	1/31/84
4,428,608	06/289,316	1/31/84
4,428,610	06/401,629	1/31/84
4,428,612	06/343,393	1/31/84
4,428,617	06/300,382	1/31/84
4,428,630	06/394,867	1/31/84
4,428,638	06/300,463	1/31/84
4,428,646	06/310,348	1/31/84
4,428,648	06/324,856	1/31/84
4,428,663	06/398,923	1/31/84
4,428,669	06/269,252	1/31/84
4,428,670	06/317,401	1/31/84
4,428,675	06/274,708	1/31/84
4,428,677	06/365,007	1/31/84
4,428,683	06/396,441	1/31/84
4,428,684	06/337,078	1/31/84
4,428,687	06/497,217	1/31/84
4,428,688	06/256,358	1/31/84
4,428,695	06/377,423	1/31/84
4,428,696	06/345,349	1/31/84
4,428,699	06/447,931	1/31/84
4,428,703	06/297,488	1/31/84
4,428,717	06/303,739	1/31/84
4,428,720	06/343,501	1/31/84
4,428,722	06/275,989	1/31/84
4,428,731	06/363,814	1/31/84
4,428,736	06/250,496	1/31/84
4,428,740	06/326,045	1/31/84
4,428,746	06/288,150	1/31/84
4,428,749	06/338,945	1/31/84
4,428,752	06/400,967	1/31/84
4,428,755	06/313,241	1/31/84
4,428,758	06/350,996	1/31/84
4,428,762	06/371,629	1/31/84
4,428,766	06/410,875	1/31/84

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4,428,769	06/299,005	1/31/84
4,428,772	06/326,571	1/31/84
4,428,773	06/454,803	1/31/84
4,428,774	06/384,299	1/31/84
4,428,776	06/391,216	1/31/84
4,428,779	06/393,691	1/31/84
4,428,781	06/423,270	1/31/84
4,428,782	06/401,155	1/31/84
4,428,787	06/369,341	1/31/84
4,428,790	06/272,445	1/31/84
4,428,792	06/371,726	1/31/84
4,428,795	06/504,577	1/31/84
4,428,798	06/401,793	1/31/84
4,428,808	06/249,805	1/31/84
4,428,810	06/377,324	1/31/84
4,428,812	06/481,954	1/31/84
4,428,818	06/447,594	1/31/84
4,428,824	06/424,778	1/31/84
4,428,830	06/361,227	1/31/84
4,428,832	06/322,875	1/31/84
4,428,841	06/237,976	1/31/84
4,428,848	06/319,780	1/31/84
4,428,850	06/343,672	1/31/84
4,428,851	06/326,186	1/31/84
4,428,856	06/428,919	1/31/84
4,428,859	06/441,324	1/31/84
4,428,861	06/314,290	1/31/84
4,428,868	06/349,908	1/31/84
4,428,888	06/408,322	1/31/84
4,428,891	06/378,087	1/31/84
4,428,892	06/404,603	1/31/84
4,428,893	06/469,329	1/31/84
4,428,894	06/296,270	1/31/84
4,428,896	06/412,533	1/31/84
4,428,902	06/263,049	1/31/84
4,428,905	06/266,672	1/31/84
4,428,911	06/423,658	1/31/84
4,428,913	06/391,786	1/31/84
4,428,917	06/381,092	1/31/84
4,428,925	06/425,282	1/31/84
4,428,926	06/425,280	1/31/84
4,428,933	06/404,545	1/31/84
4,428,939	06/311,920	1/31/84
4,428,940	06/356,445	1/31/84
4,428,945	06/359,356	1/31/84
4,428,951	06/370,668	1/31/84
4,428,952	06/387,181	1/31/84
4,428,953	06/356,043	1/31/84
4,428,955	06/372,415	1/31/84
4,428,960	06/369,954	1/31/84
4,428,963	06/474,072	1/31/84
4,428,974	06/447,597	1/31/84
4,428,989	06/390,663	1/31/84
4,428,990	06/377,096	1/31/84
4,428,993	06/377,037	1/31/84
4,429,007	06/313,448	1/31/84
4,429,014	06/399,144	1/31/84
4,429,019	06/226,992	1/31/84
4,429,021	06/328,699	1/31/84
4,429,023	06/346,308	1/31/84
4,429,033	06/377,623	1/31/84
4,429,035	06/504,855	1/31/84
4,429,038	06/401,653	1/31/84
4,429,041	06/262,018	1/31/84
4,429,049	06/350,689	1/31/84
4,429,050	06/298,811	1/31/84
4,429,051	06/356,511	1/31/84
4,429,058	06/483,406	1/31/84
4,429,060	06/441,807	1/31/84
4,429,061	06/441,655	1/31/84
4,429,066	06/430,842	1/31/84
4,429,069	06/504,630	1/31/84
4,429,075	06/378,871	1/31/84
4,429,084	06/492,931	1/31/84
4,429,098	06/412,730	1/31/84
4,429,103	06/360,000	1/31/84
4,429,106	06/497,237	1/31/84
4,429,112	06/383,975	1/31/84
4,429,118	06/374,574	1/31/84
4,429,120	06/454,133	1/31/84
4,429,121	06/330,627	1/31/84
4,429,126	06/384,998	1/31/84
4,429,139	06/435,314	1/31/84
4,429,151	06/391,583	1/31/84
4,429,154	06/381,132	1/31/84
4,429,156	06/313,905	1/31/84
4,429,160	06/296,214	1/31/84
4,429,162	06/344,681	1/31/84
4,429,165	06/391,679	1/31/84
4,429,168	06/372,060	1/31/84
4,429,169	06/372,055	1/31/84
4,429,170	06/398,068	1/31/84
4,429,172	06/305,001	1/31/84
4,428,175	06/437,029	1/31/84
4,429,178	06/282,916	1/31/84
4,429,183	06/310,349	1/31/84
4,429,200	06/430,649	1/31/84
4,429,204	06/275,327	1/31/84
4,429,205	06/348,349	1/31/84
4,429,207	06/335,812	1/31/84
4,429,212	06/249,921	1/31/84
4,429,216	06/224,453	1/31/84
4,429,221	06/295,917	1/31/84
4,429,223	06/305,032	1/31/84
4,429,224	06/310,917	1/31/84
4,429,225	06/268,231	1/31/84
4,429,228	06/262,833	1/31/84
4,429,230	06/333,413	1/31/84
4,429,231	06/324,802	1/31/84
4,429,232	06/381,191	1/31/84
4,429,235	06/296,583	1/31/84
4,429,242	06/384,169	1/31/84
4,429,245	06/321,632	1/31/84
4,429,249	06/362,759	1/31/84
4,429,256	06/307,169	1/31/84
4,429,265	06/216,707	1/31/84
4,429,266	06/329,510	1/31/84
4,429,270	06/352,905	1/31/84
4,429,271	06/260,443	1/31/84
4,429,277	06/265,643	1/31/84
4,429,291	06/329,022	1/31/84
4,429,295	06/321,237	1/31/84
4,429,304	06/256,045	1/31/84
4,429,309	06/258,434	1/31/84
4,429,316	06/353,640	1/31/84
4,429,317	06/379,307	1/31/84
4,429,323	06/301,596	1/31/84
4,429,338	06/395,187	1/31/84
4,429,340	06/458,686	1/31/84
4,429,341	06/260,871	1/31/84
4,429,342	06/368,455	1/31/84
4,429,352	06/479,853	1/31/84
4,429,354	06/427,657	1/31/84
4,429,359	06/334,291	1/31/84
4,429,365	06/291,614	1/31/84
4,429,366	06/252,683	1/31/84
4,429,377	06/384,690	1/31/84
4,429,379	06/309,806	1/31/84
4,429,380	06/305,363	1/31/84
4,429,381	06/329,679	1/31/84
4,429,383	06/225,736	1/31/84
4,429,399	06/240,237	1/31/84
4,429,400	06/312,133	1/31/84
4,429,403	06/422,029	1/31/84
4,429,410	06/229,470	1/31/84
4,429,411	06/362,172	1/31/84
4,429,412	06/291,780	1/31/84
Re. 32,105	06/672,462	4/01/86
(4,430,646)	(06/221,524)	(2/07/84)
Re. 32,515	06/827,270	10/06/87
(4,430,583)	(06/316,560)	(2/07/84)
4,429,419	06/339,620	2/07/84
4,429,428	06/314,806	2/07/84
4,429,433	06/412,101	2/07/84
4,429,435	06/343,018	2/07/84
4,429,446	06/365,365	2/07/84

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4,429,451	06/225,855	2/07/84
4,429,456	06/344,623	2/07/84
4,429,457	06/312,820	2/07/84
4,429,465	06/362,722	2/07/84
4,429,471	06/329,545	2/07/84
4,429,472	06/243,740	2/07/84
4,429,474	06/336,419	2/07/84
4,429,478	06/277,707	2/07/84
4,429,480	06/361,450	2/07/84
4,429,484	06/402,091	2/07/84
4,429,485	06/362,768	2/07/84
4,429,486	06/447,011	2/07/84
4,429,493	06/424,220	2/07/84
4,429,497	06/252,875	2/07/84
4,429,499	06/244,018	2/07/84
4,429,502	06/245,159	2/07/84
4,429,507	06/232,401	2/07/84
4,429,510	06/260,727	2/07/84
4,429,511	06/302,392	2/07/84
4,429,519	06/413,175	2/07/84
4,429,520	06/413,176	2/07/84
4,429,522	06/358,887	2/07/84
4,429,527	06/275,157	2/07/84
4,429,528	06/227,268	2/07/84
4,429,532	06/256,093	2/07/84
4,429,533	06/280,201	2/07/84
4,429,536	06/323,509	2/07/84
4,429,537	06/229,693	2/07/84
4,429,544	06/430,904	2/07/84
4,429,545	06/289,208	2/07/84
4,429,547	06/356,620	2/07/84
4,429,548	06/328,415	2/07/84
4,429,549	06/247,591	2/07/84
4,429,553	06/266,212	2/07/84
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4,430,132	06/439,836	2/14/84
4,430,133	06/439,837	2/14/84
4,430,134	06/439,838	2/14/84

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4,431,147	06/334,096	2/14/84
4,431,149	06/347,807	2/14/84
4,431,151	06/285,443	2/14/84
4,431,152	06/329,495	2/14/84
4,431,158	06/293,319	2/14/84
4,431,162	06/296,274	2/14/84
4,431,166	06/319,736	2/14/84
4,431,167	06/398,749	2/14/84
4,431,176	06/299,010	2/14/84
4,431,183	06/377,516	2/14/84
4,431,196	06/429,784	2/14/84
4,431,197	06/263,483	2/14/84
4,431,198	06/439,518	2/14/84
4,431,202	06/365,799	2/14/84
4,431,204	06/383,948	2/14/84
4,431,209	06/230,592	2/14/84
4,431,215	06/255,934	2/14/84
4,431,216	06/244,719	2/14/84
4,431,222	06/325,320	2/14/84
4,431,225	06/308,529	2/14/84
4,431,234	06/279,233	2/14/84
4,431,236	06/361,065	2/14/84
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4,431,255	06/323,608	2/14/84
4,431,256	06/317,828	2/14/84
4,431,257	06/297,627	2/14/84
4,431,262	06/309,035	2/14/84
4,431,264	06/302,058	2/14/84
4,431,290	06/367,508	2/14/84
4,431,294	06/432,816	2/14/84
4,431,295	06/374,172	2/14/84
4,431,304	06/324,976	2/14/84
4,431,306	06/259,212	2/14/84
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4,431,336	06/346,210	2/14/84
4,431,337	06/336,344	2/14/84
4,431,342	06/446,107	2/14/84
4,431,345	06/221,287	2/14/84
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4,431,356	06/278,455	2/14/84
4,431,360	06/285,836	2/14/84
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4,431,383	06/298,024	2/14/84
4,431,387	06/318,876	2/14/84
4,431,394	06/280,867	2/14/84
4,431,396	06/395,733	2/14/84
4,431,401	06/278,582	2/14/84
4,431,402	06/369,972	2/14/84
4,431,404	06/411,532	2/14/84
4,431,408	06/351,183	2/14/84
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4,431,427	06/308,291	2/14/84
4,431,428	06/306,910	2/14/84
4,431,429	06/456,194	2/14/84
4,431,434	06/241,074	2/14/84
4,431,436	06/400,562	2/14/84
4,431,442	06/231,721	2/14/84
4,431,444	06/401,209	2/14/84
4,431,445	06/281,675	2/14/84
4,431,447	06/372,320	2/14/84
4,431,458	06/366,485	2/14/84
4,431,466	06/244,004	2/14/84
4,431,472	06/453,660	2/14/84

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4,431,485	06/376,827	2/14/84
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4,431,488	06/427,275	2/14/84
4,431,489	06/480,965	2/14/84
4,431,499	06/352,738	2/14/84
4,431,503	06/275,940	2/14/84
4,431,506	06/415,379	2/14/84
4,431,512	06/346,623	2/14/84
4,431,519	06/434,205	2/14/84
4,431,524	06/461,034	2/14/84
4,431,533	06/347,330	2/14/84
4,431,534	06/401,183	2/14/84
4,431,536	06/449,951	2/14/84
4,431,541	06/411,432	2/14/84
4,431,553	06/333,417	2/14/84
4,431,555	06/418,106	2/14/84
4,431,556	06/418,114	2/14/84
4,431,563	06/400,340	2/14/84
4,431,565	06/436,329	2/14/84
4,431,566	06/353,106	2/14/84
4,431,576	06/343,348	2/14/84
4,431,579	06/373,677	2/14/84
4,431,580	06/228,247	2/14/84
4,431,585	06/237,628	2/14/84
4,431,588	06/430,080	2/14/84
4,431,591	06/424,708	2/14/84
4,431,600	06/340,665	2/14/84
4,431,602	06/426,307	2/14/84
4,431,603	06/260,864	2/14/84
4,431,604	06/228,923	2/14/84
4,431,609	06/461,301	2/14/84
4,431,610	06/351,171	2/14/84
4,431,613	06/433,640	2/14/84
4,431,615	06/428,056	2/14/84
4,431,617	06/396,743	2/14/84
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4,431,621	06/407,055	2/14/84
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4,431,647	06/404,104	2/14/84
4,431,650	06/219,218	2/14/84
4,431,651	06/442,623	2/14/84
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4,431,675	06/441,549	2/14/84
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4,431,693	06/339,400	2/14/84
4,431,695	06/230,280	2/14/84
4,431,697	06/404,064	2/14/84
4,431,700	06/451,350	2/14/84
4,431,703	06/443,574	2/14/84
4,431,704	06/480,066	2/14/84
4,431,710	06/499,019	2/14/84
4,431,720	06/399,619	2/14/84
4,431,724	06/356,900	2/14/84
4,431,728	06/386,803	2/14/84
4,431,744	06/384,319	2/14/84
4,431,749	06/318,186	2/14/84
4,431,753	06/494,198	2/14/84
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4,431,760	06/357,227	2/14/84
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4,431,774	06/414,278	2/14/84
4,431,775	06/304,959	2/14/84
4,431,787	06/265,539	2/14/84
4,431,792	06/447,371	2/14/84
4,431,793	06/386,750	2/14/84
4,431,796	06/409,008	2/14/84
4,431,803	06/339,156	2/14/84
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4,431,864	06/311,471	2/14/84
4,431,871	06/341,266	2/14/84
4,431,876	06/263,692	2/14/84
4,431,878	06/386,582	2/14/84
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4,431,882	06/407,450	2/14/84
4,431,883	06/350,630	2/14/84
4,431,885	06/318,553	2/14/84
4,431,887	06/390,391	2/14/84
4,431,899	06/343,615	2/14/84
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4,431,909	06/430,720	2/14/84
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4,431,919	06/252,722	2/14/84
4,431,925	06/407,228	2/14/84
4,431,932	06/419,372	2/14/84
4,431,937	06/314,576	2/14/84
4,431,943	06/311,279	2/14/84
4,431,946	06/370,312	2/14/84
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4,431,956	06/300,538	2/14/84
4,431,966	06/262,851	2/14/84
4,431,984	06/348,857	2/14/84
4,431,987	06/352,509	2/14/84
4,431,988	06/227,969	2/14/84
4,431,994	06/260,879	2/14/84
4,431,996	06/326,975	2/14/84
4,432,004	06/313,865	2/14/84
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4,432,019	06/357,443	2/14/84
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4,432,081	06/323,204	2/14/84
4,432,084	06/306,348	2/14/84
4,432,088	06/258,972	2/14/84
4,432,096	06/301,869	2/14/84
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4,432,115	06/397,225	2/21/84
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4,432,117	06/342,183	2/21/84
4,432,118	06/357,674	2/21/84
4,432,123	06/287,192	2/21/84
4,432,125	06/498,393	2/21/84
4,432,129	06/342,185	2/21/84
4,432,132	06/328,368	2/21/84
4,432,139	06/315,487	2/21/84
4,432,141	06/500,937	2/21/84
4,432,144	06/350,833	2/21/84
4,432,145	06/323,255	2/21/84
4,432,147	06/276,764	2/21/84
4,432,149	06/256,026	2/21/84
4,432,151	06/403,575	2/21/84
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4,432,155	06/361,062	2/21/84
4,432,159	06/282,583	2/21/84
4,432,162	06/367,397	2/21/84
4,432,169	06/264,034	2/21/84
4,432,171	06/417,340	2/21/84

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4,432,191	06/412,498	2/21/84
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4,432,206	06/481,267	2/21/84
4,432,209	06/390,322	2/21/84
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4,432,211	06/319,313	2/21/84
4,432,213	06/349,462	2/21/84
4,432,214	06/294,561	2/21/84
4,432,216	06/438,464	2/21/84
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4,432,350	06/255,125	2/21/84
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4,432,594	06/307,367	2/21/84
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4,432,619	06/373,968	2/21/84
4,432,620	06/356,318	2/21/84
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4,432,773	06/475,209	2/21/84
4,432,775	06/403,280	2/21/84
4,432,793	06/403,726	2/21/84
4,432,797	06/357,033	2/21/84
4,432,812	06/483,961	2/21/84

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4,432,814	06/484,735	2/21/84
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4,432,817	06/361,643	2/21/84
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4,432,822	06/366,489	2/21/84
4,432,824	06/402,173	2/21/84
4,432,826	06/402,080	2/21/84
4,432,835	06/351,156	2/21/84
4,432,837	06/397,693	2/21/84
4,432,838	06/394,756	2/21/84
4,432,839	06/274,822	2/21/84
4,432,846	06/448,817	2/21/84
4,432,853	06/444,124	2/21/84
4,432,859	06/371,485	2/21/84
4,432,863	06/288,952	2/21/84
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4,432,887	06/298,734	2/21/84
4,432,891	06/375,525	2/21/84
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4,432,897	06/321,823	2/21/84
4,432,899	06/335,940	2/21/84
4,432,901	06/301,884	2/21/84
4,432,904	06/427,357	2/21/84
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4,434,887	06/414,061	3/06/84
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4,434,891	06/476,475	3/06/84
4,434,894	06/439,311	3/06/84
4,434,900	06/460,887	3/06/84
4,434,906	06/436,961	3/06/84
4,434,910	06/451,933	3/06/84
4,434,912	06/292,716	3/06/84

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4,434,961	06/488,030	3/06/84
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4,434,983	06/430,311	3/06/84
4,434,984	06/348,983	3/06/84
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4,435,022	06/342,082	3/06/84
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4,435,028	06/241,575	3/06/84
4,435,033	06/421,389	3/06/84
4,435,036	06/267,966	3/06/84
4,435,045	06/372,877	3/06/84
4,435,046	06/251,452	3/06/84
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4,435,173	06/355,102	3/06/84
4,435,179	06/319,769	3/06/84
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4,435,662	06/313,122	3/06/84
4,435,671	06/371,827	3/06/84
4,435,672	06/358,386	3/06/84
4,435,673	06/240,225	3/06/84

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4,436,700	06/336,895	3/13/84

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4,435,693	06/385,343	3/06/84
4,435,700	06/415,594	3/06/84
4,435,701	06/435,421	3/06/84
4,435,704	06/354,918	3/06/84
4,435,709	06/266,983	3/06/84
4,435,710	06/253,322	3/06/84
4,435,712	06/292,573	3/06/84
4,435,727	06/382,803	3/06/84
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4,435,748	06/375,717	3/06/84
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4,435,773	06/236,823	3/06/84
4,435,776	06/228,904	3/06/84
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4,435,783	06/251,664	3/06/84
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4,435,814	06/460,302	3/06/84
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4,436,363	06/405,825	3/13/84
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4,436,703	06/328,272	3/13/84
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4,436,716	06/320,846	3/13/84
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4,437,017	06/347,491	3/13/84
4,437,026	06/217,355	3/13/84
4,437,033	06/267,583	3/13/84

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4,440,530	06/301,208	4/03/84
4,440,532	06/284,839	4/03/84
4,440,543	06/291,596	4/03/84

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4,440,544	06/380,998	4/03/84
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4,440,551	06/289,515	4/03/84
4,440,554	06/430,327	4/03/84
4,440,555	06/380,201	4/03/84
4,440,565	06/360,489	4/03/84
4,440,576	06/424,030	4/03/84
4,440,578	06/377,320	4/03/84
4,440,579	06/445,400	4/03/84
4,440,581	06/278,617	4/03/84
4,440,587	06/404,253	4/03/84
4,440,591	06/379,648	4/03/84
4,440,594	06/427,734	4/03/84
4,440,596	06/380,612	4/03/84
4,440,599	06/447,198	4/03/84
4,440,604	06/436,378	4/03/84
4,440,605	06/234,321	4/03/84
4,440,606	06/409,067	4/03/84
4,440,607	06/383,628	4/03/84
4,440,609	06/493,499	4/03/84
4,440,619	06/353,289	4/03/84
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4,440,633	06/373,595	4/03/84
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4,440,636	06/347,694	4/03/84
4,440,641	06/348,455	4/03/84
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4,440,647	06/465,224	4/03/84
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4,440,651	06/319,336	4/03/84
4,440,653	06/355,990	4/03/84
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4,440,692	06/372,798	4/03/84
4,440,693	06/327,726	4/03/84
4,440,698	06/420,969	4/03/84
4,440,699	06/381,114	4/03/84
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4,441,221	06/388,645	4/10/84
4,441,224	06/498,801	4/10/84
4,441,227	06/356,703	4/10/84
4,441,228	06/441,115	4/10/84
4,441,243	06/394,391	4/10/84

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4,441,271	06/399,598	4/10/84
4,441,273	06/363,513	4/10/84
4,441,284	06/387,214	4/10/84
4,441,287	06/286,044	4/10/84
4,441,293	06/371,304	4/10/84
4,441,296	06/380,039	4/10/84
4,441,297	06/367,106	4/10/84
4,441,301	06/413,149	4/10/84
4,441,304	06/238,672	4/10/84
4,441,306	06/413,910	4/10/84
4,441,308	06/346,881	4/10/84
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4,441,574	06/380,893	4/10/84
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4,441,917	06/381,888	4/10/84
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4,441,931	06/315,757	4/10/84
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4,441,961	06/424,086	4/10/84
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4,442,039	06/375,414	4/10/84
4,442,042	06/259,218	4/10/84
4,442,043	06/508,214	4/10/84
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4,442,475	06/395,566	4/10/84
4,442,476	06/293,551	4/10/84
4,442,477	06/333,206	4/10/84
4,442,480	06/351,808	4/10/84
4,442,482	06/429,449	4/10/84
4,442,489	06/468,026	4/10/84
4,442,515	06/331,721	4/10/84
4,442,523	06/331,750	4/10/84
4,442,524	06/384,459	4/10/84
4,442,525	06/342,813	4/10/84
4,442,526	06/369,619	4/10/84
4,442,539	06/268,811	4/10/84
4,442,545	06/305,174	4/10/84
4,442,550	06/296,655	4/10/84
Re. 33,100	07/212,951	10/24/89
(4,738,722)	(06/907,577)	(4/19/88)
4,442,556	06/470,925	4/17/84
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4,442,562	06/375,804	4/17/84
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4,442,570	06/414,613	4/17/84
4,442,571	06/405,256	4/17/84
4,442,580	06/219,939	4/17/84
4,442,581	06/345,815	4/17/84
4,442,583	06/401,777	4/17/84
4,442,587	06/275,838	4/17/84
4,442,596	06/380,428	4/17/84
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4,442,624	06/332,009	4/17/84
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4,442,628	06/486,985	4/17/84
4,442,634	06/482,354	4/17/84
4,442,637	06/296,030	4/17/84
4,442,638	06/390,786	4/17/84
4,442,640	06/478,844	4/17/84
4,442,644	06/276,077	4/17/84
4,442,655	06/392,215	4/17/84
4,442,656	06/314,658	4/17/84
4,442,659	06/411,667	4/17/84
4,442,660	06/412,733	4/17/84
4,442,661	06/412,642	4/17/84
4,442,668	06/362,494	4/17/84
4,442,672	06/355,591	4/17/84

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4,442,679	06/479,666	4/17/84
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4,442,691	06/468,490	4/17/84
4,442,700	06/356,567	4/17/84
4,442,705	06/388,213	4/17/84
4,442,719	06/338,648	4/17/84
4,442,720	06/456,146	4/17/84
4,442,722	06/456,201	4/17/84
4,442,727	06/382,533	4/17/84
4,442,731	06/281,224	4/17/84
4,442,735	06/444,406	4/17/84
4,442,738	06/342,982	4/17/84
4,442,740	06/422,133	4/17/84
4,442,750	06/483,445	4/17/84
4,442,751	06/392,899	4/17/84
4,442,764	06/419,813	4/17/84
4,442,766	06/326,421	4/17/84
4,442,768	06/344,514	4/17/84
4,442,775	06/424,988	4/17/84
4,442,776	06/370,232	4/17/84
4,442,778	06/494,136	4/17/84
4,442,786	06/377,272	4/17/84
4,442,787	06/343,779	4/17/84
4,442,788	06/429,653	4/17/84
4,442,795	06/448,028	4/17/84
4,442,796	06/456,586	4/17/84
4,442,797	06/462,016	4/17/84
4,442,805	06/403,745	4/17/84
4,442,807	06/403,902	4/17/84
4,442,810	06/409,249	4/17/84
4,442,824	06/492,463	4/17/84
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4,442,838	06/361,606	4/17/84
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4,442,847	06/362,832	4/17/84
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4,442,883	06/366,529	4/17/84
4,442,884	06/416,967	4/17/84
4,442,897	06/377,657	4/17/84
4,442,907	06/408,113	4/17/84
4,442,915	06/249,636	4/17/84
4,442,918	06/504,584	4/17/84
4,442,921	06/236,838	4/17/84
4,442,922	06/277,749	4/17/84
4,442,923	06/283,618	4/17/84
4,442,928	06/307,737	4/17/84
4,442,930	06/273,760	4/17/84
4,442,931	06/273,908	4/17/84
4,442,935	06/281,525	4/17/84
4,442,937	06/428,137	4/17/84
4,442,941	06/338,257	4/17/84
4,442,945	06/399,237	4/17/84
4,442,952	06/335,305	4/17/84
4,442,953	06/298,878	4/17/84
4,442,959	06/259,158	4/17/84
4,442,960	06/313,637	4/17/84
4,442,963	06/369,853	4/17/84
4,442,965	06/255,837	4/17/84
4,442,966	06/311,211	4/17/84
4,442,970	06/375,776	4/17/84
4,442,975	06/356,956	4/17/84
4,442,979	06/304,166	4/17/84
4,442,984	06/359,805	4/17/84
4,442,986	06/413,182	4/17/84
4,442,988	06/322,016	4/17/84
4,442,993	06/343,600	4/17/84
4,442,997	06/324,087	4/17/84
4,443,003	06/419,339	4/17/84
4,443,006	06/301,188	4/17/84

4,443,009	06/308,594	4/17/84
4,443,012	06/239,842	4/17/84
4,443,013	06/401,260	4/17/84
4,443,014	06/287,365	4/17/84
4,443,017	06/426,394	4/17/84
4,443,018	06/385,004	4/17/84
4,443,022	06/303,902	4/17/84
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4,443,026	06/335,445	4/17/84
4,443,027	06/287,980	4/17/84
4,443,028	06/292,430	4/17/84
4,443,032	06/353,590	4/17/84
4,443,034	06/293,144	4/17/84
4,443,035	06/323,327	4/17/84
4,443,036	06/281,566	4/17/84
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4,443,053	06/405,550	4/17/84
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4,443,061	06/244,951	4/17/84
4,443,077	06/258,946	4/17/84
4,443,096	06/264,410	4/17/84
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4,443,103	06/481,041	4/17/84
4,443,110	06/340,326	4/17/84
4,443,111	06/388,268	4/17/84
4,443,112	06/427,055	4/17/84
4,443,119	06/375,141	4/17/84
4,443,127	06/316,275	4/17/84
4,443,128	06/282,171	4/17/84
4,443,133	06/325,280	4/17/84
4,443,134	06/274,714	4/17/84
4,443,135	06/335,827	4/17/84
4,443,146	06/454,882	4/17/84
4,443,154	06/295,735	4/17/84
4,443,161	06/378,746	4/17/84
4,443,168	06/296,183	4/17/84
4,443,172	06/324,922	4/17/84
4,443,173	06/477,055	4/17/84
4,443,175	06/439,420	4/17/84
4,443,176	06/302,795	4/17/84
4,443,177	06/456,066	4/17/84
4,443,186	06/368,198	4/17/84
4,443,188	06/366,089	4/17/84
4,443,192	06/381,542	4/17/84
4,443,194	06/392,853	4/17/84
4,443,199	06/379,473	4/17/84
4,443,201	06/368,474	4/17/84
4,443,204	06/337,390	4/17/84
4,443,205	06/280,462	4/17/84
4,443,207	06/281,665	4/17/84
4,443,210	06/268,886	4/17/84
4,443,216	06/366,923	4/17/84
4,443,219	06/242,272	4/17/84
4,443,225	06/444,024	4/17/84
4,443,235	06/432,351	4/17/84
4,443,237	06/443,389	4/17/84
4,443,246	06/385,857	4/17/84
4,443,256	06/413,299	4/17/84
4,443,261	06/416,024	4/17/84
4,443,265	06/418,844	4/17/84
4,443,273	06/332,700	4/17/84
4,443,275	06/431,874	4/17/84
4,443,277	06/422,021	4/17/84
4,443,279	06/293,051	4/17/84
4,443,280	06/307,056	4/17/84
4,443,281	06/232,326	4/17/84
4,443,313	06/391,404	4/17/84
4,443,314	06/475,951	4/17/84
4,443,316	06/318,457	4/17/84
4,443,321	06/322,312	4/17/84
4,443,327	06/460,218	4/17/84
4,443,332	06/400,913	4/17/84
4,443,336	06/432,682	4/17/84
4,443,339	06/299,294	4/17/84
4,443,344	06/486,348	4/17/84
4,443,345	06/393,037	4/17/84
4,443,346	06/412,857	4/17/84
4,443,347	06/494,548	4/17/84

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4,443,372	06/391,798	4/17/84
4,443,377	06/419,843	4/17/84
4,443,384	06/432,471	4/17/84
4,443,385	06/421,370	4/17/84
4,443,389	06/281,151	4/17/84
4,443,392	06/317,845	4/17/84
4,443,394	06/527,641	4/17/84
4,443,401	06/331,738	4/17/84
4,443,403	06/272,430	4/17/84
4,443,413	06/528,279	4/17/84
4,443,415	06/391,027	4/17/84
4,443,431	06/267,538	4/17/84
4,443,435	06/320,264	4/17/84
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4,443,444	06/289,503	4/17/84
4,443,455	06/224,669	4/17/84
4,443,456	06/262,808	4/17/84
4,443,457	06/399,612	4/17/84
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4,443,461	06/416,773	4/17/84
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4,443,467	06/262,148	4/17/84
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4,443,478	06/392,676	4/17/84
4,443,479	06/466,141	4/17/84
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4,443,484	06/483,801	4/17/84
4,443,498	06/460,964	4/17/84
4,443,506	06/450,578	4/17/84
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4,443,539	06/271,449	4/17/84
4,443,540	06/420,196	4/17/84
4,443,541	06/384,831	4/17/84
4,443,542	06/354,730	4/17/84
4,443,546	06/344,508	4/17/84
4,443,552	06/408,441	4/17/84
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4,443,568	06/314,520	4/17/84
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4,443,581	06/296,870	4/17/84
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4,443,784	06/379,376	4/17/84
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4,443,802	06/256,424	4/17/84
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4,443,816	06/372,578	4/17/84
4,443,818	06/329,609	4/17/84
4,443,822	06/345,182	4/17/84
4,443,824	06/301,499	4/17/84
4,443,825	06/335,914	4/17/84
4,443,827	06/388,540	4/17/84
4,443,834	06/357,703	4/17/84
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4,443,837	06/427,978	4/17/84
4,443,848	06/260,141	4/17/84
4,443,851	06/403,037	4/17/84
4,443,854	06/271,580	4/17/84
4,443,862	06/256,723	4/17/84
4,443,872	06/374,462	4/17/84
4,443,875	06/350,505	4/17/84
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4,443,886	06/318,436	4/17/84
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4,443,946	06/277,637	4/24/84
4,443,953	06/381,936	4/24/84
4,443,954	06/421,235	4/24/84
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4,444,030	06/389,094	4/24/84
4,444,031	06/292,667	4/24/84
4,444,039	06/371,921	4/24/84
4,444,046	06/351,807	4/24/84
4,444,049	06/455,418	4/24/84
4,444,054	06/412,959	4/24/84
4,444,055	06/285,385	4/24/84

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			4,445,078	06/525,422	4/24/84

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4,444,058	06/382,997	4/24/84
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4,444,081	06/384,856	4/24/84
4,444,085	06/342,543	4/24/84
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4,444,092	06/364,700	4/24/84
4,444,106	06/355,537	4/24/84
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4,444,117	06/248,674	4/24/84
4,444,121	06/313,945	4/24/84
4,444,123	06/329,206	4/24/84
4,444,126	06/382,927	4/24/84
4,444,127	06/400,990	4/24/84
4,444,145	06/329,803	4/24/84
4,444,146	06/339,196	4/24/84
4,444,147	06/323,099	4/24/84
4,444,148	06/295,740	4/24/84
4,444,153	06/293,475	4/24/84
4,444,156	06/448,276	4/24/84
4,444,159	06/393,483	4/24/84
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4,444,205	06/267,471	4/24/84
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4,444,226	06/330,965	4/24/84
4,444,227	06/320,011	4/24/84
4,444,228	06/398,973	4/24/84
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4,444,240	06/398,768	4/24/84
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4,444,249	06/294,566	4/24/84
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4,444,259	06/339,682	4/24/84
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4,444,261	06/430,181	4/24/84
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4,444,303	06/310,083	4/24/84
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4,444,307	06/436,505	4/24/84
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4,444,391	06/377,814	4/24/84
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4,444,433	06/365,303	4/24/84
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4,445,421	06/318,690	5/01/84
4,445,423	06/249,710	5/01/84
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4,447,926	06/356,985	5/15/84
4,447,930	06/453,363	5/15/84
4,447,931	06/447,165	5/15/84
4,447,935	06/352,320	5/15/84
4,447,943	06/465,363	5/15/84
4,447,944	06/389,138	5/15/84
4,447,947	06/465,214	5/15/84
4,447,948	06/364,567	5/15/84
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4,447,981	06/388,887	5/15/84
4,447,982	06/401,669	5/15/84
4,447,983	06/455,204	5/15/84
4,447,985	06/388,752	5/15/84
4,447,987	06/245,497	5/15/84
4,447,988	06/470,064	5/15/84
4,447,990	06/294,297	5/15/84
4,447,994	06/266,662	5/15/84
4,447,996	06/271,802	5/15/84
4,447,997	06/394,611	5/15/84
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4,448,016	06/434,915	5/15/84
4,448,017	06/371,724	5/15/84
4,448,029	06/384,083	5/15/84
4,448,030	06/326,532	5/15/84
4,448,031	06/456,463	5/15/84
4,448,047	06/404,992	5/15/84
4,448,048	06/335,396	5/15/84
4,448,049	06/394,498	5/15/84
4,448,057	06/380,840	5/15/84
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4,448,065	06/395,682	5/15/84
4,448,066	06/399,439	5/15/84

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4,448,114	06/478,219	5/15/84
4,448,117	06/516,868	5/15/84
4,448,120	06/492,154	5/15/84
4,448,126	06/476,759	5/15/84
4,448,133	06/248,946	5/15/84
4,448,140	06/432,810	5/15/84
4,448,145	06/449,050	5/15/84
4,448,146	06/349,082	5/15/84
4,448,148	06/378,876	5/15/84
4,448,154	06/296,028	5/15/84
4,448,155	06/388,450	5/15/84
4,448,156	06/316,278	5/15/84
4,448,157	06/356,770	5/15/84
4,448,160	06/358,011	5/15/84
4,448,167	06/403,197	5/15/84
4,448,174	06/467,787	5/15/84
4,448,175	06/460,372	5/15/84
4,448,179	06/415,340	5/15/84
4,448,195	06/261,810	5/15/84
4,448,204	06/423,205	5/15/84
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4,448,217	06/424,363	5/15/84
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4,448,230	06/359,569	5/15/84
4,448,232	06/374,178	5/15/84
4,448,234	06/405,415	5/15/84
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4,449,350	06/416,400	5/22/84
4,449,351	06/276,100	5/22/84
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4,451,314	06/446,688	5/29/84
4,451,316	06/435,887	5/29/84
4,451,320	06/338,427	5/29/84
4,451,321	06/466,970	5/29/84
4,451,327	06/497,887	5/29/84
4,451,331	06/322,232	5/29/84
4,451,336	06/443,011	5/29/84
4,451,341	06/454,499	5/29/84
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4,451,351	06/369,773	5/29/84
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4,451,361	06/355,164	5/29/84
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4,451,395	06/440,113	5/29/84
4,451,400	06/375,889	5/29/84
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4,451,407	06/332,059	5/29/84
4,451,413	06/328,134	5/29/84
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4,451,416	06/291,591	5/29/84
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4,451,423	06/422,402	5/29/84
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4,451,658	06/448,314	5/29/84
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4,452,032	06/413,114	6/05/84
4,452,040	06/321,332	6/05/84
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4,452,046	06/281,503	6/05/84
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4,453,094	06/393,696	6/05/84
4,453,097	06/413,935	6/05/84
4,453,098	06/403,637	6/05/84
4,453,114	06/454,587	6/05/84
4,453,116	06/539,216	6/05/84
4,453,118	06/440,156	6/05/84
4,453,120	06/492,893	6/05/84
4,453,122	06/312,665	6/05/84
4,453,123	06/315,305	6/05/84
4,453,131	06/429,793	6/05/84
4,453,137	06/345,993	6/05/84
4,453,150	06/262,878	6/05/84
4,453,158	06/343,811	6/05/84
4,453,163	06/383,384	6/05/84
4,453,182	06/313,245	6/05/84
4,453,190	06/371,195	6/05/84
4,453,192	06/238,512	6/05/84
4,453,195	06/305,891	6/05/84
4,453,202	06/455,750	6/05/84
4,453,207	06/363,794	6/05/84
4,453,208	06/355,817	6/05/84
4,453,213	06/288,504	6/05/84
4,453,227	06/258,010	6/05/84
4,453,235	06/429,995	6/05/84
4,453,238	06/368,793	6/05/84
4,453,243	06/377,131	6/05/84
4,453,245	06/287,822	6/05/84
4,453,252	06/368,471	6/05/84
4,453,263	06/335,591	6/05/84

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4,454,228	06/426,482	6/12/84

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4,453,286	06/487,374	6/12/84
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4,453,293	06/312,634	6/12/84
4,453,299	06/388,103	6/12/84
4,453,304	06/381,538	6/12/84
4,453,305	06/397,343	6/12/84
4,453,306	06/498,897	6/12/84
4,453,308	06/379,332	6/12/84
4,453,310	06/362,809	6/12/84
4,453,312	06/402,238	6/12/84
4,453,313	06/265,424	6/12/84
4,453,314	06/363,277	6/12/84
4,453,319	06/297,212	6/12/84
4,453,324	06/459,686	6/12/84
4,453,328	06/453,782	6/12/84
4,453,332	06/361,599	6/12/84
4,453,335	06/366,377	6/12/84
4,453,336	06/384,013	6/12/84
4,453,337	06/407,657	6/12/84
4,453,343	06/483,191	6/12/84
4,453,345	06/286,176	6/12/84
4,453,348	06/417,028	6/12/84
4,453,349	06/236,188	6/12/84
4,453,350	06/384,969	6/12/84
4,453,351	06/302,413	6/12/84
4,453,353	06/301,545	6/12/84
4,453,361	06/369,353	6/12/84
4,453,363	06/348,332	6/12/84
4,453,365	06/335,529	6/12/84
4,453,369	06/402,534	6/12/84
4,453,370	06/301,762	6/12/84
4,453,373	06/357,020	6/12/84
4,453,376	06/453,629	6/12/84
4,453,379	06/460,563	6/12/84
4,453,380	06/407,389	6/12/84
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4,453,388	06/419,945	6/12/84
4,453,397	06/354,794	6/12/84
4,453,401	06/357,439	6/12/84
4,453,404	06/443,351	6/12/84
4,453,407	06/255,105	6/12/84
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4,453,546	06/423,575	6/12/84
4,453,552	06/276,049	6/12/84
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4,453,573	06/359,086	6/12/84
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4,453,617	06/366,940	6/12/84
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4,453,809	06/290,349	6/12/84
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4,453,887	06/327,924	6/12/84
4,453,892	06/280,793	6/12/84
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4,453,908	06/487,261	6/12/84
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4,453,914	06/449,921	6/12/84

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4,453,915	06/411,497	6/12/84
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4,453,918	06/422,477	6/12/84
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4,453,956	06/390,686	6/12/84
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4,454,376	06/448,974	6/12/84
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4,454,398	06/244,423	6/12/84
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4,454,583	06/279,208	6/12/84
4,454,585	06/267,939	6/12/84
4,454,588	06/302,874	6/12/84
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4,454,602	06/362,086	6/12/84
4,454,603	06/343,013	6/12/84
4,454,607	06/298,008	6/12/84
Re. 322,289	06/745,773	11/18/86
(4,455,255)	(06/371,865)	(6/19/84)
Re. 32,337	06/730,133	1/27/87
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4,454,788	06/329,336	6/19/84
4,454,791	06/377,065	6/19/84
4,454,793	06/368,991	6/19/84
4,454,798	06/352,448	6/19/84
4,454,799	06/382,038	6/19/84
4,454,804	06/274,973	6/19/84
4,454,806	06/433,793	6/19/84
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4,454,814	06/396,027	6/19/84
4,454,823	06/309,705	6/19/84
4,454,824	06/349,332	6/19/84
4,454,827	06/356,973	6/19/84
4,454,830	06/316,007	6/19/84
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4,454,835	06/417,272	6/19/84
4,454,838	06/447,920	6/19/84
4,454,840	06/502,906	6/19/84
4,454,841	06/260,594	6/19/84
4,454,844	06/355,841	6/19/84
4,454,845	06/315,611	6/19/84
4,454,848	06/411,257	6/19/84
4,454,856	06/432,892	6/19/84
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4,454,908	06/351,658	6/19/84
4,454,909	06/231,480	6/19/84
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4,455,126	06/368,152	6/19/84
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4,455,133	06/383,987	6/19/84
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4,455,138	06/431,687	6/19/84
4,455,141	06/386,241	6/19/84
4,455,161	06/417,528	6/19/84
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4,455,198	06/444,925	6/19/84
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Re. 32,443	06/868,957	6/23/87
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Re. 32,483	06/832,115	8/25/87
(4,456,472)	(06/449,959)	(6/26/84)
Re. 32,787	06/834,982	11/22/88
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4,455,688	06/290,365	6/26/84
4,455,692	06/493,094	6/26/84
4,455,694	06/399,742	6/26/84

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4,456,404	06/349,459	6/26/84
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4,458,131	06/390,240	7/03/84
4,458,148	06/276,087	7/03/84
4,458,152	06/376,299	7/03/84
4,458,156	06/333,468	7/03/84
4,458,157	06/331,754	7/03/84
4,458,165	06/478,606	7/03/84
4,458,173	06/463,963	7/03/84
4,458,178	06/426,570	7/03/84
4,458,179	06/362,117	7/03/84
4,458,181	06/290,549	7/03/84
4,458,182	06/399,239	7/03/84
4,458,183	06/434,616	7/03/84
4,458,186	06/449,663	7/03/84
4,458,193	06/287,759	7/03/84
4,458,197	06/299,920	7/03/84
4,458,199	06/345,669	7/03/84
4,458,202	06/303,187	7/03/84
4,458,207	06/302,783	7/03/84

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4,459,204	06/535,147	7/10/84

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4,458,215	06/293,153	7/03/84
4,458,219	06/353,116	7/03/84
4,458,220	06/284,187	7/03/84
4,458,222	06/261,145	7/03/84
4,458,223	06/535,535	7/03/84
4,458,229	06/331,899	7/03/84
4,458,233	06/475,972	7/03/84
4,458,236	06/367,848	7/03/84
4,458,240	06/297,677	7/03/84
4,458,249	06/350,796	7/03/84
4,458,250	06/271,056	7/03/84
4,458,257	06/447,742	7/03/84
4,458,260	06/323,200	7/03/84
4,458,267	06/309,051	7/03/84
4,458,271	06/312,293	7/03/84
4,458,274	06/391,058	7/03/84
4,458,275	06/242,136	7/03/84
4,458,280	06/339,940	7/03/84
4,458,284	06/374,411	7/03/84
4,458,298	06/438,689	7/03/84
4,458,300	06/378,543	7/03/84
4,458,304	06/461,677	7/03/84
4,458,306	06/366,641	7/03/84
4,458,309	06/307,569	7/03/84
4,458,315	06/362,291	7/03/84
4,458,321	06/294,349	7/03/84
4,458,327	06/219,321	7/03/84
4,458,332	06/313,693	7/03/84
4,458,333	06/382,584	7/03/84
4,458,340	06/367,135	7/03/84
4,458,345	06/364,160	7/03/84
4,458,347	06/416,036	7/03/84
4,458,353	06/435,044	7/03/84
4,458,354	06/385,290	7/03/84
4,458,357	06/293,503	7/03/84
4,458,363	06/389,946	7/10/84
4,458,364	06/396,619	7/10/84
4,458,369	06/443,509	7/10/84
4,458,376	06/414,781	7/10/84
4,458,377	06/320,593	7/10/84
4,458,382	06/427,704	7/10/84
4,458,388	06/495,651	7/10/84
4,458,389	06/372,092	7/10/84
4,458,392	06/316,295	7/10/84
4,458,398	06/393,964	7/10/84
4,458,400	06/253,413	7/10/84
4,458,403	06/521,215	7/10/84
4,458,411	06/382,277	7/10/84
4,458,413	06/420,071	7/10/84
4,458,416	06/390,544	7/10/84
4,458,418	06/309,292	7/10/84
4,458,428	06/373,459	7/10/84
4,458,429	06/364,860	7/10/84
4,458,436	06/360,820	7/10/84
4,458,444	06/425,105	7/10/84
4,458,453	06/334,739	7/10/84
4,458,457	06/327,071	7/10/84
4,458,459	06/405,289	7/10/84
4,458,461	06/402,326	7/10/84
4,458,463	06/402,789	7/10/84
4,458,466	06/297,966	7/10/84
4,458,468	06/401,664	7/10/84
4,458,472	06/382,025	7/10/84
4,458,473	06/363,504	7/10/84
4,458,474	06/422,734	7/10/84
4,458,484	06/365,106	7/10/84
4,458,487	06/361,928	7/10/84
4,458,499	06/388,874	7/10/84
4,458,500	06/388,875	7/10/84
4,458,501	06/403,050	7/10/84
4,458,507	06/307,422	7/10/84
4,458,510	06/400,433	7/10/84
4,458,512	06/355,929	7/10/84
4,458,514	06/471,445	7/10/84
4,458,518	06/394,367	7/10/84
4,458,519	06/355,483	7/10/84
4,458,520	06/454,815	7/10/84
4,458,521	06/364,762	7/10/84
4,458,528	06/454,782	7/10/84
4,458,532	06/368,767	7/10/84
4,458,536	06/395,266	7/10/84
4,458,538	06/456,930	7/10/84
4,458,544	06/356,585	7/10/84
4,458,545	06/337,337	7/10/84
4,458,547	06/322,258	7/10/84
4,458,551	06/263,539	7/10/84
4,458,552	06/327,345	7/10/84
4,458,555	06/387,321	7/10/84
4,458,559	06/430,440	7/10/84
4,458,563	06/344,602	7/10/84
4,458,566	06/296,273	7/10/84
4,458,567	06/376,029	7/10/84
4,458,569	06/239,490	7/10/84
4,458,578	06/344,073	7/10/84
4,458,580	06/359,410	7/10/84
4,458,582	06/434,777	7/10/84
4,458,594	06/334,216	7/10/84
4,458,597	06/354,490	7/10/84
4,458,606	06/364,378	7/10/84
4,458,608	06/252,466	7/10/84
4,458,622	06/354,062	7/10/84
4,458,634	06/465,769	7/10/84
4,458,635	06/422,427	7/10/84
4,458,636	06/334,537	7/10/84
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4,458,653	06/268,712	7/10/84
4,458,656	06/439,924	7/10/84
4,458,661	06/449,189	7/10/84
4,458,670	06/265,483	7/10/84
4,458,680	06/383,048	7/10/84
4,458,694	06/286,353	7/10/84
4,458,702	06/385,808	7/10/84
4,458,703	06/396,031	7/10/84
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4,458,749	06/485,998	7/10/84
4,458,750	06/369,522	7/10/84
4,458,754	06/403,883	7/10/84
4,458,758	06/355,433	7/10/84
4,458,759	06/373,164	7/10/84
4,458,760	06/484,088	7/10/84
4,458,761	06/416,273	7/10/84
4,458,763	06/311,265	7/10/84
4,458,765	06/377,684	7/10/84
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4,458,780	06/297,282	7/10/84
4,458,785	06/436,304	7/10/84
4,458,786	06/458,083	7/10/84
4,458,790	06/341,111	7/10/84
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4,458,793	06/324,523	7/10/84
4,458,798	06/327,007	7/10/84
4,458,803	06/356,612	7/10/84
4,458,805	06/356,062	7/10/84
4,458,806	06/319,161	7/10/84
4,458,810	06/476,501	7/10/84
4,458,815	06/355,319	7/10/84
4,588,828	06/299,669	7/10/84
4,458,834	06/424,077	7/10/84
4,458,838	06/461,142	7/10/84
4,458,841	06/441,286	7/10/84
4,458,846	06/320,789	7/10/84
4,458,847	06/337,362	7/10/84

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4,458,859	06/486,889	7/10/84
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4,458,872	06/350,343	7/10/84
4,458,893	06/423,168	7/10/84
4,458,895	06/441,487	7/10/84
4,458,896	06/411,853	7/10/84
4,458,899	06/404,126	7/10/84
4,458,903	06/453,556	7/10/84
4,458,907	06/404,207	7/10/84
4,458,911	06/352,233	7/10/84
4,458,914	06/443,323	7/10/84
4,458,915	06/403,736	7/10/84
4,458,917	06/344,824	7/10/84
4,458,918	06/334,294	7/10/84
4,458,919	06/337,135	7/10/84
4,458,920	06/319,998	7/10/84
4,458,923	06/275,349	7/10/84
4,458,927	06/275,165	7/10/84
4,458,930	06/382,373	7/10/84
4,458,932	06/372,032	7/10/84
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4,458,963	06/412,344	7/10/84
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4,458,967	06/339,411	7/10/84
4,458,976	06/434,214	7/10/84
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4,458,989	06/389,123	7/10/84
4,458,993	06/308,429	7/10/84
4,459,000	06/432,024	7/10/84
4,459,007	06/386,022	7/10/84
4,459,018	06/376,841	7/10/84
4,459,035	06/448,711	7/10/84
4,459,039	06/512,571	7/10/84
4,459,045	06/229,745	7/10/84
4,459,047	06/493,449	7/10/84
4,459,050	06/370,331	7/10/84
4,459,058	06/479,438	7/10/84
4,459,059	06/365,112	7/10/84
4,459,082	06/307,145	7/10/84
4,459,086	06/411,227	7/10/84
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4,459,102	06/365,680	7/10/84
4,459,105	06/312,696	7/10/84
4,459,112	06/414,415	7/10/84
4,459,114	06/436,280	7/10/84
4,459,119	06/237,542	7/10/84
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4,459,126	06/381,743	7/10/84
4,459,131	06/422,168	7/10/84
4,459,133	06/360,411	7/10/84
4,459,135	06/419,867	7/10/84
4,459,138	06/447,350	7/10/84
4,459,140	06/440,206	7/10/84
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4,459,151	06/408,082	7/10/84
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4,459,165	06/503,330	7/10/84
4,459,167	06/560,522	7/10/84
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4,459,203	06/335,295	7/10/84
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4,459,211	06/376,466	7/10/84
4,459,212	06/376,467	7/10/84
4,459,213	06/454,594	7/10/84
4,459,219	06/275,727	7/10/84
4,459,222	06/377,112	7/10/84
4,459,228	06/309,175	7/10/84
4,459,232	06/417,746	7/10/84
4,459,242	06/422,394	7/10/84
4,459,243	06/407,115	7/10/84
4,459,245	06/340,624	7/10/84
4,459,253	06/413,210	7/10/84
4,459,263	06/415,809	7/10/84
4,459,266	06/337,259	7/10/84
4,459,268	06/443,983	7/10/84
4,459,273	06/350,239	7/10/84
4,459,276	06/413,556	7/10/84
4,459,277	06/406,506	7/10/84
4,459,278	06/440,001	7/10/84
4,459,286	06/462,594	7/10/84
4,459,287	06/389,456	7/10/84
4,459,290	06/399,657	7/10/84
4,459,291	06/400,537	7/10/84
4,459,294	06/426,881	7/10/84
4,459,295	06/387,409	7/10/84
4,459,296	06/370,064	7/10/84
4,459,297	06/456,116	7/10/84
4,459,306	06/251,052	7/10/84
4,459,308	06/287,030	7/10/84
4,459,319	06/513,349	7/10/84
4,459,320	06/449,481	7/10/84
4,459,323	06/254,265	7/10/84
4,459,326	06/379,652	7/10/84
4,459,329	06/442,406	7/10/84
4,459,330	06/420,054	7/10/84
4,459,338	06/360,116	7/10/84
4,459,341	06/463,204	7/10/84
4,459,343	06/451,336	7/10/84
4,459,344	06/283,437	7/10/84
4,459,346	06/478,936	7/10/84
4,459,354	06/432,173	7/10/84
4,459,357	06/393,479	7/10/84
4,459,361	06/385,052	7/10/84
4,459,363	06/523,556	7/10/84
4,459,364	06/417,258	7/10/84
4,459,366	06/429,736	7/10/84
4,459,368	06/464,519	7/10/84
4,459,371	06/548,524	7/10/84
4,459,372	06/411,205	7/10/84
4,459,386	06/449,712	7/10/84
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4,459,391	06/540,256	7/10/84
4,459,392	06/540,257	7/10/84
4,459,398	06/498,933	7/10/84
4,459,405	06/442,076	7/10/84
4,459,410	06/308,655	7/10/84
4,459,416	06/411,570	7/10/84
4,459,419	06/414,477	7/10/84
4,459,421	06/406,801	7/10/84
4,459,422	06/387,065	7/10/84
4,459,423	06/355,142	7/10/84
4,459,430	06/397,736	7/10/84
4,459,435	06/341,480	7/10/84
4,459,440	06/477,128	7/10/84
4,459,441	06/359,265	7/10/84
4,459,449	06/343,317	7/10/84
4,459,451	06/322,805	7/10/84
4,459,461	06/425,996	7/10/84
4,459,470	06/342,871	7/10/84
4,459,471	06/314,747	7/10/84
4,459,476	06/340,604	7/10/84
4,459,478	06/308,944	7/10/84
4,459,480	06/327,335	7/10/84
4,459,482	06/375,496	7/10/84
4,459,493	06/450,834	7/10/84
4,459,498	06/227,891	7/10/84
4,459,499	06/423,466	7/10/84
4,459,503	06/340,380	7/10/84

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4,459,509	06/337,695	7/10/84
4,459,510	06/529,655	7/10/84
4,459,531	06/394,985	7/10/84
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4,459,547	06/259,786	7/10/84
4,459,552	06/377,601	7/10/84
4,459,553	06/347,837	7/10/84
4,459,557	06/345,653	7/10/84
4,459,559	06/326,141	7/10/84
4,459,562	06/434,084	7/10/84
4,459,564	06/326,148	7/10/84
4,459,567	06/337,987	7/10/84
4,459,573	06/376,185	7/10/84
4,459,577	06/482,239	7/10/84
4,459,579	06/322,846	7/10/84
4,459,587	06/321,720	7/10/84
4,459,597	06/319,472	7/10/84
4,459,605	06/371,598	7/10/84
4,459,608	06/364,886	7/10/84
4,459,613	06/421,828	7/10/84
4,459,616	06/274,891	7/10/84
4,459,617	06/532,328	7/10/84
4,459,630	06/412,404	7/10/84
4,459,636	06/384,481	7/10/84
4,459,641	06/341,404	7/10/84
4,459,643	06/465,290	7/10/84
4,459,645	06/325,657	7/10/84
4,459,650	06/456,092	7/10/84
4,459,651	06/394,090	7/10/84
4,459,654	06/402,842	7/10/84
4,459,667	06/356,759	7/10/84
4,459,675	06/312,057	7/10/84
4,459,682	06/330,495	7/10/84
4,459,686	06/310,296	7/10/84
4,459,691	06/313,712	7/10/84
4,459,697	06/343,291	7/10/84
4,459,702	06/406,655	7/10/84
Re. 33,125	06/884,765	12/05/89
(4,460,585)	(06/458,451)	(7/17/84)
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4,459,705	06/432,538	7/17/84
4,459,709	06/321,447	7/17/84
4,459,712	06/382,573	7/17/84
4,459,713	06/413,408	7/17/84
4,459,714	06/298,254	7/17/84
4,459,720	06/338,567	7/17/84
4,459,728	06/405,799	7/17/84
4,459,732	06/304,242	7/17/84
4,459,733	06/269,788	7/17/84
4,459,741	06/408,788	7/17/84
4,459,744	06/345,575	7/17/84
4,459,747	06/437,580	7/17/84
4,459,748	06/446,237	7/17/84
4,459,749	06/410,618	7/17/84
4,459,751	06/556,624	7/17/84
4,459,757	06/504,176	7/17/84
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4,459,761	06/457,052	7/17/84
4,459,764	06/484,664	7/17/84
4,459,769	06/406,273	7/17/84
4,459,770	06/397,360	7/17/84
4,459,774	06/359,904	7/17/84
4,459,779	06/418,948	7/17/84
4,459,780	06/337,858	7/17/84
4,459,781	06/248,856	7/17/84
4,459,782	06/418,988	7/17/84
4,459,783	06/404,701	7/17/84
4,459,789	06/380,023	7/17/84
4,459,790	06/520,428	7/17/84
4,459,794	06/269,376	7/17/84
4,459,798	06/397,304	7/17/84
4,459,802	06/309,239	7/17/84
4,459,807	06/346,327	7/17/84
4,459,814	06/317,192	7/17/84
4,459,818	06/498,376	7/17/84
4,459,822	06/342,141	7/17/84
4,459,825	06/402,840	7/17/84

4,459,836	06/341,382	7/17/84
4,459,838	06/359,357	7/17/84
4,459,848	06/347,990	7/17/84
4,459,860	06/447,509	7/17/84
4,459,861	06/364,531	7/17/84
4,459,875	06/269,802	7/17/84
4,459,880	06/414,864	7/17/84
4,459,883	06/345,744	7/17/84
4,459,887	06/432,648	7/17/84
4,459,890	06/439,528	7/17/84
4,459,891	06/421,923	7/17/84
4,459,904	06/460,362	7/17/84
4,459,908	06/533,804	7/17/84
4,459,910	06/429,664	7/17/84
4,459,911	06/460,920	7/17/84
4,459,918	06/233,717	7/17/84
4,459,920	06/289,218	7/17/84
4,459,921	06/316,847	7/17/84
4,459,935	06/344,236	7/17/84
4,459,936	06/373,650	7/17/84
4,459,946	06/378,843	7/17/84
4,459,947	06/405,387	7/17/84
4,459,948	06/313,319	7/17/84
4,459,955	06/482,895	7/17/84
4,459,956	06/409,407	7/17/84
4,459,958	06/406,790	7/17/84
4,459,962	06/494,359	7/17/84
4,459,965	06/492,192	7/17/84
4,459,968	06/499,015	7/17/84
4,459,974	06/463,509	7/17/84
4,459,975	06/317,831	7/17/84
4,459,976	06/438,767	7/17/84
4,459,980	06/389,690	7/17/84
4,459,981	06/380,217	7/17/84
4,459,991	06/235,564	7/17/84
4,460,002	06/332,001	7/17/84
4,460,005	06/250,030	7/17/84
4,460,006	06/340,605	7/17/84
4,460,007	06/460,927	7/17/84
4,460,019	06/467,520	7/17/84
4,460,021	06/482,244	7/17/84
4,460,022	06/383,029	7/17/84
4,460,026	06/348,847	7/17/84
4,460,033	06/280,550	7/17/84
4,460,040	06/444,408	7/17/84
4,460,041	06/417,012	7/17/84
4,460,048	06/258,208	7/17/84
4,460,051	06/479,670	7/17/84
4,460,056	06/316,319	7/17/84
4,460,058	06/371,004	7/17/84
4,460,063	06/367,571	7/17/84
4,460,064	06/384,549	7/17/84
4,460,068	06/435,811	7/17/84
4,460,070	06/461,839	7/17/84
4,460,075	06/381,585	7/17/84
4,460,077	06/300,596	7/17/84
4,460,085	06/411,643	7/17/84
4,460,090	06/397,252	7/17/84
4,460,091	06/413,972	7/17/84
4,460,093	06/426,479	7/17/84
4,460,097	06/224,942	7/17/84
4,460,111	06/406,412	7/17/84
4,460,112	06/315,093	7/17/84
4,460,115	06/563,465	7/17/84
4,460,121	06/417,335	7/17/84
4,460,128	06/392,679	7/17/84
4,460,133	06/396,327	7/17/84
4,460,140	06/430,283	7/17/84
4,460,141	06/309,057	7/17/84
4,460,146	06/413,431	7/17/84
4,460,147	06/222,617	7/17/84
4,460,157	06/334,871	7/17/84
4,460,159	06/309,976	7/17/84
4,460,164	06/467,901	7/17/84
4,460,165	06/506,111	7/17/84
4,460,174	06/525,159	7/17/84
4,460,176	06/353,878	7/17/84
4,460,177	06/491,354	7/17/84
4,460,179	06/430,252	7/17/84

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4,460,193	06/383,485	7/17/84
4,460,203	06/303,896	7/17/84
4,460,208	06/371,478	7/17/84
4,460,210	06/415,528	7/17/84
4,460,211	06/424,880	7/17/84
4,460,212	06/340,872	7/17/84
4,460,218	06/385,206	7/17/84
4,460,221	06/295,593	7/17/84
4,460,235	06/394,008	7/17/84
4,460,238	06/370,753	7/17/84
4,460,240	06/410,548	7/17/84
4,460,249	06/309,104	7/17/84
4,460,258	06/465,541	7/17/84
4,460,262	06/442,910	7/17/84
4,460,286	06/386,619	7/17/84
4,460,290	06/543,214	7/17/84
4,460,291	06/317,657	7/17/84
4,460,294	06/327,819	7/17/84
4,460,295	06/350,908	7/17/84
4,460,296	06/270,246	7/17/84
4,460,301	06/348,020	7/17/84
4,460,302	06/262,920	7/17/84
4,460,304	06/441,495	7/17/84
4,460,305	06/395,715	7/17/84
4,460,306	06/222,675	7/17/84
4,460,307	06/404,310	7/17/84
4,460,313	06/345,355	7/17/84
4,460,314	06/327,685	7/17/84
4,460,318	06/408,092	7/17/84
4,460,323	06/492,267	7/17/84
4,460,329	06/338,664	7/17/84
4,460,339	06/469,399	7/17/84
4,460,341	06/422,441	7/17/84
4,460,357	06/392,020	7/17/84
4,460,360	06/525,989	7/17/84
4,460,373	06/402,886	7/17/84
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4,460,382	06/331,377	7/17/84
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4,460,402	06/282,201	7/17/84
4,460,404	06/421,416	7/17/84
4,460,406	06/369,697	7/17/84
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4,460,422	06/405,792	7/17/84
4,460,431	06/442,713	7/17/84
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4,460,452	06/395,512	7/17/84
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4,460,469	06/314,233	7/17/84
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4,460,475	06/479,136	7/17/84
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4,460,496	06/448,488	7/17/84
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4,460,503	06/475,639	7/17/84
4,460,505	06/240,638	7/17/84
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4,460,510	06/376,749	7/17/84

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4,460,558	06/308,062	7/17/84
4,460,573	06/506,579	7/17/84
4,460,576	06/463,604	7/17/84
4,460,586	06/338,592	7/17/84
4,460,589	06/386,846	7/17/84
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4,460,660	06/452,116	7/17/84
4,460,661	06/419,549	7/17/84
4,460,667	06/433,665	7/17/84
4,460,668	06/454,975	7/17/84
4,460,673	06/382,475	7/17/84
4,460,674	06/336,861	7/17/84
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4,460,710	06/485,349	7/17/84
4,460,719	06/459,103	7/17/84
4,460,723	06/445,308	7/17/84
4,460,732	06/505,325	7/17/84
4,460,737	06/246,225	7/17/84
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4,460,814	06/425,118	7/17/84
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4,460,822	06/344,818	7/17/84
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4,460,829	06/379,140	7/17/84
4,460,834	06/527,264	7/17/84
4,460,838	06/405,748	7/17/84
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4,460,847	06/287,261	7/17/84
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4,460,864	06/476,172	7/17/84
4,460,866	06/284,827	7/17/84
4,460,867	06/309,490	7/17/84
4,460,869	06/351,494	7/17/84
4,460,876	06/352,067	7/17/84
4,460,881	06/429,141	7/17/84
4,460,882	06/453,772	7/17/84
4,460,884	06/392,046	7/17/84
4,460,889	06/401,663	7/17/84
4,460,892	06/314,332	7/17/84
4,460,893	06/346,934	7/17/84
4,460,914	06/258,112	7/17/84

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4,460,924	06/224,679	7/17/84
4,460,933	06/294,635	7/17/84
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4,460,951	06/394,060	7/17/84
4,460,955	06/452,139	7/17/84
4,460,965	06/232,223	7/17/84
4,460,966	06/325,345	7/17/84
4,460,968	06/312,056	7/17/84
4,460,983	06/470,527	7/17/84
4,460,987	06/370,883	7/17/84
4,460,991	06/379,957	7/17/84
4,460,995	06/370,313	7/17/84
4,461,004	06/315,081	7/17/84
4,461,009	06/302,346	7/17/84
4,461,012	06/340,285	7/17/84
4,461,013	06/447,019	7/17/84
4,461,016	06/452,574	7/17/84
4,461,019	06/304,425	7/17/84
4,461,022	06/460,892	7/17/84
4,461,026	06/285,234	7/17/84
4,461,029	06/319,206	7/17/84
4,461,030	06/429,832	7/17/84
4,461,040	06/456,158	7/17/84
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4,461,047	06/391,126	7/24/84
4,461,048	06/376,404	7/24/84
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4,461,054	06/328,585	7/24/84
4,461,055	06/393,681	7/24/84
4,461,058	06/377,273	7/24/84
4,461,059	06/362,222	7/24/84
4,461,061	06/372,670	7/24/84
4,461,062	06/406,045	7/24/84
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4,461,123	06/335,666	7/24/84
4,461,124	06/352,729	7/24/84
4,461,125	06/284,971	7/24/84
4,461,127	06/340,130	7/24/84
4,461,130	06/268,598	7/24/84
4,461,133	06/343,844	7/24/84
4,461,134	06/280,803	7/24/84
4,461,135	06/317,451	7/24/84
4,461,138	06/451,449	7/24/84
4,461,139	06/393,186	7/24/84
4,461,145	06/433,561	7/24/84
4,461,146	06/436,091	7/24/84
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4,461,156	06/324,405	7/24/84
4,461,157	06/345,293	7/24/84
4,461,161	06/335,537	7/24/84
4,461,163	06/436,272	7/24/84
4,461,167	06/308,747	7/24/84
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4,461,184	06/396,189	7/24/84
4,461,188	06/333,848	7/24/84
4,461,190	06/325,985	7/24/84
4,461,191	06/463,415	7/24/84
4,461,196	06/428,135	7/24/84
4,461,198	06/548,229	7/24/84
4,461,204	06/286,112	7/24/84
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4,461,216	06/425,450	7/24/84
4,461,218	06/290,314	7/24/84
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4,461,223	06/533,724	7/24/84
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4,461,263	06/442,578	7/24/84
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4,461,331	06/417,145	7/24/84
4,461,336	06/296,544	7/24/84
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4,461,362	06/427,427	7/24/84
4,461,363	06/401,680	7/24/84
4,461,368	06/368,749	7/24/84
4,461,370	06/512,747	7/24/84
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4,461,414	06/495,760	7/24/84
4,461,420	06/436,181	7/24/84
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4,461,470	06/505,876	7/24/84
4,461,474	06/495,044	7/24/84
4,461,476	06/247,239	7/24/84
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4,461,479	06/353,581	7/24/84
4,461,480	06/430,316	7/24/84
4,461,485	06/345,563	7/24/84
4,461,492	06/363,575	7/24/84
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4,461,501	06/261,016	7/24/84
4,461,503	06/418,249	7/24/84
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4,461,519	06/311,120	7/24/84
4,461,522	06/410,236	7/24/84
4,461,523	06/326,242	7/24/84
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4,461,541	06/362,015	7/24/84
4,461,546	06/391,574	7/24/84
4,461,548	06/254,144	7/24/84
4,461,553	06/389,807	7/24/84
4,461,557	06/421,054	7/24/84
4,461,561	06/403,807	7/24/84
4,461,566	06/448,765	7/24/84
4,461,567	06/426,111	7/24/84
4,461,569	06/337,621	7/24/84
4,461,570	06/386,488	7/24/84
4,461,573	06/378,494	7/24/84
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4,461,601	06/337,804	7/24/84
4,461,603	06/359,821	7/24/84
4,461,609	06/381,035	7/24/84
4,461,610	06/396,491	7/24/84
4,461,617	06/436,299	7/24/84
4,461,623	06/420,976	7/24/84
4,461,625	06/218,637	7/24/84
4,461,638	06/484,024	7/24/84
4,461,640	06/383,323	7/24/84
4,461,652	06/417,216	7/24/84
4,461,653	06/457,134	7/24/84
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4,462,126	06/449,549	7/31/84
4,462,127	06/373,744	7/31/84
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4,462,173	06/306,230	7/31/84
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4,463,241	06/393,225	7/31/84
4,463,245	06/391,009	7/31/84
4,463,250	06/380,713	7/31/84
4,463,253	06/504,851	7/31/84
4,463,256	06/434,444	7/31/84
4,463,259	06/357,652	7/31/84

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4,463,288	06/288,862	7/31/84
4,463,289	06/429,730	7/31/84
4,463,294	06/478,908	7/31/84
4,463,297	06/433,051	7/31/84
4,463,298	06/283,729	7/31/84
4,463,302	06/479,775	7/31/84
4,463,303	06/484,119	7/31/84
4,463,310	06/484,258	7/31/84
4,463,313	06/293,923	7/31/84
4,463,316	06/395,316	7/31/84
4,463,321	06/385,148	7/31/84
4,463,334	06/400,824	7/31/84
4,463,335	06/377,397	7/31/84
4,463,337	06/367,931	7/31/84
4,463,340	06/303,552	7/31/84
4,463,346	06/349,002	7/31/84
4,463,358	06/319,537	7/31/84
4,463,365	06/383,675	7/31/84
4,463,368	06/323,199	7/31/84
4,463,369	06/273,325	7/31/84
4,463,404	06/362,247	7/31/84
4,463,405	06/285,906	7/31/84
4,463,406	06/389,192	7/31/84
4,463,409	06/478,124	7/31/84
4,463,411	06/292,927	7/31/84
4,463,413	06/527,208	7/31/84
4,463,414	06/416,855	7/31/84
4,463,415	06/406,310	7/31/84
4,463,428	06/314,616	7/31/84
4,463,433	06/310,419	7/31/84
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4,463,448	06/333,812	7/31/84
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4,463,453	06/333,546	7/31/84
Re. 32,592	06/893,578	2/9/88
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4,463,573	06/403,442	8/07/84
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4,463,771	06/338,514	8/07/84
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4,464,221	06/461,806	8/07/84
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4,646,345	06/452,164	8/07/84
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4,464,359	06/252,926	8/07/84
4,464,361	06/368,416	8/07/84
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4,464,374	06/286,064	8/07/84
4,464,387	06/405,739	8/07/84
4,464,388	06/478,031	8/07/84

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4,464,792	06/538,912	8/07/84
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4,464,797	06/226,248	8/14/84
4,464,798	06/498,321	8/14/84
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4,464,804	06/414,410	8/14/84
4,464,805	06/426,066	8/14/84
4,464,807	06/503,584	8/14/84
4,464,809	06/385,819	8/14/84
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4,466,379	06/409,851	8/21/84
4,466,381	06/508,411	8/21/84
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4,466,386	06/335,067	8/21/84
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4,466,390	06/416,346	8/21/84
4,466,399	06/411,461	8/21/84
4,466,403	06/451,286	8/21/84
4,466,404	06/464,783	8/21/84
4,466,407	06/416,590	8/21/84
4,466,408	06/474,087	8/21/84
4,466,414	06/395,341	8/21/84
4,466,415	06/535,638	8/21/84
4,466,417	06/342,758	8/21/84
4,466,418	06/401,561	8/21/84
4,466,422	06/471,889	8/21/84
4,466,426	06/485,956	8/21/84
4,466,436	06/333,674	8/21/84
4,446,437	06/396,129	8/21/84
4,466,439	06/346,497	8/21/84
4,466,445	06/418,657	8/21/84
4,466,454	06/443,894	8/21/84
4,466,455	06/442,704	8/21/84
4,466,458	06/415,948	8/21/84
4,466,469	06/273,849	8/21/84
4,466,472	06/268,158	8/21/84
4,466,474	06/392,113	8/21/84
4,466,486	06/483,786	8/21/84
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4,466,537	06/431,314	8/21/84
4,466,539	06/502,448	8/21/84
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4,466,708	06/423,735	8/21/84
4,466,717	06/290,550	8/21/84
4,466,731	06/388,810	8/21/84
4,466,739	06/352,744	8/21/84
4,466,742	06/352,710	8/21/84
4,466,743	06/446,642	8/21/84
4,466,747	06/434,021	8/21/84
4,466,750	06/387,441	8/21/84

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4,466,763	06/227,776	8/21/84
4,466,764	06/373,001	8/21/84
4,466,766	06/497,544	8/21/84
4,466,767	06/356,339	8/21/84
4,466,777	06/389,594	8/21/84
4,466,791	06/437,058	8/21/84
4,466,796	06/312,824	8/21/84
4,466,798	06/396,816	8/21/84
4,466,800	06/405,956	8/21/84
4,466,806	06/291,099	8/21/84
4,466,807	06/324,695	8/21/84
4,466,809	06/374,217	8/21/84
4,466,813	06/387,718	8/21/84
4,466,814	06/439,317	8/21/84
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4,466,823	06/552,957	8/21/84
4,466,828	06/551,499	8/21/84
4,466,838	06/498,033	8/21/84
4,466,839	06/419,594	8/21/84
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4,466,870	06/443,577	8/21/84
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4,466,925	06/364,952	8/21/84
4,466,927	06/504,636	8/21/84
4,466,931	06/405,226	8/21/84
4,466,940	06/406,612	8/21/84
4,466,942	06/425,050	8/21/84
4,466,948	06/508,272	8/21/84
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4,467,952	06/455,054	8/28/84
4,467,957	06/427,825	8/28/84
4,467,961	06/348,087	8/28/84
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4,468,023	06/420,021	8/28/84
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4,468,051	06/408,562	8/28/84

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4,468,097	06/421,421	8/28/84
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4,468,103	06/385,068	8/28/84
4,468,107	06/397,806	8/28/84
4,468,108	06/388,981	8/28/84
4,468,118	06/419,645	8/28/84
4,468,126	06/267,296	8/28/84
4,468,127	06/411,851	8/28/84
4,468,128	06/323,918	8/28/84
4,468,129	06/496,778	8/28/84
4,468,131	06/374,018	8/28/84
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4,468,134	06/387,069	8/28/84
4,468,143	06/480,545	8/28/84
4,468,145	06/493,627	8/28/84
4,468,147	06/421,026	8/28/84
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4,468,160	06/416,155	8/28/84
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4,469,397	06/426,890	9/04/84
4,469,399	06/335,903	9/04/84
4,469,405	06/414,309	9/04/84

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4,469,861	06/453,104	9/04/84
4,469,868	06/381,484	9/04/84
4,469,876	06/418,841	9/04/84
4,469,880	06/422,103	9/04/84
4,469,884	06/484,886	9/04/84
4,469,886	06/368,533	9/04/84
4,469,888	06/391,902	9/04/84
4,469,890	06/530,152	9/04/84
4,469,891	06/570,578	9/04/84
4,469,892	06/463,484	9/04/84
4,469,902	06/378,308	9/04/84
4,469,913	06/501,335	9/04/84
4,469,928	06/387,338	9/04/84
4,469,929	06/396,338	9/04/84
4,469,930	06/396,693	9/04/84
4,469,932	06/427,374	9/04/84
4,469,936	06/487,759	9/04/84
4,469,937	06/509,330	9/04/84
4,469,938	06/524,200	9/04/84
4,469,940	06/328,374	9/04/84
4,469,942	06/358,088	9/04/84
4,469,952	06/383,009	9/04/84
4,469,957	06/339,874	9/04/84
4,469,958	06/328,363	9/04/84
4,469,963	06/528,993	9/04/84
4,469,971	06/508,176	9/04/84
4,469,976	06/395,546	9/04/84
4,469,977	06/435,156	9/04/84
4,469,984	06/348,230	9/04/84
4,469,987	06/314,301	9/04/84
4,469,994	06/483,813	9/04/84
4,469,995	06/399,207	9/04/84
4,469,996	06/437,493	9/04/84
4,469,997	06/433,012	9/04/84
4,470,000	06/421,303	9/04/84
4,470,001	06/271,981	9/04/84
4,470,002	06/385,320	9/04/84
4,470,003	06/483,466	9/04/84
4,470,006	06/428,888	9/04/84
4,470,010	06/311,531	9/04/84
4,470,013	06/339,628	9/04/84
4,470,016	06/363,358	9/04/84

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4,470,022	06/391,624	9/04/84
4,470,023	06/258,705	9/04/84
4,470,024	06/357,870	9/04/84
4,470,025	06/331,491	9/04/84
4,470,026	06/344,456	9/04/84
4,470,029	06/454,397	9/04/84
4,470,056	06/335,481	9/04/84
4,470,063	06/322,699	9/04/84
4,470,068	06/365,758	9/04/84
4,470,078	06/246,721	9/04/84
4,470,094	06/382,678	9/04/84
4,470,095	06/362,845	9/04/84
4,470,102	06/422,588	9/04/84
4,470,110	06/318,254	9/04/84
4,470,122	06/306,952	9/04/84
4,470,129	06/345,943	9/04/84
4,470,130	06/399,696	9/04/84
4,470,133	06,331,289	9/04/84
4,470,152	06/387,758	9/04/84
4,470,159	06/354,474	9/11/84
4,470,162	06/502,767	9/11/84
4,470,164	06/323,752	9/11/84
4,470,168	06/368,577	9/11/84
4,470,170	06/372,087	9/11/84
4,470,172	06/397,405	9/11/84
4,470,177	06/424,019	9/11/84
4,470,182	06/394,122	9/11/84
4,470,190	06/445,290	9/11/84
4,470,192	06/524,967	9/11/84
4,470,194	06/417,570	9/11/84
4,470,195	06/508,302	9/11/84
4,470,196	06/485,767	9/11/84
4,470,199	06/469,459	9/11/84
4,470,200	06/458,202	9/11/84
4,470,207	06/419,917	9/11/84
4,470,209	06/505,883	9/11/84
4,470,214	06/520,613	9/11/84
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4,470,217	06/432,184	9/11/84
4,470,218	06/533,788	9/11/84
4,470,219	06/549,050	9/11/84
4,470,221	06/483,579	9/11/84
4,470,226	06/412,826	9/11/84
4,470,229	06/368,255	9/11/84
4,470,230	06/426,800	9/11/84
4,470,232	06/331,266	9/11/84
4,470,234	06/224,039	9/11/84
4,470,235	06/355,508	9/11/84
4,470,237	06/398,535	9/11/84
4,470,242	06/408,232	9/11/84
4,470,243	06/560,713	9/11/84
4,470,247	06/497,932	9/11/84
4,470,252	06/481,549	9/11/84
4,470,253	06/342,021	9/11/84
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4,470,273	06/376,016	9/11/84
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4,470,294	06/433,299	9/11/84
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4,470,314	06/448,483	9/11/84
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4,470,325	06/413,355	9/11/84
4,470,326	06/446,716	9/11/84
4,470,328	06/469,208	9/11/84
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4,470,338	06/356,169	9/11/84
4,470,339	06/554,374	9/11/84
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4,470,343	06/275,432	9/11/84
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4,470,356	06/347,134	9/11/84
4,470,363	06/410,630	9/11/84
4,470,366	06/428,601	9/11/84
4,470,372	06/454,953	9/11/84
4,470,375	06/502,579	9/11/84
4,470,376	06/386,033	9/11/84
4,470,382	06/390,155	9/11/84
4,470,384	06/413,648	9/11/84
4,470,388	06/502,578	9/11/84
4,470,392	06/482,707	9/11/84
4,470,393	06/368,116	9/11/84
4,470,395	06/312,602	9/11/84
4,470,397	06/437,478	9/11/84
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4,470,402	06/339,624	9/11/84
4,470,403	06/383,068	9/11/84
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4,470,409	06/481,796	9/11/84
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4,470,424	06/537,744	9/11/84
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4,470,441	06/527,175	9/11/84
4,470,442	06/376,830	9/11/84
4,470,443	06/474,123	9/11/84
4,470,446	06/280,494	9/11/84
4,470,452	06/396,981	9/11/84
4,470,456	06/468,138	9/11/84
4,470,457	06/438,869	9/11/84
4,470,459	06/492,975	9/11/84
4,470,461	06/429,737	9/11/84
4,470,465	06/487,656	9/11/84
4,470,472	06/395,775	9/11/84
4,470,473	06/395,776	9/11/84
4,470,474	06/395,777	9/11/84
4,470,475	06/513,067	9/11/84
4,470,476	06/510,116	9/11/84
4,470,481	06/385,877	9/11/84
4,470,483	06/338,371	9/11/84
4,470,484	06/422,512	9/11/84
4,470,486	06/401,843	9/11/84
4,470,489	06/399,513	9/11/84
4,470,490	06/388,729	9/11/84
4,470,498	06/365,619	9/11/84
4,470,499	06/367,027	9/11/84
4,470,500	06/530,568	9/11/84
4,470,501	06/345,181	9/11/84
4,470,502	06/523,138	9/11/84
4,470,504	06/268,362	9/11/84
4,470,525	06/372,348	9/11/84
4,470,526	06/291,302	9/11/84
4,470,528	06/408,246	9/11/84
4,470,529	06/454,990	9/11/84
4,470,531	06/331,633	9/11/84
4,470,536	06/431,620	9/11/84
4,470,539	06/428,598	9/11/84
4,470,541	06/480,344	9/11/84
4,470,543	06/363,659	9/11/84
4,470,547	06/362,472	9/11/84
4,470,548	06/428,223	9/11/84
4,470,556	06/270,625	9/11/84
4,470,558	06/388,840	9/11/84
4,470,565	06/499,716	9/11/84
4,470,569	06/334,528	9/11/84
4,470,570	06/428,151	9/11/84
4,470,577	06/362,404	9/11/84
4,470,581	06/459,435	9/11/84
4,470,585	06/365,749	9/11/84
4,470,587	06/388,902	9/11/84
4,470,595	06/339,732	9/11/84
4,470,601	06/453,792	9/11/84

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			4,470,903	06/241,256	9/11/84
			4,470,907	06/398,898	9/11/84
4,470,602	06/383,770	9/11/84	4,470,908	06/486,093	9/11/84
4,470,603	06/477,757	9/11/84	4,470,910	06/470,027	9/11/84
4,470,605	06/568,641	9/11/84	4,470,913	06/500,014	9/11/84
4,470,606	06/562,041	9/11/84	4,470,920	06/515,881	9/11/84
4,470,607	06/551,553	9/11/84	4,470,922	06/527,206	9/11/84
4,470,612	06/449,087	9/11/84	4,470,929	06/480,733	9/11/84
4,470,613	06/442,321	9/11/84	4,470,932	06/436,093	9/11/84
4,470,617	06/338,880	9/11/84	4,470,934	06/475,274	9/11/84
4,470,620	06/403,534	9/11/84	4,470,942	06/357,745	9/11/84
4,470,625	06/263,955	9/11/84	4,470,958	06/418,855	9/11/84
4,470,627	06/420,335	9/11/84	4,470,959	06/505,620	9/11/84
4,470,629	06/384,608	9/11/84	4,470,965	06/437,072	9/11/84
4,470,630	06/360,806	9/11/84	4,470,971	06/413,632	9/11/84
4,470,634	06/287,638	9/11/84	4,470,978	06/427,891	9/11/84
4,470,635	06/461,533	9/11/84	4,470,979	06/506,238	9/11/84
4,470,641	06/422,802	9/11/84	4,470,980	06/277,445	9/11/84
4,470,649	06/391,001	9/11/84	4,470,986	06/451,903	9/11/84
4,470,650	06/449,306	9/11/84	4,470,989	06/389,677	9/11/84
4,470,653	06/406,682	9/11/84	4,470,991	06/487,632	9/11/84
4,470,658	06/499,706	9/11/84	4,470,993	06/471,920	9/11/84
4,470,659	06/318,340	9/11/84	4,471,002	06/507,289	9/11/84
4,470,660	06/297,408	9/11/84	4,471,007	06/481,435	9/11/84
4,470,671	06/385,875	9/11/84	4,471,008	06/404,013	9/11/84
4,470,672	06/372,629	9/11/84	4,471,009	06/485,522	9/11/84
4,470,679	06/463,483	9/11/84	4,471,013	06/546,508	9/11/84
4,470,684	06/484,118	9/11/84	4,471,017	06/420,916	9/11/84
4,470,696	06/311,216	9/11/84	4,471,037	06/482,164	9/11/84
4,470,698	06/377,727	9/11/84	4,471,048	06/526,181	9/11/84
4,470,704	06/340,967	9/11/84	4,471,052	06/340,139	9/11/84
4,470,708	06/527,670	9/11/84	4,471,053	06/366,276	9/11/84
4,470,717	06/516,668	9/11/84	4,471,056	06/364,997	9/11/84
4,470,718	06/371,949	9/11/84	4,471,067	06/505,006	9/11/84
4,470,720	06/306,285	9/11/84	4,471,077	06/496,294	9/11/84
4,470,722	06/336,234	9/11/84	4,471,080	06/464,572	9/11/84
4,470,723	06/219,498	9/11/84	4,471,089	06/453,527	9/11/84
4,470,728	06/384,798	9/11/84	4,471,099	06/472,687	9/11/84
4,470,730	06/364,248	9/11/84	4,471,105	06/463,205	9/11/84
4,470,731	06/281,374	9/11/84	4,471,110	06/404,373	9/11/84
4,470,733	06/405,800	9/11/84	4,471,111	06/398,212	9/11/84
4,470,738	06/265,352	9/11/84	4,471,113	06/345,442	9/11/84
4,470,741	06/356,860	9/11/84	4,471,115	06/452,159	9/11/84
4,470,744	06/324,393	9/11/84	4,471,116	06/402,704	9/11/84
4,470,745	06/415,487	9/11/84	4,471,123	06/490,014	9/11/84
4,470,747	06/451,250	9/11/84	4,471,127	06/411,933	9/11/84
4,470,759	06/384,534	9/11/84	4,471,128	06/411,944	9/11/84
4,470,760	06/388,155	9/11/84	4,471,129	06/496,704	9/11/84
4,470,770	06/398,068	9/11/84	4,471,132	06/499,639	9/11/84
4,470,771	06/409,781	9/11/84	4,471,133	06/499,589	9/11/84
4,470,775	06/413,735	9/11/84	4,471,135	06/535,800	9/11/84
4,470,779	06/482,378	9/11/84	4,471,141	06/468,529	9/11/84
4,470,782	06/489,308	9/11/84	4,471,145	06/536,067	9/11/84
4,470,784	06/382,868	9/11/84	4,471,148	06/455,279	9/11/84
4,470,792	06/500,237	9/11/84	4,471,151	06/456,156	9/11/84
4,470,795	06/443,999	9/11/84	4,471,160	06/369,576	9/11/84
4,470,799	06/311,282	9/11/84	4,471,174	06/505,192	9/11/84
4,470,805	06/386,644	9/11/84	4,471,177	06/407,820	9/11/84
4,470,809	06/501,505	9/11/84	4,471,184	06/432,380	9/11/84
4,470,810	06/382,122	9/11/84	4,471,190	06/341,628	9/11/84
4,470,811	06/403,488	9/11/84	4,471,195	06/542,897	9/11/84
4,470,815	06/476,233	9/11/84	4,471,196	06/278,912	9/11/84
4,470,816	06/474,766	9/11/84	4,471,198	06/361,129	9/11/84
4,470,817	06/276,468	9/11/84	4,471,200	06/438,715	9/11/84
4,470,818	06/433,580	9/11/84	4,471,201	06/237,453	9/11/84
4,470,820	06/452,351	9/11/84	4,471,210	06/421,049	9/11/84
4,470,823	06/289,141	9/11/84	4,471,219	06/355,952	9/11/84
4,470,824	06/356,038	9/11/84	4,471,220	06/332,476	9/11/84
4,470,825	06/542,030	9/11/84	4,471,222	06/385,145	9/11/84
4,470,837	06/443,258	9/11/84	4,471,225	06/470,242	9/11/84
4,470,847	06/439,801	9/11/84	4,471,226	06/348,790	9/11/84
4,470,848	06/517,474	9/11/84	4,471,229	06/355,608	9/11/84
4,470,850	06/311,040	9/11/84	4,471,248	06/528,376	9/11/84
4,470,855	06/583,624	9/11/84	4,471,256	06/504,304	9/11/84
4,470,858	06/446,981	9/11/84	4,471,257	06/511,230	9/11/84
4,470,860	06/337,803	9/11/84	4,471,260	06/340,553	9/11/84
4,470,884	06/291,116	9/11/84	4,471,261	06/342,986	9/11/84
4,470,885	06/464,226	9/11/84	4,471,266	06/316,683	9/11/84
4,470,901	06/402,495	9/11/84	4,471,268	06/452,904	9/11/84

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4,471,274	06/381,258	9/11/84	4,470,242	06/408,232	9/11/84
4,471,275	06/453,761	9/11/84	4,470,243	06/560,713	9/11/84
4,471,283	06/438,439	9/11/84	4,470,247	06/497,932	9/11/84
4,471,285	06/347,423	9/11/84	4,470,252	06/481,549	9/11/84
4,471,291	06/387,236	9/11/84	4,470,253	06/342,021	9/11/84
4,471,295	06/353,247	9/11/84	4,470,254	06/378,160	9/11/84
4,471,296	06/324,364	9/11/84	4,470,265	06/376,293	9/11/84
4,471,301	06/329,823	9/11/84	4,470,271	06/461,796	9/11/84
4,471,307	06/365,064	9/11/84	4,470,273	06/376,016	9/11/84
4,471,313	06/315,642	9/11/84	4,470,276	06/406,483	9/11/84
4,471,317	06/444,084	9/11/84	4,470,277	06/396,010	9/11/84
4,471,323	06/323,012	9/11/84	4,470,283	06/353,631	9/11/84
4,471,327	06/379,850	9/11/84	4,470,289	06/373,360	9/11/84
4,471,330	06/438,028	9/11/84	4,470,294	06/433,299	9/11/84
4,471,331	06/439,976	9/11/84	4,470,300	06/367,223	9/11/84
4,471,340	06/269,455	9/11/84	4,470,310	06/388,670	9/11/84
4,471,349	06/305,084	9/11/84	4,470,312	06/426,497	9/11/84
4,471,356	06/313,605	9/11/84	4,470,314	06/448,483	9/11/84
4,471,359	06/388,563	9/11/84	4,470,316	06/313,620	9/11/84
4,471,369	06/293,760	9/11/84	4,470,319	06/284,074	9/11/84
4,471,377	06/519,222	9/11/84	4,470,325	06/413,355	9/11/84
4,471,379	06/292,399	9/11/84	4,470,326	06/446,716	9/11/84
4,471,381	06/357,132	9/11/84	4,470,328	06/469,208	9/11/84
4,471,389	06/353,560	9/11/84	4,470,335	06/387,863	9/11/84
4,471,398	06/319,836	9/11/84	4,470,338	06/356,169	9/11/84
4,471,402	06/344,525	9/11/84	4,470,339	06/554,374	9/11/84
4,471,403	06/539,011	9/11/84	4,470,342	06/376,914	9/11/84
4,471,407	06/423,803	9/11/84	4,470,343	06/275,432	9/11/84
4,471,408	06/366,780	9/11/84	4,470,346	06/366,828	9/11/84
4,471,409	06/447,496	9/11/84	4,470,347	06/424,957	9/11/84
4,471,412	06/454,897	9/11/84	4,470,349	06/495,224	9/11/84
4,471,413	06/527,616	9/11/84	4,470,350	06/444,586	9/11/84
4,471,416	06/477,377	9/11/84	4,470,352	06/338,132	9/11/84
4,471,419	06/429,867	9/11/84	4,470,356	06/347,134	9/11/84
4,471,422	06/223,853	9/11/84	4,470,363	06/410,630	9/11/84
4,471,423	06/349,186	9/11/84	4,470,366	06/428,601	9/11/84
4,471,424	06/358,991	9/11/84	4,470,372	06/454,953	9/11/84
4,471,428	06/338,886	9/11/84	4,470,375	06/502,579	9/11/84
4,471,445	06/249,188	9/11/84	4,470,376	06/386,033	9/11/84
4,471,450	06/344,323	9/11/84	4,470,382	06/390,155	9/11/84
4,471,455	06/345,696	9/11/84	4,470,384	06/413,648	9/11/84
4,471,458	06/274,954	9/11/84	4,470,388	06/502,578	9/11/84
4,471,462	06/380,750	9/11/84	4,470,392	06/482,707	9/11/84
4,471,469	06/435,682	9/11/84	4,470,393	06/368,116	9/11/84
4,471,475	06/272,591	9/11/84	4,470,395	06/312,602	9/11/84
4,471,476	06/339,817	9/11/84	4,470,397	06/437,478	9/11/84
4,471,482	06/308,964	9/11/84	4,470,399	06/359,058	9/11/84
4,471,487	06/313,761	9/11/84	4,470,402	06/339,624	9/11/84
4,471,494	06/407,586	9/11/84	4,470,403	06/383,068	9/11/84
4,470,159	06/354,474	9/11/84	4,470,405	06/334,773	9/11/84
4,470,162	06/502,767	9/11/84	4,470,409	06/481,796	9/11/84
4,470,164	06/323,752	9/11/84	4,470,411	06/467,995	9/11/84
4,470,168	06/368,577	9/11/84	4,470,422	06/226,244	9/11/84
4,470,170	06/372,087	9/11/84	4,470,424	06/537,744	9/11/84
4,470,172	06/397,405	9/11/84	4,470,428	06/380,588	9/11/84
4,470,177	06/424,019	9/11/84	4,470,437	06/371,238	9/11/84
4,470,182	06/394,122	9/11/84	4,470,441	06/527,175	9/11/84
4,470,190	06/445,290	9/11/84	4,470,442	06/376,830	9/11/84
4,470,192	06/524,967	9/11/84	4,470,443	06/474,123	9/11/84
4,470,194	06/417,570	9/11/84	4,470,446	06/280,494	9/11/84
4,470,195	06/508,302	9/11/84	4,470,452	06/396,981	9/11/84
4,470,196	06/485,767	9/11/84	4,470,456	06/468,138	9/11/84
4,470,199	06/469,459	9/11/84	4,470,457	06/438,869	9/11/84
4,470,200	06/458,202	9/11/84	4,470,459	06/492,975	9/11/84
4,470,207	06/419,917	9/11/84	4,470,461	06/429,737	9/11/84
4,470,209	06/505,883	9/11/84	4,470,465	06/487,656	9/11/84
4,470,214	06/520,613	9/11/84	4,470,472	06/395,775	9/11/84
4,470,215	06/395,132	9/11/84	4,470,473	06/395,776	9/11/84
4,470,217	06/432,184	9/11/84	4,470,474	06/395,777	9/11/84
4,470,218	06/533,788	9/11/84	4,470,475	06/513,067	9/11/84
4,470,219	06/549,050	9/11/84	4,470,476	06/510,116	9/11/84
4,470,221	06/483,579	9/11/84	4,470,481	06/385,877	9/11/84
4,470,226	06/412,826	9/11/84	4,470,483	06/338,371	9/11/84
4,470,229	06/368,255	9/11/84	4,470,484	06/422,512	9/11/84
4,470,230	06/426,800	9/11/84	4,470,486	06/401,843	9/11/84
4,470,232	06/331,266	9/11/84	4,470,489	06/399,513	9/11/84

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4,470,490	06/388,729	9/11/84
4,470,498	06/365,619	9/11/84
4,470,499	06/367,027	9/11/84
4,470,500	06/530,568	9/11/84
4,470,501	06/345,181	9/11/84
4,470,502	06/523,138	9/11/84
4,470,504	06/268,362	9/11/84
4,470,525	06/372,348	9/11/84
4,470,526	06/291,302	9/11/84
4,470,528	06/408,246	9/11/84
4,470,529	06/454,990	9/11/84
4,470,531	06/331,633	9/11/84
4,470,536	06/431,620	9/11/84
4,470,539	06/428,598	9/11/84
4,470,541	06/480,344	9/11/84
4,470,543	06/363,659	9/11/84
4,470,547	06/362,472	9/11/84
4,470,548	06/428,223	9/11/84
4,470,556	06/270,625	9/11/84
4,470,558	06/388,840	9/11/84
4,470,565	06/493,716	9/11/84
4,470,569	06/334,528	9/11/84
4,470,570	06/428,151	9/11/84
4,470,577	06/362,404	9/11/84
4,470,581	06/459,435	9/11/84
4,470,585	06/365,749	9/11/84
4,470,587	06/388,902	9/11/84
4,470,595	06/393,732	9/11/84
4,470,601	06/453,792	9/11/84
4,470,602	06/383,770	9/11/84
4,470,603	06/471,757	9/11/84
4,470,605	06/568,641	9/11/84
4,470,606	06/562,041	9/11/84
4,470,607	06/551,553	9/11/84
4,470,612	06/449,087	9/11/84
4,470,613	06/442,321	9/11/84
4,470,617	06/338,880	9/11/84
4,470,620	06/403,534	9/11/84
4,470,625	06/263,955	9/11/84
4,470,627	06/428,335	9/11/84
4,470,629	06/384,608	9/11/84
4,470,630	06/360,806	9/11/84
4,470,634	06/287,638	9/11/84
4,470,635	06/461,533	9/11/84
4,470,641	06/422,802	9/11/84
4,470,649	06/391,001	9/11/84
4,470,650	06/449,306	9/11/84
4,470,653	06/406,682	9/11/84
4,470,658	06/499,706	9/11/84
4,470,659	06/318,340	9/11/84
4,470,660	06/297,408	9/11/84
4,470,671	06/385,875	9/11/84
4,470,672	06/372,629	9/11/84
4,470,679	06/463,483	9/11/84
4,470,684	06/486,118	9/11/84
4,470,696	06/311,216	9/11/84
4,470,698	06/377,727	9/11/84
4,470,704	06/340,967	9/11/84
4,470,708	06/527,670	9/11/84
4,470,717	06/516,668	9/11/84
4,470,718	06/371,949	9/11/84
4,470,720	06/305,285	9/11/84
4,470,722	06/336,234	9/11/84
4,470,723	06/219,498	9/11/84
4,470,728	06/384,798	9/11/84
4,470,730	06/364,248	9/11/84
4,470,731	06/281,374	9/11/84
4,470,733	06/405,800	9/11/84
4,470,738	06/265,352	9/11/84
4,470,741	06/356,860	9/11/84
4,470,744	06/324,393	9/11/84
4,470,745	06/415,487	9/11/84
4,470,747	06/451,250	9/11/84
4,470,759	06/384,534	9/11/84
4,470,760	06/388,155	9/11/84
4,470,770	06/353,068	9/11/84
4,470,771	06/409,781	9/11/84
4,470,775	06/413,735	9/11/84
4,470,779	06/482,378	9/11/84
4,470,782	06/489,308	9/11/84
4,470,784	06/382,868	9/11/84
4,470,792	06/500,237	9/11/84
4,470,795	06/443,999	9/11/84
4,470,799	06/311,282	9/11/84
4,470,805	06/386,644	9/11/84
4,470,809	06/501,505	9/11/84
4,470,810	06/382,122	9/11/84
4,470,811	06/403,488	9/11/84
4,470,815	06/476,233	9/11/84
4,470,816	06/474,766	9/11/84
4,470,817	06/276,468	9/11/84
4,470,818	06/433,580	9/11/84
4,470,820	06/452,351	9/11/84
4,470,823	06/289,141	9/11/84
4,470,824	06/356,038	9/11/84
4,470,825	06/542,030	9/11/84
4,470,837	06/443,258	9/11/84
4,470,847	06/439,801	9/11/84
4,470,848	06/517,474	9/11/84
4,470,850	06/311,040	9/11/84
4,470,855	06/583,624	9/11/84
4,470,858	06/446,981	9/11/84
4,470,860	06/337,803	9/11/84
4,470,884	06/291,116	9/11/84
4,470,885	06/464,226	9/11/84
4,470,901	06/402,495	9/11/84
4,470,903	06/241,256	9/11/84
4,470,907	06/398,898	9/11/84
4,470,908	06/486,093	9/11/84
4,470,910	06/470,027	9/11/84
4,470,913	06/500,014	9/11/84
4,470,920	06/515,881	9/11/84
4,470,922	06/527,206	9/11/84
4,470,929	06/480,733	9/11/84
4,470,932	06/436,093	9/11/84
4,470,934	06/475,274	9/11/84
4,470,942	06/357,745	9/11/84
4,470,958	06/418,855	9/11/84
4,470,959	06/505,620	9/11/84
4,470,965	06/437,072	9/11/84
4,470,971	06/413,632	9/11/84
4,470,978	06/427,891	9/11/84
4,470,979	06/506,238	9/11/84
4,470,980	06/277,445	9/11/84
4,470,986	06/451,903	9/11/84
4,470,989	06/389,677	9/11/84
4,470,991	06/487,632	9/11/84
4,470,993	06/471,920	9/11/84
4,471,002	06/507,289	9/11/84
4,471,007	06/481,435	9/11/84
4,471,008	06/404,013	9/11/84
4,471,009	06/485,522	9/11/84
4,471,013	06/546,508	9/11/84
4,471,017	06/420,916	9/11/84
4,471,037	06/482,164	9/11/84
4,471,048	06/526,181	9/11/84
4,471,052	06/340,139	9/11/84
4,471,053	06/366,276	9/11/84
4,471,056	06/364,997	9/11/84
4,471,067	06/505,006	9/11/84
4,471,077	06/496,294	9/11/84
4,471,080	06/464,572	9/11/84
4,471,089	06/453,527	9/11/84
4,471,099	06/472,687	9/11/84
4,471,105	06/463,205	9/11/84
4,471,110	06/404,373	9/11/84
4,471,111	06/398,212	9/11/84
4,471,113	06/345,442	9/11/84
4,471,115	06/452,159	9/11/84
4,471,116	06/402,704	9/11/84
4,471,123	06/490,014	9/11/84
4,471,127	06/411,933	9/11/84
4,471,128	06/411,944	9/11/84
4,471,129	06/496,704	9/11/84
4,471,132	06/499,639	9/11/84
4,471,133	06/499,589	9/11/84

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4,471,135	06/535,800	9/11/84
4,471,141	06/468,529	9/11/84
4,471,145	06/536,067	9/11/84
4,471,148	06/455,279	9/11/84
4,471,151	06/456,156	9/11/84
4,471,160	06/369,576	9/11/84
4,471,174	06/505,192	9/11/84
4,471,177	06/407,820	9/11/84
4,471,184	06/432,380	9/11/84
4,471,190	06/341,628	9/11/84
4,471,195	06/542,897	9/11/84
4,471,196	06/278,912	9/11/84
4,471,200	06/438,715	9/11/84
4,471,201	06/237,453	9/11/84
4,471,210	06/421,049	9/11/84
4,471,219	06/355,952	9/11/84
4,471,220	06/332,476	9/11/84
4,471,222	06/385,145	9/11/84
4,471,225	06/470,242	9/11/84
4,471,226	06/348,790	9/11/84
4,471,229	06/355,608	9/11/84
4,471,248	06/528,376	9/11/84
4,471,256	06/504,304	9/11/84
4,471,257	06/511,230	9/11/84
4,471,260	06/340,553	9/11/84
4,471,261	06/342,986	9/11/84
4,471,266	06/316,683	9/11/84
4,471,268	06/452,904	9/11/84
4,471,272	06/309,701	9/11/84
4,471,274	06/381,258	9/11/84
4,471,275	06/453,761	9/11/84
4,471,283	06/438,439	9/11/84
4,471,285	06/347,423	9/11/84
4,471,291	06/387,236	9/11/84
4,471,295	06/353,247	9/11/84
4,471,296	06/324,364	9/11/84
4,471,301	06/329,823	9/11/84
4,471,307	06/365,064	9/11/84
4,471,313	06/315,642	9/11/84
4,471,317	06/444,084	9/11/84
4,471,323	06/323,012	9/11/84
4,471,327	06/379,850	9/11/84
4,471,330	06/438,028	9/11/84
4,471,331	06/439,976	9/11/84
4,471,340	06/269,455	9/11/84
4,471,349	06/305,084	9/11/84
4,471,356	06/313,605	9/11/84
4,471,359	06/388,563	9/11/84
4,471,369	06/293,760	9/11/84
4,471,377	06/519,222	9/11/84
4,471,379	06/292,399	9/11/84
4,471,381	06/357,132	9/11/84
4,471,389	06/353,560	9/11/84
4,471,398	06/319,836	9/11/84
4,471,402	06/344,525	9/11/84
4,471,403	06/539,011	9/11/84
4,471,407	06/423,803	9/11/84
4,471,408	06/336,780	9/11/84
4,471,409	06/447,496	9/11/84
4,471,412	06/454,897	9/11/84
4,471,413	06/527,616	9/11/84
4,471,416	06/477,377	9/11/84
4,471,419	06/429,867	9/11/84
4,471,422	06/223,853	9/11/84
4,471,423	06/349,186	9/11/84
4,471,424	06/358,991	9/11/84
4,471,428	06/338,886	9/11/84
4,471,445	06/249,188	9/11/84
4,471,450	06/344,323	9/11/84
4,471,455	06/345,696	9/11/84
4,471,458	06/274,954	9/11/84
4,471,462	06/380,750	9/11/84
4,471,469	06/435,682	9/11/84
4,471,475	06/272,591	9/11/84
4,471,476	06/339,817	9/11/84
4,471,482	06/308,964	9/11/84
4,471,487	06/313,761	9/11/84
4,471,494	06/407,586	9/11/84
Re. 32,263	06/714,457	10/07/86
(4,472,600)	(06/470,573)	(09/18/84)
4,471,499	06/477,771	9/18/84
4,471,500	06/293,949	9/18/84
4,471,501	06/403,297	9/18/84
4,471,502	06/470,557	9/18/84
4,471,503	06/417,845	9/18/84
4,471,506	06/379,579	9/18/84
4,471,508	06/392,404	9/18/84
4,471,511	06/474,450	9/18/84
4,471,521	06/249,337	9/18/84
4,471,528	06/447,292	9/18/84
4,471,530	06/420,901	9/18/84
4,471,531	06/467,068	9/18/84
4,471,535	06/409,618	9/18/84
4,471,537	06/339,937	9/18/84
4,471,539	06/436,927	9/18/84
4,471,540	06/458,664	9/18/84
4,471,541	06/302,610	9/18/84
4,471,544	06/415,062	9/18/84
4,471,546	06/431,260	9/18/84
4,471,555	06/475,171	9/18/84
4,471,557	06/343,494	9/18/84
4,471,558	06/444,822	9/18/84
4,471,559	06/421,795	9/18/84
4,471,562	06/414,653	9/18/84
4,471,567	06/448,421	9/18/84
4,471,570	06/347,129	9/18/84
4,471,571	06/458,112	9/18/84
4,471,573	06/414,806	9/18/84
4,471,574	06/359,389	9/18/84
4,471,582	06/390,742	9/18/84
4,471,583	06/481,919	9/18/84
4,471,585	06/407,109	9/18/84
4,471,589	06/395,059	9/18/84
4,471,592	06/448,599	9/18/84
4,471,594	06/436,263	9/18/84
4,471,596	06/410,439	9/18/84
4,471,603	06/479,989	9/18/84
4,471,604	06/422,534	9/18/84
4,471,609	06/410,526	9/18/84
4,471,616	06/405,190	9/18/84
4,471,617	06/439,781	9/18/84
4,471,619	06/410,661	9/18/84
4,471,624	06/356,826	9/18/84
4,471,625	06/447,639	9/18/84
4,471,628	06/417,054	9/18/84
4,471,644	06/298,824	9/18/84
4,471,645	06/410,872	9/18/84
4,471,646	06/414,904	9/18/84
4,471,649	06/348,448	9/18/84
4,471,650	06/421,564	9/18/84
4,471,652	06/426,071	9/18/84
4,471,653	06/461,124	9/18/84
4,471,654	06/374,392	9/18/84
4,471,659	06/509,942	9/18/84
4,471,667	06/422,533	9/18/84
4,471,670	06/221,567	9/18/84
4,471,673	06/410,528	9/18/84
4,471,676	06/299,293	9/18/84
4,471,679	06/462,130	9/18/84
4,471,686	06/378,516	9/18/84
4,471,687	06/322,369	9/18/84
4,471,688	06/512,575	9/18/84
4,471,690	06/443,802	9/18/84
4,471,692	06/482,198	9/18/84
4,471,693	06/526,382	9/18/84
4,471,699	06/479,793	9/18/84
4,471,700	06/325,122	9/18/84
4,471,704	06/390,326	9/18/84
4,471,706	06/568,111	9/18/84
4,471,707	06/556,562	9/18/84
4,471,711	06/333,949	9/18/84
4,471,712	06/508,133	9/18/84
4,471,717	06/561,731	9/18/84
4,471,718	06/417,850	9/18/84
4,471,722	06/451,779	9/18/84
4,471,723	06/443,817	9/18/84

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			4,471,995	06/276,149	9/18/84
			4,471,996	06/417,860	9/18/84
4,471,724	06/342,730	9/18/84	4,471,998	06/416,930	9/18/84
4,471,726	06/510,218	9/18/84	4,472,002	06/463,004	9/18/84
4,471,729	06/356,663	9/18/84	4,472,009	06/369,621	9/18/84
4,471,730	06/437,842	9/18/84	4,472,014	06/423,854	9/18/84
4,471,742	06/498,947	9/18/84	4,472,018	06/467,098	9/18/84
4,471,743	06/420,942	9/18/84	4,472,020	06/414,079	9/18/84
4,471,749	06/431,453	9/18/84	4,472,021	06/447,181	9/18/84
4,471,751	06/313,480	9/18/84	4,472,022	06/377,421	9/18/84
4,471,752	06/428,428	9/18/84	4,472,025	06/416,382	9/18/84
4,471,753	06/233,558	9/18/84	4,472,029	06/353,550	9/18/84
4,471,754	06/416,041	9/18/84	4,472,035	06/358,376	9/18/84
4,471,757	06/475,595	9/18/84	4,472,036	06/253,264	9/18/84
4,471,759	06/566,961	9/18/84	4,472,038	06/333,922	9/18/84
4,471,760	06/561,687	9/18/84	4,472,046	06/379,948	9/18/84
4,471,763	06/395,981	9/18/84	4,472,050	06/567,144	9/18/84
4,471,764	06/334,015	9/18/84	4,472,052	06/331,218	9/18/84
4,471,765	06/386,661	9/18/84	4,472,054	06/290,367	9/18/84
4,471,768	06/432,069	9/18/84	4,472,057	06/318,955	9/18/84
4,471,771	06/331,914	9/18/84	4,472,058	06/463,902	9/18/84
4,471,774	06/391,191	9/18/84	4,472,060	06/471,770	9/18/84
4,471,777	06/480,412	9/18/84	4,472,062	06/437,824	9/18/84
4,471,782	06/429,815	9/18/84	4,472,063	06/510,730	9/18/84
4,471,783	06/361,804	9/18/84	4,472,065	06/358,711	9/18/84
4,471,784	06/442,109	9/18/84	4,472,068	06/456,681	9/18/84
4,471,785	06/427,735	9/18/84	4,472,070	06/445,920	9/18/84
4,471,786	06/370,298	9/18/84	4,472,074	06/547,448	9/18/84
4,471,787	06/422,558	9/18/84	4,472,077	06/484,304	9/18/84
4,471,792	06/442,748	9/18/84	4,472,088	06/370,361	9/18/84
4,471,801	06/392,172	9/18/84	4,472,091	06/488,244	9/18/84
4,471,803	06/355,532	9/18/84	4,472,095	06/288,499	9/18/84
4,471,806	06/387,953	9/18/84	4,472,106	06/468,989	9/18/84
4,471,807	06/362,072	9/18/84	4,472,110	06/455,541	9/18/84
4,471,814	06/405,361	9/18/84	4,472,111	06/373,446	9/18/84
4,471,817	06/436,462	9/18/84	4,472,112	06/423,965	9/18/84
4,471,818	06/436,460	9/18/84	4,472,113	06/341,852	9/18/84
4,471,819	06/430,516	9/18/84	4,472,114	06/452,401	9/18/84
4,471,820	06/422,868	9/18/84	4,472,116	06/353,042	9/18/84
4,471,822	06/463,997	9/18/84	4,472,117	06/353,085	9/18/84
4,471,824	06/548,324	9/18/84	4,472,119	06/509,639	9/18/84
4,471,825	06/411,680	9/18/84	4,472,125	06/411,336	9/18/84
4,471,826	06/519,890	9/18/84	4,472,134	06/318,371	9/18/84
4,471,839	06/488,514	9/18/84	4,472,136	06/538,269	9/18/84
4,471,849	06/426,275	9/18/84	4,472,138	06/372,860	9/18/84
4,471,851	06/413,200	9/18/84	4,472,139	06/502,704	9/18/84
4,471,852	06/346,641	9/18/84	4,472,143	06/371,113	9/18/84
4,471,854	06/456,627	9/18/84	4,472,144	06/475,518	9/18/84
4,471,861	06/308,641	9/18/84	4,472,149	06/369,185	9/18/84
4,471,863	06/297,445	9/18/84	4,472,153	06/343,689	9/18/84
4,471,865	06/368,320	9/18/84	4,472,156	06/378,000	9/18/84
4,471,866	06/421,561	9/18/84	4,472,157	06/484,316	9/18/84
4,471,868	06/343,025	9/18/84	4,472,166	06/543,456	9/18/84
4,471,869	06/420,121	9/18/84	4,472,182	06/347,146	9/18/84
4,471,873	06/467,460	9/18/84	4,472,186	06/419,428	9/18/84
4,471,875	06/419,737	9/18/84	4,472,188	06/364,663	9/18/84
4,471,877	06/413,761	9/18/84	4,472,189	06/453,557	9/18/84
4,471,878	06/508,604	9/18/84	4,472,191	06/436,034	9/18/84
4,471,883	06/502,604	9/18/84	4,472,192	06/400,049	9/18/84
4,471,896	06/543,490	9/18/84	4,472,193	06/395,415	9/18/84
4,471,897	06/368,770	9/18/84	4,472,194	06/462,084	9/18/84
4,471,912	06/461,461	9/18/84	4,472,195	06/523,250	9/18/84
4,471,914	06/417,973	9/18/84	4,472,196	06/504,217	9/18/84
4,471,931	06/476,891	9/18/84	4,472,198	06/344,152	9/18/84
4,471,932	06/373,416	9/18/84	4,472,215	06/478,292	9/18/84
4,471,933	06/294,883	9/18/84	4,472,218	06/564,959	9/18/84
4,471,934	06/319,386	9/18/84	4,472,219	06/418,400	9/18/84
4,471,936	06/347,613	9/18/84	4,472,220	06/320,917	9/18/84
4,471,937	06/528,738	9/18/84	4,472,221	06/408,187	9/18/84
4,471,939	06/528,736	9/18/84	4,472,224	06/437,653	9/18/84
4,471,941	06/433,777	9/18/84	4,472,226	06/359,317	9/18/84
4,471,947	06/486,601	9/18/84	4,472,234	06/448,333	9/18/84
4,471,948	06/408,090	9/18/84	4,472,244	06/345,480	9/18/84
4,471,962	06/507,671	9/18/84	4,472,251	06/478,931	9/18/84
4,471,973	06/435,909	9/18/84	4,472,252	06/478,940	9/18/84
4,471,976	06/290,521	9/18/84	4,472,257	06/466,732	9/18/84
4,471,982	06/360,169	9/18/84	4,472,258	06/491,089	9/18/84
4,471,988	06/413,605	9/18/84	4,472,260	06/440,080	9/18/84
4,471,991	06/451,022	9/18/84	4,472,264	06/461,413	9/18/84

Patent Number	Serial Number	Issue Date	Patent Number	Serial Number	Issue Date
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			4,472,586	06/520,053	9/18/84
4,472,265	06/329,432	9/18/84	4,472,602	06/522,280	9/18/84
4,472,266	06/424,773	9/18/84	4,472,603	06/462,758	9/18/84
4,472,268	06/458,825	9/18/84	4,472,607	06/544,267	9/18/84
4,472,270	06/495,567	9/18/84	4,472,610	06/477,414	9/18/84
4,472,274	06/477,499	9/18/84	4,472,612	06/444,337	9/18/84
4,472,280	06/539,494	9/18/84	4,472,619	06/290,086	9/18/84
4,472,281	06/473,708	9/18/84	4,472,620	06/481,171	9/18/84
4,472,282	06/327,842	9/18/84	4,472,623	06/568,002	9/18/84
4,472,292	06/394,585	9/18/84	4,472,626	06/339,000	9/18/84
4,472,302	06/473,477	9/18/84	4,472,627	06/431,887	9/18/84
4,472,304	06/451,437	9/18/84	4,472,630	06/357,761	9/18/84
4,472,307	06/410,138	9/18/84	4,472,631	06/385,114	9/18/84
4,472,309	06/296,114	9/18/84	4,472,633	06/344,975	9/18/84
4,472,316	06/469,000	9/18/84	4,472,634	06/373,240	9/18/84
4,472,321	06/417,908	9/18/84	4,472,641	06/461,882	9/18/84
4,472,322	06/530,340	9/18/84	4,472,651	06/534,991	9/18/84
4,472,323	06/406,968	9/18/84	4,472,657	06/325,864	9/18/84
4,472,329	06/438,149	9/18/84	4,472,671	06/465,359	9/18/84
4,472,330	06/454,208	9/18/84	4,472,687	06/331,273	9/18/84
4,472,332	06/468,745	9/18/84	4,472,692	06/426,908	9/18/84
4,472,339	06/424,913	9/18/84	4,472,693	06/368,431	9/18/84
4,472,342	06/335,989	9/18/84	4,472,700	06/450,766	9/18/84
4,472,344	06/336,063	9/18/84	4,472,705	06/455,278	9/18/84
4,472,356	06/343,136	9/18/84	4,472,715	06/384,458	9/18/84
4,472,360	06/516,629	9/18/84	4,472,722	06/532,295	9/18/84
4,472,361	06/380,024	9/18/84	4,472,728	06/350,477	9/18/84
4,472,374	06/423,448	9/18/84	4,472,731	06/396,531	9/18/84
4,472,378	06/445,272	9/18/84	4,472,734	06/361,998	9/18/84
4,472,391	06/369,555	9/18/84	4,472,737	06/413,444	9/18/84
4,472,395	06/343,054	9/18/84	4,472,747	06/486,561	9/18/84
4,472,399	06/308,037	9/18/84	4,472,752	06/327,532	9/18/84
4,472,400	06/420,798	9/18/84	4,472,754	06/398,858	9/18/84
4,472,401	06/444,040	9/18/84	4,472,765	06/420,219	9/18/84
4,472,417	06/487,633	9/18/84	4,472,786	06/371,356	9/18/84
4,472,418	06/487,926	9/18/84	4,472,795	06/301,306	9/18/84
4,472,420	06/524,457	9/18/84	4,472,797	06/362,444	9/18/84
4,472,424	06/391,741	9/18/84	4,472,804	06/252,583	9/18/84
4,472,427	06/413,001	9/18/84	4,472,823	06/470,888	9/18/84
4,472,431	06/565,379	9/18/84	4,472,835	06/444,800	9/25/84
4,472,440	06/521,405	9/18/84	4,472,841	06/352,113	9/25/84
4,472,444	06/397,904	9/18/84	4,472,842	06/462,691	9/25/84
4,472,450	06/456,115	9/18/84	4,472,843	06/491,753	9/25/84
4,472,452	06/403,716	9/18/84	4,472,845	06/298,422	9/25/84
4,472,458	06/457,554	9/18/84	4,472,846	06/298,423	9/25/84
4,472,461	06/395,529	9/18/84	4,472,848	06/380,299	9/25/84
4,472,462	06/464,160	9/18/84	4,472,849	06/336,867	9/25/84
4,472,466	06/355,800	9/18/84	4,472,853	06/370,460	9/25/84
4,472,467	06/532,134	9/18/84	4,472,854	06/387,756	9/25/84
4,472,472	06/489,334	9/18/84	4,472,860	06/339,013	9/25/84
4,472,479	06/506,582	9/18/84	4,472,861	06/336,966	9/25/84
4,472,486	06/492,150	9/18/84	4,472,865	06/245,177	9/25/84
4,472,487	06/556,735	9/18/84	4,472,867	06/597,204	9/25/84
4,472,491	06/382,287	9/18/84	4,472,870	06/318,994	9/25/84
4,472,496	06/454,871	9/18/84	4,472,875	06/508,316	9/25/84
4,472,508	06/454,717	9/18/84	4,472,881	06/428,485	9/25/84
4,472,512	06/298,338	9/18/84	4,472,887	06/449,600	9/25/84
4,472,516	06/467,214	9/18/84	4,472,888	06/385,045	9/25/84
4,472,517	06/465,854	9/18/84	4,472,889	06/339,304	9/25/84
4,472,518	06/438,818	9/18/84	4,472,893	06/450,067	9/25/84
4,472,519	06/412,347	9/18/84	4,472,895	06/426,219	9/25/84
4,472,523	06/485,791	9/18/84	4,472,899	06/394,933	9/25/84
4,472,526	06/427,092	9/18/84	4,472,900	06/452,400	9/25/84
4,472,529	06/458,674	9/18/84	4,472,904	06/383,830	9/25/84
4,472,530	06/477,043	9/18/84	4,472,905	06/480,393	9/25/84
4,472,533	06/450,096	9/18/84	4,472,909	06/484,417	9/25/84
4,472,535	06/443,499	9/18/84	4,472,921	06/368,635	9/25/84
4,472,538	06/318,862	9/18/84	4,472,923	06/290,642	9/25/84
4,472,540	06/398,225	9/18/84	4,472,924	06/396,528	9/25/84
4,472,541	06/432,216	9/18/84	4,472,929	06/419,134	9/25/84
4,472,553	06/430,590	9/18/84	4,472,932	06/443,561	9/25/84
4,472,564	06/481,526	9/18/84	4,472,934	06/484,171	9/25/84
4,472,565	06/567,609	9/18/84	4,472,937	06/442,048	9/25/84
4,472,569	06/503,432	9/18/84	4,472,945	06/361,916	9/25/84
4,472,576	06/446,534	9/18/84	4,472,948	06/435,188	9/25/84
4,472,578	06/478,010	9/18/84	4,472,950	86/463,645	9/25/84
4,472,582	06/386,104	9/18/84	4,472,959	06/348,859	9/25/84
4,472,584	06/471,959	9/18/84	4,472,960	06/287,687	9/25/84

Patent Number	Serial Number	Issue Date
4,472,963	06/364,950	9/25/84
4,472,964	06/395,949	9/25/84
4,472,965	06/420,778	9/25/84
4,472,975	06/338,750	9/25/84
4,472,979	06/229,058	9/25/84
4,472,996	06/370,341	9/25/84
4,472,998	06/442,873	9/25/84
4,473,001	06/407,750	9/25/84
4,473,003	06/459,111	9/25/84
4,473,004	06/423,647	9/25/84
4,473,007	06/331,282	9/25/84
4,473,008	06/534,103	9/25/84
4,473,010	06/327,465	9/25/84
4,473,011	06/358,057	9/25/84
4,473,013	06/515,571	9/25/84
4,473,019	06/435,576	9/25/84
4,473,023	06/410,553	9/25/84
4,473,025	06/406,259	9/25/84
4,473,027	06/419,573	9/25/84
4,473,030	06/426,073	9/25/84
4,473,033	06/592,455	9/25/84
4,473,036	06/453,980	9/25/84
4,473,039	06/288,296	9/25/84
4,473,046	06/513,490	9/25/84
4,473,048	06/482,744	9/25/84
4,473,059	06/327,815	9/25/84
4,473,060	06/455,657	9/25/84
4,473,062	06/512,104	9/25/84
4,473,065	06/365,946	9/25/84
4,473,080	06/334,170	9/25/84
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4,473,092	06/401,601	9/25/84
4,473,093	06/505,451	9/25/84
4,473,094	06/386,776	9/25/84
4,473,098	06/505,320	9/25/84
4,473,112	06/527,371	9/25/84
4,473,117	06/453,440	9/25/84
4,473,118	06/345,104	9/25/84
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4,473,124	06/490,918	9/25/84
4,473,129	06/294,353	9/25/84
4,473,131	06/485,922	9/25/84
4,473,142	06/347,211	9/25/84
4,473,144	06/379,429	9/25/84
4,473,153	06/448,642	9/25/84
4,473,156	06/439,393	9/25/84
4,473,157	06/337,754	9/25/84
4,473,158	06/317,553	9/25/84
4,473,161	06/550,987	9/25/84
4,473,163	06/442,658	9/25/84
4,473,164	06/411,144	9/25/84
4,473,166	06/431,202	9/25/84
4,473,171	06/254,734	9/25/84
4,473,174	06/403,293	9/25/84
4,473,176	06/449,518	9/25/84
4,473,177	06/510,619	9/25/84
4,473,180	06/410,973	9/25/84
4,473,190	06/481,283	9/25/84
4,473,194	06/472,602	9/25/84
4,473,214	06/418,622	9/25/84
4,473,225	06/582,359	9/25/84
4,473,233	06/349,547	9/25/84
4,473,237	06/483,376	9/25/84
4,473,239	06/384,593	9/25/84
4,473,240	06/417,666	9/25/84
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4,473,253	06/423,432	9/25/84
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4,473,256	06/458,814	9/25/84
4,473,263	06/226,924	9/25/84
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4,473,279	06/360,060	9/25/84
4,473,282	06/278,947	9/25/84
4,473,285	06/325,337	9/25/84

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4,473,336	06/418,022	9/25/84
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4,473,360	06/249,810	9/25/84
4,473,361	06/342,746	9/25/84
4,473,373	06/496,580	9/25/84
4,473,377	06/393,898	9/25/84
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4,473,386	06/515,606	9/25/84
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4,473,418	06/545,766	9/25/84
4,473,419	06/544,214	9/25/84
4,473,422	06/417,259	9/25/84
4,473,431	06/459,537	9/25/84
4,473,432	06/463,714	9/25/84
4,473,441	06/473,806	9/25/84
4,473,442	06/350,684	9/25/84
4,473,443	06/360,304	9/25/84
4,473,447	06/405,217	9/25/84
4,473,449	06/421,667	9/25/84
4,473,458	06/527,855	9/25/84
4,473,460	06/344,016	9/25/84
4,473,462	06/486,979	9/25/84
4,473,467	06/466,613	9/25/84
4,473,473	06/230,708	9/25/84
4,473,476	06/463,077	9/25/84
4,473,479	06/446,997	9/25/84
4,473,481	06/447,634	9/25/84
4,473,490	06/480,201	9/25/84
4,473,494	06/497,455	9/25/84
4,473,496	06/546,076	9/25/84
4,473,497	06/472,440	9/25/84
4,473,500	06/374,120	9/25/84
4,473,505	06/423,641	9/25/84
4,473,506	06/434,794	9/25/84
4,473,510	06/445,679	9/25/84
4,475,511	06/506,998	9/25/84
4,473,515	06/444,830	9/25/84
4,473,519	06/428,273	9/25/84
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4,473,586	06/374,352	9/25/84
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(4,476,594)	(06/447,216)	(10/16/84)
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4,480,097	06/228,624	10/30/84
4,480,098	06/441,136	10/30/84
4,480,107	06/323,578	10/30/84
4,480,126	06/369,759	10/30/84
4,480,130	06/529,914	10/30/84
4,480,131	06/500,037	10/30/84
4,480,133	06/472,196	10/30/84
4,480,136	06/456,984	10/30/84
4,480,141	06/507,398	10/30/84
4,480,143	06/229,610	10/30/84
4,480,147	06/463,209	10/30/84
4,480,148	06/377,059	10/30/84
4,480,153	06/481,723	10/30/84
4,480,156	06/319,783	10/30/84
4,480,168	06/363,301	10/30/84
4,480,171	06/445,604	10/30/84
4,480,172	06/389,224	10/30/84
4,480,173	06/275,736	10/30/84
4,480,178	06/481,832	10/30/84
4,480,180	06/261,683	10/30/84
4,480,186	06/380,266	10/30/84
4,480,191	06/424,083	10/30/84
4,480,192	06/349,396	10/30/84
4,480,193	06/502,550	10/30/84
4,480,198	06/380,313	10/30/84
4,480,202	06/471,144	10/30/84
4,480,207	06/453,666	10/30/84
4,480,208	06/430,673	10/30/84
4,480,212	06/387,737	10/30/84
4,480,214	06/369,262	10/30/84
4,480,218	06/480,049	10/30/84
4,480,220	06/318,404	10/30/84
4,480,225	06/347,759	10/30/84
4,480,229	06/450,838	10/30/84
4,480,233	06/424,948	10/30/84
4,480,234	06/303,604	10/30/84
4,480,237	06/424,371	10/30/84
4,480,240	06/432,089	10/30/84
4,480,242	06/479,616	10/30/84
4,480,243	06/398,470	10/30/84
4,480,244	06/393,097	10/30/84
4,480,254	06/431,058	10/30/84
4,480,256	06/478,203	10/30/84
4,480,257	06/461,840	10/30/84
4,480,264	06/388,029	10/30/84
4,480,266	06/390,900	10/30/84
4,480,268	06/384,716	10/30/84
4,480,280	06/403,958	10/30/84
4,480,285	06/449,896	10/30/84
4,480,289	06/537,780	10/30/84
4,480,292	06/364,008	10/30/84
4,480,293	06/541,886	10/30/84

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4,480,326	06/514,342	10/30/84
4,480,329	06/368,708	10/30/84
4,480,331	06/382,507	10/30/84
Re. 31,948	06/692,500	7/16/85
(4,480,997)	(06/568,082)	(11/06/84)
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4,480,344	06/478,028	11/06/84
4,480,348	06/477,729	11/06/84
4,480,349	06/544,797	11/06/84
4,480,355	06/409,289	11/06/84
4,480,357	06/396,154	11/06/84
4,480,362	06/337,395	11/06/84
4,480,365	06/454,686	11/06/84
4,480,367	06/364,981	11/06/84
4,480,394	06/479,907	11/06/84
4,480,398	06/532,788	11/06/84
4,480,399	06/491,606	11/06/84
4,480,408	06/486,302	11/06/84
4,480,411	06/324,129	11/06/84
4,480,419	06/392,317	11/06/84
4,480,424	06/319,642	11/06/84
4,480,426	06/340,625	11/06/84
4,480,427	06/493,624	11/06/84
4,480,434	06/430,512	11/06/84
4,480,439	06/335,336	11/06/84
4,480,444	06/497,342	11/06/84
4,480,448	06/473,041	11/06/84
4,480,450	06/523,140	11/06/84
4,480,453	06/559,975	11/06/84
4,480,462	06/436,619	11/06/84
4,480,465	06/518,004	11/06/84
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4,480,472	06/466,873	11/06/84
4,480,476	06/463,131	11/06/84
4,480,479	06/432,933	11/06/84
4,480,480	06/371,802	11/06/84
4,480,482	06/434,323	11/06/84
4,480,483	06/482,736	11/06/84
4,480,485	06/432,353	11/06/84
4,480,487	06/492,049	11/06/84
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4,480,493	06/350,384	11/06/84
4,480,502	06/300,750	11/06/84
4,480,503	06/225,428	11/06/84
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4,480,507	06/360,768	11/06/84
4,480,508	06/369,113	11/06/84
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4,480,517	06/397,694	11/06/84
4,480,521	06/404,895	11/06/84
4,480,531	06/382,826	11/06/84
4,480,536	06/565,649	11/06/84
4,480,537	06/516,974	11/06/84
4,480,544	06/465,498	11/06/84
4,480,552	06/422,398	11/06/84
4,480,554	06/394,174	11/06/84
4,480,562	06/456,474	11/06/84
4,480,568	06/472,142	11/06/84
4,480,569	06/457,470	11/06/84
4,480,575	06/391,026	11/06/84
4,480,577	06/416,928	11/06/84
4,480,580	06/460,744	11/06/84
4,480,582	06/484,482	11/06/84
4,480,586	06/417,572	11/06/84
4,480,588	06/520,833	11/06/84
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4,480,600	06/381,075	11/06/84
4,480,601	06/563,932	11/06/84
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4,480,609	06/313,304	11/06/84
4,480,610	06/576,662	11/06/84
4,480,612	06/403,739	11/06/84
4,480,613	06/516,183	11/06/84
4,480,618	06/436,943	11/06/84
4,480,621	06/594,443	11/06/84
4,480,625	06/421,302	11/06/84
4,480,628	06/448,975	11/06/84
4,480,631	06/439,304	11/06/84
4,480,632	06/363,451	11/06/84
4,480,639	06/423,659	11/06/84
4,480,643	06/398,072	11/06/84
4,480,654	06/411,913	11/06/84
4,480,658	06/418,603	11/06/84
4,480,659	06/508,003	11/06/84
4,480,663	06/417,300	11/06/84
4,480,666	06/484,145	11/06/84
4,480,676	06/532,495	11/06/84
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4,480,687	06/468,929	11/06/84
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4,480,691	06/427,134	11/06/84
4,480,692	06/437,084	11/06/84
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4,480,702	06/508,767	11/06/84
4,480,705	06/405,641	11/06/84
4,480,706	06/428,817	11/06/84
4,480,707	06/438,902	11/06/84
4,480,709	06/377,463	11/06/84
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4,480,713	06/442,233	11/06/84
4,480,715	06/428,729	11/06/84
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4,480,720	06/437,862	11/06/84
4,480,724	06/468,148	11/06/84
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4,480,733	06/260,483	11/06/84
4,480,735	06/423,616	11/06/84
4,480,740	06/396,905	11/06/84
4,480,744	06/447,707	11/06/84
4,480,747	06/509,475	11/06/84
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4,480,758	06/438,581	11/06/84
4,480,763	06/431,820	11/06/84
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4,480,765	06/449,351	11/06/84
4,480,766	06/422,392	11/06/84
4,480,769	06/388,410	11/06/84
4,480,770	06/294,323	11/06/84
4,480,775	06/431,244	11/06/84
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4,480,782	06/454,676	11/06/84
4,480,783	06/528,820	11/06/84
4,480,787	06/420,063	11/06/84
4,480,789	06/506,585	11/06/84
4,480,791	06/392,008	11/06/84
4,480,798	06/541,187	11/06/84
4,480,801	06/377,607	11/06/84
4,480,804	06/348,182	11/06/84
4,480,807	06/417,175	11/06/84
4,480,816	06/376,936	11/06/84
4,480,820	06/451,143	11/06/84
4,480,826	06/396,481	11/06/84
4,480,831	06/357,584	11/06/84
4,480,833	06/366,342	11/06/84
4,480,834	06/433,031	11/06/84
4,480,842	06/507,863	11/06/84
4,480,846	06/486,568	11/06/84
4,480,847	06/417,348	11/06/84
4,480,848	06/490,781	11/06/84
4,480,849	06/410,660	11/06/84
4,480,850	06/420,829	11/06/84
4,480,853	06/429,119	11/06/84

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4,480,865	06/359,170	11/06/84
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4,480,876	06/387,549	11/06/84
4,480,885	06/467,002	11/06/84
4,480,887	06/388,212	11/06/84
4,480,890	06/311,034	11/06/84
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4,480,900	06/503,003	11/06/84
4,480,907	06/460,612	11/06/84
4,480,912	06/351,960	11/06/84
4,480,916	06/395,769	11/06/84
4,480,918	06/354,807	11/06/84
4,480,920	06/519,216	11/06/84
4,480,922	06/437,501	11/06/84
4,480,929	06/410,970	11/06/84
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4,480,936	06/460,247	11/06/84
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4,480,943	06/397,197	11/06/84
4,480,948	06/400,209	11/06/84
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4,480,970	06/383,191	11/06/84
4,480,975	06/452,669	11/06/84
4,480,976	06/471,146	11/06/84
4,480,985	06/352,331	11/06/84
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4,481,024	06/436,183	11/06/84
4,481,025	06/426,615	11/06/84
4,481,026	06/541,504	11/06/84
4,481,034	06/417,671	11/06/84
4,481,035	06/526,374	11/06/84
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4,481,043	06/447,727	11/06/84
4,481,058	06/413,186	11/06/84
4,481,059	06/456,591	11/06/84
4,481,066	06/585,138	11/06/84
4,481,069	06/337,231	11/06/84
4,481,071	06/566,871	11/06/84
4,481,072	06/410,162	11/06/84
4,481,080	06/494,236	11/06/84
4,481,083	06/528,184	11/06/84
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4,481,088	06/395,753	11/06/84
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4,481,094	06/548,042	11/06/84
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4,481,147	06/512,322	11/06/84
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4,481,153	06/447,111	11/06/84
4,481,159	06/456,430	11/06/84
4,481,161	06/458,289	11/06/84
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4,481,173	06/443,497	11/06/84
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4,481,182	06/566,192	11/06/84
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4,481,194	06/586,934	11/06/84
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4,481,204	06/509,150	11/06/84
4,481,206	06/505,717	11/06/84
4,481,207	06/523,349	11/06/84
4,481,217	06/269,930	11/06/84
4,481,221	06/531,999	11/06/84
4,481,222	06/536,075	11/06/84
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4,481,235	06/531,678	11/06/84
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4,481,263	06/535,122	11/06/84
4,481,266	06/478,695	11/06/84
4,481,269	06/497,603	11/06/84
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4,481,301	06/444,152	11/06/84
4,481,302	06/461,318	11/06/84
4,481,310	06/503,081	11/06/84
4,481,316	06/452,266	11/06/84
4,481,321	06/516,047	11/06/84
4,481,326	06/517,486	11/06/84
4,481,327	06/454,292	11/06/84
4,481,333	06/566,207	11/06/84
4,481,338	06/528,171	11/06/84
4,481,339	06/532,326	11/06/84
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4,481,404	06/452,223	11/06/84
4,481,408	06/549,088	11/06/84
4,481,409	06/438,770	11/06/84
4,481,416	06/450,875	11/06/84
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4,481,423	06/329,159	11/06/84
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4,481,433	06/402,903	11/06/84
4,481,438	06/417,657	11/06/84
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4,481,450	06/480,127	11/06/84
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4,481,475	06/405,465	11/06/84
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4,481,491	06/456,136	11/06/84
4,481,502	06/362,554	11/06/84
4,481,503	06/403,281	11/06/84
4,481,510	06/333,408	11/06/84
4,481,513	06/377,311	11/06/84
4,481,515	06/364,296	11/06/84
4,481,516	06/428,196	11/06/84
4,481,517	06/261,415	11/06/84
4,481,525	06/407,348	11/06/84

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4,481,549	06/219,048	11/06/84
4,481,552	06/315,792	11/06/84
4,481,558	06/428,287	11/06/84
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4,481,568	06/313,614	11/06/84
4,481,570	06/291,645	11/06/84
4,481,576	06/359,643	11/06/84
4,481,579	06/397,389	11/06/84
4,481,581	06/470,249	11/06/84
4,481,584	06/288,314	11/06/84
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4,481,596	06/316,999	11/06/84
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4,481,622	06/364,320	11/06/84
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4,481,629	06/552,019	11/06/84
4,481,634	06/489,512	11/06/84
4,481,641	06/429,418	11/06/84
4,481,653	06/407,287	11/06/84
4,481,656	06/374,805	11/06/84
4,481,660	06/443,008	11/06/84
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4,481,666	06/332,213	11/06/84
4,481,668	06/492,338	11/06/84
4,481,671	06/435,685	11/06/84
4,481,674	06/393,773	11/06/84
4,481,680	06/496,610	11/13/84
4,481,682	06/479,819	11/13/84
4,481,684	06/366,843	11/13/84
4,481,689	06/399,298	11/13/84
4,481,691	06/451,483	11/13/84
4,481,702	06/429,893	11/13/84
4,481,711	06/427,403	11/13/84
4,481,712	06/476,920	11/13/84
4,481,716	06/468,293	11/13/84
4,481,717	06/461,646	11/13/84
4,481,724	06/370,124	11/13/84
4,481,725	06/350,749	11/13/84
4,481,730	06/345,218	11/13/84
4,481,736	06/283,441	11/13/84
4,481,739	06/420,629	11/13/84
4,481,741	06/466,688	11/13/84
4,481,751	06/288,140	11/13/84
4,481,755	06/302,643	11/13/84
4,481,756	06/313,822	11/13/84
4,481,757	06/352,535	11/13/84
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4,484,453	06/433,543	11/27/84
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4,484,477	06/427,693	11/27/84
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4,484,488	06/370,303	11/27/84
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4,484,492	06/354,201	11/27/84
4,484,493	06/343,277	11/27/84
4,484,495	06/370,447	11/27/84
4,484,496	06/420,315	11/27/84
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4,484,501	06/418,091	11/27/84
4,484,502	06/475,514	11/27/84
4,484,503	06/513,550	11/27/84
4,484,505	06/457,966	11/27/84
4,484,512	06/301,032	11/27/84
4,484,514	06/471,032	11/27/84
4,484,517	06/354,625	11/27/84
4,484,523	06/479,424	11/27/84
4,484,525	06/395,508	11/27/84
4,484,527	06/401,190	11/27/84
4,484,529	06/469,919	11/27/84
4,484,530	06/501,738	11/27/84

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4,484,534	06/476,293	11/27/84
4,484,535	06/477,232	11/27/84
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4,484,537	06/570,820	11/27/84
4,484,538	06/552,455	11/27/84
4,484,541	06/461,918	11/27/84
4,484,542	06/370,121	11/27/84
4,484,544	06/528,530	11/27/84
4,484,546	06/351,178	11/27/84
4,484,547	06/575,483	11/27/84
4,484,550	06/355,752	11/27/84
4,484,555	06/463,809	11/27/84
4,484,557	06/381,900	11/27/84
4,484,558	06/492,015	11/27/84
4,484,562	06/492,373	11/27/84
4,484,564	06/402,605	11/27/84
4,484,566	06/355,369	11/27/84
4,484,567	06/354,676	11/27/84
4,484,572	06/468,353	11/27/84
4,484,573	06/400,816	11/27/84
4,484,574	06/573,854	11/27/84
4,484,580	06/335,599	11/27/84
4,484,582	06/301,165	11/27/84
4,484,583	06/267,046	11/27/84
4,484,589	06/392,776	11/27/84
4,484,590	06/344,836	11/27/84
4,484,593	06/394,619	11/27/84
4,484,598	06/385,878	11/27/84
4,484,599	06/535,356	11/27/84
4,484,603	06/463,022	11/27/84
4,484,604	06/529,264	11/27/84
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4,484,621	06/368,767	11/27/84
4,484,623	06/482,968	11/27/84
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4,484,627	06/509,839	11/27/84
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4,484,879	06/477,395	11/27/84
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4,484,917	06/531,160	11/27/84
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4,484,944	06/545,849	11/27/84
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4,484,996	06/476,185	11/27/84
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4,486,418	06/501,392	12/04/84
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4,486,440	06/523,954	12/04/84
4,486,441	06/447,855	12/04/84
4,486,442	06/469,856	12/04/84
4,486,444	06/505,604	12/04/84
4,486,445	06/457,372	12/04/84
4,486,446	06/219,764	12/04/84
4,486,447	06/507,468	12/04/84
4,486,452	06/416,897	12/04/84
4,486,455	06/431,071	12/04/84
4,486,456	06/533,852	12/04/84
4,486,458	06/552,633	12/04/84
4,486,459	06/330,957	12/04/84
4,486,460	06/516,734	12/04/84
4,486,468	06/412,441	12/04/84
4,486,472	06/451,319	12/04/84
4,486,475	06/326,719	12/04/84
4,486,477	06/507,147	12/04/84
4,486,478	06/421,273	12/04/84
4,486,479	06/549,095	12/04/84
4,486,481	06/526,504	12/04/84
4,486,485	06/526,144	12/04/84
4,486,491	06/579,397	12/04/84
4,486,493	06/470,323	12/04/84
4,486,501	06/468,192	12/04/84
4,486,505	06/441,634	12/04/84
4,486,507	06/375,210	12/04/84
4,486,513	06/361,551	12/04/84
4,486,514	06/595,365	12/04/84
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4,486,535	06/366,236	12/04/84
4,486,541	06/559,018	12/04/84
4,486,542	06/534,231	12/04/84
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4,486,561	06/513,677	12/04/84
4,486,571	06/455,719	12/04/84
4,486,574	06/412,418	12/04/84
4,486,576	06/370,825	12/04/84
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4,486,584	06/450,879	12/04/84
4,486,588	06/435,164	12/04/84
4,486,589	06/435,711	12/04/84
4,486,591	06/426,580	12/04/84
4,486,592	06/543,200	12/04/84
4,486,593	06/459,074	12/04/84
4,486,596	06/526,938	12/04/84
4,486,598	06/351,069	12/04/84
4,486,600	06/552,102	12/04/84
4,486,604	06/430,510	12/04/84
4,486,606	06/477,470	12/04/84
4,486,611	06/412,643	12/04/84
4,486,613	06/420,137	12/04/84
4,486,616	06/493,853	12/04/84
4,486,617	06/553,122	12/04/84
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4,486,622	06/510,382	12/04/84
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4,486,630	06/474,357	12/04/84
4,486,633	06/405,479	12/04/84
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4,486,638	06/434,148	12/04/84
4,486,646	06/364,173	12/04/84
4,486,654	06/302,653	12/04/84
4,486,656	06/360,018	12/04/84
4,486,657	06/382,850	12/04/84
4,486,661	06/390,503	12/04/84
4,486,662	06/453,646	12/04/84
4,486,664	06/401,614	12/04/84
4,486,666	06/418,411	12/04/84
4,486,667	06/314,534	12/04/84
4,486,669	06/319,112	12/04/84
4,486,671	06/362,711	12/04/84
4,486,679	06/546,235	12/04/84
4,486,680	06/472,010	12/04/84
4,486,683	06/315,327	12/04/84
4,486,687	06/261,466	12/04/84
4,486,668	06/349,694	12/04/84
4,486,690	06/579,751	12/04/84
4,486,693	06/395,487	12/04/84
4,486,695	06/460,493	12/04/84
4,486,698	06/290,313	12/04/84
4,486,701	06/342,391	12/04/84
4,486,710	06/415,956	12/04/84
4,486,712	06/305,468	12/04/84
4,486,713	06/306,301	12/04/84
4,486,714	06/406,742	12/04/84
4,486,720	06/402,634	12/04/84
4,486,723	06/456,033	12/04/84
4,486,727	06/421,674	12/04/84
4,486,729	06/499,142	12/04/84
4,486,730	06/431,625	12/04/84
4,486,732	06/411,855	12/04/84
4,486,733	06/428,503	12/04/84
4,486,735	06/401,734	12/04/84
4,486,736	06/444,371	12/04/84
4,486,737	06/463,912	12/04/84
4,486,740	06/447,492	12/04/84
4,486,742	06/306,830	12/04/84
4,486,751	06/377,315	12/04/84
4,486,767	06/269,767	12/04/84
4,486,768	06/526,796	12/04/84
4,486,771	06/475,216	12/04/84
4,486,775	06/313,009	12/04/84
4,486,777	06/432,408	12/04/84
4,486,778	06/377,085	12/04/84
4,486,779	06/394,542	12/04/84
4,486,781	06/369,395	12/04/84
4,486,787	06/407,622	12/04/84
4,486,790	06/343,998	12/04/84
4,486,800	06/450,444	12/04/84
4,486,802	06/451,480	12/04/84
4,486,805	06/473,175	12/04/84
4,486,808	06/446,564	12/04/84

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Patent Number	Serial Number	Issue Date	4,486,985	06/281,312	12/11/84
			4,486,986	06/473,694	12/11/84
4,486,809	06/403,914	12/04/84	4,486,987	06/450,548	12/11/84
4,486,810	06/530,611	12/04/84	4,486,988	06/423,253	12/11/84
4,486,812	06/470,750	12/04/84	4,486,989	06/397,671	12/11/84
4,486,816	06/443,661	12/04/84	4,486,992	06/519,188	12/11/84
4,486,817	06/409,514	12/04/84	4,486,995	06/365,629	12/11/84
4,486,823	06/434,981	12/04/84	4,486,996	06/379,707	12/11/84
4,486,824	06/355,923	12/04/84	4,487,000	06/368,669	12/11/84
4,486,825	06/350,627	12/04/84	4,487,002	06/502,719	12/11/84
4,486,832	06/294,986	12/04/84	4,487,003	06/471,264	12/11/84
4,486,835	06/286,538	12/04/84	4,487,008	06/425,041	12/11/84
4,486,842	06/347,080	12/04/84	4,487,009	06/469,670	12/11/84
4,486,843	06/354,314	12/04/84	4,487,012	06/452,802	12/11/84
4,486,847	06/577,121	12/04/84	4,487,013	06/468,112	12/11/84
4,486,853	06/249,830	12/04/84	4,487,017	06/408,133	12/11/84
4,486,854	06/311,742	12/04/84	4,487,022	06/413,865	12/11/84
4,486,855	06/343,140	12/04/84	4,487,024	06/475,822	12/11/84
4,486,862	06/409,670	12/04/84	4,487,025	06/485,805	12/11/84
4,486,867	06/535,447	12/04/84	4,487,026	06/357,360	12/11/84
4,486,868	06/305,358	12/04/84	4,487,029	06/467,602	12/11/84
4,486,869	06/347,767	12/04/84	4,487,030	06/521,189	12/11/84
4,486,870	06/399,862	12/04/84	4,487,034	06/519,798	12/11/84
4,486,872	06/426,009	12/04/84	4,487,036	06/532,109	12/11/84
4,486,874	06/594,068	12/04/84	4,487,039	06/534,127	12/11/84
4,486,875	06/478,935	12/04/84	4,487,048	06/374,147	12/11/84
4,486,876	06/413,469	12/04/84	4,487,049	06/290,009	12/11/84
4,486,879	06/340,391	12/04/84	4,487,056	06/427,258	12/11/84
4,486,882	06/412,066	12/04/84	4,487,061	06/450,597	12/11/84
4,486,886	06/427,975	12/04/84	4,487,064	06/494,206	12/11/84
4,486,888	06/293,731	12/04/84	4,487,065	06/473,144	12/11/84
4,486,889	06/519,096	12/04/84	4,487,066	06/242,320	12/11/84
4,486,890	06/285,389	12/04/84	4,487,067	06/520,797	12/11/84
4,486,891	06/342,922	12/04/84	4,487.068	06/502,771	12/11/84
4,486,894	06/339,512	12/04/84	4,487,072	06/407,295	12/11/84
4,486,897	06/463,813	12/04/84	4,487,075	06/485,153	12/11/84
4,486,902	06/454,639	12/11/84	4,487,076	06/436,426	12/11/84
4,486,904	06/473,890	12/11/84	4,487,078	06/425,035	12/11/84
4,486,907	06/531,062	12/11/84	4,487,079	06/468,204	12/11/84
4,486,908	06/259,600	12/11/84	4,487,080	06/502,363	12/11/84
4,486,910	06/371,132	12/11/84	4,487,084	06/347,978	12/11/84
4,486,911	06/557,244	12/11/84	4,487,085	06/220,421	12/11/84
4,486,913	06/423,998	12/11/84	4,487,086	06/240,505	12/11/84
4,486,916	06/311,639	12/11/84	4,487,088	06/362,920	12/11/84
4,486,918	06/489,892	12/11/84	4,487,091	06/344,886	12/11/84
4,486,919	06/444,463	12/11/84	4,487,092	06/448,710	12/11/84
4,486,922	06/397,403	12/11/84	4,487,094	06/463,748	12/11/84
4,486,924	06/492,879	12/11/84	4,487,095	06/554,053	12/11/84
4,486,925	06/424,015	12/11/84	4,487,096	06/469,177	12/11/84
4,486,928	06/281,584	12/11/84	4,487,097	06/430,533	12/11/84
4,486,930	06/434,559	12/11/84	4,487,100	06/597,655	12/11/84
4,486,931	06/412,086	12/11/84	4,487,102	06/510,040	12/11/84
4,486,934	06/338,434	12/11/84	4,487,104	06/295,602	12/11/84
4,486,937	06/367,913	12/11/84	4,487,107	06/318,569	12/11/84
4,486,945	06/456,081	12/11/84	4,487,108	06/422,362	12/11/84
4,486,948	06/506,798	12/11/84	4,487,110	06/448,847	12/11/84
4,486,949	06/431,917	12/11/84	4,487,113	06/373,369	12/11/84
4,486,951	06/414,615	12/11/84	4,487,115	06/513,251	12/11/84
4,486,953	06/393,328	12/11/84	4,487,116	06/496,486	12/11/84
4,486,954	06/286,928	12/11/84	4,487,117	06/540,104	12/11/84
4,486,955	06/488,747	12/11/84	4,487,118	06/331,968	12/11/84
4,486,956	06/456,839	12/11/84	4,487,122	06/548,640	12/11/84
4,486,957	06/460,486	12/11/84	4,487,126	06/472,003	12/11/84
4,486,958	06/468,964	12/11/84	4,487,128	06/432,588	12/11/84
4,486,959	06/566,421	12/11/84	4,487,129	06/539,142	12/11/84
4,486,960	06/434,323	12/11/84	4,487,130	06/456,908	12/11/84
4,486,961	06/476,669	12/11/84	4,487,134	06/404,363	12/11/84
4,486,963	06/425,926	12/11/84	4,487,135	06/394,458	12/11/84
4,486,966	06/559,309	12/11/84	4,487,137	06/459,816	12/11/84
4,486,967	06/562,075	12/11/84	4,487,140	06/577,350	12/11/84
4,486,971	06/532,875	12/11/84	4,487,141	06/614,581	12/11/84
4,486,972	06/328,233	12/11/84	4,487,144	06/426,954	12/11/84
4,486,973	06/394,589	12/11/84	4,487,145	06/404,335	12/11/84
4,486,974	06/424,304	12/11/84	4,487,146	06/467,989	12/11/84
4,486,976	06/406,221	12/11/84	4,487,147	06/528,139	12/11/84
4,486,977	06/407,331	12/11/84	4,487,148	06/426,049	12/11/84
4,486,979	06/497,502	12/11/84	4,487,149	06/598,542	12/11/84
4,486,980	06/572,762	12/11/84	4,487,155	06/404,698	12/11/84

Patent Number	Serial Number	Issue Date	4,487,302	06/367,924	12/11/84
			4,487,303	06/453,302	12/11/84
4,487,156	06/361,991	12/11/84	4,487,304	06/387,426	12/11/84
4,487,163	06/448,999	12/11/84	4,487,305	06/333,288	12/11/84
4,487,164	06/393,926	12/11/84	4,487,310	06/389,687	12/11/84
4,487,165	06/572,174	12/11/84	4,487,311	06/484,808	12/11/84
4,487,167	06/341,764	12/11/84	4,487,312	06/474,075	12/11/84
4,487,169	06/418,028	12/11/84	4,487,313	06/483,905	12/11/84
4,487,170	06/421,332	12/11/84	4,487,314	06/460,262	12/11/84
4,487,171	06/497,203	12/11/84	4,487,316	06/514,141	12/11/84
4,487,172	06/468,708	12/11/84	4,487,325	06/395,396	12/11/84
4,487,173	06/414,433	12/11/84	4,487,326	06/550,349	12/11/84
4,487,175	06/338,057	12/11/84	4,487,327	06/451,844	12/11/84
4,487,178	06/444,792	12/11/84	4,487,328	06/437,640	12/11/84
4,487,179	06/436,835	12/11/84	4,487,331	06/497,635	12/11/84
4,487,183	06/488,945	12/11/84	4,487,333	06/352,753	12/11/84
4,487,184	06/482,327	12/11/84	4,487,336	06/384,096	12/11/84
4,487,186	06/323,795	12/11/84	4,487,338	06/431,801	12/11/84
4,487,187	06/462,360	12/11/84	4,487,339	06/395,124	12/11/84
4,487,189	06/477,783	12/11/84	4,487,340	06/399,196	12/11/84
4,487,191	06/550,788	12/11/84	4,487,342	06/377,097	12/11/84
4,487,194	06/522,963	12/11/84	4,487,343	06/446,207	12/11/84
4,487,196	06/440,193	12/11/84	4,487,349	06/501,424	12/11/84
4,487,201	06/443,062	12/11/84	4,487,347	06/531,405	12/11/84
4,487,204	06/433,672	12/11/84	4,487,350	06/483,077	12/11/84
4,487,208	06/459,741	12/11/84	4,487,352	06/321,219	12/11/84
4,487,211	06/490,787	12/11/84	4,487,355	06/376,014	12/11/84
4,487,212	06/282,773	12/11/84	4,487,356	06/271,071	12/11/84
4,487,213	06/416,163	12/11/84	4,487,358	06/420,057	12/11/84
4,487,214	06/303,477	12/11/84	4,487,359	06/497,111	12/11/84
4,487,220	06/522,443	12/11/84	4,487,361	06/432,074	12/11/84
4,487,224	06/361,544	12/11/84	4,487,363	06/470,331	12/11/84
4,487,225	06/442,246	12/11/84	4,487,364	06/452,928	12/11/84
4,487,226	06/534,321	12/11/84	4,487,368	06/432,853	12/11/84
4,487,229	06/503,419	12/11/84	4,487,369	06/583,802	12/11/84
4,487,233	06/483,526	12/11/84	4,487,371	06/377,653	12/11/84
4,487,234	06/365,549	12/11/84	4,487,376	06/477,165	12/11/84
4,487,237	06/459,974	12/11/84	4,487,382	06/414,820	12/11/84
4,487,239	06/330,093	12/11/84	4,487,384	06/414,249	12/11/84
4,487,241	06/420,165	12/11/84	4,487,386	06/354,603	12/11/84
4,487,242	06/239,188	12/11/84	4,487,387	06/374,179	12/11/84
4,487,243	06/380,947	12/11/84	4,487,389	06/442,289	12/11/84
4,487,247	06/403,354	12/11/84	4,487,395	06/493,953	12/11/84
4,487,250	06/367,994	12/11/84	4,487,396	06/532,060	12/11/84
4,487,252	06/521,772	12/11/84	4,487,397	06/227,064	12/11/84
4,487,253	06/318,581	12/11/84	4,487,398	06/548,969	12/11/84
4,487,254	06/484,223	12/11/84	4,487,400	06/517,046	12/11/84
4,487,255	06/527,779	12/11/84	4,487,401	06/442,276	12/11/84
4,487,256	06/282,259	12/11/84	4,487,403	06/411,602	12/11/84
4,487,257	06/307,132	12/11/84	4,487,404	06/394,805	12/11/84
4,487,260	06/584,980	12/11/84	4,487,410	06/431,847	12/11/84
4,487,262	06/452,163	12/11/84	4,487,411	06/431,211	12/11/84
4,487,263	06/453,166	12/11/84	4,487,412	06/512,229	12/11/84
4,487,264	06/394,685	12/11/84	4,487,415	06/502,221	12/11/84
4,487,265	06/333,439	12/11/84	4,487,416	06/409,414	12/11/84
4,487,268	06/462,351	12/11/84	4,487,417	06/425,224	12/11/84
4,487,269	06/487,796	12/11/84	4,487,418	06/605,481	12/11/84
4,487,271	06/348,609	12/11/84	4,487,419	06/554,542	12/11/84
4,487,273	06/469,576	12/11/84	4,487,422	06/403,656	12/11/84
4,487,274	06/400,233	12/11/84	4,487,424	06/459,716	12/11/84
4,487,275	06/468,369	12/11/84	4,487,425	06/447,314	12/11/84
4,487,277	06/416,324	12/11/84	4,487,428	06/429,253	12/11/84
4,487,278	06/525,884	12/11/84	4,487,430	06/344,026	12/11/84
4,487,281	06/438,554	12/11/84	4,487,431	06/282,751	12/11/84
4,487,283	06/428,468	12/11/84	4,487,435	06/350,109	12/11/84
4,487,284	06/441,296	12/11/84	4,487,437	06/333,843	12/11/84
4,487,285	06/455,947	12/11/84	4,487,443	06/469,633	12/11/84
4,487,286	06/485,372	12/11/84	4,487,444	06/412,231	12/11/84
4,487,289	06/353,181	12/11/84	4,487,445	06/472,594	12/11/84
4,487,290	06/490,011	12/11/84	4,487,446	06/399,685	12/11/84
4,487,293	06/478,592	12/11/84	4,487,449	06/388,621	12/11/84
4,487,294	06/407,780	12/11/84	4,487,453	06/453,217	12/11/84
4,487,295	06/498,900	12/11/84	4,487,454	06/489,455	12/11/84
4,487,297	06/415,427	12/11/84	4,487,455	06/498,770	12/11/84
4,487,298	06/490,275	12/11/84	4,487,456	06/442,260	12/11/84
4,487,299	06/356,406	12/11/84	4,487,457	06/425,160	12/11/84
4,487,300	06/447,335	12/11/84	4,487,458	06/425,196	12/11/84
4,487,301	06/316,826	12/11/84	4,487,459	06/510,374	12/11/84

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4,487,461	06/477,957	12/11/84
4,487,462	06/466,149	12/11/84
4,487,463	06/468,517	12/11/84
4,487,464	06/415,024	12/11/84
4,487,466	06/449,343	12/11/84
4,487,467	06/355,338	12/11/84
4,487,470	06/493,534	12/11/84
4,487,473	06/334,238	12/11/84
4,487,476	06/258,500	12/11/84
4,487,479	06/474,200	12/11/84
4,487,484	06/532,150	12/11/84
4,487,487	06/474,570	12/11/84
4,487,488	06/474,539	12/11/84
4,487,490	06/408,405	12/11/84
4,487,498	06/394,921	12/11/84
4,487,500	06/363,070	12/11/84
4,487,503	06/318,905	12/11/84
4,487,504	06/417,346	12/11/84
4,487,506	06/410,202	12/11/84
4,487,507	06/546,455	12/11/84
4,487,511	06/357,890	12/11/84
4,487,512	06/460,122	12/11/84
4,487,513	06/460,603	12/11/84
4,487,516	06/469,157	12/11/84
4,487,520	06/324,036	12/11/84
4,487,521	06/350,106	12/11/84
4,487,523	06/336,052	12/11/84
4,487,526	06/464,999	12/11/84
4,487,533	06/329,063	12/11/84
4,487,535	06/473,724	12/11/84
4,487,537	06/462,817	12/11/84
4,487,538	06/354,802	12/11/84
4,487,540	06/433,465	12/11/84
4,487,541	06/305,912	12/11/84
4,487,542	06/413,690	12/11/84
4,487,543	06/372,961	12/11/84
4,487,544	06/417,185	12/11/84
4,487,550	06/461,424	12/11/84
4,487,555	06/330,466	12/11/84
4,487,556	06/404,159	12/11/84
4,487,559	06/528,994	12/11/84
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4,487,568	06/440,829	12/11/84
4,487,577	06/437,138	12/11/84
4,487,579	06/558,261	12/11/84
4,487,580	06/583,015	12/11/84
4,487,581	06/429,201	12/11/84
4,487,584	06/442,410	12/11/84
4,487,585	06/573,426	12/11/84
4,487,586	06/440,948	12/11/84
4,487,588	06/406,773	12/11/84
4,487,589	06/503,927	12/11/84
4,487,590	06/455,029	12/11/84
4,487,592	06/502,130	12/11/84
4,487,593	06/317,608	12/11/84
4,487,594	06/509,042	12/11/84
4,487,599	06/479,703	12/11/84
4,487,600	06/521,849	12/11/84
4,487,606	06/462,502	12/11/84
4,487,608	06/474,640	12/11/84
4,487,610	06/520,879	12/11/84
4,487,611	06/421,304	12/11/84
4,487,613	06/536,121	12/11/84
4,487,614	06/552,337	12/11/84
4,487,615	06/504,031	12/11/84
4,487,616	06/476,971	12/11/84
4,487,621	06/585,514	12/11/84
4,487,622	06/453,733	12/11/84
4,487,623	06/514,393	12/11/84
4,487,624	06/554,161	12/11/84
4,487,626	06/286,159	12/11/84
4,487,628	06/532,181	12/11/84
4,487,631	06/522,436	12/11/84
4,487,637	06/594,592	12/11/84
4,487,640	06/468,781	12/11/84
4,487,643	06/565,211	12/11/84
4,487,645	06/514,466	12/11/84
4,487,646	06/558,132	12/11/84
4,487,649	06/421,892	12/11/84
4,487,652	06/595,229	12/11/84
4,487,658	06/528,526	12/11/84
4,487,662	06/422,405	12/11/84
4,487,663	06/483,673	12/11/84
4,487,666	06/595,207	12/11/84
4,487,669	06/462,310	12/11/84
4,487,671	06/368,091	12/11/84
4,487,673	06/370,582	12/11/84
4,487,674	06/481,186	12/11/84
4,487,675	06/546,411	12/11/84
4,487,683	06/401,806	12/11/84
4,487,684	06/511,165	12/11/84
4,487,686	06/583,182	12/11/84
4,487,688	06/439,454	12/11/84
4,487,691	06/569,092	12/11/84
4,487,692	06/527,015	12/11/84
4,487,698	06/486,884	12/11/84
4,487,701	06/609,350	12/11/84
4,487,702	06/373,552	12/11/84
4,487,703	06/478,189	12/11/84
4,487,706	06/466,529	12/11/84
4,487,707	06/532,747	12/11/84
4,487,711	06/393,270	12/11/84
4,487,713	06/343,584	12/11/84
4,487,715	06/396,578	12/11/84
4,487,719	06/467,562	12/11/84
4,487,722	06/515,645	12/11/84
4,487,723	06/336,542	12/11/84
4,487,728	06/509,057	12/11/84
4,487,735	06/483,797	12/11/84
4,487,736	06/340,184	12/11/84
4,487,741	06/325,881	12/11/84
4,487,742	06/377,018	12/11/84
4,487,753	06/560,064	12/11/84
4,487,755	06/522,085	12/11/84
4,487,761	06/365,741	12/11/84
4,487,762	06/403,491	12/11/84
4,487,763	06/402,440	12/11/84
4,487,764	06/443,900	12/11/84
4,487,766	06/469,129	12/11/84
4,487,767	06/379,729	12/11/84
4,487,774	06/370,327	12/11/84
4,487,776	06/461,369	12/11/84
4,487,777	06/297,800	12/11/84
4,487,778	06/461,420	12/11/84
4,487,779	06/280,786	12/11/84
4,487,780	06/346,208	12/11/84
4,487,783	06/406,695	12/11/84
4,487,785	06/436,970	12/11/84
4,487,797	06/557,032	12/11/84
4,487,813	06/536,018	12/11/84
4,487,814	06/557,026	12/11/84
4,487,815	06/473,009	12/11/84
4,487,816	06/568,037	12/11/84
4,487,819	06/452,391	12/11/84
4,487,820	06/516,884	12/11/84
4,487,822	06/390,387	12/11/84
4,487,825	06/227,003	12/11/84
4,487,831	06/380,025	12/11/84
4,487,832	06/442,807	12/11/84
4,487,837	06/329,479	12/11/84
4,487,838	06/338,946	12/11/84
4,487,841	06/348,227	12/11/84
4,487,843	06/579,721	12/11/84
4,487,844	06/525,517	12/11/84
4,487,847	06/517,108	12/11/84
4,487,851	06/474,577	12/11/84
4,487,859	06/553,557	12/11/84
4,487,860	06/558,292	12/11/84
4,487,861	06/555,354	12/11/84
4,487,862	06/470,373	12/11/84
4,487,864	06/489,429	12/11/84
4,487,865	06/561,817	12/11/84

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4,487,879	06/420,437	12/11/84
4,487,880	06/543,891	12/11/84
4,487,887	06/531,148	12/11/84
4,487,889	06/603,693	12/11/84
4,487,891	06/577,640	12/11/84
4,487,892	06/480,617	12/11/84
4,487,894	06/420,568	12/11/84
4,487,900	06/531,149	12/11/84
4,487,901	06/596,487	12/11/84
4,487,906	06/513,477	12/11/84
4,487,910	06/578,733	12/11/84
4,487,918	06/567,325	12/11/84
4,487,923	06/475,271	12/11/84
4,487,924	06/494,556	12/11/84
4,487,928	06/333,943	12/11/84
4,487,929	06/488,508	12/11/84
4,487,931	06/393,384	12/11/84
4,487,932	06/486,408	12/11/84
4,487,940	06/511,992	12/11/84
4,487,941	06/511,993	12/11/84
4,487,942	06/515,413	12/11/84
4,487,944	06/536,258	12/11/84
4,487,945	06/559,512	12/11/84
4,487,949	06/554,292	12/11/84
4,487,952	06/463,555	12/11/84
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4,487,963	06/455,100	12/11/84
4,487,964	06/469,434	12/11/84
4,487,965	06/508,143	12/11/84
4,487,966	06/514,376	12/11/84
4,487,968	06/392,901	12/11/84
4,487,970	06/500,679	12/11/84
4,487,971	06/537,648	12/11/84
4,487,977	06/514,255	12/11/84
4,487,978	06/514,256	12/11/84
4,487,979	06/485,793	12/11/84
4,487,981	06/530,289	12/11/84
4,487,982	06/530,443	12/11/84
4,487,988	06/489,466	12/11/84
4,487,990	06/552,899	12/11/84
4,487,991	06/514,127	12/11/84
4,487,993	06/523,317	12/11/84
4,487,995	06/529,602	12/11/84
4,487,997	06/502,874	12/11/84
4,487,998	06/517,617	12/11/84
4,487,999	06/457,112	12/11/84
4,488,001	06/331,710	12/11/84
4,488,009	06/346,312	12/11/84
4,488,010	06/422,154	12/11/84
4,488,011	06/498,733	12/11/84
4,488,012	06/486,780	12/11/84
4,488,013	06/494,973	12/11/84
4,488,023	06/451,730	12/11/84
4,488,024	06/504,896	12/11/84
4,488,029	06/234,592	12/11/84
4,488,030	06/381,026	12/11/84
4,488,035	06/425,373	12/11/84
4,488,037	06/354,672	12/11/84
4,488,039	06/414,957	12/11/84
4,488,041	06/378,197	12/11/84
4,488,043	06/411,116	12/11/84
4,488,048	06/331,295	12/11/84
4,488,051	06/334,808	12/11/84
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4,488,057	06/513,842	12/11/84
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4,488,072	06/502,085	12/11/84
4,488,075	06/315,260	12/11/84
4,488,076	06/429,076	12/11/84
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4,488,084	06/251,087	12/11/84
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4,488,102	06/412,751	12/11/84
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4,488,113	06/398,500	12/11/84
4,488,117	06/370,189	12/11/84
4,488,122	06/437,837	12/11/84
4,488,127	06/487,646	12/11/84
4,488,128	06/487,676	12/11/84
4,488,134	06/422,183	12/11/84
4,488,135	06/472,596	12/11/84
4,488,138	06/436,817	12/11/84
4,488,139	06/375,241	12/11/84
4,488,140	06/379,231	12/11/84
4,488,144	06/481,014	12/11/84
4,488,147	06/358,022	12/11/84
4,488,148	06/349,960	12/11/84
4,488,149	06/238,553	12/11/84
4,488,152	06/344,701	12/11/84
4,488,155	06/403,848	12/11/84
4,488,159	06/489,936	12/11/84
4,488,163	06/225,900	12/11/84
4,488,167	06/396,655	12/11/84
4,488,170	06/397,391	12/11/84
4,488,182	06/413,824	12/11/84
4,488,183	06/313,691	12/11/84
4,488,187	06/385,105	12/11/84
4,488,190	06/558,428	12/11/84
4,488,191	06/558,429	12/11/84
4,488,199	06/424,126	12/11/84
4,488,202	06/608,930	12/11/84
4,488,205	06/552,609	12/11/84
4,488,206	06/394,186	12/11/84
4,488,208	06/409,998	12/11/84
4,488,215	06/399,250	12/11/84
4,488,222	06/376,893	12/11/84
4,488,224	06/406,775	12/11/84
4,488,226	06/443,945	12/11/84
4,488,234	06/320,784	12/11/84
4,488,237	06/373,148	12/11/84
4,488,238	06/324,398	12/11/84
4,488,239	06/370,703	12/11/84
4,488,242	06/333,056	12/11/84
4,488,245	06/366,027	12/11/84
4,488,251	06/370,089	12/11/84
4,488,253	06/373,458	12/11/84
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4,488,264	06/387,049	12/11/84
4,488,268	06/425,649	12/11/84
4,488,269	06/367,064	12/11/84
4,488,270	06/302,289	12/11/84
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4,488,273	06/485,138	12/11/84
4,488,280	06/536,087	12/11/84
4,488,281	06/357,354	12/11/84
4,488,282	06/545,735	12/11/84
4,488,283	06/545,736	12/11/84
4,488,284	06/430,716	12/11/84
4,488,285	06/449,314	12/11/84
4,488,286	06/383,244	12/11/84
4,488,295	06/413,421	12/11/84
4,488,297	06/365,829	12/11/84
4,488,299	06/367,915	12/11/84
4,488,303	06/379,096	12/11/84
4,488,307	06/385,739	12/11/84
4,488,308	06/412,136	12/11/84
4,488,310	06/387,880	12/11/84
4,488,311	06/324,346	12/11/84
4,488,312	06/497,591	12/11/84
Re. 32,296	06/737,505	11/25/86
(4,488,644)	(06/582,021)	(12/18/84)
Re. 32,460	06/740,396	7/21/87
(4,488,358)	(06/490,330)	(12/18/84)

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Re. 33,119	07/168,525	11/28/89
(4,488,823)	(06/317,333)	(12/18/84)
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4,488,314	06/466,061	12/18/84
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4,488,316	06/542,739	12/18/84
4,488,319	06/314,798	12/18/84
4,488,320	06/456,617	12/18/84
4,488,321	06/470,388	12/18/84
4,488,322	06/238,526	12/18/84
4,488,331	06/543,779	12/18/84
4,488,336	06/467,405	12/18/84
4,488,352	06/485,854	12/18/84
4,488,360	06/592,386	12/18/84
4,488,362	06/410,065	12/18/84
4,488,363	06/482,522	12/18/84
4,488,365	06/446,982	12/18/84
4,488,369	06/498,067	12/18/84
4,488,370	06/352,712	12/18/84
4,448,371	06/425,221	12/18/84
4,488,372	06/430,723	12/18/84
4,488,373	06/567,733	12/18/84
4,488,374	06/546,756	12/18/84
4,488,375	06/423,044	12/18/84
4,488,377	06/494,142	12/18/84
4,488,379	06/490,348	12/18/84
4,488,380	06/447,938	12/18/84
4,488,382	06/489,704	12/18/84
4,488,383	06/510,820	12/18/84
4,488,385	06/388,347	12/18/84
4,488,386	06/437,898	12/18/84
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4,488,389	06/451,416	12/18/84
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4,488,394	06/254,769	12/18/84
4,488,395	06/489,527	12/18/84
4,488,400	06/481,609	12/18/84
4,488,401	06/382,934	12/18/84
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4,488,422	06/487,442	12/18/84
4,488,424	06/496,601	12/18/84
4,488,425	06/395,052	12/18/84
4,488,428	06/396,173	12/18/84
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4,488,435	06/431,637	12/18/84
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4,448,442	06/590,060	12/18/84
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4,488,453	06/348,164	12/18/84
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4,488,459	06/424,093	12/18/84
4,488,461	06/323,658	12/18/84
4,488,462	06/319,194	12/18/84
4,488,463	06/475,333	12/18/84
4,488,465	06/395,924	12/18/84
4,488,466	06/414,977	12/18/84
4,488,469	06/349,985	12/18/84
4,488,471	06/496,204	12/18/84
4,488,473	06/348,202	12/18/84
4,488,482	06/447,429	12/18/84
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4,488,488	06/452,487	12/18/84
4,488,489	06/330,850	12/18/84
4,488,490	06/527,714	12/18/84
4,488,491	06/480,442	12/18/84
4,488,492	06/352,371	12/18/84
4,488,496	06/344,664	12/18/84
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4,488,515	06/510,815	12/18/84
4,488,516	06/553,015	12/18/84
4,488,518	06/465,253	12/18/84
4,488,520	06/518,226	12/18/84
4,488,521	06/215,636	12/18/84
4,488,526	06/423,445	12/18/84
4,488,528	06/587,739	12/18/84
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4,719,199	06/852,697	1/12/88
4,719,202	06/828,277	1/12/88

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4,720,408	07/031,376	1/19/88
4,720,417	06/924,115	1/19/88
4,720,421	06/811,616	1/19/88
4,720,438	06/873,911	1/19/88
4,720,441	06/877,835	1/19/88
4,720,448	06/646,881	1/19/88
4,720,459	06/701,921	1/19/88
4,720,462	06/794,968	1/19/88
4,720,478	06/901,902	1/19/88
4,720,492	06/817,328	1/19/88
4,720,493	06/799,989	1/19/88
4,720,499	07/023,585	1/19/88
4,720,500	06/884,212	1/19/88
4,720,520	07/039,811	1/19/88
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4,720,540	06/734,245	1/19/88
4,720,543	06/742,045	1/19/88
4,720,546	06/926,944	1/19/88
4,720,548	06/858,589	1/19/88
4,720,549	06/923,535	1/19/88
4,720,559	06/916,975	1/19/88
4,720,565	06/770,214	1/19/88
4,720,567	06/942,775	1/19/88
4,720,572	06/798,526	1/19/88
4,720,581	06/631,753	1/19/88
4,720,593	06/921,473	1/19/88
4,720,594	06/873,964	1/19/88
4,720,604	06/650,395	1/19/88
4,720,607	07/004,538	1/19/88
4,720,608	06/901,519	1/19/88
4,720,621	06/702,529	1/19/88
4,720,627	06/925,954	1/19/88
4,720,649	06/894,798	1/19/88
4,720,653	06/920,634	1/19/88
4,720,657	06/809,085	1/19/88
4,720,662	06/908,196	1/19/88
4,720,683	06/888,264	1/19/88
4,720,690	06/885,557	1/19/88
4,720,692	06/895,623	1/19/88
4,720,695	07/020,170	1/19/88
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4,720,698	06/928,918	1/19/88
4,720,703	07/047,573	1/19/88
4,720,704	06/687,616	1/19/88
4,720,751	06/841,035	1/19/88
4,720,752	06/836,532	1/19/88
4,720,757	06/752,446	1/19/88
4,720,759	06/877,561	1/19/88
4,720,774	06/843,211	1/19/88
4,720,775	06/870,330	1/19/88
4,720,783	06/295,354	1/19/88
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4,720,805	06/807,175	1/19/88
4,720,808	06/734,106	1/19/88
4,720,809	06/652,628	1/19/88
4,720,820	06/888,880	1/19/88
4,720,821	06/826,242	1/19/88
4,720,839	06/937,086	1/19/88
4,720,849	06/902,051	1/19/88
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4,720,870	07/010,673	1/19/88
4,720,876	06/895,677	1/26/88
4,720,878	06/939,067	1/26/88
4,720,880	06/802,169	1/26/88
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4,720,924	06/926,059	1/26/88
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4,720,932	07/052,993	1/26/88
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4,720,941	06/877,137	1/26/88
4,720,944	07/008,291	1/26/88
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4,720,947	06/929,070	1/26/88
4,720,949	07/009,097	1/26/88
4,720,953	06/905,731	1/26/88
4,720,955	06/926,954	1/26/88

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4,720,970	06/439,492	1/26/88
4,720,975	06/863,775	1/26/88
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4,720,983	06/931,137	1/26/88
4,720,987	06/869,661	1/26/88
4,720,988	06/838,650	1/26/88
4,720,989	06/874,224	1/26/88
4,720,990	06/870,126	1/26/88
4,720,991	06/926,393	1/26/88
4,720,999	06/880,245	1/26/88
4,721,009	06/377,616	1/26/88
4,721,015	06/904,941	1/26/88
4,721,021	06/905,550	1/26/88
4,721,025	07/038,790	1/26/88
4,721,028	06/718,948	1/26/88
4,721,037	06/947,393	1/26/88
4,721,039	07/014,782	1/26/88
4,721,043	06/833,830	1/26/88
4,721,044	06/908,034	1/26/88
4,721,046	06/878,040	1/26/88
4,721,047	06/831,554	1/26/88
4,721,052	06/791,583	1/26/88
4,721,057	06/841,154	1/26/88
4,721,058	06/706,482	1/26/88
4,721,061	06/776,665	1/26/88
4,721,062	06/719,865	1/26/88
4,721,063	06/911,460	1/26/88
4,721,065	07/009,411	1/26/88
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4,721,111	06/830,585	1/26/88
4,721,121	06/829,503	1/26/88
4,721,124	06/556,973	1/26/88
4,721,128	06/909,169	1/26/88
4,721,129	07/066,997	1/26/88
4,721,130	06/941,834	1/26/88
4,721,131	07/018,698	1/26/88
4,721,132	07/011,163	1/26/88
4,721,134	06/892,822	1/26/88
4,721,145	07/035,992	1/26/88
4,721,156	07/033,663	1/26/88
4,721,158	06/896,997	1/26/88
4,721,163	06/834,167	1/26/88
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4,721,170	06/774,543	1/26/88
4,721,173	07/026,296	1/26/88
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4,721,232	06/846,781	1/26/88
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4,721,237	06/926,343	1/26/88
4,721,239	06/888,819	1/26/88
4,721,244	07/047,618	1/26/88
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4,721,276	06/847,738	1/26/88
4,721,278	06/918,314	1/26/88
4,721,279	06/866,974	1/26/88
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4,721,322	06/875,347	1/26/88
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4,721,334	06/849,179	1/26/88
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4,721,336	06/906,414	1/26/88
4,721,340	06/909,887	1/26/88
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4,721,351	06/648,810	1/26/88
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4,721,358	06/798,098	1/26/88
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4,721,437	06/947,885	1/26/88
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4,721,487	07/001,520	1/26/88
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4,721,524	06/909,167	1/26/88
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4,721,542	06/824,397	1/26/88
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4,721,624	06/791,567	1/26/88
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4,721,656	06/879,233	1/26/88
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4,721,690	06/698,330	1/26/88
4,721,699	06/900,824	1/26/88
4,721,706	06/470,828	1/26/88
4,721,710	06/838,255	1/26/88
4,721,737	06/935,825	1/26/88
4,721,738	06/785,206	1/26/88
4,721,756	06/911,518	1/26/88

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4,721,852	06/810,750	1/26/88
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4,721,859	06/709,349	1/26/88
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4,721,941	06/864,310	1/26/88
4,721,946	06/895,306	1/26/88
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4,721,949	06/801,857	1/26/88
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4,722,037	06/897,296	1/26/88
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4,722,115	06/923,186	2/02/88
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4,722,158	06/683,222	2/02/88
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4,722,176	06/916,816	2/02/88
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4,722,188	06/920,198	2/02/88
4,722,192	07/064,826	2/02/88
4,722,197	06/746,174	2/02/88
4,722,200	06/946,925	2/02/88
4,722,202	06/826,775	2/02/88
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4,722,266	06/817,682	2/02/88
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4,722,302	06/882,131	2/02/88
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4,722,326	06/817,697	2/02/88
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4,722,353	06/776,255	2/02/88
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4,722,371	06/914,322	2/02/88
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4,722,395	06/946,258	2/02/88
4,722,404	07/007,568	2/02/88
4,722,407	07/037,481	2/02/88
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4,722,421	07/001,571	2/02/88
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4,722,424	07/054,038	2/02/88
4,722,435	06/820,406	2/02/88
4,722,442	07/034,978	2/02/88
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4,722,477	06/919,842	2/02/88
4,722,486	06/790,232	2/02/88
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4,722,494	06/920,026	2/02/88
4,722,501	06/927,188	2/02/88
4,722,502	06/783,304	2/02/88
4,722,503	07/057,633	2/02/88
4,722,504	06/815,730	2/02/88
4,722,505	07/023,804	2/02/88
4,722,506	06/943,957	2/02/88
4,722,508	06/789,834	2/02/88
4,722,517	06/844,048	2/02/88

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			4,723,000	06/510,822	2/02/88
			4,723,006	06/821,081	2/02/88
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4,722,521	06/776,903	2/02/88	4,723,015	06/658,004	2/02/88
4,722,523	06/582,271	2/02/88	4,723,016	06/828,978	2/02/88
4,722,524	06/897,071	2/02/88	4,723,019	06/925,331	2/02/88
4,722,526	07/004,876	2/02/88	4,723,021	06/900,851	2/02/88
4,722,528	06/709,679	2/02/88	4,723,028	06/753,037	2/02/88
4,722,531	06/412,864	2/02/88	4,723,033	06/837,442	2/02/88
4,722,537	06/880,299	2/02/88	4,723,038	06/814,944	2/02/88
4,722,538	06/940,101	2/02/88	4,723,053	06/888,253	2/02/88
4,722,539	06/917,300	2/02/88	4,723,064	06/902,933	2/02/88
4,722,553	06/919,361	2/02/88	4,723,065	06/755,214	2/02/88
4,722,557	06/881,668	2/02/88	4,723,070	06/877,017	2/02/88
4,722,562	06/938,534	2/02/88	4,723,075	06/743,845	2/02/88
4,722,564	06/889,868	2/02/88	4,723,086	06/916,129	2/02/88
4,722,571	07/069,798	2/02/88	4,723,095	07/024,167	2/02/88
4,722,574	06/897,377	2/02/88	4,723,099	06/801,748	2/02/88
4,722,575	07/028,812	2/02/88	4,723,115	06/786,601	2/02/88
4,722,583	06/813,292	2/02/88	4,723,118	06/907,521	2/02/88
4,722,592	06/947,147	2/02/88	4,723,128	06/903,515	2/02/88
4,722,598	06/938,011	2/02/88	4,723,167	07/018,147	2/02/88
4,722,607	06/839,765	2/02/88	4,723,168	06/856,568	2/02/88
4,722,613	06/898,912	2/02/88	4,723,170	06/870,676	2/02/88
4,722,614	07/000,092	2/02/88	4,723,179	06/715,156	2/02/88
4,722,627	06/889,444	2/02/88	4,723,192	06/751,970	2/02/88
4,722,628	06/922,954	2/02/88	4,723,195	06/847,256	2/02/88
4,722,635	06/752,196	2/02/88	4,723,200	06/924,943	2/02/88
4,722,638	07/006,508	2/02/88	4,723,216	06/761,267	2/02/88
4,722,641	06/937,254	2/02/88	4,723,222	06/881,420	2/02/88
4,722,642	07/004,302	2/02/88	4,723,229	06/825,842	2/02/88
4,722,643	06/701,301	2/02/88	4,723,237	06/860,381	2/02/88
4,722,644	06/828,108	2/02/88	4,723,254	06/736,870	2/02/88
4,722,649	06/705,839	2/02/88	4,723,255	06/735,908	2/02/88
4,722,670	06/506,003	2/02/88	4,723,263	06/860,414	2/02/88
4,722,672	06/796,111	2/02/88	4,723,275	06/826,175	2/02/88
4,722,677	06/860,005	2/02/88	4,723,287	06/914,008	2/02/88
4,722,681	06/831,795	2/02/88	4,723,297	06/766,594	2/02/88
4,722,688	06/841,184	2/02/88	4,723,298	06/716,487	2/02/88
4,722,689	06/811,103	2/02/88	4,723,303	06/851,836	2/02/88
4,722,691	06/825,352	2/02/88	4,723,306	06/865,629	2/02/88
4,722,692	06/816,551	2/02/88	4,723,311	06/807,209	2/02/88
4,722,693	07/031,894	2/02/88	4,723,314	06/732,776	2/02/88
4,722,696	06/941,407	2/02/88	4,723,320	06/717,225	2/02/88
4,722,703	07/010,763	2/02/88	4,723,323	06/877,335	2/09/88
4,722,712	06/754,149	2/02/88	4,723,325	06/943,725	2/09/88
4,722,719	06/938,108	2/02/88	4,723,326	06/946,528	2/09/88
4,722,729	07/035,250	2/02/88	4,723,335	06/890,380	2/09/88
4,722,731	06/924,853	2/02/88	4,723,336	06/873,599	2/09/88
4,722,733	06/833,067	2/02/88	4,723,337	06/939,750	2/09/88
4,722,736	06/852,112	2/02/88	4,723,338	06/934,466	2/09/88
4,722,739	07/059,986	2/02/88	4,723,339	07/041,845	2/09/88
4,722,742	06/895,654	2/02/88	4,723,348	06/907,247	2/09/88
4,722,743	06/887,462	2/02/88	4,723,351	06/735,557	2/09/88
4,722,749	06/938,681	2/02/88	4,723,355	06/941,827	2/09/88
4,722,764	06/859,210	2/02/88	4,723,358	06/832,033	2/09/88
4,722,766	06/772,963	2/02/88	4,723,359	06/874,241	2/09/88
4,722,777	06/903,884	2/02/88	4,723,362	06/900,162	2/09/88
4,722,781	06/893,833	2/02/88	4,723,364	06/934,678	2/09/88
4,722,786	07/028,051	2/02/88	4,723,380	06/757,798	2/09/88
4,722,787	06/761,358	2/02/88	4,723,383	06/786,196	2/09/88
4,722,808	06/857,221	2/02/88	4,723,384	06/725,803	2/09/88
4,722,825	07/068,395	2/02/88	4,723,385	06/925,966	2/09/88
4,722,827	06/780,343	2/02/88	4,723,388	06/938,730	2/09/88
4,722,829	06/842,928	2/02/88	4,723,389	07/005,372	2/09/88
4,722,843	06/689,159	2/02/88	4,723,397	06/833,243	2/09/88
4,722,850	06/858,566	2/02/88	4,723,409	06/832,525	2/09/88
4,722,852	07/052,294	2/02/88	4,723,412	06/708,978	2/09/88
4,722,855	06/900,709	2/02/88	4,723,415	06/918,331	2/09/88
4,722,858	06/878,633	2/02/88	4,723,421	06/860,587	2/09/88
4,722,876	07/047,514	2/02/88	4,723,424	06/943,614	2/09/88
4,722,877	06/907,474	2/02/88	4,723,432	07/011,483	2/09/88
4,722,882	06/518,605	2/02/88	4,723,436	06/873,194	2/09/88
4,722,887	06/943,685	2/02/88	4,723,437	06/836,954	2/09/88
4,722,925	07/021,147	2/02/88	4,723,444	06/908,266	2/09/88
4,722,929	06/684,052	2/02/88	4,723,446	06/845,537	2/09/88
4,722,979	06/828,866	2/02/88	4,723,447	06/842,122	2/09/88
4,722,994	07/021,079	2/02/88	4,723,453	07/020,169	2/09/88

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			4,723,802	06/793,539	2/09/88
			4,723,804	06/835,103	2/09/88
4,723,462	06/901,996	2/09/88	4,723,813	06/893,479	2/09/88
4,723,469	07/030,380	2/09/88	4,723,815	06/893,497	2/09/88
4,723,473	06/924,941	2/09/88	4,723,820	06/867,044	2/09/88
4,723,477	06/802,408	2/09/88	4,723,821	06/923,563	2/09/88
4,723,491	06/942,504	2/09/88	4,723,826	06/645,256	2/09/88
4,723,492	07/069,067	2/09/88	4,723,827	06/628,650	2/09/88
4,723,494	07/002,684	2/09/88	4,723,842	06/872,500	2/09/88
4,723,497	06/845,534	2/09/88	4,723,844	06/843,620	2/09/88
4,723,499	06/766,650	2/09/88	4,723,852	06/937,783	2/09/88
4,723,506	06/892,554	2/09/88	4,723,858	06/915,361	2/09/88
4,723,510	06/820,159	2/09/88	4,723,861	07/025,888	2/09/88
4,723,511	06/721,436	2/09/88	4,723,870	06/819,300	2/09/88
4,723,512	06/791,571	2/09/88	4,723,871	07/048,556	2/09/88
4,723,515	06/880,550	2/09/88	4,723,880	07/041,199	2/09/88
4,723,528	07/020,915	2/09/88	4,723,886	06/885,452	2/09/88
4,723,531	06/887,892	2/09/88	4,723,887	06/778,187	2/09/88
4,723,534	06/797,516	2/09/88	4,723,895	06/774,704	2/09/88
4,723,537	06/943,715	2/09/88	4,723,913	06/881,917	2/09/88
4,723,540	06/885,681	2/09/88	4,723,923	06/904,384	2/09/88
4,723,547	06/731,673	2/09/88	4,723,929	07/050,610	2/09/88
4,723,548	06/936,870	2/09/88	4,723,932	06/880,858	2/09/88
4,723,558	06/806,953	2/09/88	4,723,933	07/010,066	2/09/88
4,723,591	07/024,694	2/09/88	4,723,943	06/948,367	2/09/88
4,723,596	06/762,678	2/09/88	4,723,946	06/828,538	2/09/88
4,723,597	06/765,385	2/09/88	4,723,955	06/869,307	2/09/88
4,723,604	06/568,155	2/09/88	4,723,960	06/789,723	2/09/88
4,723,607	06/848,121	2/09/88	4,723,961	06/905,632	2/09/88
4,723,609	06/814,249	2/09/88	4,723,963	06/887,838	2/09/88
4,723,613	06/866,238	2/09/88	4,723,966	06/940,612	2/09/88
4,723,618	07/020,277	2/09/88	4,723,969	06/910,072	2/09/88
4,723,625	06/809,433	2/09/88	4,723,972	07/005,746	2/09/88
4,723,626	06/769,141	2/09/88	4,723,979	06/880,047	2/09/88
4,723,629	07/014,549	2/09/88	4,723,985	06/925,767	2/09/88
4,723,631	06/908,385	2/09/88	4,723,989	06/943,619	2/09/88
4,723,637	06/815,546	2/09/88	4,723,999	07/028,665	2/09/88
4,723,638	06/944,303	2/09/88	4,724,009	06/848,247	2/09/88
4,723,639	06/900,797	2/09/88	4,724,012	06/773,235	2/09/88
4,723,641	06/835,276	2/09/88	4,724,022	06/833,806	2/09/88
4,723,649	06/887,345	2/09/88	4,724,044	06/919,259	2/09/88
4,723,650	06/879,096	2/09/88	4,724,045	06/903,833	2/09/88
4,723,654	06/883,644	2/09/88	4,724,048	06/772,613	2/09/88
4,723,655	06/938,508	2/09/88	4,724,051	06/925,440	2/09/88
4,723,660	06/941,826	2/09/88	4,724,054	06/946,005	2/09/88
4,723,663	06/942,189	2/09/88	4,724,055	06/941,314	2/09/88
4,723,666	06/928,789	2/09/88	4,724,056	07/021,935	2/09/88
4,723,671	06/913,996	2/09/88	4,724,059	06/884,334	2/09/88
4,723,672	06/940,279	2/09/88	4,724,061	06/898,623	2/09/88
4,723,674	06/924,029	2/09/88	4,724,075	06/885,001	2/09/88
4,723,675	06/895,378	2/09/88	4,724,083	07/050,009	2/09/88
4,723,680	06/802,320	2/09/88	4,724,098	06/871,073	2/09/88
4,723,684	06/857,734	2/09/88	4,724,107	06/818,788	2/09/88
4,723,686	06/942,871	2/09/88	4,724,119	06/867,498	2/09/88
4,723,688	06/548,285	2/09/88	4,724,135	06/922,238	2/09/88
4,723,690	07/009,629	2/09/88	4,724,136	06/809,557	2/09/88
4,723,701	06/942,984	2/09/88	4,724,140	06/235,845	2/09/88
4,723,702	06/526,603	2/09/88	4,724,149	07/018,943	2/09/88
4,723,712	06/852,816	2/09/88	4,724,152	07/025,740	2/09/88
4,723,722	06/900,729	2/09/88	4,724,155	07/011,112	2/09/88
4,723,731	06/894,700	2/09/88	4,724,161	06/907,224	2/09/88
4,723,734	06/911,851	2/09/88	4,724,169	06/878,061	2/09/88
4,723,740	06/945,800	2/09/88	4,724,179	06/661,072	2/09/88
4,723,743	07/000,056	2/09/88	4,724,198	06/942,025	2/09/88
4,723,744	06/892,860	2/09/88	4,724,209	06/783,634	2/09/88
4,723,745	06/878,669	2/09/88	4,724,216	06/796,194	2/09/88
4,723,756	06/851,719	2/09/88	4,724,218	06/873,679	2/09/88
4,723,759	06/942,721	2/09/88	4,724,229	06/913,439	2/09/88
4,723,760	07/049,572	2/09/88	4,724,242	06/907,000	2/09/88
4,723,768	06/896,435	2/09/88	4,724,249	07/016,466	2/09/88
4,723,774	06/693,853	2/09/88	4,724,263	06/871,974	2/09/88
4,723,775	06/919,473	2/09/88	4,724,290	06/790,770	2/09/88
4,723,776	06/886,003	2/09/88	4,724,293	06/747,964	2/09/88
4,723,788	06/875,173	2/09/88	4,724,311	06/798,768	2/09/88
4,723,796	07/008,945	2/09/88	4,724,313	07/042,536	2/09/88
4,723,798	06/922,566	2/09/88	4,724,321	06/897,693	2/09/88
4,723,799	06/775,619	2/09/88	4,724,327	06/869,216	2/09/88
4,723,801	07/006,792	2/09/88	4,724,331	06/832,778	2/09/88

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4,724,346	06/906,336	2/09/88
4,724,353	06/880,648	2/09/88
4,724,358	06/896,958	2/09/88
4,724,363	06/877,902	2/09/88
4,724,364	06/835,850	2/09/88
4,724,374	07/012,776	2/09/88
4,724,376	06/788,309	2/09/88
4,724,391	06/696,264	2/09/88
4,724,403	06/855,185	2/09/88
4,724,408	06/900,496	2/09/88
4,724,412	07/081,055	2/09/88
4,724,415	07/057,664	2/09/88
4,724,426	06/836,473	2/09/88
4,724,432	06/765,754	2/09/88
4,724,442	06/868,248	2/09/88
4,724,452	06/926,616	2/09/88
4,724,480	06/729,760	2/09/88
4,724,484	06/896,227	2/09/88
4,724,485	06/913,165	2/09/88
4,724,491	06/645,117	2/09/88
4,724,506	06/918,308	2/09/88
4,724,513	07/028,366	2/09/88
4,724,525	06/680,911	2/09/88
4,724,532	06/762,206	2/09/88
4,724,534	06/882,496	2/09/88
4,724,539	06/723,259	2/09/88
4,724,549	06/894,055	2/16/88
4,724,550	06/711,281	2/16/88
4,724,552	06/870,727	2/16/88
4,724,560	07/012,842	2/16/88
4,724,561	07/044,607	2/16/88
4,724,562	06/849,748	2/16/88
4,724,563	06/852,837	2/16/88
4,724,568	06/941,345	2/16/88
4,724,573	07/002,830	2/16/88
4,724,576	06/919,679	2/16/88
4,724,588	06/853,713	2/16/88
4,724,589	06/627,739	2/16/88
4,724,594	06/844,421	2/16/88
4,724,598	06/839,590	2/16/88
4,724,603	06/892,786	2/16/88
4,724,606	06/941,050	2/16/88
4,724,615	06/931,076	2/16/88
4,724,618	07/030,966	2/16/88
4,724,621	06/853,271	2/16/88
4,724,628	06/816,155	2/16/88
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4,724,641	06/870,656	2/16/88
4,724,645	06/878,965	2/16/88
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4,724,653	06/876,844	2/16/88
4,724,657	07/016,700	2/16/88
4,724,660	06/858,359	2/16/88
4,724,670	06/684,851	2/16/88
4,724,672	06/877,490	2/16/88
4,724,678	06/942,985	2/16/88
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4,724,685	06/906,042	2/16/88
4,724,686	07/056,015	2/16/88
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4,724,697	06/361,147	2/16/88
4,724,700	06/880,266	2/16/88
4,724,706	06/945,030	2/16/88
4,724,707	06/898,311	2/16/88
4,724,731	06/820,535	2/16/88
4,724,734	07/047,975	2/16/88
4,724,739	06/925,285	2/16/88
4,724,743	06/814,454	2/16/88
4,724,749	06/826,142	2/16/88
4,724,753	06/877,023	2/16/88
4,724,754	06/894,252	2/16/88
4,724,756	06/889,769	2/16/88
4,724,757	06/892,314	2/16/88
4,724,761	06/864,058	2/16/88
4,724,765	06/946,846	2/16/88
4,724,769	06/934,761	2/16/88

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4,724,770	06/809,476	2/16/88
4,724,772	06/860,196	2/16/88
4,724,773	06/940,343	2/16/88
4,724,774	06/936,458	2/16/88
4,724,775	06/901,348	2/16/88
4,724,776	06/886,940	2/16/88
4,724,779	06/921,134	2/16/88
4,724,787	06/905,999	2/16/88
4,724,790	06/927,048	2/16/88
4,724,791	06/903,877	2/16/88
4,724,793	06/904,181	2/16/88
4,724,795	06/861,564	2/16/88
4,724,798	07/001,845	2/16/88
4,724,799	06/822,565	2/16/88
4,724,800	06/897,102	2/16/88
4,724,802	07/006,501	2/16/88
4,724,803	06/919,431	2/16/88
4,724,806	07/027,801	2/16/88
4,724,809	06/622,038	2/16/88
4,724,818	07/002,152	2/16/88
4,724,820	06/827,642	2/16/88
4,724,821	06/817,264	2/16/88
4,724,828	06/834,427	2/16/88
4,724,829	06/857,639	2/16/88
4,724,831	06/903,492	2/16/88
4,724,834	06/900,457	2/16/88
4,724,835	06/889,596	2/16/88
4,724,837	06/804,818	2/16/88
4,724,842	06/617,158	2/16/88
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4,724,890	06/883,947	2/16/88
4,724,897	06/843,299	2/16/88
4,724,926	06/875,951	2/16/88
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4,724,937	06/924,130	2/16/88
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4,724,952	06/909,115	2/16/88
4,724,954	06/908,570	2/16/88
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4,725,233	06/913,675	2/16/88
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4,727,148	06/900,305	2/23/88
4,727,156	06/900,853	2/23/88
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4,727,182	06/748,424	2/23/88
4,727,184	06/920,466	2/23/88
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4,727,219	06/935,976	2/23/88
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4,727,229	06/825,277	2/23/88
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4,727,262	06/896,042	2/23/88
4,727,277	07/001,901	2/23/88
4,727,279	07/043,980	2/23/88
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4,727,292	06/835,923	2/23/88
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4,727,674	06/910,310	3/01/88
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4,727,686	06/905,199	3/01/88
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4,727,690	06/937,308	3/01/88

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4,727,714	06/924,238	3/01/88
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4,727,724	07/023,137	3/01/88
4,727,732	07/014,730	3/01/88
4,727,735	06/938,991	3/01/88
4,727,736	06/826,144	3/01/88
4,727,737	06/948,125	3/01/88
4,727,760	06/909,199	3/01/88
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4,727,764	06/823,490	3/01/88
4,727,769	06/846,168	3/01/88
4,727,777	06/895,172	3/01/88
4,727,779	07/033,171	3/01/88
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4,727,805	06/777,538	3/01/88
4,727,809	06/938,079	3/01/88
4,727,820	06/907,484	3/01/88
4,727,824	06/909,966	3/01/88
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4,727,843	06/427,665	3/01/88
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4,727,986	07/010,076	3/01/88
4,727,991	06/794,042	3/01/88
4,727,995	06/843,650	3/01/88
4,727,996	06/887,289	3/01/88
4,728,001	07/023,542	3/01/88
4,728,003	07/049,115	3/01/88
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4,728,013	06/770,775	3/01/88
4,728,015	07/000,559	3/01/88
4,728,016	06/800,722	3/01/88
4,728,019	06/920,903	3/01/88
4,728,028	07/045,090	3/01/88
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4,728,037	06/898,745	3/01/88
4,728,039	06/939,357	3/01/88

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4,728,116	06/865,118	3/01/88
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4,728,122	06/848,648	3/01/88
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4,728,129	06/843,023	3/01/88
4,728,131	06/862,109	3/01/88
4,728,133	06/741,447	3/01/88
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4,728,148	06/939,476	3/01/88
4,728,150	06/916,887	3/01/88
4,728,151	07/043,801	3/01/88
4,728,157	06/786,302	3/01/88
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4,728,179	06/742,522	3/01/88
4,728,181	06/758,459	3/01/88
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4,728,359	06/926,956	3/01/88
4,728,363	06/932,098	3/01/88
4,728,369	07/037,075	3/01/88
4,728,371	06/838,326	3/01/88
4,728,373	06/898,454	3/01/88
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4,728,393	06/799,865	3/01/88

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4,728,397	07/044,503	3/01/88
4,728,402	06/887,420	3/01/88
4,728,408	06/813,690	3/01/88
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4,728,479	06/817,366	3/01/88
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4,728,486	06/765,465	3/01/88
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4,728,561	06/801,911	3/01/88
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4,728,847	06/853,785	3/01/88
4,728,848	06/319,223	3/01/88
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4,728,868	06/602,643	3/01/88
4,728,879	06/872,976	3/01/88
4,728,881	07/016,286	3/01/88
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4,728,905	06/846,210	3/01/88
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4,729,136	06/902,778	3/08/88
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4,729,140	07/036,441	3/08/88
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4,729,261	06/932,593	3/08/88
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4,729,306	06/932,927	3/08/88
4,729,307	07/073,385	3/08/88
4,729,313	06/799,003	3/08/88
4,729,318	07/025,022	3/08/88
4,729,319	07/010,328	3/08/88
4,729,321	07/066,058	3/08/88
4,729,322	07/056,755	3/08/88
4,729,325	06/848,788	3/08/88

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4,729,327	06/914,320	3/08/88
4,729,328	07/041,838	3/08/88
4,729,329	06/869,875	3/08/88
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4,729,334	06/919,802	3/08/88
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4,730,943	06/928,202	3/15/88
4,730,944	07/016,765	3/15/88
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4,730,960	06/941,776	3/15/88
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4,731,694	07/040,239	3/15/88
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4,731,708	06/909,890	3/15/88
4,731,715	06/412,495	3/15/88
4,731,716	07/008,761	3/15/88
4,731,722	07/055,569	3/15/88
4,731,724	06/799,854	3/15/88
4,731,729	06/923,369	3/15/88
4,731,741	06/791,449	3/15/88
4,731,745	06/677,599	3/15/88
4,731,765	06/900,327	3/15/88
4,731,766	06/882,284	3/15/88
4,731,775	06/803,722	3/15/88
4,731,796	07/064,240	3/15/88
4,731,802	06/846,285	3/15/88
4,731,803	06/915,673	3/15/88
4,731,804	07/006,323	3/15/88
4,731,805	06/829,650	3/15/88
4,731,807	06/913,126	3/15/88
4,731,808	06/873,985	3/15/88
4,731,810	06/832,697	3/15/88
4,731,824	06/836,639	3/15/88
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4,731,828	06/742,352	3/15/88
4,731,832	06/833,056	3/15/88
4,731,834	06/876,737	3/15/88
4,731,856	07/018,869	3/15/88
4,731,858	06/726,763	3/15/88
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4,731,888	06/940,336	3/22/88
4,731,892	07/049,214	3/22/88
4,731,896	06/789,495	3/22/88
4,731,899	06/887,063	3/22/88
4,731,901	06/827,241	3/22/88
4,731,904	07/072,521	3/22/88
4,731,908	07/007,966	3/22/88
4,731,910	07/064,686	3/22/88
4,731,917	06/423,702	3/22/88
4,731,931	07/026,107	3/22/88
4,731,933	06/889,197	3/22/88
4,731,937	06/811,526	3/22/88
4,731,944	06/899,675	3/22/88
4,731,948	07/068,578	3/22/88
4,731,950	06/879,974	3/22/88

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4,731,965	07/016,545	3/22/88
4,731,969	06/775,414	3/22/88
4,731,976	07/036,129	3/22/88
4,731,980	06/942,849	3/22/88
4,731,982	06/732,659	3/22/88
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4,731,992	06/860,145	3/22/88
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4,732,056	06/914,764	3/22/88
4,732,063	06/861,403	3/22/88
4,732,066	06/821,057	3/22/88
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4,732,074	07/046,120	3/22/88
4,732,080	06/883,986	3/22/88
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4,732,100	06/944,927	3/22/88
4,732,103	06/791,573	3/22/88
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4,732,151	06/916,896	3/22/88
4,732,155	06/769,946	3/22/88
4,732,159	06/858,694	3/22/88
4,732,163	06/929,081	3/22/88
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4,732,167	06/890,465	3/22/88
4,732,169	06/930,260	3/22/88
4,732,176	07/022,544	3/22/88
4,732,177	06/684,053	3/22/88
4,732,178	06/939,133	3/22/88
4,732,182	06/886,965	3/22/88
4,732,189	06/860,172	3/22/88
4,732,192	06/803,647	3/22/88
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4,732,202	06/853,818	3/22/88
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4,732,210	06/882,543	3/22/88
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4,732,241	06/873,968	3/22/88
4,732,242	06/874,166	3/22/88
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4,732,303	06/934,494	3/22/88
4,732,307	06/915,077	3/22/88
4,732,308	07/015,783	3/22/88
4,732,320	06/863,416	3/22/88
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4,732,326	06/877,843	3/22/88
4,732,329	06/929,051	3/22/88
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4,732,352	06/921,244	3/22/88
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4,732,404	06/836,311	3/22/88
4,732,406	06/938,427	3/22/88
4,732,419	06/922,854	3/22/88
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4,732,426	06/795,995	3/22/88
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4,732,465	06/927,094	3/22/88
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4,732,487	06/756,517	3/22/88
4,732,493	06/930,935	3/22/88
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4,732,506	06/940,981	3/22/88
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4,732,534	06/911,295	3/22/88
4,732,543	06/904,080	3/22/88
4,732,547	06/815,094	3/22/88
4,732,551	06/828,752	3/22/88
4,732,554	07/039,535	3/22/88
4,732,555	06/912,600	3/22/88
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4,732,576	06/884,583	3/22/88
4,732,582	06/654,304	3/22/88
4,732,588	07/049,405	3/22/88
4,732,591	07/011,813	3/22/88
4,732,594	06/893,594	3/22/88
4,732,615	06/844,587	3/22/88
4,732,620	06/840,989	3/22/88
4,732,622	06/910,688	3/22/88
4,732,625	06/759,993	3/22/88

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4,732,641	06/750,447	3/22/88
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4,732,683	06/936,816	3/22/88
4,732,687	07/018,721	3/22/88
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4,732,709	06/877,786	3/22/88
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4,732,730	06/861,399	3/22/88
4,732,733	06/899,397	3/22/88
4,732,737	06/488,282	3/22/88
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4,732,752	06/922,386	3/22/88
4,732,753	06/700,168	3/22/88
4,732,755	06/489,590	3/22/88
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4,732,783	06/937,349	3/22/88
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4,732,813	07/042,268	3/22/88
4,732,816	06/857,925	3/22/88
4,732,818	06/913,610	3/22/88
4,732,824	07/046,856	3/22/88
4,732,839	06/902,151	3/22/88
4,732,849	06/828,562	3/22/88
4,732,861	06/920,834	3/22/88
4,732,867	06/925,983	3/22/88
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4,732,900	06/791,184	3/22/88
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4,732,915	06/877,068	3/22/88
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4,732,926	06/912,404	3/22/88
4,732,929	07/019,917	3/22/88
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4,732,965	06/809,596	3/22/88
4,732,969	06/859,527	3/22/88
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4,732,986	07/051,214	3/22/88
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4,733,123	06/918,435	3/22/88
4,733,163	07/000,007	3/22/88
4,733,170	06/867,697	3/22/88
4,733,180	06/854,775	3/22/88
4,733,184	07/001,294	3/22/88
4,733,186	06/917,603	3/22/88
4,733,190	07/026,305	3/22/88
4,733,193	06/881,360	3/22/88
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4,733,791	06/904,967	3/29/88
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4,733,822	06/860,935	3/29/88
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4,733,858	06/866,205	3/29/88
4,733,863	06/843,303	3/29/88
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4,733,872	06/874,566	3/29/88
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4,733,897	07/034,857	3/29/88
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4,733,904	06/256,703	3/29/88
4,733,906	06/872,847	3/29/88
4,733,907	07/089,918	3/29/88
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4,733,915	06/859,022	3/29/88
4,733,922	06/870,520	3/29/88

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4,733,932	06/899,192	3/29/88
4,733,934	06/859,575	3/29/88
4,733,958	06/723,504	3/29/88
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4,734,297	06/792,740	3/29/88
4,734,308	06/923,478	3/29/88

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4,736,075	07/004,648	4/05/88
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4,736,087	07/002,583	4/05/88
4,736,098	06/827,439	4/05/88
4,736,105	06/849,705	4/05/88
4,736,113	06/938,900	4/05/88
4,736,114	06/932,001	4/05/88
4,736,118	06/935,080	4/05/88
4,736,120	06/679,987	4/05/88
4,736,140	06/891,944	4/05/88
4,736,149	06/939,953	4/05/88

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4,736,151	06/946,444	4/05/88
4,736,157	06/886,885	4/05/88
4,736,158	06/878,686	4/05/88
4,736,171	06/819,073	4/05/88
4,736,172	06/865,559	4/05/88
4,736,176	06/939,157	4/05/88
4,736,181	07/018,059	4/05/88
4,736,184	06/799,860	4/05/88
4,736,186	06/786,207	4/05/88
4,736,197	06/859,083	4/05/88
4,736,202	06/683,619	4/05/88
4,736,208	06/940,022	4/05/88
4,736,216	07/040,357	4/05/88
4,736,218	06/895,026	4/05/88
4,736,220	07/043,878	4/05/88
4,736,231	06/788,146	4/05/88
4,736,232	07/005,784	4/05/88
4,736,240	06/856,660	4/05/88
4,736,250	06/936,054	4/05/88
4,736,265	07/087,955	4/05/88
4,736,268	06/943,093	4/05/88
4,736,275	07/012,588	4/05/88
4,736,286	06/936,293	4/05/88
4,736,291	06/800,854	4/05/88
4,736,297	06/837,149	4/05/88
4,736,299	06/618,024	4/05/88
4,736,308	06/754,512	4/05/88
4,736,310	06/672,872	4/05/88
4,736,314	06/893,306	4/05/88
4,736,317	06/756,048	4/05/88
4,736,328	06/779,338	4/05/88
4,736,330	06/646,662	4/05/88
4,736,341	06/750,684	4/05/88
4,736,346	06/838,969	4/05/88
4,736,351	07/001,113	4/05/88
4,736,365	06/665,416	4/05/88
4,736,372	06/905,894	4/05/88
4,736,378	06/873,411	4/05/88
4,736,391	06/887,919	4/05/88
4,736,397	06/809,247	4/05/88
4,736,403	06/894,675	4/05/88
4,736,413	07/019,347	4/05/88
4,736,416	06/906,382	4/05/88
4,736,444	06/829,189	4/05/88
4,736,447	06/769,476	4/05/88
4,736,449	06/897,006	4/05/88
4,736,469	06/930,290	4/12/88
4,736,470	06/896,733	4/12/88
4,736,471	07/019,078	4/12/88
4,736,476	07/026,761	4/12/88
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4,736,523	07/031,798	4/12/88
4,736,525	07/040,049	4/12/88
4,736,534	06/342,127	4/12/88
4,736,537	06/825,606	4/12/88
4,736,538	06/858,025	4/12/88
4,736,541	07/023,543	4/12/88
4,736,543	06/713,313	4/12/88
4,736,546	06/856,447	4/12/88
4,736,550	06/928,263	4/12/88
4,736,554	06/808,674	4/12/88
4,736,557	07/034,229	4/12/88
4,736,563	06/947,880	4/12/88
4,736,571	07/002,721	4/12/88
4,736,584	07/016,094	4/12/88
4,736,594	06/893,621	4/12/88
4,736,607	06/738,241	4/12/88
4,736,617	06/911,255	4/12/88
4,736,632	06/907,657	4/12/88
4,736,640	06/896,839	4/12/88
4,736,649	07/003,682	4/12/88
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4,736,685	06/944,755	4/12/88
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4,736,692	06/875,580	4/12/88
4,736,696	07/017,969	4/12/88
4,736,698	06/948,172	4/12/88
4,736,705	06/885,117	4/12/88
4,736,707	07/023,271	4/12/88
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4,736,712	06/936,672	4/12/88
4,736,719	06/881,196	4/12/88
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4,736,736	06/931,130	4/12/88
4,736,737	06/846,359	4/12/88
4,736,738	06/729,648	4/12/88
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4,736,750	06/256,985	4/12/88
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4,736,763	07/019,265	4/12/88
4,736,769	07/078,806	4/12/88
4,736,776	06/884,181	4/12/88
4,736,777	07/011,108	4/12/88
4,736,780	06/744,572	4/12/88
4,736,788	07/078,783	4/12/88
4,736,793	06/815,105	4/12/88
4,736,794	07/017,169	4/12/88
4,736,801	06/759,752	4/12/88
4,736,804	06/939,531	4/12/88
4,736,806	07/004,293	4/12/88
4,736,812	06/935,213	4/12/88
4,736,818	06/883,554	4/12/88
4,736,820	07/070,615	4/12/88
4,736,828	07/024,623	4/12/88
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4,736,836	07/009,895	4/12/88
4,736,837	07/050,622	4/12/88
4,736,843	07/020,516	4/12/88
4,736,845	06/799,221	4/12/88
4,736,847	06/947,721	4/12/88
4,736,856	06/890,529	4/12/88
4,736,861	06/373,414	4/12/88
4,736,862	06/277,715	4/12/88
4,736,864	07/043,150	4/12/88
4,736,865	07/063,824	4/12/88
4,736,872	07/094,098	4/12/88
4,736,875	06/919,617	4/12/88
4,736,877	07/028,979	4/12/88
4,736,889	06/863,043	4/12/88
4,736,890	06/691,656	4/12/88
4,736,897	06/890,775	4/12/88
4,736,908	07/058,937	4/12/88
4,736,909	07/058,936	4/12/88
4,736,912	07/086,185	4/12/88
4,736,913	06/909,349	4/12/88
4,736,916	06/898,029	4/12/88
4,736,924	06/890,628	4/12/88
4,736,928	06/926,085	4/12/88
4,736,930	06/878,954	4/12/88
4,736,939	06/825,323	4/12/88
4,736,942	06/908,262	4/12/88
4,736,944	06/917,179	4/12/88
4,736,946	07/044,148	4/12/88
4,736,947	06/881,622	4/12/88
4,736,951	06/867,485	4/12/88
4,736,952	06/872,203	4/12/88
4,736,953	06/739,893	4/12/88
4,736,957	06/700,319	4/12/88

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4,736,962	06/842,679	4/12/88
4,736,963	06/820,179	4/12/88
4,736,965	07/032,407	4/12/88
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4,736,973	06/933,144	4/12/88
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4,736,983	06/935,316	4/12/88
4,736,985	06/927,982	4/12/88
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4,736,996	07/003,467	4/12/88
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4,737,031	07/031,218	4/12/88
4,737,037	06/899,972	4/12/88
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4,737,040	06/702,417	4/12/88
4,737,048	07/067,162	4/12/88
4,737,051	07/001,495	4/12/88
4,737,054	06/474,732	4/12/88
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4,737,062	06/928,523	4/12/88
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4,737,116	06/854,331	4/12/88
4,737,117	07/032,921	4/12/88
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4,737,125	06/861,445	4/12/88
4,737,131	06/858,733	4/12/88
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4,737,134	06/839,285	4/12/88
4,737,135	06/905,471	4/12/88
4,737,144	07/023,725	4/12/88
4,737,150	06/858,365	4/12/88
4,737,151	06/889,212	4/12/88
4,737,157	06/942,246	4/12/88
4,737,158	06/787,431	4/12/88
4,737,164	07/000,759	4/12/88
4,737,168	07/076,335	4/12/88
4,737,169	06/855,071	4/12/88
4,737,172	06/892,098	4/12/88
4,737,187	06/921,257	4/12/88
4,737,189	06/872,091	4/12/88
4,737,193	07/057,624	4/12/88
4,737,195	06/847,398	4/12/88
4,737,202	06/909,744	4/12/88
4,737,205	06/773,853	4/12/88
4,737,212	06/611,411	4/12/88
4,737,215	06/847,989	4/12/88
4,737,218	06/946,718	4/12/88
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4,737,228	06/924,872	4/12/88
4,737,242	06/793,327	4/12/88
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4,737,252	06/612,491	4/12/88
4,737,255	06/944,986	4/12/88
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4,737,265	06/821,635	4/12/88
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4,737,313	06/893,462	4/12/88
4,737,319	06/940,680	4/12/88
4,737,324	06/928,103	4/12/88
4,737,329	06/914,255	4/12/88
4,737,339	07/084,017	4/12/88
4,737,342	06/405,764	4/12/88
4,737,349	06/922,975	4/12/88
4,737,351	06/924,180	4/12/88
4,737,360	06/821,943	4/12/88
4,737,367	06/759,413	4/12/88
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4,737,382	06/913,161	4/12/88
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4,737,406	06/874,275	4/12/88
4,737,407	06/837,624	4/12/88
4,737,414	06/652,512	4/12/88
4,737,423	06/932,984	4/12/88
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4,737,453	06/680,730	4/12/88
4,737,465	06/807,184	4/12/88
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4,737,481	06/944,103	4/12/88
4,737,487	06/793,245	4/12/88
4,737,499	06/932,075	4/12/88
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4,737,506	06/851,134	4/12/88
4,737,515	06/931,295	4/12/88
4,737,521	06/867,865	4/12/88
4,737,533	07/037,151	4/12/88
4,737,541	06/895,652	4/12/88
4,737,555	07/041,171	4/12/88
4,737,569	06/947,686	4/12/88
4,737,583	07/047,491	4/12/88
4,737,597	06/857,213	4/12/88
4,737,598	06/809,717	4/12/88
4,737,599	06/914,287	4/12/88
4,737,604	06/915,847	4/12/88
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4,737,610	06/845,934	4/12/88
4,737,615	06/824,408	4/12/88
4,737,619	06/888,515	4/12/88
4,737,623	06/865,060	4/12/88
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4,737,652	06/847,454	4/12/88
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4,737,659	07/003,473	4/12/88
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4,737,708	06/828,900	4/12/88
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4,737,744	06/831,683	4/12/88
4,737,745	06/926,282	4/12/88
4,737,746	06/920,840	4/12/88
4,737,751	07/015,383	4/12/88
4,737,759	06/901,590	4/12/88
4,737,760	06/678,739	4/12/88
4,737,764	06/869,001	4/12/88
4,737,771	06/888,495	4/12/88
4,737,776	06/894,357	4/12/88
4,737,785	06/667,110	4/12/88
4,737,791	06/831,369	4/12/88
4,737,800	06/900,913	4/12/88
4,737,826	06/824,258	4/12/88
4,737,849	06/677,195	4/12/88

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4,737,852	06/864,036	4/12/88
4,737,870	06/879,264	4/12/88
4,737,873	06/811,748	4/12/88
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4,737,894	07/037,587	4/12/88
4,737,895	07/070,305	4/12/88
4,737,914	06/757,821	4/12/88
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4,737,930	06/850,777	4/12/88
4,737,933	06/468,602	4/12/88
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4,737,943	07/009,791	4/12/88
4,737,955	06/475,659	4/12/88
4,737,965	07/000,259	4/12/88
4,737,968	06/791,622	4/12/88
4,737,970	06/741,875	4/12/88
4,737,981	07/022,705	4/12/88
4,737,986	07/024,861	4/12/88
4,737,987	06/826,176	4/12/88
4,737,995	07/023,677	4/19/88
4,737,998	06/915,667	4/19/88
4,738,007	07/068,537	4/19/88
4,738,009	06/881,590	4/19/88
4,738,018	06/878,146	4/19/88
4,738,023	07/063,797	4/19/88
4,738,032	06/385,481	4/19/88
4,738,038	07/005,621	4/19/88
4,738,045	07/086,369	4/19/88
4,738,047	07/073,586	4/19/88
4,738,048	07/083,624	4/19/88
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4,738,050	06/905,854	4/19/88
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4,738,057	07/033,216	4/19/88
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4,738,067	06/789,966	4/19/88
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4,738,090	06/506,694	4/19/88
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4,738,136	06/923,453	4/19/88
4,738,142	06/614,122	4/19/88
4,738,146	06/933,939	4/19/88
4,738,148	07/015,582	4/19/88
4,738,160	06/875,103	4/19/88
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4,738,169	07/021,525	4/19/88
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4,738,177	06/841,312	4/19/88
4,738,181	06/861,899	4/19/88
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4,738,237	06/947,900	4/19/88
4,738,238	07/080,622	4/19/88
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4,740,232	06/754,048	4/26/88
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4,742,711	06/926,375	5/10/88
4,742,713	07/021,576	5/10/88
4,742,714	07/098,946	5/10/88
4,742,721	06/360,580	5/10/88
4,742,722	06/859,196	5/10/88
4,742,727	06/938,323	5/10/88
4,742,729	06/946,984	5/10/88
4,742,734	07/077,666	5/10/88
4,742,740	06/940,541	5/10/88
4,742,745	06/910,900	5/10/88
4,742,746	06/853,072	5/10/88
4,742,750	06/880,830	5/10/88
4,742,754	07/044,664	5/10/88
4,742,756	07/008,772	5/10/88
4,742,766	07/019,632	5/10/88
4,742,770	06/701,683	5/10/88
4,742,775	06/936,510	5/10/88
4,742,777	06/816,148	5/10/88
4,742,782	07/009,070	5/10/88
4,742,789	06/342,558	5/10/88
4,742,790	07/100,897	5/10/88
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4,742,796	06/917,694	5/10/88
4,742,798	06/826,215	5/10/88
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4,742,806	06/905,560	5/10/88
4,742,808	07/086,100	5/10/88
4,742,812	06/934,184	5/10/88
4,742,813	06/857,730	5/10/88
4,742,821	06/823,688	5/10/88
4,742,827	06/909,332	5/10/88
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4,742,839	06/899,658	5/10/88
4,742,842	06/936,595	5/10/88
4,742,844	07/107,560	5/10/88
4,742,853	06/885,174	5/10/88
4,742,855	07/042,730	5/10/88
4,742,857	06/916,847	5/10/88
4,742,867	06/936,152	5/10/88
4,742,872	06/893,174	5/10/88

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4,742,911	07/030,701	5/10/88
4,742,915	06/917,693	5/10/88
4,742,917	06/908,769	5/10/88
4,742,922	07/043,767	5/10/88
4,742,926	07/053,082	5/10/88
4,742,929	06/838,075	5/10/88
4,742,933	06/945,647	5/10/88
4,742,934	06/880,843	5/10/88
4,742,941	06/740,008	5/10/88
4,742,947	06/921,220	5/10/88
4,742,951	06/841,584	5/10/88
4,742,957	06/778,009	5/10/88
4,742,964	06/922,170	5/10/88
4,742,966	06/784,865	5/10/88
4,742,970	07/034,907	5/10/88
4,742,973	07/052,718	5/10/88
4,742,984	07/077,272	5/10/88
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4,742,995	06/919,146	5/10/88
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4,743,015	06/890,098	5/10/88
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4,743,042	06/909,845	5/10/88
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4,743,271	06/606,847	5/10/88
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4,743,403	06/584,972	5/10/88
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4,743,748	06/764,116	5/10/88
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4,743,769	06/903,464	5/10/88
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4,743,846	07/027,254	5/10/88
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4,743,886	06/783,222	5/10/88
4,743,889	06/939,705	5/10/88
4,743,892	07/001,400	5/10/88
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4,743,900	06/890,007	5/10/88
4,743,904	06/870,064	5/10/88
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4,743,919	06/916,355	5/10/88
4,743,924	06/858,692	5/10/88
4,743,933	06/463,583	5/10/88
4,743,953	06/894,509	5/10/88
4,743,964	06/763,348	5/10/88
4,743,972	07/068,440	5/10/88
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4,744,116	06/940,054	5/17/88
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4,744,378	06/945,196	5/17/88
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4,744,458	06/827,741	5/17/88
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4,744,466	06/328,733	5/17/88
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4,744,499	06/904,549	5/17/88
4,744,501	06/930,184	5/17/88
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4,744,509	06/852,448	5/17/88
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4,744,523	06/885,058	5/17/88
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4,744,557	07/062,869	5/17/88
4,744,558	07/093,296	5/17/88
4,744,560	06/886,911	5/17/88

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4,744,581	06/898,631	5/17/88
4,744,584	07/070,227	5/17/88
4,744,588	07/004,031	5/17/88
4,744,593	07/054,798	5/17/88
4,744,607	06/919,405	5/17/88
4,744,630	06/434,682	5/17/88
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4,744,652	06/945,339	5/17/88
4,744,672	06/242,251	5/17/88
4,744,677	06/802,051	5/17/88
4,744,686	06/934,156	5/17/88
4,744,687	06/781,394	5/17/88
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4,744,712	06/860,331	5/17/88
4,774,717	06/820,236	5/17/88
4,744,718	06/708,179	5/17/88
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4,744,772	07/022,900	5/17/88
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4,744,779	06/938,077	5/17/88
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4,774,783	06/928,261	5/17/88
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4,744,810	06/846,475	5/17/88
4,744,817	06/835,824	5/17/88
4,744,818	06/286,935	5/17/88
4,744,825	06/937,682	5/17/88
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4,746,120	06/935,957	5/24/88
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4,746,130	06/819,149	5/24/88
4,746,135	06/943,369	5/24/88
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4,746,169	06/864,848	5/24/88
4,746,172	06/938,586	5/24/88
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4,747,124	06/731,171	5/24/88
4,747,126	06/833,888	5/24/88

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4,747,133	07/020,384	5/24/88
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4,747,144	06/713,960	5/24/88
4,747,155	06/902,854	5/24/88
4,747,158	06/914,080	5/24/88
4,747,163	07/031,244	5/31/88
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4,747,169	06/889,770	5/31/88
4,747,172	06/667,889	5/31/88
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4,747,174	07/078,057	5/31/88
4,747,177	06/889,175	5/31/88
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4,747,185	07/002,372	5/31/88
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4,747,195	06/934,807	5/31/88
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4,747,231	06/897,926	5/31/88
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4,747,243	07/044,749	5/31/88
4,747,244	07/018,931	5/31/88
4,747,246	07/022,995	5/31/88
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4,747,737	06/945,192	5/31/88
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4,747,780	06/918,790	5/31/88
4,747,784	06/864,293	5/31/88
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4,747,807	06/843,963	5/31/88
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4,748,357	07/090,168	5/31/88
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4,748,687	06/757,444	5/31/88
4,748,692	07/004,724	6/07/88
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4,748,791	07/076,389	6/07/88
4,748,793	06/919,606	6/07/88
4,748,807	07/092,229	6/07/88
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4,748,826	06/867,367	6/07/88
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4,748,840	06/897,929	6/07/88
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4,748,873	06/867,464	6/07/88
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4,748,876	06/941,395	6/07/88
4,748,878	07/033,465	6/07/88
4,748,890	07/044,650	6/07/88
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4,749,268	06/737,728	6/07/88
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4,749,816	07/051,776	6/07/88
4,749,826	07/055,496	6/07/88

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4,756,178	07/085,207	7/12/88
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4,756,192	06/785,879	7/12/88
4,756,199	07/058,145	7/12/88
4,756,204	07/013,351	7/12/88
4,756,205	07/010,096	7/12/88
4,756,206	07/059,409	7/12/88
4,756,215	07/110,216	7/12/88
4,756,216	07/116,315	7/12/88
4,756,217	07/013,726	7/12/88
4,756,221	07/007,746	7/12/88
4,756,225	06/933,224	7/12/88
4,756,227	06/237,393	7/12/88
4,756,228	06/877,874	7/12/88
4,756,237	07/110,703	7/12/88
4,756,242	07/133,136	7/12/88
4,756,247	06/423,868	7/12/88
4,756,252	06/313,925	7/12/88
4,756,258	07/118,196	7/12/88
4,756,262	07/074,950	7/12/88
4,756,265	06/896,129	7/12/88
4,756,267	07/029,394	7/12/88
4,756,278	06/435,598	7/12/88
4,756,282	07/090,920	7/12/88
4,756,283	07/045,441	7/12/88
4,756,286	06/799,182	7/12/88
4,756,288	06/912,496	7/12/88
4,756,291	07/042,509	7/12/88
4,756,293	07/017,346	7/12/88
4,756,298	06/927,474	7/12/88
4,756,300	06/395,843	7/12/88
4,756,304	06/916,944	7/12/88
4,756,308	06/790,323	7/12/88
4,756,310	06/673,509	7/12/88
4,756,312	06/920,145	7/12/88
4,756,322	06/930,267	7/12/88
4,756,331	07/075,117	7/12/88
4,756,333	07/076,205	7/12/88
4,756,336	07/054,018	7/12/88
4,756,338	07/058,806	7/12/88
4,756,343	06/945,502	7/12/88
4,756,347	06/820,400	7/12/88
4,756,353	07/016,958	7/12/88
4,756,354	06/910,465	7/12/88
4,756,358	06/913,074	7/12/88
4,756,366	07/024,254	7/12/88
4,756,369	06/935,355	7/12/88
4,756,373	06/946,442	7/12/88
4,756,378	07/027,393	7/12/88
4,756,382	07/020,787	7/12/88
4,756,384	07/116,573	7/12/88
4,756,385	07/079,719	7/12/88
4,756,386	07/021,406	7/12/88
4,756,391	07/069,878	7/12/88
4,756,397	06/827,126	7/12/88
4,756,404	06/770,230	7/12/88
4,756,409	07/102,284	7/12/88
4,756,412	07/135,313	7/12/88
4,756,417	07/054,017	7/12/88

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			4,756,725	06/900,680	7/12/88
			4,756,739	06/944,547	7/12/88
4,756,421	07/064,526	7/12/88	4,756,742	06/757,739	7/12/88
4,756,423	06/896,742	7/12/88	4,756,748	07/033,367	7/12/88
4,756,424	06/882,467	7/12/88	4,756,754	07/022,895	7/12/88
4,756,429	06/846,229	7/12/88	4,756,755	07/052,078	7/12/88
4,756,433	07/046,663	7/12/88	4,756,760	06/907,544	7/12/88
4,756,434	07/123,769	7/12/88	4,756,764	07/019,289	7/12/88
4,756,440	07/095,662	7/12/88	4,756,766	07/046,762	7/12/88
4,756,441	06/869,140	7/12/88	4,756,772	06/664,237	7/12/88
4,756,443	07/083,715	7/12/88	4,756,777	07/046,474	7/12/88
4,756,444	07/041,056	7/12/88	4,756,779	07/098,569	7/12/88
4,756,450	06/855,614	7/12/88	4,756,783	06/930,782	7/12/88
4,756,454	06/781,890	7/12/88	4,756,787	07/118,484	7/12/88
4,756,455	07/022,066	7/12/88	4,756,800	06/903,174	7/12/88
4,756,456	07/063,415	7/12/88	4,756,806	07/064,997	7/12/88
4,756,457	07/027,258	7/12/88	4,756,807	07/109,836	7/12/88
4,756,458	07/083,539	7/12/88	4,756,818	07/018,200	7/12/88
4,756,459	07/087,736	7/12/88	4,756,824	06/876,088	7/12/88
4,756,461	06/925,548	7/12/88	4,756,827	07/016,775	7/12/88
4,756,465	06/904,839	7/12/88	4,756,829	07/035,014	7/12/88
4,756,469	07/017,395	7/12/88	4,756,831	06/869,101	7/12/88
4,756,471	07/059,938	7/12/88	4,756,835	06/901,827	7/12/88
4,756,472	07/088,070	7/12/88	4,756,837	07/036,504	7/12/88
4,756,479	07/086,977	7/12/88	4,756,840	07/092,756	7/12/88
4,756,480	07/117,458	7/12/88	4,756,853	06/736,622	7/12/88
4,756,481	06/933,976	7/12/88	4,756,858	07/011,880	7/12/88
4,756,482	07/077,096	7/12/88	4,756,861	06/948,097	7/12/88
4,756,486	06/875,205	7/12/88	4,756,869	06/840,426	7/12/88
4,756,488	06/909,902	7/12/88	4,756,870	06/880,897	7/12/88
4,756,503	06/927,357	7/12/88	4,756,871	06/679,461	7/12/88
4,756,505	06/858,947	7/12/88	4,756,877	06/795,305	7/12/88
4,756,509	07/021,271	7/12/88	4,756,879	06/613,882	7/12/88
4,756,511	07/042,971	7/12/88	4,756,889	07/041,598	7/12/88
4,756,516	06/840,417	7/12/88	4,756,897	06/877,418	7/12/88
4,756,517	06/772,612	7/12/88	4,756,904	06/871,044	7/12/88
4,756,519	06/924,338	7/12/88	4,756,913	07/043,453	7/12/88
4,756,523	06/882,079	7/12/88	4,756,929	06/681,686	7/12/88
4,756,524	07/073,706	7/12/88	4,756,936	07/045,313	7/12/88
4,756,528	06/889,144	7/12/88	4,756,938	06/906,917	7/12/88
4,756,530	07/070,377	7/12/88	4,756,949	06/676,090	7/12/88
4,756,533	06/946,473	7/12/88	4,756,971	06/907,687	7/12/88
4,756,538	06/843,706	7/12/88	4,756,973	06/882,303	7/12/88
4,756,542	07/043,803	7/12/88	4,756,974	06/928,558	7/12/88
4,756,543	07/011,284	7/12/88	4,756,978	06/932,264	7/12/88
4,756,551	07/004,892	7/12/88	4,756,979	06/875,593	7/12/88
4,756,554	06/845,870	7/12/88	4,756,996	06/926,192	7/12/88
4,756,556	07/031,774	7/12/88	4,757,002	06/814,558	7/12/88
4,756,560	06/920,056	7/12/88	4,757,011	06/537,560	7/12/88
4,756,578	07/037,553	7/12/88	4,757,018	06/700,199	7/12/88
4,756,579	06/942,368	7/12/88	4,757,019	06/845,479	7/12/88
4,756,580	06/935,506	7/12/88	4,757,021	06/795,144	7/12/88
4,756,586	06/849,721	7/12/88	4,757,030	06/935,111	7/12/88
4,756,597	06/922,200	7/12/88	4,757,049	06/921,885	7/12/88
4,756,614	07/038,306	7/12/88	4,757,058	06/891,003	7/12/88
4,756,615	06/927,019	7/12/88	4,757,079	06/877,738	7/12/88
4,756,616	07/083,147	7/12/88	4,757,084	06/776,191	7/12/88
4,756,618	07/073,614	7/12/88	4,757,085	07/037,918	7/12/88
4,756,623	06/930,453	7/12/88	4,757,086	06/762,980	7/12/88
4,756,624	07/063,203	7/12/88	4,757,101	07/020,928	7/12/88
4,756,635	07/029,081	7/12/88	4,757,114	06/799,520	7/12/88
4,756,642	07/027,899	7/12/88	4,757,115	06/931,496	7/12/88
4,756,657	06/848,408	7/12/88	4,757,122	06/896,622	7/12/88
4,756,658	07/033,754	7/12/88	4,757,125	07/070,990	7/12/88
4,756,659	07/000,856	7/12/88	4,757,163	06/934,901	7/12/88
4,756,660	07/031,217	7/12/88	4,757,164	07/042,521	7/12/88
4,756,663	06/721,357	7/12/88	4,757,171	07/068,243	7/12/88
4,756,666	06/631,321	7/12/88	4,757,182	07/058,342	7/12/88
4,756,670	06/920,530	7/12/88	4,757,183	06/865,257	7/12/88
4,756,678	06/919,989	7/12/88	4,757,188	06/804,340	7/12/88
4,756,686	07/003,729	7/12/88	4,757,204	06/823,261	7/12/88
4,756,690	06/938,458	7/12/88	4,757,209	06/769,588	7/12/88
4,756,699	06/874,562	7/12/88	4,757,212	06/929,478	7/12/88
4,756,703	06/926,857	7/12/88	4,757,221	07/026,123	7/12/88
4,756,705	06/939,422	7/12/88	4,757,239	06/789,107	7/12/88
4,756,711	06/945,670	7/12/88	4,757,243	06/862,229	7/12/88
4,756,713	06/917,976	7/12/88	4,757,249	07/061,618	7/12/88
4,756,724	06/937,313	7/12/88	4,757,250	07/016,869	7/12/88

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			4,757,673	06/890,365	7/19/88
			4,757,676	07/065,343	7/19/88
4,757,254	07/054,937	7/12/88	4,757,682	07/010,471	7/19/88
4,757,259	06/927,089	7/12/88	4,757,685	07/088,448	7/19/88
4,757,270	06/921,217	7/12/88	4,757,692	07/132,461	7/19/88
4,757,278	07/116,810	7/12/88	4,757,693	07/041,285	7/19/88
4,757,284	06/848,711	7/12/88	4,757,694	06/871,938	7/19/88
4,757,291	07/018,420	7/12/88	4,757,699	07/028,684	7/19/88
4,757,293	07/055,448	7/12/88	4,757,717	06/934,767	7/19/88
4,757,294	07/079,556	7/12/88	4,757,718	07/029,503	7/19/88
4,757,295	07/097,047	7/12/88	4,757,719	07/050,021	7/19/88
4,757,305	07/000,739	7/12/88	4,757,720	07/040,555	7/19/88
4,757,308	06/791,169	7/12/88	4,757,722	06/923,618	7/19/88
4,757,317	06/827,588	7/12/88	4,757,723	07/011,686	7/19/88
4,757,318	06/924,781	7/12/88	4,757,725	06/884,801	7/19/88
4,757,320	06/807,669	7/12/88	4,757,729	06/875,458	7/19/88
4,757,324	07/041,394	7/12/88	4,757,735	07/013,032	7/19/88
4,757,330	07/019,036	7/12/88	4,757,737	06/844,930	7/19/88
4,757,333	07/096,771	7/12/88	4,757,738	07/076,848	7/19/88
4,757,334	06/940,242	7/12/88	4,757,741	06/937,912	7/19/88
4,757,341	07/011,727	7/12/88	4,757,744	06/807,872	7/19/88
4,757,358	06/752,216	7/12/88	4,757,751	07/053,773	7/19/88
4,757,360	06/511,250	7/12/88	4,757,753	07/011,745	7/19/88
4,757,367	06/797,965	7/12/88	4,757,754	07/004,590	7/19/88
4,757,405	06/885,350	7/12/88	4,757,756	06/868,782	7/19/88
4,757,407	07/034,692	7/12/88	4,757,759	06/836,409	7/19/88
4,757,408	06/866,150	7/12/88	4,757,761	07/028,606	7/19/88
4,757,415	07/026,244	7/12/88	4,757,770	07/085,617	7/19/88
4,757,419	07/040,832	7/12/88	4,757,772	07/085,629	7/19/88
4,757,422	06/906,907	7/12/88	4,757,775	06/932,302	7/19/88
4,757.427	06/921,711	7/12/88	4,757,777	07/015,911	7/19/88
4,757,452	06/859,117	7/12/88	4,757,778	06/884,065	7/19/88
4,757,453	06/843,589	7/12/88	4,757,779	06/855,747	7/19/88
4,757,464	06/874,494	7/12/88	4,757,786	06/791,119	7/19/88
4,757,485	07/024,539	7/12/88	4,757,799	06/871,793	7/19/88
4,757,486	07/048,141	7/12/88	4,757,800	07/003,223	7/19/88
4,757,498	06/836,032	7/12/88	4,757,803	07/067,010	7/19/88
4,757,514	06/765,229	7/12/88	4,757,810	06/889,089	7/19/88
4,757,524	06/841,398	7/12/88	4,757,828	06/841,212	7/19/88
4,757,527	06/772,571	7/12/88	4,757,838	07/012,551	7/19/88
4,757,544	06/941,763	7/12/88	4,757,839	06/918,349	7/19/88
4,757,548	06/803,146	7/12/88	4,757,842	07/055,154	7/19/88
4,757,555	07/077,837	7/19/88	4,757,852	06/922,053	7/19/88
4,757,558	07/047,624	7/19/88	4,757,858	06/401,780	7/19/88
4,757,559	06/922,042	7/19/88	4,757,867	06/903,539	7/19/88
4,757,561	07/092,654	7/19/88	4,757,868	07/013,363	7/19/88
4,757,562	06/556,708	7/19/88	4,757,871	06/908,328	7/19/88
4,757,563	07/090,541	7/19/88	4,757,876	07/017,714	7/19/88
4,757,564	06/899,843	7/19/88	4,757,884	07/005,290	7/19/88
4,757,568	07/013,594	7/19/88	4,757,893	07/034,680	7/19/88
4,757,571	06/853,651	7/19/88	4,757,894	06/892,377	7/19/88
4,757,572	06/922,531	7/19/88	4,757,896	07/099,404	7/19/88
4,757,574	07/147,472	7/19/88	4,757,897	06/916,425	7/19/88
4,757,576	06/924,775	7/19/88	4,757,898	06/902,867	7/19/88
4,757,578	06/943,326	7/19/88	4,757,899	07/095,410	7/19/88
4,757,582	07/012,848	7/19/88	4,757,901	07/017,823	7/19/88
4,757,594	06/884,972	7/19/88	4,757,906	07/079,954	7/19/88
4,757,603	07/045,988	7/19/88	4,757,918	07/021,468	7/19/88
4,757,605	06/863,926	7/19/88	4,757,923	06/476,444	7/19/88
4,757,610	07/110,323	7/19/88	4,757,927	06/768,462	7/19/88
4,757,611	07/009,838	7/19/88	4,757,929	07/091,775	7/19/88
4,757,616	07/112,403	7/19/88	4,757,934	07/011,670	7/19/88
4,757,617	06/838,948	7/19/88	4,757,938	07/008,760	7/19/88
4,757,618	06/932,634	7/19/88	4,757,942	07/043,437	7/19/88
4,757,623	07/044,415	7/19/88	4,757,951	06/932,917	7/19/88
4,757,624	07/030,335	7/19/88	4,757,953	07/048,043	7/19/88
4,757,628	07/031,021	7/19/88	4,757,955	07/098,303	7/19/88
4,757,629	06/805,891	7/19/88	4,757,959	07/015,304	7/19/88
4,757,634	07/100,407	7/19/88	4,757,973	07/117,930	7/19/88
4,757,635	07/042,029	7/19/88	4,757,977	07/058,556	7/19/88
4,757,641	07/072,374	7/19/88	4,757,979	07/054,019	7/19/88
4,757,642	07/018,714	7/19/88	4,757,980	07/106,567	7/19/88
4,757,650	06/913,337	7/19/88	4,757,987	07/001,521	7/19/88
4,757,653	07/006,116	7/19/88	4,757,990	06/901,404	7/19/88
4,757,662	07/012,388	7/19/88	4,757,998	07/052,499	7/19/88
4,757,663	07/048,219	7/19/88	4,757,999	06/907,838	7/19/88
4,757,669	07/119,033	7/19/88	4,758,001	07/079,593	7/19/88
4,757,672	06/461,330	7/19/88	4,758,002	07/051,343	7/19/88

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			4,758,408	06/705,950	7/19/88
			4,758,410	06/905,689	7/19/88
4,758,007	07/001,838	7/19/88	4,758,411	06/795,409	7/19/88
4,758,008	07/034,423	7/19/88	4,758,412	06/928,546	7/19/88
4,758,009	06/869,756	7/19/88	4,758,422	06/826,827	7/19/88
4,758,010	06/867,060	7/19/88	4,758,426	07/061,187	7/19/88
4,758,016	06/929,855	7/19/88	4,758,427	07/006,297	7/19/88
4,758,019	07/052,853	7/19/88	4,758,445	06/845,179	7/19/88
4,758,033	06/937,389	7/19/88	4,758,454	06/819,612	7/19/88
4,758,035	07/042,176	7/19/88	4,758,460	06/862,286	7/19/88
4,758,042	07/092,629	7/19/88	4,758,467	07/019,376	7/19/88
4,758,043	07/040,810	7/19/88	4,758,485	06/917,271	7/19/88
4,758,045	07/026,334	7/19/88	4,758,505	06/923,967	7/19/88
4,758,047	07/037,822	7/19/88	4,758,509	06/849,509	7/19/88
4,758,056	07/013,967	7/19/88	4,758,520	06/837,671	7/19/88
4,758,065	06/709,563	7/19/88	4,758,529	06/793,312	7/19/88
4,758,079	06/928,869	7/19/88	4,758,530	06/939,078	7/19/88
4,758,083	07/042,258	7/19/88	4,758,539	07/018,390	7/19/88
4,758,093	06/884,494	7/19/88	4,758,545	06/938,518	7/19/88
4,758,102	06/845,463	7/19/88	4,758,558	06/864,574	7/19/88
4,758,111	06/933,123	7/19/88	4,758,566	06/893,311	7/19/88
4,758,115	06/881,021	7/19/88	4,758,570	07/049,953	7/19/88
4,758,124	07/052,040	7/19/88	4,758,574	06/878,718	7/19/88
4,758,128	07/020,096	7/19/88	4,758,585	06/766,386	7/19/88
4,758,132	06/934,017	7/19/88	4,758,586	06/821,063	7/19/88
4,758,135	06/947,838	7/19/88	4,758,588	07/015,643	7/19/88
4,758,143	06/914,446	7/19/88	4,758,589	07/010,039	7/19/88
4,758,145	07/018,989	7/19/88	4,758,597	07/050,123	7/19/88
4,758,149	06/927,529	7/19/88	4,758,613	06/843,287	7/19/88
4,758,153	06/888,750	7/19/88	4,758,625	06/932,648	7/19/88
4,758,155	06/858,722	7/19/88	4,758,651	07/019,675	7/19/88
4,758,159	06/915,395	7/19/88	4,758,661	06/877,816	7/19/88
4,758,162	06/928,814	7/19/88	4,758,664	06/858,434	7/19/88
4,758,185	06/887,499	7/19/88	4,758,669	06/859,694	7/19/88
4,758,187	06/061,184	7/19/88	4,758,670	06/567,998	7/19/88
4,758,194	07/025,157	7/19/88	4,758,671	07/003,111	7/19/88
4,758,196	07/030,976	7/19/88	4,758,676	06/901,853	7/19/88
4,758,197	06/924,914	7/19/88	4,758,678	06/887,756	7/19/88
4,758,204	07/112,003	7/19/88	4,758,679	06/887,757	7/19/88
4,758,216	07/017,514	7/19/88	4,758,684	06/829,369	7/19/88
4,758,219	06/735,472	7/19/88	4,758,691	07/006,145	7/19/88
4,758,225	06/928,883	7/19/88	4,758,692	07/052,251	7/19/88
4,758,226	07/040,004	7/19/88	4,758,698	06/852,945	7/19/88
4,758,232	07/094,337	7/19/88	4,758,699	06/837,907	7/19/88
4,758,235	07/093,834	7/19/88	4,758,704	06/853,618	7/19/88
4,758,236	06/947,395	7/19/88	4,758,708	06/892,611	7/19/88
4,758,237	07/005,148	7/19/88	4,758,710	07/098,704	7/19/88
4,758,245	07/012,054	7/19/88	4,758,715	06/850,767	7/19/88
4,758,248	06/931,992	7/19/88	4,758,722	06/615,445	7/19/88
4,758,249	07/004,246	7/19/88	4,758,725	06/921,131	7/19/88
4,758,252	07/066,446	7/19/88	4,758,728	06/813,149	7/19/88
4,758,262	06/806,869	7/19/88	4,758,732	07/033,478	7/19/88
4,758,266	06/895,549	7/19/88	4,758,752	07/024,839	7/19/88
4,758,271	06/928,429	7/19/88	4,758,763	06/859,562	7/19/88
4,758,288	07/069,534	7/19/88	4,758,766	06/810,303	7/19/88
4,758,290	07/057,544	7/19/88	4,758,775	07/036,752	7/19/88
4,758,297	06/870,209	7/19/88	4,758,776	06/912,235	7/19/88
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4,758,309	06/749,539	7/19/88	4,758,778	06/815,588	7/19/88
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4,758,388	06/916,902	7/19/88	4,758,850	06/892,053	7/19/88
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4,758,397	07/062,935	7/19/88	4,758,909	06/806,478	7/19/88
4,758,401	06/798,180	7/19/88	4,758,914	06/939,901	7/19/88
4,758,402	06/811,643	7/19/88	4,758,931	07/039,710	7/19/88
4,758,405	07/084,184	7/19/88	4,758,933	06/876,464	7/19/88
4,758,406	07/125,504	7/19/88	4,758,934	07/083,733	7/19/88

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4,758,951	06/721,530	7/19/88	4,759,294	07/074,622	7/26/88
4,758,956	06/856,612	7/19/88	4,759,301	06/751,188	7/26/88
4,758,958	06/831,644	7/19/88	4,759,303	07/132,026	7/26/88
4,758,964	06/856,167	7/19/88	4,759,306	06/930,033	7/26/88
4,758,968	06/734,775	7/19/88	4,759,307	07/036,538	7/26/88
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4,759,071	06/896,507	7/19/88	4,759,348	06/306,086	7/26/88
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4,759,081	06/817,948	7/19/88	4,759,370	07/017,770	7/26/88
4,759,082	06/945,631	7/26/88	4,759,373	07/057,969	7/26/88
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4,759,122	06/749,670	7/26/88	4,759,440	07/049,794	7/26/88
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4,759,149	07/007,958	7/26/88	4,759,463	06/439,866	7/26/88
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4,759,169	07/044,510	7/26/88	4,759,484	06/769,387	7/26/88
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4,759,176	06/905,171	7/26/88	4,759,495	07/093,191	7/26/88
4,759,177	07/118,115	7/26/88	4,759,499	07/050,637	7/26/88
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4,759,211	06/885,240	7/26/88	4,759,516	06/782,041	7/26/88
4,759,213	06/926,453	7/26/88	4,759,519	07/052,287	7/26/88
4,759,223	06/918,760	7/26/88	4,759,520	07/031,851	7/26/88
4,759,233	06/800,126	7/26/88	4,759,522	07/046,755	7/26/88
4,759,236	06/931,742	7/26/88	4,759,524	06/946,665	7/26/88
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4,759,250	07/051,317	7/26/88	4,759,533	07/006,505	7/26/88
4,759,252	07/044,824	7/26/88	4,759,537	06/839,048	7/26/88
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4,759,267	06/597,860	7/26/88	4,759,549	07/072,433	7/26/88
4,759,268	06/860,044	7/26/88	4,759,557	07/017,065	7/26/88
4,759,270	07/115,830	7/26/88	4,759,558	07/046,432	7/26/88
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4,759,274	06/941,172	7/26/88	4,759,565	07/023,226	7/26/88
4,759,276	07/005,218	7/26/88	4,759,566	06/903,220	7/26/88

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4,759,569	07/029,189	7/26/88
4,759,571	06/925,624	7/26/88
4,759,573	06/776,661	7/26/88
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4,759,578	07/049,316	7/26/88
4,759,582	06/821,739	7/26/88
4,759,588	07/026,389	7/26/88
4,759,594	07/035,023	7/26/88
4,759,605	07/115,580	7/26/88
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4,759,615	06/872,038	7/26/88
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4,759,635	06/904,005	7/26/88
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4,760,373	06/893,995	7/26/88
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4,760,383	06/939,628	7/26/88
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4,760,432	06/923,867	7/26/88
4,760,436	06/865,531	7/26/88
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4,760,473	06/904,628	7/26/88
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4,760,589	06/853,940	7/26/88
4,760,590	07/110,576	7/26/88
4,760,594	07/093,015	7/26/88
4,760,607	06/891,311	7/26/88
4,760,611	06/898,833	8/02/88
4,760,612	07/042,580	8/02/88
4,760,614	07/113,467	8/02/88
4,760,615	06/946,371	8/02/88
4,760,622	06/892,704	8/02/88
4,760,626	07/022,242	8/02/88
4,760,628	06/907,367	8/02/88
4,760,638	06/908,876	8/02/88
4,760,639	06/899,176	8/02/88
4,760,642	07/043,357	8/02/88
4,760,649	06/940,297	8/02/88
4,760,651	07/008,530	8/02/88
4,760,656	07/084,436	8/02/88
4,760,664	07/025,178	8/02/88
4,760,665	07/019,188	8/02/88
4,760,666	07/043,756	8/02/88
4,760,693	06/886,982	8/02/88
4,760,694	06/923,615	8/02/88
4,760,700	07/080,216	8/02/88
4,760,713	06/931,593	8/02/88
4,760,714	06/844,439	8/02/88
4,760,719	07/084,128	8/02/88
4,760,722	07/052,382	8/02/88
4,760,727	07/067,370	8/02/88
4,760,738	06/883,220	8/02/88
4,760,741	06/825,333	8/02/88
4,760,753	07/045,807	8/02/88
4,760,760	06/907,871	8/02/88
4,760,762	06/903,576	8/02/88
4,760,769	07/043,270	8/02/88
4,760,771	06/930,265	8/02/88
4,760,774	07/137,379	8/02/88
4,760,776	06/890,163	8/02/88
4,760,785	06/937,048	8/02/88
4,760,786	07/053,616	8/02/88
4,760,787	06/945,391	8/02/88
4,760,798	07/016,898	8/02/88
4,760,801	07/075,632	8/02/88
4,760,802	07/088,597	8/02/88
4,760,803	07/004,542	8/02/88
4,760,805	06/861,840	8/02/88
4,760,807	07/085,738	8/02/88
4,760,812	07/090,853	8/02/88
4,760,813	07/032,970	8/02/88
4,760,836	07/101,381	8/02/88
4,760,841	07/033,143	8/02/88
4,760,843	06/884,103	8/02/88
4,760,847	06/897,747	8/02/88
4,760,855	07/077,807	8/02/88
4,760,861	07/059,115	8/02/88
4,760,863	07/022,092	8/02/88
4,760,865	07/051,744	8/02/88
4,760,875	06/830,764	8/02/88
4,760,877	06/914,285	8/02/88
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4,760,882	06/463,216	8/02/88
4,760,895	07/043,817	8/02/88
4,760,899	07/043,344	8/02/88
4,760,905	07/043,200	8/02/88
4,760,907	06/912,786	8/02/88
4,760,909	06/931,671	8/02/88
4,760,922	07/067,849	8/02/88
4,760,926	07/141,913	8/02/88
4,760,930	07/051,229	8/02/88
4,760,931	06/944,447	8/02/88
4,760,932	07/090,285	8/02/88
4,760,933	07/117,360	8/02/88
4,760,398	06/864,603	8/02/88
4,760,943	06/677,972	8/02/88
4,760,944	07/039,528	8/02/88
4,760,948	07/065,611	8/02/88
4,760,951	06/893,690	8/02/88
4,760,952	07/030,524	8/02/88
4,760,955	07/078,948	8/02/88
4,760,970	06/879,127	8/02/88
4,760,980	06/571,931	8/02/88
4,760,981	06/938,048	8/02/88
4,760,984	07/031,248	8/02/88
4,760,985	06/940,678	8/02/88
4,760,997	06/831,426	8/02/88
4,761,006	07/070,989	8/02/88
4,761,008	07/082,299	8/02/88
4,761,014	07/043,449	8/02/88
4,761,024	06/919,847	8/02/88
4,761,025	07/083,704	8/02/88
4,761,027	07/033,508	8/02/88
4,761,028	07/049,110	8/02/88
4,761,029	07/091,405	8/02/88
4,761,034	07/005,317	8/02/88
4,761,035	07/072,528	8/02/88
4,761,046	06/853,780	8/02/88
4,761,047	06/934,226	8/02/88
4,761,050	07/055,074	8/02/88
4,761,055	06/912,967	8/02/88
4,761,057	07/016,602	8/02/88
4,761,065	06/882,248	8/02/88
4,761,069	06/844,662	8/02/88
4,761,079	07/108,939	8/02/88
4,761,081	07/098,085	8/02/88
4,761,092	06/900,221	8/02/88
4,761,093	07/001,568	8/02/88
4,761,094	07/076,834	8/02/88
4,761,097	06/945,260	8/02/88
4,761,100	06/907,814	8/02/88
4,761,105	06/521,067	8/02/88
4,761,107	06/875,913	8/02/88
4,761,110	07/018,838	8/02/88
4,761,111	06/653,512	8/02/88
4,761,112	07/067,439	8/02/88
4,761,113	06/876,594	8/02/88
4,761,114	06/869,880	8/02/88
4,761,115	06/942,735	8/02/88
4,761,118	06/827,823	8/02/88
4,761,135	07/020,554	8/02/88
4,761,138	06/948,101	8/02/88
4,761,139	06/867,019	8/02/88
4,761,146	07/041,152	8/02/88
4,761,153	07/027,746	8/02/88
4,761,159	07/027,557	8/02/88
4,761,160	07/049,158	8/02/88
4,761,161	06/892,879	8/02/88
4,761,170	07/045,200	8/02/88
4,761,173	07/029,731	8/02/88
4,761,175	06/511,016	8/02/88
4,761,176	06/589,983	8/02/88
4,761,185	06/930,570	8/02/88
4,761,191	06/945,837	8/02/88
4,761,206	07/015,644	8/02/88
4,761,211	07/124,109	8/02/88
4,761,215	07/044,321	8/02/88
4,761,228	07/015,520	8/02/88
4,761,246	06/821,546	8/02/88
4,761,249	06/945,610	8/02/88
4,761,257	06/927,732	8/02/88
4,761,269	06/873,581	8/02/88

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Patent Number	Serial Number	Issue Date	4,761,854	06/917,182	8/09/88
			4,761,855	07/021,304	8/09/88
4,761,271	07/041,962	8/02/88	4,761,859	06/945,972	8/09/88
4,761,281	06/854,853	8/02/88	4,761,866	06/934,213	8/09/88
4,761,292	06/883,209	8/02/88	4,761,868	07/060,231	8/09/88
4,761,295	06/867,383	8/02/88	4,761,869	07/064,681	8/09/88
4,761,304	07/017,413	8/02/88	4,761,871	06/933,762	8/09/88
4,761,319	06/948,238	8/02/88	4,761,877	07/092,441	8/09/88
4,761,323	06/917,804	8/02/88	4,761,882	06/830,326	8/09/88
4,761,326	07/059,949	8/02/88	4,761,883	07/051,045	8/09/88
4,761,333	07/081,336	8/02/88	4,761,885	07/044,667	8/09/88
4,761,367	06/669,224	8/02/88	4,761,886	07/032,794	8/09/88
4,761,369	06/862,479	8/02/88	4,761,898	07/023,214	8/09/88
4,761,375	06/849,234	8/02/88	4,761,901	06/922,056	8/09/88
4,761,380	06/893,279	8/02/88	4,761,903	06/938,584	8/09/88
4,761,408	06/792,076	8/02/88	4,761,906	07/005,480	8/09/88
4,761,409	06/762,560	8/02/88	4,761,908	07/084,914	8/09/88
4,761,415	06/901,120	8/02/88	4,761,909	07/059,640	8/09/88
4,761,416	06/889,641	8/02/88	4,761,911	07/080,788	8/09/88
4,761,420	06/874,264	8/02/88	4,761,912	07/048,213	8/09/88
4,761,422	06/932,929	8/02/88	4,761,914	07/032,019	8/09/88
4,761,424	06/782,623	8/02/88	4,761,917	07/010,368	8/09/88
4,761,430	06/910,738	8/02/88	4,761,920	07/001,239	8/09/88
4,761,441	06/750,891	8/02/88	4,761,926	06/873,346	8/09/88
4,761,443	07/058,203	8/02/88	4,761,930	06/330,700	8/09/88
4,761,455	07/060,889	8/02/88	4,761,931	07/000,084	8/09/88
4,761,466	07/084,351	8/02/88	4,761,938	07/042,662	8/09/88
4,761,477	06/802,447	8/02/88	4,761,942	06/939,570	8/09/88
4,761,480	06/916,132	8/02/88	4,761,944	07/060,170	8/09/88
4,761,495	06/690,682	8/02/88	4,761,947	06/853,658	8/09/88
4,761,499	07/056,636	8/02/88	4,761,959	07/020,304	8/09/88
4,761,517	07/044,784	8/02/88	4,761,961	07/055,505	8/09/88
4,761,518	07/004,469	8/02/88	4,761,965	07/065,850	8/09/88
4,761,525	06/939,189	8/02/88	4,761,970	07/060,650	8/09/88
4,761,529	07/083,948	8/02/88	4,761,971	06/933,744	8/09/88
4,761,531	07/115,594	8/02/88	4,761,972	07/055,175	8/09/88
4,761,534	06/924,999	8/02/88	4,761,976	06/555,332	8/09/88
4,761,536	07/023,191	8/02/88	4,761,984	06/912,059	8/09/88
4,761,537	06/938,877	8/02/88	4,761,994	07/046,023	8/09/88
4,761,548	06/943,975	8/02/88	4,762,001	07/066,521	8/09/88
4,761,550	06/929,336	8/02/88	4,762,005	07/091,529	8/09/88
4,761,558	06/912,929	8/02/88	4,762,007	07/016,084	8/09/88
4,761,560	06/573,547	8/02/88	4,762,012	07/008,613	8/09/88
4,761,564	07/062,753	8/02/88	4,762,013	06/893,673	8/09/88
4,761,568	07/091,545	8/02/88	4,762,020	07/071,541	8/09/88
4,761,580	07/063,264	8/02/88	4,762,025	07/029,521	8/09/88
4,761,585	06/917,794	8/02/88	4,762,027	06/899,217	8/09/88
4,761,589	06/926,731	8/02/88	4,762,037	06/905,720	8/09/88
4,761,598	07/061,556	8/02/88	4,762,059	07/011,283	8/09/88
4,761,608	06/900,572	8/02/88	4,762,060	07/085,626	8/09/88
4,761,624	07/028,608	8/02/88	4,762,066	07/070,367	8/09/88
4,761,625	06/876,487	8/02/88	4,762,078	06/863,610	8/09/88
4,761,632	07/064,470	8/02/88	4,762,086	06/847,588	8/09/88
4,761,639	06/916,668	8/02/88	4,762,099	07/070,497	8/09/88
4,761,641	06/459,975	8/02/88	4,762,101	07/128,906	8/09/88
4,761,676	06/899,467	8/02/88	4,762,112	07/006,755	8/09/88
4,761,680	06/912,633	8/02/88	4,762,114	07/100,417	8/09/88
4,761,694	06/706,794	8/02/88	4,762,115	07/081,092	8/09/88
4,761,696	06/880,856	8/02/88	4,762,116	06/769,637	8/09/88
4,761,715	07/080,178	8/02/88	4,762,126	06/918,336	8/09/88
4,761,716	07/087,083	8/02/88	4,762,138	06/941,113	8/09/88
4,761,718	07/140,057	8/02/88	4,762,139	06/806,410	8/09/88
4,761,724	07/067,026	8/02/88	4,762,142	07/131,491	8/09/88
4,761,729	06/820,989	8/02/88	4,762,143	07/057,118	8/09/88
4,761,747	06/877,926	8/02/88	4,762,144	07/026,545	8/09/88
4,761,761	06/809,744	8/02/88	4,762,145	07/049,813	8/09/88
4,761,762	06/849,991	8/02/88	4,762,147	07/065,411	8/09/88
4,761,766	06/906,211	8/02/88	4,762,155	07/109,191	8/09/88
4,761,778	06/722,275	8/02/88	4,762,162	06/948,324	8/09/88
4,761,787	07/134,094	8/02/88	4,762,166	06/847,500	8/09/88
4,761,813	06/345,335	8/02/88	4,762,167	06/932,604	8/09/88
4,761,822	06/897,711	8/02/88	4,762,173	06/943,346	8/09/88
4,761,827	06/695,458	8/02/88	4,762,176	07/029,208	8/09/88
4,761,832	06/750,568	8/02/88	4,762,192	06/948,088	8/09/88
4,761,833	06/917,852	8/02/88	4,762,198	06/939,409	8/09/88
4,761,834	06/884,381	8/09/88	4,762,207	07/070,366	8/09/88
4,761,835	07/059,947	8/09/88	4,762,208	06/878,267	8/09/88
4,761,839	06/931,091	8/09/88	4,762,210	07/041,737	8/09/88

Patent Number	Serial Number	Issue Date	4,762,480	07/022,988	8/09/88
			4,762,484	07/004,101	8/09/88
4,762,214	07/081,635	8/09/88	4,762,487	07/084,817	8/09/88
4,762,220	07/000,384	8/09/88	4,762,488	07/010,009	8/09/88
4,762,221	07/104,286	8/09/88	4,762,489	07/037,206	8/09/88
4,762,222	06/911,066	8/09/88	4,762,490	06/944,670	8/09/88
4,762,223	07/070,905	8/09/88	4,762,494	07/027,356	8/09/88
4,762,224	07/135,325	8/09/88	4,762,499	07/033,785	8/09/88
4,762,225	06/901,599	8/09/88	4,762,505	07/039,557	8/09/88
4,762,226	06/541,018	8/09/88	4,762,506	06/948,239	8/09/88
4,762,227	07/122,386	8/09/88	4,762,513	06/881,890	8/09/88
4,762,228	07/013,005	8/09/88	4,762,517	06/909,002	8/09/88
4,762,231	07/083,452	8/09/88	4,762,519	07/086,562	8/09/88
4,762,233	07/054,220	8/09/88	4,762,520	07/013,987	8/09/88
4,762,240	07/005,203	8/09/88	4,762,522	07/020,626	8/09/88
4,762,242	07/109,496	8/09/88	4,762,528	06/903,602	8/09/88
4,762,244	07/100,380	8/09/88	4,762,529	07/004,036	8/09/88
4,762,258	07/004,812	8/09/88	4,762,531	07/013,612	8/09/88
4,762,259	06/924,418	8/09/88	4,762,549	06/484,027	8/09/88
4,762,262	06/860,002	8/09/88	4,762,553	07/042,074	8/09/88
4,762,265	06/559,410	8/09/88	4,762,555	06/944,766	8/09/88
4,762,271	06/540,354	8/09/88	4,762,556	06/285,926	8/09/88
4,762,272	06/902,288	8/09/88	4,762,558	07/050,914	8/09/88
4,762,275	06/889,630	8/09/88	4,762,564	07/025,317	8/09/88
4,762,276	07/046,169	8/09/88	4,762,573	06/853,812	8/09/88
4,762,277	07/129,915	8/09/88	4,762,580	06/941,711	8/09/88
4,762,278	07/116,493	8/09/88	4,762,584	06/822,752	8/09/88
4,762,281	06/486,528	8/09/88	4,762,587	07/099,634	8/09/88
4,762,288	07/028,120	8/09/88	4,762,597	07/081,691	8/09/88
4,762,289	07/016,760	8/09/88	4,762,601	06/929,242	8/09/88
4,762,296	07/054,374	8/09/88	4,762,611	07/097,050	8/09/88
4,762,297	07/066,304	8/09/88	4,762,613	07/104,515	8/09/88
4,762,305	07/070,146	8/09/88	4,762,614	06/894,527	8/09/88
4,762,307	06/885,569	8/09/88	4,762,640	06/940,686	8/09/88
4,762,313	07/021,650	8/09/88	4,762,646	06/914,987	8/09/88
4,762,314	07/063,127	8/09/88	4,762,648	06/645,266	8/09/88
4,762,315	06/865,766	8/09/88	4,762,656	06/917,460	8/09/88
4,762,318	07/024,309	8/09/88	4,762,657	06/808,148	8/09/88
4,762,319	07/068,964	8/09/88	4,762,658	06/916,895	8/09/88
4,762,320	07/037,321	8/09/88	4,762,664	06/941,155	8/09/88
4,762,321	07/053,618	8/09/88	4,762,666	06/868,223	8/09/88
4,762,323	06/934,915	8/09/88	4,762,667	06/451,530	8/09/88
4,762,328	06/836,546	8/09/88	4,762,668	07/106,962	8/09/88
4,762,338	07/105,669	8/09/88	4,762,679	07/070,276	8/09/88
4,762,339	06/918,901	8/09/88	4,762,687	06/945,710	8/09/88
4,762,340	06/923,139	8/09/88	4,762,689	06/930,315	8/09/88
4,762,341	06/719,698	8/09/88	4,762,690	06/937,164	8/09/88
4,762,345	07/032,869	8/09/88	4,762,699	07/039,865	8/09/88
4,762,350	07/107,106	8/09/88	4,762,700	07/048,352	8/09/88
4,762,351	06/742,289	8/09/88	4,762,705	06/594,436	8/09/88
4,762,353	07/023,194	8/09/88	4,762,716	07/065,196	8/09/88
4,762,355	07/000,758	8/09/88	4,762,719	06/894,068	8/09/88
4,762,357	07/084,183	8/09/88	4,762,727	06/910,248	8/09/88
4,762,361	07/064,102	8/09/88	4,762,736	07/041,330	8/09/88
4,762,363	07/005,440	8/09/88	4,762,737	06/731,432	8/09/88
4,762,364	07/082,195	8/09/88	4,762,758	06/808,096	8/09/88
4,762,365	07/025,080	8/09/88	4,762,766	06/818,796	8/09/88
4,762,370	06/893,020	8/09/88	4,762,768	06/879,385	8/09/88
4,762,371	06/660,886	8/09/88	4,762,770	07/039,505	8/09/88
4,762,379	06/864,030	8/09/88	4,762,781	06/687,033	8/09/88
4,762,383	06/818,915	8/09/88	4,762,782	06/734,535	8/09/88
4,762,406	06/809,896	8/09/88	4,762,789	06/819,892	8/09/88
4,762,409	06/849,117	8/09/88	4,762,794	06/609,871	8/09/88
4,762,411	07/097,331	8/09/88	4,762,821	06/905,828	8/09/88
4,762,417	06/879,000	8/09/88	4,762,826	07/034,196	8/09/88
4,762,423	06/946,573	8/09/88	4,762,827	07/059,720	8/09/88
4,762,424	07/000,096	8/09/88	4,762,828	07/061,067	8/09/88
4,762,433	07/068,856	8/09/88	4,762,829	06/922,224	8/09/88
4,762,435	06/884,424	8/09/88	4,762,830	06/830,430	8/09/88
4,762,438	06/876,085	8/09/88	4,762,833	07/033,628	8/09/88
4,762,439	07/046,744	8/09/88	4,762,834	06/898,834	8/09/88
4,762,448	07/002,648	8/09/88	4,762,837	07/055,816	8/09/88
4,762,451	06/947,196	8/09/88	4,762,845	06/866,194	8/09/88
4,762,452	07/092,763	8/09/88	4,762,847	06/914,265	8/09/88
4,762,456	06/873,213	8/09/88	4,762,850	07/029,512	8/09/88
4,762,457	07/062,375	8/09/88	4,762,855	06/926,895	8/09/88
4,762,458	07/028,444	8/09/88	4,762,865	07/015,740	8/09/88
4,762,463	07/035,387	8/09/88	4,762,868	06/873,974	8/09/88

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4,762,869	07/038,896	8/09/88
4,762,874	06/837,646	8/09/88
4,762,875	07/015,741	8/09/88
4,762,907	06/938,063	8/09/88
4,762,908	07/035,339	8/09/88
4,762,912	06/915,180	8/09/88
4,762,919	06/828,460	8/09/88
4,762,924	07/062,033	8/09/88
4,762,926	06/809,445	8/09/88
4,762,930	06/635,318	8/09/88
4,762,931	06/934,329	8/09/88
4,762,937	07/082,606	8/09/88
4,762,945	06/775,272	8/09/88
4,762,952	07/024,056	8/09/88
4,762,953	07/019,093	8/09/88
4,762,969	06/932,230	8/09/88
4,762,970	07/085,976	8/09/88
4,762,976	06/883,795	8/09/88
4,762,979	06/937,902	8/09/88
4,762,989	06/880,455	8/09/88
4,762,992	07/060,213	8/09/88
4,762,993	07/001,768	8/09/88
4,763,005	06/893,860	8/09/88
4,763,006	06/925,802	8/09/88
4,763,009	07/008,896	8/09/88
4,763,012	07/025,158	8/09/88
4,763,022	07/000,354	8/09/88
4,763,031	06/891,923	8/09/88
4,763,036	07/065,838	8/09/88
4,763,038	07/043,392	8/09/88
4,763,045	07/045,284	8/09/88
4,763,046	07/070,998	8/09/88
4,763,048	07/048,310	8/09/88
4,763,054	06/900,719	8/09/88
4,763,058	06/938,022	8/09/88
4,763,064	07/034,530	8/09/88
4,763,070	06/778,515	8/09/88
4,763,073	06/844,165	8/09/88
4,763,075	06/756,883	8/09/88
4,763,080	07/063,634	8/09/88
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4,763,095	06/894,781	8/09/88
4,763,096	07/086,340	8/09/88
4,763,097	06/831,074	8/09/88
4,763,106	07/075,447	8/09/88
4,763,110	07/064,516	8/09/88
4,763,112	07/007,111	8/09/88
4,763,115	06/939,537	8/09/88
4,763,116	06/759,587	8/09/88
4,763,125	07/004,745	8/09/88
4,763,133	06/694,193	8/09/88
4,763,140	07/075,533	8/09/88
4,763,153	07/024,387	8/09/88
4,763,174	06/922,423	8/09/88
4,763,185	06/507,409	8/09/88
4,763,218	07/040,226	8/09/88
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4,763,225	06/900,070	8/09/88
4,763,227	07/080,937	8/09/88
4,763,230	07/059,322	8/09/88
4,763,231	07/064,869	8/09/88
4,763,234	07/055,065	8/09/88
4,763,237	06/919,961	8/09/88
4,763,247	06/812,252	8/09/88
4,763,265	06/826,467	8/09/88
4,763,282	06/798,011	8/09/88
4,763,318	06/859,285	8/09/88
4,763,320	06/745,315	8/09/88
4,763,324	07/013,066	8/09/88
4,763,325	06/772,536	8/09/88
4,763,329	06/827,415	8/09/88
4,763,336	06/855,451	8/09/88
4,763,341	07/019,081	8/09/88
4,763,349	07/036,337	8/09/88
4,763,355	07/029,856	8/09/88
4,763,361	06/835,858	8/09/88

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4,763,364	07/037,035	8/16/88
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4,763,370	06/868,502	8/16/88
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4,763,378	07/126,246	8/16/88
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4,763,380	07/097,151	8/16/88
4,763,384	06/916,318	8/16/88
4,763,388	07/071,403	8/16/88
4,763,390	07/048,243	8/16/88
4,763,393	07/049,093	8/16/88
4,763,399	07/084,082	8/16/88
4,763,402	06/919,195	8/16/88
4,763,403	06/942,122	8/16/88
4,763,413	07/022,495	8/16/88
4,763,414	06/919,709	8/16/88
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4,763,439	06/876,005	8/16/88
4,763,442	06/359,210	8/16/88
4,763,446	06/904,174	8/16/88
4,763,451	06/877,860	8/16/88
4,763,455	06/505,369	8/16/88
4,763,457	06/881,154	8/16/88
4,763,458	06/662,268	8/16/88
4,763,461	07/003,408	8/16/88
4,763,471	07/011,347	8/16/88
4,763,478	07/065,019	8/16/88
4,763,485	07/055,369	8/16/88
4,763,491	07/002,711	8/16/88
4,763,505	07/020,379	8/16/88
4,763,507	07/048,340	8/16/88
4,763,509	06/943,541	8/16/88
4,763,512	06/923,317	8/16/88
4,763,516	06/935,521	8/16/88
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4,763,529	07/087,857	8/16/88
4,763,536	06/841,431	8/16/88
4,763,537	06/941,744	8/16/88
4,763,542	06/763,217	8/16/88
4,763,546	07/090,881	8/16/88
4,763,547	07/076,130	8/16/88
4,763,548	06/919,245	8/16/88
4,763,555	07/042,271	8/16/88
4,763,556	07/008,543	8/16/88
4,763,559	07/061,622	8/16/88
4,763,562	06/920,709	8/16/88
4,763,563	07/122,257	8/16/88
4,763,567	07/142,714	8/16/88
4,763,568	06/782,035	8/16/88
4,763,576	06/861,489	8/16/88
4,763,577	06/843,709	8/16/88
4,763,579	07/007,996	8/16/88
4,763,580	06/947,049	8/16/88
4,763,588	06/891,185	8/16/88
4,763,597	07/040,023	8/16/88
4,763,598	06/914,153	8/16/88
4,763,605	06/937,661	8/16/88
4,763,608	07/030,512	8/16/88
4,763,611	06/928,298	8/16/88
4,763,615	06/937,754	8/16/88
4,763,621	06/881,058	8/16/88
4,763,631	07/134,113	8/16/88
4,763,634	06/938,009	8/16/88
4,763,639	06/902,097	8/16/88
4,763,646	07/131,269	8/16/88
4,763,652	06/852,835	8/16/88
4,763,656	07/134,195	8/16/88
4,763,658	07/079,293	8/16/88
4,763,663	06/924,047	8/16/88
4,763,671	06/858,891	8/16/88
4,763,673	06/698,024	8/16/88
4,763,675	07/058,383	8/16/88
4,763,677	06/935,345	8/16/88
4,763,679	07/071,015	8/16/88

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4,763,689	07/076,201	8/16/88
4,763,691	06/903,270	8/16/88
4,763,693	07/022,026	8/16/88
4,763,696	07/017,893	8/16/88
4,763,697	07/009,047	8/16/88
4,763,698	06/942,378	8/16/88
4,763,701	07/043,122	8/16/88
4,763,704	07/050,759	8/16/88
4,763,709	06/881,592	8/16/88
4,763,713	06/901,935	8/16/88
4,763,717	06/484,355	8/16/88
4,763,719	06/577,789	8/16/88
4,763,721	06/760,866	8/16/88
4,763,731	06/767,653	8/16/88
4,763,737	06/895,125	8/16/88
4,763,740	07/042,678	8/16/88
4,763,743	07/056,151	8/16/88
4,763,744	07/000,035	8/16/88
4,763,755	07/057,775	8/16/88
4,763,756	07/044,774	8/16/88
4,763,758	06/944,583	8/16/88
4,763,759	07/046,669	8/16/88
4,763,760	06/902,571	8/16/88
4,763,762	07/118,992	8/16/88
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4,763,768	06/887,066	8/16/88
4,763,770	06/919,179	8/16/88
4,763,772	06/899,230	8/16/88
4,763,789	07/104,795	8/16/88
4,763,790	07/086,399	8/16/88
4,763,795	06/896,010	8/16/88
4,763,801	07/105,935	8/16/88
4,763,806	07/017,531	8/16/88
4,763,808	07/057,771	8/16/88
4,763,812	07/001,015	8/16/88
4,763,815	07/020,518	8/16/88
4,763,816	07/018,694	8/16/88
4,763,817	07/000,236	8/16/88
4,763,818	07/012,009	8/16/88
4,763,820	06/872,597	8/16/88
4,763,825	07/084,378	8/16/88
4,763,835	06/906,506	8/16/88
4,763,837	07/063,321	8/16/88
4,763,842	07/010,753	8/16/88
4,763,843	06/940,482	8/16/88
4,763,847	06/912,972	8/16/88
4,763,848	06/502,896	8/16/88
4,763,850	07/058,328	8/16/88
4,763,852	07/065,696	8/16/88
4,763,853	06/900,431	8/16/88
4,763,854	07/159,198	8/16/88
4,763,859	06/877,231	8/16/88
4,763,861	07/022,611	8/16/88
4,763,865	07/080,814	8/16/88
4,763,866	07/158,242	8/16/88
4,763,877	07/102,454	8/16/88
4,763,879	07/058,580	8/16/88
4,763,890	06/933,469	8/16/88
4,763,893	06/933,154	8/16/88
4,793,894	07/040,375	8/16/88
4,763,895	06/916,245	8/16/88
4,763,899	06/694,701	8/16/88
4,763,901	06/818,487	8/16/88
4,763,902	07/033,675	8/16/88
4,763,903	06/824,626	8/16/88
4,763,904	06/915,503	8/16/88
4,763,911	06/940,556	8/16/88
4,763,913	07/100,550	8/16/88
4,763,914	07/066,330	8/16/88
4,763,916	07/065,953	8/16/88
4,763,924	06/935,988	8/16/88
4,763,939	06/948,170	8/16/88
4,763,942	07/009,880	8/16/88
4,763,945	07/045,471	8/16/88
4,763,952	07/107,553	8/16/88

4,763,961	06/862,709	8/16/88
4,763,967	06/932,654	8/16/88
4,763,979	06/910,464	8/16/88
4,763,988	06/913,054	8/16/88
4,763,989	07/030,900	8/16/88
4,764,003	06/925,959	8/16/88
4,764,010	06/900,415	8/16/88
4,764,011	06/929,627	8/16/88
4,764,016	07/031,012	8/16/88
4,764,023	06/919,227	8/16/88
4,764,030	06/935,722	8/16/88
4,764,033	07/013,361	8/16/88
4,764,045	07/039,136	8/16/88
4,764,047	07/053,089	8/16/88
4,764,048	06/947,244	8/16/88
4,764,050	07/037,474	8/16/88
4,764,054	07/035,411	8/16/88
4,764,061	06/841,885	8/16/88
4,764,063	06/840,110	8/16/88
4,764,064	07/101,373	8/16/88
4,764,065	07/047,189	8/16/88
4,764,066	06/725,656	8/16/88
4,764,067	06/909,399	8/16/88
4,764,076	06/853,276	8/16/88
4,764,080	06/874,213	8/16/88
4,764,082	07/019,503	8/16/88
4,764,085	06/946,513	8/16/88
4,764,086	06/946,588	8/16/88
4,764,092	07/044,516	8/16/88
4,764,094	07/035,731	8/16/88
4,764,107	07/062,346	8/16/88
4,764,109	07/064,692	8/16/88
4,764,118	06/925,805	8/16/88
4,764,130	06/464,460	8/16/88
4,764,131	07/072,815	8/16/88
4,764,136	07/010,853	8/16/88
4,764,140	06/935,008	8/16/88
4,764,142	07/059,747	8/16/88
4,764,146	07/043,481	8/16/88
4,764,147	06/920,859	8/16/88
4,764,150	07/044,980	8/16/88
4,764,151	06/908,751	8/16/88
4,764,156	06/944,244	8/16/88
4,764,167	07/140,970	8/16/88
4,764,169	06/938,071	8/16/88
4,764,176	06/886,131	8/16/88
4,764,179	07/004,034	8/16/88
4,764,183	07/066,806	8/16/88
4,764,190	07/013,300	8/16/88
4,764,202	06/934,067	8/16/88
4,764,203	07/053,912	8/16/88
4,764,204	07/078,154	8/16/88
4,764,207	07/043,128	8/16/88
4,764,214	07/036,457	8/16/88
4,764,215	07/035,957	8/16/88
4,764,216	06/798,489	8/16/88
4,764,229	07/075,545	8/16/88
4,764,237	06/882,891	8/16/88
4,764,249	07/026,481	8/16/88
4,764,256	07/133,263	8/16/88
4,764,259	07/029,627	8/16/88
4,764,273	07/019,698	8/16/88
4,764,290	07/009,662	8/16/88
4,764,305	06/827,278	8/16/88
4,764,320	07/060,871	8/16/88
4,764,322	05/936,829	8/16/88
4,764,332	06/891,026	8/16/88
4,764,343	06/930,517	8/16/88
4,764,345	06/827,411	8/16/88
4,764,350	06/916,963	8/16/88
4,764,352	06/878,131	8/16/88
4,764,358	06/868,480	8/16/88
4,764,361	07/024,568	8/16/88
4,764,364	06/833,215	8/16/88
4,764,383	07/036,077	8/16/88
4,764,393	06/808,848	8/16/88
4,764,399	06/893,722	8/16/88
4,764,438	06/741,516	8/16/88

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4,764,460	06/796,372	8/16/88
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4,764,467	07/045,759	8/16/88
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4,764,472	06/865,909	8/16/88
4,764,481	07/088,238	8/16/88
4,764,485	07/009,617	8/16/88
4,764,488	06/911,213	8/16/88
4,764,493	06/874,460	8/16/88
4,764,498	06/791,890	8/16/88
4,764,506	06/853,536	8/16/88
4,764,509	06/086,208	8/16/88
4,764,511	06/853,442	8/16/88
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4,764,517	07/089,299	8/16/88
4,764,518	06/874,232	8/16/88
4,764,520	07/042,480	8/16/88
4,764,524	06/816,933	8/16/88
4,764,526	07/027,105	8/16/88
4,764,542	07/112,547	8/16/88
4,764,548	07/118,369	8/16/88
4,764,556	07/047,132	8/16/88
4,764,565	06/704,402	8/16/88
4,764,570	07/034,601	8/16/88
4,764,574	06/939,641	8/16/88
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4,764,591	07/040,966	8/16/88
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4,764,606	06/890,906	8/16/88
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4,764,646	07/096,644	8/16/88
4,764,647	07/038,786	8/16/88
4,764,648	07/090,662	8/16/88
4,764,651	07/100,015	8/16/88
4,764,658	06/891,325	8/16/88
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4,764,671	06/915,159	8/16/88
4,764,679	06/895,725	8/16/88
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4,764,696	06/907,911	8/16/88
4,764,701	06/947,655	8/16/88
4,764,712	07/082,038	8/16/88
4,764,735	06/907,465	8/16/88
4,764,742	06/796,435	8/16/88
4,764,756	06/907,884	8/16/88
4,764,757	07/025,051	8/16/88
4,764,769	06/548,522	8/16/88
4,764,774	06/916,953	8/16/88
4,764,775	06/719,619	8/16/88
4,764,776	07/071,973	8/16/88
4,764,787	07/005,674	8/16/88
4,764,797	06/883,158	8/16/88
4,764,810	07/012,228	8/16/88
4,764,812	07/006,316	8/16/88
4,764,835	07/018,511	8/16/88
4,764,839	07/001,932	8/16/88
4,764,843	06/923,677	8/16/88
4,764,847	06/936,476	8/16/88
4,764,857	07/047,353	8/16/88
4,764,858	07/110,112	8/16/88
4,764,863	06/732,327	8/16/88
4,764,866	06/894,070	8/16/88
4,764,873	07/014,368	8/16/88
4,764,876	06/923,188	8/16/88
4,764,913	06/942,713	8/16/88
4,764,918	06/944,640	8/16/88
4,764,922	06/897,435	8/16/88
4,764,938	06/436,195	8/16/88
4,764,943	06/922,412	8/16/88
4,764,946	06/890,021	8/16/88
4,764,953	07/053,085	8/16/88
4,764,957	06/767,418	8/16/88
4,764,958	07/015,065	8/16/88

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4,764,962	07/011,451	8/16/88
4,764,973	06/867,642	8/16/88
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4,764,996	07/056,876	8/23/88
4,765,003	07/081,676	8/23/88
4,765,014	07/028,219	8/23/88
4,765,021	06/942,165	8/23/88
4,765,026	06/744,953	8/23/88
4,765,028	07/047,206	8/23/88
4,765,031	06/446,599	8/23/88
4,765,033	07/103,543	8/23/88
4,765,035	07/058,869	8/23/88
4,765,037	07/053,846	8/23/88
4,765,051	07/052,468	8/23/88
4,765,061	07/085,706	8/23/88
4,765,062	07/093,721	8/23/88
4,765,065	07/118,274	8/23/88
4,765,066	07/086,974	8/23/88
4,765,074	06/908,041	8/23/88
4,765,082	07/091,100	8/23/88
4,765,083	07/125,156	8/23/88
4,765,084	07/093,504	8/23/88
4,765,086	07/107,658	8/23/88
4,765,090	06/854,417	8/23/88
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4,765,097	07/074,194	8/23/88
4,765,098	07/002,497	8/23/88
4,765,100	07/049,208	8/23/88
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4,765,163	07/040,194	8/23/88
4,765,164	07/015,300	8/23/88
4,765,170	06/794,579	8/23/88
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4,765,190	06/878,732	8/23/88
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4,765,309	07/046,876	8/23/88
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4,765,574	07/118,569	8/23/88
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4,765,886	06/862,664	8/23/88
4,765,887	07/019,422	8/23/88
4,765,889	07/034,668	8/23/88
4,765,895	06/562,852	8/23/88
4,765,898	06/878,347	8/23/88
4,765,904	06/776,976	8/23/88
4,765,928	06/766,918	8/23/88

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4,765,929	06/902,357	8/23/88
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4,765,995	07/007,202	8/23/88
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4,766,136	07/022,318	8/23/88
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4,766,144	07/035,543	8/23/88
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4,766,844	07/055,495	8/30/88
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4,766,874	07/048,245	8/30/88
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4,768,999	07/050,686	9/06/88
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4,769,007	07/029,583	9/06/88
4,769,015	06/858,102	9/06/88
4,769,024	07/034,987	9/06/88
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4,769,026	06/898,156	9/06/88
4,769,029	07/064,005	9/06/88
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4,769,036	06/755,930	9/06/88
4,769,037	06/924,059	9/06/88
4,769,039	06/900,702	9/06/88
4,769,044	07/043,954	9/06/88
4,769,046	07/081,675	9/06/88
4,769,049	07/038,055	9/06/88
4,769,050	07/052,547	9/06/88
4,769,056	07/026,248	9/06/88
4,769,057	07/048,656	9/06/88
4,769,060	07/016,049	9/06/88
4,769,083	06/822,562	9/06/88
4,769,096	06/829,420	9/06/88

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4,769,108	06/881,083	9/06/88
4,769,112	07/008,447	9/06/88
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4,769,129	06/921,004	9/06/88
4,769,130	06/493,095	9/06/88
4,769,134	06/808,828	9/06/88
4,769,147	06/800,208	9/06/88
4,769,149	07/095,604	9/06/88
4,769,156	06/890,185	9/06/88
4,769,157	07/117,914	9/06/88
4,769,177	06/377,624	9/06/88
4,769,185	07/084,894	9/06/88
4,769,196	06/673,093	9/06/88
4,769,206	06/937,344	9/06/88
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4,769,217	06/728,488	9/06/88
4,769,218	07/002,772	9/06/88
4,769,222	06/910,861	9/06/88
4,769,223	07/041,326	9/06/88
4,769,226	07/098,702	9/06/88
4,769,228	06/733,345	9/06/88
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4,769,805	06/838,506	9/06/88
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4,769,886	07/032,965	9/13/88
4,769,888	07/046,706	9/13/88
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4,769,905	07/031,294	9/13/88
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4,769,933		

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4,769,948	06/710,244	9/13/88
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4,770,463	06/927,359	9/13/88
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4,770,554	06/923,944	9/13/88
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4,770,564	07/139,151	9/13/88
4,770,565	06/937,574	9/13/88
4,770,571	06/939,071	9/13/88

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4,770,788	06/727,117	9/13/88
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4,770,796	07/002,315	9/13/88
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4,770,809	06/915,304	9/13/88
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4,770,814	06/528,314	9/13/88
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4,770,880	06/756,801	9/13/88
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4,770,887	07/056,468	9/13/88
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4,770,910	07/002,925	9/13/88
4,770,912	07/076,584	9/13/88
4,770,918	07/096,549	9/13/88
4,770,951	06/766,251	9/13/88
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4,770,967	07/044,418	9/13/88
4,770,970	06/875,569	9/13/88
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4,773,575	06/877,694	9/27/88
4,773,576	07/077,498	9/27/88
4,773,578	07/055,416	9/27/88
4,773,579	07/032,556	9/27/88
4,773,585	06/846,432	9/27/88
4,773,594	06/882,270	9/27/88
4,773,595	06/902,052	9/27/88
4,773,597	07/129,948	9/27/88
4,773,598	07/022,060	9/27/88
4,773,602	07/034,301	9/27/88
4,773,617	07/022,069	9/27/88
4,773,619	07/006,489	9/27/88

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4,773,620	07/028,832	9/27/88
4,773,623	07/033,650	9/27/88
4,773,624	06/856,274	9/27/88
4,773,631	06/889,129	9/27/88
4,773,632	06/930,300	9/27/88
4,773,633	06/832,750	9/27/88
4,773,639	07/051,205	9/27/88
4,773,641	07/015,737	9/27/88
4,773,642	06/929,646	9/27/88
4,773,651	07/078,666	9/27/88
4,773,652	07/039,705	9/27/88
4,773,653	07/005,210	9/27/88
4,773,654	07/027,225	9/27/88
4,773,659	07/104,647	9/27/88
4,773,660	07/038,901	9/27/88
4,773,665	07/095,926	9/27/88
4,773,667	07/044,173	9/27/88
4,773,668	07/062,908	9/27/88
4,773,676	06/937,971	9/27/88
4,773,681	07/005,340	9/27/88
4,773,689	07/051,542	9/27/88
4,773,690	07/049,435	9/27/88
4,773,691	07/028,237	9/27/88
4,773,695	07/088,117	9/27/88
4,773,698	07/013,874	9/27/88
4,773,705	07/065,294	9/27/88
4,773,709	07/093,181	9/27/88
4,773,710	07/073,104	9/27/88
4,773,719	07/079,800	9/27/88
4,773,722	06/554,875	9/27/88
4,773,726	06/923,304	9/27/88
4,773,728	06/876,538	9/27/88
4,773,736	06/795,138	9/27/88
4,773,743	07/014,036	9/27/88
4,773,747	06/848,990	9/27/88
4,773,754	06/325,890	9/27/88
4,773,775	06/866,141	9/27/88
4,773,783	06/892,198	9/27/88
4,773,786	07/012,331	9/27/88
4,773,788	07/053,799	9/27/88
4,773,796	06/382,688	9/27/88
4,773,802	07/001,840	9/27/88
4,773,805	07/081,021	9/27/88
4,773,806	07/033,757	9/27/88
4,773,809	06/466,344	9/27/88
4,773,813	07/032,649	9/27/88
4,773,815	06/941,554	9/27/88
4,773,816	06/761,980	9/27/88
4,773,823	06/845,324	9/27/88
4,773,826	06/347,754	9/27/88
4,773,829	07/091,501	9/27/88
4,773,830	07/024,246	9/27/88
4,773,832	06/545,090	9/27/88
4,773,840	07/110,739	9/27/88
4,773,843	07/128,012	9/27/88
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4,773,864	07/090,857	9/27/88
4,773,865	07/064,491	9/27/88
4,773,866	06/911,792	9/27/88
4,773,868	07/027,331	9/27/88
4,773,869	07/052,080	9/27/88
4,773,886	06/773,879	9/27/88
4,773,888	06/904,508	9/27/88
4,773,896	07/035,380	9/27/88
4,773,902	06/734,817	9/27/88
4,773,911	07/068,498	9/27/88
4,773,919	07/062,255	9/27/88
4,773,927	07/077,520	9/27/88
4,773,929	07/082,833	9/27/88
4,773,937	06/938,592	9/27/88
4,773,939	07/018,106	9/27/88
4,773,945	07/097,497	9/27/88
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4,773,982	06/873,180	9/27/88
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4,774,004	06/879,713	9/27/88
4,774,007	07/018,525	9/27/88
4,774,015	06/834,389	9/27/88
4,774,018	07/061,648	9/27/88
4,774,020	06/877,527	9/27/88
4,774,023	06/821,281	9/27/88
4,774,025	07/014,037	9/27/88
4,774,031	07/040,717	9/27/88
4,774,034	07/101,144	9/27/88
4,774,036	07/041,235	9/27/88
4,774,044	06/880,956	9/27/88
4,774,050	06/850,195	9/27/88
4,774,066	06/660,072	9/27/88
4,774,102	06/871,972	9/27/88
4,744,104	07/050,174	9/27/88
4,774,113	07/118,480	9/27/88
4,774,118	07/060,182	9/27/88
4,774,119	07/122,787	9/27/88
4,774,126	07/075,486	9/27/88
4,774,139	07/112,234	9/27/88
4,774,148	06/924,790	9/27/88
4,774,173	06/679,077	9/27/88
4,774,178	06/727,693	9/27/88
4,774,185	06/915,026	9/27/88
4,774,187	07/035,334	9/27/88
4,774,190	07/049,913	9/27/88
4,774,193	07/021,812	9/27/88
4,774,195	06/761,383	9/27/88
4,774,199	06/918,931	9/27/88
4,774,220	07/020,835	9/27/88
4,774,232	06/946,684	9/27/88
4,774,237	07/011,688	9/27/88
4,774,249	07/112,908	9/27/88
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4,774,253	06/917,566	9/27/88
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4,774,260	06/843,449	9/27/88
4,774,267	07/081,715	9/27/88
4,774,269	07/049,384	9/27/88
4,774,282	06/932,879	9/27/88
4,774,283	07/020,917	9/27/88
4,774,284	07/051,242	9/27/88
4,774,301	07/059,099	9/27/88
4,774,310	07/061,759	9/27/88
4,774,313	07/122,718	9/27/88
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4,774,366	06/831,903	9/27/88
4,774,368	07/052,483	9/27/88
4,774,381	06/747,099	9/27/88
4,774,384	07/058,034	9/27/88
4,774,389	07/161,379	9/27/88
4,774,391	06/899,078	9/27/88
4,774,396	07/037,947	9/27/88
4,774,405	07/053,986	9/27/88
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4,774,419	07/065,735	9/27/88
4,774,424	06/829,218	9/27/88
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4,774,434	06/896,052	9/27/88
4,774,436	07/057,427	9/27/88
4,774,443	06/805,183	9/27/88
4,774,444	07/042,234	9/27/88
4,774,456	06/834,207	9/27/88
4,774,457	07/108,481	9/27/88
4,774,458	06/918,591	9/27/88
4,774,462	06/619,051	9/27/88
4,774,469	06/923,151	9/27/88
4,774,485	07/103,046	9/27/88
4,774,487	06/939,124	9/27/88
4,774,488	07/135,010	9/27/88
4,774,493	06/863,673	9/27/88
4,774,520	06/361,846	9/27/88
4,774,537	06/867,575	9/27/88
4,774,555	07/083,751	9/27/88
4,774,563	07/045,912	9/27/88
4,774,578	06/880,792	9/27/88

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4,774,632	07/070,746	9/27/88
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4,774,638	07/024,380	9/27/88
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4,774,641	07/022,404	9/27/88
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4,774,704	06/892,028	9/27/88
4,774,707	06/905,506	9/27/88
4,774,716	06/938,958	9/27/88
4,774,722	07/062,206	9/27/88
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4,774,728	06/777,030	10/04/88
4,774,730	07/071,181	10/04/88
4,774,732	07/020,372	10/04/88
4,774,733	06/445,907	10/04/88
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4,474,736	07/020,667	10/04/88
4,774,739	07/041,688	10/04/88
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4,774,780	06/908,184	10/04/88
4,774,781	07/059,595	10/04/88
4,774,782	06/893,316	10/04/88
4,774,783	07/096,047	10/04/88
4,774,784	07/016,264	10/04/88
4,774,785	07/101,742	10/04/88
4,774,786	06/933,797	10/04/88
4,774,788	06/835,165	10/04/88
4,774,789	07/096,005	10/04/88
4,774,792	06/899,739	10/04/88
4,774,796	07/110,244	10/04/88
4,774,797	07/059,975	10/04/88
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4,774,801	07/066,033	10/04/88
4,774,804	07/104,245	10/04/88
4,774,805	07/128,755	10/04/88
4,774,806	07/143,297	10/04/88
4,774,813	07/042,701	10/04/88
4,774,817	06/768,410	10/04/88
4,774,825	06/906,682	10/04/88
4,774,826	06/939,546	10/04/88
4,774,829	07/048,146	10/04/88
4,774,833	07/107,654	10/04/88
4,774,834	07/097,954	10/04/88
4,774,835	06/929,862	10/04/88
4,774,841	07/051,750	10/04/88
4,774,848	06/905,273	10/04/88
4,774,855	06/819,197	10/04/88
4,774,858	06/859,431	10/04/88
4,774,861	07/117,272	10/04/88
4,774,862	07/052,017	10/04/88
4,774,871	07/070,309	10/04/88
4,774,878	06/929,058	10/04/88
4,778,879	07/080,484	10/04/88
4,774,883	07/134,573	10/04/88
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4,774,888	07/099,808	10/04/88
4,774,889	07/005,810	10/04/88
4,774,892	07/032,610	10/04/88
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4,774,897	06/928,224	10/04/88
4,774,902	06/842,741	10/04/88
4,774,923	07/116,550	10/04/88
4,774,926	07/014,905	10/04/88
4,774,928	06/878,987	10/04/88
4,774,930	07/131,569	10/04/88
4,774,931	07/046,670	10/04/88
4,774,939	07/069,213	10/04/88
4,774,943	06/948,052	10/04/88
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4,774,954	07/012,295	10/04/88
4,774,955	07/079,269	10/04/88
4,774,969	06/836,387	10/04/88
4,774,971	06/870,124	10/04/88
4,774,974	06/897,641	10/04/88
4,774,977	07/012,880	10/04/88
4,774,978	07/103,949	10/04/88
4,774,981	07/156,364	10/04/88
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4,774,994	06/880,246	10/04/88
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4,775,013	07/113,392	10/04/88
4,775,014	06/827,284	10/04/88
4,775,028	07/021,970	10/04/88
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4,775,053	07/067,154	10/04/88
4,775,054	07/037,882	10/04/88
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4,775,066	07/118,968	10/04/88
4,775,069	07/076,881	10/04/88
4,775,070	07/107,097	10/04/88
4,775,076	06/878,984	10/04/88
4,775,077	07/018,434	10/04/88
4,775,080	06/945,083	10/04/88
4,775,082	06/846,848	10/04/88
4,775,087	06/852,337	10/04/88
4,775,088	06/889,704	10/04/88
4,775,091	07/130,538	10/04/88
4,775,093	07/038,984	10/04/88
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4,775,101	07/024,055	10/04/88
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4,775,116	06/902,975	10/04/88
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4,775,122	07/146,139	10/04/88
4,775,125	07/032,423	10/04/88
4,775,126	06/927,354	10/04/88
4,775,129	07/017,877	10/04/88
4,775,130	07/077,419	10/04/88
4,775,141	07/003,768	10/04/88
4,775,144	07/097,705	10/04/88
4,775,149	07/045,073	10/04/88
4,775,151	07/064,064	10/04/88
4,775,152	07/095,211	10/04/88
4,775,157	07/052,907	10/04/88
4,775,159	07/064,206	10/04/88
4,775,160	06/903,415	10/04/88
4,775,161	06/810,395	10/04/88
4,775,165	06/947,865	10/04/88
4,775,168	06/931,415	10/04/88
4,775,170	07/072,925	10/04/88
4,775,171	07/034,606	10/04/88
4,775,177	07/072,325	10/04/88
4,775,186	07/067,637	10/04/88
4,775,195	07/107,416	10/04/88
4,775,196	06/921,187	10/04/88
4,775,200	07/137,107	10/04/88
4,775,201	06/931,582	10/04/88
4,775,209	07/022,707	10/04/88
4,775,210	06/905,085	10/04/88
4,775,215	06/925,938	10/04/88
4,775,229	06/830,872	10/04/88

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4,775,235	06/946,690	10/04/88
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4,775,244	07/058,447	10/04/88
4,775,256	06/896,862	10/04/88
4,775,273	06/227,725	10/04/88
4,775,276	07/051,510	10/04/88
4,775,277	07/002,706	10/04/88
4,775,278	07/012,242	10/04/88
4,775,279	06/807,531	10/04/88
4,775,281	06/936,825	10/04/88
4,775,283	06/846,457	10/04/88
4,775,290	06/822,868	10/04/88
4,775,291	07/078,408	10/04/88
4,775,292	07/069,249	10/04/88
4,775,301	07/145,738	10/04/88
4,775,303	06/699,680	10/04/88
4,775,307	06/893,202	10/04/88
4,775,311	07/117,857	10/04/88
4,775,313	07/014,588	10/04/88
4,775,315	07/134,543	10/04/88
4,775,321	07/017,997	10/04/88
4,775,330	07/123,120	10/04/88
4,775,331	07/044,763	10/04/88
4,775,342	06/558,544	10/04/88
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4,775,346	06/905,250	10/04/88
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4,775,356	06/888,582	10/04/88
4,775,363	07/000,801	10/04/88
4,775,364	07/071,879	10/04/88
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4,775,370	07/135,537	10/04/88
4,775,372	07/036,580	10/04/88
4,775,376	06/883,892	10/04/88
4,775,381	07/004,243	10/04/88
4,775,385	06/898,461	10/04/88
4,775,389	06/947,073	10/04/88
4,775,391	07/071,009	10/04/88
4,775,393	06/868,954	10/04/88
4,775,403	07/133,716	10/04/88
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4,775,409	07/009,971	10/04/88
4,775,410	07/017,509	10/04/88
4,775,416	06/812,241	10/04/88
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4,775,436	07/132,209	10/04/88
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4,775,472	07/065,141	10/04/88
4,775,473	07/028,246	10/04/88
4,775,474	06/935,547	10/04/88
4,775,486	07/122,204	10/04/88
4,775,497	06/922,919	10/04/88
4,775,502	06/891,587	10/04/88
4,775,507	06/291,230	10/04/88
4,775,511	06/883,364	10/04/88
4,775,525	06/809,428	10/04/88
4,775,532	06/664,095	10/04/88
4,775,537	07/045,101	10/04/88
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4,775,576	06/885,089	10/04/88
4,775,581	07/065,768	10/04/88
4,775,611	06/681,839	10/04/88
4,775,621	06/833,881	10/04/88
4,775,632	06/645,777	10/04/88
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4,775,662	07/114,820	10/04/88
4,775,673	06/851,339	10/04/88
4,775,675	06/874,111	10/04/88
4,775,678	06/861,021	10/04/88
4,775,696	06/945,264	10/04/88
4,775,727	07/041,673	10/04/88
4,775,731	06/844,710	10/04/88
4,775,740	06/852,461	10/04/88
4,775,745	06/939,370	10/04/88
4,775,749	06/636,901	10/04/88
4,775,756	06/917,567	10/04/88
4,775,764	07/078,616	10/04/88
4,775,774	07/093,540	10/04/88
4,775,780	06/945,352	10/04/88
4,775,784	06/832,164	10/04/88
4,775,788	06/915,072	10/04/88
4,775,789	06/841,142	10/04/88
4,775,794	07/115,314	10/04/88
4,775,798	06/867,465	10/04/88
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4,776,041	06/937,733	10/04/88
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4,777,871	07/108,548	10/18/88
4,777,877	06/909,898	10/18/88
4,777,879	07/035,794	10/18/88
4,777,881	07/065,480	10/18/88
4,777,884	07/041,685	10/18/88
4,777,886	06/940,586	10/18/88
4,777,888	07/143,254	10/18/88
4,777,893	07/008,501	10/18/88
4,777,894	07/130,883	10/18/88
4,777,900	07/056,431	10/18/88
4,777,901	07/007,667	10/18/88
4,777,910	07/024,823	10/18/88
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4,777,926	06/526,327	10/18/88
4,777,931	07/070,376	10/18/88
4,777,933	07/117,335	10/18/88
4,777,938	06/858,913	10/18/88
4,777,945	06/899,298	10/18/88
4,777,948	06/570,763	10/18/88
4,777,961	06/787,635	10/18/88
4,777,963	07/063,448	10/18/88
4,777,966	06/927,928	10/18/88
4,777,967	06/943,016	10/18/88
4,777,968	07/042,050	10/18/88
4,777,977	07/027,060	10/18/88
4,777,980	07/055,797	10/18/88
4,777,983	07/086,525	10/18/88
4,777,991	06/889,389	10/18/88
4,777,992	07/053,031	10/18/88
4,777,996	06/534,597	10/18/88
4,778,001	06/926,670	10/18/88
4,778,002	06/907,682	10/18/88
4,778,011	06/889,337	10/18/88
4,778,017	07/142,667	10/18/88
4,778,019	07/097,447	10/18/88
4,778,023	07/018,734	10/18/88
4,778,029	07/120,361	10/18/88
4,778,030	07/148,341	10/18/88
4,778,031	07/133,328	10/18/88
4,778,037	07/141,698	10/18/88
4,778,039	07/045,854	10/18/88
4,778,042	06/928,000	10/18/88
4,778,047	07/095,026	10/18/88
4,778,049	07/108,443	10/18/88
4,778,050	07/120,602	10/18/88
4,778,051	06/864,714	10/18/88
4,778,063	06/921,434	10/18/88
4,778,064	07/026,832	10/18/88
4,778,067	07/066,325	10/18/88
4,778,070	07/041,461	10/18/88
4,778,074	07/071,450	10/18/88
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4,778,091	07/068,086	10/18/88
4,778,095	07/061,849	10/18/88
4,778,096	06/868,357	10/18/88
4,778,100	06/905,349	10/18/88
4,778,102	07/059,660	10/18/88
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4,778,112	07/015,973	10/18/88
4,778,116	07/003,523	10/18/88
4,778,121	07/004,833	10/18/88
4,778,122	07/019,786	10/18/88
4,778,132	06/894,359	10/18/88
4,778,133	07/047,984	10/18/88
4,778,135	07/002,454	10/18/88
4,778,137	07/075,358	10/18/88
4,778,140	07/017,044	10/18/88
4,778,141	07/102,719	10/18/88
4,778,144	07/006,137	10/18/88
4,778,145	07/083,774	10/18/88
4,778,151	07/139,083	10/18/88
4,778,152	07/051,344	10/18/88
4,778,154	07/041,687	10/18/88
4,778,158	07/049,787	10/18/88
4,778,159	07/012,756	10/18/88
4,778,165	07/043,226	10/18/88
4,778,169	07/035,668	10/18/88
4,778,172	07/072,971	10/18/88
4,778,176	06/946,852	10/18/88
4,778,180	07/016,742	10/18/88
4,778,181	07/057,044	10/18/88
4,778,182	07/072,894	10/18/88
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4,778,186	06/936,590	10/18/88
4,778,187	06/921,619	10/18/88
4,778,188	06/904,201	10/18/88
4,778,190	06/933,665	10/18/88
4,778,193	07/001,052	10/18/88
4,778,204	06/904,876	10/18/88
4,778,207	07/091,635	10/18/88
4,778,209	07/020,692	10/18/88
4,778,210	07/100,263	10/18/88
4,778,211	06/887,738	10/18/88
4,778,214	07/099,155	10/18/88
4,778,216	07/040,024	10/18/88
4,778,221	07/055,882	10/18/88
4,778,226	07/060,194	10/18/88
4,778,230	07/127,380	10/18/88

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4,778,232	07/018,996	10/18/88
4,778,241	07/023,418	10/18/88
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4,778,270	07/004,735	10/18/88
4,778,278	07/060,489	10/18/88
4,778,282	07/094,904	10/18/88
4,778,290	06/796,285	10/18/88
4,778,295	06/624,457	10/18/88
4,778,298	07/065,430	10/18/88
4,778,301	07/060,235	10/18/88
4,778,304	07/046,374	10/18/88
4,778,305	07/032,060	10/18/88
4,778,306	06/938,602	10/18/88
4,778,312	07/050,817	10/18/88
4,778,314	07/074,926	10/18/88
4,778,318	07/047,312	10/18/88
4,778,319	07/021,277	10/18/88
4,778,321	06/912,328	10/18/88
4,778,327	07/061,022	10/18/88
4,778,329	06/842,302	10/18/88
4,778,339	07/145,624	10/18/88
4,778,346	06/648,751	10/18/88
4,778,347	06/906,898	10/18/88
4,778,353	06/548,369	10/18/88
4,778,356	06/901,928	10/18/88
4,778,362	06/947,101	10/18/88
4,778,364	06/913,460	10/18/88
4,778,365	07/003,077	10/18/88
4,778,367	07/133,404	10/18/88
4,778,368	07/037,681	10/18/88
4,778,371	07/001,876	10/18/88
4,778,376	06/551,827	10/18/88
4,778,381	07/086,050	10/18/88
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4,778,399	07/014,604	10/18/88
4,778,402	07/106,929	10/18/88
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4,778,416	06/904,161	10/18/88
4,778,423	07/109,833	10/18/88
4,778,430	06/943,325	10/18/88
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4,778,480	06/915,845	10/18/88
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4,778,535	06/425,166	10/18/88
4,778,537	07/081,470	10/18/88
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4,778,545	07/098,490	10/18/88
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4,778,562	06/639,853	10/18/88
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4,778,579	07/027,041	10/18/88
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4,778,676	06/811,601	10/18/88
4,778,677	06/523,295	10/18/88
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4,778,699	06/907,386	10/18/88
4,778,719	06/900,210	10/18/88
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4,788,864	06/946,740	10/18/88
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4,778,875	07/044,376	10/18/88
4,778,880	06/780,566	10/18/88
4,788,895	07/036,144	10/18/88
4,778,904	07/002,339	10/18/88
4,778,905	06/788,202	10/18/88
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4,778,913	06/930,395	10/18/88
4,778,919	07/015,814	10/18/88
4,778,923	06/915,252	10/18/88
4,778,924	07/062,405	10/18/88
4,778,925	07/052,917	10/18/88
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4,778,955	07/006,294	10/18/88
4,778,958	07/153,510	10/18/88
4,778,967	06/918,649	10/18/88
4,778,968	07/130,123	10/18/88
4,778,975	07/043,897	10/18/88
4,778,979	07/067,772	10/18/88
4,778,989	06/774,362	10/18/88
4,778,990	07/011,738	10/18/88
4,778,994	06/915,709	10/18/88
4,778,996	06/905,167	10/18/88
4,778,999	07/139,728	10/18/88
4,779,012	07/085,056	10/18/88
4,779,017	07/107,197	10/18/88
4,779,035	06/903,294	10/18/88
4,779,048	06/925,267	10/18/88
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4,779,060	07/056,863	10/18/88
4,779,067	06/798,078	10/18/88
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4,779,103	06/760,298	10/18/88
4,779,105	07/105,160	10/18/88
4,779,112	07/053,117	10/18/88
4,779,134	07/055,429	10/18/88
4,779,140	06/913,685	10/18/88
4,779,143	06/930,564	10/18/88
4,779,153	07/066,957	10/18/88
4,779,163	06/586,021	10/18/88

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4,779,168	07/124,180	10/18/88
4,779,169	07/132,780	10/18/88
4,779,170	07/118,655	10/18/88
4,779,171	06/886,825	10/18/88
4,779,172	07/150,844	10/18/88
4,779,173	06/945,888	10/18/88
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4,779,175	07/024,249	10/18/88
4,779,178	07/123,347	10/18/88
4,779,180	07/118,193	10/18/88
4,779,184	07/108,283	10/18/88
4,779,191	06/722,837	10/18/88
4,779,215	06/716,476	10/18/88
4,779,222	06/725,714	10/18/88
4,779,224	06/710,996	10/18/88
4,779,226	06/946,795	10/18/88
4,779,236	06/891,495	10/18/88
4,779,239	06/663,165	10/18/88
4,779,240	06/849,079	10/18/88
4,779,243	07/026,814	10/18/88
4,779,246	07/017,981	10/18/88
4,779,258	07/005,578	10/18/88
4,779,268	07/012,423	10/18/88
4,779,289	07/134,999	10/25/88
4,779,294	07/062,723	10/25/88
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4,779,316	07/047,838	10/25/88
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4,779,383	07/084,825	10/25/88
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4,779,388	07/036,668	10/25/88
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4,779,495	07/026,668	10/25/88
4,779,501	06/872,013	10/25/88
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4,779,614	07/036,304	10/25/88
4,779,621	07/016,266	10/25/88
4,779,629	06/915,245	10/25/88
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4,779,661	07/010,244	10/25/88
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4,779,672	06/919,041	10/25/88
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4,779,702	07/116,225	10/25/88
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4,779,712	06/907,220	10/25/88
4,779,715	07/106,108	10/25/88
4,779,719	07/064,091	10/25/88
4,779,722	07/090,757	10/25/88
4,779,726	07/075,611	10/25/88
4,779,730	07/141,293	10/25/88
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4,779,743	07/033,530	10/25/88
4,779,746	07/142,570	10/25/88
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4,779,752	07/137,664	10/25/88
4,779,767	06/926,621	10/25/88
4,779,777	06/727,348	10/25/88
4,779,788	07/119,654	10/25/88
4,779,789	06/938,185	10/25/88
4,779,795	07/062,701	10/25/88
4,779,796	07/128,593	10/25/88
4,779,798	07/046,958	10/25/88
4,779,800	06/917,695	10/25/88
4,779,805	06/841,022	10/25/88
4,779,815	07/082,293	10/25/88
4,779,817	07/072,794	10/25/88
4,779,820	07/116,631	10/25/88
4,779,822	06/866,366	10/25/88
4,779,824	07/145,155	10/25/88

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4,779,826	07/046,993	10/25/88
4,779,847	07/151,495	10/25/88
4,779,849	07/060,620	10/25/88
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4,779,856	07/079,942	10/25/88
4,779,860	07/108,151	10/25/88
4,779,863	07/066,518	10/25/88
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4,779,921	07/091,207	10/25/88
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4,780,269	06/711,067	10/25/88
4,780,271	06/782,859	10/25/88
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4,780,349	07/017,741	10/25/88
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4,780,369	06/599,594	10/25/88
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4,780,382	06/930,812	10/25/88
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4,780,407	07/073,864	10/25/88
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4,781,143	07/015,778	11/01/88
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4,781,151	06/934,205	11/01/88
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4,781,161	07/025,618	11/01/88
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4,781,172	06/804,047	11/01/88
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4,781,230	07/061,453	11/01/88
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4,781,355	07/079,070	11/01/88
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4,781,387	07/061,587	11/01/88
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4,781,396	07/059,965	11/01/88
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4,784,203	06/902,207	11/15/88
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4,784,216	06/905,367	11/15/88
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4,784,232	06/933,198	11/15/88
4,784,233	07/078,169	11/15/88
4,784,236	07/029,334	11/15/88
4,784,241	07/073,923	11/15/88
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4,784,304	07/105,901	11/15/88
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4,784,502	07/088,695	11/15/88
4,784,505	06/268,191	11/15/88
4,784,506	07/026,708	11/15/88
4,784,509	06/893,518	11/15/88
4,784,511	07/061,835	11/15/88

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4,784,546	07/087,735	11/15/88
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4,786,018	07/068,968	11/22/88
4,786,019	06/927,290	11/22/88
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4,786,021	07/016,040	11/22/88
4,786,022	07/053,322	11/22/88
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4,786,043	06/918,170	11/22/88
4,786,044	07/022,844	11/22/88
4,786,048	06/856,194	11/22/88
4,786,053	07/015,696	11/22/88
4,786,054	07/038,946	11/22/88
4,786,056	07/114,723	11/22/88
4,786,057	07/099,820	11/22/88
4,786,058	07/064,662	11/22/88
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			4,786,412	07/124,263	11/22/88
			4,786,418	07/167,185	11/22/88
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4,786,064	07/078,594	11/22/88	4,786,424	06/804,714	11/22/88
4,786,067	06/941,829	11/22/88	4,786,449	06/852,226	11/22/88
4,786,068	06/879,985	11/22/88	4,786,460	07/055,702	11/22/88
4,786,069	07/012,722	11/22/88	4,786,461	06/538,040	11/22/88
4,786,070	07/148,043	11/22/88	4,786,471	06/544,177	11/22/88
4,786,073	06/947,852	11/22/88	4,786,472	06/899,186	11/22/88
4,786,084	06/799,097	11/22/88	4,786,480	06/899,633	11/22/88
4,786,087	07/126,050	11/22/88	4,786,482	07/064,814	11/22/88
4,786,095	07/159,596	11/22/88	4,786,488	06/710,673	11/22/88
4,786,096	07/090,548	11/22/88	4,786,502	06/916,062	11/22/88
4,786,101	07/049,134	11/22/88	4,786,508	06/869,504	11/22/88
4,786,104	07/172,567	11/22/88	4,786,509	07/051,095	11/22/88
4,786,112	07/074,060	11/22/88	4,786,511	07/045,102	11/22/88
4,786,120	07/108,378	11/22/88	4,786,515	06/942,050	11/22/88
4,786,125	06/639,661	11/22/88	4,786,517	07/047,876	11/22/88
4,786,127	07/132,806	11/22/88	4,786,524	07/071,102	11/22/88
4,786,130	06/864,802	11/22/88	4,786,535	07/121,162	11/22/88
4,786,144	07/013,332	11/22/88	4,786,543	07/104,962	11/22/88
4,786,149	07/052,548	11/22/88	4,786,547	07/036,501	11/22/88
4,786,158	06/828,135	11/22/88	4,786,548	07/095,062	11/22/88
4,786,159	06/918,988	11/22/88	4,786,594	06/863,268	11/22/88
4,786,167	06/783,578	11/22/88	4,786,601	07/058,046	11/22/88
4,786,181	07/121,285	11/22/88	4,786,604	07/065,356	11/22/88
4,786,184	07/010,743	11/22/88	4,786,622	06/568,998	11/22/88
4,786,185	07/161,829	11/22/88	4,786,632	06/529,671	11/22/88
4,786,195	06/858,943	11/22/88	4,786,633	07/056,958	11/22/88
4,786,199	06/741,225	11/22/88	4,786,649	06/929,847	11/22/88
4,786,202	06/700,857	11/22/88	4,786,650	06/825,304	11/22/88
4,786,203	07/097,504	11/22/88	4,786,653	07/088,830	11/22/88
4,786,204	06/832,333	11/22/88	4,786,654	07/053,911	11/22/88
4,786,210	07/096,868	11/22/88	4,786,682	07/066,388	11/22/88
4,786,212	07/035,454	11/22/88	4,786,683	07/054,465	11/22/88
4,786,214	07/025,077	11/22/88	4,786,684	06/899,209	11/22/88
4,786,217	07/045,057	11/22/88	4,786,710	07/054,336	11/22/88
4,786,220	07/053,643	11/22/88	4,786,711	07/006,409	11/22/88
4,786,221	06/899,884	11/22/88	4,786,717	06/928,766	11/22/88
4,786,222	07/048,255	11/22/88	4,786,725	06/835,584	11/22/88
4,786,223	07/107,671	11/22/88	4,786,731	07/081,519	11/22/88
4,786,224	07/161,309	11/22/88	4,786,732	07/081,515	11/22/88
4,786,229	06/857,723	11/22/88	4,786,740	06/934,076	11/22/88
4,786,234	06/390,193	11/22/88	4,786,741	06/441,191	11/22/88
4,786,238	07/014,947	11/22/88	4,786,744	06/745,579	11/22/88
4,786,244	07/114,417	11/22/88	4,786,747	07/048,505	11/22/88
4,786,249	07/084,992	11/22/88	4,786,755	06/845,704	11/22/88
4,786,266	06/886,220	11/22/88	4,786,756	06/668,045	11/22/88
4,786,273	07/042,864	11/22/88	4,786,763	07/175,025	11/22/88
4,786,275	07/044,545	11/22/88	4,786,768	07/087,715	11/22/88
4,786,278	06/940,046	11/22/88	4,786,779	06/945,980	11/22/88
4,786,279	06/891,099	11/22/88	4,786,787	07/141,734	11/22/88
4,786,280	07/048,693	11/22/88	4,786,806	07/064,491	11/22/88
4,786,283	07/083,739	11/22/88	4,786,825	06/945,310	11/22/88
4,786,284	06/835,782	11/22/88	4,786,829	07/017,751	11/22/88
4,786,286	06/868,202	11/22/88	4,786,833	07/039,102	11/22/88
4,786,290	07/107,054	11/22/88	4,786,837	07/046,076	11/22/88
4,786,296	07/065,871	11/22/88	4,786,852	07/169,141	11/22/88
4,786,301	07/085,321	11/22/88	4,786,871	07/065,358	11/22/88
4,786,303	07/037,413	11/22/88	4,786,872	07/065,359	11/22/88
4,786,312	07/042,265	11/22/88	4,786,873	06/871,730	11/22/88
4,786,313	07/111,670	11/22/88	4,786,887	07/080,183	11/22/88
4,786,330	07/003,790	11/22/88	4,786,905	06/844,046	11/22/88
4,786,335	06/700,923	11/22/88	4,786,909	06/822,214	11/22/88
4,786,342	06/929,386	11/22/88	4,786,916	06/936,795	11/22/88
4,786,368	07/005,459	11/22/88	4,786,925	07/067,930	11/22/88
4,786,373	07/060,056	11/22/88	4,786,958	06/931,345	11/22/88
4,786,375	07/075,896	11/22/88	4,786,964	07/009,934	11/22/88
4,786,376	07/142,472	11/22/88	4,786,975	07/147,665	11/22/88
4,786,377	07/044,089	11/22/88	4,786,983	06/379,577	11/22/88
4,786,386	06/755,606	11/22/88	4,786,994	06/803,508	11/22/88
4,786,387	06/911,503	11/22/88	4,786,995	06/927,916	11/22/88
4,786,393	07/064,541	11/22/88	4,787,008	07/023,210	11/22/88
4,786,398	07/087,362	11/22/88	4,787,014	07/078,710	11/22/88
4,786,399	07/102,056	11/22/88	4,787,019	07/024,132	11/22/88
4,786,407	07/153,268	11/22/88	4,787,023	07/059,589	11/22/88
4,786,410	07/011,996	11/22/88	4,787,024	06/890,207	11/22/88
4,786,411	06/770,901	11/22/88	4,787,034	07/091,361	11/22/88

Patent Number	Serial Number	Issue Date	Patent Number	Serial Number	Issue Date
			4,787,374	07/175,996	11/29/88
			4,787,375	06/881,249	11/29/88
4,787,092	07/161,412	11/22/88	4,787,378	06/906,304	11/29/88
4,787,100	07/079,529	11/29/88	4,787,382	07/077,460	11/29/88
4,787,108	07/036,946	11/29/88	4,787,385	07/015,777	11/29/88
4,787,109	07/085,478	11/29/88	4,787,399	08/069,532	11/29/88
4,787,113	07/148,277	11/29/88	4,787,402	06/825,177	11/29/88
4,787,115	07/063,120	11/29/88	4,787,405	06/887,526	11/29/88
4,787,122	07/064,885	11/29/88	4,787,422	07/094,817	11/29/88
4,787,123	07/179,571	11/29/88	4,787,423	06/882,610	11/29/88
4,787,125	07/082,277	11/29/88	4,787,424	06/918,928	11/29/88
4,787,127	07/028,244	11/29/88	4,787,425	07/124,026	11/29/88
4,787,131	07/102,003	11/29/88	4,787,426	06/933,931	11/29/88
4,787,136	07/032,218	11/29/88	4,787,433	06/925,291	11/29/88
4,787,137	06/928,238	11/29/88	4,787,435	06/591,251	11/29/88
4,787,138	07/027,939	11/29/88	4,787,422	07/128,962	11/29/88
4,787,144	07/122,940	11/29/88	4,787,444	06/562,918	11/29/88
4,787,145	07/023,140	11/29/88	4,787,457	07/065,021	11/29/88
4,787,146	06/461,450	11/29/88	4,787,460	07/039,292	11/29/88
4,787,147	06/901,887	11/29/88	4,787,468	07/075,101	11/29/88
4,787,156	07/117,401	11/29/88	4,787,472	07/034,653	11/29/88
4,787,158	07/024,966	11/29/88	4,787,474	07/123,817	11/29/88
4,787,160	07/050,606	11/29/88	4,787,477	07/144,277	11/29/88
4,787,164	07/083,213	11/29/88	4,787,478	07/018,031	11/29/88
4,787,166	06/147,538	11/29/88	4,787,482	06/618,419	11/29/88
4,787,168	07/047,734	11/29/88	4,787,487	07/055,235	11/29/88
4,787,171	07/056,248	11/29/88	4,787,488	07/047,486	11/29/88
4,787,174	07/058,551	11/29/88	4,787,489	07/027,830	11/29/88
4,787,176	06/822,198	11/29/88	4,787,490	07/061,488	11/29/88
4,787,177	06/935,044	11/29/88	4,787,491	07/035,639	11/29/88
4,787,178	07/037,380	11/29/88	4,787,492	07/051,394	11/29/88
4,787,179	07/083,449	11/29/88	4,787,498	07/154,389	11/29/88
4,787,184	07/030,573	11/29/88	4,787,500	06/910,387	11/29/88
4,787,189	06/767,281	11/29/88	4,787,503	07/028,603	11/29/88
4,787,190	07/048,008	11/29/88	4,787,512	07/003,463	11/29/88
4,787,198	06/783,522	11/29/88	4,787,522	07/109,062	11/29/88
4,787,199	07/107,374	11/29/88	4,787,535	06/856,652	11/29/88
4,787,231	07/012,104	11/29/88	4,787,537	07/067,212	11/29/88
4,787,234	07/133,894	11/29/88	4,787,540	06/946,971	11/29/88
4,787,240	07/091,226	11/29/88	4,787,541	06/920,677	11/29/88
4,787,241	07/010,816	11/29/88	4,787,542	06/906,911	11/29/88
4,787,243	07/143,000	11/29/88	4,787,543	07/053,830	11/29/88
4,787,248	06/939,807	11/29/88	4,787,549	06/575,370	11/29/88
4,787,249	07/053,694	11/29/88	4,787,556	07/037,340	11/29/88
4,787,254	07/016,876	11/29/88	4,787,557	07/144,062	11/29/88
4,787,529	07/011,683	11/29/88	4,787,562	07/084,214	11/29/88
4,787,262	07/060,349	11/29/88	4,787,564	07/015,484	11/29/88
4,787,263	07/028,761	11/29/88	4,787,577	06/789,499	11/29/88
4,787,264	06/933,529	11/29/88	4,787,579	07/043,850	11/29/88
4,787,266	07/084,904	11/29/88	4,787,582	07/049,475	11/29/88
4,787,273	06/426,673	11/29/88	4,787,588	07/115,897	11/29/88
4,787,275	07/028,489	11/29/88	4,787,590	07/017,927	11/29/88
4,787,284	07/050,247	11/29/88	4,787,591	06/901,813	11/29/88
4,787,287	07/054,961	11/29/88	4,787,599	07/152,236	11/29/88
4,787,288	07/077,653	11/29/88	4,787,600	07/084,676	11/29/88
4,787,298	07/099,852	11/29/88	4,787,604	07/057,983	11/29/88
4,787,300	07/012,845	11/29/88	4,787,610	06/862,350	11/29/88
4,787,301	07/119,332	11/29/88	4,787,612	07/043,810	11/29/88
4,787,303	07/102,908	11/29/88	4,787,613	07/039,119	11/29/88
4,787,306	07/143,291	11/29/88	4,787,621	07/003,759	11/29/88
4,787,307	07/141,002	11/29/88	4,787,624	06/923,037	11/29/88
4,787,312	06/881,861	11/29/88	4,787,626	06/882,151	11/29/88
4,787,315	07/091,102	11/29/88	4,787,628	07/101,807	11/29/88
4,787,316	06/649,115	11/29/88	4,787,631	06/930,264	11/29/88
4,787,319	06/905,293	11/29/88	4,787,632	07/156,412	11/29/88
4,787,325	06/773,820	11/29/88	4,787,633	07/118,246	11/29/88
4,787,331	07/153,191	11/29/88	4,787,634	07/118,249	11/29/88
4,787,339	07/092,300	11/29/88	4,787,637	07/036,289	11/29/88
4,787,340	07/018,170	11/29/88	4,787,639	07/036,362	11/29/88
4,787,341	06/853,641	11/29/88	4,787,640	07/124,152	11/29/88
4,787,349	07/096,896	11/29/88	4,787,647	06/933,752	11/29/88
4,787,351	07/128,230	11/29/88	4,787,648	06/904,344	11/29/88
4,787,352	07/082,525	11/29/88	4,787,654	07/065,615	11/29/88
4,787,355	07/152,615	11/29/88	4,787,658	06/891,234	11/29/88
4,787,356	07/067,591	11/29/88	4,787,659	07/130,525	11/29/88
4,787,365	07/119,630	11/29/88	4,787,660	07/098,312	11/29/88
4,787,366	07/060,004	11/29/88	4,787,661	07/056,380	11/29/88
4,787,372	07/111,747	11/29/88	4,787,663	07/056,809	11/29/88

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			4,787,986	07/086,960	11/29/88
			4,788,012	07/052,074	11/29/88
4,787,666	07/123,956	11/29/88	4,788,020	06/448,517	11/29/88
4,787,672	07/048,760	11/29/88	4,788,024	06/833,128	11/29/88
4,787,677	07/059,299	11/29/88	4,788,027	07/073,152	11/29/88
4,787,685	07/076,693	11/29/88	4,788,029	07/039,858	11/29/88
4,787,691	07/036,822	11/29/88	4,788,033	06/490,059	11/29/88
4,787,694	07/025,945	11/29/88	4,788,068	06/929,249	11/29/88
4,787,695	06/813,248	11/29/88	4,788,078	07/108,957	11/29/88
4,787,701	06/671,145	11/29/88	4,788,088	06/914,503	11/29/88
4,787,702	07/112,236	11/29/88	4,788,096	07/018,210	11/29/88
4,787,716	06/706,479	11/29/88	4,788,102	07/053,131	11/29/88
4,787,717	06/477,616	11/29/88	4,788,108	07/062,029	11/29/88
4,787,725	07/001,683	11/29/88	4,788,111	07/088,314	11/29/88
4,787,727	06/898,418	11/29/88	4,788,112	07/086,300	11/29/88
4,787,730	07/034,690	11/29/88	4,788,115	06/940,047	11/29/88
4,787,735	06/812,756	11/29/88	4,788,124	07/086,853	11/29/88
4,787,739	06/936,796	11/29/88	4,788,125	07/046,380	11/29/88
4,787,746	07/041,732	11/29/88	4,788,126	07/052,638	11/29/88
4,787,752	06/922,520	11/29/88	4,788,127	06/931,495	11/29/88
4,787,756	07/160,661	11/29/88	4,788,129	06/935,999	11/29/88
4,787,765	07/094,938	11/29/88	4,788,141	07/078,009	11/29/88
4,787,767	07/188,722	11/29/88	4,788,143	06/605,321	11/29/88
4,787,768	07/162,985	11/29/88	4,788,148	06/664,435	11/29/88
4,787,769	06/943,266	11/29/88	4,788,149	06/696,856	11/29/88
4,787,772	07/067,639	11/29/88	4,788,164	07/007,548	11/29/88
4,787,774	07/068,418	11/29/88	4,788,177	07/077,806	11/29/88
4,787,775	07/158,100	11/29/88	4,788,182	07/113,359	11/29/88
4,787,776	06/288,265	11/29/88	4,788,183	07/126,441	11/29/88
4,787,779	07/008,482	11/29/88	4,788,187	07/160,855	11/29/88
4,787,786	07/088,709	11/29/88	4,788,194	07/095,952	11/29/88
4,787,787	07/031,053	11/29/88	4,788,199	07/167,126	11/29/88
4,787,788	07/057,906	11/29/88	4,788,204	06/867,555	11/29/88
4,787,794	07/096,512	11/29/88	4,788,210	06/808,962	11/29/88
4,787,795	06/905,290	11/29/88	4,788,226	07/159,583	11/29/88
4,787,797	07/072,218	11/29/88	4,788,230	06/781,866	11/29/88
4,787,798	07/053,329	11/29/88	4,788,235	07/123,794	11/29/88
4,787,801	06/923,672	11/29/88	4,788,245	07/112,041	11/29/88
4,787,813	07/089,591	11/29/88	4,788,260	06/471,738	11/29/88
4,787,814	07/003,210	11/29/88	4,788,261	07/077,865	11/29/88
4,787,822	06/850,017	11/29/88	4,788,263	07/133,855	11/29/88
4,787,824	07/087,416	11/29/88	4,788,281	06/568,124	11/29/88
4,787,840	07/145,969	11/29/88	4,788,292	06/892,219	11/29/88
4,787,843	07/065,038	11/29/88	4,788,294	07/170,702	11/29/88
4,787,848	06/934,638	11/29/88	4,788,299	07/063,044	11/29/88
4,787,854	07/064,020	11/29/88	4,788,318	07/089,129	11/29/88
4,787,856	07/028,269	11/29/88	4,788,328	06/882,330	11/29/88
4,787,857	06/892,912	11/29/88	4,788,337	07/149,657	11/29/88
4,787,862	07/054,014	11/29/88	4,788,338	07/061,105	11/29/88
4,787,865	06/937,761	11/29/88	4,788,342	07/085,353	11/29/88
4,787,870	07/109,953	11/29/88	4,788,343	07/085,186	11/29/88
4,787,781	07/146,565	11/29/88	4,788,346	07/054,852	11/29/88
4,787,873	07/134,372	11/29/88	4,788,348	07/084,199	11/29/88
4,787,874	07/017,521	11/29/88	4,788,349	07/052,969	11/29/88
4,787,876	07/159,634	11/29/88	4,788,357	07/074,137	11/29/88
4,787,878	06/889,740	11/29/88	4,788,359	07/078,372	11/29/88
4,787,882	06/945,848	11/29/88	4,788,379	06/432,214	11/29/88
4,787,888	07/056,471	11/29/88	4,788,382	07/051,664	11/29/88
4,787,890	07/001,723	11/29/88	4,788,386	07/028,495	11/29/88
4,787,903	06/758,331	11/29/88	4,788,388	06/922,283	11/29/88
4,787,904	06/628,431	11/29/88	4,788,391	07/174,089	11/29/88
4,787,906	07/020,986	11/29/88	4,788,405	07/054,583	11/29/88
4,787,909	06/903,554	11/29/88	4,788,407	07/113,492	11/29/88
4,787,910	07/018,105	11/29/88	4,788,409	07/084,555	11/29/88
4,787,911	06/942,718	11/29/88	4,788,414	07/042,428	11/29/88
4,787,913	07/164,913	11/29/88	4,788,417	07/013,984	11/29/88
4,787,929	07/001,117	11/29/88	4,788,429	06/854,149	11/29/88
4,787,930	07/004,353	11/29/88	4,788,430	07/000,352	11/29/88
4,787,935	07/042,075	11/29/88	4,788,433	07/002,389	11/29/88
4,787,936	07/078,238	11/29/88	4,788,442	07/075,747	11/29/88
4,787,942	07/006,806	11/29/88	4,788,448	06/678,848	11/29/88
4,787,943	07/045,970	11/29/88	4,788,450	07/099,433	11/29/88
4,787,948	07/068,077	11/29/88	4,788,451	07/094,332	11/29/88
4,787,952	06/717,001	11/29/88	4,788,456	07/077,746	11/29/88
4,787,955	07/132,657	11/29/88	4,788,461	07/001,590	11/29/88
4,787,964	07/048,386	11/29/88	4,788,463	07/064,080	11/29/88
4,787,971	07/006,120	11/29/88	4,788,477	06/886,697	11/29/88
4,787,979	06/942,401	11/29/88	4,788,483	07/062,125	11/29/88

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4,788,490	07/068,690	11/29/88	4,788,909	06/884,209	12/06/88
4,788,492	07/019,366	11/29/88	4,788,911	07/065,906	12/06/88
4,788,494	06/670,757	11/29/88	4,788,916	07/076,913	12/06/88
4,788,505	07/096,140	11/29/88	4,788,918	07/123,561	12/06/88
4,788,506	06/785,696	11/29/88	4,788,926	07/031,066	12/06/88
4,788,517	07/106,189	11/29/88	4,788,928	07/074,361	12/06/88
4,788,522	06/759,508	11/29/88	4,788,935	07/065,027	12/06/88
4,788,529	07/043,398	11/29/88	4,788,936	07/114,309	12/06/88
4,788,532	07/060,173	11/29/88	4,788,938	07/107,777	12/06/88
4,788,534	06/871,290	11/29/88	4,788,941	07/053,028	12/06/88
4,788,544	07/001,286	11/29/88	4,788,944	07/064,955	12/06/88
4,788,554	06/717,500	11/29/88	4,788,945	07/061,433	12/06/88
4,788,555	06/760,076	11/29/88	4,788,947	06/688,211	12/06/88
4,788,566	07/055,136	11/29/88	4,788,948	07/116,993	12/06/88
4,788,579	06/906,925	11/29/88	4,788,953	07/159,522	12/06/88
4,788,581	06/717,703	11/29/88	4,788,955	07/098,729	12/06/88
4,788,586	07/100,801	11/29/88	4,788,961	06/929,251	12/06/88
4,788,595	07/120,541	11/29/88	4,788,968	07/041,145	12/06/88
4,788,620	07/118,574	11/29/88	4,788,869	06/876,934	12/06/88
4,788,622	07/078,679	11/29/88	4,788,970	07/033,410	12/06/88
4,788,626	07/014,272	11/29/88	4,788,978	07/172,947	12/06/88
4,788,627	06/872,058	11/29/88	4,788,984	07/009,206	12/06/88
4,788,633	07/088,582	11/29/88	4,788,986	07/026,201	12/06/88
4,788,634	07/065,016	11/29/88	4,788,987	07/018,427	12/06/88
4,788,638	06/940,621	11/29/88	4,788,988	07/009,230	12/06/88
4,788,647	06/911,488	11/29/88	4,788,990	07/036,063	12/06/88
4,788,649	06/693,117	11/29/88	4,788,991	07/093,774	12/06/88
4,788,650	06/909,331	11/29/88	4,788,993	06/877,243	12/06/88
4,788,656	06/614,226	11/29/88	4,788,995	07/105,333	12/06/88
4,788,670	07/086,428	11/29/88	4,790,003	07/086,095	12/06/88
4,788,686	07/104,762	11/29/88	4,790,005	07/170,704	12/06/88
4,788,691	06/847,174	11/29/88	4,790,006	07/025,454	12/06/88
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4,788,702	06/894,655	11/29/88	4,790,011	07/025,354	12/06/88
4,788,706	07/134,311	11/29/88	4,790,015	07/011,543	12/06/88
4,788,725	07/014,698	12/06/88	4,790,017	07/109,735	12/06/88
4,788,726	07/114,337	12/06/88	4,790,023	07/078,820	12/06/88
4,788,728	07/054,876	12/06/88	4,790,027	06/861,609	12/06/88
4,788,733	07/167,689	12/06/88	4,790,030	07/082,454	12/06/88
4,788,739	07/059,447	12/06/88	4,790,036	06/940,588	12/06/88
4,788,741	07/090,010	12/06/88	4,790,037	07/057,796	12/06/88
4,788,746	06/749,250	12/06/88	4,790,043	07/044,231	12/06/88
4,788,750	07/075,812	12/06/88	4,790,047	07/076,331	12/06/88
4,788,757	06/821,167	12/06/88	4,790,050	06/824,118	12/06/88
4,788,764	07/149,037	12/06/88	4,790,054	07/003,067	12/06/88
4,788,765	07/120,626	12/06/88	4,790,055	06/945,699	12/06/88
4,788,770	07/064,247	12/06/88	4,790,056	07/010,409	12/06/88
4,788,776	07/026,474	12/06/88	4,790,058	07/153,988	12/06/88
4,788,777	07/131,603	12/06/88	4,790,059	07/155,888	12/06/88
4,788,780	07/020,584	12/06/88	4,790,061	07/119,935	12/06/88
4,788,784	07/097,611	12/06/88	4,790,064	07/100,410	12/06/88
4,788,785	07/102,226	12/06/88	4,790,065	07/046,240	12/06/88
4,788,786	07/042,931	12/06/88	4,790,069	07/114,853	12/06/88
4,788,789	07/135,275	12/06/88	4,790,072	07/040,031	12/06/88
4,788,794	07/107,009	12/06/88	4,790,082	06/944,954	12/06/88
4,788,798	07/047,749	12/06/88	4,790,087	07/154,659	12/06/88
4,788,802	07/040,745	12/06/88	4,790,091	07/114,007	12/06/88
4,788,813	07/143,471	12/06/88	4,790,102	07/053,807	12/06/88
4,788,821	07/099,645	12/06/88	4,790,104	06/583,374	12/06/88
4,788,826	07/034,427	12/06/88	4,790,107	07/013,160	12/06/88
4,788,830	07/025,665	12/06/88	4,790,119	07/117,586	12/06/88
4,788,831	07/094,131	12/06/88	4,790,123	07/104,022	12/06/88
4,788,834	07/119,066	12/06/88	4,790,124	07/079,035	12/06/88
4,788,835	06/231,560	12/06/88	4,790,137	07/079,893	12/06/88
4,788,844	07/044,766	12/06/88	4,790,138	07/121,686	12/06/88
4,788,850	07/034,549	12/06/88	4,790,153	06/782,354	12/06/88
4,788,855	07/021,225	12/06/88	4,790,155	07/090,856	12/06/88
4,788,857	07/082,081	12/06/88	4,790,156	07/100,612	12/06/88
4,788,859	07/120,066	12/06/88	4,790,157	07/118,248	12/06/88
4,788,863	07/124,205	12/06/88	4,790,159	07/084,455	12/06/88
4,788,865	06/935,013	12/06/88	4,790,162	07/054,725	12/06/88
4,788,872	06/917,965	12/06/88	4,790,163	07/060,602	12/06/88
4,788,874	07/011,525	12/06/88	4,790,165	07/121,036	12/06/88
4,788,887	06/928,099	12/06/88	4,790,166	07/095,955	12/06/88
4,788,900	07/031,238	12/06/88	4,790,168	06/940,763	12/06/88

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4,790,169	07/079,772	12/06/88
4,790,173	07/132,925	12/06/88
4,790,175	07/078,920	12/06/88
4,790,177	06/925,899	12/06/88
4,790,180	07/034,338	12/06/88
4,790,183	07/165,813	12/06/88
4,790,191	06/921,112	12/06/88
4,790,195	07/066,041	12/06/88
4,790,197	07/078,274	12/06/88
4,790,200	07/078,582	12/06/88
4,790,213	07/040,729	12/06/88
4,790,216	06/424,680	12/06/88
4,790,218	07/032,292	12/06/88
4,790,228	07/004,222	12/06/88
4,790,233	07/053,042	12/06/88
4,790,235	07/166,776	12/06/88
4,790,244	07/037,007	12/06/88
4,790,245	07/149,536	12/06/88
4,790,246	06/319,262	12/06/88
4,790,248	07/174,392	12/06/88
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4,790,261	07/033,288	12/06/88
4,790,270	07/086,883	12/06/88
4,790,273	07/021,042	12/06/88
4,790,275	07/025,657	12/06/88
4,790,276	07/093,375	12/06/88
4,790,282	06/832,991	12/06/88
4,790,284	07/116,954	12/06/88
4,790,285	07/029,536	12/06/88
4,790,286	07/058,673	12/06/88
4,790,291	07/063,171	12/06/88
4,790,300	06/505,065	12/06/88
4,790,307	07/154,223	12/06/88
4,790,310	07/000,631	12/06/88
4,790,311	07/134,003	12/06/88
4,790,313	07/036,099	12/06/88
4,790,321	07/167,904	12/06/88
4,790,326	07/007,462	12/06/88
4,790,335	07/058,159	12/06/88
4,790,336	07/066,694	12/06/88
4,790,339	07/007,141	12/06/88
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4,790,409	06/938,552	12/06/88
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4,790,522	07/133,832	12/06/88
4,790,538	07/074,736	12/06/88
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4,790,579	07/165,923	12/06/88
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4,790,628	06/874,541	12/06/88
4,790,638	07/046,385	12/06/88
4,790,642	07/032,810	12/06/88
4,790,650	07/008,204	12/06/88
4,790,657	07/112,051	12/06/88
4,790,665	06/941,604	12/06/88
4,790,668	06/929,292	12/06/88
4,790,680	06/920,623	12/06/88
4,790,697	06/774,003	12/06/88
4,790,702	06/873,681	12/06/88
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4,790,715	06/920,084	12/06/88
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4,790,842	07/124,173	12/06/88
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4,790,918	06/927,042	12/06/88
4,790,941	06/887,899	12/06/88
4,790,946	06/944,838	12/06/88
4,790,947	06/791,326	12/06/88
4,790,953	06/912,606	12/06/88
4,790,964	06/870,515	12/06/88
4,790,998	07/009,452	12/06/88
4,790,009	06/791,786	12/06/88
4,790,012	06/811,272	12/06/88
4,790,027	06/901,390	12/06/88
4,790,030	06/934,887	12/06/88
4,790,031	06/912,535	12/13/88
4,790,032	07/097,262	12/13/88
4,790,034	07/082,323	12/13/88
4,790,035	07/077,738	12/13/88
4,790,037	07/049,734	12/13/88
4,790,039	07/118,449	12/13/88
4,790,041	07/117,057	12/13/88
4,790,042	07/104,221	12/13/88

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4,790,045	07/158,571	12/13/88
4,790,046	06/816,057	12/13/88
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4,790,051	07/091,450	12/13/88
4,790,053	07/017,158	12/13/88
4,790,054	06/894,480	12/13/88
4,790,057	07/013,854	12/13/88
4,790,058	06/840,329	12/13/88
4,790,060	07/129,465	12/13/88
4,790,061	07/113,137	12/13/88
4,790,062	07/031,761	12/13/88
4,790,067	07/058,808	12/13/88
4,790,071	07/000,081	12/13/88
4,790,072	06/934,029	12/13/88
4,790,075	07/085,532	12/13/88
4,790,083	06/931,084	12/13/88
4,790,084	07/165,251	12/13/88
4,790,086	07/088,164	12/13/88
4,790,088	07/064,705	12/13/88
4,790,096	07/146,269	12/13/88
4,790,097	07/159,181	12/13/88
4,790,099	06/913,250	12/13/88
4,790,100	07/164,089	12/13/88
4,790,101	07/112,696	12/13/88
4,790,105	06/923,835	12/13/88
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4,790,118	07/037,631	12/13/88
4,790,121	07/080,954	12/13/88
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4,790,125	07/045,946	12/13/88
4,790,127	07/028,171	12/13/88
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4,790,138	07/010,359	12/13/88
4,790,139	07/066,973	12/13/88
4,790,149	06/231,525	12/13/88
4,790,151	07/102,621	12/13/88
4,790,159	07/167,263	12/13/88
4,790,162	07/092,894	12/13/88
4,790,163	07/174,151	12/13/88
4,790,171	07/079,244	12/13/88
4,790,180	07/156,069	12/13/88
4,790,181	06/768,857	12/13/88
4,790,187	07/046,194	12/13/88
4,790,197	06/079,104	12/13/88
4,790,198	07/096,518	12/13/88
4,790,201	07/041,280	12/13/88
4,790,203	07/106,607	12/13/88
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4,790,216	07/089,470	12/13/88
4,790,219	06/908,727	12/13/88
4,790,220	07/161,785	12/13/88
4,790,222	07/114,663	12/13/88
4,790,232	07/142,422	12/13/88
4,790,234	06/931,125	12/13/88
4,790,237	06/835,227	12/13/88
4,790,244	07/024,377	12/13/88
4,790,251	07/095,381	12/13/88
4,790,255	07/064,559	12/13/88
4,790,260	06/825,716	12/13/88
4,790,265	07/074,220	12/13/88
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4,792,331	06/742,467	12/20/88
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4,792,392	06/894,697	12/20/88
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4,792,418	06/810,550	12/20/88
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4,794,636	06/756,144	12/27/88

Notification of Acceptance of Delayed Payment of Maintenance Fee
(35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,644,294	06/693,777	2/17/87	1/23/85	11/25/91
4,573,856	06/533,962	3/04/86	9/20/83	8/26/91
4,507,170	06/419,352	3/26/85	9/17/82	8/27/91
4,413,452	06/281,456	11/08/83	7/08/91	11/29/91
4,355,113	06/275,170	10/19/82	6/19/81	11/29/91
4,569,511	06/774,386	2/11/86	9/09/85	11/08/91
4,629,180	06/738,388	12/16/86	5/28/85	11/25/91
4,638,013	06/674,853	1/20/87	11/26/84	12/20/90
4,665,575	06/742,398	5/17/87	6/07/85	11/12/91
4,692,003	06/549,157	9/01/87	11/07/83	11/14/91
4,369,349	06/252,091	1/18/83	4/08/81	11/12/91
4,387,553	07/222,004	6/14/83	1/02/81	8/12/91
4,390,981	06/220,375	6/28/83	12/29/80	1/03/92
4,518,528	06/577,068	5/21/85	2/06/84	1/15/92
4,556,217	06/569,893	12/03/85	12/03/85	1/06/92
4,648,081	06/572,055	3/03/87	1/19/84	12/16/91
4,649,593	06/765,543	3/17/87	8/14/85	10/29/91
4,655,146	06/636,680	4/07/87	8/01/84	1/17/92
4,668,847	06/841,621	5/26/87	3/20/86	8/27/91
4,670,798	06/851,913	6/02/87	4/14/86	9/16/91
4,671,397	06/674,825	6/09/87	11/26/84	9/30/91
4,673,175	06/772,506	6/16/87	9/04/85	11/20/91
4,369,349	06/252,091	1/18/83	4/08/81	11/12/91
4,387,553	07/222,004	6/14/83	1/02/81	8/12/91
4,390,981	06/220,375	6/28/83	12/29/80	1/03/92
4,518,528	06/577,068	5/21/85	2/06/84	1/15/92
4,556,217	06/569,893	12/03/85	12/03/85	1/06/92
4,648,081	06/572,055	3/03/87	1/19/84	12/16/91
4,674,123	06/614,827	6/16/87	5/25/84	1/14/92
4,682,217	06/860,209	7/21/87	5/06/86	11/29/91
4,684,954	06/766,545	8/04/87	8/19/85	12/09/91
4,687,038	06/562,532	8/18/87	12/19/83	9/09/91
4,690,353	06/739,792	9/01/87	5/31/85	1/18/92
4,403,040	06/350,801	9/06/83	2/25/82	1/02/92
4,674,297	06/829,429	6/23/87	2/13/86	12/30/91
4,694,874	06/801,061	9/22/87	11/22/85	10/18/91
4,695,640	06/789/950	9/22/87	10/21/85	9/24/91
4,394,089	06/304,765	7/19/83	9/23/81	12/02/91
4,404,301	06/370,900	9/13/93	4/22/82	2/28/92
4,621,372	06/674,419	11/04/86	11/23/84	10/17/91
4,649,319	06/657,414	3/10/87	10/03/84	1/16/92
4,401,545	06/332,839	8/30/83	12/21/81	3/19/92
4,401,815	06/231,047	8/30/83	2/03/81	3/19/92
4,615,809	06/734,021	10/07/86	5/14/85	2/10/92
4,676,465	06/690,776	6/30/87	1/11/85	10/07/91
4,686,302	06/677,036	8/11/87	11/30/84	12/23/91
4,687,792	06/695,985	8/18/87	1/29/85	9/30/91
4,396,695	06/358,598	8/02/83	3/16/82	12/23/91
4,397,651	06/291,500	8/09/83	8/10/81	12/23/91
4,399,139	06/359,936	8/16/83	3/19/82	12/23/91
4,400,549	06/324,277	8/23/83	11/23/81	12/23/91
4,401,643	06/313,180	8/30/83	10/20/81	12/23/91
4,401,749	06/348,196	8/30/83	2/12/82	12/23/91
4,684,392	06/690,367	8/04/87	1/09/85	12/23/91
4,684,690	06/876,758	8/04/87	6/20/86	12/23/91
4,684,743	06/782,615	8/04/87	10/01/85	12/23/91
4,686,202	06/842,994	8/11/87	3/24/86	12/23/91
4,687,157	06/810,203	8/18/87	12/18/85	12/23/91
4,687,847	06/743,157	8/18/87	6/10/85	12/23/91
4,406,744	06/321,901	9/27/83	11/16/81	3/10/92
4,682,113	06/804,217	7/21/87	12/03/85	12/03/91
4,688,129	06/868,702	8/18/87	5/30/86	12/23/91
4,689,068	06/825,387	8/25/87	2/03/86	12/23/91
4,694,858	06/901,684	9/22/87	8/29/86	12/04/91
4,379,703	06/260,488	4/12/83	5/04/81	12/18/91
4,402,466	06/264,169	9/06/83	5/15/81	4/14/92
4,407,676	06/394,785	10/04/83	7/02/82	4/10/92
4,408,410	06/426,344	10/11/83	9/29/82	4/14/92
4,666,798	06/736,168	5/19/87	5/20/85	4/14/92
4,695,414	06/625,953	9/22/87	6/29/84	4/14/92
4,388,417	06/315,252	6/14/83	10/26/81	4/28/92
4,633,084	06/691,825	12/30/87	1/16/85	12/31/91
4,674,494	06/732,680	6/23/87	5/10/85	4/17/92
4,399,001	06/315,726	8/16/83	10/28/81	3/31/92
4,665,575	06/742,398	5/17/87	6/07/85	1/09/92

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date

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Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,666,121	06/862,045	5/19/87	5/12/86	2/28/92
4,713,911	06/933,857	12/22/87	11/24/86	3/05/92
4,719,574	06/798,900	1/12/88	11/18/85	4/30/92
4,381,839	06/239,318	5/03/83	3/20/81	4/29/92
4,381,900	06/233,636	5/03/83	2/12/81	4/30/92
4,399,575	06/250,733	8/23/83	4/03/81	3/12/92
4,411,422	06/314,690	10/25/83	10/26/81	4/24/92
4,416,451	06/310,788	11/22/83	10/13/81	4/24/92
4,422,240	06/359,244	12/27/83	3/18/82	4/30/92
4,423,531	06/425,063	1/03/84	9/27/84	4/23/92
4,600,805	06/638,150	7/15/86	8/06/84	7/18/91
4,617,886	06/703,138	10/21/86	2/19/85	1/30/92
4,622,012	06/716,489	11/11/86	3/27/85	5/13/92
4,652,362	06/817,730	3/24/87	12/23/85	1/30/92
4,673,132	06/363,306	6/16/87	3/29/82	9/26/91
4,677,881	06/859,040	7/07/87	5/02/86	5/08/92
4,690,180	06/669,537	9/01/87	11/08/84	5/13/92
4,702,378	06/913,245	10/27/87	9/30/86	1/30/92
4,706,036	06/944,404	11/10/87	12/22/86	5/12/92
4,709,324	06/802,491	11/24/87	11/27/85	5/13/92
4,712,788	06/916,888	12/15/87	10/08/86	3/06/92
4,713,174	06/888,126	12/15/87	7/22/86	3/10/92
4,713,790	06/760,841	12/15/87	7/31/85	5/13/92
4,718,335	06/926,569	1/12/88	11/04/86	3/23/92
4,375,622	06/255,408	3/01/83	4/20/81	5/22/92
4,377,871	06/251,657	3/22/83	4/06/81	5/22/92
4,398,192	06/327,308	8/09/83	12/04/81	5/22/92
4,399,137	06/330,374	8/16/83	12/14/81	3/27/92
4,400,585	06/227,901	8/23/83	1/23/81	5/22/92
4,687,813	06/817,757	8/18/87	1/06/86	3/27/92
4,406,010	06/221,189	9/20/83	12/30/80	5/22/92
4,406,922	06/295,185	9/27/83	8/21/81	5/22/92
4,641,222	06/614,366	2/03/87	5/29/84	5/22/92
4,642,505	06/585,967	2/10/87	3/05/84	5/22/92
4,642,511	06/846,175	2/10/87	3/31/86	5/22/92
4,642,787	06/635,960	2/10/87	7/30/84	5/22/92
4,642,807	06/682,867	2/10/87	12/18/84	5/22/92
4,644,347	06/522,066	2/17/87	8/10/83	5/22/92
4,646,345	06/872,360	2/24/87	6/09/86	5/22/92
4,646,427	06/625,751	3/03/87	6/28/84	5/22/92
4,647,793	06/646,552	3/03/87	8/31/84	5/22/92
4,647,895	06/732,358	3/03/87	5/08/85	5/22/92
4,649,353	06/717,353	3/10/87	3/29/85	5/22/92
4,651,026	06/619,666	3/17/87	6/11/84	5/22/92
4,653,117	06/799,387	3/24/87	11/18/85	5/21/92
4,654,881	06/568,170	3/31/87	1/04/84	5/22/92
4,682,165	06/794,993	7/21/87	11/04/85	5/22/92
4,597,628	06/778,446	7/01/86	9/19/85	5/29/92
4,695,088	06/891,552	9/22/87	8/01/86	5/28/92
4,377,866	06/222,458	3/22/83	1/05/81	5/22/92
4,391,000	06/356,397	7/05/83	3/09/82	5/20/92
4,394,776	06/251,565	7/19/83	4/06/81	5/21/92
4,418,957	06/292,700	12/06/83	8/13/81	5/19/92
4,633,322	06/701,196	12/30/86	2/13/85	5/20/92
4,648,125	06/819,957	3/03/87	1/21/86	5/22/92
4,658,870	06/805,414	4/21/87	12/06/85	5/20/92
4,679,237	06/761,730	7/07/87	8/02/85	5/22/92
4,680,778	06/783,132	7/14/87	10/02/85	5/22/92
4,681,476	06/858,427	7/21/87	5/01/86	5/22/92
4,683,437	06/871,228	7/28/87	6/06/86	5/22/92
4,688,158	06/933,661	8/18/87	11/21/86	5/21/92
4,688,254	06/846,775	8/18/87	4/01/86	5/21/92
4,688,265	06/882,643	8/18/87	7/07/86	5/22/92
4,692,945	06/933,367	9/08/87	11/19/86	5/21/92
4,696,052	06/815,432	9/22/87	12/31/85	5/22/92
4,705,831	06/803,233	11/10/87	12/02/85	5/20/92
4,716,861	06/858,048	1/05/88	5/01/86	5/20/92
4,718,164	06/919,074	1/12/88	10/15/86	5/20/92
4,554,074	06/633,049	11/19/85	7/20/84	5/22/92
4,697,958	06/763,951	10/06/87	8/08/85	3/10/92
4,698,032	06/616,758	10/06/87	6/04/84	4/29/92
4,540,378	06/676,305	9/10/85	11/29/84	6/16/92
4,371,598	06/280,593	2/01/83	7/06/81	5/21/92
4,374,370	06/248,753	2/15/83	3/30/81	5/22/92
4,377,728	06/240,445	3/22/83	3/04/81	5/22/92

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4,378,534	06/249,532	3/29/83	3/31/81	5/22/92
4,378,603	06/219,765	3/29/83	12/23/80	5/22/92
4,392,138	06/222,421	7/05/83	1/05/81	5/22/92
4,393,131	06/362,938	7/12/83	3/29/82	5/22/92
4,400,817	06/221,190	8/23/83	12/30/80	5/22/92
4,403,342	06/251,644	9/06/83	4/06/81	5/22/92
4,405,836	06/336,979	9/20/83	1/04/82	5/22/92
4,405,837	06/218,878	9/20/83	12/22/80	5/22/92
4,641,925	06/841,988	2/10/87	3/20/86	5/21/92
4,642,633	06/520,790	2/10/87	8/05/83	5/21/92
4,644,260	06/762,185	2/17/87	8/05/85	5/21/92
4,644,351	06/608,334	2/17/87	5/08/84	5/22/92
4,646,038	06/849,098	2/24/87	4/07/86	5/21/92
4,646,082	06/651,194	2/24/87	9/14/84	5/21/92
4,646,326	06/543,740	2/24/87	10/20/83	5/22/92
4,649,092	06/689,352	3/10/87	1/07/85	5/22/92
4,649,543	06/771,458	3/10/87	8/30/85	5/22/92
4,647,871	06/800,832	3/03/87	11/22/85	5/22/92
4,649,538	06/657,425	3/10/87	10/03/84	5/22/92
4,651,307	06/667,039	3/17/87	11/01/84	5/22/92
4,651,319	06/786,491	3/17/87	10/11/85	5/21/92
4,652,832	06/751,919	3/24/87	7/05/85	5/22/92
4,654,631	06/816,583	5/31/87	3/06/86	5/21/92
4,389,299	06/275,784	6/21/83	6/22/81	6/15/92
4,400,584	06/365,811	8/23/83	4/05/82	5/22/92
4,408,171	06/243,607	10/04/83	3/13/81	4/29/92
4,410,930	06/346,273	10/18/83	2/05/82	6/16/92
4,649,536	06/778,902	3/10/87	9/23/85	5/22/92
4,664,763	06/731,818	5/12/87	5/08/85	6/16/92
4,668,348	06/780,469	5/26/87	9/26/85	6/16/92
4,685,337	06/833,428	8/11/87	2/24/86	6/17/92
4,710,691	06/845,923	12/01/87	3/27/86	6/16/92
4,711,705	07/004,374	12/08/87	1/15/87	6/16/92
4,713,298	06/853,078	12/17/87	4/17/86	6/15/92
4,687,792	06/695,985	8/18/87	1/29/85	3/24/92
4,339,636	06/219,883	7/13/82	12/24/80	6/30/92
4,357,503	06/219,378	11/02/82	12/22/80	6/30/92
4,357,504	06/219,880	11/02/82	12/24/80	6/30/92
4,379,956	06/216,686	4/12/83	12/15/80	6/30/92
4,403,468	06/387,042	9/13/83	6/10/82	6/30/92
4,668,394	06/456,649	5/26/87	1/10/83	6/30/92
4,654,655	06/585,753	3/31/87	3/02/84	5/22/92
4,654,867	06/894,387	3/31/87	8/11/86	5/21/92
4,654,885	06/745,480	3/31/87	6/17/85	5/21/92
4,646,358	06/882,448	2/24/87	7/07/86	5/22/92
4,669,665	06/659,684	6/02/87	10/11/84	5/21/92
4,679,028	06/846,385	7/07/87	3/31/86	5/22/92
4,680,527	06/894,217	7/14/87	8/06/86	5/22/92
4,680,667	06/778,997	7/14/87	9/23/85	5/22/92
4,680,676	06/816,521	7/14/87	1/06/86	5/22/92
4,680,787	06/907,125	7/14/87	9/12/86	5/22/92
4,680,794	06/891,496	7/14/87	7/29/86	5/22/92
4,680,795	06/812,687	7/14/87	12/23/85	5/22/92
4,683,445	06/858,323	7/28/87	4/30/86	5/22/92
4,683,585	06/858,081	7/28/87	4/28/86	5/22/92
4,684,941	06/684,999	8/04/87	12/21/84	5/22/92
4,685,233	06/715,406	8/11/87	3/25/85	5/27/92
4,686,528	06/843,876	8/11/87	3/26/86	5/22/92
4,691,175	06/797,735	9/01/87	11/14/85	5/22/92
4,692,726	06/890,686	9/08/87	7/25/86	5/22/92
4,694,201	06/728,715	9/15/87	4/30/85	5/22/92
4,694,484	06/830,145	9/15/87	2/18/86	5/22/92
4,695,886	06/785,007	9/22/87	10/07/85	5/22/92
4,696,027	06/893,116	9/22/87	8/01/86	5/22/92
4,696,051	06/815,334	9/22/87	12/31/85	5/22/92
4,673,102	06/700,083	6/16/87	5/02/85	6/15/92
4,685,947	06/775,454	8/11/87	9/12/85	6/16/92
4,693,469	06/927,399	9/15/87	11/06/86	6/15/92
4,694,907	06/832,267	9/22/87	2/22/87	5/20/92
4,698,090	06/771,554	10/06/87	8/30/85	6/29/92
4,698,284	06/791,256	10/06/87	10/25/85	6/16/92
4,717,850	06/733,132	1/05/88	5/10/85	6/30/92
4,739,287	06/739,577	4/19/88	5/30/85	6/30/92
4,494,491	06/382,445	1/22/85	5/26/82	6/29/92
4,690,844	06/665,295	9/01/87	10/26/84	7/10/92

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4,633,084	06/691,825	12/30/87	1/16/85	4/29/92
4,691,965	06/906,447	9/08/87	9/12/86	6/30/92
4,706,688	06/545,535	11/17/87	10/26/83	7/15/92
4,383,289	06/216,364	5/10/83	12/15/80	7/30/92
4,401,207	06/228,360	8/30/83	1/26/81	7/30/92
4,401,637	06/234,925	8/30/83	2/17/81	3/30/92
4,402,336	06/201,614	9/06/83	5/07/81	7/30/92
4,423,503	06/322,948	12/27/83	11/19/81	6/30/92
4,693,377	06/902,092	9/15/87	8/27/86	7/30/92
4,706,805	06/866,742	11/17/87	5/27/86	7/30/92
4,711,837	06/769,903	12/08/87	8/27/85	7/30/92
4,405,808	06/370,037	9/20/83	4/20/82	8/17/92
4,672,959	06/761,406	6/16/87	9/27/85	7/31/92
4,674,493	06/877,608	6/23/87	6/23/86	7/30/92
4,680,214	06/838,942	7/14/87	3/12/86	8/17/92
4,691,945	06/926,050	9/08/87	10/31/86	8/17/92
4,693,455	06/738,165	9/15/87	5/24/85	7/31/92
4,705,616	06/906,847	11/10/87	9/15/86	6/30/92
4,433,698	06/215,965	2/28/84	6/22/81	9/08/92
4,597,628	06/778,446	7/01/86	9/19/85	5/29/92
4,720,324	06/783,481	1/19/88	10/03/89	9/08/92
4,723,886	06/885,452	2/09/88	7/14/86	9/08/92
4,732,465	06/927,094	3/22/88	11/05/86	9/08/92
4,746,119	06/910,396	5/24/88	9/22/86	9/08/92
4,353,797	06/240,975	10/12/82	3/05/81	9/23/92
4,680,138	06/790,247	7/14/87	10/22/85	7/31/92
4,680,889	06/882,477	7/21/87	11/27/85	9/24/92
4,693,993	06/744,207	9/15/87	6/13/85	9/09/92
4,697,648	06/782,918	10/06/87	9/24/85	9/11/92
4,755,803	07/054,449	7/05/88	5/27/87	9/11/92
4,364,332	06/346,693	12/21/82	9/29/81	9/30/92
4,422,917	06/293,961	12/27/83	8/18/81	9/30/92
4,428,856	06/428,919	1/31/84	9/30/82	9/30/92
4,442,326	06/398,403	2/28/84	7/14/82	10/06/92
4,442,625	06/298,720	4/17/84	9/02/81	9/30/92
4,546,299	06/543,405	10/08/85	12/20/83	8/31/92
4,570,929	06/528,131	2/18/86	8/31/83	10/06/92
4,645,457	06/543,314	2/24/87	10/19/83	9/30/92
4,698,075	06/871,458	10/06/87	6/05/86	9/28/92
4,710,668	06/803,160	12/01/87	12/02/85	9/11/92
4,711,538	06/912,987	12/08/87	9/29/86	9/30/92
4,721,165	06/860,017	1/26/88	5/06/86	9/30/92
4,725,464	06/868,729	2/16/88	5/30/86	9/30/92
4,743,439	06/571,325	5/10/88	1/16/84	9/30/92
4,744,693	06/908,613	5/17/88	9/17/86	10/07/92
4,758,549	06/675,291	7/19/88	11/27/84	9/30/92
4,758,660	06/796,823	7/19/88	10/11/85	9/29/92
Re. 33,409	07/347,517	10/30/90	5/03/89	2/19/92
(4,662,229)	(06/769,372)	(5/05/87)	(8/26/85)	
4,680,138	06/790,247	7/14/87	10/22/85	7/31/92
4,430,549	06/371,539	2/07/84	4/26/82	9/30/92
4,595,296	06/709,315	6/17/86	2/06/85	10/14/92
4,685,065	06/797,217	8/04/87	5/23/85	10/14/92
4,722,681	06/831,795	2/02/88	2/02/86	10/13/92
Re. 33,613	07/402,658	6/18/91	9/05/89	10/26/92
4,364,754	06/253,311	12/21/82	4/13/81	7/30/92
4,430,548	06/371,535	2/07/84	4/26/82	10/07/92
4,572,210	06/369,292	2/25/86	3/18/82	3/27/91
4,641,650	06/710,431	2/10/87	3/11/85	10/19/92
Re. 33,216	07/152,812	5/15/90	2/05/88	9/28/92
4,419,016	06/394,579	12/06/83	7/02/82	10/30/92
4,708,055	06/845,224	11/24/87	3/27/86	7/31/92
4,714,914	06/853,379	12/22/87	4/15/86	10/30/92
4,724,831	06/903,492	2/16/88	9/04/86	10/28/92
4,726,252	06/844,192	2/23/88	3/26/86	10/29/92
4,727,838	07/006,142	3/01/88	5/05/87	10/29/92
4,740,390	06/946,375	4/26/88	12/24/86	10/30/92
4,756,827	07/016,775	7/12/88	2/20/87	10/28/92
4,438,854	06/323,273	3/27/84	11/20/81	11/19/92
4,617,758	06/572,827	10/21/86	1/23/84	11/06/92
4,738,543	06/863,702	4/19/88	5/15/86	11/20/92
4,438,854	06/323,273	3/27/84	11/20/81	11/19/92
4,617,758	06/572,827	10/21/86	1/23/84	11/06/92
4,738,543	06/863,702	4/19/88	5/15/86	11/20/92
4,454,662	06/347,419	6/19/84	2/10/82	12/11/92

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,466,325	06/372,051	8/21/84	4/26/82	12/09/92
4,475,556	06/454,984	10/09/84	1/03/83	12/18/92
4,578,648	06/600,723	3/25/86	4/16/84	12/15/92
4,605,501	06/754,240	8/12/86	7/12/85	12/23/92
4,712,096	06/732,875	12/08/87	5/10/85	12/24/92
4,383,161	06/261,055	5/10/83	5/06/81	1/13/93
4,630,397	06/738,559	12/23/86	6/09/86	1/13/93
4,654,897	06/803,071	4/07/87	11/29/85	1/13/93
4,671,303	06/797,761	6/09/87	11/13/85	1/13/93
4,703,859	06/924,561	11/03/87	10/29/86	1/13/93
4,757,980	07/107,567	7/19/88	10/06/87	1/13/93
4,742,277	07/079,049	5/03/88	7/29/87	1/13/93
4,749,905	06/930,416	6/07/88	11/14/86	1/13/93
4,778,683	06/937,997	10/18/88	12/04/86	1/13/93
4,676,790	06/779,808	6/30/87	9/25/85	1/19/93
4,375,480	06/275,633	3/01/83	6/22/81	1/13/93
4,402,986	06/286,088	9/06/83	7/23/81	1/13/93
4,655,120	06/812,848	4/07/87	12/23/85	1/15/93
4,674,503	06/240,728	6/23/87	3/05/81	1/13/93
4,676,240	06/773,991	6/30/87	9/09/85	1/13/93
4,707,361	06/761,988	11/17/87	8/02/85	1/15/93
4,719,937	06/802,997	1/19/88	11/29/85	1/13/93
4,726,929	07/041,650	2/23/88	4/21/87	1/13/93
4,731,980	06/942,849	3/22/88	12/17/86	1/14/93
4/732,755	06/489,590	3/22/88	4/28/83	1/14/93
4,758,187	07/061,184	7/19/88	6/11/87	1/15/93

PATENT NOTICES

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PATENT NOTICES

Certificates of Correction For Week of March 23, 1993

Des. 298,565	5,016,812	5,047,550	5,061,057
Des. 316,825	5,017,563	5,047,662	5,061,147
Des. 318,157	5,018,527	5,048,086	5,061,341
Des. 318,320	5,018,804	5,048,659	5,061,681
Des. 322,265	5,019,469	5,048,776	5,061,809
Des. 323,112	5,019,559	5,048,903	5,061,817
Des. 330,380	5,020,448	5,049,084	5,061,824
PP. 7,540	5,020,864	5,049,205	5,061,919
4,463,764	5,020,973	5,049,208	5,062,011
4,494,230	5,021,374	5,049,296	5,062,391
4,654,267	5,021,695	5,049,501	5,062,468
4,657,542	5,022,447	5,049,686	5,062,743
4,743,376	5,023,083	5,049,852	5,062,854
4,762,574	5,023,715	5,049,896	5,063,081
4,764,180	5,023,930	5,050,096	5,063,104
4,817,966	5,026,228	5,050,179	5,063,190
4,833,127	5,026,466	5,050,379	5,063,320
4,837,070	5,026,863	5,050,490	5,063,785
4,849,058	5,026,959	5,050,783	5,064,016
4,861,514	5,027,659	5,051,364	5,064,052
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4,862,810	5,028,128	5,051,579	5,064,207
4,873,190	5,028,276	5,051,630	5,064,388
4,891,357	5,028,539	5,051,774	5,064,502
4,892,786	5,028,797	5,051,779	5,064,551
4,895,342	5,028,941	5,051,994	5,064,705
4,908,096	5,029,221	5,053,122	5,065,149
4,915,322	5,029,420	5,053,448	5,065,203
4,938,956	5,029,439	5,053,536	5,065,378
4,939,262	5,029,624	5,054,380	5,065,607
4,939,580	5,029,839	5,054,682	5,065,652
4,940,282	5,030,030	5,054,794	5,065,699
4,940,787	5,031,013	5,054,978	5,065,943
4,945,255	5,032,573	5,055,316	5,066,059
4,946,749	5,032,688	5,055,358	5,066,163
4,946,977	5,032,760	5,055,527	5,066,201
4,948,077	5,033,856	5,055,544	5,066,203
4,950,330	5,034,071	5,055,555	5,066,335
4,958,146	5,034,086	5,055,588	5,066,370
4,958,987	5,034,571	5,055,657	5,066,432
4,949,476	5,034,572	5,055,996	5,066,516
4,966,286	5,034,777	5,056,067	5,066,837
4,967,115	5,034,793	5,056,089	5,066,887
4,972,306	5,035,498	5,056,100	5,067,010
4,973,714	5,035,612	5,056,193	5,067,084
4,980,272	5,035,755	5,056,336	5,067,086
4,980,917	5,036,017	5,056,439	5,067,093
4,981,533	5,036,176	5,056,587	5,067,329
4,981,772	5,037,194	5,056,590	5,067,458
4,982,259	5,037,303	5,057,075	5,067,503
4,982,682	5,037,584	5,057,319	5,067,856
4,985,166	5,037,998	5,057,410	5,067,890
4,988,379	5,038,007	5,057,516	5,067,936
4,989,643	5,038,821	5,057,552	5,067,999
4,990,612	5,039,487	5,058,123	5,068,114
4,994,643	5,040,244	5,058,244	5,068,367
4,994,804	5,040,382	5,058,361	5,068,531
4,994,963	5,040,645	5,058,525	5,068,582
4,995,481	5,041,253	5,058,704	5,069,072
4,995,932	5,041,302	5,058,751	5,069,209
4,997,537	5,041,452	5,058,916	5,069,855
5,000,356	5,041,552	5,059,139	5,070,002
5,003,473	5,041,852	5,059,186	5,070,054
5,004,193	5,042,006	5,059,199	5,070,119
5,004,591	5,042,307	5,059,262	5,070,375
5,005,087	5,043,086	5,059,291	5,070,462
5,005,329	5,043,278	5,059,468	5,070,805
5,006,041	5,043,286	5,060,151	5,070,829
5,009,367	5,043,558	5,060,207	5,071,189
5,009,636	5,044,946	5,060,232	5,071,222
5,011,278	4,045,391	5,060,503	5,071,309
5,012,971	5,046,252	5,060,547	5,071,405
5,013,982	5,046,821	5,060,721	5,071,512
5,014,092	5,046,827	5,060,890	5,071,597
5,014,257	5,047,199	5,060,924	5,072,051
5,016,544	5,047,506	5,060,981	5,072,575
5,072,940	5,075,672	5,077,404	5,079,904
5,073,425	5,075,837	5,077,411	5,080,745
5,073,768	5,075,864	5,077,629	5,081,166
5,073,837	5,075,997	5,077,918	5,085,667
5,073,982	5,076,172	5,078,075	5,097,819
5,074,301	5,076,706	5,078,652	5,116,179
5,074,503	5,076,938	5,078,874	5,147,142
5,075,227	5,076,982	5,079,019	5,152,592
5,075,369	5,077,112	5,079,318	5,163,325
5,075,454	5,077,377	5,079,862	5,172,009

Disclaimers

D.327,007—*Sandra H. Olds*, Lilburn, Ga., BOTTLE. Patent dated June 16, 1992. Disclaimer filed Nov. 25, 1992, by the assignee, The Coca-Cola Co.,

Hereby enters this disclaimer to claim 1 of said patent.

4,700,762—*Samuel P. Landers*, Uniontown, Ohio. PNEUMATIC TIRE THREAD WITH WIDE CENTRAL GROOVE AND ARCUATE GROOVES. Patent dated Oct. 20, 1987. Disclaimer filed Nov. 23, 1992, by the assignee, The Goodyear Tire & Rubber Co.

Hereby enters this disclaimer to the remaining term of said patent.

4,998,262—*Hans A. M. Wiggers*, Saratoga, Calif. GENERATION OF TOPOLOGY INDEPENDENT REFERENCE SIGNALS. Patent dated Mar. 5, 1991. Disclaimer filed Jan. 8, 1993, by the assignee, Hewlett-Packard Co.

Hereby enters this disclaimer to claims 4, 5, and 6 of said patent.

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Box Sequence	Submission of diskette for biotechnical application.
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	Springfield: Illinois State Library	(217) 782-5659
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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REEXAMINATIONS

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PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. R. TALBERT, Director	308-0661	3/28/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	6/25/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD R. KUBASIEWICZ, Director	308-0651	5/22/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	5/22/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	8/22/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	9/03/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	8/17/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	11/21/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	3/06/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. BOLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	8/10/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	11/04/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	2/01/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	5/26/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/05/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	5/29/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/18/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during February 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

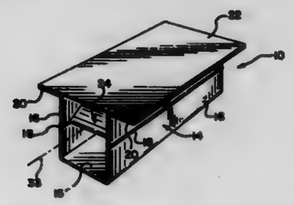
Patents ..... Numbers 3,935,596 to 3,946,800 inclusive
Plant Patents ..... 3,828 to 3,830

REEXAMINATIONS

MARCH 23, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,494,897 (1952nd)
DAMAGE PREVENTION VOID FILLER FOR SEPARATING LOADS DURING TRANSIT
Eugene A. Rogers, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Reexamination Request No. 90/002,644, Feb. 14, 1992.
Reexamination Certificate for Patent No. 4,494,897, issued Jan. 22, 1985, Ser. No. 465,522, Feb. 10, 1983.
Int. Cl.[5] B61D *45/00*; B63B *25/24*; B65D *81/04*
U.S. Cl. 410—154



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 4 is cancelled.

Claims 1–3, 5 and 7 are determined to be patentable as amended.

Claim 6, dependent on an amended claim, is determined to be patentable.

New Claims 8–13 are added and determined to be patentable.

1. A collapsible void filler [damage prevention] device [adapted to fold] *foldable* into a flat, *collapsed* configuration *for storage* and [be unfolded] *unfoldable* into an expanded configuration for [protecting] *preventing damage to* cargo during transit, [the improvement] comprising:

an outer housing [providing] *comprising* a four sided, tubular member having a bottom, *a* top, and two sides, and a longitudinal axis extending the length thereof;

said sides *of said outer housing tubular member* 171 adapted to extend] *extending* upwardly from [the] *said* bottom *of said outer housing tubular member* to said top *of said outer housing tubular member* when [the] *said* damage prevention device is *disposed* in said expanded configuration, and, said sides [having] *of said outer housing tubular member comprising* means for *permitting said* [bowing the] sides *of said outer housing tubular member to bow* outwardly *so as* to thereby allow [the] *said outer housing tubular member* [void filler] to collapse easily and *to* provide an outwardly directed spring force *upon* adjacent objects *so as* to hold [the] *said* void filler in place when [the] *said* sides *of said outer housing tubular member* are *disposed* in said expanded configuration; *and*

an inner member comprising a single cell tubular core [means with means attached] *disposed* within said *outer housing* tubular member [to hold the core means in position] and having [leg means extending to connect] *a bottom connected to said* [the] bottom *of said outer housing tubular member, a* [and] *top connected to said* top of [the] *said* outer *housing* tubular member, *and sides interconnecting said bottom and said top of said inner member tubular core,* said *inner member tubular* core [means] having a *longitudinal axis extending the length thereof which is disposed perpendicular to said longitudinal axis of said outer housing tubular member, a width which extends across a majority of said length of said outer housing tubular member, and wherein said length of said inner member tubular core is sized so as* [a width] to [thereby] contact and space apart [the] *said* sides *of said outer housing tubular member so as* to prevent [their] inward movement *of said sides of said outer housing tubular member* and *thereby* rigidify [the] *said* outer *housing* tubular member when [the] *said* void filler is *disposed* in *said* [the] expanded configuration;

said *sides of said inner member tubular* core [means] having means [to allow] *for allowing* [it] *said sides of said inner member tubular core* to be folded and collapsed when *said* [the] outer housing *tubular member* is collapsed.

B1 4,711,140 (1953rd)
THROTTLE VALVE SYSTEM FOR AUTOMATIC TRANSMISSIONS
Gilbert W. Younger, 2621 Merced Ave., El Monte, Calif. 91733
Reexamination Request No. 90/002,172, Oct. 22, 1990.
Reexamination Certificate for Patent No. 4,711,140, issued Dec. 8, 1987, Ser. No. 813,729, Dec. 27, 1985.
Int. Cl.[5] B60K *41/06*, *41/16*
U.S. Cl. 74—865

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–13 is confirmed.

New claims 14 and 15 are added and determined to be patentable.

1. A throttle valve system for automatic transmissions including a throttle valve member movable within a bore between two predetermined positions, a plunger for driving the throttle valve member in said bore, a throttle valve spring disposed between the plunger and the valve member for transmitting the force exerted by the plunger to the throttle valve member, and

a rigid spacer element fully mounted within the throttle valve spring, said spacer element being of a length less than the length of said throttle valve spring when said spring is in its normal operative position, said spacer element adapted to exert a force directly on said throttle valve member if said valve member sticks in said bore and is no longer movable with said throttle valve spring, said spacer element directly abutting against said valve member and applying a force thereagainst, under the urging of said plunger, only if said valve member is stuck in said bore and said throttle valve spring is compressed to a length substantially equal to the length of said spacer element, said spacer element not directly abutting against said valve member during normal operation of said throttle valve system.

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B1 4,749,631 (1954th)

MULTILAYER CERAMICS FROM SILICATE ESTERS

Loren A. Haluska; Michael, Keith W., both of Midland, and Leo Turbay, Sanford, all of Mich., assignors to The Dow Corning Corporation, Midland, Mich.

Reexamination Request No. 90/002,816, Aug. 14, 1992.
Reexamination Certificate for Patent No. 4,749,631, issued Jun. 7, 1988, Ser. No. 938,679, Dec. 4, 1986.
Int. Cl.[5] B05D *3/06*
U.S. Cl. 428—704

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 10–18, 28–42 and 44–76 is confirmed.

Claims 4 and 43 are cancelled.

Claims 1, 7 and 19 are determined to be patentable as amended.

Claims 2,3,5,6, 8,9 and 20–27, dependent on an amended claim, are determined to be patentable.

1. A process for forming [on an electronic device] a multilayer, ceramic or ceramic-like [coating] *topcoat on the surface of an electronic device* which process comprises:

(I) (A) coating *the surface of* an electronic device with a planarizing coating by means of diluting a hydrolyzed or partially hydrolyzed silicate ester with a solvent and applying the diluted hydrolyzed or partially hydrolyzed silicate ester solution to an electronic device; (B) drying the hydrolyzed or partially hydrolyzed silicate ester solution so as to evaporate the solvent and thereby deposit a preceramic coating on the electronic device; (C) ceramifying the hydrolyzed or partially hydrolyzed silicate ester in air, or in water vapor and air, to silicon dioxide by heating the coated device to a temperature between 200 and 1000 degrees Centigrade to produce a ceramic or ceramic-like planarizing coating; and

(II) applying to the ceramic or ceramic-like planarizing coating a passivating coating selected from the group consisting of (i) a silicon nitrogen-containing coating, (ii) a silicon carbon-containing coating, and (iii) a silicon carbon nitrogen-containing coating, wherein the silicon nitrogen-containing coating is applied onto the planarizing coating of the electronic device by a means selected from the group consisting of (a) chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, (b) plasma enhanced chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, (c) ceramification of a silicon and nitrogen-containing preceramic polymer, and wherein the silicon carbon nitrogen-containing coating is applied onto the planarizing coating of the electronic device by a means selected from the group consisting of (1) chemical vapor deposition of hexamethyldisilazane, (2) plasma enhanced chemical vapor deposition of hexamethyldisilazane, (3) chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia, and (4) plasma enhanced chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia; and wherein the silicon carbon-containing coating is deposited by a means selected from the group consisting of (i) chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane, and (ii) plasma enhanced chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane, to produce the passivating ceramic or ceramic-like coating, and

(III) applying to the passivating ceramic or ceramic-like coating a silicon-containing coating selected from the group consisting of (i) silicon coating, (ii) silicon carbon-containing coating, (iii) silicon nitrogen-containing coating, and (iv) silicon carbon nitrogen-containing coating; wherein the silicon coating is applied onto the passivating coating by a means selected from the group consisting of (a) chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof, (b) plasma enhanced chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof, or (c) metal assisted chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof, and wherein the silicon carbon-containing coating is applied by a means selected from the group consisting of (1) chemical vapor depositionof a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane, (2) plasma enhanced chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane; and wherein the silicon nitrogen-containing coating is deposited by a means selected from the group consisting of (A) chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, (B) plasma enhanced chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, and (C) ceramification of a silicon and nitrogen-containing preceramic polymer, and wherein the silicon carbon nitrogen-containing coating is deposited by a means selected from the group consisting of (i) chemical vapor deposition of hexamethyldisilazane, (ii) plasma enhanced chemical vapor deposition of hexamethyldisilazane, (iii) chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia, and (iv) plasma enhanced chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia, to produce the silicon-containing coating, whereby a multilayer, ceramic or ceramic-like, coating is obtained on the electronic device.

B1 4,895,456 (1955th)

SHOPPING BAGS

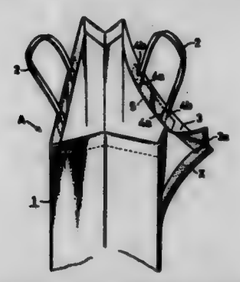
Shigenari Morita, Higashinariku, Japan, assignor to The Pack Kabushiki Kaisha, Osaka, Japan

Reexamination Request No. 90/002,531, Dec. 4, 1991.
Reexamination Certificate for Patent No. 4,895,456, issued Jan. 23, 1990, Ser. No. 294,199, Jan. 6, 1989.
Int. Cl.[5] B65D *33/06*
U.S. Cl. 383—20

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 are cancelled.

[1. A shopping bag comprising a bag portion, a bottom portion, and a pair of handles, the bag portion including a foldable tab in its rim, the foldable tab including slits for allowing the handle to pass through, each slit including a first portion extending inwardly from the edge of the tab and a second portion continuous with, but extending generally transversely to, said first portion and being inwardly spaced from said rim of said bag portion and the opposite ends of each handle being



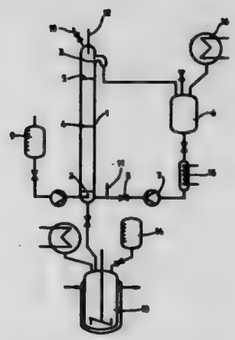
bonded to a reinforcement strap attached to the bag portion, the foldable tab being folded over the reinforcement straps with the handles protruded through the second portions of the handle-receiving slits.]

B1 5,099,040 (1956th)

PROCESS FOR THE PREPARATION OF INTERMEDIATES

Winfried Reese, Wuppertal; Paul-Christian Fiedler, Cologne, and Götz Bimus, Hohenlinden, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Reexamination Request No. 90/002,733, May 21, 1992.
Reexamination Certificate for Patent No. 5,099,040, issued Mar. 24, 1992, Ser. No. 749,835, Aug. 23, 1991.
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027608
Int. Cl.[5] C07D *301/02, 301/26*; C07C *29/40, 33/50*
U.S. Cl. 549—519

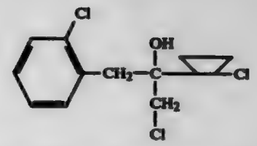


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

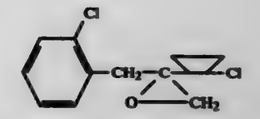
Claim 1 is determined to be patentable as amended.

Claims 6 and 10 dependent on an amended claim, are determined to be patentable.

1. A process for the preparation of 1-chloro-2-(1-chloro-cyclopropyl)-3-(2-chloro-phenyl)propan-2-ol of the formula

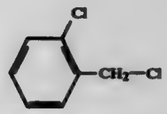


and/or 2-(1-chloro-cyclopropyl)-2-(2-chloro-benzyl-)oxirane of the formula



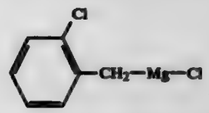
comprising

a) reacting in a first step, 2-chloro-benzyl chloride of the formula

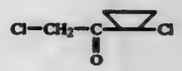


with comminuted magnesium in the presence of a mixture of toluene and tetrahydrofuran, in which the ratio of toluene to tetrahydrofuran is between [65:35 and 95:5] *70:30 and 90:10* parts by weight, at a temperature between [0° C. and 100° C.] *20° and 50° C.*, the ratio of 2-chloro-benzyl chloride to tetrahydrofuran being such that between [1 and 3] *1.5 and 2.5* moles of tetrahydrofuran are present per mol of 2-chloro-benzyl chloride, *the reaction being effected by adding a mixture of a major amount of the 2-chloro-benzyl chloride and the tetrahydrofuran to a mixture of magnesium flakes, iodine as catalyst, toluene and a minor amount of the 2-chloro-benzyl chloride and tetrahydrofuran;* and subsequently separating off any magnesium which may still be present, and

b) reacting the resulting Grignard reagent of the formula



in a second step with 1-chloro-1-chloroacetylcyclopropane of the formula



in the presence of a mixture of toluene and tetrahydrofuran, in which the ratio of toluene to tetrahydrofuran is between 63:35 and 95:5 parts by weight at a temperature between 0° C. and [100° C.] *30° C.*

REISSUES

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REISSUES

MARCH 23, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,198

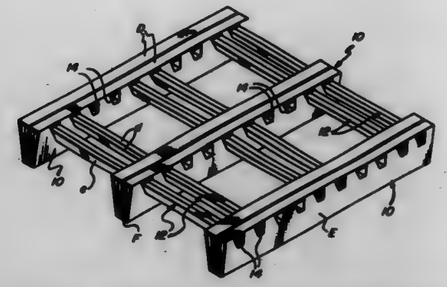
CORRUGATED CONSTRUCTION PALLET

Robert J. Quennick, Jacksonville, Fla., assignor to Gate Pallet Systems, Inc., Crown Point, Ind.

Original No. 4,867,074, dated Sep. 19, 1989, Ser. No. 321,836, Mar. 10, 1989. Application for reissue Sep. 9, 1991, Ser. No. 756,460

Int. Cl.[5] B65D *19/20*

U.S. Cl. 108—51.3 8 Claims



7. A pallet comprising a plurality of elongated stringer members and a multiplicity of elongated decking members assembled therewith, at least some of said stringer members being of trapezoidal cross section, relatively wide at the top and relatively narrow at the bottom, and being made from a single piece of material folded to form symmetrical half sections of said stringer member, said half sections being disposed to the opposite sides of a longitudinally extending medial plane thereof, each of said half sections comprising at least four sequentially contiguous rectangular panel portions, at least two of which in each of said half sections, taken in sequence, being internal panel portions and being of substantially the same width, said half sections being joined by a common central panel portion at the bottom of said stringer member with respective ones of said internal panel portions of said half sections disposed in face-to-face contact along said medial plane, another of said panel portions of each half section being disposed on the outside of said stringer member and being connected to said common panel portion and diverging outwardly and away therefrom, another of said panel portions of each half section extending inwardly from said diverging portion thereof at the top of said stringer member in a plane parallel to the plane in which said common panel portion is disposed and perpendicular to said medial plane, said panel portions being so dimensioned that said internal panel portions of each of said half sections extend substantially fully between said panel portion thereof at the top of said stringer member and said common panel portion, said internal and diverging panel portions having a multiplicity of apertures therethrough at longitudinally spaced locations therealong, with correspondingly located apertures of said internal and diverging panel portions lying in registry to define a multiplicity of passages extending transversely through said stringer members, said decking members extending through, and being tightly engaged within, said passages of a plurality of said stringer members disposed parallel to one another, an adhesive substance being present on at least one of said internal panel portions of each of said half sections to secure said at least one of said internal panel portions thereon to said diverging panel portion thereof near the top of said stringer member, thereby to maintain at least one of said panel portions in an oblique position against said diverging panel portion.

Re. 34,199

MOTORCYCLE

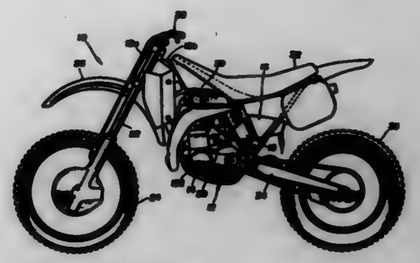
Toshimitsu Asakura, 2120-8, Shimoniikura, Waki-shi, Saitama-ken, and Tomoyuki Tagami, 661, Yawata-cho, Soka-shi, Saitama-ken, both of Japan

Original No. 4,694,924, dated Sep. 22, 1987, Ser. No. 813,254, Dec. 24, 1985. Application for reissue Feb. 19, 1988, Ser. No. 158,246

Claims priority, application Japan, Dec. 28, 1984, 59-278917; Dec. 29, 1984, 59-276553

Int. Cl.[5] B62K *5/04*

U.S. Cl. 180—68.3 11 Claims



1. A motorcycle comprising:
(a) an elongated frame having front and rear ends:
(b) an engine mounted on said frame;
(c) a fuel tank mounted on said frame above said engine and having an upper surface extending along a length of the frame;
(d) an elongated seat mounted on said frame above said fuel tank along the length of said frame, said seat having a bottom having a portion extending along the length thereof and disposed in spaced opposed relation to said upper surface of said fuel tank to define an air intake passageway therebetween, said passageway having an open front end opening toward the front end of said frame and having a rear open end, said seat having a front end disposed near to a front end of said fuel tank so that said seat covers said upper surface of said fuel tank generally entirely; and
(e) an air cleaner operatively connected to said engine and disposed rearwardly of said fuel tank, the rear open end of said passageway being in communication with said air cleaner whereby the ambient air can be fed to said air cleaner through said air intake passageway.

Re. 34,200

COIN FRAUD PREVENTING UNIT AND MODULAR CONFIGURATIONS FOR PAY TELEPHONE STATIONS

Allen W. Vogl, Melbourne; Steven C. Poe, West Melbourne; John H. MacNeill, Indialantic, and Douglas J. Burns, Micco, all of Fla., assignors to International Teleservice, Inc., Melbourne, Fla.

Original No. 4,918,724, dated Apr. 17, 1990, Ser. No. 407,947, Sep. 15, 1989. Application for reissue May 8, 1991, Ser. No. 697,015

Int. Cl.[5] H04M *1/15, 11/02, 1/08;* G8TF *3/02*

U.S. Cl. 379—145 48 Claims

42. A modular central printed circuit board having a generally planar surface for use in telephone stations, comprising at least one module removably associated with and sitting upon the generally planar surface of the board for providing a circuit connection, means associated with the at least one module for assuring that the

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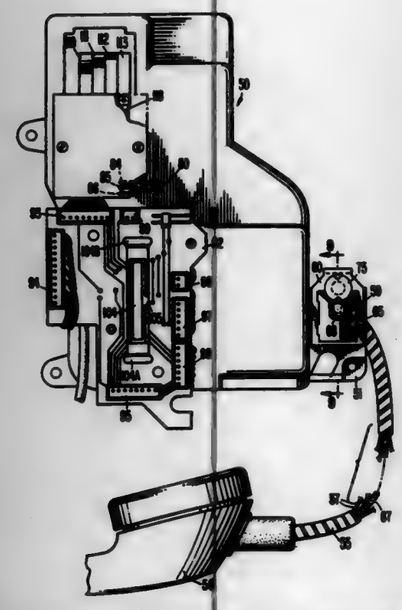
at least one module can be attached to the generally planar surface of the board in only one orientation, and pin connections associ-



ated with one of the board and the at least one module for effecting a desired circuit connection on the board.

Re. 34,201

N-ARYL-N-[4-(1-HETEROCYCLICALKYL)PIPERIDINYL-]AMIDES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUCH COMPOUNDS

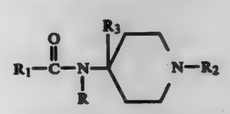
Jerome R. Bagley, North Plainfield, N.J.; Nhora L. Lalinde, West Nyack, N.Y.; Bao-Shan Huang, Edison, and H. Kenneth Spencer, Chatham, both of N.J., assignors to Anaquest, Inc., Liberty Corner, N.J.

Original No. 5,053,411, dated Oct. 1, 1991, Ser. No. 341,094, Apr. 20, 1989. Application for reissue Apr. 14, 1992, Ser. No. 868,750

Int. Cl.[5] A61K *31/505, 31/52;* C07D *239/72*

U.S. Cl. 514—259 30 Claims

1. A compound having the formula:



optically active isometric forms thereof, and pharmaceutically acceptable acid addition salts thereof, wherein:

R is selected from the group consisting of phenyl and substituted phenyl, wherein said substituents are members independently selected from the group consisting [one or more of halogen] *of one or more of halo and lower alkoxy;*

R_1 is selected form the group consisting of lower alkyl, lower-alkenyl, and a lower-alkoxy lower-alkyl group having from 2 to 6 carbon atoms;

R_2 is a [quniazolyl] *quinazolinyl* lower-alkyl group or a purinyl lower-alkyl group, the lower-alkyl portion of said groups containing from 1 to 7 carbon atoms and the heterocyclic portion thereof being unsubstituted or substituted with one or more substituents selected from the group consisting of [halogen] *halo, oxo,* hydroxyl, nitro, amino, lower-alkoxy carbonyl, lower-alkyl, lower-cycloalkyl, lower alkoxy, halogenated lower-alkyl, aryl and halogenated aryl; and

R_3 is lower-alkoxy carbonyl or lower-alkoxy methyl.

PLANT PATENTS

GRANTED MARCH 23, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,181

MINIATURE ROSE PLANT NAMED SAVARS

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Aug. 5, 1991, Ser. No. 740,582

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—7.1 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

8,182

MINIATURE ROSE PLANT NAMED SAVAFIRE

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Aug. 15, 1991, Ser. No. 746,232

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—7.1 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

8,183

HYBRID FLORIBUNDA ROSE PLANT NAMED WEKUZ

Thomas F. Carruth, Altadena, Calif., assignor to Weeks Wholesale Rose Grower, Inc., Upland, Calif.

Filed Aug. 22, 1991, Ser. No. 748,654

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—27 1 Claim

1. A new and distinct variety of Floribunda rose plant substantially as shown and described.

8,184

APRICOT CV. SUAPRIFIVE

John H. Weinberger, Fresno, Calif., assignor to Sun World, Inc., Coachella, Calif.

Filed Oct. 7, 1991, Ser. No. 772,703

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—39 1 Claim

1. A new variety of apricot cv. Suaprifive as illustrated and described.

8,185

SPRAY CARNATION NAMED OPALE

Yvon Negre, Paris, France, assignor to Laboratoire de Physiologie Vegetale, Paris, France

Filed Nov. 12, 1991, Ser. No. 791,115

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—70.5 1 Claim

1. A new and distinct spray carnation plant substantially as herein shown and described, characterized by its recurrent and profuse production of large flowers which are light pink in color and by the petals which are round at the outer margin.

8,186

CARNATION NAMED NOBGIAC

Giacomo Nobbio, San Remo, Italy, assignor to Selecta Klemm KG, Hamfacker, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 733,212

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—73.1 1 Claim

1. The new and distinctive standard carnation substantially as herein shown and described, particularly characterized by its continuous and profuse production of medium sized Signal Red colored flowers borne on strong upright stems of a tall bush having normal branching, a fast growth rate and moderately abundant foliage.

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GRANTED Mar. 23, 1993

ERRATA

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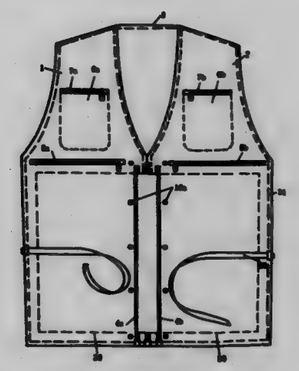
GRANTED MARCH 23, 1993

GENERAL AND MECHANICAL

5,195,187
POCKETED GARMENT
Chen Y. Yang, 11912 Riding Loop Ter., North Potomac, Md. 20878
Filed Jun. 13, 1991, Ser. No. 714,801
Claims priority, application China, Jul. 5, 1990, 90103437.1
Int. Cl.[5] A41D *1/04, 13/00*
U.S. Cl. 2—102 9 Claims



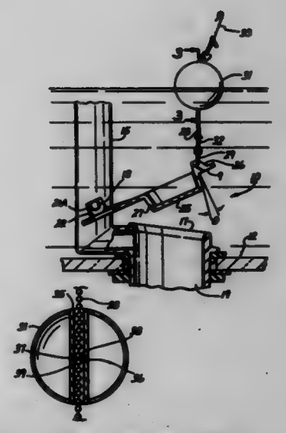
1. A pocketed garment comprising:
a) a pair of front pieces formed from an inner layer and an outer layer;
b) a back piece formed of an inner layer and an outer layer and said back piece interconnecting said front pieces;
c) said front pieces and said back piece having large capacity pockets formed between said outer and inner layers and said pieces including openings for said pockets;
d) said pocket of said back piece having at least one of said openings being an upper opening and at least one other of said openings being a lower opening;
e) means for dividing or partitioning said large capacity pocket of said back piece into smaller pockets accommodate smaller articles, said dividing or partitioning means being located between said upper and lower openings of said pocket of said back piece;
f) one of said front pieces being a left front piece, the other of said front pieces being a right front piece, each of said front pieces having a joint for attachment to each other;
g) each of said front piece pockets having a side opening adjacent to one of said joints of said front pieces;
h) covering means removably attachable to said front pieces to cover said joints and said side openings adjacent thereto; and
i) shoulder parts and fastening means therefor to effect assembly of said garb, said fastening means including means for being readily disjoined whereby said garb may be developed into a flat piece to facilitate insertion and removal of articles in and out of said pockets of said garb.

5,195,188
GOLFING GLOVE
Joël Bourdeau, Saint Jorioz, and Jacques J. Autier, Cran Gevrier, both of France, assignors to Salomon S. A., Chevanod, France
Filed Nov. 18, 1991, Ser. No. 793,519
Claims priority, application France, Nov. 16, 1990, 90 14551
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 A 16 Claims

1. Sports glove (1) comprising tightening and tension means comprising a slightly extensible or inextensible tightening strap (3) attached at a first end (31) on the dorsal metacarpal region (10) of said glove (1) and extending over a first length (32) buckle (4) forming one piece with said glove and arranged in an offset position in proximity to the region forming the edge area (11) of the glove, said tightening strap (3) extending from

said intermediate buckle (4) over a second length (33) along a second axis (Y, Y') and ending in a second end (34) movably attached, at least in part, to said dorsal metacarpal region (10) or to the wrist area (12) of said glove, wherein said first axis (X, X') and said second axis (Y, Y') are angularly offset by a positive angle (α).

5,195,189
WATER SAVING DEVICE AND METHOD OF USING SAME
Robert F. Gibb, San Diego, Calif., assignor to The Ambassat Group, Inc., San Diego, Calif.
Filed Aug. 6, 1991, Ser. No. 740,793
Int. Cl.[5] E03D *1/14*
U.S. Cl. 4—325 9 Claims



1. A toilet water saving device comprising:
a pliable hinged non buoyant flapper valve including a sealing surface having a frusto conical projection for registering said valve in relation to a toilet drain and for permitting said flapper valve to contact sealingly a toilet drain valve seat along a continuous line of engagement;
a chain connecting said flapper valve to a toilet control lever;
a ball float interposed on said chain between said lever and

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said flapper valve for holding said flapper valve in an opened position to allow a predetermined volume of water to flow through said drain, said float having a positive buoyancy slightly greater than the mass of said flapper valve; and

means for fixing frictionally said float at an adjusted position on said chain wherein said float includes an axially disposed round tube for disposition therethrough of said chain and said fixing means includes a pliant O-ring disposed within said tube for frictionally engaging said chain.

5,195,190
WATER CONSERVING TOILET TANK ADAPTER
Anh A. Nguyen-Huu, 20393 Kent Way, Los Gatos, Calif. 95030
Filed May 15, 1991, Ser. No. 700,630
Int. Cl.[5] E03D *1/34*
U.S. Cl. 4—378 15 Claims

1. A water conserving toilet tank outlet adapter, for use in conjunction with a tank outlet having a circular, generally upwardly arrayed opening into the tank, which opening mates with a valve component to selectively seal the opening, comprising:

outlet tubes means adapted to fit within the opening, and to effectively reduce the diameter thereof;

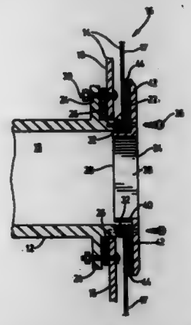
sealing means for providing an effective seal between the outlet tube means and the opening;

hollow extension means affixed to the outlet tube means for extending upward from the opening so as to effectively raise the level of the opening to an inlet situated near the top of the extensions means, the extension means including a sealing ring at said inlet for mating with the valve component is selectively sealed; and

swirl disk means interposed intermediate the outlet tube means and the extension means, said swirl disk means being in the form of a hollow annular portion, with the sealing means forming an exterior seal ring portion thereof and further including an interior constriction slope formed such that the interior diameter of said swirl disk means is greater at the interface between said swirl disk means and the extension means than at the interface between said swirl disk means and the outlet tube means.

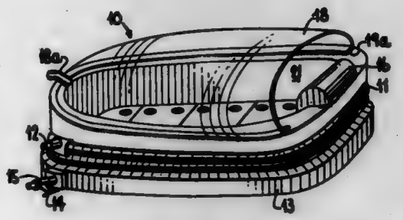
5,195,191
POOL SKIMMER MOUNT
Gunter Stefan, Unionville, and William Kindness, Etobicoke, both of Canada, assignors to Kafko International Inc., Mississauga, Canada
Filed Jul. 9, 1991, Ser. No. 727,212
Claims priority, application Canada, Jul. 16, 1990, 2021267
Int. Cl.[5] E04H *4/14*
U.S. Cl. 4—508 15 Claims

1. A pool skimmer mount for mounting a skimmer in an opening in a swimming pool wall having a metal outer wall portion and a flexible inner sheet liner; comprising: a housing having a forwardly disposed annular chamber end portion shaped to fit and project through the pool wall opening, the housing also having an outwardly projecting peripheral flange spaced from the chamber end portion, means for coupling the peripheral flange to the metal pool wall portion; a gasket



located on the chamber end portion and behind the inner sheet liner; an annular face plate having an outer flange covering the chamber end portion; and means for attaching the face plate to the chamber end portion to compress the pool liner against the gasket.

5,195,192
PORTABLE BATHING APPARATUS
Patria P. Garde, 1017 Rymill Rd., Cherry Hill, N.J. 08003
Filed Jul. 15, 1991, Ser. No. 731,193
Int. Cl.[5] A47K *3/06*; A61H *33/00*
U.S. Cl. 4—585 6 Claims

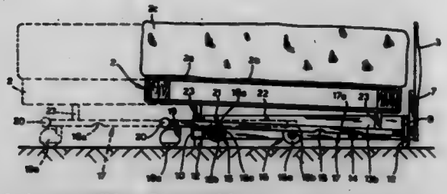


1. A portable bathing apparatus comprising a body length container having an inflatable wall which forms a shallow tub for holding water for bathing a person;

said wall having a valve for inflating said wall from a source of air and flexible means at its bottom for maintaining the shape of the bottom after deflation;

said container having a separable rigid bottom portion with an upwardly extending wall and a fluid egress means including a manual control valve for draining water from said container; and removable apertured means for cushioning said person resting on said bottom portion, wherein upon inflation of said inflatable wall a seal is formed with said wall of said rigid bottom portion.

5,195,193
SOFA WITH TRAVERSABLE SEAT SUPPORT FRAME FOR CONVERSION TO A SINGLE BED
Vico Magistretti, Milan, Italy, assignor to Flou S.p.A., Milan, Italy
Filed Mar. 24, 1992, Ser. No. 856,539
Claims priority, application Italy, Apr. 11, 1991, MI91 U 000318
Int. Cl.[5] A47C *17/13*
U.S. Cl. 5—18.1 5 Claims



1. A convertible sofa comprising:

a supporting frame having front and rear elongated sides and provided with a plurality of feet resting on a floor;

means forming a vertical rigid back and a pair of vertical rigid arms mounted on said frame; and

guide means on said frame for converting the sofa from a sitting position to a resting position corresponding to a bed, said guide means including:

two pairs of rectilinear guides mounted on said frame between said front and rear sides and spaced from one another, each of said pairs being operatively connected with said arms and including respective pair of spaced apart and parallel supports,

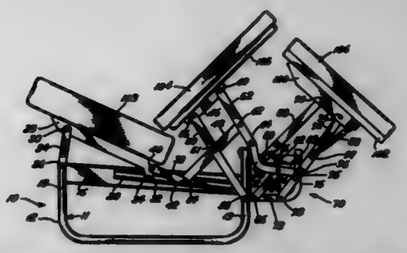
a respective plurality of spaced apart rollers mounted between each two supports of the respective pair of said guides and freely rotatable about respective axes extending parallel to said front side of said supporting frame, at least one roller of each of said pluralities being formed with a respective shaft flanked on opposite sides thereof with a pair of flanges each extending radially outwardly from the shaft,

a pair of bar members each slidably mounted on the respective plurality of rollers and having a respective front end, and

a transverse elongated bar bridging said front ends, said bar members and said transverse bar forming a displaceable frame for supporting a sofa seat slidable between a pull-in position corresponding to the sitting position and pull-out position corresponding to the resting position of the sofa, said transverse bar being provided with supporting wheels resting on the floor and with holding means for manually displacing said displaceable frame between said pull-in and pull-out positions.

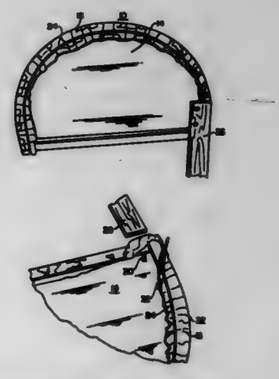
5,195,194
SEAT-BED EXTENDER
Thomas C. Bradley; John Shimkus; Fred J. Shrock, and Scott J. Shrock, all of Elkhart, Ind., assignors to Shrock Manufacturing, Inc., Elkhart, Ind.
Filed Jun. 26, 1992, Ser. No. 904,958
Int. Cl.[5] A47C *17/17*
U.S. Cl. 5—37.1 5 Claims

1. In combination an extender assembly and a seat-bed, said seat-bed comprising a base frame, a seat support, a back support, and first linkage means connected between said frame and seat and back supports for supporting the seat and back supports for movement between a seat position wherein said seat support is generally horizontal and the back support is generally vertical and a bed position wherein said seat and back supports are horizontal, said extender assembly comprising a platform support, second linkage means connected to said platform support for supporting the platform for movement between a generally vertical stored position and a horizontal use position, and third linkage means associated with said first and second linkage means for causing said platform to move from its stored position into its use position as said seat and



back supports move from their seat position into their bed position while allowing movement of the platform between its stored and use positions independently of said seat and back supports.

5,195,195
HEADBOARD
James J. Murray, 282 Century Way, Manalapan, N.J. 07726
Filed Oct. 5, 1992, Ser. No. 956,390
Int. Cl.[5] A47C *31/00*, *21/00*
U.S. Cl. 5—53.1 9 Claims



1. The combination for a bed comprising:

a headboard having front and back sides;

a groove provided along said back-side inwardly from its outer edge;

a fabric covering said front-side of said headboard and stretched taut around said outer edge and said groove to extend onto said back-side of said headboard;

a flexible tubing removably fit over said fabric and forcing said fabric into said groove;

and a pair of spaced apart legs removably secured to the back side of the headboard and overlapping at least a portion of said tubing, said legs having fastener means for removably securing the back-side of said headboard to the bed.

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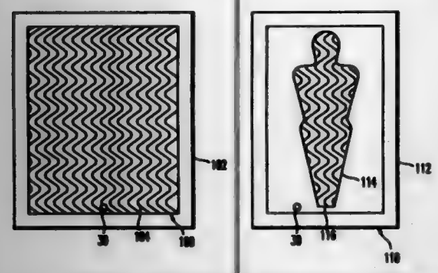
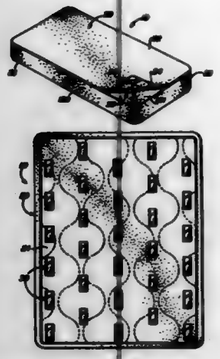
5,195,196
SCULPTURED, STRETCHABLE WATERBED MATTRESS WITH AESTHETIC APPEARANCE
John B. Johenning, Los Angeles, and Charles P. Hall, Santa Rosa, both of Calif., assignors to Land and Sky Manufacturing, Inc., Lincoln, Nebr.
Continuation of Ser. No. 810,861, Dec. 17, 1985, which is a continuation-in-part of Ser. No. 591,813, Mar. 19, 1984, Pat. No. 4,583,254. This application Jun. 24, 1991, Ser. No. 717,461
Int. Cl.[5] A47C 27/08
U.S. Cl. 5—451 29 Claims



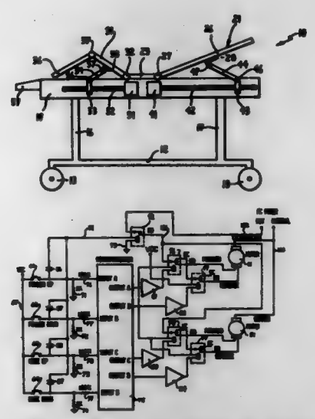
1. A waterbed mattress having a polymeric top wall providing a sleeping surface, a bottom wall, and side walls, and first and second portions of the top wall being more stretchable than the remainder of the top wall, the shape of each portion of increased stretchability conforming generally to the human anatomy with one portion of increased stretchability on each side of the mattress, the ratio of the surface area of each portion of increased stretchability when pulled taut to the surface area of that portion of increased stretchability when not pulled taut being at least 1.05, the portions of increased stretchability having a plurality of expandable folds formed therein so that the portions of increased stretchability stretch when a user lies on the mattress.

5,195,197
MATTRESS LINER WITH MAGNETS IN POCKETS
Hector Gutierrez, and Yamilo Gutierrez, both of P.O. Box 451004, Miami, Fla. 33245
Filed Sep. 28, 1992, Ser. No. 952,592
Int. Cl.[5] A47G 9/00, 9/04
U.S. Cl. 5—500 8 Claims



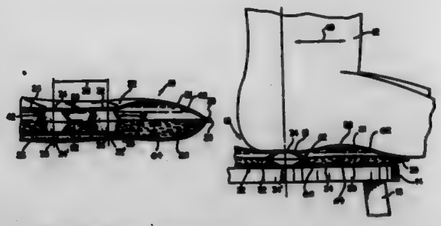
1. A mattress liner comprising:
a mattress pad, said pad including a top surface and a bottom surface, and being structured and disposed to substantially cover a mattress surface,
a plurality of substantially thin magnets, and
means to releasably secure said magnets to said bottom surface of said mattress pad in substantially spaced apart relation from one another, said means including a plurality of pockets disposed in spaced apart relation from one another along said bottom surface of said mattress pad, each of said pockets being structured and disposed to removably contain one of said magnets securely therein, said pockets including an outer material layer having outer edges, said material layer being stitched to said bottom surface of said mattress pad about a portion of the periphery thereof along said outer edges so as to form an interior holding cavity between said bottom surface of said mattress pad and said material layer, said holding cavity being structured and disposed to contain one of said magnets therein.

5,195,198
FAIL-SAFE BED MOTION CONTROL CIRCUIT HAVING A MICROPROCESSOR
Stephen C. Travis, Paw Paw Township, VanBuren County, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 821,351, Jan. 15, 1992, abandoned. This application Aug. 3, 1992, Ser. No. 925,229
Int. Cl.[5] A61G 7/018, 7/015
U.S. Cl. 5—618 14 Claims



1. An apparatus comprising: a hospital bed which includes a movably supported part, selectively actuable drive means for effecting movement of said part, a manually actuable control switch, and a control circuit operationally coupled to said switch and to said drive means, said circuit being adapted to prevent the movement by said drive means of said part unless an attendant manually actuates said control switch, wherein said control circuit includes a microprocessor having an input coupled to said control switch, said microprocessor having an output, and said microprocessor having means for selectively actuating said output thereof according to a function which includes the current state of a signal being applied to said input thereof by said control switch, and further means for actuating said drive means when said signal from said control switch and a signal from said output of said microprocessor are both actuated, and for deactuating said drive means when either of said signal from said control switch and said signal from said output of said microprocessor is deactuated, whereby upon a disfunction of the microprocessor, in the absence of an attendant manually actuating the control switch, the drive means is prevented from effecting the movement of said part.

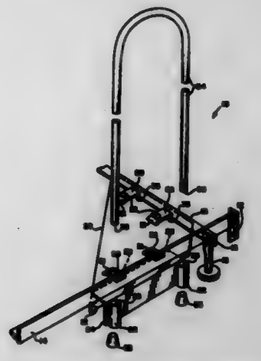
5,195,199
FLUID CUSHION
Joel L. Sereboff, 2215 Millridge Rd., Owings Mills, Md. 21117
Continuation-in-part of Ser. No. 725,512, Jul. 3, 1991, Pat. No. 5,113,540. This application May 18, 1992, Ser. No. 884,164
The portion of the term of this patent subsequent to May 19, 2009, has been disclaimed.
Int. Cl.[5] A47C 27/08; A61G 7/057
U.S. Cl. 5—654 21 Claims



1. A fluid cushion comprising:
(a) a fluid tight closed housing having an upper surface member, a lower surface member and an intermediate membrane member defining an internal fluid tight housing first chamber and an internal fluid tight housing second chamber, said first chamber having a first fluid medium contained therein and said second chamber having a second fluid medium contained therein, each of said upper and lower surfaces having at least two openings formed therethrough, said openings formed through said upper surface member being substantially vertically aligned with said openings formed through said lower surface member; and,
(b) tubular means secured to said upper surface member, said lower surface member and said intermediate membrane member in fluid tight relation, said tubular means defining at least a pair of vertically directed through openings having tubular sidewall members of varying cross-sectional diameter when taken with respect to a vertical direction wherein said tubular sidewall members define an apex diameter having a greater dimension than a diameter of said vertically directed through openings formed through said upper and lower surface members, said tubular means being adapted to interface with a user's ischial spines.

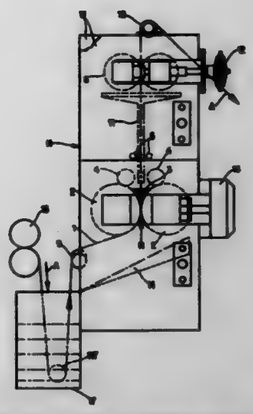
5,195,200
MANUAL SUPPORT APPARATUS ATTACHABLE TO A BEDFRAME
Thomas Loscutakos, 19 Lafayette St., Randolph, Mass. 02368
Filed Apr. 17, 1992, Ser. No. 869,956
Int. Cl.[5] A47C 21/00
U.S. Cl. 5—662 10 Claims

10. A manual support apparatus attachable to a bedframe comprising:
a planar plate member having outside edges;
a support tube having two legs;
two tubular members having internal bores for slidable receipt of said support tube;
a first means to attach said tubular members to said plate member; and



a second means to attach said plate member to said bedframe.

5,195,201
METHOD OF AND APPARATUS FOR PERMEATING TEXTILE MATERIALS WITH LIQUIDS
Waldemar Schlicht, Gütersloh, Fed. Rep. of Germany, assignor to Karl Mensel Maschinenfabrik GmbH & Co. KG., Bielefeld, Fed. Rep. of Germany
Filed Jun. 4, 1991, Ser. No. 710,287
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1990, 4023487
Int. Cl.[5] D06B 3/18
U.S. Cl. 8—151 20 Claims



1. A method of permeating a textile material with a liquid, comprising the steps of moving a web of textile material in a predetermined direction along a predetermined path inclining a first portion wherein the web moves from a lower level to a higher level and a second portion immediately preceding said first portion; squeezing the web in said second portion of said path; establishing and maintaining a liquid bath at said first portion of said path so that the web moves through and entrains liquid immediately following said squeezing step and while moving from said lower level to said higher level; expelling a portion of entrained liquid in a third portion of said path downstream of said first portion; and returning expelled liquid to said bath along a fourth portion of said path extending from

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the region of said bath towards said third portion of said path, the returning step including intercepting expelled liquid and guiding the intercepted liquid to said bath counter to said predetermined direction.

7. Apparatus for permeating a textile material with a liquid, comprising means for moving a web of textile material in a predetermined direction along a predetermined path inclining a first portion wherein the web is moved from a lower level to a higher level and a second portion immediately preceding said first portion; means for squeezing the web in the second portion of said path; a liquid bath-containing vessel surrounding said first portion of said path so that the web is contacted by liquid in said vessel while moving from said lower level to said higher level, immediately following squeezing in said second portion of said path and entrains some liquid from the bath; means for expelling a portion of entrained liqiud from the web in a third portion of said path downstream of said first portion; and means for returning expelled liquid to the bath, said returning means including a device between said expelling means and said bath for intercepting expelled liquid and guiding the intercepted liquid to the bath, and said device having a discharge end in the region of the bath and defining a fourth portion of said path in which expelled liquid travels counter to said predetermined direction.

5,195,202

METHOD FOR DYEING TEXTILES

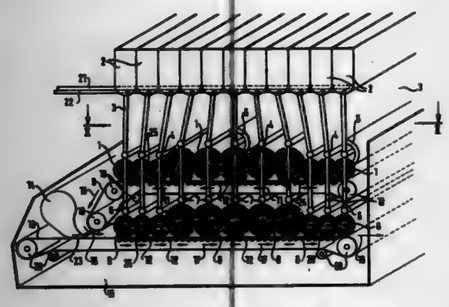
Hans-Jorg Hansen, Langenhagen, Fed. Rep. of Germany, assignor to Kekko-Mode, Langenhagen, Fed. Rep. of Germany

Filed Jun. 13, 1991, Ser. No. 713,378

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018835

Int. Cl.[5] D06B *1/12*

U.S. Cl. 8—150 7 Claims



1. A method for dyeing textiles comprising the simultaneous steps of:

exposing a surface of said textiles to bristles of a mechanically driven brush, said bristles process said surface inducing wear and softening the fabric; and

said bristles depositing a dye liquor with a diluted dye on said surface.

5,195,203

PROCESS FOR DOSING DETERGENT COMPOSITION

Johannes J. Blom, Nieuwerkerk a/d IJssel, and Marcellus G. Dunnnse, Maarssen, both of Netherlands, assignors to Lever Industrial Company, division of Indopco, Inc., Bridgewater, N.J.

Filed Sep. 16, 1991, Ser. No. 760,624

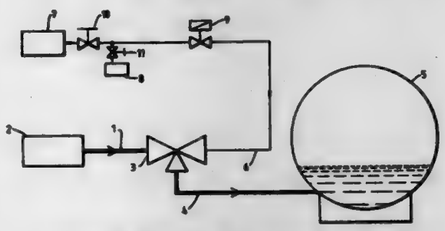
Claims priority, application United Kingdom, Sep. 18, 1990, 9020360

Int. Cl.[5] D06F *39/02;* A47L *15.44*

U.S. Cl. 8—158 5 Claims

1. A process for dosing detergent compositions which are rendered in the form of paste or gels upon contact with water comprising:

(a) transporting a detergent composition which is rendered in the form of paste or gel upon contact with water from



a container for holding the detergent composition to a washing machine via a conduit; and

(b) purging the conduit by means of a pressurized gas to clean the conduit while preventing blockages by the detergent composition.

5,195,204

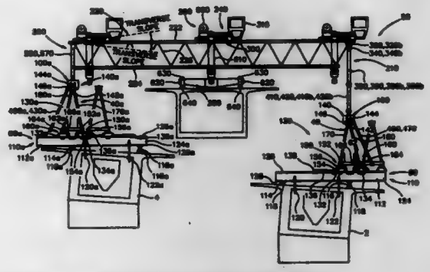
CONSTRUCTION EQUIPMENT AND METHOD FOR PRECAST SEGMENTAL BRIDGES

Jean Muller, Suresnes, France, and Gerard Sauvageot, Poway, Calif., assignors to J. Muller International, San Diego, Calif.

Continuation of Ser. No. 558,828, Jul. 27, 1990. This application May 8, 1992, Ser. No. 880,579

Int. Cl.[5] E01D *15/12, 1/00*

U.S. Cl. 14—4.0 39 Claims



1. A bridge construction system comprising:

a first independent longitudinal truss positioned over a first bridge span;

a second independent longitudinal truss positioned over a second bridge span;

a gantry movably mounted on said trusses, said gantry having a first leg mounted to said first truss and a second leg mounted to said second truss, said gantry being drivable along said first and second trusses;

gantry drive means for controllably driving said gantry along said trusses;

a transverse trolley movably mounted on said gantry, said trolley being drivable along said gantry in a direction generally transverse to said longitudinal trusses, said trolley including winching means for lifting and carrying bridge components to be positioned along said bridge spans, and said trolley being selectively positionable over each of said bridge spans;

connection means for mounting said longitudinal trusses to bridge components disposed along said bridge spans; and

said gantry including first compensation means for adapting said gantry to changes in longitudinal truss vertical spacing, second compensation means for adapting said gantry to changes in longitudinal truss grade and third compensation means for adapting said gantry to changes in longitudinal truss horizontal spacing.

22. A method for constructing a multi-span pre-cast segmental bridge having a plurality of piers and at least two decks formed by joining a series of precast segments across the spans extending between successive piers, the method comprising the steps of:

arranging a first longitudinal truss over a first bridge span so as to be mounted at one truss end to the end of a first completed section of bridge or roadway, at one end of a first bridge span, and so as to be mounted on the next adjacent bridge pier at the other end of the first bridge span;

arranging a second longitudinal truss over a second bridge span so as to be mounted at one truss end to the end of a second completed section of bridge or roadway at one end of a second bridge span, and so as to be mounted on the next adjacent bridge pier at the other end of the second bridge span;

rollably mounting on said first and second longitudinal trusses a rolling gantry, said rolling gantry extending transversely between said longitudinal trusses and having a transversely moveable lifting trolley mounted thereon, said rolling gantry further including first compensation means for adapting said rolling gantry to changes in longitudinal truss vertical spacing, second compensation means for adapting said rolling gantry to changes in longitudinal truss grade and third compensation means for adapting said rolling gantry to changes in longitudinal truss horizontal spacing; and

controllably driving said rolling gantry and said lifting trolley to fetch precast bridge segments from a source area and deliver said bridge segments for successive placement and attachment to said first and second bridge piers and bridge components previously attached thereto.

5,195,205

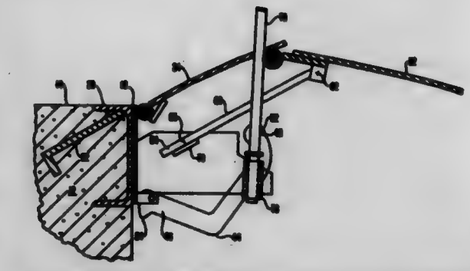
DOCK LEVELER OPERATING APPARATUS

Bobby A. Cook, Malvern, Ark., assignor to Dock Leveler Manufacturing, Inc., Malvern, Ark.

Filed Jan. 25, 1991, Ser. No. 645,689

Int. Cl.[5] E01D *1/00*

U.S. Cl. 14—71.1 21 Claims



1. A dock leveler for bridging a gap between a loading dock and a carrier bed, comprising:

a base plate to be attached to the loading dock;

a center plate having a first and second opposite edges, said first edge pivotally connected to the base plate for pivotal movement in rearward and forward directions between a rearward position and a forward position;

a lip plate having first and second opposite edges, the first edge of the lip plate pivotally connected to the second edge of the center plate for pivotal movement between a retracted position, a stored position, and a bridging position in which the lip plate is substantially coplanar with and forms an extension of the center plate;

center plate pivoting means pivotally connected to the base plate for pivoting the center plate from the forward position to the rearward position; and

lip extension means for pivoting the lip plate toward the bridging position as the center plate pivots forward from the rearward position;

wherein the center plate pivoting means includes a linkage having a first and second end, said first end being pivotally connected to the base plate, said second end having means for selectively moving along the center plate in engagement therewith in a region between the first and second opposite edges of the center plate as the center plate is pivoted from the forward position to the rearward position.

5,195,206

WINDSHIELD CLEANING SYSTEM, ESPECIALLY FOR MOTOR VEHICLES

Kurt Bauer, Ingersheim; Eckhardt Schmid, Bruchsal-Heidelsheim, and Bernd Walther, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto Electric GmbH, Bietigheim Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP90/00348, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/10562, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 2, 1990, Ser. No. 623,375

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 3907962

Int. Cl.[5] B60S *1/46*

U.S. Cl. 15—250.01 11 Claims

1. A windshield cleaning system comprising a shaft rotatably mounted in a bearing bush for driving a wiper arm-and-blade assembly, said shaft supporting an axial washing liquid pipe, whereby one end of the pipe communicates with a fluid dispensing nozzle and a second end of the pipe on a driven end of the shaft, axially projects into a rotationally fixed cup-like connecting piece communicating with a washing liquid supply tube, wherein the connecting piece is substantially centered with respect to the second end of the washing liquid pipe for limited radial displacement therewith, wherein the second end of the washing liquid pipe penetrates a bore of a lid closing a gear housing and the connecting piece is carried on an outer side of the lid, opposite the gear housing, and extends away from the lid, and wherein a holding plate is carried on an inner side of the lid, toward the gear housing, which holding plate comprises fastening means penetrating the lid and onto which fastening means the connecting piece is fixed.

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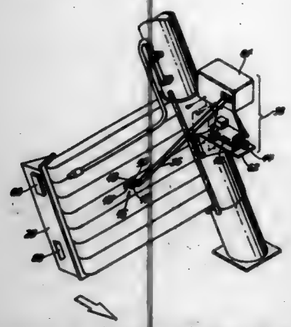
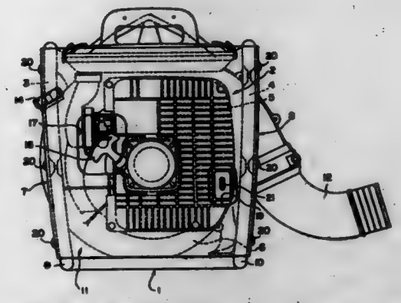
5,195,207
NON-CONTACTING AUTOMOTIVE DRYER SENSOR
Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455, and Alvin S. Raby, 3681 Hawthorne, Clarkston, Mich. 48348
Filed Nov. 14, 1991, Ser. No. 792,174
Int. Cl.[5] B60S *3/06*; F26B *19/00*
U.S. Cl. 15—316.1 19 Claims



1. An apparatus for stripping fluid from the surface of an object as the object is conveyed relative to the apparatus along a path comprising:
an air distributor (14);
at least one air directing member (18) having first and second ends, said first end is supported by said air distributor (14) about the path of the surface for receiving air under pressure from said air distributor, said second end including a nozzle (26) for directing the air toward the surface to strip fluid from the surface;
actuator means (34) connected between said distributor (14) and said air directing member (18) for moving said air directing member (18) toward and away from the surface;
control means (40) operatively connected to said actuator means (34) for receiving a control signal to control movement of said actuator means (34);
sensor means (66) connected to said second end of said air directing member (18) for sensing the distance to the surface from said second end;
said sensor means (66) including housing means (72, 74) connected to said air directing member (18) and having a sensor face (76, 78) with spaced apart transmission aperture (80, 81) and receiver apparatus (82, 83) therethrough for allowing transmissions and receptions of sonic signals, said sensor face (76, 78) including a plurality of barriers (84, 85) extending from said sensor face (76, 78) for blocking transmissions from direct reception at said receiver aperture (82, 83).

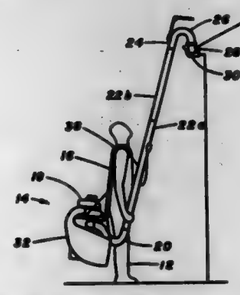
5,195,208
BACKPACK POWER BLOWER APPARATUS
Hirofumi Yamani, Akishima; Yoshinobu Hashimoto; Giichi Iida, both of Tokyo, and Shunsuke Nakadate, Hamura, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Dec. 13, 1991, Ser. No. 806,181
Claims priority, application Japan, Dec. 19, 1990, 2-408971[U]
Int. Cl.[5] A47L *9/00*
U.S. Cl. 15—326 3 Claims

1. A back power blower apparatus comprising:
a frame for carrying an engine, a blower and associated parts, said frame including a front portion to be carried on the back of an operator;
sound insulating means for reducing noises produced by the engine and the blower,
said sound insulating means having a flexible sheet including opposite side portions extending rearwardly from said front portion of the frame, and a rear portion extending between said opposite side portions whereby said sound insulating means surrounds a machine body, including the



engine and the blower, at least at the opposite sides and the rear side of the machine body.

5,195,209
GUTTER CLEANING SYSTEM
Richard L. Watkins, 13250 W. Watson Rd., St. Louis, Mo. 63127
Filed Aug. 15, 1991, Ser. No. 745,534
Int. Cl.[5] A47L *9/02*
U.S. Cl. 15—339 2 Claims

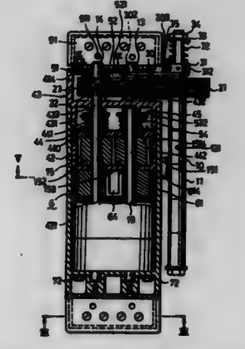


1. In a gutter and roof valley cleaning system, the combination of (a) a canister type vacuum cleaner having a hose with one end removably connected to the canister for drawing debris therein, a rigid tubular hose extension removably connected to the hose at its other end enabling an operator to reach the gutter from the ground level, and a nozzle for said tubular extension with one end fitting on the tubular extension and its other end adapted to be inserted into the gutter to contact debris therein; with (b) optical means conveying to the operator an image of the gutter or roof valley adjacent the nozzle end within the gutter or roof valley, the optical means including a fiber optic lens adjacent the nozzle, and a fiber optic bundle conveying to the operator the image of the area adjacent the nozzle.

5,195,210
HYDRAULIC DOOR HINGE
Simpson Lee, No. 11, Lane 184, Chung-Hsiao Rd., Pingtung, Taiwan
Filed Jun. 19, 1992, Ser. No. 901,848
Int. Cl.[5] E05F *3/20*; E05D *7/00*
U.S. Cl. 16—54 13 Claims

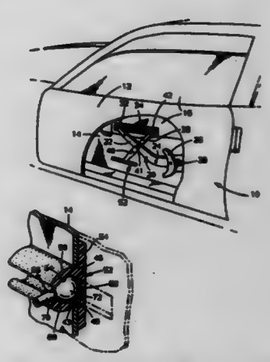
1. A hydraulic door hinge, comprising:
a hinge pin;
a stationary hinge leaf fixed to said hinge pin and adapted to be fixed to a door frame;

a rotatable hinge leaf rotatably mounted to said hinge pin and adapted to be fixed to a door;
a torsion spring assembly mounted on said hinge pin and being wound when the door is moved from a closed position to an open position relative to the door frame so as to provide a force for automatically returning the door back to the closed position;
a transmission unit including: a static gear mounted axially and being stationary relative to said hinge pin; a first gear means meshing with said static gear and rotating in a first direction relative to said static gear when the door moves toward the open position and in a second direction when the door moves toward the closed position; and a second gear means meshing with said first gear means and rotating in a direction opposite to said first gear means; and
a hydraulic retarding device including: a cylinder body which confines a fluid operating space to receive hydraulic fluid therein, said fluid operating space including first and second longitudinally extending cylindrical spaces and an intermediate longitudinal passage provided between and communicating said cylindrical spaces; a first gear axle extending axially into said first cylindrical space and rotating with said second gear means; a second gear axle extending axially into said second cylindrical space; a third gear means provided on and rotating with said first gear axle; a fourth gear means provided on said second



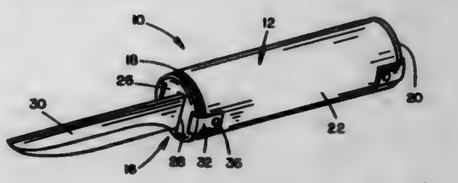
gear axle and meshing with said third gear means so as to rotate said second gear axle in a direction opposite to said first gear axle; a pair of vane units, each of said vane units being provided in a respective one of said cylindrical spaces and having a tubular portion which engages and which rotates with a respective one of said first and second gear axles, each of said vane units further having a blade which extends radially outward from the respective one of said first and second gear axles and which defines a longitudinal clearance with an inner surface of said cylinder body; a pair of baffles which extend longitudinally into a respective one of said first and second cylindrical spaces, each of said baffles being disposed between said passage and a respective one of said vane units, said baffles being substantially arc-shaped in cross-section and facing away from each other; and a gate valve means provided in said passage between said baffles;
rotation of said first gear means in the first direction causing said vane units to direct said hydraulic fluid towards one side of said gate valve means to open said gate valve means and permit said hydraulic fluid to flow through said passage when the door moves toward the open position;
rotation of said first gear means in the second direction causing said vane units to direct said hydraulic fluid towards the other side of said gate valve means to close said gate valve means, thereby preventing said hydraulic fluid from flowing through said passage and permitting said hydraulic fluid to flow only through said clearance between said vane units and the inner surface of said cylinder body in order to retard the movement of said vane units when the door moves toward the closed position.

5,195,211
GUIDE CHANNEL PIVOT FOR WINDOW REGULATOR
Gary W. Krajenke, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 13, 1992, Ser. No. 820,162
Int. Cl.[5] E05D *15/16*
U.S. Cl. 16—95 R 2 Claims



1. A device for slidably and pivotally connecting a window regulator arm to a door inner panel comprising:
a slot provided in the door inner panel and defined by spaced apart walls of the door inner panel and extending along the path of desired sliding movement of the window regulator arm;
a molded plastic slide channel having a base engaging against the door inner panel and a pair of spaced apart channel walls projecting from the base and through the slot of the door inner panel in snap fitting relationship therewith to retain the slide channel on the door inner panel, said spaced apart channel walls cooperating to define a guide slot therebetween, and
a slide member carried by the window regulator arm and slidably engaging the guide slot to enable pivoting and sliding of the regulator arm along the door inner panel.

5,195,212
TOOL HANDLE COVER
Lori A. Colwell, 304 N. 12th, Apt. 4, Norfolk, Nebr. 68701
Filed Oct. 23, 1991, Ser. No. 781,400
Int. Cl.[5] B65G *7/12*
U.S. Cl. 16—114 R 2 Claims



1. A cover for the handle of a tool, comprising:
a sheet of resilient cushioning material; and means for removably fastening the sheet to the handle of a tool; said sheet being generally rectangular with first and second opposing parallel edges, first and second opposing parallel

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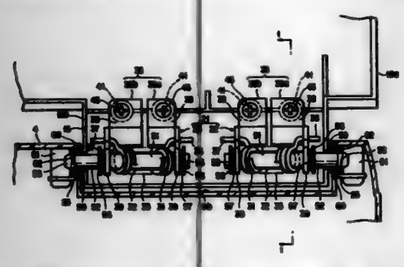
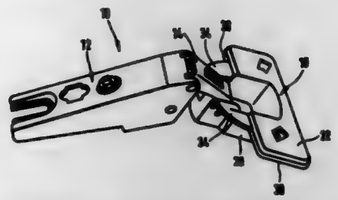
side edges, a front surface and a back surface; and said means for fastening the sheet to a handle including
one-half of cooperable fastener means mounted on the front face of said sheet adjacent the first edge, and a second half of the cooperable fastener mounted on the back surface of the sheet adjacent the second edge, such that said first and second halves will cooperably fasten when said sheet is wrapped around the handle with the first edge overlapping the second edge;
a first slot formed in the first edge extending towards the second edge; and
a second slot in the second edge opposite the first slot;
said slots juxtaposed to form an opening through said sheet when wrapped around the handle of a tool.

5,195,213
HINGE DEVICE FOR COUPLING ROTATABLE MEMBER TO ANOTHER MEMBER
Keizo Ohgami, and Takashi Hasei, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 29, 1991, Ser. No. 798,915
Claims priority, application Japan, Nov. 29, 1990, 2-333042
Int. Cl.[5] E05C *17/64*; E05D *11/10, 5/10*
U.S. Cl. 16—342 13 Claims



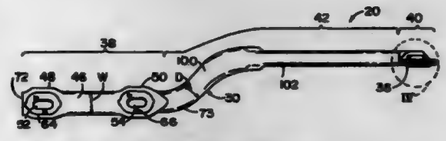
1. A hinge device for coupling a first member and a second member which are rotatable relative to each other, said hinge device comprising:
a shaft comprising a main portion having a cross section having a short diameter and a long diameter, and two end portions extending from the ends of the main portion, respectively;
a coil spring wound around the main portion of said shaft and comprising a coiled portion formed of a plurality of turns contacting one another, and two arms extending from the ends of the coiled portion, each of said turns extending at a predetermined pitch angle to a line which extends at right angles to the axis of said shaft so that each turn looks elliptical when viewed in the axial direction and has a short diameter greater than that of the main portion of said shaft, and a long diameter substantially equal to that of the main portion of said shaft;
a bracket rotatable relative to said shaft, comprising two connecting portions secured to one of said first and second members, two bearing portions supporting the end portions of said shaft, respectively, and two coil-holding means holding the two arms of the said coil spring, respectively; and
a shaft holder secured to one of said first and second members, coupled to one of the end portions of said shaft, and preventing said shaft from rotating freely.

5,195,214
HINGE HOUSING
Horst Lautenschläger, and Reinhard Lautenschläger, both of Reinheim, Fed. Rep. of Germany, assignors to Karl Lautenschlager GmbH & Co. KG, Reinheim, Fed. Rep. of Germany
Filed Aug. 26, 1991, Ser. No. 749,969
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1990, 4037752
Int. Cl.[5] E05D *5/00*
U.S. Cl. 16—382 19 Claims



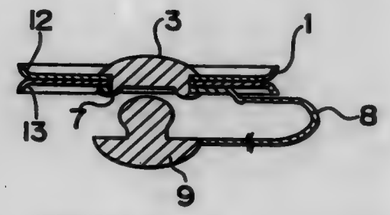
1. Hinge housing in the form of a push-in or hammer-in cup which can be sunk in a mortise in the back of the door of a piece of furniture and which has a cup portion made of metal from whose upper margin a mounting flange projects integrally in the position properly mounted on a door and overlaps areas of the inside surface of the door adjoining the mortise in the door, and whose margin is curved toward the inside surface of the door so that in the mounting flange there is formed a shallow recess opening to the inside surface of the door, and having a fastening member of plastic disposed between the mounting flange and the door, which can be releasably joined to the mounting flange and the door, a locking device for the releasably joining of the fastening member and the mounting flange comprises cooperating locking elements which can be set in locking engagement and out of locking engagement in the manner of a bayonet lock by rotating the cup portion relative to the fastening member over a given angle about an axis of rotation at right angles to the inside surface of the door, wherein said fastening member is designed as a socket plate merely in contact with and secured to the inside surface of the door without engaging into the door-mortise, the locking elements of said locking device being provided at the mounting flange and the socket plate respectively.

5,195,215
HINGE ARM
James Kiefer, Grand Rapids, Mich., assignor to RAN Enterprises, Inc., Grand Rapids, Mich.
Filed Aug. 13, 1991, Ser. No. 744,523
Int. Cl.[5] E05D *5/02, 11/00*; B62D *25/10*
U.S. Cl. 16—387 35 Claims



1. A hinge arm for a vehicle comprising:
a rigid elongate tubular member formed into a three-dimensional shape having first, second and third portions;
said first portion including attachment means integrally formed form said tubular member for attaching a panel thereto, said attachment means including a flattened side having an outer surface useful as a support surface for said panel and an inner surface useful for supporting the head of a fastener, and also including first apertures located in said flattened side and adapted to receive fasteners to attach said panel to said first portion, said first portion further including an opposite side opposite said flattened side, said opposite side including second apertures aligned with said first apertures and adapted to allow said fasteners to be positioned in said first apertures and against said inner surface of said flattened side;
said second portion including a pivot means for pivotally attaching said hinge arm to said vehicle, said pivot means including a transverse hole establishing an axis of rotation so as to pivot said panel between open and closed positions on said vehicle; and
said third portion rigidly interconnecting said first and second portions so that said panel moves in a defined arc between said open and closed positions, said third portion having a three dimensional longitudinal shape with sufficient lateral strength along with said first and second portions to prevent said panel from unstably swaying laterally damagingly into adjacent parts on the vehicle as said panel is moved to said closed position, said three-dimensional longitudinal shape being bent in a manner so as to avoid interferences on said vehicle during movement between said open and closed positions and so as to provide rigid interconnection of said panel to said vehicle.

5,195,216
HOOKING CLASP FOR A CORD-LIKE THING
Shono Ishii, Kobe, Japan, assignor to Yoko Kuramatsu, Kobe, Japan
Filed Nov. 14, 1991, Ser. No. 791,538
Claims priority, application Japan, Nov. 30, 1990, 2-341258
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—18 5 Claims

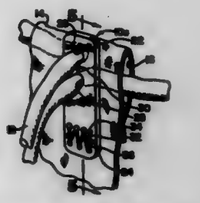


1. A hooking clasp comprising:
a pair of resilient plate each one of said pair of resilient plate members includes a substantially planar mating surface;
means for coupling said pair of plate members together at a central portion of each one of said pair of plate members, whereby the substantially planar mating surfaces of said pair of plate members are in surface contact;
a snap member connected to one of said pair of plate members by a connecting piece; and
a male snap member connected to an opposing end of the connecting piece, wherein said means for coupling is a female snap member for receiving the male snap member therein.

5,195,217
LOAD-ADJUSTABLE BREAKABLE SAFETY DEVICE
Sven Arntzen, 8090 Atlantic Blvd., E–87, Jacksonville, Fla. 32211
Continuation of Ser. No. 650,433, Feb. 4, 1991, abandoned. This application Jun. 15, 1992, Ser. No. 899,006
Claims priority, application Norway, Mar. 16, 1990, 901245
Int. Cl.[5] F16G *11/00*
U.S. Cl. 24—115 F 5 Claims

1. A load adjustable breakable device comprising a body having a plurality of securing sections to be engaged by securing means and a plurality of zones of weakness of lesser breaking strength than said securing sections for breaking when a predetermined force is exerted thereacross wherein the body comprises at least three apertured securing sections divided by and spaced from intermediate zones of weakness, and wherein the zones of weakness have successively decreasing breaking strengths in downstream adjacent zones of weakness separated by said spaced, apertured securing sections wherein independent securing means are adapted to engage the securing section adjacent the zone of weakness corresponding to a desired load capacity on the downstream side thereof and any securing section on the upstream side of the zone of weakness corresponding to the desired load capacity.

5,195,218
FLEXIBLE CORD LOCK DEVICE
Mark Joseph, Aspen, Colo., and Kurt H. Landstadt, Long Grove, Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Dec. 9, 1991, Ser. No. 804,872
Int. Cl.[5] F16G *11/00*
U.S. Cl. 24—129 R 25 Claims



1. A cord lock device for binding a cord, comprising:
a substantially flexible, planar cord lock member having a predetermined width, length, and thickness, first and second longitudinal ends, and longitudinally extending sides connecting said first and second longitudinal ends;
first aperture means defined within said substantially flexible, planar cord lock member for permitting a cord to extend therethrough; and
second longitudinally extending aperture means connected to said first aperture means and including longitudinally extending side edge portions extending longitudinally between said longitudinally extending sides of said substantially flexible, planar cord lock member so as to define along with said first aperture means a releasable locking means for lockingly engaging said cord extending through said first aperture means as a result of said longitudinally extending side edge portions of said second aperture means being disposed in a contracted state when said substantially flexible, planar cord lock member is disposed in a first, normal, non-compressed state, and for releasing said cord extending through said first aperture means as a result of said longitudinally extending side portions of said second aperture means being disposed in an expanded state wherein said longitudinally extending side edge portions of said second aperture means protrude outwardly from the plane of said substantially flexible, planar cord lock member in a predetermined selective direction, when said substantially flexible, planar cord lock member is disposed in a second compressed state as a result of being laterally compressed transversely with respect to said longitudinally extending sides thereof, so as to permit said cord to be selectively tightened or loosened.

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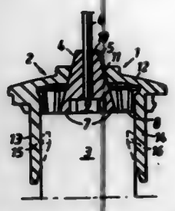
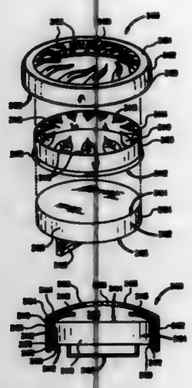
5,195,219
CORD CLAMP FOR A LAMPHOLDER
Göran Hartig, Gislaved, Sweden, assignor to Artilux AB, Anderstorp, Sweden
Filed Apr. 2, 1991, Ser. No. 679,648
Claims priority, application Sweden, Apr. 3, 1990, 9001229
Int. Cl.[5] H01R *13/58*
U.S. Cl. 24—136 R 4 Claims



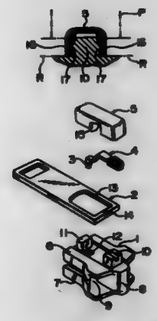
1. A cord clamp for securing a cord of a lampholder, said clamp comprising:
(a) first and second tongue elements movable towards and away from each other, said tongue elements having inner surfaces and tapered outer surfaces; and
(b) a clamping keeper means comprising:
(i) a disc-shaped top member having a centrally disposed opening which, when forced over the tapered outer surfaces of said first and second tongue elements, urges said tongue elements towards each other, such that the inner surfaces of said tongue elements securely grip the cord of said lampholder when said cord is disposed therebetween; and
(ii) at least two hooked snap tongues extending from said disc-shaped top member, said snap tongues being adapted to engage corresponding locking grooves on the lampholder to securely fasten said clamping keeper means over said first and second tongue elements.

5,195,220
DECORATIVE AND AESTHETIC MULTI-PART BUCKLE FOR BELTS AND THE LIKE AND THE FABRICATION THEREOF
Michael Herman, Huntington, N.Y., assignor to Herman Pearl Button Co., Inc., New York, N.Y.
Continuation-in-part of Ser. No. 805,321, Dec. 10, 1991. This application Feb. 28, 1992, Ser. No. 847,760
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—163 R 37 Claims



1. A buckle assembly comprising:
(a) buckle base means including attaching means for securing said buckle base means to a belt, strap, sash or the like; and
(b) buckle cap means for co-action with and mounting to said buckle base means; and
(c) said buckle base means and said buckle cap means together carrying said securing means for non-removably securing said buckle base means and buckle cap means together into a buckle assembly, said securing means including complimentary snapping securing elements which readily snap together to thereby permanently secure said buckle base means and buckle cap means together and which prevent separation of said buckle base means and said buckle cap means.

5,195,221
SLIDER WITH YOKE FOR SLIDE FASTENER AND ITS JOINING METHOD
Hisanobu Kanamaru, Ibaraki; Nobuhiro Ichikawa, Toyama; Hiroshi Yoshida, Toyama, and Koichi Koyaki, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan
Filed Apr. 21, 1992, Ser. No. 871,730
Claims priority, application Japan, Apr. 27, 1991, 3-125064; Oct. 25, 1991, 3-306998
Int. Cl.[5] A44B *19/00*
U.S. Cl. 24—429 7 Claims

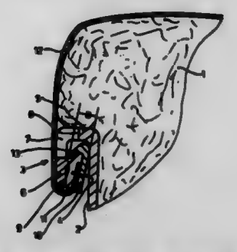


1. A slider for a slide fastener comprising:
a yoke joined to a supporting face of a slider body;
front and rear support posts being protruded upright from said slider body; and
either one of said yoke or said support posts being provided with locking grooves on the contact face;
wherein said yoke covers said support posts and is forcibly contacted with the side faces of said support posts; and
wherein the material of the other is plastic-deformed by a forging process caused by said forcible contact, and flows into said locking grooves by plastic flow to form a bulged portion in said each locking groove.

5,195,222
FASTENING BETWEEN AN UPHOLSTERY COVER AND A SUPPORT RECEIVING THE UPHOLSTERY
Manfred Rink, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 30, 1989, Ser. No. 443,778
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841531
Int. Cl.[5] A47C *31/02*
U.S. Cl. 24—587 1 Claim

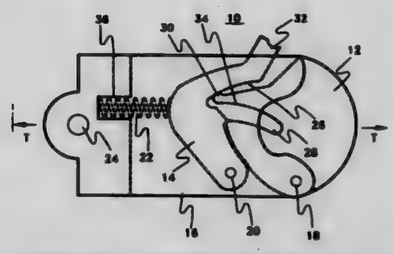
1. A fastening connection between a cover for an upholstery and a support for said upholstery wherein said support is made by injection molding from a thermoplastic molding composition said connection comprising
(1) an elastic strip attached to an edge of said cover, said strip having a hook shaped profile, and

(2) a U-shaped edge of said support, said U-shaped edge having a central web, an inner limb and an outer limb, wherein said outer limb of said U-shaped edge includes a plurality of recesses and a plurality of projections, said



projections extending towards said inner limb, said hook engaging said projections, said recesses extending into said central web at least as far as said projections extend towards said inner limb.

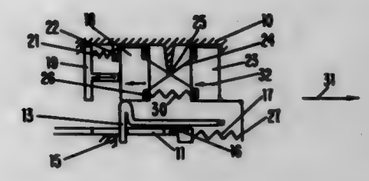
5,195,223
QUICK RELEASE APPARATUS
Timothy T. Tylaska, 138 N. Stonington Rd., Mystic, Conn. 06355
Filed Jun. 19, 1991, Ser. No. 717,387
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—602 14 Claims



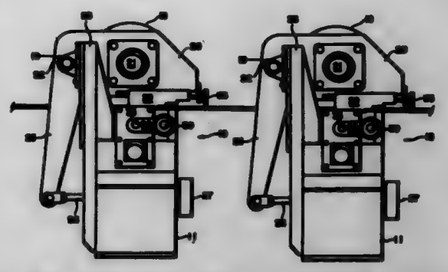
1. A quick release mechanism for releasing two members under tension comprising:
a housing having a releasable point of attachment for one said member;
means for latching having a point of attachment for the other said member, with said means pivotally attached to said housing;
means for releasing said means for latching, with said means for releasing pivotally attached to said housing, said means for releasing having a cam contact surface for engaging said means for latching, said contact surface dimensioned to provide a releasing force that is essentially constant despite the tension between said two members.

5,195,224
SHOCK-PROOF SAFETY BELT BUCKLE
Andreas Beck, Pinneberg; Alfred Lienedorf, Norderstedt, and Peter Eckmann, Hamburg, all of Fed. Rep. of Germany, assignors to Autoflug GmbH & Co. Fahrzeugtechnik, Rellingen, Fed. Rep. of Germany
Filed Apr. 3, 1992, Ser. No. 874,798
Int. Cl.[5] A44B *11/26*
U.S. Cl. 24—641 21 Claims

1. A safety belt buckle, comprising:
a housing comprising: an insertion path, a spring-loaded ejector connected to said spring housing within said insertion path, and comprising a recess communicating with said insertion path;
an insertion tongue having a cutout and insertable into said insertion path;
a latch connected inside said housing for locking said insertion tongue by engaging said cutout and said recess of said housing in a locking position of said latch;
a spring-loaded slide key, slidably connected to said housing and slidable in a direction transverse to a plane of movement of said latch for releasing said latch;
a compensation mass member displaceably arranged within said housing for compensating acceleration forces acting on said safety belt buckle in two directions;
a securing element displaceably arranged within said housing such that said securing element secures said latch in said locking position and is movable into a release position by said slide key for releasing said latch; and
a connecting rod arrangement with a scissor-type movement, said connecting rod arrangement comprising two connecting rods and a journal means, said connecting rods being pivotably connected to said journal means and said journal means being connected to said housing, said connecting rod arrangement being further connected to said compensation mass member and said securing element such that said compensation mass member and said securing element move in opposite directions relative to one another.



5,195,225
MEANS AND METHOD FOR EXTRACTING MOISTURE FROM A TRAVELING WEB OF TEXTILE MATERIAL
Dieter F. Zoffer, Iron Station, N.C., and John S. Sasallo, Ringgold, Ga., assignors to Gaston County Dyeing Machine Co., Stanley, N.C.
Continuation-in-part of Ser. No. 558,669, Jul. 27, 1990, Pat. No. 5,063,646. This application Nov. 12, 1991, Ser. No. 789,924
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] D06B *1/00*; D06F *35/00*
U.S. Cl. 28—167 9 Claims



1. Means for extracting moisture from a traveling web of textile material containing high-moisture content processing fluid, comprising fluid applicator means extending transversely across the path of the traveling web, said fluid applicator means having a fluid distribution manifold extending transversely of one side of the web path and having opening means

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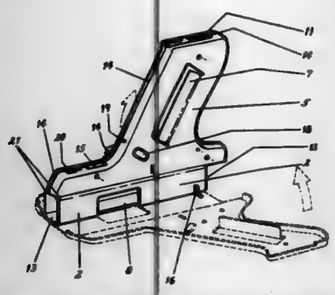
facing the traveling web and communicating between the interior of said manifold and the traveling web for application therethrough of low-moisture content fluid from the manifold into the traveling web to displace high-moisture content processing fluid from the traveling web, and flow restricting means extending across the path of the traveling web and facing the other side of the web in opposition to said fluid application means closely downstream from said opening means for confining low-moisture content fluid flow from said applicator means into and through the traveling web, thereby causing displacement of high-moisture content fluid from the traveling web with low-moisture content fluid, said flow restricting means and said applicator means defining a web passage spacing therebetween less than the free standing thickness of the traveling web, said applicator means being disposed below the traveling web and said flow restricting means being disposed above the traveling web and comprising a member at least partially supported on said traveling web to apply pressure therethrough against said applicator means to compress the traveling web, said applicator means including a plurality of applicators arranged in series for extraction and wet-on-wet finish applications.

5,195,226

SEMI AUTOMATIC PISTOL

José C. M. Bornancini, Porto Alegre, Brazil, assignor to Forjas Taurus S/A, Rio Grande Do Sul, Brazil

Filed Aug. 11, 1989, Ser. No. 392,607
Claims priority, application Brazil, Nov. 3, 1988, PI 8805801
Int. Cl.[5] B23P *13/00*
U.S. Cl. 29—1.1 6 Claims



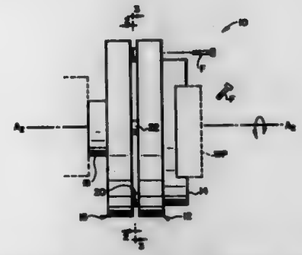
1. A process for manufacturing a semi-automatic pistol with a monocoque frame, comprising the steps of:
cutting a profiled portion from a plane metal sheet;
stamping said profiled portion, thereby forming a stamped edge contour along an outer periphery of said profiled portion, and thereby cutting several slots into said profiled portion, wherein said stamped edge contour includes lip portions extending away from the plane of said profiled portion for selected portions of said profiled portion;
folding said profiled portion about an axis thereof such that two opposing sub-portions having complementary profiles are formed wherein selected ones of said lip portions face and abut each other;
welding said sub-portions together along said lip portions facing and abutting each other without any addition of material, thereby producing a hollow monocoque pistol frame including a bolt housing having an opening for a barrel and a handle portion integrally joined to said bolt housing;
inserting a barrel into said opening and fastening said barrel to said bolt housing, such that a portion of said barrel extends from said bolt housing;
introducing a bolt into said port opposite said barrel; and
assembling an action and other parts into the hollow monocoque piston frame.

5,195,227

QUICK CHANGE MOUNTING SYSTEM FOR MACHINE TOOLS

John L. Wickham, Glen Arm, Md., assignor to The J. L. Wickham Co., Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 448,107, Dec. 13, 1989, abandoned. This application Jan. 3, 1991, Ser. No. 635,827
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 29—33 P 7 Claims



1. A connection interface for mechanically mounting a fixture to a cooperating mounting member rotatable about an axis of rotation, comprising:
cooperating surface means on the fixture and the mounting member to define a common plane therebetween, the common plane orthogonal relative to the axis of rotation;
a first alignment member having a cylindrical surface portion thereof, said first alignment member on a one of the fixture and the mounting member;
first and second spaced bearing surfaces on the other of the fixture and the mounting member for journalling the cylindrical surface portion of said first alignment member, the fixture and the mounting member rotatable relative the other about an axis established by said journalled first alignment member;
a second alignment member spaced from said first alignment member and having a flat surface thereon, said second alignment member on a one of the fixture and the mounting member;
a flat surface on the other of said fixture and mounting member for engaging the flat surface of said second alignment member to fix the relative rotatable relationship between said journalled surfaces;
first fastener means for maintaining forcible engagement between said journalled surfaces; and
second fastener means for maintaining forcible engagement between said flat surfaces.

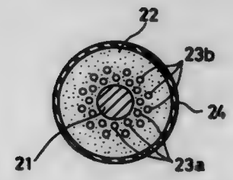
5,195,228

ROLL FOR FIXING UNIT

Noritomo Fukunaga, Tokyo, and Mitiyoshi Kurosawa, Kitamine, both of Japan, assignors to Kinyosha Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01685, § 371 Date Nov. 12, 1991, § 102(e) Date Nov. 12, 1991, PCT Pub. No. WO91/14211, PCT Pub. Date Sep. 19, 1991
PCT Filed Dec. 25, 1990, Ser. No. 784,423
Claims priority, application Japan, Mar. 16, 1990, 2-65860
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—130 14 Claims

1. A roll for a fixing unit, comprising:
a rod-like metal core;
a sponge layer covering the core and provided with a plurality of through holes spaced (i) parallel with one another in the longitudinal direction of the core, (ii) a predetermined radial distance form the core, and (iii) equidistant from one another in the circumferential direction, said through holes enabling the release of air from the sponge in response to exposure of the roll to temperature above ambient temperature; and
a surface layer covering the sponge layer.

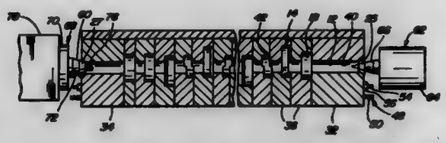


5,195,229

CAM LOBE HAVING ORIENTATING MEANS

Robert W. Hughes, 2155 14 Mile Rd., Sterling Heights, Mich. 48077

Division of Ser. No. 535,750, Jun. 8, 1990, Pat. No. 5,085,099.
This application Jul. 8, 1991, Ser. No. 726,837
Int. Cl.[5] B21D *22/10*
U.S. Cl. 29—252 4 Claims



1. An apparatus (26) for making a cam shaft (10) from lobes (14) comprising a body portion (16) and a camming portion (20) having side surfaces (22) including shoulders (24) thereon and apertures (17) therein spaced along the longitudinal axis of a hollow tubular shaft member (12), said apparatus (26) comprising:
restraining means (46) having a shaft opening (40) for surrounding the hollow tubular shaft member (12) and cam openings (42) for surrounding the lobes (14) and spaced at predetermined intervals to axially position the lobes (14) with respect to the axis;
expansion means (60) for applying pressure tot he interior of the hollow tubular shaft member (12) to expand the hollow tubular shaft member (12) into engagement with the interior of the apertures (17) and into engagement with the restraining means (46);
said apparatus (26) characterized by said cam openings (42) including shoulders (44) extending radially along said cam openings (42) for mating engagement with the corresponding shoulders (24) disposed along the sides of the lobes (14) to angularly position the lobes (14) about the shaft (12).

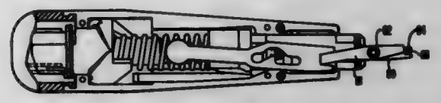
5,195,230

IMPACT TOOL AND BLADE

William Krietzman, Beaverton, Oreg., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 28, 1990, Ser. No. 589,599
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—566.4 18 Claims

1. A hand-held impact tool, comprising:
a handle;
a pouch assembly rotatable relative to the handle;
a hammer operatively arranged within the handle for causing an impact force;
a slide adapted to hold a blade with a pivotable cutter, the slide being axially movable within the handle and operatively associated with respect to the hammer to receive and transmit the impact force to the blade;
an actuator arranged within the handle and adapted selectively to engage the pivotable cutter when a cutting operation is desired;
a trigger operatively mounted on the slide and configured so as to operatively cooperate with the actuator for causing cutting movement and a return movement and a return movement of the cutter; and
a cam assembly operatively mounted in the handle for movement by the pouch assembly in one direction to allow selection of a no-impact force setting and at least one other impact force setting.



5,195,231

METHOD FOR PRODUCING INNER STATORS FOR ELECTROMAGNETIC PUMPS

Alan W. Fanning, San Jose; Leslie R. Dahl, Livermore; Mahadeo R. Patel, San Jose, and Eugene E. Olich, Aptos, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 18, 1992, Ser. No. 836,475
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—596 10 Claims

1. A method of producing the inner stator units of a double stator annular linear electromagnetic pump for service in an electrically conducting liquid metal including the steps for assembling an inner stator composed of alternating units of annular stator coils and laminated iron stator rings, comprising the combination of steps of:
forming the stator coil units by winding strips of insulated copper upon a mandrel while leaving at least two strip portions projecting inward from inside the formed coil as terminals;
assembling iron stator ring units composed of a multiplicity of thin iron elements laminated together forming a composite iron ring; and
alternately stacking a multiplicity of said wound stator coils and said rings of laminated iron in an annular column providing a composite inner stator for installation within

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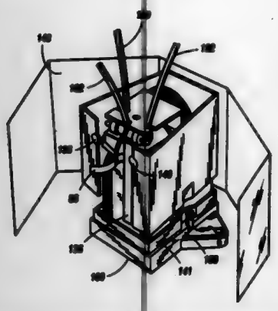
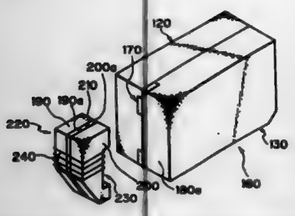
an inner stator duct of a double stator annular linear electromagnetic pump for service in a liquid metal system.

5,195,232
METHOD OF MAKING ELECTROMAGNETIC INTERFERENCE FILTERS
W. Richard Frederick, Mundelein, Ill., assignor to Integrated Power Components Inc., Mundelein, Ill.
Continuation-in-part of Ser. No. 460,573, Jan. 3, 1990, Pat. No. 5,083,101. This application Sep. 16, 1991, Ser. No. 760,696
Int. Cl.[5] H01F *7/06*
U.S. Cl. 29—602.1 27 Claims



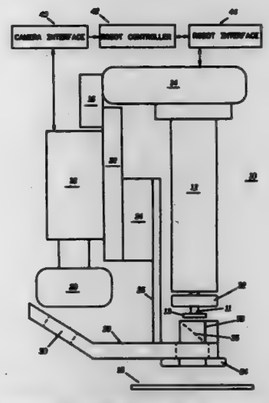
1. A method of assembling an electromagnetic interference filter adapted for connection between electrical, electronic or electromechanical equipment the operation of which causes electrical noise, and a power source for said equipment, said filter including a plurality of components comprising at least one inductor and at least one capacitor, the method comprising the steps of:
(a) disposing said plurality of components on a base;
(b) connecting said components together to form an electromagnetic interference filter;
(c) enclosing said filter in a metal case, said metal case being formed by folding a metal sheet having a first end and a second end around said filter and joining said first end to said second end, said metal sheet having an insulating coating disposed on one side thereof to prevent contact between said components and said case; and
(d) sealing the outer surface of said case with a seal tape.

5,195,233
METHOD OF PRODUCING MAGNETIC HEAD STRUCTURE
Mikio Kitamura; Shingo Makino, and Yoshio Takeshima, all of Shiga, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jul. 5, 1991, Ser. No. 726,186
Claims priority, application Japan, Jul. 5, 1990, 2-178595; Nov. 30, 1990, 2-339892
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 5 Claims



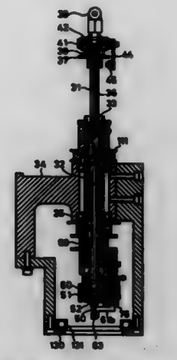
1. A method of producing a magnetic head which records or reproduces data from a magnetic recording medium, said method comprising the steps of:
(a) preparing first and second slider blocks made of a non-magnetic material;
(b) forming a first recess for accepting a core of predetermined thickness in a first surface of said first slider block;
(c) forming a metallic, magnetic film of predetermined thickness in said first recess and the remaining portion of said first surface of said first slider block;
(d) flattening said metallic, magnetic film to form a flat bonding surface on said first slider block;
(e) bonding the second slider block to said first slider block while holding a bonding surface of said second slider block in abutment against said flattened bonding surface of said first slider block;
(f) bisecting said bonded slider blocks in a direction perpendicular to said bonding surfaces, whereby a first and a second core block having a first and a second core, respectively, are produced;
(g) forming a second recess for winding a coil in said second core block; and
(h) bonding said first and second core blocks at the bisected surfaces thereof via a gap spacer while aligning said first and second cores to each other.

5,195,234
METHOD AND APPARATUS FOR VISUAL ALIGNMENT OF PARTS
Jerrold S. Pine; Stefan Peana, and Daniel Peana, all of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 19, 1991, Ser. No. 747,089
Int. Cl.[5] B23P *21/00, 19/00*
U.S. Cl. 29—720 20 Claims



1. An apparatus for visually aligning parts for placement using one camera, comprising:
means for picking and placing a part on an object within a work envelop;
means for moving and removing optics into and out of the work envelop having the object;
means for locating landmarks on the object within the work envelope; means for aligning the part with the landmark in the work envelope.

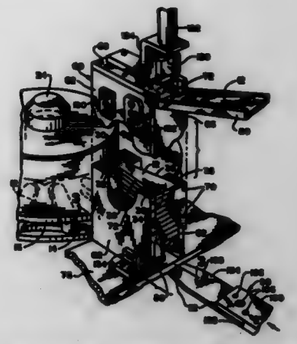
5,195,235
PARTS MOUNTING APPARATUS
Fumio Mifuji, Kami, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed May 30, 1991, Ser. No. 708,139
Claims priority, application Japan, May 31, 1990, 2-142304
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—721 6 Claims



1. A parts mounting apparatus, comprising:
a spindle vertically held and having a vacuum suction path inside;
a group of nozzles selectively mounted on a lower end of said spindle and made to have communication with said vacuum suction path;
a nozzle for image recognition included in said group of nozzles;
parts positioning jaws supported on a structure for centering parts sucked by a normal nozzle with their tips, said structure supporting said spindle being able to move upward and downward;
first means for applying to said spindle vertical motion for picking and placing the parts;
second means for opening and closing said jaws; and
third means for preventing the jaws from performing the centering operation.

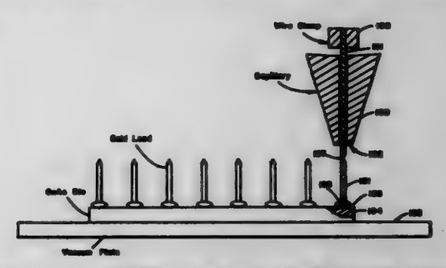
5,195,236
WEIGHT-INSERTING MECHANISM FOR BRAKE DISC ROTOR-BALANCING MACHINE
Joseph Miechowicki, Palatine, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Feb. 26, 1992, Ser. No. 841,498
Int. Cl.[5] B23Q *7/10*
U.S. Cl. 29—818 8 Claims

1. For a machine used to balance brake disk rotors having radial walls defining tapered recesses of uniform dimensions by inserting tapered weights of uniform dimensions into selected ones of said recesses, each weight having a narrow end and a broad end and two tapered sides, a mechanism comprising
(a) a magazine adapted to hold a stack of a controlled number of the weights and to permit the weights to exit the magazine individually, the magazine comprising means for guiding the weights in such manner that each individual weight exiting the magazine is oriented radially with the narrow end pointing in the same direction,
(b) means for removing a single weight exiting the magazine and inserting the single weight with the narrow end leading the broad end into a tapered recess of a brake disk rotor being balanced in the machine, and
(c) first detecting means for detecting when the magazine has been depleted of a specified number of the weights, second detecting means for detecting when the magazine holds the controlled number of the weights, and means for admitting the weights individually into the magazine, wherein the admitting means is responsive to the first and second detecting means so as to admit more of the weights into



the magazine when the first detecting means detects that the magazine has been depleted of the specified number of the weights and so as to prevent more of the weights from being admitted into the magazine when the second detector detects that the magazine holds the controlled number of the weights.

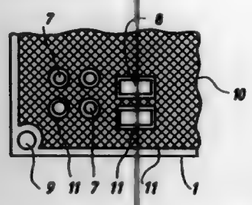
5,195,237
FLYING LEADS FOR INTEGRATED CIRCUITS
Seymour R. Cray, Chippewa Falls, and Nicholas J. Krajewski, Elk Mound, both of Wis., assignors to Cray Computer Corporation, Colorado Springs, Colo.
Continuation of Ser. No. 376,156, Jun. 30, 1989, abandoned, which is a continuation of Ser. No. 243,991, Sep. 12, 1988, abandoned, which is a division of Ser. No. 53,142, May 21, 1987, Pat. No. 5,054,192. This application Dec. 24, 1991, Ser. No. 814,067
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—838 22 Claims



1. A method of fabricating from a length of metal wire a plurality of substantially equal length flying leads which are each attached to one of a corresponding plurality of bonding pads of an integrated circuit chip and which extend generally parallel to one another and at a predetermined angle from a surface of the integrated circuit chip, each lead being fabricated by steps comprising:
forming a ball on an end of the metal wire by rapidly heating the end of the wire;
forming an electrical and mechanical connection of the ball to the bonding pad by pressing the ball against the bonding pad of the chip;
clamping the wire at a clamping location on the wire located above the surface of the chip;
holding the chip;
extending the wire substantially straight and at the predeter-

mined angle form the surface of the chip between the connection and the clamping location;
notching the connected wire at a notched location at a predetermined height above the surface of the chip and between the clamping location and the connection;
applying force from the clamping location through the wire and the connection to the chip; and
stretching the wire at a notched location by application of the force to server the wire at the notched location and to form the flying lead from the segment of the wire connected to the chip.

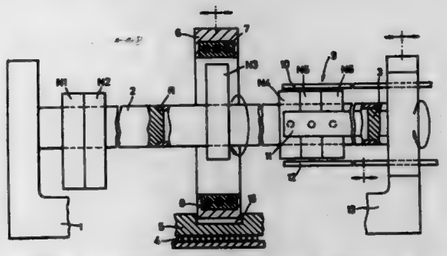
5,195,238
METHOD OF MANUFACTURING A PRINTED CIRCUIT BOARD
Shin Kawakami; Hirotaka Okonogi; Katsutomo Nikaido; Junichi Ichikawa, and Yoshio Nishiyama, all of Iruma, Japan, assignors to Nippon CMK Corp., Japan
Continuation of Ser. No. 674,681, Mar. 22, 1991, abandoned. This application Feb. 24, 1992, Ser. No. 841,196
Claims priority, application Japan, Jul. 20, 1990, 2-191977
Int. Cl.[5] H05K *3/22*
U.S. Cl. 29—846 **5 Claims**



1. A method of manufacturing a printed circuit board, comprising the steps of: providing an insulating substrate for said printed circuit board, forming circuit patterns made of a conductive material on at least one side of said insulating substrate, forming an insulating layer on said circuit patterns, and adhering a cross-mesh shield layer having inner and outer edges onto at least a portion of said insulating layer in such a manner that said outer edge of said cross-mesh shield layer defines a continuous margin line along an outer periphery of said insulating layer and said inner edges of said cross-mesh shield layer define continuous margins around electric contacts including lands and throughholes.

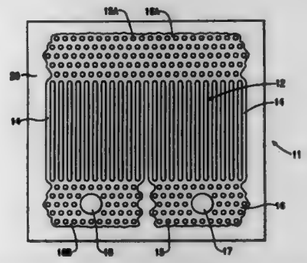
5,195,239
METHOD FOR ASSEMBLING SHAFTS
Hans-Jürgen Breuer, and Rolf Brück, both of Overath, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany
Filed Oct. 5, 1990, Ser. No. 593,675
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1989, 3933565
Int. Cl.[5] B21D *53/00*
U.S. Cl. 29—888.1 **2 Claims**

1. A method of assembling a plurality of similar asymmetrical ring-like elements in predetermined axial and angular positions on a tubular or bar-shaped base member comprising the steps of:
(a) providing an elongated tubular or bar-shaped base member;
(b) holding said base member;
(c) providing a plurality of asymmetrical ring-like elements;
(d) holding said ring-like elements in alignment with each other and in alignment with said base member;
(e) gripping a number of said aligned elements in a row;
(f) sliding the row of elements onto the base member and positioning a gripped element at an end of the row on said base member in axial and angular positions which at least approximate to said predetermined positions;
(g) releasing said element at said end of the row;
(h) supporting the released element by magnetic forces;
(i) finally positioning said released element at least in its



angular predetermined position while supported by said magnetic forces by varying the effect of said magnetic forces on said element; and
(j) repeating step (f) to (i) inclusive until all of said ring-like elements in said row are positioned in said predetermined positions on the base member.

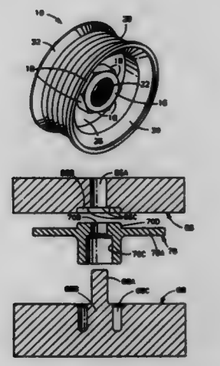
5,195,240
METHOD FOR THE MANUFACTURE OF THERMOPLASTIC PANEL HEAT EXCHANGERS
Jerry P. Shuster, Oakville, Canada, and Anthony J. Cesaroni, 9 Heathmore Court, Unionville, Ontario, Canada L3R 8J1 , assignors to Du Pont Canada Inc., Mississauga and Anthony J. Cesaroni, Unionville, both of Canada
Continuation-in-part of Ser. No. 642,391, Jan. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 335,573, Apr. 10, 1989, abandoned. This application Apr. 16, 1992, Ser. No. 869,161
Claims priority, application United Kingdom, Apr. 15, 1988, 88.08944
Int. Cl.[5] F29C *51/10, 51/12*
U.S. Cl. 29—890.039 **10 Claims**



1. A method for the manufacture of a panel heat exchanger from a thermoplastic polyamide, said heat exchanger consisting essentially of first and second panels and inlet and outlet header means with said panels being bonded together to define fluid flow passages extending between the inlet and outlet header means, each of said panels being generally planar and formed from a sheet of said polyamide having a thickness of less than 0.7 mm, said panels having orifices therein cooperatively located at each of the inlet and outlet header means, each of said inlet and outlet header means being comprised of a distributor having planar ends, an axial flow passage and at least one radial flow passage,
said method consisting essentially of the sequential steps of:
(a) placing the two sheets of thermoplastic polyamide, at least one of which has been coated with a coating composition

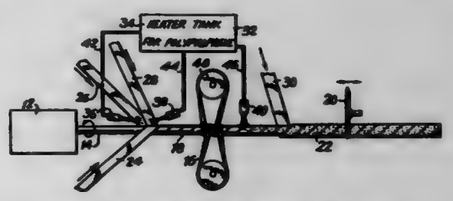
that will facilitate bonding of the sheets under the influence of heat, in face-to-face contact between moulds in a heated press, said coating being comprised of benzyl alcohol, each of said moulds being heated to a temperature in the range of 140°–200° C. and the surfaces of at least one of said moulds having a recessed pattern thereon corresponding to the fluid flow passages of the panel heat exchanger, such that (i) the sheets are in face-to-face contact with each other over substantially the entire face of the sheets and additionally in face-to-face contact with opposite ends of said distributors, the distributors being in a spaced apart relationship corresponding to the location thereof in the panel heat exchanger, and (ii) the coating is at the interface between the sheets; and
(b) pressing said heated moulds to effect bonding between the sheets and between the sheets and the ends of the distributors and applying an inert gas between said inlet and outlet header means, said inert gas being applied for at least two cycles of (i) flushing the gas between the inlet and outlet header means and (ii) increasing the gas pressure to 1.3–2.75 MPa, thereby bonding said sheets together whilst forming fluid flow passages between the inlet and outlet header means and removing volatile matter from the fluid flow passages.

5,195,241
METHOD OF MANUFACTURING A PULLEY WITH INTEGRAL FASTENER AND SPACER
Michael D. Bradfield, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 802,104, Dec. 4, 1991, Pat. No. 5,163,883. This application Apr. 27, 1992, Ser. No. 874,455
Int. Cl.[5] B21K *1/42*
U.S. Cl. 29—892 **2 Claims**



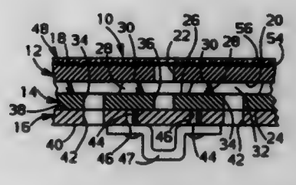
1. A method of manufacturing a pulley that has a hub, a radially extending web, a bore in said hub and a tool engaging head, the steps comprising, providing a flat circular disk of metallic material, die forming a center portion of said disk into a tubular hub that has a bore extending through the hub and through the disk, forcing material of said disk disposed about an end of said bore into a die cavity to form a tool engaging head having a plurality of flat outer surfaces, and then forming threads in the tubular surface defining said bore at least along a portion of the axial length of said bore.

5,195,242
METHOD OF MAKING A PAINT ROLLER
Chandra Sekar, 2586 Overlook Pl., Baldwin, N.Y. 11510, assignor to Chandra Sekar, Baldwin, N.Y.
Continuation of Ser. No. 806,809, Dec. 6, 1991, abandoned, which is a continuation of Ser. No. 660,970, Feb. 26, 1991, abandoned, which is a continuation of Ser. No. 512,795, Apr. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 394,073, Aug. 15, 1989, abandoned. This application Jan. 11, 1992, Ser. No. 897,579
Int. Cl.[5] B32B *31/00*
U.S. Cl. 29—895.21 **12 Claims**



8. A method for making a paint roller comprising:
winding one or more strips of thermoplastic material in overlapping relation, thereby forming a tubular core;
applying a liquid thermoplastic material to said one or more strips, thereby bonding said one or more strips together;
applying an adhesive to an outer surface of said core;
wrapping a cover about said core over said adhesive, thereby bonding said cover to said core and forming said roller.

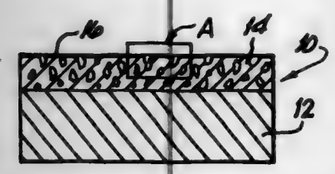
5,195,243
METHOD OF MAKING A COATED POROUS METAL PANEL
Larry A. Junod, Clayton, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 28, 1992, Ser. No. 843,033
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—897.32 **2 Claims**



1. A method of making a coated porous metal panel comprising the steps of:
forming a metal panel having a first outer surface on one side of said panel and a second outer surface on the other side of said panel,
forming a plurality of discharge pores in said first outer surface of said panel arrayed in a first pattern,
forming a plurality of inlet pores in said second outer surface of said panel arrayed in a second pattern laterally offset from said first pattern so that each of said discharge pores is laterally offset from each of said inlet pores,
forming an internal chamber in said panel communicating with each of said inlet pores and said discharge pores,
forming a plurality of extraction passages in said panel extending between said internal chamber and said second outer surface and arrayed in said first pattern so that each of said extraction passages is disposed behind a corresponding one of said discharge pores,
spraying a coating material substantially perpendicular to

said first outer surface to form a coating on said first outer surface,
capturing surplus coating material entering each of said discharge pores behind said second outer surface of said panel by conducting said surplus coating material through corresponding ones of said extraction passages whereby deposit of said surplus coating material in said internal chamber and in said inlet and said discharge pores is minimized,
forming a shield lamina having a plurality of shield pores therein at least as large as said inlet pores and arrayed in said second pattern, and
mechanically attaching said shield lamina to said panel in juxtaposition to said second outer surface thereof with each of said shield pores in register with a corresponding one of said inlet pores so that said inlet pores are open through said shield pores and said extraction passages are blocked by said shield lamina.

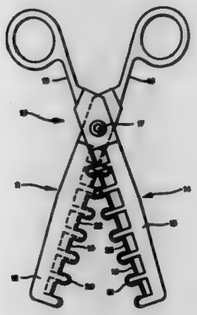
5,195,244
BEARINGS
Donald Green, Cumbria, England, assignor to Vandervell Limited, Maidenhead, England
Filed Dec. 12, 1990, Ser. No. 626,018
Claims priority, application United Kingdom, Dec. 22, 1989, 8929142
Int. Cl.[5] B21D *53/10*
U.S. Cl. 29—898.12 10 Claims



1. A method of making a sliding bearing, the method comprising the steps of:
forming a half bearing of a desired size from a leaded bronze alloy having a strong backing material,
indenting the bore surface of the leaded bronze alloy to an indentation depth between 0.01 and 0.25 mm by knurling,
depositing a layer of a lead-based overlay material onto the indented bore surface,
depositing a layer of indium onto the lead-based overlay material surface and
heat treating to diffuse the indium at least into the lead-based overlay material.

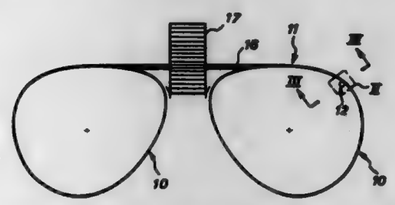
5,195,245
SAFETY SCISSORS
Jason R. Malone, Matthews, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.
Continuation of Ser. No. 790,849, Nov. 12, 1991, abandoned.
This application Oct. 28, 1992, Ser. No. 967,919
Int. Cl.[5] B26B *13/06, 13/00*
U.S. Cl. 30—195 6 Claims

1. Scissors comprising
(a) a pair of first and second elongated scissors blades each having an inner side, an outer side, a plurality of cutting edges on the inner side, separated by a plurality of non-cutting protrusions on each blade having same lengths from the cutting edge, and gripping means on each blade; and
b) means for pivotally securing said first and second scissor blades to each other with said inner sides facing towards each other such that said cutting edges cooperate with each other to cut when said first and second scissors blades are pivotally moved towards each other from an open position to a closed position and said non-cutting protrusions overlap one above the others with clearance as said first and second scissor blades are pivotally moved



towards each other from an open position to a closed position.

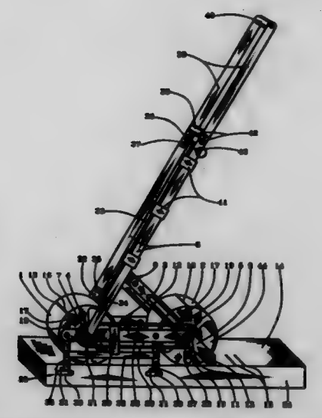
5,195,246
METHOD FOR READING THE SHAPE OF ANY ELASTICALLY DEFORMABLE ARTICLE, IN PARTICULAR FOR READING THE CONTOUR OF AN EYEGLASS FRAME RIM OR SURROUND
Alain Chauvavoir, Luzancy, France, assignor to Essilor International Cie Generale D'Optique, Creteil Cedex, France
Continuation of Ser. No. 839,185, Feb. 21, 1992, abandoned.
This application Aug. 31, 1992, Ser. No. 936,732
Claims priority, application France, Mar. 7, 1991, 91 02717
Int. Cl.[5] G01B *7/28*
U.S. Cl. 33—28 5 Claims



1. Method for reading the shape of any elastically deformable article using a contact feeler adapted to follow the shape to be read wherein said contact feeler is applied to said article with a force of particular value adapted to cause localized deformation of said article and the coordinates of said contact feeler are noted at the relevant time, two successive coordinate readings are systematically carried out, one with a first non-zero set point value of said contact feeler application force and the other with a second non-zero set point value of said application force different than said first set point value, and the coordinates for a zero set point value of said contact feeler application force are deduced mathematically from said two coordinate readings.

5,195,247
CONSTRUCTION LAYOUT MARKING DEVICE
Timothy A. Wilcox, Lawrenceville, Ga., assignor to Bremer Systems, Inc., Lilburn, Ga.
Filed May 29, 1992, Ser. No. 889,802
Int. Cl.[5] B43L *13/00*
U.S. Cl. 33—36 30 Claims

1. A construction layout marking device comprising:
a wheel frame having a front marker wheel on a front axle and a rear marker wheel on a rear axle positioned in tandem a select distance behind the front axle,
a wheel rotation equalizer in rotation equalizer relationship between the front marker wheel and the rear marker wheel,



at least one marker on at least one of the marker wheels,
a marker fork extended from the wheel frame a select distance behind the rear axle, and
a handle frame extended selectively upwardly and rearwardly from the wheel frame.

5,195,248
PLUMB-BOB
Frank Juhasz, 42-37 Union St., Apt. 22B, Flushing, N.Y. 33953
Filed Oct. 28, 1991, Ser. No. 783,404
Int. Cl.[5] G01C *15/10*
U.S. Cl. 33—393 1 Claim

1. Plumb-bob and magnet combination for attachment to a beam, comprising:
a) a magnet having a top flat surface that is connected to the beam, said magnet having two opposing sides that contain recesses;
b) a hollow casing for encompassing a string of the plumb-bob and having a top surface slideable along said magnet, said hollow casing including engagement means on said top surface for sliding engagement with the recesses on the sides of said magnet;
c) a lock on said engagement means of said casing and being cam operated by a lever that moves in the direction of an arc on said top surface of said casing for locking and unlocking said casing to said magnet; and
d) a cantilever extending from said casing and having a free end with an apex from which said string hangs with a weight at said free end, said string being wound in said casing.

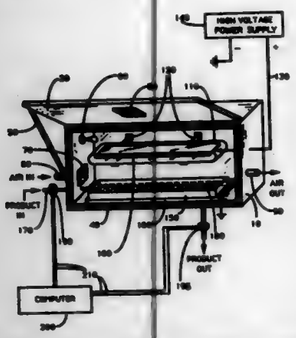
5,195,249
WALL PANEL TEMPLATE
Tommy Jackson, 249 Lincoln Ave., Syracuse, N.Y. 13204
Filed Jan. 17, 1992, Ser. No. 822,140
Int. Cl.[5] G01B *3/14*
U.S. Cl. 33—528 3 Claims

1. A method of cutting out and trimming a panel to be affixed to a structure so that it will fit in a selected area and position which comprises:
providing a thin planar sheet of material having a size at least equal to the panel to be installed on the structure and having at least one horizontal level line and one vertical plumb line marked thereon;
positioning said sheet of material on the structure so as to cover and overlap the area in which the panel is to be installed;
establishing a reference line on the structure on which the panel is to be installed in a direction selected from the group of horizontal and vertical;
aligning one of said horizontal level line or vertical plumb line on said sheet of material with said reference line;
cutting said aligned sheet of material along the edges of the area in which the panel is to be installed to form a template matching exactly said area;
positioning said template on a panel to be cut out and trimmed; and
cutting said panel to the size and shape indicated by said template;
so that the panel may be accurately fitted into the desired area of said building structure.

5,195,250
ELECTRONIC DEVOLATILIZER
Richard R. Zito, 330 N. Mathilda Ave. (#606), Sunnyvale, Calif. 94086
Filed Aug. 13, 1991, Ser. No. 744,525
Int. Cl.[5] F26B *3/34*
U.S. Cl. 34—1 H 1 Claim

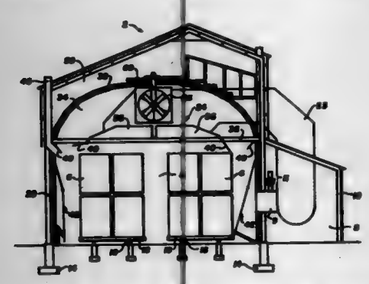
1. An electronic devolatilizer comprising:
a. an electrode wherein said electrode is made of a conducting plate upon which are mounted a plurality of conducting needles with sharp tips, whereby every high electric fields near said tips can be achieved,
b. an insulating sheath around said electrode, whereby sparks may be prevented from forming between said electrode and ground potential.
c. a spark suppressing gas within said sheath, whereby higher voltages may be applied to said electrode,

d. a vessel under said electrode for holding material to be devolatilized,



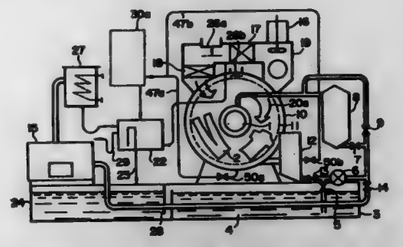
e. a high voltage power supply electrically connected to said electrode.

5,195,251
DRYING KILN
Frank T. Gyurcsek, 830 Graham Road, Kelowna, B.C., Canada V1X 1J4 , and Martin G. Gyurcsek, 29 - 1410 High Rd., Kelowna, B.C., Canada V1Y 7B3
Filed Feb. 19, 1992, Ser. No. 839,537
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—22 9 Claims



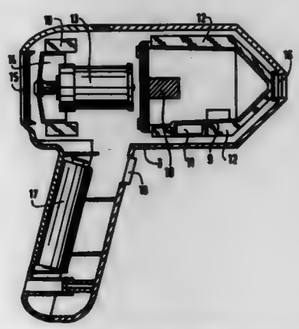
9. A method for drying material in the drying chamber of a kiln, comprising:
delivering heated air to the drying chamber through a pair of ducts extending substantially the length of the drying chamber;
establishing a low air pressure region adjacent to one of the ducts and a high air pressure region adjacent to other of the ducts in order to generate a circulation flow of heated air throughout the drying chamber;
controlling the heated air flow with valve means such that substantially all the flow is delivered to the duct adjacent to the low air pressure region and heated air exits from said duct into the low air pressure region; and
periodically switching said regions to reverse circulation of the air flow with coordinated switching of the valve means such that heated air is always directed to the duct adjacent to the low air pressure region.

5,195,252
METHOD FOR DRY CLEANING AS WELL AS A METHOD FOR RECOVERY OF SOLVENT THEREIN
Kiyomi Yamada; Haruo Hagiwara; Nobuharu Takagi; Hideo Tsukamoto; Yasuhiro Tsubaki, and Toshio Hattori, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 443,723, Nov. 29, 1989, Pat. No. 5,107,605.
This application Aug. 16, 1991, Ser. No. 746,422
Claims priority, application Japan, Nov. 30, 1988, 63-302397; Dec. 16, 1988, 63-162399; Mar. 24, 1989, 1-33986
Int. Cl.[5] D06F *43/08;* F26B *21/06;* F26D *7/00*
U.S. Cl. 34—26 2 Claims



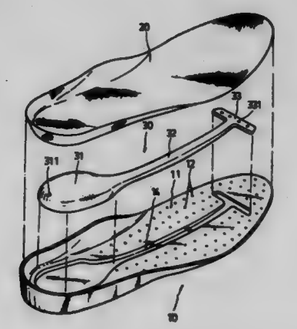
1. A method for dry cleaning which comprises the steps of stopping the rotation of a treating drum in a deodorizing step, introducing the outside air into a treating tank through an upper opening provided in the upper portion of said treating tank or the upper portion of a recovery air duct, simultaneously exhausting a solvent gas from said treating tank through a lower opening provided in the lower portion of said treating tank or a button trap portion so slowly as not to agitate said solvent gas in said treating tank by a gas delivery device in the condition that said treating drum is stopped, in order to forward said solvent gas to an air tank, opening a door of said treating tank and then taking out washed cloths therefrom, throwing other unwashed cloths thereinto and then closing the door, and returning said solvent gas in said air tank to said treating tank through a lower opening of said treating drum by said air delivery device and simultaneously releasing the air from said treating tank through said upper opening.

5,195,253
CORDLESS ELECTRIC HAIR-DRYER
Michel Pouney, Ecully, and Christian Latore, Vienne, both of France, assignors to Cableco and Beaba, France
Filed Jun. 11, 1991, Ser. No. 713,305
Claims priority, application France, Jun. 12, 1990, 90 07549
Int. Cl.[5] A24D *20/10*
U.S. Cl. 34—97 4 Claims



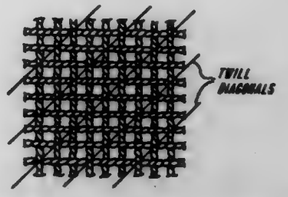
1. An electric hair dryer assembly having a stand, adapted to be connected to a source of electrical power, for receiving a cordless hand-held hair dryer, the assembly comprising:
a portable hot air unit including a housing, said housing having a rear face and a front face;
a generally U-shaped receptacle formed in the stand for receiving the portion of said housing including said rear face;
a thermal reservoir means mounted within said housing adjacent said front face including a closed container having a heat conducting substance therein and a plurality of electrical resistors positioned in heat exchange relationship therewith and adapted to be activated during non use when mounted in the stand;
a rechargeable battery mounted in a portion of said housing;
fan means mounted in another portion of said housing for blowing air over said thermal reservoir means in heat exchange relationship with said closed container; and
circuit means mounted in the stand and said housing for selectively energizing said rechargeable battery and electrical resistors only when said portable hot air unit is mounted in the stand and for operating said fan means to pulsate heated air out of the portable unit when the portable unit is removed from the stand, said circuit means including:
a primary electrical circuit mounted in the stand adjacent said U-shaped receptacle for generating a high frequency electromagnetic field; and
a secondary electrical circuit mounted in said housing adjacent the rear face thereof having an oscillator circuit with a resonant frequency slightly greater than that of the high frequency field in the primary circuit so that when said portable hot air unit is positioned in the stand, said primary electrical circuit includes electrical energy into said secondary electrical circuit.

5,195,254
SOLE
Lion Y. Tyng, P.O. Box 82-144, Taipei, Taiwan
Filed Jun. 24, 1991, Ser. No. 719,749
Int. Cl.[5] A43B *7/06, 13/20*
U.S. Cl. 36—3 R 1 Claim



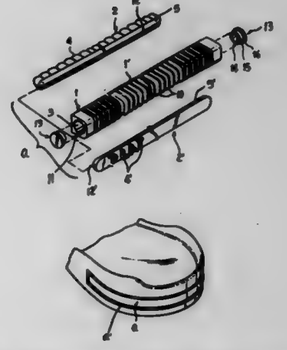
1. A sole comprising:
a resilient pad provided with a plurality of arrow-shaped recesses and diamond-shaped recesses on a bottom and an elongated slot on a top, said arrow-shaped recesses and said diamond-shaped recesses being arranged alternately and extending obliquely and upwardly through said resilient pad to form a smaller open top thereby providing a chamber;
a blast device adapted to be received in the elongated slot of said resilient pad and having a first air bag at one end, a second air bag at the other, and an air pipe connecting said first air bag and said second air bag; and
a piece of cloth covering top of said resilient pad.

5,195,255
INSOLE RIB WELTING MATERIAL
Thomas E. Coughlin, Tyngsboro, Mass., assignor to Worthen Industries, Inc., Nashua, N.H.
Filed Nov. 21, 1990, Ser. No. 618,266
Int. Cl.[5] A43B *13/28*
U.S. Cl. 36—12 1 Claim



1. In an insole rib which comprises a rib and a fabric, the fabric enclosing and securing the rib to an insole, the fabric adhered to the insole and extending outwardly from the rib, the improvement which comprises:
the fabric comprising warp and weft threads arrayed to form a twill weave, the edges of the fabric non-pinked and adhered to the insole and lying flat on the insole and in parallel relationship, and wherein the fabric is a 1-2 twill polycotton weave.

5,195,256
SHOCK ABSORBING DEVICE FOR USE IN A MIDSOLE OF A FOOTWEAR
Sang D. Kim, Woorung Apt. 104-904, 14-3 Kayang-Dong, Kangso-Gu, Seoul, Rep. of Korea
Filed May 20, 1992, Ser. No. 885,833
Claims priority, application Rep. of Korea, Jan. 31, 1992, 92-1455
Int. Cl.[5] A43B *13/18, 21/26*
U.S. Cl. 36—27 17 Claims



1. A shock absorbing device for use in a midsole of a footwear, comprising:
a transparent, tubular elongated housing having a generally rectangular configuration, said housing including:
an elongated projection disposed on the interior thereof,
a plurality of center raised portions and a plurality of side raised portions disposed on three faces of the outside thereof, and
a pair of flanges disposed on remaining one face of the outside thereof,
a shock absorbing member disposed within said transparent, tubular elongated housing, said shock absorbing member including:

a basic body having two sides,

means for displaying and cushioning supported on one of said sides, the means for displaying and cushioning being visible through the housing whom the shock absorbing member is disposed within the housing to thereby perform a fashion function, and

an elongated channel disposed on the other of said sides for slidably, tightly receiving said projection of the housing, the elongated channel when receiving the projection preventing the shock absorbing member from moving and twisting within the

tubular housing, whereby the shock absorbing device acts as a cushion.

5,195,257

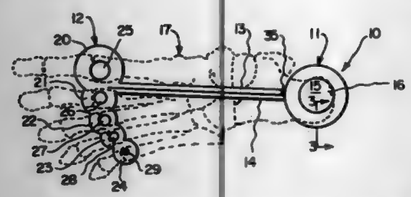
ATHLETIC SHOE SOLE

Robert R. Holcomb, R.R. 1, Box 104, Hackleberg, Ala. 35564, and Donald W. Bowlin, 206 Pine St., Florence, Ala. 35630

Filed Feb. 5, 1991, Ser. No. 650,913

Int. Cl.[5] A43B *13/18*

U.S. Cl. 36—28 **29 Claims**



1. In an athletic shoe, a sole construction having a fluid filled closed system, comprising a hallow, toroidal-shaped, semi-collapsible heel plenum having a central hole therethrough, said heel plenum sized and horizontally positioned to lie beneath and substantially support the tuberosity of the calcaneous of a heel of a wearer's foot; cushioning material at least partially filling the heel plenum; a hallow, semi-collapsible forefoot plenum sized and positioned to lie beneath and substantially support the metatarsal heads of the bony structure of a forefoot of a wearer's foot; fluid within said plenums; a plurality of flow passages interconnecting the two plenums and sized to nonadjustably allow a predetermined flow of fluid therethrough; a one way valve in at least one of the plurality of flow passages to allow flow of fluid through said at least one flow passage in only one direction, whereby the fluid flows in one direction between the plenums at a greater rate than in the other direction.

5,195,258

HIGH-HEELED FOOTWEAR

Gerald R. Loader, 49 Gatewick Close, Lansdowne Avenue, Slough, Berkshire, United Kingdom SL1 3SE

Continuation-in-part of Ser. No. 501,596, Mar. 29, 1990, abandoned. This application Aug. 12, 1991, Ser. No. 744,463

Claims priority, application United Kingdom, Mar. 31, 1989, 8907370

Int. Cl.[5] A43B *21/30*

U.S. Cl. 36—38 **9 Claims**

1. An article of high-heeled footwear having a sole with a fore portion positionable beneath the ball and toes of a wearer's foot and a rear portion having a length extending rearwardly and upwardly from the fore portion and positionable beneath the arch and heel of the wearer's foot, and a generally U-shaped support blade of substantially rectilinear cross-section having an upper limb rigidly secured to the rear portion of the sole and extending forwardly from an end of the blade at a position adjacent a back of the rear portion of the sole along more than 50% of the length of the rear portion of the sole, the blade then extending downwardly and rearwardly and away from the sole as a gently curved portion having a radius of curvature of at least 8 mm and no more than 20 mm, and the blade then extending rearwardly and away from the sole to a free end of the blade as a generally flat lower limb lying generally in a plane between the plane of the fore portion of the sole and a plane slightly thereabove, the lower limb having a length of between 44 mm and 66 mm, the blade having a degree of resilience such that the free end of the lower limb deflects

vertically towards the back of the rear portion of the sole by a deflection of at least 30 micrometers per pound of bodyweight of a wearer when substantially all of the bodyweight of the wearer is statically applied to the heel, and the lower limb of the blade being connected to the sole only by means of the sole being secured to the upper limb and the upper limb being connected to the lower limb through the curved portion of the blade.

5,195,259

SHEATH FASTENING DEVICE, PARTICULARLY FOR SKI BOOTS

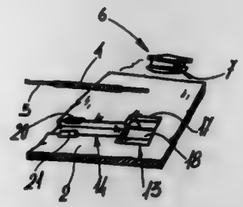
Faustino Lacchetta, Treviso, and Walter Trevisan, Venegazzu', both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Jun. 13, 1991, Ser. No. 714,536

Claims priority, application Italy, Jun. 22, 1990, 82592 A/90

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—117 **10 Claims**



1. A sheath fastening device for fixing a sheath which slidably carries a traction element to a ski boot portion, the sheath fastening device comprising a body which is axially provided with a longitudinal hole, said longitudinal hole having a first portion with a diameter which is slightly larger than an outer diameter of an end portion of said sheath, said end portion of said sheath being removably inserted inside said first portion of said longitudinal hole of said body, said longitudinal hole having a second portion which is provided sequentially to said first portion, said second portion having a diameter being smaller than said diameter of said first portion and being slightly larger than an outer diameter of said traction element, said traction element exiting from said end portion of said sheath and being slidably inserted inside said second portion of said longitudinal hole, said body being provided with means for temporarily fixing said body to a first seat defined on said ski boot portion, said means for temporarily fixing comprising two pairs of lateral flaps between which two tabs of said ski boot portion protruding transversely to said first seat are removably arranged, thereby to removably fix said body and said sheath to said ski boot portion.

5,195,260

PIPELINE PADDING APPARATUS

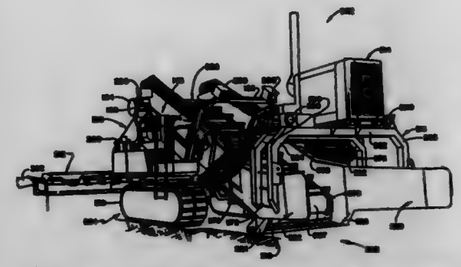
Mark Osadchuk, 10040 Happy Valley Rd., Scottsdale, Ariz. 85255

Continuation-in-part of Ser. No. 255,720, Oct. 11, 1988, abandoned. This application Jun. 15, 1990, Ser. No. 538,924

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] E02F *1/00*

U.S. Cl. 37—142.5 **19 Claims**



1. A combination for padding an excavated pipeline trough by moving along the pipeline while separating fine material from spoil such as excavated material or ground material and depositing the fine material into the trough as padding material, comprising:

(a) a support vehicle having at least two spaced-apart wheel means, said support vehicle supported at least in part by said wheel means whereby said support vehicle can be moved in a forward path along the excavated trough; and

(b) an apparatus supported from said vehicle to move therewith, said apparatus having elevator means including a plurality of spoil engaging elements that move in an endless path that extends at least around a front end of said elevator means for elevating the spoil over the front end of said elevator means and for transporting the spoil from said front end; a fine material separator positioned to receive spoil elevated by said spoil elevator; a conveyor means for transporting fine material from said separator to the excavated pipeline trough; and at least two spaced-apart spoil guide members, each guide member positioned on opposite sides of said spoil elevator in the forward path of at least one of said wheel means, the front end of said elevator means being positioned between said guide members to define an open area at the bottom, each of said guide members having at least one inner guide surface and a bottom edge, each inner guide surface extending forwardly and outwardly of said spoil elevator with respect to the direction of the forward path of said support vehicle whereby said inner guide surface engages and directs spoil toward said spoil elevator when said support vehicle is moved forward, said two bottom edges being positioned to extend substantially in a plane thereby grading two surfaces as said support vehicle moves forward, and each of said bottom edges extending at least as wide as the forward path of at least one of said wheel means following said bottom edge.

5,195,261

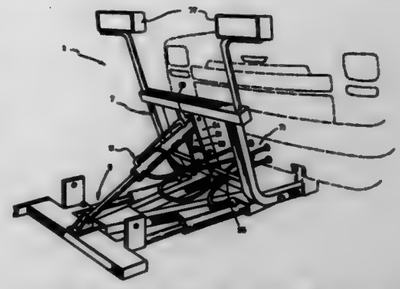
QUICK-HITCHING DEVICE FOR DETACHABLY MOUNTING AN ATTACHMENT TO A VEHICLE FRAME

Bertrand Vachon, 2796 chemin de l'Aéroport, Thetford Mines, Quebec, Canada G6G 5R7

Filed Apr. 16, 1992, Ser. No. 868,963

Int. Cl.[5] E01H *5/04*

U.S. Cl. 37—231 **13 Claims**



1. A quick hitching device for detachably mounting an attachment such as a snow plow to the frame of a road vehicle, said device comprising:

a) a quick hitching sub-frame detachably connectable to the frame of the vehicle, said quick hitching sub-frame having a rear portion including longitudinally spaced-apart front and rear hitching means detachably connectable to the bottom of said vehicle frame, said quick hitching sub-frame being tiltable with respect to said vehicle frame about a first transversal axis when said front hitching means are connected to the vehicle frame but the rear hitching means is not, said hitching sub-frame also having a front portion projecting up vertically in front of said rear portion;

b) an attachment supporting sub-frame having a rear end hingedly connected to the rear portion of the hitching sub-frame, in front of the front hitching means, about a second transversal axis parallel to the first transversal axis, said supporting frame having a front end including means for mounting said attachment; and

c) a longitudinal extensible power jack having one end pivotably attached to the front portion of the hitching sub-frame above said second transversal axis and another end pivotably attached to the front end of the supporting sub-frame, said power jack being actuable to cause said supporting sub-frame to be tilted up and down with respect to said hitching sub-frame between a first extreme position where both of said sub-frame are folded to form an inverted V, with the second transversal axis extending above the ground and the front hitching means extending up to the frame of the vehicle, and a second extreme position where the hitching sub-frame is fully connected to the vehicle frame and the supporting sub-frame is tilted up to lift up the attachment mounted thereon in an inactive position, said attachment being in active position between said first and second extreme positions, wherein:

said hitching sub-frame comprises a pair of longitudinally extending, parallel, L-shaped frame members each extending in a vertical plane, said L-shaped frame members being rigidly connected to each other by transversal frame members and having vertical arms that together define said front portion of said hitching sub-frame, and horizontal arms that together define said rear portion of said hitching sub-frame, said rear portion having a front end and a rear end;

said front hitching means comprises:

a pair of transversally extending, pin-receiving tubings fixed under the vehicle frame so as to extend above the horizontal arms of the L-shaped frame members

when the hitching sub-frame is longitudinally positioned in hitching position under said vehicle frame, said tubings being coaxial with said first transversal axis;

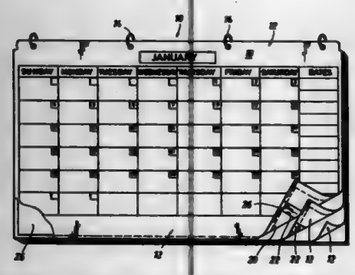
a pair of longitudinally extending, cheek plates vertically projecting from each of the horizontal arms of the L-shaped frame members, each of said pair of cheek plates having a hole and forming a longitudinal yoke in which one of the tubings may transversally engage; and

locking pins insuitable into the tubings and cheek plates for pivotably connecting said tubings to the respective cheek-plates;

said rear hitching means comprise at least one locking bolt actuable from the front end of the rear portion of the hitching sub-frame for detachably connecting the rear end of said rear position to the vehicle frame; and

said supporting sub-frame comprises a pair of opposite vertical mounting plates and a pair of pivots coaxial with the second transversal axis for vertically connecting said mounting plates to the horizontal arms defining the rear portion of the hitching sub-frame, close to the front end of said rear portion.

5,195,262
CALENDAR
James F. Roane, Rt. 2, Box 1647, Beaumont, Tex. 77705
Filed May 14, 1992, Ser. No. 882,942
Int. Cl.[5] G09D *3/04*
U.S. Cl. 40—109 7 Claims



5. A leaf for a calendar representing a month of a year, said leaf comprising:

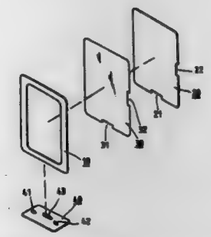
an outer sheet having seven longitudinally extending parallel columns thereon of substantially the same transverse width with each column denoting a day of a week and having five parallel transverse rows thereby providing an area having thirty five generally rectangular blocks of a similar size therein with each block having a similar transverse width and adapted to represent a specific day of the month;

a cutout portion for each block being of a width no greater than one seventh of the transverse width of a block;

an inner sheet having numerals on one side thereof for representing the days of a month and slidable relative to said outer sheet in a direction parallel to said rows with predetermined numerals registering with predetermined cutout portions in said blocks for visually showing the specific days of the month represented by said numerals; and

means adjacent said inner sheet supporting said inner sheet for sliding movement relative to said outer sheet.

5,195,263
PICTURE FRAME
Harrison Huang, No. 23, Lin T'So Rd., Shengkang, Taiwan
Filed Feb. 27, 1992, Ser. No. 842,671
Int. Cl.[5] A47G *1/06*
U.S. Cl. 40—152.1 1 Claim



1. A picture frame comprising:

(a) a frame made of iron material and provided with an open space;

(b) a back plate made of magnetic soft material;

(c) a face plate of transparent material sandwiched between said frame and said back plate;

(d) a base of flat construction having thereon a retaining portion comprising a left retaining strip, a right retaining strip, and a middle retaining strip, each of which is arranged in such a manner that it forms a predetermined angle with said base, with said left retaining strip and said right retaining strip being aligned and said middle retaining strip being located in a plane slightly spaced from said left and right retaining strips closer toward a rear side of said base; and

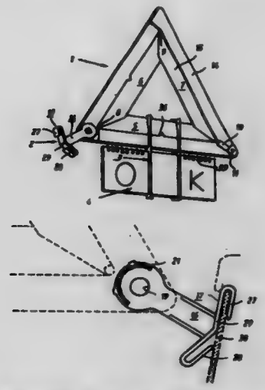
(e) wherein said back plate and said face plate comprise respectively a cut-out located along a center part of an edge thereof.

5,195,264
DISTRESS STOP WARNING INFORMATION SIGN FOR VEHICLES
Lars-Gunnar Johansson, 28 Rue St. Joseph, F-83680 LaGarde Freinet, France, and Daniel Miles, 308 Murray St., Santa Cruz, Calif. 95062
PCT No. PCT/SE89/00724, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO90/06865, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 12, 1989, Ser. No. 689,761
Claims priority, application Sweden, Dec. 13, 1988, 8804501
Int. Cl.[5] G09F *21/04*
U.S. Cl. 40—591 14 Claims

1. A distress-stop warning sign for a motor vehicle having left and right side windows, comprising:

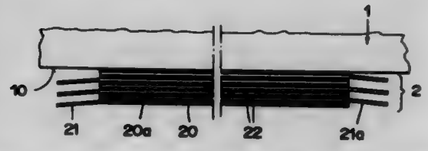
(A) a collapsible warning triangle having a colored retro-reflecting rear side and a colored fluorescent front side; and

(B) a hanger hook, connected to said triangle for hanging said triangle on said vehicle such that said triangle extends above said vehicle, said hanger hook being formed as a double hook including a first U-shaped hook loop which has an open side and which is mountable on said left side window, a second U-shaped hook loop which has an open side and which is mountable on said right side window, and a web portion integral with and connecting said first and second hook loops, said web portion being bent at an angle away from said open sides of said hook loops such that, when one of said first and second hook loops is mounted on the respective one of said left and right side



windows, the other of said first and second hook loops is free from the respective window.

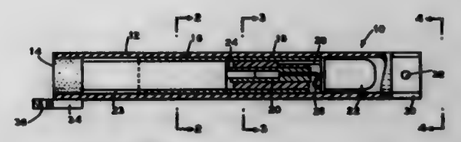
5,195,265
LABELLING METHOD AND SYSTEM HAVING ADHESIVE OVER A MAJORITY OF REAR SURFACE
Hans U. Klingenberg, St. Niklaus 4, 3274 Merlingen, Switzerland
PCT No. PCT/CH90/00236, § 371 Date May 29, 1991, § 102(e) Date May 29, 1991, PCT Pub. No. WO91/05322, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 4, 1990, Ser. No. 679,065
Claims priority, application Switzerland, Oct. 5, 1989, 3643/89
Int. Cl.[5] G09F *3/10*
U.S. Cl. 40—638 24 Claims



10. A labelling system for labelling a product, wherein the wording of the label needs to be altered periodically or according to the contents of a packaging of the product, comprising:

a plurality of labels arranged in a stack, each label having a non-adhesive indicia-receiving front surface and an adhesive rear surface facing opposite from said front surface and including adhesive on a majority of said rear surface, the adhesive on the rear surface of each label in the stack, with the exception of a lowermost label, overlying and being detachably adhered to the non-adhesive indicia-receiving front surface of an underlying label so that when a label is removed from the underlying label in the stack, the indicia-receiving front surface of the underlying label is made available for writing; said adhesive providing means for removably fastening the labels in said stack so as to allow an uppermost label of the stack to be removed to expose the indicia-receiving front surface of the underlying label to permit information regarding the contents of the packaging to be recorded on the front surface of said underlying label when it is desired to alter the wording of the uppermost label.

5,195,266
FISH LURE
Robert H. Troescher, 33 Abrams Pl., Lynbrook, N.Y. 11563
Filed Dec. 18, 1991, Ser. No. 809,339
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—17.6 6 Claims



1. A fish lure comprising

a transparent tube,

a light emitting diode in the tube,

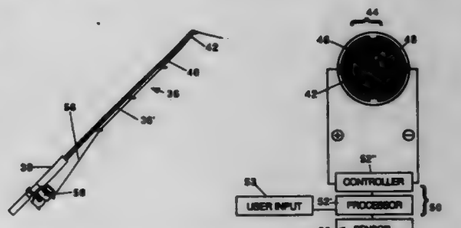
a first metallic sleeve in the tube in contact with the inner wall thereof,

a second metallic sleeve in the tube in contact with the inner wall thereof and with the first metallic sleeve,

a third metallic sleeve inside of and spaced from the second metallic sleeve, and

a power supply device in the first metallic sleeve in electrical communication with all of the sleeves and the diode.

5,195,267
TENSION RESPONSIVE FISHING APPARATUS
John J. Daniels, 350 Bristol St. Unit A-1, Waterbury, Conn. 06708
Filed Oct. 8, 1991, Ser. No. 772,930
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—18.1 8 Claims



1. A tension responsive fishing apparatus, comprising: a pole member having an interior; a variable viscosity fluid disposed in the interior, variable in response to an applied field, and effective for varying a flexibility of the pole member depending on the viscosity of the variable viscosity fluid; field applying means for applying the applied field to the variable viscosity fluid; and controlling means for controlling the field applied by the field applying means.

5,195,268
WEEDLESS HOOK FOR LURES
Gregory T. Ellis, 12752 N. MacArthur, Apartment G, Oklahoma City, Okla. 73142, and Charles W. Jackson, 12742 N. MacArthur, Apartment B, Oklahoma City, Okla. 73142
Filed Nov. 21, 1991, Ser. No. 795,536
Int. Cl.[5] A01K *83/02*
U.S. Cl. 43—37 9 Claims

1. A fishing apparatus comprising:

a hook having a shank, a curved throat portion and a point, said curved throat portion being sufficiently resilient that said point can be moved toward said shank to a retracted position and so that upon release of said point from said retracted position, said resilient curved throat portion will spring said point back to an extended position; and

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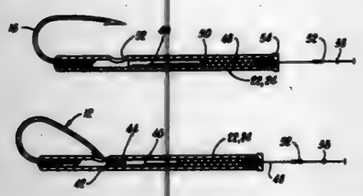
releasable retaining means for retaining said point in said retracted position and for releasing said point from said retracted position when tension is applied to a fishing line attached to said apparatus, said releasable retaining means including:

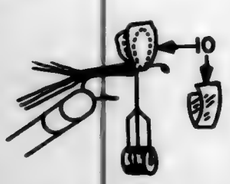
an outer member attached to said shank of said hook, said outer member having an elongated inner passage defined therethrough and having a wall with a side opening defined through said wall and communicated



with said passage, said side open being positioned to receive said point of said hook therethrough when said point is in its retracted position; and

an inner member slidably received in said elongated inner passage, said inner member being slidable between a first position wherein said inner member can engage said point of said hook to hold said point in its said retracted position, and a second position wherein said point is released.

5,195,269
FLY TYING FILM
William J. Black, 2151 Whistlers Park La., and Kenneth A. Ferguson, 2195 W. Military Ave., both of Roseburg, Oreg. 97470
Filed Aug. 2, 1991, Ser. No. 739,909
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.25 **10 Claims**



1. A method of making a fly-tying film for use as body parts of an artificial fishing fly comprising the steps of:

providing first and second sheets of low-density polyethylene film characterized as being resilient when stretched with a predetermined tension and being nonresilient when stretched with a tension greater than the predetermined tension and less than a yield tension;

adhering a face of the first sheet to a face of the second sheet;

workhardening the adhered first and second sheets by stretching the adhered first and second sheets with a tension greater than the predetermined tension and less than the yield tension.

5,195,270
FLORAL STAND
Kevin X. Donnrat, 4135 Dixie Canyon Ave., Sherman Oaks, Calif. 91423
Filed Aug. 9, 1991, Ser. No. 743,218
Int. Cl.[5] A01G *5/00*
U.S. Cl. 47—41.01 **2 Claims**

1. A flower holding stand comprising:

(a) a hollow shell, shaped in any pleasing configuration for flower and ranch display; said shell having cut in its circumferential strip or outer edge, a multiplicity of holes which are sized to accommodate flower or branch stems;

(b) a watering means inside said hollow shell, said means comprising two or more pads made of a water porous material, said pads each being located inside said hollow shell and glued to an opposite inner face of said shall; said pads having a thickness sized so that a small space, sufficient to grip a flower stem or branch is left between said pads; said pads being oriented inside said hollow shell so that said space between them is lined up with said multiplicity of holes in said shell to permit insertion of flower stems through said holes and between said pads;

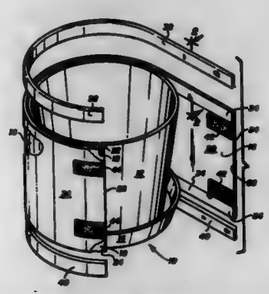
(c) two or more spring clips inside said shell to assist in

gripping flower stems or branches; said spring clips being made of flexible strips of polystyrene plastic, sized and shaped to fit around the edges of said porous pads, and glued on one edge of each clip to an opposite inner face of said shell, leaving a small space sufficient for a flower stem between each spring clip; and

(d) a means for holding said shell upright, attached to said shell;

said hollow shell being made from polystyrene plastic sheet or equivalent plastic material for light weight; said porous pads and spring clips acting to grip said flower or branch stems and watering them independent of the orientation of said shell and flower arrangement, whether horizontal or vertical.

5,195,271
PLANT CONTAINER COVER
James B. Bradley, Jr., 4805 Inverness Dr., Tyler, Tex. 75703
Filed Jan. 12, 1992, Ser. No. 897,889
Int. Cl.[5] B65D *65/10*
U.S. Cl. 47—72 **3 Claims**



1. A plant container cover adapted to cover a plant container, said cover comprising:

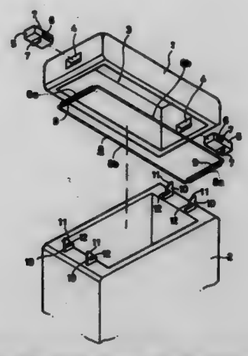
flexible sheet material conformable to the shape of a plant container, said sheet material having interior and exterior side walls, parallel top and bottom edges, and first and second ends, said interior side wall being disposed adjacent to a plant container and said sheet material being slideably disposed around a plant container;

a flexible covering for said flexible sheet material being disposed adjacent to said exterior side wall of said sheet material for completely covering said exterior side wall and extending over said top and bottom edges of said sheet material;

first fastener means for detachably interconnecting said covering to said sheet material, said first fastener means being disposed adjacent to said top and bottom edges of said sheet material and including top and bottom edges respectively of said sheet material for engaging said covering on both said interior and exterior side walls of said sheet material; and

second fastener means disposed adjacent said ends of said flexible sheet material for selectively interconnecting said ends, such that said flexible sheet material encircles a plant container.

5,195,272
LID SWITCHING DEVICE
Satoshi Yamada, Yokosuka, Japan, assignor to Kato Hatsujo Kaisha, Ltd., Kanagawa, Japan
Filed Sep. 23, 1991, Ser. No. 764,192
Claims priority, application Japan, Dec. 17, 1990, 2-411051
Int. Cl.[5] E05D *15/50*
U.S. Cl. 49—193 **8 Claims**



1. A switching device for use in opening and shutting a lid, having through holes in opposite sides thereof, on a box body in either of two directions, comprising:

a pair of operating buttons adapted to be independently supported in the through holes of the lid, each of said operating buttons having an oblong hole formed therein and a stopper part mounted thereon for preventing said operating buttons from being pushed outwardly through the through holes beyond a predetermined extent;

spring means for resiliently urging said operating buttons outwardly away from one another, said spring means comprising a rectangular wire spring adapted to be disposed in an inner portion of the lid in a flexed fashion, said rectangular wire spring including a pair of oppositely disposed resilient parts formed integrally with a pair of oppositely disposed rotary shaft parts which are loosely fitted in said oblong holes, respectively; and

a pair of upright lock members adapted to be fixed on opposing edges of a periphery of the box body, each of said lock members having a U-shaped lock hole part for detachably receiving a respective one of said rotary shaft parts, and a tapered guide part for guiding said respective one of said rotary shaft parts into said U-shaped lock hole part.

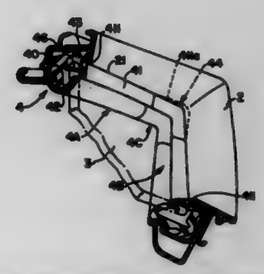
5,195,273
STRUCTURE OF WINDOW RUN-INTEGRATED GUIDE APPLICABLE TO AN AUTOMOTIVE VEHICLE
Katsumi Yamane, and Toshiaki Yamaguchi, both of Chiba, Japan, assignors to Kanagawa Rubber Industrial Co., Ltd., Chiba, Japan
Filed Aug. 28, 1991, Ser. No. 751,145
Claims priority, application Japan, Aug. 31, 1990, 2-231208
Int. Cl.[5] E05D *15/16*; E06B *7/16*
U.S. Cl. 49—441 **5 Claims**

1. A structure of a window guide integrally formed with a window run applicable to an automotive vehicle, comprising:

a) a window run member mounted on a door sash having an edge portion formed at a part of a side wall thereof facing outside of a vehicular body; and

b) a window guide boadingly formed along the edge portion of the window run and having an extended portion extending from the contour of the window run, the extended portion having a substantially oblique U-shaped cross section having an inner surface.

5,195,274
STRUCTURE FOR ATTACHING DOOR GLASS RUN
Kunio Mishima, and Masahiro Nozaki, both of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Continuation of Ser. No. 725,678, Jul. 3, 1991, abandoned. This application Aug. 19, 1992, Ser. No. 931,661
Claims priority, application Japan, Jul. 4, 1990, 2-177052
Int. Cl.[5] E06B *7/22*
U.S. Cl. 49—441 **3 Claims**



1. A structure for attaching a door glass run to door frame of a motor vehicle, comprising:

a door frame having a substantially U-shaped cross-section, said door frame including a corner part; and

a door glass run having a substantially U-shaped cross-section, said door glass run being provided with a stepped portion in an outer side wall along an end edge thereof, said stepped portion protruding outwardly, said stepped portion having a lateral portion and a vertical portion, said lateral portion and said vertical portion being joined by a corner portion,

said corner portion being composed of a lateral rising part and a vertical rising part which continue toward each other to a center of a corner of said corner portion, said

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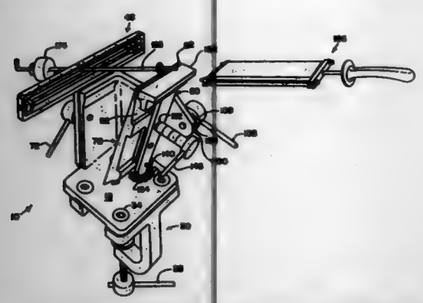
lateral rising part gradually rising along a lateral outer edge of said corner portion in a direction along said outer side wall of said door glass run, and said vertical rising part gradually rising along a vertical outer edge of said corner portion in a direction along said outer side wall of said door glass run, so as to form a corner rising portion, said stepped portion engaging with an end edge of said door frame with said corner rising portion being engaged with and compressed by said end edge of said corner part of said door frame when said door glass run is attached to said door frame.

5,195,275
BLADE SHARPENER

Peter C. McLean, Heathridge, Australia, assignor to McLean Pty. Ltd., Doubleview, Australia

PCT No. PCT/AU89/00260, § 371 Date Feb. 5, 1991, § 102(e) Date Feb. 5, 1991, PCT Pub. No. WO89/12529, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 19, 1989, Ser. No. 646,775
Claims priority, application Australia, Jun. 20, 1988, PI8857
Int. Cl.[5] B24B *3/36*
U.S. Cl. 51—69 14 Claims

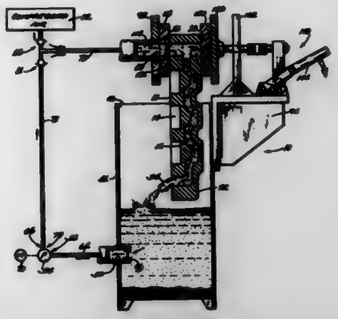


1. A blade sharpener for sharpening an edge of a blade of a cutting instrument, comprising:
(a) a frame having a first upright member, a second upright member disposed at right angles to the first upright member, and a base upon which the first upright member and the second upright member are mounted, said base being attachable to a bench;
(b) guide means attached to said first upright member and capable of guiding a sharpening tool over the blade of said cutting instrument at an appropriate sharpening angle, said guide means comprising an elongated member comprising a pair of parallel guides forming a longitudinal slot therebetween, and a channelled bar with a longitudinal slot, said channelled bar extending from the elongated member to form a "T" bar therewith, said first upright member having a rib, said rib slidably receiving said channelled bar to provide height adjustment for the elongated member; and
(c) a blade clamping means for holding the blade of said cutting instrument at a prescribed angle relative to the guide means wherein the sharpening tool can be guided by the guide means over the blade at said appropriate sharpening angle, the blade clamping means having:
(i) a first jaw comprising a relatively thin first end and a second end, a first surface and a second surface, said second surface facing in an opposite direction to said first surface, each of said surfaces extending between said first end and said second end, said first surface being substantially flat and said second surface having a ledge diverging from said first end towards said second end, a flange extending from a longitudinal edge of said first jaw and pivotally connecting said first jaw to said second upright member, whereby, in use, an angle of inclination of said first jaw can be pivotally adjusted through at least 180° in a plane substantially perpendicular to an edge of the blade of said cutting instrument; and
(ii) means to clamp the cutting instrument against said first jaw at a location selected from a group consisting of the ledge, the first surface and the second surface whereby, in use, a blade of any cutting instrument selected from a group consisting of a knife, scissors, shears, clippers, an axe, a chisel, a saw and a chain saw, can be held in said blade clamping means at said prescribed angle to effect sharpening of the blade.

5,195,276
APPARATUS AND METHOD FOR FLUSHING A CASTING

John R. Vennerholm, Spruce Pine, N.C., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 15, 1991, Ser. No. 657,658
Int. Cl.[5] B24C *1/00, 3/32*
U.S. Cl. 51—320 20 Claims



1. An apparatus for flushing a workpiece including a passageway having an inlet and an outlet, said apparatus comprising means adapted to communicate with the inlet and with the outlet for circulating a fluid through a fluid flow loop including the workpiece passageway, and means located downstream of the outlet and upstream of the inlet for removing from said fluid substantially all relatively large particles flushed from the passageway and for allowing relatively small particles flushed from the passageway to remain in said fluid so that the relatively small particles are recirculated through the passageway to act as the sole cleaning medium other than said fluid.

20. A method for flushing a workpiece including a passageway having an inlet and an outlet, said method comprising the steps of introducing a fluid containing substantially no solids into the passageway inlet, removing from fluid discharged from the passageway outlet substantially all relatively large particles and allowing relatively small particles flushed from the passageway to remain n said fluid, and reintroducing said fluid into the passageway inlet so that the relatively small particles pass through the passageway and are substantially the only solids in said fluid.

5,195,277
BLADE SHARPENING METHOD

Richard L. Courcheane, 3931 Sherwood Blvd., Delray Beach, Fla. 33445

Division of Ser. No. 538,542, Jun. 14, 1990, Pat. No. 5,103,597. This application Feb. 12, 1992, Ser. No. 834,487
Int. Cl.[5] B21K *17/00*
U.S. Cl. 51—327 4 Claims

1. A method for sharpening a blade having a turning section, a neutral zone, and a power section comprising the steps of,
selecting two elements which are pivotally connected which can both receive and secure an abrading member and a non-abrading member in longitudinal parallel orientation with a blade,
securing the abrading member in one of the two members and securing the non-abrading member in the other,
fixing the pivotal connection between the two members to provide engagement with the blade at preselected areas,
and reciprocating one member to trailingly move the other member in the same plane common to both members and the plane of the blade,
preselecting abrading members of varying cross-sections,
whereby a user of the method can sharpen the blade and preselect a wide variety of blade profiles along a wide variety of lengths of a blade and shape the same.

3. A method of sharpening a blade having a turning section, a neutral zone, and a power section by a person comprising the steps of,

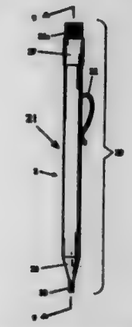
selecting two elements pivotally connected to each other which can both receive and secure a blade in longitudinal parallel orientation with at least one abrading member,
securing an abrading member in one of the two elements and securing a non-abrading member in the other element,
fixing the pivotal connection between the two members to provide engagement with the blade at preselected areas of the blade by preselectively pivoting the one member with regard to the other,
and reciprocating the blade in the element containing the abrading section while the blade is supported for movement by the element having the non-abrading portion while both are in the same plane which is also the plane of the blade,
whereby the person sharpening the blade may preselect a wide variety of blade profiles along a wide variety of lengths of a blade.

5,195,278
ABRADING TOOL

Donald E. Grove, 7200 Galgate Dr., Springfield, Va. 22153

Continuation-in-part of Ser. No. 437,380, Nov. 16, 1989. This application Sep. 12, 1991, Ser. No. 757,934
Int. Cl.[5] B24D *15/00*
U.S. Cl. 51—392 2 Claims

1. An abrading tool for close spaces comprising
manually-controllable abrasive material support means consisting of a mechanical pencil device, and
a rope core of abrasive material selectively removable and replaceable in said mechanical pencil device,
said mechanical pencil device comprising
an outer barrel having first threads formed in an inner wall of said barrel at its lower end, second threads formed in an outer wall of said barrel at its upper end, and third threads formed in the inner wall of said barrel at its mid-section;
a pencil tip threadedly attachable to said first threads of said outer barrel; and
an abrasive material feed assembly disposed within said mechanical pencil device and threadedly attachable to said second threads of said outer barrel,

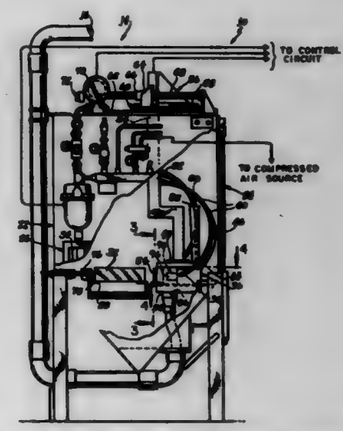


said rope core of abrasive material being selectively engageable within said feed assembly in a manner to be selectively fed through said pencil tip.

5,195,279
STENCILING APPARATUS WITH SYSTEM FOR RECYCLING STENCILING MATERIAL

Michael J. Wern, Mokena, Ill., assignor to Engineered Abrasives, Inc., Worth, Ill.

Filed Feb. 27, 1992, Ser. No. 843,905
Int. Cl.[5] B24C *3/02, 9/00*
U.S. Cl. 51—415 25 Claims



1. A stenciling apparatus for stenciling a predetermined pattern on a workpiece by directing stenciling material involved with forced air against the workpiece comprising: a stenciling chamber and a suction means operatively connected to the stenciling chamber for providing suction to the stenciling chamber; the stenciling chamber including a housing and a stenciling box shiftably mounted within the housing; the stenciling box being shiftable between a first position for operatively engaging the workpiece for stenciling, and a second position for allowing movement of the workpiece into and out of the stenciling chamber; the box having a first opening and a second opening therein; a funnel being connected to the first opening for allowing air to be sucked into the box; and the second opening being connected to the suction means such that when the suction means provides suction, air will be sucked into the box through the funnel, the air will catch up the sten-

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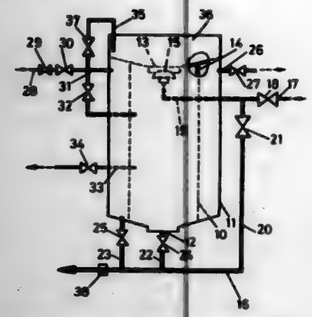
ciling material, and the air and the caught up stenciling material will be sucked out of the box.

5,195,280
ABRASIVE BLASTING APPARATUS
Bruce Nicholson, Knaresborough, and Ronald Davis, Bradford, both of United Kingdom, assignors to Gegenarch Limited, Knaresborough, United Kingdom
Continuation of Ser. No. 411,509, Apr. 12, 1991, abandoned. This application Jul. 20, 1992, Ser. No. 917,785
Claims priority, application United Kingdom, Apr. 9, 1987, 8708499
Int. Cl.[5] B24C *7/00, 9/00*
U.S. Cl. 51—436 12 Claims



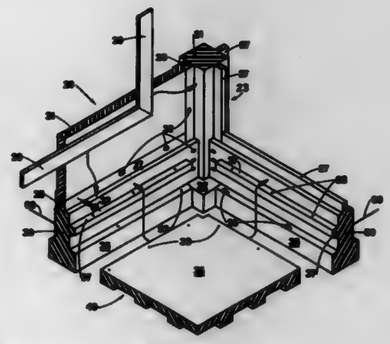
1. An abrasive blasting apparatus comprising:
a first receptacle adapted to contain a particulate material or a particulate material and a liquid combination and including an inlet and a bottom outlet;
a second receptacle to contain material to be mixed with the contents of the first receptacle and also including an inlet and a bottom outlet;
a delivery line in communication with the respective bottom outlet of each of the first and second receptacles;
a source of pressurized fluid connected to the delivery line;
means connecting the source of pressurized fluid with the interior of one of the receptacles and capable of directing pressurized fluid into said one receptacle behind the receptacle's contents in terms of the outflow of said contents from the receptacle through the bottom outlet; and
communication means between the interiors of the first and second receptacles to substantially balance the fluid pressure both between the interiors of the receptacles and between the interiors of the receptacles and the delivery line to facilitate simultaneous outflowing of the contents of the first and second receptacles through their respective outlets into the entraining fluid flowing along the delivery line.

5,195,281
DECK TROUGH
John J. Kosko, 20609 Hazelnut Ct., Germantown, Md. 20874
Filed Jun. 2, 1992, Ser. No. 892,321
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—11 5 Claims

1. A device was installed between the floor support joists of a wooden deck, said device comprising a water-tight, trough-like receiver sized to fit between and extend along the entire length of adjacent floor joists thereby covering the area between and below said joists, said device having means to collect and channel water entering said area, said receiver further comprising integral lips covering the top surfaces of adjacent joists, said lips providing means for attaching said receiver to and suspending said receiver between said joists, said receiver having a pitched depth from a shallow end to a deep end, said

receiver further comprising an outlet in said deep end providing means of water to escape.

5,195,282
LOW COST-MODULAR ELEMENT HOUSING
E. Logan Campbell, 346 W. Campbell, Phoenix, Ariz. 85013
Filed Jan. 29, 1990, Ser. No. 471,367
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—79.1 12 Claims



1. Means for assembling a building, for human occupancy, of preformed structural modules comprising in combination, on a plot of earth with a defined building grade level;
a column structural module for resisting vertical and lateral forces encountered in a building of a size suitable for human occupancy and utilizing said column, said column having a longitudinal axis and a base configured for supporting said column with said base below grade level in said earth;
a beam structural module for establishing a load hearing structural element for a building of a size suitable for human occupancy and utilizing said beam, said beam having a longitudinal axis;
said column and said beam each being performed and having complementary interlocking, mating configurations such that, when said column and said beam are interlockingly, matingly coupled by juncture of said complementary interlocking configurations, the longitudinal axis of said beam will be constrained to be generally orthogonal to the longitudinal axis of said column, said beam being interlocked with said column and said beam is a footer beam for establishing a load bearing footing for a building utilizing said beam, said footer beam configured for load bearing in said earth below said grade level;
a plurality of said columns and a plurality of said footer beams, each of said footer beams having a first end and a second end;

a first end of a first said foot beam being coupled below said grade level in said earth to a first said column adjacent the second end of a second said footer beam also coupled to said first column, also below grade level in said earth;
all said columns and said footer beams being so coupled so as to define a first enclosed area on said plot of earth;
each said column and said footer beam being coupled by juncture of said complementary interlocking mating configurations, whereby the longitudinal axis of each said footer beam is constrained to form aright angle with the longitudinal axis of said column to which said footer beam is coupled, by virtue of the mating of said complementary interlocking mating configurations;
a header beam structural module for establishing an overhead, load bearing header for a building utilizing said header beam, said header beam having a longitudinal axis;
said header beam being preformed and having a interlocking mating configuration complementary to said interlocking mating configuration of said column such that when said column and said header beam are matingly interlockingly coupled by juncture of said complementary mating configurations, the axis of said header beam will be constrained to be generally orthogonal to the axis of said column, said header beam being interlockingly coupled to said column;
a plurality of said header beams, each of said header beams having a first end and a second end;
a first end of a first said header beam being coupled to a first said column adjacent the second end of a second said header beam also coupled to said first column;
all said columns and said header beams being so coupled so as to define a second enclosed area;
each said column and said header beam being coupled by juncture of said complementary interlocking configurations, whereby the longitudinal axis of each said header beam is constrained to form a right angle with the longitudinal axis of said column to which said header beam is coupled, by virtue of the interlocking of said complementary interlocking configurations;
a ceiling/roof structural module, said ceiling/roof structural module being coupled to at least one of said header beams and having complementary interlocking configurations to permit said ceiling/roof structural module to be coupled matingly with an adjacent ceiling/roof structural module;
a plurality of said ceiling/roof modules coupled to said header beams about the periphery of said second enclosed area, each said ceiling/roof module being further coupled to a ceiling/roof module adjacent to it;
said plurality of ceiling/roof modules, so coupled, defining a roof covering said second enclosed area;
said second enclosed area further defining a horizontal plane when said columns are vertical, by virtue of the interlocking of all said complementary mating configurations made between columns and header beams, ceiling/roof modules and header beams, and adjacent ceiling/roof modules; and
a wall enclosure module configured for mating coupling with said complementary interlocking configurations of said columns, footers, and headers;
said wall enclosure module being matingly coupled to at least one of said header beams.

5,195,283
SOFFIT VENT AND BRACKET
Richard J. MacLeod, Milford; Charles E. Schiedegger, Metamora, and Jack G. Wnuk, Lapeer, all of Mich., assignors to Mid-America Building Products Corporation, Plymouth, Mich.
Filed Oct. 31, 1991, Ser. No. 785,495
Int. Cl.[5] F24F *13/18*
U.S. Cl. 52—95 10 Claims

1. A combined soffit vent and bracket comprising,
a one piece plastic extrusion having an end wall adapted to be attached to one of a fascia board and an outside wall of a house and extend generally vertically,
a vent panel integral with and extending substantially perpendicularly from said end wall,
vent means provided in said vent panel, and

a bracket integral with said vent panel defining an open channel facing away from said end wall for receiving one end of a soffit,
said vent panel with vent means therein being located between said end wall and said bracket.

5,195,284
DRYWELL COVER AND DRYWELL
Thomas Florence, Canterville, Mass., assignor to Owl 1990 Trust, Hyannis, Mass.
Continuation of Ser. No. 661,464, Feb. 26, 1991, Pat. No. 5,131,196, which is a continuation-in-part of Ser. No. 619,115, Nov. 28, 1990, Pat. No. 5,086,594, which is a continuation-in-part of Ser. No. 407,361, Sep. 14, 1989, Pat. No. 4,982,533, and a continuation-in-part of Ser. No. 394,635, Aug. 16, 1989, Pat. No. 4,983,069. This application Jun. 15, 1992, Ser. No. 898,798
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Int. Cl.[5] E04B *11/00*
U.S. Cl. 52—169.5 10 Claims

1. A cover for a drywell, which cover comprises:
a) a base cover having an outer periphery and a top and bottom surface and which base cover is adapted to extend over the drywell to be covered;
b) a generally central, raised wall section of defined height extending from the top surface of the base cover and defining an inner section;
c) a plurality of at least three, generally uniformly spaced apart, radially raised support rib elements on the top surface and extending between the outer periphery of the top surface and the raised wall section; and
d) an inner section of the wall section which includes a knock-out cover with mechanically weakened supports, which knock-out cover is adapted to be easily removed to open the inner section.

hole having the duct end adjacent to the conductor-carrying portion adapted to be secured to said hub, a free portion

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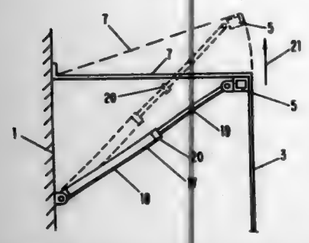
5,195,285

DEFORMABLE SEALING DEVICE FOR A GAP BETWEEN A WALL OPENING OF A BUILDING WALL AND A BACK WALL OF A VEHICLE

Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Sep. 25, 1990, Ser. No. 766,560
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1990, 4111367; Sep. 25, 1990, 4030233
Int. Cl.[5] E04H *14/00*
U.S. Cl. 52—173 DS 23 Claims



1. A deformable sealing device for a gap between a wall opening of a building wall and a back wall of a vehicle docking at the wall opening, said sealing device comprising a flappy deformable skirt, support bodies, and a transverse support, said deformable skirt comprising an upper transverse portion with an upper edge, said upper edge connected to said transverse support, said deformable skirt further comprising two deformable vertical strips that are arranged parallel to vertical sides of the wall opening and are supported at respective ones of said support bodies, that are elastically deformable in a direction towards the building wall, said sealing device further having a top cover extending from said upper transverse portion to the building wall, wherein the improvement comprises:

said transverse support together with said upper transverse portion and said top cover being supported so as to be liftable from and returnable to an initial position, with said transverse support pivotable about a horizontal axis by pivotable guide rods, said horizontal axis being located adjacent to the building wall, and with a length of said guide rods being adjustable.

5,195,286

CEILING INFEED MODULE

Ronald B. DeLong, Belmont, and Allen L. Palmbos, Georgetown, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1991, Ser. No. 697,372
Int. Cl.[5] E04F *17/08*
U.S. Cl. 52—220 21 Claims

1. A ceiling infeed module for use in routing electrical and communication cable from a suspended ceiling system to a free standing, space dividing wall panel system comprising, in combination,

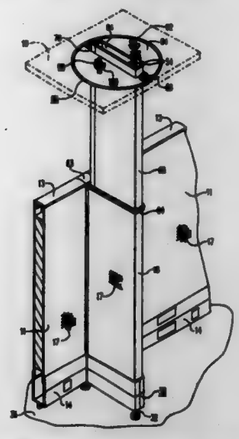
a ceiling panel adapted to be disposed in a suspended ceiling system, said ceiling panel having an aperture therethrough;

a hollow, space dividing wall panel spaced below said ceiling panel having an open top end;

a C-shaped in cross section, tubular member having a top end, a bottom end and an open side edge arranged to receive preexisting electrical and communication cables, said tubular member interconnecting the aperture in said ceiling panel and the top end of said wall panel;

a releasably retained side cap adapted to close off said open side edge of said C-shaped tubular member; and

an interconnected means connecting the bottom end of said tubular member and the open top end of said wall panel, said interconnecting means comprising a C-shaped, snap



fit, living hinge construction having open ends which are engageable to close said interconnecting means.

5,195,287

PANEL AND METHOD OF MAKING THE SAME

Bradley J. Bruggink, Oostburg, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Continuation of Ser. No. 495,846, Mar. 19, 1990, abandoned.
This application Sep. 24, 1991, Ser. No. 764,943
Int. Cl.[5] E04B *5/48*
U.S. Cl. 52—221 21 Claims

1. A panel comprising

a substantially rigid layer having therein an endless cut dividing said rigid layer into a main portion and a cut-out portion, and

a flexible layer fixed to said rigid layer, said flexible layer connecting said cut-out portion to said main portion and thereby holding said cut-out portion stationary relative to said main portion without other connecting means between said cut-out portion and said main portion.

5,195,288

FLOOR FITTING

John Penczak, Washington, W. Va., assignor to Butler Manufacturing Company, Parkersburg, W. Va.

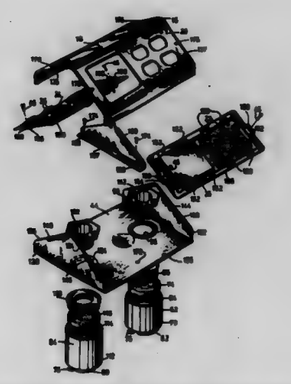
Filed Aug. 30, 1991, Ser. No. 752,878
Int. Cl.[5] E04F *17/00*
U.S. Cl. 52—220.1 15 Claims

1. An improved floor fitting to be positioned on a floor surface of a concrete floor and activated from two conductor-carrying ducts within the concrete floor through two separated activation holes in the floor that each extend from an opening in the floor surface to a hole in a wall of one of the conductor-carrying ducts and two floor fitting inserts, each insert defining a conductor passage extending through the insert from a duct end to a base end and secured in one activation hole, one insert sized to be positioned in one activation

hole having the duct end adjacent to the conductor-carrying duct with the conductor passage communicating with the hole in the wall of the conductor-carrying duct and the base end adjacent to the activation hole opening in the floor surface, and the other insert sized to be positioned in the other activation hole having the duct end adjacent to the conductor-carrying duct with the conductor passage communicating through the hole in the wall of the conductor-carrying duct and the base end adjacent to the activation hole opening in the floor surface, the floor fitting comprising:

a base sized to overlie a section of the floor surface surrounding the two activation hole openings and constructed to define two activation openings, one positioned to overlie one activation hole opening and the other positioned to overlie the other activation hole opening;

the base end of one insert secured to the base adjacent to one of the activation openings with the conductor passage of the insert communicating through the activation opening



and the base end of the other insert secured to the base adjacent to the other activation opening with the conductor passage of the other insert communicating through the other activation opening;

a cover constructed to overlie the base defining a housing interior between the cover and the base that communicates with the conductor passages of the floor inserts and defining openings that communicate with the housing interior; and

a connector frame adapted to support and position connectors adjacent to openings in the cover to accept plug connections from outside the housing, and to be secured to the base independent of the cover

whereby a connector positioned in the housing interior adjacent to the openings in the cover may be connected to conductors entering the interior of the housing through the activation openings from the conductor passages and the conductor carrying ducts and connected to connectors in the floor fitting.

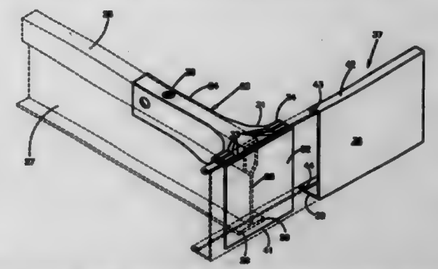
5,195,289

TRIM SYSTEM FOR SUSPENSION CEILINGS

Paul D. LaLonde, Avon; J. Wesley Sroub, Parma, and James A. Fetterick, Olmsted Falls, all of Ohio, assignors to USG Interiors, Inc., Chicago, Ill.

Filed May 31, 1991, Ser. No. 708,975
Int. Cl.[5] E04B *5/52*
U.S. Cl. 52—484 24 Claims

12. A suspension ceiling trim connector for mounting elongated trim strips on grid tee members along exposed edges of ceiling grids formed of interconnected elongated grid tee members having a central web, opposed panel supporting flanges along one edge of said web, and a stiffening bulb along the opposite edge of said web, said connector comprising a support portion adapted to be secured to said bulb, a face portion providing ends adapted to lock into elongated trim strips, and a pivot connecting said support portion and face portion, said



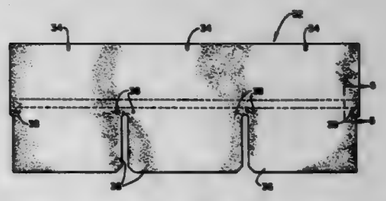
face portion being pivotally moveable relative to said support portion to align said face portion with trim strips extending in a variety of directions relative to a supporting grid tee member.

5,195,290

LAMINAR ROOFING PRODUCT

John K. Hulett, Plymouth, Minn., assignor to American Heartland Roofing Products, Inc., Plymouth, Minn.

Filed Jun. 3, 1992, Ser. No. 893,224
Int. Cl.[5] E04D *1/00*
U.S. Cl. 52—518 12 Claims



1. A continuous roll shingle product, comprising:

(a) a first substrate including a woven polyester mat;

(b) a second substrate, overlying and adhered to said first substrate, including an asphalt material;

(c) a third substrate, overlying and adhered to said second substrate, including a weather surface; and

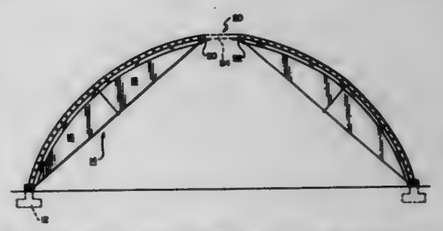
(d) an adhesive applied to an undersurface of said first substrate.

5,195,291

SPHERICAL WOODEN TRUSS FRAME BUILDING

Patrick G. Pomento, 802 W. Embargo St., Rome, N.Y. 13440

Filed Apr. 1, 1991, Ser. No. 678,446
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—644 6 Claims



1. A wooden roof truss member, for use in the formation of a partially spherical building, said truss member constructed

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for mounting at the base end on a foundation support and at the crown end to at least one matching roof truss member to form a roof frame member comprising in combination:

a pair of truss segments joinable in abutting relationship to form a chordal portion of a circle;

each truss segment including a linear inner chord portion and an arcuate outer chord portion;

the inner and outer chord portions being joined together at a first end and spaced apart at a second end a distance equal to the altitude of the circle chord formed by said pair of truss segments;

a seating stud member joining said second ends of said inner and outer chord portions of said pair of truss segments, said seating stud being essentially perpendicular to said inner chord to form a corner therewith, so that the truss segments can be pivoted about the corners to place the seating studs in abutting contact with the arcuate chords of the two truss segments forming a chordal portion of a circle;

hinge means joining the inner chord portions of said truss segments at the corners; and

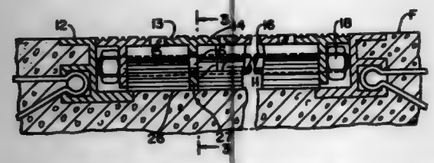
fastening means locking said seating stud members of said truss segments together in abutting contact.

5,195,292

RESILIENTLY MOUNTED RIGID FLOOR GRATING

Michael A. Bedica, Poughquag, N.Y., assignor to Pawling Corporation, Pawling, N.Y.

Filed Dec. 17, 1990, Ser. No. 628,218
Int. Cl.[5] E04F *15/00*; E04C *2/42*
U.S. Cl. 52—664 **5 Claims**



1. A resiliently mounted and constructed rigid floor grate assembly which comprises,

(a) a plurality of rigid metallic tread rails arranged in side-by-side, spaced apart relation,

(b) said tread rails having upper tread portions forming an effectively substantially continuous grating surface provided with regularly spaced openings between adjacent tread rails for the passage of foreign materials,

(c) said tread rails further having integral web portions projecting downwardly from said tread portions,

(d) the tread portions of said tread rails having side edges and said downwardly projecting web portions being located inwardly from at least one of said side edges,

(e) a plurality of spaced apart connecting elements extending at right angles to said tread rails,

(f) said connecting elements being positioned beneath said tread portions and passing through openings formed in said web portions, and

(g) a plurality of resilient spacing and support elements associated with said connecting elements and extending between adjacent web portions of each pair of adjacent tread rail members,

(h) said spacing and support elements serving to retain said tread rail members in uniformly spaced-apart relation to each other,

(i) said spacing and support elements having upwardly facing upper surface portions engaging and supporting downwardly facing surface portions of said tread portions,

(j) the vertical height of said spacing and support elements being at least slightly greater than the height of said web portions, whereby the lower edges of said web portions are supported in elevated relation to the surface on which said grating is placed,

(k) said spacing and support elements each having an opening therein extending from one end to the other and receiving said connecting elements,

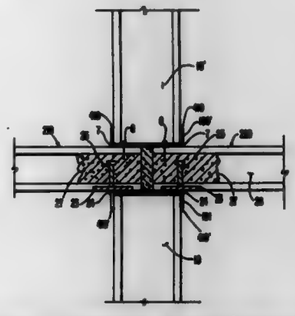
(l) said openings being of a size and shape to accommodate unresisted downward movement of said connecting elements relative to said openings.

5,195,293

STRUCTURAL SYSTEM FOR SUPPORTING A BUILDING UTILIZING LIGHT WEIGHT STEEL FRAMING FOR WALLS AND HOLLOW CORE CONCRETE SLABS FOR FLOORS AND METHOD OF MAKING SAME

Edward R. diGirolamo, #8 Stengle Pl., Smithtown, N.Y. 11787; Thomas Colasanto, 40 Pinewood Dr., Commack, N.Y. 11725, and Jonathan C. Rothstein, 155 E. 29 St., Apt. 17B, New York, N.Y. 10016

Division of Ser. No. 493,794, Mar. 15, 1990, Pat. No. 5,113,631.
This application Apr. 2, 1992, Ser. No. 866,887
Int. Cl.[5] E04G *21/00*
U.S. Cl. 52—745 **9 Claims**



1. A method of constructing a structural support system of a building from a first level of light weight steel framed bearing wall panels, including interior bearing wall panels and exterior bearing wall panels, a first level of prefabricated, hollow core concrete slabs having longitudinal sides and transverse ends, and a foundation, comprising the steps of:

a) attaching a first level of interior bearing wall panels to the foundation in a vertical position at predetermined intervals in a first direction along the foundation;

b) attaching a first level of exterior bearing wall panels to the foundation in a vertical position parallel to, and spaced outwardly from, the interior bearing wall panels;

c) placing the hollow core concrete slabs in a horizontal position on top of adjacent bearing wall panels to form a first floor; and

d) positively interlocking the concrete slabs with the bearing wall panels to form a unitary structure.

5,195,294

CONTAINER FILLING AND SEALING SYSTEM

John Baranowski, Bensalem, Pa., assignor to Campbell Soup Company, Camden, N.J.

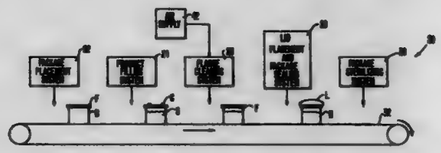
Filed Jan. 15, 1991, Ser. No. 641,138
Int. Cl.[5] B65B *7/28*, *55/02*
U.S. Cl. 53—167 **38 Claims**

1. A system for filling and sealing containers having an opening surrounded by a generally horizontal flange, said system comprising:

means for conveying said containers along a conveyance path;

filling means for filling said containers with a product;

cleaning means for cleaning contaminants off of the generally horizontal flanges of the containers after being filled by said filling means and without disturbing the container's product by blowing a cleaning fluid stream generally downward to the generally horizontal flanges, said cleaning means including a template having fluid flow-through opening pattern means for defining the cleaning fluid stream, said pattern means being selected to correspond to



the configuration and dimensions of the container flanges and operative to direct cleaning fluid onto said container flanges in a stream whose shape conforms substantially to the peripheral shape of said flanges to prevent said stream from blowing directly into said containers and disturbing the product; and

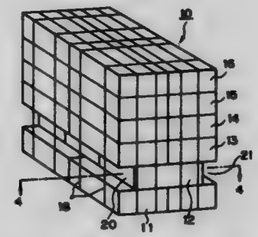
sealing means for thereafter sealing the filled containers cleaned by said cleaning means.

5,195,295

METHOD OF FABRICATING PACKED ARTICLE OF MULTI-STORIED LAYERS OF BOX-LIKE PACKAGES

Satoshi Kurosaki, Shizuoka, Japan, assignor to San-Ei Regulator Co., Ltd., Shizuoka, Japan

Filed Nov. 14, 1991, Ser. No. 792,303
Claims priority, application Japan, Nov. 15, 1990, 2-307087
Int. Cl.[5] B65B *5/06*, *13/02*, *27/02*
U.S. Cl. 53—399 **9 Claims**



1. A method for producing a packed article of a plurality of box-like packages having the same dimension, said method comprising the steps of:

forming a first layer of packages by arranging a plurality of packages in a predetermined pattern with a predetermined width;

forming an upper layer of packages, the upper layer including the same number of packages as that of the first layer and having the same pattern and width as that of the first layer;

forming an intermediate layer of packages, said intermediate layer including a number of packages less than that of the first layer and having a width less than that of the first layer;

disposing the intermediate layer between the first layer and the upper layer adjacent to the first layer such that each of the packages of the intermediate layer partially overlays at least two of the packages of the first layer and some of the packages of the first layer are only partially overlaid by the packages of the intermediate layer and such that each of the packages of the intermediate layer is overlaid by at least two of the packages of the upper layer and some of the packages of the upper layer partially overhang some of the packages of the intermediate layer to form spaces on opposite outer sides of said intermediate layer; and

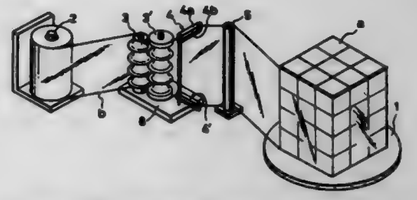
binding the first, intermediate and upper layers together with binding material.

5,195,296

WRAPPING METHOD

Ryozo Matsumoto, 239-9, Oaza-Tanaka, Sasaguri-machi, Kasuya-gun, Fukuoka-ken, Japan

Filed Aug. 12, 1991, Ser. No. 743,711
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—399 **2 Claims**



1. A method for wrapping a load with a plastic film from its roll, by creating relative rotation between said roll of film and the load to extract said film from said roll of film onto the load, said method comprising the steps of:

providing a pair of stretching rollers having vertical axes and being disposed between said load and said roll of film, said stretching rollers having alternate substantially horizontal peripheral ridges and substantially horizontal peripheral grooves and being arranged so that the peripheral ridges on each stretching roll mesh with the peripheral grooves of the other stretching roll;

passing said film extracted from said roll of film between said meshed stretching rolls;

uniformly stretching said film longitudinally while non-uniformly stretching said film laterally so as to form alternately stretched and unstretched portions in the lateral direction of said film, by rotating said stretching rollers at different speeds; and

wrapping said load with said stretched film just after stretching thereof, thereby tightening said load with said film in both vertical and horizontal directions.

5,195,297

UNITIZED DISPLAY PACKAGES AND METHOD AND APPARATUS FOR UTILIZING DISPLAY PACKAGES

William G. Lancaster, and Joseph Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 347,063, May 4, 1989, which is a continuation of Ser. No. 186,348, Apr. 26, 1988, Pat. No. 4,845,920, which is a continuation of Ser. No. 871,149, Jun. 3, 1986, Pat. No. 4,754,594, which is a continuation of Ser. No. 125,275, Feb. 27, 1980, abandoned. This application May 1, 1991, Ser. No. 694,075
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—399 **17 Claims**

1. A method of unitizing a load of successive units stacked in a longitudinal direction, the load having sides with circumferential junctions extending in a lateral direction between successive units, each of the units having at least one relatively high strength area which is resistant to circumferential crushing in the lateral direction and at least one low strength area which is substantially less resistant to circumferential crushing in the lateral direction than the high strength area, comprising:

dispensing a web from a web dispenser and stretching the web along the direction in which it is dispensed;

collapsing the web into a roped configuration;

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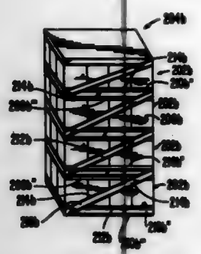
successively aligning the roped web with and within selected high strength area by moving the web dispenser generally in the longitudinal direction relative to the load and stopping the relative longitudinal movement of the web dispenser and the load at times when the web is in alignment with each of the selected high strength areas;



successively wrapping the roped web circumferentially around the load at each of the selected high strength areas in alignment with and within each of the high strength areas, wherein the roped web applies significant pressure on the load only at the high strength areas;

expanding the web from the roped configuration; and

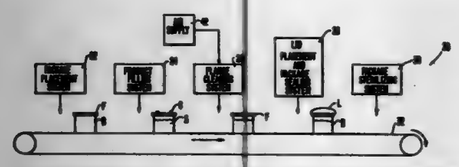
wrapping the expanded web around the load to cover the sides of the load in both the high and low strength areas.

5,195,298

CONTAINER FILLING AND SEALING SYSTEM

John Baranowski, Bensalem, Pa., assignor to Campbell Soup Company, Camden, N.J.

Division of Ser. No. 641,138, Jan. 15, 1991. This application Jun. 20, 1991, Ser. No. 718,384
Int. Cl.[5] B65B *55/02, 7/28*
U.S. Cl. 53—425 16 Claims



1. A contaminant removal method, said method comprising the steps of:

conveying to a new location product filled containers having flange seal areas;

during said conveying step, directing a downward stream of pressurized fluid which tracks the seal areas of the conveyed filled containers as they are being conveyed by focusing said stream onto said seal areas so that said stream follows the configuration of said seal areas to thereby blow contaminants off of the seal areas and generally without disturbing the product filled in the containers by preventing said stream from blowing directly into said containers; and

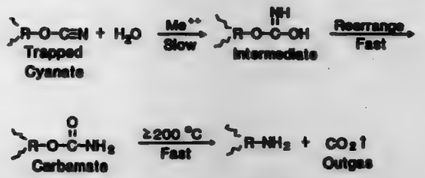
thereafter, sealing the containers on their seal areas.

5,195,299

METHOD OF REDUCING MOISTURE CONTENT OF HERMETIC PACKAGES CONTAINING SEMICONDUCTOR DEVICES

My N. Nguyen, San Diego, Calif., assignor to Johnson Matthey Inc., Valley Forge, Pa.

Filed Feb. 28, 1992, Ser. No. 843,735
Int. Cl.[5] B65B *25/00, 31/02*
U.S. Cl. 53—428 3 Claims



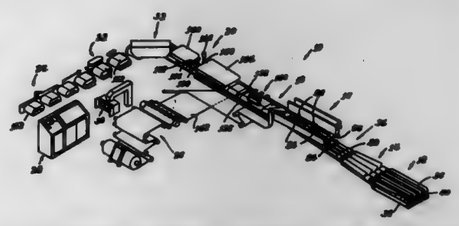
1. A method of reducing the water moisture content in a hermetic package containing a semiconductor device comprising incorporating within said package a small but effective amount of cyanate ester, reacting said cyanate ester with water to produce an imidocarbonic acid which molecularly rearranges upon formation into a stable carbamate molecular structure, exposing said package to an elevated temperature in the range of about 100° C. to 400° C. whereby said carbamate further reacts with water to produce carbon dioxide.

5,195,300

COMPRESSED ROLL PACKAGING METHOD AND APPARATUS

Lloyd Kovacs, and Dale J. Young, both of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Mar. 17, 1992, Ser. No. 852,794
Int. Cl.[5] B65B *63/02, 9/20, 35/44*
U.S. Cl. 53—438 19 Claims



1. A method of packaging a plurality of cylindrical paper rolls in a compressed state, comprising the steps of

a. orienting at least two rolls in a generally side-by-side relationship having their longitudinal axes parallel and horizontal,

b. conveying the rolls in a direction of travel parallel to the longitudinal axes of the rolls,

c. progressively compressing the rolls to a partially compressed state as the rolls are conveyed such that each roll has a generally elliptical cross section with a major cross-sectional axis,

d. orienting the partially compressed rolls with their major cross-sectional axes spaced a first predetermined distance and parallel to one another,

e. further compressing the rolls to a compressed state such that their major cross-sectional axes are spaced a second predetermined distance which is less than said first predetermined distance, and

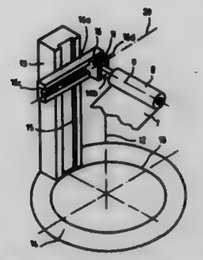
f. sealing said rolls in a package while in the compressed state.

5,195,301

METHOD AND MACHINE FOR WRAPPING THE VERTICAL LATERAL AND UPPER END FACES OF A PALLETIZED LOAD

Jean P. C. Martin-Cocher, La Motte-Servolex, and Georges Jacomelli, Aix-les-Bains, both of France, assignors to Newtec International (Societe Anonyme), Aix-Les-Bains, France

Filed Jul. 7, 1992, Ser. No. 909,725
Claims priority, application France, Jul. 11, 1991, 91 08766
Int. Cl.[5] B65B *11/04*
U.S. Cl. 53—441 26 Claims



1. A method for wrapping a palletized load bounded by a vertical lateral face which is closed on itself and two, upper and lower, end faces, by means of film made from plastic, in which:

attaching an initial outermost portion of a band of film coming from a reel of film to the lateral face of the load;

relatively rotating the axis of the reel of film and of the load about a first axis which is substantially coincident with the vertical axis of the load and which has a vertical general direction and, as a result of this movement, the band of film is progressively laid over this lateral face;

depositing said film over the upper end face to be covered;

cutting the band of film is cut transversely and securing the terminal outermost portion of the band to the load,

wherein said step of depositing said film over the upper face comprises:

stopping the relative rotation about the first axis;

relatively pivoting the axis of the reel of the film and of the load of the order of one quarter of a turn about a second axis which has a horizontal general direction and bringing the reel of film from a substantially vertical position which is parallel to and close to the lateral face of the load to a general position close to and parallel to the upper end face to be covered, the axis of the reel of film then being substantially orthogonal to the second axis;

in this situation, making at least one relative sliding movement of the axis of the reel of film and of the load substantially along the second axis over a travel of the order of the longitudinal dimension of the upper end face of the load measured along the second axis until it is covered with the film;

relatively pivoting the axis of the reel of the film and of the load of the order of one quarter of a turn about the second axis until the reel of film is brought into a position substantially parallel to and close to the lateral face of the load;

starting the relative rotation about the first axis.

5,195,302

PACKAGING FOR POPULATED CIRCUIT BOARDS

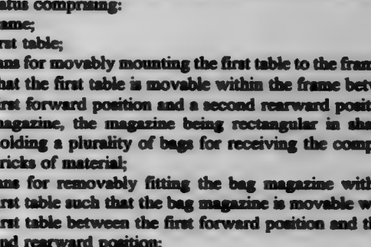
Patricio J. Collantes, Jr.; Marilyn S. Highland, both of San Jose, and Sam Kazarian, Fremont, all of Calif., assignors to Adaptec, Incorporated, Milpitas, Calif.

Filed Oct. 21, 1991, Ser. No. 779,701
Int. Cl.[5] B65B *53/02, 55/00*
U.S. Cl. 53—442 8 Claims

5. A method of packaging a populated printed circuit board, comprising the steps of:

positioning said printed circuit board on a conductive base, the dimensions of said base being larger than the dimensions of said printed circuit board;

surrounding said printed circuit board and said conductive base with a sheet of antistatic film, said film capable of being shrunk by the application of heat; and



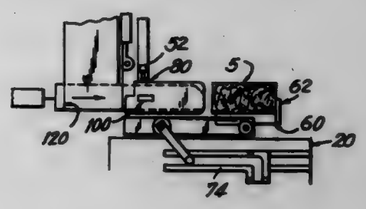
applying sufficient heat to said antistatic film to shrink said film and thereby press said printed circuit board against said conductive base, thereby preventing relative motion between said printed circuit board and said conductive base.

5,195,303

APPARATUS FOR AUTOMATIC BAGGING OF COMPRESSED TOBACCO

John Tomanovits, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed May 29, 1992, Ser. No. 891,444
Int. Cl.[5] B65B *43/14, 43/28, 43/16, 43/30*
U.S. Cl. 53—459 24 Claims



1. Apparatus for bagging compressed bricks of material, the apparatus comprising:

a frame;

a first table;

means for movably mounting the first table to the frame such that the first table is movable within the frame between a first forward position and a second rearward position;

a magazine, the magazine being rectangular in shape for holding a plurality of bags for receiving the compressed bricks of material;

means for removably fitting the bag magazine within the first table such that the bag magazine is movable with the first table between the first forward position and the second rearward position;

a second table, the second table being adjacent to the magazine and being pivotally attached to the first table so that the second table is movable between a first horizontal

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position when the first table is in the first forward position and a second tilted position when the first table is in the second rearward position; and

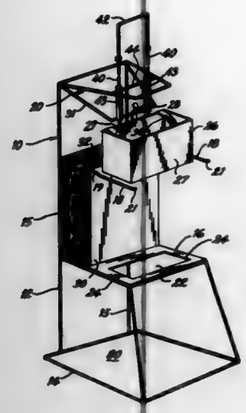
a bag opening mechanism, the bag opening mechanism being movable between a first upper position and a second lower position and being located above and attached to the first table such that the bag opening mechanism is engageable with the topmost bag of the plurality of bags held in the bag magazine when the first table with the bag magazine fitted within the first table is in the first forward position and the bag opening mechanism is in the second lowered position.

5,195,304

APPARATUS FOR SEPARATING NEWSPRINT FROM OTHER SHEET MATERIAL AND WRAPPER FOR BUNDLE PRODUCED THEREBY

Anthony C. Capaci, 1306 Faulkner Ct., Mahwah, N.J. 07430

Division of Ser. No. 746,567, Aug. 16, 1991, Pat. No. 5,154,038.
This application Jun. 10, 1992, Ser. No. 896,653
Int. Cl.[5] B65B *11/02*
U.S. Cl. 53—542 7 Claims



1. In a system for preparing sheets comprised of newsprint sheets and other sheet material for recycling the newsprint sheets by separating the newsprint sheets from the other sheet material, the improvement which comprises:

a support platform having an opening therein;

said platform being supported such that a discard area is formed below the platform;

said opening being dimensioned such that the newsprint sheets do not pass therethrough and the smaller sheets do pass therethrough to the discard area;

the platform is mounted on a frame of light weight material;

said frame having a base and a pair of spaced apart vertical members affixed to the platform;

a pair of horizontal members at the same level;

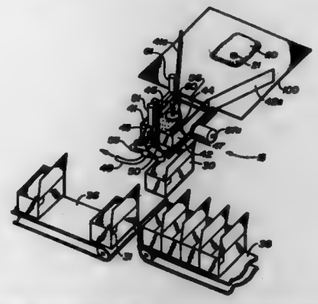
one said horizontal member being affixed to each vertical member above the platform and extending outwardly thereover for supporting a plurality of wrappers for wrapping said separated newsprint sheets.

5,195,305

LIQUID PACKAGING PLACEMENT AND CONTROL DEVICE

Louis B. Dambrosio, Modesto; Christoper C. Rutter, Oakland; James R. Lackey, Modesto, and William F. Charron, Fremont, all of Calif., assignors to The Wine Group, Inc., Ripon, Calif.

Filed Dec. 23, 1991, Ser. No. 814,364
Int. Cl.[5] B65B *5/04, 35/28*
U.S. Cl. 53—473 17 Claims



1. A flexible liquid holding container loading device comprising;

a set of trap doors;

means for providing an air cushion between said trap doors and the flexible liquid holding container disposed on said trap doors;

barrier means generally surrounding a top of said trap doors for restraining the flexible liquid holding container from moving sideways off of said trap doors once the liquid holding container is disposed on top of said trap doors; and

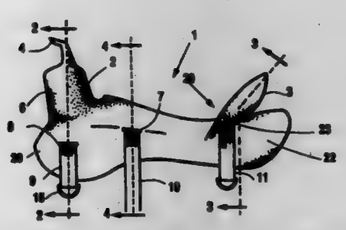
means for opening said trap doors.

5,195,306

PLASTIC SADDLETREE AND RIGGING

William B. Hadlock, New Braunfels, Tex., assignor to Hadlock & Fox Manufacturing Company, New Braunfels, Tex.

Filed Jun. 26, 1992, Ser. No. 905,023
Int. Cl.[5] B68C *1/02*
U.S. Cl. 54—44.7 16 Claims



1. In a saddletree forming the frame of a riding saddle, a construction and system for attachment of girths including:

an upper shell section formed of plastic material to the desired shape for the upper surfaces of the saddletree and having swells and a cantle, and a lower shell section formed of plastic material to the desired shape for the lower surfaces of the saddletree so as to form a complete saddletree when mated together;

said shells being bonded at least around their perimeter edges and having a cavity existing between said upper and lower shells;

slots in each side of said saddletree in the area below the swells for the passage of a first rigging strap there through;

a first continuous rigging strap passing between said upper and lower shells and depending from said saddletree through the slots located below the swells on both sides of the saddletree;

slots in each side of said saddletree in the area below the cantle for the passage of a second rigging strap there through; and

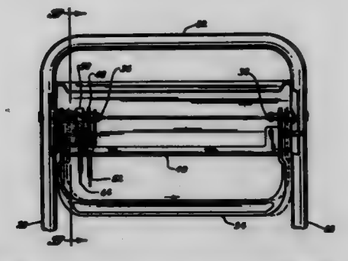
a second continuous rigging strap passing between said upper and lower shells and depending from said saddletree through the slots located below the cantle on both sides of the saddletree.

5,195,307

SIMPLIFIED BLADE BRAKE CLUTCH AND PROPULSION CONTROL

Richard A. Thorud, and Nathan J. Friberg, both of Bloomington, Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Jan. 21, 1992, Ser. No. 823,502
Int. Cl.[5] A01D *69/00, 75/20*
U.S. Cl. 56—11.3 6 Claims



1. In a walk-behind power lawn mower comprising a propelling means and a blade brake clutch, an improved control system comprising:

(a) a control arm operatively coupled to said blade brake clutch and said propelling means; and

(b) pivot means operatively connecting said control arm to said lawn mower, wherein the pivot means establishes a pivot axis;

wherein said propelling means is engaged when said control arm is generally rotated about said pivot axis and wherein said blade brake clutch and said propelling means are engaged when said control arm is first generally displaced axially along said pivot axis and then generally rotated about said pivot axis.

5,195,308

MOWER HAVING FLUID DISPERSION CHARACTERISTICS

Douglas E. Grote, McDonough; Richard Schaff, Conyers; Beth A. Logue, Jonesboro, all of Ga.; Terry Mitchell, Jenison, and Todd A. Sutton, Grand Rapids, both of Mich., assignors to Fuqua Industries, McDonough, Ga.

Filed Sep. 13, 1991, Ser. No. 758,845
Int. Cl.[5] A01D *34/82;* B05B *9/04*
U.S. Cl. 56—16.4 5 Claims

1. An apparatus for cutting grass blades extending above a ground surface and subsequently applying a liquid to said blades, comprising:

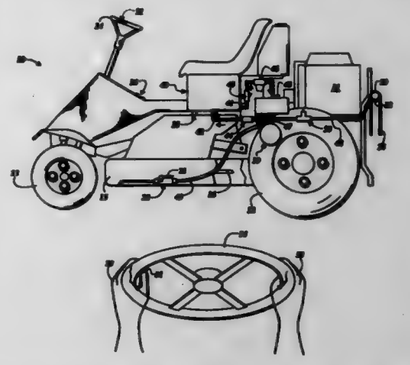
a frame means;

cutting means attached to said frame for cutting grass blades;

spray means attached to said frame for directing a spray of liquid downwardly toward said grass blades;

a manual steering handle for allowing an operator to manually steer said apparatus along a path atop said ground surface by means of manually gripping said handle by a combination of palm and fingers of a first hand; and

thumb trigger means attached to said manual steering handle to allow an operator to selectively spray, by said spray



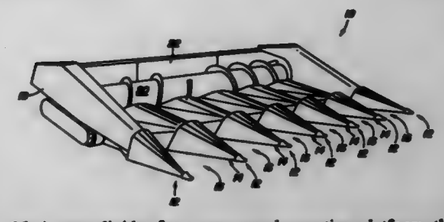
means, grass blades which have been cut by said cutting means, by depressing said trigger with the thumb of said first hand without changing the position of said first hand from said steering position.

5,195,309

PLASTIC CROP DIVIDERS FOR A ROW CROP HEADER

Michael W. Mossman, Silvis, Ill., assignor to Deere & Company

Filed Aug. 28, 1991, Ser. No. 751,277
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—119 30 Claims



16. A crop divider for a row crop harvesting platform, the crop divider comprising:

a hollow double walled self-supporting plastic semicylindrical portion; and

a hollow double walled self-supporting plastic semiconical portion pivotally coupled to the semicylindrical portion.

5,195,310

MATERIAL COLLECTION SYSTEM

Daniel J. Kettler, Beaver Dam, and Daniel A. Sebben, West Bend, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Nov. 25, 1991, Ser. No. 797,608
Int. Cl.[5] A01D *34/70*
U.S. Cl. 56—202 43 Claims

1. A material collection mechanism adapted for being coupled with a vehicle having a device for generating a stream of air and air-borne materials, said collection mechanism being adapted for receiving said stream of air and air-borne materials and for venting said air, said mechanism comprising:

attachment means for coupling the material collection system with the vehicle;

container means for receiving air and air-borne material, and within which the materials may accumulate; and

for at least one node, determining a ratio of length to

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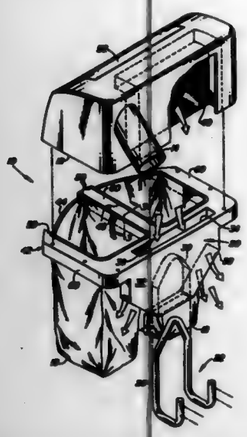
support means coupled with and extending between the attachment means and the container means for supporting the container means, a portion of said support means defining a chamber, said portion of the support means serving to rigidify the support means, said support means



defining a chamber inlet through which air from the container means passes into the chamber, said support means being adapted to vent air from the container means downwardly through said chamber to discharge said air adjacent the ground.

5,195,311

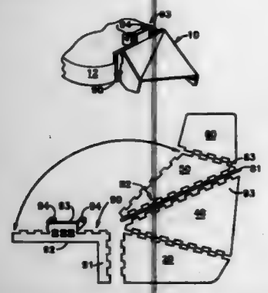
COLLAPSIBLE DISCHARGE DEFLECTING CHUTE FOR ROTARY MOWERS

Charles R. Holland, 4309 Stoltz Ct., Louisville, Ky. 40215

Filed Sep. 4, 1991, Ser. No. 754,744

Int. Cl.[5] A01D *34/67, 34/82, 75/20*

U.S. Cl. 56—320.2 **19 Claims**



1. A collapsible discharge deflecting chute for rotary mowers hingeably attachable to the mower housing at the discharge outlet comprising:

a front vertical panel;

means for hingeably attaching said front vertical panel to said mower body;

an outer top panel hingeably connected to said front vertical panel;

an inner top panel hingeably connected to said outer top panel;

means for hingeably attaching said inner top panel to said mower housing;

and a rear flap panel hingeably connected to said inner top panel.

5,195,312

SPINNING OR TWISTING SPINDLE ARRANGEMENT

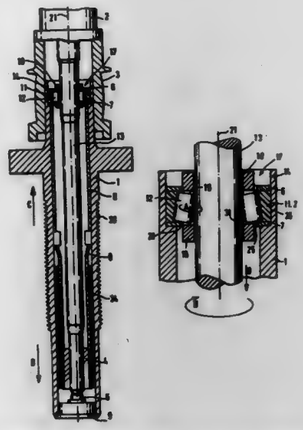
Gerd Stahlecker, Elalingen/Fils, and Hans Braxmeier, Süssen, both of Fed. Rep. of Germany, assignors to Fritz and Hans Stahlecker, Fed. Rep. of Germany

Filed Oct. 11, 1990, Ser. No. 596,032

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 3934618

Int. Cl.[5] D01H *7/08;* F16C *33/58*

U.S. Cl. 57—135 **19 Claims**



1. A spinning or twisting spindle to be arranged vertically, comprising:

a spindle bearing housing,

a bolster constructed as a roller bearing disposed in the spindle bearing housing,

a step bearing disposed in the spindle bearing housing at an axial location spaced from the roller bearing,

a spindle shaft supported in the spindle bearing housing by the roller bearing and the step bearing,

and roller bearing guide structure for guiding rollers of the roller bearing so that the guiding rollers are inclined with respect to a spindle shaft rotational axis so as to engage the spindle shaft surface to provide an axial thrust force on the spindle shaft toward the step bearing in response to rotation of the spindle shaft during operational use of the spindle, thereby preventing undesired movement of the spindle shaft in the direction from the step bearing toward the bolster.

5,195,313

METHOD FOR EVALUATING ENTANGLED YARN

Andrew M. Coons, III, Anderson, S.C., assignor to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 619,266, Nov. 28, 1990, abandoned. This application Jan. 10, 1992, Ser. No. 821,258

Int. Cl.[5] D02G *1/16;* D02J *1/08;* D01H *13/26*

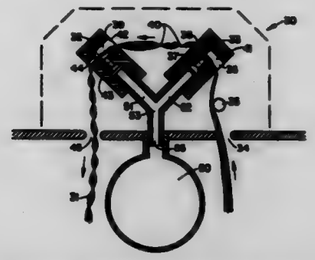
U.S. Cl. 57—264 **4 Claims**

1. A method for preparing multifilamentary yarn having a yarn harshness of no more than about 100 comprising the steps of:

a) passing multifilamentary yarn nonlinearly through a sequential tandem interlacing jet wherein fluid is jetted under pressure at a rate to each jet, thereby preparing a first interlaced multifilamentary yarn having nodal entanglement of a length and width, said preparing including operating each interlacing jet independently of the action of the other interlacing jet;

b) quantifying the nodal entanglement of the first yarn by measuring the length and width of the nodal entanglement

for at least one node, determining a ratio of length to width, for each nodal entaglement measured and assigning the ratio as a node harshness value;



c) when the node harshness is more than about 2, adjusting the relative position of said jets and the rate and pressure of fluid jetting; and

d) repeating steps a), b) and c) until the node harshness value is no more than about 2.

5,195,314

PNEUMATIC SLIVER THREADING DEVICE FOR A SPINNING MACHINE

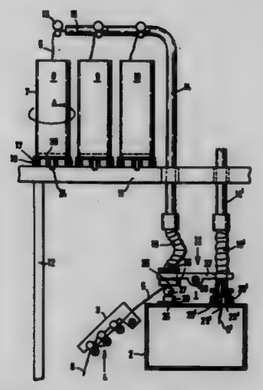
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Mar. 12, 1992, Ser. No. 850,317

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1991, 4109024

Int. Cl.[5] D01H *13/00*

U.S. Cl. 57—279 **14 Claims**



1. A spinning machine comprising:

a plurality of spinning stations,

a sliver conveying system including sliver conveyor tubes for conveying sliver to the spinning stations from sliver containing cans

a vacuum duct extending along a plurality of the spinning stations,

a connection opening to the vacuum duct at each spinning station for connecting the vacuum duct to a respective sliver conveyor tube to assist in starting conveyance of sliver through the conveyor tube,

and selectively operable connection opening cover devices for closing the respective connection opening at a spinning station during normal spinning operations and for opening the respective connection opening at a spinning station during interruption of spinning operation.

5,195,315

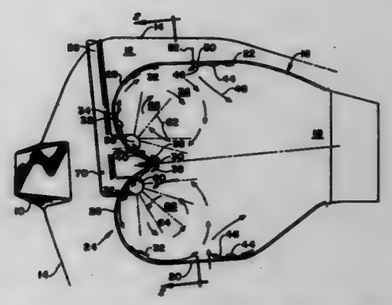
DOUBLE DOME COMBUSTOR WITH COUNTER ROTATING TOROIDAL VORTICES AND DUAL RADIAL FUEL INJECTION

Thomas E. Holladay, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 14, 1991, Ser. No. 640,757

Int. Cl.[5] F23R *3/12, 3/52*

U.S. Cl. 60—39.36 **3 Claims**



1. A dual toroidal combustor for a gas turbine engine comprising:

an annular combustor chamber having an inner circumferential wall, an outer circumferential wall, and a head structure joining said inner and outer circumferential walls at the upstream end, and an open annulus for gas egress at the end opposite said head structure;

said head structure comprising an inner substantially semi-circular inner arcuate form adjacent said inner circumferential wall and an outer substantially semi-circular outer arcuate form adjacent said outer circumferential wall, and a junction where said inner and outer arcuate forms join;

a plurality of directional jets at different arcuate locations on each arcuate form arranged to introduce air tangent to said arcuate forms, all directional jets having a common orientation with respect to said junction between said inner and outer arcuate forms;

central jets located at said junction of said inner and outer arcuate forms arranged to introduce air tangent to said arcuate forms in the direction away from said junction;

peripheral jets located on said inner and outer circumferential walls arranged to direct air tangent to said walls towards said head structure;

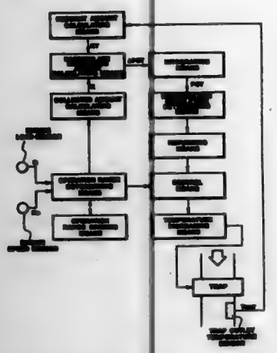
the central jets or peripheral jets direction flowing in a direction opposite said directional jets being designated as trip louvers;

said trip louvers arranged to introduce a sheet of air flow and having downstream thereof an opening in the downstream boundaries for admitting trip jet airflow perpendicular to the trip louver flow;

fuel injection nozzles arranged to directly inject fuel toward and into the center of a circle formed by each arcuate form; and

each fuel nozzle having no air mass flow therethrough.

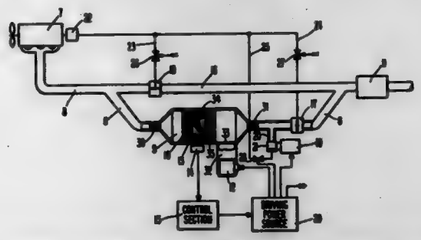
5,195,316
EXHAUST GAS PURIFYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Motohiro Shinzawa; Shunichi Aoyama, both of Yokosuka; Yoshiki Sekiya, and Nobukazu Kanesaki, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 21, 1990, Ser. No. 629,700
Claims priority, application Japan, Dec. 27, 1989, 1-339041; Dec. 27, 1989, 1-339042; Dec. 27, 1989, 1-339043; Dec. 27, 1989, 1-339044
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—274 11 Claims



1. An exhaust gas purifying system for an internal combustion engine, comprising:
a trap which is disposed in an exhaust conduit and in which particulate matter contained in gases which flow through said conduit, can be collected;
sensor means for sensing parameters which are related to the conditions which prevail in said trap;
means for deriving an approximation of the amounts of particulate matter simultaneously collected and burnt respectively in said trap based on outputs from said sensor means; and
means for selectively increasing the temperature in said trap to a level whereat combustion of the combustible fraction of the particulate matter collected therein is induced, in the event that said sensor means indicates that (a) a regeneration is indicated as being required and (b) the temperature of the gases entering the trap are insufficient to induce spontaneous combustion.

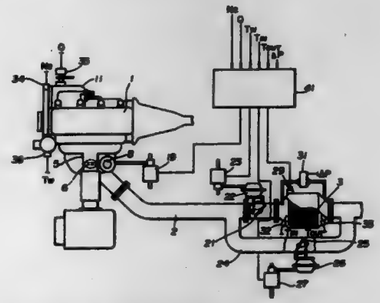
5,195,317
FILTER REGENERATING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Tomotaka Nobue; Shigeru Kusunoki; Koji Yoshino, all of Yamatokoriyama, and Takashi Koshimoto, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 26, 1992, Ser. No. 858,242
Claims priority, application Japan, Mar. 29, 1991, 3-66322
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—275 11 Claims

1. A filter regenerating device for an internal combustion engine, the filter regenerating device comprising:
a heating room provided in an exhaust pipe for discharging an exhaust gas from the internal combustion engine;
a filter, accommodated in the heating room, for scavenging particulate included in the exhaust gas;
heat-combusting means for heat-combusting the particulate;
microwave generating means for generating a microwave to be supplied to the heating room;
particulate amount detecting means for detecting an increase of an amount of the particulate scavenged by the filter, the particulate amount detecting means comprising microwave detecting means for detecting a change of an amount of the surface current generated on a wall of the heating room in accordance with the microwave; and



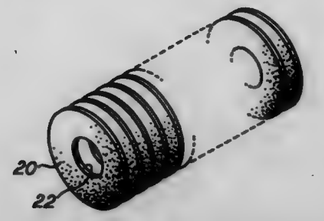
a control section for controlling the heat-combusting means based on a detection signal of the particulate amount detecting means.

5,195,318
EXHAUST GAS PURIFYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Motohiro Shinzawa; Shunichi Aoyama; Yoshiki Sekiya, and Nobukazu Kanesaki, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 27, 1990, Ser. No. 634,850
Claims priority, application Japan, Dec. 28, 1989, 1-340747
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—285 14 Claims



1. In an exhaust purifying system
a trap which is disposed in an exhaust passage which separates and collects particulate matter contained in the gases exhausted from an internal combustion engine;
trap heating means for heating the interior of said trap;
a by-pass passage which by-passes said trap, said by-pass passage having an upstream end which communicates with the exhaust passage at a location upstream of said trap and a downstream end which communicates with said exhaust passage at a location downstream of said trap;
a by-pass passage control valve which is disposed in said by-pass passage, said by-pass control valve being operatively connected with a servo;
means for determining if the exhaust gases will have a temperature slightly below a predetermined trap regeneration temperature at which accumulated particulate matter in the trap will undergo spontaneous combustion; and
means responsive to the determining means for operating said servo in a manner to close said by-pass passage control valve and for energizing the trap heating means.

5,195,319
METHOD OF FILTERING PARTICLES FROM A FLUE GAS, A FLUE GAS FILTER MEANS AND A VEHICLE
Per Stobbe, Norgaardsvej 6B, 2800 Lyngby, Denmark
Continuation of Ser. No. 623,429, Nov. 29, 1990, abandoned.
This application May 13, 1992, Ser. No. 884,480
Claims priority, application Denmark, Apr. 8, 1988, 1938/88; Aug. 18, 1988, 4650/88
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—303 12 Claims

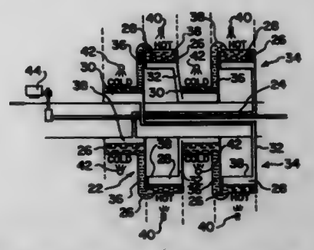


1. A flue gas filter means for filtering particles from the gas and comprising a porous filter body of particulate SiC bonded together in said porous filter body, said porous filter body having a porosity of 30–90% and a maximum pore size of 10–100 μm, and said porous filter body having a thermal conductivity in excess of 5 W/mK.

5,195,320
PISTON-CYLINDER ASSEMBLY PARTICULARLY USEFUL IN STIRLING CYCLE MACHINES
Mark Kushnir, Rehovot, Israel, assignor to Ist Engineering, Ltd., Rehovot, Israel
Filed Nov. 18, 1991, Ser. No. 794,089
Claims priority, application Israel, Nov. 23, 1990, 96453
Int. Cl.[5] F01B *29/10*
U.S. Cl. 60—517 15 Claims

1. A piston-cylinder assembly, comprising a cylinder including an end wall, a piston movable within said cylinder, and a drive for effecting relative reciprocatory movements between said piston and cylinder; characterized in that:
said piston includes first and second piston heads connected together in spaced relation by a stem and cooperable with first and second portions of the cylinder, dividing the cylinder into a working chamber on one side of said first piston head between it and the end wall of the cylinder, a drive chamber on the opposite side of said second piston head communicating with said drive, and an intermediate chamber between said working chamber and drive chamber;
said first piston head defining a clearance seal with respect to the first portion of the cylinder;
said second portion of the cylinder guiding the reciprocatory movements of the piston;
said intermediate chamber including a semi-permeable seal between the cylinder and piston, which seal is permeable by gas, but impermeable by liquids, to thereby prevent the passage of liquid from the drive chamber through the intermediate chamber to the working chamber.

5,195,321
LIQUID PISTON HEAT ENGINE
David L. Howard, Lakewood, Colo., assignor to Clovis Thermal Corporation, Lakewood, Colo.
Filed Mar. 4, 1992, Ser. No. 845,584
Int. Cl.[5] F02G *1/04*
U.S. Cl. 60—525 20 Claims



1. A liquid piston heat engine having a Stirling cycle heat engine design incorporated therein, the engine comprising:
an axis;
a hollow cylinder attached to and positioned off-center from said axis, said cylinder having a closed inner compartment, including a cold exchanger section and a hot exchanger section therein;
a liquid which is capable of acting as a piston disposed in said closed inner compartment of said cylinder;
a working gas disposed in said closed inner compartment of said cylinder for driving said liquid alternately from said cold exchanger section to said hot exchanger section and back to said cold exchanger section;
means for cooling said cold exchanger section; and
means for heating said hot exchanger section; whereby said working gas oscillates said liquid in said closed inner compartment of said cylinder outwardly during a downward power stroke and oscillates said liquid in said closed inner compartment of said cylinder inwardly during an upward drag stroke, so that the center of mass of the liquid in the cylinder provides a greater moment of force during the downward power stroke than during the upward drag stroke.

5,195,322
VALVE SEAL FOR A MASTER CYLINDER
Klaus Bergelin, Niederhausen; Harald Koenig, Ober-Moerlen, and Bernhard Hammes, Hattersheim, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 6, 1991, Ser. No. 804,880
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040271
Int. Cl.[5] B60T *11/28*
U.S. Cl. 60—589 4 Claims

1. A master cylinder for a hydraulic brake system of an automotive vehicle comprising:
a housing having a bore;
at least one piston having a radial face and axially slidably guided in said housing bore in a sealed manner, said piston defining a pressure chamber in the master cylinder housing bore;
means for establishing at least one connection from said pressure chamber to an unpressurized supply reservoir;
a longitudinal central bore formed extending from said radial face on said piston;
central valve means which controls flow of a pressure fluid

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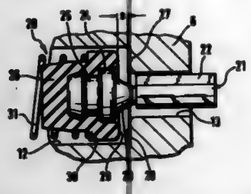
into said pressure chamber and said piston bore in dependence on said position of said piston;

said central valve means including a sealing seat formed on a radial surface around said piston bore, a valve pin having a stem guide portion extending into said piston central bore, a fixed stop in said housing adapted to engage said valve pin stem guide portion upon a predetermined extent of movement, a radially enlarged head portion at one end of said valve pin fixed to said stem guide portion, an elastomeric valve member fixed to said valve pin head



portion and adapted to seal against said sealing seat, a valve spring support on said piston and urging said valve member in the direction of said sealing seat, and said valve member including an annular end surrounding said head portion and facing said valve seat, protruding axially slightly beyond said head portion and not extending radially in past said head portion of said valve pin

said valve pin stem guide portion having a series of ribs formed thereon, and further formed with a conical transition area interposed between said head portion and said longitudinal ribs on said stem guide portion.

5,195,323

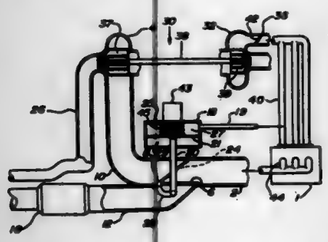
TURBOCHARGER-EXHAUST PURIFIER WASTEGATE

Anthony R. Lorts, 3366 Talbot, Troy, Mich. 48083

Filed Jul. 31, 1991, Ser. No. 738,318

Int. Cl.[5] F02B 37/00; F01N 5/04

U.S. Cl. 60—602 **7 Claims**



1. A wastegate exhaust gas control system for an internal combustion engine, said internal combustion engine including an intake manifold and an exhaust manifold said control system comprising:

an exhaust duct connected to said exhaust manifold and bifurcated at a branch point into a first and second branch;

a valve disposed in said exhaust duct at said branch point;

said first branch of said duct connected to a turbocharger;

a first vent from said turbocharger to atmosphere;

said second branch of said duct connected to an exhaust purifier;

a second vent from said exhaust purifier to atmosphere; and

means for controlling said valve means directing continuously variable proportions of said exhaust between said first and second branches of said duct.

5,195,324

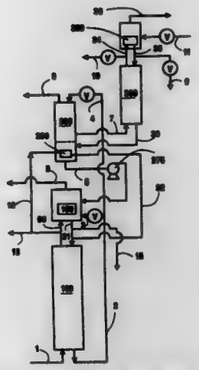
CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING NITROGEN AND ULTRA HIGH PURITY OXYGEN

Harry Cheung, Williamsville, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Mar. 19, 1992, Ser. No. 854,094

Int. Cl.[5] F25J 3/02

U.S. Cl. 62—24 **10 Claims**



1. A method for producing nitrogen and ultra high purity oxygen by cryogenic rectification of feed air comprising:

(A) introducing feed air into a single column system comprising a column and a top condenser and separating the feed air in the single column system by cryogenic rectification into nitrogen-rich vapor and oxygen-enriched liquid having an oxygen concentration not exceeding 80 percent and containing heavier and lighter components;

(B) recovering a first portion of the nitrogen-rich vapor from the column of the single column system as product nitrogen, condensing a second portion of the nitrogen-rich vapor in the top condenser, and employing resulting nitrogen-rich liquid as reflux for said column;

(C) passing oxygen-enriched liquid from the single column system into and down a first purifying column having a bottom reboiler to produce an oxygen-richer fluid in the lower portion of the first purifying column substantially free of lighter components;

(D) passing oxygen-richer liquid from the bottom reboiler of the first purifying column into the top condenser of the single column system to condense by indirect heat exchange nitrogen-rich vapor;

(E) passing oxygen-richer vapor from a point at least one equilibrium stage above the bottom reboiler of the first purifying column into and up a second purifying column to produce ultra high purity oxygen in the upper portion of the second purifying column substantially free of heavier components; and

(F) recovering ultra high purity oxygen from the second purifying column.

5,195,325

LIQUID GAS SAMPLING

Frederick J. Short, North Tonawanda, and Jeffrey R. Huber, Grand Island, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Nov. 27, 1991, Ser. No. 799,358

Int. Cl.[5] F17C 9/02

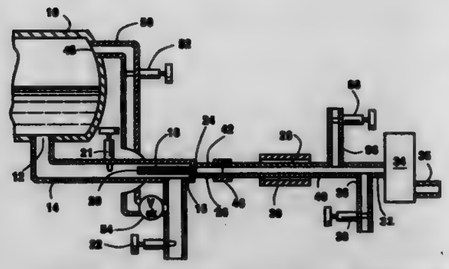
U.S. Cl. 62—50.2 **18 Claims**

1. An apparatus for withdrawing a sample stream of liquid cryogen for analysis, said apparatus comprising:

(a) an admitting tube having an open end for admitting a stream of liquid cryogen, a joined end, and a length so as

to avoid vaporization of liquid cryogen proximate said open end and in said admitting tube when immersed in liquid cryogen;

(b) a conveying tube having an end joined to said admitting tube joined end and the other end capable of connection to



a receiver, the internal flow area of said admitting tube being in the range of from about 0.01 to about 0.5 times the internal flow area of said conveying tube; and

(c) means for vaporizing the sample stream of liquid cryogen proximate to and downstream of said conveying tube joined end.

5,195,326

PROCESS FOR PROVIDING A CONTROLLED ATMOSPHERE INSIDE AN ENCLOSURE AND HAVING A CONTROLLED ATMOSPHERE

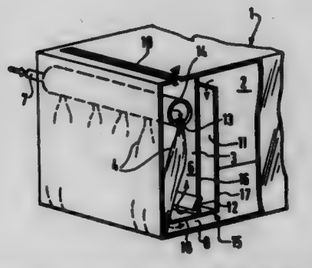
Christian Barbe, Fontenay-aux-Roses, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 22, 1992, Ser. No. 824,918

Claims priority, application France, Feb. 14, 1991, 91 01739

Int. Cl.[5] F24F 3/16

U.S. Cl. 62—78 **13 Claims**



1. A method of creating a controlled atmosphere within an enclosure by means of a permeation device having first and second compartments separated by a permeation membrane, comprising the steps of:

introducing a first gas mixture of at least two gas components under pressure into the first compartment whereby one of said gas components permeates said membrane and enters said second compartment;

withdrawing from the first compartment and introducing into the enclosure a gas mixture thus depleted in said one gas component, thereby displacing atmosphere from the enclosure through a discharge duct connected to the enclosure;

introducing the displaced atmosphere from the discharge duct into the second compartment and mixing the same with said one gas component that has permeated said membrane thereby to produce a second gas mixture; and

venting from the second compartment said second gas mixture.

5,195,327

COMPRESSOR DRIVE CONTROL METHOD FOR COOLING AND HEATING DUAL-PURPOSE AIR CONDITIONER

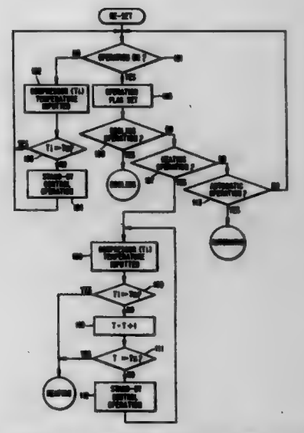
Tae-Duk Kim, Seowon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Seowon, Rep. of Korea

Filed Feb. 20, 1992, Ser. No. 837,888

Claims priority, application Rep. of Korea, Feb. 26, 1991, 91-3134

Int. Cl.[5] F25B 43/02

U.S. Cl. 62—84 **4 Claims**



1. A control drive method for an air conditioner comprising the steps of:

comparing a compressor temperature with a lubricating oil freeze temperature if the air conditioner is not in an operation-on status and performing a stand-by control operation for discriminating whether an operation-on status exists, and when the compressor temperature is below the lubricating oil freeze temperature, for raising the compressor temperature above the lubricating oil freeze temperature; and

when the air conditioner is in an operation-on status and an air conditioning operation is discriminated responsive to an operator's instructions in an operation-on status, comparing the compressor temperature with the lubricating oil freeze temperature and performing the air conditioning operation when the compressor temperature is above the lubricating oil freeze temperature and performing an operation-on stand-by control operation for raising the compressor temperature for a certain pre-set time duration if the compressor temperature is below the lubricating oil freeze temperature.

5,195,328

APPARATUS AND METHOD FOR HEATING A SPACE WITH WASTE HEAT

Owan W. Davis, Rte. 4, Box 47E, Ozark, Mo. 65721

Filed Dec. 13, 1991, Ser. No. 806,667

Int. Cl.[5] F25B 27/00

U.S. Cl. 62—117 **13 Claims**

1. Apparatus for heating a space in which mammals are located with waste heat from a biological product from the mammals such as milk, the apparatus comprising;

means for storing a quantity of the milk;

a thermally conductive fluid;

a heat exchanger disposed for thermal communication with the milk in said storing means, said heat exchanger having the fluid flowing therethrough, the fluid absorbing heat

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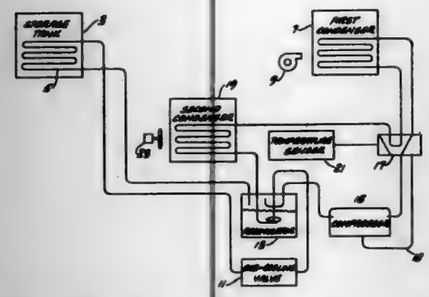
from the milk and cooling the milk as it flows through the heat exchaner;

a first condenser adapted for fluid communication with the heat exchanger for carrying fluid heated by the milk therein;

first blower means for forcing air over the first condenser thereby heating the air and cooling the fluid in the first condenser, said blower means being disposed for forcing the heated air into the space to be heated;

valve means in fluid communication with the heat exchanger;

a second condenser adapted for fluid communication with said valve means and said first condenser,



second blower means for forcing air over the first condenser thereby heating the air and cooling the fluid in the second condenser, said second blower means being disposed for forcing the heated air to the atmosphere outside the space to be heated;

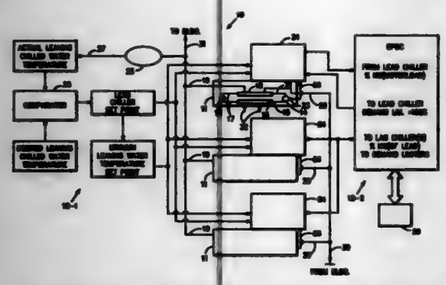
said valve means being selectively movable between a first position in which fluid flows generally from the heat exchanger, through said valve means to said fist condenser, from said first condenser back to said valve means, thence to said second condenser and returns to the heat exchanger, and a second position in which fluid flows generally from the heat exchanger through said valve means to said second condenser, bypassing said first condenser, and returns to the heat exchanger.

5,195,329

AUTOMATIC CHILLER PLANT BALANCING

Merrill A. Lewis, Syracuse, N.Y., and Paul W. James, Windsor, Conn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 12, 1991, Ser. No. 790,859
Int. Cl.[5] F25B *5/00, 7/00*
U.S. Cl. 62—117 5 Claims



1. A method of operating a refrigeration system of the type having at least two compressors each having an electrical motor, wherein one compressor is selected as a lead compressor and the other compressor is selected a lag compressor, and an evaporator for each of the at least two compressors for cooling a heat transfer medium passing through each evaporator, comprising the steps of:

generating a lead compressor temperature signal which is a function of a lead compressor desired setpoint temperature;

generating a lag compressor temperature signal which is a function of a lag compressor desired setpoint temperature;

generating a lag compressor power draw limit signal which is a function of the lead compressor power draw; and

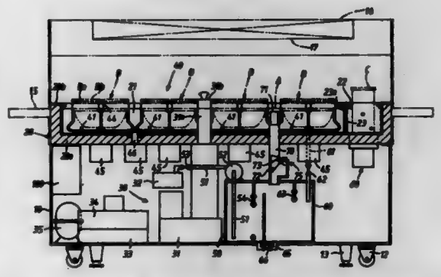
controlling the lag compressor in response to the lag compressor power draw limit signal while the lag compressor attempts to maintain the desired lag compressor setpoint temperature.

5,195,330

FOOD SERVICE COUNTER OF THE ICE STORAGE TYPE

Syuji Kado, Toyoake, and Susumu Tatematsu, Nagoya, both of Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

Filed Feb. 21, 1992, Ser. No. 839,506
Int. Cl.[5] F25C *5/18*
U.S. Cl. 62—137 6 Claims



1. An ice storage type food service counter comprising an ice storage tank arranged to store an amount of ice and having a drain hole at a bottom, an ice supply device for automatically producing chips of ice and supplying the same into the ice storage tank, an agitating device arranged within the ice storage tank for agitating and leveling the chips of ice stored in the ice storage tank, a container formed to contain food and drink therein and mounted on the agitating device to be displayed on the stored chips of ice, a water supply tank arranged to store an amount of ice making water for use in the ice supply device, and a discharge tank arranged below the ice storage tank to store the water of melted ice discharged from the ice storage tank through said drain hole.

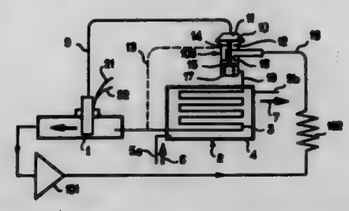
5,195,331

METHOD OF USING A THERMAL EXPANSION VALVE DEVICE, EVAPORATOR AND FLOW CONTROL MEANS ASSEMBLY AND REFRIGERATING MACHINE

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855, and Jean L Picouet, Bridgeport, Conn., assignors to Bernard Zimmern, East Norwalk, Conn.

Continuation of Ser. No. 448,271, Dec. 11, 1989, abandoned.
This application Apr. 26, 1991, Ser. No. 690,335
Claims priority, application France, Dec. 9, 1988, 88 16207
Int. Cl.[5] G05D *23/30*
U.S. Cl. 62—202 5 Claims

1. The method for controlling a refrigeration system having an evaporator for passing a refrigerant from an adjustable thermal expansion valve to a pipe downstream from the evaporator with reference to direction of refrigerant flow, the system being capable of operating to maintain the refrigerant in the evaporator within a pressure/temperature region in which a substantial percentage of refrigerant in said pipe is in a liquid phase and further including a bulb for controlling operation of the thermal expansion valve, the bulb having a heat conductive wall with opposite inner and outer surfaces and containing a fluid having a liquid phase at least partially filling the bulb, the operation of the expansion valve being dependent on a thermal balance between the bulb contained fluid and refrigerant outside of the bulb, and including means for heating the bulb contained fluid, the method comprising the steps of:



mounting the bulb with at least a portion of aid heat conductive wall extending within the pipe downstream from the evaporator and thereby enveloping at least a substantial portion of the bulb outer surface with refrigerant flow in the pipe;

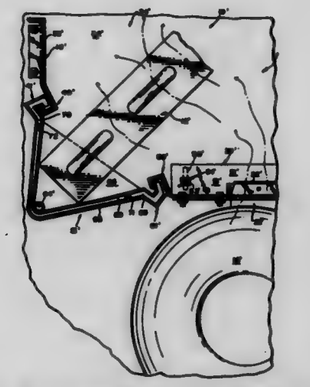
exposing at least part of the opposite inner surface portion of said heat conductive wall to fluid in said bulb; and energizing said heating means to direct a substantial portion of the heat thereof to the liquid phase of fluid contained in the bulb at least when the refrigerant flow in the discharge pipe contains a liquid phase.

5,195,332

FAN COIL UNIT WITH NOVEL REMOVABLE CONDENSATE PAN

John T. Sullivan, 3910 Madison St., Hyattsville, Md. 20781

Filed Sep. 16, 1991, Ser. No. 760,538
Int. Cl.[5] F25D *21/14*
U.S. Cl. 62—291 30 Claims



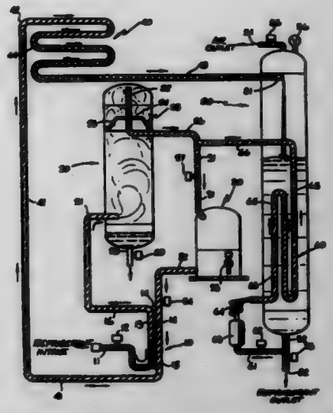
1. A fan coil unit comprising a housing defining a chamber, a condensation pan in said chamber, said condensation pan being constructed from resilient material, means formed from the resilient material of said condensation pan for snap-securing said condensation pan to said housing, and said snap-securing means being a pair of hooks formed of said resilient material with one hook disposed along each of opposite generally parallel sides of said condensation pan.

5,195,333

REFRIGERANT RECLAIM METHOD AND APPARATUS

Leon R. Van Steenburgh, Jr., 1900 S. Quince St., Unit G, Denver, Colo. 80231

Continuation of Ser. No. 109,958, Oct. 19, 1987, abandoned.
This application Mar. 31, 1989, Ser. No. 332,235
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—292 10 Claims



1. In an apparatus for reclaiming refrigerant, means for removing refrigerant from a container and separating oil from the refrigerant, comprising a heat exchanger having a hot side and a cold side, means connecting the cold side of the heat exchanger to the refrigerant container, means for connecting the hot side of the heat exchanger to a source of hot gaseous refrigerant, means for causing refrigerant from the container to flow through the cold side of the heat exchanger, means for passing heated gaseous refrigerant from the heat exchanger into the lower portion of an elongated vertically extending separator tank, baffle means in the upper portion of the separator tank for interrupting the flow of rising expanding hot gaseous refrigerant, the periphery of the baffle means providing a narrow opening between the baffle and the inner wall of the tank to permit escape of gaseous refrigerant around the baffle and a fluid conduit having an inlet above the baffle for removing gaseous refrigerant from the separator tank.

5,195,334

HEAT EXCHANGE APPARATUS HAVING MEANS FOR BACTERIAL REMOVAL

Gary D. Lang, Wooster, Ohio, and David F. Gina, New Holland, Pa., assignors to Liquid Carbonic Corporation, Chicago, Ill.

Filed May 24, 1991, Ser. No. 705,119
Int. Cl.[5] F24F *13/00*
U.S. Cl. 62—305 10 Claims

1. A mechanical refrigeration unit for use in cooling food products comprising:

a housing having an air inlet and an air outlet,

a blower circulating air in through said air inlet, through said housing and discharging said air through said air outlet,

a pair of separate evaporator sections mounted in said housing in alignment one with the other for cooling said air circulating successively through said evaporator sections,

each evaporator including an open frame having sidewalls and endwalls and defining an air passageway through which said air circulates, refrigerant tubes mounted in said frame extending in parallel spaced relation between said sidewalls,

liquid spray apparatus mounted for reciprocation at the upstream and downstream side of each of said evaporator sections,

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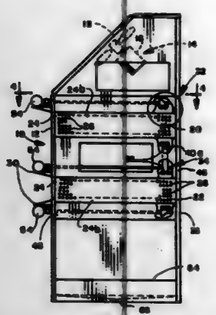
said liquid spray apparatus including elongated spray headers above and below each evaporator extending between said sidewalls parallel to said refrigerant tubes and reciprocation means for moving said headers back and forth between said endwalls, one of each of said pairs of headers being disposed to spray downwardly on each evaporator and one of each of said pairs of headers being disposed to spray upwardly onto each evaporator,

spray nozzles equally spaced along said headers and directed toward said evaporator sections to spray all of the surfaces of said refrigerant tubes exposed to air circulating through said housing,

said reciprocation means including a plurality of pairs of



elongated worms extended parallel to said sidewalls, a reversible motor drivingly coupled to each pair of adjacent worms, and

a pair of carriages supporting each header at either end thereof, each carriage having a threaded portion engaging one of said worms for translating said header between said endwalls when said motor is energized to reciprocate said header,

the liquid spray apparatus positioned between said evaporator sections includes a single pair of worms each one of which supports and reciprocates a dual carriage, said dual carriages support two parallel headers, one being positioned to spray into one of said evaporator sections and the other being positioned to spray into the other of said evaporator sections.

5,195,335

MAGNETIZED NOVELTY BEADS

James L. Hart, P.O. Box 205, Enstro, Ontario, Canada N0J 1J0

Filed Mar. 11, 1992, Ser. No. 851,296
Int. Cl.[5] A44C *25/00*
U.S. Cl. 63—2 5 Claims

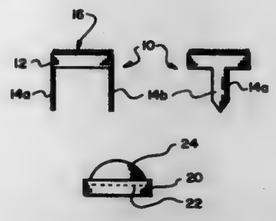
1. As a necklace, a plurality of spacially disposed discrete elements carried by a flexible strand formed as a continuous loop, wherein at least two of the discrete elements thereof are magnetized and disposed at a pre-determined distance, relative to one another, whereby when the magnetized elements are juxtaposed, they constrain the endless flexible loop into sub-loops of unique pre-determined length.

5,195,336

INTERCHANGEABLE ORNAMENTS

Randolph J. Mershon, 300 Winston Dr., Cliffside Park, N.J. 07010

Filed Apr. 10, 1992, Ser. No. 867,308
Int. Cl.[5] A44C *17/02*
U.S. Cl. 63—29.1 6 Claims



1. A device for securing an ornament, comprising:

a. an arbitrarily shaped cap for supporting the ornament, the cap comprising:

1) a ceiling;

2) a rim depending from the ceiling; and

3) a patch of one component of a hook-and-pile fastening material, the patch having a shape conforming to that of the cap, secured to the ceiling and surrounded by the rim;

b. a base shaped to fit within the rim of the cap, and comprising:

1) a floor;

2) a rim depending from the floor and which fits snugly within the rim of the cap;

3) a patch of the complementary component of a hook-and-pile fastening material, the patch having a shape conforming to that of the base, secured to the floor and surrounded by the rim; and

4) means to facilitate mounting of the base to an article.

5,195,337

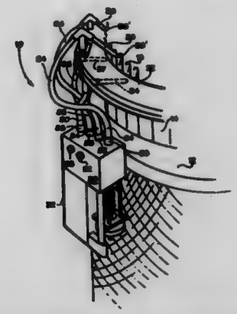
APPARATUS AND METHOD FOR FLUSHING DEBRIS FROM THE CYLINDER SLOTS OF CIRCULAR KNITTING MACHINES

Alan Gutschmit, Troy, N.C., assignor to Alandale Industries, Inc., Troy, N.C.

Filed Nov. 14, 1991, Ser. No. 792,349
Int. Cl.[5] D04B *35/32*
U.S. Cl. 66—168 41 Claims

1. In a circular knitting machine of the type having a rotatable cylinder formed with a plurality of slots for receiving reciprocating knitting elements, the improvement comprising apparatus for periodically flushing accumulated debris forcibly from said slots, said flushing apparatus including a source of pressurized flushing fluid, a flushing nozzle fixedly mounted adjacent said cylinder, means for selectively communicating said flushing nozzle with said fluid source to supply said pressurized fluid to said flushing nozzle, said flushing nozzle having an emission opening oriented relative to said cylinder to discharge said pressurized fluid directly into said slots as said cylinder rotates, a source of a pressurized gas, a cleaning nozzle fixedly mounted adjacent said cylinder, means for selectively communicating said cleaning nozzle with said gas source

to supply said pressurized gas to said cleaning nozzle, said cleaning nozzle having an emission opening oriented relative



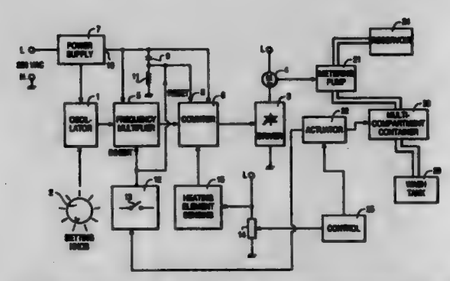
to said cylinder to discharge said pressurized gas directly into said slots as said cylinder rotates.

5,195,338

LIQUID DETERGENT DISPENSING APPARATUS FOR WASHING MACHINES

Fernando Russo, Pordenone, Italy, assignor to Zanussi Elettrodomestici S.p.A., Pordenone, Italy

Filed Aug. 1, 1991, Ser. No. 738,909
Claims priority, application Italy, Aug. 30, 1990, 45751A90
Int. Cl.[5] D06F *39/02*
U.S. Cl. 68—12.18 4 Claims



1. A liquid detergent dispensing apparatus for use in a washing machine, the washing machine including a wash tank, a liquid detergent reservoir, and a multicompartment detergent container in fluid communication with the wash tank and in fluid communication with the detergent reservoir via a metering pump, the multicompartment detergent container having an actuator associated therewith which is responsive to a control device to place at least one compartment of the multicompartment detergent container in fluid communication with the wash tank, the washing machine further including a heating element which is responsive to the control device to heat a solution of the wash tank, the washing detergent dispensing apparatus comprising:

setting means for setting a quantity of liquid detergent to be added to the wash tank, wherein said setting means includes an oscillator for generating a first pulse signal having a frequency which is variable, the frequency of the first pulse signal corresponding to the quantity of liquid detergent to be added to the wash tank; and,

drive means, operatively coupled to the heating element and the metering pump and the actuator and said setting means, for selectively driving the metering pump for a period of time corresponding to the quantity of liquid detergent set by said setting means in response to an operating state of the actuator and the heating element;

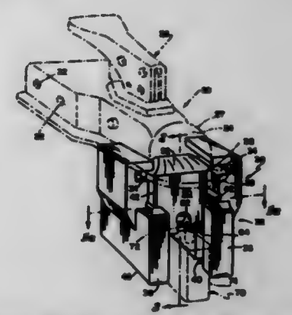
wherein said drive means comprises (a) a frequency multiplier means, operatively coupled to said oscillator, for operating in an enabled state to generate a second pulse signal having a frequency which is a multiple of the frequency of the first pulse signal generated by said oscillator, (b) logic circuit means, operatively coupled to said frequency multiplier means and the actuator, for enabling said frequency multiplier means in response to the operating state of the actuator, (c) electronic counter means, operatively coupled to said frequency multiplier means, for operating in an enabled state to count the pulses of the second pulse signal generated by said frequency multiplier means, (d) sensor means, operatively coupled to said electronic counter means and the heating element, for enabling said electronic counter means in response to an operating state of the heating element, and (e) metering pump drive means, operatively coupled to said electronic counter means and the metering pump, for operating in an enabled state to cause the metering pump to dispense liquid detergent from the reservoir in response to an output from said electronic counter means, wherein the electronic counter means enables said metering pump drive means while counting a number of pulses generated by said frequency multiplier means while being enabled by said sensor means.

5,195,339

SECURITY DEVICE FOR A TRAILER HITCH OR SIMILAR ARTICLE

Victor W. Noe; Jonathan J. Cook, and Michael N. Bruno, all of South Bend, Ind., assignors to International Trade & Technologies, Inc., South Bend, Ind.

Continuation of Ser. No. 566,120, Aug. 10, 1990, Pat. No. 5,063,759. This application Aug. 20, 1991, Ser. No. 747,883
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] E05B *73/00, 65/12*
U.S. Cl. 70—14 10 Claims



1. A security device for a trailer hitch, said trailer hitch having a peripheral flange and a coupling opening, comprising:

a body member which engages with said peripheral flange of said trailer hitch to restrict vertical movement of said security device in relation to said trailer hitch, said body member having two downwardly extending, substantially parallel legs and a transverse web which extends between said legs;

a projection element which slides vertically between said legs of said body member for entering into said coupling opening in said trailer hitch to restrict horizontal movement of said security device in relation to said trailer hitch;

said transverse web includes a first opening;

said projection element includes a second opening such that

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when said projection element extends upwardly into said coupling opening, said first opening and said second opening are aligned;

a lock means extending through said first opening and through said second opening for removably retaining said projection element in position relative to said body member;

said lock means includes a shackle and a lock body and said shackle is removably retained within said lock body; and

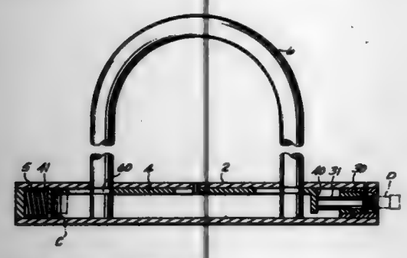
said body member includes a shielding means for precluding access to said shackle when said shackle is secured through said first opening and through said second opening.

5,195,340

PADLOCK DEVICE LOCKABLE BY PUSHING

Tzong-Chyuan Huang, Kaohsiung Hsien, Taiwan, assignor to Chang-Jie Industrial Co., Ltd., Feng-Shan, Taiwan

Filed Mar. 6, 1992, Ser. No. 847,197
Int. Cl.[5] E05B 67/22
U.S. Cl. 70—38 A 4 Claims



1. A lock device comprising:

a hollow cylindrical rod body having a plurality of retaining holes formed through a wall thereof, a closed end and an open end;

a key plug assembly including a tubular outer housing fixed in the open end of said rod body and having an inner end and an outer end, and a push rod extending through said outer housing, said push rod being locked in a locking position in said outer housing where a portion of said push rod extends from said inner end of said outer housing, said push rod being capable of being moved to an unlocking position where a portion of said push rod extends from said outer end of said outer housing when said push rod is unlocked from said outer housing;

an elongated locking plate assembly placed in said rod body between said closed end of said rod body and said key plug assembly and having an end abutting against an end of said key plug assembly so that inward pushing of said push rod impels said locking plate assembly inward, and a plurality of locking holes formed through said locking plate assembly and respectively aligned with said retaining holes of said rod body, each of said locking holes having a small-sized portion and a large-sized portion;

a lock bar assembly consisting of a plurality of lock bars respectively extending through said retaining holes of said rod body and said locking holes of said locking plate assembly, each of said lock bars having a bar notch formed therein which is aligned with one of said locking holes of said locking plate assembly, said lock bars being engaged within said small-sized portions of said locking holes when said push rod is in the locking position so as to limit said lock bars in said locking holes, thereby preventing removal of said lock bars from said rod body; and

a resilient element mounted between said closed end of said rod body and said locking plate assembly so as to bias said locking plate assembly to move toward said open end of said rod body, thereby positioning said lock bars within said small-sized portions of said locking holes of said locking plate assembly;

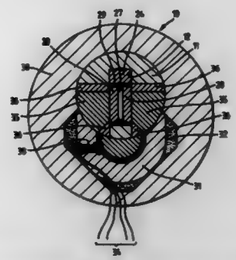
whereby, when a key is inserted into said open end of said rod body and is rotated, said push rod is unlocked from said outer housing so that said resilient element pushes said locking plate assembly to locate said lock bars within said large-sized portions of said locking holes, thereby moving said push rod to the unlocking position.

5,195,341

ELECTRONIC CYLINDER LOCK WITH INDUCTIVELY COUPLED KEY

Evert Nieuwkoop, Pijnacker, Netherlands, assignor to Chubb Lips Nederland bv, Dordrecht, Netherlands

Filed Dec. 20, 1991, Ser. No. 811,097
Claims priority, application United Kingdom, Jan. 8, 1991, 9100336
Int. Cl.[5] E05B 47/00
U.S. Cl. 70—278 19 Claims



1. A lock comprising: a housing; a barrel defining a keyway borne rotatably in the housing and adapted to receive and be turned by a proper coded key; reading means adapted to receive the code from a proper key when inserted in said keyway, by way of inductive coupling with a code transmission element of the key; and means for controlling the operation of the lock whereby to enable the retraction of a locking member by turning of the barrel when a proper key code is received via said reading means; wherein the reading means includes coil means for generating an alternating magnetic field in a region of said keyway and for detecting a modulation or addition to said field by the transmission element of a proper key when located in said region of the keyway; said coil(s) surrounding part of a toroidal magnetically-permeable core structure which defines a gap spanning the aforesaid region of said keyway; and wherein said core structure is collectively defined at least by a first frusto-toroidal part mounted in said housing, around which said coil means wind, and which presents two ends in proximity to said barrel, and by two further parts mounted in the barrel, one to either side of the aforesaid region of said keyway, and which are juxtaposed to respective ends of said first part when the barrel is a position relative to the housing in which the code can be received from a proper key.

5,195,342

CYLINDER GUARD

Louis Werner, 2284 Bowman Ave., Bensalem, Pa. 19020

Filed Feb. 5, 1992, Ser. No. 831,565
Int. Cl.[5] E05B 13/00
U.S. Cl. 70—417 3 Claims

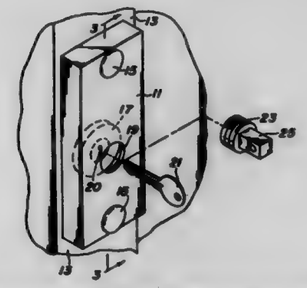
1. A cylinder guard for a door lock, comprising:

a frame;

a key-actuated lock mounted in the frame, said lock having a face and a keyhole therein;

a coverplate affixed to said frame which completely covers the lock, except for a threaded key access aperture which is approximately coaxial with the keyhole of the lock;

a threaded plug screwed into said key access aperture until a back end of the plug is forcibly tightened against the face of the lock; and



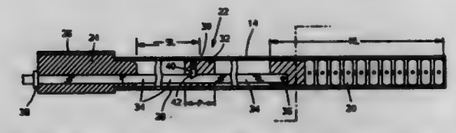
a front end of the plug lying within a front surface of the coverplate when the plug is fully tightened.

5,195,343

PUSHER APPARATUS FOR MULTI-AXIS TUBE BENDER

Antoni J. Malarz, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 26, 1992, Ser. No. 888,063
Int. Cl.[5] B21B 39/02; B21D 9/05
U.S. Cl. 72—133 2 Claims



1. For use with a tube bending machine in which a tube having a free end is continuously pushed under force along its axis through a fixed die and a movable die in order to continuously bend a curvature into said tube, an apparatus for applying pushing force to said tube as it is bent, comprising,

a flexible bending mandrel having a length substantially equal to the distance between said fixed and movable die and sized to make a close slip fit inside of said tube so as to maintain the shape of said tube as it is bent,

a mandrel bar connected to said mandrel and adapted to slide independently to extend said mandrel axially into said tube or to pull said mandrel and withdraw it from said tube,

a stop means to stop said mandrel bar when said mandrel is located within said tube between said fixed and movable die,

a piloting plug sized to make a close slip fit inside of said tube and operatively attached to said mandrel bar so as to extend partially into said tube free end when said stop means is engaged,

a pusher bar assembly having a hollow sleeve through which said mandrel bar is slidably received with a diameter substantially equal to said tube and a free end so as to be abuttable with said tube free end, said hollow sleeve also having an interior length sufficient to receive said mandrel and plug therewithin when said mandrel is withdrawn,

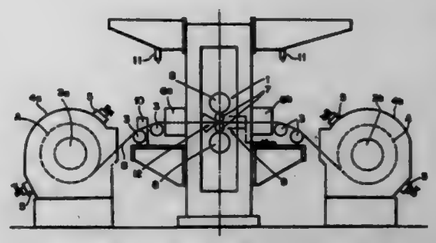
whereby, said mandrel bar may be pulled to withdraw said plug and mandrel to a stored position within said hollow sleeve, from which stored position said hollow sleeve free end may be abutted with said tube free end and said mandrel bar pushed independently through said hollow sleeve and plug to extend said mandrel and plug until said stop means engages, assuring that said plug extends out of said hollow sleeve and partially into said tube free end, thereby allowing said pusher bar to apply a pushing force to said tube as it is bent and supported by said mandrel, after which said mandrel bar may be pulled back to again withdraw said mandrel and plug to stored position.

5,195,344

WARM ROLLING FACILITY FOR STEEL STRIP COILS

Sadakazu Maruda; Fumio Fujita; Tadayoshi Murakami; Masahiko Yoshino; Ryuichi Yagi, and Masamoto Kamata, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00489, § 371 Date Dec. 15, 1988, § 102(e) Date Dec. 15, 1988
Continuation of Ser. No. 584,364, Sep. 17, 1990, abandoned, which is a continuation of Ser. No. 294,610, Dec. 15, 1988, abandoned. This PCT application May 23, 1988, Ser. No. 811,884
Int. Cl.[5] B21B 27/06
U.S. Cl. 72—202 10 Claims



1. A warm rolling facility for silicon steel strip coils, comprising in combination a rolling machine 1 having an inlet and an outlet and rolls 7 and a heating burner 9 adapted to pre-heat said rolls 7, at least two warming furnaces 4*a*,4*b*, a tension reel 2*a*,2*b* supported within each warming furnace and disposed at said inlet and outlet, respectively, a plurality of individual deflector rolls 3 provided with deflector roll heating means and disposed outside of said warming furnaces and between the tension reels and the rolling machine, heating means 6*a*,6*b* disposed at said inlet and outlet, respectively, for heating a passing steel strip, wherein said heating means 6*a*,6*b* and said deflector roll heating means comprise a plurality of components generating heat, which components are arranged in closely spaced series throughout the passage traversed by the steel strip between said tension reels for the purpose of maintaining said steel strip at a predetermined temperature throughout said passage.

5,195,345

REVERSING TWO-HIGH SECTION ROLLING MILL STAND

Burkhard Porombka, Grevenbroich, and Michael Minnerop, Düsseldorf, both of Fed. Rep. of Germany, assignors to SMS Schloemann Siemag Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 821,860, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 548,289, Jul. 3, 1990, abandoned. This application Jul. 31, 1992, Ser. No. 924,434
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, 3921928
Int. Cl.[5] B21B 31/12
U.S. Cl. 72—237 4 Claims

1. A reversible roll stand, comprising:

a plurality of multi-caliber rolls comprising at least a top roll and a bottom roll:

bearing members partially surrounding said rolls;

posts having beams;

windows having tops formed by said beams, wherein said bearing members are adjustably guided in said windows;

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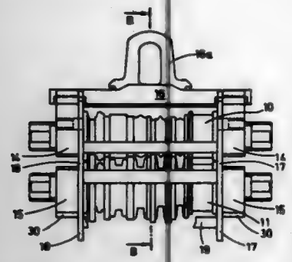
connector caps on said beams carrying adjustment elements for the bearing members displaceable for disassembly or removal of the rolls;

a support frame, wherein the rolls with their bearing members are placed and wherein said support frame is insertable and removable through the tops of the windows;

carriers of rolling material guides, wherein said carriers are insertable into said support frame, wherein said support frame, further comprises a pair of U-shaped plates connected with each other in a plane-parallel manner by spacer members, said U-shaped plates defining an aperture



and having recesses wherein said rolls with said bearing members projecting outwards on both sides are held in the recesses;

web region of the U-shaped plates, wherein said web region forms a support face for bottom sides of the bearing members of the bottom roll; and

opposed pairs of cantilever projections formed in upper portions of each U-shaped plate, wherein said cantilever projections protrude into the aperture for engaging cooperating ledge portions formed in the bearing members of the top roll during roll changes.

5,195,346

ROLLING MILL STAND WITH ARRANGEMENTS FOR SUPPORTING AN UPPER WORK ROLL OF THE STAND

Martin Braun; Jürgen Armonat, and Heinrich Röse, all of Krefeld, Fed. Rep. of Germany, assignors to SMS Schloemann Siemag Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 28, 1991, Ser. No. 783,564

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1990, 4034436

Int. Cl.[5] B21B *31/08*

U.S. Cl. 72—238 **10 Claims**

1. A rolling mill stand, comprising:

an upper work roll;

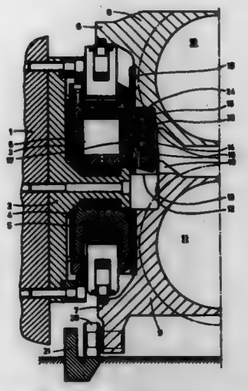
a lower work roll, wherein said upper and lower work rolls are supported in chocks;

balancing cylinders for raising the upper work roll from the lower work roll;

mechanical means for supporting the upper work roll for a roll change on the balancing cylinders above the lower work roll for preventing contact of the rolls;

pivotable support levers included as part of one of said rolls, wherein each lever is movable between a basic position and an effective position and extends in the basic position thereof around sides of the chocks of the other of said rolls;

grooves defined by the chocks of the other of the rolls; and



free ends on the support levers, wherein the free ends rest on bottoms of the grooves when the support levers are in the effective position.

5,195,347

GUIDE DEVICE FOR SHAPE ROLLING

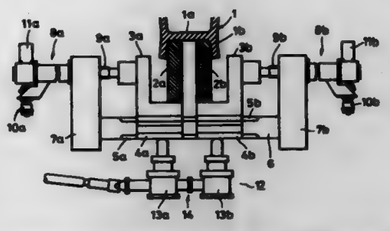
Tsuneo Seto; Atsushi Hatanaka; Hironori Miura, and Youji Fujimoto, all of Okayama, Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Dec. 19, 1991, Ser. No. 811,173

Claims priority, application Japan, Dec. 27, 1990, 2-408520; Jul. 19, 1991, 3-203691; Oct. 30, 1991, 3-311940

Int. Cl.[5] B21B *39/20*

U.S. Cl. 72—251 **3 Claims**



1. A guide device for shaped steel rolling of the type which includes a shape rolling mill for rolling shaped steel, said shaped steel passing through said mill in a rolling direction generally along a plane of a pass line of said mill, further including upper and lower pairs of width-variable web guides arranged on an entry and/or a delivery side of said shape mill, said guide device comprising:

upper and lower pairs of support bases supporting said upper and lower pairs of web guides;

said support bases being mounted on upper and lower pairs of movable bases, said movable bases being movable in a direction generally transverse to the rolling direction and generally in the plane of rolling;

upper and lower side frames, each of said side frames having ends thereto, enabling movement of said movable bases, while supporting said movable bases;

upper and lower pairs of guide frames, each of said guide frames being an individual end of a respective one of said side frames while fixing said individual end of said side frame;

guide width adjusting means connecting to individually adjust distance between said movable bases of the respective pairs; and

guide height adjusting means connected for adjusting the heights of said web guide pairs, as supported by said side frames and said guide frames, in a direction generally transverse to the plane of rolling.

5,195,348

BENDING-SHAPING MACHINE FOR SECTIONS AND METHOD TO APPLY BENDS IN THE TRAILING END OF SECTIONS

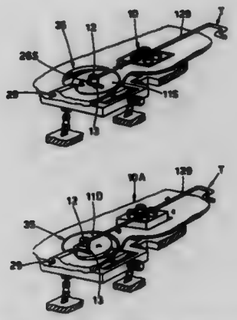
Giorgio Del Fabro, Cassacco-Fraz.Montegnacco, and Marcello Del Fabro, Udine, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale (UD), Italy

Filed Dec. 12, 1991, Ser. No. 805,978

Claims priority, application Italy, Dec. 17, 1990, 83543 A/90

Int. Cl.[5] B21D *7/022*

U.S. Cl. 72—294 **7 Claims**



1. A bending-shaping machine for bending sections passing therethrough from an upstream and to a downstream end, comprising:

a working platform;

a bending unit cooperating with said working platform and comprising a rotatable bending disk having an axial abutment roll and a bending pin for bending the sections about the abutment roll;

a drawing unit provided upstream of said bending unit and being movable between a working position cooperating with said working platform to axially move said sections from said bending assembly in a downstream direction, a retracted non-working position below said working platform so that said drawing unit is out of operative engagement with said sections, and a high position above said working platform for lifting the sections above and out of operative engagement with said abutment roll.

5,195,349

FORMING MACHINE AND PROCESS FOR FORMING MATERIAL THEREWITH

Nobuyuki Ishizaga, and Takashi Nakano, both of Sagamihara, Japan, assignors to Aida Engineering Ltd., Kanagawa, Japan

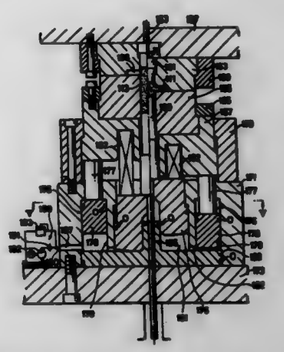
Continuation of Ser. No. 478,465, Feb. 12, 1990, abandoned.

This application Mar. 5, 1992, Ser. No. 847,424

Int. Cl.[5] B21J *9/12*

U.S. Cl. 72—359 **4 Claims**

1. A forming machine for providing selective variation of the ratio η of a closing force to a forming force, comprising a pair of dies disposed to face each other, a punch partially inserted in at least one of the dies, a die plate supporting one of the dies in which the punch is inserted, a guide member disposed outwardly of the die on the die plate and confining the die plate for axial movement within said guide member, means for driving the dies together to develop the closing force, a piston member supporting the punch for axial movement therewith and disposed at the center of a holder located beneath the guide member, the piston member disposed for driving the punch further into said one die to develop the forming force, a plurality of two-part piston members within said holder supporting the die plate and disposed radially outwards of the piston member, and a communication path communicating between a first fluid pressurized cylinder chamber accommodating the piston member and a second fluid cylinder chamber



accommodating each of the two-part piston members for increasing fluid pressure within said first chamber as the dies move together in the same direction toward the two part piston members, the two-part piston members providing displacement of fluid from the second chamber to the first chamber through said communication path for forcing the punch via the piston member further into said one die in response to such fluid pressure increase for developing the forming force on said punch, the number of complete two-part piston members being selectively variable for controlling volume of the fluid displacement thereby to selectively vary the ratio η.

5,195,350

METHOD FOR FORMING FEATURES ON AN ELONGATED METAL WIRE

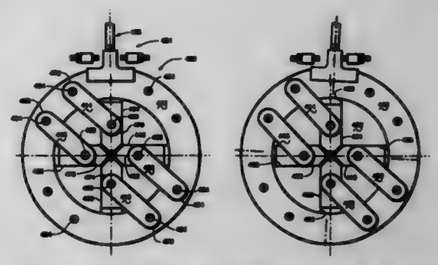
Paul W. Aitken, Etters; David F. Fasselman, Middletown, both of Pa., and James D. Strong, Bear, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 694,513, Apr. 25, 1991, Pat. No. 5,117,671.

This application Jan. 7, 1992, Ser. No. 817,630

Int. Cl.[5] B21G *3/16*

U.S. Cl. 72—402 **14 Claims**



1. A method for forming a feature on an elongated metal wire, comprising:

rotating a ring about a tool guide in a first direction, the ring connected by links to a first forming tool, a second forming tool, a third forming tool and a fourth forming tool causing the first forming tool and the second forming tool

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to slide in a first slot in the tool guide towards a first pair of distal sides of the wire;

simultaneously stamping the first pair of distal sides of the wire between a working end of the first forming tool and a working end of the second forming tool such that the working ends press into the first pair of the distal sides a first distance;

rotating the ring about the tool guide in a second direction moving the links to slide the third forming tool and the fourth forming tool in a second slot in the tool guide towards a second pair of distal sides of the wire and moving the links to slide the first forming tool and the second forming tool in the first slot away from the wire;

simultaneously stamping the second pair of distal sides of the wire between a working end of the third forming tool and a working end of the fourth forming tool such that the working ends press into the second pair of the distal sides a second distance;

rotating the ring about the tool guide in the first direction moving the links to slide the first forming tool and the second forming tool in the first slot towards the first pair of distal sides of the wire and moving the links to slide the third forming tool and the fourth forming tool in the second slot away from the wire;

simultaneously stamping the first pair of the distal sides of the wire between the working end of the first forming tool and a working end of the second forming tool such that the working ends press into the first pair of the distal sides a third distance;

rotating the ring about the tool guide in the second direction moving the links to slide the third forming tool and the fourth forming tool in the second slot in the tool guide towards the second pair of distal sides of the wire and moving the links to slide the first forming tool and the second forming tool in the first slot away from the wires; and

simultaneously stamping the second pair of distal sides of the wire between the working end of the third forming tool and the working end of the fourth forming tool such that the working ends press into the second pair of the distal sides a fourth distance,

whereby the feature is formed in the sides of the metal wire.

5,195,351

ARRANGEMENT FOR CLAMPING AND BALANCING PRESSING TOOL CARRIERS AND CRANK HOUSING OF AN UPSETTING PRESS

Gerhard Heitze, Netphen, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 4, 1991, Ser. No. 787,053

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1990, 4035000

Int. Cl.[5] B21J *9/06*; B21B *15/00*

U.S. Cl. 72—407 9 Claims

1. An arrangement for clamping and balancing a pressing tool carrier and a crank housing of an upsetting press, for width reduction of rolled material, and particularly for reducing the widths of slabs in hot-rolled wide-strip breaking-down trains by feeding said slabs through the upsetting press as said pressing tool carriers are reciprocated towards and away from said slabs, comprising:

a tool carrier for receiving pressing tools which are arranged on both sides of said slab, wherein said tool carrier is movable in a direction of a slab reduction by means of a crank drive, wherein the arrangement further comprises:

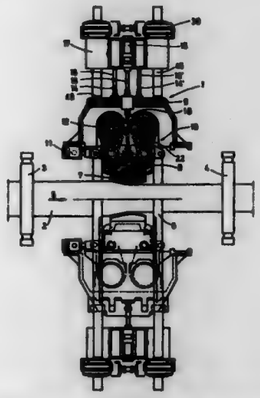
a crank housing for said tool carrier, said crank housing having said crank drive;

an upsetting stand comprising:

housing post members and a transverse member connecting said housing post members, said crank housing and its crank drive being movably mounted on and arranged between said housing post members and said transverse member;

a middle rod system mounted in an articulated manner and guided through said crank housing and attached to said tool carrier approximately in the middle thereof;

a plurality of outer rod systems which are spaced from said middle rod system wherein said outer rod system are mounted in an articulated manner and attached to said crank housing, wherein said middle rod system and said outer rod system are connected to clamping units for



applying a tensile load to said middle rod system and said outer rod systems, and further wherein said clamping units are rigidly connected to said transverse member of said housing post members of said upsetting stand, said tensile forces acting on said outer rod systems to move said crank housing relative to said transverse member in a direction away from said slab and said tensile force acting on said middle rod system to reduce any mechanical play between the tool carrier and the crank drive during slab width reduction.

5,195,352

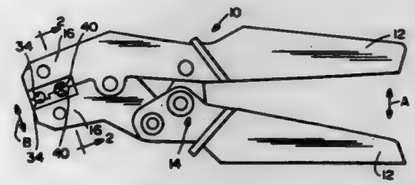
CRIMPING TOOL SYSTEM FOR OPTICAL FIBER CABLES

Igor Grois, and Mark Margolin, both of Lincolnwood, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Nov. 8, 1991, Ser. No. 789,512

Int. Cl.[5] B21D *41/04*, *7/06*

U.S. Cl. 72—410 5 Claims



1. A crimping tool for compressing a connector component onto an insulated conductor, the component including an open end into which the insulated conductor is inserted, comprising a pair of jaws relatively movable toward and away from each other, each jaw including a first stage recessed surface area combining with the first stage recessed surface area of the other jaw to define a first stage crimping cavity sized to compress the insulated conductor sufficiently to ensure that the

insulated conductor is insertable into the open end of the connector component, and each jaw including a second stage recessed surface area combining with the second stage recessed surface area of the other jaw to define a second stage crimping cavity sized to compress the connector component onto the insulated conductor and wherein each of said second stage recessed surface areas includes a protrusion for indenting the connector component and driving a portion of the component against the insulated conductor when the jaws are moved toward each other to compress the component and wherein said first stage recessed surface areas are each semi-circular to define a round crimping cavity without any protrusions when the first stage recessed surface areas cooperate with one another.

5,195,353

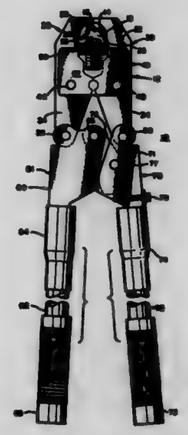
TOOLS FOR CRIMPING TUBULAR ELEMENTS ON WIRE OR CABLING

Robert S. Erbrick, Danboro, and Joseph E. Erbrick, Jr., Chalfont, both of Pa., assignors to Electroline Corp., Danboro, Pa.

Continuation of Ser. No. 718,057, Jun. 20, 1991, abandoned. This application Apr. 2, 1992, Ser. No. 864,162

Int. Cl.[5] H01R *43/042*

U.S. Cl. 72—410 19 Claims



1. A tool for crimping tubular connector and terminal elements, the tool comprising:

a first jaw member having a pair of opposing ends and a first crimping surface proximal a first of the pair of ends;

a second jaw member having a pair of opposing ends and a second crimping surface proximal a first of the pair of ends;

pivot means supporting the first and second jaw members for pivoting movement with respect to one another in a common plane of the tool, and end of the first crimping surface adjoining an end of the second crimping surface and defining a generally concave recess in the common plane when the first ends of the first and second jaws are pivoted together;

a third, generally planar crimping surface located between the first and second jaw members in the common plane within the recess, the third surface facing and extending transversely with respect to both of the first and second crimping surfaces and defining a crimp nest with the first and second crimping surfaces when the first ends of the first and second jaws are pivoted together, the crimp nest further being open on at least opposing sides of the common plane so as to receive within the three crimping surfaces a tubular element having a longitudinal direction extending perpendicularly to the common plane said third crimping surface being stationary during pivoting movement of said first and second jaw members; and

means for adjustably positioning the third crimping surface in the recess towards and away from the adjoining ends of the first and second crimping surfaces to selectively vary the size of the crimp nest defined at least when the first ends of the first and second jaw members are pivoted together.

5,195,354

CAM CRANK MECHANISM AND MOTOR DRIVEN HYDRAULIC TOOL

Tadashi Yasui, Kyoto, and Masayuki Kobayashi, Matsumoto, both of Japan, assignors to Japan Storage Battery Co., Ltd., Nagano and Izumi Products Co., Kyoto, both of Japan

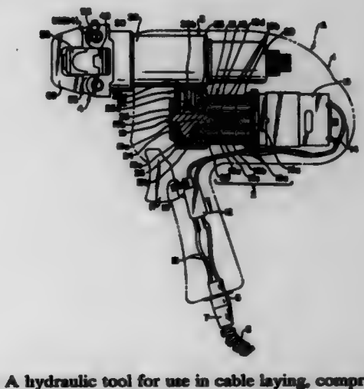
Continuation of Ser. No. 649,184, Feb. 4, 1991, Pat. No. 5,111,681. This application Mar. 17, 1992, Ser. No. 852,944

Claims priority, application Japan, Mar. 31, 1989, 1-37854; Mar. 31, 1989, 1-37855

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.[5] H01R *43/042*

U.S. Cl. 72—453.03 4 Claims



1. A hydraulic tool for use in cable laying, comprising:

a tool head including a stationary tool member and a movable tool member,

a hydraulic mechanism for displacing said movable tool member toward and away from said stationary tool member,

a cam crank mechanism for generating a hydraulic pressure, said cam crank mechanism comprising a rotational shaft, an eccentric shaft fixed with respect to said rotational shaft so as to rotate therewith, a cam plunger assembly having a reciprocal plunger for generating said hydraulic pressure, said reciprocal plunger having first and second longitudinal ends and a ring at one of said longitudinal ends, the eccentric shaft being fitted in said ring so as to be freely rotatable with respect thereto, said ring having an inner surface formed in a contour so as to permit said eccentric shaft fitted therein to reciprocate the plunger, thereby to generate said hydraulic pressure for powering the hydraulic mechanism,

a speed reduction unit with a motor for driving said cam crank mechanism and an electric power supply source for the motor, and

an aperture defined through said tool head and extending in a direction substantially perpendicular to a line connecting said stationary tool member and said movable tool member whereby an object inserted through said aperture and between said stationary tool member and said movable tool member can be crimped therebetween.

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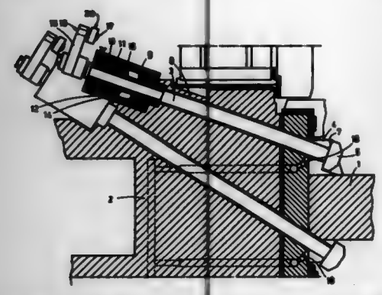
5,195,355

APPARATUS FOR CONNECTING A PRESSING DIE TO A SUPPORT IN AN UPSETTING PRESS

Gerhard Heitze, Netphen, and Horst Grafe, Hilchenbach, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 26, 1991, Ser. No. 749,585
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1990, 4026827
Int. Cl.[5] B21D *37/14*
U.S. Cl. 72—481 17 Claims



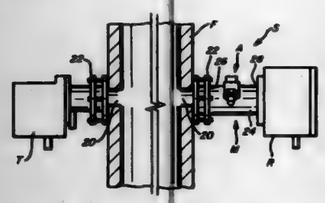
1. An apparatus for detachably connecting a pressing die and a support of an upsetting press, comprising:
- a prestressable tie rod having a hammer-shaped tie rod head, wherein said tie rod is held rotatably in guidance bores in said support;
- a recess in the pressing die open on one side and essentially adapted to said tie rod head and supporting same, wherein said tie rod engages into said recess; and
- an abutment surface located on said pressing die and adjoining said recess for supporting said tie rod head and wherein said apparatus further comprises:
- a spray nozzle arranged in said support, wherein said spray nozzle is directed toward a region of said tie rod head and said abutment surface of said pressing die for directing a cleaning medium in said region where said tie rod head contacts said abutment surface.

5,195,356

TEST ASSEMBLY FOR FLUE GAS MONITORS

Leroy F. Stavinoha, Needville, Tex., assignor to Houston Industries Incorporated, Houston, Tex.

Filed Jul. 11, 1991, Ser. No. 728,620
Int. Cl.[5] G01N *21/17*
U.S. Cl. 73—1 G 10 Claims



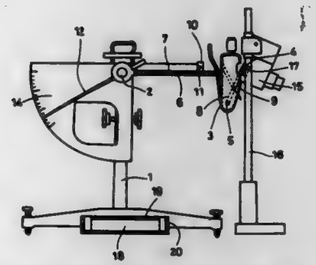
1. An assembly for mounting a calibration sample body, which contains a calibration quantity of a constituent combustion gas, between an optical gas monitor transmitter and receiver transversely and externally to a flue for exiting combustion gases to calibrate the gas monitor, comprising:
- a sample body chamber for receiving the sample body, said sample body chamber comprising:
- a yoke member into which the sample body is fitted;
- front and rear closure plates mounted with said yoke member to form a receptacle for the sample body;
- a retainer block for fitting with said yoke member above the sample body in said receptacle to hold the sample body in place between the transmitter and the receiver;
- support tube means mounting at least one of the optical test transmitter and receiver transversely and externally to the flue;
- means for mounting the sample body chamber in said support tube means between the transmitter and receiver of the gas monitor.

5,195,357

METHOD FOR MEASURING RESISTANCE TO SLIPPAGE

Hiroshi Takino; Makoto Komai, and Noriyuki Isobe, all of Ibaraki, Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

Continuation of Ser. No. 584,121, Sep. 18, 1990, abandoned. This application Aug. 18, 1992, Ser. No. 929,501
Claims priority, application Japan, Sep. 18, 1989, 1-243239
Int. Cl.[5] G01N *19/02*
U.S. Cl. 73—9 18 Claims



1. A method for measuring resistance to slippage comprising the steps of:
- using a sample of rubber having a sectional form of a sliding portion cut generally parallel to a sliding direction, the sample being shaped in a generally circular arch;
- mounting the sample of rubber at a bottom of a pendulum, the pendulum being freely swingable on a shaft;
- sliding the sample of rubber on a road surface sample during swinging of the pendulum, the road surface sample being one of dry and wet;
- coordinating temperatures of the sample of rubber and the road surface sample by one of heating and cooling the samples;
- measuring kinetic energy loss of the pendulum due to sliding of the sample of rubber and thereby obtaining resistance to slippage.

5,195,358

APPARATUS FOR MEASURING WATER-VAPOR PARTIAL PRESSURE

Ulrich Bleek, Babelsberg, and Axel Obiera, Potsdam, both of Fed. Rep. of Germany, assignors to Wilhelm Lambrecht GmbH, Gottingen, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 781,369
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 4034185
Int. Cl.[5] G01N *31/00*
U.S. Cl. 73—25.04 20 Claims

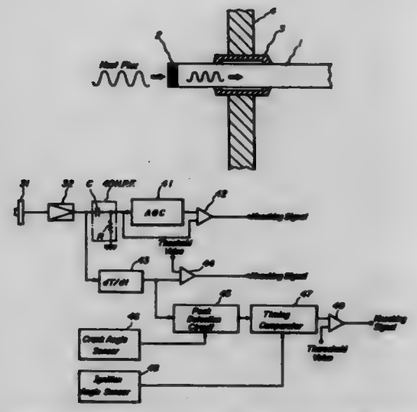
1. An apparatus for measuring the water-vapor partial pressure in a mixture of water vapor and gas, the apparatus comprising:
- an electrolytic cell having an electrolyte exposed to said mixture and configured to receive an alternating voltage, said alternating voltage configured to induce an alternating current within said electrolytic cell having a magnitude dependent upon said partial pressure;
- a measuring sensor in direct thermal contact with said electrolyte of said electrolytic cell, said measuring sensor configured to measure the temperature of said electrolyte;
- a heater separated from and surrounding said electrolytic cell thereby defining a space therebetween for passage of said mixture, said heater being controlled by said alternating current, said heater configured to heat said mixture with essentially convection heat, and said heater being geometrically so extensive relative to the cell that a homogeneous radiation field is produced around said electrolytic cell to thereby heat said electrolyte with essentially radiant heat.

5,195,359

APPARATUS FOR DETECTING OPERATING CONDITION OF INTERNAL-COMBUSTION ENGINE

Shunsuke Kubota, and Hiroshi Maru, both of Tokyo, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1990, Ser. No. 552,507
Claims priority, application Japan, Jul. 18, 1989, 1-183553; Oct. 23, 1989, 1-273658
Int. Cl.[5] G01L *23/22*
U.S. Cl. 73—35 4 Claims



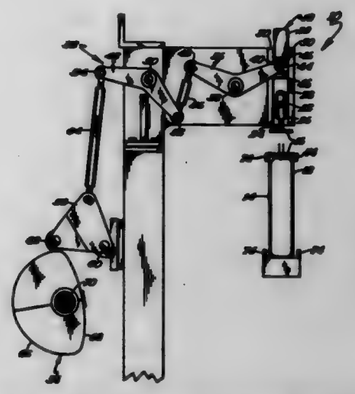
4. An apparatus for detecting an operating condition of an internal-combustion engine, comprising:
- a black body light radiating member for being arranged within a combustion chamber of the internal-combustion engine and for radiating light energy;
- a light propagating having a first end to which the black body light radiating member is optically coupled and a second end;
- a supporting member for supporting said light propagating member such that said black body light radiating member is situated at a position within the combustion chamber;
- a light detecting member arranged to receive the light energy radiated by said black body light radiating member, propagated along said light propagating member and emanated from the second end of the light propagating member and for converting the received light energy into a temperature signal representing a temperature sensed by said black body light radiating member; and
- a signal processing circuit for processing the temperature signal supplied from said light detecting member to detect the operating condition of the internal-combustion engine, wherein said signal processing circuit comprises:
- a differentiating circuit for differentiating said temperature signal in the time domain to produce a derivative signal;
- a peak detecting circuit for detecting a peak of the derivative signal;
- a timing comparator for comparing a timing of said peak of the derivative signal with a reference timing related to an ignition timing and for producing a corresponding output; and
- a second comparator for comparing the output of the timing comparator with a threshold value to derive a knocking signal when the timing of the peak of the derivative signal is advanced with respect to a timing determined by said threshold value.

5,195,360

APPARATUS AND METHODS FOR TESTING DOUBLE PACKAGES

Wayne I. Knigge, Maple Grove, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 12, 1990, Ser. No. 596,795
Int. Cl.[5] G01M *3/36*
U.S. Cl. 73—49.3 24 Claims



5. An apparatus for testing sealed liners containing a product and a volume of trapped air, comprising, in combination: a carriage; a first crank arm having at least a first end, with the first crank arm being pivotally mounted about an axis; means for rocking the first crank arm about its axis; means for operatively connecting the first end of the crank arm to the carriage for moving the carriage between a first, lower position adjacent the liner and a second, upper position elevated from the liner; means movable relative to the carriage for placing pressure on the liner; and means for detecting the extent the liner

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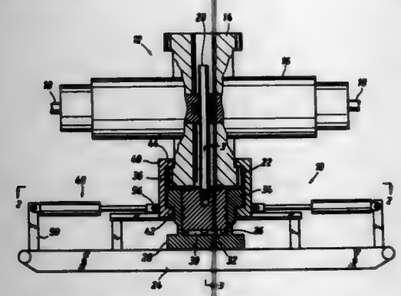
deflects under the pressure placing means, with the liner deflecting a greater extent when the liners are improperly sealed allowing escape of the trapped air from the liner.

5,195,361
TEST METHOD AND APPARATUS FOR BOP EQUIPMENT

Gary R. Wood, Lemon Grove Spring, and Carl P. Hutchinson, El Campo, both of Tex., assignors to Petco Equipment Tools Co., Houston, Tex.

Filed Nov. 25, 1991, Ser. No. 797,682
Int. Cl.[5] G01M *3/04*
U.S. Cl. 73—49.8 19 Claims



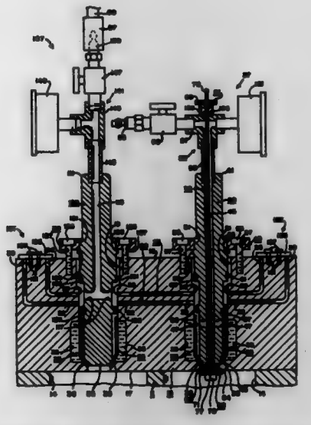
1. A BOP test apparatus comprising:
(a) an upstanding hollow cylindrical housing having a chamber therein;
(b) a piston sealingly positioned in said chamber for movement therein to define a lower pressure fluid receiving chamber and an upper pressure fluid receiving chamber separated by said piston;
(c) an upwardly directed face on said piston for mating positioning opposite the bottom flange of a BOP so that the bottom flange when positioned thereagainst defines the upper pressure fluid receiving chamber therewithin above the piston isolated from the chamber below the piston; and
(d) means for temporarily clamping the BOP bottom flange so that the BOP can be pressure tested by pressure fluid isolated above the piston in the upper pressure fluid receiving chamber, said clamping means comprising separate first and second facing portions of a clamp ring constructed with and defined by semicircular clamp rings, wherein said clamp rings have spaced parallel surfaces bearing against the bottom flange of the BOP and an uppermost flange on said housing to enable testing.

5,195,362
APPARATUS FOR AND METHOD OF TESTING DIESEL ENGINE HEADS FOR FUEL AND/OR COLLANT LEAKS

Preston M. Eason, Memphis, Tenn., assignor to Jimmy R. C. Grinder; Richard Noble Grinder, Millington and George-Houston Lyell, Memphis, both of Tenn., part interest to each

Filed Oct. 21, 1991, Ser. No. 779,966
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—49.7 10 Claims

1. A method for testing an engine cylinder head for leaks regardless of whether said cylinder head is attached to an engine block, said cylinder head having a fuel injector aperture extending from a first side to a second side thereof, having a coolant passageway communicating with said fuel injector apertures between said first and second sides of said cylinder head, and having a sleeve in said fuel injector aperture to separate said fuel injector aperture from said coolant passageway; said method comprising the steps of:
a) forming an air-tight seal in said fuel injector aperture between said coolant passageway and said first side of said cylinder head;
b) forming an air-tight seal in said aperture between said coolant passageway and said second side of said cylinder head;

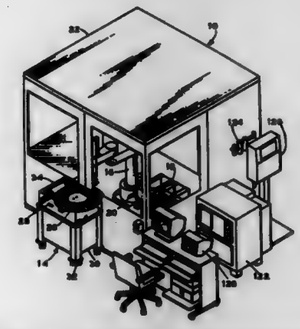


c) then pressurizing said fuel injector aperture between said air-tight seals thereof; and
d) then monitoring the pressure of said fuel injector aperture between said air-tight seals thereof over a period of time.

5,195,363
AUTOMATED MASS-MOMENT WEIGHING SYSTEM FOR JET ENGINE BLADES

E. Thomas Gossler; Michael A. Paul, and V. Edward Stubbs, III, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 16, 1991, Ser. No. 746,373
Int. Cl.[5] G01M *1/12*
U.S. Cl. 73—65 13 Claims



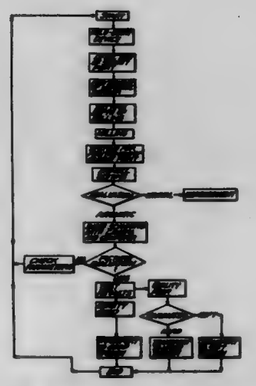
1. A method of determining the mass-moment of a blade comprising the steps of:
a) positioning an individual blade at a first work area within an enclosed chamber, said first work area being accessible from outside said enclosed chamber;
b) engaging the blade at said first work area by robotic means within said enclosed chamber for transporting the blade from said first work area to a second work area also located within said enclosed chamber;
c) automatically transferring the blade at said second work area from said robotic means to a weighing beam;

d) weighing the blade at said second work area via engagement of said weighing beam with a weighing scale, and transmitting the weight measured by said weighing scale to processing means for determination of the mass-moment of the blade;
e) disengaging the blade from said weighing beam; and,
f) automatically returning the blade from said second work area to said first work area via said robotic means for subsequent removal of the blade from said enclosed chamber.

5,195,364
METHOD AND APPARATUS FOR TESTING THE HARDNESS OF A WORKPIECE BY THE PENETRATION METHOD

Hans-Jürgen Dehe, Essen; Heinz Böcebeck, Mettmann, and Wolfgang Ruyters, Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 12, 1991, Ser. No. 713,872
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4019120; Jun. 11, 1991, 4119564
Int. Cl.[5] G01N *3/42*
U.S. Cl. 73—81 4 Claims

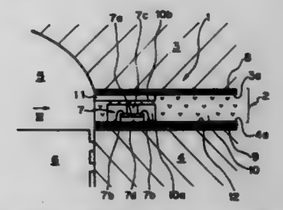


1. A method of testing the hardness of a workpiece having a continuously curved outer surface, in particular a pipe or rod, by the penetration method, comprising:
(a) holding the workpiece in a horizontally and vertically fixed position; (b) arranging a machining tool and a hardness testing instrument having a penetration body above said workpiece for movement with respect to said workpiece; (c) linearly scanning a predetermined area of said curved surface of said workpiece for determining the distance between a distance sensor and said surface, said area lying in the horizontal path of said machining tool; (d) determining the summit point of said scanned curved surface area from said scanning operation of step (c); (e) selecting said scanned curved area as the test location for the horizontal positioning of said hardness testing instrument; (f) selecting said summit point within said scanned area of said workpiece as the reference point for the vertical positioning of said machining tool; (g) performing a second distance measurement for determining the vertical position of said summit point; (h) utilizing said position for a fine vertical position of said machine tool; (i) machining a region into the surface of said workpiece; (j) pressing said penetration body with a defined force into said machined region to generate an impression surface in said machined region of said workpiece; and (k) determining the hardness of said workpiece from said surface of said depression.

5,195,365
DEVICE FOR DETECTING COMBUSTION PRESSURE OF AN INTERNAL COMBUSTION ENGINE

Yoshiki Chuje, Mishima; Masato Sahashi, Susono; Koji Tsukada, Seto, and Yutaka Nonomura, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 22, 1991, Ser. No. 748,698
Claims priority, application Japan, Aug. 24, 1990, 2-87848; Aug. 24, 1990, 2-87849; Aug. 24, 1990, 2-87850; Aug. 24, 1990, 2-87853
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—115 13 Claims

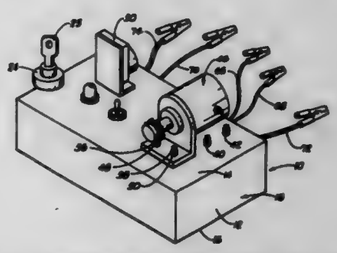


1. A device for detecting a combustion pressure in a combustion chamber of an internal combustion engine, said device comprising:
means for detecting the combustion pressure, said detecting means being provided with a pressure sensitive surface and being arranged in a cylinder head gasket so that said pressure sensitive surface is disposed substantially parallel to either a surface of a cylinder head, said cylinder head surface coming into contact with said cylinder head gasket, or a surface of a cylinder block, said cylinder block surface coming into contact with said cylinder head gasket, and
a fluid pressure inlet arranged adjacent to said pressure sensitive surface to introduce the combustion pressure in said combustion chamber into contact with said pressure sensitive surface of said detecting means.

5,195,366
TESTING APPARATUS FOR TWO OR FOUR CYLINDER ENGINES

Coy R. Duncan, 701 S. Jarrett, Wynnewood, Okla. 73098

Filed Aug. 22, 1991, Ser. No. 748,572
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 14 Claims



1. A test apparatus for testing an electric starter, a solenoid and a key operated switch operable with a key of a two or four cylinder engine of an outdoor apparatus and adapted for use with a power supply, comprising:
a component box;
means for removably connecting the key operated switch to the component box;
means for removably connecting the solenoid to the component box;
means for removably connecting the electric starter to the component box;

an indicator connected to the key operated switch, the indicator providing a perceivable output indication when the key operated switch is connected to the component box and to the power supply and the key is operated to close the key operated switch when the key functions properly to close the key operated switch;

means for connecting the solenoid to the power supply, the solenoid providing a perceivable output indication when the solenoid is connected to the power supply and properly is engaged; and

means for connecting the electric starter to the power supply, the electric starter providing a perceivable output indication indicating whether or not the electric starter properly is engaged when the electric starter is connected to the power supply.

5,195,367

ANEMOMETER

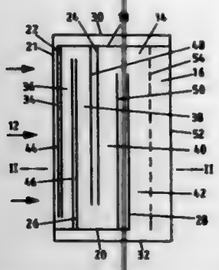
Martin Hohenstatt, Hasmersbach; Dieter Link, Hanau; Karlheinz Eckert, Gründau, and Otakar Prokopec, Hanau, all of Fed. Rep. of Germany, assignors to Sensycon, Hanover, Fed. Rep. of Germany

Filed Jun. 24, 1991, Ser. No. 725,756

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1990, 4019875

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.26 **7 Claims**



1. In an anemometer for flow speed or mass flow measurement of gases or fluids comprising a surface resistor disposed on an electrically insulating carrier and having base lines separating adjacent areas of said surface resistor and extending in the direction of flow and first and second sets of partition lines separating adjacent areas of said surface resistor and extending substantially perpendicularly to said direction of flow from said base lines to form a current path consisting of current path sections outlined by said base lines and said partition lines, the widths of said current path sections being dimensioned such that the electrical heating capacity density in each current path section decreases at least largely in the same measure as the local heat current density dissipated by the flow speed or mass flow while the width of the current path sections increases in the direction of the flow, the improvement comprising;

resistance trimming lines separating adjacent area of said surface resistor, positioned parallel to said partition lines and extending from said base lines, said resistance trimming lines being so disposed that the effective resistance of each current path section having a resistance trimming line is increased in percentage to the same extent.

5,195,368

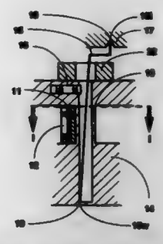
SIGNAL PICKUP MECHANISM

John E. Durand, 26581 Doloroso, Mission Viejo, Calif. 92691

Continuation-in-part of Ser. No. 235,563, Aug. 24, 1988, Pat. No. 5,024,085. This application Oct. 29, 1990, Ser. No. 604,817

Int. Cl.[5] G01F *3/08*

U.S. Cl. 73—256 **2 Claims**



1. A magnetic signal pickup mechanism, comprising:

a moving mass fixedly coupled to a moving element;

a movable element wire, wherein one of the mass and wire is magnetic and the other is one of magnetic and ferromagnetic, the movable element wire coupled magnetically to the moving mass and further the ends of the movable element wire coupled mechanically to pivot points wherein the pivot points restrict longitudinal movement of the movable element wire in relation to the moving mass, the pivot points being offset sufficiently distant from each other to prevent contact between the movable element wire and any structure other than the pivot points wherein the length of the movable element wire exceeds the distance between the two ends of the movable element wire so that the movable element wire is non straight, wherein the movable element wire attempts to track the moving mass generated magnetic forces and remain as close as possible to the moving mass.

5,195,369

APPARATUS FOR DETERMINING THE UNBALANCE OF WHEELS MOUNTED ON A VEHICLE

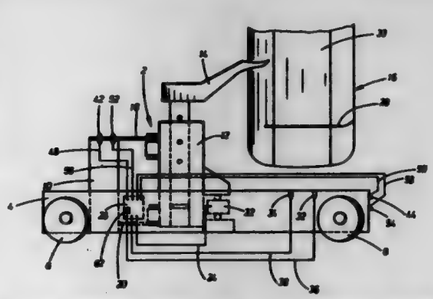
Hermann Bux, Poecking-Possenhofen, and Peter Ross, Munich, both of Fed. Rep. of Germany, assignors to A. Rohe GmbH, Scholkrippen, Fed. Rep. of Germany

Continuation of Ser. No. 396,030, Aug. 21, 1989, abandoned. This application Mar. 23, 1992, Ser. No. 855,485

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828610

Int. Cl.[5] G01M *1/28*

U.S. Cl. 73—457 **59 Claims**



1. An apparatus for determining the unbalance of wheels mounted on a vehicle, comprising:

a plurality of measuring racks each for supporting a vehicle wheel;

sensor means provided in each of said measuring racks for sensing vibrations caused by the unbalance and for issuing a sensor signal representative thereof;

measurement/control means associated with each measuring rack for generating measurement unbalance signals representing the magnitude and direction of unbalance from said sensor signals;

the sensor means and measurement/control means at each measuring rack being responsive to and controlled by control signals;

a central display and control unit cooperating with said plurality of measuring racks and including display means for displaying at least the magnitude of unbalance, said central display and control unit generating said control signals for controlling the operation of the sensor means and measurement/control means of each measuring rack to control the unbalance testing at each measuring rack;

each of said measuring racks and said central display and control unit comprising transmitter/receiver means for wireless signal transmission in the path between each of said measuring racks and said central display and control unit, whereby said measurement signals are transmitted from said measuring racks to said central display and control unit and control signals from said central display and control unit to each of said measuring racks; and

wherein said transmitter/receiver means at each of said measuring racks are arranged with respect to each other so that the measurement and control signals can be transmitted between measuring racks.

5,195,370

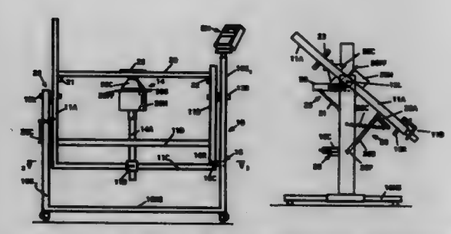
AUTOMOTIVE WHEEL BALANCING APPARATUS AND METHOD

Richard M. Hultberg, Vienna, Va., assignor to Ann Hultberg, executrix

Continuation of Ser. No. 139,124, Dec. 23, 1987, Pat. No. 5,025,662, which is a continuation of Ser. No. 502,986, Jun. 10, 1983, abandoned. This application Jun. 24, 1991, Ser. No. 719,434

Int. Cl.[5] G01M *1/22*

U.S. Cl. 73—459 **2 Claims**



1. A method for dynamically determining the imbalance of a combined wheel and tire for a motor vehicle, comprising the steps of:

mounting the wheel for rotation about a shaft having an axis of rotation;

statically balancing said combined wheel and tire, including placing said shaft at such an angel that any static unbalance will cause said wheel and tire to rotate to indicate the static unbalance;

manually rotating the wheel,

allowing the wheel and shaft to coast and slow down to a rotational velocity in the range of from 50 to 100 rpm during a settling period;

electrically measuring the forces of imbalance transmitted by the wheel to said shaft at the termination of settling period;

electronically determining imbalance data related to the measured forces; and

displaying the imbalance date.

5,195,371

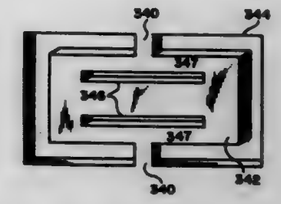
SEMICONDUCTOR CHIP TRANSDUCER

Paul Greiff, Wayland, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 143,515, Jan. 13, 1988, abandoned. This application Feb. 14, 1990, Ser. No. 479,854

Int. Cl.[5] G01P *9/04, 15/13*

U.S. Cl. 73—505 **6 Claims**



1. A semiconductor chip motion transducer assembly comprising:

a semiconductor transducer element resiliently supported and surrounded by a semiconductor frame;

said semiconductor frame and transducer element being substantially co-planar at a surface plane thereof, said surface plane being the <100> crystalline plane surface of the semiconductor material forming said frame and transducer element;

first and second flexures joining said transducer element to said frame to permit relative motion therebetween about an axis passing through said flexures;

said frame and transducer element being monocrystalline, with said frame comprising an etched portion surrounding said transducer element with peripheral walls of said etched portions substantially parallel to plural <111> orientation planes of the semiconductor material forming said frame and transducer element, wherein at least one of said frame and said transducer element defining at least one slot substantially adjacent the location at which at least one of said first flexure and said second flexure joins said transducer element to said frame, said at least one slot providing stress relief;

means for inducing relative motion of said transducer element with respect to said frame; and

means for sensing relative motion of said transducer element with respect to said frame, wherein

said means for inducing and said means for sensing each comprises at least one electrode disposed below said surface plane and extending under at least a portion of said transducer element, for providing application of forces to and detection of motion of said transducer element relative to said frame.

5,195,372

ULTRASONIC TESTING METHOD FOR DETECTING FLAWS OF BALLS FOR STRUCTURAL MEMBERS AND APPARATUS FOR SAID METHOD

Koji Fushimi, Gifu, and Keiji Kawasaki, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 617,101, Nov. 21, 1990, abandoned. This application Jul. 28, 1992, Ser. No. 920,527

Claims priority, application Japan, Nov. 21, 1989, 1-302531

Int. Cl.[5] G01N *29/04*

U.S. Cl. 73—593 **10 Claims**

1. An ultrasonic testing method for detecting flaws of balls for structural members, comprising the steps of:

rotating a ball to be tested in a medium for transmitting ultrasonic waves;

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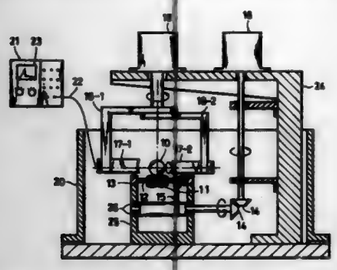
providing at least two focus-type ultrasonic probes each having a center axis set parallel to a rotational axis of said ball, wherein said probes are disposed in opposite directions to swivel along a periphery of said ball through a predetermined angle with respect to said rotational axis of said ball, wherein said probes are further disposed so as to detect respective non-overlapping flaw detecting regions on and/or in the ball, wherein one of said ultrasonic probes is disposed eccentrically with respect to said ball



such that an angle of incidence of ultrasonic waves therefrom is a critical angle of the ultrasonic waves and the focus of the ultrasonic waves is on the surface of said ball, and wherein another of said probes is disposed such that ultrasonic waves emitted therefrom are perpendicularly incident on the surface of said ball and the focus of the ultrasonic waves is located inside of said ball; and

detecting flaws of the ball by sending ultrasonic waves from the probes toward the ball.

5,195,373

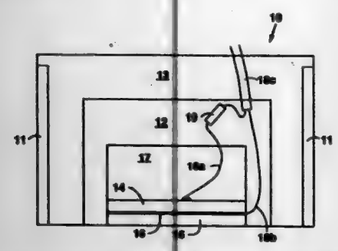
ULTRASONIC TRANSDUCER FOR EXTREME TEMPERATURE ENVIRONMENTS

Glenn M. Light; Richard A. Cervantes, both of San Antonio, Tex., and David G. Alcazar, Madrid, Spain, assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 17, 1991, Ser. No. 686,694

Int. Cl.[5] G01N *29/24*

U.S. Cl. 73—632 **10 Claims**



1. A transducer for use with ultrasonic test equipment, comprising:

a piezoelectric element having a front and a rear face;

a wearface that forms at least part of an outer surface of said transducer, attached to said front face of said piezoelectric element such that said piezoelectric element may generate or receive ultrasonic waves to or from a surrounding environment through said wearface;

a backing attached to the rear of said piezoelectric element;

an inner housing surrounding and enclosing the piezoelectric element, wearface, and backing;

wherein said piezoelectric element, said backing, and said inner housing are made from materials having similar coefficients of expansion; and

an outer housing spaced apart from said inner housing.

5,195,374

SENSOR SYSTEMS

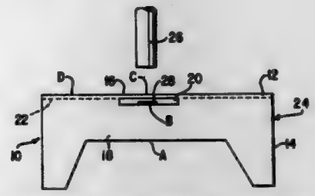
Philip Parsons, Farnham, and Jolyon P. Willson, Andover, both of England, assignors to Schlumberger Industries Limited, Farnborough, United Kingdom

Continuation-in-part of Ser. No. 567,024, Aug. 14, 1990, Pat. No. 5,105,665. This application Dec. 11, 1991, Ser. No. 805,150

Claims priority, application United Kingdom, Aug. 30, 1989, 8919573; May 11, 1990, 9010660

Int. Cl.[5] G01L *7/08, 9/08, 11/00*

U.S. Cl. 73—704 **9 Claims**



1. A sensor system for sensing a measurand, the system comprising:

a sensor comprising a resonantly vibratable element formed as part of a unitary semiconductor structure which is arranged such that application of the measurand to the structure affects the resonant frequency of the vibratable element;

means for exciting said element into resonant vibration; and means for detecting the frequency of said vibration;

wherein said element is arranged to define with an adjacent portion of said structure a Fabry-Perot cavity whose width varies with the vibration of said element; and

said frequency detecting means comprises means for directing an optical detection signal at said cavity for modulation thereby at the frequency of said vibration.

5,195,375

MINIATURIZED PRESSURE SENSOR

Lars Tenerz, Upsala, and Bertil Hök, Västerås, both of Sweden, assignors to Radi Medical Systems AB, Upsala, Sweden

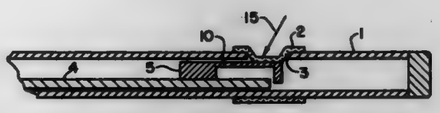
PCT No. PCT/SE90/00027, § 371 Date Jul. 11, 1991, § 102(e) Date Jul. 11, 1991, PCT Pub. No. WO90/07906, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1990, Ser. No. 721,508

Claims priority, application Sweden, Jan. 13, 1989, 8900121

Int. Cl.[5] G01D *5/30*; G01L *7/08, 9/00*

U.S. Cl. 73—705 **11 Claims**



1. A miniaturized pressure sensor for physiological in situ measurements, comprising:

an elastic material shell having an outer surface with an opening extending therethrough;

an elastic diaphragm covering said opening;

a light conductor having an end surface being disposed inside said shell and being connected to said shell by a glue joint; and

a body of silicon or gallium arsenide having a thin, cantilevered, short beam portion and a reflecting surface connected to and perpendicularly projecting from a free end of said short beam portion such that said reflecting surface is proximate to said end surface of said light conductor,

said body being glued to said light conductor and being disposed inside said shell;

wherein when said diaphragm is subjected to a pressure differential it is forced to move causing a corresponding movement in said short beam portion such that said reflecting surface is positioned opposite to said end surface of said light conductor.

5,195,376

FLUID PRESSURE DIFFERENTIAL MONITOR

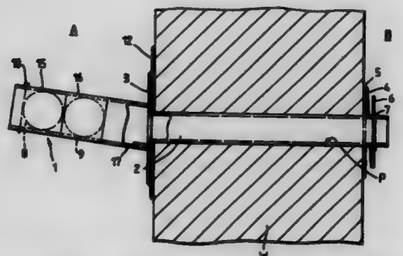
Anthony J. Banks, Northwood, and Dennis S. Poulter, London, both of England, assignors to BICC plc, London, England

Filed Nov. 15, 1991, Ser. No. 793,019

Claims priority, application United Kingdom, Nov. 15, 1990, 9024847

Int. Cl.[5] G01L *7/16, 13/02*

U.S. Cl. 73—744 **13 Claims**



1. A device for continuously monitoring the difference in pressure of fluid in two adjacent closed spaces separated by a dividing wall, which device comprises an open ended tubular housing which has a length which is at least twice the internal diameter of the housing, which over a part of its length is of a transparent material and over the remaining part of its length is opaque and in which is retained and free to roll at least one spherical body of a diameter slightly less than the internal diameter of the housing, the tubular housing being adapted to be so removably mounted on a face of said dividing wall as to effect a substantially fluid-tight seal with an end of a passage in the wall interconnecting said closed spaces and as to extend inwardly from said face of the wall with the longitudinal axis of the tubular housing lying at an angle to the horizontal, the angle of inclination of the tubular housing and the weight of the spherical body, being so selected having regard to a desired value of fluid pressure differential between the pressures of the fluid in said closed spaces and the relative lengths of the transparent and opaque parts of the tubular housing being such that, when the fluid pressure differential between the pressures of the fluid in said closed spaces is at least of said desired value the spherical body will be urged by said fluid pressure differential to the higher end of the tubular housing, when the spherical body will be either wholly visible or wholly invisible, and when said fluid pressure differential falls below said desired value the spherical body will roll down the tubular housing under the influence of gravity until it reaches the lower end of the tubular housing, when the spherical body will be either wholly invisible or wholly visible.

5,195,377

MAGNETOELASTIC FORCE TRANSDUCER FOR SENSING FORCE APPLIED TO A FERROMAGNETIC MEMBER USING LEAKAGE FLUX MEASUREMENT

Ivan J. Garshelis, 176 S. Mountain Rd., Pittsfield, Mass. 01201

Continuation-in-part of Ser. No. 509,804, Apr. 17, 1990, abandoned. This application May 24, 1991, Ser. No. 705,645

Int. Cl.[5] G01B *7/24*; G01L *1/12*; G01R *33/18*

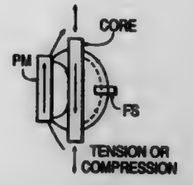
U.S. Cl. 73—779 **15 Claims**

1. A force transducer for providing a signal indicative of the magnitude of an external force applied to a ferromagnetic member, the external force causing tensile and/or compressive stresses to arise in said member, the transducer comprising:

(a) permanent magnet means for creating a polarizing magnetic field;

(b) sensor means for sensing the magnetic field intensity at said sensor means;

(c) said member being fixedly positioned relative to said magnetic field creating means and said sensor means for conducting a portion of the magnetic flux through said member, the amount of member-conducted magnetic flux



being a function of the stressed condition of said member and of the applied force creating said stressed condition, said sensor means sensing a portion of the flux not conducted through said member (leakage flux), said magnetic field creating means, sensor means and member being positioned sufficiently close to one another to cooperatively provide the sensitivity functionally required for applied force-induced flux changes; and

(d) means for converting said sensed leakage flux into a signal proportional to the magnitude of the force applied to said member.

5,195,378

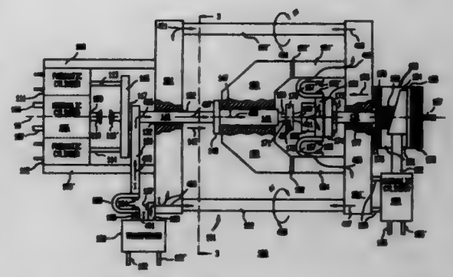
DYNAMIC THERMAL-MECHANICAL MATERIAL TESTING SYSTEM UTILIZING A BALANCED MAGNETIC FIELD

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Poestenkill, N.Y.

Continuation-in-part of Ser. No. 672,690, Mar. 7, 1991, Pat. No. 5,092,179. This application May 2, 1991, Ser. No. 694,911

Int. Cl.[5] G01D *7/02*

U.S. Cl. 73—790 **18 Claims**



1. Apparatus for a thermal-mechanical material testing system, wherein said system controllably imparts a desired deformation to a conductive test specimen and controllably heats said test specimen to a desired temperature through self-resistive heating, said apparatus comprising:

a test stand, having a longitudinal axis associated therewith, comprising:

deforming means, concentrically aligned with the longitudinal axis, for securely holding a conductive test specimen of a predefined size, for imparting a pre-defined controlled force along said axis to the test specimen in order to cause

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the test specimen to undergo a desired deformation and for establishing an electrical current path through the specimen;

a fixed frame situated about said deforming means and having first and second spaced apart supporting members and a plurality of electrically conductive columnar members arranged parallel to said longitudinal axis and situated between and securely connected to said first and second supporting members, said deforming means situated being securely mounted to said second supporting member, and said deforming means being in conductive electrical communication with all of said columnar members;

wherein, to self-resistively heat the test specimen, electrical heating current is to be applied from an external source serially through said deforming means, said test specimen and said plurality of columnar members, and wherein the plurality of conductive columnar members are arranged between said first and second supporting members and in a pre-determined manner about said longitudinal axis such that magnetic fields generated by all of said conductive columnar members and resulting from the electrical heating current flowing therethrough will substantially cancel each other in a volume containing the test specimen, whereby the test specimen will experience neither any appreciable magnetically induced non-uniform heating nor any appreciable magnetically induced motion while the heating current flows through the stand.

5,195,379

TEST DEVICE FOR TRACTION AND COMPRESSION ON A TEST PIECE AFTER ATMOSPHERE RE-ENTRY SIMULATION

Michel Cassac, La Teste, and Jean-Michel Lequertier, St. Aubin-de-Medoc, both of France, assignors to Aerospatiale - Societe Nationale Industrielle, Paris, France

Filed Sep. 18, 1991, Ser. No. 762,763
Claims priority, application France, Sep. 20, 1990, 90 11602
Int. Cl.[5] G01N *3/02*
U.S. Cl. 73—859 **9 Claims**

1. A device for the traction and compression testing of a test piece following an atmospheric re-entry, the test piece having a shape corresponding to a pellet in which two arc-shaped notches have been formed, the device comprising tooling equipment connected to self-closing traction clamping jaws by self-closing means, said tooling equipment being able to abut arcs of the extremities of the test piece and being able to be used for both the traction and compression tests.

5,195,380

PETROLEUM STREAM ANALYZING MEANS AND METHOD

Gregory J. Hatton; Michael G. Durrett, both of Houston; Earl L. Dowty, Katy; Gary E. Collier, Houston; Clifford L. Redus, Katy, and Steven M. Stockman, Alvin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 17, 1991, Ser. No. 701,731
Int. Cl.[5] G01F *1/74, 15/08*
U.S. Cl. 73—861.04 **20 Claims**

1. An inline monitor which monitors a multiphase petroleum stream in a pipeline, having an upstream section and a downstream section, comprising:

defoaming means connected to the upstream section of the pipeline for reducing foam in the petroleum stream,

stratifying means connected to the defoaming means for stratifying the petroleum stream from the defoaming means by causing the stream to flow down a decline at a predetermined angle to the horizontal,

trap means connected to the stratifying means for forming a gas trap,

liquid exit means connected to the trap means and to another section of the pipeline for allowing fluid to exit from the trap means to a downstream section of the pipeline,

accumulator means connected to the defoaming means, to the stratifying means and to the trap means for accumulating gas from the defoaming means, the stratifying means and the trap means,

gas exit means connected to the accumulator means and to the downstream section of the pipeline for allowing gas to exit from the accumulator means to the other section of the pipeline so as to recombine the petroleum stream,

a plurality of sensing means connected to the trap means, to the liquid exit means and to the gas exit means for sensing various conditions of the liquid and the gas ande providing signals corresponding thereto,

water cut means connected to the stratifying means and to the trap means for providing a signal corresponding to the water cut of the liquid, and

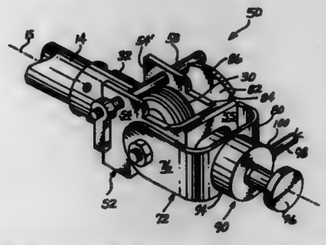
means connected to the plurality of sensing means and to the water cut means and having entered therein data relating to characteristics of the gas, the liquid and produced water for providing at least one output relating to one of the flow rates of gas, oil and water.

5,195,381

LEVER FORCE GAUGE

Gregory S. Keibler, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1991, Ser. No. 769,039
Int. Cl.[5] G01L *5/22*
U.S. Cl. 73—862.05 **20 Claims**



14. A method of measuring the force to move a landing gear control lever, comprising:

attaching a load cell to an end of said lever;

orienting said load cell in any selected one of a plurality of positions on said lever and in a desired direction so that when a tensile or compressive force is exerted on said load cell, said force will be transmitted through said load cell on said lever in said desired direction;

exerting an increasing force on said load cell in said desired direction until said lever starts to move;

generating a signal in said load cell proportional to said force exerted on said load cell;

transmitting said signal to an instrument having an indicator for converting said signal to a numerical readout indicative of the highest force exerted on said load cell;

producing a numerical readout on said indicator which is indicative of the force exerted on said lever at the moment said lever moved; and

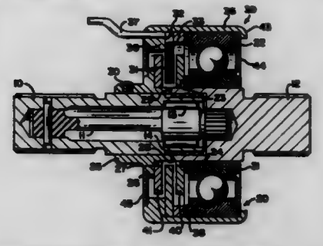
storing said readout on said indicator for reading by an operator after movement of said lever.

5,195,382

DEVICE FOR MEASURING SPEED AND TORQUE ON A SHAFT

Fernand Peilloud, Cheran, France, assignor to The Torrington Company, Torrington, Conn.

Filed Apr. 15, 1991, Ser. No. 685,037
Claims priority, application France, Apr. 20, 1990, 90 05046
Int. Cl.[5] G01L *3/02*
U.S. Cl. 73—862.321 **9 Claims**



4. A device for measuring the torque applied to a shaft, said device comprising:

sensing means comprising first and second sensing elements;

first and second encoders fixed to said shaft and generating sinusoidal magnetic fields having a periodicity (P);

said first and second sensing elements each sensing a magnetic field resulting from the magnetic fields generated by both said first and second encoders;

said first and second sensing elements being displaced relative to each other and said resulting magnetic field whereby said first sensing element produces a first sinusoidal output signal which leads a second sinusoidal output signal produced by said second sensing element;

said first and second sensing elements being positioned relative to said resulting magnetic field such that the first sinusoidal output signal leads the second sinusoidal output signal by an angle (Θ) where Θ=(2n+1)P/4 and n is zero or a positive whole number; and

response means responsive to the concurrent magnitudes of said first and second output signals for determining the torque applied to said shaft.

5,195,383

STEERING TORQUE DETECTING DEVICE

Akio Tanaka, Toyohashi; Fumiaki Murakami, Kariya; Hiroshi Tsuda, Obu; Tsutomu Kamizono, Obu; Kazunori Shimokawa, Tokai, and Kanji Takeuchi, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

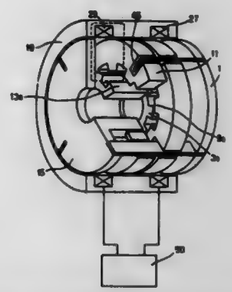
Filed Dec. 7, 1990, Ser. No. 624,216
Claims priority, application Japan, Dec. 8, 1989, 1-319482; Nov. 15, 1990, 2-310707
Int. Cl.[5] G01L *3/02*
U.S. Cl. 73—862.325 **13 Claims**

1. A steering torque detecting device for detecting a steering torque generated by turning a steering wheel comprising:

a steering wheel side rotary means which rotates with said steering wheel;

a steering shaft side rotary means which rotates with a steering shaft;

a plurality of torque transmitting means for transmitting said steering torque from said steering wheel side rotary means to said steering shaft side rotary means, said torque transmitting means being provided around a rotational center of said steering shaft, a first end of each of said torque transmitting means being connected to said steering wheel side rotary means, and a second end of each of said torque



transmitting means being connected to said steering shaft side rotary means, each of said torque transmitting means having a bending part for bending in response to a rotation of one of said steering wheel side rotary means and said steering shaft side rotary means resulting in a relative rotation therebetween, said torque transmitting means having a longitudinal direction parallel to an axial direction of said steering wheel side rotary means and said steering shaft side rotary means; and

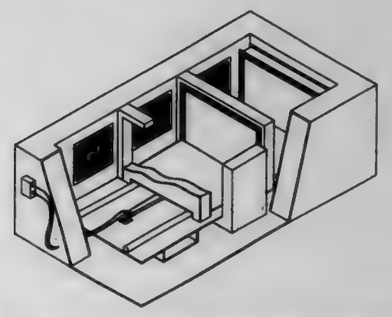
a detecting means for detecting said relative rotation between said steering shaft side rotary means and said steering wheel side rotary means.

5,195,384

ENVIRONMENTAL STRESS SCREENING DEVICE TRANSFER APPARATUS

Ira D. Daesler, Jr., 14 Walnut St., Mohawk, N.Y. 13407, and Thomas P. Harney, Jr., 62 John St., Ilion, N.Y. 13357

Filed Jan. 28, 1991, Ser. No. 646,416
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—865.6 **4 Claims**

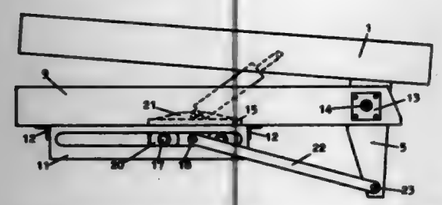


1. An apparatus for environmentally stress screening electronic devices the combination comprising:

a heat and cold insulated temperature controlled multi-compartment chamber having a substantially open top closed by a full width, full depth access door and door frame, said chamber having a pair of parallel spaced guide rails associ-

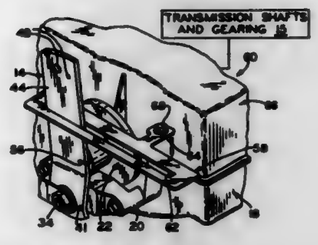
ated with the floor, said guide rails extend from side to side of the chamber continuously through each compartment;
a shuttle transfer table to carry electronic devices from said compartment to compartment, said table having parallel doors mounted to act as movable walls to seal temperatures within the compartments, said doors also having a seal that when in contact with the said chamber's door frame will seal the temperature within said compartments, said table also having sleeve bearings carried by said guide rails;
a pneumatic cylinder mounted beneath said transfer table and between said guide rails and so attached as to allow for said pneumatic cylinder, when actuated with compressed air via a solenoid valve, to move said table from compartment to compartment;
an electronic timing controller coupled to said solenoid valve electrically activates said solenoid valve causing said transfer table to move from compartment to compartment, completing one cycle;
an electronic counting controller coupled to the said electronic timing controller counts the number of cycles completed and shuts down the chamber when a programed number of cycles are completed.

5,195,235
FREE RANGING BI-DIRECTIONAL HYDRAULIC DUMPING MECHANISM
Jerome A. Johnson, 1509 W. 2nd Ave., Gary, Ind. 46402, assignor to Jerome A. Johnson, Gary, Ind.
Filed Oct. 28, 1991, Ser. No. 783,181
Int. Cl.[5] B65P *1/16*
U.S. Cl. 74—105 1 Claim



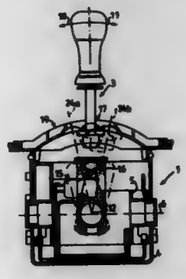
1. A mechanism for transmitting force produced by a cylinder means having a cylinder end and a cylinder rod end, said mechanism comprising:
first beam members (1);
means (4) for pivotally connecting said cylinder rod end of said cylinder means to said first beam members (1);
fulcra (5) mounted to said first beam members (1);
second beam members (9);
tram guides (11) mounted to said second beam members (9), said tram guides (11) having formed therein slots;
an anchor block (15);
members (20) mounted on said anchor block (15) and engageable with said tram guides (11) to facilitate movement of said anchor block (15) along said tram guides (11);
cylinder attachment means (21) mounted on said anchor block (15) for attaching said cylinder end of said cylinder means to said anchor block (15);
means (14) for pivotally connecting said fulcra (5) to said second beam members (9);
linkages (22) having first and second ends;
pivotal connecting means (18) mounted to said anchor block (15) and movable within said slot of said tram guides (11), said first ends of said linkages (22) being pivotally connected to said pivotal connecting means (18); and
means (23) for pivotally connecting said second ends of said linkages (22) to said fulcra (5).

5,195,386
BRAKE LEVER ARRANGEMENT
Dale I. Havens, Addison, and Roland L. von Kaler, Tecumseh, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.
Filed Nov. 20, 1991, Ser. No. 796,059
Int. Cl.[5] F16D *55/2255*
U.S. Cl. 74—411.5 21 Claims



1. A transmission comprising:
a housing;
a plurality of shafts rotatably disposed in said housing;
means for operably connecting said shafts;
a pivot attached to said housing;
braking means for applying braking force to one of said shafts, said braking means connected to said housing and operable on one of said shafts, said braking means including a brake lever for applying the braking force, said braking means including means for actuating said brake lever, said brake lever including a lower portion mounted on said pivot and an upper portion attached to said actuating means; and
means for guiding and aligning said brake lever in a desired plane of rotation, said guiding means including a bracket operatively associated with said brake lever upper portion, whereby when upon said actuating means discontinuing application of braking force, said brake lever upper portion tends to return to an unactuated, aligned position.

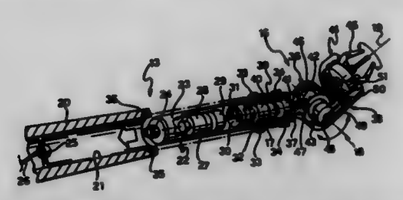
5,195,387
GEAR SELECTOR DEVICE FOR A VEHICLE GEARBOX
Tomas Skeppström, Södertälje, Sweden, assignor to Saab-Scania Aktiebolag, Sweden
PCT No. PCT/SE90/00856, § 371 Date Aug. 20, 1991, § 102(e) Date Aug. 20, 1991, PCT Pub. No. WO91/10084, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 20, 1990, Ser. No. 743,330
Claims priority, application Sweden, Dec. 27, 1989, 8904372
Int. Cl.[5] B60K *20/00*; G05G *5/06*
U.S. Cl. 74—475 16 Claims



1. A gear selector device for a gear box for motor vehicles, comprising:
a stationary housing having an open top;

a maneuvering column extending through the open top of the housing, a pivot center for the column located in the housing at which the maneuvering column is pivotable around at least one axis, and the maneuvering column having a plurality of predetermined pivot positions around the axis, corresponding to particular gear shift positions;
a locking arrangement for selectively locking the maneuvering column in selected ones of the plurality of positions and enabling unlocking of the maneuvering column from the selected positions, the locking arrangement comprising:
a first locking part on the maneuvering column and movable as the maneuvering column is pivoted;
a second locking part connected on the housing and forming a cover for the open top of the housing and with respect to which the first locking part is movable and with which the first locking part engages, the second locking part having a guide slot extending along it in the directions in which the maneuvering column may pivot around the at least one axis, the column extending through the guide slot;
locking members in the guide slot, each locking member positioned for being engaged by the first locking part such that engagement of the first locking part with a respective locking member in the guide slot determines a respective predetermined pivot position for the maneuvering column in the guide slot.

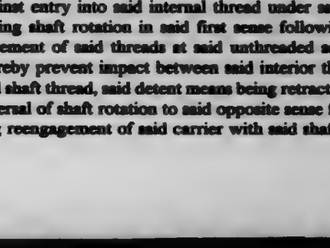
5,195,388
ARTICULATED ROBOT
Mauro Zona, and Mauro Bettinardi, both of Turin, Italy, assignors to Comau SpA, Turin, Italy
Filed Oct. 3, 1991, Ser. No. 770,432
Claims priority, application Italy, Oct. 4, 1990, 67763 A/90
Int. Cl.[5] G05G *11/00*; H02K *11/00*; B65D *33/14*; B25J *11/00*
U.S. Cl. 74—479 9 Claims



1. An articulated robot comprising an elongated arm having a shell-like structure with an open end defining an interior cavity and a module detachably secured in said cavity, said module being comprised of a cylindrical casing having a first axis and containing a motor, transmission means operatively connected to said motor and a driven wrist member operatively connected to said transmission means for rotation about said first axis, said driven wrist member having a projecting portion projecting outwardly of said casing of said module and said open end of said shell-like structure of said arm.

5,195,389
PLANETARY SPEED REDUCTION GEAR TYPE STARTER
Shunzo Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Filed Oct. 2, 1991, Ser. No. 770,010
Claims priority, application Japan, Oct. 9, 1990, 2-106404[U]
Int. Cl.[5] F02N *15/06*
U.S. Cl. 74—7 E 5 Claims

1. In a planetary speed reduction gear type starter in which a planetary speed reduction gear unit is coupled to a DC motor so that the rotation of said motor is transmitted to an output shaft of said starter through said planetary speed reduction gear unit, to rotate a pinion through an over-running clutch mounted on said output shaft which is provided on a front end portion of a clutch inner member of said over-running clutch, the improvement comprising:
a yoke including a small diameter portion for housing said motor and a large diameter portion having an inner diameter larger than an inner diameter of said small diameter portion;
a step formed on an outer surface of said yoke between said small diameter portion and said large diameter portion;



said planetary speed reduction gear unit including an internal gear fame which is fixedly fitted in said large diameter portion of said yoke;
a front bracket fixedly engaged with an outer end of said large diameter portion of said yoke; and
means for biasing said internal gear frame against said front bracket, said biasing means being located in said large diameter portion between said step and said front bracket.

5,195,390
PRECISION LINEAR MECHANICAL DRIVES
Hisami Nogaki, 6465 E. Camino Grande, Anaheim Hills, Calif. 92807
Filed Sep. 14, 1990, Ser. No. 583,113
Int. Cl.[5] E05F *11/34*; F16H *25/12*
U.S. Cl. 74—89.15 24 Claims

1. In a mechanical drive of the type where a load carrier has an interior thread mated to a threaded drive shaft and the load carrier is linearly driven by rotation of the shaft between two unthreaded shaft sections, the interior thread of the carrier disengaging from the shaft thread at said unthreaded sections responsive to shaft rotation in a first sense and having means urging the carrier against the shaft thread for reengagement therewith upon subsequent shaft rotation in an opposite sense, the improvement comprising:
detent means on said carrier for stopping said shaft thread against entry into said internal thread under said urging during shaft rotation in said first sense following disengagement of said threads at said unthreaded sections to thereby prevent impact between said interior thread and said shaft thread, said detent means being retractable upon reversal of shaft rotation to said opposite sense for admitting reengagement of said carrier with said shaft thread.

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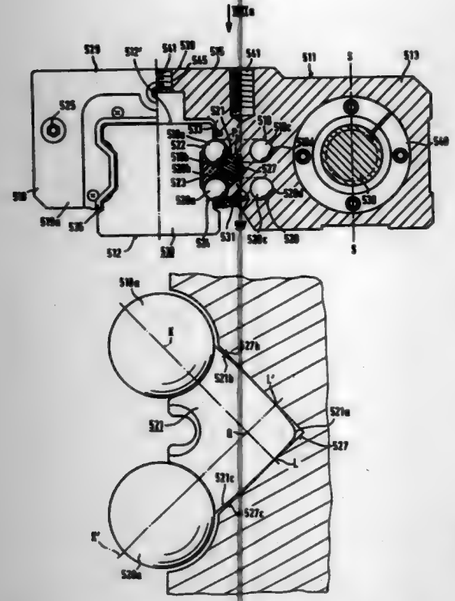
5,195,391

LINEAR GUIDING AND DRIVING UNIT

Serge Barbat, Meaux Cedex, France; Roland Greubel, Ramsthal, and Bernhard Keller, Knisten, both of Fed. Rep. of Germany, assignors to Deutsche Star GmbH, Schweinfurt, Fed. Rep. of Germany

Division of Ser. No. 428,638, Oct. 30, 1989, Pat. No. 5,097,716.
This application Dec. 3, 1991, Ser. No. 801,258
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1988, 8813656[U]; Sep. 4, 1989, 8910548[U]
Int. Cl.[5] F16C *29/06*; F16H *21/04, 19/06*
U.S. Cl. 74—89.22 36 Claims



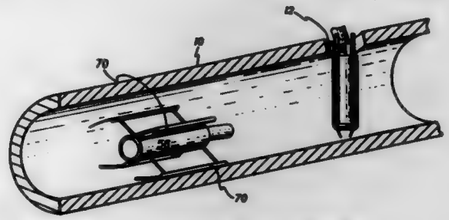
1. Linear guiding and driving unit, comprising a rail track (510) having a longitudinal axis and a longitudinal plane of symmetry containing said longitudinal axis, a seating surface, a top face remote from said seating surface and two side faces on both sides of said plane of symmetry, and a U-shaped guide carriage (515) rollingly guided on said rail track (510), said U-shaped carriage (515) having, when viewed in a cross section perpendicular to said longitudinal axis, a web part opposite to said top face and two flange parts (517,519) opposite to the respective side faces, said U-shaped guide carriage (515) being guided on said rail track (510) by at least two circuits (518,520) of rolling bodies on both sides of said plane of symmetry, each circuit (518,520) of rolling bodies having one load supporting linear row (518*a*,520*a*) of rolling bodies engaging both a rolling track (522,524) of said rail track (510) and a rolling track (518*b*,520*b*) of said U-shaped guide carriage (515), said rail track (510) being connected adjacent at least one end thereof with a cross member, linear driving means (538,540) extending between said U-shaped guide carriage (515) and said at least one cross member for moving said guide carriage (515) along said rail track (510), with respective load supporting linear rows (518*a*,520*a*) of both circuits (518,520) provided on each side of said plane of symmetry being supported on the respective flange part (517,519) by a common steel insert (521), said common steel insert (521) being supported by the respective flange part (517,519).

5,195,392

INTERNAL PIPE INSPECTION SYSTEM

Joseph P. Moore, Clinton; Andrew J. Kuderauskas; Theodore J. Kliszczewicz, both of Liverpool; John E. Allen, Altamont, all of N.Y.; Allan T. Fisk, Needham, Mass.; Philip R. Lichtman, Newton, Mass.; Gerald A. Avarbock, Brockton, Mass., and Linda T. Ystueta, Allston, Mass., assignors to Niagara Mohawk Power Corporation, Syracuse, N.Y.

Filed May 14, 1990, Ser. No. 523,323
Int. Cl.[5] G01M *19/00*; F16L *55/18, 55/26*
U.S. Cl. 73—866.5 45 Claims



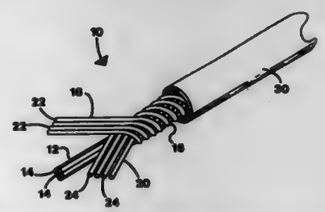
14. A pipe inspection/repair head comprising:
an elongate, central body; and
at least three radially outwardly biased members extending from said body, said members being substantially symmetrically arranged about said body and sized such that when the head is positioned within a pipe said members approximately position said body concentric with a central longitudinal axis of the pipe each of said members comprising at least two bi-directional torsion spring legs, each of said two legs being collapsible towards said body when said legs encounter a pipe obstruction and for facilitating the head's insertion into and removal from the pipe through an opening having a diameter smaller than an internal diameter of the pipe.

5,195,393

BRAIDED MECHANICAL CONTROL CABLE

Dan D. Wolfington, Modesto, and Gregory A. Giesen, San Jose, both of Calif., assignors to Cherokee Cable Company, Inc., Modesto, Calif.

Filed Jun. 4, 1990, Ser. No. 533,111
Int. Cl.[5] F16C *1/20*; F16D *1/12*
U.S. Cl. 74—502.5 1 Claim



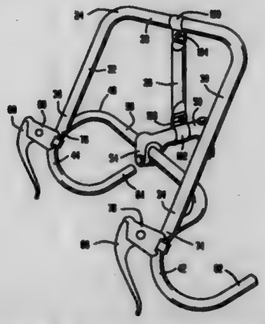
1. An inner cable for a mechanical control cable assembly, comprising:
an inner core including a plurality of longitudinal strands running generally parallel to each other;
a binding layer including a plurality of binding strands for binding the longitudinal strands together such that the longitudinal strands are maintained generally parallel to each other, the binding strands being spirally wrapped around said inner core; and
a jacket layer surrounding the binding layer said jacket having an outer diameter sized to slidably fit within the mechanical control cable housing, and further being formed so as to permeate any spaces between the binding strands such that the binding strands tend to be held in position relative to each other by said jacket layer;
an end terminal adapted for attaching the inner cable to an external mechanical device, the end terminal including a generally solid cylindrical lever pivot fitting having an aperture therethrough, the inner cable being inserted through the aperture, and a ferrule rigidly affixed to an end of the inner cable such that the lever pivot fitting is prevented from moving past the ferrule and off of the inner cable, the ferrule being affixed to the end of the inner cable by an epoxy adhesive; wherein
said jacket layer is formed of polypropylene.

5,195,394

BICYCLE HANDLEBAR EXTENSION

Richard S. Latta, 2133 West Ave., Linwood, N.J. 08221

Filed Apr. 7, 1992, Ser. No. 864,787
Int. Cl.[5] B62K *21/16*
U.S. Cl. 74—551.8 15 Claims



1. An extension for a handlebar held in a steering stem clamp of a bicycle having a seat and steering stem comprising
a generally inverted U-shaped member having an upper crossbar and two downward extending arms of a length for extending the crossbar above said handlebar to a height grasped by a rider on the seat sitting in upright position with two respective free ends spaced for juxtaposition to respective left and right outer portions of the bicycle handlebar,
means for securing the free ends of the U-shaped member to the respective left and right outer portions of the bicycle handlebar,
a stabilizer strut for extending between a midpoint of the crossbar and said steering stem to prevent rotation of the handlebars about the steering stem clamp, and
means for securing the stabilizer strut to the crossbar and the steering stem to hold the the U-shaped member at said height above the handlebar.

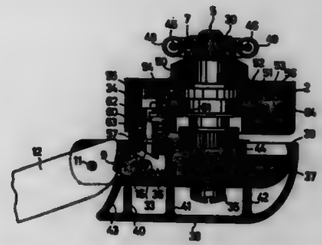
5,195,395

CRANK MECHANISM FOR A LIFT-SLIDE COVER OF A MOTOR VEHICLE

Norbert Wagner, Philipp-Reis-Strasse 22A, D-6050 Offenbach, Fed. Rep. of Germany

PCT No. PCT/DE89/00481, § 371 Date Mar. 23, 1990, § 102(e) Date Mar. 23, 1990, PCT Pub. No. WO90/00967, PCT Pub. Date Feb. 8, 1990
Continuation of Ser. No. 466,296, Mar. 23, 1990, abandoned.
This PCT application Jul. 19, 1989, Ser. No. 847,866
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 3825269
Int. Cl.[5] B62D *1/06*; B60J *7/057*
U.S. Cl. 74—557 15 Claims

1. A crank mechanism for a lift-slide cover of a motor vehicle comprising:
a crank arm (12);
a shaft (5);
a coupling means (45, 46) for connecting said shaft (5) with a lift-slide mechanism of the lift-slide cover;
an axis of rotation (11) with respect to which the crank arm (12) is swivelable, whereby said axis of rotation (11) extends perpendicularly to the longitudinal axis of said shaft (5);
a locking pin (34) extending parallel to the longitudinal axis of the shaft and being displaceable along its longitudinal



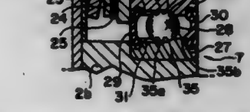
axis whereby the locking pin (34) in a first position blocks the rotary motion of the crank arm (12) and in a second position releases the rotary motion of the crank arm (12);
means (20, 24, 25, 26, 27) for establishing first and second stable swiveling positions of the crank arm (12); and
means (9) movable vertically with respect to said shaft (5), said means (9) moving said locking pin (34) from said first position into said second position during the swiveling of said crank arm (12) from said first stable swiveling position into said second stable swiveling position.

5,195,396

TORQUE VARIATION ABSORBING DEVICE

Masakazu Kamiya; Junji Kagiyama, both of Toyoake; Kiyonori Kobayashi, Chiryu, and Masaki Hosono, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Continuation of Ser. No. 599,103, Oct. 17, 1990. This application Feb. 27, 1992, Ser. No. 841,201
Claims priority, application Japan, Oct. 19, 1989, 1-122638[U]
Int. Cl.[5] F16F *15/12*
U.S. Cl. 74—574 13 Claims



1. A torque variation absorbing device comprising:
a first flywheel;
a second flywheel coaxial with and rotatable relative to the first flywheel;
at least one damping mechanism provided between the first flywheel and second flywheel;
a hysteresis mechanism disposed between the first flywheel and the second flywheel so as to bias the first flywheel and the second flywheel in directions away from each other;
a ball bearing disposed between the first flywheel and the second flywheel, the ball bearing including an inner race, an outer race and a plurality of balls positioned closely adjacent to each other and rotatably held between the inner race and the outer race, the inner race and the outer race including ball inlet grooves formed therein, each of

the balls being of an outer abrasion at a position where each ball is in contact with a circumferential discontinuous portion of the ball inlet groove of the outer race and being of an inner abrasion at a position where each ball is in contact with a circumferential discontinuous portion of the ball inlet groove of the inner race, the inner abrasion being greater than the outer abrasion, the ball inlet grooves opening toward the hysteresis mechanism;

wherein said hysteresis mechanism further comprises a cone spring, the cone spring generating an axial biasing force so that a half portion of the guide groove formed in the outer race located nearer to the hysteresis mechanism pushes the balls and the pushed balls push a half portion of the guide groove formed in the inner race located farther from the hysteresis mechanism to prevent each of the balls from being in contact with the discontinuous portion of the inner race, the cone spring also functioning as a cushion when a force directed toward the hysteresis mechanism acts on the ball bearing; and

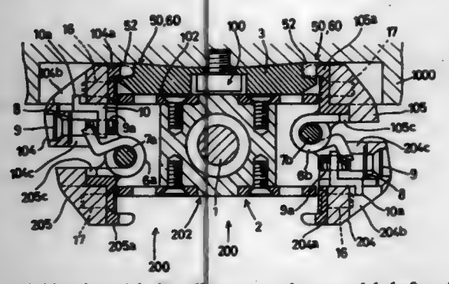
wherein the inner race and the outer race include ball guide grooves facing each other, a half portion of the ball guide groove formed in at least a side of the inner race located farther from the hysteresis mechanism being circumferentially continuous.

5,195,397

BICYCLE PEDAL HAVING TWO SURFACES FOR FIXING A CLEAT

Masashi Nagano, Izumi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Nov. 12, 1991, Ser. No. 789,965
Claims priority, application Japan, Nov. 13, 1990, 2-308127
Int. Cl.[5] G05G 1/14
U.S. Cl. 74—594.4 **14 Claims**



1. A bicycle pedal pivotally supported on a pedal shaft and having at least two surfaces available for fixing a cleat, comprising:

a pedal reference plane defined by said pedal shaft and a fore and aft axis of said pedal extending at right angles to said pedal shaft;

first cleat coupling means for fixing said cleat on one side of said pedal reference plane, said first cleat coupling means including:

a first front hook assembly for engaging a front section of said cleat,

a first rear hook assembly for engaging a rear section of said cleat,

a first cleat supporting surface defined between said first hook assembly and said first rear hook assembly,

said first front hook assembly, said first rear hook assembly and said first cleat supporting surface being cooperative to produce a first cleat fixing position at which a cleat is releasably held on said pedal, and

first shift means for shifting at least one of said first front hook assembly and said first rear hook assembly between a first cleat engaging position and a first cleat releasing position, and

first cam means for converting a displacement of said cleat away from said first cleat fixing position to a shift of the first shift means toward said first cleat releasing position; and

second cleat coupling means for fixing said cleat on the other side of said pedal reference plane, said second cleat coupling means including:

a second front hook assembly for engaging the front section of said cleat,

a second rear hook assembly for engaging the rear section of said cleat,

a second cleat supporting surface defined between said second front hook assembly and said second rear hook assembly,

said second front hook assembly, said second rear hook assembly and said second cleat supporting surface being cooperative to produce a second cleat fixing position at which a cleat is releasably held on said pedal, and

second shift means for shifting at least one of said second front hook assembly and said second rear hook assembly between a second cleat engaging position and a second cleat releasing position, and

second cam means for converting a displacement of said cleat away from said second cleat fixing position to a shift of the second shift means toward said second cleat releasing position;

wherein said first cleat coupling means and said second cleat coupling means are different in at least one of: (a) a spatial relationship of the respective cleat fixing position to said pedal reference plane and (b) a manner in which said first and second cam means produce a shift of their associated first and second shift means.

5,195,398

CRANKSHAFT COUNTERWEIGHTS

Dale E. Murrish, and Thomas M. Briolat, both of Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1991, Ser. No. 781,309
Int. Cl.[5] F16C 3/04
U.S. Cl. 74—603 **5 Claims**

1. A crankshaft for a V-type engine comprising;

a first crank arm extending between a firs main journal and a first crank pin, said first crank pin being parallel to said first main journal;

a second crank arm extending between said first crank pin and a second crank journal, said first and second main journals being coaxial;

a third crank arm extending between said second main journal and a second crank pin, said second crank pin being parallel to said second main journal;

a fourth crank arm extending between said second crank pin and a third main journal, said second and third main journals being coaxial;

a fifth crank arm extending between said third main journal and a third crank pin, said third crank pin being parallel to said third main journal;

a sixth crank arm extending between said third crank pin and a fourth main journal, said third and fourth main journals being coaxial;

a seventh crank arm extending between said fourth main journal and a fourth crank pin, said fourth crank pin being parallel to said fourth main journal;

an eighth crank arm extending between said fourth crank pin and a fifth main journal,

the axes of said main journals defining a crankshaft axis and a crankshaft plane, said crankshaft plane extending between said crankshaft axis and the axis of said first crank pin,

said second crank pin being oriented so that a plane extending between its axis and said crankshaft axis is rotated 90 degrees from said crankshaft plane in a clockwise direction as viewed from said first to second main journals along said crankshaft axis,

said third crank pin being oriented so that a plane extending between its axis and said crankshaft axis si rotated 270 degrees from said crankshaft plane in said clockwise direction,

said fourth crank pin being oriented so that a plane extending between its axis and said crankshaft axis is rotated 180 degrees from said crankshaft plane;

a No. 1 counterweight connected to said first crank arm, said No. 1 counterweight being oriented so that a plane extending from its center of gravity to said crankshaft axis is rotated between 180 and 190 degrees from said crankshaft plane in said clockwise direction;

a No. 2 counterweight connected to said second crank arm, said No. 2 counterweight being oriented so that a plane extending from its center of gravity to said crankshaft axis is rotated between 200 and 220 degrees from said crankshaft plane in said clockwise direction;

a No. 3 counterweight connected to said third crank arm, said No. 3 counterweight being oriented so that a plane extending from its center of gravity to said crankshaft axis is rotated between 220 and 245 degrees from said crankshaft plane in said clockwise direction;

a No. 6 counterweight connected to said sixth crank arm, said No. 6 counterweight being oriented so that a plane extending from its center of gravity to said crankshaft axis is rotated between 40 and 65 degrees from said crankshaft plane in said clockwise direction, the orientation of said Nos. 6 and 3 counterweights defining a first counterweight angle equal to the difference between the rotations of said Nos. 3 and 6 counterweights from said crankshaft plane in said clockwise direction;

a No. 7 counterweight connected to said second crank arm, said No. 7 counterweight being oriented so that a plane extending from its center of gravity to said crankshaft axis is rotated between 20 and 40 degrees from said crankshaft plane in said clockwise direction, the orientation of said Nos. 7 and 2 counterweights defining a second counterweight angle equal to the difference between the rotations of said Nos. 2 and 7 counterweights from said crankshaft plane in said clockwise direction; and

a No. 8 counterweight connected to said second crank arm, said No. 8 counterweight being oriented so that a plane extending from its center of gravity to said crankshaft axis is rotated between 0 and 10 degrees from said crankshaft plane in said clockwise direction, the orientation of said Nos. 8 and 1 counterweights defining a third counterweight angle equal to the difference between the rotations of said Nos. 1 and 8 counterweights from said crankshaft plane in said clockwise direction,

said counterweights being oriented with respect to one another so that at least one of the angles from the group consisting of said first, second and third counterweight angles is not 180 degrees,

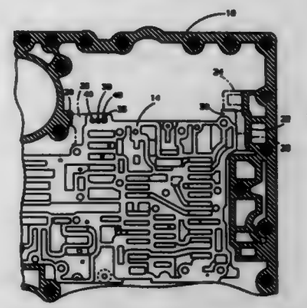
said crankshaft being internally balanced.

5,195,399

TRANSMISSION ASSEMBLY

Charles F. Long, Indianapolis; Phillip F. McCauley, Zionsville, and John D. Slaubaugh, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1992, Ser. No. 834,741
Int. Cl.[5] F16H 57/02
U.S. Cl. 74—606 R **3 Claims**



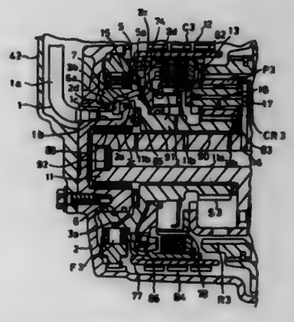
2. Alignment and assembly assisting apparatus in combination with a transmission family having a least four family members; each family member having matched transmission components comprising a casing, at least one valve body, a channel plate and a separator plate; said alignment and assembly assisting apparatus comprising: blocking surface means disposed in locations distinct on the casing of each said family member; three locating tab means on each separator plate of each family member for limiting the installation of each separator plate to a given family member casing; apertures formed in the separator plate, channel plate and valve body and disposed in specific aligned locations distinct for each family member; and pin means disposed in the aligned aperture to ensure proper assembly of the separator plate, the channel plate and valve body for a given family member for assembly into the casing.

5,195,400

OIL CHANNEL STRUCTURE IN AUTOMATIC TRANSMISSION

Youichi Hayakawa, Toyoake; Chihiro Hosono, Anjo; Masaaki Nishida, Anjo, and Makoto Shimanaga, Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Continuation of Ser. No. 293,234, Jan. 4, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 652,365
Claims priority, application Japan, Aug. 29, 1988, 63-215864
Int. Cl.[5] F16H 57/02
U.S. Cl. 74—606 R **10 Claims**



1. An automatic transmission comprising:

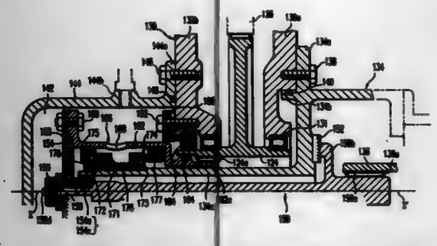
a casing;

a first shaft having a lubricating passage;
a boss section fixed to said casing and having a supply oil channel;
a rotatable hydraulic actuator including:
a hub having a first hub portion with an inner cylindrical surface which is slidably fitted on said boss section, a second hub portion slidably mounted on said first shaft and an intermediate hub portion connecting said first and second hub portions and presenting a radial surface extending radially away from said first shaft;
a drum;
a piston fitted between the hub and the drum, and an oil chamber formed in a space defined by the piston, the drum, the second hub portion and the intermediate hub portion;
a one-way, first clutch having an inner race formed on said first hub portion and interposed between the inner race and said casing;
a first annular groove formed in said inner cylindrical surface of the first hub portion, between said intermediate hub portion and the supply oil channel of the boss section;
a second annular groove formed in said inner cylindrical surface of said first hub portion in communication with said oil supply channel;
a first slanted oil channel extending through said first hub portion from said radial surface to said second annular groove where said first slanted oil channel terminates at a point radially inward of said inner cylindrical surface, and providing fluid communication between said second annular groove and said oil chamber;
a second oil channel extending through said first hub portion from said first annular groove to said one-way clutch for lubricating said one-way clutch with oil supplied through said lubricating passage of the first shaft;
sealing members located between said first hub portion and said boss section at both sides of said second annular groove.

5,195,401
SEALED TRANSMISSION ASSEMBLY BETWEEN TWO COAXIAL SHAFTS MOUNTED IN CASINGS WHICH ARE FIXED TO EACH OTHER

Pierre C. Mouton, Grigny, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A." , Paris, France

Filed Jun. 5, 1991, Ser. No. 710,457
Claims priority, application France, Jun. 5, 1990, 90 06946
Int. Cl.[5] F16H *57/02;* F02C *3/10*
U.S. Cl. 74—606 R 11 Claims

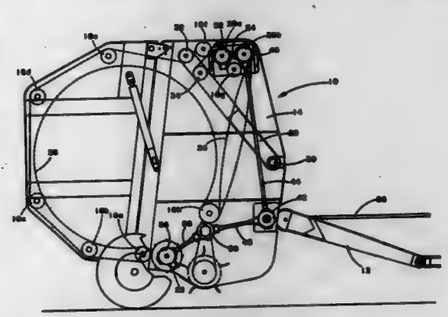


1. A sealed transmission assembly coupling a first rotary shaft mounted in a first casing to a secondary rotary shaft substantially aligned with said first shaft and mounted in a second casing fixed to said first casing, wherein:
a cover defining a chamber which separates the first casing from the second casing is removably secured to said first casing on the opposite side from said second casing;
said first shaft is tubular;
a portion of said second casing defines a tubular protrusion which extends through said first casing inside said tubular first shaft and projects into said chamber defined by said cover;
said second shaft has an extension projecting through said tubular protrusion;
a removable driving member connects the end of said extension to said first shaft for rotation therewith; and
removable sealing means for providing a sealed separation between the first and second casings are located within said chamber defined by said cover and are disposed between said driving member and the end of said tubular protrusion projecting into said chamber;
whereby said driving member and said sealing means can be disassembled, after removal of said cover from said first casing, without disconnecting said second casing.

5,195,402
DIRECT DRIVE SYSTEM FOR A BALER

Kenneth R. McMillen, Lodi, Ill., and Wallace L. Edwards, Stockton, Mo., assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed Jan. 31, 1991, Ser. No. 648,564
Int. Cl.[5] F16H *37/06;* B30B *5/06*
U.S. Cl. 74—665 GC 22 Claims



1. A drive train for a baler, comprising:
(a) a pair of bale-forming, opposite sidewalls;
(b) at least one transverse driven shaft extending between said sidewalls;
(c) at least one gearbox to which is mounted a corresponding one of said driven shafts;
(d) a drive shaft extending to each of said gearboxes; and
(e) rotational power means connected to each of said drive shafts.

5,195,403
COMPOSITE CUTTING INSERT

Mohammad N. Sani, Woodley, and Graeme D. Dufferwiel, Reading, both of England, assignors to De Beers Industrial Diamon Division Limited, Transvaal, South Africa

Filed Feb. 28, 1992, Ser. No. 843,447
Claims priority, application United Kingdom, Mar. 1, 1991, 9104366
Int. Cl.[5] B23B *51/02;* B23C *5/16*
U.S. Cl. 76—108.6 15 Claims

1. A method of producing a composite cutting insert including the steps of:
forming first and second cutting insert halves from a composite diamond compact blank, each cutting insert half defining a cutting edge of diamond material; and
arranging the cutting insert halves back-to-back to form a composite cutting insert, so that the respective cutting edges lie on opposite sides of a central plane of the composite insert.

5,195,404
DRILL BIT WITH CUTTING INSERT

Theo A. Notter, 29 Langley Drive, Camberley, Surrey, GU15 3TB, England, and David W. James, 68 Derby Square, Douglas, Isle of Man

Continuation of Ser. No. 209,223, Jun. 20, 1988, abandoned.
This application Sep. 11, 1991, Ser. No. 758,162
Claims priority, application United Kingdom, Jun. 18, 1987, 8714340
Int. Cl.[5] B23P *15/32*
U.S. Cl. 76—108.6 11 Claims

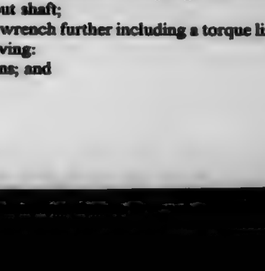
1. A method of manufacturing a twist drill, comprising the steps of:
forming at lest one cutting insert comprising an abrasive compact bonded to a cemented carbide backing, and having a prismatic shape including first and second adjacent facets forming a predetermined first angle with each other, the forming step including the steps of (i) forming the first facet with a cutting edge comprised of the abrasive compact, (ii) forming the second facet with a seating surface comprised predominantly of the cemented carbide backing, (iii) cutting an elongate strip from a larger composite abrasive compact body, and (iv) cutting the strip into a plurality of cutting inserts;
providing a drill body including at least one flank located at a front end of the drill body and at least one face extending rearward from the flank;
forming at least one seat in the flank of the drill body, and defining a support surface to support the seating surface of the insert and inclined at a predetermined second angle to the face of the drill body; and
bonding the cutting insert in the seat of the drill body, so that the cutting edge of the insert defines a major cutting edge of the twist drill and the first facet of the insert coincides with the face of the twist drill.

5,195,405
ANTI-CRUSH TOOL

Michael J. Folkrod, 575 Stagecoach Rd., Arroyo Grande, Calif. 93420

Filed Feb. 21, 1992, Ser. No. 838,906
Int. Cl.[5] B25B *23/00*
U.S. Cl. 81—180.1 1 Claim

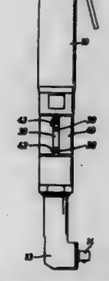
1. A method for gripping and applying torque to a free end of a pipe, said method noteworthy for minimizing damage to the pipe, said method employing an anti-crush tool that includes a cylindrical shaped plug portion having an outside diameter that is slightly less than the inside diameter of the pipe so as to permit the plug portion to be inserted into the pipe in a tight sliding fit, the plug portion having a first end and a second end, the anti-crush tool further including a shoulder portion connected to the second end of the plug portion for limiting how far the plug portion can be inserted into the pipe, the anti-crush tool further including a handle portion that extends from the shoulder portion in a direction opposite to the direction the plug portion extends and that has a striking surface, said method comprising the steps of:
a) driving the first end of the plug portion into the pipe by gently tapping on the striking surface of the handle portion until the shoulder portion makes contact with the end of the pipe;
b) gripping the free end of the pipe with a gripping tool, the plug portion preventing deformation of the free end of the pipe by the applied gripping force;
c) applying torque to the free end of the pipe by use of the gripping tool;
d) releasing the gripping tool;
e) withdrawing the plug portion of the anti-crush tool from the free end of the pipe by pulling on the handle portion.



5,195,406
POWER WRENCH

Kai G. Lindqvist, Älta, Sweden, assignor to Atlas Copco Tools AB, Stockholm, Sweden

Filed Feb. 12, 1992, Ser. No. 834,633
Int. Cl.[5] B25B *23/151*
U.S. Cl. 81—467 6 Claims



1. A power wrench with torque control means, comprising:
a housing including therein a rotation motor, an output shaft, and a power transmission coupling said rotation motor to said output shaft;
said power wrench further including a torque limiting mechanism having:
cam means; and

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a pretensioned cam means biasing compression spring positioned between a thrust member operationally coupled with said cam means and an adjustable support member;

said thrust member and said adjustable support member being arranged to provide an indication of a length of said pretensioned cam means biasing compression spring;

said housing being provided with at least one aperture for enabling at least a portion of both said thrust member and said adjustable support member to be visible to a viewer of said power wrench;

a gauge element movably supported on said housing, and positioned to be in parallel with said at least one aperture;

said gauge element including thereon two marks for enabling a comparison of said two marks respectively with said visible portions of said thrust element and of said visible adjustable support element;

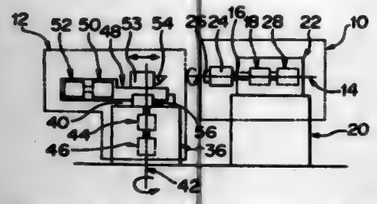
said two marks on said gauge element being spaced apart by a distance equal to a spacing between said visible thrust element and said visible adjustable support element that exists when said pretensioned cam means biasing compression spring has a predetermined pretension that corresponds to a basic setting of said torque limiting mechanism.

5,195,407

APPARATUS FOR MAKING AN ASPHERICAL LENS AND A METHOD OF MAKING AN ASPHERICAL LENS

Nakakatsu Takeno, Inazawa; Koichi Inada, and Takayuki Yokoi, both of Seki, all of Japan, assignors to Menicon Co., Ltd., Nagoya, Japan

Filed Jul. 24, 1991, Ser. No. 735,275
Claims priority, application Japan, Jul. 31, 1990, 2-204506
Int. Cl.[5] B23B *5/36*
U.S. Cl. 82—1.11 6 Claims



1. An apparatus for making an aspherical lens which comprises:

a holder for holding a predetermined lens workpiece;

a rotation member which rotatably supports the lens workpiece so that the lens workpiece can be rotated around a first axis;

rotation driving means for driving to rotate the rotation member;

rotation angle detecting means for detecting a rotation angle of the rotation member;

a cutting bit holding member disposed opposing the holder of the rotation member, which supports a cutting bit for cutting the lens workpiece held by the holder, wherein the cutting bit holding member is mounted to permit said holding member to swing around a second axis orthogonal to a rotation shaft of the rotation member and to reciprocate toward and away from the lens workpiece;

swing driving means for driving to said swing the cutting bit holding member;

swing angle detecting means for detecting a swing angle of the cutting bit holding member;

reciprocation driving means having a linear output for linearly reciprocating the cutting bit holding member toward and away from the lens workpiece held by said holder;

a first reciprocation position detecting means for detecting a linear extent of a reciprocation position of the cutting bit holding member; and

control means for controlling the reciprocation driving means to reciprocate the cutting bit holding member by a predetermined quantity corresponding to the swing angle of the cutting bit holding member detected by the swing angle detecting means, in synchronism with the rotation angle detected by the rotation angle detecting means, and with reference to the reciprocation position of the cutting bit holding member detected by the reciprocation position detecting means.

6. A method of making an aspherical lens which comprises steps of:

rotating a predetermined lens workpiece around a first axis;

contacting a predetermined cutting bit with the lens workpiece;

swinging the cutting bit around a second axis orthogonal to the first axis, thereby cutting a lens surface of the lens workpiece into a desired shape;

detecting a rotation angle of the lens workpiece and a swing angle of the cutting bit; and

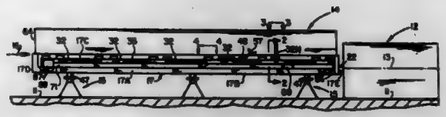
linearly reciprocating the cutting bit toward and away from the lens workpiece, by a predetermined quantity corresponding to the swing angle, in synchronism with the detected rotation angle of the lens workpiece.

5,195,408

BAR FEEDER WITH CENTERING APPARATUS

John Niehaus, Indianapolis, Ind., assignor to Westboro Engineering Company, Inc., Indianapolis, Ind.

Filed Sep. 30, 1991, Ser. No. 770,014
Int. Cl.[5] B23B *15/00*
U.S. Cl. 82—127 15 Claims



1. Holder apparatus for elongate stock while feeding to a processing station having an input axis and comprising:

an elongate stock holder for receiving the stock therein and holding the stock with the stock having an axis colinear with the input axis; and

an offset adjuster operable to move the holder transverse to the input axis to enable establishment of colinearity of the stock axis with the input axis for separate lengths of stock having different dimensions from stock axis to stock perimeter;

the holder including a trough for supporting the stock, and a guide associated with the trough to confine the stock against the trough;

the adjuster being coupled to the trough and to the guide and operable to move both the trough and guide simultaneously but in opposite directions to adapt the holder to different sizes of stock.

5,195,409

BAR FEEDER APPARATUS FOR AUTOMATIC LATHES

Roger D. Smith, P.O. Box 689, Cedar Hill, Tex. 75104

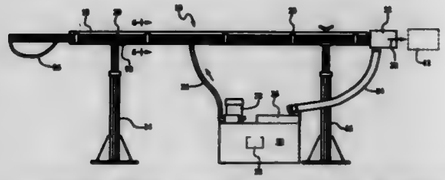
Filed Oct. 4, 1991, Ser. No. 771,464
Int. Cl.[5] B23B *15/00*
U.S. Cl. 82—127 16 Claims

1. In a bar feed apparatus for supplying an elongated length of bar stock to an automatic lathe having a headstock adapted to receive the stock, said bar feed apparatus comprising:

an elongated guide tube in which to support the length of bar stock to be supplied and having a distal open end from which the bar stock can be gradually ejected;

support means supporting said guide tube with said distal open end in alignment with the head stock of a lathe to which the bar stock is to be supplied from said tube;

hydraulically operated piston means at the other end of said guide tube and effective when operable in a forward stroke to advance the bar stock from within said tube outward of said distal open end toward said headstock;



an adjustable annular clearance defined between the interior surface of said guide tube and said piston means for hydraulic fluid applied against said piston means to flow longitudinally within said tube from the past said piston means to past the bar stock for cushioning the bar stock therein: and

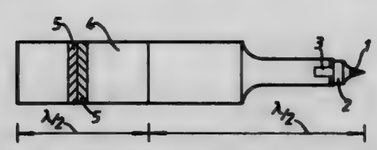
recovery means at the distal end of said guide tube to recover hydraulic fluid discharging therefrom.

5,195,410

CUTTING BRITTLE MATERIALS

Michael J. R. Young, Ashburton, England, assignor to S.R.A. Developments Limited, Ashburton, England

Filed May 8, 1989, Ser. No. 349,455
Claims priority, application United Kingdom, May 10, 1988, 8810976
Int. Cl.[5] B28D *1/22*
U.S. Cl. 83—13 5 Claims



1. The method of cutting a workpiece of brittle material into two pieces along a predetermined line comprising producing a micro crack in said material by applying directly and alone to the surface of the workpiece at a point on said line the pointed end of a tool, applying high frequency vibrations in a longitudinal direction to the tool while applying substantially steady longitudinal directed pressure from the tool to the workpiece until said micro crack occurs, moving said tool along said line to propagate micro cracks in said workpiece along the length of the line, and then breaking said workpiece along said line into two pieces.

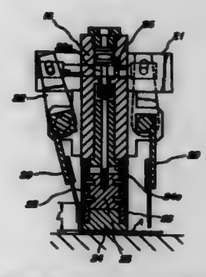
5,195,411

METHOD AND APPARATUS FOR CORRECTING CUT EDGE POSITION

Koji Okuyama, Kawagoe, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 4, 1991, Ser. No. 650,317
Claims priority, application Japan, Feb. 20, 1990, 2-37156; Mar. 7, 1990, 2-53764
Int. Cl.[5] B26D *7/02*
U.S. Cl. 83—14 16 Claims

1. A method of correcting cut edge position of a belt-shaped member cut on a support base, comprising steps of; determining a position of a cut edge of the belt-shaped member at a plurality of positions along a cut direction of the belt-shaped member, folding a cut edge portion of the belt-shaped member upwardly, holding the folded cut edge portion, and correcting the position of the cut edge by displacing at least one part of



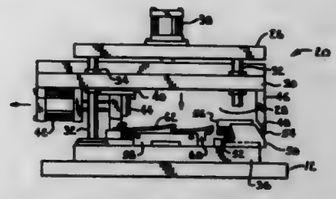
the cut edge of the belt-shaped member along the cut direction in a vertical direction while the cut edge portion is held.

5,195,412

NOTCHING AND SHEARING MACHINE FOR EXTERIOR SIDING PANELS AND METHOD OF USING SAME

Peter D. Flemming; Douglas M. Hawkinson; Douglas W. Stout, all of McPherson, and Robert T. Fry, Hutchinson, all of Kans., assignors to Plastics Extrusion Machinery, McPherson, Kans.

Filed Sep. 20, 1991, Ser. No. 764,499
Int. Cl.[5] B26D *1/60, 9/00*
U.S. Cl. 83—37 12 Claims



9. A method of notching and shearing continuous exterior siding to form panels, comprising the steps of:

advancing a carriage in a direction substantially parallel to a direction of advance of the siding toward an extended punch position;

punching the siding with a punch mounted on said carriage to form at least one notch therein;

allowing the siding to advance with respect to said carriage;

again advancing said carriage, in a direction substantially parallel to the direction of advance toward an extended shear position; and

shearing the siding at a position substantially intermediate said at least one notch with a shear mounted on said carriage to thereby form one of the panels.

5,195,413

SHEARING TOOL FOR PUNCH PRESSES

Gary E. Johnson, Ramsey, Minn., assignor to Mate Punch & Die Co., Anoka, Minn.

Filed Aug. 16, 1991, Ser. No. 746,363
Int. Cl.[5] B26D *7/02*
U.S. Cl. 83—132 6 Claims

1. A shearing tool for a punch press having a first support element mounted for reciprocation relative to a second support element, said tool comprising,

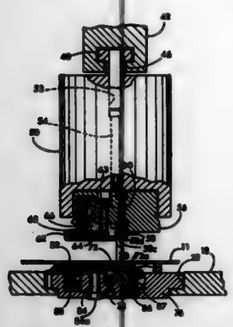
first and second elongated cooperating cutting blades, said blades having slidably related mating surfaces aligned in a plane of reciprocation whereby the blades engage each

other on a single surface corresponding to said plane of reciprocation,

each blade having a single cutting edge along one end of the mating face thereof for cutting a work piece,

said cutting edges being oriented obliquely relative to one another within said plane so as to sever a piece of sheet stock progressively along a line with a scissor action as the blades move toward one another,

intermittent work piece advancing means for shifting the



work piece along a path aligned with said line toward the cutting blades when the blades are apart from one another between cuts, and

a pair of separate, independently movable stripper elements are positioned laterally of the second blade and on opposite sides thereof, and each of the stripper elements is yieldably biased in the direction of the first blade for independently yieldably lifting the work piece when extended in a resting position above an exposed face of the second blade.

5,195,414

SHEARING MACHINE

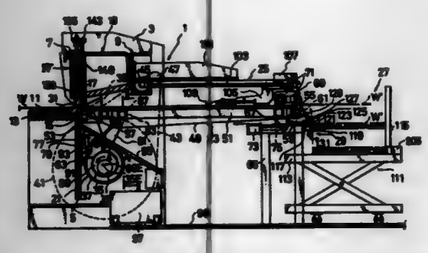
Kazui Ogasawara, Kanagawa, Japan, assignor to Amada Company, Ltd., Japan

Continuation of Ser. No. 285,396, Dec. 15, 1988, Pat. No. 5,062,333, which is a continuation-in-part of Ser. No. 227,133, Aug. 2, 1988, abandoned. This application Sep. 4, 1991, Ser. No. 754,748

Claims priority, application Japan, Aug. 3, 1987, 118130; Aug. 3, 1987, 192603; Aug. 5, 1987, 119307

Int. Cl.[5] B26D *1/08, 7/32*

U.S. Cl. 83—155 **7 Claims**



1. A shearing machine for shearing a plate workpiece, the shearing machine having a front side and a rear side, the shearing machine comprising:

a frame;

a ram having an upper cutting blade and being mounted on the frame in a vertically movable manner, the upper cutting blade having a front side and a rear side;

a worktable being fixedly mounted on the frame and having a lower cutting blade to define an opening between the upper cutting blade and the lower cutting blade so that the plate workpiece to be sheared may be fed from the front side of the upper blade into the opening with a portion of the plate workpiece extending to the rear side of the opening;

a conveying means being mounted on the frame for supporting the portion of the plate workpiece and for conveying a sheared portion of the plate workpiece to the rear side of the shearing machine, said conveying means having a front side and a rear side and said conveying means being vertically pivotable in response to the vertical movement of the ram; and

a mechanical drive shaft means for driving both the ram and the front side of said conveying means reciprocally up and down so that the conveying means descends no later than the actual cutting into the workpiece by the upper cutting blade; said mechanical drive shaft means adapted to drive the ram and the conveying means independently of any hydraulic system or any clutch and including at least one first eccentric member connected to a rotatable drive shaft at a first shaft center for activating the ram, and a connecting rod which engages at least one second eccentric member and is connecte to the front side of the conveying means for driving the conveying means, wherein the second eccentric member is connected to the rotatable drive shaft at a second shaft center which is, viewed in the direction of rotation of the drive shaft, positioned with its phase staggered in a slightly delayed manner from the first shaft center of the mechanical drive shaft means, said first and second eccentric members each mounted on said drive shaft.

5,195,415

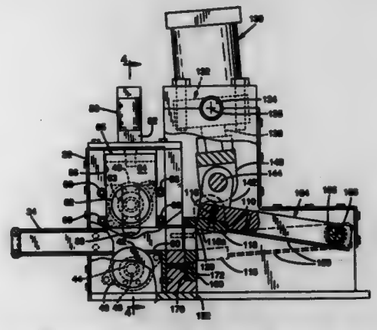
APPARATUS FOR CUTTING ELONGATE PIECES

Wayne R. Buck, and Todd E. Hoffman, both of Medford, Oreg., assignors to Sweed Machinery, Inc., Gold Hill, Oreg.

Filed Jan. 24, 1992, Ser. No. 825,563

Int. Cl.[5] B26D *5/20, 7/08*

U.S. Cl. 83—176 **2 Claims**



1. A power-driven chopper for cutting elongate material in chunks comprising:

a frame,

feed roll means including a pair of opposed rotatable feed rolls mounted on said frame for rotation about horizontal axes and means biasing the rolls toward each other to press against opposite sides of material fed to the feed rolls, feed roll powered means for rotating the feed rolls, the feed rolls advancing material along a feed path extending transversely of the rolls and downstream from the rolls,

an anvil downstream from the extending transversely of and on the underside of the path of material from the feed rolls for supporting material to be chopped, said anvil having a horizontal anvil cutting edge,

a knife and a pivot arm mounting the knife, pivot means mounting the pivot arm for pivotal movement about a horizontal axis located along the feed path downstream from the anvil and the axis extending transversely of the feed path, the knife having a knife cutting edge and the knife cutting edge moving in a cutting pass with pivoting of the pivot arm and the cutting edge during a cutting pass moving from a starting position which is above said feed path to a finish position where the knife cutting edge has moved across and below the anvil cutting edge, a guide surface mounted on said pivot arm which extends at an incline across the feed path in a region located downstream from the cutting edge of the anvil with the cutter knife held by the pivot arm in the starting position for the cutter knife, and

cutter powered means operatively connected to the pivot arm for pivoting the arm under power.

5,195,416

Patent Not Issued For This Number

5,195,417

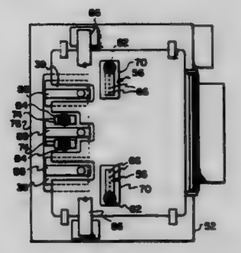
REGISTRATION OF ARTWORK PANELS IN THE MANUFACTURE OF PRINTED CIRCUIT BOARDS

Stephen H. Hancock, Tequesta; Aaron L. Arnold, Palm Beach Gardens, and Daniel R. Leiwe, Royal Palm Beach, all of Fla., assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 26, 1990, Ser. No. 514,409

Int. Cl.[5] B26D *1/00*; G01N *21/86*; G01B *11/00*

U.S. Cl. 83—34 **15 Claims**



1. A method of registering an artwork panel in position and then of punching a registration hole in the artwork panel comprising:

providing two spaced apart groups of target location areas in fixed locations upon a registration apparatus, the target location areas having light emitting properties which are different from light emitting properties of surface areas surrounding the target location areas, the target location areas in each group being rectilinearly spaced apart along a desired axis;

providing a light monitoring means for each group of target location areas, each light monitoring means being movable along an axis enabling it to be selectively directed towards any chosen target location area within the respective group;

directing each light monitoring means towards the chosen target location area;

monitoring the positions of the chosen target location areas and the positions of targets which are precisely located upon the artwork panel and located over the chosen target location areas, wherein the artwork panel is supported by a support means, and the targets have different light emitting properties from artwork panel regions surrounding the targets;

providing signals corresponding to the monitored positions of the chosen target location areas and of the targets and analyzing the signals to provide an analysis relating to the positions of the targets relative to precisely selected datums on the chosen target location areas;

dependent upon said analysis, controllably moving the artwork panel on the support means relative to the chosen target location areas while the positions of the targets continue to be monitored and analyzed so as to locate the two targets in specific locations relative to the precisely selected datums whereby the artwork panel is registered in position prior to punching; and

then punching the registration hole in the artwork panel at a permanently fixed location relative to the target location areas.

5,195,418

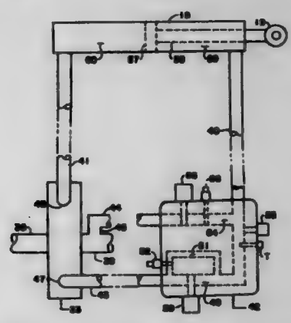
HYDRAULIC CONTROL SYSTEM FOR WEIGHTING AND TWO-WAY VALVE THEREFOR

Ronald Smith, Narraboen, Australia, assignor to Wray-Tech Instruments, Inc., Downers Grove, Ill.

Division of Ser. No. 683,078, Apr. 10, 1991, Pat. No. 5,139,101. This application Apr. 14, 1992, Ser. No. 868,305

Int. Cl.[5] F15B *13/04*

U.S. Cl. 91—31 **2 Claims**



1. A flow control system for a hydraulically operated lifting apparatus capable of controlling the ascent and descent of the lifting apparatus at a rate less than the rate provided by a main hydraulic valve of the system, said flow control system comprising a two-way valve connected to a port of the main hydraulic valve and providing a flow through passage therein communicating with a lift circuit line means of a hydraulic cylinder of the lifting apparatus, said two-way valve including in said flow through chamber a normally open valve whereby fluid under pressure can be directed from said port through said two-way valve to the lift circuit line means, a bypass circuit fluidly communicating with said flow through chamber at either side of said normally open valve and including therein a flow control valve for reducing flow through the two-way valve upon closing said normally open valve whereby to direct fluid under pressure at a reduced rate to said lift circuit line means, said two-way valve including a second bypass chamber fluidly communicating with said flow-through chamber between said normally open valve and said lift circuit line means and having therein a normally closed valve and a second flow control valve, said normally closed valve being openable to direct fluid back from the lift circuit line means through said second bypass chamber at a controlled rate and wherein said second bypass chamber communicates outwardly of said two-way valve with a return line means for returning hydraulic fluid to the hydraulic system of the lifting apparatus.

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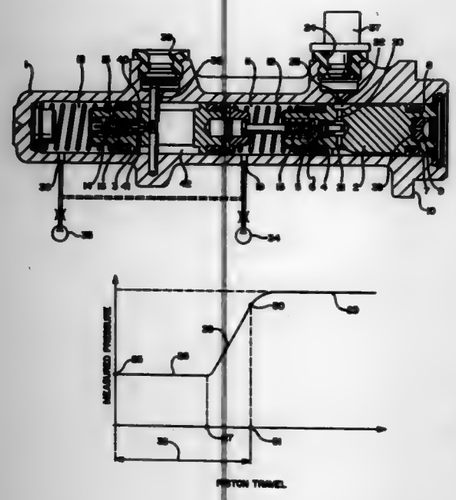
5,195,419
METHOD FOR ASSEMBLING A PISTON-AND-CYLINDER UNIT AND FORCE TRANSMISSION ELEMENT

Hans D. Reinertz, Frankfurt am Main, and Helmut Steffes, Hattersheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP90/00816, § 371 Date Mar. 19, 1991, § 102(e) Date Mar. 19, 1991, PCT Pub. No. WO91/01462, PCT Pub. Date Feb. 7, 1991
PCT Filed May 21, 1990, Ser. No. 659,370
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1989, 3923842
Int. Cl.[5] F16R 15/24
U.S. Cl. 92—13.3 14 Claims

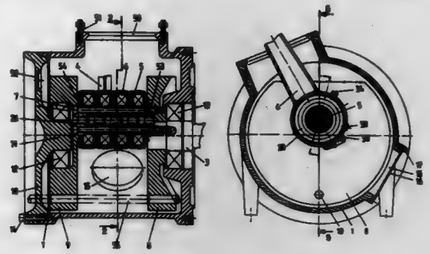


1. A method for assembling a piston-and-cylinder unit and a force transmission element, said unit comprising a push rod piston and a floating piston connected downstream of the push rod piston in an actuating direction, each piston including a central valve including a seat and closing member which separates pressure chambers associated with each of said piston from an unpressurized brake fluid supply reservoir and connects said chambers with the brake fluid supply reservoir in response to the pistons' movement, characterised in that to reduce lost travel of the central valve in the floating piston, the central valve is moved with the floating piston in a direction of pressure increase and, simultaneously the pressure chambers associated with the pistons are acted upon by a measurement medium while the central valve allocated to the push rod piston remains open, with the pressure being measured which prevails in the pressure chamber allocated to the floating piston and experiences a marked increase due to the closing action of the central valve, in that the travel of the central valve from an initial position up to the marked increase (measure distance) is used as an information for the dimensioning of spacers to be arranged between the force transmission element and the push rod piston.

5,195,420
PISTON COMPRESSOR, PARTICULARLY AN OIL-FREE PISTON COMPRESSOR

Hans Wanner, Herisau, Switzerland, assignor to Fritz Haug AG, St. Gallen, Switzerland

Filed Mar. 12, 1992, Ser. No. 850,265
Claims priority, application Switzerland, Mar. 12, 1991, 737/91
Int. Cl.[5] F01B 1/00
U.S. Cl. 92—72 15 Claims

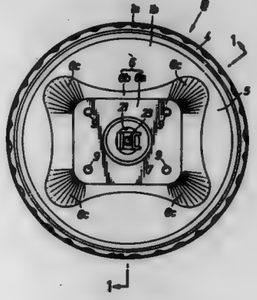


1. A piston compressor comprising at least two angularly displaced pistons and a crank case within which the pistons are connected via respective connecting rods and a crank mechanism to a common drive shaft, wherein
the crank mechanism comprises, for each piston, a separate crank disk which supports a roller bearing at one end of a respective connecting rod, and the crank disks have congruent axes which are eccentric with respect to that of the drive shaft,
said crank disks being compressed together into a package by at least two tensioning bolts which pass through the crank disks around their said axes.

5,195,421
VACUUM BOOSTER

Takayoshi Shinohara, and Toshiyuki Sawa, both of Nagano, Japan, assignors to Nissin Kogyo Co., Ltd., Nagano, Japan

Filed Oct. 29, 1991, Ser. No. 783,963
Claims priority, application Japan, Jan. 17, 1991, 3-000965[U]
Int. Cl.[5] F01B 29/00
U.S. Cl. 92—161 3 Claims

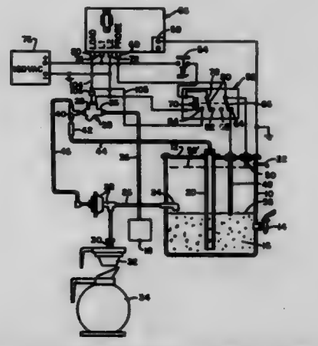


1. A vacuum booster comprising:
a pedestal formed on a rear wall of a booster shell;
a rectangular seating face wall surrounding an axis of the booster shell; and
a peripheral wall inclined from the seating face wall,
said pedestal being attached to a vehicle body through four connecting bolts fixedly mounted on the seating face wall in proximity to four corners thereof,
wherein the peripheral wall of the pedestal is formed such that a length from a dish-like wall of the rear wall of the booster shell to the seating face wall becomes larger toward each of corners of the peripheral wall.

5,195,422
HOT WATER BATCH DELIVERY SYSTEM FOR A BEVERAGE BREWING APPARATUS

Brian D. Newman, Louisville, Ky., assignor to Grindmaster Corporation, Louisville, Ky.

Continuation of Ser. No. 594,165, Oct. 9, 1990, abandoned. This application Apr. 7, 1992, Ser. No. 864,525
Int. Cl.[5] A47J 31/40
U.S. Cl. 99—283 13 Claims

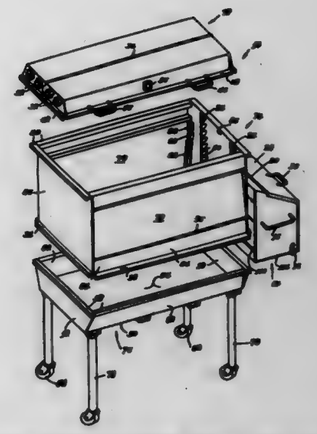


1. A system for manually delivering a selected volume of hot water and a batch of hot water in a predetermined volume from a single holding tank to a beverage dispenser comprising
(a) a hot water holding tank, said tank connected a remote source of water;
(b) water tap means communicating with said tank below a first preselected level of water within said tank for manually removing a selected volume of water therefrom, thereby causing said water level to temporarily recede below said first preselected level;
(c) first sensing means for sensing when the level of water in said tank is below said first preselected level;
(d) water level control means connecting said tank to said remote source of water and raising the level in said tank back to said first preselected level in response to said first means sensing water below said first preselected level;
(e) Means for initiating delivery a batch of hot water of a predetermined volume from said tank to said beverage dispenser, said water level control means responsive to said initiating means for connecting said tank to said remote source of water;
(f) second sensing means for sensing when said water in said tank reaches a second predetermined level above said first level, said water level control means disconnecting said tank from said remote source of water in response to said second sensing means sensing water at said second level; and
(g) means for connecting said tank to said beverage dispenser when reaches said second predetermined level and maintaining the connection until the water reaches an intermediate level between said first and second levels thereby delivering said batch of hot water from said tank to said beverage dispenser.

5,195,423
SMOKER ASSEMBLY

Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc., North Aurora, Ill.

Filed Jul. 2, 1992, Ser. No. 909,095
Int. Cl.[5] A47J 37/00
U.S. Cl. 99—340 17 Claims



1. A two-part smoker assembly having a first part and second part for attachment to a barbeque grill for converting the grill to a food smoking device, comprising:
a smoking chamber comprising said first-part of the assembly, said smoking chamber having a rectangular box-like configuration and comprising four walls, including two long opposing walls having pivotally openable doors for granting access to the interior of the smoking chamber, said smoking chamber further including a plurality of food rack supports, food racks supportable on said food rack supports at any of a selectable variety of elevations therein, a removable hinged cover lid for covering over the smoke chamber whereby to enclose it for forming a box-like enclosure mountable on the firebox of a barbeque grill, said cover lid including means for opening said cover lid at either of two locations and the cover lid further having draft dampers, said smoking chamber further including an aperture with engageable means thereabout for engaging slide-engageable means of a fire chamber; and, said second part comprising a slide-attachable fire chamber for combusting fuel to create smoke for said smoking chamber, said fire chamber including an aperture for egress of smoke therein, said aperture having arranged adjacent thereto slide-engageable means for engaging the engageable means of said smoking chamber and said slide-engageable means including means for sealing placement around said aperture of the smoking chamber to thereby sealingly join said apertures of the fire chamber and the smoking chamber, said fire chamber further including a stoking door for adding fuel, a grate for holding, and a clean-out door for cleaning the ash products of combustion.

5,195,424
TAMALE STEAMER

Nora B. Guajaca, 1325.5 W. 219th St., Torrance, Calif. 90501

Filed Apr. 16, 1992, Ser. No. 868,838
Int. Cl.[5] A47J 36/22
U.S. Cl. 99—418 16 Claims

1. A steamer for tamales and other comestibles, comprising:
an open-topped vessel;
a plurality of steamer racks fitted within said vessel, each

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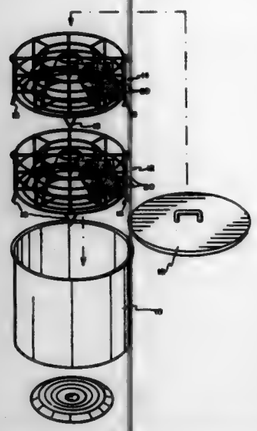
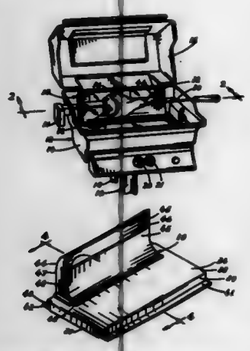
said rack having a plurality of receptacles for retaining comestibles placed therein at an inclined orientation and adapted to be stacked one rack upon another, wherein each said steamer rack includes:
an upper horizontal support assembly;
a lower horizontal support assembly positioned beneath said upper horizontal support assembly;
at least one medial horizontal support assembly positioned between said upper and lower support assemblies,



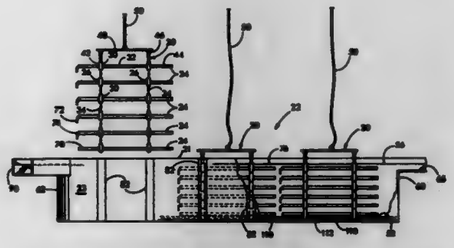
wherein each of said upper, lower and medical support assemblies includes:
a plurality of rings, each of said rings positioned in the same plane, said rings including:
an innermost ring;
an outermost ring surrounding said innermost ring;
at least one medial ring positioned between said innermost and said outermost ring;
a plurality of spokes joining said rings; and
means for closing said vessel thereby retaining steam within.

5,195,425
ROTISSERIE HEAT DIRECTING DEVICE
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Apr. 24, 1992, Ser. No. 873,325
Int. Cl.[5] A47J *37/04*
U.S. Cl. 99—421 H **20 Claims**



11. A heat directing device for use in a barbecue grill, said grill having a heat source and a rotisserie supported by a base member of said grill, said heat directing device comprising:
a substantially flat base portion adapted to be positioned and extended over said heat source and placed directly in contact with said grill, said base portion constructed and arranged to provide heat confinement and vaporization of meat juices and fats and a hollow duct portion positioned on at least one portion of said base portion and offset from said rotisserie when said base portion is placed on said grill, said base portion extending upwardly from said base portion, said duct portion terminating in an opening constructed and arranged to direct heat from said heat source in the direction of said rotisserie when said heat directing device is placed on said grill such that heat flows laterally over and above said base portion.

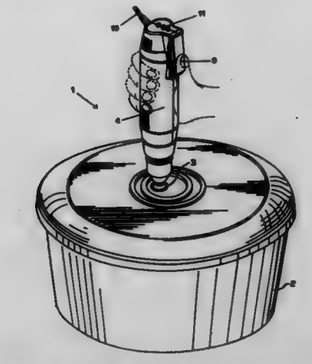
5,195,426
CHEESE BRINING SYSTEM WITH COLLAPSIBLE RACKS
Joseph J. Thuli, Darlington, Wis., assignor to Darlington Dairy Supply Co., Inc., Darlington, Wis.
Filed Dec. 31, 1991, Ser. No. 816,887
Int. Cl.[5] A01J *25/00*; A23C *19/00*
U.S. Cl. 99—452 **11 Claims**



1. A system for brining cheese comprising:
a) a tank having a length and being filled with a brine solution and adapted to receive a stream of flowing brine along the length of the tank; and
b) at least one rack having a plurality of planar perforated shelves vertically spaced from one another, the rack being movable vertically to alternatively submerge the shelves within or to elevate the shelves above the brine solution, and wherein the shelves are collapsibly connected to one another, such that when the rack is suspended with less than all of the shelves submerged within the brine solution, an unsubmerged shelf is spaced above the uppermost submerged shelf in a loading spacing which is a sufficient distance to admit the unobstructed float loading of bouyant cheese beneath the unsubmerged shelf, and when the rack is entirely submerged within the brine solution the shelves collapse toward one another and are disposed at a spacing narrower than the loading spacing.

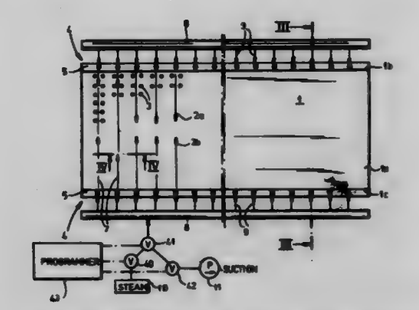
5,195,427
SUCTION DEVICE TO CREATE A VACUUM IN CONTAINERS
Maina Germano, Via Rossini 3, 20090 Limito (Milano), Italy
Filed Mar. 20, 1992, Ser. No. 854,245
Claims priority, application Italy, Apr. 3, 1991, MI91-1A000927; Feb. 14, 1992, MI92U000129
Int. Cl.[5] B65B *31/04*; B65D *51/16*; A23B *7/00*
U.S. Cl. 99—472 **19 Claims**
1. A suction device for drawing a vacuum in a container (2) having a valve (3), comprising:
a casing (4,5);
an electric motor (7) having a shaft (16) and mounted in said casing;

a suction pump in said casing having a cylinder with an inlet and a piston movable in said cylinder (14,15), said suction pump being mounted in said casing at a location space from said electric motor;
a motor gear (17) force-fit onto said shaft;
a crown gear (19) meshed with said motor gear and mounted for rotation in said casing between said motor and said pump, said crown gear including an eccentric (37) eccentrically movable when said motor gear rotates to rotate said crown gear;



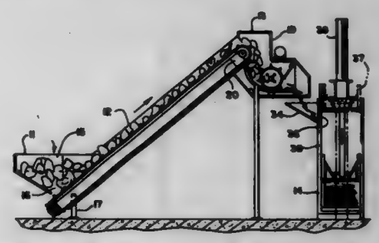
a connecting rod (23) operatively connected between said eccentric and said piston for reciprocal movement of said piston in said cylinder with rotation of said motor gear; and
a hollow suction tip (34) adapted for engagement with the valve of the container, said tip being engaged with an end of the casing opposite from the motor and in communication with said inlet of said cylinder for drawing a vacuum from the container through the valve when the motor gear rotates.

5,195,428
PRESS FOR PRODUCING PRESSED BOARD BY TREATING THE MATERIAL WITH STEAM
Werner Gawlitta, Tegelen, Netherlands; Karl Walter, Kempen, and Stephan Schulz, Krefeld, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany
Filed May 7, 1991, Ser. No. 696,578
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015142
Int. Cl.[5] B30B *15/34*
U.S. Cl. 100—73 **9 Claims**



1. A press for the production of pressed board by compression of a mat with heat and pressure and with injection of steam into the mat, said press comprising:
at least one steel press platen formed with a surface turned toward said mat and a plurality of mutually parallel steam-supply channels opening along opposite sides of said platen, said platen having respective groups of steam-nozzle bores arrayed along each of said channels, communicating with the respective channel and opening at said surface,
each of said channels having a flow cross section which is at least 60% of a sum of the flow cross sections of the bores of the respective group arrayed along the channel where said bores communicate with the channel;
a source of steam;
respective steam-distribution ducts connectable to said source and formed along each of said sides of said platen, transverse to said channels and communicating with the respective ends of said channels at the respective side for feeding steam to said channels whereby the stem fed to said channels from the respective ducts flows in collision paths in the respective channels in opposite directions;
utility pipes extending along said ducts parallel thereto;
a multiplicity of passages spaced along said ducts and connecting each of said ducts with the respective utility pipe; and
programmable means connected to said pipes for selectively supplying steam to said pipes and connecting said pipes to a suction source.

5,195,429
ASSEMBLY FOR PERFORATING, CRUSHING AND BALING CRUSHABLE OBJECTS
Sergio E. Firpo, 338 S. Wisconsin, Oak Park, Ill. 60302
Continuation of Ser. No. 662,479, Feb. 28, 1991, abandoned. This application Aug. 3, 1992, Ser. No. 924,409
Int. Cl.[5] B30B *9/32*
U.S. Cl. 100—96 **11 Claims**



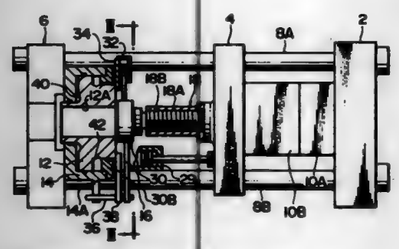
1. An assembly for baling crushable objects, said assembly comprising: a hopper for receiving crushable objects, said hopper defining an opening through which it receives the crushable objects; first means for crushing and perforating the crushable objects; conveyor means disposed between the hopper and the first means for conveying the crushable objects from the hopper to the first means; and baling means disposed proximate the first means for receiving the crushed and perforated objects and compressing them into a predetermined shape; said first means including: a frame, a support member pivotally mounted to the frame, springs means secured to the frame for biasing the support member to a predetermined position, a cooperating member rotatably mounted on the frame and including a plurality of perforating elements for impaling the crushable objects, said cooperating member coacting with the support member to crush and impale the crushable objects, and drive means disposed on the frame for rotating the cooperating member, said support member defining openings through which the perforating elements pass; each perforating element being flat and having a generally triangular penetrating portion defining an edge for penetrating the crushable objects, the perforating element also having a gener-

ally oblong base portion secured to the cooperating member for supporting the crushable object way away from the cooperating member.

5,195,430
DUAL ROLLER APPARATUS FOR PRESSURE FIXING SHEET MATERIAL
James D. Rise, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.
Continuation-in-part of Ser. No. 357,382, May 24, 1989, Pat. No. 5,092,235. This application Nov. 21, 1991, Ser. No. 796,095
Int. Cl.[5] B30B *3/04*
U.S. Cl. 100—168 8 Claims

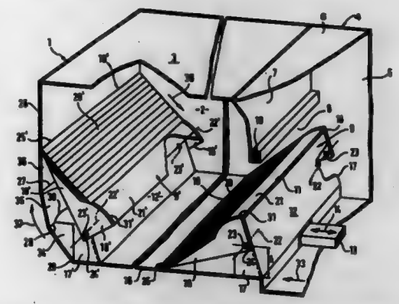
1. A dual roller apparatus for pressure fixing sheet material and reducing the dimensional distortion of sheet material processed therein, comprising:
a first elongate composite roller comprising a central core, a shell having an inner diameter greater than an outer diameter of said central core aligned concentrically with said core, said shell providing a shell pressure application surface, and an elastomeric filler disposed in the space between said core and said shell; and
a second elongate roller having a pressure application surface aligned with said shell pressure application surface of said first composite roller to form a nip; and
means for applying a load to at least one of said rollers to provide a fixing pressure to sheet material passing through the nip in excess of a threshold pressure which is sufficient to pressure fix the material,
wherein said fixing pressure applied at a central portion of said nip is higher than said fixing pressure applied near terminal ends of said nip.

5,195,431
SHUTTER-TYPE CLAMPING DEVICE
Yasuyuki Kohno, and Mitso Suzuki, both of Chiba, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan
Filed Oct. 7, 1991, Ser. No. 772,292
Claims priority, application Japan, Oct. 8, 1990, 2-270265
Int. Cl.[5] B03B *1/00*
U.S. Cl. 100—214 6 Claims



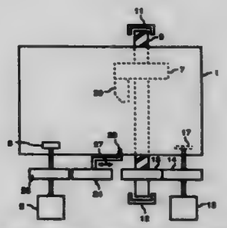
1. A shutter-type clamping device comprising:
a stationary platen;
a movable platen;
a base plate;
support means for supporting said stationary platen, said movable platen, and said base plate in an aligned relationship;
a clamping piston;
drive cylinder means connected to said base plate, for selectively driving said clamping piston toward and away from said movable platen;
said clamping piston being connected to said drive cylinder means supported by said base plate and having a hollow section;
a protrusion connected to said movable platen, said protrusion entering said hollow section of said clamping piston when said clamping piston is driven toward said movable platen when said hollow section of said clamping piston is open;
a shutter connected to said clamping piston for movement therewith, and which is selectively movable into and out of a blocking position which blocks entry of said protrusion into said hollow section when said clamping piston is driven toward said movable platen; said shutter being movably mounted to said clamping piston; and
drive means for moving said shutter into and out of the blocking position; whereby said protrusion is clamped when said clamping piston is driven toward said movable platen when said hollow section of said clamping piston is closed by said shutter.

5,195,432
COMPACTOR FOR WASTES, IN PARTICULAR TRASH
Heinz Bergmann, Im Runderdiek 1, 4474 Lathen, Fed. Rep. of Germany
Filed Aug. 15, 1991, Ser. No. 745,203
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027217
Int. Cl.[5] B30B *15/06, 7/00*
U.S. Cl. 100—229 A 14 Claims



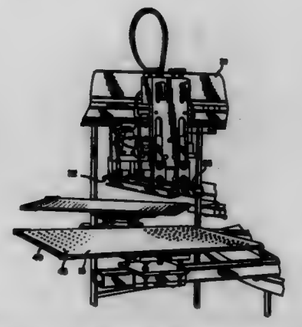
1. A compactor for continually receiving and compacting wastes, in particular for compressible trash,
a compaction plunger with a compaction blade in a lower part of a trash receiving chamber in a compactor housing, said plunger being mounted in a horizontally displaceable manner and moving the trash into a container adjoining the receiving chamber and compacting the trash therein,
a scoop being supported by the compaction plunger so as to be rotatable about a horizontal axis and comprising an acute-angle leading edge distal form the compaction blade to slide underneath the trash in the receiving chamber during a return stroke of the compaction plunger, toward the end of the return stroke the scoop being tipped upward about the horizontal axis by a tipping means for tipping the scoop about said horizontal axis whereby the trash is moved by the scoop in front of the compaction blade of the compaction plunger.

5,195,433
SYSTEM FOR PRINTING DOCUMENTS WITH A POST-MARKING ROLLER
Michel Krumenacker, and Daniel ReBoul, both of Granges les Valence, France, assignors to Sextant Avionique, Cedex, France
Filed Oct. 10, 1991, Ser. No. 819,891
Claims priority, application France, Oct. 10, 1990, 90 12711
Int. Cl.[5] B41J *3/28, 13/00*; B41L *47/44*
U.S. Cl. 101—45 5 Claims



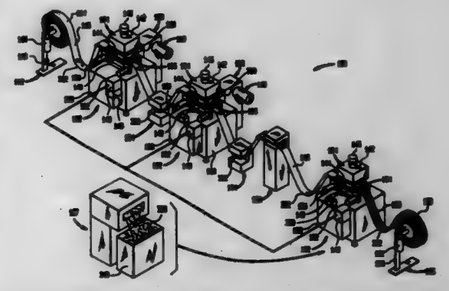
1. A system for printing a document (1) comprising:
a frame; a first motor;
means (3, 4) associated with the first motor (5) for driving the document with respect to the frame along a first horizontal direction, the document being vertically arranged; a vertical linear displacement system;
a printer (7) coupled to said frame by means of said vertical linear displacement system (9, 11, 12) for printing information on the document;
a post-marking roller (17) bearing symbols to be selectively pressed on the document, an ink ribbon (19) associated with said post-marking roller and means for intermittently driving said ink ribbon;
a second motor (15) for driving said vertical linear displacement system;
clutching means (24, 28, 30) for coupling the means for intermittently driving said ribbon to said first motor (5) only when the printer is in a predetermined range of its vertical displacement.

5,195,434
TRANSFER PRINTING PRESS
Richard Hoffman, Chicago, Ill., assignor to M & R Printing Equipment, Inc., Glen Ellyn, Ill.
Filed Oct. 2, 1990, Ser. No. 591,729
Int. Cl.[5] B41F *15/20*
U.S. Cl. 101—126 8 Claims



1. An improved transfer printing press of the type having a plurality of beds movable between at least one printing station and at least one curing station and having a top surface and outside edges, means for squeegeeing ink through a screen onto a substrate at said printing station, heating means for curing the ink remaining on the substrate at said curing station, and means for drawing outside air through said top surface of said bed, wherein the improvement comprises means for maintaining said substrate at a given substantially uniform temperature at said curing station and including an air porous material interposed between the top surface of the bed and the substrate to be printed to permit the flow of outside air through said air porous material.

5,195,435
CONTINUOUS INTAGLIO PRINTING APPARATUS AND METHOD
Ross F. Morrone, Cranbury; Vincent E. Criollo, Highlands, both of N.J., and Jack D. Stewart, Doylestown, Pa., assignors to All-State Legal Supply Co., Cranford, N.J.
Filed Mar. 18, 1991, Ser. No. 670,987
Int. Cl.[5] B41F *9/02, 9/14*
U.S. Cl. 101—151 49 Claims



1. A continuous intaglio printing apparatus comprising a hydraulic press having an intermittently moveable ram, supply means for supplying a continuous web of material to said hydraulic press, intaglio printing means in operative association with said ram for engraving said web of material upon intermittent movement of said ram by operation of said hydraulic press, said intaglio printing means including first support means for removably supporting an engraving-die underlying said ram, application means for applying printing fluid to said engraving-die, wiping means for wiping excess printing fluid from said engraving-die, moving means coupled to said first support means for moving said engraving-die from a first position underlying said ram to a second position in operative association with said application means and said wiping means, and then to said first position between intermittent movement of said ram, a first pair of guides attached to said ram on either side of said first support means, said first pair of guides concurrently moveable with said movement of said ram, and a second pair of guides unattached to said first pair of guides fixedly positioned adjacent said application means and said wiping means in alignment with said first pair of guides, said second pair of guides remaining stationary during movement of said ram and said first pair of guides, the sides of said first support means engaging said first and second pair of guides for translational movement therealong in response to the operation of said moving means when said first pair of guides are in registration with said second pair of guides between intermittent movement of said ram.

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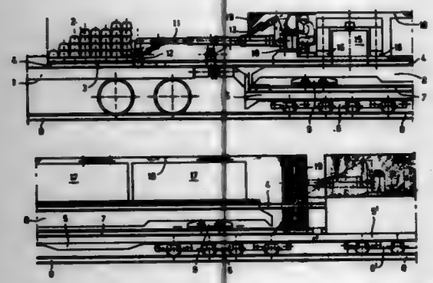
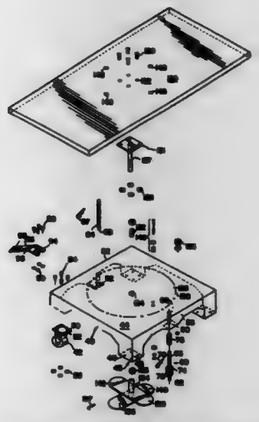
5,195,436
PROCESS FOR CONTINUOUS WELDING OF TRACK SECTIONS, AND SET OF WAGONS ESPECIALLY EQUIPPED FOR ITS IMPLEMENTATION
Sergio Valditerra, Viale Rimembranze 67, I-15067 Novi Ligure, Italy
PCT No. PCT/EP90/00819, § 371 Date Apr. 29, 1991, § 102(e) Date Apr. 29, 1991, PCT Pub. No. WO90/14470, PCT Pub. Date Nov. 29, 1990
PCT Filed May 8, 1990, Ser. No. 640,405
Claims priority, application Italy, May 23, 1989, 67386 A/89
Int. Cl.[5] E01B *29/17*
U.S. Cl. 104—15 10 Claims



4. An equipped train set for continuously welding railroad rail sections (3), said train set comprising:
at least two trucks (5, 5'), each having a lowered load platform;
head means (15) for mutually welding abutting ends of the rail sections (3);
first side guides (4) and second side guides (7) mounted onto the trucks (5, 5') and extending along the longitudinal axis of the trucks; and
trolley means (8), guided on the second side guides (7), for carrying the welding head means (15) thereon.

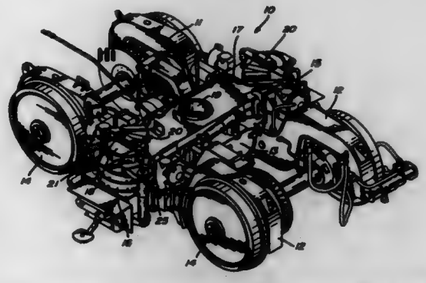
5,195,437
CONVEYOR SYSTEM
Gregory M. Wallace, Evansville, Ind., and David M. Horton, Henderson, Ky., assignors to George Koch Sons, Inc., Evansville, Ind.
Filed Oct. 11, 1991, Ser. No. 775,119
Int. Cl.[5] B61B *10/04*
U.S. Cl. 104—172.3 20 Claims

1. An endless conveyor system comprising:
individual wheeled trucks supported to roll on a floor, each truck having:
a truck bed for supporting carried articles;
depending drive means having a lower portion extending below said truck bed;
said lower portion having a first and second cam surface thereon;
a guide track mounted on the floor;
an endless drive means in said track;
said endless drive means having a plurality of driver means connected thereto for imparting movement to said depending drive means on each truck;
said depending drive means being movable between a first position in which a lower end thereof lies in a plane of the driver means to contact the driver means, to a second position in which the lower end of the depending drive means avoids the plane of the driver means;
a movable disengagement means attached to the floor to contact the first cam surface and move the depending drive means to the second position;
an actuator means for moving the moveable disengagement means to an actuated position and wherein said moveable disengagement means normally rests in a non-actuated position;
control means for moving said actuator means to cause said disengagement means to move to its actuated position,
wherein there is a second disengagement means for contacting the second cam surface on the depending drive means



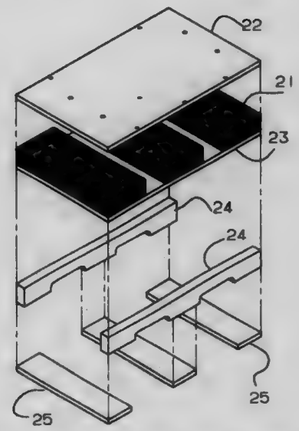
on each truck to move the depending drive means to avoid the plane of the driver means; and
wherein the second disengagement means automatically disengages the depending drive means of a truck from the driver means just before the truck comes into contact with another truck just ahead of it to avoid the truck from having a rear end collision with another truck.

5,195,438
HEIGHT COMPENSATION DEVICE FOR RAILWAY TRUCK
Raymond Dumoulin, Rosemere; Denis Arvisais, St-Basile; Marc Brunet, St-Lambert; Benoit Lussier, Ste-Julie, and Louis Thibault, St-Thomas d'Aquin, all of Canada, assignors to Bombardier Inc., Boucherville, Canada
Filed Feb. 21, 1992, Ser. No. 838,678
Int. Cl.[5] B61F *5/14*
U.S. Cl. 105—199.3 9 Claims



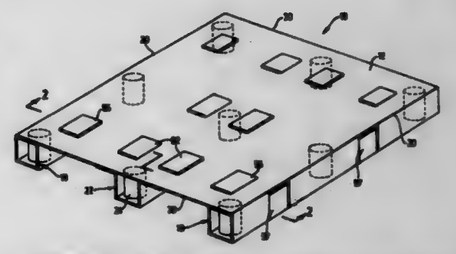
1. A height compensation device for a railway truck having at least two pairs of rail engaging support wheels, said height compensation device being secured at opposed ends of a truck bolster and compensates for car body height loss after said wheels are re-profiled, said height compensation device comprising a bearing element having a top support surface on which said car body rests, a pivotal height adjustment plate having at least one shim section, said shim section being disposed between said bearing element and truck bolster by lifting said car body off said bearing element and pivoting said plate under said bearing element whereby to support said top support surface of said bearing element at a predetermined desired height above said truck bolster to maintain said car body at a substantially constant height from track level after wheel profiling.

5,195,439
SHIPMENT PALLET FOR HEAVY AND SENSITIVE EQUIPMENT
Melvin S. Harder, 2434 Alvardo Dr., Santa Clara, Calif. 95051-1305
Filed Mar. 24, 1992, Ser. No. 856,745
Int. Cl.[5] B65D *19/00*
U.S. Cl. 108—51.1 4 Claims



1. A shipment pallet for heavy and sensitive equipment, comprising:
(a) a first deck board, and
(b) a first, a second, and a third stringer affixed to the said first deck board, the said second stringer being disposed between the said first and the said third stringer, and
(c) a first foam cushion comprised of 2 pounds per cubic foot density polyethylene affixed to the top of the said first stringer as a means for absorbing shock, and
(d) a second foam cushion comprised of 9 pounds per cubic foot density polyethylene affixed to the top of the said second stringer as a means for damping vibration, and
(e) a third foam cushion comprised of 2 pounds per cubic foot density polyethylene affixed to the top of the said third stringer as a means for absorbing shock, and
(f) a second deck affixed to the said first cushion, the said second cushion and the said third cushion, wherein the density of the second cushion is greater than the density of the first cushion and the density of the third cushion, and
(g) the densities of the first cushion and the third cushion are the same, and
(h) the said first stringer, said second stringer, and said third stringer are parallel to each other, and
(i) the first stringer and the third stringer are placed equidistant from the second stringer, whereby the tri pod construction with a denser, stiffer cushion centrally located underneath the second deck board, parallel to and equidistant from two less dense, softer cushions, produces the desired effect of reducing shock forces without the associated increase in vibration forces.

5,195,440
PALLET FABRICATED OF STILL FOLDABLE MATERIAL
Norman J. Gottlieb, Thornhill, Canada, assignor to Container Corporation International Inc., Bridgetown, Barbados
Continuation-in-part of Ser. No. 767,687, Sep. 30, 1991, abandoned. This application Nov. 4, 1991, Ser. No. 787,623
Int. Cl.[5] B65D *19/00*
U.S. Cl. 108—51.3 17 Claims



1. A pallet comprising:
a first rectangular sheet of stiff, foldable material having opposed side and end edges and having a central portion and opposed side edge portions, the central portion having a top and bottom surface, the side edge portions each being folded into a plurality of parallel panels to form rectangular first and second channel members beneath the bottom surface of the central portion forming a platform, the outermost panels of the sheet being provided with transverse slits such that each of said outermost panels has at least one first tab and at least one second tab, the central portion having a plurality of first slots located in two spaced rows, the first slots being suitable to receive the first tabs, the at least one first tab of each outer panel being inserted through the first slots of one of said rows of first slots and folded to overlay a portion of the central portion top surface of the first sheet and being secured thereto, the at least one second tab of each outermost panel being folded to underlie the bottom surface of the central portion and being secured thereto, the at least one first and at least one second tab of the outermost panels forming an array of tabs alternately overlaying and underlaying the central portion respectively;
at least one second rectangular sheet of stiff, foldable material folded into a plurality of parallel panels to form at least a third rectangular channel member with the outermost panels extending laterally from said at least a third rectangular channel member and being provided with transverse slits to provide a plurality of third tabs, the central portion of the first sheet having a plurality of second slots located between the two rows of the first slots to receive the third tabs, the third tabs being inserted through the second slots of the first sheet and folded to overlay a portion of the central portion of the first sheet and being secured thereto; and
the channel members for receiving vertical reinforcement means.

5,195,441
DRAFTING TABLE
Charles Kay, Lakeland, Fla., assignor to Log/Panel Systems, Inc., Madisonville, Tenn.
Filed Aug. 26, 1991, Ser. No. 750,187
Int. Cl.[5] A47B *3/06*
U.S. Cl. 108—153 6 Claims

1. An architect's table comprising:
an elongated top having front and rear edges and opposite ends, comprising a pair of vertically spaced upper and lower panels, a first plurality of elongated splines between

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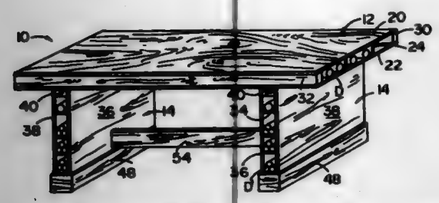
said panels extending between said opposite ends of said top, and having flanges embedded in both said panels; said vertically spaced panels and said first plurality of splines defining first elongated pigeonhole cavities with open ends facing at least one of a front edge, rear edge, or an end;

a pair of elongated edge members between said panels along said front and rear edges;

said upper panel having an upper dress surface;

a pair of upright pedestals oriented transversely of said elongated top, spaced from each other, positioned beneath said top, each said pedestal having a pair,. of laterally spaced parallel panels and a second plurality of elongated splines between said panels with flanges embedded in said panels;



each said pedestal having an elongated top edge member between the upper ends of said laterally spaced panels and abutting said lower panel of said top, and having an elongated bottom edge member between the lower ends of said laterally spaced panels;

said laterally spaced panels and said second plurality of splines defining second elongated pigeonhole cavities with open ends facing at least the rear of said table;

fastener means between said top edge members and said bottom panel of said top for fastening said pedestals to said top; and

an elongated connector between said pedestals having its ends secured to said pedestals and located between the bottom of said pedestals and the bottom of said top.

5,195,442

PROCESS AND SEWING MACHINE FOR PRODUCING SEWING PATTERNS

Willi Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to PFAFF Haushaltmaschinen GmbH, Karlsruhne, Fed. Rep. of Germany

Filed Aug. 29, 1991, Ser. No. 751,745

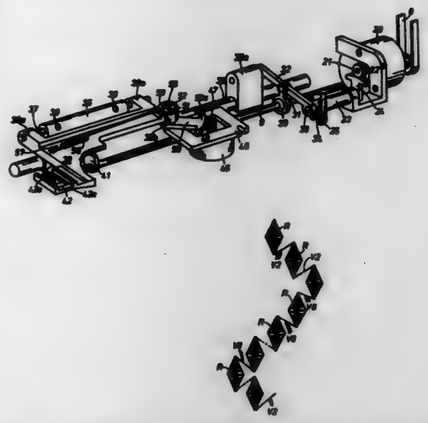
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1990, 4027364

Int. Cl.[5] D05B *3/02, 27/00*

U.S. Cl. 112—266.1 **7 Claims**

1. A process for producing combination sewing patterns including a plurality of individual sewing patterns by means of an electronically controlled sewing machine, which has a feed mechanism for driving a feed dog for transporting fabric to be sewn in a primary feed direction as well as at right angles to the primary feed direction, and a drive for a needle bar rocker for deflecting the needle bar rocker at right angles to the normal feed direction during a feed pause of the feed dog, a memory for storing a great variety of individual sewing patterns, as well as for a plurality of individual stitches with different feed directions, wherein at least one individual stitch is made in a selectable manner between a formation of a last touchdown of a first individual sewing pattern and a formation of a first touchdown of a second individual sewing pattern, the process comprising the steps of:

inserting at least one individual stitch in a selectable manner between the formation of a last needle touchdown of a first individual sewing pattern and the formation of a first needle touchdown of a second individual sewing pattern; and feeding the fabric to be sewn at least partially at right angles with respect to the normal feed direction after a predeterminable number of individual stitches for preparing a combination pattern exceeding a normal stitch field width of an individual sewing pattern, said feeding the fabric being performed exclusively by the feed dog.



5,195,443

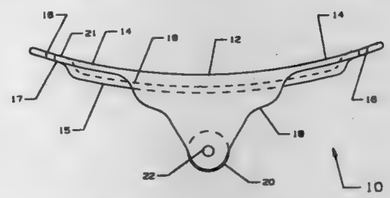
WINDSURFING SPREADER

Kevin B. Williams, Box 3141, Sunriver, Oreg. 97787

Filed Sep. 23, 1991, Ser. No. 763,618

Int. Cl.[5] B63B *35/82*

U.S. Cl. 114—39.2 **18 Claims**



1. A windsurfing spreader bar comprising:

a spreader bar having side portions for securing said bar across the front of a user's body,

an arm formed integral with said spreader bar projecting forwardly from one edge of said spreader bar,

means located adjacent the outer end of said arms for releasably retaining a harness, and

said spreader bar is initially cold stamped from a sheet of untempered material and, after forming, is heat treated in a solution containing copper, magnesium, zinc and silicon to super-saturate the aluminum, is quenched in water, and then is maintained at slightly above room temperature to permit precipitation of the super-saturants.

5,195,444

SAILBOARD

John J. Daniels, 350 Bristol St., Unit A-1, Waterbury, Conn. 06708

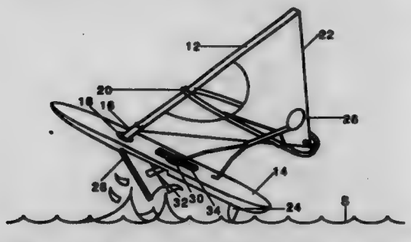
Filed Aug. 29, 1991, Ser. No. 751,797

Int. Cl.[5] B63B *35/79*

U.S. Cl. 114—39.2 **18 Claims**

1. An apparatus for launching a sailboard and user having a combined momentum while sailing on a body of water, comprising:

at least one flap submergible in the water, pivotally supported by the sailboard and having an initial angle of attack relative to the water and relatively parallel with a longitudinal axis of the sailboard; and positioning means



operable by the user while sailing for selectably extending the flap to an operable angle of attack relative to the water and relatively oblique with the longitudinal axis of the sailboard to position the flap effective to convert a least a portion of the momentum into a lifting force effective to launch at least a portion of the sailboard out of the water during the movement of the flap to the extended position.

5,195,445

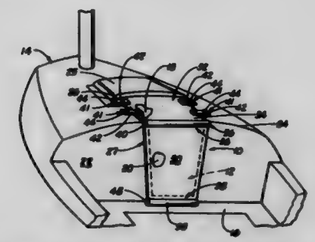
COMPANIONWAY ENCLOSURE ASSEMBLY

Marilyn S. Riddles, and Steven W. Riddles, both of Rte. 1, Box 59B, Edmond, Okla. 73034

Filed Apr. 2, 1992, Ser. No. 862,193

Int. Cl.[5] B63B *19/12*

U.S. Cl. 114—201 R **11 Claims**



1. A companionway enclosure assembly for enclosing a companionway of a boat in which the companionway has a hatch portion and a side portion, the companionway enclosure assembly comprising:

a flexible cover comprising an awning portion and a door portion, the awning portion extendible over the hatch portion of the companionway and having a first end and a second end, the door portion extendible over the side portion of the companionway and having a first end and a second end;

connector means for connecting the awning portion of the flexible cover to the boat adjacent the hatch portion of the companionway;

support means for supporting and maintaining the awning portion of the flexible cover in a taut position over the hatch portion of the companionway when the flexible cover is extended over the companionway, the support means traversing the width of the flexible cover and separating the awning portion from the door portion; and

weight means attached to the second end of the door portion for maintaining the door portion in a stretched out condition when the door portion is extended over the side portion of the companionway.

5,195,446

APPARATUS AND METHOD FOR COVERING OPENINGS IN HULLS OF DAMAGED SHIPS

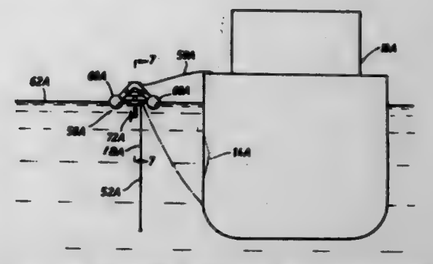
Floyd A. Riddell, 15835 Rippling Water Dr., Houston, Tex. 77084-2935

Continuation-in-part of Ser. No. 512,352, Apr. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 498,012, Mar. 23, 1990, Pat. No. 5,038,701. This application Aug. 12, 1991, Ser. No. 743,996

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] B63B *43/16*

U.S. Cl. 114—229 **17 Claims**



1. In a ship particularly adapted for the transport of liquid lading and having a metal hull;

improved means for covering an opening in the metal hull resulting from accidents to block the flow of liquid lading from the hull, said improved means comprising:

a coiled roll of flexible covering material adapted to be positioned alongside the outer surface of the metal hull over the opening in the hull, said covering material being formed of a liquid impermeable material and having a plurality of electromagnets arranged in generally transverse rows from the upper end of said covering material to the lower end thereof upon the positioning of the material along the hull of the ship;

means to unroll said covering material along the outer surface of the hull for covering said opening;

a fluid assist device attached to said flexible material to urge said material toward said hull; and

means to supply electrical current to said electromagnets in sequence to said transverse rows between the upper end of said covering material and the lower end of said covering material for securing said magnets electrically to said hull in sequence.

5,195,447

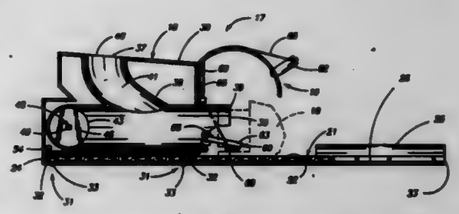
PERSONAL WATER CRAFT RACE STARTING DEVICE

Joseph C. Jones, P.O. Box 2292, Coeur d'Alene, Id. 83814

Filed Aug. 13, 1992, Ser. No. 929,785

Int. Cl.[5] B63B *35/00*

U.S. Cl. 114—270 **20 Claims**



1. A race starting device for personal water craft having a hull, a user support tray, a jet drive with a water intake on the

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hull, and a substantially horizontal rearward discharge nozzle for directing a stream of water in a rearward thrusting direction at a transom end of the hull, comprising:

a thrust diverter having an intake end and a discharge end, the intake end adapted to be positioned to receive at least a portion of the stream of water thrust from the discharge nozzle of the personal water craft, and the discharge end being angularly oriented with respect to the intake end to divert the water stream to a selected angle to thereby inhibit forward propulsion of the personal water craft; and

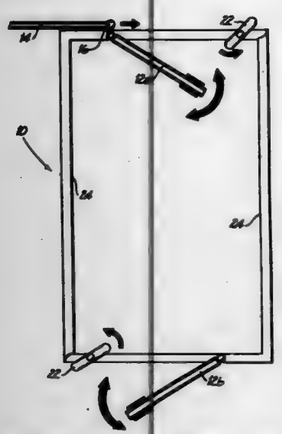
quick release means for releasably securing the thrust diverter and personal water craft together with the intake end of the thrust diverter positioned to receive thrust from the discharge nozzle, and for selective operation to release the thrust diverter from the personal water craft.

5,195,448

SECURITY SYSTEM

Allen G. Sims, #01315-192 "J" Unit, 3901 Klein Blvd., Lompoc, Calif. 93436

Filed Dec. 2, 1991, Ser. No. 801,420
Int. Cl.[5] E05G *5/02*
U.S. Cl. 109—6 **6 Claims**



1. A security system for controlling the entry and exit of persons from an establishment comprising a substantially enclosed vestibule entry;

at least tow doorways set in the walls of said vestibule, each of said doorways having a door extending from the floor to the ceiling of said vestibule, said doors and walls of said vestibule being made of bullet resistant material;

means for detecting the movement of persons through each of said doorways;

means, responsive to said detection means for selectively controlling the locking of said at least two doors so as to enable a person to pass through or to be detained within said vestibule;

a vertically oriented panel mounted on the edge of the wall abutting the free edge of each of said doors, each of said vertically oriented panels being pivotable about a vertical axis; and

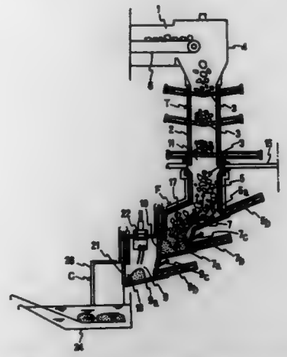
means for acting on each of said panels to cause an object placed in the space between the free edge of the associated door and panel to be pushed away from said space so as to prevent the unwanted obstruction of said doorway and/or the wedging of the door in an undesired open condition.

5,195,449

DRY DISTILLATION TYPE INCINERATOR

Kiyoharu Michimae, 4-10, Kofu 2-chome, Fushiki, Takaoka-shi, Toyama-ken 933-01, Japan

Filed Feb. 12, 1992, Ser. No. 835,124
Int. Cl.[5] F23G *5/00*
U.S. Cl. 110—257 **2 Claims**



1. A dry distillation type incinerator comprising:

a feeding tower which is composed of a hopper and a body;

the hopper composed of an inlet and a conveyor;

the body which is composed of plural dampers, each damper having an opening through which combustible matters are thrown and stored thereon;

an inclined multistage furnace integrated with the feeding tower, the inclined multistage furnace composed of a first stage chamber serving as mainly a dry incinerator chamber, a middle stage chamber serving as mainly a combustible chamber and a last stage chamber serving as a chamber for melting residue therein, which chambers are gradually inclined forward in the descending order, characterized in that:

a first gate is provided between the last stage chamber and the middle stage chamber and a second gate is provided at a discharge port of the last stage chamber, each chamber has a furnace floor, which is inclined proportionally to the inclination of each chamber, and pushers which are provided for raking out unburned matters or residue along the inclined furnace floors, the first stage chamber has an exhaust pipe fixed to an upper end thereof for exhausting a combustion gas, the second stage chamber has an air inlet for introducing air thereinto, the third stage chamber has an air inlet and a smoke duct for discharging the combusting gas.

5,195,450

ADVANCED OVERFIRE AIR SYSTEM FOR NO_x CONTROL

John L. Marion, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 607,177, Oct. 31, 1990, abandoned. This application Dec. 16, 1991, Ser. No. 808,244
Int. Cl.[5] F23K *1/00*; F23D *1/00*
U.S. Cl. 110—347 **4 Claims**

1. A method of operating for NO_x control a fosil fuel-fired furnace having a plurality of walls embodying therewithin a burner region comprising the steps of:

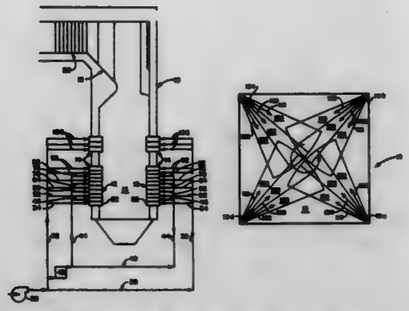
a. providing in the burner region of the furnace a windbox embodying a plurality of elevations;

b. introducing fossil fuel in a first direction into the burner region of the furnace through the windbox at a first elevation thereof;

c. introducing combustion supporting secondary air in the first direction into the burner region of the furnace through the windbox at a second elevation thereof;

d. introducing fossil fuel in the first direction into the burner region of the furnace through the windbox at a third elevation thereof;

e. providing a plurality of overfire air compartments in the burner region of the furnace above and in spaced relation to the windbox;



f. introducing overfire air into the burner region of the furnace in a second direction opposite to the first direction through one of the plurality of overfire air compartments;

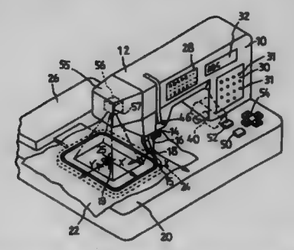
introducing overfire air into the burner region of the furnace in a direction other than the second direction through one of the plurality of overfire air compartments.

5,195,451

SEWING MACHINE PROVIDED WITH A PROJECTOR FOR PROJECTING THE IMAGE OF A STITCH PATTERN

Akifumi Nakashima, Ichinomiya, Japan, assignor to Broher Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 27, 1992, Ser. No. 874,090
Claims priority, application Japan, Jul. 12, 1991, 3-198766
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 **20 Claims**



11. A sewing machine capable of projecting the image of a stitch pattern on a workpiece, said sewing machine comprising:

a stitch pattern data generating means for generating stitch pattern data representing a stitch pattern to be formed on the workpiece;

a workpiece holding means for holding the workpiece having a holding frame defining a stitch pattern forming area;

an image data generating means for generating image data representing a stitch pattern;

an image projecting means for projecting the image of a stitch pattern on the basis of the image data generated by the image data generating means on an image projecting area;

a stitch forming means for forming a stitch pattern in the stitch pattern forming area on the workpiece in a stitching area of said sewing machine on the basis of the image of the stitch pattern projected by said image projecting means; and

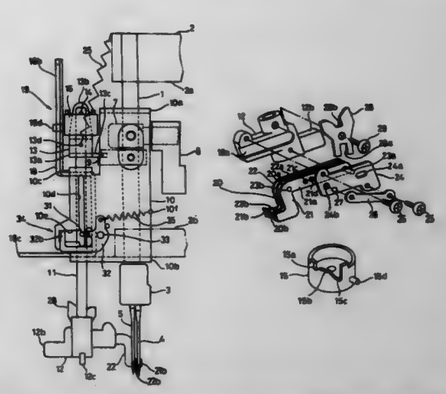
a moving means for moving said workpiece holding means between the stitching area of said sewing machine and the image projecting area.

5,195,452

SEWING MACHINE PROVIDED WITH A THREADING DEVICE FOR THREADING A PLURALITY OF NEEDLES

Osamu Kamiya, Chiryu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 27, 1992, Ser. No. 874,091
Claims priority, application Japan, Jul. 2, 1991, 3-188198
Int. Cl.[5] D05B *87/02*
U.S. Cl. 112—225 **20 Claims**



1. A multineedle sewing machine provided with a plurality of needles and a threading device for threading the plurality of needles, comprising:

a needle bar supported for vertical reciprocation and provided at its lower end with a needle holding member holding a plurality of needles having eyes;

a threading bar supported for vertical movement substantially parallel to said needle bar;

a threading hook member provided with a hook, supported on said threading bar and rotatable about the axis of said threading bar so that the hook is advanced into and retracted from the eye of a selected one of the plurality of needles; and

level selecting means rotatably supported on said threading bar for positioning said threading hook member selectively on a level corresponding to the selected needle depending on a rotation position of said level selecting means.

5,195,453

TRAFFIC CONE INSERT

David A. McGibbon, II, P.O. Box 1543, San Ramon, Calif. 94583

Filed Jan. 17, 1992, Ser. No. 822,112
Int. Cl.[5] E01F *9/10*
U.S. Cl. 116—63 C **4 Claims**

1. An insert device for a hollow traffic cone having a small end and a large end

comprising:

an element having a first truncated cone shaped portion cable of lying within the hollow traffic cone, said first portion of said element including an overall transverse dimension larger than the transverse dimension of the small end of the traffic cone so as to be wedged therein;

a second portion, said second portion having an overall

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transverse dimension which is less than the overall transverse dimension of said first portion to permit passage of said second portion through the small end of the hollow traffic cone; and

an elongated intermediate portion connecting said first and second portions, an exterior surface of said intermediate portion being reduced in diameter relative to a diameter of

said second portion of said element, said intermediate portion being capable of extending outside the hollow traffic cone so as to provide a gripping area for a hand of a user; and

means for holding said element within the hollow traffic cone, said means including an outer surface of said first portion which engages an inner wall of the small end of the hollow traffic cone.

5,195,454

APPARATUS FOR DISTRIBUTING PARTICULATE MATERIAL

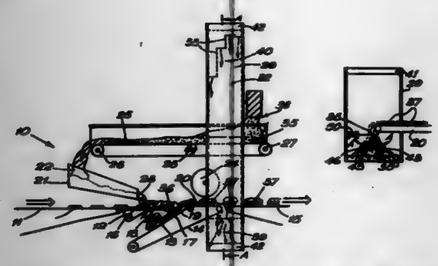
Lars G. A. Wadell, Aengelholm, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Jul. 20, 1990, Ser. No. 556,651

Claims priority, application European Pat. Off., Aug. 1, 1989, 89114154.1

Int. Cl.[5] B08C *19/00*

U.S. Cl. 118—16 15 Claims



1. An apparatus for coating a foodstuff with particulate material comprising:

a drum having open ends and having an interior wall which circumscribes a drum hollow portion and which is capable of rotating about a substantially horizontal longitudinal axis;

a first conveyor positioned to convey material through the drum hollow portion;

a second conveyor positioned below the first conveyor to travel to convey material through the drum in a direction substantially opposite the first conveyor, the second conveyor comprising at least first, second and third successive endless belts each having a horizontal upper run and a gap between each successive pair of belts, the second belt having an inclined portion extending from its horizontal upper run towards the first belt terminating at a position below the horizontal run of the first belt, the gap between the second and third belts being situated within the drum hollow portion;

at least one plate which is positioned beneath the gap between the second and third belts within the drum hollow portion and having a longitudinal axis parallel to a longitudinal axis of the gap between the second and third belts for guiding and distributing particulate material falling in the gap from the second belt substantially evenly over the interior wall of the drum;

means for feeding particulate material onto the first conveyor; and

means for feeding a foodstuff onto the first belt;

such that in operation:

particulate material is fed from the first conveyor onto the foodstuff on the first belt for coating the foodstuff on an upper side,

the coated foodstuff is transported to the second belt with excess particulate material falling off the upstream end of the first belt,

the excess particulate material on the second belt is conveyed to the horizontal upper run of the second belt to form a layer on which the coated foodstuff lies after being transported from the first belt to the horizontal upper run of the second belt for coating the foodstuff on a bottom side,

the coated foodstuff is fed to the third belt with further particulate material falling from the second belt being guided and distributed by the at least one plate substantially evenly onto the interior wall of the drum which rotates for conveying the further material to a position above the first conveyor upon which the further material falls by gravity, and

the first conveyor transports the further material back to the second conveyor.

5,195,455

ARRANGEMENT FOR KEEPING DAIRY ANIMALS CLEAN

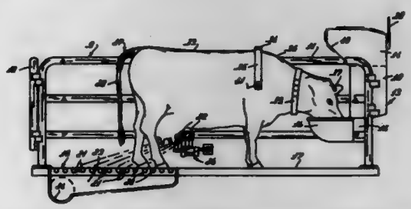
Ary van der Lely, Maasland; Cornelis van der Lely, Zug; Cornelis J. G. Bom, Rozenburg, and Karel van den Berg, Bleiskensgraaf, all of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Continuation of Ser. No. 482,520, Feb. 21, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 774,166

Claims priority, application Netherlands, Feb. 21, 1989, 8900415; Feb. 21, 1989, 8900416

Int. Cl.[5] A01K *1/01, 1/12*

U.S. Cl. 119—14.03 33 Claims



1. A device for feeding animals, particularly dairy animals such as dairy cows, comprising means for receiving the droppings of the animals, the device being provided with food providing means which performs the function of providing food to the animal immediately after the animal has deposited its droppings in said receiving means.

5,195,456

MILKING APPARATUS

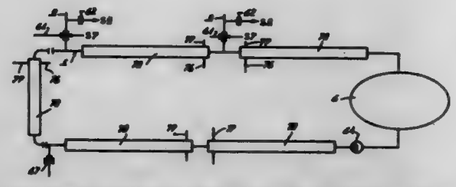
Edwin van der Lely, Maasland; Karel van den Berg, Bleiskensgraaf, and Rene Franzen, Vlaardingen, all of Netherlands, assignors to C. vander Lely N.V., Maasland, Netherlands

Continuation-in-part of Ser. No. 485,579, Feb. 27, 1990, Pat. No. 5,080,040. This application Jan. 13, 1992, Ser. No. 818,764

Claims priority, application Netherlands, Feb. 27, 1989, 89.00479

Int. Cl.[5] A01J *9/04*

U.S. Cl. 119—14.09 9 Claims



1. A milking plant for milking cows that comprises a plurality of automatic milkers, a milk cooling tank, a circulation milk conduit line, individual milk meters for each of said automatic milkers, individual milk meters from each teat cup, discharge lines from said individual milk meters intercconnected into said circulation milk conduit line, said milk cooling tank being included in a circulation loop including said circulation milk conduit line in an arrangement wherein milk can be continuously circulated around said loop including through said milk cooling tank and said circulation milk conduit line.

5,195,457

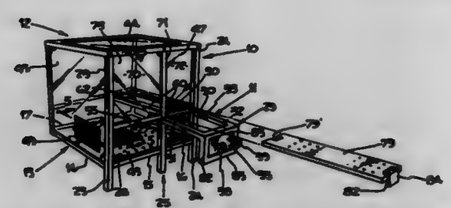
PET ENCLOSURE

Bradley L. Namaney, 4619 W. Broadway, Hawthorne, Calif. 90250

Filed Aug. 17, 1992, Ser. No. 931,140

Int. Cl.[5] A01K *1/00*

U.S. Cl. 119—19 11 Claims



1. A pet enclosure adapted to be mounted to a window sill of a house or apartment or the like comprising:

a framework having a first elongated framework defining a pair of spaced side walls, an interconnecting front wall and an interconnecting rear wall;

a bracket connected to said front wall, said bracket having a first portion extending above said front wall terminating in a top flange, a second portion extending in a generally horizontal plane from said top flange, and a third portion integral with said second portion extending downwardly generally normal thereto and spaced from said first portion;

a box-like structure mounted in said framework, said structure having a top wall, a bottom wall, a front wall and a rear wall, and side walls interconnecting said last-mentioned top, and bottom, front and rear walls, said first portion abutting against said structure front wall when said box-like structure is mounted in said framework, said structure front wall having a first open area leading into the interior of said structure above said bracket top flange, a second open area adjacent said first open area leading into the interior of said structure above said bracket top flange, said first open area being disposed above said bracket second portion and said second open area being closed off by a door hingedly mounted to said structure; and

a panel associated with said second portion leading from substantially said third portion into the interior of said structure on one side thereof, said panel being spaced from the bottom wall of said structure when disposed in the interior of said structure.

5,195,458

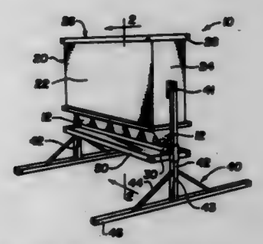
BLOCK FEEDER

Garland Black, Fredericksburg, Tex., and Roy W. Sanders, HC 64, Box 492, Harper, Tex. 78631, assignors to Roy W. Sanders, Harper, Tex.

Filed Jan. 29, 1992, Ser. No. 827,409

Int. Cl.[5] A01K *5/015*

U.S. Cl. 119—51.03 13 Claims



1. A block feeder for feeding compressed block feed to animals such as cattle, sheep, goats, deer, and the like, the block feeder keeping the block feed dry so that the feeder can be restocked less frequently, the block feeder comprising:

(a) feed receptacle, said receptacle of a size and shape to at least partially accommodate at least one feed block, said receptable having side walls and top wall so that at least the upper portion of the feed block is substantially protected from precipitation;

(b) support means for supporting the bottom of the feed block, said support means being spaced below the side walls an amount less than the height of the feed block such that said side walls retain the feed block in position on said support means and a portion of the feed block extends below said side walls of said receptacle whereby animals may reach and eat at the lower extending portion of the feed block and as the lower portion of the feed block is consumed by the animals, the feed block slides dowaward, exposing more of the feed block for the animals;

(c) structure means for supporting said feed receptacle and said support means for supporting the feed block; and

(d) a tray supported by said structure support means beneath the feed block so that dislodged feed particles from the feed block fall into the tray and may be eaten therefrom.

5,195,459

BIRD FEEDERS

David Ancketill, 25 Sunningfields Rd., Hendon, London NW4 4QR, England

Filed Mar. 4, 1992, Ser. No. 845,688

Claims priority, application United Kingdom, Mar. 6, 1991, 9104688

Int. Cl.[5] A01K *39/01*

U.S. Cl. 119—57.9 13 Claims

1. A bird feeder comprising: a food holder, for containing bird food, having a sidewall formed from a mesh defining apertures for permitting birds access to the food; attachment means for allowing the bird feeder to be suspended from a

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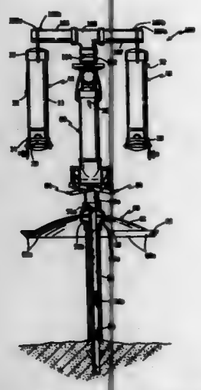
fixing point; a shroud movably mounted on the bird feeder between an open position in which substantially all of the apertures are accessible to birds and a closed position in which the shroud surrounds the sidewall so as to prevent access to the food; and bias means for maintaining the shroud in the open

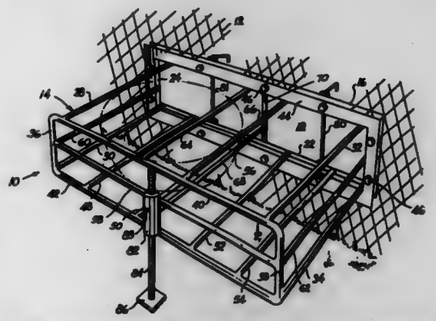
position except when an animal having a weight exceeding a predetermined level attempts to gain access to the food by standing on the shroud whereby the shroud descends to the closed position under the weight of the animal against the action of the bias means.

5,195,460
BIRD FEEDER
Selmer M. Loken, 1270 Wild Ridge Trail, Newport, Minn. 55055
Continuation-in-part of Ser. No. 718,963, Jun. 21, 1991, Pat. No. 5,105,765. This application Oct. 21, 1991, Ser. No. 780,152
Int. Cl.[5] A01K *39/01*
U.S. Cl. 119—57.9 8 Claims



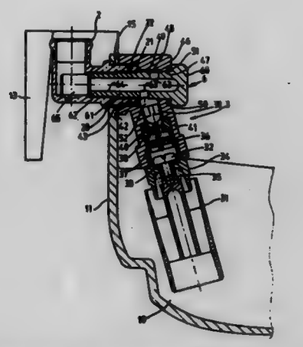
1. A disassemble gang feeder for individually feeding multiple birds comprising:
a first pipe having a central opening for sliding over a first portion of a fence post, said first pipe having a first end;
a second pipe having a central opening for sliding over a second portion of the fence post, said second pipe having a first end and a second end, said second end engageable with soil located around the fence post to support said second pipe in an upright position;
a cross member located on said first pipe for supporting at least two separate hanging bird feeders on said cross member;
a seed-catching pan adapted to be positioned around a further portion of the fence post, said seed catching pan sandwiched and rotatably held between said first end of said first pipe and said first end of said second pipe, said first pipe rotatable mounted with respect to said second pipe and said seed catching pan to permit rotation of said cross members with respect to said second pipe to enable a person to place feed in hanging feeders on said cross members without having to walk around the gang feeder, said seed-catching pan extending sufficiently far so that seeds which fall from a hanging bird feeder located on said cross member fall onto said seed-catching pan to collect spilled bird seeds and to prevent squirrels for getting access to the feeders and to also permit larger birds to feed on the spilled seeds.

5,195,461
FENCED DOG FEEDER
T. Walter Brown, Chickamauga, Ga., assignor to Brown Fence Company, Chattanooga, Tenn. and Circle A Chain Link Fence Company, Marietta, Ga., part interest to each
Filed Sep. 29, 1992, Ser. No. 954,165
Int. Cl.[5] A01K *5/01*
U.S. Cl. 119—61 7 Claims



1. An animal feeder for an animal pen having chain-link or similar wire rod fencing in which a rectangular aperture is formed, said feeder comprising first and second frames each having front and rear surfaces, wall means defining a substantially rectangular opening in each of said frames through the respective front and rear surfaces, a first plurality of rods secured to said first frame about said opening and extending rearwardly from said rear surface, said rods being disposed in an array of three groups defining a rectangle in a plane substantially parallel to said first frame for extending through said aperture when said rear surface of said first frame abuts said fence, a second plurality of rods disposed in a rectangular array spaced from and substantially parallel to said first frame secured to said first plurality of rods, said first and second plurality of rods defining a feeder cage with one group of said first rods forming a floor of said cage for supporting at least one feeder dish, a second group of said first rods forming ends for precluding removal of said dish at ends of said cage and a third group of said first rods forming upper rafters disposed above said floor for precluding removal of said dish at the top of said cage while permitting an animal to feed from said dish, at least one rod of said second plurality of rods being disposed for precluding removal of said dish through said rectangular array, closure means for selectively closing said opening in said front frame to preclude removal of said dish at the front of said cage selectively while permitting said dish to be inserted into and removed from said cage selectively, and means for clamping said second frame to said first frame with said first and second plurality of rods extending through the opening in said second frame and with said fence intermediate said first and second frames and the front surface of said second frame abutting said fence.

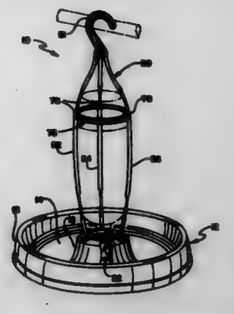
5,195,462
DRINKING TROUGH
Jean P. Gustin, Charleville Mezieres, France, assignor to La Buvette S.A., Montherme, France
Filed Nov. 12, 1991, Ser. No. 790,032
Claims priority, application France, Nov. 12, 1990, 90 13979
Int. Cl.[5] A01K *7/06*
U.S. Cl. 119—75 10 Claims



1. A drinking trough, comprising:
a basin having a back wall with a hole therethrough,
a conduit having first and second end portions, the first end portion being attached to a source of fluid and the second end portion extending through the basin hole;
a spigot; and
means for detachably connecting the spigot to the second end portion of the conduit, wherein the connecting means includes a hollow axial bore having at least one aperture therein to allow fluid to flow from the conduit and through the bore and aperture to the spigot.

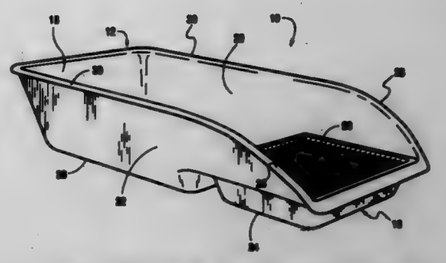
5,195,463
BIRD BATHS AND COMBINATION HANGING AND PEDESTAL MOUNTINGS THEREFOR
Moises B. Lorenzana, 601 Lake Hinsdale Dr. Unit 310F, Willowbrook, Ill. 60514, and Vance A. Lorenzana, 698 Springfield Cir., Naperville, Ill. 60540
Filed Sep. 25, 1991, Ser. No. 765,264
Int. Cl.[5] A01K *39/00*
U.S. Cl. 119—77 4 Claims

1. A bird bath comprising in combination:
a tray having a web portion and an outer ridge for retaining water within said tray,
retaining means centrally located in said tray for removably retaining a mouth of an inverted reservoir, and
said web portion having a passage therein permitting the flow of liquid from said reservoir to said tray,
mounting means adapted for mounting said tray on top of a vertical support member,
suspension means adapted for suspending said tray from an elevated member comprising a hook and a plurality of strands extending from said hook and engagingly retaining said tray, and



a ring adapted to surround a reservoir to secure said strands on said reservoir when said mouth of said reservoir is retained in said retaining means.

5,195,464
ANIMAL LITER STATION
Raymond G. Mattar, 4920 N. 1000 E., Brownsburg, Ind.
Filed Sep. 9, 1992, Ser. No. 942,428
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—165 22 Claims



1. A sanitary commode for use by animals, comprising:
an integral tray unit having a bottom wall, a front wall, a rear wall taller than said front wall, and two opposing side walls, said bottom wall having a first recessed portion and a second recessed portion, means arranged within the first recessed portion for dislodging animal waste and absorbent material carried by the animal, each said side wall having a forward portion adjacent said first recessed portion and a rear portion adjacent said second recessed portion, said rear portion of each said side wall being taller than said forward portion, said shorter front wall and the shorter forward portions of each said side wall defining an ingress/egress path to and from said second recessed portion, said second recessed portion being adapted for receiving animal waste-absorbent material therein, said taller rear wall and said taller rear portions of each said side wall substantially confining within the tray unit animal waste-absorbent material scattered by the animal during use of said commode.

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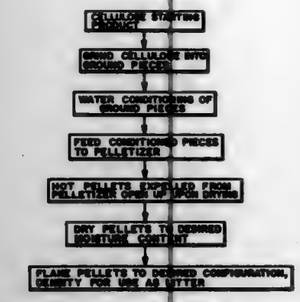
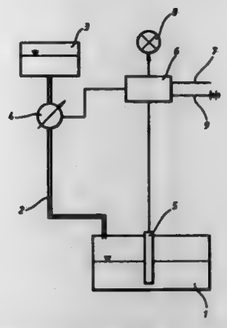
5,195,465
FLAKED CELLULOSE LITTER MATERIAL WHICH CAN BE REUSED AS FOOD OR FERTILIZER
John L. Webb, Richmond; Robert D. Kilgore, Rosharon, and Shitalprasad N. Patil, Houston, all of Tex., assignors to International Cellulose Corporation, Houston, Tex.
Continuation-in-part of Ser. No. 383,167, Jul. 20, 1989, Pat. No. 5,082,563. This application Aug. 19, 1991, Ser. No. 746,938
Int. Cl.[5] A01K *1/015*
U.S. Cl. 119—172 16 Claims



1. A method for producing animal litter comprising:
grinding cellulose in sheet form to produce ground cellulose,
reducing the ground cellulose to produce pieces ranging in size in a largest dimension between about one eight and about one fourth of an inch,
conditioning the pieces with water to a water content between about 12% to about 20% by weight,
feeding the conditioned pieces having a density between about four to about seven pounds per cubic foot to a pelletizing machine which produces hot pellets and expels them, the pellets opening up upon drying,
drying the pellets to a water content between about 8% to about 12% by weight, and
flaking the dried pellets to produce a flaked litter whose density ranges between about 15 to 22 pounds per cubic foot.

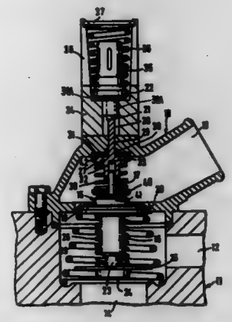
5,195,466
METHOD FOR THE CONTROLLED ADDITION OF AN ADDITIVE TO THE FUEL SUPPLY OF A VEHICLE INTERNAL COMBUSTION ENGINE
Roland Schulte, Lautenbach; Hans-Joachim Langer, Remseck; Erwin Strohmer, Bergtes, and Dietmar Hagenloch, Stuttgart, all of Fed. Rep. of Germany, assignors to Mercedes Benz AG, Fed. Rep. of Germany
Filed May 26, 1992, Ser. No. 887,808
Claims priority, application Fed. Rep. of Germany, May 25, 1991, 4117148
Int. Cl.[5] F02B *75/12*
U.S. Cl. 123—1 A 3 Claims

1. Method for the controlled addition of an additive to the fuel supply of a vehicle internal combustion engine, in which the point in time and the quantity of the metered addition is dependent on an increase in the fuel supply level detected by a measuring device integrated into the vehicle, said method comprising the steps of:
measuring the fuel level at predetermined time intervals, while the vehicle is moving with the engine running;
averaging the results of such measurement over a predetermined number of said time intervals to determine a current average value;
supplying the current average value to a measured-value storage device;
comparing said current average value to a preceding average value;
when a differential value between said current average value and said preceding average value exceeds a predetermined tolerance level, triggering an addition of additive proportional to an increase in the level; and



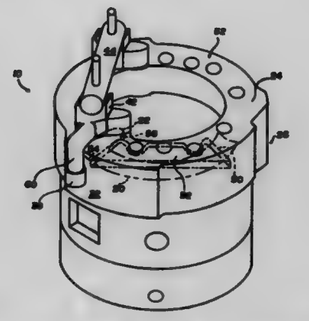
after each comparison, erasing said preceding average value and entering said current average value in place thereof.

5,195,467
THERMOSTATIC VALVE FOR CONTROLLING COOLANT TEMPERATURE OF AN INTERNAL-COMBUSTION ENGINE
Manfred Kurz, Ditzingen, Fed. Rep. of Germany, assignor to Behr-Thompson-Dehnstoffregler GmbH & Co., Fed. Rep. of Germany
Filed Dec. 31, 1991, Ser. No. 814,839
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1991, 4100310; Feb. 27, 1991, 4106081
Int. Cl.[5] F01P *7/14*
U.S. Cl. 123—41.1 16 Claims



1. A thermostatic valve for controlling the temperature of the coolant of an internal-combustion engine, particularly of a motor vehicle engine, comprising:
a movable valve member for controlling a flow opening,
a working piston connected to the valve member for movement with the valve member,
a first thermostatic working element for controlling the position of the working piston in response to coolant temperature of coolant acting on the first thermostatic working element,
a supporting body assigned to the working piston for controlling an end position of the working piston,
an adjusting element for adjusting the position of the supporting body, and
an elastic restoring device for restoring the working piston away from the supporting body,
wherein the supporting body is a piston of a second thermostatic working element which forms the adjusting element and is aligned coaxially with respect to the working piston, and wherein the elastic restoring device is supported against the working piston and against the piston of the second thermostatic working element.

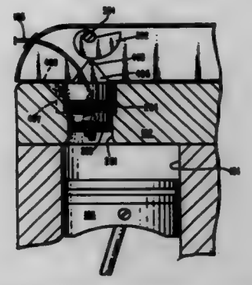
5,195,468
CYLINDER HEAD COOLING SYSTEM
Richard J. Clark, R.R. 1, Box 155; Richard K. Clark, 317 E. Second, both of Gilman, Ill. 60938, and Dennis E. Clark, 809 S. Poplar, Onarga, Ill. 60955
Filed Sep. 29, 1992, Ser. No. 953,498
Int. Cl.[5] F02F *1/36*
U.S. Cl. 123—41.82 R 11 Claims



1. An improved cooling system for a cylinder head of a locomotive engine, the improvement residing in the configuration of an outlet end thereof, and comprising:
a full thickness side wall about a periphery of said cylinder head;
an outlet port extending from a fluid flow path within said cylinder head radially inwardly to an upwardly directed surface of said cylinder head;
a rocker arm support including a planar bottom support surface and an arcuate upper surface for supporting a rocker arm thereon;
said rocker arm support including a port therein leading to a passageway within said support, said passageway creating a continuation of said outlet in said cylinder head and said port in said support aligning with said port in said cylinder head, said support further including a nipple formation thereon forming a termination for said pathway therethrough, said nipple formation extending past a peripheral end edge of said cylinder head top surface and then downwardly to a predetermined level along the side wall of said cylinder head to a preselected position.

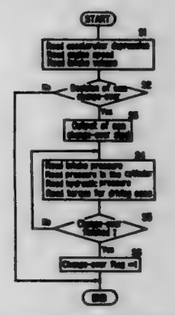
5,195,469
CONTROLLED VARIABLE COMPRESSION RATIO INTERNAL COMBUSTION ENGINE
Ahmed Syed, 1101 W. 29th St., Apt. 3, Los Angeles, Calif. 90007
Continuation-in-part of Ser. No. 497,666, Mar. 23, 1990, abandoned. This application Aug. 13, 1991, Ser. No. 744,561
Int. Cl.[5] F02B *75/04*
U.S. Cl. 123—48 A 22 Claims

1. An improved arrangement for a variable compression internal combustion engine having a plurality of primary cylinders in which a primary piston slides, driven by a crank shaft by means of a connecting rod, and a plurality of cylinder heads comprising in combination:
a plurality of secondary cylinders, one of which is mounted in said cylinder head in a position communicating with one of said primary cylinders to form a combustion chamber;
a secondary piston slidably mounted within each said secondary cylinders and having a first end forming a cap and a second end adjacent said primary piston forming a combustion chamber, the volume of which may be varied;
actuating means mounted on said cylinder head and reciprocating said secondary piston within said secondary cylinder comprising in combination;
a control means;
a rotational shaft positioned by said control means;
a plurality of involute surfaces mounted on said shaft, one of which is adjacent each said cap;



said cap of said secondary piston being formed as a wedge;
a key mounted in the side of said secondary piston;
walls forming a slot in said secondary cylinder engagable by said key whereby said secondary piston is aligned within said secondary cylinder so that the upper edge of said wedge is essentially normal to the surface of said involute; and,
a return spring mounted between said secondary piston and said cylinder head whereby said cap is urged against said involute surface.

5,195,470
VARIABLE CAM ENGINE
Kenji Ikeura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 26, 1991, Ser. No. 797,945
Claims priority, application Japan, Nov. 26, 1990, 2-321679
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.15 3 Claims



1. A variable cam engine wherein each cylinder has at least one valve driven by a plurality of cams formed on a camshaft and giving different engine torque outputs, comprising:
decision-making means for deciding a change-over of said cams and for selecting a target cam according to the engine running conditions;
a cam change-over mechanism which disengages a current cam from said valve and engages said target cam instead;
a torque sensor which detects a camshaft drive torque;
determining means for determining whether said cam

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change-over has occurred by comparing said camshaft drive torque with previously set values of camshaft drive torque; and

regulating means for regulating combustion in each cylinder according to said cam change-over determined by said determining means.

5,195,471

VALVE TIMING CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

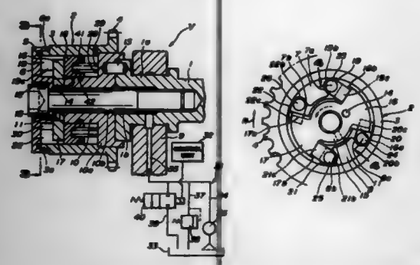
Seinosuke Hara, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Atsugi, Japan

Filed Dec. 20, 1991, Ser. No. 811,029

Claims priority, application Japan, Dec. 28, 1990, 2-408764; Jun. 27, 1991, 3-156753

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 17 Claims



1. A valve timing control system of an internal combustion engine, comprising:

a generally cylindrical rotatable member coaxially and movably connected to one end of a camshaft, said rotatable member being drivably connected to a camshaft of the engine;

an arm fixed to the one end of the camshaft and projecting radially outwardly;

a generally annular piston located coaxial with the camshaft and movably disposed inside said cylindrical rotatable member, said piston being movable in an axial direction of the camshaft;

at least three sliding members supported on said piston and slidably movable inside said rotatable member, each sliding member having an inclined face which is inclined relative to a plane parallel with the axis of the camshaft so as to push said arm in a direction to rotate around the axis of the camshaft; and

means for driving said piston in the axial direction of the camshaft in accordance with an engine operating condition.

5,195,472

CYLINDER HEAD

Robert L. Jacques, Troy; James E. Foss, and Scott K. Wilson, both of Lake Orion, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1991, Ser. No. 773,339

Int. Cl.[5] F01M *9/10*

U.S. Cl. 123—90.33 3 Claims

1. A cylinder head for supporting and lubricating hydraulic valve lifters comprising:

a head member having a deck face adapted for mating with an engine block enabling said head member to be mounted thereon, said head member having a bottom face which is generally perpendicular to said deck face, said deck face forming an acute angle with a horizontal plane of the engine block when mated therewith;

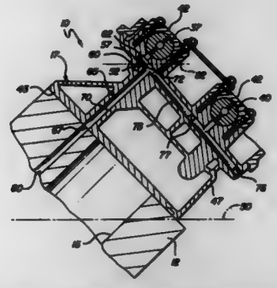
a plurality of sockets formed in said head member, each of said sockets being adapted to receive a hydraulic valve lifter, each of said sockets having a socket port being adapted to communicate with a valve lifter received therein;

a one-way gallery formed in said head member above said sockets, said one-way gallery being parallel to a horizontal plane of the engine block when said head member is mated therewith, said one-way gallery having a plurality of gallery ports, each of said gallery ports being adapted to communicate with one of said socket ports;

a one-way passage formed in said head member, said one-way passage having a gallery end communicating with said one-way gallery and a supply end which is above said gallery end;

said one-way passage being perpendicular to said deck face; and

a supply passage formed entirely in said head member, said



supply passage having one end communicating with said supply end and another end communicating with a block port formed in said deck face, said block port being below said one-way gallery, said supply passage extending away from said supply end toward said deck face;

said supply passage having a supply portion in registry with said block port, said supply portion being perpendicular to said deck face, said supply passage further having a distribution portion between said supply portion and said one-way passage;

said block port registering with a fluid passage in the engine block so that, when said fluid passage contains pressurized fluid, the fluid can flow through said supply passage and one-way passage into said one-way gallery, the fluid in said one-way gallery being distributed through said gallery ports and socket ports to the valve lifters.

5,195,473

ROCKER ARM AND METHOD OF CASTING

Makoto Kano; Ichiro Tanimoto, both of Yokohama; Osamu Kawamura, and Teruo Takahashi, both of Nogimachi, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama and Nippon Piston Ring Co., Ltd., Tokyo, both of Japan

Continuation of Ser. No. 569,440, Aug. 20, 1990, abandoned. This application Jan. 15, 1992, Ser. No. 821,908

Claims priority, application Japan, Sep. 8, 1989, 1-231732

Int. Cl.[5] B22D *27/20*; F01L *1/18*

U.S. Cl. 123—90.39 7 Claims

1. A method of making a rocker arm from a high chrome cast iron metal by casting, characterized in that a Ca-Si base addition agent is added in an amount of 0.3 to 0.6% by weight to the molten high chrome cast iron metal to globulize carbide precipitates, and said high chrome cast iron metal comprising, by weight, 2.5 to 3.7% of C, 1.0 to 2.0% of Si, 0.5 to 1.0% of Mn, 15 to 20% of Cr, 0.3 to 0.7% of Ni, no more than 0.3% of P, no more than 1.0% of S and 3 to 10% of at least one of W, Mo, V, Nb, Ta, Ti and B.

4. An as-cast rocker arm for an internal combustion engine made from a casting composition comprising:

a high chrome cast iron metal, and

a Ca-Si base addition agent which is present in an amount of 0.3 to 0.6% by weight based on the weight of the metal, said high chrome cast iron metal comprising, by weight, 2.5 to 3.7% of C, 1.0 to 2.0% of Si, 0.5 to 1.0% of Mn, 15 to 20% of Cr, 0.3 to 0.7% of Ni, no more than 0.3% of P, no more than 1.0% of S and 3 to 10% of at least one of W, Mo, V, Nb, Ta, Ti and B.

5,195,474

OIL SUPPLY SYSTEM IN INTERNAL CONBUSTION ENGINE

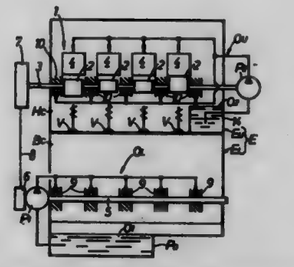
Yasuhiro Urata; Kazuhide Kanagai, and Shigeru Suzuki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1992, Ser. No. 850,613

Claims priority, application Japan, Mar. 15, 1991, 3-15489[U]

Int. Cl.[5] F01L *9/02*; F01M *9/10*

U.S. Cl. 123—90.12 4 Claims



1. An oil supply system in an internal combustion engine comprising a valve operating device which is disposed in a cylinder head coupled to an upper surface of a cylinder block and which includes a valve operating cam shaft connected to a crank shaft rotatably carried in a lower engine body portion including the cylinder block, and valve operation characteristic changing means for changing, in accordance with a variation in hydraulic pressure in a hydraulic pressure chamber, the operation characteristics of an engine valve which is supported in the cylinder head for opening and closing, said oil supply system comprising

a lower oil supply system comprised of a first oil pump connected to individual oil consumption parts disposed in the lower engine body portion for supplying a first oil, and

an upper oil supply system comprised a second oil pump connected to individual oil consumption parts included in the valve operating device as well as to the hydraulic pressure chamber for supplying a second oil, said lower and upper oil supply systems being disposed independently of each other.

5,195,475

ROCKER ARM ASSEMBLY

Richard F. Murphy, and Gordon L. Stoltzner, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.

Filed May 29, 1992, Ser. No. 890,992

Int. Cl.[5] F01L *1/18*

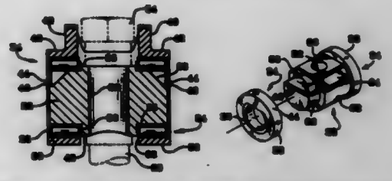
U.S. Cl. 123—90.39 23 Claims

1. A rocker arm assembly for mounting about a stud means, the assembly comprising:

a rocker arm having two spaced apart side walls and having an aperture for receiving the stud means;

a bearing support member within the rocker arm having two support arms extending in opposite directions, each support arm extending toward one of the side walls of the rocker arm, the bearing support member being adapted for mounting about the stud means;

two bearing cups having a common axis, one bearing cup rigidly mounted on each side wall of the rocker arm and extending over a portion of the respective arm of the bearing support member, at least one bearing cup including key means for engaging keyway means on the support arm to limit orientation therebetween; and



rolling members within an annulus formed between the bearing cups and the bearing support member such that the rocker arm is free to oscillate rotatably with respect to the bearing support member, the rocker arm being constrained axially with respect to the bearing support member.

5,195,476

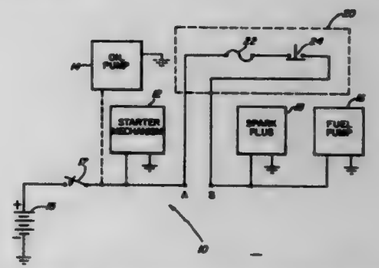
METHOD AND APPARATUS FOR PREVENTING WEAR IN AN INTERNAL COMBUSTION ENGINE

Irving L. Schwarz, 42 Nickerson Rd., Newton, Mass. 02167

Filed Jul. 30, 1991, Ser. No. 737,678

Int. Cl.[5] F02N *11/08*

U.S. Cl. 123—179.5 23 Claims



1. A method for preventing wear in an internal combustion engine having a plurality of movable parts, a starter mechanism for cranking the engine thereby initiating movement of the parts, an oil supply system having an oil pump for circulating oil to the movable parts, a fuel pump for supplying a combustible fuel to the engine, and an ignition means for igniting the combustible fuel, the method comprising the steps of:

a. actuating the starter mechanism to initiate movement of the plurality of movable parts;

b. actuating the oil pump to circulate oil to the movable parts; and

c. preventing delivery of fuel to the engine from the fuel pump while the oil pump and starter mechanism are actuated and until a predetermined condition occurs wherein the engine is adequately prelubricated.

5,195,477

COLD START FUEL ATOMIZER AND PROCESS

Sharon J. Hudson, Jr., Laubertville, Mich., and Richard J. Mazur, Sylvania, Ohio, assignors to Walbro Corporation, Cass City, Mich.

Filed Dec. 11, 1991, Ser. No. 805,088

Int. Cl.[5] F02M *17/08*; F02N *61/16*

U.S. Cl. 123—179.7 21 Claims

1. An engine air intake manifold apparatus for atomizing a gasoline-alcohol blend of automotive fuel during cold start-up, said apparatus comprising: an atomizing tube member having a

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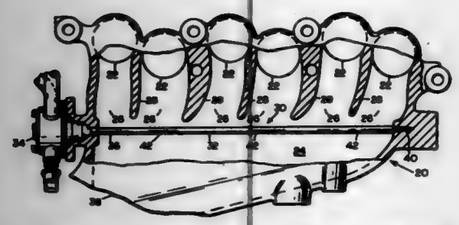
fuel supply end and a remote end, at least one atomizing orifice on a side of said tubular member, said orifice having a horn



section defined by contoured side sections and a generally "T" shaped opening defined by the inner edges of said contoured side sections.

5,195,478

PISTON FOR AN INTERNAL COMBUSTION ENGINE

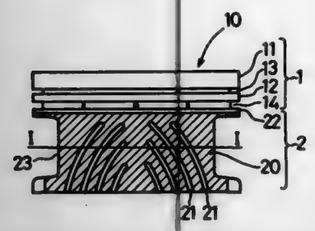
Yasuhiro Kawabata, Anjo; Seiichi Hara; Hiroshi Kageyama, both of Toyota; Toshiaki Konomi, and Motoichi Murakami, both of Susono, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Sep. 27, 1991, Ser. No. 766,379

Claims priority, application Japan, Sep. 27, 1990, 2-101253[U]; Jun. 4, 1991, 3-050185[U]

Int. Cl.[5] F02F *1/00*

U.S. Cl. 123—193.4 **17 Claims**



1. A piston for an internal combustion engine, comprising:
a land portion; and
a skirt portion including a non-coated portion and a coated portion, said non-coated portion formed on a sliding portion thereof and including a plurality of streaks which are formed in curves parallelly and independently of each other, which extend upward from a lower end portion of the skirt portion to a central portion thereof and which are disposed on both sides thereof when the skirt portion is viewed laterally, the coated portion formed on a sliding portion thereof other than the sliding portion on which the non-coated portion is formed.

5,195,479

DRIVE APPARATUS FOR ONE OR MORE SUPPLEMENTAL APPARATUSES DRIVEN BY AN INTERNAL COMBUSTION ENGINE

Sakumi Hasetoh; Osamu Kameda; Hitoshi Akutagawa, all of Hiroshima; Junichi Okita, Iwakuni, and Yoshimichi Tanaka, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

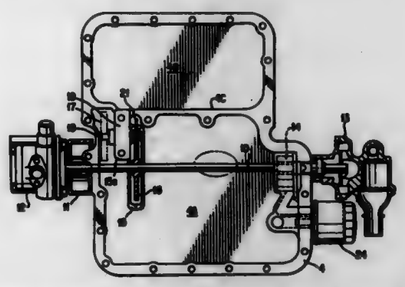
Filed Feb. 27, 1992, Ser. No. 842,615

Claims priority, application Japan, Mar. 1, 1991, 3-036345; Mar. 1, 1991, 3-36357; Mar. 1, 1991, 3-036362

Int. Cl.[5] F02B *67/06*

U.S. Cl. 123—195 A **15 Claims**

1. A drive apparatus for at least one supplemental apparatus which is driven by an internal combustion engine having an output shaft and connected with an oil pan disposed under the engine, said drive apparatus comprising:
a drive shaft, disposed in said oil pan, for driving said at least one supplemental apparatus; and



power transmission means, disposed in said oil pan, for linking said output shaft with said drive shaft so as to transmit drive power between said output shaft and said drive shaft.

5,195,480

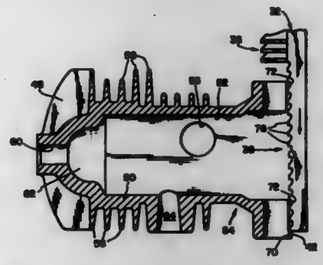
METHOD OF MANUFACTURING ENGINES

Eric B. Hudson, Hilbert, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Apr. 19, 1991, Ser. No. 688,052

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—195 R **21 Claims**



1. A method of preparing crankcase halves, wherein the halves may be subsequently assembled in random pairs for use in internal combustion engines, comprising the steps of:
providing a pair of crankcase halves, each one of said halves including a mating surface for mating with the other one of said halves and a round recessed portion defining a main bearing half bore; and
broaching said mating surface and said main bearing half bore of each one of said halves, said broaching being performed in a manner allowing any two of said plurality of crankcase halves to be mated to form a crankcase, wherein said main bearing half bores define an opening for a main bearing of a crankshaft.

5,195,481

TWO-CYCLE ENGINE WITH SEPARATE LUBRICATING SYSTEM

Yoshihito Oyama; Kenji Ikeda, and Masami Ohara, all of Hamamatsu, Japan, assignors to Sanshin Kogyo, KK, Japan

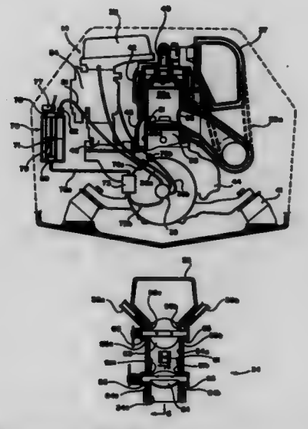
Filed Nov. 22, 1991, Ser. No. 796,395

Claims priority, application Japan, Nov. 22, 1990, 2-319693

Int. Cl.[5] F02M *13/06*

U.S. Cl. 123—196 R **18 Claims**

1. A lubricating system for a two-cycle engine having a carburetor including at least one air/charge flow control valve rotatably mounted through at least one bearing arranged within at least one sidewall of a longitudinally extending air/charge intake passage of the carburetor, comprising:
an oil tank;
an oil pump;



means for actuating the oil pump;
supply line means connecting said oil tank and said oil pump;
output line means extending from said oil pump, terminating in said sidewall and opening into said intake passage upstream from and along an imaginary longitudinal line extending through said at least one bearing.

5,195,482

METHOD FOR REMOVING INJECTOR NOZZLE DEPOSITS

Darren A. Smith, Doubleview, Australia, assignor to Orbital Engine Company (Australia) Pty. Limited, Western Australia, Australia

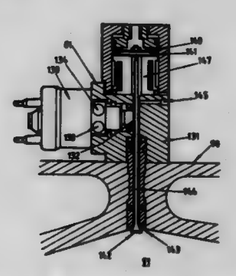
PCT No. PCT/AU90/00158, § 371 Date Oct. 15, 1991, § 102(e) Date Oct. 15, 1991, PCT Pub. No. WO90/12954, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 19, 1990, Ser. No. 768,759

Claims priority, application Australia, Apr. 20, 1989, PJ3801

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 A **25 Claims**



1. A method of operating an internal combustion engine fuel injection system wherein an individual metered quantity of fuel entrained in a gas is cyclically injected directly into each combustion chamber of an engine through a respective selectively openable injector nozzle, the method including controlling the operation of the injector nozzle of each combustion chamber to periodically maintain the injector nozzle open for a portion of at least one engine cycle, said portion of the engine cycle being while no fuel is being delivered to or through the injector nozzle and when the combustion chamber gases are at a temperature and pressure to pass into the open injector nozzle to raise the temperature therein sufficient to remove contaminate deposits in the injector nozzle.

5,195,483

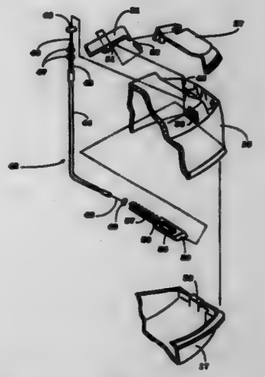
LOCKING DEVICE FOR OUTBOARD MOTOR COWLING

Hitoshi Ishida, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 22, 1992, Ser. No. 872,163

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 E **15 Claims**



1. A locking device for connecting a top portion and tray of a cowling for an outboard motor comprising an operating mechanism positioned on an upper surface of the top portion of said cowling and moveable relative to the top portion, a locking mechanism positioned remotely from said operating mechanism for connecting the top portion and tray of said cowling with each other, and means for transmitting movement of said operating mechanism to said locking mechanism for unlocking the top portion and tray of said cowling from each other.

5,195,484

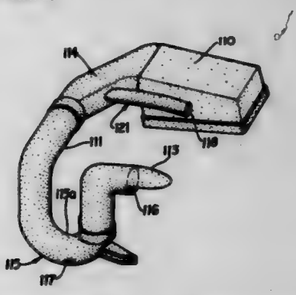
AIR CLEANER AND SNORKEL ASSEMBLY

Fritz J. Knapp, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1991, Ser. No. 781,305

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 E **2 Claims**



1. An engine air intake system comprising an air cleaner, a primary inlet tube with an opening that has access to fresh air, said inlet tube and said air cleaner defining a path for air flow

to the engine, and a secondary inlet with an opening that has access to air, said primary and secondary inlet openings communicating air to said air flow path,

said secondary inlet opening having a more restricted flow area than the primary inlet opening,

said primary inlet opening being spaced from the secondary inlet opening and air cleaner, said primary inlet tube being formed to include a descending region and an ascending region and a sump in said air flow path between said regions, said sump having a drain at its low point,

and said secondary inlet opening communications air to said air flow path at a location in said flow path which is downstream of said sump and at an elevation higher than said sump,

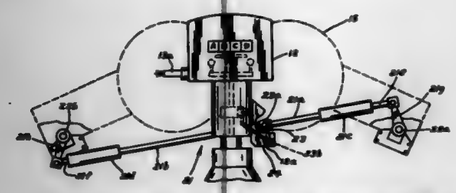
wherein a greater amount of air flows through the primary inlet opening than through the secondary inlet opening when the sump is dry, and if water collects in the sump and completely blocks air access from said primary inlet opening to the air cleaner, the secondary inlet opening will provide adequate air for the engine air intake system until the drain can eliminate the water from the sump.

5,195,485

LOW EMISSION CYLINDER CUT-OUT IDLE SYSTEM

Scott P. Jensen; Mitchell J. Gillispie, both of Tacoma, and Robert A. McLean, Puyallup, all of Wash., assignors to Energy Conversions, Inc., Tacoma, Wash.

Filed Apr. 21, 1992, Ser. No. 871,550
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 F 5 Claims



1. An automatically actuated dual fuel low emission idle structure for a locomotive engine in circuit with the engine throttle contacts which determine the operation of the governor of said engine, comprising

a timer in circuit with said contacts of said throttle to monitor the same,

a pair of solenoid valves in circuit with said timer,

an air line running to each of said solenoid valves,

a shaft,

a pneumatic cylinder integral with each end portion of said shaft with each cylinder having a piston to in effect respectively extend said end portions of said shaft,

said air lines respectively extending to said pneumatic cylinders from said solenoids,

said engine having two banks of cylinders,

a fuel injection control shaft along each of said banks of cylinders at right angles to said shaft, and

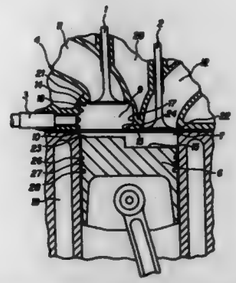
pivot members respectively connecting the ends of said first mentioned shaft with the adjacent ends of said fuel injection control shafts whereby an extension of an end portion of said first mentioned shaft causes the rotation of a corresponding of said second mentioned shafts to shut off the fuel supply valves to a corresponding bank of said cylinders.

5,195,486

TWO STROKE DIESEL ENGINE

Mitsunori Ishii, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 26, 1991, Ser. No. 797,870
Claims priority, application Japan, Nov. 28, 1990, 2-326242
Int. Cl.[5] F02B *19/04*
U.S. Cl. 123—257 5 Claims



1. A two stroke diesel engine having a cylinder with an open end, a cylinder head having a bottom surface which closes the open end of said cylinder, a piston accommodated in said cylinder such that it is free to slide in said cylinder between its top dead center and bottom dead center, said piston having a piston head facing said cylinder head, a combustion chamber formed in said cylinder by said piston head and said bottom surface, said combustion chamber having minimum capacity when said piston is at the top dead center, comprising;

a cavity formed in said cylinder head with an opening in said bottom surface,

an intake valve fitted to said cylinder head and pointing toward said cavity,

a fuel injector fitted to said cylinder head and pointing toward said cavity,

an exhaust valve fitted to said cylinder head outside said cavity and pointing toward said combustion chamber,

a cavity wall located between said intake valve and exhaust valve, and

a projection formed on said piston head such that it enters and separates said cavity from the combustion chamber when said piston is in the vicinity of the top dead center said projection having a band-shaped horizontal cross-section so that it enters into said cavity along said cavity wall at a constant distance therefrom when said piston is in the vicinity of the top dead center.

5,195,487

FUEL INJECTION SYSTEM FOR AIR-COMPRESSING INTERNAL COMBUSTION ENGINES

Hans-Jürgen Zürner, Ammerndorf, and Dietmar Henkel, Neumarkt, both of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 10, 1991, Ser. No. 805,206
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1990, 4039304; Feb. 20, 1991, 4105168
Int. Cl.[5] F02B *3/00*; F02M *7/00*
U.S. Cl. 123—300 14 Claims

1. A fuel injection system for air-compresing internal combustion engines, having an injection pump and an injection valve connected to one another by an injection line; said fuel injection system comprising:

a metering piston unit, being arranged close to said injection valve, comprising a housing having a cylinder chamber and a piston positioned in said cylinder chamber, said metering piston unit connected in series between said injection pump and said injection valve within said injection line, with a volume of said cylinder chamber corresponding to a pre-injection quantity of fuel, said metering piston unit further having a control opening that connects to said cylinder chamber;

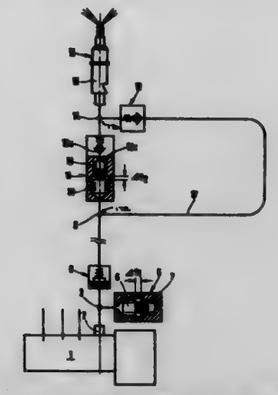
a time-delay member having an inlet and an outlet, and being connected in parallel to said metering piston unit, with said inlet of said time-delay member being connected to said control opening of said metering piston unit, when said piston of said metering piston unit is displaced from a resting position thereof by a given distance, an with said outlet being connected to said injection line at a position between said metering piston unit and said injection valve;

a first check valve connected in series within said time-delay member before said outlet, said first check valve being open in a direction towards said injection valve;

a pressure connection for connecting said injection pump to said injection line;

a pressure wave generator connected in series between said pressure connection and said metering piston unit, said pressure wave generator comprising:

a valve holder, a valve body, a valve piston, and a control



member, said control member being supplied with fuel from said injection pump via an inlet bore of said pressure wave generator, said inlet bore ending in a pressure chamber of said pressure wave generator, and said piston being supplied with a selected hydraulic pressure via a bore of said pressure wave generator;

said control member being comprised of a valve shaft that opens and closes an outlet bore of said pressure wave generator in the direction of fuel flow, said valve shaft being comprised of a cylindrical portion and a conical portion, so that a surface area corresponding to a difference of a diameter of a base of said conical portion and a diameter at a top of said conical portion, when exposed to fuel pressure, is sufficient to open said control member at a selected fuel pressure against a force of said valve piston generated by said hydraulic pressure; and

a volume reservoir branching off said injection line between said pressure connection and said pressure wave generator, with an actuating pressure of said volume reservoir being smaller than an actuating pressure of said pressure wave generator.

5,195,488

INTERNAL COMBUSTION ENGINE WITH UNIQUE SWIRL

Jerry D. Rattigan, 10802 Miles Ave., Cleveland, Ohio 44105

Filed Jul. 14, 1992, Ser. No. 913,177
Int. Cl.[5] F02B *31/02, 77/02*
U.S. Cl. 123—308 16 Claims

1. An engine, comprising:

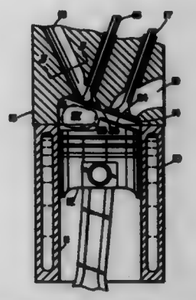
a) at least one hollow cylinder having a longitudinal axis;

b) a piston mounted in the cylinder for reciprocating along the longitudinal axis thereof;

c) at least one circular, intake port communicating with the cylinder, the piston reciprocating to and from the intake port which has a center axis which intersects the longitudinal axis of the cylinder in angular relation;

d) an intake valve mounted in the intake port for reciprocating along the center axis thereof to open and close the intake port in synchronized relation with movement of the piston in the cylinder; and

e) means coacting with the intake port for directing fluid through the intake port, when open, into the cylinder,



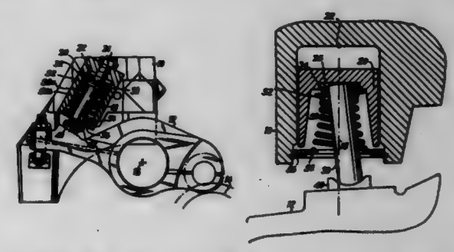
such that at least a portion of the fluid swirls within the cylinder about an axis which is angularly disposed to the longitudinal axis of the cylinder, rather than swirling about the longitudinal axis of the cylinder, said means including a straight intake passageway extending from the at least one intake port in angular relation to the center axis of said intake port, such that the included angle (A) between the longitudinal axis of the straight intake passageway and the center axis of the intake port, is in the range of from 35 to 55 degrees, so that fluid flows from the intake passageway through the intake port towards the piston and towards and beyond the longitudinal axis of the cylinder.

5,195,489

PUSH RODS FOR PISTONS IN COMPRESSION RELEASE ENGINE RETARDERS

Steven A. Reich, Simsbury, Conn., assignor to Jacobs Brake Technology Corporation, Wilmington, Del.

Filed Jan. 3, 1992, Ser. No. 816,664
Int. Cl.[5] F01L *1/14, 13/06*; F02D *9/06*
U.S. Cl. 123—321 15 Claims



1. Hydraulic piston apparatus for use in a compression release engine retarder for coupling the motion of a piston in the engine retarder which reciprocates along a reciprocation axis to the motion of an element in the engine associated with said retarder which pivots about a pivot axis which is transverse to said reciprocation axis, said apparatus comprising:

a push rod having a longitudinal axis which is generally

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aligned with said reciprocation axis, a first surface transverse to said longitudinal axis being associated with said push rod adjacent to said piston, and bearing means adjacent to the end of said push rod which is remote from said first surface for contacting said element so that said bearing means moves through an arc concentric with said pivot axis when said element pivots; and

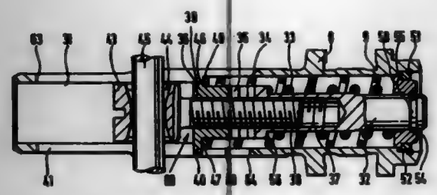
a second surface associated with said piston, said second surface being transverse to said reciprocation axis and in contact with said first surface, and one of said first and second surfaces being convex while the other of said first and second surfaces has a shape selected from the group consisting of substantially flat and convex.

5,195,490

SPEED GOVERNOR FOR FUEL INJECTION PUMPS OF INTERNAL COMBUSTION ENGINES

Siegbert Maier, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 9, 1992, Ser. No. 910,921
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1991, 4129837
Int. Cl.[5] F02D *31/00*
U.S. Cl. 123—373 9 Claims



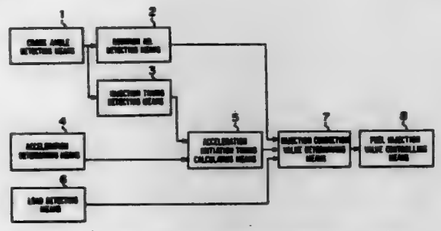
1. A speed governor for fuel injection pumps of internal combustion engines, having a centrifugal speed transducer (4) with flyweights (5), which are adjustable counter to a governor spring (6) and are coupled to a governor lever (11) via a governor sleeve (8), which has a prestressed, first drag spring (34), the governor lever having a pivot shaft (19) that is adjustable by means of an adjusting lever (16) and being connected to a fuel injection quantity adjusting device (3), whose adjustment travel in a direction of increasing the fuel injection quantity is limited by a full load stop (27), a second drag spring (33) is disposed coaxially with the first drag spring (34), said second drag spring (33) is supported on a spring plate (50) shared with the first drag spring (34), said spring plate is connected to a drag member part (60) coupled to the flyweights (5) and is held by the prestressed, first drag spring (34) in contact with a first stop (52) on said governor sleeve (8) connected to the governor lever (11), said governor sleeve (8) has a support face (49), on which the first drag spring (34) is supported on its one end, and wherein between the full load stop (27) and the fuel injection quantity adjusting device (3), a spring plate (23) is provided that is displaceable between second and third stops (25, 26), between which spring plate and the fuel injection quantity adjusting device (3) a compression spring (24) is fastened, said compression spring acts upon the spring plate (23) in a direction of the full load stop (27), the first and second drag springs (33, 34) are disposed such that upon an adjustment of the governor sleeve (8) and the member part (60) relative to one another in the adjusting direction of the governor lever pivot point on the governor sleeve (8) to the flyweights (5), both drag springs (33, 34) are operative, and in a contrary adjustment of the governor sleeve (8) and the drag member part (60), only one of the drag springs (33, 34) is operative.

5,195,491

METHOD AND APPARATUS FOR CONTROLLING AN ENGINE

Toshiki Kuroda, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1992, Ser. No. 870,279
Claims priority, application Japan, May 14, 1991, 3-108002
Int. Cl.[5] F02D *41/10*
U.S. Cl. 123—492 2 Claims



1. An apparatus for controlling an engine comprising:

crank angle detecting means for detecting a crank angle of an engine;

rotation number detecting means for detecting a rotation number of the engine based on an output of the crank angle detecting means;

injection timing detecting means for detecting an injection timing by a fuel injection valve;

acceleration determining means for determining an acceleration state;

acceleration initiation timing calculating means for calculating a time period from injection to acceleration initiation based on an output of the acceleration determining means and an output of the injection timing detecting means;

load detecting means for detecting a load of the engine;

injection correction value determining means for determining an injection correction value based on at least an output of the acceleration initiation timing calculating means and the rotation number of the engine; and

fuel injection valve controlling means for determining a fuel injection pulse width based on the injection correction value and controlling the fuel injection valve.

5,195,492

METHOD AND DEVICE FOR THE CONTROL OF A SOLENOID-VALVE-CONTROLLED FUEL-METERING SYSTEM

Roland Gronenberg, and Joachim Tauscher, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1992, Ser. No. 894,003
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1991, 4120463
Int. Cl.[5] F02M *37/04*
U.S. Cl. 123—506 12 Claims

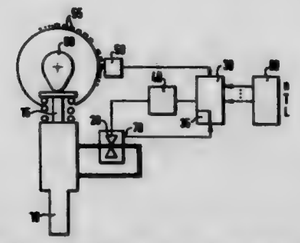
1. A method of controlling a solenoid-valve-controlled fuel-metering system for an internal combustion engine, comprising the steps of:

measuring a first rotational speed of the engine at a first predetermined time increment;

determining a first time value based upon the first rotational speed;

measuring a second rotational speed of the engine at a second predetermined time increment;

determining a second time value based upon the second rotational speed; and



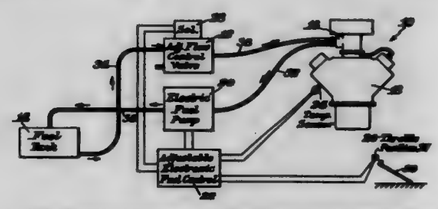
determining a weighted mean value of the first and second time values, and a weighted time value based thereon to control triggering of the solenoid valve.

5,195,493

ADJUSTABLE ELECTRONIC FUEL MANAGEMENT SYSTEM FOR VEHICLE ENGINES

Ron Re, Wilmington, Del., assignor to Re-Tech, Inc., New Castle, Del.

Filed Jun. 18, 1992, Ser. No. 900,307
Int. Cl.[5] F02M *37/04*; B01D *47/00*
U.S. Cl. 123—510 13 Claims



1. A fuel management system for reducing pollution when an internal combustion engine is at idle wherein the engine includes a carburetor having a float bowl and fuel is fed from a fuel tank to the float bowl, comprising fuel flow control valve means between said fuel tank and said float bowl for controlling the amount of fuel flow from said fuel tank to said carburetor to selectively permit full fuel flow and reduced fuel flow, pump means communicating with said float bowl for selectively removing fuel from said float bowl, and control means connected to said fuel flow control valve means and to said pump means for activating said fuel flow control valve means to its reduced fuel flow condition when said engine is at a predetermined temperature and at idle and for activating said pump means and controlling the period of time of activation of said pump means when said engine is at idle whereby fuel is removed from said float bowl by said pump means and the flow of fuel to said float bowl through said fuel flow control valve means is reduced when said engine is at idle.

5,195,494

FUEL DELIVERY SYSTEM WITH OUTLET PRESSURE REGULATION

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

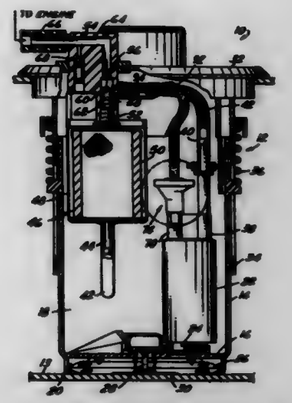
Filed Feb. 27, 1992, Ser. No. 842,561
Int. Cl.[5] F02M *37/04*
U.S. Cl. 123—514 8 Claims

1. A fuel delivery system for an internal combustion engine that includes:

a fuel supply, and a fuel pump having an inlet for drawing fuel from said supply and an outlet,

a fuel filter connected to said pump outlet and means for connecting said filter to the engine such that fuel delivered to the engine by said pump flows through said filter, and

pressure regulating means having a first input connected to said pump outlet and a second input connected to said filter, and having an outlet for returning fuel to said supply bypassing said filter as a function of fuel pressure at said filter so as to maintain substantially constant fuel pressure delivery to the engine.



said pressure regulating means comprising a valve including a movable valve element and passage means selectively opened by movement of said valve element, means operatively coupling said valve element to said filter outlet such that fuel pressure at said filter outlet urges said valve element to open said passage means and bypass said pump outlet to said supply, and spring means operatively coupled to said valve element in opposition to said fuel pressure at said filter outlet to urge said valve element to close said passage means.

5,195,495

EVAPORATIVE FUEL-PURGING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masakazu Kitamoto; Fumio Hosoda; Hideo Moriwaki, and Sachito Fujimoto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1992, Ser. No. 921,158
Claims priority, application Japan, Aug. 2, 1991, 3-216357
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 16 Claims

1. In an evaporative fuel-purging control system for an internal combustion engine having an intake system, a fuel tank, a canister in which evaporative fuel from the fuel tank is adsorbed, a purging passage extending between said canister and said intake system, and purging control valve means arranged across said purging passage for controlling a flow rate of said evaporative fuel supplied from said canister to said intake system through said purging passage,

the improvement comprising:

purging flow rate-calculating means for integrating an estimated value of said flow rate of said evaporative fuel which is estimated as an allowable purging flow rate in said purging passage in accordance with operating conditions of said engine when said purging control valve means is open to thereby obtain an integrated purging flow rate value, and subtracting a predetermined decremental value from said integrated purging flow rate value when said purging control valve means is closed; and

purging flow rate-decreasing means for decreasing said flow rate of said evaporative fuel supplied to said intake system

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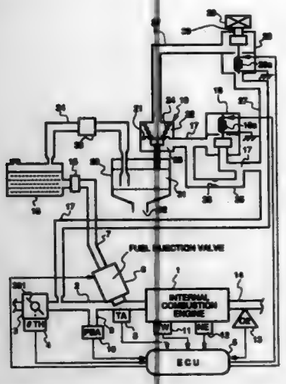
via said purging control valve means when said integrated purging flow rate value obtained by said purging flow rate-calculating means is equal to or smaller than a predetermined lower limit value.

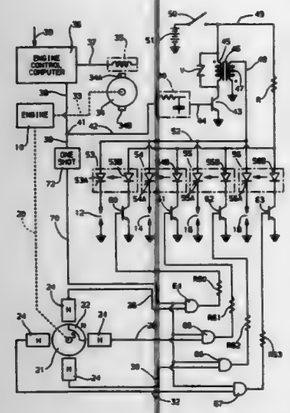


5,195,496

IGNITION SYSTEM HAVING AN ELECTRONIC DISTRIBUTOR

Kalyan P. Gokhale, Shelby Township, Macomb County, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 13, 1992, Ser. No. 912,357
Int. Cl.[5] F02P 7/02
U.S. Cl. 123—643 10 Claims



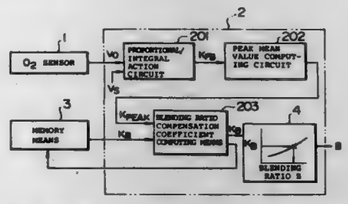
1. An ignition system for a spark ignited internal combustion engine comprising, means synchronized with operation of said engine for developing a spark plug firing voltage, means for applying said spark plug firing voltage to a conductor means, a spark plug, a high voltage switch connected between said conductor means and said spark plug, said high voltage switch being comprised of a plurality of light sensitive semiconductors that are connected in series, each light sensitive semiconductor being biased conductive when light energy is applied thereto, means operating in synchronism with said engine for periodically applying light energy to each said light sensitive semiconductors to thereby bias all of said semiconductors conductive and means for causing said semiconductors to be all biased conductive before said spark plug firing voltage is developed.

5,195,497

METHOD FOR DETECTING FUEL BLENDING RATIO

Masato Yoshida, Kyoto; Takanao Yokoyama, Nagaokakyo; Muneyoshi Nanba, Kyoto; Yoshihiko Kato, Kyoto; Kazumasa Iida, Kyoto, and Katsuhiko Miyamoto, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP91/00033, § 371 Date Sep. 26, 1991, § 102(e) Date Sep. 26, 1991, PCT Pub. No. WO91/10823, PCT Pub. Date Jul. 25, 1991
PCT Filed Jan. 16, 1991, Ser. No. 752,451
Claims priority, application Japan, Jan. 19, 1990, 2-11516
Int. Cl.[5] F02B 75/12
U.S. Cl. 123—696 4 Claims



1. A fuel blending ratio detecting method for an internal combustion engine having a fuel feed system for feeding a mixed fuel of gasoline and methanol to the internal combustion engine, an O_2 sensor for generating information of an air/fuel ration in exhaust gases from the internal combustion engine, the O_2 sensor output being increased or decreased with time relative to a rich/lean decision voltage, and control means for computing an air/fuel ration feedback compensation coefficient by a method including at least an integral control of the output of said O_2 sensor thereby regulating the quantity of supplied fuel so that an air/fuel ratio of the fuel supplied to the internal combustion engine corresponds to a target value, comprising the steps of:

computing a peak mean value of the current and preceding peak values of said air/fuel ratio feedback compensation coefficient each time peak values appear; and

multiplying the current blending ratio compensation coefficient by said peak mean value to compute the next current blending ratio compensation coefficient.

5,195,498

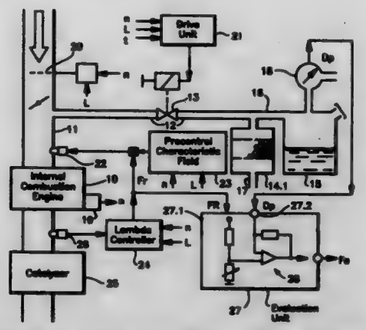
TANK-VENTING APPARATUS AS WELL AS A METHOD AND ARRANGEMENT FOR CHECKING THE TIGHTNESS THEREOF

Johann Siebler, Fahlenbach; Stephan Pelters, Tiefenbronn; Andreas Blumenstock, Ludwigsburg; Helmut Denz, Stuttgart; Axel-Rene Michelet, Karlsfeld; Siegfried Wesinger, Fürstenfeldbruck; Kurt Almstadt, Wendeburg, and Jens Drückhammer, Braunschweig, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart; Audi AG, Ingolstadt; BMW AG, Munich; Dr.Ing.h.c. F. Porsche Aktiengesellschaft, Stuttgart-Zuffenhausen and Volkswagen AG, Wolfsburg, all of Fed. Rep. of Germany

Filed Mar. 19, 1992, Ser. No. 854,424
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1991, 4108856
Int. Cl.[5] F02D 41/14; F02M 33/04, 25/08
U.S. Cl. 123—698 4 Claims

1. A method of checking the tightness of a tank-venting apparatus for a motor vehicle having a fuel tank and an internal combustion engine including a lambda controller and an air intake pipe, the tank-venting apparatus including an adsorption filter, a supply line interconnecting the adsorption filter and the fuel tank, a connecting line interconnecting the adsorption filter and the intake pipe and a tank-venting valve mounted in the connecting line between the adsorption filter and the intake pipe, the method comprising the steps of:

measuring the pressure difference between the pressure in the tank and the ambient pressure;



when the tank-venting valve is opened, determining whether the pressure difference increases above a threshold value and whether a lean correction by the lambda controller is required; and,

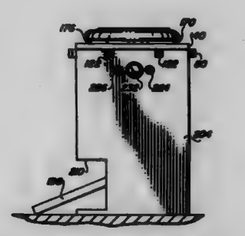
drawing the conclusion that the tank-venting apparatus leaks when neither a lean correction is determined nor the pressure difference exceeds said threshold value.

5,195,499

APPARATUS FOR ROTATABLY LAUNCHING SAUCER-SHAPED GAME DISC

John S. Thorne, 21941 Ybarra Rd., Woodland Hills, Calif. 91364-4237

Filed Jan. 24, 1992, Ser. No. 825,474
Int. Cl.[5] F41J 9/18
U.S. Cl. 124—1 22 Claims



1. A disc launching apparatus, comprising:

a support member having a top surface defining a first side and a second side opposite said first side;

a first wheel mounted for rotation about a fixed axis extending from said top surface of said support member on said first side thereof;

means for driving said first wheel to rotate;

a second wheel mounted for rotation about a moveable axis extending from said top surface of said support member on said second side thereof, said second wheel being moveable between a first position relatively far away from said first wheel and a second position relatively closer to said first wheel to adapt to the size of a disc fitting over both of said first and second wheels;

means for biasing said second wheel said second position toward said first position; and

means for urging a rotating disc located on said first and second wheels upwardly off of said disc launching apparatus.

22. A method of launching a saucer-shaped game disc, comprising:

placing one side of the saucer-shaped game disc over a first wheel mounted for rotation about a moveable axis extending from a top surface of a support member on a first side thereof, a second wheel being mounted for rotation about a fixed axis extending from said top surface of said support member on a second side thereof opposite said first side;

moving said first wheel from a first position relatively farther away from said second wheel toward a second position relatively closer to said second wheel;

placing the other side of the saucer-shaped game disc over said second wheel;

biasing said first wheel in a direction from said second position toward said first position to cause said first wheel to adapt to the size of the disc fitting over both of said first and second wheels;

driving said first wheel to rotate to rotate the disc; and

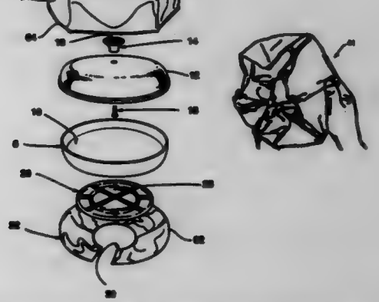
urging the rotating disc located on said first and second wheels upwardly off of said disc launching apparatus.

5,195,500

OVEN DEVICE

Robert A. Lerner, Albany, Calif., assignor to Traveling Light, Inc., Albany, Calif.

Filed Aug. 30, 1991, Ser. No. 752,792
Int. Cl.[5] A47J 37/00; F24B 3/00
U.S. Cl. 126—29 20 Claims



1. An oven device, for use with a source of heat and a cooking utensil positioned over the source of heat, the cooking utensil having an upper portion and a sidewall portion, the oven device comprising:

a high temperature flexible, foldable, fabric convection dome including a circumferential sidewall and a top, the top having a centrally located convection exhaust vent through which a convection exhaust flows; and

means for supporting the convection dome on the upper portion of the cooking utensil with the top spaced apart from the upper portion and the circumferential sidewall spaced apart form the sidewall portion to provide a convection path up past the sidewall portion, over the upper portion and out the convection exhaust vent.

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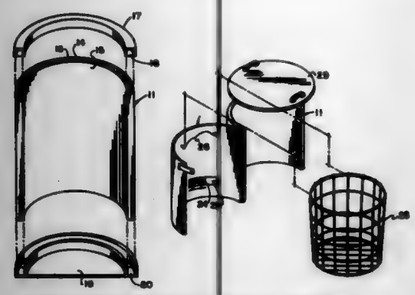
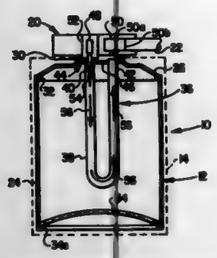
5,195,501
REFUSE BURNER BARREL APPARATUS
John W. Ault, P.O. Box 67, Washington Crossing, Pa. 18977
Filed Dec. 26, 1991, Ser. No. 813,602
Int. Cl.[5] F23G 5/00
U.S. Cl. 126—224 7 Claims



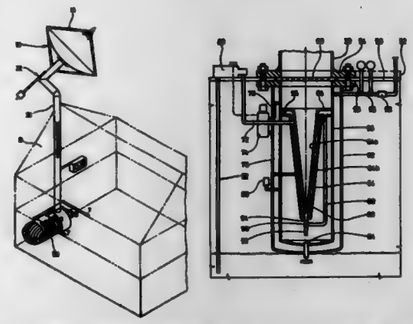
1. A refuse burner barrel apparatus, comprising,
a semi-cylindrical first shell and a semi-cylindrical second shell, the first shell and the second shell include a hinge hingedly mounting the first shell to the second shell, wherein the first shell and the second shell are arranged in a circular configuration in a first position, and wherein the second shell is displaced relative to the first shell when pivoted relative to the hinge to provide access to a burning cavity within the first shell and the second shell, and the first shell includes a first shell inner wall and a first shell outer wall concentric relative to one another and coextensive relative to one another to define a first shell cavity therebetween, wherein the first shell cavity includes a powdered brick aggregate coextensively directed throughout the first shell cavity.

5,195,502
DOWN-FIRED U-TUBE WATER HEATER
David M. Hassing, Montgomery, Ala., assignor to Rheem Manufacturing Company, New York, N.Y.
Filed Apr. 2, 1992, Ser. No. 862,292
Int. Cl.[5] F24H 1/20
U.S. Cl. 126—360 R 20 Claims



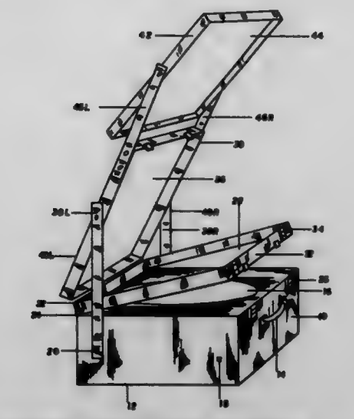
1. A down-fired water heater comprising:
a metal tank for storing water, including:
a hollow body having open top and bottom ends,
a bottom head portion interengaged with and welded to said bottom end of said tank body, and
an upwardly domed top head portion interengaged with and welded to said top end of said tank, said top head portion having an upwardly projecting annular flange extending around a central opening formed in said top head portion;
a tube sheet structure having an open top side, a bottom side wall having spaced apart first and second openings formed therethrough, and an upwardly projecting wall extending around the entire periphery of said bottom side wall, said upwardly projecting peripheral wall of said tube sheet structure being telescopingly received within and welded to said annular top head portion flange;
a U-tube immersion heating member disposed within the interior of said tank, said U-tube immersion heating member being formed from a single length of metal tubing having a cylindrical cross-section along its entire length, said U-tube immersion heating member having first and second open ends upwardly and respectively received in said first and second openings in said bottom side wall of said tube sheet structure, and welded to said bottom side wall of said tube sheet structure, and a curved lower end spaced upwardly apart from said bottom head portion;
burner means operative to downwardly flow a flame, and resulting hot combustion gases, into said first open end of said U-tube immersion heating member; and
forced draft means operative to force the combustion gases through said U-tube immersion heating member, and outwardly through said second open end thereof, and then discharge the combustion gases outwardly away from said water heater.

5,195,503
SOLAR COLLECTOR
Gilbert T. Ludlow, R.R. #1, Barrie/Ontario, Canada L4M 4Y8
Filed Jun. 3, 1991, Ser. No. 709,332
Int. Cl.[5] F24J 2/18-
U.S. Cl. 126—600 14 Claims



1. A solar collector system for use in association with a building defining an interior and an exterior, for collecting heat from the sun throughout a predetermined period of each day and responsive to track both the azimuth angle and the declination angle of the path of the sun each day and said system comprising:
generally concave collector mirror means adapted to be located exteriorly of said building and to receive the rays of the sun, and direct the same as a concentrated beam at a focal point;
secondary reflector means having a focal point located co-incident with said focal point of said collector mirror means whereby to receive the sun's rays reflected from said concave collector mirror means, and reflect same as a concentrated beam of rays along the central axis of said collector mirror means;
opening means located in said collector mirror means substantially along said central axis thereof and adapted to receive said concentrated beam of rays reflected from said secondary reflector means;
mounting tube means connected to said collector mirror means and extending along said central axis rearwardly thereof;
angle tube means connected to said mounting tube means at right angles thereto and being moveable whereby to in turn move said mounting tube means and said collector mirror means continuously over said predetermined period whereby to maintain said collector mirror means aimed directly at the sun through said period;
third reflector means located rearwardly of said collector mirror means in said angle tube means and oriented to receive said concentrated beam of rays at 45 degrees thereto from said secondary reflector means through said opening means, and to redirect the same along said angle tube means;
support column means connected to said angle tube means by swingable connection means;
adjustment means operable to adjust the angle of said angle tube means whereby in turn to adjust the declination angle of said collector mirror means whereby to maintain the same in accordance with variations in the declination angle of the sun;
fourth reflector means at the junction between said angle tube means and said support column means and adapted to receive said redirected beam, said support column means being adapted to transmit said beam from the exterior to the interior of a said building;
energy conversion means within said building interior adapted to receive said redirected light beam from said concave mirror means and to convert the same into useable heat, and,
storage means within said building for storing said useable heat converted from said concentrated beam of rays.

5,195,504
PORTABLE SOLAR OVEN
Bert Lane, 3675 N. Cnty. Cl. Dr. #208, North Miami Beach, Fla. 33180
Continuation-in-part of Ser. No. 605,672, Oct. 29, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 770,226
Int. Cl.[5] F24J 2/02
U.S. Cl. 126—682 19 Claims



1. A portable cooking assembly comprising:
a) a housing having a hollow interior and including a heat collector chamber defined within said hollow interior,
b) a cooking chamber mounted on said housing and disposed within said heating chamber and including an open end disposed adjacent an exposed inner face of said housing,
c) a glazier assembly comprising at least one transparent material glazier pivotally mounted on said housing into and out of substantially covering relation to said open end of said heat collector chamber,
d) a reflector assembly including a reflector frame and a reflector mounted there on and adjustable to reflect light through said at least one glazier into said cooking chamber and said reflector frame and reflector movably mounted on said housing and positionable between an operative position and a closed position,
e) support means mounted on said housing and adapted for movably supporting said reflector assembly substantially above and in outwardly spaced relation to said housing when said reflector assembly is in said operative position,
f) said reflector assembly adapted when in said operative position to have substantially an entire periphery thereof pivotally adjustable in above, spaced relation to said cooking chamber,
g) said closed position being defined by said reflector frame and reflector disposed in overlying relation to said glazier assembly and in closed, covering relation to said cooking chamber.

5,195,505
SURGICAL RETRACTOR
Turi Josefson, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Dec. 27, 1990, Ser. No. 634,482
Int. Cl.[5] A61B 17/02
U.S. Cl. 128—20 24 Claims

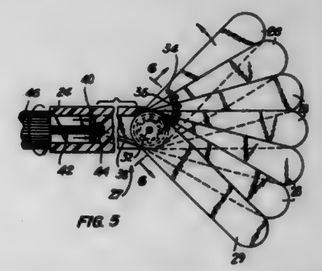


FIG. 5

1. A surgical retractor comprising:
an elongated housing having a proximal and distal end;
a retractor assembly having a plurality of interleaved retractor blades pivotally attached to the distal end of said housing and controllably positionable between a closed position wherein said blades are in stacked relation, a second position wherein said blades are partially deployed and an open position wherein said blades are deployed in an interleaved fan configuration; and
means associated with said housing for remotely moving said blades between said closed, said second and said open position from adjacent said proximal end of said housing.

5,195,506
SURGICAL RETRACTOR FOR PUNCTURE OPERATION
Douglas A. Hulfish, Arlington Heights, Ill., assignor to Life Medical Products, Inc., River Forest, Ill.
Filed Oct. 18, 1991, Ser. No. 779,299
Int. Cl.[5] A61B 17/02
U.S. Cl. 128—20 10 Claims

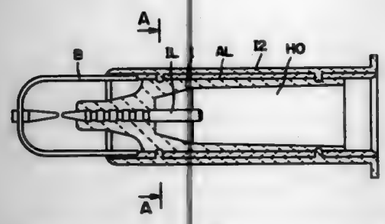
1. A retractor for use during surgical procedures conducted through trocar sleeves, said retractor comprising telescoping inner and outer retractor tubes, a plurality of fingers pivotally attached to a distal end of one of said tubes, and means on a proximal end of said tubes for selectively controlling the pivotal attitude of said fingers, a block which is pivotally attached to said distal end of said inner tube, said fingers being attached to said block, a pull wire pivotally attached to said block in

order to control the attitude thereof, said pull wire extending throughout the length of said inner retractor tube, and means at the proximal end of said inner tube for pulling or pushing said pull wire.

5,195,507
ENDOSCOPIC SURGICAL INSTRUMENT FOR DISPLACING TISSUE OR ORGANS
Joseph Bilweis, Noisy le Roi, France, assignor to Ethicon, Inc., Somerville, N.J.
Filed Nov. 4, 1991, Ser. No. 787,451
Claims priority, application France, Nov. 6, 1990, 90 13711
Int. Cl.[5] A61B *17/00*
U.S. Cl. 128—20 8 Claims

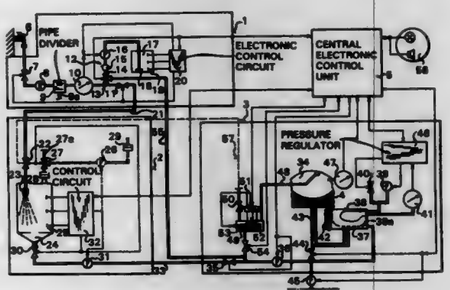
1. A surgical instrument for endoscopic surgery, the instrument comprising a tube having a proximal end and distal end, inflation/deflation means comprising a bulb connected in a sealed manner to the distal end of the tube, and an inflatable fan-shaped spatula connected to said tube at its proximal end, said spatula being used for displaying tissues or organs and communicating with the inflation/deflation means via said tube, said tube placed in a cannula and extending at its distal end out of the cannula, said spatula made from two main sheets which are generally parallel to each other in the inflated state and which are connected together at their peripheries by a transverse connecting wall, said spatula being able to be received in a retracted position inside said cannula and said spatula provided with lines of stiffening.

5,195,508
SPARK GAP UNIT FOR LITHOTRIPSY
Michael Müller, Schoendorf; Peter Buchbauer, Garching; Harald Eisenhöfer, Munich; Friedrich Ueberle, Gilching; Herbert Weller, Alling, and Reiner Schultheiss, Eching, all of Fed. Rep. of Germany, assignors to Dornier Medizintechnik GmbH, Fed. Rep. of Germany
Filed May 17, 1991, Ser. No. 701,817
Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4016054
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 EL 10 Claims



1. A spark gap unit for generating underwater shock waves, particularly for non-invasive lithotripsy, comprising:
an internal conductor with an inner electrode;
an insulation which at least partially envelops the internal conductor;
an external conductor with a bow and an outer electrode, the internal conductor being significantly shorter than the external conductor, and the external conductor at a rearward end of the spark gap unit projecting beyond the internal conductor;
said internal conductor, said insulation, and said external conductor being coaxially arranged, and an outside diameter of the internal conductor being relatively small in comparison to an inside diameter of the external conductor, and wherein
the spark gap unit has a hollow space inside the insulation, said hollow space being open in the direction of a rearward end of the spark gap unit and which, in the opposite direction from the rearward end, is bounded by the internal conductor itself and the envelopment of the internal conductor by the insulation.

5,195,509
DISINFECTANT SYSTEM FOR A LITHOTRIPSY APPARATUS
Gunter Rentschler, Kraichtal-Münzesheim, and Michael Burkhardt, Mühlacker, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany
Filed Feb. 11, 1991, Ser. No. 654,131
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005228
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 EL 5 Claims

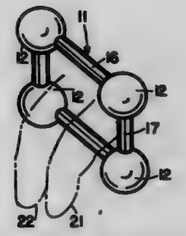


1. A lithotripsy apparatus comprising:
an ultrasonic shock wave generator;
a coupling cushion for receiving water which acts as an acoustic coupling medium between the shock wave generator and a body of a patient to be treated by said apparatus, the coupling cushion being adaptable to the patient's body;
a pressure device connected to the coupling cushion for controlling the pressure of the coupling medium therein;
a degasifying device connected to the coupling cushion for degasifying the coupling medium; and
a disinfecting device connected to the degasifying device and having a storage container for receiving a disinfectant, a control circuit for controlling material flow of the disinfectant from the storage container and a metering device connected to the storage container for introducing disinfectant into the coupling medium.

5,195,510
DEEP PRESSURE MASSAGE DEVICE
Lawrence M. Svacina, 2822 Tennyson St., Denver, Colo. 80212
Continuation of Ser. No. 559,822, Jul. 30, 1990, abandoned. This application May 21, 1991, Ser. No. 703,417
Int. Cl.[5] A61H *7/00*
U.S. Cl. 128—61 6 Claims

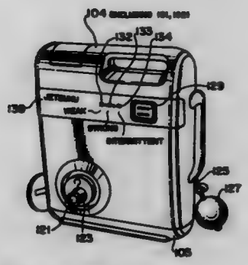
1. A hand-held living body massage device operable by hand motion over said body comprising:
four, generally spherical bodies with each of said bodies having first and second radial bore holes disposed at right angles to one another,

a first longer dowel-type rod extending between and connecting by means of the first of said bore holes a first pair of laterally spaced spherical bodies and a second longer dowel-type rod extending between and connecting by means of the first of said bore holes a second pair of laterally spaced bodies, and
a first shorter, dowel-type rod extending between and connecting by means of the second of said bore holes one of said spherical bodies of said first pair of spaced bodies and one of said spherical bodies of said second pair of spaced bodies and a second shorter dowel-type rod extending between and connecting by means of the second of said bore holes the other of said spherical bodies of said first pair of spaced bodies and the other of said spherical bodies



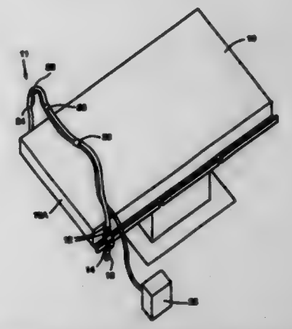
of said second pair of spaced bodies to form a rigid assembly arranged in a rectangular configuration defining a rigid frame portion with a window sized for receiving at least the middle finger and ring finger of the hand of a user in a relatively close fitting relation with said frame portion when the ring finger and middle finger are inserted past the larger finger joints, whereby
an outer spherical surface area of one of said pairs of laterally spaced bodies provides massage portions for contacting and penetrating a living body as said massage portions are moved against said living body by moving the hand of a user to perform an effective and efficient deep pressure massaging action on the muscles and tissue of said living body.

5,195,511
BUBBLE MASSAGER
Toshiharu Kodato; Koso Tamura; Tomotaka Honda; Toshihiro Takahashi; Masaki Kaji, all of Hitachi, and Shoichi Ito, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Ibitachi Taga Technology, Ltd., Ibataki, both of Japan
Filed Jan. 11, 1991, Ser. No. 640,212
Claims priority, application Japan, Jan. 19, 1990, 2-008257; Jan. 19, 1990, 2-008258
Int. Cl.[5] A61H *9/00*
U.S. Cl. 128—66 6 Claims



5. A bubble massager comprising:
a nozzle;
an air intake port;
a diffuser connected to said nozzle and said air intake port;
pumping means for pumping water through said nozzle into said diffuser, thereby taking in air through said air intake port, mixing the air with the water in said diffuser and discharging the mixed air and water from said diffuser to produce a bubble jet;
a rechargeable storage battery for supplying electric power to said pumping means;
charging means for charging said storage battery;
charge display means for displaying a charging state of said storage battery when said charging means is charging said storage battery;
operation display means for displaying an operating state of said bubble massager when said pumping means is operating; and
trouble location display means for displaying trouble locations in said bubble massager;
wherein said charge display means, said operation display means, and said trouble location display means use a same display unit including at least one display lamp; and
wherein said trouble location display unit causes at least one of said at least one display lamp to flicker at a high speed when trouble occurs in said bubble massager.

5,195,512
APPARATUS FOR EVACUATING EXCESS GASES FROM SURGERY PATIENT'S FACE
Sunny Rosso, 623 Redwood Ave., Corte Madera, Calif. 94925
Filed Dec. 31, 1991, Ser. No. 815,438
Int. Cl.[5] A61M *16/00*; A62B *9/04*
U.S. Cl. 128—200.24 6 Claims



1. An apparatus for removing gases from the mouth and nose area of a patient via a suction device, wherein the patient is positioned for surgery on an operating table, comprising:
a. a first cylinder which is flexible and hollow and has one closed end and one open end and a plurality of small openings grouped together in a central portion of the cylinder, said open end being attachable to the suction device;
b. malleable support means attachable to the operating table for supporting the first cylinder;
c. coupling means for coupling the first cylinder to the support means;
d. movable support means further comprise a second cylinder which is flexible and hollow; and
e. tubing means extending through the second cylinder for providing rigidity and malleability to the second cylinder.

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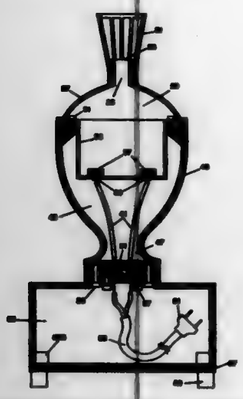
5,195,513
INFANT PALATE PROTECTIVE PROSTHESIS
George E. Sinko, and Charles A. Jones, both of San Antonio, Tex., assignors to Gesco International, Inc., San Antonio, Tex.
Filed Jul. 2, 1992, Ser. No. 907,845
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—200.26 5 Claims

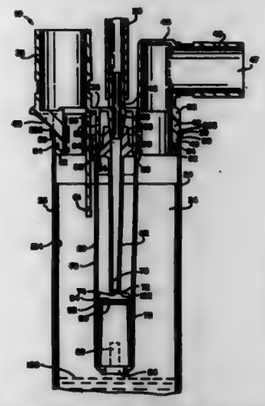
1. Apparatus for protecting the palate of an infant patient from harmful pressure of an airway tube passing through the mouth comprising:
a thin mass of soft, resiliently deformable plastic having an arcuate forward portion approximating the curvature of the upper gum of the infant patient;
said mass having a molded upper surface conforming to the normal contour of the palate of an infant of the same approximate size as the infant patient;
said molded upper surface being readily resiliently compressible to conform to the palate of the infant patient;
an upstanding rim integrally formed on said arcuate forward portion of said mass and engagable with the inner surface of the upper gum of the infant patient to position said mass in the infant patient's mouth; and
an integral, generally radial projection formed on said arcuate forward portion of said mass;
said projection defining a passage for receiving an airway tube and thereby positioning said mass intermediate said airway tube and the infant patient's palate.

5,195,514
PORTABLE HAND-HELD MEDICINAL VAPORIZER
Dongfeng Liu, and Hui Zhao, both of 2547 46th Ave., San Francisco, Calif. 94116
Filed Apr. 21, 1992, Ser. No. 871,912
Int. Cl.[5] A61M *15/00*
U.S. Cl. 128—203.17 1 Claim



1. A portable hand-held medicinal vaporizer comprising:
a vessel for holding liquid,
a lid for covering said vessel,
a heating element attached to the outside of said vessel such that said heating element can heat said vessel and said liquid while said heating element is separated from said liquid,
an adjustable cooling extension slidably fitted to said lid to keep the nose of the user away from said lid when said lid is hot,
a ventilated stainless steel base plate having ventilation holes for allowing cool air to enter said vaporizer,
a ventilated shell for housing said vessel and said heating element, said ventilated shell having air ports for allowing hot air to exit said vaporizer,
a power cord for supplying electricity to said heating element,
a ventilated adapter for connecting said power cord to said heating element,
an internal storage compartment located under said vessel for storing said power cord,
a plurality of rubber legs.

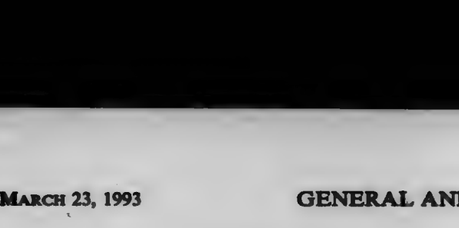
5,195,515
HEATED CARTRIDGE HUMIDIFIER AND HUMIDIFICATION CHAMBER FOR USE THEREWITH
Walter Levine, 6948 N. Keating, Lincolnwood, Ill. 60646
Continuation-in-part of Ser. No. 665,402, Mar. 6, 1991, abandoned. This application Mar. 31, 1992, Ser. No. 861,315
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—203.26 31 Claims



1. A heated cartridge humidifier for use with a collapsible gravity feed water supply container and a separate heating means, and, when engaged in the heating means, said humidifier being adapted for heating and humidifying a breathable gas to be inhaled by a patient, said humidifier comprising:
a humidifier housing configured to operationally engaged the heating means for receiving heat therefrom, said housing having an open upper end;
a cap portion configured to sealingly engage said open upper end of said humidifier housing, said cap portion having a gas inlet port, a gas delivery port, and a water delivery port adapted to receive water from the container, all of said ports being in fluid communication with said humidifier housing;
a water feed tube depending from an underside of said cap portion;
float retaining means circumscribing said feed tube, depending from said underside of said cap portion, being in fluid communication with said humidifier housing and dimensioned to retain a float therein, said float retaining means including a float retaining tube with an upper end configured for secure engagement with a formation depending from said underside of said cap portion;

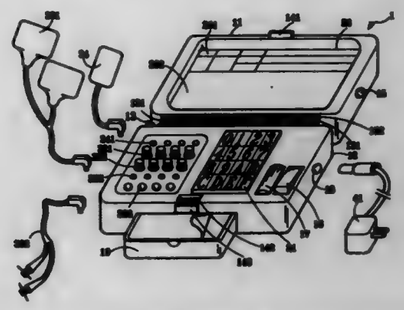
a float dimensioned to be slidingly retained in said float retaining tube and having an upper end for sealingly engaging a lower end of said water feed tube, so that the engagement of said float with said feed tube, both said float and said feed tube being retained within said float retaining tube, controls the flow of water into said humidifier housing; and
said cap portion, said water feed tube, said float, and said float retaining tube being secured as a unit into said humidifier housing.

5,195,516
BREATHING GAS RECIRCULATION APPARATUS WITH REDUCED WORK OF BREATHING
Peter K. Grimsey, Aberdeen, Scotland, assignor to Gas Services Offshore Limited, Aberdeen, Scotland
PCT No. PCT/GB88/08725, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO89/01895, PCT Pub. Date Mar. 9, 1989
PCT Filed Sep. 2, 1988, Ser. No. 469,507
Claims priority, application United Kingdom, Sep. 2, 1987, 8720663
Int. Cl.[5] A61M *16/00*; A62B *7/04*, *7/10*
U.S. Cl. 128—204.26 7 Claims



1. Breathing apparatus for use in recirculation of a breathing gas and having a supply line for supply of the gas to a user and a return line for return of exhaust gas from the user to be recirculated; the apparatus including a first variable volume chamber in the supply line and a second variable volume chamber in the return line; said supply line comprising i) an inlet flow line to said first chamber for supply of said breathing gas to said first chamber and ii) a separate outlet flow line from said first chamber for flow of said breathing gas from said first chamber to the user; said return line being separate from said supply line and comprising i) an inlet flow line to said second chamber for flow of said breathing gas from the user to said second chamber and ii) a separate outlet flow line from said second chamber for flow of said exhaust gas from said second chamber to be recirculated; the chambers in the supply and return lines being capable of changing volume in unison with the user's breathing to accommodate a change in gas volume in the apparatus due to the user's breathing action; means for causing the volumes of the first and second chambers to increase and decrease together in such a way that the variation of volume of either the first or second chamber is accompanied by a similar variation in the volume of the other chamber and the first and second chambers are at a maximum volume together and at a residual volume together; and first means to shut off the supply line when the first and second chambers contain a maximum operational volume of breathing gas and second means to shut off the return line when the first and second chambers contain a residual volume.

5,195,517
ACUPUNCTURE POINT DISPLAY TYPE ELECTRIC STIMULATING THERAPEUTIC DEVICE
I-Cheng Chen, 2F1. No. 6 Alley 8, Sunwei Lane, Cheng Cheng Road, Hsin-Tien City, Taipei Hsien, Taiwan
Filed Sep. 17, 1991, Ser. No. 761,238
Int. Cl.[5] A61N *1/00*; A61H *39/02*
U.S. Cl. 128—419 R 14 Claims



1. An acupuncture point display type electric stimulating therapeutic device comprising:
a casing, divided into an upper casing and a lower casing connected together by a connecting element and fixed together by means of a tenon and a mortise, in which the upper casing defines a hollow interior space with a recessed display and a tenon thereon; the lower casing has a hollow interior space, a power source switch, a reset switch, an input device, a plurality of voltage regulating knobs, frequency regulating knobs, indicator lamps, electric therapeutic device connectors and heat curing plate connectors, and a mortise adapted to be engaged by the tenon;
an acupuncture point display system comprising an input device, an input/output port, a microprocessor, a memory, a time sequence generator, and a display, in which the input device is located on a top surface of the lower casing, the display is located on a surface of the upper casing, and the input/output port, the microprocessor, the memory and the time sequence generator are located within the upper casing such that when a code representing a disorder to be treated is entered through the input device and the input/output port to the microprocessor and the memory, related data is retrieved from the memory with a preset program and then a description of the disorder, names and locations of the related acupuncture points, and a figure showing the positions of such acupuncture points on a human body are displayed on the display;
an electric stimulating and heat generation system comprising a low frequency generator, a plurality of regulators and electric therapeutic devices and heat curing plates, in which the low frequency generator and the regulators are located within the lower casing, the electric therapeutic devices and the heat curing plates are connected to their respective connectors on the lower casing, and the lower frequency generator generates a low frequency high voltage signal which is adjusted by the regulators to cause the electric therapeutic devices and heat curing plates to provide an electric stimulation and heating effect of appropriate strength; and
a power supply to provide electric power to the aforesaid systems;
whereby the description of the disorder to be treated, names and locations of related acupuncture points, and the figure showing locations of such acupuncture points on the human body are displayed so that the electric therapeutic devices and heat curing plates can be applied to the human body at a correct position by referring to the figure after

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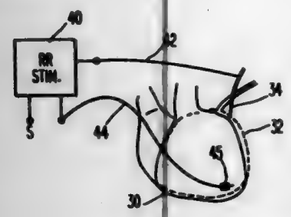
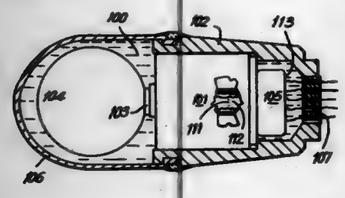
a code representing the disorder to be treated is entered via the input device.

5,195,518
SYSTEM AND METHOD FOR ENHANCING COLLATERAL CARDIAC BLOOD FLOW
John D. Mannion, Mount Laurel, N.J., and Michael G. Magno, Oxford, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.
Filed Sep. 6, 1991, Ser. No. 756,157
Int. Cl.[5] A61F 2/16
U.S. Cl. 128—421 12 Claims



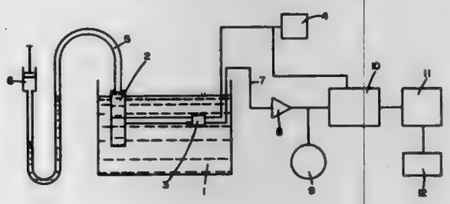
1. A method of providing collateral blood flow through a patient's skeletal muscle to a patient's myocardial tissue, comprising:
a) operatively connecting a skeletal muscle pedicle of the patient to said myocardial tissue, the muscle pedicle retaining its source of blood flow;
b) attaching a stimulator to said skeletal muscle and delivering stimulus pulses from said stimulator to said skeletal muscle; and
c) controlling said stimulator to deliver chronic stimulus pulses to said muscle in accordance with a chronic pattern so as to provide chronic collateral blood flow from said muscle to said myocardium, and changing the pattern of delivering stimulus pulses for acute periods during increased levels of patient cardiac demand, said controlling providing for increased collateral flow from said skeletal muscle to said myocardial tissue.

5,195,519
MINIATURIZED MECHANICALLY-STEERABLE ULTRASONIC PROBE
Bjorn A. J. Angelsen, Anders Tvereggens veg 34, 7037 Trondheim, Norway
Continuation-in-part of Ser. No. 288,690, Dec. 22, 1988, Pat. No. 4,972,839. This application Nov. 19, 1990, Ser. No. 615,213
The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.
Int. Cl.[5] A61B 8/06
U.S. Cl. 128—660.1 36 Claims



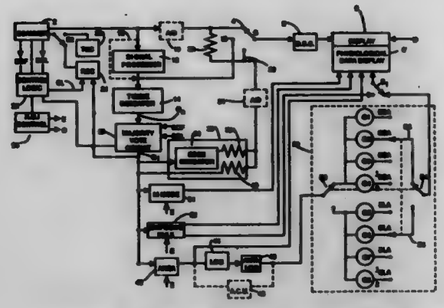
1. A miniaturized ultrasonic probe, comprising:
ultrasonic transducer means for emitting and receiving ultrasound waves for continuous wave Doppler measurements of blood velocity, said ultrasonic transducer means comprising a first part operable for continuously transmitting an ultrasound beam along a direction and a second part operable for continuously receiving backscattered ultrasound reflections from said transmitted ultrasound beam;
a motor having a shaft and operable for rotating said shaft, said transducer means being connected to said shaft for selective rotation of said transducer means with said shaft to selectively orient the ultrasound beam emitted by said transducer means first part;
sensor means connected to said motor shaft for providing a signal indicative of the angular position of said shaft and said transducer means so as to enable controlled steering of said transducer means for selectively varying the beam direction;
a substantially sealed housing encasing said transducer means, said motor and said sensor means, said housing comprising a dome of ultrasonically transparent material disposed about said transducer means and within which said transducer means is noninterferingly movable with operative rotation of said shaft; and
an ultrasonically transparent fluid filling said substantially sealed housing so that the ultrasound beam emitted by said transducer means is radiated outwardly from said probe through said fluid and said housing dome along a direction which, with selective operation of said motor, is selectively variable through at least a portion of a scan sector.

5,195,520
ULTRASONIC MANOMETRY PROCESS IN A FLUID BY MEANS OF MICROBUBBLES
Reinhard Schlief, and Hans Poland, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany
PCT No. PCT/EP87/00654, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO88/03388, PCT Pub. Date May 19, 1988
Continuation of Ser. No. 350,476, filed as PCT/EP87/00654, Nov. 02, 1987, published as WO 88/03388, May 19, 1988, abandoned.
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637926
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—660.02 33 Claims



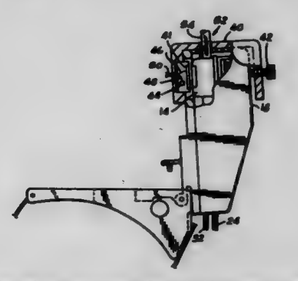
1. An ultrasonic manometry process in a fluid comprising introducing microbubbles into a fluid, radiating ultrasonic impulses into the fluid, and receiving and evaluating ultrasonic impulses after interaction of the radiated ultrasonic impulses with the microbubbles to determine fluid pressure, wherein the frequency range of ultrasonic impulses which are received and evaluated lie outside of the frequency range of the ultrasonic impulses radiated into the fluid and wherein the microbubbles are those created by introducing into the fluid an ensemble comprising the microbubbles and microparticles of a mixture of a semi-solid or fluid boundary surface active substance with a non-boundary surface active solid in a fluid carrier.

5,195,521
TISSUE MEASUREMENTS
Hewlett E. Melton, Jr., Sunnyvale, Calif., and Thomas A. Shoup, Lowell, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 9, 1990, Ser. No. 614,780
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—660.02 28 Claims



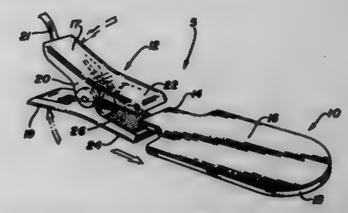
1. Apparatus for deriving a signal corresponding to the incremental area that lies between the edges of a fluid filled cavity and between successive scan lines comprising:
means for transmitting pulses of ultrasonic pressure waves along scan lines of a frame in sequence,
means for deriving electrical signals from the reflections of said pulses of pressure waves from reflectors in each scan line,
a tissue/fluid indicator circuit responsive to said electrical signals for producing at each of a plurality of ranges a first output value when the reflections are from tissue and a second output value when the reflections are from fluid,
means synchronized with said means for transmitting pulses for producing a voltage during a scan line such that integration thereof provides a signal corresponding to one of the area between successive radial scan lines and the area between successive parallel scan lines, and
means for integrating said voltage only when said tissue/fluid indicator circuit produces said second output value so as to produce a first output signal representing said incremental area.

5,195,522
TONOMETRY SENSOR CALIBRATION APPARATUS
Kenneth J. Pytel, San Diego; Stephen A. Martin, Carlsbad, and Robert D. Butterfield, Poway, all of Calif., assignors to IVAC Corporation, San Diego, Calif.
Continuation-in-part of Ser. No. 621,165, Nov. 30, 1990, Pat. No. 5,158,091. This application Jun. 18, 1991, Ser. No. 717,224
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—680 26 Claims



1. A calibration apparatus for use in calibrating a tissue stress sensor used in a blood pressure monitoring system, said apparatus comprising:
a calibration head,
means, attached to said calibration head, for retaining said calibration head in close proximity to said tissue stress sensor, and
means, attached to said calibration head, for heating said tissue stress sensor.

5,195,523
MEDICAL ELECTRODE ASSEMBLY
James V. Cartmell, Xenia; Joseph F. DeRose, Centerville, and Jeffrey W. Stone, Cincinnati, all of Ohio, assignors to NDM Acquisition Corp., Minneapolis, Minn.
Filed Apr. 24, 1991, Ser. No. 690,868
Int. Cl.[5] A61B 5/0402
U.S. Cl. 128—640 3 Claims



1. A medical electrode assembly for an electrocardiograph comprising:
an electrolyte pad including
an electrolyte layer which may be secured to the skin of a patient; and
a backing member made from a nonconductive material being continuously and coextensively superimposed directly onto said electrolyte layer; said backing member and said electrolyte layer having a tab; and
a reusable lead wire connector including
a set of jaws configured in substantially an alligator-type clip, each of said jaws having an inner surface which may be compressed together for contacting said tab of said electrolyte pad such that electrocardiographic voltages generated by a patient are transmitted through said electrolyte layer and said inner surface of at least one of said jaws to said electrocardiograph, wherein said inner surface of each said jaw includes an insert made from a nonconductive binder material having a conductive filler dispersed therein; and
at least one metal particle superposed directly onto the inner surface of said jaws.

5,195,524
FLOW IMAGING METHOD BY MEANS OF AN MRI APPARATUS AND APPARATUS FOR REALIZING SAME
Kenji Takiguchi, Kodaira; Etsuji Yamamoto, Akishima, and Hideki Kohno, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 29, 1991, Ser. No. 647,563
Claims priority, application Japan, Feb. 2, 1990, 2-023973
Int. Cl.[5] A61B 5/055
U.S. Cl. 128—653.3 8 Claims

1. A flow imaging method utilizing an MRI apparatus comprising the steps of:
(a) setting a width of a relevant region in a flow direction, in which fluid in a subject body flows, and applying a first 90° radio frequency pulse thereto to excite selectively said relevant region;
(b) applying a gradient magnetic field thereto in a projection direction, in which it is desired to project said fluid, whereby a phase of magnetization excited by said first 90°

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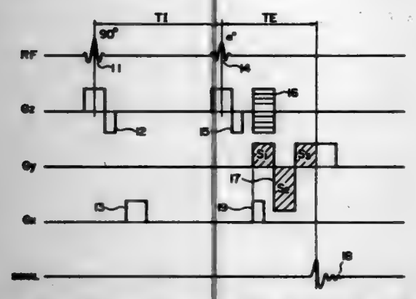
radio frequency pulse in said relevant region is disturbed to saturate magnetization;

(c) waiting a predetermined time until new fluid pours in said relevant region;

(d) applying a second radio frequency pulse to said relevant region after a lapse of said predetermined time to excite said relevant region selectively;

(e) applying said gradient magnetic field in said projection direction;



(f) applying an encoding gradient magnetic field in a direction perpendicular to said projection direction and further applying a reading out gradient magnetic field in a direction perpendicular both to said projection direction and to said encoding gradient magnetic field in a form of a flow compensating pulse so as to detect an echo signal from said fluid;

(g) measuring said echo signal from said subject body; and

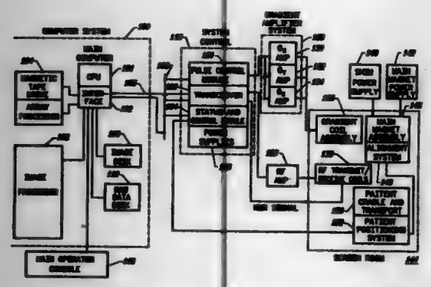
(h) processing said echo signal to obtain a two-dimensional image of said fluid.

5,195,525

NONINVASIVE MYOCARDIAL MOTION ANALYSIS USING PHASE CONTRAST MRI MAPS OF MYOCARDIAL VELOCITY

Norbert J. Pelc, 490 Distel Dr., Los Altos, Calif. 94022

Filed Nov. 26, 1990, Ser. No. 617,904
Int. Cl.[5] A61B 5/055
U.S. Cl. 128—653.2 23 Claims



16. Apparatus for assessing motion of a region within an object comprising

first means for (a) establishing a magnetic field within said object,

second means for (b) obtaining magnetic resonance image signals representative of at least one velocity component of said region at a plurality of time frames,

third means for (c) identifying the position of said region in the image signal at one of said plurality of time frames,

fourth means for (d) estimating a new position of said region in a time frame other than said one time frame, and

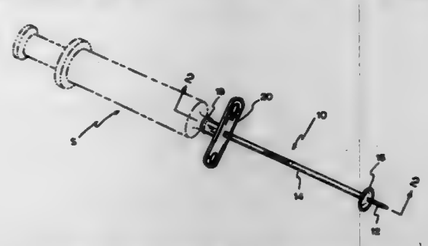
fifth means for (e) translating said region to said new position.

5,195,526

SPINAL MARKER NEEDLE

Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291

Continuation of Ser. No. 421,963, Oct. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 167,167, Mar. 11, 1988, abandoned. This application Dec. 26, 1990, Ser. No. 633,999
Int. Cl.[5] A61M 5/02, 5/00
U.S. Cl. 128—654 16 Claims



1. A marker needle comprising a hollow upper portion and a lower portion having a longitudinal axis, said upper portion and said lower portion joining at a juncture, the lower portion comprising a hollow needle about 1 centimeter long, said upper portion having a larger outside diameter than the outside diameter of said lower portion, and penetration restriction means for restricting the depth of penetration of said lower portion of said marker needle, said penetration restriction means being at least 1 centimeter in diameter and fixed to said marker needle proximate said juncture of said upper portion and said lower portion, said penetration restriction means comprising a member extending perpendicular to the longitudinal axis of said lower portion and being substantially larger in diameter than the outside diameter of said lower portion, at least a portion of said marker needle being radiographically opaque.

3. A marker needle having a hollow lower needle segment and an upper tubular segment having a larger outside diameter than the outside diameter of said needle segment, said upper tubular segment and said lower needle segment joining at a juncture, said marker needle having an external penetration restriction means surrounding said juncture of said upper segment and said lower needle segment for restricting the penetration of said lower needle segment into the patient, said upper segment having an internal chamber for retaining marking dye, and marking dye within said chamber and a plunger movable within said upper tubular segment, said dye being ejected from the needle by movement of said plunger movable within said upper segment.

5,195,527

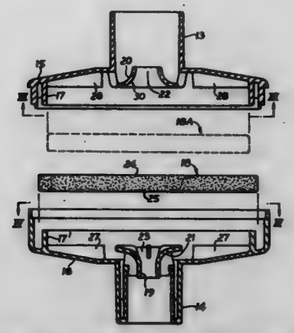
RESPIRATORY FILTERS

Richard B. Hicks, Kingston-upon-Thames, United Kingdom, assignor to Intersurgical Limited, Twickenham, United Kingdom

PCT No. PCT/GB90/00795, § 371 Date Nov. 18, 1991, § 102(e) Date Nov. 18, 1991, PCT Pub. No. WO90/14122, PCT Pub. Date Nov. 29, 1990
PCT Filed May 21, 1990, Ser. No. 776,348
Claims priority, application United Kingdom, May 19, 1989, 8911627
Int. Cl.[5] A61M 16/10
U.S. Cl. 128—205.12 11 Claims

1. A respiratory filter included in a respiratory system for use in anaesthesia and/or patient ventilation, the respiratory filter (10) comprising a housing (12) containing at least one filter member (18), said housing (12) having at least one port

(14) for connection to a line for the supply of a gaseous medium to and from a patient, the port (14) being of smaller cross section than the housing (12), means (17, 17') in the housing (12) for maintaining said at least one filter member (18) therein to span the interior of the housing (12) transversely to the direction of flow of said medium from said port (14) into the



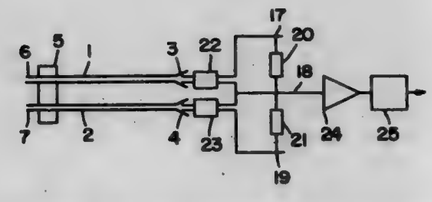
housing (12) and a deflector member (19) positioned relative to the junction between the port (14) and housing (12) so as to disperse said medium entering the housing (12) from said port (14) over the opposed, planar surface (25) of said filter member (18), wherein the deflector member (19) has a through bore (23) generally aligned with said port (14) and an outer surface (21) which increases in cross section away from said port (14).

5,195,528

ACOUSTIC RESPIRATION DETECTOR

Bertil Hok, Västerås, Sweden, assignor to Hok Instrument AB, Västerås, Sweden

PCT No. PCT/SE91/00099, § 371 Date Oct. 11, 1991, § 102(e) Date Oct. 11, 1991, PCT Pub. No. WO91/12051, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 13, 1991, Ser. No. 768,185
Claims priority, application Sweden, Feb. 16, 1990, 9000552
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—716 5 Claims



1. Detector of air flow at the respiratory organs of a human being or an animal including:

at least two tubular air transmission lines positioned side by side, each defining an inner lumen and openings near or at opposite ends thereof,

means for mechanically coupling said transmission lines,

at least one microphone element acoustically connected to the inner lumen of each of said tubular air transmission lines,

a bridge circuit having at least two voltage supply leads and at least one signal carrying lead connected to said microphone elements, and

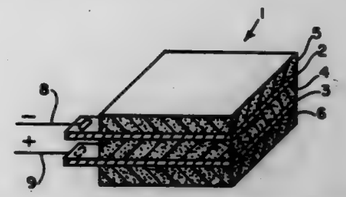
at least one holding element securing said air transmission lines such that said openings are exposed to said air flow.

5,195,529

SENSOR FOR MONITORING RESPIRATION

Lauri Malkamäki, Salem, N.H., assignor to Instrumentarium Corporation, Finland

Filed Oct. 25, 1990, Ser. No. 603,478
Claims priority, application Finland, Oct. 27, 1989, 895131
Int. Cl.[5] A61B 5/087
U.S. Cl. 128—716 28 Claims



1. A sensor for monitoring the respiration of air occurring through one or more respiratory tracts of a patient and for providing an indication of the same to a measuring instrument, said sensor comprising:

two spaced-apart electrically conductive elements (2,3), said elements having means (8,9) for coupling same to the measuring instrument (10);

an intermediate layer means between said elements, said intermediate layer means being capable of transferring electric charge carriers between said elements in the presence of moisture in said intermediate layer means to establish a current between said elements; and

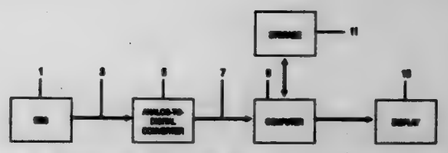
means for affixing the sensor to the patient proximate one or more respiratory tracts of the patient to subject the sensor to moisture contained in the air moving during respiration occurring in said one or more tracts.

5,195,530

APPARATUS FOR ANALYZING EEG AND RELATED WAVEFORMS

Larry Shindel, 248 Rolling Hills Pl., Lancaster, Tex. 75146

Filed Dec. 10, 1990, Ser. No. 624,897
Int. Cl.[5] A61B 5/0476
U.S. Cl. 128—731 8 Claims



1. A method for analyzing the brain waves of a patient comprising the steps of:

sampling said brain wave periodically, the sampling period being variable in order to detect the particular brain waves of interest;

calculating parameters which describe said brain waves;

comparing said calculated parameters with standards for said parameters for normal and a plurality of abnormal brain waves to determine the condition which corresponds to the patient's brain waves; and

displaying the result of said comparison.

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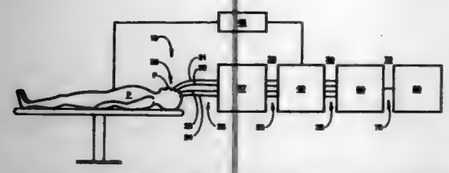
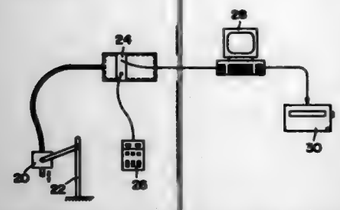
5,195,531
ANESTHESIA ADEQUACY MONITOR AND METHOD
Henry L. Bennett, 1006 Bienville, Davis, Calif. 95616
Filed Mar. 1, 1991, Ser. No. 663,434
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—733 39 Claims



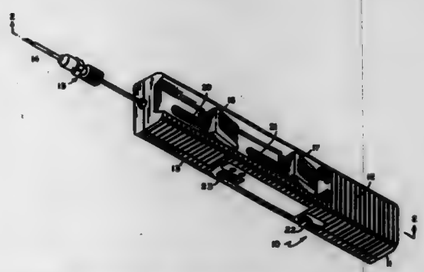
1. A device for monitoring the consciousness of a patient under anesthesia comprising, in combination:
an array of facial muscle sensors adapted to be strategically located on the patient to generate signals representing the activity of at least two facial muscles, said muscles being responsible for eliciting distinctive patterns of facial expressions,
a processor for interpreting the patient's awareness from comparison of measurements made by said sensors and operatively coupled to said sensors, wherein said processor includes a means for determining the facial expression of the patient by interpreting a signal created by said sensors, and
a display with means receiving output from said processor for accurately communicating to an anesthesiologist the level of patient awareness and therefore consciousness;
whereby the anesthesiologist may monitor the patient's consciousness and take corrective action to improve patient comfort when indicated.

5,195,532
APPARATUS FOR PRODUCING A STIMULATION BY VIBRATION OF A TAPPET WHICH IS PUT ON A HUMAN'S SKIN
Walter Schumacher, Ohrum; Walter Wetzel, Brunswick; Gerd Hollnagel, Brunswick; Gerald Arndt, Brunswick; Ulrich Plü quett, Göttingen; Arno May, Göttingen; Dietmar Oberdorfer, Göttingen, and Heiko Baden, Schneverdingen, all of Fed. Rep. of Germany, assignors to Physic Systeme GmbH, Fed. Rep. of Germany
Filed May 28, 1991, Ser. No. 706,395
Claims priority, application Fed. Rep. of Germany, May 29, 1990, 4017251
Int. Cl.[5] A61B *5/00, 19/00*; A61H *7/00, 23/00*
U.S. Cl. 128—739 11 Claims



1. An apparatus for testing a threshold of perception of mechanical vibration by producing a mechanical stimulation by vibration of a tappet applied to a patient's skin, wherein an amplitude of the mechanical vibration can be varied around a threshold of perception, the apparatus comprising:
a measuring head, including a housing and a tappet elastically held in the housing and guided for back and forward movement;
a tippet actuating unit attached to the tappet;
an acceleration sensor attached to the tappet and connected to control electronics, the control electronics being attached to the measuring head and including a power amplifier attached to the tappet actuating unit; and,
a patient reaction panel attached to the control electronics, the patient reaction panel including means for receiving a response from the patient to indicate a reaction upon perceiving a mechanical stimulation.

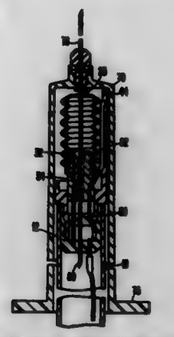
5,195,533
BIOPSY NEEDLE INSTRUMENT FOR STORING MULTIPLE SPECIMENS
Yeun Chin, Burlington, and Michael S. H. Chu, Brookline, both of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.
Filed May 8, 1992, Ser. No. 881,028
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 19 Claims



1. In a biopsy needle instrument having a housing, axially elongated stylet means extending from said housing at a proximal position for defining a specimen of a predetermined specimen length at a distal position thereof, cannula means coaxially extending from said housing and disposed about said stylet means for severing the defined specimen adjacent said stylet means and displacement means for moving said stylet and cannula means relative to each other and to said housing between extended and retracted positions, the improvement of multiple specimen capture means formed with said stylet means and cooperatively positioned with said cannula means for sequentially obtaining and storing multiple specimens.

5,195,534
BIOLOGICAL FLUID COLLECTION AND DISPENSING APPARATUS AND METHOD
Robert J. Sarrine, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.
Filed Aug. 16, 1991, Ser. No. 746,414
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—764 20 Claims

1. Apparatus for drawing biological fluid from a patient into a test tube, the test tube being sealed with a puncturable closure, and for thereafter dispensing the biological fluid through the closure and from the test tube comprising:
pump means adapted to be connected to said test tube;
housing means for said pump means; and
cannula means having a first portion extending interiorly of said pump means and said housing means and having a tip insertable through said closure;
said housing means having a first position for withdrawal of biological fluid from a patient, such that said biological fluid flows through said pump means and through said housing means into said sealed test tube; and
said housing means having an second position for advancing said cannula means first portion tip through said closure such that upon actuation of said pump means, biological fluid is dispensed from said sealed test tube through said cannula means.

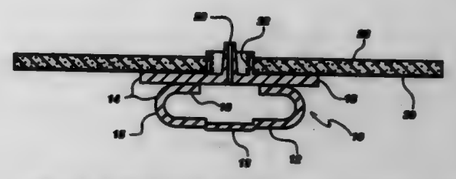


5,195,535
DETACHABLE GUIDEWIRE EXTENSION
Peter J. Shank, Burlington, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Continuation of Ser. No. 612,108, Nov. 9, 1990, abandoned. This application Mar. 12, 1992, Ser. No. 850,149
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 22 Claims

1. An extendible guidewire system for guiding an elongate, flexible catheter having a guidewire lumen through a lumen in the body of a patient and adapted to facilitate exchange of the catheter for another catheter comprising:
a guidewire having a proximal end and a distal end;
an extension wire having a proximal end and a distal end;
the proximal end of the guidewire and the distal end of the extension wire being connectibly matable with each other, the connection between said mating ends including a manually operable mechanism movable between positions for locking and unlocking the connection the locking mechanism being movable independently of mating of said ends.

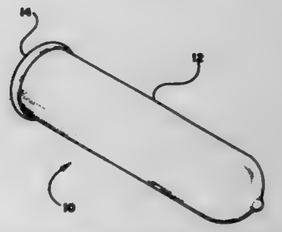
5,195,536
SELF-ADHERING NONINVASIVE INTRACORPOREAL MOVEMENT DETECTOR
Fidel H. Silva, Sandy; Dwayne R. Westenskow, and Joseph A. Orr, both of Salt Lake City, all of Utah, assignors to Axon Medical, Inc., Salt Lake City, Utah
Filed Sep. 12, 1991, Ser. No. 758,616
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—782 17 Claims

1. A noninvasive intracorporeal movement transducer to use with an external monitor, comprising:
a bubble defining a closed interior volume and including spaced laterally co-extensive front and rear walls resiliently joined at their periphery;
a duct extending from said closed interior volume to the exterior of said bubble;
tubing having one end thereof in communication with said duct via tubing connection means associated therewith;
substantially planar attachment means affixed on one side to said bubble adjacent said rear wall, extending laterally therebeyond, and including an adhesive on the side thereof adjacent said bubble for securing said bubble to the skin of a patient with said forward wall of said bubble in contact with said skin; and



a rigid back plate disposed between said rear wall and said attachment means, said back plate sized and positioned to overlay substantially the entire cross-sectional area of said bubble.

5,195,537
ELASTOMERIC CONDOM
Neil E. Tillotson, Dixville Notch, N.H., assignor to Tillotson Corporation, Boston, Mass.
Filed May 10, 1991, Ser. No. 698,837
Int. Cl.[5] A61F *6/04*
U.S. Cl. 128—844 16 Claims

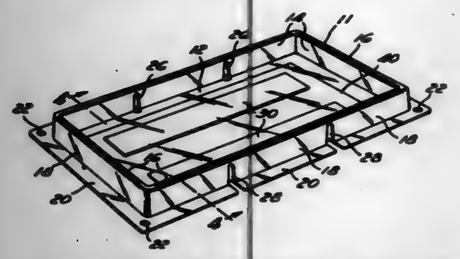


1. A condom comprising a sheath of elastomeric material having an initial configuration adapted to receive a penis and characterized by being substantially impermeable to water vapor and liquid water and having elastic properties such that when stretched from the initial configuration to fit about the penis, the sheath conforms to the configuration of the penis initially exerting a predetermined pressure on the penis and thereafter relaxing to exert on the penis a reduced pressure which is substantially less than about 80% of the predetermined pressure, the elastomeric material being characterized such that when the elastomeric material is formed into a sample having a thickness from about 4.0 to about 4.5 mils, the sample has a tensile strength of at least about 1500 psi, an elongation greater than about 700% , and a 500% modulus less than about 350 psi.

5,195,538
SURGICAL INSTRUMENT TRAY
John D. Eldridge, Jr., and Mary A. Morgan, both of Newport Beach, Calif., assignors to Devon Industries, Inc., Chatsworth, Calif.
Filed Feb. 27, 1991, Ser. No. 662,242
Int. Cl.[5] B65D *85/24*
U.S. Cl. 128—849 32 Claims

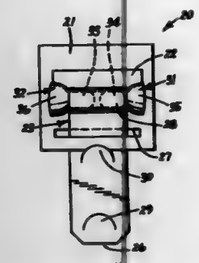
1. A surgical instrument retainer, comprising:
a non-magnetic shell including:
a base portion defined by a periphery, said base portion

incorporating a magnetic element disposed within said periphery;
an inner wall projecting from said periphery and terminating at a brim, said inner wall having a notched recess; and



an outer wall depending from said brim, said outer wall having a notched recess opposite said notched recess of said inner wall, wherein said notched recess of said inner wall and said notched recess of said outer wall provide increased flexure of said surgical instrument retainer.

5,195,539
EARPLUG COMPRESSION DEVICE
James F. Dyrud, New Richmond, Wis., and Gerald V. Elstran, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 23, 1992, Ser. No. 855,316
Int. Cl.[5] A61F *11/00*
U.S. Cl. 128—864 11 Claims

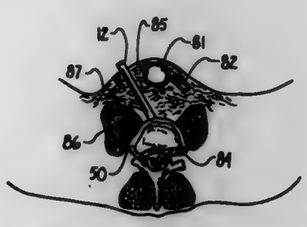


1. A device for compressing slow recovery earplugs comprising a flexible strip having an elongate compression portion having first and second ends and a base portion at said first end of said compression portion, said base portion having a width greater than that of said compression portion, an opening proximate said compression portion and having a width transverse of said compression portion larger than the width of said compression portion, said compression portion being at least 15 mm wide and of sufficient length that said second end can pass through said opening to form a tubular compression means having a diameter at least that of a slow recovery earplug and so that when a slow recovery earplug is positioned in said tubular compression means and tension is applied between said second end and said base portion, the part of said compression portion between said base portion and said opening will decrease to radially compress said slow recovery earplug.

5,195,540
LESION MARKING PROCESS
Samuel Shiber, P.O. Box 1366, Atkinson, N.H. 03811
Filed Aug. 12, 1991, Ser. No. 744,462
Int. Cl.[5] A61B *17/34*
U.S. Cl. 128—898 2 Claims

1. A lesion marking process comprising the following steps:
Inserting a guiding needle to the vicinity of the lesion while using an imaging system for guidance,
rotating and sliding a spiral wire over the guiding needle to the vicinity of the lesion while using an imaging system for guidance,
withdrawing the guiding needle from the patient, leaving the spiral wire in the vicinity of the lesion as a marker.

5,195,541
METHOD OF PERFORMING LAPAROSCOPIC LUMBAR DISCECTOMY
Theodore G. Obenchain, 12002 Royal Birkdale Row, #A, San Diego, Calif. 92128
Filed Oct. 18, 1991, Ser. No. 780,865
Int. Cl.[5] A61B *19/00*
U.S. Cl. 128—898 4 Claims

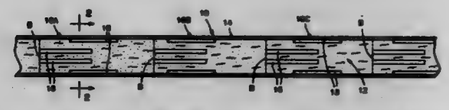


1. A method of performing laparoscopic lumbar discectomy comprising:
securing a patient in a supine position with lumbar vertebrae at 12 o'clock relative to the aorta at 6 o'clock,
inserting surgical apparatus comprising an elongated sleeve member having a first and a second end, endoscope receiving means and an endoscope secured therein, laser fiber receiving means having a laser fiber secured therein, and suction and irrigation channel means, each of said means extending along the interior of said sleeve member between said first and second ends through an abdominal incision at a location adjacent said 6 o'clock above the patient's lumbar vertebrae, directing said sleeve member from said incision through the abdominal cavity toward said lumbar vertebrae at 12 o'clock, observing the direction of said sleeve with said endoscope while guiding said sleeve member toward said 12 o'clock until the second end thereof is adjacent the exterior annulus of a lumber disc space, surgically entering the disc space through said vertebra and removing disc tissue by energizing and manipulating said laser fiber, and directing irrigating fluid through one or more of said conduits and removing fluid with suctioning through one or more of said conduits.

5,195,542
REINFORCEMENT AND SUPPORTING DEVICE FOR THE ROTATOR CUFF OF A SHOULDER JOINT OF A PERSON
Dominique Gazielly, 47 Rue Henri Déchaud, 42100 Saint Etienne, and Pierre Blondel, La Feria, 63600 Ambert, both of France
PCT No. PCT/FR90/00291, § 371 Date Dec. 13, 1990, § 102(e) Date Dec. 13, 1990, PCT Pub. No. WO90/12551, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 25, 1990, Ser. No. 623,641
Claims priority, application France, Apr. 27, 1989, 89 06005
Int. Cl.[5] A61B *19/00*; A61F *2/40*
U.S. Cl. 128—898 2 Claims

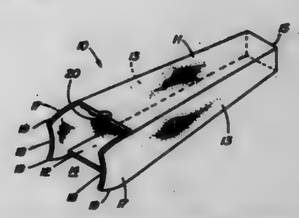
1. A method of reinforcing a rotator cuff of a person, comprising the steps of:
fixing a rear heel of a strip to at least one of a tendinous mass and a trochiter of such a rotator cuff, said rear heel having a linear extension defining an opposite end; and
fixing said opposite end to a tendon of such a rotator cuff.

5,195,543
BALANCED FLOW TOBACCO SMOKE FILTER
Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.
Filed Oct. 28, 1991, Ser. No. 783,345
Int. Cl.[5] A24D *1/04*
U.S. Cl. 131—336 16 Claims



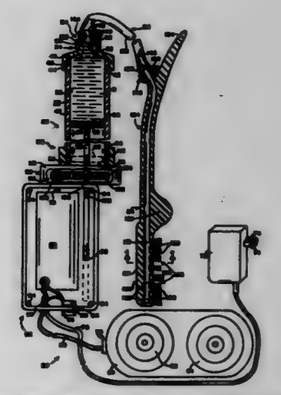
7. A tobacco smoke filter comprising a cylindrical core of fibrous filter material and an outer tubular member encasing the core, portions of the core defining a plurality of elongate bores symmetrically located relative to a longitudinal axis of the filter, extending into the core from one end of the filter and terminating at a location spaced from an opposite end of the filter, and further portions of the core defining a plurality of elongated channels substantially symmetrically spaced around an outer surface of the core within the tubular member, the channels having opposite ends which are spaced from respective ends of the filter.

5,195,544
NAIL CATCHER CASE
Vince Campagna, 830 Westwood St., Coquitlam, Canada V3L 3C2
Filed Dec. 11, 1991, Ser. No. 804,677
Int. Cl.[5] A45D *29/18*
U.S. Cl. 132—75.5 2 Claims



1. A slip-on nail catcher case which is adapted to contain a nail clipper having forward nail clipping jaws, said nail catcher case being constructed of a thin synthetic plastic material and comprising: an upper roof, a lower floor and a pair of side walls, each of said roof, floor and side walls being of trapezoidal shape and being joined together to provide a hollow truncated pyramid for sliding over said nail clipper, the forward end of said nail catcher case including a pair of forwardly-extending, gently-inwardly-curved, flexible gripping walls, said walls being of sufficient longitudinal length fully to enclose the sides of said nail clipper when said nail clipper is slipped into said nail catcher case, thereby to enable said nail catcher case to be universally usable in many different kinds of nail clippers, the forward ends of said forwardly-extending, gently-curved, flexible gripping walls also being sharply angled inwardly at their forward termini, and said ends being shaped with vertically-extending, arcuately-shaped, terminal ends, and also with upper and lower curved surfaces; said gripping walls extending only as far as said nail clipping jaws, thereby enabling the provision of a receptacle within said nail clipper for catching nail clippings.

5,195,545
HAIR RELAXANT APPLICATOR APPARATUS
Gregory W. Thibodeaux, 561 N. Jefferson, Apt. 1, Memphis, Tenn. 38103
Filed Apr. 27, 1992, Ser. No. 874,537
Int. Cl.[5] A45D *24/22*
U.S. Cl. 132—116 3 Claims



1. A hair relaxant applicator apparatus for applying a controlled flow of hair relaxant to a person's hair, said apparatus comprising:

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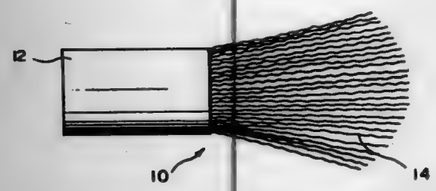
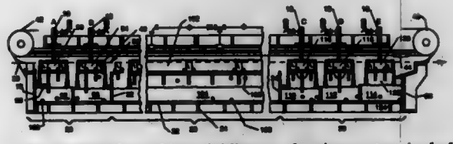
(a) a supply unit, said supply unit comprising:
i. a tubular supply container having a longitudinal bore therethrough, said bore terminating in an opening through a first end of said supply container and terminating in a mouth through a second end of said supply container;
ii. a piston slidingly and sealingly engaging said longitudinal bore, said piston being longitudinally reciprocable within said bore;
iii. a piston rod having a first and a second end, said piston rod being attached at said first end of said piston rod to said piston and with said second end of said piston rod reciprocatingly extending out of said bore through said mouth of said supply container;
iv. an electric motor having a rotating shaft;
v. power supply means for supplying a source of power to said motor;
vi. switch means, interposed between said power supply means and said electric motor, for selectively causing said electric motor to rotate said shaft in either a clockwise or a counterclockwise direction, said switch means including a footswitch having a forward and a reverse switch;
vii. gearing means for translating the rotation of said shaft of said electric motor into reciprocating motion of said piston rod through said longitudinal bore; and
viii. rheostat means for varying the speed at which said electric motor rotates said shaft;
(b) an applicator brush remote from said supply unit, said applicator brush having a passageway therein and further having an orifice in communication with said passageway, said applicator brush comprising:
i. a head portion, said head portion having a plurality of bristles extending outwardly from an outer surface of said head portion, and further having a plurality of openings through said outer surface adjacent said bristles, said openings being in communication with said passageway; and
ii. a handgrip portion adjacent said head portion for holding by an operator; and
(c) tubing means for piping said hair relaxant from said opening through said first end of said supply container to said orifice of said applicator brush.

5,195,546
COSMETIC BRUSH AND BRISTLES
Ronald B. Cassler, Davidsonville; Scott B. Taylor, Glen Burnie, and William M. Wagner, Severn, all of Md., assignors to Kotsms, Odenton, Md.
Filed Dec. 11, 1990, Ser. No. 625,390
Int. Cl.[5] A45D *40/24*
U.S. Cl. 132—317 13 Claims



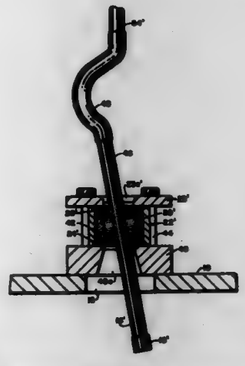
1. In a cosmetic brush for the application of powder to the human skin, comprising a handle and a plurality of bristles extending from said handle from one end thereof, the improvement wherein
said plurality of bristles form a full and fluffy brush configuration, said bristles being of diameter of 2.0–4.5 mils and being formed of synthetic plastic, each of said bristles having a random and irregular wavy configuration in amplitude and frequency along its length extending from said handle, and adjacent bristles having non-complementary wave patterns.

5,195,547
PRESSURIZED WEIR FOR A FUMELESS PICKLING OR CLEANING SYSTEM
Daniel R. Devens, Zelienople, Pa., assignor to Allegheny Plastics, Inc., Coraopolis, Pa.
Filed Nov. 1, 1991, Ser. No. 786,754
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—114 11 Claims



1. In combination with a pickling or cleaning system including a closed cell tank having opposed ends, at least two cells for water and a cell therebetween for acid and wherein the ends of the tank are normally open to the atmosphere, the improvement in means for containing fumes from the acid within the tank comprising at least one pressurized weir in each cell for water, each weir comprising:
a pair of housing plates, one plate having an inlet opening for admitting water under pressure to the weir;
a reservoir plate and a metering plate;
means for retaining said reservoir plate and said metering plate between said housing plates;
a reservoir provided by said reservoir plate and said metering plate for receiving water under pressure from said inlet opening;
at least one truncated triangular opening in each of said reservoir plate and said metering plate, the bottom of said opening permitting water under pressure to be exhausted from said reservoir in the form of a water curtain.

5,195,548
WASHING DEVICE
Tanguy Roger, Villeneuve d'Ascq, France, assignor to FCB, Montreuil, France
Filed Jun. 7, 1991, Ser. No. 712,339
Claims priority, application France, Jun. 11, 1990, 90 07216
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—167 R 2 Claims

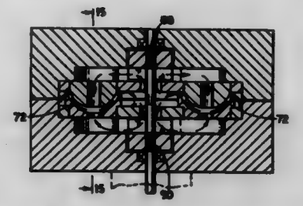


1. A washing device for an apparatus comprising a tank having a wall defining an interior chamber for holding a liquid and substantially vertical partitions dividing the interior chamber, the partitions having parts which are not immersed in the liquid and are susceptible to becoming fouled, the washing device comprising
(a) tubes passing through the wall of the tank and each of the tubes having an end extending into the interior chamber,
(b) tubing in communication with the tubes for feeding a washing liquid thereto,
(c) a nozzle affixed to each tube end and arranged to project the washing liquid onto respective ones of the partition parts susceptible to becoming fouled,
(d) a spherical body of revolution carrying each tube,
(e) a bearing box holding each spherical body inside thereof, the bearing box being mounted fluid-tight on the wall of the tank and the body being pivotal in the bearing box about a substantially horizontal axis, the bearing box having
(1) a bottom defining an opening receiving the tube and being of a dimension which permits angular movements of the tube upon pivoting of the body, and
(2) a cover closing the bearing box outside the tank, and
(3) two collars mounted in the bearing box and bearing the spherical body therebetween, one of the collars being arranged adjacent the bearing box bottom and one of the collars being arranged adjacent the bearing box cover, the collars defining curved bearing cavities complementary to the surface of the body, and the tube and lever passing through a respective one of the collars, and
(f) a lever affixed to the body and passing through an opening in the bearing box cover, the opening being of a dimension which permits angular movements of the lever for pivoting the body and the tube carried thereby about said horizontal axis.

5,195,550
UMBRELLA
John C. Y. Chan, 14/E Flat C, 459-469 Castle Peak Road, Wah Lik Ind. Bldg., Tsuen Wan, N.T., Hong Kong
Continuation-in-part of Ser. No. 578,252, Sep. 6, 1990, abandoned. This application Jan. 18, 1991, Ser. No. 641,642
Int. Cl.[5] A45B *25/28*
U.S. Cl. 135—48 12 Claims

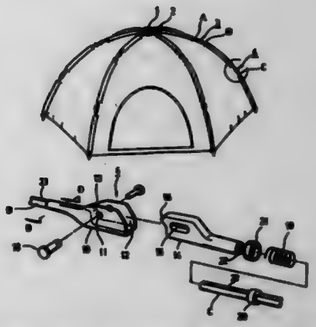
1. An umbrella, comprising:
containment means at an outer end of the umbrella for containing rainwater that has moved down the umbrella when wet and closed,
a waterproof and leakproof retractable cover means capable of being extended along the closed and wet umbrella so as to cover a substantial portion of canopy material of the umbrella and retain rainwater on the canopy material within the cover means for subsequent movement down into the containment means, and
a collar that is formed by an inner member which is mounted to an outer member, with an end of the cover means being rotatably trapped between the inner and outer members.

5,195,549
CLEANING DEVICE
James C. Adams, 845 S. Winton Rd., Rochester, N.Y. 14618-1607
Filed Aug. 23, 1991, Ser. No. 748,885
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—188 6 Claims



1. A device for cleaning contact lenses which comprises:
(a) a housing having an inner compartment or tank which includes a continuous passageway formed by a plurality of internal opposed interconnecting recessed channels which allow for the flow of fluid under pressure;
(b) a pair of oppositely opposed impellers contained within two of said recessed channels, said impellers being suitable to drive a fluid under pressure;
(c) said inner compartment further containing a removable case in sealed engagement with said compartment to define a fluid tight closed system, said case being designed to hold at least one contact lens in place opposite and between one pair of said recessed channels adjacent said impellers; and
(d) means for driving said impellers in order to move a cleaning fluid under pressure through said continuous passageway to simultaneously clean both surfaces of said contact lens.

5,195,551
DEVICE FOR PREVENTING FOLDING OF A LOWER JOINT FOR A ONE TOUCH TYPE DOME SHAPED TENT
Dong-Soo Ju, Seoul, Rep. of Korea, assignor to Bae Jin Corporation, Seoul, Rep. of Korea
Filed Jan. 19, 1991, Ser. No. 717,684
Claims priority, application Rep. of Korea, Apr. 4, 1991, 91-4601
Int. Cl.[5] E04H *15/36*
U.S. Cl. 135—102 2 Claims



1. A foldable frame for a dome shaped tent of the kind in which the tent fabric is supported within an external, outwardly bowed frame when the tent is erected, said foldable frame comprising,
an upper, central hub,
a plurality of foldable, outwardly bowable frame legs,

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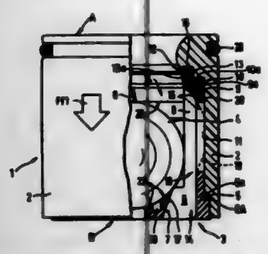
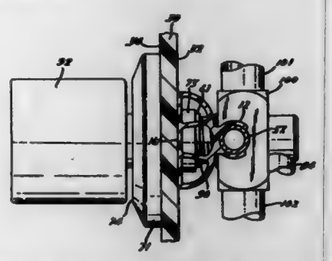
each frame leg having an upper segment, a middle segment, and a lower segment,
each frame leg having a hub pivot connection between the upper end of each upper segment and the central hub,
each frame leg having an upper pivot means between the upper segment and the middle segment which permit the upper and middle segments to be bowed outwardly when the tent is erected and which permit the upper and middle segments to be folded inwardly in the shape of an inward V when the tent is folded and collapsed,
each frame leg having manually actuated locking means for retaining the upper and middle segments locked together and bowed outwardly in the erected position of the tent and for releasing the segments for inwardly folding about the upper pivot means when the tent is to be collapsed and folded,
each frame leg having lower pivot means between the middle segment and the lower segment for maintaining the middle and lower segments engaged and bowed outwardly when the upper and middle segments are locked together, and for spontaneously and automatically causing the middle and lower segments to disengage and to fold outwardly in the shape of an inverted V when the manually actuated locking means of the upper pivot means are actuated to release the upper and middle segments for inwardly folding of those two segments,
said lower pivot means comprising,
a pin interconnecting adjacent ends of the middle and lower segments for pivoting about the pin,
a slot in the lower segment for permitting a limited amount of longitudinal shifting of the lower segment with respect to the pin and the middle segment, said slot having a lower end and an upper end
complementary surfaces on the middle and lower segments, which complementary surfaces are engaged to hold the segments bowed out when the lower end of the slot is engaged with the pin by a downwardly acting force produced by locking the top and middle segments in the bowed out condition of those two segments, and
spring biasing means for shifting the lower segment to a position in which the upper end of the slot is engaged with the pin and in which the complementary surfaces are moved out of engagement when the upper pivot means are unlocked and the resultant downwardly acting force is terminated.

5,195,552
CHECK VALVE WITH EXCHANGEABLE VALVING ELEMENTS
Holger Nehm, Müllheim, Fed. Rep. of Germany, assignor to Dieter Wildfang GmbH, Müllheim, Fed. Rep. of Germany
Filed Oct. 31, 1991, Ser. No. 785,690
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1990, 4039280
Int. Cl.[5] F16K *15/04, 15/06*
U.S. Cl. 137—269 29 Claims



1. A check valve comprising a substantially tubular housing having a fluid-admitting inlet and a fluid-discharging outlet; a seat provided in said housing at said inlet and having an annular sealing surface; a cage removably and reinsertably installed in said housing and including a stop between said seat and said outlet, said housing having an internal surface at least partially surrounding said cage upon reinsertion of said cage, and said cage further having an annular section which is adjacent said seat upon reinsertion of said cage, said annular section having an inner surface which diverges from the surface of said seat toward said internal surface in a direction from said seat toward said outlet; and a plurality of interchangeable discrete valving elements a selected one of which is insertable into said housing upon at least partial removal of said cage, the inserted valving element being confined in said housing—upon reinsertion of said cage—to movements between a sealing position in which the inserted valving element sealingly engages said surface of said seat to prevent penetration of a fluid into said housing through said inlet and beyond said seat, and an inoperative position in which the inserted valving element is remote from said seat and is at least close to said stop to define with said housing and said cage a path for the flow of a fluid through said housing from said inlet toward, through and beyond said outlet.

5,195,553
SPACER FOR MOUNTING PLUMBING TO A WALL
John C. Wright, Carmel, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.
Filed Jan. 15, 1992, Ser. No. 822,023
Int. Cl.[5] F16L *5/00*
U.S. Cl. 137—359 4 Claims

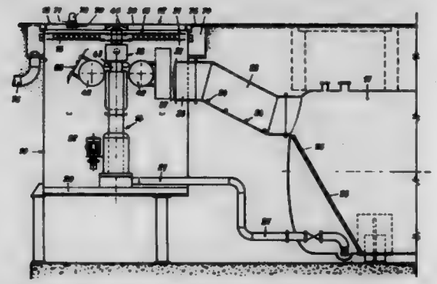


1. A plastic spacer for rigidly securing plumbing pipe to the hidden or back side of a wall in combination with an escutcheon disposed on the front or exposed side of said wall comprising a back portion comprised of a generally C-shaped clamping section adapted to snap-fit over a plumbing pipe and a front portion comprised of an abutting section containing a generally flat face adapted to abut against the hidden surface of said wall.

5,195,554
SHIELDED ASSEMBLY FOR THE DELIVERY OF FUEL ENTIRELY DISAPPEARING INTO THE GROUND AND DIRECTLY CONNECTED TO THE FUEL TANK THROUGH A MANHOLE
Catore Gaetano, Casella Postale 72, 00040 Montecompatri, Italy
PCT No. PCT/IT90/00059, § 371 Date Jan. 2, 1992, § 102(e) Date Jan. 2, 1992, PCT Pub. No. WO91/00214, PCT Pub. Date Jan. 10, 1991
PCT Filed Jul. 3, 1990, Ser. No. 793,388
Claims priority, application Italy, Jul. 4, 1989, 48159 A/89
Int. Cl.[5] B65H *75/34;* F16L *5/00*
U.S. Cl. 137—355.19 7 Claims

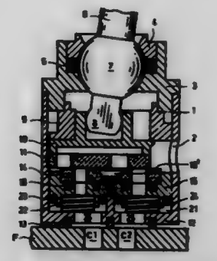
1. A shielded assembly for the delivery of fuel, entirely disappearing into the ground and adapted to be used as gasoline pump delivering fuel from a suitable supply source as a supply tank (11), in civil, in particular military, airports and heliports, bus stations, garages, gas stations, said assembly comprising a gasoline pump provided with the components

and accessories usually needed for the refuelling according to the rule meeting the requirements for refuelling military vehicles, such as pumping, filtering and metering members including a refuelling hose (16) and a reel (15) therefor, and vertically displaceable between an operative position and a concealed, shielded rest position in which it is entirely received in a casing (10) buried in the ground and closed by a rugged armoured tamper-free plate (30), the vertical movements of the displaceable pump being controlled by a hydraulic cylinder and piston



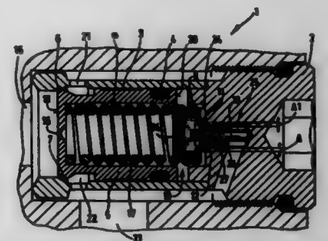
assembly (14) coaxial with the telescopic pipes supplying the gasoline pump with the fuel of the tank (11), under control of a motor (22) operated by control means actuated from the outside of said armoured plate, characterized in that said armoured plate (30) has a central opening (45) closed by a plug (46) which is raised and opened by the upper end (47) of said telescopic piston (43) of said raising assembly (14) during the initial step of the raising stroke and closed at the end of the lowering stroke, to allow any gas developed within the assembly to escape therefrom.

5,195,555
CARTRIDGE FOR MIXER VALVE HAVING AN INTERNAL BOTTOM WITH HYDRAULIC EFFECT
Francesco Knapp, Via Brigata Pavia 10, I-27100 Pavia, Italy
Filed Nov. 6, 1991, Ser. No. 788,472
Claims priority, application Italy, Nov. 16, 1990, 67894 A/90
Int. Cl.[5] F16K *11/06, 25/00*
U.S. Cl. 137—454.6 9 Claims



1. In a cartridge intended to be inserted into a body chamber of a hydraulic mixer valve for hot and cold water, said chamber having a bottom, said cartridge comprising a cage, seal means for acting against said bottom of the valve body chamber, a fixed plate of hard material mounted in operatively fixed position in said cage, at least one movable plate of hard material mounted in operatively controllable position in said cage and contacting a surface of said fixed plate, said fixed and movable plates having mutually cooperating controllable position in said cage and contacting a surface of said fixed plate, said fixed and movable plates having mutually cooperating conformations intended to control the flow rate delivered by the valve and the mixing ratio between hot and cold water, and operating means intended to effect the displacement of said movable plate for executing the controls,
the improvement that said cartridge cage comprises an operatively fixed bottom having at the outside seal means that seal between said cartridge fixed bottom and said bottom of the valve body chamber as a consequence of the tightening of the cartridge within said chamber, said fixed bottom having at the inside coupling means, and the cartridge including coupling means operatively solid with said fixed plate of the cartridge, complementary to said coupling means of the fixed bottom and co-operating therewith; that said fixed plate is mounted within said cartridge cage with a possibility of displacement along a direction perpendicular to its surface contacting said movable plate; and that the cartridge comprises pressure means for applying to the fixed plate a contact pressure against the movable plate, said pressure means operating at least in part under hydraulic pressure of water in said coupling means.

5,195,556
PRESSURE RELIEF VALVE
Rolf Fassbender, Mutlangen, Fed. Rep. of Germany, assignor to ZF Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany
Filed Jun. 5, 1992, Ser. No. 894,590
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1991, 4118932
Int. Cl.[5] G05D *16/04*
U.S. Cl. 137—491 4 Claims



1. In a precontrolled pressure relief valve including a relief piston (5) acting as a pressure regulator that is sealed off against a valve seat (7), the relief piston (5) having a pressure-regulating aperture (16) leading from a connector (15) into its interior chamber (17), a pilot valve (10) comprising a precontrol piston (11) and a seat valve and loaded with a spring, the pilot valve having an inlet (24) that is connected with the interior chamber (17) of the relief piston (5), a locking spring (8) for pressing the relief piston (5) against the valve seat (7), and a plunger (13) located in sealing relation in the precontrol piston and resting against a housing for reducing a surface of the precontrol piston that acts in the closing direction, the precontrol piston (11) connecting the interior chamber (17) with a drilled hole (25) connected with an outlet and the relief piston (5) having a front surfaces (18 and 20) of different sizes,
the improvement which comprises
the pressure-regulating aperture in the relief piston (5) comprises an aperture (16) constructed so that the pressure drop thereacross is independent of the viscosity of the fluid being controlled, and the precontrol piston (11) includes pressure regulating means (27) constructed so that the pressure drop thereacross is dependent upon the viscosity of the fluid being controlled, said pressure regulating means comprising a bushing shaped extension (26) of said precontrol piston arranged coaxial with and spaced from the plunger (13).

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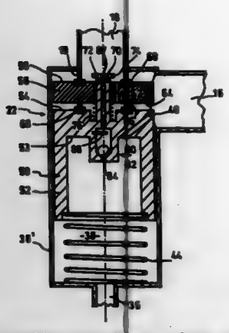
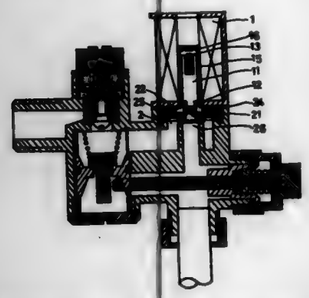
5,195,557
VALVE WITH A CONTROL CHAMBER AND WITH CONTROLLED CLOSING
Jacques Fournier, Bretigny S/Orge, France, assignor to Schlumberger Industries, Paris, France
Filed Apr. 2, 1992, Ser. No. 862,327
Claims priority, application France, Apr. 4, 1991, 91 04096
Int. Cl.[5] F16K *39/02, 31/122*
U.S. Cl. 137—509 6 Claims



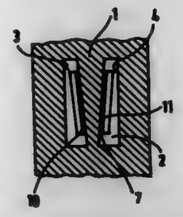
1. A valve assembly comprising a piston assembly with a first face located in a control chamber receiving a control pressure and a second face adapted to cooperate with a fixed seat to interrupt the flow of a fluid between an inlet duct and an outlet duct, wherein said piston assembly comprises a first piston having a first and a second face mounted to slide in the control chamber and a second piston having a first face which cooperates with said fixed seat around said outlet pipe and a second face which faces the second face of the first piston, said second piston including a through channel opening out to face said outlet pipe, and wherein said piston assembly further comprises means on said first and second pistons to provide sealing between said pistons when they are applied one against the other, means to effect displacement of the first piston and not of the second piston during the application of the high pressure in the inlet duct, and means to separate the second piston from the seat when said first piston has been displaced a predetermined distance under the effect of the application of the high pressure.

5,195,558
AUTOMATIC/MANUAL DOUBLE-FUNCTION URINAL FLUSH VALVE
Wen Liang, 3 Fl., No. 22, Lane 301, Sec. 3, Duh Duh Road, Peitou Dist., Taipei, Taiwan
Filed Jul. 6, 1992, Ser. No. 908,328
Int. Cl.[5] E03D *13/00, 5/10*
U.S. Cl. 137—549 1 Claim



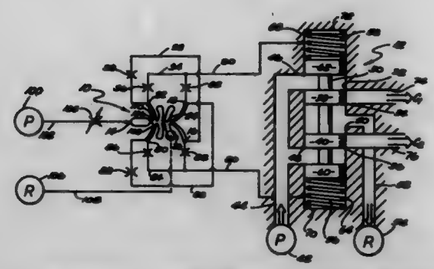
1. An automatic/manual double-function urinal flush valve comprising a water intake port controlled by a water flow rate regulator, a water discharge port through which water is discharged to flush a urinal, a first water passage port having one end connected to said water intake port and an opposite end connected to said water discharge port, a diaphragm stopped by an electromagnetic valve controlled reciprocating rod to seal said first water passage port, a second water passage port having one end connected to said water intake port and an opposite end connected to said water discharge port, a manual flush control assembly controlled by a manual control knob to seal said second water passage port, said manual flush control assembly comprising a valve seat locked inside said second water passage port by a locknut and externally sealed with a water seal ring, an oscillating rod attached with a water seal cushion and supported by a spring to seal a gap through said valve seat, and a wire gauze filter to filtrate impurities from water passing therethrough, said manual control knob being comprised of a press rod inserted through a hole on a guide fastened in place by a locknut and supported on a spring and sealed inside the urinal flush valve by water seal means with a head thereof extended out of the urinal flush valve, pressing on the head of said press rod causing said oscillating rod to open the gap on said valve seat permitting a flow of water to pass through said second water passage port toward said water discharge port for flushing the urinal.

5,195,559
ROTARY SLIDE VALVE FOR AUXILIARY-POWER STEERING DEVICES FOR MOTOR VEHICLES
Werner Breitweg, and Rainer Schiezel, both c/o Zahnradfabrik Friedrichshafen AG, Postfach 25 20, D-7990 Friedrichshafen 1, Fed. Rep. of Germany
PCT No. PCT/EP89/01056, § 371 Date Feb. 21, 1991, § 102(e) Date Feb. 21, 1991, PCT Pub. No. WO90/03295, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 12, 1989, Ser. No. 654,616
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831728
Int. Cl.[5] B62D *5/083*
U.S. Cl. 137—625.23 8 Claims



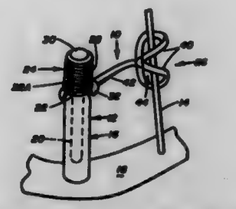
1. In a rotary valve for auxiliary-power steering devices for motor vehicles including a control sleeve (1) having a rotary member (2) arranged therein, the sleeve and member having opposed cylindrical surfaces containing a plurality of longitudinal grooves (3, 4, 7, 8) which cooperate to direct a pressure agent from a pressure source to a servomotor, the opposed cylindrical surfaces having guide edges (5, 6, 10, 11) along the grooves, the opposed guide edges of the sleeve and member being arranged parallel to each other,
the improvement which comprises
the guide edges of the longitudinal grooves of the rotary member are connected with the pressure source and are arranged obliquely to each other at the same angle with respect to a longitudinal axis of the valve.

5,195,560
ADJUSTABLE LOW FREQUENCY HYDROFLUIDIC OSCILLATOR
Muchlis Achmad, 27565 N. Artine Dr., Santa Clarita, Calif. 93150
Filed Apr. 27, 1992, Ser. No. 874,248
Int. Cl.[5] F15C *3/04*
U.S. Cl. 137—826 11 Claims



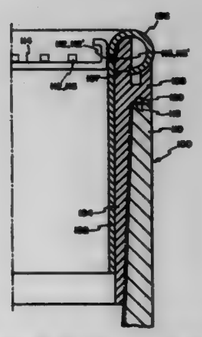
1. An adjustable low frequency hydrofluidic oscillator comprising:
A. Reciprocal valve means (12) for providing discrete output fluid pulses (112–114) responsive to application of fluid pressure signals thereto and including chamber means (56–58) within which said fluid pressure signals are received;
B. Momentum exchange fluidic amplifier means (10) having an interaction chamber (24) defining an input (14), first (20) and second (22) control, and first (16) and second (18) output ports; and
C. Passageway means (80, 84, 98 and 90, 94, 88) coupling each of said output ports (16–18) to each of said control ports (20–22) and to said chamber means (56–58) for providing simultaneously a fluid pressure signal to said chamber means (56–58) and a positive and negative feedback signal to said first (20) and second (22) control ports respectively.

5,195,561
TETHERED COVER DEVICE FOR A PNEUMATIC TIRE VALVE
Scott A. Wilson, 1218 Alexandria, Lafayette, Colo. 80026
Filed Nov. 8, 1991, Ser. No. 791,473
Int. Cl.[5] F16L *55/10*
U.S. Cl. 138—89.2 18 Claims



17. A cover device for protecting an end of a valve of a pneumatic tire, comprises:
(a) a hollow cap made solely of semi-flexible semi-rigid materia and having an annular sidewall open at one end and being configured to be releasably force-fitted over an end of a tire valve to protect the valve end; and
(b) an elongated flexible retaining member made solely of the same semi-flexible semi-rigid material as said cap and being a single elongated strip including an inner portion integrally attached at one end to said open end of said cap and having a row of spaced openings defined therethrough and an outer portion integrally attached to an opposite end of said inner portion and having at least one enlarged head integrally formed thereon being larger in cross-sectional size than each of said openings defined in said inner portion to permit said head to be forceably inserted through and withdrawn from a selected one of said openings for firmly securing said retaining member about either one of a tire spoke or tire valve, said single elongated strip thereby being bendable to encircle and attach to either the tire spoke or tire valve in order to tether said cap such that when said cap is removed from the valve end it will be suspended in space adjacent the valve end by said retaining member.

5,195,562
PIPE-END PROTECTOR
Wilfried Dreyfuss, Elmke, Fed. Rep. of Germany; Thomas E. Remp, Houston, Tex., and Kurt Müller, Eicklingen, Fed. Rep. of Germany, assignors to Drilltec Patents & Technologies Co., Houston, Tex.
Division of Ser. No. 212,795, Jun. 29, 1988, Pat. No. 4,957,141. This application May 31, 1990, Ser. No. 531,107
Int. Cl.[5] B65D *59/06*
U.S. Cl. 138—96 T 6 Claims



1. A protector for the threads of a pipe-end, comprising:
a) a tubular member including a longitudinal portion and a curved end portion bent outwardly substantially 270°, said curved end portion including an edge disposed a distance away from said longitudinal portion;
b) an elastomeric sleeve disposed co-axially and substantially co-extensively outside of said tubular member, said sleeve being adapted to engage the threads of a pipe-end;
c) said sleeve including an end portion disposed between said edge and said longitudinal portion, said edge clamping said sleeve end portion against said longitudinal portion, thereby securing said sleeve to said tubular member;
d) said sleeve including a radially extending annular flange disposed outside said curved end portion for engaging an end portion of the pipe-end; and
e) an elastic lid removably secured to said tubular member adjacent said curved end portion.

5,195,563
FLEXIBLE HOSE AND FITTINGS
David A. Brooks, Transvaal, South Africa, assignor to Oakleigh Limited c/o Havelet Trust Company International Limited, St Peter Port, Channel Islands
Division of Ser. No. 271,539, Nov. 15, 1988, abandoned. This application Jan. 9, 1992, Ser. No. 818,291
Int. Cl.[5] F16L *57/00;* E04H *3/20*
U.S. Cl. 138—103 11 Claims

1. For use in a swimming pool, a hose assembly comprising: an elongated resiliently flexible hose having alternating relatively long ribbed portions and relatively short

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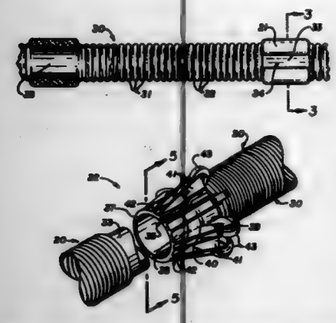
smooth portions with respect to each other along the longitudinal length thereof, each of the ribbed portions comprising a series of alternating ribs and grooves extending around the circumference of the hose and each of the smooth portions having an outer diameter substantially smaller than the outer diameter of the ribs of the ribbed portions;

at least one attachment removeably mounted on said hose around one of said smooth portions in a position longitudinally between an adjacent pair of said ribbed portions, said attachment having a generally hollow cylindrical body having a length no longer than the length of said one of



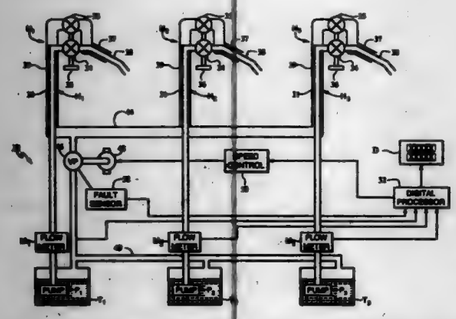
said smooth portions and being divided longitudinally along one side to form a slot extending the full length of the body, said body having an inside diameter smaller than the outer diameter of the ribs of said adjacent pair of said ribbed portions so that the ribs of said adjacent pair of ribbed portions longitudinally retain the attachment on the hose about said one of said smooth portions, said body being composed of resiliently flexible material to permit opening of said slot for assembly of the attachment on the hose; and said body being a non-buoyant sleeve having a plurality of outwardly projecting fin members each having a wheel rotatably mounted thereon.

5,195,564

GASOLINE DISPENSER WITH VAPOR RECOVERY SYSTEM

Robert G. Spalding, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 30, 1991, Ser. No. 693,549
Int. Cl.[5] B65B *1/04, 31/00*
U.S. Cl. 141—1 **8 Claims**



1. A dispensing system for dispensing volatile liquids such as hydrocarbon fluids for vehicles while collecting the vapors to reduce atmospheric pollution comprising:

a plurality of liquid dispensing means, each dispensing means including;

a hand-held nozzle and liquid valve means disposed at the end of a flexible hose for flowing liquid into the fuel tank of a vehicle under the control of an operator,

vapor collection means including:

a vapor intake means positioned to be closely adjacent, but not sealed with, the fuel tank; including a normally closed vapor valve associated with each hand-held nozzle and operable in response to opening of the respective liquid valve of the respective nozzle for collecting vapors displaced from the fuel tank as the liquid is flowed through the liquid valve into the tank at a variable, controlled rate,

vapor suction means including a vapor pump driven by an electrical motor and coupled to draw vapors from all of the plurality of vapor intakes associated with the plurality of liquid dispensing means, and delivering the vapor to vapor storage means,

a plurality of flow meter means each for producing a first electrical signal representative of the rate of flow of liquid being dispensed from one of the respective nozzles; and

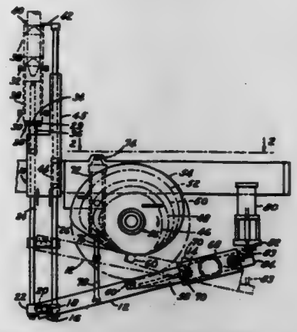
digital processing means for receiving each of the first electrical signals and operating the vapor collection means at a controlled rate to pump vapors through the vapor intake at a volumetric rate having a predetermined relationship to the volumetric rate at which liquid is being flowed from the nozzles whereby substantially all fuel vapor and will be delivered to the vapor storage means.

5,195,565

VARIABLE STROKE LIFTER SYSTEM

Barry C. Owen, Southfield, and Timothy H. Drury, Howell, both of Mich., assignors to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Oct. 11, 1991, Ser. No. 775,005
Int. Cl.[5] B65B *43/50*
U.S. Cl. 141—148 **9 Claims**



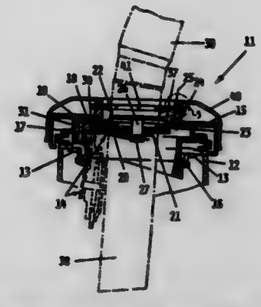
1. In a lifting system adapted to lifting different size containers from a holding device for bottom-up filling thereof by a filler nozzle, said system including pivotally mounted lift arm means for lifting said containers, pivotally and slidably mounted slide arm means operatively connected to said lift arm means for turning therewith, laterally fixed, rotatably mounted camming means having differing camming profiles, cam follower means mounted on said slide arm means, and actuator means for laterally moving said slide arm means with respect to said camming means to thereby reposition said cam follower means adjacent a different selected camming profile, characterized in that said lift arm means is laterally fixed and that said actuator means serves to move said slide arm means laterally with respect to said lift arm means.

5,195,566

CAP FOR THE FILLER NECK OF LIQUID CONTAINERS

Siegfried Ott, Traunstein-Hufschlag, Fed. Rep. of Germany, and Friedrich Wimmer, Schalchen, Austria, assignors to Mecrom Ott & Holey OHG, Hufschlag, Fed. Rep. of Germany

Filed May 1, 1991, Ser. No. 694,398
Int. Cl.[5] B65B *31/00*
U.S. Cl. 141—312 **8 Claims**



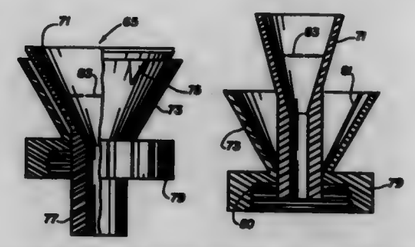
1. A self-closing cap for the filler neck of a liquid container, comprising a closure ring being detachably mountable to said filler neck and having an orifice for receiving a nozzle that discharges a pressurized stream of liquid and a spring-biased closure flap pivotally mounted to said closure ring such that said closure flap is located within said orifice when the closure flap is in a first position and the closure flap is located outside the orifice in a second position when the spring bias is overcome by insertion of the nozzle through the orifice and being provided with a seal for sealingly engaging said orifice until said spring-bias is overcome, and a gasket having an outer edge mounted around and above said orifice, and an inner edge that defines an aperture about the same size or slightly smaller in cross-section than said nozzle for obstructing droplets of atomized liquid from being discharged out of said orifice when said nozzle discharges a pressurized stream of liquid into said container, said gasket forming only on incomplete seal between said nozzle and said orifice for defining an opening for conducting air and vaporized liquid displaced out of the liquid container out of the orifice.

5,195,567

FILLER FOR SMALL TANKS OR THE LIKE

Lewis Tyree, Jr., Mulberry Hill, Liberty Hall Rd., Lexington, Va. 24450

Continuation-in-part of Ser. No. 514,295, Apr. 25, 1990, Pat. No. 5,074,343. This application Dec. 23, 1991, Ser. No. 813,125
Int. Cl.[5] B67C *11/00*
U.S. Cl. 141—331 **14 Claims**



1. A filling unit to prevent overfilling of a container having an upstanding generally tubular inlet which container inlet is normally closed by attaching a closure thereto, which filling unit comprises

(a) holder means for engaging said tubular container inlet to seal therewith,

(b) funnel means of noncircular cross section for receiving liquid and leading to an always open depending passageway into said container,

(c) displacer means integral with the lower end of said funnel means and extending into said container through said tubular inlet when installed, said displacer means being circular in exterior cross section and displacing a predetermined amount of liquid in the container so that, when said container is filled with liquid with said displacer in a lower position such that liquid extends upward to a predetermined level in said funnel means, said displaced predetermined amount is sufficient so that the volume of liquid occupying said funnel means up to said predetermined level can be accommodated in said container with said displacer in a raised position, and

(d) said holder means having a circular opening proportioned to slidably receive said circular cross section displacer means,

whereby filling may be carried out so that the liquid level extends above the upper end of said container inlet to a visible location within said funnel means, and

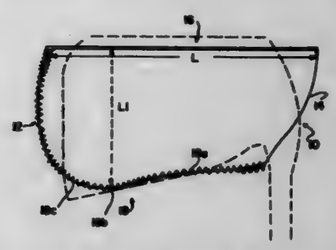
whereby upward vertical sliding and rotation of said funnel means within said holder means substantially removes said displacer means from within the container and engagement between said noncircular cross section funnel means and said holder means supports said funnel means in said raised position and permits all the liquid previously remaining in said funnel means up to said predetermined level to be accommodated in said container.

5,195,568

NEOPRENE IRON COVERS

Dominick Cirone, 5441 E. Angela Dr., Scottsdale, Ariz. 85254

Continuation of Ser. No. 735,915, Jul. 25, 1991, Pat. No. 5,105,863. This application Jan. 24, 1992, Ser. No. 826,478
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[5] A63B *57/00*
U.S. Cl. 150—160 **13 Claims**



1. A cover for the head of the golf club iron, comprising elastic rubber material shaped in the form of an elongated casing and defining an opening, said opening having a width less than the maximum width of the golf club iron head to be covered, wherein said cover comprises a piece of neoprene material folded along a first edge and stitched along a second edge opposing said first edge and further comprising a closed end between said first edge and said second edge, wherein said closed end is also stitched, said casing including means for allowing said cover to fit snugly over said golf club iron head along its entire length.

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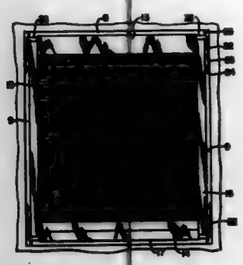
5,195,569
CLOSED LOOP CONTROL SYSTEM FOR SHADE ASSEMBLY
James E. Peterson, Denver, and Robert W. Collett, Arvada, both of Colo., assignors to Daylighting, Inc., Denver, Colo.
Division of Ser. No. 37,716, Apr. 13, 1987, Pat. No. 4,852,627.
This application May 26, 1989, Ser. No. 357,638
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—94.1 1 Claim



1. In a shade assembly for removable installation within an opening in the wall of a building structure wherein the opening is defined by a generally rectangular frame having spaced parallel frame members, and the shade assembly is dimensioned for close-fitting relation within the opening of the building structure with spaced parallel frame portions disposed in closely spaced, confronting relation to each of the respective spaced parallel frame members defining the opening, the improvement comprising:

at least one mounting bracket fastened to one of the confronting surfaces between each of the respective frame portions and frame members, the other of said respective frame portions and frame members having a notched portion alignable with each said mounting bracket, each said mounting bracket including a spring element biased for extension away from the confronting surface to which it is attached toward the other confronting surface for releasable insertion into a notched portion of the other confronting surface, each of said spring elements defined by a leaf spring angled in a direction away from said one confronting surface toward the other confronting surface, said spring elements yieldable in a direction normal to the other confronting surface for movement into and away from a respective notched portion but non-yieldable in a direction parallel to the other confronting surface.

5,195,570
BRACKET FOR WINDOW COVERING ASSEMBLY
Norbert Marocco, 46 Pennycross Ct., Woodbridge, Ontario, Canada L4L 3M6
Filed May 14, 1992, Ser. No. 883,275
Int. Cl.[5] A47H *1/14*
U.S. Cl. 160—178.1 3 Claims

1. A support bracket apparatus for use in association with a window covering device having a head rail, said head rail having forward and rear edge portions, said support bracket apparatus being adapted to be spaced apart from one another a predetermined distance along said head rail, and said support bracket apparatus comprising:

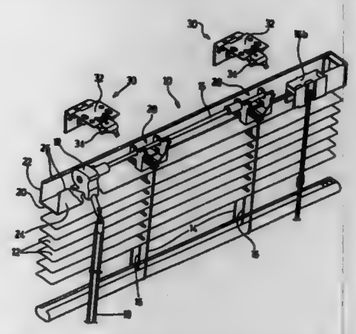
a generally horizontal body portion defining forward and rear edges;

attachment means for securing said body portion to a building fabric;

forward engagement means formed on said body member, and engageable with a forward edge of said head rail said forward engagement means having a forwardly extending hook portion formed integrally with said generally horizontally body portion, and defining a hook like shape in section, open upwardly, to receive a forward edge portion of said head rail;

a generally planar clamp member slideably supported by said body member and slideable between respective forward and rearward positions;

downwardly dependent rearwardly facing clamping hook means on said clamp member adjacent a rearward end thereof interengageable with said rearward edge portion of said head rail, when said clamp member is moved rearwardly said hook means having an angled ramp surface, whereby progressive rearward movement of said clamp member increases the clamping force on said head rail;

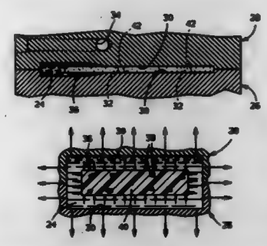


opening means in said body portion for receiving said clamp member, whereby the same may be slid to and fro relative to the said body portion for clamping engagement as aforesaid;

manually engageable means adjacent a forward edge of said clamp member whereby the same may be manually operated to and fro, and,

interlock means interengageable between said clamp member and said body member, whereby to hold the same locked in said rearward position.

5,195,571
METHOD OF DIE CAST MOLDING METAL TO FIBER REINFORCED FIBER PLASTIC
Mark R. Morgan, Dayton, and Johnny R. Gentry, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 25, 1991, Ser. No. 660,202
Int. Cl.[5] B22D *19/04, 19/14*
U.S. Cl. 164—98 3 Claims



1. A method of manufacturing a structural component having a fiber reinforced plastic main body and a metal member on said body, comprising the steps of,

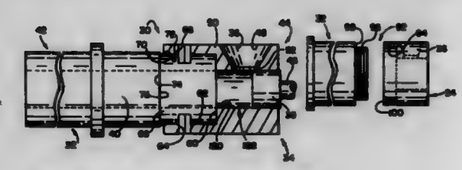
providing said main body comprised of a matrix of substantially continuous reinforcing fibers having a heat resistance greater than the melting point of said metal, said fibers further being bound together by a resin that has

significantly less resistance to heat decomposition than said fibers,

introducing said metal in a molten state to a surface portion of said main body so as to establish a direct contact interface therewith, and,

cooling said metal to a sufficient degree and for a sufficient time such that the molten metal solidifies to form said member while simultaneously decomposing sufficient resin at said direct interface interface to expose a layer of reinforcing fibers around which some molten metal may flow to interlock with said exposed fibers and thereby create a secure interconnection.

5,195,572
TWO PART SHOT SLEEVE FOR DIE CASTING
Henry Linden, Jr.; Bobby J. Smith, both of Grafton; Barry F. Bronson, Mentor, and Dennis J. Sobol, Cleveland, all of Ohio, assignors to Rex-Buckeye Company, Inc., Cleveland, Ohio
Continuation of Ser. No. 607,593, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 378,064, Jul. 11, 1989, abandoned. This application Nov. 21, 1991, Ser. No. 799,674
Int. Cl.[5] B22D *17/08, 17/30*
U.S. Cl. 164—312 11 Claims



10. A die casting machine comprising:

a die;

a source of molten liquid for casting;

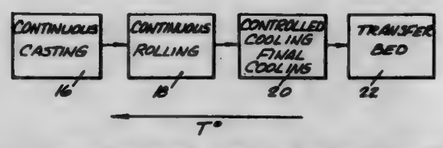
a two-piece shot sleeve including a die end section and a pour end section, each section being of a single-piece homogeneous construction and including an interior passage means for contact with molten liquid and for the flow of molten liquid therethrough and each section being transversely securable together in axial series;

a plunger disposed within said interior passage means for forcing such molten liquid through such interior passage means in series and into said die; and,

a ram for moving said plunger axially within said shot sleeve;

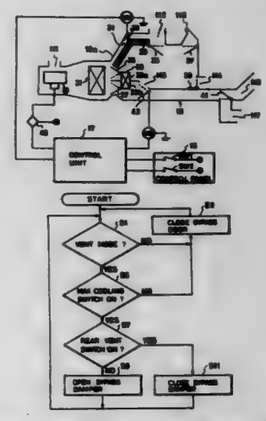
wherein said pour end section of said two-piece shot sleeve is removable from said machine without removing said die end section.

5,195,573
CONTINUOUS RAIL PRODUCTION
Robert L. Cryderman, and John C. Winkley, both of Pueblo, Colo., assignors to CF&I Steel Corporation, Pueblo, Colo.
Division of Ser. No. 444,789, Dec. 1, 1989, Pat. No. 5,018,666.
This application Oct. 15, 1990, Ser. No. 568,552
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—476 9 Claims



1. A method for manufacturing a railroad rail at least 500 feet long and free of welds, comprising: forming a bloom by continuously casting, reheating said bloom to a temperature that is consistent along its length and maintaining said temperature so that the first rolling station rolls the bloom at a constant temperature along its length, and continuously rolling said bloom in a single direction with a plurality of in-line rolling stations to form said rail.

5,195,574
AUTOMOBILE AIR CONDITIONING SYSTEM
Kazumasa Tanaka, Isehara, and Joji Shimizu, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 28, 1991, Ser. No. 750,946
Claims priority, application Japan, Sep. 17, 1990, 2-243908
Int. Cl.[5] F25B *29/00*; B60H *3/00*; B61D *27/00*
U.S. Cl. 165—22 8 Claims



1. An automobile air conditioning system for supplying conditioned air to a passenger compartment of an automobile, comprising:

cooling means for cooling an incoming flow of air;

heating means for heating incoming air from said cooling means to a predetermined temperature;

front and rear vent means for discharging air to front and rear sections of the passenger compartment, respectively, said front vent means having a front vent nozzle;

single mode selector means for expelling temperature conditioned air out only said front vent means;

dual mode selector means for expelling temperature conditioned air out both said front and rear vent means;

bypass means for directly leading air from said cooling means to said front vent nozzle; and

control means for opening said bypass means when both a single mode is selected by said single mode selector means and a maximum cooling mode is selected, and for closing said bypass means when a dual mode is selected by said dual mode selector means.

5,195,575
PASSIVE THREE-PHASE HEAT TUBE FOR THE PROTECTION OF APPARATUS FROM EXCEEDING MAXIMUM OR MINIMUM SAFE WORKING TEMPERATURES
Roger Wylie, Wylie Engineering & Construction 5907 Bayway Dr. Bay Suite, Baytown, Tex. 77520
Filed Apr. 9, 1991, Ser. No. 682,319
Int. Cl.[5] F28D *15/02*
U.S. Cl. 165—132 26 Claims

1. A heat transfer apparatus for transferring heat from a hot region to a colder region comprising

a heat pipe comprising a tube closed at both ends with one

said base portion E_1 toward said end portion E_2, the ratio

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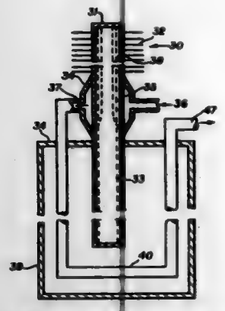
end positioned in said hot region and the other end positioned in said colder region,

heat exchange means positioned on he outside of said tube on said other end for transferring heat therefrom,

a heat transfer fluid at said one end of said tube operable to be vaporized by heat from said hot region and the vaporized fluid flowing to said other end of said tube to be condensed to a liquid by releasing heat to said colder region,



said condensed liquid flowing back to said one end to continue the process of heat transfer,

said fluid having a melting point below a selected temperature limiting the operation of said apparatus by freezing said condensed liquid adjacent to said other end to prevent further operation when all of said fluid is solidified therein, and

said heat exchange means solidifying said liquid under first predetermined conditions and preventing solidification of said liquid under other predetermined conditions.

5,195,576

LSI COOLING APPARATUS AND COMPUTER COOLING APPARATUS

Toshio Hatada, Tsuchiura; Hiroshi Matsushima, Ibaraki; Yoshihiro Kondou; Hiroshi Inoue, both of Ibaraki; Kanji Otsuka, Higashiyamato; Yuji Shirai, Hodaira; Takao Ohba, and Akira Yamagiwa, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,671

Claims priority, application Japan, Feb. 28, 1990, 2-45413

Int. Cl.[5] F28F *7/00*; H02B *1/56*; H05K *7/20*

U.S. Cl. 165—80.3 **5 Claims**

1. An LSI cooling apparatus for cooling LSIs by flowing a fluid through heat sinks attached to the LSIs, each of said heat sinks comprising a group of a plurality of thin-wire fins,

said group of thin-wire fins being aligned in parallel with each other in a plane and being bent in a corrugated shape,

said group of thin wire fins including a plurality of wide-width members, each of the wide-width members having a cross section of a width wider than a width of the thin-wire fins,

each of said wide-width member being disposed at a predetermined interval from another wide-width member.

5,195,577

COOLING DEVICE FOR POWER SEMICONDUCTOR SWITCHING ELEMENTS

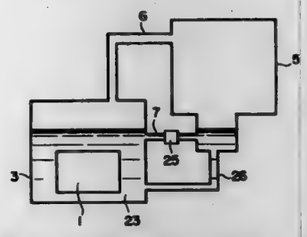
Takashi Kamoda; Nobuyoshi Takahashi; Takeo Yoshioka; Kenichi Meri, and Masahiro Ashiya, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1990, Ser. No. 602,866

Claims priority, application Japan, Oct. 26, 1989, 1-124570; Oct. 31, 1989, 1-126565; Feb. 5, 1990, 2-24438; Mar. 7, 1990, 2-56836; Apr. 20, 1990, 2-106011; Jul. 19, 1990, 2-189602

Int. Cl.[5] F28D *15/02*; H01L *23/427*

U.S. Cl. 165—104.13 **4 Claims**



1. A boiling type cooling device comprising:

an evaporator containing a cooling medium comprising water and an antifreeze liquid for lowering the freezing temperature of the cooling medium;

a condenser for condensing vapor of the cooling medium generated in the evaporator;

a vapor pipe connecting the evaporator to the condenser for transferring vapor of the cooling medium generated in the evaporator to the condenser;

a first connecting pipe connecting the condenser to the evaporator for transporting liquid between the condenser and the evaporator;

a second connecting pipe connecting the condenser to the evaporator for transporting liquid between the condenser and the evaporator; and

driving means for circulating liquid from the condenser to the evaporator and back to the condenser through the first and second connecting pipes, the driving means comprising a magnetically operated pump having an impeller disposed inside the first connecting pipe and magnetic drive means disposed outside the first connecting pipe for driving the impeller by magnetic force through the first connecting pipe.

5,195,578

METHOD OF AND AN APPARATUS FOR TRICKLING FILM HEAT EXCHANGE

Pierre Le Goff, Nancy, and Bertrand Claunade, Lesupdes, both of France, assignors to Pechiney Recherche, Courbevoie, France

Filed Nov. 14, 1990, Ser. No. 612,445

Claims priority, application France, Nov. 14, 1989, 89 15283

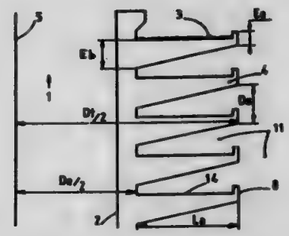
Int. Cl.[5] F28F *1/34*

U.S. Cl. 165—115 **36 Claims**

1. An apparatus for heat exchange, comprising:

a substantially vertical tube of circular cross-section having a greatest outside diameter D_e between 1 mm and 1,000 mm, an outer surface, and an interior adapted for circulation of a first fluid; and

provided on said outer surface, a pseudo-helically shaped solid fin of heat-conductive material continuously inclined with respect to the horizontal, said fin having a width L_e, a base portion E_b at which said fin is in thermal contact with said tube, and an opposite end portion E_e, the thickness of said fin generally decreasing in the direction from said base portion E_b toward said end portion E_e, the ratio L_e/E_b being between about 0.5 and 3.5,



said fin forming at least part of a channel for gravity flow of a second liquid in a thin layer therein.

5,195,579

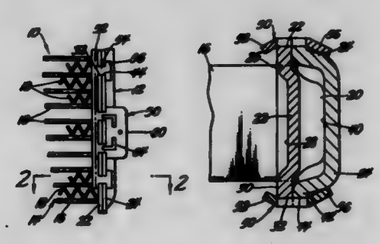
INTEGRAL TAB LOCK AND BRACKET ASSEMBLY FOR HEADERED TUBE CONDENSER

William J. Buchanan, Olcott, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1992, Ser. No. 916,456

Int. Cl.[5] F28D *1/053*; F28F *9/02*

U.S. Cl. 165—149 **2 Claims**



1. In a locking heat exchanger apparatus a pair of longitudinal tank units supporting a core therebetween, each tank unit providing a fluid chamber formed by separate headers and tanks, the core having a plurality of parallel flow tube passes extending between the tank units and including air centers therebetween each of the headers and tanks including longitudinal flanges extending longitudinally along a perimeter for providing complementing abutting surfaces along the perimeter to seal the tank unit during brazing thereof, the tanks and headers providing a tank width established between the flanges across the fluid chamber, the improvement comprising:

said longitudinal flanges of the tank and header each including spaced, aligned notches therein;

locking means extending within said aligned notches of said flanges of the tank and header for securement about said longitudinal flanges to maintain said header against said tank.

5,195,580

HEAT EXCHANGER SEAM AND METHOD OF MAKING SAME

Russell W. Hoeffken, Belleville, Ill., assignor to Eberhardt Tool and Machine Co., Inc., St. Louis, Mo.

Filed Feb. 11, 1992, Ser. No. 834,887

Int. Cl.[5] F28F *3/12*

U.S. Cl. 165—170 **3 Claims**

1. A heat exchanger cell for a furnace, the cell comprising:

a first cell division having a generally concave configuration;

a second cell division having a generally concave configuration;

the first cell division being positioned adjacent the second cell division and the first and second cell divisions being joined by a rigid seam, the seam extending around at least a portion of a circumference of the first and second cell divisions, the seam having a terminal edge;

a crease formed in the seam joining the first and second cell divisions, the crease being spaced form the terminal edge of the seam and dividing the seam into first and second sections the first seam section being substantially planar and the second seam section being substantially planar and positioned at an angle relative to the first seam section; and,

a plurality of indentations formed in the seam, the plurality of indentations being specially arranged along the seam and each indentation of the plurality of being spaced from the terminal edge of the seam and having a configuration of a groove traversing the crease formed in the seam, the groove having a generally V-shaped configuration with opposed planes that intersect along a line separating the opposed planes, the opposed planes ad their line of intersection extending transverse to the crease formed in the seam, and the line of intersection having opposite terminal ends with one terminal end being formed in the first section of the seam and the other terminal end being formed in the second section of the seam.

3. A method of constructing a heat exchanger cell from complementary first and second cell divisions, the first cell division having a first rim extending around at least a portion of a circumference of the first cell division and the second cell division having a second rim extending around at least a portion of a circumference of the second cell division, the method comprising:

positioning the first cell division adjacent the second cell division with the first rim being adjacent and coextensive with the second rim;

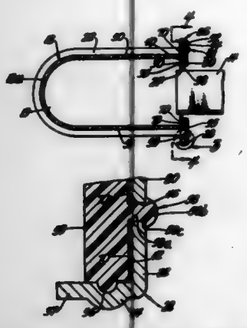
folding the second rim over the first rim overlapping opposite sides of the first rim with the second rim and thereby forming a rigid seam joining the first and second rims, the seam having a terminal edge;

forming a crease in the seam spaced from the terminal edge, the crease being coextensive with the first and second rims and dividing the seam into first and second sections with the first and second sections being positioned at an angle relative to each other; and,

forming a plurality of indentations in the seam spaced for the terminal edge of the seam and spatially arranged along the seam, each indentation being formed in a configuration of a generally V-shaped groove with opposed plane intersecting along a line, the opposed planes and their line of intersection traversing the crease formed in the seam, and forming the line of intersection with opposite terminal ends in the first section of the seam end the second section of the seam.

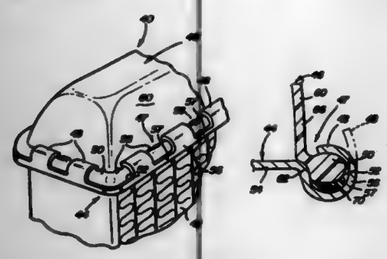
VOL 1148 ISS 4 MR 23 1993 U.M.I

5,195,581
SNAP ON RADIATOR TANK
Girish K. Punstambekar, and Karl P. Krotsch, both of Williamsville, N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed May 15, 1992, Ser. No. 883,743
Int. Cl.[5] F28F 9/04; B32B 7/12
U.S. Cl. 165—173 4 Claims



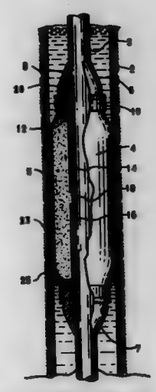
1. A tank and header assembly for a heat exchanger of the type having a pair of tank units with a plurality of tubes and air centers connected therebetween for communicating fluid through the tank units and tubes to conductively cool the fluid passing therethrough as air is passed over the air centers, said assembly comprising:
a separate tank member and header;
said header including a body portion having first and second sides and apertures therein to receive the tubes, said first and second sides each including a cavity having a side wall and a base perpendicular to one another, said cavity including a plurality of pairs of first and second retaining members spaced along said first and second sides;
said tank including a pair of flanges extending therefrom, said flanges including a plurality of pairs of first and second snap members for coacting with said pairs of retaining members to retain said tank against said header.

5,195,582
SEALING JUNCTION FOR A HEAT EXCHANGER
Martin W. Haase, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 21, 1992, Ser. No. 933,273
Int. Cl.[5] F28F 9/04; B23P 11/00
U.S. Cl. 165—173 8 Claims



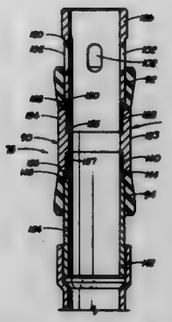
1. A heat exchanger characterized by:
a tank being sealingly secured to a header;
said tank having an outwardly extending foot section with an inner heel section displaced outwardly from an upwardly extending wall of said tank;
said foot section being outwardly displaced from said heel section and having a convexly contoured outer perimeter surface from said heel section;
said outer perimeter surface being smoothly contoured from said heel section to another end connected to said upwardly extending wall and having no corners therebetween; said header having a channel configured to receive the tank foot section and having an outer flange for gripping the foot section, said outer flange being continuously and smoothly curved about said tank foot section outer perimeter surface; and
an annular gasket being mounted in said channel and being compressed between the foot section and said header.

5,195,583
BOREHOLE PACKER
Donald A. Toon, Burlington, and Douglas J. Belshaw, Georgetown, both of Canada, assignors to Solinst Canada Ltd, Glen Williams, Canada
Filed Sep. 25, 1991, Ser. No. 765,246
Claims priority, application United Kingdom, Sep. 27, 1990, 9021059
Int. Cl.[5] E21B 33/127
U.S. Cl. 166—187 13 Claims



1. Borehole packer assembly, wherein:
the assembly includes an inner tube, and an outer tube of elastomeric material that is flexible and stretchable;
the inner and outer tubes are so dimensioned and arranged as to create an elongate annular chamber therebetween;
the annular chamber is elongate in the sense that the chamber is many times longer in its axial extent than in its radial extent;
the assembly includes means for closing off the upper and lower ends of the annular chamber;
the assembly includes a body of expandable packer material, the material being of the kind which expands considerably when wet, and which becomes impermeable when wet;
the body of expandable packer material is located in, and substantially fills, the elongate annular chamber;
the assembly includes an activation port or ports, so disposed as to provide passage between the said chamber and natural groundwater present in the borehole;
the nature and dimensions of the body of expandable packer material are such that a quantity Q of the groundwater is required to be introduced into the body of material in order for the body to expand sufficiently to fully seal off the borehole;
the assembly includes a distribution means, which is effective to distribute the quantity Q of the groundwater received via the port or ports throughout the whole body of expandable packer material;
and the assembly includes a delay means which is effective to delay for a substantial period of time, passage of the full quantity Q of the groundwater from the port or ports, through the distribution means and into the body of expandable packer material.

5,195,584
SEALING APPARATUS FOR REPAIRING BREACHES IN CASING
Albert E. Basinger, Jr., P.O. Box 749, Pawhuska, Okla. 74056
Filed May 21, 1991, Ser. No. 703,810
Int. Cl.[5] E21B 33/124
U.S. Cl. 166—191 3 Claims

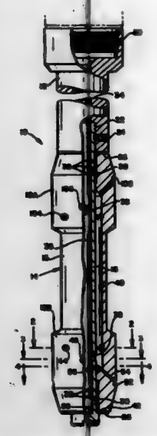


1. A sealing apparatus for repairing a breach of casing integrity in a well bore having a casing affixed therewith and a tubing string extending therethrough, the tubing string made up of tubing sections connected by tubing collars, the sealing apparatus comprising:
casing sleeve means supported on the tubing string for providing an alternate fluid flow route about the tubing string at a defective portion of the casing; and
first and second sealing means for sealing against fluid communication external to the casing sleeve means, each of the first and second sealing means supported at one end of the casing sleeve means and comprising:
a seal support housing having one end portion attachable to the casing sleeve means and an opposing retaining end portion dimensioned to prevent a tubing collar from passing therethrough, the seal support housing having an internal bore through which a tubing section is passable and at least one fluid communication slot disposed a predetermined distance from the retaining end portion so as to provided substantially unrestricted annular fluid flow about the tubing string, the seal support housing comprising:
a first tubular member having a first end portion, a second end portion and a support shoulder, the support shoulder disposed a predetermined distance from the second end portion thereof;
a second tubular member having a first end portion, a second end portion and a support shoulder, the support shoulder disposed a predetermined distance from the first end portion thereof; and
coupling means for coupling the first tubular member to the second tubular member, such that a first annular recess is formed between the support shoulder of the first tubular member and the coupling means and a second annular recess is formed between the support shoulder of the second tubular member and the coupling means, the coupling means comprising:
a coupling member having a first end portion and a second end portion, the first end portion of the coupling member connected to the second end portion of the first tubular member such that fluid communication is provided therebetween, the opposed second end portion of the coupling member connected to the first end portion of the second tubular member such that fluid communication is provided therebetween; and
at least one extension member having a first end portion, a second end portion and an internally disposed bore extending therebetween, the first end portion of the extension member having a support shoulder disposed a predetermined distance from the first end thereof, the opposed second end of the extension member cooperating with the support shoulder of the second tubular member for defining of the second annular recess, the support shoulder of the extension member cooperating with the opposed second end portion of the coupling member to define a third annular recess; and
casing engaging means supported by the seal support housing for providing a seal between the seal support housing and the internal wall of the casing, the casing engaging means comprising:
a first resilient casing engaging member having a first end, an opposed second end and an internally disposed shoulder formed near the first end thereof, the internally disposed shoulder supported within the first annular recess and the opposed second end adapted to supportingly engage the first end portion of the coupling member so that the first resilient casing engaging member is secured in a stable position on the first tubular member;
a second resilient casing engaging member having a first end, an opposed second end and an internally disposed shoulder formed near the opposed second end, the internally disposed shoulder supported within the second annular recess and the opposed second end of the second resilient casing engaging member adapted to supportingly engage the second end portion of the coupling member so that the second resilient casing engaging member is secured in a stable position on the second tubular member; and
a third resilient casing engaging member having a first end, an opposed second end and an internally disposed shoulder formed near the first end thereof, the internally disposed shoulder of the third resilient casing engaging member supported within the third annular recess such that the opposed second end thereof abuttingly engages the second end portion of the coupling member,
wherein the first, second and third resilient casing engaging members are each provided with an internally disposed groove between the opposed second end and the internally disposed shoulder thereof, and wherein the casing engaging means further comprises an O-ring member positionable within the internally disposed groove of the first, second and third resilient casing engaging members.

5,195,585
WIRELINE RETRIEVABLE JET CLEANING TOOL
Jack G. Clemens, Plano; John H. Yenker, Carrollton; Stewart H. Fowler, Plano; Charles C. Cobb, Frisco, and William G. Boyle, Dallas, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.
Filed Jul. 18, 1991, Ser. No. 732,054
Int. Cl.[5] E21B 37/00
U.S. Cl. 166—222 19 Claims

1. A jet cleaning tool for simultaneously cleaning a plurality of longitudinally spaced target areas comprising a stationary, longitudinally extended axle; means for connecting the axle to a support member; a nozzle housing rotatable around the axis inside a well tubular, the nozzle housing comprising at least two longitudinally spaced nozzle sections, each nozzle section having at least one fluid spray nozzle directed against the wall

of the well tubular; and means for providing fluid communication for a pressurized fluid through the axle and nozzle housing

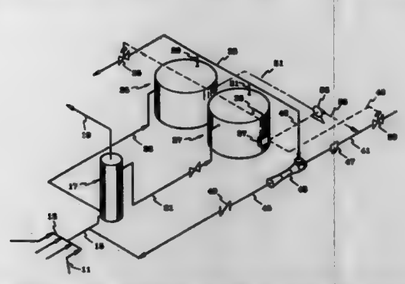


to each fluid spray nozzle in each nozzle section, thereby directing fluid to each target area.

5,195,586
RIGHT-HAND ON AND RIGHT-HAND OFF RETRIEVING HEAD
Louis M. Gambertoglio, The Woodlands, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Mar. 23, 1992, Ser. No. 856,117
Int. Cl.[5] E21B *23/00, 31/00*
U.S. Cl. 166—240 **18 Claims**

1. A connection for use in a wellbore to matingly and releasably engage a workstring to a wellbore tool, said connection comprising:
- a plurality of torque members for transmitting torque from said workstring through said connector to said wellbore tool; and
- a plurality of engagement members for engaging and disengaging said workstring and said wellbore tool in response to, at least in part, a unidirectional rotation of said workstring applied to said connector.

5,195,587
VAPOR RECOVERY SYSTEM
Willis G. Webb, Midland, Tex., assignor to Conoco Inc., Ponca City, Okla.
Filed Mar. 4, 1992, Ser. No. 846,372
Int. Cl.[5] E21B *43/40, 44/00, 47/06*
U.S. Cl. 166—252 **14 Claims**

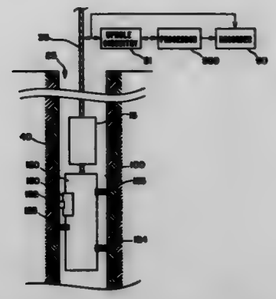


1. In an oil field production facility for collecting hydrocarbon fluids being produced from wells into a facility at the surface wherein produced fluids are initially passed into a production separator where the production fluids are separated into component streams comprised of oil, gas and water for sale or disposal, with the oil and water components being passed into separate storage tanks to await further processing and a gas collection line for passing gas separated from the production fluids, a system for collecting gas vapors from the storage tanks in the facility, comprising;
- vent means on each of the tanks in the system;
- common flowline means in fluid communication with each of said vent means for venting fluids from said tank;
- water flowline means for providing a flow of water under pressure;
- fluid operated jet pump means located in said water flowline and arranged so that said jet pump is operated by the flow of water in said water flowline, said jet pump having a suction inlet for pulling vented fluids into said pump for entrainment into and discharge with the water flowing through said pump; and
- means for providing a fluid communication path between said suction inlet and said common flowline to permit vented fluids to pass into said jet pump suction inlet.

5,195,588
APPARATUS AND METHOD FOR TESTING AND REPAIRING IN A CASED BOREHOLE
Yogesh S. Dave, Stamford, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Jan. 2, 1992, Ser. No. 815,982
Int. Cl.[5] E21B *33/13, 43/11, 49/08*
U.S. Cl. 166—255 **38 Claims**

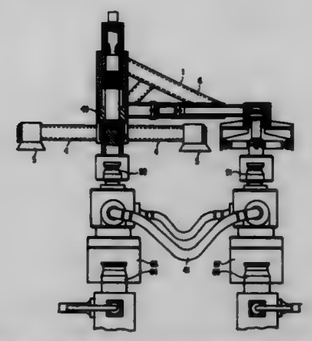
1. Apparatus for perforating and repairing casing in an earth borehole, comprising:
- a device moveable through the casing;
- perforating means mounted in said device for producing a perforation in said casing; and
- plugging means mounted in said device, for plugging said perforation by inserting a plug of solid material into the perforation.

19. A method for perforating and repairing casing in an earth borehole, comprising the steps of:
- moving a device to a position in a cased region of said borehole;
- setting said device at said position in the borehole;
- perforating said casing from said device while said device is set at said position;
- establishing fluid communication between said device and said perforation while said device is set at said position;
- providing a solid plug in said device; and



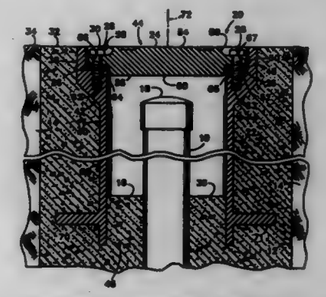
- plugging said perforation from said device with said solid plug while said device is set at said position.

5,195,589
TOOL FOR SIMULTANEOUS VERTICAL CONNECTIONS
Juvenal D. Mota, Rio de Janeiro, and Joel d. Miguez, Salvador, both of Brazil, assignors to Petroleo Brasileiro S.A., Rio de Janeiro and Conforja Equipetrol S A, Salvador, both of Brazil
Filed Oct. 15, 1991, Ser. No. 775,899
Claims priority, application Brazil, Oct. 12, 1990, PI 9005130
Int. Cl.[5] E21B *33/038, 43/013*
U.S. Cl. 166—341 **13 Claims**



1. Tool for simultaneous vertical connections by installation of a bridge of fluid connectors (41) for connecting flow line terminals (64, 65) for fluid flow therebetween and containing a jumper of flexible lines and fishing mandrels (50, 51) for achieving the connection between said flow line terminals (64, 65), said tool comprising:
- vertical, first and second hydraulic connectors (2, 3) for locking to the fishing mandrels (50, 51) of said bridge of fluid connectors (41);
- a vertical compensation system of upwards and downwards movement of a structure (6) supporting said second connector (3);
- a turning system of said structure (6) comprising a set of bearing (54, 55, 56) located in a lower part of said vertical compensation system allowing for the turning of said structure (6) relative to said first connector (2);
- a guideline orientation system external to a case (7), consisting of two structural arms (4), each of said two structural arms (4) having in an extremity thereof, a guide funnel (5) for orientation with cables and guide posts;
- a horizontal movement system via a hydraulic cylinder (17) having a shaft (18) coupled to a telescopic arm (20);
- an angular compensation system utilized in said second connector (3) via a spherical-shaped articulation (24) supporting, through a pin (58), a supporting shaft (27) of said second connector (3); and
- a turning system of said second connector (3) operated through the extension and retraction of respective shafts of cylinders (21, 22).

5,195,590
METHOD AND APPARATUS FOR PROTECTING AN ENVIRONMENTAL MONITORING WELL HEAD
Donald A. Kenner, Rt. 3, Box 220A, Sherwood, Oreg. 97006
Division of Ser. No. 565,139, Aug. 10, 1990, Pat. No. 5,063,996, which is a continuation-in-part of Ser. No. 397,010, Aug. 22, 1989, Pat. No. 5,010,957. This application Aug. 30, 1991, Ser. No. 753,639
The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.
Int. Cl.[5] E21B *33/03*
U.S. Cl. 166—379 **13 Claims**



1. In an environment monitoring well having a well pipe disposed in a well bore with an upper end thereof extending toward the surface of the earth, a housing comprising:
- (a) an enclosure having an upper opening and a lower end with a lower opening, said enclosure being of unitary construction and being disposed in said well bore around said upper end of said well pipe;
- (b) closure means, adapted to be disposed within said enclosure at said upper opening thereof, for closing said upper opening and preventing fluid from entering therethrough, said closure means having a substantially flat upper surface substantially flush with said surface of the earth when installed in said enclosure; and
- (c) sealing means disposed in said well bore between the outer surface of said enclosure and the inner surface of said well bore, directly under said lower end of said enclosure and under said lower opening of said enclosure between the outer surface of said well pipe and the inner surface of said well bore, so as to seal off the space between the outer surface of said enclosure and the inner surface of said well bore and to seal off said lower opening of said enclosure, said sealing means comprising a material having a characteristic that allows it to flow into the space between the outer surface of said enclosure and the inner surface of said well bore and under said lower opening of said enclosure and to assume a stable condition.

7. In an environmental monitoring well having a well pipe disposed in a well bore with an upper end thereof extending toward the surface of the earth, a housing comprising:
- (a) an enclosure having an upper end with an upper opening and a lower end with a lower opening, an outer surface extending between said upper and lower ends, said enclo-

sure being disposed in said well bore around said upper end of said well pipe;

(b) closure means for closing said upper opening;

(c) sealing means disposed in said well bore between said outer surface of said enclosure and said inner surface of said well bore, directly under said lower end and under said lower opening of said enclosure between the outer surface of said well pipe and the inner surface of said well bore, so as to seal off the space between the outer surface of said enclosure and the inner surface of said well bore and to seal off said lower opening of said enclosure; and

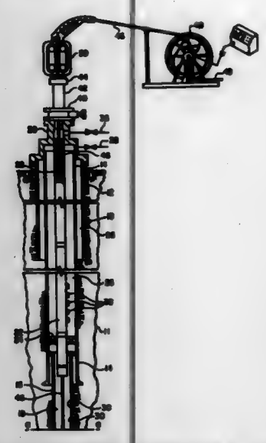
(d) means for anchoring said enclosure in said well bore, said mens for anchoring having a protrusion extending outwardly from said outer surface of said enclosure so as to be substantially covered by said sealing means thereby anchoring said enclosure in said well bore.

5,195,591

PERMANENT WHIPSTOCK AND PLACEMENT METHOD

Curtis G. Blount, Wasilla, and David D. Hearn, Anchorage, both of Ak., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 30, 1991, Ser. No. 752,705
Int. Cl.[5] E21B *33/128*
U.S. Cl. 166—380 17 Claims



1. A method for installing a whipstock in a wellbore, said whipstock having a guide surface thereon for guiding devices inserted in said wellbore through a tubing string disposed in said wellbore, said method comprising the steps of:

inserting said whipstock in said wellbore and orienting said guide surface in a predetermined direction with respect to a longitudinal central axis of said wellbore;

encasing at least part of said whipstock in stabilizing material after orientation of said guide surface; and

providing a pilot surface on said material for guiding a cutting tool for cutting through said material to engage said guide surface.

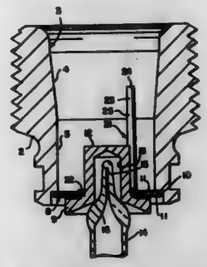
5,195,592

SPRINKLER HEAD HAVING CAP EJECTION SYSTEM

John R. Simons, Greendale, Wis., assignor to Star Sprinkler Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 594,056, Oct. 9, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 771,747
Int. Cl.[5] A62C *37/14*
U.S. Cl. 169—37 18 Claims

14. In a sprinkler head construction, a frame including conduit means to be connected to a source of water under pressure, said frame also including a pair of arms extending outwardly from said conduit means and connected together at a junction, sealing means for closing said conduit means, releasible means responsive to a predetermined elevated temperature for releasing said sealing means from said conduit means, said sealing means including a generally cylindrical section disposed within said conduit means, and an ejection device having a generally cylindrical base disposed concentrically of said cylindrical section, said ejection device also including a skirt connected to said base and disposed within said conduit means, said skirt extending through an arc of approximately 180° and comprising a pair of overlapping arcuate skirt sections disposed in contiguous relation, said skirt sections having longitudinal side edges joined together.

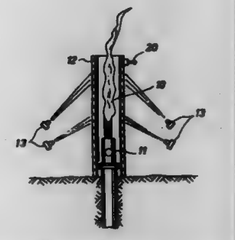


5,195,593

CYLINDRICAL STACK FOR CONFINING AND EXTINGUISHING AN OIL WELL FIRE

Allen E. Cassin, 1750 Day Dr., St. Clair, Mo. 63077

Filed Jun. 7, 1991, Ser. No. 712,344
Int. Cl.[5] A62C *3/06*
U.S. Cl. 169—46 11 Claims



1. A method of extinguishing a flame of an oil well that is on fire, comprising the steps of: positioning a tubular member having an open top end and an open bottom end in an upright position over the well to confine an oil flow and the flame to an interior thereof; and shutting off any flow of air into said bottom end of said tubular member, thereby to at least substantially extinguish the flame.

5,195,594

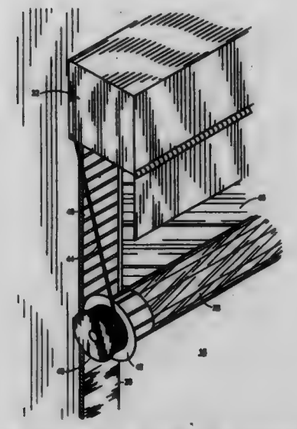
APPARATUS AND METHOD FOR RAPIDLY AND RELIABLY SEALING OFF CERTAIN EXIT AND ENTRANCE WAYS IN RESPONSE TO SMOKE OR FIRE

Thomas H. Allen, 2004 N. 10th St., Boise, Id. 83702, and Dale G. Hobson, 10622 W. Sandpiper St., Boise, Id. 83709

Filed Aug. 12, 1991, Ser. No. 744,079
Int. Cl.[5] A62C *2/10*
U.S. Cl. 169—48 15 Claims

1. An apparatus for sealing off selected exit ways and entrance ways in response to fire or smoke which comprises:

a. means including a fire resistant material having magnetic edge strips or sections thereon, said material being wound on a cylinder to which a spring reel is attached at each end and each spring reel having a wire wound thereon and being operative to restrain vertical acceleration of said first resistant material when dropped vertically from said exit and entrance ways, and



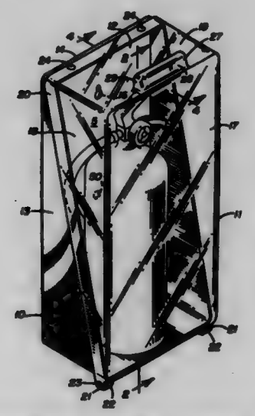
b. means for releasing said cylinder in vertical fall and in close proximity adjacent to an exit way or an entrance way desired to be sealed off, whereby the magnetic edge strips falling in close proximity to said exit way or entrance way become rapidly pulled toward the surface thereof.

5,195,595

FIRE EXTINGUISHER MOUNTING APPARATUS

Henry Nakagawa, 358 Clifton Ave., San Carlos, Calif. 94070

Filed Aug. 12, 1992, Ser. No. 929,708
Int. Cl.[5] A62C *39/00*
U.S. Cl. 169—51 7 Claims



1. A fire extinguisher mounting apparatus for storing a fire extinguisher or other like articles, comprising:

a housing defining a containment region therein;

an access panel adapted for enclosing said containment region;

hinge means operatively connected to said housing and said access panel at corresponding edges thereof to permit pivotal interengagement of said housing and said panel;

said hinge means being permanently adapted to permit pivotal movement of said access panel to an open position wherein said panel is sufficiently spaced from said housing to permit repeated insertion and removal of a fire extinguisher or like article into and from said containment region without disengagement of said hinge means and to a closed position wherein said access panel is disposed in covering relation to said housing;

handle means connected to said access panel for manual pivoting of said access panel about said hinge means;

securing means for securing said access panel to said housing and for preventing disengagement of said access panel with said housing when in said closed position and adapted for permitting selective disengagement of said access panel from said housing to said open position,

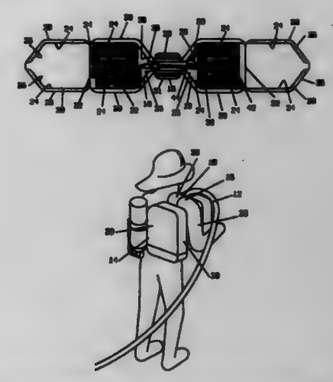
said securing means including at least one replaceable shear member separate from said hinge means and being of sufficient frangibility in response to the application of a predetermined force to said handle means to sever said shear member to permit said access panel to be disengaged from said housing and pivoted on said hinge means to said open position.

5,195,596

FIREHOSE CARRYING CASE

William T. Mount III, 5203 Lynnwood Dr., Camarillo, Calif. 93012, and Elwyn J. Brunelle, 18819 Nadal St., Canyon Country, Calif. 91351

Filed Oct. 3, 1991, Ser. No. 770,239
Int. Cl.[5] A62C *39/00*
U.S. Cl. 169—52 3 Claims



1. A firehose storage and transportation device comprising:

a pair of pouches joined by a strap,

each of said pouches having a front panel and a rear panel secured together along a lower edge and having flaps extending along the other edges of said panels with releasable fastening means carried by said flaps to permit said flaps to be releasably secured together to enable said panels to form said pouches,

at least one firehose loaded in said device in a serpentine manner with one end of said firehose located adjacent the lower edge of one of said pouches and extending across said pouch from side to side until the hose reaches the top of said one of said pouches adjacent said strap and at least a portion of said firehose extends across said strap and diagonally downward to a point adjacent the lower edge of the other of said pouches and continues from side to side across the other of said pouches until the hose reaches the top of said other of said pouches adjacent said strap

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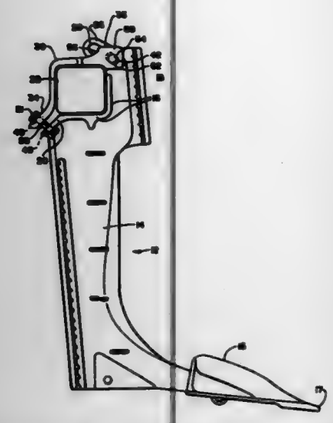
and the flaps extending along said strap serve to releasably retain said portion of said firehose.

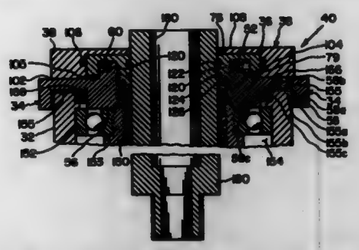
5,195,597
SHEAR PIN ASSEMBLY
Allan J. Yeomans, 69 Sunrise Blvd., Surfers Paradise, Gold Coast City, Queensland 4217, Australia
Filed Feb. 3, 1992, Ser. No. 829,487
Int. Cl.[5] A01B 61/04
U.S. Cl. 172—271 14 Claims



1. A soil penetrating tool assembly for mounting to a tool bar of a soil penetrating implement, comprising:
a shank member having an elongate body, a soil penetrating tool located on a first end of said body, and a facing plate located on a second end of said body, said facing plate engaging one side of said tool bar when mounted to said tool bar, said facing plate having a first end and a second end, said facing plate second end having a facing plate transverse opening with a first selected dimension;
a clamping plate engaging another side of the tool bar when mounted thereto, said clamping plate having a first end and a second end, said clamping plate second end having a clamping plate transverse opening with a second selected dimension;
means for securing said facing plate first end to said clamping plate first end, and;
a substantially cylindrical shear pin extending through said facing plate opening and said clamping plate opening and having a selected diameter less than both said first and second selected transverse dimensions of said plate openings;
wherein said facing plate opening and said clamping plate opening include aligned portions defining a generally cylindrical passage therethrough with the selected diameter when said shank member is mounted to said tool bar with the shear pin extending through said passage.

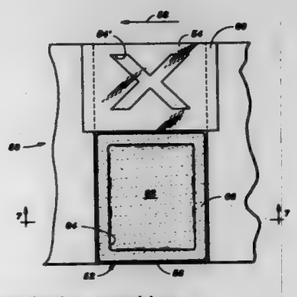
5,195,598
DRILL HEAD ASSEMBLY
Donald L. DeVall, 1082 Charles Ave., Morgantown, W. Va. 26505
Filed Dec. 23, 1991, Ser. No. 814,399
Int. Cl.[5] E21C 7/02
U.S. Cl. 173—197 20 Claims

1. In a rotary drill head assembly including a drill head cover having an upper portion, a rotatable tubular member having a drill retaining socket therein and having an upper end and an outer surface and a support member having an upper portion, said rotatable tubular member extending above said upper portion of said support member, the improvement comprising:
a flinger connected to said upper portion of said support member and having an axial passage extending therethrough;
a top cap having an axial passage extending therethrough,



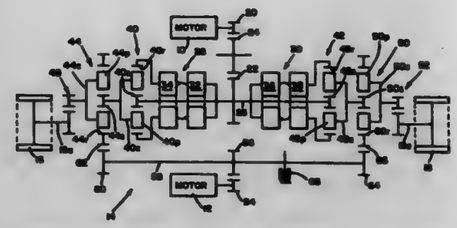
said flinger axial passage and said top cap axial passage forming a flinger assembly passage through which said rotatable tubular member passes; and
at least one retaining pin received by said flinger and said top cap to attach said flinger and said top cap said at least one retaining pin extending substantially perpendicular to the axis of said rotatable tubular member.

5,195,599
MERCHANDISE DAMPER AND PROTECTOR FOR WEIGHING SCALES
Robert J. Salini, 1416 Mellissa Cir., Oakley, Calif. 94509
Continuation-in-part of Ser. No. 640,270, Jan. 11, 1991, abandoned. This application Oct. 7, 1991, Ser. No. 774,043
Int. Cl.[5] G01G 21/10, 21/22
U.S. Cl. 177—189 8 Claims



1. The combination comprising:
a grocery weighing scale having a merchandise receiving platform provided with a rigid, unyielding merchandise receiving upper surface, indicating means for indicating a weight of merchandise disposed upon said merchandise receiving platform, and zero adjustment means whereby the weight indicated by said indicating means may be adjusted over a predetermined zero adjustment range to bring the indication on said indicating means to zero; and
a temporary, expendable cushioning cover disposed upon said merchandise receiving surface of said merchandise receiving platform, said cushioning cover being comprised of resilient foam material and being immediately removable from said merchandise receiving platform without use of tools;
a weight of said cushioning cover being less than said zero adjustment range, whereby the weight reading indicated by said indicating means may be adjusted to zero when said cushioning cover is disposed upon said merchandise receiving platform without modifying any part of said grocery weighing scale.

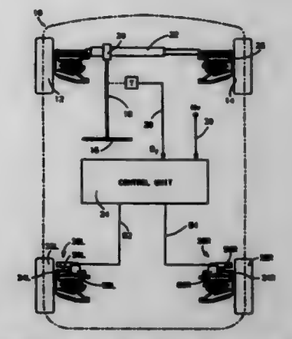
5,195,600
ELECTRIC DRIVE SYSTEM FOR TRACK-LAYING VEHICLES
Robert J. Dorgan, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.
Filed Jul. 11, 1991, Ser. No. 729,245
Int. Cl.[5] B62D 55/00
U.S. Cl. 180—9.1 16 Claims



1. An electrical drive system for track-laying vehicles comprising, in combination:
A. a first electric motor for developing a first mechanical output;
B. a second electric motor for developing a second mechanical output; and
C. a transmission including
1) a left output shaft drivingly connected to one vehicle track,
2) a right output shaft drivingly connected to the other vehicle track,
3) first and second variable stroke hydrostatic propulsion units commonly driven by said first mechanical output to produce respective infinitely variable speed first and second hydrostatic outputs,
4) a left output combining gear set having a first gear element driven by said first hydrostatic output, a second gear element drivingly connected with said left output shaft, and a third gear element,
5) a right output combining gear set having a first gear element driven by said second hydrostatic output, a second gear element drivingly connected with said right output shaft, and a third gear element,
6) means for commonly applying said second mechanical output to said third gear elements of said left and right output gear sets, and
7) a brake operating to ground said third gear elements of said left and right output gear sets to produce low range vehicle propulsion and steer and, with said second electric motor energized, to release said third gear elements of said left and right output gear sets to produce high range vehicle propulsion and steer.

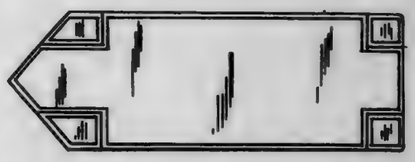
5,195,601
INDEPENDENT REAR WHEEL TOE-IN CONTROL IN A VEHICLE FOUR WHEEL STEERING SYSTEM
Ronald W. Voigt, Essexville; Jeffrey A. Zaremski, Saginaw; Brian P. McDonald, Saginaw; James W. Babinson, Saginaw, and Scott D. Merrison, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 2, 1991, Ser. No. 694,296
Int. Cl.[5] B62D 5/04
U.S. Cl. 180—79.1 3 Claims

1. In a motor vehicle having left and right front wheels which are steered at an angle determined in relation to the position of an operator manipulated handwheel, and left and right rear wheels which trail said left and right front wheels during forward motion of said vehicle, a rear wheel steering control system comprising:
left actuator means effective when activated for steering said left rear wheel in a toe-in direction;
right actuator means effective when activated for steering said right rear wheel in a toe-in direction; and control means for effecting independent activation of said left and right actuator means in response to operator manipulation of said handwheel, wherein said control means comprises
inside wheel control means effective when said front wheel steering angle is within a range of relatively small steering angles to effect (1) activation of said left actuator means



independent of said right actuator means if said front wheels are steered in a leftward direction, (2) activation of said right actuator means independent of said left actuator means if said front wheels are steered in a rightward direction, and
outside wheel control means effective when said front wheel steering angle is within a range of relatively large steering angles to effect (1) activation of said right actuator means independent of said left actuator means if said front wheels are steered in a leftward direction, (2) activation of said left actuator means independent of said right actuator means if said front wheels are steered in a rightward direction.

5,195,602
STABILIZED AIR CUSHION VEHICLE
Carl W. Welland, 1769 Goldridge Dr., Bloomfield Hills, Mich. 48302
Filed Jul. 26, 1991, Ser. No. 736,637
Int. Cl.[5] B60V 1/12
U.S. Cl. 180—118 13 Claims



1. A stabilized air cushion vehicle adapted to travel over a surface comprising:
a body;
first means on said body for creating therebeneath a central primary air cushion including a central peripheral air curtain peripherally surrounding said central cushion for creating and containing said central cushion;
second means on said body for creating therebeneath at least

case, said rollers positioned in said raceway at said cam

associated with one of said ball joints in a first predeter-

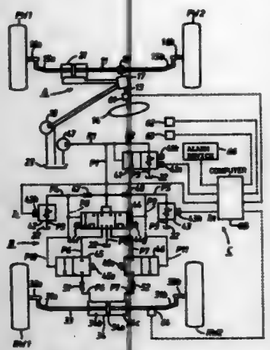
two secondary stabilizing air cushions on generally opposite sides of said central cushion including secondary peripheral air curtains peripherally surrounding said secondary cushions for creating and containing the respective secondary cushions, each of said secondary peripheral air curtains being spatially separated from said central peripheral air curtain and each of said secondary cushions being smaller in plan view than said central cushion.

5,195,603

ELECTRO-HYDRAULIC CONTROL APPARATUS FOR REAR WHEEL STEERING MECHANISM

Mizuho Sugiyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 21, 1991, Ser. No. 793,727
Claims priority, application Japan, Nov. 21, 1990, 2-316868
Int. Cl.[5] B62D 5/06
U.S. Cl. 180—132 2 Claims



1. An electro-hydraulic control apparatus for a rear wheel steering mechanism having a hydraulic power cylinder arranged to be operated under control of fluid under pressure supplied thereto for steering a set of rear road wheels, said apparatus comprising:

a fluid supply passage connected to a source of the fluid under pressure;

a first bypass passage bifurcated from said fluid supply passage to permit therethrough flow of the fluid under pressure into a fluid reservoir;

a first orifice disposed within said first bypass passage to throttle the flow of the fluid passing therethrough;

a first electromagnetic flow control valve disposed within said first bypass passage downstream of said first orifice to decrease the flow of the fluid passing through said first bypass passage in accordance with an increase of electric power applied thereto;

a second bypass passage bifurcated from said fluid supply passage to permit therethrough flow of the fluid under pressure into said reservoir;

a second orifice disposed within said second bypass passage to throttle the flow of the fluid passing therethrough;

a second electromagnetic flow control valve disposed within said second bypass passage downstream of said second orifice to decrease the flow of the fluid passing through said second bypass passage in accordance with an increase of electric power applied thereto;

a directional control valve arranged to be applied with a first pilot pressure from said first bypass passage between said first orifice and said first flow control valve and a second pilot pressure from said second bypass passage between said second orifice and said second flow control valve, said directional control valve selectively connecting said fluid supply passage to one of opposite fluid chambers of said power cylinder and connecting another of the fluid chambers to said reservoir in accordance with a difference between the first and second pilot pressures; and

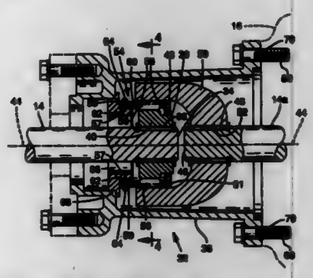
first and second cut-off valves respectively disposed within first and second distribution passages connecting said directional control valve to the opposite fluid chambers of said power cylinder, said first cut-off valve being arranged to be applied with the first pilot pressure for permitting flow of the fluid passing through said first distribution passage when the first pilot pressure is maintained higher than a predetermined value and for interrupting the flow of the fluid passing through said first distribution passage when the first pilot pressure becomes lower than the predetermined value, while said second cut-off valve being arranged to be applied with the second pilot pressure for permitting flow of the fluid passing through said second distribution passage when the second pilot pressure is maintained higher than the predetermined value and for interrupting the flow of the fluid passing through said second distribution passage when the second pilot pressure becomes lower than the predetermined value.

5,195,604

ALL WHEEL DRIVE VEHICLE WITH INDEPENDENT WHEEL BRAKING

David J. Brockett, Milwaukie, and Thomas M. Telford, Gladstone, both of Oreg., assignors to Warn Industries, Inc., Milwaukie, Oreg.

Filed Jun. 17, 1991, Ser. No. 716,120
Int. Cl.[5] B60K 23/08
U.S. Cl. 180—248 12 Claims



1. In a vehicle having a drive train rotatively inter-connecting front and rear differentials of front and rear wheel sets, said vehicle adapted to be driven in either forward or rearward direction of travel and said drive train correspondingly driven in alternate directions of rotation, and said front and rear wheel sets equipped with brakes for effecting independent braking action as between the front and rear wheel sets, said driving train including;

a driving shaft and a driven shaft and a clutch mechanism which couples the driving shaft and driven shaft when the driving shaft overdrives the driven shaft in either direction of rotation and which uncouples the driving shaft and driven shaft when the driven shaft overdrives the driving shaft in either direction of rotation,

said driving shaft having an end terminating at a position between said differentials, said driven shaft having an end adjacent the driving shaft end and extended toward one of said differentials of one of said wheel sets, and said clutch mechanism comprising;

an inner race member attached to one of said shaft ends and an outer race member attached to the other of said shaft ends and surrounding said inner race member in spaced relation and forming therewith a circular raceway, the race member provided on the end of said driving shaft end configured with cam surfaces to provide said raceway with alternating positions of restricted and opened spacings,

a rotatable cage and a plurality of rollers carried by said cage, said rollers positioned in said raceway at said cam surfaces and said rollers having a diameter larger than said positions of restricted spacings and smaller than said positions of opened spacings, a drag ring having a circular surface concentric with said rotatable cage, drag shoes in frictional engagement with said circular surface of said drag ring, one of said drag shoes and drag ring carried by said cage and the other in fixed non-rotative relation to said cage whereby the rollers are rotatably driven by the race member of said driving shaft end as dictated by the rotation of the drive train,

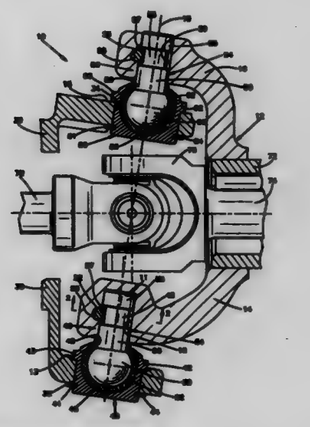
said clutch mechanism responsive to a driving torque applied by the driving shaft to shift the rollers to the trailing restricted positions and said mechanism responsive to a braking torque applied by the driving shaft wherein there is a greater braking action of the other of said wheel sets as compared to said one of said wheel sets to shift the rollers to the opened spacings and permit independent braking of said one of said wheel sets.

5,195,605

APPARATUS FOR MOUNTING A STEERABLE GROUND ENGAGING WHEEL OF A VEHICLE

Ruey E. Wood, St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Mar. 28, 1991, Ser. No. 676,861
Int. Cl.[5] B60K 17/30
U.S. Cl. 180—254 10 Claims



1. An apparatus comprising:

a first member having first and second coaxial spaced apart passages;

a second member for supporting a vehicle wheel for steering movement about an axis relative to said first member corresponding with the axis of said passages, said second member having upper and lower openings therethrough coaxial with said first and second passages;

first and second ball joints for interconnecting said first and second members for relative pivotal movement about said axis;

said first ball joint having a first socket secured in said lower opening and a first stud supported in said first socket for rotational movement about said axis relative to said first socket and extending from said first socket into said first passage;

said second ball joint having a second socket secured in said upper opening and a second stud supported in said second socket for rotational movement about said axis relative to said second socket and extending from said second socket into said second passage;

said first member including means for locating the stud associated with one of said ball joints in a first predetermined position of minimum stress in one of said passages, the stud associated with the other one of said ball joints being located in a second predetermined position of minimum stress in the other one of said passages in response to positioning said stud associated with said one ball joint in said first predetermined position of minimum stress;

means for securing said stud of said one ball joint in said first predetermined position of minimum stress in said one passage; and

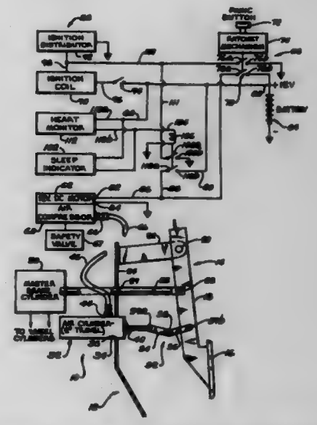
means for securing said stud of said other ball joint in said second predetermined position of minimum stress in said other passage in which it is located in response to positioning said stud of said one ball joint in said first predetermined position of minimum stress, said first and second ball joints substantially equally sharing load forces acting on said apparatus when said stud of said one ball joint is in said first predetermined position of minimum stress and said stud said other ball joint is in said second predetermined position of minimum stress.

5,195,606

EMERGENCY STOPPING APPARATUS FOR AUTOMOTIVE VEHICLES

Andrew Martyniuk, P.O. Box 164, Bensenville, Ill. 60106

Filed Sep. 17, 1991, Ser. No. 760,994
Int. Cl.[5] B60T 7/08, 7/14
U.S. Cl. 180—272 13 Claims



1. Emergency stopping apparatus for an automotive vehicle having a brake system including a brake pedal operable by the driver in the cab of the vehicle,

said apparatus comprising fluid power means mounted on the vehicle and operable by the application of compressed air to said fluid power means,

a collapsible tension element for connecting said fluid power means to the brake pedal for actuating the brake pedal to apply the brakes in response to the application of compressed air to said fluid power means,

a selectively operable air compressor for selectively supplying compressed air to said fluid power means,

said air compressor having an electrically operable drive motor for driving said air compressor,

the vehicle having an electrical battery for energizing the drive motor,

and a latching push button switch having alternate open and closed positions and connected directly between the battery and the drive motor for energizing the drive motor and thereby causing the air compressor to supply com-

pressed air to the fluid power means when the switch is in

axis on which a crank center resides on a vertical plane

cavity as long as the person stands on the upper surface.

half step between said lower rails thereof and to one said

pressed air to the fluid power means when the switch is in its closed position whereby the fluid power means actuates the brake pedal,

the latching push button switch being mounted in the cab of the vehicle and being operable by the driver or a passenger in the cab of the vehicle.

5,195,607

EXHAUST SYSTEM FOR AUTOMOTIVE ENGINE

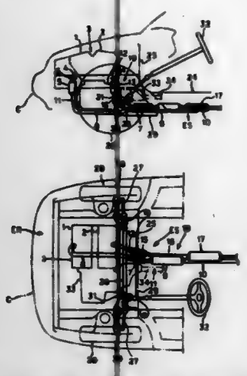
Yukichiro Shimada, Hiroshima; Nobuhiro Komatsu, Yokohama; Seiichi Tsuji, Hiroshima; Satoshi Fujita, Hiroshima; Hiroshi Nakatsuka, Hiroshima; Hiromichi Kawamura, Hiroshima, and Makoto Shinbara, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 19, 1990, Ser. No. 615,630

Claims priority, application Japan, Nov. 21, 1989, 1-135896; Nov. 21, 1989, 1-135899; Nov. 23, 1989, 1-136355; Nov. 24, 1989, 1-136356; Nov. 27, 1989, 1-137098

Int. Cl.[5] B60K *13/04, 5/04*

U.S. Cl. 180—296 76 Claims



1. A dual type exhaust system for use with an internal combustion engine with front and rear rows of cylinders transversely mounted in a front engine room of a car body wherein a floor panel structure is formed with a bottom opened space for accommodating exhaust pipes, said dual type exhaust system comprising:

a pair of exhaust pipe assemblies, one of said pair of exhaust pipe assemblies extending from the front row of cylinders and the other of said pair of exhaust pipe assemblies extending from the rear row of cylinders toward a back of said car body, the exhaust pipe assemblies being arranged side by side in said bottom opened space; and

a pair or catalytic converters, only one of said pair of catalytic converters disposed in a interconnected with each exhaust pipe assembly of said pair of exhaust pipe assemblies;

said catalytic converters being offset in a lengthwise direction of said car body with respect to said bottom opened space relative to each other.

5,195,608

POWER PLANT FOR AUTOMOTIVE VEHICLE

Kunihiko Morikawa, and Masaki Sugimoto, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 13, 1991, Ser. No. 744,171

Int. Cl.[5] B60K *5/04*

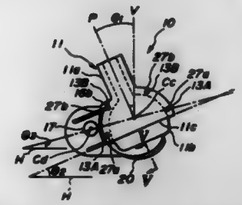
U.S. Cl. 180—297 17 Claims

1. A power plant for an automotive vehicle, comprising:

an engine including a cylinder block having a bottom face to which an oil pan is secured, and a crankshaft having an axis on which a crank center resides on a vertical plane perpendicular to the crankshaft axis;

a transaxle fixedly joined with said cylinder block and including a transmission and a final drive unit including a differential having a differential center residing on said vertical plane, said differential center being located below said crank center;

means for mounting said engine at an inclined angle such that an inclination angle of said cylinder block bottom face, relative to a horizontal plane, is greater than another inclination angle of a line connecting said crank center and said differential center, relative to said horizontal plane; and



a flange including a reinforcement rib formed integral with said transmission and located at an outer peripheral surface of said transmission, said rib being located below a level of said cylinder block bottom face and projecting along a plane perpendicular to the axis of the crankshaft, said rib extending from the vicintiy of the cylinder block bottom face on a first side of the cylinder block to the vicinity of the cylinder block bottom face on a second side of the cylinder block, said first and second sides being opposite to each other with respect to a center plane of said cylinder block which center plane is perpendicular to the cylinder block bottom face.

5,195,609

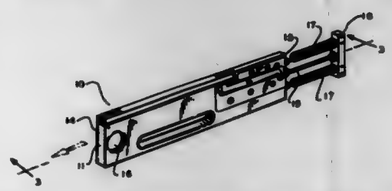
AUTOMATICALLY RETRACTABLE STEP

Brian T. Ham, and Keith T. Willoughby, both of Jacksonville, Fla., assignors to Aircraft Products Company, Jacksonville, Fla.

Filed Jan. 30, 1992, Ser. No. 828,024

Int. Cl.[5] B60R *3/00*

U.S. Cl. 182—90 8 Claims



1. An automatically stowed step associable with a cabinet assembly, a person standing on said step when deployed being able to gain access to elevated areas of the assembly, said step comprising:

(a) a platform having an upper surface on which a person may stand, the platform being movable into and out of a cavity in the assembly;

(b) means for biasing the platform into the cavity in a normal stowed position;

(c) means responsive to a selected amount of movement of the platform out of the cavity and into a deployed position for latching the platform against movement into the cavity by the biasing means; and

(d) means responsive to the weight of a person standing on the upper surface for releasing the latching means, the biasing means being unable to move the platform into the cavity as long as the person stands on the upper surface, the biasing means moving the platform back into the cavity when the person steps off the upper surface.

5,195,610

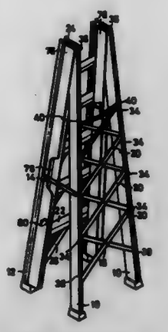
BIDIRECTIONALLY FOLDABLE STEP LADDER

Wan Li Chang, No. 66, Lane 142, Sec. 1, Yung An Nan Rd., Lu Chou Hsiang, Taipei Hsien, Taiwan

Filed May 4, 1992, Ser. No. 878,237

Int. Cl.[5] E06C *1/00*

U.S. Cl. 182—156 5 Claims



1. A foldable step ladder comprising:

a first pair of like side rails and a second pair of like side rails, said first and said second side rails in opposition and pivotally attached at top portions thereof;

a pair of foldable spreaders each being pivotally attached between opposing said first and said second side rails;

extendable cross-bracing means being disposed between said first side rails, said cross-bracing means being pivotally and slidably attached to said first side rails;

a plurality of foldable steps being disposed in a spaced relationship between said second side rails, said steps being pivotally attached to said second side rails by suitable means, said steps being foldable in a single direction;

whereby said step ladder is foldable from an unfolded position with respect to a width thereof by pivoting said steps, drawing said second side rails together, and by extending said cross-bracing means, drawing said first side rails together, and is foldable with respect to a depth thereof by pivoting said spreaders, drawing said first and said second side rails together, thereby said step ladder is in a folded position;

locking means for locking said step ladder in said unfolded position, preventing said side rails from being drawn together;

bracing means pivotally attached to each said step for supporting said steps; and

translation means disposed in each said second side rail for allowing said bracing means movement when said steps fold, said bracing means being pivotally attached to said translation means;

each said second side rail comprising a substantially U-shaped channel;

each said step comprising two half steps each having an upper stepping surface and a pair of lower parallel rails, said half steps being pivotally attached to each other at first ends thereof and to respective said side rails on an inside thereof and being receivable in said U-shape channels;

each said translation means comprising a longitudinal slot formed in said U-shaped channel, a plate slidably received in said slot, and a plurality of brackets fixed to said plate corresponding to said bracing means; and

each said bracing means being pivotally attached to one said half step between said lower rails thereof and to one said bracket;

said plate being in a lowermost position in said slot such that further downward movement thereof is prevented which prevents said steps from pivoting below horizontal positions thereof; and

said locking means being disposed on said second side rails preventing upward movement of said plate.

5,195,611

PORTABLE OBSERVATION AND HUNTING STAND

Reese E. Untz, 4902 Ridge Rd., Charlotte, N.C. 28269

Filed Mar. 3, 1992, Ser. No. 845,279

Int. Cl.[5] A47F *3/26*

U.S. Cl. 182—187 3 Claims

1. A mobile observation and hunting stand apparatus comprising:

an elongate ladder-like frame having laterally-extending rungs spaced lengthwise therealong to enable a user to climb end-to-end along said frame, said frame including a first frame portion and a second frame portion pivotably attached to one another for selective folding and unfolding movement between an operative disposition wherein said first and second frame portions are aligned in an end abutting relation and a storage and transportation disposition wherein said first and second frame portions are disposed in a proximate side-by-side relation;

a base on one end of said frame for ground engagement when said frame is unfolded into its operative disposition for erection in an upright orientation for use;

a seat at the other end of said frame;

at least one wheel permanently affixed to said frame at a location sufficiently adjacent said base for ground engagement of said wheel when said frame is folded in its storage and transportation disposition and oriented in a generally horizontal orientation to facilitate manual rolling movement of said frame by a user gripping said frame at a spacing from said wheel, said wheel being spaced at a sufficient distance from said base to be out of ground engagement upon erection of said frame in an upright orientation in its unfolded operative disposition for use of said frame without removal of said wheel;

a foot platform projecting outwardly from said frame adjacent said seat and being movable between a storage position against said frame and a use position generally perpendicular to said frame for user foot support;

a pair of truss members laterally spaced from one another at opposite sides of said frame adjacent said foot platform for supporting said foot platform when in its use position

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generally perpendicular to said frame and to form side supports for retaining articles carried on said frame during rolling movement thereof; and

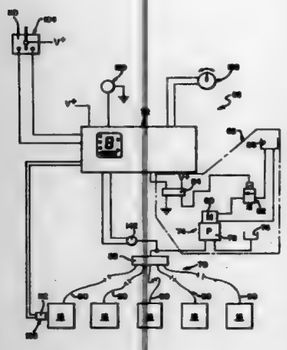
brace means selectively mountable removably to said frame for selective free-standing support of said frame in an upright orientation without placement thereof against a tree, pole or other fixed separate structure when said brace means is mounted to said frame in its unfolded operative disposition, said brace means comprising a pair of elongate braces, each attachable at one respective end thereof to said frame adjacent said seat in an orientation wherein the opposite respective ends of said brace are disposed for ground engagement at lateral spacings from one another and from said base to cooperatively form therewith a tripod-like support for said seat, said frame being alternatively supportable in an upright orientation in its unfolded operative disposition for use when said brace means is demounted from said frame by placement with said base in ground engagement and said other end of said frame leaning against a tree, pole or other like fixed structure.

5,195,612

LUBRICATION SYSTEM FOR A COTTON HARVESTER

Robert W. Hahn, Lemont; Alan H. Ludwig, Hinsdale, and G. Neil Thedford, Naperville, all of Ill., assignors to Case Corporation, Racine, Wis.

Filed May 18, 1992, Ser. No. 884,028
Int. Cl.[5] F01M *1/18*
U.S. Cl. 184—6.4 16 Claims



5. A lubrication system for a cotton harvester having a plurality of harvesting units, each harvesting unit including lubricated mechanisms which are intermittently operated and whose accumulated intermittent operations define an operational cycle having a predetermined duration measured as a function of the lubricant amounts provided to the lubricated mechanisms, said lubrication system comprising:

lubrication means operable during a lubrication cycle to supply substantially equivalent amounts of lubricant under pressure to corresponding lubricated mechanisms on the harvesting units;

means for computing accumulated intermittent operations of said lubricated mechanisms during the operation cycle and for initiating a lubrication cycle whose duration is correlated to the lubricant usage of the lubricated mechanisms during the operation cycle of the harvester; and

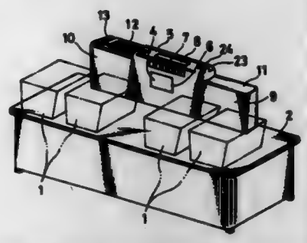
means for visually indicating the accumulated intermittent operations of the lubricated mechanisms relative to the operation cycle of the harvester.

5,195,613

COMMODITY DATA READER

Mitsunori Kohno, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 406,603, Sep. 13, 1989, abandoned. This application Jun. 3, 1991, Ser. No. 711,106
Claims priority, application Japan, Sep. 20, 1988, 63-235434; Sep. 20, 1988, 63-235435; Sep. 29, 1988, 63-244958
Int. Cl.[5] A47F *9/02*; G06K *7/10*
U.S. Cl. 186—59 7 Claims



1. A commodity data reader comprising an elongated check-out counter on which baskets containing commodities are placed, the improvement comprising:

a bar-code scanner having a console provided with a scanning window on the front surface thereof facing the customer, and disposed near an edge of one of the longer sides of the check-out counter on the side of the operator;

displays for displaying data entered in the bar-code scanner respectively to the customer and the operator, and disposed in said console near the edge of the same longer side of the check-out counter;

a data input device for entering data other than those represented by bar-codes, disposed in a first stand integrally formed with said console near the edge of the same longer side of the check-out counter; and

a concave surface for temporarily keeping coins and commodities thereon disposed on one side of the bar-code scanner near the edge of one of the longer sides of the check-out counter on the side of the operator on a level below that of the upper surface of the console of the bar-code scanner.

5,195,614

HYDRAULIC CUSHIONRIDE ELEVATOR

John Hornyack, Tolland; Louis Bialy, Simsbury, and Rajendra V. Mistry, Farmington, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Sep. 23, 1991, Ser. No. 764,438
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—17 13 Claims

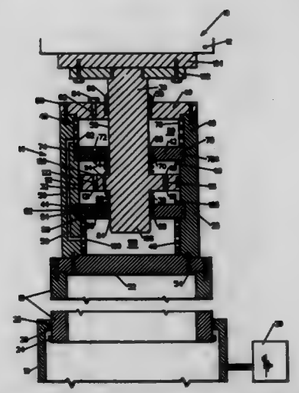
1. An hydraulic elevator comprising:

a cylinder;

a plunger mounted for translation in a first and second direction within said cylinder;

a platform; and

a shock absorption means connecting said plunger to said platform, said shock absorber means isolating said platform from sudden relative motion between said cylinder and said plunger, wherein said shock absorption means comprises a housing connected to one of said plunger or said platform, a piston connected to the other of said platform or said plunger, said piston mounted for translation within said housing, and means reacting to motion of said piston for dissipating energy caused by sudden relative motion between said piston and said housing.



5,195,615

MINE SHAFT CONVEYANCE SYSTEM

Michael J. N. Manning, Warwickshire, England, assignor to GEC Alsthom Limited, England

Filed Mar. 5, 1990, Ser. No. 489,687
Claims priority, application United Kingdom, Mar. 3, 1989, 8904875
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—17 8 Claims

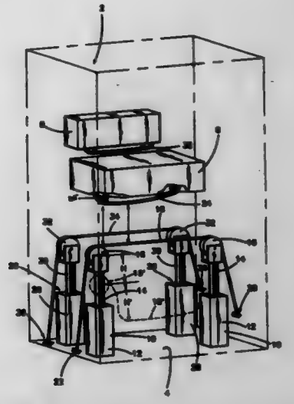
1. A mine shaft conveyance system, comprising: a linear motor having spaced, parallel, elongate winding support members carrying stator windings, the winding support members being mountable in a mine shaft having a longitudinal direction, and having lengths extending along said longitudinal direction; and a reaction member located between the winding support members so as to be driven up and down the mine shaft by electromagnetic forces, the reaction member comprising a plurality of magnetic members articulated together about axes transverse to the lengths of the winding support members, and having means for the attachment thereto of a shaft conveyance which is to be driven up and down the mine shaft with the reaction member.

5,195,616

ONE TO TWO STROKE ROPED ELEVATOR PIT BUFFERS

Young S. Yoo, Avon, and John K. Salmon, South Windsor, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 15, 1992, Ser. No. 914,821
Int. Cl.[5] B66B *5/28*
U.S. Cl. 187—67 6 Claims



1. A pit buffer assembly for use in an elevator system comprising a cab and counterweight interconnected by traction cables, said buffer assembly being operable to intercept the cab or counterweight in the hoistway pit, said buffer assembly comprising:

a) a pair of cooperating fluid operated piston and cylinder buffer assemblies, one of said piston and cylinder buffer assemblies being positioned on one side of the path of travel of said cab or counterweight, and the other of said piston and cylinder buffer assemblies being positioned on an opposite side of the path of travel of said cab or counterweight, said piston and cylinder buffer assemblies being positioned so as to avoid direct contact with said cab or counterweight,

b) cable means extending between said piston and cylinder buffer assemblies, said cable means having opposite ends thereof dead hitched to a fixed portion of the pit, and being reeved across an upper part of each of said piston and cylinder buffer assemblies whereby the medial portion of said cable means is disposed in a substantially horizontal plane containing said upper part of each of said piston and cylinder buffer assemblies when said cab or counterweight is upwardly offset from said cable means; and

c) said cable means being operable, when contacted by a descending cab or counterweight, to drop below said upper parts of said piston and cylinder buffer assemblies to provide a buffer stroke for decelerating said descending cab or counterweight which buffer stroke is greater than a corresponding downward stroke of said piston and cylinder buffer assemblies.

5,195,617

BRAKE LINKAGE SELF-ADJUSTMENT MECHANISM

Joseph A. Clemens, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1991, Ser. No. 790,991
Int. Cl.[5] F16D *65/60*
U.S. Cl. 188—71.8 11 Claims

1. A self-adjustment mechanism for use between a brake apply cam and an apply piston in a brake system, comprising:

(a) a first sprag clutch seated in a support;

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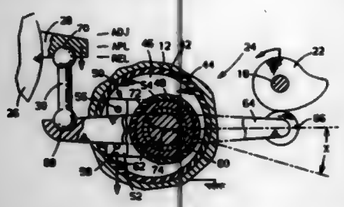
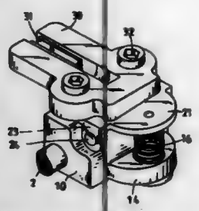
(b) an eccentric functioning as an inner race for the first sprag clutch and as an outer race for a second sprag clutch oriented to permit rotation opposite the first sprag clutch;
(c) a timing assembly functioning as an inner race for the second sprag clutch, the timing assembly including a post seated in the second sprag clutch and a plate affixed to the post, and first and second spaced-apart pins projecting from a surface of the plate;



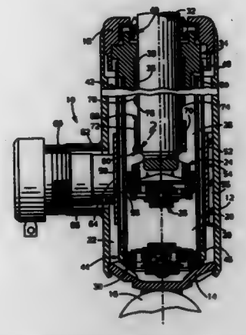
(d) an arm pivotally connected to the timing assembly and positioned between the pins;
(e) means for pivoting the arm with respect to the timing assembly; and
(f) means for rotating the apply piston as the timing assembly is pivoted.

5,195,618
BRAKE ADJUSTER FOR A PEDALING TRAINING MACHINE OR EXERCISE BICYCLE
Ma C. Wu, No. 23, Hai Huan Street, Tainan, Taiwan
Filed Mar. 13, 1992, Ser. No. 850,527
Int. Cl.[5] B60L 7/28; A63B 23/04
U.S. Cl. 188—164 1 Claim



1. A brake adjuster for a pedaling training machine comprising:
a base having a main shaft hole for a main shaft of the pedaling training machine to firmly fit therein so as to rotate together with the main shaft and a round cavity in the rear portion for the lower end of a coiled spring to sit therein;
a position plate pivotally combined on the upper surface of said base, having a downward projection extending from a semi-circular rear portion in a corresponding location to the round cavity in the base for the upper end of the coiled spring to fit around the projection to position the coiled spring elastically stabilized between the base and the position plate;
a U-shaped magnetic arm being positioned on and fixed together with the position plate, having a straight intermediate opening and two permanent magnets respectively attached on two side walls defining the intermediate opening, and said two permanent magnets in said magnetic arm being located to cross part of both side surfaces of a turning disc in the pedal training machine; and
said spring having elasticity to push up the rear portion of said position plate so as to force down the front portion of said position plate and said magnetic arm fixed together with said position plate when said magnetic arm is pulled up by the turning disc crossing said two permanent magnets, and said magnetic arm being kept horizontal by said spring so as to have a preset dimension to cross said surfaces of the turning disc.

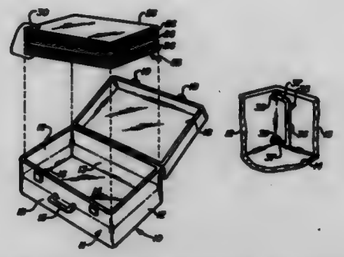
5,195,619
INTERNAL ACCUMULATOR FOR A HYDRAULIC DAMPER
Stephen E. Dourson, Dayton, and Wayne V. Fannin, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 3, 1991, Ser. No. 754,098
Int. Cl.[5] F16F 9/46
U.S. Cl. 188—299 9 Claims



1. An adjustable automotive suspension damper comprising:
(a) a fluid-filled inner cylinder;
(b) a piston, slidably mounted in the inner cylinder, dividing an interior of the inner cylinder into first and second chambers;
(c) a reciprocating piston rod secured at one end to the piston;
(d) a valving assembly mounted on the piston for controlling fluid flow between the first and second chambers.
(e) a reservoir formed between the inner cylinder and a reservoir tube for receiving fluid flow from the second chamber as the piston slides in the inner cylinder;
(f) a compression valving assembly mounted at one end of the inner cylinder for controlling fluid flow between the second chamber and the reservoir;
(g) a bypass channel formed between the inner cylinder and an intermediate tube concentrically mounted between the inner cylinder and the reservoir tube for bypassing fluid from the first chamber to the reservoir;
(h) a solenoid valve assembly mounted on the reservoir tube in fluid communication with the bypass channel and the reservoir, wherein energization of the solenoid valve assembly permits fluid flow from the first chamber to the reservoir; and
(i) accumulator means mounted on the piston rod in the first chamber for storing and dissipating energy resulting from a fluid pressure rise in the first chamber of the inner cylinder caused by closure of the solenoid valve assembly to reduce transmission of noise, the accumulator means including
(i) a housing concentrically mounted about the piston rod in the first chamber of the inner cylinder having an inlet at one end and being sealed at an opposite end so that an interior chamber is provided between the housing and the piston rod,
(ii) a compressible medium housed in the interior chamber between the housing and the piston rod, and
(iii) accumulator valving means for controlling fluid flow through the inlet end of the housing including an orifice plate, concentrically mounted on the piston rod, having a plurality of openings provided about the piston rod,

and deflectable disk means, seated on the orifice plate, covering the orifice plate openings.

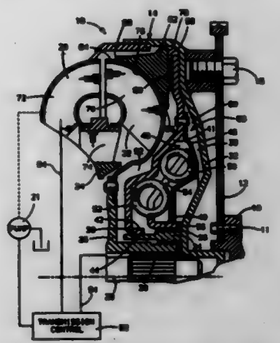
5,195,620
WRINKLE-REDUCING INSERT FOR SUITCASES AND THE LIKE
Patty L. Tate, 22 Marlwood Ln., Palm Beach Gardens, Fla. 33418
Filed Nov. 25, 1991, Ser. No. 797,205
Int. Cl.[5] A45C 13/02
U.S. Cl. 190—36 10 Claims



1. A wrinkle-reducing insert for suitcases and travel containers used for holding garments and articles for travel purposes, and having container cavities of a depth which is considerably less than the width and height of the container, the cavities defined with side walls, end walls and bottoms to form the containers, and with a top for closing the cavities comprising:
a stack of substantially identical layers of relatively smooth-surfaced, thin, flat plastic sheets which are characterized by being flexible for bending, but somewhat stiff to resist crumpling and wrinkling and to remain substantially planar;
each of said layers being of a size to closely fit within the container cavity with which said stack is to be used, so as to be substantially restricted against transverse movement by engagement with opposing portions of the container walls;
said layers being loosely separable, one from another, but being formed for arrangement in substantial parallelism;
connecting means loosely connecting said layers together at one common location on each layer, so that the layers may be picked-up and handled as a unit, apart from the suitcase or container, for removal from and insertion within the suitcase or container, with the unit formed of loosely interconnected sheets, but wherein the layers may be separated from each other while remaining parallel and are capable of said transverse movement for sufficient distances to receive folded travel items between adjacent pairs of such layers;
whereby folded clothing and travel items may be packed between adjacent layers until the layers and the items packed there between fill the depth of the container, so as to substantially reduce wrinkling of the items when the suitcase or travel container is closed and is transported or stored during travelling use.

5,195,621
TORQUE CONVERTER AND CLUTCH WITH A TURBINE RING FRICTION INTERFACE
Dennis C. Dull, Arcanum, and James P. Poorman, Huber Heights, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed May 18, 1992, Ser. No. 884,354
Int. Cl.[5] F16H 45/02
U.S. Cl. 192—3.29 3 Claims

1. A torque converter and clutch comprising: an input shell; an impeller drivingly connected with said input shell; turbine means mounted on an axis for rotation and having a bladed portion for receiving fluid from said impeller, a substantially semi-toroidal outer surface and an inertia mass secured to the outer surface of the turbine having a substantially semi-toroidal surface complementary to the turbine outer surface and a flat annular friction surface disposed in a plane substantially perpendicular to the axis of rotation of the turbine; and torque converter clutch means for establishing a friction drive connection between said input shell and said turbine including a pressure plate drivingly connected with and axially movable relative to the input shell and an annular friction facing secured to said pressure plate in axial alignment with, presented toward and selectively frictionally engageable with said flat annular friction surface.



5,195,622
LOCK-UP CLUTCH FOR A HYDROKINETIC POWER TRANSMISSION APPARATUS FOR A MOTOR VEHICLE
Fabrice Tauvron, Creteil, and André Dallidet, Argenteuil, both of France, assignors to Valeo, Paris, France
Filed Mar. 19, 1992, Ser. No. 854,487
Claims priority, application France, Mar. 22, 1991, 91 03490
Int. Cl.[5] F16H 45/02; F16D 3/50
U.S. Cl. 192—3.29 4 Claims

1. A lock-up clutch for a hydrokinetic power transmission apparatus, comprising an annular coupling element, means coaxially mounting the coupling element for piston-like movement of the latter, and actuating means for driving the coupling element in rotation, wherein the actuating means comprise a torsion damping device which itself comprises a first rotatable

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continuously driven by a power source for providing, disks depends on the diameter of the disks, said device more-

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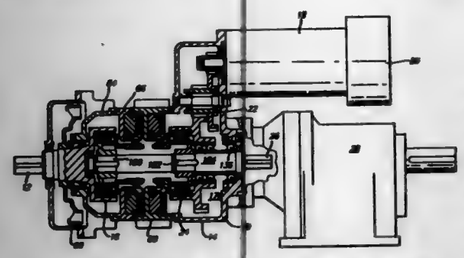
part, a second rotatable part, circumferentially acting resilient means operatively disposed between said first and second rotatable parts, and means mounting said rotatable parts for relative rotation of one with respect to the other against the action of said resilient means, said first rotatable part comprising a first retaining member and a second retaining member associated with the first retaining member for retaining said resilient means in position, said coupling element having an outer flange at its outer periphery, the outer flange of the coupling element constituting said first retaining member, said outer flange being so shaped as to receive said resilient means partly within it, whereby the coupling element constitutes a guide ring and said second retaining member is carried by the coupling element wherein the inner periphery of the outer flange is recessed to receive the outer periphery of said resilient means, and said coupling element comprises a main portion and said outer flange integrally formed with the main portion, the thickness of the outer flange being less than that of the main portion.

5,195,623

TWO SPEED DRIVE WITH OIL SHEAR ELECTRO CLUTCH/BRAKE

Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to Sommer Company, Warren, Mich.

Filed Jan. 24, 1992, Ser. No. 825,034
Int. Cl.[5] F16D *67/06*; F16H *37/06*
U.S. Cl. 192—18 B 7 Claims



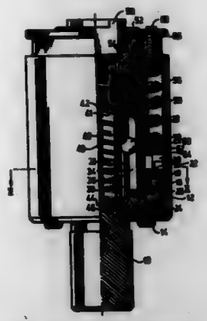
1. A two speed drive unit for an apparatus comprising:
output means for transmitting rotation from said two speed drive unit;
first input means for transmitting rotation to said output means;
second input means for transmitting rotation to said output means;
selectively operable first brake means for prohibiting rotation of said second input means;
gear reduction means for reducing the rotational speed of said second input means; said gear reduction means operably connected to said second input means and disposed between said second input means and said output means;
selectively operable second brake means for connecting said output means to said gear reduction means;
first spring means for urging said second brake means into engagement to connect said output means to said gear reduction means;
first electrical actuating means for releasing said second brake means, said first electrical actuating means operable in conjunction with said first spring means to apply said second brake means such that rotation of said output means follows a specified rate of deceleration;
selectively operable clutch means for connecting said first input means to said output means;
second spring means for urging said clutch means into a disengaged condition to allow said first input means to rotate relative to said output means;
second electrical actuating means for engaging said clutch means, said second electrical actuating means operable in conjunction with said second spring means to engage said clutch means such that rotation of said output means follows a specified rate of acceleration.

5,195,624

ARRANGEMENT IN SCREW THREAD CUTTING APPARATUS

Alf Eriksson, Nacka, Sweden, assignor to Tapmatic International Corporation (Tic AG), Kriessern, Switzerland

Continuation of Ser. No. 289,307, Dec. 23, 1988, abandoned.
This application Dec. 18, 1990, Ser. No. 630,393
Claims priority, application Sweden, Jan. 8, 1988, 8802148
Int. Cl.[5] F16D *43/20*
U.S. Cl. 192—56 R 5 Claims



1. In thread cutting apparatus, including a driving part, a driven part, and a displaceable clutch member intermediately disposed therebetween with torque transmitting means on the displaceable clutch member and on said parts, driving part torque transmitting means on the driving part and driven part torque transmitting means on said driven part a displaceable clutch member comprising an annular element with torque transmitting means, said latter torque transmitting means being engageable with the torque transmitting means on both the driving and the driven parts, and spring means providing bias acting against the clutch member, whereby when torque is transmitted between the parts, and a predetermined value of the torque is exceeded, said annular element moves substantially axially away from driving engagement with said driving and driven parts, said torque transmitting means of said driven part having a ramp member engageable by the torque transmitting means of the clutch member for moving said clutch member in an axial direction for displacement, the torque transmitting means on one of said parts having a contour engageable with the torque transmitting means on said clutch member whereby to hold the said clutch member out of driving engagement when said predetermined value of torque has been exceeded.

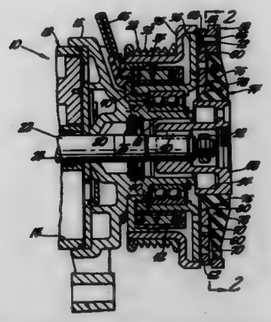
5,195,625

TORQUE CUSHION FOR ELECTROMAGNETIC CLUTCH

Roy Y. Chang, Wilmette, Ill., and Robert L. Swadner, East Amherst, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 29, 1992, Ser. No. 889,898
Int. Cl.[5] F16D *27/112, 3/76*
U.S. Cl. 192—84 C 1 Claim

1. An electromagnetic clutch assembly adapted for use in actuating a fluid pumping means, said assembly comprising;
a drive shaft rotatably supported about a central axis and for operatively connecting to the fluid pumping means to actuate the fluid pumping means;
a rotor means including a friction plate rotatably supported about said drive shaft and operatively coupled to and continuously driven by a power source for providing power input to said drive shaft;
an armature assembly having an armature plate supported in spaced parallel relationship from said rotating friction plate so as to present a gap of predetermined width therebetween;
means for providing an electromagnetic force acting through said rotating friction plate and said armature plate;
an elastomeric member disposed between and interconnecting said drive shaft and said armature plate, said elastomeric member capable of flexing axially to allow said armature plate to bridge said gap under the influence of the force generated by said means for providing an elec-



tromagnetic force to engage said friction plate thereby translating power from said rotor means to said drive shaft; and
at least one reinforcing member disposed within said elastomeric member, said assembly characterized by said reinforcing member including a cylindrical, axially extending ring, said ring being disposed concentrically about said shaft and having side walls which are disposed substantially parallel to said shaft for preventing said elastomeric member from buckling radially as said armature assembly is subjected to torque from the engagement of said armature plate and said rotating friction plate while substantially maintaining the axial flexibility of said elastomeric member.

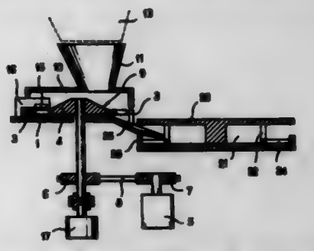
5,195,626

DEVICE FOR CHECKING COINS

Son Le Hong, 5 Rue de Chevreuse, Villebon sur Yvette, France 91140 , and Claude Rigolet, 13 Rue du Flamant rose, Limours, France 91470

PCT No. PCT/FR89/00314, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO89/12872, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 20, 1989, Ser. No. 623,908
Claims priority, application France, Jun. 21, 1988, 88 08322
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—317 19 Claims

14. A device for influencing a detector by successive metal disks, said device comprising means for transferring the disks so that the centers of the disks move one by one along a predetermined path of travel including a single motor-driven circular plate which makes it possible to perform simultaneously the functions of separation and identification of disks, said plate being toothed along its periphery and rotatable above a stationary portion which is almost entirely surrounded by a circular rim on which the disks slide when they are engaged between the teeth of the plate, and an electromagnetic detector placed above the path of travel of the disks so as to detect the material of the disks, the air-gap between the detector and the disks which varies with the thickness of the disks, whereby the area of the magnetic field of the detector which is intersected by the disks depends on the diameter of the disks, said device moreover comprising means for automatic discharge of disks, said means comprising two shutters which are hinged on the stationary portion, which constitute in the closed position a portion of the circular rim at the periphery of a bulk admission zone and which, when they open allow all the disks located in this zone to escape to the exterior.

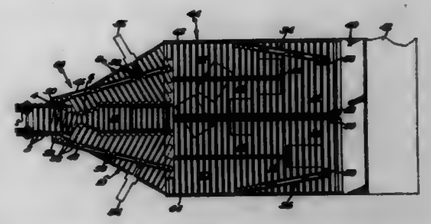


5,195,627

PATTERN-FORMING METHOD APPARATUS FOR CONTAINER PALLETIZING

Ronald E. Wyman, Forest Lake, Minn., assignor to Wyard Industries, Inc., Forest Lake, Minn.

Division of Ser. No. 485,142, Feb. 26, 1990, Pat. No. 5,092,447.
This application Mar. 2, 1992, Ser. No. 844,122
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—374 5 Claims



1. A method of forming containers into desired patterns in a conveyor system having an infeed conveyor, movable between straight, left and right positions with respect to the direction of container infeed movement for reception in a collection area and stacking on pallets, comprising:
directing a predetermined number of containers one at a time from said infeed conveyor onto one of at least three parallel, pattern-forming conveyors, with each of said containers being initially received onto one of said pattern-forming conveyors in a first orientation with respect to the direction of conveyor movement;
intermittently positioning the infeed conveyor in a selected left, right or straight orientation to direct a preselected container along a path between two adjacent pattern-forming conveyors such that the container overlaps and is carried by said two adjacent conveyors, at least one of said two adjacent conveyors having selectively adjustable speed control means mechanically associated therewith;
selectively changing the speed of said one of said two adjacent conveyors to thereby cause one side of said preselected container to advance at a different linear rate than the other side thereof, whereby said preselected container is caused to rotate to a predetermined, second orientation with respect to the direction of conveyor movement; and
discharging said predetermined number of containers in a predetermined pattern from said plurality of pattern-forming conveyors into said collection area for reception onto a pallet.

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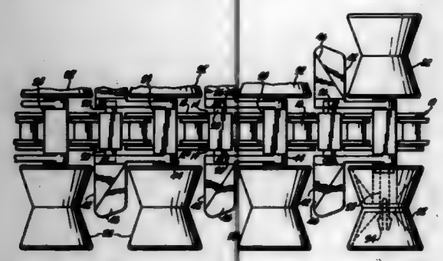
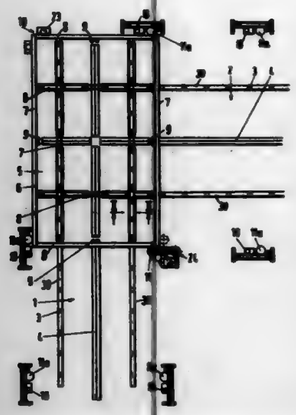
5,195,628
OFF-LOADING CONVEYING SYSTEM
Aaron J. Warkentin, 13551 View Dr., Orange Cove, Calif. 93646
Filed Jul. 10, 1992, Ser. No. 911,766
Int. Cl.[5] B65G *47/46*
U.S. Cl. 198—370 9 Claims



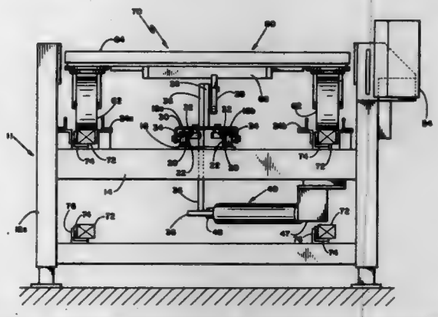
1. An off-loading conveyor of product units, comprising
a support structure defining a conveying path;
an endless flexible member mounted on said support structure to extend along said conveying path;
supports mounted to said endless flexible member, said supports being mutually spaced apart and including support surfaces defining concavities between adjacent said supports;
off-loading elements pivotally mounted on said endless flexible member about axes perpendicular to said conveying path, extending to between adjacent said supports, respectively, and having downwardly inclined portions facing adjacent said concavities, respectively, to off load product units away from said endless flexible member when selectively pivoted.

5,195,629
DEVICE FOR TRANSFERRING PLATFORMS MOVABLE ON ROLLERS FROM A CONVEYOR TO A CROSS-CONVEYOR
Norbert Gottstein, Weinheim, and Klaus Schäfer, Darmstadt, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany
Filed Dec. 12, 1991, Ser. No. 806,729
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1990, 4040795
Int. Cl.[5] B65G *47/84*
U.S. Cl. 198—465.2 19 Claims



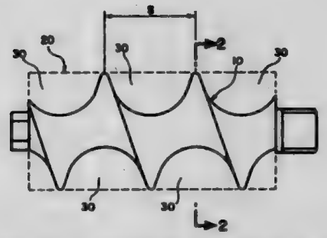
1. A transfer station operable on a platform conveyor system for transferring a platform (5), displaceable on rollers (3), from a first conveyor (1) to a second, intersecting conveyor (2) in which said platform conveyor system moves the platform (5) along said conveyors (1, 2) by a plurality of driven, vertically rotatable friction wheels positioned alongside said conveyors (1, 2), said rollers (3) being rotatably mounted in said conveyors (1, 2) and spaced along said conveyors (1, 2) so as to contact said platform (5) when said platform (5) is adjacent each of said rollers (3), comprising:
a rotatable friction wheel assembly (24) positioned in an intersection point where said first conveyor (1) intersects said second conveyor (2) comprising:
a frame;
a swing lever (12) mounted to said frame so that said swing lever (12) is rotatable about a vertical swing axis (13), said swing axis (13) positioned adjacent to said conveyors (1, 2); and
at least one friction wheel (11) rotatably mounted to said swing lever (12) so that said friction wheel (11) is capable of making contact with said platform (5) to drive said platform (5) along either of said conveyors (1, 2).

5,195,630
CURVED RATCHET CONVEYOR
Richard P. Donovan, and James A. Behne, both of New Richmond, Wis., assignors to Cannon Equipment Company, Cannon Falls, Minn.
Filed Dec. 4, 1991, Ser. No. 802,387
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—465.3 16 Claims



1. A conveying apparatus for conveying load carrying means through a curve, comprising:
a frame, the frame having an intake end and an outlet end, a central stationary support means secured to a top surface of the frame, the central support extending through an arc from the intake end to the outlet end,
load carrying means supports secured to the frame on either side of the central support and extending through the same arc as the central support from the frame intake end to the outlet end,
a singular rigid mount rail slideably secured to the central support and extending through the same arc thereof, the mount rail including one or more retractable pushing means secured thereto,
a drive means secured to the main mount rail for moving the mount rail in a ratcheting motion so that the pushing means intermittently contact the load carrying means for moving the load carrying means in a direction from the frame inlet end to the outlet end, and
at least one of the load carrying means supports having continuously driven chain means operating there along for providing driving contact with the load carrying means.

5,195,631
OPTIMUM SCREW
George K. Bermann, Moscow, U.S.S.R.; Vladimir N. Kostelmann, Pennsauken, N.J., and George S. Khait, Alameda, Calif., assignors to Development Products, Inc., Pennsauken, N.J.
Filed Oct. 1, 1991, Ser. No. 771,455
Int. Cl.[5] B65G *33/26*
U.S. Cl. 198—676 1 Claim



1. A helical screw, having spiral convolutions and a conveying cavity, and having a cross section with the following geometric parameters:
an outer diameter D defined as the diameter of a first circle described by the cross section of a cylinder into which said helical screw snugly fits, said cross section of said cylinder being taken perpendicular to the longitudinal axis of said cylinder;
a cross-sectional diameter d defined as the diameter of a second circle described by the cross section of said helical screw through the outermost point of one of said spiral convolutions, said cross section of said helical screw being taken perpendicular to the longitudinal axis of said screw;
wherein the following equations are satisfied:

$$h=D-d,$$

where h is the channel depth of said helical screw;

$$S=2h,$$

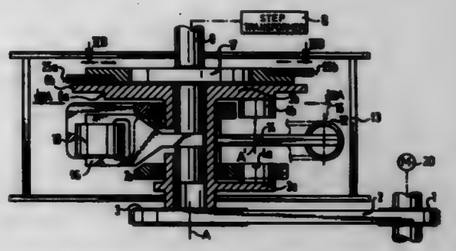
where S is the pitch of said helical screw; and

$$e=\tfrac{1}{2}D-\tfrac{1}{2}d,$$

where e is the eccentricity of the helical screw, defined as the distance between the centers of said first and said second circles.

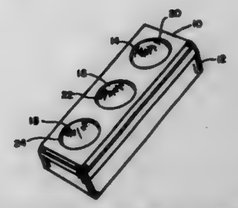
5,195,632
FORCE-STORING ACTUATOR FOR LOAD SWITCH OF STEP TRANSFORMER
Rolf Lauterwald, Pettendorf, Fed. Rep. of Germany, assignor to Maschinenfabrik Reinhausen GmbH, Regensburg, Fed. Rep. of Germany
Filed Oct. 25, 1991, Ser. No. 783,629
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1990, 4034126
Int. Cl.[5] H01H *5/10*
U.S. Cl. 200—400 8 Claims

1. A force-storing actuator for connection to a rotor of a step transformer, the actuator comprising:
a support;
a central upright axle connected to the rotor, defining an axis, and rotatable on the support about the axis;
upper and lower input wheels fixed rotationally to each other and rotatable on the shaft about the axis;
respective upper and lower drive elements fixed respectively underneath and atop the upper and lower input wheels;
upper and lower force-storing levers rotatable on the shaft about the axis between the input wheels and respectively juxtaposed with the upper and lower input wheels, each lever being angularly engageable with the respective drive element;
a spring arm rotatable on the shaft about the axis between the upper and lower levers and having an outer end;
a spring having outer ends connected to the two levers offset from the axis and a middle secured on the outer end of the spring arm;
an output wheel fixed on the shaft above the upper input wheel;
an output element fixed angularly on the shaft axially between the levers and engageable angularly with both of the levers;



latching formations on the output wheel;
at least one latch pawl movable on the support between a blocking position latchingly engaging the formations to angularly arrest the output wheel and a freeing position out of engagement with the output wheel;
cam means on the upper drive wheel engageable with the pawl for displacing same between its positions; and
drive means for rotating the input wheels with the pawl in the blocking position for tensioning the spring and for bringing the cam means into engagement with the pawl to displace it briefly into the freeing position to allow rotation of the output wheel and shaft and relaxation of the spring.

5,195,633
GOLF BALL DISPLAY DEVICE
David Kaniuski, 2496 Kingsbury, Troy, Mich. 48098
Filed Jan. 27, 1992, Ser. No. 826,117
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—315.9 6 Claims



1. A display device for a golf ball, comprising:
a front body member of a rigid material having an outer, front surface with a viewing opening, the viewing opening having a diameter less than that of a golf ball;
a rear body member of a rigid material disposed behind the front body member, the rear body member having a rear surface;
the front and rear body members having internal structure defining a pair of spaced, aligned, annular shoulders including a front shoulder, the front shoulder being spaced behind the viewing opening, and a rear shoulder located forward of the rear surface of the rear body member;
the front shoulder and the rear shoulder each having a diam-

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eter less than that of a golf ball and being spaced a distance less than the diameter of a golf ball, and

means for connecting the front body member to the rear body member to retain a golf ball between the front shoulder and the rear shoulder in a position in which a portion of the surface of a retained golf ball may be viewed through the viewing opening, and a retained golf ball is recessed from the rear surface of the rear body member so the rear surface of the display device may be disposed on a flat surface.

4. A combination, comprising

a golf ball;

a front body member of a rigid material having an outer, front surface with a viewing opening, the viewing opening having a diameter less than that of the golf ball;

a rear body member disposed behind the front body member, the rear body member having a rear surface;

the front and rear body members having internal structure defining a pair of spaced, aligned, annular shoulders including a front shoulder, the front shoulder being spaced behind the viewing opening, and a rear shoulder located forward of the rear surface of the rear body member,

the front and rear shoulders each having a diameter less than that of the golf ball and being spaced a distance less than the diameter of the golf ball, and

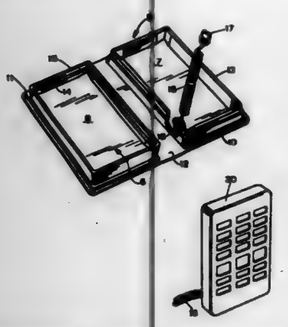
means for connecting the front body member to the rear body member to retain the golf ball between the front shoulder and the rear shoulder in a position in which a portion of the surface of the golf ball may be viewed through the viewing opening, and the golf ball is recessed from the rear surface of the rear body member so the rear surface thereof may be disposed on a flat surface.

5,195,634

REMOTE CONTROL HOLDER

Gregory P. Zang, 707 E. 7th St., Hinsdale, Ill. 60521

Filed Aug. 16, 1991, Ser. No. 745,684
Int. Cl.[5] B65D *25/10*
U.S. Cl. 206—320 15 Claims



1. A combination of a remote control device for remotely operating a controlled device and an apparatus for hindering the misplacement of the remote control device, said combination comprising:

a base member of sufficient size that said base member is less easily misplaced than said remote control device; and,

attaching means attaching said remote control device to said base member, said attaching means including a helical-type cord.

5. An apparatus for impeding the misplacement of a remote control device comprising:

a book-type holder having a tray joined to a cover wherein the cover and the tray form a compartment within which a remote control device can be enclosed, the tray having two pairs of opposing walls and a bottom defining a volume; and,

attaching means for attaching said remote control device to said book-type holder, said attaching means including

an elongated member having a first end attached by a coupler to said tray within said volume wherein said remote control device may be used remotely from said book-type holder when said remote control device is attached to said book-type holder, and

coupling means for coupling a second end of said elongated member to said remote control device;

wherein one of said coupler and said coupling means is an adhesive-type coupler.

5,195,635

CRYPTOPLATE MOBILE SYSTEM FOR DISPOSING AND CONTAINING SHARPS AND INFECTIOUS MEDICAL WASTES

James T. Cornwell, Cleveland, Tenn., assignor to Quality Containers International, Inc., Cleveland, Tenn.

Filed Feb. 10, 1992, Ser. No. 833,075
Int. Cl.[5] B65D *85/24*
U.S. Cl. 206—366 7 Claims

1. A single mobile system for containing and disposing of medical sharps and infectious waste comprising:

a master barrier container having an interior surface, said container being adapted to contain non-sharp medical waste, said barrier container having an open top;

a semirigid sharps container adapted to contain sharp medical waste and having a bulbous front wall and a rear wall, said sharps container being fixed to said interior surface of the master barrier container at said rear wall of said sharps container, said sharps container having an opening for receiving said sharp medical waste adjacent said open top of said master barrier container and having a closure adapted to lock closed said opening to close said sharp medical waste in said sharps container; and

means for closing said open top of said master barrier container with said sharps container therein.

5. A single mobile system for containing and disposing of medical sharps and infectious waste comprising:

a master barrier container having an interior surface, said container being adapted to contain non-sharp medical waste, said barrier container having an open top including an open top margin, self-adhesive tape being partially secured to said top margin and being adapted to close said barrier container;

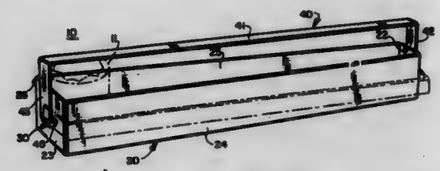
a semirigid sharps container adapted to contain sharp medical waste, said sharps container being ultrasonically welded to said interior surface of the master barrier container, said sharps container having an opening for receiving said sharp medical waste and having a closure adapted to lock closed said opening to close said sharp medical waste in said sharps container; and

a mobile support stand adapted to hold said master barrier container with said sharps container, said stand having casters for transporting said stand thereon, said stand including U-shaped stainless steel tubing structure adapted to laterally support said master barrier container.

5,195,636

METAL SOCKET TRAY WITH PIVOTING SOCKET RETAINER

Gerald A. Wridt, Racine, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

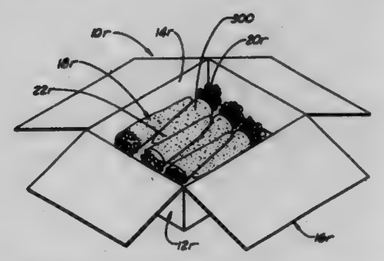
Filed Mar. 27, 1992, Ser. No. 859,088
Int. Cl.[5] B65D *25/28, 85/00*
U.S. Cl. 206—378 20 Claims

1. A tray assembly for articles comprising: an article receptacle having opposed upstanding end walls, each of said end walls having an opening therein with each of said openings shaped to define first and second stop surfaces, and a bail retainer having end portions respectively disposable along said end walls, each of said end portions having a projection extending therefrom such that said projections are respectively pivotally receivable in said openings for pivotal movement of said retainer between first and second positions, said retainer in its first position closely overlying said receptacle for retaining articles therein with said projections respectively engaged with said first stop surfaces, said retainer in its second position being disposed alongside said receptacle for permitting access to the interior thereof with said projections respectively engaged with said second stop surfaces, said first stop surfaces being positioned relative to said second stop surfaces so as to limit the pivotal movement of said retainer to substantially less than 360°.

5,195,637

SHIPPING CARTON FOR FLORAL GROUPING ASSEMBLIES

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 831,767, Feb. 5, 1992, Pat. No. 5,148,918, which is a continuation-in-part of Ser. No. 692,329, Apr. 26, 1991, Pat. No. 5,092,465. This application Apr. 13, 1992, Ser. No. 868,068
The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.
Int. Cl.[5] B65D *85/50, 85/52*
U.S. Cl. 206—423 6 Claims



1. A shipping carton comprising:

A box assembly having an inner surface and an outer surface and at least partially enclosing a retaining space; and

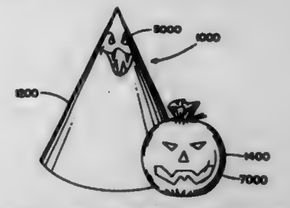
A plurality of floral grouping assemblies, the floral grouping assemblies being disposed in the retaining space in the box assembly and each floral grouping assembly having an adhesive disposed on a portion thereof with the adhesive on the floral grouping assemblies removably and adhesively engaging an adjacent floral grouping assembly for connecting the floral grouping assemblies when the floral grouping assemblies are placed in the retaining space in the box assembly for substantially preventing movement of the floral grouping assemblies in the box assembly during movements of the box assembly.

5,195,638

COMBINATION OF THEMATICALLY RELATED DECORATIVE OBJECTS

Benson E. Zinberg, 320 Chestnut Hill Road, Stamford, Conn. 06903

Continuation-in-part of Ser. No. 554,967, Jul. 18, 1990, and Ser. No. 664,023, Mar. 4, 1991, and Ser. No. 664,024, Mar. 4, 1991.
This application Aug. 23, 1991, Ser. No. 749,165
Int. Cl.[5] B65D *33/00*
U.S. Cl. 206—457 21 Claims



1. Decorative structures for simulating a common conception of the appearance of a fanciful character or object together with a common conception of the appearance of a thematically related object or character, comprising in combination:

a support bag means having a compressible filling material therein;

a plastic flexible sheet member placed over said support bag means and supported thereby, said sheet member supported by said support bag means forming a first structural element substantially in the shape of a pyramid or an inverted, truncated or pointed cone, and said sheet member having indicia thereon simulating the appearance of a said fanciful character or object;

a plastic flexible bag forming a second structural element, and having a first end and a second end opposite each other, at least said second end being open for receiving filling material therein; and

bunching means for bunching together and closing said second end of said flexible bag to form therein a second bunched closed end after filling material is inserted in said bag;

said flexible bag having a substantially rounded shape when filled with filling material and when said second end is bunched by said bunching means, and said bag having indicia thereon simulating appearance of a common conception of an object or character thematically related to the indicia of the flexible sheet member when positioned within viewing distance of said flexible sheet member.

16. A kit for forming a decorative structure for simulating a common conception of the appearance of a fanciful character or object in combination with a thematically related object or character comprising:

a support bag adapted to be filled for forming a central structural member of a fanciful character or object;

a plastic flexible sheet member adapted to be placed over said support bag when said support bag is filled, said sheet member adapted to form a structural element substantially in the shape of a pyramid or an inverted cone and having first indicia thereon for simulating the appearance of a fanciful character or object;

at least one connecting member for connecting said sheet

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member to said support bag at an upper portion of said support bag member;

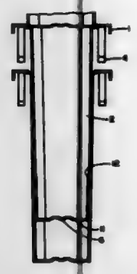
a plurality of anchoring means adapted to be anchored in the ground or a floor surface for anchoring free ends of said sheet member to the ground or a floor surface at spaced apart locations around a peripheral portion of said sheet member in the vicinity of a lower portion of said support bag;

a plastic flexible bag having an open end for receiving filling material, said plastic flexible bag having second indicia thereon for simulating the appearance of an object or character thematically related to but different from that of said first indicia of the flexible sheet member; and

bunching means for bunching together and closing said open end of said plastic flexible bag after filling material is inserted in said plastic flexible bag.

5,195,639
STACKABLE BOX

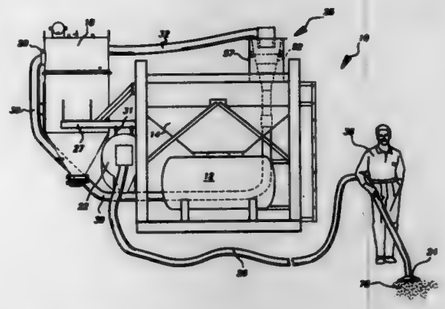
Georg Oubekk, Boks 42, N-8250, Rognan, Norway

PCT No. PCT/NO90/00060, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO90/11942, PCT Pub. Date Oct. 18, 1990
Continuation of Ser. No. 768,570, filed as PCT/NO 90/00060, Apr. 3, 1990, published as WO90/11942, Oct. 18, 1990, abandoned.
Claims priority, application Norway, Apr. 11, 1989, 891493
Int. Cl.[5] B65D *21/02*
U.S. Cl. 206—507 3 Claims

1. Stackable box for storing and transportation of a number of similar objects, the front and rear walls of the box being tapered inwardly downwards and being provided with webs for transversial support of the objects, the box being provided with an interior shoulder in a lower portion of the interior surface of the walls such that one box may be placed into another with the bottom resting on the shoulder of the lower box for boxes having the same orientation, the bottom of an upper box resting on a surrounding flange on top of a lower box for boxes having different orientation, CHARACTERIZED IN the box being non-symmetric about a centric transversal axis with a symmetric upper flange on which an upper box rests having opposite orientation from a lower box thereby to allow the lower box to contain objects, the box below the flange being tapered to a trapeze form in a horizontal cross section having one short end wall and one larger end wall and that the surface of the flange having recessed portions to receive the bottom of an upper box, the the recess in the flange above the shorter end thereby having a recess shape to receive the larger end of an upper box.

5,195,640
METHOD AND APPARATUS FOR CLEANING ABRASIVE BLAST MEDIA

Glenn A. Seaverns, 9638 47th Ave., SW., Seattle, Wash. 98136

Filed Mar. 3, 1992, Ser. No. 846,220
Int. Cl.[5] B07B *9/00*
U.S. Cl. 209—2 20 Claims



1. An apparatus for recovering and cleaning contaminated particulate abrasive blast media for reuse, comprising:

a vacuum system for entraining contaminated blast media from a work site in a transporting gas;

a rotatable, cylindrical drum having cylindrical walls, said drum having solid wall section and an apertured wall section, the solid wall section being positioned forward of the apertured wall section;

an inlet member coupled to a front region of said cylindrical drum, said inlet member being positioned for receiving contaminated blast media from an inlet pipe and depositing said contaminated blast media on said solid wall section of said rotatable drum;

a blocking assembly positioned within said rotatable drum in said solid wall section, said blocking assembly including an air restriction member that restricts the airflow through a selected portion of the drum, thus creating an increased airflow velocity through the unrestricted portion of said rotatable drum;

an outlet for air-entrained contaminants in a back region of said rotatable drum; and

an outlet positioned below said apertured wall section for receiving cleaned blast media that passes through apertures in said apertured wall section of said rotatable drum, the apertured wall section being positioned aft of the solid wall section and the blocking assembly such that said blast media passes through said aperture after significant contaminants are removed by air-washing in said rotatable drum prior to exiting through said apertures.

12. An apparatus for entraining, transporting and cleaning contaminated particulate abrasive blast media for reuse, comprising:

an operator-controllable vacuum nozzle having a flow of air drawn into it, said vacuum airflow being provided to entrain contaminated blast media under the manual control of an operator;

a first stage cleansing assembly including a rotatable drum that is suspended from a frame member, said flow of air going through said first cleansing stage to remove contaminants from said blast media and an outlet positioned below said rotatable drum and receiving blast media as it exits from said drum;

a first tubing extending from said first stage cleansing assembly to a first dust collector for removing airborne fines from said flow of air that have been separated from said contaminated blast media in the first cleansing stage;

a second tubing extending from said first dust collector to said outlet to transport blast media exiting from said first

cleansing stage in said flow of air, said air being once cleaned air by passing through said first dust collector;

a second cleansing stage coupled to said tubing, said blast media entering said second cleansing stage entrained within said flow of air for removing additional contaminants from said blast media;

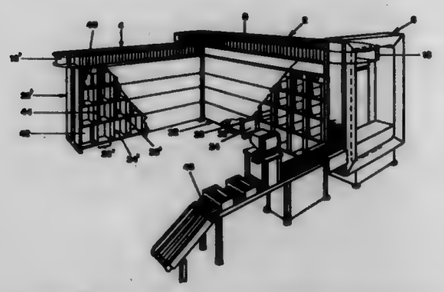
a third tubing extending from said second cleansing stage to a second dust collector for removing air-borne fines a second time from said flow of air; and

a vacuum source coupled to the outlet of said second dust collector, said vacuum source providing the vacuum flow of air for entraining the blast media from said operator-controlled vacuum nozzle in a series pass through said first stage cleansing assembly, said first tubing, said first dust collector, said second tubing, said second cleaning stage, said third tubing and said second dust collector.

5,195,641
SORTING LINE FOR PROCESSING ENVELOPES, PARTICULARLY FOR PHOTOGRAPHIC LABORATORIES

Roberto Signorette, Olmo Di Martellago, Italy, assignor to Systel International S.p.A., Italy

Filed Oct. 17, 1990, Ser. No. 599,013
Claims priority, application Italy, Oct. 24, 1989, 84159 A/89
Int. Cl.[5] B07C *5/342*; B65G *47/46*
U.S. Cl. 209—698 8 Claims

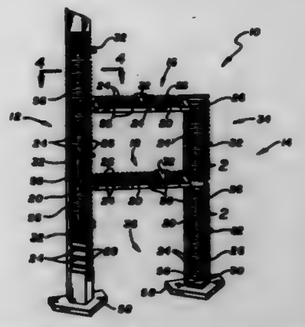


1. A sorting line for processing envelopes comprising at least one endless conveyor for a plurality of boxes provided with a base which opens under a command correlated with the position of said boxes along their path; and a plurality of compartments, arranged on several levels in a position below said endless conveyor, and provided with upperly open communication channels which emerge in positions corresponding with the different positions in which the base of said boxes opens wherein said boxes are provided with a gravity-openable base which is kept closed by interference between an operating appendix thereof and a guide extending along the endless conveyor, gaps being produced on command in said guide at that point of said endless conveyor in which said base is to be made to open and wherein said sorting line further comprises a feeder for automatically inserting processing envelopes into said boxes, said feeder comprising a tray elevator which receives said processing envelopes from a feed line and after raising them to a height exceeding the upper edge of said boxes inserts them, when in a predetermined position, into an underlying box ready to receive them whereby said tray elevator extends vertically through at least one section to raise the horizontally arranged processing envelopes to a height exceeding the upper edge of the boxes, and then extending horizontally through a further section to convey the now vertically arranged processing envelopes to the region for their insertion into the underlying boxes and said feeder further comprises a belt conveyor extending within said tray elevator to prevent movement of the processing envelopes relative to trays of the elevator, the horizontal portion of said belt conveyor extending as far as the region in which said envelopes are inserted into said boxes.

5,195,642
DISPLAY OR STORAGE UNIT

Shahriar Dardashti, 236 S. Oakhurst Dr., Beverly Hills, Calif. 90212

Filed Mar. 30, 1992, Ser. No. 859,894
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—41 23 Claims



1. A display or storage unit for selectively holding compact disc cases, tapes and cassettes, comprising a plurality of modular units removably attached together to form a desired configuration, each of said modular units including:

side portions having apertures therein;

back portions;

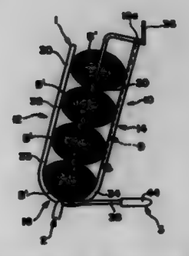
spaced apart front portions forming openings adapted to selectively hold said cases, tapes and cassettes; and

top and bottom plates having apertures therein adapted so that said modular units may be removably attached to one another to form said desirable configuration, selectively using said apertures in said side portions and said apertures in said top and bottom plates.

5,195,643
DELI BAG DISPENSER

Frank J. Rocco, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 23, 1991, Ser. No. 811,868
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 18 Claims



1. A wire frame dispenser for dispensing individual objects stored in rolls, comprising:

a front frame, a rear frame, and a bottom frame, each frame made of wire and connected together to define a storage region adopted to contain a plurality of said rolls, each roll resting on top of each other in stacked succession with their respective longitudinal axis extending parallel to each other and to the bottom frame, said front frame

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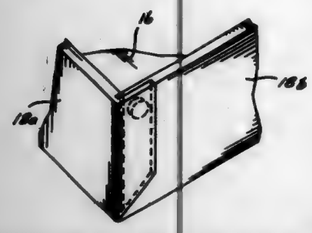
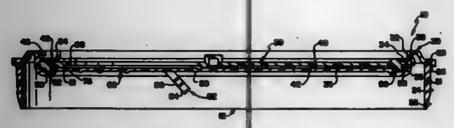
including at least two front frame wire members extending upward from the bottom frame and spaced a sufficient distance from each other to enable a user's hand to reach in between the front frame wire members to engage and remove an object from one of the rolls.

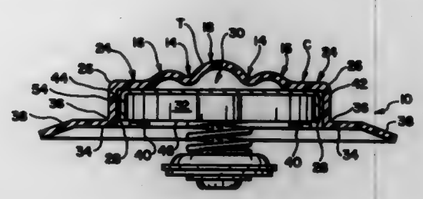
5,195,644
SEALED, SEAMLESS BOX AND METHOD OF MANUFACTURING SAME
Hartmut Schmid, North Vancouver, Canada, assignor to Glenayre Electronics Ltd., Vancouver, Canada
Filed Jul. 13, 1992, Ser. No. 912,349
Int. Cl.[5] B65D *5/40*
U.S. Cl. 220—6 24 Claims



1. A box assembly comprising: a box body formed from a single sheet of metal having a selected thickness, said box body having a base panel, a plurality of side panels that extend upward from said base portion such that adjacent said side panels have adjacent longitudinally extending edges, and a tab extending from a selected said side panel longitudinally extending edge, wherein said tab has a thickness less than the thickness of the metal sheet, and a cutout formed in said side panel adjacent said side panel to which said tab is attached and said tab being seated in said cutout so that said tab and cutout form a corner of said box body that has a uniform thickness equal to the thickness of the metal sheet.

5,195,645
END CLOSURE HAVING ADJUSTABLE PUSH OPEN LID
Dave Schuermann, Wausau, Wis., assignor to Specialty Packaging Group, Inc., Wausau, Wis.
Filed Apr. 7, 1992, Ser. No. 865,026
Int. Cl.[5] B65D *51/20, 43/24*
U.S. Cl. 220—253 13 Claims

8. An end closure for a container comprising:
a substantially planar lid portion including means for engaging an upper rim of a container to be closed; and
an openable lid portion defined in said lid portion, said openable lid portion including a flexible hinge extending along a first edge thereof and a frangible coupling extending along the remaining edges thereof, whereby when a force is applied to an upper surface of said openable lid portion, the frangible coupling is broken to define a free edge of the openable lid portion and the openable lid can be pivoted about the hinge, a bottom surface of said lid portion including engaging means extending partially beneath a portion of said frangible coupling so that when force is applied to said openable lid portion and said openable lid portion pivots about said hinge, at least a portion of said free edge of said openable lid portion engages said engaging means, said engaging means including means for selectively retaining said openable lid portion in one of at least two open, engaged positions, each defining a different opening size.

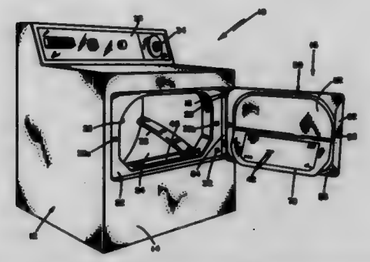
5,195,646
RADIATOR CAP COVER
Ricky L. Robinson, 6546 Hollywood Blvd., Suite 201, Hollywood, Calif. 90028
Filed Jun. 4, 1992, Ser. No. 893,825
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—256 6 Claims



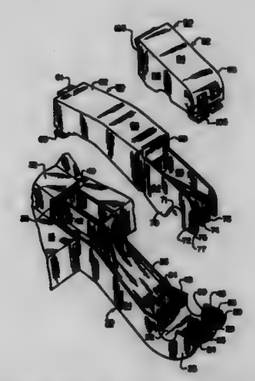
1. A radiator cap cover formed of a resilient material and installable upon a cap for a radiator, said radiator cap cover comprising:
a crowned upper portion including a top surface and a depending rim;
said crowned upper portion including an interior cavity formed so as to closely cooperate with said cap installed therein;
said depending rim including a plurality of resilient tabs extending inwardly therefrom to engage a lower edge of said cap;
said crowned upper portion formed atop a circular base;
said circular base having a flange extending downwardly and outwardly therefrom; whereby
said radiator cap cover being cooperatingly installed upon said cap by means of said crowned upper portion interior cavity and said plurality of resilient tabs and said downwardly and outwardly extending flange providing for the deflection of heated fluid issuing from said radiator when said cap and cooperating radiator cap cover are removed from said radiator.

5,195,647
CLOTHES DRYER DOOR ASSEMBLY AND METHOD FOR REVERSING MOUNTING SIDE
Timothy K. Stadt, Ripon, Wis., assignor to Raytheon Company, Lexington, Mass.
Division of Ser. No. 677,216, Mar. 29, 1991, Pat. No. 5,113,562.
This application Mar. 4, 1992, Ser. No. 845,909
Int. Cl.[5] B65D *43/14*
U.S. Cl. 220—334 5 Claims

1. A door assembly adapted to be mounted in alternate positions on the front panel of a clothes dryer cabinet so that the door assembly can be configured to be opened from either the left or right side, said door assembly comprising:
a door panel having a handle and a latching mechanism mounted adjacent to one lateral edge and hinges mounted at the opposite lateral edge; and
an inner liner comprising means for mounting said liner to said front panel in alternate inverted orientations of said door panel wherein said door panel can be inverted to reverse the respective sides of said edges to reverse the opening side of said door assembly while maintaining said inner liner in the same orientation.

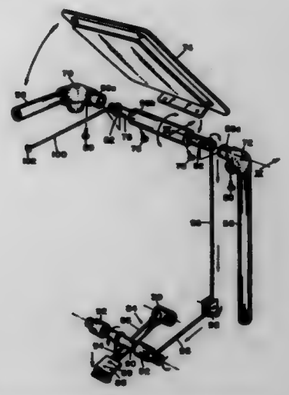


5,195,648
MOLDED SNAP-TOGETHER CONNECTOR
R. G. Harris, Rte. 7, Box 1200, Thomasville, N.C. 27360
Filed Oct. 21, 1991, Ser. No. 781,697
Int. Cl.[5] B65D *43/14*
U.S. Cl. 220—343 14 Claims



1. A connector for securing one member to a second member, said connector comprising:
a) a first latch receiving component positioned on one of said members and having at least one row of spaced parallel resilient ribs extending from a base portion each rib including an opening therein, the openings of the ribs in each row being in coaxial registration;
b) a second latching component mounted on the other of said members and having at least one row of spaced parallel resilient ears extending from a support portion, each ear provided with a boss extending laterally from at least one surface thereof;
c) said ribs and ears being so configured and spaced that, when said second latching component is assembled onto said first component, the bosses of said ears are received into the openings of said ribs, whereby said first and second connector components are retained in assembled relationship;
d) a locking cap comprising an upper wall and a plurality of flanges extending downwardly therefrom into locking relationship between at least some of adjacent ones of said ribs and ears, whereby flexure of said ribs and ears is limited.

5,195,649
TREADLE TOP REFUSE CONTAINER
Richard H. Wolters, 3316 S. Creek Dr., SE., Grand Rapids, Mich. 49508
Continuation of Ser. No. 421,373, Oct. 13, 1989, Pat. No. 5,048,712. This application May 6, 1991, Ser. No. 696,153
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] B65D *43/16*
U.S. Cl. 220—343 1 Claim

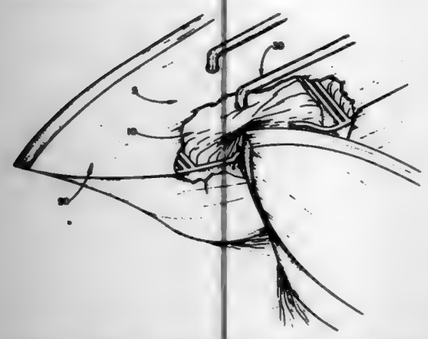


1. A lift top container for refuse comprising:
a container body shaped to retain articles therein, and adapted to be supported on a floor surface;
an upper container member shaped to define an open marginal edge through which said articles pass into and out of said container body, and including at least first and second segments spaced laterally apart a preselected distance at a predetermined position on said upper container member;
a lid shaped to selectively close the open marginal edge of said upper container member;
a pivot rod rotatably mounting said lid on said upper container member and pivoting said lid between open and closed positions; said pivot rod being fixedly connected with said lid for rotation therewith, and having opposite ends thereof disposed adjacent to the first and second segments of said upper container member;
said first and second segments being connected by a screw fitted into a slot in each opposite end of said pivot rod in a manner which permits said pivot rod and said lid to rotate between the open and closed positions, yet laterally interconnects the first and second segments of said upper container member to provide structural rigidity to said container.

5,195,650
LEAKAGE PREVENTION SYSTEM FOR LIQUID STORAGE AND TRANSPORTATION TANKS
Tom Leidig, 114 Evernia St., Jupiter, Fla. 33458
Filed Aug. 10, 1992, Ser. No. 926,674
Int. Cl.[5] B65D *88/16*
U.S. Cl. 220—461 11 Claims

1. For use in combination with liquid storage and transportation tanks, as those used in tankers and oil trucks, a leakage prevent system comprising:
a puncture proof bladder disposed along the inner surface of the tank and sized to substantially the volume of the tank, said puncture proof bladder including an inner lining and an outer lining,
said inner lining including a liquid impervious, flexible material,
said outer lining including a substantially flexible material

shell designed to be completely puncture resistant, thereby protecting said inner lining from punctures that could lead to leakage,



said bladder further including fastening means to attach said puncture proof bladder to the upper surface of the tank, and

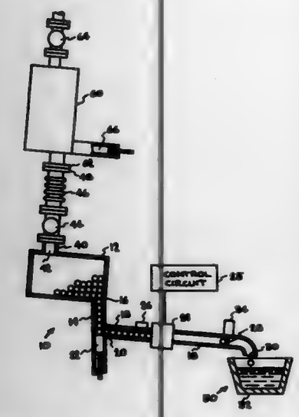
a means for containing and redistributing overflow that may result from impact to said puncture proof bladder.

5,195,651

BALL FEEDER FOR REPLENISHING EVAPORATOR FEED

David K. Felde, Oak Ridge, Tenn., and Robert H. McKoon, San Ramon, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1991, Ser. No. 721,009
Int. Cl.[5] B23Q *7/00*
U.S. Cl. 221—174 6 Claims



1. A ball feeder comprising:

a container for containing balls of specified size;

an elongated passageway means having an inlet and an outlet for allowing said balls to travel sequentially therealong by gravity from said inlet to said outlet;

connecting means connecting said container with said inlet for causing said balls to roll out of said container and to move one by one through said passageway means from said inlet toward said outlet;

metering valve means for metering the passage of said balls, said metering valve means being responsive to a pass signal and having an open and a closed position and disposed between said inlet and said outlet of said passageway means, wherein in said closed position said metering valve means acts to block the travel of said balls through said passageway means and wherein in said open position said metering valve means permits said balls to pass through said passageway means one at a time in response to said pass signal;

pass signal generating means for generating said pass signal and for communicating said pass signal to said metering valve means; and

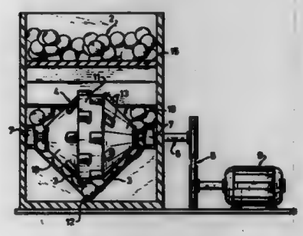
gate means disposed within said passageway means between said metering valve means and said outlet for momentarily stopping thereat a ball which is moving along said passageway means.

5,195,652

APPARATUS FOR REGULARLY DELIVERING BALL-SHAPED OBJECTS

George A. Hooghiemstra, late of Baarnseweg, Netherlands, by Jessica Hooghiemstra, legal representative

Filed Mar. 15, 1991, Ser. No. 669,861
Claims priority, application Netherlands, Mar. 16, 1990, 9000607
Int. Cl.[5] B65G *29/00*
U.S. Cl. 221—203 5 Claims



1. In apparatus for regularly delivering essentially ball-shaped objects from a quantity, provided with a container for a supply of said objects, a discharge channel for the objects to be delivered, and a body rotating about a horizontal axis between said container and said channel and above said channel for regulating the passage of the objects through the channel; the improvement wherein the channel has a V-shaped cross-section, and the rotating body has two conical end parts of which the tips facing away from each other coincide with said horizontal axis of rotation, which end parts face the channel walls in such a way that between the bottom of the channel and the rotating body a free passage exists for said objects in single file.

5,195,653

SLIDE MOUNTER WITH IMPROVED SLIDE MOUNT ADVANCE

Wilbur Gerrans, Marysville, Wash., assignor to Pakon, Inc., Minnetonka, Minn.

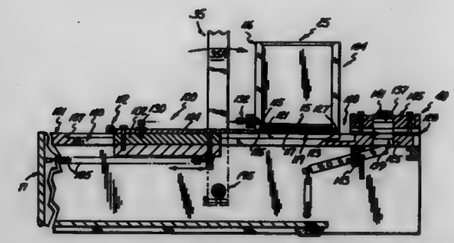
Filed Jan. 15, 1992, Ser. No. 820,988
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—274 14 Claims

1. An apparatus for advancing a slide mount to an insertion station of a slide mounting apparatus of the type having a slide magazine for holding a plurality of mounts in stacked relation, the slide mounts being discharged from the slide magazine through a slide mount opening aligned with a slide track and advanced along the slide track to an insertion station to receive a film transparency therein, the apparatus comprising:

a slide ejector movable between an ejection position and a retraction position for advancing a bottom slide mount from the slide magazine to the insertion station, the slide ejector extending through a rear slide ejector opening of the slide magazine to contact a bottom slide mount to advance the slide mount through the slide mount opening of the slide magazine;

means for advancing the slide ejector from the retraction position to the ejection position;

means for retracting the slide ejector from the ejection position to the retraction position; and



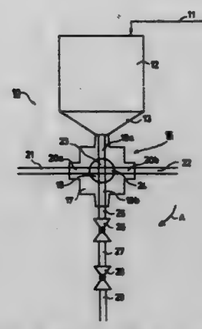
positioning means for aligning an upper surface of the bottom slide mount at or above an upper edge of a front contact surface of the slide ejector while maintaining the bottom slide mount in a position to be engaged by the contact surface of the slide ejector as the slide ejector moves from the retraction position through the rear slide ejector opening toward the ejection position.

5,195,654

METHOD FOR FEEDING A MUD-LIKE CATALYST INTO A POLYMERIZATION REACTOR

Jouni Takakarias, Helsinki, and Kari Sarantila, Porvoo, both of Finland, assignors to Neste Oy, Finland

Filed May 17, 1991, Ser. No. 702,226
Claims priority, application Finland, May 17, 1990, 902453
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—1 6 Claims



1. A method for feeding a mud-like catalyst mixture into a polymerization reactor, comprising

feeding a catalyst mixture from a container into a feeder connected thereto, said feeder comprising a plug valve having borings adapted to be continuously rotated to alternately connect a first inlet channel connected to a lower end of said container to a first outlet channel, and a second inlet channel for a catalyst-mixture transfer medium to a second outlet channel leading to said polymerization reactor,

batchwise filling a first one of said borings with said catalyst mixture transfer medium while at the same time batchwise filling a second one of said borings with said catalyst mixture, and feeding said catalyst mixture by batches into said polymerization reactor by means of pressure of said transfer medium fed into said feeder,

providing an outlet space for said first outlet channel and providing said outlet space with first and second on/off valves coupled to each other via a outlet space,

opening said first on/off valve and closing said second on/-off valve, thereby removing said transfer medium from one of said bores into said outlet space, and thereafter

opening said second on/off valve for leading out said transfer medium as said first on/off valve closes.

4. A device for feeding a mud-like catalyst mixture by batches from a container of a polymerization reactor as a continuous process, comprising

a catalyst feeder comprising a frame and a plug valve provided with a rotatable plug fitted in one or more borings formed on said frame,

a first crosswise channel formed on said frame comprising a first inlet channel connecting said container to a side of said plug, said first crosswise channel further comprising a first outlet channel on an opposite side of said plug, said first outlet channel leading out of said frame,

a second crosswise channel formed on said frame comprising a second inlet channel connected to a catalyst-mixture transfer medium feeding line on a side of said plug, said second crosswise channel further comprising a second outlet channel on an opposite side of said plug, said second outlet channel connected to a reactor line entering a polymerization reactor,

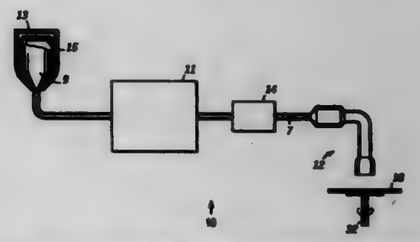
an exhaust space connected to said first outlet channel, said exhaust space comprising first and second on/off valves and a tube located between said first and second on/off valves, said valves operating sequentially so that when said borings align with said first outlet channel and said second on/off valve is closed, said first on/off valve opens and allows the catalyst transfer medium in said boring to flow into said tube, after which said first valve closes and said second valve opens for leading out the catalyst transfer medium, said opening and closing of said first and second on/off valves being regulated according to the rotation of said plug.

5,195,655

INTEGRATED FLUID DISPENSE APPARATUS TO REDUCE CONTAMINATION

Yefim Bakhmutsky, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 24, 1991, Ser. No. 705,197
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—1 16 Claims



1. A method for reducing fluid contamination comprising:

providing a reservoir for containing fluid;

providing means for cooperating with a pumping mechanism to pump the fluid; and

generating a saturated vapor atmosphere at a nozzle from which the fluid is dispensed to prevent the fluid from drying on the nozzle.

5. An integrated fluid dispense apparatus comprising a fluid delivering dispense nozzle having means for moisturizing a tip of said nozzle to prevent the fluid from drying in the dispense

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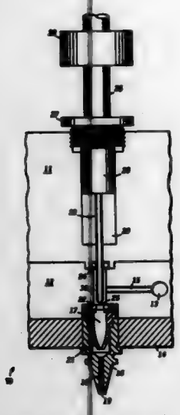
nozzle; and a fluid delivery apparatus coupled to the dispense nozzle.

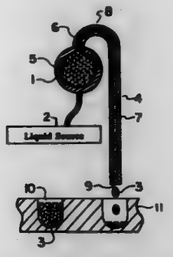
5,195,656
ACCURATELY CONTROLLED FLUID DISPENSER WITH UPPER AND LOWER STROKE ADJUSTERS
Martin J. Briehl, Scottsdale; Kristin F. Cocking, Paradise Valley, and Albert J. Lanings, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 3, 1991, Ser. No. 753,534
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—1 19 Claims



11. A multiple nozzle dispenser system comprising:
a plurality of nozzles wherein each nozzle has an orifice for dispensing a material and a positive displacement cavity for storing the material;
a nozzle plate having a plurality of nozzle openings with the plurality of nozzles positioned through the plurality of nozzle openings;
a manifold plate on the nozzle plate wherein the manifold plate has an input port that is an opening through the manifold plate, and has a plurality of input channels that connect the input port to the plurality of nozzles;
a plurality of bodies on the manifold plate wherein the plurality of bodies is centered to the plurality of nozzles;
a plurality of shafts extending from the plurality of bodies wherein the plurality of shafts move toward the plurality of nozzles to emit a portion of the material from each orifice, and moves away from the plurality of nozzles to fill each positive displacement cavity with the material;
a plurality of upper stroke adjusters that terminate movement of the plurality of shafts away from the plurality of nozzles at a first predetermined position;
a plurality of lower stroke adjusters that terminate movement of the plurality of shafts toward the plurality of nozzles at a second predetermined position.

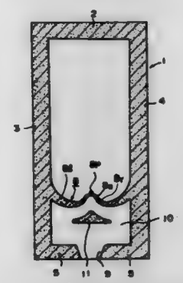
16. A method of dispensing a material comprising:
filling a positive displacement cavity within a nozzle with a material to be dispensed by withdrawing a plunger from the nozzle;
stopping withdrawal of the plunger at a first predetermined point that is determined by a position of an upper stroke adjuster;
varying the first predetermined point by varying the position of the upper stroke adjuster;
controlling a rate of emitting the material from the nozzle by controlling a velocity at which the plunger is inserted into the positive displacement cavity;
stopping the material emission at a second predetermined point by abutting a lower stroke adjuster to the upper stroke adjuster; and
varying the second predetermined point by varying the position of the lower stroke adjuster.

5,195,657
MANIFOLD LIQUID HANDLING DEVICE WITH BACKSIP FUNCTION
John R. Wells, Culver City, Calif., assignor to Source Scientific Systems, Garden Grove, Calif.
Filed Apr. 30, 1990, Ser. No. 517,562
Int. Cl.[5] B01L *3/02*
U.S. Cl. 222—1 8 Claims



6. An improved method for dispensing liquid into an array of liquid vessels, the method being of the type having the following steps:
Step A: charging a manifold with a liquid from a liquid source; then
Step B: expressing liquid simultaneously from the manifold through a plurality of pipettes; and then
Step C: terminating the expression of liquid;
wherein the improvement comprises:
in said Step B, the liquid being expressed through pipettes having a configuration of a siphon with both a long leg and a short leg; the
after said Step C,
Step D: withdrawing liquid from the long leg of each of the pipettes for preventing leakage from the manifold.

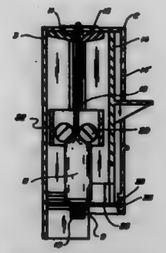
5,195,658
DISPOSABLE CONTAINER
Takahiro Hoshino, Yokohama, Japan, assignor to Toyo Bussan Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 4, 1991, Ser. No. 664,129
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—92 18 Claims



18. In a bag-like container having at least one sealed side and a concavity in one said sealed side, the wall of said concavity being ruptured to release the contents from the interior of the container, the improvement comprising:

inverted-U-shaped rupture means on an interior-facing surface of said concavity for facilitating the rupture of said wall, said rupture means extending into said interior farther than said concavity.

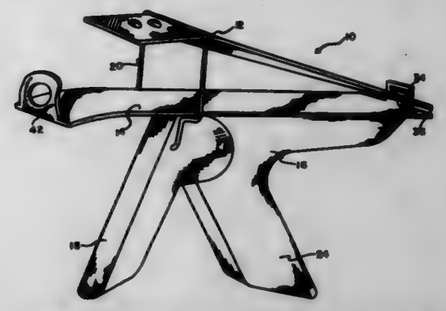
5,195,659
DISCREET AMOUNT TOOTHPASTE DISPENSER
Ronald E. Eiskant, 305 N. 9th St., Belleville, Ill. 62220
Filed Nov. 4, 1991, Ser. No. 787,549
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—102 1 Claim



1. A device to supply discreet amounts of toothpaste from a collapsible tube having a flat end and a cap end, comprising:
(1) an outer shell having front and rear halves hingedly attached to each other;
(2) an upper gripping mechanism for attaching the flat end of the tube to the shell, comprising a front gripping protrusion attached to the front half of the shell and a rear gripping mechanism attached to the rear half of the shell, comprising a groove corresponding to said front protrusion and griping teeth in said groove;
(3) a lower adjustable tube cap bracket having an aperture for receiving the cap of said tube;
(4) a rear roller housing comprising a pair of rollers pivotably mounted therein and rear engaging teeth thereon, said rollers adapted to receive said tube; and
(5) an inner drive mechanism having a plunger attached thereto which engages said rear roller housing said drive mechanism comprising an inner front surface and inner front sides connected perpendicularly to said front surface, riding on upper and lower pins, biased upwardly by a spring, further comprising front drive engaging teeth corresponding to said rear roller housing engaging teeth, said inner front surface being movable downward by means of said plunger, said pins riding in grooves further comprising lower pin engaging guides which force said front drive engaging teeth into contact with said rear roller housing engaging teeth, when said plunger is pushed downward;
whereby a discreet amount of toothpaste is dispensed each time said plunger is forced downwardly.

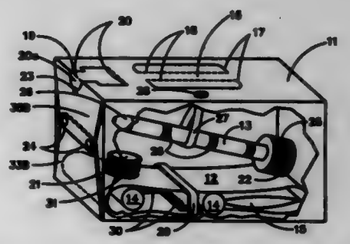
5,195,660
CLAMPING TYPE CAULKING GUN
Joseph A. Lekes, 3415 Pico Dr., Tampa, Fla. 33614
Filed Dec. 23, 1991, Ser. No. 811,614
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—103 5 Claims

2. A device for dispensing fluid from a tube, the tube being of the type having a slot at the rear end and an apertured nozzle at the front end, the device comprising:
a handle with an upper support surface;
a trigger pivotally secured to the handle;
a fixed pressure plate secured to the support surface for receiving a tube, the fixed pressure plate having a rear vertical flange and a front vertical flange, the rear vertical flange designed with horizontal slot means and the front vertical flange having an aperture for receiving a tube nozzle;
a movable preasure plate having a rearwardly extending projection for engagement in the horizontal slot means; and



a coupling mechanism formed of a wire in an inverted U-shaped configuration with fixed ends coupled to the trigger and with an upper central extent positionable on the upper surface of the moveable pressure plate whereby squeezing the trigger with respect to the handle will cause the two plates to move together to compress a tube between the two plates and dispense the fluid from the tube.

5,195,661
COMPOSITE FLUID CARRIER
Bradley J. Light, Littleton, Colo., assignor to Gas-O-Haul Incorporated, Aurora, Colo.
Continuation-in-part of Ser. No. 264,788, Nov. 28, 1989, abandoned. This application Aug. 31, 1990, Ser. No. 576,698
Int. Cl.[5] B65D *35/56*
U.S. Cl. 222—105 14 Claims



1. An emergency liquid carrier consisting essentially of:
a) at least one empty, fluid tight, substantially nonelastic container with a single opening, the opening including a container mouth means for fluid tight connection to at least one nozzle;
b) said at least one nozzle having connection means for fluid tight external connection to the container mouth means; and
c) a shell enclosing the at least one nozzle and the at least one container and including a first opening means for forming a retainer for the container mouth means and a second opening means for forming a second substantially larger opening than said first opening means, said shell including lock means for releasably locking together, portions of said shell defining said larger opening, said second opening means being for the removal of said at least one nozzle and to permit seating of the container mouth means within the first opening means from the inner side of the shell and the connection of the at least one nozzle to the container mouth means external to the shell.

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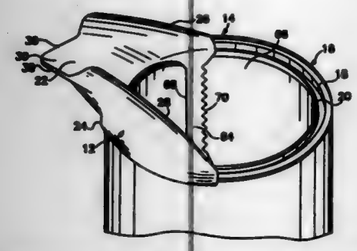
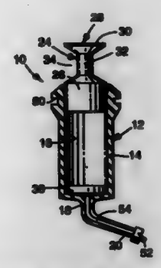
5,195,662
PAINT CAN SPOUT ATTACHMENT
Ted Neff, 24701 Raymond Way, #115, Lake Forest, Calif. 92630
Continuation-in-part of Ser. No. 687,458, Apr. 17, 1991, abandoned, which is a continuation-in-part of Ser. No. 249,290, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 81,018, Aug. 3, 1987, abandoned. This application Mar. 11, 1992, Ser. No. 850,345
Int. Cl.[5] B67D *5/72*
U.S. Cl. 222—108 6 Claims



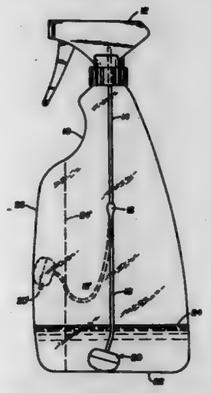
1. A one piece pouring spout for attaching to an can having a bead & defining the inner rim of an open top of said can comprising
a. a body section extending upwardly from a base section at an angular plane of approximately 45 degrees from a vertical plane, then curving forward through another angle of approximately 45 degrees to terminate in a plane where said body is substantially parallel to said base section;
b. a pouring lip on a forward end of said body section remote from said base section, said pouring lip being formed substantially in the shape of a wide "V" and further having a shallow trough in its top surface and a pouring edge;
c. a flat surface angled backward underneath the edge of said pouring lip providing a sharp pouring edge on said pouring lip, said flat surface culminating in a bead extending along the bottom surface of said sharp pouring edge;
d. a small rounded nodule extending downwardly from the center of said pouring edge; and
e. an inner wall and an outer wall projecting downwardly from said base section in close proximity to each other and extending entirely around the bottom of said base section, said inner and outer walls forming a slot that is narrower at its inner end than at its outer end by means of tapered inner surfaces, said inner surfaces of said inner and outer walls being angled inwardly toward each other to accomodate the insertion of can beads having differing diametrical dimensions.

5,195,663
MIXING AND DISPENSING ASSEMBLY FOR PREPARATIONS SUCH AS DENTAL MATERIALS
Thomas W. Martin, Ramsey, and Craig S. Hasson, Washington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 25, 1991, Ser. No. 796,762
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—327 4 Claims

1. An assembly for mixing and dispensing preparations comprising:
a dispensing device having a housing with a receptacle, a lever movably connected to the housing and a plunger connected to said lever, said plunger being movable toward said receptable upon movement of said lever; and
a mixing and dispensing capsule removably received in said receptacle, said capsule including a chamber having an outlet and a piston movable in said chamber toward said outlet as said lever moves said plunger toward said receptacle, said piston being removable from said chamber and having a handle portion with a recess for gripping said piston, said handle portion being moveable within the confines of said chamber,
wherein said piston includes a head having a certain diameter, and wherein said handle portion includes a flange having a diameter,
wherein said diameter of said flange is equal to said certain diameter.

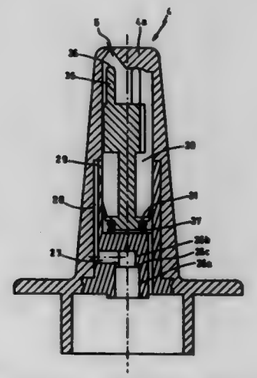


5,195,664
ALL DIRECTIONAL FLUID PICK-UP
Steven Rhea, 553 County Road #3, Louisville, Colo. 80027
Filed Apr. 3, 1992, Ser. No. 862,790
Int. Cl.[5] B67D *5/40, 5/60*
U.S. Cl. 222—464 17 Claims



1. An all directional fluid pick-up, adapted for use with a container defining an interior volume capable of containing a liquid of known specific gravity and having a valve means on the container capable of selectively opening and discharging liquid from the interior volume of the container, wherein the fluid pick-up comprises:
a flexible dip tube;
a connecting means for, in use, connecting the valve means with a first end of said flexible dip tube;
a pick-up head connected to the flexible dip tube, wherein the pick-up head is formed of first and second portions, the first portion is of lower density than the second portion such that the first portion is adapted, in use, to be buoyant within the liquid and exert, a self-righting influence on the pick-up head as a whole, and the second portion is of sufficiently high density that, in use, the pick-up head as a whole is non-buoyant within the liquid; and
a conduit means carried by the pick-up head, extending through the first and second portions of the pick-up head, connected to the flexible dip tube near the first portion of the pick-up head and having an end forming an inlet housed in said second portion of the pick-up head at a position substantially opposite from said first portion, for, in use, receiving and transmitting the liquid through the pick-up head to the flexible dip tube and, in use, to said valve means.

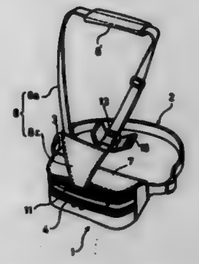
5,195,665
CLOSABLE PUSHBUTTON HAVING MULTIPLE JETS
Jean-Pierre Lina, Le Neubourg, France, assignor to Valois (société anonyme), Le Neubourg, France
Filed Jan. 6, 1992, Ser. No. 817,384
Claims priority, application France, Jan. 7, 1991, 91 00123
Int. Cl.[5] B05B *1/30*
U.S. Cl. 222—496 10 Claims



1. A pushbutton for a fluid dispenser, the pushbutton comprising: means defining a chamber (39) provided with three outlet orifices (5), and at least one cylindrical cavity (24) having an axis of symmetry (2), a piston (31) secured on one side thereof to outlet closure members and slidably disposed in said cylindrical cavity, and resilient means (37) engaging another, opposite side of the piston for biasing the piston and therewith the closure members in a first direction to close the outlet orifices, said piston and closure members being movable in a second, opposite direction in response to pressure in the chamber of a fluid substance to be emitted by the dispenser to open said outlet orifices, and wherein the piston is extended towards said outlet orifices by a flexible rod (32), and the closure members comprise three valve pins (35) secured to the rod and each including a tip (36; 36') configured to close one of the outlet orifices.

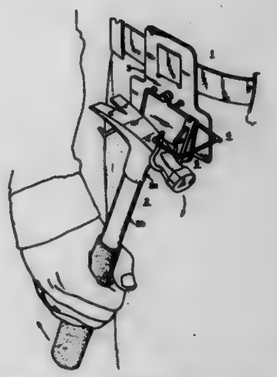
5,195,666
WAIST BAG
Sumiko Yamaguchi; Takamichi Yamaguchi, both of 16-32-103 Seagen Uemachi, and Keiko Hirazawa, 1221-1 Matsuoka, all of Fuji-shi, Shizuoka-ken, Japan
Filed Feb. 13, 1991, Ser. No. 654,888
Claims priority, application Japan, Oct. 8, 1990, 2-105238
Int. Cl.[5] A45F *4/02*
U.S. Cl. 224—159 2 Claims

1. A waist bag comprising:
a bag body having a flat top portion;
a plate core with which said flat top portion is reinforced from the inside of said bag body for seating a baby thereon;
a first receptacle formed in said bag body for accommodating small articles therein;
a first opening and shutting device provided at a front side of said bag body for opening and closing said first receptacle;
a length-adjustable waist belt having opposite ends connected to opposite sides of said bag body for supporting said bag body on a user;
a shoulder strap attached to said bag body and having means for supporting the baby from the back when the baby is seated on the bag body, said means including an inverted triangular piece having base angle portions and a apex angle portion;
a second receptacle formed in said bag body and disposed between said plate core and said first receptacle for storing said shoulder strap therein when said shoulder strap is not in use; and



a second opening and shutting device provided at the front side of said bag body for opening and closing said second receptacle;
said apex angle portion of said inverted triangular piece being sewed to an inside portion of said second receptacle and said shoulder strap having opposite ends each sewed to a respective one of said base angle portions to give said shoulder strap a loop shape as a whole and provide additional support to said bag body by suspending said bag body from the neck or shoulder of the user.

5,195,667
TOOL HOLDER
David Gallant, Box 109, Newfield, Me. 04056
Continuation of Ser. No. 375,672, Jul. 5, 1989, abandoned. This application Oct. 16, 1991, Ser. No. 778,339
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—197 11 Claims



1. Apparatus for holding a tool which includes a handle at one end of the tool and a head at an opposite end of the tool, the handle being attached to the head intermediate a first end thereof and a second end thereof, said apparatus comprising attaching means for attaching said apparatus to a user's belt on one side of the user; supporting means for supporting the tool

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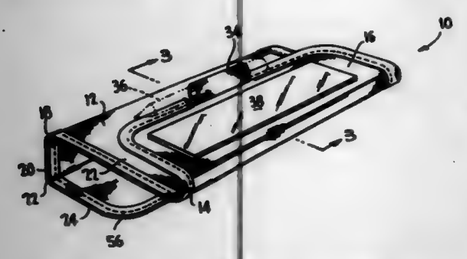
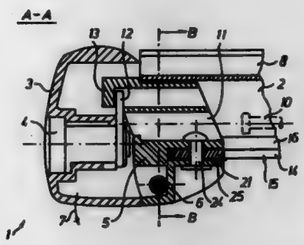
such that the head is arranged generally horizontally with the first end thereof facing in a rearward direction relative to the user and with the second end thereof facing in a forward direction relative to the user and such that the handle is arranged generally vertically below the head; mounting means for pivotally mounting said supporting means to said attaching means such that said supporting means is pivotable in one arcuate direction from an intermediate position toward a first terminal position in which the handle of the tool points generally in said rearward direction and such that said supporting means is pivotable in an opposite arcuate direction from said intermediate position to a second terminal position in which the handle of the tool points generally in said forward direction; first retaining means, provided on a rearward portion of said supporting means, for releasably retaining the first end of the head; and second retaining means, provided on a forward portion of said supporting means, for releasably retaining the second end of the head, said second retaining means including releasing means for releasing the second end of the head from said second retaining means in response to the pivotal movement of said supporting means from said intermediate position to said first terminal position as a result of the user pulling rearwardly and upwardly on the handle of the tool, said first and second retaining means being spaced apart so as to form an opening therebetween, said opening being sized and shaped so as to permit the tool to be inserted into said supporting means from an outwardly facing side thereof, whereby the user may stow and retrieve the tool while gripping the handle in the manner normally employed when the tool is in use.

5,195,668
ARTICLE HOLDER
Robert J. Kunes, and Lupe J. Kunes, both of Ventura, Calif., assignors to Regina Coeli Enterprises, Inc., Oxnard, Calif.
Filed Apr. 18, 1990, Ser. No. 510,847
Int. Cl.[5] A50R 7/00
U.S. Cl. 224—312 **1 Claim**



1. An article holder for attachment to a vehicle sun visor, said article holder being of a solid sheet core section configured into a generally S-shaped cross section throughout its entire width and length and including an upper rearwardly opening slot for receiving a sun visor and a lower rearwardly opening slot for receiving an article to be supported, said upper slot being of a height and depth to snugly receive a sun visor, and said lower slot being of a greater height than said upper slot and having a depth sufficient for receiving articles such as eyeglasses wherein said lower slot includes a T-shaped divider member adapted to be held in said lower slot to separate the lens portion of said eyeglasses from the folding arms of said eyeglasses.

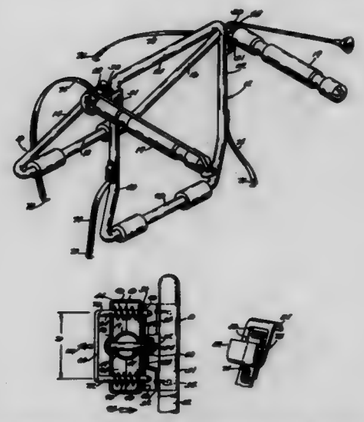
5,195,669
COVERING CAP ASSEMBLY FOR A TRANSVERSE GIRDER OF A ROOF LUGGAGE CARRIER
Stephan Duemmler, Radermark, Fed. Rep. of Germany, assignor to Votex GmbH, Dreieich, Fed. Rep. of Germany
Filed Mar. 10, 1992, Ser. No. 848,759
Int. Cl.[5] B60R 9/04
U.S. Cl. 224—315 **13 Claims**



1. A covering cap assembly for a transverse girder of a roof luggage carrier to cover and lock a profiled forward end, said covering cap being movable toward and away from said forward end, a lock installed in the covering cap, and said lock having a latch which engages behind a support abutment carried by said transverse girder, and said transverse girder has a hollow profile containing a longitudinal channel with undercuts which is open at the top to receive accessories, said assembly comprising;
a bearing element adapted for connection to said transverse girder;
a covering cap carried by said bearing element;
a lock carried by said covering cap;
said covering cap pivotally carried by said bearing element so that said covering cap may pivot toward and away from said profiled forward end;
said transverse girder having a longitudinal slot included in said hollow profile towards said forward end of said transverse girder;
said bearing element being received in said longitudinal slot and including longitudinal grooves which engage longitudinal edges of said longitudinal slot and;
retaining means for securing said bearing element in said longitudinal slot.

5,195,670
BICYCLE RACK WITH ADJUSTABLE PIN LOCKING
Giancarlo Piretti, Bologna, Italy, and Ervin L. Severson, Oregon, Wis., assignors to Graber Products, Inc., Green Bay, Wis.
Filed Aug. 10, 1990, Ser. No. 565,572
Int. Cl.[5] B60R 9/10
U.S. Cl. 224—321 **9 Claims**

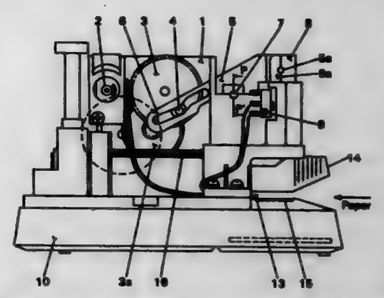
1. An accessory carrier for a motor vehicle comprising:
a pair of support frames having legs for engaging the motor vehicle and supporting the carrier on the motor vehicle;
connecting means for connecting said support frames together;
a pair of support arms for supporting a load remote from the vehicle;
rotary mounting means for connecting each of said support arms to said support frames, said rotary mounting means affording rotation each of said support arms into any one of a plurality of selectable angular positions about a rotational axis provided by a bolt assembly supported on said support frames;
said rotary mounting means including a first bracket fixed to one of said support frames, a bolt within said bolt assembly being supported on said bracket and projecting laterally outwardly, apertures in said support arms for receiving said bolt and for supporting said arm for rotary movement about said bolt to the selected angular position; and
manually operable locking means for locking the support arms in and releasing the support arms from the selected angular position, said locking means comprising:
a generally U-shaped handle having projecting ends;
plate means fixed to one of said support arms and provided with a plurality of circumferentially spaced locking apertures arranged to simultaneously receive said projecting ends of said handle in two of said apertures to define one of the angular positions of the support arms; and



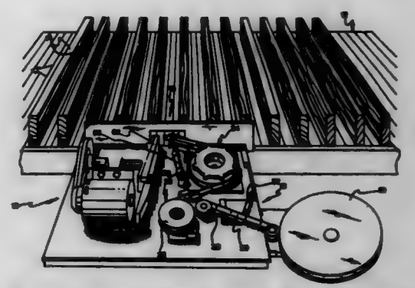
means for supporting and biasing the locking handle into a locking position with the handle ends engaged in the locking apertures to hold the support arm in the selected angular position;
said handle being withdrawable against the bias to free the handle ends from the locking apertures to change the angular position of the support arms.

5,195,671
STAPLER
Shigehiko Shimomura, Yawata; Tadayuki Haruyama, Katano; Yasuzo Hatazaki, Osaka; Shuichi Yasunaga, Katano, and Yuji Wada, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 14, 1990, Ser. No. 612,769
Claims priority, application Japan, Nov. 17, 1989, 1-300472; Dec. 20, 1989, 1-330535; Dec. 20, 1989, 1-330536
Int. Cl.[5] B27F 7/36
U.S. Cl. 227—5 **8 Claims**

1. A stapler comprising:
a striking block having a staple striking blade for striking staples on its end and a rib formed on the striking block as an integral part of said striking block;
a coupling rod, at one end of which is attached the striking block, and at the midsection of which is attached a fulcrum shaft;
a driving means for allowing the coupling rod to reciprocate to cause reciprocating motion of the staple striking block over a range from a staple striking position to a stopping position apart from the staple;
a switching means that is provided adjacent to the striking block, and is turned on and off by said rib, based on the rise and fall of the striking block; and
a control means which reverses the driving direction of the driving means, moves the striking block to the stopping position, and turns off the switching means, in case the switching means is not turned off within a predetermined time after the switching block is turned on by the motion of the striking block.



5,195,672
TAG STAPLER
Michel Souverain, Montreal, Canada, assignor to D.F.I. Souverain Inc., Canada and Potomac Supply Corp., Kinsale, Va.
Filed Jul. 11, 1991, Ser. No. 728,266
Claims priority, application Canada, Jun. 27, 1991, 2045840
Int. Cl.[5] B27F 7/17
U.S. Cl. 227—21 **10 Claims**



1. An apparatus for stapling tags onto timber, comprising:
tag feeder, including:
a) a magazine for holding a continuous strip comprised of individual tags attached endwise to one another;
b) a guide system establishing a predetermined path for advancing the continuous strip away from said magazine;
c) a strip device engaging the strip for advancing same along said path;
a tag applicator station located at an end of said path, said tag applicator station cutting the tag strip in individual tags and fastening the tags onto timber with wire staples, said tag applicator station including:
a) an anvil member;
b) a cutter movable with respect to said anvil member between operative and inoperative positions, in said operative position said cutter transversely severing the strip against said anvil member to separate a tag from the tag strip;
c) a temporary tag holder adjacent said anvil member, said temporary tag holder comprising means responsive to movement of said cutter toward said operative position for moving at least a portion of the tag holder against the tag to engage and retain the tag separated from the tag strip in a predetermined position; and
d) a stapler gun adjacent said temporary tag holder for applying a staple wire to a timber piece in registration

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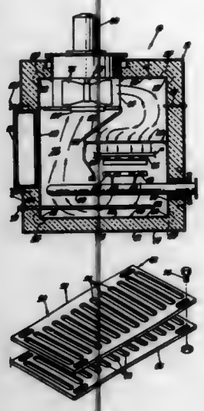
with said tag applicator station through the tag separated from the tag strip while it is being held in said predetermined position in which it extends between said stapler gun and the timber piece.

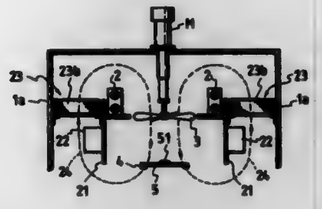
5,195,673
METHOD AND APPARATUS FOR CONVECTION BRAZING OF ALUMINUM HEAT EXCHANGERS
Michael J. Irish, Tonawanda; Gary A. Halstead, and Brian L. Burton, both of Lockport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 25, 1991, Ser. No. 765,333
Int. Cl.[5] B23K *1/00*
U.S. Cl. 228—18 3 Claims



1. A high velocity convection braze furnace assembly for brazing aluminum heat exchanger workparts in a controlled atmosphere, said assembly comprising:
a substantially sealed housing defining a controlled atmosphere brazing chamber;
heater means for elevating the temperature of said controlled atmosphere within said housing;
conveyer means having a planar workpart support surface for successively conveying workparts through said housing supported flat against said support surface;
an impeller for convectively circulating the atmosphere through the workparts at high velocity;
and atmosphere director means disposed within said housing for directing the circulating atmosphere perpendicularly toward said support surface so that the high velocity circulating atmosphere urges the workparts tightly against said support surface to prevent lateral and torsional movement of the workparts on said support surface while concurrently rapidly heating said workparts.

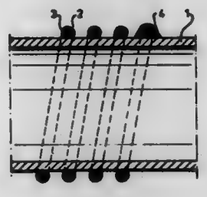
5,195,674
REFLOW SYSTEM
Toshio Nishi, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 14, 1992, Ser. No. 835,332
Claims priority, application Japan, Feb. 14, 1991, 3-20746; Jun. 18, 1991, 3-145834
Int. Cl.[5] B01D *50/00*
U.S. Cl. 228—42 11 Claims

1. A reflow unit for heating a circuit board to melt down and then solidify solders to firmly attach electronic components to the circuit board, the electronic components being temporarily attached to the circuit board before the circuit board is heated by said reflow system, said reflow system comprising:
(a) an elongated heating chamber having an inlet and an outlet;
(b) a conveyor unit disposed in said heating chamber for feeding the circuit board from said inlet to said outlet;
(c) at least one first heater unit disposed in said heating chamber for heating a gas in said heating chamber so as to melt down the solders as the circuit board is fed through said heating chamber by said conveyor unit;
(d) at least one fan unit disposed in said heating chamber for circulating the gas along a circulation path such that the



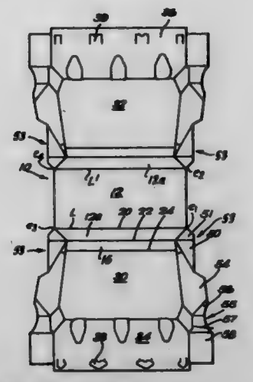
gas is first heated by said at least one first heater unit, then forced by said at least one fan unit against said conveyor, and thereafter heated again by said at least one first heater unit;
(e) an organic substance decomposition unit disposed in said circulation path for decomposing organic substances produced during the heating of the circuit board, solders and electronic components; and
(f) means for supplying nitrogen gas into said heating chamber.

5,195,675
METHOD FOR PRODUCING A COMPOSITE PIPE
Jacob D. Ouden, Noordeloos, Netherlands, assignor to Verolme Machinefabriek Ijsselmonde B.V., Al Rotterdam, Netherlands
Filed Aug. 15, 1991, Ser. No. 745,427
Int. Cl.[5] B21D *39/00*
U.S. Cl. 228—174 16 Claims



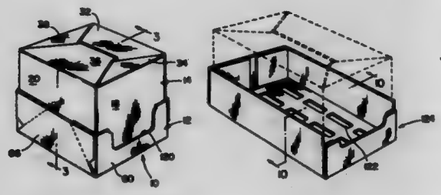
1. Method for producing a composite pipe suitable for use at high temperatures, comprising the steps of:
(1) providing a metal pipe;
(2) providing a reinforcement member comprising a reinforcing material encased in a molecular diffusion barrier material; and
(3) fixing said reinforcement member to an outside surface of said pipe at least locally along a length of said reinforcement member.

5,195,676
CARTON FOR CANS
Philippe LeBras, Chateauroux, France, assignor to The Mead Corporation, Dayton, Ohio
Filed Apr. 16, 1992, Ser. No. 869,404
Claims priority, application United Kingdom, Apr. 16, 1991, 9108057
Int. Cl.[5] B65D *65/22*
U.S. Cl. 229—40 5 Claims



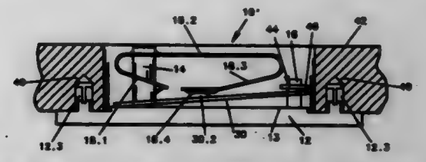
1. A carton blank comprising:
main panels hingedly connected along hinged connections and comprising a top panel, a bottom panel, and a pair of side panels for forming a wraparound carton;
gusset structures hingably connected to pairs of adjacent ones of said main panels, one said gusset structure at each end of each of said hinged connections which connect said main top, bottom and side panels;
a pair of top panel fold lines in said top panel which are spaced from, but substantially parallel to, respective ones of said hinged connections which join said top panel to said side panels;
said side panels each including hingable bevel strips and hingable flap panels, one of said flap panels at each end of said side panel wherein said flap panels are further hingably connected to said gusset structures at the respective end of said side panel between said side panel and said top panel and said side panel and said bottom panel.

5,195,677
HOOD AND TRAY CARTON AND BLANKS FOR FORMING SAME
Terry J. Quintana, and Stephen J. Balderson, both of Des Moines, Iowa, assignors to Tone Brothers, Inc., Des Moines, Iowa
Filed May 15, 1992, Ser. No. 883,764
Int. Cl.[5] B65D *13/00, 5/64*
U.S. Cl. 229—117.07 16 Claims



1. A carton comprising:
a hood, and
a tray,
said hood including four panels connected together and four closure flaps, one closure flap extending from a same side of each of said four panels, and a connection tab extending from a side edge of one of said four panels for joining opposite ends of said four panels together,
said tray including a base panel and two side panels, a rear panel and a front access panel connected to said base panel and extending above said base panel to define an opening for receipt of a lowermost portion of said hood,
said rear panel and said front access panel of said tray each include two fold tabs each secured to one of said two side panels.

5,195,678
AUTOMOTIVE OIL LEVEL CONTROL APPARATUS
Eric J. Gleason, Somerset, Mass.; Alfred J. White, North Providence, R.I.; Narendra R. Zaveri, No. Attleboro, Mass.; Joseph M. Gondusky, Warwick, and Phillip J. Leipf, Chepachet, both of R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 20, 1991, Ser. No. 810,979
Int. Cl.[5] G05D *23/08*
U.S. Cl. 236—93 R 25 Claims



19. A fluid control valve comprising a base, a fluid receiving aperture formed through the base, a cover member having first and second ends on opposite sides of a center line received over the fluid receiving aperture and being adapted to move toward and away from the fluid receiving aperture, means to guide movement of the cover member toward and away from the fluid receiving aperture, a first biasing member attached to the base and having a portion engaging the cover member between the center line and one end of the cover member with a preselected force at a selected temperature to bias the cover member toward the base with a force which varies with the temperature of the biasing member, a second biasing member attached to the base and having a portion engaging the cover member between the center line and the other end of the cover member to bias the cover member toward the base with a force which is relatively independent of temperature whereby at temperatures below a selected level fluid passing through the fluid receiving aperture causes the member to pivot around the second biasing member and at temperatures above the selected level the cover member is caused to pivot on the base adjacent the opposite side of the fluid receiving aperture.

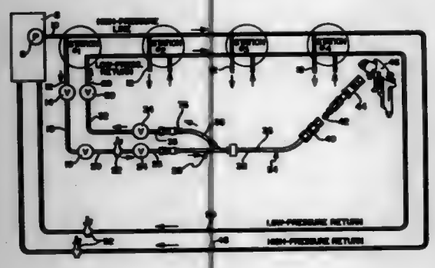
5,195,679
RAIL PADS
Geoffrey G. Leeves, Bearsted, and Paul A. Abraham, Dunstable, both of United Kingdom, assignors to Pandrol Limited, Weybridge, England
Continuation-in-part of Ser. No. 720,859, Jul. 16, 1991, abandoned. This application Jul. 6, 1992, Ser. No. 909,581
Claims priority, application United Kingdom, Jan. 28, 1989, 8901274
Int. Cl.[5] E01B *9/68*
U.S. Cl. 238—283 10 Claims

1. A pad which is suitable for positioning between the foot of a railway rail and an underlying rail foundation in order to cushion the rail from the foundation, the pad comprising a membrane (3) of elastomeric material having two major faces

from which protrusions (4 or 5) extend, such that when the membrane (3) is horizontal no vertical line passes through

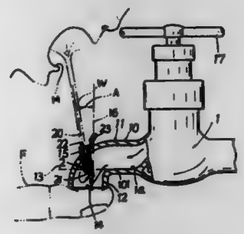
more than one protrusion (4 or 5), characterised in that said pad is stiffer on one side than on the other side.

5,195,680
COAXIAL PAINT HOSE AND SUPPLY SYSTEM
Earl R. Holt, Rochester, Mich., assignor to Hose Specialties/-Capri, Inc., Highland Park, Mich.
Continuation-in-part of Ser. No. 237,838, Aug. 29, 1988, Pat. No. 5,060,861. This application Nov. 21, 1990, Ser. No. 616,326
Int. Cl.[5] F16L *39/02*
U.S. Cl. 239—124 **17 Claims**



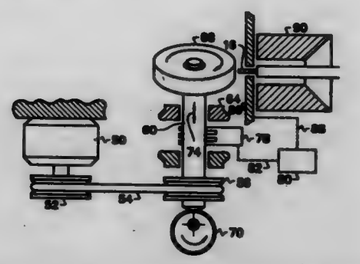
13. An apparatus for providing fluid communication between a paint supply source and a paint spray gun in a paint supply system, the apparatus adapted to return from the spray gun to the supply source paint supplied to the spray gun but not discharged by the spray gun, the apparatus comprising:
- first tubing means in fluid communication with the supply source and the spray gun for supplying paint from the supply source to the spray gun, said first tubing means having multiple tubing layers including an outermost layer impervious to corrosion by caustic fluids, an innermost layer impervious to corrosion by the paint and a flexible intermediate layer disposed between said outermost and innermost layers, said intermediate layer being susceptible to degradation by caustic fluids and the paint;
- second tubing means in fluid communication with the supply source and the spray gun for returning paint from the spray gun to the supply, said second tubing means disposed substantially coaxially within said first tubing means; and
- a Y-shaped coupling member having paint supply and paint return tubing members and a coupling member in fluid communication with said paint supply and paint return tubing members, said paint supply tubing member being in fluid communication with said paint supply source and said paint return tubing member being in fluid communication with said paint supply, said coupling member further being in independent fluid communication with said first tubing means to enable said first tubing means to receive said paint through said paint supply tubing member, said coupling member further being in independent fluid communication with said second tubing means to enable said paint flowing through said second tubing means not discharged by said paint spray gun to be independently returned to said paint supply source through said paint return tubing member.

5,195,681
FAUCET FOR SELECTIVELY DISCHARGING DOWNWARD OR UPWARD WATER STREAM
Jen T. Chyen, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei (10477), Taiwan
Filed Dec. 31, 1991, Ser. No. 815,151
Int. Cl.[5] E03B *9/20*
U.S. Cl. 239—25 **1 Claim**



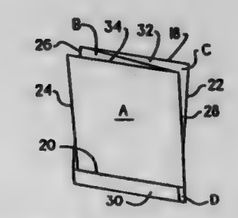
1. A faucet comprising: a valve body including: a spout having a horizontal spout portion connected with a water outcoming port of the valve body, a generally vertically oriented downcomer spout portion bent downwardly from and connected with the horizontal spout portion, an overflow level horizontally tangential to a bottom wall surface of the horizontal spout portion and generally perpendicular to a longitudinal axis longitudinally formed on a center line of the downcomer spout portion, a discharge outlet formed in a lowermost end of the downcomer spout portion, an upper opening formed in a deflection portion between the horizontal spout portion and the downcomer spout portion, and a valve handle rotatably mounted on the valve body for opening or closing the faucet, and an inner tube having an upper tube hole formed in an upper end thereof the inner tube upper and extending above the upper opening of the spout when the inner tube is inserted into the upper opening and affixed to the deflector portion, the inner tube having an outside diameter smaller than an inside diameter of the spout, the improvement which comprises said inner tube deeply poking into the downcomer spout portion with a lower tube hole formed on a lower end of the inner tube, the hole being positioned below the overflow level of the spout and a plane containing the hole being oriented downwardly towards the discharge outlet, said inner tube defining a tube axis longitudinally formed on a center line of the inner tube forming an acute angle, tilting away from the valve body, between the tube axis and the longitudinal axis of the downcomer spout portion, whereby upon an opening of the faucet and a shielding or closing of the discharge outlet of the spout by an external body, a water stream will enter the inner tube through the lower tube hole of the inner tube and be ejected upwardly through the upper tube hole of the inner tube for rinsing or drinking purpose and when the opening is not closed water will flow therethrough without uprising through the inner tube.

5,195,682
METHOD FOR ATTACHING COPPER TO A FERROUS ALLOY
Simon M. Rabinovich, Plano, Tex., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 5, 1992, Ser. No. 846,649
Int. Cl.[5] H01R *43/02*; H01L *21/60*
U.S. Cl. 228—179 **3 Claims**



1. A method for preparing a first conductor for attachment to a second conductor, comprising:
- melting an end of said first conductor by passing an electric current through said first conductor between a graphite electrode and another electrode, said graphite electrode being disposed proximate said end of said first conductor, said electric current flowing in a direction from said graphite electrode toward said first conductor, said graphite electrode being rotatable; and
- permitting said end of said first conductor to resolidify following said melting step.

5,195,683
COMBINATION PHOTOGRAPHIC NEGATIVE AND PROOF HOLDER
Ralph R. Gaetano, Bethel Park, Pa., assignor to Think, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 578,737, Sep. 6, 1990, Pat. No. 5,082,168. This application Aug. 23, 1991, Ser. No. 748,232
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] B65D *27/08*
U.S. Cl. 229—72 **20 Claims**



1. A holding device for receiving inserts comprising,
- an elongated body portion fabricated of a flexible, foldable material having upper and lower edges and a pair side edges,
- a plurality of transverse score lines positioned in spaced relation along the length of said body portion and extending between said upper and lower edges,
- said transverse score lines dividing said body portion into a plurality of panels separated from one another by a set of score lines,
- a first end panel at one of said side edges,
- a second end panel at the other of said side edges,
- an intermediate panel positioned between said first and second end panels,
- a first fold formed along a score line separating said first end panel from said intermediate panel to position said first end panel in overlying relation with said intermediate panel,
- a first pocket for receiving one insert formed by said first end panel overlying said intermediate panel,
- a second fold formed along a score line separating said second end panel from said intermediate panel to position said second end panel in overlying relation with said intermediate panel,
- a second pocket for receiving a second insert formed by said second end panel overlying said intermediate panel,
- said first and second pockets being positioned in back-to-back relation to position said first and second inserts back-to-back and separated from one another by said intermediate panel,
- said first and second pockets each having opposite open end portions, said opposite open end portions of said first pocket being positioned in overlying relation with said opposite said open end portions of said second pocket respectively, and
- a bottom flap formed at said body portion lower edge to close one of said overlying open end portions of said first and second pockets with the opposite end portions of said first and second pockets remaining open for insertion and removal of the inserts relative to said first and second pockets.

5,195,684
SCREENLESS DISK MILL
Edmund Radzius, Boynton Beach, Fla., assignor to Curt G. Joa, Inc., Boynton Beach, Fla.
Filed May 6, 1992, Ser. No. 879,784
Int. Cl.[5] B02C *7/02*; D21B *1/00*
U.S. Cl. 241—57 **11 Claims**

1. A disk mill for breaking pulp into fibers comprising:
- a housing including spaced apart opposite walls, one of the walls having a slot for feeding pulp sheets into the housing and a rotationally driven shaft extending through the opposite wall into the housing,
- a curved breaker plate member arranged in the housing generally concentric to the axis of the shaft and radially spaced from the shaft, the curved radially inwardly presented sides of the breaker plate member having teeth, said breaker plate member extending axially across the space between the walls of the housing, the breaker plate member having a gap for fibers produced within the breaker plate member to flow to an outlet in the housing,
- a stationary disk mounted adjacent one wall in the housing, the disk having a slot aligned with said slot in the wall for allowing the leading edge of a sheet of pulp to enter the housing,
- the disk having a conical face presented inwardly of the

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housing and having a plurality of concentric serrations on said face,

a rotary disk mounted to said shaft, said rotary disk having a direction of rotation and a conical face that is complementary in shape to the conical face of said stationary disk and is positioned adjacent said conical face of the stationary disk,

a plurality of angularly spaced apart radially extending rows of teeth on said conical face of the rotary disk, said teeth in the rows projecting axially of the disk in close proximity to but in nonintermeshed fashion with the serrations on said stationary disk to provide for pulp particles that result from the pulp sheet fed through said slot in the stationary disk being engaged by rows of teeth to be driven against said serrations for causing the pulp to break into fibers as the pulp and fibers are advanced radially along said serrated face of the stationary disk, and

hammer members extending radially from said rotary disk for sweeping past said teeth on the breaker plate member to further break up pulp that is discharged from between said disks.

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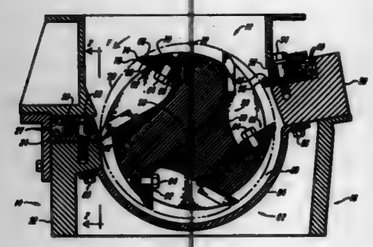
GRANULATOR FOR WASTE MATERIAL

Thomas J. Dumaine, North Attleboro, Mass., assignor to Medi-clean Technology, Inc., West Warwick, R.I.

Filed Oct. 7, 1991, Ser. No. 772,280
Int. Cl.[5] B02C *1/08, 18/06*
U.S. Cl. 241—242 5 Claims



1. A granulator for size reduction of waste material comprising, in combination,

a frame having bearings defining an axis,

a rotor mounted in the bearings and having a first pair of accurately formed surfaces intersecting on a line extending along said axis,

a rotating knife having a second pair of intersecting surfaces accurately formed to be congruent with said first pair, and a third, cylindrical surface defining a cutting edge and accurately formed to be coincident with a cylinder generated by said edge about said axis when said first and second pairs of surfaces are mated and the rotor is turned,

means for detachably securing the rotating knife to the rotor with said pairs of surfaces firmly mated,

a bed knife mounted on the frame, extending along said axis and having a cutting edge,

means for firmly securing the bed knife to the frame detachably and adjustably relative to said cylinder, and

stop means on the frame having a surface located to abut the cutting edge of the bed knife when it is spaced a predetermined gap distance from said cylinder.

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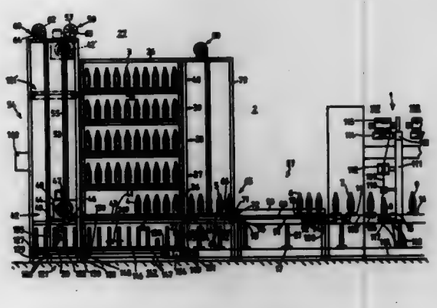
Patent Not Issued For This Number

5,195,687

TEXTILE TUBE TRANSPORT ASSEMBLY HAVING INDEPENDENT LOADING AND UNLOADING CAPABILITIES

Josef Dericks, Moenchengladbach, and Paul Landmesser, Erkelenz, both of Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 604,123
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935627
Int. Cl.[5] B65H *54/02;* B65G *1/00*
U.S. Cl. 242—35.5 R 26 Claims



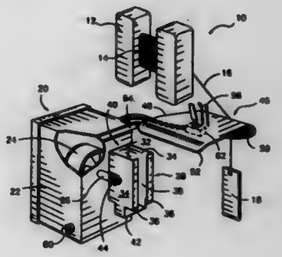
1. In a textile production system in which a textile spinning machine is operable to build yarn packages on tubes which are individually supported on tube support members and a textile winding machine having a plurality of winding stations each for winding yarn packages, a transport assembly for delivering tube support members having yarn packages supported thereon from the textile spinning machine to the textile winding machine and for returning tube support members having empty tubes supported thereon from the textile winding machine to the textile spinning machine, comprising:

cross location transport means for supporting a plurality of tube support members for groupwise transport thereof between a spinning machine exchange location associated with the spinning machine and a winding machine exchange location associated with the winding machine, said cross location transport means being movable between, and disposable at, each of said exchange locations for the transfer of tube support members between said cross location transport means and the respective textile machine associated with the exchange location and said cross location transport means including first shelf means for supporting a first group of tube support members and second shelf means for supporting a second group of tube support members, said first and second shelf means being disposed at different heights from one another; and

linking means, associated with at least one of the textile machines, for supporting tube support members during travel thereof between said cross location transport means and said at least one textile machine, said linking means including incoming travel support means for supporting a plurality of tube support members which have been transferred thereto from said cross location transport means during travel thereacross of the tube support members to said respective textile machine and outgoing travel support means for supporting a plurality of tube support members which have been transferred thereto from said respective textile machine for travel thereacross to said cross location transport means,

said incoming and outgoing travel support means each being operable to support tube support members thereon independently of the other said travel support means and said outgoing travel support means being at a different height than at least one of said first and second shelf means and including an outgoing height differential transfer means for transferring tube support members from said outgoing travel support means to said first and second shelf means and said incoming travel support means being at a different height than at least one of said first and second shelf means and including an incoming height differential transfer means for transferring tube support members from said first and second shelf means to said incoming travel support means, said incoming height differential transfer means including means for advancing tube support members out of the first shelf means independent of the introduction of other tube support members onto the first shelf means and contemporaneous with the introduction of tube support members into the second shelf means by said outgoing height differential transfer means, whereby the unloading of tube support members from the first shelf means proceeds independently of the availability of the tube support members for loading onto said cross location transport means by said outgoing travel support means.

(e) a switch connected between said motor and a source of electrical power moveable between an "on" position and an "off" position;



(f) shutoff means responsive to contact with a shutoff actuator attached to the line for moving the switch from the "on" position.

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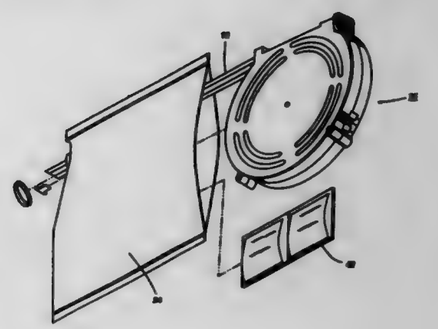
MOISTURE PROOF BINDING TAPE CARTRIDGE

Ted A. Beer, Webster; Paul N. Richards, Fairport, and David P. Van Bortel, Walworth, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1990, Ser. No. 538,615
Int. Cl.[5] B65H *19/00*
U.S. Cl. 242—55.53 10 Claims



1. A binding tape cartridge, including:

means for storing a supply of binding tape;

means, substantially impervious to moisture, for enclosing said storing means, said enclosing means being attached to said storing means and having an exit port through which binding tape advances; and

means, substantially impervious to moisture, for sealing the exit port in said enclosing means while being pervious to tape advancing through the exit port in said enclosing means so that the tape in said enclosing means is maintained substantially dry and does not absorb moisture.

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WINDING DEVICE FOR A BUOY MARKER

Richard G. Clemmons, Rte. 4, Box 416K, Roanoke Rapids, N.C. 27870

Filed Jan. 27, 1992, Ser. No. 826,434
Int. Cl.[5] B65H *75/00;* B63B *22/18*
U.S. Cl. 424—64 R 12 Claims

1. A winding device for winding a weighted buoy marker line onto a generally "H-shaped" buoy marker having two leg members attached by a cross-member, comprising:

(a) a housing;

(b) a motor contained within said housing and having an output shaft;

(c) a buoy marker receiver attached to the output shaft of the motor and rotating with the output shaft, the buoy marker receiver having an opening therein sized to receive and frictionally retain one of the leg members of the buoy marker in the buoy marker receiver, such that the buoy marker is rotated about a longitudinal axis of said cross member when the motor is actuated so as to wind the line onto the cross member;

(d) guide means associated with the winding device for guiding the buoy marker line as it is wound onto the buoy marker;

first direction such that said exposed portion of said ribbon

bing being drawn out of said takeup shaft, said clamp

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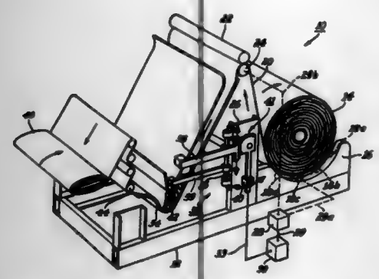
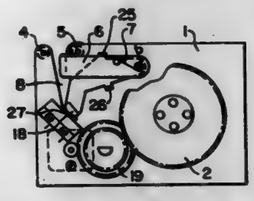
5,195,690
FABRIC HANDING APPARATUS HAVING VARIABLE SPEED FABRIC TRAVEL
Andrew L. Cross, Mantua, and Frank Albert, Jr., Parma, both of Ohio, assignors to Cleveland State University, Cleveland, Ohio
Filed Oct. 15, 1991, Ser. No. 775,519
Int. Cl.[5] B65H *16/10, 20/00, 20/30, 23/185*
U.S. Cl. 242—67.2 **5 Claims**



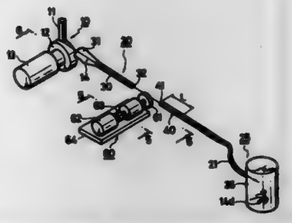
1. A fabric handling apparatus comprising:
(a) a fabric supply roll rotatably supported on first variable speed roller means to deliver a moving fabric sheet at first travel speed,
(b) second variable speed roller means receiving the moving fabric sheet from the first variable speed roller means and being operated to impart a faster fabric travel speed than the first variable speed roller means,
(c) variable speed electric motor drive means connected to both first and second variable speed roller means for continuous regulation of the fabric travel speed,
(d) fabric accumulator means having a slidably mounted counterbalanced trough member to receive the moving fabric sheet being delivered from the second variable speed roller means by gravity action, the trough member being caused to move downward by the weight of the accumulated fabric sheet while being caused to move upward when the accumulated fabric sheet is removed therefrom,
(e) movable counterbalancing weight means fixedly connected to the trough member for counterbalancing the trough member and the accumulated fabric sheet, the counterbalancing weight means including means for producing control signals in response to movement of the counterbalancing weight means and trough member, and
(f) motor speed control means responding to the control signals from the movable counterbalancing weight means so that upward movement of the trough member automatically and continuously increased fabric travel speed whereas downward movement of the trough member automatically and continuously reduces fabric travel speed.

5,195,691
TAPE WINDER
Horst Pfeiffer, Aldingen, and Heinz W. Feinmechaniker, Trossingen, both of Fed. Rep. of Germany, assignors to Hengstler GmbH, Aldingen, Fed. Rep. of Germany
Filed Jan. 6, 1991, Ser. No. 711,457
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1990, 9006401[U]
Int. Cl.[5] B65H *18/10, 19/22*
U.S. Cl. 242—67.1 R **8 Claims**

1. A tape winder of the type comprising a frame defining a winding space, a reel hub rotatably mounted in said frame, drive means disposed on said frame for rotating said reel hub to wind a tape on said reel hub to form a tape coil in said winding space, two laterally spaced apart, deflecting roller means for guiding and deflecting said tape as it is wound on said reel hub, and a tensioner arm means disposed in said frame and movable between said two deflecting roller means for applying tension to said tape, the improvement comprising:
a plurality of winding rods for engaging said tape, said winding rods disposed on said reel hub, said winding rods slidably extendable through said frame, and said winding rods removably disposed in said winding space through said frame;
bore means disposed in said drive means for slidably receiving and engaging said winding rods when said winding rods are slidably extended through said frame and disposed in said winding space, said winding rods driven in rotation by said drive means when said bore means are engaged by said winding rods thereby winding said tape around said winding rods to form said tape coil; and
stop means disposed on said drive means for preventing the disengagement of said winding rods from said drive means when said winding rods are removed from said winding space upon slidably extending said winding rods through said frame.

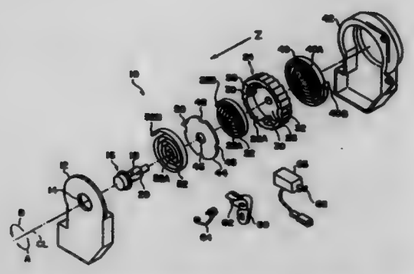


5,195,692
AMORPHOUS RIBBON TAKE-UP METHOD AND APPARATUS THEREFOR
Hiroyuki Fujii; Masaaki Tanahashi, both of Saitama, and Yukio Yoshimura, Matsue, all of Japan, assignors to Hitachi Metal, Ltd., Tokyo, Japan
Filed Mar. 18, 1991, Ser. No. 670,851
Claims priority, application Japan, Apr. 5, 1990, 2-91006; Apr. 5, 1990, 2-91007; Sep. 12, 1990, 2-242045
Int. Cl.[5] B21C *47/02*
U.S. Cl. 242—78.1 **15 Claims**



1. A method of taking up an amorphous ribbon, which is solidified to fly by means a cooling roll, on a rotationally driven drum having a self-adhesive layer on its outer circumference, comprising the steps of:
passing said ribbon through both a guide tube, which is arranged in the vicinity of said roll and in a tangential direction to said roll, and a suction tube, which is connected to suction means, by connecting said guide tube and said suction tube;
exposing a portion of said ribbon to the outside by moving said suction tube apart from said guide tube;
moving said drum in a first direction toward said exposed ribbon only until a surface of said drum first tangentially contacts said exposed portion of said ribbon; and
moving said suction tube in a second direction opposite said first direction such that said exposed portion of said ribbon is partly wound around said drum.

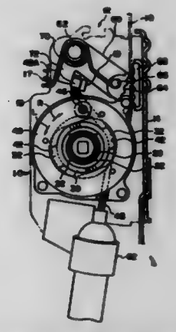
5,195,693
TENSION REDUCER
Hironori Sasaki, and Hisao Yamada, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho, Aichi, Japan
Filed Mar. 26, 1991, Ser. No. 675,429
Claims priority, application Japan, Mar. 29, 1990, 2-33199; Mar. 29, 1990, 2-33200
Int. Cl.[5] B60R *22/44*
U.S. Cl. 242—107 **19 Claims**



1. A tension reducer suitable for use in a webbing retractor, which comprises:
a weak resilient spiral spring whose one end is connected to a webbing take-up spindle of said webbing retractor and which exerts an urging force in a webbing winding direction;
a connecting member connected to the other end of said weak resilient spiral spring and disposed rotatably about said take-up spindle;
a strong resilient spiral spring whose one end is connected to said connecting member and which exerts a urging force in the webbing winding direction greater than said urging force of said weak resilient spiral spring;
means for stopping the rotation of said connecting member in the webbing winding direction so as to avoid the exertion of said urging force of said strong resilient spiral spring on webbing at the time that said webbing is pulled out of said take-up spindle to be fastened to an occupant; and
means for holding torque ranges of said weak resilient spiral spring such that torque is substantially free from variation irrespective of whether or not said stopping means stops the rotation of said connecting member in the webbing winding direction.

5,195,694
PRELOADER
Yasutaka Watanabe; Shigeru Kotama, and Fuminori Teraoka, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho, Aichi, Japan
Filed Nov. 25, 1991, Ser. No. 796,822
Claims priority, application Japan, Nov. 30, 1990, 2-130470[U]
Int. Cl.[5] B60R *22/40*
U.S. Cl. 242—107.2 **24 Claims**

1. A preloader for use in a webbing retractor and adapted to forcibly take up an occupant-restraining webbing onto a takeup shaft when a vehicle suddenly decelerates, comprising:
a rotating drum disposed in such a manner as to be capable of engaging said takeup shaft and adapted to impart a torque integrally with said takeup shaft at the time of engagement between said rotating drum and said takeup shaft;
a clamp member disposed in correspondence with the webbing being drawn out of said takeup shaft, said clamp member being movable in a direction in which said clamp member engages the webbing and in a direction in which said clamp member moves away from the webbing, and said clamp member being adapted to clamp the webbing being drawn out of said takeup shaft in a state of engagement so as to prevent the webbing from being drawn out;
urging means for constantly urging said clamp member in a webbing-clamping direction;
holding means for normally holding said clamp member in spaced-apart relationship with the webbing against an urging force of said urging means;

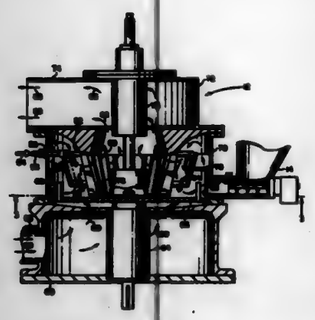


an elongated member wound around said rotating drum and arranged such that said elongated member, when tightly drawn, forcibly causes said rotating drum to engage said takeup shaft and to be rendered integral with said takeup shaft so as to rotate said rotating drum in a webbing taking-up direction, and cancels a holding state of said holding means so as to permit the movement of said clamp member in the webbing-clamping direction; and
an actuating source connected to one end of said elongated member and adapted to forcibly pull said elongated member in the webbing-taking-up direction and render the elongated member taut when the vehicle suddenly decelerates.

5,195,695
APPARATUS FOR FINE GRINDING
Andrew P. Ondash, Catasauqua; Richard D. Ritter, Bath, and Arthur H. Anderson, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Division of Ser. No. 297,222, Jan. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 125,638, Nov. 25, 1987, abandoned. This application Mar. 8, 1990, Ser. No. 490,246
Int. Cl.[5] B02C *23/06, 23/18*
U.S. Cl. 241—38 **6 Claims**

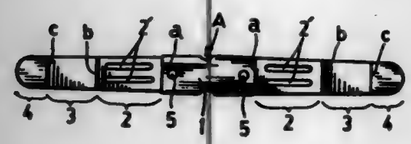
1. A closed system for fine grinding rubber and plastic material comprising in combination
means for collecting and conveying said material to a fluid classification grinding mill; said means including means to pre-cool said material to below its embrittlement temperature;
a fluid classification grinding mill, of the type containing a generally flat disc having a plurality of equally spaced hammers or comminuting devices disposed equally around the peripheral edge of said disc, connected in fluid tight relation to said collecting and conveying means, said mill including means to inject a liquid cryogen onto said material during grinding said liquid cryogen injection means comprising a plurality of inlets uniformly disposed in a circular pattern and placed inside said hammers whereby said cryogen is distributed uniformly through inner parts of said mill:

removal means to conduct ground material and cryogen vaporized in said mill to separator means;
separator means to separate such ground material form said vaporized cryogen;



recirculation means to convey such vaporized cryogen from said separator means to said mill; and
collection means to recover said ground material as a product.

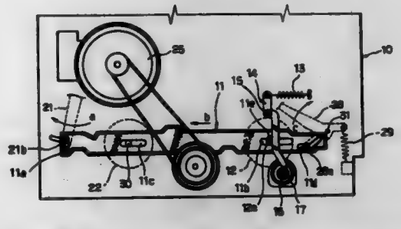
5,195,696
VIDEO TAPE REEL SUPPORT SPRING
Lee Kee Dong, Seoul, Rep. of Korea, assignor to SKC Limited, Suwon, Rep. of Korea
Filed Jan. 18, 1989, Ser. No. 298,571
Claims priority, application Rep. of Korea, Jan. 25, 1988, 88-576
Int. Cl.[5] G11B *23/04*
U.S. Cl. 242—199 **3 Claims**



1. An improved resilient reel support spring for a video tape cassette, comprising: a central base portion with opposing ends having extending portions on the opposite ends of the central base portion which are of similar construction, each said extending portion further comprising a support portion having at least one depression embossed longitudinally of said support portion, and each said extending portion further including an elastic portion and adjacent end portion; and the various sections of said extending portion being staged with separate division lines separating the elastic portion from the end portion and the support portion.

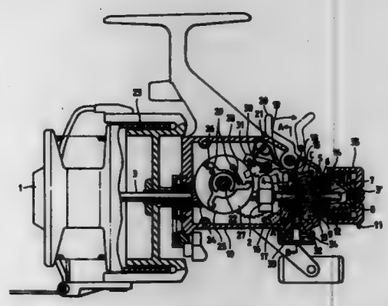
5,195,697
APPARATUS FOR PREVENTING TAPE SAG DURING MODE CHANGING IN A VIDEO RECORDER
Yoshiaki Ikeda, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 10, 1991, Ser. No. 639,332
Claims priority, application Rep. of Korea, Aug. 30, 1990, 90-13430
Int. Cl.[5] G11B *15/43, 15/48*
U.S. Cl. 242—204 **13 Claims**

4. A tape recorder, comprising:
a master cam;
reel disks mounted in said tape recorder for suporting a length of a tape, said tape being wound around said reel disks;
braking means movable by said master cam, for retarding rotation of one of said reel disks;
a main slide, interlocking with said braking means, being translated by said master cam; and
tape sag preventing means for preventing sagging of said tape during a change in direction of travel of the tape in response to movement of said main slide, said tape sag preventing means comprising:



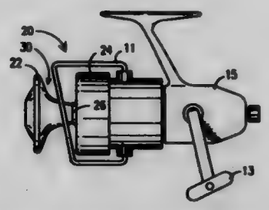
a rotatable operating lever and resilient means mounted on one end of said operating lever for biasing said operating lever,
driving means rotating in a forward and in a reverse direction under influence of said operating lever,
a transmission gear meshed with said one of said reel disks, and
coupling means for transmitting rotational force between said driving means and said transmission gear.

5,195,698
DRAG MECHANISM IN SPINNING REEL FOR FISHING
Kaneko Kyoichi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 13, 1990, Ser. No. 611,716
Claims priority, application Japan, Nov. 17, 1989, 1-133071[U]; Nov. 17, 1989, 1-133072[U]; Jun. 15, 1990, 2-62718[U]
Int. Cl.[5] A01K *89/027*
U.S. Cl. 242—245 **13 Claims**



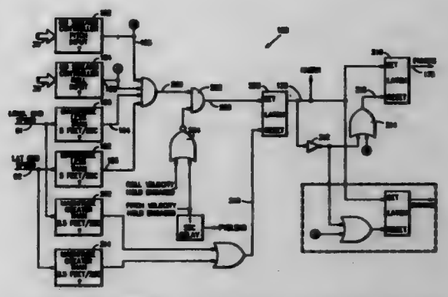
1. A drag mechanism in a spinning reel for fishing, comprising:
a reel casing;
an actuator member having a first end pivoted on said reel casing and having a second end tensionally connected to a spring;
a yoke pivoted across said actuator member;
a spool shaft;
a braking cylinder having drag mechanism means and engagement holes;
a cylindrical shaft fitted on an end of said spool shaft so as to be slidable only in the axial direction and rotatably locked in said yoke, said cylindrical shaft having engagement portions axially engageable/disengageable fitted in said engagement holes; and
an operation lever pivoted on said reel casing, said operation lever having an actuating portion engaged with a side of said second end of said actuator member, said operation lever being provided with a spring for urging said operation lever between a first and second position.

5,195,699
APPARATUS FOR REMOVING LINE FROM A SPOOL
Harry H. Stimsetto, Brandon, Fla., assignor to Julius Fender and Betty L. Fender, both of Brandon, Fla.
Continuation-in-part of Ser. No. 731,553, Jul. 17, 1991, abandoned. This application Feb. 25, 1992, Ser. No. 841,155
Int. Cl.[5] A01K *89/01*
U.S. Cl. 242—322 **1 Claim**



1. A fishing reel apparatus of the type having a housing, a spool, means for mounting the spool non-rotatingly to the housing, a line coiling means rotatably mounted to the housing for coiling a fishing line around the spool, and a handle rotatably mounted to the housing for rotating said line coiling means, said spool comprising:
a central part having a predetermined, non-uniform diameter;
an end plate disposed at each end of said central part;
said end plates having a common diameter greater than the non-uniform diameter of said central part;
said spool having a first part and a second part of independent structure;
said first part including a first part of said central part and a first end plate;
said second part including a second part of said central part and a second end plate;
said first and second parts of said spool being disposed in abutting relation to one another when the spool is in its assembled configuration;
quick release means for detachably securing said first and second parts to one another;
a parting line formed between said first and second parts where said first and second parts about one another;
said first and second parts being separable from one another along said parting line;
said parting line being positioned remote from said first end plate and in closely spaced relation to said second end plate;
said non-uniform diameter being greatest at said first end plate and said non-uniform diameter being smallest at said parting line;
said central part of said spool having a parabolic contour between said first end plate and said parting line; and
said central part of said spool being asymmetrical relative to said parting line;
whereby a line is coilable about said spool such that said line collects primarily near said second end plate and is therefore removable in a few moments from said spool with the coil intact.

5,195,700
LOW SPEED MODEL FOLLOWING VELOCITY COMMAND SYSTEM FOR ROTARY WING AIRCRAFT
Donald L. Fegler, Jr., Milford; James L. Richard, Stratford; Phillip J. Gold, Shelton, all of Conn., and Steven L. Glasman, Springfield, Pa., assignors to United Technologies Corporation, Hartford, Conn.
Filed Aug. 28, 1991, Ser. No. 751,437
Int. Cl.[5] B64C *11/44*; G05D *1/10, 1/08*
U.S. Cl. 244—17.21 **10 Claims**



1. A helicopter flight control system of the type having a plurality of sensors which provides: rate signals indicative of the helicopter's pitch and roll rates of change, attitude signals indicative actual bank angle and pitch attitude, and a signal indicative of actual ground speed; a sidearm controller provides a control input signal value indicative of desired ground speed to the system which controls ground speed in response to the control input signal by providing a command signal to the helicopter's main rotor, the control system comprising:
means for providing, for each value of the control input signal, a corresponding signal value indicative of the helicopter desired rate of change about the pitch and roll axes of the helicopter;
a feedforward path including inverse model means for providing for each said desired rate of change signal value a feedforward set point signal value indicative of the command to the main rotor required for the helicopter to fly at the desired ground speed;
a rate feedback path including means for computing a difference value between said desired rate of change signal value and the corresponding sensed rate of change signal value, and for providing a rate of change error signal value indicative of the difference;
an attitude feedback path comprising:
means for integrating said desired rate of change signal value to provide a desired attitude signal value;
means for computing a difference value between said desired attitude signal value and the corresponding sensed attitude signal value, and for providing an attitude error signal value indicative of the difference;
means, having a derivative lag filter, for filtering said desired attitude signal value to provide a washed out signal value;
velocity model means, for providing for each value of said washed out signal, a desired ground speed command signal value indicative of the desired helicopter ground speed;
means for computing a difference value between said desired ground speed command signal value and the sensed ground speed signal value, to provide a ground speed error signal value indicative of the difference;
means for summing said ground speed error signal value and said attitude error signal value to provide a command modifying signal;
means for summing said command modifying signal value,

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said rate error signal value, and said feedforward signal value to provide a command signal; and

means for outputting said command signal to the main rotor.

5,195,701

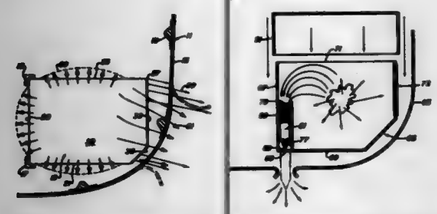
AIR CARGO CONTAINER WITH BOMB DAMAGE MITIGATION FEATURES

W. Craig Willan, P.O. Box 574, Hurst, Tex. 76053

Filed Feb. 4, 1992, Ser. No. 830,725

Int. Cl.[5] B64D *47/00*

U.S. Cl. 244—118.1 20 Claims



1. In a container for holding cargo for storage in an airplane, the container adapted to be positioned near a fuselage wall of the airplane when stowed therein, an improved means for reducing damage caused by an explosive contained in the cargo, comprising in combination:

a venting device mounted to the container;

directing means for causing an explosion in the container to propel the venting device toward the fuselage wall of the airplane for piercing the fuselage wall of the air plane to vent the explosion; wherein the venting device comprises a door and a blade mounted to and protruding from the door; and wherein the directing means comprises:

connection means connecting the door to the outer side of the container for opening and closing the door, the connection means releasing the door to open in the event of an explosion of sufficient magnitude, to propel at least a portion of the door outward through the fuselage wall of the airplane with the blade slicing through the fuselage wall of the airplane.

5,195,702

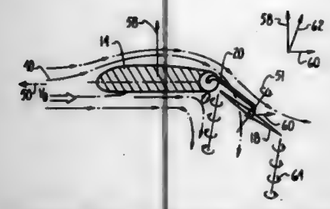
ROTOR FLAP APPARATUS AND METHOD

Frank S. Malvestuto, Jr., 330 Winamar Ave., La Jolla, Calif. 92037

Filed Apr. 9, 1991, Ser. No. 683,596

Int. Cl.[5] B64C *23/02*; B62D *37/02*; B63G *8/20*

U.S. Cl. 244—215 14 Claims



1. A rotor flap apparatus attached to a wing of an object of the type which moves through a medium, comprising:

a rotor rotatable about an axis of rotation;

drive means for rotating said rotor about said axis of rotation; and

movable attachment means mounting said rotor to a trailing edge portion of said wing for variably disposing said rotor to vary the orientation of said axis of rotation with respect to said wing;

wherein said rotor has tips and is mounted so that during rotation a forward edge of said tips are disposed substantially behind and within a vertical cross-section of said trailing edge portion of said wing.

5,195,703

DEVICE FOR LOCKING A SWITCH BLADE WITH A STOCK RAIL

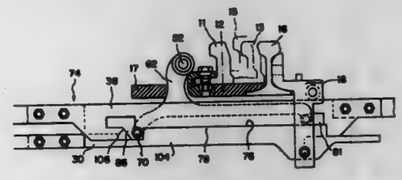
Alfred Kais, Lich-Eberstadt; Erich Nuding, Aalen, and Sebastian Benesowski, Butzbach, all of Fed. Rep. of Germany, assignors to BWG Butzbacher Weichenbau GmbH, Butzbach, Fed. Rep. of Germany

Filed May 2, 1991, Ser. No. 694,547

Claims priority, application Fed. Rep. of Germany, May 4, 1990, 4014248

Int. Cl.[5] E01B *7/20*

U.S. Cl. 246—443 13 Claims



1. A device for locking a switch blade with a stock rail, the switch blade having a rail foot resting on a base, and said device comprising:

a lock piece connected with the stock rail and extending away from the stock rail;

a slide element that is reciprocally supported by said lock piece and adapted for movement between a switch blade locked position and a switch blade open position;

a locking element connected with the switch blade and said locking element being in contact with said slide element and dimensioned and arranged such that the rail foot is held in contact with the base when said switch blade is in said switch blade open and locked positions and is spaced away from the base for a period when the switch blade travels between said switch blade open and locked positions.

5,195,704

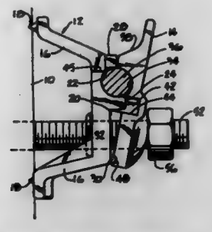
NEUTRAL CONDUCTOR CLAMP

Paul Louie, Scarborough, Canada, assignor to A.B. Chance Company, Centralia, Mo.

Filed Jan. 8, 1992, Ser. No. 817,774

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—67.5 5 Claims



1. A clamp apparatus for suspending a conductor from a support structure, the clamp apparatus comprising:

a body having means for engaging the support structure and for positioning the body relative to the support structure, the body including a first conductor-supporting surface provided with a first trough having opposed sides and a curved wall surface, and a first set of upstanding tabs lining both sides of the first trough and protruding from the first conductor-supporting surface;

a cover including a second conductor-supporting surface provided with a second trough having opposed sides and a curved wall surface, and a second set of upstanding tabs lining both sides of the second trough and protruding from the second conductor-supporting surface, the second set of tabs being spaced from the first set of tabs in the longitudinal direction along both sides of the troughs such that the first and second sets of tabs intermesh when the cover is positioned on the body,

the cover being movable relative to the body between first and second positions in which the troughs, together with the first and second sets of tabs, define conductor-retaining structure having a closed circumference such that the circumferential surface of a conductor retained in the apparatus is completely surrounded,

the circumference defined by the conductor retaining structure being smaller when the cover is in the first position than when the cover is in the second position so that the apparatus is capable of suspending any of a plurality of conductors having different diameters from one another; and

securing means for pressing the cover onto the body and holding the clamp apparatus against the support structure.

5,195,705

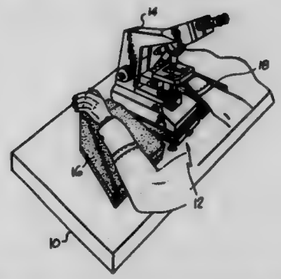
MICROSCOPE STAND AND ARMREST SYSTEM

Richard C. Klase, Loveland, Colo., and James R. McCaleb, El Paso, Tex., assignors to Scopease, Inc., El Paso, Tex.

Filed May 5, 1992, Ser. No. 878,758

Int. Cl.[5] B43L *15/00*

U.S. Cl. 248—118.3 10 Claims



1. A microscope stand and armrest system for placement on a fixed horizontal surface comprising:

a base plate having a plurality of height adjustment/levelling feet attached to an underside thereof;

a top plate coextensively positioned over said base plate for receiving a microscope thereon, said base plate and said top plate being hingedly attached at rearward edges thereof such that said top plate may be angularly elevated with respect to the horizontal to thereby tilt the microscope received thereon rearward toward the user;

tilt control means engaging said base plate and said top plate for maintaining said top plate in a desired position of angular elevation, said tilt control means comprising a plurality of spaced apart grooves provided on a top surface of said base plate, a plurality of spaced apart grooves correspondingly provided on a bottom surface of said top plate, and a space bar adapted to matingly engage corresponding ones of said pluralties of grooves in said base plate and said top plate; and

left and right armrest members positioned on said fixed horizontal surface to the left and right of said base plate for receiving a user's forearms, each of said left and right armrest members having a horizontal top surface proximate a forward edge thereof and a downward sloping top surface rearward of said horizontal top surface.

5,195,706

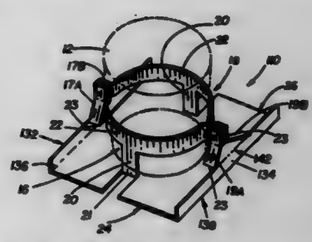
DEVICE FOR HOLDING A CONTAINER UPRIGHT

William M. Allen, 204 Cayuga Rd., Louisville, Ky. 40207

Continuation-in-part of Ser. No. 328,900, Mar. 27, 1989, Pat. No. 5,028,023. This application Jul. 1, 1991, Ser. No. 723,784

Int. Cl.[5] A47G *7/00*

U.S. Cl. 248—152 20 Claims



1. A device for holding a container upright, the device when in a preassembled state, comprising:

a base panel having generally parallel first and second sides, and generally parallel third and fourth sides generally perpendicular to the first and second sides, upon which the bottom of the container to be held will rest;

a pair of Tee-shaped anchoring flanges, each Tee-shaped anchoring flange having a stem integrally connected at a proximal end of the stem to the base panel and a cross arm integral with and extending outwardly from a distal end of the stem, the Tee-shaped anchoring flanges being coplanar with the base panel with the cross arms of the two anchoring flanges being adjacent to and extending along opposite first and second sides of the base panel and the stems of the two anchoring flanges extending inwardly of the base panel from the arms of the anchoring flanges; and,

two sets of reinforcement stems being integrally connected and coplanar with the base panel and disposed adjacent to opposite third and fourth sides of the base panel.

5,195,707

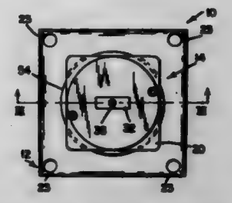
OPTIC POSITIONING DEVICE

Wayne R. Ignatuk, P.O. Box 98, Crystal Beach, Fla. 34681, and David A. Steffey, 12701 Chocktaw Trail, Hudson, Fla. 34669

Filed May 12, 1992, Ser. No. 882,061

Int. Cl.[5] F16M *11/12*

U.S. Cl. 248—179 12 Claims



1. An optic positioning device for holding an optical element which has a center and for moving said optical element relative to the central longitudinal axis of a beam of electromagnetic radiation, said optical positioning device comprising:

(a) a supporting base which has a concave spherical surface, said spherical surface having a radial center at the center of said optical element, said supporting base having an access opening which is spaced from said concave surface

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and a threaded bore which extends from said concave surface to said access opening,

(b) a holding body for supporting said optical element, said holding body having a convex-spherical surface which has a radial center of the center of said optical element, said convex surface being slidably mounted on said concave spherical surface for universal positioning on said concave surface, said holding body having a concave spherical clamping surface which is spaced from said convex surface and an aperture which extends from said clamping surface to said convex surface, said clamping surface having a radial center at the center of said optical element, and

(c) clamping means for selectively locking said holding body in a selected position relative to said supporting base, said clamping means comprising

(i) a bolt which has a head portion and a threaded shank portion which extends form said head to said access opening and is threaded into said bore, said shank portion having a central longitudinal axis, said head portion having a convex surface for engaging said concave clamping surface, said convex surface having a radial center at the center of said optical element, and

(ii) a clamping actuator which is located at said access opening and which is fixed to said shank portion for rotating said shank portion about its central longitudinal axis and causing said head portion to move toward said clamping surface when said shank portion is rotated in one direction and away from said clamping surface when said shank portion is rotated in the opposite direction from said one direction.

5,195,708
SUPPORT BRACKET
Thomas R. Marsh, Winston-Salem, N.C., assignor to Tean-Tex Plastics, Inc., Wallburg, N.C.
Filed Feb. 18, 1992, Ser. No. 837,215
Int. Cl.[5] A47G *29/02*
U.S. Cl. 248—250 **19 Claims**

1. A support bracket for attaching a shelf to walls comprising:

a substantially planar body having upper and lower body portions, said upper body portion including a pair of substantially parallel lateral edges extending upward from the lower body portion and being coplanar with said lower body portion,

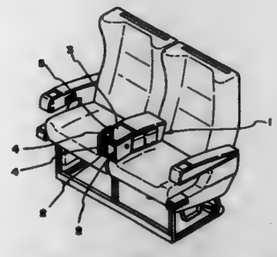
means for securing the body to a wall,

a support projecting forward from the lower body portion opposite the wall securing means for supporting the edge of a shelf, and

a flexural plate attached to each of said pair of parallel lateral edges and having an inner edge, an upper edge and a lower shelf engaging edge below said inner and parallel edges, and each flexural plate being of substantially similar dimension to the other and extending forwardly and inwardly from the lateral edge toward a medial portion of the upper body portion to form a gap between the inner edges of the plates that is about one-half the length of said lower shelf engaging edge

wherein upon pressure from a shelf edge lowered onto the upper edges of the flexural plates, the inner edges of the flexural plates move toward each other and the plates flatten into a more coplanar configuration with the body member and wherein the flexural plates return to their original orientation as the upper edge of the shelf passes the lower shelf engaging edges.

5,195,709
TELEVISION RECEIVER SUPPORTING STRUCTURE OF ARM REST
Kanda Yasuhi, Kanagawa, Japan, assignor to Koito Industries, Ltd., Tokyo, Japan
PCT No. PCT/JP90/00180, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/10403, PCT Pub. Date Sep. 20, 1990
PCT Filed Feb. 14, 1990, Ser. No. 599,914
Claims priority, application Japan, Mar. 10, 1989, 1-26607; Jun. 30, 1989, 1-76231
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—280.1 **6 Claims**



1. A supporting structure for supporting a TV set on an armrest of a seat so that the TV set can be turned in a vertical plane between an operating position outside a cavity formed under a cocktail tray formed in the front upper portion of the armrest and a housing position within the cavity, can be turned about a vertical axis at the operating position and can be tilted with respect to the vertical axis, said supporting structure comprising:

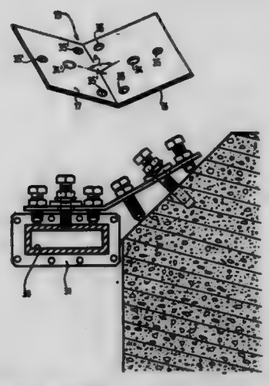
a hinge mechanism provided at the front upper end of the cavity; and

a turning mechanism supported on the hinge mechanism and supporting the TV set so that the TV set can be turned at the operating position in both horizontal and vertical planes;

characterized in that a hinge pin included in the hinge mechanism is provided at its one end with a diametrical through hole expanding toward the opposite open ends, a locking pin included in a locking mechanism is provided so that the extremity of the locking pin engages one of the open ends of the diametrical through hole of the hinge pin when the hinge pin is at a first predetermined angular position and engages the other open end of the diametrical through hole of the hinge pin when the hinge pin is at a second predetermined angular position differing from the first predetermined position by an angle of about 180°, and the hinge mechanism is interlocked with a shock absorbing mechanism.

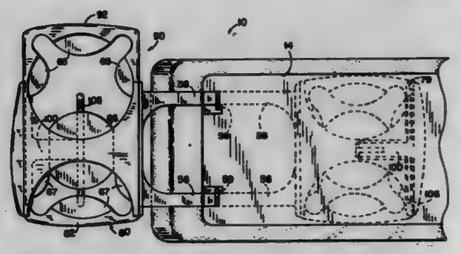
5,195,710
THREE-DIMENSIONAL FIXING DEVICE
Michel Remblier, Auvers Sur Oise, France, assignor to Alcatel Telespace, France
Filed Oct. 25, 1991, Ser. No. 782,471
Claims priority, application France, Oct. 30, 1990, 90 13451
Int. Cl.[5] A47K *1/00*
U.S. Cl. 248—300 **9 Claims**

1. A device for fixing a first element to be positioned in three dimensions relative to a second element, the device comprising at least one support piece acting as a connecting member between a first connection with the first element and a second connection with the second element; wherein said at least one support piece is in the form of a bracket comprising two arms at a determined angle relative to each other; each of the arms being pierced by at least four spaced holes including an inner hole and at least three outer holes about said inner hole for



insertably receiving fixing and abutment components; and at least one fixing component being insertably installed in said inner hole, and at least three abutment components being insertably installed respectively in the three outer holes on each of said arms thereby fixing a respective arm to a respective one of said first and second elements for the purpose of implementing said two connections.

5,195,711
MULTIPLE CONTAINER HOLDER
Gordon Miller; Ronald Dykstra; David Spykerman, and Joseph Buonodono, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Division of Ser. No. 627,554, Dec. 10, 1990, Pat. No. 5,087,008, which is a continuation of Ser. No. 379,816, Jul. 14, 1989, abandoned. This application Sep. 24, 1991, Ser. No. 764,456
Int. Cl.[5] A47C *7/62*
U.S. Cl. 248—311.2 **22 Claims**

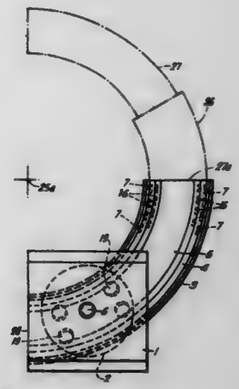


1. A container holder for a vehicle comprising:

a base member pivotally mounted to a vehicle and movable between a use position and a stored position, said base member including a pair of spaced guide and support slots facing one another; and

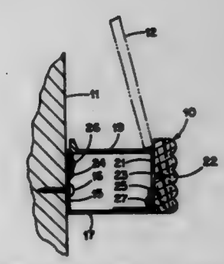
a first and a second container support movably mounted to said base member and movable in a parallel plane with respect to each other, each container support individually defining at least a portion of a container supporting aperture for supporting a container therein, said first and second container supports each being movable toward and away form each other between a first position for concealed storage of said container holder and a second position in which at least one container can be supported therein, each of said first and second container supports including flange means extending outwardly from opposite sides thereof, said container supports being captively and slideably mounted into said slots.

5,195,712
EXTENDABLE SEAT ARRANGEMENT FOR VEHICLES
Melvyn J. Goodall, 7 Neville Road, Bognor Regis, Sussex, England
Filed Sep. 20, 1990, Ser. No. 585,598
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—430 **7 Claims**



1. An extendable seat arrangement for use in moving a seat into and out of a confined space, including a base, a plurality of curved interlocking sections, the curved interlocking sections being designed to telescope with one another and with the base so that they can retract and extend relative to the base, a carriage mounted upon the one of the interlocking sections which is able to extend the furthest from the base, and a mounting plate for a seat, the mounting plate for a seat being pivotally attached to the carriage for rotation relative thereto.

5,195,713
PRESENTATION RAIL ASSEMBLY
Questin R. Van Dore; Mitchell Bakker, both of Grand Rapids, and Nelson Chapman, Hastings, all of Mich., assignors to Nucraft Furniture Company, Comstock Park, Mich.
Filed Jul. 19, 1991, Ser. No. 732,594
Int. Cl.[5] A47B *47/00*
U.S. Cl. 248—441.1 **13 Claims**



1. A presentation rail assembly for supporting display materials on a wall comprising:

a lower rail element providing a vertical mounting flange attached to a wall by fasteners extending through open-

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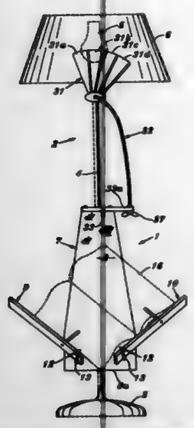
ings in the mounting flange, the lower rail element further including a horizontal shelf extending outwardly from a lower portion of said mounting flange;

an elongated upper rail element that completely covers the lower rail element and the fasteners that attach it to the wall, the upper rail element having an inner portion thereof engageable with the upper extremity of said mounting flange so as to prevent the inner portion of the upper rail element from downward or outward movement with respect to the lower rail element, the upper rail element also having a floor extending outwardly from the inner portion above said shelf to an outer extremity which is a sufficient distance away from the inner portion that the floor can serve as a support for display materials in an inclined position, the upper rail element further having a frontal portion extending downward from an outer portion of said floor and engageable with said shelf so as to provide vertical support for the outer portion of the floor, the frontal portion including a frontal flange extending downwardly from the floor and a facing strip attached to the frontal flange and covering the front of the upper and lower elements, the frontal portion further including;

abutment means at the outer extremity of said floor and extending above said floor to restrain display materials from sliding off the front of the rail assembly.

5,195,714
BOOKHOLDER WITH ADJUSTABLE SHADE
Richard M. Stewart, 238 Central Rd., Middlebury, Conn. 06762
Continuation-in-part of Ser. No. 760,117, Sep. 16, 1991, abandoned. This application Mar. 13, 1992, Ser. No. 851,276
Int. Cl.[5] A47B *97/04*
U.S. Cl. 248—448 **12 Claims**



1. An improved bookholder for use with a lamp of the type having a standard and a light source mounted on said standard, said bookholder comprising:

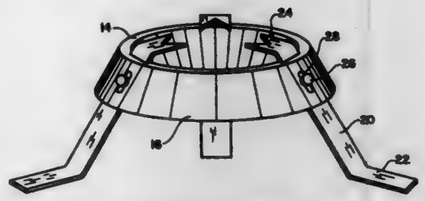
a hook support having a back rest and a plurality of ledges adapted to hold a book at a selected orientation for a reader;

attachment means connected to said book support adapted to be removably attached to said standard and arranged to hold said book support for illumination under said light source;

an adjustable arm adapted for attachment at one end thereof to aid bookholder, said arm being sufficiently flexible to be bent to a desired shape and sufficiently rigid to maintain said shape after it has been bent; and

a shade attachment to the other end of said adjustable arm, whereby said shade may be adjusted with respect to the light source and book on the bookholder to block glare from the light source to the eyes of said reader.

5,195,715
CHRISTMAS TREE HOLDER
Richard E. Cone, Dayton, Ohio, assignor to Mitchell Associates, Paso Robles, Calif.
Filed Jan. 27, 1992, Ser. No. 826,530
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—526 **3 Claims**



1. A holder for supporting in an upright position a tree that has been cut off at its trunk, said holder comprising:

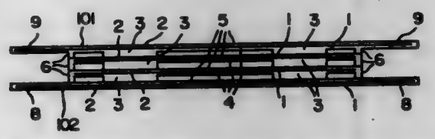
a cup having a bottom and a lip;

a skirt connected to the lip of said cup, sloping downwardly and outwardly from the lip, and having the shape of a frustrum of a cone, the cone having a generally vertical axis and a vertex located above said skirt;

at least three legs spaced circumferentially around said skirt, each having a lower end, an inclined central portion, and an upper portion directed inwardly toward the axis of said skirt;

means coupling said skirt to said at least three legs for independently sliding each leg with respect to said skirt in a direction toward and away from the vertex of the cone and for temporarily affixing each leg to said skirt at a chosen position;

whereby, with the trunk of the tree resting on the bottom of said cup, said at least three legs may be slidably adjusted so that the upper portion of each leg bears against the trunk of the tree to steady the tree in an upright attitude, and whereby the lower ends of said at least three legs are more widely spaced when adjusted for a large tree than when adjusted for a small tree.

5,195,716
HIGH STABILITY ASEISMIC BEARING
Ray G. Tyler, Lower Hutt, New Zealand, assignor to Skellerup Rubber Manufacturing Limited, New Zealand
Filed Aug. 1, 1989, Ser. No. 388,077
Claims priority, application New Zealand, Aug. 2, 1988, 225652
Int. Cl.[5] E04H *9/02*
U.S. Cl. 248—632 **4 Claims**

1. A high stability structural bearing for placement between members of a structure, the bearing comprising:

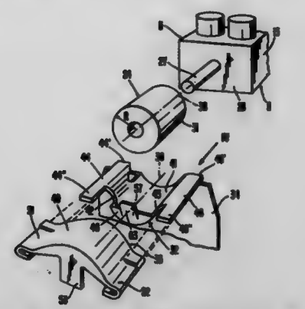
a plurality of adjacent metal stiffening plates constructed from a planar, stiff and rigid material, each plate having a plurality of discrete, spaced-apart resilient disc shaped bearings on a surface thereof abutting a surface of an adjacent plate, the stiffening plates and the disc shaped bearings providing a layered bearing assembly in which the disc shaped bearings of adjacent plates provide generally columnar resilient bearings stiffened by the matal plates to form a stable bearing unit for protecting members of the structure against horizontal shear forces,

said bearing further including energy absorbing components between the adjacent plates so that the components are deformed by shear movement between the plates, the components absorbing energy being steel, lead or a polymeric material of moderate viscosity trapped between rubber rings bonded to the plates;

each plate or assembly of the plurality of adjacent plates having a skirt which protects against ingress of deleterious matter to spaces between adjacent plates; and

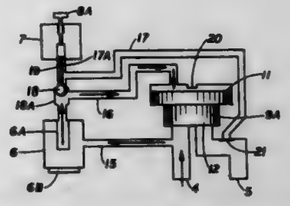
each plate being formed in two parts and being integral with or attached to adjacent plates above or below, and being constructed from a synthetic or natural rubber material having a shore hardness in the range of above 30 to 80.

5,195,717
DEVICE FOR MOUNTING AND FIXING THE HYDRAULIC UNIT OF AN ABS
Erwin Benz, Gechingen; Günter Köhler, Sindelfingen, and Karl Wörner, Uhingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany
Filed May 9, 1991, Ser. No. 697,436
Claims priority, application Fed. Rep. of Germany, May 15, 1990, 4015561
Int. Cl.[5] F16M *1/00*
U.S. Cl. 248—638 **16 Claims**



1. A device for mounting and fixing the hydraulic unit of at least one of an anti-lock system and a drive-alip control device in an engine space of a road vehicle body, comprising a bracket having a baseplate which is fastenable to a region of the body, and from which at least two supporting legs arranged at a distance from each other project upwardly and carry three cylindrical rubber-buffer bearings comprising shell-shaped holding elements for rubber buffers constituted by a sleeve or a pot for mounting the hydraulic unit in a vibration-insulating manner, in a three-point mounting manner, by journals projecting from a housing of the hydraulic unit and engaging the rubber buffers having central axes parallel to the baseplate, wherein the holding elements arranged on the supporting legs are upwardly open partial shells for carrying the rubber buffers over a lower sector regions thereof, which shells are provided at their ends facing away from one another with radial bottom flanges for axially supporting the rubber buffers, and shell parts are attachable to these bearing elements fixed to the bracket to completely surround the buffer elements over 360°, which shell parts are guided displaceably in the axial direction on the bearing elements and are secured against radial shifts as a result of positive engagement with the bearing elements fixed to the bracket and against axial shifts by catch elements locking resiliently into mutual engagement with the bearing elements fixed to the bracket.

5,195,718
SPRINKLER VALVE
Gordon H. May, 3261 Woodleigh La., Cameron Park, Calif. 95682
Filed Sep. 18, 1991, Ser. No. 762,565
Int. Cl.[5] F16K *31/02, 31/126*
U.S. Cl. 251—30.02 **14 Claims**



1. A sprinkler valve for controlling fluid flow comprising:

a shell,

a plurality of chambers in the shell,

an inlet port,

an outlet port,

an upper diaphragm and a lower diaphragm,

a passageway connecting the inlet port to the bottom of the lower diaphragm,

a plurality of passageways connecting the inlet port to the top of the upper diaphragm and

the top of the upper diaphragm to the outlet port,

a passageway connecting the bottom of the lower diaphragm to the outlet port,

a solenoid operably connected to a fluid flow blocking means which fluid flow blocking means in a first position blocks fluid flow from the top of the upper diaphragm to the outlet port and which fluid flow blocking means in a second position blocks fluid flow from the inlet port to the top of the upper diaphragm,

a means for activating the sprinkler valve without connecting electrical current to the solenoid,

a means for preventing fluid from flowing from the outlet port into the first of the plurality of passageways connecting the outlet port to the top of the upper diaphragm and for preventing fluid pressure at the outlet port from being applied to the top of the upper diaphragm, and

a means for allowing only momentary fluid flow from on top of the upper diaphragm toward the outlet port.

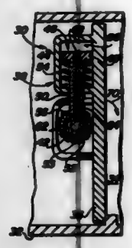
5,195,719
BUTTERFLY VALVES WITH ACTUATORS CARRIED ON VALVE PLATE
Larry K. Ball, Chandler, and Marshall U. Hines, Scottsdale, both of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Continuation of Ser. No. 374,897, Jun. 30, 1989, abandoned. This application Jan. 12, 1992, Ser. No. 898,225
Int. Cl.[5] F16K *1/22*
U.S. Cl. 251—56 **53 Claims**

1. Butterfly valve apparatus comprising a duct defining an elongate flow path for fluid, a plate-like valve member disposed in said flow path and rotatable between a closed position spanning said flow path to close fluid communication therethrough and a fully open position associated with maximum

body port cavities, said closed-flow position occurs when

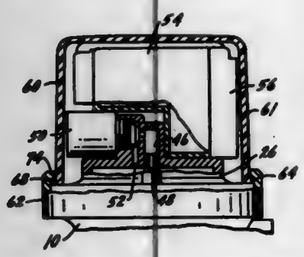
closed end of the valve body is in fluid communication

fluid communication through said flow path, and a motor disposed in said path logic carried by said valve member for



moving the latter between said closed position and said fully open position.

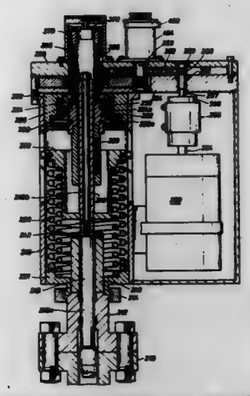
5,195,720
FLUSH VALVE COVER
Richard Nortier, Brookfield, and John F. Whiteside, Franklin Park, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.
Filed Jul. 22, 1992, Ser. No. 916,707
Int. Cl.[5] F16R *31/40*
U.S. Cl. 251—129.04 15 Claims



1. A flush valve including a body having a water inlet and a water outlet, an inner cover mounted on said body and defining a portion of a chamber which is in communication with said inlet, an outer cover enclosing said inner cover, interfitting means on said inner and outer covers preventing relative rotation therebetween, and a locking ring mounted on said body and having means thereon cooperating with said inner and outer cover interfitting means to attach said inner and outer covers to said body.

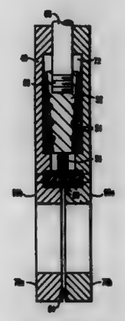
5,195,721
FAIL SAFE VALVE ACTUATOR
Neil H. Akkerman, Houston, Tex., assignor to AVA International Corporation, Houston, Tex.
Continuation-in-part of Ser. No. 518,942, May 4, 1990, abandoned. This application Mar. 28, 1991, Ser. No. 676,841
Int. Cl.[5] F16K *31/04*; F16D *7/02, 43/20*
U.S. Cl. 251—129.13 39 Claims

1. A fail safe valve actuator comprising a housing for mounting on a valve body, a valve stem having one portion adapted to be connected to the valve member of a valve and another portion having an elongated helical groove in its outer surface, means mounting the valve stem in the housing to reciprocate and thereby move the valve member between valve open and valve closed positions, compressible means for urging the valve stem toward one position, means for moving the valve member to its other position including a ball nut in engagement with the helical groove on the valve stem and mounted in the housing for rotation relative to the valve stem, an electric motor having an output shaft, a centrifugal clutch connected to the output shaft of the electric motor that will engage and transmit torque when the motor reaches a preselected speed of rotation, means for transmitting the torque from the centrifugal clutch to the ball nut to rotate the nut and move the valve stem



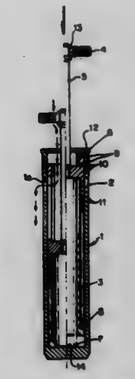
and valve member to one position, and electrically powered means for holding the stem and valve member in said one position and then releasing the valve stem and valve member for movement by the compressible means to the other position when the electrical power fails.

5,195,722
FOOL PROOF SLIDE GATE VALVE
Michael P. Bedner, 33 Circle Dr., Monessen, Pa. 15062
Filed Jun. 14, 1990, Ser. No. 538,009
Int. Cl.[5] F16K *3/18*
U.S. Cl. 251—199 6 Claims



1. A fool proof slide gate valve comprising:
a body having axially opposed body port cavities on a horizontal axis enabling a medium to flow freely, including a seat means secured to an inner circumferential side of said body port cavities;
a gate means located within said body on a vertical axis, said gate means enclosing and protecting by a resilient seal member a wedge member which is mounted to a valve stem, said valve stem operated by a drive means on said vertical axis, said drive means transmits a force to said wedge member reciprocating said gate means between an open-flow position and a closed-flow position, said open-flow position occurs when said gate means is driven vertically upward enabling a gate port cavity corresponding in size and shape to said body port cavities to align with said body port cavities, said closed-flow position occurs when said gate means is driven vertically downward enabling a gate means outer surface to align with said body port cavities, said open-flow position and said closed-flow position occurring in cooperation with said seat means which remains in contact with said gate means outer surface at an inlet body port cavity and an outlet body port cavity, comprising said body port cavities.

5,195,723
BALANCED RETENTION VALVE
Bruno Schneerte, and Ricardo Moreira Seixas, both of Rio de Janeiro, Brazil, assignors to ABB Vetco Gray (Brasil) S.A., Rio de Janeiro, Brazil
Filed May 28, 1992, Ser. No. 889,400
Int. Cl.[5] F16K *1/44*
U.S. Cl. 251—282 11 Claims

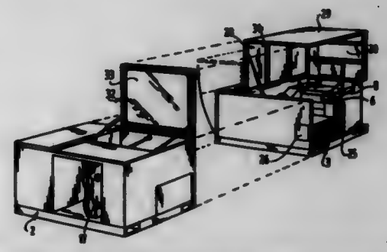


1. A balanced retention valve, particularly for the annulus of a riser in submarine oil prospection in great depth, comprising:
a valve body shaped substantially as a cylindrical sleeve with an open end and a closed end, being provided with at least one opening in its side wall and at least one internal sealing ring located inside the valve body between the open end and said opening;
a first sliding member displaceable inside the valve body under an external actuation force against a first elastic force from the closed position, in which it covers both said at least one opening sealingly and the internal sealing ring of the valve body to an open position, in which it is away from said opening and from the internal sealing ring towards the closed end of the valve body,
a second sliding member also displaceable inside the valve body, by virtue of a second elastic force from a closed position, in which it is located between the open end of the valve body and the first sliding member, to an open position, in which it covers the internal sealing ring, but does not cover said opening,
at least one sealing ring located axially between the opening of the valve body and the closed end thereof and radially between the valve body and the first sliding member,
elastic means for providing said first and second elastic forces,
a stop surface suitable for stopping the course of said second sliding member in said open position,
wherein the second sliding member rests against the first sliding member in the closed position and displaces together therewith until it stops against said stop surface, whereafter the first sliding member displaces as far as the respective open position, and
wherein a space between the first sliding member and the closed end of the valve body is in fluid communication with the open end of the valve body.

5,195,724
STAPLE REMOVER
Ja M. Koo, 87-6, Dae Jo dong, Eun Pyung-Ku, Seoul, Rep. of Korea
Filed Dec. 19, 1991, Ser. No. 810,219
Claims priority, application Rep. of Korea, Dec. 26, 1990, 90-20914
Int. Cl.[5] B25C *11/00*
U.S. Cl. 254—28 6 Claims

1. An improved staple remover having an inner side staple removing arm and an outer side staple removing arm, each of said arms forming a vertex with an external curved surface portion and an internal slant wall, the improvement comprising:
at least one groove formed into the external curved surface portion of one of said staple removing arms.

5,195,725
DISPLACEABLE, TWO-PART WINCH DEVICE
Sietse J. Koopmans, No. 32, Buitenhaven, NL-2965 AE Nieuwpoort, Netherlands
Filed Apr. 4, 1990, Ser. No. 505,305
Int. Cl.[5] B66D *1/00*
U.S. Cl. 254—266 8 Claims



1. In a displaceable winch device comprising a drive unit and a winching unit which is separable from said drive unit for a transporting state and connectable thereto for a state of use as a winch, said drive unit having an output drive shaft and drive gear, a frame, a unit compartment means for housing a combustion motor and a radiator said radiator providing means for cooling a coolant of said motor, and an operator compartment provided with a seat for an operator of said winch and controls situated about said seat within reach of said operator, the improvement comprising:
said frame protruding just above a horizontal top surface of said seat;
at least a portion of said unit compartment means extending beneath said seat; and
said radiator being fitted in said portion of said unit compartment means.

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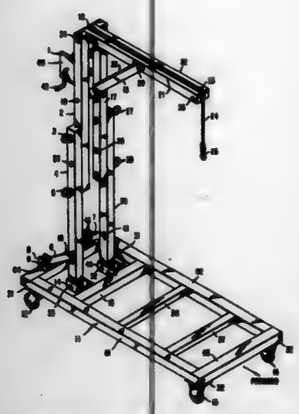
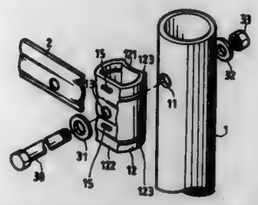
5,195,726
PORTABLE LUGGAGE CARRIER
Albert Kaner, Bloomfield Hills, Mich., assignor to AGC Research and Development Corp., Southampton, N.J.
Filed Jul. 3, 1991, Ser. No. 725,335
Int. Cl.[5] B66D *3/00*
U.S. Cl. 254—325 8 Claims



1. A foldable, portable luggage carrier which can be hand carried having a platform with front and rear wheels and a handle structure which supports a winch and pulley attached to the platform comprising
(a) a generally rectangular platform having wheels attached to the underside of each of the front and rear corners thereof and being sufficiently lightweight to enable it to be hand carried;
(b) an upright handle structure supporting a winch and a pulley structure, said upright handle structure removably and foldably attached substantially upwardly perpendicular to said platform at a position intermediate the location of the said rear wheels and a center line running from side to side of said platform, said handle structure comprising a first pair of spaced apart upright posts perpendicular to the platform and attached foldably and removably at one end to said platform, and each of said posts foldably attached at an end portion thereof not attached to said platform to one end portion of a second pair of upright posts which are substantially upwardly perpendicular to said platform, said second pair of upright posts having a winch supported between them and having attached at their ends not attached to said first pair of upright posts a pair of substantially parallel arms foldably attached to and extending substantially perpendicular therefrom over the platform in parallel relationship thereto and supporting pulleys at each end thereof with a rope or chain thereon, said rope or chain being attached at one end thereof to said winch and to a hook at an end thereof which is not attached to said winch, said handle structure being sufficiently light-weight to enable it to be hand carried to a desired location, either alone or folded to said platform.

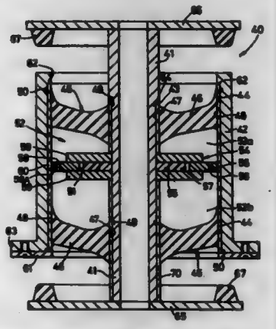
5,195,727
TUBULAR SHOCK-ABSORBING DEVICE FOR A RAIL
Wen-ming Liao, No. 200, Hung-Guen Street Da-Chia Gien, and Chun-Chien Yen, 24, Lin 9, Rui Ke Tsun, Ta-An hsiang, both of Tai-Chung Hsien, Taiwan
Filed Mar. 18, 1992, Ser. No. 854,358
Int. Cl.[5] A01K *3/00*
U.S. Cl. 256—13.1 3 Claims

1. A tubular shock-absorbing device comprising a post, a tubular member having a front face, a rear face, and two side faces, said rear face having a curved surface for engagement with said post, said front face having a wavy surface, and each of said side faces having at least one reinforcing flange which is cast integrally with said tubular member, a rail which has a



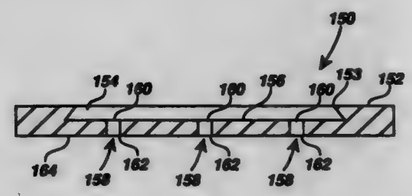
wavy shape engageable with said wavy surface of said front face of said tubular member, and a bolt which penetrates through said rail, said tubular member and said post to form said tubular shock-absorbing device.

5,195,728
ELASTOMERIC MOUNTING WITH FLUID DAMPING
John B. Skipper, Latterworth, England, assignor to BTR plc, United Kingdom
Filed Mar. 21, 1991, Ser. No. 672,824
Claims priority, application United Kingdom, Mar. 31, 1990, 9007300
Int. Cl.[5] B60G *11/62*; F16F *9/18*
U.S. Cl. 267—140.13 18 Claims



1. An elastomeric mounting comprising
an inner rigid member and an outer rigid member arranged to define an annular space therebetween,
a pair of annular elements of elastomeric material located in said annular space and each arranged to extend between and serve to interconnect said rigid members with said annular elements being axially spaced in a direction of relative longitudinal movement of the rigid members to define therebetween and between said rigid members a fluid chamber,
each said annular element of elastomeric material being of a shape which deforms by both shear and bending movements during relative longitudinal movement of the rigid members but each element being substantially inextensible whereby a change of fluid pressure in the chamber does not result in the volume of the chamber changing significantly,
the elastomeric mounting additionally comprising integral damping means arranged to provide a damping effect additional to that provided by the annular elements of elastomeric material during relative longitudinal movement of the rigid members,
said damping means being a fluid damping means comprising said fluid chamber filled with a substantially incompressible fluid and a partition member carried by the inner rigid member and movable therewith within the chamber, said partition member having a periphery in sliding contact with an inner surface of said outer rigid member during relative longitudinal movement of the rigid members thereby to provide a damping effect,
the partition member comprising an annular elastomeric buffer bush at least a part of which is transversely compressible thereby to resist excessive relative movement between at least a part of the partition member and the outer rigid member in a transverse direction perpendicular to the direction of said relative longitudinal movement.

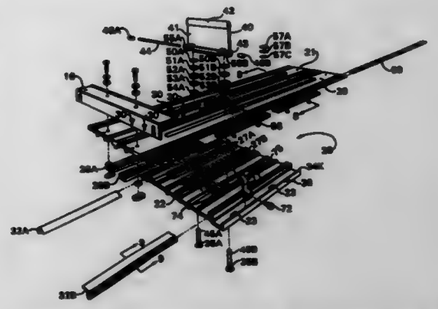
5,195,729
WAFER CARRIER
Michael E. Thomas, Milpitas; Satoshi Sekigahama, Fremont, and Richard von Salza Brown, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed May 17, 1991, Ser. No. 702,632
Int. Cl.[5] B23F *17/00*
U.S. Cl. 269—21 18 Claims



1. A carrier for a substrate of a selected size comprising:
(a) an outer portion adapted for engagement by equipment for processing wafers;
(b) a substantially planar supporting surface, interior to said outer portion; and
(c) a retaining lip above the plane in which said supporting surface lies by at least the height of a substrate of the selected size; the circumference of said retaining lip defining an opening in said carrier of sufficient size and proper shape to permit the passage of a substrate of said selected size;
said carrier being undercut under said retaining lip sufficiently to cause a substrate of said selected size placed on said supporting surface to be retained, said carrier being rigid.

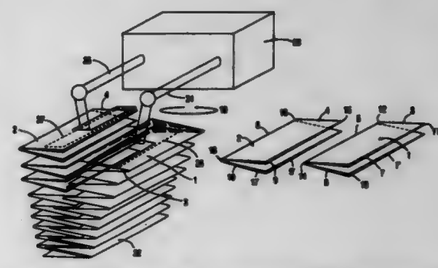
5,195,730
UNIVERSAL PRECISION POSITIONING JIG
Christopher L. Taylor, 13229 Cedar La., Dallas, Tex. 75234
Filed Jun. 4, 1992, Ser. No. 893,492
Int. Cl.[5] B23Q *3/00*; G01B *5/14*
U.S. Cl. 269—303 20 Claims

1. A positioning jig comprising:
(a) a first elongated substantially flat member having a principal longitudinal axis, an upper surface and a lower surface;
(b) a second elongated substantially flat member having a principal longitudinal axis, an upper surface and a lower surface; said lower surface of said first member being adapted for controllably moveable engagement with said upper surface of said second member when said lower surface of said first member and said upper surface of said second member are separated by greater than a predetermined distance and being locked together when said lower surface of said first member and said upper surface of said second member are closer than said predetermined distance; and
(c) a multi-position cam clamp mounted on one of said substantially flat members effective when in a first position to position said lower surface of said first member and said upper surface of said second member closer than said predetermined distance, and when in a second position to



separate said lower surface of said first member and said upper surface of said second member by said greater than said predetermined distance.

5,195,731
METHOD AND APPARATUS FOR STACKING FOLDED PRODUCTS, ESPECIALLY NEWSPAPERS, HAVING LONGITUDINAL FOLDS AND, POSSIBLY, ALSO CROSS FOLDS
Ingo Kobler, Anhausen, and Gedber Petersen, Augsburg, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany
Filed May 4, 1990, Ser. No. 518,806
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915195
Int. Cl.[5] B65H *39/10*
U.S. Cl. 270—55 16 Claims



1. Apparatus for stacking folded, essentially flat products (1, 2) received by the apparatus in identical orientation, said products having a back fold line (5, 6) and two sheet portions (1*a*, 1*b*; 2*a*, 2*b*) joined by a back fold at said back fold line, and, optionally, having a longitudinal fold line (3, 4) extending transversely to said back fold line,
said apparatus comprising
a product holder and engagement means (24, 25) having two parts, each part holding a respective first and second (1, 2) folded product;
separating means (26, 27; 46, 47; 64, 65) inserted into the folded products such that the sheet portions (1*a*, 1*b*; 2*a*, 2*b*) are held apart;
rotary means (23; 31, 42; 59) rotating the first product by 180° about an axis essentially perpendicular to the major plane of said first product; and
means for moving said parts towards each other, after the rotary means have rotated said first product, for engaging said first and second products in a dual-comb like interdig-

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ited position within each other to permit forming a stack (22) of products of essentially uniform height, whereby the products in the stack will have facing orientation.

5,195,732

APPARATUS FOR THE EXTRACTION OF BLANKS FROM A BLANK MAGAZINE

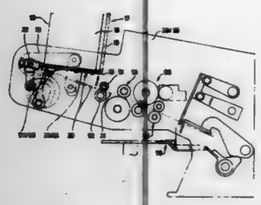
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

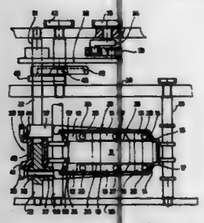
Filed Jul. 23, 1991, Ser. No. 734,661

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1990, 4024396

Int. Cl.[5] B65H *3/12*

U.S. Cl. 271—11 12 Claims





9. Apparatus for the extraction of pack blanks of thin cardboard from an underside of a blank stack located in a blank magazine of a packaging machine, the extracted blanks being introducible into a discharge-conveyor located in a plane (21) extending underneath the blank stack, characterized:

in that, for the extraction of the blanks (10), there is an extraction member (28) comprising holding members (23, 24) which are subjected to a vacuum and by which a blank (10) can be grasped in its lateral regions on a free lower side of the blank, and, as a result of a downward movement of the blank, transported to and deposited on the discharge-conveyor plane (21);

in that said extraction member produces said downward movement;

in that the holding members (23, 24) are elongate and arm-like and in a lower position are rotatable away from the deposited blank (10) in opposite directions and are movable into an upper receiving position for grasping a further blank (10);

in that there are means for rotating and moving said holding members in said opposite directions; and

in that the holding members (23, 24) are mounted rotatably at first ends thereof by respective shaft pieces (36) located in pivot bearings (37) forming part of a transversely directed shaft (22) for pivotally driving the holding members (23, 24) over an acute angle.

5,195,733

RESTORATIVE SHEET TRANSPORT APPARATUS

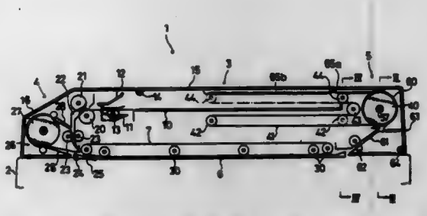
Kazushi Takimoto, Kadoma; Yasushi Kamezaki, Sakai, and Yukio Tanizaki, Hyogo, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Mar. 27, 1992, Ser. No. 858,403

Claims priority, application Japan, Apr. 1, 1991, 3-96274; Apr. 1, 1991, 3-96275

Int. Cl.[5] B65H *5/00*

U.S. Cl. 271—3.1 33 Claims



1. An apparatus for transporting a sheet from a stack of original material to an image forming apparatus and restoring the sheet onto the stack, comprising:

an original sheet container;

a sheet feeder for feeding a sheet from said original sheet container to said image forming apparatus; and

a sheet restorer for restoring said sheet into said original sheet container, said sheet restorer including a turning path which has a plurality of rollers that have a relatively low stiffness and at least one guide rib between adjacent pairs of said rollers having said relatively low stiffness, and a straight transport path which has a plurality of rollers that have a relatively high stiffness and that are adapted to shift with respect to said path, transport belts extending around said rollers having said relatively high stiffness and at least one guide rib between adjacent pairs of said transport belts.

5,195,734

SHEET FEEDING DEVICE FOR IMAGE FORMING EQUIPMENT

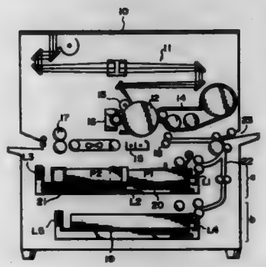
Hiroshi Tanabe, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 28, 1991, Ser. No. 751,063

Claims priority, application Japan, Aug. 31, 1990, 2-228175; Oct. 25, 1990, 2-285826

Int. Cl.[5] B65H *5/26*

U.S. Cl. 271—9 21 Claims



1. A sheet feeding device for image forming equipment, comprising:

first storing means for stacking a plurality of sheets;

feeding means for feeding sheets one by one from said first storing means;

second storing means positioned horizontally and parallel to said first storing means;

shifting means for shifting sheets collectively from said second storing means to said first storing means; and

guide means for guiding said second storing means such that said second storing means may be pulled out in a direction substantially perpendicular to an intended direction of sheet shift.

5,195,735

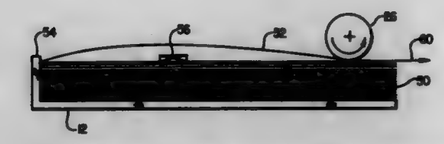
PAPER HANDLING METHOD FOR CONTROLLABLY REMOVING AN INDIVIDUAL SHEET OF PAPER FROM A STACK OF PAPER

Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jul. 20, 1990, Ser. No. 556,568

Int. Cl.[5] B65H *3/54*

U.S. Cl. 271—21 7 Claims



1. A method of horizontally removing a top sheet of paper from a stack of paper within a tray having a rear surface, said method comprising the steps of:

bringing a wheel member into frictional contact with the upper side surface of said top sheet of paper;

rotating said wheel member in a first direction to rearwardly drive said top sheet of paper against said rear tray surface in a manner causing a portion of said top sheet of paper to bow upwardly away from the remainder of said stack of paper;

moving a grabber member into and downwardly through the space between the upwardly bowed top sheet portion and said remainder of said stack of paper in a manner causing said grabber member to contact said remainder of said stack of paper with a downward force sufficient to essentially preclude it from being shifted by rotation of said wheel member; and

rotating said wheel member in a second direction opposite said first direction to forwardly remove said top sheet of paper from said remainder of said stack of paper.

5,195,736

METHOD AND APPARATUS FOR FEEDING SHEETS

Takeo Ishidate, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1991, Ser. No. 761,009

Claims priority, application Japan, Sep. 19, 1990, 2-249785; Sep. 19, 1990, 2-249786; Mar. 14, 1991, 3-022194; Jun. 24, 1991, 3-177762

Int. Cl.[5] B65H *3/06, 7/06, 7/08*

U.S. Cl. 271—22 17 Claims

2. An apparatus for sequentially feeding sheets one by one, comprising

a storing section for storing said sheets, and

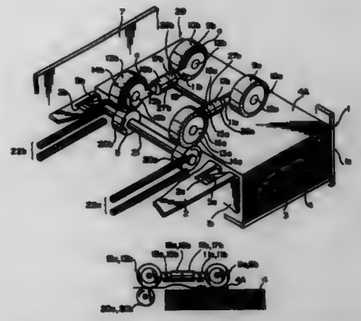
pay-out means for paying out one of said sheets in a predetermined feed direction, and causing part of the sheet being paid out to bend; and wherein

said storing section comprises pressing means for pressing said sheets stored in said storing section against said pay-out means, and

said pay-out means comprises:

first support means and second support means sequentially arranged in said feed direction to face said storing section, and each being expansible and contractible in the opposite direction to the other;

pay-out rollers each being mounted on one end of a respective one of said first and second support means and rotatable only in the same direction as the other; and



a separation roller located in close proximity to said pay-out roller mounted on said second support means and rotatable in the same direction as said pay-out roller.

5,195,737

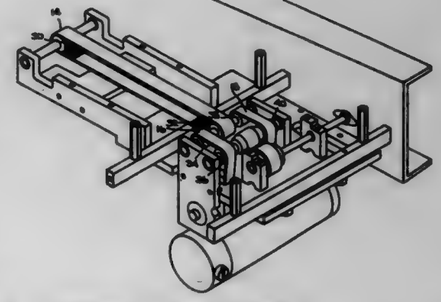
ANTI-SKEW DEVICE FOR SINGULATING FEEDER

Edward M. Iftovits, Jr., and Edward F. Iftovits, Sr., both of New Fairfield, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 24, 1992, Ser. No. 826,329

Int. Cl.[5] B65H *3/04*

U.S. Cl. 271—35 4 Claims



1. A belt feeding assembly, comprising:

a pair of side frames;

an upstream and a downstream shaft mounted in said side frames;

a first timing pulley and a second timing pulley each having a one-way clutch for mounting on said downstream shaft;

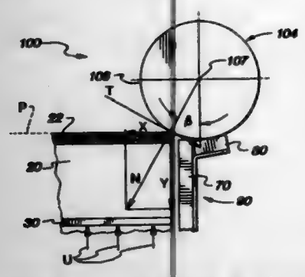
a third timing pulley and a fourth timing pulley each having a one-way clutch for mounting on said upstream shaft;

a first timing belt mounted on said first and third pulleys;

a second timing belt mounted on said second and fourth pulleys; and

means for driving said first and second timing belts, whereby when said first and second timing belts are initially driven at the start of operation, said one-way clutches enable said timing belts to properly and precisely seat in said timing pulleys.

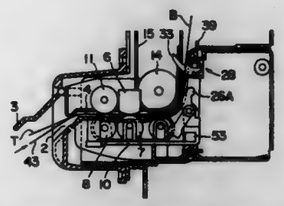
5,195,738
SINGLE SHEET PICKING AND TRANSPORT MECHANISM
Walter Gysling, Excelsior, Minn., assignor to National Computer Systems, Inc., Minneapolis, Minn.
Continuation of Ser. No. 374,256, Jun. 30, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 674,317
Int. Cl.[5] B65H 3/06
U.S. Cl. 271—111 19 Claims



1. An apparatus for removing a single, top sheet of material from a stack of sheet material comprising:
means for supporting said stack of sheet material so that prior to removal and transport of any sheet the sheets lie substantially flat and parallel to each other with at least one edge of each stacked sheet substantially aligned with one edge of the other stacked sheets, said aligned edges defining a sheet edge plane;
rotatable pick means for frictionally engaging and removing the top sheet of said stacked sheets, the rotational axis of said pick means being oriented generally parallel to said sheet edge plane and being positioned in front of and spaced from said sheet edge plane such that a plane containing said rotational axis and oriented parallel to said sheet edge plane does not pass through the stack of sheet material;
a frictional retard surface located adjacent and tangent to said pick means and in front of the sheet edge plane, said retard surface and the periphery of said pick means forming a tapered retard gap into which each sheet removed from the stack is drawn;
a low-friction guide means located between the at least one edge of said top sheet and the retard surface for receiving said at least one edge of sheets as they are drawn from the stack by the pick means and guiding the sheets into the retard gap; and
means for selectively rotating pick means so that its peripheral motion draws sheets from the stack toward the guide means.

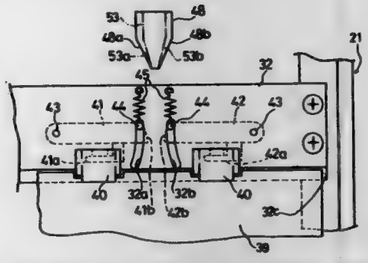
5,195,739
APPARATUS FOR PREVENTING BILLS OR THE LIKE FROM BEING PULLED OUT
Masayuki Watabe, Iruma, Japan, assignor to Nippon Conlux Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 828,014, Jan. 30, 1992, abandoned. This application Aug. 5, 1992, Ser. No. 925,907
Claims priority, application Japan, Feb. 1, 1991, 3-32213
Int. Cl.[5] B65H 29/40
U.S. Cl. 271—207 4 Claims

1. An apparatus for preventing a bill from being pulled out, in which a bill inserted from a bill inlet is judged as to whether or not it is genuine, and only a genuine bill is passed into a bill accumulating box through a bill passage, the apparatus comprises pull out preventing means, arranged in the bill passage, for preventing a bill from being pulled out from the bill accumulating box, the pull out preventing means including:
pull out preventing levers each including a pawl;
hang preventing means including a tongue for preventing a bill from hanging from the bill accumulating box into the bill passage;
supporting means for pivotally supporting the pull out preventing levers and the hang preventing means, the pawl of each pull out preventing lever being arranged to traverse the bill passage to block a bill, received in the bill accumulating box from returning to the bill inlet;
first biasing means for spring biasing the pull out preventing levers toward the bill passage to block a bill, received in



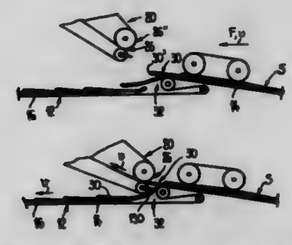
the bill accumulating box, from returning to the bill inlet while allowing the pull out preventing levers to be turned by a bill which passes through the bill passage for entering the bill accumulating box; and
second biasing means for spring biasing the hang preventing means to prevent by way of the tongue a bill, received in the bill accumulating box, from hanging from the bill accumulating box, while allowing the tongue to be turned by a bill which passes through the bill passage for entering the bill accumulating box.

5,195,740
NIPPING DEVICE OF A TRANSFER UNIT
Arikiro Tsunoda, Higashiosaka; Atsushi Kanou, Amagasaki; Toshiyuki Osaka, Osaka; Toshinobu Katafuchi, Fujiidera; Syuji Yamada, Kobe, and Hiroyoshi Omuras, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Nov. 19, 1991, Ser. No. 794,587
Claims priority, application Japan, Nov. 22, 1990, 2-320038; Nov. 22, 1990, 2-320040; Mar. 12, 1991, 3-73882
Int. Cl.[5] B65H 5/12
U.S. Cl. 271—277 21 Claims



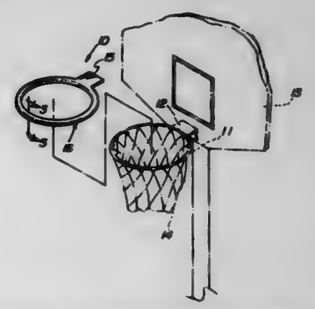
1. A nipping device provided in a transfer unit, wherein the transfer unit includes a fixed portion and a rotating element rotatably supported by said fixed portion, said nipping device being adapted to retain a printing sheet on a circumferential surface of said rotating element and to separate the printing sheet from said rotating element, the nipping device comprising:
nipping means, openably disposed on the circumferential surface of the rotating element, for retaining a leading edge of the printing sheet fed thereto;
a pivoting lever device provided in said rotating element, said pivoting lever device including pivotion levers pivotal on axes intersecting the circumferential surface of said rotating element, and opening and closing said nipping means; and
a drive device provided in said fixed portion, for operating said pivoting lever device;
said rotating element including rims of a pair disposed on either end of said transfer unit, and a stay connecting said pair rims and forming a portion of the circumferential surface of said rotating element; wherein said nipping means and said pivoting lever device are attached to said stay;
said pivoting lever device including elastic members by which said pivoting levers close said nipping means;
said drive device including drive cams which come into driving contact with said pivoting levers in the direction opening said nipping means;
wherein said stay includes an arched slot, each of said pivoting levers includes a pin of which one end is inserted into said slot, and
said elastic member is a tension spring having one end engaged on said pin and the other end engaged on said stay.

5,195,741
APPARATUS FOR SELECTIVELY TRANSFERRING PRODUCTS FROM AN IMBRICATED FORMATION CONVEYED ALONG A FIRST CONVEYING PATH ONTO A SECOND CONVEYING PATH
Hans-Ulrich Stauber, Grlit, Switzerland, assignor to Ferag AG, Hinwil, Switzerland
Filed Oct. 2, 1991, Ser. No. 769,835
Claims priority, application Switzerland, Oct. 4, 1990, 03197/90
Int. Cl.[5] B65H 29/66
U.S. Cl. 271—303 16 Claims



1. An apparatus for selectively transferring flexible flat products, especially printed products such as newspapers, magazines and the like, from an imbricated formation conveyed along a first conveying path onto a second conveying path, comprising:
a first conveyor defining the first conveying path;
a second conveyor defining the second conveying path;
a transfer conveyor provided between said first conveyor and said second conveyor;
said transfer conveyor having a conveying entrance facing said first conveyor and a stationary conveying exit facing said second conveyor;
said transfer conveyor comprising two conveying arms arranged in tandem and pivotably connected with each other;
said two conveying arms comprising belt conveyors and including a first conveying arm and a second conveying arm;
said first conveying arm having a conveying-active end;
said first conveying arm being arranged directly upstream of said second conveyor and stationarily pivotably mounted in the region of said conveying-active end;
said second conveying arm having a free end;
said conveying entrance of said transfer conveyor being provided at said free end of said second conveying arm and having a working position adjacent to said first conveyor and a withdrawal position remote from said first conveyor;
a driving arrangement;
said two conveying arms being pivotably in a knee-like manner by means of said driving arrangement to take said conveying entrance at said free end of said second conveying arm to said working position for separating printed products from the imbricated formation, and to said withdrawal position for terminating the separation of printed products from the imbricated formation;
pressing means allocated to said conveying arms;
said pressing means comprising at least one endless revolving pressing belt serving to form a conveying gap in conjunction with said conveying arms;
said transfer conveyor having a conveying direction; and
roller means for guiding and retaining said pressing means in said conveying direction of said transfer conveyor such that said roller means is stationary with respect to said conveying arms, irrespective of the pivoting position of said conveying arms.

5,195,742
BASKETBALL HOOP GUARD
Kevin N. Bailey, 1694 Rte. 245, Stanley, N.Y. 14561
Filed Sep. 2, 1992, Ser. No. 939,162
Int. Cl.[5] A63B 63/08
U.S. Cl. 273—1.5 R 5 Claims



1. A basketball hoop guard for securement to a basketball hoop and a basketball hoop mounting plate, wherein the guard comprises,
a torroidal ring, and the torroidal ring includes a mounting web, wherein the mounting web is radially directed and fixedly secured to the torroidal ring projecting exteriorly of the torroidal ring, with the torroidal ring having a central torroidal cavity, and a torroidal polymeric foam body arranged in surrounding relationship relative to the torroidal cavity of a resilient shape retentive construction, and
a fluid impermeable flexible covering sheath arranged in surrounding relationship relative to the foam body, and
the foam body including a mounting slot radially directed into the torroidal cavity, with the mounting slot orthogonally oriented relative to the mounting web.

5,195,743
GOLF CLUB CLEANER AND TEE
Thomas J. Walsh, Jr., 2 Deer Run Rd., Poughkeepsie, N.Y. 12603
Filed Oct. 10, 1991, Ser. No. 774,212
Int. Cl.[5] A63B 57/00
U.S. Cl. 273—32 B 2 Claims

1. A combined cleaning device and tee for supporting a golf ball comprising an elongated stem having a periphery, first and second ends, and a head at one end thereof, said head having an upper surface and a periphery extending laterally outward

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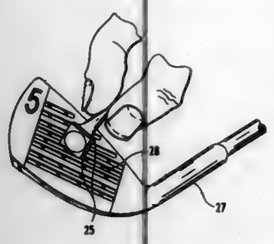
beyond the periphery of said stem, a depression in the upper surface of said head in which a golf ball may be supported, said periphery of said head having a predetermined thickness and including at least two linear peripheral edges which intersect each other to define a linear corner edge, said predetermined

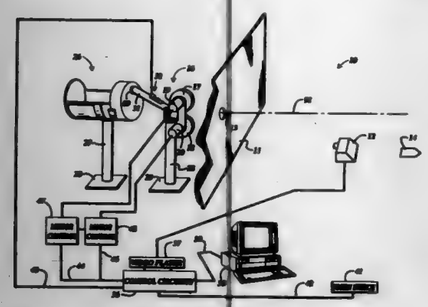


thickness being such that a substantial portion of the peripheral extent of said head is adapted to extend into the grooves in the striking face of a golf club and said linear corner edge is adapted to scrape dirt therefrom, said stem being adapted to support said head in a generally horizontal position with a golf ball located in said depression.

5,195,744
BASEBALL BATTING PRACTICE APPARATUS WITH CONTROL MEANS

Neil S. Kapp; Roger J. Gallant, both of London, and Mark W. Davis, Ilona Station, all of Canada, assignors to Video Baseball, Inc., London, Canada

Filed Nov. 13, 1991, Ser. No. 791,207
Int. Cl.[5] A63B *69/40*
U.S. Cl. 273—26 D **10 Claims**

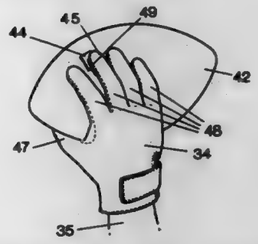


1. A baseball batting practice apparatus comprising:
a display screen having a passageway therethrough;
video display means for displaying a moving image of a baseball pitcher on said screen adjacent said passageway;
electronic means for detecting that the baseball pitcher of the moving image is about to release a baseball in the moving image for creating a signal;
baseball propelling means positioned to one side of said display screen adjacent said passageway for propelling baseballs through said passageway along a forward direction, said baseball propelling means comprising a pair of counter-rotating wheels defining a nip therebetween;
baseball staging means adjacent said baseball propelling means for holding a baseball in a queued position a selected distance above and away from said nip, said baseball staging means comprising a conduit extending between said queued position and said nip, and baseball retaining and releasing means adjacent said conduit operable for retaining the baseball in said queued position and for releasing the baseball from said queued position for allowing the baseball to travel, urged by gravity, along said conduit from said queued position to said nip; and
electronic control means responsive to said signal for controlling the release of the baseball from said baseball retaining and releasing means to synchronize the propelling of the baseball through said passageway with the moving image such that the propelled baseball appears to be thrown by the moving image of the baseball pitcher.

5,195,745
THROWING PROJECTILES AND THROWING AIDS THEREFOR

Elliot Rudell, 1619 Gramercy St., Torrance, Calif. 90501, and George T. Foster, 2700 Panorama Dr. #404, Signal Hill, Calif. 90806

Filed Aug. 12, 1991, Ser. No. 743,758
Int. Cl.[5] A63B *43/00, 65/12*
U.S. Cl. 273—65 EG **29 Claims**

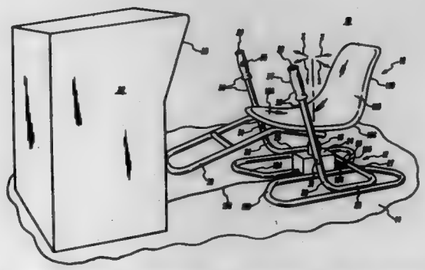


1. The combination of an airborne, untethered, throwing projectile and a throwing aid therefor which comprises:
a receptor site located on the surface of said airborne throwing projectile in the area thereof which is grasped by a thrower; and
a throwing aid worn on the throwing hand, wrist or finger of a thrower of the object and including at least one distal covering bearing a mating surface which adheres to the receptor site on the outer surface of said airborne throwing projectile.

5,195,746
VIDEO DISPLAY CONTROL APPARATUS

Cecil E. Boyd; Terry N. Tessmer; Kenneth F. Dwyer, all of Neosho, Mo., and Glen E. Thomas, Grove, Okla., assignors to Simulator Technology, Inc., Neosho, Mo.

Filed Apr. 4, 1991, Ser. No. 680,584
Int. Cl.[5] A63B *71/04*; A63F *9/22*; G09B *9/02*
U.S. Cl. 273—148 B **23 Claims**



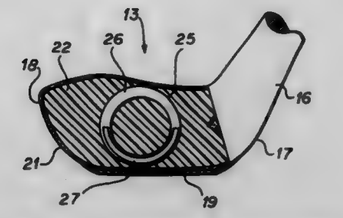
1. Apparatus for controlling movement of an electronic image on a video display, comprising:

a base member;
a seat for supporting a human operator in a seated position;
support means for mounting said seat for tilting movement relative to said base member, said support means including a socket member located on a bottom portion of said seat, a housing mounted on said base member, a shaft mounted for tilting movement relative to said housing, a portion of said shaft protruding from said housing for engaging said socket member to mount said seat for co-movement with said shaft, tilting movement being imparted to said seat and to said shaft by the operator shifting his weight in a direction corresponding to a desired direction of movement of the electronic image; and
control means responsive to tilting movement of said seat for controlling movement of the electronic image.

5,195,747
GOLF CLUB

Jung-Soo Choy, 4104-A Dunwoody Park, Dunwoody, Ga. 30338

Filed May 26, 1992, Ser. No. 887,888
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—170 **8 Claims**



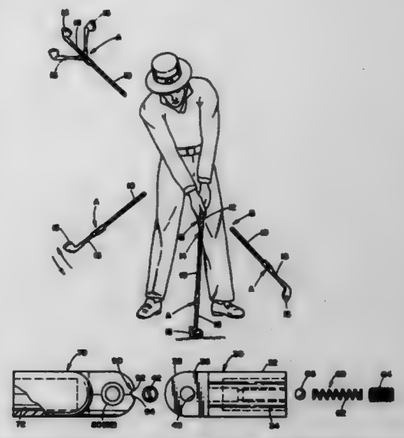
1. A golf club comprising a shaft and a head mounted at an end of said shaft, said head having a face, and wherein said head has a generally annular channel mounted wholly therein and oriented substantially parallel to said face, and a weight located within said channel for free movement therein, whereby the weight may move to different radially locations within the channel as the club is swung to distribute the mass of the head to counter torquing effects of the club.

5,195,748
GOLF SWING TRAINING DEVICE

Robert C. Koch, and Alfred J. Koch, both of Strongsville, Ohio, assignors to Roberts Metals, Inc., Brunswick, Ohio

Filed Jan. 21, 1992, Ser. No. 823,129
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.2 **27 Claims**

1. A golf club used for training a golfer's swing, the club having a first end with a hand grip and a second end having a club head adapted for hitting a ball, a hinge interposed between the first and second ends permitting the second end to selectively break from longitudinal alignment along a first axis with the first end, means operatively associated with the hinge for selectively maintaining the first and second ends in longitudinal alignment including biasing means that requires a predetermined force to overcome it and break the alignment, and means for altering the biasing means, the improvement comprising:



an access to the altering means being accessible from a location adjacent and non-aligned with the first axis.

5,195,749
GOLF CLUB HEADS

Felipe A. Ugarte, Las Arenas, Spain, assignor to Maker, S.A., Las Arenas Getxo—(Bizkaia), Spain

Continuation of Ser. No. 343,738, Apr. 27, 1989, abandoned. This application Jul. 30, 1990, Ser. No. 561,204
Claims priority, application Spain, Apr. 29, 1988, 8801344
Int. Cl.[5] A63B *69/36, 53/04*
U.S. Cl. 273—187.4 **7 Claims**

1. An improved golf club head for a putter comprising front face means having a negative inclination, means to obtain alignment of a shank of the club with a ball and a hole independently of a golfer's stance, and means to prevent said shank from moving outward combined on one single club;
wherein said means to align the ball and hole consists of an intermediate face (3) which is at least partially smooth and polished and mirror shiny, is recessed with respect to said front face means and wherein said intermediate face has a 40 to 50 degree incline with respect to a vertical plane and is combined with a groove (17) or ridge (8) placed in an upper edge of said front face means of said club head.

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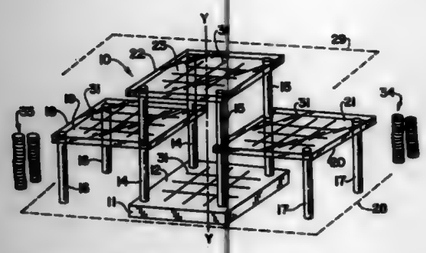
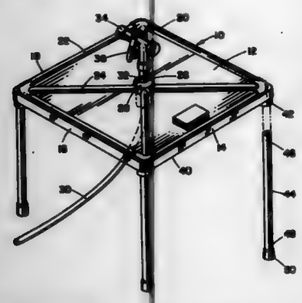
5,195,750
FOUR-PLANE GAME, GAME APPARATUS AND GAME PRODUCT
Tally Courialis, 5855 N. Sheridan Rd., Chicago, Ill. 60660
Continuation-in-part of Ser. No. 720,020, Jun. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 556,950, Jul. 23, 1990, abandoned. This application Apr. 10, 1992, Ser. No. 867,749
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—241 12 Claims



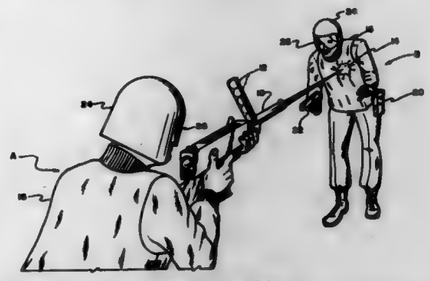
1. A games-playing structure comprising
a central portion comprising a base defining a lower plane and a first surface with
a configuration of spaces, and
an upper stage connected with the base and defining
an upper plane substantially parallel with the lower plane, and
a second surface with a configuration of spaces;
a first side portion
including a first side stage defining a third surface with a configuration of spaces and support means operative between the first side stage and the lower plane, and joined with the central portion intermediate the lower and upper planes;
a second side portion
including a second side stage defining a fourth surface with a configuration of spaces and support means operative between the second side stage and the lower plane, and
joined with the central portion intermediate the lower and upper planes, and generally opposed to the first side portion;
wherein the configurations are substantially congruent.

5,195,751
BOARD GAME WITH SPRAY NOZZLE
Joseph C. Senart, 19771 Meredith, Euclid, Ohio 44119
Filed Nov. 21, 1991, Ser. No. 795,769
Int. Cl.[5] A63B *67/00*
U.S. Cl. 273—349 17 Claims



1. A game comprising:
a support frame having a playing surface;
a means for ejecting water, said means for ejecting being operatively connected to said support frame;
a first set of playing cards for the game wherein said first set of playing cards comprises a plurality of cards each having thereon a number indicating the number of times a player is to be sprayed with water; and,
a second set of playing cards for the game wherein said second set of playing cards comprises a plurality of cards each having thereon a number in the range of 0 to 10.

5,195,752
PAINT BALL SENSOR VEST
Gary L. Reeves, 575 Hillcrest - Apt. 7, and John Ellis, 2800 Chavez Dr., both of Reno, Nev. 89502
Filed Oct. 21, 1991, Ser. No. 779,904
Int. Cl.[5] A41D *1/04*; A63B *71/06*; F41J *5/04*
U.S. Cl. 273—374 5 Claims

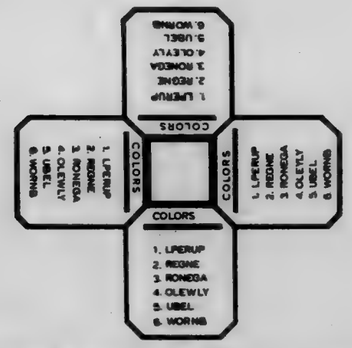


1. A paint ball sensor vest comprising:
a vest means including a piezoelectric film means effective to provide a signal in response to an impact force;
a compact control module means connected to said vest means, said control module means being programmed to differentiate paint ball impacts from other impacts, and including alarm means to alert the wearer of the vest means of impacts by paint balls;
amplifier means connected to said piezoelectric film means by wire leads;
a micro controller means connected to said amplifier means, said micro controller means including an analog to digital converter means and a compare circuit means;
a programmable read-only memory means connected to said micro controller means, said memory means including parameters in terms of signal amplitude of paint ball impacts; and
audible alarm means responsive to a signal from said compare means in said micro controller means to produce an audible alarm when there is no match between the signal produced by the piezoelectric film means; whereby
the wearer of the vest means is audibly alerted of a paint ball impact.

5,195,753
METHOD OF PLAYING A GAME OF KNOWLEDGE
Penelope Brukl, and Charles E. Burkl, both of Eight Alleaby Dr., Ft. Saloaga, N.Y. 11768
Filed Mar. 20, 1991, Ser. No. 672,382
Int. Cl.[5] A63F *9/18*
U.S. Cl. 273—429 9 Claims

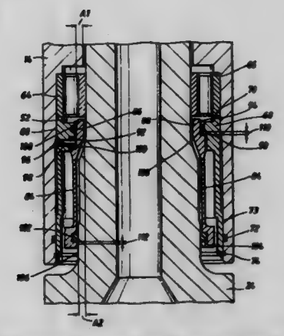
1. A method of playing a game, comprising:
(i) defining one topic category which is intelligible and communicated to a player of the game;
(ii) providing to a player a plurality of correct scrambled answer words each of which pertains to the topic category;
(iii) unscrambling the words pertaining to the topic category;

(iv) awarding a point value to the player for each correctly unscrambled word;



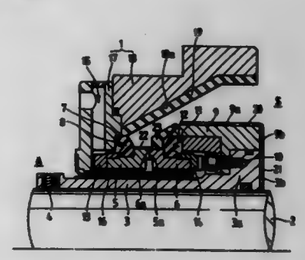
(v) playing successive rounds of play each comprised of steps (i), (ii), (iii) and (iv) until a predetermined winning point total has been accrued.

5,195,754
LATERALLY TRANSLATING SEAL CARRIER FOR A DRILLING MUD MOTOR SEALED BEARING ASSEMBLY
Lannie Dietle, Houston, Tex., assignor to Kaisl Engineering, Inc., Sugarland, Tex.
Filed May 20, 1991, Ser. No. 702,839
Int. Cl.[5] F16J *15/16*
U.S. Cl. 277—27 29 Claims



1. A high pressure rotary shaft sealing mechanism for a rotary shaft of equipment capable of operating in a high pressure fluid environment and having a sealing surface that is subject to lateral excursion during rotation thereof, said rotary shaft sealing mechanism comprising:
(a) a housing having said rotary shaft located therein and projecting therefrom;
(b) a pilot being located within said housing;
(c) a laterally translating seal carrier being disposed within said housing and about said rotary shaft and having at least a portion thereof capable of lateral translation responsive to lateral excursion of said sealing surface of said rotary shaft;
(d) a first sealing element establishing sealing engagement between said pilot and said laterally translating seal carrier and establishing a first pressure responsive sealing area of said seal carrier; and
(e) a second sealing element establishing sealing engagement between said laterally translating seal carrier and said sealing surface of said rotary shaft and defining a second pressure responsive area of said seal carrier being substantially equal with said first pressure responsive area, whereby opposed pressure induced hydraulic forces acting axially and oppositely on said first and second pressure responsive areas of said laterally translating seal carrier are substantially balanced and thus said laterally translating seal carrier in substantially free floating and is thus readily movable by shaft induced forces and is capable of simultaneous lateral excursion along with said sealing surface of said rotary shaft to maintain optimum sealing engagement between said second sealing element and said sealing surface of said rotary shaft during all aspects of rotation and lateral excursion thereof.

5,195,755
SHAFT SEAL FOR SLURRY PUMPS
Junji Ootsuka; Youichi Ogata, and Keizaburo Nishi, all of Sakado, Japan, assignors to Eagle Industry Co., Ltd., Japan
Continuation of Ser. No. 633,311, Dec. 24, 1990, abandoned. This application Feb. 26, 1992, Ser. No. 841,272
Claims priority, application Japan, Dec. 25, 1989, 1-148837[U]
Int. Cl.[5] F16J *15/16*
U.S. Cl. 277—92 1 Claim



1. A mechanical seal apparatus for a slurry pump comprising:
a rotatable shaft;
a non-rotating sealing ring disposed about said shaft;
a non-rotating annular flange disposed about said shaft and said non-rotating sealing ring;
a first annular elastic packing member positioned in sealing relationship between said non-rotating flange and said sealing ring;
a rotatable sealing ring axially spaced from said non-rotating sealing ring along the axis of said rotatable shaft and disposed about said shaft;
an annular sleeve in sealing relationship with said shaft;
a seal cover fixed to and extending laterally from said annular sleeve;
a second annular elastic packing member positioned in sealing relationship between said seal cover and said rotatable sealing ring;
an annular skirt member attached to one end to said rotatable sealing ring, with said annular skirt member being spaced from but coextensive with said annular elastic packing member, and the outer extend of said annular skirt terminating adjacent to and spaced from said seal cover;
said non-rotating and rotatable sealing rings having opposed sealing surfaces generally perpendicular to the axis of said shaft and in contact with each other to form a seal therebetween;
wherein portions of said non-rotating flange, annular sleeve, rotatable and non-rotating seal rings, and seal cover which are exposed to fluid slurry being pumped being covered by a coating of synthetic rubber.

that the filling comprises a plurality of adjacent turns of flat

ing recesses which provide a profile that corresponds to

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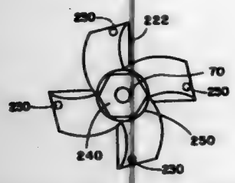
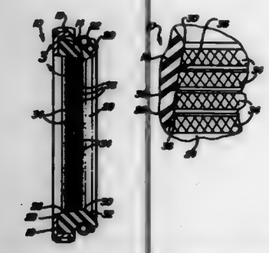
5,195,756
LIVE-LOAD DEVICE
William J. Wachter, Wexford, Pa., assignor to Electric Power Research Institute, Palo Alto, Calif.
Filed May 20, 1991, Ser. No. 703,009
Int. Cl.[5] F16J *15/18*; F16F *1/34, 1/20*; F16B *43/00*
U.S. Cl. 277—106 43 Claims



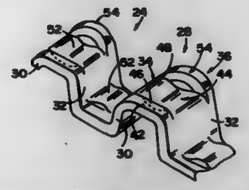
1. A spring device for maintaining a compressive load, comprising:
at least one spring-washer having a central hub defined by a central aperture for retaining said washer on a stud, and a plurality of integral resilient blades equally spaced around a periphery of said central hub and extending radially therefrom, said blades having a uniform length and curvature from a plane of said hub, and each blade having a curved leading edge defining an involute in the plane of said hub, whereby said blades impart a spring force to a surface brought into compressive contact therewith.

5,195,757
PATTERNED TEXTURED SEAL
Hans H. Dahl, V, Danbury, N.H., assignor to Freudenberg-NOK General Partnership, Plymouth, Mich.
Filed Jun. 10, 1991, Ser. No. 713,414
Int. Cl.[5] T16J *15/32*
U.S. Cl. 277—134 19 Claims



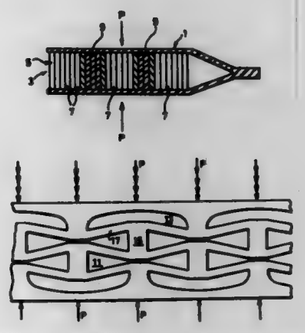
1. A seal adapted to be disposed about a cylindrical shaft, comprising:
a body portion including means forming an aperture extending axially therethrough;
said body portion including an axially extending frustoconical lip surface defining said aperture;
means forming a textured pattern on said lip surface; and
means extending along said lip surface for retaining lubricant between said lip surface and the cylindrical shaft, wherein said textured pattern means comprises a plurality of bands having a textured pattern and axially spaced and extending circumferentially about said lip surface.

5,195,758
THREE-PIECE OIL CONTROL RING ASSEMBLY
Parker K. Erway, Battle Creek, Mich., assignor to Hastings Manufacturing Company, Hastings, Mich.
Filed Nov. 19, 1991, Ser. No. 794,571
Int. Cl.[5] F16J *9/06*
U.S. Cl. 277—140 22 Claims



1. A spacer-expander for use with a pair of rails in a multi-piece oil control ring assembly, said spacer-expander comprising:
an annular member defining a plurality of alternating corrugations spaced around its periphery, said corrugations each defining:
a pad;
a pair of legs joined to radially extending edges of said pad; and
a raised lug joined to said legs and extending along the inner circumference of said member, said lug defining a rail contact surface, said legs extending at an angle "a" from vertical within the range of 0° to 13° and said pad having a stepped configuration in cross section and including a pair of radially spaced, circumferentially extending slits, an opening along one of the slits at the lug and below the lug contact surface for oil drainage and a central depression, said lug having a generally rectangular shape in front elevation and wherein the ratio of pitch between adjacent corrugations to the length of the contact surface of each lug is less than 2.70, and wherein said contact surface of said lug extends at an angle "b" from vertical, said angle "b" being in the range of zero to twenty degrees.

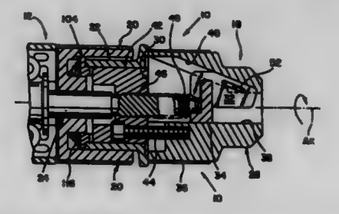
5,195,759
STATIC SEAL
Terence P. Nicholson, Hexham, Great Britain, assignor to Specialist Sealing Ltd., Jersey, Channel Islands
Filed Aug. 6, 1991, Ser. No. 740,848
Claims priority, application United Kingdom, Aug. 6, 1990, 9017173
Int. Cl.[5] F16J *15/06*
U.S. Cl. 277—215 12 Claims



1. A static seal comprising: an envelope having opposed sealing faces, and a filling within the envelope; characterized in

that the filling comprises a plurality of adjacent turns of flat strip material, arranged in face to face contact with the width direction of the strip extending generally perpendicular to said sealing faces, the strip material being made of resilient material and having apertures extending through its thickness, distributed along the strip length, whereby the strip material is resilient in the direction of its width, and the adjacent turns of strip material are so arranged that they can slide and deform individually relative to one another, in the plane of the strip material.

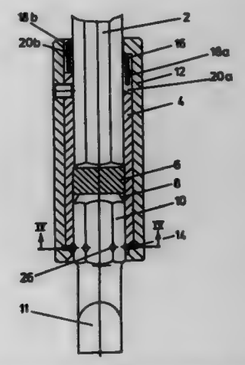
5,195,760
KEYLESS CHUCK
Dale K. Wheeler, Fallston, Md., and Charles W. Coleman, Cassville, Pa., assignors to Black & Decker Inc., Newark, Del.
Filed Jun. 12, 1990, Ser. No. 537,038
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] B23B *31/16*
U.S. Cl. 279—60 53 Claims



1. A chuck comprising:
a jaw housing having a forwardly disposed opening to receive a bit, a central guideway, a plurality of jaw guideways and a longitudinal axis;
a plurality of jaws slidably mounted in the respective jaw guideways between a rearward opened and a forward closed position;
a carrier engaged with the jaws and slidably mounted in the central guideway for maintaining each jaw in the same relative axial location;
a nut fixed to said housing and having a threaded opening coaxial of the longitudinal axis;
a threaded spindle (a) engaged in the nut opening, (b) movable forwardly toward the carrier (1) to engage and fix the carrier and jaws in an axial location and (2) to apply clamping force to the jaws and (c) movable rearwardly away from the carrier (1) to disengage the carrier and (2) to remove the clamping force; and
biasing means for biasing the jaws and the carrier forwardly to the closed position both when the spindle is engaged with the carrier and when the spindle is disengaged from the carrier.

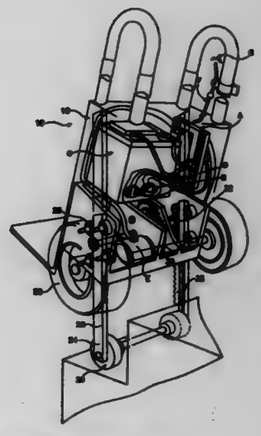
5,195,761
CHUCK FOR TOOL INSERTS, ESPECIALLY SCREWDRIVER BITS
Wilfried Elsner, Schonach, Fed. Rep. of Germany, assignor to Willi Hahn GmbH & Co., KG, Schonach, Fed. Rep. of Germany
Filed Nov. 25, 1991, Ser. No. 795,879
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1990, 9014997[U]
Int. Cl.[5] B25B *23/00*
U.S. Cl. 279—90 4 Claims

1. A chuck for a tool insert having a non-circular shaft comprising:
a body having a non-circular cavity having a profile,
a capping sleeve rotatable on said body, and extending beyond one end of said body,
a locking plate within a non-rotatably attached to said capping sleeve beyond said one end of said body, said locking plate having a central circular hole and outwardly extending recesses which provide a profile that corresponds to the profile of said non-circular cavity,
means for urging said capping sleeve to a position in which said profiles are not in registry,
means for limiting rotation of said capping sleeve between positions of in registry and out of registry of said profiles comprising a pin in one of the body and capping sleeve and a slot in the other of the body and capping sleeve receiving said pin therein, said slot being inclined relative



to a plane perpendicular to the capping sleeve and comprising means for moving said capping sleeve axially to extend further beyond the said end of said body as said capping sleeve and body are relatively moved to the said position of registry,
whereby said capping sleeve may be rotated to selectively position said profile of said locking plate in or out of registry with said profile of said cavity and to axially move a tool in said cavity engaged by said locking plate.

5,195,762
HAND TRUCK LIFT
William B. S. Prouty, 112 Cashmere Ct., Greer, S.C. 29650
Filed Jul. 11, 1991, Ser. No. 728,616
Int. Cl.[5] B62B *5/02*
U.S. Cl. 280—5.28 10 Claims



1. A hand truck lift comprising:
a frame formed of spaced elongated bars;

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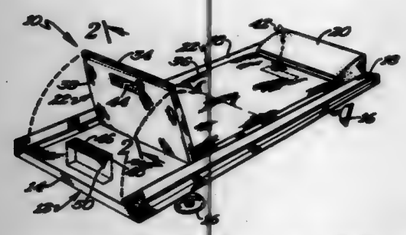
a base portion between said spaced elongated bars;
a pair of spaced wheels mounted to said base portion;
an elevating assembly attached to said base portion in a vertically moveable position by a plurality of guide bearings which fixedly hold said elevating assembly at an angle within said base portion such that said elevating assembly is substantially vertical when said hand truck lift is leaned in a rearward direction;
a pair of rollers positioned on an end of said elevating assembly said elevating assembly being extendable downwardly while said hand truck lift is in a rearwardly tilted position, thereby causing said hand truck lift to elevate, being supported on said rollers of said elevating assembly; and
means for moving said elevating assembly downwardly with respect to said frame.

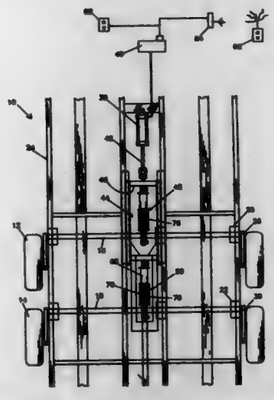
5,195,763
CREEPER CUSHION
Walter B. Scott, Superior, and David Salanda, Burlington, both of Wis., assignors to Walter B. Scott, Superior, Wis.
Continuation of Ser. No. 264,995, Oct. 31, 1988, abandoned. This application Oct. 19, 1990, Ser. No. 601,030
Int. Cl.[5] B25H *5/00*
U.S. Cl. 280—32.6 **20 Claims**



1. For use with a creeper including a rigid platform having a top end, a bottom end, and first and second sides around a top surface, with the mechanic lying on the top surface of the platform, the improvement comprising a cushion of a size generally equal to and complementary to the platform of the creeper, with the cushion including an upper surface and a lower surface, with the mechanic lying on the upper surface of the cushion and the lower surface being on the opposite side of the cushion than the upper surface; and means for releasably securing the lower surface of the cushion directly to the top surface of the platform without the use of tools or modification to the platform of the creeper, with the cushion being intermediate the mechanic and the platform when the mechanic is lying upon the creeper and with the releasably securing means being free of projections which would detract from the comfort to the mechanic lying on the creeper and upon the cushion.

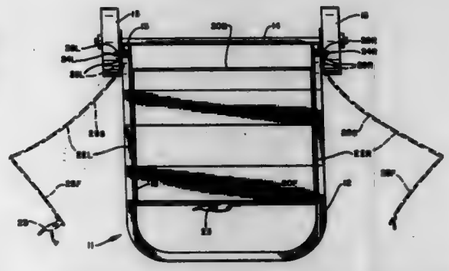
5,195,764
SPRING LOADED RETRACTABLE WHEEL TRAILER
Ray G. Schantz, 105 N. Duncan, and Michael A. Schantz, 109 S. Duncan, both of Marine, Ill. 62061
Filed Oct. 21, 1991, Ser. No. 779,953
Int. Cl.[5] B60P *1/18*
U.S. Cl. 280—43.23 **14 Claims**

9. A retractable wheel trailer comprising a trailer bed, a bell crank axle journalled to the bed, said bell crank axle having a pair of wheel supporting arms keyed to said axle at an angle to an axle operating arm and operating means connected to an axle operating arm for pivotally moving said axle operating arm about an axis of said axle to effect raising and lowering of the trailer bed, said operating means comprising a hydraulic cylinder having a reciprocable piston connected to an operating train connected to said axle operating arm, support means pivotally connecting said operating train to said piston, said support means comprising means for limiting it to axial movement with said piston, said operating train comprising an operating rod consisting of a telescopic rod member having a heavy duty helical spring connected coaxially with said telescopic



rod and adapted to bear against opposed stop elements on telescopic inner and outer elements comprising said telescopic rod member, said operating rod serving to transmit force to said operating arm to raise and lower said trailer bed and absorb shock.

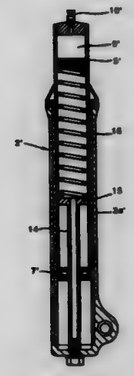
5,195,765
PAPER SACK HOLDING DOLLY WITH TOP ENTRY GUIDE AND BAG TOP TO GUIDE SHANK HOLDING STRAP
Harvey W. Lacey, Jr., 2925 Monarch, Plano, Tex. 75074
Filed Oct. 18, 1991, Ser. No. 779,044
Int. Cl.[5] B62B *1/06*
U.S. Cl. 280—47.26 **12 Claims**



1. A bag holding dolly comprising: a bag carrying dolly having a bottom platform supporting the bottom of a paper bag carried thereby; an upright frame extended upwardly from the rear of said bottom platform and having two opposite sides: a top entry guide mounted on said upright frame and extended forwardly from the top of said upright frame in vertical alignment with said bottom platform; said top entry guide including a four rectangular sided bottom shank sized to fit within the top of a bag carried by said dolly; and a bag top retainer strap having opposite ends fastened to said opposite sides of the top of said upright frame and with the bag top retainer strap having two opposite side portions interconnected by a latch tightening the bag top against the opposite sides and the front of the four rectangular sided bottom shank of said top entry guide; and wherein said bag top retainer strap opposite side portions each

have an inwardly directed resiliently deflectable convex bend toward said top entry guide bottom shank; and front engaging sections of said bag top retainer strap opposite side portions each have an inwardly directed resiliently deflectable convex bend toward said top entry guide bottom shank when moved to a latch engaging state.

5,195,766
BICYCLE WITH FRONT FORK SUSPENSION
Wolfgang Dohrmann, Eitorf, and Alfred Schiefen, Windeck, both of Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany
Filed May 30, 1991, Ser. No. 707,561
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1990, 4017924
Int. Cl.[5] B62K *25/08, 25/06*
U.S. Cl. 280—276 **2 Claims**

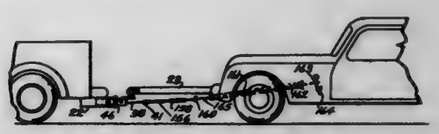


2. A fork for fastening a wheel to a bicycle, said fork comprising:
a fork member for being disposed on each side of a front wheel of a bicycle;
each of said fork members having shock absorbing means;
each of said shock absorbing means comprising:
a first cylinder and a second cylinder, said second cylinder being telescopically slideable into said first cylinder;
damping means disposed in said second cylinder for damping oscillation of said shock absorbing means, said damping means comprising a piston;
damping fluid disposed in said first cylinder; and
biasing means for absorbing movement between said first cylinder and said second cylinder, said biasing means being disposed in said second cylinder;
wherein said second cylinder has a first end and a second end, said second end being disposed opposite to said first end, said damping means being disposed in said first end of said second cylinder, said second end of said second cylinder being connected to said connecting means;
wherein said biasing means comprises a coil spring;
wherein said coil spring is braced against a contact surface;
wherein said damping means is disposed in said first end of said second cylinder, said damping means being traversed by a hollow piston rod, said hollow piston rod having a first side and a second side, said first side being fastened to said contact surface, said second side being connected to said first cylinder;
wherein said second cylinder further comprises a base member, said base member being sealed in said second cylinder by a sealing ring disposed around said base member, said coil spring being braced against said base member, said base member and said second cylinder limit a chamber, said chamber being filled with fluid, said fluid being gas, said second cylinder further comprising valve means, said valve means for pressurizing said fluid in said chamber, said base member being a piston; and
wherein said first cylinder is disposed in a housing, said housing having a fastening lug for fastening a bicycle wheel to said housing, said housing further comprising at least one of fastening ring, a gasket, and a wipe ring.

5,195,767
TELESCOPING, EXTENDING GUIDE RAILS FOR USE WITH BOAT TRAILERS
Ronald J. Des Rochez, 1007 8th St. SE., Minot, N. Dak. 58701
Filed May 3, 1990, Ser. No. 518,183
Int. Cl.[5] B60P *3/10*
U.S. Cl. 280—414.1 **23 Claims**

1. A boat trailer, comprising:
a boat support chassis having a frame, including means for releasably attaching the boat trailer to a towing vehicle and at least one pair of opposed trailer support wheels;
a first guide rail assembly and a second guide rail assembly;
said first guide rail assembly and said second guide rail assembly each include a transverse support assembly, an upright support assembly and a longitudinal guide assembly;
said transverse support assembly includes a first attachment assembly fixed to said frame of said boat support chassis and a second attachment assembly fixed to said frame of said boat support chassis; and
said first and second guide rail assemblies are selectively moveable relative to said chassis.

5,195,768
TOWING HITCH BALL MOUNT FOR AUTOMATICALLY ACTIVATING TOWED VEHICLE BRAKES
William A. Hendrix, 326 N. Bowen Rd., #101, Arlington, Tex. 76012
Filed Nov. 25, 1991, Ser. No. 797,304
Int. Cl.[5] B60T *13/08*
U.S. Cl. 280—428 **25 Claims**



1. A towing hitch ball mount adapted for telescopic use with a towing hitch ball mount receiver attached to a towing vehicle and for automatically controlling brakes of a towed vehicle, said ball mount comprising:
first and second opposed, substantially parallel elements, said elements respectively defining first and second opposed, elongated openings;
means in operative relationship with said first and second elements for connecting a hitch ball element to said first and second elements;
pulley means mounted between said first and second ele-

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ments in operative relationship with said first and second openings and with said ball mount receiver for predetermined movement when said ball mount telescopically moves with respect to said ball mount receiver;

a flexible line adapted to be removably connected to a brake system of a towed vehicle and in operative relationship with said pulley means for enabling control of said towed vehicle's brake system as said ball mount and said ball mount receiver move telescopically with respect to each other; and

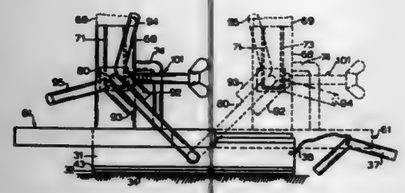
shock absorbing means in operative relationship with said pulley means and with said first and second elements for moderating movement of said pulley means.

5,195,769

SLIDING JACK SUPPORT

Thomas M. Williams, Jr., 2310 Old Oxford Hwy., Durham, N.C. 27704

Filed Aug. 30, 1991, Ser. No. 752,828
Int. Cl.[5] B60D *3/00*
U.S. Cl. 280—478.1 12 Claims



1. A sliding jack post support assembly for use with a trailer having a tongue and a trailer jack on the tongue fitted with a vertically adjustable jack post having a lower end and adapted when engaged with the jack post lower end to support and adjust the trailer tongue with respect to a towing vehicle, said sliding jack post support assembly comprising:

(a) a base support member having a ground engaging support portion and a first elevated flat horizontal rectangular wall;

(b) an upper support member having a second elevated flat horizontal rectangular wall positioned for being supported by and for moving longitudinally of said first wall in a plane parallel thereto, a socket member opening upwardly of said second wall with a base portion supported on said second wall and dimensioned to receive and support the lower end of a trailer tongue jack post forming part of a trailer, and means for limiting widthwise movement of said second wall on said first wall;

(c) friction reducing means interposed between said first and second walls providing a low friction sliding support for said second wall on said first wall;

(d) lever means mounted on said base support member adapted for engaging a selected portion of said upper support member and by lever action forcing limited longitudinal sliding movement of said second wall on said first wall to thereby force corresponding limited longitudinal sliding movement of said jack post when mounted in said socket member; and

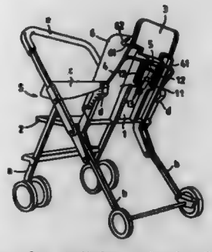
(e) wherein said lever means comprises a lever member having a first portion mounted for pivoting on said base support member, a second integral portion located on one side of and above said base support member and adapted to releasably receive a handle member providing leverage for operating said lever member and a third integral portion extending from said second portion and adapted to slidably engage a selected portion of said socket member.

5,195,770

RECLINING MECHANISM FOR BABY CARRIAGE

Takashi Ishikura, Tokyo, Japan, assignor to Combi Corporation, Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 758,974
Claims priority, application Japan, Sep. 20, 1990, 2-98122[U]
Int. Cl.[5] B62B *7/12*
U.S. Cl. 280—648 11 Claims



1. A mechanism for reclining a back of a baby carriage including a seat upon which said baby sits and to which said back is pivotally attached, said mechanism comprising:

an engagement member disposed on a rear of said back and having a plurality of notches arranged vertically with respect to one another;

a substantially U-shaped rod extending across the rear of said back, said support rod being pivotable up and down with respect to said back wherein said support rod is pivotally coupled at both the ends thereof to sides of said carriage;

a stopper rotatably attached to said support rod, said stopper further including an engagement rod attached thereto which is engageable with said notches of said engagement member, said engagement rod being movable up and down along said back in correspondence with the pivotable movement of said support rod when said stopper is rotated wherein said back is supported at a selected position by engaging said engagement rod in one of said notches;

a head protection plate pivotally coupled to said back at a top thereof so that said head protection plate can be pivoted up and down; and

head plate pivot means for causing said head protection plate to pivot up and down in response to up and down pivotal movement of said back.

5,195,771

DEVICE FOR OBTAINING AN AXLE-LOAD SIGNAL FROM A DRIVE AXLE OF A LIFTING AXLE STRUCTURE

Horst Eckert, Alte Poststrasse 15, D-3056 Rehburg-Loccum 3, Fed. Rep. of Germany

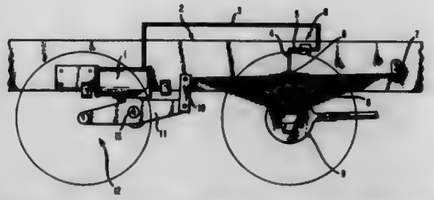
Continuation of Ser. No. 540,376, Jun. 19, 1990, abandoned.
This application Oct. 18, 1991, Ser. No. 780,279
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1989, 3920288
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—704 10 Claims

1. An apparatus for obtaining an axle-load signal derived from a mechanically spring-supported drive axle of a lifting axle structure aggregate comprising said drive axle and a lifting axle supported by at least one pressure-means element, said lifting axle being disengageable by application of a pressure of at least a level of a disengagement pressure to said at least one pressure means element, comprising

(a) a signal body which is rotatable, depending on a path of a first point of the drive axle relative to a vehicle chassis, around a rotation axis fixedly disposed at the vehicle chassis;

(b) a jacket face of the signal body exhibits at least one

contour, which assumes for each rotation angle position of the signal body a predetermined distance from a second point of the vehicle chassis, said perdetermined distance being substantially disposed perpendicular to the rotation axis;



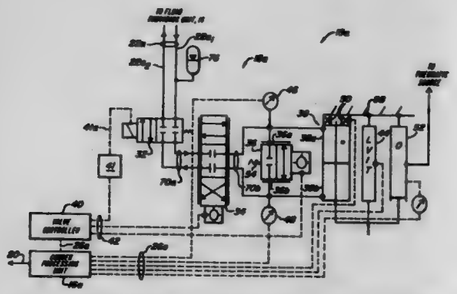
(c) a tappet, capturing the predetermined distance and wherein said tappet is shiftably guided in tappet axial direction on the vehicle chassis, wherein a cylinder unit, fed by the pressure of the pressure-means element, is disposed in the tappet.

5,195,772

VALVE CONFIGURATION FOR CONVERTING AN ACTIVE SUSPENSION SYSTEM INTO A PASSIVE SUSPENSION SYSTEM

Benjamin I. Bachrach, Dearborn; Joel A. Levitt, Ann Arbor, and John E. Nametz, Ypsilanti, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 18, 1991, Ser. No. 717,295
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 4 Claims



1. A vehicle suspension system having active and passive modes comprising, in combination,

a pump for producing pressurized fluid,

a cylinder supporting a moveable piston and defining first and second chambers on opposing sides of said piston,

a fluid supply conduit for supplying pressurized fluid from said pump to said cylinder,

an electrically controllable protection valve coupled between said cylinder and said supply conduit, said protection valve being positionable in a first state for coupling said conduit to said cylinder and in a second state for preventing fluid flow between said cylinder and said conduit,

an electrically controllable by-pass valve connected in fluid flow relation between said first and said second chambers of said cylinder, said by-pass valve providing a controllable resistance to fluid flow between said chambers,

an electrically controlled servo valve connected in fluid flow relation between said protection valve and said cylinder for controlling the relative pressure applied to said first and chambers,

a plurality of condition-responsive sensors, and

a processor responsive to said sensors for generating electrical control signals which are applied to said protection valve, said by-pass valve and said servo valve to establish said active and said passive modes,

said control signals in said active mode positioning said protection valve in said first state and controlling the level of flow through said servo valve and said by-pass valve in response to conditions detected by said sensors, and

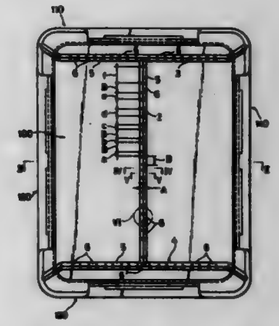
said control signals in said passive mode positioning said protection valve in said second state, and placing said by-pass valve and said servo valve in predetermined states.

5,195,773

COVER FOR ACCOMMODATING AN AIR BAG

Masami Sawada; Yuichi Nambu, and Takayasu Zushi, all of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Apr. 15, 1991, Ser. No. 684,849
Claims priority, application Japan, May 24, 1990, 2-134683
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—728 7 Claims



1. A cover for accommodating an air bag, comprising:

a main plate having an inner surface facing the air bag and side portions,

a plurality of erected pieces extending from the side portions of the main plate, and

a tear line formed at least in the main plate for tearing the cover, said tear line including a plurality of concave holes depressed inwardly from the inner surface of the main plate and extending along the tear line, each concave hole having a bottom, side walls and two ends along longitudinal direction of the tear line, each end having an acute angle defined by convergence of the side walls so that the ends with acute angles of the holes disposed adjacent to each other face against each other, distances between the concave holes situated adjacent to each other being changed so that the distance in a middle of the main plate is smaller than the distance in edge portions of the main plate to thereby allow the cover to be easily opened along the tear line upon inflation of the air bag.

5,195,774

AIR BAG ATTACHING STRUCTURE

Kazuo Morita, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Nov. 7, 1991, Ser. No. 788,769
Claims priority, application Japan, Nov. 30, 1990, 2-334589; Nov. 30, 1990, 2-334590
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—731 14 Claims

1. An air bag attaching structure of an air bag device comprising:

a retainer having an inflator attaching opening with a marginal portion,

5,195,777

vehicle and a means for attaching said lower edge of the

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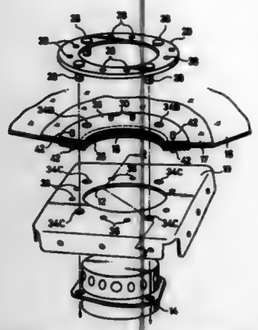
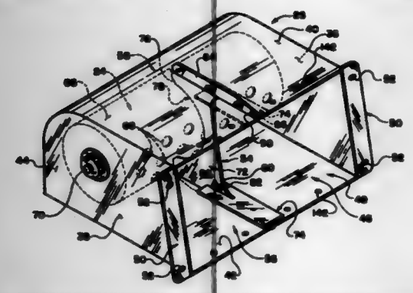
an air bag secured to the retainer, said air bag having a gas introducing opening, a marginal portion of the opening, and a plurality of through holes formed in the marginal portion, said marginal portion of the air bag being aligned with and secured to the marginal portion of the inflator attaching opening of the retainer, and



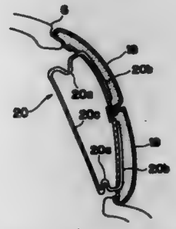
synthetic resin sheets disposed on both faces of the marginal portion of the gas introducing opening of said air bag so that the synthetic resin sheets on both faces are secured to the marginal portion of the air bag by a synthetic resin filling the through holes formed in the marginal portion of the air bag.

5,195,775
VEHICLE AIR BAG MODULE AND METHOD OF ASSEMBLY
Anthony J. Komenska, Sterling Hts.; Mark T. Leznar, Dearborn Hts.; John P. Wallner, Rochester Hills, and Richard E. Shellabarger, Sterling Heights, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Continuation of Ser. No. 629,427, Dec. 17, 1990, Pat. No. 5,096,222. This application Mar. 16, 1992, Ser. No. 851,807
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 8 Claims



1. Apparatus for use in forming an air bag assembly comprising a receptacle, an air bag a continuous frame, and fastening elements;
said receptacle having walls defining an internal cavity in which said air bag is disposed in a folded form and a front opening through which said air bag is deployed;
at least some of said wall of said receptacle having a series of holes adjacent said front opening;
said air bag having a mouth which forms a gas inlet opening;
said continuous frame being incorporated into said mouth of said air bag and securing said mouth of said air bag to said receptacle;
said continuous frame being disposed inside said front opening within said internal cavity and including a series of holes aligned with said series of holes in said walls of said receptacle; and
said fastening elements extending through said series of holes in said walls of said receptacle and through said series of holes in said continuous frame to connect said continuous frame to said walls in a force transmitting relationship.

5,195,776
AIR BAG INSTALLATION
Masafumi Sakakida; Haruhiro Inada, both of Hiroshima, and Hisao Muramoto, Yamaguchi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 26, 1991, Ser. No. 675,523
Claims priority, application Japan, Mar. 27, 1990, 2-75518; Mar. 28, 1990, 2-81732; Dec. 17, 1990, 2-411048
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 11 Claims

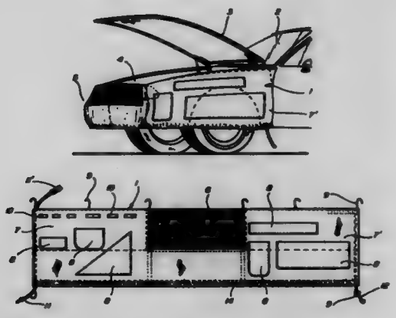


1. An installation for providing air bag protection for a passenger side of a motor vehicle, said installation comprising:
an instrument panel having therein an opening directed toward the passenger side, said instrument panel including an upper portion and a lower portion, said upper portion having a rearwardly facing end defining an upper edge of said opening, and said lower portion extending rearwardly and downwardly from a forwardly facing end thereof defining a lower edge of said opening;
an upper lid and a lower lid mounted in a position to close said opening in a normal condition, said upper and lower lids having respective confronting lower and upper ends, said upper lid having an upper, forwardly facing end confronting an edge of said rearwardly facing end of said upper portion of said instrument panel, and said lower lid having a downwardly directed lower end having an edge confronting an edge of said forwardly facing end of said lower portion of said instrument panel;
an air bag unit mounted forwardly of said opening in said instrument panel and including an air bag operable, upon the occurrence of a shock imparted to the motor vehicle, to be inflated to expand rearwardly through said opening and to move said upper and lower lids from said position closing said opening; and
at least one mounting member connected to a body member of the motor vehicle and connected to said upper and lower lids to mount said upper and lower lids in said position closing said opening, said mounting member having respective bent portions that are plastically deformable to cause, upon inflation of said air bag, said upper and lower lids to move rearwardly away from said opening and to pivot respectively upwardly and downwardly about respective fulcrums without interference with said upper and lower portions, respectively, of said instrument panel.

5,195,777
AIR BAG INFLATOR
Jess A. Cuevas, Scottsdale, Ariz., assignor to TRW Inc., Lyndhurst, Ohio
Filed Feb. 18, 1992, Ser. No. 837,334
Int. Cl.[5] B60R *21/26*
U.S. Cl. 280—736 7 Claims

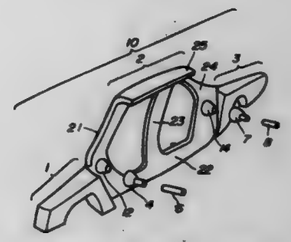
1. Apparatus for inflating a vehicle occupant restraint, comprising:
a gas source,
means for defining a gas outlet opening in said gas source to allow flow of gas from said gas source into the vehicle occupant restraint to inflate the vehicle occupant restraint, and
valve means for controlling flow of gas through said gas outlet opening,
said valve means comprising a piston slidably received in a cylinder, said piston having a first surface against which said gas acts upon actuation of said apparatus to move said piston in a first direction to allow increased flow of gas through said gas outlet opening,
said valve means including a crushable honeycomb disposed in the path of movement of said piston for controlling movement of said piston in said cylinder.

5,195,778
CAR UTILITY APRON
Keith T. Dismuke, 1513 Pearl St., Eldorado, Ill. 62930
Filed Jun. 24, 1991, Ser. No. 719,480
Int. Cl.[5] B60R *11/06*
U.S. Cl. 280—770 5 Claims



1. A utility apron for a vehicle, comprising:
an essentially rectangular flexible cover having two sides, upper and lower edges, a first left section, a center section and a second right section;
a plurality of tool-receiving pockets spaced on one side of said cover;
an air hose connector located in the first left section and an electrical connector located in the second right section wherein said connectors are adapted to allow air pressure and electrical current to be connected through said cover;
a means for attaching said upper edge of the cover to the vehicle and a means for attaching said lower edge of the cover to the vehicle.

5,195,779
MOTOR VEHICLE BODY STRUCTURE EMPLOYING SANDWICHED STRUCTURAL BODY
Tadatoshi Aoyama; Suguru Yoshida; Masanori Suganuma, and Takashi Chirifu, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 446,429, Dec. 5, 1989, Pat. No. 5,060,975. This application Apr. 19, 1991, Ser. No. 688,636
Claims priority, application Japan, Apr. 20, 1990, 2-42209[U]; Apr. 25, 1990, 2-44404[U]
Int. Cl.[5] B62D *21/15*
U.S. Cl. 280—784 20 Claims



1. A motor vehicle body structure comprising:
a pair of side frames each comprising a core layer having opposite surfaces and a pair of outer skin layers covering said opposite surfaces;
a motor vehicle component; and
joint means connected between said side frames and said motor vehicle component, for joining said motor vehicle component to said side frames through surface-to-surface contact therebetween, said joint means having surfaces joined in overlapping relation to surfaces of said side frames.

5,195,780
REAR BODY STRUCTURE OF AUTOMOTIVE VEHICLE
Michitaka Inoue; Kazuo Ikeda, both of Hiroshima; Wataru Tsutagawa, Higashihiroshima; Yoshio Oda, Kure, and Shoji Nobumoto, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 24, 1990, Ser. No. 630,974
Claims priority, application Japan, Dec. 25, 1989, 1-149948; Nov. 13, 1990, 2-119076
Int. Cl.[5] B60P *3/22*
U.S. Cl. 280—834 25 Claims

1. A rear body structure of a vehicle including at least a passenger room and a trunk room, comprising:
a pair of rear side frames separately located in a transverse direction of the vehicle and extending in a lengthwise direction, from front to back, of the vehicle;
cooperating means for cooperating with said pair of rear side frames to form a fuel tank chamber with a bottom opening open in an underside of the vehicle;
a fuel tank installed in said fuel tank chamber;
rigid means, extending across over said bottom opening in said lengthwise direction and secured to said cooperating means, for supporting said fuel tank from an underside of said fuel tank; and
a pair of cross beams extending in a transverse direction of the vehicle between said pair of rear side frames and located separately on both sides of said bottom opening in said lengthwise direction, to which said rigid means is secured, wherein said rigid means comprises support

surfaces thereof which, when said strip is so wrapped, is

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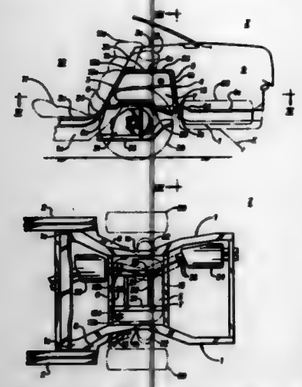
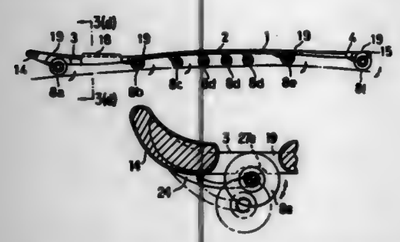
beams, each extending in said lengthwise direction and connected to said pair of cross beam, and connecting



beams, each extending in said transverse direction and connected to said support beams.

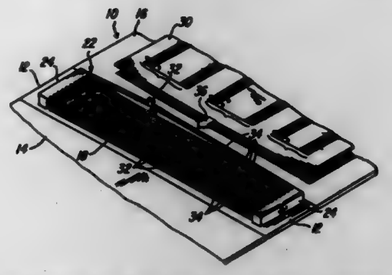
5,195,781
GRASS SKI ROLLER BOARDS
Kazuo Ozawa, No. 3-4, 3-Chome, Miyazaichi, Fuchu-shi, Tokyo, Japan
Division of Ser. No. 499,685, Mar. 27, 1990, Pat. No. 5,096,225.
This application Dec. 16, 1991, Ser. No. 807,508
Claims priority, application Japan, Mar. 28, 1989, 1-77323; Mar. 28, 1989, 1-77324; Apr. 28, 1989, 1-50697; May 25, 1989, 1-61635
Int. Cl.[5] A63C *5/06, 17/02*
U.S. Cl. 280—842 3 Claims



1. A grass ski comprising an elongate footboard having a forward portion, a central portion and a rear portion, the central portion being arched lengthwise in elevational view, and a plurality of roller pairs interconnected with and extending beneath the footboard in spaced relation lengthwise of the footboard including at least one roller pair on the forward portion, at least three roller pairs on the central portion and at least one roller pair on the rear portion, wherein said roller pair on the forward portion is mounted on a T-shaped bracket having a base attached to the board, and a resilient arm extending downwardly and rearwardly from the base, said roller pair being mounted on the arm and the footboard has a recess containing a striker pad for limiting upward movement of the arm upon engagement of the arm with the striker pad within the recess.

2. A grass ski comprising an elongate footboard having a forward portion, a central portion and a rear portion, the central portion being arched lengthwise in elevational view, and a plurality of roller pairs interconnected with and extending beneath the footboard in spaced relation lengthwise of the footboard including at least one roller pair on the forward portion, at least three roller pairs on the central portion and at least one roller pair on the rear portion, wherein the forward portion of the board is provided with a guard connected thereto comprising a first portion extending upwardly from each respective side edge of the footboard and a second portion inclined downwardly from an upper end of the first portion towards a longitudinal center line or an upper surface of the footboard.

5,195,782
SHEET MUSIC BINDER
Karl S. Schroeder, 6822 Salem Ave., Clayton, Ohio 45315
Filed Nov. 15, 1991, Ser. No. 792,388
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—48 19 Claims



1. In a binder for sheet music comprising a narrow, elongated back panel having inner and outer faces, first and second side edges, and first and second ends, and said binder comprising front and rear panels hinged to said side edges of said back panel to form a folder:

a first band holder on said inner face of said back panel adjacent said first end thereof, said first band holder having end portions directed outwardly toward said first end of said back panel;

a second band holder on said inner face of said back panel adjacent said second end thereof, said second band holder having ends directed outwardly toward said second end of said back panel;

a unitary, elongated elastomeric and comprising an array of parallel, sheet music-receiving stretchable strands which extend essentially the length of said band;

said band further having portions at each end thereof which portions are hookable over the outwardly directed end portions of said band holders; and

the length of said band between the hookable end portions being less than the distance between said ends of said band holders whereby the band must be stretched lengthwise for hooking over the band holders, and said band being relatively taut after being so hooked over said band holders while individual strands can be readily stretched out of lateral alignment with other of said strands so as to enable sheet music to be inserted edgewise beneath or withdrawn from under each said individual strand.

5,195,783
IDENTIFICATION DEVICES
Matthew J. Lavoie, 225 Rte. 16B, Somersworth, N.H. 03878
Filed Feb. 19, 1992, Ser. No. 836,732
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—75 20 Claims

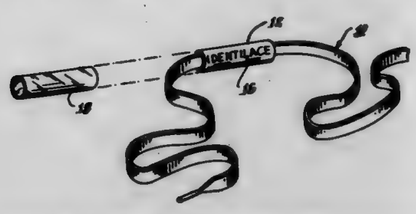
1. An information device comprising

a flexible strip of material which has oppositely oriented outer surfaces and is adapted for

being retentively wrapped about an elongated article of wearing apparel, and

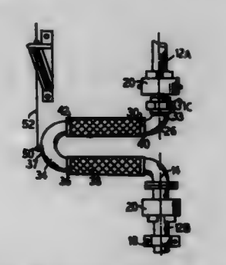
bearing information of desired content on one of said surfaces thereof which, when said strip is so wrapped, is concealed from view,

means for displaying information of desired content that is exposed to view after said strip has been so wrapped, and



means for retaining said strip wrapped around an article of wearing apparel.

5,195,784
METHOD AND MEANS FOR ABSORBING MOVEMENT IN PIPELINES
James R. Richter, 848 W. Wisconsin St., Chicago, Ill. 60614
Filed Aug. 13, 1990, Ser. No. 565,933
Int. Cl.[5] F16L *51/00*
U.S. Cl. 285—61 6 Claims



3. An expansion loop system for use with a pipe extending along a longitudinal axis and divided along its length to form a pair of central open ends, said pipe being subject to movement along said axis, said expansion loop system comprising:

an expansion loop member attached to said pipe at said central open end;

anchor means for supporting said pipe comprising at least one support member being in engagement with said pipe on one side of said expansion loop member;

pipe guide means for surrounding said pipe comprising at least one guide member with a central opening receiving said pipe through said central opening, said guide member positioned between a support member and said expansion loop member for guiding said pipe along said longitudinal axis;

said expansion loop member comprising:

a pair of elbow connectors each having a first connector end configured to mate with one of said central open ends of said divided pipe and a 90° bend between said connector end and an opposite second end,

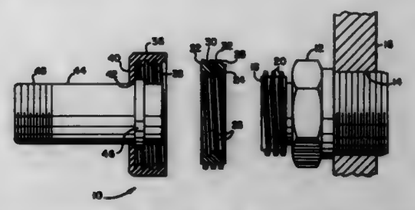
a return member having a pair of open ends separated by a 180° bend, and a support connection formed thereon at an apex thereof for engagement by a hanger rod to permit movement of said return member in a direction perpendicular to said axis,

a pair of flexible tube members each having one end connected to said second end of said elbow connector and a second end connected to one of said ends of said return member;

said flexible tube members each comprising an inner corrugated hose and an outer braided cover, and

said expansion loop member lying in a plane containing said axis.

5,195,785
ADAPTER FOR CUSTOMIZING GAS TANK FILL FITTINGS
Billy L. Jellison, 1160 W. Milton St., Alliance, Ohio 44601
Filed Nov. 18, 1991, Ser. No. 797,447
Int. Cl.[5] F16L *15/08*
U.S. Cl. 285—90 14 Claims



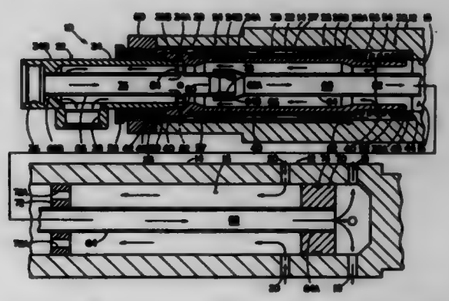
1. In combination with a gas tank fill fitting for attachment into a tank wall, which fitting has an outwardly projecting male threaded nipple for engaging matching female threads on a retaining collar of a fill hose outlet end fitting, to hold said end fitting in operative engagement with the fill fitting, both the male and female threads being a standard size and pitch, the improvement comprising:

(A) a customizing adapter member comprising a substantially annular body having an axially extending threaded hole therethrough with standard acme female internal threads which match the standard male threads on the nipple of the fill fitting to permit the adapter member to be screwed onto the fill fitting;

(B) said adapter member having customized non-standard male threads on its outer circumference to prohibit the connection thereto a filler hose end fitting having a retaining collar with standard acme female threads; and

(C) thread damaging means of harder material than the nipple associated with the adapter and positioned to damage the male threads on the nipple of the fill fitting when the adapter member is forcibly unscrewed therefrom and thereby render the fill fitting unusable for connecting any fill hose fitting thereto.

5,195,786
INTERNALLY-LOCATED DUAL FLOW ROTATING UNION
Richard F. Guardiani, Ohio Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 1, 1991, Ser. No. 649,506
Int. Cl.[5] F16L *39/04*
U.S. Cl. 285—190 25 Claims



1. A rotating union for use in transmitting pressurized fluid form a stationary source into and out of a rotating shaft having an interior wall defining an open axial bore and a pair of infeed

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and return passages axially spaced from one another and communicating with the axial bore, said rotating union comprising:

(a) an elongated stationary hollow tubular housing having axially-displaced inner and outer ends and inlet and outlet ports defined on said outer end thereof, said tubular housing including

(i) an inner hollow housing portion disposable within the axial bore in the shaft end section and having axially-spaced inner and outer ends; and

(ii) an outer hollow housing portion at least partially disposable within the axial bore in the shaft end section and having axially-spaced inner and outer ends, said outer housing portion at said inner end being detachably connected to said inner housing portion at said outer end, said outer housing portion having said inlet and outlet ports defined on said outer end thereof;

(b) bearing means for mounting said stationary tubular housing within the axial bore in the shaft end section to permit rotation of the rotating shaft relative to said stationary housing, said bearing means further mounting said tubular housing in spaced relation to the interior wall of the shaft end section for defining an annular fluid cavity between the interior wall of shaft end section and the exterior of said tubular housing to permit flow of fluid between said outer and inner ends of said tubular housing at the exterior thereof and within said bearing means;

(c) means for sealing said annular fluid cavity at said outer and inner ends of said tubular housing;

(d) an inner hollow tubular pipe disposed in said hollow tubular housing and having axially-displaced inner and outer ends and a central passage extending therebetween, said inner tubular pipe projecting from said inner end of said tubular housing into the axial bore of the shaft end section;

(e) means disposed in the axial bore of the shaft end section between the infeed and return passages of the shaft end section for supporting said inner pipe at said inner end thereof for rotation with the rotating shaft, said supporting means also for permitting flow communication between the infeed passage and the interior of said inner pipe and between the return passage and the exterior of said inner pipe, said supporting further for preventing flow communication between the infeed and return passages through the axial bore of the shaft end section; and

(f) an outer tubular pipe disposed in said hollow tubular housing and having axially-displaced inner and outer ends, said outer pipe having a central channel defined therethrough and being rigidly connected in stationary relationship at its outer end with said outer end of said tubular housing and in flow communication with said inlet port but not with said outlet port thereof, said outer pipe being disposed in flow communication at its central channel with said central passage of said inner pipe for transmitting fluid from said inlet port at said outer end of said tubular housing to the infeed passage of the rotating shaft, said outer and inner pipes being spaced radially inwardly form the interior of said tubular housing to define an annular channel for transmitting fluid to said outlet port at said outer end of said tubular housing from the return passage of the rotating shaft.

5,195,787

QUICK CONNECTOR WITH HEAVY-DUTY RETAINER

Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 465,773, Jan. 16, 1990, abandoned. This application Dec. 7, 1990, Ser. No. 195,787
Int. Cl.[5] F16L *37/00*
U.S. Cl. 285—319 **8 Claims**

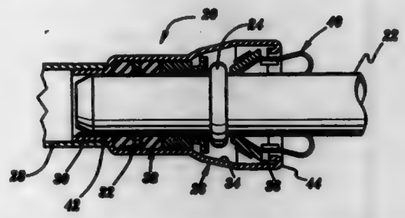
1. A quick connector assembly comprising:

a conduit having a radially outward extending annular bead at a predetermined distance from an end of said conduit;

a housing having an axial bore formed therein for receiving said conduit;

seal means for sealing said conduit with said housing, said seal means positioned in said axial bore of said housing; and

retainer means for retaining said conduit in said housing axial bore, said retainer means positioned in said housing and including first and second retainers, said first retainer maintaining said sealing means in said housing and said second retainer for retaining said conduit in



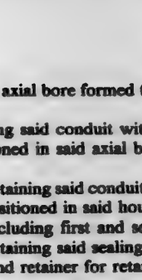
said housing, each of said first and second retainers including a ring means including an axial bore enabling passage of said conduit, a pair of arms extending from said ring means, said second retainer arms each having an overall U-shape with a first leg of each said second retainer arms coupled with said ring means and a second leg of each said second retainer arms including means for abutting said annular bead for retaining said conduit in said housing, and wherein said second leg is generally radially outwardly disposed of said first leg.

5,195,788

INSERT MEMBER FOR USE WITH HOSE CLAMP ARRANGEMENTS

Hans Oetiker, Oberdorfstrasse 21, CH-8812, Horgen, Switzerland

Continuation-in-part of Ser. No. 472,280, Jan. 30, 1990, Pat. No. 5,031,301. This application Feb. 22, 1991, Ser. No. 660,122
Int. Cl.[5] F16L *33/207*
U.S. Cl. 285—252 **32 Claims**



1. An insert member for use in a hose connection to securely fasten a hose onto a nipple provided with an external collar portion integral with the nipple, characterized in that the insert member is of open ring-shape in the circumferential direction constructed asymmetrically with one end thereof bent outwardly and the other end bent inwardly leaving therebetween a main surface portion extending substantially uninterruptedly over its circumferential length, and at least one inwardly extending groove means in said main surface portion of the insert member to assist anchoring of the hose whereby said outwardly and inwardly bent ends at the same time assure proper positioning of the various parts during assembly of the hose connection, said insert member having an internal diametric dimension greater than the diametric dimension of the collar

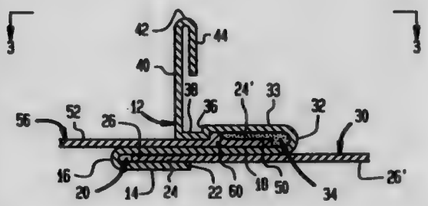
portion so that it can be mounted over the nipple with the one end first, and said groove means extending over substantially the entire uninterrupted circumference of the main surface portion.

5,195,789

SLIP LOCK CONNECTOR ASSEMBLY FOR JOINING SHEET METAL DUCTS

Timothy E. Walsh, 56 Frederick Ave., Babylon, N.Y. 11702, and Thomas Howard, 288 N. Monroe St., Lindenhurst, N.Y. 11757

Filed Feb. 3, 1992, Ser. No. 829,426
Int. Cl.[5] F16L *25/06*
U.S. Cl. 285—331 **9 Claims**



1. A slip lock connector assembly for joining end-to-end first and second flat-sided ducts made of sheet metal, comprising:

a plurality of connector members disposed in a framelike coplanar array, each of said members being made of molded, rolled and bent sheet metal, each of said members having a main flat wall and integral first flat wall radially spaced from one side of said main wall to define a laterally open first channel therebetween for receiving a free end of one flat side of said first duct;

a first filling of highly viscous adhesive sealant compound in said first channel for adhering to and sealing said one side of said first duct in said first channel;

a second flat wall integral with, and radially spaced from the other side of said main wall and parallel to said main wall to define therewith a second channel open laterally for receiving a free end of one flat side of said second duct; and

a second filling of highly viscous adhesive sealant compound in said second channel for adhering to and sealing one side of said second duct in said second channel;

said second wall of said connector member having a ledge formed along its length and extending into said second channel for engaging and locking projections on said one side of said second duct to cooperate with said second filling of sealant for sealing said one side of said second duct in said second channel, so that said first and second ducts can be secured in end-to-end alignment by said connector members.

5,195,790

APPARATUS FOR BLOCKING THE MOVEMENT OF A CHAMBER DOOR

John M. Bulko, and Arthur T. Nagare, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Apr. 15, 1992, Ser. No. 868,804
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—201 **5 Claims**

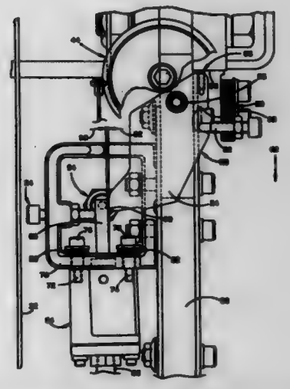
1. An apparatus for preventing the movement of a sliding door of a chamber from a closed position to an open position when the chamber pressure is above a preselected threshold, the chamber having an inside and an outside, comprising:

a pin member attached to the door;

a cam, pivotally attached to the outside of the chamber, said cam member having a recessed area, a lobe surface adjacent said recessed area and a contact surface;

a piston having an extended position and a retracted position, said piston being in fluid communication with the chamber and being responsive to changes in chamber pressure above a preselected threshold such that said piston moves from said extended position to said retracted position when the chamber pressure falls below said preselected threshold;

wherein said pin member, said cam and said piston are positioned relative to one another such that when the door is in the closed position and said piston is in said extended position said contact surface of said cam abuts said piston,



said pin member is held captive by said recessed area, and movement of the door from the closed position to the open position is prevented, and when said piston is in said retracted position, the door moves said pin member along said lobe surface of said cam to rotate said cam thus allowing the door to move to the open position; and

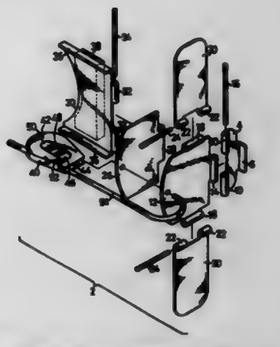
means for movably mounting said piston to said chamber such that said piston may move slightly in response to contact between said piston and said contact surface of said cam.

5,195,791

PORTABLE SECURITY BUCKLE FOR DOORS

Chin S. Hu, No. 217, Kao Hsuan Rd., Feng Shan City, Kao Hsiung Hsien, Taiwan

Filed Aug. 13, 1992, Ser. No. 929,666
Int. Cl.[5] E05C *17/54*
U.S. Cl. 292—298 **3 Claims**



1. A portable security buckle comprising:

a hooking strip from which a tongue extends for being inserted in a recess in a jamb of a door frame;

a first plate being pivotally connected with said hooking

strip and having a working position parallel to said hook-

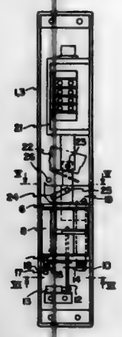
and engageable with said clip means, for mounting said

fin means against longitudinal movement relative to said hous-

in proximity to the edge, a second end and a connection

strip and having a working position parallel to said hooking strip;
two lateral plates being pivotally connected with said first plate beside said hooking strip and having a working position perpendicular to said first plate;
a second plate securely attached to said first plate;
a third plate pivotally connected with said second plate for restraining said lateral plates when disposed in a working position perpendicular to said first and second plates;
a rope being securely attached to said first and second plates and having two terminal sections for being disposed around a door knob; and
means for fastening said rope.

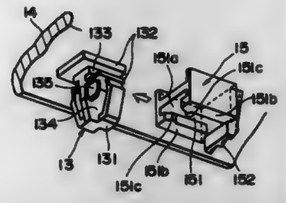
5,195,792
ELECTRICALLY OPERATED SECURING PLATE FOR DOOR LOCKS
Jan Stendal, Västerås, Sweden, assignor to Stendals Elektriska AB, Västerås, Sweden
PCT No. PCT/SE90/00138, § 371 Date Sep. 20, 1991, § 102(e) Date Sep. 20, 1991, PCT Pub. No. WO90/11422, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 2, 1990, Ser. No. 761,955
Claims priority, application Sweden, Mar. 21, 1989, 8900968
Int. Cl.[5] E05B *47/00*
U.S. Cl. 292—341.16 13 Claims



1. A locking device for doors comprising: a housing (1), a securing plate (8) having side walls forming a recess, ratchet means (19, 20) located in said housing for selectively retaining said securing plate in a locked position, an extendable bolt (9) in the door, said bolt when extended pressing against one side wall to force the securing plate from an unlocked position to a locked position during a door closing movement, pressing against another securing plate side wall to force the securing plate from a locked position to an unlocked position during a door opening movement, and indicator means in the form of a cam (11), pin (12), microswitch (22) for cooperation with said securing plate to sense whether or not the bolt is in an extended position, said securing plate and cam (11) being journalled on a common spindle (10).

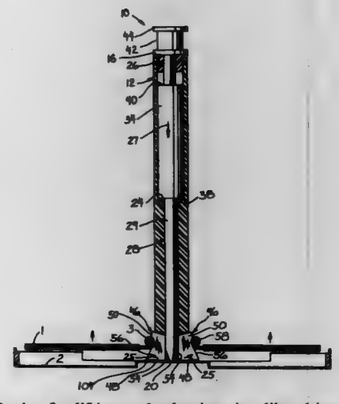
5,195,793
MOLDING FOR AUTOMOBILE
Renji Maki, Tochigi, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan
Filed Nov. 6, 1991, Ser. No. 788,377
Claims priority, application Japan, Nov. 7, 1990, 2-117093[U]
Int. Cl.[5] B60B *19/42*
U.S. Cl. 293—155 5 Claims

1. An automobile molding including a molding body having a rear surface;
a clip means for fitting in an attaching hole formed in a vehicle body panel of an automobile; and
a holder provided on the rear surface of said molding body and engageable with said clip means, for mounting said molding body; wherein
said holder is integrally incorporated with a locating boss insertable into said attaching hole in said vehicle body panel so as to prevent said molding body from being positionally shifted;



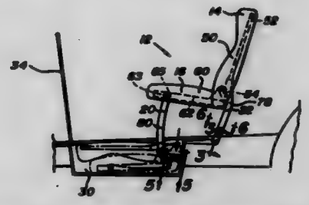
said holder on said molding body is formed therein with a clip-receiving groove extending longitudinally of said molding body and having one end opened and another end closed, and
said locating boss is arranged adjacent to the closed end of said clip-receiving groove.

5,195,794
COMPACT DISK LIFTING DEVICE
Donald L. Hummel, Jr., LaPorte, Ind., and Michael Bacon, Greenville, Pa., assignors to KIS Products, Greenville, Pa.
Filed Oct. 16, 1990, Ser. No. 598,972
Int. Cl.[5] B66C *1/00*
U.S. Cl. 294—94 8 Claims



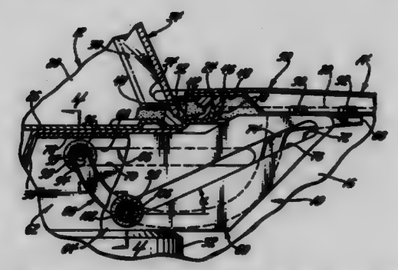
1. A device for lifting and releasing ring-like objects having a disk-shaped body and a central opening, said device including a housing having a side wall and opposite longitudinal ends, fin means positioned in said housing adjacent one end of said housing and being shiftable between a retracted position and an extended position relative to said housing side wall, said fin means for lifting and carrying said ring-like objects when shifted from said retracted position to said extended position and for releasing said ring-like objects when the fin means is shifted from said extended position towards said retracted position, plunger means shiftably carried by said housing for shifting said fin means from said retracted position to said extended position, biasing means carried by said housing adjacent said one end and engaging said fin means, said biasing means positioned against said fin means at a prespecified location wherein said biasing means also constitutes cushion means for supporting said ring-like object as the fin means is shifted into its said extended position, said biasing means securing the fin means against longitudinal movement relative to said housing and for urging said fin means towards its retracted position.

5,195,795
AUTOMOTIVE VEHICLE SEAT ASSEMBLY FULLY RETRACTABLE BELOW THE VEHICLE'S FLOOR
Raymond C. Cannara, 4767 Eastmoore Dr., Drayton Plains, Mich. 48346, and Douglas J. Stafford, 1410 3 Mile Dr., Grosse Pointe Park, Mich. 48230
Filed Apr. 1, 1992, Ser. No. 861,702
Int. Cl.[5] B60N *3/04*
U.S. Cl. 296—65.1 15 Claims



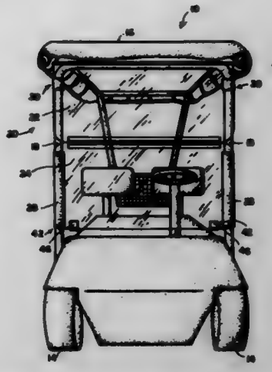
1. A storable vehicle seat assembly wherein the vehicle seat is fully retractable below floor level of the vehicle, comprising:
storage means for storage of a seat assembly, said storage means positioned within the vehicle below floor level;
at least one channel within said vehicle floor, said at least one channel extending rearwardly from said storage means;
a seat assembly having an upper seat member coupled with a lower seat member;
at least one rotatable forward leg member pivotally attached at one end to said lower seat member and at a second end to said storage means;
at least one rotatable rearward leg member pivotally attached at one end to said upper seat member and at a second end to said vehicle floor, within said channel; and
cover means for covering said storage means when said seat member is in an operative and inoperative position, said cover means being substantially flush with said floor when covering said storage means.

5,195,796
DECK LID HINGE ASSEMBLY
Charles W. Wampler, II, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 24, 1992, Ser. No. 840,218
Int. Cl.[5] B62D *25/10*
U.S. Cl. 296—76 4 Claims



1. A hinge assembly for mounting a closure panel with an edge on a body structure of a vehicle, the hinge assembly comprising:
a pair of stationary guide paths carried by the body structure;
a hinge strap having a first end secured to the closure panel in proximity to the edge, a second end and a connection point located between the two ends;
first guide means carried by the second end of the hinge strap and slideably retained by one of the guide paths for slideable movement of the second edge of the hinge strap relative to the body structure; and
second guide means carried by the connection point of the hinge strap and slideably retained by the other guide path for slideable movement of the connection point relative to the body structure so that the hinge strap rotates relative to the body structure as the second end and the connection point of the hinge strap slideably moves whereby the opening movement of the closure panel will shift the edge of the closure panel away from the body structure.

5,195,797
GOLF CART WINDSHIELD ASSEMBLY
L. T. Hobbs, Raleigh, N.C., assignor to US Supply Company, Raleigh, N.C.
Filed Mar. 13, 1992, Ser. No. 850,498
Int. Cl.[5] B60J *1/04*
U.S. Cl. 296—77.1 5 Claims



1. A two-piece fold down golf cart windshield assembly for mounting on a golf cart having a pair of laterally spaced upstanding front support posts, the golf cart windshield assembly comprising:
a) a first fixed lower windshield panel secured between the upstanding front posts and including a top edge portion;
b) a second movable upper windshield panel secured adjacent the top edge portion of the first windshield panel and movable between a closed position where the second windshield panel extends generally co-planar with the first windshield panel and an open position where the second windshield panel lies generally back-to-back with the first windshield panel; and
c) means for securing the second windshield panel to the support posts when the same assumes the closed position and for securing the second windshield panel to the first windshield panel when the second windshield panel assumes the open position, said securing means including:
1) a pair of resilient post clamps secured to opposite edges of the second windshield panel, each post clamp being of a generally u-shape and having a pair of resilient arms that extend around and frictionally engage a portion of each support post to hold the second windshield panel in the closed position, the resilient arms of each clamp being movable slightly inwardly and outwardly such that the clamps can be easily pushed onto and removed from respective support posts;
2) at least one holding clip mounted to the first windshield panel; and
3) means associated with said second windshield panel for

mating with the holding clip associated with the first

5,195,799

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mating with the holding clip associated with the first windshield panel and securing the second windshield panel in the open position where it lies generally back-to-back with the first windshield panel.

5,195,798

RETRACTABLE ROOF FOR VEHICLES

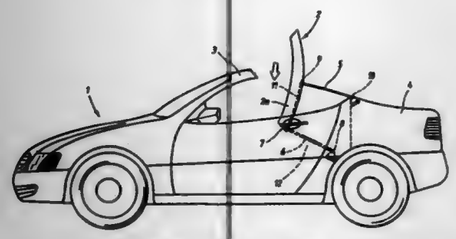
Berthold Klein, Rutesheim; Anton Reichel, Ditzingen; Johann Tomforde, and Bruno Sacco, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Nov. 29, 1991, Ser. No. 800,098

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1990, 4038074

Int. Cl.[5] B60J *7/08, 1/18*

U.S. Cl. 296—146 L **10 Claims**



1. A retractable vehicle roof for covering a passenger space of a vehicle, comprising a roof shell configured to cover the passenger space, a rear roof window, roof pillars associated with and rearwardly of the roof shell and extending along sides of the roof rear window and movable with respect to the roof rear window, the roof shell situated forwardly of the roof pillars, and the roof being configured to have a stowing position in a receiving space situated below the roof pillars in a closed position of the roof shell over the passenger space and to move into the receiving space, with the roof pillars configured to move into the receiving space first during a retraction operation of the roof shell to uncover the passenger space, such that the roof is located with a forward region of the roof shell disposed substantially vertically in the receiving space, wherein, with the roof in the closed position over the passenger space, the rear window forms a lower width boundary of the roof lying between the roof pillars and is configured to be moved out of the closed position into the stowing position, in which, with the roof shell in the stowing position, the rear window is vertically spaced from lower ends of the roof pillars such that a window aperture between the roof pillars and the roof shell defines an open space to accommodate storage items in the receiving space, and, for the purpose of constrained motion control during the retraction operation, the roof is operatively attached to the vehicle body via a link arrangement comprising two supporting links which are mirror-symmetrical in relation to a longitudinal center plane of the vehicle, and the upper ends of each of the two supporting links in the closed position are articulated in a lower end region on an associated one of the roof pillars, and at least one guiding link extends parallel to a line of inclination of the rear window and is operatively articulated above the rear window in the closed position on the roof shell and below the rear window on the body of the vehicle said at least one guiding link being constituted by the rear window as a result of which, in the course of the retraction operation, the rear window automatically lifts from an associated sealing seat on the roof and undergoes a forward and downward swinging movement of the guiding link in a direction the same as the supporting links.

5,195,799

CONVERTIBLE WINDSCREEN

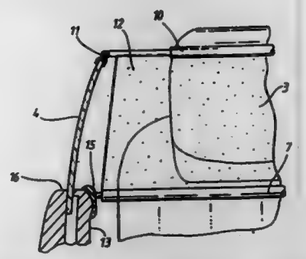
Hans Götz, Böblingen, and Karl-Heinz Baumann, Boudorf, both of Fed. Rep. of Germany, assignors to Mercedes-Benz, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 797,979

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1990, 4037704

Int. Cl.[5] B62D *25/00*

U.S. Cl. 296—180.1 **5 Claims**



1. A convertible having two adjustable side panes, a windscreen arranged behind a row of seats and extending upwardly in an operating position approximately perpendicularly between the two adjustable side panes which are height-adjustable with auxiliary force actuation on a path which is curved with respect to the vehicle passenger compartment and can be lowered into an out-of-use position toward a floor of the convertible, and a telescopic tube entrainer operatively connected for transverse movement between the side panes and the windscreen arranged on at least one of the side panes such that the position of the windscreen can be changed in accordance with the movement of the at least one side pane to compensate for the correct path of the side pane with respect to the windscreen, wherein the telescopic tube entrainer is operatively configured to move the windscreen therewith and is secured in an articulated manner to the two side panes.

5,195,800

PLATE WALL TRAILER

Brian K. Stafford; Donald M. Brown, Jr.; Gregory Radanovic, all of Fort Madison; Mark T. Grimm, and Roger L. Niebuhr, both of Burlington, all of Iowa, assignors to Fruehauf Trailer Corporation, Southfield, Mich.

Filed Feb. 24, 1992, Ser. No. 840,318

Int. Cl.[5] B62D *33/04*

U.S. Cl. 296—181 **23 Claims**

1. A trailer body comprising:

a top wall;

a bottom wall positioned beneath said top wall;

an opposed pair of spaced apart side walls extending between said top wall and said bottom wall;

a top beam extending along a juncture between said top wall and one of said side walls, said top beam having a flange portion which extends downwardly partly to the bottom wall;

a bottom beam extending along a juncture between said bottom wall and said one of said side walls;

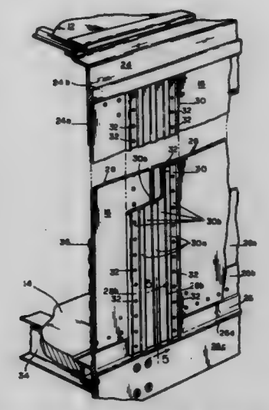
said one of said side walls comprising;

a longitudinally extending plurality of relatively rigid, vertically oriented, co-planar plates, the adjacent edges of each adjacent pair of plates being non-overlapping and substantially co-planar, each of said plates being rigidly secured to an outwardly facing surface of said flange portion of said top beam and being rapidly secured to said bottom beam;

a plurality of generally vertically extending reinforcing members positioned outwardly of said one of said side walls, each reinforcing member overlapping and covering

an adjacent pair of edges of an adjacent pair of said plates and being rigidly secured to each of said adjacent pair of said plates, each reinforcing member extending to an elevation above a bottom edge of said flange portion of said top beam, an upper portion of said each reinforcing member being rigidly secured to said flange portion and to an upper portion of said each of said adjacent pair of said plates which is positioned therebetween; and

wheel means secured to said bottom wall to permit said trailer body to be towed by a truck;



wherein the adjacent edges of each adjacent pair of plates are spaced apart from each other, and wherein each reinforcing member has an inwardly projecting, vertically extending rib positioned between the adjacent edges of an adjacent pair of plates, said vertically extending rib helping to accurately position the plates of said adjacent pair of plates relative to each other during the assembly of the trailer body and serving to increase the section modulus and resistance to bending of said reinforcing member in a direction extending transversely of said one of said side walls.

5,195,801

TILTABLE CHAIR

Klaus Franck, Hanover, and Werner Sauer, Springe, both of Fed. Rep. of Germany, assignors to Wilkhahn Wilkening & Hahne GmbH & Co., Fed. Rep. of Germany

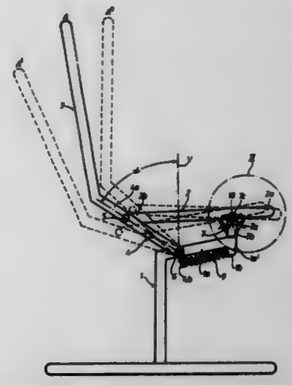
Continuation of Ser. No. 457,296, Dec. 26, 1989, abandoned. This application Oct. 24, 1991, Ser. No. 782,898

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1989, 3900220

Int. Cl.[5] A47C *3/00*

U.S. Cl. 297—301 **21 Claims**

1. A chair construction comprising a pedestal member; a seat member having a forward end and a rearward end; a back rest having an upper end and a lower end; means connecting said back rest to said pedestal member for rocking movements of said back rest about a substantially horizontal first axis; means coupling said seat member to said back rest; and flexible and resilient mounting means connecting said seat member to said pedestal member, the flexibility of said mounting means enabling said mounting means to deform from an unstressed condition an amount sufficient to enable said seat member simultaneously to rock about a second substantially horizontal axis and move endwise between forwardmost and rearward-most positions in response to said rocking movements of said back rest about said first axis, the resilience of said mounting



means constantly biasing said mounting means toward said unstressed condition.

5,195,802

SEAT CUSHION LATCHING DEVICE FOR AUTOMOTIVE SEAT

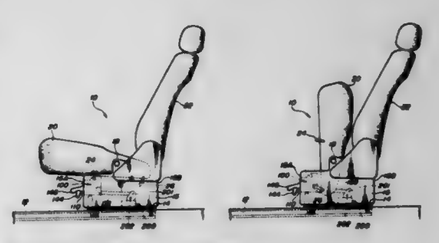
Hatsuo Hayakawa; Mikio Houma; Hidemasa Hirakui, all of Yokohama; Hideki Irie, and Mikio Fujiwara, both of Kanagawa, all of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase and Ohi Seisakusho Co., Ltd., Yokohama, both of Japan

Filed Dec. 7, 1990, Ser. No. 623,497

Claims priority, application Japan, Feb. 9, 1990, 2-28258

Int. Cl.[5] B60N *2/30*

U.S. Cl. 297—335 **17 Claims**



1. An automotive set comprising:

a seat cushion;

a fixed member;

pivot means for permitting said seat cushion to pivot between an operative position and a folded position with respect to said fixed number;

a first and second strikers secured to spaced portions of said seat cushion;

a base structure secured to said fixed member;

first latching means installed in said base structure for latching said first striker when said seat cushion assumes said operative position;

second latching means installed in said base structure for latching said second striker when said seat cushion assumes said folded position;

an operation lever pivotally supported by said base structure; and

link means linking said operation lever to both said first and second latching means so that a pivotal movement of said

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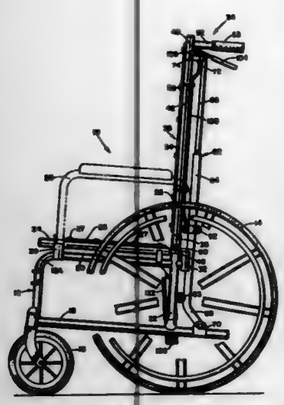
operation lever in a given direction cancels a latched condition of one of said first and second latching means.

5,195,803
RECLINING SEAT BACK ASSEMBLY FOR A WHEELCHAIR

Mark J. Quintile, Brunswick, Ohio, assignor to Invacare Corporation, Elyria, Ohio

Continuation of Ser. No. 734,099, Jul. 22, 1991, abandoned, which is a continuation of Ser. No. 649,303, Jan. 30, 1991, abandoned, which is a continuation of Ser. No. 369,645, Jun. 21, 1989, abandoned. This application Jan. 30, 1992, Ser. No. 827,862
Int. Cl.[5] A47C 1/026
U.S. Cl. 297—365 6 Claims



1. A reclining seat back assembly for a wheelchair having a chassis supporting a generally horizontal seat bottom, the seat back assembly comprising:

a. a frame member having a proximal end and a distal end, said proximal end being pivotally connected to the chassis proximate the seat bottom, said frame member being pivotable relative to the seat bottom through a range of angles between an upright position and a reclined position;

b. an extendable strut including a hollow outer strut member and an inner strut member, said outer strut member having an open first end and a second end, said inner strut member having a first end and a second end received within said outer strut member through said first end of said outer strut member, one of said second end of said outer strut member and said first end of said inner strut member being pivotally connected to the chassis, the other of said second end of said outer strut member and said first end of said inner strut member being pivotally connected to said frame member at said distal end thereof, said inner strut member sliding relative to said outer strut member when said frame member is pivoted relative to the seat bottom, said inner strut member having adjacent said second end thereof a first engaging surface with a toothed profile;

c. means for releasably locking said frame member at a desired angle relative to the seat bottom, said locking means including:

an engaging member movably mounted on said outer strut member, said engaging member including a second engaging surface having a profile complementary to said first engaging surface of said inner strut member,

means for biasing said second engaging surface of said engaging member into engagement with said first engaging surface of said inner strut member to prevent movement of said inner strut member relative to said outer strut member,

actuating means mounted on said frame member at said distal end thereof, and

means for linking said actuating means to said engaging member so that movement of said actuating means moves said engaging member against said biasing means to disengage said first and second engaging surfaces and permit movement of said inner strut member relative to said outer strut member; and

d. means for urging said frame member to pivot toward said upright position, said urging means including:

a lever arm fixed to said frame member at said proximal end thereof,

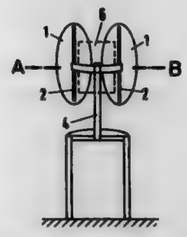
an extendable link assembly including a first link member having a first end pivotally connected to said lever arm and a second link member having a second end pivotally connected to the chassis, said first and second link members moving relative to each other along a common link axis as said frame member is pivoted relative to the seat bottom, the distance between said first end of said first link member and said second end of said second link member decreasing as said frame member is pivoted toward said upright position and increasing as said frame member is pivoted toward said reclined position, and

a spring connected between said first and second link members, said spring urging said first and second ends toward each other to urge said frame member toward said upright position.

5,195,804
BACK-REST HAVING TWO OVAL SHAPED SHELLS EACH CONCAVE TO VERTICAL AND CONVEX TO HORIZONTAL

Herbert D. Stolle, Gustav-Adolf-Strasse 37a, D-2000, Hamburg 70, and Matthias Brünig, Diekberg 48, D-2000, Hamburg 65, both of Fed. Rep. of Germany

PCT No. PCT/EP89/00826, § 371 Date Mar. 6, 1990, § 102(e) Date Mar. 6, 1990, PCT Pub. No. WO90/00873, PCT Pub. Date Feb. 8, 1990
PCT Filed Jul. 15, 1989, Ser. No. 466,349
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824461
Int. Cl.[5] A47C 7/02
U.S. Cl. 297—460 5 Claims

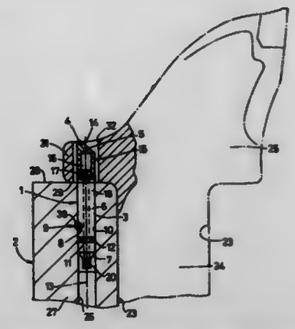


1. Backrest characterized by two backrest shells (1), the shells being laterally spaced and configured so as to be substantially oval-shaped and elongated in the vertical direction when viewed in elevation as well as being concave with respect to an axis vertical to a seat surface (20) and convex with respect to a transverse horizontal axis arranged above the seat surface (20) a transverse rail (3), and means for resiliently connecting each backrest shells to each be rotatable about so as to enable said backrest shells to each be rotatable about three spatial axes.

5,195,805
WATER SPRAY NOZZLE FOR USE WITH A MINERAL PICK BOX

Stephen W. Clapham, Sheffield, England, assignor to Hydra Tools International PLC, Sheffield, England

Filed Nov. 19, 1991, Ser. No. 794,567
Claims priority, application United Kingdom, Nov. 29, 1990, 9025934
Int. Cl.[5] E21C 35/22
U.S. Cl. 299—81 20 Claims



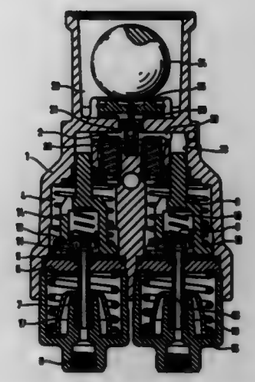
1. A water spray nozzle for use with a pick box, comprising an elongate body member of circular section, a head having a water discharge aperture of such geometry that it generates the discharge of a spray of water droplets, a water conveying passage communicating between said discharge aperture and a water inlet end of said passage, and a recess located intermediate opposite ends of said nozzle, with said recess adapted to be engaged, in use, by a wire like fastener adapted to latch said nozzle mechanically in a receiving bore of an associated pick box, a circumferential groove also being provided in said nozzle and carrying a resilient 'O'-ring adapted, in use, to constitute a water seal by engaging said receiving bore of said pick box, and a water swirl unit located upstream of said discharge aperture.

5,195,806
BRAKE PRESSURE CONTROL DEVICE FOR AUTOMOTIVE VEHICLES

Juergen Schonlau, Walluf; Holger von Hayn, Bad Vilbel; Alfred Birkenbach, Hattersheim; Ralf Harth, and Wolfgang Ritter, both of Oberursel, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 1, 1991, Ser. No. 678,493
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010546
Int. Cl.[5] B60T 8/32
U.S. Cl. 303—9.67 18 Claims

1. A brake pressure proportioning control device for a hydraulic brake system for an automotive vehicle, said brake system operated by hydraulic pressure adapted to proportionally reduce fluid pressure applied to a rear wheel brake included in said system, said device comprising: a housing defining an inlet chamber, at least one hydraulic fluid inlet and one hydraulic fluid outlet in said housing each communicating with said inlet chamber, said inlet adapted to be connected to a source of operating fluid pressure, said outlet adapted to be connected to said rear wheel brake; pressure reducing valve means in said housing disposed between said inlet chamber and said outlet causing a proportionally reduced fluid pressure to be established between said inlet chamber and said outlet, said pressure reducing valve means including a regulating piston having one end protruding into said inlet chamber and having a sealing seat formed on said one end and a through bore extending through said sealing seat from said one end to another end of said regulating piston, said regulating piston subjected to fluid pressure in said inlet chamber at said one end and to fluid pressure of said outlet at said another end and configured to be urged in a direction towards said one end by the net effect of said fluid pressure; said pressure reducing valve means including a valve closing member located opposite said sealing seat to be movable thereon to close said bore; regulating spring means urging said regulating piston in a direction away from said valve closing member; a control piston mounted in said inlet chamber; said valve closing member being supported by said control piston; said control piston mounted to be displaceable towards and away from said sealing seat, spring means urging said control piston towards said sealing seat, said control piston configured to be moved away from said sealing seat due to the effects of fluid pressure in said



inlet chamber acting thereon, causing said valve closing member to be moved away from said sealing seat at said one end of said regulating piston with increasing fluid pressure in said inlet chamber to prevent operation of said pressure reducing valve means; vehicle deceleration responsive means operative to prevent said displacement of said control piston upon the vehicle deceleration reaching a predetermined rate to thereafter allow operation of said pressure reducing valve means; and flow restriction means defining a restrictive flow path disposed between said inlet and said inlet chamber substantially reducing the rate of build up of fluid pressure in said inlet chamber upon development of a predetermined rate of increase of fluid pressure said inlet, whereby a substantial reduction in the rate of build up of fluid pressure in said inlet chamber occurs upon a sudden development of elevated fluid pressure at said inlet.

5,195,807
VENTING WHEEL BEARING END CAP

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 20, 1992, Ser. No. 870,846
Int. Cl.[5] B60B 7/00
U.S. Cl. 301—108.1 2 Claims

1. An end cap for use in a wheel bearing of the type having a generally cylindrical hub surrounding a central spindle having an end near the edge of said hub, and in which said bearing is subject to an internal pressure fluctuation, said end cap comprising,

a latch means retaining said cap to said hub,

a generally cylindrical center section surrounding the end of said spindle, said center section further including a concavity, and,

a vent located within said concavity and responsive to said

5,195,810

5,195,811

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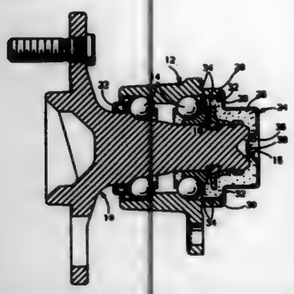
pressure fluctuations so as to open and close to equalize the internal pressure,



whereby said cap is prevented from dislodging by said pressure fluctuations while said vent is protected by being sheltered within said concavity.

5,195,808

METHOD AND SYSTEM FOR NON-LOCKING AND NON-SKIDDING BRAKING/TRACTION OF A VEHICLE WHEEL

Oddvard Johnsen, Elkesvingen 8, 3400 Lier, Norway

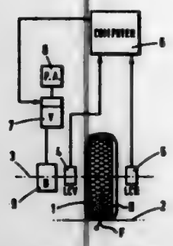
PCT No. PCT/NO89/00029, § 371 Date Oct. 9, 1990, § 102(e) Date Oct. 9, 1990, PCT Pub. No. WO89/09710, PCT Pub. Date Oct. 19, 1989

PCT Filed Apr. 7, 1989, Ser. No. 582,937

Claims priority, application Norway, Apr. 7, 1988, 881513; Feb. 16, 1989, 890663

Int. Cl.[5] B60T *8/58*

U.S. Cl. 303—113.2 6 Claims



1. A braking and traction system for a wheeled vehicle, comprising driver's operating devices, force-transmitting means, (8), an electronic control unit (6), controllable motor organs (10) as well as braking exercising means (9) attached to the vehicle wheels (1), characterized in that said system comprises at least one force measuring device (4, 5) attached to an axle of at least one of the vehicle wheels (3) for measuring forces on said axle including a road normal force normal to a surface on which the vehicle is to travel and a road parallel force parallel to said surface, a signal connection from the measuring device to the electronic control unit (6), and that said electronic control unit (6) has means for controlling the braking and traction power in accordance with results of continuous calculations of friction coefficient between said wheel (1) and said surface (2), as well as variations of said coefficient, on the basis of continuously incoming measurement signals from the force measuring device (4,5) in an up or down direction to obtain a maximum instantaneous friction coefficient, and for selecting delivery of traction or braking power to said wheel depending on the direction of the road parallel force.

5,195,809

HYDRAULIC BRAKE SYSTEM WITH DEVICES FOR CONTROLLING BOTH BRAKE SLIP AND TRACTION SLIP

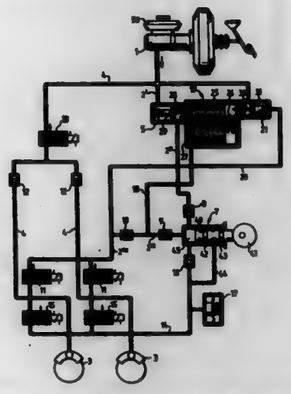
Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Feb. 7, 1992, Ser. No. 832,291

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1991, 4104069

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—113 TR 12 Claims



1. An automotive wheel brake system with brake controls for controlling both brake slip and traction slip of a wheel brake for a vehicle wheel comprising:

a master brake cylinder;

a brake line connecting said wheel brake to said master cylinder;

a fluid pump having a pumping chamber and a suction side inlet connected to said pumping chamber and said master brake cylinder, a one way acting first suction valve connected between said inlet and said master cylinder allowing flow only into said pumping chamber, said pump also having a pressure side outlet connected to said pumping chamber and wheel brake;

a separating valve in said brake line interposed between said master brake cylinder and said inlet of said pump;

a high pressure accumulator connected to said pressure side outlet of said pump, and means closing said brake line separating valve when said high-pressure accumulator is partially charged;

one way valve means allowing one way communication between said master cylinder and said wheel brake after closing of said separating valve;

a brake shunt line associated with said wheel brake, placing said wheel brake in communication with said master brake cylinder in parallel with said brake line, which connects said wheel brake to said master cylinder;

a normally open traction slip control valve in said shunt line closed by said brake controls whenever traction wheel slip occurs;

a return line placing said wheel brake in communication with said pumping chamber;

a second one way acting suction valve in said return line, said second suction valve having an opening pressure in excess of 1 bar to allow flow into said pumping chamber from said wheel brake;

an inlet valve and outlet valve, each operated by said brake controls, said inlet valve arranged in said brake line, which connects said wheel brake to said master cylinder, and said outlet valve arranged in said return line.

5,195,810

ANTI-LOCK HYDRAULIC BRAKE SYSTEM

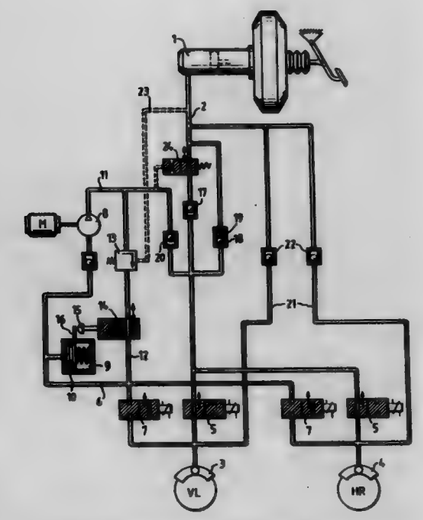
Norbert Ocvirk, Offenbach; Lutz Weise, Mainz, Fed. Rep. of Germany, and James Remfrey, Oberursel, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Feb. 7, 1992, Ser. No. 832,517

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1991, P4104068

Int. Cl.[5] B60T *13/14*

U.S. Cl. 303—116 SP 4 Claims



1. An anti-lock hydraulic brake system comprising:

a brake circuit and a closed pump circuit, said brake circuit including a master cylinder and a wheel brake and a connecting brake line, an electromagnetically operated inlet valve in said brake line;

said pump circuit having a suction side, a return line communicating with said brake line between said inlet valve and said wheel brake, a pump having a pressure side, a pressure line communicating said pump pressure side with said brake line at a junction located between said master cylinder and said inlet valve, a pressure control valve controlled by the pressure developed by said master cylinder, a bypass line interconnecting said pressure side and suction side of said pump, said pressure control valve in said bypass line, a low-pressure accumulator which can be charged to varying degrees and is connected to said suction side of said pump, a shut-off valve in said bypass line, means operating said shut off valve in dependence on the charging degree of said low-pressure accumulator, whereby said bypass line is closed when said low-pressure accumulator is fully charged, separating valve means in said brake line between said junction of said pressure line therewith and said master cylinder said separating valve means comprising a non-return valve in said brake line which closes towards said master cylinder, and a pressure opening valve arranged in parallel to said non-return valve and which opens towards said master cylinder at a defined difference in pressure thereacross, said difference in pressure being at a level such that at an opening pressure of said pressure control valve said pressure opening valve is not able to open.

5,195,811

CIRCUIT CONFIGURATION FOR AN ELECTRONICALLY CONTROLLED ANTI-LOCK BRAKE SYSTEM

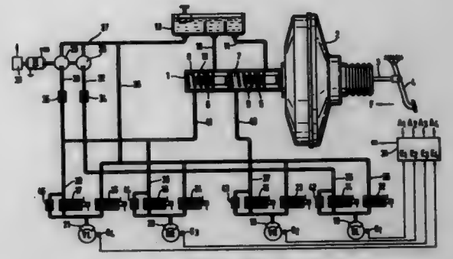
Bunther Buschmann, Griesheim, and Frank Jourdan, Buettelborn, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 658,138, Feb. 20, 1991, abandoned. This application Jul. 6, 1992, Ser. No. 911,245

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005264

Int. Cl.[5] B60T *8/40, 13/68, 15/08*

U.S. Cl. 303—116 R 3 Claims



1. A anti-lock brake system for use in a traction vehicle including a plurality of wheels and associated brakes, said system comprising:

a master cylinder;

inlet and outlet valves in circuit with brake lines interconnecting said master cylinder and wheel brakes, said valves selectively actuatable to effect anti-lock control;

at least one pump operable to draw pressure fluid from a reservoir and discharge fluid to said master cylinder at an elevated pressure; and

a control device for detecting an imminent locked condition on at least one wheel and for energizing said pump in response thereto, said control device including means for actuating all said inlet valves to a closed condition wherein upon said imminent locked condition all said inlet and outlet valves are closed upon initial detection of said imminent locked condition and thereafter for modulating braking pressure applied to an associated brake of said imminently locked wheel and means for alternately opening and closing the inlet valves of the remaining wheels by predetermined pulsewise actuation of inlet valves associated therewith.

5,195,812

COLUMBARIUM

John K. Eickhof, R.R. 2, Box 17, Crookston, Minn. 56716, assignor to Paul Eickhof, Erskine, Minn.

Filed Feb. 27, 1991, Ser. No. 661,687

Int. Cl.[5] A47B *47/00*

U.S. Cl. 312—257.1 20 Claims

1. A shelving apparatus, having a cabinet with a plurality of substantially rectangular compartments, comprising:

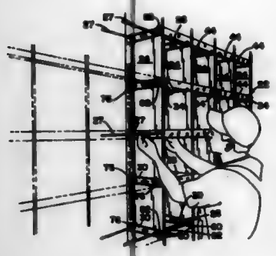
a) riser means extending perpendicularly into a face of a cabinet;

b) shelving means for forming tops and bottoms of each of the compartments;

c) shelf supporting means attached to the riser means for supporting the shelving means wherein the shelf-supporting means include brackets and wherein the shelving means include molded shelf portions extending between the riser means and over and around each bracket;

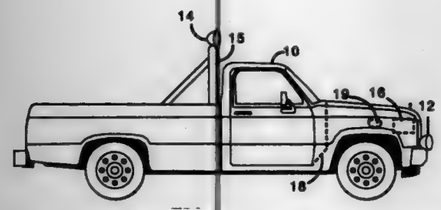
d) horizontal rod means extending through each of the riser means perpendicular to the plane of each of the riser

means and through the shelf supporting means for bracing the shelving apparatus; and



e) backing means providing covering to a rear face of the apparatus.

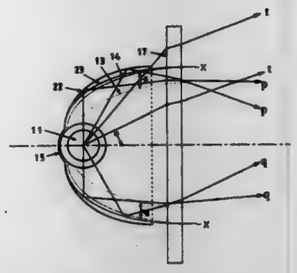
5,195,813
WIRELESS CONTROL FOR AUXILIARY LIGHTING
Peter K. Brown, Flagstaff, Ariz., assignor to KC Hilites, Inc., Williams, Ariz.
Filed Sep. 3, 1991, Ser. No. 754,405
Int. Cl.[5] F21M *3/02*
U.S. Cl. 362—61 **6 Claims**



1. In a lighting control system for a motor vehicle having a battery and driving lights, the improvement comprising:
transmitter means, located in a cabin of said vehicle, for producing a low power radio frequency;
a lamp mounted on an exterior of said vehicle;
a control module, including receiving means, for mounting outside the cabin of the vehicle remote from said lamp, said receiving means responsive to said radio frequency signal for connecting said battery to said lamp and thereby energizing said lamp;
wiring means for interconnecting said lamp and said control module;
said lamp being controlled from within the cabin of said vehicle by operation of said transmitter means without a direct electrical connection between said transmitter means and said control module; and
sensing means responsive to an illumination condition of said driving lights to inhibit energization of said lamp.

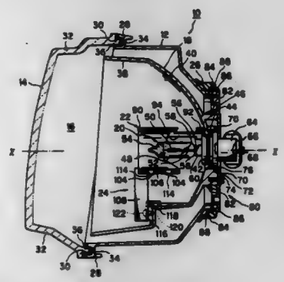
5,195,814
STROBE UNIT
Sachio Hasushita, and Takayuki Ito, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 11, 1992, Ser. No. 833,676
Claims priority, application Japan, Feb. 15, 1991, 3-106963; May 28, 1991, 3-223757
Int. Cl.[5] G03B *15/02*
U.S. Cl. 362—18 **16 Claims**

1. A strobe unit having a light source and a reflecting mirror that is located behind said light source, the improvement comprising an imaginary semi-elliptical reflecting mirror having a major axis that is located on an axis of an illumination passing through a center of said light source and imaginary reflecting mirrors which are quarter-elliptical in shape and are formed by splitting said imaginary semi-elliptical reflecting mirror along a major axis into two mirror elements which are spaced a predetermined distance from one another in a direction that is perpendicular to said major axis, said reflecting mirror being



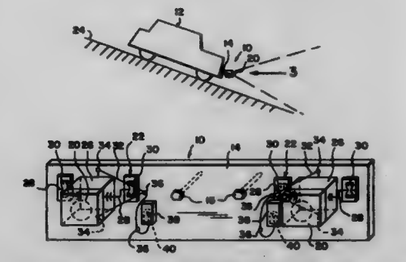
defined by modified reflecting mirrors which are symmetrical in shape with respect to said axis of illumination and which have continuous smooth reflecting surfaces extending between open ends of said imaginary quarter-elliptical reflecting mirrors and ends which are adjacent to said light source and which are located between said imaginary semi-elliptical reflecting mirror and said quarter-elliptical reflecting mirrors.

5,195,815
ANTIGLARE BULB SHADE FOR A VEHICLE HEADLAMP
Takao Watanabe, and Akio Mochizuki, both of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Jul. 22, 1991, Ser. No. 733,773
Claims priority, application Japan, Jul. 23, 1990, 2-194589
Int. Cl.[5] F21M *3/14*
U.S. Cl. 362—61 **16 Claims**



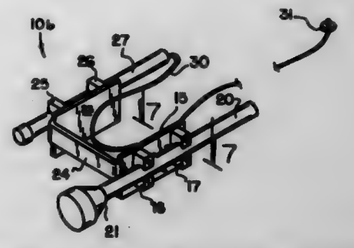
1. A vehicle headlamp comprising:
(a) a lamp body;
(b) a lens secured to the lamp body to define a lighting chamber therebetween, the lighting chamber having an optical axis extending through the lens;
(c) an electric lighting bulb mounted to the lamp body and disposed in the lighting chamber along the optical axis, the bulb having an envelope portion of vitreous material containing a filament for emitting rays of light, and a base portion formed in one piece with the envelope portion by pinch sealing, with the consequent creation of an indefinitely tapering part between the envelope portion and the base portion;
(d) a reflector in the lighting chamber for reflecting the light rays that have been emitted by the filament of the bulb and which have passed through the envelope portion, and hence for producing light rays that are parallel to the optical axis; and
(e) an antiglare shade comprising at least a rear portion disposed between a rear portion of the bulb and the reflector for cutting off primarily light rays that have been emitted by the filament of the bulb and which have issued upwardly through an upper portion of the indefinitely tapering part of the bulb, in order to prevent the reflector from producing light rays that are angled with respect to the optical axis, said antiglare shade being in the form of an arcuate strip of rigid material disposed only above and to the rear of said bulb.

5,195,816
ADJUSTABLE AUXILIARY HEADLAMPS
Donald R. Moss, Jr., 614 6th St. #11, Racine, Wis. 53404-1154, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007
Filed Nov. 4, 1991, Ser. No. 787,650
Int. Cl.[5] B60Q *1/10, 11/00*
U.S. Cl. 362—71 **1 Claim**



1. An auxiliary adjustable headlight assembly for a motor vehicle with a front bumper and conventional headlights which comprises:
a) an elongated rectangular plate mounted above said front bumper and between said conventional headlights of the motor vehicle;
b) a pair of auxiliary headlights spaced apart in a left right relationship on said elongated rectangular plate; and
c) means for vertically adjusting said auxiliary headlights on said elongated rectangular plate with respect to the path of travel of said motor vehicle, so that especially at night when the motor vehicle is traveling down an inclined road, said auxiliary headlights can be vertically adjusted to shine upwardly in said path of travel and when the motor vehicle is traveling up an inclined road said auxiliary headlights can be vertically adjusted to shine downwardly in the path of travel, enabling better sight of said path of travel; wherein said vertically adjusting means for each said auxiliary headlight includes:
d) a receptacle having a rear, top and bottom for holding said auxiliary headlight;
e) a pair of horizontal swing shafts, each affixed to one side of said receptacle;
f) a pair of brackets, each for pivotally attaching one of said swing shafts to said elongated rectangular plate, so that said receptacle can be vertically adjusted thereto;
g) electrical wiring connected to said auxiliary headlight and extending from the rear of said receptacle;
h) a pair of eyelets, each affixed to the top and bottom of said receptacle to guide said wiring from said receptacle;
i) a pair of pulleys mounted to said elongated rectangular plate for adjusting said wiring;
j) a housing mounted to said elongated rectangular plate for mechanical incline detection; and
k) a gravity feed control inclinometer for indicating inclination of said motor vehicle carrier in said housing and connected to the wiring for indicating said inclination.

5,195,817
FLASHLIGHT HOLDER APPARATUS
Timothy A. Deccio, 10326 Irene Ave. SW, Tacoma, Wash. 98499
Filed Mar. 26, 1992, Ser. No. 858,042
Int. Cl.[5] B62J *6/00*
U.S. Cl. 362—72 **2 Claims**



1. A flashlight holder apparatus arranged for securement to a motorcycle, wherein the motorcycle includes a frame assembly and a rear wheel, and an axle rotatably mounting the rear wheel within the frame assembly, and a support member mounted to the frame assembly above the rear wheel, and wherein the apparatus comprises,
a mounting plate, the mounting plate fixedly secured to the support member, and
the mounting plate including a mounting plate forward surface, with the forward surface including a first C-shaped resilient clamp spaced from a second C-shaped resilient clamp, with the first C-shaped resilient clamp including a first clamp recess, and the second C-shaped resilient clamp including a second clamp recess, wherein the first clamp recess and the second clamp recess are coaxially aligned relative to one another, and a cylindrical flashlight housing mounted to the first C-shaped resilient clamp and the second C-shaped resilient clamp within respective first and second clamp recesses, and
a second mounting plate arranged in a parallel coextensive spaced relationship relative to the mounting plate, wherein the second mounting plate and the mounting plate include a mounting plate forward edge and a second plate mounting plate forward edge, and a junction plate mounted to the mounting plate forward edge and the second mounting plate forward edge orthogonally oriented between the mounting plate and the second mounting plate, and the second mounting plate including a second mounting plate forward surface, the second mounting plate forward surface including a third C-shaped resilient clamp and a fourth C-shaped resilient clamp, including respective third and fourth clamp recesses, wherein the third and fourth clamp recesses are coaxially aligned to receive a cylindrical magazine tube therewithin, and the cylindrical magazine tube includes a plurality of counterbalanced battery members contained therewithin.

5,195,818
ELONGATED LAMP
Adrian Simmons, Kaarst, Fed. Rep. of Germany, and Alberto de la Cruz Garcia, Tres Cantos, Spain, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Dec. 5, 1991, Ser. No. 803,017
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1990, 4039290
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—224 **14 Claims**

1. A lamp comprising
a case having a light exit opening,
an elongated light source, and
a reflector,
characterized in that
a flexible transparent optical film, stable in shape is arranged

between said light exit opening and said light source, said film having a smooth first surface and a structured second surface facing said light source, which second surface is provided with mutually parallel and adjacent substantially

V-shaped grooves extending transversal to the longitudinal extension of said light source, and

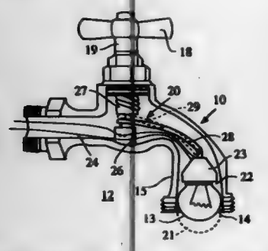
said optical film extends only over an area within said case in which said light source emits its light directly towards said light exit opening.

5,195,819

DRY SPIGOT LAMPS

Yaron Chant, Ramat Gan, Israel, and Ely Shneider, Rumson, N.J., assignors to 4-D Design, Inc., Long Branch, N.J.

Filed Jul. 11, 1991, Ser. No. 728,553
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—253 36 Claims



1. A method of illuminating a space with a light bulb, comprising:

providing a dry and simulated spigot structure with a spout having an open mouth; and

sticking said light bulb out of said open mouth of said spout of the dry and simulated spigot structure.

5,195,820

FIREPLACE WITH SIMULATED FLAMES

Thomas R. Rehberg, Anaheim, Calif., assignor to Superior Fireplace Company, Fullerton, Calif.

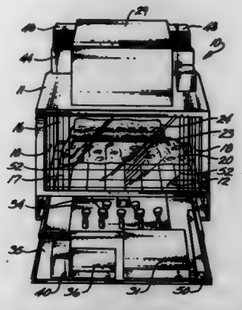
Filed Jan. 21, 1992, Ser. No. 822,969
Int. Cl.[5] F24C *3/00*; A47G *1/12*
U.S. Cl. 362—523 10 Claims

1. A simulated-flame fireplace assembly, comprising:

a housing surrounding and supporting a simulated firebox, the firebox having back, side, top and bottom walls, and a front wall with a transparent door panel, the housing further including a simulated ember bed on the firebox bottom wall, and a log set with an andiron resting on the ember bed and a log supported on the andiron;

an image projector mounted on the housing and arranged to project a recorded image of fireplace flames into the firebox;

a transparent and partially reflecting beam-splitting panel disposed within the firebox and arranged so the projected



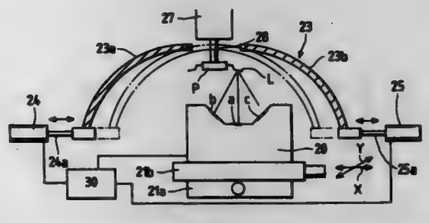
flame image appears to an outside viewer to be superimposed on the log and a firebox space around the log.

5,195,821

ELECTRONIC-COMPONENT MOUNTING APPARATUS WITH LASER MONITORING DEVICE

Shigeru Eguchi, Kasuga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 5, 1992, Ser. No. 846,062
Claims priority, application Japan, Mar. 8, 1991, 3-43306
Int. Cl.[5] F21K *7/00*
U.S. Cl. 362—259 14 Claims



1. A mounting apparatus for mounting an electronic component on a circuit board, said mounting apparatus comprising:

pickup head means arranged to be movable vertically, said pickup head means being equipped with a suction nozzle coupled to a suction device so as to suck and pick up said electronic component; and

laser monitoring means for monitoring said electronic component picked up and carried up to a monitoring position by said pickup head means, said laser monitoring means including:

laser illuminating means for emitting a laser light beam to said electronic component placed at said monitoring position and for receiving light reflected from said electronic component to obtain information indicative of a state of said electronic component; and

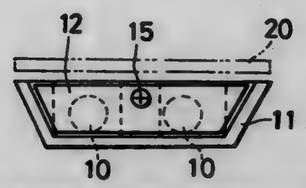
cover means arranged to be openable and closable to cover said electronic component picked up by said pickup head means when said electronic component reaches said monitoring position.

5,195,822

PLAIN LIGHT SOURCE DEVICE

Nobuyuki Takahashi, Kawachinagano, and Hitoshi Oyama, Ikoma, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1991, Ser. No. 690,578
Claims priority, application Japan, Apr. 24, 1990, 2-109835
Int. Cl.[5] F21V *7/22*
U.S. Cl. 362—296 8 Claims



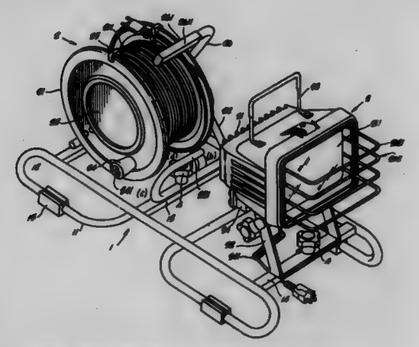
1. A plain light source device comprising a light source disposed on a rear side of a display panel and a reflector for reflecting the light from the light source toward the display panel, the reflector being formed from a conductive resin to prevent noise generated by the light source from causing external interference, the conductive resin having a metal fiber mixed therein, a board for holding the light source, wherein the reflector is electrically connected to the board for grounding.

5,195,823

LAMP AND EXTENSION CORD SET

Ronie K. Sidabras, Riverside, Calif., assignor to Allied Wholesale, Inc., Sylmar, Calif.

Filed May 6, 1992, Ser. No. 880,205
Int. Cl.[5] F21L *15/22*
U.S. Cl. 362—387 4 Claims



3. A lamp and extension cord set comprising:

a base frame having means for securing a plurality of objects thereto;

an extension cord reel, removably secured to said base frame and comprising a rotatable barrel, a removable extension cord wound on said barrel, a curved stop bar disposed adjacent to said barrel, a U-shaped handlebar and a driving handle to rewind said extension cord; and

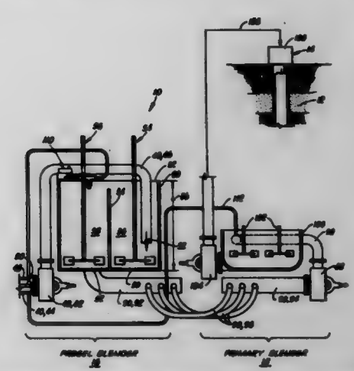
a lamp set, comprising a light source within a lamp head assembly, said lamp head assembly attached to a U-shaped bracket and removably coupled to said base frame to allow said lamp set to rotate in a vertical plane and to rotate in a horizontal plane, a power switch and a retractile power cord attached to said power switch, a handlebar and a lamp guard placed over said light source.

5,195,824

VESSEL AGITATOR FOR EARLY HYDRATION OF CONCENTRATED LIQUID GELLING AGENT

James L. Stromberg; Dennis Brown; Vincent G. Reidenbach, and Donald E. Bailey, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 12, 1991, Ser. No. 685,377
Int. Cl.[5] B01F *15/02*
U.S. Cl. 366—131 16 Claims



1. A system for mixing of concentrated liquid gelling agent and water to form a fracturing fluid for fracturing of a subterranean formation, comprising:

a blender tub having an inlet and an outlet;

supply means for introducing a concentrated liquid gelling agent and water mixture to said inlet at a mixture throughput flow rate; and

a rotary mixer means disposed in said blender tub for providing a total circulation flow rate at least an order of magnitude greater than said mixture throughout flow rate so that an average fluid particle of said mixture passes through said mixer means a total of at least ten times while passing through said blender tub.

5,195,825

DEVICE FOR MIXING AT LEAST ONE AQUEOUS FLUID SUBSTANCE

Anthony Ringrose, Chene-Bougeries, Switzerland, assignor to Gene-Trak Systems, Framingham, Mass.

PCT No. PCT/EP88/00419, § 371 Date Oct. 26, 1990, § 102(e) Date Oct. 26, 1990, PCT Pub. No. WO89/10785, PCT Pub. Date Nov. 16, 1989
PCT Filed May 9, 1988, Ser. No. 613,478
Int. Cl.[5] B01F *11/00*; B04B *5/02*
U.S. Cl. 366—213 3 Claims

1. Device for mixing at least one aqueous substance contained in a vessel having an open upper end and a closed bottom end, the device comprising:

a support plate for receiving at least one vessel,

a resilient member cooperating with said support plate for retaining the vessel during mixing action,

a mixing cylinder having a vertical axis and a recess eccentrically positioned with respect to said axis, said recess engaging the bottom end of the vessel upon upward movement of said mixing cylinder from a first position to a second position, and

a drive cylinder member for imparting rotation to said mixing cylinder, said drive cylinder member including means for urging said mixing cylinder generally upward along said vertical axis from said first position to said second position simultaneously with said rotation, whereby said recess engages said vessel causing the bottom end of said vessel to be positioned eccentrically to said vertical axis

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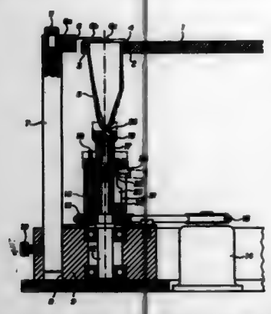
and to rotate about said vertical axis, to thereby impart mixing action to the aqueous substance, said drive cylinder member being rotatable and said mixing cylinder being urged upward from said first position to said second position only when said drive cylinder member exceeds a predetermined rotational speed, said means for urging said mixing cylinder upwardly to said second position includ-



ing at least one lever, pivotably mounted on said drive cylinder, said lever having an inoperative position at rotational speeds below the predetermined rotational speed of said drive cylinder member, and when said drive cylinder reaches a rotational speed greater than said predetermined speed, said lever moves to an operative position thereby urging said mixing cylinder upward to said second position.

5,195,826

METHOD FOR RAPIDLY MEASURING THE TEMPERATURE OF A WORKPIECE ON A COORDINATE MEASURING APPARATUS

Eckhard Enderle, Aalen-Dewangen; Michael Wirth, and Bernd Baier, both of Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

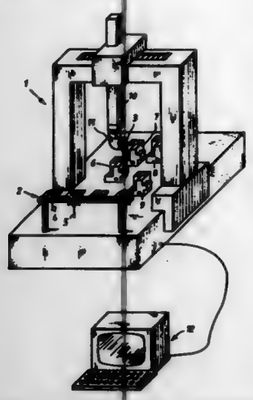
Filed Dec. 9, 1991, Ser. No. 804,059

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1990, 4039336

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.[5] G01K *1/14, 13/00;* G01D *3/04*

U.S. Cl. 374—142 **8 Claims**



6. A temperature measuring arrangement for rapidly measuring the temperature of a workpiece on a coordinate measuring apparatus with the aid of a temperature measuring head applied to the workpiece, the measuring head including switching means for issuing a signal when contact is made with the workpiece, the arrangement comprising:

means for determining the time point at which the temperature measuring head comes into contact engagement with the workpiece as indicated by said signal;

means for measuring the temperature of the workpiece for a predetermined time interval after said time point to obtain measured values defining a curve of temperature variation as a function of time;

computer means for receiving said signal for initiating temperature measurements over said predetermined time interval and for receiving and adapting said measured values to a predetermined function defining the temperature of said sensing means as a function of time; and,

said computer means being adapted to extrapolate said function to compute the actual temperature of the workpiece.

5,195,827

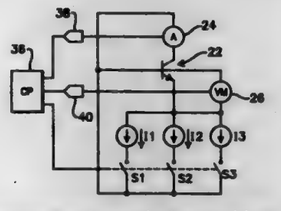
MULTIPLE SEQUENTIAL EXCITATION TEMPERATURE SENSING METHOD AND APPARATUS

Jonathan M. Audy, Campbell, Calif., and Barrie Gilbert, Portland, Oreg., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Feb. 4, 1992, Ser. No. 830,633

Int. Cl.[5] G07K *7/24;* H01L *29/66, 23/58*

U.S. Cl. 374—172 **13 Claims**



1. A temperature sensing method, comprising:

exciting a device with at least three sequential input signals of different magnitudes, said device producing a resultant output signal in response to each of said input signals, said device having a predictable non-linear input-output characteristic that varies with temperature and is subject to ohmic effects,

sensing the sequential output signals produced by said device in response to each of said sequential input signals, and

determining the temperature of said device from each of said sensed sequential input and output signals so as to substantially cancel said ohmic effects.

5,195,828

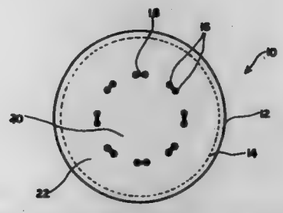
COMBINATION GROUND COVER AND TOTE BAG

Jeffrey Bush-Rodriquez, P.O. Box 18749, Raleigh, N.C. 27619

Filed Mar. 13, 1992, Ser. No. 851,064

Int. Cl.[5] B65D *33/28*

U.S. Cl. 383—4 **7 Claims**



1. A pliable cover convertible from a ground cover or blanket to a tote bag and vice versa, the pliable cover comprising:

(a) a center section having a center point and a substantially circular outer boundary;

(b) a drawstring formed along the outer boundary of the center section intersection;

(c) an outer section extending from the outer boundary of the center section to a substantially circular outer cover edge wherein the outer cover edge is substantially evenly spaced from the boundary of the center section, and wherein the boundary of the center section is spaced at least substantially midway from the outer cover edge to the center point; and

(d) the pliable convertible cover being transformable from the ground covering position to a tote position by gathering the draw string so as to form the center section into a bag having a side section and a bottom section and so as to form the cover's outer section into a skirt that depends downwardly from the drawstring to at least substantially the bottom section of the bag, wherein the skirt covers substantially all portions of the side section of the bag such that the skirt forms a protective barrier between a user carrying the bag and substantially all portions of the side section of the bag in order to prevent soil adhering to substantially any portion of the side section of the bag from coming into contact with a user carrying the bag.

5,195,829

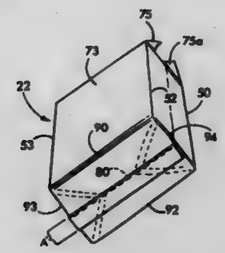
FLAT BOTTOMED STAND-UP MICROWAVE CORN POPPING BAG

Jeffrey T. Watkins, Eden Prairie, and Lawrence C. Brandberg, Edina, both of Minn., assignors to Golden Valley Microwave Foods Inc., Edina, Minn.

Continuation-in-part of Ser. No. 604,759, Oct. 26, 1990, Pat. No. 5,044,777. This application Jul. 24, 1991, Ser. No. 735,374

Int. Cl.[5] B65D *30/16, 30/20*

U.S. Cl. 383—100 **7 Claims**



1. A bag for popping popcorn in a microwave oven comprising, as seen in an upright collapsed position,

a pair of first and second rectangular face panels each having parallel top and bottom edges defining a top and a bottom of the bag and each face panel having parallel side edges,

left and right longitudinally extending centrally projecting gusset folds extending between the first and second panels of the bag, the gussets separating the bag into a pair of communicating chambers,

seals having diagonal edges at both the top and bottom of the bag between the gussets and at least the second face panel, the diagonal edges extending diagonally from the side edges of the second face panel proceeding centrally and toward an adjacent end of the bag,

the face panels at the bottom of the bag being pinched together and being bonded to one another transversely all the way across to provide a temporary fin at the bottom end of the bag,

the fin being folded along a transverse fold line parallel to the bottom edge of each face panel and being adhesively bonded to an adjacent outside surface of a face panel to form a transversely extending stay that acts as a stiffening element extending across a rectangular bottom wall of the bag which forms responsive to internal vapor and steam pressure developed during popping of the popcorn in said microwave oven, and

said stay cooperating with the diagonal bottom seals to assist in maintaining the rectangular bottom wall in a flat condition when the bag inflates under pressure and when the top of the bag is opened for the removal of the popped corn, thereby enabling the bag to stand on said bottom wall when placed on a horizontal surface.

5,195,830

LEAKTIGHT SENSOR ASSEMBLY WHICH CAN BE INCORPORATED IN A DATA SENSOR BEARING AND BEARING EQUIPPED WITH SUCH AN ASSEMBLY

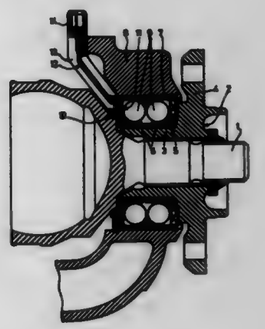
Claude Caillault, Saint Roch, and Christophe Houdayer, Tours, both of France, assignors to SKF France, Clamart Cedex, France

Filed Jul. 6, 1992, Ser. No. 909,204

Claims priority, application France, Jul. 5, 1991, 91 08466

Int. Cl.[5] F16C *19/08*

U.S. Cl. 384—448 **19 Claims**



1. Sensor assembly for data sensor bearing comprising a coder element (11) rigid with the rotating race (6, 33) of the bearing and a sensor element (17, 18) rigid with the fixed race (7, 32) of the bearing and arranged facing the coder element with an air gap, characterised in that it comprises an annular sensor-holder part (15) mounted entirely within the annular space between the rotating and fixed races of the bearing, the said sensor-holder part being provided with an annular span (28) for fitment onto the non-rotating race of the bearing and with a flat support face (30) in a radial plane serving both as reference for the axial positioning of the sensor assembly (12) in the bearing, and an annular leaktight carrier part (16) axially offset relative to and outside the said support face of the sensor-holder part (15) and carrying a leaktight seal (24, 25), which cooperates with the coder element (11) fitted onto the rotating race of the bearing inside the said annular space.

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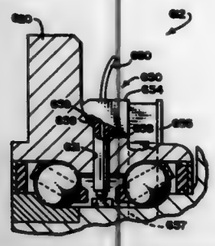
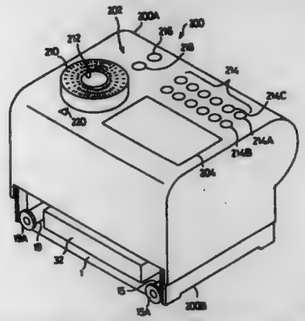
5,195,831
ANTIFRICTION BEARING ASSEMBLY SPEED SENSOR
Bradley D. Faye, Goshen; James A. Hilby, Watertown, both of Conn.; Denis Alff, and Christian Hajsler, both of Annecy, France, assignors to The Torrington Company, Torrington, Conn.
Division of Ser. No. 794,559, Nov. 19, 1991, Pat. No. 5,129,743, which is a division of Ser. No. 706,676, Jul. 26, 1991, Pat. No. 5,123,755, which is a division of Ser. No. 562,502, Aug. 2, 1990, abandoned, which is a division of Ser. No. 422,218, Oct. 16, 1989, Pat. No. 4,960,333. This application Feb. 13, 1992, Ser. No. 809,180
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] F16C *33/30*; G01P *3/48*
U.S. Cl. 384—448 5 Claims



1. An antifriction bearing assembly mountable on a rotatable shaft, said bearing assembly comprising:
an outer race which is stationary relative to said shaft, said outer race having an inner surface and an outer surface;
an inner race which is rotatable relative to said outer race, said inner race being attachable to said shaft;
two annular rows of rolling elements between said inner and outer races;
an encoder mounted on said inner race between said two rows of rolling elements;
a sensor assembly having a sensor aligned with said encoder to provide an output signal proportional to the rotational speed of said shaft; and
means for mounting said sensor assembly in said outer race;
said means for mounting said sensor assembly in said outer race comprising a radial bore penetrating said outer race, said sensor assembly being inserted into said bore and being held in place by a support member which makes a snug fit with said outside surface of said outer race, said support member having an axially-extending saddle portion which mates with an easily removable C-ring which is clipped onto said outer surface of said outer race.

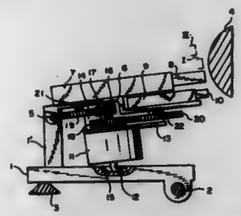
5,195,832
ELECTRICAL STAMP DEVICE WITH INK TEMPERATURE COMPENSATION FOR STENCIL PAPER PERFORATION
Toshihide Fujikawa, Nagoya, and Tetsuji Fuwa, Hashima, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Apr. 6, 1992, Ser. No. 864,349
Claims priority, application Japan, May 10, 1991, 3-105801
Int. Cl.[5] B41J *3/02*
U.S. Cl. 400—120 21 Claims

1. A stamp device, comprising:
a stencil paper;
perforating means for forming a perforation pattern of an image on said stencil paper;
temperature detecting means for detecting an environmental temperature of the stamp device and for outputting environmental temperature information; and
control means for controlling a size of the perforations which are formed on said stencil paper by said perforating



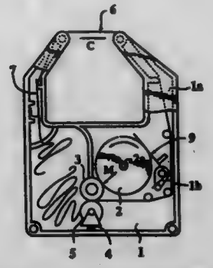
means according to the environmental temperature information output by said temperature detecting means.

5,195,833
TYPEWRITER OR SIMILAR MACHINE
Rudolf Schmeykal, Hemhofen, and Johannes Haftmann, Schwabach, both of Fed. Rep. of Germany, assignors to Ta Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany
Filed Aug. 1, 1988, Ser. No. 227,535
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729308
Int. Cl.[5] B41J *23/34, 35/12, 35/22*
U.S. Cl. 400—185 5 Claims



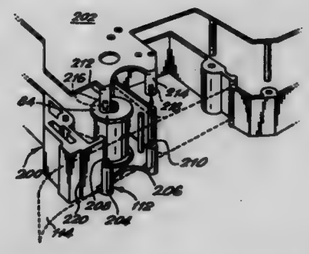
1. A typewriter or similar machine comprising a pivotable support for supporting at least one tape means so as to move said at lest one tape means upwardly and downwardly, said at least one tape means being moveable in steps; and a reciprocation-rotation motor for transporting said at least one tape means into upward and downward positions by pivoting said pivotable support,
wherein the reciprocation-rotation motor comprises a motor shaft and the machine further comprises a drive means for driving said at least one tape means, toothed wheels for transferring he rotational movement of the motor shaft to said at lest one tape means, and oppositely acting overriding clutches respectively for connecting or disconnecting the drive, responsive to the rotational direction of the reciprocation-rotation motor.

5,195,834
INK RIBBON CASSETTE
Naotoshi Matsuo, Chiba, Japan, assignor to Hitachi Powdered Metals Co., Ltd., Chiba, Japan
Filed Aug. 7, 1991, Ser. No. 741,358
Claims priority, application Japan, Aug. 10, 1990, 2-213526
Int. Cl.[5] B41J *27/12*
U.S. Cl. 400—202 2 Claims



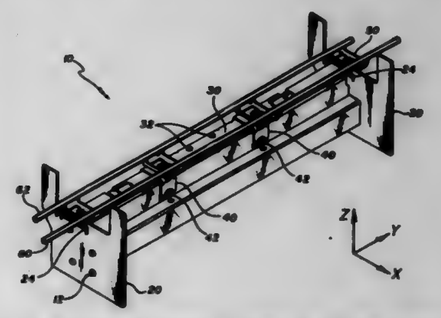
1. An ink ribbon cassette for use in an office machine, comprising:
an inking roll impregnated with ink;
a ribbon-drive roll for driving an ink ribbon;
a ribbon-driven roll driven by said ribbon-drive roll through said ink ribbon;
wherein said ink is transferred from said inking roll to said ink ribbon through said ribbon-drive roll, said ribbon-drive roll being pressed against said inking roll so as to be brought into a slidable contact with said inking roll; and
leaf spring means having a width less than the width of said inking roll and which has a contact portion brought into a direct resilient contact with an outer peripheral surface of said inking roll so as to urge said inking roll against said ribbon-drive roll so that, in a printing operation, said inking roll is slightly deformed by said ribbon-drive roll, while being rotatably driven by said ribbon-drive roll;
wherein said contact portion of said spring means is equal in width to a printing area through which printing is made by a printing head of said office machine.

5,195,835
CASSETTE
Ian P. Collins, Houghton, United Kingdom, assignor to Esselte Dymo N.V., Niklaas, Belgium
Filed Nov. 20, 1991, Ser. No. 795,326
Claims priority, application United Kingdom, Nov. 20, 1990, 9025242
Int. Cl.[5] B41J *35/28, 35/04*
U.S. Cl. 400—207 6 Claims



1. A cassette comprising:
a base part comprising a wall defining an area for containing a first spool of tape, a base for supporting the first spool of tape within said wall, a first guide member spaced apart from said wall externally thereof and of a height less than the height of said wall and defining with said wall a slot for receiving tape from the first spool; and
a closure member comprising a surface for closing said first spool containing area and adapted to be supported by said wall and a second guide member extending from said surface and having a height such that the combined height of said first and second guide members is substantially equal to the height of said wall, said first and second guide members having mating elements to properly position said guide members with respect to each other so as to together to define with said wall a first enclosed guide for the tape from the first spool; and
means for securing the closure member to the base part.

5,195,836
GUIDEWAY AND SUPPORT STRUCTURE FOR A PRINTER/PLOTTER CARRIAGE
Timothy A. Longust, San Diego, and David Petersen, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 29, 1991, Ser. No. 784,282
Int. Cl.[5] B41J *11/22*
U.S. Cl. 400—354 22 Claims



1. A guideway and support structure for a printer/plotter carriage comprising:
a. an elongated beam having a pair of spaced ends;
b. a first generally planar sideplate having a cradle thereon, said sideplate being securely affixed to one of said spaced ends of said beam;
c. a second generally planar sideplate having a cradle thereon, said sideplate being securely affixed to the other of said spaced ends of said beam;
d. an elongated X yoke having stiffness in a first (X) direction of a three dimensional rectangular coordinate system;
e. at least one Z yoke having stiffness in a second (Z) direction of said coordinate system;
f. at least one bridge disposed between said sideplates in a location which divides said beam into approximately equal length sections, said bridge having rod cradles thereon for supporting spaced parallel carriage slider rods extending substantially parallel to said beam;
g. a pair of parallel carriage slider rods supported in said cradles on said sideplates and in said cradles in said bridge;
h. a first set of fasteners clamping said rods to said bridge cradles and to said X yoke and clamping said rods to said cradles on said sideplates;
i. a second set of fasteners affixing said Z yoke or yokes to said beam; and
j. a third set of fasteners affixing said X yoke to said beam.

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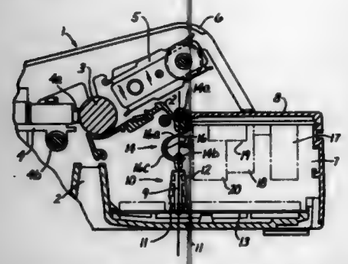
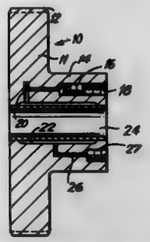
5,195,837
COOLING DEVICE FOR AN ELECTRIC PRINTER, PARTICULARLY MATRIX PRINTER
Erich Steppe, and Manfred Graesser, both of Ulm, Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 412,643, Sep. 25, 1989, abandoned, which is a continuation of Ser. No. 753,656, Jul. 10, 1985, abandoned. This application Apr. 16, 1992, Ser. No. 870,053
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425469
Int. Cl.[5] B41J *29/377*
U.S. Cl. 400—719 7 Claims



1. In a printer, such as a matrix printer, having compactly arranged electric and electronic components further having an outer casing and an internal metal frame, the improvement comprising:
- a flexible metal ribbon established by a plurality of stacked foils to serve as a heat bridge, the metal ribbon being an easily flexing metal strip on account of the plurality of metal foils and having a relatively large surface;
- means establishing two fastening points, arranged one above each other, the flexible metal ribbon being connected to said fastening points, one of which being provided for connecting the ribbon to the component, the other one being a connection that compresses the foils of the ribbon and forces end portions of them into good heat conductive contact with at least that one of the casing and the frame which is made of metal to thereby physically and heat conductively connect the component heat conductively to the casing or the frame.

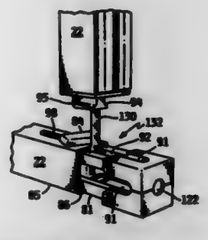
5,195,838
HYDRAULICALLY SECURABLE AND ANGULARLY ADJUSTABLE GEARS
Sidney Katz, 6 Hedgerow La., Spring Valley, N.Y. 10977; Jose O. Gutierez, 184 - 14th St., Wood-Ridge, N.J. 07075, and Joseph Klucsarics, 279 Liberty St. #30, Little Ferry, N.J. 07643
Continuation of Ser. No. 510,041, Apr. 17, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 780,404
Int. Cl.[5] F16B *2/04*
U.S. Cl. 403—5 7 Claims

1. A hydraulically securable and angularly adjustable gear, for use in a drive to a printing cylinder or other member requiring precise positional angular adjustment, comprising in combination:
- an annular body having an axial bore;
- a toothed gear extending radially outward beyond said body, and secured directly to said body, said gear providing a concentric, radially outwardly extending extension of said annular body;
- a gallery of larger diameter than said bore formed in said annular body and extending axially thereof, said gallery having one side open to said bore, and terminating at its axially opposite ends in radially inwardly extending lands;
- a sleeve positioned within said bore and bridging said lands, said sleeve being secured to and hermetically sealed to said lands; and, having an internal diameter greater than that of a shaft with which said gear is associated;
- hydraulic actuator means operative to pressurize said gallery with an incompressible hydraulic fluid; and,
- an hermetically closable bleed passage means connected to said gallery to permit air to be purged from said gallery;



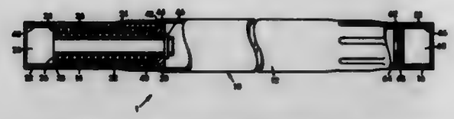
whereby said gear and annular body can be slid onto a shaft of complementary diameter, adjusted axially and angularly relative to said shaft and locked to said shaft in any selected position of axial and angular adjustment relative to said shaft.

5,195,839
INTERCONNECTED FRAME ASSEMBLY
Eric Wicklund, Burnsville; Sue Oleson, Savage, and Bryan J. Beaulieu, Burnsville, all of Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.
Filed Feb. 27, 1992, Ser. No. 842,464
Int. Cl.[5] B65D *59/00*
U.S. Cl. 403—12 13 Claims



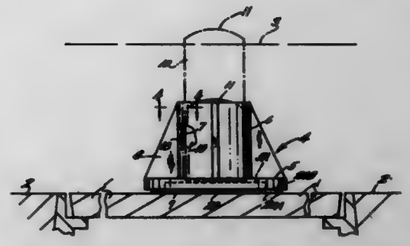
1. A frame assembly for a display structure, comprising:
(a) a plurality of tubular support members having adjacent ends which are joinable to form the frame assembly, each of the adjacent ends of the tubular support members being interlockable by a male and female connection having male and female portions;
(b) at least two of the tubular support members being joinable to each other at an angle to define a pair of angular tubular support members;
(c) the male and female connection of the angular tubular support members further comprising a cord between its respective male portion and the female portion to match such portions to each other to facilitate set up of the frame assembly; and
(d) at least some of the male and female connections comprising key and keyhole connections, the key of at least some of the key and keyhole connections including an aperture, the cord extending through the aperture to and through the keyhole cooperating with the key to match the key to its respective keyhole to further facilitate set up of the frame assembly.

5,195,840
TORQUE TRANSMISSION SHAFT ASSEMBLY
Gary S. Ruschke, Edison, and Richard S. Smarz, Bayonne, both of N.J., assignors to Curtiss Wright Flight Systems, Inc., Fairfield, N.J.
Filed Dec. 10, 1991, Ser. No. 805,849
Int. Cl.[5] F16D *1/10*
U.S. Cl. 403—359 6 Claims



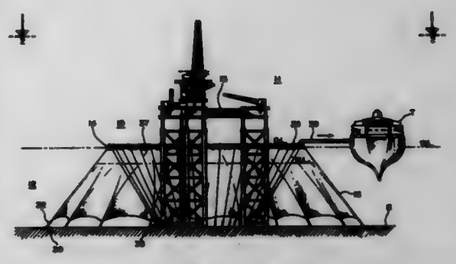
1. A torque transmission shaft assembly for connecting a drive shaft and driven shaft which are mutually spaced less than the length of the assembly, comprising:
- a rigid elongated hollow rod member having a body portion and first and second open end portions,
- each end portion being adapted to receive either said drive or driven shafts and being provided with internal involute splines for mating with complimentary external splines on the shafts to be connected by said assembly;
- said first end portion having an axially displaceable stop means and spring biasing means compressible by displacement of said stop means away from said open first end, for biasing said stop means against a said shaft received in said first end portion; and
- said second end portion having a rigid stop at the end of said internal splines, for abutting against the end of the said shaft receivable therein;
- whereby one of said shafts to be connected may be received into said first end portion to abut against said displaceable stop member and compress said spring biasing means while the other shaft is received into said second end portion, the compression of said spring biasing means being thereupon relaxes to complete the connection of the shafts, wherein said first end portion comprises:
- a transverse shoulder formed within said end portion and axially spaced from the opening thereof;
- a spring having an axially displaceable end and a base end, said spring being coaxially disposed within said first end portion with said base end resting on said transverse shoulder; and
- a plunger means having a head portion and a stem portion, being axially disposed within said end portion for compressing said spring means, said stem portion being axially received within the coil of said spring and said displaceable end of said spring engaging head portion to urge said plunger means axially outward; said plunger means thereby defining said axially displaceable stop means, wherein said first end portion further comprises a first sleeve which is coaxially disposed within and affixed to said body portion of said rod member, and within which said plunger means is axially moveable; said sleeve being open at one end and having an inwardly directed shoulder at its opposite end which defines said shoulder for said spring base, said assembly further including means for limiting the spring-biased movement of said plunger means toward the open end of said first end portion, thereby maintaining said spring in a minimum preload condition, wherein said inwardly directed shoulder surrounds a central opening through which said stem portion of said plunger means is axially moveable; said stem having a transverse stop pin on its portion projecting through said opening, for effecting the said limiting of the spring-biased movement of said plunger means toward the open end of said first end portion, thereby maintaining said spring in a minimum preload condition.

5,195,841
MANHOLE COVER LOCATOR AND METHOD OF PAVING
Relis A. Mullins, 4452 Altura St., Eugene, Oreg. 97404
Filed May 13, 1991, Ser. No. 698,781
Int. Cl.[5] G01K *11/06*; E02D *29/14*; E02B *15/04*
U.S. Cl. 404—72 15 Claims



1. A locator for placement on a street supported cover in place in a roadway to be paved with heated material, said locator to provide a visual indication of cover location below the heated material, said locator comprising,
- a main body defining an upward opening area, said main body including a flat base having a surface for surfacial placement on the cover,
- an indicator disposed in said upwardly opening area of the main body,
- a resilient member in said main body in biasing contact with said indicator,
- a heat fusible retainer carrier by said main body and offset upwardly from said base and having a protruding portion in said upwardly opening area in contact with said indicator and restraining said indicator before fusing occurs against the action of said resilient member, and
- said heat fused retainer fusible by the heat of the paving material and permitting displacement of the indicator through the paving material to an exposed position.

5,195,842
OIL SPILL TENT
Toshihiko Sakow, 82 Copley Ave., Teaneck, N.J. 07666
Continuation of Ser. No. 790,484, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 644,302, Jan. 22, 1991, abandoned. This application Jan. 29, 1992, Ser. No. 905,829
Int. Cl.[5] E02B *15/06*
U.S. Cl. 405—60 12 Claims



1. An apparatus for handling an oil spill in a body of water having an upper surface comprising:
- a first buoyant ring;
- means for anchoring said first ring in a position afloat on said upper surface of said body of water overlying the area of a potential oil escape;

5,195,846

5,195,848

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a first flexible apron wall depending from and extending peripherally along said first ring;

a second buoyant ring substantially coextensive with said first ring; and

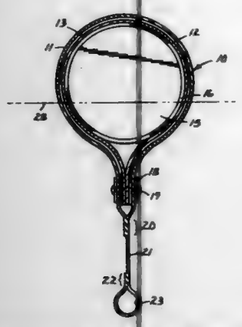
a second flexible apron wall extending between and secured to said first and second rings, said second ring being upwardly movable relative said first ring and said water surface to extend said second apron wall above said water surface to delineate an oil containing space.

5,195,843

CERAMIC FOAM BODY HAVING CLOSED CELL STRUCTURE

Billy L. George, Hudson, Wis.; Timothy J. Gesnrich, Lake Elmo, and Joseph Graham, Plymouth, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 30, 1991, Ser. No. 707,836
Int. Cl.[5] E02B *15/08*; C04B *20/04*
U.S. Cl. 405—63 **19 Claims**



1. A ceramic foam body produced by firing a green shape of a mixture of fine particles of, by weight,

100 parts of ceramic precursor selected from the group consisting of volcanic ash, vermiculite, perlite, obsidian, and feldspar,

a source of carbon in an amount of providing from 0.3 to 5 parts of carbon, and

a nonrefractory metallic oxide in an amount providing from 0.3 to 3 parts of oxygen at a temperature sufficient to produce a ceramic foam body having a hard-cell crust, a closed-cell interior, and a density of from 0.1 to 0.5 g/cm^3.

5,195,844

FLOATING BARRIER METHOD AND APPARATUS

Kip B. Goans, Harvey, La., assignor to Oil Stop, Inc., Harvey, La.

Continuation of Ser. No. 638,704, Jan. 8, 1991, abandoned, which is a continuation of Ser. No. 424,158, Oct. 19, 1989, Pat. No. 5,022,785. This application Aug. 29, 1991, Ser. No. 752,002
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] E02B *15/06*
U.S. Cl. 405—69 **6 Claims**

1. A float boom for confining material floatable on a liquid surface comprising, in combination:

(a) a first elongated collapsible tube formed of fluid impervious material, said first tube defining a flat, reelable configuration when collapsed;

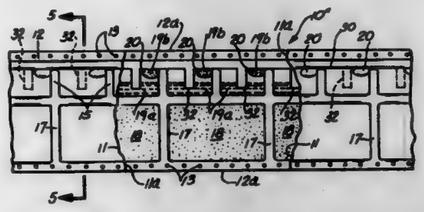
(b) sealing means separating the interior of said first tube into a plurality of adjacent compartments sequentially disposed along the length of said first tube;

(c) a second elongated collapsible tube formed of fluid impervious material and defining a flat, reelable configuration when collapsed, said second tube having a substantially smaller diameter when expanded, than said first tube;

said sealing means longitudinally securing said second tube and said first tube together;

(d) a plurality of conduits spaced along the length of said second tube and respectively transversely communicating between said second tube and said compartments, whereby pressured gas supplied to said second tube in a deployed position produces inflation of said compartments;

(e) a plurality of chemicals disposed in each said compartment in separated relationship, said chemicals when mixed being capable of producing a quantity of gas sufficient to inflate the respective compartment; and,



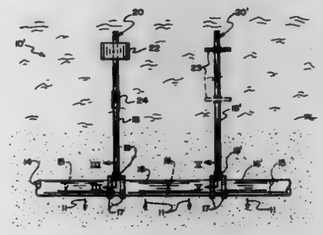
(f) a pouch in each compartment enclosing one of said chemicals, said pouches being successively rupturable by a compressive force successively applied by upper and lower roller means to at least one side of said first tube in its flat, collapsed condition, while in a pre-deployed position, whereby inflation of said compartments can be effected initially by said gas produced by mixture of said chemicals or subsequently by pressured gas supplied to said second tube in a deployed position.

5,195,845

MONITORING FLOW IN SUBSOIL FLUIDIZATION

James M. Parks, 3509 Merrick Ct., #210, Lexington, Ky. 40502

Continuation-in-part of Ser. No. 565,283, Aug. 1, 1990, Pat. No. 5,094,566. This application Mar. 9, 1992, Ser. No. 848,482
Int. Cl.[5] E02B *3/02*
U.S. Cl. 405—74 **16 Claims**



1. Method of monitoring flow of non-cohesive subsoil fluidized via fluid jetting from a substantially horizontal two-dimensional underwater array of foraminous piping into the subjacent subsoil, comprising the steps of

establishing monitoring sites underwater above the array, sensing fluid flow at respective monitoring sites over time, including sensing flow in orthogonal directions at various of the sites, and

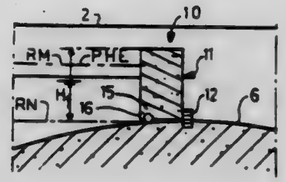
including sensing vertical flow as well as orthogonal horizontal flows.

5,195,846

SPILLWAY FOR DISCHARGING EXTRAORDINARY FLOODS AT DAMS HAVING AT LEAST TWO FLOOD DISCHARGE STRUCTURES

Francois Lemperiere, Meudon, France, assignor to GTM Entrepose, Nanterre, France

Filed Dec. 12, 1991, Ser. No. 806,704
Claims priority, application France, Dec. 28, 1990, 90 16430
Int. Cl.[5] E02B *7/22, 8/06*
U.S. Cl. 405—108 **17 Claims**



1. Spillway for discharging extraordinary floods for dams and similar works having two flood discharge structures, one of the two discharge structures being an overspill sill whose crest is set at a first predetermined level lower than a second predetermined level corresponding to a maximum reservoir level for which the dam is designed, the difference between the said first and second predetermined levels corresponding to a predetermined maximum discharge of an extraordinary flood, and a moveable water level raising means closing off the said sill, wherein the water level raising means comprises at least one heavy rigid element resting on the crest of the overspill sill and held in place thereon by gravity, the said element having a predetermined height at least equal to the difference between the first and second predetermined levels and being of such size and weight that the moment of the forces applied by the headwater on the element comes to equal the moment of the gravity forces tending to maintain the element in place on the overspill sill so that consequently the element is destabilized when the water reaches a third predetermined level at most equal to the second predetermined level.

5,195,847

PROCESS FOR CLEANING DRILLING MUD CONTAMINATED WITH HYDROCARBONS

E. Park Guymon, 4085 Eccles Ave., Ogden, Utah 84403

Filed Jan. 15, 1992, Ser. No. 821,018
Int. Cl.[5] C09K *7/02*
U.S. Cl. 405—128 **7 Claims**

1. A process for recovering hydrocarbons from a drilling mud contaminated with a first hydrocarbon comprising:

placing said drilling mud contaminated with said first hydrocarbon in a vessel;

obtaining a predetermined quantity of water;

selecting a surfactant and dissolving said surfactant in said water to form a wash water;

combining said wash water with said drilling mud contaminated with said first hydrocarbon;

providing a second hydrocarbon as a diluent, said second hydrocarbon comprising said first hydrocarbon and mixing said hydrocarbon diluent to said wash water and said drilling mud contaminated with said first hydrocarbon to form a mixture;

subjecting said mixture to centrifugation thereby separating said mixture into three distinct layers comprising a first layer of said first hydrocarbon recovered from said drilling mud and said second hydrocarbon diluent, a second layer of said wash water, and a third layer of said drilling mud wetted with said wash water; and

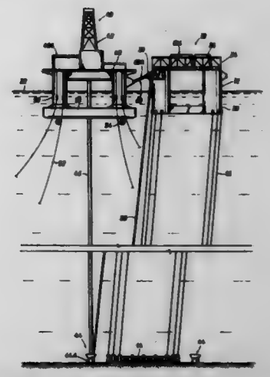
recovering said first layer containing said first and second hydrocarbons.

5,195,848

METHOD AND SYSTEM FOR DEVELOPING OFFSHORE HYDROCARBON RESERVES

David A. Haete, Spring; Lee K. Brasted, Kingwood, and George Rodenbusch, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 624,864, Dec. 10, 1990, abandoned.
This application Jul. 24, 1992, Ser. No. 919,629
Int. Cl.[5] E02B *17/00*
U.S. Cl. 405—202 **62 Claims**



1. A method for establishing hydrocarbon production from an offshore reservoir, comprising:

a) installing a compliant platform at a selected site;

b) restraining an offshore drilling vessel with respect to the compliant platform and positioning the offshore drilling vessel over a selected well site at an ocean floor;

c) conducting drilling operations from the offshore drilling vessel through a drilling riser connected to a well at the selected well site;

d) transferring a production riser which extends from the well near the ocean floor to the offshore drilling vessel from the offshore drilling vessel to the compliant platform;

e) securing the production riser to the compliant platform; and

f) establishing communication between the reservoir and a facility on the compliant platform.

5,195,849

TRENCH SHORING APPARATUS

Thomas J. Stapleton, 15821A Timbervalley, Chesterfield, Mo. 63017

Filed Mar. 12, 1992, Ser. No. 850,262
Int. Cl.[5] E02D *17/00*
U.S. Cl. 405—282 **18 Claims**

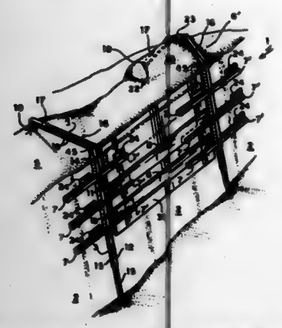
1. A trench shoring apparatus for use in the shoring, bracing, and cave-in prevention of earthen trenches comprising:

a vertical wall support leg, adapted to extend substantially vertically from a trench's floor to the ground's surface above;

a plurality of horizontal support arms joined to said support leg and adapted to receive lateral wall support members, said horizontal support arms being pivotally joined to said support leg; and,

an anchor means joined to said support leg, whereby loads generated by shifting trench wall soils exerted upon said support legs are transmitted to the ground's surface

through said anchor means and said arms may be rotated into a position substantially parallel to said support leg to



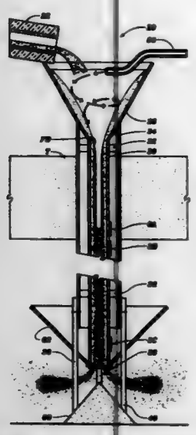
reduce the width of said trench anchoring apparatus permitting easy storage thereof when not in use.

5,195,850

APPARATUS AND METHOD FOR TRANSPORTING BUOYANT PARTICULATE MATTER SUCH AS ICE TO A SUBMERGED LOCATION IN A FLUID

Thomas L. Davis; Robert N. Elliott, III, and Charles R. Zickefoose, all of Raleigh, N.C., assignors to Carolina Power & Light Company, Raleigh and North Carolina Alternative Energy Corporation, Research Triangle Park, both of N.C.

Filed Sep. 9, 1991, Ser. No. 756,498
Int. Cl.[5] B65G *53/30*
U.S. Cl. 406—92 **18 Claims**



1. An apparatus for transporting buoyant particulate material to a submerged location in a vessel containing a fluid, said apparatus being characterized by providing a fluid dynamics system that permits the buoyant particles to move against the buoyant force created by their presence in the fluid, said apparatus comprising:

a buoyant particle delivery conduit having an upper end and a lower end positioned for buoyant particle discharge substantially below the fluid level in the vessel;

means for introducing buoyant particles into the conduit upper end; and

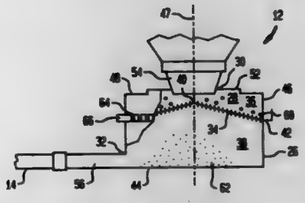
means for introducing transport fluid to the conduit and (i) providing the transport fluid with a sufficient axial velocity to create enough drag to overcome the buoyant force of the buoyant particles, thereby entraining the buoyant particles in the transport fluid and (ii) imparting a swirl to the transport fluid and entrained particles of sufficient angular velocity to facilitate efficient transport to the discharge end of the conduit.

5,195,851

APPARATUS AND METHOD FOR TRANSFERRING DRY BULK MATERIALS HAVING AN IMPROVED UNLOADING ADAPTER

James M. Shepard, Hockessin, Del., and Michael J. Schunk, Boonton, N.J., assignors to General Chemical Corporation, Parsippany, N.J.

Filed Nov. 12, 1991, Ser. No. 791,564
Int. Cl.[5] B65G *53/40, 53/36*
U.S. Cl. 406—121 **25 Claims**



10. A system comprising:

a storage container for particulate solids comprising a storage container outlet;

an unloading adapter in communication with the storage container comprising:

an enclosed adapter housing comprising an adapter chamber, an adapter inlet in communication with the storage container outlet and an adapter outlet;

a screen separating the adapter chamber into a pre-screen chamber and a post-screen chamber, the screen being in the shape of a pyramid or cone having a screen apex and a screen perimeter, the apex facing the adapter inlet and the perimeter fitting against an enclosed perimeter of the adapter chamber; and

a means for removal of unscreened oversized particles;

a hydrator comprising:

a means to draw the particulate solids from the adapter outlet;

a means to hydrate the particulate solids; and,

a means to transfer the hydrated particulate solids from the hydrator.

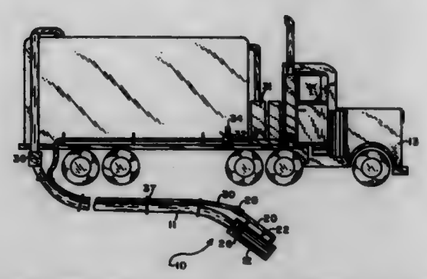
5,195,852

VACUUM PICK-UP NOZZLE WITH AIR BOOST MANIFOLD

Jack R. Malugani, 29619 Lilly Mt. La., Coarse Gold, Calif. 93614; Joseph Malugani, Jr., 1210 Coronet Way, Carson City, Nev. 89701, and Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434

Filed Nov. 18, 1991, Ser. No. 793,801
Int. Cl.[5] B65G *53/28, 53/14, 53/42*; B60P *1/60*
U.S. Cl. 406—153 **14 Claims**

8. A vacuum booster manifold adapted to be used in conjunction with a vacuum system comprising: a first substantially elongated tubular member having first and second ends, a second substantially elongated tubular member having first and second ends, said second member having its outer circumference smaller than the inner circumference of said first member, means to mount said second member on the interior of said first member providing an air gap between said first and second members, said second member being substantially shorter in its length than said first member, said first end of said first member terminating short of said first end of said second member, said second end of said first member terminating in means to attach to a vacuum line, means to close said air gap between said first and second members at the first end of the first member, said first end of said second member terminating in means to attach to a vacuum line, said second end of said second member terminating on the interior of said first member leaving a chamber between said second end of said second member and said second end of said first member, a third substantially tubular member, said third member having means for mounting said third member to the exterior of said first member, said third



member having first and second ends, said first end of said third member having means to attach to an air supply line, said second end of said third member communicating with said air gap between said first and second members,

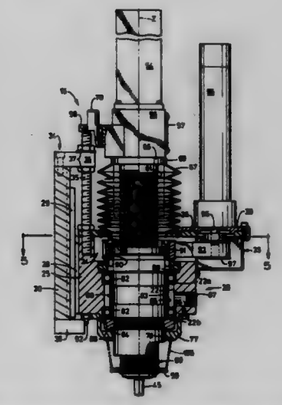
whereby, when compressed air is forced through said third member through said air gap into said chamber and when said vacuum booster manifold is activated by said vacuum line, particulates passing through said manifold mix with said compressed air in said chamber and said particulates are forced at an increased velocity through said vacuum line.

5,195,853

QUILL FEED AND SPINDLE DRIVE ASSEMBLY

Robert A. Dooley, Maineville, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 15, 1991, Ser. No. 685,627
Int. Cl.[5] B23B *47/20*; B23Q *5/32*
U.S. Cl. 408—137 **20 Claims**



1. A quill feed and spindle drive assembly comprising:

a housing having a bore formed along a longitudinal axis thereof;

an elongate rotatable spindle of predetermined fixed longitudinal length passing through said bore;

an externally threaded quill coaxially telescoped over said spindle, said quill slidably mounted in said housing for longitudinal reciprocation along said axis, and fixed against rotational movement relative to said housing, said quill and spindle being of substantially equal length and coextensive with one another and fixed together for simultaneous axial movement, said spindle being journaled for rotation relative to said quill;

a rotatable nut mounted over a portion of said quill in a threadable connection, said nut fixed against movement along said longitudinal axis relative to said housing, said nut providing a guideway for slidably moving and guiding said quill;

a spindle motor for rotating said spindle and connected to said quill for reciprocable movement therewith along said longitudinal axis; and

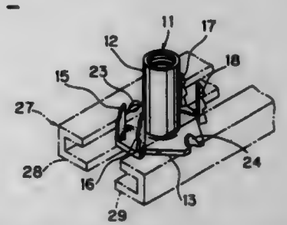
means for selectively rotating said nut relative to said quill to longitudinally reciprocate said quill, spindle and spindle motor along said axis and relative to said housing.

5,195,854

TEE NUT

Yutaka Nagayama, Osaka, Japan, assignor to Nagayama Electronic Industry Co. Ltd., Wakayama, Japan

Filed Dec. 18, 1991, Ser. No. 809,765
Claims priority, application Japan, Jun. 21, 1991, 3-149027
Int. Cl.[5] F16B *37/00*
U.S. Cl. 411—427 **4 Claims**



1. A tee nut integrally made of a metallic material, comprising a shaft portion and a flange portion projecting outward from a first end of said shaft portion, said shaft portion having a hollow cylindrical body internally formed with a female thread, said flange portion having two pairs of pawls extending toward a second end opposite to said first end of said shaft portion, said pairs of pawls being positioned diametrically opposite to each other and substantially radially outwardly of the flange portion, wherein pawls of a pair have a small circumferential spacing from each other, and pairs of pawls are spaced from each other by circumferential flange segments having a circumferential length larger than said small circumferential spacing between pawls of a pair, and projections in said circumferential flange segments at positions diametrically opposed to each other, said projections having an on-center circumferential spacing of about 90° from a neighboring pair of pawls, said projections extending toward said second end of said shaft portion.

5,195,855

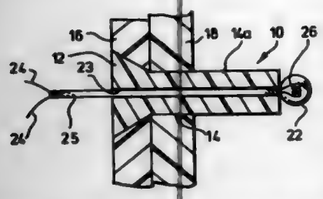
BLIND RIVET

Alan W. Atkinson, Rugby; Melanie J. Walsh, Braunston, and David Cater, Birmingham, all of England, assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed Apr. 14, 1992, Ser. No. 868,541
Claims priority, application United Kingdom, May 3, 1991, 9109604
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—43 **9 Claims**

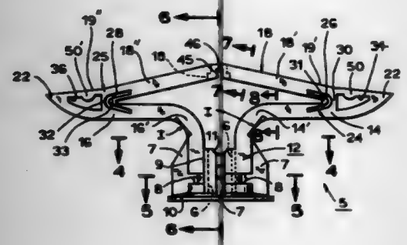
1. A blind rivet comprising a rivet head, a shank made at least partially of heat-softenable polymeric material projecting from one side of the rivet head, and force transmitting means

which projects from an opposite side of the rivet head, extends through the rivet head and along the shank, and engages a portion of the shank, the force transmitting means being arranged, when the rivet head is held stationary, to transmit force applied thereto on said opposite side of the rivet head so that the force is applied to said portion of the shank to cause said portion to deform to form a further rivet head opposed to the first-mentioned rivet head, transmitting means comprising



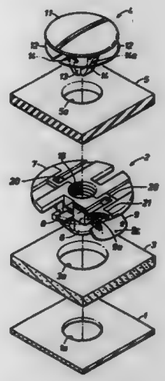
an anvil member engaging said portion of the shank, and pulling means passing through the rivet head and along the shank, the pulling means being connected to the anvil member, wherein the anvil member is made of an electrically insulating material and the blind rivet also comprises an electrical resistance heater embedded in the anvil member and arranged to be supplied with electrical current through the first-mentioned rivet head, the heater being operable to heat the anvil member from which heat is conducted to heat said portion of the shank.

5,195,856
DEFORMABLE FASTENING DEVICE
Thomas S. McSherry, Medford, N.Y.; Steven D. Townsend, and Philip S. Townsend, both of Waterbury, Conn., assignors to Titan Technology, Inc., Stamford, Conn.
Continuation-in-part of Ser. No. 751,702, Aug. 29, 1991, abandoned. This application Feb. 14, 1992, Ser. No. 836,136
Int. Cl.[5] F16B *13/04, 21/00*
U.S. Cl. 411—55 19 Claims



1. A fastener having a stem, a stop flange at one end of said stem having a diameter greater than the diameter of the stem, toggle arms at the opposite end of said stem, said toggle arms extending outwardly from an extended axis of said stem, toggle hinge means forming a part of said toggle arms and connecting said toggle arms to said stem for elastically biasing said toggle arms in the outwardly extended position, said toggle arms being pivotable about said toggle hinge means to a closed position extending substantially parallel with the extended axis of said stem, strap means extending across the extended axis of said stem between the extremities of said toggle arms for maintaining said toggle arms in the extended position, means connecting the extremities of said strap means to the extremities of said toggle arms, a mid-hinge formed centrally of said strap means at the extended axis of said stem and comprising means for pivoting the portions of said strap means extending laterally of the extended axis from an extended position with said toggle arms to a closed position substantially parallel with the extended axis, resilient biasing means extending between said strap and said toggle arms at positions inwardly displaced from said means connecting the extremities of said strap means and said toggle arms for retaining said strap means away from said toggle arms with said mid-hinge disposed at or over center to constitute said strap means as means for locking said toggle arms in the extended position.

5,195,857
FASTENER FOR A PLATE OR SHEET LIKE MEMBER
Kouji Hiramoto, Kanagawa, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Apr. 14, 1992, Ser. No. 868,147
Claims priority, application Japan, Apr. 18, 1991, 3-35241[U]
Int. Cl.[5] F16B *21/00*
U.S. Cl. 411—344 10 Claims



1. A fastener for mounting a plate or sheet-like member onto a support member, comprising:

a stem portion which is adapted to be passed through an opening provided within said plate or sheet-like member and a mounting hole provided within said support member;

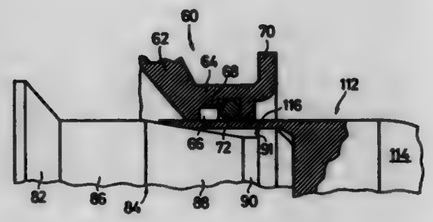
stem engagement means for securing said stem portion within said mounting hole of said support member;

a flange portion provided upon one end of said stem portion;

engagement means provided upon said stem portion so as to be moveable between a first position for enabling said engagement means to be passed through said opening of said plate or sheet-like member along with said stem portion, and a second position at which said engagement means engages said plate or sheet-like member so as to cooperate with said flange portion in securing said plate or sheet-like member between said flange portion and said engagement means prior to insertion of said stem portion through said mounting hole of said support member such that said fastener and said plate or sheet-like member comprise an assembly to be mounted upon said support member; and

elastic engagement means provided between said engagement means and said stem portion for selective retention of said engagement means at said second position.

5,195,858
FASTENER APPARATUS FOR LOCKING TOGETHER TWO COMPONENTS
Peter Dibbeler, Kirchheimbolanden, Fed. Rep. of Germany, assignor to Camloc GmbH, Kelkheim, Fed. Rep. of Germany
Filed Oct. 15, 1991, Ser. No. 775,522
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1990, 4032594
Int. Cl.[5] F16B *21/18, 39/00*
U.S. Cl. 411—353 15 Claims



1. A fastener apparatus for joining together first and second at least locally flat components having therethrough aligned holes, said apparatus comprising:

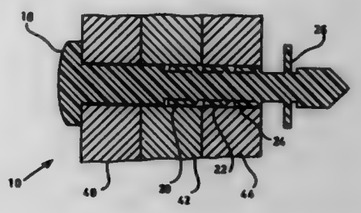
a closure pin insertable through the aligned holes in the components and lockingly securable to the first component, said pin having a head section to be supported at an outer side of the first component, a shank section to be inserted through the aligned holes and a threaded section, said shank section having an outer periphery including a tapered portion and a stop rim defining a stop face extending radially outwardly of said tapered portion, said stop rim having a maximum outer diameter less than a maximum outer diameter of said shank section other than said tapered portion;

a safety element to be mounted relative to the hole in the first component so as to be urged inwardly thereof, such that as said shank section of said pin is inserted in a direction through the hole in the first component said safety element is urged toward said outer periphery of said shank section, and such that when said stop rim is moved in said direction beyond said safety element, withdrawal of said pin from the first component in an opposite direction is prevented by abutment of said stop face with said safety element, thereby preventing complete extraction of said pin from the hole in the first component and securing said pin thereto;

a receptacle member positionable at an outer side of the second component and having a threaded fastening section engageable with said threaded section of said pin, thereby to join together the two components; and

means for, upon disengagement of said receptacle member from said pin, selectively enabling said pin to be removed from the first component without damage to said pin, said means comprising a releasing tool having a hollow cylindrical section having an inner diameter equal to or larger than said outer diameter of said stop rim and an outer diameter equal to or less than said outer diameter of said shank section, such that said hollow cylindrical section may be fitted over said stop rim and said tapered portion to cover said tapered portion and urge said safety element away from said tapered portion to a position such that it may not be abutted by said stop face.

5,195,859
FASTENER FOR JOINING A PLURALITY OF LAYERS
Harold C. Thornton, Jr., Anderson County, Tenn., assignor to The GlenScrew Company, Oak Ridge, Tenn.
Continuation-in-part of Ser. No. 569,612, Aug. 20, 1990, abandoned. This application Oct. 28, 1991, Ser. No. 783,505
Int. Cl.[5] F16B *19/00*
U.S. Cl. 411—510 22 Claims



1. A fastener for joining a plurality of layers of materials including a top layer defining an exposed surface and a bottom layer defining a second exposed surface, said layers provided with aligned apertures of a selected cross-sectional configuration, said fastener comprising:

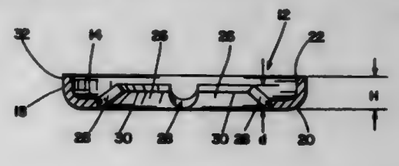
a shank member having a first end portion and a distal end portion, with an axial length portion between said first and distal end portions having a cross section to be closely received in said aligned apertures;

means associated with said shank member to limit passage of said shank member through said aligned apertures whereby said distal end portion extends from said second exposed surface of said bottom layer when said fastener is fully inserted into said aligned apertures;

a plurality of sets of fingers positioned at selected axial locations along said shank member between said first end portion and said distal end portion, said sets of fingers being integral with said shank member and extending substantially radially outward from said shank member, fingers of each of said set of fingers having a substantially uniform thickness along their length, said thickness being in a direction parallel to an axis of said shank member; and

wherein said shank member is provided with a recess immediately adjacent each set of said fingers in a direction toward said first end, said recess having a depth substantially equal to said thickness of said fingers so as to fully receive said adjacent set of fingers as said fingers are displaced toward said shank member as said shank member is passed through said apertures whereby fingers displaced into said recesses fill said aligned apertures to prevent relative transverse movement of said plurality of layers with respect to each other.

5,195,860
PUSH-ON TYPE FASTENER FOR AUTOMATIC FEED AND INSTALLATION EQUIPMENT
Willem J. Steyn, Jackson, N.J., assignor to TRW Inc., Cleveland, Ohio
Filed Jul. 20, 1992, Ser. No. 916,512
Int. Cl.[5] F16B *21/18, 37/16*
U.S. Cl. 411—526 7 Claims



1. A pushnut fastener for engagement on a cylindrical stud

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and particularly suited for conveying to the point of use through automatic feed systems, the pushnut comprising:

a metal body of relatively thin, uniform thickness having oppositely facing first and second exterior surfaces and a circular radial outer marginal periphery;

a central opening extending axially through the body between the oppositely facing exterior surfaces and defining a generally circular inner marginal periphery having resilient finger-like engagement portions for engaging and gripping the exterior of the cylindrical stud, the finger-like engagement portions being inclined to extend laterally of the body outwardly of the first exterior surface a maximum distance of d;

a circumferentially continuous cylindrical peripheral flange formed on the radial outer marginal periphery extending generally perpendicular to the first exterior surface and terminating in a continuous free end which lies entirely in a plane parallel to the first exterior surface outwardly thereof a distance D which is substantially greater than d, the outer free end being smooth and being radiused on the radial inner edge thereof; and,

a relatively large transition radius completely about the radial outer marginal periphery joining between the second face and the circumferentially continuous peripheral flange.

5,195,861

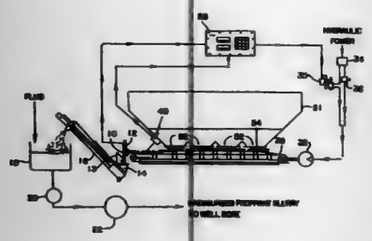
AUTOMATIC RATE MATCHING SYSTEM

Wayne A. Handke, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 607,908, Nov. 1, 1990, Pat. No. 5,102,281, which is a division of Ser. No. 337,501, Aug. 13, 1989, Pat. No. 5,004,400. This application Nov. 22, 1991, Ser. No. 796,271

Int. Cl.[5] B65G 47/19

U.S. Cl. 414—296 **1 Claim**



1. An apparatus for automatically controlling an amount of proppant delivered from a bulk delivery system to a hopper feeding proppant to a proppant metering device, wherein the bulk delivery system includes a storage container with proppant and delivery means for delivering proppant from the storage container to the hopper, said apparatus comprising:

an optical probe including at least four discrete signal generating means for generating respective discrete signals in response to a sensed level of proppant in the hopper, each of said at least four signal generating means adapted to be disposed at a respective vertical location in the hopper so that in response to the sensed level of proppant in the hopper being below a respective signal generating means, the respective signal generating means provides a respective first signal and so that in response to the sensed level of proppant in the hopper being at least at the respective signal generating means, the respective signal generating means provides a respective second signal;

a computer responsive to said optical probe, said computer including means for generating one of at least four different control signals in response to the sensed level of proppant indicated by said first and second signals of said at least four signal generating means, wherein said at least four different control signals include (1) a signal for stopping proppant delivery by the delivery means of the bulk delivery system when the sensed level of proppant in the hopper is above an uppermost one of said signal generating means, (2) a signal for decreasing a pre-existing delivery rate of the delivery means when the sensed level of proppant is above more than half the number of said signal generating means, (3) a signal for increasing a pre-existing delivery rate of the delivery means when the sensed level of proppant is below half the number of said signal generating means, and (4) a signal for operating the delivery means at its maximum delivery rate when the sensed level of proppant is below a lowermost one of said signal generating means; and

control means, connected to said computer and to the delivery means of the bulk delivery system and responsive to said one of at least four different control signals, for controlling the rate at which proppant is delivered from the storage container of the bulk delivery system to the hopper.

5,195,862

APPARATUS FOR LOADING AN UNLOADING FLAT ARTICLES WITH RESPECT TO A STORAGE CASSETTE

Didier Cruz, Grenoble, France, assignor to Commissionariat A l'Energie Atomique, Paris, France

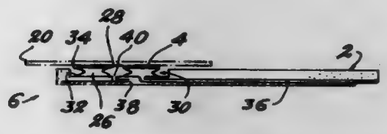
Filed Dec. 27, 1990, Ser. No. 634,416

Claims priority, application France, Dec. 29, 1989, 89 17449

The portion of the term of this patent subsequent to Feb. 2, 2010, has been disclaimed.

Int. Cl.[5] B65G 65/00

U.S. Cl. 414—416 **8 Claims**



1. Apparatus for use in the manufacture of integrated circuits for loading and unloading thin wafers to be stored in a cassette, the apparatus having at least one gripping and release means for a wafer in said cassette, wherein each gripping and release means comprises a track movable substantially solely in a horizontal direction and adapted to be inserted under said wafer and being terminated by a gripping end, said gripping and release means including a mobile part arranged in said gripping end, said mobile part having an upper surface and a flexible portion, said mobile part being movable between a raised and a lowered position and adapted to contact said wafer at said upper surface and lift said wafer in its raised position and release said wafer in its lowered position, said mobile part lying substantially wholly within said track in its lowered position and above said track in its raised position and means for moving said mobile part between said raised and lowered positions via said flexible portion.

5,195,863

EXCAVATOR LOADER

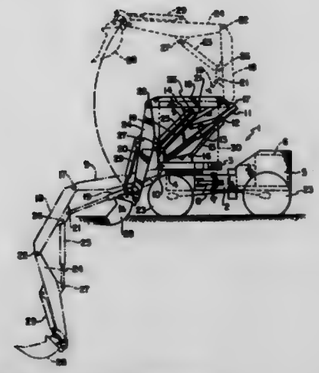
Pierre J. De Plagon, 7 Avenue du Parmelan, 74000 Annecy, France

Continuation of Ser. No. 613,927, Nov. 8, 1990, abandoned, which is a continuation of Ser. No. 467,323, Jan. 18, 1990, abandoned, which is a continuation of Ser. No. 185,310, Apr. 20, 1988, abandoned, which is a continuation of Ser. No. 530,288, Sep. 7, 1983, abandoned. This application Oct. 10, 1991, Ser. No. 776,674

Claims priority, application France, Sep. 8, 1982, 82 15231

Int. Cl.[5] E02F 3/28

U.S. Cl. 414—694 **9 Claims**



1. A loader-excavator, comprising:

a chassis mounted on wheels;

a turntable mounted on said chassis for rotation in a substantially horizontal plane about an axis, said turntable having a forward portion to be located at the front of said chassis and a rear portion,

a boom assembly including:

an inner boom having one end pivotally attached to said forward portion of said turntable for arcuate movement in a vertical plane,

an intermediate boom having one end pivotally connected to the other end of said inner boom for arcuate movement in a vertical plane relative to said inner boom,

an implement arm having one end pivotally connected to the other end of said intermediate boom for arcuate movement in a vertical plane relative to said intermediate boom, and a work implement attached to the other end of said implement arm;

each of said inner boom, intermediate boom and implement arm being independently pivotable relative to each other;

operating means for operating said boom assembly as a loader including

first means for pivoting said one end of said inner boom to pivot said inner boom to a first position in which said inner boom is angled back and upwards from the front portion of the turntable and extends backwards across said turntable toward its rear portion,

third means for pivoting said one end of said implement arm relative to said other end of said intermediate boom for locating said implement arm substantially perpendicular to said intermediate boom, and

second means for pivoting said one end of said intermediate boom relative to said other end of said inner boom to raise and lower the implement arm connected to the intermediate boom by moving said intermediate boom between a substantially horizontal position with its other end extending across and over the forward portion of the turntable with said implement arm directed downwardly to the ground and a substantially vertical position with said implement arm directed toward the horizontal;

said operating means operating the boom assembly as an excavator by operating said first means for pivoting said one end of said inner boom relative to said turntable for moving the inner boom from said first position for loading to a second position extending forwardly and outwardly of the forward position of said turntable and the chassis and substantially horizontally; and

operating said second means for pivoting to pivot one end of said intermediate boom relative to said other end of said inner boom so that said intermediate boom is moved to extend vertically downwardly relative to said inner boom and said implement arm extends below said intermediate boom to position the work implement for excavation.

5,195,864

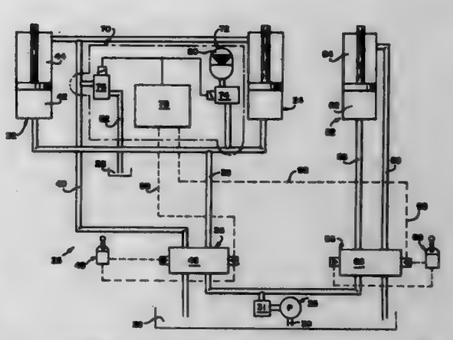
HYDRAULIC SYSTEM FOR A WHEEL LOADER

Frank J. Drake, and Bruce K. Jaecks, both of Wausau, Wis., assignors to Case Corporation, Racine, Wis.

Filed Aug. 28, 1991, Ser. No. 751,862

Int. Cl.[5] B66C 23/56

U.S. Cl. 414—699 **21 Claims**



1. A hydraulic system for vertically positioning an implement relative to a frame of a wheeled loader adapted to be driven over a field, said implement being carried at forward ends of a pair of lift arms pivotally connected to said frame, said hydraulic system comprising:

a pressurized fluid source;

hydraulic motor means connected between said frame and said lift arms for causing said implement to be lifted vertically relative to the frame in response to fluid flow to said motor means;

manually operated control valve means connected to said fluid source for selectively controlling fluid flow to said motor means;

fluid conduits interconnecting and directing fluid flow between said valve means and said motor means; and

manually actuated shock absorbing means including electro/hydraulic circuitry arranged in parallel with said fluid conduits, the electro/hydraulic circuitry of said shock absorbing means including fluid pressure responsive switch means switchable from a first state to a second state under the influence of pilot line pressures and upon initial lift of said implement in response to manual actuation of said control valve means such that when said switch means is in said first state, and the shock absorbing means has been manually actuated, the shock absorbing means is operatively disconnected from the hydraulic motor means thus blocking fluid flow in the fluid conduits, and when said switch means is switched into said second state, and the shock absorbing means is manually actuated, relative movement between said frame and said implement is allowed by providing fluid flow through said conduits to

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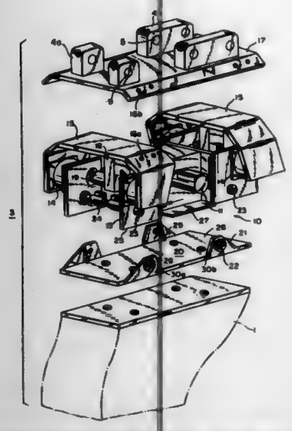
provide a dampening effect thereby enhancing handling characteristics as the loader is driven across a field.

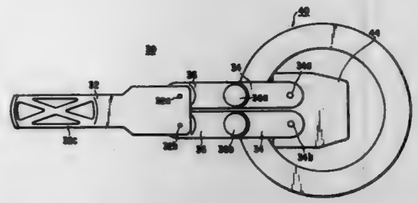
5,195,855
RAPID INTERCHANGEABILITY DEVICE FOR EARTH-MOVING DEVICES CARRYING VIBRATORS
Jean Koehl, 3 rue Varengue, 92340 Bourg La Reine, Hauts de Seine, France
Continuation of Ser. No. 691,663, Apr. 25, 1991, abandoned, which is a continuation of Ser. No. 358,022, May 30, 1989, abandoned. This application Jul. 21, 1992, Ser. No. 918,901
Claims priority, application France, May 30, 1988, 88 07169; May 29, 1989, 89 07000
Int. Cl.[5] E02F *3/28*
U.S. Cl. 414—723 20 Claims



1. A rapid interchangeability device for selectivity engaging construction tools to a shovel arm of an earth mover, said device comprising:
a connector (10–50),
a first rapid interchangeability connection plate (17–60), said first connection plate being connected to said connector (10) and having receiving ears (4, 4a; 51) with perforations (5, 9),
said shovel arm (2; 52) having connecting means comprising blocking pins with actuating means for controllably extending said pins from said arm into said perforations of said first connection plate,
a second rapid interchangeability connection plate (20; 57), said second connection plate having receiving ears (21; 56) with perforations (22; 55),
said connector (10; 50) having blocking pins (23; 54) with actuating means (24; 53) for controllably extending said connector blocking pins from said connector into said perforations of said second connection plate and guiding members (27; 58) operatively cooperating with said receiving ears of said second connection plate for guiding said connector into fixed engagement with said connection plate.

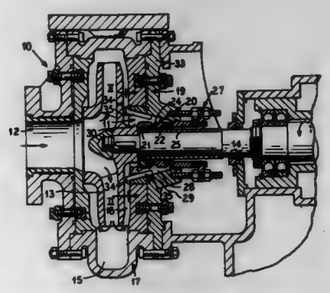
5,195,866
CONVEYING APPARATUS
Isahiro Hasegawa, Zushi, and Satoshi Kaneko, Yokohama, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan
Filed Nov. 29, 1991, Ser. No. 799,999
Claims priority, application Japan, Nov. 29, 1990, 2-334210
Int. Cl.[5] B65G *65/00*
U.S. Cl. 414—749 17 Claims

1. A conveying apparatus comprising first drive means having a first rotation shaft; a base rotated with a rotational drive of the first rotation shaft; second drive means having a second rotation shaft; a pair of first arms which, with the rotational drive of the second rotation shaft, are rotated with a pair of first supporting points as their centers, the pair of first supporting points being provided on the base in a spaced-apart relation; a pair of second arms rotated with a pair of second supporting points as their centers, the pair of second supporting points being provided on forward end portions of the paired



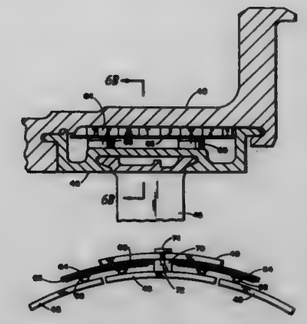
first arms; a support member having a pair of third supporting points rotatably supporting forward end portions of the paired second arms, the support member supporting an article to be conveyed; means for linearly moving the support member beyond the base by achieving a superimposed state between the first and second arms; and variation absorption means for absorbing one of a variation in a distance between the first supporting points and variation in a distance between the third supporting points.

5,195,867
SLURRY PUMP SHAFT SEAL FLUSHING
Thomas E. Stirling, Sugarloaf, Pa., assignor to Barrett, Haentjens & Co., Hazleton, Pa.
Filed Mar. 5, 1992, Ser. No. 847,775
Int. Cl.[5] F01D *25/18*
U.S. Cl. 415—111 13 Claims



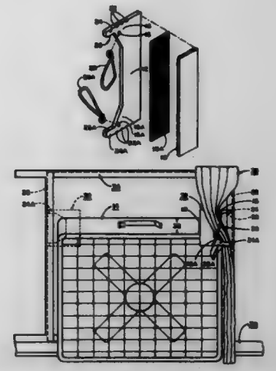
1. A pump assembly including a shaft driven rotary impeller operating in a pump chamber within a housing and adapted for pumping a stream of material-carrying liquid through the pump chamber, and comprising:
annular seal means operative about a portion of the impeller shaft where the shaft extend through a wall of the housing;
said seal means including relatively rotatable seal elements having relatively rotatably slidably engaged seal faces;
means on said wall for defining an annular seal chamber about said seal means and providing an entrance leading from said pump chamber into said seal chamber for receiving impeller driven seal lubricating and cooling liquid from said stream;
a cheek plate lining said wall within said pump chamber and having an inner diameter about said entrance; and
means for causing a sweeping flow of said stream liquid to move through said chamber with flushing effect comprising a plurality of vanes mounted on said cheek plate inner diameter and having ends at said entrance, said vanes extending from said entrance into said seal chamber and beyond said cheek plate generally toward said seal faces for impelling efficient cooling flow of the liquid directly onto said sealing surfaces and in flushing relation through said seal chamber wherein said entrance of each vane has a tail portion for assisting entry of liquid into said seal chamber, and a curved vane body extending into said chamber for causing said sweeping flow.

5,195,868
HEAT SHIELD FOR A COMPRESSOR/STATOR STRUCTURE
Larry W. Plemmons, Fairfield; Mark S. Rocklin, Wyoming, and Jay A. Benson, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Jul. 9, 1991, Ser. No. 727,186
The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.
Int. Cl.[5] F01D *25/08*
U.S. Cl. 415—177 11 Claims



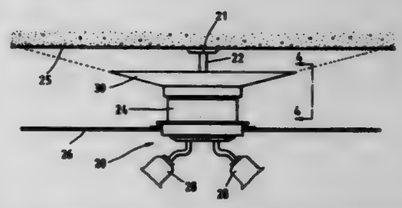
1. A method of assembling a gas turbine engine, the gas turbine engine including a casing defining in part at least one cavity for separating the flow of high energy compressed air from the casing, a thermal shield including a plurality of adjacent honeycomb cells each having an open end and a closed end, the method comprising the steps of:
associating the thermal shield in thermal insulating relation with the casing within the at least one cavity and arranging the thermal shield in engagement with the casing generally about at least some of the open ends of the honeycomb cells with the thermal shield adjacent the closed ends of the honeycomb cells being exposed to the at least one cavity during the associating step; and
resiliently biasing the thermal shield into engagement with the casing to impede and slow down the flow of high energy compressed air.
3. A gas turbine engine comprising:
a casing defining in part at least one cavity for separating the flow of compressed air within said engine from said casing;
means for thermally insulating said casing within said at least one cavity, said thermally insulating means including a plurality of generally adjacent honeycomb cells each having an open end and a closed end, said thermally insulating means being engaged with said casing generally about the open end of at least some of said honeycomb cells and being exposed to said at least one cavity adjacent said closed ends of said honeycomb cells; an
means for resiliently biasing said thermally insulatinq means into engagement with said casing.

5,195,869
WINDOW FRAME ADAPTER FOR PORTABLE BOX FANS
Larry C. Groenhoff, 816 W. 10th St., Loveland, Colo. 80537
Filed Aug. 18, 1992, Ser. No. 931,609
Int. Cl.[5] F01D *25/26*
U.S. Cl. 415—213.1 6 Claims



1. An adapter for attachment to a portable box fan for supporting said fan in an operable position on a sill of a window frame wherein said frame includes a track or groove for supporting said fan, said adapter includes:
(a) a base member of flat rigid material, and
(b) adjustable fastener means connected directly between said base member and an enclosure of said fan for fastening said base member to said fan enclosure and
(c) a protruding arm having one end connected to said base member and an opposite end having attaching means for attachment to said window frame whereby said fan is supported in said operable position wherein said attaching means comprises a contact finger which fits into said track or groove of said window frame, and
(d) window curtain retaining means, whereby a window curtain adjacent said window frame is prevented from being drawn into said fan.

5,195,870
CEILING FAN HAVING LIGHTING FIXTURE
Wun-Hui Liu, No. 2, Jiann Huon Lane, Jiann Huon Li, Taichung, Taiwan
Filed Dec. 30, 1991, Ser. No. 814,649
Int. Cl.[5] F04D *29/70*
U.S. Cl. 415—005 7 Claims



1. An improved ceiling fan having a lighting fixture for use on a ceiling comprising:
a shaft having first end fastened to the ceiling and having a length extending downwardly;
a main body fastened to a second end of said shaft,
a swivel portion rotatably mounted on a lower side of said main body;

a first lighting fixture mounted to said main body under said

capable of forwardly rotating a horizontal shaft of a fan

a lost-motion coupling between each of said paddles and said

tions with the upper surface of the liquid within the

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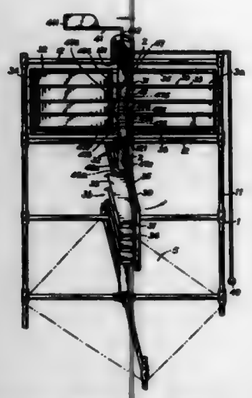
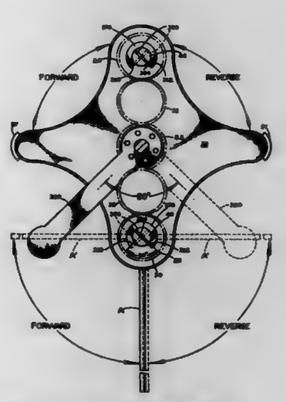
a first lighting fixture mounted to said main body under said swivel portion;
a plurality of fan blades fastened respectively at one end thereof to said swivel portion and between said lighting fixture and said ceiling; and
light reflecting means mounted on an upper side of said main body for emitting light on said ceiling to eliminate shadows created by light from said first lighting fixture on said fan blades.

5,195,871
SELF-RESTORED WINDMILL
Lee Hseeh-Pen, P.O. Box 16-317, Taipei, Taiwan
Filed Sep. 19, 1991, Ser. No. 762,910
Int. Cl.[5] F03D 7/04
U.S. Cl. 416—12 6 Claims



1. A self-restored windmill comprising:
a supporting frame having a plurality of vertical columns and plurality of sets of horizontal bracing rod cross, each set of bracing rod cross horizontally secured by the columns;
a central vertical transmission shaft rotatably mounted in the plural sets of horizontal bracing rod cross;
a fan blade means including an upper blade combination and a lower blade combination, each blade combination having a plurality of fan blade units, each unit having a horizontal blade shaft pivotally mounted in the central transmission shaft, a right-leaf vertical fan blade vertically fixed to a right portion of the horizontal shaft on a right side of the central transmission shaft, and a left-leaf horizontal fan blade horizontally fixed to a left portion of the horizontal shaft on a left side of the transmission shaft projectively perpendicular to said vertical fan blade, said upper blade combination being projectively separated from said lower blade combination at a right angle;
a wind-receiving restoring means operatively feathering the vertical fan blade of the fan blade means on the leeward at its leftward rotation towards windward, and restoring the horizontal fan blade to be vertical and ready for receiving wind force at its rightward rotation towards leeward; and
a power generator formed on a lower portion of the supporting frame driven by said transmission shaft;
said wind-receiving restoring means including: a wind-direction tracking means having a steering tail blade operatively aligned with a blowing wind direction, an actuating distributor having a first forward-rotation contactor formed on a right side portion of the distributor and a first reverse-rotation contactor formed on a left side portion of the distributor and a second forward-rotation contactor formed on a front side portion of the distributor and a second reverse-rotation contactor formed on a rear side portion of the distributor, an upper driving motor being capable of forwardly rotating a horizontal shaft of a fan blade unit of the upper blade combination through an upper clutch coupling and an upper driving means as actuated by said first forward-rotation contactor and said upper driving motor being capable of reversely rotating the horizontal shaft as actuated by said first reverse-rotation contactor, and a lower driving motor operatively rotating a horizontal shaft of a fan blade unit of the lower blade combination through a lower clutch coupling and a lower driving means, either forwardly as actuated by the second forward-rotation contactor, or reversely as actuated by the second reverse-rotation contactor.

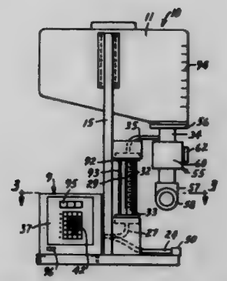
5,195,872
PADDLEWHEEL APPARATUS
Bruce S. Morgan, Embassy Park 3188 Lake Shore Dr., Pembroke Park, Fla. 33009
Continuation-in-part of Ser. No. 549,952, Jul. 9, 1990, Pat. No. 5,082,423. This application Jul. 29, 1991, Ser. No. 737,336
The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.
Int. Cl.[5] B63H 1/10
U.S. Cl. 416—111 4 Claims



1. A paddlewheel apparatus comprising:
first and second fixed supports spaced apart along a predetermined axis;
first and second sun gears respectively supported from said first and second supports on said axis;
first and second holders rotatable on said axis and extending around said first and second sun gears respectively, said holders being interconnected to rotate in unison;
a drive member drivably connected to said first holder on the outside and rotatable in unison with said first holder;
a first set of additional gears forming a first epicyclic gear train with said first sun gear and rotatably mounted within said first holder, said first set of additional gears including planet gears spaced apart circumferentially around said first sun gear;
a second set of additional gears forming a second epicyclic gear train with said second sun gear and rotatably mounted within said second holder, said second set of additional gears including second planet gears spaced apart circumferentially around said second sun gears;
and a plurality of paddles located between said holders and each coupled at its opposite ends to a corresponding planet gear of said first epicyclic gear train and to a corresponding planet gear of said second epicyclic gear train, each of said paddles hanging down substantially vertically and being unobstructed between said holders in all rotational positions of said holder;

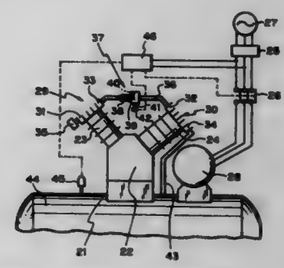
a lost-motion coupling between each of said paddles and said corresponding planet gears at its opposite ends, said lost-motion coupling permitting rotational lost-motion between each said paddle and its corresponding planet gears;
and wherein at least one said sun gear is free to rotate on said axis, additionally comprising lever means attached to at least one said sun gear for rotating said sun gear about its axis to alter the positions of the planet gears.

5,195,873
CHEMICAL TRANSFER SYSTEM
Steven W. Claussen, Clontarf Township, Swift County, and Michael D. O'Dougherty, Maplewood, both of Minn., assignors to C.A.P., Inc., Benson, Minn.
Filed Mar. 13, 1992, Ser. No. 852,375
Int. Cl.[5] F04B 49/02
U.S. Cl. 417—18 14 Claims



1. A system adapted for use to transfer a desired volume of liquid chemical from a supply of the liquid chemical to a container, said system comprising:
a frame;
a pump comprising
a pump housing mounted on said frame, said pump housing having a cavity and having inlet and outlet passageways communicating with said cavity, and
pumping means mounted for rotation in either direction relative to said housing, and adapted for correspondingly moving liquid through said cavity in either direction between said inlet and outlet passageways;
a motor having a fixed portion mounted on said frame, and a rotor rotatably mounted on said fixed portion and coupled to said pumping means, the motor being adapted to rotate the rotor portion and the pumping means in either direction;
counting means for counting part revolutions of said pumping means;
means adapted for connecting the supply of the liquid to the inlet passageway of the pump housing;
a wall defining a chamber having inlet and outlet openings;
liquid level indicating means for providing an indication of different volumes of liquid in the chamber including initial level indicating means indicating a predetermined small volume of liquid in the chamber compared to the total volume of the chamber and upper level indication means indicating a larger volume of liquid in the chamber than said initial level indicating means;
means for conveying liquid expelled from the outlet opening of said pump housing to the inlet opening of said chamber;
means adapted for conveying liquid expelled from the outlet opening of said chamber to the container;
pump calibrating means including
control means for operating said motor and thereby said pumping means to pump liquid into the chamber until the upper surface of the liquid within the chamber is aligned with the initial level indicating means;
operating means for operating said pumping means for a predetermined or determinable number of part revolutions with the upper surface of the liquid within the chamber initially aligned with said initial level indicting means to correspondingly pump a determinable or predetermined volume of the liquid into the chamber; and
means including a programmed computer for receiving an indication of the determinable number of part revolutions from said counting means or of the determinable volume from said level indicating means and for dividing the volume of the liquid pumped into the chamber by operation of said pumping means for said number of part revolutions by the number of part revolutions to thereby determine the volume of the liquid pumped by each part revolution of the pumping means; and
means for receiving an indication of the desired volume of the liquid and for operating said motor only for a determined number of part revolutions to deliver the desired volume of liquid to the container.

5,195,874
MULTISTAGE COMPRESSOR
Akiharu Odagiri, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan
Filed Jan. 10, 1991, Ser. No. 712,711
Claims priority, application Japan, Jan. 19, 1990, 2-160395
Int. Cl.[5] F04B 23/06, 49/08
U.S. Cl. 417—27 4 Claims



1. A multistage compressor comprising:
a compressor body including a lower pressure side compression part, a higher pressure side compression part and a motor for actuating said lower pressure side and higher pressure side compression parts to compress gas;
an electromagnetic switch connected to said motor to energize and de-energize the motor;
a tank connected to said higher pressure side compression part so as to receive pressurized gas therefrom and store the pressurized gas;
a pressure sensor which senses the pressure in said tank;
an intermediate conduit placing said lower pressure side and higher pressure side compression parts in communication with one another;
cooler means disposed in said intermediate conduit for cooling gas flowing therethrough, said cooler means having a condensate discharge outlet;
an electromagnetic valve disposed at said condensate discharge outlet; and
control means operatively connected to said pressure sensor and said electromagnetic switch for selectively energizing and de-energizing said motor by turning on and off said electromagnetic switch depending on signals from said pressure sensor, and said control means also operatively connected to said electromagnetic valve for opening said electromagnetic valve during a predetermined period of time after said electromagnetic switch is turned on to start or re-start the compressing operation of the compressor and for closing said electromagnetic valve upon the lapse of said predetermined period of time.

said vent means extends through at least one of said suction

their one ends on opposite faces of said body member and with their other ends movable and free from rigid connec-

5,195,880
ECCENTRIC SCREW PUMP WITH REVERSIBLE ROTOR

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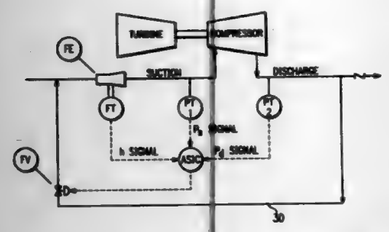
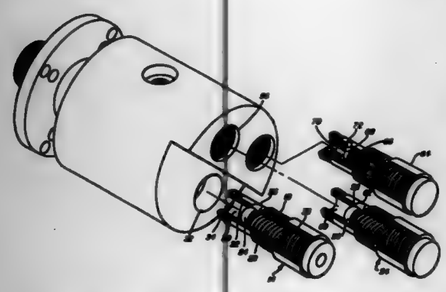
5,195,875
ANTISURGE CONTROL SYSTEM FOR COMPRESSORS
John R. Gaston, Allegany, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.
Filed Dec. 5, 1991, Ser. No. 803,197
Int. Cl.[5] F04B *49/00*
U.S. Cl. 417—282 27 Claims



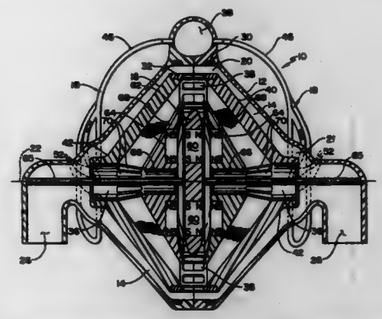
1. A method for determining the position of a compressor's operating point relative to the compressor's surge point, comprising the steps of:
(a) determining a surge line for the compressor as a function of a flow coefficient $(M\sqrt{RTZ})/P_s$;
(b) generating a process signal that indicates the compressor's operating point as a function of the flow coefficient $(M\sqrt{RTZ})/P_s$; and
(c) comparing the compressor's operating point with the surge line to determine the position of the compressor's operating point relative to the compressor's surge point.

5,195,876
PLUNGER PUMP
Peter N. Hansen, Dallas, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Apr. 12, 1991, Ser. No. 684,586
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—307 18 Claims



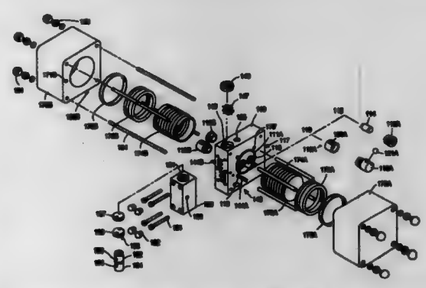
1. A plunger pump, comprising:
a housing;
an inlet and outlet on said housing;
a passage connecting said inlet and outlet defining a bore;
a plunger mounted in said housing for inward and outward movement to vary the volume of said bore;
a suction check valve assembly in said housing selectively sealing off said inlet from said bore and removably mounted to said housing at a point removed from said inlet;
a discharge check valve assembly in said housing selectively sealing off said outlet from said bore and removably mounted to said housing at a point removed from said outlet;
vent means to allow purging of trapped fluid from said bore; said vent means extends through at least one of said suction and discharge valve assemblies.

5,195,877
FLUID PUMP WITH MAGNETICALLY LEVITATED IMPELLER
Harold D. Kletschka, 1925 Noble Dr., Minneapolis, Minn. 55422
Continuation-in-part of Ser. No. 593,695, Oct. 5, 1990, Pat. No. 5,055,005. This application Oct. 7, 1991, Ser. No. 774,034
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—356 14 Claims



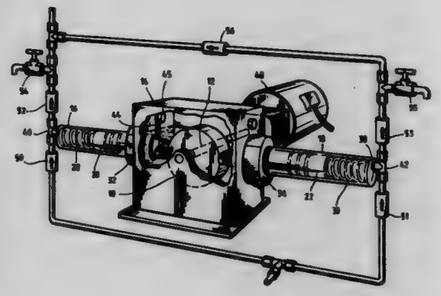
1. A method for stabilizing the position of a rotatable impeller suspended in fluid in a pumping chamber, the impeller having an axis of rotation, the pumping chamber having a pumping chamber inlet port and a pumping chamber outlet port, which comprises: the step of suspending the impeller in the fluid in the pumping chamber by repulsive permanent magnetic forces directed in opposed axial directions toward the impeller, and the additional step of conducting fluid from the periphery of the impeller and discharging the fluid in the pumping chamber in opposed radial directions toward the impeller, to thereby stabilize the impeller axially by levitating magnetic forces and radially by levitating fluid forces.

5,195,878
AIR-OPERATED HIGH-TEMPERATURE CORROSIVE LIQUID PUMP
John Sahiavo, and Robert Garber, both of Sunnyvale, Calif., assignors to Hytec Flow Systems, Sunnyvale, Calif.
Filed May 20, 1991, Ser. No. 703,192
Int. Cl.[5] F04B *45/02*; F16S *3/04*
U.S. Cl. 417—393 43 Claims



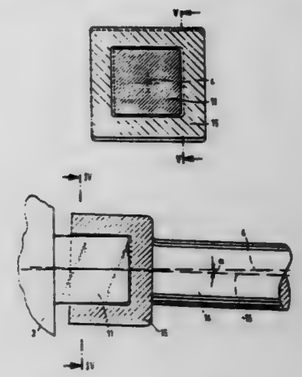
1. An air operated liquid pump comprising, in combination:
a center body member having liquid inlet and outlet passageways and air inlet and outlet passageways, p1 at least a pair of opposed bellows pumping members mounted at their one ends on opposite faces of said body member and with their other ends movable and free from rigid connection between said bellows and each bellows pumping member surrounded by a cooling chamber and compressible toward said center body member by air in an associated bellows compression chamber, and
means for passing air sequentially first to one and then to the other of said bellows compression chambers for successively pumping first from one and then the other of said bellows pumping members.

5,195,879
IMPROVED METHOD FOR INJECTING TREATMENT CHEMICALS USING A CONSTANT FLOW POSITIVE DISPLACEMENT PUMPING APPARATUS
D. Dwaine Reese, Richmond; Roy D. Sawyer, and Stanley G. Crow, both of Livingston, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.
Continuation of Ser. No. 425,566, Oct. 23, 1989, Pat. No. 5,066,199. This application May 8, 1991, Ser. No. 697,062
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] F04B *23/04*
U.S. Cl. 417—521 15 Claims



1. A pumping apparatus for delivering a constant flow of fluid, the apparatus comprising:
a pair of piston/cylinder combinations, each of said combinations having a piston and a cylinder, said piston being coaxially disposed within said cylinder and being adapted to move axially within said cylinder such that movement of said piston in a first axial direction draws fluid into said cylinder and movement of said piston in a second axial direction opposite said first axial direction discharges fluid from said cylinder; and
a rotatable cam having a surface being adapted to contact an end of each of said pistons so that rotation of said cam causes said pistons to move axially within said respective cylinders, said end of each of said pistons contacting said cam surface at locations which are 180° out of phase with each other;
said cam having a center of rotation which defines a plurality of radial distances between said center and said surface, wherein said radial distances generally increase at a first constant rate from an angle of 0° to a first preselected angle being less than 190°, wherein said radial distances generally increase at a second constant rate from said first preselected angle to a second preselected angle of about 190°, wherein said radial distances generally increase at said about first constant rate from said second preselected angle to a third preselected angle being greater than 190°, and wherein said radial distances generally decrease from said third preselected angle to an angle of 360°.

5,195,880
ECCENTRIC SCREW PUMP WITH REVERSIBLE ROTOR
Heinz Gruber, Seesen/Rhüden, Fed. Rep. of Germany, assignor to GD-Anker GmbH, Seesen/Rhüden, Fed. Rep. of Germany
PCT No. PCT/DE88/00599, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO90/03521, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 30, 1988, Ser. No. 477,971
Int. Cl.[5] F04C *2/107, 5/00*; F16D *1/10, 3/10*
U.S. Cl. 418—5 6 Claims



1. An eccentric screw pump, comprising a stator having an internal profile; a rotor having an external screw profile, operating with said internal profile of said stator, said rotor having a longitudinal central axis and two axial ends, a first coupling device provided at one of said ends of said rotor and a second coupling device provided at another of said ends of said rotor, said coupling devices being formed as multi-cornered spigets projecting form said ends of said rotor and axially outwardly beyond said ends of said stator, said spigets having central axes extending coaxially with respect to said longitudinal central axis of said rotor and having external dimensions which are not greater than the internal profile of said stator enabling a connection to a respective one of said ends of said rotor either to a drive system or to a further rotor.

5,195,881
SCREW-TYPE COMPRESSOR/EXPANDER WITH VALVES AT EACH AXIAL END OF ROTORS
Leslie C. George, Jr., P.O. Box 15743, New Orleans, La. 70175
Division of Ser. No. 682,306, Apr. 9, 1991, Pat. No. 5,121,607. This application Jan. 21, 1992, Ser. No. 822,860
Int. Cl.[5] F04C *18/16, 29/08*
U.S. Cl. 418—97 4 Claims

1. In a screw-type compresor/expander comprising a housing with an inlet end and an outlet end, and two matching profile rotors with male and female lobes helically wrapped to form endless screws, the improvement comprising
(a) end plates at each axial end of the rotors, said end plates having spaced ports; and
(b) valve gates selectively slidable in opposite directions with respect to each end plate to selectively open one of compression mode ports and expansion mode ports, respectively, whereby when the expansion mode ports are selected, the rotors and the housing enclose spaces initially opening to the inlet end that have a volume that expands as the rotors are turned and when the compres-

in said furnace from within the space defined by the cen- tube with an annular space between said inner tube and said

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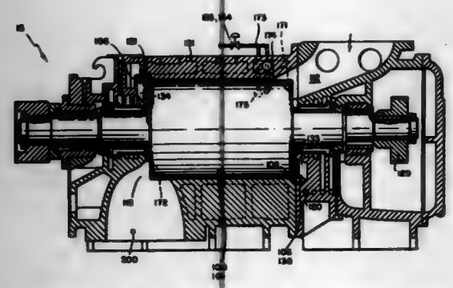
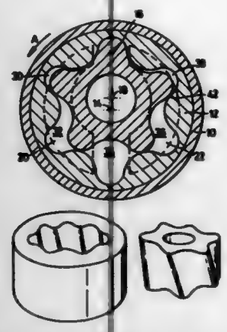
sion mode ports are selected, the rotors and the housing enclose spaces initially opening at the inlet end and then closing such that the volume of the spaces contracts as the rotors are turned.

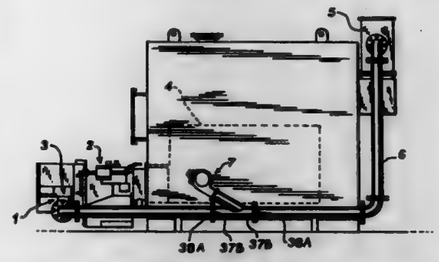


5,195,882
GEROTOR PUMP HAVING SPIRAL LOBES
Richard R. Freeman, Alcester, Great Britain, assignor to Concentric Pumps Limited, United Kingdom
Continuation of Ser. No. 697,803, May 9, 1991, abandoned. This application Aug. 4, 1992, Ser. No. 925,319
Claims priority, application United Kingdom, May 12, 1990, 9010686
Int. Cl.[5] F04C 2/107
U.S. Cl. 418—171 10 Claims



1. A gerotor pump comprising a body having a cylindrical cavity therein between a pair of end walls; an annulus having n+1 internally projecting lobes accommodated in said cavity for rotation about a first axis; a rotor accommodated in said cavity for rotation about a second axis parallel to said first axis and having n externally projecting lobes in mesh with all n+1 lobes of said annulus and forming a series of pumping chambers in an orbital path about said axes between said rotor and said annulus, said chambers increasing in volume in the first half of said orbital path and decreasing in volume in the second half of said orbital path; an arcuate inlet port in one of said end walls in axial communication with said increasing volume chambers and having an arcuate length less than 180°; and an arcuate outlet port in one of said end walls in axial communication with said decreasing volume chambers and having an arcuate length less than 180°, thereby enabling fluid to be drawn axially into the increasing volume chambers via said inlet port, travel orbitally about said axes into the decreasing volume chambers, and then exhaust axially via said outlet port, the lobes of each of said annulus and said rotor spiraling helically along their length through a fraction of a revolution which is such that one end of each of said lobes is between 5° and 15° out of phase with its opposite end.

5,195,883
FLUE GAS RECIRCULATION SYSTEM WITH FRESH AIR PURGE FOR BURNERS
Terrance B. Hanna, and Robert K. Black, both of Monroe, Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.
Filed Apr. 1, 1992, Ser. No. 861,468
Int. Cl.[5] F23J 7/00
U.S. Cl. 431—3 10 Claims

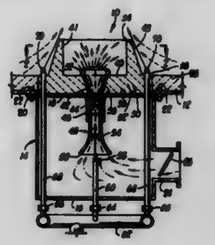


1. An induced flue gas recirculation system comprising:
a. a mixing assembly for mixing combustion air and a controlled volume of recirculated flue gas into a substantially homogeneous, combustible mix;
b. a burner assembly for mixing and combusting the combustible mix and a combustible fuel to produce flue gas;
c. an injection assembly, connected to and downstream from the mixing assembly and connected to and upstream from the burner, for receiving the combustible mix from the mixing assembly and injecting it with the combustible fuel into the burner assembly;
d. a combustion chamber connected to and downstream of the burner assembly for receiving and containing the combustible mix and flue gas;
e. an emissions stack connected to and downstream from the combustion chamber for venting the flue gas from the combustion chamber;
f. substantially gas-tight recirculating means for capturing and recirculating the volume of flue gas from the emissions stack to the mixing assembly; and
g. a purge assembly connected to the recirculating means for purging the recirculating means of flue gas with air prior to initiating the operation of the burner assembly.

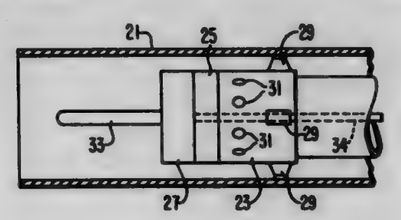
5,195,884
LOW NO_x FORMATION BURNER APPARATUS AND METHODS
Robert E. Schwartz, Tulsa; Samuel O. Napier, Sapulpa; Andrew P. Jones, Bixby, and Roger K. Noble, Tulsa, all of Okla., assignors to John Zink Company, A Division of Koch Engineering Company, Inc., Tulsa, Okla.
Filed Mar. 27, 1992, Ser. No. 858,663
Int. Cl.[5] F23C 5/00
U.S. Cl. 431—8 21 Claims

1. An improved burner apparatus for discharging a mixture of fuel gas and air into a furnace wherein said mixture is burned and flue gases having low NO_x content are formed therefrom comprising:
a refractory burner tile attached to said furnace having a base portion and a wall portion, the wall portion extending into said furnace, surrounding a central area of said base portion and having exterior sides which slant towards the central area of said base portion;
means connected to said burner tile for mixing a portion of said fuel gas with said air and discharging the resulting primary fuel gas-air mixture into a primary burning zone in said furnace from within the space defined by the central area of said base portion and the interior of said wall portion of said burner tile; and
at least one secondary fuel gas nozzle means positioned outside said wall portion of said refractory burner tile adjacent the intersection of an external slanted side of said wall portion with the surface of said base portion for discharging the remaining portion of said fuel gas adjacent to an external slanted side of said wall portion and spreading said fuel gas over said slanted side whereby said fuel gas mixes with flue gases in said furnace and burns in a secondary burning zone therein.

13. A method of discharging a mixture of fuel gas and air into a furnace wherein said mixture is burned and flue gases having a low NO_x content are formed therefrom comprising the steps of:
(a) mixing a portion of said fuel gas with said air to form a primary fuel gas—air mixture;
(b) discharging said primary fuel gas—air mixture into a primary burning zone in said furnace from at least one location surrounded by a wall which extends into said furnace and has exterior sides which are slanted towards said location; and
(c) discharging the remaining portion of said fuel gas from at least one location outside of said wall at the bottom of and adjacent to an exterior slanted side thereof whereby said fuel gas is spread over said slanted side and said fuel gas mixes with flue gases and air in said furnace space and is burned in a secondary burning zone therein.

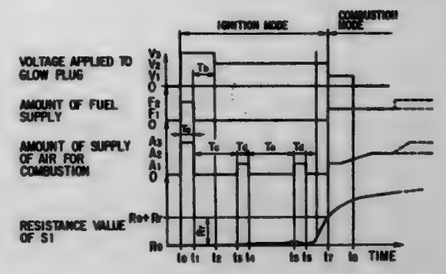


5,195,885
SELF-PROVING BURNER IGNITER WITH STABLE PILOT FLAME
Ramon A. Medina, Houston, Tex., assignor to Forney International, Inc., Addison, Tex.
Filed Feb. 4, 1991, Ser. No. 650,205
Int. Cl.[5] F23Q 9/00
U.S. Cl. 431—25 8 Claims



1. An igniter comprising an inner tube for receiving the fuel gas and having a closed distal end, an outer tube for receiving air concentric with said inner tube and having an open distal end, said inner tube having apertures communicating said inner tube with an annular space between said inner tube and said outer tube, said apertures being angled relative to the radii from the axis of said inner tube to impart angular momentum to the fuel gas flowing from said inner tube into the annular space between said inner tube and said outer tube so that a mixture of air and fuel gas will swirl as it flows from said apertures toward the open distal end of said outer tube, an electrically conducting spark disk on the distal end of said inner tube defining an annular gap between said spark disk and said outer tube, the air and fuel mixture moving in a swirling motion from said apertures in said inner tube through said annular gap between said spark disk and said outer tube, and means to generate an electrical spark across said annular gap between said spark disk and said outer tube to ignite the air and fuel mixture moving through said annular gap.

5,195,886
COMBUSTION HEATER
Hiroyuki Ida, Konan, Japan, assignor to Zexel Corporation, Tokyo, Japan
Filed Sep. 21, 1990, Ser. No. 586,581
Claims priority, application Japan, Sep. 29, 1989, 1-114678[U]; Oct. 31, 1989, 1-128313[U]
Int. Cl.[5] F23N 5/00
U.S. Cl. 431—30 20 Claims



1. In a combustion heater for heating a vehicle compartment or for keeping foods warm, said combustion heater including a combustor having a glow plug, voltage-applying means for applying a voltage to said glow plug, fuel supply means for supplying fuel to said combustor, air supply means for supplying air for combustion to said combustor, ignition-detecting means for detecting ignition of said combustor, and control means for controlling operations of said glow plug, said voltage-applying means, said fuel supply means, and said air supply means,
the improvement wherein said control means is responsive to an instruction signal instructing starting ignition of said combustor supplied thereto for starting to cause said voltage-applying means to apply a first predetermined voltage to said glow plug, and at the same time starting to cause both of said fuel supply means and said air supply means to operate for a first predetermined time period which is substantially shorter than a possible time period from the supply of said instruction signal to occurrence of ignition of said combustor, and when ignition of said combustor is detected by said ignition-detecting means, said control means starts to cause both of said fuel supply means and said air supply means to operate, and at the same time starts to cause said voltage-applying means to apply a second predetermined voltage lower than said first predetermined voltage to said glow plug.

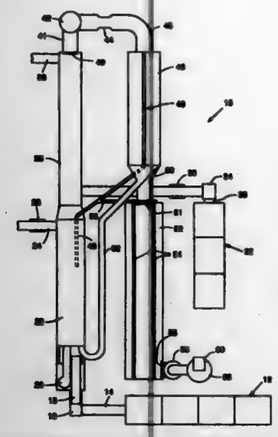
5,195,887

wall having a pore size of from about 0.5 micrometers to

locked, inside surface (241.40 m^2/K a0 the ends (2', 3')

coupling with said coating means of said anchor means

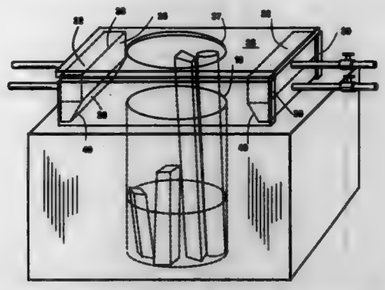
5,195,887
REMEDIATION OF HYDROCARBONS FROM SOILS, SAND AND GRAVEL
Charles R. Peterson, 4575 Corsetta Rd., Catheys Valley, Calif. 95306; Gregory M. Peterson, 5265 Laguna Ct., Byron, Calif. 94514; Daniel C. Hopper, 7775 Pebble Dr., Kingman, Ariz. 86401, and Trudy J. Weichlein, P.O. Box 154, Cathey's Valley, Calif. 95306
Filed Sep. 10, 1991, Ser. No. 756,855
Int. Cl.[5] F23G *5/20*
U.S. Cl. 432—14 **12 Claims**



10. A soil remediation process comprising the steps of:
in an apparatus comprising two generally cylindrically shaped rotary heaters positioned in series with one another,
(a) introducing a first lot of contaminated soil to a first end of a first one of said heaters;
(b) rotating said heater and heating said soil as it is transported from said first end to a second end of said first heater to volatilize said contaminants and produce a first lot of remediated soil and a first lot of hot gases and fines;
(c) removing said first lot of remediated soil from a second end of said first heater;
(d) introducing a second lot of soil to a second one of said rotary heaters;
(e) introducing said first lot of gases and fines to said second heater so as to heat said second lot of soil, to cool said first lot of fines and gases and to thereby form a second, cooler, lot of fines and gases;
(f) discharging said second lot of soil from a second end of said second heater; and
(g) discharging said second lot of fines and gases to a fines/gas separator.

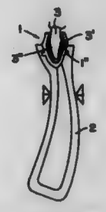
5,195,888
MULTI-LAYER FLUID CURTAINS FOR FURNACE OPENINGS
Sudhir K. Sharma, Stormville, N.Y.; Michael F. Riley, Danbury, Conn.; Mark S. Nowotarski, and Alan R. Barlow, both of Stamford, Conn., assignors to Praxair Technology, Inc., Danbury, Conn.
Filed Aug. 19, 1991, Ser. No. 746,750
Int. Cl.[5] F27B *7/00*; F24F *9/00*
U.S. Cl. 432—64 **28 Claims**

23. A diffuser for emitting a laminar fluid curtain across an opening to a contained volume, said diffuser comprising:
(a) a hollow tubular body having an inlet for fluid and a porous wall for emitting fluid in laminar flow, said porous wall having a pore size of from about 0.5 micrometers to about 100 micrometers;
(b) a housing enclosing said perforated body and having an outlet extending substantially the length of said tubular body, said outlet for directing fluid from said housing across the opening to the volume; and



(c) a screen across said housing outlet for dispersing the flow from said housing and for protecting said perforated body, said screen having a mesh size of from about 1 to about 50 openings per centimeter.

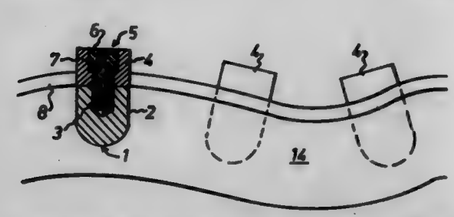
5,195,889
DEVICE FOR THE RECONSTRUCTION OF AN ANGULAR ZONE OF A TOOTH
Beat von Weissenfluh, Gentilino, Switzerland, assignor to Hawe-Neos Dental Dr. H. Von Weissenfluh SA, Gentilino, Switzerland
Filed Nov. 19, 1991, Ser. No. 797,805
Claims priority, application Switzerland, Dec. 19, 1990, 4025/90
Int. Cl.[5] A61C *9/00*
U.S. Cl. 433—40 **6 Claims**



1. A dental device for reconstruction of an angular zone of a tooth (3), comprising:
an angular matrix (1) made of a material transparent to light radiations able to cause photopolymerization of composite resins used for the reconstruction and externally carrying at least one projection;
forceps (2) for locking the matrix (1) on the tooth (3) on which an operation is being performed;
said forceps (2) being made of a material transparent to light radiations and having a shape suitable for allowing connection to said at least one projection to lock the matrix (1);
characterized by the fact that said at least on projection is a flap (1'') being extended along the entire contour of the matrix (1) and projecting outwardly of the matrix (1) that adheres to two walls (3', 3'') of the tooth (3), so that the matrix (1) is held in position by lateral thrust exerted on it by the forceps (2);
wherein the inside surface (1') of the matrix (1) has a shape substantially reproducing the shape of the tooth (3) on which it is to be applied and two ends (2', 2'') of the forceps (2) are dimensioned so that, when the forceps (2) are

locked, inside surfaces (241 40 , 2^{IV} of) the ends (2', 2'') themselves also form a shape substantially equal to that of the tooth (3); and
wherein the matrix (1) carries at least one hole (1^{IV}) in a zone which, when the matrix (1) is applied on the tooth (3), is substantially opposite an apex of the tooth (3) itself.

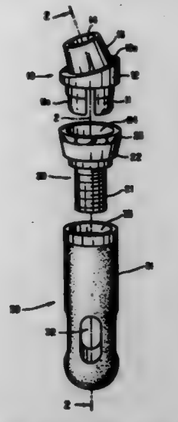
5,195,890
DEVICE AND METHOD FOR SUPPORTING ARTIFICIAL TEETH
Stig Johansson, and Anders Lindberg, both of Åhus, Sweden, assignors to Titanbron I Åhus AB, Stormgatan, Sweden
PCT No. PCT/SE89/00688, § 371 Date May 15, 1991, § 102(e) Date May 15, 1991, PCT Pub. No. WO90/05499, PCT Pub. Date May 31, 1990
PCT Filed Nov. 24, 1989, Ser. No. 689,775
Claims priority, application Sweden, Nov. 24, 1988, 8804257
Int. Cl.[5] A61C *13/12, 13/225, 8/00, 11/00*
U.S. Cl. 433—172 **12 Claims**



1. Device for supporting artificial teeth, comprising at least two non-bendable extension members and a tooth-supporting means extending therebetween, said extension members and said tooth-supporting means being an integral piece, each said extension member having a first end and a second end, said first end and said second end having end surfaces, said first end being securable to an anchoring element embedded in a jaw, said extension members forming extensions of said anchoring elements and having the same angles between their longitudinal axes as said anchoring elements, said tooth-supporting means extending between said extension members and being fixed to said second ends of said extension members, wherein at least one of said extension members has an end surface of its second end making an angle which is different from zero with the end surface of its first end, wherein said angle between the first and the second end surface is such that the second end surfaces of said extension members are located in and define parallel planes, and wherein said tooth-supporting means is fixed to said extension members prior to said use of the device in the jaw, said tooth-supporting means and said extension members being an integral piece, said tooth-supporting means having surfaces for engaging the extension members, said surfaces being located in said planes of their respective extension members.

5,195,891
ADJUSTABLE DENTAL IMPLANT SYSTEM
Josef M. Sale, 1145 Mountain Rd., Wilton, Conn. 06897
Filed Dec. 6, 1990, Ser. No. 623,135
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 **32 Claims**

1. An angularly alignable prosthetic implant attachment system for mounting a dental prosthesis on the jawbone comprising:
an implant means for permanently mounting to a cavity formed in a jaw bone, said implant means having a bore with a fastening means;
an anchor means having a complementary fastening means for fastening to said bore of said implant means, said anchor means having a seating means;
a prosthesis support means comprising an angled eyelet for coupling with said prosthesis and a coupling means for coupling with said seating means of said anchor means, said angled eyelet being angled at a fixed predetermined angle about a longitudinal axis of said coupling means,
wherein said seating means seats said prosthesis support means;
means for rotatably seating said coupling means of said support means so that said coupling means is freely rotatable through 360° about the longitudinal axis of said anchor means so that said support means is alignable about any of the 360° with respect to said anchor means while maintaining said fixed predetermined angle, while said coupling means of said support means is fully seated in said seating means of said anchor means; and
means for immobilizing said coupling means relative to said seating means once alignment has been made to prevent said support means from moving relative to said seating means.



5,195,892
BONE-INTEGRATED DENTAL IMPLANT SYSTEM
Juan J. Gersberg, Buenos Aires, Argentina, assignor to Odontit S.A., Buenos Aires, Argentina
Filed Jul. 23, 1991, Ser. No. 733,752
Claims priority, application France, Jul. 23, 1990, 90 09393
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—174 **7 Claims**

1. A bone-integrated dental implant system for supporting a dental prosthesis installed in the jawbone of a patient, comprising:
an implant including a cylindrical body having an externally threaded portion and a hemispherical dome at one end of the cylindrical body, the threaded portion having a plurality of vertically extending grooves extending through the threaded portion but stopping short of the threads toward

the other end of the cylindrical body and at least one pair

said character code member for moving said character

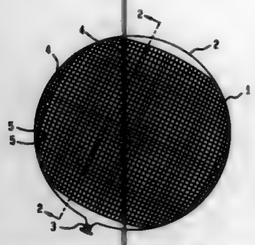
5,195,896

5,195,897

the other end of the cylindrical body and at least one pair of diametrically opposite depressions for securing the implant in the jawbone, the cylindrical body further having a smooth neck portion at the other end that extends to the threaded portion, a threaded internal bore at the other end with a first diameter, and a cylindrical cavity at the other end abutting said threaded internal bore and having a second diameter larger than the first diameter; and

a dental prosthesis supporting superstructure securable in the cylindrical cavity and including screw means for connecting it with the implant.

5,195,893
SHAPE RETAINING STENCIL FOR THREE DIMENSIONAL IMAGE PLACEMENT
Angelo J. Casale, 74-02 Thirteenth Ave., Brooklyn, N.Y. 11228
Filed Jan. 9, 1991, Ser. No. 639,114
Int. Cl.[5] G09B *11/00*
U.S. Cl. 434—87 **16 Claims**



1. A connect-the-marks guide for image placement, comprising

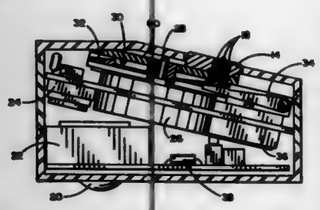
a sheet of moldable, shape-retaining material,

said material being composed of fibers arranged mesh-like in a grid to define a natural fiber spacing of already-present spaces between said mesh-like fibers, and

said sheet defining a plurality of holes arranged to suggest a pattern,

said holes being an enlargement of selected said already-present spaces formed by expansion of a plurality of said already-present spaces.

5,195,894
BRAILLE MOUSE HAVING CHARACTER CODE MEMBER ACTUATED BY SINGLE SOLENOID
Pieter W. C. J. le Blanc, Pollock Pines, and Timothy R. Maher, Orangevale, both of Calif., assignors to Nimbus, Inc., Rancho Cordova, Calif.
Filed May 15, 1991, Ser. No. 701,458
Int. Cl.[5] G09B *21/00*
U.S. Cl. 434—114 **20 Claims**



1. Apparatus for receiving from a computer signals identifying a character at a cursor position, and displaying said character in Braille format, comprising:

a) means for receiving character-identifying signals from said computer;

b) a character code member carrying character indicia;

c) motor means cooperating with said receiving means and said character code member for moving said character code member into predetermined positions in response to said character-identifying signals;

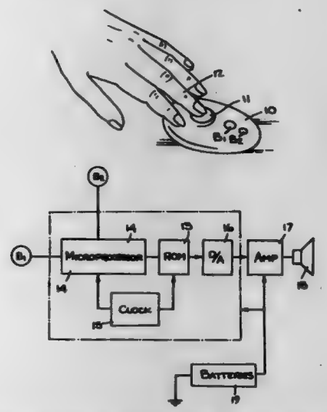
d) a set of Braille pins positioned adjacent said character code member, each pin being movable between a retracted position and an extended position in which it projects from said apparatus;

e) a single solenoid;

f) means for operating said solenoid in response to said character code member being in one of said predetermined positions; and

g) actuating means operatively interconnecting said solenoid, character code member, and pins so as to move selected ones of said pins between said retracted and extended positions in response to said character code nearest said pins, and to the operation of said solenoid.

5,195,895
SENTIC CYCLER UNIT
Manfred Clynes, 19181 Mesquite Ct., Sonoma, Calif. 95476
Filed Nov. 4, 1991, Ser. No. 787,254
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—236 **14 Claims**



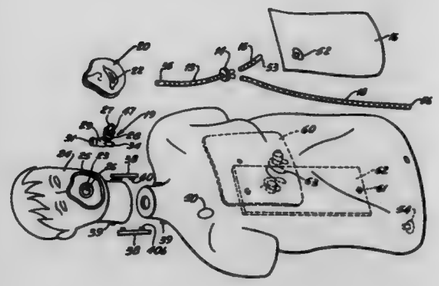
1. A sentic cycler unit provided with a finger rest engageable by a finger of a subject, said unit incorporating therein a microelectronic system comprising:

(a) a solid-state memory having digitally stored therein data constituted by a set of words representing different emotions and a click or other command signal instructing the subject to then express by finger pressure exerted on said rest, the emotion represented by a word selected by said set;

(b) a programmed microprocessor controlling the memory to produce a sentic cycle in the course of which the words are extracted from the set in a predetermined sequence, each extracted word being followed by a series of time-spaced clicks, the time spacing between the clicks in the series thereof following a given work in the set depending on the emotion represented by the word, whereby the data extracted from the memory takes the form of a digital signal; and

(c) means to convert the digital signal into an analog signal and to reproduce the analog signal so that it can be heard by the subject who after hearing a selected word, upon then hearing each click in the series, exerts finger pressure on the rest to physically express the emotion represented by the word.

5,195,896
MANIKIN CONSTRUCTION
Kevin Sweeney, Woodstock, Wis., and Collin Montigne, Lake Katrine, N.Y., assignors to Simulaids, Inc., Woodstock, N.Y.
Filed Feb. 28, 1992, Ser. No. 843,639
Int. Cl.[5] G09B *23/28*; A61H *31/00*
U.S. Cl. 434—265 **7 Claims**



1. A CPR training manikin including;

(a) a torso having a hollow chest cavity, an upper neck portion and a lower abdominal portion;

(b) a lung port at an outer wall of the torso in the general area of the chest; a disposable thermoplastic lung bag supported on said chest adjacent said lung port;

(c) a stale air exhaust port disposed in the torso remotely of the lung port;

(d) a separable, tiltable head mounted on the neck of the torso;

(e) a flexible nose/mouthpiece removably supported on said head portion;

(f) a rigid plate in said head underlying said nose/mouthpiece;

(g) a ball valve assembly removably mounted to said plate;

(h) said ball valve assembly including an inlet mouth tube communicating with a valve body having a ball chamber; an outlet tube communicating with the valve body through an orifice defining a valve seat; and a ball disposed in said chamber and displaceable by gravity from an orifice-opening to an orifice closing position;

(i) flexible airway tubing communicating between said outlet tube and a non-rebreathing one-way diaphragm valve;

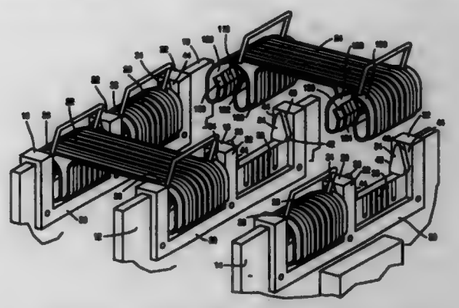
(j) said diaphragm valve having a housing defining an inlet, a first outlet port allowing ventilating air to flow to the lung bag, and a second exit port allowing lung ventilating air to flow outwardly from the manikin;

(k) an airway tube connecting said first outlet port to said disposable lung bag;

(l) an airway tube connecting said second outlet port to said stale air exhaust port; and

(m) said plastic lung bag is adapted to be inflated by breathing into the nose/mouthpiece while the head is tilted into a CPR-correct position in which the ball in the ball valve assembly is unseated, the orientation of the head in the CPR-correct position properly corresponding to the orientation of a head of a patient which will allow the administrator of CPR to inflate a human lung, and said ball valve is adapted to be closed by the displacement by gravity of the ball into the valve seat when the manikin head is not properly tilted or oriented into a position in which a human patient may be resuscitated by CPR techniques.

5,195,897
CONNECTOR AND OPENING ACCESSORY
Harold B. Kent, Portola Valley, and Gary Yasumura, Santa Clara, both of Calif., assignors to Beta Phase, Inc., Menlo Park, Calif.
Filed May 8, 1992, Ser. No. 880,496
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—67 **19 Claims**



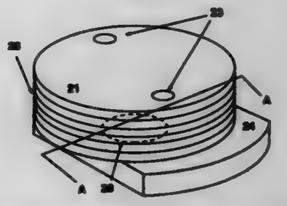
1. An opening accessory for a connector comprising:

a base member adapted to be secured to the edge of a printed circuit board like member, said base member being elongated and having opposite ends;

at least one set of first and second cam means connected to said base member, said first cam means positioned at one end of said base member and said second cam means positioned at the other end of said base member exposing portions of a printed circuit board like member between said first and second cam means, each said cam means having first and second camming surfaces to spread open a connector upon mating and de-mating to a printed circuit board like member; and

at least one alignment means connected to said base member to position end portions of a connector to be mated to a printed circuit board like member.

5,195,898
NON-SHEARING CONNECTORS FOR FLEXIBLE CIRCUITS
Brian J. Mary, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 17, 1992, Ser. No. 822,517
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—77 **3 Claims**



1. A non-shearing connector for flexible circuits comprising:

a) a solid retaining disc having a exteriorly threaded section designed to be compatible with a hollow interiorly threaded section of a connector body having a cut-away segment of wall,

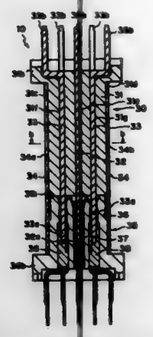
b) a slot milled in the bottom of the disc,

c) a pressure plate attached to the retaining disc,

c) captive stub means integral with the pressure plate and cooperating with the slot means,

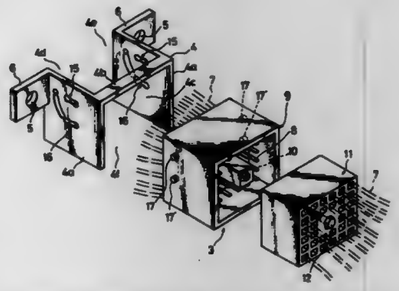
d) the slot means being of sufficient dimensions and configuration to allow the retaining disc to rotate freely,
e) a center stub protruding inwardly through the bottom of the conductor body comprising an insulating resin,
f) On the assembly of the connector by screwing the retaining disc into the connector body, the rotational movement of the pressure plate is restrained.

5,195,899
IMPEDANCE MATCHED ELECTRICAL CONNECTOR
Nobuo Yatsu; Hideo Miyazawa, and Kouji Watanabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed May 13, 1992, Ser. No. 882,005
Claims priority, application Japan, May 13, 1991, 3-107437
Int. Cl.[5] H01R *13/648, 13/652*
U.S. Cl. 439—101 **14 Claims**



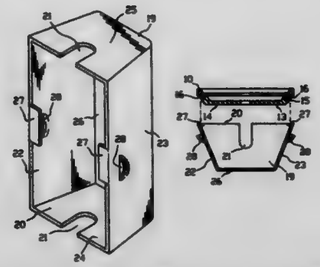
1. An impedance matched electrical connector comprising a plug connector member and a jack connector member matable with the plug connector member and affording an electrical connection between printed wiring boards, said plug connector member comprising:
a plug housing of insulating material having an axis, an outer peripheral surface about the axis, at least one elongated slotted opening arranged in a first plane parallel to the axis, a first row of small holes arranged in a second plane parallel to the first plane, and a second row of small holes arranged in a third plane parallel to the first plane and disposed on the side of the at least one elongated slotted opening remote from the first row of small holes; the outer peripheral surface including first and second opposite planar outer surface portions arranged in parallel relationship to the first plane in an overlapping, opposed relationship with respect to the at least one elongated slotted opening and the first and second rows of small holes;
at least one generally planar and elongated male conductor fitted in the at least one elongated slotted opening;
a first row of male signal terminals fitted in said first row of small holes, respectively;
a second row of male signal terminals fitted in said second row of small holes, respectively; and
a conductive ground shell attached to the outer peripheral surface of the plug housing, the ground shell having a first planar shell portion covering the first planar outer surface portion, such that the distance between the first planar shell portion and the first row of male signal terminals substantially equals the distance between the first row of male signal terminals and the elongated male conductor, and a second planar shell portion covering the second planar outer surface portion, such that the distance between the second planar shell portion and the second row of male signal terminals substantially equals the distance between the second row of male signal terminals and the elongated male conductor, whereby the impedance of the first and second rows of male signal terminals is controlled by the at least one elongated male conductor and the ground shell; and
the jack connector member comprising a jack housing of insulating material, at least one female conductor disposed for mating engagement with the elongated male conductor, a first row of female signal terminals disposed for mating engagement with the first row of male signal terminals, and a second row of female signal terminals disposed for mating engagement with the second row of male signal terminals.

5,195,900
ADJUSTABLE POSITION CONNECTOR MOUNTING STRUCTURE
Fumio Kumagai, and Mamoru Ono, both of Aichi, Japan, assignors to Yazaki Corporation, Japan
Filed Oct. 1, 1991, Ser. No. 769,454
Claims priority, application Japan, Oct. 2, 1990, 2-103375[U]; Jan. 7, 1991, 3-002739[U]
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—131 **6 Claims**



1. A connector-mounting structure for mounting a pair of mating connectors for connecting wires conducting electrical current, comprising:
a bracket mounted to a member of a vehicle;
a first connector held in the bracket, holding a plurality of first terminals with wires connected thereto;
a second connector fitted to the first connector, holding a plurality of second terminals with wires connected thereto;
means for supporting the first connector with the second connector fitted thereto in the bracket, said means for supporting the first connector with the second connector fitted thereto in the bracket comprising pivot pins formed in the first connector and center-side guide slots formed in the bracket in which the pivot pins are received; and;
means for retaining the first connector at a second position to which the first connector is moved from a first position by turning it in the bracket,
said means for retaining the first connector at the second position comprising stopper pins formed in the first connector, arc-shaped turn-side guide slots formed in the bracket so as to guide the stopper pins from the first position to the second position, and stopping members formed at the end of said turn-side guide slots for preventing the backward movement of the stopper pins from the second position.

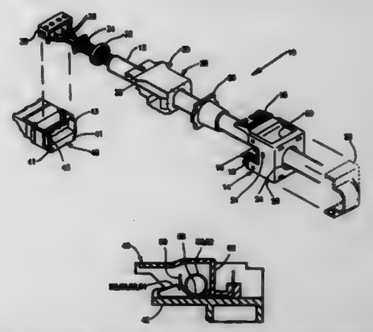
5,195,901
ELECTRICAL OUTLET SAFETY COVER
Giuseppe A. Correnti, Little Ferry, N.J., assignor to G & G New Idea Corporation, Little Ferry, N.J.
Continuation-in-part of Ser. No. 769,406, Oct. 1, 1991, abandoned. This application Jul. 8, 1992, Ser. No. 910,522
Int. Cl.[5] H01R *13/44*
U.S. Cl. 439—147 **2 Claims**



1. An electrical wall plug outlet enclosure and safety device comprising:
(a) a generally rectangular face plate having at least one electrical plug receiving opening detachably mounted to an electrical wall plug outlet for detachably receiving a box-like cover;
(b) a plurality of slots formed in vertical sides of said generally rectangular face plate;
(c) a generally rectangular shaped box-like cover having one open end for positioning over said face plate wherein said box-like cover is a truncated pyramid wherein the open end is rectangular and the four sides adjacent the open end taper toward the side opposite the open end and wherein at least one side of said box-like cover has an opening for receiving an electrical cord which si attached at one end to an electrical plug and at its other end to an electrical appliance and wherein finger holes are formed in the two longer sides of said box-like cover adjacent said flanges whereby when it is desired to disengage said box-like cover from said face plate one finger of each band grasps one of said finger hole while at the same time the thumb of each hand presses downwardly on the top of said box-like cover causing said flanges to be disengaged from said slots of said face plate; and
(d) a plurality of flanges formed on the longer sides of said box-like cover adjacent the open end whereby when said box-like cover is positioned over and pressured against said face plate said flanges engage said slots holding said box-like cover in locking engagement with said face plate.

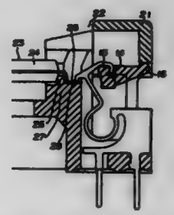
5,195,902
ELECTRICAL CONNECTOR
Ofer Bengal, Kfar Saba, Israel, assignor to Rit-Rad Interconnection Technologies Ltd., Telaviv, Israel
Division of Ser. No. 522,534, May 11, 1990, Pat. No. 5,052,940. This application Jun. 24, 1991, Ser. No. 719,768
Int. Cl.[5] H01R *13/658, 13/703*
U.S. Cl. 439—188 **11 Claims**

1. A hermaphroditic self shorting electrical connector comprising:
a housing;
a plurality of electrical terminals supported within the housing; and
electrical shunt means including at least one resilient conductive member having first and second end portions and an intermediate portion, positioned and configured such that when the connector is in an unmated condition, said first end portion and said intermediate portion of the resilient conductive member are each in electrical terminals and such that mating engagement of the connector with a corresponding connector produces engagement with said second end portion of the resilient conductive member which deflects the resilient conductive member such that said intermediate portion breaks contact with



the electrical terminal with which it was in contact with the result that said resilient conductive member is in electrical contact with one but not both of the two electrical terminals.

5,195,903
SOCKET FOR ELECTRIC PART
Kazumi Uratsuji, Tokyo, Japan, assignor to Yamaichi Electric Co., Ltd., Tokyo, Japan
Filed Dec. 19, 1991, Ser. No. 810,292
Claims priority, application Japan, Dec. 25, 1990, 2-413749
Int. Cl.[5] H01R *11/22*
U.S. Cl. 439—266 **5 Claims**



3. A socket for an electric part including an accommodating space for accommodating an electric part, and a plurality of contacts arranged in parallel relation to form rows of contacts along at least two opposing sides of said accommodating space, each of said contacts being provided with a contacting portion to be contacted with a contacting point of the electric part accommodated within said accommodating space, and a curved spring portion adapted to urge said contacting portion inwardly to obtain a contacting pressure with said contacting point of said electric part, wherein said socket further includes a pivotal lever pivotably supported along an external side of each of said rows of contacts for vertical pivotal movements about a fixed fulcrum, said pivotal lever having an operation portion formed on one end thereof and adapted to be operated to cause pivotal movement of said lever in a vertical direction, and an acting portion formed on the other end and adapted to exert an outward force against said contact, said contact having a latch portion which extends away from said spring portion in an opposite direction with respect to said contact portion such that said latch portion is spaced away from said contacting portion and from said curved spring portion, said latch portion being engaged with said acting portion and said acting portion being disposed outside of said curved spring portion, said operating portion of said pivotal lever being

5,195,906
having first and second ends, said first end terminating in

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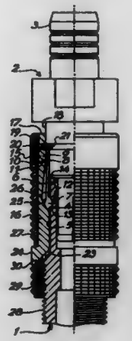
urged into an upper pivotal position by said spring portion of said contact, said acting portion exerting an outward tensile force to said latch portion upon a downward pivotal movement of said operating portion, in order to displace said contacting portion of said contact outwardly against a resiliency of said curved spring portion so as to separate said contacting portion away from the contacting point of the electric part.

5,195,904
COAXIAL ELECTRICAL CONNECTOR
Michel P. Cyvoct, Saint Etienne de Crossey, France, assignor to Radiall, Rosny sous Bois, France
Filed Dec. 11, 1991, Ser. No. 804,944
Claims priority, application France, Dec. 18, 1990, 90 15835
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—349 1 Claim

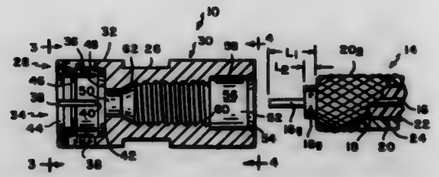
1. Quick locking and releasing coaxial electrical connector comprising two connector elements, one of said elements having a center contact of a pin type and the other of said elements having a center contact of a socket type; said two connector elements being adapted to axially engage at the time of connection; said one element including an external ground contact sleeve; an outer wall of said ground contact sleeve having an annular groove; the other connector element of said two elements including an external ground contact forming a socket of radial elasticity; the ground contact sleeve and elastic external ground contact socket engaging at the time of said axial engagement; said other element comprising a body having a recess in which there is lodged and retained an annular elastic keeper having radial projections; said keeper being adapted to engage the annular groove of said ground contact sleeve when the two connector elements are axially engaged; and a peripheral release sleeve slideably secured to the other connector element body and having an annular wall for engaging said elastic keeper and for pushing said elastic keeper into the recess so as to disengage the keeper from the groove of said ground contact sleeve characterized by said elastic external ground contact socket of the other connector element having a diameter corresponding substantially to the diameter of the annular wall of the peripheral release sleeve; said elastic external ground center contact socket having an end inside of the annular recess of the body; said annular wall having an end, the ends of said elastic center contact socket and said annular wall facing each other; the elastic keeper including inclined portions projecting radially outwardly relative to the center contact and disposed between the facing ends of the elastic external ground center contact socket and of the annular wall of the peripheral sleeve, said elastic keeper having a V shaped cross section with a truncated apex; a cylindrical central core and, on each side of the apex, an inclined lateral branch projecting radially outwardly toward the exterior; said lateral branches of the keeper forming between them an angle of about 90 degrees.

5,195,905
CONNECTING DEVICE
Marcello Pesci, Echandens, Switzerland, assignor to Interlemo Holding S.A., Switzerland
Filed Nov. 13, 1991, Ser. No. 791,452
Claims priority, application Switzerland, Apr. 23, 1991, 01207/91
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 3 Claims



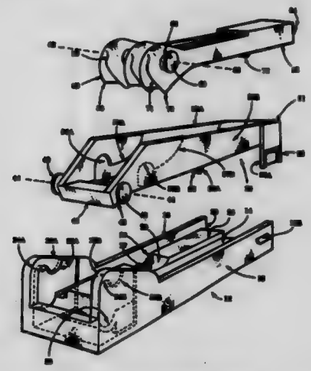
1. A connecting device comprising:
a) a first tubular body for connection to a conductor to enable transmission of signals, said first tubular body having an outer wall and a peripheral groove thereon;
b) a second tubular body for connection to a conductor to enable transmission of signals, said second tubular body being dimensioned and configured for engagement over said first body;
c) cylindrical sleeve means mounted on said second tubular body for sliding axial movement over a limited portion thereof, said cylindrical sleeve means having:
i) a plurality of peripheral resilient tongues each said tongue having a protruding stop dog disposed and dimensioned to penetrate into said peripheral groove upon engagement of said second tubular body over said first tubular body; and
ii) a radial wall having at least two diametrically opposed openings;
d) a cylindrical chuck mounted over said resilient tongues, said cylindrical chuck having:
i) first and second ends;
ii) at least two extension arms at the first of said ends, said extension arms respectively passing through said openings of said cylindrical sleeve means;
iii) means for axial engagement of said two arms with said second tubular body;
iv) a front resting face and a peripheral axial retention collar at the second of said ends; and
v) between said ends, inner frustoconical cam surface means for retaining said stop dogs in said peripheral groove, and inner chamber means between said cam surface means and the first of said ends for permitting release of said stop dogs from said groove upon relative axial displacement of said sleeve;
e) unlocking ring means mounted on said cylindrical chuck for sliding movement between said retention collar and said radial wall over a distance sufficient to permit release of the stop dogs into said chamber means by axially pushing against said radial wall;
(f) a threaded portion on said first tubular body, behind said peripheral groove; and
(g) nut means engaged said threaded portion for facing and engaging said front resting face of the cylindrical chuck.

5,195,906
COAXIAL CABLE END CONNECTOR
Andrew Szegda, Canastota, N.Y., assignor to Production Products Company
Filed Dec. 27, 1991, Ser. No. 815,062
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—394 13 Claims



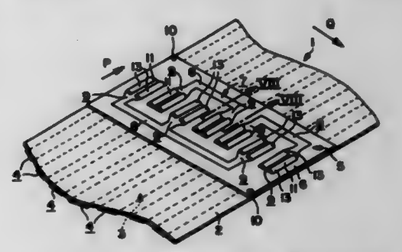
1. An end connector for connecting a coaxial cable to a port, comprising:
a tubular body having front and rear end portions;
cable attachment means associated with said rear end portion for attaching said connector to said cable; and
port attachment means associated with said font end portion for attaching said connector to said port, said port attachment means comprising a split ferrule having an open end and a partially enclosed end, said split ferrule having a plurality of longitudinal slits extending from said open end to an intermediate region to thereby define a plurality of resilient fingers, said split ferrule defining an inner surface which is inwardly tapered from a first portion proximate to said intermediate region to a second portion proximate to said partially enclosed end of said split ferrule, wherein said inwardly tapered surface is configured to contact the front end portion of said port so as to prevent signal loss between said port and said end connector.

5,195,907
TOOLESS ELECTRICAL CONNECTOR AND CONDUCTOR CABLE FOR USE THEREWITH
Joseph Urban, 3 Ocean Ave., Niantic, Conn. 06357
Filed May 31, 1990, Ser. No. 531,118
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—410 27 Claims



1. An electrical connector, comprising:
a base structure having a bottom segment and first and second opposed side walls attached thereto and including a passageway between said side walls for receiving an insulated conductor cable having wires embedded therein, said base structure further comprising electrical connection means;
a clamping arm pivotally attached to said base structure and having first and second ends, said first end terminating in at least one clamping means for clamping a length of conductor cable into pre-elicing alignment in said passageway of said base structure, and said second end for moving said first end into clamping contact with a conductor cable;
a splicing arm pivotally attached to said clamping arm, said splicing arm having first and second ends such that said first end terminates in at least one pivotable cutting means and at least one wire pusher element such that pressure on or about said second end of said splicing arm causes said pivotable cutting means and said wire pusher element to pierce an insulated conductor and splice some of the wire therein away from the insulation whereupon said cutting means and said wire pusher element engages the spliced wire and moves the wire into spatial and electrical connection with said electrical connection means.

5,195,908
MULTICIRCUIT CABLE CONNECTOR
Tetuo Yamamoto, Yokkaichi; Yasuharu Meriai, Suzuka; Kuniharu Kusumoto, Ouna Atsugi; Meriehiko Yamamoto, Utsunomiya, and Tetsuaki Wada, Inabe, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan
Continuation of Ser. No. 561,272, Jul. 30, 1990, abandoned, which is a continuation of Ser. No. 374,477, Jun. 30, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,844
Claims priority, application Japan, Jun. 30, 1988, 63-165367
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—422 17 Claims



1. A method of making electrical connections between continuous conductive strips of multicircuit cable, said cable comprising a plurality of said conductive strips extending substantially parallel to each other in a longitudinal direction with an insulation layer, said method comprising;
laying a matching circuit over or under said multicircuit cable, said matching circuit comprising a plurality of terminals corresponding to said plurality of conductive strips, and interconnecting portions which connect said plurality of terminals whereby at least a first terminal is connected to each of a plurality of other terminals,
pushing a first substantially U-shaped conductive clip having a bottom and upstanding sides through said insulation from a side opposite that of said matching circuit, said upstanding sides piercing said insulation and establishing electrical contact with said first terminal of said matching circuit, said bottom establishing electrical contact with a corresponding first conductive strip,
pushing at least a second U-shaped clip through said insulation from the same side as said first clip, said upstanding sides of said second clip establishing electrical contact with a second terminal of a plurality of remaining interconnected terminals of said matching circuit, said second terminal being one of a plurality of terminals connected to said first terminal by an interconnecting portion on said matching circuit, the bottom of said second clip establishing electrical contact with a second conductive strip corresponding to said second terminal.

5,195,909

sheath surrounding and protecting said braid and having an

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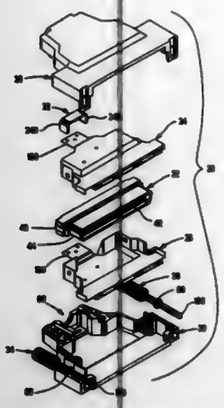
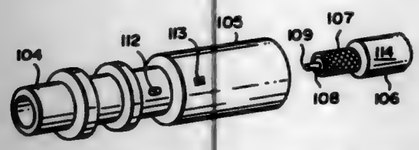
5,195,909
INSULATIVE BACKSHELL SYSTEM PROVIDING STRAIN RELIEF AND SHIELD CONTINUITY
John P. Hunt, Jr., Harrisburg, and Michael E. Shirk, Grantville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 5, 1992, Ser. No. 846,639
Int. Cl.[5] H01R *13/58, 13/648*
U.S. Cl. 439—465 24 Claims



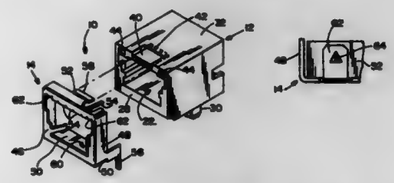
1. An electrical connector for terminating to conductors of a shielded cable, the cable having at least an region with an exposed cable shield, the connector comprising:
an insulated housing member having a cavity therein, the insulated housing member having a cable exit between the cavity and an exterior surface thereof;
a shield member receivable in the cavity, said shield member having a flange extending into the cable exit; and
a pressure member adapted to be received and secured in said cable exit, said pressure member adapted to be moved into the cable exit to compress a cable passing therethrough and to be secured to the insulated housing member proximate the cable exit such that the shield member flange is pressed into engagement with the exposed cable shield on the cable, whereby strain relief is provided and simultaneously electrical continuity is achieved between the cable shield and the flange.

5,195,910
COAXIAL CONNECTOR
Hideyuki Enomoto, and Ikujiro Mitani, both of Tokyo, Japan, assignors to NEC Corporation and Hirose Electric Co., Ltd., Tokyo, Japan
Filed Jan. 15, 1991, Ser. No. 641,269
Claims priority, application Japan, Jan. 16, 1990, 2-2877[U]
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—578 12 Claims



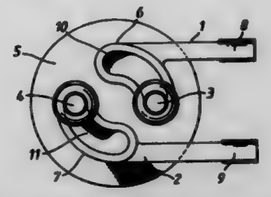
1. A coaxial connector for use in connecting a first cable having a terminal processed in advance, to a second cable, said first cable comprising a central conductor, an insulator surrounding said conductor, a braid surrounding and shielding said insulator and having an outer peripheral surface, and a sheath surrounding and protecting said braid and having an outer peripheral surface, said coaxial connector comprising:
a sleeve section having an inner peripheral surface in close contact with said outer peripheral surface of said sheath;
a shell section integral with said sleeve section in coaxial relation thereto and having a smaller inner diameter than the sleeve section and an inner peripheral surface; and
at least one viewing bore formed in said sleeve section through which the presence of said sheath may be viewed and a plurality of soldering bores formed in said shell section and arranged peripherally thereof and axially displaced from said viewing bore, said plurality of soldering bores cooperating with each other to form passage means through which molten solder can pass to fill up an annular gap form between said outer peripheral surface of said braid and said inner peripheral surface of said shell section, said molten solder being solidified to connect to said braid to said shell section.

5,195,911
SHIELDED ELECTRICAL CONNECTOR WITH IMPROVED SHIELD
Paul Murphy, Des Plaines, Ill., assignor to Molex Incorporated, Lisle, Ill.
Filed Jan. 22, 1992, Ser. No. 826,318
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—607 3 Claims



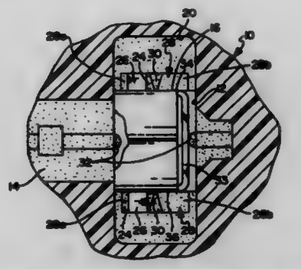
1. An electrical connector comprising;
a substantially rectangular cross-section dielectric housing having a front face, top, bottom and a pair of sidewalls enclosing a substantially rectangular opening extending rearwardly from the front face for receiving a mating connector,
a one-piece, substantially rectangular, stamped and formed metal shield including a front plate portion for abutting the front face of the housing and having flanges extending partially along the top, bottom and each of the sidewalls,
a locking finger portion extending from the top flange into a locking recess in the outside of the top wall,
a grounding spring portion extending rearwardly from the front plate into the opening inside the top wall for engagement by the mating connector,
a grounding spring finger extending rearwardly from the front plate into the opening inside each of the sidewalls for engagement with the mating connector,
a barb projecting from the bottom flange for engaging a recess in the outside of the bottom wall to lock the shield onto the front of the housing,
a pair of substantially rectangular slots located in the front face of the housing between the opening and the top wall thereof, each slot having its major surfaces substantially parallel to the top wall,
a pair of locking tabs extending rearwardly from the flange, each tab having a generally planar configuration and including a locking barb formed within the plane thereof projecting into its respective slot to prevent movement of the shield during the engagement of the grounding spring portion by the mating connector and thereby preventing lifting of the locking finger portion of the shield out of the locking recess on the outside of the top wall.

5,195,912
ELECTRICAL CONNECTORS
Edward R. Lintott, London, England, assignor to Lucas Industries, England, United Kingdom
Filed Jan. 28, 1992, Ser. No. 826,978
Claims priority, application United Kingdom, Feb. 5, 1991, 9102465
Int. Cl.[5] H01R *21/00*
U.S. Cl. 439—685 10 Claims



2. An electrical connector for forming an electrical connection to a pair of electrical terminals, the electrical connector comprising first and second electrical connection members each having a respective terminal-receiving slot and forming, in use, an electrical connection between a said terminal received in the slot and an electrical conductor attached to that electrical connection member, wherein the terminal-receiving slots span at least opposite quadrants of a circle passing through the two electrical terminals received in the terminal-receiving slots,
and the electrical connection members are configured to provide sites of attachment for the electrical conductors at locations that are independent of the angular orientation of the electrical terminals.

5,195,913
TERMINAL BLOCK HAVING IMPROVED TERMINAL CAVITY
Bradley A. Shattuck, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 767,449, Sep. 30, 1991, abandoned. This application Sep. 3, 1992, Ser. No. 940,156
Int. Cl.[5] H01R *13/432*
U.S. Cl. 439—748 1 Claim



1. In a terminal block having a terminal cavity that houses a female terminal right side up or upside down in the terminal cavity, the female terminal being three sided and having a deflectable lock tang that projects rearwardly and outwardly, the terminal cavity extending through the terminal block and having a front opening for receiving a mating terminal blade and a rear opening by means of which the female terminal is inserted into the terminal cavity, the terminal cavity also having internal projection locks associated with its respective top and bottom walls that cooperate with the deflectable lock tang to lock the female terminal in place when it is inserted into the terminal cavity through the rear opening, the terminal block having wide axial slots in its respective top and bottom walls of the terminal cavity that are associated with the respective internal projection locks, the wide axial slots extending from the front opening of the terminal cavity to forwardly facing shoulders of the internal projection locks, the improvement comprising:
an axial rail that depends from each of the top and bottom walls of the terminal cavity to divide each of the wide axial slots into two narrower parallel slots each of which is sized to accommodate the cooperating lock tang of the female terminal, the axial rails engaging opposite sides of the female terminal along substantially the entire length of said opposite sides to locate the female terminal vertically in the terminal cavity, said rails also extending for the full length of said slots for locating the female terminal in the terminal cavity in the vertical direction more precisely and for preventing improper insertion of a mating blade terminal between the female terminal and the slotted top or bottom walls of the cavity, and
positioning ribs that project into the terminal cavity from its side walls to locate the female terminal laterally in the terminal cavity so that the lock tang is properly disposed in one of the narrower slots where the longitudinal rails do not interfere with the proper locking function of the lock tang.

5,195,914
TWO-STAGE TILT CYLINDER MECHANISM FOR MARINE PROPULSION STERN BRACKET ASSEMBLY
Gregory J. Binversie; David C. Calamia, both of Grayslake; David J. Hall, Zion, all of Ill., and H. Norman Petersen, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 25, 1991, Ser. No. 659,901
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—56 21 Claims

13. A shock absorber for a marine drive of the type which has an assembly which permits movement of the drive relative to a boat to which the assembly is adapted to be attached, said assembly having a first mounting means attached to said marine drive and a second mounting means adapted to be attached to the boat, the first and second mounting means being pivotable relative to one another, said shock absorber comprising:
a cylinder having a cylindrical inner bore adapted to receive fluid therein, a first end of the cylinder having an end wall with an aperture therein adapted to receive a rod means in generally sealing engagement, said cylinder having an end wall at the second end thereof and attachment means located at said second end, said attachment means being adapted to be connected to one of said first and second mounting means;
an elongated cylindrical slider element moveable within said cylinder bore, said slider element having an end wall near the first end of said cylinder and a large aperture in said end wall adapted to receive a rod means in generally sealing relation;
a piston means having a rod means attached thereto, said

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piston means having an outer diameter in sliding engagement with the inner surface of said slider element, said rod means extending through said aperture in said slider element and through said cylinder first end wall and having an attachment means located at the outer end portion thereof adapted to be connected to the other of said first and second mounting means;

said piston means having a plurality of apertures of a first predetermined size located therein adapted to pass fluid from said bore to the interior of said slider element during movement of said piston means toward said first end of said cylinder;

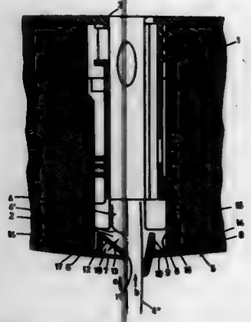
said slider element having a plurality of apertures in said end wall that are in fluid communication with the apertures of said piston means, said apertures of said slider element being of a second predetermined size that is smaller than said first predetermined size, said slider element having an inwardly directed stop means adapted to contact said piston means so that movement thereof toward said second end of said cylinder will move said slider element toward said second end after the piston means comes in contact with said stop means.

5,195,915

SEALING LIP OF PLASTIC FOR THE LOWER END OF THE INLET OPENING FOR A DAGGER BOARD HOUSING AND DAGGER BOARD, PARTICULARLY OF SAILBOARDS

Marc Naeser, Im Harras 10, D-6100 Darmstadt, Fed. Rep. of Germany

Filed Sep. 9, 1991, Ser. No. 756,966
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1990, 9012804[U]; Sep. 21, 1990, 4029937
Int. Cl.[5] B63B *1/00*
U.S. Cl. 441—79 4 Claims



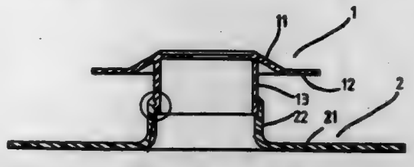
1. A lip seal assembly for the bottom closure of an inlet opening in a board hull for dagger board housing and dagger board, comprising: one mounting strip of a hard synthetic resin attached respectively on each side of the inlet opening in the board hull and being flush with the profile of the hull below the waterline, and a sealing lip of an elastic synthetic resin, produced together with said mounting strip as an extruded profile, said sealing lips forming an elastic closure for the inlet opening for dagger board housing and dagger board, said mounting strip exhibiting a U-profile with an inner and an outer, short leg, said legs being joined by means of a connecting web, said sealing lip adjoining the connecting web of the mounting strip on the side of the outer leg and being formed, on a longitudinal side facing away from the mounting strip, into a rounded sealing edge, said rounded sealing edge passing over into an elastic supporting leg oriented obliquely upwardly, said supporting leg being attached to a free terminal edge of the outer leg of the mounting strip and constituting with said outer leg and said sealing lip an elastic hollow-profile strip; and said mounting strip being attached with the inner leg in a corresponding groove in the board hull, whereby the inner surface of the connecting web contacts entirely or partially a rim of the inlet opening.

5,195,916

DUAL DISC FLYING TOY WITH FLAT LOWER MEMBER

Ming-Long Her, No. 24, Alley 3, Lane 42, Sec. 2, Hsiang Shang Rd., Taichung, Taiwan

Continuation of Ser. No. 695,338, May 3, 1991, abandoned. This application Jun. 29, 1992, Ser. No. 905,224
Int. Cl.[5] A63H *27/00, 27/127;* A63B *65/10*
U.S. Cl. 446—46 2 Claims



1. A causer-shaped flying toy comprising:

a) a circular base disc having a substantially flat and thin configuration, a top connecting portion extending upwardly from a top surface of the base disc at the center thereof, and the top connecting portion including an inner wall surface and an annular groove formed around the inner wall surface;

b) a circular top disc having an arched top surface and a bottom connecting portion extending downwardly from a bottom surface thereof, the bottom connecting portion including an outer wall surface and an annular projection around the outer wall surface, and the top disc being configured to provide an aerodynamic lift exceeding that of the base disc;

c) the annular projection of the bottom connection portion being engaged within the annular groove of the top connecting portion to secure the top disc to the base disc; and

d) the outer diameter and weight of the base disc exceeding the outer diameter and weight of the top disc to disposed the center of gravity of the toy in the base disc, thereby permitting the toy to always right itself and maintain a normal flying position with the top disc being disposed above the base disc when the top is thrown into the air.

5,195,917

TEAR-APART STRESS RELIEF DOLL AND METHOD

Mary Russell, Rte. 1, Box 1201, Eastsound, Wash. 98245, and Cheryle Karaikis, P.O. Box 178, Orcas, Wash. 98280, assignors to Mary Russell, Eastsound and Cheryle Karaikis, Orcas, both of Wash.

Continuation of Ser. No. 458,895, Dec. 29, 1989, abandoned. This application May 20, 1992, Ser. No. 887,409
Int. Cl.[5] A63H *3/16, 3/00, 3/02, 3/36*
U.S. Cl. 446—97 4 Claims

1. A method for relieving tension, comprising:

providing a stuffed doll simulating a sports referee with indicia simulating a referee uniform, the doll representing an actual sports referee whose actions can constitute a source of tension-inducing stress, the doll having

a torso portion; and

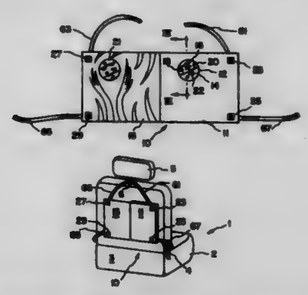
leg elements, arm elements, said arm elements mounting a releasable attachment means and terminating in a simulated hand and said leg elements comprising a fabric casing, the fabric extended into an integral flap which mounts a releasable attachment means, a flag attached to one of said hands and a head element with releasable attachments, at least some of the elements being removably attached to the torso portion by said attachment means, said elements selectively torn off the torso portion in response to an action of the actual sports referee, such as in the event of a bad call, and the removably-attached elements subsequently replaced after user tension has been relieved.

5,195,918

CHANGEABLE MOBILE

Judith A. Mozes, 4267 W. 63rd St., Cleveland, Ohio 44144

Filed Oct. 30, 1991, Ser. No. 785,010
Int. Cl.[5] A63H *33/00*
U.S. Cl. 446—227 4 Claims



1. A changeable mobile, comprising:

a) a first page-like structure having an aesthetic design on one face thereof;

b) a plurality of second page-like structures each having first and second faces and an aesthetic design on each of said first and second faces, said second page-like structures being hingedly connected to said first page-like structure;

c) said mobile having a first configuration with said first page-like structure laterally adjacent one of said second page-like structures with a first face thereof facing in a same direction as said one face, said one of said second page-like structures being pivotable to a position overlying said first page-like structure with a second face thereof exposed whereby a first face of another of said second page-like structures is thereby exposed to view;

d) attachment means for attaching said mobile on a fixed object; and

e) each said aesthetic design including a container filled with liquid and a plurality of objects floating in said liquid.

5,195,919

PANEL PIECE COMBINATION TOY

Bungo Hasegawa, Machida, Japan, assignor to Ozen Corporation, Machida, Japan

Filed Dec. 11, 1991, Ser. No. 807,124
Claims priority, application Japan, May 29, 1991, 3-126005
Int. Cl.[5] A63H *5/00*
U.S. Cl. 446—397 4 Claims

1. A panel piece combination toy comprising:

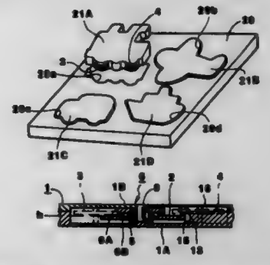
(a) at least one panel piece comprising a casing;

(b) a member matched with the panel piece and combinable with the panel piece; and

(c) means for generating sound formed in the panel piece, the means for generating sound comprising:

(1) a disk record disposed in the casing, the disk record having an upper surface and a lower surface, the upper surface having a modulated groove formed therein,

(2) a driving mechanism disposed in the casing for rotating the disk record,



(3) a pickup for scanning the modulated groove in the disk record, and

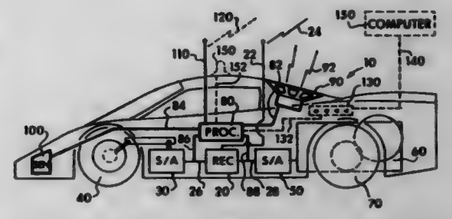
(4) a diaphragm formed by making at least a part of a side of the casing thin, the pickup abutting against the diaphragm.

5,195,920

RADIO CONTROLLED MODEL VEHICLE HAVING COORDINATED SOUND EFFECTS SYSTEM

Harry B. Collier, 1356 E. Goldsmith Dr., Highlands Ranch, Colo. 80126

Continuation of Ser. No. 312,063, Feb. 16, 1989, Pat. No. 4,964,837. This application Oct. 18, 1990, Ser. No. 599,659
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] A63H *5/00, 30/04, 30/00, 29/22*
U.S. Cl. 446—409 25 Claims



1. A self-contained sound effects system for a model radio controlled toy vehicle, said toy vehicle having a remote transmitter for transmitting radio signals through air to said toy vehicle, said transmitted radio signals comprising one or a plurality of internal control signals for the operation of said toy vehicle, said self-contained system comprising:

means located in said toy vehicle and receptive of said transmitted radio signals for detecting said internal control signals,

means located in said toy vehicle and connected to said detecting means for generating sound data coordinated with said detected internal control signals, said generating means comprising:

a. means for delivering sound data corresponding to a plurality of predetermined realistic sounds for said toy vehicle,

b. means receptive of said detected internal control signals from said detecting means and of said sound data from said sound data delivering means for outputting sound

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data coordinated with said detected internal control signals, and

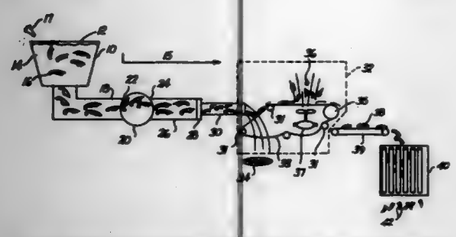
means located in said toy vehicle and receptive of said outputted sound data from said generating means for producing a realistic sound corresponding to said sound data.

5,195,921

APPARATUS FOR DEHEADING AND CLEANSING SHRIMP

Brent A. Ledet, Kenner, La., assignor to The Laitram Corporation, Harahan, La.

Filed Dec. 3, 1991, Ser. No. 801,069
Int. Cl.[5] A22C *29/02*
U.S. Cl. 452—4 27 Claims



1. Apparatus for detaching heads from shrimp conveyed in a fluid stream through conduits, comprising:

upstream conduit enclosing a first channel with a first cross-sectional area, said upstream conduit having a first end and a second end downstream of the first end;

downstream conduit enclosing a second channel with a second cross-sectional area less than said first cross-sectional area, said downstream conduit having an entrance end and an exit end;

conduit connecting structure having a transition region of sharply decreasing channel cross-sectional area for putting the second end of said upstream conduit into exclusive communication with the entrance end of said downstream conduit such that the fluid stream entering the entrance end of said downstream conduit is limited to the fluid stream exiting the second end of said upstream conduit, the sharply decreasing channel cross-sectional area of said transition region causing a significant change in fluid speed through a turbulent flow path; and

flow control means for inducing a flow rate of shrimp-laden fluid through said upstream and downstream conduits producing a change in the speed of the fluid in said transition region sufficient to detach heads from the shrimp by restriction of the turbulence of the fluid.

5,195,922

ENVIRONMENTAL CONTROL SYSTEM

Robert M. Genco, Atlanta, Ga., assignor to Intelligent Enclosures Corporation, Norcross, Ga.

Filed Apr. 19, 1991, Ser. No. 688,645
Int. Cl.[5] F24F *3/16, 7/007*
U.S. Cl. 454—57 1 Claim

1. An environmental control system utilizing a fluid, comprising:

a. equipment for conditioning the fluid to a preselected temperature, pressure, and relative humidity;

b. first means for filtering the conditioned fluid to crate first-filtered fluid, comprising a housing containing:

i. a filter frame;

ii. first and second particulate filters positioned in the filter frame;

iii. first and second activated charcoal filters positioned in the filter frame; and

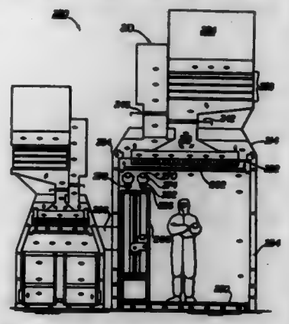
iv. a first inflatable seal for compressively sealing the first and second particulate and first and second activated charcoal filters to the housing;

c. a first damper, connected to the first filter means, for controlling the velocity of the first-filtered fluid;

d. second means, comprising an ULPA filter, for filtering the first-filtered fluid to create second-filtered fluid;

e. a chamber, connected to the first damper, for containing the second filtering means;

f. a hollow cover, which may be sealed to the chamber, defining a first opening into which the second-filtered



fluid may enter and a second opening out of which the secondfiltered fluid may exit, for conveying the second-filtered fluid to the conditioning means;

g. a second damper for occluding the conveying means and at leas temporarily preventing at least a portion of the second-filtered fluid from being conveyed to the conditioning equipment; and

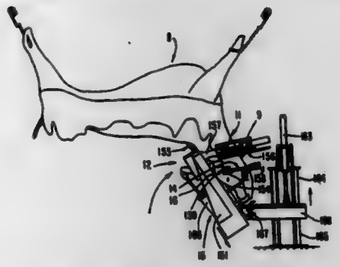
h. a pipe, positioned intermediate the first damper and second filtering means, for isolating the first-filtered fluid from the second-filtered fluid conveyed in the hollow cover.

5,195,923

AUTOMATIC ANIMAL PROCESSING

Russel J. Rankin, Clean Mountain; David J. de Chastel, deceased, late of Virginia by Ann de Chastel, executrix ; Graeme L. Wescombe, Manly West; David T. Kerr, Beenleigh; Phillip R. Boyce, Tingalpa; Raymond M. White, Capalaba; Robert W. Tritchler, Manly, and John W. Bahot, Coorparoo, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organization, Campbell and Australian Meat & Live-Stock Research & Development Corporation, Sydney, both of Australia

Filed May 20, 1992, Ser. No. 885,939
Division of Ser. No. 724,660, Jul. 2, 1991, Pat. No. 5,139,457, which is a division of Ser. No. 566,386, Aug. 23, 1990, Pat. No. 5,062,820.
Claims priority, application Australia, Dec. 23, 1987, PI 6045
Int. Cl.[5] A22B *3/00*
U.S. Cl. 452—64 7 Claims



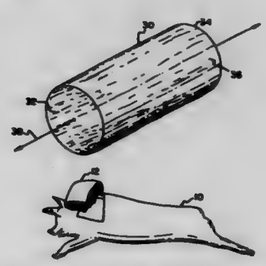
1. An apparatus for automatically processing an animal carcass so as to remove the animal head (10) from the remainder of the carcass (8), the apparatus including head holding means (12), the head holding means (12) comprising locating means (13) for locating in use the animal head (10) in a generally desired position, and clamping means (14) for clamping the head (10) against movement, the apparatus further including stretching means (15) for stretching the neck of the carcass (8) so as to spread the atlas joint, and cutting means (151) comprising a cutting blade (156) which is selectively movable along a cut line located below and generally along the line of the jaw (9) and through the atlas joint so as to sever the head (10) from the remainder of the carcass.

5,195,924

METHOD OF BUTCHERING AN ANIMAL CARCASS TO PRODUCE A GENERALLY FLAT, BONELESS MEAT PRODUCT AND MEAT PRODUCT PRODUCED

Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Designer Foods, Inc., Wilmington, Del.

Filed Jun. 11, 1992, Ser. No. 896,938
Int. Cl.[5] A22C *7/00*
U.S. Cl. 452—149 22 Claims



1. A method of forming a generally flat, boneless meat product from a shoulder cut of an animal having a rib eye muscle portion comprising:

cutting the shoulder to remove the rib eye muscle portion;

forming from the removed rib eye muscle portion a generally cylindrically shaped base having two generally circular spaced end surfaces, a generally continuous curved outer surface extending between the two end surfaces, and a center axis extending generally through the radial center of each of the end surface thereof;

making a first cut extending into the cylindrically shaped base a predetermined distance from the curved outer surface along a cut line extending generally from one end surface to the other along the curved outer surface and generally parallel to the center axis;

making a second cut extending from the first cut and extending generally circumferentially with respect to the cylindrically shaped base at said predetermined distance from the curved outer surface and extending generally from end surface to the other along the cylindrically shaped base, and generally parallel to the center axis, the second cut continuing to extend to the center axis of the cylindrically shaped base along a generally helically shaped path when viewing the cylindrically shaped base from either end; and

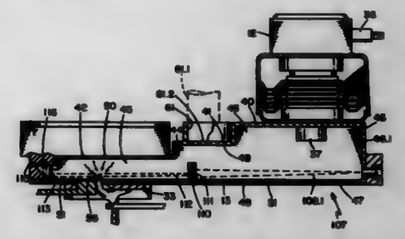
removing generally continuously from the cylindrically shaped base, as the second cut is made, a generally flat meat product having a width generally corresponding to the distance between the two end surfaces, having a thickness generally corresponding to said predetermined distance and having a length determined by the length of the second cut extending from the first cut to the center axis.

5,195,925

METHOD AND APPARATUS FOR DECLAWING POULTRY

Marc S. Gorans, Willmar, Minn., assignor to Nova-Tech Engineering, Inc., Willmar, Minn.

Filed Jan. 30, 1991, Ser. No. 648,531
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—166 49 Claims



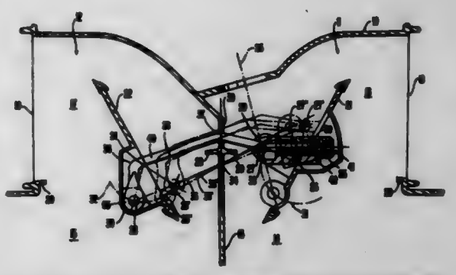
1. A method of processing live poults, comprising treating a portion of the germinal bed tissue of a toe with heat to at least partially inhibit growth of the claw from said tissue.

5,195,926

FLAP ARRANGEMENT

Thomas Dietterle, Simmozheim, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Apr. 9, 1991, Ser. No. 682,317
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1990, 4012215
Int. Cl.[5] B60H *1/24*
U.S. Cl. 454—143 9 Claims



1. A flap arrangement for a ventillation and an air-conditioning system of a vehicle, comprising two flaps pivotable about pivot axes parallel to one another, with a regulating member engaging on one flap for the flap adjustment, and with a linkage coupling the two flaps and connected to the flaps by articulation points such that a pivoting movement of the coupled flap, the articulation points on the flaps being determined such that the radii of the circular path described thereby during a pivoting of the flaps are equal, wherein the coupling linkage connecting the two flaps has a multi-angular configuration, and an imaginary straight line connecting the two articulation points during a pivoting of the flaps rotates about a center of rotation located approximstely midway of the pivot axes and in an area of a wall physically separating the two flaps.

5, drawing a fourth arc having a radius of 0.780 inches clamping axis so that a length of the wire extends axially

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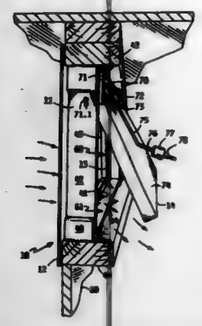
5,195,927
AIR INTAKE APPARATUS FOR INNER WALL
David A. Raisanen, Dassel, Minn., assignor to Raydot, Incorporated, Cokato, Minn.
Filed Aug. 5, 1991, Ser. No. 740,113
Int. Cl.[5] F24F *13/10*
U.S. Cl. 454—271 8 Claims



8. An air intake apparatus for being fixed in the inner wall of a structure, comprising

a rectangular frame with outer and inner surfaces and opposing sides, the outer surface of the frame confronting the inner wall, the inner surface of the frame forming an inlet port and an outlet port,

a rectangular flange integrally affixed to one side of the frame and extending peripherally and outwardly at a right angle relative to the outer surface of the frame to trim the frame relative to the inner wall, the flange comprising pin-engaging apertures for connection to the inner wall,

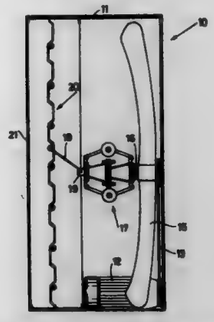
a rectangular counterweighted valve swingably and removably mounted in the frame and responding to differential air pressure for permitting air flow through the ports, the valve being swingable for at least 90° relative to the frame, the valve comprising an insulated plate of styrofoam with a rigid strip having a metal piece, the valve further comprising a horizontally-extending rod rotatably mounted in the frame to provide for swinging of the valve, the metal piece being fixed to the rod,

an adjustable counterweight affixed to the valve for adjusting an amount of leverage to be exerted by the valve on air flow through the inlet and outlet ports such that the valve is responsive to the differential air pressure, the counterweight comprising a bent rod affixed to the metal piece and extending downwardly therefrom and a weight slidable on the rod to and away from the metal piece to vary the amount of leverage, and

a rectangular valve seat extending inwardly at a right angle from the inner surface of the frame and being disposed approximately medially between the sides of the frame whereby the valve is removable to be mounted on either of the sides of the frame.

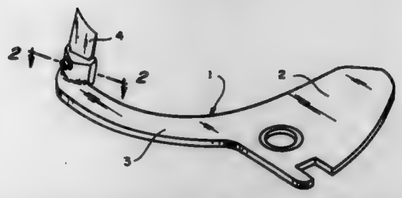
5,195,928
CENTRIFUGAL ACTUATING DEVICE FOR PUSHING OR PULLING AN ELEMENT TO BE OPERATED
Antonio Gigola, Via Quattro Novembre, 3, 25046 Cazzago San Martino (Brescia), Italy
Filed Dec. 2, 1991, Ser. No. 801,681
Claims priority, application Italy, Dec. 4, 1990, 5244 A/90
Int. Cl.[5] F24F *11/04*
U.S. Cl. 454—352 6 Claims

6. In ventilating apparatus having a fan with blades (15) pointing substantially in a radial direction from a central rotating shaft (16), a plurality of shutters (20) being spaced from and facing said fan, and which are movable from a position in which they open to a position in which they close an air outlet (21) of the fan, the improvement characterized by a centrifugal device (17) secured to one end of said shaft for rotation thereby in the space between said fan and said shutters, and comprising a pair of plates, one of which is fixed to said one end of said shaft, means mounting the other of said plates for movement toward and away from said one plate and said one end of said shaft along an axis disposed substantially coaxially of said shaft, and a control rod rotatably connected at one end thereof to said other plate coaxially of said axis and connected at its opposite end to said shutters to operate said shutters upon



rotation of said device, said mounting means comprising at least three centrally articulated arms each of which is pivotally connected at opposite ends thereof to one of said plates, and is pivotally connected intermediate its ends to one of at least three central joints, and means operative upon rotation of said shaft to cause said joints to move radially outwardly from said axis in a plane extending normal to said axis, and in equiangularly spaced paths about the axis of said shaft, thereby to move said other plate relative to said one plate and to effect the opening of said shutters.

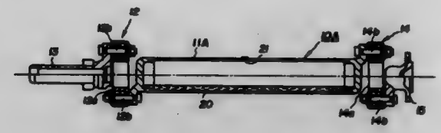
5,195,929
COB CUTTER BLADE AND METHOD OF MANUFACTURE
Eugene F. Felstehausen, Hoopeston, Ill., assignor to Felste Co., Inc., Hoopeston, Ill.
Filed Sep. 10, 1990, Ser. No. 580,166
Int. Cl.[5] A01F *11/06*
U.S. Cl. 460—48 6 Claims



1. A method to determine the off-set grinding dimension for a non-concentric cutting blade insert comprising the steps of:

1. drawing initial perpendicular vertical and horizontal center lines to determine a point of origin at the intersection;
2. intersecting the vertical centerline axis at the small cob diameter point by drawing a first arc having a 0.500 inch radius from the point of origin;
3. locating the large cob diameter point by intersecting the vertical centerline with a second 0.875 line arc having its center at said small cob diameter point;
4. locating the knife pivot point on the horizontal center line by drawing a third arc having a radius of 2.625 inches from said large cob diameter point;
5. drawing a fourth arc having a radius of 0.790 inches having its center at said small cob point;
6. drawing a fifth arc having a radius of 2.640 inches having its center at said knife pivot point and intersecting said fourth arc in the lower right quadrant of said center lines;
7. measuring the distance between the intersection of said fourth and fifth arc and said vertical center line.

5,195,930
SELF-BALANCED DRIVE SHAFT ASSEMBLY
Yoshinori Hirano, Yokohama, Japan, and Hiroshi Okuzumi, New York, N.Y., assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 29, 1990, Ser. No. 619,346
Claims priority, application Japan, Nov. 30, 1989, 1-311304
Int. Cl.[5] F16C *1/04*; F16D *3/26, 3/78*
U.S. Cl. 464—180 19 Claims



1. A drive shaft assembly comprising:

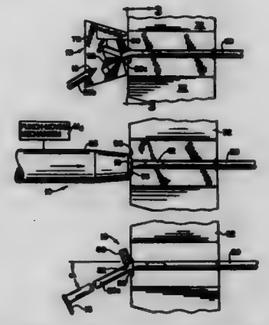
a cylindrical shaft having an axially extending cylindrical bore formed therein;

a given amount of liquid contained in said bore of the cylindrical shaft, said liquid being movable in said bore in response to movement of said shaft;

two joints connected to axially opposed ends of said shaft respectively; and

means for permitting a radial displacement between one of said joints and the corresponding end of said shaft thereby to allow a pivotal movement of said shaft about a pivot point defined by the other joint.

5,195,931
METHOD AND APPARATUS FOR MAKING WIRE NAILS HAVING RADIALLY OFFSET, FULLY CIRCULAR HEADS
Robert W. Wright, Buffalo Grove; John Binder, Morton Grove, and William L. Gabriel, Barrington, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed Feb. 7, 1992, Ser. No. 832,802
Int. Cl.[5] B21G *3/00*
U.S. Cl. 470—40 20 Claims



1. A method for manufacturing nails having elongate shanks and integral heads from a malleable wire, comprising the steps of:

(a) clamping the wire with a clamping mechanism defining a clamping axis so that a length of the wire extends axially from the clamping mechanism;

(b) bending the extending length of the clamped wire at an acute angle relative to the clamping axis;

(c) cutting a leading portion of said bent extending length of said clamped wire from the entire bent extending length portion of the clamped wire from the entire bent extending length portion clamping mechanism;

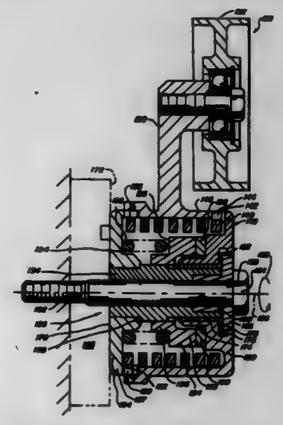
(d) forming a nail head from the bent stub of the clamped wire whereby said nail head is offset with respect to said clamping axis;

(e) releasing the wire from the clamping mechanism after the head forming step;

(f) feeding the released wire axially until a length of the wire extends axially from the clamping mechanism; and

(g) repeating steps (a) through (F) so as to repetitively form the shank and head of a nail from the leading portion of said clamped wire cut within each repetition cycle except possibly for an initial cycle of steps.

5,195,932
COMPACT COIL SPRING TENSIONER
Hideo Hirai, Kakogawa; Masakatsu Ando, Kobe; Yasuhiro Hashimoto, Miki; Naoki Fujimoto, Kobe; Norikazu Tanaka, Osaka, and Susumu Yamakawa, Kobe, all of Japan, assignors to Mitsuboshi Belting, Kobe, Japan
Continuation-in-part of Ser. No. 412,941, Sep. 26, 1989, Pat. No. 4,983,145. This application Oct. 12, 1989, Ser. No. 421,259
Claims priority, application Japan, Oct. 13, 1988, 63-258870; Dec. 15, 1988, 63-318201
Int. Cl.[5] F16H *7/12*
U.S. Cl. 474—135 22 Claims



1. A serpentine belt system comprising:

an endless belt trained in a circuitous path about a plurality of rotatable pulleys as on an automobile engine in an engine compartment, the pulleys operatively connected to various accessories operable by rotation of the pulleys, the pulleys driven by a frictional force exerted by the driven belt on the pulleys;

a tensioner arm having an idler pulley thereon for engagement with a surface of the endless belt;

means for mounting the tensioner arm to a support for pivoting movement in first and second opposite directions relative to the support about an axis; and

torsion coil spring means formed of a wire and acting between the mounting means and tensioner arm for biasing the tensioner arm in one of first and second directions,

said wire having a non-circular cross section,

said tensioner arm having an integrally formed first cylindri-

slave relationship and 180 degrees out of phase relative to

5,195,937

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cal wall radially outside of the torsion coil spring means which acts as an envelope around said coil spring means.

5,195,933

FRICTION DRIVE TRANSMISSION

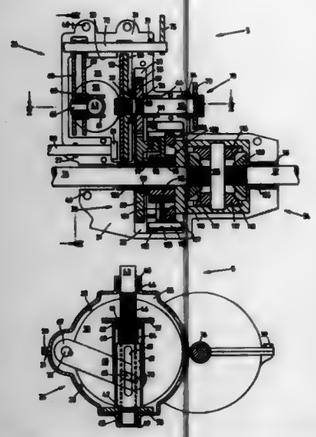
Christian H. Thoma, St. Clement, and George D. M. Arnold, St. Helier, both of Channel Islands, assignors to Unipat AG, Glarus, Switzerland

Filed Dec. 9, 1991, Ser. No. 802,252

Claims priority, application United Kingdom, Dec. 7, 1990, 9026651

Int. Cl.[5] F16H *15/10, 37/08*

U.S. Cl. 475—206 **40 Claims**



1. A friction-drive transmission apparatus having a housing defining a chamber; said friction-drive transmission encapsulated in said chamber and comprising: first and second driver wheels; an input shaft rotatably mounted in said housing and axially immovable with respect to said housing, said input shaft drivingly engaging said driver wheels and means for moving said driver wheels along the axis of said input shaft; a driven wheel disposed in said chamber for engagement by said driver wheels; an output shaft rotatably mounted in said housing for drivingly engaging said driven wheel and means for selectively controlling said driver wheels for engaging said first driver wheel with said driven wheel to provide rotation of said output shaft in one sense and for separately engaging the said second driver wheel with said driven wheel to provide rotation of said output shaft in the other sense.

5,195,934

DIFFERENTIAL DEVICE FOR VEHICLE

Shiro Ichiki, and Hideyasu Takeuta, both of Saitama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Continuation of Ser. No. 521,251, May 8, 1990, abandoned. This application Oct. 29, 1991, Ser. No. 784,108

Claims priority, application Japan, Jul. 14, 1989, 1-180431

Int. Cl.[5] F16H *1/45*

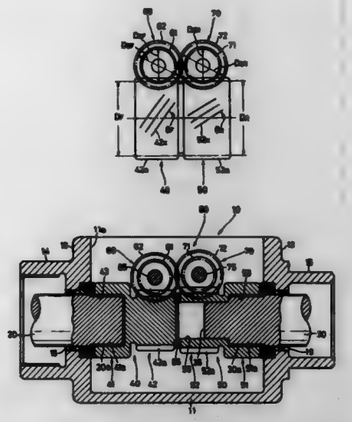
U.S. Cl. 475—227 **11 Claims**

1. A differential device for use in a vehicle having front wheels and rear wheels, comprising:

(a) a housing connectable to a power source of the vehicle so as to be supplied with a drive torque;

(b) a pair of front and rear propeller shafts operatively connected to the front and rear wheels, respectively, said pair of propeller shafts extending along a common straight line into said housing, so that one end of each of said two propeller shafts are disposed in opposing relation to each other within said housing;

(c) a pair of side gears connected respectively to said ends of said pair of front and rear propeller shafts so as to transmit rotations of said two side gears respectively to said two propeller shafts, each of said two side gears having a screw gear portion on its outer periphery, with pitch diameters of said screw gear portions of said two side gears being equal to each other, and helix angles of said screw gear portions of said pair of side gears being different from each other; and



(d) at least one pair of element gears each rotatably mounted on said housing, an axis of rotation of each of said element gears being skew relative to the axis of rotation of said propeller shafts and the axis of rotation of said side gears, each of said element gears having a screw gear portion and a coupling gear portion, said screw gear portions of said pair of element gears meshing with said screw gear portions of said pair of side gears, respectively, and said coupling gear portions of said pair of element gears meshing with each other.

5,195,935

EXERCISE APPARATUS WITH AUTOMATIC VARIATION OF PROVIDED PASSIVE AND ACTIVE EXERCISE WITHOUT INTERRUPTION OF THE EXERCISE

Stanley R. Fencel, Newport Beach, Calif., assignor to SF Engineering, Fountain Valley, Calif.

Filed Dec. 20, 1990, Ser. No. 633,225

Int. Cl.[5] A63B *22/00*

U.S. Cl. 482—70 **39 Claims**

1. Exercising apparatus, which comprises:

(a) track means,

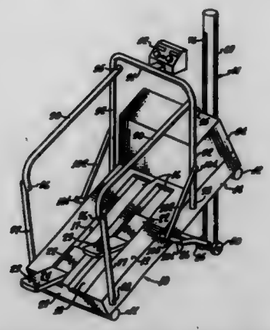
(b) first and second oscillating support elements mounted for movement on said track means and respectively adapted to support two limbs of the exerciser using the exercising apparatus,

said track means and said support elements being so related that said first and second support elements can oscillate along substantially parallel paths relative to each other,

said paths being spaced apart a distance generally corresponding to the distance between the supported limbs of the exerciser,

(c) means to oscillate one of said support elements with harmonic motion, with no abrupt changes in speed,

(d) means to connect said one support element to the other of said support elements to cause said other support element to oscillate with said one support element in master-slave relationship and 180 degrees out of phase relative to said one support element, and



(e) means to change the amplitude of oscillation of said one support element to thereby simultaneously change the amplitude of oscillation of said other support element by the same amount.

5,195,936

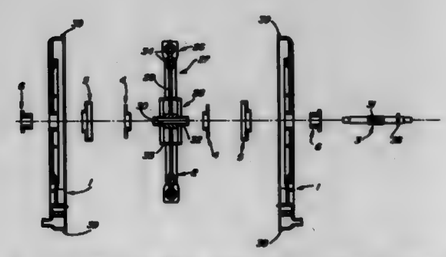
EXERCISE DEVICE HAVING FLUID RESISTANCE

Chien-Kao Mao, Taipei, Taiwan, assignor to Gemini Mercantile Inc., Taipei, Taiwan

Filed Dec. 9, 1991, Ser. No. 805,262

Int. Cl.[5] A63B *22/06, 69/16*

U.S. Cl. 482—112 **7 Claims**



1. An energy absorbing device for gymnastic exercisers comprising:

(a) two side plates for forming a closed space therebetween, said side plates are vaned toward said closed space;

(b) a vaned rotating plate being capable of rotating inside said closed space; and

(c) a shaft drivingly engaged with said rotating plate, said shaft having a sprocket wheel means engaged with a chain means driven by a user of the device, said shaft is capable of being urged to drive said rotating plate, wherein

said side plates are capable of accommodating fluid therebetween, when said shaft is urged to drive said rotating plate to rotate in said closed space, said fluid is urged to swirl in said closed space and applies resisting forces on said rotating plate and said shaft, wherein said rotating plate includes two opposed faces which are generally perpendicular to an axis of rotation of said plate, and vanes extending axially and radially outwardly from said axis of rotation on at least one of said faces to impel said fluid.

5,195,937

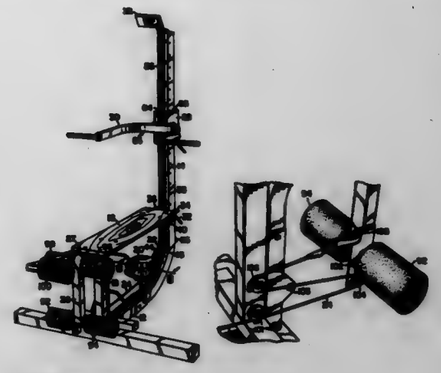
MULTI-EXERCISE APPARATUS

Timothy S. Engel, Mound; Frank W. Campbell, Robbinsdale; Stephen S. Peterson, Maple Grove; Craig A. Loubert, Minneapolis, and Edward R. Holden, Prior Lake, all of Minn., assignors to NordicTrack, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 500,517, Mar. 28, 1990, Pat. No. 5,090,694. This application Nov. 12, 1991, Ser. No. 791,073

Int. Cl.[5] A63B *21/015*

U.S. Cl. 482—119 **21 Claims**



1. An exercise apparatus comprising:

(a) a positionable bench;

(b) a horizontal member extending below said bench;

(c) a vertical member extending upwardly from a first end of said horizontal member;

(d) a loading device operable to apply a drag on a moveable element forming part of the loading device, said loading device situated on said horizontal or vertical member, said loading device comprising a rotatable centrifugal force sensitive force generating brake member that provides a resistive force proportional to the speed of rotation of the rotatable member, said loading device comprising a housing having sidewalls that define an interior cylindrical contact surface and function as a brake drum, a braking rotor rotatably mounted within said housing and coaxially aligned relative to said interior cylindrical contact surface, at least one brake shoe pivotally mounted on said braking rotor, at least one brake pad secured to said at least one brake shoe and having an exterior cylindrical contact surface configured to mate with said interior cylindrical contact surface;

(e) an exercise operable element connected to said loading device by a flexible line means, said exercise operable element being mounted such that upon movement of said exercise element, said line means is pulled away from said loading device, said moveable element of said loading device is moved and said line means is loaded; and

(f) a line extending means outside said loading device for multiplying the rate at which said line means is pulled away from said loading device, wherein said line means extends through said line extending means.

5,195,938

ABDOMINAL EXERCISING DEVICE

Kevin R. Robertson, Cocoa, Fla., assignor to KR Innovations Inc., Cocoa, Fla.

Continuation of Ser. No. 795,289, Nov. 19, 1991, abandoned, which is a continuation of Ser. No. 557,618, Jul. 24, 1990, abandoned. This application Jun. 19, 1992, Ser. No. 902,480

Int. Cl.[5] A63B *21/00*

U.S. Cl. 482—131 **7 Claims**

1. A manually operated exercising device for applying exter-

nal pressure to a user's external oblique and rectus abdominis

which is axially aligned with the primary inlet of the

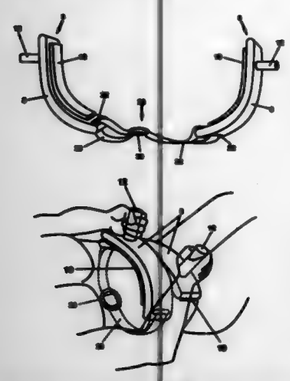
(b) generating an applied magnetic flux with the magnetic

5,195,942

nal pressure to a user's external oblique and rectus abdominis muscles comprising:

a) first and second structures, each of sufficient size and shape to substantially cover said user's external oblique and rectus abdominis muscles, and each of said first and second structures comprised of:

1) a rigid member having a contoured shape, and having a bottom surface configured to contact said user's external oblique and rectus abdominis muscles, and



2) a handle attached to each of said rigid members for grasping by the user and simultaneously applying external pressure to said user's external oblique and rectus abdominis muscles during an abdominal exercise; and

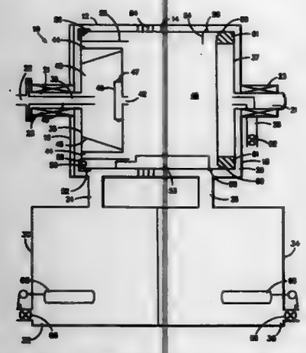
b) strap means connected to and extending between said rigid members for extending about the user's back to position said rigid members at the user's oblique and rectus abdominis muscles.

5,195,939

THREE PHASE CENTRIFUGAL SEPARATOR

Earl Glagras, Box 542, Valleyview, Alberta, Canada T0H 3N0

Filed Feb. 19, 1992, Ser. No. 838,570
Claims priority, application Canada, Sep. 9, 1991, 2050981
Int. Cl.[5] B04B *7/02*
U.S. Cl. 494—60 7 Claims



1. A three phase centrifugal separator for separating the components of a fluid mixture of oil, water and gas, comprising:

a. a pressure vessel having a first end, a second end, an internal cavity, a primary inlet and a water phase outlet, an oil phase outlet, and a gas phase outlet;

b. a cylindrical drum rotatably mounted within the interior cavity of the pressure vessel, the drum having an inlet which is axially aligned with the primary inlet of the pressure vessel, the inlet being enclosed by an initial separation chamber having a central gas passage and peripheral liquid passages, a partition being positioned transversely across the central gas passage such that a fluid mixture entering the initial separation chamber strikes the partition, with gaseous phase fluids flowing around the edges of the partition to enter a primary separation chamber via the central gas passage, and liquid phase fluids being directed by centrifugal force to the peripheral liquid passages whereby the liquid phase fluids enter the primary separation chamber, a first annular weir secured to a peripheral exterior edge of the drum and spaced from a second annular weir formed within the primary separation chamber of the drum, a fluid port extending through the peripheral exterior edge of the drum such that water forced to the outer circumference of the drum by centrifugal force forms a water zone within the confines of the annular weirs, the first annular weir being lower than the second annular weir such that water is retained in the water zone until the level of the first annular weir is attained, thereafter any additional water entering the water zone results in a migration of water between the drum and the first annular weir to the water phase outlet of the pressure vessel, oil being forced into a water/oil interface on top of the water zone by centrifugal force, an oil passage being provided between the second annular weir and the second end of the drum, the second annular weir serving as a spillway whereby oil passes over the second annular weir to the oil passage leading to the oil phase outlet of the pressure vessel, peripheral gas passages being provided at the second end of the drum, gas flowing from the primary separation chamber of the drum via the gas passages to the gas phase outlet of the pressure vessel;

c. a control valve being positioned in the gas phase outlet to maintain the pressure vessel at a predetermined pressure level, such that gas is released from the gas phase outlet as required to maintain the pressure vessel at the predetermined pressure level; and

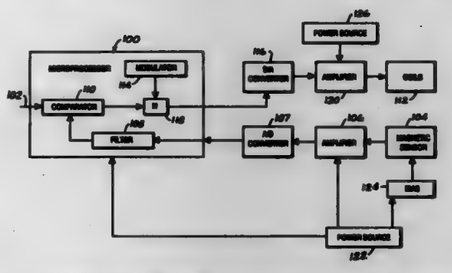
d. a seal between the cylindrical drum and the interior cavity of the pressure vessel whereby separation of the water phase outlet and the oil phase outlet is maintained.

5,195,940

METHOD FOR INCREASED PRODUCTION OF GROWTH FACTOR IN LIVING TISSUE USING AN APPLIED FLUCTUATING MAGNETIC FIELD

David J. Bayliak, Redlands, Calif., assignor to IstroMed, Inc., Phoenix, Ariz.

Filed Jun. 20, 1991, Ser. No. 718,455
Int. Cl.[5] A61N *1/40*
U.S. Cl. 600—14 18 Claims



1. A method for stimulating the production of growth factor in living tissue, said method comprising the steps of:

(a) positioning a magnetic field generating means adjacent the living tissue, where the living tissue is subject to an ambient magnetic field flux;

(b) generating an applied magnetic flux with the magnetic field generating means such that the applied magnetic field flux extends through the living tissue along an axis and combines with the ambient magnetic field to form a composite magnetic flux; and

(c) fluctuating the applied magnetic flux and controlling the average value of the magnetic flux density of the combined magnetic flux to create and maintain a relationship between the frequency of the fluctuations and the average value of the combined magnetic flux density, wherein the average value of the combined magnetic flux density is a non-zero average value, wherein the relationship stimulates the production of growth factor in the living tissue, and wherein the relationship between the frequency of the fluctuations and the average value of the combined magnetic flux density is a function of

$$f_c=(B/2\pi)(q/m)$$

wherein f_c is the frequency in Hertz, B is the non-zero average value of the combined magnetic field flux density in Tesla, and q/m is the charge to mass ratio of an ionic species in Coulombs/kilograms.

5,195,941

CONTOURED TRIANGULAR TRANSDUCER SYSTEM FOR PEMF THERAPY

John H. Erickson, Plano, and John C. Tepper, Carrollton, both of Tex., assignors to American Medical Electronics, Inc., Dallas, Tex.

Filed Jan. 7, 1991, Ser. No. 638,219
Int. Cl.[5] A61N *1/00*
U.S. Cl. 600—14 21 Claims

1. A PEMF contoured triangular transducer system for providing PEMF therapeutic stimulation to a selected target area of a patient's body, comprising:

a transducer including at least a primary winding with a selected number of turns encased in a shell, said shell being at least semi-rigid;

when flat, said transducer is substantially triangular to define three sides and three respective angular areas;

said transducer being anatomically contoured to fit snugly adjacent the back of the neck or the shoulder of a patient, with at least one of said sides being conformably curved such that corresponding angular areas are positioned on either side of the target area for PEMF therapy; and

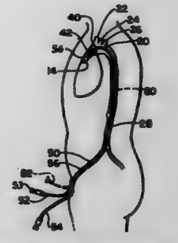
activation electronics coupled to said primary winding for selectively activating electromagnetic fields, thereby implementing a prescribed PEMF therapy.

5,195,942

CARDIAC ARREST TREATMENT

Max H. Weil, Northbrook, and Jose Biscra, Lake Bluff, both of Ill., assignors to Institute of Critical Care Medicine, Palm Springs, Calif.

Filed Aug. 12, 1991, Ser. No. 744,082
Int. Cl.[5] A61M *29/02*
U.S. Cl. 600—18 17 Claims



1. A method for resuscitating a person or other mammal who has suffered cardiac arrest, comprising:

blocking a majority of the flow of blood from the heart in a normal downstream direction from the left ventricle through the ascending aorta, and using means external to the patient to cause compression of the heart, to thereby direct a high portion of flow into the coronary arteries.

5,195,943

MALE ORGAN RESTRICTOR RING APPLICATOR

John L. Chaney, 156 Broad St., P.O. Box 790, Lake Geneva, Wis. 53147

Filed Sep. 30, 1991, Ser. No. 767,884
Int. Cl.[5] A61F *5/41*
U.S. Cl. 600—41 4 Claims

1. A device to assist maintaining an erect penis by applying a blood flow restrictor ring to the root of the penis, comprising:

a hollow cylinder having an open end for receiving the penis and for effecting a seal with the anatomy surrounding the root of the penis, said cylinder having a region adjacent said open end for storing a restrictor ring circumjacent said cylinder,

means for coupling said cylinder to a vacuum inducing source,

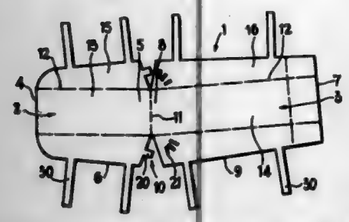
a cam element fixed on the periphery of said cylinder at a predetermined distance from said open end,

a sleeve member slidable axially and rotatable on the periphery of said cylinder, said sleeve member having a first end presented toward said region for storing said restrictor ring and having a second end,

said second end having an axially projecting cam riser such that when said sleeve member is rotated with said riser running on said cam element said sleeve member moves

axially for said first end thereof to push said restrictor ring from the cylinder and onto the root of the penis.

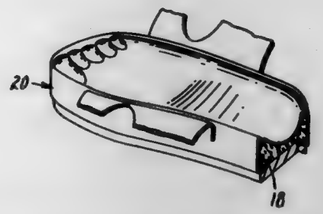
5,195,944
DEVICE FOR ARTICULAR STABILIZATION
Gilbert Schlegel, Saint-Tropez, France, assignor to Societe d'Etudes et de Recherches Creativity, Aix-en-Provence and Cartonnerie Beausoleil, Brignoles, both of France
Filed Sep. 7, 1989, Ser. No. 404,183
Claims priority, application France, Sep. 8, 1988, 88 11759
Int. Cl.[5] A61F 5/04
U.S. Cl. 602—5 7 Claims



1. A device for articular stabilization of a part of the body which comprises:
a sheet of thin material having a central portion extending longitudinally and having a width corresponding approximately to that of the part of the body to be stabilized wherein said central portion has longitudinal sides;
articulated flanges connected to the longitudinal sides of the central portion, said longitudinal sides of the central portion defining at least two folding lines;
stabilization means extending outwards from at least one of said articulated flanges and forming a continuous cover around a substantial portion of said part of the body; and
holding means cooperating with said stabilization means for holding said articulated flanges in a closed position so as to form a peripheral encasement around said part of the body and for defining angular locking means, said holding means comprising planar tongues and locking slots, said planar tongues and said locking slots both being provided in said flanges, said tongues extending outwards from said flanges and being designed to enter into said locking slots provided in a flange opposite to the flange having the tongues to lock the articulated flanges in place;
wherein said articulated flanges, said stabilization means and said holding means form an integral part of said sheet of thin material so as to form a one piece device.

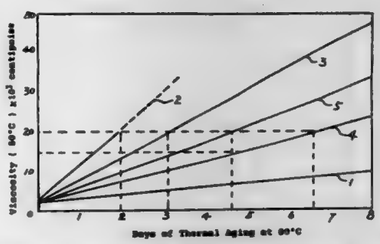
5,195,945
ORTHOTIC PADS AND METHODS
Timothy C. Sandvig, Woodville, Wis., and Dennis C. Bartizal, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 93,408, Sep. 4, 1987, Pat. No. 5,002,047, which is a continuation-in-part of Ser. No. 903,281, Sep. 3, 1986, Pat. No. 4,968,542, and Ser. No. 15,972, Feb. 18, 1987, Pat. No. 4,946,726, which is a continuation-in-part of Ser. No. 784,345, Oct. 4, 1985, Pat. No. 4,683,877. This application Mar. 25, 1991, Ser. No. 674,565
The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.
Int. Cl.[5] A61F 5/00
U.S. Cl. 602—8 6 Claims

1. An orthotic pad bearing the impression of a body part and prepared from an orthotic blank comprising an open-celled foam impregnated with a resin system, said resin system comprising
a. a water curable prepolymer resin comprising an isocyanate component and a polyol component, said polyol component having an average hydroxyl equivalent weight greater than about 400 grams of polyol per hydroxyl group, and
b. a catalyst capable of setting and curing said prepolymer resin upon exposure to water
wherein said blank, when cured in the uncompressed state of the 50% compressed state would exhibit, in both states, an



inverse modulus of greater than about 40% deformation in response to a load of 1.05 kg/cm^2 over a period of 0.5 seconds, and a resilience of greater than about 30% recovery within 0.5 seconds after being deformed to one-half its cured thickness.
and wherein said pad is a cushion for sports equipment.

5,195,946
STABLE CATALYTIC AND AQUA-ACTIVATED POLYURETHANE CASTING BANDAGE
Hai-sheng Li, Shanghai, and Jia-ju Fan, Huangyan, both of, assignors to Zhejiang Province Science & Technology Development Corp., Huangyan, China and Huangyan Medical Treatment Material Factory, China
Filed Sep. 12, 1991, Ser. No. 758,827
Claims priority, application China, Sep. 15, 1990, 90102934.3
Int. Cl.[5] A61F 5/04
U.S. Cl. 602—8 11 Claims

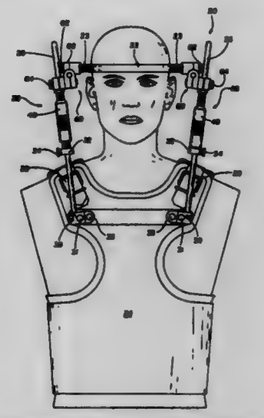


1. A stable catalytic and aqua-activated polyurethane bandage comprising a woven glass fiber or synthetic fiber substrate coated with an aqua-active polyurethane prepolymer, said prepolymer comprising an aromatic isocyanate, a polyhydroxy compound, and a catalyst, wherein the equivalent ratio of NCO: OH in the prepolymer is from 3:1 to 9:1, and said catalyst is α-(morpholinopolyethoxy)-β-morpholinoethane or a mixture of α-(morpholinopolyethyoxy)-β-morpholinoethane and a cocatalyst of bis-(2-dimethylaminoethyl) ether.

5,195,947
CALIBRATED CERVICAL TRACTION DEVICE
Gerd B. Bode, 3601 E. Cherry Street, Seattle, Wash. 98122
Filed Oct. 15, 1991, Ser. No. 776,846
Int. Cl.[5] A61F 5/08
U.S. Cl. 602—18 16 Claims

12. A cervical traction device for supporting the head of a patient with a neck or spinal injury, comprising:
a vest adapted to be worn about a patient's torso;
a halo adapted to be secured to the patient's head;

multiple support rods, each support rod having a top end and a bottom end, the bottom end being fixedly coupled to the vest;
a coupling member interconnecting the halo and the top end of the support rod;
an expansion member coupled to the support rod for providing a supporting force to the halo, the expansion member comprising a clamp fixedly attached to the support rod, a sleeve threadably secured at a first end to the clamp, a support insert being moveably disposed inside a second



end of the sleeve, a bias means disposed in-between the insert and the sleeve for providing an upward force on the support insert such that rotation of the sleeve causes the insert to move relative to the clamp to vary the upward force generated by bias means and, in turn, the supporting force applied to the halo; and
each support rod including a calibrated scale for measuring and displaying the magnitude of the supporting force such that a balanced, evenly distributed force can be applied to the halo.

5,195,948
ADJUSTABLE BACK SUPPORT DEVICE
Dennis M. Hill, 23931 SE. 25th Ct., Issaquah, Wash. 98027, and Richard T. Wesala, 16606 162 NE., Woodinville, Wash. 98072
Filed Mar. 5, 1992, Ser. No. 847,663
Int. Cl.[5] A61F 5/00
U.S. Cl. 602—19 11 Claims

1. A back support device, comprising:
a. a belt structure capable of being placed around the waist area of a user, said belt structure having a first end, a second end, an outside surface, an inside surface and an longitudinal axis, said belt structure being constructed to be not stretchable along said longitudinal axis, said outside surface being made of loop fabric material;
b. an adjustable belt holding means attached to said belt structure capable of adjustably holding said belt structure around said waist of said user during use, said adjustable belt holding means comprises a pad hook fabric material attached to said inside surface of said belt structure near said first end capable of engaging said outside surface to adjustably hold said belt structure around said waist;
c. an inflatable air bladder disposed inside said belt structure, said belt structure being disposed therein so that said air bladder is positioned adjacent to said user's lower back when said belt structure is placed around said waist, said air bladder having an upper section, a middle section, a lower section, and a vertical mid-line axis;
d. an adjustable air bladder positioning means disposed between said belt structure and said air bladder, said adjustable air bladder positioning means being capable of forcibly curving said air bladder around said waist and adjusting the force exerted by said air bladder on said lower back when said back support device is placed around said waist, said adjustable air bladder positioning means includes two elastic, horizontal strap members, each said horizontal strap member having a first end and a second ned, each said first end being attached to said air bladder along said vertical mid-line axis, each said horizontal strap member being extended in opposite directions thereof laterally across said middle section of said air bladder, said adjustable air bladder positioning means also including a hook fabric pad attached to each said horizontal strap member near said second end, said hook fabric pad being capable of selectively engaging said loop fabric material located on said outside surface of said belt structure, and;
e. an air inflation means attached inside said belt structure and connected to said air bladder, said air inflation means comprising a hand pump and a two-way value, said two-way valve being capable of controlling the amount of air in said air bladder.

5,195,949
TRACTION DEVICE
Charles V. Burton, Excelsior; Gregory K. Peterson, North Oaks; Casey L. Carlson, Edina; Jeffrey A. Weber, and William E. Stumpf, both of Minneapolis, all of Minn., assignors to Spinal Designs International, Inc., Minneapolis, Minn.
Continuation of Ser. No. 789,616, Nov. 8, 1991, abandoned, which is a continuation of Ser. No. 473,350, Feb. 1, 1990, abandoned. This application Jul. 21, 1992, Ser. No. 918,778
Int. Cl.[5] A61H 1/02
U.S. Cl. 602—19 12 Claims

1. A device for transferring stress from a lumbar spine to a rib cage of a person, the device comprising:
(a) a torso embracing member for at least partially surrounding the torso and for engaging and supporting a person proximate a person's waist below the rib cage, said member having a first section and a second section;
(b) a first pivot arm having first and second ends, said first end operatively connected to said first section;

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(c) a second pivot arm having first and second ends, said first end operatively connected to said second section;
(d) a base support configured to pivotally mount said first and second pivot arms;
(e) a seat member operatively connected to said device wherein said pivot arms move between an unengaged position to an engaged position, wherein when in the unengaged position said first and second sections are spaced at a distance greater than when in the engaged position; and
(f) means for locking said pivots arms in the engaged position wherein said pivot arms are fixed with respect to said base support, wherein said locking means comprises a first linear locking device having a piston rod for movement in a cylinder, said piston rod being continually adjustable to a locked, engaged position and wherein said torso embracing member supports the person when said pivots arms are in the engaged position and transfer stress from the lumbar spine to the rib cage.

5,195,950
COMPRESSION BANDAGE WITH CALIBRATION MEANS

Robert Delannoy, Paris, France, assignor to Molinier SA, France

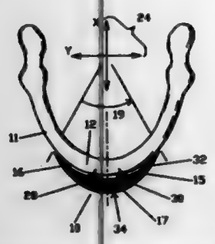
Filed Dec. 11, 1991, Ser. No. 804,957
Claims priority, application France, Dec. 11, 1990, 90 15877
Int. Cl.[5] A61F *13/00, 15/00*
U.S. Cl. 602—75 18 Claims

1. Compression bandage with calibration means, comprising a plurality of visual marks spaced along a length of the bandage at a variable and gradually increasing distance between said marks, the bandage being stretchable and having constant elasticity along the length, whereby when the bandage is stretched around a body part, a uniform distance between said marks indicates a gradually decreasing pressure on the body part along the length of the bandage.

5,195,951
CHIN IMPLANT

Vincent C. Giampapa, 89 Valley Rd., Montclair, N.J. 07042

Filed Mar. 25, 1991, Ser. No. 674,394
Int. Cl.[5] A61F *2/28*
U.S. Cl. 623—16 8 Claims

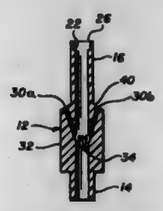


1. A chin implant for augmentation of a human mandible, comprising:
(a) a biocompatible solid crescent-shaped body having an axis of symmetry, the body comprising an inner portion having an inner surface defining an inner radius and an outer portion having an outer surface defining an outer radius, said inner portion defining a solid included angle about said axis of symmetry greater than a solid included angle defined by said outer portion, each of said inner surface and said outer surface tapering bi-laterally to form respective merged surfaces, said inner radius having a radius of curvature slightly smaller than an opposing radius of curvature of an area of the mandible to be augmented said inner portion having an outer surface opposite said inner surface and said outer portion having an inner surface opposite said outer surface, said outer surface of said inner portion and said inner surface of said outer portion being bonded to each other bonded to each other along opposing faces thereof, said outer portion formed of a lower durometer material than said inner portion, said lower durometer material approximating resilience of a fat pad of the human mandible; and
(b) radially disposed offset means formed integrally with said inner portion of said crescent-shaped body and extending to outwardly from said inner surface of said inner portion to space said inner surface of said inner portion away from the mandible, said offset means including longitudinal bores proportioned for the receipt of surgical securing pins from said outer surface of said outer portion, said longitudinal bores extending linearly through said inner and outer portions of said body.

5,195,952
NOISE REDUCING ASPIRATOR

Albert Solnit, 250 N. Robertson Blvd., Suite 401, Beverly Hills, Calif. 90211; Robert Goldstein, 2222 Avenue of the Stars, Suite 805, Los Angles, Calif. 90067, and Martin Brouillette, 1649 Ontario, Sherbrooke, (Quebec), Canada J1J 3T1

Filed Feb. 25, 1992, Ser. No. 840,931
Int. Cl.[5] A61M *1/00*; A61C *17/04*
U.S. Cl. 604—19 14 Claims

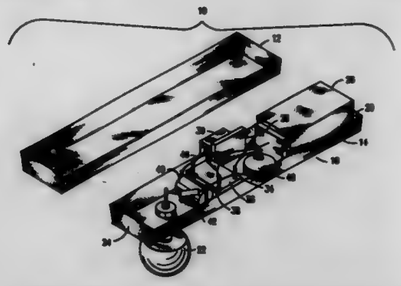


1. An aspirator for removal of dental, surgical or other debris from a site comprising:
an open ended, tubular housing having a first end configured to be connected to a source of suction; a second end for reception of surgical or dental debris; a main portion having a larger diameter than said first and second ends, said main portion having an outer surface, a first end proximate said first end of said housing and a second angular end sloping away from said second end of said housing, said tubular housing having a substantially uniform diameter passageway extending from said first end of said housing through said main portion to said second end of housing;
a plurality of unblocked venting means extending from said outer surface of said second angular end of said main portion through said main portion so as to intersect with said passageway at an angle, said venting means located around said second angular end so as to ensure smoother air flow into said passageway by minimizing the introduction of turbulent air entering the aspirator,
wherein when said first end of said housing is connected to a suction source, surgical or dental debris will be removed from the surgical or dental site with a minimum of noise and tissue grabbing without the need to block the venting means or stop the air flow into the aspirator.

5,195,953
METHOD OF INCREASING SKIN ABSORPTION OF A DRUG

Richard J. DeMartini, 8380 Ulmerton Rd., Rm. 206, Largo, Fla. 34641

Continuation-in-part of Ser. No. 184,374, Apr. 21, 1988, abandoned and a division of Ser. No. 294,878, Jan. 9, 1989, U.S. Pat. No. 4,997,418. This application Nov. 20, 1990, Ser. No. 615,924
Int. Cl.[5] A61N *1/30*
U.S. Cl. 604—20 2 Claims

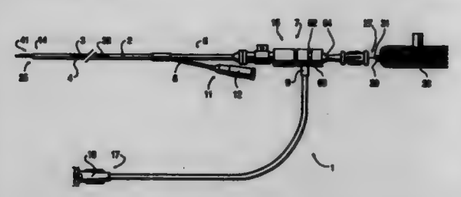


1. A method of increasing the absorption of an ionic form of a drug through scalp epidermis tissue of a patient comprising applying a thin layer of minoxidil in a liquid form in a carrier medium to the scalp epidermis, applying 15–20 milliamps of DC current to the layer of minoxidil through an apparatus having a negatively charged electrode in contact with the scalp epidermis covered with the minoxidil, a positive electrode of the apparatus applied to the patient, and connecting the two electrodes with an electrical circuit having a nine volt battery electrically connected to a DC/DC converter with a 2 V–40 V output range, a 470 microfarad capacitor in electrical contact with the DC/DC converter, a load regulator resistor and a momentary switch electrically connected to the capacitor and wiring to connect elements of the circuit to the electrodes to produce a voltage differential across the electrodes.

5,195,954
APPARATUS FOR THE REMOVAL OF DEPOSITS IN VESSELS AND ORGANS OF ANIMALS

Wolfram Schnepp-Pesch, Schönblick 6, D-7505 Ettlingen, and Josef Lindenberg, Käthe-Kollwitz-Str. 10a, D-7500 Karlsruhe, both of Fed. Rep. of Germany

Filed Jun. 26, 1990, Ser. No. 543,428
Int. Cl.[5] A61B *17/32*
U.S. Cl. 604—22 7 Claims

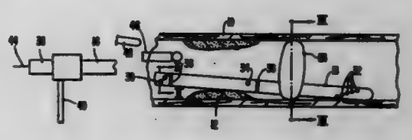


1. An apparatus for the removal of deposits, such as patches in vessels and stones in organs of animals, the apparatus comprising:
a hollow guidance part;
a drive means;
a shaft driven by the drive means and projecting into the hollow guidance part;
a helical portion provided on a distal end of the driving shaft at least partly projecting out of a distal end of the hollow guidance part, said helical portion having a cross-sectional dimension not greater than an internal dimension of the hollow guidance part, individual turns of the helical portion have a finite spacing with respect to one another, said individual turns surround a free space within the helix whereby deposits received between the individual turns of the helical portion are lead by the individual turns through said free space to a distal end of the hollow guidance part;
a sleeve connected firmly and in a rotary manner to the connecting part and in a non-rotary manner to a drive casing and having a closed meandering groove guided around a circumference of the sleeve and;
a cam of a transmission part rotating at a lower angular velocity than an angular velocity of the connecting part engageable in said groove, wherein the drive means includes means for receiving one end of the hollow guidance part, a rotary drive rotatably driving the helical portion, and a rotary connecting part axially reciprocatable relative to the hollow guidance part by a motor means.

5,195,955
DEVICE FOR REMOVAL OF EMBOLIC DEBRIS

T. Anthony Don Michael, 309 Panorama Dr., Bakersfield, Calif. 93305

Continuation-in-part of Ser. No. 435,887, Nov. 14, 1989, abandoned. This application Mar. 13, 1990, Ser. No. 492,580
Int. Cl.[5] A61B *17/20*; A61M *29/00*
U.S. Cl. 604—22 9 Claims



1. A device for temporarily obstructing a region of a blood vessel of a patient, without imposing any substantial radial force which act to stretch the vessel wall on the blood vessel, during a procedure for removing embolic material deposited on the blood vessel wall, which device allows blood flow through the vessel beyond the region blocked by the device, said device comprising:
a catheter having a proximal end, a distal end and a longitudinal axis intersecting the ends, said catheter being arranged to be inserted into the blood vessel via said distal end, said catheter having a peripheral wall and being provided with first and second lumens extending from said proximal end, said first lumen extending fully to said distal end of said catheter, a first opening extending from said first lumen to said peripheral wall for communication with the interior of the blood vessel in order to permit blood flow from a point upstream of the embolic material and through said first lumen to said distal end of said catheter, and a second opening extending from said second lumen to one side of said peripheral wall at a location between said first opneing and said distal end of said catheter; and
a high compliance volume balloon secured to said peripheral wall, said balloon having an inflation opening surrounding said second opening and located at the one side of said peripheral wall, the compliance of said balloon being such that when said catheter is inserted into the blood vessel and said balloon is being inflated, sid balloon expands eccentrically around and excircling a major portion of said catheter and expands radially to conform substantially to the interior cross section of the blood vessel, without stretching the blood vessel wall, in order to substantially completely block the blood vessel while urging said catheter away from the center of the blood vessel.

nicating with said channel where said collection has a

and the thumb in close proximity to the first conduit

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MEDICAL CATHETER WITH A CUTTING DEVICE

Uwe Stockmeier, Heimgartenstr. 15, 8132 Tutzing, Fed. Rep. of Germany

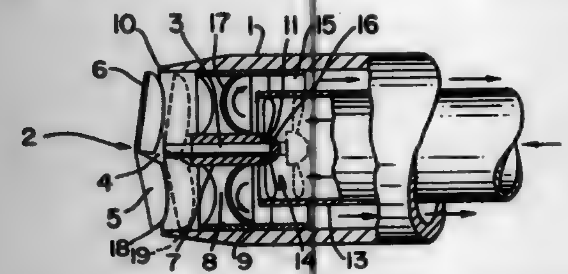
Filed Sep. 19, 1990, Ser. No. 536,561

Continuation at PCT/EP89/00054, Jan. 18, 1989.

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801318

Int. Cl.⁵ A61B *17/22, 17/32*

U.S. Cl. 604—22 10 Claims



1. A medical catheter comprising a tube; a cutting device provided at a front end of said tube for introducing into blood vessels, said tube having an inner diameter, said cutting device comprising a rotary cutting tool having an outer diameter with is smaller than the inner diameter of said tube, said tool being capable of being axially shifted along an axis of rotation thereof relative to said tube between a retracted rest position in which said cutting tool is completely covered by said front end of said tube, and an extended working position in which said cutting tool protrudes from said front end of the tube; and stops so that each of said positions is defined by a stop, said cutting device further comprising a rigid shaft on which said cutting tool is mounted, and a bearing member in which said rigid shaft is received, said bearing member being located at said front end of the tube, and wherein the stops which define the working position and the rest position, respectively, of said cutting tool interact with said bearing member to define said working and rest positions.

5,195,957

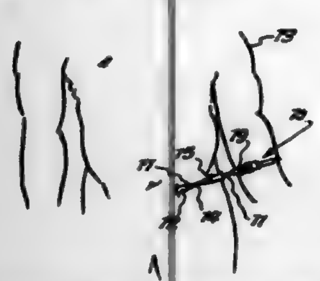
STERILANT CARTRIDGE-CAP AND ASSOCIATED CONNECTION

Dennis R. Tollini, 19 Palmdale Dr., Williamsville, N.Y. 14221

Continuation-in-part of Ser. No. 650,406, Feb. 1, 1991, abandoned. This application Aug. 30, 1991, Ser. No. 753,407

Int. Cl.⁵ A61M *3/00*

U.S. Cl. 604—29 22 Claims



1. A sterilant cartridge-cap connector assembly comprising a sterilant cartridge cap including a tubular body member having first and second ends, flexible sidewall means on said tubular body member for receiving digital pressure, means sealing said first end, first connector means on said second end, second connector means for attachment to said first connector means, sterilant liquid means in said tubular body member for transfer to said second connector means upon the application of said digital pressure to said flexible sidewall means, inner seal means for providing a first seal between said first and second connector means, and outer seal means for providing a second seal between said first and second connector means when said first connector means is mounted onto said second connector means, said inner and outer seal means being dimensioned to maintain said second seal closed while said first seal is being opened during uncoupling of said first and second connector means to thereby cause a flow of said sterilant liquid means from said first connector means into said second connector means as a result of a vacuum created proximate said inner seal means during said uncoupling.

5,195,958

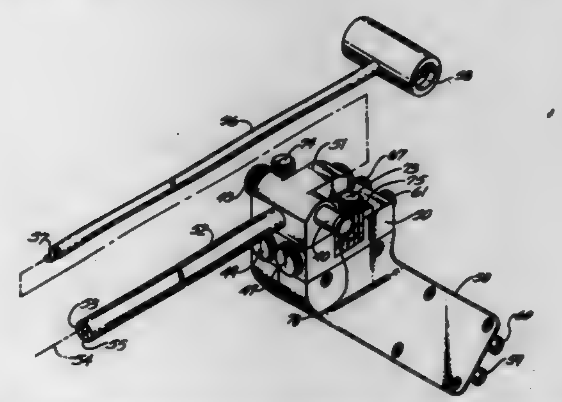
TOOL FOR LAPAROSCOPIC SURGERY

Edward H. Phillips, 712 N. Roxbury Dr., Beverly Hills, Calif. 90210

Filed May 25, 1990, Ser. No. 528,954

Int. Cl.⁵ A61B *17/39, 17/36, 17/22*

U.S. Cl. 604—33 25 Claims



1. An instrument for laparoscopic evacuation and collection of stones and particulate matter from a body cavity comprising in combination:

(a) a handpiece having an inlet port and an outlet port and an inlet vacuum port and an outlet vacuum port where said handpiece has an internal fluid conduit connecting said inlet port and said outlet port, said handpiece having an internal vacuum conduit connecting said inlet vacuum port and said outlet vacuum port to permit the passage of irrigating fluid through said internal fluid conduit and to permit the passage of evacuated fluid through said internal vacuum conduit, said handpiece further comprising a valve means responsive to external force in a normally closed position to perclude the flow of irrigating or evacuating fluid for selectively permitting the passage of irrigating fluid through said internal fluid conduit or permitting the passage of evacuated fluid through said internal vacuum conduit;

(b) a shaft member having a distal end and a proximate end and a longitudinal axis removeably mounted to said handpiece where said shaft member has an axially extending channel therethrough which communicates with said outlet port of said handpiece and said inlet vacuum port of said handpiece adjacent said proximate end, said channel having a single flow path therethrough and opening at or adjacent said distal end of said shaft member to permit the passage of irrigating fluid into the operative region of the body cavity or to permit the passage of evacuated fluid into said flow path of said channel or to permit the evacuation of said stones and particulate matter from said body cavity for collection in said flow path of said channel, where said shaft member has an engagement lip extending radially at said distal end of said shaft member for manipulating said stones and said particulate matter from said body cavity into said flow channel, said lip forming a terminus of said channel and an axial boundary of said opening, said shaft member further comprising a collection chamber for collecting said stones and said particulate matter at said distal end, said collection chamber communicating with said channel where said collection has a greater cross-sectional area than said channel.

5,195,959

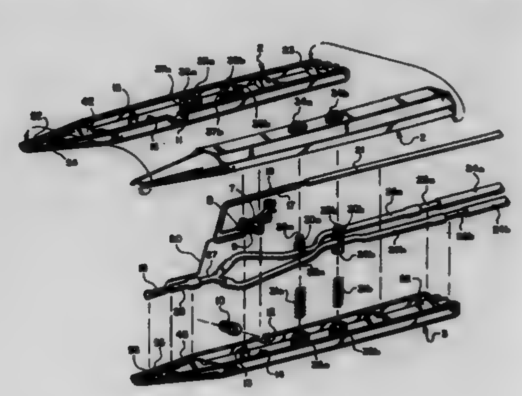
ELECTROSURGICAL DEVICE WITH SUCTION AND IRRIGATION

Paul C. Smith, 2930 Blaisdell Ave. South Apt. #317, Minneapolis, Minn. 55408, assignor to Paul C. Smith, Minneapolis, Minn.

Filed May 31, 1991, Ser. No. 708,208

Int. Cl.⁵ A61B *17/39*

U.S. Cl. 604—34 15 Claims



1. A combined electrosurgical-suction-irrigation device comprising:

an elongated handle having a distinct distal end and a distinct proximal end;

an electrocauterizing tip which forms a connection to the extreme distal end of the elongated handle;

a switching means providing controlled transmission of electrosurgical current to the electrocauterizing tip, wherein the switching means can be activated by a switch mechanism distally oriented within the elongated handle;

a first fluid conduit extending through said handle which forms a fluid connection to a remote source of suction and provides a fluid communication passageway to a location in close proximity to the electrocauterizing tip, wherein the first extended fluid conduit is acted upon by a first conduit collapsing mechanism, contained within the elongated handle, which normally applies a collapsing force constricting the first extended fluid conduit into a closed-off configuration preventing fluid communication and when hand actuated relieves said collapsing force returning the first extended fluid conduit to an open configuration allowing fluid communication;

a second fluid conduit extending through said handle which forms a fluid connection to a remote source of irrigation and provides a fluid communication passageway to a location in close proximity to the electrocauterizing tip, wherein the second extended fluid conduit is acted upon by a second conduit collapsing mechanism, contained within the elongated handle, which normally applies a collapsing force constricting the second extended fluid conduit into a closed-off configuration preventing fluid communication and when hand actuated relieves said collapsing force returning the second extended fluid conduit to an open configuration allowing fluid communication;

said elongated handle wherein a distally oriented single hand grip, located on the elongated handle, can conveniently position both the index finger over the switch mechanism and the thumb in close proximity to the first conduit collapsing mechanism and the second conduit collapsing mechanism, allowing the controlled transmission of electrosurgical current to the electrosurgical tip, the application suction and irrigation to a location in close proximity to the electrocauterizing tip, to be accomplished separately or simultaneously without a relocation of the distally oriented single hand grip.

5,195,960

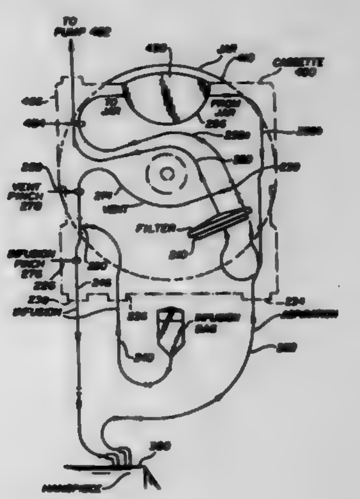
DISPOSABLE VACUUM/PERISTALTIC PUMP CASSETTE SYSTEM

K. Mosaddeq Hossain, Hillsborough, N.J.; Jude V. Paganelli, New Britain; Bernd R. Fischer, E. Norristown, both of Pa.; Deborah A. DeMeo, Tustin, Calif.; Robert M. Bross, Ivyland, and Kenneth P. Cook, Blue Bell, both of Pa., assignors to Site Microsurgical Systems, Inc., Horsham, Pa.

Continuation of Ser. No. 253,801, Oct. 5, 1988, Pat. No. 5,125,891, which is a continuation-in-part of Ser. No. 43,120, Apr. 27, 1987, Pat. No. 4,798,580. This application Apr. 17, 1991, Ser. No. 686,901

Int. Cl.⁵ A61M *1/00;* F04B *43/08*

U.S. Cl. 604—34 6 Claims



1. A microsurgical irrigation/aspiration system, comprising:

a control system including:

(i) means for mounting a disposable cassette;

(ii) means for selectably occluding an infusion line; and

(iii) means for pumping a fluid, wherein said pumping means is chosen from the group consisting of peristaltic pumping mean and vacuum pumping means; and

a disposable cassette, adpated for mounting on said control system so as to engage said pumping means and said selectably occluding means, and including;

(i) a selectably occludable infusion line, operable in conjunction with said selectably occluding means;

(ii) means for connecting said infusion line to a solution source;

(iii) a pumping segment suitable for engagement with and capable of operation by said pumping means such that said pumping means, when engaged with said pumping segment is capable of the performance of either peristalic pumping or vacuum pumping through said pumping segment; and

(iv) means for connecting said pumping segment to a solution container; wherein when said pumping means performs vacuum pumping, said vacuum pumping is accomplished outside said cassette.

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the septum a circular IV lumen about the axis of the body

gate shaft member means provided at and extending be-

5,195,966

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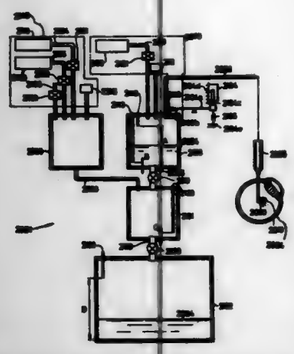
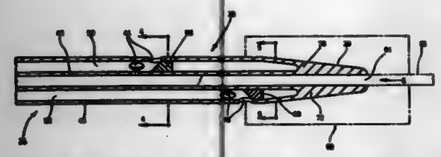
ASPIRATOR
Susumu Takahashi; Yoshihiro Takahashi, and Mineki Hayafuji, all of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Japan
PCT No. PCT/JP89/00417, § 371 Date Mar. 18, 1991, § 102(e) Date Mar. 18, 1991
PCT Filed Apr. 19, 1989, Ser. No. 427,132
Claims priority, application Japan, Apr. 20, 1988, 63-95738; May 12, 1988, 63-113636; Jul. 25, 1988, 63-183563
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—35 15 Claims



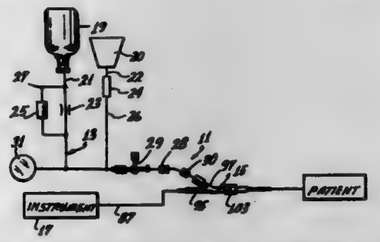
1. An adjustable pressure aspirator comprising:
aspirating means for removing material by aspiration;
a receiving vessel connected to said aspirating means, said receiving vessel having an interior for collecting the material removed by aspiration;
vacuum means for producing a vacuum pressure within said receiving vessel;
pressure detecting means for detecting said vacuum pressure within said receiving vessel;
a vent for connecting the interior of said receiving vessel with atmosphere external to said vessel, said vent having an opening of variable size; and
pressure control means for controlling the vacuum pressure within the interior of said receiving vessel to maintain a constant pressure by adjusting the size of said opening, responsive to said detected vacuum pressure.

5,195,962
TRIPLE LUMEN CATHETER
Geoffrey S. Martin, and Michael R. LeBlanc, both of Mississauga, Canada, assignors to Vas-Cath Incorporated, Mississauga, Canada
Filed Dec. 22, 1988, Ser. No. 288,364
Claims priority, application Canada, Dec. 22, 1987, 555076
Int. Cl.[5] A61M *3/00, 5/178*
U.S. Cl. 604—43 33 Claims



28. A catheter for use in haemodialysis, comprising:
a smooth elongate flexible body of cylindrical shape and having proximal and distal ends, the body having an outer wall and a septum extending between diametrically spaced points on the outer wall to define similar first and second blood flow lumens and defining centrally within the septum a circular IV lumen about the axis of the body and substantially smaller in cross-section than that of the individual blood flow lumens;
a tip at the distal end of the body blending smoothly into the body and converging towards the distal end of the catheter and defining at this end an aperture at the end of the IV lumen;
access means attached to the proximal end of the body providing access to the lumens; and
one of the body and tip defining first side apertures adjacent the distal end communicating with a first of the blood flow lumens, and defining second side apertures spaced towards the proximal end from the first apertures and communicating with the other of the blood flow lumens.

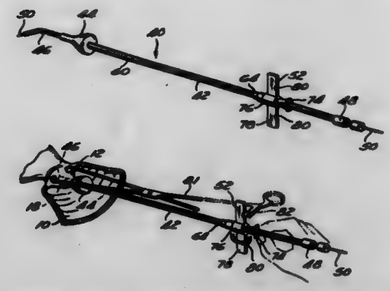
5,195,963
METHOD AND SYSTEM FOR MONITORING OF BLOOD CONSTITUENTS IN VIVO
Masao Yafuso, El Toro, Calif., and Laurence A. Harker, Atlanta, Ga., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 478,248, Feb. 9, 1990, abandoned. This application Jan. 14, 1992, Ser. No. 820,565
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—49 39 Claims



1. In a method for determining the concentration of a constituent of blood of a patient employing a sensor located in a blood vessel for producing a signal related to the concentration of said constituent of blood, the improvement which comprises obtaining said signal while at least one of the following is introduced into said blood vessel: (1) at least one of an added vasodilator component and an added vasodilation promoter in an amount effective to reduce the vasoconstriction caused by the presence of said sensor in said blood vessel and (2) at least one of an added platelet/white cell inhibitor component and an added platelet/white cell deactivation promoter in an amount effective to reduce at least one of: (A) the platelet activation caused by the presence of said sensor in said blood vessel; and (B) the white cell activation caused by the presence of said sensor in said blood vessel; thereby providing a more accurate determination of the concentration of the blood constituent.

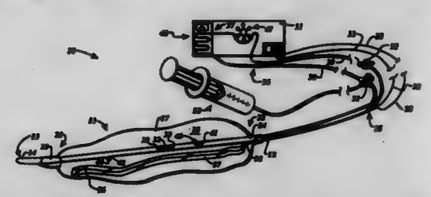
5,195,964
TRANSCERVICAL CATHETERIZATION CANNULA
Oscar A. Kletzky, Beverly Hills; Timothy M. Koci, Redondo Beach, and Fredrick P. Torres, Sherman Oaks, all of Calif., assignors to Research and Education Institute, Inc., Torrance, Calif.
Filed Dec. 5, 1991, Ser. No. 804,230
Int. Cl.[5] A61B *17/34*
U.S. Cl. 604—55 24 Claims

1. A transcervical catheterization cannula retained by forceps and for use with a catheter wire and radiopaque dye fluid, comprising:
an elongate shaft member having a proximal end and a distal end and having at least one lumen passing therethrough through which the catheter wire and the fluid can pass;
a curved tip means curved relative to the axis of said elongate shaft member means provided at and extending beyond said distal end of said shaft member, said tip means being in communication with said at least one lumen and being open at its distal end;
a cervical canal seating member positioned on said shaft rearward of said tip means; and
a handle member which is rotatable and axially movable on said shaft member, said handle member being located rearward of said cervical canal seating member and having a locking means allowing said handle to be axially and



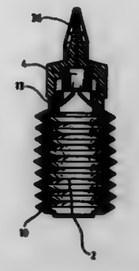
rotatably locked on said shaft member, said handle member being axially and rotatably adjustable to positively engage with the forceps clamped to the patient's cervix to thereby cause said cervical canal member to liquid-tightly engage with the patient's cervical canal, while permitting said elongate shaft member, said cervical canal seating member and said curved tip means to be selectively axially rotated as a unit relative to the cervical canal in order to aim the curved tip towards the patient's fallopian tube so as to permit the catheter wire to enter the fallopian tube.

5,195,965
METHOD AND APPARATUS FOR LOCALIZED TREATMENT OF HUMAN VIRAL INFECTIONS AND CANCERS
Totada R. Shastha, 1657 Kanawha Dr., Stone Mountain, Ga. 30087
Filed Mar. 7, 1991, Ser. No. 665,784
Int. Cl.[5] A61M *31/00*; A61F *7/12*; A61B *17/36*
U.S. Cl. 604—54 7 Claims



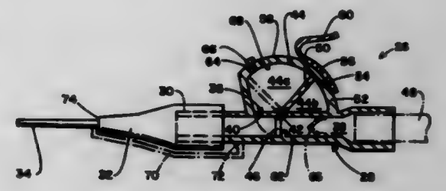
1. A method for heating the interior surfaces of a hollow organ or orifice of a human body for the treatment of a virus or cancer, the method comprising the steps of:
inserting an insertion body into the hollow organ, the insertion body having a flexible outer surface adapted to contact and conform to the interior surfaces of the hollow organ;
heating the outer surface of the insertion body to maintain a selected temperature at the outer surface;
maintaining the insertion body in the hollow organ for a length of time between two and six hours; and
withdrawing the insertion body from the hollow organ.

5,195,966
TREATMENT OF MASTITIS AND APPLICATOR THEREFOR
Michael P. Corby, Ravensheed, England, assignor to Diversey Limited, Northampton, England
Division of Ser. No. 290,629, Dec. 27, 1988, Pat. No. 4,983,634. This application Jul. 26, 1990, Ser. No. 558,218
Int. Cl.[5] A61M *1/06*
U.S. Cl. 604—75 19 Claims



1. A mastitis infusion applicator which comprises
(a) a body portion including a compartment containing a first material which is an aqueous carrier;
(b) a cap portion which is movable relative to the body portion and comprising a canula having a tip which is configured to be inserted into a cow teat to inject a medication thereinto, the cap portion including a compartment containing a second material which is an active material selected from the group consisting of (mon) oxychlorosene, sodium oxychlorosene and mixtures thereof;
(c) a seal secured to one of said portions and operable to separate the body portion and the cap portion to thereby preserve the essential activity of the second material;
(d) a seal breaking means secured to the other of said portions and moveable into engagement with said seal upon relative movement of the cap and body portion between a first position in which the seal is intact and a second portion in which the seal is broken and in which the materials in the two compartments come into contact, to thereby provide a freshly prepared infusion composition immediately prior to infusion, and
wherein at least the surfaces contacting the second material are post molded fluorinated.

5,195,967
ANTICLOTTING DEVICE AND METHOD FOR USE WITH IV CATHETERS
Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022, and Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023
Filed Feb. 18, 1992, Ser. No. 836,768
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—83 19 Claims



1. A method for use in an intravenous tube assembly, comprising the steps of:
automatically monitoring liquid flow along a fluid flow path

extending through an intravenous catheter to detect at

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extending through an intravenous catheter to detect at least a partial cessation of liquid flow along said fluid flow path;

upon detecting at least a partial cessation of liquid flow along said fluid flow path, automatically feeding an anticlotting agent to said fluid flow path; and

upon feeding of said anticlotting agent to said fluid flow path, maintaining said anticlotting agent within a predetermined region of said fluid flow path.

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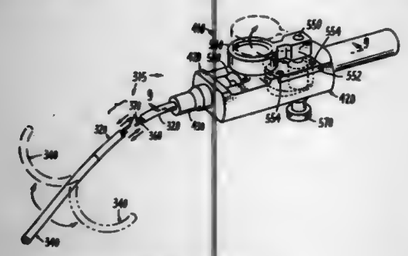
CATHETER STEERING MECHANISM

Ingemar Lundquist, 17 Mile Dr. at The Dunes Rd., Pebble Beach, Calif. 93953, and Russell B. Thompson, 3266 Sweetwater Dr., San Leandro, Calif. 94578

Continuation of Ser. No. 473,667, Feb. 2, 1990, abandoned. This application Jul. 17, 1992, Ser. No. 915,790

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—95 12 Claims



1. A steering mechanism including

a steering shaft having a proximal end and a distal end and a lumen therethrough;

a coiled spring mounted in the steering shaft;

a lead spring positioned within the distal end and fixed in place distally of the coiled spring;

a first steering wire extending through the steering shaft lumen having a distal end attached to the lead spring at a first location and having a proximal end exiting the proximal end of the steering shaft;

a second steering wire extending through the steering shaft lumen having a distal end attached to the lead spring at a second location and having a proximal end exiting the proximal end of the steering shaft;

a controller including a housing having a longitudinal axis connected to the proximal end of the steering shaft, a control shaft rotatably carried within the housing having an axis mounted nonparallel to the longitudinal axis of the housing, means attached to the shaft for rotating the shaft, means for attaching the proximal ends of the first and second steering wires to the control shaft for placing tension on the first steering wire when the control shaft is rotated in a first direction and for placing tension on the second steering wire when the control shaft is rotated in a second direction, the controller being operative for causing the distal end to bend toward the tensed steering wire, and

means for adjusting rotational friction on the shaft.

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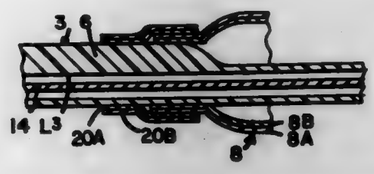
CO-EXTRUDED MEDICAL BALLOONS AND CATHETER USING SUCH BALLOONS

James C. Wang, Norton; George R. Roberts, Arlington, and Brian A. Pederson, Sr., So. Attleboro, all of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Filed Apr. 26, 1991, Ser. No. 691,999

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 16 Claims



1. A catheter for medical purposes, said catheter comprising:

a tubular member having a distal end and at least one lumen disposed therethrough;

a balloon having at least one open end, said open end being sealed at a joint to said distal end, the interior of said balloon being in communication with said lumen, said balloon having an elongated tubular body and comprising a plurality of co-extruded layers of different polymeric materials, at least one of said layers being a polyolefin that is sealed by heat to said tubular member.

5,195,970

COLLAPSIBLE BALLOON CATHETERS

William J. Gahara, 10 Mountain Laurels, Nashua, N.H. 03062

Filed Apr. 26, 1991, Ser. No. 692,015

Int. Cl.[5] A61M *29/02*

U.S. Cl. 604—96 9 Claims

1. An inflatable and collapsible balloon for use in a medical dilatation catheter wherein the internal surface of the balloon has been formed with at least three radially inwardly projecting ribs which project directly into the balloon and extend along the complete longitudinal length of the inner balloon wall, the balloon and ribs being of unitary construction, wherein said construction acts to prevent a flat-collapsed configuration of the balloon.

5,195,971

PERFUSION TYPE DILATATION CATHETER

Motasim M. Sirhan, Santa Clara, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Feb. 10, 1992, Ser. No. 833,537

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—96 14 Claims

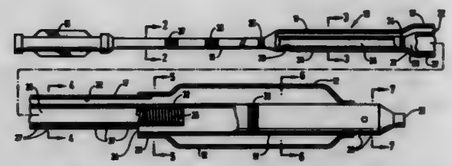
1. A perfusion type catheter comprising:

a) an elongated catheter shaft having proximal and distal sections and an inner tubular member with a distal end and a guidewire receiving lumen extending within the inner tubular member to the distal end thereof;

b) an inflatable dilatation member on the distal section of the catheter shaft; and

c) a tubular extension, having proximal and distal sections, extending through the interior of the inflatable dilatation member, being connected to a distal portion of the inner tubular member having an inner lumen in fluid communication with the guidewire receiving lumen within the

tubular member with an interior proximal section of the tubular extension defining a primary perfusion port which



is offset from and proximal to the distal end of the tubular member having the guidewire receiving lumen.

5,195,972

BALLOON CATHETER ASSEMBLY

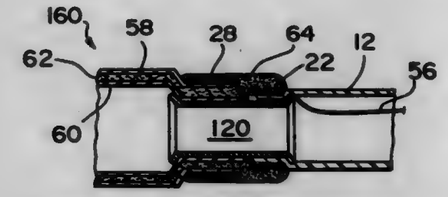
Kanji Inoue, 13, Shimogamo-Miyazaki-cho 98 banchi, Sakyo-ku, Kyoto-fu, Japan

Continuation of Ser. No. 427,345, Oct. 27, 1989. This application Jul. 15, 1991, Ser. No. 731,150

Claims priority, application Japan, Oct. 28, 1988, 63-272366; Oct. 28, 1988, 63-272367

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—103 4 Claims



1. A catheter assembly, comprising:

a double lumen catheter including an elongated outer flexible tube and an elongated inner flexible tube movably disposed in the outer flexible tube, each of the outer and inner flexible tubes having an open distal end, the inner and outer tubes being longitudinally displaceable relative to each other;

a balloon element fixedly attached at its respective ends to the open distal ends of the outer and inner tubes, and;

an elastic connector ring disposed in the open distal end of the outer catheter tube, the open distal end of the outer tube and the proximal end of the balloon element being fitted over the connector ring for firm attachment thereto by fastener means, said connector ring being flared at both ends and being such that the open distal end of the outer catheter tube does not collapse under the force applied by the fastener means.

5,195,973

SELF-DESTRUCTING DISPOSABLE SAFETY SYRINGE SYSTEM WITH PISTON AND PLUNGER JOINED BY WEAK ATTACHMENT SEALANT

Howard J. Novick, 1474 Sugar Creek Blvd., Sugarland, Tex. 77478

Filed Feb. 21, 1992, Ser. No. 839,943

Int. Cl.[5] A61M *5/50, 5/315*

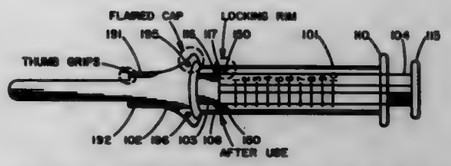
U.S. Cl. 604—110 20 Claims

1. A self-destructing disposable safety syringe system, suitable for preventing needle sticks, preventing syringe reuse, and dispensing fluids from, drawing fluids into and mixing fluids within said system, comprising:

(a) a cylinder having a nozzle on one end to which a syringe needle can be affixed;

(b) an at least partially resilient piston, suitable for sliding against the inside wall of said cylinder under the control of a force applied through an actuator rod attached to said piston, comprising a body arranged so as to form a liquid tight movable partition;

(c) an actuator rod, connected to said piston via a weak attachment, for controlling the displacement of said piston within said cylinder by the application of forces through said actuator rod, wherein the weak attachment between said actuator rod and said piston is formed by directly coupling said actuator rod to said piston utilizing an adhesive sealant; and



(d) a syringe locking mechanism, located on the inside wall of said cylinder and extending therein, arranged to permit the passage of said piston in the direction of said needle when forced in said direction by said actuator rod, wherein said syringe locking means is further arranged to engage and inhibit the passage of said piston in the direction away from said needle only once the entire piston has been forced past said syringe locking mechanism, thereby accommodating the dispensing the fluids from, drawing of fluids into and mixing of fluids within the syringe system until such time as said locking mechanism is engaged.

5,195,974

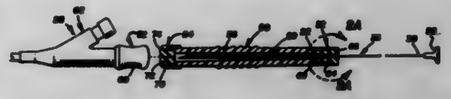
NEEDLE PROTECTOR FOR A CATHETER ASSEMBLY

Dwayne E. Hardy, San Mateo, Calif., assignor to Menlo Care, Inc., Menlo Park, Calif.

Filed Oct. 30, 1987, Ser. No. 115,158

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 12 Claims



1. In a catheter assembly having a cannula having a proximal end portion, a distal end portion and a longitudinal duct therethrough from said proximal end portion to said distal end portion; a longitudinal piercing member having a proximal end and distal end having a sharp insertion tip, the longitudinal piercing member being positioned within the longitudinal duct of the cannula with the insertion tip extending beyond the distal end of the cannula; a hub having a passageway therethrough from the proximal end to the distal end thereof, the proximal end portion of the cannula being attached adjacent the distal end of the hub with the passageway in flow communication with the duct in the proximal end portion of the cannula; and an extraction wire having proximal and distal ends, said wire being of smaller diameter than the longitudinal piercing member, having said distal end thereof attached to extend longitudinally from the proximal end of the longitudinal piercing member, said extraction wire extending through the duct of the cannula and through the passageway of the hub to said proximal end of said wire, an improvement comprising:

a rigid longitudinal piercing member receiving tube having proximal and distal end portions and a longitudinal bore therethrough from said proximal to said distal end portion, said tube being adjacent to said proximal end of said hub, said extractor wire extending from said passageway through and beyond said bore of said tube;

a first closure across said proximal end portion of said tube, said first closure having a generally central opening large enough to allow said wire to pass longitudinally therethrough but too small to allow said longitudinal piercing member to pass fully longitudinally therethrough; and

a second closure across said distal end portion of said tube, said second closure having a generally central access through which said wire and said longitudinal piercing member can longitudinally pass;

wherein said second closure includes means for automatically entrapping said insertion tip of said longitudinal piercing member in said longitudinal bore of said receiving tube, said entrapping means operating in response to said longitudinal piercing member being moved fully proximally into said receiving tube by proximal movement of said extraction wire; and

wherein said second closure comprising a deformable sealing member and said central access comprises a self-sealing hole through which said longitudinal piercing member can longitudinally pass.

5,195,975
SINGLE USE HYPODERMIC SYRINGE
John F. Castagna, 200 W. Sarah St., Milford, Pa. 18337
Filed Jan. 15, 1992, Ser. No. 820,917
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 19 Claims

1. A single-use hypodermic syringe comprising:

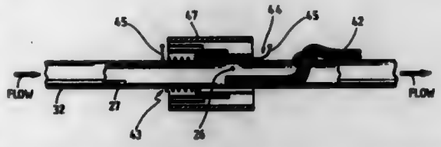
a barrel having a needle end and a drive shaft end;

a plunger slidably received in said barrel and having a bottom and a top, said bottom facing said needle end of said barrel and said top facing said drive shaft end of said plunger;

a drive shaft received in said barrel through said drive shaft end and slidable in said barrel between an inserted position and a withdrawn position; and

connecting means for drivably connecting said drive shaft to said plunger, said connecting means including disengaging means for disengaging said connecting means from said plunger when said drive shaft is moved from said retracted position to said inserted position to bottom said plunger in said barrel, wherein said disengagine means comprising a pair of resilient fingers movable between a spaced-apart position and a collapsed position, said fingers in the extended position engaging said plunger, and wherein at least a portion of said fingers is received within said drive shaft when said drive shaft is in said inserted position, to move said fingers into said collapsed position, whereby said fingers are disengaged from said plunger.

5,195,976
INTRAVENOUS FLUID TEMPERATURE REGULATION METHOD AND APPARATUS
Charles A. Swenson, Spring, Tex., assignor to Houston Advanced Research Center, Houston, Tex.
Continuation-in-part of Ser. No. 626,626, Dec. 12, 1990, Pat. No. 5,108,372. This application Feb. 10, 1992, Ser. No. 833,346
Int. Cl.[5] A61F *7/12*
U.S. Cl. 604—113 25 Claims



1. A device for controlling the temperature of intravenous fluids as they enter the human body comprising:

(a) an intravenous infusion assembly;

(b) a heat exchange assembly removably mounted to said intravenous infusion assembly, wherein said heat exchange assembly comprises:

(i) one or more heat exchangers coaxially mounted within said intra venous infusion assembly;

(ii) one or more fluid temperature sensors;

(iii) one or more fluid flow sensors; and

(iv) a control signal wire bundle;

(c) a controller, said controller being functionally attached to said intravenous infusion assembly and to said heat exchange assembly; wherein said controller includes the use of a flow feedback algorithm comprising:

$$P = (T_{set} - T_0)\, C_2 \frac{F}{\epsilon} - \alpha T_2$$

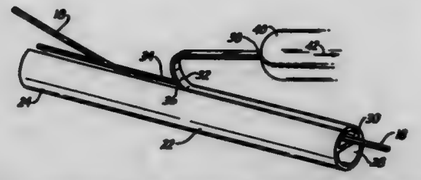
where T_{set} is the set point temperature, T_0 is the initial fluid temperature in ° C., C_2 is the heat capacity of the IV solution, F is the IV fluid flow in (ml/sec), ϵ is the working efficiency of the heat exchanger, T_2 is the time derivative of the final fluid temperature T_2, and α is an empirical damping coefficient; and

(d) an energy source functionally associated with said controller and said heat exchange assembly.

5,195,977
VALVE PLASTER FOR THE EMERGENCY TREATMENT OF OPEN THORAX INJURIES
Sebastian Pollitt, Rheinbrohl, Fed. Rep. of Germany, assignor to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany
Filed Jun. 4, 1991, Ser. No. 709,933
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1990, 4018591
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—122 8 Claims

1. A plaster for the emergency treatment of open thorax injuries permitting external closure of the wound gap and improving the respiration of the injured person until clinical treatment, comprising a wound dressing (4), a substantially airtight carrier layer (5) provided with a pressure-sensitive adhesive coating on the side which will face the skin, the carrier layer (5) projecting beyond the lateral edges of the wound dressing and being provided with an aperture, a gas check valve (2) responding to slight pressure variations projecting through the aperture, the gas check valve opening when positive pressure builds up during the expiration phase and permitting air to escape from the chest cavity, and closing when negative pressure arises during the inspiration phase, the plaster being relatively flat and of low profile.

5,195,978
RAPID EXCHANGE OVER-THE-WIRE CATHETER WITH BREAKAWAY FEATURE
Michael C. Schiffer, Laguna Hills, Calif., assignor to Baxter International Inc., Deerfield, Ill.
Filed Dec. 11, 1991, Ser. No. 806,947
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—161 16 Claims

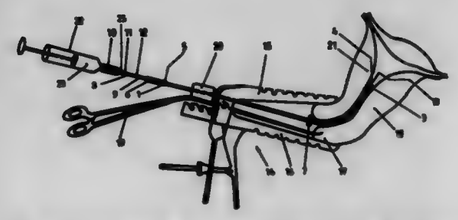


1. A rapid exchange over-the-wire catheter for use in combination with a guidewire which has been positioned at a target site in a patient's body, said catheter comprising:

a tubular shaft having a proximal end, a distal end, and at least one lumen adapted to receive said guidewire; and

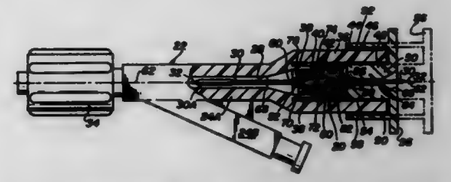
a tear strip longitudinally disposed in said tubular shaft along said lumen from said proximal end toward said distal end for progressively removing said tear strip from said tubular shaft from said proximal end toward said distal end to expose said guidewire and to allow said catheter to be removed from said guidewire while maintaining said guidewire in said desired position.

5,195,979
SET OF INSTRUMENTS FOR THE UTERINAL EMBRYO TRANSFER AND INTRA-UTERINE INSEMINATION
Otto Schinkel, Bovenden, and Josef Horvath, Göttingen, both of Fed. Rep. of Germany, assignors to Labotect-Labor-Technik Gottinger GmbH, Gottingen, Fed. Rep. of Germany
Filed Dec. 24, 1991, Ser. No. 814,410
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1991, 9107792
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 10 Claims



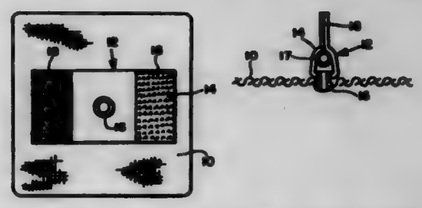
1. Set of instruments for uterine embryo transfer and intra-uterine insemination comprising a catheter guide tube (1) and a catheter (8) slidably movable within the catheter guide tube, the catheter having a proximal area and (8) being provided with a metal reinforcing tube (11) surrounding the catheter (8) in its proximal area, the catheter guide tube having a distal area and an open distal end and (1) including a slight bend (2) in its distal area and a ball (3) on its distal end, with said distal area being flexible.

5,195,980
HEMOSTATIC VALVE
David G. Catlin, West Chester, Pa., assignor to Thomas Medical Products, Inc., Malvern, Pa.
Filed Jan. 3, 1992, Ser. No. 816,988
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—167 10 Claims



1. A hemostatic valve for use in a device having a housing for enabling the introduction of an elongated member into the body of a living being while precluding blood from flowing thereout, said valve being located within said housing and comprising resilient valve means and plunger means, said housing means comprising a hollow interior portion in which said valve means is located, said valve means comprising at least one valve member, said valve means having a small diameter opening and a slit therein, said plunger means being movable and comprising a cap and a tubular member secured thereto, said tubular member having an outer diameter which is larger than the diameter of said opening in said valve means, said tubular member being arranged to be moved into and out of said opening and said slit in said valve means, said cap having an entrance port, said tubular member having a central passageway in communication with said entrance port, said entrance port and said passageway being arranged to enable said elongated member to be readily extended therethrough for location at a desired position within the body of said being when said tubular member is extended through said opening and said slit in said valve means, whereupon said tubular member may be retracted out of said opening and said slit in said valve means thereafter so that said valve means engages the periphery of said elongated member to preclude blood from flowing out of said hemostatic valve, said slit of said valve means automatically closing when said elongated member is moved out of said opening and out of said slit to preclude blood from flowing out of said hemostatic valve.

5,195,981
HOLDER FOR ELONGATED MEMBERS
Melissa C. Johnson, 758 Main St., Leominster, Mass. 01453
Division of Ser. No. 451,579, Dec. 18, 1989, Pat. No. 5,100,393. This application Dec. 5, 1991, Ser. No. 802,620
Int. Cl.[5] A61M *25/02*
U.S. Cl. 604—180 7 Claims



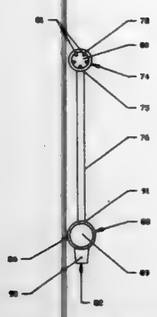
1. A holder for tubes, rods or other elongated members comprising:

a flat, flexible support base having opposite surfaces,

VOL 1148 ISS 4 MR 23 1993 UMI

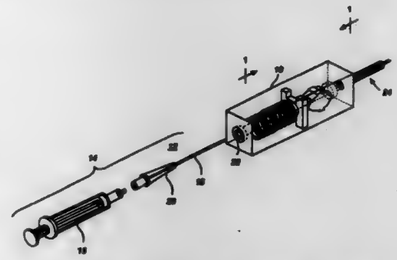
a member holder means mounted on one surface of said base for holding a tube, rod or other elongated member on said base,
a rivet connecting said member holder means to said base, said rivet being permanently crimped to said base and to said member holder means so that the base and member holder means are permanently secured,
said flat flexible support base comprising a thin sheet of flexible material which is conformable to a separate flat or contoured surface,
a layer of pressure sensitive adhesive means covering the surface of said sheet opposite the surface on which said member holder means is mounted for removably securing said base to a separate supporting surface,
a removable protective cover covering said pressure sensitive adhesive means,
said member holder means comprising a strip of flexible material having opposite end portions bendable over a tube, rod or other elongated member placed on said strip between the ends thereof,
conjoining means on said opposite end portions of said strip for releasably securing said end portions together about a tube, rod or other elongated member which is placed on said strip between said end portions,
said rivet extending through said flat, flexible support base and said strip of flexible material intermediate the end portions of said strip.

5,195,982
HYPODERMIC NEEDLE AND PROTECTIVE CAP HANDLING METHOD
John R. Hoenig, 7224 McLaren Ave., West Hills, Calif. 91307
Continuation of Ser. No. 406,167, Sep. 12, 1989, abandoned. This application Jul. 15, 1991, Ser. No. 730,578
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 10 Claims



1. A needle cap holding device for uncapping and recapping a needle cap over a hypodermic needle on a hypodermic syringe comprising:
(a) a handle including a hand holding end and a cap gripping end that includes means for attaching said handle to said needle cap, and
(b) attachment means for attaching said handle to said cap gripping end, in order to allow said handle to be moved repeatedly toward or away from said syringe while said gripping end is attached to said needle cap and said needle cap is attached on said syringe, and
(c) a clamping means attached to said handle for securing the hand holding end of said handle on said syringe while the gripping end is attached to said needle cap and said needle cap is attached on said syringe, and
(d) a means for locking said needle cap onto said syringe, whereby a user can extend said handle a suitable distance from the capped needle and remove said needle cap including the attached said holding device from said syringe and said needle, leaving said syringe and said needle unaltered for use, and replace said needle cap on said needle keeping the hands and fingers a safe distance from said needle, and secure said handle on said syringe for storage and positive retention of said needle cap on said syringe.

5,195,983
SYRINGE GUARD AND DISPOSAL SYSTEM
Ted Boese, Loxahatchee, Fla., assignor to Penta Associates, Loxahatchee, Fla.
Filed Aug. 27, 1991, Ser. No. 750,822
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 7 Claims

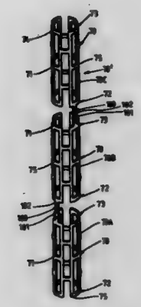


1. An improved apparatus for the safe use and disposal of syringes, said apparatus comprising;
a housing having a plurality of side walls and first and second end walls, wherein said plurality of side walls include cam control surfaces disposed on an interior surface thereof, said first end wall including means for receiving the needle assembly of a syringe having a needle and said second end wall having an aperture aligned with said means for receiving;
a needle guard slidably disposed within the aperture of said second end wall, said needle guard having a longitudinal channel for receiving said needle, said needle guard further including a disk-like flange for limiting the movement of said needle guard within said housing;
a rotable cam disposed within said housing, said rotable cam including a plurality of cam arms responsive to said cam control surfaces, said cam further including a first and second pair of cam surfaces, said first pair of cam surfaces cooperatively disposed with respect to said disk-like flange;
a spacer member slidable disposed within said housing said spacer member including a plurality of notches aligned with said cam control surfaces which permit the movement of said spacer member over said cam control surfaces, said spacer member disposed in cooperative engagement with said second pair of cam surfaces; and
spring biasing means disposed within said housing for urging said spacer member and said rotable cam in a direction opposing said first end wall.

5,195,984
EXPANDABLE INTRALUMINAL GRAFT
Richard A. Schatz, Paradise Valley, Ariz., assignor to Expandable Grafts Partnership, San Antonio, Tex.
Continuation of Ser. No. 253,115, Oct. 4, 1988, abandoned. This application Feb. 19, 1991, Ser. No. 657,296
Int. Cl.[5] A61M *29/00*
U.S. Cl. 606—195 6 Claims

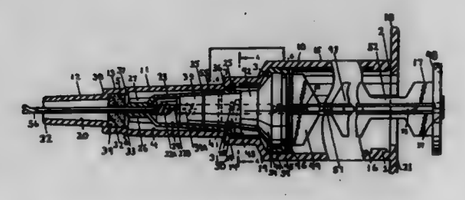
1. An expandable intraluminal vascular graft, comprising:
a plurality of thin-walled tubular members, each having first and second ends and a wall surface disposed between the first and second ends, the wall surface having a substantially uniform thickness and a plurality of slots formed therein, the slots being disposed substantially parallel to the longitudinal axis of each tubular member;

only one connector member being disposed between adjacent tubular members to flexibly connect adjacent tubular members, the connector member being disposed in a substantially parallel relationship with respect to the longitudinal axis of the tubular members and coplanar with each tubular member.
each tubular member having a first diameter which permits intraluminal delivery of the tubular members into a body passageway having a lumen; and



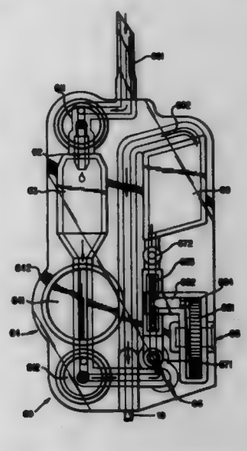
the tubular members having a second, expanded and deformed diameter, upon the application from the interior of the tubular members of a radially, outwardly extending force, which second diameter is variable and dependent upon the amount of force applied to the tubular members, whereby the tubular members may be expanded and deformed to expand the lumen of the body passageway.

5,195,985
SYRINGE HAVING A RETRACTABLE NEEDLE
John E. Hall, 5751 Richards Cir., Shawnee, Kans. 66216
Filed May 25, 1990, Ser. No. 528,592
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—195 12 Claims



1. An article of manufacture comprising a barrel having at the distal end a needle attached thereto, said needle having a male threaded rearward extension that extends into said barrel, said barrel having at the proximal end an opening into which there is fitted a plunger, said plunger having a its distal end a grommet seal and a female threaded accepting cavity for accepting the rearward extension of the needle.

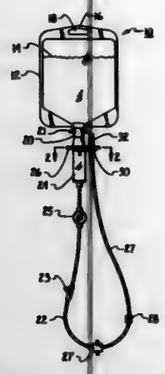
5,195,986
INTEGRAL INTRAVENOUS FLUID DELIVERY DEVICE
Dean L. Kamen, Bedford, N.H., assignor to DEKA Products Limited Partnership, Manchester, N.H.
Continuation of Ser. No. 614,806, Nov. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,801, May 15, 1990, Pat. No. 5,088,515, and a continuation-in-part of Ser. No. 345,387, May 1, 1989, Pat. No. 4,976,162, which is a continuation-in-part of Ser. No. 92,481, Sep. 3, 1987, Pat. No. 4,826,482, which is a continuation-in-part of Ser. No. 22,167, Mar. 5, 1987, Pat. No. 4,808,161, and a continuation-in-part of Ser. No. 836,023, Mar. 4, 1986, Pat. No. 4,778,451. This application Jun. 29, 1992, Ser. No. 908,524
Int. Cl.[5] A61M *5/00, 5/14*
U.S. Cl. 604—251 14 Claims



1. An integral intravenous fluid delivery device for use between an intravenous fluid source and an intravenous fluid line in fluid communication with a patient, the device comprising:
a housing including a fluid passageway, the passageway having a portion through which fluid normally flows against gravity;
a spike for connecting the rigid housing directly to the intravenous fluid source, another portion of the fluid passageway being disposed in the spike;
a rigid drip chamber, the fluid passageway passing through the drip chamber;
repeatedly compressible priming means for urging fluid from the intravenous fluid source into the drip chamber and through the intravenous fluid line, the priming means including a rigid portion and a flexible portion, including a priming membrane, the priming means being in fluid communicating with the fluid passageway; and
means, mounted on the housing, for receiving the intravenous fluid line, such that the fluid passageway leads into the intravenous fluid line;
wherein the spike, the drip chamber, the rigid portion of the priming means and the receiving means all form an integral piece of rigid material; and further including
a valve chamber disposed in the housing, such that the fluid passageway leads into and out of the valve chamber through first and second mouths; and
a valve membrane attached to the housing and disposed over the valve chamber so that the valve membrane may be urged to cover at least one of said first and second mouths, such that flow through the fluid passageway may be stopped; and further including
a cap having a hold defined therethrough, the cap being disposed on the housing over the valve membrane, such that gas may be supplied through the hole to urge the

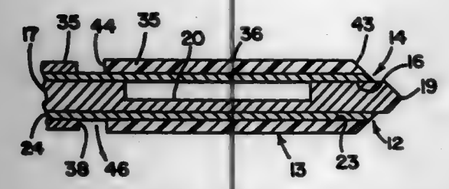
valve membrane to cover at least one of said first and second mouths.

5,195,967
EMERGENCY I.V. SET-UP APPARATUS
Kenneth D. Karpiak, 2286B Levante St., Carlsbad, Calif. 92009
Filed Aug. 16, 1991, Ser. No. 745,919
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—262 9 Claims



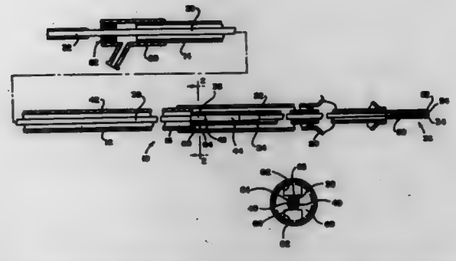
1. An emergency I.V. set-up apparatus, comprising:
a flexible container for containing I.V. fluid having means for hanging said container;
a flexible tube fixedly connected in fluid communication with said container, said tube having a sterile outlet end;
a drip chamber connected to said tube, said drip chamber having a rigid base;
a cap for covering said sterile outlet end, said cap being fixedly connected to said rigid base to permit said sterile outlet end of said tube to be removed from said cap by pulling on said tube.

5,195,968
MEDICAL NEEDLE WITH REMOVABLE SHEATH
John R. Haaga, 3409 N. Hilltop, Chagrin Falls, Ohio 44022
Division of Ser. No. 514,769, Apr. 26, 1990, Pat. No. 5,080,655, which is a division of Ser. No. 288,858, Dec. 23, 1988, Pat. No. 4,936,835, which is a continuation-in-part of Ser. No. 199,130, May 26, 1988, Pat. No. 4,838,280. This application Nov. 4, 1991, Ser. No. 787,518
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—265 10 Claims



1. A hemostatic sheath in combination with a medical needle, said needle including a metal cylinder; puncture means associated with the distal end of said cylinder for puncturing the tissue of a body by said needle; a generally cylindrical hollow sheath circumferentially applied over a portion of said cylinder; means associated with said cylinder and said sheath for sliding said sheath over and off said cylinder and depositing said sheath at the site where said tissue has been accessed, and means for preventing body fluid loss or bleeding from the body site where said tissue has been accessed by establishing the diameter of said sheath to be of size sufficient to compress the tissue where said sheath is deposited to prevent bleeding or loss of body fluid from the tissue in contact with said sheath.

5,195,989
LOW PROFILE CATHETER FOR INCREASING LUMEN SIZE OF A BLOOD VESSEL AND GUIDE WIRE THEREFOR
Charles L. Eutenener, St. Michael, Minn., assignor to Scimed Life Systems, Inc., Maple Grove, Minn.
Filed Sep. 17, 1990, Ser. No. 583,437
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—280 53 Claims

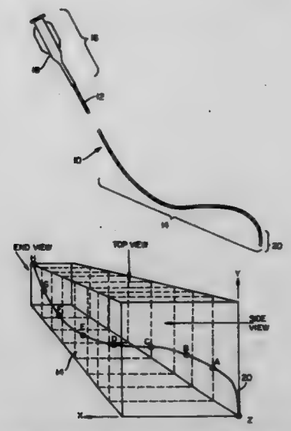


1. A low profile catheter for increasing lumen size of a blood vessel, comprising:
a catheter shaft having proximal and distal ends and defining an axis extending therebetween;
first means, carried by the distal end of the shaft, for increasing lumen size of a blood vessel in which the catheter shaft is positioned;
a guide wire positioned in the catheter shaft, said guide wire having proximal and distal ends, said distal en extending beyond the distal end of the catheter shaft and the lumen size increasing means; and
second means for automatically transmitting torque from the catheter shaft to the guide wire when the catheter shaft is rotated with respect to the guide wire and for automatically permitting relative axial movement therebetween when the guide wire is advanced with respect to the catheter shaft said second means located in said catheter shaft at least in part adjacent to said guide wire.

5,195,990
CORONARY CATHETER
Thomas D. Weldon, Aquadilla, P.R., assignor to Novoste Corporation, Aquadilla, P.R.
Filed Sep. 11, 1991, Ser. No. 757,684
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—281 8 Claims

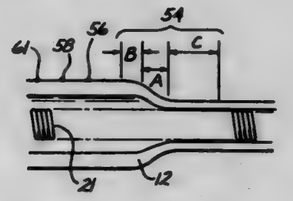
1. A method of performing diagnosis or treatment of the right coronary artery of a patient comprising:
providing a catheter having an elongated hollow body with a proximal end portion and a distal end portion which is substantially curved in three dimensions;
advancing the distal end portion through the descending aorta, over the aortic arch, into the ascending aorta, and into proximity with the ostium of the right coronary artery;
rotating said distal end portion of said catheter as it advances over the aortic arch so as to place said tip end portion in proximity with the right coronary ostium, said rotating

being the automatic result of interaction between the particular shape of the coronary catheter and the wall of



the aorta, whereby the tip end portion may be placed into said ostium with minimum manual adjustment required.

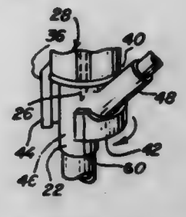
5,195,991
PRESTRESSED COLUMN
Kelly A. Pike, Laguna Hills, Calif., assignor to Applied Vascular Devices, Laguna Hills, Calif.
Division of Ser. No. 643,525, Jan. 18, 1991, Pat. No. 5,121,536. This application Apr. 20, 1992, Ser. No. 871,841
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—282 13 Claims



1. A catheter, including:
a core element having a longitudinal axis and being characterized by an irregular outer surface the element having a first modulus;
a sheath overlying the core element and engaging the outer surface of the element to impart axial compressive stresses to the core element; and
the modulus of the stressed element being greater than the first modulus.

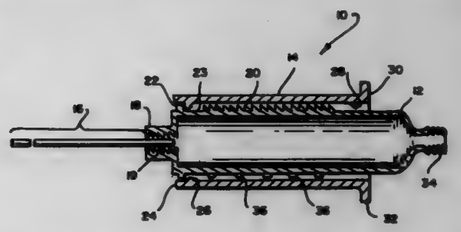
5,195,992
PROTECTOR SHIELD FOR NEEDLES
Thomas E. Dudar, Palatine, and Vincent C. Deseckl, Ingleside, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed May 13, 1988, Ser. No. 193,457
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—283 26 Claims

18. A protector shield for a needle, which comprises an arcuate wall, longitudinally positionable about the pointed end of a tubular needle in spaced relation thereto, said pointed needle end being in recessed relation with the forward end of said arcuate wall, said needle being positioned in generally axial relation with said arcuate wall, the arcuate wall defining an open side, and an arcuate arm positioned forward of the needle end, extending from said arcuate wall across a portion of said open side, said arm extending generally circumferentially about said needle, said arcuate wall defining a rearward end, said wall being attached at said rearward end to a forward end of a tubular member, the diameter of said arcuate wall



being greater than the diameter of said tubular member, said arcuate wall defining an arc about said needle of essentially 150 to 240 degrees, whereby said protector shield lockingly engages and disengages said needle with a Y-type injection site having a side arm and septum, by rotating said arcuate arm under said arm after insertion of said needle into said septum.

5,195,993
NEEDLE PROTECTING ASSEMBLY
Arthur Gianakos, 6 White Fir Dr., Londonville, N.Y. 12211
Filed Aug. 30, 1990, Ser. No. 575,226
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—283 3 Claims



1. A protective medical device comprising
an elongated hollow body, there being a needle element carried at one end of the body and extending longitudinally a distance beyond said one end,
a sleeve mounted encirclingly on the body and having a sleeve retracted position wherein a first end of said sleeve is proximate the body one end, and a sleeve second end is proximate a body second end,
said sleeve being slidable on said body from its retracted position in a sleeve extending travel advancing its second end toward the body one end to position the first sleeve end beyond a tip end of the needle element for the purpose optionally of protecting against inadvertent user contact with the said tip end, or removably mounting the sleeve to a Y-site structure at a securement location distant from that at which the needle element would have passage through a diaphragm covering an entry to the Y-site structure during sleeve mounting to the Y-site, said sleeve having resilient locking means thereon proximal the said first end thereof for removably locking the medical device to the Y-site structure,
means for preventing retraction travel of said sleeve from any extended travel position thereof, said means including a linear arrayed series of teeth carried on one of an exterior surface of said body and an inner surface of said sleeve, and a pawl carried on the other of said exterior and

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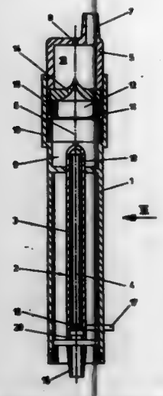
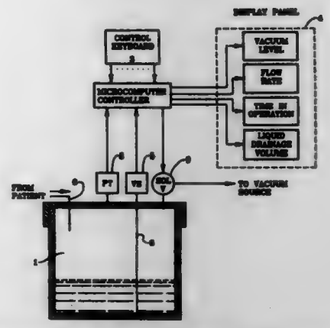
interior surfaces, said pawl being urged into locking engagement with the teeth of said series by a force imposed on the sleeve tending to retract it, and
a fitting at the second end of the hollow body for connecting it with another medical device.

5,195,994
COUPLING FOR JOINING FLEXIBLE TUBING FOR MEDICAL PURPOSES
Franz A. Dieringer, Prinz Eugenstrasse 18, A-1040 Vienna, Austria
PCT No. PCT/AT90/00008, § 371 Date Nov. 7, 1990, § 102(e) Date Nov. 7, 1990, PCT Pub. No. WO90/07953, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 19, 1990, Ser. No. 573,018
Claims priority, application Austria, Jan. 19, 1989, 104/89
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—283 20 Claims



1. In a coupling having a longitudinally extending axis for connecting hose conduits for medical purposes including a first coupling member, a second coupling member releasably connected to said first coupling member, second hose connecting means for connecting said first and second coupling members to a second hose length, a sponge member soaked with a disinfectant within said first coupling member, a diaphragm connected within said second coupling member, and a hollow plug axially movable within said coupling members and extending in the operating position thereof through said sponge member and piercing through said diaphragm for coupling a first hose length to said second hose length through said coupling, the improvement comprising:
said second hose connecting means being on said second coupling member;
means for supporting said hollow plug on said first coupling member for relative axial movement therein;
said hollow plug comprising an outer part and an inner part telescopically and rotatably disposed within and relatively to said outer part; cooperating sealing means on said inner and outer parts for sealing said inner and outer parts with respect to each other;
a plurality of axially extending channels on said inner part;
at least one radial perforation in said inner part extending radially relative to and communicating with said axially extending channels;
first hose connecting means for said first hose length on said inner part and communicating with said at least one radial perforation; and
radially extending openings in said outer part, said radial openings being closed by said inner part when said outer part is in a first relative rotated position with respect to said inner part, and in communication with said channels and said at least one radial perforation through said channels when said outer part is in a second position of rotation with respect to said inner part.

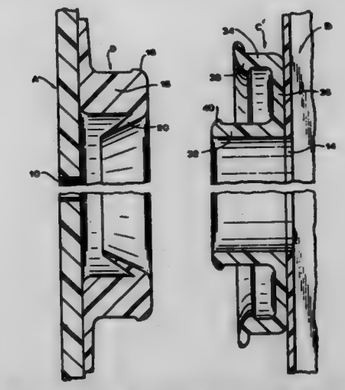
5,195,995
CONTROL VACUUM TO MEASURE GAS FLOW
Clarence L. Walker, Webster Groves, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.
Filed May 9, 1989, Ser. No. 349,155
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—319 7 Claims



1. In a chest drainage apparatus having a collection chamber therein for receiving fluid and gas to be drained from a pleural cavity of a patient and a vacuum source for applying suction to said collection chamber, the improvement comprising:
a pressure transducer for measuring the negative pressure in said collection chamber;
valve means connecting said chest drainage unit to said vacuum source;
means responsive to said pressure transducer for causing said vacuum source to the connected to said chest drainage unit when the negative pressure in said collection chamber is less than or equal to a first predetermined threshold and for causing said vacuum source to be disconnected from said chest drainage unit when the negative pressure in said collection chamber equals or exceeds a second predetermined threshold; and
means for measuring the time period during which said vacuum source is disconnected from said chest drainage unit and means for determining the rate of flow of gas into said collection chamber.

5,195,996
OSTOMY DEVICE WITH IMPROVED COUPLING SYSTEM
John V. Edwards, Reigate, England; Walter F. Leise, Jr., Yardley, Pa., and John B. Cline, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Princeton, N.J.
Division of Ser. No. 530,635, May 30, 1990, Pat. No. 5,088,992.
This application Jan. 9, 1991, Ser. No. 639,105
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—338 8 Claims

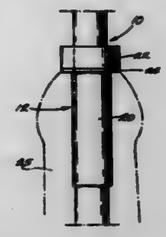
1. An ostomy device comprising waste collection means, faceplate means attachable to a peristomal surface and means for detachably mounting said collection means on said faceplate means, said mounting means comprising first and second coupling means affixed to said collection means and said faceplate means, respectively, one of said coupling means comprising substantially axially extending rib means comprising a body rim means extending in a substantially radial direction from and outwardly of said body, and sealing flange means extending in said substantially radial direction from and inwardly from said body, said body being substantially non-deformable in said radial direction, said other of said coupling means comprising channel means for removably receiving said rib means, said channel means comprising spaced inner and outer walls and a connecting wall, each having an interior surface, said outer wall and said inner wall comprising first and second protrusions, respectively, extending from points on said interior surfaces of said outer and inner walls proximate the ends of said walls remote from said connecting wall, said inner wall being formed of substantially deflectable material, said flange means causing said inner wall to deflect to a significant degree when said rib means is received in said channel means, said first protrusion cooperating with said rim means and said second protrusion cooperating with said flange means to securely retain said rib means within said channel means.



5,195,997
INCONTINENT'S AID
William A. Carns, 629 E. 10th Ave., Ste. 4, Apache Junction, Ariz. 85219
Filed Nov. 27, 1991, Ser. No. 799,088
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—347 13 Claims

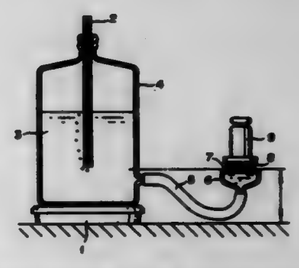
1. In apparatus for the receiving, transferring, and accumulating of fluids excreted from the body and having fluid collection means to be coupled to the body for receiving said fluids, reservoir means for accumulating said fluids, hollow conduit means for transferring said fluids from said collection means to said reservoir means, and air flow impelling means for drawing air into said collector means, through said conduit means and said reservoir, to enhance the flow of said fluid from said collector means to said reservoir means, the improvement comprising:
adjustable air flow control means coupled to said collection means for selectively reducing air flow through said conduit and for:
a. creating a partial vacuum within said collection means whereby said collection means is retained in place on the body, and
b. for increasing the velocity of air flowing through said conduit whereby the flow of excreted body fluids from said collection means to said reservoir means through said conduit means is aided and enhanced.

5,195,998
MEATAL GUARD
Bernard M. Abraham, and Joel Z. Cornfield, both of Oak Park, Ill., assignors to Adastra Corporation, Oak Park, Ill.
Filed Aug. 21, 1991, Ser. No. 748,246
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—351 11 Claims



1. A combination of a meatal guard and a urinary catheter constructed and arranged for insertion into the urethra of a male, said meatal guard comprising a hollow tubular section constructed and arranged to slideably engage the outer surface of the catheter for insertion into the end of a male patient's urethra and for being positioned between the catheter and the urethra, said catheter being formed of a material more flexible than said tubular section, and locating means projecting from the tubular section and positioned to be engaged by the tip of the patient's penis for limiting the insertion of the meatal guard into the urethra, said meatal guard acting to limit flexure of the catheter to reduce stress on the penile meatus.

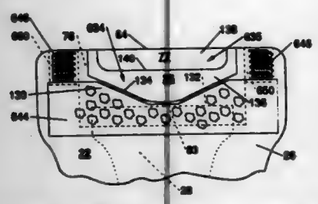
5,195,999
ABSORBENT BODY AND ABSORBENT ARTICLE
Nobuyuki Harada, Suita; Kazumasa Kimura, Ikoma, and Tadao Shimomura, Toyonaka, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan
Filed Aug. 29, 1991, Ser. No. 751,988
Claims priority, application Japan, Aug. 30, 1990, 2-226682; Aug. 30, 1990, 2-226683
Int. Cl.[5] A61F *13/15*; B32B *13/20*; D04H *1/58*
U.S. Cl. 604—368 16 Claims



1. An absorbent body having absorbent polymer particles and hydrophilic fibers as main components thereof, wherein said absorbent polymer is a cross-linked polymer of a water-soluble ethylenic monomer having acrylic acid or an acrylate as a main component; said absorbent body having a density in a range of from 0.1 to 0.5 g/cm^3, a capacity for absorption of

physiological saline solution under a load in a range of from 11 to 25 g/g, and a ratio of exfoliation of not more than 45%.

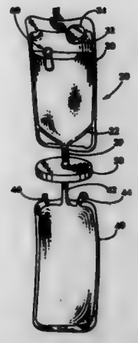
5,196,000
ABSORBENT ARTICLE WITH DYNAMIC ELASTIC WAIST FEATURE COMPRISING AN EXPANSIVE TUMMY PANEL
Sandra H. Clear, Maineville; Daniella T. Falcone, and Kenneth B. Buell, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 715,014, Jun. 13, 1991, abandoned. This application Aug. 22, 1991, Ser. No. 750,774
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—385.1 25 Claims



1. A unitary disposable absorbent article having a first waist region, a second waist region, end edges, and longitudinal edges, the absorbent article comprising:
a containment assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined with said top sheet, and an absorbent core positioned between said topsheet and said backsheet, said absorbent core having side edges and waist edges;
an elastic waist feature at least extending longitudinally outwardly from one of said waist edge of said absorbent core said elastic waist feature comprising an elasticized waistband, said elasticized waistband comprising (i) a shaping panel zone being elastically extensible in at least the lateral direction, (ii) a waistline panel zone resiliently flexurally joined with said shaped panel zone, said waistline panel zone being elastically extensible in at least the lateral direction, and (iii) a predisposed, resilient, waistband flexural hinge zone joining said shaping panel zone and said waistline panel zone for allowing relatively flexural bending between said shaping panel zone and said waistline panel zone when forces are applied and for providing a restoring force/moment to resiliently return said shaping panel zone and said waistline panel zone to essentially their preceding in-use configuration when the forces are removed, said waistband flexural hinge zone having a bending flexure restoring force greater than about 20 grams/, and the extension forces of said elasticized waistband being less than or equal about 400 grams/ at extensions of between about 25 mm and about 50 mm; and
a closure system disposed on the absorbent article for creating/maintaining lateral tension through at least a portion of said elasticized waistband.

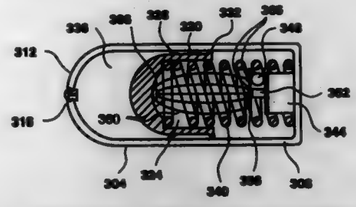
5,196,001
DEVICES AND METHODS FOR PREPARING PHARMACEUTICAL SOLUTIONS
Ti Kao, P.O. Box 14, Rego Park, N.Y. 11374-0014
Filed Mar. 5, 1991, Ser. No. 664,773
Int. Cl.[5] A61B *19/00*
U.S. Cl. 604—416 26 Claims

1. A device for the preparation of sterile pharmaceutical solutions comprising:
(a) a first bag having a transparent, flexible plastic lining that defines a chamber;
(b) an inlet port formed in the lining and leading to the chamber, the inlet port permitting the loading of a unit dose holder into the chamber and the admission of a solvent into the chamber;
(c) a cap which seals the first bag inlet port after the loading of a unit does holder within the chamber;
(d) an outlet port leading away from the chamber located in the lining beneath the inlet port;
(e) a unit dose holder located completely within the chamber;



(f) a filtration unit having a filter combination suitable for the filtration of bacteria and particulate matter and an inlet tube and an outlet tube, the inlet tube of the filtration unit being attached to the outlet port of the first bag; and
(g) a second bag having an inlet port and an outlet port, the inlet port of the second bag being attached to the outlet tube of the filtration unit, wherein a solution contained within the first bag may be forced through the filtration unit into the second bag to form a solution adapted for medical use.

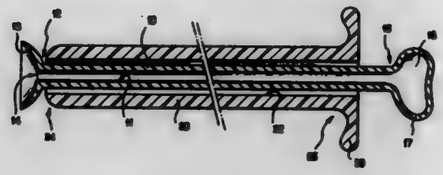
5,196,002
IMPLANTABLE DRUG DELIVERY SYSTEM WITH PISTON ACUTATION
Barry K. Hanover; Stephen C. Jacobsen; Eric M. Simon; Tomasz Petelenz, all of Salt Lake City, and Michael G. Mladejovsky, Murray, all of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah
Division of Ser. No. 594,271, Oct. 9, 1990, Pat. No. 5,059,175. This application Jun. 18, 1991, Ser. No. 716,926
Int. Cl.[5] A61K *9/22*
U.S. Cl. 604—891.1 7 Claims



1. An implantable drug delivery system comprising
a housing having a base end and a discharge end for holding drug solution at the discharge end,
valve means disposed at the discharge end of the housing to allow the drug solution to flow out of the valve means and out of the housing when the drug solution pressure is applied to the valve means,
piston means slidably disposed in the housing to slide between the base end and discharge end to force the drug solution toward the discharge end and out the valve means,

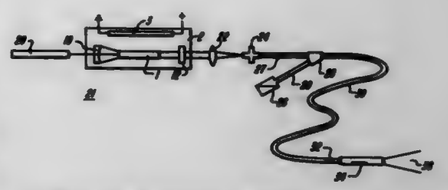
biasing means for urging the piston means toward the discharge end of the housing,
movement control means, connected to the piston means, for allowing successive step-wise movement of the piston means toward the discharge end of the housing in response to a plurality of release signals, and for otherwise restraining movement of the piston means, wherein said movement control means comprises
a plurality of different length tethers each having a first and second end, the different length tethers being connected at a first end to the piston means,
a plurality of release nodes located in the housing near the base end thereof, each for holding the second end of a different one of the tethers and for releasing said second end in response to a release signal, and
means for supplying release signals in a predetermined sequence to said movement control means
wherein said release signal supplying means comprises means for sequentially supplying release signals to the release nodes in the order of the shortest tether node to the longest tether node so that as a tether is released, the piston means is moved toward the discharge end of the housing to thereby discharge a bolus of drug solution from the housing, until the next shortest unreleased tether stops further movement of the piston means.

5,196,003
ENDOSCOPIC SURGICAL INSTRUMENT FOR TAKING HOLD OF TISSUE
Joseph Bilweis, Noisy Le Roi, France, assignor to Ethicon, Inc., Somerville, N.J.
Filed Nov. 4, 1991, Ser. No. 787,450
Claims priority, application France, Nov. 6, 1990, 90 13712
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—1 10 Claims



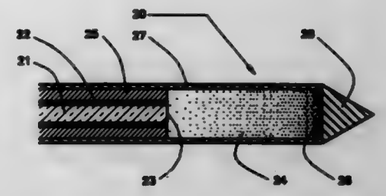
1. A surgical instrument wherein the instrument comprises a tube having a proximal end and a distal end, said tube placed in a cannula and having its proximal end and its distal end emerging from the cannula, said tube provided at its proximal end with a flexible suction cup in the form of a concave cap provided with a central orifice and said tube provided at its distal end with a bulb having an inside volume in communication with said central orifice via said tube in order to enable said suction cup to be applied against and to adhere to tissues or organs for displacement under the control of pressure and/or suction from the bulb.

5,196,004
INFRARED LASER CATHETER SYSTEM
Edward L. Sinofsky, Reading, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Continuation-in-part of Ser. No. 166,315, Mar. 10, 1988, Pat. No. 4,917,084, which is a continuation-in-part of Ser. No. 14,990, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 761,188, Jul. 31, 1985, abandoned. This application Oct. 25, 1989, Ser. No. 427,251
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] A61N *5/06*
U.S. Cl. 606—3 35 Claims



1. A system for the removal of atherosclerotic plaque comprising:
a Holmium-doped laser energy source having a pulsed output in a wavelength range of about 1.9 to about 2.1 micrometers; and
an optical fiber for conducting laser energy from a proximal end of said optical fiber to a surgical site at a distal end of said optical fiber to a surgical site at a distal end of said optical fiber, the proximal end of said optical fiber being optically coupled to the output of said laser energy source, said laser energy source providing at least about 0.6 joules per square millimeter per pulse to a surgical site at the distal end of said optical fiber for removal of atherosclerotic plaque substantially by vaporization.

5,196,005
CONTINUOUS GRADIENT CYLINDRICAL DIFFUSION TIP FOR OPTICAL FIBERS AND METHOD FOR MAKING
Daniel R. Doiron, Santa Ynez; Hugh L. Narciso, Jr., and Paul Paspa, both of Santa Barbara, all of Calif., assignors to PDT Systems, Inc., Goleta, Calif.
Filed Nov. 26, 1991, Ser. No. 799,047
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—7 5 Claims



1. A diffuser tip having a proximal end which abuts against the tip of an optical fiber or array of fibers and a distal end, said diffuser tip comprising a cylindrical central core of a substantially transparent elastomer, said core containing scattering centers embedded therein, said scattering centers being distributed within the core so that the concentration of scatterers increase continuously in a direction from the proximal end of the diffuser tip to the distal end of the diffuser tip.

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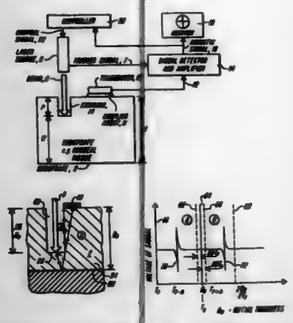
5,196,006
METHOD AND APPARATUS FOR EXCISION ENDPOINT CONTROL

Peter J. Klopotek; Alex C. Sacharoff, both of Framingham, and Richard G. Caro, Boston, all of Mass., assignors to Summit Technology, Inc., Waltham, Mass.

Continuation of Ser. No. 343,038, Apr. 25, 1989, abandoned. This application Oct. 10, 1991, Ser. No. 773,781
Int. Cl.[5] A61H *5/06*
U.S. Cl. 606—12 20 Claims

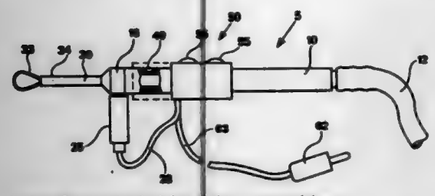


1. Apparatus for measuring, in a biological material, the depth of an excision generated in the biological material and caused by a laser ablation process, the apparatus comprising
detection means for detecting an acoustic pulse generated by the laser ablative process, and for detecting a second acoustic pulse resulting from the first acoustic pulse, said second acoustic pulse being reflected from a boundary of the material,
said detection means being located such that
said first acoustic pulse travels along a first acoustic path to said detection means and said second acoustic pulse travels along a second acoustic path to said detection means, and such that
the length of the second acoustic path is greater than the length of the first acoustic path, and
measuring means for measuring a time separation between detection of the first acoustic pulse and detection of the second acoustic pulse, said time separation being representative of excision depth.

5,196,007
ELECTROSURGICAL HANDPIECE WITH ACTIVATOR

Alan Ellman, and Jon C. Garito, both of 1135 Railroad Ave., Hewlett, N.Y. 11557

Filed Jun. 7, 1991, Ser. No. 711,860
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—32 12 Claims

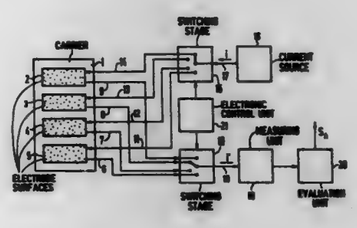


1. An electrosurgical handpiece comprising:
an elongated handle having at a first end means for attaching a suction hose and having at a second end means for receiving and holding an electrode,
an electrosurgical electrode comprising a hollow electrically-conductive tube having a first end removably-mounted in the handle electrode receiving and holding means and having a second end having an electrically exposed conductive portion that can perform an electrosurgical function when energized,
said handle having a hollow bore connecting its first end to its second end such that suction applied via a suction tube at its first end is transmitted to and effective at the electrode second end via the handle bore and the electrode hollow tube,
said handle having a suction bypass hole opening at its surface and extending through the handle and into communication with its hollow bore for controlling the suction pressure at the electrode second end in response to user closure of the hole,
an electrical finger switch comprising a housing containing a printed circuit board, at least one finger actuator button accessible on the outside of the housing and when depressed establishing via the printed circuit board an electrical connection between first and second terminals on the printed circuit board,
a first electrical cable connected to the finger switch and its first terminal for supplying electrosurgical energy,
a second electrical cable connected to the second terminal and having means for electrical connection to the electrosurgical handpiece, whereby electrosurgical energy will be made available at an electrode mounted in the handpiece in response to actuation of the finger switch button on the finger switch,
means for removably mounting the finger switch on the handpiece,
said handle comprising a removable front piece having a bore communicating with the handle bore, said front piece bore having a diameter to receive with a friction fit the first end of the electrode tube,
an electrical connector connected to the front piece and having a portion extending into the front piece bore,
means for removably connecting the connector to the front piece such that when connected its extending portion engages and clamps the electrode to the front piece.

5,196,008
METHOD AND CIRCUIT FOR MONITORING ELECTRODE SURFACES AT THE BODY TISSUE OF A PATIENT IN AN HF SURGERY DEVICE

Peter Kuenecke, Buckenhof, and Uwe Hagen, Forchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 23, 1990, Ser. No. 571,124
Claims priority, application European Pat. Off., Sep. 7, 1989, 89116573.0
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—35 11 Claims

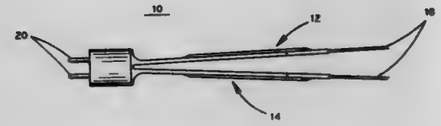


7. A circuit for monitoring a neutral electrode of an HF surgery device, said neutral electrode having a plurality of electrode surfaces, for planar adjacency against body tissue of a patient, said circuit comprising:
a current source;
means for measuring current;
first switching means for successively connecting said means for measuring current to each of said plurality of electrode surfaces;
second switching means for successively connecting at least two of said plurality of electrode surfaces to said current source such that an electrode surface connected to said current source is not simultaneously connected to said means for measuring current, connection of one of said electrode surfaces to said current source causing a resulting current to arise at each of the remaining electrode surfaces, said resulting currents at each at said remaining electrode surfaces being measured by said means for measuring current;
means for comparing the resulting current measured by said means for measuring current for equality; and
means for generating an alarm signal is said resulting currents which are compared differ by more than a predetermined deviation.

5,196,009
NON-STICKING ELECTROSURGICAL DEVICE HAVING NICKEL TIPS

Lawrence T. Kirwan, Jr., 203 Indian Pond Rd., Kingston, Mass. 02364

Filed Sep. 11, 1991, Ser. No. 757,575
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—51 1 Claim



1. A microsurgical bipolar forceps comprising elongated, unitary, coined, all nickel first and second blade portions and first and second housing portions, each of the blade portions having first and second terminal ends the first blade portion positioned within the first housing portion and the second blade portion positioned within the second housing portion, the first terminal end providing a tip and the second terminal end providing a connector pin, and the first and second blade portions capable of carrying an electric current, the first housing portion overmolded and covering a major portion of the first blade portion and the second housing portion overmolded and covering a major portion of the second blade portion, the connector pin of each of the blade portions adapted to engage an electrical socket.

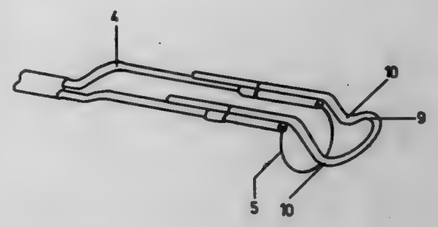
5,196,010

Patent Not Issued For This Number

5,196,011
CUTTING ELECTRODE FOR MEDICAL RESECTOSCOPE

Knut Korth, Mersbausen, and Bernd Nösel, Lutjensee, both of Fed. Rep. of Germany, assignors to Olympus Winter & Ibe GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 756,335
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1990, 4032601
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—46 7 Claims

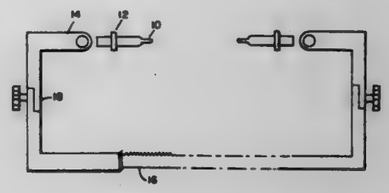


1. A cutting electrode structure for a medical resectoscope of the type having a hollow shaft having a central axis, the electrode comprising
an electrically insulated loop support displaceable axially with respect to the resectoscope shaft, said loop support having proximal and distal ends;
an un-insulated, electrically conductive cutting loop carried by said distal end of said loop support and extending laterally a predetermined distance from said loop support;
a spacer (9, 9′, 9″) carried by said loop support (4, 4′), said spacer extending distally beyond said cutting loop (5, 5′) and extending laterally in the same direction as said cutting loop but a smaller distance from said loop support, thereby limiting the cutting depth of said loop.

5,196,012
EXTERNAL COMPRESSION FRAME RAPIDLY STABILIZING UNSTABLE PELVIC FRACTURES

Jeffrey S. Malka, 6845 Elm St., McLean, Va. 22101-3889

Filed Jul. 11, 1991, Ser. No. 728,576
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—54 16 Claims



1. A device to stabilize a fractured pelvis using
a) at least two substantially oppositely axially aligned pins that attach to the lateral wall of the bony pelvis;
b) an external frame with first and second arms having receiving sockets for said pins and having a compressive

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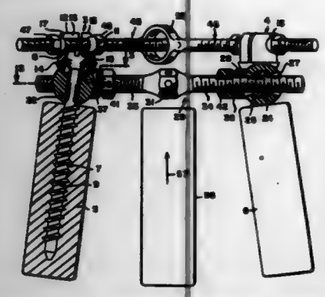
means comprising a ratchet means for simultaneously compressing the said pins and said attached pelvis;
said device for rapidly applying without need for sterile surroundings or operating room and with minimal training,
and for rapidly stabilizing said pelvis in an emergency setting for reducing intrapelvic bleeding and pain and permitting further diagnostic studies, xrays, and surgery to be undertaken safely.

5,196,013
PEDICEL SCREW AND CORRECTING AND SUPPORTING APPARATUS COMPRISING SUCH SCREW

Jürgen Harms, Beichenweg 9, Waldkraiburg-Reichenbach, and Lutz Biedermann, Berta-Suttner-Str. 23, D-7730 VS-Schwenningen, both of Fed. Rep. of Germany

PCT No. PCT/EP90/01834, § 371 Date Jun. 28, 1991, § 102(e) Date Jun. 28, 1991, PCT Pub. No. WO91/06254, PCT Pub. Date May 16, 1991
PCT Filed Nov. 2, 1990, Ser. No. 679,086
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1989, 3936702
The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.
Int. Cl.[5] A61F 5/04
U.S. Cl. 606—61 11 Claims



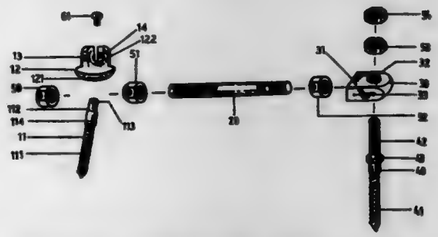
1. A correction and supporting apparatus for a spinal column having vertebrae (5, 6, 56) comprising two pairs of screws (1, 3; 2, 4), each screw having a threaded shaft (7) and a receiver member (8), each pair of screws (1,3; 2, 4) to be anchored in a vertebra, a first pair of threaded rods (45, 46) each of said rods (45, 46) connecting with two of said screws (1, 4; 2, 3) on a first connecting point on said two of said screws respective receiver member (8), and a second pair of threaded rods (29, 30) each respective one of said second pair of threaded rods (29, 30) connected to two of said screws (3, 4; 1, 2) on a connecting point shifted with respect to said first connecting point towards said threaded shaft (7) of each connected screw, said first and second pairs of rods (45, 46, 29, 30) for bridging at least one further vertebra (56) in between said vertebrae (5, 6), a pedicel screw (58, 59) which is adjustable such that a thrust may be applied on said at least one further vertebra (56) in a direction to move it away from said correction and supporting apparatus.

5,196,014
VERTEBRAL LOCKING AND RETRIEVING SYSTEM

Chih-I Lin, 513 S. Golden Pardee Dr., Diamond Bar, Calif. 10765

Continuation-in-part of Ser. No. 764,222, Sep. 23, 1991. This application Aug. 4, 1992, Ser. No. 924,448
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—61 10 Claims

1. A vertebral locking and retrieving system for use in retrieving a deformed vertebra and maintaining the deformed vertebra in a normal, healthy position comprising:
at least one locking pin assembly having a threaded pin; a receiving mount and a fastening bolt; said threaded pin defining a longitudinal axis and having a threaded portion at one end thereof adapted to be secured to a normal, healthy vertebra and a threaded bore being formed axially at the other end thereof; said receiving mount having a hole adapted to receive the other end of said threaded pin; said fastening bolt having a head which has a diameter larger than that of the hole of said receiving mount adapted to be threaded into the threaded bore of said threaded pin through the hole of said receiving mount



such that said receiving mount is fastened to said threaded pin at an acute angle of deflection relative to the axis defined by said threaded pin;
a remedial component adapted to be secured at one end thereof to one of a deformed vertebra located immediately adjacent to said normal, healthy vertebra or to a vertebra immediately adjacent to the deformed vertebra but different from said normal, healthy vertebra to which said at least one locking pin assembly is secured;
coupling means for interconnecting said at least one locking pin assembly and said remedial component; and
fastening means for fixedly securing said at least one locking pin and said remedial component to said coupling means.

5,196,015
PROCEDURE FOR SPINAL PEDICLE SCREW INSERTION

Seth L. Neubardt, 12 Shore Rd., Rye, N.Y. 10580

Filed Apr. 30, 1992, Ser. No. 876,861
Int. Cl.[5] A61B 17/56
U.S. Cl. 606—61 8 Claims

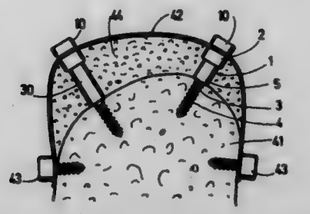
1. A technique of inserting a screw member into bone tissue, the screw member being part of a spinal fixation instrument system wherein rigid rods or plates are attached to heads of a number of screw members after insertion into adjacent parts of the bone tissue, said technique comprising the steps of:
making an incision in a patient and exposing a skeletal region for which region a bone fixation procedure is to be performed;
locating an entrance point on a part of the skeletal region into which part a screw member of a spinal fixation instrument system is to be inserted;

forming a screw opening in said part of the skeletal region for insertion of the screw member, using a determined direction for formation of the opening;
applying an electric potential of a certain magnitude to the inner surface of said opening while observing the patient for nervous reactions to said electric potential;
continuing said forming step and said applying step until a desired depth is attained for the screw opening in the absence of nervous reactions of the patient to said electric potential; and
redirecting the formation of said screw opening in a direction other than a last determined direction after observing nervous reactions of the patient to said electric potential when forming the screw opening in the last determined direction.

5,196,016
AUXILIARY MEANS AND METHOD FOR FASTENING A CAPPING ON BONE TISSUE OR THE LIKE

Daniel Buser, Muri bei Bern; Franz Sutter, Niederdorf, and Ulrich Mundwiler, Teuffen, all of Switzerland, assignors to Institut Straumann AG, Waldenburg, Switzerland

Filed Mar. 5, 1992, Ser. No. 846,356
Claims priority, application Switzerland, Mar. 11, 1991, 720/91
Int. Cl.[5] A61B 17/56
U.S. Cl. 606—72 22 Claims



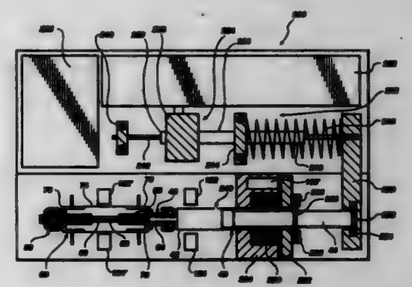
1. A method of securing a cover over an area of original, locally depressed, chipped, or fractured tissue to promote the growth of additional tissue, comprising the steps of:
providing a pin having, on one end, external thread and, on another end, internal thread and a bead, wherein said bead has an engagement face for engaging a rotational tool;
providing a cylindrical, smooth-walled segment between said bead and the external thread, wherein the diameter of said segment is greater than or equal to the diameter of the external thread;
detachably securing said external thread into or near the original tissue;
covering said pin and said area with a foil; and
threading a cap screw into said internal thread of the pin, wherein said cap screw retains said foil against said bead of the pin.

5,196,017
METHOD AND APPARATUS FOR PATIENT PROTECTION AGAINST VESSEL RUPTURE FROM BALLOON-TIPPED CATHETERS

Fidel H. Silva, 967 E. Centerfork Cir., Sandy, Utah 84094, and Dwayne R. Westenskow, 3439 E. Wasatch Rd., Salt Lake City, Utah 84121

Continuation-in-part of Ser. No. 419,828, Oct. 11, 1989, Pat. No. 5,007,919. This application Apr. 15, 1991, Ser. No. 685,534
Int. Cl.[5] A61M 29/00
U.S. Cl. 604—97 16 Claims

6. A safety inflation apparatus for use with a catheter inflation apparatus comprising a syringe having a plunger slidable within a barrel, for preventing inadvertent inflation in a small body cavity of a catheter balloon having a predetermined inflation pressure threshold, said safety inflation apparatus comprising:
tubular relief conduit means including first receptacle means adapted for sealing engagement with said catheter inflation means, second receptacle means adapted for sealing engagement with a balloon channel of a catheter having said balloon at the distal end thereof, and a relief aperture extending through the wall of said relief conduit means in communication with the interior of a sleeve-like inflatable safety reservoir means disposed about and sealed to said



relief conduit means at either side of said relief aperture between said first and second receptacle means, said safety reservoir means having an inflation pressure threshold greater than that of said catheter balloon;
plunger drive means for deploying said plunger in said syringe barrel;
return spring means for withdrawing said deployed plunger form said syringe barrel when said plunger drive means is deactivated; and
plunger deployment detection means for detecting the deployment of said plunger within said syringe barrel.

5,196,018
KNOCK-OUT INSTRUMENT FOR THE SHANKS OF HIPJOINT PROSTHESES

Hans-Georg Willert, Göttingen, Fed. Rep. of Germany, and Rudolf Koch, Frauenfeld, Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur, Switzerland

Filed May 7, 1992, Ser. No. 879,475
Claims priority, application Switzerland, Jan. 26, 1991, 01888/91
Int. Cl.[5] A61F 2/32
U.S. Cl. 606—99 5 Claims

1. A knock-out instrument for a hipjoint prosthesis, comprising a shank (1) with a coupling-part (2) for a sliding hammer, an extension-piece (3) connected rigidly to the shank (1) and extending away from the shank at an angle α of between 20° and 60°, the extension-piece including a recess (8) formed to be slid from one side over the neck (6) for engaging the neck over an angle of up to 180°, a width measured inside the recess being greater than a smallest diameter of the neck (6) measured in the same direction to provide clearance between them, the exten-

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sion-piece being shaped to touch the neck (6) at two points (11) offset by 180° and at a lowest point (7), all points (11, 7) lying substantially in one plane which is parallel with the axis (9) of the stem so that a moment generated by the hammer when its line of action is offset with respect to the stem axis is compensated for by a moment generated at said points, whereby the generation of laterally acting forces between the shank and surrounding bone tissue is prevented.

5,196,019

GONIOMETER FOR NEEDLE PLACEMENT

Richard E. Davis, Grand Rapids, Mich., and John E. Drace, Portola Valley, Calif., assignors to DLP, Inc., Grand Rapids, Mich.

Filed Oct. 4, 1991, Ser. No. 771,627
Int. Cl.[5] A61B *19/00*
U.S. Cl. 606—130 **11 Claims**

1. A goniometer comprising:
(a) a first support member in the form of an outer ring having an outer diameter and an inner diameter,
(b) a bubble level on said first support member to orient the first support member relative to a horizontal position,
(c) a second support member in the form of an inner ring to rotate within said outer ring,
(d) a needle carrier on said second support member to receive needles selectively of varying sizes,
(e) means associating said support members for relative rotation, said means comprising a first surface on one of said members, and means on the other of said members operatively associated with said first surface to control said relative rotation,
(f) a graduated surface on one of said support members to provide visual observation of the relative adjusted rotation of said one support member relative to the other support member, and
(g) said means associating said support members comprising serrations formed on said first surface of said outer ring, and means on the other of said members comprise a resilient detent formed on said inner ring to contact and ride over said serrations to a selected position of rotation of said inner ring.

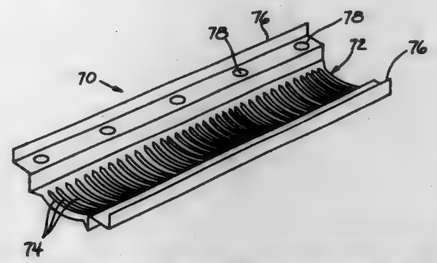
5,196,020

COMB FOR USE WITH SKIN GRAFT PREPARATION APPARATUS

Robert W. Atkinson, Dover; John P. McDougall, Strasburg, and William J. Donizetti, Dover, all of Ohio, assignors to Zimmer, Inc., Warsaw, Ind.

Filed Sep. 30, 1991, Ser. No. 767,728
Int. Cl.[5] A61B *19/00*
U.S. Cl. 606—132 **1 Claim**

1. A one piece comb for connection to a skin preparation device, said skin preparation device including a plurality of cutting blades for cutting into a sample of skin, said one-piece comb including a body having a flange extending therefrom said body also including a plurality of slots therethrough adapted to accomodate said blades such that a portion of said blades pass through said body for cutting engagement with said skin sample passing betwees said one-piece comb and said blades, said plurality of slots each terminating in a converging V-shaped end, said flange being configured for pivotal connection to said skin preparation device, said comb constituting means for removing portions of said skin sample from said cutter blades wherein said V-shaped ends of said slots are



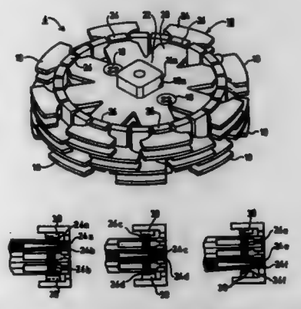
configured to substantially match a converging cutting surface of said blades, said comb being pivotable about said flange between a generally horizontal use position and a generally vertical cleaning position.

5,196,021

DEPILATORY DEVICE

Victor Kabla, Paris, France, assignor to Perfect Lady Ltd., Tikoa, Israel

Filed Feb. 25, 1992, Ser. No. 841,116
Int. Cl.[5] A45D *26/00*
U.S. Cl. 606—133 **19 Claims**



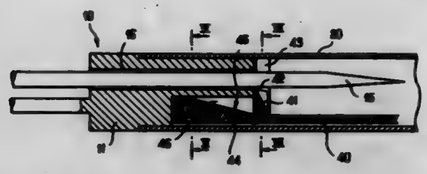
1. A depilatory device for removing body hair, comprising: a housing having an opening therein; an electrical motor within the housing; a hair-plucker body coupled to the motor to be driven thereby for plucking hair via said opening; said hair-plucker body including a plurality of pairs of hair-plucker elements each formed with a plurality of jaws projecting from an outer edge of each element to define a plurality of pairs of jaws adapted to sequentially traverse said opening when the hair-plucker body is driven by the electrical motor; the jaws of each pair of being normally spaced apart in an open condition to receive a hair between them, but being movable towards each other to a closed condition to clamp the hair received between them; the jaws of each pair of hair-plucker elements being angularly staggered with respect to the jaws of the other pairs of hair-plucker elements; and camming means carried by said housing for sequentially moving said pairs of jaws to said closed and open conditions as they sequentially traverse said housing opening.

5,196,022

LIGATURE SYSTEM FOR USE IN ENDOSCOPIC SURGERY, LIGATURE AND HANDLING INSTRUMENT FOR SAID SYSTEM

Joseph Bilweis, Noisy le Roi, France, assignor to Ethicon, Inc., Somerville, N.J.

Filed Jul. 26, 1990, Ser. No. 548,943
Claims priority, application France, Dec. 12, 1988, 88 16311
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—144 **6 Claims**



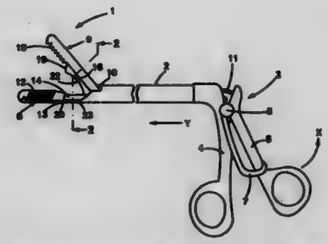
1. A ligating assembly for endoscopic surgery, comprising:
a trocar tube; and
a one-piece element constituted by a body fittable in mating relationship with the end of said trocar tube, and by a thread having a free end extending from said body and constituting binding means, the body including a threading channel receiving the free end of the thread at one of its ends and opening out to the inside of the trocar tube at its other end, the thread and the channel being provided with tightening means for retaining the thread in position once it has been inserted at least partially into the channel; and
further comprising cutting means insertable into the trocar tube for cutting off the free end of the thread, said cutting means including a guillotine movable inside the trocar tube, and transverse guide means for guiding said guillotine.

5,196,023

SURGICAL NEEDLE HOLDER AND CUTTER FOR AN ENDO-SUTURE, ENDO-LIGATURE OR THE LIKE

Werner Martin, Panoramastr. 6, 7207 Rietheim, Fed. Rep. of Germany

Filed Feb. 5, 1991, Ser. No. 650,889
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1990, 9001262[U]
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—148 **2 Claims**

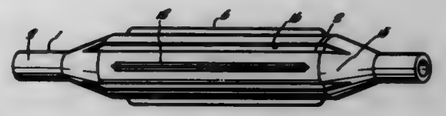


1. A surgical instrument having a forceps handle, a forceps jaw comprising a stationary jaw and a pivotable jaw, and a steel core connecting said forceps handle with said pivotable jaw for pivoting said pivotable jaw for selectively opening and closing said forceps jaw upon actuation of said forceps handle, the improvement which comprises: said stationary jaw having a first surface provided with a serrated portion and an indented portion; and said pivotable jaw having a second surface opposed to said first surface of said stationary jaw provided with a serrated portion that cooperates with the serrated portion of the stationary jaw, and a projecting ridge portion, opposite said indented portion and received therein when said forceps pivotable jaw is closed said projecting ridge portion being provided with a recess surface extending from one side of said projecting ridge portion proximate to said second surface toward a second side of said projecting ridge portion remote from said second surface so as to define a cutter on said remote portion wherein said recess surface defines an opening for introducing a surgical thread into said indented portion of said stationary jaw when said projecting ridge portion is received in said indented portion.

5,196,024

BALLOON CATHETER WITH CUTTING EDGE

Peter L. Barath, W. Hollywood, Calif., assignor to Cedars-Sinai Medical Center, Los Angeles, Calif.

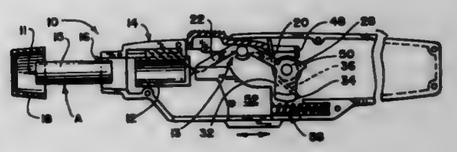
Filed Jul. 3, 1990, Ser. No. 547,957
Int. Cl.[5] A61B *17/32*; A61M *25/10*
U.S. Cl. 606—159 **5 Claims**

1. A device for dilating or recanalizing a vessel comprising:
an inflatable balloon catheter with cuting edges situated parallel with the longitudinal axis of said balloon;
said cutting edges covered by folds of the balloon while in the deflated state to prevent injury of said vessel during delivery; and
said cuttign edges being further defined as positioned on plates mounted onto the balloon surface.

5,196,025

LANCET ACTUATOR WITH RETRACTABLE MECHANISM

Joseph V. Ranalletta, Guntersville, and Fred E. Williams, Jr., Arab, both of Ala., assignors to Ryder International Corporation, Arab, Ala. and Boehringer Mannheim Corporation, Indianapolis, Ind., a part interest

Filed May 21, 1990, Ser. No. 526,290
Int. Cl.[5] A61B *5/00*
U.S. Cl. 606—182 **30 Claims**



1. A mechanism for sequentially advancing and retracting a lancet needle, comprising:
(a) drive carriage means for carrying, advancing, and retracting the lancet needle;
(b) a hinge structure operatively connected to linearly displace said drive carriage means on a linear path along an

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axis of said drive carriage means and including first and second coupled leaf members, said drive carriage means being connected to one of said first and second leaf members which are relatively pivotal between a first position thereof in which said drive carriage means is advanced to project and thrust the lancet needle into a tissue penetration position and a second position in which said drive carriage means is retracted from said advance to withdraw the lancet needle from the penetration position the other of said first and second leaf members being further coupled to a pivot bearing structure of said mechanism for supporting said relative pivot.

5,196,026

METHOD OF IMPLANTING CORNEAL INLAY LENSES SMALLER THAN THE OPTIC ZONE

Graham D. Barrett, Perth, Australia; William J. Link, Irvine, and Cary J. Reich, Laguna Hills, both of Calif., assignors to Chiron Ophthalmics, Inc., Irvine, Calif.

Filed Sep. 16, 1991, Ser. No. 759,599
Int. Cl.[5] A61F 2/14
U.S. Cl. 623—5 9 Claims

1. A method of treating refractive errors in a patient comprising the steps of:
a) making a stromal cut in a cornea parallel to the limbus;
b) forming a pocket in said stromal cut to the center or close to the center of said cornea;
c) inserting in said pocket one or more solid optical lenses having no apertures therethrough composed of a biocompatible-hydrogel, polymeric material, cellulose ester, or silicone of a diameter or configuration such that the entire optic zone of said cornea is not covered by said lens or lenses, wherein the diameter of said lens is substantially less than the diameter of said optic zone, thereby producing a cornea with multiple refractive indices and multiple focalities created only by the presence or absence of said lens or lenses such that the focal distance created in one or more portions of the cornea is suitable for distance vision and the focal distance created in one or more other portions of the cornea is suitable for near vision; and
d) allowing the incision to heal with or without sutures or other means of closing the incision.

5,196,027

APPARATUS AND PROCESS FOR APPLICATION AND ADJUSTABLE REPROFILING OF SYNTHETIC LENTICULES FOR VISION CORRECTION

Keith P. Thompson, 4548 E. Brookhaven Dr., Atlanta, Ga. 30319; Yung S. Liu, 2201 Pineridge Ct., Schenectady, N.Y. 12309; Seth R. Banks, 9459 N. Fairway Cir., Milwaukee, Wis. 53217, and Raymond P. Gaillitis, 2107 N. Crossing Way, Decatur, Ga. 30033

Continuation-in-part of Ser. No. 517,378, May 2, 1990, abandoned. This application Sep. 12, 1991, Ser. No. 757,968
Int. Cl.[5] A61F 2/14
U.S. Cl. 623—5 6 Claims

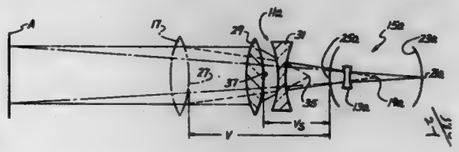
1. A process for application of a synthetic lenticule over the cornea of a human eye for correcting vision, said lenticule having the inherent capability to be profiled with a laser, said process comprising the steps of:
a) removing the outer epithelial layer from the anterior surface of the cornea;
b) applying a viscous synthetic material to the exposed corneal surface layer
c) cross-linking the said material to form said material into a lenticule; and
d) profiling the lenticule thus formed with a laser to the extent necessary to effect correction of the patient's vision.

5,196,028

HIGH-MAGNIFICATION TELEPHOTO SPECTACLES FOR AGE-RELATED MACULAR DEGENERATION

Valdemar Portney, Irvine, Calif., and Jeffrey E. Koziol, Arlington Hgts., Ill., assignors to Allergan, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 690,814, Apr. 23, 1991, Pat. No. 5,088,809, which is a division of Ser. No. 141,482, Jan. 5, 1988, Pat. No. 5,030,231. This application Jul. 16, 1991, Ser. No. 730,471
Int. Cl.[5] A61F 2/16; G02C 1/00
U.S. Cl. 623—6 10 Claims



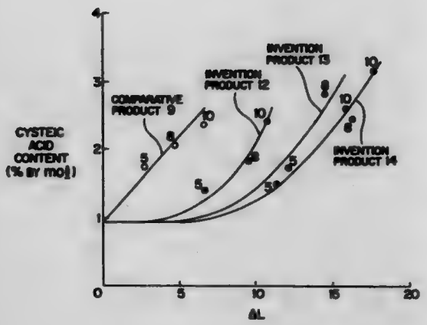
8. An ophthalmic lens system comprising:
an intraocular lens adapted for implantation in the eye;
spectacles including a first telephoto lens system adapted to be located outside the eye and including a plurality of lenses each having a power other than unity; and
said intraocular lens being adapted to cooperate with said telephoto lens system of the spectacles to provide a second telephoto lens system.

5,196,029

HAIR-TREATMENT COMPOSITION, BLEACHING COMPOSITION AND HAIR COLOR TONE MODIFIER COMPOSITION

Jiro Kawase, Funabashi; Kazuo Ukaji, Chiba, and Emi Nagashima, Ichikawa, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Division of Ser. No. 511,216, Apr. 19, 1990, Pat. No. 5,064,441. This application Aug. 21, 1991, Ser. No. 747,965
Claims priority, application Japan, Apr. 24, 1989, 1-103977
Int. Cl.[5] A61K 7/13
U.S. Cl. 8—405 4 Claims



1. A hair treatment composition consisting essentially of:
(1) 0.01 to 10% by weight of a ferrous salt,
(2) 0.1 to 10.0% by weight of a non-reducing organic chelate-forming compound having the formula (II):

$$R^1(CO)_nR^2(OH)_m—COOH \quad (II)$$

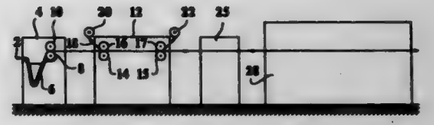
wherein R^1 and R^2 may be the same or different and wherein R^1 represents a hydrogen atom, a straight-chain or branched alkyl group having one to five carbon atoms or an alkenyl group having one to five carbon atoms, and wherein R^2 represents a straight-chain or branched alkyl group having one to five carbon atoms or an alkenyl group having one to five carbon atoms, n is from 0 to 2 and m is from 0 to 6, and wherein when m is 1 to 6, said hydroxyl group may be bound at any position on said R^2; and
wherein said non-reducing organic chelate-forming compound (II) is capable of forming a chelate compound with a ferrous ion, having a pH of from 3 to 6, wherein the stability constant (K_1) between said ferrous ion and said non-reducing organic chelate-forming compound is lower than 3 and wherein said ferrous salt, which is the chelate compound of said ferrous ion with said non-reducing organic chelate-forming compound, is highly soluble in water; and
(3) 0.0001 to 5% by weight of a direct dye.

5,196,030

PROCESS WITH NO HEATING FOR TRANSFER PATTERN PRINTING OF A MOIST CELLULOSE, WOOL OR SILK TEXTILE WEB, AND AN APPARATUS AS WELL AS A PATTERN CARRIER WEB FOR USE IN THE PROCESS

Inga S. Åkerblom; Claes-Göran Theren, both of Stiffle; Knud V. Rasmussen, Engesvang, all of Sweden, and Jørgen Pedersen, Herning, Denmark, assignors to Dansk Transfertryk A/S, Ikast, Denmark and Billerud AB, Stiffle, Sweden

PCT No. PCT/DK88/00162, § 371 Date Apr. 30, 1990, § 102(e) Date Apr. 30, 1990, PCT Pub. No. WO89/02950, PCT Pub. Date Apr. 6, 1989
PCT Filed Oct. 4, 1988, Ser. No. 469,527
Claims priority, application Denmark, Oct. 5, 1987, 5205/87
Int. Cl.[5] D06P 5/00; B41F 16/02; B41M 1/26
U.S. Cl. 8—467 20 Claims



1. A continuous process for transfer pattern printing on a moist textile web comprising the steps of:
pre-printing a pattern with a reactive dye admixed with a readily soluble thickener having temporary binder effect on a pattern carrier web of an absorbent material;
wetting a textile web with water optionally containing a reactive dye dissolved or dispersed in said water, the textile web comprising predominantly cellulose or protein fibers and from 0% to 30% synthetic fibers;
moving the wetted textile web to a region where the transfer of the pre-printed pattern from the pattern carrier web to the wetted textile web takes place;
continuously transferring the pattern from the pattern carrier web to the wetted textile web without heat by compression of the two webs between one or more pairs of rollers under pressure, the textile web being subjected between the rollers to compression to a reduced thickness followed by a natural expansion such that the pattern is effectively absorbed from the pattern carrier web to the textile web.

3. A process according to claim 1, wherein in the step of wetting prior to transfer pattern printing, the textile web is ground colored with an aqueous reactive dye solution.

5,196,031

EXHAUST DYEING PROCESS FOR MIXED FIBRE SUBSTRATE IN SINGLE BATH: DISPERSE DYE, COPPER COMPLEX DYE, COMPLEXING AGENT AND OXIDIZING AGENT

John A. Hook, Bradford, Great Britain, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 464,476, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 307,437, Feb. 7, 1989, abandoned. This application Aug. 27, 1991, Ser. No. 750,339
Claims priority, application United Kingdom, Feb. 8, 1988, 8802794
Int. Cl.[5] B01F 17/50; D06P 1/65, 3/87, 5/08
U.S. Cl. 8—531 32 Claims

1. A process for dyeing a mixed polyester/cellulose or polyamide/cellulose fibrous substrate comprising applying to the substrate by exhaust dyeing in an aqueous dyebath at a temperature in the range 60°–135° C.:
a) at least one disperse dye;
b) at least one copper-containing direct or reactive dye;
c) a complexing agent having a K-value with the metal of the direct or reactive dye of from 6 to 17 inclusive;

d) a lignin sulphonate dispersing agent; and
e) an oxidizing agent capable of converting copper (I) to copper (II) at a temperature of 100°–130° C. at a pH of 5 to 7 in the process for dyeing the mixed substrate and selected from the group consisting of alkali metal and alkaline earth metal chlorates, bromates and iodates.

5,196,032
PROCESS FOR WET-ON-WET MERCERIZATION AND DYEING OF CELLULOSE MATERIAL WITH REACTIVE DYES
Christian Oschatz, Schallbach, Fed. Rep. of Germany, assignor to Sandoz Ltd., Basle, Switzerland
Filed May 9, 1991, Ser. No. 697,866
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015133; Jan. 18, 1991, 4101371
Int. Cl.[5] D06P *3/60*; D06B *3/18*; D06H *1/10*; D06M *11/38*
U.S. Cl. 8—543 **28 Claims**

1. A two liquor process for the alkali treatment and dyeing of a cellulosic fibrous substrate which comprises pad treating the substrate with an aqueous alkali liquor and, without an intermediate washing or drying step, dyeing the alkali treated substrate by pad dyeing or printing with an aqueous liquor containing a reactive dyestuff, said aqueous alkali liquor comprising alkali hydroxide and having an alkalinity of 20° to 30° Bé or comprising a mixture of alkali hydroxide and salt in a ratio from 10:1 to 1:10 and having an alkalinity of 6° to 25° Bé.

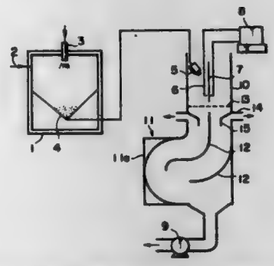
5,196,033
BIS-AZOTRIAZINYL REACTIVE DYES HAVING AN N-ALKYL-PHENYLENEDIAMINE LINK FOR CELLULOSE TEXTILES
John A. Taylor, Prestwich, United Kingdom, assignor to Imperial Chemical Industries plc, London, United Kingdom
Division of Ser. No. 472,407, Feb. 1, 1990, Pat. No. 5,059,681, which is a continuation of Ser. No. 84,097, Aug. 11, 1987, abandoned. This application Jul. 9, 1991, Ser. No. 727,533
Claims priority, application United Kingdom, Aug. 15, 1986, 8619914
Int. Cl.[5] C09B *62/04*, *67/24*; D06P *1/38*
U.S. Cl. 8—549 **13 Claims**

1. A process for coloring a cellulosic textile material which comprises applying thereto a water-soluble reactive dye of the formula:

$$D^1—Z^1—NR^1—T—NR^2—Z^2—D^2$$

wherein
each of D^1 and D^2, independently, represents the radical of a water-soluble azo compound,
each of Z^1 and Z^2, independently, represents a triazine or pyrimidine residue carrying a Cl, Br, F, SO_3H or quaternary ammonium group,
R^1 represents a C_{1-8}-alkyl radical which is unsubstituted or substituted by a halogen, hydroxy, cyano, carboxy or carbamoyl group,
R^2 represents hydrogen or a C_{1-8}-alkyl radical which is unsubstituted or substituted by a halogen, hydroxy, cyano, carboxy or carbamoyl group, and
T represents a 1,3- or 1,4-phenylene radical which may carry one or more substituents selected from halogen, alkyl, alkoxy, acylamino, nitro and carboxy.

5,196,034
SEMICONDUCTOR WAFER CLEANING APPARATUS
Toshiki Ono; Shiro Yamasaki, both of Itami, and Toshihiko Noguchi, Fukuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 30, 1991, Ser. No. 737,666
Claims priority, application Japan, Jul. 31, 1990, 2-201407
Int. Cl.[5] B24C *3/32*
U.S. Cl. 29—25.01 **5 Claims**



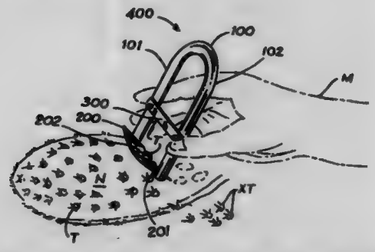
1. A semiconductor wafer cleaning apparatus comprising:
a cleaning vessel having a cross-sectional area;
holding means for holding a semiconductor wafer within the cleaning vessel;
ice making means for making fine ice particles;
jet means for ejecting said fine ice particles via a gas under high pressure against a semiconductor wafer held within said cleaning vessel by the holding means;
an exhaust chamber having an expanded portion including a larger cross-sectional area than the cross-sectional area of said cleaning vessel and connected to said cleaning vessel;
guide plates extending from the cleaning vessel into the exhaust chamber to guide a flow of fine ice particles from the cleaning vessel into the expanded portion; and
an exhaust blower for exhausting said exhaust chamber.

5,196,035
GASOLINE COMPOSITION FOR REDUCING INTAKE VALVE DEPOSITS IN PORT FUEL INJECTED ENGINES
Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Sep. 20, 1991, Ser. No. 763,010
Int. Cl.[5] C10L *1/22*, *1/18*
U.S. Cl. 44—350 **20 Claims**

1. A composition comprising the reaction product of (a) an oil soluble polyalkylene polyamine containing at least one polyalkylene polymer chain having at least one double bond and which chain is attached to a nitrogen and/or carbon atom of the alkylene radical(s) connecting the amino nitrogen atoms and said polyalkylene polyamine having a molecular weight in the range of from about 600 to about 10,000 and (b) furan, wherein the mole ratio of furan to polyalkylene polyamine ranges from about 1:1 to about 10:1, said reaction product being obtained under Diels-Alder reaction conditions wherein the temperature ranges from about 0° C. to about 200° C.

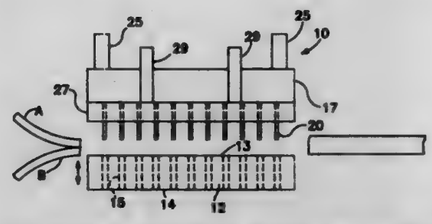
5,196,036
DE-THORNING APPARATUS FOR REMOVING THORNS FORM THE NOPAL CACTUS PETALS AND THE LIKE
Leonardo R. Lamas, Tucson, Ariz., assignor to Victor Flores, Tucson, Ariz.
Filed May 28, 1991, Ser. No. 706,163
Int. Cl.[5] A01G *3/02*
U.S. Cl. 47—1.01 **4 Claims**

1. An edged apparatus for de-thorning a nopal cactus petal in preparation for use as a food staple, said apparatus comprising:
a flexible edged body structure having at least one concave edged portion and an expanded body portion that, in combination, facilitate cutting and simultaneous removal of a nopal cactus thorn;
a handle member attached to said edged body structure for manipulating said edged body structure,
said edged body structure comprising flexible material that facilitates forming said at least one concave edged portion and said expanded body portion,
said handle member comprising a U-shaped structure having opposed flexible arms, each of said arms having attachment means at a distal end for attaching to respective ends of said flexible edged body structure,



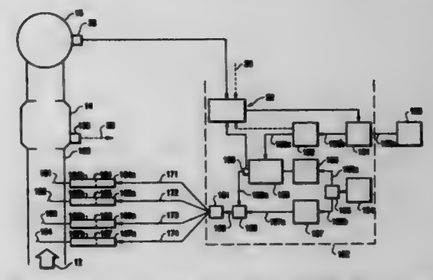
said flexible edged body structure being detachably attached to said attachment means for coacting with said opposed flexible arms for forming said at least one concave edged portion and said expanded body portion; and
latching means for adjustably maintaining said opposed flexible arms and said edged body structure in a tensioned state, said latching means comprising a cross member mounted to a pivot pin on one of said flexible arms, said cross member having a plurality of adjustments engagable on a pin member disposed on another one of said flexible arms opposite said pivot pin for selecting a desired flexed tensioned setting of said flexible arms and a desired concave form on said edged body structure.

5,196,037
PRODUCTS FOR USE IN POLISHING AND THE LIKE AND PROCESS FOR PRODUCING SAME
Robert J. Rossi, 2212 Edgefield Rd., Spartanburg, S.C. 29302; Andreas C. Ladjias, 23 Birch Rd., Kenmelon, N.J. 07405, and Henry A. Ramella, 208 Woodridge Dr., Spartanburg, S.C. 29301
Filed Jul. 2, 1990, Ser. No. 547,808
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **23 Claims**



1. A process for producing an improved fibrous composite for use in grinding, cutting and/or polishing of a surface comprising the steps of:
a) feeding at least two juxtaposed layers of blended polyester fibers to a needling apparatus;
b) needling said layers from both sides with total needle penetration therethrough to form a core;
c) feeding said needled core and a further layer of blended fibers to said needling apparatus; and
d) needling said core and said further layer with needle penetration adequately beyond fifty percent of the total thickness of said core and said further layer to produce a unitary fibrous product characterized by an absence of any layer definition.

5,196,038
FLUE GAS CONDITIONING SYSTEM
Robert A. Wright, 6250 Behner Crossing, Indianapolis, Ind. 46250
Continuation-in-part of Ser. No. 494,234, Mar. 15, 1990, Pat. No. 5,032,154. This application Jul. 24, 1992, Ser. No. 919,525
Int. Cl.[5] B03C *3/66*
U.S. Cl. 55—5 **20 Claims**



19. A method of conditioning a flow of boiler flue gas with sulfur trioxide for treatment by electrostatic precipitator, comprising:
providing a flow of sulfur dioxide and air at a temperature above the condensation temperature of sulfurous acid;
dividing the flow of sulfur dioxide and air into a plurality of reduce volume flows of sulfur dioxide and air;
carrying the plurality of reduced volume flows of sulfur dioxide and air to a plurality of separate injection sites for conversion to sulfur trioxide and injection of sulfur trioxide into the flow of boiler flue gas while maintaining the plurality of reduced volume flows above the condensation temperature of sulfurous acid;
providing each reduced volume flow of sulfuric dioxide and air at a temperature in excess of the minimum temperature for its catalytic conversion to sulfur trioxide at one of the plurality of injection sites;
converting each reduced volume flow of sulfur dioxide and air into a flow of sulfur trioxide at one of the plurality of injection sites to thereby provide a reduced volume flow of sulfur trioxide sufficient for injection at each injection site; and
immediately injecting each of the reduced volume flows of sulfur trioxide into the flow of boiler flue gas at each of the plurality of separated injection sites.

5,196,039
APPARATUS AND METHOD OF MULTI-DIMENSIONAL CHEMICAL SEPARATION
John B. Phillips, Cabondale, Ill., and Zaiyou Liu, Provo, Utah, assignors to Southern Illinois University at Carbondale, Carbondale, Ill.
Continuation-in-part of Ser. No. 647,790, Jan. 30, 1991, Pat. No. 5,135,549. This application Mar. 6, 1992, Ser. No. 846,330
Int. Cl.[5] B01D *15/08*
U.S. Cl. 55—67 **76 Claims**

1. A method of chemical separation within one or more portion of tube forming one or more chromatographic column, said method comprising the steps of:
(a) injecting a sample composed of two or more substances into a first dimension of chromatography;
(b) carrying said sample along said first dimension of chromatography in a direction so as to cause a first separation

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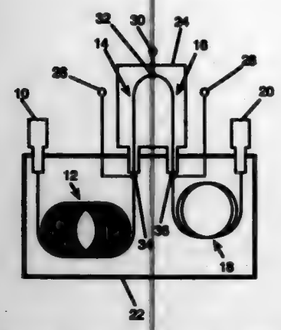
of said sample into a first series of bands dispersed during a first separation time period, each band of said first series of bands being composed of one or more substance and being either separated from or partially overlapping with one or more other band in said first series of bands;

(c) accumulating a portion of the sample in a modulator positioned between said first dimension of chromatography and a final dimension of chromatography disposed in serial relationship with said first dimension of chromatography;

(d) transmitting said portion of the sample from said modulator as a concentration pulse into said final dimension of chromatography;

(e) carrying said portion of the sample along said final dimension of chromatography in a direction so as to cause a



final separation of said portion of the sample into a final series of bands dispersed during a final separation time period; and

(f) repeating steps (c), (d), and (e) during said first separation time period so as to generate a multiplicity of said concentration pulses, a multiplicity of said final separations and a multiplicity of said final series of bands during a multiplicity of said final separation time periods such that, said concentration pulses are generated at a rate faster than one every thirty seconds, said multiplicity of final separations comprises more than ten said final separations in a single chemical separation, and said first series of bands emerging from said first dimension of chromatography is submitted to and transmitted through said final dimension of chromatography with fidelity.

5,196,040

GREASE TRAP AND FILTER APPARATUS

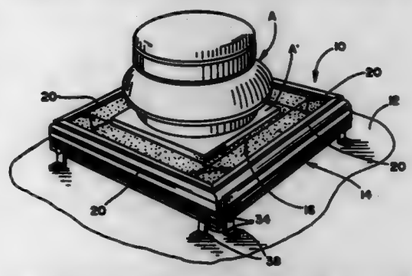
Patrick A. Malloy, Hanover Park; Jean L. Jodoin, Buffalo Grove; Charles M. Murphy, Hanover Park; Christopher S. Barry, Elgin; Kevin R. Chwala, Sleepyhollow, and Charles E. Bain, West Dundee, all of Ill., assignors to Grease Guard, Inc., Schaumburg and Dundee Manufacturing Co. Inc., Carpentersville, both of Ill.

Filed May 7, 1990, Ser. No. 519,738
Int. Cl.[5] B01D *35/02*
U.S. Cl. 55—323 40 Claims

1. A grease trap and filter assembly for roof ventilators, comprising:

a) a frame structure having an aperture through which a grease discharge vent can project surrounded by said frame structure and trap assembly; and

b) a replaceable, grease-trapping material removably securable in said frame structure and exposed within said aperture and having a passageway aligned with said aperture for passage of said vent therethrough, for trapping grease discharged from said vent surrounded by said grease-trapping material which comprises an upper, porous layer for trapping particulate debris and being permeable for passage of liquid grease therethrough, and a first lower layer for absorbing grease passing through said upper layer.

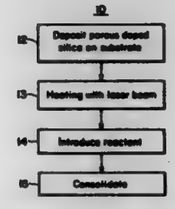


5,196,041

METHOD OF FORMING AN OPTICAL CHANNEL WAVEGUIDE BY GETTERING

Richard P. Tumminelli, Ashland; Farhad Hakimi, Watertown, and John R. Haavisto, Marshfield Hills, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 761,416, Sep. 17, 1991. This application Feb. 4, 1992, Ser. No. 830,618
Int. Cl.[5] C03C *15/00*
U.S. Cl. 65—30.1 14 Claims



1. A method of forming an optical channel waveguide by gettering, comprising:

preparing a compound including an index of refraction raising dopant;

forming on a substrate a porous waveguide layer including said compound;

sealing a portion of the waveguide layer along a path; and

reacting the compound including the index of refraction raising dopant with a reactant in the unsealed portion of said waveguide layer to form a volatile product from the reactant and dopant to deplete the dopant in the unsealed portion of the waveguide layer and reduce its index of refraction relative to that in the path to produce a channel waveguide along the path.

5,196,042

MYCELIAL FERTILIZER

Ryusuke Iijima, 8-14, Minamiosanoku 1-chome, Ota-ku, Tokyo, Japan

Continuation of Ser. No. 338,912, Apr. 14, 1989, abandoned. This application Sep. 17, 1991, Ser. No. 759,973
Claims priority, application Japan, Apr. 15, 1988, 63-93996
Int. Cl.[5] C05F *11/08*
U.S. Cl. 71—8 4 Claims

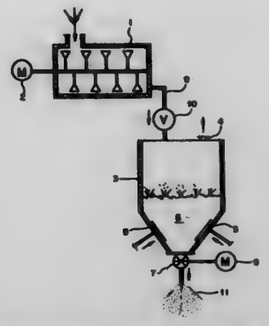
1. A process for preparing a carrier-supported mycelial fertilizer consisting of cultivating a thermoactinomyces fungus at a temperature of about 55°–80° C. and at a pH of about 7.9–9.5 on a mixture containing 70–80 parts by weight of at least one porous carrier selected from the group consisting of charcoal, active carbon, coal, coke and active coke, with 30–20 parts by weight of an organic substance having a water content of about 25–60% by weight and less than about 15% by weight carbon and capable of being fermented by said fungus.

5,196,043

DELAYED, EXOTHERMIC, ALKALINE STERILIZATION METHOD FOR TREATING WASTEWATER SLUDGES

William O. Wurtz, Paramus, N.J., assignor to Willow Technology, Inc., Toms River, N.J.

Filed Jan. 25, 1991, Ser. No. 646,659
Int. Cl.[5] C02F *11/00, 1/68;* C05F *7/00*
U.S. Cl. 71—12 19 Claims



1. A method for sterilizing, beneficiating, and drying waste materials such as wastewater treatment plant sludge, animal excrement, or process wastes, comprising the steps of:

settling and/or dewatering the waste material to provide a sludge cake containing 4% to 60% by weight of dry solids, and 40% to 96% by weight of liquids;

blending and reacting said sludge cake with alkaline earth metal oxides, admixtures of alkaline earth metal oxides, and carbon dioxide, all as reactants in a blending container whereby exothermic reaction between the constituents and intermediate reaction products is retarded;

overflowing the blended constituents from the blending container into a reaction chamber, at atmospheric pressure in the presence of oxygen, thereby causing an exothermic reaction between the water, alkaline earth oxides, carbon dioxide and intermediate reaction products, which initiates after a retention time in the system ranging up to 20 minutes and generally from 5 to 20 minutes;

allowing the temperature resulting from the complex exothermic reactions to rapidly rise in the reaction chamber from room temperature to over 100° C., exceeding the boiling point of liquids entrained in the blended constituents, and ranging up to 117° C.;

allowing the moisture content of the reacted constituent which was originally the moisture content of the dewatered sludge cake, namely 40% to 96% moisture, to be evaporated and reduced to a final moisture content ranging from 50% to 10% or less;

percolating the constituents to allow water vapor to escape from every reacted particle, as the temperature, due to the reaction, uniformly reaches the boiling point of the liquid within each particle, thereby causing sterilization of said constituents by the relatively high temperature of the exothermic reaction; and

following the completion of the exothermic reaction, discharging the reacted constituent product from the reaction chamber.

5,196,044

PROCESS AND COMPOSITION FOR CONTROLLING WEEDS

Jerry Caulder, San Diego; R. Hugh Crowley, Oceanside; Paul S. Zorner, La Costa, and Steven L. Evans, San Diego, all of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Filed Jan. 8, 1991, Ser. No. 638,708
Int. Cl.[5] A01N *57/12, 37/00*
U.S. Cl. 71—86 17 Claims

1. An agricultural composition for controlling weeds, said composition comprising a first ingredient which is a monocarboxylic acid having about seven to about twenty carbon atoms, or a salt thereof, and a second ingredient which is glyphosate, wherein said first ingredient is present in a concentration which, when used alone without other active ingredient, does not exhibit complete control of said weeds.

5,196,045

SUBSTITUTED PYRIDINE HERBICIDES

Lee F. Lee, St. Charles, Mo., and Mark G. Dolson, San Pablo, Calif., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 444,587, Dec. 1, 1989, Pat. No. 5,019,153, which is a division of Ser. No. 861,954, May 12, 1986, Pat. No. 4,855,026. This application Mar. 20, 1991, Ser. No. 672,231
Int. Cl.[5] A01N *43/40;* C07D *213/55, 213/58, 213/80*
U.S. Cl. 504/127 33 Claims

1. A compound having the structural formula

wherein:

Y is selected from O and S;

R_1 and R_4 are independently selected from fluorinated methyl, chlorofluorinated methyl, and C_1–C_4 alkyl, provided that not both R_1 and R_4 may be C_1–C_4 alkyl;

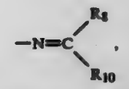
R_2 is selected from hydrogen, lower alkyl, haloalkyl, alkenyl, alkynyl, haloalkenyl, and a cation;

R_3 is selected from C_1–C_5 alkyl, cycloalkyl, cycloalkylalkyl, hydroxy, and alkoxy; and

X is selected from

a) $-N_3$;

b)

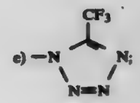


in which R_8 is selected from H, alkyl and CF_3 and R_{10} is selected from F, Cl, $-OR^1$, $-SR^1$, $-NHR^1$, $-N(R^1)_2$, phenyl, substituted phenyl, and

where R^1 is as defined above;

c) $-N{=}S{=}O$;

d) $-NO_2$;



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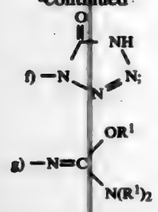
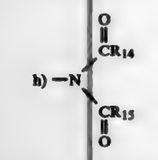


wherein R^1 is as defined above;



wherein R_{14} and R_{15} are independently selected from hydrogen and alkyl; and

i) —N=C=O

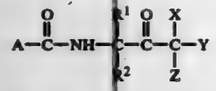
5,196,046

N-ACETONYL-SUBSTITUTED-AMIDES

Ashok K. Sharma, Horsham, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 634,917, Jul. 26, 1984, Pat. No. 4,863,940.
This application Sep. 5, 1989, Ser. No. 403,212
Int. Cl.[5] A01N *43/72*; C07D *403/12*
U.S. Cl. 71—94 12 Claims

1. A compound of the structure:



wherein A is pyridyl which may be substituted with up to three substituents independently selected from halo, trifluoromethyl, fluorosulfonyl, methyl, ethyl, methoxy or phenyl;

X is chloro, bromo, iodo, fluoro, cyano, thiocyano, isothiocyano, methylsulfonyloxy, thio(C_1–C_2)alkyl, (C_1–C_2)alkoxy, carbamoyl, thiocarbamoylthio, hydroxy, azido, (C_1–C_4)alkylcarbonyloxy, phenylcarbonyloxy, trifluoromethylcarbonyloxy, phenoxy, phenylthio, imidazolyl or triazolyl; when X is phenylcarbonyloxy, phenoxy or phenylthio, the phenyl moiety may be substituted with up to one substituent selected from chloro, fluoro, bromo, iodo and methyl;

Y and Z are each independently hydrogen, bromo, chloro, iodo, fluoro, cyano, thiocyano, isothiocyano, methylsulfonyloxy, thio((C_1–C_2)alkyl, (C_1–C_2)alkoxy, carbamoyloxy, thiocarbamoylthio, hydroxy, azido or (C_1–C_4)alkylcarbonyloxy and either Y or Z may be imidazolyl or triazolyl; and

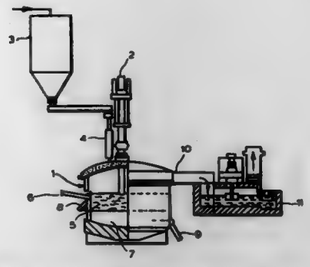
R^1 and R^2 are each independently selected from hydrogen and (C_1–C_6)alkyl.

5,196,047

METHOD OF TREATMENT OF ZINC-CONTAINING BY-PRODUCTS AND WASTE MATERIALS

Jan A. Aune, Eschakk, Norway, assignor to Elkem Technology a/s, Norway

Filed Nov. 13, 1991, Ser. No. 791,961
Claims priority, application Norway, Dec. 6, 1990, 905291
Int. Cl.[5] C22B *4/00*
U.S. Cl. 75—10.3 14 Claims



1. A method for treating a waste material which contains zinc and heavy metals to form an inert slag and to separate the zinc from the heavy metals and recover the zinc and heavy metals, said method comprising:

supplying to a gas-tight electric smelting furnace a waste material and a sulfur-containing compound, said waste material obtained from a process used to produce a non-ferrous metal, said waste material containing oxidized zinc and one or more heavy metals selected from the group consisting of copper, nickel, lead, arsenic, bismuth, antimony and silver;

adding a metallic reduction material to the furnace to reduce said oxidized zinc to zinc;

maintaining the furnace at a temperature of about 1200° C. to about 1700° C. to form a gas phase of zinc, a slag phase, and a molten sulfide phase, said molten sulfide phase containing said heavy metals, thereby separating the zinc from said heavy metals;

a first tapping step to remove the sulfide phase and thereby recover the heavy metals from the waste material in the form of a sulfur compound;

a second tapping step to remove the slag phase as an inert slag suitable for deposit in a landfill; and

condensing the gas phase and recovering the zinc.

5,196,048

PROCESS FOR PREPARING A VANADIUM-NICKEL-CHROMIUM MASTER ALLOY

Robert G. Antrim, Albany; Edward G. Dirrett, Jefferson, and Steven M. Tsoumines, Albany, all of Oreg., assignors to Teledyne Industries, Inc., Albany, Oreg.

Filed Jan. 30, 1992, Ser. No. 828,212
Int. Cl.[5] C22C *1/05, 1/04*
U.S. Cl. 75—315 8 Claims

1. A process for preparing a first precursor alloy of vanadium-nickel-chromium or a master alloy used in preparing a second multi-component metal alloy selected from the group of metals consisting of vanadium, nickel, chromium, titanium, cobalt, manganese zirconium and aluminum, said second alloy adopted for use as material for electrodes in rechargeable electrochemical hydrogen storage cells, said process for preparing the first precursor alloy comprising the steps of:

(a) forming a starting powder mix of aluminum powder, vanadium pentoxide powder, nickel powder and chromium powder, said aluminum powder added in slight excess of its stoichiometric amount for an aluminothermic reduction reaction;

(b) placing said powder mix in a slag bed and initiating an aluminothermic reaction with sufficient local heating to reduce the vanadium pentoxide to vanadium metal and sufficient heat to melt the vanadium and to melt and dissolve the nickel and chromium present therein, providing a molten vanadium-nickel-chromium alloy;

(c) solidifying and cooling said molten alloy at ambient temperature in the slag bed, then separating said solidified alloy from the slag bed; and

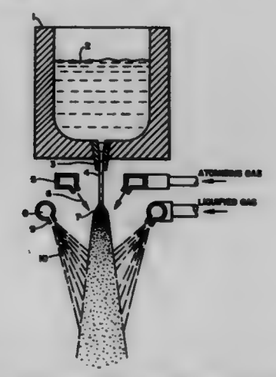
(d) comminuting said separated alloy, having a particle size of less than about 1 inch across.

5,196,049

ATOMIZING APPARATUS AND PROCESS

Jeffrey S. Coombs, West Glamorgan, and Gordon R. Dunstan, Swansea, both of United Kingdom, assignors to Osprey Metals Limited, United Kingdom

Filed Dec. 5, 1990, Ser. No. 623,459
PCT No. PCT/GB89/00627 § 371 Date: Dec. 5, 1990, § 102(e) Dec. 5, 1990, PCT Pub. No. WO89/12116, PCT Pub. Date Dec. 14, 1989
PCT Filed June 6, 1989
Claims priority, application United Kingdom, Jun. 6, 1988, 8813338
Int. Cl.[5] C23C *4/12*; B22F *9/08*
U.S. Cl. 75—338 11 Claims



1. A method of atomizing a liquid stream of metal or metal alloy for the production of powders or spray deposits comprising the steps of:

providing an atomizing device;

teeming a stream of molten metal or metal alloy into said atomizing device;

providing primary jets at said atomizing device for applying atomizing gas at the stream to atomize the stream;

providing secondary jets for the application of cryogenic liquified gas;

atomizing the stream with atomizing gas issuing from the primary jets, said gas being at a temperature less than the temperature of the metal or metal alloy, and said gas atomizing the stream into a plurality of atomized droplets of metal or metal alloy having a mean axis and a certain size distribution; and

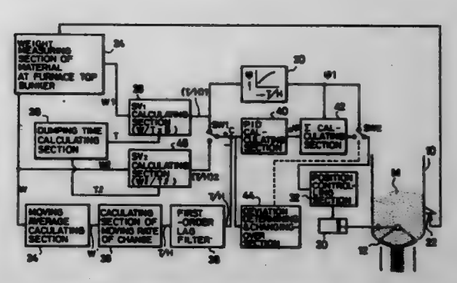
removing further heat from the atomized droplets by directing cryogenic liquified gas from secondary jets substantially at the mean axis of the spray of atomized droplets at a pressure such that the secondary jets have substantially no effect on said size distribution which is determined substantially solely by the gas of the primary jets.

5,196,050

CONTROL METHOD OF AND APPARATUS FOR MATERIAL CHARGING AT A TOP OF A BLAST FURNACE

Shuichi Tsuiyoshi, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

Filed Nov. 26, 1991, Ser. No. 798,534
Claims priority, application Japan, Nov. 30, 1990, 2-339852; Feb. 28, 1991, 3-57794; Jul. 30, 1991, 3-212816
Int. Cl.[5] C21B *7/24*
U.S. Cl. 75—386 15 Claims



1. A control method for material charging into a top of a blast furnace, wherein material being stored in a furnace top bunker is dumped at a flow rate through a flow rate control gate into a blast furnace in a specified time period, said control method comprising the steps of:

measuring an initial material weight by weighing the material in the furnace top bunker prior to a dumping operation;

calculating a first target dumping speed by dividing the value of the initial material weight by the specified time period;

measuring a current material weight during the dumping operation by reweighing the material in the furnace top bunker; and

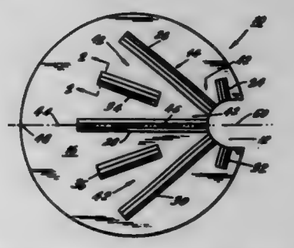
controlling during the dumping operation an amount of opening of said flow rate control gate based on the current material weight to maintain a first actual material dumping speed at the first target dumping speed.

5,196,051

LADLE AND METHOD FOR DRAINING LIQUID METAL WITH IMPROVED YIELD

Lawrence J. Heaslip, West Hill, and James D. Derricott, Burlington, both of Canada, assignors to Premier Refractories and Chemicals Inc., King of Prussia, Pa.

Filed Jul. 19, 1991, Ser. No. 732,595
Int. Cl.[5] B22D *41/02*
U.S. Cl. 75—582 59 Claims



1. A ladle for housing and transferring liquid metal, said ladle comprising an outlet for said liquid metal and a ladle bottom, said ladle bottom having a surface adapted to be in

contact with said liquid metal, and an outlet nozzle formed in said ladle bottom surface adapted to be in fluid communication with said outlet of said ladle, said ladle bottom surface including means for substantially preventing the entrainment of undesirable matter in liquid metal exiting said ladle, said means including means for substantially entrapping said undesirable matter on said ladle bottom surface.

5,196,052

BACTERIAL-ASSISTED HEAP LEACHING OF ORES

Anthony E. Gross, St. Charles, and Jay S. Gomer, Geneva, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 19, 1992, Ser. No. 901,508

Int. Cl.[5] C01G *5/00*

U.S. Cl. 75—712 **24 Claims**

1. A bacterial-assisted heap leach process for the solubilization of a metal from a refractory ore containing said metal and containing fines and/or clay wherein said ore is formed into a heap and at least a portion of said metal in said ore is solubilized by sequential or concomitant bacterial oxidation of sulfides and dissolution of said metal into a leaching solution, said bacterial oxidation of sulfides being effectuated with a bacteria-containing solution having a pH of less than about 3, the improvement in which comprises:

application of an aqueous solution of acrylamide polymer to said ore prior to said ore being formed into said heap, then forming said heap, and then affectuating said solubilization of said metal by sequential or concomitant percolations of said bacteria-containing solution and said leach solution through said heap, said aqueous solution of acrylamide polymer being applied to said ore in an amount effective to agglomerate said fines and/or clay and improve the permeability of said heap during said percolations,

wherein said acrylamide polymer has a molecular weight of at least 500,000 and is comprised of from about 0 to about 100 mole percent of acrylamide or methacrylamide mer units and from about 0 to about 100 mole percent of N-sulfoalkyl acrylamide or N-sulfoalkyl methacrylamide mer units.

5,196,053

COMPLEXING AGENT FOR DISPLACEMENT TIN PLATING

John R. Dodd; Anthony J. Ardovengo, III; Randal D. King, all of Wilmington, Del., and Americus C. Vitale, West Chester, Pa., assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed Nov. 27, 1991, Ser. No. 799,136

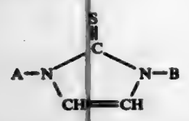
Int. Cl.[5] C23C *18/31*; B05D *5/12*

U.S. Cl. 106—1.22 **31 Claims**

1. An aqueous plating solution for the displacement plating of a substrate metal surface with an other metal comprising:

(i) a metal ion of a free metal, wherein the free metal is different from the metal of the substrate surface;

(ii) a complexing agent which is a an imidazole-2-thione compound of the formula:



wherein A and B are the same or different —R—Y groups, wherein R is linear, branched or cyclic alkenyl group containing 1 to 12 carbon atoms and Y is a hydrogen, halogen, cyano, vinyl, phenyl, or ether moiety and

(iii) an acid.

5,196,054

PREPARATION FOR THE WATER-REPELLANT IMPREGNATION OF POROUS, MINERAL BUILDING MATERIALS

Manfred Schmuck, and Herlbert Seyffert, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Aug. 28, 1991, Ser. No. 751,292

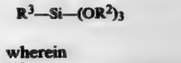
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1990, 4029640

Int. Cl.[5] C04B *41/64*; C09C *3/18*

U.S. Cl. 106—2 **11 Claims**

1. Preparation for the water-repellent impregnation of mineral building materials comprising a emulsion of

a) about between 5 to 45% by weight of an alkoxysilane of the general formula



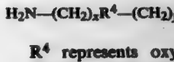
wherein

R^1 is an alkyl group with 1 to 16 carbon atoms and

R^2 is an alkyl group with 1 to 4 carbon atoms,

b) about between 45 to 5% by weight of a mixture of

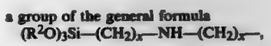
b1) a silane of the general formula



wherein

R^2 the above meaning and

R^3 is an aminoalkyl group with 1 to 6 carbon atoms or a group of th % general formula



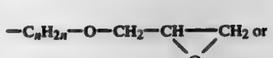
, in which

R^4 represents oxygen, sulfur, —NH— or —NH—CH_2—CH_2—NH and

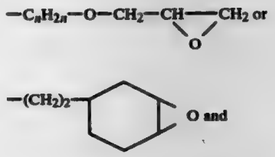
$x \geqq 2$ and

$y \geqq 2$, or

a group of the general formula



in which R^2 and x are defined as above,



n is a whole number from 1 to 5, and

b2) a polysiloxane of the general formula

wherein

R^5 is a methyl or phenyl group, with the proviso that at least 90% of the R^5 groups are methyl group and

$m = 20$ to 250,

the ratio of b1) to b2) being such that more than 1 and up to 3 OR^2 groups of compound b1) correspond to one SiOH group of compound b2),

c) between about 0.5 to 10% by weight of an O/W emulsifier or emulsifier mixture and

d) about between 40 to 49.5% by weight of water.

5,196,055

VOC COMPLIANT PRETREATMENT PRIMERS

William B. Lesney, Westchester, and Frank M. Jachim, Calumet City, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jan. 23, 1991, Ser. No. 644,717

Int. Cl.[5] C04B *9/02*

U.S. Cl. 106—14.12 **23 Claims**

1. A two-component pre-treatment primer system for application to cleanmetal surfaces comprising:

(a) an aqueous first component comprising:

(1) a resin comprising the emulsion polymerization product of one or more monomers selected from the group consisting of acrylic and vinyl monomers and prepolymers, multifunctional epoxides, melamines and isocyanates,

(2) a zinc chromate pigment present in an amount less than about 4.5% PVC,

(3) a zinc phosphate pigment present in an amount less than about 6% PVC, and

(4) a package stabilizing agent comprising an agent selected from the group consisting of sodium salts of carboxylated polyelectrolytes; and

(b) an aqueous second component comprising a catalyst for said first component, wherein said second component comprises a blend of a naturally occurring organic acid and an anhydride in water.

5,196,056

INK JET COMPOSITION WITH REDUCED BLEED

Keshava A. Prasad, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1990, Ser. No. 606,233

Int. Cl.[5] C09D *11/02*

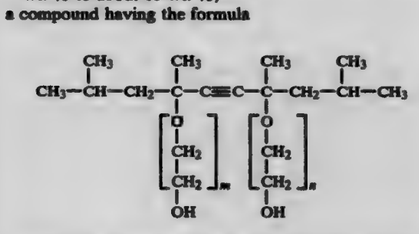
U.S. Cl. 106—15.05 **2 Claims**

1. An ink jet composition comprising:

an aqueous solution consisting essentially of water in an amount of from about 85 wt. % to about 90 wt. % of the solution, a colored dye dissolved in the solution and in an amount of from about 1 wt. % to about 5 wt. %,

2-(2-butoxyethoxy)ethanol in an amount of from about 1.5 wt. % to about 10 wt. %,

a compound having the formula



where m plus n is about 10, said compound being in an amount of from about 1 wt. % to about 3 wt. %, and optionally, one or more of a bactericide and a buffer.

5,196,057

PLAIN PAPER INK FOR DROP-ON-DEMAND PRINTING

Nelson Z. Escano, Cincinnati, and Sandra K. Brewer, Canton, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 129,573, Dec. 7, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,080

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22R **8 Claims**

1. In an aqueous ink useful for printing on plain paper with a thermal drop-on-demand printer, the ink comprising a humectant comprising more than 40 weight % of the total ink composition, and a compatible dye;

the improvement wherein the ink further includes a nonionic, acetylenic diol surfactant, effective, when used in amounts of from about 0.5 to about 10 weight % of the total ink composition, to provide a drying time less than about five seconds, a dot size having an average equivalent circular diameter of at least about 0.25 mm, and an optical density of at least 0.80; all when printed on #4 xerographic bond paper having the following properties: a roughness of between about 120 and 260 ml/min., an air permeability of between 200 and 500 ml/min., a moisture content of between about 3.9 and about 5.5%, a resin content of about 0.9%, a pH value of between about 7 and about 9, and a Cobb C_{60} value of between about 15 and about 30 g/m^2; using a print head having orifices spaced to print about 37.8 dots/cm (96 dots/inch) and constructed to generate dots having an average equivalent circular diameter of from about 0.25 mm to about 0.29 mm when printing with Hewlett-Packard Think Jet Black Ink on said #4 bond paper.

5,196,058

PAVEMENT CONSTRUCTION COMPOSITION AND METHOD THEREFOR

Byron Merrell, Vernal, Utah, assignor to Uintah Resources, Inc., Chula Vista, Calif.

Filed Dec. 7, 1990, Ser. No. 624,309

Int. Cl.[5] C08L *95/00*

U.S. Cl. 106—278 **27 Claims**

1. A road construction material comprising:

a hydrocarbon-laden fine aggregate mixture, the hydrocarbon content of said mixture being in a range of approximately five to twenty-five percent by weight;

a hydrocarbon diesel fuel or C5–C6 solvent cold-blended with said hydrocarbon-laden mixture for a period of not less than about one minute at a weight ratio of at least approximately two parts of said solvent to two-hundred parts of said hydrocarbon-laden mixture, said hydrocarbon-laden fine aggregate and solvent mixture being thereafter marinated in a stock pile for a period of at least about two days at room temperatures of not more than about 120° F.

5,196,059

PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS

Leonard M. Niebylski, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 301,450, Jan. 25, 1989, abandoned. This application Jan. 17, 1990, Ser. No. 446,622

Int. Cl.[5] G09K *15/02*

U.S. Cl. 106—287.11 **7 Claims**

1. A dispersion consisting essentially of aluminum-silicon eutectic, silicon carbide, silicon boride, and silicon metal in a solution of one part by weight of a polysilazane in an organic solvent, wherein the amount of aluminum-silicon eutectic is about 0–3 parts by weight, silicon carbide is about 0–4 parts by weight, silicon boride is about 1.5–5 parts by weight, and silicon metal is about 0.4–5 parts by weight, all per one part by weight polysilazane.

5,196,060

AIR-ENTRAINING ADJUVANT CONTAINING BLOOD PLASMA AS A SUBSTITUTE FOR SYNTHETIC COLLOID, AND PRODUCT OBTAINED

Georges Canalesa, 28 rue Victor Hugo, 47190 Aiguillon, France

Filed Nov. 30, 1990, Ser. No. 620,115

Continuation-in-part of PCT/FR89/00258, May 29, 1989. Claims priority, application France, Jun. 1, 1988, 88 07311

Int. Cl.[5] C04B *24/00*

U.S. Cl. 106—645 **13 Claims**

1. A hydraulic binder including an air entraining adjuvant comprising at least one of animal whole blood and cruor as an air-entraining agent and further comprising blood plasma as a

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stabilizer for entrained air in an amount of about 15 to about 25% by weight of the total adjuvant and such that the total adjuvant does not have the composition of animal whole blood.

5,196,061
CEMENTITIOUS COMPOSITE THAT INCLUDES DELIGNIFIED CELLULOSIC MATERIAL AND PROCESS OF MAKING IT

Robert C. Thomas, 18 Foxglove Way, Irvine, Calif. 92715, and Craig O. Thomas, Apt. 1, 853 Auburn Rd., Groton, N.Y. 13070

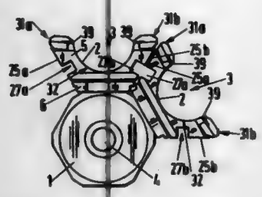
Continuation-in-part of Ser. No. 274,617, Nov. 22, 1988, Pat. No. 4,920,312, which is a continuation of Ser. No. 144,565, Jan. 15, 1988, abandoned. This application Apr. 26, 1990, Ser. No. 514,831
Int. Cl.[5] C04B *18/24*
U.S. Cl. 106—697 **22 Claims**

1. A method for making a cementitious composite comprising the steps of:
providing wastewater sludge from a paper recycling process, the sludge having a waste and solids content that consists essentially of nonfibrous delignified cellulose debris, the cellulose debris being of particles that substantially are less than 5 mm long and having an aspect ratio of less than 100-to-1;
b) mixing the sludge with Portland cement;
c) molding the mixture into a desired shape; and
d) curing the mixture.

5,196,062
ARRANGEMENT FOR HOLDING AND COOLING WORK PIECES POSITIONED NEXT TO ONE ANOTHER

Erich Bergmann, Mels; Martin Zäch, Balzers, both of Switzerland, and Anton Kuaz, Triesenberg, Liechtenstein, assignors to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

Filed Apr. 19, 1991, Ser. No. 688,093
Claims priority, application Switzerland, Apr. 20, 1990, 1351/90-8
Int. Cl.[5] B65G *29/00*
U.S. Cl. 118—69 **11 Claims**

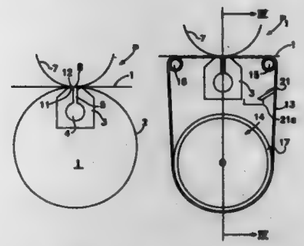


1. An arrangement for holding and cooling work pieces (2) placed next to one another during a coating process in a vacuum coating chamber, comprising:
at least one longitudinal cooling body part (6);
at least one longitudinal work piece holding part (5);
coupling means for detachably connecting said longitudinal cooling body part (6) to said longitudinal work piece holding part (5);
said longitudinal work piece holding part (5) having, on one side thereof, a longitudinal bearing surface (32) for work pieces (2), and, on an opposite side thereof, a first heat transfer surface (7), said longitudinal bearing surface (32) having a longitudinal surface projection and said first heat transfer surface (7) extending parallel to and over the entire length of the longitudinal surface projection of said bearing surface (32), said first heat transfer surface (7) and said longitudinal bearing surface (32) being separated only by a solid metallic material-thickness of said work piece holding part (5) which is thin compared to the extent of said first heat transfer surface (7); and
said cooling body part (6) having a second longitudinal heat transfer surface (9) with a surface area of at least the same dimensions as a surface area of said first heat transfer surface (7), when said work piece holding part (5) is connected to said cooling body part (6), so that said first heat transfer surface (7) is totally covered by said second heat transfer surface (9).

5,196,063
METHOD FOR APPLYING LIQUID, PASTY OR PLASTIC SUBSTANCES TO A SUBSTRATE

Volker Ludwig, Untere Muhlewiesen 10, 7986 Wutoschingen, Fed. Rep. of Germany

Filed Jun. 26, 1991, Ser. No. 721,115
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020420
Int. Cl.[5] B05C *1/08, 1/14, 5/02*
U.S. Cl. 118—213 **18 Claims**

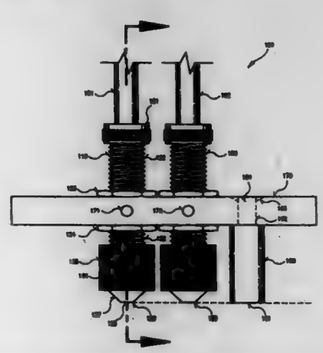


1. A device for applying a coating material to a substrate through perforations, which comprises: first means closed on all sides thereof and defining an enclosed interior space, said first means having perforations therein; means for applying a coating material through said perforations; a backing means adjacent said first means, wherein said first means and said backing means form a coating nip therebetween; means for passing a substrate to be coated through said coating nip; and a vacuum pump operatively connected to said interior space to remove air and coating vapors from said interior space.

5,196,064
REPLACEABLE FLUID DISPENSING NOZZLE

Everett J. Branderhorst, Portland, and Jose Y. Gonzales, Aloha, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1991, Ser. No. 811,167
Int. Cl.[5] B05B *7/00*
U.S. Cl. 118—313 **7 Claims**



1. A nozzle assembly for use in a semiconductor fabrication

liquid dispensing apparatus which dispenses a liquid onto a surface comprising:
a. a bulkhead comprised of a non-stick material coupled at a first end to a dispensing tube of the liquid dispensing apparatus, the bulkhead containing an internal fluid flow path to direct fluid from the dispensing tube;
b. a holding cap which mates with the bulkhead such that when the holding cap is torqued the bulkhead becomes secured to the dispensing tube;
c. a bridge plate with a bore for receiving the bulkhead, the bridge plate residing a fixed distance from the surface; and
d. a nozzle coupled to a second end of the bulkhead, the nozzle being comprised of the non-stick material, and comprising an orifice for letting fluid from the dispensing tube exit out the orifice.

5,196,065
GARDEN SPRAY SHIELD APPARATUS

William J. Joswiak, 8878 S. Allison St., Littleton, Colo. 80123

Filed Oct. 21, 1991, Ser. No. 780,157
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—504 **2 Claims**

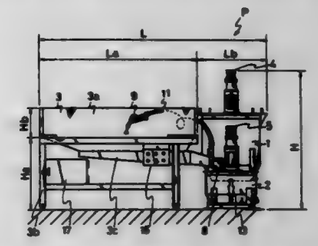
1. A garden spray shield apparatus, comprising,
a continuous vertical wall, the vertical wall formed of a memory shaped retentive material, wherein the vertical wall includes an upper edge and a lower edge, wherein a through-extending conduit is directed between the upper edge and the lower edge, the upper edge including a continuous cylindrical upper edge member integrally mounted to the upper edge, and
the vertical wall includes at least one through-extending handle slot, and
the vertical wall includes an interior surface in confrontation with the conduit, and a plurality of parallel conduits are directed coextensively through the vertical wall extending from the lower edge to the upper edge in communication with the upper edge member, and
the upper edge member includes a cylindrical charcoal body, with a mesh screen exterior wall formed about the charcoal body to permit vapors to be directed through the screen exterior wall.

5,196,066
FACING MATERIAL SPRAY APPARATUS

Motoo Kusuda; Hirokazu Ueda, both of Nara, and Hitoshi Masuda, Yamatotakada, all of Japan, assignors to Kusuda Company Limited, Nara, Japan

Filed Oct. 28, 1991, Ser. No. 783,416
Int. Cl.[5] B05C *5/00*
U.S. Cl. 118—612 **3 Claims**

1. A facing material spray apparatus comprising:
a first tank for housing a facing material and regulating its concentration:
first agitating means for agitating the facing material in the first tank:
a second tank, for receiving the facing material from the first tank, provided adjacent to and below the bottom of the first tank:
second agitating means for agitating the facing material in the second tank:
a connecting pipe for connecting the first and second tanks to each other and causing the facing material in the first tank to gravity flow into the second tank:
a valve attached to the connecting pipe for opening and closing a facing material supply passage;
a facing pump removably attached to the second tank for sucking the facing material in the second tank;

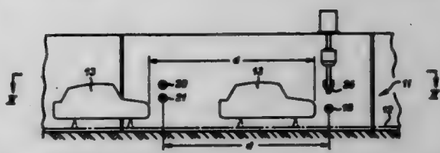


a nozzle attached to the facing pump through a hose for spraying the sucked facing material on a mold; and
a facing material receiving base provided adjacent to the second tank for receiving the facing material sprayed on the mold and recovering the received facing material not remaining on the mold to the second tank by virtue of its gravity flow.

5,196,067
ELECTROSTATIC SPRAYING INSTALLATION FOR WATER-BASED PAINT

Adrien Lacchia, Grenoble, France, assignor to Sames S.A., Meylan, France

Continuation of Ser. No. 494,547, Mar. 16, 1990, abandoned, which is a continuation of Ser. No. 113,269, Oct. 27, 1987, abandoned. This application Jul. 26, 1991, Ser. No. 735,706
Claims priority, application France, Nov. 26, 1986, 86 16466
Int. Cl.[5] B05C *11/10*; B05B *5/053*
U.S. Cl. 118—694 **7 Claims**



1. An electrostatic spraying installation for low resistivity water based paints comprising:
(a) a plurality of electrically grounded primary paint circulation circuits each adapted to contain paint of a respective color;
(b) a plurality of intermediate storage tanks electrically insulated from ground, equal in number to said primary circuits and each assigned to a respective primary circuit;
(c) operable insulating duct means inserted between each intermediate storage tank and its respective primary circuit;
(d) a conveyor adapted to convey spaced like large objects at least substantially of the size of an automobile body, said objects to be painted being regularly spaced to provide for a substantially constant distance between their respective leading edges;
(e) a plurality of electrostatic sprayers comprising respective spray members connected to adjustable high voltage means, said sprayers being positioned to paint respective specific parts of said objects as they are displaced by said conveyor, and being separated into groups respectively

substantially situated in the vicinity of a number of planes perpendicular to the path of movement of said objects, said planes being spaced from each other by said substantially constant distance;

(f) a number of paint change units equal to said number of planes, each unit having one outlet connected to feed sprayers of a corresponding said group and having several controlled inlet means respectively connected to said intermediate storage tanks; and

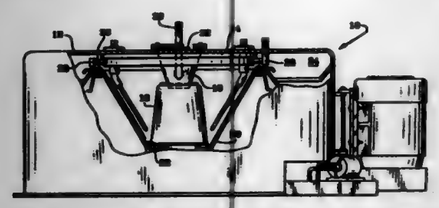
(g) control means for controlling operations of said high voltage means, said insulating duct means and said paint change units, said control means being adapted to at least substantially lower said high voltage means and then to operate at least a subset of said insulating duct means and to operate said paint change units simultaneously, only and as soon as said spray members of all the sprayers of all groups are simultaneously facing spaces between said like objects.

5,196,068

MEANS FOR PRODUCING A HIGH BRIX LUMP-FREE MAGMA

Ted D. Milner, Westminster, Colo., assignor to Silver Engineering Works, Inc., Aurora, Colo.

Continuation of Ser. No. 619,646, Nov. 29, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 887,401
Int. Cl.[5] C13F *1/00*; B04B *15/12, 11/00*
U.S. Cl. 127—2 6 Claims



1. In a massecuite-separating centrifuge which has (a) a rotating basket having a frustoconic form with an open divergent upper extremity, and (b) a magma ring, about said basket, for receiving magma from said upper extremity of said basket, means for producing a high brix, lump-free magma, said means comprising:

a conduit coupled to said centrifuge with a first portion thereof external to said centrifuge, and a second portion thereof disposed adjacent to the inner top of the basket; and

means joined to said conduit for conducting water from said conduit only onto said upper extremity of said basket for wetting sugar crystals, thereat, which subsist in magma, before discharge of magma from said basket to said magma ring.

5,196,069

APPARATUS AND METHOD FOR CELLULOSE PROCESSING USING MICROWAVE PRETREATMENT

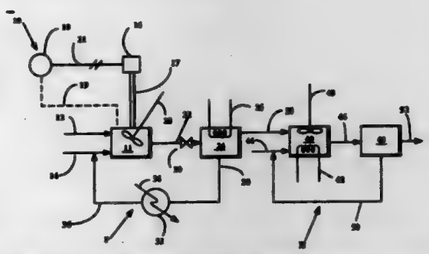
Hatice S. Callaghford, Houston, Tex.; Clifford E. George, Starkville, Miss., and George R. Lightsey, Starkville, Miss., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 5, 1991, Ser. No. 728,901
Int. Cl.[5] C13K *1/02*; D21C *3/20, 5/00*
U.S. Cl. 127—37 16 Claims

15. A method for converting cellulose into saccharides, comprising, the steps of:

(a) irradiating cellulose in the presence of water and an organic acid with microwaves at superatmospheric pressure for sufficient length of time to enhance hydrolyzability, said organic acid being selected from the group comprising; acetic acid, citric acid, tartaric acid, formic acid, propanoic acid, and propenoic acid;

(b) enzymatically hydrolyzing said irradiated cellulose to form soluble saccharides, and



(c) separating said acid from said irradiated cellulose prior to said hydrolyzing step and recycling said separated acid to said irradiating step.

5,196,070

THERMALLY STABLE WATER SOLUBLE SOLDER FLUX AND PASTE

Wallace H. Ables, Apalachin, N.Y.; Dwight R. Howle, Cedar Park; John S. Humphrey; Robert G. Raines, both of Austin; Richard A. Reich, Georgetown, all of Tex.; Robert A. Sorensen, Poway, Calif.; Robert Valdez, Round Rock, and Abdoul R. Zamani, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1991, Ser. No. 815,669
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 20 Claims

1. A water soluble, thermally stable, solder flux containing four major chemical groups, the water soluble, thermally stable, solder flux consisting essentially of:

an organic moiety with a polar group;

a non-halogenated amine combined with the organic moiety in a ratio non-halogenated amine to organic moiety with a polar group of about 0.6:1 to 1.2:1, to form a flux vehicle;

from about 17 percent to about 26 percent, of a mixed-polarity solvent system for rheological modification; and

from about 4 percent to about 6 percent by weight based on total weight of solder flux, of an acidic organic compound to serve as an activator.

5,196,071

METHOD AND APPARATUS FOR DROSS FREE BURNING OF SLABS

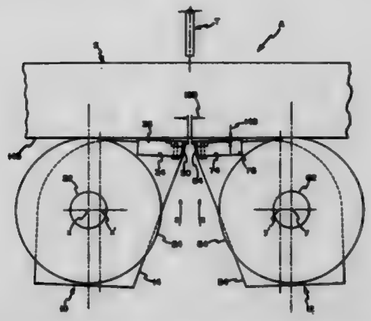
Joseph L. Voye, Jr., Portage, Ind., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 12, 1991, Ser. No. 729,341
Int. Cl.[5] B23K *37/04*
U.S. Cl. 148—194 30 Claims

1. A torch-cutting apparatus for slabs to prevent dross from forming on the underside of the slabs in the area of a cut, comprising:

a) means to be positioned beneath a slab for applying a tight clamping pressure to the underside of said slab in the area of the cut during a cutting operation thereby preventing dross from flowing laterally and forming on the underside of said slab in the area of the cut during said cutting operation;

b) said clamping pressure applying means includes laterally spaced first and second clamps to be positioned on either side of a kerf line; and



c) each of said first and second clamps is pivotable between clamped and unclamped positions.

5,196,072

METHOD AND APPARATUS FOR CONTROLLING METAL OXIDE FUME GENERATION DURING SUBDIVISION OF A BODY CONTAINING METAL VALUES

Curtis L. Bernel, Chicago, Ill., and Creseda L. Douglas, Upper Darby, Pa., assignors to Liquid Air Corporation, Walnut Creek, Calif.

Filed Dec. 12, 1990, Ser. No. 626,207
Int. Cl.[5] B23K *7/00*
U.S. Cl. 148—194 14 Claims

1. A method of decreasing metal oxide fume generation during the oxide-induced subdivision into smaller physical units of a body containing metal values said method comprises the steps of:

a. providing a body containing metal values and

b. subdividing said body with a consumable lance using gaseous oxygen in a carbon dioxide-enriched, oxygen environment in the absence of a fuel gas.

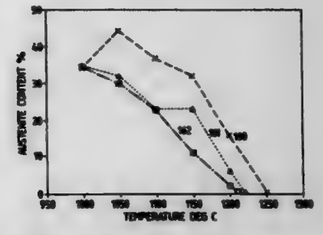
5,196,073

STAINLESS STEEL

Mats Liljas, Avesta; Jaroslav Pleva, Hagfors, and Peter Stenvall, Avesta, all of Sweden, assignors to Avesta Aktiebolag, Avesta, Sweden

Filed Apr. 1, 1992, Ser. No. 861,445
Int. Cl.[5] C22C *38/44, 38/50*
U.S. Cl. 148—326 6 Claims

1. A stainless steel having a two-phase structure of austenite and ferrite, the steel consisting essentially of in weight-% not more than 0.03% C, not more than 0.03% N, the total amount of C+N not being more than 0.05%, 1.5–2.5% Si, 0.5–2% Mn, not more than 0.03% P, not more than 0.010% S, 22–26% Cr, 8–11% Ni, 2–3% Mo, 0.35–0.55% Ti, % Cr+3.3×% Mo being at least 29.0, balance iron and impurities, said steel having been subjected to a heat treatment consisting of solution annealing in the temperature range 1100°–1250° C. and water quenching followed by aging in a temperature range 500°–600° C. for at least 30 min, wherein precipitated consisting essentially of $Ni_{16}Ti_6Si_7$, so called G-phase, are precipitated in the form of particles evenly distibuted in the ferrite, said particles typically having a size of 10–50 Å, imparting the material an improved yield strength in the annealed and aged condition,



said yield strength amounting to at least 800 MPa in combination with a Charpy V impact strength of at least 25 J, a critical pitting temperature (CPT) higher than about 50° C. in 3% NaCl-solution at 200 mV SCE, and a pitting potential Ep in 0.1N-NaCl-solution, 80° C., of at least about 300 mV SCE.

5,196,074

COPPER ALLOYS CAPABLE OF SPINODAL DECOMPOSITION AND A METHOD OF OBTAINING SUCH ALLOYS

Jean-Marie Welter, Gisors, and Pierre Nandot, Maisons Laffitte, both of France, assignors to Trefimetaux, Courbevoie, France

Filed May 6, 1991, Ser. No. 696,127
Claims priority, application France, May 11, 1990, 90 06489
Int. Cl.[5] B22F *1/00*
U.S. Cl. 148—514 11 Claims

1. A method of manufacturing a finished product which comprising a copper nickel and tin based alloy and which has undergone spinodal decomposition, comprising the steps of:

a) preparing an alloy melt of the Cu Ni Sn based alloy which contains also titanium or any other decarburising and refining element and optionally lead;

b) forming a semi-finished product by spray-deposition of the alloy melt onto a backing which serves as a support;

c) transforming the semi-finished product, a part of which may be constituted by the said backing, by an annealing stage followed by rapid tempering;

d) subjecting the transformed semi-finished product to a heat annealing treatment in order to effect spinodal decomposition of the part of the product which is constituted by the Cu Ni Sn based alloy to obtain a finished product.

5,196,075

METHOD FOR MODIFYING AND THEREBY IMPROVING THE CORROSION RESISTANCE AND HARDNESS OF WORKPIECES OF FERRITIC STEEL

Knut Jansen, Mülheim; Andreas Franziskus, and Hans J. Plümer, both of Hemer, all of Fed. Rep. of Germany, assignors to ITW-ATECO GmbH, Norderstedt, Fed. Rep. of Germany

Continuation of Ser. No. 385,126, Jul. 26, 1989, abandoned. This application Jan. 27, 1992, Ser. No. 825,736
Int. Cl.[5] C21D *9/00*
U.S. Cl. 148—530 19 Claims

1. A method for modifying and thereby improving the corrosion resistance and hardness of workpieces of ferritic steel, comprising the steps of:

forming a workpiece core from a ferritic chrome steel having a chrome percentage by weight of at least 13%;

providing said workpiece core with an outer layer of nickel, said outer layer having a thickness of at least 5 μm; and

diffusion annealing said workpiece under an oxygen-free environment a at at least 850° C. so as to form an intermediate austenitic chrome-nickel alloyed layer between said

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chrome steel core and said outer layer of nickel which provides said workpiece with a desired corrosion resistance while said chrome steel core is changed from ferritic chrome steel to martensitic chrome steel which provides said workpiece with a desired degree of hardness.

5,196,076

RADIAL TIRE CARCASS PROFILE

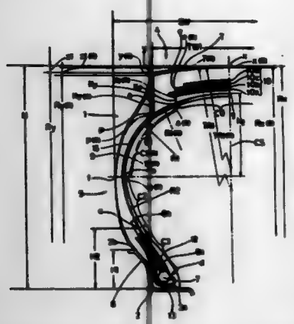
Kiyoshi Ochiai, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Continuation-in-part of Ser. No. 185,273, Apr. 18, 1988, Pat. No. 4,955,416, which is a continuation-in-part of Ser. No. 835,783, Mar. 3, 1986, abandoned. This application Jun. 5, 1990, Ser. No. 533,452

Claims priority, application Japan, Jun. 6, 1989, 1-43795; Jun. 6, 1989, 1-143796

Int. Cl.[5] B60C *3/04*

U.S. Cl. 152—454 4 Claims



1. A tire and rim assembly comprising a radial tire for heavy duty use and a regular rim adapted to receive said tire, said tire comprising

a carcass having at least one ply of radially arranged cords, a tread on the carcass provided on the outer face thereof with a curvature, and

a belt disposed between the carcass and the tread and having at least two plies of parallel cords inclined with respect to the circumferential direction of the tire,

the carcass provided with a profile comprising an upper region provided with an outwardly swelling curvature at least 90% of which is formed by a circular arc having a radius (R1), and

a lower region provided with an outwardly swelling curvature at least 90% of which is formed by a circular arc having a radius (R2) where the upper region extends between a maximum carcass section width point (b) corresponding to the maximum tire section width point (f) and a belt outer edge point (a) defined as an intersection of the carcass with a line (Ke) extending parallel to the tire equator from a edge (e) of the belt ply which is narrowest within three plies from the innermost ply, and the lower region extends between the maximum carcass section width point (b) and an inflection point (c) at a height H2 of 160% of the height H1 of a flange of said rim, each from the bead base line,

the ratio (R1/R1(5)) of the radius (R1) of the upper region when the tire is mounted on the rim and inflated to a normal pressure to the radius (R1(5)) of the upper region when the tire is mounted on said rim and inflated to 5% of its normal pressure, being not less than 0.70 and not more than 0.95,

the ratio (TR1/SW) of the radius (TR1) of the curvature of the tread face to the maximum tire section width (SW) when the tire is mounted on said rim and inflated to the normal pressure, being not less than 1.28 and not more than 1.95,

the ratio (R1/R2) of the radius (R1) of the upper region to the radius (R2) of the lower region, when the tire is mounted on the rim and inflated to the normal pressure, being not less than 0.95 and not more than 1.08, and

the ration (R1/Hg) of said radius (R1) of the upper region to the radial distance (Hg) between the maximum tire section width point (b) and the center point (g) on the tire equator, when the tire is mounted on the rim and inflated to the normal pressure, being not less than 0.90 and not more than 1.05.

5,196,077

PNEUMATIC RADIAL TIRE

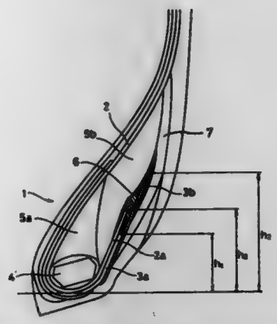
Yukio Kaga, Atsugi, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 217,922, Jun. 17, 1988, abandoned. This application May 1, 1990, Ser. No. 517,131

Claims priority, application Japan, Oct. 27, 1986, 61-253613

Int. Cl.[5] B60C *15/06*

U.S. Cl. 152—541 2 Claims



1. A pneumatic radial tire having a bead portion in which a carcass layer is folded back and turned up around a bead bundle from inside to outside of the tire, at least two reinforcing layers comprising a steel cord reinforcing layer and a fiber cord reinforcing layer are arranged outer to a turnup portion of the carcass layer and, while the steel cord reinforcing layer immediately adjacent the turnup portion of the carcass layer has its upper end located lower to the upper end of the turnup portion, the fiber cord reinforcing layer has its upper end located higher to the upper end of the turnup portion and the upper end of the steel cord reinforcing layer adjacent the turnup portion; wherein (1) a rubber stock is disposed between an upper end portion of each of said turnup portion and said fiber cord reinforcing layer to contact and cover the upper end surface of said steel cord reinforcing layer and extend beyond the upper end portion of said fiber cord reinforcing layer, the rubber stock completely covers the upper end portions of the turnup portion and said fiber cord reinforcing layer and axially inner the rubber stock completely covers the side of the fiber cord reinforcing layer; (2) that at the location of the upper end of said fiber cord reinforcing layer, the rubber stock has a thickness b in the direction toward the fiber cord reinforcing layer which is 0.5 to 1.5 times the thickness a of the fiber cord reinforcing layer; (3) that at the location of the upper end of said turnup portion, the rubber stock has a thickness d between the carcass layer and the fiber cord reinforcing layer which is 1.0 to 4.0 times the cord diameter r of the cords of the steel cord reinforcing layer; (4) the upper end of the rubber stock and the upper end of the fiber cord reinforcing layer are spaced from each other by a distance c which is 1.0 to 15.0 times the thickness a of the fiber cord reinforcing layer; and (5) that the rubber stock has an elastic modulus which is higher than the

elastic modulus of each of the rubber composition in the carcass layer and the rubber composition in the fiber cord reinforcing layer and is also higher than the elastic modulus of each of a bead filler adjacent to the inner side of the rubber stock and a rubber layer adjacent to the outer side of the rubber stock, and the elastic modulus of the rubber stock is within a range of 10 to 15 MPa.

5,196,078

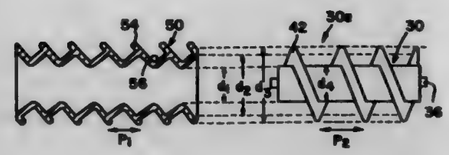
METHOD OF MAKING FLEXIBLE COAXIAL CABLE HAVING THREADED DIELECTRIC CORE

William T. Pote, Glen Gardner, N.J., assignor to Flexco Microwave, Inc., Port Murray, N.J.

Filed Jul. 9, 1991, Ser. No. 727,458

Int. Cl.[5] H01B *13/22*

U.S. Cl. 156—52 12 Claims



1. A method of making a flexible coaxial cable comprising the steps of providing a threaded core for said cable, said threaded core comprising an inner conductive member and threaded dielectric means surrounding said inner conductive member, said inner conductive member being located substantially along the longitudinal axis of said threaded dielectric means, said threaded dielectric means having a normal outermost radial extent about said longitudinal axis and comprising a plurality of threads extending along said longitudinal axis and having a peak-to-peak diameter determined by said normal outermost radial extent, said threads having a predetermined pitch along said longitudinal axis dependent on the desired electrical characteristics of said cable; providing a flexible hollow outer conductive sheath of substantially the same extent as said threaded core, said sheath having a longitudinal axis coextensive with said threaded core longitudinal axis and an innermost radial extent about said longitudinal axis which defines the innermost circumference of said hollow within said sheath, said threaded core threaded dielectric means normal outermost radial extent being larger than said sheath innermost radial extent and having a predetermined peak-to-peak diameter sufficient to permit threadable insertion of said threaded core in said hollow outer conductive sheath, said sheath comprising a corrugated portion having a plurality of peaks and valleys of predetermined pitch and a conductive portion disposed about said peaks and having a pitch equivalent to said predetermined pitch, said conductive portion being conductively disposed on said peaks, said valleys defining said sheath innermost radial extent, said peak mounted conductive portion defining said sheath outermost radial extent; and threadably inserting said threaded core into said hollow outer conductive sheath until said sheath and said threaded core are substantially coextensive for threadably locking said threadably inserted dielectric means to said sheath for providing a locked flexible coaxial cable due to said threadable insertion.

5,196,079

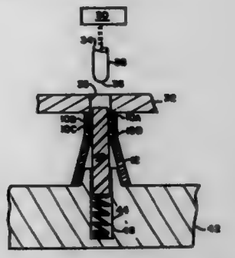
METHOD AND APPARATUS FOR JOINING THERMOPLASTIC WORKPIECES BY HIGH FREQUENCY VIBRATIONS

Thomas R. Sager, Newtown, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Jan. 18, 1991, Ser. No. 643,125

Int. Cl.[5] B32B *31/16*

U.S. Cl. 156—73.1 16 Claims



1. The method of joining a plurality of tubular thermoplastic workpieces comprising:

stacking the tubular workpieces upon one another in a manner causing the respective inner surfaces of said workpieces to be axially aligned to cause an axially extending opening delimited by said inner surfaces;

causing said workpieces to be in forced abutting contact with one another along their respective radially disposed surfaces;

applying during a time interval high frequency vibrations to the respective inner surfaces for causing, responsive to the dissipation of energy provided by said vibrations, thermoplastic material to soften and flow along said respective inner surfaces and across the interface between two abutting stacked workpieces at said opening, and

terminating said time interval for causing said vibrations to cease, whereby said softened and flowed thermoplastic material along said inner surfaces and respective interface between two abutting workpieces rigidifies to cause abutting workpieces to be joined to one another.

5,196,080

HEAT TRANSFER SHEET

Akira Mizobuchi; Yoshiaki Hida; Shigeki Umino, all of Tokyo; Kyoichi Yamamoto, and Kyohei Takahashi, both of Sagamihara, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 387,436, Jul. 27, 1989, abandoned, which is a continuation of Ser. No. 135,385, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 766,297, Aug. 16, 1985, Pat. No. 4,732,815. This application Jun. 21, 1991, Ser. No. 719,101

Claims priority, application Japan, Aug. 20, 1984, 59-172998; Aug. 20, 1984, 59-172999; May 10, 1985, 60-99378

Int. Cl.[5] B44C *1/165*

U.S. Cl. 156—234 1 Claim

1. A process for heat transfer printing which performs dotwise printing by means of thermal heads, comprising the steps of:

providing a heat transfer sheet and an image-receiving sheet to be used in combination with said heat transfer sheet, said heat transfer sheet comprising a base film, a mat layer formed on the surface of said base film, said mat layer comprising a resin and inorganic pigments dispersed in the resin, and a hot melt ink layer formed on the surface of said mat layer;

superposing said heat transfer sheet on said imagereceiving sheet; and

performing dotwise printing a heat-transfer portions of said

sponding text on at least one of said sheet or said envelope

a container for said material;

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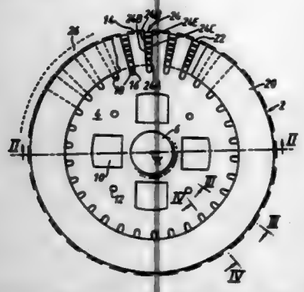
hot melt ink layer from the mat layer provided on said base film to said image-receiving sheet, whereby the heat-transferred portions of said hot melt ink layer have surface contours similar to those of corresponding portions of said mat layer maintained on said base film.

5,196,081

A METHOD FOR A FRICTION FACING MATERIAL AND CARRIER ASSEMBLY

Graham R. Bicknell, Rugby, United Kingdom, assignor to Automotive Products plc, England

PCT No. PCT/GB88/00953, § 371 Date Jun. 8, 1990, § 102(e) Date Jun. 8, 1990, PCT Pub. No. WO89/05411, PCT Pub. Date Jun. 15, 1989
PCT Filed Nov. 9, 1988, Ser. No. 488,050
Claims priority, application United Kingdom, Dec. 9, 1987, 8728804
Int. Cl.[5] B29C *47/06*
U.S. Cl. 156—244.11 11 Claims



1. A method of forming a bonded friction facing material and carrier assembly for a clutch driven plate rotatable about an axis, the assembly comprising a carrier formed so as to define at least one void, at least one array of friction material, and elastomeric material, the method comprising the steps of:
applying the elastomeric material to said one array of friction material in the form of a plurality of stripes such that each said stripe extends around said axis in continuous contact with said one array of friction material, and radially of said axis, said stripes being at least mainly spaced one from another; and
applying said stripes against the carrier such that said at least one void is spanned by said one array of friction material, so as to adhere said one array of friction material to said carrier.

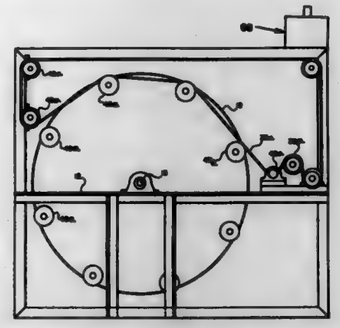
5,196,082

LABEL AUTO-TRANSFER TURRET REWIND ASSEMBLY

Glenn E. Randolph, 5234 Furman Pl., Charlotte, N.C. 28210

Continuation-in-part of Ser. No. 115,484, Nov. 2, 1987. This application Mar. 19, 1990, Ser. No. 495,151
Claims priority, application United Kingdom, Mar. 31, 1988, 8807676; Fed. Rep. of Germany, Apr. 5, 1988, 3811377; Canada, Apr. 8, 1988, 563583; Italy, Jun. 14, 1988, 20955 A/88; Japan, Jun. 14, 1988, 63-146683
Int. Cl.[5] B65H *81/00*
U.S. Cl. 156—353 19 Claims

1. Apparatus for rewinding a web of material, comprising:
a frame;
a rotatable disc mounted on said frame;
indexing means for intermittently rotating said rotatable disc through a predetermined arc;
a plurality of mandrels rotatably mounted at equal intervals about said disc, said mandrels extending horizontally from said disc and being arranged with their axes being equidistant from the central axis of said disc, each of said mandrels being adapted to receive a web-receiving core thereon;
drive means adapted to rotate at least two but less than all of said mandrels as positioned in a predetermined location with regard to said frame and to engage and disengage mandrels as they move into and out of said predetermined location;
web-attaching means mounted on said frame for attaching said web to a core mounted on a mandrel;
cutting means mounted on said frame for cutting said web;



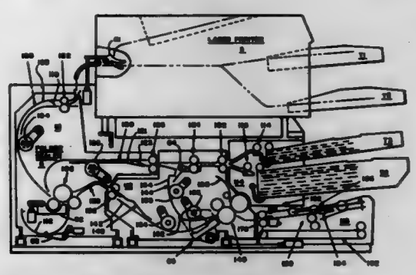
a counter communicating with said cutting means for controlling the amount of web rewound;
programmable control means communicating with said indexing means, said drive means, said web-attaching means, said cutting means, and said counter, for programmably controlling said apparatus; and
a core positioning gauge pivotally connected at its upper end to said frame to bear against a mandrel adjacent said gauge, thereby providing a limit stop for placement of a core on said mandrel against said gauge.

5,196,083

SYSTEM AND METHOD FOR PRODUCING ITEMS IN SELECTED CONFIGURATIONS

Walter J. Baker, Stratford; Michael A. Brown, Norwalk; David W. Hubbard, Stamford; Samuel W. Martin, Weston; Carl A. Miller, Fairfield; William V. Pickering, Jr., New Canaan; Christopher S. Riello, Hamden; Arthur Rubinstein, Norwalk; Morton Silverberg, Westport, and Steven A. Supros, Norwalk, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1990, Ser. No. 493,016
Int. Cl.[5] B43M *3/00, 5/00*
U.S. Cl. 156—364 49 Claims



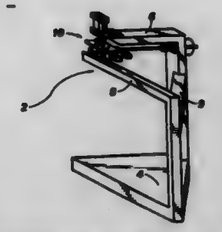
1. Apparatus for forming a mail piece, comprising:
a) means for input of text signals;
b) means for input of a sheet;
c) means for input of an envelope form;
d) a printer responsive to said text signals for printing corresponding text on at least one of said sheet or said envelope form; and,
e) folder sealer means for, after printing of said text;
e1) forming an accumulation including said sheet and said envelope form;
e2) simultaneously folding said sheet and said envelope form so that said envelope form surrounds said sheet; and
e3) sealing said envelope form to form a mail piece.

5,196,084

JOINING MACHINE FOR CONTINUOUS LOOP ABRASIVE BANDS

Alfieri Maurizio, Turin, Italy, assignor to Alfieri S.n.c. Di Alfieri Paola & C., Turin, Italy

Filed Jan. 24, 1992, Ser. No. 825,280
Claims priority, application Italy, Jan. 24, 1991, A/91 000041
Int. Cl.[5] B30B *1/02*
U.S. Cl. 156—583.5 11 Claims



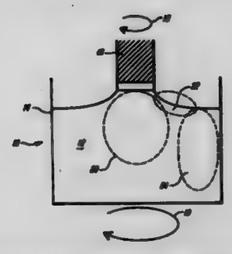
1. A joining machine for continuous loop abrasive bands, which comprises:
a support structure including a base and a reinforcing cross-member; a first and second arm connected to one of said base and said cross-member;
a compressing device;
first rotating means mounted on the first arm and second rotating means mounted on the second arm for exerting compression joining of surfaces of an object to be glued and for conveying the abrasive bands;
heating means positioned between said first and second rotating means; and
driving means for transmitting rotational movement to at least one of said first and second rotating means.

5,196,085

ACTIVE MAGNETIC FLOW CONTROL IN CZOCHRALSKI SYSTEMS

Julian Szekely, Weston, and Olusegun J. Ilegbusi, Sharon, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 28, 1990, Ser. No. 635,947
Int. Cl.[5] C30B *15/00*
U.S. Cl. 156—617.1 7 Claims



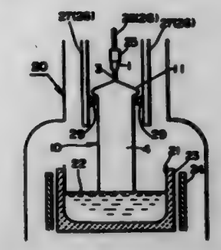
1. An apparatus for Czochralski crystal growth comprising:
a crystal precursor material;
a container for said material;
a heater;
induction coils for imposition of a magnetic field within said material for controlling a recirculation motion;
a withdrawal seed crystal; and
a magnetic field generator for imposition of an external axial magnetic field separate from said field applied by said induction coils in the vicinity of a melt/crystal interface, whereby laminar flow and quiescent conditions are established in said vicinity.

5,196,086

MONOCRYSTAL ROD PULLED FROM A MELT

Michio Kida, Uraws; Kensho Sahira, Yono, and Akifumi Nosse, Hyogo, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Division of Ser. No. 568,224, Aug. 16, 1990, Pat. No. 5,173,270, which is a division of Ser. No. 178,966, Apr. 7, 1988, Pat. No. 4,973,518. This application Jan. 17, 1992, Ser. No. 821,819
Claims priority, application Japan, Apr. 9, 1987, 62-87463
Int. Cl.[5] C30B *15/06*
U.S. Cl. 156—68.1 2 Claims



1. A method of preparing a monocrystal rod which has a stopper section for preventing said monocrystal rod from falling, said stopper section being a bulbous shoulder portion of said monocrystal rod located at a top portion of said monocrystal rod and having a diameter larger than a diameter of a lower portion of said crystal rod, said method utilizing an apparatus including safety means having an upper surface for supporting said monocrystal rod, comprising the steps of:
(a) pulling out said lower end of a seed crystal from a melt in a crucible while rotating said seed crystal and said crucible;
(b) increasing a speed of pulling said seed crystal while maintaining said temperature of said melt at a predetermined level;
(c) decreasing gradually said pulling speed and said temperature of said melt until a diameter of said monocrystal rod becomes larger than a required diameter to form said stopper section;
(d) moving said safety means in a horizontal direction to a position beneath said stopper section;
(e) increasing said pulling speed again so that said diameter of said monocrystal rod becomes similar to said required diameter; and
(f) after said diameter of said rod is equal to said required diameter, decreasing said pulling speed again.

5,196,087

METHOD FOR MAKING MULTI-LAYER PRINTED CIRCUIT BOARD

Robert Q. Kerns, Blanchester, Ohio, assignor to Multimedia Design, Inc., Blanchester, Ohio

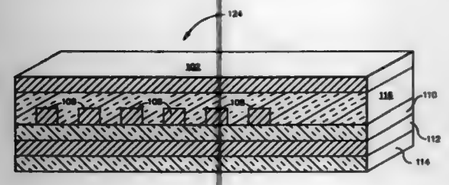
Filed Jun. 18, 1991, Ser. No. 717,341
Int. Cl.[5] B44C *1/22*; C23F *1/00*
U.S. Cl. 156—626 18 Claims

1. A method for manufacturing high-precision multi-layer printed circuit boards having predetermined custom artwork

data on a predefined working area, said method comprising the following steps:

(a) grading printed circuit board raw material said grading step further comprising the following steps:
(i) creating a plurality of double-sided printed circuit boards using a standard conductive path test pattern from a particular material batch number and same manufacturing lot number;
(ii) creating at least one three-dimensional X-ray image of each of said double-sided printed circuit boards;
(iii) computing basic correction factors by comparing the X-ray image to a standard template;
(iv) using the computed basic correction factors to create at least one test multi-layer printed circuit board test piece using material from said particular material batch number and manufacturing lot number;
(v) creating a three-dimensional X-ray image of said multi-layer printed circuit board test piece;
(vi) measuring the X and Y axis drift of said test piece;
(vii) measuring the Z axis shift of said test piece;
(viii) measuring the X, Y and Z axis quiver of said test piece;
(ix) computing correction factors for circuit boards made from said particular material batch number and manufacturing lot number;

(b) implementing artwork computation and adjustments, wherein said basic correction factors are used to make changes to desired custom artwork digitized data in order to account for the variations encountered in said test piece, said changes in the custom artwork digitized data



providing the necessary correction factors for use with the particular batch;

(c) processing of inner layers of said high-precision printed circuit boards, said processing step, further comprising the following steps:
(i) drilling tooling and registration holes in said inner layer printed circuit board, said holes falling outside the predefined working area;
(ii) masking first areas of said inner layer printed circuit board which will not have conductive traces in order to prevent conductive plating in said first areas, leaving unmasked second areas of said printed circuit board which will have conductive traces;
(iii) pattern Plating said inner layer printed circuit board in order to build up the thickness of said conductive traces;
(iv) stripping and etching said inner layer printed circuit board as necessary to remove unwanted conductive material from the conductive layers on the inner layer printed circuit board;

(d) evaluating the processed inner layers, wherein said inner layer printed circuit board is subjected to a three-dimensional X-ray test in order to ensure that said correction factors are valid, and an electrical test to ensure that each inner layer printed circuit board provides correct electrical circuitry;

(e) laminating said inner layer printed circuit boards in proper order and using the correction factors which have been computed for the particular material batch, thus creating a laminated printed circuit board;

(f) processing of outer layers high-precision printed circuit boards, this processing step further comprising the following steps:
(i) drilling said laminated printed circuit board according to a desired pattern of holes;
(ii) depositing of conductive material on said outer layers, wherein the interior walls of said holes are plated with conductive material, in order to allow electrical signals to travel from conductive top outer layer, to the conductive bottom outer layer, and to allow electrical signals to travel from the said outer layers to desired said inner layer printed circuit boards;
(iii) masking third areas of said laminated printed circuit board which will not have conductive traces in order to prevent conductive plating in said third areas, leaving unmasked fourth areas of said printed circuit board which will have conductive copper traces;
(iv) pattern plating said laminated printed circuit board in order to build up the thickness of the conductive material in the interior of said hole walls and said conductive traces;
(v) stripping and etching said laminated printed circuit board in order to remove unwanted conductive material from the top and bottom layers of the laminated printed circuit board;

(g) evaluating the outer layers, wherein said laminated printed circuit board is subjected to a three-dimensional X-ray test in order to ensure that said correction factors are valid, and an electrical test to ensure that said laminated printed circuit board provides correct electrical circuitry; and

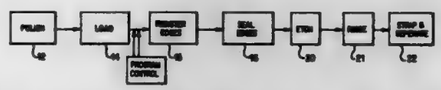
(h) completing final quality evaluation of the resulting multi-layered circuit board.

5,196,088

PROCESS AND APPARATUS FOR PRODUCING NON-GLARE GLASS BY ETCHING

Ken Soda, Chicago, Ill., assignor to Tru Vue, Inc., Chicago, Ill.

Continuation of Ser. No. 431,616, Nov. 3, 1989, abandoned, which is a division of Ser. No. 333,317, Apr. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,468, Aug. 5, 1988, abandoned. This application May 28, 1991, Ser. No. 706,551
Int. Cl.[5] C03C *15/00*
U.S. Cl. 156—631 **8 Claims**



1. A process for etching only one side of a sheet of glass comprising the steps of:
providing an etching solution;
applying a viscous liquid to a major planar surface of a first sheet of glass;
placing the first sheet of glass and a second sheet of glass having corresponding edges of similar dimensions in a face to face relationship so that the viscous liquid contacts the major planar surface of said first sheet of glass and said second sheet of glass when in said face-to-face relationship;
maintaining said first sheet of glass in close proximity to said second sheet of glass;
applying a flexible non-porous sealing means resistant to said etching solution along the edges of said first sheet of glass and said second sheet of glass to provide a fluid tight seal around said edges;
dipping said first sheet of glass and said second sheet of glass in said etching solution to visibly etch only one side of said first sheet of glass and only one side of said second sheet of glass;

removing said sealing means from said edges of said first sheet of glass and said second sheet of glass; and
thereafter separating said first and second sheets of glass.

5,196,089

MULTILAYER CERAMIC SUBSTRATE FOR MOUNTING OF SEMICONDUCTOR DEVICE

Toshikatsu Takada; Ryuji Imai, and Rokuro Kambe, all of Nagoya, Japan, assignors to Ngk Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 28, 1991, Ser. No. 751,326
Claims priority, application Japan, Aug. 28, 1990, 2-227627; Aug. 13, 1991, 3-228302
Int. Cl.[5] B44C *1/22*; B29C *37/00*; C03C *15/00*
U.S. Cl. 156—645 **6 Claims**

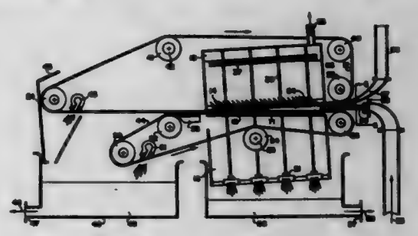
1. A method for fabricating an integral metal-to-metal electrical interconnection package adapted for bonding to semiconductor integrated circuit chips, said method comprising the steps of:
providing a substrate made of ceramic material with alumina and aluminum nitride as main compositions;
forming a coating of a metallized conductive pattern on an upper surface of the substrate;
forming a plurality of vertical conductive studs on the substrate for an interconnection with the metallized conductive pattern, each of said vertical conductive studs being made of copper;
providing a polyimide slurry on the surface of the substrate in a manner to cover each top surface of the conductive studs;
polishing an upper surface of the polyimide slurry to expose each top surface of the conductive studs;
providing a masking film on each top surface of the conductive studs prior to supplying an intermediate derivative of a polyimide polymer, the masking film working to protect the intermediate derivative against a chemical reaction with the conductive studs to avoid production of a chelate compound at the time of a subsequent heating step;
providing a coat of the intermediate derivative of the polyimide polymer entirely on the polished surface of the polyimide slurry;
heating the intermediate derivative to form a coating of a polyimide layer;
partly removing the coating of the polyimide layer to expose portions corresponding to each top surface of the conductive studs so as to form openings on the portions corresponding to each top surface of the conductive studs; and
removing the masking film located at the openings by means of etching.

5,196,090

METHOD FOR RECOVERING PULP SOLIDS FROM WHITEWATER USING A SIPHON

Glauco Corbellini, 33100 Via Carducci 48, Udine, Italy, and Peter A. Rodriguez, 1785 Selva Marina Dr., Atlantic Beach, Fla. 32233

Continuation of Ser. No. 431,456, Nov. 3, 1989, abandoned. This application Jun. 5, 1991, Ser. No. 711,373
Int. Cl.[5] D21F *1/66, 1/80*
U.S. Cl. 162—190 **18 Claims**



1. Recovering method which removes solid fines from white water produced from a paper making process and which recovers purified water therefrom, the method comprising:
(a) feeding white water and an aqueous dispersion of paper pulp into a wedge-shaped space between upper and lower horizontal, continuouly moving, converging paper-making wire meshes in a horizontal zone, the aqueous dispersion of paper pulp being fed so as to be contiguous to the upper wire mesh subsequently to form a filter web thereon and the white water being fed between the aqueous dispersion of paper pulp and the lower wire mesh;
(b) applying a siphon means as the upper wire passes through the horizontal zone to the upper wire on the side opposite to the side contiguous to the aqueous dispersion of paper pulp so as to form the filter web of pulp and solid fines on the upper wire mesh and remove a resultant purified water through the filter web and the upper wire mesh, wherein the siphon means includes a siphon mouth in contact with the upper wire mesh while the upper wire mesh is submerged in water flowing into the siphon means and being discharged at a distant location without a meniscus forming at an interface between water and air in the upper wire mesh;
(c) recovering the purified water from the siphon means to be used in showers and elsewhere in the paper making process;
(d) dislodging the filter web and solid fines from the upper wire and directing the filter web and solid fines into an aqueous collection pool; and
(e) recycling the aqueous collection pool into the paper making process.

5,196,091

HEADBOX APPARATUS WITH STOCK DILUTION CONDUITS FOR BASIS WEIGHT CONTROL

Richard E. Hergert, Rockton, Ill., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Oct. 29, 1991, Ser. No. 784,288
Int. Cl.[5] D21F *1/08*
U.S. Cl. 162—258 **10 Claims**

1. A headbox apparatus for electing stock onto a forming wire for forming a web, said apparatus comprising:
a housing connected to a pressurized source of the stock, said housing defining a tapered inlet for the flow therethrough of the stock;
a tube bank having an upstream and a downstream end, said upstream end of said tube bank being connected to said tapered inlet such that the stock flows at a substantially constant flow rate through said inlet and through said

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upstream end of said tube bank to said downstream end of said tube bank;

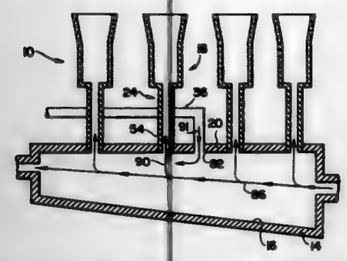
said tube bank including:

a plurality of tubes for the flow therethrough of the stock;

a member defining a slice chamber, said slice chamber having an upstream extremity and a downstream extremity, said upstream extremity being connected to said downstream end of said tube bank, said downstream extremity being disposed adjacent to the forming wire such that the stock flows through said downstream end of said tube bank and through said upstream extremity of said slice chamber so that the stock is ejected from said downstream extremity of said slice chamber onto the forming wire;

a plurality of supply conduits connected to said upstream end of said tube ban, each supply conduit of said plurality of supply conduits being connected to a stock diluting source for permitting dilution of the stock flowing into said tube bank;

control means cooperating with said supply conduits for controlling said dilution of the stock flowing through at



least some of said tubes of said tube bank, said control means structured and arranged for controlling the cross-machine directional basis weight of the resultant web;

each supply conduit extending through said tube bank between adjacent tubes, each conduit having a termination disposed closely adjacent to and upstream relative to an adjacent tube of said plurality of tubes, said termination being disposed adjacent to said upstream end of said tube bank;

said stock diluting source being white water removed from the stock through the forming wire and clarified, said clarified white water flowing through said termination such that said clarified white water mingles with and dilutes the stock flowing through said adjacent tube without changing the flow rate through said adjacent tube;

each said supply conduit and respective termination being structured and arranged such that said flow of white water through said termination is substantially normal to the flow of stock past said termination towards said adjacent tube.

5,196,092

REINFORCEMENT OF COATED SURFACES OF LNP BELTS

Carl E. Stigberg, Schenectady, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Sep. 25, 1991, Ser. No. 766,437

Int. Cl.[5] D21F *3/02*

U.S. Cl. 162—358.4 **9 Claims**

1. A belt on a long nip press for dewatering a fibrous web, said long nip press having a cylindrical press roller and an arcuate pressure shoe which together define a nip therebetween, said belt being passed through said nip in conjunction with at least one press fabric supporting and carrying said fibrous web to be dewatered between said press fabric and said arcuate pressure shoe, said belt therefore having a shoe side and a fabric side, said belt comprising:

a base fabric in the form of an endless loop having an inner surface and outer surface, said inner surface being on said shoe side of said belt and said outer surface being on said fabric side of said belt, said base fabric having machine-direction and cross-machine direction yarns and being a fabric woven therefrom, said machine-direction being around said loop and said cross-machine direction being across said loop; and

a coating of a polymeric resin on at lest said inner surface of said base fabric, said coating impregnating and rendering said base fabric impervious to liquids, said coating being smooth and providing said belt with a uniform thickness, said coating further being reinforced with a flexible layer of reinforcing fiber material separate from and spaced from said base fabric, said reinforcing fiber material including elongated filaments finer than said machine-direction and cross-machine direction yarns of said base fabric and said flexible layer of reinforcing fiber material being encapsulated within said coating, so that said coating may be less susceptible to cracking and to damage from foreign objects while said belt is in use on said long nip press.

5,196,093

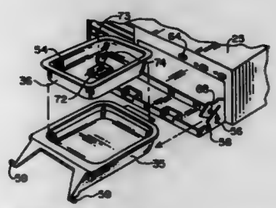
WATER DISTILLER HAVING OPERATING PORTIONS THAT CAN BE REMOVED FOR CLEANING

Thomas J. Weber, Oak Creek, Wis.; Dale L. Garrison, Antioch, Ill., and Richard E. Forrest, Racine, Wis., assignors to Emerson Electric Co., Racine, Wis.

Filed Jan. 18, 1991, Ser. No. 642,884

Int. Cl.[5] B01D *3/42*; C02F *1/04*

U.S. Cl. 202—83 **22 Claims**



1. A water distiller comprising

a housing having an open interior area, the housing having a door movable between an opened position permitting access into the interior area and a closed position blocking the access,

a steam chamber located in the interior area, the steam chamber including a movable bottom portion defining a tray for holding water to be distilled and a fixed top portion for collecting steam created in the chamber by heating the water in the tray, the steam chamber further including means for heating water in the tray to create steam,

first means for moving the tray between a first position, in which the tray is located in sealed relationship with the top portion of the steam chamber thereby closing the steam chamber to the housing interior, and a second position in which the tray is located out of the sealed relationship with the top portion thereby opening the steam chamber to the housing interior, and

second means connecting the housing door and the first means for moving the tray into the first position in response to moving the door from its opened position toward its closed position and for moving the tray into the second position in response to moving the door from its closed position toward its opened position, the second means being further operative, when the door is in its opened position, for exposing the tray for removal from the housing interior for cleaning.

5,196,094

SEPARATION OF 1,1,1-TRICHLOROETHANE FROM THE LOWER ALCOHOLS BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and Zuyin Yang, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Nov. 8, 1991, Ser. No. 789,286

The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.

Int. Cl.[5] B01D *3/40*; C07C *17/38, 29/84*

U.S. Cl. 203—57 **9 Claims**

1. A method for recovering 1,1,1-trichloroethane from a mixture of 1,1,1-trichloroethane and methanol which comprises distilling a mixture of 1,1,1-trichloroethane and methanol in the presence of about one part of an extractive agent per part of 1,1,1-trichloroethane-methanol mixture, recovering the 1,1,1-trichloroethane as overhead product and obtaining the methanol and the extractive agent from the stillpot, wherein said extractive agent consists of one material selected from the group consisting of dimethylsulfoxide, sulfolane, dimethylformamide, acetophenone, dimethylacetamide,1-methyl-2-pyrrolidone, ethylene glycol methyl ether, ethylene glycol ethyl ether, ethylene glycol butyl ether, ethylene glycol phenyl ether, ethylene glycol hexyl ether, diethylene glycol methyl ether, diethylene glycol ethyl ether, diethylene glycol butyl ether, propylene glycol methyl ether, diethylene glycol hexyl ether, dipropylene glycol methyl ether, propylene glycol isobutyl ether, tripropylene glycol methyl ether, propoxypropanol, butoxypropanol, propylene carbonate, isophorone, diethylene glycol diethyl ether, ethylene carbonate, isoamyl alcohol, 2-ethyl butanol, 4-methyl -2pentanol, heptyl alcohol, isooctyl alcohol, di-butyl carbinol, isodecyl alcohol, n decanol, 2-octanol, benzyl alcohol, tetrahydrofurfuryl alcohol, methyl isoamyl ketone, diisobutyl ketone, 2-heptanone, isobutyl heptyl ketone, 3-heptanone, propylene glycol methyl ether acetate, dipropylene glycol methyl ether-acetate, propylene glycol phenyl ether, 2,4-pentanedione, methyl benzoate, methyl salicylate, adiponitrile, amyl acetate, 4-methyl pentyl acetate-2, hexyl acetate, 2-ethyl hexyl acetate, benzyl acetate, isobornyl acetate, ethylene glycol ethyl ether acetate, ethylene glycol butyl ether acetate, diethylene glycol ethyl ether acetate, 1-methoxy-2-propanol acetate, dipropylene glycol methyl ether acetate, isobutyl isobutyrate, 1-methoxy-2-acetoxy propanol, ethyl isovalerate, isobutyl butyrate, ethyl n-valerate, n-hexyl formate, ethyl acetoacetate, diethyl maleate, nitrobenzene, nitroethane, 1-nitropropane and 2-nitropropane.

5,196,095

PROCESS FOR RECOVERING A METAL FROM AN AQUEOUS SOLUTION COMPRISING A MIXTURE OF METAL CHLORIDES

Robert B. Sudderth; Archibald W. Fletcher, and Stephen M. Olafson, all of Tucson, Ariz., assignors to Henkel Corporation, Ambler, Pa.

Filed Apr. 3, 1990, Ser. No. 504,166

Int. Cl.[5] C25C *1/12, 1/16*

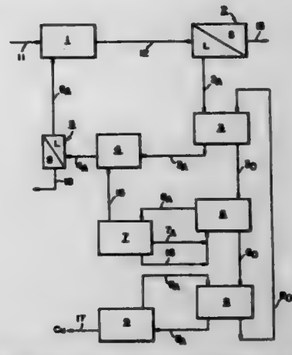
U.S. Cl. 204—106 **21 Claims**

1. A process for recovering metal values from an aqueous solution comprising a mixture of metal chlorides which comprises:

(A) contacting the aqueous solution comprising a mixture of metal chlorides with an organic solution of a complexing agent, selective for the neutral metal chloride of the metal to be recovered, and a chelating agent having affinity for the cation of the metal to be recovered, in a water immiscible solvent, to form an organic solution containing a complex of the complexing agent and the neutral metal chloride of the metal to be recovered in the water immiscible solvent;

(B) separating the water immiscible solvent from the aqueous solution comprising the mixture of metal chlorides;

(C) contacting the water immiscible solvent, containing the neutral metal chloride complex, with an aqueous chloride washing solution to remove chloride ions from the water immiscible solvent and simultaneously chelate the cation



of the metal to be recovered in solution in the water immiscible solvent;

(D) contacting the water immiscible solvent containing the chelated cation of the metal to be recovered with an aqueous stripping solution to form an aqueous solution rich in the cation of the metal to be recovered and a water immiscible solvent containing a reduced amount of chelated cation of the metal to be recovered; and

(E) recovering the metal from the aqueous solution rich in the cation of the metal to be recovered.

5,196,096

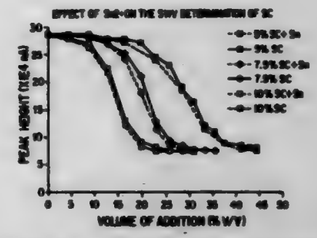
METHOD FOR ANALYZING THE ADDITION AGENTS IN SOLUTIONS FOR ELECTROPLATING OF PBSN ALLOYS

I-Chin H. Chang, Peekskill, and Wilma J. Herkana, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1992, Ser. No. 857,024

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—153.1 **6 Claims**



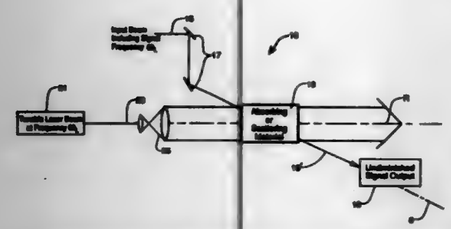
1. A method for measuring concentrations of addition agents in solutions of additive mixtures, comprising the steps of:

(a) preparing a basis solution which contains an electroactive species whose electroreduction reaction is sensitive to the additive of interest;

(b) preparing calibration standard solutions comprising appropriate concentrations of all species, other than the additive of interest, in the vicinity of their expected con-

centrations in the working solution at an appropriately chosen series of concentrations;
(c) sampling a working solution whose additive concentration is to be determined;
(d) applying a pulse voltammetry technique at a hanging Hg drop electrode to a sample of said basis solution;
(e) thereafter measuring the polarographic peak height for the indicator reaction in said basis solution;
(f) adding a measured amount of one of said additive-containing sample solutions to said basis solution sample in said cell;
(g) thereafter measuring the peak height for said indicator reaction in the mixed solution of step (f); and
(h) repeating steps (f) and (g) until said peak height has dropped to a constant value.

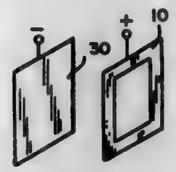
5,196,097
METHOD AND APPARATUS FOR FIELD-INDUCED TRANSPARENCY USING LASER RADIATION
David A. Cardimona, and Mohinder P. Sharma, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jan. 7, 1991, Ser. No. 637,916
Int. Cl.[5] C01B *3/00*
U.S. Cl. 204—157.41 4 Claims



1. A system for tuning a material to selectively induce transparency therein at a preselected laser frequency, comprising:
(a) a material having a ground state and two closely-spaced first and second excited states wherein the transition dipole moment d_1 between said ground state and said first excited state is parallel to the dipole moment d_2 between said ground state and said second excited state, and wherein d_1 is substantially equal to zd_2 where z is a scalar proportionality constant characteristic of said material, and wherein the frequencies of transition between said ground state and said first excited state and between said ground state and said second excited state are, respectively, ω_o and $\omega_o+\Delta$; and
(b) a source of laser radiation for substantially totally irradiating said material with laser radiation of frequency ω_L substantially equal to $\omega_o+\Delta/(1+z^2)$.

5,196,098
APPARATUS AND PROCESS FOR ELECTROPHORETIC DEPOSITION
Stephen S. Rodrigues, San Jose, Calif.; Martin J. Harris, Leominster, Mass., and Wayne T. Smith, Philadelphia, Pa., assignors to Shipley Company Inc., Newton, Mass.
Filed Jan. 4, 1988, Ser. No. 140,632
Int. Cl.[5] C25D *13/00*
U.S. Cl. 204—180.2 14 Claims

11. A method of electrodepositing an organic insulating composition on a conductive substrate from an electrodeposition bath, said method comprising:
a. providing an electrodeposition bath comprising an insulating composition;
b. using the conductive substrate as a cathode disposed in the bath;
c. providing one or more anodes disposed in the bath positioned to face the cathode; and

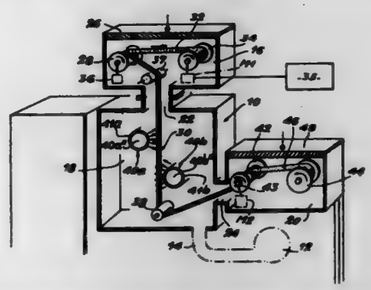


d. applying a voltage between the cathode and the anodes to produce a current whereby a current density gradient is formed on the cathode, the gradient comprising high and low current density areas, and wherein the anode is concentrated opposite the high current density areas of the cathode.

5,196,099
ELECTROPHORETIC MATRIX AND ELECTROPHORESIS USING SAME
Yuichi Mori; Masato Mikami, and Hiroshi Yoshioka, all of Kanagawa, Japan, assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Division of Ser. No. 762,272, Sep. 19, 1991, Pat. No. 5,164,057.
This application Jun. 22, 1992, Ser. No. 901,650
Int. Cl.[5] G01N *27/26, 27/447*; B01D *57/02*
U.S. Cl. 204—182.8 5 Claims

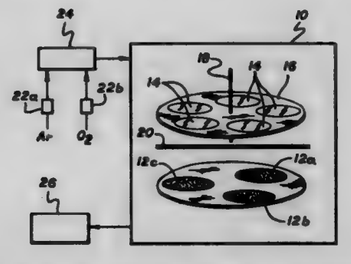
1. An electrophoretic method comprising charging a sample onto an electrophoretic matrix comprising at least one water-insolubilized temperature-responsive polymeric compound having an LCST and providing a temperature gradient ranging from a temperature below said LCST to a temperature above said LCST between the anode side and the cathode side of said matrix to carry out electrophoresis.

5,196,100
PROCESS AND INSTALLATION FOR THE CONTINUOUS METALLIZATION OF A SPREAD FIBRE SLIVER
Gérard Goffetre, Colombes, and Pierre Renard, Itteville, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Sep. 19, 1991, Ser. No. 762,592
Claims priority, application France, Oct. 5, 1990, 90 12314
Int. Cl.[5] C23C *14/56*
U.S. Cl. 204—192.12 14 Claims



1. Process for the continuous metallization of a spread fibre sliver, wound with a first interpolated sheet onto a sliver supply spool, said process consisting of continuously pulling on the interpolated sheet, so as to regularly unwind the spread fibre sliver from the sliver supply spool and make the sliver travel vertically by gravity in front of the metallization means.

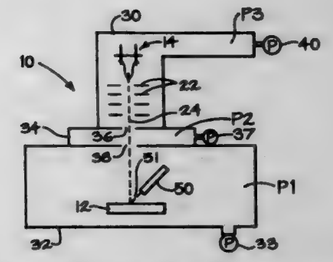
5,196,101
DEPOSITION OF THIN FILMS OF MULTICOMPONENT MATERIALS
Sarita Thakoor, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.
Filed Feb. 5, 1991, Ser. No. 651,329
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.26 24 Claims



1. A process for depositing thin films of multicomponent oxides and nitrides comprising:
(a) providing a plurality of sputtering targets laterally spaced apart from each other and disposed substantially symmetrically about an axis and generally defining a first plane, each target corresponding to one element of said multicomponent material, each target independently controllable;
(b) providing at least one substrate, defining a second plane spaced apart from said first plane and substantially parallel thereto;
(c) continuously rotating said at least one substrate relative to said plurality of targets;
(d) sequentially depositing a plurality of layers on said at least one substrate by independent, controlled reactive magnetron sputtering from each said target in a reactive atmosphere to form a composite film, said reactive atmosphere consisting essentially of a mixture of an inert gas and a reactive gas selected from the group consisting of oxygen and nitrogen; and
(e) heating said composite film to a temperature sufficient to initiate a solid state reaction to form a substantially single phase, homogeneous multicomponent material selected from the group consisting of oxides and nitrides.

5,196,102
METHOD AND APPARATUS FOR APPLYING A COMPOUND OF A METAL AND A GAS ONTO A SURFACE
Nalin Kumar, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.
Filed Aug. 5, 1991, Ser. No. 741,928
Int. Cl.[5] C23C *14/32*
U.S. Cl. 204—192.31 11 Claims

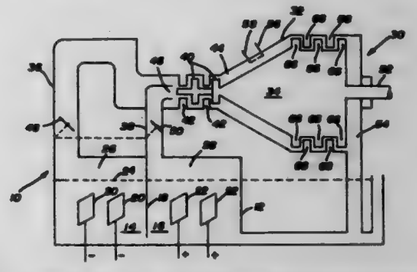
1. A method of applying a compound of a metal and a reactive gas to repair lines on an electrical display having a transparent conductor, comprising,
selectively depositing said metal on the transparent conductor by a focused liquid metal cluster source ion deposition in the presence of a reactive gas,
isolating the ion source from the reactive gas by inserting an inert gas spaced from the ion source and between the ion source and the reactive gas at a pressure greater than the pressure of the reactive gas.



5,196,103
METHOD OF MAKING AN ELECTRICAL INTERCONNECTION DEVICE
James C. Tou, and Paul H. Townsend, III, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jul. 12, 1991, Ser. No. 729,525
Int. Cl.[5] B29B *13/00, 13/08*
U.S. Cl. 204—192.34 16 Claims

1. A method of adhering a conductive metal layer onto a dielectric cyclobutarene polymer layer, method which comprises
a) low energy sputtering the dielectric cyclobutarene polymer surface with a low energy ion/neutral beam to activate the surface by sputtering off the aliphatic hydrogens present on the polymer surface at an energy density such that the polymer surface is roughened to a depth of no more than about 50Å;
b) depositing a carbide-forming metal interface layer having a thickness between about 5 and about 200Å onto the sputtered polymer surface:
c) depositing the conductive metal layer onto the carbide-forming metal interface layer, and wherein the multilayered structure is built up on a supporting substrate.

5,196,104
OXYGEN AND HYDROGEN GAS DRIVEN TURBINE
John F. Munday, General Delivery, Shediac Bridge, New Brunswick, Canada E0A-3H0
Filed Mar. 19, 1992, Ser. No. 854,079
Int. Cl.[5] C25B *1/10, 9/00, 15/08*
U.S. Cl. 204—258 11 Claims



1. A water to fuel production apparatus for providing fuel for a gas turbine engine, comprising:
a fuel production tank having a first compartment and a second compartment, where a divider seals each compart-

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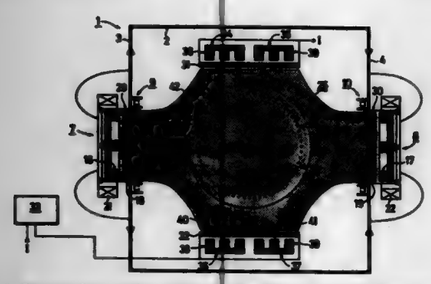
ment from the other at the top of the tank, and connect said compartments along the bottom of the tank;
said first compartment having cathodes for the production of hydrogen, and connected to a hydrogen manifold for removing hydrogen gas from the compartment;
said second compartment having anodes for production of oxygen, and connected to an oxygen manifold for removing oxygen gas from the compartment;
said oxygen manifold having a diameter of a size to fit within said hydrogen manifold whereby said gases will mix together where the open ends of said manifold meet;
said hydrogen manifold being connected to a turbine having an intake end with impellers for pumping said mixed gases into said turbine, where they subsequently ignite.

5,196,105
SYSTEM FOR COATING SUBSTRATES WITH MAGNETRON CATHODES

Albert Feuerstein, Neuberg; Dieter Hofmann, Bruchköbel, and Hans Schussler, Schiffweiler, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 665,624
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1990, 4038497
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—298.19 8 Claims



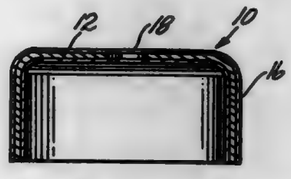
1. System for coating substrates which are arranged within a vacuum chamber on a substrate holder which is situated at least partially in a coating range on whose both sides magnetron cathodes with magnetic systems of permanent magnets with outside poles and inside poles are disposed, wherein
a) the polarity of the magnet systems of the magnetron cathodes is such that poles of opposed polarity are opposite one another on both sides of the coating range,
b) on opposite sides of the coating range at least one magnet coil is disposed, the oppositely situated magnet coils being connectable to a power source in such a manner that the fields of the magnet coils together make up a closed magnetic field, and that
c) the polarity of the outside poles of the permanent magnet systems and of the magnet coils is the same.

5,196,106
INFRARED ABSORBENT SHIELD

Don DuPree, Alta Loma; Neil E. Mattson, Ontario, and Jack E. Cunningham, Huntington Beach, all of Calif., assignors to Optical Radiation Corporation, Azusa, Calif.

Filed Mar. 20, 1991, Ser. No. 673,231
Int. Cl.[5] C25D *1/00*
U.S. Cl. 205—67 12 Claims

1. A method for preparing an infrared absorbent shield comprising:
providing a dissolvable metal substrate;
forming a layer of infrared absorbing material over the substrate;
forming a layer of metal over the surface of the infrared absorbing material; and



selectively dissolving the metal of the substrate to thereby form an infrared absorbent shield comprising a layer of metal and a layer of infrared absorbent material mechanically anchored to a surface of the metal layer.

5,196,107
DISPERSION PLATING METHOD

Yasuyuki Nakaoka; Minoru Fujita, both of Amagasaki; Toshikazu Izumo, and Tsuyoshi Watanabe, both of Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1991, Ser. No. 808,774
Claims priority, application Japan, Dec. 25, 1990, 2-413050; Feb. 6, 1991, 3-15119; Apr. 15, 1991, 3-108264
Int. Cl.[5] C25D *15/00*
U.S. Cl. 205—110 6 Claims

1. A dispersion plating method for making first grains of a size larger than 10 μm adhere to an object to be plated, comprising:
a step of bringing simultaneously both said first grains and second grains different from said first grains into contact with the surface of said object to be plated;
a step of bringing plating liquid into contact with the surface of said object to be plated with which both said first and second grains come to contact; and
a step of removing said second grains on the surface of said object to be plated.

5,196,108
SUCKER ROD OIL WELL PUMP

Thomas S. Wilmeth, and Jesse L. Eades, both of Daingerfield, Tex., assignors to Scot Industries, Inc., Lone Star, Tex.

Filed Apr. 24, 1991, Ser. No. 690,703
Int. Cl.[5] C25D *3/56, 3/04*
U.S. Cl. 205—243 11 Claims

1. A method for alloy chrome plating a workpiece from an aqueous electrolyte bath, comprising the steps of:
forming a base electrolyte bath by combining water, from about 250 to 300 grams per liter chromic acid, from about 2 to 4 grams per liter of a sulfate component and about 2 to 4 grams per liter of an alkyl sulphonic acid;
adding from about 25 to 50 grams per liter of a source of molybdenum anions to the base electrolyte bath;

exposing the workpiece to the aqueous electrolyte bath at a current density and at a plating temperature sufficient to

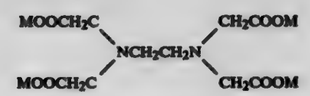
form an alloy chromium deposit of desired thickness on the workpiece.

5,196,109
TRIVALENT CHROMIUM ELECTROLYTES AND PLATING PROCESSES EMPLOYING SAME

Geoffrey Scott, 530 Tashua Rd., Trumbull, Conn. 06611

Filed Aug. 1, 1991, Ser. No. 738,886
Int. Cl.[5] C25D *3/06*
U.S. Cl. 205—289 14 Claims

1. An aqueous acidic trivalent chromium electrolyte consisting essentially of trivalent chromium ions, a water soluble complexing agent for maintaining the trivalent chromium ions in solution, and at least one bath soluble EDTA additive present in an effective amount sufficient to increase the tolerance of the electrolyte to the presence of deleterious contaminating metal ions and organic contaminants, said EDTA additive being of the structural formula:



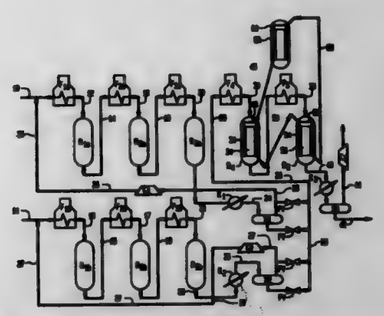
wherein M is hydrogen, an alkali metal or an alkaline earth metal.

5,196,110
HYDROGEN RECYCLE BETWEEN STAGES OF TWO STAGE FIXED-BED/MOVING-BED UNIT

Gerrit S. Swart, Westfield; Paul W. Kamienski, Basking Ridge, both of N.J.; Stuart S. Goldstein, Ewell, England; David W. Stauba, Morris Plains, N.J., and George A. Swan, III, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 9, 1991, Ser. No. 805,349
Int. Cl.[5] C10G *59/02*
U.S. Cl. 208—65 10 Claims

1. A process for catalytically reforming a gasoline boiling range hydrocarbon reactant stream in the presence of hydrogen in a reforming process unit comprised of a plurality of reforming zones wherein each of the reforming zones contains a reforming catalyst comprised of one or more Group VIII noble metals on a refractory support, which process comprises:
(a) reforming two separate reactant streams in two separate fixed-bed reforming process units, each comprised of one or more serially connected reforming zones containing a fixed-bed of catalyst comprised of one or more Group VIII noble metals on a refractory support, which one or more reforming zones are operated at reforming conditions which includes a pressure of about 100 to 500 psig, thereby producing a first effluent stream for each unit;
(b) passing the effluent stream from each fixed-bed process unit through a separate separation zone to produce a hydrogen-rich gaseous stream and a predominantly C_5+ stream from each effluent stream;
(c) recycling a portion of each of the two hydrogen-rich gaseous streams to the respective fixed-bed reforming zones;
(d) passing said remaining portion of the hydrogen-rich gaseous streams, along with the two C_5+ liquid streams,



to a second reforming stage comprised of one or more serially connected reforming zones which are operated in a moving-bed continual catalyst regeneration mode wherein the catalyst in comprised of one or more Group VIII noble metals on a refractory support, which catalyst continually descends through the reforming zone, exits, and is passed to a regeneration zone where at least a portion of any accumulated carbon is burned-off, and wherein the regenerated catalyst is recycled back to the one or more moving-bed reforming zones; and
(e) passing the resulting effluent stream from said second reforming stage to a separation zone wherein another hydrogen-rich gaseous stream and a predominantly C_5+ liquid stream are produced, and wherein both streams are collected or passed to further refinery processing.

5,196,111
REACTOR FOR THE BIOLOGICAL TREATMENT OF SEWAGE

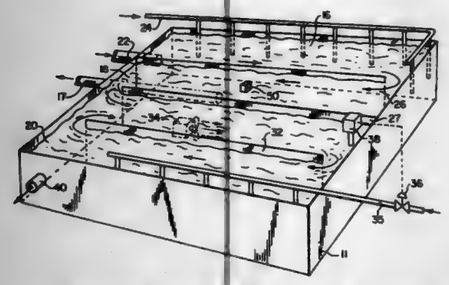
Roger Nicol, Issy-les-Moulineaux, and Vincent Savall, Villecoublay, both of France, assignors to Degremont, Rueil-Malmaison, France

Filed Sep. 23, 1991, Ser. No. 763,535
Claims priority, application France, Sep. 25, 1990, 90 11804
Int. Cl.[5] C02F *3/30*
U.S. Cl. 210—96.1 5 Claims

1. Improved reactor for the biological treatment of sewage, for replacing the aeration tank in plants which comprise, in combination, an anaerobic tank in which denitrification takes place, an aeration tank where the nitrification of the effluents by aerobic bacteria is carried out and a final clarifier, wherein said reactor comprises a single tank having three separate zones which are, in the order in which the liquid to be treated passes through them successively:
an aeration zone comprising means for plug flow operation wherein said aeration zone comprises air supply means for enabling a dissolved oxygen content higher than 2 mg per liter to be maintained by aeration;
an anaerobic zone following said aeration zone and being provided with means for stirring using a mechanical stirring system for keeping sludge in suspension and which at

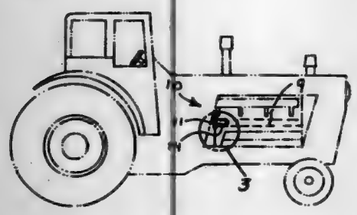
its entry and at the exit of the aeration zone, comprises a conduit for the recycling of liquor towards an anaerobic tank which is situated at the head of the plant, upstream of said reactor; and

a mixing zone providing adjustable aeration and complete



mix operation, comprising circulators for stirring and circulating the flow in said mixing zone, aeration means, means for monitoring the redox potential and servo controlling the aeration means in response to the redox potential, and means for transferring the liquor to a clarifier including an exit orifice opening into said conduit.

5,196,112
OIL DRAIN APPARATUS
James F. Eichman, R.R. 1, Box 45, Plainville, Kans. 67663
Filed Nov. 25, 1991, Ser. No. 797,367
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—171 1 Claim



1. An oil drain apparatus arranged for securement to a self-propelled vehicle, wherein the vehicle includes an internal combustion engine, and the internal combustion engine includes an oil filter mounting block, the apparatus comprises in combination, the oil filter mounting block wherein the oil filter mounting block includes an oil inflow conduit and an oil outflow conduit directed thereto, and

an oil filter canister mounted to the oil filter mounting block, and

the mounting block further including a mounting block bottom surface positioned below the oil filter canister, and

the mounting block bottom surface including a mounting block output central conduit in fluid communication with the oil filter canister, and

the output conduit including an output conduit lower distal end, and the output conduit lower distal end in fluid communication with a valve member, and the valve member arranged in fluid communication with the output conduit, including a valve member handle to permit selective fluid flow through the valve member, and

the valve member including a valve member output conduit, and

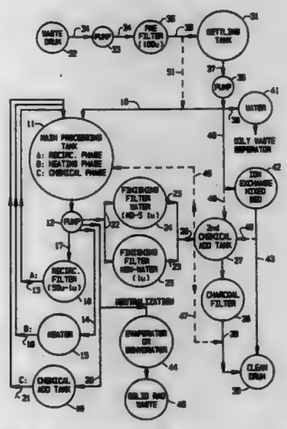
the valve member output conduit is rigid, and the valve member output conduit including a valve member output conduit lower distal end, the valve member output conduit lower distal end including a flexible hose mounted thereto in fluid communication therewith, and the flexible hose directed downwardly relative to the valve member output conduit to permit selective orientation of the flexible hose relative to the valve member output conduit, and

a protective housing, with the flexible hose directed through the protective housing, and the flexible hose including a flexible hose lower externally threaded rigid end portion defined by a predetermined external diameter, and the housing including a housing floor, the housing floor including a housing floor bore defined by a bore diameter greater than the predetermined diameter, and an internally threaded lock boss mounted to an exterior surface of the housing floor threadedly receiving the rigid end portion therewithin, and the internally threaded lock boss including a lock boss bore in fluid communication with the flexible hose through the rigid end portion, and wherein the housing is arranged in surrounding relationship relative to the flexible hose, and

the housing floor includes a first flange directed downwardly therefrom, and a second flange integrally and orthogonally mounted to the first flange, the second flange including a second flange bore spaced below and coaxially aligned with the lock boss bores, and

the second flange bore includes a ferromagnetic screen directed across the second flange bore, and a magnetic torroidal ring arranged in surrounding relationship relative to the magnetic screen and the second flange bore.

5,196,113
PROCESSING MIXED WASTE
Brian D. Metz, Oceanside, Calif., assignor to Southern California Edison Co., Rosemead, Calif.
Division of Ser. No. 482,883, Feb. 21, 1990, Pat. No. 5,076,936.
This application Jul. 22, 1991, Ser. No. 734,339
Int. Cl.[5] C02F *1/28, 1/42*
U.S. Cl. 210—181 12 Claims



1. Apparatus for removing radioactive chemicals including cobalt 60 from liquid hazardous waste containing at least one organic phase and an aqueous phase, said apparatus comprising:

means for separating any organic phases from the aqueous phase;

means comprising an ion exchange mixed bed for treating the aqueous phase for removing therefrom ionic radioactive contaminants;

means comprising a charcoal filter for removing organic contaminants from the aqueous phase;

means associated with said charcoal filter for adding a chemical to the aqueous phase, said chemical facilitating removal of organic contaminants from the aqueous phase in the charcoal filter;

a main processing tank for processing said at least one organic phase having said radioactive contaminants;

means for directing said organic phase into the processing tank;

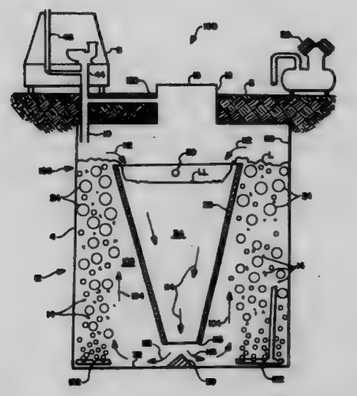
means for adding a non-radioactive chemical containing cobalt 60 to the organic phase in the processing tank for exchanging radioactive cobalt contaminants in the organic phase with the non-radioactive cobalt added thereto;

means for circulating said organic phase through the processing tank;

a filter associated with said processing tank for removing radioactive particulates from said organic phase circulating through said processing tank;

wherein said apparatus is effective to remove cobalt 60 from each of said organic phase and said aqueous phase in such an amount that the level of cobalt 60 remaining in any of said phases is essentially undetectable as measured by non-detection of radioactivity for at least about 1,000 seconds by a gamma spectrophotometer.

5,196,114
AEROBIC SEPTIC SYSTEM
Demcy L. Burwell, Rte. 8, Box 168, Lake Charles, La. 70605
Filed Jan. 14, 1992, Ser. No. 820,258
Int. Cl.[5] C02F *3/20*
U.S. Cl. 210—188 2 Claims



1. In a residential aerobic septic system for holding and treating wastewater containing solid waste, said septic system including a tank being buried in the ground near a residence, said tank having height, length, and width dimensions, a floor, upstanding walls, and a top wall substantially enclosing and sealing said tank, said top wall including means defining a projection of said tank, said projection having height, length, and width dimensions less than said dimensions of said tank, said tank top wall also having a removable cover, said tank containing

separator means comprising a hollow, conical member having upper and lower open ends each having a diameter, said upper end diameter being greater than said lower end diameter, said separator means being suspended within said tank such that said open ends open upwardly and downwardly, said separator means defining an annulus existing between said separator walls and said tank upstanding walls, said separator means also dividing standing wastewater in said tank into a central volume contained within said separator conical member and a peripheral volume filling said annulus,

flow director means comprising a cone disposed centrally upon said tank floor, a point of said cone oriented upwardly and being aligned with said separator open ends,

said aerobic septic system further including an incoming wastewater line collecting and discharging the wastewater into said peripheral volume, said wastewater line including a residential building sewage vent stack open to the atmosphere,

a discharge line drawing wastewater from said central volume, said discharge line having one end open to the interior of said separator and further being located above the level of one of said separator open ends and below the level of the other one of said separator open ends, whereby standing wastewater establishes a level below the level of one of said separator open ends and above the level of the other of said separator open ends,

air vent means comprising a conduit terminating at ingress and egress ports communicating respectively with said tank projection and with said residential incoming wastewater line, said egress port being connected to said wastewater line upstream of discharge of said wastewater line into said tank, whereby said tank communicates with the open atmosphere by means of said vent stack open thereto,

air supply means including air compressor means, air discharge header means, and conduit means conducting compressed air from said air compressor means and said discharge header means,

said discharge header means discharging air around the entire periphery of said annulus, whereby substantially all wastewater of said peripheral volume is urged upwardly by air buoyancy, and whereby a water level existing above said annulus is raised by air buoyancy, thus causing wastewater to flow over a top of said separator, and whereby tank central volume wastewater is induced to flow downwardly, a constant water flow circuit within said tank thus being created upon injection of air by said air supply means, wherein water flows only upwardly in said annulus and only downwardly in said separator,

whereby substantially all solid waste suspended in the wastewater is subjected to agitation and to oxygenation by intimate contact with air rising in said annulus.

5,196,115
CONTROLLED CHARGE CHROMATOGRAPHY SYSTEM
Marc D. Anderman, 6 Nadine Rd., Framingham, Mass. 01701
Division of Ser. No. 512,970, Apr. 23, 1990, abandoned. This application Sep. 16, 1991, Ser. No. 760,752
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 27 Claims

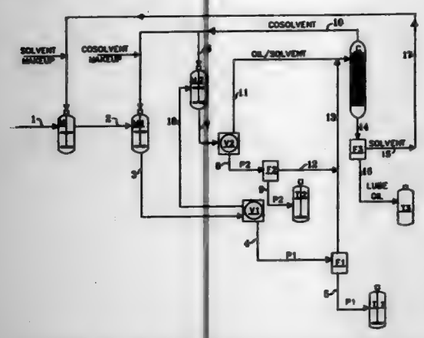
1. A chromatographic column for the controlled charge purification of a fluid, which column comprises:

a) an inlet at the one end of the column for the introduction of a fluid containing at ionic material to be purified;

b) an outlet at the other end of the column for the discharge of a purified ionic material; and

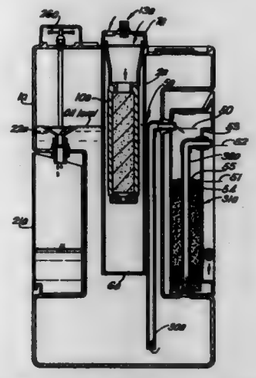
c) a flow-through capacitor disposed in the column between the inlet and the outlet and generally axially aligned with the axis of the column which capacitor comprises a spirally wound plurality of spaced apart layers including:
i) a first electrically conductive backing layer;
ii) a first high surface area electrically conductive layer to act as the stationary phase of the chromatographic column;
iii) a first non-conductive, porous spacer layer to permit the flow of fluid;
iv) a second electrically conductive backing layer;
v) a second high surface area electrically conductive layer to act as a stationary phase of the chromatographic column; and
vi) a second non-conductive porous spacer layer, the layers spirally wound so as to permit the flow of fluid generally axially through the spirally wound flow-through capacitor through the non-conductive, porous spacer layers from the one to the other end, and which flow-through capacitor contains first and second anode and cathode leads adapted to be connected to a power supply to provide for the conductive first and second backing to become the anode and cathode of the flow-through capacitor.

5,196,116
PROCESS FOR PETROLEUM - WAX SEPARATION AT OR ABOVE ROOM TEMPERATURE
Michael D. Ackerson, Fayetteville, Ark.; Seyed-Hamid Arabshahi, Houston, Tex., and Robert E. Babcock, Fayetteville, Ark., assignors to University of Arkansas, Little Rock and Diversified Petroleum Recovery, Inc., North Little Rock, both of Ark.
Filed Feb. 11, 1991, Ser. No. 653,626
Int. Cl.[5] C10G *73/06, 73/08*
U.S. Cl. 208—33 **48 Claims**



1. A process for separating wax from a quantity of hydrocarbon containing wax in solution therein comprising the steps of:
(a) maintaining said quantity of hydrocarbon at a temperature sufficient for fluidity;
(b) adding a light-to-intermediate hydrocarbon solvent which is essentially free of acetone, methanol, ethanol, isopropanol or propanol the ratio by weight of said solvent to said quantity of hydrocarbon being at least about 1:4;
(c) producing a homogeneous solution of said solvent and said quantity;
(d) thereafter admixing a co-solvent with said homogeneous solution to cause a wax precipitate to form therein wherein said co-solvent is a chemical selected from the group consisting of water and hydrocarbon miscible ketones, alcohols, aldehydes, or acids each represented by the formula $C_aH_bO_c$ where a, b, and c are integers and a is less than 5, b is divisible by 2, and c is less than 3, the ratio by weight of said co-solvent to said solvent being at least about 1:10; and
(e) separating said wax precipitate from said solution.

5,196,117
APPARATUS FOR SEPARATING OIL FROM AN OIL/WATER MIXTURE
Colin T. Billiett, Durham; Robert M. Fielding, Blyth; Anthony Harrop, and Paul A. Feather, both of Chester le Street, all of England, assignors to Domnick Hunter Limited, County Durham, England
Filed Jan. 9, 1992, Ser. No. 818,755
Claims priority, application United Kingdom, Jan. 9, 1991, 9100369; Jul. 9, 1991, 9114689
Int. Cl.[5] B01D *24/14*
U.S. Cl. 210—265 **12 Claims**

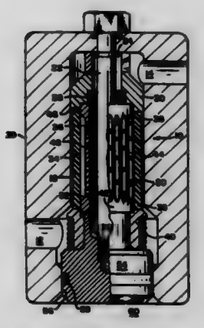


1. Apparatus for separating oil from an oil water mixture comprising a settlement chamber, a coalescing filter, an entry port comprising a means for introducing the mixture initially into the coalescing filter for flow therethrough into the settlement chamber, an oil outlet opening from an upper region of the settlement chamber, a sorbent bed contained in a second chamber, a water outlet from a lower region of the settlement chamber through which water may flow to the sorbent bed, a water outlet from the sorbent bed at a level below the oil outlet opening, said coalescing filter including a cylinder of filter medium depending from a closed top of the settlement chamber with the axis of the cylinder substantially vertical, and the entry port opening into the interior of the cylinder through the top of the settlement chamber.

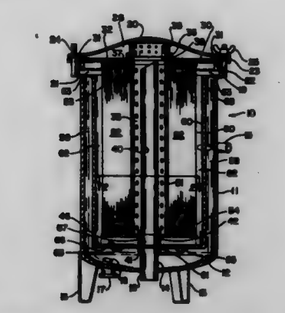
5,196,118
PERCUSSION TOOL FLUID FILTER APPARATUS
Leland H. Lyon, and Richard L. Eggeling, both of Roanoke, Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Continuation of Ser. No. 509,116, Apr. 16, 1990, abandoned. This application Feb. 28, 1992, Ser. No. 842,809
Int. Cl.[5] B01D *29/11*
U.S. Cl. 210—315 **22 Claims**

1. A filter apparatus comprising:
a housing;
a filter recess formed within the housing;
an assembly fastener rotatably and fixedly connected to the housing, and disposed within the recess, said assembly fastener having a portion thereof extending outside of said housing;
a first filter permanently in place within the recess, slidably disposed about the assembly fastener;
a filter support disposed about the first filter;
a second filter mounted around the filter support;

support; and
a plurality of apertures formed in the filter support, connecting an inner wall of the filter support to recessed portions of the grooves.



5,196,119
FILTERING SYSTEM UTILIZING ROTATIONAL FLOW AND DUAL CHAMBERS
Harold H. Harms, Palm Beach Gardens, Fla., and Edmund B. Bourgeois, Warren, Mich., assignors to Harmsco, Inc., Riviera Beach, Fla.
Filed Jun. 25, 1990, Ser. No. 543,326
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—438 **10 Claims**

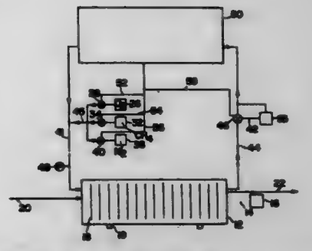


1. A filtering system, comprising:
a cylindrical outer chamber having an inlet port for receiving fluid into the outer chamber;
means for inducing unidirectional rotational flow about a central axis of the outer chamber;
an inner can disposed within said outer chamber and having an opening at its top for receiving fluid from said outer chamber;
a filter cartridge, having a hollow central portion, disposed in said inner can, whereby fluid in said inner can flows into said filter cartridge towards said hollow portion; and
an outlet chamber providing an aperture engaging said hollow portion of said filter cartridge, whereby fluid flows into said outlet chamber, said outlet chamber extending through an orifice in a surface of the inner can and through a hole in the surface in said outer chamber and providing an outlet through which fluid in said outlet chamber exits.

5,196,120
CERAMIC-CERAMIC COMPOSITE FILTER
Lloyd R. White, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 698,804, May 13, 1991, abandoned. This application Apr. 2, 1992, Ser. No. 863,159
Int. Cl.[5] B01D *39/06, 39/20*; C04B *35/76*
U.S. Cl. 210—504 **5 Claims**

1. A ceramic fiber-ceramic composite filter comprising a base or support of at least one layer of ceramic fibers, at least some of which are texturized; a carbonaceous layer over said base; a felt layer comprising chopped ceramic fibers deposited over said carbonaceous layer; and a silicon carbide coating over said felt layer.

5,196,121
DECOMPOSITION OF HALOGENATED ALIPHATIC HYDROCARBONS IN A BIOREACTOR
Alan T. Moore, Cambridge; Maureen C. Leahy, Quincy; M. Margaret Findlay, and Sam Fogel, both of Newton, all of Mass., assignors to ABB Environmental Services, Inc., Portland, Me.
Continuation-in-part of Ser. No. 253,087, Oct. 4, 1988, abandoned. This application Oct. 3, 1989, Ser. No. 416,500
Int. Cl.[5] C02F *3/08*
U.S. Cl. 210—603 **12 Claims**



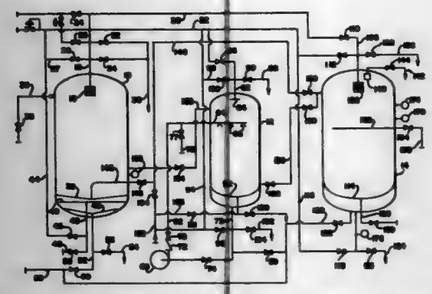
1. A method for biodegrading volatile halogenated contaminants in a fluid stream which includes:
maintaining a sealed environment in a rotating biological contactor;
maintaining a methanotrophic biomass in the contactor;
introducing methane and oxygen into the contactor;
introducing a fluid stream containing the halogenated contaminants into the contactor;
biodegrading the halogenated contaminants;
measuring the amount of methane consumed in the biodegradable reaction; and
controlling the flow of methane and oxygen into the contactor based on the consumption of methane to slow the reaction rate of the methanotrophic biomass and to maintain the methane concentration in the contactor at a desired level.

5,196,122
EXTERNAL REGENERATION SYSTEM FOR MIXED BED ION EXCHANGERS
Michael J. O'Brien, Basking Ridge, N.J., assignor to The Graver Company, Union, N.J.
Filed Aug. 10, 1992, Ser. No. 927,323
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—662 **12 Claims**

1. A method for regenerating a mixture of anion and cation resins from a mixed bed demineralizer, comprising the steps of:
transferring exhausted anion and cation resins into a separation vessel containing a small quantity of anion and cation resins from a previous transfer;
directing a backwash liquid upward through the separation

VOL 1148 ISS 4 MR 23 1993 UMI

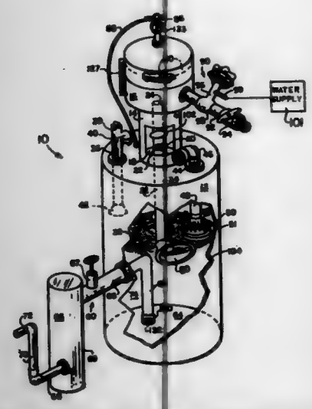
vessel so as to separate the resins into an upper anion resin layer and a lower cation resin layer;
transferring an upper portion of the anion resin layer from the separation vessel to an anion regeneration vessel, leaving a lower portion of the anion resin layer and substantially all of the cation resin in the separation vessel;
passing a regenerant liquid through the anion regeneration vessel to regenerate the anion resin;
transferring a lower portion of the cation resin layer from the separation vessel to a cation regeneration vessel;



detecting an interface between the anion resin and the backwash liquid at a predetermined elevation in the separation vessel;
terminating the transfer of the cation resin layer upon detection of the interface at the predetermined level, leaving an upper portion of the cation resin layer and the lower portion of the anion resin layer in the separation vessel; and
passing a regenerant liquid through the cation regeneration vessel to regenerate the cation resin.

5,196,123
METHOD AND APPARATUS FOR OIL SEPARATION FROM CONDENSATE

Robert W. Guthy, Fort Salonga, N.Y., assignor to Scales Air Compressor Corporation, Carle Place, N.Y.
Filed Apr. 29, 1992, Ser. No. 875,991
Int. Cl.[5] B01D *17/02, 17/025*
U.S. Cl. 210—663 19 Claims



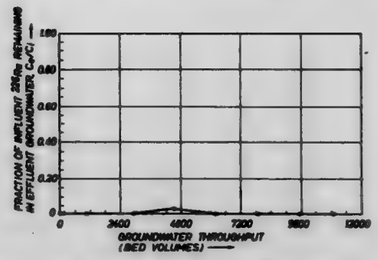
1. A method for treating an oil-containing aqueous condensate to separate oil therefrom, said method comprising
confining first and second pools of liquid each comprising water in respective ones of vertically spaced upper and lower enclosed spaces wherein a head space is present above a surface of the pool in each space with the head space in the upper enclosure evacuated to a sub-atmospheric pressure, the head space in the lower enclosure being in communication with atmospheric pressure,
establishing a vertical liquid column communicating a below surface location in the first liquid pool with a below surface location in the second pool, a difference between atmospheric pressure in the lower enclosure head space and the sub-atmospheric pressure in the upper enclosure head space draft maintaining the liquid column between said two below surface locations,
introducing a flow of an oil-containing water condensate into the head space of the lower enclosure in discrete mass form thereof and in an impacting flow against an impact surface to dissipate effect of any super-atmospheric condensate pressure thereby to promote separation of oil from the condensate, separated lower specific gravity oil accumulating as an oil layer at the top of said second water pool, higher specific gravity water passing to the second liquid pool,
communicating in air-excluding course the oil layer with the below surface location in the second liquid pool whereby oil therein can access and enter the liquid column and ascend through the liquid column into the first liquid pool, the ascending lighter oil displacing heavier water from the first liquid pool which displaced water descends into the second liquid pool,
outflowing water taken from a location at the bottom of the second liquid pool at a rate compensating for an introduction rate thereto of water separated from the condensate so as to maintain a level height of the surface of the second liquid pool at least a predetermined distance above a bottom of the pool while restricting the outflow rate to one at which temporary presence of a super atmospheric pressure condition in the lower enclosure head space is ineffective to force the second liquid pool surface downwardly to the said below surface location, and
gravity draining oil accumulated in the upper enclosed space when a liquid presence in the liquid column above a certain height therein is exclusively oil, the gravity draining being effected from a bottom location in the upper enclosed space by venting the head space of the upper enclosed space to atmosphere and with communication of the liquid column between said first and second liquid pools blocked.

5,196,124
METHOD OF CONTROLLING THE PRODUCTION OF RADIOACTIVE MATERIALS FROM A SUBTERRANEAN RESERVOIR

John A. Connor; Dennis A. Clifford, both of Houston, Tex., and Philip T. King, Anchorage, Ak., assignors to Groundwater Services, Inc., Houston, Tex.
Filed Apr. 9, 1992, Ser. No. 866,341
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—679 17 Claims

1. A method for reducing the dissolved radionuclide content of fluids withdrawn from subterranean reservoirs comprising:
(a) introducing a first carrier solution, comprising a dissolved component of a solid scavenger for dissolved radionuclides found in reservoir fluids, into a reservoir in the area surrounding a production well, the quantity and concentration of the carrier solution being sufficient to ensure deposition of a mass of sorbent solid, sufficient to reduce the dissolved radionuclide content of withdrawn fluids, over a predetermined area when ions are precipitated from the carrier solution;
(b) introducing a second carrier solution, comprising a complementary component of a solid scavenger for soluble radionuclides, into the reservoir area to commingle with the ions of the first carrier solution;

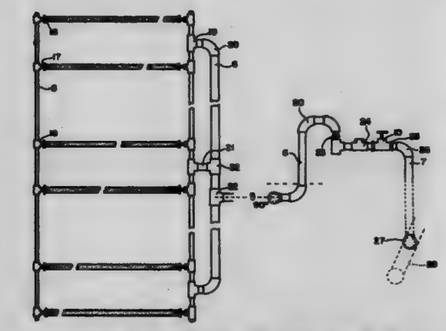
(c) reacting the dissolved component of the first carrier solution and the complementary component of the second carrier solution to precipitate a solid scavenger able to remove dissolved radionuclides from fluids in the reservoir when the fluids contact the precipitated solid, and



(d) allowing the solid scavenger to contact fluids containing dissolved radionuclides in the reservoir to remove dissolved radionuclides from the fluids.

5,196,125
UNDERGROUND EFFLUENT DISPOSAL-DELIVERY SYSTEM

Richard J. O'Brien, 1847 SW. 1st Ave., Ocala, Fla. 32671
Filed Aug. 15, 1991, Ser. No. 745,570
Int. Cl.[5] C02F *1/00*
U.S. Cl. 210—747 3 Claims

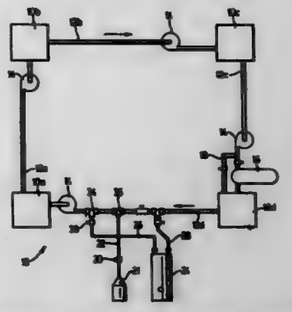


1. A process for upgrading and disposing of wastewater taken directly from a wastewater treatment facility, said process comprising conveyance of said wastewater through a closed, subsurface pipe which allows the conveyance of said wastewater through the walls of said pipe, wherein said conveyance occurs essentially uniformly over the length and surface area of said pipe, and wherein said pipe is periodically cleaned by removing water from said pipe and increasing air pressure in said pipe to at least about 20 psi.

5,196,126
OSCILLATING CHEMICAL REACTION

Dennis H. O'Dowd, Toronto, Canada, assignor to Iomech Limited, Mississauga, Canada
Filed Aug. 6, 1990, Ser. No. 562,697
Int. Cl.[5] C02F *1/50*
U.S. Cl. 210—754 7 Claims

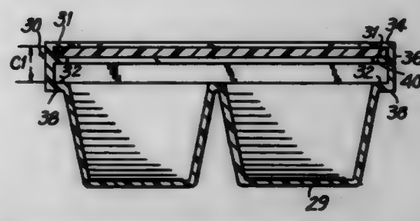
1. A process of producing a disinfecting BZ reaction comprising continuously adding at a point in a system of continuously flowing water in which a reductant consisting of microbial life forms or their metabolic by-products is present, chlorine (Cl_2) or a Cl_2 releasing compound and iodine (I_2) or a I_2 releasing compound, the amount of I_2 present being in the range of about 0.025–0.15 mg/l of water, the I_2 being added before about 50% of the Cl_2 has been hydrolized, the amount of Cl_2 not exceeding 5.0 mg/l at the I_2 addition point, which hydrolize to create two bistable systems at equilibrium, the first bistable system consisting of Cl_2, HOCl, OCl and chloramines in the water, the total chloramine existing in the water or



produced by reaction with microbial life or their metabolic by-products being present to an amount being less than 25% of the total HOCl, the second bistable system consisting of IO_3, I_2 and HIO in the water, which bistable systems when perturbed by the reductant will initiate an oscillating reaction certain of whose intermediate products are microbicidal.

5,196,127
ICE CUBE TRAY WITH COVER

Zev Solell, 41 W. 71st St., New York, N.Y. 10023
Continuation of Ser. No. 418,119, Oct. 6, 1989, abandoned. This application Feb. 19, 1992, Ser. No. 836,537
Int. Cl.[5] B28B *7/24*
U.S. Cl. 249—121 12 Claims



1. An ice cube tray assembly comprising:
a substantially rectangular tray housing in which a liquid is transformed into a plurality of ice cubes and a tray cover for said tray housing, said tray housing having an internal cavity with means for defining a plurality of ice cube tray compartments, said housing including a sealing and spill-prevention means formed inwardly of said housing for receiving said cover and preventing spillage of the liquid, said sealing and spill-prevention means including an upper channel having means therein to slidably receive and retain said cover within said housing and a lower channel having means to prevent spillage of the liquid when said housing is moved and further including a top face extending inwardly of said housing, a rear face depending downwardly from said top face, a lower face extending inwardly from said rear face and a partition extending inwardly from said rear face between said top and lower faces, said upper channel being defined by said top face, said rear face and said partition and said lower channel

being defined by said partition, said rear face and said lower face;

said cover being removable, substantially flat and of unitary construction and being slidably insertable into said upper channel so as to overlie said internal cavity and having a centrally located longitudinal opening exposing a substantial portion of the internal cavity of the ice cube tray housing containing said plurality of ice cube compartments.

5,196,128

LAUNDRY RINSE CONTAINING N-OCTADECYL-N,N-DIMETHYLAMINE OXIDE AND N-DIHYDROGENATEDTALLOW-N,N-DIMETHYLAMMONIUM CHLORIDE

Terry Crutcher; Kim R. Smith; James E. Borland; Joe D. Sauer, and Jeffrey W. Perine, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 8, 1991, Ser. No. 652,602

Int. Cl.[5] C11D *1/62, 1/75, 1/86*

U.S. Cl. 252—8.8 **2 Claims**

1. A laundry rinse which provides improved rewettability of laundered fabrics and which consists essentially of an aqueous solution of a mixture of 20–75% by weight of N-octadecyl-N,N-dimethylamine oxide and respectively 80–25% by weight of N-dihydrogenatedtallow-N,N-dimethylammonium chloride as a fabric softener.

5,196,129

STABLE, SINGLE-PHASED SOLUTIONS OF WATER-IN-OIL MICROEMULSIONS DERIVED FROM CRUDE OIL AND ALLIED PRODUCTS AND WHICH CONTAIN MICROORGANISMS AND/OR PARTS THEREOF

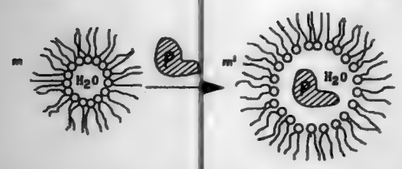
Pier L. Luisi, Zollikerberg, Switzerland, assignor to Eniricerche S.p.A., Milan, Italy

Filed Jul. 10, 1990, Ser. No. 550,573

Claims priority, application Switzerland, Jul. 17, 1989, 02751-89

Int. Cl.[5] C10M *173/00*

U.S. Cl. 252—49.5 **19 Claims**



1. A stable water-in-oil microemulsion which contains microorganisms for carrying out microbiological processes obtained by adding to crude oil an aqueous, concentrated solution of microorganisms selected from the group consisting of bacteria, animal and vegetable cells in such a way that said aqueous solution becomes solubilized in said crude oil, the thus-prepared blend being in the form of a stable water-in-oil microemulsion.

5,196,130

LUBRICITY ADDITIVE FOR HIGH-TEMPERATURE GAS TURBINE ENGINE OILS

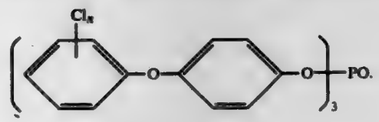
Lois J. Gschwender, Kettering, and Carl E. Snyder, Jr., Trotwood, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 9, 1991, Ser. No. 805,352

Int. Cl.[5] C10M *137/04*; C07F *9/14*

U.S. Cl. 252—49.9 **6 Claims**

1. A high-temperature gas turbine engine oil comprising a high-temperature base stock and 0.1 to 7.0 weight percent of a tris(4-(chlorophenoxy)phenyl)phosphate of the formula



wherein n has a value of 1 to 5.

5,196,131

SOAP BARS WITH THE APPEARANCE OF FINISHED WOOD GRAIN

Erika M. Baumgartner, Freeport; Philip Greenberg, and Harold A. Miller, both of White Plains, all of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.

Filed Nov. 26, 1990, Ser. No. 617,544

Int. Cl.[5] C11D *17/00*; C04B *14/00*

U.S. Cl. 252—89.1 **5 Claims**

1. A soap bar having the appearance of a polished wood grain containing a generally unidirectionally oriented iron oxide coated micaceous nacreous pigment.

5,196,132

UNIT-DOSE DRYCLEANING PRODUCT

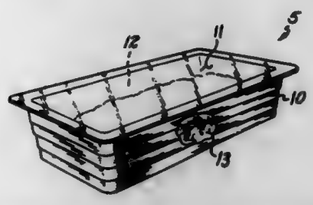
Harold E. Mains, and Joseph A. Piepmeyer, both of Montgomery, Ohio, assignors to Fabritec International Corporation, Cold Springs, Ky.

Continuation of Ser. No. 318,595, Mar. 3, 1989, Pat. No. 5,055,215. This application Apr. 1, 1991, Ser. No. 678,599

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.[5] C11D *17/08*; C11P *17/04*

U.S. Cl. 252—90 **29 Claims**



1. A unit-dose drycleaning product comprising at least one drycleaning additive contained within a sealed water insoluble article wherein at least a portion of said sealed water insoluble article is comprised of a material which dissolves in a drycleaning solvent during the drycleaning cycle for releasing said drycleaning additive.

5,196,133

GRANULAR DETERGENT COMPOSITIONS CONTAINING PEROXYACID BLEACH AND SULFOBENZOYL END-CAPPED ESTER OLIGOMERS USEFUL AS SOIL-RELEASE AGENTS

Kenneth A. Leslie, and Allen D. Clauss, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 429,896, Oct. 31, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 713,642

The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.

Int. Cl.[5] C08G *63/688*; C11D *3/34, 3/37, 3/39*

U.S. Cl. 252—95 **23 Claims**

1. A granular detergent composition comprising:

(a) peroxyacid bleach used at a level which provides an amount of available oxygen (AvO) from about 0.1% to about 10%, by weight of the composition; and

(b) from about 0.1% to about 10% by weight of an oligomeric or polymeric composition comprising a substantially linear, sulfobenzoyl end-capped ester; said ester comprising, per mole of said ester:

i) from about 1 to about 2 moles of sulfobenzoyl end capping units of the formula $(MO_3S)(C_6H)C(O)$— wherien M is sodium;

ii) from about 2 to about 10 moles of oxyethyleneoxy units and oxy-1,2-propyleneoxy units in a mole ratio of oxyethyleneoxy units to oxy-1,2-propyleneoxy units of from about 2.5:1 to about 15:1; and

iii) from about 1 to about 9 moles of terephthaloyl units; wherein the mole ratio of said oxyalkyleneoxy units to said terephthaloyl units is from about 2:1 to about 1.1:1; and wherein said ester is at least about 90% by weight amorphous in form and access of free water to the ester is limited to maintain the amorphous form.

5,196,134

PEROXIDE COMPOSITION FOR REMOVING ORGANIC CONTAMINANTS AND METHOD OF USING SAME

David P. Jackson, Saugus, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 700,353, May 7, 1991, abandoned, which is a continuation of Ser. No. 453,446, Dec. 20, 1989, abandoned. This application Aug. 17, 1992, Ser. No. 929,480

Int. Cl.[5] C11D *1/12, 7/18, 3/08*

U.S. Cl. 252—103 **5 Claims**

1. A composition for removing flux residue from a chosen solid substrate by decomposing said flux residue into non-hazardous by-products, said composition comprising:

(a) hydrogen peroxide in the amount of about 3 to 5 percent by weight of said composition;

(b) an alkali metal hydroxide in sufficient amount to provide a pH of at least 10.5 in said composition;

(c) a wetting agent in the amount of about 0.1 to 0.3 percent by weight of said composition, said wetting agent being unreactive with said hydrogen peroxide and said alkali metal hydroxide and being selected from the group consisting of sodium 2-ethylhexyl sulfate and sodium metasilicate;

(d) purified water as the balance of said composition, wherein said hydrogen peroxide is selectively adsorbed into said flux residue and decomposes into water and oxygen gas, said oxygen gas emulsifies said flux residue, and said flux residue is oxidized by atomic oxygen formed by the spontaneous decomposition of said hydrogen peroxide.

5,196,135

ANTIMICROBIAL, LOW TOXICITY, BLEND COMPOSITION OF BIS-QUATERNARY AMMONIUM COMPOUNDS

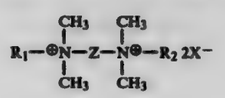
John J. Merianos, Middletown, N.J., assignor to ISP Investments Inc., Wilmington, Del.

Filed Oct. 7, 1991, Ser. No. 772,182

Int. Cl.[5] C11D *3/48, 1/18*; A01N *33/12*; C07C *211/00*

U.S. Cl. 252—106 **7 Claims**

1. An antimicrobial, low toxicity blend composition of bis-quaternary ammonium compounds having the formula:



in which

Z is $—CH_2CH_2O)_nCH_2CH_2—$

where n is 1 or 2; and

R_1 and R_2 are independently C_{12} or C_{14}-alkyl; in the weight ratio of about

25% by weight of the compound where both R_1 and R_2 are C_{12}-alkyl ;

50% by weight of the compound where R_1 is C_{12}-alkyl and R_2 is C_{14}-alkyl; and

25% by weight of the compound where both R_1 and R_2 are C_{14}-alkyl;

the stated weight percents being ±20%; and X^- is a halogen such as Cl, Br or I.

5,196,136

CLEANING COMPOSITION OF HYDROCARBON COMPONENT, SURFACTANT AND MULTIBASIC ESTER ADDITIVE

Kenneth T. Diehart, Wilmington; Harold L. Jackson, Hockessin, both of Del., and Abraham B. Cohen, deceased, late of Princeton, N.J. by Anita Cohen, executrix , assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 20, 1991, Ser. No. 718,543

Int. Cl.[5] C11D *7/50*; C23G *5/024*

U.S. Cl. 252—170 **23 Claims**

1. A cleaning composition suitable for cleaning a substrate which comprises:

(a) a liquid hydrocarbon component;

(b) a multiple ester additive having the formula:

$$(RO)_m\text{-}A\text{-}(CO_2\text{-}R')n$$

wherein A is a linear, branched or cyclic alkane having 1 to 20 carbon atoms, or a di, tri, or tetra alkylene glycol wherein the alkylene contains 2 or 3 carbon atoms; m is an integer 1 to 6 and n is 0 or an integer 1 ti 6; wherein when n is 0, then m is 2 to 6 and R is hydrogen or a linear, branched or cyclic alkyl carbonyl group having 1 to 20 carbon atoms; and when n is 1 to 6 and m is 1 to 6, then R' is a linear, branched or cyclic alkyl group having 1 to 20 carbon atoms; and then R is hydrogen or a linear, branched or cyclic alkyl carbonyl group having 1 to 20 carbon atoms; wherein the multiple ester additive contains at least two ester groups; and

(c) a compatibilizing agent to improve mutual solubility of the hydrocarbon component and the multiple ester.

5,196,137

AZEOTROPIC COMPOSITION OF 1,1,1,2,3,4,4,5,5,5-DECAFLUOROPENTANE AND TRANS-1,2-DICHLOROETHYLENE, CIS-1,2-DICHLOROETHYLENE OR 1,1-DICHLORETHANE

Abid N. Merchant, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 1, 1991, Ser. No. 769,383

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.[5] C09K *5/04*; C11D *7/30, 7/50*; C23G *5/028*

U.S. Cl. 252—172 **8 Claims**

1. An azeotropic or azeotrope-like composition consisting essentially of about 58 to 68 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane and about 32 to 42 weight percent trans-1,2-dichloroethylene wherein said composition boils at about 37.3° C.±1.6° C. at substantially atmospheric pressure.

3. An azeotropic or azeotrope-like composition consisting essentially of about 63 to 73 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane and about 27 to 37 weight percent cis-1,2-dichloroethylene wherein said composition boils at about 12.3° C.±1.2° C. at substantially atmospheric pressure.

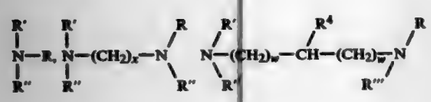
5. An azeotropic or azeotrope-like composition consisting essentially of about 68 to 78 weight percent 1,1,1,2,3,4,4,5,5,5-decafluoropentane and about 22–32 weight percent 1,1-dichloroethane wherein said composition boils at about 43.0° C.±2.8° C. at about atmospheric pressure.

5,196,138
PREPARATION OF MIXED LITHIUM AMIDE REAGENTS

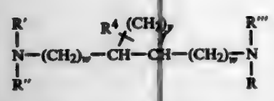
W. Novis Smith, Jr., Philadelphia, Pa., assignor to Cyprus Foote Mineral Company, Malvern, Pa.

Continuation-in-part of Ser. No. 374,740, Jun. 30, 1989. This application Oct. 11, 1989, Ser. No. 419,966
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—182.12 16 Claims

1. A method of preparing lithium amides in a greater concentration which comprises the step of reacting in a suitable substantially ether free hydrocarbon solvent an alkyl lithium and a mixture of amines of the formula selected from the group consisting of:



and

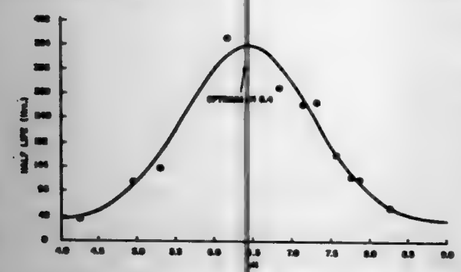


wherein at least one lithium amide formed is by itself soluble in said solvent and one of said lithium amides is by itself less soluble in said solvent, and R is hydrogen, an alkyl to 1 to 8 carbon atoms, alkyl phenyl or an alkyl monocyclic aliphatic group, R′ and R″ are the same or different and each represent hydrogen, an alkyl of 1 to 8 carbon atoms, an alkyl phenyl, an alkyl monocyclic aliphatic group, R″ is hydrogen, alkyl or alkoxy, R^4 is hydrogen, alkyl or phenyl,
W is from 0 to 4,
x is an integer of 2 to 8, and
y is an integer of 2 to 6,
with the proviso that at least one of R′, R″, and R‴ is hydrogen.

5,196,139
BLEACH ARTICLE CONTAINING POLYACRYLATE OR COPOLYMER OF ACRYLIC AND MALEIC

Karl Moschner, Troy, N.Y., assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 368,437, Jun. 19, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 685,975
Int. Cl.[5] C09K *3/00*; C11D *17/00*
U.S. Cl. 252—186.25 8 Claims



1. A bleaching article for use in laundry cleaning comprising:
(a) a flexible substrate; and
(b) an aqueous slurry composition which is stable at a pH of 5 to 8 and which is evaporated at elevated temperatures onto the flexible substrate, the slurry composition consisting essentially of
(1) 20–90% by weight of a chlorine bleach,
(2) 2 to 30% by weight of a polymeric material selected from the group consisting of polyacrylate and copolymers of acrylic and maleic acid, wherein the polymeric material is bleach stable and is in a ratio of the chlorine bleach to the polymeric material of 10:1 to 3:1, and
(3) a balance of water.

5,196,140
ELECTRO-OPTICAL LIQUID CRYSTAL DISPLAY ELEMENT

Eike Poetsch, Mühltal; Hans A. Kurmeier, Seeheim-Hugenheim; Rudolf Eidenschink, Bodenheim; Georg Weber, Erzhausen, and Andreas Wächtler, Griesheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP88/00335, § 371 Date Dec. 23, 1988, § 102(e) Date Dec. 23, 1988, PCT Pub. No. WO88/08441, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 21, 1988, Ser. No. 294,630
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714043
Int. Cl.[5] C09K *19/06, 19/34, 19/52*; G02F *1/13*
U.S. Cl. 252—299.6 8 Claims

1. An electro-optical liquid crystal display element, based on an effect from the group consisting of the twisted cell, guest-host, deformation of aligned phase, dynamic scattering, SBE and STN effects, containing a dielectric with at least two liquid-crystalline components, characterized in that, for shortening the switching times, the dielectric contains at least one fluorine-containing compound of the formula I

I

wherein

one of the radicals R^1 and R^2 is H, F, Cl, Br, —CN, —NCS or an unsubstituted straight-chain alkyl group having 1–15 C atoms, in which one or two CH_2 groups can also be replaced by a grouping selected from the group comprising —O—, —CO—, —O—CO—, —CO—O—, —C≡C— and —CH=CH—, no 2 heteroatoms being directly linked to one another,
the other radical R^1 or R^2 has the formula

in which
X′ is —CO—, —O—CO—, —O—, or a single bond,
Q′ is alkylene having 2 to 5 C atoms,
Y′ is perfluoroalkylene having 2 to 15 C atoms, in which one or more CF_2 groups can also be replaced by —CHF— or —CF=CF—, and
R^5 is H, F, or an alkyl group having 1 to 5 C atoms,
with the proviso that the group of the formula —X′—Q′—Y′—R^5 does not contain more than 15 C atoms in total and contains at least two CF_2 groups,
A^1 and A^2 independently of one another are each 1,4-phenylene which is unsubstituted or substituted by one or two F and/or Cl atoms and/or CH_3 groups and/or CN groups and in which one or two CH groups can also be replaced by N atoms, 1,4-cyclohexylene in which one or two non-adjacent CH_2 groups can also be replaced by O atoms and/or S atoms, piperidine-1,4-diyl, 1,4-bicyclo-[2.2.2]octylene, unsubstituted or CN-substituted decahydronaphthalene-2,6-diyl or 1,2,3,4,-tetrahydronaphthalene-2,6-diyl, and A^2 is optionally a single bond,
m is 0, 1, 2 or 3 and
Z^1 is —CO—O—, —O—CO—, —OCH_2—, —CH_2O—, —CH_2—CH_2—, substituted ethylene or a single bond,
it being possible for the groups A^1 to be identical or different and the groups Z^1 to be identical or different in the case of m=2 or 3, with the proviso that, in the case of m=0, the sum

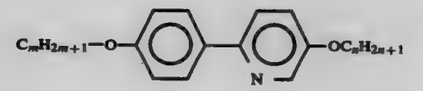
of the number of C atoms in the two groups R^1 and R^2 is at least 8.

5,196,141
5-OXY-2-PHENYLPYRIDINES, AND A LIQUID-CRYSTALLINE MEDIUM

Andreas Wachtler, Griesheim; Volker Reiffenrath, Rossdorf; Reinhard Hittich, Modautal; Thomas Geelhaar, Mainz, and Eike Poetsch, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP90/01351, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO91/02722, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 17, 1990, Ser. No. 598,603
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928264
Int. Cl.[5] C09K *19/34*; C07D *211/72*; G02F *1/13*
U.S. Cl. 252—299.61 2 Claims

1. A ferroelectric liquid-crystalline medium having at least two liquid-crystalline components, wherein said medium contains one or more 5-oxy-2-phenylpyridine compounds of the formula



Ib

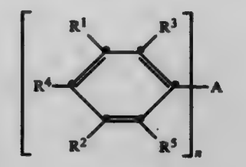
in which n and m, independently of one another, are each from 5 to 12.

5,196,142
AQUEOUS ANTIOXIDANT EMULSIONS

Hans Mollet, Reinach, and Martin Holer, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

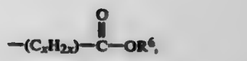
Division of Ser. No. 395,245, Aug. 17, 1989, Pat. No. 5,059,347. This application Aug. 2, 1991, Ser. No. 739,640
Claims priority, application Switzerland, Mar. 17, 1989, 998/89
Int. Cl.[5] B01J *13/00*; C09K *15/04*
U.S. Cl. 252—311 27 Claims

1. A storage-stable, non-sedimenting emulsion comprising
a) 10 to 80% by weight, based on the emulsion, of one or more antioxidants of formula I

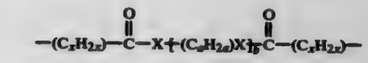


(I)

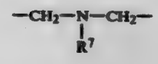
wherein
R^1 is C_1–C_{16}alkyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-substituted cycloalkyl of 5 to 12 ring carbon atoms, phenyl or C_7–C_9aralkyl,
R^2 is —H, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-substituted cycloalkyl of 5 to 12 ring carbon atoms, phenyl or C_7–C_9aralkyl,
R^3 is —H or CH_3,
n is 1 or 2, when n is 1,
A is



x is 0 to 6,
R^6 is —H, C_1–C_{23}alkyl, C_5–C_{12}cycloalkyl or C_1–C_4alkyl-substituted cycloalkyl of 5 to 12 ring carbon atoms, and
R^4 is —OH, R^5 is —H, or,
when n is 2,
A is



x is 0 to 6,
X is sulfur,
a is 2 to 6, and
b is 3 to 40,
R^4 is —OH and R^5 is —H, or,
when n is 2,
A is —S—, —CH_2—S—CH_2—,



or is an unsubstituted or a C_1–C_{20}alkyl-substituted C_1–C_{20}alkylene radical, and
R^4 is —OH and R^5 is —H or R^5 is —OH and R^4 is —H or C_1–C_4alkyl, and
R^1 is additionally —H, and
R^7 is C_1–C_{18}alkyl, unsubstituted, hydroxy-substituted or C_1–C_{18}alkyl-substituted phenyl or phenyl- or hydroxyphenyl-substituted C_1–C_{18}alkyl,
b) 0.25 to 10% by weight, based on the emulsion, of a surfactant in the form of a fatty acid salt of formula R—COOY, wherein R is straight chain or branched C_3–C_{18}alkyl or straight chain or branched C_3–C_{18}alkenyl, or is phenyl(C_3–C_{18})alkyl, and Y is an alkali metal, which salt is prepared in situ from the fatty acid,
c) 0.25 to 10% by weight, based on the emulsion, of a co-surfactant in the form of an alcohol of the general formula R′—OH, wherein R′ is straight chain or branched C_4–C_{19}alkyl or straight chain or branched C_4–C_{19}alkenyl, or is phenyl(C_4–C_{19})alkyl, and
d) water to make up 100%.

5,196,143
MIXED METAL HYDROXIDE-CLAY ADDUCTS AS THICKENERS FOR WATER AND OTHER HYDROPHYLIC FLUIDS

John L. Burba, III, Angleton, and Audrey L. Barnes, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

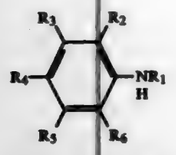
Continuation of Ser. No. 526,970, May 16, 1990, Pat. No. 5,094,778, which is a continuation of Ser. No. 282,445, Dec. 9, 1988, abandoned, which is a continuation of Ser. No. 47,808, May 7, 1987, Pat. No. 4,790,954, which is a continuation of Ser. No. 752,326, Jul. 5, 1985, Pat. No. 4,664,843. This application May 10, 1991, Ser. No. 698,428
Int. Cl.[5] B01F *3/14*; B01J *13/00*
U.S. Cl. 252—315.5 21 Claims

1. The adduct or reaction product of at least one mineral clay with at least one crystalline multi-layered mixed metal hydroxide conforming essentially to the empirical formula
$Li_mD_dT(OH)_{(m+2d+3+na)}(A^n)_{m-x}(H_2O)$, where
m is an amount in the range of zero to 1, representing the number of Li ions,
d is an amount in the range of zero to about 4 representing

the amount of D ions, and D represents divalent metal ions,
T represents trivalent metal ions,
A represents monovalent or polyvalent anions or negative valence radicals other than OH^-, of valence $-n$, with a being the amount of A anions, n a being negative,
where x is zero or more representing excess waters of hydration, and
where $(m+2d+3+na)$ is equal to or greater than 3.

5,196,144
ELECTRICALLY CONDUCTIVE POLYANILINE
Paul Smith; Alan J. Heeger, both of Santa Barbara; Yong Cao, Goleta; Jin-Chih Chiang, Goleta, and Alejandro Andreatta, Goleta, all of Calif., assignors to Regents of the University of California, Oakland, Calif.
Filed Oct. 31, 1988, Ser. No. 264,682
Int. Cl.[5] H01B 1/06
U.S. Cl. 252—500 15 Claims

1. A solid composition comprising an acid soluble, electrically conductive polyaniline having a minimum molecular weight of at least about 5,000 that is from about 10% to 90% crystalline, said polyaniline comprised of monomer units in any of their oxidation states which allow for the composition to be electrically conductive, the monomer units having the structure:



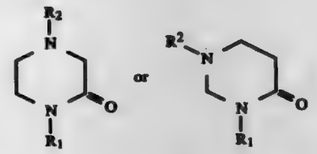
wherein R_1 is H or alkyl, and R_2–R_6 are, independently, H, alkyl, aralalkyl, alkaryl, hydroxy, alkyloxy, halogen or nitro.

5,196,145
TEMPERATURE SELF-CONTROLLING HEATING COMPOSITION
Takahito Ishii, Kyoto; Nobuyuki Hirai, Neyagawa, and Tadataka Yamazaki, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 1, 1989, Ser. No. 360,146
Claims priority, application Japan, Jan. 1, 1988, 63-134997; Jan. 28, 1988, 63-159983; Jul. 25, 1988, 63-185911
Int. Cl.[5] H01B 1/06
U.S. Cl. 252—511 5 Claims

1. A temperature self-controlling heating composition which comprises:
(1) about 15 to about 60% by weight of a crystalline polyethylene or polyethylene modified with a polar group,
(2) about 15 to about 60% by weight of an elastomer having compatibility with the crystalline polyethylene or polyethylene modified with a polar group and heat resistance higher than that of the crystalline polyethylene or polyethylene modified with a polar group, and
(3) about 15 to about 60% by weight of carbon black.

5,196,146
AQUEOUS CLEANING FORMULATION CONTAINING A 2-PIPERAZINONE, METHOD OF USING THE SAME AND CONCENTRATE FOR PREPARING THE SAME
Jeanne M. Farella, Midland, Mich.; Dane Chang, Houston, Tex.; Felipe A. Donate, Midland, Mich., and Aubrey J. Rhynes, Jr., Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Oct. 28, 1991, Ser. No. 784,203
Int. Cl.[5] C11D 3/28
U.S. Cl. 252—542 35 Claims

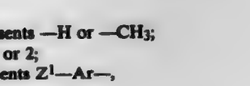
1. An aqueous cleaning formulation for removing grease and oil from a surface, comprising water, a surfactant possessing at least some ability to disperse the grease and oil in aqueous suspension, and a corrosion-inhibiting amount of a 2-piperazinone of the formula



wherein R_1 and R_2 are chosen from the class consisting of H and straight-chain alkanes, alkanols and ethers containing from 1 to 14 carbons, such that R_1 and R_2 are not both H.

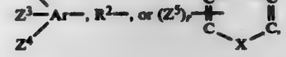
5,196,147
ORGANIC NONLINEAR OPTICAL SUBSTANCE
Yutaka Takatani; Hiroshi Matsuzawa, both of Hino, and Kaoru Iwata, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Mar. 28, 1989, Ser. No. 329,746
Claims priority, application Japan, Mar. 28, 1988, 63-72080; May 17, 1988, 63-118327; May 30, 1988, 63-130090; Sep. 8, 1988, 63-223592; Sep. 8, 1988, 63-223593; Sep. 12, 1988, 63-226491; Sep. 13, 1988, 63-227428; Nov. 15, 1988, 63-286902; Nov. 15, 1988, 63-286903; Nov. 17, 1988, 63-288978; Nov. 17, 1988, 63-288979; Dec. 26, 1988, 63-326099
Int. Cl.[5] F21V 9/04, 9/00; G02B 6/00
U.S. Cl. 252—589 11 Claims

1. An organic nonlinear optical crystal of a substance having the formula (I):



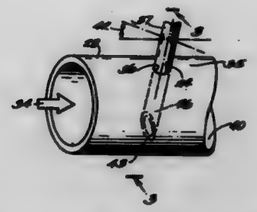
(I)

wherein
R^1 represents —H or $—CH_3$;
n is 0, 1, or 2;
A represents Z^1—Ar—,



wherein Ar represents a 6–14 membered aromatic group including a heterocyclic ring or bisphenylene type ring;
Z^1 represents H—, R^5R^6N—, R^7O—, R^8S—, NC—, R^9O-CO—, $R^{10}COO$—, O_2N—, $R^{11}R^{12}NOC$—, $R^{13}CO(R^{14}-)N$—, or R^{15}—;
Z^2, Z^3, and Z^4 independently represent H—, a C_1–C_8 alkyl, $R^{16}O$—, $R^{17}R^{18}N$—, $R^{19}S$—, or O_2N—, with the proviso that Z^2 and Z^3 together may form —O—$CH(R^{20})$—O—;
R^2 represents H— or a C_1–C_{12} alkyl;
R^5 to R^{20} independently represent H—, or a C_1–C_{10} hydrocarbon residue;
Z^5 independently represents H—, a C_1–C_8 saturated hydrocarbon residue, O_2N—, $R^{21}O$—, $R^{22}S$—, NC— or $R^{23}R^{24}N$—, wherein R^{21} to R^{24} independently represent H or a C_1–C_8 saturated hydrocarbon residue;
X represents —S—, —O—, or $>NR^{28}$;
r is 0 or an integer of 1 to 3; and
R^{28} represents H or a hydrocarbon group having 1 to 8 carbon atoms;
B represents —OH.Amine* where Amine* represents an optically active amine selected from the group consisting of 1-(phenyl)ethylamine, 1-(α-naphthyl)ethylamine, 1-phenyl-2-(methyl)ethylamine, 1-phenyl-2-aminopropane, brucine, 2-amino-1-butanol, 1-amino-2-propanol, 2-amino-1-propanol, 2-amino-1-(p-nitrophenyl)-1,3-propanediol, 2-dimethyl-amino-1-phenyl-1-benzyl-1-propanol, 1-(N,N-dimethyl-amino)-1-phenyl-propylamine, and a residue of an optically active α-amino acid and the derivative thereof; $—NR^4Y$ where R^4 represents —H or a single bond; Y represents $—(CH_2)_pCO^1O^2O^3$ where p is 0 or 1; Q^1, Q^2, and Q^3 are different and represent —H, a C_1–C_5 alkyl, phenyl, naphthyl, —OH, $—CH_2OH$, $—COOR^{25}$, $—CNR^{26}R^{27}$, a residue of an α-amino acid from which an amino group is removed, where R^{25} to R^{27} independently represent —H or $—C_1$–C_8 hydrocarbon residue; or $—CQ^4Q^5Q^6$ where Q^4, Q^5 and Q^6 are different and Q^4 and Q^5 are as defined for Q^1, Q^2 and Q^3 and Q^6 represents $—(CH_2)_q$ or which one bond is linked to the bond of R^4 where q is an integer of 1 to 4.

5,196,148
AERATOR
Nicholas R. Nigrelli, Kiel, Wis., assignor to Nigrelli Systems Inc., Kiel, Wis.
Filed Feb. 18, 1992, Ser. No. 837,160
Int. Cl.[5] B01F 5/04
U.S. Cl. 261—76 4 Claims

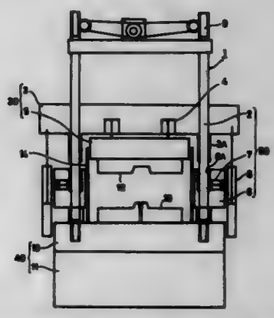


1. In an aspirator, air-injector aerator or the like, a fluid-transport tube having an upstream or intake end and also a downstream or discharge end, an air transport pipe connected to said tube with one end thereof disposed within said tube, the end of said pipe disposed within said tube being cut at an angle to the axis of the pipe to provide a face and disposed within said tube with the tip of the cut end being spaced between ¼" and 1" of the inner wall of said tube,
the face of said cut end of said pipe facing upstream,
said pipe being rotated about its axis so that the cut face is disposed at an angle to the upstream direction, and
the rotated angle of said pipe being between 5 degrees and 20 degrees.

5,196,149
PREPARATION OF HIGH SOLIDS, LOW VISCOSITY CARBONLESS PAPER GELATIN BASE MICROCAPSULES
Joseph A. Scarpelli, Dayton, Ohio, assignor to Eurand America, Inc., Vandalia, Ohio
Division of Ser. No. 385,652, Jul. 27, 1989, Pat. No. 5,064,470. This application Jun. 26, 1991, Ser. No. 721,798
Int. Cl.[5] B01J 13/10, 13/20
U.S. Cl. 264—4.3 8 Claims

1. A process for preparing a high solids, low viscosity, aqueous suspension of gelatin base microcapsules having average particle size diameter ranging from about 3 to about 10 microns, wherein the solids content of said suspension ranges from about 25 to about 50 weight percent in combination with a low viscosity ranging from about 10 to about 60 centipoises, said microcapsules containing single oil drop color-producing internal phase core material which comprises (1) mixing low bloom gelatin with a core oil containing a color-producing material to form an emulsion thereof; (2) adding an aqueous solution containing sodium hexametaphosphate and at least one additional anionic phase inducer selected from the group consisting of a copolymer of vinyl methyl ether and maleic anhydride, a copolymer of ethylene and maleic anhydride, gum arabic and carboxy methyl cellulose; (3) lowering the pH of the resultant batch from about 6.0 to about 4.5; (4) slowly cooling the resulting batch to a temperature of about 28 degrees C. followed by chilling to a temperature of about 15 degrees C. with continuous agitation; and (5) hardening the resulting microcapsules using aqueous formaldehyde solution and aqueous glutaraldehyde solution.

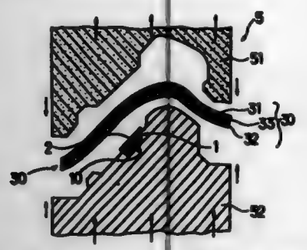
5,196,150
MAINTAINING DIES IN AN INJECTION PRESS PARALLEL TO EACH OTHER
Kazuhiro Mimura, Hiratsuka; Yosuke Sasaki, Zama, and Noboru Harashima, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
PCT No. PCT/JP89/01115, § 371 Date Aug. 23, 1990, § 102(e) Date Aug. 23, 1990, PCT Pub. No. WO90/05058, PCT Pub. Date May 17, 1990
PCT Filed Oct. 30, 1989, Ser. No. 536,566
Claims priority, application Japan, Oct. 31, 1988, 63-275468
Int. Cl.[5] B29C 45/80
U.S. Cl. 264—40.5 20 Claims



1. An injection press forming method for injecting and supplying molten resin to a cavity formed by a fixed die positioned on a fixed die plate and a movable die positioned on a movable die plate, and performing a forming of the injected molten resin by compressing and cooling, said injection press forming method being characterized by:
utilizing mechanical positioning means to position said moveable die plate, having said movable die associated therewith, to a compression starting position whereat injection of the molten resin into said cavity is performed;
detecting the position of said moveable die plate with respect to said fixed die plate;
controlling the flow and the pressure level of operating fluid to a plurality of compression cylinders, disposed between a lift frame and said moveable die plate, in accordance with the result of the detection of the position of the moveable die plate in order to compress the injected molten resin while maintaining the parallelism of said moveable die plate with respect to said fixed die plate during the compression of the injected molten resin.

VOL 1148 ISS 4 MR 23 1993 UMI

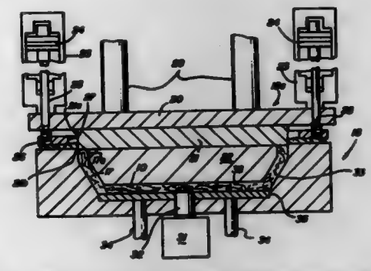
5,196,151
METHOD FOR PRODUCING FOAM BASE MATERIAL PRODUCT WITH SECURING DEVICE
Shoji Sakaide; Kaino Ito; Takashi Kato, and Hikaru Andoh, all of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Sep. 10, 1991, Ser. No. 756,620
Claims priority, application Japan, Sep. 11, 1990, 2-241880
Int. Cl.[5] B29C *67/22*; B32B *31/00*
U.S. Cl. 264—46.7 8 Claims



1. A method for producing a foam base material product including a composite sheet having a surface layer and a foam base layer with a securing device fixed on the foam base layer, said method comprising the steps of:
foaming and expanding resin beads to form an insert part, said insert part being integral with said securing device;
placing said insert part within a mold including placing said insert part in a recess formed in said mold;
providing said foam base layer in the form of hot molten composite sheet;
placing said foam base layer of hot molten composite sheet on said mold such that said foam base layer is facing said insert part; and
closing said mold whereby said composite sheet is formed and said composite sheet is integrally heat fused with said insert part, thereby producing said foam base material product;
said method being carried out using a mold including a plug mold member, which has an air permeability that allows pressurized gas into said mold during molding, and a porous mold member, which has an air permeability that allows reduced pressure within said mold during molding, said reduced pressure being applied to the surface layer of said composite sheet.

5,196,152
REACTION INJECTION MOLDING METHOD WITH INTERNAL FRAME AND SHEAR EDGE
Ronald R. Gamache, Northford, Conn., and Douglas P. Wasacisk, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 453,426, Dec. 12, 1989, Pat. No. 5,040,962.
This application May 10, 1991, Ser. No. 698,623
Int. Cl.[5] B29C *45/14*
U.S. Cl. 264—163 4 Claims

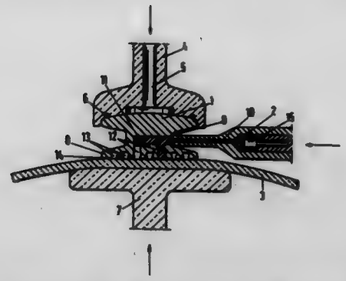
1. A reaction injection molding (RIM) method for forming a fiber reinforced molded article from an impregnatable batt of fibrous material having a peripheral portion around a central portion, said method comprising the steps of
A. forming a batt of fibrous reinforcing material,
B. providing a die part having an upwardly opening die cavity and a support surrounding the periphery of the opening of said die cavity,
C. providing said die part with a first shearing edge defining said periphery,
D. placing said batt across said upwardly opening die cavity and supporting peripheral portions of said batt on said support,
E. clamping said peripheral portions of said batt to said support,
F. providing a die plunger movable into said die cavity to form part of a mold cavity between said die plunger and the walls of said die cavity,
G. providing a cutter extending around said die plunger and movable into said cavity independently of said die plunger to cooperate therewith to complete said mold cavity, said cutter being sleeved on said plunger in sliding sealing engagement therewith,
H. moving said plunger into said die cavity to form said part of said mold cavity and to press portions of said batt overlying said die cavity into said part of said mold cavity,
I. providing said cutter with a second shearing edge cooperable with the first shearing edge for shearing said batt at said periphery from the portions of said batt within said die cavity and for effecting a seal between said shearing edges to close said die cavity upon movement of said cutter into said die cavity,



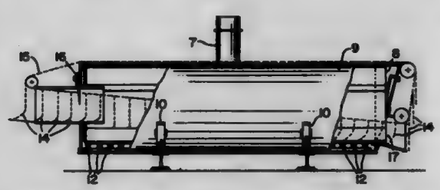
J. moving said cutter into said die cavity to effect said shearing and said seal and to form said mold cavity in cooperation with said plunger,
K. injecting at high pressure a reactive fluid chemical into said mold cavity to fill the same and impregnate said fibrous batt therein with said chemical, said chemical being suitable for RIM and capable of reacting and hardening in said mold cavity to provide said article,
L. allowing said chemical to react and harden to complete said fiber reinforced molded article.

5,196,153
PROCESS AND APPARATUS FOR SECURING A GRIP ELEMENT TO CROCKERY OR POTTERY
Walter Kramer, Mainz, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany
Division of Ser. No. 388,465, Aug. 2, 1989, Pat No. 5,056,188.
This application Jul. 26, 1991, Ser. No. 736,142
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826314
Int. Cl.[5] B29C *65/54*
U.S. Cl. 264—263 14 Claims

1. A process of securing a grip element having an abutment area to a wall of a crockery article in which the grip element has a passage therethrough which communicates with the abutment area of the grip element to be joined to the article, the process comprising:
pressing the abutment area of the grip element into contact with an intended adhesion area on the wall of the article and injecting an adhesive under pressure into said passage so that the adhesive flows through the passage and is distributed between the abutment area of the grip element and intended adhesion area on the wall of the article.



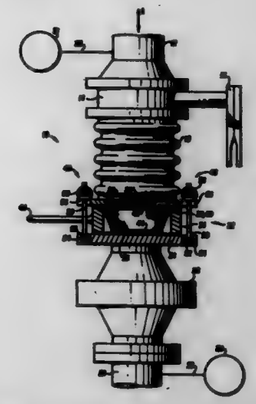
5,196,154
APPARATUS FOR THE TREATMENT OF METAL-LAMINATED PLASTICS SCRAP
Antonio M. Celi, Im Engelgarten 2, D-5466, Neustadt, Italy
Filed Dec. 5, 1991, Ser. No. 803,140
Int. Cl.[5] C21D *11/00*
U.S. Cl. 266—78 8 Claims



1. An apparatus for the treatment of metallaminated plastics scrap, radio, television and computer scrap and the like, comprising a heatable container (1) provided with a closable charging opening (2) for introducing scrap into said container, a closable removal opening (3) for removing plastics and metal from the container, a feed means (4) and discharge means (5) for inert gas, respectively introducing inert gas into and removing inert gas from the container, a gas washing means (6) for the inert gas removed from the container, said gas washing means being interconnected between said feed means and said discharge means for inert gas, said container being formed as a rotatable tubular container and including means for circulating scrap introduced thereinto, and means for heating said container with the scrap introduced therein so as to break metal-plastics bond and separate plastics parts from metal parts.

5,196,155
REMOVABLE FILTER SIEVE FOR COMBUSTION PIPING
Kerim Askin, and John D. Butler, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.
Filed Nov. 1, 1991, Ser. No. 786,635
Int. Cl.[5] C21B *7/24*
U.S. Cl. 266—99 20 Claims

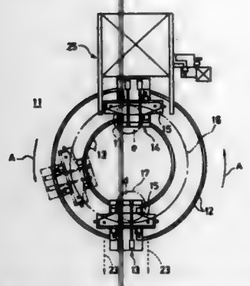
1. A piping portion of a stationary combustion piping system of a metal melting furnace for supplying a flow of premixed gaseous fuel to a burner assembly, said piping portion comprising a flashback arrester, a shutoff valve located upstream of the flashback arrester, a sieve means disposed in said piping portion between the flashback arrester and the shutoff valve for collecting particulate matter from the flow of premixed gaseous fuel supplied to said burner assembly and means for connecting said sieve means in said piping portion and for permitting rapid withdrawal of the sieve means transversely of the piping portion for replacement or cleaning.



5,196,156
ROD COOLING SYSTEM
Charles H. Gage, Westborough, and Alfred R. Lager, North Grafton, both of Mass., assignors to Engineered Production Increase, Inc., North Grafton, Mass.
Filed Nov. 7, 1991, Ser. No. 788,905
Int. Cl.[5] C21D *9/56*
U.S. Cl. 266—106 4 Claims

1. Rod cooling system for use in a rod rolling mill having a reel for receiving and coiling the rod, comprising
(a) an elongated conveyor for receiving the rod from the reel in the form of overlapping offset rings and carrying it to a remote disposal position, the conveyor including an entry portion underlying the reel followed by sequential cooling zone portions, the conveyor having transversely-extending driven shafts with a plurality of radially-extending disks for receiving and supporting the rings on their upper edges,
(b) air supply means underlying the conveyor for supplying cooling air to the zone portions,
(c) a grid underlying the shafts and having nozzles for directing the cooling air upwardly at a small angle to the horizontal into flow spaces defined by the disks and the underside of the rings,
(d) each nozzle having a slot defined by two spaced, parallel surfaces extending upwardly and by an aerodynamic surface located at the exit of the nozzle into the said space to produce substantial flow of air in a direction generally parallel to the direction of movement of the rings along the conveyor.

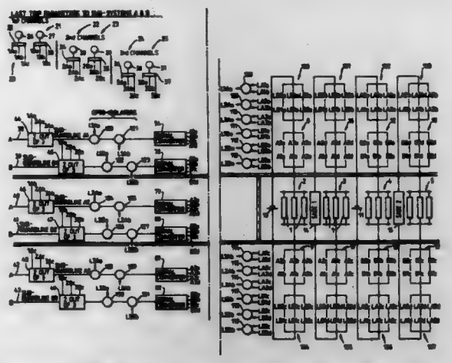
5,196,157
TUNDISH EXCHANGE APPARATUS FOR A CONTINUOUS CASTING EQUIPMENT
Takao Inoue, and Hiroshi Shamoto, both of Nara, Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan
Continuation of Ser. No. 718,947, Jun. 21, 1991, abandoned.
This application Aug. 10, 1992, Ser. No. 927,875
Claims priority, application Japan, Jun. 28, 1990, 2-68952[U]
Int. Cl.[5] B22D *11/10, 41/12*
U.S. Cl. 266—143 1 Claim



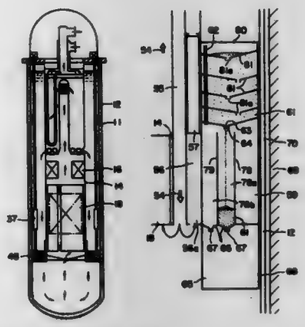
1. A tundish apparatus for a continuous casting equipment, comprising
two tundishes,
first and second tundish cars each provided with means for detachably carrying one of said tundishes,
continuous circular rail means supporting said tundish cars for moment between a pouring position and a standby position spaced along said rail means from said pouring position,
a pair of guide rails mounted above said circular rail means at said standby position, said guide rails extending radially outwardly from said circular rail means to a slag discharge position spaced from said circular rail means and provided with a slag receiving pot,
tundish reconditioning apparatus mounted below said pair of guide rails adjacent to said slag discharge position and radially outwardly of said circular rail means,
a truck moveable along said guide rails between said standby position and said slag discharge position,
and hoisting means carried by said truck for lifting one of said two tundishes from one of said first and second tundish cars in said standby position, and transporting said one tundish to said slag discharge position for the discharge of slag into said slag receiving pot, to said tundish reconditioning apparatus, and back to said standby position for reloading on the one of said first and second tundish cars therein.

5,196,158
ELECTRICAL SAFETY SYSTEM
Simon Partington, Manchester, England, assignor to NNC Limited, England
Filed Jan. 17, 1992, Ser. No. 822,123
Claims priority, application United Kingdom, Jan. 18, 1991, 9101146
Int. Cl.[5] G21C *7/36*
U.S. Cl. 376—216 8 Claims

1. An electrical safety system for de-energising a load in response to a plurality of fault conditions occurring simultaneously, the system comprising first and second groups of electrically-operated switches connected between the load and a load-energising supply; a plurality of guardlines to which are applied input signals; a plurality of opto-isolators connected to each guardline to produce optical signals in response to said input signals; a respective signal converter connected to each guardline and responsive to said input signal on the respective guardline to cause energisation of said first group of switches; a plurality of photo-detectors optically coupled to respective ones of the opto-isolators and responsive to said input signals to cause energisation of said second group of switches; a plurality of sensors for sensing said fault conditions; and means responsive to the sensing of fault conditions by more than one of the sensors to inhibit the feeding of said input signals to the opto-isolators and the signal converters, whereby the groups of switches become non-conductive and cause de-energisation of the load.



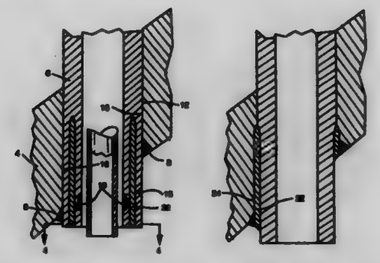
5,196,159
FAST REACTOR
Masatoshi Kawashima; Kazumi Miyagi, both of Yokohama; Masaaki Iida, Chigasaki; Katutada Aoki, Kamakura, and Norihiko Handa, Narashino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 24, 1991, Ser. No. 735,355
Claims priority, application Japan, Jul. 24, 1990, 2-195936; Jul. 27, 1990, 2-200320; Nov. 28, 1990, 2-327562
Int. Cl.[5] G21C *7/28*
U.S. Cl. 376—221 15 Claims



12. A fast reactor comprising:
a reactor vessel to be arranged vertically in a reactor building;
a reactor vessel upper structure disposed at an upper portion of the reactor vessel;
a drum structure suspended from the reactor vessel to substantially a central portion in the reactor vessel so as to define an annular portion between an outer periphery of the drum structure and an inner periphery of the reactor vessel;
a reactor core disposed in the drum structure;

an intermediate heat exchanger disposed at a portion above the reactor core;
a pump disposed in the reactor vessel to circulate coolant; and
a reflector disposed in the reactor vessel to fall along an outer periphery of the reactor core during reactor power operation, wherein the reflector is composed of materials each in the form of a grain and the reflector materials are stored in a storage tank disposed in an upper portion of a reflector area, the storage tank including an opening through which the reflector materials are supplied into the reflector area.

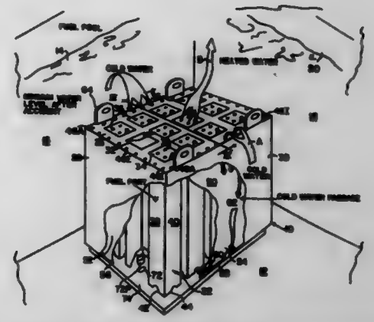
5,196,160
NUCLEAR REACTOR HEAD AND PROCESS FOR OBTAINING SAME
Jan S. Porowski, 241 Carry Hollow Rd., Pittsburgh, Pa. 15236
Filed Mar. 23, 1992, Ser. No. 855,575
Int. Cl.[5] G21C *13/00*
U.S. Cl. 376—260 12 Claims



1. A process for improving nozzles extending substantially vertically through openings in the head of a nuclear reactor and which are circumferentially welded to said head through a weld lying on an inner surface of said head and the outer surface of said nozzle immediately adjacent thereto which comprises forming a coaxial, circumferential groove extending upwardly into at least a portion of at least one of said nozzles extending into said reactor and thereafter filling said circumferential groove with a weld material.

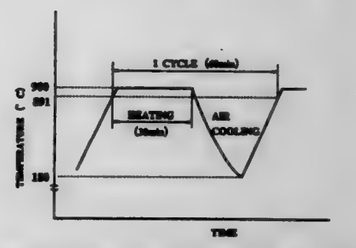
5,196,161
FAIL-SAFE STORAGE RACK FOR IRRADIATED FUEL ROD ASSEMBLIES
Donald R. Lewis, Pocatello, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 14, 1991, Ser. No. 744,746
Int. Cl.[5] G21C *19/32*
U.S. Cl. 376—272 10 Claims

1. A storage rack for retaining hazardous nuclear fuel rod assemblies normally disposed in liquid moderator filled pools while providing passive nuclear accident safety protection, comprising:
a) a generally rectangular bottom plate;
b) generally planar upstanding sidewalls conjoined along their vertical edges and joined along their lower edges to the periphery of said bottom plate to form an imperforate container;
c) a plurality of vertically disposed, rectangular receiving tubes having lower ends which rest upon the bottom plate and upper ends of which are conjoined with an upper planar member defining the upper surface of said storage rack;
d) a contiguous inner rectangular shell interposed between said conjoined sidewalls and the elongate receiving tubes disposed therein and spaced from the rack sidewalls to define a peripheral passageway with the sidewalls to permit convection liquid flowthrough of cooler moderator fluid entering from an ambient fluid pool to the rack bottom portion;
e) at least one laterally disposed inlet port on the lower edges of each of said elongate tubes configured to permit moderator liquid entry and upflow therein fostered by the heat which is generated by the nuclear fuel assembly normally stored in said tubes; and



f) at least one outlet port disposed in the upper planar member and overlying each of the elongate tubes to permit escape of warmed temperature moderator liquid from the rack to the ambient filled pool, such that the moderator liquid can circulate through said rack both while it is beneath the pool liquid level and while it is devoid of an ambient liquid envelope.

5,196,162
TI-AL TYPE LIGHTWEIGHT HEAT-RESISTANT MATERIALS CONTAINING NB, CR AND SI
Kunio Maki, Yokohama; Mamoru Sayashi, Miura; Susumu Isobe; Tomohito Iikubo, both of Nagoya, and Toshiharu Noda, Chita, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa and Dido Steel Co., Ltd., Aichi, both of Japan
Filed Aug. 21, 1991, Ser. No. 747,824
Claims priority, application Japan, Aug. 28, 1990, 2-225778
Int. Cl.[5] C22C *14/00*
U.S. Cl. 420—418 10 Claims



1. A Ti-Al type lightweight heat-resistant alloy exhibiting improved oxidation resistance and ductility consisting essentially of: 32 to 36% by weight of Al; a combination of 0.1 to 2.0% by weight of Si and 0.1 to 5.0% by weight of Nb to improve oxidation resistance; and 0.1 to 3.0% by weight of Cr to improve ductility and strength, the balance being substantially Ti.

5,196,163
HIGHLY CORROSION-RESISTANT ZIRCONIUM ALLOY FOR USE AS NUCLEAR REACTOR FUEL CLADDING MATERIAL

Yutaka Matsuo, Tokyo; Yoshitaka Sada, Oyama; Nobuo Sada, Omiya; Takashi Isobe, Omiya, and Kazuyoei Adachi, Omiya, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Continuation of Ser. No. 300,239, Jan. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 72,411, Jul. 13, 1987, abandoned. This application Jun. 11, 1990, Ser. No. 536,075
Claims priority, application Japan, Jul. 29, 1986, 61-178442; Jan. 22, 1988, 63-12323
Int. Cl.[5] C22C *16/00*
U.S. Cl. 420—422 7 Claims

1. A corrosion resistant zirconium alloy for uses as a nuclear reactor fuel cladding material consisting essentially of on a weight % basis
0.2–1.7% Sn,
0.19–0.6% Fe,
0.07–0.4% Cr,
0.01–0.2% Ta,
the balance being Zr and incidental impurities, provided that the content of nitrogen in the form of incidental impurities is no more than 60 ppm.

5,196,164
METHOD OF PREVENTING POLYMER SCALE FORMATION

Toshihide Shimizu, Urayasu; Ichiro Kaneko, and Mikio Watanabe, both of Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 391,199
Claims priority, application Japan, Aug. 10, 1988, 63-199119; Aug. 10, 1988, 63-199120
Int. Cl.[5] C08F *2/00*
U.S. Cl. 422—1 21 Claims

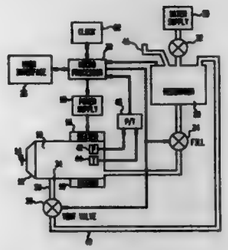
1. A method of preventing polymer scale formation in a polymerization vessel during the polymerization of a chlorine containing monomer having an ethylenically unsaturated double bond consistently essentially of:
polymerizing said monomer in a polymerization vessel in which the inner wall surface thereof is previously coated with a water-based coating solution containing (A) a water-soluble anionic dye and (B) at least one member selected from the group consisting of water-insoluble cationic dyes and water-insoluble nitrogen-containing organic compounds and having a pH of 7 or less and then dried to form a coating.

5,196,165
AIR BLEEDING APPARATUS FOR AN AUTOCLAVE

Durennie L. Harrell, and Ye Mu, both of Charlotte, N.C., assignors to The Pelton & Crane Company, Charlotte, N.C.

Filed Dec. 20, 1990, Ser. No. 631,134
Int. Cl.[5] G05B *19/00*; A61L *2/06*
U.S. Cl. 422—26 6 Claims

1. A sterilizing apparatus comprising:
a sterilization chamber for receiving items to be sterilized;
means coupled to said chamber for converting a fluid inside said chamber to sterilize said items during a sterilization cycle;
means for monitoring temperature within said chamber;
means for monitoring pressure within said chamber;
a vent coupled to said chamber;
a selectively activated valve coupled to said vent for opening and closing said vent during a preconditioning cycle before the start of said sterilization cycle, said vent enabling gases within said chamber to exit said chamber via said vent when said valve is open; and
digital control means, including a memory having stored therein a plurality of different pressure and temperature values representative of a curve of related pressure and temperature values, for controlling said selectively activated valve during said preconditioning cycle, said control means receiving said monitored temperature and pressure as pairs of inputs and periodically comparing said pairs of inputs with said pressure and temperature values

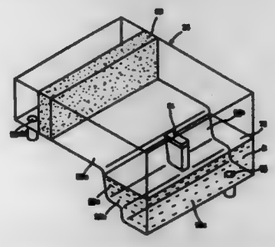


stored in said memory and on the basis of the comparison generating a control signal to selectively open or close said valve until one of said pairs of inputs first matches any one of said pairs of said pressure and temperature values stored in said memory, whereupon said valve remains closed and ending said preconditioning cycle.

5,196,166
BLOOD STORAGE TANK

Yoshiro Katsura, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 196,049, May 19, 1988, abandoned. This application Mar. 8, 1991, Ser. No. 668,820
Claims priority, application Japan, May 19, 1987, 62-122243
Int. Cl.[5] A61M *1/34*
U.S. Cl. 422—45 15 Claims



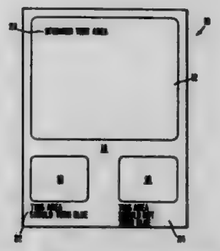
1. A blood reservoir comprising: a blood storage section for temporarily storing blood including a bottom surface comprising an uppermost substantially horizontal portion, a lowermost substantially horizontal portion, and vertically inclined portions located therebetween a blood discharge port defined in said lowermost substantially horizontal portion of said blood storage section for discharging blood from said blood storage section, said inclined portions arranged for smoothly leading blood stored therein toward said blood discharge port, and a top positioned opposite said bottom surface, a blood inlet port defined in said upper most substantially horizontal portion thereof, an antifoaming member disposed on said uppermost substantially horizontal portion of said bottom surface adjacent said blood inlet port and at least one baffle plate extending along at least a portion of said inclined portions within said blood storage section, said at least one baffle plate extending toward the top so as to be substantially vertically positioned, wherein said at least one baffle plate contacts said blood storage section only along said bottom surface such that blood stored in said blood storage section is kept in contact with oppositely positioned side faces of said at least one baffle plate at substantially the same level in order to suppress resonant

vibration on a surface of blood caused by pulsative discharge of blood through the blood discharge port.

5,196,167
FECAL OCCULT BLOOD TEST PRODUCT WITH POSITIVE AND NEGATIVE CONTROLS

Philip A. Guadagno, Vidor, and Janine P. Burrows, Orange, both of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Division of Ser. No. 333,828, Apr. 4, 1989. This application May 9, 1991, Ser. No. 697,419
Int. Cl.[5] G01N *33/48*
U.S. Cl. 422—56 16 Claims



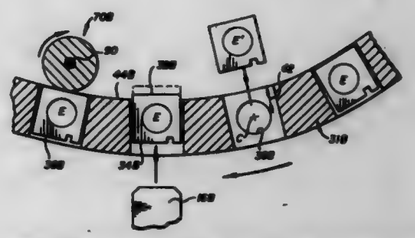
1. A test sheet for the determination of the presence of a substance having peroxidase-like activity such as hemoglobin in an aqueous solution comprising:
a sheet having a specimen test area, a positive monitor area and a negative monitor area, said sheet comprising an inert water insoluble matrix;
said specimen test area having deposited thereon a first composition comprising at least one oxygen donor agent in a solvent comprising a surfactant to form a first solution and at least one chromogen reagent in a solvent comprising a surfactant, to form a second solution, the chromogen reagent capable of being oxidized by the oxygen donor in the presence of a substance having the peroxidase-like activity, to provide a visually observable change of color; said oxygen donor agent and said chromogen reagent of said first composition being inert relative to each other in the absence of both an aqueous solution and a substance in said aqueous solution having peroxidase-like activity,
said first solution and said second solution being mixed together to form said first composition prior to being deposited on said specimen test area; and
said positive monitor test area having deposited thereon said first composition and a second composition comprising a substance having peroxidase-like activity, said first composition being inert relative to said second composition in the absence of said aqueous solution.

5,196,168
INCUBATOR WITH POSITIONING DEVICE FOR SLIDE ELEMENTS

Martin F. Muszak; Gary S. Hartman, and Roger G. Leighton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1991, Ser. No. 810,262
Int. Cl.[5] G01N *35/04*
U.S. Cl. 422—64 7 Claims

1. In a rotating incubator in a clinical analyzer for use with a detector, the incubator comprising a support, stations provided in said support around a circumference of the support constructed to receive a test element for incubation, means for rotating the support, an entrance port permitting access to each of said stations from a location exterior to said support, and referencing means interior of said stations in said support for locating a datum surface of a slide test element inside said support;
the improvement wherein said referencing means comprise a positioning element rotatably mounted on a shaft, and means for moving said positioning element relative to said support by pressing said positioning element against said

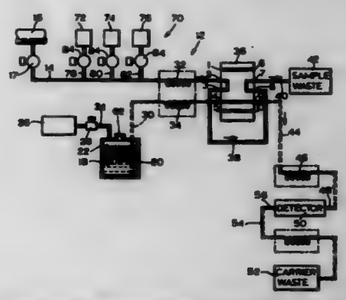


datum surface to properly locate said datum surface in said incubator with respect to said detector after said slide element is inserted into said station, said positioning element being rotatable sufficiently to push a slide element already in a station back towards said entrance port such that the element is within said station and aligned with said detector.

5,196,169
METHOD AND SYSTEM FOR DETERMINING FREE FATTY ACID CONTENT

Karl G. Schick; Paul M. Karges, both of Milwaukee; Gary A. Lang, Brookfield, and David A. Uhen, Palmyra, all of Wis., assignors to Eppendorf North America, Inc., Madison, Wis.

Continuation of Ser. No. 666,546, Mar. 7, 1991, abandoned, which is a continuation of Ser. No. 582,139, Sep. 13, 1990, abandoned, which is a continuation of Ser. No. 436,976, Nov. 16, 1989, abandoned, which is a continuation of Ser. No. 127,626, Dec. 1, 1987, abandoned, which is a continuation of Ser. No. 902,646, Sep. 2, 1986, abandoned. This application Oct. 2, 1991, Ser. No. 771,318
Int. Cl.[5] G01N *33/03, 35/08*
U.S. Cl. 422—81 17 Claims



1. An automated apparatus for determining free fatty acid content of an organic sample dissolved in a carrier solution comprising:
i) a carrier solution supply means and carrier solution conduit providing a continuous stream of the carrier solution containing an indicating reagent capable of reacting with the free fatty acid of the sample wherein the carrier solution supply means comprises a solution reservoir means for pressuring the carrier solution in the reservoir to a predetermined pressure with an oxygen-free gas connected to the carrier solution supply conduit and means for substantially isolating the pressuring gas from the carrier solution;

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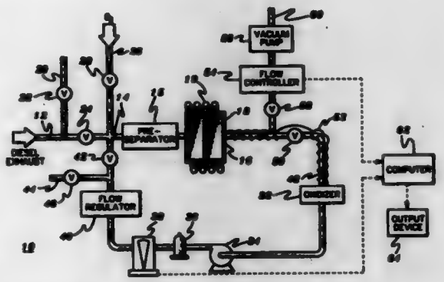
ii) a sample supply means and sample supply conduit;
iii) sample injection valve connected to the sample supply conduit and carrier solution supply means wherein the sample injection valve is positionable between a load position having the carrier solution supply means connected to the carrier solution conduit and a sample collection conduit means connected between a sample waste collection means and the sample supply conduit and a measure position having the sample collection conduit connected between the carrier solution supply means and the carrier conduit means wherein the sample is contacted with the carrier solution;
iv) the sample collection conduit including a sample loop with two ends and the two ends being connected to the sample injection valve;
v) the sample waste collecting means in linear relationship to the sample supply means and connected to the sample injection valve;
vi) a carrier waste collecting means connected to a detector;
vii) a flow through detector effective to produce a signal representative of the free fatty acid content of the sample in response to the reaction of an indicating reagent with the free fatty acid content of the sample having an inlet connected to the carrier solution conduit and an outlet connected to the carrier waste means; and
viii) means for regulating flow of the carrier solution through the detector.

10. A method for determining the free fatty acid content of a continuous stream of a sample stream dissolved in a carrier solution stream comprising the steps of:
(a) heating both the sample and carrier solution streams to suitable temperature;
(b) mixing a predetermined volume of the sample stream with a continuous stream of the carrier solution containing a suitable solvent and a color indicating reagent;
(c) reacting the free fatty acid in the combined streams with the color indicating reagent to give a reacted solution to produce a detectable signal representative of the free fatty acid content;
(d) passing the reacted solution through a detector which produces a signal representative of fatty acid content of the sample; and
(e) repeating steps (b)–(e) to determine the free fatty acid content of the sample at timed intervals.

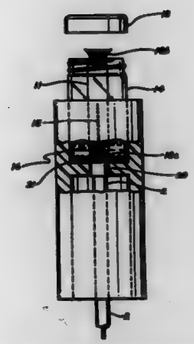
5,196,170
CARBON PARTICULATE MONITOR
Harvey Patashnick, and Georg Rupprecht, both of Voorheesville, N.Y., assignors to Rupprecht & Patashnick Company, Inc., Albany, N.Y.
Continuation-in-part of Ser. No. 612,562, Nov. 13, 1990, Pat. No. 5,110,747. This application May 1, 1992, Ser. No. 877,542
The portion of the term of this patent subsequent to Feb. 5, 2009, has been disclaimed.
Int. Cl.[5] G01N *15/00*
U.S. Cl. 422—83 7 Claims

1. An integral sampling and analyzing apparatus for providing an indication of the level of carbon particulate in sampled gas comprising:
collection means for collecting carbon particulate from sampled gas;
containing means for containing the collection means;
means for directing sampled gas at the collection means in said containing means;
means for supplying oxygen in said containing means to carbon within the particulate collected by the collection means;
means for heating collected particulate in said containing means to facilitate oxidation of carbon within the particulate;
means for measuring the amount of carbon dioxide obtained from oxidation of the carbon; and



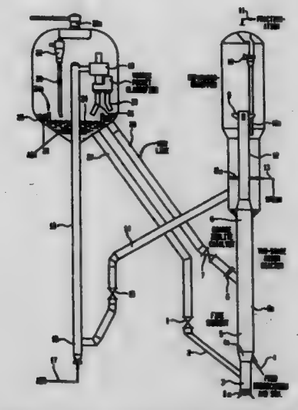
means for providing an indication of the level of carbon particulate based on the measured amount of carbon dioxide.

5,196,171
ELECTROSTATIC VAPOR/AEROSOL/AIR ION GENERATOR
Mark E. Peltier, So. St. Paul, Minn., assignor to In-Vironmental Integrity, Inc., Minneapolis, Minn.
Filed Mar. 11, 1991, Ser. No. 667,200
Int. Cl.[5] A61L *9/12*
U.S. Cl. 422—121 16 Claims



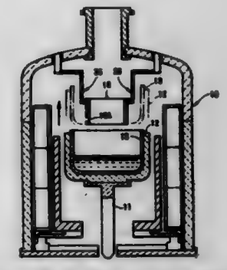
1. Apparatus for generating electrostatically charged aerosols and vapors comprising:
a porous, capillary unit of elongated configuration having a vapor dispensing end;
electrode means, said electrode means consisting essentially of a single electrode disposed in close proximity to said capillary unit;
electrical contact means on said electrode for connecting said electrode to a source of high voltage, direct current (DC) power; and
means for supplying liquid to said capillary unit, whereby liquid passes through said porous capillary unit in proximity to said electrode and is electrostatically charged and dispensed as vapor or aerosol from said dispensing end of said capillary unit.

5,196,172
APPARATUS FOR THE FLUID CATALYTIC CRACKING OF HYDROCARBON FEED EMPLOYING A SEPARABLE MIXTURE OF CATALYST AND SORBENT PARTICLES
Harold N. Weinberg, Livingston, N.J.; W. Benedict Johnson, Pebble Beach, Calif.; Michael F. Raterman, Doylestown, Pa.; Barry K. Speronello, Belle Mead, N.J.; William J. Reagan, Naperville, Ill., and Larry G. Sherman, Flemington, N.J., assignors to Engelhard Corporation, Iselin, N.J.
Division of Ser. No. 515,540, Apr. 26, 1990, Pat. No. 5,059,302, which is a continuation of Ser. No. 352,433, May 16, 1989, abandoned. This application Jul. 1, 1991, Ser. No. 724,235
Int. Cl.[5] B01J *8/26*; F27B *15/08*
U.S. Cl. 422—144 6 Claims



1. An apparatus for catalytically cracking hydrocarbon feedstock to form gaseous cracking products therefrom by contacting the feedstock with fluidizable solid sorbent particles and fluidizable solid catalyst particles, the sorbent particles being one or both of finer in size and less dense than the catalyst particles, such as to permit physical separation therebetween, the apparatus comprising:
a riser having a lower zone for vaporizing a hydrocarbon feedstock, an upper zone above the lower zone for cracking the feedstock, a feedstock inlet means below the lower zone for receiving the feedstock and an outlet means above the upper zone for discharging the feedstock from the riser;
a first inlet means in flow communication with the lower zone to charge the fluidizable solid sorbent particles into the lower zone;
a second inlet means in flow communication with the upper zone to charge the fluidizable solid catalyst particles into the upper zone whereby the fluidizable sorbent and catalyst solids are commingled in the riser;
gas/solid separation means in communication with the outlet means for separating the gaseous cracking products from the commingled fluidizable solids;
stripper means in flow communication with the riser outlet means for stripping carbonaceous deposits from the commingled fluidizable solids discharged from the riser outlet means;
a primary regenerator means;
first transfer means to transfer the stripped commingled fluidizable solids from the stripper means to the primary regenerator means;
sorbent/catalyst separation means in communication with the primary regenerator means and dimensioned and configured to effect physical separation of the sorbent and catalyst fluidizable solids discharged from the primary regenerator means by reason of the finer and/or less dense nature of the sorbent particles as compared to the catalyst particles to provide segregated sorbent and catalyst solids;
a secondary regenerator means;
means for conducting the segregated sorbent particles from the sorbent/catalyst separation means to the secondary regenerator means for regeneration of the sorbent therein;
means for conducting the sorbent particles from the secondary regenerator means to the first inlet means for discharge therefrom into the lower zone as defined above; and
means for conducting the catalyst particles from the sorbent-/catalyst separation means to the second inlet means for discharge therefrom into the upper zone as defined above.

5,196,173
APPARATUS FOR PROCESS FOR GROWING CRYSTALS OF SEMICONDUCTOR MATERIALS
Yoshiaki Arai; Michio Kida; Naoki Ono, and Kensho Sahira, all of Omiya, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Oct. 12, 1989, Ser. No. 420,518
Claims priority, application Japan, Oct. 13, 1988, 63-257608
The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.
Int. Cl.[5] C30B *35/00*
U.S. Cl. 422—249 6 Claims

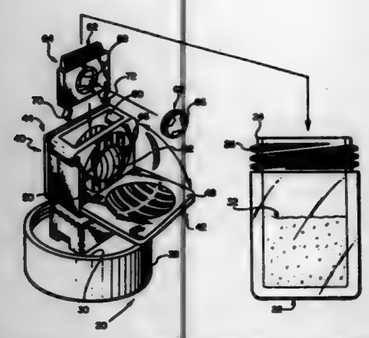


1. An apparatus for melting semiconductor material and growing single crystals of semiconductor material, the apparatus comprising:
(a) a furnace,
(b) a cylindrical double crucible assembly comprising a) an inner crucible open at a bottom thereof, in which single crystals of semiconductor material are grown, the inner crucible having side walls and being bottomless, and b) an outer crucible having a bottom in which melted semiconductor material is received, the outer crucible having the inner crucible disposed in contact with said outer crucible bottom in a separable manner,
(c) a susceptor for supporting the outer crucible,
(d) rotating means for rotating the susceptor,
(e) a feed pipe for supplying starting material in the space formed between the inner and outer crucibles,
(f) fluid-passage means for permitting the melted semiconductor material to flow between the inner and outer crucibles, the fluid-passage means being disposed at the lower part of the inner crucible,
(g) heating means disposed to surround the susceptor for heating the semiconductor material in the double crucible,
(h) at least two joining means for concentrically setting the inner crucible inside the outer crucible inside the furnace, said joining means being disposed at least at two circumferential locations relative to the inner crucible, separated by circumferential intervals,
(i) engaging means coupled to said inner crucible at an upper end of said side walls, for detachably engaging with each said joining means at the upper end of the inner crucible, said inner crucible being adapted to operate with said joining means detached, and

1993 UMI

(f) drive means for providing vertical movement of either said inner or outer crucible.

5,196,174
APPARATUS FOR STERILIZING CONTACT LENSES
Joseph J. Cerola, Gastonville, and Steven C. Perisky, Arab, both of Ala., assignors to Ciba Vision Corporation, Duluth, Ga.
Continuation of Ser. No. 364,471, Jun. 9, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 631,759
Int. Cl.[5] A61L *2/00*
U.S. Cl. 422—300 15 Claims

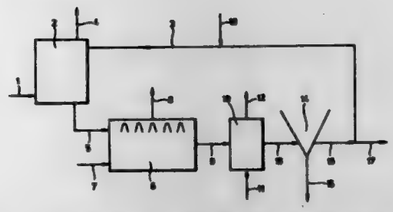


1. Apparatus for use in the sterilization of contact lenses, wherein the lenses are disposed within a sterilizing solution contained within a reaction vessel, which sterilizing solution is capable of being decomposed through contact with a catalystic agent, said apparatus comprising: a reaction vessel capable of containing a sterilizing solution and comprising a container portion and removable cover means for said container portion; lens supporting means removably insertable into said container portion for supporting a contact lens in contact with sterilizing solution in said container; a catalytic agent comprising a catalyst-receiving body of predetermined shape coated with a quantity of catalyst material; and further including means for removably mounting said catalytic agent on said lens supporting means independently of the contact lens, said mounting of said catalytic agent on said lens supporting means thereby preventing contact of the catalytic agent with the solution in said reaction vessel until the lens supporting means with the catalytic agent and contact lens mounted thereto is immersed in the solution in the container for beginning the sterilizing process, to thereby prevent premature breakdown of the sterilizing solution prior to the introduction of contact lenses for sterilization therein.

5,196,175
DISPERSION ENHANCED PT GROUP METAL CATALYSTS
Somasundaram Subramanian, Melvindale, Mich.; William L. H. Watkins, Toledo, Ohio, and Mohinder S. Chattha, Northville, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 620,514, Nov. 28, 1990. This application Dec. 9, 1991, Ser. No. 803,825
Int. Cl.[5] B01D *45/00, 46/00*
U.S. Cl. 423—213.5 1 Claim

1. A method of treating a stream of exhaust gas from an internal combustion engine containing CO, NO_x, and HC, said stream having a space velocity of about 30 Khr^{-1} and a temperature within the range of 900°–1000° C., comprising exposing said stream to an acid modified platinum group metal-/alumina-based three-way catalyst containing said metal in a concentration of 0.1–5% and said exposure resulting in a hydrocarbon oxidation increase of at least 10% at 580° C., an increase in CO oxidation of at least 5% at 500° C., and an increase in nitric oxide reduction of at least 3–5% at 250°–600° C., said modification being the result of using a water soluble acid RCOOH with R being an alkyl, aryl, substituted alkyl, or substituted aryl.

5,196,176
PROCESS FOR THE REMOVAL OF SULFUR DIOXIDE FROM WASTE GAS
Cees J. N. Buisman, Harich, Netherlands, assignor to Paques, B.V., Balk, Netherlands
Filed Apr. 12, 1991, Ser. No. 688,995
Claims priority, application Netherlands, Apr. 12, 1990, 9000876
Int. Cl.[5] C01B *17/00*; C02F *3/00*
U.S. Cl. 423–242.2 4 Claims



1. A process for the removal of sulfur dioxide from waste gas, comprising the steps of:
a) contacting the waste gas with a basic aqueous solution wherein sulfur dioxide is dissolved as sulfite;
b) subjecting the aqueous solution containing sulfite to sulfur reducing bacteria in an anaerobic reactor wherein sulfite is reduced to sulfide;
c) subjecting the aqueous solution containing sulfide to sulfur oxidizing bacteria in the presence of a limiting amount of oxygen ranging from about 0.5 to 1.5 moles of oxygen per mole of sulfide in a reactor wherein sulfide is oxidized to elemental sulfur;
d) separating the elemental sulfur from the aqueous solution; and
e) recycling the aqueous solution to step a).

4. A process for the removal of sulfite from waste water, comprising the steps of:
a) adjusting the concentration and the pH in the waste water to obtain an aqueous solution containing sulfite;
b) subjecting the aqueous solution containing sulfite to sulfur reducing bacteria in an anaerobic reactor wherein sulfite is reduced to sulfide;
c) subjecting the aqueous solution containing sulfide to sulfur oxidizing bacteria in the presence of a limiting amount of oxygen ranging from about 0.5 to 1.5 moles of oxygen per mole of sulfide in a reactor wherein sulfide is oxidized to elemental sulfur; and
d) separating the elemental sulfur from the aqueous solution.

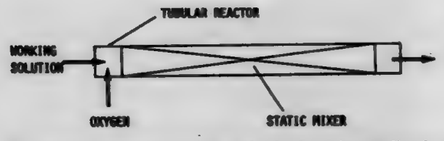
5,196,177
PRODUCTION OF STABLE AQUEOUS SILICA SOL
Yoshitane Watanabe; Yoshiyuki Kashima, and Kenji Tanimoto, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan
Filed Jan. 15, 1991, Ser. No. 641,709
Claims priority, application Japan, Jan. 17, 1990, 2-7305
Int. Cl.[5] B01J *13/00*; C01B *33/14*
U.S. Cl. 423—335 10 Claims

1. A process for producing an aqueous sol containing 2–50 wt% SiO_2 in the form of colloidal silica with a flat shape, whose thickness is 7–100 nm and whose dimension in the planar direction is 10–150 times the thickness and within the range of 100–1000 nm, said process comprising the steps of:
(a) mixing 100 parts by weight (as SiO_2) of an acidic aqueous sol (S_0) of negatively charged silica (7–30 nm in particle diameter) having pH 2–5 and containing 2–50 wt% SiO_2, with 0.2–10 parts by weight (as Al_2O_3 or ZrO_2) of an aqueous solution (B) containing 1–50 wt% basic aluminum or zirconium salt, with stirring at 0°–100° C., continuing stirring for 0.1–5 hours, and adjusting the resulting sol to pH 4–7 with an alkaline aqueous solution, thereby yielding an aqueous sol (S_1) of positively charged silica,
(b) mixing 100 parts by weight (as SiO_2) of the sol (S_1) obtained in step (a) with 20–200 parts by weight (as SiO_2) of the sol (S_0) with stirring at 0°–100° C., continuing stirring for 0.1–5 hours, and adjusting the resulting sol to pH 4–7 with an alkaline aqueous solution, thereby yielding an aqueous sol (S_2) of negatively charged silica,
(c) mixing 100 parts by weight (as SiO_2) of the sol (S_2) obtained in step (b) with the aqueous solution (B) in an amount corresponding to 2–50% of the amount (as Al_2O_3 or ZrO_2 in parts by weight) added to 100 parts by weight (as SiO_2) of the sol (S_0) used in step (a) with stirring at 0°–100° C., continuing stirring for 0.1–5 hours, and adjusting the resulting sol to pH 4–7 with an alkaline aqueous solution, thereby yielding an aqueous sol (S_3) of positively charged silica, and
(d) mixing 100 parts by weight (as SiO_2) of the sol (S_3) obtained in step (c) with the sol (S_0) in an amount corresponding to 10–95% of the amount (as SiO_2 in parts by weight) added to 100 parts by weight (as SiO_2) of the sol (S_1) in step (b) with stirring at 0°–100° C., continuing stirring for 0.1–5 hours, and adjusting the resulting sol to pH 4–7 with an alkaline aqueous solution, thereby yielding an aqueous sol (S_4) of negatively charged silica.

5,196,178
METHOD OF PRODUCING DUSTFREE SILVER NITRATE
Dieter Hollmann, and Roland Gerner, both of Rodenbach, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 8, 1991, Ser. No. 771,552
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1990, 4031952
Int. Cl.[5] C01B *21/48*; C01F *11/36*
U.S. Cl. 423—395 6 Claims

1. A method of producing dustfree silver nitrate spherules comprising atomizing a silver nitrate melt to form drops and solidifying the formed drops in a cooling medium, wherein the silver nitrate in said melt exhibits a purity of more than 99% and a pH of 2 to 6, measured as 10% aqueous solution, and wherein the melting, the atomizing and the solidifying of said silver nitrate is carried out under the exclusion of light.

5,196,179
PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE
Ilkka Turunen, and Eva-Liisa Mustonen, both of Oulu, Finland, assignors to Kemira Oy, Helsinki, Finland
Filed Sep. 20, 1990, Ser. No. 585,389
Claims priority, application Finland, Sep. 22, 1989, 894502
Int. Cl.[5] C01B *15/023*
U.S. Cl. 423—588 12 Claims

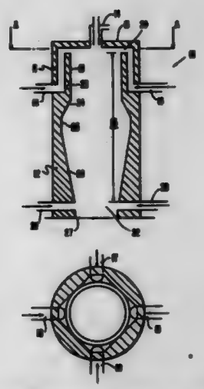


1. A process for converting anthrahydroquinone dissolved in an organic solvent to hydrogen peroxide and anthraquinone wherein said process comprises causing a mixture of oxygen and anthrahydroquinone to flow concurrently through a reaction zone, wherein the mixture is caused, as an almost continuous dispersion, to flow through a tubular reaction zone at such a velocity that the vacuum-pipe velocity of the liquid therein is higher than 0.05 m/s wherein the oxygen or oxygen containing gas is fed in not only at the beginning of the reaction zone but also at one or more points thereafter.

5,196,180
CERAMIC POWDERS
Angus J. Hartshorn, Pascoe Vale South, Australia, assignor to ICI Australia Operations Proprietary Limited, Melbourne, Australia
PCT No. PCT/AU89/00425, § 371 Date Jun. 13, 1991, § 102(e) Date Jun. 13, 1991, PCT Pub. No. WO90/03838, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 3, 1989, Ser. No. 689,289
Claims priority, application Australia, Oct. 13, 1988, PJ 0949
Int. Cl.[5] C01F *7/02*; C01G *25/00*
U.S. Cl. 423—593 2 Claims

1. A process of preparing a ceramic powder suitable for pressing into articles by the steps of
(a) dispersing a particulate ceramic in water in the presence of ammonia or an alkylamine having a boiling point below that of water, present in a quantity sufficient to disperse the ceramic; and
(b) spray-drying the resulting dispersion to give a ceramic powder.

5,196,181
PROCESS FOR THE PRODUCTION OF TITANIUM DIOXIDE
Achim Hartmann, Pulheim, Fed. Rep. of Germany, assignor to Kronos (USA), Inc., Hightstown, N.J.
Filed Nov. 7, 1990, Ser. No. 610,126
Claims priority, application European Pat. Off., Nov. 13, 1989, 89120996.7
Int. Cl.[5] C01G *23/04*
U.S. Cl. 423—613 9 Claims



1. Process for production of titanium dioxide through reaction of at least vaporous $TiCl_4$ with oxygen in a radially symmetrical reaction chamber closed at one end and having a preheating zone which extends from the closed end and followed by a reaction zone, comprising the steps of:
(a) indirectly preheating the oxygen required for the reaction;
(b) introducing the indirectly preheated oxygen into the reaction chamber immediately adjacent its closed end;
(c) uniformly distributing the oxygen over the entire circumference of the preheating zone via annular passages in the

interior peripheral wall of the chamber such that the flow of oxygen through each of the annular passages is characterized by a Reynolds' number between 15,000 and 20,000 to produce cooling of the preheating chamber with a protective oxygen film;

(d) further heating the oxygen introduced in the preheating zone through the combustion of a gaseous and/or a liquid combustible fuel and through direct contact with the hot combustion gases, to a temperature sufficient for an essentially complete oxidation of all metal halides and thereafter reacting the heated oxygen in the reaction zone with the at least $TiCl_4$ fed therein; and

(e) isolating the resultant titanium dioxide.

5,196,182

TISSUE FIXATIVE

Wayne L. Ryan, Omaha, Nebr., assignor to Streck Laboratories, Inc., Omaha, Nebr.

Filed May 8, 1991, Ser. No. 696,926
Int. Cl.[5] G01N *1/28*
U.S. Cl. 424—3 **34 Claims**

1. A fixative solution for tissues and cells comprising histological fixing amounts of an active agent selected from the group consisting of:

i) diazolidinyl urea
ii) imidazolidinyl urea
iii) dimethylol-5,5-dimethylhydantoin
(iv) dimethylol urea
(v) 2-bromo-2-nitropropane-1,3-diol; and
(vi) quaternary adamantane

in a solvent selected from the group consisting of water, alcohol, dimethylsulfoxide and mixtures thereof, said active agent being present in an amount of about 20 to 100 grams per liter.

5,196,183

CONTRAST AGENTS FOR ULTRASOUND IMAGING

Joseph S. Yudelson, and Susan E. Power, both of Rochester, N.Y., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed Dec. 4, 1991, Ser. No. 803,293
Int. Cl.[5] A61K *49/00*; A61B *8/12*
U.S. Cl. 424—9 **27 Claims**

1. A diagnostic imaging agent comprising particles having an average diameter no larger than 12 microns, said particles comprising a core of one or more fatty acids encapsulated with human serum albumin.

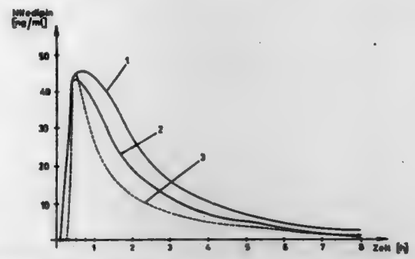
5,196,184

PHARMACEUTICAL PREPARATION

Kurt Burghart, Sägeberg 8, D-2217 Roedorf, Fed. Rep. of Germany, and Walter Burghart, Salmgasse 4, A-1030 Vienna, Austria

PCT No. PCT/AT89/00130, § 371 Date Aug. 27, 1990, § 102(e) Date Aug. 27, 1990, PCT Pub. No. WO90/07345, PCT Pub. Date Jul. 12, 1990
PCT Filed Dec. 28, 1989, Ser. No. 474,835
Claims priority, application Australia, Dec. 30, 1988, 3211/88
Int. Cl.[5] A61L *9/04*
U.S. Cl. 424—45 **8 Claims**

1. A sprayable pharmaceutical preparation, comprising, in a spray jet, 1 to 7.5% by weight Nifedipin, 20 to 40% by weight glycerol-polyethyleneglycol oxystearate, 1 to 5% by weight benzyl alcohol, 15 to 25% by weight ethanol, 0.5 to 5% by



weight copolyvidon and 30 to 45% by weight of a propelling agent.

5,196,185

COLLAGEN-BASED WOUND DRESSING AND METHOD FOR APPLYING SAME

Fred Silver, Bangor, Pa.; Vinay Sharma, Long Valley, N.J.; Dieter R. Berndt, Allenwood, N.J., and Louis E. Marn, Morris Plains, N.J., assignors to Micro-Collagen Pharmaceutics, Ltd., Long Valley, N.J.

Filed Sep. 11, 1989, Ser. No. 405,520
Int. Cl.[5] A61L *9/04*
U.S. Cl. 424—45 **12 Claims**

1. A method of wound treatment, which comprises: applying to such a wound particulate collagen in a carrier, said particulate collagen being of a particle size of from about 1 to 50 μm.

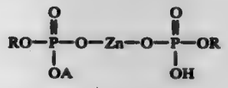
5,196,186

ALKALI METAL ZINC MONOALKYLPHOSPHATE, PARTICLES THEREOF, PROCESS FOR PREPARING THE SAME, AND COSMETIC CONTAINING THE SAME

Shinichiro Omatsu; Mitsuharu Masuda, both of Wakayama; Hiroshi Ito, Tokyo; Takashi Imamura, Chiba, and Tomihiro Kurosaki, Osaka, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Division of Ser. No. 693,496, Apr. 30, 1991, which is a division of Ser. No. 494,001, Feb. 27, 1990. This application Dec. 31, 1991, Ser. No. 815,225
Claims priority, application Japan, Feb. 27, 1989, 1-45796; May 25, 1989, 1-131989; Sep. 26, 1989, 1-249412
Int. Cl.[5] A61K *7/35*
U.S. Cl. 424—69 **4 Claims**

1. A cosmetic containing particles of an alkali metal zinc monoalkylphosphate represented by formula (I):



(I)

wherein R represents a saturated or unsatured straight-chain or

branched hydrocarbon group having from 8 to 32 carbon atoms, and A represents an alkali metal.

5,196,187

COSMETIC COMPOSITION

Gregg A. Nicoll, Dumont, N.J.; Ann C. Ojo-Omgie, Bedford, and Mavis C. Pereira, Lower Bebington, both of Great Britain, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed May 10, 1991, Ser. No. 698,412
Claims priority, application United Kingdom, May 10, 1990, 9010525
Int. Cl.[5] A61K *7/075*
U.S. Cl. 424—70 **13 Claims**

1. A water-in-silicone oil emulsion, suitable for topical application to mammalian skin or hair, which comprises, in addition to water;

i. from 1 to 50% by weight of a volatile polydimethylsiloxane;
ii. from 0.1 to 25% by weight of a silicone surfactant;
iii. from 0.1 to 10% by weight of a 2-hydroxyalkanoic acid having from 3 to 28 carbon atoms, or a salt, soap, acid-soap thereof, or mixtures thereof;
iv. from 1 to 10% by weight of ultrafine titanium dioxide having an average particle size of from 1 to 100 nm; and
v. from 0.001 to 10% by weight of an inorganic electrolyte.

5,196,188

TERPOLYMERS, USE THEREOF IN HAIR SETTING COMPOSITIONS FOR INCREASED STIFFNESS, AND HAIR SETTING COMPOSITIONS CONTAINING SAME

Birgit Potthoff-Karl, Ludwigshafen; Karin Sperling-Vietmeier, Neustadt; Franz Frosch, Bad Durkheim, and Axel Sanner, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 20, 1991, Ser. No. 763,417
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1990, 4031912
Int. Cl.[5] A61K *7/11*
U.S. Cl. 424—71 **9 Claims**

1. A terpolymer, obtainable by free radical polymerization of 10–19% by weight of N-vinylpyrrolidone, 46–74% by weight of tert-butyl acrylate or methacrylate and 16–30% by weight of acrylic or methacrylic acid, whose carboxyl groups may be partially or completely neutralized with an organic amine, ammonia or a basic metal compound and which has a K value of from 25 to 65, wherein said terpolymer is water-soluble and said terpolymer is sufficient to form a composition providing a bending force of 104 pounds or greater.

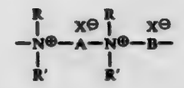
5,196,189

QUATERNIZED POLYMER FOR USE AS A COSMETIC AGENT IN COSMETIC COMPOSITIONS FOR THE HAIR AND SKIN

Bernard Jacquet, Antony, and Gerard Lang, Deuil-La-Barre, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 527,948, Apr. 23, 1990, abandoned, which is a division of Ser. No. 345,770, Oct. 26, 1983, Pat. No. 4,948,579, which is a division of Ser. No. 163,411, Jun. 26, 1980, Pat. No. 4,422,853, which is a continuation-in-part of Ser. No. 849,667, Nov. 8, 1977, Pat. No. 4,148,370, which is a continuation-in-part of Ser. No. 577,836, May 15, 1975, abandoned. This application Jun. 12, 1992, Ser. No. 897,483
Claims priority, application Luxembourg, May 16, 1974, 70096; Feb. 14, 1975, 71849
Int. Cl.[5] A61K *7/09*
U.S. Cl. 424—72 **24 Claims**

1. A process for treating the skin comprising applying to the skin a cosmetic composition in an amount sufficient to impart a soft feeling to the skin and to assist in the hydration thereof, said cosmetic composition comprising in gel or emulsion form an aqueous phase and an emulsified oil phase, said aqueous phase containing in solution a quaternized polymer having recurring units of the formula



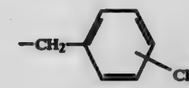
wherein

R is lower alkyl or $—CH_2—CH_2OH$;

R′ is alkyl, cycloalkyl or aralkyl containing a maximum of 20 carbon atoms, or R and R′ together with the nitrogen atom to which they are attached form a heterocycle capable of containing a heteroatom other than nitrogen;

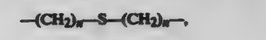
A is a divalent group selected from

o-, m- or p-xylylidene of the formula (1)



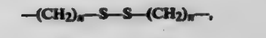
(2)

wherein x, y and t are whole numbers ranging from 0 to 11 such that the sum (x+y+t) is greater than or equal to 0 and lower than 18, and E and K represent hydrogen or alkyl having less than 18 carbon atoms,

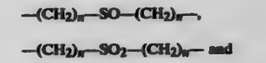


(3)

(4)



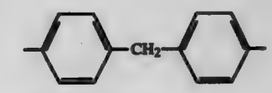
(5)



(6)

(7) and

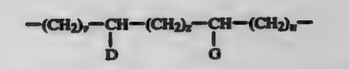
(8)



wherein n is equal to 2 or 3;

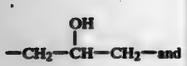
B represents a divalent group selected from

o-, m- or p-xylylidene of the formula (1)



(2)

wherein D and G represent hydrogen or alkyl having less than 18 carbon atoms and v, z and u are whole numbers ranging from 0 to 11, with two of v, z and u simultaneously being capable of being 0, such that the sum (v+z+u) is greater than or equal to 1 and lower than 18 and such that the sum (v+z+u) is greater than 1 when the sum (x+y+t) is equal to 0,



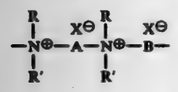
(3)

(4)

wherein n is 2 or 3; and

$X^{\ominus}$ is an anion derived from an organic or mineral acid, said polymer being present in an amount between 0.25 and 10 percent by weight of said composition.

23. A process for treating the skin comprising applying to the skin a composition comprising in a cosmetically acceptable vehicle suitable for application to the skin a quaternized polymer having recurring units of the formula



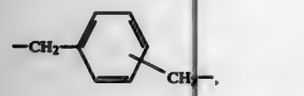
wherein

R is lower alkyl or $-CH_2-CH_2OH$;

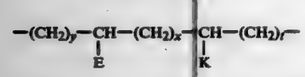
R′ is alkyl, cycloalkyl or aralkyl containing a maximum of 20 carbon atoms, or R and R′ together with the nitrogen atom to which they are attached form a heterocycle capable of containing a heteroatom other than nitrogen;

A is a divalent group selected from

o-, m- or p-xylylidene of the formula (1)



(2)



wherein x, y and t are whole numbers ranging from 0 to 11 such that the sum (x+y+t) is greater than or equal to 0 and lower than 18, and E and K represent hydrogen or alkyl having less than 18 carbon atoms,

$-(CH_2)_n-S-(CH_2)_n-$, (3)

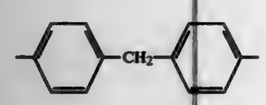
$-(CH_2)_n-O-(CH_2)_n-$, (4)

$-(CH_2)_n-S-S-(CH_2)_n-$, (5)

$-(CH_2)_n-SO-(CH_2)_n-$, (6)

$-(CH_2)_n-SO_2-(CH_2)_n-$ and (7)

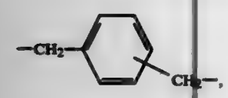
(8)



wherein n is equal to 2 or 3;

B represents a divalent group selected from

o-, m- or p-xylylidene of the formula



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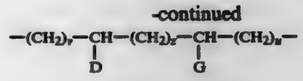
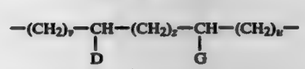


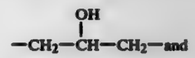
(2)

o-, m- or p-xylylidene of the formula (1)



(2)

wherein D and G represent hydrogen or alkyl having less than 18 carbon atoms and v, z and u are whole numbers ranging from 0 to 11, with two of v, z and u simultaneously being capable of being 0, such that the sum (v+z+u) is greater than or equal to 1 and lower than 18 and such that the sum (v+z+u) is greater than 1 when the sum (x+y+t) is equal to 0,



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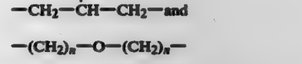


(4)

wherein n is 2 or 3; and

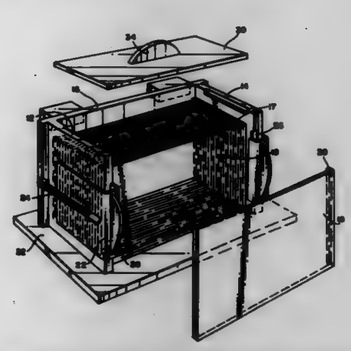
$X^{\ominus}$ is an anion derived from an organic or mineral acid, said quaternized polymer being present in an amount sufficient to impart a soft feeling to the skin and to assist in the hydration thereof.

5,196,190

SYNTHETIC SKIN SUBSTITUTES

Avinash Nangia, San Francisco, Calif., and Cheung-Tak Hung, Pine Hill, New Zealand, assignors to Zenith Technology Corporation, Limited, Dunedin, New Zealand

Filed Oct. 3, 1990, Ser. No. 607,128
Int. Cl.[5] A61L *15/06*; A61K *31/74*
U.S. Cl. 424—78.06 19 Claims



1. A membrane suitable for use as a synthetic skin substitute consisting essentially of a polyacrylamide network and a non-gellable polysaccharide dispersed evenly throughout said network, wherein said polymeric polyacrylamide network comprises acrylamide monomers cross-linked together by a cross-linking agent and wherein the membrane has a water absorptive capacity greater than of a membrane which includes an amount of a gellable polysaccharide in substitution for the same amount of non-gellable polysaccharide, but which is otherwise the same.

5,196,191

TEMPORAL GAMMA-INTERFERON ADMINISTRATION FOR ALLERGIES

Paula M. Jardieu, Belmont, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 325,406, Mar. 17, 1989, Pat. No. 5,112,605. This application Oct. 10, 1991, Ser. No. 774,429
The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.
Int. Cl.[5] A61K *37/66*
U.S. Cl. 424—85.5 20 Claims

1. A method for the prophylaxis and amelioration of an allergic response to an airborne allergen in a patient known to be susceptible to such response, which comprises administering a therapeutically effective dose of gamma interferon to the patient within a temporal period extending from about 4 days prior to about 4 days following exposure to the allergen, which period is sufficient to suppress the allergic response in such patient upon subsequent exposure to the allergen.

5,196,192

ACTIONS OF HORMONES

David M. De Kretser; David M. Robertson, and mark P. Hedger, all of Victoria, Australia, assignors to Biotechnology Australia Pty. Ltd., East Roseville; Monash University, Clayton; St. Vincent's Institute of Medical Research, Fitzroy and Monash Medical Centre, Melbourne, all of Australia

PCT No. PCT/AU89/00245, § 371 Date Apr. 2, 1990, § 102(e) Date Apr. 2, 1990, PCT Pub. No. WO89/11862, PCT Pub. Date Dec. 14, 1989
PCT Filed May 31, 1989, Ser. No. 459,704
Claims priority, application Australia, May 31, 1988, P18534; Nov. 15, 1988, PJ1470
Int. Cl.[5] A61K *37/04, 37/02*
U.S. Cl. 424—85.8 7 Claims

1. A method for treating a host having autoimmune disease, comprising immunizing the host with a composition of matter comprising a substance selected from the group consisting of inhibin, and inhibin composition, the alpha subunit of inhibin, an alpha subunit composition, and combinations thereof, in an amount effective to treat the autoimmune disease.

5,196,193

ANTIVENOMS AND METHODS FOR MAKING ANTIVENOMS

Sean B. Carroll, Cottage Grove, Wis., assignor to Ophidian Pharmaceuticals, Inc., Madison, Wis.

Filed Oct. 31, 1989, Ser. No. 429,791
Int. Cl.[5] A61K *39/395*
U.S. Cl. 424—85.8 31 Claims

1. A composition comprising purified polyvalent antivenom, comprised of immunoglobulin of which greater than fifty percent is venom-reactive, derived from a first polyvalent antivenom having two or more monovalent subpopulations, purified such that greater than fifty percent of said monovalent subpopulations are recovered by weight.

5,196,194

VACCINES CONTAINING HEPATITIS B S-PROTEIN

William J. Rutter, and Howard M. Goodman, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 513,055, Jul. 12, 1983, abandoned, which is a continuation of Ser. No. 107,267, Dec. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 41,909, May 24, 1979, abandoned. This application Dec. 7, 1984, Ser. No. 679,621
Int. Cl.[5] A61K *39/29*; C07K *13/00*; C12N *15/51*
U.S. Cl. 424—89 5 Claims

1. A vaccine against hepatitis B consisting essentially of a sterile, physiologically acceptable diluent and a purified, non-glycosylated antigen free from other HBV surface antigen forms consisting essentially of full length hepatitis B S-protein having an amino acid sequence of 226 amino acids wherein said S-protein is recombinantly produced by expressing a recombinant DNA sequence encoding said S-protein.

5,196,195

USE OF ARGINASE TO CONTROL NITRIC OXIDE FORMATION

Owen W. Griffith, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 27, 1990, Ser. No. 499,610
Int. Cl.[5] A61K *37/54, 37/48*
U.S. Cl. 424—94.6 6 Claims

1. A method for limiting nitric oxide production in a subject in need of such limiting, said method comprising parenterally administering an amount of a plasma arginine depleting enzyme to effect reduction of plasma level of arginine to a nitric oxide production limiting level.

5,196,196

USE OF PROTEASE NEXIN-I IN WOUND DRESSINGS

Randy W. Scott, Sunnyvale, Calif., and Richard A. Berg, Lambertville, N.J., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Division of Ser. No. 505,442, Apr. 5, 1990, Pat. No. 5,112,608, which is a continuation-in-part of Ser. No. 25,450, Mar. 13, 1987, which is a continuation-in-part of Ser. No. 871,501, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 870,232, Jun. 3, 1986, abandoned. This application Jan. 16, 1992, Ser. No. 821,989
The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.
Int. Cl.[5] A61K *37/547*; A61L *15/00*; A61F *13/00*; C12N *11/14*
U.S. Cl. 424—94.64 10 Claims

1. A wound dressing, comprising:

a support base; and

a therapeutically effective amount of purified protease nexin-I thereon.

5,196,197
REVERSIBLE FERTILITY CONTROL FOR PREVENTION OF PREGNANCY IN FEMALES
Gurunam P. Talwar; Shakti Upadhyay; Charu Kanabic; Amarjeet Singh, and Madan G. Sharma, all of New Delhi, India, assignors to National Institute of Immunology, New Delhi, India
Filed Aug. 28, 1990, Ser. No. 574,307
Int. Cl.[5] A61K 35/78
U.S. Cl. 424—195.1 8 Claims

1. An antifertility agent comprising neem oil and a reetha extract wherein the neem oil is present in a concentration of about 10%–25% weight/weight and the concentration of the reetha extract is about 0.5–1% weight/weight.

5,196,198
PARENTERAL NUTRITION PRODUCT
Howard L. Shaw, Deerfield, and William D. Leathem, Lindenhurst, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Continuation of Ser. No. 458,858, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 360,966, Jun. 2, 1989, abandoned. This application Jun. 16, 1992, Ser. No. 899,821
Int. Cl.[5] A61K 37/78, 31/20
U.S. Cl. 424—195.1 6 Claims

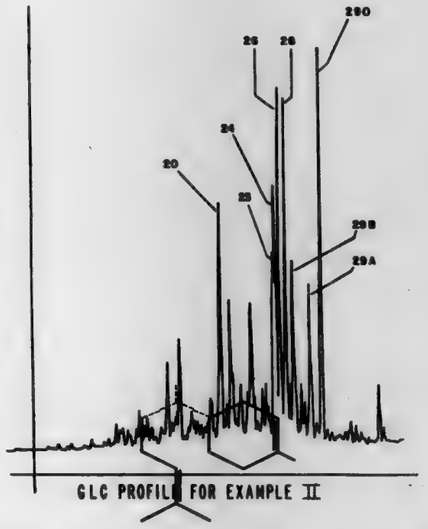
1. A parenteral nutritional composition that contains fatty acids, wherein such fatty acids are present in an amount from about 2 to about 30 weight percent calculated as triglycerides where from about 1 to about 25 weight percent of said fatty acids is gamma-linolenic acid provided by an oil having a weight percent ratio of linoleic acid to gamma-linolenic acid less than 2 and where the weight percent ratio of gamma-linolenic acid to linoleic acid in said fatty acids is about 0.05 to about 1.50.

5,196,199
HYDROPHILIC FORM OF PERFLUORO COMPOUNDS AND METHOD OF MANUFACTURE
Richard C. Fuisz, Washington, D.C., assignor to Fuisz Technologies Ltd., Chantilly, Va.
Filed Dec. 14, 1990, Ser. No. 627,693
Int. Cl.[5] A61K 47/26, 31/02, 31/025, 9/10
U.S. Cl. 424—401 24 Claims

1. A perfusion product containing a combination of a perfluoro compound and a sugar, said combination spun into a mass of fibers, wherein said product is water-dispersible, and such that when said product is added to an aqueous medium free from any emulsifying agent a colloidal dispersion is formed.

5,196,200
BISABOLENE-CONTAINING COMPOSITION, PROCESS FOR PREPARING SAME, ORGANOLEPTIC USES THEREOF AND USES THEREOF AS INSECT REPELLENT
Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel; Michael J. Zampino, Roselle Park, all of N.J., and Jerry F. Butler, Gainesville, Fla., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.
Continuation of Ser. No. 691,635, Apr. 25, 1991, abandoned. This application Mar. 6, 1993, Ser. No. 847,342
Int. Cl.[5] A01N 25/34, 27/00
U.S. Cl. 424—411 4 Claims

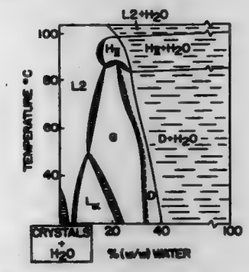
1. A method of repelling at least one of the insect species:
(a) *Musca Domestica* L.(Diptera:Muscidae); and/or
(b) *Aedes aegypti*
from a three dimensional space inhabited by at least one of said insect species comprising the step of exposing said three dimensional space inhabited by at least one of said insect species to a:
(a) *Musca domestica* L.(Diptera:Muscidae); and/or
(b) *Aedes aegypti*
repelling concentration and quantity of an insect repellent composition of matter consisting essentially of bisabolene isomers defined according to the structure:



GLC PROFILE FOR EXAMPLE II

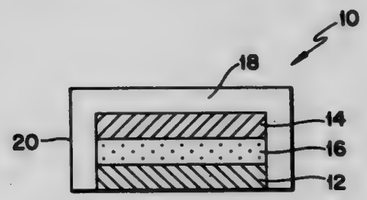
wherein in the mixture in each of the compound one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond.

5,196,201
IMPLANT MATERIAL COMPOSITION, PREPARATION THEREOF AS WELL AS USES THEREOF AND IMPLANT PRODUCT OBTAINABLE THEREFROM
Kare Larsson, Björred, and Hakan Hakansson, Lund, both of Sweden, assignors to Biocapatite AB, Malmo, Sweden
Continuation-in-part of Ser. No. 424,417, Oct. 20, 1989, abandoned. This application Oct. 19, 1990, Ser. No. 600,335
Int. Cl.[5] A61F 2/28
U.S. Cl. 424—422 35 Claims



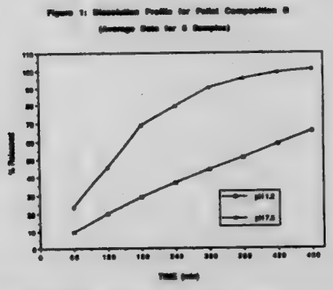
1. An implant material composition for restoring bone tissue in a human or animal body comprising a solid biocompatible bone tissue substitute material, said bone tissue substitute material comprising a material selected from the group consisting of minerals, ceramics and metals, and said bone tissue substitute material being distributed in a bioacceptable mixture of
(a) a water-based liquid and
(b) a monoglyceride,
said mixture forming an L2-phase or a lamellary liquid phase, and said (a) and (b) being present in such proportions that said L2 or lamellary phase is capable of being transformed into a cubic liquid crystalline phase or a reversed hexagonal crystalline phase when contacted with an aqueous liquid.

5,196,202
SUSTAINED RELEASE DOSAGE FORM
Ryoji Konishi, Kagawa, Japan, assignor to Teikoku Seiyaku Kabushiki Kaisha, Japan
Division of Ser. No. 90,916, Aug. 31, 1987, Pat. No. 4,889,720. This application Oct. 2, 1989, Ser. No. 415,769
Claims priority, application Japan, Sep. 1, 1986, 61-206590
Int. Cl.[5] A61K 9/24
U.S. Cl. 424—448 3 Claims



1. A method for preparing a controlled release form for the controlled release of an active substance, said dosage form including an adhesive layer, a reservoir containing the active substance, and a controlled release layer in contact with the reservoir, the method comprising the steps of placing said controlled release layer around a first portion of the reservoir, placing a layer impermeable to the passage of said active substance around the remaining portion of the reservoir and placing the adhesive layer over said impermeable layer wherein the impermeable layer is interposed between the reservoir and the adhesive layer.

5,196,203
THEOPHYLLINE DOSAGE FORM
Garth Boehm, Adelaide, Australia, assignor to F. H. Faulding & Co. Limited, Salisbury South, Australia
Continuation of Ser. No. 457,198, Dec. 29, 1989, abandoned. This application Sep. 27, 1991, Ser. No. 767,342
Claims priority, application Australia, Jan. 6, 1989, PJ2191
Int. Cl.[5] A61K 9/24, 9/58
U.S. Cl. 424—469 14 Claims



1. A pH-dependent sustained release pharmaceutical pellet composition for administration to a patient at a predetermined dosage and interval which comprises: a core element containing a therapeutically effective amount of methylated xanthine or a salt thereof as the active ingredient and a coating on said core element which comprises the following components:
(a) at least 40% of a matrix polymer which is insoluble at a pH of from 1 to 7.5 and contributes to the control of the rate of release of the active ingredient in the stomach and intestines;
(b) from 1 to 30% of an enteric polymer which is substantially insoluble at a pH of from 1 to 4, sufficient to delay the release of the active ingredient in the stomach, but which is soluble at a pH of from 6 to 7.5 so as not to substantially delay release in the intestines;
(c) from 1 to 60% of a compound soluble at a pH of from 1 to 4, sufficient to enable initiation of release of the active ingredient in the stomach; said percentages being by weight based on total weight of components (a), (b), and (c); the ratio of the components (a), (b), and (c) in said coating being effective to allow the initiation of the release of the active ingredient in the stomach at a slow rate and to control the release in the intestines at a rate faster than that in the stomach such that a dose of the pellet composition delivers to the patient a therapeutically effective amount of said active ingredient over the course of said predetermined interval, said coated core element having a diameter of from 510 to 2400 microns.

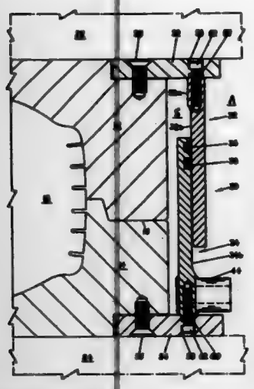
5,196,204
SPIDER TOXINS AND METHODS FOR THEIR USE AS BLOCKERS OF CALCIUM CHANNELS AND AMINO ACID RECEPTOR FUNCTION
J. R. Hunter Jackson, and Thomas N. Parks, both of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah
Continuation of Ser. No. 523,608, May 11, 1990, Pat. No. 5,064,657, which is a continuation of Ser. No. 921,218, Oct. 20, 1986, Pat. No. 4,925,664. This application Nov. 12, 1991, Ser. No. 791,010
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] C07K 15/00; A61K 35/56
U.S. Cl. 424—538 8 Claims

1. A composition functioning as an excitatory amino acid receptor blocker comprising at least one toxin extracted from the *Hololena curta* spider, said at least one toxin being capable of functioning as an excitatory amino acid receptor blocker.

5,196,205
METHOD FOR TREATMENT OF GASTRO INTESTINAL DISORDERS
Thomas J. Borody, 144 Great North Rd., Five Dock, Australia 2046
PCT No. PCT/AU88/00379, § 371 Date Jun. 12, 1990, § 102(e) Date Jun. 12, 1990, PCT Pub. No. WO86/05981, PCT Pub. Date Oct. 23, 1986
PCT Filed Sep. 29, 1988, Ser. No. 466,310
Claims priority, application Australia, Oct. 12, 1987, PI4838; Dec. 18, 1987, PI5985; Mar. 30, 1988, PI7513
Int. Cl.[5] A01N 59/16, 37/18, 13/50; A61K 31/43
U.S. Cl. 424—653 3 Claims

1. A method of preventing recurrence of duodenal ulcer associated with *Campylobacter pylori* infection in a patient suffering from duodenal ulcer disease associated with *Campylobacter pylori* infection, said method comprising administering to said patient *Campylobacter pylori* infection eradicating amounts of pharmaceutically acceptable bismuth compound, first antibiotic selected from the group consisting of tetracycline and penicillins and second antibiotic which is metronidazole.

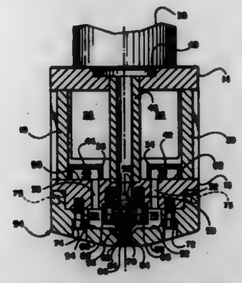
5,196,206
VACUUM HEAT SHIELD
Phillip P. Trola, Bath; Joe F. Scantland, and Thomas A. Flory, both of Akron, all of Ohio, assignors to Scantland Industries Inc., Copley, Ohio
Filed Nov. 26, 1991, Ser. No. 800,446
Int. Cl.[5] B29C 33/00
U.S. Cl. 425—28.1 7 Claims



1. An apparatus comprising:
(a) first and second mating mold halves which are reciprocable relative to one another between an open position and a closed position and which when in said closed position are in mating engagement along a parting line and enclose a mold cavity;
(b) a first shield member fixedly secured to said first mold half and surrounding said first mold half in spaced relationship;
(c) a second shield member fixedly secured to said second mold half and surrounding said second mold half in spaced relationship;
said first and second shield members being relatively reciprocable with respect to each other,
said first and second shield members together enclosing a space surrounding said mold halves; and
(d) sealing means forming a vacuum tight seal between said first and second shield members, whereby air flow between said space surrounding said mold halves and the atmosphere outside said shield members is prevented and heat transfer to said atmosphere is reduced.

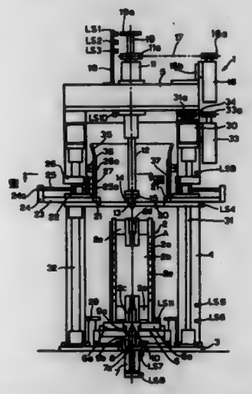
5,196,207
MELTBLOWN DIE HEAD
Robert J. Koenig, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jan. 27, 1992, Ser. No. 826,332
Int. Cl.[5] B29C 47/12
U.S. Cl. 425—72.2 8 Claims

1. A meltblown die head comprising:
a. an elongated support member comprising:
i. a box beam with sides and ends defining a gas reservoir, wherein
(a) the gas reservoir has at least one gas inlet for introducing heated gas into the gas reservoir, and
(b) the gas reservoir has gas outlets for exhausting gas from the gas reservoir; and
ii. a polymer feed tube extending through the gas reservoir and terminating in a longitudinally extending feed groove along one side of the box beam; and
b. a detachable meltblown die assembly attached to the side of the box beam having the feed groove and comprising:
i. a die tip in communication with the feed groove for receiving polymer from the feed tube; and
ii. gas plates on either side of the die tip forming gas delivery channels, said channels being in communication with the gas outlets of the gas reservoir; and



c. at least one internal expansion chamber in the box beam in communication with the gas reservoir by a first series of holes and in communication with the meltblown die assembly via the gas outlets which comprise a second series of holes.

5,196,208
APPARATUS FOR REMOVING CYLINDRICAL MOLDINGS FROM MOLDS
Shin-ichi Kaji, and Kouji Watanabe, both of Kobe, Japan, assignors to Bando Kagaku Kabushiki Kaisha, Kobe, Japan
Filed Jul. 16, 1991, Ser. No. 730,557
Claims priority, application Japan, Jul. 23, 1990, 2-194159
Int. Cl.[5] B29C 39/36, 43/02, 43/50
U.S. Cl. 425—90 4 Claims



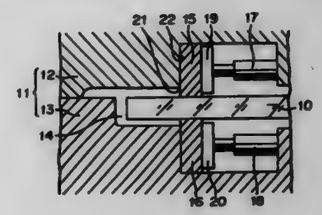
1. A mold removing apparatus for cylindrical moldings, said apparatus comprising a mold having a circumferential wall forming an external circumferential surface for supporting a molding thereon, said molding having at least one end face, said mold being hollow, having center bores at the center of both the top and the bottom thereof, and having a plurality of small through holes in said circumferential wall, a mold lifting apparatus which includes, positioning pieces which are insertable into said respective center bores of said mold, said pieces holding said mold between the top and the bottom to raise the mold to the specified elevations, a pressurized fluid inlet port which is provided in said positioning pieces to introduce a pressurized fluid into said cavity of said mold, a mold removing means including a plurality of teeth which are arranged to move towards or away from said outer circumferential surface of said mold, said teeth being capable of contacting or closing to the outer circumferential surface of said mold to engage said end face of said molding, a lifting mechanism for lifting or lowering said mold removing stage in the axial direction of said mold, and a mold transferring machine for delivering the mold to and discharging the mold from said mold lifting apparatus.

5,196,209
MAKING A PRESTRESSED CONCRETE BEAM
Frithjof Schimpff, Wiesbaden, Fed. Rep. of Germany, assignor to Wayss & Freytag AG, Frankfurt a.M., Fed. Rep. of Germany
Filed Jan. 14, 1991, Ser. No. 641,157
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1990, 4000729
Int. Cl.[5] B28B 23/06
U.S. Cl. 425—111 4 Claims

1. A system for making a prestressed concrete beam, the system comprising:
a longitudinally extending mold having end walls having inner faces;
respective rigid end plates juxtaposed with the inner faces of the mold end walls, each formed with at least one longitudinally throughgoing hole, and having longitudinally outwardly directed outer faces;
at least one longitudinally extending reinforcing rod extending longitudinally in the mold and having opposite ends projecting longitudinally outward through the respective holes in the end plates, the rods being provided longitudinally outward of the outer faces with respective laterally projecting heads, the holes in the end plates being wide enough that the rod heads can pass longitudinally through them;
respective latching elements each forming a cutout snugly engageable around the respective rod between the outer face of the respective plate and the respective head, whereby the latching elements brace the rod heads longitudinally inward against the plate outer faces; and
means for applying longitudinally opposite outward traction to the end plates to tension the rods, whereby when the rods are tensioned a mass of concrete can be filled into the mold around the rods and between the plates and this mass can be cured, the elements being laterally removable from between the rod heads and the respective end plates after curing of the concrete to allow the plates to be separated from the rods.

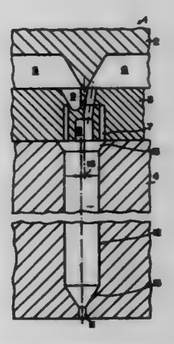
5,196,210
SHAPING MOLD FOR PREPARING A WINDOW GLASS WITH A GASKET
Noriyuki Yoshihara; Yoshio Honaka, both of Yokohama; Shigehito Shibata, Sagamihara, and Nobuaki Kuni, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan
Division of Ser. No. 390,218, Aug. 7, 1989, Pat. No. 5,061,429. This application Apr. 8, 1991, Ser. No. 681,341
Claims priority, application Japan, Aug. 9, 1988, 63-197075
Int. Cl.[5] B29C 39/10
U.S. Cl. 425—116 2 Claims

1. A shaping mold for preparing window glass comprising a glass sheet with a gasket formed at its peripheral portion which consists of at least two mold parts to provide an inner cavity when assembled, wherein at least one of said two mold parts is provided with a resilient sealing member which is in contact with a surface of a glass sheet placed in said inner cavity so as to define a gasket forming cavity from said inner cavity, and a



pushing means for pushing said resilient sealing member to an inner cavity wall of the shaping mold no earlier than the time of assembling said shaping mold and said glass sheet and only in a direction other than perpendicular to the surface of said glass sheet.

5,196,211
APPARATUS FOR SPINNING OF CORE/SHEATH FIBERS
Gunter Goossens, Trin, Switzerland, assignor to EMS-Inventa AG, Tokyo, Japan
Continuation of Ser. No. 555,069, Jul. 18, 1990, abandoned. This application Apr. 14, 1992, Ser. No. 869,890
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1989, 3923923; Aug. 30, 1989, 3928740
Int. Cl.[5] B29C 47/04
U.S. Cl. 425—131.5 7 Claims



1. A pack for spinning core/sheath fiber from a plurality of

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fiber-forming materials, said pack comprising a distributor, a spinneret plate and a separating plate therebetween, said distributor having, for each fiber, at least one first chamber for supplying at least one sheath material, at least one second chamber for supplying at least one core material, at least one first conduit and at least one second conduit, said first conduit being adapted to convey said sheath material from said at least one first chamber in a downstream direction, said second conduit being adapted to convey said core material from said at least one second chamber in said downstream direction,

said separating plate comprising, for each fiber, a single core cavity and an annulus of constant width, said annulus having an annular diameter and surrounding said core cavity, a sheath channel fluidly connecting said first conduit to said annulus whereby said sheath material is supplied to said annulus substantially around the entire circumference thereof, said sheath material being transported through said annulus to form a fiber sheath; a core channel fluidly connecting said second conduit to said single core cavity, whereby said core material is transported through said core cavity to form a single fiber core,

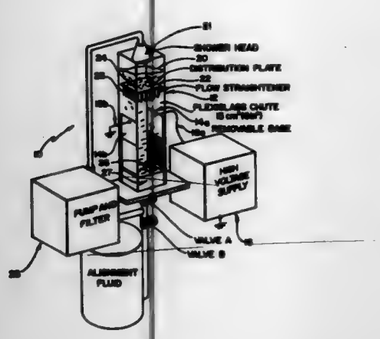
said spinneret plate comprising, for each fiber, an exit channel having a die capillary at a downstream end, said exit channel being fluidly connected to said annulus and said core cavity at an upstream end of said exit channel said exit channel having an entry portion at said upstream end, said entry portion having an entry diameter greater than said annular diameter, and said die capillary having a die diameter, whereby said sheath formed by said annulus and said core formed by said core channel are co-extruded through said die capillary to form said core/sheath fiber.

5,196,212

ELECTRIC ALIGNMENT OF FIBERS FOR THE MANUFACTURE OF COMPOSITE MATERIALS

Gerald M. Knobbach, 2421 Bresser Ct., Roseville, Minn. 55113

Division of Ser. No. 520,666, May 8, 1990, Pat. No. 5,057,253. This application Aug. 12, 1991, Ser. No. 743,782
Int. Cl.[5] B29C *35/08*
U.S. Cl. 425—174.8 R 8 Claims



1. An apparatus for aligning prepreg rods for the manufacture of composite materials comprising:

a) an alignment tank having a top and a conductive bottom;

b) alignment fluid disposed within said tank having a density less than that of the prepreg rods;

c) a source of high voltage; and

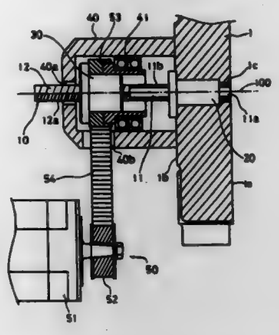
d) a plurality electrodes, including at least one generally vertical rod electrode, disposed in said tank and electrically connected to said source of high voltage, said plurality of electrodes being arranged such that upon application of said high voltage, an electric field is generated between said plurality of electrodes and said prepreg rods are aligned relative to said field into a desired prepreg rod alignment as said prepreg rods fall by gravity through said alignment fluid from the top of said alignment tank toward said conductive bottom.

5,196,213

EJECTOR MECHANISM IN AN INJECTION MOLDING MACHINE

Kikuo Watanabe; Ryuji Tai, both of Oshino, and Masaki Murasaka, Tokyo, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP91/00294, § 371 Date Nov. 27, 1991, § 102(e) Date Nov. 27, 1991, PCT Pub. No. WO91/14561, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 5, 1991, Ser. No. 777,362
Claims priority, application Japan, Mar. 29, 1990, 2-78742
Int. Cl.[5] B29C *45/40*
U.S. Cl. 425—556 3 Claims



1. An ejector mechanism installed in an injection molding machine having a movable platen, comprising:

a ball screw-spline shaft having a ball screw portion, a spline portion integral with said ball screw portion, and a distal end portion extending through the movable platen and serving as a molded article-ejecting portion;

a ball nut threadedly engaged with said ball screw portion;

a spline nut spline-fitted on said spline portion; and

a drive mechanism;

wherein one of said ball nut and said spline nut is fixed to the movable platen, and the other of said ball nut and said spline nut is rotatably supported by the movable platen and drivingly coupled to said drive mechanism.

5,196,214

WATER SOLUBLE TEA EXTRACTS

Eldon C. Lee, New Milford, Conn., assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 534,978, Jun. 7, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 806,812
Int. Cl.[5] A23F *3/18*
U.S. Cl. 426—52 5 Claims

1. A process for obtaining water-soluble tea extracts comprising hydrolyzing spent tea residues with cellulase in water at a temperature of from 30° C. to 65° C. and at a pH of from 3 to 7, wherein the spent tea residues have been obtained form tea leaves extracted with hot water, to obtain an aqueous extract containing soluble hydrolyzed spent tea residues, separating insoluble residue from the extract, hydrolyzing the insoluble residue with a protease in water to obtain a second aqueous extract containing soluble hydrolyzed spent tea residue and then separating the second extract from insoluble residue.

5,196,215

CAVITY FORMING AGENT FOR EDIBLE FOODS

Kazuaki Yokoyama, Chiba; Kiyomi Taniguchi, Koshigaya; Hisao Sekiguchi, Tokyo, and Tomiatsu Kaneko, Ichikawa, all of Japan, assignors to Myoshi Oil & Fat Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 585,774, Sep. 20, 1990, abandoned. This application Dec. 20, 1991, Ser. No. 814,192
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—94 7 Claims

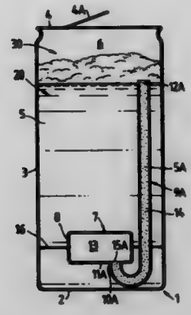
1. A cavity forming agent for edible foods wherein the food is selected from the group consisting of cakes and breads comprising by weight 10% to 30% edible oils and fats, 2% to 25% polysaccharides, 0.1% to 5% edible emulsifiers, 40% to 88% water, and being free of proteins to the extent that the cavity forming agent does not form a hard film when baked.

5,196,216

BEVERAGE PACKAGE

Francis J. Lynch, Glenageary, and Joseph B. Whyte, Lucan, both of Ireland, assignors to Guinness Brewing Worldwise Limited, London, Great Britain

Filed Jan. 18, 1992, Ser. No. 900,854
Claims priority, application United Kingdom, Jan. 25, 1991, 9113649; Jan. 29, 1992, 92300759
Int. Cl.[5] B65D *1/24, 85/72*
U.S. Cl. 426—112 11 Claims



1. A beverage package comprising a sealed container having a primary chamber containing beverage having gas in solution therewith and forming a primary headspace comprising gas at a pressure greater than atmospheric; a secondary chamber containing gas at a pressure greater than atmospheric and having a restricted orifice which communicates with an intermediate chamber containing beverage, said intermediate chamber opening to the primary chamber at a position remote from the bottom of the beverage in the primary chamber, and wherein said package is openable to open the primary headspace to atmospheric pressure and said opening creates a pressure differential causing gas and/or beverage in the secondary chamber to be ejected by way of the restricted orifice into the beverage in the intermediate chamber and said ejection causes gas in solution to be evolved from the beverage in the intermediate chamber for forming froth in the primary headspace.

5,196,217

Patent Not Issued For This Number

5,196,218

MICROWAVE TOASTING OF UNPUFFED R-T-E CEREALS

Edward C. Schwab, New Brighton, and George E. Brown, Edina, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 744,546, Aug. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 726,591, Jul. 5, 1991, abandoned. This application Jan. 18, 1992, Ser. No. 899,574
Int. Cl.[5] A23L *1/00*; A21D *15/00*
U.S. Cl. 426—241 44 Claims

1. A method for toasting an unpuffed R-T-E cereal base to improve its flavor and texture, comprising the step of:

subjecting an unpuffed R-T-E cereal base to a high intensity microwave field for a sufficient period of time to toast the cereal base to provide a toasted R-T-E cereal base,

wherein the microwave field has a field strength of about 125–350 V/cm.

5,196,219

METHOD FOR PRODUCING A MICROWAVE BROWNING COMPOSITION

Chern J. Hsu, Alhambra, and Nicholas Melachouris, Westlake Village, both of Calif., assignors to Nestec S.A., Vevey, Switzerland

Filed Sep. 24, 1990, Ser. No. 587,082
Int. Cl.[5] A23B *5/00*; A23L *1/00*
U.S. Cl. 426—302 21 Claims

1. A method of producing a microwave browning composition for a food product having a dough crust which consists essentially of

spray drying an aqueous solution containing reducing sugar and milk protein to form a dried powder containing Amadori rearrangement products in which at least about 15% of the lysine content of the milk protein is present as blocked lysine, and

reconstituting the spray dried powder with an aqueous medium to form a solution which when coated onto the surface of a dough crust undergoes a browning reaction upon microwave heating.

5,196,220

FOAM-STABILIZED MALT BEVERAGE

Kenneth Clare, deceased, late of Vista by Jean Clare, legal representative , and Margaret A. Lawson, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 23, 1990, Ser. No. 527,453
Int. Cl.[5] C12C *5/02*
U.S. Cl. 426—329 16 Claims

1. A process for improving the foam properties of a fermented malt beverage comprising adding to said beverage

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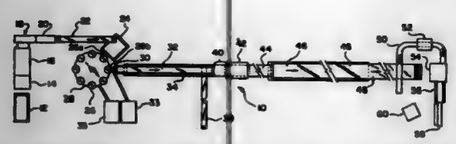
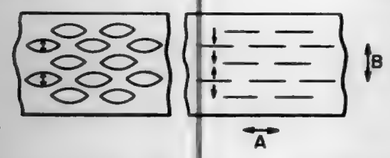
gellan gum and a cold-water soluble protein, in a combined amount of about 5–400 ppm by weight of said beverage.

5,196,221
PROCESS FOR INHIBITING THE GROWTH OF BACTERIA ON SEAFOOD
Thomas J. Montville, North Brunswick, and Donna M. Curran, East Brunswick, both of N.J., assignors to Rutgers University, New Brunswick, N.J.
Filed Feb. 8, 1990, Ser. No. 477,328
Int. Cl.[5] A23B *4/027*
U.S. Cl. 426—332 15 Claims

1. A process for inhibiting the microbial spoilage of fresh seafood which comprises immersing the seafood in an aqueous solution containing an alkali metal bicarbonate in a concentration of from about 3 percent by weight up to saturation for a period of up to about eight hours to inhibit the growth of bacteria wherein said alkali metal bicarbonate is selected from the group consisting of ammonium bicarbonate and mixture of ammonium bicarbonate and sodium bicarbonate in weight ratios of from about 1:1 to about 1:15.

5,196,222
METHOD FOR PEELING FRESH FRUIT
William Kirk, Alta Loma, Calif., assignor to Sunkist Growers, Inc., Ontario, Calif.
Division of Ser. No. 689,634, Apr. 23, 1991. This application Nov. 20, 1991, Ser. No. 795,365
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—482 11 Claims

1. The method for peeling fruit having a meat and a peel attached thereto covering said meat, comprising the steps of:
providing access to at least a portion of said fruit between the outer surface of said peel and said meat;
slitting the outer surface of said peel about at least a portion of the circumference thereof;
disposing a fluid in said portion of said fruit between the outer surface of said peel and said meat to weaken attachment of said peel to said meat; and
removing said peel from said meat.

5,196,223
METHOD OF PRODUCING PIE DOUGH HAVING SLITS
Yasuhiro Nakamura, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan
Filed Dec. 27, 1991, Ser. No. 814,351
Claims priority, application Japan, Jan. 11, 1991, 3-12524
Int. Cl.[5] A23D *8/02*
U.S. Cl. 426—503 3 Claims



1. A method of producing a pie dough sheet comprising the steps of stretching a dough sheet, laminating the dough sheet by alternately folding it in two opposite directions normal to its traveling direction, stretching the laminated dough sheet, and, if necessary, repeating the laminating and stretching processes, wherein the degree of stretching of the finally stretched dough sheet in the lateral direction is different from the degree of stretching in the lengthwise direction of the dough sheet, said method including making slits in the stretched dough sheet in a direction normal to the direction in which the dough sheet has a higher degree of stretching.

5,196,224
SUBSTITUTED THIOPHENES, AND FLAVORING AND PERFUME COMPOSITIONS AND FLAVORED AND PERFUMED PRODUCTS WHICH CONTAIN ONE OR MORE SUBSTITUTED THIOPHENES
Henry L. A. Van den Heuvel, Bussum, and Paulus P. J. M. Jaegers, Hilversum, both of Netherlands, assignors to Naarden-International N.V., Naarden-Bussum, Netherlands
Continuation of Ser. No. 69,119, Jul. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 901,433, Aug. 28, 1986, abandoned. This application Jun. 20, 1991, Ser. No. 717,994
Claims priority, application Netherlands, Sep. 16, 1985, 8592530
Int. Cl.[5] A23L *1/235*
U.S. Cl. 426—535 4 Claims

1. A flavoring composition comprising greater than 0.03% of one or more compounds of the formula

wherein the dotted lines represent single or double bounds, with the provisos that no more than two of the dotted lines represent double bonds, and no two double bonds are adjacent; together with
(a) at least one additional flavoring substance; and
(b) customary auxiliary materials.

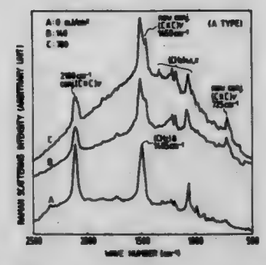
5,196,225
PREPARED FOOD PRODUCT WITH SWEET CORN AND METHOD OF PREPARING SAME
Raymon W. Lash, 205 N. Broadway, Bloomfield, Nebr. 68718
Filed Jun. 20, 1990, Ser. No. 541,263
Int. Cl.[5] A23L *1/10*
U.S. Cl. 426—560 7 Claims

1. A method for improving a prepared food product selected from the group consisting of tortilla chips, taco shells, flour, cornmeal, corn flakes cereal and corn oil, and made with ingredients including ground field corn, comprising,
providing the ingredients for said prepared food product,
providing mature sweet corn,
grinding said mature sweet corn to produce ground sweet corn,
substituting said ground sweet corn for at least a portion of the ground field corn ingredient of said food product, and
preparing said food product with said mature ground sweet corn.

5,196,226
POWDERY FOAMING AGENT
Hiroshi Sakka, Hirakata; Yuzo Ikenoe, Neyagawa, and Tetsuro Fukuda, Yotsukaido, all of Japan, assignors to Riken Vitamin Co., Ltd., Tokyo, Japan
Filed Nov. 4, 1991, Ser. No. 787,789
Claims priority, application Japan, Apr. 23, 1991, 3-119296
Int. Cl.[5] A23L *1/035;* A21D *2/16*
U.S. Cl. 426—564 4 Claims

1. A powdery foaming agent comprising, as essential ingredients, about 25–35% by weight of a mixture of saturated monoglyceride and saturated diglycerine monoester, said mixture having a weight ratio of from 1:0.5 to 1:5.5 monoglyceride:saturated diglycerine monoester, 0.5 to 4% by weight of lecithin and 0.2 to 5% by weight polyphosphate.

5,196,227
METHOD FOR MAKING OPTICAL RECORDING MEDIUMS
Kazufumi Ogawa, Osaka; Hidekazu Tamura, Tokyo, and Norihisa Mino, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 4, 1989, Ser. No. 389,395
Claims priority, application Japan, Aug. 5, 1988, 63-196569
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427–512 24 Claims



1. A method for making an optical recording medium, comprising
(a) immersing a substrate having a hydrophilic surface in a non-aqueous solution of a substance having a —C≡C—C≡C— diacetylene group and a —Si—Cl group in an organic solvent to form a monomolecular film of the substance on the substrate by chemical adsorption between the hydrophilic surface and the Si—Cl group; and
(b) irradiating the thus immersed substrate with an energy beam to activate and polymerize the diacetylene groups in the monomolecular film thereby forming a recording layer, whereby the monomolecular film serving the recording layer has a polydiacetylene bonding assuming a certain color which is capable of undergoing a photochromic color change on irradiation with a light energy beam and is aligned under the substrate
wherein said substrate is an aluminum substrate whose surface is oxidized or a semiconductive Si substrate provided with an SiO_2 surface layer.

5,196,228
LASER RESISTANT ELASTOMER COMPOSITION AND USE IN COATING PROCESS
John S. Kirby, Laguna Beach, and Robert F. Reizer, Stanton, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Feb. 17, 1984, Ser. No. 581,186
Int. Cl.[5] B05D *3/06, 3/02;* C08L *83/06*
U.S. Cl. 427–515 15 Claims

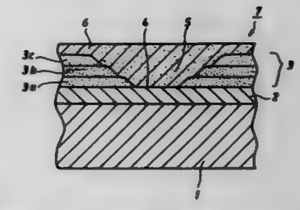
1. An elastomeric composition having high resistance to laser radiation and thermal radiation, said composition forming a substantially white char when subjected to high intensity laser radiation or thermal radiation, which consists essentially of a phenylpolysiloxane and titanium dioxide as additive in an amount of about 21 parts to 100 parts of said phenylpolysiloxane, and substantially free of calcium carbonate or alumina.

3. A process for protecting the surfaces of an object from laser radiation and thermal radiation, which comprises applying to said object a composition which consists essentially of a polysiloxane and an additive selected from the group consisting of titanium dioxide, boron nitride, and mixtures thereof, in a proportion of about 10 to about 30 parts of said additive per 100 parts of said polysiloxane, curing said composition and subjecting said cured composition to high intensity laser radiation or thermal radiation, and converting said cured composition to a substantially white char which is effectively reflective to laser radiation and to thermal radiation.

5,196,229
COATED PHOSPHOR ARTICLES
Chung N. Chau, Sayre, Pa., assignor to GTE Products Corporation, Danvers, Mass.
Filed Aug. 21, 1989, Ser. No. 396,193
Int. Cl.[5] B05D *00/00*
U.S. Cl. 427—66 1 Claim

1. A method of providing a continuous, non-particulate, conformal coating on phosphor particles comprising the steps of: suspending phosphor particles in a gel solution containing a metal alkoxide; maintaining the phosphor particles in suspension while causing the suspension to gel; and drying the gelled suspension whereby the metal alkoxide is converted to metal oxide and whereby the phosphor particles are coated with a continuous, non-particulate, conformal coating of the metal oxide, wherein the metal alkoxide is an ethoxy compound and wherein the gel suspension contains ammonium hydroxide as a catalyst.

5,196,230
METHOD FOR CONNECTING AN ELECTROMAGNETIC WAVE SHIELDING LAYER WITH A GROUND CIRCUIT IN A PRINTED CIRCUIT BOARD
Hirotaka Okonogi; Katsutomo Nikaido, and Junichi Ichikawa, all of Iruma, Japan, assignors to Nippon Cmk Corp., Japan
Filed Feb. 19, 1991, Ser. No. 657,456
Claims priority, application Japan, Apr. 18, 1990, 2-102146
Int. Cl.[5] B05D *5/12;* H01Q *17/00*
U.S. Cl. 427—96 8 Claims

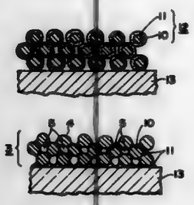


4. A method of connecting an electromagnetic wave shielding layer with a printed circuit of a printed circuit board, comprising the steps of:
providing a substrate;
forming a printed circuit on at least one surface of the substrate;
forming an insulative layer on the printed circuit having at least one connecting region which has a tapered opening converging in the direction of the printed circuit; and
forming an electromagnetic wave shielding layer on the insulative layer having a terminal portion connected with the printed circuit through said at least one connecting region.

5,196,231
OPTICAL RECORDING MEDIA
Sumio Hirose; Shigeru Takahara; Tadashi Koike; Shin Aihara, and Keiji Ueno, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan
Division of Ser. No. 456,645, Dec. 27, 1989, Pat. No. 5,132,153.
This application Mar. 9, 1992, Ser. No. 848,595
Claims priority, application Japan, Dec. 28, 1988, 63-329172
Int. Cl.[5] B05D 5/06
U.S. Cl. 427—164 12 Claims

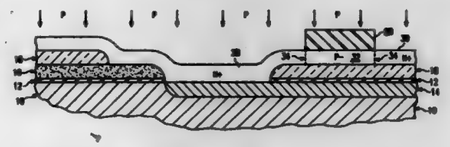
1. A process for the production of a recording layer on an optical recording medium, which comprises the steps of:
contacting a transparent substrate with a dye solution of an organic dye and an organic solvent, thereby forming an organic dye layer on the substrate; contacting the organic dye layer with either (a) a resin solution of a trifunctional silane represented by $R^1S_i(OR^2)_{3-n}(X)_n$ and a tetrafunctional silane represented by $Si(OR^3)_{4-m}(X)_m$, wherein R^1, R^2 and R^3 individually represent an alkyl or aryl group, X represents a hydroxyl group or a halogen atom and n and m represent 0, 1, 2 or 3 and 0, 1, 2, 3 or 4, respectively, or (b) a resin solution of a trifunctional silane, the tetrafunctional silane and a thermoplastic resin, thereby forming a resin layer on the dye layer;
heating the substrate to condense the resin thereon, thereby forming an organopolysiloxane resin layer on the substrate.

5,196,232
MANUFACTURING METHOD OF BASE HEAT TRANSFER MATERIAL WITH POROUS SURFACE
Kuraki Kitazaki, and Youichi Hisamori, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 6, 1991, Ser. No. 711,090
Claims priority, application Japan, Jun. 7, 1990, 2-150772
Int. Cl.[5] B05D 1/12
U.S. Cl. 427—180 26 Claims



1. A method for manufacturing a base heat transfer material having a porous surface which comprises the steps of:
(a) coating a metallic core material with a metallic coating material having a lower fusing point than that of said metallic core material so as to form a coat treatment material;
(b) depositing said coat treatment material on a substrate; and
(c) heating the coat treatment material to a temperature higher than the fusing point of said coating material but lower than the fusing point of said core material so as to form a base heat transfer material having a porous surface.

5,196,233
METHOD FOR FABRICATING SEMICONDUCTOR CIRCUITS
Tsiu C. Chan, Carrollton, and William A. Bishop, Irving, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Filed Jan. 18, 1989, Ser. No. 298,530
Int. Cl.[5] H01L 21/44
U.S. Cl. 437—186 4 Claims



1. A method for making a resistive load element for a semiconductor integrated circuit device, comprising the steps of:
forming a first layer of polycrystalline silicon signal lines over the integrated circuit;
forming an insulating layer over the integrated circuit;
forming contact openings in the insulating layer, wherein a selected set of such openings expose portions of the first layer of signal lines and an underlying substrate in each opening;
forming a second layer of polycrystalline silicon having a first conductivity type over the surface of the integrated circuit;
within the second polycrystalline layer, forming regions having a second conductivity type;
patterning the second polycrystalline layer to form elongate elements having a region of the first conductivity type between two separate regions of the second conductivity type, wherein current flowing through the element passes successively through second conductivity type, then first conductivity type, then second conductivity type regions, and further wherein the elongate elements make electrical contact with both the underlying substrate and with the exposed first polycrystalline silicon layer portions in the contact openings, thereby forming a shared contact.

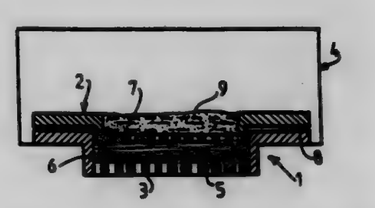
5,196,234
METHOD FOR PREPARING ZINC ORTHOSILICATE PHOSPHOR PARTICLE
Fred R. Taubner, Danvers; A. Gary Sigai, Lexington, both of Mass.; Charles F. Chenot, Towanda, and Henry B. Minnier, Dushore, both of Pa., assignors to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 762,154, Sep. 17, 1991, abandoned, which is a continuation of Ser. No. 666,460, Mar. 5, 1991, abandoned, which is a continuation of Ser. No. 587,589, Sep. 24, 1990, abandoned, which is a continuation of Ser. No. 902,252, Aug. 29, 1986, abandoned. This application Jul. 20, 1992, Ser. No. 917,724
The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.
Int. Cl.[5] C09K 11/59
U.S. Cl. 427—213 12 Claims

1. A method for preparing a manganese-activated zinc orthosilicate phosphor particle having a nonparticulate, conformal aluminum oxide coating, said phosphor particle having the empirical formula:

$$Zn_{(2.00-x-y)}Mn_xSiO_{(4.00-y)}(WO_3)_z$$

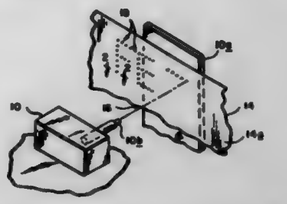
wherein:
$0.04 \leq x \leq 0.15$;
$0 \leq y \leq 0.05$; and
$0 \leq z \leq 0.002$,
wherein all of said manganese activator is present as manganese (II) and occupies zinc (II) sites whereby said phosphor particle has improved white bodied coloration and improved brightness due to the absence of unreacted manganese containing second phases which result in discoloration and reduced brightness, comprising the steps of:
blending a zinc source, a manganese (II) source, a silicon source, and a tungsten source in amounts in accordance with said formula with NH_4Cl and NH_4F in an amount of up to about 2 weight percent NH_4Cl and up to about 0.2 weight percent NH_4F to form a relatively uniform admixture, said zinc source consisting essentially of zinc oxide or zinc carbonate, said manganese source consisting essentially of manganese (II) oxide or manganese (II) carbonate, said silicon source consisting essentially of silicic acid, and said tungsten source consisting essentially of tungsten trioxide;
firing said admixture in a closed container under an inert non-oxidizing atmosphere to promote retention of manganese in the plus two valance state whereby oxidation of manganese to a higher valence state is avoided wherein the NH_4Cl and NH_4F being in a amount sufficient to purge the closed container of residual air and/or O_2 and the NH_4F being in an amount sufficient to effect a larger size phosphor particle than said method absent NH_4F, said firing comprising increasing the temperature from about 700 degrees Centigrade to about 1250 degrees Centigrade over a time period of about 30 minutes, heating the admixture at a temperature of about 1250 degrees Centigrade for about 2 to about 3 hours, and decreasing the temperature to about 700 degrees Centigrade over a time period of about one hour to form a phosphor particle containing substantially all of said manganese in the plus two valance state and including unreacted manganese;
milling and washing said phosphor particle in an aqueous citric acid solution to remove substantially all of said unreacted manganese to form said phosphor particle, said citric acid solution comprises from about 0.2 to about 0.4 weight percent citric acid;
rinsing the citric acid washed phosphor particle with ammonium hydroxide;
drying the rinsed phosphor particle; and sieving the dried phosphor particle through a 200-mesh to 400-mesh screen;
and depositing a continuous nonparticulate, conformal aluminum oxide coating on said dried phosphor particle.

5,196,235
PROCESS FOR THE PRODUCTION OF A CERAMIC FIBER/MATRIX COMPOSITE MATERIAL
Michel Parlier, Voisins Le Bretonneux; Erick Bouillon, Bordeaux; Claude Muller, Verrieres Le Buisson; Bertrand Bloch, Paris; Patrick Notreaux, Le Mans, and Jean Jamet, Floirac, all of France, assignors to Office National D'Etudes et de Recherches Aerospatiales, Chatillon Sous Bagneux, France
Filed Dec. 19, 1990, Ser. No. 629,945
Claims priority, application France, Dec. 20, 1989, 89 16918
Int. Cl.[5] B05D 7/00
U.S. Cl. 427—214 16 Claims



1. A process for the production of a ceramic composite material comprising a fibrous structure of silicon carbide embedded in a matrix, in which process on the one hand discrete particles of ceramic material and on the other hand a liquid substance capable of being converted to ceramic material by heat treatment are introduced into the empty spaces of the fibrous structure and the whole is heated to convert said substance and bind the discrete particles to one another by means of the ceramic material thus obtained, forming a continuous matrix, wherein said liquid substance is a polymer which converts to ceramic material by pyrolysis.

5,196,236
INK JET COLOR PRINTING METHOD
Robert Howard, New York, N.Y.; Richard R. Helinski, Hudson, and Herbert E. Meshbesher, Windham, both of N.H., assignors to Howtek, Inc., Hudson, N.H.
Division of Ser. No. 402,028, Sep. 1, 1989, abandoned, which is a continuation of Ser. No. 128,462, Feb. 9, 1988, abandoned, which is a continuation of Ser. No. 921,345, Oct. 20, 1986, Pat. No. 4,741,930, which is a division of Ser. No. 688,000, Dec. 31, 1984, abandoned. This application Aug. 22, 1990, Ser. No. 571,298
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[5] B05D 5/06, 1/02, 1/36
U.S. Cl. 427—265 9 Claims



1. A method of color printing on a printing medium comprising the steps of jetting a first color phase-change ink as a liquid onto an area of a printing medium so that the first ink forms a first, thin, solid, semi-transparent, well-defined ink layer that adheringly covers without appreciably penetrating or distorting said medium area, and then jetting a second color phase-change ink as a liquid onto an exposed surface area of said first ink layer so that the second ink forms a second, thin, solid, semi-transparent well-defined ink layer that adheringly covers said first ink layer surface area whereby the ink layers transmit ambient light which is reflected from said medium back through said ink layers and provide subtractive color printing on said medium area that is characterized by high color density and brightness.

5,196,237
METHOD FOR COLORING FABRIC WITH CRAYON
Brian W. May, 2509 Kennelly Ct., Burnsville, Minn. 55337
Filed Sep. 27, 1991, Ser. No. 766,712
Int. Cl.[5] B41M 1/40; C09D 11/12
U.S. Cl. 427—288 24 Claims

15. A method for permanently fixing crayon material to fabric comprising:
contacting the crayon to a surface of the fabric to form a mark on the fabric;
covering the mark on the fabric with a piece of paper;
applying heat to the piece of paper covering the mark on the fabric to elevate the temperature to approximately 350°–375° F.;
removing the piece of paper from the mark on the fabric.

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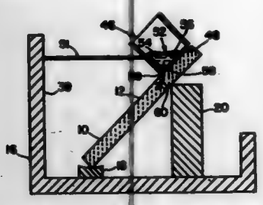
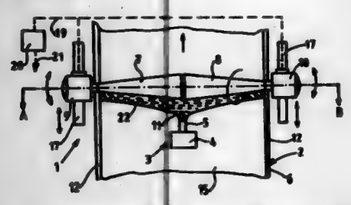
5,196,238
METHOD FOR FORMING A CERMET POROUS CERAMIC COMPACT AND HEATING THE METAL SO THAT IT MELTS AND FLOWS INTO THE PORES OF THE CERAMIC
Aleksander J. Pyzik, Midland, and Jack Ott, Hemlock, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Feb. 25, 1991, Ser. No. 660,370
Claims priority, application United Kingdom, Aug. 14, 1990, 9017823
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—347 6 Claims



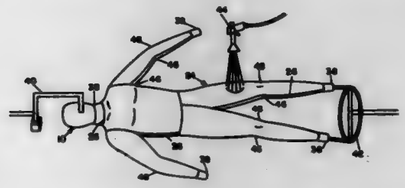
1. A method of forming a cermet, comprising the steps of:
a) disposing a solid-phase metal, which can form a metal oxide, on a surface of a porous ceramic compact, said surface having an angle to the horizontal in the range of between about five and about ninety degrees, said angle being sufficient to allow a molten metal phase formed from the solid-phase metal to rupture a layer of the metal oxide which is at least partially supporting the molten metal;
b) heating the solid-phase metal to a temperature sufficient to cause the solid-phase metal to melt and form the molten metal phase and the metal oxide layer, and whereby the molten metal ruptures the metal oxide layer to form an opening in the metal oxide layer through which the molten metal phase flows, thereby allowing the molten metal phase to infiltrate pores of the porous ceramic compact; and
c) cooling the porous ceramic compact, containing the molten metal phase, to a temperature which causes the molten metal phase to solidify thereby forming the cermet.

5,196,239
PROCESS FOR UNIFORM DISTRIBUTION OF A FREE-FLOWING REACTION MIXTURE ONTO A CONTINUOUSLY TRANSPORTED SUBSTRATE
Kurt Krippl, Monheim, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 449,690, Dec. 12, 1989, abandoned. This application May 14, 1991, Ser. No. 699,531
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1988, 3842625
Int. Cl.[5] B05D *3/04*
U.S. Cl. 427—348 1 Claim



1. In a process for uniformly distributing a free-flowing reaction mixture on a continuously conveyed substrate wherein said reaction mixture is applied to said substrate at a feed point and wherein a stream of air is directed onto said reaction mixture downstream of said feed point, the improvement wherein said stream of air is produced by two rotating ventilator rollers 1) positioned above said substrate at right angles to the conveying direction and 2) rotating in said conveying direction, whereby said stream of air flows in the same direction as the conveyed substrate and conveys said reaction mixture laterally from said feed point towards the sides of said substrate.

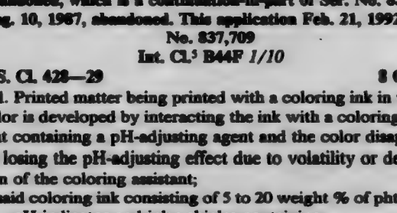
5,196,240
SEAMLESS BODYSUIT AND A METHOD FOR FABRICATING SAME
Gregg M. Stockwell, 1513 Via Madrina St., San Diego, Calif. 92111
Filed Mar. 18, 1991, Ser. No. 670,579
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—389.9 22 Claims



13. A process for fabricating a bodysuit comprising the steps of:
fabricating a bodysuit foundation by sewing a textile covering onto a mannequin;
selecting a first solvent from the group consisting of medium naphtha, 1,1,1-trichloroethane, trichloroethylene, toluene, xylene, methyl ethyl ketone, hexane, methylene chloride, and mixtures of medium naphtha with any other solvent in the group;
mixing 100 parts by volume of said first solvent with up to 50 parts by volume of a thermoset resin coloring agent to form a first colorized solvent;
mixing 100 parts by volume of said first colorized solvent with from 0.5 to 2.0 parts by volume of an ultraviolet (UV) stabilizer to form a second colorized solvent;
mixing 100 parts by volume of said second colorized solvent with up to 400 parts by volume of a thixotropic agent to form a thickened colorized solvent;
mixing 100 parts by volume of said thickened colorized solvent with from 10 to 400 parts by volume of silicone rubber adhesive sealant to form a coating compound;
applying said coating compound in at least one layer to said bodysuit foundation to form a coated bodysuit foundation;
curing said layer; and
removing said coated bodysuit foundation from said mannequin.

5,196,241
METHOD FOR PROCESSING SUBSTRATES PRINTED WITH PHASE-CHANGE INKS
Edward F. Burke, Lake Oswego; Donald R. Titterington, Tualatin; James D. Rise, Beaverton; Joern B. Eriksen, Oregon City, and Clark W. Crawford, Wilsonville, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed Apr. 5, 1991, Ser. No. 681,252
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—444 17 Claims

1. A method for processing a substrate printed with a phase change ink layer comprising:
providing a first planar surface and a second planar surface, each having a contact surface area at least generally coextensive with the surface area of the phase change ink layer, said first and second planar surfaces adjustable between a substrate insertion position wherein said first and second planar surfaces are spaced apart and a pressure application position wherein said first and second planar surfaces are aligned on substantially parallel planes;
inserting the substrate printed with the phase change ink



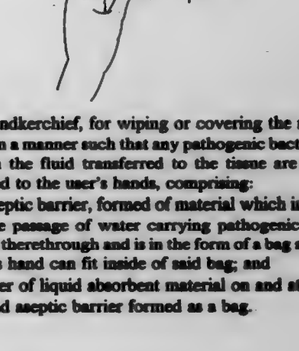
layer between said first and second planar surfaces in said substrate insertion position; and
adjusting said first and second planar surfaces to said pressure application position and applying a contact pressure to the entire surface area of the phase change ink layer simultaneously.

5,196,242
SELF-INFLATING FOAM STRUCTURE
Robert K. Vicino, 6064 Mohler St., San Diego, Calif. 92120
Filed May 29, 1991, Ser. No. 706,783
Int. Cl.[5] B32B *1/00, 3/00*
U.S. Cl. 428—12 34 Claims

1. A collapsible, self-erecting structure comprising:
a layer of resilient, dry, open-cell foam material inclosing a hollow central core;
an outer skin of pliable material covering said layer, said skin having an aperture forming an air passage leading to said central core and to said layer; and
means for closing said aperture.

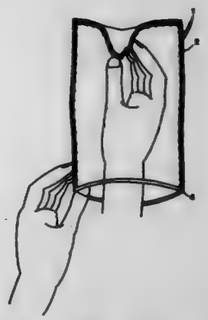
5,196,243
PRINTED MATTER
Kiyoharu Kawashima, 5-7, Esaka-cho 5-chome, Suita-shi, Osaka-fu, Japan
Continuation-in-part of Ser. No. 211,038, Jun. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 83,251, Aug. 10, 1987, abandoned. This application Feb. 21, 1992, Ser. No. 837,709
Int. Cl.[5] B44F *1/10*
U.S. Cl. 428—29 8 Claims

1. Printed matter being printed with a coloring ink in which color is developed by interacting the ink with a coloring assistant containing a pH-adjusting agent and the color disappears by losing the pH-adjusting effect due to volatility or desiccation of the coloring assistant;
said coloring ink consisting of 5 to 20 weight % of phthalein pH-indicator and ink vehicles containing,
8 to 20 weight % of surface active agent consisting of a mixture of sodium alkylether-sulfate ester, α-olefinsulfonate sodium, alkylarylsulfonateamide, and alkylamineoxide at same ratio,
10 to 26 weight % of alkylolamide,



0.12 to 2 weight % of citric acid,
0.12 to 2 weight % of rust preventives, and water as remainder.

5,196,244
DISPOSABLE TISSUE TRAP WITH ASEPTIC BARRIER
William C. Beck, Sayre, Pa., assignor to Donald Guthrie Foundation for Medical Research, Inc., Sayre, Pa.
Continuation-in-part of Ser. No. 524,659, May 17, 1990, abandoned, which is a continuation of Ser. No. 326,373, Mar. 20, 1989, abandoned. This application Nov. 13, 1990, Ser. No. 614,801
Int. Cl.[5] B29D *22/00*
U.S. Cl. 428—35.2 10 Claims



1. A handkerchief, for wiping or covering the nose, mouth or hands in a manner such that any pathogenic bacteria or virus present in the fluid transferred to the tissue are not further transmitted to the user's hands, comprising:
a. an aseptic barrier, formed of material which is impervious to the passage of water carrying pathogenic bacteria or virus therethrough and is in the form of a bag such that the user's hand can fit inside of said bag; and
b. a layer of liquid absorbent material on and at the outside of said aseptic barrier formed as a bag.

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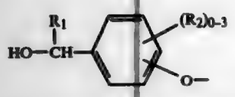
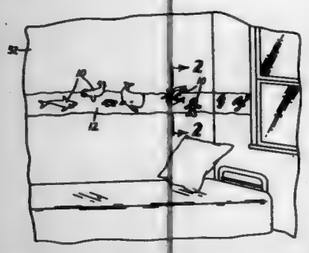
5,196,245
IRRADIATION RESISTANT FUNCTIONALLY ENCAPPED POLYCARBONATE
James L. DeRudder, Mt. Vernon, and Niles R. Rosenquist, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.
Filed Apr. 1, 1991, Ser. No. 677,940
Int. Cl.[5] B65B 55/08; A61L 2/08; C08L 69/00
U.S. Cl. 428—35.5 11 Claims

1. An article molded from a thermoplastic molding composition, which comprises; a blend of
A. from 1 to 99 parts by weight of an aromatic polycarbonate resin endcapped with a monovalent moiety of the formula:



wherein R_1 is selected from hydrogen and hydrocarbyl and each R_2 is independently selected from hydrocarbyl or hydrocarbyloxy; and
B. from 99 to 1 parts by weight of a polycarbonate resin not endcapped with said monovalent moiety;
said article having been subjected to sterilization by ionizing ray.

5,196,246
WALL DECORATING SYSTEM
Del A. Kaun, Maplewood; Patrick J. Hager, Woodbury, and Janet T. Keller, Eagan, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 17, 1991, Ser. No. 702,605
Int. Cl.[5] B32B 7/12; B44C 5/04
U.S. Cl. 428—39 32 Claims



1. An improved wall decorating system comprising:
a backing sheet having first and second sides with a portion of the first side coated with an adhesive and with the second side adapted to receive indicia;
an applique having first and second sides with a portion of the first side coated with an adhesive and with the second side adapted to receive indicia;
wherein the applique comprises a flexible and conformable film comprising:
a) about 60–98% by weight ionomer resin that is a copolymer of ethylene and acrylic acid or methacrylic acid neutralized by a metal cation, said resin having a melt flow index greater than about 10 and
b) about 2–40% by weight of a filler material, wherein said film has a thickness of between 0.050 and 0.127 mm, and
wherein said film is substantially free of migrating plasticizers or leachable additives and wherein said film has an Elmendorf tear strength in excess of 280 grams/ply.
17. An improved wall decorating system comprising:
a backing sheet having first and second sides with a portion of the first side coated with an adhesive and with the second side adapted to receive indicia;
an applique having first and second sides with a portion of the first side coated with an adhesive and with the second side adapted to receive indicia;
wherein the backing sheet comprises a flexible and conformable film comprising:
a) about 60–98% by weight ionomer resin that is a copolymer of ethylene and acrylic acid or methacrylic acid neutralized by a metal cation, said resin having a melt flow index greater than about 10 and
b) about 2–40% by weight of a filler material, wherein said film has a thickness of between 0.050 and 0.127 mm, and
wherein said film is substantially free of migrating plasticizers or leachable additives and wherein said film has an Elmendorf tear strength in excess of 280 grams/ply.

5,196,247
COMPOSTABLE POLYMERIC COMPOSITE SHEET AND METHOD OF MAKING OR COMPOSTING SAME
Pai-Chuan Wu, Cincinnati, Ohio; Thomas R. Ryle, Burlington, Ky., and Leopoldo V. Cancio, Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio
Filed Mar. 1, 1991, Ser. No. 663,445
Int. Cl.[5] B65D 65/128; B32B 5/14, 7/12, 15/04
U.S. Cl. 428—43 21 Claims

1. A compostable polymeric composite sheet comprising
a water insoluble and impermeable top film of thermoplastic polymer,
a water insoluble bottom layer of thermoplastic polymer and
an intermediate film of water soluble polymer for bonding said top film and bottom layer together to form said composite sheet, each of said films or layer being biodegradable or environmentally degradable, said water soluble film facilitating the separation of the composite in the presence of water for exposure of the top film and bottom layer to enhance degradation,
wherein said sheet is formed by coextrusion of said top film and said intermediate film, said top film has a plurality of post-extruded stretched areas along lines spaced substantially uniformly across the film surface areas and through the depth of the film, said stretched areas being separated by unstretched areas and having a thickness less than the unstretched areas, said stretched areas for weakening said film to further enhance its degradation while maintaining its water impermeability.

5,196,248
TILE DESIGNS AND METHODS OF MAKING TILE DESIGNS
Richard Danico, and Kathleen Danico, both of 620 Palm Dr., Satellite Beach, Fla. 32937
Division of Ser. No. 128,723, Dec. 4, 1987, Pat. No. 4,889,572.
This application Dec. 20, 1989, Ser. No. 453,699
Int. Cl.[5] B32B 3/10; F04F 13/08
U.S. Cl. 428—46 5 Claims

1. A tile design comprising:
a planar shaped transparent or translucent substrate, said substrate being sufficiently flexible to be readily handled yet sufficiently rigid to maintain its planar shape; and
a plurality of various shaped and colored tile pieces primarily selected from commercially available precut tile pieces, secured on the sides abutting to said substrate to form an irregular shaped tile design thereon whereby the

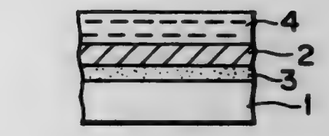
substrate provides the permanent support to maintain the shape of the tile design.

5,196,249
MARTIAL ARTS BOARD
Oswald C. Svehaug, 1010 San Ysidro Blvd., San Ysidro, Calif. 92173
Filed Oct. 11, 1991, Ser. No. 775,018
Int. Cl.[5] B32B 3/06
U.S. Cl. 428—60 9 Claims

1. A reusable martial arts board which comprises:
two symmetrical half-portions, each half-portion comprising:
a planar quadrangular slab having substantially flat top and bottom surfaces;
along one edge, a plurality of alternating and parallel male and female interconnecting elements wherein each of said male interconnecting elements is shaped and dimensioned to intimately nest into one of
said female interconnecting elements; and
wherein each of said female elements comprises a circular, tubular cavity having a slot opening into said bottom surface.

5,196,250
OPTICAL INFORMATION RECORDING MEDIUM
Michiharu Abe, and Masaakira Umehara, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 18, 1991, Ser. No. 732,038
Claims priority, application Japan, Jul. 20, 1990, 2-190407
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—64 21 Claims

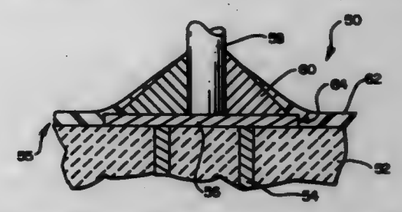
1. An optical information recording medium comprising a substrate and a recording layer capable of producing optical changes therein by the application of a focused laser beam which comprises a diarylpolyene compound, represented by general formula (I):



$$A^1-(C=C)_n-A^2 \quad (I)$$
$$\quad R^1 \quad R^2$$

wherein A^1 and A^2 each represent an aryl group which may have a substituent and may be the same or different; R^1 and R^2 each represent hydrogen, a halogen or an alkyl group having 1 to 4 carbon atoms; and n is an integer of 2 or more.

5,196,251
CERAMIC SUBSTRATE HAVING A PROTECTIVE COATING THEREON AND A METHOD FOR PROTECTING A CERAMIC SUBSTRATE
Nasik Bakhru, Danbury, Conn.; Richard A. Bates, Wappingers Falls, N.Y.; George Csorayj; Nunzio DiPaolo, both of Poughkeepsie, N.Y.; Ananda H. Kumar, Hopewell Junction, N.Y.; Suryanarayana Mukkavilli, Certon On Hudson, N.Y.; Heinz O. Steinel, Fishkill, N.Y., and Rao R. Tummala, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 30, 1991, Ser. No. 693,746
Int. Cl.[5] B32B 9/00
U.S. Cl. 428—76 29 Claims



1. A ceramic substrate having a protective coating on at least one surface thereof comprising:
a ceramic substrate having at least one electrically conductive via extending to a surface of said substrate;
an electrically conductive I/O pad electrically connected to said at least one via, wherein said I/O pad is susceptible to corrosion that is enhanced or aided by exposure to the atmosphere;
an I/O pin brazed to said I/O pad, wherein said I/O pad is larger in cross-section than said I/O pin, said brazed pin having a braze fillet; and
a protective layer of polymeric material fully encapsulating said I/O pad, wherein said layer of polymeric material protects said I/O pad from corrosion.

5,196,252
BALLISTIC RESISTANT FABRIC ARTICLES
Gary A. Harpell, Morristown, N.J., assignor to Allied-Signal, Morristown, N.J.
Filed Nov. 19, 1990, Ser. No. 615,516
Int. Cl.[5] B32B 5/06
U.S. Cl. 428—102 51 Claims

1. A flexible penetration resistant article of manufacture comprising at least one substrate layer comprising a plurality of rigid penetration resistant non-metallic planar bodies affixed to

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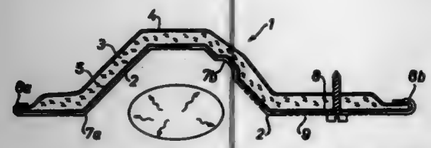
a surface thereof such that said article has at least three continuous or semi-continuous seams in which the seam directions

intersect at an angle, wherein said article is capable of flexing along said seams.

5,196,253
SOUND ABSORBING HEAT SHIELD WITH PERFORATE SUPPORT LAYER

Peter Mueller, Reinheim, Fed. Rep. of Germany, and Ivan Gheczy, Sevelen, Switzerland, assignors to Matec Holding AG, Knonacht, Switzerland

Filed Jan. 10, 1991, Ser. No. 639,433
Claims priority, application Switzerland, Jan. 22, 1990, 188/90
Int. Cl.[5] B32B *3/24*
U.S. Cl. 428—138 10 Claims



1. A contoured sound absorbing heat shield for attachment to motor vehicles between exhaust systems and floor portions thereof, said sound absorbing heat shield comprising:

a perforate metallic support layer having perforations therethrough distributed over a substantial portion of a surface thereof;

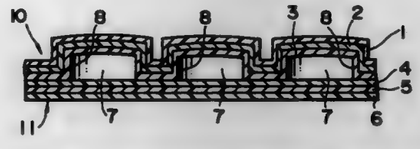
a sound absorbing heat insulating layer attached to said support layer, said sound absorbing heat insulating layer comprising a sheet of a first insulating material with a thin protective coating of a different material on each of opposite sides thereof, said protective coatings covering substantially the entire opposite sides, said sound absorbing heat insulating layer being attached to said perforate support layer with one of said protective coatings lying on said surface of said support layer;

wherein said support layer includes at least one perforation-free partial area, and at least one partial area which is substantially free of perforations arranged on said surface of said support layer in a substantially non-symmetrical manner being substantially surrounded by perforate areas, said protective coating lying on both said perforation-free and perforate areas of said support layer, said at least one substanially perforation free partial area including an attachment means for attaching said support layer to structure of said motor vehicle.

5,196,254
CUSHIONING MATERIAL

Hiroyuki Akiyama, Hiratsuka, Japan, assignor to JSP Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 75,973, Jul. 21, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,562
Claims priority, application Japan, Jul. 25, 1986, 61-114159; European Pat. Off., Jul. 21, 1987, 87306440
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—178 4 Claims

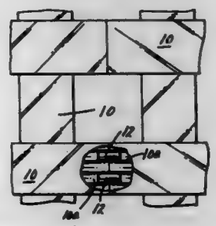


1. A cushioning material comprising first and second composite films, each film including an intermediate layer formed of a polyamide resin and a surface layer laminated on each side of said intermediate layer, each surface layer being formed of a polyolefin resin, at least one of said first and second composite films being formed to provide one or more discrete embossments, and said first and second composite films being bonded to form a substantially unitary structure and to seal said embossments so that one or more air-tight cells are defined between said first and second composite films, said polyamide resin including an aromatic polyamide resin selected from the group consisting of (a) a first product obtained by polycondensing m-xylylenediamine with adipic acid, (b) a second product obtained by polycondensing m-xylylenediamine with a mixture of dicarboxylic acids composed of 55–70 mol % of adipic acid, 20–30 mol % of isophthalic acid and 5–20 mol % of terephthalic acid, the total amount of the isophthalic acid and terephthalic acid in said mixture being in the range of 30–45 mol % and (c) a blend of 60–40% by weight of said first product (a) and 40–60% by weight of said second product (b), and nylon-6 in an amount of 10–90% by weight of said aromatic polyamide resin, and said polyolefin resin being a member selected from the group consisting of low density polyethylenes, copolymers of ethylene and an α-olefin and mixtures thereof.

5,196,255
EXTRUDED PLASTIC SLAT

John M. Cohen, 6500 Newburgh Rd., Evansville, Ind. 47715

Filed Jul. 1, 1991, Ser. No. 723,913
Int. Cl.[5] B32B *3/20, 3/00*
U.S. Cl. 428—188 11 Claims



1. A slat assembly comprising an extended plastic first body defined by a series of longitudinal cavities disposed in a side-by-side relationship and arranged in a coplanar relationship with an extruded plastic second body also defined by a series of longitudinal cavities disposed in a side-by-side relationship, and fastening means extending between and within contiguous longitudinal cavities in said first body and in said second body.

5,196,256

Patent Not Issued For This Number

5,196,257
BIDIMENSIONAL ORGANIC DIAPHRAGMS AND THEIR PREPARATION PROCESSES

André Barraud, Bures-sur-Yvette; Serge Palacin, Montigny; Florence Porteu, Tours, and Annie Ruaudel, Verrieres le Buisson, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

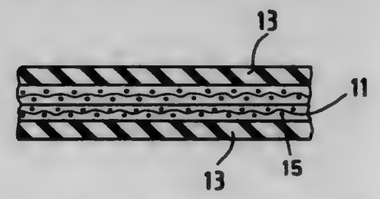
Filed Aug. 20, 1991, Ser. No. 747,746
Claims priority, application France, Aug. 23, 1990, 90 10597
Int. Cl.[5] B32B *27/28*
U.S. Cl. 428—220 22 Claims

1. Diaphragm comprising at least one monomolecular layer of organic molecules, wherein each organic molecule of the monomolecular layer is bonded to n identical molecules of the same layer, n being an integer chosen from the group consisting of 3, 4, and 6, by n direct chemical bonds or by n linking groups consisting of a divalent ion bonded to two molecules by ionic bonds and wherein the n chemical bonds between a central molecule and the n adjacent molecules are arranged so that the molecules form a substantially regular array, and wherein said molecules are amphiphilic or capable of complexing with amphiphilic molecules.

5,196,258
WALL FOR AN AIR-SPRING BELLOWS

Michael Keller; Klaus Schreck, both of Hannover; Siegfried Dietrich, Hildesheim, and Gerhard Thurow, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 755,821
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1990, 4028601
Int. Cl.[5] B32B *7/10, 25/08;* D04H *3/12;* D04B *1/18*
U.S. Cl. 428—224 3 Claims



1. A wall for an air-spring bellows subjected to flexural stress during use, the wall comprising:

an elastomeric matrix including an inner rubber layer and an outer rubber layer;

two mutually adjacent reinforcement layers embedded in said elastomeric matrix; and,

each of said reinforcement layers including a textile fabric of synthetic polymers having fabric threads impregnated with an aqueous dispersion of resorcinol formaldehyde resin and vinyl pyridine latex and thereafter dried to define a first adhesive interface coating;

each of said reinforcement layers further including a second adhesive interface coating applied over said first adhesive interface coating and being made from an organic adhesive interface solution containing a vulcanizable polar rubber; and a skim coating made of rubber stock and applied to said second adhesive interface coating made from said organic adhesive interface solution.

5,196,259
MATRIX COMPOSITES IN WHICH THE MATRIX CONTAINS POLYBENZOXAZOLE OR POLYBENZOTHIAZOLE

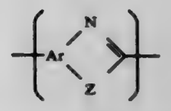
Peter E. Pierini; Ritchie A. Wessling, both of Berkeley, and Peter K. Kim, Danville, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1990, Ser. No. 624,164
Int. Cl.[5] B32B *27/02;* C08G *18/60*
U.S. Cl. 428—245 19 Claims

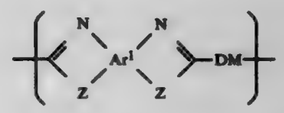
1. A fiber-reinforced composite comprising:

(1) a number of fibers sufficient to provide reinforcement for the composite; and

(2) a matrix, that contains a polybenzoxazole polymer or copolymer and/or a polybenzothiazole polymer or copolymer, in a quantity sufficient to bind the fibers together and maintain the alignment of the fibers, wherein the matrix polymer or copolymer contains AB-PBZ mer units represented by the formula:



or AA/BB-PBZ mer units represented by the formula:



or both, and each Z is independently an oxygen or a sulfur atom; each Ar contains an aromatic group selected so that the matrix polymer forms liquid crystalline domains when dissolved in solution at suitable concentrations; and DM is a bond or an aromatic group selected so that the matrix polymer forms liquid crystalline domains when dissolved in solution at suitable concentrations.

5,196,260
PROCESS FOR THE TREATMENT OF FIBROUS MATERIALS WITH MODIFIED ORGANOPOLYSILOXANES AND THE MATERIALS

Franz Dirschl, Munich; Jürgen Uhl, Augsburg, and Michael Bernheim, Aystetten, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 437,402, Nov. 15, 1989, abandoned. This application May 27, 1992, Ser. No. 892,387
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1988, 3839136
Int. Cl.[5] B05D *3/02;* B32B *27/12*
U.S. Cl. 428—290 19 Claims

1. A process for waterproofing fibrous material which comprises applying an aqueous dispersion of a modified organopolysiloxane to the fibrous material, then drying the fibrous material, and then subjecting the fibrous material to condensation, said aqueous dispersion being obtainable by a process which comprises:

(1) preparing an organopolysiloxane copolymer by reacting a compound (A) with a compound (B) in an aqueous medium and in the presence of a cross-linking agent and a first emulsifier, the compound (A) being a cyclic siloxane and the compound (B) being a (meth)acrylate-silane, a vinyl-silane or a cyclic vinylsiloxane, or a mixture thereof; and

(2) copolymerizing the organopolysiloxane copolymer with a vinyl monomer at a ratio of organopolysiloxane copoly-

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mer to vinyl monomer of 1:0.5 to 1:4, the copolymerization being carried out in the aqueous medium of step (1), without isolation of the organopolysiloxane copolymer, in the presence of a second emulsifier, said first and second emulsifiers being the same or different.

5,196,261

COMPOSITE MATERIAL HAVING AN EXPANDED, CURED EPOXY RESIN LAYER, METHOD OF PRODUCING SAME AND POWDER EPOXY RESIN COMPOSITION FOR FORMING SUCH AN EXPANDED LAYER

Kazuya Ono, Tokyo; Katsuji Kitagawa, Kasukabe; Seitaro Iwamoto, Soka; Mikio Ono, Saitama, and Takeshi Watanabe, Soka, all of Japan, assignors to Somar Corporation, Japan

Filed Jul. 27, 1992, Ser. No. 919,276
Claims priority, application Japan, Jul. 31, 1991, 3-216077
Int. Cl.[5] B32B *3/26, 27/38, 5/14*
U.S. Cl. 428—310.5 12 Claims

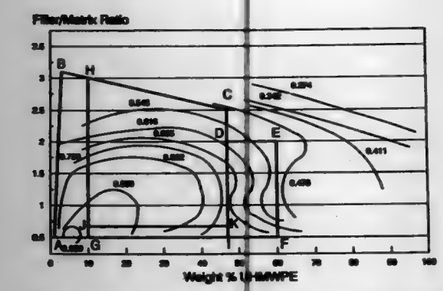
1. A composite material comprising a substrate and an expanded, cured layer of an epoxy resin composition provided over a surface of said substrate and having a closed cellular structure and an expansion ratio of 7–35%, wherein a majority of the cells of said expanded layer are present in a portion adjacent to the interface between said substrate and said expanded layer and substantially no cells are present in a portion adjacent to the outer surface of said expanded layer.

5,196,262

MICROPOROUS MATERIAL

Richard A. Schwarz, Akron, and William Keim, Barberton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1990, Ser. No. 596,175
Int. Cl.[5] B32B *3/26, 5/16*
U.S. Cl. 428—315.5 45 Claims



1. In microporous material which on a coating-free, printing ink-free, impregnant-free, and pre-bonding basis comprises:
(a) a matrix comprising a mixture of substantially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least about 10 deciliters/gram and lower molecular weight polyethylene having an ASTM D 1238-86 Condition E melt index of less than about 50 grams/10 minutes and an ASTM D 1238-86 Condition F melt index of at least 0.1 gram/10 minutes;
(b) finely divided substantially water-insoluble filler particles, of which at least about 50 percent by weight are siliceous particles, said filler particles being distributed throughout said matrix; and
(c) a network of interconnecting pores communicating substantially throughout said microporous material, said pores constituting from about 35 to about 80 percent by volume of said microporous material;
the improvement wherein the weight percent of said ultrahigh molecular weight polyethylene in the total polyethylene of said matrix and the filler/matrix weight ratio are within the polygon ABCDEF of FIG. 6 of the drawings.

5,196,263

RUBBER ARTICLES HAVING A TEXTURED SURFACE AND A METHOD FOR THEIR PREPARATION

Dennis W. Melby, Mogadore, and James C. Moore, Ravenna, both of Ohio, assignors to H & M Rubber Company, Inc., Kent, Ohio

Filed Oct. 25, 1991, Ser. No. 782,133
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—327 10 Claims

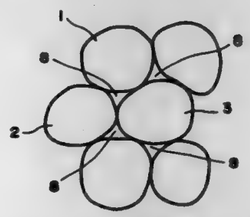
1. In an expandable, vulcanizable rubber article of the type formed from a vulcanizable rubber composition having a rubber component, the improvement comprising a texturing layer on the surface of the article, said texturing layer having a modulus of elasticity at least equal to that of the rubber article and comprising a mixture of from about 90 to about 70 parts by weight of a vulcanizable rubber composition and from about 10 to about 30 parts by weight of vulcanizable rubber particles; wherein said vulcanizable rubber composition of said texturing layer and said vulcanizable rubber particles each have a rubber component which is substantially the same as the rubber component of the vulcanizable rubber article such that said rubber article is capable of up to 700 percent expansion without substantial delamination of said rubber particles therefrom.

5,196,264

POROUS SINTERED BODY AND METHOD OF MANUFACTURING SAME

Yoshinobu Tsuchiya, Fujisawa; Ken Kurabayashi, Chigasaki; Hiroyoshi Merobochi, Yokohama; Akio Yoshida, Kamakura; Tadakuni Nishitani, Yokohama, and Yoriaki Nitda, Yamato, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 14, 1990, Ser. No. 567,164
Claims priority, application Japan, Aug. 22, 1989, 1-215278
Int. Cl.[5] B05D *3/00*
U.S. Cl. 428—328 16 Claims



1. A porous sintered body comprising fine particles of one of an electrically conductive material and an electrically semiconductive material, said fine particles having a diameter of less than or equal to about 10 μm, said fine particles being fused together at areas of contact with each other under a pulse voltage applied between said fine particles.

5,196,265

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Yutaka Kakuishi, and Toshiyuki Kitahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1991, Ser. No. 772,748
Claims priority, application Japan, Oct. 8, 1990, 2-270156
Int. Cl.[5] B32B *27/06;* G11B *23/00*
U.S. Cl. 428—332 5 Claims

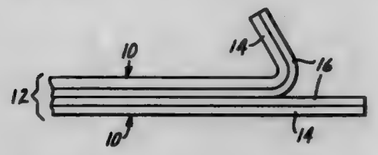
1. A magnetic recording medium for use in a digital recording system comprising a non-magnetic support having thereon a magnetic layer containing a ferromagnetic powder and a binder, said non-magnetic support comprising polyethylene naphthalate in which Young's Modulus in the transverse direction is at least 700 to 900 kg/mm^2 and Young's Modulus in the longitudinal direction is from 600 to less than 800 kg/mm^2, the ferromagnetic powder being magnetic metal powder, and the total thickness of said magnetic recording medium being not more than 11 μm and wherein the coercive force (Hc) and maximum magnetic flux density (Bm) of said magnetic recording medium are at least 1400 and at least 3,000 gauss, respectively, and wherein a short wave recording wavelength of said magnetic recording medium is not more than 0.8 μm.

5,196,266

RECLOSABLE MECHANICAL FASTENER BASED ON A COMPOSITE ARTICLE

Shih-Lai Lu, Woodbury; James J. Kobe, Newport; John D. Moon, Hastings; Maurice E. Freeman, Maplewood, all of Minn.; Forrest J. Rosser, San Rafael, Calif.; Robert V. Heiti, St. Paul, and Thomas E. Boettcher, Hastings, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 427,448, Oct. 26, 1989, abandoned. This application Aug. 29, 1990, Ser. No. 573,321
Int. Cl.[5] B32B *7/12;* A41F *1/00;* A44B *11/25*
U.S. Cl. 428—355 7 Claims



1. A fastening component of a reclosable mechanical fastener, which fastening component comprises:
(a) a substrate, and
(b) a fastening layer having a first major surface and a second major surface, said first major surface being adhered to said substrate, said second major surface being non-tacky, substantially flat, and comprising a crosslinked polymer formed from radiation-curable, addition-polymerizable, oligomers or prepolymers having one or more like or different hard segments of mono- or poly-valent moieties containing one or more carbocyclic or heterocyclic groups or both said moieties, wherein each of said moieties of said hard segments, when their valences are satisfied by protons, has at least one major transition temperature above 250° K., one or more like or different soft segments of mono- or poly-valent moieties, wherein each of said moieties of said soft segments has a number average molecular weight in the range of about 500 to 5000 and each of which in the form of homopolymer has a glass transition temperature below 250° K., one or more like or different monovalent moieties containing a radiation-sensitive, addition-polymerizable, functional group selected from the group consisting of acrylyl, methacrylyl, allyl, and vic-epoxy, said second major surface capable of releasably adhering to an identical second major surface of a second fastening layer.

5,196,267

PROCESS FOR COATING SILICA SPHERES

Timothy J. Barder, Addison, and Philip D. DuBois, Lisle, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 21, 1991, Ser. No. 718,682
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—404 26 Claims

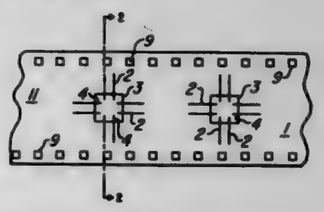
13. A process for producing microspheres of silica having a uniform size between about 0.1 and 10 microns diameter and a surface coating comprising a metal comprising:
(a) forming a first solution combining a hydrolyzable silica precursor, an alcohol, ammonia, and water in proportions such that two liquid phases form;
(b) forming said microspheres by hydrolysis of said silica precursor of (a);
(c) recovering the microspheres of (b) and redispersing said recovered microspheres in a liquid;
(d) adding to the redispersed microspheres of (c) a second solution of a soluble compound of at least one metal selected from the group consisting of the noble metals, transition metals, rare earth metals, and representative metals;
(e) maintaining said microspheres in contact with said second solution for a period of time sufficient to deposit a coating of said soluble metal compounds of (c) on said microspheres; and
(f) recovering the coated microspheres of (e).

5,196,268

INTEGRATED CIRCUIT INTERCONNECT LEADS RELEASABLY MOUNTED ON FILM

Galen F. Fritz, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 27,716, Mar. 19, 1987, Pat. No. 5,057,461.
This application Jul. 30, 1991, Ser. No. 738,002
Int. Cl.[5] B32B *15/08;* H01L *21/06*
U.S. Cl. 428—458 4 Claims



1. A combination comprising:
a film translucent to the light emitted by a laser bonder;
a plurality of metallic interconnect leads affixed by an energy degradable adhesive to a surface of the film in a pattern to facilitate their bonding to the bond pads of an integrated circuit and to a leadframe or to a substrate;
wherein the film presents a surface without holes; and
the adhesive degrades by having its bonding strength lessened by application of energy.

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5,196,269

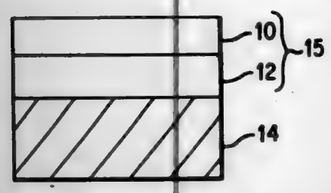
PAPERBOARD LAMINATES HAVING POLAR COPOLYMER/NONPOLAR POLYMER BLEND SURFACE COATINGS

James M. Kittrell; Charles F. Gibbons; Allan A. Whillock, all of Mobile; Joe L. Kinsey, Jr., Irvington, and Cynthia L. Tanner, Mobile, all of Ala., assignors to International Paper Company, Tuxedo Park, N.Y.

Continuation-in-part of Ser. No. 552,022, Jul. 13, 1990, abandoned. This application Nov. 22, 1991, Ser. No. 797,508

Int. Cl.[5] B32B *23/08, 27/10*

U.S. Cl. 428—513 7 Claims



1. A paperboard laminate for constructing blanks and containers having an improved exterior coating layer comprising:

(a) a paperboard substrate having an exterior and an interior side corresponding to the exterior and interior of a blank or container; and

(b) a coating comprising a layer of polyolefinic polymer located on said exterior side of said substrate and an outermost skin layer comprising a blend of a nonpolar polymer and a polar copolymer located on said polyolefinic polymer layer.

5,196,270

COATED RESIN MOLDING

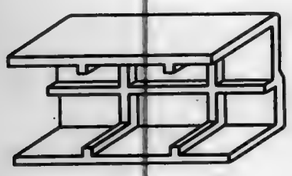
Sadao Kitagawa, and Yuta Kusuno, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Nov. 14, 1990, Ser. No. 612,488

Claims priority, application Japan, Nov. 14, 1989, 1-295746; Mar. 27, 1990, 2-77450; Mar. 27, 1990, 2-77451

Int. Cl.[5] B32B *27/32*

U.S. Cl. 428—523 15 Claims



1. A coated resin molding which comprises:

a molding composed of a resin composition comprising 100 parts by weight of a base resin comprising 100 to 30% by weight of at least one propylene copolymer selected from the group consisting of propylene/ethylene block copolymers having an ethylene content of 3 to 45% by weight and propylene/ethylene random copolymers having an ethylene content of 0.5 to 10% by weight and 0 to 70% by weight of an elastomer, and at least one member selected from the group consisting of (A) 0.01 to 10 parts by weight of a 1,3-diene polymer having at least one terminal hydroxy group or a hydrogenation product thereof, and (B) 0.01 to 40 parts by weight of a copolymer of ethylene with an ethylenically unsaturated compound containing a hydroxyl group, provided that the total amount of components (A) and (B) does not exceed 40 parts by weight; and

a coating formed directly on the surface of said molding.

5,196,271

METHOD OF MAKING CERAMIC ARTICLES HAVING CHANNELS THEREIN AND ARTICLES MADE THEREBY

Danny R. White, New Castle; Michael K. Aghajanian, Newark, both of Del., and Harry R. Zwicker, Glen Mills, Pa., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 697,749, May 6, 1991, abandoned, which is a continuation of Ser. No. 308,880, Feb. 9, 1989, abandoned, which is a division of Ser. No. 907,924, Sep. 16, 1986, Pat. No. 4,847,025. This application Feb. 20, 1992, Ser. No. 839,456

Int. Cl.[5] C04B *35/65*

U.S. Cl. 428—545 18 Claims

1. A self-supporting ceramic matrix composite body comprising:

(a) a first ceramic matrix incorporating at least one first filler material, said first ceramic matrix embedding said first filler material and said first ceramic matrix consisting essentially of about 60–99 percent by weight of a first polycrystalline oxidation reaction product consisting essentially of a material selected from the group consisting of aluminum oxide, aluminum nitride, silicon nitride, silicon carbide, silicon boride, silicon oxide, aluminum boride, titanium nitride, zirconium nitride, titanium boride, zirconium boride, tin oxide and aluminum oxynitride, and the remainder of said first ceramic matrix consisting essentially of at least one first metallic constituent and voids; and

(b) at least one channel wherein at least a portion of at least one wall of said at least one channel comprises a lining, said lining comprising a second ceramic matrix, said second ceramic matrix consisting essentially of about 60–99% by weight of a second polycrystalline oxidation reaction product consisting essentially of a material selected from the group consisting of aluminum oxide, aluminum nitride, silicon nitride, silicon carbide, silicon boride, aluminum boride, aluminum carbide, titanium nitride, zirconium nitride, titanium boride, zirconium boride, tin oxide and aluminum oxynitride, and the remainder of said second ceramic matrix consisting essentially of at least one second metallic constituent and voids.

5,196,272

CORROSION RESISTANT STAINLESS STEEL

Norio Morishige, Yokosuka; Kenji Hirano, Yokohama; Kiyofumi Ishikawa, Hiratsuka, and Shuji Furuya, Yokohama, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 561,072, Aug. 1, 1990, abandoned. This application Jul. 15, 1992, Ser. No. 914,025

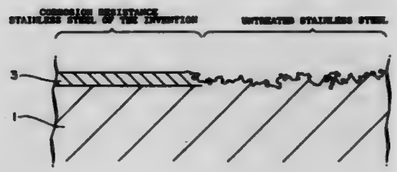
Claims priority, application Japan, Aug. 1, 1989, 1-199919; Aug. 1, 1989, 1-199920; Aug. 1, 1989, 1-199921; Sep. 8, 1989, 1-234231; Sep. 21, 1989, 1-245682

Int. Cl.[5] B22F *00/00*

U.S. Cl. 428—557 5 Claims

1. Corrosion resistant stainless steel comprising a cladding layer formed on a surface of a base metal of the stainless steel, said base metal containing Cr, Ni and Fe, wherein said cladding layer comprises 15–40 weight % Cr, 20–30 weight % Ni, 40–60 weight % Fe and 1–4 weight % Mo, and the amount of

Cr and Ni in weight % in the cladding layer satisfies the following equation:



$Cr/25+Ni/80>1$.

5,196,273

TANTALUM CARBIDE COMPOSITE MATERIALS

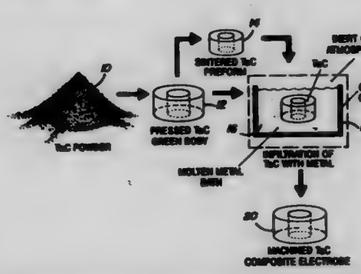
Peter Tsantrizos, Ville St-Pierre; Lakis T. Mavropoulos, Montreal; Kartik Shanker, Ile des Soeurs; Robin A. L. Drew, Pointe-Claire; Bruce Henshaw, Rigaud, and Raynold Lachance, Pincourt, all of Canada, assignors to Noranda Inc., Toronto, Canada

Filed May 13, 1991, Ser. No. 698,898

Claims priority, application Canada, Sep. 18, 1990, 2025619

Int. Cl.[5] C22C *29/00*

U.S. Cl. 428—614 4 Claims



1. A stable electrode for plasma torches operating on reactive plasmagas, comprising a composite made by infiltrating a metal having a low melting temperature selected from the group consisting of aluminum, copper, gold, silver and various alloys thereof into a preform consisting of a sintered body of tantalum carbide having a volume fraction % form over 50% to about 80%.

5,196,274

ELECTROCHEMICAL ENERGY DEVICE

Wallace N. Popravsky, 30106 White Hall Ct., Farmington Hills, Mich. 48331

Filed Jul. 9, 1990, Ser. No. 550,110

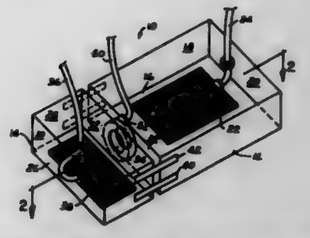
Int. Cl.[5] H01M *8/00*

U.S. Cl. 429—13 10 Claims

1. A device for the electrochemical generation of direct current comprising:

an electrode comprised of aluminum mercury amalgam mixture;

an electrode comprised of an oxidant which is a source of oxygen; and



an electronic conductor separator therebetween wherein the separator is a wafer comprised of germanium.

5,196,275

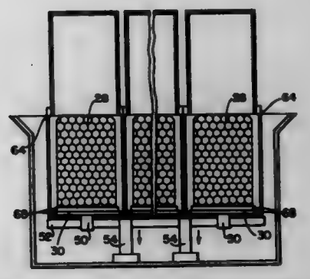
ELECTRICAL POWER STORAGE APPARATUS

Arnold J. Goldman, Jerusalem; Eugeny Pecherer, Netanya; Jonathan Goldstein, Jerusalem, and Arieh Meitav, Rishon Lezion, all of Israel, assignors to Electric Fuel Limited, Jerusalem, Israel

Continuation-in-part of Ser. No. 560,832, Jul. 27, 1990, abandoned, and a continuation-in-part of Ser. No. 555,921, Jul. 19, 1990, Pat. No. 5,121,044. This application Dec. 31, 1990, Ser. No. 636,606

Int. Cl.[5] H01M *4/02*

U.S. Cl. 429—27 2 Claims



1. An electrical power storage system comprising:

an electrical power storage unit having at least one rechargeable electrical cell which comprises:

a pair of generally planar outer electrode means configured to define therebetween an interior space for an electrical power storage medium; and

inner electrode means removably mounted between said pair of outer electrode means so as to be in electrically conductive contact with said electrical power storage medium and defining a plurality of volumes each having a pair of open ends, each open end facing an adjacent outer electrode means; and

means for replacing a discharged volume of said electrical power storage medium with a charged volume of said electrical power storage medium,

wherein said cell is a metal-gas battery cell and said electrical power storage medium contained in said interior space comprises a bed of power storage slurry containing active metal particles saturated with an electrolyte solution, said pair of outer electrode means defines an opening communicating with said interior space, said plurality of volumes are configured to contain portions of the bed of slurry, and said inner electrode means is configured for removal from said interior space via said opening, thereby causing the

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simultaneous removal of the bed of slurry from said interior space, and

wherein said means for replacing a discharge volume comprises:

means for removing said inner electrode means from said interior space so as to remove therefrom the discharged volume of the electrical power storage medium,

means for immersing said inner electrode means in a body of charged slurry so as to enable the charged slurry to flow into and fill each of said plurality of volumes, and

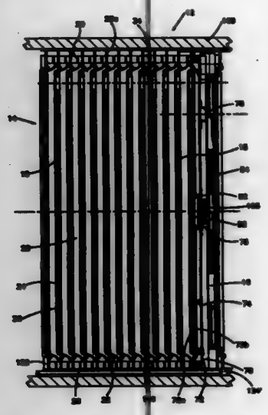
means for replacing said inner electrode means in said interior space.

5,196,276

RESERVE BATTERY

Marilyn J. Nikas, Concord; Kenneth J. Gregg, Mentor; Jay M. Noecal, Jefferson, and Roger J. Camara, Mentor, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed May 17, 1991, Ser. No. 701,899
Int. Cl.[5] H01M *6/36, 10/44*
U.S. Cl. 429—52 40 Claims



1. An activatable compact reserve battery comprising:

a cell cage;

an expandable cell stack contained within a first portion of said cage;

an electrolyte reservoir assembly contained within a second portion of said cage;

said cell stack being expandable into said cage second portion, expansion of said cell stack displacing electrolyte from said electrolyte reservoir to the cell stack thereby activating said battery.

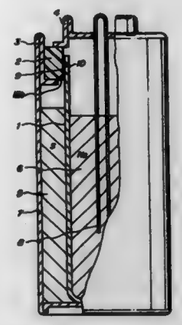
5,196,277

SODIUM-SULFUR CELL AND METHOD OF JOINING SOLID ELECTROLYTE TUBE AND INSULATIVE RING

Toshiyuki Mima, Toyoake; Michimasa Fujii, Mie, and Hirohiko Iwasaka, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 7, 1991, Ser. No. 772,325
Claims priority, application Japan, Oct. 25, 1990, 2-290266; Sep. 24, 1991, 3-273383
Int. Cl.[5] H01M *10/39*
U.S. Cl. 429—104 8 Claims

2. A sodium-sulfur cell, comprising a solid electrolyte tube, an insulative ring, a gap of 100–500 μm formed between the solid electrolyte tube and the insulative ring, and a solder glass filled in the gap for joining the insulative ring to the solid electrolyte tube, wherein a tapered portion is formed on at least one of the solid electrolyte tube and the insulative ring for



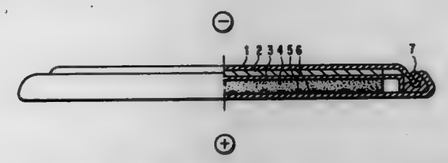
providing a glass reservoir at an end portion of the solder glass which faces the negative electrode chamber.

5,196,278

LITHIUM SECONDARY BATTERY WITH A CATHODE COMPRISING LITHIUM, COBALT AND VANADIUM

Yoshio Idota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 6, 1992, Ser. No. 846,925
Claims priority, application Japan, Mar. 7, 1991, 3-042010
Int. Cl.[5] H01M *4/58, 6/16*
U.S. Cl. 429—194 7 Claims



1. A lithium secondary battery comprising an anode active material which contains at least one member selected from the group consisting of lithium, a lithium alloy, and a compound capable of intercalating and deintercalating lithium, a cathode active material, and an electrolyte which is an organic electrolyte containing a lithium salt, wherein said cathode active material is a crystalline compound obtained by mixing a lithium compound, a cobalt compound, and a vanadium compound in a molar ratio of x:y:z, respectively, wherein x is from 0 to 1.1, y is from 0.12 to 0.98, and z is 1−y, and heating the mixture.

5,196,279

RECHARGEABLE BATTERY INCLUDING A $LI_{1+x}MN_2O_4$ CATHODE AND A CARBON ANODE

Jean-Marie Tarascon, Martinsville, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Jan. 28, 1991, Ser. No. 646,694
Int. Cl.[5] H01M *10/40*
U.S. Cl. 429—194 8 Claims

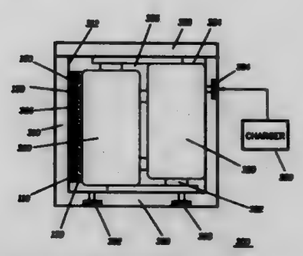
1. Lithium metal free non-aqueous secondary battery comprising a carbon anode of the formula Li_xC_6 wherein x ranges from 0 to 1, an electrolyte, and a cathode consisting essentially of lithium manganese oxide of the formula $Li_xMn_2O_4$ wherein x ranges from 0 to 2.

5,196,280

ADHESIVE PAD WITH A SHRINKABLE LAYER

Russell E. Gyenes, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 8, 1991, Ser. No. 726,498
Int. Cl.[5] H01M *2/10*
U.S. Cl. 429—144 28 Claims



19. A battery housing assembly, comprising:

an energy source having an outer surface;

a housing member for housing the energy source having at least

one surrounding wall, the surrounding wall having an inner surface;

a pad being adhesively attached between the energy source and the housing member, comprising:

an adhesive member including an adhesive surface; and

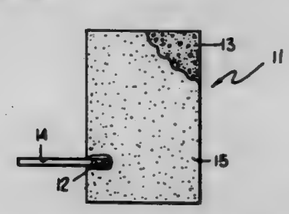
a shrinkable member attached to the adhesive member for reducing size to expose at least a portion of the adhesive surface wherein the portion being exposed bonds the pad to the device.

5,196,281

ELECTRODE HAVING A CONDUCTIVE CONTACT AREA AND METHOD OF MAKING THE SAME

Saverio F. Passabene, and Roy L. Royalty, both of Gainesville, Fla., assignors to Gates Energy Products, Inc., Gainesville, Fla.

Filed Sep. 20, 1990, Ser. No. 585,575
Int. Cl.[5] H01M *4/02*
U.S. Cl. 429—211 9 Claims



1. A nickel electrode for a rechargeable electrochemical cell comprising an electrically conductive porous substrate having at least two major surfaces, a layer of an electrochemically active nickel hydroxide material attached to at least one of said major surfaces and at least partially covering said one major surface and impregnating pores in the substrate, said active nickel hydroxide material being a reducible species of nickel metal, at least one conductive contact area formed of metallic nickel attached to said substrate, said conductive contact area comprising the reduced nickel form of said reducible species which has been converted by reduction to said metallic nickel form by exposing the nickel hydroxide impregnated electrode to a heat source in an atmosphere containing a reducing gas.

5,196,282

GLASSY OXIDE NETWORK PASSIVATION OF DICHROMATED GELATIN HOLOGRAMS

Edward T. Knobbe, Playa Del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 16, 1990, Ser. No. 552,716
Int. Cl.[5] G03C *1/66, 9/08*
U.S. Cl. 430—2 17 Claims

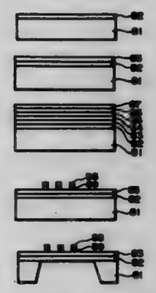
1. A passivated dichromated gelatin film adapted for use in a hologram, said passivated film comprising a gelatin film impregnated with a sufficient amount of glassy oxide network to provide a passivated dichromated gelatin film having increased structural strength.

5,196,283

X-RAY MASK STRUCTURE, AND X-RAY EXPOSURE PROCESS

Tsutomu Ikeda, Tokyo; Masao Sugata, and Hideo Kato, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 489,277
Claims priority, application Japan, Mar. 9, 1989, 1-55031; Feb. 23, 1990, 2-41110; Mar. 1, 1990, 2-47238
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—5 20 Claims



1. An X-ray mask structure comprising an X-ray transmissive membrane, an X-ray absorber held on said x-ray transmissive membrane, and a holding frame that holds said X-ray transmissive membrane, wherein;

said X-ray transmissive membrane comprises a layer of aluminum nitride;

said X-ray absorber comprises a nitride of heavy metal; and

an intermediate layer mainly composed of aluminum, a heavy metal and nitrogen is further held between said X-ray transmissive membrane and said X-ray absorber.

5,196,284

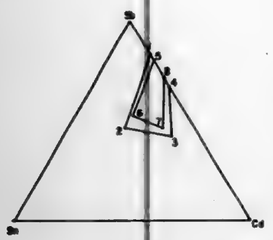
ERASABLE PHASE CHANGE OPTICAL RECORDING ELEMENTS AND METHODS

Kee-chuan Pan, Pittsford; Yuan-sheng Tyan, Webster, and Friedrich Vazan, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1990, Ser. No. 594,581
Int. Cl.[5] G11B *7/24*
U.S. Cl. 430—19 9 Claims

3. An erasable, initialized optical recording element comprising a thin film optical recording layer of an alloy in a crystalline form, said alloy represented by the formula:

$Sb_xCd_ySn_z$



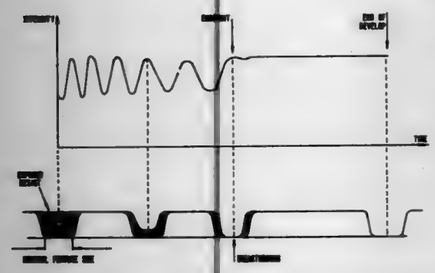
wherein $Sb_xCd_ySn_z$ is within the polygon enclosed by $Sb_{83}Cd_{17}$-$Sb_{46}Cd_{24}Sn_{30}$-$Sb_{42}Cd_{46}Sn_{12}$-$Sb_{68}Cd_{32}$ in a ternary Sb-Cd-Sn composition diagram.

5,196,285

METHOD FOR CONTROL OF PHOTORESIST DEVELOP PROCESSES

Mariste A. Thomson, Santa Clara, Calif., assignor to Xinix, Inc., Santa Clara, Calif.

Filed May 18, 1990, Ser. No. 526,639
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—30 13 Claims



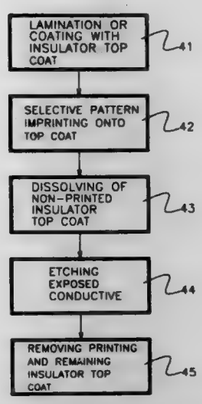
1. A method of developing a layer of photoresist material, comprising the steps of:
applying a developer solution onto the photoresist layer,
thereafter allowing at least some of the applied developer solution to remain on the photoresist layer,
while the developer solution remains on the photoresist layer, monitoring the development process in a manner to determine when the photoresist layer is first developed completely therethrough,
applying fresh developer solution onto the photoresist layer in a direct response to said determination,
thereafter allowing at least some of the applied fresh developer solution to remain on the photoresist layer, and
terminating action of the developer solution on the photoresist layer at a controlled time after application of the fresh developer solution, whereby the photoresist development is completed after said controlled time.

5,196,286

METHOD FOR PATTERNING A SUBSTRATE

Roger D. Watkins, 921 Lake Ave., P.O. Box 754, Quinnesec, Mich. 49876

Filed Jul. 31, 1989, Ser. No. 387,941
Int. Cl.[5] G03G *13/14, 13/28, 13/00*
U.S. Cl. 430—126 18 Claims



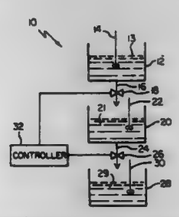
1. A method for patterning a blank comprising the steps of:
Xerographically forming a pattern on a first electrically non-conductive surface of said blank; and
selectively removing a first portion of said first non-conductive and a first portion of an electrical conductor to leave said pattern and a second portion of said non-conductive and a second portion of said conductor, said second portions having form substantially similar to said pattern.

5,196,287

PROCESS FOR PRODUCING ENCAPSULATED PHOTOSENSITIVE COMPOSITION BY ALTERING THE CONCENTRATION OF THE INTERNAL PHASE DURING ENCAPSULATION

William A. Hammann, IV; Kerry Kovacs, both of Centerville; Margaret T. Thomas, Medway; Jing-Den Chen, and Ranganatha Raghaven, both of Spring Valley, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 255,795, Nov. 11, 1988, abandoned. This application Aug. 9, 1990, Ser. No. 565,388
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—138 26 Claims



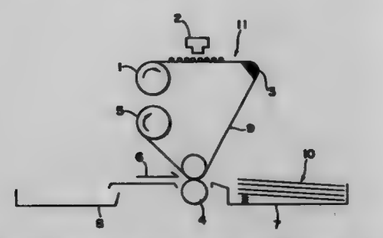
1. A process for producing a microencapsulated photosensitive composition having broadened dynamic range comprising the steps of:
dispersing a portion of a first internal phase comprising a first concentration of photohardenable monomer, image-forming agent, and photoinitiator in a continuous phase as droplets;
diluting a second portion of said first internal phase with an internal phase modifying material to form a second internal phase having a second concentration of said photohardenable monomer, said image-forming agent, or said photoinitiator;
dispersing said second internal phase in said continuous phase as droplets; and
forming a wall around said droplets.

5,196,288

IMAGE FORMING METHOD OF EXPOSING AND HEATING LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER PROVIDED ON SUPPORT

Taku Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa; Seiko Epson Corp. and Seiko Instruments, Inc., both of Tokyo, all of Japan

Filed Sep. 9, 1991, Ser. No. 756,655
Claims priority, application Japan, Sep. 10, 1990, 2-239464
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—138 13 Claims



1. An image forming method which comprises the steps of:
imagewise exposing a light-sensitive material which comprises a support and a light-sensitive layer provided thereon containing silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound, a color image forming substance and a base precursor,
wherein the silver halide, the reducing agent, the polymerizable compound, the color image forming substance and the base precursor are contained in microcapsules which are dispersed in the light-sensitive layer, and the support is made of a polymer film having a thickness of not more than 50 μm; and
simultaneously or thereafter heating the light-sensitive material from the side of the support for 0.1 to 5 seconds.

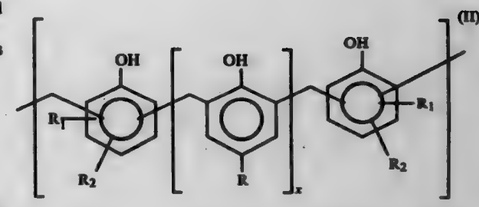
5,196,289

SELECTED BLOCK PHENOLIC OLIGOMERS AND THEIR USE IN RADIATION-SENSITIVE RESIST COMPOSITIONS

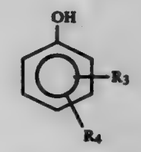
Alfred T. Jeffries, III, Providence; Kenji Honda, Barrington, both of R.I.; Andrew J. Blakeney, and Sobhy Tadros, both of Seekonk, Mass., assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Continuation of Ser. No. 404,138, Sep. 7, 1989, abandoned. This application Jun. 4, 1991, Ser. No. 711,350
The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.
Int. Cl.[5] G03F *7/023, 7/32*
U.S. Cl. 430—192 13 Claims

1. A radiation-sensitive composition comprising an admixture of at least one radiation-sensitive o-quinonediazide compound and a block copolymer binder resin comprising the reaction product of:
(1) a block phenolic oligomer having a unit of formula (II):



wherein x=2 to 5; wherein R is hydrogen a lower alkyl or lower alkoxy group having 1–4 carbon atoms or a halogen; wherein R_1 and R_2 are individually selected from a hydrogen, a hydroxyl, a lower alkyl group or lower alkoxy having 1 to 4 carbon atoms or a halogen group subject to the following provisos:
(a) at least one ortho- or para-position to the hydroxyls on both terminal phenolic moieties is unsubstituted;
(b) the terminal phenolic moieties are different from the phenolic moiety used to construct the interior block; with
(2) at least one aldehyde source and at least one other phenolic monomeric compound having formula (III):



wherein R_3 and R_4 are individually selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, halogen, and hydroxyl; wherein said block phenolic oligomer units constitute from about 5% to about 70% by weight of said binder resin; and wherein the amount of said o-quinonediazide compound or compounds being about 5% to about 40% by weight and the amount of said binder resin being about 60% to 95% by weight, based on the total solids content of said radiation-sensitive composition.

5,196,290

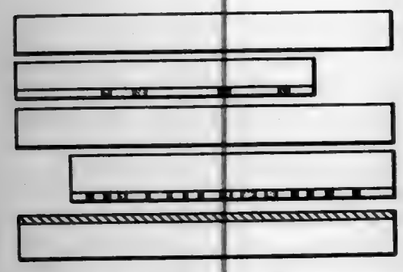
METHOD FOR MAKING A LITHOGRAPHIC ALUMINIUM OFFSET PRINTING PLATE BY THE SILVER SALT DIFFUSION TRANSFER PROCESS

Paul J. Coppens, Turnhout; Ludovicus H. Vefvloet, Kessel, and Eric M. Hoes, Herentals, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed May 27, 1992, Ser. No. 888,488
Claims priority, application Belgium, Jun. 20, 1991, EP 91201578.1
Int. Cl.[5] G03C *5/54*
U.S. Cl. 430—204 8 Claims

1. A method for making a lithographic aluminium offset printing plate comprising the steps of:
information-wise exposing an imaging element comprising on an aluminium support a silver halide emulsion layer
developing said information-wise exposed imaging element in the presence of a silver halide solvent to obtain a silver image on said aluminium support and
removing said silver halide emulsion layer and any optional layer on top of said silver image to expose said silver image by means of washing with rinsing water characterized in that said rinsing water has a pH between 4 and 8 and is bufferred.

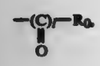
5,196,291
SILVER HALIDE PHOTOGRAPHIC MATERIAL
Hisashi Okada, and Kazunobu Katoh, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 527,906, May 24, 1990, abandoned. This application Jul. 30, 1991, Ser. No. 741,190
Claims priority, application Japan, May 24, 1989, 1-130984
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.
Int. Cl.[5] G03C *1/42*
U.S. Cl. 430—264 6 Claims



1. A silver halide photographic material, which comprises a support having thereon at least one light-sensitive emulsion layer, and which contains in said emulsion layer or at least one other layer (i) at least one hydrazine derivative, (ii) at least one contrast enhancing agent which is an amine derivative, an onium derivative, a disulfide derivative or a hydroxymethyl derivative, and (iii) at least one redox compound which is represented by the following formula (II):

(II)

wherein A_3 and A_4 both represent a hydrogen atom, or one of A_3 and A_4 represents a hydrogen atom and the other represents a sulfinic acid residue or



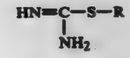
wherein R_0 represents an alkyl group, an alkenyl group, an aryl group, an alkoxy group or an aryloxy group, l represents 1 or 2, Time represents a divalent linking group, t represents 0 or 1, PUG represents a development inhibitor, V represents a carbonyl group,

a sulfonyl group, a sulfoxy group

(wherein R' represents an alkoxy group or an aryloxy group), an imino-methylene group or a thiocarbonyl group, and R represents an aliphatic group, an aromatic group or a heterocyclic group.

5,196,292
NUCLEATED HIGH CONTRAST PHOTOGRAPHIC ELEMENTS CONTAINING BALLASTED THIOETHER ISOTHIOUREAS TO INHIBIT PEPPER FOG AND RESTRAIN IMAGE SPREAD
Harold I. Machonkin, Webster, and Donald L. Kerr, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 17, 1991, Ser. No. 778,037
The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.
Int. Cl.[5] G03C *1/34, 1/42*
U.S. Cl. 430—264 20 Claims

1. A silver halide photographic element adapted to form a high contrast image when developed with an aqueous alkaline developing solution; said element comprising:
(1) a hydrazine compound that functions as a nucleator,
(2) an amino compound that functions as an incorporated booster, and (3) a ballasted thioether isothiourea that functions as a pepper fog inhibitor and image spread restrainer, said ballasted thioether isothiourea having the formula:



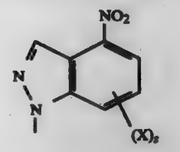
wherein R is a monovalent thioether group of such size and configuration as to confer on the isothiourea sufficient bulk as to render it substantially non-diffusible from the layer of said element in which it is coated.

5,196,293
SILVER HALIDE PHOTOGRAPHIC MATERIAL
Hisashi Okamura; Kazunobu Katoh; Shoji Yasuda, and Takashi Hoshimiya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 15, 1992, Ser. No. 821,217
Claims priority, application Japan, Jan. 17, 1991, 3-15648; Mar. 12, 1991, 3-70388
Int. Cl.[5] G03C *1/06, 1/34*
U.S. Cl. 430—264 14 Claims

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein the silver halide photographic material contains at least one compound represented by formula (I):

(I)

wherein ED represents a group capable of releasing $(Time)_t$-Ind upon a reaction with an oxidation product of a developing agent; Time represents a divalent linking group; t represents 0 or 1; and Ind represents a group represented by formula (II):



(II)

wherein X represents a monovalent group; and s represents an integer of from 0 to 4.

12. A silver halide photographic material as claimed in claim 1, wherein a different hydrazine compound from the compound represented by formula (I) is further incorporated into a silver halide emulsion layer or another hydrophilic colloid layer.

5,196,294
ERASABLE OPTICAL RECORDING MATERIALS AND METHODS BASED ON TELLURIUM ALLOYS
Kee C. Pan, Pittsford; Yuan S. Tyan, Webster, and Fridrich Vazan, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 17, 1990, Ser. No. 583,105
Int. Cl.[5] G03C *1/72;* G11B *7/24*
U.S. Cl. 430—270 3 Claims

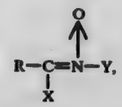
1. An optical recording element comprising a thin film optical recording layer of an alloy, said alloy represented by the formula

$$Te_a(Sb_xSn_yIn_z)_{1-a}$$

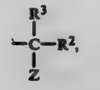
wherein a is between about 0.38 and 0.62; x is between about 0.05 and 0.65; y divided by z is between about 0.5 and 5; with the proviso that the product of (y+z) and (1−a) is greater than 0.20.

5,196,295
SPIN CASTABLE MIXTURES USEFUL FOR MAKING DEEP-UV CONTRAST ENHANCEMENT LAYERS
Gary C. Davis, Albany, N.Y., assignor to MicroSi, Inc., Phoenix, Ariz.
Continuation of Ser. No. 546,673, Jun. 29, 1990, abandoned, which is a continuation of Ser. No. 79,988, Jul. 31, 1987, abandoned. This application May 7, 1991, Ser. No. 700,355
Int. Cl.[5] G03F *7/095;* G03C *1/727*
U.S. Cl. 430—273 9 Claims

9. Composites comprising a photoresist layer having a contrast enhancement layer thereon, wherein the contrast enhancement layer is obtained from a spin castable mixture comprising by weight
(A) 100 parts of an inert solvent,
(B) 2 to 20 parts of an inert organic binder, and
(C) 2 to 20 parts of a nitrone of the formula,

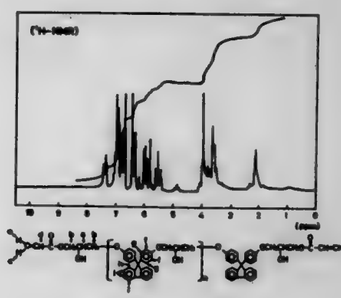


wherein R is selected from the group consisting of hydrogen, and a $C_{(1-8)}$ alkyl radical, a $C_{(3-5)}$ divalent alkylene radical, and a $C_{(3-5)}$ divalent alkylene radical substituted with one to three monovalent radicals selected from the group consisting of cyano, halogen, carbalkoy, nitro, amino, alkylamino, and mixtures thereof, wherein X is hydrogen or a monovalent electron-withdrawing radical selected from the group consisting of carbalkoxy, acyl, and oxirane, and wherein Y is
(i) hydrogen, or
(ii) a monovalent aliphatic group selected from the group consisting of R^1 and

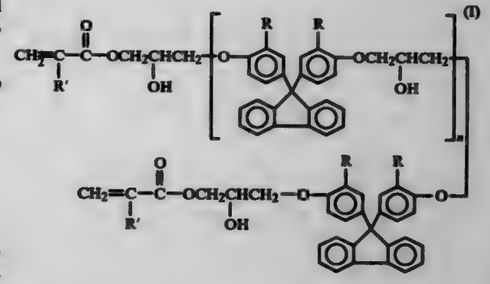


wherein R^1 is a $C_{(1-5)}$ alkyl radical, wherein R^2 and R^3 are monovalent radicals selected from the group consisting of hydrogen and $C_{(1-5)}$ alkyl, and wherein Z is selected from the group consisting of hydrogen, $C_{(1-5)}$ alkyl radical, and an electron-withdrawing radical selected from the group consisting of nitrile, carbalkoxy, acyl, or
(iii) a $C_{(3-5)}$ divalent alkylene radical, or
(iv) a $C_{(3-5)}$ divalent alkylene radical substituted with one to three monovalent radicals selected from the group consisting of cyano, halogen, carbalkoxy, nitro, amino, alkylamino, and mixtures thereof, with the proviso that R and Y are divalent radicals only when both radicals react to form a $C_{(5-7)}$ ring.

5,196,296
EPOXY ACRYLATE RESINS AND PHOTOSENSITIVE RESIN COMPOSITIONS THEREFROM
Kazuhiro Watanabe, and Takero Terumoto, both of Kawasaki, Japan, assignors to Nippon Steel Corporation and Nippon Steel Chemical Co., Ltd., Tokyo, Japan
Filed Jul. 26, 1990, Ser. No. 557,846
Claims priority, application Japan, Oct. 6, 1989, 1-259942; Dec. 15, 1989, 1-323829
Int. Cl.[5] G03F *7/027;* C08F *283/00, 36/00*
U.S. Cl. 430—288 2 Claims



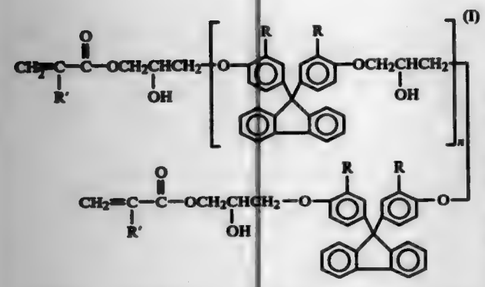
1. Epoxy acrylate resins represented by the general formula (I)



(I)

in which R is hydrogen or a lower alkyl group, R' is hydrogen or methyl group, and n is an integer from 0 to 20.

2. Photosensitive resin compositions characterized by containing 15 to 90% by weight of epoxy acrylate resins of the general formula (I)



(I)

in which R is hydrogen or a lower alkyl group, R′ is hydrogen or methyl group, and n is an integer from 0 to 20 and 10 to 85% by weight of at least one compound selected from trifunctional and higher acrylates and epoxy acrylates.

5,196,297

RECORDING MATERIAL AND PROCESS OF USING

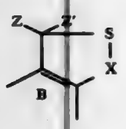
Edward J. Dombrowski, Jr., Allston; James R. Freedman, Newton Centre, and Patrick F. King, North Quincy, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 809,157, Dec. 16, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 935,534

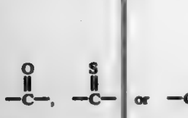
Int. Cl.[5] G03C *1/73, 1/494;* B41M *5/30, 5/34*

U.S. Cl. 430—338 45 Claims

1. A recording material which comprises (a) at least one di- or triarylmethane dye precursor compound



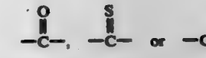
wherein X is



ring B represents a substituted or unsubstituted carbocyclic aryl ring or a heterocyclic aryl ring; and Z and Z′ taken individually represent the moieties to complete the auxochromophoric system of a diarylmethane or a triarylmethane dye when said S-containing ring is open and Z and Z′ when taken together represent the bridged moieties to complete the auxochromophoric system of a bridged triarylmethane dye when said S-containing ring is open, and (b) a Lewis acid material capable of opening said S-containing ring whereby said compound is rendered colored, said dye precursor compound being coated on a support and said Lewis acid material being coated on the same or on a separate support.

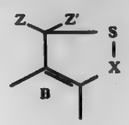
27. A method of forming color which comprises contacting (a) a di- or triarylmethane dye precursor compound having the formula

wherein X is

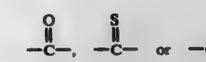


ring B represents a substituted or unsubstituted carbocyclic aryl ring or a heterocyclic aryl ring; and Z and Z′ taken individually represent the moieties to complete the auxochromophoric system of a diarylmethane or a triarylmethane dye when said S-containing ring is open and Z and Z′ when taken together represent the bridged moieties to complete the auxochromophoric system of a bridged triarylmethane dye when said S-containing ring is open, with (b) a Lewis acid material capable of opening said S-containing ring whereby said compound is rendered colored.

38. A method of thermal imaging which comprises heating imagewise a recording element which comprises a support carrying at least one layer comprising (a) at least one di- or triarylmethane dye precursor compound having associated therewith in the same or a different layer, (b) an organic silver salt and optionally, (c) a heat-fusible organic acidic material, said dye precursor compound having the formula



wherein X is



ring B represents a substituted or unsubstituted carbocyclic aryl ring or a heterocyclic aryl ring; and Z and Z′ taken individually represent the moieties to complete the auxochromophoric system of a diarylmethane or a triarylmethane dye when said S-containing ring is open and Z and Z′ when taken together represent the bridged moieties to complete the auxochromophoric system of a bridged triarylmethane dye when said S-containing ring is open, said imagewise heating providing an imagewise distribution of Ag+ for reaction with said dye precursor compound whereby color is formed in an imagewise pattern corresponding to said imagewise heating.

5,196,298

PHOTOGRAPHIC DEVELOPING SOLUTION CONTAINING AN ASCORBIC ACID DERIVATIVE

Pascal F. Meens, Turnhout; Peter M. Willems, Stekene, and Gino L. De Rycke, Mortsel, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

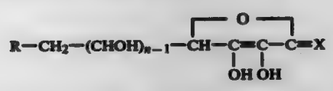
Filed Feb. 5, 1992, Ser. No. 831,509

Claims priority, application European Pat. Off., Feb. 14, 1991, 91200311.8

Int. Cl.[5] G03C *5/24*

U.S. Cl. 430—440 13 Claims

1. Photographic developing solution for immersion development showing a pH of at least 12.0 and containing more than 0.45 moles/liter of a sugar derivative, or an alkali metal salt thereof, corresponding to general formula (I):



(I)

wherein X represents an oxygen atom or an imino group, and n represents a positive integer from 1 to 4, and R represents a

hydroxy group when n is 1, and R represents a hydroxy group or a hydrogen atom when n is 2 to 4.

5,196,299

TABULAR GRAIN EMULSION CONTAINING RADIOGRAPHIC ELEMENTS EXHIBITING REDUCED DYE STAIN

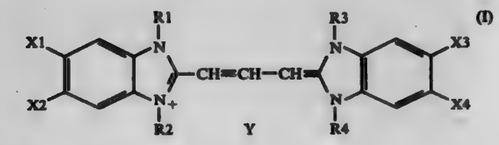
Robert E. Dickerson; Steven G. Link; Fred M. Macon, all of Rochester; Richard B. Anderson, Fairport, and Wayne W. Weber, II, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1991, Ser. No. 677,004

Int. Cl.[5] G03C *1/18, 1/46*

U.S. Cl. 430—567 11 Claims

1. A radiographic element comprised of
a transparent film support and
spectrally sensitized tabular grain silver halide emulsion layer units coated on opposite sides of the film support,
CHARACTERIZED IN THAT
at least one of the emulsion layer units is comprised of tabular grains having a thickness of less than 0.2 micrometer accounting for greater than 50 percent of total grain projected area and exhibiting an average tabularity of greater than 25 and
adsorbed to the surface of the tubular grains at least one benzimidazolocarbocyanine dye of the formula:



(I)

where
R1 and R3 are methyl or ethyl, at least one of R1 and R3 being methyl;
R2 and R4 are substituted or unsubstituted C_1 to C_6 alkyl, provided that at least one of R2 and R4 is fluorsubstituted alkyl;
X1 and X3 are each independently methyl, methylthio, fluoro-substituted methyl or methylthio, or hydrogen;
X2 and X4 are each fluoro-substituted methyl and
Y represents an ion as needed to balance the charge of the molecule.

5,196,300

METHOD FOR MAKING SILVER HALIDE EMULSION, PHOTOSENSITIVE MATERIALS USING THE SAME, AND METHODS OF RECORDING IMAGES USING THE PHOTOSENSITIVE MATERIALS

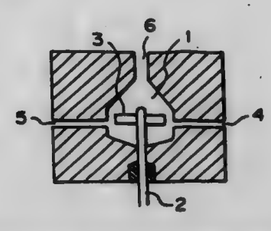
Shigeharu Urabe, and Shunichi Aida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 5, 1990, Ser. No. 622,682

Claims priority, application Japan, Dec. 5, 1989, 1-316115; Jun. 19, 1990, 2-161054

Int. Cl.[5] G03C *1/015*

U.S. Cl. 430—568 8 Claims



1. A method of preparing a silver halide emulsion containing superfine grains, wherein said method is continuous and comprises
feeding an aqueous solution of a water-soluble silver salt and an aqueous solution of a water-soluble halide to a mixing device furnished with an agitator and having a reaction chamber,
mixing all the solutions in said device to form superfine silver halide grains, wherein the solutions are present in said device for a residence time (t) of 20 seconds or less, where the residence time is expressed by the following equation:

$$t = \frac{V}{a + b + c}$$

V: the volume of the reaction chamber in the mixing device (ml)
a: the amount of aqueous silver nitrate solution added (ml/min)
b: the amount of aqueous halide solution added (ml/min)
c: the amount of aqueous protective colloid solution added (ml/min),
expelling an emulsion containing the formed superfine grains from said mixing device, and
collecting the emulsion expelled from said mixing device,
and the method further comprises forming the superfine grains in the presence of at least one of a high molecular weight compound and a substance capable of adsorbing to silver halide, each of which has a physical retardance value of at least 40 as determined by the PAGI method, to ensure an average grain size of 0.05 μm or less,
wherein the method of preparing a silver halide emulsion containing superfine grains avoids the occurrence of Ostwald ripening.

5,196,301

POST-PROCESSING STABILIZATION OF PHOTOTHERMOGRAPHIC EMULSIONS

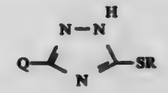
Sharon M. Simpson, Lake Elmo; John R. Boon, Woodbury, both of Minn.; Marco Bucci, Genova, Italy; Massimo Bertoldi, Cuneo, Italy; Cristina Soncini, Savona, Italy, and Kumars Sakizadeh, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 30, 1990, Ser. No. 559,618

Int. Cl.[5] G03C *1/02, 5/24*

U.S. Cl. 430—617 20 Claims

1. A photothermographic imaging element comprisign a substrate having on at least one side thereof a layer comprisign a photographic silver halide in reactive association with a silver source material, a reducing agent for silver ion, and a binder, said layer having therein or in an adjacent layer a post processing stabilizing amount of a 5-alkylthio-1,2,4-triazole represented by the formula:

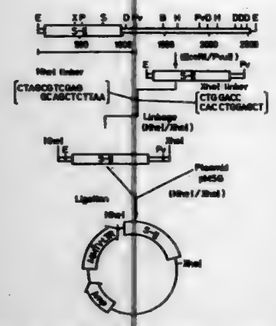


wherein
R represents alkyl group, and
Q represents H, an alkyl group, or an electron-withdrawing group.

5,195,302
ENZYMATIC ASSAYS USING SUPERABSORBENT MATERIALS
David A. Kidwell, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 29, 1990, Ser. No. 574,175
Int. Cl.[5] C12Q *1/00*; G01N *21/76, 21/00*
U.S. Cl. 435—4 14 Claims

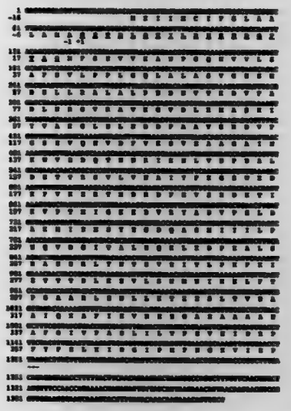
1. In an apparatus for conducting an assay which includes an absorbent detecting layer and wherein the concentration of a specific material is determined through the use of a reaction which takes place on the absorbent detecting layer and which produces a detectable substance whose concentration is proportional to the concentration of the specific material being assayed, the improvement wherein the absorbent detecting layer forms a colorless and transparent gel upon hydration, has an absorptive capacity for distilled water of at least about 225 mL/g and is a polymeric material which hydrates in under 3 seconds.

5,195,303
CLONING OF DNA ENCODING TRANSCRIPTION FACTOR S-II AND UTILIZATION OF THE DNA
Shunji Natori, Tone, Japan, assignor to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan
Division of Ser. No. 246,244, Sep. 19, 1988, Pat. No. 5,055,392.
This application Apr. 11, 1991, Ser. No. 683,922
Claims priority, application Japan, Sep. 29, 1987, 62-242817
Int. Cl.[5] C12Q *1/68, 1/70*; C12N *15/00*; C07H *15/12*
U.S. Cl. 435—5 1 Claim



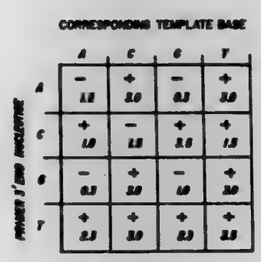
1. A method for the diagnosis of HIV infection comprising steps of:
a) preparing a probe by digesting a single-stranded DNA clone shown in FIG. 4 which encodes the transcriptional S-II of Ehrlich ascites tumor with restriction enzymes EcoRI and PstI to obtain a single-stranded DNA fragment with 534 deoxyribonucleotides, and labelling said fragment with a radioisotope;
b) preparing a serial system of dilutions with a serum sample obtained from an individual to be diagnosed;
c) preparing a test filter by spotting each diluted sample on a nitrocellulose filter and baking the same;
d) carrying out a dot-blot hybridization with use of the probe and said test filter; and
e) checking each spot with autoradiograph scanning to measure an expression of mRNA of transcriptional S-II.

5,196,304
SERINE PROTEINASE INHIBITOR GENE FROM THE INSECT *MANDUCA SEXTA*
Michael R. Kanost; Michael A. Wells, both of Tucson, Ariz., and Sarvamangala V. Prasad, Houston, Tex., assignors to Arizona Technology Development Corporation, Tucson, Ariz.
Filed Jan. 12, 1990, Ser. No. 464,310
Int. Cl.[5] C07H *21/04*; C12Q *1/68*
U.S. Cl. 435—6 4 Claims



1. A purified DNA molecule having a sequence defined by nucleotides 25–1200 of FIG. 3 which encodes for Manduca sexta hemolymph serine proteinase inhibitor.

5,196,305
DIAGNOSTIC AND AMPLIFICATION METHODS USING PRIMERS HAVING THYMINE AT 3' END TO OVERCOME PRIMER-TARGET MISMATCH AT THE 3' END
John B. Findlay, and Lynn Bergmeyer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 12, 1989, Ser. No. 406,221
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 16 Claims



1. A method for amplifying at least one nucleic acid, said method comprising:
A. contacting a specimen comprising a nucleic acid with a primer composition,
said primer composition consisting essentially of a primer which is complementary to a sequence of said nucleic acid in every position of said sequence except a single position at the 3' end of said primer, resulting in a single mismatch at said single position between said primer and said nucleic acid sequence,

said primer having a nucleotide with a thymine base in the position of said mismatch, and
B. substantially simultaneously, contacting said specimen with a DNA polymerase under conditions such that said nucleic acid is amplified in the resulting mixture by forming primer extension products, and denaturation of said primer extension products, said product formation and denaturation being carried out at least five times.

5,196,306
METHOD FOR THE DETECTION OR QUANTITATION OF AN ANALYTE USING AN ANALYTE DEPENDENT ENZYME ACTIVATION SYSTEM
Mark N. Bobrow, Woburn, and Gerald J. Litt, Wellesley, both of Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 330,357, Mar. 29, 1989, abandoned, and a continuation-in-part of Ser. No. 494,226, Mar. 20, 1990, abandoned. This application Sep. 28, 1990, Ser. No. 589,719
Int. Cl.[5] C12Q *1/00, 1/64*; G01N *33/53, 33/566*
U.S. Cl. 435—7.9 10 Claims

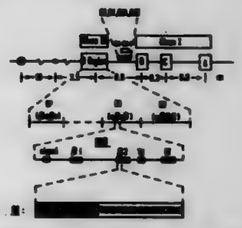
1. A method for the detection or quantitation of an analyte in an assay which comprises using an analyte dependent enzyme activation system comprising at least one enzyme to react with a conjugate consisting of a detectably labeled substrate specific for the enzyme system to form an activated conjugate which deposits substantially wherever at least one receptor for the activated conjugate is immobilized, said receptor not being reactive with the analyte dependent enzyme activation system, wherein deposited detectable labels either directly or indirectly generate a signal which can be detected or quantitated.

5,196,307
CLONED HUMAN CENTROMERE AUTOANTIGEN
William Earnshaw, Monkton, Md.; Don Cleveland, Baltimore, both of Md., and Kevin F. Sullivan, San Diego, Calif., assignors to The Johns Hopkins University, Baltimore, Md.
Filed Mar. 29, 1988, Ser. No. 174,854
Int. Cl.[5] C12N *15/12*; G01N *33/531, 33/564*
U.S. Cl. 435—7.9 10 Claims

1. A cDNA sequence comprising a cDNA sequence encoding a CENP-B polypeptide consisting essentially of an epitope reactive with at least 90% of those samples having anticentromere autoantibodies, wherein said epitope is destroyed by disruption at a site 42 amino acids from the carboxy terminus of CENP-B.

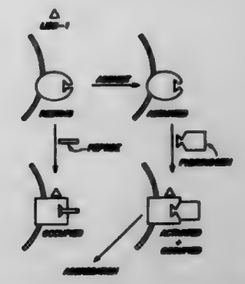
5,196,308
METHODS FOR IDENTIFYING THE DQW3.2 ALLELE ASSOCIATED WITH INCREASED RISK OF INSULIN-DEPENDENT DIABETES MELLITUS
Gerald T. Nepom, and Barbara S. Nepom, both of Bainbridge Island, Wash., assignors to Genetic Systems Corporation, Redmond, Wash.
Continuation of Ser. No. 745,321, Jun. 14, 1985, abandoned.
This application Mar. 13, 1989, Ser. No. 325,058
Int. Cl.[5] G01N *33/543, 33/564, 33/577*
U.S. Cl. 435—7.21 11 Claims

1. A method for identifying an individual having the DQw3.2 haplotype associated with susceptibility to insulin-dependent diabetes mellitus comprising:
incubating a first monoclonal antibody with a portion of cells obtained form said individual, wherein said first monoclonal antibody is reactive with cell lines homozygous for HLA-DQw3.2 and with cell lines homozygous for HLA-DQw3.1, said respective cell lines having a BamHI restriction endonuclease fragment pattern comprising a 12Kb fragment or 6.9 Kb and 3.7 Kb fragments, said fragments detectable by a DNA probe substantially homologous with a fragment of the DQβ gene of the human major histocompatibility complex;
incubation a second monoclonal antibody with a separate portion of cells from said individual wherein said second monoclonal antibody is reactive with cell lines homozygous for HLA-DQw3.1 and having a BamHI restriction endonuclease pattern comprising 6.9 Kb and 3.7 Kb fragments, said fragments detectable by a DNA probe substantially homologous with a portion of the DQβ gene of the human major histocompatibility complex;



detecting the presence of immunocomplexes formed between said first monoclonal antibody and said individual's cells, and said second monoclonal antibody and said individual's cells; and
determining from the results of the step of detection whether the DQw3.2 haplotype associated with susceptibility to diabetes is present.

5,196,309
CHARACTERIZATION OF PLATELET AGGREGATION DISORDERS
Mark H. Ginsberg, San Diego, Calif., assignor to The Scripps Research Institute, La Jolla, Calif.
Filed Nov. 15, 1990, Ser. No. 614,723
Int. Cl.[5] G01N *33/567, 33/577*
U.S. Cl. 435—7.21 13 Claims



1. A method for characterizing a platelet adhesion defect in a patient having said defect as an activation, ligand binding, or post-occupancy defect, said method comprising:
(a) determining the presence of activation competent platelets in a first platelet-containing sample from said patient;
(b) determining the presence of ligand-occupancy competent platelets in a second platelet-containing sample from said patient; and
(c) correlating the results in steps (a) and (b) with predetermined criteria for characterizing platelet adhesion defects, whereby (i) activation defects are identified when the presence of activation competent platelets is less than a predetermined activation level using said predetermined criteria, (ii) ligand binding defects are identified when the presence of ligand-occupancy competent platelets is less than a predetermined ligand-occupancy level using said predetermined criteria, and (iii) post-occupancy defects are identified when the presence of activation competent platelets exceeds said predetermined activation level and

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the presence of ligand-occupancy competent platelets exceeds said predetermined ligand-occupancy level.

5,196,310

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO A HUMAN MONOCYTE ANTIGEN, ANTIBODY, AND METHODS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 763,330, Aug. 8, 1985, Pat. No. 4,912,045, which is a continuation of Ser. No. 432,456, Oct. 4, 1982, abandoned, which is a division of Ser. No. 110,509, Jan. 8, 1980, Pat. No. 4,364,936. This application Aug. 3, 1989, Ser. No. 389,246

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] G01N *33/577*

U.S. Cl. 435—7.24 1 Claim

1. A diagnostic composition of matter for detection of OKM1$^+$ cell excess or deficiency comprising, in admixture with a diagonstically acceptable carrier, an amount of a monoclonal antibody effective to detect such OKM$^+$ cell excess or deficiency, wherein said monoclonal antibody is produced by a hybridoma formed by fusion of cells from a mouse myeloma cell line and spleen cells from a mouse previously immunized with human mononuclear cells.

5,196,311

ELISA TEST FOR VON WILLEBRAND FACTOR

Roger E. Benson, Albany; James L. Catalfamo, South Bethlehem, both of N.Y., and W. Jean Dodds, Santa Monica, Calif., assignors to Health Research, Incorporated, Albany, N.Y.

Filed Oct. 27, 1989, Ser. No. 428,161

Int. Cl.[5] G01N *33/53, 33/531, 33/543;* C07K *15/06*

U.S. Cl. 435—7.94 17 Claims

1. A polyclonal antibody against canine von Willebrand factor antigen that is useful for measuring von Willebrand factor antigen in vertebrate plasma, wherein said vertebrate plasma is isolated from a vertebrate species selected from the group consisting of at least three of human, nonhuman primate, dog, horse, pig, mouse, rat, guinea pig, rabbit, cow and cat and wherein said polyclonal antibody is isolted by (1) isolating and purifying von Willebrand factor antigen from canines, (2) immunizing a vertebrate species with the isolated and purified canine von Willebrand factor antigen, so as to produce polyclonal antibody against canine von Willebrand factor antigen in the vertebrate species, (3) isolating the polyclonal antibody against canine von Willebrand factor antigen from the vertebrate species, and (4) purifying the isolated polyclonal antibody against canine von Willebrand factor antigen by adsorption with plasma isolated from canines homozygous for von Willebrands disease.

5,196,312

METHOD AND TEST COMPOSITION FOR DETERMINATION OF ENZYME ACTIVITY

Akira Miike, Shizuoka, and Toshio Tatano, Numazu, both of Japan, assignors to Kyowa Medex Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,676

Claims priority, application Japan, Nov. 13, 1987, 62-286559

Int. Cl.[5] C12Q *1/56, 1/26*

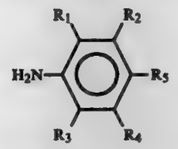
U.S. Cl. 435—13 7 Claims

1. A method for determination of an enzyme activity, which comprises the steps of:

(a) allowing a substrate for the enzyme whose activity is to be determined and which is capable of releasing an aniline derivative, to act on the enzyme to thereby form the analine derivative,

(b) oxidizing a chromogen which is capable of being oxidized without condensing with the aniline derivative by an oxidase selected from the group consisting of bilirubin oxidase, monophenol monooxygenase, ascorbic acid oxidase, catechol oxidase, laccase, o-aminophenol oxidase, 3-hydroxy-anthranilate oxidase and phenol monooxygenase, in the presence of oxygen and in the absence of a coupler to be oxidatively condensed with the aniline derivative, to thereby form a pigment; and

(c) quantitatively determining the pigment by colorimetry; the aniline derivative being represented by the formula (I):



(I)

wherein R_1, R_2, R_3 and R_4 may be same or different and are selected from the group consisting of hydrogen, halogen, alkyl, sulfonyl and hydroxyl, R_5 is selected from the group consisting of hydroxyl, amino and substituted amino, wherein said substituent is selected from the group consisting of alkyl, sulfoalkyl and hydroxyalkyl.

5,196,313

METHOD FOR THE EVALUATION OF ANTICOCCIDIAL ACTIVITY OF COMPOUNDS USING 2,3,5-TRIPHENYLTETRAZOLIUM CHLORIDE AND TRYPAN BLUE INDICATORS

Walter M. Calbreth, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 205,051, Jun. 6, 1988, abandoned, which is a continuation of Ser. No. 909,382, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 455,382, Jan. 3, 1983, abandoned. This application Oct. 16, 1990, Ser. No. 600,559

Int. Cl.[5] C12Q *1/02, 1/24, 1/22, 1/18*

U.S. Cl. 435—32 5 Claims

1. A method for evaluating a number of different chemotherapeutic agents for antisporozoan activity, said method consisting essentially of the steps of providing a plurality of different anticoccidial chemotherapeutic agents and for each agent:

(a) isolating free-living sporozoites from sporulated oocysts of E. tenella,

(b) suspending the isolated sporozoites in a sterile culture medium containing about 0.05% by weight of 2,3,5-triphenyltetrazolium chloride,

(c) mixing the sporozoite suspension with about 0.001 to 100 micrograms per milliliter of the chemotherapeutic agent to be evaluated for antisporozoan activity to form a mixture and incubating said mixture in a humid atmosphere of about 5% CO_2 at a temperature of about 41° C. for about 4–20 hours;

(d) macroscopically examining the incubated mixture for the appearance of a red formazan pigment, wherein the red formazan pigment indicates viable sporozoites and no color change indicates dead or metabollically impaired sporozoites, and

(e) mixing the incubated mixture showing no color change with about 0.4% by weight of trypan blue,

(f) microscopically examining the mixture of step (e) for blue stained sporozoites, wherein the blue stained sporozoites indicate killed sporozoites.

5,196,314

PROCESS AND REAGENT FOR THE DETERMINATION OF SUBSTRATES OR ENZYME ACTIVITIES

Michael-Harold Town, Oberhausen; Joachim Siedel, Beraried, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 35,617, Apr. 3, 1987, Pat. No. 5,013,647.

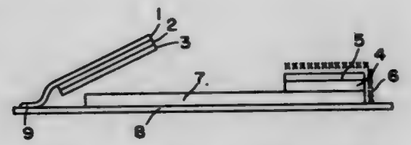
This application Feb. 26, 1991, Ser. No. 661,271

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611227

The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.

Int. Cl.[5] C12Q *1/26, 1/28, 1/32*

U.S. Cl. 435—25 7 Claims



5. A method of removing disturbing reducing substances from an enzyme substrate or enzyme sample to be analyzed by a photometrically detectible redox reaction of redox color indicator system, wherein light absorption of a photometrically measurable material formed by a redox reaction or light absorption of said color indicator system after said reaction is measured at a measurement wavelength, which method comprises adding to said sample a tetrazolium salt which, by reaction with the reducing substances, forms a formazane which does not absorb light at all or absorbs light only to a negligible extent that does not interfere with measuring the light absorption resulting from the redox reaction at the measurement wavelength.

5,196,315

HUMAN NEURONAL CELL LINE

Gabriele V. Ronnett, Baltimore, Md.; Jeffrey S. Nye, New York, N.Y.; Lynda D. Hester, Towson, and Solomon H. Snyder, Baltimore, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 515,760, May 1, 1990, abandoned. This application Apr. 25, 1991, Ser. No. 689,002

Int. Cl.[5] C12Q *1/02;* C12N *5/00*

U.S. Cl. 435—29 6 Claims

1. A continuous non-malignant neuronal cell line, the cells of which:

a) in the undifferentiated form are essentially free of branched processes;

b) stain positively for neurofilament protein and neurotransmitters;

c) do not stain positively for glial fibrillary acidic protein; and

d) in the presence of nerve growth factor differentiate into cells with long branched processes.

5,196,316

ENZYME AND DNA CODING THEREFOR

Yasuno Iwasaki, Takarazuka, and Yoshiki Nishikawa, Kobe, both of Japan, assignors to Japat Ltd., Basel, Switzerland

Filed May 30, 1991, Ser. No. 707,367

Claims priority, application Japan, Jun. 1, 1990, 2-141678; Aug. 10, 1990, 2-210535; Nov. 30, 1990, 2-329911

Int. Cl.[5] C12D *21/00;* C12H *9/00*

U.S. Cl. 435—69.1 11 Claims

1. A recombinant DNA molecule selected from the group of molecules consisting of hybrid vectors and manufactured DNA molecules which can be used for preparation of hybrid vectors, said recombinant DNA molecule comprising a DNA sequence encoding the polypeptide from *Xenopus laevis* with peptidylhydroxyglycine N-C lyase (PHL) activity which polypeptide catalyzes the following reaction

R-GlyOH→R—NH_2

wherein R represents a peptide residue, and GlyOH represents an α-hydroxyglycine residue linked to the C-terminus of said peptide R by an amide bond, said DNA sequence consisting essentially of the nucleotide sequence extending from position 1177 to 2148 of the sequence with SEQ ID No. 1.

5,196,317

OVEREXPRESSION OF PROTEINS IN RECOMBINANT HOST CELLS

Martin Heinrich, Darmstadt; Wolfgang Eboling, Bickenbach, and Wolfgang Brümmer, Alsbach-Hähnlein, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

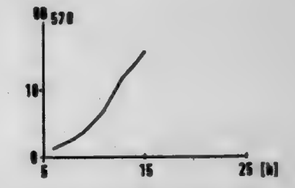
Filed Nov. 2, 1990, Ser. No. 608,443

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936408

The portion of the term of this patent subsequent to Jan. 30, 2009, has been disclaimed.

Int. Cl.[5] C12N *15/00, 15/53, 15/67, 15/70*

U.S. Cl. 435—69.1 14 Claims



1. In a process for the preparation of a protein by cultivating recombinant prokaryotic host cells in a nutrient solution and by expression of the protein with a thermally-inducible promoter system and subsequent isolation of the protein, the improvement comprising carrying out the expression of the protein

(a) at a biomass of the recombinant host cells present at the beginning of induction of expression which is equivalent to 5 to 40% of the maximum achievable biomass,

(b) at a suboptimal expression temperature and

(c) in the presence of one or more added amino acids and/or a yeast extract,

whereby the thus-produced protein is biologically active.

5,196,318

PRECISELY REGULATED EXPRESSION OF DELETERIOUS GENES

Thomas O. Baldwin, Bryan; Jerry H. Devine, and Gerald S. Shadel, both of College Station, all of Tex., assignors to The Texas A&M University System, College Station, Tex.

Filed Jan. 26, 1990, Ser. No. 544,268

Int. Cl.[5] C12P *21/00;* C12N *15/09, 15/70, 15/31*

U.S. Cl. 435—69.1 15 Claims

1. An expression system comprising a lux regulatory circuit, said regulatory circuit further comprising a luxR gene and truncated luxI gene of Vibrio, operably linked to and capable of stringently regulating expression of a gene, a product of which said gene is deleterious to an *Escherichia coil* host cell in which said expression system and said gene are resident.

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5,196,319

PRIMARY BILIARY CIRRHOSIS AUTOANTIGEN

Ross L. Coppel, Victoria, Australia, and Merrill E. Gershwin, Davis, Calif., assignors to Amrad Corporation Limited, Abbotsford, Australia

PCT No. PCT/AU87/00427, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO88/04689, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 16, 1987, Ser. No. 259,119

Claims priority, application Australia, Dec. 16, 1986, PH9523/86

Int. Cl.[5] C12P *21/02, 19/34;* C12N *15/00, 7/00*

U.S. Cl. 435—69.3 11 Claims

1. An isolated DNA molecule consisting essentially of a nucleotide sequence selected from the group consisting of a nucleotide sequence which encodes the human 70 kDa mitochondrial autoantigen of primary biliary cirrhosis (PBC), a nucleotide sequence which encodes an antigenic fragment of said human autoantigen, and a nucleotide sequence which hybridizes to the nucleotide sequence encoding said human autoantigen and which encodes a mitochondrial autoantigen of PCB.

6. An isolated DNA molecule comprising a nucleotide sequence of claim 1, operatively linked to an expression control sequence.

8. A transforming host cell comprising vector of claim 6, operatively linked to an expression control sequence.

9. A process for preparing the 70 kDa mitochondrial autoantigen of primary biliary cirrhosis or an antigenic fragment thereof, which comprises cultivating the transformed host cell of claim 8 under suitable conditions and recovering the 70 kDa mitochondrial autoantigen.

5,196,320

METHOD OF PRODUCING ENGINEERED BINDING PROTEINS

Stephen D. Gillies, Hingham, Mass., assignor to Abbott Biotech, Inc., Needham Heights, Mass.

Continuation of Ser. No. 409,889, Sep. 20, 1989, abandoned. This application Dec. 17, 1991, Ser. No. 810,522

Int. Cl.[5] C12N *15/62*

U.S. Cl. 435—697 7 Claims

1. A method of producing an engineered binding protein comprising the steps of:

(a) providing a cDNA encoding an immunoglobulin variable (V) region and defining a restriction site located 5' to and adjacent the 3' end of said V region;

(b) digesting said V region-encoding cDNA at said restriction site to produce a new 3' end;

(c) ligating a linker/adapter (1/a) DNA to said new 3' end to produce a V region cassette, said 1/a DNA comprising, in sequence from tis 5' end:

a DNA encoding the removed portion of said V regionencoding cDNA; and

a splice donor site;

(d) transfecting a eucaryotic host cell with a vector comprising said cassette nd a second DNA comprising:

DNA defining a splice acceptor site at its 5' end, compatible with said splice donor site on said 1/a DNA and

DNA encoding a human constant region domain; and

(e) culturing said transfected host cell to co-express said cassette and said second DNA as a single chain, fused binding protein.

5,196,321

METHODS FOR IN VITRO CLEAVAGE OF UBIQUITIN FUSION PROTEINS

Andreas Bachmair, Cologne, Fed. Rep. of Germany; Daniel Finley, Cambridge, and Alexander Varshavsky, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 356,378, May 24, 1989, Pat. No. 5,093,242, which is a continuation-in-part of Ser. No. 178,924, Apr. 7, 1988, Pat. No. 5,132,213, which is a continuation-in-part of Ser. No. 103,910, Oct. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 915,151, Oct. 2, 1986, abandoned. This application Jan. 15, 1992, Ser. No. 821,720

The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.

Int. Cl.[5] C12P *21/06, 21/04;* C12N *15/09*

U.S. Cl. 435—69.7 6 Claims

1. A method for producing a protein or polypeptide having a predetermined amino-terminal amino acid residue, comprising:

a) expressing the protein or polypeptide in a host cell as a fusion protein wherein the amino terminus of the protein or polypeptide is fused to ubiquitin, the fusion protein being specifically cleavable by a protease at the junction of ubiquitin with the amino-terminal amino acid residue of the protein or polypeptide, the host cell lacking a protease which cleaves the ubiquitin fusion protein at the junction of ubiquitin and the amino-terminal amino acid residue of the protein or polypeptide;

b) isolating the ubiquitin fusion protein from the host cell; and

c) contacting the ubiquitin fusion protein with an extract containing a protease which specifically cleaves the ubiquitin fusion protein at the junction of ubiquitin and the amino-terminal amino acid residue of the protein or polypeptide, said extract being derived from cells which produce said protease.

5,196,322

VECTORS AND COMPOUNDS FOR EXPRESSION OF ZYMOGEN FORMS OF HUMAN PROTEIN C

Nils U. Bang; Hartmut Ehrlich; Brian W. Grinnell, and S. Betty Yan, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 512,620, Apr. 11, 1990, abandoned, which is a continuation of Ser. No. 138,009, Dec. 28, 1987, abandoned. This application Oct. 4, 1991, Ser. No. 771,880

Int. Cl.[5] C12N *9/64, 15/06, 15/79, 15/52*

U.S. Cl. 435—69.8 20 Claims

1. A DNA compound comprising a coding sequence for a protein, said protein comprising, from the amino terminus to the carboxyterminus:

a) a signal peptide and propeptide of a γ-carboxylated, secreted protein;

b) the light chain of human protein C;

c) a dipeptide selected from the group consisting of lysine-arginine, arginine-lysine, lysine-lysine, and arginine-arginine; and

d) the amino acid residue sequence:

ASP THR GLU ASP GLN GLU ASP GLN VAL

R_1 R_2 ARG LEU ILE R_3 GLY LYS MET THR ARG ARG

GLY ASP SER PRO

-continued

TRP GLN VAL VAL LEU LEU ASP SER LYS LYS LYS

LEU ALA CYS GLY ALA

VAL LEU ILE HIS PRO SER TRP VAL LEU THR ALA

ALA HIS CYS MET ASP

GLU SER LYS LYS LEU LEU VAL ARG LEU GLY GLU

TYR ASP LEU ARG ARG

TRP GLU LYS TRP GLU LEU ASP LEU ASP ILE LYS GLU

VAL PHE VAL HIS

PRO ASN TYR SER LYS SER THR THR ASP ASN ASP ILE

ALA LEU LEU HIS

LEU ALA GLN PRO ALA THR LEU SER GLN THR ILE

VAL PRO ILE CYS LEU

PRO ASP SER GLY LEU ALA GLU ARG GLU LEU ASN

GLN ALA GLY GLN GLU

THR LEU VAL THR GLY TRP GLY TYR HIS SER SER

ARG GLU LYS GLU ALA

LYS ARG ASN ARG THR PHE VAL LEU ASN PHE ILE

LYS ILE PRO VAL VAL

PRO HIS ASN GLU CYS SER GLU VAL MET SER ASN

MET VAL SER GLU ASN

MET LEU CYS ALA GLY ILE LEU GLY ASP ARG GLN

ASP ALA CYS GLU GLY

ASP SER GLY GLY PRO MET VAL ALA SER PHE HIS

GLY THR TRP PHE LEU

VAL GLY LEU VAL SER TRP GLY GLU GLY CYS GLY

LEU LEU HIS ASN TYR

GLY VAL TYR THR LYS VAL SER ARG TYR LEU ASP

TRP ILE HIS GLY HIS

ILE ARG ASP LYS GLU ALA PRO GLN LYS SER TRP

ALA PRO—COOH

wherein R_1 is selected from the group consisting of PHE, GLY, TYR, and TRP, R_2 is selected from the group consisting of VAL and PRO, R_3 is selected from the group consisting of ASP and ASN, ARG is Arginine, ASN is Asparagine, ASP is Aspartic acid, —COOH is the carboxy terminus, CYS is Cysteine, GLN is Glutamine, GLU is Glutamic Acid, GLY is Glycine, HIS is Histidine, $—H_2N$ is the amino terminus, ILE is Isoleucine, LEU is Leucine, LYS is Lysine, MET is Methionine, PHE is Phenylalanine, PRO is Proline, SER is Serine, THR is Threonine, TRP is Tryptophan, TYR is Tyrosine, and VAL is Valine.

5,196,323

PROCESS FOR PREPARING AND PURIFYING ALPHA-INTERFERON

Gerhard Bode; Ingrid Maurer-Fogy; Edgar Falkner, all of Vienna, and Silvia J. Lindner, Perchtoldsdorf, all of Austria, assignors to Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 856,333, Apr. 28, 1986, abandoned. This application Jan. 12, 1991, Ser. No. 713,618

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515336

Int. Cl.[5] C07K *13/00, 3/28, 3/22, 3/24*

U.S. Cl. 435—69.51 8 Claims

1. A process for the preparation and purification of recombinant alpha-interferon, which comprises:

cultivating *E. coli* containing the interferon gene for a growth period during which not more than 5% methionine-interferon is formed;

extracting and concentrating the expressed interferon;

subjecting the concentrated material to Tandem Chromatography, wherein said Tandem Chromatography comprises separation on a cellulose column followed by an anti-alpha-interferon monoclonal antibody affinity column;

subjecting the affinity purified material to isoelectric precipitation of impurities at about pH 4.0 to about pH 4.8; and

purifying the interferon by chromatography on a high performance cation exchange column using a volatile buffer, wherein said purified interferon is non-immunogenic when administered parenterally to a human.

5,196,324

MONOCLONAL ANTIBODIES REACTIVE WITH A HUMAN ATHEROMA ASSOCIATED ANTIGEN

Thomas F. Bumol, Carmel, Ind., and Leslie M. McEvoy, Mountain View, Calif., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 451,399, Dec. 15, 1989. This application Oct. 17, 1990, Ser. No. 599,549

Int. Cl.[5] C12P *21/08;* C07K *3/18;* C12N *15/02;* A61K *39/00*

U.S. Cl. 435—70.21 4 Claims

2. A method for preparing an antibody reactive with the MB001 atheroma-associated antigen, said method comprising:

a) homogenizing human plaque intimal and inner medial tissue in a sucrose extraction buffer to create an initial homogenate,

b) centrifuging said initial homogenate to precipitate any insoluble homogenate,

c) removing the supernatant from the insoluble homogenate,

d) solubilizing said sucrose-insoluble homogenate in a detergent extraction buffer containing lithium bromide,

e) immunizing a suitable non-human mammal with said detergent extract, then

f) preparing antibody-secreting hybridoma cells from the tissue of said immunized non-human mammal.

5,196,325

Patent Not Issued For This Number

5,196,326

METHOD FOR CONCURRENT FERMENTATION OF BASIC AMINO ACID AND ACIDIC AMINO ACID

Hideo Kurosawa; Harufumi Miwa; Shigeru Nakamori, all of Kawasaki; Toshimasa Ishii, Yokkaichi, and Yasuhiko Yoshihara, Saga, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 655,993

Claims priority, application Japan, Feb. 15, 1990, 34066

Int. Cl.[5] C12P *13/04, 13/08;* C12R *1/15, 1/13*

U.S. Cl. 435—106 3 Claims

1. A method for concurrent fermentative production of a

basic L-amino acid and an acidic L-amino acid, which comprises (a) culturing a basic L-amino acid-producing bacteria belonging to the genus Brevibacterium or the genus Corynebacterium under a condition for producing an acidic L-amino acid, wherein said basic L-amino acid-producing bacteria is biotin-auxotrophic and said condition for producing an acidic L-amino acid is (i) a biotin-poor medium, containing 0.5 to 10 μg/l of biotin, or (ii) a medium containing a sufficient amount of biotin and a lactam type antibiotic, incorporated into said medium at the initial stage or during the incubation, wherein said basic L-amino acid-producing bacteria is selected from the group consisting of *Brevibacterium lactofermentum* ATCC 21798, *Brevibacterium lactofermentum* ATCC 21799, *Brevibacterium lactofermentum* ATCC 21800, *Brevibacterium lactofermentum* ATCC 21801, *Brevibacterium lactofermentum* ATCC 21086, *Brevibacterium flavum* ATCC 21475, *Brevibacterium flavum* ATCC 21127, *Brevibacterium flavum* ATCC 21128, *Brevibacterium flavum* ATCC 21129, *Brevibacterium flavum* ATCC 21474, *Brevibacterium flavum* ATCC 21493, *Brevibacterium flavum* ATCC 21406, *Brevibacterium flavum* ATCC 21605, *Brevibacterium ammoniagenes* ATCC 19355, *Corynebacterium acetoacidophilum* ATCC 21476, *Corynebacterium acetoacidophilum* ATCC 21407, *Corynebacterium glutamicum* ATCC 13286, *Corynebacterium glutamicum* ATCC 21659, *Corynebacterium glutamicum* ATCC 21339, and *Corynebacterium acetoglutamicum* ATCC 21491and (b) recovering said basic L-amino acid and said acidic L-amino acid.

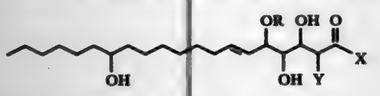
5,196,327

PROCESS FOR PRODUCING ANTIFUNGAL FERMENTATION PRODUCTS AND COMPOSITIONS THEREOF

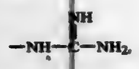
Maria B. Lopez, Hillside, and Richard L. Monaghan, Somerset, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 79,192, Jul. 29, 1987, Pat. No. 5,019,593. This application May 8, 1991, Ser. No. 669,700
Int. Cl.[5] C12P *13/00, 13/02;* C12R *1/68*
U.S. Cl. 435—128 6 Claims

1. A process for producing a compound of the formula



wherein R is —H or —$COCH_3$, X is —OH, or $O^{\oplus}$ and Y is $—NH_3^{\oplus}$, $—NHCOCH_3$ or



provided that when R is H and X is —OH, Y is $—NHCOCH_3$ or

and when R is H or —$COCH_3$ and X is $O^{\ominus}$, Y is $—NH_3^{\oplus}$ which comprises cultivating *Aspergillus fumigatus* ATCC 20859 or *Aspergillus fumigatus* ATCC 20857 in a fermentation medium to obtain a mixture of compounds therein, separating the mixture from solid materials and thereafter isolating the products.

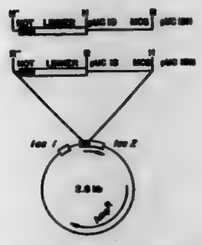
5,196,328

MODIFIED CLONING VECTORS FOR RESTRICTION MAPPING, THEIR PREPARATION AND USE

Kenneth D. Tartof, Jenkintown, Pa., assignor to Institute for Cancer Research, Philadelphia, Pa.

Filed May 21, 1987, Ser. No. 52,799
Int. Cl.[5] C07H *17/00;* C12P *19/34*
U.S. Cl. 435—172.3 13 Claims

1. A modified cloning vector for facilitating mapping of a DNA molecule present in said modified cloning vector, said vector having a multiple cloning site including said DNA molecule and a DNA construct, said construct being a linear, synthetic oligonucleotide consisting essentially of an infrequent cutter segment providing a recognition sequence for a



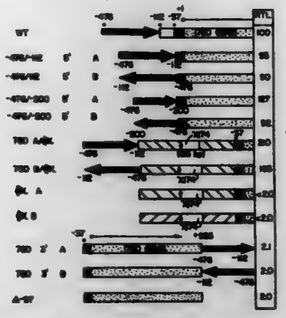
site-specific restriction enzyme, said recognition sequence being at least eight base pairs in length, and a discrete, hybridizable linker segment, said construct being positioned in said vector with said linker segment adjacent to said DNA molecule.

5,196,329

780 T-DNA GENE TRANSCRIPTION ACTIVATOR

William B. Gurley, Gainesville, Fla., and Wesley B. Bruce, Fremont, Calif., assignors to Labrizol Genetics Inc., Wickliffe, Ohio and The University of Florida, Gainesville, Fla.

Continuation of Ser. No. 135,147, Dec. 18, 1987, abandoned. This application Sep. 24, 1990, Ser. No. 587,517
Int. Cl.[5] C12N *15/00;* C07H *15/12*
U.S. Cl. 435—172.3 34 Claims



11. A method for activating the expression of a plant-expressible gene in plant tissue, said method comprising the steps of:

(a) inserting a T-DNA 780 gene transcription activating element which comprises a nucleotide sequence, as in Table 1, from about −427 to about nucleotide −348 or a functionally equivalent sequence with at least about 90% homology thereto and further comprises a nucleotide sequence from about nucleotide −290 to about −271 or a functionally equivalent nucleotide sequence being at least about 90% homologous thereto into a recombinant DNA molecule which comprises said plant-expressible gene, wherein said plant-expressible gene is not the 780 gene and wherein said gene comprises a TATA region, in such a way that said transcription activating element increases the expression of said plant-expressible gene, and

(b) introducing said recombinant DNA molecule containing said transcription activating element into plant tissue such that said plant-expressible gene is expressed under the control of said transcription activating sequence in said plant tissue.

5,196,330

TYPE II RESTRICTION ENDONUCLEASE, PME I, OBTAINABLE FROM *PSEUDOMONAS MENDOCINA* AND A PROCESS FOR PRODUCING THE SAME

Richard Morgan, Middleton, and Bing Zhou, Beverly, all of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Jun. 3, 1991, Ser. No. 710,040
Int. Cl.[5] C12N *9/22*
U.S. Cl. 435—199 5 Claims

1. A substantially pure Type II restriction endonuclease obtainable from *Pseudomonas mendocina* (ATCC#55181) recognizing the following base sequence in double-stranded deoxyribonucleic acid molecules:

5'-G T T T↓A A A C-3'
3'-C A A A↑T T T G-5'

and having a cleavage position defined by the arrows.

5,196,331

CLONING TH[illegible]PI RESTRICTION AND MOL[illegible]CATION GENES

Geoffrey G. Wilson, Boxford, Mass., assignor to New England Biolabs, Inc., Beverly, Mass.

Continuation of Ser. No. 323,114, Mar. 13, 1989, which is a continuation of Ser. No. 826,892, Feb. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 707,079, Mar. 1, 1985. This application May 13, 1991, Ser. No. 699,148
Int. Cl.[5] C12N *9/22, 15/55*
U.S. Cl. 435—199 8 Claims

1. Isolated DNA coding for the MspI restriction endonuclease, wherein the isolated DNA is obtainable from ATCC Accession No. 75277.

5,196,332

CLONING THE HAE II RESTRICTION AND MODIFICATION GENES

Geoffrey G. Wilson, Boxford, Mass., assignor to New England Biolabs, Inc., Beverly, Mass.

Division of Ser. No. 323,114, Mar. 13, 1989, which is a continuation of Ser. No. 826,892, Feb. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 707,079, Mar. 1, 1985, abandoned. This application May 13, 1991, Ser. No. 699,146
Int. Cl.[5] C12N *9/22, 15/55*
U.S. Cl. 435—199 8 Claims

1. Isolated DNA coding for the HaeII restriction endonuclease, wherein the isolated DNA is obtainable from ATCC Accession No. 75275.

5,196,333

DNA SEQUENCES INVOLVED IN NEURONAL DEGENERATION, MULTICELLULAR ORGANISMS CONTAINING SAME AND USES THEREOF

Maria Chalfie, New York, N.Y.; Eve Wolinsky, Princeton, N.J., and Monica Driscoll, New York, N.Y., assignors to The Trustees of Columbia University, New York, N.Y.

Filed May 30, 1990, Ser. No. 530,968
Int. Cl.[5] C12N *5/00;* C07H *15/12;* C12P *21/06;* C12Q *1/68*
U.S. Cl. 435—240.1 7 Claims

1. An isolated nucleic acid molecule encoding a wild-type *C. elegans* protein, wherein the *C. elegans* protein is encoded by the deg-1 gene which has the DNA sequence shown in FIG. 7 and, when mutated, is the genetic basis of neuronal degeneration associated with a neurodegenerative disorder.

5,196,334

UROGENITAL SINUS DERIVED GROWTH INHIBITORY FACTOR

David R. Rowley, and Donald J. Tindall, Sr., both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Sep. 2, 1988, Ser. No. 240,171
Int. Cl.[5] C07K *15/00;* C12N *5/00*
U.S. Cl. 435—240.2 4 Claims

1. Substantially pure polypeptide urogenital sinus derived growth factor, UGIF, having the property of inhibiting the growth of Y-79, A-549, Mv-1 Lu, NRK, NBT-II, and Hela cells, further having the properties of:

(a) a molecular weight of 10 to 20 kiloDaltons;
(b) being stable at 80° C. when exposed for 10 minutes; and
(c) acid stability.

5,196,335

HUMAN SUPEROXIDE DISMUTASE CDNA

Yoram Groner, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation of Ser. No. 315,331, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 726,508, Apr. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 489,786, Apr. 29, 1983, abandoned. This application Jul. 2, 1990, Ser. No. 547,827
Claims priority, application Canada, Apr. 27, 1984, 452943
Int. Cl.[5] C12M *15/00, 9/02, 1/21, 5/10, 15/53*
U.S. Cl. 435—240.2 14 Claims

1. A dDNA molecule which comprises DNA encoding human cytoplasmic superoxide dismutase.

4. A cell into which the cDNA molecule of claim 1 has been introduced.

5,196,336

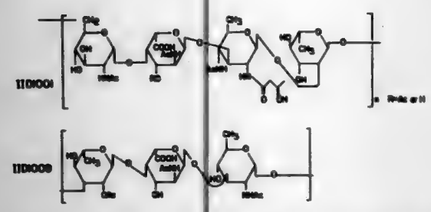
ADVENTITIOUS CITRUS JUICE VESICLES FROM PRE-EXISTING JUICE VESICLES

Brent Tisserat, Upland, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 3, 1989, Ser. No. 389,194
Int. Cl.[5] A01H *5/08*
U.S. Cl. 435—240.4 5 Claims

1. Adventitious citrus juice vesicles resembling normal juice vesicles in that they are generally elliptical in shape, said vesicles having the following characteristics: they branch out of pre-existing intact citrus juice vesicles and they have the ability to produce additional adventitious citrus juice vesicles through branching.

5,196,337
HUMAN MONOCLONAL ANTIBODY, AND ITS PRODUCTION AND USE
Hiroshi Ochi, Osaka; Hiroshi Ohtsuka, Hyogo; Shinichi Yokota, Hyogo; Hiroshi Noguchi, Kawanishi; Masazumi Terashima, Ibaraki; Ikuko Uezumi, Osaka, and Kenji Irie, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited and Sumitomo Pharmaceuticals Company, Limited, both of Osaka, Japan
Filed Apr. 24, 1990, Ser. No. 513,933
Claims priority, application Japan, Apr. 24, 1989, 1-104849
Int. Cl.[5] C12N *5/12*; C12P *21/08*; C07K *15/28*
U.S. Cl. 435—240.27 3 Claims



1. A human monoclonal antibody, which is produced from hybridoma TS3G2, having the Accession No. FERM BP-2372.

5,196,338
RECOMBINANT VECTORS FOR *HAEMOPHILUS INFLUENZAE* PEPTIDES AND PROTEINS
Algis Anilionis, Pittsford, N.Y.; Robert C. Seid, Jr., San Francisco, Calif.; Robert A. Disch, Rochester, N.Y.; Gary W. Zlotnick, Penfield, N.Y., and Bruce A. Green, Pittsford, N.Y., assignors to Praxis Biologics, Inc., Rochester, N.Y.
Division of Ser. No. 396,572, Aug. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 239,572, Sep. 1, 1988, Pat. No. 5,098,997, which is a continuation-in-part of Ser. No. 132,073, Dec. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 20,849, Mar. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 948,364, Dec. 31, 1986, abandoned. This application Feb. 15, 1990, Ser. No. 480,396
Int. Cl.[5] C12N *15/62, 15/31, 15/63*
U.S. Cl. 435—252.3 19 Claims

1. A recombinant vector comprising a DNA sequence coding for an antigenic determinant of an *Haemophilus influenzae* fusion protein having an amino acid sequence comprising (a) the amino acid sequence as depicted in FIG. 11 from amino acid residue 20 to 153 of an *Haemophilus influenzae* PBOMP-1 protein and (b) the amino acid sequence as depicted in FIG. 15 from amino acid residue 19 to 154 of an *Haemophilus influenzae* PBOMP-2 protein.

5,196,339
RAPID DEGRADATION OF HALOGENATED HYDROCARBONS BY METHANOTROPHIC BACTERIA
Richard S. Hanson, and John D. Lipscomb, both of Wayzata, Minn., assignors to BioTrol, Inc., Chaska, Minn.
Continuation of Ser. No. 384,859, Jul. 21, 1989, abandoned, which is a continuation of Ser. No. 272,538, Nov. 17, 1988, abandoned. This application Dec. 20, 1991, Ser. No. 814,202
Int. Cl.[5] C02F *3/00*
U.S. Cl. 435—262 15 Claims

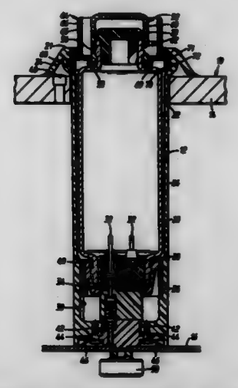
1. A method for microbial degradation of a halogenated hydrocarbon compound, said method comprising: contacting said halogenated hydrocarbon compound with an amount of a methane-oxidizing bacterium effective to completely degrade said halogenated hydrocarbon compound at a rate from about 500 to about 10,000 micromoles per hour per gram cells, said methane oxidizing bacterium being cultured under continuous culture conditions, said continuous culture conditions comprising exposing said bacterium to a continuous-flow gas mixture comprising air and methane in a ratio of about 25:1–1:10, respectively.

5,196,340
ENZYME ELECTRODE CONTAINING AN ENZYME AND A COENZYME IMMOBILIZED IN SEPARATE LAYERS OF A MEMBRANE
Shigeyuki Miyamoto, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jul. 30, 1990, Ser. No. 559,685
Claims priority, application Japan, Aug. 4, 1989, 1-201208; Oct. 6, 1989, 1-259988
Int. Cl.[5] C12M *1/40*; C12N *11/04*; C12Q *1/32*; G01N *27/26*
U.S. Cl. 435—288 6 Claims

1. An enzyme electrode comprising:
(a) an electrode;
(b) an inner membrane covering the electrode (a), said inner membrane comprising two separate layers comprising an inner layer in which an enzyme is immobilized and an outer layer in which a coenzyme which is cooperative with the enzyme is contained, and
(c) an outer membrane covering the inner membrane (b) and consisting essentially of a material which is difficult for the coenzyme to diffuse therein; whereby the coenzyme in the inner membrane (b) is prevented from dissipation.

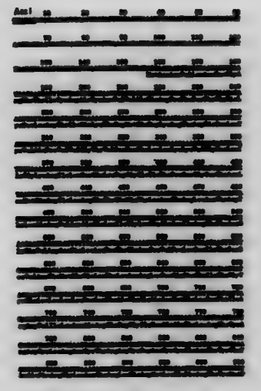
5,196,341
APPARATUS FOR DETECTING MICRO-ORGANISMS
Martin R. Ackland, and Roderick M. De'Ath, both of Wantage, England, assignors to CMB Foodcan plc, United Kingdom
Continuation of Ser. No. 15,927, Feb. 18, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 759,601
Claims priority, application United Kingdom, Mar. 19, 1986, 8606807
Int. Cl.[5] C12Q *1/04*; C12N *13/00*; C12M *1/34*; G01M *3/04*
U.S. Cl. 435—291 10 Claims

8. Apparatus for detecting micro-organisms in a sample, comprising;
container means for holding a sample and having first and second electrodes contactable with a sample for the detection of micro-organisms therein;
an outer vessel within which the container means is received and supported and within which spillage of sample material from the container means is contained;
detection probe means located in the outer vessel for the detection of any such spillage;
a socket member of complementary cross-section with the outer vessel and adapted to embrace the outer vessel in nesting relation to said outer vessel;
said outer vessel comprising electrical contact means for electrical connection with at least said first electrode of the container means;
orientation means between the socket member and the outer vessel, whereby when the container means is received by the outer vessel, the first electrode is at a predetermined orientation to the outer vessel and, hence, to the or each respective electrical contact means; and



said orientation means comprises a key and keyway, one of which is provided on the socket member and the other on the outer vessel.

5,196,342
***BACILLUS THURINGIENSIS* P-2 TOXIN GENE**
William P. Donovan, Yardley, Pa., assignor to ProTech R&D Partnership II, Santa Clara, Calif.
Continuation of Ser. No. 39,542, Apr. 16, 1987, abandoned. This application Dec. 18, 1990, Ser. No. 630,379
Int. Cl.[5] C12N *15/32, 15/75*
U.S. Cl. 435—320.1 11 Claims



1. A purified and isolated gene for *Bacillus thuringiensis* P2 toxin having the DNA sequence of FIG. 2.

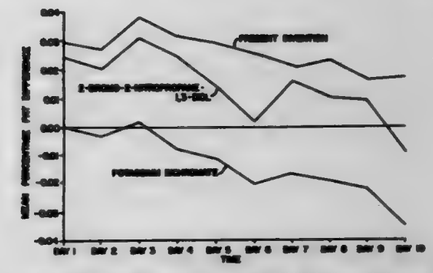
10. A recombinant vecotr containing the DNA sequence of claim 1.

5,196,343
ULTRASONIC CALIBRATION MATERIAL AND METHOD
Moustafa B. Zarkoumi, and Mohammed Rachedine, both of Computerized Imaging Reference Systems, Inc. 2428 Almeda Ave., Suite 212, Norfolk, Va. 23513
Filed Oct. 4, 1990, Ser. No. 592,678
Int. Cl.[5] G01N *29/00, 31/00, 33/483*; G21F *1/10*
U.S. Cl. 436—8 9 Claims

1. An ultrasonic calibration material comprising, a solid elastic material;
said solid elastic material comprising a vacuum degassed, liquid based acrylamide polymerized resin matrix;
wherein, said liquid comprises ethylene glycol and, wherein, said resin matrix comprises homogeneously suspended particles and a suspending agent.

3. An ultrasonic calibration material comprising:
a solid elastic material,
said solid elastic material having a calibrated speed of sound, sonic attenuation and backscatter reflection characteristics, each of said calibrated speed of sound, said sonic attenuation and said backscatter reflection characteristics being definable within the range of speed, attenuation and backscatter, respectively, of living tissue;
said solid elastic material comprising a vacuum degassed, liquid based acrylamide polymerized resin matrix, wherein said liquid comprises ethylene glycol, and,
said resin matrix comprising homogeneously suspended particles and a suspending agent.

5,196,344
MILK SAMPLE PRESERVATIVE
Garry R. S. Ruttan, New Hamburg, Canada, assignor to D & F Control Systems, Inc., San Ramon, Calif.
Continuation of Ser. No. 485,583, Feb. 27, 1990, abandoned. This application May 19, 1992, Ser. No. 887,111
Int. Cl.[5] A23C *3/08*; G01N *1/00*
U.S. Cl. 436—18 17 Claims



1. A solid antimicrobial composition for the preservation of milk samples, which comprises a mixture of 2-bromo-2-nitropropane-1,3- diol and natamycin in a ratio by weight of about 10–40:1, respectively.

8. A method of preserving a milk sample for analysis comprising adding to said milk sample a solid composition comprising 6–12 mg of 2-bromo-2-nitropropane-1,3- diol and 0.3–0.6 mg of natamycin for each 50 ml of milk.

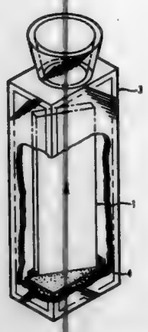
5,196,345
METHOD FOR CONTROLLING THE REMOVAL OF ACIDIC METAL CARBONYL HYDRIDE FROM PRODUCT STREAMS
James L. Cooper, and Jack M. Bogle, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 231,566, Aug. 12, 1988, Pat. No. 5,091,317.
This application Feb. 28, 1991, Ser. No. 662,132
Int. Cl.[5] G01N *33/20*
U.S. Cl. 436—55 8 Claims

1. A method for controlling the quantity of air added during an air demetallating process of an organic liquid containing an acidic transition metal carbonyl hydride, comprising the steps of:
(i) measuring the change in the electrical conductivity or pH of said organic liquid with a measuring device; and
(ii) controlling said quantity of air added by a means of feedback from said measuring device.

5,196,346
REAGENT AND METHOD OF USING SAME FOR AUTOMATICALLY COUNTING BASOPHILIC LEUKOCYTES IN THE BLOOD IN RESISTIVITY VARIATION MEASURING APPARATUS
Didier Lefevre, Mantes La Ville, and Henri Champseix, Montferrier-Sur-Lez, both of France, assignors to ABX, Cedex, France
Filed Feb. 6, 1991, Ser. No. 651,564
Claims priority, application France, Feb. 13, 1990, 90 01660
Int. Cl.[5] G01N *33/48*
U.S. Cl. 436—63 8 Claims

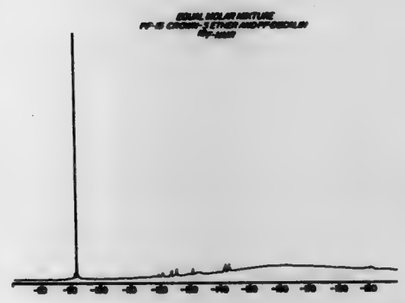
1. A differential lysing reagent for counting basophilic leukocytes in the blood in an automatic analyzer using resistivity measurement, which comprises:
a polyoxyethylene ether type surfactant,
a phthalic acid-HCl mixture,
SDS (sodium dodecyl sulphate)
a butylated hydroxytoluene type anti-oxidizing agent, in that its pH is between 2.5 and 3.2 and that it is electrically conductive.

5,196,347
METHOD FOR MEASURING OXYGEN CONCENTRATION
Masao Kaneko, Tokyo, and Hideki Nakamura, Fujinomiya, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo and Rikagaku Kenkyusho, Wako, both of Japan
Division of Ser. No. 295,596, Jan. 3, 1989, Pat. No. 5,128,102.
This application Jan. 10, 1992, Ser. No. 820,001
Claims priority, application Japan, Jul. 3, 1986, 61-157033
Int. Cl.[5] G01N *31/22, 33/52*
U.S. Cl. 436—127 5 Claims



1. A process for measuring oxygen concentration by luminescence quenching, comprising:
exposing a probe to a solution or gas, said probe comprising
a support made of a material that conducts visible light, and
an immobilized polypyridine metal complex film on said support, said film comprising a macromolecule prepared by polymerizing a polypyridine ligand having a polymerizable vinyl group, said polypyridine ligand being selected from the group consisting of bipyridine, phenanthroline, terpyridine and derivatives thereof, then complexing said macromolecule with a metal selected from the group consisting of ruthenium, osmium, chromium, iridium, iron, cobalt and europium to form an immobilized polypyridine metal complex,
irradiating said probe with visible light,
measuring the luminescence intensity of said immobilized polypyridine metal complex, and correlating the measured intensity to an oxygen concentration.

5,196,348
PERFLUORO-CROWN ETHERS IN FLUORINE MAGNETIC RESONANCE SPECTROSCOPY OF BIOPSIED TISSUE
Frank K. Schweighardt, Allentown, and Joseph A. Rubertone, Contesville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Division of Ser. No. 535,818, Jun. 11, 1990, Pat. No. 5,068,098.
This application Jul. 3, 1991, Ser. No. 725,692
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] G01N *24/00, 31/00;* A61K *31/335*
U.S. Cl. 436—173 4 Claims

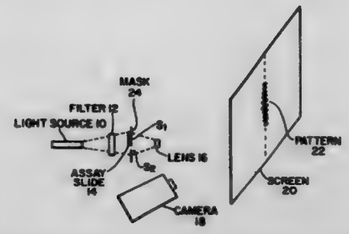


1. In a method of obtaining a ^{19}F-fluorine magnetic resonance spectrum from body organs or tissue by administering to a mammal a fluorine-containing agent in a diagnostically effective amount to provide a fluorine magnetic resonance spectrum from such organs or tissues, the improvement comprising using as said fluorine-containing agent an aqueous isotonic emulsion of perfluoro 15-crown-5 ether and after the administration of the agent to the mammal, the desired tissue is biopsied and the biopsied and extracted tissue is analyzed to give an ^{19}F-fluorine magnetic resonance spectrum.

5,196,349
IMMUNOASSAYS FOR THYROID HORMONES USING THYROGLOBULIN
Uri Piran, Sharon, and Milos Stastny, Ashland, both of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.
Continuation of Ser. No. 126,660, Dec. 1, 1987, abandoned. This application Oct. 17, 1990, Ser. No. 598,570
Int. Cl.[5] G01N *33/53, 33/543, 33/553*
U.S. Cl. 436—500 2 Claims

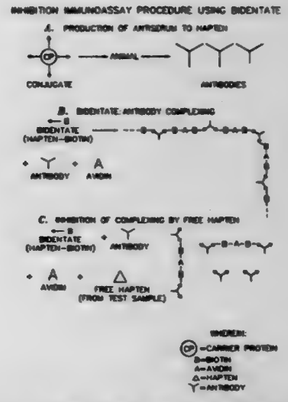
1. A method for measuring a thyroid hormone in a serum sample which comprises:
a. incubating a serum sample with a labeled antibody to a thyroid hormone and a composite comprising a thyroglobulin chemically modified by succinic anhydride immobilized on an insoluble carrier material, to form a complexed composite;
b. separating the complexed composite from unbound labeled antibody;
c. measuring the amount of label associated with the complexed composite or associated with the unbound labeled antibody; and
d. relating the measurement of step c. to the amount of the thyroid hormone in the serum sample.

5,196,350
LIGAND ASSAY USING INTERFERENCE MODULATION
Keith C. Backman, Bedford, and Christiane Muukholm, Salem, both of Mass., assignors to OmniGene, Inc., Cambridge, Mass.
Filed May 29, 1991, Ser. No. 706,772
Int. Cl.[5] C12Q *1/00;* G01N *33/53, 33/566, 33/554*
U.S. Cl. 436—501 22 Claims



1. A method for determining the presence and/or concentration of one or more analytes in a sample, in which each analyte to be determined is capable of being recognized as a ligand by at least one antiligand, comprising the steps of:
a) providing one or more assay substrate(s), each comprising a transparent surface which is coated with an antiligand capable of binding an analyte;
b) reacting the sample with each provided assay substrate under conditions sufficient to cause each analyte whose presence or concentration is to be determined, if and when present in the sample, to bind to the surface coated with its corresponding antiligand;
c) reacting each surface form step b) with an antiligand specific for the analyte immobilized thereon under conditions sufficient to cause the introduced antiligand to bind to the surface substantially only if and when analyte is bound to the surface;
d) providing an opaque mask containing two or more transparent apertures through which light may be projected to form an interference pattern;
e) determining the interference pattern formed when light is projected through apertures substantially identical to the apertures of the mask provided in step d);
f) positioning each assay substrate so that the surface treated in steps b), and c) covers at least one of the apertures of the mask provided in step d), with the proviso that at least one of the apertures of the mask remains uncovered;
g) determining the interference pattern formed when light is projected through the apertures after the positioning of the surface in step f) and
h) correlating changes in one or more features of the interference patterns of step e) and g) with the presence and/or concentration of an analyte in the sample.

5,196,351
BIDENTATE CONJUGATE AND METHOD OF USE THEREOF
Paul C. Harris, Edmonds, Wash., and Chan S. Oh, Diamond Bar, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Continuation of Ser. No. 103,237, Sep. 30, 1987, abandoned. This application Jan. 8, 1990, Ser. No. 536,058
Int. Cl.[5] G01N *33/536, 33/557, 33/566*
U.S. Cl. 436—501 12 Claims



1. An assay for determining the presence of an analyte of interest in a test sample comprising the steps of:
(A) forming a reaction mixture by contacting a test sample with:
(i) at least one bidentate conjugate soluble in the test sample, the conjugate comprising a first bidentate member, a second bidentate member, and a spacer moiety intermediate the first and second bidentate members, wherein:
(a) said first bidentate member and second bidentate member are different small molecule ligands,
(b) said first bidentate member is selected from the group consisting of entities identical to the analyte of interest and entities analogous to to the analyte of interest wherein said analogous entity has the same or substantially the same binding affinity for a binding partner to said analyte of interest,
(c) each of said first and second bidentate members is capable of specifically binding to first and second soluble, non-labeled, multivalent macromolecular binding partners, respectively, and
(d) said spacer moiety is of sufficient length to avoid steric hindrance effects whereby the binding of the first bidentate member to a first binding partner does not prevent the binding of a second bidendate member to a second binding partner;
(ii) at least one soluble, non-labeled, multivalent macromolecular binding partner for said analyte of interest; and
(iii) at least one soluble, non-labeled, multivalent macromolecular binding partner for said second bidentate member;
(B) incubating the reaction mixture for a period of time sufficient to allow formation of at least one complex, said complex comprising at least two different bidentate conjugates bound to the same soluble, non-labeled, multivalent macromolecular binding partner; and
(C) detecting any complexes generated in step (B) by a method utilizing light absorption or light scattering.

5,196,352

NEW FK-506 CYTOSOLIC BINDING PROTEIN

John J. Siekierka, Nutley; Hatsen-Yun Hung, East Brunswick; Marie J. Staruch, Toms River; Nolan H. Sigal, Westfield, and Richard A. Mumford, Red Bank, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 548,429, Jul. 5, 1990, Pat. No. 5,109,112, which is a continuation of Ser. No. 369,576, Jun. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 300,659, Jan. 19, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 722,066

Int. Cl.[5] G01N *33/566*

U.S. Cl. 436—501 8 Claims

1. A method for detecting a biologically useful ligand comprising contacting Homogenous Cytosolic Binding Protein ("HCB") having a specific binding affinity for FK-506 with a sample comprising a biologically useful ligand having binding affinity for said HCB under conditions, and for a time, sufficient for complex formation between said HCB and said ligand, and measuring complex formation.

5,196,353

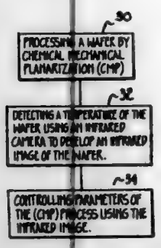
METHOD FOR CONTROLLING A SEMICONDUCTOR (CMP) PROCESS BY MEASURING A SURFACE TEMPERATURE AND DEVELOPING A THERMAL IMAGE OF THE WAFER

Gurtej S. Sandhu, and Trung T. Doan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 3, 1992, Ser. No. 817,474

Int. Cl.[5] H01L *21/66*

U.S. Cl. 437—8 7 Claims



1. A method for controlling a chemical mechanical planarization (CMP) process for a semiconductor wafer comprising:
detecting and mapping temperatures of the wafer during the (CMP) process to develop an infrared image of the wafer in real time;
controlling process parameters of the (CMP) process using the infrared image of the wafer.

5,196,354

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITH CONTROLLED CARRIER LIFETIME

Shigeo Ohtaka, Takasaki; Akio Andoo, Gunma, and Tetsuo Iijima, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

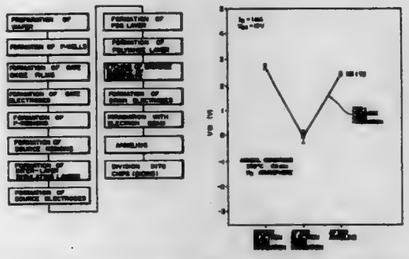
Filed Sep. 14, 1990, Ser. No. 582,583

Claims priority, application Japan, Sep. 18, 1989, 1-240167

Int. Cl.[5] H01L *21/31, 21/76, 21/78*

U.S. Cl. 437—17 8 Claims

1. A method of manufacturing semiconductor devices comprising the steps of:
preparing a semiconductor substrate of a first conductivity type;
forming a plurality of first doped regions of a second conductivity type and at least one second doped region of said second conductivity type in first and second surface portions of said substrate, respectively, said first surface portion being generally located centrally of said substrate while said second surface portion is generally located peripherally of said substrate to substantially surround said first surface portion;
forming a first conductor layer over a part of each of said first doped region, each first conductor layer being electrically insulated from its associated part of the first doped region;
forming at least one third doped region of said first conductivity type in each of said plurality of first doped regions;
forming a second conductor layer and a fourth conductor layer on said first and second surface portions of said substrate, respectively, so that said second conductor layer is in contact with said first and third doped regions and is electrically insulated from said first conductor layers and that said fourth conductor layer is in contact with said second doped region;



forming a passivation layer of an organic material to cover said second surface portions of said substrate, but not cover said first surface portion of said substrate;
forming a third conductor layer on a surface of said substrate which is opposite to said first and second surface portions, said first, second and third conductor layers, said first and third doped regions, and said substrate constituting a field-effect transistor;
treating said first surface portion of said substrate, which is not covered with said passivation layer, with a treatment for decreasing lifetime of carriers in said substrate which may cause an undesirable decrease of a threshold voltage of said field-effect transistor; and
annealing said first surface portion of said substrate, which is not covered with said passivation layer, to thereby recover said threshold voltage of said field-effect transistor.

5,196,355

SIMOX MATERIALS THROUGH ENERGY VARIATION

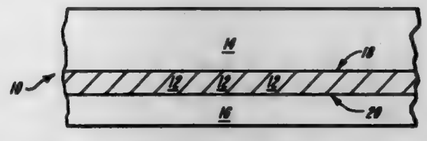
Andrew B. Wittkower, Rockport, Mass., assignor to IBIS Technology Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 342,484, Apr. 24, 1989, Pat. No. 5,080,730. This application Dec. 14, 1990, Ser. No. 627,265

The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—24 8 Claims



1. A method of producing a buried insulating layer in a silicon substrate comprising the steps of:
implanting oxygen ions into a silicon substrate in a single implant sequence to form an implant layer, wherein the implantation energy of said oxygen ions increases throughout said implant sequence such that the implanted ions are concentrated at a lower interface between the implant layer and the underlaying substrate to retard integration of silicon ions into the implant layer during subsequent annealing; and
annealing said substrate to form a buried layer of SiO_2 in said silicon wafer, said buried layer lying between a overlying silicon body and an underlying bulk silicon region, and said buried layer being substantially free of silicon islands.

5,196,356

METHOD FOR MANUFACTURING BICMOS DEVICES

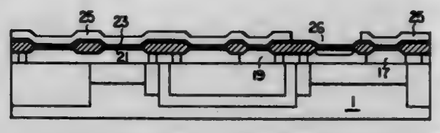
Tae Y. Won; Moon H. Kim, both of Seoul; Kwang D. Yoo, Incheon, and Ji H. Yoo, Bucheon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Apr. 27, 1992, Ser. No. 874,612

Claims priority, application Rep. of Korea, Nov. 14, 1991, 91-20269

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—31 8 Claims



1. A method for manufacturing BiCMOS devices, comprising the steps of:
forming a buried layer of second conductive type in a silicon substrate of first conductive type and forming a highly doped bottom layer of said first conductive types and a highly doped bottom layer of said second conductive types;
growing an intrinsic epitaxial layer;
forming wells of said first conductive type and wells of said second conductive type in an epitaxial layer by a twin well process;
forming a channel stop region for preventing field inversion;
forming selectively a first insulating layer by a local oxidation of silicon;
defining a collector region of a vertical PNP transistor and a collector region of an NPN transistor photolithographically and doping said collector regions with impurities of said first conductive type and impurities of said second conductive type respectively;
growing said first insulating layer and depositing a first polysilicon layer;
defining an intrinsic base region of said NPN transistor photolithographically and doping said intrinsic base region with impurities of said first conductive type;
removing said first polysilicon layer and said first insulating layer on said NPN transistor region and said vertical PNP transistor region defined photolithographically;
depositing a second polysilicon layer and doping said second polysilicon layer with highly doped impurities of said second conductive type;
depositing a second insulating layer on said second polysilicon layer;
forming gates of CMOS transistors, emitter electrodes and collector electrodes of said NPN transistor, and base electrodes of said vertical PNP transistor by removing predetermined parts of said second insulating layer and said second polysilicon layer photolithographically;
defining an NMOS transistor region and an intrinsic base region of said vertical PNP transistor photolithographically and doping said regions with impurities of the second conductive type;
defining source/drain regions of said PMOS transistor photolithographically and doping said source/drain regions with impurities of said first conductive type;
depositing a third insulating layer and forming sidewall spacers by reactive ion etching of said third insulating layer;
defining source/drain regions of said NMOS transistor photolithographically and doping said source/drain regions with impurities of said second conductive type;
highly doping said source/drain regions of said PMOS transistor, said emitter/collector regions of said vertical PNP transistor, and said base of said NPN transistor;
removing said second insulating layer;
forming said extrinsic base of said vertical PNP transistor by using said second polysilicon layer as a diffusion source; and
performing contact and metal interconnections.

5,196,357

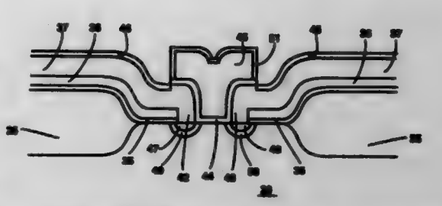
METHOD OF MAKING EXTENDED POLYSILICON SELF-ALIGNED GATE OVERLAPPED LIGHTLY DOPED DRAIN STRUCTURE FOR SUBMICRON TRANSISTOR

William J. Boardman, San Jose; Ying T. Loh, Saratoga; Edward D. Nowak, Pleasanton, and Chung S. Wang, Fremont, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Nov. 18, 1991, Ser. No. 793,916

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—40 20 Claims



1. A method for producing a structure with an overlapping gate region, the method comprising the steps of:
(a) forming a first insulator layer on a substrate;
(b) forming a source-drain polysilicon layer on the insulator layer;
(c) doping the source-drain polysilicon layer with atoms of a first conductivity type;
(d) forming a second insulator layer on the source-drain polysilicon layer;
(e) creating a gap in the second insulator layer and the source/drain polysilicon layer to expose a portion of the first insulator layer;
(f) removing the exposed portion of the first insulator layer and an additional amount of the first insulator layer under the second insulator so as to enlarge the gap created in step (e) and to undercut a portion of the source/drain polysilicon layer;
(g) forming polysilicon filler regions which fill a portion of the gap created in step (e), the filled portion of the gap including area under the source/drain polysilicon layer undercut by the removing in step (f);
(h) thermally annealing the source-drain polysilicon layer and the polysilicon filler regions to cause some of the atoms used to dope the source/drain polysilicon layer in step (c) to diffuse through the polysilicon filler regions to the substrate to form two source/drain regions within the substrate; and,
(i) forming a gate region in the gap and extending over the source/drain polysilicon layer, the gate region being separated from the polysilicon filler regions and the substrate by a dielectric region.

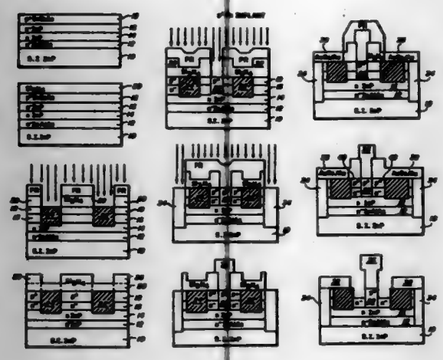
VOL 1148 ISS 4 MR 23 1993

5,196,358

METHOD OF MANUFACTURING INP JUNCTION FETS AND JUNCTION HEMTS USING DUAL IMPLANTATION AND DOUBLE NITRIDE LAYERS

John B. Boos, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1989, Ser. No. 459,155
Int. Cl.[5] H01L *21/334*
U.S. Cl. 437—40 15 Claims



1. A method of fabricating a sub-micron gate semiconductor device which device includes source, drain, gate regions and a channel region connecting the source and drain regions, which method comprises the steps of:

epitaxially growing a sample with the layered sequence of a semi-insulating InP substrate, a channel region, an n^- doped InP etch buffer layer and a p^+ doped InGaAs cap layer;

growing a first insulating film on top of said layered sample;

patterning said first insulating film for aiding the selective, etch registration of n^+ implants into said source and drain regions;

forming n^+ source and drain regions by the selective implantation of an n-type dopant, while using said first insulating layer as a mask;

applying a second insulating layer on said first insulating layer;

applying a photoresist layer and delineating a gate photoresist opening above said second insulating layer;

patterning said first and second insulating layers by anisotropic etching to limit the amount of undercutting while using the photoresist layer as a mask;

sequentially implanting a first ion selected from a group consisting of P and As, followed by the implantation of a second ion selected from the group consisting of Be, Zn, and Cadmium through the gate opening into the gate region down to the channel region;

annealing the structure with said first and second insulating layers still in place;

patterning a gate metallization using said gate photoresist opening for gate registration and self-alignment;

defining source and drain metalizations on top of the n^+ implant regions on either side of the gate; and

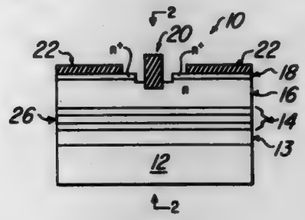
removing the remaining p^+ InGaAs on either side of the gate.

5,196,359

METHOD OF FORMING HETEROSTRUCTURE FIELD EFFECT TRANSISTOR

Hung-Dah Shih, Plano, and Busuman Kim, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 618,005, Nov. 26, 1990, Pat. No. 5,091,759, which is a continuation of Ser. No. 428,423, Oct. 30, 1989, abandoned, which is a continuation of Ser. No. 213,551, Jun. 30, 1988, abandoned. This application Oct. 5, 1991, Ser. No. 710,596
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 10 Claims



1. A method for making a field effect transistor comprising the steps of:

forming a doped pseudomorphic semiconductor channel layer of a first conductivity type between first and second other semiconductor layers, the second layer including a net dopant concentration of the first conductivity type; and

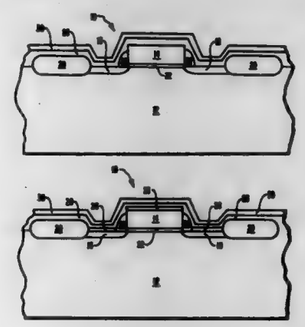
forming a Schottky gate electrode in contact with the second layer.

5,196,360

METHODS FOR INHIBITING OUTGROWTH OF SILICIDE IN SELF-ALIGNED SILICIDE PROCESS

Trung T. Doan, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Technologies, Inc., Boise, Id.

Continuation of Ser. No. 591,972, Oct. 2, 1990, abandoned. This application Apr. 6, 1992, Ser. No. 866,093
Int. Cl.[5] H01L *21/366, 21/283*
U.S. Cl. 437—41 17 Claims



1. A method for preparing silicide contact areas on integrated circuit devices which inhibit formation of short circuit paths between adjacent silicide contact areas over silicon dioxide spacer regions formed between said silicide contact areas, said method comprising the steps of:

(a) fabricating an integrated circuit structure having a plurality of upper and lower silicon contact areas situated on a silicon substrate,

each said lower silicon contact area having a top and a bottom surface,

each said upper silicon contact area having a top, a bottom and multiple vertical surfaces, said upper silicon contact area being vertically offset from each said lower silicon contact area by a substantially horizontally-oriented offset area,

each said offset area comprising silicon dioxide and being situated substantially under the entire bottom surface of one of said upper silicon contact areas, and at least partially over the top surface of one of said lower silicon contact areas;

(b) forming silicon dioxide spacer regions on said silicon substrate, each said silicon dioxide spacer region being in contact with:

the top surface of one of said lower silicon contact areas,

at least one of said vertical surfaces of one of said upper silicon contact areas, and below the top surface of one of said upper silicon contact areas, and each said offset area;

(c) depositing a metal film directly over and onto the integrated circuit structure, said top surface of each said lower silicon contact area, said top and vertical surfaces of each said upper silicon contact area, and said silicon dioxide spacer regions, said metal being capable of reacting with silicon to form a metal silicide and with nitrogen to form a metal nitride, said metal nitride being capable of inhibiting diffusion of silicon;

(d) depositing a nitrogen rich metal nitride film over said metal film;

(e) annealing said integrated circuit structure and forming a plurality of vertically offset upper and lower metal silicide regions, each said lower metal silicide region having:

a top surface and being substantially over the entire top surface of one of said lower silicon contact areas and partially over the silicon spacer region that is on said top surface of said one of said lower silicon contact areas,

each said upper metal silicide region having a top surface and being substantially over the entire top surface of one of said upper silicon contact areas, substantially above each said vertical surface of said one of said upper silicon contact areas and substantially above and completely out of contact with the silicon dioxide spacer region contacting said vertical surfaces of said one of said upper silicon contact areas, and forming metal nitride regions: in said metal film,

substantially entirely over the top surface of each said upper and lower metal silicide regions, and both in contact with and substantially entirely over each said silicon dioxide spacer regions, so as to inhibit diffusion of silicon from said silicon contact areas not covered by said spacer oxide regions; and

(f) etching excess metal rich metal nitride film and metal film from said top surfaces of said upper and lower metal silicide regions, and from said silicon dioxide spacer regions, and generally from said integrated circuit structure.

5,196,361

METHOD OF MAKING SOURCE JUNCTION BREAKDOWN FOR DEVICES WITH SOURCE-SIDE ERASING

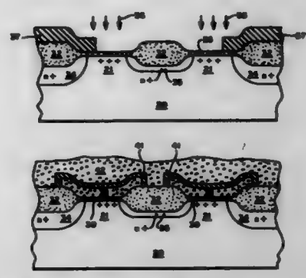
Tong-Chern Ong, San Jose, and Been-Jon Woo, Saratoga, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 15, 1991, Ser. No. 700,512
Int. Cl.[5] H01L *21/266*
U.S. Cl. 437—43 26 Claims

1. A method of forming an electrically erasable and electrically programmable memory cell on a semiconductor substrate, the cell having a first region and a second region within the substrate, the cell being electrically erasable through the first region, the method comprising the steps of:

forming the first region and the second region within the substrate, wherein a channel area lies between and adjacent to the first region and the second region, the channel area having a first segment directly adjacent to the first region and a second segment directly adjacent to the second region;

masking said first segment of the channel area:



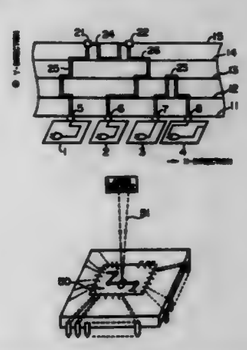
doping the channel area with a dopant wherein, due to said masking step, the first segment is doped to a first concentration and the second segment is doped to a second concentration, the second concentration being heavier than the first concentration.

5,196,362

MULTILAYER WIRING METHOD OF ON-CHIP MODIFICATION FOR AN LSI

Katsuyoshi Suzuki, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 749,269
Claims priority, application Japan, Aug. 28, 1990, 2-228770
Int. Cl.[5] H01L *21/80*
U.S. Cl. 437—51 7 Claims



1. A multilayer wiring method for connecting signal wires between circuit elements included in a semiconductor integrated circuit chip having a plurality of wiring layers comprising the steps of:

classifying said signal wires into a first group of signal wires with low modification-requisite possibility and a second group of signal wires with high modification-requisite possibility;

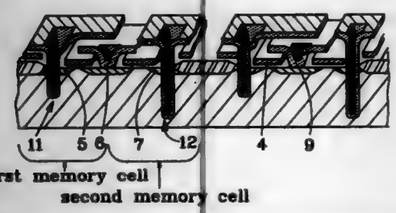
allocating said first group of signal wires into at least one lower layer of said plurality of wiring layers; and

allocating said second group of signal wires into at least one upper layer of said plurality of wiring layers.

5,196,363
METHOD OF FORMING MIST TYPE DYNAMIC RANDOM ACCESS MEMORY CELL

Yeongtae Kang, and Laeku Kang, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 28, 1990, Ser. No. 635,728
Claims priority, application Rep. of Korea, Nov. 10, 1990, 90-16121
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 4 Claims

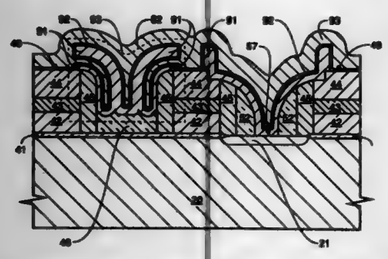


1. A process for making a dynamic random access memory cell structure with at least two memory cells having a shallow first trenched capacitor and a deeper second trenched capacitor comprising:
forming a shallow first trench using a first mask;
forming a second trench deeper than said first shallow trench using a second mask;
applying a conductive layer to serve as storage electrodes of the capacitors onto said first and second trenches so that a portion of the conductive layer is on each of the first and second trenches and covering said conductive layer with a third mask; and
etching said conductive layer to form the storage electrodes, wherein the storage electrode on the shallow trench having a larger surface area than the storage electrode on the deep trench.

5,196,364
METHOD OF MAKING A STACKED CAPACITOR DRAM CELL

Pierre C. Fazan; Charles H. Dennison; Ruojia Lee, and Yauh-Ching Liu, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 24, 1990, Ser. No. 602,828
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 13 Claims

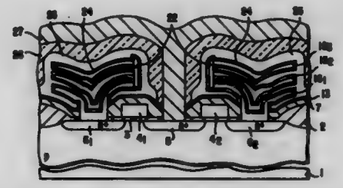


1. A process for fabricating a DRAM array on a silicon substrate, said process comprising the following sequence of steps:
creating a plurality of separately isolated active areas arranged in parallel interdigitated rows and parallel non-interdigitated columns;
creating a gate dielectric layer on top of each active area;
depositing a first conductive layer superjacent surface of said array;
depositing a first dielectric layer superjacent said first conductive layer;
masking and etching said first conductive and said first dielectric layers to form a plurality of parallel conductive word lines aligned along said rows such that each said word line passes over a inner portion of each said active area being separated therefrom by a remnant of said gate dielectric layer;
creating of a conductively-doped digit line junction and storage node junction within each said active area on opposite sides of each said word line;
depositing a second dielectric layer superjacent said array surface;
creating a first aligned buried contact location at each said digit line junction in each said active area;
depositing a second conductive layer superjacent said array surface, said second conductive layer making direct contact to said digit line junctions at said first buried contact locations;
depositing a third dielectric layer superjacent to said second conductive layer;
masking and etching said second conductive layer and said third dielectric layer to form a plurality of parallel conductive digit lines aligned along said columns such that a digit line makes electrical contact at each digit line junction within a column, said digit lines running perpendicular to and over said word lines forming a 3-dimensional, waveform-like topology;
depositing a fourth dielectric layer superjacent said array surface of said waveform-like topology;
creating a second aligned buried contact location at each said storage node junction in each said active area, wherein said second aligned buried contact locations are defined by a patterned photomask which exposes a portion of said fourth dielectric layer, said exposed fourth dielectric layer being etched away to expose said storage node junctions;
depositing a third conductive layer superjacent said array surface assuming said waveform-like topology in response to existing topology, said third conductive layer making contact to said storage node junctions at said second buried contact locations;
patterning said third conductive layer to form a portion of a storage node plate at each said storage node junction, said third conductive layer making contact to said storage node junction at said second buried contact location;
isotropically etching a remaining portion of said fourth dielectric layer to thereby expose an underneath portion of said third conductive layer;
depositing a fourth conductive layer superjacent said patterning of said third conductive layer and said exposed underneath third conductive layer, and superjacent said array surface assuming said waveform-like topology in response to existing topology, said fourth conductive layer combining with said third conductive layer;
patterning and dry etching said fourth conductive layer to form a complete storage node plate and at each storage node junction, said storage node plate having a multi-fingered cross-section;
depositing a cell dielectric layer adjacent and coextensive with said storage node plate and adjacent said array surface; and
depositing a fifth conductive layer adjacent to and coextensive with said cell dielectric layer to form a cell plate common to the entire memory array.

5,196,365
METHOD OF MAKING SEMICONDUCTOR MEMORY DEVICE HAVING STACKED CAPACITOR

Hiroshi Gotou, Saitama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 547,368, Jul. 3, 1990, abandoned, and a continuation of Ser. No. 742,261, Aug. 7, 1991, abandoned. This application Oct. 18, 1991, Ser. No. 779,548
Claims priority, application Japan, Jul. 5, 1989, 1-171827
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 5 Claims



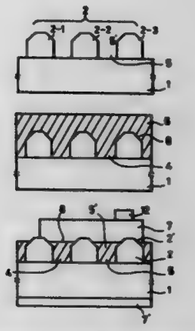
1. A method of producing a semiconductor memory device which includes a substrate, a transfer transistor formed on said substrate and a charge storage capacitor electrically coupled to one of drain and source regions of said transfer transistor, said method comprising the steps of:
alternately forming first and second layers a plurality of times on an insulator layer which is formed on said substrate to form a stacked structure above said one of the drain and source regions of said transfer transistor, at least said first layers being made of a conductive material, a lowermost one of said first layers being electrically coupled to said one of the drain and source regions of said transfer transistor via a contact hole in said insulator layer;
patterning said stacked structure to have a side at a position avoiding said contact hole;
forming at least one side wall on said side of said stacked structure at said position avoiding said contact hole, said side wall being made of a conductive material and forming a storage electrode of said charge storage capacitor together with said first layers;
removing the second layers of said stacked structure without removing said first layers immediately above said contact hole;
forming a dielectric layer on exposed surfaces of said first layers and said side wall; and
forming a conductor layer on a surface of said dielectric layer to form an opposed electrode of said charge storage capacitor.

5,196,366
METHOD OF MANUFACTURING ELECTRIC DEVICES

Shunpei Yamazaki, Tokyo; Kenji Itoh, Zama; Masaya Kadono, Atsugi, and Naoki Hirose, Shimonoseki, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Aug. 15, 1990, Ser. No. 567,352
Claims priority, application Japan, Aug. 17, 1989, 1-211801
Int. Cl.[5] H01L *21/302*
U.S. Cl. 437—61 12 Claims

1. A method of manufacturing an electric device comprising the steps of:
forming a number of discrete crystallization centers on a surface;
growing one single crystal of diamond or boron nitride from each crystallization center; and

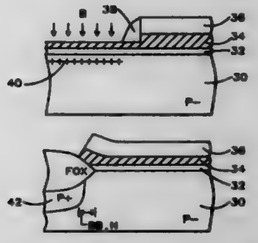


filling spaces between the single crystals grown from said crystallization centers on said surface with an insulating material.

5,196,367
MODIFIED FIELD ISOLATION PROCESS WITH NO CHANNEL-STOP IMPLANT ENCROACHMENT

Chih-Yuan Lu, Taipei, and Hsiao-Chin Tuan, Hsin-Tien, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

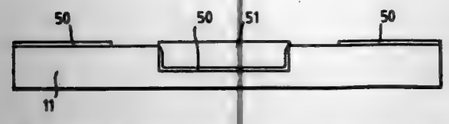
Filed May 8, 1991, Ser. No. 697,190
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—70 16 Claims



1. A method for fabricating semiconductor devices having field oxide isolation structures with a channel stop comprising:
providing a semiconductor substrate;
forming a multilayer oxidation masking structure of a silicon oxide layer, a polycrystalline silicon layer and a silicon nitride layer;
patterning said multilayer oxidation mask by removing the said silicon nitride layer and a portion of the thickness of said polycrystalline silicon layer in the areas designated to have said field oxide isolation grown therein;
wherein said polycrystalline silicon layer is between about 400 to 800 Angstroms in thickness and said patterning removes a portion of said layer to leave between about 200 to 400 Angstroms of said polycrystalline silicon layer;
forming a sidewall structure on the exposed sidewalls of the patterned oxidation mask by deposition of a uniformly thick, nonconductive layer over the patterned mask and anisotropically etching said uniformly thick layer, wherein the remaining thickness of said polycrystalline silicon is sufficient enough to prevent etching and undercutting into said silicon oxide layer during the formation of said sidewall structure and thin enough to not have a significant adverse effect on the subsequently formed said field oxide isolation structure;

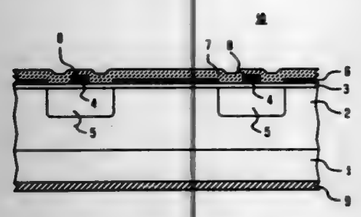
implanting impurities into the said area designated to have said field oxide isolation to form said channel stop;
removing said sidewall structure; and
growing said field oxide isolation structure by subjecting the structure to oxidation whereby the said channel stop is confined under the said field oxide isolation and not encroaching the planned device regions.

5,196,358
SEMICONDUCTOR DEVICE MANUFACTURE
George H. B. Thompson; Piers J. G. Dawe, both of Sawbridgeworth Herts, and David A. H. Spear, Essex, all of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada
Filed May 8, 1991, Ser. No. 697,096
Claims priority, application United Kingdom, May 19, 1990, 9011249
Int. Cl.[5] H01C *21/20*
U.S. Cl. 437—90 10 Claims



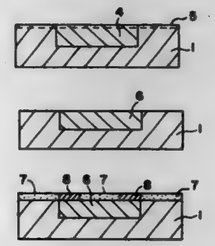
1. A method of semiconductor device manufacture, which method includes the use of a window-frame shaped epitaxial growth resistant mask having an inner perimeter and an outer perimeter, which mask is located on one surface of a semiconductor body, wherein masking that is used to delineate the side walls of a well formed in said semiconductor body is also used to delineate the inner perimeter of the frame-shaped mask, wherein, using said mask, a layer is epitaxially grown upon the semiconductor body both in the region surrounded by the inner perimeter of the mask and in the region surrounding the outer perimeter, and wherein further masking is provided to cover the epitaxially grown layer in the region surrounded by the inner perimeter of the mask while, in the region surrounding the outer perimeter, at least a portion of the thickness of the layer is removed by etching.

5,196,369
METHOD OF PRODUCING A LIGHT EMITTING DIODE ARRAY DEVICE
Toshiro Hayakawa, Yokohama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 28, 1991, Ser. No. 676,652
Claims priority, application Japan, Mar. 30, 1990, 2-84731
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—128 6 Claims



1. A method of fabricating a light emitting diode array device in which a plurality of light emitting diodes are formed at desired locations on a substrate, said method comprising the steps of;
depositing a first semiconductor layer having a first conductive pattern and a second semiconductor layer having a second opposite conductive pattern such second conductivity being provided by a heavily added second conductivity impurity serving as a diffusion source,
removing by etching an area of said layered second semiconductor layer leaving island-like areas at locations corresponding to where the light emitting diodes are to be formed, and
diffusing said impurity into said first semiconductor layer from said island-like areas to form a diffusion area, with the junction between the diffusion area and the first layer providing pn junctions.

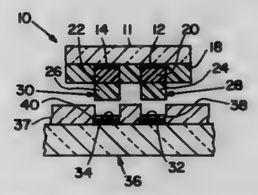
5,196,370
METHOD OF MANUFACTURING AN ARSENIC-INCLUDING COMPOUND SEMICONDUCTOR DEVICE
Katsushi Tara; Toshiharu Tanbo, both of Kyoto; Kaname Motoyoshi, Osaka; Hidetaka Hashimoto; Shotaro Umebachi, both of Kyoto, and Susumu Koike, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Nov. 8, 1991, Ser. No. 789,283
Claims priority, application Japan, Nov. 8, 1990, 2-304350
Int. Cl.[5] H01L *21/266*
U.S. Cl. 437—161 6 Claims



1. A method of manufacturing an Arsenic-including compound semiconductor device, comprising:
step a) forming an ion implantation layer in a specified region on an As compound semiconductor wafer,
step b) treating the As compound semiconductor wafer with a solution in a wet process for dissolving elements other than As to form an As layer containing As on the surface of the As compound semiconductor wafer, and
step c) heating the As compound semiconductor wafer on which the As layer is formed, such that the ion implantation layer is modified into an active layer.

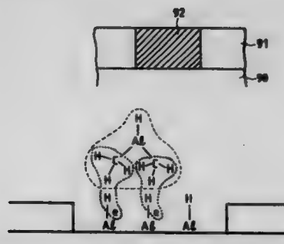
5,196,371
FLIP CHIP BONDING METHOD USING ELECTRICALLY CONDUCTIVE POLYMER BUMPS
Frank W. Kulesza, Winchester, Mass., and Richard H. Estes, Pelham, N.H., assignors to Epoxy Technology, Inc., Billerica, Mass.
Continuation-in-part of Ser. No. 452,191, Dec. 18, 1989, Pat. No. 5,074,947. This application Aug. 16, 1991, Ser. No. 746,333
Int. Cl.[5] H01L *21/56, 21/58, 21/60*
U.S. Cl. 437—183 19 Claims

1. A method of forming an electrically conductive interconnection between a bond pad of a flip chip and a bond pad of a substrate, comprising the steps of:
a) selectively forming a first organic protective layer over a surface of the flip chip around the flip chip bond pad, leaving the flip chip bond pad exposed;
b) forming an electrically conductive polymerizable precursor layer on the flip chip bond pad to a level extending beyond the first organic protective layer to produce a bump;
c) selectively forming a second organic protective layer over a surface of the substrate around the substrate bond pad, leaving the substrate bond pad exposed; and



d) forming an electrical interconnection between the bump and the substrate bond pad, thereby forming an electrical interconnection between the flip chip bond pad and the substrate bond pad.

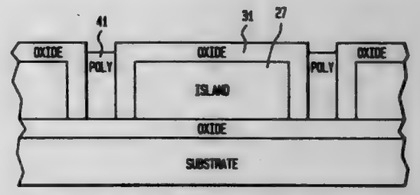
5,196,372
PROCESS FOR FORMING METAL DEPOSITED FILM CONTAINING ALUMINUM AS MAIN COMPONENT BY USE OF ALKYL HYDRIDE
Nobuo Mikoshiba; Kazuo Tsubouchi, and Kazuya Masu, all of Sendai, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 578,449, Sep. 7, 1990, abandoned. This application Jun. 15, 1992, Ser. No. 899,162
Claims priority, application Japan, Sep. 9, 1989, 1-233925; Sep. 9, 1989, 1-233927
Int. Cl.[5] H01L *21/285*
U.S. Cl. 437—187 27 Claims



22. A process for forming a deposited film, which comprises depositing silicon-containing aluminum on a substrate according to the chemical vapor deposition method utilizing a gas of an alkyl aluminum hydride, a gas containing silicon atoms and hydrogen gas.

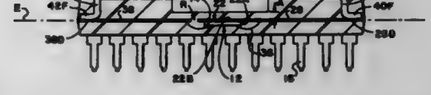
5,196,373
METHOD OF MAKING TRENCH CONDUCTOR AND CROSSUNDER ARCHITECTURE
James D. Beason, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.
Division of Ser. No. 563,276, Aug. 6, 1990, Pat. No. 5,057,895. This application Jul. 31, 1991, Ser. No. 738,532
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—203 21 Claims

1. A method of manufacturing a semiconductor device comprising the steps of:
(a) forming a trench pattern in a semiconductor layer that is electrically isolated from an underlying substrate, so as to subdivide said semiconductor layer into a plurality of spaced-apart, electrically isolated islands;
(b) forming dielectric material on top surfaces of said islands, and upon sidewalls of said trench pattern;
(c) forming electrically conductive interconnect material in said trench pattern; and
(d) forming a first aperture in dielectric material that has been formed on the top surface of an island, such that said first aperture extends from a first island location to a first portion of said electrically conductive interconnect material in said trench pattern, and forming a second aperture in dielectric material that has been formed on the top surface of an island, such that said second aperture extends from a second island location to a second portion of said



electrically conductive interconnect material in said trench pattern; and
(e) conductively connecting first and second island locations to said first and second portions of the electrical interconnect material formed in said first portion of said trench pattern.

5,196,374
INTEGRATED CIRCUIT PACKAGE WITH MOLDED CELL
Michael J. Hundt, Double Oak, and Krishnan Kolappan, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Division of Ser. No. 617,500, Nov. 21, 1990, Pat. No. 5,124,782, which is a continuation-in-part of Ser. No. 470,939, Jan. 26, 1990, abandoned. This application Dec. 3, 1991, Ser. No. 801,254
Int. Cl.[5] H01L *21/60*
U.S. Cl. 437—209 3 Claims



1. A method for packaging an electronic circuit device of the type having positive and negative power nodes and a battery for providing electrical power to the electronic circuit device comprising the steps:
arranging the conductive finger leads of a coplanar finger lead assembly in spaced relation about an interconnect region with one of the conductive finger leads defining a first polarity power lead and having a base plate disposed within said interconnect region, and one of the conductive finger leads defining a second polarity power lead;
mounting said electronic circuit device on the base plate on one side of the coplanar finger lead assembly;
connecting the positive and negative power leads of a battery to the first and second polarity power finger leads on one side of the coplanar finger lead assembly;
connecting the positive and negative power nodes of said electronic circuit device to the first and second power finger leads by first and second wire conductors, respectively; and,
encapsulating the electronic circuit device, battery, battery power leads, finger leads and wire conductors within a body of non-conductive material.

VOL 1148 ISS 4 MR 23 1993

5,196,375
METHOD FOR MANUFACTURING BONDED SEMICONDUCTOR BODY

Tadahide Hoshi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 506,521, Apr. 6, 1990, which is a continuation of Ser. No. 221,572, Jul. 20, 1988, abandoned. This application Jul. 29, 1991, Ser. No. 737,805
Claims priority, application Japan, Jul. 24, 1987, 62-183518
Int. Cl.[5] H01L *21/302*
U.S. Cl. 437—225 17 Claims

1. A method for manufacturing a bonded semiconductor body, said method comprising the steps of:
prepering a predetermined number of silicon substrates each with a predetermined diameter, resistivity, and total thickness variation, and with a surface roughness within 30 Å to 280 Å in a range of 1 mm length;
bringing flat mirror surfaces of the semiconductor substrates together in close contact in pairs at a bonding interface of each pair;
subjecting each of said semiconductor substrates to infrared topography to detect images corresponding to voids on said bonding interface; and
selecting pairs of semiconductor substrates in which no images appeared, each said semiconductor substrate of said pair thereby having a flat mirror surface with a surface roughness of less than 130 Å in a range of 1 mm length.

5,196,376
LASER LITHOGRAPHY FOR INTEGRATED CIRCUIT AND INTEGRATED CIRCUIT INTERCONNECT MANUFACTURE

John J. Roche, Phoenix, Ariz., assignor to Polycon Corporation, Tempe, Ariz.

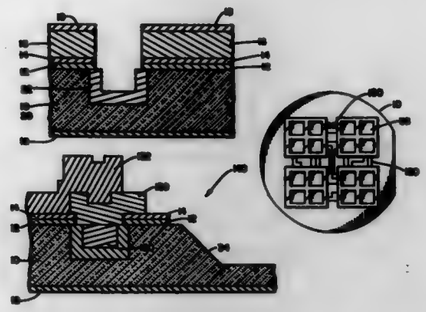
Filed Mar. 1, 1991, Ser. No. 662,748
Int. Cl.[5] H01L *21/302, 21/268*
U.S. Cl. 437—225 17 Claims

1. A method of patterning a layer of metal during the fabrication of a microelectronic circuit comprising the steps of:
(a) vapor depositing a layer of polymer having a thickness of approximately 200 to 1000 Angstroms onto the layer of metal by vaporizing a corresponding monomer in a vacuum and allowing the same to deposit onto the layer of metal substantially as a polymer;
(b) patterning the thin layer of polymer to expose corresponding areas of the metal layer therebeneath by removing the same in selected areas with a laser; and,
(c) selectively etching the exposed areas of the metal layer to pattern the metal layer in accordance with a pattern defined by the thin layer of polymer.

5,196,377
METHOD OF FABRICATING SILICON-BASED CARRIERS

John J. Wagner, Elevs; Thomas P. Chojnacki, River Falls, and Delvin D. Eberlein, Altoona, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Continuation-in-part of Ser. No. 631,376, Dec. 20, 1990, abandoned. This application Aug. 20, 1991, Ser. No. 747,523
Int. Cl.[5] H01L *21/302*
U.S. Cl. 437—225 33 Claims



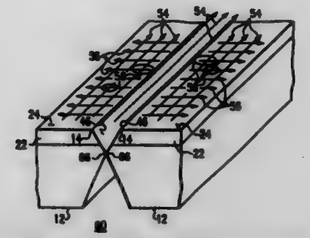
1. A method of fabricating at least one integrated circuit chip carrier, each chip carrier having at least one cavity for holding an integrated circuit chip, comprising the steps of:
(a) providing a keyed wafer from silicon;
(b) forming at least one channel in a top surface of the wafer, each channel being elongate and extending from proximate the at least one cavity to proximate a periphery of the chip carrier;
(c) depositing a first conductive material in the at least one channel to form traces;
(d) fabricating a plurality of bonding pads from a second conductive material on the top surface of the wafer, each bonding pad being in electrical communication with at least one of the traces;
(e) depositing a passivation layer on the top surface of the wafer, the traces and the plurality of bonding pads;
(f) etching the at least one cavity in the top surface of the wafer, each cavity being sized to contain at least one integrated circuit chip; and
(g) partially etching the passivation layer so that at least one of the plurality of bonding pads is uncovered for bonding.

5,196,378
METHOD OF FABRICATING AN INTEGRATED CIRCUIT HAVING ACTIVE REGIONS NEAR A DIE EDGE

Kenneth E. Bean, Celina; John Powell, Canton; Jack W. Freeman, Plano, all of Tex., and Robert D. McGrath, Andover, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 550,234, Jul. 10, 1990, abandoned, which is a continuation of Ser. No. 363,314, Jun. 5, 1989, abandoned, which is a continuation of Ser. No. 134,398, Dec. 17, 1987, abandoned. This application Mar. 25, 1991, Ser. No. 679,122
Int. Cl.[5] H01L *21/00, 21/02, 21/78*
U.S. Cl. 437—226 10 Claims

1. A method of forming integrated circuit dice on a wafer having a first electrically active layer overlying a second substrate layer, said method comprising the steps of:
(a) providing a silicon semiconductor wafer having a first electrically active layer overlying a second substrate layer and integrated circuit dice having corners, said dice disposed in at least said first layer;
(b) orienting said wafer so that said wafer represents a (100) orientation silicon crystal;
(c) applying a mask to a surface of said first layer of said wafer which covers active regions of said dice and has an opening therethrough along an edge of each of said dice, said opening forming a substantially straight line between adjacent corners of each of said dice;



(d) aligning said opening of said mask to be substantially in a <110> direction of the wafer;
(e) anisotropically etching said wafer through said first layer and into said second layer through said opening to form a generally V-shaped channel in said first and second layers; and
(f) separating adjacent dice along a vertex of said channel.

5,196,379
METHOD OF DEPOSITING OXIDE PASSIVATION LAYERS ON HIGH TEMPERATURE SUPERCONDUCTORS

John H. Weaver, Golden Valley, Minn.; Robert K. Grasselli, Aurora, Ohio; David L. Nelson, Falls Church, Va.; Harry M. Meyer, III, Coon Rapids, and Donald M. Hill, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 554,016, Jul. 17, 1990, abandoned, which is a division of Ser. No. 246,100, Sep. 19, 1988, Pat. No. 4,965,244. This application Nov. 21, 1991, Ser. No. 799,677
Int. Cl.[5] B05D *5/12*
U.S. Cl. 505—1 7 Claims

1. A method comprising evaporating Al, Bi, Si or Al-W in an atmosphere of activated oxygen in the presence of a superconductive ceramic oxide surface so that a layer of an oxide of Al, Bi, Si or Al-W is applied to said surface, wherein said oxide layer is effective to passivate said superconductive oxide surface without disrupting the superconductive properties.

5,196,380
REACTIVE MEMBRANE FOR FILTRATION AND PURIFICATION OF GASES OF IMPURITIES

Farhang F. Shadman, Tucson, Ariz., assignor to Arizona Board of Regents, Tucson, Ariz.

Filed Jan. 6, 1991, Ser. No. 710,719
Int. Cl.[5] B01J *20/20, 20/08, 20/28;* B01D *39/00*
U.S. Cl. 502—4 10 Claims

1. A reactive membrane for removal of homogeneous and heterogeneous impurities from gases, the reactive membrane comprising:
(a) a porous ceramic or porous carbon substrate layer having a plurality of pores therein;
(b) at least one layer of carbon deposited on the substrate layer and coating the pores thereof; and
(c) at least one reactive layer of a metal in reduced form selected from the group consisting of manganese and alkali metals, said reactive layer formed by depositing the metal in an oxidized form on the carbon layer and heating to produce the metal in reduced form having none or less than stoichiometric amount of oxygen, and wherein said metal in reduced form is capable of reacting with impurities and removing them from gases and is chemically bonded to the carbon layer.

5,196,381
METAPHOSPHATE GLASS COMPOSITION

Yung-Haw Ha, Hockessin, Del.; Michael A. Saltzberg, Glen Mills, Pa., and Robert D. Shannon, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 16, 1990, Ser. No. 465,403
Int. Cl.[5] C03C *10/2*
U.S. Cl. 501—10 4 Claims

1. A thick film composition comprising finely divided particles of an amorphous crystallizable glass having a softening point of 550°–800° C. and a dielectric constant less than about 5.8, consisting essentially by mole % of:
41–70% P_2O_5;
10–48% MgO, ZnO or mixtures thereof;
2–20% Al_2O_3, Cr_2O_3 or mixtures thereof;
0–10% alkali metal oxide(s);
0–10% CaO, SrO, BaO or mixtures thereof;
0–10% SiO_2;
0–20% B_2O_3;
0–10% ZrO_2, TiO_2 or mixtures thereof; and
0–10% Fe_2O_3 with the provisos that:
(i) a=n(b+3c+d+e+2f+3g), wherein n=0.8–1.0, and
a=mole % P_2O_5;
b=mole % MgO, ZnO or mixtures thereof;
c=mole % Al_2O_3, Cr_2O_3 or mixtures thereof;
d=mole % M_2O, where M=Na, K, Rb, Cs
e=mole % M'O, where M'=Ca, Sr, Ba
f=mole % ZrO_2, TiO_2 or mixtures thereof;
g=mole % Fe_2O_3;
(ii) the total amount of alkali oxides, CaO, SrO, and BaO does not exceed 10 mole %;
(iii) the total amount of ZrO_2, TiO_2, Fe_2O_3 does not exceed 10 mole %
dispersed in an organic medium.

5,196,382
METHOD FOR RAPID PRODUCTION OF LARGE SOL-GEL SiO_2 CONTAINING MONOLITHS OF SILICA WITH AND WITHOUT TRANSITION METALS

Larry L. Hench, and Shi-Ho Wang, both of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Continuation of Ser. No. 372,192, Jun. 26, 1989, abandoned, which is a continuation of Ser. No. 704,938, Feb. 25, 1985, abandoned. This application Aug. 16, 1990, Ser. No. 568,619
Int. Cl.[5] B01J *13/00;* C03C *3/00, 3/078*
U.S. Cl. 501—12 6 Claims

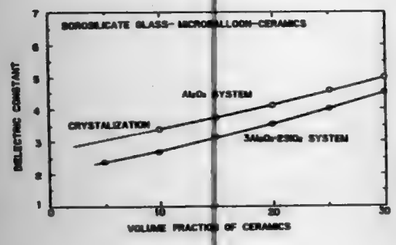
1. A process for producing sol-gel monoliths containing SiO_2 comprising the steps of:
a. mixing water, a SiO_2 precursor and ketomalonic acid to form a sol,
b. gelling the sol,
c. aging the gelled sol, and
d. drying the aged gelled sol,
wherein the constituents are present in the ratio 10–25 moles of water, 0.5–2.5 moles SiO_2 precursor and 0.01–0.1 moles ketomalonic acid.

5. A process according to claim 1 wherein the dried aged gelled sol is densified by heating to from about 500° C. to about 1350° C.

5,196,383
METHOD FOR PRODUCING RARE EARTH ELEMENT-DOPED GLASS BY SOL-GEL PROCESS
Masami Ito; Tatsuhiko Saitoh, and Hiroshi Yokota, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Nov. 9, 1990, Ser. No. 610,226
Claims priority, application Japan, Dec. 20, 1989, 1-328123; Dec. 28, 1989, 1-338744
Int. Cl.[5] C03C 3/095
U.S. Cl. 501—12 5 Claims

1. A method for producing a rare earth element-doped glass comprising the following steps:
(a) mixing at least one metal alkoxide with a chloride or nitrate of a rare earth element to form a mixture;
(b) hydrolyzing mixture obtained in (a);
(c) adding hydrolyzed mixture obtained in (b) to a mixture of $Si(OR)_4$, wherein R is an alkyl group, and an alcohol containing water;
(d) hydrolyzing combined mixture obtained in (c) wherein this combined hydrolysis mixture has pH value of 6 to 9; and
(e) condensing hydrolyzed materials obtained in (d) to form a rare earth element-doped glass.

5,196,384
METHOD FOR PREPARING GREEN SHEETS
Hiroshi Kawazaki; Masato Wakamura; Kishio Yokouchi; Yoshihiko Imanaka, and Noboo Kamehara, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 17, 1991, Ser. No. 761,006
Claims priority, application Japan, Sep. 17, 1990, 2-246502
Int. Cl.[5] C03C 14/00
U.S. Cl. 501—32 8 Claims



1. A method for preparing a green sheet comprising the steps of:
preparing a mixture of hollow silica microspheres, borosilicate glass powder and ceramic powder as a principle ingredient;
adding a plasticizer, a binder and a solvent to the mixture;
kneading the mixture and forming it into a green sheet; and
for the step of preparing the mixture, providing hollow silica microspheres having the same specific gravity as that of the solvent, said specific gravity being in the range of from about 0.78 g/cm^3 to about 1.50 g/cm^3.

5,196,385
PROCESS FOR THE PREPARATION OF A HEAT-RESISTANT AND WEAR RESISTANT CERAMIC MATERIAL
Junichiro Suzuki, and Minoru Nakamura, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan
Continuation of Ser. No. 503,087, Apr. 2, 1990, abandoned, which is a continuation of Ser. No. 296,288, Jan. 11, 1989, abandoned, which is a continuation of Ser. No. 893,848, Aug. 6, 1986, abandoned. This application Jan. 14, 1991, Ser. No. 639,774
Claims priority, application Japan, Aug. 6, 1985, 60-173519
Int. Cl.[5] C04B 35/56
U.S. Cl. 501—87 2 Claims

2. A process for preparation of a heat-resistant and wear-resistant ceramic material formed from a starting composition consisting essentially of from 1 to 40 wt. % of Al_2O_3, from 0.05 to 8 wt. % of sintering assistant, from 3 to 20 wt. % total of 1 or both of ZrO_2 and HfO_2 in dispersed form, and from 50 to 95.95 wt. % of a carbide component composed of components (a), (b), and (c), which process comprises sintering the composition under a non-oxidizing atmosphere until the metal of said component (a) no longer exists as a metallic phase, wherein
component (a) is from 4 to 30 wt. % based on the weight of the carbide component of one or more metals selected from the group consisting of metals of Groups IVB, VB, and VIB of the Periodic Table,
component (b) is from 30 to 91 wt. % based on the weight of the carbide component of TiC,
component (c) is from 5 to 40 wt. % based on the weight of the carbide component of carbides of one or more metals selected from the group consisting of Zr, Hf and metals of Groups IVB and VIB of the Periodic Table, and
said sintering assistant is one or more members selected from the group consisting of MgO, CaO, SiO_2, NiO and oxides of rare earth metals.

5,196,386
SINTERED CERAMIC COMPOSITE BODY AND METHOD OF MANUFACTURING SAME
Yutaka Furuse, Choufu, and Keiji Matsuhiro, Nagoya, both of Japan, assignors to The Tokyo Electric Power Company, Incorporated, Tokyo and NGK Insulators, Ltd., Nagoya, both of Japan
Filed Sep. 14, 1990, Ser. No. 582,586
Claims priority, application Japan, Sep. 18, 1989, 1-243132; Sep. 18, 1989, 1-243134
Int. Cl.[5] C04B 35/56
U.S. Cl. 501—88 14 Claims

1. A sintered ceramic composite body consisting essentially of:
a base material selected from the group consisting of oxide ceramics and nonoxide ceramics and
a reinforcement material consisting essentially of particles of silicon carbide which have a size of 1 μm or less and particles of silicon carbide having a size ranging from 5 to 20 μm,
the volume ratio of said reinforcement material to said base material being in the rang of 10 to 50%.

5,196,387
CERAMIC COMPOSITION AND A PROCESS FOR PRODUCING THE SAME
Kouichi Ayama, Minamata, and Kaneo Noake, Yokohama, both of Japan, assignors to Chiao Corporation, Osaka, Japan
Filed May 28, 1991, Ser. No. 706,033
Claims priority, application Japan, May 29, 1990, 2-139283
Int. Cl.[5] C04B 35/10
U.S. Cl. 501—89 16 Claims

1. A novel ceramic composition obtained by sintering and molded body consisting of 80.1 to 97.3%, by weight, of alumina powder and 2.7 to 19.9%, by weight, of a polysilazane

which forms silicon nitride, silicon carbide, sialon or a mixture thereof in an atmosphere of nitrogen, argon and/or ammonia or under pressure, at a temperature of 800° to 1,950° C.

5,196,388
PROCESS FOR THE PREPARATION OF DOUBLE METAL OXIDE POWDERS CONTAINING A GROUP IIIA AND A GROUP IVB ELEMENT AND A NOVEL DOUBLE METAL HYDROXYL CARBOXYLATE USEFUL IN PREPARING SAME
Lieh-Jiun Shyu, Yorktown Heights, N.Y., assignor to Akzo N.V., Arnhem, Netherlands
Filed Jun. 10, 1991, Ser. No. 713,195
Int. Cl.[5] C04B 35/46
U.S. Cl. 501—134 20 Claims

1. A process for the preparation of double metal oxide ceramic powders which contain at least one metal of Group IIIA and at least one metal of Group IVB comprising the steps of:
(a) forming an aqueous solution of mixed metal compounds which respectively contain said Group IIIA and Group IVB metals and which compounds are selected from the group consisting of the metal salts, the metal alkoxides, and the mixtures thereof, the solution also containing a polyfunctional compound capable of chelating the metal compounds;
(b) adding an effective amount of a base to the solution formed under (a) in order to form a homogeneous double metal precipitate; and,
(c) converting the precipitate formed under (b) into a double metal oxide.

5,196,389
CATALYTIC SYSTEM PARTICULARLY FOR THE POSTCOMBUSTION OF EXHAUST GASES AND A METHOD OF PRODUCING SUCH A SYSTEM
Dominique Dubots, Pussy, France, assignor to Pechiney Electrometallurgie, Courbevoie, France
Filed Apr. 24, 1992, Ser. No. 873,196
Claims priority, application France, Apr. 29, 1991, 91 05771
Int. Cl.[5] B01J 27/224, 27/22; C04B 35/52; C01B 31/36
U.S. Cl. 502—178 23 Claims

20. A catalytic system comprising a porous support and a deposited coating of catalyst on the pores of said support,:
said support consisting essentially of silicon carbide having a specific surface area between 0.5 and 4 m^2/g and having a texture and/or form selected from the group consisting of a monolithic alveolate, a honeycomb structure, extrudates, granules in various shapes and sizes, and powders;
said deposited coating of catalyst consisting essentially of carbides of large specific surface area, of one or more metals selected from the group consisting of molybdenum, tungsten, vanadium, tantalum, niobium, chromium and iron.

21. A catalytic system according to claim 20, wherein the catalyst further includes at least one oxycarbide of said one or more metals.

22. A catalytic system comprising a porous support and a deposited coating of catalyst on the pores of said support,
the support formed of silicon nitride or a compound of alumina and silicon nitride, and having a specific surface area of 0.5 to 4 m^2/g,
the deposited coating consisting essentially of carbides having a large specific surface area, of one or more metals selected from the group consisting of molybdenum, tungsten, vanadium, tantalum, niobium, chromium and iron.

5,196,390
HYDROGEN SULFIDE-SUPPRESSING CATALYST SYSTEM
Samuel Taunter, Englishtown; Joseph C. Dettling, Howell, and John J. Mooney, Wyckoff, all of N.J., assignors to Engelhard Corporation
Continuation of Ser. No. 644,697, Jan. 22, 1991, abandoned, which is a continuation of Ser. No. 532,008, Jun. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 116,598, Nov. 3, 1987, Pat. No. 4,939,113. This application Jun. 15, 1992, Ser. No. 899,015
Int. Cl.[5] B01J 21/04, 21/06, 23/10, 23/64, 23/89
U.S. Cl. 502—251 18 Claims

1. A catalyst system comprising:
inlet means for receiving an exhaust gas from an internal combustion engine; duct means operably connected to said inlet means for receiving exhaust gas from said inlet means; outlet means operably connected to said duct means for receiving and discharging to the atmosphere exhaust gas received from said duct means; three-way catalyst means and means for suppressing release of hydrogen sulfide being disposed on a refractory substrate located within said duct means, said means for suppressing release of hydrogen sulfide comprising a metal oxide undercoat dispersed on said refractory substrate, the undercoat comprising one or more metal oxides selected from the group consisting of manganese oxide, nickel oxide and iron oxide and being present in an amount sufficient to suppress H_2S release; said three-way catalyst comprising a topcoat overlying said undercoat, the topcoat comprising a gamma alumina support having dispersed thereon catalyst metals selected from the group consisting of palladium, the combination of platinum plus rhodium, and mixtures of platinum palladium and rhodium.

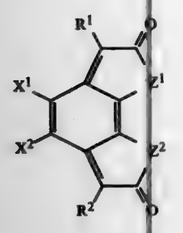
5,196,391
SUPPORT FOR DYE TRANSFER TYPE THERMOSENSITIVE PRINTING SHEET
Akihiko Ohno, and Akira Iwai, both of Ibaraki, Japan, assignors to Oji Yuka Gosishi Co., Ltd., Tokyo, Japan
Filed Jan. 18, 1991, Ser. No. 642,776
Claims priority, application Japan, Jan. 20, 1990, 2-11249
The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.
Int. Cl.[5] B41M 5/20
U.S. Cl. 503—200 8 Claims

1. A support for a dye transfer thermosensitive printing sheet comprising a porous film base having a biaxially stretched film of a thermoplastic resin containing an inorganic fine powder having adhered thereon a thermoplastic resin film having a centerline-average roughness of not more than 0.5 μm as a surface layer on which a dye transfer thermosensitive printing layer is to be provided, said surface layer having a thickness of from 0.3 to 1.5 μm and a Bekk's smoothness of from 2500 to 7000 seconds, and said support having an opacity of not less than 70%, a density of not more than 0.91 g/cm^3, and a compression ratio of from 15 to 35% under a stress of 32 kg/cm^2.

5,196,392
THERMAL TRANSFER PRINTING
Roy Bradbury, St. Helens; Ronald W. Kenyon, Manchester, and Derek Thorp, Heywood, all of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Jul. 26, 1991, Ser. No. 736,714
Claims priority, application United Kingdom, Jul. 30, 1990, 9016653
Int. Cl.[5] B41M *5/035, 5/38*
U.S. Cl. 503—227 3 Claims

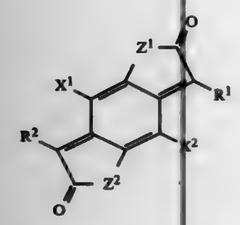
1. A thermal transfer printing sheet comprising a substrate having a coating of a dye of Formula (1A):

Formula (1A)



or a dye of Formula (1B):

Formula (1B)



wherein:

Z^1 and Z^2 each independently represent oxygen or —NY in which Y is hydrogen, an optionally substituted hydrocarbon radical or an acyl radical;

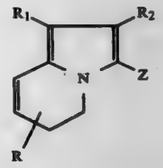
X^1 and X^2 each independently represent H; halogen; cyano; alkyl; alkoxy; nitro; amino; substituted amino; carboxylic acid ester; optionally substituted carbamoyl; optionally substituted sulphamoyl; alkylthio; arylthio; alkylsulphonyl; arylsulphonyl; acyl; acyloxy; hydroxy; sulphonic acid; sulphonic acid ester; or in dyes of Formula (1A) X^1 and X^2 together form a 5- or 6-membered carbocyclic or heterocyclic, saturated or unsaturated ring which may carry further substituents;

R^1 and R^2 each independently represent an unsubstituted aryl radical or an aryl radical substituted by at least one of the following: nitro, halogen, optically substituted alkyl, optionally substituted alkoxy, phenyl, alkenyl, alkoxyphenyl, phenoxy, cyano, carboxylic acid ester, optionally substituted carbamoyl, sulphonic acid, sulphonyl chloride, sulphonic acid ester, optionally substituted sulphamoyl, mercapto, optionally substituted alkylthio, arylthio, primary, secondary, tertiary or quaternary amino, acylamino, acyl, phosphonic acid, phosphonic acid ester, alkylsulphonyl, arylsulphonyl, aldehyde, acyloxy, and hydroxy.

5,196,393
HEAT TRANSFER DYE-PROVIDING MATERIAL
Seiiti Kubodera, and Yoshio Inagaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 24, 1991, Ser. No. 781,873
Claims priority, application Japan, Oct. 26, 1990, 2-286958; Nov. 2, 1990, 2-295304
Int. Cl.[5] B41M *5/035, 5/38*
U.S. Cl. 503—227 6 Claims

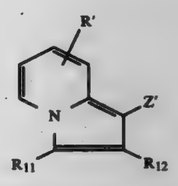
1. A heat transfer dye-providing material comprising a support and having thereon a layer containing a heat migrating dye, wherein at least one of the dye-containing layer and a layer adjacent thereto contains an infrared-absorbing dye represented by the following Formula (I) or (II):

Formula (I)



wherein R represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, a halogen atom, or a benzene ring condensed with a pyridine ring; R_1 represents an alkyl group or an aryl group; R_2 represents a hydrogen atom, an alkyl group, or an aryl group; and Z represents the group of atoms which have a nitrogen atom or an oxygen atom and complete a conjugate chain between the nitrogen atom of the picoline nucleus and the nitrogen atom or the oxygen atom contained in Z;

Formula (II)

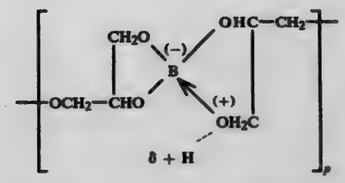


wherein R′ represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group, or a benzene ring condensed with a pyridine ring; R_{11} and R_{12} represent independently a hydrogen atom, an alkyl group and an aryl group; and Z′ represents the group of atoms which have a nitrogen atom or an oxygen atom and complete a conjugate chain between the nitrogen atom of the picoline nucleus and the nitrogen atom or the oxygen atom contained in Z′.

5,196,394
HEAT-SENSITIVE RECORDING MATERIAL
Atsushi Nakazawa; Hideaki Shinohara, both of Tokyo; Yoshitaka Tomino, Funabashi, and Yoichi Shin, Yachiyo, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 512,229, Apr. 20, 1990, Pat. No. 5,093,304. This application Oct. 30, 1991, Ser. No. 784,215
Claims priority, application Japan, Apr. 2, 1990, 2-84815
Int. Cl.[5] B41M *5/40*
U.S. Cl. 503—209 18 Claims

1. A heat-sensitive recording material comprising:
a substrate sheet;
a heat-sensitive color-forming layer formed on a surface of the substrate sheet and comprising a substantially colorless dye precursor, a color-developing agent reactive with the dye precursor upon heating to develop a color, and a binder and
at least one protective layer formed on the heat-sensitive color-forming layer and comprising, as the principal component, a mixture of:
(A) a polyvinylalcohol resin;
(B) a water-soluble cross-linking agent; and
(C) an organic boron-containing polymer of the formula (I):

(I)



wherein p represents an integer of 10 or more.

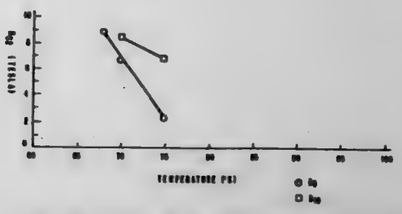
5,196,395
METHOD FOR PRODUCING CRYSTALLOGRAPHIC BOUNDARY JUNCTIONS IN OXIDE SUPERCONDUCTING THIN FILMS
Timothy W. James, and Julia S. Fleming, both of Goleta, Calif., assignors to Superconductor Technologies, Inc., Santa Barbara, Calif.
Filed Mar. 4, 1991, Ser. No. 664,586
Int. Cl.[5] B05D *5/12;* H01L *39/22*
U.S. Cl. 505—1 11 Claims

1. A method for producing weak link junctions in an oxide superconductor on a substrate comprising the steps of:
forming an epitaxial oxide superconductor film on a first face and,
on a second face of the substrate, the second face being adjacent and not parallel to the first face, such that a planar fault is formed in the superconductor at the intersection of the first face and the second face.

5,196,396
METHOD OF MAKING A SUPERCONDUCTING FULLERENE COMPOSITION BY REACTING A FULLERENE WITH AN ALLOY CONTAINING ALKALI METAL
Charles M. Lieber, Lexington, Mass., assignor to The President and Fellows of Harvard College, Cambridge, Mass.
Filed Jul. 16, 1991, Ser. No. 730,737
Int. Cl.[5] H01B *12/00;* H01L *39/24;* C01B *31/00*
U.S. Cl. 505—1 16 Claims

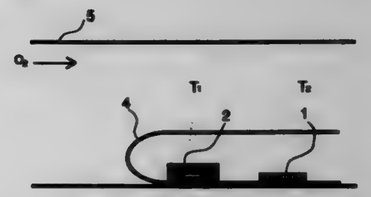
1. A method for making a superconducting fullerene composition having the formula $(M)_xC_{60}$ wherein x is in the range between about 1.5 and about 3 and wherein M is one or more alkali metals, comprising reacting a C_{60} fullerene with an alloy wherein said alloy is a binary alloy containing an alkali metal or a ternary alloy containing at least two different alkali metals.

5,196,397
HIGH TEMPERATURE SUPERCONDUCTING CERAMIC COPPER OXIDE PEROVSKITE WITH ENHANCED UPPER CRITICAL FIELD (H_{c2})
Carol Z. Rosen, Teaneck, N.J., assignor to GEC-Marconi Electronics Systems Corp., Wayne, N.J.
Division of Ser. No. 648,546, Jan. 30, 1991, Pat. No. 5,093,310.
This application Nov. 12, 1991, Ser. No. 790,434
Int. Cl.[5] H01B *1/00;* B05D *3/06*
U.S. Cl. 505—1 3 Claims



1. A Type II superconducting material exposed to gamma radiation to increase the current carrying capacity of the material and to enhance the upper critical field (H_{c2}) of the material; wherein the exposure to the gamma radiation is in the range of about 10^7 to about 10^8 rads at a dose rate of about 3 million rads per hour.

5,196,398
PROCESS FOR PRODUCING THALLIUM TYPE SUPERCONDUCTING THIN FILM
Keizo Harada; Hideo Itozaki, and Shuji Yazu, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 616,685, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 392,871, Aug. 10, 1989, abandoned. This application Jul. 30, 1991, Ser. No. 740,641
Claims priority, application Japan, Aug. 10, 1988, 63-199398
Int. Cl.[5] B05D *5/12*
U.S. Cl. 505—1 7 Claims



1. A process for producing a superconducting film of a thallium type compound oxide with a critical current density Jc in the order of 10^6 A/Cm^2 at 77 K comprising depositing a film of thallium-containing compound oxide on a substrate by physical vapor deposition method or chemical vapor deposition method and then subjecting the resulting film to a first heat-treatment, characterized in that said heat-treatment is effected at a temperature between 880° C. and 920° C. for a time duration under such conditions that the partial pressure of thallium oxide becomes higher than the saturated vapor pressure of thallium oxide at said temperature and the resulting heat-treated film is subjected to a second heat-treatment which is effected at a temperature between 600° C. and 900° C. for a time duration under such condition that the partial pressure of thallium oxide becomes lower than the saturated vapor pressure of thallium oxide at said temperature; said first and second heat-treatments being effected in an oxygen-containing atmosphere for more than one minute; said superconducting film of

thallium type compound oxide having a composition represented by the general formula:

$$Tl_q(Ca_{1-x}Ba_x)_mCu_nO_{p+y}$$

in which m, n, x and y are numbers each satisfying ranges of $6 \leq m \leq 16$, $4 \leq n \leq 12$, $0.2 < x < 0.8$ and $-2 \leq y \leq +2$, respectively, and $p=(6+m+n)$.

5,196,399
APPARATUS FOR PRODUCING OXIDE SUPERCONDUCTOR CABLE

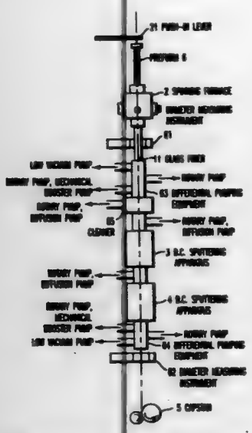
Takao Shiota, Sakura; Hiroshi Hidaka, Tsukuba; Koichi Takahashi, Funabashi; Masahiro Sato, Yotsukaido; Osamu Fukuda, Narashino, and Koichi Inada, Sakura, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Division of Ser. No. 178,264, Apr. 6, 1988, Pat. No. 5,093,311. This application Aug. 6, 1991, Ser. No. 740,947

Claims priority, application Japan, Apr. 6, 1987, 62-85152; Apr. 6, 1987, 62-85153; Apr. 6, 1987, 62-85154; Apr. 28, 1987, 62-105570

Int. Cl.[5] H01L *39/24*; C23C *14/56*

U.S. Cl. 505—1 5 Claims



1. A device for fabricating an oxide superconductor cable comprising:

spinning furnace means for receiving a preform and spinning said preform into a glass fiber;

a sputtering apparatus for receiving said spun glass fiber and coating said glass fiber with an oxide superconductor film;

pumping means connected to said sputtering apparatus for controlling a vacuum degree at said sputtering apparatus;

pulling means for pulling said glass fiber as it passes through said sputtering apparatus; and

diameter measuring means for determining a diameter of the glass fiber after the glass fiber leaves the spinning furnace means;

wherein said spinning furnace means, said sputtering apparatus and said pulling means are vertically aligned, and a plurality of pumping means are provided on each side of said sputtering apparatus so that the vacuum degree of said pumping means becomes gradually higher in the directions toward said sputtering apparatus.

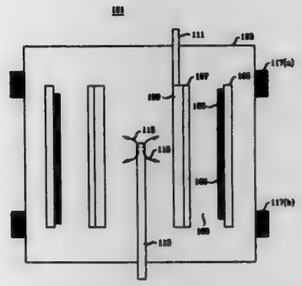
5,196,400
HIGH TEMPERATURE SUPERCONDUCTOR DEPOSITION BY SPUTTERING

Chou T. Chen, and Dennis L. Krause, both of Atkinson, N.H., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 17, 1990, Ser. No. 569,047

Int. Cl.[5] C23C *14/34*; H01L *39/24*

U.S. Cl. 505—1 10 Claims



1. A method of employing a direct-current magnetron sputtering device to sputter a first material which has low heat and electrical conductivity at the temperatures encountered in the sputtering operation from a target to a substrate, the method comprising the steps of:

employing a second material with high heat and electrical conductivity for the target;

applying a coating of the first material to a surface of the target which is subject to ion bombardment in the sputtering device, the coating being applied by spraying a powder of the first material onto the surface and having the property that particles of the first material are tightly bound to each other and/or to the surface; and

operating the sputtering device using the target.

5,196,401
METHOD OF ENHANCING ROCK FRAGMENTATION AND EXTENDING DRILL BIT LIFE

William H. Engelmann, Henderson, Nev.; Pamela J. Watson, Inver Grove Heights; Sanaa E. Khalafalla, Minneapolis; John E. Pahlman, Bloomington, and Patrick A. Tuzinski, Minneapolis, all of Minn., assignors to The United State of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 211,650, Jun. 27, 1988, Pat. No. 4,959,164. This application Jul. 18, 1990, Ser. No. 553,510

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] C09K *7/02*

U.S. Cl. 507—120 20 Claims

1. A method of increasing the fragmentation rate of a solid and prolonging the life of a bit, cutting tool, grinding medium or other polishing or drilling tool during drilling, tunneling, cutting, grinding, polishing or other operation involving said tools comprising the steps of:

a) providing an aqueous solution containing a high molecular weight nonionic polymer capable of hydrogen bonding with water to produce charge-neutralizing positive charge dipoles;

b) determining the minimum concentration of the polymer in the aqueous solution that will be effective in neutralizing the surface charge of the solid and producing a zero surface charge (ZSC) condition on the solid; and

c) adding to the solid during the drilling, tunneling, cutting, grinding or polishing operation the aqueous solution with the polymer concentration equal to or greater than the minimum concentration that will be effective in neutralizing the surface charge of the solid and producing a zero surface charge (ZSC) condition on the solid.

5,196,402
S-ADENOSYL-METHIONINE IN THE TREATMENT OF PANCREATITIS AND OF THE IMMUNO REJECTION IN THE PANCREAS TRANSPLANT

Joan M. Braganza, Sale, and Ian V. Hutchinson, Stockport, both of United Kingdom, assignors to Bioresearch S.p.A., Milan, Italy

PCT No. PCT/EP90/00048, § 371 Date Aug. 15, 1990, § 102(e) Date Aug. 15, 1990, PCT Pub. No. WO90/07928, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 10, 1990, Ser. No. 573,211

Claims priority, application United Kingdom, Jan. 14, 1989, 8900612

Int. Cl.[5] A61K *31/16*, *31/70*

U.S. Cl. 514—9 4 Claims

1. A therapeutic method for treating pancreatitis in a patient in need thereof comprising administering a therapeutically effective amount of SAMe or a pharmaceutically acceptable salt thereof.

3. A therapeutic method for treating pancreatitis and for reducing graft rejection, both occurring after pancreas transplant in a patient in need thereof comprising administering a therapeutically effective amount of SAMe or pharmaceutically acceptable salts thereof, in combination with a therapeutically effective amount of cyclosporin.

5,196,403
METHOD OF INHIBITING PLATELET ACTIVATION

John M. Maraganore, Tewksbury, Mass.; Joseph A. Jakubowski, Indianapolis, Ind., and Betty H. Chao, Winchester, Mass., assignors to Biogen, Inc., Cambridge and Trustees of Boston University, Boston, both of Mass.

PCT No. PCT/US90/00465, § 371 Date Jul. 23, 1991, § 102(e) Date Jul. 23, 1991

Continuation-in-part of Ser. No. 430,313, Nov. 1, 1989, which is a continuation-in-part of Ser. No. 303,585, Jan. 27, 1989, abandoned, and a continuation-in-part of Ser. No. 303,590, Jan. 27, 1989, abandoned. This PCT application Jan. 26, 1990, Ser. No. 741,403

Int. Cl.[5] A61K *37/02*

U.S. Cl. 514—12 3 Claims

1. A method for decreasing or inhibiting platelet activation in a patient or extracorporeal blood comprising the step of treating said patient or said extracorporeal blood with a pharmaceutically acceptable composition comprising a pharmaceutically acceptable carrier and a polypeptide inhibitor of platelet activation, wherein said polypeptide consists essentially of two homologous disulfide-linked polypeptide chains, each of said polypeptide chains having the amino acid formula:

EAGEE CDCGS PENPC CDAAT CKLRP
GAQCA EGLCC DQCKF MKEGT VCRRA
RGDDV NDYCN GISAG CPRNP FH.

5,196,404
INHIBITORS OF THROMBIN

John M. Maraganore, Concord, Mass.; John W. Fenton, II, Malden Bridge, and Toni Kline, New York, both of N.Y., assignors to Biogen, Inc., Cambridge, Mass. and Health Research, Inc., Albany, N.Y.

Continuation-in-part of Ser. No. 395,482, Aug. 18, 1989, abandoned. This application Jul. 6, 1990, Ser. No. 549,388

Int. Cl.[5] A61K *37/02*; C07K *7/08*, *7/10*

U.S. Cl. 514—13 37 Claims

1. A thrombin inhibitor consisting of:

a) a catalytic site-directed moiety that binds to and inhibits the active site of thrombin; wherein said catalytic site-directed moiety is selected from serine proteinase inhibitors, heterocyclic protease inhibitors, thrombin-specific inhibitors, transition state analogues, benzamidine, DAPA, NAPAP, argipidine, or moieties of the formulae:

X—A_1—A_2—A_3—Y or X—C_1—C_2—A_3—Y,

wherein X is hydrogen or is characterized by a backbone chain consisting of from 1 to 35 atoms; A_1 is Arg, Lys or Orn; A_2 is a non-amide bond; A_3 is characterized by a backbone chain consisting of from 1 to 9 atoms, Y is a bond; C_1 is a derivative of Arg, Lys or Orn comprising a carboxylate moiety that is reduced, or displaced from the α-carbon by a moiety characterized by a backbone chain consisting of from 1 to 10 atoms; and C_2 is a non-cleavable bond;

b) a linker moiety characterized by a backbone chain having a calculated length of between about 18 Å and about 42 Å; and

c) an anion binding exosite associating moiety;

said catalytic site-directed moiety being bound to said linker moiety and said linker moiety being bound to said anion binding exosite associating moiety; wherein said inhibitor is capable of simultaneously binding to the catalytic site and the anion binding exosite of thrombin.

5,196,405
COMPOSITIONS AND METHODS OF TREATING HEMORRHOIDS AND WOUNDS

Elias W. Packman, Merion, Pa., assignor to Norman H. Oakman, Baltimore, Md., a part interest

Continuation of Ser. No. 70,904, Jul. 8, 1987, Pat. No. 4,945,084. This application Feb. 27, 1990, Ser. No. 485,573

The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/715*

U.S. Cl. 514—53 19 Claims

1. A therapeutic method for alleviating symptoms of wounded tissue not associated with or caused by high acidity which comprises providing to the wounded tissue, a therapeutic composition which comprises sucralfate as a vehicle for and with a topical, therapeutically-active compound selected from the group consisting of an antibiotic, an anti-inflammatory, a steroid, and a vasoconstrictor, causing a complex to be formed between the wounded tissue and the sucralfate, and promoting prolonged adhesion of the therapeutically-active compound to the wounded tissue.

9. A therapeutic method for alleviating the symptoms caused by hemorrhoids in humans comprises applying topically to the hemorrhoids in a region which has a pH of between about 6 to basic, a hemorrhoidal composition comprising a therapeutic amount of sucralfate and a pharmaceutically-acceptable vehicle specially adapted for topical application.

5,196,406
CYCLODEXTRIN COMPLEX OF FUMAGILLIN DERIVATIVE

Shigeru Kamei, Takarazuka; Hiroaki Okada, Suita; Katsuichi Sudo, Takatsuki, and Shoji Kishimoto, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 23, 1991, Ser. No. 704,367

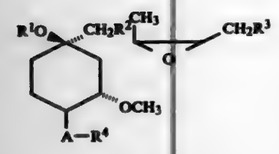
Claims priority, application Japan, May 25, 1990, 2-136343; Feb. 6, 1991, 3-015333

Int. Cl.[5] A61K *31/335*, *47/40*

U.S. Cl. 514—58 32 Claims

1. A complex of a fumagillin derivative represented by the formula:

VOL 1148 ISS 4 MR 23 1993 UMI



(I)

wherein R^1 is hydrogen; R^2 is halogen, $N(O)mR^5R^6$, $N^+R^5R^6R^7.X^-$, $S(O)NR^5$ or $S^+R^5R^6.X^-$(wherein R^5, R^6 and R^7 are independently an optionally substituted hydrocarbon or heterocyclic group; X^- is a counter anion; m is an integer of 0 or 1; n is an integer from 0 to 2; and R^5 and R^6 together with the adjacent nitrogen or sulfur atom may form a nitrogen- or sulfur-containing heterocyclic group which may be substituted and form a condensed ring); or R^1 and R^2 together represent a bond; R^3 is 2-methyl-1-propenyl group or isobutyl group; A is O or NR^8 (wherein R^8 is hydrogen or an optionally substituted lower alkyl or aryl group); R^4 is hydrogen, an optionally substituted hydrocarbon group or an optionally substituted acyl group with the proviso that when R^1 and R^2 together represent a bond and R^3 is $—CH═C(CH_3)_2$ then $A—R^4$ is not $—OOC(CH═CH)_2COOH$; or a salt thereof, with a cyclodextrin or etherified cyclodextrin.

5,196,407

COMPOSITION FOR PRESERVING WOOD AND WOOD MATERIALS

Peter Goletz, Kempen Sankt Hubert, and Lucian Naczinski, Moerkamp-Lank, both of Fed. Rep. of Germany, assignors to Dasowag Materialschutz GmbH, Duesseldorf, Fed. Rep. of Germany

Filed May 22, 1991, Ser. No. 703,093

Claims priority, application Fed. Rep. of Germany, May 23, 1990, 4016601; May 23, 1990, 4016602

Int. Cl.[5] A01N *37/34, 43/64, 47/10, 55/00*

U.S. Cl. 514—63 **21 Claims**

1. An aqueous composition for preserving wood and wood materials comprising:

(a) a first fungicide ranging from about 0.1 to about 2.0% by weight of said composition wherein said first fungicide is selected from the group consisting of α-[[2-(4-chlorophenyl)ethyl]-α-(1,1-dimethylethyl)-1H-1,2,4-triazol-1-ethanol and 1-[[2-(2,4-dichlorophenyl-4-propyl-1,3dioxolan-2-yl}methyl}-1H-1,2,4-triazole;

(b) a second fungicide, said fungicide being a fungicidal carbamate ranging from about 0.2 to about 2.3% by weight of said composition wherein said second fungicide is selected from the group consisting of 3-iodo-2-propynylbutyl carbamate and methyl benzimidazol-2-ylcarbamate;

(c) a stabilizer ranging from about 1.0 to about 5.0% by weight of said composition wherein said stabilizer is 2,2,4-trimethyl-1,3-pentadiol monoisobutyrate; and

(d) a diluent comprising at least about 89% by weight of said composition.

5,196,408

N-SULFENYLATED PYRAZOLINES, COMPOSITIONS AND USE

Mohamed A. H. Fahmy, deceased, late of Wilmington, Del. by Salwa Fahmy, executrix; Charles R. Harrison, Newark; George P. Laiss, Wilmington, and Thomas M. Stevenson, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

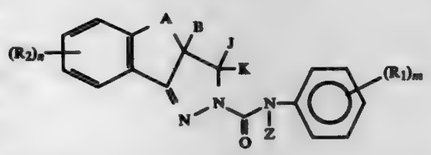
PCT No. PCT/US89/04078, § 371 Date Mar. 12, 1991, § 102(e) Date Mar. 12, 1991

Continuation-in-part of Ser. No. 304,011, Jan. 25, 1989, abandoned, and a continuation-in-part of Ser. No. 249,881, Sep. 27, 1988, abandoned. This PCT application Sep. 26, 1989, Ser. No. 659,402

Int. Cl.[5] A01N *43/56, 57/32*; C07D *23/54*; C07F *9/24*

U.S. Cl. 514—80 **8 Claims**

1. A compound of the formula:



III

wherein

A is a 1, 2 or 3-atom bridge comprising 0 to 3 carbon atoms, 0 to 1 oxygen atoms, NR_6, or S(O)q, wherein each carbon individually can be substituted with 1 to 2 substituents selected from 1 to 2 halogen, C_1 to C_6 alkyl, C_2 to C_4 alkoxycarbonyl or phenyl optionally substituted with 1 to 3 substituents independently selected from W and one of the carbon atoms can be combined into the group C(O) or C(S);

B is H, C_1 to C_6 alkyl, C_4 to C_7 cycloalkyl alkyl, C_3 to C_6 cycloalkyl optionally substituted with 1 to 2 halogens or 1 to 2 CH_3; C_1 to C_6 haloalkyl, C_2 to C_6 alkenyl, C_2 to C_6 haloalkeny, C_2 to C_6 alkynyl, OR_7, C_2 to C_6 alkoxyalkyl, C_2 to C_6 cyanoalkyl, C_3 to C_8 alkoxycarbonylalkyl, CO_2R_4, $C(O)R_4$, $C(O)NR_4R_5$, $C(S)NR_4R_5$, $C(S)R_4$, $C(S)SR_4$, phenyl, phenyl substituted by $(R_{14})p$, benzyl, or benzyl substituted with 1 to 3 substituents independently selected from W;

J is H, C_1 to C_4 alkyl or phenyl optionally substituted with W;

K is H or CH_3;

q is 0, 1 or 2;

R_1, R_2, and R_{14} are independently selected from R_4, halogen, CN, N_3, SCN, NO_2, OR_4, SR_4, $S(O)R_4$, $S(O)_2R_4$, $OC(O)R_4$, $OS(O)_2R_4$, CO_2R_4, $C(O)R_4$, $C(O)NR_4R_5$, $S(O)_2NR_4R_5$, NR_4R_5, $NR_5C(O)R_4$, $OC(O)NHR_4$, $NR_5C(O)NHR_4$ and $NR_5S(O)_2R_4$; or when m, n or p is 2, R_1, R_2, or R_{14} can independently be taken together as OCH_2O, OCH_2CH_2O or CH_2CH_2O, to form a 5 or 6-membered ring, each of which can be independently substituted with 1 to 4 halogen atoms or 1 to 2 methyl groups;

R_4 is selected from H, C_1 to C_6 alkyl, C_3 to C_6 cycloalkyl, C_3 to C_8 alkoxycarbonylalkyl, C_3 to C_6 alkenyl, C_3 to C_6 alkynyl, C_1 to C_6 haloalkyl, C_3 to C_6 haloalkenyl, C_1 to C_6 alkyl substituted with CN, CO_2CH_3, $CO_2CH_2CH_3$, OCH_3, OCH_2CH_3, SCH_3, SCH_2CH_3 or NO_2, or R_4 is phenyl or benzyl, either optionally substituted with W; or R_4 and R_5 can be taken together as $(CH_2)_4$, $(CH_2)_5$ or $CH_2CH_2OCH_2CH_2$;

R_5 is selected from H, C_1 to C_4 alkyl, C_3 to C_4 alkenyl, C_3 to C_4 alkynyl or C_1 to C_4 haloalkyl;

m, n and p are independently 1 to 3;

W is halogen, CN, NO_2, C_1 to C_2 alkyl, C_1 to C_2 haloalkyl, C_1 to C_2 alkoxy, C_1 to C_2 haloalkoxy, C_1 to C_2 alkylthio, C_1 to C_2 haloalkylthio, C_1 to C_2 alkylsulfonyl or C_1 to C_2 haloalkylsulfonyl;

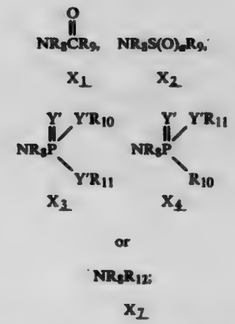
R_6 is H, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, C_2 to C_4 alkenyl,

C_2 to C_4 haloalkenyl, phenyl optionally substituted with W or benzyl optionally substituted with W;

R_7 is H, C_1 to C_4 alkyl, C_2 to C_4 alkenyl, C_2 to C_4 alkynyl, C_2 to C_4 alkylcarbonyl, C_2 to C_4 alkoxycarbonyl or C_1–C_4 alkylsulfonyl;

Z is SX;

X is



or

R_8 and R_{12} are independently C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_3 to C_6 cycloalkyl, C_4 to C_7 cycloalkylalkyl, phenyl optionally substituted by 1 to 2 substituents selected from W, benzyl optionally substituted by 1 to 2 substituents independently selected from W, phenethyl optionally substituted by 1 to 2 substituents independently selected from W, C_2 to C_6 cyanoalkyl, C_2 to C_6 alkoxyalkyl, C_3 to C_8 alkoxycarbonylalkyl, C_4 to C_8 dialkylaminocarbonylalkyl; or R_8 and R_{12} can be taken together as $(CH_2)_4$, $(CH_2)_5$ or $(CH_2)_2O(CH_2)_2$.

R_9 is F, C_1 to C_{22} alkyl, C_3 to C_6 cycloalkyl, C_3 to C_6 cycloalkoxy, C_2 to C_8 dialkylamino, C_1 to C_6 haloalkyl, phenyl or phenoxy either optionally substituted by 1 to 2 substituents independently selected from W; C_1 to C_{22} alkoxy, C_1 to C_4 alkoxy substituted by cyano, nitro, C_2 to C_4 alkoxy, C_4 to C_8 alkoxyalkoxy, C_1 to C_2 alkylthio, C_2 to C_3 alkoxycarbonyl, C_3 to C_5 dialkylaminocarbonyl, phenyl or 1 to 6 halogens; or R_9 is morpholino, piperidino or pyrrolidino, 1-naphthoxy, 2,2-dimethyl-2,3-dihydrobenzofuranoxy-7 or $ON═C(CH_3)SCH_3$;

R_{10} and R_{11} are independently C_1 to C_4 alkyl, C_2 to C_4 haloalkyl or phenyl optionally substituted by 1 to 2 substituents independently selected from W; or R_{10} and R_{11} can be taken together as $(CH_2)_2$, $(CH_2)_3$ or $CH_2C(CH_3)_2CH_2$;

Y' is S or O; and

a is 0 to 2.

5,196,409

BISPHOSPHONATES, PHARMACEUTICAL COMPOSITIONS, AND PROCESS FOR THE TREATMENT OF IRREGULARITIES IN CALCIUM METABOLISM

Eli Breuer, Jerusalem, and Gershon Golomb, Efrat, both of Israel, assignors to Yissum, Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

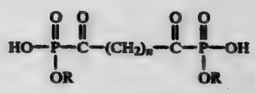
Division of Ser. No. 570,266, Aug. 20, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 764,035

Claims priority, application Israel, Aug. 20, 1989, 91362

Int. Cl.[5] A61K *31/66*; C07F *9/40, 9/38*

U.S. Cl. 514—108 **20 Claims**

1. Bisphosphonate compounds of the formula

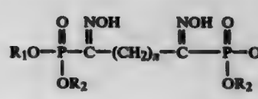


wherein

n=an integer from 3 to 24

R=hydrogen or a monovalent alkali metal cation.

16. Bisphosphonate compounds of the formula



wherein

n=an integer from 3 to 24

R_1=a lower alkyl group, and

R_2=hydrogen or a monovalent alkali metal cation.

5,196,410

TRANSDERMAL FLUX ENHANCING COMPOSITIONS

Michael L. Francoeur, East Lyme, and Russell O. Potts, Old Saybrook both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 511,828, Apr. 16, 1990, abandoned, which is a continuation of Ser. No. 161,926, Feb. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 925,641, Oct. 31, 1986, abandoned. This application Sep. 11, 1991, Ser. No. 759,705

Int. Cl.[5] A61K *31/54, 31/60*

U.S. Cl. 514—159 **35 Claims**

1. A transdermal flux enhancing pharmaceutical composition for transdermal administration to a human or lower animal subject comprising

(a) a safe and effective amount of a pharmacologically active compound or a prodrug thereof,

(b) an aqueous solvent system comprising from about 30 to 75% by volume of one or more water miscible solvents, and

(c) from about 0.01 to 5% (w/v) of a penetration enhancer selected from a 1-alkylazacycloheptan-2-one, said alkyl having from 8 to 16 carbon atoms, and a cis-olefin compound of the formula

$$CH_3(CH_2)_xCH═CH(CH_2)_yR^3$$

where R^3 is CH_2OH, CH_2NH_2 or COR^4, and R^4 is OH or $(C_1–C_4)$alkoxy, x and y are each an integer from 3 to 13 and the sum of x and y is from 10 to 16;

wherein in (b) the solvent or combined solvents content is from about 30 to 75% by volume and is within 10% of that which gives optimum transdermal flux for said compound or prodrug.

5,196,411

17β-ACYL-3-CARBOXY-ANDROSTA-3,5-DIENES AS TESTOSTERONE 5α-REDUCTASE INHIBITORS

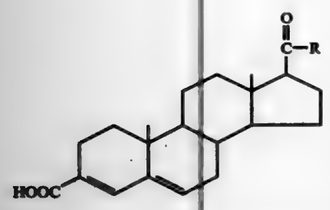
Gary H. Rasmusson, Watchung; Richard L. Tolman, Warren, and Geol F. Patel, Millington, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 16, 1991, Ser. No. 745,679

Int. Cl.[5] C07J *3/00*; A61K *31/56*

U.S. Cl. 514—169 **3 Claims**

1. A compound of the formula:



wherein

R is C_3–C_8 cycloalkyl, which can be substituted with C_1–C_4 alkoxy; C_6–C_{12} aryl, which can be substituted with one or more of: —OH, —OC_1–C_4 alkyl, C_1–C_4 alkyl, —$(CH_2)_m$OH, —$(CH_2)_n$ COOH, or triorganosilyl protected —OH, where m is 1–4, n is 1–3 and pharmaceutically acceptable salts or esters thereof.

2. A method of treating the hyperandrogenic condition of acne vulgaris, seborrhea, female hirsutism, and benign prostatic hypertrophy comprising administering to a patient in need of such treatment of a therapeutically effective amount of a compound of claim 1.

5,196,412

GALLIUM COMPOUNDS

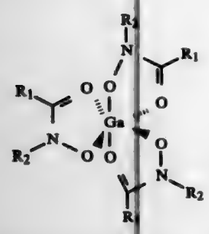
Fontaine C. Bradley, Lansdowne; Chris M. Giandomenico, West Chester; Michael J. Abrams, Glenmore; Danielle T. Frost, Philadelphia, and Jean F. Volianc, Exton, all of Pa., assignors to Johnson Matthey, Inc., Valley Forge, Pa.

Filed Mar. 6, 1991, Ser. No. 665,233

Int. Cl.[5] A61K *31/555*; C07D *223/10, 711/94*

U.S. Cl. 514—184 11 Claims

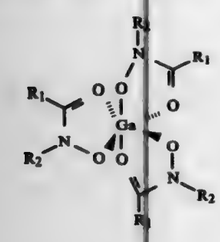
1. A method of administering gallium to a patient, comprising administering an effective dose of gallium(III) complex of formula I



(I)

wherein R_1 and R_2 together form tetra- or penta-methylene.

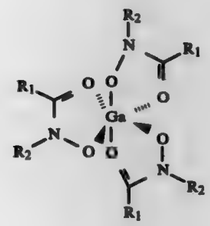
3. A gallium(III) complex of formula I,



(I)

wherein R_1 and R_2 together form tetra- or penta-methylene.

4. A method of treating excessive loss of calcium from bone tissue and inhibiting bone resorption comprising administering to a patient with an excessive calcium loss and bone resorption disorder, a gallium(III) complex of formula (I)



(I)

wherein R_1 and R_2 together form tetra- or penta-methylene; wherein said complex is useful in reducing calcium loss from bone tissue and inhibiting bone resorption, in an amount sufficient to cause a reduction in calcium loss from said bone and to cause inhibited bone resorption.

5,196,413

PLATINUM COMPLEXES AND THE LIKE

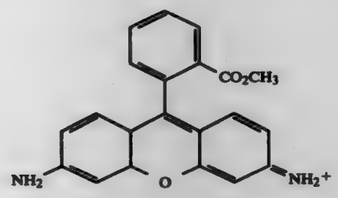
Beverly A. Teicher, Boston, Mass.; Robert C. Richmond, Hanover, N.H., and Lan B. Chen, Boston, Mass., assignors to Johnson Matthey, Inc., Valley Forge, Pa.

Continuation of Ser. No. 186,158, Apr. 26, 1988, abandoned, which is a continuation of Ser. No. 680,044, Dec. 10, 1984, abandoned. This application Feb. 27, 1991, Ser. No. 660,904

Int. Cl.[5] A61K *31/555*

U.S. Cl. 514—185 1 Claim

1. In a method of treating tumor cells wherein said cells are susceptible to treatment with Pt complexes by administration of the Pt complex thereto, the modification which comprises administering, as said Pt complex, an effective amount of the $Pt(Rh\text{-}123)_2$ complex obtained by reacting an alkali metal tetrachloroplatinate and rhodamine 123 of the formula:



5,196,414

Patent Not Issued For This Number

5,196,415

5-AMINOCARBONYL-5H-DIBENZO[A,D]CYCLOHEPTEN-5,10-IMINES FOR TREATMENT OF EPILEPSY AND COCAINE ADDICTION

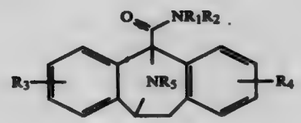
James A. Moss, Gaithersburg; Andrew Thurkauf, Crofton; Shunichi Yamaguchi, Bethesda; Michael A. Rogawski, Columbia; Kenner C. Rice, Bethesda; Mariena V. Mattson, Rockville, and Arthur E. Jacobson, Potomac, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 349,187, May 9, 1989, abandoned. This application Jan. 29, 1992, Ser. No. 827,383

Int. Cl.[5] C07D *221/22, 223/10*; A61K *31/44, 31/55*

U.S. Cl. 514—210 11 Claims

1. A compound of the formula



wherein each of R_1 and R_2 is independently selected from hydrogen, linear or branched alkyl groups of from one to twenty carbon atoms, alkenyl groups from two to twenty carbon atoms, alkynyl groups from two to twenty carbon atoms, cycloalkyl groups of three to eight carbon atoms, cycloalkenyl groups from three to eight carbon atoms, and wherein R_1 and R_2 may be taken together to form a N-containing cyclic structure having two to eight carbon atoms, any of the said groups being optionally substituted with one or more substituents selected from alkyl, haloalkyl, hydroxyalkyl, alkenyl, oxo, hydroxyl, alkoxy, thio, alkoxyalkyl, amino, halo, cyano or mercapto, and wherein R_3 and R_4 is independently selected from hydrogen, halo, linear or branched alkyl groups of from one to ten carbon atoms, alkenyl groups from two to ten carbon atoms, alkynyl groups from two to ten carbon atoms, hydroxyl, amino, alkylamino, alkoxy, cyano, nitro, haloalkyl and mercapto, and wherein R_5 is selected from hydrogen, linear or branched alkyl groups of from one to ten carbon atoms, alkenyl groups from two to ten carbon atoms, alkynyl groups from two to ten carbon atoms, hydroxyl, phenyl, haloalkyl, aminoalkyl, 1-phenylmethyl, 2-phenylethyl and alkoxy; or a pharmaceutically acceptable salt thereof.

5,196,416

TRANSDERMAL FLUX-ENHANCING PHARMACEUTICAL COMPOSITIONS COMPRISING AZONE, ETHANOL AND WATER

Kirti H. Valia, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 449,200, Dec. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 90,726, Aug. 28, 1987, abandoned. This application Mar. 26, 1991, Ser. No. 679,164

Int. Cl.[5] A61K *31/55, 31/50, 31/505, 31/44*

U.S. Cl. 514—212 8 Claims

1. A permeation enhancement composition for providing increased percutaneous absorption of an effective amount of an agent selected from (+)-1,4-dihydro-2,6-dimethyl-4-(3-nitrophenyl-3,5-pyridinedicarboxylic acid, methyl 1-(phenyimethyl)-3-pyrrolidinyl ester; 1,3-dihydro-3,3-dimethyl-5-(1,4,5,6-tetrahydro-6-oxo-3-pyridazinyl)2H-indol-2-one; (±)-N-cyano-N'-4-pyridinyl-N"-(1,2,2-trimethylpropyl) guanidine, monohydrate; and trans(−)5,5A,6,7,8,9,9A,10-octahydro-6-propylpyrimidino (4,5-G)-quinoline-2-amine; and further comprising from 30 to 70 parts by weight ethanol, from 0.1 to 10 parts by weight azone and from 30 to 69.9 parts by weight water; providing that emulsifiers and gelling agents are absent.

5,196,417

PIROXICAM-CONTAINING PHARMACEUTICAL COMPOSITION FOR TOPICAL USE

Reinhold Dölling, Feldkirchen-Westerham, and Uwe N. Johann, München, both of Fed. Rep. of Germany, assignors to Sagitta Arzneimittel GmbH, Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 604,677

Claims priority, application European Pat. Off., Apr. 4, 1990, 90107992.1

Int. Cl.[5] A61K *31/54*

U.S. Cl. 514—226.5 30 Claims

1. Pharmaceutical composition for topical application comprising a water in oil emulsion, characterized in that said emulsion contains a therapeutically effective amount of piroxicam in the oil phase as the active ingredient.

5,196,418

HEMICHOLINIUM LIPIDS AND USE THEREOF

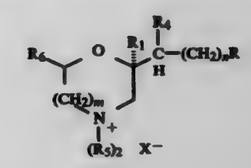
Richard D. Gandour, and Gnanasambandam Kumaravel, both of Baton Rouge, La., assignors to Board of Supervisors, Louisiana State University Agricultural & Mechanical College, Baton Rouge, La.

Filed Feb. 14, 1992, Ser. No. 837,360

Int. Cl.[5] A61K *31/535*; C07D *265/30, 265/32*

U.S. Cl. 514—230.8 12 Claims

1. An optically active or racemic mixture of a compound of the formula:



I

where R is a linear or branched chain of 10 to 22 carbon atoms selected from the group consisting of alkyl, alkenyl or alkynyl or said C_{10} to C_{22} chains substituted with —SR_3, —OR_3, —NHR_3, —CH_3, or —$C(O)OR_2$ where R_2 is hydrogen or C_1 to C_6 alkyl;

R_1 is —SR_3 or —OR_3;

R_3 is hydrogen, C_1 to C_6 alkyl, alkylthioalkyl, alkoxyalkyl, aminoalkyl, aminoalkyl substituted with phenyl, substituted phenyl, benzoyl, substituted benzoyl, heteroaryl or substituted heteroaryl;

R_4 is hydrogen, C_1 to C_6 alkyl, or —C(O)OR_2 where R_2 is defined previously;
R_5 is hydrogen, C_1 to C_6 alkyl, phenyl, or substituted phenyl;
R_6 is hydrogen, C_1 to C_6 alkyl, phenyl, substituted phenyl, heteroaryl or substituted heteroaryl;
m is 1;
and n is an integer from 1 to 23.

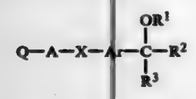
5,196,419

HETEROCYCLIC CYCLIC ETHERS

Graham C. Crawley, Macclesfield, United Kingdom, and Annie Hamon, Reims, France, assignors to Imperial Chemical Industries PLC, London, England and ICI Pharma, Cergy Cedex, France

Continuation of Ser. No. 486,853, Feb. 27, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 785,879
Claims priority, application European Pat. Off., Feb. 28, 1989, 894005586
Int. Cl.[5] C07D *215/227, 215/12, 251/42, 239/32*
U.S. Cl. 514—241 9 Claims

1. A heterocyclic cyclic ether of the formula I



I

wherein
Q is quinolyl which may optionally bear one, two or three substituents selected from halogeno, hydroxy, oxo, carboxy, cyano, amino, (1–4C)alkyl, (1–4C)alkoxy, fluoro-(1–4C)alkyl, (1–4C)alkylamino, di-[(1–4C)alkyl]amino, hydroxy-(1–4C)alkyl, amino-(1–4C)alkyl, (1–4C)alkylamino-(1–4C)alkyl, di-[(1–4C)alkyl]amino-(1–4C)alkyl, amino-(2–4C)alkoxy, (1–4C)alkylamino-(2–4C)alkoxy, di-[(1–4C)alkyl]amino-(2–4C)alkoxy, and phenyl-(1–4C)alkyl; wherein A is (1–6C)alkylene, (3–6C)alkenylene, (3–6C)alkynylene or cyclo(3–6C)alkylene;
wherein X is oxy, thio, sulphinyl, sulphonyl or imino; wherein Ar is phenylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, nitro, cyano, ureido, carbamoyl, (1–4C)alkyl, (3–4C)alkenyloxy, (1–4C)alkoxy, (1–4C)alkylthio, (1–4C)alkylsulphinyl, (1–4C)alkylsulphonyl, (1–4C)alkylamino, di[(1–4C)alkyl]amino, fluoro-(1–4C)alkyl, (1–4C)alkoxycarbonyl, N-[(1–4C)alkyl]carbamoyl, N,N-di-[(1–4C)alkyl]carbamoyl, (2–4C)alkanoylamino, cyano-(1–4C)alkoxy, carbamoyl-1(1–4C)alkoxy, amino-(2–4C)alkoxy, (1–4C)alkylamino-(2–4C)alkoxy, di-[(1–4C)alkyl]amino-(2–4C)alkoxy and (1–4C)alkoxycarbonyl-(1–4C)alkoxy; or
Ar is a 6-membered heterocyclene moiety selected from pyridylene, pyrimidinylene, pyridazinylene, pyrazinylene and 1,3,5-triazinylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, cyano, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylamino and di-[(1–4C)alkyl]amino;
wherein R^1 and R^2 together form a group of the formula —A^2—X^2—A^3— which, together with the oxygen atom to which A^2 is attached and with the carbon atom to which A^3 is attached, defines a ring having 5 to 7 ring atoms, wherein A^2 and A^3, which may be the same or different, each is (1–3C)alkylene and X^2 is oxy, and which ring may bear one, two or three substituents, which may be the same or different, selected from hydroxy, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylthio, (1–4C)alkylsulphinyl and (1–4C)alkylsulphonyl or which ring may bear a (1–4C)alkylenedioxy substituent, and wherein R^3 is hydrogen, (1–6C)alkyl, (2–6C)alkenyl, (2–6C)alkynyl, fluoro-(1–4C)alkyl, cyano-(1–4C)alkyl, hydroxy-(1–4C)alkyl, (1–4C)alkoxy-(1–4C)alkyl or (2–4C)alkanoyloxy(1–4C)alkyl; or a pharmaceutically-acceptable salt thereof.

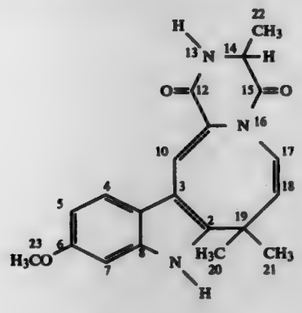
5,196,420

CYCLOECHINULIN ANTIINSECTAN METABOLITE

Florecita S. deGuzman, Coralville, Iowa; Patrick F. Dowd, Peoria, Ill.; James B. Gloer, Iowa City, Iowa, and Donald T. Wicklow, Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.; University of Iowa Research Foundation, Iowa City, Iowa and Biotechnology Research & Development Corporation, Peoria, Ill.

Filed Jul. 19, 1991, Ser. No. 732,776
Int. Cl.[5] C07D *471/14*; A61K *31/475*
U.S. Cl. 514—250 11 Claims

1. A substantially pure diketopiperazine compound designated cycloechinulin having the structure:



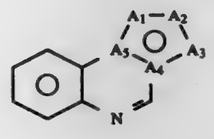
5,196,421

EXCITATORY AMINO ACID RECEPTOR ANTAGONISTS IN METHODS FOR THE USE THEREOF

Loretta A. McQuaid; Charles H. Mitch; Paul L. Ornstein; Darryle D. Schoepp, and Edward C. R. Smith, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

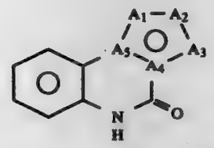
Division of Ser. No. 710,649, Jun. 5, 1991, Pat. No. 5,153,196. This application Jun. 25, 1992, Ser. No. 904,358
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—250 18 Claims

1. A method for blocking one or more excitatory amino acid receptors in a mammal requiring decreased excitatory amino acid neurotransmission which comprises administering to the mammal a pharmaceutically effective amount of a compound of the general structure



(I)

or



(II)

a tautomer thereof, or a pharmaceutically acceptable salt thereof, in which
each of A_1, A_2 and A_3 is independently either C or N except that at least one of A_1, A_2 and A_3 is N; and A_5 is C and A_4 is N.

5,196,422

5-LIPOXYGENASE INHIBITING THIAZOLES

Thomas G. Colerick Bird, Witry-les-Reims, France; Graham C. Crawley, Cheshire, United Kingdom; Martin P. Edwards, Cheshire, United Kingdom; Philip N. Edwards, Cheshire, United Kingdom; Jean-Marc M. M. Girodeau, Rilly la Montagne, France, and John F. Kingston, Macclesfield, United Kingdom, assignors to ICI Pharma, Cergy Cedex, France and Imperial Chemical Industries plc, London, England

Division of Ser. No. 378,163, Jul. 11, 1989, Pat. No. 5,089,513. This application Nov. 14, 1991, Ser. No. 791,375
Claims priority, application France, Jul. 12, 1988, 88 401816
Int. Cl.[5] A61K *31/50, 31/505, 31/495, 31/38*
U.S. Cl. 514—252 5 Claims

1. A method of treating a disease or medical condition mediated alone or in part by one or more leukotrienes which comprises administering to a warm-blooded animal requiring such treatment an effective amount of a thiazole of the formula I

wherein Ar^1 is phenyl or naphthyl which may optionally bear one or more substituents selected from halogeno, amino, hydroxy, cyano, formyl, carbamoyl, (1–6C)alkyl, (2–6C)alkenyl, (2–6C)alkynyl, (1–6C)alkoxy, (1–6C)alkylthio, (1–6C)alkylsulphinyl, (1–6C)alkylsulphonyl, (1–6C)alkylamino, di-[(1–4C)alkyl]amino, (1–4C)alkoxycarbonyl, N-[(1–6C)alkyl]carbamoyl, N,N-di[(1–4C)alkyl]carbamoyl, (2–6C)alkanoyl, (2–6C)alkanoylamino, (1–4C)alkylureido, hydroxy-(1–4C)alkyl and fluoro-(1–4C)alkyl;
wherein A is a direct link to X, or is (1–6C)alkylene, (3–6C)alkenylene, (3–6C)alkynylene or cyclo(3–6C)alkylene;
wherein X is oxy, thio, sulphinyl, sulphonyl or imino;
wherein Ar^2 is phenylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, nitro, cyano, carbamoyl, (1–6C)alkyl, (1–6C)alkoxy, (3–4C)alkenyloxy, (1–6C)alkylthio, (1–6C)alkylsulphinyl, (1–6C)alkylsulphonyl, (1–6C)alkylamino, di-[(1–4C)alkyl]amino, (1–4C)alkoxycarbonyl, N-[(1–6C)alkyl]carbamoyl, N,N-di-[(1–4C)alkyl]carbamoyl, (2–6C)alkanoylamino, fluoro-(1–4C)alkoxy, hydroxy-(2–4C)alkoxy, (1–4C)alkoxy-(2–4C)alkoxy, amino-(2–4C)alkoxy, cyano-(1–4C)alkoxy, carbamoyl-(1–4C)alkoxy, (1–6C)alkylamino-(2–4C)alkoxy, di-[(1–4C)alkyl]amino-(2–4C)alkoxy, (1–4C)alkoxycarbonyl-(1–4C)alkoxy, N-[(1–6C)alkyl]carbamoyl-(1–4C)alkoxy, N,N-[di-(1–4C)alkyl]carbamoyl-(1–4C)alkoxy, fluoro-(1–4C)alkyl, hydroxy-(1–4C)alkyl, amino-(1–4C)alkyl, cyano-(1–4C)alkyl, (1–4C)alkyl, (1–4C)alkylamino-(1–4C)alkyl, di-[(1–4C)alkyl]amino-(1–4C)alkyl, (2–6C)alkanoylamino-(1–4C)alkyl, (1–4C)alkoxycarbonyl-(1–4C)-alkylamino, carbamoyl-(1–4C)alkylamino, cyano-(1–4C)alkylamino, hydroxy-(2–4C)alkylamino and (1–4C)alkylsulphonamido, or Ar^2 is 2,4-, 2,5-, 3,5- or 2,6-pyridylene, 2,4-, 2,5- or 4,6-pyrimidinylene, 3,5- or 3,6-pyridazinylene or 2,5- or 2,6-pyrazinylene which may optionally bear one or two substituents selected from halogeno, hydroxy, amino, cyano, (1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkylamino and di-[(1–4C)alkyl]amino;
wherein R^1 is (1–6C)alkyl, (2–6C)alkenyl, (2–6C)alkynyl, fluoro-(1–4C)alkyl, cyano-(1–4C)alkyl, hydroxy-(1–4C)alkyl, (1–4C)alkoxy-(1–4C)alkyl and (2–4C)alkanoyloxy-(1–4C)alkyl;
wherein R^2 is hydrogen, (1–6C)alkyl, (3–6C)alkenyl, (3–6C)alkynyl, fluoro-(1–4C)alkyl, (1–4C)alkylthio-(1–4C)alkyl, cyano-(1–4C)alkyl, (1–4C)alkoxycarbonyl-(1–4C)alkyl, carboxy-(1–4C)alkyl, carbamoyl-(1–4C)alkyl or (2–6C)alkanoyl or R^2 is benzoyl which may optionally bear a substituent selected from halogeno, (1–6C)alkyl or (1–6C)alkoxy; and
wherein Q is thiazolyl which may optionally bear one or two substituents selected from halogeno, amino, nitro, cyano, (1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkylamino, di-[(1–4C)alkyl]amino, (1–4C)alkoxycarbonyl, (2–6C)alkanoyl, (2–6C)alkanoylamino, (1–4C)alkoxycarbonylamino, fluoro-(1–4C)alkyl and hydroxy-(1–4C)alkyl;
or a pharmaceutically-acceptable salt thereof.

5,196,423

UNSATURATED CYCLOHEXYLACETIC ACID DERIVATIVES, AND CROP-PROTECTION AGENTS CONTAINING SAME

Bernd Mueller, Frankenthal; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 641,900, Jan. 16, 1991, abandoned. This application Jun. 15, 1992, Ser. No. 899,158
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001618
Int. Cl.[5] C07C *321/22*; C07D *241/02, 215/16, 333/32*
U.S. Cl. 514—255 5 Claims

1. An unsaturated cyclohexylacetic acid compound of the formula I:

I

wherein
U is $NOCH_3$, $CHOCH_3$, CH_2, CH—CH_3, CH—CH_2—CH_3, N—NH—CH_3 or CH—S—CH_3,
n is from 0 to 10,
A is hydrogen; phenyl; phenyl substituted by from 1 to 3 identical or different substituents selected from the group consisting of halogen, C_1–C_8-alkyl, C_1–C_8-alkylthio, C_1–C_8-alkylsulfinyl, cyano, hydroxyl, nitro, C_1–C_8-alkoximino, C_1–C_8-alkoxy, phenyl, C_1–C_4-haloalkyl, C_1–C_8-alkenyloximino, formyl and C_1–C_8-alkylcarbonyl; heteroaryl; alkyl; substituted heteroaryl or substituted alkyl, wherein the substitutents on the heteroaryl and alkyl groups are from 1 to 3 identical or different substituents selected from the group consisting of halogen, C_1–C_8-alkyl, C_1–C_8-alkylthio, C_1–C_8-alkyl-sulfinyl, cyano, hydroxyl, nitro, C_1–C_8-alkoximino, C_1–C_8-alkoxy, phenyl, C_1–C_4-haloalkyl, C_1–C_8-alkyenyloximino, formyl, C_1–C_8-alkylcarbonyl, C_1–C_8-alkoxycarbonyl, and phenyl which is substituted by from 1 to 3 identical or different substituents selected from the group consisting of halogen, C_1–C_8-alkyl, C_1–C_8-alkylthio, C_1–C_8-alkylsulfinyl, cyano, hydroxyl, nitro, C_1–C_8-alkoximino, C_1–C_8-alkoxy, phenyl, C_1–C_4-haloalkyl, C_1–C_8-alkenyloximino, formyl and C_1–C_8-alkylcarbonyl,
X is a single bond when n is 0, and oxygen, sulfur or a single bond when n is not 0,
and a plant-compatible acid base salt thereof.

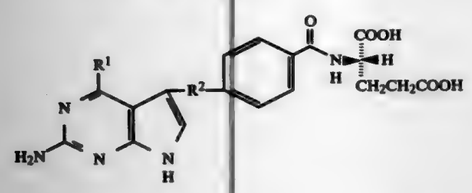
5,196,424

N-[2-AMINO-4-SUBSTITUTED[(PYRROLLO OR PYRIDO)[2,3-D]PYRIMIDINYL]-ALKYL]BENZOYL]-L-GLUTAMIC ACIDS

Lynn S. Gossett, Indianapolis, and Chuan Shih, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 24, 1992, Ser. No. 856,611
Int. Cl.[5] A61K *31/505*; C07D *471/04, 475/04, 475/08*
U.S. Cl. 514—258 20 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen, chloro, C_1–C_4 alkylthio, C_1–C_4 alkoxy, C_1–C_4 alkylamino, or di(C_1–C_4) alkylamino; and

R^2 is C_2–C_3 alkyl; or a pharmaceutically acceptable salt thereof.

11. A method of treating susceptible neoplasms in a mammal in need of such treatment comprising administering a neoplasm growth inhibiting dose of a compound according to claim 1.

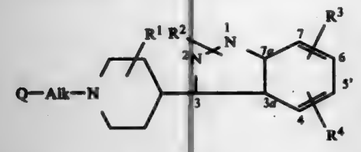
5,196,425

ANTIHYPERTENSIVE 3-PIPERIDINYL-INDAZOLE DERIVATIVES

Jan Vandenberk, Beerse; Lodo E. J. Kennis, Turnhout, and Albertus H. M. T. Van Heertum, Beerse, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 239,915, Sep. 2, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 380,958
Int. Cl.[5] C07D *239/72*; A61K *31/505*
U.S. Cl. 514—258 6 Claims

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein

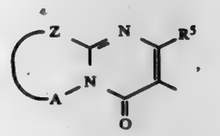
R^1 is hydrogen or $C_{1\text{-}6}$alkyl;

R^2 is hydrogen; $C_{1\text{-}6}$alkyl; hydroxy$C_{1\text{-}6}$alkyl; phenyl optionally substituted with up to three substituents independently selected from $C_{1\text{-}6}$alkyl, $C_{1\text{-}6}$alkyloxy, hydroxy, halo, amino, nitro and trifluoromethyl; aryl$C_{1\text{-}6}$alkyl; $C_{1\text{-}6}$alkylcarbonyl; $C_{1\text{-}6}$alkyloxycarbonyl or phenylcarbonyl, wherein phenyl is optionally substituted with up to three substituents independently selected from $C_{1\text{-}6}$alkyl, $C_{1\text{-}6}$alkyloxy, hydroxy, halo, amino, nitro and trifluoromethyl;

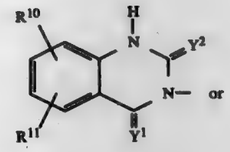
R^3 and R^4 each independently are hydrogen, halo, hydroxy, $C_{1\text{-}6}$alkyloxy or $C_{1\text{-}6}$alkyl;

Alk is $C_{1\text{-}4}$alkanediyl; and

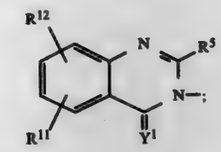
Q is a bicyclic heterocyclic radical of formula



(a)



(b)



(c)

wherein

R^5 is hydrogen or $C_{1\text{-}6}$alkyl;

Z is —S— or —CR^6=CR^7—; said R^6 and R^7 each independently being hydrogen or $C_{1\text{-}6}$alkyl; or Z is —CH_2— wherein one hydrogen atom may be replaced by hydroxy or $C_{1\text{-}6}$alkyl;

A is a bivalent radical —CH_2—CH_2— or —CH_2—CH_2—CH_2 — wherein in the latter two radicals one or two hydrogen atoms may be replaced by $C_{1\text{-}6}$alkyl; or A is a bivalent radical —CR^8=CR^9, wherein R^8 and R^9 each independently are hydrogen, halo, amino or $C_{1\text{-}6}$alkyl; or when Z is —S—, then A may also be —CR^{10}=N—, R^{10} being hydrogen or $C_{1\text{-}6}$alkyl; or when Z is —CR^6=CR^7—, then A also may be —O—; and

Y^1 and Y^2 each independently are O and S;

R^{11} is hydrogen, halo, $C_{1\text{-}6}$alkyl, $C_{1\text{-}6}$alkyloxy, trifluoromethyl, nitro, amino, mono- or di($C_{1\text{-}6}$alkyl)amino, $C_{1\text{-}10}$alkylcarbonylamino, cyano, hydroxy, $C_{1\text{-}10}$alkylcarbonyloxy, phenylmethoxy or azido;

R^{12} is hydrogen or halo; and aryl is phenyl optionally substituted with up to three substituents independently selected from $C_{1\text{-}6}$alkyl, $C_{1\text{-}6}$alkyloxy, hydroxy, halo, amino, nitro and trifluoromethyl; pyridinyl, furanyl or $C_{1\text{-}6}$alkyl substituted furanyl.

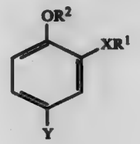
5,196,426

CALCIUM INDEPENDENT C AMP PHOSPHODIESTERASE INHIBITOR ANTIDEPRESSANT

Nicholas A. Saccomano, Ledyard, and Fredric J. Vinick, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 696,690, Aug. 30, 1991, Pat. No. 5,128,358, which is a division of Ser. No. 155,932, Jan. 19, 1988, abandoned. This application Mar. 19, 1992, Ser. No. 854,136
Int. Cl.[5] A61K *31/505*; C07D *471/04*
U.S. Cl. 514—258 14 Claims

1. A compound having the formula



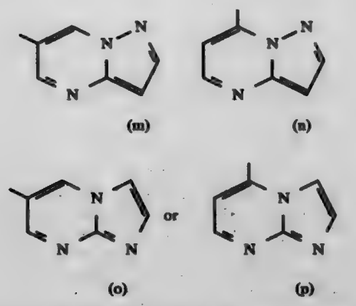
wherein

R^1 is a tricycloalkyl or bicycloalkyl group having from 7 to 11 carbon atoms, or indan-2-yl;

R^2 is methyl or ethyl;

X is O or NH; and

Y is



(m) (n) (o) (p)

a pharmaceutically acceptable acid addition salt of said compound having a basic nitrogen atom; or the racemic-diastereomeric mixtures and optical isomers of said compounds.

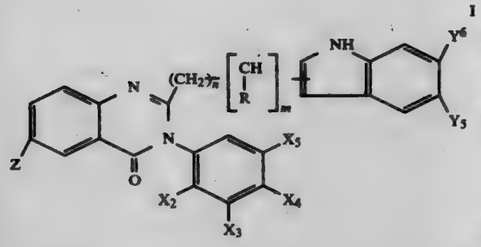
5,196,427

3-ARYL-4(3H) QUINAZOLINONE CCK ANTAGONISTS AND PHARMACEUTICAL FORMULATIONS THEREOF

Melvin J. Yu; Jefferson R. McCowan, both of Indianapolis, and K. Jeff Thrasher, Beech Grove, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 581,943, Sep. 13, 1990, Pat. No. 5,075,313. This application Sep. 20, 1991, Ser. No. 763,104
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] A61K *31/505*; C07D *403/06*
U.S. Cl. 514—259 21 Claims

1. A compound of the formula



(I)

in which n is 1 or 2 and m is 0 or 1;

R is hydrogen, C_1–C_4 alkyl, benzyl, or phenyl;

Z is hydrogen or halo;

X_2, X_3, X_4, and X_5 are independently selected from the group consisting of hydrogen, halo, trifluoromethyl, C_1–C_6 alkoxy, C_1–C_6 alkyl, C_1–C_6 alkylthio, and —NR_2R_3, in which R_2 and R_3 are independently hydrogen, C_1–C_4 alkyl, benzyl, or phenyl, or R_2 and R_3 taken together with the nitrogen atom to which they are bonded form a 5- or 6-membered ring; or

X_r and X_{r+1}, in which r is 2, 3, or 4, taken together form a divalent C_3–C_5 alkylene group or methylenedioxy; provided at least one of X_2, X_3, X_4, and X_5 is NR_2R_3in which R_2 and R_3 taken together with the nitrogen atom to which they are bonded form a 6-membered ring; and

Y_5 and Y_6 are independently selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, halo, and trifluoromethyl; and pharmaceutically acceptable salts thereof.

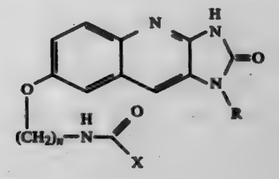
5,196,428

IMIDAZO[4,5-B]QINOLINYL OXY ALKYL UREAS

Nicholas A. Meanwell, East Hampton, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Apr. 3, 1992, Ser. No. 862,899
Int. Cl.[5] A61K *31/495, 31/505, 31/535*; C07D *401/00*
U.S. Cl. 514—253 22 Claims

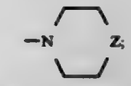
1. A compound of the formula



wherein

R is H, or C_1–C_4 lower alkyl;

X is OR^1, NR^2R^3, or



Z is O, NH, $N(CH_2)_mR^5$ or CHR^6;

R^1 is C_1–C_4 lower alkyl;

R^2 is H, or C_1–C_4 lower alkyl;

R^3 is H, C_1–C_4 lower alkyl, or C_4–C_8 cycloalkyl;

R^5 is C_1–C_8 alkyl, C_4–C_8 cycloalkyl, 2-pyranyl, 2-thienyl, 3-thienyl, piperidinyl-N-CH, N-2-pyridyl, N-2-pyrimidinyl, or substitued or unsubstituted phenyl wherein the substituent is halogen;

R^6 is H, 1-piperidinyl, or phenylmethyl;

m is an integer of 1–3; and

n is an integer of 1–5;

or pharmaceutically acceptable salt thereof.

21. A method for inhibiting blood platelet aggregation in a mammal which comprises administering a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

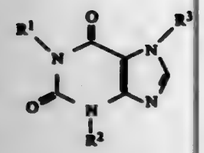
5,196,429

METHOD OF INHIBITING THE ACTIVITY OF LEUKOCYTE DERIVED CYTOKINES

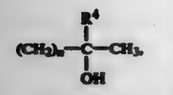
Gerald L. Mandell, North Garden; Gail W. Sullivan, Charlottesville, both of Va., and William J. Novick, Lebanon, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J. and University of VA Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 622,138, Dec. 5, 1990, Pat. No. 5,096,906, which is a continuation of Ser. No. 508,535, Apr. 11, 1990, abandoned, which is a continuation of Ser. No. 239,761, Sep. 2, 1988, abandoned, which is a continuation of Ser. No. 947,905, Dec. 31, 1986, abandoned, and a continuation of Ser. No. 131,785, Dec. 31, 1986, Pat. No. 4,965,271, which is a continuation-in-part of Ser. No. 947,905, Dec. 11, 1987. This application Jul. 30, 1991, Ser. No. 738,096
Int. Cl.[5] A61K *31/52*
U.S. Cl. 514—263 13 Claims

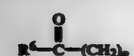
1. A method of treating an adverse condition in a mammal caused by human immunodeficiency virus (HIV), which comprises administering to the mammal an amount of a compound of the formula:



wherein at least one of R^1 and R^3 is either
a) a branched hydroxyalkyl group of the formula



in which R^4 stands for an alkyl group with 1 to 3 carbon atoms and n stands for a whole number from 2 to 5, the other R^1 or R^3 group that may optionally be present stands for a hydrogen atom or an aliphatic hydrocarbon group R^5 with up to 6 carbon atoms, whose carbon chain may be interrupted by up to 2 oxygen atoms or may be substituted with a hydroxy or oxo group, or
b) an oxoallyl group of the formula



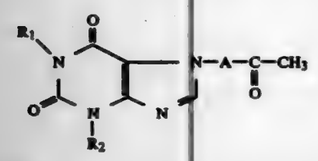
wherein R^6 is C_1–C_6 and p is 2, 3 or 4, the remaining R^1 or R^3 being as defined above, and R^2 is a C_1–C_4 alkyl group; wherein said amount is sufficient to affect the activity of Human Immunodeficiency Virus (HIV).

5,196,430
METHOD OF INHIBITING THE ACTIVITY OF LEUKOCYTE DERIVED CYTOKINES

Gerald L. Mandell, Earlysville; Gail W. Sullivan, Charlottesville, both of Va., and William J. Novick, Lebanon, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J. and University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Division of Ser. No. 622,138, Dec. 5, 1990, Pat. No. 5,096,906, which is a continuation of Ser. No. 508,535, Apr. 11, 1990, abandoned, which is a continuation of Ser. No. 239,761, Sep. 2, 1988, abandoned, which is a continuation of Ser. No. 947,985, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 131,785, Dec. 11, 1987, Pat. No. 4,965,271, which is a continuation-in-part of Ser. No. 947,985, Dec. 31, 1986, abandoned. This application Sep. 18, 1991, Ser. No. 762,200
The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.
Int. Cl.[5] A61K *9/22, 31/52, 31/62*
U.S. Cl. 514—263 49 Claims

1. A method for alleviating septic shock in a patient, wherein the method comprises administering to the patient an amount of at least one 7-(oxoalkyl) 1,3-dialkyl xanthine of the formula:



(I)

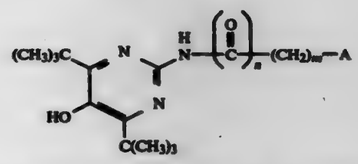
in which
R_1 and R_2 are the same or different and are independently selected from the group consisting of straight-chain or branched alkyl radicals with 2 to 6 carbon atoms, cyclohexyl, straight-chain or branched chain alkoxyalkyl and hydroxyalkyl radicals;
A represents a hydrocarbon radical with up to 4 carbon atoms, which can be substituted by a methyl group; and
wherein the amount is effective in alleviating septic shock in said patient.

5,196,431
2-SUBSTITUTED AMINO-4, 6-DI-TERTIARY-BUTHYL-5-HYDROXY-1, 3-PYRIMIDINES AS ANTIINFLAMMATORY AGENTS

Thomas R. Belliotti, Ypsilanti; David T. Connor, Ann Arbor, and Catherine R. Kostlan, Saline, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 24, 1992, Ser. No. 840,360
Int. Cl.[5] C07D *403/00, 239/02*
U.S. Cl. 514—272 11 Claims

1. A compound of the formula I



I

or a pharmaceutically acceptable salt, or hydrate thereof; wherein n is an integer of zero or one; m is an integer of zero to five, and A is a 5- or 6-membered heteroaromatic ring selected from pyridinyl, pyrimidinyl, pyrrolyl, pyrazinyl, triazinyl, oxazolyl, isoxazolyl, pyrazolyl, pyridazinyl, imidazolyl, thiazolyl, isothiazolyl, thiadiazolyl, oxadiazolyl, and triazolyl, which ring is optionally substituted by lower alkyl or COOR, in which R is hydrogen or lower alkyl.

10. A pharmaceutical composition for the treatment of conditions affected by the inhibition of 5-lipoxygenase alone or with the inhibition of cyclooxygenase which comprises an effective amount for the treatment of said conditions of a compound of claim 1 together with a pharmaceutically acceptable carrier.

5,196,432
MECHANISM MEDIATING RUMINAL STASIS IN RUMINAL LACTIC ACIDOSIS

Eugene C. Crichlow, 25 Mozon Crescent, Saskatoon, Saskatchewan, Canada S7H 3B8

Filed Feb. 14, 1990, Ser. No. 480,010
Claims priority, application Canada, Feb. 21, 1989, 592375
Int. Cl.[5] A61K *31/505, 31/44, 31/415*
U.S. Cl. 514—274 10 Claims

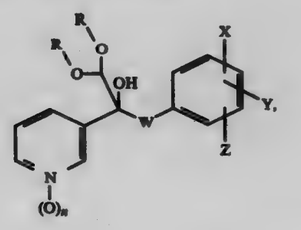
1. A method for the treatment or prevention of ruminal lactic acidosis, said method comprising administering to a ruminant animal an alpha-2 adrenoceptor antagonist for the purpose of preventing or treating ruminal lactic acidosis in said animal.

5,196,433
3-SUBSTITUTED PYRIDINEMETHANOLS AND FUNGICIDES CONTAINING THEM

Thomas Zierke, Boehl-Iggelheim; Eberhard Ammermann, Heppenheim, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 4, 1992, Ser. No. 893,844
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1991, 4121049
Int. Cl.[5] A01N *43/40*; C07D *213/30*
U.S. Cl. 514—277 7 Claims

1. A compound of the formula 1



1

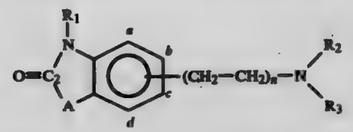
where
R is C_1–C_6-alkyl or C_3–C_6-cycloalkyl,
X,Y,Z are identical or different and each is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoximino, haloalkyl, cyano, nitro or unsubstituted or halo-substituted phenyl or phenoxy,
W is a single bond or one of the groups —CH_2—, —CH(CH_3)— or —CH_2CH_2— and
n is 0 or 1, and
plant-tolerated acid addition salts thereof.

5,196,434
HETEROCYCLE-SUBSTITUTED ALKYLAMINES COMPOUNDS

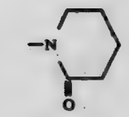
Thierry Taverne, Saint Martin les Boulogne; Isabelle Lesieur, Gondecourt; Patrick Depreux, Armentieres; Daniel H. Caignard, Paris; Béatrice Guardiola, Neuilly sur Seine; Gérard Adam, Le Mesnil le Roi, and Pierre Renard, Verrailles, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Sep. 26, 1991, Ser. No. 765,959
Claims priority, application France, Sep. 26, 1990, 90 11866
Int. Cl.[5] C07D *221/20*; A61K *31/44*
U.S. Cl. 514—278 11 Claims

1. A compound selected from these of formula (I):



in which:
R_1 represents hydrogen or lower alkyl,
n represents 1 or 2,
A represents oxygen or sulfur,
R_2 represents hydrogen or lower alkyl or lower acyl and R_3 represents $(CH_2)pR_4$, with p being integer from 1 to 6 inclusive, and R_4 represents



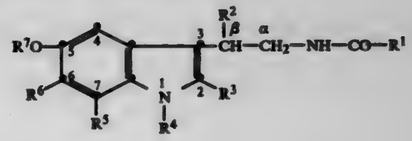
in which:
m is 1 or 2, its enantiomers, diastereoisomers, and epimers as well as its addition salts with a pharmaceutically-acceptable acid or a pharmaceutically-acceptable base when R_1 = H.

5,196,435
MELATONIN DERIVATIVES AND COMBINATIONS WITH ANTIESTROGEN COMPOUNDS FOR TREATING MAMMALIAN BREAST CARCINOMA

James A. Clemens, and Michael E. Waugh, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 21, 1991, Ser. No. 796,108
Int. Cl.[5] A01N *43/38, 43/42*; A61K *31/44, 31/405*
U.S. Cl. 514—284 36 Claims

1. A method of therapeutically treating hormonally dependent breast carcinoma in a mammal in need of such treatment which comprises administering to said mammal an effective amount of a compound of the formula



(I)

wherein
R^1 is H, C_1–C_4 alkyl, or C_1–C_4 alkoxy;
R^2 is H or C_1–C_4 alkyl;
R^3 is H or methyl;
R^4 is H, haloacetyl, C_1–C_3 alkanoyl, benzoyl, or benzoyl substituted with halo or methyl;
R^5 and R^6 are individually H or halo;
R^7 is H or C_1–C_4 alkyl;
provided that when R^2 is H, at least one of R^5 and R^6 is halo; or when R^5 and R^6 are H, R^2 is C_1–C_4 alkyl; or a pharmaceutically acceptable salt thereof.

5,196,436
DEXTROMETHORPHAN ANTITUSSIVE COMPOSITIONS

Ronald L. Smith, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 606,294, Oct. 31, 1990, abandoned.
This application Feb. 24, 1992, Ser. No. 841,244
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—289 8 Claims

1. An antitussive composition, in dosage unit form, for peroral administration consisting essentially of a safe and effective amount of dextromethorphan and an orally-acceptable pharmaceutical carrier in the form of an aqueous-based liquid, or solid dissolvable in the mouth, selected from the group consisting of syrup, elixer, suspension, spray, lozenge, chewable lozenge, powder, and chewable tablet, the composition, or 10% artificial saliva solution thereof for solid dosage forms, being at a pH of about 8 to about 11, the carrier comprising a buffer system whereby the composition when mixed with saliva in the mouth is within such pH range.

5,196,437

METHOD FOR TREATING HEPATIC DISEASES AND REGENERATING LIVER TISSUE USING FK 506 AND RELATED COMPOUNDS

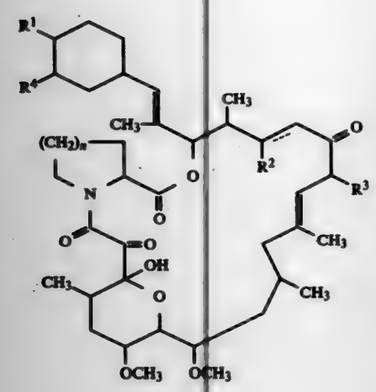
Thomas E. Starzl; Satoru Todo, and Antonio Francavilla, all of Pittsburgh, Pa., assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Continuation of Ser. No. 479,465, Feb. 13, 1990, abandoned. This application Dec. 18, 1990, Ser. No. 629,028

Int. Cl.[5] A61K *31/44, 31/40*

U.S. Cl. 514—294 32 Claims

1. A method of regenerating mammal liver tissue, comprising administering to a mammal in need thereof a regeneration effective amount of a macrolide of formula I:



(I)

where R^1 is hydroxy or pharmaceutically acceptable protected hydroxy, R^2 is hydrogen, hydroxy or pharmaceutically acceptable protected hydroxy, R^3 is methyl, ethyl, propyl or allyl, R^4 is hydroxy, methoxy or oxo, n is 1 or 2 and the symbol of a line and a dotted line is a single bond or a double bond, provided that R^2 is not pharmaceutically acceptable protected hydroxy where R^4 is hydroxy or oxo, wherein said pharmaceutically acceptable protected hydroxy is selected from the group consisting of 1-(lower alkylthio)(lower)alkoxy, tri(lower)alkylsilyloxy, lower alkyl-diphenylsilyloxy, pharmaceutically acceptable organic carboxylic acyloxy, pharmaceutically acceptable organic sulfonic acyloxy and pharmaceutically acceptable organic carbamic acyloxy, and salts thereof.

5,196,438

AMINO ACID DERIVATIVES

Joseph A. Martin, Harpenden, and Sally Redshaw, Stevenage, both of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

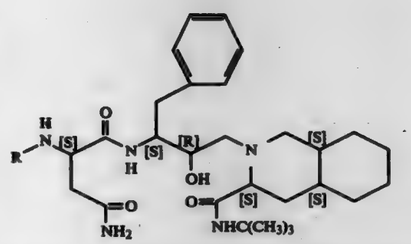
Filed Nov. 19, 1990, Ser. No. 615,534

Claims priority, application United Kingdom, Dec. 11, 1989, 8927913

Int. Cl.[5] A61K *31/47;* C07D *265/30*

U.S. Cl. 514—311 17 Claims

1. A compound having the formula



I

wherein R is benzyloxycarbonyl or 2-quinolylcarbonyl, and its pharmaceutically acceptable acid addition salts.

5,196,439

PIPERIDINE COMPOUNDS USEFUL TO TREAT CEREBROVASCULAR DISEASES

Hachiro Sugimoto, Ushiku; Takaharu Nakazawa, Abiko; Norio Karibe; Isao Saito, both of Tsukuba; Kunio Higuraski, Tokyo; Masahiro Yonago; Takeru Kaneko, both of Tsukuba; Takahiro Nakazawa, Fujishiromachi; Masataka Ueno, Tsukuba; Kiyomi Yamatsu, Kamakura; Kohshi Ueno, and Masahiro Ikeda, both of Tsukuba, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

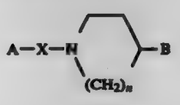
Continuation of Ser. No. 668,327, Mar. 14, 1991, abandoned, which is a continuation of Ser. No. 495,112, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 273,971, Nov. 21, 1988, abandoned. This application Jan. 24, 1992, Ser. No. 825,423

Claims priority, application Japan, Nov. 27, 1987, 62-299438; Mar. 28, 1988, 63-74127

Int. Cl.[5] A61K *31/445;* C07D *211/46, 211/58, 401/02*

U.S. Cl. 514—318 9 Claims

1. A cyclic amine or a pharmacologically acceptable salt thereof represented by the formula:

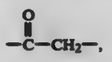


wherein

A is a naphthyl group or a naphthyl group substituted with a lower alkoxy or hydroxy group; phenyl or a phenyl group substituted with a lower alkyl group or halogen; a quinolyl group; or a lower alkyl group,

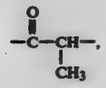
n is 2,

X is a group represented by the formula

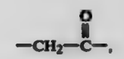


a group of the formula

a group represented by the formula



or a group represented by the formula



and

B is a group represented by the formula —O—Z or —NH—Z and

Z is a phenyl group which may be substituted with one or two identical or different substituents selected from the group consisting of halogen, nitro, acetyl, lower alkyl, and lower alkoxy; a naphthyl group; a pyridyl group; a lower alkyl group; or a cycloalkyl group.

9. A method for improving, treating or preventing a mental symptom associated with a cerebrovascular disease due to ischemia and elevated glutamate levels, which comprises administering a pharmacologically effective amount of a cyclic amine or a pharmacologically acceptable salt thereof as defined in claim 1 to a patient suffering from the mental symptom associated with a cerebrovascular disease as due to ischemia and elevated glutamate levels.

5,196,440

COMPOUNDS ACTIVE AS INHIBITORS OF THE CHOLESTEROL BIOSYNTHESIS

Giorgio Bertolini, Sesto San Giovanni; Cesare Casagrande, Arese, and Francesco Santangelo, Milan, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

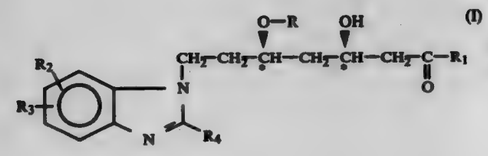
Continuation-in-part of Ser. No. 385,369, Jul. 27, 1989, Pat. No. 4,940,800. This application May 4, 1990, Ser. No. 519,444

Claims priority, application Italy, Jul. 29, 1988, 21542 A/88

Int. Cl.[5] C07D *487/00, 401/00;* A61K *31/44, 31/415*

U.S. Cl. 514—339 5 Claims

1. A compound of the formula



(I)

wherein

R represents a hydrogen atom;

R_1 represents a hydroxy or an OR_5 group where R_5 represents a C_1–C_4 alkyl or benzyl; or R and R_1 together are a single bond between the oxygen or carbonyl;

R_2 and R_3, equal to or different from each other, represent hydrogen atoms, C_1–C_3 alkyl or alkoxy, halogen atoms, CF_3, phenoxy, benzyloxy, amino, or mono or dialkylamino having 1 to 4 carbon atoms in the alkyl moiety; and

R_4 is phenyl which is unsubstituted or substituted by halogen or a pyrrolyl or pyridyl

the carbon atoms marked by an asterisk have contemporaneously R or S configuration; and, when R_1 is hydroxy, a salt thereof with a pharmaceutically acceptable base.

5,196,441

COMPOUNDS USEFUL AS ANTIMICROBIAL AGENTS

Franz Kunisch, Odenthal-Gilbusch; Peter Bobczinski, Wuppertal; Dieter Arlt, Cologne; Wilhelm Brandes, Leichlingen; Heinz-Wilhelm Dehne, Monheim; Stefan Dutzmann, Hilden, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

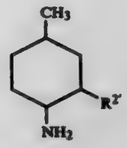
Filed Oct. 10, 1991, Ser. No. 777,832

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1990, 4033415

Int. Cl.[5] C07D *213/55;* A61K *31/44*

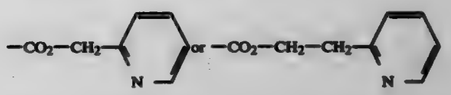
U.S. Cl. 514—357 7 Claims

1. A substituted cyclohexan-1-yl-amine derivative of the formula



in which

$R^{2'}$ represents the grouping



or an acid addition salt or metal salt complex thereof.

5,196,442

FORMICIDAL AGENT FOR COMBATING TERMITES

Shuichi Tsuboi; Ikuro Honda; Sakae Murata, and Yumi Hattori, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

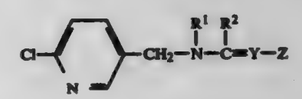
Division of Ser. No. 537,405, Jun. 13, 1990, Pat. No. 5,087,632. This application Oct. 3, 1991, Ser. No. 770,682

Claims priority, application Japan, Jun. 16, 1989, 1-52243; Feb. 28, 1990, 2-45720

Int. Cl.[5] A01N *43/40*

U.S. Cl. 514—357 12 Claims

1. A method of combating termites comprising contacting termites or their habitat with an effective termite combating amount of at least one active compound of the formula (I)

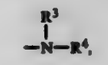


(I)

wherein

R^1 represents hydrogen atom or C_{1-4} alkyl group,

R^2 represents —S—CH_3 or



wherein R^3 and R^4 each represent hydrogen atoms or a C_{1-4} alkyl group,

Y represents N, and

Z represents a cyano group,

either alone or in admixture with an extender, a surface active agent or both.

VOL 1148 ISS 4 MR 23 1993 U.M.I

5,196,443

SYNERGISTIC COMBINATIONS OF 2-(THIOCYANOMETHYLTHIO) BENZOTHIAZOLE WITH A MIXTURE OF 4,4-DIMETHYLOXAZOLIDINE AND 3,4,4-TRIMETHYLOXAZOLIDINE IN CONTROLLING FUNGAL AND BACTERIAL GROWTH IN AQUEOUS FLUIDS

David Oppong, Memphis, and C. George Hollis, Germantown, both of Tenn., assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Sep. 25, 1991, Ser. No. 765,189
Int. Cl.[5] A01N *43/76, 43/78*
U.S. Cl. 514—367 22 Claims

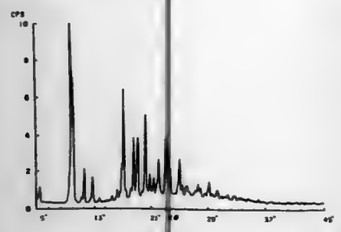
1. A microbicidal composition comprising (a) 2-(Thiocyanomethylthio)benzothiazole and (b) a mixture of 4,4-dimethyloxazolidine and 3,4,4-trimethyloxazolidine, wherein (a) and (b) are present in an amount synergistically effective to reduce the growth of at least one microorganism "selected from the group consisting of bacteria and fungi".

5,196,444

1-(CYCLOHEXYLOXYCARBONYLOXY)ETHYL 2-ETHOXY-1-[[2'-(1H-TETRAZOL-5-YL)BIPHENYL-4-YL]METHYL]BENZIMIDAZOLE-7-CARBOXYLATE AND COMPOSITIONS AND METHODS OF PHARMACEUTICAL USE THEREOF

Takehiko Naka, Kobe; Kohei Nishikawa, Kyoto, and Takeshi Kato, Higashiosaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1991, Ser. No. 687,238
Claims priority, application Japan, Apr. 27, 1990, 2-113148; May 30, 1990, 2-141942; Aug. 6, 1990, 2-208662; Oct. 1, 1990, 2-264579; Dec. 24, 1990, 2-413479
Int. Cl.[5] C07D *257/04;* A61K *31/41*
U.S. Cl. 514—381 9 Claims



1. A stable crystal of 1-(cyclohexyloxycarbonyloxy)ethyl 2-ethoxy-1-[[2'-(1H-tetrazol-5-yl)-biphenyl-4-yl]methyl]benzimidazole-7-carboxylate.

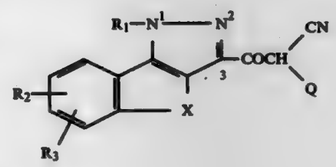
5,196,445

HETEROARYL-3-OXO-PROPANENITRILE DERIVATIVES USEFUL IN THE TREATMENT OF RHEUMATOID ARTHRITIS AND OTHER AUTOIMMUNE DISEASES

Gianfederico Doria, Milan; Anna M. Isetta, Rho; Rinaldo Ferreccio, Gorgonzola; Mario Ferrari, Milan; Maria C. Fornaniero, Vigevano, and Domenico Trizio, Cassina Rizzardi, all of Italy, assignors to Farmitalia Carlo Erba Srl, Milan, Italy

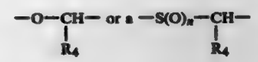
PCT Filed Apr. 4, 1990
PCT No. PCT/EP/00527, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO90/11760, PCT Pub. Date Oct. 18, 1990
PCT Filed Oct. 31, 1990, Ser. No. 613,482
Filed Oct. 31, 1990, Ser. No. 613,482
Claims priority, application United Kingdom, Apr. 6, 1989, 8907799
Int. Cl.[5] A01N *43/56, 43.14, 43/16*
U.S. Cl. 514—405 2 Claims

1. A method of treating a mammal suffering from rheumatoid arthritis, which method comprises administering to said mammal a therapeutically effective amount of a heteroaryl-3-oxo-propanenitrile derivative of formula (I):

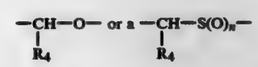


(I)

wherein
X represents:
(a) an

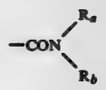


group, wherein n is zero, 1 or 2 and R_4 represents hydrogen or C_1–C_6 alkyl; or
(b) a



group, wherein n and R_4 are as defined above;
R_1 represents phenyl unsubstituted or substituted by a substituent chosen from halogen, trifluoromethyl and C_1–C_6 alkyl;
R_2 represents:
(a) hydrogen, halogen or C_1–C_6 alkyl;
(b) amino, formylamino, C_2–C_8 alkanoylamino or di (C_1–C_6 alkyl) amino;
(c) a C_2–C_7 alkoxycarbonyl group which is unsubstituted or substituted by a

group, wherein R' and R" are each, independently, C_1–C_6 alkyl; or
(d) a -NHCO$(CH_2)_n$COOR group, wherein n is as defined above and R is hydrogen or C_1–C_6 alkyl;
R_3 is hydrogen, halogen, C_1–C_6 alkyl, amino, formylamino or C_2–C_8 alkanoylamino;
Q represents a



group wherein R_a represents hydrogen and R_b represents a —$(A)_m$—R_5 group wherein m is zero or 1, A is a C_1–C_6 alkylene chain and R_5 is phenyl, unsubstituted or substituted by a substituent chosen from halogen, CF_3, C_1–C_6 alkyl and nitro, or a pharmaceutically acceptable salt thereof.

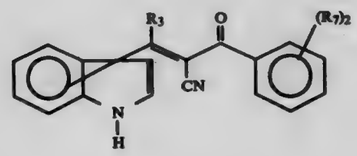
5,196,446

CERTAIN INDOLE COMPOUNDS WHICH INHIBIT EGF RECEPTOR TYROSINE KINASE

Alexander Levitzki, Chaim Gilon, Aviv Gazit, all of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Continuation-in-part of Ser. No. 509,981, Apr. 16, 1990, abandoned. This application Apr. 16, 1991, Ser. No. 686,166
Int. Cl.[5] C07D *209/14, 209/18;* A61K *31/405*
U.S. Cl. 514—415 15 Claims

1. A compound of the formula



wherein R_3 is hydrogen and R_7 is hydroxy or lower alkoxy of one to four carbon atoms.

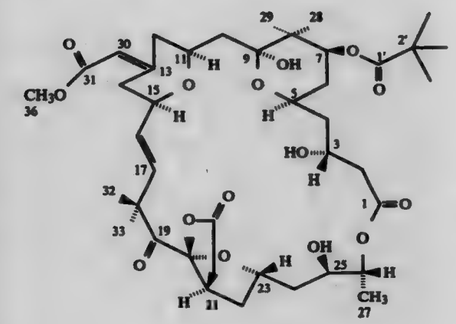
5,196,447

NERISTATIN 1

George R. Pettit, Paradise Valley, and Feng Gao, Tempe, both of Ariz., assignors to Arizona Board of Regents, a body Corporate of The State of Arizona, Acting on behalf of Arizona State University, Tempe, Ariz.

Filed Aug. 8, 1991, Ser. No. 742,609
Int. Cl.[5] C07D *493/22;* A61K *31/365*
U.S. Cl. 514—450 4 Claims

1. A compound denominated neristatin 1 having the structural formulae:



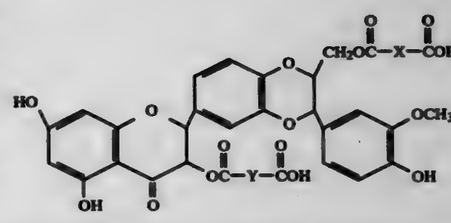
5,196,448

ANTIINFLAMMATORY COMPOSITIONS AND METHOD OF USE

Parry H. Ely, Nevada City, Calif., assignor to Stiefel Laboratories, Inc., Coral Gables, Fla.

Filed Jan. 22, 1991, Ser. No. 643,219
Int. Cl.[5] A61K *31/335, 31/445, 31/535*
U.S. Cl. 514—452 5 Claims

1. The method of treating inflammatory dermatoses which comprises topically applying to the loci of the dermatosis an effective amount of a preparation comprising (a) from 0.5% to 20% by weight of (i) a dicarboxylic acid of the formula:



in which each of X and Y, independently of the other, is alkylene of from 1 to 6 carbon atoms or phenylene, or
(ii) a pharmaceutically acceptable salt thereof having one or two cations in which the cation is selected from the group consisting of the cationic form of alkali metal, alkaline earth metal, ammonia, ethylamine, triethylamine, ethanolamine, diethylaminoethanol, ethylenediamine, piperidine, morpholine, 2-piperidinoethanol, benzylamine and procaine; and
(b) a topically acceptable pharmaceutical carrier therefor.

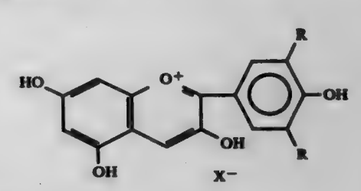
5,196,449

METHODS AND PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF OPHTHALMIC DISEASES

Maria J. Magistretti; Marisa Costi, and Giorgio Pifferi, all of Milan, Italy, assignors to IdB Holding SpA, Milan, Italy

Filed Jun. 24, 1990, Ser. No. 557,558
Claims priority, application United Kingdom, Jul. 28, 1989, 8917323
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—456 6 Claims

1. A method of reducing the hyperpermeability of the ciliary body ocular vessels in a subject which comprises administering to the subject a hyperpermeability-reducing effective dose of compound selected from the group consisting of anthocyanidins of formula



wherein
(I) each R represents hydrogen, or
(II) each R represents hydroxy, and
X represents one equivalent of a pharmaceutically acceptable anion.

5,196,450

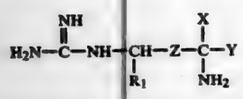
METHOD OF INHIBITING PROTOZOAL GROWTH

Albert Sjoerdsma, Cincinnati, Ohio; Peter P. McCann, Lebanon, Ind.; Philippe Bey, Cincinnati, and Patrick J. Casara, Fairfield, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 453,011, Dec. 20, 1989, abandoned, which is a continuation of Ser. No. 330,967, Mar. 28, 1989, abandoned, which is a continuation of Ser. No. 205,039, Jun. 7, 1988, abandoned, which is a continuation of Ser. No. 930,055, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 931,991, Nov. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 811,147, Dec. 19, 1985, abandoned. This application Sep. 30, 1991, Ser. No. 768,789
Int. Cl.[5] A61K *31/195*
U.S. Cl. 514—565 11 Claims

1. A method of inhibiting the growth of the protazoa *Try-*

panosoma cruzi which comprises administering protazoal inhibiting amounts of an X-substituted arginine or agmatine of the formula



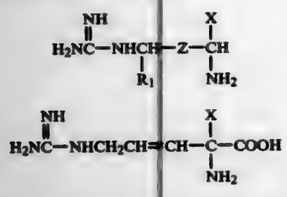
and the pharmaceutically acceptable salts thereof, the individual and racemic mixtures of their optical isomers, wherein

R_1 is h or CH_3

Z is $—CH_2—CH_2—$ or $—CH=CH—$, X is $—CH_2F$, $—CHF_2$, $CHCl_2$, $—CHClF$, $—C\equiv CH$ or $—CH=C=CH_2$

Y is H or COOR with R being H or C_{1-18}lower alkyl.

8. Compounds of the formulae



A

B

the individual optical isomer and mixtures thereof, wherein

X is $—CH_2F$, $—CHF_2$ or $—CH=C=CH_2$,

Z is $—CH_2—CH_2—$ or $—CH=CH—$,

and R_1 is hydrogen, with the proviso that when Z is $—CH_2—CH_2—$, X is $—CH=C=CH_2$.

5,196,451

AVIAN CONTROL

Peter W. Greig-Smith, Headley, and Michael F. Wilson, Esher, both of England, assignors to National Research Development Corporation, London, England

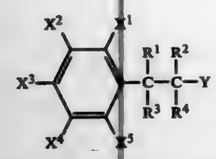
Continuation of Ser. No. 391,522, Jul. 21, 1989, abandoned. This application Nov. 14, 1991, Ser. No. 793,292

Claims priority, application United Kingdom, Dec. 14, 1987, 8729109

Int. Cl.[5] A01N *37/10*

U.S. Cl. 514—570 20 Claims

1. A method of treating a plant material which is an embryo, growing or harvested crop to confer avian repellency, which method comprises applying to said plant material in an amount sufficient to confer avian repellency (a) a compound of formula (I)



(I)

wherein X^1 and X^5 are each separately selected from hydrogen and C_{1-4} alkyl groups; X^2, X^3 and X^4 are each separately selected from hydrogen and C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy and phenoxy groups; R^1 and R^2 are each separately selected from hydrogen and C_{1-4} alkyl groups; R^3 and R^4 are each hydrogen or together constitute the second bond of a carbon—carbon double bond joining $—CR^1R^3—$ and $—CR^2R^4—$; and Y is carbamoyl or carbamoyl N-substituted by one or two of the same or different C_{1-4} groups and/or (b) a compound being 3,5-dimethoxycinnamic acid or a carboxylic ester or carboxylate salt thereof.

5,196,452

MACROCYCLIC ANTI-VIRAL COMPOUND AND METHOD

Kou M. Hwang, Danville; You M. Qi, Redwood City, and Su-Ying Liu, Belmont, all of Calif., assignors to Genelabs Incorporated, Redwood City, Calif.

Filed Jan. 29, 1991, Ser. No. 647,720

Int. Cl.[5] A61K *31/185*

U.S. Cl. 514—577 4 Claims

1. A method of inhibiting cell infection by an enveloped virus comprising

administering to the site of infection a therapeutically effective dose of a macrocyclic chromotropic acid derivative.

5,196,453

CRYSTALLINE DEOXYSPERGUALIN, PROCESS FOR ITS PREPARATION AND SUPPOSITORY CONTAINING THE SAME

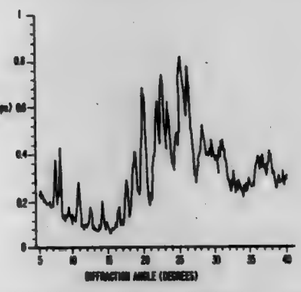
Yoshihisa Umeda, Otsu; Hirosobu Hiraga, and Takaaki Ohkuma, both of Yono, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Division of Ser. No. 744,828, Jul. 29, 1991, Pat. No. 5,162,581, which is a continuation-in-part of Ser. No. 528,191, May 24, 1990, abandoned. This application Jun. 29, 1992, Ser. No. 905,535

Claims priority, application Japan, May 29, 1989, 1-132878; May 29, 1989, 1-132879; Aug. 10, 1990, 2-213505

Int. Cl.[5] A61K *9/02, 31/16*

U.S. Cl. 514—614 7 Claims



1. A 15-deoxyspergualin suppository which comprises β-form crystals of 15-deoxyspergualin trihydrochloride and a lipophylic base which is solid at an ambient temperature.

5,196,454

METHOD OF TREATING DISORDERS OF THE DOPAMINERGIC SYSTEMS USING 2,5-DIAMINOTETRALINES

Matthias Grauert; Herbert Merz, both of Ingelheim am Rhein; Joachim Mieran, Mainz; Gunter Schingnitz, Bad Kreuznach, and Claus Schneider, Eppelheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

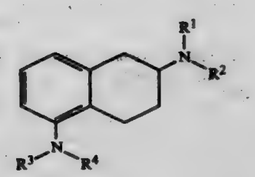
Filed Jun. 15, 1990, Ser. No. 539,093

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 3919624

Int. Cl.[5] A61K *31/135;* C07C *211/60*

U.S. Cl. 514—654 7 Claims

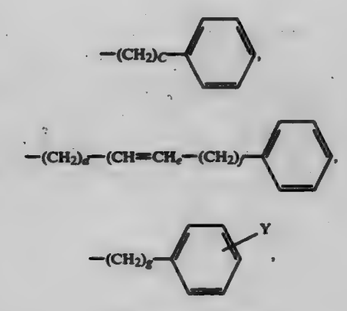
1. A method for treating disorders of the dopaminergic systems treatable by an agent having dopamine-agonizing activity, in a patient, which comprises administering to the patient a compound of the formula:



wherein

R^1 represents hydrogen, C_{1-12} alkyl, C_{3-12} alkenyl, C_{3-12} alkynyl, $—(CH_2)_a$-cycloalkyl, or aralkyl wherein a represents one of the numbers 1,2,3,4,5,6,7,8,9,10,11,12;

R^2 represents C_{1-12} alkyl, C_{1-12} alkyl, C_{3-12} alkenyl, C_{3-12} alkynyl, $—(CH_2)_b$-cycloalkyl,



$—(CH_2)_h$-heteroaryl, or

acyl wherein

b represents one of the numbers 1,2,3,4,5,6,7,8,9,10,11 or 12,

c represents one of the numbers 1,2,3,4,5,6,7,8,9,10,11 or 12,

d represents one of the numbers 1,2,3,4,5 or 6,

e represents one of the numbers 1,2 or 3,

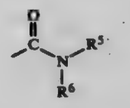
f represents one of the numbers 0,1,2,3 or 4,

g represents one of the numbers 1,2,3,4,5 or 6,

h represents one of the numbers, 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19 or 20,

Y represents C_{1-12} alkyl, halogen, alkoxy or hydroxy;

R^3 represents hydrogen, C_{1-12} alkyl, C_{3-12} alkenyl, C_{3-12} alkynyl, $—(CH_2)_i$-cycloalky, aralkyl, formyl, acyl, alkylcarbonyl, alkyloxycarbonyl, or



wherein

R^5 represents alkyl,

R^6 represents alkyl,

R^5 and R^6 together with the nitrogen atom can represent a heterocyclic group which can contain another heteroatom, and

i represents one of the numbers 1,2,3,4,5,6,7,8,9,10,11 or 12;

R^4 represents hydrogen of C_{1-12} alkyl; or the acid addition salts thereof,

in an amount to exert a therapeutically effective dopamine-agonizing effect.

5,196,455

SELF-LEVELING SEALANT COMPOSITION AND METHOD RELATING THERETO

Joy Bryant, Newport News, Va., assignor to Tremco Incorporated, Cleveland, Ohio

Filed May 30, 1991, Ser. No. 707,715

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—51 14 Claims

1. A one-part, self-leveling sealant comprising:

a polyurethane prepolymer having a weight average molecular weight of from about 400 to about 20,000, wherein the weight percentage of isocyanate groups within the prepolymer is from about 0.9% to about 1.2% and the weight percentage of prepolymer in the sealant is from about 25% to about 60%; and

an organo-polyvalent metal catalyst, wherein the weight ratio of said catalyst to said prepolymer in the sealant is from about 0.05:1000 to about 1:1000,

whereby the sealant cures to a final product comprising substantially uniformly distributed internal cavities.

5,196,456

ACRYLATE SUPERABSORBENT POLYMERIZATION PROCESS

Hien V. Nguyen, East Windsor, and Franklin Boardman, Englishtown, both of N.J., assignors to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 94,200, Sep. 8, 1987, abandoned. This application May 13, 1988, Ser. No. 193,862

Int. Cl.[5] C08F *2/46, 20/06*

U.S. Cl. 522—81 3 Claims

1. In the process of producing a water-insoluble acrylate superabsorbent polymer by the electron beam initiated polymerization of an aqueous monomer solution of partially neutralized acrylic acid, the improvement comprising adding a tetravalent platinum salt to the monomer solution before polymerization, said salt being present in an amount ranging from about 0.3% to about 2% based on the weight of said solution, whereby both the absorbent capacity and the swelling rate of the resultant acrylate superabsorbent polymer are increased.

5,196,457

DUAL CURE EPOXY PREPREG CONTAINING UNSATURATED POLYESTER

Paul Wilkinson, and Arno Montorfano, both of Como, Italy, assignors to DSM N.V., Heerlen, Netherlands

Filed Jun. 28, 1990, Ser. No. 544,545

Claims priority, application European Pat. Off., Jun. 30, 1989, 89830299

Int. Cl.[5] C08F *2/46*

U.S. Cl. 522—103 9 Claims

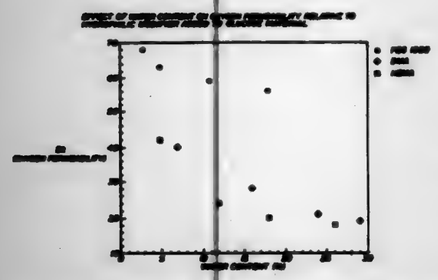
1. Resin composition, that can be used for manufacturing a storage stable prepreg, which said prepreg has a thickness between 2–200 mm, comprising a liquid epoxy resin, a monomer reactive with the epoxy resin, an unsaturated polyester, a monomer reactive with the unsaturated polyester and a hardening catalyst for the unsaturated polyester, characterized in that the catalyst for the unsaturated polyester is a first catalyst that has a working range below 40° C. and the catalyst for the epoxy resin is a second catalyst that has a working range above 40° C. and that the unsaturated polyester and the epoxy resin are mixed in the ratio 99:1 to 10:90.

5,196,458

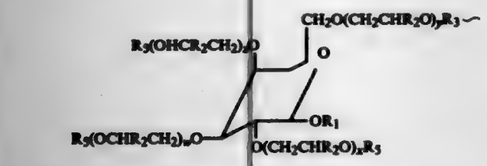
SOFT, HIGH OXYGEN PERMEABILITY OPHTHALMIC LENS

Ivan M. Nunez, Jacksonville; James D. Ford, and Frank Molock, both of Orange Park, all of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Oct. 15, 1991, Ser. No. 777,767
Int. Cl.[5] C08F 24/00
U.S. Cl. 523—106 11 Claims



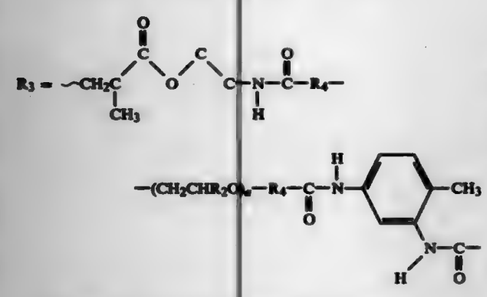
1. A soft ophthalmic lens adapted for placement over the cornea or in the eye made from a polymer having repeating units of:



where:

R_1 is one of the group consisting of N-aliphatic and branched aliphatic chains having between 1 and 7 carbon atoms,

R_2=either of the group consisting of CH_3 and H,



R_4=either of the group consisting of O and NH,

R_5=either of the group consisting of H and R_3,

$a \leq 75$ for $R_2=CH_3$, $a \leq 225$ for $R_2=H$

and

$5 \leq z+x+y+z \leq 50$

5,196,459

WATER-BASED AEROSOL COATING COMPOSITIONS

Thomas J. Smrt, Marengo, and Walter S. Mierzwinski, Schaumburg, both of Ill., assignors to Fox Valley Systems, Inc., Cary, Ill.

Filed Oct. 22, 1990, Ser. No. 601,439
Int. Cl.[5] C08L 67/03, 93/04
U.S. Cl. 523—502 26 Claims

1. A water-based aerosol coating composition suitable for discharge from an aerosol container comprising:

a monomer-modified alkyd resin which is rendered water-soluble by neutralization with a base,

a rosin-modified maleic resin which is rendered water soluble by neutralization with a base,

a water-soluble organic solvent,

water, and

a liquid propellant,

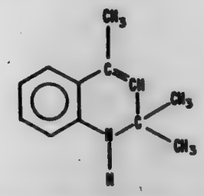
wherein the weight percent of the maleic resin in the composition is greater than the weight percent of alkyd resin in the composition.

5,196,460

RUBBER COMPOSITIONS CONTAINING HIGH PURITY LIGNIN DERIVATIVES

Jairo H. Lora, Media; Michael J. Trojan, West Chester, both of Pa., and William H. Klingensmith, Akron, Ohio, assignors to Repap Technologies Inc., Valley Forge, Pa.

Filed May 29, 1990, Ser. No. 530,179
Int. Cl.[5] C08J 3/00; C08K 5/13; C08L 97/00
U.S. Cl. 524—76 41 Claims



1. A tackifier composition for rubber comprising a lignin recovered from biomass wherein said lignin has a water solubility of up to 1% by weight at a pH of 7 or less and a carbohydrate level of less than 50% by weight.

5,196,461

STYRENIC COPOLYMER/POLYACETAL BLEND COMPOSITIONS

Martin J. Guest, Terneuzen; P. F. M. v/d Berghen, Graauw, both of Netherlands; Ludo M. Aerts, Lokeren, Belgium; Antonios Gkagkidis, Terneuzen, Netherlands, and Abraham F. de Bert, Zelzate, Belgium, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 474,415, Feb. 2, 1990, abandoned. This application Sep. 16, 1991, Ser. No. 760,553
Int. Cl.[5] C08L 55/02, 59/02, 59/04
U.S. Cl. 524—91 13 Claims

1. A polymer blend composition comprising, on the basis of a total of 100 parts by weight of the stated polymer ingredients:

A. from about 50 to 85 parts by weight of a rubber-modified monovinylidene aromatic copolymer ingredient which comprises, on a rubber-modified copolymer weight basis, (1) from about 2 to about 35 weight percent of dispersed particles of a rubbery conjugated diene polymer (a) which has a glass transition temperature of 0° C. or lower and is selected from the group consisting of homopolymers of a 1,3-conjugated alkadiene monomer and copolymers of from about 60 to about 99 weight percent of a 1,3-conjugated alkadiene monomer with from about 1 to about 40 weight percent of a monoethylenically unsaturated monomer; and (b) which serves as a substrate having grafted thereto a superstrate polymer composed of a monovinylidene aromatic copolymer comprising, in polymerized form and on a grafted superstrate polymer weight basis, from about 55 to about 99 weight percent of one or more monovinylidene aromatic monomers and from about 1 to about 45 weight percent of one or more ethylenically unsaturated nitrile comonomers and (2) wherein the remainder of said rubber-modified monovinylidene aromatic copolymer is composed of a continuous monovinylidene aromatic copolymer matrix phase comprising, in polymerized form and on a matrix phase weight basis from about 55 to about 99 weight percent of one or more monovinylidene aromatic monomers and from about 1 to about 45 weight percent of one or more ethylenically unsaturated nitrile comonomers; and

B. from 15 to about 50 parts by weight of one or more acetal homopolymer or copolymer ingredients having a melt flow rate, measured at 190° C. and 2.16 kg, of from 0.5 to 5 grams per 10 minutes.

5,196,462

ZINC-SALTS OF CERTAIN MERCAPTO COMPOUNDS AS ANTIOXIDANTS FOR HIGH TEMPERATURE AGING OF THERMOPLASTIC ELASTOMERS

Dominic A. Berta, Wilmington, Del., assignor to Hüls America Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 701,234, May 16, 1991, abandoned. This application Sep. 18, 1991, Ser. No. 762,092
Int. Cl.[5] C08K 5/34
U.S. Cl. 524—94 12 Claims

1. A dynamically partially crosslinked thermoplastic elastomer comprising, by weight,

(A) 100 parts of a thermoplastic elastomer containing (i) 30 to 70 parts propylene polymer material selected from the group consisting of a crystalline polypropylene having an isotactic index of greater than 90% and an ethylene-propylene random copolymer having an ethylene content of up to about 10%, (ii) 70 to 30 parts amorphous olefin copolymer rubber selected from the group consisting of an ethylene-propylene copolymer rubber, an ethylene-butene copolymer rubber, an ethylene-propylene-non-conjugated diene monomer rubber and an ethylene-butene-non-conjugated diene monomer rubber, wherein the ethylene content is from 30 to 70% and the diene content is from 1 to 10% and is xylene soluble at room temperature, (iii) 10 to 30 parts semi-crystalline, ethylene-propylene or ethylene-butene copolymer which is xylene insoluble at room temperature, and optionally, (iv) 2 to 20 parts polybutene-1 based on 100 parts of (i)+(ii)+(iii), wherein the ratio of polybutene-1 to rubber is less than 0.5, and

(B) 1.4 to 4.0 parts of a zinc salt of a mercapto compound selected from the group consisting of zinc 2-mercaptobenzothiazole, zinc 2-mercaptobenzimidazole and zinc 2-mercaptotoluimidazole, based on 100 parts of (i)+(ii)+(iii).

5,196,463

NON-POSTCURE VULCANIZING COMPOSITION AND ELASTOMERS MADE THEREFROM

Eugene Chang, Bridgewater, N.J.; Robert Cody, Stamford, Conn., and Edward Maxnone, Bound Brook, N.J., assignors to Enichem Elastomeri S.r.l., Milan, Italy

Filed Feb. 7, 1991, Ser. No. 650,250
Int. Cl.[5] C08K 5/34
U.S. Cl. 524—100 50 Claims

1. A vulcanizable composition comprising

(a) an acrylic gum having active halogen groups, epoxy groups, or a mixture thereof;

(b) trithiocyanuric acid;

(c) an aluminum salt of an aliphatic organic acid; and

(d) a metal dialkyl dithiocarbamate, wherein said trithiocyanuric acid is present in an amount from about 0.3 wt.% to about 3.0 wt.% relative to the amount of said acrylic gum, said aluminum salt of said aliphatic organic acid is present in a weight ratio of from about 1:7 to about 8:1 with respect to said trithiocyanuric acid, and said metal dialkyl dithiocarbamate is present in a weight ratio of from about 2:7 to about 7:1 with respect to said trithiocyanuric acid.

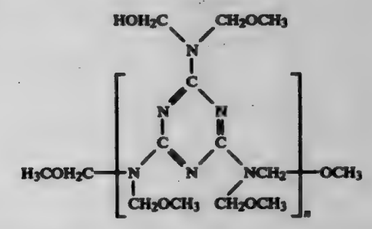
5,196,464

RUBBER COMPOSITIONS

Shigeru Shinoda, Chigasaki, and Masayoshi Dale, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed May 10, 1991, Ser. No. 698,098
Claims priority, application Japan, Jun. 6, 1990, 2-146130
Int. Cl.[5] C08K 5/3477
U.S. Cl. 524—100 5 Claims

1. A rubber composition having increased warm water adhesion consisting essentially of 100 parts by weight of a starting rubber and, based on said weight of the rubber, from 1.0 to 5 parts by weight of partial condensates of hexamethylolmelamine pentamethylether having the formula



where n=1 to 3; from 0.5 to 5 parts by weight of a meta cresol resin; from 4 to 7 parts by weight of sulfur; and from 0.1 to 0.8 parts by weight of a cobalt salt of an organic acid in terms of the cobalt element.

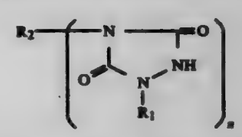
5,196,465

POLYMERIC THERMOPLASTIC MATERIALS, COMPRISING 1,2,4-TRIAZOLIDINE-3,5-DIONE DERIVATIVES AS STABILIZERS

Roberto Scrima, Bologna; Graziano Zagnoni, Vergato-Bologna, and Valerio Borzatta, Bologna, all of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 3, 1992, Ser. No. 830,013
Claims priority, application Italy, Feb. 5, 1991, 285 A/91
Int. Cl.[5] C08K 5/3492, 3/3472
U.S. Cl. 524—101 9 Claims

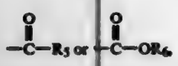
1. A composition stabilised against thermal degradation, comprising a polymeric thermoplastic material and an effective stabilising amount of a compound of the formula (I)



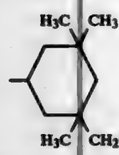
(I)

in which R_1 is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl; C_3–C_{18}alkenyl, phenyl which is unsubstituted or mono-, di-or tri-substituted by radicals selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy and OH; C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by radicals selected from the group consisting of C_1–C_4alkyl and OH; n is 1, 2 or 3 and, when n is 1, R_2 is as defined for R_1 or is a group

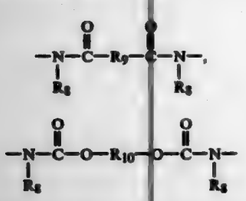
where R_3 and R_4 which are identical or different are as defined for R_1, or R_3 is also hydrogen or a group



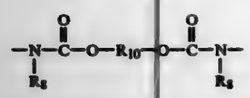
in which R_5 is hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di-or tri-substituted by C_1–C_4alkyl; C_2–C_{18}alkenyl, phenyl which is unsubstituted or mono-, di- or tri-substituted by radicals selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy and OH; C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by radicals selected from the group consisting of C_1–C_4alkyl and OH; and R_6 is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl; C_3–C_{18}alkenyl or C_7–C_9phenylalkyl which is unsubstituted or mono-, di-or tri-substituted on the phenyl by C_1–C_4alkyl; and when n is 2, R_2 is C_2–C_{12}alkylene, 2-hydroxytrimethylene, C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms or by an >N—R_7 group, with R_7 being as defined for R_6 or being hydrogen; C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi-(C_1–C_4alkylene), C_1–C_4alkylenedi-(C_5–C_7cycloalkylene), C_2–C_4alkylidenedi-(C_5–C_7cycloalkylene), a group



phenylene, phenylenedi-(C_1–C_4alkylene), (C_1–C_4alkylene)-diphenylene, (C_2–C_6alkylidene)-diphenylene or oxydiphenylene, each phenylene group and cycloalkylene group is unsubstituted or mono- or di-substituted by C_1–C_4alkyl; or R_2 is a group of the formula (IIa) or (IIb)



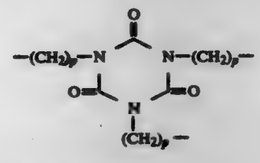
(IIa)



(IIb)

in which R_8 is as defined for R_1, R_9 is a direct bond, C_1–C_{12}alkylene, C_2–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms or by an >N—R_7 group, with R_7 being as defined above; C_2–C_{20}alkylidene, phenyl-(C_1–C_{14}alkylidene), phenylene which is unsubstituted or mono- or di-substituted by C_1–C_4alkyl; C_2–C_{20}alkenylene, C_5–C_7cycloalkylene, C_5–C_7cycloalkenylene, C_7–C_9bicycloalkylene or C_7–C_9bicycloalkenylene, each cycloalkylene group, cycloalkenylene group, bicycloalkylene group and bicycloalkenylene group is unsubstituted or mono- or di-substituted by C_1–C_4alkyl; R_{10} is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms; C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi-(C_1–C_4alkylene), C_1–C_4alkylenedi-(C_5–C_7cycloalkylene), C_2–C_4alkylidenedi-(C_5–C_7cycloalkylene), phenylene, phenylenedi-(C_1–C_4alkylene), (C_1–C_4alkylene)-diphenylene or (C_2–C_6alkylidene)-diphenylene, each phenylene group and cycloalkylene group is unsubstituted or mono- or di-substituted by C_1–C_4alkyl; and, when n is 3, R_2 is a group of the formula (III)

(III)



in which p is an integer from 2 to 6.

5,196,466

POLYMER MIXTURES HAVING IMPROVED THERMOSTABILITY II

Karl-Erwin Piejko, Bergisch Gladbach; Hans-Eberhard Braese, and Holger Lütjens, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 755,737

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1990, 4029536

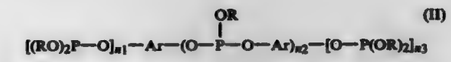
Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—109 **2 Claims**

1. Polymer mixtures of acrylate graft rubbers, certain special acrylate copolymers and optionally resinuous vinyl polymers, containing from 0.1 to 8% by weight of oxetanyl group-containing phosphites corresponding tot he following formula

$$P(OR)_3 \quad \text{(I)}$$

or the formula



(II)

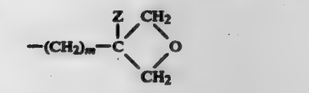
wherein

n_1 denotes 1 or 2,

n_2 denotes any integer from 0 to 2 and

n_3 denotes 1 to 2,

R denotes a group corresponding to the following formula



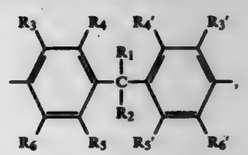
wherein

m=0 or 1 and

Z=H, CH_3, C_2H_5, n—C_3H_{11}, CH_2—C_6H_5, CH_2—O—C_6H_5 or CH_2—O—C_2H_5 and

Ar denotes the residue of a mononuclear divalent or trivalent phenol,

the residue corresponding to the following formula



(B)

wherein

R_1 and R_2 are identical or different and denote H, C_1–C_{18}-alkyl, a mononuclear or polynuclear C_3–C_6-cycloalkyl or a mononuclear or polynuclear C_6–C_{18}-aryl, and wherein R_3, R_4, R_4', R_5, R_5', R_6 and R_6' are identical or different and stand for H, C_{1-18}-alkyl, C_1–C_{18}-alkoxy or chlorine or bromine, or the residue of α, α-bis-(hydroxyphenyl)-diisopropylbenzene, and the Ar's may be identical to one another or differ when $n_2 \neq 0$, or mixtures of the above-mentioned phosphites,

and wherein the polymer mixtures comprise either polymer mixtures of

a) from 10–60 parts by weight of a graft polymer comprising:

a1. mixtures of from 20–40% by weight of acrylonitrile and 80–60% by weight of styrene, α-methylstyrene, alkylmethacrylate or mixtures thereof, or

a2. methylmethacrylate, optionally mixed with up to 30% by weight of styrene, acrylonitrile and/or alkylacrylate, on

a3. a particulate, highly cross-linked alkylacrylate rubber with an average particle diameter (d_{50}) of from 100 to 800 nm which may contain up to 30% by weight of dienes, the graft polymers (a) having rubber contents of from 30–70% by weight,

b) from 10–50 parts by weight of an at least partially cross-linked rubber-like copolymer of from 5–40% by weight of acrylonitrile, styrene, alkylmethacrylate or mixtures thereof and from 95–60% by weight of alkylacrylate and small amounts of a cross-linking monomer having a gel content of from 20–99% by weight, a swelling index above 10 determined in dimethylformamide at 23° C. and an average particle diameter (d_{50}) of from 100–600 nm,

c) from 5–80 parts by weight of an uncross-linked polymer of styrenes, α-methylstyrenes, acrylonitrile, methacrylonitrile, esters of (meth)acrylic acid, vinyl C_1–C_4-carboxylic acids or mixtures of these monomers having Staudinger indices of from 0.3 to 1.5 dl/g (determined in toluene at 23° C.); and

d) from 0–30, in particular from 5–25, parts by weight of a graft polymer comprising:

d1. methylmethacrylate and optionally up to 30% by weight of styrene, acrylonitrile and/or alkylacrylate, or

d2. a mixture of from 20–35% by weight of acrylonitrile and from 80–65% by weight of styrene, α-methylstyrene, alkylmethacrylate or mixtures thereof, on

d3. a particulate, highly cross-linked alkylacrylate rubber which may contain up to 30% by weight of diene and has an average particle diameter (d_{50}) of from 100–800 nm,

the graft polymer (d) having a rubber content of from 70–90% by weight,

or polymer mixtures of

a) 30–70 parts by weight of a graft polymer of a mixture of 25–40 parts by weight of acrylonitrile and 75–60 parts by weight of styrene, α-methylstyrene, alkyl methacrylate or mixtures thereof on particulate, highly cross-linked alkyl acrylate rubbers having an average particle diameter (d_{50}) of from 0.1 to 0.8 μm, with a total rubber content of 20–55% by weight, prepared with a graft yield greater than 25% by weight, preferably greater than 40% by weight,

b) 60–5 parts by weight of a graft polymer of

b1. methyl methacrylate, optionally in combination with up to 30% by weight of styrene, acrylonitrile and/or alkyl acrylate or

b2. a mixture of 20–40% by weight of acrylonitrile and 80–60% by weight of styrene, α-methylstyrene, alkyl methacrylate or mixtures thereof

on a particulate, highly cross-linked alkyl acrylate rubber having an average particle diameter (d_{50}) of from 0.1 to 0.8 μm, with a total rubber content of 65–90% by weight, and

c) 10–40 parts by weight of a partially cross-linked rubber-like copolymer of 5–40% by weight of acrylonitrile, styrene, alkylmethacrylate or mixtures thereof and 95–60% by weight of alkyl acrylate with a gel content of from 20 to 99% by weight and a swelling index greater than 10, determined in dimethylformamide at 23° C., and

d) optionally up to 6% by weight, based on the total quantity of a+b+c, of a resinous polymer of at least 60% by weight of styrene, o-methylstyrene or alkyl methacrylate and up to 40% by weight of acrylonitrile or methacrylonitrile with a Staudinger index (in dimethylformamide at 25° C.) of from 2–10 dl/g.

5,196,467

GLASS SIZE COMPOSITIONS, COATED GLASS FIBERS AND REINFORCED THERMOPLASTICS

David W. Garrett, Marietta, Ga., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 19, 1991, Ser. No. 810,312

Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—114 **15 Claims**

1. An aqueous size composition for glass fibers comprising:

a compound with N-Methylol function or N—CH_2—OR function or both, with R being an alkyl radical;

carboxyl modified polyhydroxy ether; and

epoxy silane coupling agent.

5,196,468

SOLVENT-FREE ADHESIVE COMPOSITION BASED ON AN AQUEOUS ACRYLATE LATEX

Thomas Schwarzel, Meckenheim; Peter Fickelson, Dirmstein, and Hans J. Neumann, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 3, 1991, Ser. No. 801,856

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1990, 4039781

Int. Cl.[5] C08L *93/04, 13/02*; C08K *5/06*

U.S. Cl. 524—272 **6 Claims**

1. An essentially solvent-free adhesive composition containing less than 2% by weight of low-boiling organic solvent having a flash point below 100° C., comprising

A) an aqueous acrylate latex and

B) 30 to 150% by weight, based on the solids content of the acrylate latex A), of a mixture of

b1) 50 to 95% by weight, based on the mixture, of at least one tackifying resin and

b2) 5 to 50% by weight, based on the mixture, of a compound of the formula I

$$R^1\text{-}O\text{-}(X\text{-}O)_n\text{-}R^2 \quad \text{I}$$

where X is alkylene of 2 to 4 carbons, n is an integer from 1 to 8 and R^1 and R^2 are each hydrogen or aryl or alkaryl of 6 to 12 carbon atoms, where R^1 R^2 are not both hydrogen.

5,196,469

ETHYLENE/VINYL ALCOHOL COATINGS

Virginia P. Cushing, Milford, and Daniel Siegal, Stratford, both of Conn., assignors to Mica Corporation, Stratford, Conn.

Filed Mar. 28, 1991, Ser. No. 680,101

Int. Cl.[5] C08K *5/05, 5/09*; C08L *23/08, 29/02*

U.S. Cl. 524—300 **9 Claims**

1. A coating composition useful for forming a liquid barrier resin, comprising a substantially homogenous system of the following components:

(1) from 0.5 to 20 weight % of a copolymer of from 27 to 48 mole percent ethylene copolymerized with, correspondingly, 73 to 52 mole percent vinyl alcohol;

(2) from 30 to 90 weight % of n-propanol or secondary butanol;

(3) from 0.5 to 20 weight % of a monobasic or dibasic carboxylic acid containing from two or eight carbon atoms or an anhydride thereof, or a mineral acid; and

(4) from 5 to 45 weight % of water.

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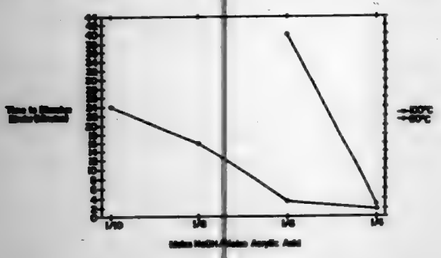
5,196,470

WATER SOLUBLE ALCOHOL BASED NONWOVEN BINDER FOR WATER SWELLABLE, SOLUBLE OR SENSITIVE FIBERS

Stewart C. Anderson, Eden Prairie, and Richard Mahnsten, Vadnais Heights, both of Minn., assignors to H. B. Fuller Licensing & Financing Inc., Wilmington, Del.

Filed Mar. 1, 1991, Ser. No. 663,407
Int. Cl.[5] C08F 220/06; C08K 5/05
U.S. Cl. 524—379 4 Claims



1. A nonwoven, water soluble binder composition useful for binding water swellable, water soluble or water sensitive fibers, in which said binder composition is a substantially anhydrous liquid comprising:

(a) about 50 to 70 wt-% of a neutralization product of:

(i) a water soluble polymeric resin comprising about 10 to 65 wt-% of a C_{1-6} alkyl acrylate monomer, about 10 to 70 wt-% of a C_{1-6} alkyl methacrylate monomer, and about 15 to 25 wt-% of an alpha, beta ethylenically unsaturated carboxylic acid monomer; and

(ii) an alkali metal hydroxide; wherein said neutralization product has a mole ratio of alkali metal hydroxide to acid monomer of about 1:4 to 1:10 and has a controlled rate of solubilization resulting in a dissolution time of about 1 to 42 minutes which can be varied based on the concentration of acid monomer and alkali metal hydroxide utilized to generate the neutralization product; and

(b) about 30 to 50 wt-% of an alcoholic diluent; wherein said polymeric resin has a glass transition temperature of about −18° to +80° C., and can bind the water swellable, soluble or sensitive fibers into a nonwoven material without causing the fibers to react to the binder composition.

5,196,471

THERMAL SPRAY POWDERS FOR ABRADABLE COATINGS, ABRADABLE COATINGS CONTAINING SOLID LUBRICANTS AND METHODS OF FABRICATING ABRADABLE COATINGS

Subramaniam Rangaswamy, Rochester Hills, and Robert A. Miller, Oak Park, both of Mich., assignors to Sulzer Plasma Technik, Inc., Troy, Mich.

Filed Nov. 19, 1990, Ser. No. 615,557
Int. Cl.[5] C08K 3/10
U.S. Cl. 524—406 22 Claims

1. A method of forming a thermal spray powder comprising the steps of:

combining a matrix-forming component, a binder, a solid lubricant and a plastic in a slurry within a vessel; and

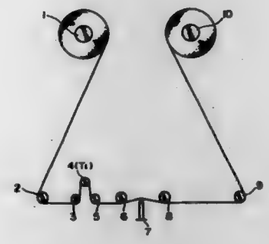
agglomerating said matrix-forming component, said binder, said solid lubricant and said plastic together to form agglomerated particles, wherein said agglomerating step is spray-dried agglomeration.

5,196,472

BIAXIALLY ORIENTED POLYESTER FILM

Manabu Kimura; Tetsuo Ichihashi, and Nobuo Minobe, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 26, 1991, Ser. No. 798,103
Claims priority, application Japan, Nov. 26, 1990, 2-317946
Int. Cl.[5] C08J 5/18
U.S. Cl. 524—425 13 Claims



1. A biaxially oriented polyester film formed from an aromatic polyester composition containing:

(A) 100 parts by weight of an aromatic polyester, and

(B) 0.005 to 5 parts by weight of calcium carbonate particles defined by

(a) a length/width ratio (2a/2b) in the range of from 1.25 to 3,

(b) an average particle diameter ($\overline{D}$), as a diameter of a circle converted from an area, in the range of from 0.05 to 5 μm, and

(c) an ellipse coefficient, represented by the following equation (1), in the range of from 0.7 to 1.2,

$$R = \frac{S_1}{S_2} \quad (1)$$

wherein R is an ellipse coefficient, S_1 is an observed area of a projected plane of a particle, and S_2 is an elliptical area determined on the basis of observed values of the length (2a) and width (2b).

5,196,473

GRANULES EXHIBITING REDUCED DUSTING

Rudolph C. Valenta, Buffalo Grove, and Leslie C. Giron, Elmhurst, both of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Filed Feb. 28, 1989, Ser. No. 316,861
Int. Cl.[5] C08K 3/34
U.S. Cl. 524—445 12 Claims

1. Substantially dust-free granules comprising consisting essentially of a normally dusty particulate clay material and a water-dispersible nonionic vinyl polymer distributed on the particulate material in an amount less than about 0.25 weight percent, based on the weight of the granules, but sufficient to retain dust-size particles present and provide a Dust Index for said substantially dust-free granules that is no more than about 25 percent of the Dust Index of said normally dusty particulate clay material.

5,196,474

Patent Not Issued For This Number

5,196,475

IONOMERS OF LOW MOLECULAR WEIGHT COPOLYMER AMIDES

Charles F. Lanceo, Parsippany, and Manfred K. Seven, Long Valley, both of N.J., assignors to Allied-Signal Inc., Morris Township Morris County, N.J.

Division of Ser. No. 452,917, Dec. 18, 1989, Pat. No. 5,130,372.
This application Mar. 30, 1992, Ser. No. 859,755
Int. Cl.[5] C08L 77/00
U.S. Cl. 524—514 18 Claims

1. A composition comprising at least one first polymer and at least one second polymer, said second polymer comprising an ionomer of a copolymer reaction product of (a) a copolymer acid of an α-olefin and an unsaturated carboxylic acid, said copolymer acid having a number average molecular weight of from about 500 to about 6,000, and (b) from about 0.1 to about 50 weight percent, based on the total weight of said reaction product, of at least one amino acid compound, said reaction product being neutralized in an amount in excess of zero and up to 100 percent with at least one cation selected from the group consisting of metal cations having a valence of 1 to 3.

5,196,476

POLYMER/POLYOL AND PREFORMED STABILIZER SYSTEMS

Donald W. Sinroth, Charleston, W. Va., assignor to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Jan. 12, 1990, Ser. No. 537,187
Int. Cl.[5] C08K 5/04; C08F 220/26, 220/44
U.S. Cl. 524—769 42 Claims

1. A polymer/polyol composition which possesses a polymer content of about 30 to about 60 weight percent, based on total weight, a viscosity in centistokes less than about 20,000 cSt over the range of said polymer content, product stability such that essentially 100% passes through a 150 mesh screen, comprising

(I) a liquid base polyol having a hydroxyl number of about 10 to about 180 present in the composition in an amount of from about 40 to about 70 weight percent of the composition,

(II) a particulate polymer portion dispersed in the liquid base polyol (I) having an average particle size less than about 10 microns and being stable to settling, comprising free radically polymerized ethylenically unsaturated monomer, in the presence of

(III) a high potency preformed stabilizer which is a free radical polymerization product of

(A) a free radically polymerizable ethylenically unsaturated monomer and

(B) an adduct of a polyhydric alcohol having the average formula

$$A(OROX)_{>3}$$

wherein A is a polyvalent organic moiety from a polyol, the free valence of which is >3, or has an average value equal to >3, R is the divalent residue comprising an alkylene oxide moiety and X is one or more of an organic moiety containing reactive unsaturation copolymerizable with (A), that is, X is from a reactive unsaturated compound capable of forming the adduct with the polyol which leaves A, and hydrogen, about one of such X is the organic moiety containing reactive unsaturation and the remaining X's are hydrogen,

(C) optionally adducted with an organic polyisocyanate,

(D) a liquid diluent in which (A), (B) and (C) are soluble, but in which the free radical polymerization product (III) is essentially insoluble, wherein when at least a portion of said liquid diluent is a mono-ol, substantially all of said mono-ol is stripped from the polymer polyol composition prior to a use thereof,

wherein the amount of (B) or reaction product of (B), unreacted with (A), that is contained in the liquid polyol (I) is less than about 2 weight percent of the weight of the liquid polyol (I).

5,196,477

SILICONE COMPOSITIONS COMPRISING ORGANIC COMPOUNDS HAVING THE CAPABILITIES OF COORDINATION WITH METALS

Masatoshi Arai; Yoshifumi Inoue, and Kei Miyoshi, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 556,496
Claims priority, application Japan, Jul. 25, 1989, 1-192371; Sep. 5, 1989, 1-229795
Int. Cl.[5] C08L 83/04
U.S. Cl. 524—863 12 Claims

1. A room temperature vulcanizable silicone composition which comprises:

(a) 100 parts by weight of a diorganopolysiloxane having a hydroxyl group, or two or more alkoxy groups, or a vinyloxy group blocked at ends of the molecular chain;

(b) from 1 to 400 parts by weight of a filler;

(c) up to 50 parts by weight of an alkoxysilane of the following general formula or its partial hydrolyzate

$$(R^1)_mSi(OR^2)_{4-m}$$

wherein R^1 represents a substituted or unsubstituted monovalent hydrocarbon group, R^2 represents a lower alkyl group or lower alkoxyalkyl group, and m is an integer of from 0 to 2;

(d) from 0.01 to 10 parts by weight of an organosilicon

compound having at least one group of the following general formula in one molecule

$$\{(R^3)_2N\}_2C{=}N-$$

wherein R^3 represents a hydrogen atom or a monovalent hydrocarbon group;

(e) from 0.01 to 10 parts by weight of an organic tin compound;

(f) from 0.1 to 20 parts by weight of an organosilicon compound having a group of the general formula

$$\equiv SiC(CH_2)_nCOOR^4$$
(with R^5 and R^6 on the silicon)

wherein R^4 represents a substituted or unsubstituted monovalent hydrocarbon group, R^5 and R^6 independently represent a hydrogen atom, a methyl group or an ethyl group, and n is a value of 0, 1 or 2; and

(g) from 0.01 to 15 parts by weight of an organic compound which has the capability of coordination with metals and has a boiling point of from 50° to 300° C. whereby when the silicone composition is applied as an insulating material for electric or electronic parts, the organic compound in the silicone composition is preferentially adsorbed and deposited on metal contacts in an electric or electronic part, said organic compound being selected from a group consisting of ethers, β-ketoesters, diketones, phosphines, phosphites, phosphates, olefins, acetylene compounds, sulfides, sulfoxides, lactones and lactams.

5,196,478

IMMOBILIZATION OF LIGANDS BY RADIO-DERIVATIZED POLYMERS

James M. Varga, and Peter Fritsch, both of Innsbruck, Austria, assignors to Epipharm Allergie-Service Gesellschaft M.B.H., Linz, Austria

Filed Apr. 9, 1990, Ser. No. 507,348

Claims priority, application Austria, Aug. 21, 1989, A 1976/89

Int. Cl.[5] C08J *7/12, 7/00;* **C07K** *17/06;* **C12N** *11/06;* **G01N** *33/543;* **C12O** *1/68*

U.S. Cl. 525—54.1 **32 Claims**

1. A method for preparing a radio-derivatized polymer comprising contacting a radiolysable polymer and a nonpolymerizable conjugand wherein at least one of said radiolysable polymer and said conjugand is irradiated with high energy radiation, thereby linking said conjugand to said polymer by means of said irradiation.

5,196,479

IMPACT RESISTANT BLENDS OF HIGH HEAT POLYCARBONATE AND AROMATIC POLYESTER

Michael K. Laughner, Lake Jackson, and Hani Farah, Sugarland, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 27, 1991, Ser. No. 661,755

Int. Cl.[5] C08L *71/12, 69/00, 67/03*

U.S. Cl. 525—67 **43 Claims**

1. A composition of matter comprising, in admixture, by weight of the total composition, (a) about 40 to about 90 parts of an aromatic polycarbonate which has a glass transition temperature in excess of at least 165° C. and a weight average molecular weight of less than 40,000, (b) about 5 to about 69 parts aromatic polyester, (c) about 1 to about 40 parts polyphenylene ether, and (d) about 1 to about 25 parts elastomeric impact modifier.

5,196,480

THERMOPLASTIC MOLDING MATERIAL BASED ON GRAFT COPOLYMERS WITH BIMODAL PARTICLE SIZE DISTRIBUTION AND A TWO-STEP GRAFT SHELL

Friedrich Seitz, Friedelsheim; Karl Ruppmich, Ludwigshafen, and Juergen Vietmeier, deceased, late of Neustadt, all of Fed. Rep. of Germany by Karin Sperling-Vietmeier, executrix, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 5, 1991, Ser. No. 681,054

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011162

Int. Cl.[5] C08L *31/02, 51/00, 51/03*

U.S. Cl. 525—71 **8 Claims**

1. A thermoplastic molding material containing

A. a first graft copolymer A comprising

A1: from 55 to 75% by weight, based on A, of an elastomeric, crosslinked acrylate polymer A1 having a mean particle diameter (weight average) of from 50 to 150 nm as the graft base, and

A2: from 45 to 25% by weight, based on A, of a graft shell A2 made from a vinyl-aromatic monomer and a polar, copolymerizable, ethylenically unsaturated monomer in a weight ratio of from 80:20 to 65:35,

B: a second, separately prepared graft copolymer B comprising

B1: from 50 to 80% by weight, based on B, of an elastomeric, crosslinked acrylate polymer B1 which is different from A1 and has a mean particle diameter (weight average) in the range from 200 to 700 nm as the graft base,

B2: a first graft shell B2 comprising from 5 to 30% by weight, based on B, of a vinyl-aromatic monomer and

B3: a second graft shell B3 comprising from 15 to 40% by weight, based on B, of a mixture of a vinyl-aromatic monomer B31 and a polar, copolymerizable, ethylenically unsaturated monomer B32 in a B31:B32 weight ratio of from 90:10 to 60:40, and

C: a hard matrix C comprising a copolymer or mixture of two copolymers prepared from monomers selected from the group consisting of styrene, α-methylstyrene, acrylonitrile, methyl methacrylate and phenylmaleimide,

wherein the A1:B1 weight ratio of the graft bases is in the range from 95:5 to 35:65, and the proportion of A1 plus B1 in the graft bases is from 10 to 35% by weight, based on the molding material comprising A, B and C.

5,196,481

ACRYLIC TERPOLYMER SURFACTANT FOR AQUEOUS DISPERSED EPOXY/ACRYLIC BINDERS

Phillip M. Owens, Parma, and Gary C. Pompignano, North Royalton, both of Ohio, assignors to Glidden Company, Cleveland, Ohio

Filed Nov. 13, 1989, Ser. No. 435,340

Int. Cl.[5] C08L *33/08, 33/12, 63/02*

U.S. Cl. 525—108 **3 Claims**

1. A protective coating composition containing a polymeric binder comprising on a weight basis:

epoxy-acrylic copolymer containing by weight between about 20%–90% epoxy resin and between 10% and 80% acrylic copolymer of copolymerized ethylenically unsaturated monomers comprising between 10% and 90% acrylic ester of acrylic or methacrylic acid, between 5% and 25% carboxyl functional monomer, with the balance of monomers being other ethylenically unsaturated monomer;

based on the weight of said epoxy-acrylic copolymer, between 0.02% and 0.3% of a terpolymer surfactant comprising copolymerized monomers on a weight basis consisting of between 20% and 90% of 2-ethyl hexyl acrylate, between 2% and 50% methyl methacrylate, and between 5% and 50% of an acrylic acid, where the Acid No. of said terpolymer surfactant is above about 50 and said terpolymer surfactant has a number average molecular weight between about 1,500 and 20,000.

5,196,482

THERMOPLASTIC MOLDING COMPOSITIONS

Peter O. Stahl, Mt. Vernon, Ind., and Eugen J. Geyer, Lenox, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jul. 31, 1990, Ser. No. 562,209

Int. Cl.[5] C08L *31/02, 67/02, 79/08*

U.S. Cl. 525—167 **26 Claims**

1. A thermoplastic resin composition comprising:

A. from about 5 to about 95 parts by weight of a polyetherimide ester resin; and

B. from about 95 to about 5 parts by weight of:

(a) a copolymer of an alpha-olefin of from 2 to 4 carbon atoms and a vinyl ester of a saturated aliphatic monocarboxylic acid of 2 to 13 carbon atoms; or

(b) a mixture of such copolymers.

5,196,483

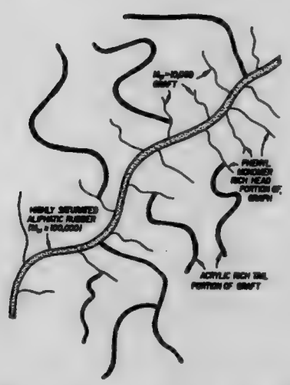
RUBBER COMPOSITIONS WITH A HIGH ELASTIC MODULUS

Daniel Zimmerman; John Milks; Sidney Binder; Roger J. Card, all of Stamford, Conn.; Winfried Wunderlich, Rossdorf, and Werner Siol, Darmstadt, both of Fed. Rep. of Germany, assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 220,868, Jul. 18, 1988, abandoned. This application Jul. 6, 1990, Ser. No. 549,322

Int. Cl.[5] C08F *265/04*

U.S. Cl. 525—310 **13 Claims**



1. A modified rubber composition for reinforcing polyacrylate products by adding it to acrylate or polyacrylate comprising, apart from solvent, by weight percent

A) About 15 to 60% of at least one highly saturated rubber having less than 1% carbon-carbon double bonds in its main chain and more than 0.1% carbon-carbon double bonds in its side chain;

B) about 25 to 80% of acrylate monomer units of the structure

$$CH_2{=}C(R^1){-}CO_2R^2$$

where R^1 is selected from the group consisting of H and an alkyl group, and R^2 is an alkyl group comprising less than about 9 carbon atoms;

wherein greater than about 10% of said monomer units are present in the form of polymer chains grafted to said rubber and less than about 90% of said monomer units are not grafted to said rubber; and at least 85% of the homopolymers and copolymers of said acrylate monomer units have a T_g between 50°–170° C.

5,196,484

POLYMERIC ION CONDUCTORS

Jeremy R. M. Giles, Farnham, England; Fiona M. Gray, Cupar, Scotland; Colin A. Vincent, Newport-on-Tay, Scotland, and James R. MacCallum, St. Andrews, Scotland, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 346,171, May 3, 1989, abandoned. This application Jan. 24, 1992, Ser. No. 825,195

Claims priority, application United Kingdom, Oct. 27, 1986, 8625659

Int. Cl.[5] C08F *297/04*

U.S. Cl. 525—314 **16 Claims**

1. An ABA triblock polymer having a B/A block length ratio greater than 1, in which the A block material is a polymer selected from the group consisting of glassy polymers having a glass transition temperature above 70° C. and crystalline polymers having a softening or melting temperature above 70° C., and in which the B-block material is a polymer selected from the group consisting of elastomeric and amorphous polymers; wherein said B-block material incorporates attached side chains including oxyalkane sequences containing 2 to 6 carbon atoms between neighbouring oxygen atoms, which side chains serve to render the B-block material at least partially ion-coordinating due to the presence of oxygen in said oxyalkane sequences.

5,196,485

ONE PACKAGE STABLE ETCH RESISTANT COATING

Susan U. McMonigal, Allison Park; Debra L. Singer, Pittsburgh; Dennis A. Simpson, Wexford; Joseph A. Klanica, Sarver, and Michael A. Mayo, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1991, Ser. No. 692,885

Int. Cl.[5] C08F *20/32;* **B05D** *7/14*

U.S. Cl. 525—327.3 **19 Claims**

1. A stable one-package etch-resistant liquid film-forming composition, comprising:

(a) a polyepoxide having a weight average molecular weight of less than 10,000, an epoxy equivalent weight on resin solids of less than about 600;

(b) a polyacid curing agent having an average acid functionality of 3 or greater;

(c) wherein said film-forming composition is substantially free of basic esterification catalyst; and

(d) wherein said film-forming composition has a cured softening point of 44.8° C. and higher; said composition is stable for at least 16 hours at 140° F. such that the composition has less than a 25 second gain in No. 4 Ford cup viscosity.

5,196,486
ALKOXYLATED VINYL POLYMER DEMULSIFIERS
William K. Stephenson, Sugar Land, Tex., assignor to Nalco Chemical Company, Naperville, Ill.
Division of Ser. No. 325,165, Mar. 17, 1989, Pat. No. 4,968,449.
This application Aug. 20, 1990, Ser. No. 569,626
Int. Cl.[5] C08F 20/26, 220/26, 222/20; B01D 17/05
U.S. Cl. 525—328.8 7 Claims

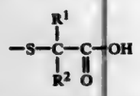
1. A process for making an alkoxylated vinyl polymer comprising:

polymerizing at least one hydrophobic monomer selected from the group consisting of butyl acrylate, decyl acrylate, and lauryl acrylate, and at least one hydrophilic monomer selected from the group consisting of hydroxyethyl acrylate, hydroxyethyl methacrylate and methyl methacrylate in the presence of an initiator at an elevated temperature in the range between about 70°–160° C. to form a vinyl polymer; wherein said vinyl polymer is at least one compound selected from the group consisting of: butyl acrylate/hydroxyethyl acrylate copolymers; butyl acrylate/hydroxyethyl acrylate/methyl methacrylate terpolymers; butyl acrylate/hydroxyethyl methacrylate copolymers; butyl acrylate/hydroxyethyl methacrylate/decyl acrylate terpolymers; butyl acrylate/hydroxyethyl acrylate/lauryl acrylate terpolymers; and butyl acrylate/hydroxyethyl methacrylate/lauryl acrylate terpolymers; and

alkoxylating said vinyl polymer with at least one alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide; said alkylene oxide being present in an amount between about 2–40%.

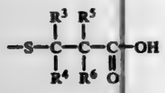
5,196,487
CORROSION PREVENTIVE RESIN AND PHOTOPOLYMERIZABLE COMPOSITION INCORPORATING SAME
Hideo Kogure, Atsugi; Heihachi Murase, Kanagawa, and Naozumi Iwasawa, Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Hyogo, Japan
Filed Jun. 10, 1991, Ser. No. 712,279
Claims priority, application Japan, Jun. 12, 1990, 2-154356; Aug. 9, 1990, 2-212299
Int. Cl.[5] C08F 2/46, 3/34; C08J 3/28; C08C 19/20
U.S. Cl. 525—343 10 Claims

1. A corrosion preventive resin characterized in that the resin has in the molecule group selected from among the groups represented by the general formula



(I)

wherein R^1 and R^2 are the same or different and are each a hydrogen atom or alkyl having 1 to 8 carbon atoms, and groups represented by the general formula



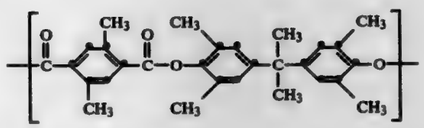
(II)

wherein R^3, R^4, R^5 and R^6 are the same or different and are each a hydrogen atom, alkyl having 1 to 8 carbon atoms or a group forming a bivalent o-phenylene group along with two carbon atoms attached thereto at least one chelate forming group represented by the formula

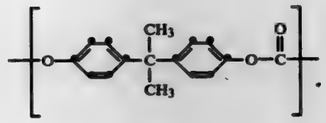
5,196,488
BLEND OF A POLYESTER AND A POLYCARBONATE
Hsinjin Yang, Fairport, and Daniel Y. Paul, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 22, 1991, Ser. No. 748,368
Int. Cl.[5] C08L 69/00, 67/03
U.S. Cl. 525—439 3 Claims

1. A polymeric blend comprising a polyester and a polycarbonate, wherein:

the polyester contains recurring units having the structure



and the polycarbonate contains recurring units having the structure



5,196,489
PROCESS FOR EXTRUSION POLYMERIZATION OF ACRYLIC MONOMERS
Dennis G. H. Ballard, Chester; Anthony Pickering, Cheshire, and Peter J. I. Runciman, Durham, all of England, assignors to Imperial Chemical Industries, Plc, London, England
Filed Jun. 25, 1991, Ser. No. 719,294
Claims priority, application United Kingdom, Jun. 25, 1990, 9014080
The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.
Int. Cl.[5] C08F 2/02, 4/16
U.S. Cl. 526—64 8 Claims

1. A process for the bulk addition polymerisation of one or more acrylic monomers to give a homopolymer or copolymer, which process comprises the step of contacting the one or more monomers, or a partly polymerised product derived therefrom, in the confines of an extruder with a catalyst comprising:

(a) at least one initiator component of formula:

$$MX(Y_n)Z_p \qquad I$$

wherein

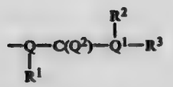
X, Y and Z are bonded to M;

M is Si, Ge or Sn;

n is 0 or an integer and represents the number of Y groups bonded to M;

p is an integer such that $(n+p)=3$ and represents the number of Z groups bonded to M or the valency of group Z;

X is a group



where

Q and Q^1 are independently N, P or As;

Q^2 is O, S, NR or PR where R is C_{1-4} alkyl;

R^1 is H or optionally substituted hydrocarbyl; and

R^2 and R^3 are independently optionally substituted hydrocarbyl, or R^2 and R^3 together are optionally substituted aliphatic hydrocarbadiyl;

all such R^1, R^2 and R^3 being inert in the conditions of the polymerisation process of the present invention;

each Y is independently an optionally substituted hydrocarbyl or hydrocarbyloxy group which is inert in the conditions of the polymerisation process of the present invention, or trialkylsilylalkyl; and

when p=1, 2 or 3 and represents the number of Z groups attached to nucleus M, each Z is monovalent and is independently any group as defined for Y, or an organic polymer radical comprising further MXY_n moieties; or

when p=2 and represents the valency of group Z, Z is a divalent group having the formula:

(i) —$OSiR^5R^6OSiR^7R^8O$— where R^5, R^6, R^7 and R^8 are independently H or optionally substituted hydrocarbyl, or

(ii) -J- or -EJE- where E is oxygen and J is a polymer carrying further -MXY- or -EMXYE- moieties, or

(iii) -ELE- where E is oxygen and L is an inorganic solid on whose surface the two —O— groups are located, said L carrying further -EMXYE- moieties; and

(b) at least one co-catalyst which is a salt comprising an anion selected from azide, cyanide, cyanate, fluoride, bifluoride, nitrate and optionally substituted organic mono- and poly-phosphonates, -phosphinates, -sulphonates, -sulphinates, -carboxylates, -siloxides and -oxides; and

a cation which in use of the catalyst is inert under the polymerisation process conditions yet renders the co-catalyst available in the polymerising medium.

5,196,490
PROCESS FOR PREPARATION OF SYNDIOTACTIC POLYSTYRENE
Richard E. Campbell, Jr., Midland, Mich., and John G. Hefner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jun. 6, 1991, Ser. No. 711,241
Division of Ser. No. 462,861 Jan. 5, 1990, Pat. No. 5,045,517, which is a continuation of Ser. No. 64,282, Jun. 17, 1987, abandoned.
Int. Cl.[5] C08F 4/64, 12/08
U.S. Cl. 526—160 7 Claims

1. A process for preparing polymers of vinyl aromatic monomers having a high degree of syndiotacticity comprising contacting one or more vinyl aromatic monomers under polymerization conditions with a catalytically effective amount of a catalyst comprising the reaction product of polymethylaluminoxane and a complex corresponding to the formula: $CpTiX_3$, wherein Cp is a π-bonded cyclopentadienyl group, a ring fused derivative thereof or a substituted derivative of the foregoing wherein the substituents are selected from the group consisting of alkyl, aryl and silyl substituents containing up to 18 carbons, and X is independently each occurrence halide, OR, or NR_2, wherein R is independently each occurrence an aliphatic, cycloaliphatic or aromatic hydrocarbon group having from 1 to about 12 carbon atoms and provided further that in at least one occurrence X is OR or NR_2.

5,196,491
LIVING CATIONIC POLYMERIZATION OF ALKYL VINYL ETHERS
Chang Cho, Wilmington, Del.; Ben-Ami Feit, Tel Aviv, Israel, and Owen W. Webster, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 25, 1988, Ser. No. 276,352
Int. Cl.[5] C08F 4/52
U.S. Cl. 526—185 20 Claims

1. A process for the living cationic polymerization of vinylic unsaturated monomers containing electronic donating substituents, comprising contacting said vinylic unsaturated monomers under polymerizing conditions at a temperature of about −80° C. to about 0° C. in a suitable solvent, in the presence of an initiating combination consisting essentially of a Lewis base selected from the group consisting of CH_3SR^1, wherein: R^1 is straight chain C_1 to alkyl; $(CH_3CH_2)_2S$; $(CH_3CH_2CH_2)_2S$; $(CH_3)_2SSCH_2SCH_3$; CH_3CH_2SH; $(CH_3)_2SO$; $CH_3SCH_2SCH_3$; $CH_3SCH_2CH_2SCH_3$; tetrahydrothiophene: tetrahydrofuran: diisopropyl sulfide: and p-dioxane, and a second component selected from: a proton source; a proton source and a Lewis acid; a carbenium or siliconium ion source; and a carbenium or siliconium ion source and a Lewis acid; provided that when the Lewis base is dioxane, the Lewis acid $RAlCL_2$, where R is C_1 to C_4 alkyl, is not present.

5,196,492
POLYMERIZABLE COMPOSITION COMPRISING POLY(ALLYL CARBONATE) OF POLYHYDROXY COMPOUND AND POLYHYDROXY COMPOUND
Florenzo Renzi, Gorgonzola; Claudio Gagliardi, San Donato Milanese, and Franco Rivetti, Milan, all of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy
Filed Aug. 27, 1991, Ser. No. 750,603
Claims priority, application Italy, Aug. 29, 1990, 21327 A/90
Int. Cl.[5] C08F 18/24
U.S. Cl. 526—210 9 Claims

1. Liquid composition which can undergo radical polymerization to produce an almost colourless and easily dyeable organic glass, containing (i) at least one poly(allyl carbonate) composition of a polyhydroxy alcohol having from 2 to 20 carbon atoms and from 2 to 6 hydroxy groups in the molecule, (ii) at least on aliphatic polyol having from 2 to 6 hydroxy groups in the molecule in quantities ranging from 0.01 to 1% by weight based on the weight of the composition, and (iii) a component composed of one or more acrylic, vinylic or allylic monomers, different from allyl carbonates, copolymerizable copolymerized with poly(allyl carbonate) of polyhydroxy alcohol in quantities from 25% to 50% by weight based on the composition, selected from the group consisting of methyl acrylate, methyl methacrylate, phenyl methacrylate, vinyl acetate, vinyl benzoate, diallyl phthalate, diallyl adipate and triallyl cyanate, said poly(allyl carbonate) composition (i) being selected from the group consisting of:

bis(allyl carbonates) of diethylene glycol obtained by the transesterification of diallyl carbonate with ethylene glycol, in a molar ratio ranging from approximately 20/1 to approximately 2/1, and containing a quantity of bis(allyl carbonate) of diethylene glycol monomer which ranges from approximately 93 to approximately 34% by weight, the remaining percentage consisting of oligomers;

bis(allyl carbonates), both monomer and oligomers, of bis(-hydroxy methyl)tricyclo decane prepared by the transesterification of diallyl carbonate with bis(hydroxy methyl)-tricyclo decane, in a molar a ratio ranging from approximately 18/1 to approximately 2/1;

bis(allyl carbonates), both monomer and oligomers, of 1,4-dimethanol cyclohexane, prepared by the transesterification of diallyl carbonate with 1,4-dimethanol cyclohexane, in a molar ratio ranging from approximately 10/1 to approximately 2/1;

mixed poly(allyl carbonates), both monomers and oligomers, obtained by the transesterification of diallyl carbonate

with a mixture of pentaerythritol and diethylene glycol, with a molar ration between the diallyl carbonate and the total amount of pentaerythritol and diethylene glycol ranging from approximately 3/1 to 12/1;

mixed poly(allyl carbonates), both monomers and oligomers, obtained by the transesterification of diallyl carbonate with a mixture of tris(hydroxy ethyl)isocyanate and diethylene glycol, with a molar ratio between the diallyl carbonate and the total amount of tris(hydroxy ethyl)isocyanate and diethylene glycol ranging from approximately 3/1 to approximately 12/1; and

liquid compositions containing 10–50% by weight of bis(allyl carbonate) of diethylene glycol monomer, 20–70% by weight of bis(allyl carbonate) of diethylene glycol oligomer and 5–50% by weight of tris(allyl carbonate) of tri(hydroxy ethyl)isocyanurate monomer.

5,196,493

NOVEL POLYMERS AND HARD, GAS-PERMEABLE CONTACT LENSES MADE THEREFROM

Erich Gruber, Marly, Switzerland; Horst Schäfer, Aschaffenburg, Fed. Rep. of Germany; Bernhard Seiferling, Goldbach, Fed. Rep. of Germany, and Harro M. von der Haegen, Laufach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 25, 1991, Ser. No. 691,626

Claims priority, application Switzerland, May 2, 1990, 1479/90

Int. Cl.[5] C08F *14/18*

U.S. Cl. 526—245 10 Claims

1. A polymer that is a copolymerization product of a monomer mixture comprising the following monomers:

a) about 20–60% of a siloxane monovinyl component of formula I

wherein Q^1 is a radical of the partial formula

Ac is the acyl radical of a vinylically unsaturated carboxylic acid having from 3 to 5 carbon atoms, R^1 and R^2 are each independently of the other lower alkylene, cycloalkylene, arylene or a combination of lower alkylene with cycloalkylene or lower alkylene with arylene, R^3 is lower alkylene or cycloalkylene, A and A^1 are each independently of the other X^1—CO—X^2, X^2 in each case being bonded to R^2, and X^2 is —NH— or a bond and X^1 is —O—, or —NR— wherein R is lower alkyl, wherein the radicals Z^1 are each independently of the other $OSi(R^4)_3$ wherein the radicals R^4 are each independently of the others lower alkyl, phenyl or OSi(lower alkyl)$_3$, Z^2 is lower alkyl, phenyl or Z^1, and n is 0 or 1,

b) about 1–25% of a siloxane oligovinyl component of formula II

wherein Q^2 has the same meaning as Q^1 or is Ac—O, wherein Q^1, Ac and Z^2 are as defined above, Z^3 is Z^2 or has the same meaning as Q^2 and m is 0 to 4,

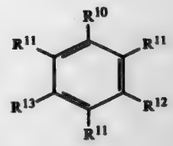
c) about 10–55% of a fluorine-containing vinyl component of formula IIIa

wherein Ac is as defined above, R^5 is C_1–C_8alkylene or cycloalkylene, R^6 is fluorinated lower alkyl having at least 3 fluorine atoms or wherein R^5–R^6 together are hexafluoroisopropyl or nonafluoro-tert-butyl, or of formula IIIb

wherein Ac and R^5 are as defined above and R^7 is fluorinated C_1–C_{10}alkylene, or of formula IIIc

wherein Ac is as defined above and R^8 is phenylene that is unsubstituted or substituted by lower alkyl, fluorine or by fluorinated lower alkyl having at least 3 fluorine atoms, or of formula IIId

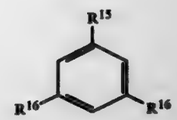
wherein Ac is as defined above, R^9 is perfluorinated C_1–C_{10}alkyl and p is 0, 1 or 2, or of formula IIIe



wherein R^{10} is C_2–C_8alkenyl having the double bond in conjugation to the phenyl ring, the radicals R^{11} are each independently of the others hydrogen or fluorine, R^{12} is fluorinated lower alkyl having at least 3 fluorine atoms and R^{13} is hydrogen or fluorine or has the same meaning as R^{12}, and

d) about 3–30% of a hydrophobic vinyl component having a bulky hydrocarbon radical of formula IVa

wherein Ac is as defined above and R^{14} is lower alkyl-substituted cycloalkyl, lower alkyl-substituted cycloalkyl-lower alkyl, unsubstituted or lower alkyl-substituted di- or oligo-cycloalkyl, unsubstituted or lower alkyl-substituted di- or oligo-cycloalkyl-lower alkyl, or C_5–C_{10}alkyl that contains at least one tert-butyl group and is unsubstituted or substituted by cycloalkyl, or of formula IVb



wherein R^{15} is C_2–C_8alkenyl having the double bond in conjugation to the phenyl ring and R^{16} is hydrogen or has the same meaning as R^{14}, but at least one radical R^{16} is other than hydrogen,

e) about 0–10% of a hydrophilic vinyl component and

f) about 0–15% of an additional cross-linking vinyl component.

5,196,494

HYDROXY CONTAINING FLUOROVINYL COMPOUNDS AND POLYMERS THEREOF

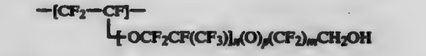
Ming-Hong Hung, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 713,948, Jun. 12, 1991, Pat. No. 5,093,446, which is a division of Ser. No. 592,172, Oct. 9, 1990, Pat. No. 5,059,720, which is a division of Ser. No. 473,883, Jan. 31, 1990, Pat. No. 4,982,009. This application Dec. 4, 1991, Ser. No. 802,393

Int. Cl.[5] C08F *16/24*

U.S. Cl. 526—247 8 Claims

1. A copolymer comprising the hydroxy containing repeat unit



wherein:

p is 0 or 1;

m is 0 to 10; and

n is 1 to 20;

provided that when m is 0, p is 0, and

further provided that when m is greater than 0, p is 1; and one or more other repeat units.

5,196,495

HAIR FIXATIVE POLYMERS

Jui-Chang Chuang, Wayne; Edward W. Walls, Jr., Cranford, both of N.J., and Stephen C. Johnson, Singapore, Singapore, assignors to ISP Investments Inc., Wilmington, Del.

Filed Jan. 25, 1991, Ser. No. 653,207

Int. Cl.[5] C08F *26/10*

U.S. Cl. 526—264 4 Claims

1. A terpolymer comprising:

a. a vinyl ester,

b. a water insoluble or water miscible alkyl maleate half ester and,

c an N-substituted acrylamide which is N-t-butyl acrylamide in a molar ratio of a to b to c of about 1.0 to 0.6–0.8 to 0.08–0.12 and having a relative viscosity in the range of 1.2 to 2.0.

5,196,496

SYNDIOTACTIC CRYSTALLINE COPOLYMERS OF PROPYLENE AND 1-BUTENE

Maurizio Galimberti, Milan; Enrico Albizzati, and Romano Mazzocchi, both of Novara, all of Italy, assignors to Himont Incorporated, Wilmington, Del.

Filed Jun. 26, 1991, Ser. No. 721,049

Claims priority, application Italy, Jun. 27, 1990, 20778 A/90

Int. Cl.[5] C08F *210/06, 4/64*

U.S. Cl. 526—348.6 2 Claims

1. Crystalline copolymers of propylene and 1-butene with an essentially syndiotactive structure, containing from 1.3 to 10 mole % of 1-butene units, having a melting point from 110° to 140° C., a fraction soluble in xylene at 25° C. less than 10% by weight, and a composition similar to the mixture of the monomers present in the gas phase during preparation of said polymer, wherein the difference between the amount of comonomer present in the gas phase and the amount of comonomer in said composition is between 13% to 23% less in the composition of said copolymer.

5,196,497

PROCESS FOR THE PRODUCTION OF ALKOXY-TERMINATED POLY-(DIORGANOSILOXANES)

Wilhelm Weber; Theo Achtenberg; Karl-Heinz Sockel, all of Leverkusen, and Hans Sattlegger, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 8, 1991, Ser. No. 726,682

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1990, 4022661

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—14 7 Claims

1. A process for the production of triorganyloxysilyl- or diorganyloxyorganosilyl-terminated poly(diorganosiloxanes) by reacting α,χ-dihydroxypoly(dimethylsiloxanes) with tetraorganyloxysilanes or triorganyloxyorganosilanes of the formula

wherein m is 0 or 1, R^1 is an alkyl, aryl or alkenyl radical and R^2 is an alkyl radical wherein the process comprises conducting the reaction in the presence of a catalyst consisting of a strongly basic alkali metal compound and neutralizing the reaction mixture after the desired reaction but prior to the occurance of polymer rearrangements.

5,196,498

ORGANOSILICON POLYMERS

Raymond T. Leibfried, Sr., Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 24, 1991, Ser. No. 764,746

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 39 Claims

1. An organosilicon crosslinked polymer or crosslinkable prepolymer which is the hydrosilation reaction product of:

(a) at least one polycyclic polyene having at least two non-aromatic carbon-carbon double bonds in its rings;

(b) at least one first silicon compound selected from the group consisting of cyclic polysiloxanes and tetrahedral siloxysilanes having at least two ≡SiH groups; and

(c) at least one second silicon compound, comprising at least one first silicon atom and at least one second silicon atom:

(i) said at least one first silicon atom having attached thereto at least one first hydrocarbyl group; and

(ii) said at least one second silicon atom having attached thereto at least one second hydrocarbyl group; said first and second hydrocarbyl groups being the same or different;

said first and second hydrocarbyl groups substantially each having at least one carbon-carbon double bond, and each being selected from the group consisting of:

(A) terminally monoolefinic aliphatic groups;

(B) aliphatic groups having at least one nonterminal carbon-carbon double bond;

(D) cycloalkyl groups;

(E) aromatic groups;

(F) aralkyl groups; and

(G) alkaryl groups;

wherein at least one of said at least one polycyclic polyene, said at least one first silicon compound, and said at least one second silicon compound has more than two reactive sites; and

wherein at least one of said first and said second hydrocarbyl groups is selected from the group consisting of:

(I) terminally monoolefinic aliphatic groups having one carbon-carbon double bond and four or fewer carbon atoms; and

(II) aliphatic groups having one nonterminal carbon-carbon double bond and four or fewer carbon atoms.

VOL 1148 ISS 4 MR 23 1993 UMI

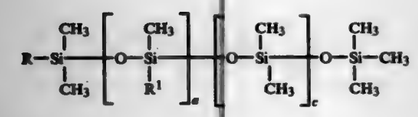
5,196,499

TERMINAL SILICONE ESTER QUATERNARY COMPOUNDS

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 822,752, Jan. 21, 1992, Pat. No. 5,098,979. This application Apr. 6, 1992, Ser. No. 866,900
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—15 18 Claims

1. A silicone polymer which conforms to the following structure;



wherein;
R is

a is an integer from 0 to 200;
c is an integer from 1 to 200, with the proviso that a+c is no more than 200;
R^1 is selected from the group consisting of $-(CH_2)_nCH_3$ and phenyl;
n is an integer from 0 to 10;
x, y and z are integers and are independently selected from 0 to 20;
R' is selected from the group consisting of;

R^3, R^4, and R^5 are each independently alkyl having from 1 to 20 carbon atoms;

R^6 is alkyl having from 6 to 20 carbon atoms,
R^7 and R^8 are independently methyl or ethyl;
l is an integer from 1 to 5;
and

wherein
R^9 is alkyl having from 6 to 20 carbon atoms;
v is an integer from 1 to 5.

5,196,500

TETRAPOLYIMIDE FILM CONTAINING BENZOPHENONE TETRACARBOXYLIC DIANHYDRIDE

John A. Kreuz, Columbus; Richard F. Sutton, Jr., and Stuart N. Milligan, both of Circleville, all of Ohio, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1990, Ser. No. 628,769
The portion of the term of this patent subsequent to Nov. 24, 2009, has been disclaimed.
Int. Cl.[5] C08C 8/02, 69/26, 73/10; C08F 265/10
U.S. Cl. 528—125 13 Claims

1. A tetrapolyimide film for use in flexible printed circuits and tape automated bonding applications, comprising on the basis of dianhydride from 20 to 90 mole % of 3,3', 4,4'-benzophenone tetracarboxylic dianhydride and from 10 to 80 mole % of pyromellitic acid dianhydride and on the basis of diamine from 30 to 90 mole % of a phenylene diamine and from 10 to 70 mole % of a diaminophenyl ether.

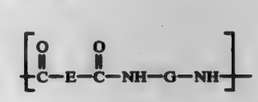
5,196,501

SUBSTITUTED AROMATIC POLYAMIDES AS ORIENTATION LAYERS FOR LIQUID CRYSTAL DISPLAY ELEMENTS AND LIQUID CRYSTAL SWITCHING ELEMENTS

Hans-Rolf Dübal; Mikio Murakami, both of Königstein/-Taunus; Otto Herrmann-Schönherr, Bensheim, and Arnold Schneller, Mainz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 415,713, Oct. 2, 1989, abandoned. This application Dec. 17, 1991, Ser. No. 808,987
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833631
Int. Cl.[5] C08G 75/00, 69/08, 69/12, 69/26
U.S. Cl. 528—171 8 Claims

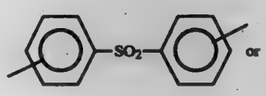
1. An orientation layer in liquid crystal display elements and liquid crystal switching elements, comprising substituted aromatic polyamides wherein the polyamides contain structural units of the formula I



(I)

in which in formula I the units E and G have the following meaning:
E is

where R^1, R^2, which can be identical or different, are H, (C_1-C_6)-alkyl or (C_1-C_6)-alkoxy, with the proviso that at least one of the radicals R^1 or R^2 contains a tertiary substituted carbon atom, preferably the group $-C(CH_3)_3$, or
E is



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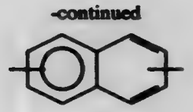
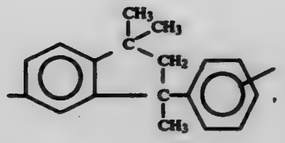
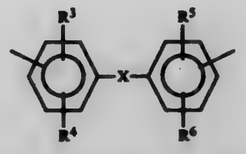


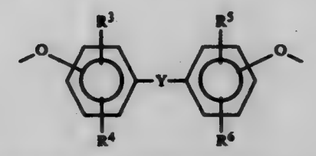
or
E is



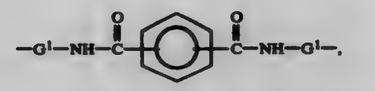
and
G is



where R^3, R^4, R^5, R^6, which can be identical or different, are $-CH_3$, $-CF_3$, $-OCH_3$, —F, —Cl, —Br or —H, and X can be —O—, $-C(CH_3)_2-$, $-C(CF_3)_2-$, $-SO_2-$, —CO—, $-CH_2-$ or the radical



where R^3 to R^6 are as defined above and Y is $-C(CH_3)_2-$, $-C(CF_3)_2-$, $-SO_2-$, —CO—, $-CH_2-$, or —O—, or
G is



in which G^1 can have the meanings mentioned above for G.

5,196,502

METHOD FOR THE PREPARATION OF MULTIPLY-BRANCHED AROMATIC POLYESTERS

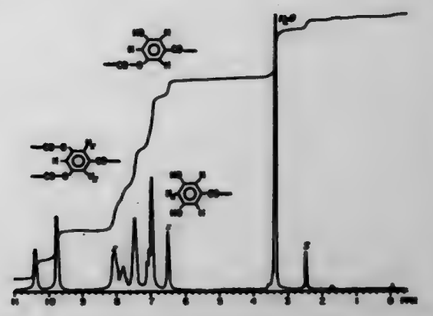
S. Richard Turner, Pittsford; Brigitte I. Voit, and Ralph B. Nielsen, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1991, Ser. No. 788,070
Int. Cl.[5] C08G 63/00
U.S. Cl. 528—272 18 Claims

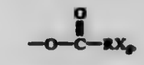
1. A method for producing multiply-branched polyester comprising the step of condensing Z^1 and Z^2 groups of a branching reactant having the general formula

$Z^1—Ar—(Z^2)_y$

wherein
j is 2 or 3,



Ar is an aryl or heteroaryl group having from 1 to 3, solitary or linked or fused, unsubstituted or substituted by unreactive substituents, five or six membered rings,
and one of Z^1 and Z^2 is a carboxyl group and the other is a group having the general formula



wherein
R is an alkyl group having from 1 to 3 carbon atoms, X is a member selected from the group consisting of fluoro and chloro and g is an integer from 0 to about 7.

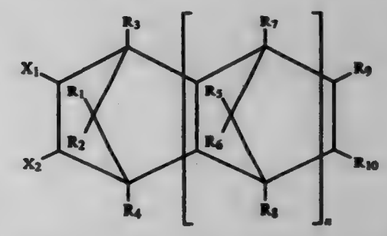
5,196,983

RESIN COMPOSITION FOR USE AS PAINT

Masahiro Ishidoya, Kawakura; Kishio Shibata, Yokohama; Osamu Oba, Tokyo, and Masaaki Kawasaki, Hiroshima, all of Japan, assignors to Nippon Oil and Fats Co., Ltd. and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan

Division of Ser. No. 564,824, Aug. 7, 1990, Pat. No. 5,091,492. This application Jul. 24, 1991, Ser. No. 735,854
Claims priority, application Japan, Aug. 14, 1989, 1-207990
Int. Cl.[5] C08F 220/00, 220/10, 220/56
U.S. Cl. 526—282 22 Claims

1. A resin composition for use as paint comprising a copolymer prepared by copolymerizing
a monomer (I) represented by the following formula



(I)

wherein one of X_1 and X_2 stands for an acryloyloxy or methacryloyloxy group, with the other being a hydrogen atom or an alkyl having 1 to 6 atoms; R_1 and R_{10} each stand for a hydrogen atom of an alkyl group having 1 to 6 carbon atoms; and n is an integer of 1 to 4;
with a monomer having a single α,β-ethylenically unsaturated site and a reactive functional group and
with a α,β-ethylenically unsaturated monomer having no

reactive functional group, wherein the monomer mixture used for preparing said copolymer contains between 5 to 95 wt % of said monomer (I).

5,196,504

REPULPABLE PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS

William F. Scholz, Altadena, and Robert H. Van Ham, Arcadia, both of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Oct. 15, 1991, Ser. No. 777,667
Int. Cl.[5] C08F *220/06, 220/10, 2/16*
U.S. Cl. 526—318.4 20 Claims

1. A water dispersible, inherently tacky pressure-sensitive adhesive comprising a tacky emulsion polymer formed from about 80 to 90% by weight of first monomers comprising a major portion of at least one alkyl acrylate containing from 4 to about 8 carbon atoms in the alkyl group and from about 20 to 10% by weight of second monomers which are of a mixture of acrylic acid with at least one oleophilic unsaturated carboxylic acid, said emulsion polymer having a glass transition temperature of from abbot −15° to about −50° C. and formed in the presence of anionic and nonionic surfactants and a sufficient amount of chain transfer agent to provide a polymer which when coated onto a repulpable paper substrate is sufficiently dispersible to enable recovery of paper fibers substantially free of adhesive under conditions of TAPPI Useful Method 213, said adhesive under resistant to loss of adhesive properties on exposure to high humidity.

5,196,505

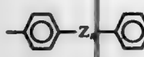
PROCESS FOR THE PREPARATION OF A THERMOPLASTICALLY PROCESSABLE AROMATIC POLYAMIDE WITH PHOSPHORUS ACID CATALYST

Günter Poll, and Jürgen Finke, both of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

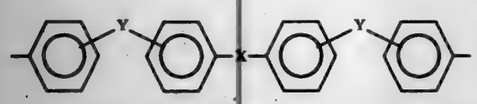
Filed Dec. 6, 1990, Ser. No. 623,680
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942941
Int. Cl.[5] C08G *69/28*
U.S. Cl. 528—336 3 Claims

1. A process for the preparation of a thermoplastically processable aromatic polyamide, comprising:

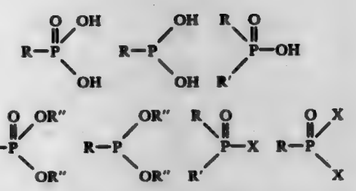
polycondensing diacid monomer A of the formula: HOOC-Ar-COOH, wherein Ar is 1,3- or 1,4-phenylene; 1,4-, 1,5-, 2,6- or 2,7-naphthylene or



with diamine monomer B of the formula: H_2N-Ar'-NH_2, wherein Ar' is



wherein X is —SO_2— or —CO—; Y is —O— or —S—; Z is —O—, —S—, —SO_2—, —CO— or —CRR'—, wherein R and R' each is hydrogen or C_{1-4}-alkyl and n is 0 or 1, in the melt at a temperature in the range of from 200° to 400° C. in the presence of at least one catalyst selected from the group consisting of catalysts of the formula:



wherein R, R' and R'', independently of one another, are phenyl, 1- or 2-naphthyl, 2-, 3- or 4-chlorophenyl, 2-, 3- or 4-tolyl, C_{1-20}-alkyl or cycloalkyl and X is chlorine or bromine, the catalyst content ranging from 0.01 to 2.0 mole % relative to the total content of components A and B.

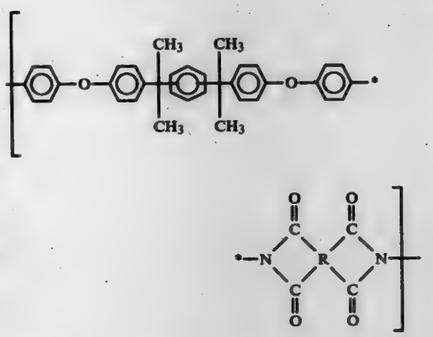
5,196,506

POLYMIDE

Shoji Tamai, Kanagawa; Masahiro Ohta, Fukuoka, and Akihiro Yamaguchi, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 601,373, Oct. 23, 1990, abandoned. This application Jul. 15, 1992, Ser. No. 914,016
Claims priority, application Japan, Nov. 17, 1989, 1-297518
Int. Cl.[5] C08G *69/26, 73/10, 8/02, 14/00*
U.S. Cl. 528—353 6 Claims

1. A polyimide having recurring structural units represented by the formula (I):



(I)

wherein R is a tetravalent radical selected from the group consisting of an aliphatic radical having at least two carbon atoms, alicyclic radical, monocyclic aromatic radical, fused polycyclic aromatic radical and polycyclic aromatic radical bonded through a direct bond or a bridge member.

5,196,507

PROCESS FOR PRODUCING GRANULES OF POLYCARBONATE AND COMPOSITION THEREOF

Yoshiyuki Totani; Masakatsu Nakatsuka, and Akihiro Yamaguchi, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jan. 21, 1992, Ser. No. 822,926
Claims priority, application Japan, Jan. 24, 1991, 3-006678
Int. Cl.[5] C08J *3/12, 3/14*
U.S. Cl. 528—491 21 Claims

8. A process for producing granules of a polycarbonate composition comprising polycarbonate and at least one stabilizing agent which comprises adding a solution of polycarbonate in an organic solvent to a suspension composed of water, an anti-solvent for polycarbonate and polycarbonate powder with stirring in the presence of at least one stabilizing agent while

evaporating and removing the organic solvent for polycarbonate added to the suspension.

5,196,508

METHOD FOR MAKING UNIFORM POLYVINYLIDENE DIFLUORIDE MEMBRANES

Ioannis P. Sipsas, Forest Hills; Isaac Rothmann, Brooklyn, and Irving Joffee, Huntington, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 683,817, Apr. 11, 1991. This application Jun. 6, 1991, Ser. No. 711,017
Int. Cl.[5] C08F *14/22;* B01D *71/34*
U.S. Cl. 528—503 20 Claims

1. A method for enhancing the characteristics of a hydrophobic polyvinylidene difluoride membrane comprising heating the membrane to a temperature of at least about 80° C. but less than the temperature at which the membrane softens and deforms for a time sufficient to achieve a state such that, when subsequently hydrophilized, the resultant hydrophilic membrane has substantially uniform hydrophilic properties.

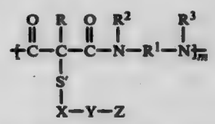
5,196,509

SIDE CHAIN CONDENSATION POLYMER WHICH EXHIBITS NONLINEAR OPTICAL RESPONSE

Diane E. Allen, Springfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Mar. 25, 1991, Ser. No. 675,342
Int. Cl.[5] C08G *69/00*
U.S. Cl. 528—331 8 Claims

1. A polymer comprising recurring monomeric units corresponding to the formula:



where m is an integer of at least 10; R is hydrogen or a C_1–C_4 alkyl substituent; R^1 is a divalent organic radical containing between about 2–12 carbon atoms; R^2 and R_3 individually are hydrogen or a C_1–C_4 alkyl substituent, or taken together with the connecting nitrogen atoms form an alicyclic structure; S' is a spacer group having a linear chain length of about 1–10 carbon atoms; X is an electron-donating group; Y is a 4,4'-diphenylene or 4,4'-stilbene structure; and Z is an electron-withdrawing group.

5,196,510

MOLECULAR RECOGNITION UNITS

John D. Rodwell, Yardley; Thomas J. McKearn, New Hope; Vernon L. Alvarez, Morrisville, all of Pa., and Robert D. Radcliffe, Titusville, N.J., assignors to Cytogen Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 291,730, Dec. 29, 1988, abandoned. This application May 7, 1990, Ser. No. 519,702
Int. Cl.[5] C07K *7/08, 7/10;* A61K *43/00;* G01N *33/533*
U.S. Cl. 530—324 16 Claims

1. A compound, comprising a first amino acid sequence having binding activity and affinity for an activated platelet fibrinogen receptor and selected from the group consisting of:

SYGRGDVRGDF,
SGAYSRGDG,
SGAYGSRGDG,
SYRGDSK,
PSYYRGDGAPSYYRGDGA,
PSYYRGDGAPSYYRGDGAPSYYRGDA,
ARRSPSYYRGDAGPYYAMDY,

attached directly to a second amino acid sequence capable of binding a metal ion selected from the group consisting of:

KCTCCA,
SCTCTSSCA,
ACKACKC,
GCSKCAQGCV,
CKGAADKCTCCA,
GHFPFHW,
YKCGLCERSFVEKSALSRHQRVKKN,

and such peptides in which either or both the amino or carboxy terminus is blocked.

5,196,511

PEPTIDES AND ANTIBODIES THAT INHIBIT INTEGRIN-LIGAND BINDING

Edward F. Plow; Stanley E. D'Souza, and Mark H. Ginsberg, all of San Diego, Calif., assignors to The Scripps Research Institute, San Diego, Calif.

Filed Dec. 1, 1989, Ser. No. 444,777
Int. Cl.[5] C07K *7/06, 7/08, 7/10, 15/28*
U.S. Cl. 530—324 6 Claims

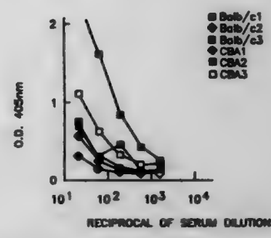
1. A polypeptide of no more than 30 amino acid residues in length having a sequence that corresponds to the sequence of GPIIb shown in FIG. 1 that includes an amino acid residue sequence represented by the formula: —TDVNGDGRH-DL—, said polypeptide being capable of inhibiting platelet aggregation.

5,196,512

SYNTHETIC PEPTIDES USEFUL AS UNIVERSAL CARRIERS FOR THE PREPARATION OF IMMUNOGENIC CONJUGATES AND THEIR USE IN THE DEVELOPMENT OF SYNTHETIC VACCINES

Elisabetta Bianchi; Antonello Pessi, both of Rome, Italy, and Giampietro Corradin, Lausanne, Switzerland, assignors to Enitrcerche S.p.A., Milan, Italy

Filed Nov. 8, 1990, Ser. No. 610,525
Claims priority, application Italy, Nov. 10, 1989, 22355 A/89
Int. Cl.[5] C07K *7/08, 7/10, 17/00;* A61K *39/385*
U.S. Cl. 530—326 1 Claim



1. An immunogenic conjugate comprised of a synthetic peptide carrier covalently bound to a hapten and able to induce a protective and genetically unrestricted antibody response against *Plasmodium falciparum*, said conjugate having the sequence:

synthetic peptide-(Asn-Ala-Asn-Pro)$_n$-OH

wherein:

n is between 3 and 40 and the synthetic peptide is the carrier and is selected from Phe-Asn-Asn-Phe-Thr-Val-Ser-Phe-Trp-Leu-Arg-Val-Pro-Lys-Val-Ser-Ala-Ser-His-Leu-Glu (Sequence No. 1) or Phe-Asn-Asn-Phe-Thr-Val-Ser-Phe-Trp-Leu-Arg-Val-Pro-Lys (Sequence No. 6).

subsequences thereof consisting of at least one epitope that

5,196,513
SYNTHETIC PEPTIDES DERIVED FROM THE BETA-SUBUNIT OF HUMAN THYROID STIMULATING HORMONE
Robert J. Ryan; Daniel J. McCormick, and John C. Morris, all of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.
Continuation of Ser. No. 403,564, Sep. 5, 1989, abandoned. This application Jul. 25, 1991, Ser. No. 736,030
Int. Cl.[5] C07K *7/00*
U.S. Cl. 530—327 1 Claim

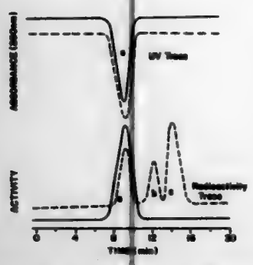
1. A polypeptide of the formula:

NH_2-Lys-THr-Asn-Tyr-Cys-Thr-Lys-Pro-Gln-Lys-Ser-Tyr-COOH.

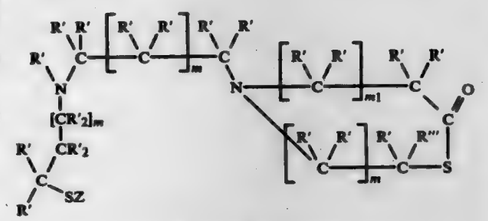
5,196,514
METHOD OF DETECTING MYCOPLASMA INFECTION IN POULTRY AND COMPOSITIONS THEREFOR
Alan P. Avakian, Raleigh, N.C., and Stanley H. Kleven, Athens, Ga., assignors to The University of Georgia Research Foundation, Inc., Athens, Ga.
Filed Mar. 6, 1990, Ser. No. 489,011
Int. Cl.[5] C12N *1/00, 1/20;* C07K *3/00, 13/00, 15/00, 17/00*
U.S. Cl. 530—350 1 Claim

1. A purified *Mycobacterium gallisepticum* antigen having the characteristics of ATCC No. 40748 of a molecular weight of abut 56,000 and substantially lacking immunogenic cross reactivity with *Mycoplasma synoviae.*

5,196,515
THIOLACTONE BIFUNCTIONAL CHELATING AGENTS FOR DIAGNOSTIC AND THERAPEUTIC PRODUCTS
Susan Z. Lever; Kwamena E. Baidoo, both of Baltimore, Md.; Alfred V. Kramer, Upper Providence, and Hugh D. Burns, Harleysville, both of Pa., assignors to The Johns Hopkins University, Baltimore, Md.
Division of Ser. No. 324,859, Mar. 17, 1989, Pat. No. 5,095,111. This application Sep. 6, 1991, Ser. No. 755,775
Int. Cl.[5] A61K *39/00;* A01N *37/18;* C07K *3/00, 15/00*
U.S. Cl. 530—363 9 Claims

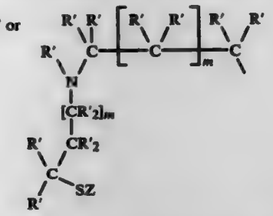


1. A ligand capable of forming a coordination complex with a metal, said ligand comprising the reaction product of:
(i) a bifunctional ligand capable of reaction with a protein, protein fragment, peptide, amino acid, natural or synthetic analogs thereof or simple molecules containing amino, thiolate, alcholate or other nucleophilic group capable of reacting with a thiolactone and a metal, said ligand having the structure:



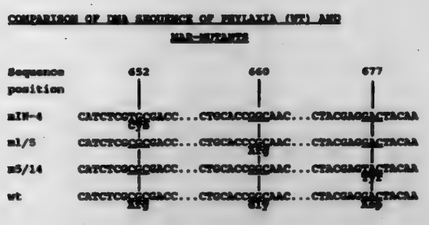
where Z = H, or labile thiol- protecting group

R'' = R' or



wherein each R' is independently a hydrogen atom or an alkyl group or substituted alkyl group; each R'' is independently a hydrogen atom, an alkyl group or the defined group, R''' is independently a hydrogen atom or an alkyl group; m and m_1 are 0 or 1, Z is a hydrogen atom or a labile thiol protecting group, and the simple salts thereof, and
(ii) a compound containing an amino, thiolate, alcolate or any other nucleophilic group capable of reacting with a thiolactone.

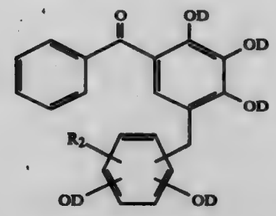
5,196,516
PSEUDORABIES VIRUS VACCINE
Christa S. Schreurs, Kerkrade; Thomas C. Mettenleiter, Tübingen; Artur J. Simon, Munich; Noèmi Lukacs, Düsseldorf, and Hanns J. Rziha, Tübingen, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands
Filed Jul. 21, 1989, Ser. No. 383,833
Claims priority, application European Pat. Off., Aug. 1, 1988, 112479.6
Int. Cl.[5] C07K *15/14*
U.S. Cl. 530—395 5 Claims



1. Purified polypeptide having an immunizing activity characteristic of glycoprotein gII of pseudorabies virus, consisting essentially of a fragment of a glycoprotein gII subunit protein said fragment corresponding to the amino acid sequence positioned between about amino acid no. 590 and 710 of said gII or subsequences thereof consisting of at least one epitope that reacts with virus neutralizing antibodies, substantially free of other envelope glycoprotein fragments.

5,196,517
SELECTED TRIHYDROXYBENZOPHENONE COMPOUNDS AND THEIR USE AS PHOTOACTIVE COMPOUNDS
Medhat A. Toukhy, Barrington, and Alfred T. Jeffries, III, Providence, both of R.I., assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.
Division of Ser. No. 429,298, Oct. 30, 1989, Pat. No. 5,019,478. This application Feb. 28, 1991, Ser. No. 661,928
Int. Cl.[5] C07C *245/00;* H03F *7/023*
U.S. Cl. 534—557 5 Claims

1. A photoactive compound of the formula (V):

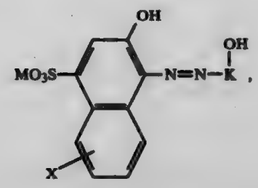


(V)

wherein R_2 is selected from the group consisting of an OD group, a halide group, a lower alkyl group having 1 to 4 carbon atoms and a lower alkoxy group having 1 to 4 carbon atoms; and D is selected from the group consisting of o-naphthoquinone diazide sulfonyl group and hydrogen; with the proviso that at least four D's are o-naphthoquinone diazide sulfonyl groups.

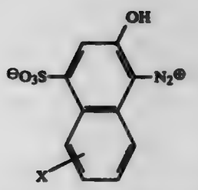
5,196,518
PROCESS FOR THE PREPARATION OF METALLISABLE AZO DYES BY CARRYING OUT THE COUPLING IN THE PRESENCE OF A BUFFER MIXTURE
Horst Langfeld; Claudio Puebla, both of Grenzach-Wyhlen, and Günter Sereinig, Schopfheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 486,343, Feb. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 237,474, Aug. 19, 1988, Pat. No. 5,026,830. This application Aug. 28, 1991, Ser. No. 758,327
Claims priority, application Switzerland, Sep. 8, 1987, 3447/87; Fed. Rep. of Germany, Mar. 2, 1989, 3906664
Int. Cl.[5] C09B *41/00, 29/02*
U.S. Cl. 534—583 18 Claims

1. A process for the preparation of an azo dye of formula



(1)

wherein K is a benzene or naphthalene radical, and the hydroxy group is attached to K adjacent to the azo group, X is hydrogen or nitro and M is an alkali metal ion, which process comprises coupling a diazo component of formula



(2)

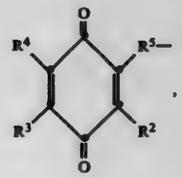
in the presence of one or more buffer mixtures, excepting the buffer mixture ammonium chloride/ammonia, and in the presence of an alkali metal chloride, to a coupling component of formula

(3)

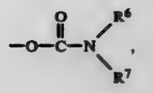
in which formulae (2) and (3) K and X are as defined for formula (1).

5,196,519
REDUCIBLE COMPOUNDS WHICH PROVIDE ANILINE DYES, AND ANALYTICAL COMPOSITIONS, ELEMENTS AND METHODS USING SAME
Jared B. Mooberry, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 215,127, Jul. 5, 1988, Pat. No. 5,108,902. This application Dec. 4, 1991, Ser. No. 819,162
Int. Cl.[5] C07C *245/06, 271/28;* G01N *21/78*
U.S. Cl. 534—733 4 Claims

1. A reducible compound of the structure CAR—R^1 wherein CAR— is the quinone structure



R^1 is



R^2 and R^4 are independently hydrogen, alkyl, aryl or an electron withdrawing group,
R^5 is methylene,
R^3 is the same as —R^5—R^1, or is hydrogen, alkyl, aryl or an electron withdrawing group, or R^3 and R^4, taken together, represent the atoms necessary to complete a fused carbocyclic ring,
R^6 is alkyl, aryl, cycloalkyl or a heterocyclic moiety, and
R^7, together with the nitrogen atom forms an aniline dye, or R^6 and R^7 taken together form a ring that forms part of an aniline dye moiety which, upon release of R^1 from said quinone nucleus and decarboxylation, form an aniline dye.

5,196,520

AZO DYES, THEIR PREPARATION AND THE USE THEREOF

Jürgen Schnetzer, Rheinfelden, Fed. Rep. of Germany, and Jean-Marie Adam, Rosenau, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 18, 1991, Ser. No. 645,374
Claims priority, application Switzerland, Jan. 24, 1990, 227/90
Int. Cl.[5] C09B *31/10*
U.S. Cl. 534—756 6 Claims

1. An azo dye of formula

(1)

wherein R_1 is hydrogen or C_1–C_4alkyl, R_2 is C_2–C_4alkyl, R_3 is hydrogen, C_1–C_4alkyl or unsubstituted or substituted C_5–C_7-cycloalkyl or phenyl, and the benzene rings I and II are independently of one another either unsubstituted or substituted with a substituent selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, C_2–C_4alkanoylamino, hydroxy, sulfo, cyan, nitro, sulfamoyl, fluoro, chloro and bromo.

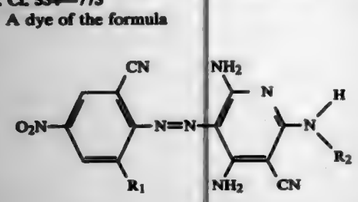
5,196,521

AZO DYES PREPARED USING 2-ALKYLAMINO-3-CYANO-4,6-DIAMINOPYRIDINES AS COUPLING COMPONENTS

Visvanathan Ramanathan, Basle, and Angelo D. Cass, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 24, 1991, Ser. No. 719,868
Claims priority, application Switzerland, Jun. 27, 1990, 2134/90
Int. Cl.[5] C09B *29/42*; D06P *1/18*
U.S. Cl. 534—773 5 Claims

1. A dye of the formula



(1)

in which R^1 is halogen and R_2 is unsubstituted open-chain alkyl or open-chain alkyl which is substituted by hydroxyl, alkoxy, phenoxy, halogen, cyano or phenyl, in which the alkyl and phenyl groups in these substituents are unsubstituted or substituted by hydroxyl, alkoxy or phenoxy.

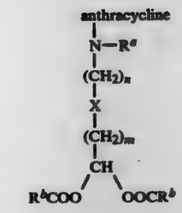
5,196,522

ANTHRACYCLINE ANALOGUES BEARING LATENT ALKYLATING SUBSTITUENTS

David Farquhar, and Abdallah Cherif, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Nov. 1, 1990, Ser. No. 608,149
Int. Cl.[5] C07H *15/24*
U.S. Cl. 536—6.4 18 Claims

1. A compound of the formula



where:
anthracycline is doxorubicin, or daunorubicin;
N is the 3'nitrogen of daunosamine;
R^a is H, methyl, ethyl, propyl or butyl;
X is O, S, CR^c_2 or NR^c, wherein R^c is H, methyl, ethyl, propyl or butyl;
R^b is methyl, ethyl, porpyl or butyl;
n is 1 to 6; and
m is 0 to 6.

5,196,523

CONTROL OF GENE EXPRESSION BY GLUCOSE, CALCIUM AND TEMPERATURE

Amy S. Lee, San Marino, Calif., assignor to The University of Southern California, University Park, Calif.

Continuation-in-part of Ser. No. 282,880, Dec. 5, 1988, abandoned, which is a continuation of Ser. No. 690,951, Jan. 1, 1985, abandoned. This application May 19, 1989, Ser. No. 354,988
Int. Cl.[5] C12N *15/11*, *15/00*
U.S. Cl. 536—23.5 2 Claims

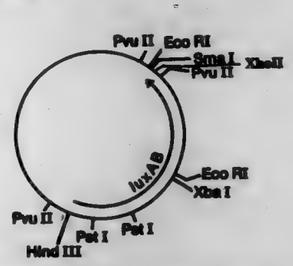
1. A recombinant DNA comprising the regulatory sequence of a gene encoding a glucose regulated protein which can effect transcription, or a functional fragment of the regulatory sequence which can effect said transcription, having the nucleic acid sequence for rat shown in FIG. 20.

5,196,524

FUSION REPORTER GENE FOR BACTERIAL LUCIFERASE

Gary D. Gustafson; Thomas D. Ingolia, both of Indianapolis; Gretchen Kirchner, Jeffersonville, and Jean L. Roberts, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 6, 1989, Ser. No. 294,170
Int. Cl.[5] C12N *15/00*
U.S. Cl. 536—23.2 24 Claims



1. A recombinant DNA encoding a fusion protein having bacterial luciferase activity comprising operable linked in the 5' to 3' direction, the coding region of the luxA gene, a DNA linker, and the luxB gene, wherein the coding region of the luxA and the luxB genes are isolated from *Vibrio harveyi* and the DNA linker consists essentially of TCTAGA.

5,196,525

DNA CONSTRUCT FOR ENHANCING THE EFFICIENCY OF TRANSCRIPTION

Joan C. McPherson, Vancouver, and Robert Kay, West Vancouver, both of Canada, assignors to University of British Columbia, Vancouver, Canada

Division of Ser. No. 395,155, Aug. 17, 1989, Pat. No. 5,164,316, which is a continuation of Ser. No. 147,887, Jan. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 2,780, Jan. 13, 1987, abandoned. This application Apr. 8, 1991, Ser. No. 682,049
Int. Cl.[5] C12N *5/14*, *15/67*, *15/82*; C07H *21/04*
U.S. Cl. 536—24.1 5 Claims

1. A DNA construct having as components, (a) a transcription initiation region including (i) a tandemly duplicated CaMV 35S enhancer sequence comprising an AluI-EcoRV fragment of a CaMV 35S upstream region; (ii) a promoter comprising an RNA polymerase binding site and an mRNA initiation site; (b) a nucleotide sequence of interest for transcription to mRNA; and (c) a termination region wherein said components are operably joined:

5,196,526

CDNA CLONE FOR T-CELL SUPPRESSOR INDUCER FACTOR

Kenneth D. Beaman, Gurnee, Ill., assignor to University of Health Sciences/The Chicago Medical School, North Chicago, Ill.

Filed Nov. 28, 1989, Ser. No. 442,116
Int. Cl.[5] C07H *21/04*
U.S. Cl. 536—3.51 10 Claims

1. A nucleic acid sequence encoding a polypeptide consisting of a T-cell suppressor inducer factor.

5,196,527

POROUS ION-EXCHANGED FINE CELLULOSE PARTICLES, METHOD FOR PRODUCTION THEREOF, AND AFFINITY CARRIER

Shigeru Ookuma, Hofu; Kouei Igarashi, Osaka; Masami Hara, Hofu; Kazuhiro Aso, Iberaki; Hideo Yoshidome, Kishiwada; Hiroshi Nakayama, Hirakata; Keizo Suzuki, and Kazuhiko Nakajima, both of Osaka, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

Division of Ser. No. 445,667, filed as PCT/JP89/00363 on Apr. 5, 1989, Pat. No. 5,108,596.
Claims priority, application Japan, Apr. 5, 1988, 63-82145; Apr. 8, 1988, 63-85350; Mar. 13, 1989, 1-57949
Int. Cl.[5] C08B *11/193*, *11/00*, *11/187*, *11/16*
U.S. Cl. 536—56 11 Claims

1. An affinity carrier comprising porous fine cellulose particles, said cellulose particles being characterized by
(a) comprising spherical or long spherical particles having a particle diameter of from 3 to 400 micrometers when wet,
(b) comprising a crystalline cellulose phase and an amorphous crystalline phase,
(c) having a crystallinity, determined by X-ray diffractometry, of 5 to 45%,
(d) in a relation between pore diameter and pore volume of particles subjected to critical drying, which is measured by a mercury porosimeter method, said cellulose particles having a maximum value of pore volume within a pore diameter range of 0.006 to 1 micrometer, and the total volume of pores within the above range is 0.1 to 3 ml/g,
(e) the amount of albumin that can be introduced into the cellulose particles is 30–330 mg/g, and
(f) having a pressure resistance in the wet state of 5 to 83 kg/cm^2.

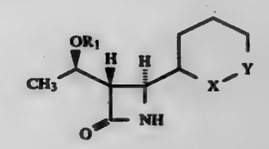
5,196,528

4-CYCLOHEXENYL AZETIDINONES AND EPOXY DERIVATIVES THEREOF

Alcide Perboni, San Giorgio di Mantova; Claudio Bisnara, Oppeano, and Giorgio Pentaruglia, Trento, all of Italy, assignors to Glaxo S.p.A., Verona, Italy

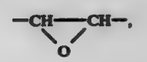
Filed Jul. 12, 1991, Ser. No. 729,146
Claims priority, application United Kingdom, Jul. 13, 1990, 9015485
Int. Cl.[5] C07D *205/08*, *405/08*, *487/04*
U.S. Cl. 540—200 9 Claims

1. Compounds of the formula (I)



(I)

in which R_1 represents a hydrogen atom or a hydroxyl protecting group and —X—Y— represents a group selected from —CH=CH— and



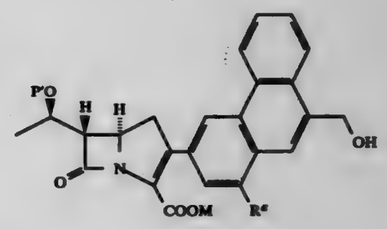
5,196,529

2-PHENANTHRENYL CARBAPENEM INTERMEDIATES

Frank P. Dininno, Old Bridge; Thomas N. Salzmann, North Plainfield, and Mark L. Greenlee, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 9, 1990, Ser. No. 594,895
The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.
Int. Cl.[5] C07D *487/04*
U.S. Cl. 540—300 3 Claims

1. A compound of the formula:



wherein
P' is a removable protecting group for hydroxy;
M is a removable protecting group for carboxy; and
R^a is selected from the group consisting of H, Cl, Br, I, SCH_3, CN, CHO, $SOCH_3$, SO_2CH_3, CO_2M, CH_2OP', $CONH_2$ and OP'.

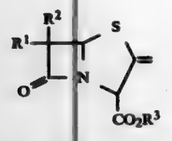
5,196,530

PROCESS FOR PREPARING 2-EXO-METHYLENEPENAM DERIVATIVES

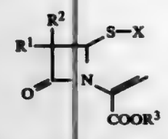
Sigeru Torii; Hideo Tanaka, both of Okayama; Masatoshi Taniguchi, Osaka; Michio Sasaoka, Tokushima; Takashi Shirai, Tokushima, and Yutaka Kaneyama, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1992, Ser. No. 848,939
Claims priority, application Japan, Mar. 11, 1991, 3-72449
Int. Cl.[5] C07D 499/00
U.S. Cl. 540—310 3 Claims

1. A process for preparing a 2-exo-methylenepenam of the formula



wherein R^1 is hydrogen, halogen, amino or protected amino; R^2 is hydrogen, halogen, lower alkoxyl, lower acyl, lower alkyl, lower alkyl substituted with hydroxyl or protected hydroxyl, hydroxyl or protected hydroxyl; R^1 and R^2 taken together represent =O; and R^3 is hydrogen or a carboxylic acid protecting group; which comprises cyclizing an allenyl-β-lactam of the formula



wherein R^1, R^2 and R^3 are as defined above and X is $—SO_2R^4$ or $—SR^4$, wherein R^4 represents phenyl, naphthyl, thiazol-2-yl, thiadiazol-2-yl, benzothiazol-2-yl, oxazol-2yl, benzoxazol-2-yl, imidazol-2-yl, benzoimidazol-2-yl, pyrimidinyl and pyridyl, optionally substituted by halogen, hydroxyl, nitro, cyano, aryl, lower alkyl, amino, mono lower alkylamino, di lower alkylamino, mercapto, lower alkyl alkylthio, arylthio, formyl or formyloxy, $R^6COO—$, $R^6CO—$, $R^6O—$ or $R^6OCO—$, wherein R^6 is lower alkyl or aryl, with a metallic reducing agent selected from the group consisting of lead, titanium, zirconium, gallium, bismuth and antimony, or a compound thereof.

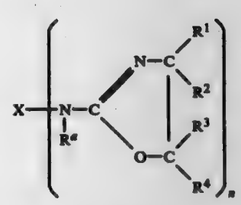
5,196,531

POLY(N-CYCLIC IMINOETHER), PROCESS FOR PRODUCTION THEREOF, THERMOSETTING COMPOSITION CONTAINING IT AND THERMOSET RESIN

Hiroyuki Umetani; Hiroshi Mera; Hiroo Inata, and Shunichi Matsumura, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 382,584, Jul. 20, 1989, abandoned. This application Aug. 18, 1992, Ser. No. 929,496
Claims priority, application Japan, Jul. 20, 1988, 63-178961; Dec. 19, 1988, 63-318475
Int. Cl.[5] C07D 263/00, 265/04
U.S. Cl. 544—72 5 Claims

1. A poly(N-cyclic iminoether) compound represented by the following formula (I)-A

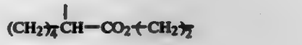


(I)-A

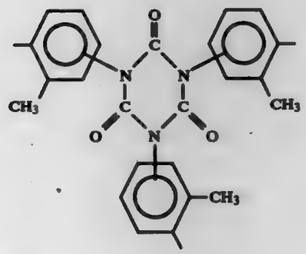
wherein R^1, R^2, R^3 and R^4 are identical or different and each represents a hydrogen atom, an alkyl group having 1 to 3 carbon atoms, a benzyl group, a phenyl group or a tolyl group,

R^a's are identical or different and each represents a hydrogen atom or a monovalent hydrocarbon group which may be interrupted by a heteroatom,

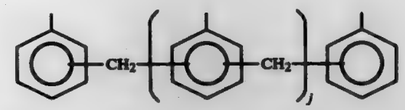
n is an integer of 2 to 10, and X is an n-valent hydrocarbon group selected from the group consisting of an alkylene group having 1 to 15 carbon atoms, an alicyclic hydrocarbon group having from 6 to 15 carbon atoms, a monocyclic or bicyclic aromatic hydrocarbon group having from 6 to 15 carbon atoms, a monocyclic or bicyclic aromatic hydrocarbon group interrupted by a heteroatom,



or

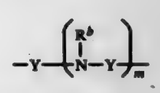


and



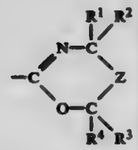
wherein j is a number of 1 to 8; and

when n is 2, X may be a direct bond or a group of the formula (a)



(a)

wherein Y is a divalent hydrocarbon group which may be interrupted by a heteroatom, m is an integer of 1 to 10, with the proviso that when m is an integer of 2 to 10, two or more R^b's may be the same or different, and R^b represents a hydrogen atom or a group of the formula



wherein R^1, R^2, R^3 and R^4 are as defined above, and Z is a direct bond or group of the formula

wherein R^5 and R^6 are identical or different and each represents a hydrogen atom, an alkyl group having 1 to 3 carbon atoms, a benzyl group, a phenyl group or a tolyl group.

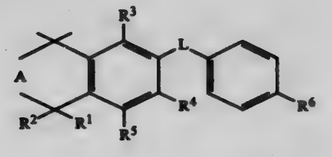
5,196,532

DIARYL-SUBSTITUTED HETEROCYCLIC COMPOUNDS, THEIR PREPARATION AND DRUGS AND COSMETICS OBTAINED THEREFROM

Hans-Heiner Wenst, Deusenheim; Bernd Janssen, Ludwigshafen, both of Fed. Rep. of Germany; William V. Murray, Belle Mead; Michael P. Wachter, Bloomsbury, both of N.J., and Stanley Bell, Narberth, Pa., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 476,875, Feb. 8, 1989, Pat. No. 5,061,705. This application Jun. 18, 1991, Ser. No. 717,264
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 3903993
Int. Cl.[5] C07D 413/02, 211/06, 263/34, 405/02, 333/12, 307/02
U.S. Cl. 544—114 7 Claims

1. A compound of the formula I:



I

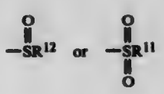
where R^1 and R^2 are each hydrogen or methyl, A is an ethylene or methylene radical which is unsubstituted or substituted by methyl, hydroxyl or oxo, L is furan, thiophene, pyrrole, isoxazole, oxazole, or thiazole radical which is unsubstituted or substituted by hydroxyl, mercapto, C_1–C_6-alkyl, or C_1–C_4-alkanoyl,

R^3 is hydrogen, a hydroxy or C_1–C_6-alkoxy group,

R^4 is hydrogen, C_1–C_4-alkyl, halogen or methoxy,

R^5 is hydrogen or methoxy or tert-butyl,

R^6 is hydrogen, methyl, nitrile or a C_2–C_{10}-ketal group of the radical $—CHR^7OR^8$, $—CHR^7—NR^9R^{10}$, $—COR^{11}$, $—SR^{12}$,



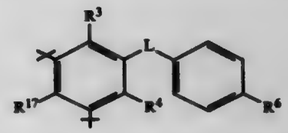
in which

R^7 is hydrogen or C_1–C_4-alkyl,

R^8 is hydrogen, C_1–C_4-alkyl or C_1–C_{20}-alkanoyl or is benzoyl which is unsubstituted or substituted by methoxy, nitro, methyl or chlorine,

R^9 and R^{10} are each hydrogen, C_1–C_6-alkyl or C_1–C_6-alkanoyl or are each benzoyl which is unsubstituted or substituted as for R^8, or R^9 and R^{10} together with the nitrogen atom to which they are bonded, form a pyrrolidino, piperidino or morpholino ring, R^{11} is hydrogen, C_1–C_4-alkyl $—OR^{13}$ or $—NR^{14}R^{15}$, where R^{13} is hydrogen, unsubstituted or hydroxyl-substituted C_1–C_6-alkyl, aryl or aralkyl which is unsubstituted or substituted by chlorine, bromine, methyl, methoxy or nitro, substitution in the case of the aralkyl group being in the aryl moiety, and where R^{14} and R^{15} are each hydrogen, unsubstituted or hydroxyl-substituted C_1–C_6-alkyl or an aralkyl or aryl group which is unsubstituted or substituted as for R^{13}, or R^{14} and R^{15}, together with the nitrogen atom to which they are bonded, form a pyrrolidino, piperidino or morpholino ring, and

R^{12} is C_1–C_4-alkyl, and compounds of formula Ia



Ia

where R^3, R^4, R^6 and L have the abovementioned meanings and R^{17} is hydrogen or hydroxyl, and their physiologically tolerated salts.

5,196,533

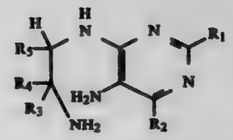
CYCLIZATION OF 5 AMINO-PYRIMIDINES TO QUINOID 6,6 DISUBSTITUTED DIHYDROPTERIDINES

June E. Ayling, and Steven W. Bailey, both of Mobile, Ala., assignors to South Alabama Medical Science Foundation, USA, Mobile, Ala.

Division of Ser. No. 483,708, Apr. 11, 1983, abandoned, and a continuation of Ser. No. 910,327, Sep. 22, 1986, abandoned, and a continuation of Ser. No. 161,292, Feb. 18, 1988, abandoned. This application Mar. 14, 1991, Ser. No. 669,662
Int. Cl.[5] C07D 475/04
U.S. Cl. 544—118 4 Claims

1. A method of synthesizing quinoid 6,6-disubstituted dihydropteridines which comprises the steps of:

(a) addition of an oxidant selected from the group consisting of bromine, iodine, hypochlorite, ferricyanide, bromate, iodate, periodate, or dichlorophenol-indophenol to a solution of a 6-(2'-amino-2',2'-disubstituted-ethylamino)-5-amino-pyrimidine of the formula (XIX) in an acidic medium comprising a mixture of nonaqueous solvent and water, said water being in an amount between one mole of water per mole of said 6-(2'-amino-2',2'-disubstituted-ethylamino)-5-amino-pyrimidine and 33% of the total volume of said medium, whereby a 5-imino-quinoid pyrimidine is formed;

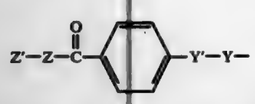


XIX

(b) adjusting the pH of said acidic medium to between pH 1 and pH 3 after said addition of an oxidant, whereby hydrolysis of said 5-imino-quinoid pyrimidine occurs;

(c) neutralizing said acidic medium, whereby intramolecular condensation occurs to give said quinoid 6,6-disubstituted dihydropteridine;

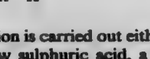
wherein R_1 and R_2 are the same or different and represent
(1) hydrogen;
(2) hydroxy;
(3) alkoxy of 1 to 4 carbon atoms;
(4) amino of the formula $—NR_6R_7$, wherein R_6 and R_7 are the same or different and represent
(a) hydrogen;
(b) alkyl of 1 to 4 carbon atoms; or
(c) cycloalkyl of 3 to 6 carbon atoms;
(5) cycloamino selected from
(a) aziridino,
(b) azetidino,
(c) pyrrolidino,
(d) piperidino, and
(e) morpholino, wherein said cycloamino is attached to the pyrimidine ring of said formula through a nitrogen of said cycloamino;
(6) alkylthio of 1 to 3 carbons; or
(7) benzylthio;
with the provision that not more than one of R_1 and R_2 is hydrogen; R_3 and R_4 are the same or different and represent
(1) alkyl of 1 to 12 carbon atoms;
(2) alkenyl of 2 to 7 carbon atoms;
(3) alkynyl of 2 to 7 carbon atoms;
(4) cycloalkyl, saturated or unsaturated, of 3 to 10 carbon atoms with 3 to 7 atoms in the ring;
(5) bicycloalkyl, saturated or unsaturated, of 6 to 13 carbon atoms with 4 to 7 atoms per ring;
(6) adamantyl;
(7) alkyl of 1 to 12 carbon atoms or alkenyl of 2 to 7 carbon atoms, substituted with 1, 2, 3 or 4 of hydroxy, protected amino, oxo, or thio; phosphate, or fluoro, with the proviso that when the number of carbons is greater than one the number of substituents is no greater than the number of carbon atoms in R_3 or R_4;
(8) aryl, wherein aryl is phenyl or naphthyl;
(9) arylalkyl of 7 to 13 carbon atoms;
(10) aryl or arylalkyl substituted with 1, 2, or 3 alkyl of 1 to 4 carbon atoms, trifluoromethyl, hydroxy, alkoxy of 1 to 4 carbon atoms, fluoro, chloro, bromo, amino, methylamino, or dimethylamino in the aryl group;
(11) thienyl, thienylmethyl;
(12) furyl, furylmethyl;
(13) tetrahydrofuryl;
(14) pyridyl, pyridylmethyl;
(15) pyridyl substituted with 1, 2, or 3 alkyl of 1 to 4 carbon atoms, amino, hydroxy, chloro, or fluoro;
(16) a group consisting of



wherein Y is methylene or ethylene either of which is unsubstituted or is substituted with 1 or 2 substituents selected from fluoro, chloro, and methyl; Y′ is
(a) $—NR_{10}—$, wherein R_{10} is hydrogen; formyl; formimino; hydroxymethyl; alkyl of 1 to 3 carbon atoms; or alkenyl or alkynyl of 2 to 3 carbon atoms,
(b) —O—, or
(c) —S—; and
ZZ′ is OH, C_1–C_4 alkoxy, NH_2, or an amino acid residue of the formula ZZ wherein ZZ represents the residue of an amino acid or amino acid polymer of the formula

wherein Z represents OH, C_1–C_4 alkyloxy, or NH_2, R represents a divalent alkyl radical of 1 to 5 carbons, and Z^1 represents protected NH_2 or COZ^2 where Z^2 is Z or the residue of an amino acid or amino acid polymer of the formula

where the total number of amino acid residues in ZZ does not exceed 7 and each Z, R, Z^1 and Z^2 operates independently in defining ZZ;
(17) carboxyl, or
(18)



wherein R_{12} is a 1- to 22-carbon alkyl or alkenyl group; and R_5 is
(1) hydrogen,
(2) alkyl of 1 to 6 carbon atoms,
(3) cycloalkyl of 3 to 7 carbon atoms,
(4) phenyl, phenylmethyl,
(5) alkoxy of 1 to 4 carbon atoms, or
(6) carboxyl;
with the provisions that (i) R_3 and R_4 together may form a 3- to 7-carbon spiro alkyl ring, with carbon 6 of the pteridine ring being the spiro carbon; (ii) R_4 and R_5 together may form a 5- or 6-membered carbocyclic ring fused to pteridine carbons 6 and 7.

5,196,534

PROCESS FOR THE PREPARATION OF LACTAM DERIVATIVES

John W. F. Whitehead; Keith Mills, both of Ware; Ian H. Coates, Hertford; Alexander W. Oxford, and Peter C. North, both of Royston, all of England, assignors to Glaxo Group Limited, London, England

Filed May 22, 1991, Ser. No. 704,099
Claims priority, application United Kingdom, May 23, 1990, 9011469
Int. Cl.[5] C07D 471/04
U.S. Cl. 546—86 9 Claims

1. A process for the preparation of a compound of formula (I):

(I)

wherein R represents a hydrogen atom or a methyl or ethyl group, which comprises: cyclising a compound of formula (IV)

(IV)

whereby said cyclisation is carried out either in the presence of 80 to 100% w/w sulphuric acid, a mixture of 100% w/w sulphuric acid and glacial acetic acid, 85% orthophosphoric acid or a hydrocarbylsulphonic acid; and

when R represents a hydrogen atom, optionally alkylating the compound of formula (I) to produce the compound of formula (I) in which R is methyl or ethyl.

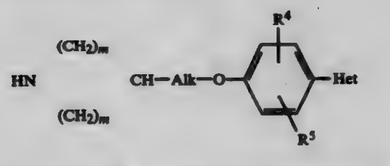
5,196,535

INTERMEDIATES FOR PRODUCING ANTIPICORNAVIRAL PYRIDAZINAMINES

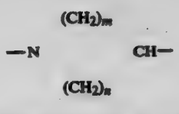
Raymond A. Stokbroekx, Beerse; Marcel G. M. Luyckx, Geel; Gilbert A. J. Grauwels, Kessel-Lo, and Cyriel A. M. Van der Eycken, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 618,775, Jan. 27, 1990, Pat. No. 5,100,893, which is a continuation-in-part of Ser. No. 510,635, Apr. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 456,395, Dec. 26, 1989, abandoned. This application Nov. 8, 1991, Ser. No. 789,563
Int. Cl.[5] C07D 271/06
U.S. Cl. 546—209 8 Claims

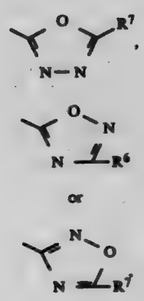
1. A compound of the formula:



an acid addition salt or a stereochemically isomeric form thereof, wherein:
one or two carbon atoms of the CH_2 groups of the



moiety may be substituted with C_{1-4}alkyl or C_{1-4}alkyloxy;
m and n each independently represent 1, 2, 3, or 4 with the sum of m and n being 3, 4 or 5;
Alk represents C_{1-4}alkanediyl;
R^4 and R^5 each independently represent hydrogen, C_{1-4}alkyl or halo; and
Het represents a group of the formula:



(a)

(b)

or

wherein:
R^6 represents hydrogen; C_{1-6}alkyl; hydroxyC_{1-6}alkyl; C_{3-6}cycloalkyl; aryl; arylC_{1-4}alkyl; C_{1-4}alkyloxyC_{1-4}alkyl; C_{3-6}cycloalkylC_{1-4}alkyl; trifluoromethyl or amino; and
each R^7 independently represents hydrogen; C_{1-6}alkyl; C_{3-6}cycloalkyl; aryl; arylC_{1-4}alkyl; C_{1-4}alkyloxyC_{1-4}alkyl; C_{3-6}cycloalkylC_{1-4}alkyl or trifluoromethyl,
wherein each aryl independently represents phenyl or phenyl substituted with 1 or 2 substituents each independently selected from halo, C_{1-4}alkyl, trifluoromethyl, C_{1-4}alkyloxy or hydroxy.

5,196,536

2-FLUORO-1-METHYLPYRIDINIUM SALT ACTIVATED DIOLS AND POLYOLS AS CROSS-LINKERS

Thai T. Ngo, Irvine, and Faizy Ahmed, Anaheim, both of Calif., assignors to UniSyn Fibertec Corporation, Tustin, Calif.

Division of Ser. No. 404,930, Sep. 8, 1989, Pat. No. 5,130,436.
This application Apr. 16, 1992, Ser. No. 869,507
Int. Cl.[5] C07D 213/64
U.S. Cl. 546—261 6 Claims

1. A method of cross-linking at least two organic molecules each with at least one substituent independently selected from the group consisting of primary amino, secondary amino and sulfhydryl, said method comprising reacting said at least two organic molecules with a cross-linker which comprises a monomeric organic compound having at least two hydroxyl groups each bound to a different carbon atom, said at least two hydroxyl groups having been activated by reaction with 2-fluoro-2-methylpyridinium toluene-4-sulfonate.

5,196,537

5-APYLHETEROARYLALKYL-1,3,5-TRISUBSTITUTED-1,2,4-TRIAZOLE COMPOUNDS FOR TREATMENT OF CIRCULATORY DISORDERS

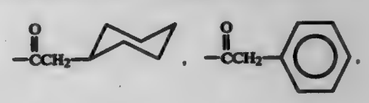
David B. Reitz, Chesterfield, Mo., assignor to G. D. Searle & Co., Chicago, Ill.

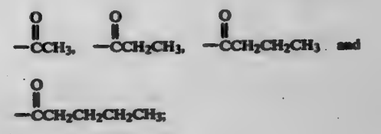
Filed Mar. 21, 1991, Ser. No. 674,276
Int. Cl.[5] C07D 401/06; A01N 43/40
U.S. Cl. 546—276 26 Claims

1. A compound of the formula

wherein R^1 is selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl, tert-butyl, isopentyl, n-pentyl, neopentyl, phenyl, benzyl, phenethyl, cyclohexyl, cyclohexylmethyl, 2-butenyl, 3-butenyl, 2-butynyl, 3-butynyl and 2-hydroxybutyl; wherein R^2 is selected from ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, isobutyl, isopentyl, tert-butyl, n-pentyl, neopentyl, 1,1-difluoro-2-phenylethyl, 1,1-difluoro-2-cyclohexylethyl, 2-cyclohexylethyl, 1,1-difluoro-3-cyclohexylpropyl, 1,1-dimethoxybutyl, 1,1-difluoroethyl, 1,1-difluoropropyl, 1,1-difluorobutyl, 1,1-difluoropentyl, benzyl, 2-phenylethyl, 1,1-difluoro-3-phenylpropyl, cyclohexylmethyl, cyclohexanoyl, acetyl, 1-butenyl, 2-butenyl, 3-butenyl, 1-butynyl, 2-butynyl, 3-butynyl, propylthio, butylthio,

(c)





and

wherein R^5 is COOH or

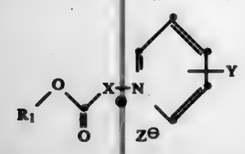
or a tautomer thereof or a pharmaceutically-acceptable salt thereof.

5,196,538
ESTER-CONTAINING QUATERNARY PYRIDINIUM SALTS

John W. Wilson, Rochester, and Alexandra D. Bernal, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1991, Ser. No. 734,353
Int. Cl.[5] C07D *213/55*
U.S. Cl. 546—301 8 Claims

1. An ester-containing quaternary pyridinium salt useful in electrostatographic toners as a charge control agent having the structure;



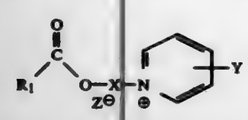
wherein R_1 is alkyl, phenyl, naphthyl or anthryl, X is $-(CH_2)_n-$, Y is hydrogen, alkyl, alkoxy or halogen, $Z^{\ominus}$ is an anion selected from the group consisting of tosylate, tetraphenylborate and m-nitrobenzenesulfonate and n is an integer from 1 to 6.

5,196,539
ESTER-CONTAINING QUATERNARY PYRIDINIUM SALTS

John W. Wilson, Rochester, and Alexandra D. Bernal, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1991, Ser. No. 734,355
Int. Cl.[5] C07D *213/55*
U.S. Cl. 546—301 9 Claims

1. An ester-containing quaternary pyridinium salt useful in electrostatographic toners as a charge control agent having the structure:



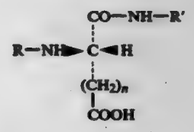
wherein R_1 is alkyl, phenyl, naphthyl or anthryl, X is $-CH_2-_n$, Y is hydrogen, alkyl, alkoxy or halogen, $Z^{\ominus}$ is an anion selected from the group consisting of tosylate, tetraphenylborate and m-nitrobenzenesulfonate and n is an integer from 2 to 6.

5,196,540
SWEETENING AGENT DERIVED FROM L-ASPARTIC OR L-GLUTAMIC ACID

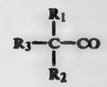
Claude Nofre, 119, Cours Albert Thomas, 69003 Lyon, and Jean-Marie Tinti, 5, Avenue de Grenoble, 69330 Meyzieu, both of France

Filed Oct. 23, 1990, Ser. No. 601,623
Claims priority, application France, Oct. 24, 1989, 89 14236
Int. Cl.[5] C07D *213/75*
U.S. Cl. 546—309 9 Claims

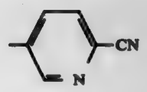
1. A sweetening agent of the formula:



in which:
R is an acyl group of the formula



in which:
R_1 is a methyl radical;
R_2 is a hydrogen atom or a methyl radical;
R_3 is an alkyl radical having 4 carbon atoms or a phenoxy radical;
n is equal to 1 or 2; and
R′ is a group of the formula:

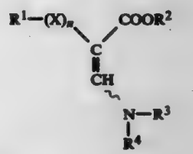


5,196,541
PROCESS FOR THE PREPARATION OF SUBSTITUTED 3-AMINOACRYLIC ESTERS

Herbert Gayer, Monheim-Baumberg; Alexander Klausener, Krefeld; Peter C. Knüppel, Wermelskirchen, all of Fed. Rep. of Germany, and Fritz Maurer, Yuki, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

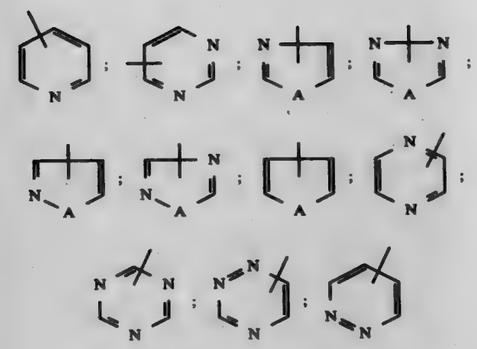
Filed Aug. 2, 1991, Ser. No. 739,746
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025892
Int. Cl.[5] C07D *261/14, 277/38, 229/34, 227/10, 231/38*
U.S. Cl. 546—312 5 Claims

1. Process for the preparation of 3-aminocrylic esters of the general formula (I)

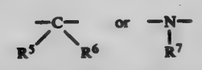


(I)

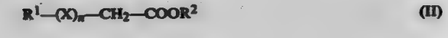
in which
R^1 represents a carbo- or heterocycle, each of which is optionally substituted, wherein the heterocycle is:



which are optionally benzo-fused and in which
A represents oxygen, sulphur or an NH group, suitable substituents in each case being halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkylthio, each of which has 1 to 6 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio, each of which has 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, in each case straight-chain or branched alkoxycarbonyl, alkoximinoalkyl, dialkylamino or dialkylaminocarbonyl, each of which has 1 to 4 carbon atoms in the individual alkyl moieties, in each case straight-chain or branched alkenyl or alkynyl, each of which has 2 to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, divalent alkanediyl having 3 to 5 carbon atoms, or aryl, aryloxy, arylthio, arylcarbonyl, aralkyl, aralkenyl, aralkinyl, aralkyloxy, aralkythio, heteroarylalkyl, heteroarylalkenyl, heteroaryloxy, heteroarylthio, heteroarylcarbonyl, heteroarylalkyloxy, heteroarylalkylthio or heteroaryl, each of which has 6 to 10 carbon atoms in the aryl moiety or 2 to 9 carbon atoms and 1 to 4 identical or different hetero atoms selected from nitrogen, oxygen or sulphur—in the heteroaryl moiety and if appropriate 1 to 6 carbon atoms in the straight-chain or branched alkyl moiety or if appropriate 2 to 6 carbon atoms in the straight-chain or branched alkenyl moiety or alkinyl moiety, each of which is optionally monosubstituted or polysubstituted in the aryl moiety or in the heteroaryl moiety by identical or different substituents from the series comprising
halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, dioxyalkylene, halogen-substituted dioxyalkylene or optionally substituted phenyl;
R^2 represents optionally substituted alkyl,
R^3 and R^4 either independently of one another in each case represent optionally substituted alkyl, or together with the nitrogen atom to which they are bonded represent a 1-pyrrolidinyl, 1-piperidinyl or 4-morpholinyl radical,
X represents oxygen, sulphur or one of the radicals

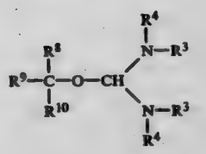


and n represents a number 0 or 1, where
R^5, R^6 and R^7 independently of one another in each case represent hydrogen or represent alkyl or alkenyl, each of which is optionally substituted,
characterised in that substituted acetic esters of the formula (II)



(II)

in which
R^1, R^2, X and n have the abovementioned meaning, are reacted with orthoformic acid diamide esters of the formula (III)



(III)

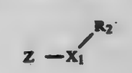
in which
R^8 represents hydrogen or alkyl,
R^9 and R^{10} either independently of one another in each case represent alkyl, or together with the carbon atom to which they are bonded represent a cycloalkyl radical, and
R^3 and R^4 have the abovementioned meaning, optionally in the presence of a diluent.

5,196,542
CYCLIC HYDROCARBONS WITH AN AMINOALKYL SIDECHAIN

Roy A. Johnston, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

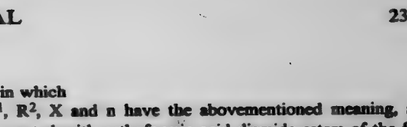
Division of Ser. No. 394,396, Aug. 15, 1989, which is a division of Ser. No. 117,851, Jun. 16, 1987, Pat. No. 4,917,826, which is a continuation-in-part of Ser. No. 843,120, Mar. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,995, Oct. 18, 1985, abandoned. This application Feb. 20, 1991, Ser. No. 657,721
Int. Cl.[5] C07D *213/38, 313/50*; A61K *31/58, 31/44*
U.S. Cl. 546—326 3 Claims

1. A compound of the formula

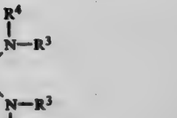


Formula I

wherein Z is 4-bicyclohexenylcyclohexyl,
wherein X_1 is NR_1;
wherein R_1 is



—CH(CH_2OH)—CH(OH) (phenyl), —CH(phenyl)$_2$, -(phenyl)—CH_2-(3-pyridinyl), or

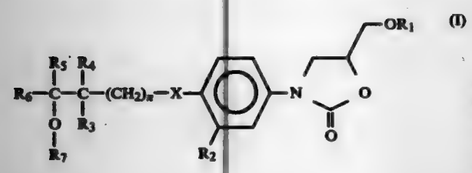


wherein R_8 is hydrogen;
wherein X_7 and X_8 are the same or different and are hydrogen, —CH_3, —CF_3, halogen, —OH, —OCH_3, —NO_2, —NR_4R_4, —$SO_2N(R_3)$ (R_4), —CO_2R_4, —$CON(R_3)$ (R_4), —$CH_2N(R_3)$ (R_4), or tetrazolyl;
wherein R_2 is hydrogen, or -C_1–C_3 alkyl;

wherein R_3 and R_4 are hydrogen, $-C_1$–C_2 alkyl, $—CH_2OH$, or nothing;
wherein r is 1–8; and
pharmacologically acceptable salts thereof.

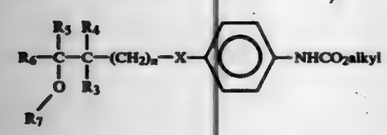
5,196,543
3-ARYLOXAZOLIDINONE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR USE IN THERAPY
Francois X. Jarreau, Versailles; Vincenzo Rovei, Rueil Malmaison; Jean-Jacques Koenig, Maisons Laffitte, and Alain R. Schoffit, Paris, all of France, assignors to Delalande S.A., Courbevoie, France
Division of Ser. No. 597,583, Oct. 15, 1990, Pat. No. 5,036,091. This application Jul. 19, 1991, Ser. No. 733,105
Claims priority, application France, Oct. 17, 1989, 89 13555
The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.
Int. Cl.[5] C07D *263/24*
U.S. Cl. 548—232 **7 Claims**

1. A process for preparing a compound of the formula:



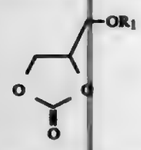
(I)

wherein:
R_1 is C_1–C_4 alkyl;
X is an oxygen atom, a methylene group of a CH═CH group;
n is 1 or 2 when X is an oxygen atom or a methylene group and 0 or 1 when X is a —CH═CH-group;
each or R_3 and R_4 is independently H, C_1–C_4 alkyl, C_4–C_7 cycloalkyl, phenyl of benzyl;
R_5 is H or C_1–C_4 alkyl;
R_6 is C_1–C_4 alkyl, CHF_2, CF_3CH_2, C_4–C_7 cycloalkyl, phenyl or benzyl;
R_4 and R_6 may further form together a $—(CH_2)_3—$ or $—(CH_2)_4—$ chain;
R_5 and R_6 may further form together a $—(CH_2)_4—$ or $—(CH_2)_5—$ chain; and
R_7 if H, C_1–C_4 alkyl, C_2–C_5 acyl or benzyl;
said compounds being in the form of diastereoisomers or enantiomers or in the cis- or trans-form or in the form of a mixture of all these forms, including the racemic forms, said process comprising the steps of:
cyclizing a compound of the formula:



(II)

wherein n, X and R_3 to R_7 have the same meaning as in formula (I), with a compound of the formula:

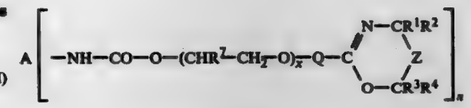


(III)

wherein R_1=C_1–C_4 alkyl, and when said reaction occurs in the presence of (III) said reaction also occurs in the presence of K_2CO_3 under heating.

5,196,544
CYCLIC OLIGOIMINOETHERS
Brigitte Haase, Erkrath; Horst-Juergen Krause, Duesseldorf, both of Fed. Rep. of Germany, and William Fristad, Santa Rosa, Calif., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Jan. 16, 1992, Ser. No. 776,247
Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915874
Int. Cl.[5] C07D *263/14, 265/08*
U.S. Cl. 548—238 **19 Claims**

1. Bis-, tris-, and tetrakis-iminoethers corresponding to formula I:

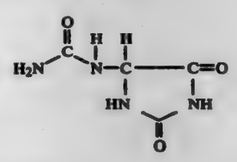


I

in which A is an aliphatic, aromatic or araliphatic group containing 4 to 40 carbon atoms and n free valencies at various carbon atoms; x has a value from 0 to 40; n has a value of 2, 3 or 4; Z is either a direct bond or the group CR^5R^6; the substituents R^1 to R^6 independently of one another are H, alkyl or aryl having up 8 carbon atoms; the substituent R^7 is selected from the group consisting of hydrogen, methyl and ethyl and Q is a phenylene group, which may be substituted by one or two methyl groups, or the group —CHR—M—, where R is selected from the group consisting of H, alkyl or alkenyl and M is selected from the group consisting of alkylene, alkenylene, arylene and alkarylene, and the parts R and M of the molecule independently of one another have 0 to 12 carbon atoms and may be substituted by a C_{1-3} alkoxy group.

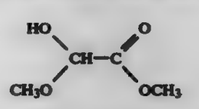
5,196,545
PROCESS FOR THE PREPARATION OF ALLANTOIN
Karl Schermanz, Graz, and Klaus Fitzinger, Linz, both of Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria
Filed May 30, 1991, Ser. No. 714,281
Claims priority, application Austria, Jun. 5, 1990, A 1210/90
Int. Cl.[5] C07D *233/88*
U.S. Cl. 548—311 **3 Claims**

1. Process for the preparation of (2,5-dioxo-4imidazolinyl-)urea (allantoin) of the formula



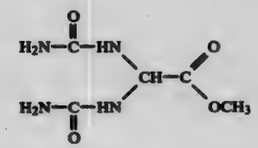
I

comprising reacting
a) methyl glyoxylate methyl hemiacetal of the formula



II

with urea in the presence of catalytic amounts of an inorganic acid at a pH-value of 1.0–2.0 to give a compound of the formula

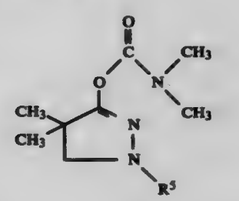


III

and then carrying out
b) the ring-closure reaction at a pH-value of 7.0–9.0.

5,196,546
SELECTIVE PYRAZOLINE INSECTICIDES AND FUNGICIDES
John J. Delany, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 478,881, Feb. 12, 1990, Pat. No. 4,999,368. This application Dec. 21, 1990, Ser. No. 633,643
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.
Int. Cl.[5] C07D *231/06*
U.S. Cl. 548—379 **13 Claims**

1. A compound having the structure:



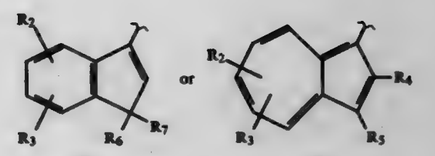
wherein:
R^5 is selected from the group consisting of substituted alkyl of 1–10 carbon atoms, substituted aryl of 6–20 carbon atoms, and cycloalkyl of 5 or 6 nuclear atoms, wherein the substituent on the alkyl is selected from straight or branched alkyl of 1 to 6 carbon atoms, aryl of 6 to 12 carbon atoms, halogen, alkoxy of 1 to 6 carbon atoms, N,N-dialkylcarbamoyloxy where each alkyl has from 1 to 6 carbon atoms or (N,N-dialkylcarbamoyl)methanesulfonamido with each alkyl portion having from 1 to 6 carbon atoms and the substituent on the aryl is selected from aryl of 6 to 12 carbon atoms, alkoxy of 1 to 6 carbon atoms, N,N-dialkylcarbamoyloxy where each alkyl has from 1 to 6 carbon atoms or (N,N-dialkylcarbamoyl)methanesulfonamido.

5,196,547
MESO-AZACYCLIC AMIDES OF IMIDAZOPYRIDINE CARBOXYLIC ACIDS AND ANALOGS THEREOF
Daniel P. Becker, Glenview; Daniel L. Flynn, Mundelein; Alan E. Moormann, Skokie; Roger Nosal, Buffalo Grove, and Clara I. Villamil, Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.
Division of Ser. No. 666,278, Mar. 7, 1991, Pat. No. 5,137,893. This application Jun. 10, 1992, Ser. No. 896,293
Int. Cl.[5] C07D *487/04;* A61K *31/40*
U.S. Cl. 548—453 **6 Claims**

1. A compound of the formula

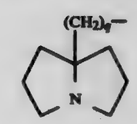
Ar—CO—X—Z

the stereoisomers and pharmaceutically acceptable salts thereof, wherein Ar represents a radical of the formula:



D E

wherein in Group D, one of R_6 or R_7 is C_{1-6} alkyl and the other is C_{1-6} alkyl, phenyl or phenyl C_{1-4} alkyl optionally substituted in either phenyl ring by one or two of C_{1-6} alkyl, C_{1-6} alkoxy, or halogen, or R_6 and R_7 together are C_{2-6} polymethylene or C_{2-5} polymethylene interrupted by an —O—linkage, R_2 and R_3 are independently H or halogen;
wherein in Group E, R_4 is H or C_{1-6} alkoxy, R_5 is H or C_{1-6} alkoxy, R_2 is H, halogen, CF_3, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6}-alkylthio, C_{1-6} alkylsulfonyl, C_{1-6} alkylsulfinyl, C_{1-7} acyl, cyano, C_{1-6} alkoxycarbony, C_{1-7} acylamino, hydroxy, nitro, amino, aminocarbonyl, or aminosulfonyl, optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl and C_{1-4}alkyl or disubstituted by C_4 or C_5 polymethylene; phenyl or phenyl C_{1-4} alkyl group optionally substituted in the phenyl ring by one or two of halogen, C_{1-6} alkoxy or C_{1-6} alkyl groups, R_2 and R_3 are independently H or halogen;
X is NH or O; and
Z represents a radical of the formula



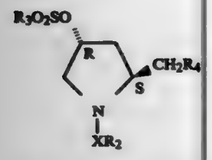
wherein q is 1 or 2.

5,196,548
PREPARATION OF DIAZABICYCLIC INTERMEDIATES
Tasnim F. Brunis, Ledyard, and Darrell E. Fox, Pawcatuck, both of Conn., assignors to Pfizer Inc., New York, N.Y.
Continuation of Ser. No. 665,380, Mar. 4, 1991, abandoned, which is a division of Ser. No. 423,063, Oct. 18, 1989, Pat. No. 5,036,153, which is a continuation-in-part of Ser. No. 350,423, May 11, 1989, abandoned. This application Jul. 2, 1992, Ser. No. 908,840
Int. Cl.[5] C07D *209/02*
U.S. Cl. 548—453 **12 Claims**

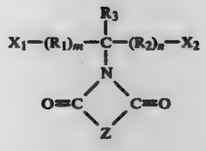
1. A process for preparing a compound of the formula

IA

or the enantiomer, racemate, or acid addition salt thereof, wherein Y is hydrogen or XR_2, R_1 is hydrogen or C_1–C_6 alkyl, and X and R_2 are as defined below, which comprises
(a) reacting a compound of the formula



III



or the enantiomer or the racemate thereof, wherein X is SO_2 or CO_2, R_2 and R_3 are each independently C_1–C_6 alkyl, trifluoromethyl, benzyl, or phenyl optionally substituted by one or two C_1–C_6 alkyl, halogen, nitro, methoxy or trifluoromethyl, and R_4 is halogen or OSO_2R_3 wherein R_3 is as defined above, with a (C_1–C_6)alkylamine or ammonia to form a compound of the formula IA wherein Y is XR_2, and X, R_1 and R_2 are as defined above, and, if desired,

(b) reducing or hydrolyzing the compound of formula IA wherein Y is XR_2 to form a compound of formula IA wherein Y is hydrogen.

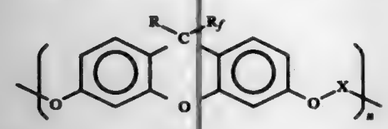
5,196,549

POLYETHERS BASED ON 9,9-BIS-PERFLUOROALKYL-3,6-DIHYDROXY-XANTHENE OR 9-ARYL-9-PERFLUOROALKYL-3,6-DIHYDROXY-XANTHANE

Brian C. Auman, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1991, Ser. No. 714,222
Int. Cl.[5] C07D *209/48, 311/82*
U.S. Cl. 548—462 5 Claims

1. A composition comprising a polyether of the structure:



wherein

R_f is perfluoroalkyl of 1–16 carbon atoms,

R is selected from the group consisting of aryl, and perfluoroalkyl of 1–16 carbon atoms,

n is an integer, greater than zero and

—X— is a bivalent radical selected from the group consisting of aryl sulfone radical, aryl ketone radical, imide radical and mixtures thereof.

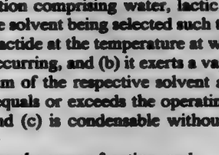
5,196,550

MALEIMIDO GROUP CONTAINING MONOMERS

Carl J. Long, II, Elyria; William F. Masler, Hinckley; William R. Wilbur, Avon Lake; Gary L. Julian, Parma, and Julius Farkas, Westlake, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 30, 1990, Ser. No. 516,409
Int. Cl.[5] C07D *207/444*
U.S. Cl. 548—548 8 Claims

1. A reactive multifunctional monomer comprising the following formula:



wherein

X_1 and X_2 are organic reactive sites selected from the group consisting essentially of OH, NHR, COOH, SH, H_2C=CH—, Cl and Br with proviso that only one of X_1 or X_2 may be OH;

m an n are the same or different and are 0 or 1;

R_1 and R_2 are the same or different and represent any organic substituent selected to optimize the properties of said multifunctional monomer depending upon its desired end use while not adversely affecting the reactivity of X_1 or X_2 or the properties of said multifunctional monomer;

R and R_3 may be H or any organic substituent selected to optimize the properties of said multifunctional monomer depending upon its desired end use while not adversely affecting the reactivity of X_1 or X_2 or the properties of said multifunctional monomer; and

Z is an ethylenically unsaturated hydrocarbyl group wherein at least one alkyl group is bonded to a carbon of the ethylenically unsaturated group and wherein said hydrocarbyl group totals from 3 to about 12 carbon atoms, and wherein said ethylenically unsaturated group is capable of undergoing a 2+2 cyclo-addition reaction with another like group.

5,196,551

CO-VAPORIZATION PROCESS FOR PREPARING LACTIDE

Kamlesh K. Bhatia, Newark, and James V. Tarbell, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1991, Ser. No. 719,952
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] C07D *319/00*
U.S. Cl. 549—274 9 Claims

1. A co-vaporization process for converting lactic acid oligomer to lactide, which comprises:

(i) heating an oligomer of lactic acid in the presence of a depolymerization catalyst and an water-immiscible high-boiling inert solvent in a reaction zone to a temperature and at a pressure which will vaporize the solvent and depolymerize the oligomer to lactide while forming a vapor fraction comprising water, lactic acid, lactide and solvent, the solvent being selected such that (a) it is distillable with lactide at the temperature at which depolymerization is occurring, and (b) it exerts a vapor pressure such that the sum of the respective solvent and lactide vapor pressures equals or exceeds the operating pressure of the process, and (c) is condensable without using refrigeration;

(ii) condensing the vapor fraction, and

(iii) recovering the lactide from the condensate.

5,196,552

PREPARATION OF CYCLIC ETHERS

K. Pushpananda A. Samaratne; Patrick S. Bynum; Kenneth C. Lilje, and Edward F. Zaweski, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 2, 1991, Ser. No. 769,644
Int. Cl.[5] C07D *309/18, 311/94, 307/28*
U.S. Cl. 549—396 10 Claims

1. A mixture of cyclic ethers prepared by the process comprising reacting a mixture of an oligomer derived from an alpha-olefin monomer containing from about 6 to 20 carbon atoms and an aliphatic aldehyde in the presence of an acid catalyst.

5,196,553

PREPARATION PROCESS FOR AMINOANTHRAQUINONE DERIVATIVES

John H. Brady, Tottington; Peter J. Brogden, Shotton, and Malcolm B. Nield, Moseley, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 25, 1991, Ser. No. 720,549
Claims priority, application United Kingdom, Jun. 26, 1990, 9014234
Int. Cl.[5] C07C *303/30, 307/02*
U.S. Cl. 552—225 18 Claims

1. A process for the preparation of aminoanthraquinone derivatives which comprises reacting (A) bromaminic acid or a metal salt thereof with (B) an aromatic sulphonamide having at least one reactive hydrogen atom attached to nitrogen or an amine having only one primary amine group in an aqueous medium in the presence of a copper (II) salt and an organic reducing agent therefor, the molar ratio of copper (II) salt to (A) being less than 0.05:1.

5,196,554

ALUMINUM BIS(HYDROXYMETHYL)PHOSPHINATE, AND A PROCESS FOR THE PREPARATION OF BIS(HYDROXYMETHYL)PHOSPHINATES

Jürgen Svara, Cologne, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1991, Ser. No. 695,470
Claims priority, application Fed. Rep. of Germany, May 19, 1990, 4016258
Int. Cl.[5] C07F *9/28, 9/02, 5/06, 3/06*
U.S. Cl. 556—13 2 Claims

1. A process for the preparation of a bis(hydroxymethyl)-phosphinate of the formula

$$M^{a+}[(HOCH_2)_2PO_2^-]_a$$

in which M is Li, Na, K, Ca, Mg, Zn or Al, and n is the valency of the element concerned and has a value of 1, 2 or 3, which comprises reacting a phosphinate of the formula $M^{a+}[H_2PO_2^-]_a$ with formaldehyde, trioxane or paraformaldehyde in water in an autoclave at a temperature of from 100° to 200° C. under the autogenous pressure at a residence time of from 5 to 20 hours.

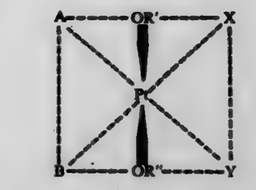
5,196,555

WATER AND SOLVENT SOLUBLE AXIAL HYDROXY AND MONO- AND DI- CARBOXYLIC ACID DERIVATIVES HAVING HIGH TUMOR ACTIVITY

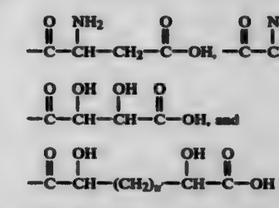
Murray A. Kaplan, Syracuse; Robert K. Perrone, Liverpool; Joseph B. Bogardus, and Kenneth J. Wilcox, Syracuse, all of N.Y., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 661,714, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 422,843, Oct. 17, 1989, abandoned. This application Dec. 13, 1991, Ser. No. 808,262
Int. Cl.[5] C07F *15/00*; A61K *31/28*
U.S. Cl. 556—137 17 Claims

1. A compound of the formula



wherein A and B are each independently ammine or monodentate amine, or A and B taken together represent a bidentate amine, and A and B are coordinated to the platinum atom through their nitrogen atom; X and Y are each independently halogen; R' is C_1–C_{20} alkanoyl, aroyl, heteroaroyl, or a group selected from the group consisting of



wherein u' is an integer from 1 to 5; and R" is hydrogen with the proviso that A, B, X, and Y are structurally equatorial substituents with respect to OR'-Pt-OR".

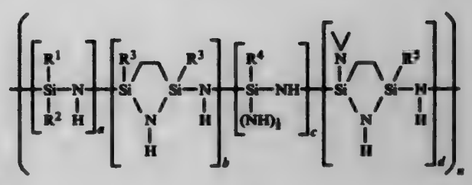
5,196,556

POLYSUBSTITUTED CHLORINE-CONTAINING SILAZANE POLYMERS, PROCESS FOR THEIR PREPARATION, CERAMIC MATERIALS CONTAINING SILICON NITRIDE WHICH CAN BE MANUFACTURED THEREFROM, AND THEIR MANUFACTURE

Tilo Vaahs, Kelkheim; Marcellus Peuckert, and Martin Brück, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 30, 1989, Ser. No. 444,012
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840779
The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—409 5 Claims

1. A process for the preparation of polysubstituted chlorine-containing silazane polymers which comprises reacting oligosilazanes of formula (I)



in which at least one of the indices a or b and at least one of the indices c or d are not equal to 0 and n is about 2 to about 12, with at least one of the chlorosilanes Cl_2R^6Si—CH_2C-H_2—SiR^6Cl_2, Cl_3Si—CH_2CH_2—SiR^7Cl_2, R^8SiCl_3 or R^9SiHCl_2 at 30° C. to 300° C., where the radicals independently of one another have the following meanings: R^1, R^2, R^4=H, C_1–C_6 alkyl or C_2–C_6 alkenyl and R^3,R^5, R^6,R^7, R^8,R^9=C_1–C_6 alkyl or C_2–C_6 alkenyl.

5,196,557
ORGANIC SILICON COMPOUNDS AND METHOD FOR MAKING
Toshio Takago; Hirofumi Kishita; Shinichi Sato, and Hideki Fujii, all of Annaka, Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan
Filed May 29, 1992, Ser. No. 889,875
Claims priority, application Japan, May 29, 1991, 3-153944
Int. Cl.[5] C07F 7/10
U.S. Cl. 556—422 12 Claims

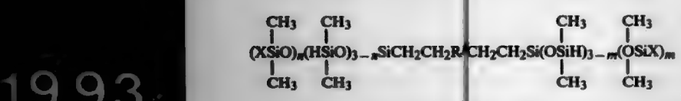
1. An organic silicon compound of the following formula (1):

(1)

wherein R^1, R^2 and R^3 are independently selected from monovalent hydrocarbon groups having 1 to 8 carbon atoms,
R^4 is an alkyl group having 1 to 6 carbon atoms,
R^5 is an alkylene group having 2 to 6 carbon atoms or an alkylene group having 2 to 6 carbon atoms and containing at least one —C—O—C— linkage,
Rf is selected from the group consisting of perfluoroalkylene and perfluorocycloalkylene groups having 1 to 12 carbon atoms and perfluoroalkylene and perfluorocycloalkylene groups having 1 to 20 carbon atoms and containing at least one—C—O—C— linkage, and
letter n is equal to 1, 2 or 3.

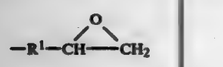
5,196,558
SILOXANE COMPOUNDS
Hiroshi Inomata, Annaka; Yasushi Yamamoto; Yasuo Tarumi, both of Takasaki, and Kenichi Fukuda, Annaka, all of Japan, assignors to Shin-Etsu Chemical Company, Limited, Tokyo, Japan
Filed Aug. 6, 1992, Ser. No. 925,147
Claims priority, application Japan, Aug. 7, 1991, 3-222131; Aug. 15, 1991, 3-229428
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—434 8 Claims

1. A siloxane compound of the following formula (1):

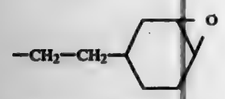


(1)

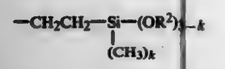
wherein Rf is a perfluoropolyether group or perfluoroalkylene group, X is a group of the following formula (2), (3) or (4):



(2)



(3)



(4)

wherein R^1 is a divalent organic group, R^2 is a monovalent hydrocarbon group, and k is an integer of from 0 to 2, and letters n and m are integers of from 0 to 3 meeting $0<n+m\leqq 5$.

5,196,559
EQUILIBRATION OF CYCLIC SILOXANES WITH NOVEL CATALYSTS
William J. Schulz, Jr., Midland, Mich.; Joseph B. Lambert, Glenview, Ill., and Lidia Kania, Warsaw, , assignors to Dow Corning Corporation, Midland, Mich.
Filed Jan. 23, 1992, Ser. No. 824,664
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—460 17 Claims

1. A process, said process comprising, contacting at least one cyclic siloxane with at least one catalyzing organosilicon compound at a temperature and a time sufficient to redistribute said cyclic siloxane under anhydrous conditions.

5,196,560
PROCESS FOR PREPARING FLUORINE-CONTAINING DIMETHYLCHLOROSILANES
Shinichi Sato; Hitoshi Kinami; Takashi Matsuda, and Hirokazu Yamada, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1991, Ser. No. 720,705
Claims priority, application Japan, Jun. 26, 1990, 2-168038
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—479 7 Claims

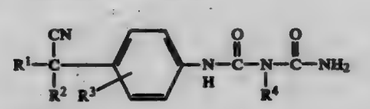
1. A process for preparing a fluorine-containing dimethylchlorosilane, which comprises reacting an ethylene compound having a fluorine-containing organic group with dimethylchlorosilane in the presence of a rhodium complex.

5,196,561
METHOD OF PRODUCING CARBONIC ACID ESTERS AND A CATALYST THEREFORE
Kenji Mori; Masao Tonosaki; Hidekazu Nakamura, all of Handa; Kenzo Yamamoto, Yokohama; Tsutomu Toida, and Miki Tojima, both of Handa, all of Japan, assignors to JGC Corporation, Tokyo, Japan
PCT No. PCT/JP90/00768, § 371 Date Feb. 15, 1991, § 102(e) Date Feb. 15, 1991, PCT Pub. No. WO90/15791, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 13, 1990, Ser. No. 656,061
Claims priority, application Japan, Jun. 15, 1989, 1-150624; Feb. 26, 1990, 2-42404
Int. Cl.[5] C07C 68/02, 68/00
U.S. Cl. 558—277 19 Claims

1. A method of producing carbonic acid esters by reacting an alcohol with carbon monoxide and oxygen in the presence of a catalyst, the catalyst comprising one of:
(a) a copper halide and a tertiary organophosphorus compound in a ratio of 0.05–0.4 mol of the tertiary organophosphorus compound per copper atom mol in the copper halide, the tertiary organophosphorus compound having a phenyl group or an alkyl group, and the copper halide and the tertiary organophosphorus compound being carried on a porous carrier; and
(b) a copper complex having a molar ratio copper atom: the tertiary organophosphorus compound: halogen atom of 1:1–3: 1 prepared by reacting the copper halide with the tertiary organophosphorus compound, and the copper complex being carried on a porous carrier.

5,196,562
SUBSTITUTED 1,3,5-TRIAZINETRIONES, FOR USE AGAINST PARASITIC PROTOZOA
Werner Lindner, Cologne, and Axel Haberkorn, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Division of Ser. No. 414,551, Sep. 28, 1989, Pat. No. 4,933,341. This application Dec. 27, 1989, Ser. No. 457,666
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1988, 3834272
Int. Cl.[5] C07C 255/40; C07D 513/00
U.S. Cl. 558—404 2 Claims

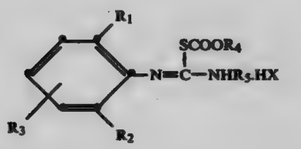
1. A compound of the formula



in which
R^1 represents phenyl or naphthyl, each of which is optionally substituted by halogen, alkyl, cyano, nitro, alkoxy, alkylthio, halogenalkyl, halogenoalkoxy, halogenalkylthio, halogenoalkylsulphinyl or halogenoalkylsulphonyl,
R^2 represents H, alkyl, alkenyl, alkinyl or aralkyl,
R^3 represents one or more identical or different radicals from the group consisting of hydrogen halogen, alkyl, halogenoalkyl, alkoxy, alkylthio, halogenoalkoxy, halogenoalkylthio, cyano, alkoxycarbonyl, alkylsulphonyl and halogenoalkylsulphonyl, and
R^4 represents hydrogen, alkyl, alkenyl or alkinyl, each of which is optionally substituted by halogen, halogenoalkyl, alkoxy, alkylthio, phenoxy, phenylthio or phenyl, the alkyl, alkenyl and alkinyl moieties having 4 carbon atoms.

5,196,563
N-PHENYL-N-CARBOXYTHIOUREAS
Josef Drabek, Oberwil, and Josef Ehrenfreund, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 356,665, May 23, 1989, Pat. No. 4,908,383, which is a continuation of Ser. No. 130,246, Dec. 8, 1987, abandoned. This application Nov. 14, 1989, Ser. No. 435,879
Claims priority, application Switzerland, Dec. 17, 1986, 5056/86; Jul. 29, 1987, 2909/87
Int. Cl.[5] C07C 323/29
U.S. Cl. 560—16 4 Claims

1. A compound of the formula IV

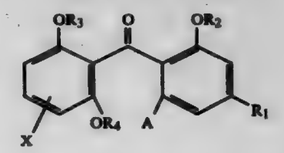


(IV)

in which
R_1 and R_2 are each C_1–C_{10}alkyl, C_3–C_7cycloalkyl or C_5–C_6-cycloalkenyl,
R_3 is hydrogen, halogen, C_1–C_{10}alkyl, C_1–C_{10}alkoxy or C_1–C_{10}alkylthio,
R_4 is C_1–C_{10}alkyl, C_2–C_{10}alkenyl, C_2–C_{10}alkynyl or phenyl-C_1–C_7alkyl; C_1–C_{10}alkyl, C_2–C_{10}alkenyl, C_2–C_{10}alkynyl or phenyl-C_1–C_7alkyl each substituted one to eleven times by fluorine, chlorine or bromine or interrupted by one oxygen or sulphur atom; C_3–C_6cycloalkyl; or C_3–C_6cycloalkyl substituted one to three times by fluorine, chlorine, bromine or by C_1–C_5alkyl, and
R_5 is C_1–C_{10}alkyl; phenyl-C_1–C_7alkyl; C_1–C_{10}alkyl or phenyl-C_1–C_7alkyl each substituted one to eleven times by fluorine, chlorine or bromine or interrupted by one oxygen or sulphur atom; C_3–C_6cycloalkyl; or C_3–C_6cycloalkyl substituted one to three times by fluorine, chlorine, bromine or by C_1–C_5alkyl, and
X is the radical of a hydrohalic acid.

5,196,564
PHYSIOLOGICALLY ACTIVE SUBSTANCE TAN-931, ITS DERIVATIVES, THEIR PRODUCTION AND USE
Tsuneo Kanamaru, Takatsuki; Tsuneaki Hida, Osaka, and Masayuki Murai, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Division of Ser. No. 508,188, Apr. 13, 1990, Pat. No. 5,013,757, which is a division of Ser. No. 353,755, May 18, 1989, Pat. No. 4,935,543. This application Feb. 27, 1991, Ser. No. 661,115
Claims priority, application Japan, May 20, 1988, 63-124067
Int. Cl.[5] C07C 69/76
U.S. Cl. 560—52 11 Claims

1. A compound of the formula (I):

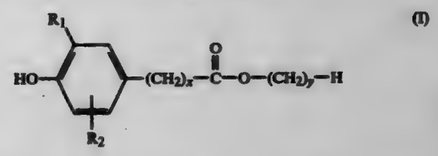


(I)

wherein R_1 is esterified carboxyl; R_2, R_3 and R_4 are the same and different and are hydrogen or alkyl; A is formyl, hydroxyiminoethyl or carboxyl; and X is hydrogen or halogen, or a salt thereof.

5,196,565
EXTRACTIVE PURIFICATION OF PHENOLS
John R. Ross, Mobile, Ala., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jun. 26, 1992, Ser. No. 904,806
Int. Cl.[5] B29B 9/10; C07C 69/78, 69/88
U.S. Cl. 560—55 23 Claims

1. A process for the manufacture of granules of low-melting alkyl ester containing hindered hydroxylphenyl groups, which comprises
(a) extracting a melt of crude alkyl ester containing hindered hydroxylphenyl groups of the formula:

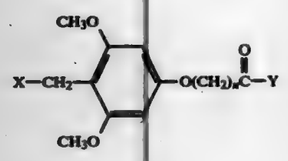


(I)

wherein
R_1 and R_2, independently of each other, are C_1–C_8-alkyl;
x is an integer from 0 to 6; and
y is an integer from 1 to 30 with an aqueous alcoholic solution of N,N-dibenzylhydroxylamine (DBHA),
(b) granulating the extracted melt by introducing said melt into an aqueous alcoholic solution maintained under a turbulent state at a temperature below 20° C., and
(c) isolating the resulting granules.

5,196,566
HYPERSENSITIVE ACID-LABILE HANDLE FOR SOLID-PHASE PEPTIDE SYNTHESIS
George Barany, Falcon Heights, Minn., and Fernando Albericio, Barcelona, Spain, assignors to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Aug. 31, 1990, Ser. No. 576,233
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—61 5 Claims

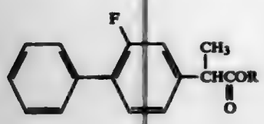
1. A compound for use in peptide synthesis having the general formula:



wherein n is from about 1 to about 10, X is OH, a halogen or a protected amino acid or peptide attached to the compound by its α-carboxyl group, and Y is selected from the group consisting of the activating group of an active ester, thioester and amide.

5,196,567
BIPHENYLYLPROPIONIC ACID DERIVATIVE, PROCESS FOR PREPARING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME
Katsuhiro Uchida, Kyoto; Shozo Matsumoto, Shiga; Masao Tohno; Mitsuo Minura, both of Otsu, and Makoto Okumura, Moriyama, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan
Division of Ser. No. 742,147, Jun. 7, 1985, Pat. No. 4,766,148, which is a continuation of Ser. No. 531,378, Sep. 12, 1983, abandoned. This application Jun. 9, 1988, Ser. No. 204,313
Claims priority, application Japan, Feb. 19, 1983, 58-26559
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—102 4 Claims

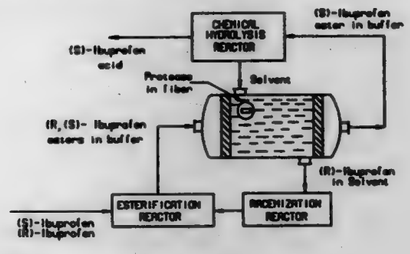
1. A biphenylylpropionic acid derivative having the formula (I):



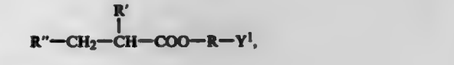
(I)

wherein R is 1-propionyloxyethyl, 1-isobutyryloxyethyl, 1-acetoxypropyl, or 1-crotonoyloxyethyl.

5,196,568
COMPOUNDS USEFUL IN ENZYMATIC RESOLUTION SYSTEMS AND THEIR PREPARATION
Charles M. Zepp, Berlin; Stephen A. Wald, Wayland, and David R. Dodds, Millis, all of Mass., assignors to Sepracor, Inc., Marlborough, Mass.
Filed Apr. 7, 1988, Ser. No. 178,735
Int. Cl.[5] C07C *9/76*
U.S. Cl. 560—110 1 Claim



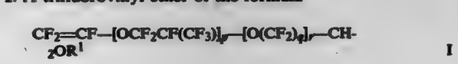
1. A compound of the formula:



wherein:
R is ethylene;
R′ is 4-isobutylphenyl;
R″ is hydrogen; and
Y^1 is trimethylammonium; and salts thereof.

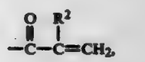
5,196,569
FUNCTIONALIZED TRIFLUOROVINYL ETHERS AND POLYMERS THEREFROM
Ming-Hong Hung, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 532,618, Jun. 4, 1990, abandoned. This application Oct. 10, 1991, Ser. No. 774,407
Int. Cl.[5] C07C *69/52, 21/02, 43/14*; C07D *303/12*
U.S. Cl. 560—223 9 Claims

1. A trifluorovinyl ether of the formula

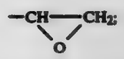


I

wherein:
R^1 is alkyl or cycloalkyl containing 1 to 30 carbon atoms,



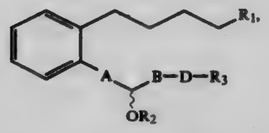
$-(CF_2)_sR^3$ or $-(CF_2)_tR^5$;
R^2 is hydrogen or methyl;
R^3 is —C≡CH, —CH=CH_2, styryl, or



R^5 is aryl or substituted aryl;
p is an integer of 0 to 20;
q is an integer of 1 to 10;
r is 0 or 1;
s is 1, 2, 3 or 4; and
t is 0, 1, 2, 3 or 4;
provided that when r is 0, p is not 0.

5,196,570
LEUKOTRIENE-B_4 DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND THEIR USE AS PHARMACEUTICAL AGENTS
Bernd Buchmann; Werner Skuballa; Joseph Heindl; Wolfgang Frohlich, and Roland Ekerdt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, both of Fed. Rep. of Germany
PCT No. PCT/DE90/00211, § 371 Date Nov. 16, 1990, § 102(e) Date Nov. 16, 1990, PCT Pub. No. WO90/11271, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 16, 1990, Ser. No. 602,283
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3909327
Int. Cl.[5] G07C *67/02*
U.S. Cl. 560—254 15 Claims

1. Leukotriene-B_4 analogs of formula I,

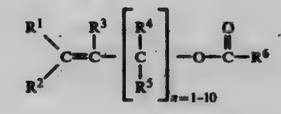


(I)

in which
R_1 is $COOR_4$ with R_4 meaning a hydrogen atom, an alkyl radical with 1–10 C atoms, a cycloalkyl radical with 3–10 C atoms, an aryl radical with 6–10 C atoms optionally substituted by 1–2 chlorine, bromine, phenyl, alkyl with 1–4 C atoms, chloromethyl, fluoromethyl or trifluoromethyl,
A means a trans, trans—CH=CH—CH=CH— group, trans—CH_2—CH_2—CH=CH group or a tetramethylene group,
B means a straight-chain or branched-chain, saturated or unsaturated alkylene group with up to 10 C atoms which can optionally be substituted by fluorine,
D means a direct bond, a —C≡C group or a —CH=CR_6 group with R6 as hydrogen, C_1–C_5 alkyl, chlorine or bromine, or
B and D together mean a direct bond,
R_2 means a hydrogen atom or an acid radical of an organic acid with 1–15 C atoms and
R_3 means a hydrogen atom, an alkyl radical with 1–10 C atoms, or an alkyl radical with 1–10 C atoms substituted by chlorine or bromine and, if R_4 means a hydrogen atom, their salts with physiologically compatible bases and their cyclodextrin clathrates.

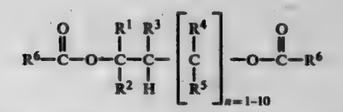
5,196,571
PREPARATION OF UNSATURATED MONOESTERS
Wolfgang Hoelderich, Frankenthal, and Hardo Siegel, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 595,693, Oct. 5, 1990, abandoned, which is a continuation of Ser. No. 257,012, Oct. 13, 1988, abandoned. This application Dec. 30, 1991, Ser. No. 815,649
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735755
Int. Cl.[5] C07C *67/02*
U.S. Cl. 560—261 9 Claims

1. A process for preparing an unsaturated monoester of the formula (I)



(I)

comprising reacting a diester of the formula (II)



(II)

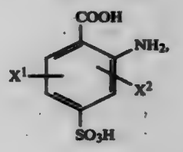
where the radicals R^1 to R^5 are identical to or different from each other and each is hydrogen, straight-chain or branched alkyl or alkenyl of from 1 to 8 carbon atoms, cycloalkyl or cycloalkenyl of from 5 to 8 carbon atoms, phenyl, benzyl, tolyl, phenylethyl, p-methylbenzyl or p-propylphenyl and R^6 is hydrdogen or alkyl of from 1 to 6 carbon atoms, in the presence of a catalyst, said catalyst being selected from the group consisting of zeolites in their acidic form, a phosphate of the element B, Al, Zr, Ce, Fe or Sr and mixtures thereof, thereby eliminating a carboxyl group R^6COOH so as to convert the diester of the formula (II) to the unsaturated monester of the formula (I).

5,196,572
PROCESS FOR PRODUCING XYLYLENE DIISOCYANATE
Takashi Okawa; Yoshifumi Sato; Hideo Igarashi, and Syunsuke Suzuki, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Osaka, Japan
Filed Nov. 12, 1991, Ser. No. 790,038
Claims priority, application Japan, Dec. 20, 1990, 2-411820
Int. Cl.[5] C07C *263/04*
U.S. Cl. 560—345 5 Claims

1. A process for producing xylylene diisocyanate by the thermal decomposition of xylylene dicarbamate, which comprises subjecting the xylylene dicarbamate to reactive distillation in a reaction system at a temperature of 200–300° C. and at a pressure of 1–500 mm Hg with a thermal decomposition catalyst comprising at least one of antimony, tin or a compound thereof, in the presence of an inert solvent having a boiling point at least 40° C. higher than that of the xylylene diisocyanate being produced, withdrawing vapors of the xylylene diisocyanate and of the alcohol formed by the thermal decomposition of the xylylene dicarbamate from the reaction system, and separately condensing the vapors of the xylylene diisocyanate and of the alcohol.

5,196,573
PROCESS FOR THE PREPARATION OF SULFONATED ANTHRANILIC ACIDS
Manfred Patsch, Wachenheim; Klaus Pandl; Jacques Dupuis, both of Ludwigshafen, and Helmut Hagen, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 711,870, Jun. 7, 1991, abandoned. This application May 28, 1992, Ser. No. 888,444
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1990, 4018245
Int. Cl.[5] C07C *309/29*
U.S. Cl. 562—57 3 Claims

1. A process tor the preparation of an anthranilic acid of formula I

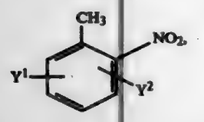


(I)

in which

X^1 and X^2 are the same or different and independently denote hydrogen, halogen or amino, comprising

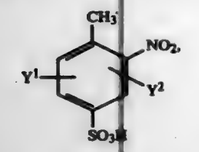
a) treating in a first stage a nitrotoluene of formula II



(II)

in which Y^1 and Y^2 are the same or different and independently denote hydrogen, halogen or nitro, with chlorosulfonic acid or from 10 to 75% w/w oleum at a temperature of from 40° to 150° C. and,

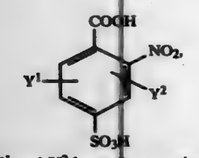
b) in a second stage, diluting in situ the resulting reaction mixture containing the nitrotoluenesulfonic acid of formula III



(III)

in which Y^1 and Y^2 have the meanings stated above, with water and treating the mixture with nitric acid in the presence of V_2O_5 at from 130° to 170° C. and,

c) in a third stage, reducing the resulting nitrobenzoic acid of formula IV



(IV)

in which Y^1 and Y^2 have the meanings stated above.

5,196,574

DETERGENT ALKYLATION PROCESS USING A FLUORIDED SILICA-ALUMINA

Joseph A. Kocal, Gurnee, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 23, 1991, Ser. No. 816,341
Int. Cl.[5] C11D 1/12, 1/755
U.S. Cl. 562—94 15 Claims

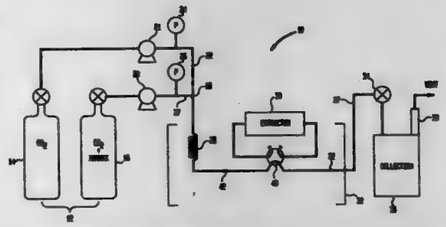
8. A process for the production of a biodegradable detergent alkylbenzene sulfonate which comprises: alkylating benzene with at least one linear monoolefin containing from 6 to about 20 carbon atoms at alkylating conditions in an alkylation zone in the presence of a catalytic composite to selectively form monoalkylated benzenes, said catalytic composite being a fluorided silica-alumina having a silica:alumina weight ratio of from about 1:1 to about 9:1 and containing from about 1 to about 6 weight percent fluorine; sulfonating the monoalkylated benzenes in a sulfonation zone with a sulfonating agent at sulfonation conditions to form sulfonic acids of the monoalkylated benzenes; and reacting said sulfonic acids with an aqueous solution of an alkali metal base to form the monoalkylbenzene alkali metal sulfonate.

5,196,575

SUPERCRITICAL SEPARATION OF ISOMERS OF FUNCTIONAL ORGANIC COMPOUNDS AT MODERATE CONDITIONS

Mark J. Sebastian, Lebanon, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Feb. 19, 1992, Ser. No. 838,387
Int. Cl.[5] C07B 57/00
U.S. Cl. 562—402 16 Claims



1. A method of separating isomers of functionalized aromatic compounds using a supercritical gas mixture consisting essentially of:

(a) preparing a supercritical fluid, the major component of which is carbon dioxide and a minor proportion of which is a polar solvent to form solvent-modified carbon dioxide and imparting flow to said solvent-modified supercritical carbon dioxide;

(b) contacting a mixture containing at least first and second isomers of a functionalized aromatic organic compound with said flowing solvent-modified supercritical carbon dioxide in a suitable apparatus, said mixture being substantially inert with respect to said solvent-modified supercritical carbon dioxide, at a temperature of at least about 30° Celsius and a pressure of at least about 70 atmospheres to, selectively extract said first isomer from said mixture essentially by way of interaction with said solvent-modified supercritical carbon dioxide such that the mixture residue becomes enriched with said second, isomer; and

(c) precipitating said first isomer from said flowing solvent-modified carbon dioxide by expanding the gas stream to a pressure substantially below 70 atmospheres.

5,196,576

CHELATING COMPOUNDS AND THEIR USE

Shigemi Seri; Hirohiko Yamauchi; Makoto Azuma, all of Chiba, and Yoji Arata, Tokyo, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Filed Apr. 9, 1991, Ser. No. 682,080
Claims priority, application Japan, Apr. 10, 1990, 2-94353
Int. Cl.[5] C07C 317/06, 317/12, 229/46
U.S. Cl. 562—427 6 Claims

1. A chelating compound of the formula:

$$(R—NHOC—CH_2)_n—A—(CH_2COOH)_m$$

wherein R is an aromatic ring-containing organic group, A is a residue of an aminopolyacetic acid excluding acetic acid groups therefrom, m is an integer of 2 to 4 and n is an integer of 1 or 2, or its salt, wherein the aromatic ring-containing organic group is aryl, aryl(lower)alkyl, arylsulfonyl, aryl(lower)alkylsulfonyl, arylamino(lower)alkyl, aryl(lower)alkylamino(lower)alkyl, arylsulfonylamino(lower)alkyl or aryl(lower)alkylsulfonylamino(lower)alkyl, the aryl moiety being naphthyl which can be substituted with lower alkyl, lower alkylamino or di(lower)alkylamino.

5,196,577

COMPOUND MARKED WITH TRITIUM, ITS PREPARATION AND ITS USE IN PARTICULAR IN THE DETERMINATION OF THE AFFINITY OF RETINOIDS FOR THEIR NUCLEAR RECEPTORS AND THEIR CYTOSOLIC BINDING PROTEIN

Braham Shroot; Yves M. Darmon, both of Antibes; Philippe Nedoncelle, and Claude Martin, both of Grasse, all of France, assignors to Centre International de Recherches Dermatologiques, Valbonne, France

Filed Aug. 31, 1989, Ser. No. 400,537
Claims priority, application France, Sep. 1, 1988, 88 11469
Int. Cl.[5] C07C 63/49; A61K 49/02; C07B 59/00
U.S. Cl. 562—490 2 Claims

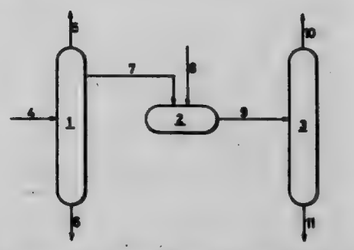
1. 4-(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-2-anthracenyl) benzoic acid labelled with tritium.

5,196,578

PURIFICATION PROCESS OF METHACRYLIC ACID

Morimasa Kuragano, Sakai; Takeshi Isobe; Nobutaka Ueda, both of Takaishi; Minoru Koshibe, Sakai; Yoshihiro Sezaki, Izumi; Hiroso Segawa, Niigata; Katsuji Yogachi, Niigata, and Rensuke Ikarashi, Niigata, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo and Kurary Co., Ltd., Kurashiki, both of Japan

Continuation of Ser. No. 211,262, Jun. 24, 1988, abandoned. This application Sep. 10, 1991, Ser. No. 758,362
Claims priority, application Japan, Oct. 9, 1987, 62-253808; Oct. 12, 1987, 62-254687; Feb. 4, 1988, 63-22921
Int. Cl.[5] C07C 51/16, 51/235, 51/42
U.S. Cl. 562—531 4 Claims



1. In a process for the purification of methacrylic acid by distilling crude methacrylic acid obtained by the vapor-phase catalytic oxidation of isobutylene, t-butanol, methacrolein or isobutylaldehyde with specific amines to obtained purified methacrylic acid, the improvement comprising:

initially distilling said crude methacrylic acid in a distillation column and withdrawing a fraction from an intermediate stage of an enriching section of the distillation column;

contacting said distilled crude methacrylic acid with at least one amine compound selected from the group consisting of m-aminophenol, m-phenylenediamine, 2,4-diaminotoluene and 2,4-diaminodiphenylamine in the presence of at least one p-phenylenediamine of formula (I):

wherein R_1 is hydrogen, C_3–C_6-alkyl, phenyl, p-tolyl, p-methoxyphenyl or β-naphthyl and R_2 is hydrogen, phenyl, p-tolyl or β-naphthyl in a molar amount ranging from 3–10 times based on the carboxylic acid groups derived from unsaturated dibasic acids and aldehyde groups at a temperature ranging from 50°–100° C.; and

distilling said crude methacrylic acid contacted with said at least one amine to prepare purified methacrylic acid.

5,196,579

PROCESS FOR THE RECOVERY OF PERFLUOROETHERCARBOXYLIC ACIDS

Thomas Gries, Frankfurt am Main; Klaus-Dieter Glanzl, Hofheim am Taunus, and Frank Ehmeyer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 13, 1991, Ser. No. 806,497
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1990, 4041718
Int. Cl.[5] C07C 51/42, 59/00, 17/38
U.S. Cl. 562—580 6 Claims

1. A process for the recovery of perfluoroethercarboxylic acids of the formula I

$$R_f—COOH, \quad (I)$$

in which

$R_f = C_aF_{2a+1}O—(C_3F_6O)_m—CF(CF_3)—$

where a=1, 2 or 3

and m=0, 1, 2 or 3

from the crude product of the electrochemical preparation of perfluorinated ethers, which comprises separating off the perfluoroethercarboxylic acid of the formula I and its ester of the formula II

$$R_f—COOR,$$

in which

R_f is as defined under (I) and

R=—C_cH_{2c+1} where c=1, 2, 3, 4 or 5 or

R=—$C_dH_{2d+1}O_e$ where d=2, 3, 4, 5 or 6 and e=1, 2 or 3

which are contained in the crude product, with the aid of a solid basic alkali metal salt or its solution, and reacting the resulting salts with a strong acid for conversion into the corresponding perfluoroethercarboxylic acid of the formula I.

3. A process for the recovery of the two perfluoroethercarboxylic acids of the formulae I and I'

$$R_f—COOH, \quad (I)$$

in which

$R_f = C_aF_{2a+1}O—(C_3F_6O)_m—CF(CF_3)—$

where a=1, 2 or 3 and m=0, 1, 2 or 3

$$R_f—COOH, \quad (I')$$

in which

$R_f = C_bF_{2b+1}O—(C_3F_6O)_n—CF(CF_3)—$

where b=1, 2 or 3 and n=0, 1, 2 or 3

from the crude product of the electrochemical conversion of these acids or their soluble salts to perfluorinated ethers, which comprises separating off the perfluoroethercarboxylic acid of the formulae I and I' and their esters of the formulae II and II'

$$R_f—COOR \quad (II)$$

$$R_f—COOR \quad (II')$$

in which

R_f and R_f are as defined under (I) and (I')

and R=—C_cH_{2c+1} where c=1, 2, 3, 4 or 5 or

R=—$C_dH_{2d+1}Oe$ where d=2, 3, 4, 5 or 6 and e=1, 2 or 3

which are contained in the crude product, with the aid of a solid basic alkali metal salt or its solution, and reacting the resulting salts with a strong acid for conversion into the corresponding perfluoroethercarboxylic acids of the formulae I and I'.

5. A process for the recovery of a perfluoroethercarboxylic acid of the formula I

$$R_f—COOH, \quad (I)$$

in which
R_f=$C_eF_{2e+1}O$—$(C_3F_6O)_m$—$CF(CF_3)$—
where a=1, 2 or 3
and m=0, 1, 2 or 3
from the crude product of the electrochemical conversion of this acid or one of its soluble salts to a perfluorinated ether, which comprises separating off the perfluoroethercarboxylic acid of the formula I and its ester of the formula II

$$R_f\text{—COOR,} \qquad \text{(II)}$$

in which
R_f is as defined under (I) and
R=—C_cH_{2c+1} where c=1, 2, 3, 4 or 5 or
R=—$C_dH_{2d+1}O_e$ where d=2, 3, 4, 5 or 6 and e=1, 2 or 3
which are contained in the crude product, with the aid of a solid basic alkali metal salt or its solution, and reacting the resulting salt with a strong acid for conversion into the corresponding perfluoroethercarboxylic acid of the formula I.

5,196,580
RECOVERY OF OXALATE FROM SOLUTIONS CONTAINING COMPLEXES OF IRON AND CHROMIUM
Judith A. Ladd, Sayre, and Michael J. Miller, Towanda, both of Pa., assignors to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 861,903, May 12, 1986, abandoned.
This application Oct. 17, 1988, Ser. No. 259,494
Int. Cl.[5] C07C *51/42, 55/06*
U.S. Cl. 562—593 **1 Claim**

1. A method for recovering oxalate from oxalate containing solutions containing complexes of iron and chromium as trisoxalato iron complex and hydrated chromium complex, respectively, said method consisting essentially of:
a) adjusting the pH of said oxalate containing solution to from about 1 to about 2 with hydrochloric acid;
b) heating the resulting pH adjusted solution to at least about 80° C.;
c) adding calcium chloride to said pH adjusted solution in an amount equal to at least about 3 moles per mole of iron;
d) digesting the resulting calcium chloride treated solution at a temperature of at least about 50° C. for a sufficient time to form a solid consisting essentially of calcium oxalate wherein said solid contains at least about 90% by weight of the oxalate in said oxalate containing solution; and
e) separating said solid from the resulting mother liquor.

5,196,581
ALKYLCARBAMOYLBORANE CYCLIC DIMERS
Karen W. Morse, Providence; Mohammad-Reza M.-D. Charandabi, Salt Lake City, both of Utah; Debra A. Feakes, Los Angeles, Calif., and Malkiah Mittakanti, Logan, Utah, assignors to Utah State University Foundation, Logan, Utah
Filed May 1, 1991, Ser. No. 694,320
Int. Cl.[5] C07F *5/02*
U.S. Cl. 564—8 **7 Claims**

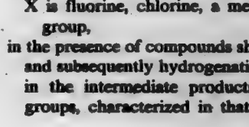
1. An alkylcarbamoylborane cyclic dimer comprising $[BH_2C(O)NHR']_2$; wherein R' is selected from the group consisting of —CH_3, —CH_2CH_3, —$CH_2CH_2CH_3$, —CH_2CH=CH_2, and —$C(CH_3)_3$.

5,196,582
PREPARATION OF SOLID QUATERNARY AMMONIUM HALIDES
Kim R. Smith; James E. Borland; Jeffrey W. Perine, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.
Filed Jul. 1, 1991, Ser. No. 723,975
Int. Cl.[5] C07C *209/12*
U.S. Cl. 564—292 **8 Claims**

1. In a process for preparing a quaternary ammonium halide by reacting an alkyl or aralkyl halide with a nitrogen compound selected from ammonia and amines, the improvement which comprises conducting the reaction in a liquefied gas as the solvent.

5,196,583
PROPARGYL AMINO COMPOUNDS
Mitsuo Yamada, Osaka, and Kei Aoki, Nara, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan
Filed Dec. 4, 1990, Ser. No. 621,440
Claims priority, application Japan, Dec. 4, 1989, 1-315852
Int. Cl.[5] C07C *211/22*
U.S. Cl. 564—305 **7 Claims**

1. A propargyl compound represented by the formula:



wherein R is an alkylene group having 1 to 20 carbon atom s; and alkylene group having 2 to 20 carbon atoms interrupted by —NH— group(s); or an aromatic group selected from the group consisting of diphenyl methane and diphenyl sulfone; said R being optionally substituted with a lower alkyl, halogen, nitro, lower alkoxy or cyano group; R_1 is a —CH_2—C≡CH group and n is an integer of 2 to 4.

5,196,584
PROCESS FOR THE PRODUCTION OF POLYETHERS CONTAINING AMINOPHENOXY GROUPS
Urs Thiery, Dormagen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jul. 10, 1991, Ser. No. 727,713
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1990, 4022931
Int. Cl.[5] C07C *209/32*
U.S. Cl. 564—418 **4 Claims**

1. A process for the production of an aminophenoxy-terminated polyether containing recurring structural units corresponding to the following formula

—CH_2—CH_2—CH_2—CH_2—O—

comprising reacting:
a) a polyether component consisting essentially of a polyether diol containing recurring structural units corresponding to the formula

—CH_2—CH_2—CH_2—CH_2—O—

and having a molecular weight in the range from 400 to 6,000
with
b) a compound corresponding to the following formula

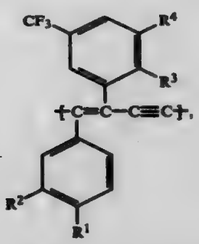
in which
R is hydrogen or a methyl group and
X is fluorine, chlorine, a methoxy group or an ethoxy group,
in the presence of compounds showing an alkaline reaction, and subsequently hydrogenating the nitro groups present in the intermediate products thus obtained to amino groups, characterized in that component a) contains at least 2% by weight ethylene oxide units incorporated within polyether chains, these ethylene oxide units being part of the polyether diols mentioned and/or having been introduced into component a) by admixture of other polyether polyols containing ethylene oxide units and having a molecular weight in the range from 200 to 6,000 with these polyether diols, with the proviso that the percentage content of the last mentioned polyether polyols is at most 30% by weight, based on the total weight of component a).

5,196,585
PROCESS FOR TREATING DINITROANILINES WITH SULFITE TO REDUCE IMPURITIES AND TO REDUCE THE ABILITY TO PRODUCE NITROSAMINES
David D. Wirth, Lafayette, Ind., assignor to DowElanco, Indianapolis, Ind.
Filed Oct. 2, 1990, Ser. No. 591,590
Int. Cl.[5] C07C *209/84*
U.S. Cl. 564—437 **5 Claims**

1. A process for treating a dinitroaniline which comprises contacting crude dinitroaniline one or more times with an effective amount of inorganic sulfite in aqueous solution at a pH of from 8 to 11, and at a temperature above the melting point of dinitroaniline and below the boiling point of water, the dinitroaniline being selected from the group consisting of trifluralin, benefin, ethalfluralin, isopropalin, butralin, pendimethalin, fluchloralin, profluralin, dintramine, chlornidine, oryzalin, nitralin, prosulfalin, and prodiamine.

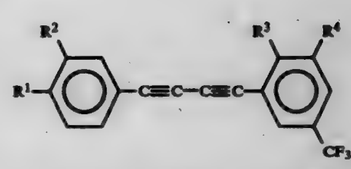
5,196,586
POLYDIPHENYLDIACETYLENES
Hiro Matsuda; Shuji Okada; Hachiro Nakanishi; Masao Kato; Minoru Obungi, all of Tsukuba; Shigeru Takaragi, and Nanao Horiishi, both of Hiroshima, all of Japan, assignors to Toda Kogyo Corp., Hiroshima and The Agency of Industrial Science and Technology, Tokyo, both of Japan
Continuation-in-part of Ser. No. 479,438, Feb. 9, 1990, abandoned. This application Aug. 9, 1991, Ser. No. 742,760
Claims priority, application Japan, Feb. 16, 1989, 1-37020
Int. Cl.[5] C07C *211/44, 43/215*
U.S. Cl. 564—442 **4 Claims**

1. Polydiphenyldiacetylenes having a single crystal form of substantially 100% crystallinity, a non-linear susceptibility of not less than 1×10^{-10} esu and a repeating monomeric unit (III):



(III)

and produced by solid-state polymerizing a diphenyldiacetylene derivative represented by the following formula (II):

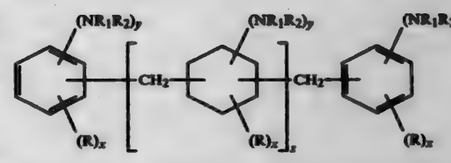


(II)

wherein R^1 denotes a hydrogen atom or a methoxy group; R^2 denotes a hydrogen atom, a methoxy group or a methylamino amino group; R^3 denotes a hydrogen atom or a trifluoromethyl group; and R^4 denotes a hydrogen atom or a trifluoromethyl group; provided that R^1 is not a hydrogen atom when R^2 is hydrogen atom, and R^3 is not a hydrogen atom when R^4 is hydrogen atom, wherein said solid-state polymerizing is conducted by exposing the diphenyldiacetylene derivative to ultraviolet radiation or γ-rays, or by heating to a temperature sufficiently high for exciting the diphenyldiacetylene derivative.

5,196,587
CATALYTIC HYDROGENATION OF CRUDE METHYLENE BRIDGED POLYPHENYLAMINES TO PRODUCE POLYCYCLOHEXYLAMINES
Gamini A. Vedage, Bethlehem; William W. Henderson, and Bernard A. Toseland, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Continuation of Ser. No. 175,010, Mar. 30, 1988, abandoned.
This application May 13, 1991, Ser. No. 699,425
Int. Cl.[5] C07C *209/00*
U.S. Cl. 564—451 **16 Claims**

1. In a process for the hydrogenation of a crude methylene bridged polyphenylamine feed containing oligomers to produce the corresponding methylene bridged polycyclohexylamine counterpart in the presence of a rhodium hydrogenation catalyst at a temperature and for a time sufficient to effect hydrogenation of the phenyl ring to the cyclohexyl ring, said methylene bridged-polyphenyl amine feed represented by the formula:



wherein R is H_1, $C_{1\text{-}6}$ alkyl, C—O—R_3, where R_3 is $C_{1\text{-}4}$ alkyl, CH_2NH_2, R_1 and R_2 are H or $C_{1\text{-}6}$ alkyl, x is 1–4, y is 0 to z with the sum being at least 1, provided that x+y is not greater than 5, and z is from 0 to 3
pretreating the crude methylene bridged polyphenylamine feed via an initial hydrogenation in the presence of hydrogen and a hydrogenation catalyst consisting essentially of ruthenium under conditions sufficient to at least partially hydrogenate the feed, and then
catalytically hydrogenating the methylene bridged polyphenylamine in a secondary hydrogenation zone containing rhodium catalyst for producing the corresponding methylene bridged polycyclohexylamine counterpart.

5,196,588

ETHYLENEDIAMINE AND DIETHYLENETRIAMINE PRODUCERS COMPOSITION AND METHOD FOR PRODUCING SAME

Lloyd M. Burdeen, South Charleston, W. Va.; Charles A. Gibson, Centerville, Va., and David Schreck, Cross Lanes, W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 102,930, Sep. 30, 1987, abandoned. This application May 25, 1990, Ser. No. 528,879

Int. Cl.[5] C07C 209/16

U.S. Cl. 564—480 8 Claims

1. A process of manufacturing an alkyleneamines producers composition without a net increase in piperazine in the reaction product mixture comprising, based on 100% of the moles of the composition and exclusive of any MEA and water present,

a. about 14 to about 20 mole % DETA,

b. about 45 to about 75 mole % EDA (net generated),

c. about 4 to about 10 mole % AEEA,

d. about 3 to about 25 mole % of the combination of PIP, AEP and HEP,

e. about 0.5 to about 5 mole % of one or more of TETAs and TEPAs,

f. less than about 1 mole % of other polyalkylene polyamines,

g. an EDA to DETA mole ratio greater than about 2.60,

h. a DETA to AEEA mole ratio greater than about 1.35, and

i. an EDA to AEEA mole ratio greater than about 8,

which comprises feeding hydrogen, ammonia, MEA and a recycle stream comprising water, PIP and EDA to a reaction zone containing a fixed bed of a reductive amination catalyst in a tubular reactor, wherein the hydrogen comprises about 1 to about 30 mole percent of the feed in the reaction zone, the mole ratio of EDA to MEA is less than 0.25 and the mole ratio of ammonia to MEA is about 1 to about 15, the temperature of the reaction zone is about 120° C. to about 300° C., the pressure of the reaction zone is about 1800 to about 2500 psig, the conversion of MEA is about 20 to about 60 weight percent, and recovering said producers composition from the reaction zone.

5,196,589

STABILIZED ACRYLONITRILE POLYMERIZATIONS

Anthony J. O'Lenick, Jr., Lilburn, Ga., and J. Michael Chapman, Delavan, Wis., assignors to LCE Partnership, Jeanerville, Wis.

Filed Sep. 16, 1991, Ser. No. 760,335

Int. Cl.[5] C07C 209/48

U.S. Cl. 564—493 13 Claims

1. A process for the preparation of an polyamine which comprises the reaction of;

(a) a primary alkyl amine, said primary alkyl amine compound having had between 1 and 100 parts per million of a stable free radical compound added;

(b) acrylonitrile;

(c) an alkaline catalyst selected from group consisting of benzyltrimethylammonium hydroxide, potassium hydroxide, sodium methoxide, and sodium hydroxide; and

(d) in a subsequent step, reaction with hydrogen in the presence of a hydrogenation catalyst.

5,196,590

METHOD OF MAKING 2,4,5-TRIHALOBENZOIC ACID

J.Steven Oi, Amherst, and Joseph J. Moritz, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

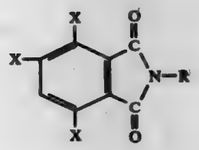
Filed May 11, 1992, Ser. No. 881,112

Int. Cl.[5] C07C 63/04

U.S. Cl. 562—493 20 Claims

1. A method of making 2,4,5-trihalobenzoic acid comprising heating to a temperature of about 130° to about 190° C. a composition that comprises

(A) a compound having the general formula



where each "X" is independently selected from fluorine, chlorine, or bromine and "R" is alkyl from C_1 to C_{10} or aryl;

(B) water; and

(C) a mineral acid.

5,196,591

PROCESS FOR THE PRODUCTION OF POLYNUCLEAR AROMATIC POLYAMINES

Hartmut Knöfel, Odenthal; Michael Brockelt, Leverkusen, both of Fed. Rep. of Germany; Marcel Potiaux, Pittsburgh, Pa.; Rudolf Uebdorf, Krefeld, and Hans-Peter Schal, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 6, 1992, Ser. No. 863,613

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1991, 4112131

Int. Cl.[5] C07C 209/78, 209/84

U.S. Cl. 564—331 4 Claims

1. In a process for the production of polynuclear aromatic polyamines by reaction of aniline with formaldehyde in the presence of water and acidic catalysts in a single or two stage reaction at a temperature of from 0° to 180° C., optionally preceded by a preliminary aminal stage in which N,N'-disubstituted aminal is formed and is then converted into the desired end product in one or more stages in the presence of acid catalyst at a temperature of from 0° to 180° C., working up of the resulting reaction mixture by extraction with an aniline-containing hydrophobic solvent in a product extraction stage, separation of the resulting organic phase by distillation into (i) a distillate consisting of aniline-containing solvent, which distillate is reused in the extraction stage, optionally after addition of fresh aniline, and (ii) a distillation residue consisting essentially of end product and recycling of aqueous phase accumulating during extraction and containing the acid catalyst, with reuse of the catalyst contained in the aqueous phase and removal of the water of condensation formed in the condensation reaction and of the water introduced into the process with the aqueous formaldehyde solution in a water separator placed downstream of the preliminary aminal stage and upstream of the first reaction stage and/or in an evaporator placed downstream of the extraction stage, the improvement wherein

a) the formaldehyde is either reacted by mixing in a preliminary aminal stage with an organic phase consisting of aniline and hydrophobic solvent, and optionally aniline/formaldehyde condensates, and/or in a first reaction stage with an organic phase consisting of aniline and hydrophobic solvent, and optionally aniline/formaldehyde condensates, and with recycled aqueous phase containing the catalyst in the form of amine salts,

b) the two-phase reaction mixture obtained is separated on completion of the reaction into an aqueous phase and an organic phase in a phase separator upstream of the product extraction stage,

c) the organic phase accumulating in said phase separator is extracted in a post-extraction stage following the product extraction stage with at least a portion of the aqueous phase substantially freed from reaction product which accumulates in the product extraction stage,

d) the aqueous phase accumulating in the post-extraction stage, which is enriched with reaction product of the organic phase accumulating in the phase separator is completely or at least partly recycled to the reaction after the completion of rearrangement and before the product extraction stage and any aqueous phase remaining is recycled before the completion of rearrangement,

e) the organic phase consisting of aniline and hydrophobic solvent, and, optionally aniline/formaldehyde condensates, which accumulates in the post-extraction stage, is returned to the beginning of the process and reacted in accordance with a),

f) the aqueous phase accumulating in the phase separator is extracted with aniline-containing hydrophobic solvent in the product extraction stage, optionally after combination with aqueous phase from the post-extraction stage,

g) either 1) the aqueous phase accumulating in the product extraction stage is divided into two partial streams of which one is returned to the beginning of the process while the other is delivered to the post extraction stage, or 2) the aqueous phase accumulating in the product extraction stage is delivered to the post-extraction stage and is then divided into partial streams of which one is returned to the beginning of the process while the other is delivered to a point after the completion of the rearrangement reaction and before the product extraction stage,

h) the organic phase accumulating in the product extraction stage is separated in the distillation stage into a distillate consisting of aniline-containing hydrophobic solvent and a distillation residue consisting essentially of end product, and

i) distillate accumulating in the distillation stage is used as extractant in the product extraction stage after addition of fresh aniline.

5,196,592

PROCESS FOR THE PREPARATION OF DIPHENYLAMINES

Otto Immel, Krefeld; Helmut Waldmann, Leverkusen; Reinhard Langer, Krefeld; Gerhard Darsow, Krefeld, and Hans-Josef Buysch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

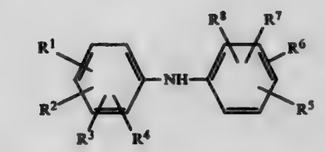
Filed Dec. 11, 1991, Ser. No. 805,441

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1991, 4100514; Jan. 16, 1991, 4101066

Int. Cl.[5] C07C 209/52

U.S. Cl. 564—415 20 Claims

1. A process for the preparation of a diphenylamine of the formula



in which

R^1 represents hydrogen, C_1–C_6-alkyl, C_1–C_2-alkoxy, C_3–C_6-cycloalkyl, benzyl or aryl,

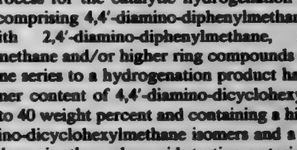
R^2 represents hydrogen, C_1–C_6-alkyl or C_1–C_2-alkoxy,

R^5 denotes hydrogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_3–C_6-cycloalkyl, benzyl, aryl, hydroxyl, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, aryloxy or arylamino,

R^6 represents hydrogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, hydroxy, amino or C_1–C_6-alkylamino and

R^3, R^4, R^7 and R^8 independently of one another denote hydrogen or C_1–C_2-alkyl,

wherein aryl represents phenyl or represents 5- or 6-membered heteroaryl which has 1 or 2 hetero atoms from the group comprising N, O and S and is bonded in the 2-, 3- or 4-position, wherein a N-cyclohexylidene-aniline of the formula



in which the radicals R^1 and R^8 have the above meaning, and which can be in admixture with a gaseous diluent, is dehydrogenated at 250°–500° C. on a catalyst which has a rhodium content of 0.05–5% by weight, it being possible for up to 90% by weight of the rhodium content to be replaced by one or more platinum metals from the group comprising palladium, platinum and iridium, and which furthermore contains additions of 1–6% by weight of an alkali metal hydroxide and 1–6% by weight of an alkali metal sulphate, and all the percentages being based on the total weight of the catalyst.

5,196,593

HALOGENATED TRIFLUOROMETHYLBENZENES

Karl W. Seper; James J. Maul, and Henry C. Lin, all of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,729

Int. Cl.[5] C07C 211/45

U.S. Cl. 564—442 1 Claim

1. Halogenated trifluoromethylbenzene having the structural formula:

5,196,594

PROCESS FOR THE PRODUCTION OF 4,4'-DIAMINO-DICYCLOHEXYLMETHANE WITH A LOW TRANS-TRANS ISOMER CONTENT BY THE CATALYTIC HYDROGENATION OF 4,4'-DIAMINO-DIPHENYLMETHANE

George H. Schmelzer, Pittsburgh, Pa.; Gary F. Allen, New Martinsville, W. Va.; Guenther K. H. Buh, Marl, and Werner Otte, Dorsten, both of Fed. Rep. of Germany, assignors to Miles, Inc., Pittsburgh, Pa. and Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 143,884, Jan. 14, 1988, abandoned. This application Sep. 21, 1989, Ser. No. 410,382

Int. Cl.[5] C07C 211/35

U.S. Cl. 564—452 13 Claims

1. A process for the catalytic hydrogenation of a starting material comprising 4,4'-diamino-diphenylmethane or its mixture with 2,4'-diamino-diphenylmethane, 2,2'-diamino-diphenylmethane and/or higher ring compounds of the diphenylmethane series to a hydrogenation product having a trans-trans isomer content of 4,4'-diamino-dicyclohexylmethane of about 15 to 40 weight percent and containing a higher yield of 4,4'-diamino-dicyclohexylmethane isomers and a smaller content of polymerics than when said starting material is hydrogenated in a corresponding slurry phase process which comprises continuously hydrogenating said starting material in at least one fixed bed reactor at a temperature of about 100° to 190° C. and a pressure of about 50 to 350 bar in the presence of a ruthenium catalyst on a catalyst support having a BET surface area of about 70 to 280 m^2/g and an average pore diameter d_p of about 10 to 320 Å, said catalyst being prepared by impreg-

nating said catalyst support to a penetration depth of at least about 50 μm with a soluble ruthenium compound in an amount sufficient to provide a catalyst containing about 0.1 to 5 weight percent ruthenium and subsequently reducing said soluble ruthenium compound to ruthenium.

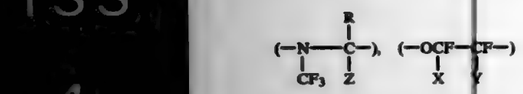
5,196,595

POLYPERFLUOROAMINOETHERS

Walter Navarrini, Bollaloro, Italy, and Darryl D. Desmarteau, Clemson, S.C., assignors to Ausimont S.R.L., Milan, Italy

Continuation of Ser. No. 811,921, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 340,512, Apr. 19, 1989, abandoned. This application Apr. 28, 1992, Ser. No. 877,280
Claims priority, application Italy, Apr. 22, 1988, 20290 A/88
Int. Cl.[5] C07C *217/26, 217/40*
U.S. Cl. 564—504 18 Claims

1. Polymeric perfluoroaminoethers having



and optionally (—CF_2—CF_2) repeating units distributed at random in the chain and having the formula:

wherein R_f and R'_f are either equal or different from each other and represent:

—O—CF_3; CF_3—N(H)—CF_2—O—; —CF_2COF;

—$COCF_3$; —N(CF_3)—COF; —CF_2—N=CF_2;

—CF=N—CF_3; —N(CF_3)—C(=O)—$N(CF_3)_2$; —CF(—N=CF_2)—$N(CF_3)_2$;

—C(—N—CF_3)=N(CF_3)$_2$; a perfluoroalkyl C_1–C_6 radical;

a, b are integers and c is an integer or zero;
a+b+c≧2
a/b=1;
Z represents F or

or a C_1–C_{10} perfluoroalkyl group;
R represents F or a C_1–C_{10} perfluoralkyl group, like or different from Z;
X and Y are defined as follows:
a) when at least one of R and Z is different from F, X and Y represent F and CF_3, so that if X=F then Y=CF_3 or vice versa and c=0, or both represent F; or
b) when R=Z=F, X represents F and Y represents a perfluoroalkyl C_1–C_5 group or vice versa and c=0, or both represent F.

5,196,596

HIGHER ALDEHYDE SEPARATION PROCESS

Anthony G. Abatjoglou, Charleston, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Dec. 26, 1991, Ser. No. 813,528
Int. Cl.[5] C07C *45/78, 45/81*
U.S. Cl. 568—492 10 Claims

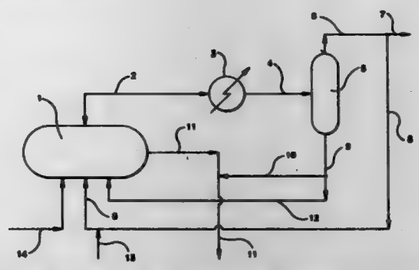
1. A process for separating an aldehyde that contains at least seven carbon atoms and that is free of alpha substituents from a solution containing the aldehyde and a non-polar organic liquid which process comprises contacting the solution with water to form a solid hydrate of the aldehyde by the reaction of the aldehyde with the water at a temperature above the melting point of the aldehyde but below the decomposition temperature of the solid hydrate and separating the solid hydrate from the solution.

5,196,597

OXIDATION OF ISOBUTANE TO TERTIARY BUTYL HYDROPEROXIDE

Robert N. Cochran, and Shaw-Chan Lin, both of West Chester, Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Apr. 22, 1992, Ser. No. 872,794
Int. Cl.[5] C07C *179/02, 27/12*
U.S. Cl. 568—571 3 Claims



1. The process for the oxidation of isobutane to produce tertiary butyl alcohol and tertiary butyl hydroperoxide wherein isobutane is reacted with molecular oxygen in the liquid phase at 100°–200° C., a vapor stream comprised of tertiary butyl alcohol and tertiary butyl hydroperoxide is continuously removed during the oxidation from the oxidation zone and condensed, and 5 to 95% of the liquid condensate comprised of tertiary butyl alcohol and tertiary butyl hydroperoxide is recovered as a product of the oxidation.

5,196,598

PROCESS FOR PRODUCING POLYHYDROPEROXY AROMATIC COMPOUND

Hiroshi Iwane; Takahiro Sugawara; Naoki Suzuki, and Kimiko Kaneko, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1991, Ser. No. 779,053
Claims priority, application Japan, Oct. 25, 1990, 2-288139
Int. Cl.[5] C07C *409/08*
U.S. Cl. 568—575 12 Claims

1. A process for preparing a polyhydroperoxy aromatic compound which comprises reacting a poly-secondary alkyl-substituted aromatic hydrocarbon with the secondary alkyl groups on carbon atoms that are not adjacent to each other on the aromatic ring thereof with a molecular oxygencontaining gas in a basic aqueous solvent in the presence of a surface active agent, wherein the reaction is conducted in a reaction apparatus whose part in contact with a reaction liquid comprises a metal containing 10% by weight or more of iron, and the reaction is carried out in the presence of a metal ion selected from the group consisting of a cobalt ion, a nickel ion, a zinc ion, and a lead ion.

5,196,599

METHOD OF PREPARING FLUORO, NITRO, AND FLUORONITROALKYL DIFLUOROFORMALS

William H. Gilligan, Ft. Washington, and Michael E. Sitzmann, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1981, Ser. No. 256,463
Int. Cl.[5] C07C *43/12, 205/02*
U.S. Cl. 568—590 3 Claims

1. A method of preparing a difluoroformal of the formula

$(RCH_2O)_2CF_2$,

wherein R is selected from the group consisting of —C(NO_2)$_3$, —$CF(NO_2)_2$, —$CF_2(NO_2)$, —$C(NO_2)_2CH_3$, —CF_3, and —CF_2CF_3, comprising:
(1) adding a dichloroformal of the formula

$(RCH_2O)_2CCl_2$,

wherein R is as defined above, to a solution of hydrogen fluoride in pyridine and allowing the dichloroformal to react with the hydrogen fluoride to give the difluoroformal; and
(2) isolating the product difluoroformal.

5,196,600

SYNTHESIS OF FLUORINATED DIMETHYL ETHERS

Gerald J. O'Neill, Arlington, Mass., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 25, 1992, Ser. No. 858,387
Int. Cl.[5] C07C *43/12, 41/22*
U.S. Cl. 568—684 22 Claims

1. A process for the preparation of fluorinated dimethyl ethers of the formula $CF_2HOCCl_xF_yH_{3-(x+y)}$, wherein x is 0, 1 or 2 and y is 1, 2 or 3 and wherein the total x+y is 1, 2 or 3, said process comprising:
chlorinating CHF_2OCH_3 by reacting said CHF_2OCH_3 with chlorine to form a chlorinated admixture containing at least one compound of the formula $CF_2HOCH_{3-z}Cl_z$, wherein z is 1, 2 or 3; and
fluorinating said at least one compound of the formula $CF_2HOCH_{3-z}Cl_z$ with hydrogen fluoride in the absence of a catalyst to obtain a fluorinated admixture containing at least one compound of a formula $CF_2HOCH_{3-x-y}F_yCl_{z-y}$.

5,196,601

PROCESS FOR PRODUCING ALCOHOL OR AMINE

Tomohito Kitsuki, Wakayama, and Yoshiaki Fujikura, Utsunomiya, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 630,230, Dec. 19, 1990, abandoned.
This application Jan. 17, 1992, Ser. No. 899,951
Claims priority, application Japan, Dec. 26, 1989, 1-337227
Int. Cl.[5] C07C *29/32, 27/04, 209/30*
U.S. Cl. 568—817 5 Claims

1. A process for producing an alcohol or an amine, which comprises reducing a compound having a formyl, keto, nitro, oxirane, ester, nitrile, amide, carboxyl or halogenated carboxyl group with an alkali metal borohydride in the presence of a compound having a hydroxyl group and ether linkage, wherein the compound having a hydroxyl group and ether linkage is a compound represented by formula (I):

(I)

wherein R^1 represents an alkyl group or an alkenyl group; R^2 represents a hydrogen atom or an alkyl group; R^1 and R^2 may be linked together to form an alkylene group; and m represents a number of 1 to 5.

5,196,602

TWO-STAGE MALEIC ANHYDRIDE HYDROGENATION PROCESS FOR 1,4-BUTANEDIOL SYNTHESIS

John R. Budge, Cleveland Hts.; Thomas G. Attig, Aurora, and Anne M. Graham, Northfield, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 30, 1991, Ser. No. 814,644
Int. Cl.[5] C07C *29/149, 31/20*
U.S. Cl. 568—864 13 Claims

1. A process for the production of 1,4-butanediol comprising contacting at least one of maleic anhydride or maleic acid with hydrogen in a two stage process wherein in the first stage at least one of maleic anhydride or maleic acid is hydrogenated to at least one of succinic anhydride or gammabutyrolactone in the presence of a hydrogenation catalyst selected from the group consisting of copper chromite, copper chromite promoted with at least one additional metal or metal oxide, Pd/Al_2O_3, Pd on a carbon support, or a mixed oxide catalyst comprising copper, zinc and aluminum, and wherein in the second stage at least one of the succinic anhydride or gammabutyrolactone is hydrogenated to 1,4-butanediol in the presence of a ruthenium-containing hydrogenation catalyst of the formula

$R_{a=0.001-2}M_{0.01-2}M'_{0.01-2}M''_{0.01-1}O_x$

where
M is at least one of nickel and palladium,
M' is at least one of iron, cobalt, rhodium, osmium, iridium and platinum,
M'' is at least one of zinc and cadmium, and
x is a number sufficient to satisfy the valency requirements of the other elements present, and wherein the total contact time is about 0.1 minutes to 10.0 minutes.

5,196,603

PROCESS FOR DECOMPOSING PEROXIDE IMPURITIES IN A TERITARY BUTYL ALCOHOL FEEDSTOCK USING AN IRON (II) COMPOUND

Chwo-Ching Jan, Elk Grove Village, and Thomas P. Malloy, Lake Zurich, both of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 653,921, Feb. 12, 1991, Pat. No. 5,124,492.
This application Jan. 30, 1992, Ser. No. 828,252
Int. Cl.[5] C07C *29/88, 29/132, 31/12*
U.S. Cl. 568—917 4 Claims

1. A process for removing peroxide impurities from a tertiary butyl alcohol feedstock to afford a tertiary butyl alcohol product containing less than 20 ppm of peroxides, comprising contacting the feedstock with an iron (II) compound at reduction conditions to reduce the peroxides to alcohols and oxidize the iron (II) to iron (III) thereby providing a mixture of the treated tertiary butyl alcohol, iron (III) compound, and any residual iron (II) compound and flowing the mixture over a cation exchange column to separate the iron compounds from the tertiary butyl alcohol and recover the tertiary butyl alcohol product.

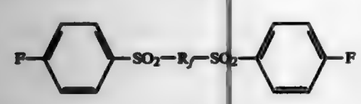
5,196,604

FLUORINATED POLY(ETHER SULFONES)

Andrew E. Feiring, and Samuel D. Arthur, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 435,831, Nov. 9, 1989, Pat. No. 5,084,548. This application Nov. 4, 1991, Ser. No. 786,677
Int. Cl.[5] C07C *317/06*
U.S. Cl. 568—34 5 Claims

1. A compound of formula (II)



(II)

wherein:

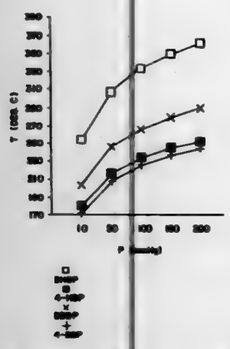
R_f is a straight chain or branched polyfluoroalkylene of from 1 to about 20 carbon atoms unsubstituted or substituted with one or more ether oxygens.

5,196,605

PROCESS FOR THE PREPARATION OF PURE 4,4'-DIHYDROXYBIPHENYL

Jakob Oren, Qiryat Bialik; Hugo Kesselman, Karmiel, and Joshua Hermolin, Ramat-Hasharon, all of Israel, assignors to Bromine Compounds, Ltd., Beer-Sheva, Israel

Filed May 28, 1991, Ser. No. 706,291
Claims priority, application Israel, May 29, 1990, 94554
Int. Cl.[5] C07C *39/14, 37/70*
U.S. Cl. 568—730 15 Claims



1. A process for the preparation of 4,4'-dihydroxybiphenyl of high purity, by treating a product mixture obtained from the hydrolysis reaction of 4,4'-dibromobiphenyl in the presence of a copper catalyst, further comprising the steps of:

filtering insoluble materials comprising the catalyst from the product mixture;

adjusting the pH of the resulting solution to a value of 9 or less, to precipitate crude 4,4'-dihydroxybiphenyl;

separating crude 4,4'-dihydroxybiphenyl from the product mixture; and

fractionally distilling the crude 4,4'-dihydroxybiphenyl to obtain substantially pure 4,4'-dihydroxybiphenyl.

5,196,606

AROMATIC TERTIARY AMINES, ENAMINES, DEOXYBENZOINS AND BENZILS

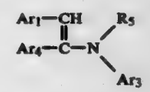
Allan S. Hay, 5015 Glencairn Avenue, Montreal, Quebec, Canada H3W 2B3 , and Martino Paventi, 11786 28th Avenue, Montreal, Quebec, Canada H1E 9Z7

Continuation of Ser. No. 644,261, Jan. 22, 1991, Pat. No. 5,117,062, which is a continuation of Ser. No. 475,992, Jan. 6, 1990, Pat. No. 5,011,998. This application Nov. 26, 1991, Ser. No. 798,585
Int. Cl.[5] C07C *45/00*
U.S. Cl. 568—309 7 Claims

1. A process for preparing a deoxybenzoin of formula (VIII):

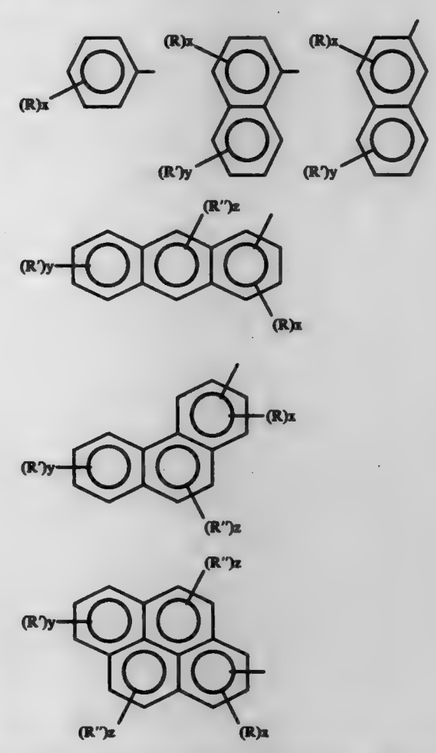
(VIII)

comprising hydrolyzing an enamine of formula (V):



(V)

wherein Ar_1, Ar_3 and Ar_4 are each aromatic radicals independently selected from:



x and y are integers independently selected from 0, 1, 2 or 3 and z is an integer independently selected from 0, 1 or 2, and R, R' and R" are each independently selected from halogen atoms selected from F, Cl and Br; alkyl of 1 to 6 carbon atoms; alkenyl of 2 to 6 carbon atoms; aryl of 6 to 12 carbon atoms, aralkyl of 7 to 18 carbon atoms; aralkenyl of 8 to 18 carbon atoms; alkoxy of 1 to 6 carbon atoms; a thioalkoxy of 1 to 6 carbon atoms; aryloxy of 6 to 12 carbon atoms and thioaryloxy of 6 to 12 carbon atoms, and

R_5 is alkyl of 1 to 8 carbon atoms or a radical Ar_6, wherein Ar_6 is an aromatic radical as defined for Ar_1, Ar_3 and Ar_4.

4. A process according to claim 1, including oxidizing the resulting deoxybenzoin of formula (VIII) to produce a corresponding benzil of formula (XII):

(XII)

wherein Ar_1 and Ar^4 are as defined in claim 1.

5,196,607

PROCESS FOR PREPARING KETONE ENANTIOMER

George J. Quallich, North Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 14, 1992, Ser. No. 837,012
Int. Cl.[5] C07C *45/41, 45/46*
U.S. Cl. 568—327 15 Claims

1. A process for preparing the (4S)-enantiomer of 4-(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone in a highly optically-pure form, starting from 3,4-dichlorocinnamyl chloride, which comprises the sequential series of steps that involve:

(a) first reacting 3,4-dichlorocinnamyl chloride with at least an equimolar amount of L-(−)-ephedrine in a chlorinated lower hydrocarbon solvent at a temperature ranging from about −20° C. up to about 25° C. to form the corresponding chiral N-methyl-N-(β-hydroxy-β-phenylisopropyl)-3-(3,4-dichlorophenyl)propenoamide;

(b) subjecting the chiral unsaturated amide product obtained in step (a) to a Grignard reaction with a large excess in moles of phenyl magnesium chloride or bromide in a cyclic or lower dialkyl ether at a temperature ranging from about −80° C. up to about 25° C., followed by hydrolysis, to effect a conjugate addition of the phenyl group and the hydrogen element to the aforesaid α,β-propenoamide and so selectively form the corresponding chiral N-methyl-N-(β-hydroxy-β-phenylisopropyl)-3-(3,4-dichlorophenyl)-3phenylpropanoamide;

(c) hydrolyzing the aforesaid chiral 3-phenylated propanoamide product of step (b) in a lower alkylene glycol solvent in the presence of an alkali metal hydroxide as base to form the corresponding 3-(3,4-dichlorophenyl)-(3R)-phenylpropanoic acid;

(d) esterifying the stereospecific (3R)-phenylated propanoic acid obtained in step (c) with an appropriate lower alkanol in the presence of thionyl chloride or a lower alkanoyl chloride to form the corresponding lower alkyl 3-(3,4-dichlorophenyl)-(3R)-phenylpropanoate;

(e) reducing the stereospecific (3R)-phenylated propanoic acid ester of step (d) with an appropriate carbonyl reducing agent in a reaction-inert polar aprotic organic solvent at a temperature ranging from about 0° C. up to about 100° C. until the reduction to form the corresponding desired 3-(3,4-dichlorophenyl)-(3R)-phenylpropanol intermediate is substantially complete;

(f) chlorinating the stereospecific phenylated n-propanol compound obtained in step (e) with carbon tetrachloride in an excess of said reagent as solvent and in the presence of triphenylphosphine at a temperature ranging from about 50° C. up to about the reflux temperature of the reaction mixture to form the corresponding 3-(3,4-dichlorophenyl)-(3R)-phenylpropyl chloride;

(g) reacting the stereospecific (3R)-phenylated n-propyl chloride obtained in step (f) with an alkali metal cyanide in a reaction-inert polar organic solvent at reflux temperatures to form the corresponding 4-(3,4-dichlorophenyl)-(4R)-phenylbutyronitrile;

(h) hydrolyzing the stereospecific (4R)-phenylated butyronitrile product of step (g) in a lower alkylene glycol solvent in the presence of an alkali metal hydroxide as base to form the corresponding 4-(3,4-dichlorophenyl)-(4R)-phenylbutanoic acid; and

(i) thereafter converting the stereospecific (4R)-phenylated n-butanoic acid compound obtained in step (h) to the corresponding4-(3,4-dichlorophenyl)-(4R)-phenylbutanoyl chloride by treatment with thionyl chloride in a reaction-inert aprotic organic solvent, followed by cyclization of the aforesaid butanoyl chloride compound in the presence of a Friedel-Crafts type catalyst at a temperature ranging from about −5° C. up to about 25° C. to finally yield the corresponding(4S)-4-(3,4-dichlorophenyl)-3,4-dihydro-l(2H)-naphthalenone enantiomer in the desired isomer weight ratio in the resultant isomeric product mixture that allows for the ready recovery of said individual isomer therefrom in a highly optically-pure form.

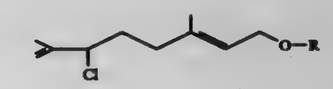
5,196,608

USE OF AN ALLYLCHLORIDE FOR PREPARING AN ALDEHYDE

Gerrit J. Lagerweij; Cornelis Bakker, and Monique E. A. De Bruin-Van Der Flier, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Dec. 2, 1991, Ser. No. 801,654
Claims priority, application European Pat. Off., Dec. 5, 1990, 90203204.4
Int. Cl.[5] C07C *45/37, 45/32*
U.S. Cl. 568—471 3 Claims

1. Use of an allychloride of the formula

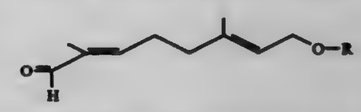


(I)

wherein

R is a C_1–C_{12} alkyl group or a C_2–C_{12} alkenyl group, which groups may be substituted with one or more substituents selected from the group consisting of C_1–C_4 alkoxy, halogen, unsubstituted phenyl and substituted phenyl; a (trihydrocarbyl)silyl group; a (dihydrocarbyl)(hydrocarbyloxy)silyl group; or a dihydropyran-2-yl group, a tetrahydropyran-2-yl group, a dihydrofur-2-yl group or a tetrahydrofur-2-yl group, which groups may be substituted with C_1–C_6 alkyl;

for preparing an aldehyde compound of the formula



(IV)

wherein R has the above meaning, by successively:

(i) converting said allylchloride with a salt of a C_1–C_4 carboxylic acid, in the presence of an iodide as a catalyst, and in an inert organic solvent, at increased temperature, followed by saponification of the ester thus obtained into an alcohol compound of the formula

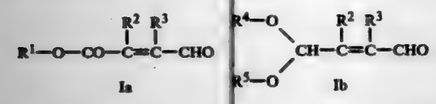
(V)

and

(ii) oxidizing the alcohol compound thus obtained with oxygen in the presence of a cuprous compound and an N-oxy compound as catalysts, in a dipolar organic solvent.

5,196,609
PREPARATION OF 3-ALKOXYCARBONYL PROPENALS AND 3-DIALKOXYMETHYL PROPENALS
Werner Aquila, Mannheim; Hans-Ulrich Scholz, Weisenheim; Hartwig Fuchs, Ludwigshafen; Wolfgang Krause, Mannheim; Joachim Paust, and Werner Hoffmann, both of Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Mar. 2, 1992, Ser. No. 844,317
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1991, 4106907
Int. Cl.[5] C07C *45/37, 47/277*
U.S. Cl. 568—473 4 Claims

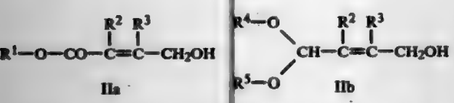
1. A process for the preparation of a 3-alkoxycarbonyl propenal or 3-dialkoxymethyl propenal of the formulae Ia and Ib respectively



Ia

Ib

in which R^1 denotes a C_1–C_3-alkyl group, R^2 and R^3 denote hydrogen, methyl, or ethyl, and R^4 and R^5 denote C_1–C_4-alkyl groups, which may be joined to form a 5-membered or 6-membered ring, wherein a corresponding alcohol of the formula IIa or IIb



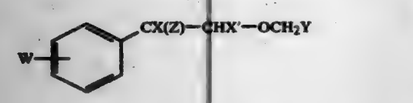
IIa

IIb

is reacted with oxygen or an oxygen-containing gas in the gas phase in the presence of a metal from Group IB of the Periodic Table or a compound of one such metal acting as catalyst at 300° to 700° C. and 0.0005 to 2 bar.

5,196,610
INSECTICIDAL ETHERS
Michael J. Bushell, Wokingham; Alan J. Whittle, Aldershot, and Robin A. E. Carr, Camberley, all of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Jul. 31, 1986, Ser. No. 891,350
Claims priority, application United Kingdom, Aug. 9, 1985, 8520027
Int. Cl.[5] C07C *41/00*
U.S. Cl. 568—661 19 Claims

1. A compound of formula:



(I)

wherein W represents one or two substituents selected from halo, alkyl, alkoxy, alkoxyalkyl, haloalkyl and haloalkoxy, or W represents a bidentate group linking adjacent carbon atoms selected from alkylene of 3 or 4 carbon atoms and alkylenedioxy of up to 2 carbon atoms; Z represents trifluoromethyl; Y represents a substituted aryl group where each substituent is selected from halo, alkyl, aryl, aralkyl, aryloxy and arylamino; and either X' is hydrogen and X is selected from hydrogen, halo, hydroxy, alkoxy and aryloxy, or X and X' together represent a second bond between the adjacent carbon atoms.

5,196,611
PREPARATION OF ALKYL, ALKENYL, AND ALKYNYL CHLORIDES
Jochem Henkelmann, Ludwigshafen; Irene Troetsch-Schaller, Frankenthal; Thomas Wettling, Limburgerhof; Thomas-Michael Kahl, Roemerberg; Leopold Hupfer, Friedelsheim; Wolfgang Franzischka, Frankenthal, and Hermann Koehler, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed May 6, 1992, Ser. No. 879,214
Claims priority, application Fed. Rep. of Germany, May 18, 1991, 4116365
Int. Cl.[5] C07C *17/16, 41/18*
U.S. Cl. 568—663 1 Claim

1. A process for the preparation of an alkyl, alkenyl, or alkynyl chloride by the reaction of a corresponding alcohol with phosgene or thionyl chloride in the presence of a phosphine oxide acting as catalyst, wherein the catalyst used is an aliphatic, cycloaliphatic, or cyclic/aliphatic phosphine oxide.

5,196,612
ETHERIFICATION OF ISOAMYLENES BY CATALYTIC DISTILLATION
Dennis J. Ward, St. James City, Fla., assignor to UOP, Des Plaines, Ill.
Filed Feb. 3, 1992, Ser. No. 829,812
Int. Cl.[5] C07C *41/06*
U.S. Cl. 568—697 5 Claims

1. A process for the production of ethers which comprises passing a first feed stream comprising a mixture of isomers of a C_5-plus isoolefin and a second feed stream comprising an alcohol into a catalytic distillation zone containing an etherification catalyst and also containing an olefin double bond isomerization catalyst, with the catalytic distillation zone being operated under conditions which result in the reaction of the alcohol with a tertiary olefin, the isomerization of unreactive olefins to reactive tertiary olefins and the separation of compounds present in the zone into an overhead vapor stream comprising unreacted C_5-plus tertiary olefins and a net bottoms stream which comprises a product ether.

5,196,613
PROCESS FOR THE MANUFACTURE OF ALPHA-AMBRINOL
Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.
Division of Ser. No. 534,108, Jun. 6, 1990, Pat. No. 5,107,037.
This application Jan. 21, 1991, Ser. No. 823,232
Claims priority, application European Pat. Off., Jun. 13, 1989, 89810451
Int. Cl.[5] C07C *35/36, 29/00*
U.S. Cl. 568—819 4 Claims

1. 1-Chloro-2-hydroxy-2,5,5-trimethyl-1,2,3,4,4a,5,6,7-octahydronaphthalene.

5,196,614
PROCESS FOR PREPARING BROMINATED TELOMERS OF CHLOROTRIFLUOROETHYLENE
Gerardo Caporiccio, Milan, Italy; Gerald A. Gornowicz, Midland, Mich., and Bernard Boutevin, Montpellier, France, assignors to Dow Corning Corporation, Midland, Mich.
Continuation-in-part of Ser. No. 590,850, Oct. 1, 1990, Pat. No. 5,110,973, which is a continuation-in-part of Ser. No. 373,393, Jun. 30, 1989, abandoned. This application Apr. 29, 1992, Ser. No. 874,900
Int. Cl.[5] C07C *17/26, 19/08*
U.S. Cl. 570—139 7 Claims

1. An uncatalyzed, thermally initiated process for preparing a telomer of the structure $BrCF_2CFCl(CF_2CFCl)_nBr$ which comprises reacting a telogen of the structure $BrCF_2CFClBr$ with chlorotrifluoroethylene at a temperature in excess of 200° C. for a time sufficient to form the telomer, wherein n is 1–10.

5,196,615
CATALYZED HYDROFLUORINATION HALOGENATED ALKANES
V. N. Mallikarjuna Rao, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 365,685, Jun. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 210,556, Jun. 23, 1988, abandoned. This application Aug. 22, 1990, Ser. No. 570,952
Int. Cl.[5] C07C *17/08*
U.S. Cl. 570—168 8 Claims

1. A process for the preparation of fluorinated alkanes which comprises contacting, at a temperature of about 0° C. to about 185° C., under substantially anhydrous conditions, one molar equivalent of a starting material selected from halogenated alkanes of the following formulas

$R^1R^2R^3R^4C$ and $R^5R^6R^7R^8C$

wherein

R^1, R^2, R^3, R^4, are C_xZ_{2x+1}, wherein Z is H, F, Br, or Cl and x=0 to 10 with the proviso that at least one of R^1, R^2, R^3, or R^4 be Cl or Br or contain Cl or Br;

R^5 and R^6 taken together are $-(CH_2)_n$, wherein n is an integer from 2 to 7, wherein R^7 and R^8 are C_xZ_{2x+1}, wherein Z is H, F, Br, or Cl and x=0 to 10, with the proviso that at least R^7 or R^8 is Cl or Br or contains Cl or Br, with HF in the presence of at least one catalyst consisting essentially of tantalum pentachloride or tantalum pentabromide to produce reaction products; removing said reaction products from contact with said catalyst and isolating a fluorinated alkane having one or more fluorine atoms above the number present in said starting material.

5,196,616
PROCESS FOR SEPARATING AND RECOVERING FLUOROCARBONS AND HYDROGEN FLUORIDE FROM MIXTURES THEREOF
Kung H. Lee, Chadds Ford, Pa.; Domenic J. Barsotti, Vineland, N.J., and Edward K. Sakata, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 18, 1991, Ser. No. 779,534
Int. Cl.[5] C07C *17/38*; B01D *59/10*
U.S. Cl. 570—178 14 Claims

1. A process for separating and recovering a fluorocarbon phase and a hydrogen fluoride phase from a feed stream of a mixture of fluorocarbon and hydrogen fluoride wherein said mixture is characterized as forming at least one azeotrope or azeotrope-like composition involving at least one fluorocarbon and hydrogen fluoride, comprising the steps of:

(a) providing a semipermeable membrane means for separating fluorocarbon from hydrogen fluoride having a feed side and a permeate side wherein said semipermeable membrane means is characterized as having a selectivity for allowing the passage of hydrogen fluoride relative to the fluorocarbon phase of at least 3;

(b) passing a feed stream of fluorocarbon and hydrogen fluoride across the feed side of the semipermeable membrane such that hydrogen fluoride passes preferentially through the membrane thus forming a fluorocarbon-depleted hydrogen fluoride permeate stream and a fluorocarbon enriched residual stream;

(c) subjecting said fluorocarbon-depleted hydrogen fluoride permeate stream produced in step (b) to distillation, thus separating and recovering hydrogen fluoride; and

(d) subjecting said fluorocarbon enriched residual stream produced in step (b) to distillation, thus separating and recovering a fluorocarbon phase.

5,196,617
METHOD OF HYDRODEHALOGENATING HALOGENATED ORGANIC COMPOUNDS IN AQUEOUS ENVIRONMENTAL SOURCES
Sophon Kovenklioglu, Chatham; Edward N. Balko, Middletown; Jeffrey B. Hoke, North Brunswick; Robert J. Ferrante, Westfield, and Gary A. Granuzzioni, Flemington, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.
Filed Jan. 14, 1992, Ser. No. 820,458
Int. Cl.[5] C07C *17/00, 17/34, 39/24*
U.S. Cl. 570—204 9 Claims

1. A method of hydrodehalogenating chlorinated aliphatic hydrocarbons from a substantially aqueous contaminated waste stream suspected of suspected of containing halogenated hydrocarbons comprising passing the waste stream into contact with hydrogen gas or a source of hydrogen gas selected from hydrazine, hydrazine hydrate, hydrazine salts and borohydrides in the presence of a catalyst consisting essentially of palladium on carbon at a temperature of from ambient temperature to 50° C. and at a pressure of from atmospheric pressure to 50 psig.

5,196,618
METHOD FOR THE PREPARATION OF METHYL CHLORIDE FROM CARBON TETRACHLORIDE AND METHYL ALCOHOL
Toshihiro Okon, and Takashi Shimizu, both of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1992, Ser. No. 843,848
Claims priority, application Japan, Mar. 1, 1991, 3-077443; Mar. 26, 1991, 3-086085
Int. Cl.[5] C07C *17/16*
U.S. Cl. 570—258 13 Claims

1. A method for the preparation of methyl chloride from carbon tetrachloride and methyl alcohol which comprises the successive steps of:

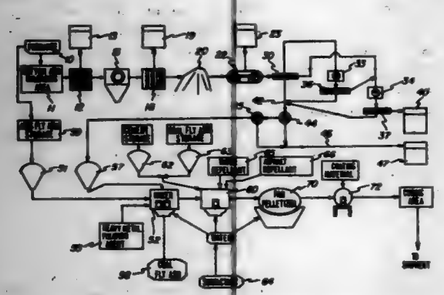
(a) introducing carbon tetrachloride and water into a first reaction zone kept at an elevated temperature and filled with a solid catalyst containing, as an active catalytic ingredient, a halide or oxide of a metallic element selected from the group consisting of the elements belonging to the Group 1B, Group 2A, Group 2B, Group 4B, Group 7B and Group 8 in the Periodic Table supported on active carbon as a carrier so as to produce a gaseous reaction mixture containing carbon dioxide and hydrogen chloride by the hydrolysis of carbon tetrachloride; and

(b) introducing the gaseous reaction mixture coming out of the first reaction zone and containing carbon dioxide and hydrogen chloride either as such or after condensation into a liquid form and methyl alcohol into a second reaction zone kept at an elevated temperature so as to produce methyl chloride by the reaction of hydrogen chloride with methyl alcohol.

5,196,619
INHIBITING POPCORN POLYMER FORMATION WITH SULFUR-CONTAINING COMPOUNDS
Hsiang-ning Sun, 4212 Villanova, Houston, Tex. 77005; John J. Cikut, 3700 Kingwood Dr. Apt. 1306, Kingwood, Tex. 77339; Roque V. Martir, 2214 Enchanted Isle Dr., Houston, Tex. 77062, and Jon P. Wristers, 16011 Craighurst, Houston, Tex. 77059
Filed Jan. 29, 1991, Ser. No. 647,356
Int. Cl.[5] C07C *7/20*
U.S. Cl. 585—862 16 Claims

1. A method for inhibiting popcorn polymer growth in organic material, comprising adding intermittently, to said organic material, at least one sulfur containing compound selected from the group consisting of mercaptans and hydrogen sulfide.

5,196,620
FIXATION AND UTILIZATION OF ASH RESIDUE FROM THE INCINERATION OF MUNICIPAL SOLID WASTE
Frederick H. Gustin; Hugh P. Shannonhouse, and Robert W. Styron, all of Marietta, Ga., assignors to Municipal Services Corporation, Kennesaw, Ga.
Filed Jan. 13, 1991, Ser. No. 714,578
Int. Cl.[5] C04B 18/30
U.S. Cl. 588—257 26 Claims



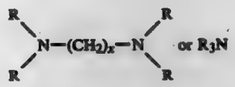
1. A cold bonded aggregate for a concrete mix in the form of a pellet comprising a body of processed ash residue from the incineration of municipal solid waste in which the heavy metal content of said ash residue has been fixed by an alkali metal fixative and said body is bonded by a cementitious binder, and having a hard sealing coating formed on the outer surface of the pellet body which is compatible with said concrete mix.

5,196,621
PROCESS FOR THE CYCLODIMERIZATION OF 1,3-BUTADIENES TO 4-VINYLCYCLOHEXENES
Ronald W. Diesen; Kenneth A. Burdett; Ravi S. Dixit; Stanley S. T. King, and Michael M. Olken, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 19, 1991, Ser. No. 688,808
Int. Cl.[5] C07C 2/50
U.S. Cl. 585—361 55 Claims

1. A process for the cyclodimerization of 1,3-butadiene or substituted 1,3-butadiene to 4-vinylcyclcohexene or a substituted derivative thereof, the process comprising contacting 1,3-butadiene or a substituted 1,3-butadiene with a catalytic amount of a catalyst composition containing copper(I) ions supported on a carrier and containing a promoting amount of an hydroxylic solvent such that the promoting amount of hydroxylic solvent ranges from about 2.5 to about 22 weight percent when the catalyst is prepared by ionexchanging copper ions into the carrier, or alternatively, such that the promoting amount of hydroxylic solvent ranges from abut 3 to about 14 weight percent when the catalyst is prepared by impregnating copper ions onto the carrier, the contacting of the 1,3-butadiene or substituted 1,3-butadiene with the catalyst occurring under reaction conditions such that the activity of the catalyst, a measured by the rate of formation of 4-vinylcyclohexene or substituted 4-vinylcyclohexene, is increased when compared with a control process which is identical to the process of this invention with the exception that the control catalyst contains no greater than 2 weight percent of an hydroxylic solvent.

5,196,622
ALKENE ADDITION PROCESS
Ted M. Pettijohn, and Mark E. Lashier, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 22, 1991, Ser. No. 796,142
Int. Cl.[5] C07C 2/66; B01J 23/04
U.S. Cl. 585—457 13 Claims

1. A process to produce a single alkene addition product said process consisting essentially of contacting:
a hydrocarbyl alkali metal compound selected from the group consisting of methyl lithium, ethyl lithium, propyl lithium, butyl lithium, butyl sodium, butyl potassium, butyl rubidium, butyl cesium, benzyl lithium, phenyl lithium, and mixtures thereof; with
a nitrogen containing compound wherein said nitrogen-containing compound is characterized by one of the following formulas:



wherein each R group is independently selected from the group consisting of hydrogen and alkyls of 1 to 20 carbon atoms, inclusive, and x is an integer between 1 and 10, inclusive;
in the presence of an aromatic compound wherein said aromatic compound is characterized by the following formula:

wherein each R is independently selected from the group consisting of hydrogen, alkyl, aryl, and alkylaryl; and
also in the presence of at least one alpha-olefin selected from the group consisting of propylene, isobutylene, 1-butene, 3-methyl-1-butene, 1-pentene, 3-methyl-1-pentene, 4-methyl-1-pentene, 1-hexene, 3-ethyl-1-hexene, 1-octene, 1-decene, and mixtures thereof; and
recovering said single alkene addition product wherein said single alkene addition product consists essentially of a molecule of said aromatic compound joined to a molecule of said alpha-olefin.

5,196,623
AROMATIC ALKYLATION PROCESS EMPLOYING ZEOLITE OMEGA CATALYST
James R. Butler, Houston, Tex., assignor to Fina Technology, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 371,502, Jun. 23, 1989, Pat. No. 5,073,653. This application Dec. 16, 1991, Ser. No. 807,698
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] C07C 2/66
U.S. Cl. 585—467 10 Claims

1. In a process for the production of ethylbenzene by the liquid phase ethylation of benzene, the steps comprising:
(a) supplying a benzene feedstock into a reaction system containing an alkylation catalyst comprising zeolite omega;
(b) supplying an ethylating agent to said reaction system;
(c) operating said reaction system at temperature and pressure conditions providing a pressure in said reaction zone at least 50 psi above the vapor pressure of said benzene and causing mono-ethylation of said benzene in the liquid phase by said ethylating agent in the presence of said catalyst, and under which conditions the xylene made based upon the amount of ethylbenzene produced is no more than 0.05 wt.%; and
(d) recovering ethylbenzene from said reaction system.

5,196,624
DETERGENT GRADE TO C_{10} TO C_{28} OLEFINS, (C_{10} TO C_{28} ALKYL)BENZENES AND C_{10} TO C_{28} ALKYL) BENZENE SULFONATES AND PROCESS FOR PREPARING SAME USING A PHOSPHINE CONTAINING CATALYST
Richard S. Threlkel, Albany; Victor P. Kurkov, San Rafael, and Gar L. Woo, Tiburon, all of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.
Continuation of Ser. No. 515,798, Apr. 27, 1990, abandoned. This application May 6, 1992, Ser. No. 880,474
Int. Cl.[5] C07C 2/24
U.S. Cl. 585—513 10 Claims

1. A process for preparing C_{10} to C_{28} linear and mono-branched olefins comprising contacting a C_5 to C_{14} olefin feed with a dimerization catalyst which is selective to the production of linear and mono-branched olefins, under dimerization conditions to produce a C_{10} to C_{28} olefin product wherein said dimerization catalyst is selected from the group consisting of:
(1) a mixture comprising:
(a) a nickel (II) compound having the formula NiXY wherein X is an organic carboxy anion RCOO— where R is an aliphatic hydrocarbyl group of at least 4 carbon atoms and Y is a carboxylate or pentane dionylate anion;
(b) a phosphine compound having the formula PR'$_3$ where R' is an aryl group; and
(c) an alkyl aluminum halide;
wherein components (1)(a), (1)(b) and (1)(c) are present in relative amounts such that the P/Ni mole ratio is from about 0.75 to about 1.25 and the Al/Ni mole ratio is from about 5.0 to about 15.0;
(2) a mixture comprising:
(a) a complex of a nickel (O) compound and a phosphine PR' where R' is as defined above; and
(b) an alkyl aluminum halide or aluminum trihalide;
wherein components (2)(a) and (2)(b) are present in relative amounts such that the Al/Ni mole ratio is from about 5.0 to about 7.0; and
(3) a mixture comprising:
(a) a mixture of a nickel (O) compound and a phosphine PR$_3$' where R' is as defined above; and
(b) an aluminum trihalide;
wherein components (3)(a) and (3)(b) are present in relative amounts such that the Al/Ni mole ratio is from about 5.0 to about 7.0 and the P/Ni mole ratio is from about 1.0 to about 2.0.

5,196,625
DETERGENT GRADE TO C_{10} TO C_{28} OLEFINS, (C_{10} TO C_{28} ALKYL) BENZENES AND (C_{10} TO C_{28} ALKYL) BENZENE SULFONATES AND PROCESS FOR PREPARING SAME USING A PHOSPHITE CONTAINING CATALYST
Richard S. Threlkel, Albany, and Victor P. Kurkov, San Rafael, both of Calif., assignors to Chevron Research & Technology Company, San Francisco, Calif.
Continuation of Ser. No. 515,956, Apr. 27, 1990, abandoned. This application May 6, 1992, Ser. No. 880,473
Int. Cl.[5] C07C 2/24
U.S. Cl. 585—513 10 Claims

1. A process for preparing C_{10} to C_{28} linear and mono-branched olefins comprising contacting a C_5 to C_{14} olefin feed with a dimeriztion catalyst which is selective to the production of linear and mono-branched olefins, under dimerization conditions to produce a C_{10} to C_{28} olefin product wherein said dimerization catalyst is selected from the group consisting of:
(1) a mixture comprising:
(a) a nickel (II) compound having the formula NiXY wherein X is an organic carboxy anion RCOO— where R is an aliphatic hydrocarbyl group of at least 4 carbon atoms and Y is a carboxylate or pentane dionylate anion;
(b) a phosphite compound having the formula P(OR")$_3$ where R" is as defined above; and
(c) an alkyl aluminum halide;
wherein components (1)(a), (1)(b) and (1)(c) are present in relative amounts such that the P/Ni mole ratio is from about 0.75 to about 1.25 and the Al/Ni mole ratio is from about 5.0 to about 15.0;
(2) a mixture comprising:
(a) a complex to a nickel (O) compound and a phosphite P(OR")$_3$ where R" is as defined above; and
(b) an alkyl aluminum halide or aluminum trihalide;
wherein components (2)(a) and (2)(b) are present in relative amounts such that the Al/Ni mole ratio is from about 5.0 to about 7.0; and
(3) a mixture comprising:
(a) a mixture of a nickel (O) compound and a phosphite P(OR")$_3$ where R" is as defined above; and
(b) an aluminum trihalide;
wherein components (3)(a) and (3)(b) are present in relative amounts such that the Al/Ni mole ratio is from about 5.0 to about 7.0 and the P/Ni mole ratio is from about 1.0 to about 2.0.

5,196,626
FILM TYPE ALKYLATION PROCESS
Jonathan E. Child, and Tomas R. Melli, both of Sewell, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 4, 1991, Ser. No. 787,185
Int. Cl.[5] C07C 2/62
U.S. Cl. 585—720 12 Claims

1. A process for alkylating an isoparaffin with an olefin comprising the steps of:
(a) providing a cylindrical alkylation reactor;
(b) providing a liquid acid catalyst distributor in said alkylation reactor;
(c) charging a liquid acid catalyst through said distributor to said alkylation reactor under controlled flow conditions including linear fluid velocities within said alkylation reactor sufficient to maintain a film of liquid acid flowing upwardly on the inner surface of said alkylation reactor;
(d) flowing a hydrocarbon mixture containing at least one isoparaffin having from about 4 to about 12 carbon atoms and at least one olefin having from about 3 to about 10 carbon atoms upwardly through said alkylation reactor;
(e) effecting reaction of isoparaffin and olefin with said film of liquid acid catalyst wherein alkylation conditions include temperature from about −40° to 500° C. and pressure from subatmospheric to about 5000 psig; and
(f) breaking said liquid film and dispersing said liquid film into said hydrocarbon.

5,196,627
ISOPARAFFIN:OLEFIN ALKYLATION PROCESS AND REACTOR APPARATUS
Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 21, 1991, Ser. No. 796,510
Int. Cl.[5] C07L 2/62
U.S. Cl. 585—723 12 Claims

1. A process for alkylating an isoparaffin with an olefin in the presence of hydrofluoric acid comprising the steps of:
(a) providing a longitudinally extensive reaction vessel for retaining a less dense hydrocarbon phase superimposed above a lower hydrofluoric acid phase;

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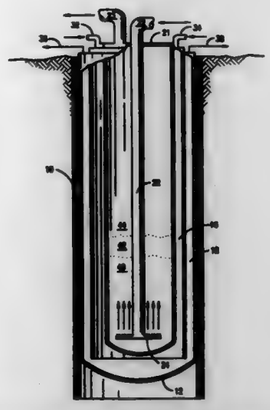
(b) providing a jacket surrounding and substantially concentric with said longitudinally extensive reaction vessel and flowing liquid into the annular region defined by said longitudinally extensive reaction vessel and said jacket;
(c) controlling the height of said less dense hydrocarbon phase above said more dense hydrofluoric acid phase within said longitudinally extensive reaction vessel such that the head exerted by said less dense hydrocarbon phase on said hydrofluoric acid phase is sufficient to maintain said hydrofluoric acid phase in the liquid state in the absence of externally applied pressure at operating temperature;
(d) flowing feedstock containing at least one paraffin and at least one olefin through said hydrofluoric acid phase under alkylation conditions to convert at least a portion of said feedstock to alkylate product; and
(e) withdrawing hydrocarbon containing said alkylate product from an upper portion of said reaction vessel.

5,196,628
LIQUID ACID ALKYLATION CATALYST AND ISOPARAFFIN:OLEFIN ALKYLATION PROCESS
Kenneth J. Del Rossi, Woodbury, N.J., and Albin Huss, Jr., Chadds Ford, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Jan. 21, 1991, Ser. No. 719,277
Int. Cl.[5] C07C 2/62
U.S. Cl. 585—725 10 Claims

1. A process for alkylating an isoparaffin with an olefin comprising effecting reaction of isoparaffin and olefin with an alkylation catalyst composition comprising from about 10 to about 90 percent of at least one acid selected from the group consisting of hydrofluoric acid and the halogen-substituted sulfonic acids, together with from about 10 to about 90 weight percent of an additive having the formula R—(NO_2), wherein R is an alkyl, aromatic, halide-substituted alkyl or halide-substituted aromatic group having from about 1 to about 30 carbon atoms.

5,196,629
ISOPARAFFIN:OLEFIN ALKYLATION PROCESS AND REACTOR APPARATUS
Hartley Owen, Bell Mead, N.J., and Paul H. Schipper, Doylestown, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Nov. 21, 1991, Ser. No. 796,522
Int. Cl.[5] C07C 2/62
U.S. Cl. 585—723 11 Claims



1. A process for alkylating an isoparaffin with an olefin in the presence of hydrofluoric acid comprising the steps of:
(a) providing a longitudinally extensive subterranean vessel within a well casing;
(b) maintaining a less dense hydrocarbon phase above a more dense hydrofluoric acid phase within said longitudinally extensive subterranean vessel such that the head exerted by said less dense hydrocarbon phase on said hydrofluoric acid phase is sufficient to maintain said hydrofluoric acid phase in the liquid state in the absence of externally applied pressure at operating temperature;
(c) flowing feedstock containing at least one paraffin and at least one olefin through said hydrofluoric acid phase under alkylation conditions to convert at least a portion of said feedstock to alkylate product; and
(d) withdrawing hydrocarbon containing said alkylate product from an upper portion of said subterranean vessel.

5,196,630
PROCESS FOR THE REMOVAL OF CATALYST RESIDUES FROM OLEFIN POLYMERIZATION PRODUCTS
Anil K. Agrawal, Princeton Junction, N.J., and Frederick C. Loveless, Yardley, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Apr. 25, 1991, Ser. No. 693,117
Int. Cl.[5] C07C 7/00, 2/08
U.S. Cl. 585—860 19 Claims

1. A process for the removal of halogen-containing catalytic residues from olefin polymerization products comprising:
(a) admixing an olefin polymerization product with a quantity of a quaternary ammonium salt, having the structural formula

$R_4N^+X^-$

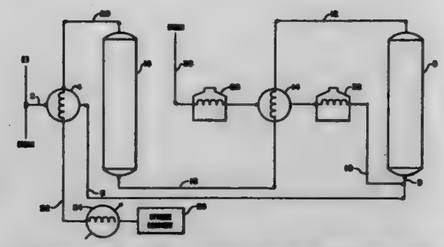
wherein R is alkyl, aralkyl or alkaryl and X is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine, effective to facilitate the removal of greater than 80% of contaminating halogen-containing Friedel-Crafts type or Ziegler-type catalytic residues

upon subsequent washing with aqueous solution and separation of the aqueous phase;
(b) washing the mixture of step (a) with an aqueous washing solution;
(c) allowing the washed solution of step (b) to settle for a period of time effective to cause the aqueous and organic phases to separate; and
(d) separating the aqueous phase from the orgainic phase to provide an organic phase that is substantially free of contaminating catalytic residues.

5,196,631
CATALYST FOR PRODUCTION OF AROMATIC HYDROCARBONS AND PROCESS FOR PRODUCTION OF AROMATIC HYDROCARBONS USING SAME
Takashi Murakawa, and Hisashi Katsuno, both of Sodegaura, Japan, assignors to Research Association for Utilization of Light Oil, Tokyo, Japan
Division of Ser. No. 341,386, Apr. 21, 1989, Pat. No. 5,091,351. This application Nov. 15, 1991, Ser. No. 793,079
Int. Cl.[5] C07C 5/41
U.S. Cl. 585—419 7 Claims

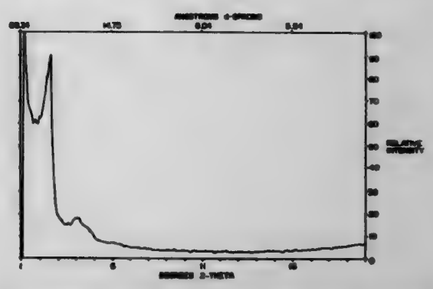
1. A process for preparing an aromatic hydrocarbon comprising exposing one or more hydrocarbons selected from the group consisting of a paraffin hydrocarbon, an olefin hydrocarbon, a cyclic paraffin hydrocarbon and a cyclic olefin hydrocarbon to a catalyst comprising an zeolite having a structure of an L-zeolite with platinum supported thereon, said catalyst being prepared by supporting the platinum on the zeolite having a structure of an L-zeolite, and treating the platinum and zeolite with a halogen-containing compound.

5,196,632
TREATMENT OF HEAT EXCHANGERS TO REDUCE CORROSION AND BY-PRODUCT REACTIONS
Thomas L. Larsen, Andover; Max E. Underwood, Bedford; Maarten P. Neerdzij, and Shiou-Shan Chen, both of Winchester, all of Mass., assignors to The Badger Company, Inc., Cambridge, Mass.
Division of Ser. No. 565,048, Aug. 9, 1990, Pat. No. 5,141,049. This application Jan. 11, 1992, Ser. No. 896,990
Int. Cl.[5] C07C 5/367
U.S. Cl. 585—440 7 Claims



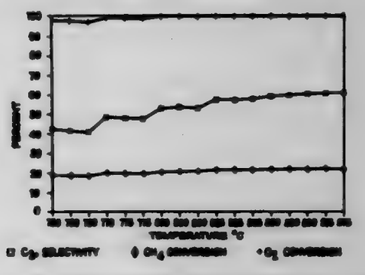
1. A process for the dehydrogenation of an alkylaromatic hydrocarbon which comprises the steps of:
(a) continuously mixing a selected alkylaromatic hydrocarbon and water so as to form a reactant vapor stream; and
(b) continuously contacting said reactant vapor stream with a dehydrogenation catalyst in a reactor under dehydrogenation conditions so as to form a vapor phase dehydrogenation reaction effluent comprising a predetermined product hydrocarbon;
(c) continuously removing said effluent as a stream from said reactor;
(d) cooling said effluent stream and heating said reactant vapor stream by indirect exchange of heat therebetween in a shell and tube heat exchanger wherein the exterior surfaces of the tubes in said heat exchanger have been mechanically treated so as to produce a microfinish that renders said exterior surfaces less susceptible to attack by said reactant vapor stream.

5,196,633
CATALYTIC CONVERSION
Charles T. Kresge, West Chester, Pa.; Michael E. Leonowicz, Medford Lakes; Wieslaw J. Roth, Sewell, both of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corp., Fairfax, Va.
Continuation-in-part of Ser. No. 625,245, Dec. 10, 1990, Pat. No. 5,098,684, which is a continuation-in-part of Ser. No. 470,008, Jan. 25, 1990, Pat. No. 5,102,643. This application Mar. 18, 1992, Ser. No. 853,458
The portion of the term of this patent subsequent to Apr. 14, 2009, has been disclaimed.
Int. Cl.[5] C07C 1/20
U.S. Cl. 585—469 34 Claims



1. A process for effecting catalytic conversion of an organic compound-containing feedstock to conversion product which comprises contacting said feedstock under catalytic conversion conditions with a catalyst comprising an active form of an inorganic, porous crystalline phase material having, after calcination, a hexagonal arrangement of uniformly-sized pores having diameters of at least about 15 Angstrom Units and exhibiting a hexagonal electron diffraction pattern that can be indexed with a d_{100} value greater than about 18 Angstrom Units.

5,196,634
HYDROCARBON CONVERSION
Don M. Washecheck, Naperville; Mark K. Barr, Wheaton; George A. Huff, Jr., Naperville; Mark P. Kaminsky, Winfield; Mark S. Kleefisch, and Victor K. Shum, both of Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Oct. 11, 1991, Ser. No. 775,209
Int. Cl.[5] C07C 2/00
U.S. Cl. 585—500 18 Claims



1. A method for converting lower alkanes to a product composition comprising a higher molecular weight hydrocar-

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bon, said method comprising contacting a feed composition comprising at least one lower alkane material with an oxidative coupling contact material comprising an intimately mixed, mixed oxide of:

a) at least one cationic species of a naturally occurring Group IIIB element;

b) at least one cationic species of a Group IIA metal selected from the group consisting of magnesium, calcium, strontium and barium; and

c) a cationic species of aluminum

with the contacting being at oxidative coupling reaction conditions and in the presence of oxygen.

5,196,635

OLIGOMERIZATION OF ALPHA-OLEFIN

Govind Kumar, and Mark A. Davis, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 699,361, May 13, 1991, abandoned. This application Jul. 9, 1992, Ser. No. 912,050

Int. Cl.[5] C07C *2/22*

U.S. Cl. 585—532 15 Claims

1. A process for preparing an olefin oligomer comprising polymerizing one or a mixture of olefins, each of which has about 6 to 20 carbon atoms, in the presence of a catalyst prepared by reacting, in an organic solvent, an aluminum halide with an alcohol in proportions of from about 0.05 to 0.42 mol of alcohol per mole of aluminum halide such that said solvent absorbs hydrogen halide which is generated in said reaction so as to provide a controlled amount of hydrogen halide in the polymerization to produce an olefin oligomer having a kinematic viscosity of from about 30 to 400 cSt at 100° C.

5,196,636

HIGH YIELD SWEET CORN HYBRID

Maro R. Sondahl, Cherry Hill, N.J.; William J. Da Silva, Campinas, and Tharcizio C. De Almeida, Ribeirao Preto, both of Brazil, assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Filed Jul. 21, 1988, Ser. No. 222,474

Int. Cl.[5] A01H *5/00, 1/00*

U.S. Cl. 800—205 21 Claims

1. A corn hybrid, which is produced by crossing a field corn dent parent as the male with a field corn flint parent as the female, the kernels of which female field corn flint parent are characterized by a round shape and a thick starchy endosperm, said hydrob having kernels with a sugar content of at least about 20–30% at 25–30 days after pollination; (b) the genotype $SuSush_2sh_2$; (c) kernels with a germination rate of at least about 80%; and (d) an average fresh ear weight of at least about 6 metric tons per acre.

5,196,637

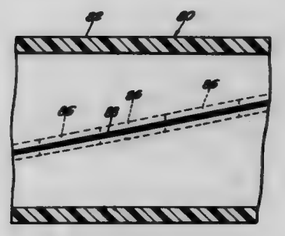
NONMETALLIC GUN BARREL

Paul A. Petrovich, 11269 Judd Rd., Fowlerville, Mich. 48836

Division of Ser. No. 774,949, Oct. 11, 1991. This application Jun. 22, 1992, Ser. No. 901,648

Int. Cl.[5] F41A *21/18*

U.S. Cl. 42—76.02 7 Claims



1. A nonmetallic gun barrel, comprising:

a radially elastically deformable tube comprised of a thermosetting resin;

a plurality of segmented inserts forming each of two or more ceramic engraving spines embedded in the tube, the spines wound in spiral fashion about a longitudinal axis of the barrel, a circumferential distance between the spines being greater than a circumferential width of the spines;

the spines having essentially triangular cross sections, the apexes of the triangular cross sections protruding radially inwardly from the tube, a majority of each of the cross sections remaining buried within the tube such that the spines longitudinally stiffen the tube;

the triangular cross sections each having two sides joined at the apex, the two sides forming an obtuse angle with one another.

5,196,638

MUTING DEVICE OF UPRIGHT PIANO

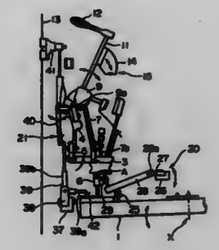
Hajime Hayashida; Satoshi Inoue, and Toshiaki Sakai, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 25, 1991, Ser. No. 720,714

Claims priority, application Japan, Jun. 26, 1990, 2-167817; Apr. 10, 1991, 3-104804

Int. Cl.[5] G10C *3/18*

U.S. Cl. 84—240 4 Claims



1. A muting device for an upright piano comprising:

a butt which rotates with a hammer striking a string of the upright piano;

a wippen which supports a jack such that the jack can be freely rotated, wherein the jack displaces the butt in response to a displacement of a key;

a first capstan button, provided at a back edge portion of the key, for transmitting the displacement of the key to the wippen;

a muting mechanism for rotating the hammer so that a string-striking stroke is reduced; and

key-displacement-transmission-rate changing means for, when reducing the string-striking stroke with the muting mechanism, moving a displacement transmission point, at which displacement of the key is transmitted to the wippen, toward a rotation center of the key from the capstan button.

5,196,639

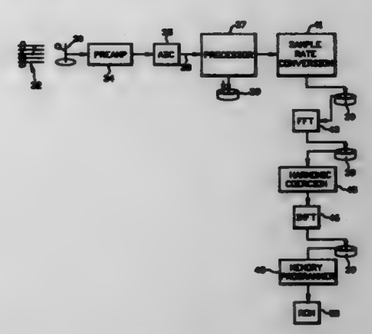
METHOD AND APPARATUS FOR PRODUCING AN ELECTRONIC REPRESENTATION OF A MUSICAL SOUND USING COERCED HARMONICS

J. Robert Lee, and David T. Starkey, both of San Diego, Calif., assignors to Gulbransen, Inc., Las Vegas, Nev.

Filed Dec. 20, 1990, Ser. No. 633,475

Int. Cl.[5] G10H *17/00*; G10L *9/14*

U.S. Cl. 84—603 14 Claims



1. A method of creating and preserving a counterpart of a sound having a fundamental frequency, the method utilizing an addressable memory and comprising the steps of:

generating a sequence of original time-domain samples of the sound, the sequence including successive adjacent portions in which a first portion exhibits aperiodic fluctuations of amplitude of the sound, a second portion, following the first portion, exhibits decreasing aperiodic fluctuations of amplitude of the sound, and a third portion, following the second portion, exhibits substantially periodic fluctuations of amplitude of the sound;

transforming the sequence of original time domain samples to frequency domain values including a set of frequency values representing component frequencies of the sound, the frequency values including the fundamental frequency and a plurality of related frequencies;

from the beginning of the second portion, changing related frequencies in the set of frequency values such that the related frequencies are substantially integral multiples of the fundamental frequency by the end of the second portion;

transforming the frequency domain values to a sequence of adjusted time domain values; and p1 storing the sequence of adjusted time domain values in a memory device.

5,196,640

CONTROL MECHANISM FOR ELECTRONIC MUSICAL INSTRUMENT

Yasuhiko Asahi; Satoshi Suzuki; Minoru Kitamura, and Toshiyuki Suzuki, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 450,001, Dec. 13, 1989, abandoned. This application Feb. 10, 1992, Ser. No. 833,808

Claims priority, application Japan, Dec. 27, 1988, 69-330168; Dec. 27, 1988, 63-330169; Dec. 27, 1988, 63-330170; Jan. 19, 1989, 1-4830

Int. Cl.[5] G10H *1/02, 1/06*

U.S. Cl. 84—692 **14 Claims**

8. A musical tone control mechanism for an electronic musical instrument, comprising:

a keyboard;

a musical tone adjustment device including a rotary body and a rotating shaft, the rotary body being arranged in front of said keyboard and along the longitudinal direction of the keyboard and rotated by a performer so as to control one of a plurality of musical tone parameters;

a detecting means connecting to the rotary body for detecting a rotation amount of the rotary body; and

a selection means for selecting one of the plurality of the musical tone parameters to be controlled by the rotary body, the selected musical tone parameter being controlled based on the rotation amount of the rotary body, wherein the plurality of the musical tone parameters are controlled by the rotation of the rotary body.

5,196,641

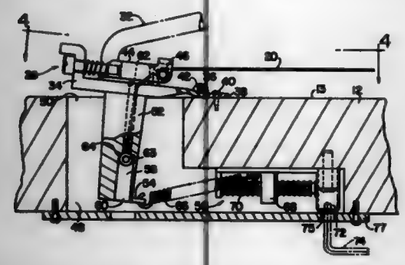
VIBRATO TAILPIECE FOR GUITAR

Helmut F. K. Schaller, Feucht, Fed. Rep. of Germany, assignor to Schaller Electronic, Feucht, Fed. Rep. of Germany

Filed Feb. 21, 1992, Ser. No. 839,912

Int. Cl.[5] G10D *3/00*; G10H *1/053, 3/18*

U.S. Cl. 84—740 **13 Claims**



8. A vibrato tailpiece for use as part of an electric guitar having a body and a plurality of strings, said tailpiece comprising:

a tailpiece base,

means for attaching said tailpiece base to a guitar body for rotation about an axis extending generally perpendicularly to the guitar strings,

means for anchoring one end of each string of the guitar to said tailpiece base, and

a plurality of saddles carried by said tailpiece base each having an upwardly facing string supporting surface for supporting as a bridge an associated one of the guitar strings,

said strings supporting surface of each of said saddles having a dimension extending perpendicularly of the string to be supported thereby approximately equal to the diameter of the associated string and each of said saddles including a wall extending upwardly relative to said guitar strings, said wall having a hole extending therethrough through which the associated string passes, said hole providing said string supporting surface for the associated string and also restraining said string to movement to the same position on the string supporting surface of the saddle each time it moves into engagement with said saddle from a condition of looseness relative to said saddle.

5,196,642

UNBALANCE-COMPENSATING DEVICE FOR A WEAPON, ESPECIALLY A LARGE-CALIBER WEAPON WITH A LONG BARREL

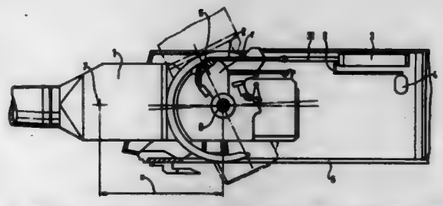
Ernst Tripp, Vellmar, Fed. Rep. of Germany, assignor to Firma Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Jan. 2, 1992, Ser. No. 815,984

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1991, 4100102

Int. Cl.[5] F41A *27/30*

U.S. Cl. 89—37.08 **2 Claims**



1. An unbalance-compensating device for a weapon, comprising: a stationary accommodation, trunnions in the stationary accommodation, a pivoting component pivotable about an axis of rotation on the trunnions and having a center of gravity outside the axis of rotation, means disposed on the stationary accommodation for producing a positioning force, a flexible tractioning member containing the pivoting component to the means for producing the positioning force to produce a torque that counteracts a moment of unbalance, means defining a contour of a prescribed shape attached to the pivoting component, wherein the tractioning member travels along the contour to determine an effective component of lifting force and wherein the means for producing the positioning force comprises a pneumatic cylinder with a first compression reservoir and a piston rod attached to the flexible tractioning member and having an interior in communication with the first compression reservoir, a manually operated valve, a second compression reservoir pressurized higher than the first compression reservoir and in communication with the interior of the pneumatic cylinder via the manually operated valve, a first control valve providing communication between the first compression reservoir and the pneumatic cylinder, wherein the first control valve opens and closes to block access to the first compression reservoir, a second control valve providing communication between the second compression reservoir and the pneumatic cylinder, wherein the second control valve opens and closes to block access to the pneumatic cylinder, and means for activating the first and second control valves in response to pressure on the pneumatic cylinder such that when the manually operated valve is closed and the pressure is below a prescribed threshold, the first control valve is in the open state and the second control valve is in the closed state and when the threshold is exceeded the first control valve is shifted into the closed state and the second control valve into the open state.

5,196,643

APPARATUS FOR LOADING TUBULAR WEAPONS, PARTICULARLY TANK HOWITZERS

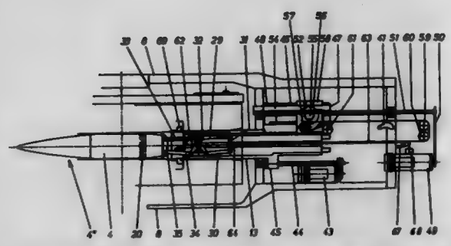
Josef Jörg, Augsburg; Rudolf Bobinger, Nordendorf, and Wolfgang Eyb, Leonberg, all of Fed. Rep. of Germany, assignors to KUKA Wehrtechnik GmbH, Augsburg, Fed. Rep. of Germany

Filed Apr. 3, 1991, Ser. No. 679,941

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1990, 4010845

Int. Cl.[5] F41A *9/43*

U.S. Cl. 89—46 **14 Claims**



1. Apparatus for loading a tubular weapon with a propellant charge chamber, the apparatus comprising a loading arm pivotably mounted on a pilot bearing of a barrel of the weapon, a loading tray for a shell, a ramer engaging a bottom of the shell, and a drive for said rammer, said shell being brought into a starting position aligned with the barrel bore axis by said loading arm and said loading tray and transported by the rammer into the barrel and rammed into a rifling of the barrel, wherein the loading tray is movable in a guide on the loading arm between the starting position and a support position with the shell being centered with respect to the barrel bore axis, the rammer includes a support engaging on the bottom of the shell which is retracted in eh starting position, whereby said support can be brought into a stretched position synchronously with the movement of the loading tray into the support position and, in the stretched position can be displaced in a guide by the drive relative to the loading tray while the loading tray is in said support position, said displacement being accompanied by an acceleration of the shell into the barrel, and wherein driving mean sis connected to the support to the loading tray so as to enable the support tray to be raised into the stretched position by a movement of the loading tray.

5,196,644

FUZING SYSTEMS FOR PROJECTILES

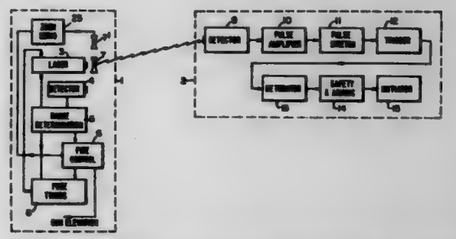
Leslie G. Knight, Sevenoaks, and Trevor W. Waters, Petts Wood, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 7, 1977, Ser. No. 841,316

Int. Cl.[5] F42C *13/02*

U.S. Cl. 102—213 **16 Claims**

1. A fuzing system for an explosive projectile comprising: fuze means adapted to be incorporated in the projectile and comprising a light-signal detector arranged to initiate the explosion upon receipt of a light-signal by the detector; and means operable by a signal produced when firing the projectile for transmitting, at a time after firing the projectile related to the known velocity of the projectile and the predetermined range to a target, a said light-signal receivable by said detector so that said explosion occurs at least approximately when the projectile reaches the target.



5,196,645

PROCESS AND DEVICE FOR THE DETECTION OF THE SECTORIAL PROXIMITY OF A TARGET, AND WEAPON USING THE DEVICE

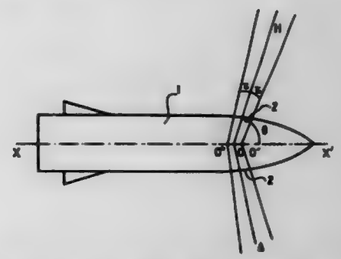
Daniel Wiznaupt, Orleans la Source, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Dec. 18, 1991, Ser. No. 809,916

Claims priority, application France, Dec. 28, 1990, 90 16436

Int. Cl.[5] F42C *13/03*

U.S. Cl. 102—213 **17 Claims**



1. A process for detonating a projectile having a longitudinal axis XX' and an optical device with detectors, said process comprising:

detecting the transit of an optically radiating target in a particular one of a plurality of solid detection volume sectors Ω1, Ω2 . . . ≠n which together form a rotational detection volume Ω about XX', said detection volume Ω being delimited by the rotational surfaces created by the straight lines defined by the optical field of said optical device, which in turn depend upon the dimensions of the surfaces of said detectors, each detection volume sector Ω1, Ω2 . . . Ωn being uniquely allocated to at least one detector, said step of detecting comprising sensing optical radiation emitted by said target at a detector corresponding to said particular detection volume sector in which said target is located, and

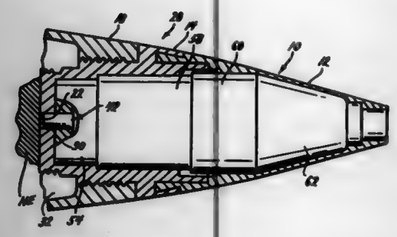
detonating said projectile in the direction of said particular detection volume sector in which said target is located.

5,196,646

DUAL PURPOSE FUZE

Paul N. Worsey, Rolla, Mo., assignor to Curators of the University of Missouri, Columbia, Mo.

Filed Oct. 3, 1990, Ser. No. 594,111
Int. Cl.[5] F42C *14/00, 19/00;* F42B *12/58*
U.S. Cl. 102—293 16 Claims



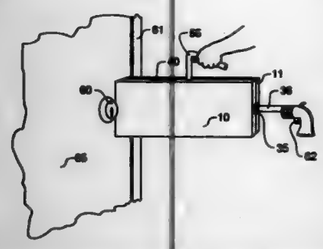
1. A projectile comprising:
an outer casing;
a quantity of material to be activated in the casing, the material being selected from a group including high explosive, low explosive, propellant and pyrotechnic compounds, the projectile being capable of carrying the quantity of material as its payload and for carrying cargo as its payload;
a dual purpose fuze having a housing shaped and configured for connection to the outer casing, the fuze being capable of activating any of the materials in said group of materials, the fuze comprising:
a fuze charge located in the socket having a depression therein;
means for detonating the fuze charge;
safety means for preventing premature detonation of the fuze;
arming means for releasing said safety means to allow detonation of the fuze; and
means for activating said detonating means thereby to detonate the fuze charge, the depression being formed to cause the fuze charge to explode in a jet directed outwardly from the socket of sufficiently high energy to activate a high explosive in a high explosive projectile, the fuze charge being sufficiently small to prevent rupture of containment for a propellant in a cargo projectile.

5,196,647

DOOR UNLOCKING DEVICE AND METHOD

J. Paul Majors, 102 S. Riley, Greenfield, Ind. 46140

Filed Oct. 23, 1990, Ser. No. 602,164
Int. Cl.[5] F12D *3/00*
U.S. Cl. 102—303 20 Claims



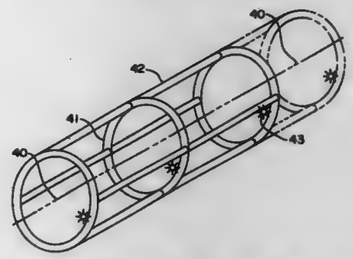
1. A device for forcibly opening a locked door comprising:
a housing having
a door engaging surface, the door engaging surface having an opening,
a plurality of guide rails,
a door ramming member reciprocable within the guide rails, the door ramming member being movable between a first retracted position wherein the ramming member does not project from the opening, and a second extended position in which the door ramming member projects from the opening,
the housing and door ramming member having cooperating stop means to limit the extent to which the ramming member can project from the opening,
pressure chamber defining means connected to the housing, the pressure chamber defining means comprising a reciprocable piston within the pressure chamber, the piston being connected to the door ramming member,
means for sealably connecting the pressure chamber defining means to the barrel of a firearm to create a sealed chamber,
such that upon detonation of an explosive charge in the pressure chamber defining means, pressure in the chamber is increased so that the piston forces the ramming member from its retracted position to its extended position.

5,196,648

METHOD FOR DESLAGGING A CYCLONE FURNACE

Liaza J. Jones, Alvarado, Tex., assignor to Jet Research Center, Inc., Alvarado, Tex.

Filed May 30, 1991, Ser. No. 707,711
Int. Cl.[5] F42B *1/02;* F23B *7/00*
U.S. Cl. 102—307 10 Claims



1. A method for fracturing slag and ash on the interior surfaces of a combustion chamber, comprising the steps of:
inserting explosive charges into a plurality of hollow flexible tubes;
placing each hollow tube at a preselected location in the combustion chamber such that the hollow tube is biased outwardly against the ash and slag covering the interior surface of the combustion chamber;
placing a linear shaped charge along a selected surface of the combustion chamber; and
detonating the explosive charges in a preselected sequence, whereby vibrations are established in the combustion chamber fracturing the ash and slag and whereby the explosion of the linear shaped charge is directed generally toward the thickest portion of accumulated slag.

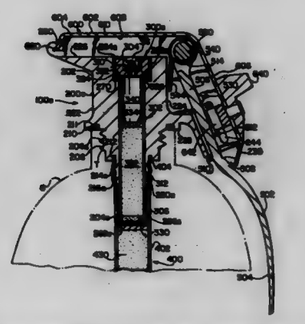
5,196,649

SAFETY FUZE FOR A HAND GRENADE

Vincent DiRubbio, Perry, Fla., and Edmund Galinski, Newton, N.J., assignors to DiNova, Inc., Perry, Fla.

Filed Dec. 4, 1991, Ser. No. 802,176
Int. Cl.[5] F42B *27/08*
U.S. Cl. 102—486 21 Claims

16. A fuze for a hand grenade comprising:
(a) a fuze body having a top having a recess therein, a bottom, a head adjacent said fuze body top, a stem adjacent said fuze body bottom, and a central portion intermediate said fuze body head and stem, and a bore extending longitudinally therethrough, said recess having an opening therein, said opening in said recess defining the top of said bore and said fuze body bottom defining the bottom of said bore, said central portion of said fuze body having a bottom wall, said bottom wall having an annular channel formed therein, and said fuze body further having sealing means therein for forming a seal between said fuzed body and the grenade; and
(b) a delay case assembly matingly received in said bore and comprising:
a delay case having a top and a bottom, a primer portion adjacent said top, and a delay portion adjacent said bottom;



a primer holder positioned in said primer portion, said primer portion having an upper surface, said upper surface having a recess therein, and said recess having a base;
a primer holder seal positioned between said primer holder and said primer portion of said delay case;
a primer seal positioned in said base of said recess;
a primer positioned in said primer holder above said primer seal;
at least one charge positioned at said bottom of said delay case; and
an air gap separating said primer seal from said at least one charge.

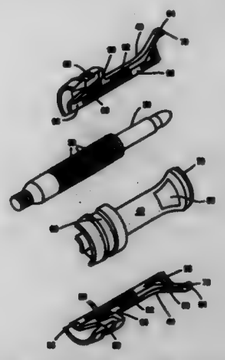
5,196,650

PROJECTILE AND SABOT ASSEMBLY

Sheldon Cytron, Mountain Lakes, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 3, 1992, Ser. No. 893,481
Int. Cl.[5] F42B *14/06*
U.S. Cl. 102—521 4 Claims

1. A projectile-sabot assembly comprising a projectile rod and
a plurality of sabot pieces coupled to said projectile rod, wherein said sabot pieces surround said projectile rod, and
a cavity in each of said sabot pieces and extending through each of said sabot pieces, the cavity in one sabot piece being aligned with the cavity in the adjacent sabot piece, and
at least one heat sensitive shape memory alloy metal shim secured between at least two of said sabot pieces within said aligned cavities which are adjacent to each other, said at least one shim heating during gun launch and exerting pressure pushing said sabot pieces apart when the projectile leaves the gun barrel, and an auxiliary heat sensitive



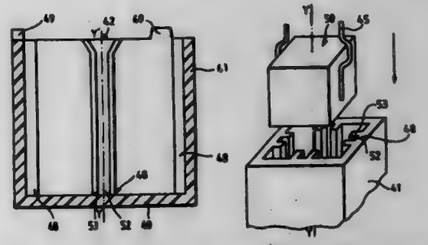
shape memory alloy metal shim disposed between a sabot piece and said projectile rod.

5,196,651

ENCAPSULATION PACKAGE FOR ELECTRONIC COMPONENT

Michel Pageaud, Seurre, and Michel Dautriche, Chamblanc, both of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Nov. 30, 1990, Ser. No. 620,001
Claims priority, application France, Dec. 8, 1989, 89 16267
Int. Cl.[5] H05K *5/00*
U.S. Cl. 174—52.1 11 Claims



1. A package for the encapsulation of an electronic component, said package having a bottom and lateral faces, said lateral faces including guiding means for guiding connection wires of the component, said lateral faces arranged around a main axis of the package, wherein the bottom includes a periphery having equal sides therearound and wherein the lateral faces all have guiding means, the guiding means being distributed evenly around the main axis of the package.

5,196,652

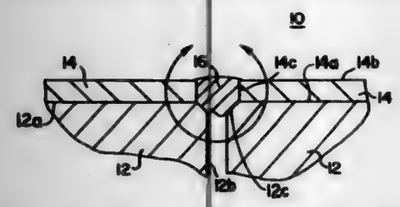
WIRELESS ELECTRICAL CONNECTIONS OF ABUTTING TILED ARRAYS

James C. Mikkelsen, Jr., Los Altos; William Meuli, Sunnyvale; Richard Bruce, Los Altos, and Jackson Ho, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1990, Ser. No. 633,923
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—250 12 Claims

1. An apparatus comprising:
(a) a plurality of adjacent dielectric means (12) for providing support; each one of said dielectric means (12) having a substrate face (12*a*), and a substrate edge (12*b*);

(b) a pair of conductive means (14) for transmitting electricity; said conductive means (14) each having a pad edge (14c), a lower pad face (14d) and an upper pad face (14b); said upper pad face (14b) defining a reference plane (20); said lower pad face (14a) of each one of said pair of conductive means (14) being coupled to said substrate face



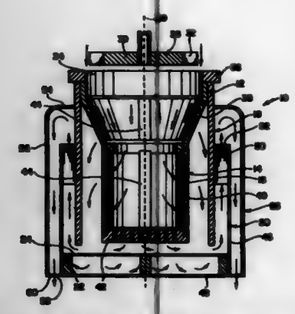
(12a) of each one of said plurality of adjacent dielectric means (12); and

(c) a conductive bridging means (16) for transmitting electricity; said conductive bridging means (16) located between said pad edges (14c) of said conductive means (14); said conductive bridging means (16) connected to said conductive means (14).

5,196,653
MUFFLER FOR AIR POWERED TURBINE DRIVE

Mark J. Kiss, Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1991, Ser. No. 702,570
Int. Cl.[5] F04F *17/04*
U.S. Cl. 181—224 8 Claims



1. A muffler for an air powered turbine drive comprising:

an inner cone section having an inlet end and an axis and including a perforated cone section side wall extending from said inlet end to a terminal end and a perforated inner cone section end wall on the terminal end of said inner cone section side wall, whereby air entering said inner cone section through said inlet end passes outwardly through said inner cone section side wall and said inner cone section end wall;

means for securing said inner cone section to said turbine drive for receiving air exhausted therefrom through said inlet end;

inner housing means substantially enclosing said inner cone section and redirecting air passing through said inner cone section side wall and said inner cone section end wall so that it passes in a direction substantially back toward said inlet end through an annular inner housing means outlet;

outer housing means surrounding at least a portion of said inner housing means for reversing the direction of the air from said inner housing means outlet;

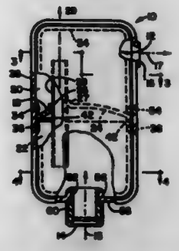
an inner channel wall between said inner cone section side wall and said inner housing means, said inner channel wall being spaced outwardly from said inner cone section side wall for substantially reversing the direction of the air from said inner housing and redirecting air passing through said inner cone section side wall in a direction away from said inlet end before it passes into said inner housing means; and

a layer of sintered material for each of said cone section side wall and said cone section end wall having inner and outer sides, and a plurality of layers of sintered material on the sides of said cone section side wall and said inner cone section end wall, before air entering said inner cone section through said inlet end passing through said layer of sintered material before passing outwardly through said cone section side wall and said inner cone section end wall.

5,196,654
COMPRESSOR DISCHARGE MUFFLER CONSTRUCTION

Michael A. DiFlora, Bristol, Tenn., and Gordon T. Boyd, Bristol, Va., assignors to Bristol Compressors, Bristol, Va.

Filed Mar. 19, 1991, Ser. No. 672,207
Int. Cl.[5] F02M *35/00*
U.S. Cl. 181—229 23 Claims



1. A gas compressor discharge muffler comprising casing means defining noise attenuation cavity means, inlet means and outlet means located at substantially opposite portions of said casing means and communicating with said cavity means, each of said inlet and outlet means having a flow axis, baffle plate means having an inlet side and an outlet side and positioned in said cavity means intermediate said inlet and outlet means and partitioning said cavity means into inlet and outlet chamber means, said inlet side of said plate means having concave arcuate surface means oriented generally normally to said flow axis of said inlet means and formed substantially on a radius of from about 1.0 to about 4.0 inches, and conduit means formed through said plate means and placing said inlet and outlet chamber means in fluid communication with each other.

5,196,655
MUFFLER FOR MARINE ENGINE

Woodrow E. Woods, 3640 Fiscal Ct., Riviera Beach, Fla. 33404

Filed Oct. 31, 1991, Ser. No. 786,101
Int. Cl.[5] F01N *7/12*
U.S. Cl. 181—235 11 Claims

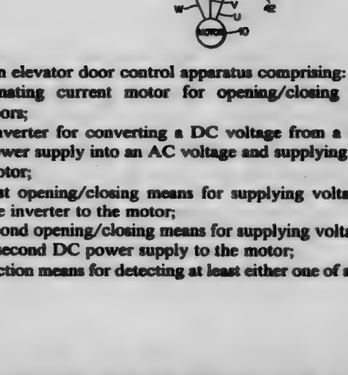
1. A muffler for a marine engine, comprising:

a housing means comprised of a side wall, a top closure panel and a bottom closure panel sealingly connected to said side wall to define an interior chamber therein;

an impervious means for baffling defining a centrally disposed aperture therethrough, said means for baffling having an outer peripheral edge sealingly attached to said side wall such that said housing interior chamber is partitioned into an upper and a lower silencing volume;

means for conveying exhaust gas from said lower silencing volume to said upper silencing volume fluidly communicating said lower silencing volume with said upper silencing volume, said means for conveying being sealingly connected to said means for baffling;

means for receiving a flow of exhaust gas fluidly communicating said lower silencing volume with a source of exhaust gas flow;



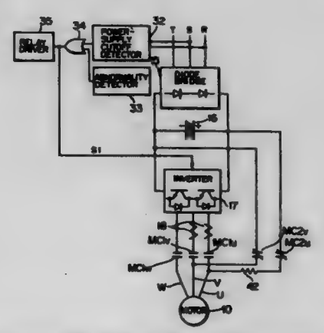
means for exhausting an exhaust gas flow of reduced energy to the ambient fluidly communicating said upper silencing volume with the ambient;

said means for baffling being disposed at an angle with respect to the horizontal so as to expel by the force of gravity fluid entering said upper silencing volume through said means for exhausting.

5,196,656
ELEVATOR DOOR CONTROL APPARATUS

Masamoto Mizuno; Terumi Hirabayashi; Masanori Tawada, and Toshiyuki Kodera, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,267
Claims priority, application Japan, Jun. 29, 1990, 2-169888
Int. Cl.[5] B66B *13/14*
U.S. Cl. 187—103 9 Claims



1. An elevator door control apparatus comprising:

alternating current motor for opening/closing elevator doors;

an inverter for converting a DC voltage from a first DC power supply into an AC voltage and supplying it to the motor;

a first opening/closing means for supplying voltage from the inverter to the motor;

a second opening/closing means for supplying voltage from a second DC power supply to the motor;

detection means for detecting at least either one of an abnormality of the first DC power supply or an abnormality of the motor; and

control means that, at normal times, supplies an AC voltage from the inverter to the motor by means of the first opening/closing means and cuts off a DC voltage from the second DC power supply to the motor by means of the second opening/closing means, and that, when the detection means detects an abnormality, cuts off an AC voltage from the inverter to the motor by means of the first opening/closing means and supplies a DC voltage from the second DC power supply to the motor by means of the second opening/closing means so as to cause a braking torque to be generated in the motor.

5,196,657
ELECTRIC SWITCH

Jorgen W. Jensen, Niels Juels Vej 18, DK-2680 Solrod Strand, Denmark DK-2680

PCT No. PCT/DK90/00066, § 371 Date Sep. 6, 1991, § 102(e) Date Sep. 6, 1991, PCT Pub. No. WO90/10943, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 9, 1990, Ser. No. 752,476
Claims priority, application Denmark, Mar. 14, 1989, 1229/89
Int. Cl.[5] H01H *23/20, 1/12*
U.S. Cl. 200—6 R 1 Claim

1. An electric, automatically centering self-cleaning switch comprising a switch box of an electrically-insulating material, the upper part of the box forming a bearing for a push rod made from an electrically-insulating material, the push rod being provided with an internal space and which, in a central plane of the box, may be moved from a center position symmetrically to either side and when so moved tends to be resiliently biased back to its center position by virtue of a spring mechanism within the box, the box having in its lower part securely fixed at least three electrically-conducting terminals corresponding to a neutral center position and activating side positions of the push rod, the spring mechanism being formed as an electrically-conducting U-formed spring, the upper end of the spring being fixedly mounted within the internal space of the rod, wherein the legs of the U-formed spring are equally long, each of the legs at their lower ends being curved outwardly and projecting from the space down between the terminals so that the legs in the neutral or center position of the rod are substantially parallel and their inner surfaces rest in contact with the upper part of the neutral center terminal, in an activated side position of the switch, the leg furthest away from the side to which the push rod is moved rests in contact with its lower outer surface against a side terminal furthest away from the side to which the push rod is moved, while the other leg remains in contact with the center terminal for establishing an electrically-conducting connection through the spring between the relevant side terminal and neutral central terminal for as long as the push rod is maintained in a side position, the internal space of the push rod is designed so that a clearance tapering outwardly in the push rod is formed for the free movement of the downwardly projecting spring legs corresponding to the side to which the push rod is moved, the U-formed spring has a spring tension for allowing the spring and the push rod to automatically reverse to the neutral center

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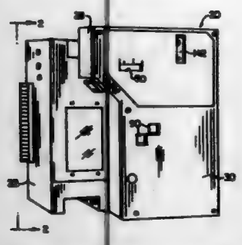
position of the switch when the activation of the push rod is discontinued, and the upper ends of each of the terminals being designed so that the upper end of each terminal forms a contact surface for a sliding connection with the corresponding inside or outside of a spring leg, the contact surfaces being self-cleaning by the gliding connection of the spring leg with the corresponding contact surface when the push rod is moved to or from a side position.

5,196,658

INTEGRAL MANUAL ON/OFF CRANK ASSEMBLY

Lance Gula, Aliquippa, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1991, Ser. No. 709,008
Int. Cl.[5] H01H *9/22*
U.S. Cl. 200—50 R 30 Claims



15. An electric operator for a molded case circuit breaker or a molded case switch having a pair of main contacts, controllable by an extending operating handle comprising:

a housing;

a handle actuator assembly for capturing said operating handle, mounted for reciprocal movement within said housing;

a drive assembly mechanically coupled to said handle actuator assembly for driving said handle actuator assembly between a first position and a second position to move said operating handle to open and close said main contacts;

an electric motor;

means for coupling said electric motor to said drive assembly; and

a manual crank assembly which includes a crank arm and a crank hand coupled to said drive assembly in a first position and disengaged from said drive assembly in a second position.

16. An electric operator as recited in claim 15, wherein aid manual crank assembly includes means for disposing said crank handle outwardly from said housing in said first position and means for disposing said crank handle within said housing in said second position.

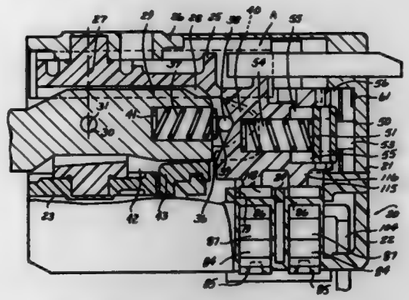
17. An electric operator as recited in claim 16, wherein said disposing means includes means for interlocking said manual drive assembly, slidably mounted with respect to said housing, said interlocking means comprising means allowing said crank handle to be disposed outwardly from aid housing in a cranking position and second means for allowing said crank handle to be disposed within said housing in other predetermined positions.

5,196,659

TURN SIGNAL SWITCH WITH CAM OPERATED SNAP ACTION SWITCHES

Walter Neubener, Lauffen, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Fed. Rep. of Germany

PCT No. PCT/EP90/02185, § 371 Date Aug. 21, 1991, § 102(e) Date Aug. 21, 1991, PCT Pub. No. WO91/09752, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 14, 1990, Ser. No. 743,430
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942925
Int. Cl.[5] H01H *25/04, 3/42, 5/04;* B60Q *1/38*
U.S. Cl. 200—61.27 32 Claims



2. An electric switch comprising:

a housing;

a carrier swivellably mounted in the housing for movement from a central position into first and second opposite directions;

a first snap contact bar swivellably mounted at an outer end to a side wall of the housing;

a catch carried at an inner end of the first snap contact bar;

a first touch slide supported adjacent the inner end of the first snap contact bar;

means, mounted in the housing, for biasing the first touch slide toward the carrier such that the first touch slide is displaceable only to one side of the central position of the carrier upon movement of the carrier;

a catch mounted on the first touch slide and springingly co-operating with the catch on the first snap contact bar;

a first stationary contact mounted in the housing and engaged by the first snap contact bar when the carrier is swivelled out of the central position in a first direction and the first touch slide is displaced;

a second snap contact bar swivellably mounted at an outer end to a side wall of the housing;

a catch carried at an inner end of the second snap contact bar;

a second touch slide supported adjacent an inner end of the second snap contact bar;

means, mounted in the housing, for biasing the second touch slide toward the carrier such that the second touch slide is displaceable only to one side of the central position of the carrier upon movement of the carrier;

a catch mounted on the second touch slide and springingly co-operating with the catch on the second snap contact bar;

a second stationary contact mounted in the housing and engaged by the second snap contact bar when the carrier is swivelled out of the central position in a second direction and the second touch slide is displaced; and

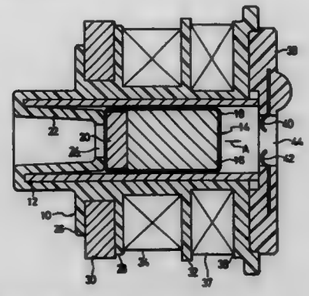
the second snap contact bar, the second touch slide and the second stationary contact being arranged symmetrically to the first snap contact bar, the first touch slide and the first stationary contact, respectively, relative to the central position of the carrier whereby the first and second touch slides are positioned beside each other.

5,196,660

ACCELERATION SENSOR

Kazuo Yoshimura; Shigeru Shimozono, and Ryo Sato, all of Kanagawa, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Nov. 18, 1991, Ser. No. 793,154
Claims priority, application Japan, Dec. 25, 1990, 2-405802
Int. Cl.[5] H01H *35/14*
U.S. Cl. 200—61.45 M 3 Claims



1. An acceleration sensor comprising:

a cylinder made of a conductive material and having first and second ends located at longitudinal ends thereof;

a magnetized inertial member situated in the cylinder so as to be slidable longitudinally of the cylinder;

a conductive member mounted on at least one end surface of the inertial member, said end surface facing the first end of the cylinder,

a pair of electrodes disposed at the first end of the cylinder, said electrodes being electrically connected together when the conductive member mounted on the inertial member contacts the electrodes,

an attracting member disposed near the second end of the cylinder, said attracting member being made of a magnetic material and attracting the inertial member to be located near the second end of the cylinder,

a first coil wound around the cylinder, said first coil, when actuated, operating to move the inertial member toward the first end to electrically connect the electrodes together by contacting the conductive member on the inertial member to the electrodes,

a second coil wound around the cylinder near the first end to compensate movement of the inertial member when acceleration is applied to the inertial member, said second coil being actuated in a condition such that a braking force which is created and applied to the inertial member when the inertial member is moved inside the cylinder upon detection of a predetermined acceleration is outside a predetermined range, and said second coil forming a magnetic field around the cylinder to move the inertial member inside the cylinder within the predetermined range, and

means for actuating the second coil to compensate a variation of resistance of the cylinder so that the braking force applied to the inertial member is within the predetermined range.

5,196,661

ACCELERATION SENSOR

Shigeru Shimozono; Kazuo Yoshimura, and Ryo Sato, all of Kanagawa, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Nov. 12, 1991, Ser. No. 789,956
Claims priority, application Japan, Dec. 25, 1990, 2-405799
Int. Cl.[5] H01H *35/14*
U.S. Cl. 200—61.45 M 3 Claims

1. An acceleration sensor comprising:

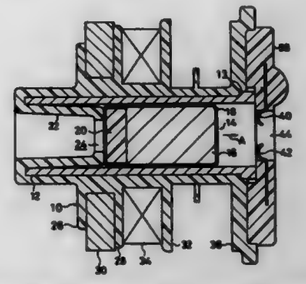
a cylinder made of a conductive material and having first and second end portions at longitudinal ends thereof,

a magnetized inertial member mounted in the cylinder to be movable in a longitudinal direction within the cylinder,

a conductive member mounted on at least one end surface within the inertial member facing the first end portion,

a pair of electrodes disposed near the first end portion, the electrodes, when contacting the conductive member, being electrically connected to each other through the conductive member,

an attracting member disposed near the second end portion



of the cylinder and made of a magnetic material, the attracting member magnetically attracting the inertial member, and

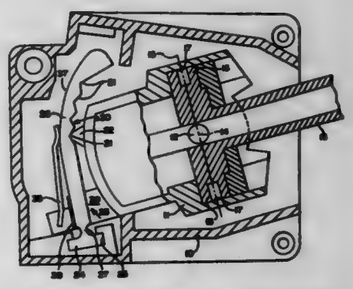
a thick wall portion of the cylinder formed at the first end portion, the thick wall portion having an outer diameter greater than that of a regular portion of the cylinder so that when the inertial member is moved inside the cylinder upon detection of a predetermined acceleration, the thick wall portion provides a magnetic field stronger than that of the regular portion to reduce speed of the movement of the inertial member to thereby prevent chattering of the inertial member against the electrodes.

5,196,662

ELECTRIC STEERING COLUMN SWITCH FOR MOTOR VEHICLES

Georg Hofmann, Heilbronn-Horkheim, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Fed. Rep. of Germany

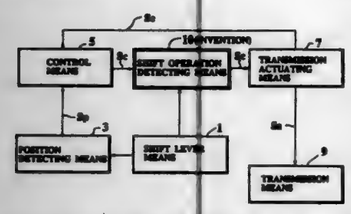
PCT No. PCT/EP89/00952, § 371 Date Sep. 19, 1991, § 102(e) Date Sep. 19, 1991, PCT Pub. No. WO90/02411, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 11, 1989, Ser. No. 466,388
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829109
Int. Cl.[5] H01H *9/00, 21/50;* B60Q *1/42*
U.S. Cl. 200—61.54 17 Claims



1. An electric steering column switch for motor vehicles including an actuator mechanism, the improvement comprising:

a switching member pivotally mounted for pivotal movement about a pivot axis between predetermined positions, said switching member having a locking cam thereon;
a locking lever having switch cams thereon, said locking lever being mounted for swivelling movement with respect to said switching member and said locking cam, said locking cam being selectively received within said switching cams corresponding to said predetermined positions;
a biasing means biased against said locking lever urging said lever in the direction of said locking cam, said biasing means being mounted upon said switching member such that said biasing means pivots with said switching member and said locking cam;
whereby said biasing means pivots with said switching member applying consistent generally equal biasing pressure against said locking lever and said adjacent locking cam.

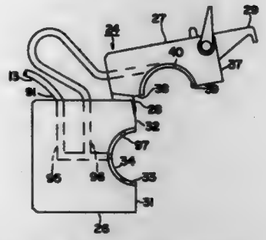
5,196,663
TRANSMISSION CONTROL APPARATUS FOR AUTOMOTIVE VEHICLE
Tomotaka Kurosu, and Mikio Takeuchi, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jun. 11, 1990, Ser. No. 536,097
Claims priority, application Japan, Jun. 29, 1989, 1-165348
Int. Cl.[5] B60K *23/00*
U.S. Cl. 200—61.91 **4 Claims**



1. A transmission control apparatus for an automotive vehicle provided with a transmission, comprising:
(a) shift lever means having a shift operation detecting switch, for selecting any one of transmission gear change positions;
(b) position detecting means associated with said shift lever means, for detecting a transmission gear change position selected by said shift lever means and generating a shift lever position signal corresponding to the detected gear change position;
(c) control means responsive to said position detecting means, for generating a transmission actuating control signal on the basis of the generated shift lever position signal;
(d) transmission actuating means responsive to said control means, for actuating the transmission ion the basis of the generated transmission actuating control signal; and
(e) shift operation detecting means connected between said control means and said transmission actuating means and responsive to the shift operation detecting switch of said shift lever means, for applying the transmission actuating control signal generated by said control means to said transmission actuating means to actuate the transmission only when said shift lever means is being operated.

5,196,664
ORBITAL WELDER FOR HIGH PURITY WELDING
Kevin D. McGushion, 2450 Oak St. #E, Santa Monica, Calif. 90405
Filed May 20, 1991, Ser. No. 702,812
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—60 A **10 Claims**

1. An orbital welder comprising a welder head and a clamp means,
said welding head comprising a body having an axis around which a weld is to be formed, and having a pair of spaced apart blade-like head jaws, said head jaws forming a track normal to said axis interrupted by an access gap, a ring-like rotor rotatably engaged to said track, said rotor being circular and interrupted by an access gap, the peripheral length of the rotor being greater than the width of the access gap in the head jaws, drive means engaging said rotor to rotate it, an electrode mounted to said rotor and projecting inwardly toward said axis, said rotor being electrically conductive, and having an external track, a conductive bus having a curved edge in conductive sliding contact with the track on said rotor, and drive means driving said rotor;



clamp means, said clamp means having a base portion mounted to said body, and a closure portion hingedly mounted to said base portion, each said portion comprising a pair of blade-like members joined together to fit over said blade-like head jaws when the portions are brought together, each said portion having a pair of jaws with socket surfaces adapted to receive respective socket halves in order to grasp tubes to be held in abutment whereby at least partially to bound a welding region between said blade-like members in which the rotor turns; and
gas supply means connected to said clamp portions adapted to discharge shielding gases into said region, gas being supplied to said region only from said clamp portions.

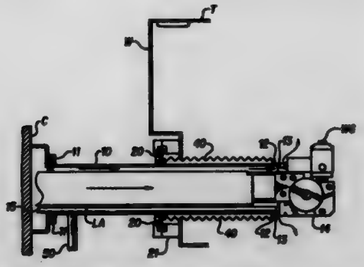
5,196,665
MULTI-LAYER ELECTRODE WIRE AND METHOD FOR PRODUCING THE SAME
Jean-Paul Briffod, Les Carelines chez Uegradaz, France, assignor to Charmilles Technologies SA, Meyrin, Switzerland
Filed Aug. 29, 1990, Ser. No. 574,655
Claims priority, application Switzerland, Aug. 30, 1989, 03140/89
Int. Cl.[5] B23H *7/08, 7/24*
U.S. Cl. 219—69.12 **14 Claims**

1. A wire electrode for electro-erosion cutting, comprising:
a core of electrically conductive material with good mechanical properties;
a film of multiple fine layers covering said core; and
said multiple fine layers having alternately a first metal with high electrical conductivity and a second metal whose vaporization and melting temperatures are lower than that of said first metal.

5,196,666
ARM SEALING DEVICE FOR AN EDM MACHINE
Akio Hosaka, Fukui, Japan, assignor to Sodick Co., Ltd., Yokohama, Japan
Filed Oct. 2, 1991, Ser. No. 769,777
Claims priority, application Japan, Oct. 3, 1990, 2-265619
Int. Cl.[5] B23H *7/02, 7/36*
U.S. Cl. 219—69.12 **5 Claims**

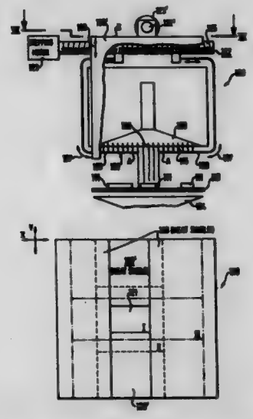
1. A wire-cut electric discharge machining apparatus having a column for supporting a wire guide assembly and comprising:

(a) a processing tank movable in two orthogonal directions and having at least one wall with an opening therein;
(b) a slide plate, having a passageway therein, said slide plate being sealed to said one wall and movable along a direction parallel to said one wall;
(c) a pipe extending through said passageway, said pipe having a first end connected to said column and a second end disposed in said tank;
(d) an arm unit disposed inside said pipe, said arm unit having an end disposed in said tank for supporting a wire guide unit therein; and



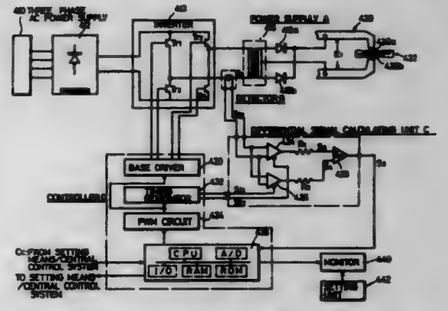
(e) a sealing member connecting said slide plate to said pipe, said sealing member including means operable for expanding and contracting to seal said passageway and said opening when said tank moves in one of said orthogonal directions;
wherein machining fluid flows between said pipe and said arm unit whereby the temperature of said arm unit is maintained at a constant value.

5,196,667
SOLDERING AND DESOLDERING DEVICE
Peter Gassmelin, Im Binzig 14, D-6948 Wald-Michelbach, Fed. Rep. of Germany
PCT No. PCT/EP88/00812, § 371 Date Jun. 27, 1990, § 102(e) Date Jun. 27, 1990, PCT Pub. No. WO89/04589, PCT Pub. Date May 8, 1989
PCT Filed Sep. 8, 1988, Ser. No. 466,316
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3737457
Int. Cl.[5] B23K *1/005, 1/012*
U.S. Cl. 219—85.12 **5 Claims**



2. A device for making and undoing soldered connections between an electronic component provided with several connections and a component carrier, comprising:
a heat source for providing at least one of a hot air jet and a stream of infrared radiation; and
a continuously adjustable mask providing a mask window;
said heat source being arranged at a distance from the soldered connections, said continuously adjustable mask being arranged between said heat source and said electronic component, said mask window being adaptable to contours of said electronic component, the at least one of the hot air jet and the stream of infrared radiation being provided by said heat source and directed onto said connections, the continuously adjustable mask being made from a material with a low thermal conductivity, wherein the continuously adjustable mask comprises two pairs of horizontally displaceable shields, each pair having parallel edges, the two pairs being arranged at an angle of 90° to allow perpendicular movement thereof, the operation and adjustment of one pair of shields are independent from the operation and adjustment of the other pair of shields, and the shields of each pair of shields are arranged so that they increase and decrease the size of the mask window by simultaneous movement in opposite directions.

5,196,668
DC RESISTANCE WELDING APPARATUS
Nobuo Kobayashi; Fumitomo Takase; Makoto Suzuki; Hitoshi Saito, and Hidenori Koga, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 437,369, Nov. 16, 1989, Pat. No. 5,120,929.
This application Mar. 12, 1992, Ser. No. 850,320
Claims priority, application Japan, Nov. 17, 1988, 63-290949; Apr. 4, 1989, 1-085210; Sep. 20, 1989, 1-244501
Int. Cl.[5] B23K *11/24*
U.S. Cl. 219—110 **3 Claims**



1. A DC resistance welding apparatus comprising:
a welding gun for sandwiching workpieces to be welded therebetween;
a power supply unit including,
a converter,
an inverter,
a welding transformer, and
a rectifier;
said power supply unit supplying a welding current produced from said rectifier to said welding gun;
detecting means for producing a pulse signal having a leading edge and a trailing edge, said pulse signal corresponding to an output waveform from said inverter;
pulse signal edge detecting means for detecting and holding current signals corresponding to the leading and trailing edges of said pulse signal;
control means for producing a control signal to enable said pulse signal edge detecting means; and
calculating means for producing a logarithmic signal from

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said current signals, said logarithmic signal being indicative of a change in a resistance of the workpieces when the welding current flows therethrough, produced by said pulse signal edge detecting means and for applying said logarithmic signal to said control means;

said control means controlling a flow of current to said welding gun in response to said logarithmic signal.

5,196,669

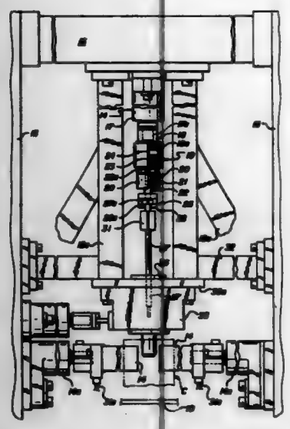
METHODS AND APPARATUS FOR SUPPLYING GAS UNDER HIGH PRESSURE TO WELDABLE AIR BAG VESSELS WITH A GAS PASSAGE FORMED THEREIN, AND LIKE PRODUCTS, AND THEN WELD-SEALING THE PASSAGE

Ronald W. Richardson, Essexville, Mich., assignor to RWC, Inc., Bay City, Mich.

Filed Nov. 12, 1991, Ser. No. 790,531

Int. Cl.[5] B23K *11/00*; B65B *31/02*; F16F *9/43*; F17C *5/06*

U.S. Cl. 219—117.1 **19 Claims**



1. A method for supplying gas under extreme pressure to a weldable air bag canister, having an opening in a wall thereof through which gas may be charged to the canister, and weld sealing the opening with a weldable welding ball, after the canister has been charged with an inert gas under a heavy pressure measured in thousands of pounds per square inch, the method employing an electrode welding head and weld ball supplying assembly having a lower tubular end with a seal surrounded a ball dispensing opening therein, a welding electrode and an element for moving it from a retracted position through said tubular end to an extended welding position, a reciprocable initial ball delivery element and a second reciprocable ball delivery element, each having ball receiving openings and being operable in a ball delivery passageway system, having upstream and downstream portions, provided in said assembly, and a deformable seal system forming part of the marginal wall of said ball delivery passageway system for sealing said reciprocable elements and passageway system, said initial ball delivery element being movable from a retracted position in which its ball accommodating opening is outside the assembly to a position inside said ball delivery passageway system, said second ball delivery element being disposed in a first retracted position in the downstream portion of said passageway system in which its ball accommodating opening is inboard of said seal system, comprising the steps of:

(a) relatively axially moving the canister and said electrode welding head and weld ball supplying assembly to dispose the seal surrounding the ball dispensing opening in said tubular end in abutting sealing relationship with the canister around the opening therein;

(b) separating individual balls from a supply thereof and furnishing them one at a time to said initial delivery element when its ball receiving opening is outside the assembly;

(c) moving said initial delivery element in a forward path of travel to move its ball receiving opening past said seal system and releasing the ball from said ball receiving opening to said second delivery element when its ball receiving opening is in said first position inboard of said seal system;

(d) only then supplying gas under pressure to said assembly to communicate with the tubular end of the electrode welding head and weld ball supplying assembly and the opening in the canister;

(e) moving said second delivery element in a forward path of travel to a second position in which its ball receiving opening communicates with said tubular end to supply a ball through the ball receiving opening in said second delivery element to the canister opening and then returning said second delivery element to retention position;

(f) moving said welding electrode from retracted to welding position and supplying a welding current to said electrode to weld the ball in said opening and seal said opening; and

(g) depressurizing the said assembly and restoring the initial ball delivery element and electrode to retracted position.

5,196,670

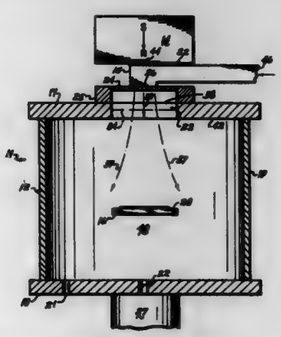
MAGNETIC PLASMA PRODUCING DEVICE WITH ADJUSTABLE RESONANCE PLANE

Thomas D. Mantei, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Filed Oct. 3, 1989, Ser. No. 416,531

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.43 **10 Claims**



1. A plasma producing device comprising:

a chamber having at least one opening;

means for transporting microwave energy and an associated electric field with said microwave energy along a path through said opening into said chamber; and

a permanent magnet having a north and a south pole outside said transporting means, said north and south pole of said permanent magnet being aligned with said path of said microwave energy through said opening so that a predominant axial magnetic field component produced by said permanent magnet extends through said means for transporting microwave energy and through said opening into said chamber, whereby electrons within said chamber rotating around said magnetic field component and said electric field associated with said microwave energy are in phase within a plane within said chamber.

5,196,671

DEVICE AND PROCESS FOR THE LASER WELDING OF A TUBE

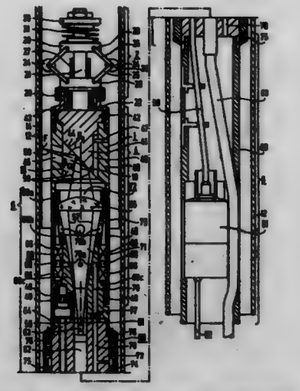
Gerhard Krochnert, Todtenfelde, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 746,450, Aug. 16, 1991, abandoned. This application Apr. 21, 1992, Ser. No. 873,519

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1990, 9011959[U]; May 13, 1991, 4115561

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 **39 Claims**



1. A device for laser welding a tube, comprising:

a deflecting member for deflecting a laser beam transmitted within the device onto a surface of the tube upon insertion of the device into the tube, the device defining an outlet opening for permitting the laser beam to pass through the outlet opening upon deflection by the deflecting member onto the surface of the tube for welding the surface of the tube;

first means mounted within the device for transmitting a first stream of gas to the outlet opening so that the gas flows out of the device through the outlet opening; and

second means for transmitting a second stream of gas between the device and the tube upstream of the outlet opening so that the second stream of gas flows between the device and the tube in the vicinity of the outlet opening.

5,196,672

LASER PROCESSING ARRANGEMENT

Hidenobu Matsuyama; Kimihiro Shibata, and Hiroki Sakamoto, all of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 25, 1992, Ser. No. 840,545

Claims priority, application Japan, Feb. 28, 1991, 3-34508

Int. Cl.[5] B23K *26/02*

U.S. Cl. 219—121.83 **5 Claims**

1. A laser processing arrangement, comprising:

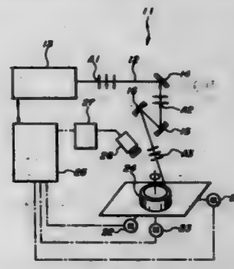
a laser oscillator, said laser oscillator outputting a polarized laser beam therefrom, said laser beam incident upon an optical system for aiming said laser beam to irradiate a material to be processed;

a processing surface, for retaining said material, which surface is movable relative said laser beam;

drive means for moving said processing surface;

temperature detecting means including a sensor for detecting a temperature of an irradiated portion of said material; and

control means, associated with said laser oscillator, said drive means and said temperature detecting means, for controlling at least one of the laser oscillator output and/or a moving speed of said processing surface relative said beam, in response to said detected temperature, said material being positioned relative said laser beam such that a



plane of polarization of said laser beam is parallel to a plane of incidence thereof, said irradiated portion of said material being irradiated by said laser beam at a predetermined angle less than a brewster angle of said material.

5,196,673

AIRCRAFT INTAKE PIPE BOLT HEATER FOR ELECTRICALLY PREHEATING AN AIRCRAFT ENGINE

Peter G. Tanis, R.R. 4, P.O. Box 143, Glenwood, Minn. 56334

Filed Nov. 13, 1990, Ser. No. 611,769

Int. Cl.[5] H05B *3/40*; F02N *17/02*; F16B *23/00*; F02M *31/12*

U.S. Cl. 219—205 **11 Claims**

1. A preheat apparatus for an internal combustion engine of the type having a plurality of individual cylinder heads, an air intake pipe connectable to each cylinder head by fixation of a fastening member between the air intake pipe and a threaded mounting hole in the cylinder head, comprising:

a plurality of heater devices for installation with respect to the cylinder heads of the engine;

each said heater device having a body with an air intake pipe mounting bolt-like configuation including a bolt head and a threaded bolt shank installable in an air intake pipe mounting bolt opening of the cylinder head

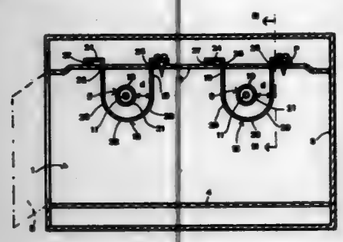
said bolt shank having a thread with a flat root to provide a wall thickness of approximately 0.060 inch;

said body formed of steel heat treated to a grade 8 hardness and tempered at approximately 1,050 degrees F.;

heater means installed in the shank of the body;

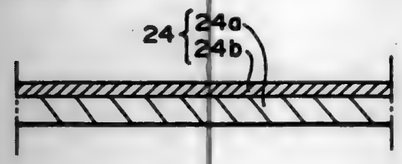
a wiring harness having a plurality of interconnected heater leads connected to the heater means of the heater devices and a power lead connectable to a source of electrical power.

5,196,674
COOKING APPARATUS, FOR EXAMPLE AN OVEN HAVING A PROTECTOR FOR AN ELECTRIC HEATING ELEMENT
Pierre Chartrain, Soliers Bourgeubus, and Bernard M. Bois, Caen, both of France, assignors to Moulinex (Societe Anonyme), Bagneulet, France
Filed Jan. 10, 1992, Ser. No. 819,130
Claims priority, application France, Jan. 17, 1991, 91 00480
Int. Cl.[5] F27D 11/02; F24C 7/04
U.S. Cl. 219—411 6 Claims



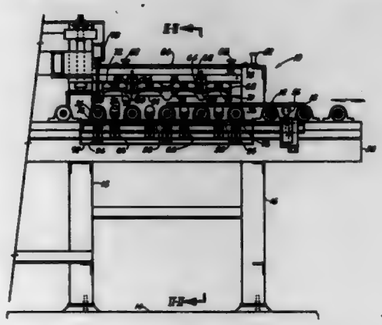
1. Cooking apparatus comprising an oven having a forwardly opening cooking chamber (1)and at least one electrical heating element (9) in the chamber, said chamber having an internal wall, said electrical heating element having a tubular envelope (10) of fragile material which contains a heating wire (11) and whose ends (12 and 13) are connected respectively to two bases (14 and 15) each disposed at one end of the envelope, each base being adapted to be mounted in the support (16, 17) secured to said chamber (1) so as to maintain said envelope (10) spaced from the internal wall of the chamber, said tubular envelope (10) having the shape of a straight barrel and being enclosed in a cage (18) having the form of a trough whose wall (19) has perforations to let pass infrared radiation from the heating wire (11) toward the interior of the chamber (1), and is sufficiently rigid to resist any mechanical shock, said wall (19) further having longitudinal edges which include means for securing (24, 25) the cage (18) to the chamber, and said cage (18) being spaced from a side wall (21) of the tubular envelope (10) turned toward the interior of the chamber.

5,196,675
IMAGE FIXING APPARATUS HAVING A HEATER, A MOVABLE FILM AND ELECTRICAL INSULATING MEMBER DISPOSED AT LATENT END
Yoshihiko Suzuki, and Koki Kuroda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 31, 1990, Ser. No. 636,147
Claims priority, application Japan, Jan. 9, 1990, 2-002318
Int. Cl.[5] G03G 15/20
U.S. Cl. 219—216 15 Claims



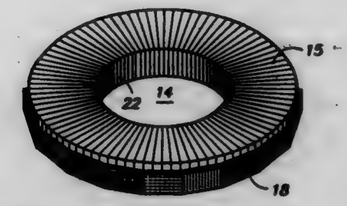
1. An image fixing apparatus, comprising:
a movable film movable together and in contact with a recording material supporting a visualized image, said film having a base layer made of electrically insulating material and a low resistance surface layer contactable to the visualized image, said surface layer containing low electric resistance material;
a heater extending in a direction crossing with a movement direction of said film, said heater being in contact with the base layer of said film, said heater including a base plate, an electric resistance layer producing heat from electric power and extending along a longitudinal direction of said film adjacent said film and a protection layer for protecting said electric resistance layer; and
a thermally insulating member between said film and said protection layer only at lateral end portions of said film.

5,196,676
OVEN UNIT FOR HEAT TREATING SEALANT MATERIAL
Michael A. Hallahan, Butler, Pa., assignor to Bilco Manufacturing, Inc., Zelienople, Pa.
Filed Apr. 27, 1992, Ser. No. 874,411
Int. Cl.[5] F27B 9/06
U.S. Cl. 219—388 19 Claims



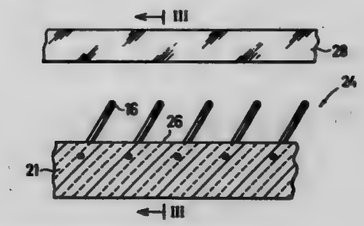
1. An oven unit for heat-treating material applied to a workpiece, comprising:
an oven box having a pair of opposed, spaced-apart sidewalls and an upstream entrance end for receiving the workpiece and a downstream exit end for the egress of the workpiece after heat treating;
a conveyance means for conveying the workpiece through the oven box from the entrance end to the exit end;
a plurality of removably insertable radiant heat generating emitters disposed within the oven box, each emitter being elongated and transverse to the conveyance means for heating the material, with the end of each emitter protruding through each sidewall;
the emitters further characterized by a lower row of emitters interspersed among the conveyance means and located immediately adjacent and below the workpiece conveyed therethrough, and an upper row of spaced-apart emitters located immediately adjacent and above the workpiece;
a plurality of removably insertable, spaced-apart reflector housings interspersed among the upper row of emitters and extending between the sidewalls transverse to the path of the workpiece and parallel to one another, each reflector housing having opposed depending side members and an inwardly-projecting lip extending from each side member; and
a plurality of removably insertable, elongated, heat-reflective panels with each panel mounted within each respective reflector housing, the panels adapted for reflecting and dispersing radiant heat onto the material for facilitating heat treatment of the material.

5,196,677
IN A COFFEE POT APPARATUS
John G. Stasyshyn, R.R. 1, Box 1137, Bangor, Pa. 18013
Filed Nov. 21, 1991, Ser. No. 797,417
Int. Cl.[5] H05B 3/72
U.S. Cl. 219—433 4 Claims



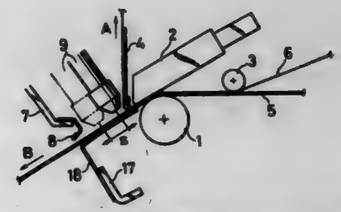
1. A coffee pot apparatus, comprising,
a coffee pot container, and
a heating surface, and
a torroidal spacer disc, including a planar top wall spaced from and parallel to a planar bottom wall, with the planar top wall in contiguous communication with the coffee pot container, and the planar bottom wall in contiguous communication with the heating surface, and
the spacer disc includes a cylindrical central opening defined by a central opening wall, and the spacer disc further includes a cylindrical side wall spaced from the central wall, wherein the central wall and the side wall are concentrically arranged relative to one another, and the spacer disc is defined by a disc diameter and the coffee pot container includes a bottom surface, wherein the bottom surface is defined by a predetermined coffee pot diameter, wherein the coffee pot diameter is greater than the disc diameter to effect projection of the bottom surface of the coffee pot beyond the spacer disc to provide for a first air gap between the coffee pot and the heating surface within the central opening, and a second air gap defined exteriorly of the spacer disc between the bottom surface of the coffee pot container and the heating surface, and
the cylindrical side wall includes a temperature sensitive indicator strip fixedly mounted thereto for providing visual indication of available temperature directed to the spacer disc.

5,196,678
RADIANT HEATER, AS WELL AS METHOD AND APPARATUS FOR ITS PRODUCTION
Leonhard Doerner, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany
Division of Ser. No. 385,008, Jul. 25, 1989, Pat. No. 5,048,176. This application Apr. 24, 1991, Ser. No. 690,709
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3823192
Int. Cl.[5] H05B 3/10, 3/68
U.S. Cl. 219—542 14 Claims



1. A radiant heater comprising:
an insulator of an insulating material;
at least one heating coil partly embedded in said insulator, wherein said insulating material comprises a compressed material of flowing characteristics in an uncompressed state, and interior space of said heating coil being filled over a portion of an internal cross-sectional area with said insulating material by embedding, thereby providing a fixing of said heating coil to said insulator, wherein said insulating material is substantially made of a material from a group including an aerogel based on pyrogenic silicic acid and an aerogel based on alumina.

5,196,679
METHOD AND APPARATUS FOR PRINTING AND READING ELECTRONICALLY READABLE INDICIA, BY SHIFTING A SCANNER POSITION DURING SCANNING
Genzi Oshima, Miyagi, Japan, assignor to Tohoku Ricoh Co., Ltd., Miyagi, Japan
Continuation of Ser. No. 468,473, Jan. 3, 1990, abandoned. This application Mar. 26, 1992, Ser. No. 859,241
Claims priority, application Japan, Jan. 31, 1989, 1-22066
Int. Cl.[5] G06K 7/015, 7/10
U.S. Cl. 235—437 7 Claims

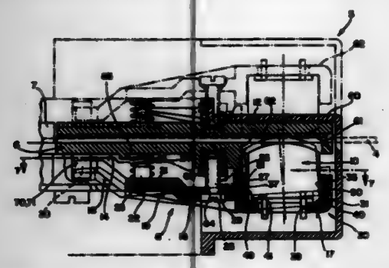


1. An indicia printing/verifying apparatus comprising:
indicia printing means for printing indicia on paper perpendicular to a direction in which the paper is fed, said indicia including a plurality of elements which have a certain length in the direction in which paper is being fed;
line feed means for feeding paper though said indicia printing means;
indicia verifying means for reading and verifying the indicia printed by said indicia printing means by scanning the indicia in a direction perpendicular to said direction in which said paper is being fed by using a scanner, and by verifying a print result of the indicia based on the output of said scanner; and
scanner shift means for shifting said scanner in the direction in which the paper is being fed while the indicia is scanned by said scanner, and while said paper is being fed;
wherein said scanner shift means moves said scanner independently from said indicia printing means.

5,196,680
CARDAN-TYPE SUPPORT FOR MAGNETIC HEADS
Bernd Schuder, Schwaigern, Fed. Rep. of Germany, assignor to Amphenol-Tuchel Electronics GmbH, Fed. Rep. of Germany
Filed Apr. 4, 1990, Ser. No. 503,898
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 3910880
Int. Cl.[5] G06K 7/08; G11B 21/16
U.S. Cl. 235—449 20 Claims

1. A reader for cards carrying magnetic stripes containing information, said reader comprising:
a stationary frame including means for receiving said cards;
support means mounted on said stationary frame for supporting a magnetic head at different selectable locations, said support means comprising means including a support arm and a positioning frame for receiving said magnetic head at said different selectable locations, said support means being mounted on said stationary frame for car-

danic movement by means of a cardanic bearing on said support means, said bearing engaging a screw mounted on said stationary frame to permit cardanic movement of said



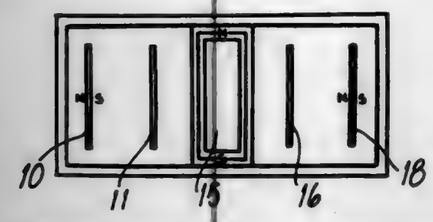
support means in respect to said stationary frame, and said support means further comprising a guide portion cooperating with guide means provided on said stationary frame for inhibiting sideways movement of the support arm.

5,196,681

MAGNETIC INK MEDIUM AND CORRESPONDING READING UNIT, AND METHOD FOR USING SAME

Antonio Mastegazza, Noverasco Di Opera, Italy, assignor to Mastegazza Antonio Arti Grafiche S.r.l., Ospiate Di Bollate, Italy

Filed Nov. 27, 1989, Ser. No. 441,668
Int. Cl.[5] G06K 7/08, 7/00, 19/06
U.S. Cl. 235—449 3 Claims



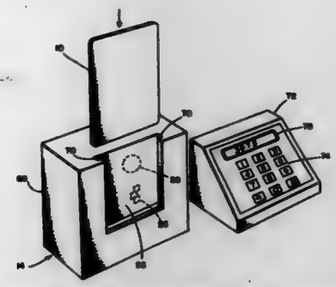
1. In combination, a magnetic ink medium and a reading unit for reading said magnetic ink medium, a read direction being defined along which said reading unit reads said magnetic ink medium, said magnetic ink medium comprising a plurality of magnetic material regions mutually arranged along said read direction, said plurality of magnetic material regions being mutually separated along said read direction by non-magnetic spaces, at least one first part of said magnetic material regions having a first magnetic coercivity, at least one second part of said magnetic material regions having a second magnetic coercivity, said first magnetic coercivity being substantially higher than said second magnetic coercivity, at least one first portion of said magnetic material regions having a first magnetic intensity according to a first amount of magnetic material used therein, at least one second portion of said magnetic material regions having a second magnetic intensity according to a second amount of magnetic material used therein, said first magnetic intensity being substantially different than said second magnetic intensity, said reading unit comprising, arranged in succession along said read direction, an entry magnet, a first read head, a reorientation magnet, a second read head, and an exit magnet, said entry magnet providing an entry magnetic field having a first direction, said entry magnetic field having sufficient induction to magnetize both said at least one first part and said at least one second part of said magnetic material regions in a direction parallel to said first direction, said first read head being adapted to read said magnetic material regions after such regions have been subjected to said entry magnetic field and being adapted to generate a first electrical signal which is a function of the reading thereof, said reorientation magnet providing a reorientation magnetic field having a reorientation direction, said reorientation direction being substantially perpendicular to said first direction, said reorientation magnetic field having a reorientation induction which selectively magnetizes said at least one second part of said magnetic material portions in a direction parallel to said reorientation direction while leaving said at least one first part of said magnetic material portions magnetized in said first direction, said second read head being adapted to read said magnetic material regions after such regions have been subjected to said reorientation magnetic field and being adapted to generate a second electrical signal which is a function of the reading thereof, said exit magnet providing an exit magnetic field sufficient to magnetize both said at least one first part and said at least one second part of said magnetic material regions in an identical direction, said first direction being substantially perpendicular to said read direction and said reorientation direction being substantially parallel to said read direction.

5,196,682

INFRARED OPTICAL CARD HAVING AN OPAQUE CASE FOR HIDING INTERNAL COMPONENTS

Gary A. Eaglehardt, Manchester, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 880,410, Jun. 30, 1986, abandoned. This application May 31, 1989, Ser. No. 363,421
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—454 6 Claims



1. A secure portable data storage device for use with an external data reading apparatus, comprising

a sealed case;

memory means, within the sealed case, for storing data, the memory means including an internal serial communications processor providing a bidirectional data transfer protocol for facilitating the output of data from the memory means in response to a clock signal and read command received from an external data reading apparatus;

infrared optoelectronic means for exchanging infrared optical signals between the data storage device and the data reading apparatus consisting of

first light receiving means for receiving light pulses representing clock pulses and providing the clock signals therefrom;

second light receiving means for receiving light pulses representing read commands and providing the read commands therefrom;

light providing means for receiving the output data from the memory means and producing light pulses representing the output data;

the infrared optoelectronic means predeterminately disposed within the sealed case for precise alignment with complementary infrared optoelectronic means in the external data reading apparatus; and

the sealed case being transmissive to infrared light but opaque to visible light so that the predetermined disposition of the optoelectronic means within the sealed case is obscured from visual inspection, to provide enhanced security.

5,196,683

BAR CODE ACQUISITION UTILIZING MOIRE PATTERNS

Emanuel Marom, and Joseph Katz, both of Stony Brook, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Apr. 8, 1991, Ser. No. 681,601
Int. Cl.[5] G06K 9/00, 7/10
U.S. Cl. 235—462 27 Claims

12. A method for detecting the presence of a bar code pattern in a field of view, comprising:

a. generating an image of the field of view at a reference pattern or image of a reference pattern while producing relative rotation between the image of the field of view and the reference pattern or image thereof;

b. detecting the optical interaction of the image of the field of view with the reference pattern or image thereof, including any Moire patterns generated by the optical interaction; and

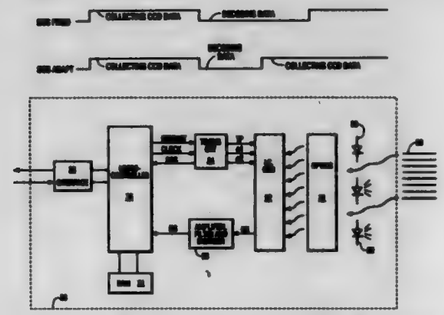
c. processing the detected optical interaction to detect the generation of any Moire patterns, which are indicative of the presence of a bar code pattern in the field of view.

5,196,684

METHOD AND APPARATUS FOR IMPROVING THE THROUGHPUT OF A CCD BAR CODE SCANNER/DECODER

Jackson Lam, Roslyn; Gerard J. Knight, Nesconset; Xin Zheng, Island Park, and Wenyu Han, Flushing, all of N.Y., assignors to Opticon, Inc., Orangeburg, N.Y.

Filed Mar. 25, 1991, Ser. No. 674,709
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 26 Claims



21. An apparatus for scanning and decoding the symbols of a bar code comprising:

a microcontroller having a timing circuit for generating a start of scan (SOS) first level signal and a SOS second level signal;

an image sensor, coupled to said microcontroller and viewing the bar code, for scanning the bar code in response to the SOS signal;

said image sensor producing a digital data signal representative of the bar code;

memory means coupled to said image sensor for storing in memory the representative data signal read by said image sensor; and

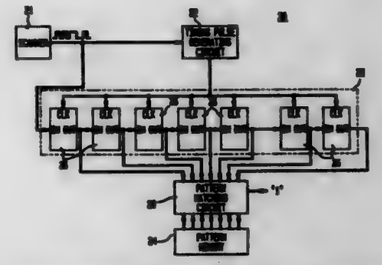
said microcontroller including means validating and decoding the stored data signal in said memory means when the SOS signal is at the second level for determining whether the representative data is valid and for initiating a new SOS first level signal in response to the decoding of either one of an invalid and a valid bar code data signal.

5,196,685

BAR CODE READER

Masaki Izumi, Yokohama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 681,844, Apr. 8, 1991, abandoned. This application Jan. 18, 1992, Ser. No. 908,634
Claims priority, application Japan, May 2, 1990, 2-116686
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 20 Claims



1. A bar code reader for reading bar codes recorded on a surface and converting the bar codes into respective alphanumeric code signals corresponding thereto comprising:

scanning means for scanning and quantizing the bar codes to generate a respective rectangular wave output signal;

sampling and holding means for sampling the rectangular wave output signal from the scanning means at predetermined sequential time periods, and for holding the samples for providing corresponding data bit pattern output signals;

memory means for storing matching bit pattern signals corresponding to the respective bar codes to be read; and

pattern matching means for comparing the data bit pattern output signals from the sampling and holding means with the matching bit pattern signals stored in the memory means for determining an identified data bit pattern output signal corresponding to the read bar code indicated in the most likely matching bit pattern signals and for generating a representative alphanumeric code output signal.

5,196,686

CHECKOUT SYSTEM WITH INLAID CHECKOUT COUNTER KEYPAD

Darrel E. Leister, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 440,568, Nov. 22, 1989, abandoned. This application Jul. 10, 1991, Ser. No. 728,798
Int. Cl.[5] G07G 1/12; G06K 7/10
U.S. Cl. 235—462 5 Claims

1. A checkout system comprising:

a checkout counter having a supporting surface for supporting purchased merchandise items adjacent to a position for an operator;

an aperture in said supporting surface;

an optical scanner mounted in the checkout counter adjacent the aperture for projecting scanning light beams through

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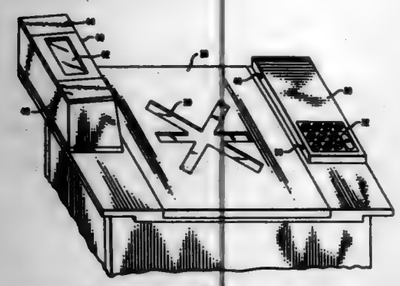
the aperture for reading coded labels on a merchandise item positioned adjacent the aperture and outputting the data read from the coded label;

a data terminal device adjacent the operator and coupled to the optical scanner for receiving the data read from the optical scanner for use in printing a record of the checkout operation and including a first keypad having a first transaction key and a total key; and

a second keypad mounted in the checkout counter between



the optical scanner and the operator and coupled to the data terminal device for use by the operator for the sole purpose of entering a single numerical value corresponding to the number of merchandise items being purchased which are of the same type enabling the data terminal device to print the total amount due for the purchased merchandise items without requiring each one of a plurality of items of the same type to be individually scanned and individually entered using the first transaction key in the first keypad.

5,196,687

CARD READER HAVING LOCKING MECHANISM

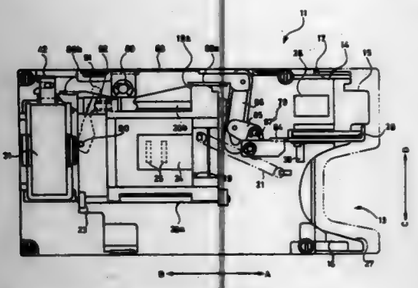
Kiyotaka Sugino; Teruyoshi Yufu, and Masayuki Ishii, all of Kusatsu, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 16, 1989, Ser. No. 421,777

Claims priority, application Japan, Oct. 14, 1988, 63-134838[U]; Nov. 4, 1988, 63-279942; Nov. 8, 1988, 63-282125; Jan. 5, 1989, 64-657

Int. Cl.[5] G06K *13/06, 13/24, 7/06, 13/04*

U.S. Cl. 235—483 **4 Claims**



1. A card reader, comprising:

a housing (14, 15, 16 and 17) having an inlet (13) through which a card (12) is inserted, for accepting the card (12) inserted through said inlet (13);

a slider (19) provided in said housing (14, 15, 16 and 17), said slider being moved from a standby position to a second position when the card is inserted through said inlet (13), said slider being moved from its second position to its standby position when the card is extracted through said inlet;

shutter means (28) movable between opened and closed positions for opening and closing said inlet (13), respectively;

a shutter linked lever (80) which is pivotably mounted with respect to said housing, said shutter linked lever being pivotably movable between first and second positions, wherein said shutter linked lever and said shutter means (28) are arranged such that said shutter means is in its opened position when said shutter linked lever is in its first position and such that said shutter means is in its closed position when said shutter linked lever is in its second position, and wherein said shutter linked lever is maintained in its first position by said slider when said slider is in its standby position;

driving means (31) for moving said shutter linked lever (80) to its first position; and

an engaging member (91) for engaging said shutter linked lever (80) and for thereby maintaining said shutter linked lever in its first position when said shutter linked lever is moved to its first position by said driving means (31), wherein said engaging member (91) remains engaged with said shutter linked lever (80) and thereby maintains said shutter linked lever in its first position as said slider (19) moves from its second position toward its standby position.

5,196,688

APPARATUS FOR RECOGNIZING AND FOLLOWING A TARGET

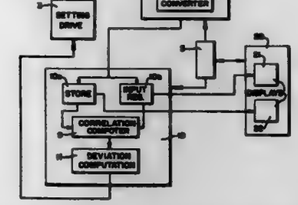
Klaus Hesse, Hamburg, and Gerhard Schöne, Wedel/Holstein, both of Fed. Rep. of Germany, assignors to Telefunken Systemtechnik GmbH, Ulm, Fed. Rep. of Germany

Continuation of Ser. No. 655,259, Feb. 4, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,670

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1975, 2504536

Int. Cl.[5] G01J *1/20*; H04N *5/225*; G06F *15/336*

U.S. Cl. 250—203.6 **5 Claims**



1. In a system for recognizing and tracking a target including observation means directed toward the target for producing an output signal representative of the momentary image of the scene including the target being observed, computer means, responsive to the output signals from the observation means, for producing output signals representative of the position of the target within the scene, and setting drive means, responsive to the output signals from said computer means, for causing said observation means to follow the target; the improvement wherein: said computer means is a digital computer; said output signal from said observation means is an analog signal; an analog to digital converter means is connected between the output of said observation means and the input of said computer means; said computer means includes correlation computing means for computing the genuine correlation between a target structure signal corresponding to a previously received output signal from said observation means which is stored in said computer and a signal, representing a shifted target structure, corresponding to the momentary image of the scene then being observed by said observation means, by determining the position of the maximum of the cross correlation function

$$K(\xi)=\int B(x)B'(x-\xi)dx$$

where the factor $B(\vec{x})$ represents the stored target structure signal and the factor $B'(\vec{x}-\xi)$ represents the shifted target structure signal, and means, responsive to the output signal from the correlation computing means, for continuously determining the deviation of the target in the x and y directions from the center of the scene image and for emitting setting signals to said setting drive means which correspond to said deviation.

5,196,689

DEVICE FOR DETECTING AN OBJECT INCLUDING A LIGHT-SENSITIVE DETECTING ARRAY

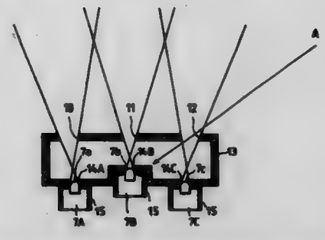
Keizo Sugita; Shunei Saito; Akira Tajiri; Hitoshi Kaneko; Iwao Okamura, and Kentaro Ishizuka, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 11, 1991, Ser. No. 775,134

Claims priority, application Japan, Oct. 16, 1990, 2-108354[U]; Jul. 26, 1991, 3-208847; Jul. 26, 1991, 3-208848

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—206.1 **12 Claims**



1. A device for detecting an object, which device detects the position of said object on the basis of receiving a light ray projected from said object by using a plurality of light receiving elements, wherein

at least two of said light receiving elements are arranged, a light receiving angle of each of said light receiving elements being set so that each of said light receiving elements has an equal length and mutually exclusive detection area on a light receiving plane.

5,196,690

OPTICALLY POWERED PHOTOMULTIPLIER TUBE

Larry D. Flesner, San Diego; Stephen A. Miller, Upland, and Wadad B. Dubbelday, Spring Valley, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 18, 1991, Ser. No. 721,844

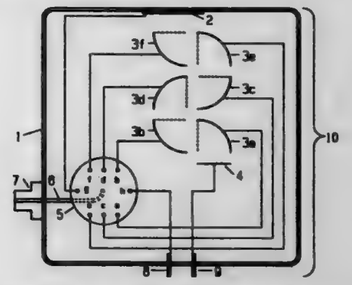
Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—207 **13 Claims**

1. an optically powered photomultiplier tube, comprising:

a photomultiplier tube having an electron multiplier; and

a series connection of a plurality of photovoltaic power cells mounted within said photomultiplier tube and operably



coupled to said electron multiplier for providing electrical bias power to said electron multiplier.

5,196,691

PHOTOELECTRIC CONVERTING DEVICE HAVING ORIGINAL CONVEYANCE GUIDE AND AN IMAGE PROCESSING APPARATUS INCORPORATING THE DEVICE

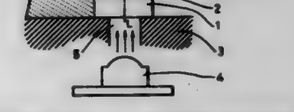
Masaaki Kitai, Yokohama; Toyoki Matsushima, Atsugi; Tetsuya Shimada, Zama; Makoto Ogura, Isehara; Masayoshi Murata, Atsugi; Katsumi Komiyama, Isehara, and Tomokazu Daisaku, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,921

Claims priority, application Japan, Nov. 21, 1989, 1-302669; Nov. 21, 1989, 1-302670; Nov. 21, 1989, 1-302671

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **95 Claims**



1. A photoelectric converting device comprising:

a plurality of photoelectric converting elements disposed to confront an original sheet the image information of which is to be read;

a protection layer disposed on said photoelectric converting elements;

a light transmissive substrate on which said photoelectric converting elements are disposed; and

flexible guide means disposed on an original-sheet supply side of said light transmissive substrate, said guide means being disposed such that at least a portion of said guide means is positioned in contact with an edge surface of said light transmissive substrate without overlapping a top surface of said substrate.

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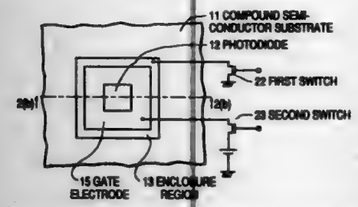
VOL 1148 ISS 4 MR 23 1993 U.M.I.

5,196,692

PHOTOELECTRIC TRANSDUCER SWITCHABLE TO A HIGH-RESOLUTION OR HIGH-SENSITIVITY MODE

Kouji Arinaga; Nobuyuki Kajihara; Gen Sudo; Koji Fujiwara; Soichiro Hikida, and Yuichiro Ito, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 24, 1992, Ser. No. 825,497
Claims priority, application Japan, Feb. 1, 1991, 3-12058
Int. Cl.[5] H01J *40/14*; H01L *27/14*
U.S. Cl. 250—208.1 **8 Claims**



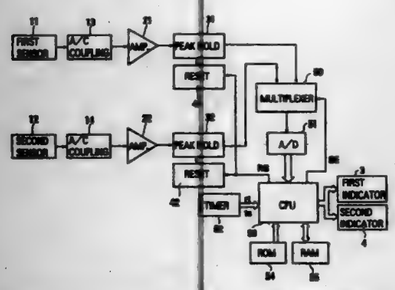
1. A photoelectric transducer having a photocell, comprising:
a compound semiconductor substrate of a first conductivity type and having a main surface;
a photodiode region, doped with an impurity of a second conductivity type opposite to said first conductivity type, formed on the main surface of said compound semiconductor substrate;
an enclosure region, surrounding and separated from said photodiode region and doped with an impurity of said second conductivity type, formed on said main surface of said compound semiconductor substrate;
an insulation layer formed on said main surface;
a gate electrode formed on said insulation layer and located over a portion thereof extending between said photodiode region and said enclosure region;
a first switch for applying a first predetermined voltage to said enclosure region; and
a second switch for applying a second predetermined voltage to said gate electrode, said second switch being closed when said first switch is opened and said second switch being opened when said first switch is closed.

5,196,693

METHOD AND APPARATUS OF PHOTODETECTION WITH MAXIMUM SIGNAL HOLDING MEANS

Kazuki Ozaragi, Tama, Japan, assignor to Kabushiki Kaisha Topcon, Japan

Filed Dec. 20, 1990, Ser. No. 631,716
Claims priority, application Japan, Dec. 20, 1989, 1-329937
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 B **4 Claims**



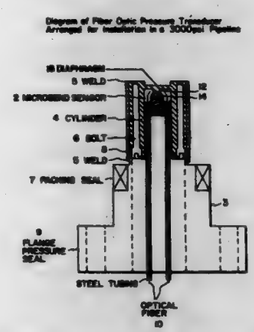
1. A photodetection method, comprising the steps of:
1) converting incident rays into an electrical signal;
2) separating AC signal components from the electrical signal;
3) holding a maximum signal level of the AC signal components, if an AC signal component appears during a predetermined sampling period;
4) storing the held maximum signal level associated with the predetermined sampling period, if a maximum signal level is held in the holding step;
5) determining whether or not a maximum signal level has been stored during each of a sequential plurality of the predetermined sample periods; and
6) either:
a) taking the stored maximum value signal from the storing step as a detection signal, for further processing; or
b) disregarding, as a noise signal, the maximum value stored in the storing step, so that the noise signal does not deteriorate the further processing;
step 6 constituting step a) or step b), depending on whether or not, during three consecutive sampling periods A, B and C:
A) a maximum value is not stored in the storing step associated with sampling period A due to an AC signal component not appearing therein;
B) a maximum value is stored in the storing step associated with sampling period B due to an AC signal component appearing therein; and
C) a maximum value is not stored in the storing step associated with sampling period C due to an AC signal component not appearing therein.

5,196,694

TEMPERATURE COMPENSATED SELF-REFERENCED FIBER OPTIC MICROBEND PRESSURE TRANSDUCER

John W. Berthold, Salem, and Stuart E. Reed, Homeworth, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 13, 1991, Ser. No. 700,387
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.16 **19 Claims**



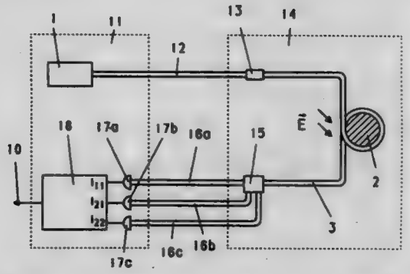
1. A temperature compensated, self-referenced fiber optic sensor, comprising:
a pair of plates with corrugated surfaces having facing and offset teeth, at least one of said plates being in contact with a parameter to be sensed;
a first signal optical fiber clamped between said corrugated plates for being bent to a greater or less extent depending on a parameter exerted on said corrugated plates;
a second reference optical fiber located adjacent said plates to be exposed to a similar environment, said second reference optical fiber being formed in a loop with at least one turn and secured to itself by at least one point with securing means, said optical fiber loop having a predetermined radius r constructed to produce a controlled degree of microbending loss for mode conversion to compensate for thermal offset in addition to cable and connector offsets and light source fluctuations;
a light source for supplying light to said signal and reference optical fibers; and
optical detecting means for receiving light from said signal and reference optical fibers, said optical detecting means measuring changes in transmitted light therethrough for determining a sensed parameter, said optical detecting means further including light transmission determining means for measuring a change in transmission in said reference fiber to compensate for thermal offset in the sensed parameter.

5,196,695

FIBER-OPTIC SENSOR HAVING NEAR-FIELD AND REMOTE-FIELD SIGNALS

Klaus Bohnert, Niederrohrdorf, and Mathias Fauth, Baar, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed May 1, 1992, Ser. No. 877,071
Claims priority, application Fed. Rep. of Germany, May 2, 1991, 4114253
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.17 **12 Claims**



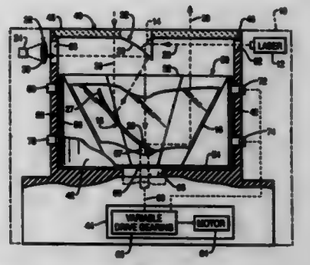
1. A fiber-optic sensor for alternating electric fields or voltages, comprising
(a) a piezoelectric sensor element (2);
(b) an optical fiber having an entrance end and an exit end, which optical fiber is fixed at least partially to the sensor element (2) so that a dimensional change of the sensor element (2) in an electric field leads to a change in the length of the fiber; and
(c) means for measuring the field-dependent change in length of the fiber;
wherein
(d) the fiber is a bimodal fiber (3), the parameters of which are selected so that the LP_{01} fundamental mode and the even LP_{11} mode can propagate within it;
(e) upstream of the entrance end of the bimodal fiber (3) there is disposed a coherent light source (1), which excites the two modes of the bimodal fiber (3); and
(f) the means for measuring the field-dependent change in length of the fiber comprise optical means (15) for the separation of the near-field and remote-field signals present at the exit end of the bimodal fiber (3), detectors (17*a, b, c*) for the conversion of the near-field and remote-field signals into corresponding electrical signals and electronic means (18) for obtaining the length change information from these converted near-field and remote-field signals.

5,196,696

COUNTER ROTATING OPTICAL SCANNING UNIT WITH FRESNEL REFLECTION FILTERING

Joseph M. Lindacher, Duluth, Ga., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 10, 1992, Ser. No. 833,238
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—236 **19 Claims**



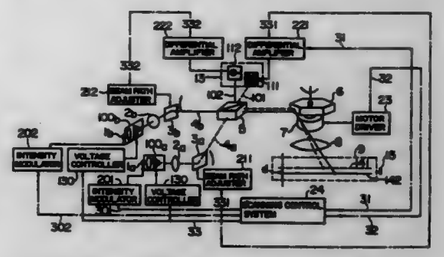
1. An optical scanner comprising:
a laser diode for producing a laser beam;
a mirrored spinner;
a plurality of pattern mirrors for reflecting the laser beam from the spinner to an article having a bar code label to be scanned, said beam reflecting from the label back to the scanner;
a collection filtering system for filtering Fresnel reflections from the beam after it has reflected from the article; and
means for counter rotating the spinner and the pattern mirrors.

5,196,697

LASER BEAM SCANNING APPARATUS HAVING A VARIABLE FOCAL DISTANCE DEVICE AND THE VARIABLE FOCAL DISTANCE DEVICE FOR USE IN THE APPARATUS

Akira Arimoto, Kodaira, and Susumu Saito, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

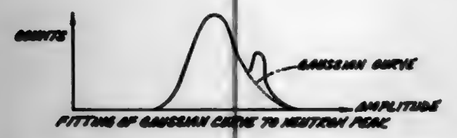
Continuation-in-part of Ser. No. 398,400, Aug. 7, 1989, Pat. No. 5,006,705, and a continuation-in-part of Ser. No. 501,879, Mar. 30, 1990, Pat. No. 5,053,619. This application Dec. 20, 1990, Ser. No. 631,257
Claims priority, application Japan, Dec. 26, 1989, 1-335084
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—236 **18 Claims**



1. A laser beam scanning apparatus, comprising:
a laser light source for emitting at least one laser beam;
a variable focal distance device including an optical waveguide which receives, conducts and outputs said laser beam, and electrode means provided on said optical waveguide to form in said optical waveguide a lens which can change, in a direction perpendicular to a scan line of the output laser beam, the focal point of the laser beam output

from said optical waveguide in accordance with a voltage applied to said electrode means;
deflection means for receiving said laser beam from said variable focal distance device, and for deflecting said laser beam to produce the scan line; and
a lens for focusing said deflected laser beam on a scan plane including the scan line.

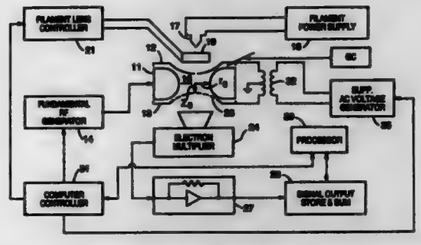
5,196,698
METHOD AND APPARATUS FOR NUCLEAR LOGGING USING LITHIUM DETECTOR ASSEMBLIES
David M. Schneider, Cheshire, Conn., assignor to Baker Hughes Corporation, Houston, Tex.
Filed Nov. 1, 1991, Ser. No. 786,728
Int. Cl.[5] G01V *5/10*
U.S. Cl. 250—262 24 Claims



1. A nuclear logging apparatus for logging a borehole formation comprising:
a drill collar sub;
a radioactive source in said sub;
at least one lithium detector assembly in said sub, said at least one detector assembly being spaced form said radioactive source and said at least one detector assembly being positioned to detect radiation resulting from neutrons emitted by said source;
electronic circuit means communicating with said at least one detector assembly, said electronic circuit means including microprocessor means for analyzing radiation detected by said at least one detector assembly and providing a nuclear log of a borehole formation;
wherein said electronic circuit means develop a raw radiation spectrum based on input from said at least one detector assembly, said raw radiation spectrum including a gamma ray background and a hydrogen absorption peak based on detected gamma rays and a neutron peak based on detected neutrons; and
digital processing means for removing the gamma ray background from said raw spectrum to define a stripped spectrum, said stripped spectrum includes the hydrogen absorption peak and the neutron peak, said digital processing means including;
means for defining a Gaussian curve indicative of a neutron ray contributed spectrum portion of said stripped spectrum.

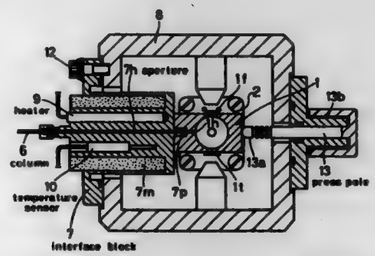
5,196,699
CHEMICAL IONIZATION MASS SPECTROMETRY METHOD USING NOTCH FILTER
Paul E. Kelley, San Jose, Calif., assignor to Teledyne MEC, Mountain View, Calif.
Filed Feb. 28, 1991, Ser. No. 662,427
The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.
Int. Cl.[5] H01J *49/42*
U.S. Cl. 250—282 19 Claims

1. A mass spectrometry method, including the steps of:
(a) establishing a trapping field capable of storing reagent ions and product ions having mass-to-charge ratio within a selected range within a trap region bounded by a set of electrodes;
(b) applying a filtered noise signal to at least one of the electrodes to resonate out of the trap region unwanted ions having mass-to-charge ratio within a second selected range, wherein the selected range corresponds to a trapping range of ion resonance frequencies, wherein the filtered noise signal has frequency components within a lower frequency range from a first frequency up to a



notch frequency band, and within a higher frequency range from the notch frequency band up to second frequency, and wherein the frequency range spanned by the first frequency and the second frequency includes said trapping range.

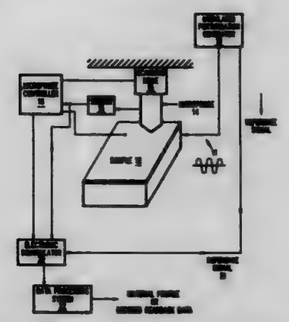
5,196,700
ION SOURCE OF MASS SPECTROMETER
Norio Kameshima, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan
Filed Nov. 27, 1991, Ser. No. 798,755
Claims priority, application Japan, Nov. 30, 1990, 2-338668
Int. Cl.[5] H01J *49/04*
U.S. Cl. 250—288 4 Claims



1. An ion source for a mass spectrometer comprising:
interface block means connected to a sample source for introducing said sample source to an ionization chamber means;
said ionization chamber means being in direct mechanical and thermal contact with and positioned at a side of said interface block means in said mass spectrometer;
heater means provided in said interface block means for heating both said interface block means and said ionization chamber means; and
temperature sensor means provided in said interface block means for sensing the temperature of said interface block means and that of said ionization chamber means.

5,196,701
HIGH-RESOLUTION DETECTION OF MATERIAL PROPERTY VARIATIONS
John S. Foster, Morgan Hill; Kurt A. Rubin, Santa Clara, and Jaquelin K. Spong, Mountain View, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 31, 1991, Ser. No. 739,011
Int. Cl.[5] H01J *37/00*
U.S. Cl. 250—306 11 Claims

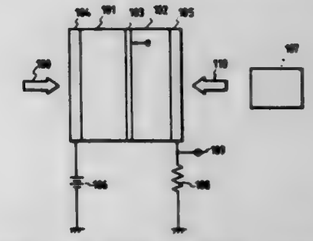
5. An apparatus for imaging non-topographical material property variations over the surface or the subsurface of a scanned sample with approximately nanometer resolution comprising:
a modulated perturbation generator for generating modulated perturbations, for transmitting the modulated perturbations to said scanned sample to produce a detectable change in said sample corresponding to said material property variations, and for producing a reference signal related to the perturbations;
a microprobe having a fine tip disposed close to the surface of the scanned sample, said microprobe being responsive to said detectable change to generate an output signal having first and second contributions related to topo-



graphic and non-topographic material property variations of the sample, respectively, and having a definite phase relationship with the reference signal;
a microprobe drive control system for positioning and controlling the movement of the microprobe over the surface of the scanned sample; and
a demodulator for receiving the reference signal from the perturbation generator and said output signal from the microprobe and for decoupling said first and second contributors of the output signal, thereby demodulating said output signal received from the microprobe, whereby in scanning over the sample, an image of the material proprty variations is generated.

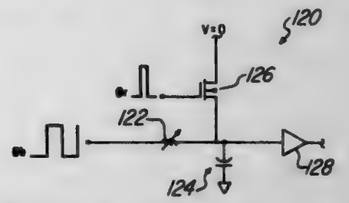
5,196,702
PHOTO-SENSOR AND METHOD FOR OPERATING THE SAME
Kazutaka Tsuji, Hachioji; Tadaaki Hirai, Kogenei; Yukio Takasaki, Kawasaki; Haruo Itoh, Hino; Tetshuhiko Takahashi, Tokyo, and Kenichi Okajima, Houyua, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
PCT No. PCT/JP88/01073, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989, PCT Pub. No. WO89/04063, PCT Pub. Date May 5, 1989
Continuation of Ser. No. 415,301, Aug. 21, 1989, abandoned.
This PCT application Oct. 21, 1988, Ser. No. 824,857
Claims priority, application Japan, Oct. 21, 1987, 62-263797; Mar. 9, 1988, 63-55892
Int. Cl.[5] H01L *31/0272*
U.S. Cl. 250—327.2 6 Claims

1. A method of operating a photo-sensor having a first photoconductive region generating first charge carriers in response to irradiation of signal light and a second photoconductive region generating second charge carriers in response to irradiation by a reading light and an intermediate region disposed between said first and second photoconductive regions, said method comprising the steps of:
(a) applying an electric field to said first and second photoconductive regions and irradiating said reading light on said second photoconductive region, thereby storing second charge carriers at the intermediate region, until a predetermined electric potential exists across said second photoconductive region;
(b) irradiating said first photoconductive region with said signal light thereby generating first charge carriers in said first photoconductive region, said first charge carriers



migrating to said intermediate region and thereby reducing the second charge carries stored at the intermediate region; and
(c) irradiating said reading light on said second photoconductive region until said predetermined electric potential exists across said second photoconductive region.

5,196,703
READOUT SYSTEM AND PROCESS FOR IR DETECTOR ARRAYS
William F. Kosonocky, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 27, 1991, Ser. No. 766,879
Int. Cl.[5] H01L *31/08*
U.S. Cl. 250—332 18 Claims



1. A pixel detector for detecting radiation emanating from an object comprising:
a resistive detector element with a resistance dependent upon said radiation and having first and second terminals;
a capacitor coupled to the first terminal of said resistive detector element;
circuitry for applying a reference voltage to the first terminal of said resistive detector element;
a shutter for focusing and defocusing said radiation;
bias circuitry for applying a first voltage to the second terminal of said resistive element when said radiation is defocused and for applying a second voltage to the second terminal of said resistive element when said radiation is focused; and
circuitry for sensing an output voltage on the first terminal of said resistive detector element, said output voltage substantially dependent upon said radiation.

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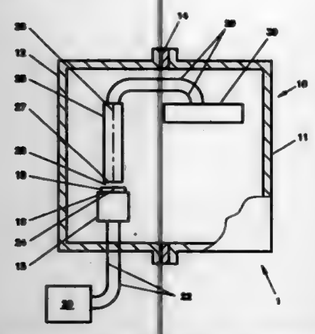
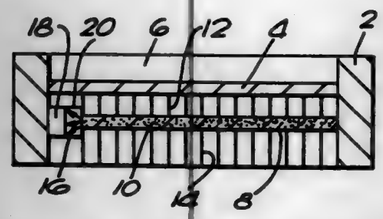
5,196,704
ENVIRONMENTAL RADIATION DETECTION VIA THERMOLUMINESCENCE
Steven D. Miller, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.
Filed Sep. 27, 1991, Ser. No. 766,685
Int. Cl.[5] G01T 1/115
U.S. Cl. 250—337 20 Claims



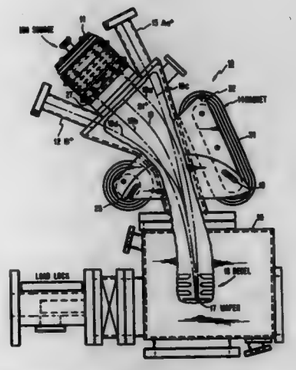
20. A method for radiation detection comprising:
(a) shaping a thermoluminescent material into a shape having a longitudinal axis,
(b) providing a means for counting photons emitted by the thermoluminescent material, said means having a longitudinal axis oriented to and substantially aligned with the longitudinal axis of the thermoluminescent material,
(c) cooling the thermoluminescent material below the excitation temperature of most traps,
(d) exposing the termoluminescent material to ionizing radiation,
(e) heating the thermoluminescent material after exposure to ionizing radiation to a temperature above the excitation temperature of most traps, and
(f) counting the photons emitted from the traps upon heating.

5,196,705
SUN EXPOSURE MONITORING DEVICE
Paul T. Ryan, Cambridge, Great Britain, assignor to Saitek Limited, Kowloon, Hong Kong
PCT No. PCT/GB90/00290, § 371 Date Aug. 23, 1991, § 102(e) Date Aug. 23, 1991, PCT Pub. No. WO90/10201, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 23, 1990, Ser. No. 761,365
Claims priority, application United Kingdom, Feb. 24, 1989, 8904314
Int. Cl.[5] G01J 1/58
U.S. Cl. 250—372 21 Claims



1. A sun exposure monitoring device comprising a sensing sheet mounted in a housing with an exposed face thereof adapted to receive incident sunlight, the sensing sheet including a dye which lumineaces in response to incident ultraviolet light in a selected wavelength range within the ultraviolet range to emit light at longer wavelengths, light so emitted preferentially reflecting internally between the faces of the sheet and emerging at the edges thereof; a sensor disposed in the housing adjacent an edge portion of the sheet to receive light emerging therefrom; means for reducing the light propagating to the sensor in high order reflection modes; and means connected to the sensor for determining the power of incident ultraviolet light in the selected wavelength range on the sheet from signals generated by the sensor.

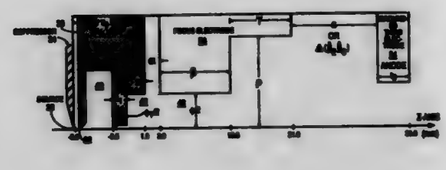
5,196,706
EXTRACTOR AND DECELERATION LENS FOR ION BEAM DEPOSITION APPARATUS
John H. Keller, Poughkeepsie, N.Y., and James W. Robinson, State College, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 30, 1991, Ser. No. 738,214
Int. Cl.[5] H01V 37/147
U.S. Cl. 250—396 R 17 Claims



1. An ion beam apparatus including
an extractor including a first extraction electrode having an aperture of predetermined dimensions and a shield positioned between said first extraction electrode and a plasma, said shield having an aperture substantially congruent with said aperture of said first extraction electrode, and
a deceleration lens including
an aperture defining an ion beam path perimeter of an ion beam at said deceleration lens,
means for forming a meniscus lens substantially larger than said ion beam path perimeter to reduce aberration of said meniscus lens of said ion beam within said ion beam path perimeter.

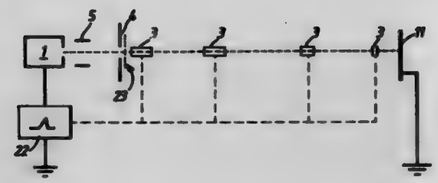
5,196,707
LOW ABERRATION FIELD EMISSION ELECTRON GUN
Mark A. Gesley, Oakland, Calif., assignor to Etec Systems, Inc., Hayward, Calif.
Filed Mar. 4, 1991, Ser. No. 671,425
Int. Cl.[5] H01J 37/073
U.S. Cl. 250—398 8 Claims

1. An apparatus for producing a beam of charged particles along an axis and focusing said beam onto a target spot, said apparatus comprising:
emitter means for emitting said beam along said axis;
an electrostatic lens system spaced from and disposed about said axis beneath said emitter means for focusing said beam onto said target spot, said electrostatic lens system including:
(i) a first lens element conducting a first voltage and having therein a first aperture through which said beam passes, said first aperture being centered about said axis;
(ii) a second lens element conducting a second voltage and including a second aperture through which said beam passes after it leaves said first aperture, said second lens element being spaced from and disposed beneath said first lens element,
said second aperture having an upper portion which is circular, and is centered about said axis, and has a first diameter,



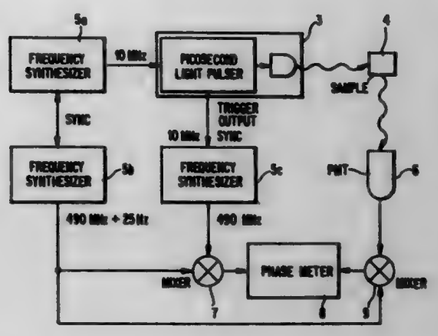
said second aperture having a lower portion which is approximately cylindrical, and centered about said axis, and has a second diameter, and has a predetermined thickness in the direction of said axis, said second diameter being greater than said first diameter;
(iii) a third lens element located below said second aperture and conducting a third voltage and having a third aperture through which said beam passes only after it leaves said second aperture, said third aperture being centered about said axis, the distance between said emitter means and said first lens element being about 8 mm.

5,196,708
PARTICLE SOURCE
Stephen J. Mullock, Cambridge, England, assignor to Kratos Analytical Limited, Urmston, England
Filed Feb. 19, 1992, Ser. No. 838,364
Claims priority, application United Kingdom, Feb. 20, 1991, 9103535
Int. Cl.[5] H01J 3/40
U.S. Cl. 250—423 R 9 Claims



1. A particle source for producing a series of bursts of particles of predetermined energy comprising: means for producing a beam of charged particles, means for varying the accelerating voltage within the means for producing the charged particles such that the energy of the charged particles is periodically ramped from a first energy to a second energy, and chopping means for chopping the beam to produce pulses of charged particles from the beam at times corresponding to the periods during which the energy of the charged particles is ramped.

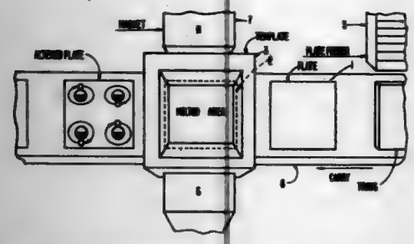
5,196,709
FLUOROMETRY METHOD AND APPARATUS USING A SEMICONDUCTOR LASER DIODE AS A LIGHT SOURCE
Klaus W. Berndt; Ignacy Gryczynski, both of Baltimore, and Joseph R. Lakowicz, Columbia, all of Md., assignors to University of Maryland Systems, Baltimore, Md.
Filed May 3, 1991, Ser. No. 695,074
Int. Cl.[5] G01N 21/64
U.S. Cl. 250—458.1 16 Claims



1. An apparatus for detecting, in the frequency-domain, a change in phase angle and/or modulation, corresponding to a change in a lifetime in a range from about 50 ps to 100 ns, of a fluorescence emission of at least one fluorophore comprising:
semiconductor laser diode means which outputs modulated light when driven by a first electrical signal, said light being substantially monochromatic and coherent;
first electrical signal generator means (5a), coupled to said semiconductor laser diode means, for generating said first electrical signal to cause said semiconductor laser diode means to output said modulated light having a wavelength which excites said at least one fluorophore to emit fluorescence; and
second electrical signal generator means (5b), having a synchronization port coupled to said first electrical signal generator means or to an auxiliary electrical signal corresponding to the light output of said laser diode means, said second electrical signal generator means generating at a signal output port thereof a second electrical signal that is phase locked to a modulation phase of said light output of said laser diode means;
a first electrical signal mixer (7) and a second electrical signal mixer (9), said first mixer being responsive to said second electrical signal and to a signal derived from said first electrical signal to produce a first difference-frequency signal;
photodetector means for sensing said emitted fluorescence, said photodetector means being coupled via said second mixer to said second electrical signal generator means to produce a second difference-frequency signal representative of a change in phase angle and/or modulation of said emitted fluorescence of said at least one fluorophore, wherein said change corresponds to a change in fluorescence lifetime; and
comparator means for comparing the second difference-frequency signal with the first difference-frequency signal to produce a signal indicative of said change in fluorescence.

the board, the electrical contacts being part of an electric

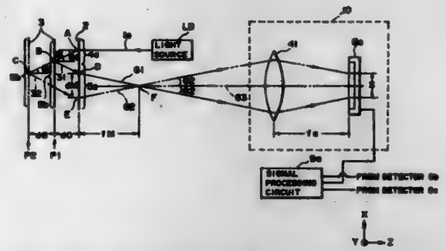
5,196,710
METHOD AND APPARATUS OF IMPLANTING ELECTRONS IN A SOLID FOR ELECTRICAL GENERATION
Meguer V. Kalfaian, 962 Hyperion Ave., Los Angeles, Calif. 90029
Continuation-in-part of Ser. No. 345,002, Apr. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 231,436, Aug. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 140,572, Jan. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 13,076, Feb. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 642,250, Aug. 20, 1984, abandoned. This application Oct. 30, 1991, Ser. No. 784,862
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.1 **6 Claims**



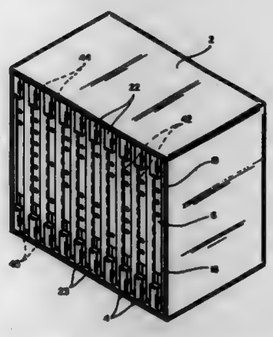
5. Apparatus for artificially uniformalizing the configurative orientations of atoms in a non-conductive plate having two oppositely spaced flat surfaces, whereby rendering said plate receptive to electron implantation freely from one surface to the other without resistance, and with polar unity axially perpendicular to the planes of said surfaces, comprising:
a non-conductive substance;
a heat radiating means for heating and shaping said substance into a solid plate having two oppositely parallel flat surfaces, said heat radiating means having been adjusted to a degree of heat where the atomic magnetic binds are weakened for magnetic control;
magnetic control means, and means for applying its field to the said plate for uniformalizing the configurative orientations of said weakened atoms from a direction parallel to said surface planes, whereby retaining said atomic uniformity after said heat radiating is removed;
electron implanting means, and means therefore for implanting electrons in said plate from one of said surfaces; and
a mask in said electron implanting means, covering a marginal edge at the periphery of said plate to avoid electron implantation, where randomness of atomic configurative orientations occur naturally.

5,196,711
DEVIATION MEASURING DEVICE INCLUDING A MASK HAVING A GRATING PATTERN AND A ZONE PLATE PATTERN
Masakazu Matsugu, Atsugi, and Kenji Saitoh, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 22, 1991, Ser. No. 643,475
Claims priority, application Japan, Jan. 23, 1990, 2-013263
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—548 **29 Claims**

1. A device for detecting relative positional deviation between a mask and a wafer, wherein the mask has a first grating pattern and a zone plate pattern and the wafer has a second grating pattern, said device comprising:
directing means for directing a radiation beam to the first gating pattern of the mask such that the first grating pattern produces a first transmitted beam which is then inputted to the wafer substantially perpendicularly and a second transmitted beam which is obliquely inputted to the wafer and such that the first grating pattern also produces a first reflected beam; and
detecting means for detecting (i) the first reflected beam and also for detecting (ii) a second reflected beam resulting from reflective diffraction of the first transmitted beam by the second grating pattern of the wafer, the second reflected beam being displaceable with any inclination of a surface of the wafer and (iii) a third reflected beam resulting from reflection of the second transmitted beam by the wafer surface and from diffraction of the same by the zone plate pattern of the mask, the third reflected beam being displaceable with any inclination of the wafer surface and any change in an interval between the mask and the wafer.

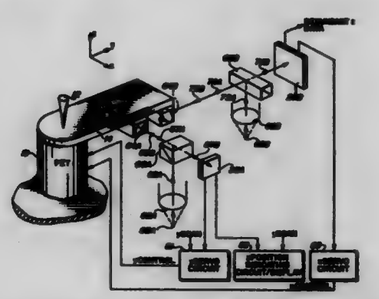


5,196,712
PRINTED CIRCUIT BOARD APPARATUS WITH OPTICAL SWITCHING
Nguyen T. Nguyen, San Jose; Sharon Pellerin, San Francisco, and Steven P. Sanoski, Cupertino, all of Calif., assignors to Raynet Corporation, Menlo Park, Calif.
Filed Dec. 20, 1991, Ser. No. 812,910
Int. Cl.[5] G02B *27/00*
U.S. Cl. 250—551 **14 Claims**



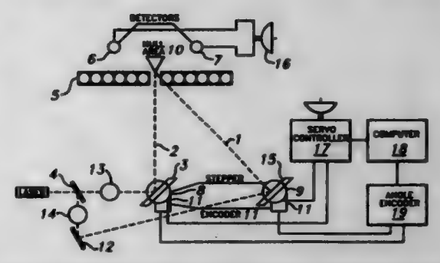
1. A printed circuit board apparatus which is removeably contained in a printed circuit board housing, comprising:
a printed circuit board on which electrical elements are fixed;
a face plate attached to a front end of the printed circuit board;
a moveable handle attached to and extending from the face plate which is moveable between first and second positions;
means for securing the board and the face plate to the housing when the handle is in its first position and for releasing the board and the face plate from the housing when the handle is in its second position so that the board can be removed from the housing and upon removal electrical contacts contained in the housing are electrically disconnected from electrical pins extending from a back end of the board, the electrical contacts being part of an electrical path for signals being transmitted between the board elements and other electronic components;
an optical switch including a light emitter, a light detector for detecting light emitted by the light emitter, and means for instructing at least one of the other electronic components to gracefully inactivate the printed circuit board and switch to a redundant printed circuit board when an output level of the detector is changed by moving the handle between its first and second positions.

5,196,713
OPTICAL POSITION SENSOR WITH CORNER-CUBE AND SERVO-FEEDBACK FOR SCANNING MICROSCOPES
Daniel R. Marshall, Tucson, Ariz., assignor to Wyko Corporation, Tucson, Ariz.
Continuation-in-part of Ser. No. 748,460, Aug. 22, 1991. This application May 13, 1992, Ser. No. 882,581
Int. Cl.[5] G01J *1/20*; G01N *23/00*
U.S. Cl. 250—561 **14 Claims**



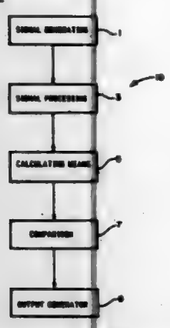
1. A scanning probe microscope, comprising in combination:
(a) a probe support carrying a microscope probe so that a tip of the microscope probe is proximate to a surface of a sample;
(b) a piezoelectric transducer having an anchored end and a free end connected to one of the probe support and a stage on which the sample is supported;
(c) probe sensing circuitry connected to sense a signal representative of an interaction between the tip of the probe and a point of the surface of the sample closest to the tip and producing in response thereto a first control voltage applied to the piezoelectric transducer that moves the one of the probe support and the stage along an axis of a first coordinate variable so as to optimize the interaction;
(d) optical circuitry including
i. a first corner cube connected in fixed relation to the one of the probe support and stage and producing a first beam of light and means for directing the first beam of light along an axis of a second coordinate variable, the first beam of light moving transversely with respect to the axis of the second coordinate variable in accordance with movement of the one of the probe support and the stage,
ii. a second corner cube connected in fixed relation to the one of the probe support and stage and producing a second beam of light and means for directing the second beam of light along an axis of a third coordinate variable, the second beam of light moving transversely with respect to the axis of the third coordinate variable in accordance with movement of the one of the probe support and the stage,
iii. a first position sensitive photodetecting device receiving the first beam of light, the first beam of light producing thereon a first spot of light that moves in accordance with the movement of the one of the probe support and the stage to cause the first position sensitive photodetecting device to produce a first signal representing a value of the first coordinate variable and a second signal representing a value of the third coordinate variable,
iv. a second position sensitive photodetecting device receiving the second beam of light, the second beam of light producing thereon a second spot of light that moves in accordance with the movement of the one of the probe support and the stage to cause the second position sensitive photodetecting device to produce a third signal representing a value of the second coordinate variable;
(e) a first feedback servo circuit receiving the third signal and a first scanning signal and producing in response thereto a first error signal, and a second servo circuit receiving the second signal and a second scanning signal and producing in response thereto a second error signal; and
(f) means responsive to the first and second error signals for producing second and third control voltages applied to the piezoelectric transducer that move the one of the probe support and the stage along axes of the second coordinate variable and the third coordinate variable, respectively.

5,196,714
SYSTEM FOR X-Y ALIGNMENT AND TRACKING OF MOVING TARGETS HAVING ANGULAR DISPLACEMENT WITH FIBER OPTIC SENSING SURFACE
Felix Garcia, Jr., Round Rock, and Rodney D. Williams, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 752,732, Aug. 8, 1991, abandoned. This application May 12, 1992, Ser. No. 884,296
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **56 Claims**



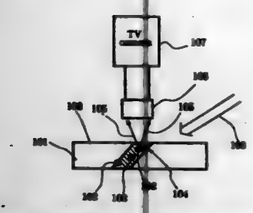
1. A system for tracking a parameter of an object comprising:
(a) a sensor comprising a sensing array for providing an indication of the position of a beam of radiation incident on said sensing array;
(b) a radiation source for providing a beam of radiation,
(c) means for simultaneously directing said beam of radiation along two separate paths;
(d) inhibiting circuitry for alternately inhibiting travel of said beam of radiation in each of said separate paths;
(e) reflecting means in each of said separate paths deflecting said beam of radiation in each of said separate paths to said sensing array and responsive to the position of a beam of radiation incident on said sensing array for altering the position of said beam relative to said sensing array; and
(f) circuitry responsive to the position of said beam for providing a desired object parameter indication.

5,196,715
OPTICAL SURFACE INSPECTION OF WEB WITH STREAK SIGNAL GENERATING MEANS
Gary N. Burk, Powell, and Mark A. Miller, Columbus, both of Ohio, assignors to ABB Process Automation Inc., Columbus, Ohio
Filed Oct. 31, 1991, Ser. No. 786,318
Int. Cl.[5] G01N *21/88*
U.S. Cl. 250—562 9 Claims



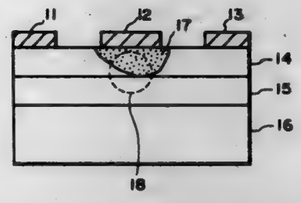
1. In a material inspection apparatus for use in a sheet forming machine, said apparatus being of the type including:
detecting means for providing a plurality of pixel signals, each having a magnitude representing the intensity of electromagnetic radiation received from a corresponding point on a moving sheet of material, said signals being generated sequentially as a series of cross-machine sets, said series extending in the machine direction; and
calculating means for calculating an exponential average of the signals for each of said cross-machine locations;
comparison means for comparing said exponential average for each of said cross-machine locations to a predetermined standard; and
output generating means for generating a streak signal when said exponential average exceeds said predetermined standard, said streak signal including a cross-machine location.

5,196,716
METHOD AND APPARATUS FOR MEASURING INTERNAL DEFECTS FOR POSITION AND DEPTH
Kazuo Moriya, Agoo; Hideo Wada, and Katsuyuki Hirai, both of Saitama, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed May 17, 1991, Ser. No. 702,087
Claims priority, application Japan, May 21, 1990, 2-129182
Int. Cl.[5] G01N *21/88*
U.S. Cl. 250—572 16 Claims



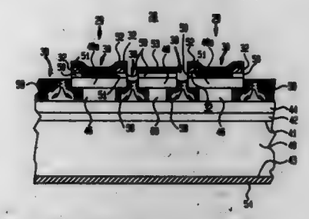
1. A methd of measuring internal defects of a specimen having a flat surface through which the defects are to be measured and which is sufficiently smooth for a laser beam to be incident into the specimen, comprising the steps of:
allowing a laser beam to be incident into the specimen through said flat surface; and
observing the scattered light of the incident laser beam from the defects through said flat surface and in a direction different from the optical axis of the incident laser beam,
wherein the laser beam is finely contracted whereby the observed position of each defect corresponds to the depth of the defect.

5,196,717
FIELD EFFECT TRANSISTOR TYPE PHOTO-DETECTOR
Tamayo Hiroki, Ebina, and Hidetoshi Nojiri, Hadano, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 610,940, Nov. 9, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 807,622
Claims priority, application Japan, Nov. 14, 1989, 1-293927
Int. Cl.[5] H01L *27/14*
U.S. Cl. 257—21 12 Claims



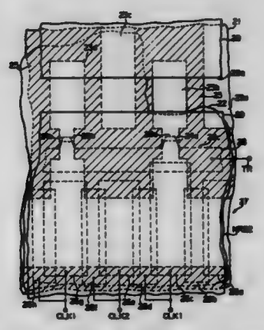
1. A field effect transistor type photo-detector, comprising:
a substrate;
a super-lattice structure semiconductor buffer layer arranged on said substrate;
a semiconductor activation layer formed on said super-lattice structure semiconductor buffer layer;
a source electrode, a drain electrode and a gate electrode arranged on said semiconductor activation layer; and
a further buffer layer arranged between said substrate and said super-lattice structure semiconductor buffer layer;
wherein a depletion layer for controlling a current flowing between said source electrode and said drain electrode is created in said semiconductor activation layer by applying a voltage to said gate electrode, wherein when light irradiates said semiconductor activation layer, a width of the depletion layer changes, wherein a lowest energy sub-bank of said super-lattice structure semiconductor buffer layer has a wider band width than a band gap of said semiconductor activation layer, and wherein the lowest energy sub-band of said super lattice structure semiconductor buffer layer serves as a barrier to carriers.

5,196,718
LIGHT-EMITTING DIODE ARRAY
Teruo Sasagawa, Kanagawa, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 13, 1991, Ser. No. 744,605
Claims priority, application Japan, Aug. 14, 1990, 2-215232
Int. Cl.[5] H01L *33/00*
U.S. Cl. 257—88 22 Claims



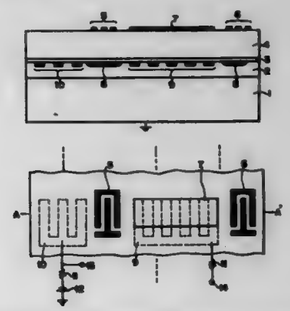
1. A light emitting diode array comprising:
a substrate having a surface;
a plurality of light-emitting elements is spaced isolated relation on the substrate surface, each of the light-emitting elements comprising:
a light-emitting layer of a material which will emit light by the injection of carriers;
first and second cladding layers at opposite sides of the light-emitting layer so that the first cladding layer is between the light-emitting layer and the substrate surface and the second cladding layer is over the light-emitting layer, each of the cladding layers being of a material having a wider band gap than the material of the light-emitting layer so as to form a heterojunction therebetween;
an electrode over the second cladding layer and extending in an enclosed path around a light-emitting surface portion of the second cladding layer; and
the light-emitting layer being wholly within the light-emitting surface of the second cladding layer.

5,196,719
SOLID-STATE IMAGE PICK-UP DEVICE HAVING ELECTRIC FIELD FOR ACCELERATING ELECTRIC CHARGES FROM PHOTOELECTRIC CONVERTING REGION TO SHIFT REGISTER
Kazuo Miwada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 699,828, May 14, 1991, abandoned. This application Aug. 18, 1992, Ser. No. 931,434
Claims priority, application Japan, May 14, 1990, 2-123691
Int. Cl.[5] H01L *29/78, 27/14, 31/00*
U.S. Cl. 257—233 5 Claims



1. A solid-state image pick-up device comprising
a) a semiconductor substrate of a first conductivity type,
b) a plurality of photo-electric converting regions having first impurity regions of a second conductivity type opposite to said first conductivity type, respectively, and formed in a surface portion of said semiconductor substrate at spacings, said plurality of photo-electric converting regions respectively having second impurity regions of said first conductivity type overlapped with the associated first impurity regions except for outlet subregions so that said first impurity regions are buried beneath the associated second impurity regions, said outlet subregions being inside said semiconductor substrate,
c) a shift register having a charge transfer region of said second conductivity type separated from said first impurity regions by respective channel forming regions of said first conductivity type, each of said channel forming region being exposed to a surface of said semiconductor substrate,
d) a thin insulating film covering said channel forming regions and said outlet subregions of said first impurity regions, said outlet subregions being contiguous to said channel forming regions, respectively, and
e) a transfer gate electrode extending on said thin insulating film, and having a boss portion provided for said outlet subregions and said associated channel forming regions and projections each projecting from said boss portion and shaped in such a manner as to create an electric field over each outlet subregion and said associated channel forming region for accelerating carriers from said each outlet subregion through said associated channel forming region to said shift register, each of said projections having a trapezoidal configuration decreased in width toward the leading end thereof.

5,196,720
NARROW BAND INTERFERENCE SIGNAL REMOVING DEVICE
Kazuyoshi Sugai, and Katsuyuki Omori, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan
Filed May 8, 1990, Ser. No. 521,142
Claims priority, application Japan, May 15, 1989, 1-120880; Oct. 13, 1989, 1-267503; Oct. 31, 1989, 1-283820; Dec. 14, 1989, 1-325652; Dec. 26, 1989, 1-337839
Int. Cl.[5] H01L *29/84, 41/02;* H03H *9/25*
U.S. Cl. 257—254 22 Claims



1. A narrow band interference signal removing device comprising:
a multi-layer structure including a silicon substrate and a piezoelectric layer;
input transducers provided in contact with said piezoelectric layer to divide an input signal according to its frequencies and generate a plurality of propagation paths of surface acoustic waves corresponding to respective said frequencies;
output transducers provided in contact with said piezoelectric layer to obtain output signal from surface acoustic waves propagated in respective said propagation paths;
gate electrodes provided on said piezoelectric layer in locations corresponding to respective said propagation paths;
first pn diode arrays provided in a surface portion of said silicon substrate in a location between said input and output transducers;
second pn diode arrays provided in a surface portion of said silicon substrate on a side of said input transducers opposite from said first pn diode arrays;
a third pn diode array having substantially the same configuration as that of said second pn diode array and provided in a location outside said propagation paths;
detection terminals independently extended form said second and third pn diode arrays; and
bias applying terminals independently extended from respective said first pn diode arrays.

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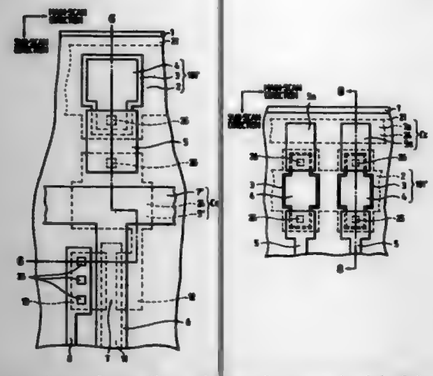
5,196,721

IMAGE READING DEVICE

Hiroyuki Miyake, and Tsutomu Abe, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 578,609, Sep. 7, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 803,728
Claims priority, application Japan, Oct. 3, 1989, 1-257142
Int. Cl.[5] H01L 00/00
U.S. Cl. 257—292 9 Claims



1. A device for reading an image of a scanned original document, comprising:
- a plurality of photoelectric conversion elements arrayed in a main scan direction so as to generate charges corresponding to optical density information of specific portions of the image of the original document, each of the conversion elements having first and second ends;
- a corresponding plurality of thin-film transistors, each of said thin-film transistors including a gate electrode, a source electrode, and a drain electrode, wherein the drain electrode of each of said thin-film transistors is connected in series with the first end of a corresponding one of said photoelectric conversion elements;
- a corresponding plurality of discrete storage capacitors, each of said storage capacitors being connected to the second end of a corresponding one of said photoelectric conversion elements; and
- a corresponding plurality of load capacitors, each connected to the source electrode of a corresponding one of said thin-film transistors;

wherein the charges generated by each of said photoelectric conversion elements are initially stored in said corresponding one of said storage capacitors and, when each of said thin-film transistors is sequentially activated, the charges stored in each of said corresponding storage capacitors are transferred to said corresponding one of said load capacitors where the charges are sequentially read to obtain image information of the original image.

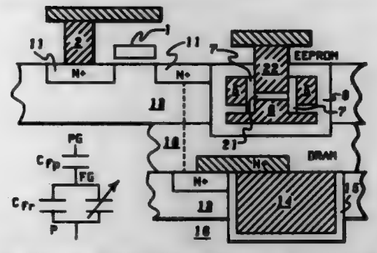
5,196,722

SHADOW RAM CELL HAVING A SHALLOW TRENCH EEPROM

Albert S. Bergendahl, Underhill; Claude L. Bertin, South Burlington; John E. Cronin, Milton; Howard L. Kalter, Colchester; Donald M. Kenney, Shelburne; Chung H. Lam, Williston, and Hsing-San Lee, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1992, Ser. No. 848,913
Int. Cl.[5] H01L 29/78, 27/10, 29/06
U.S. Cl. 257—304 35 Claims

1. A semiconductor device memory array formed on a semiconductor substrate, comprising:
- a multiplicity of DRAM cells, each of said DRAM cells having a FET with a gate electrode and first and second diffusion regions, and a storage capacitor having first and second storage electrodes, said storage electrode being coupled to said first diffusion region of said FET;
- and a multiplicity of EEPROM cells, each having a floating gate disposed in a trench in said semiconductor substrate running between respective ones of said multiplicity of



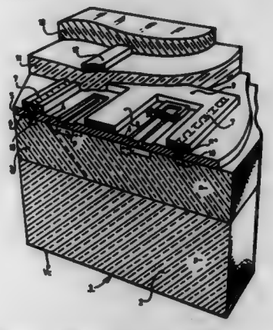
DRAM cells, each of said multiplicity of EEPROM cells having a first controlled electrode connected to said first diffusion region of a respective one of said FETs of a respective one of said DRAM cells, so that a logic state stored by said storage capacitor modulates a charge region in a portion of said substrate adjacent to said floating gate to control a charge stored in said floating gate.

5,196,723

INTEGRATED CIRCUIT SCREEN ARRANGEMENT AND A METHOD FOR ITS MANUFACTURE

Bo S. Andersson, Sundbyberg, and Hans T. Lind, Stockholm, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 4, 1991, Ser. No. 680,509
Foreign Application Priority PCT on Apr. 20, 1990, Sweden, 9001403
Int. Cl.[5] H01L 29/40, 27/02, 29/04
U.S. Cl. 257—489 4 Claims



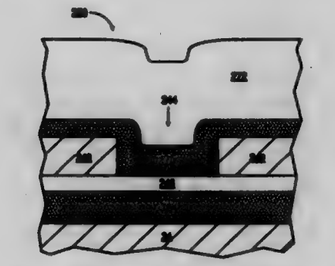
1. An integrated circuit screen arrangement comprising
- a semiconductor layer which is doped with ions of a desired polarity,
- a plurality of mutually spaced component regions in the semiconductor layer surface, of which at least two regions are doped with ions of polarity opposite to the desired polarity,
- a first insulating semiconductor oxide layer on the semiconductor layer having cut-outs for electric connection to the semiconductor layer, and
- a plurality of layers of polycrystalline semiconductor material disposed on the semiconductor oxide layer, wherein the polycrystalline semiconductor material layers include an electric contact layer which is heavily doped with ions of the desired polarity and which extends in the cut-outs for electrical connection;
- a screen layer which is heavily doped with ions of the desired polarity, said screen layer extending in a region between the aforesaid at least two component regions; and
- a connecting layer which is heavily doped with ions of the desired polarity and which extends between the electric contact layer and the screen layer and connects these layers together electrically, wherein the screen layer screens electrically a region in the semiconductor layer against the influence of a non-desired electrical potential on an upper surface of the integrated circuit.

5,196,724

PROGRAMMABLE INTERCONNECT STRUCTURES AND PROGRAMMABLE INTEGRATED CIRCUITS

Kathryn E. Gordon, Mountain View, and Richard J. Wong, Milpitas, both of Calif., assignors to QuickLogic Corporation, Santa Clara, Calif.

Continuation of Ser. No. 691,950, Apr. 26, 1991, abandoned. This application Apr. 23, 1992, Ser. No. 874,983
Int. Cl.[5] H01L 27/02, 29/34, 23/48, 29/46
U.S. Cl. 257—530 12 Claims



1. An antifuse formed in an integrated circuit and comprising:
- a first electrode comprising a metal layer;
- a material deposited over and contacting said metal layer, said material being non-conductive when said antifuse is unprogrammed, said material being conductive when said antifuse is programmed;
- a dielectric overlaying said material and having an opening therethrough; and
- a second electrode in said opening, said second electrode overlaying and contacting said material,

wherein said material has a substantially uniform thickness and a substantially planar surface under said opening in said dielectric, and said first electrode also has a substantially planar surface under said opening in said dielectric.

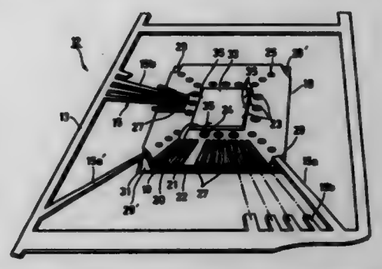
5,196,725

HIGH PIN COUNT AND MULTI-LAYER WIRING LEAD FRAME

Mamoru Mita; Shoji Takagi, both of Hitachi, and Seigi Aoyama, Kitaibaraki, all of Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Filed Jun. 6, 1991, Ser. No. 711,214
Claims priority, application Japan, Jun. 11, 1990, 2-152156; Mar. 14, 1991, 3-049675
Int. Cl.[5] H01L 23/48, 23/12
U.S. Cl. 257—672 13 Claims

1. A high pin count and multi-layer wiring lead frame comprising:
- an inner multi-layer portion, including:
  - a conductive layer for providing one of a ground and power from a power supply;
  - an insulating layer formed on said conductive layer; and
  - a plurality of inner leads formed on said insulating layer in a high density pattern by one of an etching process and a vapor deposition process;
- a metal frame portion surrounding at least a portion of said inner multi-layer portion, said metal frame portion having a plurality of outer leads for providing at least one of a signal transmission therethrough, a connection to said ground, and a connection to said power supply;
- said inner leads formed on said insulating layer of said inner multi-layer portion being electrically connected to said



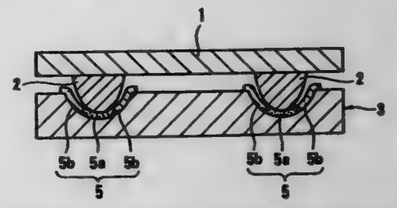
outer leads of said metal frame portion, said outer leads, when providing said at least one of said ground and said connection to said power supply, being connected to said conductive layer; and
- a plurality of apertures formed in said insulating layer for exposing portions of said conductive layer for thereby enabling a wire bonding of a plurality of electrodes of a semi-conductor element to said exposed portions of said conductive layer.

5,196,726

SUBSTRATE FOR PACKAGING A SEMICONDUCTOR DEVICE HAVING PARTICULAR TERMINAL AND BUMP STRUCTURE

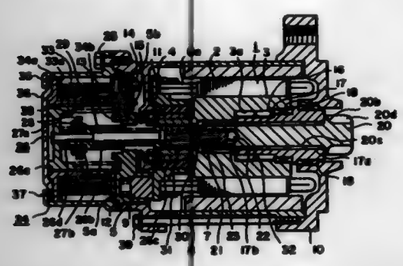
Masanori Nishiguchi, and Atsushi Miki, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 23, 1991, Ser. No. 644,846
Claims priority, application Japan, Jan. 23, 1990, 2-13414; Jan. 23, 1990, 2-13415; Jan. 23, 1990, 2-13416
Int. Cl.[5] H01L 23/14, 23/54
U.S. Cl. 257—737 15 Claims



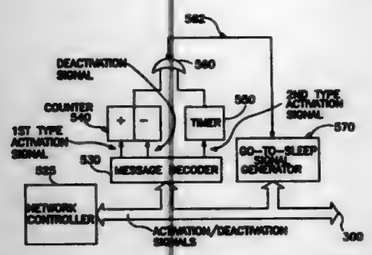
1. A substrate arrangement for packaging a semiconductor device having a bump projecting from a surface thereof comprising:
- a substrate element;
- an electrode terminal formed on said substrate element, said electrode terminal having a recess for receiving at least a top of said bump, a depth of said recess increases as it goes from a periphery to a center; and
- a conductive member of a lower melting point than that of the peripheral portion of said electrode is formed at the central portion of the recess of said electrode terminal.

5,196,727
COAXIAL ENGINE STARTER
Shunso Isomura; Shigeru Shirofuma, and Akira Morishita, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 484,968, Feb. 26, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 811,667
Claims priority, application Japan, Feb. 27, 1989, 1-47526
Int. Cl.[5] F02N *11/00, 15/06*
U.S. Cl. 290—48 7 Claims



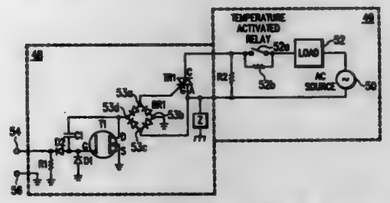
1. A coaxial engine starter comprising:
an electric motor having an armature winding characterized in that each coil of said armature winding is a single turn armature coil and a hollow armature rotary shaft for generating a rotational force for starting an engine;
an over-running clutch mechanism disposed within said hollow armature rotary shaft for preventing the occurrence of an excessive-speed of said armature and having a pinion having a gear teeth number equal to or less than seven for engaging with a ring gear of an engine upon starting of said electric motor; and
a solenoid switch disposed behind said electric motor for moving a pinion shaft forward and supplying electric power to said electric motor.

5,196,728
METHOD OF CONTROLLING A NETWORK OF ELECTRONIC STATIONS INCLUDING A SLEEP MODE WHEN NO ACTIVE FUNCTION IS ACTIVATED
Tony Jaux, Vincennes, France, assignor to Jaeger, France
Filed Dec. 18, 1990, Ser. No. 629,137
Claims priority, application France, Dec. 19, 1989, 89 16805; Dec. 19, 1989, 89 16906
Int. Cl.[5] G06F *1/32*
U.S. Cl. 307—10.1 26 Claims



1. A method of controlling a network of electronic stations in a motor vehicle each suitable for generating at least one function, the method comprising the following steps:
i) generating an activation signal at at least one of the stations when a request is made for a previously inactive function;
ii) generating a deactivation signal at the same station when a previously active function is to be deactivated;
iii) detecting the generated activation and deactivation signals;
iv) incrementing at least one counter by one step each time an activation signal associated with the counter is detected;
v) decrementing the same counter by one step each time an associated deactivation signal is detected; and
vi) generating a "go to sleep" signal whenever a counter reaches a zero count on being decremented.

5,196,729
LIQUID ACTIVATED CONTROL SWITCH
John T. Thorsgren, 5947 Williamstown, Dallas, Tex. 75230
Filed Mar. 30, 1990, Ser. No. 503,467
Int. Cl.[5] H01H *35/18*
U.S. Cl. 307—118 39 Claims

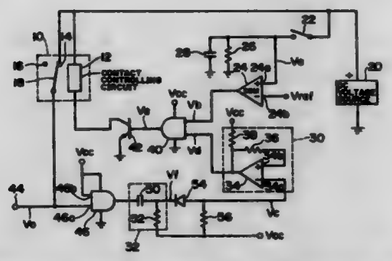


1. A control switch apparatus for controlling the operation of an electrical system based upon the accumulation of liquid at a designated location in said electrical system, comprising:
a control switch in series with the electrical system;
a first liquid detecting probe positioned at said designated location;
a second liquid detecting probe positioned at said designated location;
means for connecting said electrical system by placing a positive conductive charge on said control switch;
means for disconnecting said electrical system upon the detection of accumulated liquid at said designated location by said first and second probes, said disconnecting means comprising a control switch discharge path for discharging said positive conductive charge when said first and second probes contact said accumulated liquid;
means for resetting said control switch, said resetting means reapplying a positive conductive charge on said control switch; and
means for maintaining the disconnection of said electrical system after said first and second probes no longer detect accumulated liquid at said designated location, and before said control switch is reset, said means for maintaining disconnection maintaining a negative or neutral conductive charge on said control switch, said negative or neutral conductive charge preventing said control switch from turning on.

5,196,730
ARRANGEMENT OF AUTOMATICALLY RESTORING NORMAL OPERATION OF LATCH-IN RELAY
Ryuji Matsuo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 30, 1990, Ser. No. 559,613
Claims priority, application Japan, Jul. 31, 1989, 1-199621
Int. Cl.[5] H01H *47/00*
U.S. Cl. 307—132 EA 10 Claims

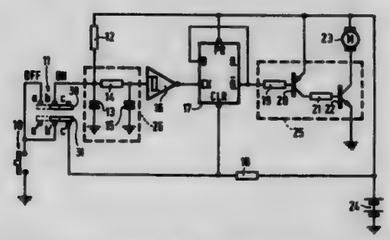
1. A relay circuit comprising:
a switch coupled to a direct current voltage source;
a latch-relay including a relay armature and a contact controlling means, said relay armature being switched over between on and off positions thereof in response to voltage changes induced by said switch and applied to said contact controlling means;

output voltage sensing means including a differentiating circuit which is responsive to an abrupt falling in potential at an output of said latch-in relay due to switching from said on position to said off position of said relay armature and which generates a control signal representative of said abrupt falling in potential; and



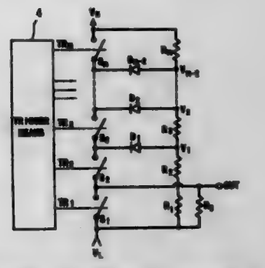
relay controlling means coupled to said switch and coupled to receive said control signal, said relay controlling means including a wave-shaping circuit which generates a rectangular pulse in response to said control signal, said relay controlling means using said rectangular pulse for changing said relay armature from the off position to the on position in the event that said switch remains closed.

5,196,731
POWER ON/OFF CIRCUIT WITH LOCK FUNCTION
Katsumi Abe, and Akinori Takie, both of Tokyo, Japan, assignors to U. S. Philips Corporation, New York, N.Y.
Filed Feb. 26, 1991, Ser. No. 661,924
Claims priority, application Japan, Mar. 1, 1990, 2-49817
Int. Cl.[5] H01H *3/00;* B26B *19/00*
U.S. Cl. 307—142 20 Claims



1. A power on/off circuit with a lock function comprising: a power supply and a load, a main switch and a lock switch connected in said circuit so as to enable and disable a connection between the power supply and the load by operation of the main switch if the lock switch is in a first and second position, respectively, wherein the main switch is a momentary type switch and the lock switch is a two-switching circuit two-contact type switch, a switching state holding circuit having an output operable to control said connection between the power supply and the load, one switching circuit of the lock switch being connected between the main switch and an input terminal of the switching state holding circuit, the other switching circuit of the lock switch being connected between the main switch and a reset terminal of the switching state holding circuit, whereby it is only possible to open and close the connection between the power supply and the load by a manual operation of the main switch.

5,196,732
STEP VOLTAGE GENERATOR
Akira Takahashi; Masanori Hirano, and Teruo Takeshita, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan
Filed Dec. 11, 1990, Ser. No. 628,847
Claims priority, application Japan, Jan. 12, 1990, 2-005767
Int. Cl.[5] H03K *4/02;* H03D *1/20*
U.S. Cl. 307—227 18 Claims

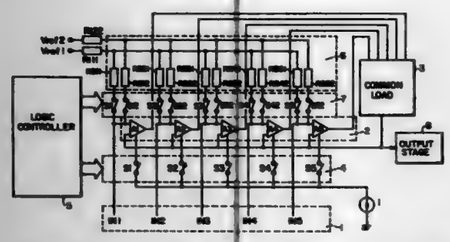


1. A step voltage generator for outputting a step voltage from an output terminal, comprising:
voltage dividing means comprising:
a first circuit having a plurality of voltage dividing elements serially connected to each other between two power sources of different voltage levels; and
a second circuit connected to said first circuit and having a plurality of transistors parallely connected to corresponding ones of said voltage dividing elements,
wherein said voltage dividing means voltage divides a potential difference between said two power sources, and the base or gate of each of the transistors is supplied with a divided voltage output from a corresponding one of said plurality of voltage dividing elements;
switch means comprising a third circuit disposed between said two power sources, said third circuit having a plurality of switch devices serially connected and associated with corresponding ones of said voltage dividing elements, wherein said output terminal is connected to one terminal of a switch device located nearest to one of said two power sources;
trigger means for causing the switch devices to sequentially turn-on; and
reverse flow preventive means for prohibiting current from a switch device which has been most recently turned on from flowing to a voltage dividing element corresponding to a switch device which had been previously turned on and remained on.

5,196,733
CROSSTALK-RESISTANT MULTI-INPUT TO SINGLE OUTPUT ANALOG SWITCHING DEVICE
Young-ho Shin, Pucheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea
Filed Mar. 20, 1992, Ser. No. 855,546
Claims priority, application Rep. of Korea, Jul. 2, 1991, 91-11215[U]
Int. Cl.[5] H04Q *3/00;* H03K *17/56*
U.S. Cl. 307—243 12 Claims

1. A crosstalk-resistant multi-input to single output analog switching device including an input stage having a plurality of input ports for receiving various analog input signals, a differential amplification unit connected to said input stage and having a plurality of differential amplifiers for amplifying said received analog input signals, a first selective switch unit connected to said differential amplification unit for performing a switching operation so that only one of said differential amplifiers is enabled and allows the corresponding analog input signal of said received analog input signals to be passed

through the enabled differential amplifier transmitting it to an output stage, a first reference voltage source for supplying a first reference bias voltage to a first input of each of said differential amplifiers, a logic controller for controlling said first selective switch unit with its output signal, a constant current source coupled to the first selective switch unit and serving as a bias supply source to the differential amplification unit, and a common load connected to an output of the differential amplification unit for outputting the output of the differential amplification unit to the output stage, said analog switching device further comprising:



a second reference voltage source for supplying a second reference bias voltage to said first input of each of said differential amplifiers; and

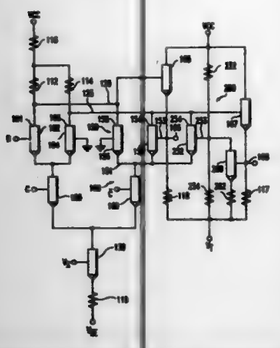
a second selective switch unit connected between said first and second reference voltage sources and said differential amplification unit and having a plurality of switch pairs, for performing a switch operation so that each bias voltage from said first and second reference voltage sources is selectively supplied to the corresponding differential amplifiers in response to the output signal of said logic controller.

5,196,734

CCS LATCH WITH IN-CIRCUIT REDUNDANCY

Bing-Hou Han, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1992, Ser. No. 921,188
Int. Cl.[5] H03K *3/284, 19/086*
U.S. Cl. 307—247.1 3 Claims



1. A cascode current switch integrated circuit latch formed from a plurality of bipolar transistors comprising:

input means for loading data into one of a pair of in-phase and out-phase storage nodes located on first and second current paths extending from an upper voltage terminal to a lower voltage terminal;

a current switch comprising first and second switch transistors having common emitters connected to a switch node and first and second collectors connected to respective ones of said pair of in-phase and out-phase storage nodes, and a first cascode current source connected between said switch node and a lower voltage terminal, said first switch transistor having a first switch base connected to a switch reference voltage;

storage node bias means for biasing said first and second switch transistors so that said current flows through said first switch transistor when said second switch transistor is off and so that said first switch transistor is off when said second switch transistor is on; and

a feedback link comprising a first coupling transistor having a coupling base connected to one of said storage nodes and an emitter coupled to a second switch base of said second switch transistor, the collector of said second switch transistor being connected to the other of said storage nodes, whereby said switch node is connected through said current switch to one of said in-phase and out-phase storage nodes in response to the state of said first coupling transistor, thereby connecting said in-phase and out-phase nodes in a stable latch configuration, characterized in that:

a third switch transistor is connected between said other of said storage nodes and said switch node, said third switch transistor having a third switch base connected to a second feedback link;

said second feedback link comprises a second coupling transistor having a second coupling base connected to said other of said storage nodes and an second coupling emitter coupled to said third switch base of said third switch transistor through inverter means, whereby said second and third switch transistors are connected in a wired-or configuration to said switch node and are controlled in response to the state of said in-phase and out-phase storage nodes such that they are in the same state in normal operation; and

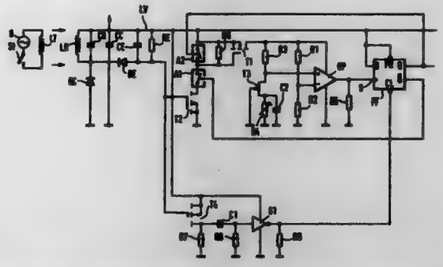
bias means for biasing said third switch transistor on when said second coupling transistor is off, whereby said latch is immune to single event upset from charge deposited on said one of said storage nodes and is sensitive to single event upset when charge above a predetermined critical charge is deposited on said other of said storage nodes.

5,196,735

CIRCUIT ARRANGEMENT

Herbert Meier, Moosburg, and Martin Sellmeir, Neufinsing, both of Fed. Rep. of Germany, assignors to Texas Instruments Deutschland GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 496,391, Mar. 20, 1990, abandoned.
This application Jun. 14, 1991, Ser. No. 715,318
Int. Cl.[5] H03K *3/02*
U.S. Cl. 307—260 7 Claims



1. Circuitry for generating a control signal comprising:

an energy storage element operable to be charged by a carrier oscillation pulse and having a voltage level representative of the amount of energy stored;

a detection circuit for generating a switching signal in response to the termination of said carrier oscillation pulse, and;

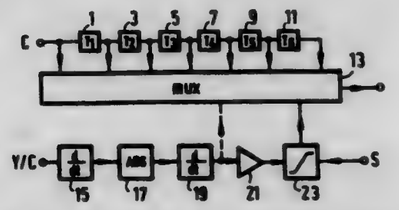
signal generating circuitry activated by said switching signal, said signal generating circuitry generating said control signal when said voltage level of said energy storage element is substantially equal to a selected value, said generated control signal deactivating said signal generating circuitry.

5,196,736

SIGNAL TRANSIENT IMPROVEMENT DEVICE HAVING A DELAY CIRCUIT IN WHICH THE AMOUNT OF DELAY IS ADJUSTABLE

Laurens Doorenbos, and Jeroen Kettenis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1991, Ser. No. 749,791
Claims priority, application European Pat. Off., Sep. 27, 1990, 90202551.9
Int. Cl.[5] H03K *5/159, 3/01;* H04N *9/64, 5/14*
U.S. Cl. 307—263 12 Claims



1. Signal transient improvement device having an input for receiving an input signal with smooth transitions and an output for supplying an output signal with sharpened transitions, comprising:

delay means having an input coupled to said device input, a control signal input, and an output for furnishing said output signal to said device output, wherein, in response to a control signal applied to said control signal input, said output signal is a version of said input signal delayed by a predetermined amount, said output signal is a version of said input signal delayed by a controllable amount less than said predetermined amount, or said output signal is a version of said input signal delayed by a controllable amount greater than said predetermined amount; and

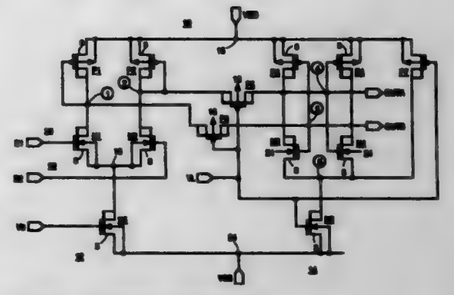
control means having a control signal output for applying said control signal to said control signal input of said delay means, and including differentiating means coupled to receive a characteristic signal indicative of a characteristic of said input signal, for obtaining a second derivative of said characteristic signal, an output of said differentiating means being coupled to said control signal output, a sign of said control signal controlling whether said output signal is said version of said input signal which is delayed by a controllable amount less than or greater than said predetermined amount by said delay means, while an amplitude of said control signal controls whether said output signal is said version of said input signal which is delayed by said delay means by said predetermined amount, or said amplitude of said control signal controls a magnitude of the controllable amount by which said input signal is delayed by said delay means less than or greater than said predetermined amount.

5,196,737

LATCHING COMPARATOR EMPLOYING TRANSFER GATES

John A. Olmstead, Cape May Court House, N.J., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 9, 1991, Ser. No. 682,482
Int. Cl.[5] H03K *3/26, 3/284*
U.S. Cl. 307—279 10 Claims



1. The combination comprising:

a deferential amplifier stage having first and second inputs for the application thereto of first and second input signals respectively and having first and second differential outputs at which are produced first and second output signals corresponding to the relative values of the first and second input signals;

a selectively enabled complementary flip-flop having first and second inputs, said flip-flop, when enabled, being settable to either one of two states corresponding to the signals applied to said first and second inputs;

first and second selectively enabled transmission gates, said first transmission gate being coupled between said first differential output and one of said first and second inputs of said flip-flop and said second transmission gate being coupled between said second differential output and the other one of said first and second inputs of said flip-flop; and

a single clock signal coupled to said flip-flop and to said first and second selectively enabled transmission gates for, during one time period, enabling said transmission gates and concurrently disabling said flip-flop and for, during a subsequent time period, disabling said transmission gates and concurrently enabling said flip-flop.

5,196,738

DATA DRIVER CIRCUIT OF LIQUID CRYSTAL DISPLAY FOR ACHIEVING DIGITAL GRAY-SCALE

Kazuhiro Takahara; Tadahiro Yamaguchi; Masami Oda; Hiroshi Yamaguchi, all of Atsugi; Tetsuo Aoki, Kawasaki, and Fumitaka Asami, Kasukachi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1991, Ser. No. 766,132
Claims priority, application Japan, Sep. 28, 1990, 2-259300; May 21, 1991, 3-116036
Int. Cl.[5] H03K *3/01;* H09G *3/00*
U.S. Cl. 307—296.1 32 Claims

1. A data line driver circuit providing a plurality of digitally selectable, gray-scale display drive signal outputs, of a first number, for a liquid crystal display, comprising:

plural power source voltage terminals at a second number of respective and different, plural voltage levels, the second number being less than the first number;

a driver circuit output terminal;

a plurality of analog switches with corresponding load resistances, each having an input terminal connected to a corresponding one of the power source voltage terminals, an output terminal connected to the driver circuit output terminal and associated switching terminals for receiving

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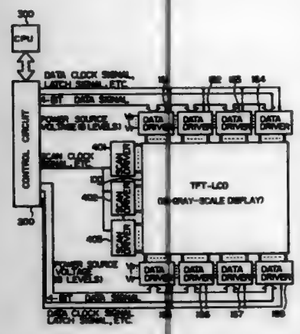
corresponding input ON signals, each analog switch being selectively switched to an ON condition by a corresponding input ON signal;

a source of display data signals defining the specific gray-scale value, of the first number of gray-scale values, of a display to be produced by the liquid crystal display; and

a selection circuit having input terminals connected to the display data signal source for receiving the display data signals, having output terminals respectively connected to the associated switching terminals of the plurality of analog switches, and being responsive to the received display data signals for selectively generating at and transmitting



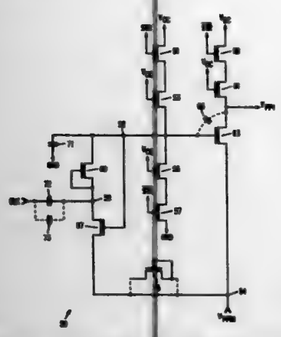
from the output terminals thereof one or more input ON signals respectively to one or more of the associated input terminals of the plurality of analog switches in accordance with and in response to the specific gray-scale value defined by the received display data signals for the corresponding display to be produced, the analog switches which receive the ON signals from the selection circuit producing outputs through the corresponding load resistances thereof and thereby at the respective output terminals thereof, and which outputs are combined at the driver circuit output terminal as the thereby selected, gray-scale display drive signal output of the data line driver circuit.

5,196,739

HIGH VOLTAGE CHARGE PUMP

Bal S. Sandhu, Fremont, and Frederick K. Leung, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 3, 1991, Ser. No. 679,702
Int. Cl.[5] H03K *17/10*
U.S. Cl. 307—296.1 9 Claims



1. A charge pump circuit, the circuit receiving a D.C. charge signal, a programming signal, a complement programming signal and a clock signal, the circuit producing a D.C. charging signal and comprising:

a first and second transistor coupled drain to source, the source of the first transistor being coupled to a D.C. power source, the gate of the first transistor being coupled to the programming signal, the gate of the second transistor being coupled to the d.c. power source and the drain of the second transistor being coupled to a first node;

a voltage feedback circuit comprising first and second capacitors and third and fourth transistors, the first capacitor being coupled to a ground and the first node, the drain of the third transistor being coupled to the first node, the second capacitor being coupled to the clock signal and the gate and source of the third transistor and the drain of the fourth transistor, the gate of the fourth transistor being coupled to the first node and the source of the fourth transistor being coupled to the D.C. charge signal;

a fifth and sixth transistor, coupled drain to source, the source of the fifth transistor being coupled to the ground, the gate of the fifth transistor being coupled to the compliment programming signal, the gate of the sixth transistor being coupled to the D.C. power source and the drain of the sixth transistor being coupled to the first node; and

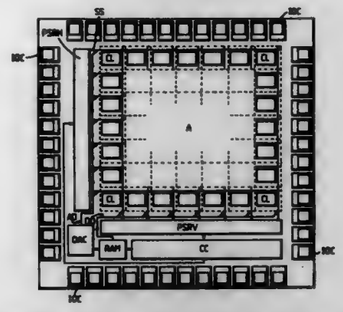
seventh, eighth, and ninth transistors, coupled in series drain to source, the gate of ninth transistor being coupled to the first node, the drain of the ninth transistor being coupled to the D.C. charge signal the gate of the eighth transistor being coupled to the D.C. power source, the gate of the seventh transistor being coupled to the compliment programming signal and the source of the seventh transistor being coupled to the D.C. power source, the D.C. charging signal appearing on the connection between the drain of the eighth transistor and the source of the ninth transistor.

5,196,740

INTEGRATED CIRCUIT FOR ANALOGUE SYSTEM

Kenneth Austin, Northwich, England, assignor to Pilkington Micro-Electronics Limited, England

Filed Apr. 2, 1991, Ser. No. 679,483
Claims priority, application United Kingdom, Apr. 3, 1990, 9007492
Int. Cl.[5] H03K *3/26*; H01L *25/00*
U.S. Cl. 307—303 21 Claims



1. A semiconductor integrated circuit for executing a plurality of different analogue functional applications, the circuit comprising:

an array of analogue cells, each cell having internal circuitry with variable connections in said internal circuitry to permit internal configuration in a selected one of a plurality of different circuit functions;

interconnection circuitry coupled to said array for enabling the interconnection of any cell in said array with any other one or more cells in said array; and

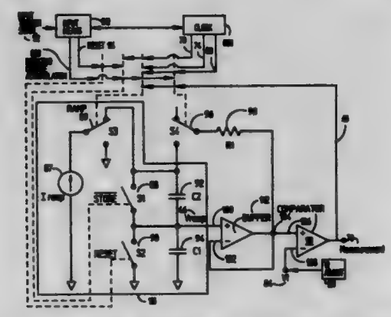
selection and accessing circuitry coupled to said interconnection circuitry for selectively and individually selecting and accessing each cell in said array, and connecting a selected and accessed cell to a source of configuration data to internally configure the selected and accessed cell in one of said different circuit functions and for controlling said interconnection circuitry to affect selective interconnection of a selected and accessed cell with one or more other cells in said array to implement a particular analogue functional application from said plurality of different analogue functional applications.

5,196,741

RECYCLING RAMP INTERPOLATOR

David J. Rustici, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 672,145, Mar. 19, 1991, Pat. No. 5,132,558, which is a continuation of Ser. No. 551,683, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 301,915, Jan. 25, 1989, abandoned. This application Nov. 18, 1991, Ser. No. 793,776
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Int. Cl.[5] H03K *5/153*; G11C *27/02*
U.S. Cl. 307—353 4 Claims



1. A recycling ramp interpolator apparatus for increasing the speed of reconstructing an input waveform the apparatus comprising:

a current source;

a current source switch means for switching the current source between one of at lest two positions, a first position being a ground and a second position being to a charge accumulator means;

in response to an input trigger signal, the current source switch means changes to the second position;

in response to a first predetermined clock signal, the current source switch means changes to the first position,

in response to a second predetermined clock signal, the current source switch means changes to the second position;

in response to a trigger out signal changes to the first position; and

in response to a third predetermined clock signal changes to the second position;

the charge accumulator means for accumulating charge form the current source in response to the input trigger sinal, holding the accumulated charge in response to the first predetermined clock signal accumulating an additional charge in response tot the second predetermined clock signal, discharging the additional change in response to the trigger out signal, the charge accumulator means having a charge accumulator input connected to the current source switch man and a charge accumulator output, the charge accumulator means having a reset switch, the reset switch having two positions, an open position and a closed position, the reset switch being responsive to a reset signal and closes upon receiving the reset signal;

a buffer means or discharging the additional a charge in the charge accumulator means, having a positive input, a negative input, and an output, the negative input connected to the output of the buffer means, the positive input connected to the output of the charge accumulator means the output of the buffer means connected to an additional charge discharge switch, the additional charge discharge switch having an input and an output, the output of the buffer means connected to the inpu of the additional charge discharge switch, the output of the additional charge discharge switch connected to the input of the charge accumulator means, the additional charge discharge switch having two positions, an open position and a discharge position, the additional charge discharge switch responsive to the trigger output signal by staying in the open position until the trigger out signal is received and, then, changes to the discharge position until the additional charge is fully discharged, then the additional charge discharge switch changes to the open position.

a comparator means having a positive input, a negative input, and a trigger out signal output, the positive input connected to the output of the buffer means, the negative input connected to a reference voltage, for comparing the buffer means output to the reference voltage and for producing the trigger out signal at a predetermined comparison value of the buffer means output to the reference voltage.

5,196,742

LOW VOLTAGE DIFFERENTIAL CIRCUIT

Mark D. McDonald, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 26, 1992, Ser. No. 905,106
Int. Cl.[5] H03K *5/22, 5/153*
U.S. Cl. 307—355 31 Claims

1. A circuit suitable for relatively low voltage operation for processing first and second input signals so as to produce an output signal, said circuit including:

first and second power supply busses;

first control stage means for receiving the first input signal and for producing the output signal, said first control stage means including

(1) a first differential stage which includes a first and second transistors each having first, second and third control electrodes, with the first electrodes coupled together and the second electrode of at least the first transistor for receiving the first input signal;

(2) a second differential stage which includes third and fourth transistors each having first, second and third control electrodes, with the first electrodes coupled together;

(3) load means for providing a load for at least the second differential stage which is coupled between the second differential stage and the first bus, with the output signal appearing at the junction between the second differential pair and the load means;

second control stage means for controlling current flow through the first and second differential stages in response to the second input signal, said control means including

(1) a third differential stage which includes fifth and sixth transistors, each having first, second and third control electrodes, the first electrodes coupled together and at least the second electrode of the fifth transistor for receiving the second input signal and a first current source coupled between the first electrodes of the fifth and sixth transistors and the first power supply bus; and

(2) current control means for controlling current flow in said first and second differential stage in response to current flow in said third differential stage, said current control means being coupled between said second bus and said first electrodes of said first, second, third and fourth transistors.

5,195,743

LOW-POWER CLOCKING CIRCUITS

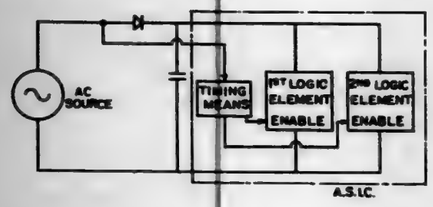
David R. Brooks, Perth, Australia, assignor to Magellan Corporation (Australia) Pty. Ltd., Australia

PCT No. PCT/AU89/00192, § 371 Date Jan. 12, 1990, § 102(e) Date Jan. 12, 1990, PCT Pub. No. WO89/11182, PCT Pub. Date Nov. 16, 1989

PCT Filed May 4, 1989, Ser. No. 459,761

Int. Cl.[5] H03K *17/16, 19/20*

U.S. Cl. 307—443 9 Claims



1. A method of switching a circuit comprising a plurality of non or minimal power consumption logic elements, said circuit comprising at least a first switchable CMOS logic element and a second switchable CMOS logic element, the method comprising the steps of:

enabling said first logic element to allow said first logic element to reach a steady logic state, and

enabling said second logic element when said first logic element reaches a substantially steady logic state,

the enabling of each element being substantially coordinated with cycles of an AC power source.

5,195,744

PEAK CLIPPING CIRCUIT

Georges Neu, Marell-Sur-Marldre, France, assignor to Bull, S.A., France

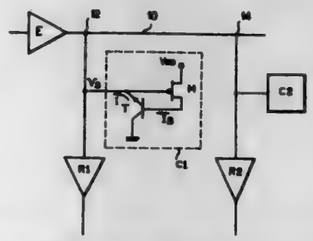
Filed Jul. 22, 1991, Ser. No. 733,857

Claims priority, application France, Jul. 23, 1990, 90 09364

Int. Cl.[5] H03K *5/08, 5/00*

U.S. Cl. 307—540 4 Claims

1. A peak clipping circuit (C1) for an integrated circuit of the VLSI type including a circuit device (R1) having an input (12), means for connecting said clipping circuit with the circuit device, said clipping circuit including a peak clipping bipolar transistor (T) of the pnp bipolar type having base collector and emitter electrodes and a charge transistor (M) of the MOS type, means for connecting the base electrode to a drain terminal of the MOS-type, transistor (M), and means for connecting a gate electrode of said charge transistor and the emitter electrode of said bipolar transistor to said input (12) of the circuit device (R1), and further including a low level supply voltage (ground) connected to the source of the charge transistor (M)



and a high level supply voltage (VDD) connected to the collector electrode.

5,196,745

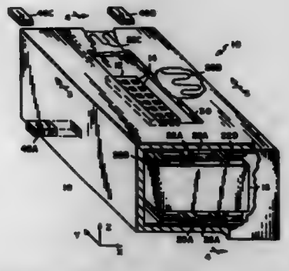
MAGNETIC POSITIONING DEVICE

David L. Trumper, Concord, N.C., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 16, 1991, Ser. No. 746,342

Int. Cl.[5] H02K *41/00*

U.S. Cl. 310—12 42 Claims



1. A device for positioning a movable member having a first surface relative to a stationary member having a second surface, said first and second surfaces being adjacent each other, the device comprising:

a magnetic array mounted in one of said surfaces, said array having adjacent magnetic elements in the direction of movement which are adapted to be of opposite polarity;

a multiphase coil array mounted in the other of said surfaces, said other surface being formed of a material having low magnetic permeability;

said magnetic array and coil array being mounted so as to provide smooth mating adjacent surfaces spaced from each other by a substantially uniform gap; and

means for selectively applying controlled currents to each phase of said coil array in a phase, amplitude and polarity to interact with said magnetic array to drive said movable member to a selected position relative to aid stationary member.

5,196,746

GENERATOR AUXILIARY FORCED COOLING AND LUBRICATION SYSTEM AND METHOD

Jack L. McCabria, Lima, Ohio, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 18, 1991, Ser. No. 780,689

Int. Cl.[5] H02K *9/00, 9/19, 9/24*

U.S. Cl. 310—54 12 Claims

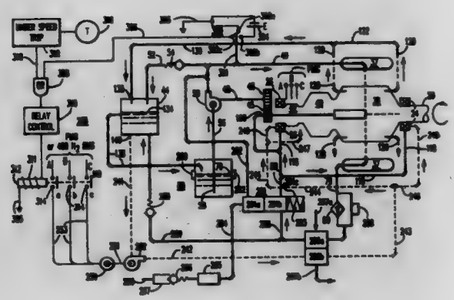
1. A generator system adaptive, auxiliary forced cooling-oil lubrication system, comprising:

a heat exchanger having primary and auxiliary cooling paths;

a primary reservoir compartment and a power generation compartment in fluid communication with said primary reservoir compartment, said primary reservoir compartment being adapted for pressurizing cooling-oil through an oil line to said power generation compartment, said cooling-oil lubricant normally being passed through said primary heat exchanger path to dissipate heat;

a power generation section of said power generation compartment including composite rotor means with a main rotor section and a permanent magnet section between the ends of a rotor shaft, said rotor shaft being supported by bearings and rotationally coupled to stationary means including a synchronously AC rotating main electric field winding section and a magnet generator winding section for producing main and auxiliary electrical power generation output for said power generation section;

first pump means for scavenging the cooling-oil lubricant from said primary reservoir compartment in order to pressurize the cooling-oil lubricant for a forced entry passage to said power generation compartment, with return being to said primary reservoir during normal



operational cooling and lubricating of vital rotational and electrical components of said power generation section, when fluid pressure in the forced entry passage is within an established operational range;

a residual reservoir section of said power generation compartment in a casing adapted to normally cause a primary recirculated fluid passage of the cooling-oil lubricant from said first pump means, with return to said primary reservoir compartment, and to cause a secondary or auxiliary recirculated fluid passage of a reserve portion of cooling-oil lubricant through an auxiliary fluid passage, upon said first pump recirculation pressure failing to achieve a predetermined level;

second pump means adapted for pressurizing the cooling-oil lubricant from an auxiliary exit path from said residual reservoir section for the amount of the reserve quantity of cooling-oil lubricant remaining when the cooling-oil lubricant is no longer being pumped by said first pump means from said primary reservoir compartment;

said second pump means being coupled to said composite rotor means of said power generator section when fluid pressure from said first pump means falls below a predetermined minimum pressure in the input passage of said power generation compartment.

5,196,747

UNIVERSAL ELECTRIC MOTOR

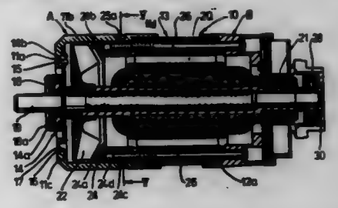
Willy Kress, and Alfred Binder, both of Bisingen, Fed. Rep. of Germany, assignors to Kress-Elektrik GmbH & Co., Elektromotoren Fabrik, Bisingen, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 551,510

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923421

Int. Cl.[5] H02K *5/00*

U.S. Cl. 310—89 25 Claims



1. A universal electric motor for any drive application, comprising:

a rotor rotatably supported along a rotational axis, said rotor having a commutator, and a first end and an axially opposed second end;

a first end shield being pot-shaped and having an end face connected to a cylindrical portion, said cylindrical portion including at least one opening therethrough;

a second end shield being pot-shaped, said first end shield having a first bearing for rotatably supporting said first end of said rotor, said second end shield having a second bearing for rotably supporting said second end of said rotor;

switching means mounted on said second end shield and electrically connected with said rotor for changing direction of rotation of said rotor in operating said motor;

a stator having stator field windings, said stator being axially and concentrically positioned between said end shields;

an air conduction ring, said ring being received concentrically in said first end shield at a position axially between said stator and said first end face;

connection means positioned between said conduction ring and said first end shield, said connection means including at least one radial projection engageable in said at least one opening in said cylindrical portion of said first end shield, said conduction ring and first end shield being fixedly joined together;

means for internally connecting said second end shield directly to said conduction ring one of said stator field windings retained therebetween, said means for internally connecting extending through said stator field winding; and

dimensions of the end shields, rotor, stator field windings and conduction ring producing automatic axial self-alignment of said motor upon assembly, said end shields and stator windings forming an enclosure for said rotor.

5,196,748

LAMINATED MAGNETIC STRUCTURE FOR SUPERCONDUCTING BEARINGS

Thomas K. Rigney, Torrance, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 753,760, Sep. 3, 1991. This application Mar. 5, 1992, Ser. No. 846,647

Int. Cl.[5] H02K *7/09*

U.S. Cl. 310—90.5 21 Claims

1. A laminated structure for superconducting bearings having at least one superconducting member, comprising:

at least two magnet means stacked in opposing polarity, each said magnet means functioning to generate a magnetic field; and

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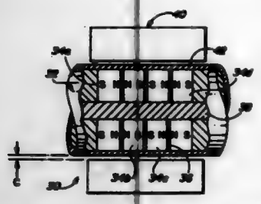
permeance means, disposed between adjacent magnet means, for separating said adjacent magnet means to increase flux density gradient between said adjacent magnet means.

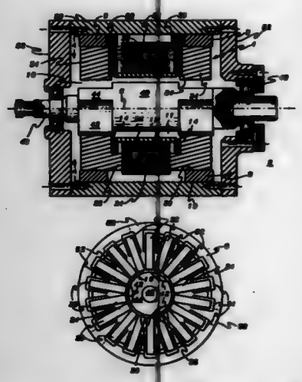


5,196,749

STATOR SUPPORT AND POSITIONING STRUCTURE FOR A DYNAMOELECTRIC MACHINE

Rodolfo Palma, Troy, and John J. Castro, Delanson, both of N.Y., assignors to REM Technologies, Inc., Schenectady, N.Y.

Filed Sep. 23, 1991, Ser. No. 763,632
Int. Cl.[5] H02K 1/06
U.S. Cl. 310—217 25 Claims



1. A support and positioning structure for a stator assembly of an inductor type dynamoelectric machine wherein the stator assembly includes a plurality of stationary C-shaped armature elements circumferentially spaced about a central longitudinal axis and supported by one or more end portions, each C-shaped armature element including an armature winding on a base and a leg extending from each end of said base in a radially inward direction, said support and positioning structure comprising:

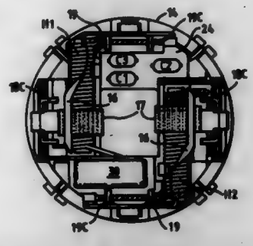
a nonmagnetic thermally conductive ring shaped member sized to be insertable over the bases of the circumferentially spaced C-shaped armature elements wherein said bases are in contact with an inner portion of the ring shaped member to radially position the C-shaped armature elements, and an outer surface of the ring shaped member is in contact with an outer frame of the dynamoelectric machine to transfer heat from the armature elements to said frame.

5,196,750

ELECTRIC MOTORS WITH ELECTROMAGNETIC INTERFERENCE REDUCTION

Georg Strobl, Repulse Bay Garden, Hong Kong, assignor to Johnson Electric S.A., Switzerland

Filed Sep. 27, 1991, Ser. No. 766,114
Claims priority, application United Kingdom, Sep. 28, 1990, 9021108
Int. Cl.[5] H02K 13/00
U.S. Cl. 310—239 9 Claims



1. In an electric motor, the combination comprising:

(a) a plastic brush holder having a compartment and a plurality of openings formed therein;

(b) a circuit board mounted in said compartment;

(c) a suppression circuit mounted on said circuit board and including discrete electrical components, at least some of which have respective wire ends;

(d) first and second power input terminals extending through respective ones of said openings, each of said power input terminals having a wire receiving and gripping slot which automatically receives and grips a respective said wire end when said first and second power terminals are inserted through their respective openings; and

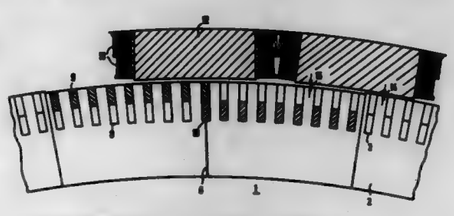
(e) first and second brush mounting plates extending through respective openings formed in said brush holder, each of said brush mounting plates having a wire receiving and gripping slot which automatically receives and grips a respective said wire end when said first and second brush mounting plates are inserted through their respective openings.

5,196,751

LARGE-DIAMETER A.C. MOTOR WITH JOINTS IN THE STATOR

Franz Spirk, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/DE89/00452, § 371 Date Dec. 30, 1991, § 102(e) Date Dec. 30, 1991, PCT Pub. No. WO90/13935, PCT Pub. Date Nov. 15, 1990
PCT Filed Jul. 6, 1989, Ser. No. 768,716
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914731
Int. Cl.[5] H02K 1/12
U.S. Cl. 310—254 7 Claims



1. A large diameter a.c. motor comprising:

a stator including a plurality of stator joints,

a stator coil, divided into a plurality of zones corresponding in number to said plurality of stator joints, each of said zones having closed windings;

a plurality of grooves formed in the stator such that a first plurality of grooves in an area adjacent to, but not exactly on, any one of said joints are each occupied with only one winding side and a second plurality of grooves not exactly on any one of said plurality of stator joints are filled with two layers of winding sides; and

wherein a rotor is disposed adjacent to the stator such that an air gap is formed, said air gap having a plurality of sizes.

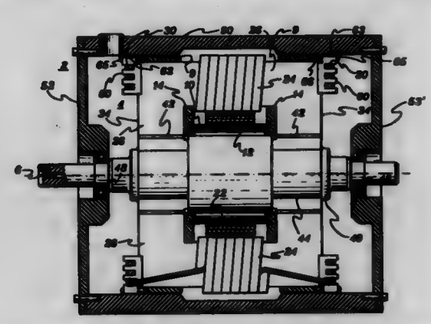
wherein, in an area of the stator having said first plurality of grooves, the air gap has a first size and in an area of the stator having said second plurality of grooves, the air gap has second size, said second size being smaller than said first size.

5,196,752

SYSTEM FOR SUPPORTING CONDUCTORS FOR USE IN A DYNAMOELECTRIC MACHINE

Rodolfo Palma, Troy, N.Y., assignor to REM Technologies, Inc., Schenectady, N.Y.

Filed Oct. 31, 1991, Ser. No. 785,761
Int. Cl.[5] H02K 3/46
U.S. Cl. 310—260 22 Claims



1. A system for supporting conductors which interconnect windings of armature elements, one to another, in a dynamoelectric machine having a stator assembly including a plurality of stationary armature elements spaced along a circumference, the armature elements being positioned radially about a central longitudinal axis, each armature element including an armature winding on a longitudinally extending base portion thereof and a leg extending from each end of said base portion in a radially inward direction, said system comprising:

a spacer for supporting one or more electrical conductors and for insulating said one or more electrical conductors from one of said armature elements, said spacer being mountable on said armature element; and

an electrical conductor adapted to be supported by said spacer, said electrical conductor extending between a pair of said armature elements and electrically interconnecting said armature windings of said pair, one to another.

5,196,753

SURFACE ACOUSTIC WAVE DEVICES HAVING LONG-TERM FREQUENCY STABILITY

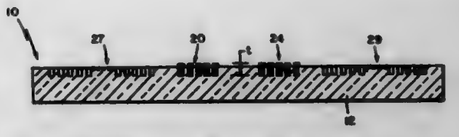
James A. Greer, Andover, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 566,750, Aug. 13, 1990, abandoned.
This application Oct. 25, 1991, Ser. No. 783,720
Claims priority, application Japan, Jul. 31, 1989, 1-198648
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—313 B 3 Claims

1. A surface acoustic wave device comprising:

a quartz substrate having a surface which supports surface acoustic wave propagation, said surface having grooves disposed therein; and

at least one transducer having conductive members disposed in said grooves in said surface with said conductive members having thicknesses between approximately 1.5% and 2.0% of the acoustic wavelength at the center frequency of the device.

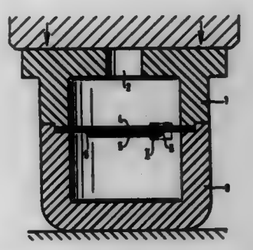


5,196,754

PIEZOELECTRIC TONE GENERATOR AND A PROCESS FOR PRODUCING IT

Heinrich Berthold, Erlangen; Thomas Uhl, Selb; Kurt Handschuh, Eckental, and Georg Wiesend, Heufenfeld, all of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany

Filed May 10, 1991, Ser. No. 697,996
Claims priority, application Fed. Rep. of Germany, May 12, 1990, 4015253
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—324 20 Claims



1. A process for producing a tone generator comprising the steps of:

a) forming a layer of filler-free bonding agent having a dynamic viscosity of between 800 and 18,000 mPa-s between a metallized carrier plate and a metallized ceramic wafer,

b) pressing together the carrier plate, bonding layer, and ceramic wafer,

c) curing the bonding layer catalytically or thermally, and

d) curing the bonding layer by UV irradiation,

wherein the quantity of bonding layer applied in step a) is chosen so that during step b) a bead covering the edge of the ceramic wafer is formed.

5,196,755

PIEZOELECTRIC PANEL SPEAKER

F. Douglas Shields, Rte. 6, Box 246, Oxford, Miss. 38655

Filed Apr. 27, 1992, Ser. No. 873,777
Int. Cl.[5] H01L 41/08
U.S. Cl. 310—324 10 Claims

1. An acoustic transducer device, comprising:

an array of piezoelectric driver elements, each of said piezoelectric driver elements including a support member, a pair of conductive plates loosely bonded to said support member to form a space between the plates, and a pair of piezoelectric layers on at least one surface of each of said pair of plates;

means for electrically connecting said piezoelectric driver elements to a varying electrical signal source for causing

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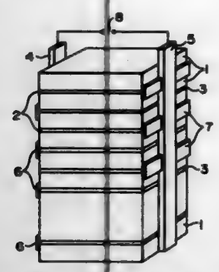
said piezoelectric layers to expand and contract, causing said plates to vibrate with a transflexural motion at a frequency of expansion and contraction of said layers; and

means including a panel made of a flexible material in which said piezoelectric driver elements and connecting means are potted.

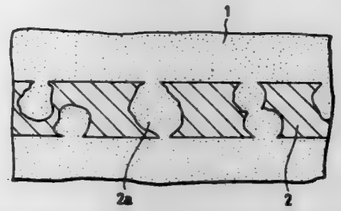
5,196,756
STACK-TYPE PIEZOELECTRIC ELEMENT, PROCESS FOR PRODUCING THE SAME, AND STACK-TYPE PIEZOELECTRIC DEVICE
Akiomi Kohno; Masatugu Arai, both of Ibaraki, and Takeshi Harada, Toride, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan
Continuation of Ser. No. 377,172, Jul. 10, 1989, abandoned. This application Aug. 29, 1990, Ser. No. 574,373
Claims priority, application Japan, Jul. 15, 1988, 63-175050
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 12 Claims



1. A stack-type piezoelectric element constructed of a stacked body comprising plural layers of sintered piezoelectric ceramic material and electrodes which lie between and bond by diffusion the respective layers of the piezoelectric ceramic material, wherein said respective electrodes each comprises an aluminum core between a pair of aluminum alloy skins, and wherein said aluminum alloy is capable of diffusion-bonding with said ceramic material at a temperature lower than the sintering temperature of the piezoelectric ceramic material.

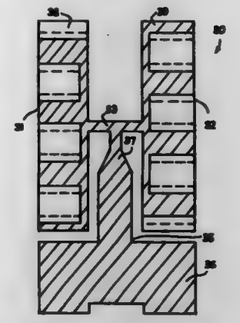
5,196,757
MULTILAYER PIEZOELECTRIC CERAMIC ACTUATOR
Kenichi Onuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 30, 1992, Ser. No. 859,988
Claims priority, application Japan, Mar. 28, 1991, 3-064235
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—358 21 Claims

1. A piezoelectric ceramic actuator comprising:
a laminated body including a plurality of piezoelectric ceramic layers, and a plurality of internal electrodes, alternately laminated with the plurality of ceramic layers,
wherein each of the plurality of internal electrodes is formed from a film containing a electroconductive material containing metals and a ceramic powder and the ceramic powder including particles having an average particle size ranging from one-third to one times a thickness of each of the respective internal electrodes, the particles of the ceramic powder causing adjacent layers of the plurality of piezoelectric ceramic layers to be cross-linked through



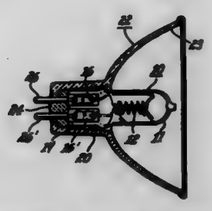
and bonded to at least one of the plurality of internal electrodes.

5,196,758
HIGH FREQUENCY PIEZOELECTRIC RESONATOR
Jean Hermann, Neuchatel, Switzerland, assignor to Centre Suisse D'Electronique et de Microtechnique S.A., Switzerland
Filed Mar. 8, 1991, Ser. No. 666,641
Claims priority, application Switzerland, Mar. 8, 1990, 00738/90
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—361 2 Claims



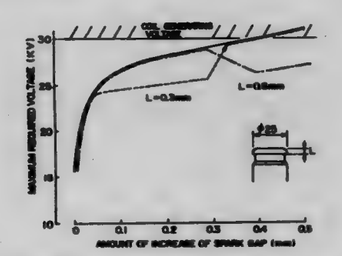
1. A piezoelectric resonator, comprising:
two rectangular parallelepipedal slices comprising N and M base structures, respectively, wherein N and M are integers, said two rectangular parallelepipedal slices each comprising at least one base structure shaped as a thin crystal slice of piezoelectric material in the form of a rectangular parallelepiped having a width w directed along an electrical axis X of the crystal slice, a length 1 directed along an axis Y' of the crystal slice, and a thickness t directed along an axis Z' of the crystal slice, said axes Y' and Z' forming with a mechanical Y and optical Z axes of the crystal slice, respectively, an angle ϕ equal to 24°24'±3°, and a ratio w/l of said width to said length is equal to N(0.64±0.03) or M(0.64±0.03);
a non-resonant arm connecting said two rectangular parallelepipedal slices in juxtaposition in a single plane;
an embedding zone connected to said arm through a connection zone to fix said resonator outside a center thereof; and
a plurality of electrodes disposed on opposite surfaces of said two rectangular parallelepipedal slices, said electrodes being polarized to excite preferentially the Nth harmonic of a fundamental contour vibration mode in each said base structure and to produce respective extension modes in said two rectangular parallelepipedal slices in a direction perpendicular to an axis of said non-resonant arm.

5,196,759
HIGH TEMPERATURE LAMPS HAVING UV ABSORBING QUARTZ ENVELOPE
Thomas G. Parham, Gates Mills, Ohio; Robert L. Bateman, Jr., Kitty Hawk, N.C.; Gary R. Allen, and Paul G. Mathews, both of Chesterland, Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed Feb. 28, 1992, Ser. No. 843,660
Int. Cl.[5] H01K *1/32*; H01J *61/30*
U.S. Cl. 313—112 15 Claims



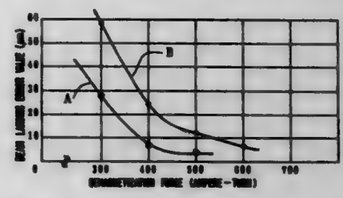
1. A lamp comprising a light source which emits both UV and visible light radiation surrounded by a UV-absorbing and visible light transmissive fused quartz envelope codoped with both titanium dioxide and cerium oxide to absorb at least a portion of said UV radiation, with said envelope being at a temperature above 500° C. during operation of said lamp.

5,196,760
SPARK PLUG FOR INTERNAL COMBUSTION ENGINE WITH PILLAR SHAPED ELECTRODE
Kozo Takasuura, Nagoya, and Kiyoaki Tanaka, Numazu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Dec. 26, 1990, Ser. No. 634,241
Claims priority, application Japan, Dec. 27, 1989, 1-343736
Int. Cl.[5] H01T *13/20*
U.S. Cl. 313—142 11 Claims



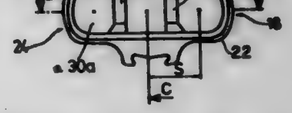
1. A spark plug for an internal combustion engine, comprising:
a central electrode; and
an earth electrode disposed opposite to said central electrode on a longitudinal axis of said central electrode so as to form an unobstructed spark gap between said central electrode and said earth electrode;
wherein said central electrode is solid and includes a pillar-like portion provided at a discharge side thereof disposed close to said spark-gap, said pillar-like portion having a predetermined thickness corresponding to an intended lifetime of said spark plug;
wherein said central electrode also includes a smaller-diameter portion disposed adjacent to a non-discharge side of said pillar-like portion, said smaller-diameter portion having a smaller diameter portion than said pillar-like portion,
wherein said pillar-like portion and said smaller-portion are interconnected in a step-like manner by a stepped portion; and
wherein discharge is confined to the area between said stepped portion and an end face of the central electrode and said earth electrode.

5,196,761
COLOR CATHODE-RAY TUBE
Kazuo Majima, and Tohru Sano, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 14, 1991, Ser. No. 669,577
Claims priority, application Japan, Mar. 14, 1990, 2-60970
Int. Cl.[5] H01J *29/81*
U.S. Cl. 313—402 6 Claims



1. A shadow mask system color cathode-ray tube, comprising a shadow mask having a shadow mask frame and an internal magnetic shield, which are exposed to a magnetic field which is applied in an area including said shadow mask and said internal magnetic shield, wherein the coercive force of each of said shadow mask frame and said internal magnetic shield is smaller than 90 A/m at an applied magnetic field of 800 A/m.

5,196,762
ELECTRON GUN FOR COLOR PICTURE CATHODE-RAY TUBE WITH HEXAGONAL CROSS-SECTION
Nam J. Go, Gumi, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Continuation of Ser. No. 459,295, Dec. 29, 1989, abandoned. This application Mar. 9, 1992, Ser. No. 845,801
Claims priority, application Rep. of Korea, Dec. 30, 1988, 7874/88
Int. Cl.[5] H01J *29/62*
U.S. Cl. 313—414 2 Claims



1. An electron gun for a color picture cathode-ray tube, which comprises:
an electron beam formative region for emitting three electron beams, said electron beam formative region including cathode emitting electrons fixed on a cathode support wherein the electrons are emitted from a heater located in the cathode, and a first grid electrode and a second grid electrode for controlling the amount of actuate function of said electrons, and
an electrostatic focusing lens for focusing said three electron beams, said electrostatic focusing lens including a first accelerating, focusing electrode and a second accelerating, focusing electrode for reducing the spherical aberration and the magnification of the said electrostatic focusing lens, said first accelerating, focusing electrode and said second accelerating, focusing electrode having their open-

ings facing each other and containing a rim extended from an outer wall and having an oblong hole, a slanting enlarging aperture electrode located in said outer wall, said slanting enlarging aperture electrode having a longitudinally oblong center hole of a longitudinal cross section larger than a lateral cross section, two longitudinally elongated semi-hexagonal outer end portions of the longitudinal cross section being larger than the lateral cross section of said semi-hexagonal outer end portions, two electrode connecting portions in parallel to said outer wall, and two side slant portions narrowing down to a bottom portion extended from two head portions and said two electrode connecting portions, whereby a laterally oblong hole is formed by said rim and three longitudinally oblong holes, and said electron beam formative region and said electrostatic focusing lens are fixed on the head glass, respectively.

5,196,763

MIXED GREEN LIGHT-EMITTING PHOSPHOR, AND A CATHODE RAY TUBE USING THIS PHOSPHOR

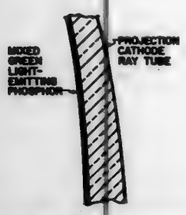
Joon-Mo Yang, Suwon; Min-Soo Kim, Seoul, and Woo-Chan Kim, Suwon, all of Rep. of Korea, assignors to Samsung Electron Devices Co., Ltd., Hwasung-Kun, Rep. of Korea

Filed May 10, 1991, Ser. No. 697,967

Claims priority, application Rep. of Korea, May 11, 1990, 90-6751

Int. Cl.[5] H01J *29/20*

U.S. Cl. 313—468 5 Claims



1. A mixed green light-emitting phosphor for a projection cathode ray tube, consisting of:

a mixture having a predetermined weight ratio of:

(a) LaOCl phosphor activated with Tb; and

(b) at least two phosphors selected from the group consisting of:

(i) $Y_3(Al,Ga)_5O_{12}$ activated with Tb,

(i) $Y_3(Al,Ga)_5O_{12}$ activated with Tb,

(ii) Zn_2SiO_4 activated with Mn, and

(iii) $InBO_3$ activated with Tb.

5,196,764

CATHODE RAY TUBE HAVING SYMMETRICAL ANODE POTENTIAL

Dukryong Kim, Incheon, and Kyungwon Kim, Suwon, both of Rep. of Korea, assignors to Samsung Electron Devices Co., Ltd., Kyunggi-do, Rep. of Korea

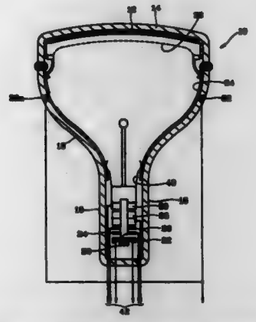
Filed Jul. 8, 1991, Ser. No. 726,955

Claims priority, application Rep. of Korea, Dec. 27, 1990, 90-22558

Int. Cl.[5] H01J *29/88, 29/92*

U.S. Cl. 313—477 HC 4 Claims

1. A CRT having a faceplate panel whose inner surface comprises a fluorescent material, a neck positioned opposite to the panel, a funnel having an interior portion and forming a bulb by connecting integrally the faceplate panel with the neck, and an electron gun mounted in the neck, wherein the funnel has a conductive coating on its interior portion to form an electrical path for supplying anode voltage to its inner portion, and the CRT further comprises a pair of anode buttons fixed in a symmetrical position with respect to each other on a periphery of the funnel, to thereby contact the conductive



coating through the funnel, and means for commonly electrically connecting the anode buttons.

5,196,765

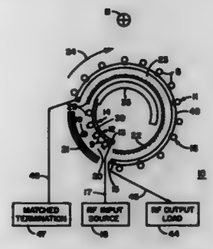
HIGH RF ISOLATION CROSSED-FIELD AMPLIFIER

George H. MacMaster, Lexington, and Lawrence J. Nichols, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1988, Ser. No. 220,659

Int. Cl.[5] H01J *25/34*

U.S. Cl. 315—39.3 32 Claims



1. A cathode-driven crossed-field amplifier (CDCFA) tube comprising:

a cathode slow-wave RF-field producing circuit and an anode slow-wave RF-field producing circuit;

said cathode and anode RF-field producing circuits having their respective RF fields substantially directly uncoupled;

said cathode having an input adapted to receive an RF signal voltage; and

said anode having an output adapted to provide an amplified said RF signal voltage to a load.

5,196,766

DISCHARGE CIRCUIT FOR FLASH LAMPS INCLUDING A NON-REACTIVE CURRENT SHUNT

William C. Beggs, 4110 Shawnee La., NE., Atlanta, Ga. 30319

Filed Sep. 4, 1991, Ser. No. 754,834

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—241 R 5 Claims

1. A discharge circuit comprising

a flashlamp,

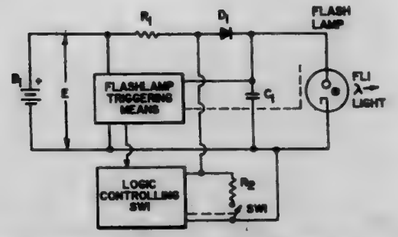
a triggering means for making the gas in the flashlamp conductive,

an energy storage means for discharging stored energy into the flashlamp when the flashlamp is triggered,

an electrical power source, and

a recharge circuit associated with the electrical power source including,

a first impedance means to restrict the flow of energy from the electrical power source into the energy storage means, and



a switch means for shunting recharge energy through a non-reactive means around the energy storage means so that the rate of recharging of the energy storage means is reduced at the beginning of recharging below that rate which would allow the flashlamp to conduct before intentional triggering.

5,196,767

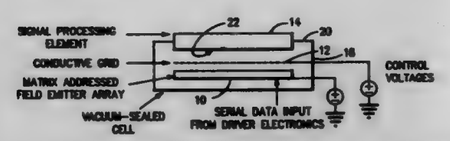
SPATIAL LIGHT MODULATOR ASSEMBLY

Francis L. Leard, Sudbury; Todd N. Tsakiris, and Cardinal Warde, both of Newtonville, all of Mass., assignors to Optron Systems, Inc., Bedford, Mass.

Filed Jan. 4, 1991, Ser. No. 638,317

Int. Cl.[5] G02F *1/13*

U.S. Cl. 315—349 21 Claims



1. A two-dimensional light modulator comprising a vacuum cell comprising an output port having a two-dimensional signal processing element mounted in said output port;

a field emitter array for supplying a controlled electron emission located within said vacuum cell and spaced from said signal processing element; and

a conductive grid for providing a controlled voltage located within said vacuum cell between and spaced from said field emitter array and said signal processing element.

5,196,768

COLOR DISPLAY TUBE SYSTEM

Albertus A. S. Sluyterman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1992, Ser. No. 859,198

Claims priority, application European Pat. Off., Apr. 4, 1991, 91200783

Int. Cl.[5] G09G *1/28;* H01F *7/00;* H01J *29/50*

U.S. Cl. 315—368.28 5 Claims

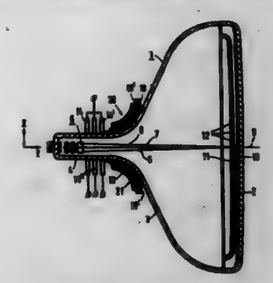
1. A colour display tube system comprising

a) an evacuated envelope having a neck, a cone and a display window,

b) an electron gun in the neck, which gun has a beam-forming part for generating a central electron beam and two outer electron beams whose axes are co-planar, and a first and a second electrode system which in operation jointly constitute a main lens, and

c) a deflection unit for generating deflection fields for deflecting the electron beams in the horizontal and vertical directions and for scanning the display window by means of convergent beams,

characterized in that three consecutive elements influencing convergence are arranged between the beam-forming part of



the electron gun and the side of the deflection unit facing the display window, the two outer elements producing, in operation, opposite effects and the central element being energizable for correcting remaining convergence errors.

5,196,769

MOTOR CONTROL DEVICE

Hiroshi Chiba, 248-1 Henge, Mimomi-cho, Narashino-shi; Satoshi Miura, 13-4 Miyagidai 2-chome, Funabashi-shi; Motonobu Hattori, 26-19 Mitsuwadai 3-chome, Chiba-shi, and Takashi Obata, 248-1 Henge, Mimomi-cho, Narashino, all of Chiba, Japan

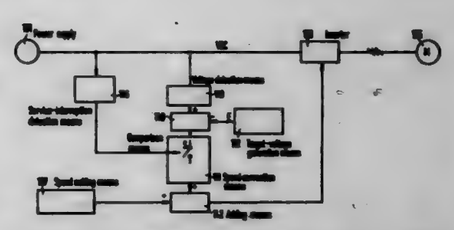
PCT No. PCT/JP90/00744, § 371 Date Dec. 9, 1991, § 102(e) Date Dec. 9, 1991, PCT Pub. No. WO90/15474, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 7, 1990, Ser. No. 776,292

Claims priority, application Japan, Jun. 9, 1989, 1-145161

Int. Cl.[5] H02P *7/74;* D01H *1/244, 1/26*

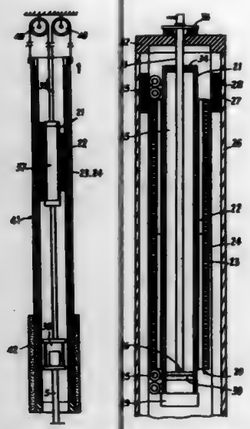
U.S. Cl. 318—39 9 Claims



1. A motor control device comprising: an inverter whose DC side being connected to a power supply and to whose AC side being connected at least one motor; a speed setting means for giving a speed instruction to said inverter; a voltage detection means for detecting voltages on the DC side of said inverter; a target voltage generation means for generating a target voltage on the DC side of said inverter; a comparison means for comparing a voltage detected by said voltage detection means with the target voltage and for outputting a deviation voltage; a speed correction means for generating a speed correction signal changing continuously in connection with the output of said comparison means; and an adding means for adding the output of said speed correction means to the output of said speed setting means, wherein said speed correction means is provided with a proportional integration and differentiation element and generates said speed correction signal in connection with a deviation voltage by the proportional integration and differentiation operation and changes continuously the output of said speed setting means, and said motor is decelerated continuously keeping the voltage on the DC side of said

inverter at the target voltage is a regenerative operation time of said motor.

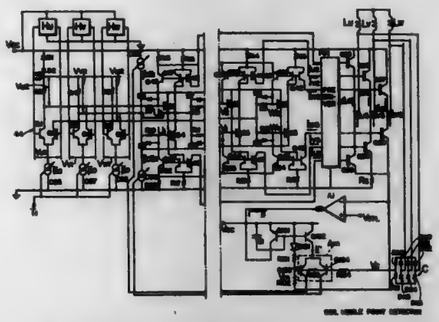
5,196,770
VERTICALLY RECIPROCATING CONSTANT POWER DRIVE UNIT FOR RAISING A LOAD STEP BY STEP
Paul Champa, Nantes; Joël Chardonnesse, Orvault; Jean-Louis Mange, Villejuif, and Jean-Bernard Ayasse, Chevilly-Larue, all of France, assignors to Marine and Petroleum Equipment, Nantes, France
PCT No. PCT/FR89/00626, § 371 Date Jun. 10, 1991, § 102(e) Date Jun. 10, 1991, PCT Pub. No. WO90/07215, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 1, 1989, Ser. No. 679,070
Claims priority, application France, Dec. 12, 1988, 88 16313
Int. Cl.[5] F04B *13/04*; H02K *41/02*
U.S. Cl. 318—135 9 Claims



1. A vertically reciprocating power drive unit for raising a load step by step by means of a load support for supporting the load, the drive unit comprising a linear electric motor having a field inductor and an armature which are constituted by two coaxial cylindrical parts, one of which cylindrical parts is coupled to a top end of the support and is movable relative to a stationary structure, and a balancing device exerting a force on moving equipment constituted by the support and the cylindrical part of the motor which is coupled to the support, which force is equal and opposite to the sum of the weight of the moving equipment plus one-half of the weight (H/2) of the load such that the power required by the drive unit is substantially constant.

5,196,771
BRUSHLESS MOTOR DRIVE CIRCUIT
Hayato Naito, Komagane, Japan, assignor to Sankyo Seiki Mfg. Co., Ltd., Nagano, Japan
Filed Jan. 16, 1992, Ser. No. 821,797
Claims priority, application Japan, Jan. 21, 1991, 3-20542
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 6 Claims

1. A brushless motor drive circuit comprising:
- a stator having drive coils for m-phases;
- a rotor having a plurality of poles and urged to rotate by the stator;
- position detecting means for detecting the rotary position of the rotor relative to the stator and for generating an m-phase sine wave-like output signal representing the rotary position of the rotor;
- a signal synthesizing circuit for modifying the output signal of said position detecting means to a substantially rectangular pulse-like signal by logarithmically compressing the output signal to make it flat and synthesizing an m-phase soft switching signal from said pulse-like signal;
- a plurality of groups of transistors for switching the electric current supplied to said drive coils by the output signal of said signal synthesizing circuit;
- current control means for controlling the rate of electric current supplied to said drive coils by controlling said plurality of groups of transistors;
- a rate of electric current detecting resistor connected so as to negatively feed back said current control means; means

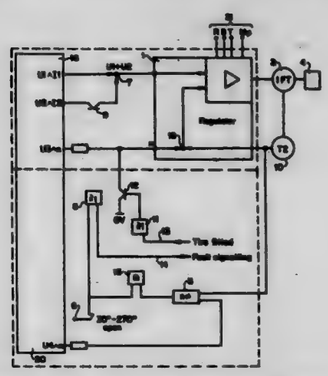


for supplying a reactive current to said rate of electric current detecting resistor during a period when said drive coils are not to be energized;
- interrupting means for interrupting said reactive current during a period when said drive coils are to be energized;
- coils middle point detecting means for detecting the voltage applied to the middle point of said m-phase drive coils; and
- coils middle point feedback means for feeding back changes in the output of said coils middle point detecting means to said plurality of groups of transistors.

5,196,772
APPARATUS FOR FITTING TIRES ON WHEELS
Heinz Kupka, Sulzbach, and Heinz Rouge, Mühltal, both of Fed. Rep. of Germany, assignors to Hofmann Maschinenbau GmbH, Pfungstadt, Fed. Rep. of Germany
Filed Aug. 27, 1991, Ser. No. 750,317
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1990, 4028080
Int. Cl.[5] B60C *25/05*
U.S. Cl. 318—434 9 Claims

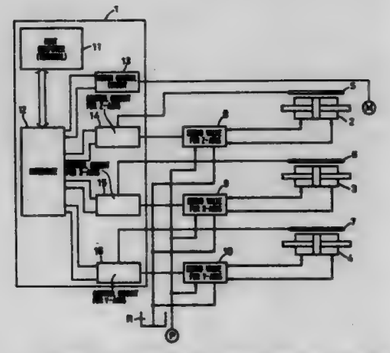
1. Apparatus for fitting a tire on a wheel comprising:
- a tool member rotatably mounted about an axis and being spaced therefrom;
- A drive motor for rotating the tool member about the axis;
- means for supplying current to the drive motor;
- means for controlling current so as to provide a first control current to the drive motor;
- means for regulating torque of the drive motor, a regulating parameter being supplied as a reference torque to the regulating means; and
- means for limiting torque of the drive motor being operatively connected to (1) the torque regulating means such that when a torque threshold is exceeded the regulating parameter is set to zero, and (2) the current controlling

means such that when the torque threshold is exceeded an additional control current is passed to the first control



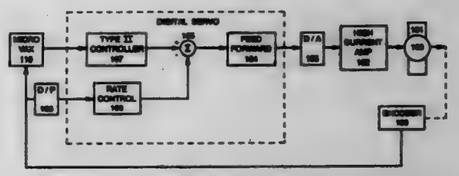
current to cause a braking current to be supplied to the drive motor so as to stop rotation thereof.

5,196,773
CONTROLLER FOR RIVETTING MACHINE
Seiichi Yoshikawa, Higashiosaka; Minoru Yamada, Osaka; Shuichi Nakagawa, Saita, and Kazuo Kobayashi, Katano, all of Japan, assignors to Yoshikawa Iron Works Ltd., Osaka, Japan
Filed Mar. 5, 1991, Ser. No. 665,217
Int. Cl.[5] H02P *7/00*
U.S. Cl. 318—561 10 Claims



1. A controller of a rivetting machine having a hydraulic cylinder, and a motor and a hydraulic power source connected to said hydraulic cylinder, the cylinder including a piston shaft, a spindle extending through and journaled to said piston shaft and driven by said motor, a rivet head forming tool secured to the bottom end of said spindle, and a forming shaft supported by said rivet head forming tool, whereby said spindle is lowerable by said hydraulic cylinder to cause abutting contact between the bottom end face of said forming shaft and the top end face of a work rivet and at the same time said spindle is rotatable by said motor to form a rivet head on the work rivet with said forming shaft, said controller comprising:
- a linear encoder in operative association with said piston shaft so as to detect the axial position of said piston shaft;
- an electric/hydraulic servo valve provided in a hydraulic circuit between said hydraulic power source and said hydraulic cylinder so as to control the flow of hydraulic fluid to and from said hydraulic cylinder, said hydraulic circuit including a hydraulic line extending to said hydraulic cylinder;
- an electromagnetic pressure control valve operatively hydraulically connected in said hydraulic line so as to control the pressure of hydraulic fluid flowing therethrough to said cylinder;
- a control unit programmable to receive machining data for rivets to be worked by the rivetting machine, said control unit being operatively connected to said linear encoder so as to receive the output of said linear encoder, said control unit being operatively connected to hydraulic cylinder via said electric/hydraulic servo valve so as to control said hydraulic cylinder by controlling the position of said electric/hydraulic servo valve based on the machining data and the output of said linear encoder, and said control unit being operatively connected to said electromagnetic pressure control valve so as to control said electromagnetic pressure control valve to regulate the pressure of hydraulic fluid flowing through said hydraulic line to be no higher than a predetermined pressure established by the machining data for a rivet to be worked.

5,196,774
DIGITAL SERVO SYSTEM
Mark G. Baciak, West Melbourne; Christina Padgett, Indialantic, both of Fla., and Craig A. Beer, Colorado Springs, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 22, 1991, Ser. No. 733,493
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—569 10 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 10 Pages)



1. A digital servomechanism and control system, for controlling the pointing of a mechanical structure, said digital servomechanism and control system comprising:
- a rotary gimbal which is fixed to said mechanical structure and which may be driven in response to a stream of digital data signals to point the mechanical structure;
- an electric motor which is mechanically interconnected with said rotary gimbal to drive it in response to an amount of electric current which the electric motor receives;
- a means for generating said stream of digital data signals;
- a digital-to-analog converter unit which receives and converts digital control signals into analog electric control signals;
- a high current amplifier which is electrically connected between said digital-to-analog converter and said electric motor in order to supply said electric current to said electric motor in amounts governed by said stream of digital data signals, said high current amplifier producing said electric current for said electric motor by amplifying said analog electric control signals;
- a summing junction which produces said digital control signals by subtracting a digital rate error signal from a digital engine velocity signal, said digital engine velocity signal representing an ideal value of engine velocity said electric motor must achieve to cause said mechanical structure to be pointed as desired, said rate error signal being a measurement of an amount of engine velocity said electric motor would be operating above its operable limit if said ideal value of engine velocity were implemented;

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a means for measuring said rate error signal which is electrically connected between said electric motor and said summing junction;

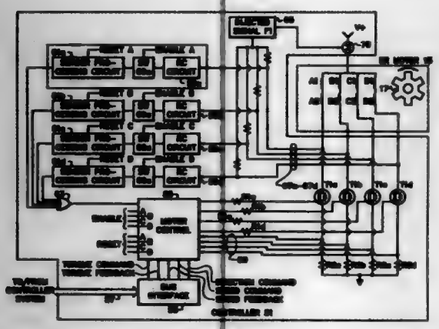
and a means for processing said stream of digital data signals from said generating means into said digital engine velocity signal for said summing junction, wherein said processing means comprises an integrator circuit which is electrically connected between said summing junction and said generating means, said integrator circuit producing said digital engine velocity signal by integrating said stream of digital data signals.

5,196,775

SWITCHED RELUCTANCE MOTOR POSITION BY RESONANT SIGNAL INJECTION

William A. Harris, Coon Rapids; Jay R. Goetz, Minnetonka, and Kevin J. Stainberg, White Bear Lake, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 20, 1991, Ser. No. 658,482
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—638 27 Claims



1. For a brushless commutated motor having a plurality of poles on a rotor and a plurality of phase windings on a stator, a system for controlling a switching frequency F_s of the power signal applied to each phase winding, the system comprising:

at least one tank circuit comprising capacitive, resistive and inductive elements, wherein one of the phase windings of the motor is the inductive element;

a switch in series connection with the phase winding and in parallel connection with the capacitive and resistive elements of the tank circuit, the switch being responsive to a drive signal for providing the power signal to the phase winding at a switching frequency F_s;

means for injecting into an input of the tank circuit a low-energy signal having a frequency F_1 that is substantially greater than the switching frequency F_s of the power signal;

a detector responsive to an output of the tank circuit for monitoring the low-energy signal and detecting an event resulting from a change in the value of the inductance of the phase winding caused by a change in the relative position of the stator and rotor and generating a signal indicative thereof; and

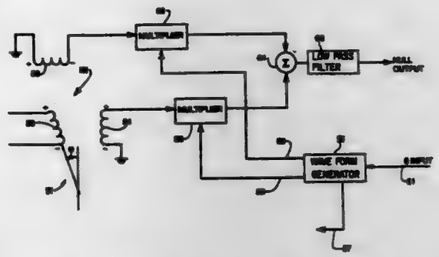
a motor controller responsive to the signal from the detector for adjusting the timing of the drive signal in order to maintain a predetermined relationship between the signal from the detector and the power signal.

5,196,776

WAVEFORM GENERATOR FOR A RESOLVER

Marcus M. Shipley, Palo Alto, Calif., assignor to Space Systems/Loral, Inc., Palo Alto, Calif.

Continuation of Ser. No. 404,167, Sep. 6, 1989, abandoned. This application Apr. 9, 1991, Ser. No. 683,084
Int. Cl.[5] H03K *13/00*
U.S. Cl. 318—660 3 Claims



1. A waveform generator for a resolver comprising:

means for forming a first bi-state electrical input signal approximating a first sinusoidal waveform having a first phase;

means for forming a second bi-state electrical input signal approximating a second sinusoidal waveform having generally the same frequency as said first sinusoidal waveform and a second phase having a first phase relationship with said first phase that is proportional to a first value of an input variable;

means for summing said first and second bi-state electrical signals while said first phase relationship therebetween is maintained, thereby to generate a first 3-level electrical output signal representative of a third sinusoidal waveform having a maximum amplitude proportional to a sine of said variable;

means for forming a third bi-state electrical input signal approximating a fourth sinusoidal waveform having a third phase;

means for forming a fourth bi-state electrical input signal approximating a fifth sinusoidal waveform having generally the same frequency as said fourth sinusoidal waveform and a fourth phase having a second phase relationship with said third phase proportional to a second value of said variable; and

means for summing said third and fourth bi-state electrical signals while said second phase relationship therebetween is maintained, thereby to generate a second 3-level electrical output signal representative of a sixth sinusoidal waveform having a maximum amplitude proportional to a cosine of said variable.

5,196,777

STEPPING MOTOR DRIVE CONTROL SYSTEM

Junnosuke Katsuka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,867
Claims priority, application Japan, Feb. 13, 1990, 2-31725
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 6 Claims

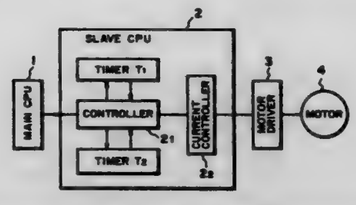
1. A stepping motor drive control system for facsimile systems, comprising:

a stepping motor for transporting sheets, the stepping motor being driven one step angle with every step drive command;

a motor driver for driving said stepping motor;

first control means for generating step drive commands upon starting a facsimile communication, said first control means generating a certain step drive command and a next step drive command at irregular intervals; and

second control means for effecting control of current to said motor driver by receiving a step drive command from said first control means, said second control means determining, upon receiving the next drive command, if the time from reception of the certain step drive command to the next step drive command is within an inhibited time period or a reception time period, and when said second control means determines that the time is within the reception time period, said second control means receives the next step drive command and effects control of the current to said motor driver, wherein the reception time period in which said second control means receives a step drive command and the inhibited time period in which said second control means is inhibited from receiving a step drive command, are determined depending on the response characteristics of the stepping motor for one step drive command.

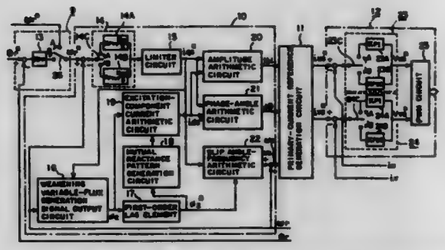


5,196,778

CONTROL APPARATUS SUITABLE FOR USE IN INDUCTION MOTOR

Takahiro Hayashida, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 524,106, May 16, 1990. This application Dec. 9, 1991, Ser. No. 804,476
Claims priority, application Japan, Jun. 23, 1989, 1-162067
Int. Cl.[5] H02P *7/26*
U.S. Cl. 318—807 4 Claims



1. A control apparatus suitable for use in an induction motor in a machine tool drive, which includes a current loop for performing feedback control of the primary current of the induction motor, a velocity loop for performing feedback control of the rotational speed of said induction motor and a position loop for performing a feedback control of the rotational position of said induction motor, said apparatus being adapted to select either one of a rotational-speed control mode and a rotational-position control mode and being adapted to control said primary current of said induction motor in accordance with said selected mode of either said rotational-speed control mode or said rotational-position control mode, said control apparatus comprising:

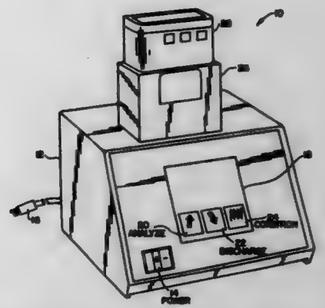
a gain control change-over means for changing the value of the loop gain of at least one of said current loop and said velocity loop in said rotational-position control mode to a predetermined value of said loop gain greater than the value of said loop gain in said rotational-speed control mode.

5,196,779

BATTERY MAINTENANCE SYSTEM

Richard B. Alexandres, Clear Lake, and Dennis P. Kindschuh, Mason City, both of Iowa, assignors to Alexander Manufacturing Company, Mason City, Iowa

Filed Nov. 16, 1989, Ser. No. 437,094
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—14 23 Claims



1. A method of determining the need for charging a nickel cadmium battery, comprising:

a. sensing the battery voltage of said battery;

b. when said sensed battery voltage is greater than or equal to a first predetermined voltage and less than or equal to a second larger predetermined voltage, setting a timer out to a first short time and analyzing whether said battery voltage is diminishing; and,

c. When said analysis reveals that said battery voltage is not diminishing, saving said battery voltage, setting a drop delay to a second longer time and charging said battery.

5. A method of determining whether to discharge a nickel cadmium battery, comprising:

a. sensing the voltage per cell of said battery;

b. when said sensed voltage per cell is greater than or equal a first predetermined voltage and less than or equal to a second predetermined voltage, setting a timer out to a first short time and analyzing whether said voltage per cell is less than one volt; and,

c. when said analysis reveals that said voltage per cell is not less than one volt, discharging said battery.

11. A method of conditioning a nickel cadmium battery comprising:

a. sensing the battery voltage of said battery;

b. when said sensed battery voltage is greater than or equal to a first predetermined voltage and less than or equal to a second predetermined voltage, setting a timer out to a first short time and analyzing whether said battery voltage is diminishing;

c. when said analysis reveals that said battery voltage is not diminishing, saving said battery voltage, setting a drop delay to a second longer time and charging said battery;

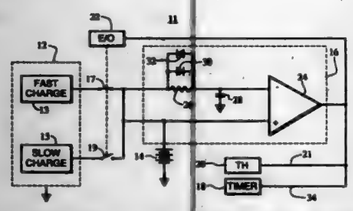
d. sensing the voltage per cell of said battery;

e. when said sensed voltage per cell is greater than or equal to a third predetermined voltage and less than or equal to a fourth predetermined voltage, setting a timer out to the first time and analyzing whether said voltage per cell is less than a fifth predetermined voltage;

f. when said analysis reveals that said voltage per cell is not less than the fifth predetermined voltage, discharging said battery; and,

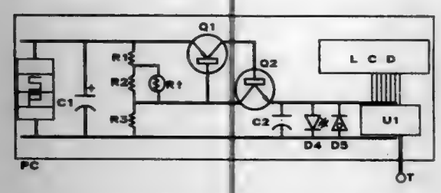
g. recharging said battery by repeating steps a–c.

5,196,780
NI-CAD BATTERY CHARGER CIRCUIT
David R. Pacholok, 1815 W. Higgins, Sleepy Hollow, Ill.
Filed Sep. 10, 1991, Ser. No. 757,237
Int. Cl.[5] H02J 7/04
U.S. Cl. 320—40 15 Claims



1. A battery charger having a fast charging current circuit and a slow charging current circuit comprising:
means for coupling the fast charging current circuit to a battery to provide a voltage developed across the battery and to a resistor/capacitor time constant circuit for storing a voltage in the capacitor of the time constant circuit such that the capacitor voltage tries to catch up with the battery voltage;
means for comparing the instantaneous voltage developed across the battery in response to the fast charging current with the instantaneous voltage stored by the capacitor; and
means for removing the fast charging current circuit from, and coupling the slow charging current circuit to, the battery when the voltage stored by the capacitor exceeds the battery voltage developed by the fast charging current.

5,196,781
METHOD AND APPARATUS FOR POWER CONTROL OF SOLAR POWERED DISPLAY DEVICES
Robert S. Jamieson, Aurora, Colo., and John Weiss, Amityville, N.Y., assignors to Weiss Instruments, Inc., West Babylon, N.Y.
Continuation-in-part of Ser. No. 583,853, Sep. 14, 1990, abandoned. This application Feb. 12, 1991, Ser. No. 655,217
Int. Cl.[5] H02J 7/00; G05F 1/67, 1/56
U.S. Cl. 320—61 71 Claims

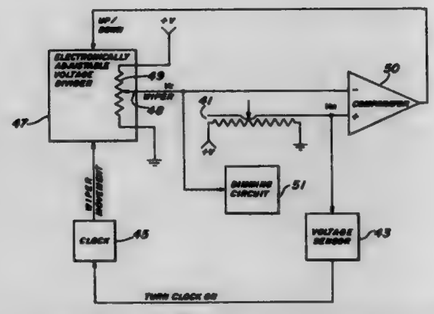


1. A lower power latch circuit for connecting and disconnecting a source of d.c. electric power to and from a load, said source and said load each having first and second means for connections of opposite electric polarity, said source having an output voltage subject to variation, said latch circuit comprising:
first and second bipolar transistors (Q1, Q2) of opposite polarity types, each having emitter, base and collector connections and each having its base connected to the collector of the other, whereby between the respective emitters of said transistors a regenerative latch unit is constituted;
a substantially resistive voltage divider (D1, D2, D3; R1, R2, R3, Rt) connected between said first and second connection means of said d.c. power source and having a tap connection, which is connected to the base of said first transistor, the emitter of said first transistor being connected to said first connection means of said d.c. power source, the emitter of said second transistor being connected to said first connection means of said load, and the second connection means of said load being connected to the second connection means of said d.c. power source, with the particular electric polarities of said first and second source and load connections and the particular conductivity types of said first and second transistors being suited to each other for operation of said latch unit as a series latch circuit, whereby the voltage divider provides by said tap connection a control of said latch which avoids unstable operation of said latch during relatively low voltage output of said d.c. source.

34. A method of charging a storage battery over a wide range of light conditions by means of a solar panel assembly, comprising:
charging a first capacitor which is permanently connected to a solar panel assembly by electric current produced by said solar panel assembly, and
operating a regenerative bipolar transistor latch unit connected in series with said storage battery and with said solar panel, under control of a substantially resistive voltage divider connected in parallel with said first capacitor and having a tap connection to which a control connection of said latch unit is connected, said latch unit comprising first and second bipolar transistors of opposite polarity types, each having a base electrode connected to a collector electrode of the other, said second transistor having an emitter electrode connected to a first polarity power input connection of said instrument and said first transistor having an emitter electrode connected to a corresponding output connection of said solar panel and having a base electrode connected, for operation as a control electrode of said latch unit, to said tap connection of said voltage divider.

68. A method of powering by solar energy, with economical assistance of a battery at low light levels, an electronic instruments having a liquid crystal display, comprising:
charging a first capacitor by said battery during essentially total darkness, by said battery and said solar panel together from a first threshold light level in a band lying between 2 and 8 lux up to a second threshold light level in the band between 30 and 40 lux and exclusively by said solar battery at above said second threshold light level;
supplying voltage present across said capacitor to a voltage detector (U2) for providing an output signal to a control electrode of a transistor (Q2) having its switched path connected between a terminal of said capacitor and a terminal of said load, for turning on said transistor when a predetermined voltage is reached in said voltage detector where said voltage is reduced by a diode chain (D8, D9);
as soon as said transistor is turned on, keeping said transistor turned on, by means of a resistance path (R6) between said control electrode of said transistor and an electrode of said transistor connected to said capacitor, until a voltage above or near said predetermined voltage no longer is present as aforesaid in said voltage detector;
limiting the availability to said load of power from said battery by provision of auctioneer diodes (D6, D7) through which said solar panel and said battery are respectively connected to said first capacitor, and
preventing leakage current through said transistor, when said transistor is turned off, from accumulating a charge in said load, by providing a leakage path resistance across said load.

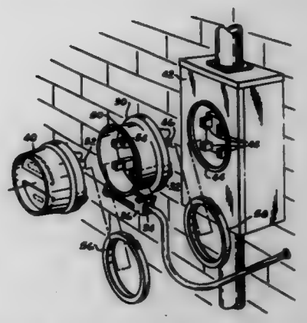
5,196,782
TOUCH-OPERATED POWER CONTROL
Michael J. D'Aleo, Erwinna; Richard J. Kwiatkowski, Allentown, and Michael J. Rowen, Center Valley, all of Pa., assignors to Latron Electronics Co., Inc., Coopersburg, Pa.
Continuation of Ser. No. 372,575, Jun. 28, 1989, abandoned. This application Oct. 4, 1991, Ser. No. 772,627
Int. Cl.[5] G05F 5/02
U.S. Cl. 323—320 34 Claims



1. A system for controlling power from a source to a load, comprising, in combination:
(a) a cover plate that has a front surface, an area of which is flexible,
(b) touch-operable means behind said flexible area having a continuous surface for providing a signal in response to pressure applied anywhere along said flexible area, the signal having at least one characteristic which is a function of the actual location on the flexible area to which said pressure is applied, said touch-operable means comprising first and second electrically conductive elements juxtaposed substantially coexistensively between substrates, at least one of which is flexible, and separated by a small gap, wherein said first electrically conductive element is operable to provide a voltage gradient along its surface, a point along which is electrically connectable to a corresponding point along said second electrically conductive element to selectively provide a voltage to a terminal thereof, and
(c) circuit means to determine the power provided from said source to said load in accordance with said signal.

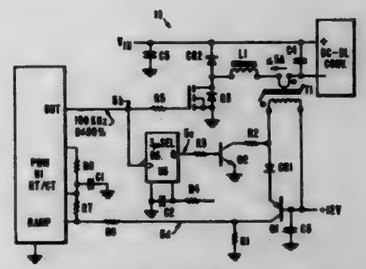
5,196,783
VENT FOR ELECTRICITY METERING DEVICE
Chesley R. Howell, Scarborough, Canada, assignor to Schlumberger Canada, Ltd., Toronto, Canada
Filed May 31, 1991, Ser. No. 708,451
Int. Cl.[5] G01R 1/00, 1/04
U.S. Cl. 324—110 3 Claims

1. An air circulation and tamper-resistant venting device for the cover of an electricity metering apparatus, the apparatus including a base portion from which a terminal housing extends, said venting device comprising:
at least one opening in the cover, said opening having a generally rectangular configuration and including a first side wall which is generally perpendicular to the surface of the cover and a second side wall which is angled relative to the surface of the cover in such a manner that an object inserted into the vent opening would be urged toward the first side wall and at an angle through the vent opening; and
a vent shield including a first wall projecting from the inside surface of the cover adjacent the first side wall of the vent opening and a second wall extending perpendicular from the first wall and parallel to the surface of the cover over the vent opening, whereby an object inserted through the



vent opening would be directed toward said first and second walls.

5,196,784
ISOLATED CURRENT MONITORING CIRCUIT FOR MEASURING DIRECT AND HIGH DUTY FACTOR CURRENTS
Earl M. Estes, Jr., Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Mar. 18, 1991, Ser. No. 670,664
Int. Cl.[5] G01R 33/00, 1/22
U.S. Cl. 324—117 R 4 Claims



1. An isolated current monitoring circuit for measuring direct and high duty factor current in a conductor comprising:
A. transformer means for magnetically sensing current flow in said conductor, said transformer means including a transformer having a primary winding connected electrically in series with said conductor and a secondary winding;
B. means for driving said transformer into saturation during a first time interval including:
a. an operational amplifier with an inverting input connected to the first end of said secondary winding of said transformer, a noninverting input connected to means for providing a reference potential and an output terminal connected via a first resistor to the first end of the secondary winding of said transformer; and
b. means connected to said inverting input of said operational amplifier for providing a saturation control signal;
C. means for bringing said transformer out of saturation and operation said transformer as a current transformer during a second time interval, comprising:
c. said noninverting input connected to means for providing a reference potential and an output terminal of said operational amplifier connected via a first resistor to the

first terminal of the secondary winding of said transformer; and

d. a second resistor connected to said inverting input of said operational amplifier at one end and the first end of said secondary winding of said transformer at a second end thereof;

D. said means for providing a reference potential comprises:

e. a third resistor connected to said noninverting input of said operational amplifier at one end and a potential well at a second end thereof; and

f. a fourth resistor connected to said inverting input of said operational amplifier at one end and a source of potential at a second end thereof; and

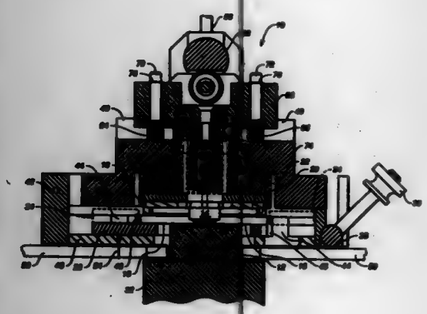
E. means for providing an output signal, after the initiation of the second time interval, which is proportional to the flow of current in said conductor.

5,196,785

TAPE AUTOMATED BONDING TEST APPARATUS FOR THERMAL, MECHANICAL AND ELECTRICAL COUPLING

Kevin Douglas, San Mateo, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 12, 1990, Ser. No. 629,283
Int. Cl.[5] G01R *31/02, 31/28*
U.S. Cl. 324—158 F 16 Claims



8. A test apparatus comprising,

alignment means for positionally fixing a tape automated bonding frame having an electronic component bonded thereto,

a metallic member disposed to be in thermal transfer engagement with said electronic component when positioned by said alignment means,

a horizontally disposed first printed circuit board having an upper surface having an array of conductive traces in contact with leads of said tape automated bonding frame positioned by said alignment means, said conductive traces and said leads being generally parallel,

an elastomeric member disposed on a side of said leads opposite to said array of conductive traces, and

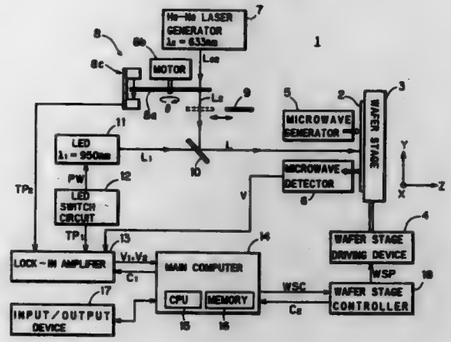
reciprocating means for selectively pressing said elastomeric member onto said leads to provide mechanical and electrical contact of said leads to said conductive traces.

5,196,786

METHOD FOR INSPECTING AN ELECTRONIC STATE OF A SURFACE OF A SEMICONDUCTOR SUBSTRATE AND AN APPARATUS THEREFOR

Akira Usami, Aichi; Kazunori Matsuki, and Tsutomu Takeuchi, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Mar. 27, 1991, Ser. No. 675,796
Claims priority, application Japan, Mar. 27, 1990, 2-80386
Int. Cl.[5] G01R *31/26, 27/06*
U.S. Cl. 324—158 R 12 Claims



1. A device for inspecting an electronic state of a surface of a semiconductor substrate, comprising:

(a) electromagnetic wave emitting means for emitting a first electromagnetic wave to a surface of said semiconductor substrate, wherein said first electromagnetic wave has an energy smaller than a minimum energy required for generating an electron-hole pair in said semiconductor substrate;

(b) first light emitting means for emitting a first light to said surface of said semiconductor substrate, wherein said first light has a first wave length and an energy larger than said minimum energy;

(c) second light emitting means for emitting a second light to said surface of said semiconductor substrate, wherein said second light has a second wave length and an energy larger than said minimum energy and wherein said second wave length is different from said first wavelength;

(d) light selecting means for alternately selecting one of said first and second lights and leading a selected light to a surface of said semiconductor substrate;

(e) electromagnetic wave detecting means for detecting a second electromagnetic wave which is emitted from said semiconductor substrate in response to said first electromagnetic wave when said surface is exposed to said selected light and for generating an electric signal representing an intensity of said second electromagnetic wave;

(f) data generating means for generating first and second data values representing said electric signal in first and second time periods during which said first and second lights are selected by said light selecting means, respectively; and

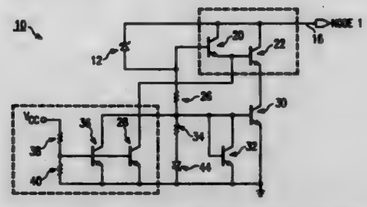
(g) calculator means for substituting said first and second data values for variables included in a predetermined finite difference-type function to thereby obtain a function value which is employable in inspecting an electronic state of said surface of said semiconductor substrate.

5,196,787

TEST CIRCUIT FOR SCREENING PARTS

Kevin M. Ovens, Garland, and Jeffrey A. Nielsen, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 754,239, Aug. 26, 1991, abandoned, which is a continuation of Ser. No. 424,012, Oct. 19, 1989, abandoned. This application Jul. 23, 1992, Ser. No. 919,071
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R 8 Claims



1. Circuitry for testing an integrated circuit, comprising:

model circuitry on the integrated circuit having a plurality of transistors with a size ratio proportional to the minimum desired beta characteristic of the transistors on the integrated circuit, coupled so that the current drawn by said transistors is proportional to said size ratio of said transistors;

a test node coupled to a pin of said integrated circuit and said model circuitry; and

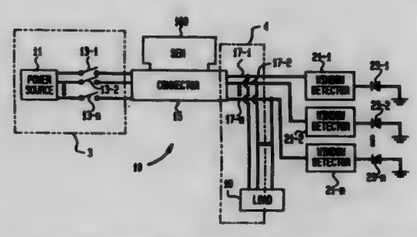
operable such that an accurate estimate of the performance of the transistors on said integrated circuit may be obtained by observing the current drawn by said transistors within said model circuitry in response to certain voltages applied at said test node, such observations being made without enabling the other circuitry on said integrated circuit.

5,196,788

SELF-CONTAINED FUNCTIONAL TEST APPARATUS FOR MODULAR CIRCUIT CARDS

Steven E. Cistulli, Bristol, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 3, 1991, Ser. No. 725,141
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R 16 Claims



1. A self-contained test apparatus capable of performing functional tests on any one of a plurality of varied function, modular circuit cards employing digital logic, comprising:

a regulated power source;

a series of manually set single pole double throw switches electrically connecting said power source to a series of input terminals of the modular circuit card being tested, each of said switches being connected to a corresponding one of the series of input terminals and having a predetermined position based upon the function of the modular circuit card being tested, wherein one of either a digital logic high or low is applied as a functional input to each of the input terminals;

first means, coupled to each output terminal of a series of output terminals of the modular circuit card being tested, for simulating in-situ load characteristics of the modular circuit card being tested, wherein a series of digital logic responses are generated at the corresponding output terminals of the series of output terminals; and

a series of second means connected to the series of output terminals of the modular circuit card being tested, each second means of said series comparing each generated digital logic response with a response expected at the same output terminal to generate a comparative result indicative of a pass/fail condition at each output terminal, whereby the functional test is passed only if all outputs achieve a pass condition.

5,196,789

COAXIAL SPRING CONTACT PROBE

Joseph R. Golden, 10290 S. Foothill Blvd., Cupertino, Calif. 95014, and Brian T. Bernard, 13337 Pierce Rd., Saratoga, Calif. 95070

Filed Jan. 28, 1991, Ser. No. 646,267
Int. Cl.[5] G01R *31/02, 15/12*
U.S. Cl. 324—158 P 10 Claims

1. An electrical circuit test spring probe comprising:

an electrically conductive member having a predetermined impedance and having an inner conductor and an outer conductor;

a contact head having a generally rounded contact surface and fastened to the inner conductor of said electrically conductive member;

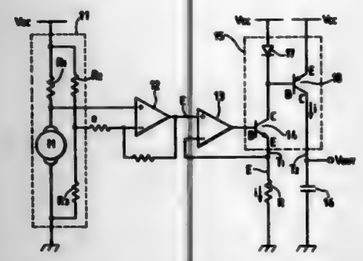
an electrically conductive housing;

a non-conductive bushing slidably mounted within and spring loaded to the housing, said bushing surrounding said conductive member and being fastened to the contact head;

means for electrically connecting the housing to the outer conductor of the electrically conductive member.

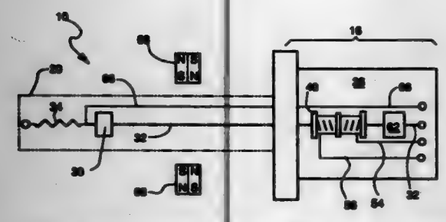
VOL 1148 ISS 4 MR 23 1993

5,196,790
APPARATUS FOR DETECTING REVOLUTION COUNTS OF AN ELECTRIC MOTOR OR GENERATOR
Norihiko Ito, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Oct. 21, 1991, Ser. No. 779,875
Claims priority, application Japan, Jul. 7, 1991, 3-136134
Int. Cl.[5] G01P *3/46*; G01R *31/02*; H02H *3/04*; H02K *11/00*
U.S. Cl. 324—177 5 Claims



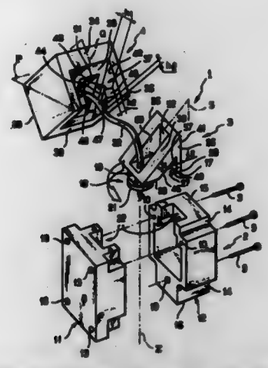
1. An apparatus for detecting revolution counts, comprising:
detection means for detecting an induced voltage of an electric motor;
capacitor for storing charges; and
charging means for charging said capacitor on the basis of said detected induced voltage;
wherein said charging means includes a current generation circuit for converting said detected voltage into a current as an output current thereof, and a current mirror circuit for producing a charging current equal to said output current.

5,196,791
MAGNETOSTRICTIVE LINEAR POSITION DETECTOR AND A DUAL POLE POSITION MAGNET THEREFOR
Arthur Dumais, Rochester, Mich., assignor to MagneTek Controls, Clawson, Mich.
Filed Sep. 27, 1991, Ser. No. 766,517
Int. Cl.[5] G01B *7/14*
U.S. Cl. 324—207.13 15 Claims



1. A magnet assembly for use in a magnetostrictive position sensor having a magnetostrictive wire, comprising:
a first magnet section having a toroidal shape around the magnetostrictive wire with radially disposed magnetic poles, a South magnetic pole disposed inwardly and a North magnetic pole disposed outwardly; and
a second magnet section disposed adjacent to said first magnet section, having a toroidal shape around the magnetostrictive wire with radially disposed magnetic poles, a North magnetic pole disposed inwardly and a South magnetic pole disposed outwardly.

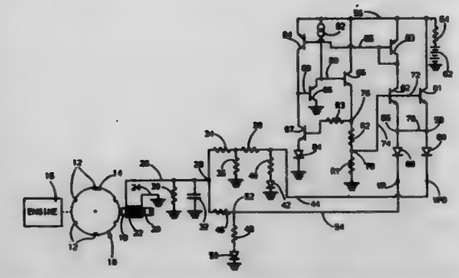
5,196,792
PROXIMITY DETECTOR HOUSING WITH ORIENTABLE HEAD
Michel Lafaye, Soyaux, France, assignor to Telemecanique, Rueil-Malmaison, France
Filed Jan. 7, 1992, Ser. No. 817,657
Claims priority, application France, Jan. 11, 1991, 91 00290
Int. Cl.[5] G01B *7/14*
U.S. Cl. 324—207.16 17 Claims



1. A proximity detector comprising a housing (2), a mounting (3, 63) provided with means (18) for positioning on the housing (2) in a selected one of a plurality of orientations about an axis (Z) and one orientation perpendicular to the axis (Z), and a cubic detector head (4) which, for receiving the mounting, comprises a recess (37, 87) extending over two recessed faces (33, 34) having a common edge (36) and may be associated with the mounting (3, 63) in two positions of association, in each of which the positioning means (18) are adjacent to one of the recessed faces (33, 34) which is intended to be adjacent to the housing (2), wherein the mounting (3, 63) can be separated from the housing (2) and, once separated from the housing, can be engaged in the recess (37, 87) by each of the two recessed faces (33, 34) and be displaced in the recess until inter-engagement of stop means (43, 57; 93, 107) of the head (4) and of the mounting (3, 63) which define the selected position of association, in which the positioning means (18) are adjacent to the recessed face (34, 33) other than that (33, 34) by which the mounting has been engaged.

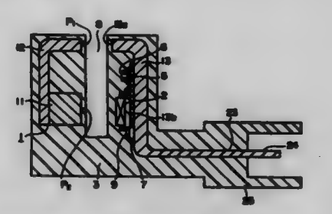
5,196,793
CRANKSHAFT POSITION VOLTAGE DEVELOPING APPARATUS HAVING A VOLTAGE CLAMP
Brian K. Good, Greentown; Mark B. Kearney, Kokomo; William P. Whitlock, Cicero, and John R. Shreve, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.
Filed Jul. 24, 1991, Ser. No. 735,026
Int. Cl.[5] H03K *5/08*; G01B *7/30*; G01P *3/44*
U.S. Cl. 324—207.25 4 Claims

1. Apparatus for developing a signal voltage that represents the angular position of the crankshaft of an internal combustion engine, comprising in combination, a variable reluctance sensor having a pick-up coil, means driven by the crankshaft of said engine associated with said sensor for causing an alternating voltage to be induced in the pick-up coil of said sensor, a negative voltage clamp circuit connected to said pick-up coil for providing a voltage at a junction of said clamp circuit which is clamped substantially to ground potential during a negative half-cycle of said alternating voltage, a source of direct voltage having a positive terminal and a negative terminal connected to ground, said clamp circuit comprising a conductor connected to said positive terminal of said source of direct voltage, a series circuit connected between said conductor and said junction of said clamp circuit comprising the collector and emitter of a first NPN transistor and a first diode, said diode having an anode connected to said emitter of said first NPN transistor and having a cathode connected to said junction, means connecting said junction to one side of said pick-up coil, a reference voltage generating circuit connected across said voltage source comprising a second NPN transistor



connected in series with a second diode, said reference voltage generating circuit developing a reference voltage at the base of said second transistor, and means connected to the base of said second NPN transistor and to the base of said first NPN transistor for applying a voltage to the base of said first transistor that follows the reference voltage developed at the base of said second transistor.

5,196,794
HALL-EFFECT SENSOR WITH INTEGRALLY MOLDED FRAME, MAGNET, FLUX GUIDE AND INSULATIVE FILM
Shigeaki Murata, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Division of Ser. No. 493,526, Mar. 14, 1990, Pat. No. 5,093,617. This application Apr. 8, 1991, Ser. No. 681,307
Claims priority, application Japan, Mar. 14, 1989, 1-59539; Mar. 15, 1989, 1-60706; Mar. 15, 1989, 1-60707; Mar. 15, 1989, 1-60708; Mar. 15, 1989, 1-60709
Int. Cl.[5] G01R *33/06*; G01B *7/30*; H01L *23/12, 23/28*
U.S. Cl. 324—251 7 Claims

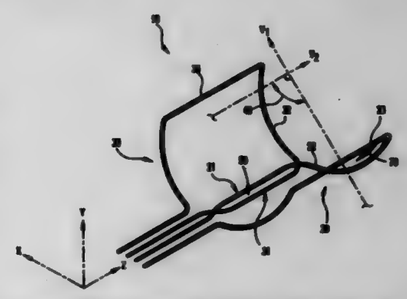


1. A Hall-effect sensor, comprising:
flux generating means for generating a magnetic flux, wherein said flux generating means includes a magnet for generating magnetic flux, a first flux guide disposed in contact with said magnet, and a second flux guide arranged in a position to face said magnet and said first flux guide with a gap therebetween;
a Hall element disposed in the path of said magnetic flux, and wherein said Hall element is fixed to one of said magnet and said second flux guide;
holding means for holding said flux generating means and said Hall element integrally therewith, said holding means comprising a molded frame;
a peripheral circuit provided with said Hall element such that said peripheral circuit is commonly mounted with said Hall element; and
an insulative film formed integrally on said magnet or said second flux guide,
wherein said Hall element is fixed to said magnet or said second flux guide with said insulative film therebetween, said molded frame completely encapsulating said Hall element, said flux generating means, and said peripheral circuit to fixedly position said Hall element, said flux generating means, and said peripheral circuit relative to each other.

5,196,795
METHOD FOR SELECTIVE EXCITATION OF NMR SIGNALS
Geoffrey Bodenhausen, Pully, and Lyndon Emsley, Lausanne, both of Switzerland, assignors to Spectrospin AG, Fallanden, Switzerland
PCT No. PCT/EP89/01360, § 371 Date Jul. 24, 1990, § 102(e) Date Jul. 24, 1990, PCT Pub. No. WO90/06523, PCT Pub. Date Jun. 14, 1990
PCT Filed Jul. 25, 1990, Ser. No. 573,050
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1988, 3839820
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 4 Claims

1. A method for selective excitation of NMR signal including the step of irradiating upon a sample, which is located within a homogeneous static magnetic field, an rf pulse sequence comprising at least one frequency-selective Gaussian pulse, wherein
the at least one frequency-selective Gaussian pulse is a 270° pulse.

5,196,796
ANATOMICALLY CONFORMAL QUADRATURE MRI SURFACE COIL
George J. Misic, Novelty, Ohio, and Eric D. Reid, Turtle Creek, Pa., assignors to Medrad, Inc., Pittsburgh, Pa.
Filed Aug. 6, 1991, Ser. No. 740,920
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 11 Claims



1. A magnetic resonance quadrature surface probe for detecting magnetic resonance signals comprising:
a first coil loop having a first net magnetic field vector;
a second coil loop having a second net magnetic field vector;

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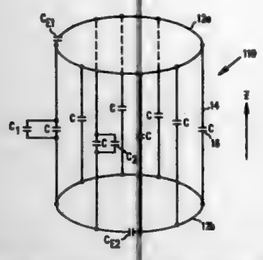
said first and second coil loops being shaped to be mirror images of each other and oriented relative to each other so that said first and second net magnetic field vectors are substantially perpendicular to one another.

5,196,797
METHOD OF CORRECTING AN ASYMMETRY IN AN NMR RADIO FREQUENCY COIL AND AN IMPROVED RADIO FREQUENCY COIL HAVING N-FOLD SYMMETRY AND REDUCED EDDY CURRENT

James S. Tropp, Berkeley, Calif., assignor to Toshiba America MRI, Inc., So. San Francisco, Calif.

Filed Oct. 31, 1990, Ser. No. 607,146
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 8 Claims



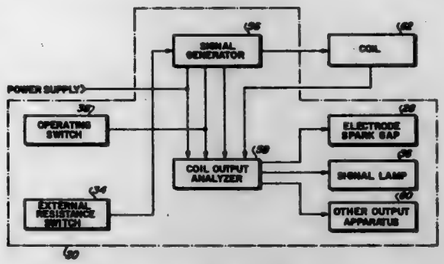
1. A method of correcting an asymmetry in an NMR radio-frequency coil of the type having a pair of conductive loop elements disposed in a spaced apart relation along a common longitudinal axis, with at least 2^n ($n \geq 3$) conductive segments each having at least one reactive element in series therewith, said segments electrically interconnecting said loop elements at points spaced along the periphery of each of said loops, said segments being disposed substantially parallel to said longitudinal axis, wherein said method comprising:
detecting said asymmetry in said coil;
calculating the magnitude and position of a first reactive element to be placed in series with a first segment;
placing said first reactive element in series with said first segment;
detecting said asymmetry in said coil;
calculating the magnitude of a second reactive element in series with a second segment; and
placing said second reactive element in series with said second segment, said second segment and said first segment are spaced apart substantially 45° from one another.

5,196,798
AUTOMOTIVE IGNITION COIL TESTER

Pedro Baeza, and Michael Baeza, both of 2734 Rosarita St., San Bernardino, Calif. 92407

Filed Jun. 17, 1991, Ser. No. 716,497
Int. Cl.[5] F02P *17/00*
U.S. Cl. 324—388 17 Claims

1. A device for testing an automotive ignition coil having a primary winding and a secondary winding, said device comprising:
a small, compact housing suitable for holding in the hand of a user;
a first pair of wires extending from said housing, said first pair of wires for making an electrical connection to an automobile battery to supply power to said device;
a second pair of wires extending from said housing, said second pair of wires for making an electrical connection to the primary winding of the coil;
a high voltage input connector mounted on said housing for electrical connection to the secondary winding of the coil;
generating/detecting means for generating an electrical output signal to drive the primary winding of the coil and for detecting at least one electrical characteristic of the coil, said generating/detecting means being electrically connected to said first and second pairs of wires, said generating/detecting means being mounted in said housing;
a first switch mounted in said housing for actuating said generating/detecting means when said first switch is actuated;
a sealed spark gap mounted in said housing and electrically connected to said high voltage input connector, said sealed spark gap displaying a spark when said first switch is actuated if the coil if operating properly;

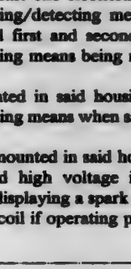


a signal lamp mounted in said housing and electrically connected to said generating/detecting means, said signal lamp for illumination when said first switch is actuated if said one electrical characteristic of the coil is detected;
a resistor for use with a coil requiring an external resistance for proper operation; and
a second switch for selectively, alternatively either electrically connecting said resistor to the coil if the coil requires an external resistance for proper operation, or electrically disconnecting said resistor from the coil if the coil does not require an external resistance for proper operation, said second switch being mounted in said housing.

5,196,799
METHOD AND APPARATUS FOR TESTING A PROTECTIVE BARRIER MATERIAL FOR PINHOLES AND TEAR STRENGTH

Richard B. Beard, Atco, N.J.; Robert Schmukler, Rockville, Md.; Herman P. Schwan, Radnor, and Frederick Prout, Huntingdon Valley, both of Pa., assignors to Drexel University, Philadelphia, Pa. and United States of America as represented by the Food & Drug Administration, Rockville, Md.

Filed Jul. 12, 1990, Ser. No. 552,284
Int. Cl.[5] G01R *27/00, 27/26*
U.S. Cl. 324—557 34 Claims



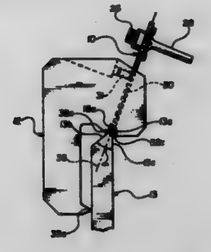
1. A method for the non-destructive testing of the integrity of a protective barrier material comprising
(a) applying an alternating electrical current across the protective barrier material for establishing a quality factor, Q, of the protective barrier material;

(b) measuring the quality factor, Q, at more than one frequency; and
(c) comparing the quality factor measurements obtained to a predetermined quality factor limit.

5,196,800
APPARATUS AND METHOD FOR NON-CONTACT MEASUREMENT OF THE EDGE SHARPNESS OF A KNIFE

Ernest A. Graff, Ontario, N.Y., and Mathew J. Podhorecki, Clearwater, Fla., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 13, 1991, Ser. No. 759,027
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—662 9 Claims

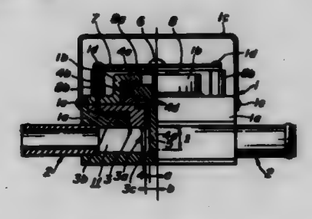


1. Apparatus for measuring the sharpness of the cutting edge of a knife, the cutting edge being formed at the line of intersection between two converging side cutting surfaces defining an acute angle between the surfaces, the apparatus comprising:
a capacitance sensor probe having an active sensor area, the sensor area having a principal reference plane;
means for holding said active sensor area repeatably at a predetermined nominal offset from said cutting edge with the principal reference plane of the active sensor area substantially normal to a plane bisecting the acute angle formed between said side cutting surfaces;
and means for coupling the central sensor lamination of said active sensor area to a capacitance measuring-instrument, whereby changes, in sharpness of the cutting edge are measured by changes in capacitance between the cutting edge and the sensor active area in successive measurements.

5,196,801
CAPACITANCE-TYPE FUEL SENSOR FOR SENSING METHANOL IN METHANOL-MIXED FUEL

Yasuhiro Nogami; Hisao Nunokawa, both of Tokyo, and Toshio Hirota, Yokosuka, all of Japan, assignors to Calsonic Corporation, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of Japan

Filed Dec. 15, 1989, Ser. No. 450,302
Claims priority, application Japan, Dec. 19, 1988, 63-164211
Int. Cl.[5] G01R *27/26*; G01N *27/22*
U.S. Cl. 324—663 8 Claims

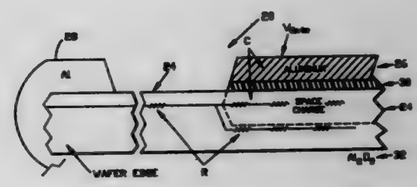


1. A fuel sensor for sensing a mixing ratio of a mixed fuel, said fuel sensor comprising:
a housing;
a structure disposed within said housing, said structure having a fuel passage formed therethrough;
an electrode assembly disposed within said housing and secured to said structure, said electrode assembly including paired electrodes which have respective probe portions exposed to said fuel passage;
an integrated circuit board arranged within said housing and on which an output control circuit is disposed, said output control circuit issuing an amplified voltage output which varies in accordance with a small information signal applied to an input portion of said output control circuit;
at least two fastening screws connecting said integrated circuit board to said structure to form a tight mechanical connection therebetween, said fastening screws being constructed of electrically conductive material;
wherein said fastening screws have respective upper portions directly contacting mutually insulated sections of said input portion of said output control circuit, and respective lower portions directly contacting said paired electrodes, respectively,
wherein each of said probe portions of said electrode assembly is entirely covered with an electrically insulating film,
wherein one of said probe portions is a cylindrical conductive solid member and the other probe portion is a cylindrical conductive hollow member and concentrically surrounds said solid member, and
wherein said electrode assembly is so arranged that said probe portions extend perpendicular to a longitudinal axis of said fuel passage along which said mixed fuel flows.

5,196,802
METHOD AND APPARATUS FOR CHARACTERIZING THE QUALITY OF ELECTRICALLY THIN SEMICONDUCTOR FILMS

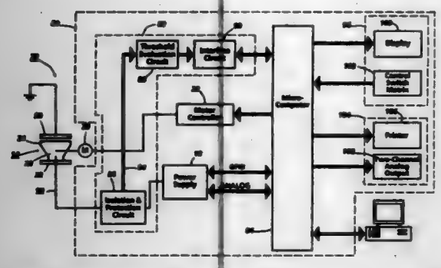
Mark L. Burgener; Graham A. Garcia, and Ronald E. Reedy, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1990, Ser. No. 516,492
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—663 42 Claims



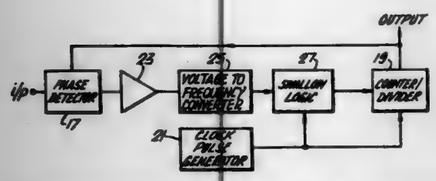
1. A method of characterizing electrically thin semiconductor films, comprising the steps of:
(a) forming a capacitor and a separate electrical contact on the same side of said electrically thin semiconductor film; and
(b) measuring electrical transfer characteristics of said capacitor to determine the electrical characteristics of said electrically thin semiconductor film.

5,196,803
APPARATUS AND METHOD FOR DETERMINING THE VOLTAGE BREAKDOWN AND CONDUCTIVITY OF PARTICULATE MATERIAL
Michael Cellini, Jr., East Rochester; Rudolph Forgenzi; Edward J. Gutmann, both of Webster; Kallis H. Mamik, Penfield; Robert J. Turchetti, Webster; Donald H. Wood, Penfield, and Morris M. DeYoung, Jr., Farmington, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 1, 1991, Ser. No. 739,034
Int. Cl.[5] G01R 27/14
U.S. Cl. 324—713 13 Claims



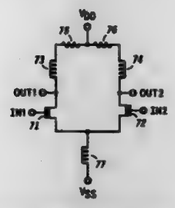
1. An apparatus for determining breakdown voltage of a particulate material, comprising:
means for storing a preselected quantity of the particulate material;
means for applying a first voltage across at least a portion of the preselected quantity of the particulate material so that a second voltage, which varies in magnitude as a function of the first voltage, is developed, said applying means progressively varying the magnitude of the first voltage until the second voltage substantially equals a preselected reference voltage;
means, coupled to said storing means, for measuring the second voltage, wherein the breakdown voltage substantially equals the first voltage when the second voltage substantially equals the preselected reference voltage.

5,196,804
PHASE DETECTORS
Emerson H. Oetzmann, Kent, England, assignor to Marconi Avionics Limited, England
Filed Jan. 23, 1989, Ser. No. 588,445
Int. Cl.[5] H03B 3/04
U.S. Cl. 328—133 11 Claims



1. A phase detector for producing an output signal indicative of the relative phase of a multiplex time division input signal comprising frames each consisting of a plurality of channels containing analogue data and a pair of adjacent channels containing pedestal voltages of different values to provide a voltage transition for synchronizing purposes, and a further periodic signal, the detector comprising: a smoothing circuit; a variable gain amplifier means via which the input signal is applied to the smoothing circuit; and means for varying the gain of the amplifier means cyclically in steps between positive and negative values at the frequency of said further signal, the number of steps per cycle being at least as great as the number of channels in a frame of said input signal.

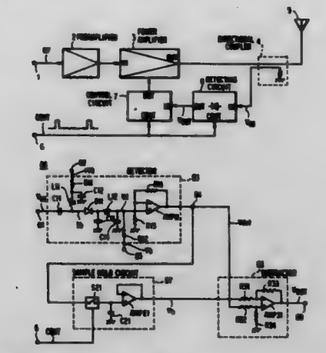
5,196,805
DISTRIBUTED DIFFERENTIAL AMPLIFIER ARRANGEMENT
William B. Beckwith, and Warren L. Seely, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 31, 1992, Ser. No. 828,623
Int. Cl.[5] H03F 3/60
U.S. Cl. 330—54 14 Claims



1. A differential distributed amplifier arrangement including at least one amplifier stage, said differential distributed amplifier arrangement comprising:
input means adapted to receive at least one input signal for amplification;
output means coupled to said input means, said output adapted to provide at least one output signal which is an amplified signal of said at least one input signal;
said at least one amplifier stage including:
amplifier means coupled to said input means said amplifier means producing said amplified signal; and
means for transmitting said amplified signal to said output means, said means for transmitting coupled between said amplifier means and said output means; and
said output means provides said at least one output signal in response to said amplified signal;
said at least one amplifier stage includes a plurality of amplifier stages including a previous amplifier stage and a next amplifier stage, said previous and next amplifier stages coupled in parallel, said each amplifier stage coupled to said input means and to said output means;
each of said plurality of amplifier stages includes said amplifier means and said means for transmitting; said means for transmitting including means for adding coupled to said amplifier means, said means for adding said amplified signal of said previous amplifier stage with said amplified signal of said next amplifier stage;
each of said amplifier means includes:
first and second voltage sources;
first and second transistor means, each coupled to said first voltage source, each of said first and second transistor means providing for an output;
third and fourth transistor means coupled respectively to said first and second transistor means and coupled in common, said third and fourth transistor means each providing for an input; and
fifth transistor means coupled to the common connection of said third and fourth transistor means and to said second voltage source; and
wherein said means for transmitting includes a plurality of serially connected inductor means, said means for adding being coupled between each of said plurality of inductor means; and
said serial connection of inductor means connected to resistive means, said resistive means connected between one of said inductor means and a source of electrical ground; and
wherein each of said transistor means includes field effect transistor means; and

wherein said field effect transistor means each include high electron mobility transistors.

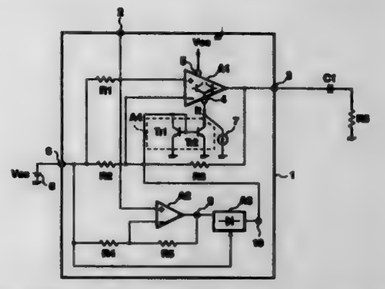
5,196,806
OUTPUT LEVEL CONTROL CIRCUIT FOR USE IN RF POWER AMPLIFIER
Masaki Ichihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 21, 1991, Ser. No. 779,879
Claims priority, application Japan, Oct. 19, 1990, 2-279440; Oct. 22, 1990, 2-281782
Int. Cl.[5] H03G 3/20
U.S. Cl. 330—137 14 Claims



1. An apparatus comprising:
power amplifier means responsive to a first control signal for amplifying a high frequency signal to produce an amplified signal;
high frequency power extracting means for taking out part of said amplified signal to produce an extracted signal;
detecting means responsive to a second control signal having "on" and "off" periods in a recurrent cycle for detecting said extracted signal to produce, for each of said cycles, a control voltage representing a voltage difference between said extracted signals taken out during one "on" period of said second control signal and an "off" period immediately preceding said one "on" period, respectively; and
control circuit means responsive to said control voltage and to said second control signal for producing and supplying said first control signal to said power amplifier.

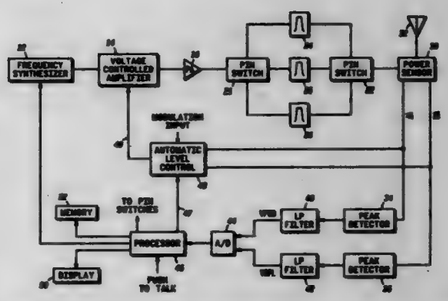
5,196,807
AMPLIFYING CIRCUIT
Masanori Fujisawa, Kumagaya, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 29, 1991, Ser. No. 751,941
Claims priority, application Japan, Aug. 30, 1990, 2-230434
Int. Cl.[5] H03G 3/20
U.S. Cl. 330—254 7 Claims

1. An amplifying circuit for amplifying an input signal, comprising:
a constant-current source for determining the operating current of the amplifying circuit; and
a full-wave rectifier for subjecting the input signal to full-wave rectification,
wherein the constant-current source includes a first current circuit for causing a constant current having a predetermined value to flow, and a second current circuit for causing a current corresponding to the signal output from the full-wave rectifier to flow so that when the input signal is below a predetermined value, the operating current of the amplifying circuit is determined in accordance with the first current circuit, while when the input signal is above the predetermined value, the operating current of



the amplifying circuit is determined in accordance with the first and second current circuits.

5,196,808
RF AMPLIFIER PROTECTOR AND METHOD
Michael N. Pickett, Phoenix, and Gary P. English, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 2, 1991, Ser. No. 801,554
Int. Cl.[5] H03F 1/52
U.S. Cl. 330—298 18 Claims



1. An amplifier protector arrangement for coupling modulated signals to an antenna for transmission, said amplifier protector arrangement comprising:
amplifier means for receiving said modulated signals and amplifying said modulated signals to produce amplified signals;
power sensor means for determining the power of said amplified signals transmitted to said antenna and said power sensor means providing first and second voltage indicators proportional to said power of said amplified signals, said power sensor means coupled to said amplifier means and to said antenna;
control means for adjusting the power of said amplified signals, said control means coupled between said amplifier means and said power sensor means;
amplifier protection means for turning off said amplifier means, if said first and second voltage indicators show said power of said amplified signals being below a threshold voltage, said amplifier protector means coupled to said power sensor means and to said control means;
said amplifier protection means including:
detection means coupled to said power sensor means, said detection means operating in response to said first and second voltage indicators to provide corresponding forward and reflected voltage indicator; and
analog-to-digital conversion means coupled to said detec-

tion means for converting said forward and reflected voltage indicators to digital form;

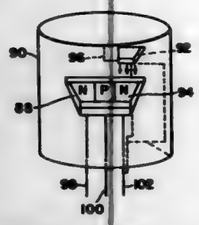
wherein said amplifier protection means further includes processor means connected to said analog-todigital conversion means, said processor means for determining said threshold voltage from said digital form of said reflected voltage indicator, said processor means further operating to compare said digital form of said forward voltage indicator with said threshold voltage to produce a fault indicator, if said forward voltage indicator is greater than said threshold voltage.

5,196,809

HIGH GAIN, LOW DISTORTION, FASTER SWITCHING TRANSISTOR

William J. Fogal, 4222 Wheeler Rd., Martinez, Ga. 30907

Filed Mar. 1, 1991, Ser. No. 663,011
Int. Cl.[5] H03F *3/191*
U.S. Cl. 330—307 9 Claims



1. An integrated circuit comprising:
a) a substrate;
b) one of an NPN and a PNP transistor integrally formed on the substrate, the transistor having a base, a collector, and an emitter;
c) a parallel resistor and filter capacitor network coupled with the emitter and mounted on the transistor to form an integral part of the integrated circuit, the filter capacitor including an outer casing; and
d) base, collector, and emitter terminals on the substrate and coupled with the base, the collector, and the emitter, respectively, to permit the integrated circuit to be connected with an electronic circuit, wherein the integrated circuit is contained within the filter capacitor outer casing.

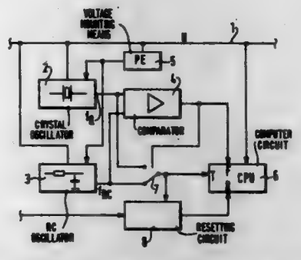
5,196,810

PLURAL OSCILLATOR CIRCUIT ARRANGEMENT FOR RAPIDLY RESETTING A COMPUTER CIRCUIT

Guenter Graether, Wiernsheim/Pinache; Werner Jundt, Ludwigsberg, and Guenther Kaiser, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE90/00810, § 371 Date Feb. 3, 1992, § 102(e) Date Feb. 3, 1992, PCT Pub. No. WO91/09361, PCT Pub. Date Jun. 27, 1991
PCT Filed Oct. 25, 1990, Ser. No. 777,550
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 3940745
Int. Cl.[5] G06F *1/08, 1/24*; H03B *1/00*; H03L *3/00*
U.S. Cl. 331—49 11 Claims

1. Circuit arrangement for supplying an oscillating electrical signal at a predetermined frequency to a computer circuit comprising:
a voltage supply means for supplying a voltage;
a first oscillator means connectable with a computer circuit means and the voltage supply means, said first oscillator means being operable to produce a first oscillating electrical output signal having a frequency when the voltage from the voltage supply means is applied thereto;
a second oscillator means connectable with the voltage supply means and the computer circuit means and operable to produce a second oscillating electrical output signal having a frequency, the second oscillator means being structured to begin oscillating more quickly than the first oscillator means when the voltage of the voltage supply means is applied thereto;
means for connecting the second oscillator means with the computer circuit means, said means for connecting the second oscillator means to the computer circuit means



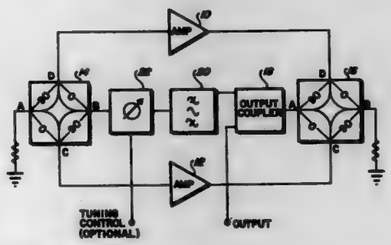
acting to connect the second oscillator means and the computer circuit means when the voltage from the voltage supply means is greater than a preset minimum supply voltage and is applied to the second oscillator means; and
means for connecting the first oscillator means with the computer circuit means after a predetermined time period beginning at a time of connection of the second oscillator means with the computer circuit means.

5,196,811

OSCILLATOR CIRCUIT EMPLOYING QUADRATURE NETWORKS FOR MAINTAINING A CONSTANT IMPEDANCE

Jorgen W. Andersen, St. Cloud, Fla., assignor to Sawtek, Inc., Apopka, Fla.

Filed Oct. 18, 1991, Ser. No. 777,890
Int. Cl.[5] H03B *5/02*
U.S. Cl. 331—135 15 Claims



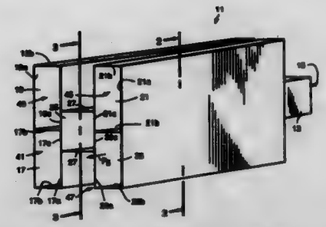
1. An oscillator comprising:
filter means for passing electric signals in a predetermined frequency band;
means for amplifying the electric signals, the amplifying means having a varying output and impedance; and
network means for passing the electric signals between the filter means and the amplifying means, and for maintaining a constant impedance in response to variations in the impedance as the amplifying means goes into gain compression, the network means including a first and a second quadrature network, where said first network is coupled between an output of said amplifying means and an input of said filter means, and said second network is coupled between an input of said amplifying means and an output of said filter means.

5,196,812

COMPACT N-WAY WAVEGUIDE POWER DIVIDER

Steven W. Drost, Redondo Beach, and William W. Milroy, Playa del Rey, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 27, 1991, Ser. No. 722,727
Int. Cl.[5] H01P *5/18*
U.S. Cl. 333—113 11 Claims



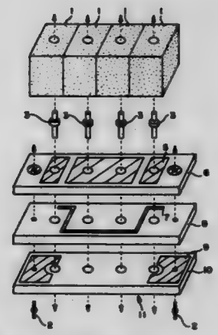
1. A compact n-way waveguide power divider, comprising:
a first waveguide section having a power input port, a pair of opposite broad walls and a pair of opposite narrow walls;
a plurality of parallel waveguide sections, each being parallel to said first waveguide section and each having a pair of opposite broad walls and narrow walls, a longitudinal portion of each of said plurality of waveguide sections being juxtaposed a different longitudinal portion of said first waveguide section defining common wall portions thereof wherein said plurality of waveguide sections comprises four waveguide sections, wherein said four waveguide sections comprise two pairs of waveguide sections, each pair sharing a common narrow wall; and
coupling means including a pair of relatively narrow coupling members disposed in each of said common wall portions for directionally coupling power entering said first waveguide section into each of said plurality of waveguide sections.

5,196,813

DIELECTRIC FILTER HAVING A SINGLE MULTILAYER SUBSTRATE

Hideaki Nakakubo, Higashiosaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 23, 1991, Ser. No. 734,574
Int. Cl.[5] H01P *1/202, 1/205*
U.S. Cl. 333—206 2 Claims



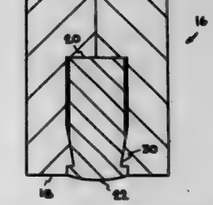
1. A dielectric filter comprising:
a) a plurality of dielectric coaxial resonators;
b) a multilayer substrate comprising:
a first dielectric layer having a first conductive pattern deposited thereon; a second dielectric layer having a second conductive pattern deposited thereon; a third dielectric layer having both a third conductive pattern and a fourth conductive pattern deposited thereon and said third dielectric layer is located between said third conductive pattern and said fourth conductive pattern;
said third conductive pattern, said third dielectric layer and said fourth conductive pattern forming a plurality of first capacitors having a plurality of electrodes, said plurality of first capacitors arranged in series connection;
said first conductive pattern, said first dielectric layer and said second conductive pattern forming a second capacitor, a stripline and a third capacitor arranged in series connection;
said second dielectric layer located between said second conductive pattern and said third conductive pattern;
said second dielectric layer having a dielectric constant smaller than each of said first dielectric layer and said third dielectric layer;
c) a plurality of metal connectors, each of said plurality of metal connectors connecting a respective one of said plurality of dielectric coaxial resonators to a respective one of said plurality of first capacitors; and
d) two terminals, one of said two terminals connected to one of said electrodes included in one of said plurality of first capacitors, the other of said two terminals connected to one of said electrodes included in another one of said plurality of first capacitors.

5,196,814

HIGH POWER, HIGH FREQUENCY, VACUUM FLANGE

Brian Felker, Livermore, and Michael R. McDaniel, Manteca, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 1, 1991, Ser. No. 786,647
Int. Cl.[5] H01P *1/04*
U.S. Cl. 333—254 13 Claims



1. A waveguide comprising at least one flange having a surface with a central opening and a counterbore extending around the periphery of said central opening, wherein;
said counterbore having extended first and second sections of predetermined length and different depth and including a step along a portion of its length interconnecting said first and second sections
said first section being contiguous with said central opening, and;
said step being beveled on the far side most removed from said central opening so that the height of said step changes gradually from its maximum height adjacent said first section of said counterbore to the height of said second section of said counterbore at said far side.

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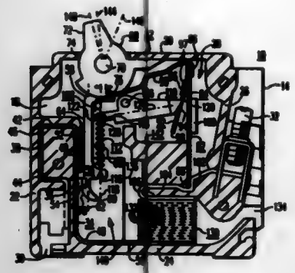
5,196,815

MINIATURE CIRCUIT BREAKER

Yun-Ko N. Chien, Murrysville; John J. Shea, Ross Township, Allegheny County; Edmond F. Kowal, Export, and John A. Wafer, Brighton Twp., Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 31, 1992, Ser. No. 828,831
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—16 14 Claims



1. A miniature circuit breaker comprising an insulative housing, first and second electrical terminals supported by said housing, manually operable actuating means pivotally supported by said housing, fixed and movable electrical contacts in said housing, an electrically conductive fixed contact support structure supporting said fixed contact, with the fixed contact support structure being electrically connected to the first terminal, an elongated, electrically conductive, movable contact arm supporting said movable contact, and being movable between closed and open positions in which the fixed and movable electrical contacts are respectively engaged and separated, a trip mechanism which includes a bi-metal having a first end electrically connected to the movable contact arm and a second end electrically connected to said second terminal, and an operating mechanism comprising an operating member pivotally fixed to the housing, and a tension spring having first and second ends and a longitudinal axis therebetween, with said operating member having first and second ends and a longitudinal axis therebetween, with the first end being releasably engageable with said trip mechanism, the improvement comprising:

said movable contact arm having first and second ends, a contact support side, and an opposite spring supporting side, with the first end of said movable contact arm being actuatable by the manually operable actuating means and with the movable contact being fixed to the contact supporting side adjacent to the second end of said movable contact arm,

the second end of said pivotable operating member being adjacent to and spaced from the spring supporting side of said movable contact arm, in both the engaged and separated positions of the fixed and movable contacts,

the first and second ends of said tension spring respectively linking the second end of said pivotable operating member and the spring supporting side of said movable contact arm, with said longitudinal axes of the tension spring and movable contact arm being in spaced, substantially parallel relation in both the engaged and separated positions of the fixed and movable electrical contacts,

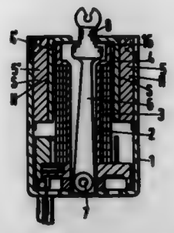
and wherein the fixed contact support structure includes a contact supporting leg portion which is in closely spaced relation with the movable contact arm, when the fixed and movable contacts are in engagement, to provide a reverse current loop which magnetically aids in rapidly separating the fixed and movable contacts upon the onset of an over current condition.

5,196,816

POLARIZED REVERSIBLE MAGNET

Dietmar Harting, Espelkamp; Ernst-Heinrich Hartung, Hausnech-Oldendorf; Joachim Brendel, Espelkamp, and Wilhelm Niermann, Wehdem, all of Fed. Rep. of Germany, assignors to Harting Elektronik GmbH, Espelkamp, Fed. Rep. of Germany

Filed Mar. 25, 1992, Ser. No. 857,196
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1991, 4110815
Int. Cl.[5] H01H *51/22*
U.S. Cl. 335—78 18 Claims



1. A polarized, reversible magnet comprising an essentially U-shaped yoke having a bottom end and two spaced yoke legs extending from said bottom end, said bottom end having recesses, a coil former means disposed between said spaced yoke legs, said coil former means having an upper flange and a lower flange, said lower flange having projections engaging said recesses in said bottom end of said U-shaped yoke, said upper flange having upper flange recesses, each of said two spaced yoke legs having upper end portions which are engaged in said upper flange recesses, permanent magnets positioned between said spaced legs and said coil former means, said upper flange having openings in which said permanent magnets are received, pole pieces disposed between said permanent magnets and said coil former means, said pole pieces being received in said openings, said pole pieces having stop means disposed outside of said openings and engaging said upper flange to determine the position of said pole pieces relative to said upper flange, said coil former means having a longitudinal passage and an armature disposed in said passage, said lower flange having pivot means for pivotably mounting said armature in said passage.

5,196,817

MOLDED CASE CIRCUIT BREAKER ARC EXHAUST GAS CONTROLLER

Linda Y. Jacobs, Barkhamsted; Joseph M. Palmieri, Southington; James I. Smith, Avon, all of Conn., and Franco Pardini, Milan, Italy, assignors to General Electric Company, New York, N.Y.

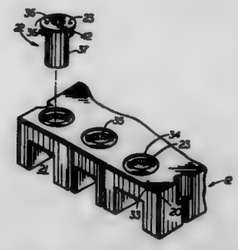
Continuation of Ser. No. 736,673, Jul. 26, 1991. This application May 15, 1992, Ser. No. 883,635
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 4 Claims

1. A line terminal insert for molded plastic circuit breaker covers comprising:

a hollow cylindrical planar plastic top;

a hollow cylindrical body member extending from and formed integral with said top;

a key-shaped projection formed on said hollow body member proximate said hollow top for connecting within line terminal access openings formed within a circuit breaker cover whereby said hollow top and said hollow body member provide access to a circuit breaker line terminal



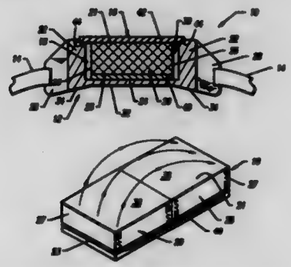
connector when said hollow body member is inserted within said line terminal access openings.

5,196,818

WRIST MOUNTED MAGNETIC HOLDER

Steven P. Anderson, 6666 Reseda Blvd., #204, Reseda, Calif. 91355

Filed Mar. 30, 1992, Ser. No. 860,166
Int. Cl.[5] H01F *7/20, 7/02;* A45F *5/00*
U.S. Cl. 335—285 14 Claims



1. A magnetic holder for releasably supporting magnetically attractable objects comprising:

a generally rectangular shaped housing formed of non-magnetic material and having longitudinal sides laterally spaced by interconnected end walls, said housing having a generally rectangular cavity formed therein;

a generally rectangular shaped magnet mounted within said cavity and having a generally flat upper face and a generally flat lower face, said magnet being divided laterally into two regions of reverse polarity with substantially one half of said upper face having one polarization and the other half having the opposite polarization;

a generally rectangular shaped concentrator plate of ferrous material disposed within said cavity between said lower face of said magnet and said housing; and

a cover plate having a generally flat upper surface dimensioned to overlie said upper surface of said magnet and said cavity, said cover plate being formed of non-magnetic material and secured to said housing to retain said magnet and said concentrator plate within said cavity, said cover plate forming a support surface for supporting objects magnetically attracted to said holder.

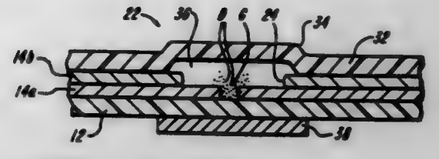
5. A magnetic holder as set forth in claim 1 further including a flexible band attached to said housing for releasably securing said holder to an arm of a user.

5,196,819

PRINTED CIRCUITS CONTAINING FUSE ELEMENTS AND THE METHOD OF MAKING THIS CIRCUIT

Joseph A. Roberts, Hudson, N.H., assignor to Rock Ltd. Partnership, Nashua, N.H.

Continuation-in-part of Ser. No. 662,256, Feb. 28, 1991, Pat. No. 5,099,219. This application Mar. 23, 1992, Ser. No. 855,747
Int. Cl.[5] H01H *85/04, 85/43*
U.S. Cl. 337—297 10 Claims



1. A fusible circuit comprising

a dielectric substrate;

one or more electrical circuit paths adhered to said substrate, at least one of said paths being a fused path, said fused path having

a layer of electrically conductive material defining a gap between juxtaposed ends in said path,

a layer of fusible material extending between said ends and pressure welded into said gap of said conductive material at said ends, and

a force concentrator means fixed relative to said fusible layer and disposed in registration with and remote from said gap,

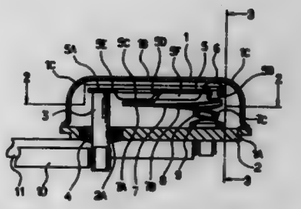
whereby electrical current flowing along said fused path is conducted primarily through said conductive material layer except at the location of each said gap where it is connected solely through said fusible material layer.

5,196,820

THERMALLY RESPONSIVE SWITCH AND METHOD OF MAKING THE SAME

Susumu Ubukata, deceased, late of Nagoya by Shinya Ubukata, Reiko Ubukata, Shinosuke Ubukata, legal representatives and/or heirs; Yasukazu Mizutani, Nagoya; Isao Higashikata, Owariasahi, and Hideki Koseki, Owariasahi, all of Japan, assignors to Ubukata Industries Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 809,445, Dec. 19, 1991. This application Jul. 1, 1992, Ser. No. 908,858
Claims priority, application Japan, Dec. 19, 1990, 2-412348; Apr. 3, 1991, 3-96377
Int. Cl.[5] H01H *37/12, 37/54, 37/00*
U.S. Cl. 337—368 8 Claims



1. A thermally responsive switch comprising:

a) an elliptic dome-shaped receptacle formed of a metallic material and having a generally arc-shaped central portion, two generally hemispheric ends and an open end;

b) a header plate formed of a metallic material and hermetically secured to the receptacle by way of welding so as to close the open end thereof such that a hermetic casing is formed by the receptacle and the header plate, the header

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plate having an aperture formed therethrough at one of two longitudinal ends;

c) an electrical conductor inserted through the aperture of the header plate so that both ends thereof are projected from both sides by predetermined dimensions respectively, the conductor being secured in the aperture with an electrically insulating material inserted between the peripheral wall surface of the aperture and the outer periphery of the conductor for hermetically sealing the enclosure in the casing;

d) a support disposed within the receptacle along the longitudinal direction thereof and having at one of two longitudinal ends a fixed portion secured to the end of the conductor and a supporting portion positioned away from the other end thereof in the direction of the fixed portion;

e) a thermally responsive element secured at one of two ends to the supporting portion of the support and carrying a movable contact at the other end, the thermally responsive element being formed of a thermally deformable material the thermally responsive element having a generally central shallow dish-shaped portion reversing its curvature with a snap action in response to an ambient temperature;

f) a fixed contact secured to the header plate in the vicinity of the other longitudinal end thereof for thermal conduction so as to cooperate with the movable contact; and

g) a calibrating member interposed between the inner wall of the receptacle and the other end of the support opposing the movable contact, the calibrating member being moved, pushing the other end of the support when the receptacle wall corresponding to the calibrating member is deformed for calibration of an operating temperature of the thermally responsive switch, so that the support is bent in the vicinity of the fixed portion thereof such that a contact pressure between the movable and fixed contacts is varied.

5,196,821

INTEGRATED MAGNETIC FIELD SENSOR

Dale L. Partin, Romeo; Jackson G. Gay, Birmingham; Brian K. Fuller, Washington; Bruno P. B. Lequesne, Troy, and Frederick E. Pinkerton, Shelby Township, Macomb County all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 9, 1992, Ser. No. 848,512
Int. Cl.[5] H01L *32/00*
U.S. Cl. 338—32 R 22 Claims

1. A magnetic field sensor comprising:

a body having a surface;

a strip of a material whose characteristics vary when a magnetic field is applied thereto on said surface of the body;

spaced conductive layers on said strip forming active regions on the strip therebetween;

a permanent magnet assembly mounted on said body across the strip; and

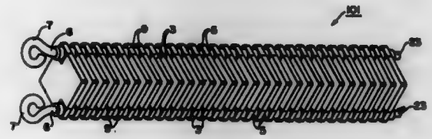
a layer of a ferromagnetic material over said body and in close proximity only to said strip.

5,196,822

STACKED TERMINATION RESISTANCE

David O. Gallusser, Oneonta; Jon P. Bixby, Endicott, and James B. LeBaron, Sidney, all of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Dec. 12, 1991, Ser. No. 805,655
Int. Cl.[5] H01C *1/14*
U.S. Cl. 338—328 16 Claims



1. A resistance stack component for termination of an electrical cable, comprising:

a plurality of electrical resistance elements, including at least two openings in each of said elements and means for conductively plating said openings; and

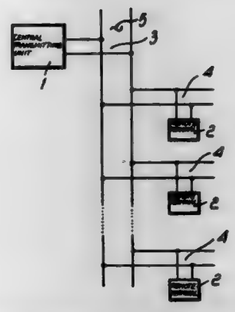
elongated conductive members electrically connected to one of each of said conductive plating means, wherein walls of said openings substantially surround said elongated conductive members to engage said members over an angle of greater than 180°, said walls thereby serving to support and align said members with respect to said resistance elements.

5,196,823

DERATIZATION APPARATUS WITH REMOTE TERMINALS

Michele Formigoni, Padua, Italy, assignor to Multitecno S.p.A., Padua, Italy

Continuation-in-part of Ser. No. 214,809, Jul. 5, 1988, abandoned, which is a continuation of Ser. No. 38,860, Apr. 15, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 338,813
Claims priority, application Italy, Apr. 24, 1986, 41559 A/86
Int. Cl.[5] H04M *11/04;* A01M *5/04*
U.S. Cl. 340—310 R 14 Claims



1. Deratization apparatus for use in buildings, the apparatus comprising a central transmitting unit and a plurality of remote terminals connected to the central transmitting unit through an electrical net,

said central transmitting unit comprising first means adapted to generate a high frequency signal of variable frequency and length and to send the signal through said electrical net to said plurality of remote terminals,

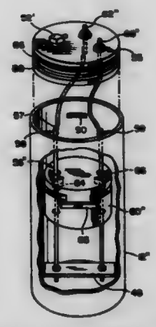
each remote terminal of said plurality of remote terminals comprising second means adapted to receive the high frequency signal and to actuate vibration generating means, said vibration generating means generating vibrations according to the high frequency signal received from said central transmitting unit, the remote terminals further comprising control means adapted to send through said electrical net an error signal to the central unit in case of malfunction.

5,196,824

FLOAT ACTUATED LIQUID LEVEL MONITORING APPARATUS

James D. Helm, Murphy, N.C., assignor to Oil Monitoring Systems, Inc., Murphy, N.C.

Continuation-in-part of Ser. No. 583,572, Sep. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 277,336, Nov. 29, 1988, abandoned. This application May 2, 1991, Ser. No. 694,301
Int. Cl.[5] G01F *23/60*
U.S. Cl. 340—450.3 10 Claims



1. A float actuated oil level monitoring apparatus for providing a continuously variable analog indication of oil level in an oil pan of an engine having a lubricating system, the apparatus comprising:

a reservoir having a top and a bottom portion, said reservoir having means to secure same relative to said oil pan such that oil level in said reservoir continuously corresponds with oil level in said oil pan;

first means for providing fluid communication between said bottom portion of said reservoir and said oil pan proximate its bottom;

second means for providing fluid communication between said top portion of said reservoir and the atmosphere above said oil level in said oil pan;

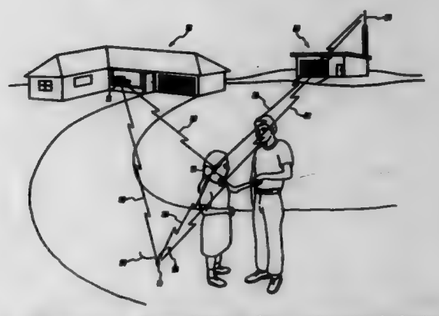
a float of selected material, size, and shape, together with an electrical element, disposed within said reservoir, and a contact associated with said float engaging said element whereby electrical characteristic of said element continuously varies as a function of changes in the level of oil in said reservoir as determined by the position of said float, said float and associated electrical contact having a frictional resistance to movement due to oil level changes in said reservoir caused by operation and non-operation of said lubricating system for compensating for the differences in indicated oil quantity between conditions of an operating lubricating system and a non-operating lubricating system, said float member being of a selected material, shape, and size and said contact providing frictional resistance for cooperating with said element to accomplish said compensating.

5,196,825

PERSONAL SECURITY APPARATUS

James T. Young, 8809 Cross Mountain Trl., San Antonio, Tex. 78255

Filed Dec. 16, 1991, Ser. No. 807,713
Int. Cl.[5] G08B *1/08, 23/00*
U.S. Cl. 340—539 20 Claims



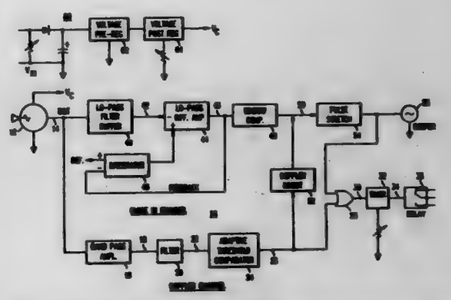
1. An apparatus comprised of first and second devices mountable at respective first and second locations on a person's body, said first device including a first transmitter for normally transmitting a first electromagnetic signal, said first transmitter being responsive to a first predetermined condition for transmitting a second electromagnetic signal in lieu of said first signal, said second device including a receiver for receiving said first and second signals and a second transmitter for transmitting a third electromagnetic signal in response to a second predetermined condition, said second predetermined condition being indicated by either said second signal being received by said receiver or said first signal not being received by said receiver, at least said second and third signals being detectable by a remote receiver.

5,196,826

SENSOR FOR DETECTING THE PASSAGE OF A PERSON OR AN ANIMAL IN A FIELD OF VIEW

Gordon S. Whiting, Orangevale, Calif., assignor to C & K Systems, Inc., Folsom, Calif.

Filed Jun. 26, 1991, Ser. No. 721,142
Int. Cl.[5] G08B *13/18, 21/00*
U.S. Cl. 340—554 8 Claims



1. A sensor for detecting the passage of a person or an animal in a field of view; said sensor comprising:

means for detecting the motion of a said person or animal in said field of view, said detecting means generating a first signal in response to the detection of the motion of said person or animal in said field of view;

means for sensing the presence of said person or animal in a portion of said field of view, and for generating a second

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signal in response thereto; said sensing means being inhibited in response to said first signal; and

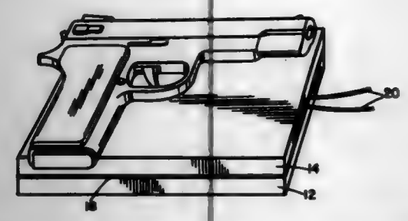
means responsive to said first or second signal, for generating an actuation signal for indicating the passage of said person or animal in said field of view.

5,196,827

ALARM APPARATUS FOR HANDGUN SECURITY

William J. Allen, 7711 Hillside Dr., La Jolla, Calif. 92037, and Leon A. Chavis, P.O. Box 8788, La Jolla, Calif. 92038

Filed May 13, 1991, Ser. No. 698,788
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—568 13 Claims



1. An alarm apparatus for sensing the removal of a handgun, comprising:

a lower base plate;

an upper base plate separate from said lower base plate and disposed above and adjacent to the lower base plate, the upper base plate having an upper surface for placement of said handgun on said surface;

at least one alarm means for producing an alarm signal in response to an alarm activation signal;

a symmetrical array of force sensors disposed directly between said lower base plate and said upper base plate and secured to one of said plates, said force sensors each comprising a thin membrane having an electrical property which varies in response tot he force applied to each of said force sensors by said upper and lower base plates;

a cushioning pad located directly between each of said force sensors and one of said plates for cushioning said sensors;

a sensor signal means for providing a voltage comprising a sensor signal proportional to said electrical property of each of said force sensors;

an upper threshold means for providing an upper sensor signal level, the upper threshold means including means for adjusting said upper sensor signal level in response to the force applied by said handgun on said upper base plate;

a lower threshold means for providing a lower sensor signal level, the lower threshold means including means for adjusting the lower sensor signal level in response to the force applied by said handgun on said upper plate;

the upper and lower sensor signal levels together defining a force threshold window encompassing the force exerted by the handgun weight on said upper plate;

a compressor means for detecting said sensor signal and generating an alarm activation signal in response to said sensor signal falling outside the force threshold window bounded by said upper and lower sensor signal levels; and

a reset means for resetting the alarm apparatus.

5,196,828

BENDABLE CURRENCY SECURITY DYE PACK

Scott E. Kenleton, Scottsdale, Ariz., assignor to U.S. Currency Protection Corp., Fountain Hills, Ariz.

Filed Jan. 14, 1992, Ser. No. 820,367
Int. Cl.[5] G08B *15/02*
U.S. Cl. 340—571 21 Claims

6. A security dye pack disguised as a bundle of currency bills for discharging active chemicals to assist in the apprehension of an assailant and in the recovery of monies stolen from a protected premises, said security dye pack comprising in combination:

a. a housing resembling a bundle of currency bills and having a hollowed inner chamber, said housing having a central portion and opposing first and second ends;

b. a substrate disposed within said hollowed inner chamber, said substrate having a flexible central region and opposing first and second ends;

c. electronic circuit means disposed upon said substrate outside the central region thereof for detecting removal of said security dye pack from the protected premises and generating an actuating electrical current in response thereto;

d. canister means disposed within the hollowed inner chamber of said housing proximate to said substrate outside the central region thereof and responsive to said actuating electrical current for discharging active chemicals from said housing;

e. battery means secured to said substrate outside the central region thereof for supplying electrical power to said electronic circuit means; and

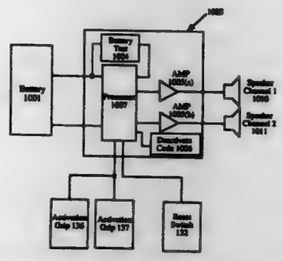
f. said substrate permitting said security dye pack to be bent about the flexible central region thereof into a U-shape to help avoid detection by an assailant while supporting said electronic circuit means, said canister means, and said battery means within said hollowed inner chamber.

5,196,829

PERSONAL SAFETY DEVICE HAVING MICROPROCESSOR CONTROL AND METHOD FOR OPERATING THE SAME

Bruce A. Janis, San Francisco, Calif., assignor to Egis Personal Safety Systems, San Jose, Calif.

Filed Sep. 17, 1991, Ser. No. 761,477
Int. Cl.[5] G08B *13/00*
U.S. Cl. 340—574 11 Claims



1. A personal safety device comprising:

(a) a housing for housing components of said personal safety devices;

(b) sound generation means for producing an audible alarm, said sound generation means housed within said housing, said audible alarm being produced by a first signal having a sinusoidal wave component sin(a) and a second signal having a sinusoidal wave component sin(b), wherein the frequency of said sinusoidal wave component sin(a) oscillates between F1 and F2 with a period P1 and the frequency of said sinusoidal wave component sin(b) oscillates between F3 and F4 with a period P2;

(c) activation means for allowing a user of said personal safety device to cause activation of said sound generation means, said activation means housed within said housing; and

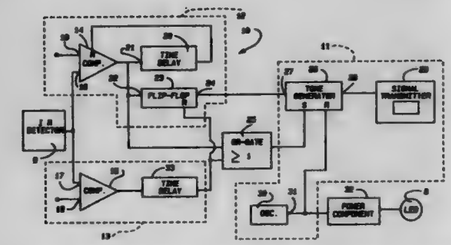
(d) a microprocessor for controlling functions of said personal safety device, said microprocessor housed within said housing.

5,196,830

APPARATUS FOR SUPERVISING OBJECTS WITH REGARD TO OVERHEATING

Torbjörn Birging, Västra Lön, and Carl-Gösta Ardenjö, Vesterby Lön, both of S-714 00 Kopparberg, Sweden

PCT No. PCT/SE89/00075, § 371 Date Aug. 24, 1990, § 102(e) Date Aug. 24, 1990, PCT Pub. No. WO89/08308, PCT Pub. Date Sep. 8, 1989
PCT Filed Feb. 23, 1989, Ser. No. 571,597
Claims priority, application Sweden, Feb. 24, 1988, 8800625
Int. Cl.[5] G08B *17/00*
U.S. Cl. 340—584 4 Claims



1. An apparatus for supervising an object, such as a hot plate or an electrical stovetop, with regard to overheating, said apparatus comprising:

at least one detector for detecting the temperature of said object to generate output signals indicative of said temperature;

an alarm device for delivering an alarm;

an electrical control for activating said alarm device in response to said output signals from said detector, said electrical control comprising at least a first control circuit responsive to said output signals to activate said alarm device at a first temperature level of said object, and a second control circuit responsive to said output signals to activate said alarm device at a second temperature level, higher than said first temperature level, said first control circuit being manually deactivatable by a user, said second control circuit will always activate said alarm device when said output signals from said at least one detector indicate that said second temperature level has been reached independent of whether said user has deactivated said first control circuit;

said first control circuit further includes a time delay circuit responsive to said deactivation of said first control circuit by said user, to maintain said deactivation of said first control circuit for a predetermined time period, said time delay circuit reactivating said first control circuit after the expiration of said predetermined time period; and

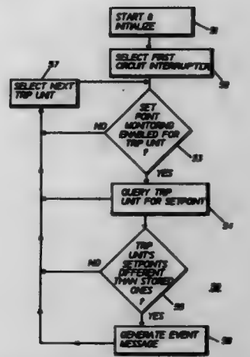
said at least one detector being a pyroelectric IR-detector of the type adapted to detect relatively rapid temperature variations, characterized in that said apparatus comprises a screen spaced ahead of said detector and being of the type having liquid crystals and an electrical drive circuit to drive said screen to alternatingly screen off said detector from IR-radiation from said object and expose said detector to said IR-radiation.

5,196,831

ELECTRIC SWITCHGEAR EQUIPMENT WITH DETECTION OF UNAUTHORIZED CHANGES TO THE SETPOINTS

Jose Bacheider, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 19, 1991, Ser. No. 732,529
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—638 5 Claims



1. A method of deterring unauthorized setpoint change in electronic trip circuit interrupters comprising the steps of:

providing a central processor unit a plurality of circuit interrupters having electronic trip units;

providing a communication link between each of said circuit interrupters and said central processor unit;

recording original setpoint data within each of said electronic trip units and within said central processing unit;

periodically comparing said original setpoint data to real time setpoint data within said electronic trip units; and

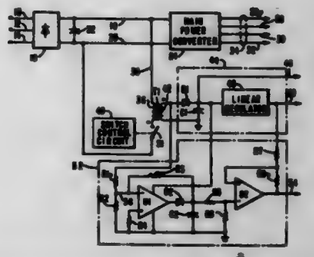
displaying indication of any difference between said real time setpoint data and said original setpoint data.

5,196,832

ELECTRIC POWER SYSTEM WITH LINE FAILURE DETECTION

John M. Griffin, Wapakoneta, Ohio, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 30, 1990, Ser. No. 605,985
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—663 13 Claims



1. An electric power circuit with line voltage failure detection, said circuit comprising:

a pair of DC power conductors for receiving a DC voltage;

a compressor connected across said DC power conductors;

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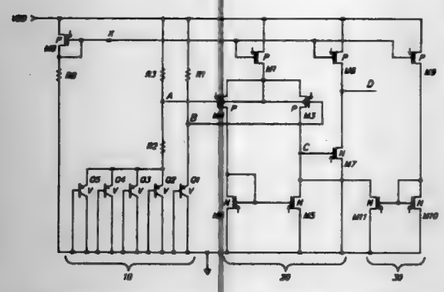
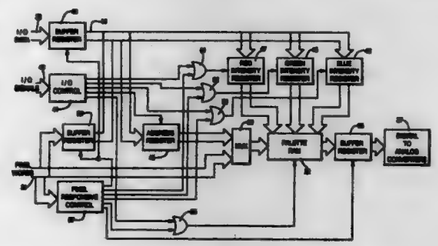
a capacitor connected across said DC power conductors;
a main power converter connected to receive said DC voltage from said DC power conductors, for producing an output supply voltage on a main power bus;
a circuit branch connected in parallel with said DC power conductors, said circuit branch including a switching device and a primary winding of a transformer electrically connected in series with each other;
means for controlling the operation of said switching device to produce a voltage across a secondary winding of said transformer, said voltage across said secondary winding including a series of voltage pulses corresponding to on and off times of said switching device, said series of voltage pulses having a negative peak amplitude that is proportional to said DC voltage; and
means for producing a line failure indicating signal when the negative peak amplitude of said voltage pulses, in said voltage across said secondary winding during the off times of said switching device, falls below a preselected value, said line failure indicating signal indicating a failure of said DC voltage across said DC power conductors.

5,196,833
LOW VOLTAGE DETECTOR CIRCUIT
Christopher J. Kemp, Monument, Colo., assignor to Ford Motor Company, Dearborn, Mich.
Filed Aug. 13, 1991, Ser. No. 744,613
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—663 7 Claims



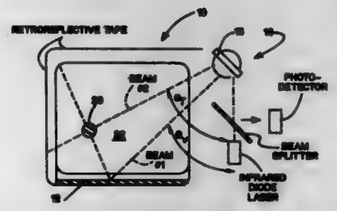
1. A temperature insensitive low voltage detector, adapted for implementation on an integrated circuit, for generating a warning signal when the supply voltage powering the integrated circuit drops below a predetermined range, comprising:
comparator means, coupled to and powered by the supply voltage, for generating at a signal node an operating signal which is generally proportional to the level of the supply voltage when it exceeds the predetermined range,
failure driver means, coupled to and powered by the supply voltage and having an output node coupled to said signal node, for generating at said output node a failure signal that is generally constant for supply voltages near the predetermined range and in opposition to said operating signal, said failure signal being generally much smaller than said operating signal under normal temperature and voltage supply conditions but which in comparison becomes larger than said operating signal when the supply voltage drops below the predetermined range, and
output driver means, coupled to and powered by the supply voltage and having an input node coupled to said signal node, for generating at an output thereof warning signal responsive to said failure signal exceeding said operating signal.

5,196,834
DYNAMIC PALETTE LOADING OPCODE SYSTEM FOR PIXEL BASED DISPLAY
Steven D. Edelson, Wayland, and Marc Norvig, Allston, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.
Filed Dec. 19, 1989, Ser. No. 452,422
Int. Cl.[5] G09A *1/28*
U.S. Cl. 340—703 9 Claims



1. In a color pixel display system comprising a palette random access memory having a multiplicity of storage locations, each capable of storing a value representing a color to be displayed, means to apply pixel words in sequence to said palette random access memory, said palette random access memory having means to read out values from memory locations selected by said pixel words, and means to generate a pixel based color display in accordance with the values read out from said palette random access memory, the improvement comprising pixel control means responsive to a predetermined pixel word in the sequence of pixel words applied to said palette random access memory to cause a new color to be stored in said palette random access memory at a selected address location, wherein the new color stored by said pixel control means is specified in the pixel words immediately following said predetermined pixel word in said sequence of pixel words.

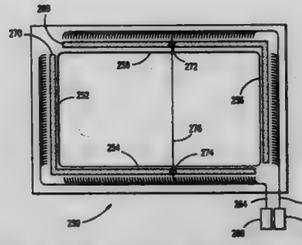
5,196,835
LASER TOUCH PANEL REFLECTIVE SURFACE ABERRATION CANCELLING
Larry A. Blue, Durham; Bruce T. Freedman, Cary, both of N.C.; Jose F. Gonzalez-Heres, Miami Beach, Fla., and Alexander G. MacInnis, Chapel Hill, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 554,977, Jul. 12, 1990, abandoned, which is a continuation of Ser. No. 251,604, Sep. 30, 1988, abandoned. This application May 2, 1991, Ser. No. 697,493
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—712 15 Claims



1. In an apparatus which determines the location of a pointer relative to a surface area by triangulation where the apparatus includes a light source, means for causing light beams from said source to form a light plane relative to the surface area, one or more reflective surfaces positioned at the periphery of said light plane and means for detecting the absence of light reflected from those surfaces, a method for compensating for aberrations in the reflective surfaces which may otherwise be interpreted as indicating the presence of a pointer, said method comprising the steps of:
(a) activating the light beams to form the light plane relative to said surface area;
(b) determining each beam position whereat an aberration indicating beam interruption occurs during a sequence while no pointer is in use;
(c) determining each beam position whereat beam interruptions occur while a pointer is in use;
(d) comparing the beam positions at interruptions occurring during no pointer use with beam positions at interruptions occurring during pointer use; and discarding beam positions only if the offset between their respective displacements e fall within a range of predetermined values, otherwise performing further tests to distinguish aberration-cause signals from valid pointer signals.

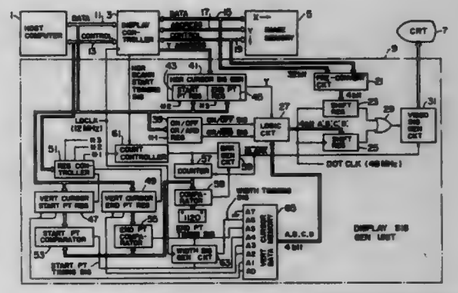
energy detector such that energy traveling through the second energy path is detected by the energy detector;
the energy detector further having means to provide a signal to the computer indicating the presence or absence of energy;
first and second vertical LCD masks attached respectively to the first and second vertical sides of the frame, the masks arranged such that they lie in the path of energy transmitted from the first vertical side to the second vertical side;
first and second horizontal LCD masks attached respectively to the first and second horizontal sides of the frame, the masks arranged such that they lie in the path of energy transmitted from the first horizontal side to the second horizontal side;
a multiplexor having means to receive control signals from the computer;
the multiplexor having means to synchronously scan the first and second vertical LCD masks such that only a narrow beam of energy can travel from the first vertical side to the second vertical side at any point in time;
the multiplexor having means to synchronously scan the first and second horizontal LCD masks such that only a narrow beam of energy can travel from the first horizontal side to the second horizontal side at any point in time;
the multiplexor having means to mask all first and second horizontal LCD masks when the first and second vertical LCD masks are scanned, and mask all first and second vertical LCD masks when the first and second horizontal LCD masks are scanned;

5,196,836
TOUCH PANEL DISPLAY
Donald D. Williams, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 723,347, Jun. 28, 1991, abandoned. This application Feb. 21, 1992, Ser. No. 839,824
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—712 23 Claims



11. An optical input device for detecting and communicating to a computer the location of a stylus within a predetermined field, comprising:
a frame;
the frame further comprising a first vertical side, a second vertical side, a first horizontal side, and a second horizontal side;
a single energy emitter;
a single energy detector;
a fiber optic bundle;
the fiber optic bundle having a first energy path connected at one end to the energy emitter such that energy from the energy emitter enters the first energy path and travels through the fibers of the energy path;
the first energy path connected at the other end to the first horizontal side and the first vertical side such that the first horizontal side and the first vertical side do not obstruct the energy when the energy exits the first energy path;
the fibers in the first energy path further arranged such that energy exiting the first energy path is transmitted from a wide area of the first horizontal side and the first vertical side substantially perpendicular to the surfaces of the first horizontal side and the first vertical side, and toward the second horizontal side and the second vertical side respectively;
the fiber optic bundle having a second energy path connected at one end to the second horizontal side and the second vertical side, the fibers in the second energy path arranged such that energy received along a wide area of the second horizontal side from the first horizontal side, and energy received along a wide area of the second vertical side from the first vertical side enter the fibers;
the second energy path connected at the other end to the

5,196,837
CURSOR GENERATING APPARATUS
Wataru Shoji; Daisuke Tabuchi, and Ichiro Nakajima, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daimichi, Tokyo, Japan
Filed Apr. 23, 1991, Ser. No. 689,339
Claims priority, application Japan, Apr. 24, 1990, 2-107765
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—723 1 Claim



1. A cursor generating apparatus for generating cursor data applied in series to a display unit to display a cursor on a display screen in computer graphics, comprising:
register means for receiving and holding information indicative of start and end points of a cursor on the display screen and given from a host computer;
counting means for counting block numbers now being scanned on the basis of scanning timing related signals, when a scanning line is divided into plural blocks each including a predetermined number of pixels on the display screen;
comparing means for comparing the block number outputted from said counting means with a specific block number belonging to start and end points included in the information held in said register means and generating start and

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end point timing signals corresponding to the compared result;

generating means for generating a width timing signal on the basis of the start and end point timing signals;

cursor data memory means for receiving start and end point pixel numbers in a specific block included in the information indicative of the start and end points and held in said register means, the start and end point timing signals, and the width timing signal as address data and for reading one pattern in parallel from a pattern group of previously programmed cursor data of a predetermined number of bits; and

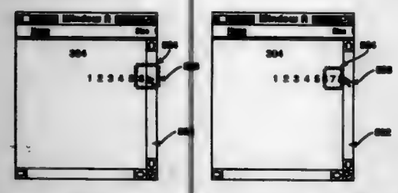
shift register means for converting the pattern of cursor data read in parallel from said cursor data memory means into serial data.

5,196,838

INTELLIGENT SCROLLING

John R. Meier; John W. Sullivan, both of Cupertino, and Paul Mercer, Palo Alto, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 28, 1990, Ser. No. 635,228
Int. Cl.[5] G09G 3/02
U.S. Cl. 340—724 19 Claims



1. In a computer controlled display system having a display wherein a plurality of regions may be displayed including at least a first region, said first region having at least a first item within a visible display area of said first region and said first region having at least one item, including a second item, which is not within the visible display area of said first region, a method for scrolling the contents of said first region to display said second item comprising:

selecting at least said first item within said first region by positioning a cursor over said first item and by placing a switch means in a predetermined position so that said first item is associated with said cursor for further operation or manipulation;

positioning said cursor over a predetermined scrolling area;

determining that a predetermined period of time has elapsed while the cursor has been positioned in said predetermined scrolling area; and

scrolling the contents of said first region in a direction corresponding to said predetermined scrolling area to display said second item while said first item remains selected and associated with said cursor.

5,196,839

GRAY SCALES METHOD AND CIRCUITRY FOR FLAT PANEL GRAPHICS DISPLAY

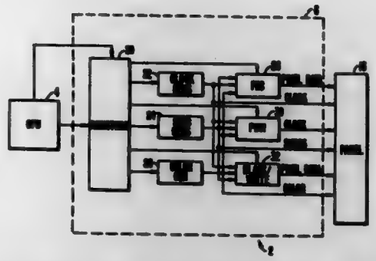
Arun Johary, and Tetsuji Oguchi, both of San Jose, Calif., assignors to Chips and Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 245,875, Sep. 16, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 598,582
Int. Cl.[5] G09G 3/20
U.S. Cl. 340—793 6 Claims

1. A controller for controlling a monochrome video display, the monochrome video display comprised of a plurality of pixel elements, the pixel elements having a non-linear response of a first predetermined time period to the application of a predetermined display voltage, the controller providing zero to N gray scale levels of the pixel elements, the controller comprising:

table means for storing zero to N time periods, the N time periods corresponding to the zero to N gray scale levels, wherein the N time periods corresponding to gray scale levels two to N are dependent upon an incremental time period, the incremental time period being determined by the steps of:

determining a minimum baseline time for applying the predetermined display voltage to a pixel element, the minimum baseline time corresponding to the time period necessary to apply the display voltage to charge pixel element to gray scale level one, the minimum baseline time being at least equal to the first predetermined time period during which the pixel has a non-linear response to the predetermined voltage;



determining a maximum time that the display voltage can be applied to a pixel element, the maximum time corresponding to the time period necessary to apply the display voltage to charge the pixel element to the gray scale level N;

subtracting the minimum baseline time from the maximum time;

dividing the result of the subtracting step by N, the maximum gray level, the result being the incremental time; and

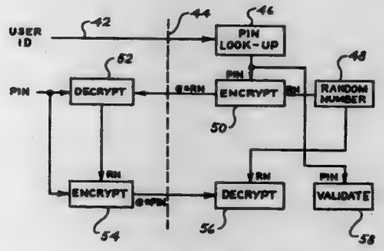
means for applying the display voltage to the pixel elements for a time equal to the zero to N time periods, wherein time period one is equal to the minimum baseline time and time periods two through N correspond to the minimum baseline time added to the incremental time period multiplied by two through N, respectively.

5,196,840

SECURE COMMUNICATIONS SYSTEM FOR REMOTELY LOCATED COMPUTERS

Victor S. Leith, Stanley, and James V. Stevens, Huntersville, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1990, Ser. No. 609,354
Int. Cl.[5] H04Q 9/00
U.S. Cl. 340—825.3 49 Claims



1. A security system for validating the authority of a remote user to communicate with a host device, said system comprising:

means at the host device for storing user ID and personal identification number (PIN) information;

means for sending the ID information across a communications channel from the remote user to the host device;

means at the host device for providing a non-predetermined signature value;

means at the host device for ciphering the signature value under a first key value which is dependent upon at least a portion of the stored ID and PIN information;

means for sending the ciphered signature value across the communications channel to the remote user;

means at the remote user location for deciphering the ciphered signature value received from the host device under a second key value which is equal to said first key value and derived from the same information as said first key value;

means at the remote user location for ciphering the deciphered signature value under a third key value and for sending the ciphered signature value to the host device; and

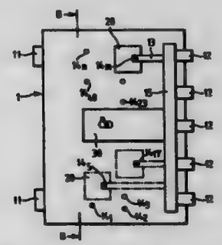
validation means at the host device for deciphering the ciphered signature value received from the remote user location and for determining if the deciphered signature value is equal to the signature value originally provided by the host device.

5,196,841

VAULT DOOR LOCKING SYSTEM FEATURING MICROPROCESSOR-BASED LOCKING MEANS WITH REDUNDANCY CONTROL OVERRIDE

Josef Harder, Regensberg, and Peter Kappeler, Regensdorf, both of Switzerland, assignors to Bauer AG, Rumlang, Switzerland

Continuation-in-part of Ser. No. 100,161, Sep. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 556,333, Nov. 30, 1983, abandoned. This application May 29, 1990, Ser. No. 531,913
Claims priority, application Switzerland, Dec. 3, 1982, 7056/82
Int. Cl.[5] G06F 7/00; E05B 47/00, 49/00
U.S. Cl. 340—825.31 11 Claims



1. A decentralized locking system for a security door having a bolt beam with bolts, comprising:

a plurality of locks mounted on an inner surface of the door, each lock being operatively connected to the bolt beam by a lock bar, each lock having a respective lock control means for separately and independently blocking or releasing the bolt beam, each lock being randomly distributed at a different location on the inner surface of the door;

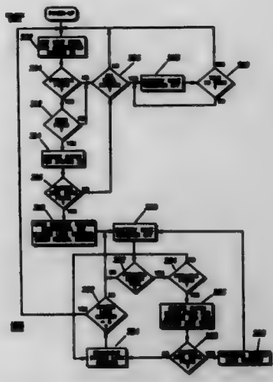
lock operating means for receiving opening and closing codes from a user and controlling each of said plurality of locks in response thereto, having input means being spaced from said plurality of locks and located outside said door, said input means being electrically interconnected in parallel to the respective lock control means for supplying the opening and closing codes to each of said locks.

5,196,842

PAGER CAPABLE OF OPERATING IN MULTIPLE PAGING SYSTEMS

Fernando A. Gomez, West Palm Beach; Tommy R. Rudy, and Thomas F. Holmes, both of Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 22, 1991, Ser. No. 733,921
Int. Cl.[5] H04Q 7/00
U.S. Cl. 340—825.44 8 Claims



4. A method for selecting a paging system on which a pager having multiple paging system capability is to operate, each of the plurality of paging systems transmitting information messages which include idle messages during periods of idle system activity, each of the paging systems also having unique system identification information that is transmitted periodically via the idle messages, the pager having a plurality of system configuration parameters, each set of system configuration parameters being associated with a unique paging system identification number which is also stored in the pager, each set of system configuration parameters corresponding to a unique paging system, comprising the steps of:

presetting the pager to one of the plurality of system configuration parameters stored in the pager;

attempting to receive information messages from one of the plurality of paging system;

decoding any received information messages in order to determine the unique system identification information contained in the idle messages;

comparing the unique system identification information decoded with the unique paging system identification number which is part of the system configuration parameters presently being utilized by the pager;

maintaining the pager operating with the presently selected system configuration parameters if the system identification information that was decoded matches the unique paging system identification number associated with the preset system configuration parameters; and

selecting a new set of system configuration parameters if the system identification information that was decoded does not match the unique paging system identification number.

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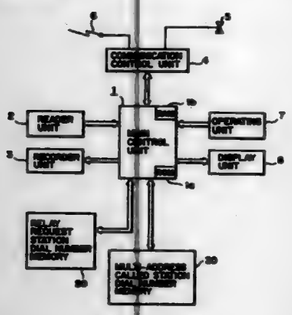
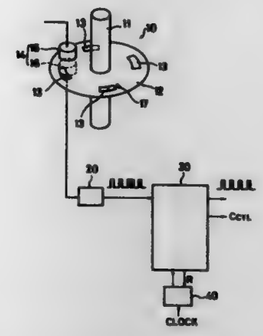
5,196,843
DATA COMMUNICATION APPARATUS WITH MULTI-ADDRESS CALLING
Motoshi Yoshino, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 442,721, Nov. 29, 1989, abandoned. This application Sep. 3, 1991, Ser. No. 752,979
Claims priority, application Japan, Nov. 29, 1988, 63-299541
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.52 8 Claims



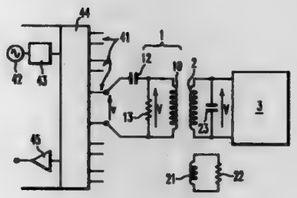
1. A data communication apparatus comprising:
receiving means for receiving data;
memory means for storing address data of multi-address called stations in advance;
sending means for sending the data received by said receiving means in a multi-address calling mode;
means for receiving an instruction signal for instructing relay multi-address calling from a relay request station, and receiving address data of the relay request station; and
control means for causing said sending means to perform multi-address calling to multi-address called stations using the address data stored in said memory means in response to reception of the relay instruction signal,
wherein said control means, without receiving address data of multi-address called stations from the relay request station, transmits the received data to the multi-address called stations in accordance with the address data stored in said memory means, and
wherein said control means discriminates the existence of the address data of the relay request station from among the address data stored in said memory means to inhibit sending-out the received data to the relay request station and thereby transmit the received data to the multi-address called stations exclusive of the relay request station.

5,196,844
METHOD AND APPARATUS FOR DETECTING REFERENCE ROTATIONAL ANGLE FOR EACH CYLINDER IN MULTIPLE-CYLINDER INTERNAL COMBUSTION ENGINE
Naoki Tomisawa, and Takaaki Mogi, both of Isesaki, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan
Filed Aug. 22, 1989, Ser. No. 397,260
Int. Cl.[5] F02P *7/073, 7/04;* G01P *3/486*
U.S. Cl. 340—870.29 21 Claims

1. A method for detecting a reference rotational angle for each cylinder in a multiple-cylinder internal combustion engine, which comprises outputting a reference pulse signal at a position of a predetermined rotational angle of the engine at a specific stroke of each cylinder synchronously with the revolution of the engine, outputting a cylinder-discriminating pulse signal of a predetermined amplitude in the same output line as said reference pulse signal just after termination of one of said reference pulse signals, detecting and storing precedent and present values of elements, concerning the time, of said pulse signals, calculating the ratio of said present value to said precedent value, and performing discrimination of said cylinder when said ratio is smaller than a predetermined constant value.

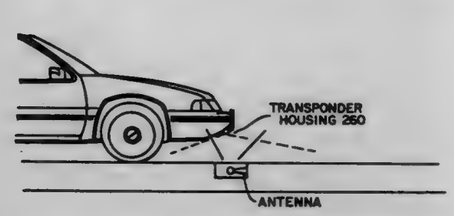


5,196,845
ANTENNA FOR TIRE MONITORING DEVICE
David Myatt, Chateaugay, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand Cedex, France
Continuation of Ser. No. 424,911, Oct. 23, 1989, abandoned. This application Dec. 27, 1991, Ser. No. 818,441
Claims priority, application France, Oct. 24, 1988, 88 14295
Int. Cl.[5] G08C *19/06*
U.S. Cl. 340—870.31 18 Claims



1. First antenna integral with a wheel support for a tire monitoring device which transmits by inductive coupling with a second antenna integral with a wheel, said first antenna comprising:
an inductance forming coil;
a capacitance connected to said coil, said capacitance and said coil forming a resonant circuit; and
means to clip the flux passing from said first antenna to said second antenna, so as to introduce a non-linear damping of said resonant circuit whereby said first antenna acquires a combination of a high quality factor and a broad pass band.

5,196,846
MOVING VEHICLE IDENTIFICATION SYSTEM
William K. Brockelsby, 11025 82 Avenue #1006, Edmonton, Canada T6G 0T1 ; Conrad M. B. Walker, Rural Route #5, Site 11, Edmonton, Canada T5P 4B7 ; Michael L. Hryciuk, 11719-28 Avenue, Edmonton, Canada T6J 3P1 , and Donald P. Gillis, 11448 71st Avenue, Edmonton, Canada T6G 0A7
Continuation-in-part of Ser. No. 446,234, Dec. 5, 1989, which is a continuation-in-part of Ser. No. 383,169, Jul. 20, 1989, Pat. No. 4,937,581, which is a continuation of Ser. No. 195,400, May 13, 1988, Pat. No. 4,870,419, which is a continuation of Ser. No. 661,712, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 536,010, Sep. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 234,570, Feb. 13, 1981, abandoned. This application Jan. 18, 1990, Ser. No. 539,703
Int. Cl.[5] G08G *1/01*
U.S. Cl. 340—933 14 Claims

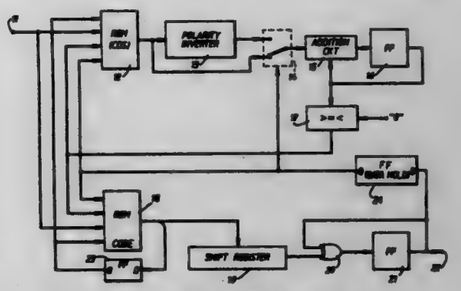


14. In a system for exchanging information between a fixed position interrogator and a transponder comprising storage means and moving in the vicinity of said interrogator, a method of operating said transponder comprising:
receiving a first trigger pulse from said interrogator;
transmitting, in response to said received first trigger pulse, a first data message derived from data contained by said storage means at the time said first trigger pulse is received;
receiving a second data message from said interrogator;
storing in said storage means data derived from said second data message;
receiving a second trigger pulse from said interrogator after said storing step; and
transmitting a third data message comprising data derived from data contained by said storage means at the time that said second trigger pulse is received.

5,196,847
GROUND PROXIMITY WARNING INSTRUMENT USING FLIGHT PATH MODULATION OF GLIDE SLOPE ALERTING FUNCTION
Charles D. Batemana, Bellevue, Wash., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Sep. 18, 1991, Ser. No. 761,537
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—970 11 Claims

1. A glide slope warning system for aircraft responsive to a signal representative of the deviation of an aircraft from a glide slope radio beam and to a signal representative of the flight path of the aircraft, comprising:
means responsive to said glide slope deviation signal for generating a glide slope alert when the aircraft descends below the glide slope by a predetermined amount according to a predetermined set of criteria; and
means for reducing nuisance warnings, including means responsive to said flight path representative signal for altering said predetermined set of criteria as a function of the flight path of the aircraft to increase said predetermined amount when the aircraft is descending at less than a predetermined rate.

5,196,848
CODE MODULATION SYSTEM USING MODULATED DATA CODE TABLES
Yoshihiro Sakazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jul. 12, 1991, Ser. No. 728,686
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—58 4 Claims

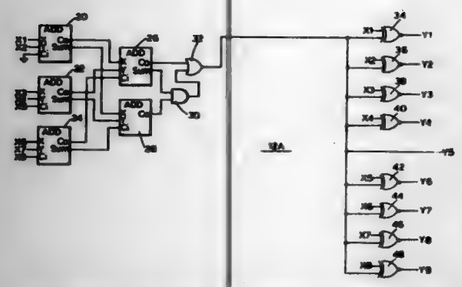


1. A modulation circuit apparatus comprising:
input means for receiving m-bit digital data codes;
table means for storing a plurality of conversion tables, each table including a conversion from an m-bit digital data code to an n-bit modulated data code, where n>m;
digital sum variation calculation means for determining a digital sum variation polarity value of said modulated data code;
non-return to zero inverted conversion means for converting said digital data code to a waveform polarity value, said waveform polarity value being either positive or negative;
waveform polarity determining means for determining the value of a predetermined bit of a preceding modulated data code;
table selecting means for selecting one of the plurality of conversion tables in accordance with the digital sum variation polarity value, the waveform polarity value, and the value of the predetermined bit of the preceding modulated data code;
modulated data code selecting means for selecting a modulated data code from said selected conversion table that corresponds to the digital data code; and
output means to output said modulated data code.

5,196,849
METHOD AND APPARATUS FOR IMPLEMENTING PRML CODES WITH MAXIMUM ONES
Richard L. Galbraith, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 31, 1992, Ser. No. 829,796
Int. Cl.[5] H03M *7/46*
U.S. Cl. 341—59 16 Claims

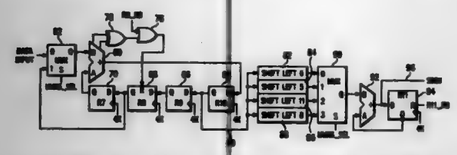
1. A method for encoding a predefined number of bits of binary data into codewords having a predefined number of bits for a partial-response maximum-likelihood (PRML) data channel in a direct access storage device (DASD) comprising the steps of:
receiving the binary data; and

generating sequences of codewords responsive to the received binary data;
each of said generated codewords being included within a predetermined set of codewords, said codeword set having a maximum number of binary ones;
said generated sequences of codewords having less than a first predetermined number of consecutive zeros;



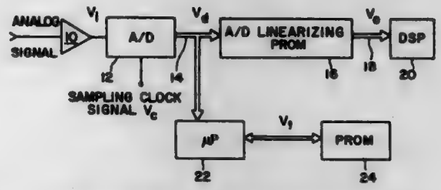
said generated sequences of codewords including two subsequences, one of said subsequences including odd bit positions and another of said subsequences including even bit positions, said subsequences having less than a second predetermined number of consecutive zeros.

5,196,850
FOURTH ORDER DIGITAL DELTA-SIGMA MODULATOR
Michael L. Duffy, and Navdeep S. Sooch, both of Austin, Tex., assignors to Crystal Semiconductor, Austin, Tex.
Filed Nov. 13, 1991, Ser. No. 791,977
Int. Cl.[5] H03M *3/00*
U.S. Cl. 341—76 **28 Claims**



1. A delta-sigma converter of nth order for a digital-to-analog converter for receiving an m-bit digital word at a first sampling rate and converting it to an m'-bit word, m' being less than m, comprising:
an input summing junction for receiving as a digital input the m-bit digital word and a feedback value and generating the sum thereof;
n integration stages of modulation, select ones thereof having a feed-forward path and a scaling factor associated therewith;
an output summing junction for receiving an output of each of said feed-forward paths and generating the sum thereof; and
a quantizer for receiving the output of said output summing junction and generating both the m'-bit output of the delta-sigma converter and the feedback signal for input to said input summing junction;
said n integration stages each having:
an adder having two inputs,
a data register medium for temporarily storing an output of said adder and having at least one register that is operable to present on an output thereof more than one accumulated value at different times for a given digital input,
a multiplexing device for multiplexing the operation of said adder for each word received from said input summing junction to perform a plurality of summations with the value of the digital input and previously stored values from said data register medium to perform the operation of each stage of integration and store the result in said data register medium as accumulated values, and
an output device for selecting the accumulated values for input to said output summing junction after generation thereof in accordance with the operation of the associated integration stage thereof.

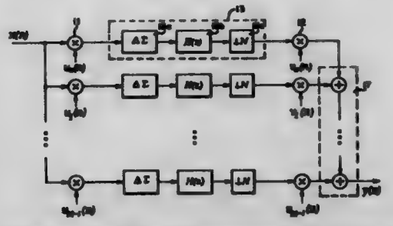
5,196,851
LINEARIZING NON-LINEAR ANALOG-TO-DIGITAL PROCESS AND CIRCUIT
Chandrakant B. Patel, Hopewell, and Thomas Meyer, Mercerville, both of N.J., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed May 24, 1991, Ser. No. 704,986
Int. Cl.[5] H03M *1/10*
U.S. Cl. 341—140 **7 Claims**



1. An analog-to-digital converter, comprising:
converter means for converting amplitudes of a plurality of corresponding successive intervals of an analog signal into first digital values representative of said successive intervals of said analog signal, said converting means being of a substantially linear type in which the change in amplitude over each successive interval is substantially similar to each of the changes in amplitude over each of the other of those successive intervals and said first digital values are numbers that change in their lease significant place when said analog signal goes from one of said successive intervals to the adjoining one; and
storage means for storing a plurality of second digital values at different corresponding ones of a plurality of distinct addresses, said plurality of distinct addresses corresponding to specific ones of said plurality of first digital values, said plurality of second digital values extending over a range and exhibiting a linear relation over said range to said amplitudes of said analog signal, and for responding to reception of said first digital values by addressing said linear values stored at corresponding ones of said plurality of distinct address.

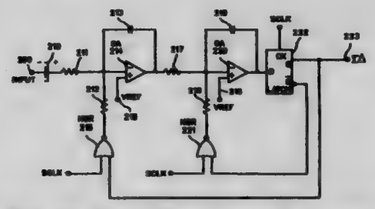
5,196,852
ANALOG-TO-DIGITAL CONVERTER USING PARALLEL ΔΣ MODULATORS
Ian A. Galton, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.
Filed Feb. 21, 1992, Ser. No. 839,793
Int. Cl.[5] H03M *3/02*
U.S. Cl. 341—143 **8 Claims**

1. An analog-to-digital converter comprising a plurality, M, of channels connected to operate in parallel on a sequence of analog input signal samples, x(n), received at a sampling rate Nf, where f is the Nyquist sample rate of said input signal and N, a constant positive integer, is an oversampling ratio, each channel comprising,
means for multiplying each of said signal samples in sequence at said sampling rate Nf by a sequence of multipliers, $u_r(n)$, of +1 and −1 derived from an MxM Hadamard matrix,
a delta-sigma modulator for analog-to-digital conversion of said modulated signal samples in sequence,
means for digitally filtering said analog-to-digital signal samples in sequence at a rate f and decimation of said signal samples in sequence by a factor N, and
means for digitally multiplying said digitally filtered signal samples in sequence at a rate f by a sequency of multipliers, $v_r(n)$, of +1 and −1 derived from an MxM Hadamard



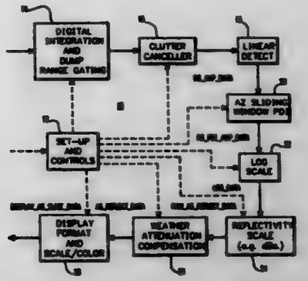
matrix, where the rate of said sequence of multipliers $v_r(n)$ is that of $u_r(n)$ divided by said oversampling ratio, N, to produce a channel output sequence, wherein said multiplying means for said sequence of analog input samples and said digital multiplying means for said sequence of digitally filtered samples are comprised of sign inverters for each sample in sequence in response to said sequence of +1 and −1,
and means for digitally summing all channel output sequences to produce an overall output.

5,196,853
SIGMA DELTA CONVERTER INSENSITIVE TO ASYMMETRICAL SWITCHING TIMES
Jean-Claude Abbiate, La Gaude, and Gerard Richter, Nice, both of France, assignors to International Business Machines Corp., Armonk, N.Y.
Filed Nov. 25, 1991, Ser. No. 797,609
Claims priority, application European Pat. Off., Jan. 15, 1991, 91400009.9
Int. Cl.[5] H03M *3/02*
U.S. Cl. 341—143 **4 Claims**



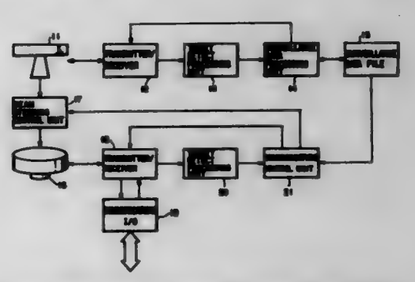
1. Sigma-delta converter for converting an analog input signal into a sigma-delta code including a threshold device (222) for generating an output and feedback signal, a filter (214, 220) receiving said analog input signal and said output and feedback signal by means of at least one feedback loop, characterized in that it further includes:
means (215, 221) located in said at least one feedback loop for performing a return-to-specified-logical-state of the sigma-delta code generated by said threshold device at every period of the sigma delta clock whereby said sigma-delta converter is insensitive to the asymmetry of the rise and fall times of said threshold device and further including: means (204, 206, 205, 207) for varying the duration of said return-to-zero thereby introducing an amplification step into the sigma-delta conversion process.

5,196,854
INFLIGHT WEATHER AND GROUND MAPPING RADAR
Bruce D. Mathews, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 13, 1991, Ser. No. 714,132
Int. Cl.[5] G01S *13/95, 13/89*
U.S. Cl. 342—26 **11 Claims**



1. A method of weather radar rain compensation, comprising:
(a) determining a rain rate from a first radar return based on the apparent reflectivity of the rain within a first radar range gate region;
(b) producing a two way attenuation value for the first radar range gate region from the rain rate responsive to first and second adjustment values, the first adjustment value corresponding to negligible self attenuation and the second adjustment value corresponding to dominant self attenuation, which second adjustment value is a non-linear function of said apparent reflectivity and of the width of said first radar range gate region; and
(c) adjusting a second radar return from a second radar range gate region behind the first radar range gate region responsive to the two way attenuation value.

5,196,855
SECONDARY SURVEILLANCE RADAR SYSTEM
Yuichi Kuroda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 8, 1992, Ser. No. 879,918
Claims priority, application Japan, May 9, 1991, 3-104283
Int. Cl.[5] G01S *13/76, 13/87*
U.S. Cl. 342—37 **5 Claims**



1. A secondary surveillance radar system comprising:
a mechanical scanning sensor using a mechanical rotation type of antenna to form a beam in a horizontal plane and rotate it at a constant speed and having a function of performing mode-A/C general inquiry/response with aircraft targets within the beam, and a function of preparing management data file for the aircraft targets on the basis of responses from the aircraft targets; and

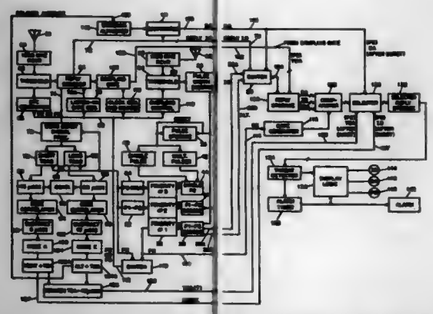
an electronic scanning sensor using an electronic scanning type of antenna for electronically causing a beam to scan in a horizontal plane, and having a function of designating the aircraft targets in sequence by referring to the management data file, a function of performing mode-S individual inquiry/response with each of the aircraft targets designated in sequence, and a function of performing data link communications with each of the targets.

5,196,856

PASSIVE SSR SYSTEM UTILIZING P3 AND P2 PULSES FOR SYNCHRONIZING MEASUREMENTS OF TOA DATA

George B. Litchford, Northport, and Burton L. Halland, Long Beach, both of N.Y., assignors to Litchstreet Co., Northport, N.Y.

Filed Jul. 1, 1992, Ser. No. 908,183
Int. Cl.[5] G01S *3/02*
U.S. Cl. 342—455 12 Claims



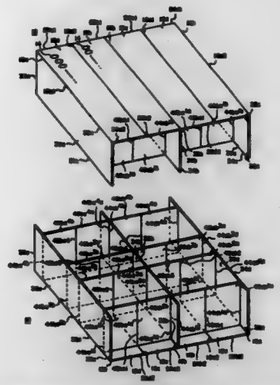
1. A method for detecting at an Own station the proximity of transponder-equipped Other stations, comprising the steps of:
(a) receiving side lobe suppression signals (SLS) transmitted by SSR stations located within operating range of said Own station;
(b) receiving reply messages transmitted by transponder-equipped Other stations in response to main beam interrogations of Others by said SSR stations during a predetermined time period following the reception of each SLS signal;
(c) determining from said received SLS signals and said reply messages a differential time of arrival (TOA) value for each reply message;
(d) associatively storing said reply messages and TOAs for several of the most recent reply messages representative of a predetermined number of interrogation periods;
(e) selecting from the TOA values stored in step (d) those TOA values that differ by 13 microseconds;
(f) subtracting 19 microseconds from the longer TOA values and 6 microseconds from the shorter TOA values selected in step (e), for establishing a common TOA value representative of what the TOA value would have been had main beam interrogation signals, rather than SLS signals, been used in step (c) to determine TOA values; and
(g) decoding reply messages having longer TOA values as altitude codes and reply messages having shorter TOA values as identity codes.

5,196,857

STOWABLE AND DEPLOYABLE ANTENNA ARRAY

Frank R. Chiappetta, Berwyn; Christopher L. Frame, King of Prussia, and Kenneth L. Johnson, Eagleville, all of Pa., assignors to General Electric Company, East Windsor, N.J.

Filed Jan. 3, 1991, Ser. No. 709,736
Int. Cl.[5] H01Q *1/08, 1/12;* B64G *1/44*
U.S. Cl. 343—881 14 Claims



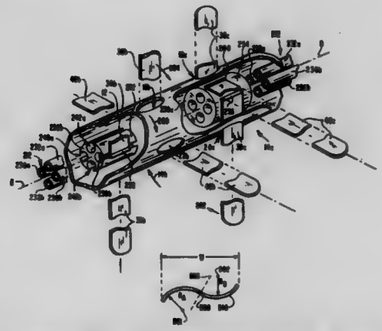
1. An array antenna deployable from a stowed state, comprising:
a first plurality of mutually similar, flat, rectangular antenna panels, upon each of which antenna panels at least one flat antenna is disposed, each of said antenna panels defining a thickness dimension associated with its shortest sides, a width dimension associated with second sides, which width dimension is greater than said thickness dimension, and a length dimension associated with its longest sides, which length dimension is greater than said width dimension, each of said antenna panels including a hinged connection to at least one other of said antenna panels, said connection being made along one of said longest sides, to thereby define plural hinged connections and a pair of free ends, said plurality of antenna panels being in a coplanar condition in a deployed state of said array antenna, and being folded along said hinged connections accordian-style in a stowed state of said array antenna, the volume of said antenna in said stowed state being directly related to said thickness dimension, whereby it is desirable to reduce said thickness of said antenna panels to reduce said stowed volume, but the stiffness of said antenna panels is itself thereby reduced so that said antenna array may, in said deployed state, undesirably be deflected away from said coplanar condition;
a second plurality, smaller in number than said first plurality, of mutually similar, flat, rectangular lateral stiffening panels, each of said lateral stiffening panels defining a thickness dimension associated with its shortest sides, a width dimension associated with its second sides, which width dimension is greater than said thickness dimension, and a length dimension associated with its longest sides, which length dimension is greater than said width dimension, each of said lateral stiffening panels being associated with either (a) one of said free ends or (b) one of alternate ones of said hinged connections, each of said stiffening panels being hingedly joined along one of its long sides to its associated one of said free ends and said alternate ones of said hinged connections; and
a plurality of mutually similar, flat, rectangular, foldable longitudinal stiffening panels, each of said longitudinal stiffening panels being capable of assuming a folded state and an unfolded state, each of said longitudinal stiffening panels in said unfolded state defining a thickness dimension associated with its shortest sides, a width dimension associated with its shortest sides, which width dimension associated with its second sides, which width dimension is greater than said thickness dimension, and a length dimension associated with its longest sides, which length dimension is greater than said width dimension and which is also substantially equal to twice said width dimension of one of said antenna panels, each of said longitudinal stiffening panels being foldable along a line extending parallel to, and midway between, said second sides of said longitudinal stiffening panel, each of said longitudinal stiffening panels having one of its said second sides hingedly attached, at a location, to one of said lateral stiffening panels along a line parallel to one of said second sides of said one of said lateral stiffening panels, and the other one of its said second sides hingedly attached, at a corresponding location, to the next adjacent one of said lateral stiffening panels.

5,196,858

DEPLOYABLE S-SHAPED ANTENNA ELEMENT

David G. Reed, Langhorne, Pa., assignor to General Electric Co., East Windsor, N.J.

Filed Dec. 20, 1990, Ser. No. 630,476
Int. Cl.[5] H01Q *1/08, 9/30*
U.S. Cl. 343—900 1 Claim



1. An antenna with a self-supporting element, comprising:
a thin, electrically conductive first element defining an axis of elongation when in a deployed state, said element being formed from a spring material capable of storing mechanical energy when said element is coiled in a retracted state, said element further having a deployed cross-sectional shape in a plane orthogonal to said axis of elongation, said cross-sectional shape being continuous, and consists solely of a first portion having a radius of curvature with a center residing on one side of said element, and a second portion having a radius of curvature with a center residing on the other side of said element, said first and second portions connecting in a manner defining an open figure.

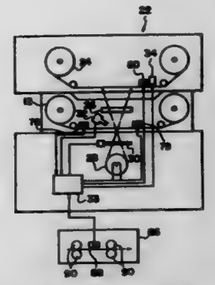
5,196,859

PICTURE PROCESSING SYSTEM

Susumu Tomiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 21, 1991, Ser. No. 748,125
Claims priority, application Japan, Sep. 12, 1990, 2-241901
Int. Cl.[5] G11B *9/00;* G03B *17/24*
U.S. Cl. 346—74.5 18 Claims

1. A picture processing system for printing an image on a negative film onto a photographic paper to form a photographic paper image, said photographic paper having a photographic paper magnetic recording portion, and said negative film having a negative film recording portion, said image of said negative film being a negative film image, said negative film recording portion having recorded thereon information about the negative film image, said system comprising:
write means for magnetically writing first information onto said photographic paper magnetic recording portion to store said first information therein, said first information being information about said photographic paper image;



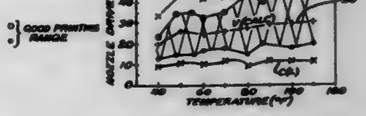
read means for reading said first information stored in said photographic paper magnetic recording portion; and
processing means for performing a subsequent processing on said photographic paper in response to said first information read by said read means, said processing means including means for determining whether said photographic paper image corresponds to said negative film image.

5,196,860

INK JET DROPLET FREQUENCY DRIVE CONTROL SYSTEM

James R. Pickell, Bartlett; Robert I. Keur, Niles, and James E. Clark, Naperville, all of Ill., assignors to Videojet Systems International, Inc., Wooddale, Ill.

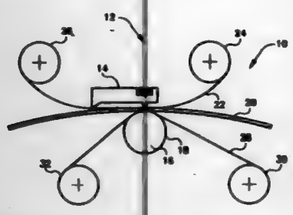
Continuation of Ser. No. 332,009, Mar. 31, 1989, abandoned. This application May 16, 1990, Ser. No. 523,847
Int. Cl.[5] G01D *18/00*
U.S. Cl. 346—75 15 Claims



1. A control circuit for setting a magnitude of an exciting voltage applied to a nozzle of an ink jet printer to break a stream of ink into droplets comprising:
(a) first means for detecting an exciting voltage value C(L) at which droplet frequency doubles as the magnitude of the exciting voltage is slowly increased from a minimum value;
(b) second means for detecting a value C(H) at which droplet formation first occurs closest to said nozzle, as said exciting energy is slowly increased from said value C(L);
(c) third means receiving as inputs the values C(L) and C(H) for calculating the exciting voltage magnitude to be utilized for printing therefrom.

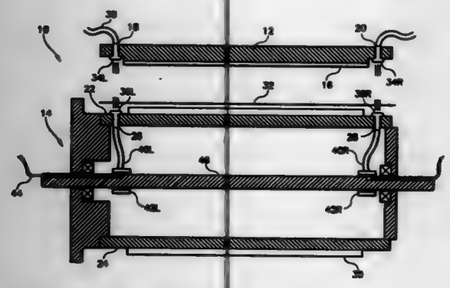
VOL 1148 ISS 4 MR 23 1993

5,196,861
APPARATUS AND METHOD FOR PROTECTING A FUSER ROLLER
Terrence L. Fisher, Sr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 5, 1992, Ser. No. 846,107
Int. Cl.[5] B41J 2/325
U.S. Cl. 346—76 PH 4 Claims



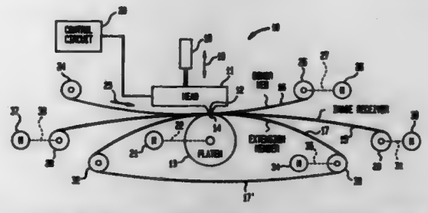
1. A thermal printing apparatus, comprising:
a fuser roller having a cylindrical surface;
a heating element having a preselected width and being movable relative to said surface between a nonfusing position at which said heating element is spaced a first preselected distance from said surface, and a fusing position at which said heating element is spaced a second preselected distance from said surface, said first preselected distance being greater than said second preselected distance; and
a protective web traversing a path between said heating element and said surface and covering a portion of said surface greater than said width of said heating element to thereby protect said surface.

5,196,862
APPARATUS AND METHOD FOR DONOR SENSING AT THE PRINT LINE IN A THERMAL PRINTER
Terrence L. Fisher, Sr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 21, 1992, Ser. No. 838,014
Int. Cl.[5] B41J 2/325
U.S. Cl. 346—76 PH 12 Claims



1. A thermal printing apparatus, comprising:
a thermal print head having a bead line;
a print drum having a cylindrical surface with openings; and
a two-part sensor assembly having a first member mounted on said thermal print head adjacent said bead line and a second member mounted in one of said surface openings.

5,196,863
PLATEN PROTECTING BORDERLESS THERMAL PRINTING SYSTEM
Joseph P. Palmer, Batavia, and Terrence L. Fisher, Sr., Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 5, 1992, Ser. No. 846,098
Int. Cl.[5] B41J 2/325
U.S. Cl. 346—76 PH 9 Claims



1. A borderless thermal printing assembly for printing images across a width of an image receiver having two side edges, from one of said edges to the other of said side edges thereof, the assembly comprising:
(a) a thermal printing head having a linear array of energizable heating elements, and a platen arranged to form a printing nip with the head defining a nip width;
an image receiver having a width smaller than the nip width and arranged to travel through the nip, and a donor web of heat transferable image imparting substance defining two donor web sides and which define a width between such donor web sides larger than the receiver width and sufficient to occupy at least a portion of the nip width, and arranged to travel through the nip between the head and the receiver with the sides of the donor web extending laterally beyond the side edges of the receiver in facing relation to the platen and with the donor web occupying at least a portion of the nip width; and
an extension member defining extension member sides which have a width larger than the receiver width and the nip width occupied by the donor web, and disposed at the nip between the receiver and the platen with the sides of the extension member extending laterally beyond the side edges of the receiver and correspondingly beyond the nip width occupied by the donor web;
whereby to effect by way of heating from the head, donor web borderless printing on the receiver and lateral overprinting on the extension member adjacent the side edges of the receiver while preventing lateral overprinting on the platen.

5,196,864
ELECTRONIC REGISTRATION IN A MULTIPLE PRINTHEAD THERMAL PRINTER
Holden R. Caine, Albany, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 12, 1991, Ser. No. 744,031
Int. Cl.[5] B41J 2/325
U.S. Cl. 346—76 PH 15 Claims

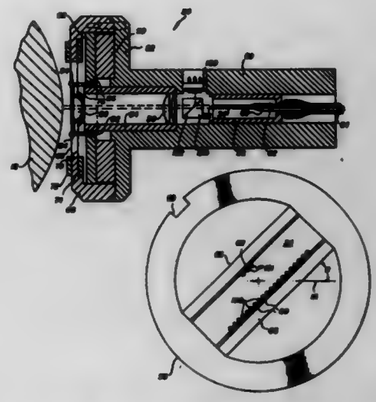
1. A thermal printer, comprising:
a dye receiver having a length;
a print platform supporting said receiver as dye is transferred to said receiver;
a first printhead having a dye bearing donor web and being associated with said print platform for controllably transferring dye to said receiver;
a second printhead having a dye baring donor web and being associated with said print platform a preselected distance from said first printhead for controllably transferring dye to said receiver;
a third printhead having a dye bearing donor web and being associated with said print platform a preselected distance from said first printhead for controllably transferring dye to said receiver; and
means for effecting start of printing of each of said first, second and third printheads so that said first printhead

begins printing at a preselected location along the length of said receiver, and, said second and third printheads each begin printing at said preselected location, said means including means for controlling side to side and sub-pixel registration.

5,196,865
TEMPERATURE SENSING OF HEATER POINTS IN THERMAL PRINT HEADS BY RESISTIVE LAYER BENEATH THE HEATING POINTS
Claude Morelle, Chatenay Malabry, and Bernard Mouchet, Paris, both of France, assignors to Axiohm, Montrouge, France
Filed May 20, 1991, Ser. No. 703,261
Claims priority, application France, May 23, 1990, 90 06444
Int. Cl.[5] B41J 2/325
U.S. Cl. 346—76 PH 7 Claims

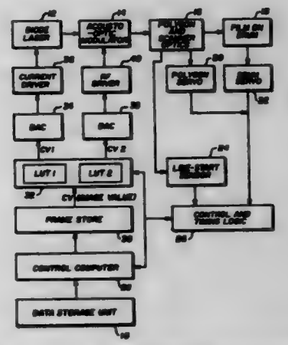
1. A thermal print head comprising:
an insulating substrate;
a layer of glass on a first face of the substrate and said layer of glass having a top surface supporting a line of heater points and power conductors connected to said heater points, which conductors extend perpendicularly to the line heater points;
an electrically-insulating and erosion-resisting protective layer covering a top surface of the layer of glass, the line of heater points and the conductors;
a layer of thermal conducting material disposed on a second face of the substrate opposite to the first face and a heat dissipating radiator on said layer of thermal conducting material; and
wherein the head further includes a sensor film of thermoresistive material beneath the line of heater points, which film is electrically insulated from the line of heater points.

5,196,866
FOCUS FIBER MOUNT
Michael S. Ferschl; James A. Cutsia, both of Rochester; Eileen M. Kemp, Livonia; Joseph Y. Kaukeinen, Rochester, and Erich Zielinski, Bergen, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 15, 1991, Ser. No. 670,895
Int. Cl.[5] H04N 1/21
U.S. Cl. 346—108 29 Claims



1. In an imaging apparatus utilizing a writing element, a moveable writing head including means for generating a writing beam of light arranged to be projected onto said writing element to generate an image, and means for focusing said writing beam with respect to said writing element, said focusing means comprising means for generating a focusing beam of light to be projected onto said writing element and means for detecting said focusing beam, the improvement comprising means for projecting said focusing beam onto said writing element at a first projection point distinct from a second projection point of said writing beam.

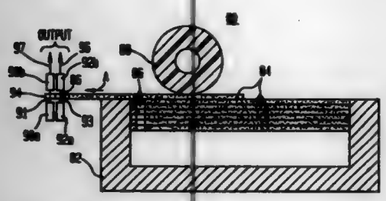
5,196,867
EXTENSION OF DYNAMIC RANGE FOR CONTINUOUS TONE LASER PRINTERS
Nea-Yea Woo, Rochester, and Kwok-leung Yip, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 8, 1991, Ser. No. 681,792
Int. Cl.[5] H04N 1/21
U.S. Cl. 346—108 9 Claims



1. An extended range laser imaging system comprising:

a laser diode for producing a laser beam having a first dynamic range;
an acousto-optical modulator for continuously modulating said laser beam and having a second dynamic range; and
means for applying an continuous tone input image signal to simultaneously modulate said laser diode and said acousto-optic modulator as a function of said input signal wherein an output laser beam is produced having a continuous dynamic range which is a function of and greater than said first and second dynamic ranges.

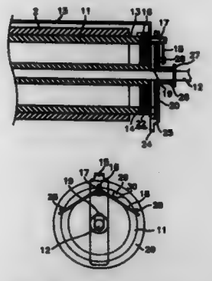
5,195,868
IMAGE RECEIVING SHEET INVERSION SENSING TECHNIQUES
Yeung No, Pittsford; Stanley W. Stephenson, Spencerport, and James A. Whittenor, Mendon, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 28, 1992, Ser. No. 874,873
Int. Cl.[5] G01D *15/24*
U.S. Cl. 346—134 13 Claims



6. A printing apparatus wherein a separate image is to be printed on an image receiving coating formed on only one specified major surface of an image receiving sheet, the printing apparatus comprising:
an irregularity formed long at least one nominally straight edge of the image receiving sheet at a predetermined location relative to the one major surface having the image receiving coating thereon;
sensing means for sensing a presence or an absence of the irregularity at the predetermined location prior to the image receiving sheet having the image imposed thereon, and for outputting a first valued output signal in response to detecting the presence of the irregularity and for outputting a second valued output signal in response to detecting the absence of the irregularity; and
selective means for selectively printing the image on the image receiving sheet in response to the first valued output signal from the sensing means, and for preventing the image from being imposed on the image receiving sheet in response to the second valued output signal from the sensing means.

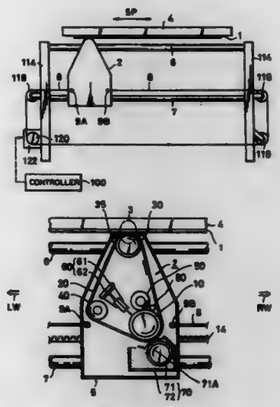
5,195,869
RECORDING PAPER CLAMPING APPARATUS FOR A VIDEO PRINTER
Geun-Yong Park, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Dec. 17, 1991, Ser. No. 808,725
Claims priority, application Rep. of Korea, Feb. 12, 1991, 1991-2343
Int. Cl.[5] B41J *13/22*
U.S. Cl. 346—138 5 Claims

1. An apparatus for holding a printable medium on a platen drum, comprising:
a platen shaft disposed in said platen drum, for enabling said platen drum to rotate about a driving shaft, said platen shaft having a first disc clutch disposed on a side surface of said platen shaft of said platen drum;
paper holding means having a vertical bar loosely mounted on one end of said driving shaft of said platen drum, and a horizontal bar connected to said vertical bar extending over a periphery of said platen drum, for pressing said printable medium on said platen drum, said vertical bar of said paper holding means having a second disc clutch disposed on an inner side surface of said vertical bar facing toward said first disc clutch of said platen shaft;
a clutch plate disposed on an outer side surface of said vertical bar of said paper holding means about said driving shaft, for pressing said second disc clutch to be engaged with said first disc clutch of said platen shaft in dependence upon exertion of a lever; and



whereby when said disc clutch is engaged with said second disc clutch, said paper holding means moves downward to press said printable medium onto said platen drum to enable a thermal printhead to a plurality of first color ribbons, and when said first disc clutch is disengaged from said second disc clutch, said paper holding means moves upward to release said printable medium from said platen drum to thereby discharge said printable medium immediately after a lost color ribbon is printed by said thermal print head.

5,196,870
ELECTROPHOTOGRAPHIC PRINTER
Shinichi Itoh, and Takayuki Takeda, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1991, Ser. No. 721,398
Claims priority, application Japan, Jul. 10, 1990, 2-180621; Oct. 22, 1990, 2-281937
Int. Cl.[5] G01D *15/06*; G03G *5/00*; B41J *2/45*
U.S. Cl. 346—155 8 Claims



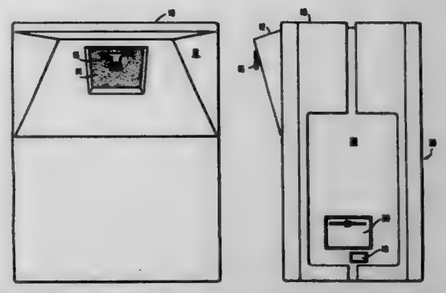
1. An electrophotographic printer comprising:
(a) a flat platen having a surface;

(b) paper feed means for feeding recording paper over the surface of said platen in a first direction;
(c) a movable print head having a portion thereof confronting the recording paper where it is fed over said platen, said print head comprising:
(c1) an electrostatic latent image carrier having a surface for receiving a charge;
(c2) a transfer roller disposed in opposition to the recording paper where it is fed over the surface of said platen;
(c3) a toner image bearing belt passing around said electrostatic latent image carrier and between said transfer roller and said recording paper;
(c4) first charging means for charging the surface of said electrostatic latent image carrier;
(c5) exposure means for exposing the charged electrostatic latent image carrier to form an electrostatic latent image;
(c6) developing means disposed in opposition to the toner image bearing belt where it passes around said electrostatic latent image carrier to form, on said toner image bearing belt, a toner image corresponding to the latent image on said electrostatic latent image carrier, said transfer roller pressing the toner image bearing belt on which the toner image is formed against the recording paper over the platen to transfer the toner image onto the recording paper;
(c7) drive means for moving the electrostatic latent image carrier and said toner image bearing belt in timed sequence with the movement of said print head; and
(c8) heating means provided in one of said platen and said transfer roller to fix the toner image on said recording paper; and
(d) a space-driving means for moving said print head along the surface of said platen in a second direction at an angle with said first direction, whereby transfer and fixing take place between said transfer roller and said platen.

5,196,871
NOSE BRIDGE PAD
Calvin F. Tom, 2445 Newport Ave., Cardiff, Calif. 92007
Filed Oct. 9, 1990, Ser. No. 594,331
Int. Cl.[5] G02C *5/02, 5/12*
U.S. Cl. 351—132 3 Claims

1. A nose bridge protector for attaching to an eyeglass nose bridge on a pair of eyeglasses having a frame and a saddle type bridge comprising:
(a) an elongated segment of resilient foam wherein said segment has two opposite long sides edges, one of which is straight and the other being concave;
(b) said segment being expanded at its ends to form widened pad portions and having a narrower central bridge portion; and
(c) one of the surfaces of the segment having means to bond said segment to the eyeglass nose bridge;
said protector being sized to contact and protect the bridge and sides of the wearer's nose when adhered to the eyeglass nose bridge.

5,196,872
DATA ACQUISITION AND PUPIL TRACKING APPARATUS FOR AN OPHTHALMOLOGOCIAL INSTRUMENT
Ross J. Beesmer; Tom N. Cornsweet, both of Irvine, Calif., and George Honey, Eindhoven, Netherlands, assignors to Pulse Medical Instruments, Rockville, Md.
Division of Ser. No. 448,718, Dec. 11, 1989, Pat. No. 5,042,937.
This application Oct. 23, 1990, Ser. No. 602,136
Int. Cl.[5] A61B *3/14*
U.S. Cl. 351—208 14 Claims



1. In an ophthalmological instrument for examination of pupillary responses and extrinsic eye muscle balance including pupil imaging optics and a video camera having a photosensitive image plane on which images of a patient's pupils are focused by the pupil imaging optics, pupil measurement apparatus comprising:
an analog comparator connected to receive a video output signal from said video camera, said comparator providing an output when one of said patient's pupils is detected during a horizontal scan by said video camera;
a counter responsive to the output of said comparator for counting clock pulses during said comparator output to provide a measure of a chord of the patient's pupil;
a first latch temporarily storing a count in said counter;
a digital comparator connected to said first latch and to said counter to compare the count in the counter with a previous count stored in said first latch and storing the count in said counter in said first latch when said count is greater than said previous count in said first latch; and
a second latch connected to said first latch and storing the count stored in said first latch during a vertical sync pulse of said video camera, said second latch storing a count corresponding to a horizontal measurement the patient's pupil.

5,196,873
EYE MOVEMENT ANALYSIS SYSTEM
Shigeharu Yamamoto, Nagasaki, and Norio Ishikawa, Tokyo, both of Japan, assignors to Nihon Kohden Corporation and Toshiaki Yagi, Tokyo, Japan
Filed Apr. 30, 1991, Ser. No. 693,196
Claims priority, application Japan, May 8, 1990, 2-116943
Int. Cl.[5] A61B *3/14*
U.S. Cl. 351—210 7 Claims

1. An eye movement analysis apparatus comprising:
imaging means including an imaging camera and a light source for projecting imaging light to an eyeball to image eye movements through such a quick exposure as not to blur an imaging object;
image recording means for recording imaged outputs produced from said imaging camera of said imaging means;
tracing destination specifying means for specifying the center of an eyeball and a position outside said center of said eyeball, said center to said eyeball and said position out-

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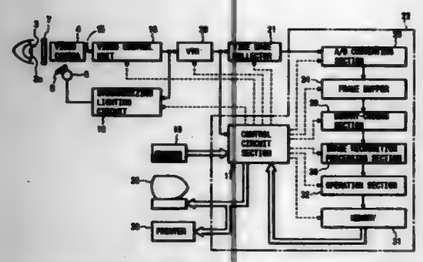
side said center of said eyeball being designations for tracing imaged outputs produced from said imaging camera;

position coordinate calculating means for calculating position coordinates of said center of said eyeball and said position outside said center of said eyeball specified by said tracing destination specifying means for each single piece of image data sequentially read from said image recording means; and



eye movement calculating means for calculating an eye movement incorporating a torsional component from time-dependent changes in position coordinates of said center of said eyeball and said position outside said center of said eyeball obtained from said position coordinate calculating means, wherein polarizing plates are disposed in front of an optical lens of said imaging camera and in front of said light source to reduce influence of light reflected from the surface of said eyeball, said polarizing plates having polarizing angles which are different from each other.

5,196,874

SLIT LAMP APPARATUS WITH PERIPHERAL ILLUMINATION

Ortwin Müller, Aalen; Günter Geiss, Königsbronn, and Victor Stopar, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

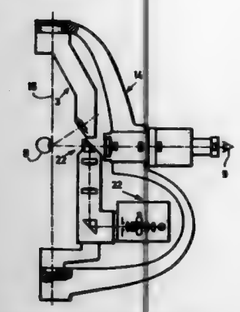
PCT No. PCT/EP88/01012, § 371 Date Feb. 14, 1990, § 102(e) Date Feb. 14, 1990, PCT Pub. No. WO89/04138, PCT Pub. Date May 18, 1989

PCT Filed Nov. 9, 1988, Ser. No. 460,916

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 8714962[U]

Int. Cl.[5] A61B *3/02*

U.S. Cl. 351—221 **5 Claims**



1. A slit lamp apparatus comprising:

a frame;

a slit illuminating device rotatably mounted on said frame at a first position thereon so as to define a vertical first axis of rotation at said first position;

a stereomicroscope mounted on said frame;

a peripheral illuminating device pivotally mounted on said frame at a second position thereon so as to be pivotable about a vertical second axis at said second position independently of said stereomicroscope and said slit illuminating device, said first and second axes being isocentric.

5,196,875

PROJECTION HEAD

Gerd Stöckler, Tegernsee, Fed. Rep. of Germany, assignor to RoyoCad Gesellschaft für Hard-und Software mbH, Ebersberg, Fed. Rep. of Germany

PCT No. PCT/EP89/00676, § 371 Date Feb. 1, 1991, § 102(e) Date Feb. 1, 1991, PCT Pub. No. WO90/01862, PCT Pub. Date Feb. 22, 1990

PCT Filed Jun. 15, 1989, Ser. No. 640,378

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826442

Int. Cl.[5] G02B *26/08*

U.S. Cl. 353—97 **22 Claims**

1. Projection head for a light point (16) on a surface (10), particularly on an assembly surface of an assembly table for indicating the outfitting location, comprising a carrier part (18), a point light source, particularly in the form of a pin diaphragm (50) which is illuminated from the rear, a holder (52) for the point light source, which is arranged at the carrier part (18) so as to be movable, and imaging optics arranged at the carrier part (18) for imaging the point light source, as light point (16), on the surface (10) with at least one optical element, which is attached to the carrier part (18) so as to be movable, for shifting the light point (16) on the surface (10), as desired, characterized in that the imaging optics comprise an imaging lens or lens group (63) which is attached at the carrier part (18) so as to be stationary, said at least one optical element being supported at the carrier part (18) so as to be swivelable, and the holder (52) being coupled to said at least one optical element for movement of said holder (52) in the direction of the optical axis in dependence on the swivel movement of the at least one optical element.

5,196,876

PHOTOGRAPHY BOOTH AND METHOD

Donald O. Thayer, 153 Lincoln Ave., Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 439,642, Nov. 20, 1989, Pat. No. 5,072,246. This application Nov. 13, 1991, Ser. No. 791,656

Int. Cl.[5] G03B *29/00, 13/08, 15/06*; H04N *5/225*

U.S. Cl. 354—78 **21 Claims**

15. A photography booth, comprising:

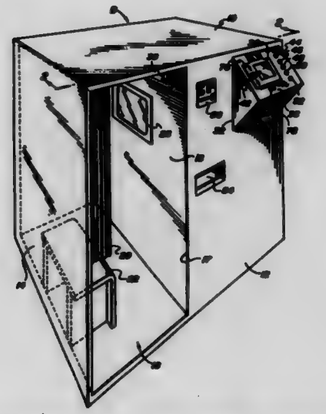
a) an enclosure having angularly disposed first and second walls, and said first wall having an opening therein;

b) a first camera disposed within said enclosure and having an image inlet oriented in a first direction aligned with said opening;

c) a first display system disposed within said enclosure and including means aligned with said opening for directing a generated image therethrough;

d) photograph producing means operably associated with said first camera for generating a photograph of an image perceived through the image inlet;

e) a second camera operably associated with said second wall, said second camera having an image inlet oriented in a second direction disposed exteriorly relative to said enclosure;



f) a second display operably associated with second camera and having a display outlet generally aligned in said second direction; and

g) control means operably associated with said first and second cameras and with said first and second displays for causing the image perceived by said first camera to be displayed by said second display and for selectively causing a photograph to be generated by said photograph producing means upon a desired image being displayed by said second display.

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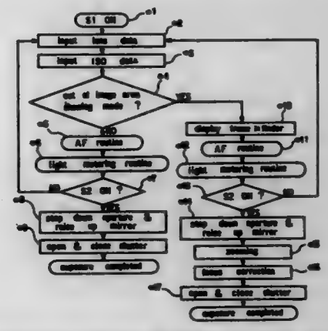
by the focus detecting means, irrespective of the focus detecting result to shift the photo-taking lens with a predetermined amount in the direction toward the longest focal length from a preset focal length.



5,196,878

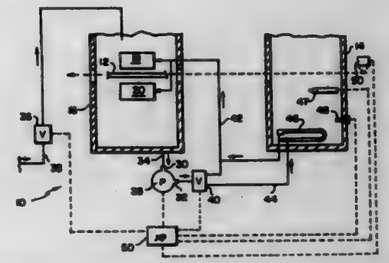
PROCESSOR FOR PHOTOSENSITIVE MATERIAL

Bruce R. Muller, Rochester; David G. Sherburne, Ontario, and Douglas O. Hall, Canandaigua, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 27, 1991, Ser. No. 766,375

Int. Cl.[5] G03D *13/00*

U.S. Cl. 354—299 **5 Claims**



1. In a processor for a photosensitive material, such as film, the processor having a plurality of chambers for processing the material including a first chamber for holding a processing fluid and a second chamber for holding water used for washing the material, a pump connected to the second chamber for removing water from the second chamber and recirculating the water to the second chamber, means for providing fresh water from a supply of such water to the second chamber, and a heat exchanger in the first chamber, the heat exchanger having an inlet and an outlet, the improvement comprising:

a diverter located between the outlet of the pump and the second chamber, the diverter having an inlet connected to the outlet of the pump and first and second outlets, the first outlet of the diverter being connected to the second chamber so that water from the pump can be provided directly to the second chamber, the second outlet of the diverter being connected to the inlet of the heat exchanger with the outlet of the heat exchanger being coupled to the second chamber,

a temperature sensor located with respect to the first chamber for detecting the temperature of the processing fluid in the chamber, and

a processor control for positioning the diverter (1) to recirculate water from the second chamber through the pump and the first outlet of the diverter valve directly back to the second chamber when the sensor detects a fluid tem-

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5,196,877

VIEWFINDER FRAMING DEVICE FOR ZOOM LENS CAMERA

Hiromu Mukai; Hisashi Tokumaru, and Kohtaro Hayashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 418,492, Oct. 10, 1989, abandoned. This application Jan. 14, 1992, Ser. No. 821,128

Claims priority, application Japan, Oct. 12, 1988, 63-257953; Oct. 12, 1988, 63-257954; Oct. 12, 1988, 63-257955

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—195.12 **16 Claims**

1. A camera system having a photo-taking lens capable of zooming, comprising:

focus detecting means for detecting a focus condition of the photo-taking lens using light passing through the photo-taking lens; and

zooming means for automatically carrying out a zooming operation after the focus detecting operation is carried out

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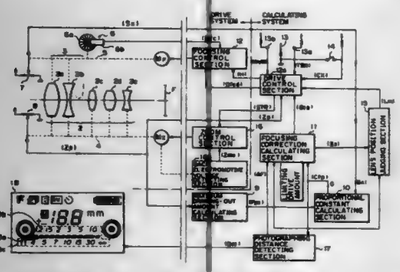
perature in the first chamber below a first predetermined temperature, and (2) to position the diverter to circulate water from the second outlet of the diverter valve to the heat exchanger when the sensor detects a developer temperature above the minimum temperature to effect cooling of the fluid in the second chamber.

5,196,879
LENS CONTROLLER

Daisuke Hata, Funabashi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 455,154, Dec. 22, 1989, abandoned. This application Jun. 4, 1991, Ser. No. 710,254
Claims priority, application Japan, Dec. 23, 1988, 63-323468; Apr. 19, 1989, 1-97264; Nov. 18, 1989, 1-300044
Int. Cl.[5] G03B *3/10*
U.S. Cl. 354—400 **7 Claims**

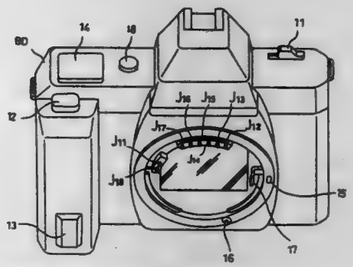


1. A controller for a varifocal lens in which a drawing amount of a focusing lens group varies according to a position of a zoom lens group, comprising;
focusing drive means for driving said focusing lens group;
zoom drive means for driving said zoom lens group;
first position detecting means for detecting a position of said focusing lens group on an optical axis;
second position detecting means for detecting a position of said zoom lens on said optical axis corresponding to a focal distance thereof;
driving amount determining means for determining a drive amount of the focusing lens group in a drive direction from a present position thereof to a focusing position of imagery position in response to receiving light from a photographed object through a photographing optical system;
calculating means coupled to said first position detecting means and said second position detecting means for calculating a limiting drive amount of said focusing lens group in respect to said driving direction from the present position thereof to one of an infinite position and a proximate position toward which said focusing lens group is to be driven by using detected positions of said focusing lens group and said zoom lens group;
selecting means for selecting a smaller one of said determined drive amount and said calculated limiting drive amount; and
controlling means coupled to said selecting means for controlling an operation of said focusing drive means according to a selected amount in such a manner that said focusing driving means drives said focusing lens group in said driving direction by said selected value without detecting during a time when said focusing drive means is actuated as to whether the focusing lens group is situated on the infinite or proximate position.

5,196,880
PHOTOGRAPHIC CAMERA SYSTEM

Kenji Ishibashi; Minoru Kuwana; Yasuaki Serita, all of Sakai; Tetsuya Arimoto, Osaka; Hiroshi Ootsuka, Sakai; Yoshihiro Hara, Kishiwada; Hiroshi Ueda, Habikino, and Masayuki Ueyama, Toyonaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 9, 1990, Ser. No. 593,980
Claims priority, application Japan, Oct. 7, 1989, 1-262593; Oct. 7, 1989, 1-262594; Oct. 7, 1989, 1-2622592; Dec. 18, 1989, 1-327514; Dec. 18, 1989, 1-327515
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—400 **15 Claims**



1. A camera system which comprises:
a photo taking lens assembly of varifocal type including a zooming lens and a focusing lens, wherein a position of focus may deviate with a drive of the zooming lens;
a manipulatable means adapted to be operated manually;
a zooming drive means for driving the zooming lens;
a focusing means detecting means for sequentially detecting a current focal length of the photo-taking lens assembly;
a zooming amount calculating means for repeatedly calculating a target focal length based on the current focal length during the manipulation of the manipulatable means thereby to sequentially update a target focal length used as a reference for the drive of the zooming lens;
a first control means adapted to receive the target focal length updated by the zooming amount calculating means for calculating the amount of deviation in focus which would occur before the target focal length is attained and also for controlling the focusing means so as to eliminate the amount of deviation in focus which has been calculated; and
a second control means for controlling the zooming drive means, even if the manipulation of the manipulatable means is released, so as to drive the zooming lens to a position where the target focal length calculated by the zooming amount calculating means is attained.

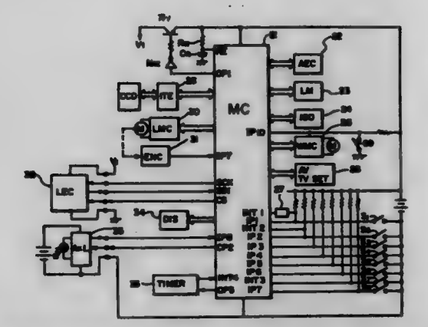
5,196,881
AUTOMATIC FOCUS CONTROL DEVICE

Masataka Hamada, Osaka; Tokuji Ishida, Daito; Kenji Ishibashi, Sakai; Nobuyuki Taniguchi, Nishinomiya, and Hiroshi Ootsuka, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 508,274, Apr. 11, 1990, Pat. No. 5,040,015, which is a division of Ser. No. 374,590, Jun. 28, 1989, Pat. No. 4,924,250, which is a continuation of Ser. No. 247,079, Sep. 20, 1988, abandoned, which is a division of Ser. No. 32,738, Mar. 30, 1987, Pat. No. 4,816,856. This application Aug. 6, 1991, Ser. No. 741,785
Claims priority, application Japan, Mar. 31, 1986, 61-74580
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—402 **12 Claims**

1. An automatic focusing device, comprising:
an objective lens, at least a part of which is movable along the optical axis of the objective lens in a focusing operation;

means for storing electric charges corresponding to an image formed by said objective lens;
means for calculating defocus of said objective lens with respect to a predetermined focal plane on the basis of the electric charges stored in said storing means;
means for driving said part of the objective lens in accordance with the defocus calculated by said calculating means; and

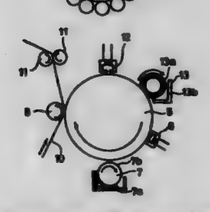


control means for selecting any one of modes consisting of a first mode and a second mode, the first mode for permitting the operation of said storing means while varying the speed of said part of the objective lens driven by said driving means, the second mode for inhibiting the operation of said storing means while varying the speed of said part of the objective lens driven by said driving means.

5,196,882
MAGNETIC RECORDING COLOR MICROCAPSULE AND A MAGNETIC RECORDING DEVICE USING THE SAME

Nobuhiro Kondo, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Division of Ser. No. 799,534, Nov. 27, 1991. This application May 13, 1992, Ser. No. 882,404
Claims priority, application Japan, Nov. 28, 1990, 2-327878
Int. Cl.[5] G03B *27/52*
U.S. Cl. 355—27 **8 Claims**

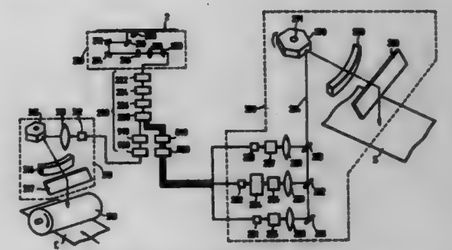


1. A magnetic recording device comprising:
a latent image carrier,
a writing means for imparting a magnetic latent image on said latent image carrier;
a developing means for moving a magnetic recording color microcapsule onto said magnetic latent image carrier;
said microcapsule comprising a colored material covered with an outer wall and a magnetic material disposed on an outer surface of said outer wall;
a transfer means for transferring said colored material in said microcapsule on said latent image carrier onto a recording medium as said magnetic material disposed on said outer wall of said microcapsule substantially remains attracted to said magnetic latent image;
a demagnetizing means for demagnetizing the magnetic latent image on said latent image carrier; and
cleaning means for cleaning off from said latent image carrier said magnetic material which substantially remained attracted to said magnetic latent image when said colored material was transferred onto said recording medium.

5,196,883
IMAGE FORMING APPARATUS

Atsushi Takagi, and Minoru Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 225,991, Jul. 29, 1988, abandoned. This application Dec. 1, 1989, Ser. No. 444,249
Claims priority, application Japan, Jul. 29, 1987, 62-187831; Aug. 27, 1987, 62-214045; Oct. 7, 1987, 62-251455
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—27 **21 Claims**



1. An image forming apparatus, comprising:
a color image forming unit for forming a latent color image on a photosensitive material utilizing a chemical reaction;
monochromatic electrophotographic unit for forming a monochromatic image;
means for controlling said color image forming unit and said monochromatic electrophotographic unit in a formation of said monochromatic image and of a visible color image from said latent color image; and
a color tone discriminating unit for determining whether an original image is an original color image or an original monochromatic image, and when said original image is an original color image, said color image forming unit is operated to form said color image, and when said original image is an original monochromatic image, said monochromatic electrophotographic image forming unit is operated to form said monochromatic image.

5,196,884
APPARATUS HAVING A PLURALITY OF REPLACEABLE PARTS

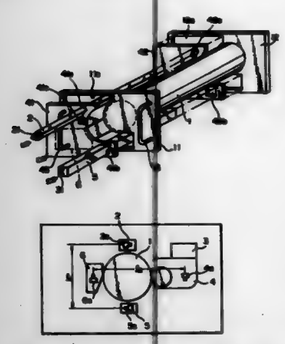
Toshihiro Sagiyama, Yokohama, and Toshihiko Takaya, Matsudo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 1, 1990, Ser. No. 591,373
Claims priority, application Japan, Oct. 2, 1989, 1-116103[U]; Aug. 2, 1990, 2-205625
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—200 **2 Claims**

1. An apparatus comprising:
a plurality of replaceable parts each assigned a particular useful life, a first one of said parts being assigned a first life and a second one of said parts being assigned a second life which is an integral multiple of said first life;
first means for removing said first one of said parts;
second means for removing said second one of said parts;
wherein said first means is operable independently of said

second means such that said first one of said parts is removable and replaceable without removing said second one of said parts;

wherein said second means is constructed such that said second one of said parts is not removable independently of said first one of said parts; and



wherein said first means for removing comprises a first jig having a projection engageable with a recess in said first one of said parts, and wherein said second means for removing comprises a second jig having a first projection engageable with a recess in said first one of said parts and a second projection engageable with a recess in said second one of said parts.

5,196,885

IMAGE FORMING APPARATUS

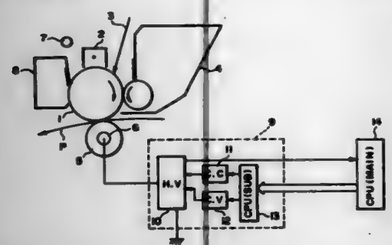
Akihiko Takeuchi, Yokohama; Akihisa Kusano, Kawasaki; Junichi Kinizuka; Kaoru Sato, both of Yokohama; Toshiyuki Itoh, Sagamihara; Masanori Ishizu, Tokyo; Toshihiko Inuyama, Fujisawa; Kazuhiko Okazawa, Kawasaki, and Tatsuto Tachihana, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 656,966

Claims priority, application Japan, Feb. 16, 1990, 2-33698; May 16, 1990, 2-124170; Sep. 14, 1990, 2-242568

Int. Cl.[5] G03G *15/02, 15/14*

U.S. Cl. 355—219 **99 Claims**



1. An image forming apparatus, comprising:

image forming means for forming an image on a recording material, said image forming means including an image bearing member, a movable charging member for charging the image bearing member and a power source for supplying electric power to the charging member;

constant current control means for supplying the charging member with a predetermined constant level of electric current; and

second control means for controlling an image forming condition by said image forming means on the basis of plural voltages sampled at different points of time during a constant current control operation with the same constant current level by said constant current control means.

5,196,886

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS INCLUDING MEANS FOR CORRECTING DENSITY DRIFT

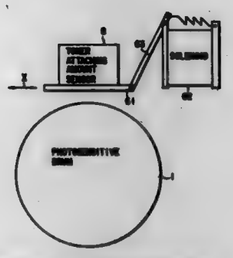
Rintaro Nakane, Yokohama; Jiro Egawa, Yokosuka, and Shigeru Fujiwara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 23, 1992, Ser. No. 855,871

Claims priority, application Japan, Jan. 26, 1991, 3-154338

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—246 **1 Claim**



1. An image forming apparatus comprising:

means for forming a latent image on an image carrier on the basis of image data;

means for developing the latent image formed on said image carrier by said forming means using a developing material;

means, arranged to oppose a surface of said image carrier, for measuring in a measurement mode an amount of the developing material attached to said image carrier upon development by said developing means, so as to provide a measurement value;

means, arranged between said measuring means and said image carrier, for shielding said measuring means from said image carrier in a state other than the measurement mode of said measuring means;

means for comparing the measurement value from said measuring means with a predetermined reference value so as to provide a comparison result; and

means for changing either an image forming condition of said forming means or a developing condition of said developing means according to the comparison result from said comparing means.

5,196,887

IMAGE FORMING APPARATUS HAVING A MAGNETIC BRUSH TONING STATION

Thomas K. Hilbert, Spencerport, and Theodore H. Morse, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 7, 1991, Ser. No. 712,022

Int. Cl.[5] G03G *15/09*

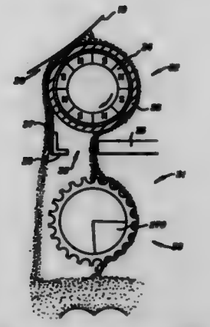
U.S. Cl. 355—251 **9 Claims**

9. A toning station for applying toner to an electrostatic image, which toner is part of a developer having at least a component which is magnetic, said station comprising:

a non-magnetic sleeve,

a magnetic core positioned inside said sleeve and rotatable to tumble or roll said developer from an upstream position through a toning position in toning relation with an electrostatic image to a downstream position,

a skive positioned in skiving relation with the sleeve to separate developer from said sleeve at said downstream position, said skive being within the magnetic influence of the magnetic core, and



a roughened surface on said skive to facilitate the movement of developer as it tumbles or rolls away from said sleeve.

5,196,888

METHOD OF FEEDING DEVELOPER TO DEVELOPING ZONE IN ELECTROPHOTOGRAPHY

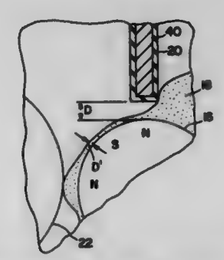
Masanori Matsuda; Mamoru Kato, both of Tokyo; Takeshi Hori, Yokohama; Atsuhiko Irie, Tokyo, and Tomiyasu Matsuda, Yokosuka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 23, 1991, Ser. No. 704,883

Claims priority, application Japan, May 30, 1990, 2-138600

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—251 **10 Claims**



1. A method of uniformly feeding a magnetic developer in the form of a magnetic brush to a developing zone which comprises providing an electrostatic charge to the magnetic developer, feeding the developer to a developer carrier sleeve having an outer magnetic surface to attract the developer and to coat the outer surface with a layer of a thickness of developer to form a magnetic brush, feeding the developer on the sleeve to have the developer pass under an ear-cutting member spaced 0.05 to 2.0 mm above the surface of the sleeve, said ear-cutting member forming an ear cut gap between the sleeve surface and the ear-cutting member, said ear-cutting member reducing the thickness of the magnetic brush as the brush passes thereunder to a thickness about equal to the size of the ear cut gap, providing said ear-cutting member with a coating of a layer of an electret dielectric material having a charge density of 5×10^{-10} c/cm^2 to 2×10^{-7} c/cm^2 and a charge the same as that of the developer and sufficient to repel and compress to a smaller and uniform thickness the layer of developer forming the magnetic brush, and compressing said layer of developer to a uniform thickness and feeding the compressed developer layer of uniform thickness to the developing zone and to a nip position between the sleeve surface and a photosensitive surface of an electrophotographic drum disposed in operable relationship to the sleeve to develop an image on the surface of the drum.

5,196,889

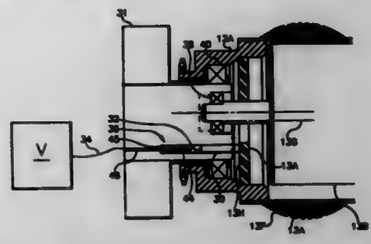
APPARATUS FOR APPLYING AN ELECTRICAL BIAS TO A SHELL OF A MAGNETIC BRUSH

Robert J. Rommelburg; Satyan R. Kalyandurg, both of Rochester, N.Y., and John M. Fiske, Medford, Mass., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 4, 1992, Ser. No. 830,828

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—259 **13 Claims**



1. Apparatus for applying toner to, and/or removing toner from, a surface, said apparatus comprising:

a conductive shell rotatable about an axis of rotation and having an end surface generally perpendicular to said axis;

a bearing block adjacent said end surface, said bearing block having an opening elongated generally in the direction of the axis, said opening having a wide portion toward said end surface, a narrow portion away from said end surface and a spring support surface facing said end surface into which said narrow portion opens;

an elongated conductive member, said end surface moving relative to said elongated conductive member when said conductive shell is rotated;

a compression spring positioned in the wide portion between the spring support surface and the conductive member, said spring urging said conductive member out of said opening and into contact with the end surface, said conductive member rubbing said end surface when said shell is rotated, at least said spring being too large to pass through the narrow portion; and

a narrow conductive connecting means positioned in said narrow portion for connecting said conductive member to a source of electrical bias.

5,196,890

ELECTROSTATIC RECORDING HAVING SWINGABLE RECORDING ELECTRODES TO PREVENT DEPOSIT OF MAGNETIC TONER ON OPPOSITE ELECTRODE

Kenji Nakayama, Kodaira; Eiichi Takeuchi; Shigeru Shimizu, both of Iruma; Tadao Yamamoto, Tokyo; Hideaki Inoue, Musashimurayama; Yasuhito Sato, Akishima; Hideki Takahashi, Fuse; Toshiro Honda, Mitaka, and Kenichiro Asako, Kokubunji, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1991, Ser. No. 784,999

Claims priority, application Japan, Nov. 29, 1990, 2-334566; Nov. 30, 1990, 2-334535

Int. Cl.[5] G03G *21/00*

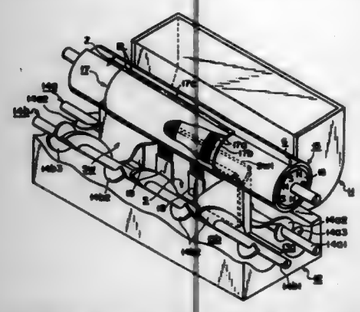
U.S. Cl. 355—259 **9 Claims**

1. An electrostatic recording apparatus comprising:

developing agent carrier member having a surface and arranged along a predetermined developing agent convey path;

developing agent conveying means for conveying a developing agent along said surface of said developing agent carrier member;

a plurality of recording electrodes arranged on said surface of said developing agent carrier member at a predetermined pitch;
an opposite electrode arranged to oppose said plurality of recording electrodes at a predetermined gap;
voltage applying means for applying a voltage corresponding to recording information to each of said plurality of recording electrodes to selectively transfer the developing agent, which is conveyed along said surface of said developing agent carrier member, to said opposite electrode, thereby forming a recording image corresponding to the recording information on said opposite electrode;



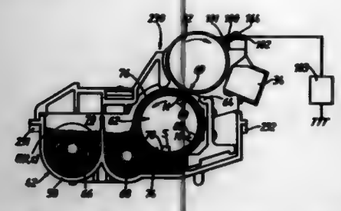
said developing agent carrier member having a step at a portion on said surface thereof shifted from a position closest to said opposite electrode to an upstream side of a developing agent convey direction, at least distal end portions of said plurality of recording electrodes project from said step toward said closest position to form projections, said projections being swingable in a direction toward and away from said opposite electrode during transfer of the developing agent from said surface to said opposite electrode to maintain said gap between said recording and opposite electrodes constant.

5,196,891

IMAGE FORMING APPARATUS HAVING DISTRIBUTION BRUSH AND IMAGE CARRIER MOUNTED IN A REMOVABLE UNIT

Takashi Shimazaki, and Seiichiro Fushimi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 262,842, Oct. 26, 1988, abandoned. This application Oct. 22, 1990, Ser. No. 602,376
Claims priority, application Japan, Nov. 2, 1987, 62-278046
Int. Cl.[5] G03G *13/00*
U.S. Cl. 355—269 **3 Claims**



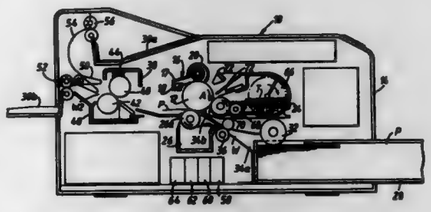
1. An image forming apparatus, including a reusable image carrier and utilizing a developing agent for forming an image on a recording medium, comprising:
means for forming a charged pattern corresponding to the image on the image carrier;
means for simultaneously developing the charged pattern with developing agent into a developed image on the image carrier and removing developing agent remaining on the image carrier from a previous image forming operation from portions of the image carrier other than the developed image;
means for transferring the developed image from the image carrier to the recording medium;
means for distributing any developing agent remaining on the image carrier after transfer of the developed image, the distributing means including a conductive brush member mounted in sliding contact with the image carrier and being electrically biased to a potential of a polarity reverse to the polarity of the pattern formed on the image carrier; and
means for mounting at least the image carrier and the distributing means together in the apparatus as a single removable unit.

5,196,892

IMAGE FORMING APPARATUS HAVING A DISORDERING AND CHARGING DEVICE FOR DISORDERING A DEVELOPING AGENT REMAINING ON AN IMAGE BEARING MEMBER AND FOR CHARGING THE IMAGE BEARING MEMBER

Kohyama Mitsuaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 11, 1992, Ser. No. 896,991
Claims priority, application Japan, Jun. 28, 1991, 3-158597
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—269 **14 Claims**



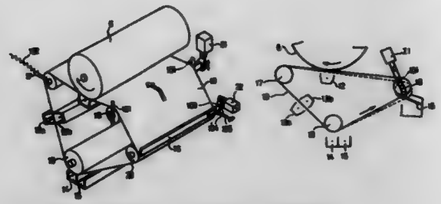
1. An image forming apparatus comprising:
means for forming a latent image on an image bearing member;
developing and cleaning means for developing the formed latent image with a developing agent and for simultaneously removing the developing agent remaining on the image bearing member;
image transfer means for transferring the developed image on the image bearing member to a recording medium; and
disordering and charging means for disordering the developing agent remaining on the image bearing member after transfer of the developed image by the image transfer means and for simultaneously charging the image bearing member to permit forming the latent image on the image bearing member by the forming means, the disordering and charging means having a first disordering and charging member for disordering the residual developing agent and for charging the image bearing member and a second disordering and charging member for disordering the developing agent disordered by the first disordering and charging member and for uniformly charging the image bearing member.

5,196,893

IMAGE FORMING METHOD AND APPARATUS HAVING INTERMEDIATE TRANSFER MEMBER WHICH IS MOVABLE TOWARD AND AWAY FROM A PHOTOCONDUCTOR

Hideya Nishie; Masaru Imaizumi; Toshiyuki Sakai; Katsuhiko Takeda, and Hideo Kitakubo, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1988, Ser. No. 287,845
Claims priority, application Japan, Dec. 22, 1987, 62-326487; Dec. 22, 1987, 62-326488
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—271 **12 Claims**



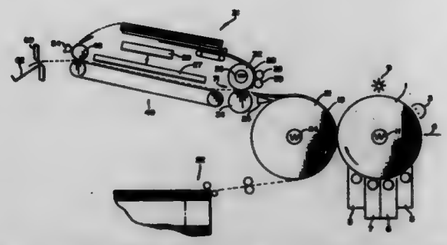
1. An image forming apparatus, comprising:
a photoconductor;
a forming means for forming an electrostatic latent image on the photoconductor;
a developing means for developing by toner said electrostatic latent image formed on the photoconductor to visualize the image;
an intermediate transfer member for firstly receiving the visualized image from the photoconductor and for secondly transferring the image onto a transfer material;
a cleaner for removing toner remaining on the intermediate transfer member after the second transfer process; and
a means for correlatively causing the intermediate transfer member to contact with or separate from the photoconductor and from the cleaner.

5,196,894

TONER IMAGE FUSING AND COOLING METHOD AND APPARATUS

Thomas C. Merle, Rochester, and John P. Swapceinski, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1992, Ser. No. 817,033
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 **9 Claims**



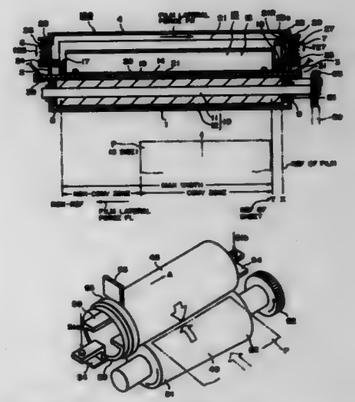
1. A method of fixing a toner image to a surface of a receiving sheet, said method comprising:
placing the receiving sheet surface in contact with a hard surface of a web or sheet with a toner image between said receiving sheet surface and said hard surface,
with said toner image at or above its glass transition temperature, moving said web or sheet and receiving sheet between a pair of pressure members while applying sufficient force urging said pressure members toward each other to fix said toner image to said surface of said receiving sheet,
then, stopping said web or sheet and receiving sheet and while said surfaces are still in contact and are stopped, directly contacting at least one of said sheets or web with a heat sink member to remove heat from said toner image and reduce the temperature of said toner image below its glass transition temperature, and
then separating said receiving sheet from said sheet or web.

5,196,895

HEATING APPARATUS USING ENDLESS FILM

Takeshi Seteriyama, and Akira Kuroda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1992, Ser. No. 835,373
Claims priority, application Japan, Feb. 15, 1991, 3-044334; Feb. 15, 1991, 3-044335; Jun. 21, 1991, 3-177195
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 **27 Claims**



20. A heating apparatus, comprising:
a heater;
an endless film;
driving rotatable member for driving said endless film;
wherein a circumferential length of said driving rotatable member increases from its one end to the opposite end.

5,196,896

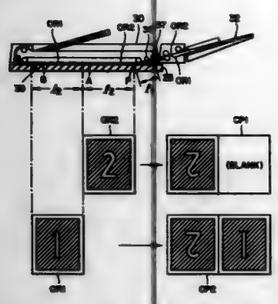
IMAGE FORMING APPARATUS AND AUTOMATIC FEEDER CAPABLE OF COPYING TWO DOCUMENTS ON A SINGLE SURFACE OF A COPY SHEET

Wataru Hamakawa, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 705,029, May 21, 1991, Pat. No. 5,124,758, which is a continuation of Ser. No. 561,068, Aug. 1, 1990, Pat. No. 5,077,577, which is a continuation of Ser. No. 421,408, Oct. 13, 1989, Pat. No. 4,958,198, which is a continuation of Ser. No. 328,062, Mar. 23, 1989, Pat. No. 4,914,472, which is a continuation of Ser. No. 184,662, May 21, 1988, Pat. No. 4,831,413, which is a division of Ser. No. 95,954, Sep. 14, 1987, Pat. No. 4,771,319. This application Feb. 19, 1992, Ser. No. 836,813
Claims priority, application Japan, Sep. 18, 1986, 61-217954
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—309 **4 Claims**

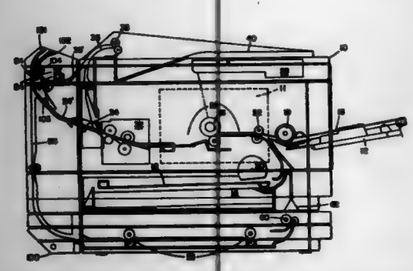
1. A copying apparatus comprising:
document feeding means for supporting a plurality of stacked documents and feeding the documents succes-

sively to an exposure position and for discharging the documents from the exposure position after exposure;
an image forming means for forming images of two discrete documents side by side on a single surface of copy paper;
a determining means for determining if total number of documents supported on said document feeding means is an even number or an odd number; and



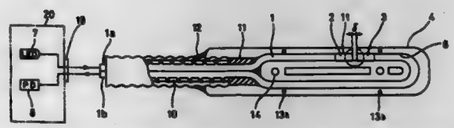
a control means, when the total number of the documents is determined to be odd number, for controlling said image forming means so as to form only an image of a first document fed by said document feeding means on the single surface of copy paper and then controlling said image forming means so as to form images of two successive documents on the next successive single surface of copy paper.

5,196,897
HIGH SPEED DUPLEX PRINTING MECHANISM HAVING PLURAL REVERSING PATHWAYS
Jeffrey L. Trask, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jul. 16, 1991, Ser. No. 731,844
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—319 **8 Claims**



1. An apparatus for producing images on media sheets in correct page order, wherein said media sheets are identically arranged in supply tray means whether single or double sided image imprinting is to occur, said apparatus including an imprinting path with imprinting means for transferring an image to one side of a media sheet, and a sheet-side reversing path communicating with said imprinting path, said apparatus further comprising:
an output path;
first and second non-intersecting reversing paths communicating with said imprinting path, said first direction reversing path also communicating with said sheet side reversing path and said second direction reversing path also communicating with said output path; and
path selection means, operable when said apparatus is to imprint a double-sided image on a media sheet, to direct said media sheet initially to said first direction reversing path after an image has been imprinted on one side of said media sheet, and to direct said media sheet to said second direction reversing path after a second image has been imprinted on a second side of said media sheet, whereby said second direction reversing path enables said media sheet to be directed to said output path.

5,196,898
OPTICAL LIQUID SENSOR, A METHOD OF MANUFACTURING THE SAME, AND AN AUTOMOTIVE OIL/BATTERY CHECKER EMPLOYING THE SENSOR
Kunimitsu Tamura, Warabi; Taiso Takatori, Kitakatsuragi; Akihiro Ishihara, Nara, and Tadaaki Masui, Osaka, all of Japan, assignors to Tatsuta Electric Wire and Cable Co., Ltd., Osaka, Japan
PCT No. PCT/JP90/00531, § 371 Date Nov. 29, 1990, § 102(e) Date Nov. 29, 1990, PCT Pub. No. WO90/13018, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 24, 1990, Ser. No. 601,777
Claims priority, application Japan, Mar. 27, 1989, 2-32642; Apr. 25, 1989, 1-49135; Jun. 27, 1989, 1-75072; Nov. 28, 1989, 1-137651; Dec. 22, 1989, 1-148091; Mar. 26, 1990, 2-31745; Mar. 28, 1990, 2-79944
Int. Cl.[5] G01N *33/28, 21/88, 21/59*
U.S. Cl. 356—70 **13 Claims**

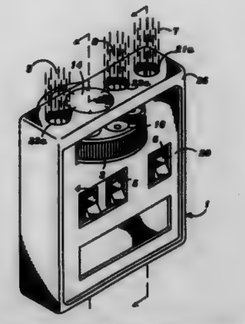


8. An optical liquid sensor comprising an optical fiber folded black in two, a light-emitting element disposed at one end of said optical fiber, a light-receiving element disposed at the other end, and a detection means comprising a pair of units of a rod lens and/or a large-diameter glass optical fiber with a narrow gap interposed therebetween in a linear segment of a folded back portion of said optical fiber, said folded-back portion being hermetically sealed except at an aperture portion for admitting a liquid to be tested into said narrow gap, each rod lens and/or said large-diameter glass optical fiber forming said pair being accommodated in a metal sheath with its forward end projecting beyond the end face of said metal sheath by 0 to 0.3 mm and with the other end being abutted against the core of said optical fiber in said metal sheath, the projecting ends of said pair being juxtaposed with said narrow gap interposed therebetween.

5,196,899
FIBER OPTIC TEST LIGHT WITH MULTIPLE CONNECTOR ADAPTERS
Robert Serwatka, 1703 Rock Fence, Richmond, Tex. 77469
Filed Jul. 19, 1991, Ser. No. 733,157
Int. Cl.[5] G01N *21/88, 21/59*; G02B *6/42*
U.S. Cl. 356—73.1 **2 Claims**

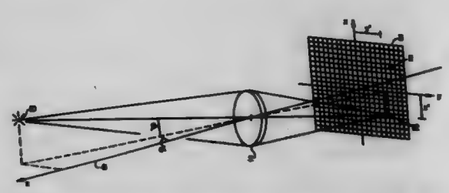
1. An apparatus for testing optical fiber continuity and integrity in a fiber optic linkage comprising:
(a) a housing;
(b) a plurality of optical energy source means located within said housing for providing multiple light sources;
(c) a bare fiber interface means located within said housing for holding a bare fiber optic end in the direct path of at least one of said multiple light sources;
(d) an adaptive interface means located within said housing for interchangeably holding at least one of a variety of optical fiber connectorized ends in the direct path of at least one of said multiple light sources;
(e) said adaptive interface means comprises a wheel having a variety of fiber optic connectorized end fittings;

(f) said wheel mounted within said housing for selectively turning said wheel to place an appropriate fiber optic connectorized end fitting in said direct path of at least one of said multiple light sources;



(g) said adaptive interface means and said bare fiber interface means being located separately and distinctively within said housing; and
(h) a plurality of switches located within said housing to control each of said optical energy source means independently.

5,196,900
METHOD AND SENSOR FOR OPTO-ELECTRONIC ANGLE MEASUREMENTS
Alf Pettersen, Gjettum, Norway, assignor to Metronor A.S., Nesbru, Norway
PCT No. PCT/NO89/00030, § 371 Date Oct. 9, 1990, § 102(e) Date Oct. 9, 1990, PCT Pub. No. WO89/09922, PCT Pub. Date Oct. 19, 1989
PCT Filed Apr. 12, 1989, Ser. No. 582,936
Claims priority, application Norway, Apr. 12, 1988, 881579; Sep. 30, 1988, 884337
Int. Cl.[5] G01B *11/26, 11/24*; G01C *1/00*
U.S. Cl. 356—141 **15 Claims**



1. An opto-electronic angle sensor measuring spatial directions towards point sized light sources or reflecting points illuminated by a light source, said sensor comprising a spherical lens and a two dimensional array of photosensitive elements, and said sensor further comprising:
means for computing a spatial direction of said light sources or illuminated points from the position of the image of said light sources or illuminated points as registered in the local coordinates of said array of photosensitive elements, said means for computing further using a two dimensional calibration table created by a single calibration that allows the angle sensor to be used in various locations without requiring any recalibration, said calibration resulting from a determination of the center of rotational symmetry of the angle sensor lens, and a determination of the relation between the spatial directions and the position of the image on the photosensitive array by the use of a high precision angle reference wherein said calibration table is obtained using light sources having a well defined and known spectral distribution; and
means for performing a statistical analysis of the intensity values registered by multiple neighboring photosensitive elements wherein the resolution and accuracy of the angle measurements are increased to fractions of the size of said photosensitive elements.

5,196,901
DISCRIMINATING SURFACE CONTAMINATION MONITOR
Robert J. Champetier, San Pedro, Calif., assignor to EOS Technologies, Inc., Santa Monica, Calif.
Filed Aug. 22, 1991, Ser. No. 748,688
Int. Cl.[5] G01N *21/00*; H01J *5/16*
U.S. Cl. 356—237 **5 Claims**

1. A discriminating surface contamination monitor, comprising in combination; a horizontal sensing plate, a coupling prism abutted under one end thereof, three laser diodes for directing light beams into said prism and radiating into said sensing plate, a light detector under said plate, a bandpass filter therebetween, means for a beam from a first of said diodes to emerge from said sensing plate and graze and outer surface thereof for detecting dust upon said plate surface, means for a beam from a second of said diodes to principally detect molecular film deposit on said plate, and means for a beam from a third of said diodes to detect craters in said plate surfaces; and the first said means including a quartz crystal microbalance located beneath said sensing plate for detecting molecular contamination.

5,196,902
TWO-BEAM INTERFEROMETER APPARATUS AND METHOD, AND SPECTROMETER UTILIZING THE SAME
Peter R. Solomon, West Hartford, Conn., assignor to Advanced Fuel Research, Inc., East Hartford, Conn.
Filed Oct. 9, 1991, Ser. No. 773,225
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—346 **25 Claims**

1. A two beam interferometer comprising:
mounting means;
first and second walls supported by said mounting means and spaced from one another so as to define a channel having opposite ends and a longitudinal axis extending therebetween, said walls having confronting, specularly reflecting planar surfaces extending longitudinally along said channel on axes substantially parallel to said longitudinal axis, and said mounting means supporting said walls for relative movement so as to vary the spacing therebetween

while maintaining the orientation of said axes of said reflecting surfaces;

a beamsplitter disposed at one end of said channel; and

retroreflecting means disposed at the opposite end of said channel, whereby electromagnetic radiation impinging upon said beamsplitter may be partially directed therefrom into said channel toward said opposite end, to reflect alternatingly between said reflecting surfaces along a path onto said retroreflecting means, and may be returned thereby along virtually the same path to said beamsplitter.

5,196,903

PULSED LIGHT SOURCE SPECTROMETER WITH INTERFEROMETER

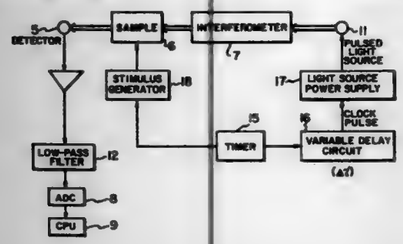
Koji Masutani, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 676,576

Claims priority, application Japan, Mar. 29, 1990, 2-82126; Mar. 29, 1990, 2-82127; Mar. 29, 1990, 2-82128; Sep. 28, 1990, 2-259356; Sep. 28, 1990, 2-259358

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—346 **13 Claims**



1. In a Fourier transform spectrometer for Fourier-transforming an inteferogram obtained from a sample and interferometer through which a single light beam is transmitted to give rise to a spectrum, said spectrometer comprising:

a light source for producing a single light beam directed to the interferomter and sample;

an activating means for impulsively and repeatedly lighting up the light source at predetermined intervals of time;

means for detecting the output intensity of the light beam transmitted through the interferometer and sample; and

an interferogram-taking means for extracting the envelope of the entire output intensity from the interferometer and sample as an interferogram,

whereby the interferogram can be Fourier transformed.

5,196,904

FIBER OPTIC GYROSCOPE BIAS MODULATION AMPLITUDE DETERMINATION

Preston Dane; Rudolf C. Dankwort, both of Phoenix, and Tamim F. El-Wailly, Peoria, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 31, 1990, Ser. No. 636,305

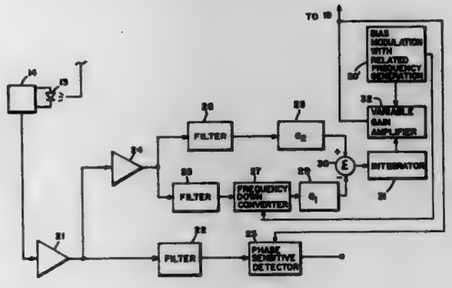
Int. Cl.[5] G01C *19/72*

U.S. Cl. 356—350 **28 Claims**

1. A bias modulation amplitude monitoring means for a rotation sensor capable of sensing rotation thereof about an axis of a coiled optical fiber to provide a rotation sensor output signal indicative of such rotation through having a pair of electromagnetic waves propagating in said coiled optical fiber in opposite directions and along other optical path portions to reach and leave said coiled optical fiber as they travel along an optical path to both impinge on a photodetector means with a phase difference relationship therebetween providing a basis for a resulting photodetector means output signal at an output thereof, and with a bias optical phase modulator positioned in a said optical path portion capable of phase modulating any such electromagnetic waves passing therethrough in propagating along said optical path so as to provide a varying phase difference between such electromagnetic waves of a selectable frequency and a selectable amplitude but with said amplitude subject to variation, said bias modulating amplitude monitoring means comprising:

a first photodetector output signal component determination means having an output and having an input which is electrically connected to said photodetector means output, said first photodetector output signal component determination means being capable of providing at its output an indication of that magnitude occurring in a first component of said photodetector means output signal selected therefrom by its frequency content to form a first component determination means output signal at said output thereof;

a second photodetector output signal component determination means having an output and having an input which is electrically connected to said photodetector means output, said second photodetector output signal component determination means being capable of providing an indication of that magnitude occurring in a second component of said photodetector means output signal selected therefrom by its frequency content to form a second component determination means output signal at said output thereof; and



a photodetector output signal component relationship determination means having a pair of inputs each of which is electrically connected to one of said first and second photodetector output signal component determination means outputs, said photodetector output signal component relationship determination means being capable of scaling magnitudes of each of said first and second component determination means output signals by a corresponding multiplicative factor having a selected value independent of rotation of said rotation sensor about an axis of said coiled optical fiber, to form first and second weighted component signals, said photodetector output signal component relationship determination means being capable of adjusting said photodetector means output signal through said bias optical phase modulator such that said rotation sensor output signal has a selected value in a range of values for a selected rate of rotation of said rotation sensor about said axis, and of correcting deviations therefrom due to said phase modulation amplitude variation, by forcing values of said first and second weighted component signals toward a selected relationship.

5,196,905

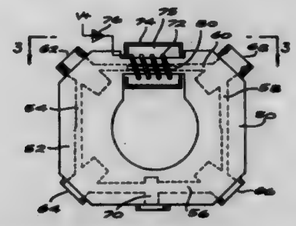
RADIO FREQUENCY EXCITED RING LASER GYROSCOPE

Tae W. Hahn, North Hollywood, and Salim N. Jabr, Woodland Hills, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 218,405, Jun. 22, 1988, abandoned. This application Apr. 6, 1990, Ser. No. 517,644

Int. Cl.[5] H01S *3/05*; G01C *19/64*; G01B *9/02*; G01P *9/00*

U.S. Cl. 356—350 **11 Claims**



1. A ring laser gyroscope, comprising:

a resonant optical cavity formed within a monolithic block, said block defining a closed optical path, defined by at least three legs, having a gain medium therein; and,

a closed Radio-Frequency cavity resonator positioned along a portion of said closed optical path, including at least one of said legs, which applies a localized longitudinal radio frequency signal for exciting discharge of the gain medium;

said closed Radio-Frequency cavity resonator having a helical coil powered up by a power source exhibiting reduced power dissipation surrounding a portion of said closed optical path; and,

said helical coil contained within an enclosed conductive resonator shield, said helical coil and enclosed conductive resonator shield forming a high-Q, distributed parameter coaxial Radio-Frequency resonator assembly, and substantially aligned according to the following equations:

$$Q_u = 50\ D\ f_o^{\frac{1}{2}};$$

and,

$$N = (1900/f_o\ D)\ \text{turns};$$

where,

Q_u is unloaded Q (quality factor);

D is the inside diameter of the resonator shield;

f_o is a resonant frequency (MHz) of said resonator assembly; and,

N is the total number of windings of said helical coil.

5,196,906

MODULAR SCATTEROMETER WITH INTERCHANGEABLE SCANNING HEADS

John C. Stover; James A. Bender; Marvin L. Berst; Donald R. Bjork; Paul D. Chausse; Daniel R. Cheever; Kelly H. Kirchner; Tod F. Schiff, and Vincent C. Skurdal, all of Bozeman, Mont., assignors to TMA Technologies, Inc., Bozeman, Mont.

Filed Jun. 29, 1990, Ser. No. 547,468

Int. Cl.[5] G01N *21/47*

U.S. Cl. 356—446 **19 Claims**

1. A modular scatterometer for measuring light scatter from a subject surface comprising:

a base unit, including:

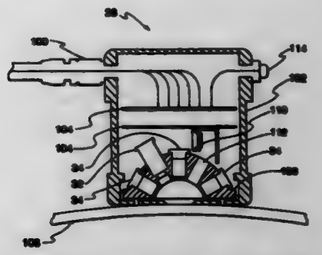
means for supplying electrical power to the scatterometer;

processor means for controlling operational flow of various functions of the scatterometer and for analyzing light scatter measurements; and

operator control means for providing control information to the processor means relating to the operational flow of the scatterometer;

a scanning head selected from a plurality of interchangeable scanning heads, the selected scanning head being operatively connected to the base unit, each of the interchangeable scanning heads being detachably connectable to the base unit and each of the interchangeable scanning heads including:

one or more light source means for generating a light beam that is incident upon the subject surface;



one or more detector means for detecting light scattered from the subject surface by the light beam; and

means for storing profile information that describes certain characteristics and parameters associated with the interchangeable scanning head; and

transmission means operably connected to the base unit and the selected scanning head for transmitting and receiving both analog and digital signals between the selected scanning head and the base unit.

5,196,907

METAL INSULATOR SEMICONDUCTOR FIELD EFFECT TRANSISTOR

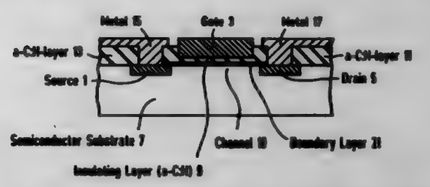
Siegfried Birkle, Höchstadt a/Aisch, and Johann Kammermaier, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 745,420, Aug. 15, 1991, abandoned. This application Jul. 31, 1992, Ser. No. 924,422

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1990, 4026314

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.2 **20 Claims**



1. A metal insulator semiconductor field-effect transistor (MISFET) comprising:

a) a gate electrode;

b) a semiconductor substrate composed of a semiconductor material other than silicon; and

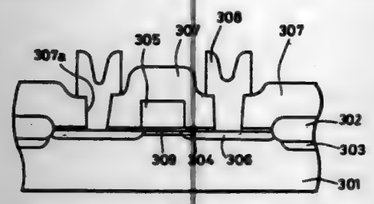
c) an insulating layer disposed between said gate electrode and said semiconductor substrate, composed of amorphous, hydrogenated carbon (a-C:H), having a thickness in the region of the gate electrode less than or equal to 1 μm, and having a boundary surface to the semiconductor substrate with a resistivity (ρ) of greater than or equal to $10^6\Omega$-cm.

VOL 1148 ISS 4 MR 23 1993 UMI

5,196,908
MICRO MIS TYPE FET AND MANUFACTURING PROCESS THEREFOR

Shigeru Kusunoki; Shigeki Komori, and Katsuhiro Tsukamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1991, Ser. No. 637,871
Claims priority, application Japan, Jan. 12, 1990, 2-5161
Int. Cl.[5] H01L *29/10, 29/78*
U.S. Cl. 357—23.3 4 Claims

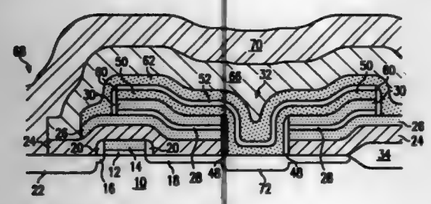


1. A micro MIS type FET comprising:
a semiconductor substrate of a first conductivity type;
a pair of source/drain regions of a second conductivity type formed in a surface of said semiconductor substrate and spaced apart by a distance of less than 2 μm;
a channel layer of said first conductivity type having an impurity concentration of less than $1\times10^{16}/cm^3$ formed between said source/drain regions in said substrate surface, a lower boundary of said channel layer having a depth less than depths of said source/drain regions;
a first conductivity type threshold voltage control region of impurity concentration greater than $1\times10^{17}/cm^3$ formed in said substrate surface beneath said lower boundary of said channel layer; and
an isolation insulating film selectively formed on said semiconductor substrate, and an epitaxial layer extending from said surface of said semiconductor substrate over to said isolation insulating film;
wherein said source/drain regions extends also into portions of said epitaxial layer over said isolation insulating film, and
said substrate has an abrupt change in impurity concentration at said lower boundary of said channel layer.

5,196,909
CAPACITOR FOR DRAM CELL

Tsiu C. Chan, Carrollton, and Frank R. Bryant, Denton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 443,897, Nov. 30, 1989, Pat. No. 5,116,776.
This application May 7, 1991, Ser. No. 697,227
Int. Cl.[5] H01L *29/68*
U.S. Cl. 357—23.6 7 Claims

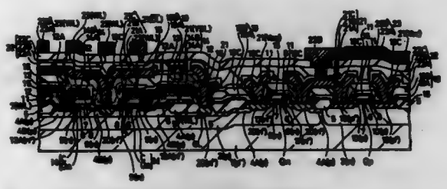


6. A DRAM memory cell, comprising:
a substrate;
a pass gate overlying said substrate;
a first interlevel dielectric layer overlying said substrate and said pass gate;
a lower polycrystalline silicon capacitor plate overlying said first interlevel dielectric layer;
a first insulating layer in overlying contact with said lower capacitor plate;
a buffer polycrystalline silicon layer in overlying contact with a portion of said first insulating layer, and extending over said pass gate; a first opening extending through said first interlevel dielectric layer, said lower capacitor plate, said first insulating layer, and said buffer layer to expose a portion of said substrate adjacent said pass gate;
a charge storage polycrystalline silicon capacitor plate in overlying contact with said buffer layer and extending through said first opening to contact said substrate;
a second insulating layer in overlying contact with said charge storage polycrystalline silicon capacitor plate and sidewalls of said charge storage plate and said buffer layer; and
an upper polycrystalline silicon capacitor plate in overlying contact with said second insulating layer and separated from said charge storage polycrystalline silicon capacitor plate thereby, wherein said upper capacitor plate is physically connected to said lower capacitor plate adjacent to the charge storage plate and buffer layer sidewalls.

5,196,910
SEMICONDUCTOR MEMORY DEVICE WITH RECESSED ARRAY REGION

Nobuo Moriuchi; Yoshiki Yamaguchi; Toshihiko Tanaka, all of Tokyo; Norio Hasegawa, Hinode; Yoshifumi Kawamoto, Kanagawa; Shin-ichiro Kimura, Hachioji; Toru Kaga, Urawa, and Tokuo Kure, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 401,616, Aug. 31, 1989, abandoned, which is a division of Ser. No. 184,786, Apr. 22, 1988, Pat. No. 4,882,289. This application Feb. 4, 1991, Ser. No. 650,999
Claims priority, application Japan, Apr. 24, 1987, 62-99741
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.6 21 Claims



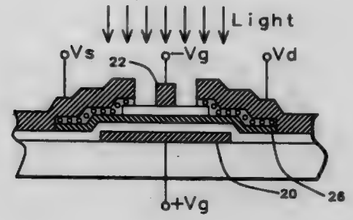
1. A semiconductor memory comprising:
(a) a semiconductor substrate having a major surface which includes a recessed part and a projected part;
(b) a memory array having a plurality of memory cells, each of which includes a first MISFET of N-type conductivity and a capacitor connected in series, said first MISFET comprising a first gate electrode, first source and drain regions, of n-type conductivity, and said capacitor comprising first and second electrodes and a dielectric film therebetween, wherein said first and second electrodes and said dielectric film are formed over said major surface of said semiconductor substrate and over said first gate electrode of said first MISFET; and
(c) a peripheral circuit including a plurality of second MISFETs of N-type conductivity, each having a second gate electrode and second source and drain regions of N-type conductivity and third MISFETs of P-type conductivity each having a third gate electrode and third source and drain regions of P-type conductivity,
wherein said first MISFETs and said capacitors of memory cells are formed on said recessed part of said major surface and said second MISFETs of said peripheral circuit is formed on said projected part of said major surface, and
wherein an altitude difference between said recessed part and said projected part of said major surface is set to a predetermined value based upon a depth of focus of a predetermined exposure apparatus used for forming said first and second MISFETs so that predetermined areas of both said first and second MISFETs will be with said depth of focus of the predetermined exposure apparatus to permit simultaneous processing of said predetermined areas of said first and second MISFETs during formation of said first and second MISFETs.

5,196,911
HIGH PHOTOSENSITIVE DEPLETION-GATE THIN FILM TRANSISTOR

Bing-Seng Wu, Tainan, Taiwan, assignor to Industrial Technology Research Institute, Chutung, Taiwan

Filed Mar. 25, 1991, Ser. No. 674,451
The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.
Int. Cl.[5] H01L *27/01, 27/14, 45/00, 29/78*
U.S. Cl. 357—23.7 10 Claims

1. An array of thin film transistor photodetectors comprising:
a substrate;
an array of accumulation gates upon said substrate;

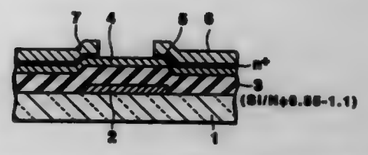


a bottom insulating layer located over each of said accumulation gates;
an undoped amorphous silicon layer upon said bottom insulating layer;
a top insulating layer over said amorphous silicon layer over that portion of said amorphous silicon layer designated to be the channel region of the thin film transistor photodetectors and leaving exposed the regions of said amorphous silicon layer designated to be the source and drain regions of said thin film transistor photodetectors;
a layer of doped amorphous silicon over only the peripheral portions of said top insulating layer and the exposed source and drain regions of said thin film transistor photodetectors to produce ohmic contacts to said exposed source and drain regions;
depletion gate electrodes;
a patterned conductive film which constitutes said depletion gate electrodes and the source-drain electrodes for said thin film transistor photodetectors; and
connections to said photodetectors to form the array.

5,196,912
THIN FILM TRANSISTOR HAVING MEMORY FUNCTION AND METHOD FOR USING THIN FILM TRANSISTOR AS MEMORY ELEMENT

Hiroshi Matsumoto, Tachikawa; Hiroyasu Yamada, Funa; Nobuyuki Yanamura, Hanno; Shinichi Shimomaki, Tokyo; Naohiro Konya, Hino, and Kyuya Baba, Hachioji, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 437,041, Oct. 25, 1989, abandoned.
This application Mar. 13, 1991, Ser. No. 668,741
Claims priority, application Japan, Oct. 28, 1988, 63-270893; Nov. 10, 1988, 63-282596; Mar. 31, 1989, 1-78398; Apr. 7, 1989, 1-87009; Apr. 14, 1989, 1-43098[U]; Apr. 14, 1989, 1-43099[U]; May 12, 1989, 1-117580
Int. Cl.[5] H01L *27/01, 29/68, 29/34*
U.S. Cl. 357—23.7 31 Claims



1. A memory transistor system having electrically writable and electrically erasable functions, comprising:
a thin film transistor including:
a semiconductor layer having a channel region;
a source electrode electrically connected to said semiconductor layer;
a drain electrode electrically connected to said semiconductor layer and formed separately from said source electrode;
a gate electrode formed over said channel region of said semiconductor; and
a gate insulating film means disposed between said semiconductor and said gate electrode and being in contact with aid channel region of said semiconductor for trapping electrical charges, said gate insulating film means including a silicon nitride film whose composition ratio of Si/N is 0.85 to 1.1;
writing means for applying a writing voltage (+Vp) to said gate electrode relative to said source electrode;
erasing means for applying an erasing voltage (−Vp) to said gate electrode relative to said source electrode; and
reading out means for applying a read out voltage (Vd) to said drain electrode;
whereby charges are trapped in said gate insulating film means so as to shift a threshold voltage (Vth), to the positive direction after an application of said writing voltage (+Vp), and to shift a threshold voltage (Vth) to the negative direction after an application of said erasing voltage (−Vp).

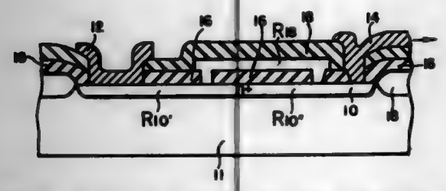
5,196,913
INPUT PROTECTION DEVICE FOR IMPROVING OF DELAY TIME ON INPUT STAGE IN SEMI-CONDUCTOR DEVICES

Chang-Hyun Kim, and Hyun-Soon Jang, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation-in-part of Ser. No. 333,432, Apr. 4, 1989, abandoned. This application Dec. 28, 1990, Ser. No. 634,797
Claims priority, application Rep. of Korea, Jul. 11, 1988, 88-8604
Int. Cl.[5] H01L *29/78, 27/02*
U.S. Cl. 357—23.13 4 Claims

1. An input protection device for a semiconductor device including a substrate of semiconductor material of a first conductivity type, a signal input pad on a surface of said substrate, a first region, having first and second ends, of a second conduc-

tivity type within said substrate, said first end being connected to said input pad, said first region providing an electrical path between said ends thereof for an electrical signal, and a signal conductor connected to said second end for extending said electrical path beyond said first region, a second region of said second conductivity type within said substrate spaced from

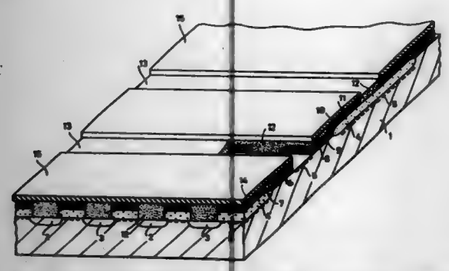


said first region and providing means for collecting static charges arriving along said first region, and a layer of low resistance material disposed on the surface of said substrate overlying and in direct contact with said first region for reducing the electrical resistance of said electrical path between said ends.

5,196,914
TABLE CLOTH MATRIX OF EPROM MEMORY CELLS WITH AN ASYMMETRICAL FIN

Stefano Manzini, Milan, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

Continuation of Ser. No. 488,120, Mar. 5, 1990, abandoned. This application Aug. 29, 1991, Ser. No. 753,028
Claims priority, application Italy, Mar. 15, 1989, 19778 A/89
Int. Cl.[5] H01L *29/78, 29/68*
U.S. Cl. 357—45 4 Claims

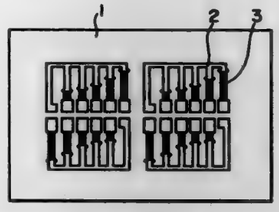


1. A matrix of EPROM memory cells, comprising a semiconductor substrate, source lines and drain lines parallel to and alternated with one another, field oxide areas interposed in a checkerboard pattern between said source and drain lines to define uncovered active areas of the substrate, pairs of floating gate areas associated to respective pairs of adjacent field oxide areas and to interposed active areas, each said pair of floating gate areas consisting of first and second floating gate areas, so that said first floating gate area of at least one of said pairs of floating gate areas has a first portion facing to a corresponding first portion of said second floating gate area of the same pair and superimposed to said active area, and a second portion forming a single lateral fin of said first floating gate area and superimposed to a respective field oxide area, and control gate lines parallel to one another and perpendicular to said source and drain lines and superimposed to and aligned with said first and second floating gate areas.

5,196,915
SEMICONDUCTOR DEVICE

Osamu Ito, Gaithersburg, Md.; Tadamichi Asai, Ibaraki, Japan; Toshio Ogawa, Katsuta, Japan; Mitsuru Hasegawa, Hitachi, Japan; Akira Ikegami, Yokohama, Japan; Yoshihige Endoh, Tsuchiura, Japan; Michio Ootani, Chiba, Japan, and Katsuo Ebisawa, Ibaraki, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 437,825
Claims priority, application Japan, Nov. 21, 1988, 63-294019; Nov. 21, 1988, 63-294020
Int. Cl.[5] H01B *1/06;* H01L *27/01;* H01C *17/06*
U.S. Cl. 357—51 44 Claims

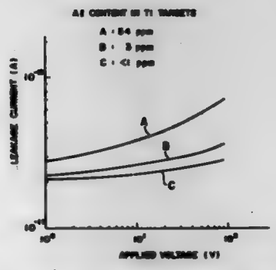


1. A semiconductor device, which comprises a ceramic substrate, a semiconductor element, a thick film conductor, and a thick film resistor electrically connected to the thick film conductor; the semiconductor element, the thick film conductor and the thick film resistor being formed on the ceramic substrate, wherein the thick film resistor is made of a glass matrix and has particles of a metal boride dispersed in the glass matrix, the particles having a particle size of 0.005 to 0.1 μm and are particles formed by vapor phase solidification.

5,196,916
HIGHLY PURIFIED METAL MATERIAL AND SPUTTERING TARGET USING THE SAME

Takashi Ishigami, Yokohama; Minoru Obata, Isagi; Mitno Kawai, Yokohama; Michio Satou, Yokohama; Takashi Yamanobe, Yokohama; Toshihiro Maki, Yokohama; Noriaki Yagi, Yokohama, and Shigeru Ando, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 15, 1991, Ser. No. 655,950
Claims priority, application Japan, Feb. 15, 1990, 2-36908
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—65 36 Claims

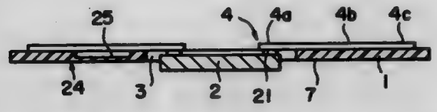


1. A highly purified metal consisting essentially of titanium, having an Al content of not more than 10 ppm.

5,196,917
CARRIER TAPE

Tetsuya Ueda; Kou Shinozuka; Osamu Nakagawa; Seiji Takemura, and Kazunari Michii, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 444,973
Claims priority, application Japan, Aug. 22, 1989, 1-214165
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—70 3 Claims

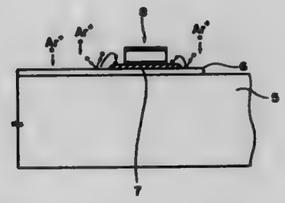


1. A carrier tape comprising:
an electrically insulating film including a center device hole for receiving a semiconductor chip therein, a plurality of outer lead holes spaced from and disposed at the periphery of the center device hole, a lead supporting portion positioned between the center device hole and the outer lead holes, and a link portion positioned between a pair of adjacent outer lead holes and connected to said lead supporting portion, said link portion including a recess in said insulating film, extending into said lead supporting portion and spaced from the center device hole for limiting the flow path of molten resin toward the center device hole from said insulating film beyond the outer lead holes during resin molding of the semiconductor chip; and
a plurality of leads, each lead having first and second ends, being supported on said lead supporting portion of said insulating film, and crossing one of the outer lead holes, the first ends of said leads projecting into the center device hole of said insulating film.

5,196,918
INTEGRATED CIRCUIT DEVICE AND METHOD FOR MANUFACTURING THE SAME

Mitsuaki Fujihira, and Yoshiaki Tanaka, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 566,504, Aug. 13, 1990, abandoned. This application Nov. 18, 1991, Ser. No. 794,669
Claims priority, application Japan, Aug. 28, 1989, 1-220848
Int. Cl.[5] H01L *29/48*
U.S. Cl. 357—71 10 Claims



1. An integrated circuit device, comprising:
a substrate;
an underlying member formed on said substrate;
a bonding mask member formed on said underlying member;
an electronic circuit component formed on said bonding mask member, said underlying member extending over an area greater than a bottom surface area of said electronic circuit component; and
electrodes, formed on a surface of said electronic circuit component, for being pre-cleaned by a sputter cleaning method prior to having wires connected thereto, said electrodes being made of a material having a lower sputtering rate than that of a material of which said underlying member is formed;
said bonding mask member (i) being made of a material having a lower sputtering rate than said sputtering rate of said electrodes and (ii) extending over an area sufficiently greater than said bottom surface area of said electronic circuit component to prevent atoms which scatter from said underlying member from reaching said electrodes while said electrodes are being pre-cleaned by said sputter cleaning method prior to said wires being connected thereto;
said underlying member comprising a conductive pattern having a contact portion adapted to have one end of said wires connected thereto, whereby said substrate is pre-cleaned by a sputter cleaning method while said electrodes are also being pre-cleaned by sputter cleaning.

5,196,919
USE OF A CONTAMINATION SHIELD DURING THE MANUFACTURE OF SEMICONDUCTOR PACKAGES

Nobuaki Miyauchi; Hiroshi Yonemasa, and Bakji Cho, all of San Diego, Calif., assignors to Kyocera America, Inc., San Diego, Calif.

Filed Dec. 7, 1990, Ser. No. 623,601
Int. Cl.[5] H01L *23/04*
U.S. Cl. 357—74 10 Claims

1. A ceramic lid for an erasable programmable read only memory package comprising:
a ceramic lid substrate having an opening formed therethrough and a first surface;
an ultraviolet transparent window positioned within the opening of the ceramic lid substrate, the window having a first surface and a second surface and hermetically sealing the opening by being fused to the ceramic lid substrate; and
a protective shield removably covering substantially the entire first surface of the ultraviolet transparent window, the protective shield preventing accumulation of foreign particulate matter on the first surface of the window.

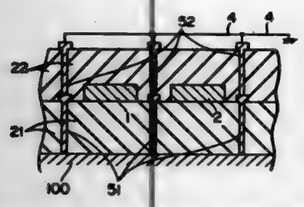
5,196,920
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE FOR LIMITING CAPACITIVE COUPLING BETWEEN ADJACENT CIRCUIT BLOCKS

Toshio Kumamoto, and Hiroyuki Kouno, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1992, Ser. No. 871,655
Int. Cl.[5] H01L *27/00, 23/48*
U.S. Cl. 357—84 9 Claims

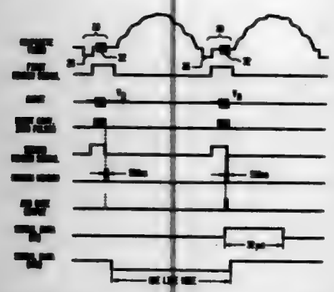
1. A semiconductor integrated circuit device comprising:
a first semiconductor integrated circuit block;
a second semiconductor integrated circuit block disposed in the vicinity of said first semiconductor integrated circuit block;
a first insulating layer interposed between said first and second semiconductor integrated circuit blocks; and
electroconductive shield means formed between said first and second semiconductor integrated circuit blocks to limit the capacitive coupling between said first and second semiconductor integrated circuit blocks wherein said

shield means is formed of an impurity containing semiconductor material electrically insulated from said first and



second semiconductor integrated circuit blocks and is maintained at a predetermined fixed potential.

5,196,921
DATA TRANSMISSION USING COLOR BURST POSITION MODULATION
Mohamed M. A. Megeid, Zurich, Switzerland, assignor to RCA Thomson Licensing Corporation, Princeton, N.J.
Filed Dec. 13, 1990, Ser. No. 625,665
Claims priority, application United Kingdom, Mar. 22, 1990, 9006414
Int. Cl.[5] H04N *9/45, 9/455*
U.S. Cl. 358—19 **16 Claims**



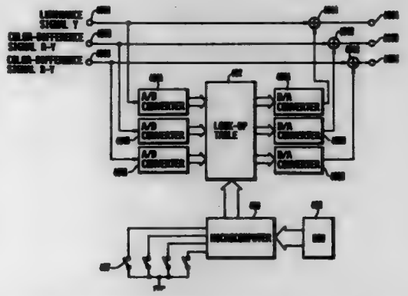
1. A method for transmitting digital data in a composite color television signal containing color information modulated on a color subcarrier comprising the steps of:
(a) transmitting a first color burst of the television signal having the same frequency as the color subcarrier and a predetermined number of cycles in a first position of a first horizontal line relative to a respective horizontal synchronization pulse of said first horizontal line to represent a first digital value; and
(b) transmitting a second color burst of the television signal having the same frequency as the color subcarrier and the same number of cycles as the first color burst in a second position of a second horizontal line to represent a second digital value, the second position having its beginning delayed from a respective horizontal synchronization pulse of said second horizontal line with respect to the first position by a predetermined period of time.

5,196,922
DIGITAL IMAGE GENERATION
James V. Yeomans, Hertfordshire, England, assignor to Crosfield Electronics Ltd., England
Filed Dec. 11, 1990, Ser. No. 625,389
Claims priority, application United Kingdom, Dec. 12, 1989, 8928058
Int. Cl.[5] H04N *9/74*
U.S. Cl. 358—22 **4 Claims**

1. A method of generating a representation of a subsidiary coloured image intially contained within a larger image represented by digital data defining the colour content of pixels of said larger image, the method comprising defining a control data array which defines for at least those pixels in said larger image corresponding to the region containing said subsidiary image the proportion of the image pixel colour which is due to said subsidiary image; determining the average colour in each

background region of said larger image where the colour is different from said subsidiary image region; multiplying corresponding areas of the inverse of said control data array by respective ones of said determined average colours to generate a background image; and subtracting said background image from the corresponding region of said larger image so as to generate said representation of said subsidiary image.

5,196,923
AUTOMATIC IMAGE SIGNAL CORRECTING DEVICE
Osamu Ueda; Teruo Hieda, both of Kanagawa, and Hideo Kawahara, Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 800,888, Nov. 27, 1991, abandoned, which is a continuation of Ser. No. 527,062, May 22, 1990, abandoned. This application Jan. 17, 1992, Ser. No. 900,508
Claims priority, application Japan, May 25, 1989, 1-130123; May 25, 1989, 1-130124; May 25, 1989, 1-130125; May 25, 1989, 1-130126; May 25, 1989, 1-130127
Int. Cl.[5] H04N *9/64*
U.S. Cl. 358—27 **3 Claims**



1. An image signal correction device for correcting an image signal, comprising:
a) correction data holding means for holding a plurality of kinds of correction data, said correction data held in said correction data holding means being not changeable to another data;
b) correction data outputting means for selecting one kind of correction data among the plurality of kinds of correction data held in said correction date holding means and outputting the selected correction data;
c) correction data storing means for temporarily storing the one kind of correction data output from said correction

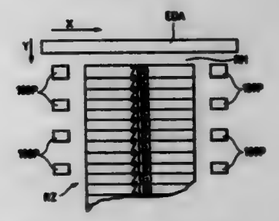
data outputting means, said temporarily stored correction data being changeable to anotehr correction data, and for outputting the correction data corresponding to an input image signal among said temporarily stored correction data; and
d) correcting means for correcting the input image signal on the basis of the correction data output from said correction data storing means.

5,196,924
LOOK-UP TABLE BASED GAMMA AND INVERSE GAMMA CORRECTION FOR HIGH-RESOLUTION FRAME BUFFERS
Leon Lumelsky, Stamford, Conn.; Calvin B. Swart, Poughkeepsie, N.Y.; John L. Pitts, Bethel, Conn.; Sung M. Choi, White Plains, N.Y., and Alan W. Peevers, Berkeley, Calif., assignors to Internation Business Machines, Corporation, Armonk, N.Y.
Filed Jul. 22, 1991, Ser. No. 733,576
Int. Cl.[5] H04N *5/202*
U.S. Cl. 358—32 **31 Claims**

1. An image display system comprising:
a source of image pixel data wherein each pixel has an M-bit value within a first non-linear range of values;
first means, coupled to an output of said source, for converting each of said M-bit pixel values to an N-bit pixel value within a linear range of values;
storage means, having an input coupled to an output of said first converting means, for storing the N-bit pixel values; and
second means, coupled to an output of said storage means, for converting N-bit pixel values output by said storage means to P-bit pixel values within a second non-linear range of values, said second means converting the N-bit pixel values prior to an application of said converted P-bit pixel values to a display means.

5,196,925
COMPENSATING STRUCTURE FOR POSITION ERRORS IN APPARATUS FOR RECORDING AND REPRODUCING CHARGE LATENT IMAGE
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga; Tsutou Asakura, both of Yokohama; Masato Furuya, and Hiromichi Tai, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan
Division of Ser. No. 433,240, Nov. 8, 1989, Pat. No. 5,003,402, which is a continuation-in-part of Ser. No. 347,640, May 5, 1989.
This application Jan. 22, 1991, Ser. No. 644,155
Claims priority, application Japan, May 10, 1988, 63-113306; May 10, 1988, 63-113307; Nov. 10, 1988, 63-284343; Jan. 31, 1989, 1-21789
Int. Cl.[5] H04N *1/40, 9/07*
U.S. Cl. 358—55 **6 Claims**

5. An apparatus for recording and reproducing a charge latent image, comprising:
a color separation filter including recurrent groups, each of said groups having stripes of at least three different colors, said stripes oriented in a predetermined direction;
a photoconductive member;
a recording medium including an information region and a reference region, the reference region extending along a side of the information region;
means for focusing information on the photoconductive member via the color separation filter;
recording means for forming a charge latent image on the information region of the recording medium in response to the information on the photoconductive member, and recording the information into the information region of the recording medium;
said recording means operating to record color information of the charge latent image in portions having said predetermined orientation in said information region;
means for forming a charge latent image on the reference region of the recording medium in response to a positional reference pattern, and recording the positional reference pattern into the reference region of the recording medium, the positional reference pattern including a plurality of sections;
information readout means for reading out the information from the recording medium and generating a color information signal representing the readout information;
correcting means, including first compensating means for compensating misalignment between said information readout means and said predetermined direction,

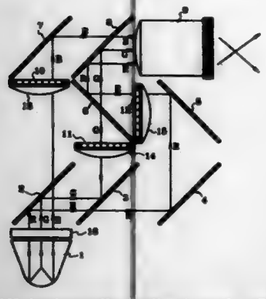


said first compensating means comprising:
reference means for reading out the positional reference pattern from the recording medium and generating a corrective signal on a basis of the readout positional reference pattern, wherein said reference means generates the corrective signal as a function of a positional relation between the recording medium and the information reading means;
subcarrier generating means for generating a subcarrier signal having a phase which depends on a phase of the corrective signal; and
means for demodulating color information from the generated color information signal on a basis of the subcarrier signal,
thereby obtaining stable color information during readout of the information from the recording medium even when an angle between the predetermined direction and said information readout means changes.

5,196,926
OPTICAL SYSTEM FOR AN LCD PROJECTOR
Seung G. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed May 14, 1991, Ser. No. 699,500
Claims priority, application Rep. of Korea, May 19, 1990, 7186/1990
Int. Cl.[5] H04N *9/31*
U.S. Cl. 358—60 **2 Claims**

1. An optical system for an LCD projector comprising an illuminating means having a light source, an infrared filter positioned on an original optical path from the light source and adapted for filtering out infrared rays from the light emitted by the light source, an optical system for separating red, green and blue light elements from the light transmitted through the infrared filter and then for reemerging an image in respective colors by using the separated red, green and blue light elements to compose a reemerged image, and a projection lens projecting an enlarged composed image, wherein said optical system further comprises:

a 45° horizontally inclined blue light transmission means positioned after said infrared filter on the original optical path from the light source, said means is adapted for transmitting blue light element of said light transmitted through said infrared filter and simultaneously reflecting red and green light elements along a red and green optical path perpendicular to said original optical path;
a first condensing means positioned on said original optical path, and adapted for condensing said blue light element;
a first LCD panel positioned on said original optical path after said first condensing means, and adapted for reemerging blue color image upon receiving said blue light element condensed by said first condensing means;
a first 45° horizontally inclined total reflection means positioned on a first blue image path after said first LCD panel, and adapted for reflecting said blue color image along a second blue image path perpendicular to said original image path;
a 45° horizontally inclined green light reflection means positioned on said red and green optical path, and adapted for transmitting said red light element and reflecting said green light element along a first green optical path perpendicular to said red and green optical path;
a second condensing means positioned on said first green optical path, and adapted for condensing said green light element;
a second LCD panel positioned on said first green optical path after said condensing means, and adapted for reemerging green color image upon receiving said light element condensed by said second condensing means;



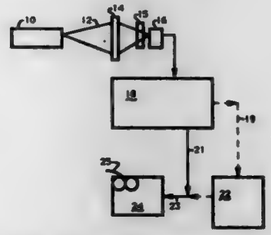
a second 45° horizontally inclined total reflection means positioned on a first red optical path of the red light element transmitted through said 45° horizontally inclined green light reflection mirror, and adapted for reflecting said red light element along a second red optical path perpendicular to said first red optical path;
a third 45° vertically inclined total reflection means positioned on said second red optical path, and adapted for reflecting said red light element along a third red optical path perpendicular to said second red optical path;
a third condensing means positioned on said third red optical path, and adapted for condensing said red light element;
a third LCD panel positioned on said third red optical path after said third condensing means, and adapted for reemerging red color image upon receiving said red light element condensed by said third condensing means;
a 45° vertically inclined red image reflection means positioned at a cross of a first green image path and a first red image path respectively from said second and third LCD panels, and adapted for transmitting said green color image and reflecting said red color image along a second red image path perpendicular to said first red image path; and
a 45° horizontally inclined blue image transmission means positioned at a cross of said first green, said second blue and said second red image paths, and adapted for transmitting said blue color image and reflect said green and red color images along an image path perpendicular to said first green image path, thereby causing the red, green and blue color images to be composed.

5,196,927

METHOD FOR ELECTRONIC COLOR PROCESSING

George T. Warner, Lititz, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1990, Ser. No. 494,463
Int. Cl.[5] G03F 3/00
U.S. Cl. 358—80 17 Claims



1. A method for processing original color separation image density values comprising:
generating original color separating image density values of pixels of an original image, the number of the original values corresponding to a first set of n colors, where n is at least 2,
generating, for each pixel, two matrixes, a 1 by 2^n-1 matrix V of intermediate color values relating to the original values for the first set of n colors, and a 1 by 2^n-1 matrix D of color indexes also relating to the original values for the first set of n colors,
calculating, for each pixel, a corrected set of n color separation values, $F_i=\{F_1, F_2, \ldots, F_n\}$, utilizing the generated matrix V_j of intermediate color values, the generated matrix D_j of color indexes, and coefficients E_{ijDj} selected from a three dimensional matrix E_{ijm} of preselected color coefficients utilizing the equation:

$$F_i = \sum_{j=1}^{2^n-1} (V_j)(E_{ijDj}),$$

and
using the calculated corrected set of n color separation values, $F_i=\{F_1, F_2 \ldots F_n\}$, for each pixel to control a color output device to produce a faithful color reproduction of the image.

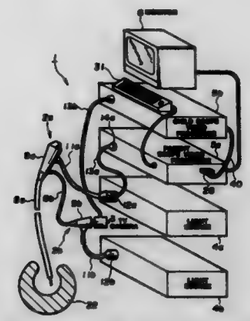
5,196,928

ENDOSCOPE SYSTEM FOR SIMULTANEOUSLY DISPLAYING TWO ENDOSCOPIC IMAGES ON A SHARED MONITOR

Isamu Karasawa; Yasuyuki Kaneko; Masahiko Hamano, all of Hachioji; Kazufumi Takamizawa, Chofu; Matsumi Ōshima; Hideyuki Shoji, both of Hachioji; Ken-ya Inomata, Mitaka; Atsushi Amano, Hachioji; Toshiaki Nishikori, Sagamihara, and Akira Ōsawa, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1992, Ser. No. 828,744
Claims priority, application Japan, Apr. 2, 1991, 3-070159
Int. Cl.[5] A61B 1/04, 1/06; H04N 5/272
U.S. Cl. 358—98 20 Claims

1. An endoscope system, comprising:
a first endoscope including an elongated insertion tube and a first imaging means for producing a first endoscopic image;
a second endoscope including an elongated insertion tube and a second imaging means for producing a second endoscopic image;
a video processor including a function for processing a first image signal originating from said first imaging means which is input from an input terminal and a function for mixing a second image signal originating from said second imaging means which is input from an external input terminal with at least a first video signal originating from said first imaging means to thereby generate a composite video signal; and
a monitor which is provided with said composite video signal sent from said video processor and capable of simultaneously displaying said first endoscopic image and said second endoscopic image corresponding to said composite video signal.

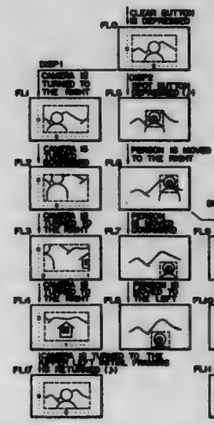


5,196,929

DISPLAY SYSTEM OF CAMERA HAVING TRACKING APPARATUS

Tetsuo Miyazaka, Tsukui, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 547,059
Claims priority, application Japan, Jul. 5, 1989, 1-173552; Jul. 5, 1989, 1-173553; Jul. 5, 1989, 1-173554; Apr. 20, 1990, 2-104636; Apr. 20, 1990, 2-104637; Apr. 25, 1990, 2-107548; Apr. 25, 1990, 2-107549
Int. Cl.[5] H04N 5/225, 7/18
U.S. Cl. 358—125 63 Claims



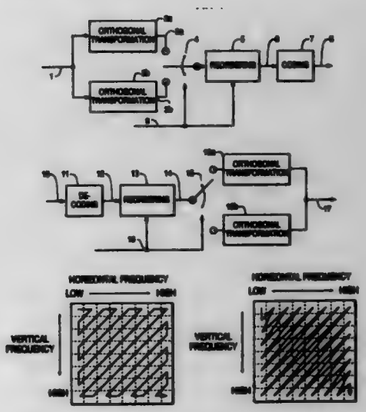
1. A display apparatus of a camera, comprising:
two-dimensional sensor means for repeatedly imaging an object to be photographed and for generating two-dimensional luminance signals;
pattern signal generating means for repeatedly generating one-dimensional pattern signals from the two-dimensional luminance signals;
memory means for storing an immediately preceding pattern signal each time said pattern signal generating means generates a new pattern signal;
moving amount detecting means for performing, after said memory means stores an immediately preceding pattern signal, a correlation arithmetic operation between a new pattern signal and the immediately preceding pattern signal stored in said memory means to detect a moving amount of the object to be photographed during a repetition time interval, and for performing the correlation arithmetic operation each time said memory means stores an immediately preceding pattern signal; and
display means for displaying a moving amount of the object by using a width of a photographing picture as a basic unit even if an image of the object is outside the range of the photographing picture.

5,196,930

HIGH EFFICIENCCY CODING AND DECODING APPARATUS FOR LOWERING TRANSMISSION OR RECORDING RATE OF TRANSMITTED OR RECORDED VIDEO SIGNAL WITHOUT REDUCING PICTURE QUALITY

Shinya Kadono, Katano, and Tatsuro Juri, Osaka, both of, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 17, 1991, Ser. No. 731,311
Claims priority, application Japan, Jul. 20, 1990, 2-193627; Aug. 21, 1990, 2-220910; Oct. 19, 1990, 2-282119
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—133 9 Claims



1. A high efficiency coding apparatus comprising: an orthogonal transforming device for performing at least two types of orthogonal transformations on a digital video input signal formed in blocks and for selecting one output signal of the orthogonal transforming device and for reordering the selected signal; and a device for coding the reordered selected signal by a specific technique regardless of the type of orthogonal transformation; wherein the orthogonal transforming device orthogonally transforms in two types, that is, an orthogonal transformation for reordering in a sequence of frequency by a two-dimensional orthogonal transformation of vertical m points×horizontal for reordering in a sequence of frequency by a three-dimensional orthogonal transformation of vertical

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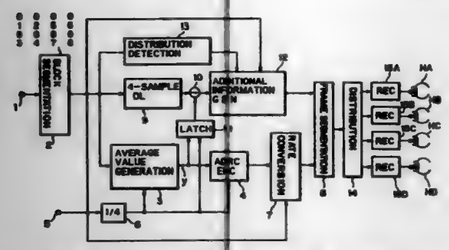
(m/2) points×horizontal n points×time on signals in each field at a position corresponding to a signal in the frame.

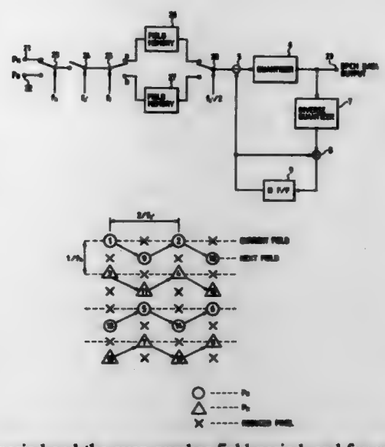
5,196,931
HIGHLY EFFICIENT CODING APPARATUS PRODUCING ENCODED HIGH RESOLUTION SIGNALS REPRODUCIBLE BY A VTR INTENDED FOR USE WITH STANDARD RESOLUTION SIGNALS
Tetsujiro Kondo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 23, 1991, Ser. No. 811,973
Claims priority, application Japan, Dec. 28, 1990, 2-417504
Int. Cl.[5] H04N *7/12, 7/13*
U.S. Cl. 358—133 **9 Claims**



1. A highly efficient coding apparatus for encoding an input digital video signal comprised of digital video data representing relatively high resolution picture elements according to a first standard having a first picture element resolution which is a value N times greater than a second picture element resolution of relatively lower resolution picture elements according to a second standard, comprising:
averaging means for averaging said digital video data of said digital video signal representing said value N of said relatively high resolution picture elements so as to generate averaged data representing relatively lower resolution picture elements substantially according to said standard,
block encoding means for encoding said averaged data in a block-type format allowing data compression so as to generate encoded data corresponding to said relatively lower resolution picture elements,
subtracting means for subtracting from said averaged data each of said digital video data representing said value N of said relatively high resolution picture elements and providing subtracted data therefrom,
additional encoding means for encoding said subtracted data so as to generate additional data, and
combining means for combining said encoded data and said additional data in an order in which said encoded data is next to said additional data so as to generate combined encoded data corresponding to said relatively high resolution picture elements.

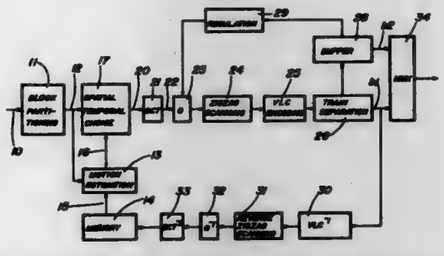
5,196,932
IMAGE SIGNAL TRANSMISSION APPARATUS
Nobuhiro Hoshi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 24, 1991, Ser. No. 690,612
Claims priority, application Japan, Apr. 26, 1990, 2-108914
Int. Cl.[5] H04N *7/137*
U.S. Cl. 358—135 **14 Claims**

1. An image signal processing apparatus, which processes image signals, comprising:
(a) line sequential output means for simultaneously receiving first image data and second image data both of which are different from each other and each of which comprises a plurality of different sample data and for sequentially outputting the received first and second image data every one horizontal period;
(b) data thinning-out means for performing a thinning-out processing on sample data output from said line sequential output means in the horizontal direction of a screen so that vertical positions of the sample data on the screen are different from each other between the odd-number field



period and the even-number field period, and for outputting the sample data thinning-out processed; and
(c) prediction coding means for prediction coding the sample data output from said data thinning-out means and for outputting prediction coded data.

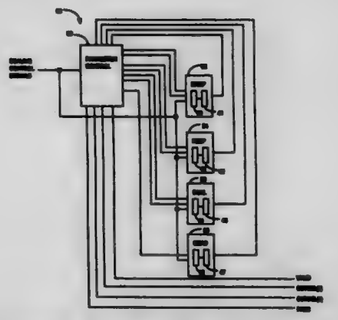
5,196,933
ENCODING AND TRANSMISSION METHOD WITH AT LEAST TWO LEVELS OF QUALITY OF DIGITAL PICTURES BELONGING TO A SEQUENCE OF PICTURES, AND CORRESPONDING DEVICES
Jean-Pierre Henot, Thorigne, France, assignor to Etat Francais, Ministere des PTT and Telediffusion de France S.A., both of France
Filed Mar. 19, 1991, Ser. No. 671,456
Claims priority, application France, Mar. 23, 1990, 90 03926
Int. Cl.[5] H04N *7/12, 7/04*
U.S. Cl. 358—136 **7 Claims**



1. An encoding and transmission method with at least two levels of quality of digital pictures made of picture elements, the method comprising the steps of:
partitioning each of said digital pictures into blocks of picture elements;
applying a reversible mathematical transformation to each of said blocks of picture elements to form transformed blocks of transformed coefficients corresponding to a distinct spatial frequency in the corresponding block of picture elements;

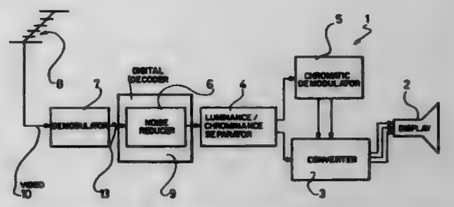
quantizing said transformed coefficients to form quantized coefficients;
encoding the quantized coefficients to form encoded coefficients;
distributing said encoded coefficients into a first and at least one second digital trains of encoded coefficients, each of said trains having a beginning and an end, the first digital train including basic coefficients corresponding to lower spatial frequencies, and at least one second digital train including a set of complementary coefficients corresponding to higher spatial frequencies;
channel encoding the encoded coefficients of said first digital train with a first level of protection against transmission errors to form a first series of data elements to be broadcast;
channel encoding the encoded coefficients of said at least one second digital train with a second level of protection against transmission errors to form at least one second series of data elements to be broadcast, said first level of protection being greater than said second level of protection;
multiplexing said channel encoded digital trains in a common channel utilizing specific synchronization words in the common channel to enable the ready identification of the beginning and the end of each of said digital trains, said digital trains being broadcast at a fixed rate relative to each other.

5,196,934
IMAGE SCALING APPARATUS FOR A MULTIMEDIA SYSTEM
Ross M. Fleischman, Boca Raton, and Bruce J. Wilkie, West Palm Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 1, 1991, Ser. No. 650,388
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—160 **28 Claims**



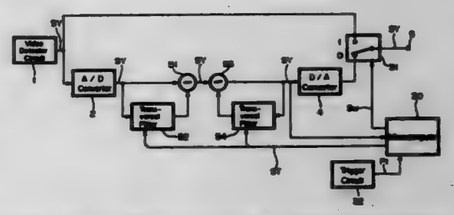
1. An apparatus for scaling an image as represented by an arrangement of picture elements comprising
a scaler control circuit configured to provide a plurality of scaling parameters based upon a desired scaling factor,
said plurality of scaling parameters being integer numbers, and
a scaler circuit,
said scaler circuit including a plurality of separate parameter counter circuits, each said parameter counter circuit receiving a respective scaling parameter and providing a respective signal manipulation control signal based upon said respective scaling parameter,
said scaler circuit being configured to
receive said arrangement of picture elements,
manipulate said arrangement of picture elements based upon said signal manipulation control signals to provide a manipulated arrangement of picture elements,
said manipulation including performing a discrete number of different operations on subsets of said arrangement of picture elements based upon said respective signal manipulation control signals, as discrete number of different operations being selectively enabled based upon said signal manipulation control signals, and
provide said manipulated arrangement of picture elements as a scaled image.

5,196,935
METHOD AND AN APPARATUS FOR REDUCING NOISE OF THE PULSIVE TYPE IN DIGITAL VIDEO RECEIVER SETS
Alessandro Cremonesi, Milan; Franco Cavallotti, Turin, and Gianguido Rizzotto, Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milano, Italy
Filed Dec. 20, 1990, Ser. No. 630,511
Claims priority, application Italy, Dec. 22, 1989, 22835 A/89
Int. Cl.[5] H04N *5/213*
U.S. Cl. 358—167 **5 Claims**



4. An apparatus for reducing noise of the pulsive type in digital video receiver sets operating on a composite synchronism video signal, comprising means for picking up and sampling the noise-affected pulsive portion of said signal, and means for computing the average value of sampled impulses bounding the noise sample and comparing said average value to the value of said noise sample, said means for picking up comprising first and second static selectors having inputs to receive a sampled video signal, each via respective predetermined delay blocks effective to apply a line delay to the signal, and having outputs connected to further delay blocks so as to define a matrix of sampling values corresponding to chrominance components of the video signal.

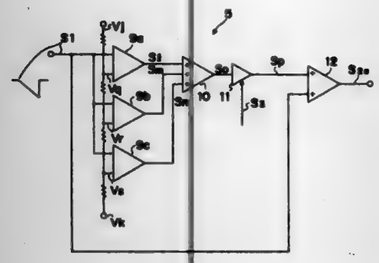
5,196,936
GHOST CANCELLING RECEIVER USING GHOST CANCEL REFERENCE SIGNAL
Satoshi Kobayashi, Tokyo; Junya Saito, Saitama; Tsutomu Kume, Ibaraki, and Takatomo Nagamine, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jun. 27, 1991, Ser. No. 722,531
Claims priority, application Japan, Jul. 3, 1990, 2-176071
Int. Cl.[5] H04N *5/21*
U.S. Cl. 358—167 **5 Claims**



1. A ghost cancelling receiver using a ghost cancel reference signal and comprising:
a transversal filter supplied with a received video signal;

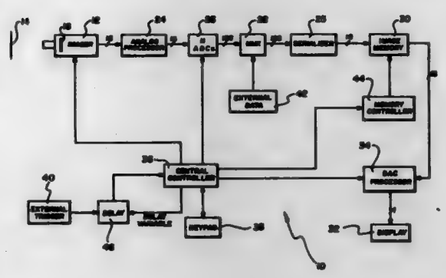
a gate circuit connected to the output of said transversal filter for gating a ghost cancel reference signal;
a calculating circuit connected to the output of said gate circuit deriving a distortion component from said gated ghost cancel reference signal, said distortion component being utilizable for cancelling a ghost signal from said received video signal;
a maximum value detection circuit connected to the output of said calculating circuit;
a comparator for comparing the output of said maximum value detection circuit and a signal which is derived from said calculating circuit but has not gone through said maximum value detection; and
a feedback loop starting from the output of said comparator and extending to a control terminal of said transversal filter for controlling a characteristic of a pass band of said transversal filter.

5,196,937
CONTRAST CORRECTION DEVICE FOR CORRECTING VIDEO SIGNAL CONTRAST BY VARYING LUMINANCE SIGNAL
Atsuhisa Kageyama, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 29, 1991, Ser. No. 707,003
Claims priority, application Japan, May 31, 1990, 2-143158
Int. Cl.[5] H04N *5/57*
U.S. Cl. 358—169 4 Claims



1. A contrast correction device for controlling a contrast of an image formed by video signals by varying a luminance signal, comprising:
an average detection circuit for detecting an average luminance level of a video signal; and
at least one slice circuit for slicing an input luminance signal comprising:
a voltage divider for dividing the potential difference between a pedestal voltage of the video signal and a white peak voltage thereof;
an adder circuit for adding the output signals from said slice circuit;
a gain control circuit for controlling the gain of the output from said adder circuit from a negative to a positive level according to said average luminance level and for producing a gain controlled signal; and
another adder for adding the gain controlled signal from said luminance signal, such that the contrast correction is changed from positive gamma correction characteristics to negative gamma correction characteristics according to the average value of the video signal.

5,196,938
SOLID STATE FAST FRAME RECORDER HAVING INDEPENDENTLY SELECTABLE FRAME RATE AND EXPOSURE
Kurt V. Biessinger, Vista, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 20, 1989, Ser. No. 439,226
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—209 7 Claims

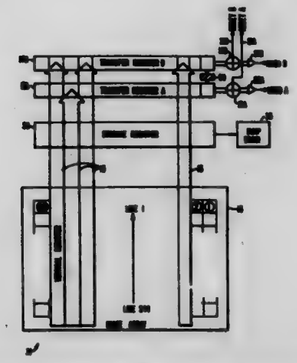


7. A solid state fast frame recorder comprising:
solid state imager means for capturing images of an event and for producing a sequence of image frame signals corresponding to said captured images;
solid state memory means coupled to said imager means for storing image frame signals produced by said imager means; and
control means for selectively controlling said imager means to operate at a frame rate F to produce F image frame signals per second and for selectively controlling said memory means to operate at a frame rate F/m, where m is a positive integer greater than 1 and to store each F/m image frame signal produced by said imager means so that F/m image frame signals are stored per second and F-F/m image frame signals per second produced by said imager means are not stored by said memory means.

5,196,939
METHOD AND APPARATUS FOR TRANSFERRING IMAGES FROM AN IMAGING ARRAY
Hassaan Elabd, Sunnyvale; Martin K. S. Shih, San Jose, and Philip C. Cheng, Cupertino, all of Calif., assignors to Loral Fairchild Corporation, Syosset, N.Y.
Filed Dec. 28, 1989, Ser. No. 457,988
Int. Cl.[5] H04N *3/14, 5/335*
U.S. Cl. 358—213.11 24 Claims

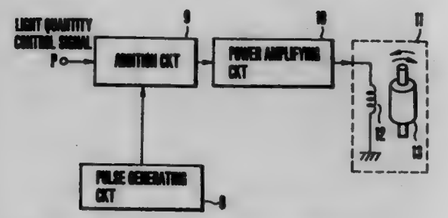
1. A system for achieving high frame rate transfer of an image from an image array including a plurality of pixels arranged in columns and rows for storing an image, comprising:
at least one dump drain connected to a storage register for dumping rows of the image not selected for transfer;
at least two vertical registers connected between the image array and said storage register, each vertical register for transferring a column of pixel data, said at least two vertical registers transferring pixel data to said storage register a row at a time; and

a first output register for receiving first output data from said storage register via said at least two vertical registers



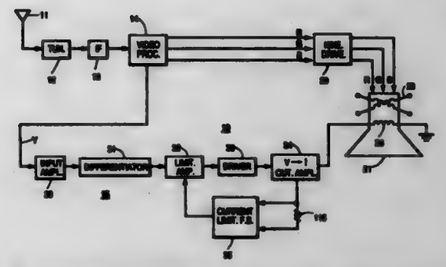
which have not been dumped in said at least one dump drain.

5,196,940
ELECTROMAGNETICALLY-DRIVEN AUTOMATIC IRIS DEVICE NOT REQUIRING SPEED DETECTING DAMPING COIL
Osamu Sato, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 11, 1990, Ser. No. 625,461
Claims priority, application Japan, Dec. 12, 1989, 1-322024
Int. Cl.[5] H04N *5/238*
U.S. Cl. 358—228 27 Claims



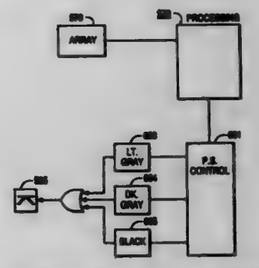
1. A light quantity adjusting device comprising:
a) a light quantity adjusting member arranged to adjust a quantity of light;
b) electromagnetic driving means for moving said light quantity adjusting member to adjust the quantity of light; and
c) output generating means for supplying a driving output to said electromagnetic driving means, said output generating means being arranged to generate a pulse output at a period shorter than a time constant of said electromagnetic driving means, wherein said output generating means is arranged to generate said pulse output by adding to a pulse signal having a period shorter than a time constant of said electromagnetic driving means a target signal indicative of a desired quantity of light.

5,196,941
BEAM SCAN VELOCITY MODULATION APPARATUS
Robert D. Altmanshofer, Carmel, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.
Division of Ser. No. 561,988, Aug. 2, 1990, Pat. No. 5,093,728.
This application Jan. 27, 1992, Ser. No. 826,541
Int. Cl.[5] H04N *3/32*
U.S. Cl. 358—242 24 Claims



11. Apparatus, comprising:
a video signal processing means for noise coring and symmetrically limiting a video signal;
means for scanning beam velocity modulation in accordance with said noise cored and symmetrically limited video signal; and,
means operable in accordance with said scanning beam velocity modulation means for varying at least one of said limiting and said noise coring in said video signal processing means to reduce dissipation in said scanning beam velocity modulation means.

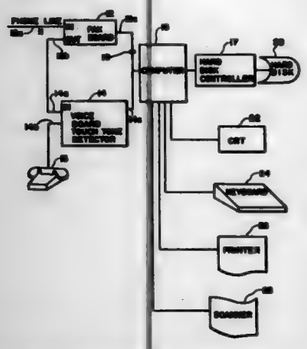
5,196,942
SYSTEM AND METHOD FOR DETERMINING PICTURE ELEMENT VALUES
Jeng-Nan Shiau, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 17, 1990, Ser. No. 583,337
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—298 9 Claims



1. In an image processing system having an input section for generating input image data having multiple input pixels, each input pixel having an input intensity value, being one of a set of input intensity values corresponding to an intensity of a sampled area of an image, and an output section for reproducing each input pixel by generating one of an output set of intensity values, a size of the output set of intensity values being OI, OI being at least 3 , and a size of the input set of intensity values being larger than OI, a method of processing data generated by the input section in accordance with (OI—1) threshold arrays comprising the steps performed by a processor of:
partitioning the input image data into cells having a number of pixels, each cell having dimensions corresponding to dimensions of the threshold arrays and each pixel of each

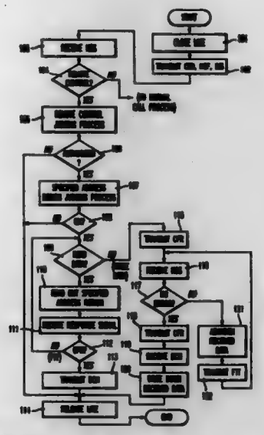
cell corresponding to one threshold in each of the threshold arrays;
processing each cell including first substeps of
processing each pixel of a cell, including second substeps performed for each pixel in a cell, of
comparing a sum of the pixel input intensity value and an error directed to the cell during the processing of previous cells with a corresponding threshold in a first threshold array;
generating an output intensity value corresponding to a first value of the set of output intensity values when the sum is greater than the corresponding threshold in the first threshold array;
comparing the sum with a corresponding threshold in a second threshold array;
generating an output intensity value corresponding to a second value of the set of output intensity values when the sum is greater than the corresponding threshold in the second threshold array and not greater than the corresponding threshold in the first threshold array; and
generating an output intensity value corresponding to an OIth value of the set of output intensity values when the sum is not greater than the corresponding thresholds in all of the threshold arrays;
applying the output intensity value to the output section;
calculating an error for the cell; and
directing an amount of the error to a set of unprocessed neighboring cells including third subsets of
determining a set of fractions, one for each of the set of unprocessed neighboring cells, the sum of the set of fractions being substantially equal to one; and
directing an amount of the error equal to a product of the calculated error and one of the set of fractions to an unprocessed neighboring cell.

5,196,943
FACSIMILE INFORMATION DISTRIBUTION APPARATUS
Stephen A. Hersee, Wheaton, and Terrence J. Flanagan, Bensenville, both of Ill., assignors to Copia International, Ltd., Wheaton, Ill.
Filed Aug. 25, 1989, Ser. No. 398,457
Int. Cl.[5] H04N *1/00*; H04M *11/00*
U.S. Cl. 358—403 22 Claims



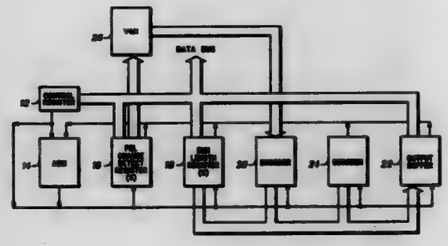
1. Apparatus for distributing image data borne on a selected one of a plurality of documents in response to a data request message identifying said selected one document, said data request message comprising a sequence of multifrequency audible tones indicative of said selected one document, said data request message transmitted by a data requestor over a bi-directional transmission medium to said distributing apparatus, said distributing apparatus comprising:
(a) addressable memory means for storing said plurality of documents;
(b) receiving means for receiving said data request message over said transmission medium and for providing address signals corresponding to said selected one document to said memory means to read out document image signals from said memory means corresponding to said selected one document;
(c) transmitting means connected to said memory means to receive said document image signals for generating and transmitting over said transmission medium to said data requestor a return message bearing said image data of said selected one document; and
(d) means responsive to the presence of said data request message on said transmission medium for seizing said transmission medium continuously during the operation of both of said receiving means and said transmitting means, whereby said return message may be transmitted to said data requestor over said same transmission medium as transmitted said request message to said distributing apparatus.

5,196,944
FACSIMILE APPARATUS
Yoshiaki Satake, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1990, Ser. No. 625,423
Claims priority, application Japan, Dec. 18, 1989, 1-325837
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—404 8 Claims



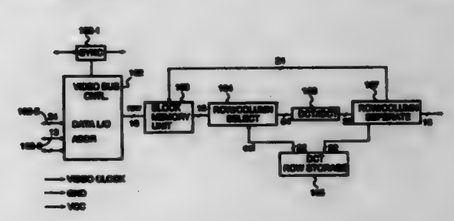
1. A facsimile apparatus comprising:
memory means for storing predetermined data;
setting means for setting the predetermined data to be in one of a first state and a second state;
control means, coupled to said memory means and setting means, for authorizing an access from an exterior of the facsimile apparatus to the predetermined data when the predetermined data are set to be in the first state by said setting means, and for unauthorizing the access to the predetermined data when the predetermined data are set to be in the second state by said setting means; and
wherein said setting means further comprises count means for counting a predetermined number of times the access is performed so that said setting means sets the predetermined data to be in the second state after the count means counts the predetermined number of times the access is performed, said control means authorizing the access until the counting means counts the predetermined number of times.

5,196,945
DATA COMPRESSION/EXPANSION CIRCUIT FOR FACSIMILE APPARATUS
Steve Ho, and Patrick Law, both of Hong Kong, Hong Kong, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 4, 1990, Ser. No. 576,827
Int. Cl.[5] H04N *1/41*
U.S. Cl. 358—426 8 Claims



1. A data compression/expansion unit for facsimile apparatus comprising:
a control register for selecting a specific coding scheme to be utilized;
an algorithmic state machine connected to said control register for receiving start signals therefrom and connected to other components of the unit for controlling the sequence and timing of the unit in accordance with the specific coding scheme selected in said control register;
pel change detect registers coupled to receive image data from a data bus, said pel change detect registers shifting the image data therethrough to provide pel change output signals representing each color change in the image data;
run length registers connected to provide run length output signals representative of the number of pels between each adjacent pair of pel change output signals, in response to the pel change output signals;
said algorithmic state machine controlling said pel change detect registers and said run length registers to operate simultaneously to reduce the required run time;
an encoder connected to receive the run length output signals and provide coded output signals, coded in accordance with the specific coding scheme selected in the control register;
an output buffer connected to receive the coded output signals from said encoder and arrange them in bytes, each byte including a predetermined number of bits; and
a decoder connected to said control register and algorithmic state machine and receiving binary code words on an input thereof, said decoder including at least one memory device having stored therein the nodes of a binary tree for converting the received binary code words into image data.

5,196,946
SYSTEM FOR COMPRESSION AND DECOMPRESSION OF VIDEO DATA USING DISCRETE COSINE TRANSFORM AND CODING TECHNIQUES
Alexandre Balkanski, San Francisco; Steve Purcell, Mountain View, and James Kirkpatrick, San Jose, all of Calif., assignors to C-Cube Microsystems, San Jose, Calif.
Filed Mar. 14, 1990, Ser. No. 494,242
Int. Cl.[5] H04N *1/415*
U.S. Cl. 358—433 6 Claims



1. A system for data compression and decompression, comprising:
video interface means for receiving and transmitting digitized images;
discrete cosine transform means for performing, during data compression, a 2-dimensional discrete cosine transform on data received by said video interface means, and providing coefficients of said 2-dimensional discrete cosine transform, and for performing, during data decompression, a 2-dimensional inverse discrete cosine transform, and providing as output data said coefficients of said 2-dimensional inverse discrete cosine transform to said video interface for transmission as digitized images;
quantization means for attenuating, during data compression, higher frequency coefficients of said 2-dimensional discrete cosine transform, and for partially restoring, during data decompression, said higher frequency coefficients of said 2-dimensional discrete cosine transform, in preparation for said 2-dimensional inverse discrete cosine transform;
zig-zag means for rearranging, during data compression, said coefficients of said 2-dimensional discrete cosine transform from "sequential" order into "zig-zag" order, and for rearranging, during data decompression, said zig-zag ordered coefficients of said 2-dimensional discrete cosine transform from a "zig-zag" order to a "sequential" order;
data packing and unpacking means for packing, during data compression, said "zig-zag" ordered coefficients of said 2-dimensional discrete cosine transform as run length-represented coefficients of said 2-dimensional discrete cosine transform, said run length-represented coefficients of said 2-dimensional discrete cosine transform represent runs of zero coefficients as run lengths of zero coefficients, and for unpacking, during data decompression, said run length-represented coefficients of said 2-dimensional discrete cosine transform to said "zig-zag" ordered coefficients of said 2-dimensional discrete cosine transform;
Huffman coding/decoding means for coding, during data compression, said run length-represented coefficients of said 2-dimensional discrete cosine transform into Huffman codes, and for decoding, during data decompression, said Huffman codes into said run length-represented coefficients of said 2-dimensional discrete cosine transform;
host interface means for transmitting, during data compression, said Huffman codes to a host computer, and for retrieving, during data decompression, said Huffman codes from a host computer;
wherein said discrete cosine transform means comprises:
block memory means for storing, during data compression, said data received by said video interface means, and for

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storing, during data decompression, said output data of said 2-dimensional inverse discrete cosine transform;

discrete cosine transform processor means for providing, during data compression, coefficients of a discrete cosine transform and during decompression, coefficients of an inverse discrete cosine transform;

row storage means for temporarily storing intermediate data of said 2-dimensional discrete cosine transform, and intermediate data of said 2-dimensional inverse discrete cosine transform;

input selection means for alternatively receiving, during data compression, data from said block memory means and intermediate data of said 2-dimensional discrete cosine transform from said row storage means for transmitting to said discrete cosine transform processor means, and for alternatively receiving, during data decompression, data from said quantization means and said intermediate data of said 2-dimensional inverse discrete cosine transform from said row storage means for transmitting to said discrete cosine transform processor means; and

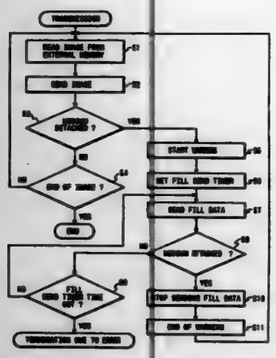
row/column separation means for, during data compression, separating from said coefficients of said discrete cosine transform said coefficients of said 2-dimensional discrete cosine transform and said intermediate data of said 2-dimensional discrete cosine transform, for transmitting said coefficients of said 2-dimensional discrete cosine transform to said quantization means and said intermediate data of said 2-dimensional discrete cosine transform to said row storage means, for, during data decompression, separating from said coefficients of said inverse discrete cosine transform said coefficients of said 2-dimensional inverse discrete cosine transform and said intermediate data of said 2-dimensional inverse discrete cosine transform, and for transmitting said coefficients of said 2-dimensional inverse discrete cosine transform to said block memory means, and for transmitting said intermediate data of said 2-dimensional inverse discrete cosine transform to said row storage means.

5,196,947

IMAGE COMMUNICATION APPARATUS

Masatomo Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1990, Ser. No. 615,149
Claims priority, application Japan, Nov. 22, 1989, 1-302221
Int. Cl.[5] H04N *1/00, 1/40*
U.S. Cl. 358—441 8 Claims



1. An image communication apparatus comprising:

data storage means for storing image data in a detachable storage medium or reading out image data from said storage medium;

detection means for detecting an attach/detach state of said storage medium;

means for transmitting image data stored in said storage medium;

warning means for generating an alarm according to a detection result of said detection means during transmission of the image data; and

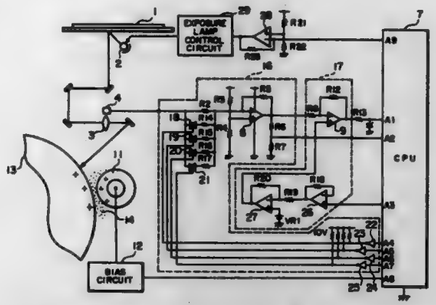
communication control means for, when said detection means detects during transmission of image data stored in said storage medium that said storage medium is detached, transmitting time adjustment data to a destination station for a predetermined period of time, for causing said detection means to detect if said storage medium is reattached, for, when said detection means detects reattachment of said storage medium within the predetermined period of time, continuing transmission of the image data stored in said storage medium, and for, when said detection means does not detect reattachment of said storage medium within the predetermined period of time, terminating transmission processing as an error.

5,196,948

IMAGE DENSITY READING APPARATUS CAPABLE OF SELECTING A DESIRED AMPLIFICATION LEVEL FOR THE DENSITY

Seitaro Kasahara; Haruo Itakura; Susumu Kurihara, all of Hachioji, and Hiroshi Ishii, Kiyose, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 3, 1990, Ser. No. 547,308
Claims priority, application Japan, Jul. 7, 1989, 1-176356; Jul. 7, 1989, 1-176357
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—446 13 Claims



1. An image density reading apparatus in which a document is irradiated by a light source and density data is generated on the basis of an image reflected from the document, comprising:

reading means for reading the image and generating a density signal;

amplification means for amplifying the density signal, the amplification means including a switch member for changing amplification of the density signal over a plurality of amplification levels to produce a plurality of amplified density signals;

signal processing means for selecting a desired amplification level from the plurality of amplification levels by using the plurality of amplified density signals as a selection criterion and outputting a gain control signal for controlling the switch member to provide the desired amplification level, the signal processing means including means for determining a difference amount for each amplification level, the difference amount being a difference between a black density signal and a white density signal at an amplification level, and means for determining the desired amplification level by selecting the amplification level yielding a desired difference amount; and

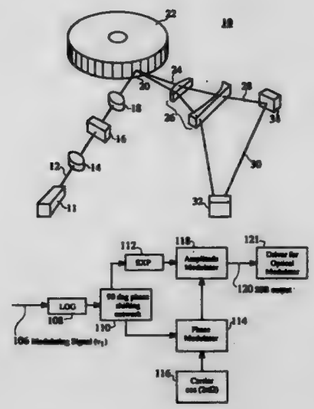
exposure control means for controlling an amount of light output by the light source in accordance with the amplification level set by the switch member.

5,196,949

VESTIGIAL SIDEBAND SCOPHONY IMAGING MODULATOR

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 10, 1990, Ser. No. 597,921
Int. Cl.[5] H04N *5/455*
U.S. Cl. 358—469 8 Claims



1. An apparatus for modulating a carrier signal, with a swept frequency vestigial sideband signal [150], comprising:

a. a fixed frequency generating means [138] for producing a fixed frequency signal [137];

b. a first mixing means [139] for mixing a video information signal [136] with said fixed frequency signal [137], to produce an AM modulated signal [140];

c. a vestigial sideband filtering means [142] for producing a vestigial sideband signal [144] from said AM modulated signal [140];

d. a swept frequency generating means [146] for producing a swept frequency signal [147];

e. a second mixing means [148] for mixing said vestigial sideband signal [144] with said swept frequency signal [147], producing a swept frequency vestigial sideband signal [150];

f. a modulator means [154] for modulating a final carrier frequency [156] with said swept frequency vestigial sideband signal [150], producing an output carrier [158] modulated by said swept frequency vestigial sideband signal [150]; and

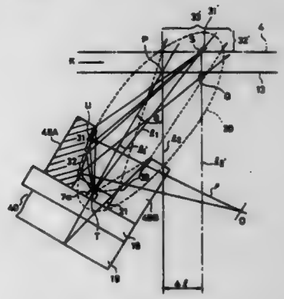
g. a driver means [152] for driving said modulator means [154] with said swept frequency vestigial sideband frequency [150].

5,196,950

OPTICAL READER AND LIGHT SOURCE USED FOR THE SAME

Shinobu Fukoka, and Takeshi Kamada, both of Atsugi, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,016
Claims priority, application Japan, Aug. 4, 1988, 63-102685[U]; Sep. 14, 1988, 63-231325; Dec. 27, 1988, 63-331170; May 15, 1989, 1-120743
Int. Cl.[5] H04N *1/04;* H04J *40/14*
U.S. Cl. 358—475 14 Claims



1. An optical reader comprising:

transport means for transporting a document in a document transport direction, said transport means including a lower guide plate and an upper guide plate opposite to said lower guide plate so as to form a gap through which said document is transported, said lower guide plate having an opening window;

light source means for obliquely projecting light along a projection optical axis onto said document through said opening window;

a first reflection frame mounted adjacent to said light source means;

read means for receiving light reflected by said document and outputting an electrical signal corresponding to the received light, said read means having a read optical axis along which said light reflected by said document goes,

said read optical axis and said projection optical axis intersecting on the side of said upper guide plate outside of said gap, having a first position where said projection optical axis and said document intersect and which is upstream in the document transport direction, as compared with a second position where said read optical axis and said document intersect,

a second reflection frame which is closer to said second position than said first reflection frame,

the reflection surface of said first reflection frame includes a curved surface which corresponds to a part of a first ellipse two focuses thereof, a first being a point on said LED chip, and the second being a point where said read optical axis and said upper guide plate intersect and which is in the cross section of said curved surface.

5,196,951

REFLECTION HOLOGRAMS WITHOUT TRANSMISSION GHOSTS

John E. Wreede, Azusa, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 26, 1991, Ser. No. 721,726
Int. Cl.[5] G02B *5/32;* G03H *1/26, 1/30*
U.S. Cl. 359—15 11 Claims

1. A reflection hologram structure comprising:

a transparent substrate;

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a pattern of hologram containing regions disposed on the transparent substrate; and

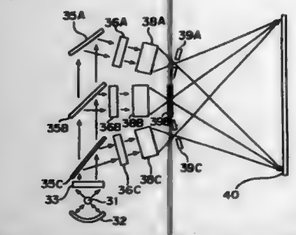
fixed predetermined shielding regions disposed over said hologram containing regions for said reflection hologram structure.

5,196,952

LIQUID CRYSTAL DISPLAY ELEMENT AND A PROJECTION TYPE LIQUID CRYSTAL DISPLAY APPARATUS

Yoshinori Hirai; Satoshi Niiyama, and Tomoki Gunjima, all of Yokohama, Japan, assignors to AG Technology Co., Ltd., Yokohama, Japan

Filed Mar. 26, 1991, Ser. No. 858,025
Claims priority, application Japan, Mar. 27, 1991, 3-087541
Int. Cl.[5] G02F *1/13, 1/137*
U.S. Cl. 359—51 20 Claims



1. A liquid crystal display element comprising a pair of substrates provided with electrodes and a liquid crystal and solidified matrix composite material, disposed between the pair of substrates, which includes a nematic liquid crystal dispersed and held in a solidified matrix, said nematic liquid crystal being such that the refractive index of the liquid crystal is changed depending on states of applying a voltage wherein in a state, the refractive index of the liquid crystal substantially coincides with that of the solidified matrix to thereby pass light, and in the other state, the former does not coincide with the latter to thereby cause the scattering of light, characterized in that the refractive index anisotropy Δn of the liquid crystal used is 0.18 or higher, and the dielectric anisotropy $\Delta\epsilon_{LC}$ of the liquid crystal used satisfies the relation of $5<\Delta\epsilon_{LC}<13$.

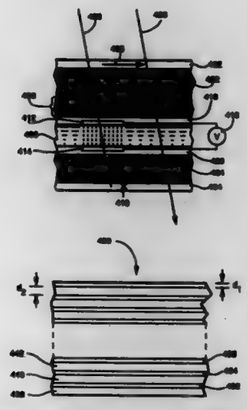
5,196,953

COMPENSATOR FOR LIQUID CRYSTAL DISPLAY, HAVING TWO TYPES OF LAYERS WITH DIFFERENT REFRACTIVE INDICES ALTERNATING

Pochi A. Yeh, Thousand Oaks; William J. Gunning, Newbury Park; John P. Eblen, Jr., Newbury Park, and Mohsen Khoshnevisan, Newbury Park, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Nov. 1, 1991, Ser. No. 786,621
Int. Cl.[5] G02F *1/1335, 1/137*
U.S. Cl. 359—73 12 Claims

1. A liquid crystal display, comprising:
a polarizer layer;
an analyzer layer;
a liquid crystal layer disposed between the polarizer layer and the analyzer layer;
a first electrode proximate to a first major surface of the liquid crystal layer;
a second electrode proximate to a second major surface of the liquid crystal layer, the first and second electrodes being adapted to apply a voltage across the liquid crystal layer when the electrodes are connected to a source of electrical potential; and



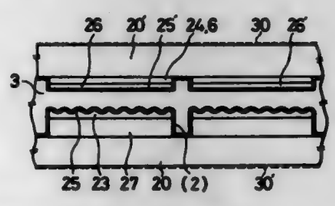
a multilayer thin film compensator disposed between the polarizer layer and the analyzer layer, including a first plurality of layers, each having a first refractive index and a first thickness, alternating with a second plurality of layers, each having a second refractive index and a second thickness, the values of the first and second refractive indices and thicknesses being such that the phase retardation of the multilayer is equal in magnitude but opposite in sign to the phase retardation of the liquid crystal layer in its homeotropically aligned state over a predetermined range of viewing angles.

5,196,954

LIQUID CRYSTAL DISPLAY

Shunpei Yamazaki, Tokyo; Takashi Inujima, Atsugi; Toshimitsu Konuma, Atsugi; Toshiji Hamatani, Atsugi; Akira Mase, Atsugi; Mitsunori Sakama, Hiratsuka; Minoru Miyazaki, Atsugi; Kaoru Koyanagi, Saku, and Toshiharu Yamaguchi, Zama, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 895,029, Aug. 8, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 243,218
Claims priority, application Japan, Aug. 8, 1985, 60-175193
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—75 9 Claims



1. A liquid crystal display comprising:
a transparent substrate provided with a transparent electrode pattern whereby the transparent substrate and the transparent electrode pattern provide a first inner surface;

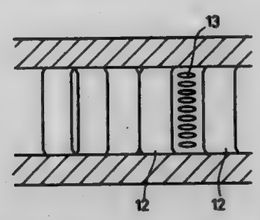
an opposed substrate provided with an opposed electrode pattern whereby the opposed substrate and the opposed electrode pattern provide a second inner surface, said transparent and opposed electrode patterns being arranged in order to define a plurality of pixels inbetween;
a chiral smectic liquid crystal layer disposed between the first and second inner surfaces;
one of the inners surfaces contiguous to the liquid crystal being an unrubbed, uneven surface; and
the other inner surface being a rubbed, oriented surface,
wherein each said pixel comprises a plurality of regions having various thicknesses dispersed in the pixel.

5,196,955

FERROELECTRIC LIQUID CRYSTAL OPTICAL DEVICE WITH VISCOSITY NOT MORE THAN 30000 CPS

Toshimitsu Konuma, Kanagawa; Shunpei Yamazaki, Tokyo; Toshimitsu Hagiwara, Kanagawa, and Hitoshi Kondou, Tokyo, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa and Takasago International Corporation, Tokyo, both of Japan

Filed May 22, 1991, Ser. No. 703,097
Claims priority, application Japan, May 24, 1990, 2-134441; May 24, 1990, 2-134442
Int. Cl.[5] G02F *1/13, 1/1337*
U.S. Cl. 359—100 10 Claims



7. A liquid crystal optical device comprising:
a pair of substrates;
an electrode pattern provided on the inside surfaces of said substrates; and
a ferroelectric liquid crystal material having a negative dielectric anisotropy disposed between said substrates and a viscosity of not more than 30000 cps at the operation temperature of the liquid crystal device,
wherein liquid crystal molecules of said material can be made parallel to the surfaces of said substrates by virtue of said negative dielectric anisotropy by application of alternating electric fields thereto.

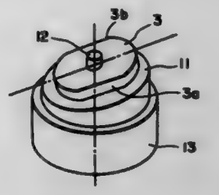
5,196,956

BEAM DEFLECTOR AND LASER BEAM PRINTER USING ONLY TWO INCLINED REFLECTING SURFACES

Yoshinori Sugiura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 642,560, Jan. 18, 1991, abandoned, which is a continuation of Ser. No. 297,965, Jan. 17, 1989, abandoned, which is a division of Ser. No. 149,020, Jan. 27, 1988, Pat. No. 4,915,465. This application Jul. 24, 1992, Ser. No. 924,603
Claims priority, application Japan, Jan. 30, 1987, 62-019915; Apr. 28, 1987, 62-107002; Jun. 30, 1987, 62-101356; Oct. 8, 1987, 62-255992
Int. Cl.[5] G02B *26/10*
U.S. Cl. 359—196 44 Claims

1. A laser beam deflecting device for scanningly deflecting a laser beam for image exposure, comprising:
a rotational mirror for reflecting the laser beam, said rotational mirror being inclined with respect to a rotational central axis of said deflecting device and having two opposite side refelcting surfaces effective to reflect the laser beam, wherein only the two surfaces are used for scanningly deflecting the laser beam for image exposure;



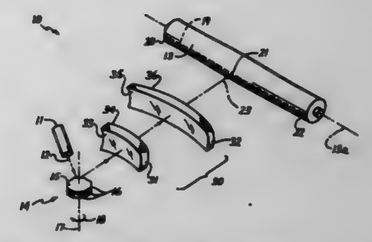
wherein said two reflecting surfaces are substantially parallel with the direction of inclination of said rotational mirror.

5,196,957

LASER SCANNER WITH POST-FACET LENS SYSTEM

Harry P. Brueggemann, San Marino, Calif., assignor to Olive Tree Technology, Inc., San Marino, Calif.

Continuation-in-part of Ser. No. 496,459, Mar. 20, 1990, abandoned. This application Apr. 3, 1990, Ser. No. 503,734
Int. Cl.[5] G02B *26/08, 7/02*
U.S. Cl. 359—206 11 Claims



1. A scanner system, comprising:
light source means for producing a light beam;
scanning means for directing the light beam to a spot on a surface to be scanned that is located at a predetermined location relative to the scanning means and for removing the spot across the surface along a scan line of predetermined length; and
a lens system, having first and second lens elements, at least one of which is composed of plastic material, interposed between the scanning means and the scan line,
the first and second elements each having first and second surfaces such that the light beam passes from the first surface of each element to its second surface,
the first and second surfaces of each element compensating for field curvature and wobble by being configured according to the following prescription, wherein the light beam is focused at the scanning means in the cross-scan plane and collimated in the scan plane (dimensional unit in inches and the thickness dimension of the first surface, measured from said scanning means and the thickness of subsequent surfaces 1 to 4, are each measured from its previous surface):

Surface		Radius of Carvature	Thickness	Mat'l	Remarks
			0.800		
1	Scan	−2.3797	0.250	PolyC	Spherical
	X-Scan	−2.3797			
2	Scan	−1.8583	2.300	Air	Toroidal
	X-Scan	−2.4834			

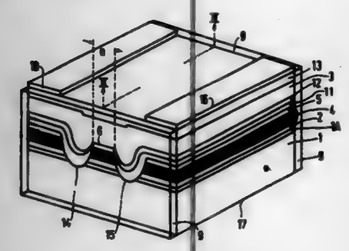
-continued

Surface		Radius of Curvature	Thickness	Mat'l	Remarks
3	Scan	−4.2680	0.250	PolyC	Toroidal
	X-Scan	−2.0902			
4	Scan	−3.4064		Air	Toroidal
	X-Scan	−0.8756			

5,196,958
OPTICAL AMPLIFIER HAVING GAIN AT TWO SEPARATED WAVELENGTHS

Bastiaan H. Verbeek; Wilma van Es-Spiekman, and Leonardus J. M. Hendrix, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1990, Ser. No. 603,977
Claims priority, application Netherlands, Oct. 31, 1989, 8902685
Int. Cl.[5] H01S 3/02, 3/18; G02B 1/10
U.S. Cl. 359—344 8 Claims

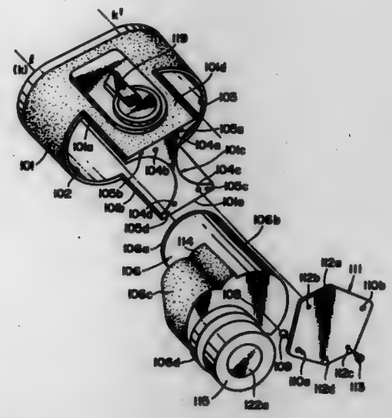


1. An optical amplifier comprising:
a substrate of a first conductivity type;
a strip shaped amplification region on the substrate, the amplification region including:
a covering layer including at least a first passive layer of the first conductivity type;
a second passive layer of a second, opposite conductivity type;
a PN junction between the first and second passive layers;
an active layer disposed between the first and the second passive layers, the active layer consisting of a plurality of quantum well layers of a semiconductor material with direct band transition, which layers are separated from one another by barrier layers of another semiconductor material, the number and thickness of the quantum well layers and the barrier layers and the length of the strip shaped amplification region selected so that two optical transitions can take place between a conduction band and two valency bands in the active layer, the amplification region being operative at a current density through the PN junction sufficient to produce saturation effects for at least one of said two optical transitions to amplify radiation at two wavelengths corresponding to the two optical transitions;
end surfaces bounding the active layer of the strip shaped amplification region, the end surfaces being practically perpendicular to the active layer and forming input and output surfaces for radiation to be amplified;
connection conductors on the second passive layer and the substrate; and anti-reflection layers on end surfaces of the amplifier having a reflection coefficient of at most 0.5 for the two wavelengths.

5,196,959
BINOCULAR WITH OBJECTIVE LENS-BARRELS ROTATABLE ABOUT THE OPTICAL AXES OF THE OBJECTIVES

Akira Yanagisawa, Tokyo, and Keiichi Hotta, Higashi, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo and Petori Kogyo Kabushiki Kaisha, Saitama, both of Japan

Continuation of Ser. No. 546,702, Jul. 2, 1990, Pat. No. 5,071,242, which is a continuation of Ser. No. 225,749, Jul. 29, 1988, abandoned. This application Jan. 30, 1991, Ser. No. 648,141
Claims priority, application Japan, Apr. 26, 1988, 63-55267; Apr. 26, 1988, 63-55268; Apr. 29, 1988, 63-58089; Apr. 30, 1988, 63-57336; Apr. 30, 1988, 63-57337; Apr. 30, 1988, 63-57338; Apr. 30, 1988, 63-57339; Apr. 30, 1988, 63-57340
Int. Cl.[5] G02B 7/12, 7/06, 23/18, 23/00
U.S. Cl. 359—415 18 Claims

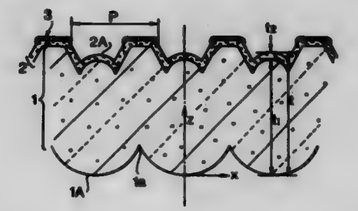


1. A binocular comprising:
a binocular body;
a pair of objective lens-barrels being mounted on said binocular body, a pair of objective lenses having their respective optical axes extending parallel to each other, said pair of objective lenses being incorporated respectively in said pair of objective lens-barrels, said pair of objective lens-barrels being mounted within said binocular body for angular movement relative thereto about the respective optical axes of said pair of objective lenses;
a pair of eyepiece lens-barrels including respective eyepiece lenses, said eyepiece lenses having respective optical axes extending parallel to the respective optical axes of said objective lenses, each of said eyepiece lens-barrels being adapted to move with respect to said binocular body about a corresponding one of said of optical axes of said objective lenses in such a manner that said optical axes of the respective lenses are respectively moveable towards and away from each other about said pair of optical axes of said objective lenses; and
a pair of image-erecting chambers, each chamber being arranged between an objective lens-barrel and a corresponding one od said eyepiece lens-barrels, said eyepiece lens-barrels extending from said pair of image-erecting chambers, each image-erecting chamber including optical means for optically connecting said optical axes of said objective lenses with the optical axes of the respective eyepiece lens, said pair of image-erecting chambers being separate respectively from said pair of objective lens-barrels.

5,196,960
LENTICULAR LENS SHEET

Ichiro Matsuzaki; Hiroshi Kuwada; Masao Otaki, and Ken Abe, all of Nakajo, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 29, 1991, Ser. No. 784,513
Claims priority, application Japan, Oct. 29, 1990, 2-293309
Int. Cl.[5] G03B 21/60
U.S. Cl. 359—453 9 Claims



1. A double-sided lenticular lens sheet comprising an entrance lens layer having an entrance lens, and an exit lens layer having an exit lens whose lens surface is formed at the light convergent point of the entrance lens, or in the vicinity thereof, wherein;
said entrance lens layer and said exit lens layer are each formed of a substantially transparent thermoplastic resin;
at least said exit lens layer contains light-diffusing fine particles; and
said lens sheet has parameters satisfying the following expressions (I) and (II).

$$t_1 > t_2 > 0 \quad \text{(I)}$$

$$0 \leq \frac{\Delta n_1 c_1}{\rho_1 d_1} < \frac{\Delta n_2 c_2}{\rho_2 d_2} \quad \text{(II)}$$

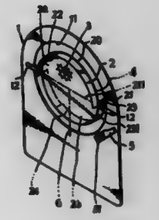
wherein t_1 represents a thickness of the entrance lens layer; t_2, a thickness of the exit lens layer; Δn_1, a difference in refractive index between the thermoplastic resin and the light-diffusing fine particles in the entrance lens layer; Δn_2, a difference in refractive index between the thermoplastic resin and the light-diffusing fine particles in the exit lens layer; c_1, a weight concentration of the light-diffusing fine particles in the entrance lens layer; c_2, a weight concentration of the light-diffusing fine particles in the exit lens layer; ρ_1, a gravity of the light-diffusing fine particles in the entrance lens layer; ρ_2, a gravity of the light-diffusing fine particles in the exit lens layer; d_1, an average particle diameter of the light-diffusing fine particles in the entrance lens layer; and d_2, an average particle diameter of the light-diffusing fine particles in the exit lens layer.

5,196,961
WIND-ACTUATED FLASHING ROAD SIGN

Chih-Kuo Sun, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Feb. 4, 1992, Ser. No. 829,969
Int. Cl.[5] G02B 5/12; G09F 7/22
U.S. Cl. 359—522 6 Claims

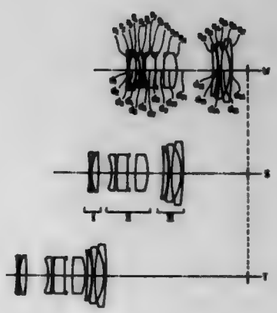
1. A road sign comprising: a frame means having a rotor opening formed in said frame means; a rotor means including a rotor disk rotatably mounted in said rotor opening of said frame means having a retroreflective sheet formed on a first side surface of said rotor disk capable of reflecting an incident light projecting towards said retroreflective sheet on said disk for forming a bright surface on said first side surface, a light-absorptive surface formed on a second side surface of said rotor disk opposite to said first side surface capable of absorbing incident light for forming a dark surface, an upper blade formed on an upper portion of said rotor disk and protruding frontwardly towards an observer's eyes from said disk, a lower blade formed on a lower portion of said disk and protruding rearwardly from said disk opposite to said upper blade, and a weight formed on a lower portion of said disk; whereby upon an action of a slight wind pressure on said rotor disk, said rotor disk will be pendulously vibrated for helping an initiation of a rotation of said rotor disk, and upon a further action of an increased wind pressure on said disk, said disk will be driven and rotated to first orient said bright surface frontwardly as effected by said retroreflective sheet on said first side surface of said disk and then subsequently orient said dark surface frontwardly as effected by said light-absorptive surface on said second side surface, thereby causing a flashing operation by a continuous rotation of said rotor disk when subjected to a wind pressure.



5,196,962
VARI-FOCAL LENS SYSTEM

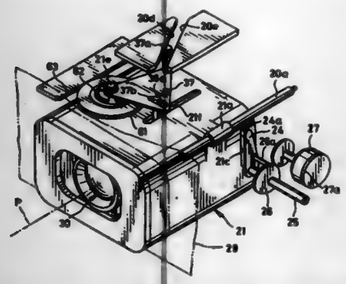
Norihiko Aoki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 726,999
Claims priority, application Japan, Jul. 9, 1990, 2-179583
Int. Cl.[5] G02B 15/14
U.S. Cl. 359—686 32 Claims



1. A vari-focal lens system comprising, in the order from the object side, a first lens unit having a positive refractive power, a second lens unit having a positive refractive power and a third lens unit having a negative refractive power, and using, in said second lens unit, at least one graded refractive index lens element having a refractive index distribution in the direction perpendicular to the optical axis.

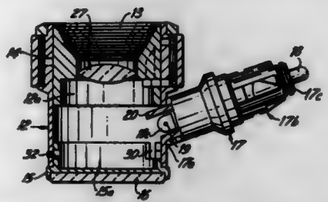
5,196,963
ZOOM LENS DEVICE
Tokuji Sato; Kazuo Kamata; Yasuhiro Nishitani, and Kiyotaka Kobayashi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 18, 1992, Ser. No. 855,052
Claims priority, application Japan, Mar. 18, 1991, 3-78447; Mar. 25, 1991, 3-84795; Mar. 25, 1991, 3-84796
Int. Cl.[5] G02B *15/14*
U.S. Cl. 359—699 28 Claims



10. A zoom lens device having a first lens holder holding a first lens group, a second lens holder holding a second lens group, and a movable lens barrel containing said first and second lens holders in a manner allowing said first and second lens holders to be movable along an optical axis, said movable lens barrel being adapted to move in first and second directions along said optical axis between a wide-angle end position and a telephoto end position during zooming, and said first lens holder moving together with said movable lens barrel along said optical axis during zooming and moving along said optical axis within said movable barrel during focussing to be set to a position corresponding to subject distance, said zoom lens device comprising:
- a cam follower for moving said second lens holder along said optical axis;
- a first cam surface for guiding said cam follower when said movable lens barrel moves in said first direction and for moving said second lens holder along said optical axis within said movable lens barrel;
- a second cam surface for guiding said cam follower when said movable lens barrel moves in said second direction and for moving said second lens holder along said optical axis within said movable lens barrel; and
- switching means for bringing said cam follower into contact with one of said first and second cam surfaces when said movable lens barrel moves into said first direction and into contact with the other of said first and second cam surfaces when said movable lens barrel moves in said second direction.

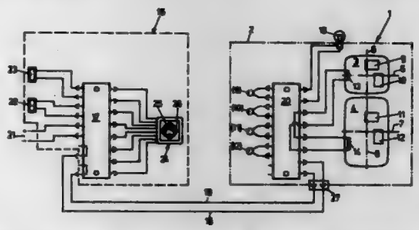
5,196,964
MAGNIFIER
Helmut A. Heine; Otto H. Schmidt, both of Herrsching, and Helmut Rosenbusch, Weltheim, all of Fed. Rep. of Germany, assignors to Heine Optotechnik GmbH & Co. KG, Herrsching, Fed. Rep. of Germany and Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed Jan. 7, 1991, Ser. No. 637,908
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1990, 9000190[U]
Int. Cl.[5] G02B *27/02*
U.S. Cl. 359—800 40 Claims

34. A magnifier for observing a surface, comprising:
- a housing having a first end and a second end and a hollow interior;
- window means including a window and coupled to said first end of said housing for observing the surface therethrough, said window means including an exterior wall having at least one slot extending therethrough and said housing including at least one protrusion extending inwardly, each said slot operable for slidably receiving a corresponding protrusion to secure said window means to said housing and for slidable releasing the corresponding protrusion to separate said window means from said housing, each said slot and corresponding protrusion serve as a



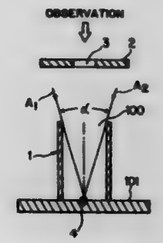
coupling means for separating said window means from said housing and securing said window means to said housing;
- eyepiece means coupled to said second end of said housing for magnifying the surface observed through said window means; and
- light source means coupled to said housing for supplying light to the hollow interior of said housing.

5,196,965
REAR-VIEW UNIT FOR MOTOR-VEHICLES
Heinrich Lang, Ergersheim, and Wolfgang Seiboth, Bad Windsheim, both of Fed. Rep. of Germany, assignors to Mekra Rangau Plastics GmbH & Co. KG, Fed. Rep. of Germany
Filed Sep. 20, 1991, Ser. No. 764,502
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029890
Int. Cl.[5] G02B *5/08*
U.S. Cl. 359—841 19 Claims



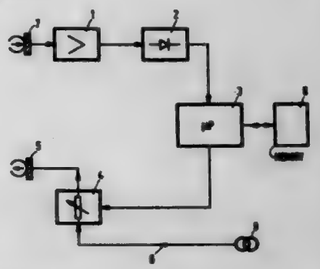
13. A rear-view unit for a truck (36) with a trailer (semi-trailer 37) and with at least one external rear-view mirror (1, 1*a*, 1*b*, 1*c*) comprising a housing (2, 2*a*, 2*b*, 2*c*),
- at least one pivotable mirror glass (3, 4; 4*a*, 4*b*; 3*c*, 4*c*)
- at least one electric servomotor (9, 10, 11, 12; 11*a*, 11*b*, 12*a*, 12*b*; 9*c*, 10*c*, 11*c*, 12*c*) for pivoting at least the mirror glass (3, 4; 4*a*, 4*b*; 3*c*, 4*c*) about a positioning axis (5, 6, 7, 8*a*; 7*a*, 8*a*, 8*b*, 5*c*, 6*c*, 7*c*, 8*c*);
- a mirror switch (24, 24*ab*, 24*c*) remote from said housing (2, 2*a*, 2*b*, 2*c*) to connect said at least one servomotor (9, 10, 11, 12; 11*a*, 11*b*, 12*a*, 12*b*; 9*c*, 10*c*, 11*c*, 12*c*) with a current supply (21, 21*ab*, 21*c*) via at least one electric line (18, 19; 18*a*, 19*a*, 18*b*, 19*b*; 18*c*, 19*c*);
- said mirror switch (24, 24*ab*, 24*c*) is connected to a transmitting unit (17, 17*ab*, 17*c*) and said at least one servomotor (9, 10, 11, 12; 11*a*, 11*b*, 12*a*, 12*b*, 9*c*, 10*c*, 11*c*, 12*c*) is connected to a receiving unit (20; 20*a*, 20*b*; 20*c*); of a multiplex system arranged in said housing (2, 2*a*, 2*b*, 2*c*),
- said at least one electric line (18, 19; 18*a*, 19*a*, 18*b*, 19*b*; 18*c*, 19*c*) being in the form of a data bus between said transmitting unit 17, 17*ab*, 17*c*) and said receiving unit (20; 20*a*; 20*b*; 20*c*),
- said transmitting unit (17*c*) of said multiplex system is associated with an angle detection equipment detecting an angle (W) between longitudinal axes L_Z, L_A) parallel to the direction of travel of said truck (36) and trailer (semi-trailer 37), by means of which equipment the position of said at least one mirror glass (3*c*, 4*c*) is automatically adjustable corresponding to said angle (W) via said multiplex system;
- said angle detection equipment comprises at least one angle transmitter responding to a change of angle between said truck (36) and said trailer (semi-trailer 37) and an evaluation unit (38) to generate control signals for the adjustment of the mirror position, the input of which evaluation unit (38) is connected with said angle transmitter, and the output of which evaluation unit (38) is connected with said transmitting unit (17*c*), and
- two distance sensors (46, 47) each arranged in the vicinity of side walls (44, 45) of said truck (36) facing away from one another are provided as angle transmitters, by means of each of which a signal can be generated for said evaluation unit (38), which signal corresponds to the respective distance between lateral regions of a front (48) of said trailer (semi-trailer 37) in the vicinity of said side walls (44, 45) and said distance sensors (46, 47).

5,196,966
METHOD AND IMPLEMENT FOR OBSERVING OR PHOTOGRAPHING GEM SUCH AS DIAMOND
Kinsaku Yamashita, Tokyo, Japan, assignor to Masayo Yamashita, Tokyo, Japan
Filed Jun. 27, 1991, Ser. No. 722,536
Claims priority, application Japan, Jul. 6, 1990, 2-177557
Int. Cl.[5] G02B *27/00*
U.S. Cl. 359—896 37 Claims



1. A method of observing or photographing a gem such as a diamond, comprising the steps of:
- placing the gem inside a container having an opening at the top in such a way that light can enter the container from directions lying within the range of angles of 20 to 50 degrees about the line vertical to the gem; and
- observing or photographing the gem from above while directing light into the container from above.

5,196,967
METHOD OF AUTOMATICALLY OPTIMIZING THE RECORDING BIAS FOR A VIDEO SIGNAL, AND ARRANGEMENT FOR CARRYING OUT THE METHOD
Werner Moderer, Lauf/Peg; Ulrich Grothaus, Puschendorf, and Karl Singer, Reichenschwand, all of Fed. Rep. of Germany, assignors to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holland Stiftung & Co., Furth/Bay, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 268,112, Nov. 7, 1988. This application Oct. 17, 1990, Ser. No. 599,338
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739180
Int. Cl.[5] G11B *5/02, 5/03*
U.S. Cl. 360—66 6 Claims



1. A method of automatically optimizing the video recording bias for a video signal recorded in the same tracks of a record carrier as an audio signal, the audio signal having been recorded in deeper layers of the record carrier in a first recording step followed by the video signal being recorded in upper layers of said record carrier in a second recording step, wherein during recording of said video signal, said method comprises the steps:
- changing, step-wise, the video recording bias during the recording of said video signal;
- after every change of said video recording bias, deriving a d.c. signal from a playback envelope of the audio signal, a value of said d.c. signal being a measure of the playback amplitude of the audio signal;
- comparing said d.c. signal value to a predetermined minimum value; and
- terminating the changing of said video recording bias and storing the value of said video recording bias when said d.c. signal value has decreased to said predetermined minimum value.

5,196,968
MAGNETIC TAPE CASSETTE APPARATUS HAVING A MICROPROCESSOR CONTROLLED SERVO ROD AND TAPE DEVICE
Hans-Werner Dietz, Ehringshausen; Karl Klos-Hein, Wetzlar, and Horst-Hermann Rumpf, Herborn-Schlechbach, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 683,083, Apr. 9, 1991, abandoned, which is a continuation of Ser. No. 366,701, Jun. 14, 1989, abandoned. This application Sep. 12, 1991, Ser. No. 758,027
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820501; May 10, 1989, 3915201
Int. Cl.[5] G11B *15/02, 21/02*
U.S. Cl. 360—69 20 Claims

1. A magnetic- tape cassette apparatus having capstans for driving a magnetic tape of a tape cassette loaded in said apparatus, a capstan drive means for driving said capstans, a pair of rotatable turntables for driving winding spindles of a loaded tape cassette, a head-mounting plate movable between a rest position, a play position, and a fast-wind position, electromagnetic holding means for holding said head mounting plate in

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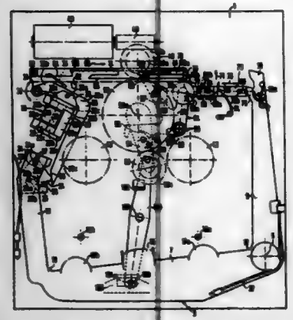
said play and fast-wind positions, an axially movable servo rod for moving said head mounting plate from said rest position towards said play and fast-wind positions, servo drive means for moving said servo rod and driving said turntables, and electronic control means for controlling the functioning of the apparatus, the improvement comprising:

said servo drive means comprises a movable switching member arranged such that said servo rod controls the position of said switching member during axial movement of said servo rod, said switching member being movable independent of the servo rod when said servo rod is stationary;

switching means actuatable between a plurality of actuation



states by said servo rod and said switching member for supplying switching signals to said control means upon actuation by said servo rod or said switching member; and

said electronic control means comprising memory means for storing switching signals from said switching means, deriving means for deriving the instantaneous geometrical position of said servo rod and switching member and the actuation state of said switching means from the last stored switching signal received from said switching means, and converting means for converting the switching signal from said switching means into control commands for said servo drive means, said capstan drive means, and said electromagnetic holding means.

5,196,969

HEAD POSITIONING SYSTEM FOR SERPENTINE MAGNETIC RECORDING/REPRODUCING SYSTEM

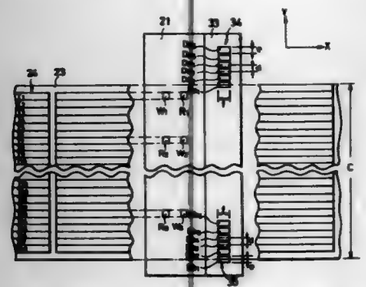
Tadashi Iwamatsu, and Toru Okuda, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1990, Ser. No. 498,571

Claims priority, application Japan, Mar. 31, 1989, 1-81708; Mar. 31, 1989, 1-81709; Mar. 31, 1989, 1-81710; Oct. 31, 1989, 1-285378; Oct. 31, 1989, 1-285379

Int. Cl.[5] G11B *21/02, 5/55*

U.S. Cl. 360—75 12 Claims



1. A head positioning system for changing the position of a plurality of heads relative to a width dimension of magnetic tape, the width dimension being perpendicular to a direction in which the tape travels, the heads traversing tracks on the tape arranged in parallel with each other in the direction in which the tape travels; the system comprising:

light emitting means located at a position facing a first side of the magnetic tape for emitting light toward the first side of the magnetic tape;

light receiving means for potentially receiving light emitted from the light emitting means, the light receiving means being located at a position facing a second side of the magnetic tape, the light receiving means comprising a plurality of light receiving elements, each of the light receiving elements producing an output signal related to reception of light;

head control means for producing a control signal, the head control means being connected to the light receiving elements comprising the light receiving means and being connected to receive an indication when the heads are to change tracks, the control signal being produced to establish a predetermined relation between the output signals of selected ones of the light receiving elements, the predetermined relation and the selected light receiving elements being dependent upon the track next to be traversed; and

means responsive to the control signal for moving the heads relative to the width of the tape whereby the heads change tracks and for enabling the output signals of the selected ones of the receiving elements to acquire the predetermined relation.

5,196,970

MAGNETIC DISC APPARATUS

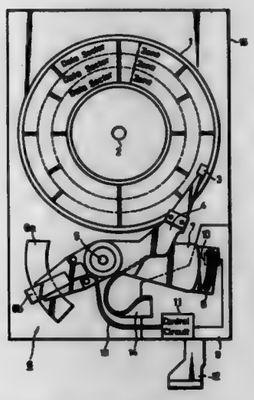
Satoru Seko; Yoshiyuki Kunito; Takayasu Muto, and Tomoki Kawabata, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 25, 1989, Ser. No. 427,260

Claims priority, application Japan, Oct. 26, 1988, 63-270366; Oct. 31, 1988, 63-275325; Nov. 29, 1988, 63-301768

Int. Cl.[5] G11B *5/596*

U.S. Cl. 360—77.03 9 Claims



1. A magnetic disc apparatus comprising:

(a) at least one magnetic disc having a plurality of track groups thereon at different distances from the center of the disc, each of which track groups comprises plural data tracks having plural data sectors, each of the track groups having a different number of the data sectors therein in such a manner that the radially outermost track group has more data sectors than the radially innermost track group;

(b) transducer means for reading and writing data signals from and on the data tracks;

(c) actuator means for positioning the transducer means over a desired one of the data tracks;

(d) position sensor means for sensing the position of the transducer means relative to the magnetic disc, and for generating at least two periodic signals each of which is out of phase with each other; and

(e) controller means for controlling the actuator means according to the periodic position signals so that the transducer means can be positioned over a selected one of the data tracks.

5,196,971

TAPE LOADING MECHANISM FOR USE IN MAGNETIC RECORDING/REPRODUCING APPARATUS HAVING TAPE CONTROL FEATURES FOR PREVENTING DAMAGE TO TAPE

Yuzo Tsuchiya, and Toshiaki Tanaka, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

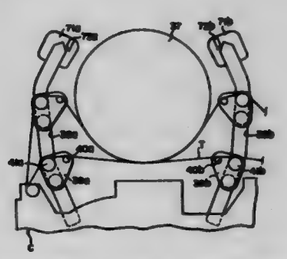
Continuation of Ser. No. 457,967, Dec. 27, 1989, abandoned.

This application Dec. 5, 1991, Ser. No. 801,592

Claims priority, application Japan, Dec. 28, 1988, 63-333589

Int. Cl.[5] G11B *5/027*

U.S. Cl. 360—85 27 Claims



1. A tape-loading mechanism for pulling a tape out of a tape cassette and bringing the tape into contact with a cylinder used for recording/reproducing information on the tape, the mechanism comprising:

a first tape-pulling member, provided on a tape inlet side of the cylinder and having a first slanted post and a first guide roller thereon, for pulling the tape out of the tape cassette, the first slanted post and the first guide roller contacting the tape, the first guide roller including a first tape-winding portion, the tape passing around the first tape-winding portion when the tape contacts the first guide roller;

first guide means, provided on the tape inlet side of the cylinder, for guiding the first tape-pulling member between first and second positions, the first slanted post and the first guide roller of the first-tape pulling member initially contacting the tape contained in the tape cassette at the first position, and the first tape-pulling member bringing the tape pulled out of the tape cassette into contact with the cylinder at the second position;

a first holding member for holding, at the second position, and the first tape-pulling member guided from the first position by the first guide means;

first damage preventing means, formed on the first holding member such that the first damage preventing means is positioned relative to at least one of a tape inlet and tape outlet side of the first guide roller of the first tape-pulling member, for preventing the tape from being damaged when the tape falls off of the first guide roller in a slackened state, the first damage preventing means supporting only a lower edge of the tape at a level corresponding to a lower end of the first tape-winding portion of the first guide roller, leaving the other edge and surfaces of the tape unsupported, so that should the tape in a slackened state leave the first guide roller, the lower edge of the slackened tape will rest upon the first damage preventing means;

a second tape-pulling member, provided on a tape outlet side of the cylinder and having a second slanted post and a second guide roller thereon, for pulling the tape out of the tape cassette, the second slanted post and the second guide roller contacting the tape, the second guide roller including a second tape-winding portion, the tape passing around the second tape-winding portion when the tape contacts the second guide roller;

second guide means, provided on the tape outlet side of the cylinder, for guiding the second tape-pulling member between third and fourth positions, the second slanted post and the second guide roller of the second tape-pulling member initially contacting the tape contained in the tape cassette at the third position, and the second tape-pulling member bringing the tape pulled out of the tape cassette into contact with the cylinder at the fourth position;

a second holding member for holding, at the fourth position, the second tape-pulling member guided from the third position by the second guide means; and

second damage preventing means, formed on the second holding member such that the second damage preventing means is positioned relative to at least one of a tape inlet and tape outlet side of the second guide roller of the second tape-pulling member, for preventing the tape from being damaged when the tape falls off of the second guide roller in a slackened state, the second damage preventing means supporting only the lower edge of the tape at a level corresponding to a lower end of the second tape-winding portion of the second guide roller, leaving the other edge and surfaces of the tape unsupported, so that should the tape in a slackened state leave the second guide roller, the lower edge of the slackened tape will rest upon the second damage preventing means.

5,196,972

CASSETTE LOADING DEVICE FOR VIDEO CASSETTE RECORDER

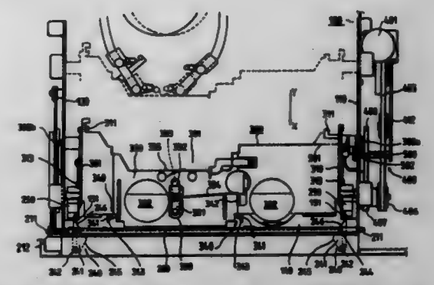
Masahiro Matsumaru, Abiko; Mitsuo Haruzumiya, Tokyo, and Masato Mihara, Hiratsuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 7, 1990, Ser. No. 624,010

Claims priority, application Japan, Dec. 7, 1989, 1-318600; Mar. 30, 1990, 2-83785; Mar. 30, 1990, 2-83786; Mar. 30, 1990, 2-83787; Aug. 27, 1990, 2-225684

Int. Cl.[5] G11B *5/48, 21/16*

U.S. Cl. 360—94 13 Claims



2. A cassette loading device of the front loading type for selectively loading either a standard cassette or a smaller cassette into a loaded position in a video cassette recorder, comprising:

a housing having a cassette insertion slot, said cassette insertion slot having a width which is substantially the same as the width of the standard cassette;

a first door mounted on said housing for selectively opening and closing said cassette insertion slot, said first door

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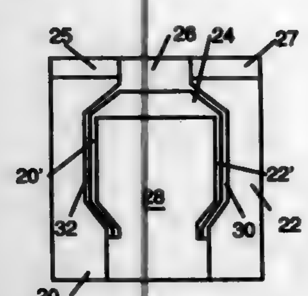
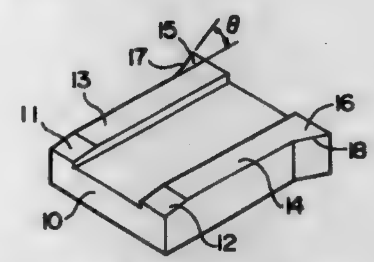
having an opening defined therein, said opening having a width which is substantially the same as the width of the smaller cassette;
a second door mounted on said first door for selectively opening and closing said opening;
a pair of door lock members mounted on said housing, one on each side of said cassette insertion slot, each of said door lock members having an engaging surface for locking said first door in engagement therewith and a tapered surface for engaging a standard cassette upon insertion into said cassette insertion slot in front of said first door; and
the arrangement being such that when no cassette is inserted, said first door is locked at lateral opposite ends thereof against angular movement by said door lock members, and when the standard cassette is inserted through said cassette insertion slot, said tapered surface of each of the door lock members is pushed by the inserted standard cassette to disengage said engaging surface from said first door to unlock the first door, and when the smaller cassette is inserted through said opening, the smaller cassette is guided through said opening for thereby opening said second door.

5,196,973
NEGATIVE PRESSURE AIR BEARING SLIDER HAVING ISOLATION CHANNELS WHICH TERMINATE PRIOR TO TRAILING EDGE
Robert E. Chapin, Burnsville, and Richard A. Strom, Eagan, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.
Division of Ser. No. 528,925, May 25, 1990, Pat. No. 5,128,822. This application Apr. 9, 1992, Ser. No. 865,856
Int. Cl.[5] G11B *21/21*
U.S. Cl. 360—103 9 Claims



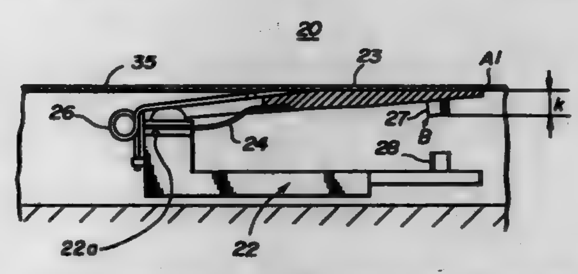
1. A negative pressure air-bearing slider, comprising:
a slider body having a surface with a leading edge, a trailing edge and first and second side edges;
first and second raised side rails positioned along the first and second side edges, respectively, the side rails each forming an air-bearing surface which develops positive pressure during flight;
a raised cross rail positioned near the leading edge and extending between the side rails;
a negative pressure cavity trailing the cross rail and positioned between the side rails;
a first isolation channel and a first isolation separating rail positioned primarily between the first side rail and the negative pressure cavity;
a second isolation channel and a second isolation separating rail positioned primarily between the second side rail and the negative pressure cavity; and
wherein the isolation channels communicate with the leading edge and wherein the isolation channels and the isolation separating rails terminate prior to the trailing edge.

5,196,974
RAIL-TYPE FLOATING MAGNETIC HEAD SLIDER
Teruyoshi Higashiya, Hiratsuka; Yoshihiko Miyake, Odawara; Mikio Takada, Kanagawa; Toshinori Kazama, Hiratsuka, and Kousaku Wakatsuki, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 15, 1991, Ser. No. 641,255
Claims priority, application Japan, Jan. 22, 1990, 2-10622; Jan. 24, 1990, 2-12481
Int. Cl.[5] G11B *5/60*
U.S. Cl. 360—103 4 Claims



1. A magnetic head slider, having a disk-advancing end facing a direction in which a rotating disk advances towards the magnetic slider, and a disk-receiving end facing a direction in which the rotating disk recedes from the magnetic head slider, comprising a pair of slider rails provided on opposing sides of said magnetic head slider, said slider rails having opposing inner sides which extend substantially parallel to a tangential velocity vector line of the rotating magnetic disk, and outer sides having protruding portions which diverge in the direction of the disk-receding end of said magnetic head slider, said protruding portions extending outwardly beyond said outer sides at the disk-advancing end of said magnetic head slider when viewed in a direction parallel to said inner sides of said slider rails.

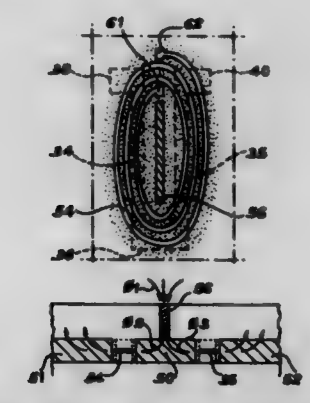
5,196,975
MAGNETIC DISK APPARATUS HAVING HEAD ARM ELASTICALLY SUPPORTED ON HEAD CARRIAGE
Kazuhiko Inoue, Houya, Japan, assignor to TEAC Corporation, Japan
Filed Jan. 4, 1991, Ser. No. 638,054
Claims priority, application Japan, Oct. 30, 1990, 2-293443; Nov. 9, 1990, 2-305783
Int. Cl.[5] G11B *5/54, 21/22*
U.S. Cl. 360—105 11 Claims



1. A magnetic disk apparatus for recording and reproducing information to and from a magnetic disk loaded in a housing therefor, said magnetic disk apparatus comprising:
a head carriage unit having a head carriage main body, a leaf spring which is fixed on said head carriage main body at a first end thereof, and an upper arm connected to a second end of said leaf spring; said upper arm being separably supported on said head carriage main body and provided with a magnetic head;
a lift mechanism for performing a first operation for moving said upper arm in an upward direction while a magnetic disk is being loaded and ejected and a second operation for moving said upper arm in a downward direction so that

the magnetic head is set on the magnetic disk loaded in said housing; and
an engagement member for engaging with said upper arm moved by a predetermined amount in the upward direction by the first operation of said lift mechanism;
wherein after said engagement member is engaged with said upper arm, said upper arm is pivoted, by the further first operation of said lift mechanism, on a point at which said upper arm and said engagement member are engaged with each other, so that said lead spring is elastically deformed.

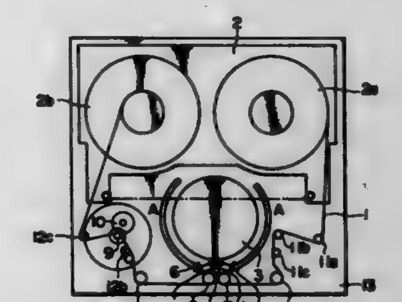
5,196,976
MAGNETORESISTANCE MAGNETIC HEAD FOR PERPENDICULAR RECORDING ON A MAGNETIC SUPPORT
Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France
PCT No. PCT/FR90/00212, § 371 Date Nov. 16, 1990, § 102(e) Date Nov. 16, 1990, PCT Pub. No. WO90/11594, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 28, 1990, Ser. No. 603,757
Claims priority, application France, Mar. 29, 1989, 89 04061
Int. Cl.[5] G11B *5/39, 5/30*
U.S. Cl. 360—113 4 Claims



1. Horizontal magnetic head for a perpendicular recording on magnetic support, comprising:
a semiconductor substrate having therein, a horizontal magnetic layer having a central pole piece surmounted by a thin vertical monopole flush with a surface of the head, wherein the magnetic layer is interrupted by two spacers arranged symmetrically with respect to a plane of the monopole and parallel thereto, the magnetic layer comprises a U-shaped magnetoresistant element, constituted by two ribbons parallel to the monopole and respectively arranged in the two spacers of the magnetic layer and a bridge connecting the two ribbons, the U-shaped magnetoresistant element having two ends connected to connectors constituting reading outputs of the head.

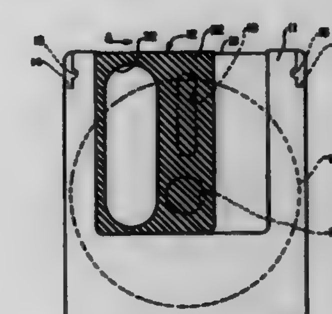
5,196,977
TAPE GUIDE MECHANISM FOR RECORDING AND REPRODUCING DEVICE
Hirokazu Shimizu, Chigasaki; Kyuichirou Nagai, Fujisawa, and Kenji Ogiro, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 20, 1991, Ser. No. 658,257
Claims priority, application Japan, Feb. 21, 1990, 2-038212
Int. Cl.[5] G11B *15/60*
U.S. Cl. 360—130.220 4 Claims

1. A tape guide mechanism for use in a recording and reproducing device in which signals are recorded on and reproduced from a tape, wound around an outer peripheral surface of a cylinder, respectively, by signal recording and signal reproducing means mounted on said cylinder, said tape guide mechanism comprising:
a pair of first guides disposed respectively at a tape entrance side and a tape exit side of said cylinder and positioned adjacent to said cylinder in a condition in which the winding of said tape around said cylinder is completed, so as to define a posture of entrance of said tape to said cylinder and a posture of exit of said tape from said cylinder, respectively;
a pair of second guides disposed adjacent to said pair of first guides, respectively, so as to change a direction of travel of said tape; and



a third guide disposed between a signal recording surface side of the tape on a tape travel path, which is provided between said first guide of the tape entrance side and said second guide, and other signal recording surface side of the tape on the tape travel path, which is located from said first guide of the tape exit side to said second guide, and wherein said third guide rotates about a stationary shaft.

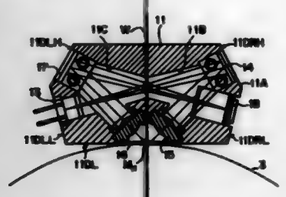
5,196,978
CARTRIDGE CASE
Junichi Washo; Kenji Ohta; Shigeo Terashima; Masahiro Horii, all of Nara; Takao Hyuga, Kyoto, and Toshihisa Deguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 12, 1987, Ser. No. 48,768
Claims priority, application Japan, May 27, 1986, 61-79798; May 27, 1986, 61-79799
Int. Cl.[5] G11B *23/03*
U.S. Cl. 360—133 12 Claims



1. In an cartridge case for containing a disk-shaped data recording medium, said cartridge case having planar outer surfaces and a front edge and being formed with an opening through which a portion of said data recording medium is exposed, said cartridge case including a shutter which is attached thereto slidably along said front edge and is adapted to thereby open and close said opening, the improvement wherein said shutter has two planar covering pieces which are parallel to each other and to said planar outer surfaces of said cartridge case and serve to sandwich said cartridge case therebetween, said planar covering pieces having inner surfaces which face each other, said planar covering pieces further having side edges which extend perpendicularly to said front edge, said inner surfaces of said planar covering pieces being

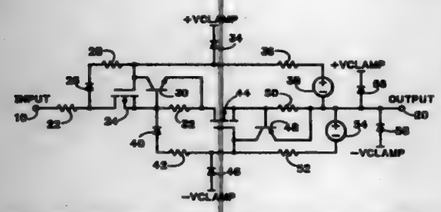
rounded along said side edges so as to reduce friction between said shutter and said cartridge case.

5,196,979
MAGNETIC HEAD POSITION MEASURING DEVICE
Etsuro Saito, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 28, 1990, Ser. No. 619,140
Claims priority, application Japan, Nov. 30, 1989, 1-311696
Int. Cl.[5] G11B 5/40
U.S. Cl. 360—137 14 Claims



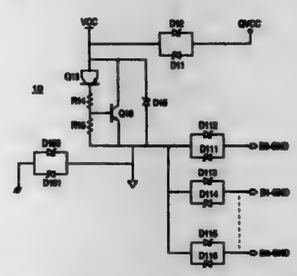
1. A magnetic head position measuring device for a recording and/or reproducing apparatus including a rotary magnetic head unit having a rotor with a cylindrical wall and a magnetic head positioned on said rotor, said magnetic head position measuring device comprising:
means defining a light source for emitting an irradiating light beam;
first reflecting means for reflecting the irradiating light beam emitted from said light source means;
first lens means for leading the irradiating light beam reflected by said first reflecting means to said magnetic head to be reflected therefrom;
second lens means for leading a light beam comprised of light from said irradiating light beam which has been reflected by said magnetic head;
second reflecting means for reflecting said light beam led through said second lens;
light receiving means for receiving said light beam reflected from said second reflecting means and outputting a signal representative of the position of an image of said light source formed on said light receiving means by said light beam; and
processing means for processing said signal outputted from said light receiving means to provide an output signal representative of the position of said magnetic head.

5,196,980
LOW IMPEDANCE, HIGH VOLTAGE PROTECTION CIRCUIT
Daniel B. Carson, Bothell, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Jan. 28, 1991, Ser. No. 646,865
Int. Cl.[5] H02H 3/09; G01R 1/36
U.S. Cl. 361—18 21 Claims



15. A low impedance overvoltage protection circuit comprising:
a low impedance stage for normally coupling an input signal to an output terminal, said low impedance stage comprising a first and a second MOSFET, the drain terminal of said first MOSFET receiving said input signal, the source terminal of said first MOSFET being coupled to the drain terminal of said second MOSFET, and the source terminal of said second MOSFET being coupled to said output terminal;
high impedance means disposed in shunt relation to said low impedance stage;
means for switching said low impedance means to a high impedance state, said means for switching including means responsive to said input signal and providing a voltage for biasing said first MOSFET to an off state for excessive positive signal values and providing a voltage for biasing said second MOSFET to an off state for excessive negative signal values; and
means for coupling said input signal to said high impedance means.

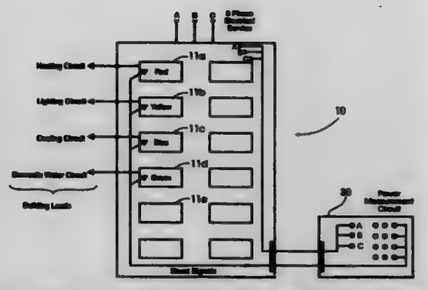
5,196,981
ESD PROTECTION SCHEME
James R. Kuo, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Dec. 28, 1990, Ser. No. 635,874
Int. Cl.[5] H02H 9/04
U.S. Cl. 361—56 3 Claims



1. An improved energy dissipation circuit for protecting an integrated circuit that includes a primary functional circuit, a plurality of input pins connected to provide input signals to the primary functional circuit, and a plurality of output pins connected to provide output signals from the primary functional circuit, the energy dissipation circuit including a primary shunt diode protection circuit that includes, for each input pin, a supply diode connected between said input pin and a positive supply and a ground diode connected between said input pin and logic ground, the primary shunt diode protection circuit further including, for each output pin, an output diode connected between said output pin and logic ground, the improvement comprising a secondary energy dissipation circuit connected between the positive supply and logic ground and operative in conjunction with the primary shunt diode protection circuit to provide an energy dissipation path between any combination of an input pins and output pins and wherein the energy dissipation path includes elements of only the primary shunt diode protection circuit and the secondary energy dissipation circuit whereby a voltage spike having a voltage greater than a preselected limit and applied at one of the input pins or one of the output pins is not applied to the primary functional circuit, said primary functional circuit includes a plurality of ground logic output pads connected between the primary functional circuit and logic ground, and wherein the secondary energy dissipation circuit comprises:
(a) an NPN bipolar transistor connected between the positive supply and ground;
(b) a Zenor diode connected in series with a resistor divider connected between the positive supply and logic ground such that the resistor divider provides a drive signal to the base of the NPN transistor;

(c) a reverse-current path Schottky diode connected between the positive supply and logic ground; and
(d) a plurality of inverse parallel Schottky diode paris, one such Schottky diode pair being connected between an associated ground logic output pad and logic ground.

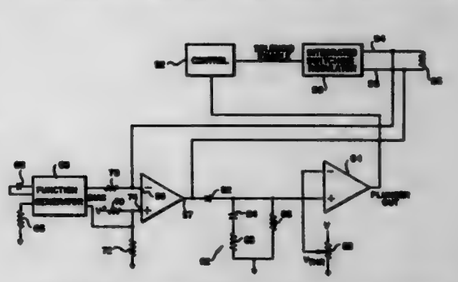
5,196,982
ELECTRICAL POWER MONITORING SYSTEM
Dennis Landeberg, Syracuse, and Bradley J. Hesse, Dewitt, both of N.Y., assignors to The Fleming Group, Syracuse, N.Y.
Filed Aug. 23, 1991, Ser. No. 749,374
Int. Cl.[5] H02H 3/08
U.S. Cl. 361—93 16 Claims



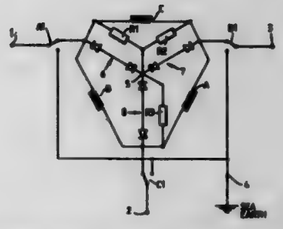
1. An end use power consumption monitor for industrial or commercial buildings integrally constructed with a circuit breaker, said power consumption monitor disposed in a current carrying line feeding an end use circuit of said industrial or commercial building, said power consumption monitor providing a voltage signal proportional to current being carried by said circuit breaker for said end use circuit, said power consumption monitor operatively connected to a processing circuit for receiving said voltage signal and for processing said voltage signal to provide a power consumption value for said end use circuit, said end use power consumption monitor further including a circuit breaker panel for housing said power consumption monitor integrally constructed with said circuit breaker, and wherein a plurality of power consumption monitors and integral circuit breakers are housed by said circuit breaker panel, each of said plurality of power consumption monitors and integral circuit breakers being operative for a separate end use, and further wherein each end use is coded to identify said end use on said circuit breaker panel.

5,196,983
SOLENOID ENGAGEMENT SENSING CIRCUIT
Paul B. Stumpf, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 7, 1991, Ser. No. 772,525
Int. Cl.[5] H01H 47/32
U.S. Cl. 361—154 4 Claims

1. A solenoid engagement sensing circuit comprising:
a solenoid having a coil and a plunger which is moveable into and out of said coil in response to an actuating signal;
means for applying an actuating signal to said coil and for electrically isolating said coil when no actuating signal is applied to said coil;
a generator for generating a periodic signal;
an operational amplifier having an input and an output, wherein said periodic signal is applied to the input of said amplifier, and said solenoid coil is connected between the input and output of said operational amplifier;
an envelope detector connected to the output of said amplifier for detecting and storing the peak value of the output signal from said operational amplifier; and
a voltage comparator having an output and inputs connected to said envelope detector and to a reference threshold voltage, said voltage comparator being responsive to an increase in the voltage detected by said envelope detector as a result of a presence of said solenoid plunger within said coil to produce at said output a signal indicating the presence of said plunger within said coil.



5,196,984
SUBMARINE TELECOMMUNICATIONS SYSTEMS
Stephen M. Webb, London, England, assignor to Northern Telecom Limited, Montreal, Canada
Filed Dec. 12, 1991, Ser. No. 806,724
Claims priority, application United Kingdom, Feb. 8, 1991, 9102714
Int. Cl.[5] H01H 47/22; H04B 3/00
U.S. Cl. 361—191 4 Claims



1. A branching unit, for use in submarine telecommunications systems employing electrical power feeding, the unit having first, second and third line terminations, one for each of three line cables, and a termination for a sea earth, which unit includes first, second and third electrical relays, only one of which is energised at a time in use of the branching unit, which relays each have a respective relay coil and a respective set of relay contacts with first and second connecting states, wherein each one of the first, second and third line terminations is electrically connected to the set of relay contacts of a respective one of said first, second and third relays and the relay coil corresponding to said set of relay contacts is electrically connected between the sets of relay contacts of the other two of the first, second and third line terminations, the relay coils being electrically connected in a delta network, wherein the sea earth termination is electrically connected to each of the sets of relay contacts and in the first connecting state of each set of the relay contacts the sea earth terminal is electrically connected to the respective line termination, wherein in an unpowered, quiescent state of the branching unit the sets of relay contacts are all in the second connecting state and the first, second and third line terminations are electrically connected to the delta network and electrically disconnected from the sea earth termination, and wherein when electrical power is supplied between any pair of the first, second and third line terminations the relay corresponding to the other of the first, second and third line terminations is energised and the relay contacts set thereof switched to the first connecting state whereby to electrically isolate said other line termination from

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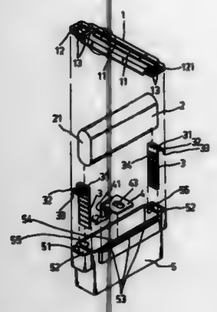
the said pair of terminations and to electrically connect it to the sea earth termination.

5,196,985
STATIC-CONDUCTIVE WRIST BAND
Randolph J. Ford, and Bob Delturco, both of Tucson, Ariz., assignors to Bystat, Inc., Ville St-Laurent, Canada
Filed Sep. 23, 1991, Ser. No. 763,648
Int. Cl.[5] H05F *3/02*
U.S. Cl. 361—220 31 Claims

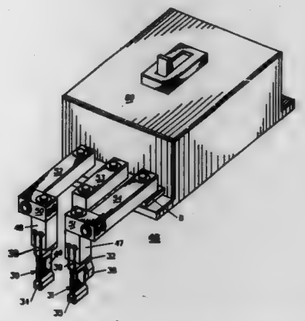
1. A static-conductive strap comprising:
spring means convertible between a spirally coiled configuration and a self supported axially extended configuration, said spring means having opposed top and bottom surfaces, said spring means being electrically conductive;
cover means for covering said top surface of said spring means, said cover means being electrically non-conductive; and
electrical connector means being disposed on said cover means and being in electrical contact with said bottom surface of said spring means, said connector means being electrically conductive.

5,196,986
CAPACITOR
Cheng-Nan Chen, Taipei, Taiwan, assignor to VIM Electronic Co., Ltd., Tai-Chung, Taiwan
Filed Apr. 21, 1992, Ser. No. 871,716
Int. Cl.[5] H01G *1/14*
U.S. Cl. 361—306 1 Claim



1. A capacitor comprising:
a cover provided with two parallel ribs, an engaging flange on which there is an annular protuberance, and a plurality of holes on both sides;
two conducting springs having a body portion with a plurality of projections and a plurality of U-shaped members extending downward to form an inclined member, said inclined member being formed with a notch on the outer edge;
a fixing plate having a lower portion with a hook member; and
a housing formed with a chamber for receiving an insulating material, two recesses for insertion of a wire, and a plurality of slots for engaging with said fixing plate.

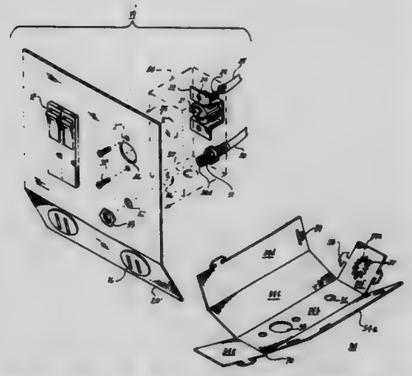
5,196,987
ELECTRIC BUSWAY POWER TAKE-OFF ASSEMBLY
Timothy W. Webber, Bristol; Louis A. Rosen, Hartford, and Louis M. Frutnose, Newington, all of Conn., assignors to General Electric Company, New York, N.Y.
Filed Mar. 27, 1992, Ser. No. 858,471
Int. Cl.[5] H01R *25/16*
U.S. Cl. 361—334 5 Claims



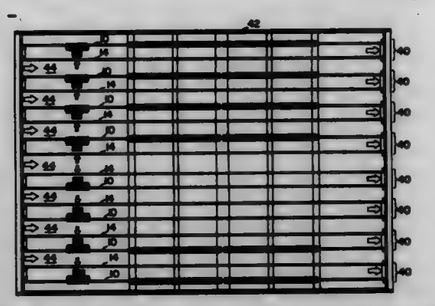
1. An electric busway power take-off assembly comprising in combination:
an enclosure;
an electric switch or circuit breaker within said enclosure;
a busway tab connector including a plurality of exterior clips extending from a bottom of said enclosure arranged for engaging corresponding tabs on electric power busway conductors and a plurality of connection conductor blocks arranged within said enclosure and electrically connected with said electric switch or circuit breaker, each of said clips comprising a pair of opposing bevelled pieces of conductive metal fastened together defining a busway tab receiving slot at one end and offset flanges at an opposite end, each of said connection conductor blocks including a plurality of linear slots formed at a bottom thereof receiving said offset flanges in press-fit relation to ensure electric conductivity between said connection conductor blocks and said clips.

5,196,988
POWER PEDESTAL TELEVISION AND TELEPHONE ADAPTER UNIT
Dale W. Horn, Mapleton, Minn., assignor to General Electric Company, New York, N.Y.
Filed Feb. 21, 1991, Ser. No. 658,497
Int. Cl.[5] H02B *1/26*
U.S. Cl. 361—362 1 Claim

1. A power pedestal television and telephone adapter panel comprising:
a rectangular front plate having a first and a second aperture;
a telephone receptacle within said first aperture arranged for accessing from a front surface of said front plate;
a television cable connector within said second aperture arranged for accessing from said front surface; and
means extending from a rear surface of said front plate electrically isolating telephone and television cables connecting with said telephone receptacle and said television cable connector, said isolating means comprising a rectangular closure encompassing a part of said television cable and said telephone cable, said isolating means including a striated opening through a side of said closure, said telephone and television cables exiting said closure through said opening, said striated opening thereby providing strain relief to said cables.

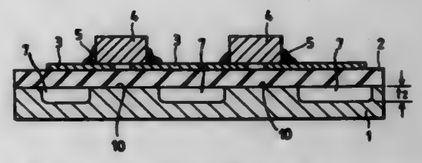


5,196,989
RIGID CIRCUIT BOARD STRUCTURE USING IMPINGEMENT COOLING
Denes L. Zsolnay, Rolling Hills Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Continuation of Ser. No. 506,057, Apr. 9, 1990, abandoned. This application Feb. 7, 1992, Ser. No. 832,635
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—383 3 Claims



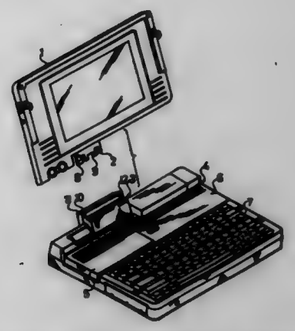
1. A circuit board construction in which multiple circuit boards function as faces of cooling air plena, the construction comprising:
a plurality of circuit boards on which circuit modules are mounted on at least one face of each board;
a plurality of baffle plates of approximately the same length and width as the circuit boards each having openings at selected locations;
means for rigidly connecting one or two of the baffle plates to one of the circuit boards in a parallel, spaced-apart relationship with the openings arranged to direct cooling air directly onto selected circuit modules, thereby forming a plurality of separable circuit-board units, each unit including one circuit board, connecting means and said one or two baffle plates; and
a circuit board cage having an interior surface, said cage removably mounting the plurality of circuit board units in a parallel, spaced-apart relationship with said interior surface proximate said mounted circuit boards and said baffle plates,
said circuit boards, baffle plates and cage arranged to form a plurality of cooling air plena, each cooling air plenum being defined in part by adjacent parallel faces of a baffle plate and a circuit board and said interior surface of said cage.

5,196,990
METAL PRINTED CIRCUIT BOARD
Toshio Kuroseki, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 661,210, Feb. 27, 1991, abandoned. This application Mar. 25, 1992, Ser. No. 857,125
Claims priority, application Japan, Mar. 1, 1990, 2-49812
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 4 Claims



1. In a metal printed circuit board having circuit conductors on a surface of an insulating plate layered on a metal plate having surface portions facing said insulating plate, and electronic parts mounted on said circuit conductors, the improvement comprising grooves formed in said surface portions and underlying said circuit conductors, and lands in said metal plate between said grooves and underlying said electronic parts, said lands being in contact with said insulating plate, whereby said grooves reduce stray capacitance without impairing conduction of heat from said electronic parts to said metal plate.

5,196,991
PORTABLE COMPUTER HAVING PIVOTABLE DETACHABLE COVER WITH DISPLAY
La-Fei Hsieh, P.O. Box 372, Hsin Chu, Taiwan
Filed Sep. 13, 1991, Ser. No. 763,667
Int. Cl.[5] H05K *7/10*; H01R *4/52*; E05C *1/12*; G06F *1/00*
U.S. Cl. 361—392 4 Claims



1. A portable computer comprising a mainframe and an upper cover, said mainframe having a disk holder for alternatively holding a floppy disk drive or a hard disk drive, a hard disk drive and a keyboard, said upper cover being detachably pivotably fastened in an upper cover mounting seat on said mainframe by an elongated hook plate, said upper cover mounting seat comprising a movable plate, an elongated rod attached to said movable plate at the middle, two retainer blocks on said movable plate at two opposite locations, a stub rod fastened within said upper cover mounting seat, and a

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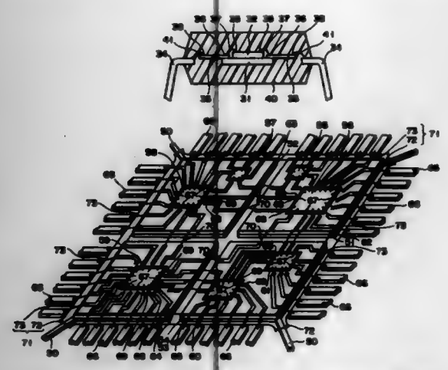
spring having one end fastened in a hole in said elongated rod and an opposite end secured to said stub rod, said elongated hook plate having two hooked portions extending from the bottom edge thereof at two opposite locations, wherein inserting said elongated hook plate into said upper cover mounting seat causes said two hooked portions to be engaged with said two retainer blocks; and moving said movable plate sidewards causes said two hooked portions to disconnect from said two retainer blocks.

5,196,992

RESIN SEALING TYPE SEMICONDUCTOR DEVICE IN WHICH A VERY SMALL SEMICONDUCTOR CHIP IS SEALED IN PACKAGE WITH RESIN

Hiromichi Sawaya, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 570,537, Aug. 21, 1990, abandoned.
This application Dec. 6, 1991, Ser. No. 803,783
Claims priority, application Japan, Aug. 25, 1989, 1-219404; Jun. 29, 1990, 2-173065
Int. Cl.[5] H05K 5/02; H01L 23/02, 23/28, 23/48
U.S. Cl. 361—392 16 Claims



1. A resin sealing type semiconductor device for sealing a semiconductor chip in a package with resin without deforming a plurality of electrical connections with the resin, comprising:

a semiconductor chip having a plurality of electrodes arranged on a surface of the semiconductor chip;

a bed having a surface supporting said semiconductor chip, said surface extending beyond said semiconductor chip, the portion of said surface extending beyond said semiconductor chip being a periphery surface;

a plurality of leads apart from said bed;

a printed circuit board provided to fill a gap between said bed and said leads, said printed circuit board fixed to said periphery surface of said bed so as to overhang from said bed, said printed circuit board having a wiring pattern having first and second ends;

first connecting means for connecting the electrodes on said semiconductor chip to the first end of the wiring pattern on the surface of said printed circuit board; and

second connecting means for connecting said leads to the second end of the wiring pattern on the surface of said printed circuit board,

wherein said device is covered with mold resin with parts of said leads left uncovered.

10. A resin sealing type semiconductor device for sealing a semiconductor chip in a package with resin without deforming a plurality of electrical connections with the resin, comprising:

a plurality of semiconductor chips, each of said semiconductor chips having a plurality of electrodes arranged on a surface of said semiconductor chip;

a plurality of beds separated from each other, each bed having a surface supporting at least one semiconductor chip, said surface extending beyond said at least one semiconductor chip, the portion of said surface extending beyond said at least one semiconductor chip being a periphery surface;

a plurality of leads apart from said beds;

a printed circuit board fixed to each periphery surface of said beds, at least one of said printed circuits boards overhanging the corresponding one of said beds, each of said printed circuit boards having a wiring pattern connected to said electrodes; and

wiring of a film carrier type for connecting the wiring patterns on said printed circuit boards and said leads,

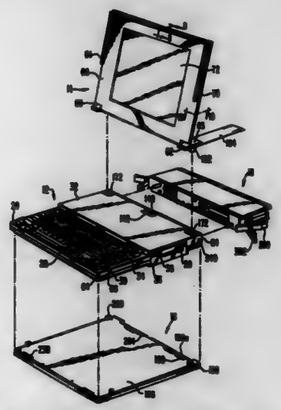
wherein said device is covered with mold resin with parts of said leads left uncovered.

5,196,993

REMOVABLE STAND ALONE DISPLAY FOR LAPTOP COMPUTER

Matthew A. Herron, and Dennis J. Boyle, both of Menlo Park, Calif., assignors to Unisys Corp., Detroit, Mich.

Division of Ser. No. 319,157, Mar. 6, 1989, Pat. No. 5,028,025.
This application Apr. 15, 1991, Ser. No. 684,755
The portion of the term of this patent subsequent to Dec. 19, 2007, has been disclaimed.
Int. Cl.[5] H05K 7/10; G06F 1/00
U.S. Cl. 361—393 20 Claims



1. A portable computer assembly comprising:

computer base means including base connector means,

display means adapted and arranged to be removably attached to said base means so as to be pivotable with respect thereto; said display means including deployable support means and also including display-connect means adapted for detachable electrical connection with said base connector means whereby to receive electrical signals therefrom; said display means being arranged and adapted to be disconnected from said base means and said base connector means and placed in independent free-standing condition; and

extended-length electrical cable means adapted for removable connection between said base connector means and said display connect means when said display means is removed from mounting on said base means and is set in independent free-standing condition remote from said computer base means;

said base means including means for so pivotably mounting said display means thereon;

said display means further including display-base means including said display-connect means and pivotably deployable support feet means facilitating said free-standing condition.

4. Two-way display means adapted to be removably mounted upon associated computer housing means, and electrically-connected thereto, while also being adapted for independent, free-standing operation remote from said housing means, said housing means including computer base means with base connector means,

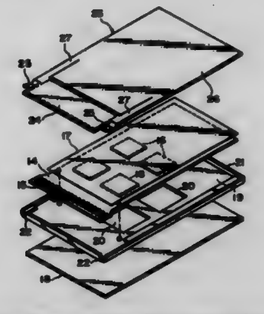
said display means including pivoting deployable support means, being adapted and arranged to be removably attached to said base means so as to be pivotable with respect thereto; said display means including display - connect means adapted for detachable electrical connection with said base connector means whereby to receive electrical signals therefrom; said display means being arranged and adapted to be disconnected from said base means and said base connector means and placed in independent free-standing condition.

5,196,994

CARD TYPE INTEGRATED CIRCUIT AND RESPECTIVE 8/16-BIT CARD CONNECTOR

Jiro Tasuma; Hideaki Ishimizu, and Takao Uchida, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,597
Claims priority, application Japan, Sep. 21, 1989, 1-109653
Int. Cl.[5] H05K 1/14
U.S. Cl. 361—395 5 Claims



1. A card type integrated circuit and respective 8/16-bit card connector compatible with 8-bit and 16-bit systems, wherein the card type integrated circuit comprises:

a substrate;

predetermined number of circuit devices disposed on the substrate, the circuit devices including memory;

a plurality of terminals arranged in a terminal array to be compatible with 8-bit and 16-bit systems in that terminals common to both 8 and 16 bit systems are disposed in a central portion of the terminal array and terminals associated with only a 16 bit system are symmetrically disposed at end portions of the terminal array, the terminal array being connected to said circuit devices through an I/O bus system for inputting and outputting signals from and to an external device via the card connector;

a surface cover having a separatable terminal protector formed thereon for protecting said plurality of terminals when not in use;

a backup battery for maintaining memory contents when external power is removed; and

a control circuit for controlling operations of said card type integrated circuit;

and wherein the card connector comprises:

a pair of grooves for receiving said card type integrated circuit;

a connecting pin array having connecting pins corresponding to said plurality of terminals of said card type integrated circuit, for connecting to said plurality of terminals when said card type integrated circuit is received in said connector grooves, said connecting pins extending to an external portion of said connector for connection to an external device; and

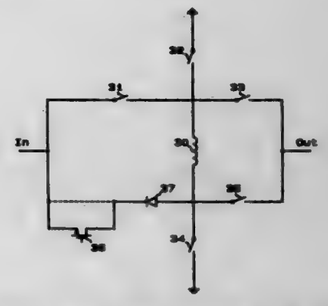
a protrusion for separating said terminal protector of said surface cover so that contact between said plurality of terminals and said connecting pin array can be made when said memory card is received by said pair of grooves.

5,196,995

3-TERMINAL BIDIRECTIONAL SWITCHING POWER SUPPLY WITH AC OR DC INPUT AND AC OR DC OUTPUT

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Dec. 1, 1989, Ser. No. 444,729
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—16 20 Claims



1. Switching power supply converting AC or DC input voltage applied to an input into AC or DC output current appearing at an output, comprising:

a first and second nodes separately coupled to the input and output in either order;

an inductive means having a pair of terminals, for attaining a current;

a first, second and third switching means each coupled to one terminal for selectively applying the inductive means current to the first node, ground and second node respectively; and

a fourth and fifth switching means each coupled to the other terminal for selectively applying the inductive means current to ground and second node respectively.

5,196,996

HIGH VOLTAGE GENERATING CIRCUIT FOR SEMICONDUCTOR DEVICES HAVING A CHARGE PUMP FOR ELIMINATING DIODE THRESHOLD VOLTAGE LOSSES

Jong H. Oh, Icheonkun, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungkido, Rep. of Korea

Filed Aug. 13, 1991, Ser. No. 744,482
Claims priority, application Rep. of Korea, Aug. 17, 1990, 1990-12703
Int. Cl.[5] H02M 3/07
U.S. Cl. 363—60 10 Claims

1. A high voltage generating circuit for semi-conductor devices which removes a threshold voltage and generates a high voltage above a source voltage or a negative voltage below a ground voltage, comprising:

oscillation signal generating means for generating an input oscillation signal and first through fourth oscillation signals;

first clamping means connected to said oscillation signal generating means and coupled to said source voltage, for

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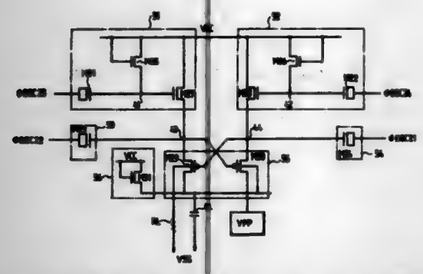
inputting said third oscillation signal from said oscillation signal generating means;

second clamping means connected to said oscillation signal generating means and coupled to said source voltage, for inputting said fourth oscillation signal from said oscillation signal generating means;

first charge pump means connected to said oscillation signal generating means and to an output stage of said first clamping means, for inputting said second oscillation signal from said oscillation signal generating means;



second charge pump means connected to said oscillation signal generating means and to an output stage of said second clamping means, for inputting said first oscillation signal from said oscillation signal generating means; and

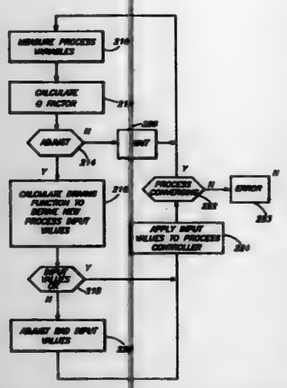
charge transfer means including its input stage connected to output stages of said first and second charge pump means and said output stages of said first and second clamping means and its output stage connected to a final output stage.

5,196,997

METHOD AND APPARATUS FOR QUALITY MEASURE DRIVEN PROCESS CONTROL

Jerome M. Kurtzberg, and Menachem Levanoni, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1991, Ser. No. 644,170
Int. Cl.[5] G05F *15/46*; G01N *15/02*
U.S. Cl. 364—152 **11 Claims**



1. A method of controlling a process which produces a product in a system which includes production apparatus, means for measuring a parameter of one of the process and the product, the parameter having a preferred value and a predetermined range of possible values, and adjustment means for changing the manner in which the product is processed to change the value of the parameter, said method comprising the steps of:

a) measuring said parameter value using the measuring means;

b) calculating a measure of the quality of the measured parameter value by substituting said measured parameter value into a function of said parameter value which is continuous and monotonically strictly decreasing over said predetermined range of possible values and has one maximum value corresponding to the preferred value for the parameter;

c) comparing the calculated measure of quality to the maximum measure of quality;

d) applying an input signal to said adjusting means in response to a difference between the calculated measure of quality and the maximum measure of quality;

e) adjusting said production apparatus using the adjusting means, to change the parameter value so as to increase the measure of quality;

f) producing said product by said adjusted production apparatus; and

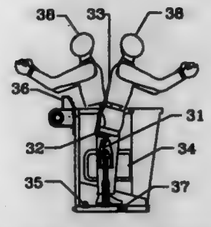
g) repeating steps (a) through (f) until said difference does not exceed a predetermined value.

5,196,998

ADAPTIVE CONTROL MAN-AUGMENTATION SYSTEM FOR A SUSPENDED WORK STATION

Francis M. Fulton, 20090 S. Mountain Rd., Santa Paula, Calif. 93060

Filed Apr. 2, 1990, Ser. No. 503,379
Int. Cl.[5] B66F *11/04*; G06F *15/46*
U.S. Cl. 364—167.01 **17 Claims**



1. An adaptive control man-augmentation system for controllably moving a suspended work station comprising:

a support structure including at least one moveable member supporting a work station;

means for moving said at least one moveable member to move said work station in horizontal and vertical directions;

means for continuously monitoring the position of said work station relative to a predetermined support structure coordinate;

a directing member including means for connection of said directing member to an operator's body part for movement therewith;

control means for determining movement of said directing member by said operator and resolving said movement relative to two axes normal to each other and in a substantially horizontal plane and having a substantially fixed relationship to said support structure, said control means including;

means for producing control signals related to the direction of said movement relative to said axes and related to the displacement of said directing member, to move said work station in the direction of said movement at a speed relative to said displacement, and maintaining said work station at a predetermined vertical position; and

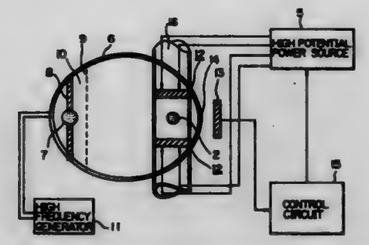
micro-processor means adapted to receive signals produced by said operator's body part positioning and to generate said control signals, said micro-processor being programmable so as to transpose said operator's body reflex generated movements into precise work station movements.

5,196,999

ELECTROSTATIC LEVITATION FURNACE

Toshio Abe, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 10, 1990, Ser. No. 550,679
Claims priority, application Japan, Jul. 13, 1989, 1-181290; Jul. 14, 1989, 1-181942; Jul. 26, 1989, 1-193075; Jul. 27, 1989, 1-194597; Aug. 19, 1989, 1-213213
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—400 **24 Claims**



15. An electrostatic levitation furnace for use in the production of microgravity materials comprising:

a test sample;

means for accommodating said test sample;

means, coupled to said accommodating means, for positioning said test sample within said accommodating means; and

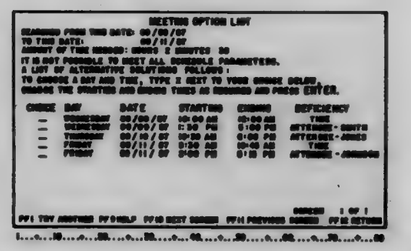
means, coupled to said accommodating means, for rotatably heating said test sample, said means for rotatably heating comprising a rotary elliptical mirror means having a reflective surface or an interior surface thereof for generating a spherical focussed image, and, an electric wave shielding plate disposed in the interior of said elliptical mirror means, said shielding plate having a circumferential edge contacting the interior of the elliptical mirror means to form a resonation cavity therewith.

5,197,000

METHOD OF SCHEDULING MEETINGS

James P. Vincent, Arlington, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 551,607, Jul. 9, 1990, Pat. No. 5,050,077. This application May 15, 1991, Ser. No. 701,409
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—401 **7 Claims**



1. A data processing system for scheduling a meeting using attendee calendars stored in said data processing system, said data processing system comprising:

means for presenting a scheduler with a prompting screen for keying in a plurality of desired meeting parameters including at least: a list of desired attendees, a desired data range, and a desired time span;

means for establishing an initial time period equal to all available time within said desired date range;

means for comparing in said data processing system said initial period of time with each desired attendee's calendar;

means for subdividing said initial period of time into a plurality of shorter periods of time in response to said comparing, each of said shorter periods of time having a specified beginning time, a specified ending time and a designation of any desired attendee who is unavailable during that shorter period of time; and

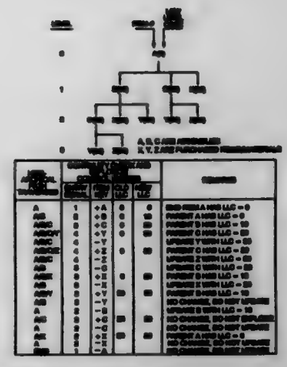
means for presenting an option screen to said scheduler displaying available times for selection of a meeting time within one of said plurality of shorter periods of time which complies with said desired meeting parameters.

5,197,001

BILL OF MATERIAL AND PROJECT NETWORK PROCESSING

Sajan K. Mukherjee, Roswell, Ga., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 14, 1990, Ser. No. 523,092
Int. Cl.[5] G06F *15/24*
U.S. Cl. 364—403 **13 Claims**



1. A method for processing bill of material data stored in an information processing system wherein product structure data is represented through low-level coding in which the low-level code of each component is numerically higher than the low-level code of its parent assembly, said method comprising the steps of:

traversing a product structure hierarchy representing a bill of material, said product structure hierarchy containing a plurality of hierarchical paths wherein each hierarchical path is traversed in a sequence beginning with a leftmost hierarchical path and continuing through a rightmost hierarchical path, said traversing of each hierarchical path proceeding first in a downward vertical traversal from a highest level item to a lowest level item, and then in an upward vertical traversal until a higher level item is found that is also on a next hierarchical path to traverse;

assigning a new low-level code to each item encountered in each of said plurality of hierarchical paths traversed if the low-level code of said each item is lower than the low level code of its immediate predecessor item;

maintaining a temporary list of an item identifier, a corresponding current low-level code, and a newly assigned

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low-level code for each item encountered in the hierarchical path currently traversed; and

updating the low-level code for said each item if the newly assigned low-level code of said each item is higher than the corresponding current low-level code for said each item during the upward vertical traversal of the hierarchical path currently traversed.

5,197,002

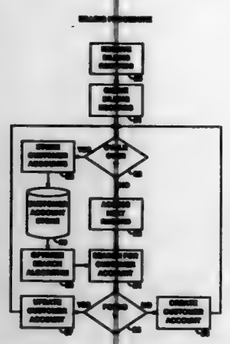
METHODS AND APPARATUS FOR DYNAMIC HASHING

Paul A. Spencer, Highland Park, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 22, 1989, Ser. No. 455,264

Int. Cl.[5] G06F *15/21, 15/40*

U.S. Cl. 364—406 **6 Claims**



1. A billing system for data packet transmission systems comprising

means for generating billing records reflecting the customer traffic through said packet transmission systems, said billing records each including a source address, a destination address and a packet count,

means for queuing said billing records in the order received at a billing location,

means for accessing said billing records, one at a time,

means responsive to the contents of accessed ones of said billing records for searching for a matching customer account record to be updated by the contents of said billing record, said searching means comprising means for hashing at least some portion of said source and destination addresses to access said customer account records and said means for hashing including modulo arithmetic means for operating on said source and destination addresses and means for varying the modulus used by said modulo arithmetic means in order to optimize the customer account record access, and

means responsive to previously received billing records for optimizing the operation of said searching means.

5,197,003

GEARSHIFT FOR A VEHICLE SIMULATOR HAVING A SOLENOID FOR IMPOSING A RESISTANCE FORCE

Rick L. Mosnelef, San Jose; Max L. Behensky, Hayward; Erik J. Durfy, Los Gatos, and Jacques D. Akain, San Carlos, all of Calif., assignors to Atari Games Corporation, Milpitas, Calif.

Continuation of Ser. No. 561,086, Aug. 1, 1990, abandoned. This application Apr. 7, 1992, Ser. No. 865,782

Int. Cl.[5] G06F *15/44*; G05B *13/04*; G09B *9/02, 9/04*

U.S. Cl. 364—410 **20 Claims**

1. A gearshift for a simulated vehicle, said gearshift comprising:

a gearshift lever;

a first axle connected to said gearshift lever so as to provide movement of the gearshift lever along a first axis;

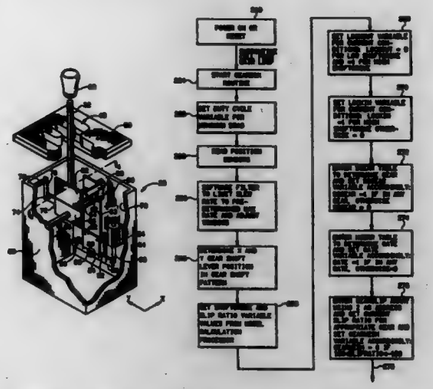
a second axle normal to said first axle connected to the gearshift lever so as to provide movement of the gearshift lever along a second axis;

a first position sensor connected to said gearshift lever for transducing mechanical position along said first axis into a first sensor signal;

a second position sensor connected to said gearshift lever for transducing mechanical position along said second axis into a second sensor signal;

means for selectively locking the gearshift lever in a plurality of predetermined positions and for providing variable resistance when shifting said gearshift lever out of and between said plurality of predetermined positions;

a solenoid in communication with said locking and resistance means to selectively prevent movement of said



locking and resistance means and to provide variable resistance to said locking and resistance means when shifting said gearshift lever into as well as between said plurality of predetermined positions, said solenoid controlled by a solenoid signal; and

a control unit which simulates an engine and a transmission, and generates engine and transmission modeling information, said control unit responsive to said first and second sensor signals and at least partially therefrom determines when to generate said solenoid signal so that said locking means secures said gearshift lever in one of said predetermined positions and when to modulate said solenoid signal so that a selected resistance is applied to said locking and resistance means.

5,197,004

METHOD AND APPARATUS FOR AUTOMATIC CATEGORIZATION OF APPLICANTS FROM RESUMES

David Sobotka, Sunnyvale; Ka L. Leung, San Jose; Yui J. Ian, Mountain View, and Lance Tokuda, Milpitas, all of Calif., assignors to Resumix, Inc., Santa Clara, Calif.

Filed May 8, 1989, Ser. No. 349,028

Int. Cl.[5] G06F *15/38*; G06G *7/60*

U.S. Cl. 364—419 **15 Claims**

1. A method for generating the job category or categories most appropriate for a job application from the applicant's printed resume using a programmed computer, the method comprising;

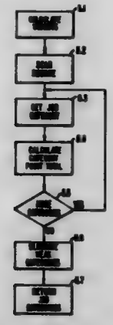
loading a digital representation of the printed resume into the computer;

extracting and storing predefined words and word groups from the digital representation, each work and word group being related to one or more job categories;

assigning a weight to each extracted and stored word or work group, the weights varying in relation to the strength of each word or word group as an indicator of

applicant's ability to fulfill a position in the particular job category or categories;

summing the weights for each job category;



selecting the job category or categories with the highest weights; and

delivering as output in either computer-readable or text form the job category or categories with the highest weights.

5,197,005

DATABASE RETRIEVAL SYSTEM HAVING A NATURAL LANGUAGE INTERFACE

Steven Shwartz, Orange; Claudio Fratarcangeli, Trumbull; Richard E. Callingford, Monroe; Gregory S. Aimi, North Haven, and Donald P. Strasburger, Stratford, all of Conn., assignors to Intelligent Business Systems, Milford, Conn.

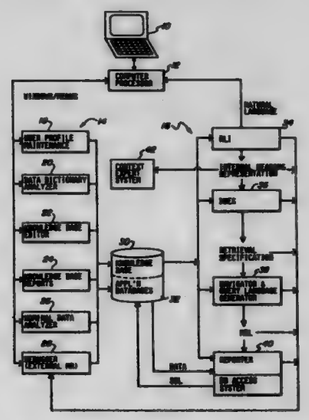
Filed May 1, 1989, Ser. No. 345,966

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—419 **41 Claims**

MICROFICHE APPENDIX INCLUDED

(11,603 Microfiche, 47 Pages)



1. A database retrieval system having a natural language interface, said system comprising:

a computer processor;

a natural language interface coupled to said computer processor;

first means operatively associated with said computer processor for producing a database-independent, canonical, internal meaning representation of a natural language query entered into said natural language interface;

second means operatively associated with said computer processor for identifying database elements that are necessary to satisfy the query represented by said internal meaning representation;

third means operatively associated with said computer processor for generating a database query among database elements identified by said second means, said database query enabling the retrieval and aggregation of data from a database to satisfy said natural language query; and

debugging means for deriving an external meaning representation from said internal meaning representation, wherein said external meaning representation is provided in a form that can be easily understood by a database developer;

said external meaning representation enabling a database developer to comprehend the internal meaning representation and verify that a natural language query entered into the natural language interface is properly interpreted to enable the correct retrieval and aggregation of data from said database.

5,197,006

AUTOMATIC TRANSMISSION SYSTEM WHICH MINIMIZES SHIFT-SHOCK USING DUTY CYCLE-CONTROLLED SOLENOID VALVES

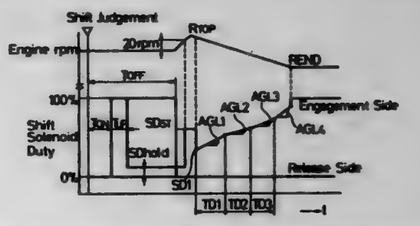
Yoshitami Saitoo, Nishikamo; Nobuyuki Inoue, Nagoya; Nobuyasu Sasamura, Toyota, all of Japan, and Makoto Inoue, Brussels, Belgium, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 442,644, Nov. 29, 1989, abandoned. This application Nov. 4, 1991, Ser. No. 790,007

Claims priority, application Japan, Nov. 30, 1988, 63-303393; Nov. 30, 1988, 63-303395

Int. Cl.[5] F16H *59/42, 61/06, 61/08*

U.S. Cl. 364—424.1 **13 Claims**



1. An electronically controlled automatic transmission system comprising:

a plurality of clutches and brakes actuated by applying a fluid pressure thereto;

fluid pressure switching means for controlling application of the fluid pressure to said clutches and said brakes;

drive power detecting means for detecting a drive force of an engine;

electronic control means for driving said fluid pressure switching means in accordance with the detected drive force to adjust the pressure applied to said clutches and said brakes;

revolution number measuring means for measuring a number of revolutions of an input shaft of said automatic transmission after said clutches and said brakes at a release side of said transmission are released during a current gear shift operation; and

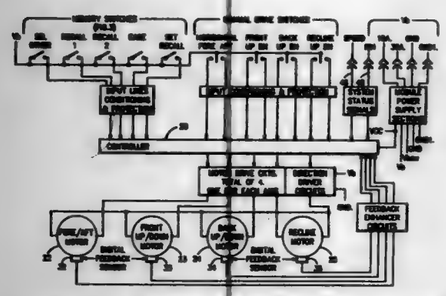
calculating means for calculating a rate of change of the number of revolutions detected by said revolution number measuring means, wherein said electronic control means commands said fluid pressure switching means to reengage said clutches and said brakes at the release side during the gear shift operation if the rate of change calculated by said calculating means, after the release of said clutches and said brakes at the release side and before an engagement of said clutches and said brakes at an engagement side of the transmission, is higher than a first threshold

when the detected drive force is less than a second threshold.

5,197,007
CONTROL SYSTEM FOR VEHICLE MEMORY SEAT RECALL POSITIONING

David A. Parker, Westland, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Apr. 30, 1991, Ser. No. 693,217
Int. Cl.[5] B60N *2/02*; G06F *15/20*
U.S. Cl. 364—424.05 18 Claims



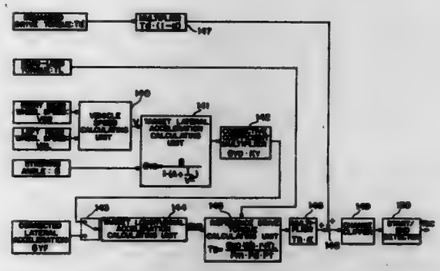
6. Apparatus for controlling a plurality of seat positioning motors, each motor being operative to reposition one of a plurality of vehicle seats in either of two opposite directions along a corresponding axis of limited extent, comprising:
- means for producing digital signals during operation of one of said motors, each digital signal being representative of incremental displacement of a seat along a corresponding axis;
- present position signal means containing digital signals indicative of a present displacement position of a corresponding one of said seats along a corresponding axis;
- recall signal means containing digital signals indicative of a recall position of another of said seats along a corresponding axis;
- first user control means for providing a reposition signal in response to the selective activation of said first user control means; and
- motor control means responsive to said reposition signal for providing a motor control signal to said one of said motors to continuously reposition said corresponding one of said seats until said present displacement position of said corresponding one of said seats is the same as said recall position of said another of said seats.

5,197,008
SYSTEM FOR CONTROLLING THE OUTPUT POWER OF A MOTOR VEHICLE

Masayoshi Itoh, Okazaki; Kiichi Yamada, Nagoya; Hiroaki Yoshida, Okazaki; Katsunori Ohtake, Nagoya; Yasunobu Miyata, Komaki; Masayuki Hashiguchi, Ohbu; Masanori Tani, Okazaki; Keiji Isoda, Nagoya; Toshio Shigehara, Okazaki, and Hiroo Yuasa, Nagoya, all of Japan, assignors to Mitsubishi Jidosha Kokyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1991, Ser. No. 645,828
Claims priority, application Japan, Jan. 25, 1990, 2-13553; Jan. 30, 1990, 2-17821; Jan. 30, 1990, 2-17828; May 16, 1990, 2-124280; May 16, 1990, 2-124293; May 18, 1990, 2-127011
Int. Cl.[5] B60K *31/12*
U.S. Cl. 364—426.01 24 Claims

1. A system for controlling the output power of a motor vehicle having an engine, comprising:
- operation means to be operated by the driver of the motor vehicle for controlling the drive torque produced by the engine;
- torque control means for controlling the drive torque produced by the engine independently of said operation means operated by the driver of the motor vehicle;
- target drive torque calculating means for calculating a target drive torque depending on a lateral acceleration of the motor vehicle;
- operation amount detecting means for detecting an operated amount of said operation means for controlling the drive torque;
- demanded drive torque calculating means for calculating a demanded drive torque based on said operated amount;

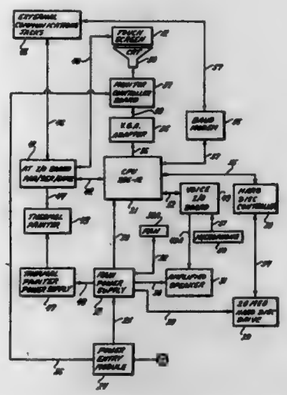


- turn torque calculating means for adding said target drive torque and said demanded drive torque at a predetermined ratio to determine a turn target drive torque;
- selecting means for selecting said turn target drive torque as a final target drive torque; and
- electronic control means for controlling said torque control means to equalize the drive torque produced by the engine to said final target drive torque.

5,197,009
APPARATUS FOR AND METHOD OF CREATING DELIVERY ROUTE MAPS

Donald J. Hoffman, Jr., Melville, and Robert D. Covington, St. Louis, both of Mo., assignors to Mid America Technologies, Inc., St. Louis, Mo.

Continuation of Ser. No. 715,303, Jun. 5, 1991, which is a continuation of Ser. No. 469,205, Jan. 24, 1990, abandoned. This application Jun. 12, 1992, Ser. No. 898,177
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—443 1 Claim



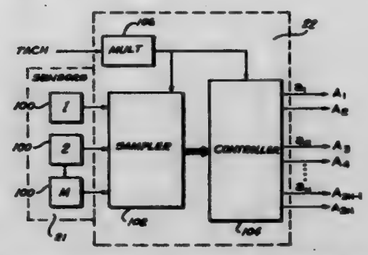
1. Apparatus for a store operator to be able to produce a route map printout for use by a delivery person hired by the

store operator to make a delivery to a customer remote from the store but residing in the area serviced by the store, the delivery being in response to an order called in by said remote customer to the store offering delivery service to said customer residing at an address in the service area of said store, said apparatus comprising:
- a) central processing unit means for electronically storing in a memory a store service area map which includes address locations of all potential customers residing within the service area related to said store;
- b) a console having a cathod ray tube presenting a visible screen on which are presented divisions denoting numeric, alphabetic, street name address, and a division for street and numeric address display, and said console including touch screen means on said cathod ray tube visible screen in position readily operable by said store operator, in response to a remote customer calling in to request delivery service on an order, for selecting by touching said visible screen address information corresponding to a portion of the service area map which includes the address location of said given customer given to the store operator by the given customer calling in an order;
- c) video graphic array means connected to said central processing unit and said cathod ray tube for energizing from said visible screen the street and number address operated by said store operator for depicting on the said selected portion of the said service area map the actual address marking and a complete delivery route to follow from said store to the said given customer's address location; and
- d) means for producing a printout of the said selected portion of the service area map and said marking thereon depicting the actual marking of the delivery route for visual guidance of the delivery person for making a delivery to said given remote customer's address location, said printout of said selected portion of the service area map being made available to said delivery person for guidance to complete delivery to said remote customer.

5,197,010
APPARATUS FOR CONTINUOUSLY ACTIVELY BALANCING ROTORS

Anders O. Andersson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1990, Ser. No. 626,977
Int. Cl.[5] G01M *1/38*
U.S. Cl. 364—463 41 Claims



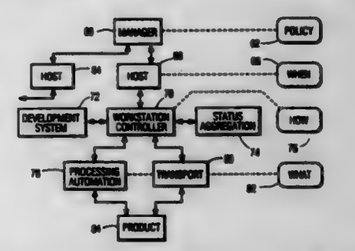
1. A system for continuously actively balancing the rotor of a rotating machine comprising:
- (a) rotor balancing means for radially shifting the mass distribution of a rotor relative to an axis-of-rotation about which the rotor rotates, said axis-of-rotation being defined by a stator;
- (b) sensing means for sensing repetitive vibrations generated by said rotating rotor; and
- (c) control means coupled to said sensing means and said rotor balancing means for.
  - (i) continuously applying control signals to said rotor balancing means for controlling the mass distribution of said rotor relative to said axis-of-rotation; and
  - (ii) cyclically updating said control signals by:
    - (1) receiving a repetitive vibration sensed by said sensing means and determining the amplitude and phase of a frequency component of said sensed repetitive vibration;
    - (2) calculating updates for said control signals using: (a) a transfer function that models the effect of changes in said control signals on the amplitude and phase of said frequency component; and (b) said amplitude and phase of said frequency component; and
    - (3) using said calculated updates to update said control signals.

38. A hydraulic mass balancer for balancing the rotor of a rotating machine rotating about an axis-of-rotation lying within the stator of said rotating machine, said hydraulic mass balancer comprising:
- (a) a plurality of cavities located in said rotor;
- (b) a hydrostatic fluid located in said plurality of cavities; and
- (c) a plurality of ports formed in said rotor, one of said ports opening into each of said plurality of cavities for supplying fluid to and draining fluid from said plurality of cavities.

5,197,011
WORK STATION CONTROLLER MODULE

Franciscus P. M. Biemans, Biel, Switzerland, and Sjoerd Sjoerdsma, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1990, Ser. No. 524,252
Claims priority, application European Pat. Off., May 17, 1989, 89201248.5
Int. Cl.[5] G06F *15/46*, *15/16*
U.S. Cl. 364—468 8 Claims



1. A work station controller module for controlling a work station and comprising processor means interconnected to storage means for on the basis of predetermined operation-linked process data and under control of higher level commands and lower level status signals producing lower level commands and higher level status signals, said work station controller module further comprising:
- first bidirectional communication means for receiving said higher level commands from and transmitting said higher level status signals to a host device;
- second bidirectional communication means for receiving said lower level status signals from and transmitting said lower level commands to one or more product processing automation modules;
- third bidirectional communication means for transmitting product exchange requests and receiving product exchange acknowledgements with respect to any access point the work station has in common with a product transfer system or with at least one other work station;
- first receiving means for receiving operation names and process data from a product development system;
- second receiving means for receiving status aggregation rules for aggregating said lower level status signals to said higher

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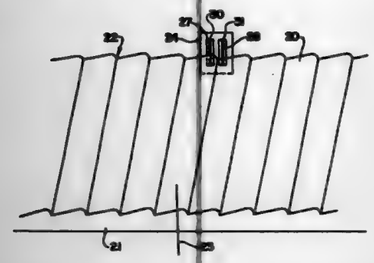
level status signals and command decomposition rules for decomposing said higher level commands to said lower level commands from a product preparation system.

5,197,012

METHOD AND APPARATUS FOR DETECTING AND FOR COUNTING ANY INSTANTANEOUS VARIATIONS IN A PROFILE, AND APPLICATIONS THEREOF

Mohamed El-Sarout, Villeneuve D'Ascq, France, assignor to Datatronic, Centre d'Etude et de Developpement Electronique et Informatique Sarl, France

Continuation of Ser. No. 439,598, Nov. 20, 1989, abandoned. This application Jul. 14, 1992, Ser. No. 913,733
Claims priority, application France, Nov. 21, 1988, 88 16091
Int. Cl.[5] G01N *21/89, 21/86*
U.S. Cl. 364—470 **11 Claims**



1. Apparatus for mechanical and optoelectronic detection of instantaneous variations in the profile of a continuously traveling object or set of contacting or overlapping objects on a conveyor, the apparatus comprising:

a) means for reproducing the profile of the continuously traveling object or set of contacting or overlapping objects on the conveyor, said profile being reproduced in the plane of an optical detector;

b) two receivers delimited by two slots ensuring that the intersections between the function Y=f(X) defined by the profile and lines representing the two receivers are reduced approximately to two points, with the distance between the two points being as small as possible; and

c) an electronic circuit associated with the receivers including two converters connected to a differential amplifier and providing an output signal directly proportional to the derivative Y'(X) of the function Y=f(X) defined by the profile.

5,197,013

METHOD OF FORMING A CARVED SIGN USING AN AXIALLY ROTATING CARVING TOOL

David M. Dundorf, 389 Shelbourne Ter., Ridgewood, N.J. 07450, assignor to David M. Dundorf, Ridgewood, N.J.

Division of Ser. No. 78,832, Jul. 28, 1987, abandoned. This application Jan. 9, 1991, Ser. No. 639,258
Int. Cl.[5] G05B *19/02*
U.S. Cl. 364—474.24 **8 Claims**

1. A method of forming a carved sign embodying a signage work having three-dimensional surfaces, comprising:

(a) designing on a computer-aided design system, a three-dimensional graphical model of said signage work including an alphanumerical character having three-dimensional surfaces to be carved in a signboard, said three-dimensional graphical model comprising a three-dimensional graphical representation of said alphanumerical character having three-dimensional surfaces;

(b) determining on said computer-aided design system, a desired mathematical representation of said three-dimensional graphical model of said signage work to be carved in said signboard;

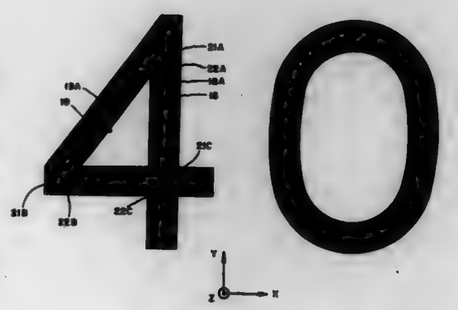
(c) providing said desired mathematical representation to a computer-aided machining system having a carving tool; and

(d) removing constituting material of said signboard using said carving tool moving under the controlled guidance of said computer-aided machining system, to leave in said signboard, a three-dimensional carved pattern corresponding to said three-dimensional graphical model of said signage work, wherein said three-dimensional carved pattern in said signboard has three-dimensional surfaces corresponding to said three-dimensional surfaces of said three-dimensional graphical model of said signage work,

wherein said three-dimensional graphical representation of said alphanumerical character is generated from a corresponding two-dimensional graphical representation having a characteristic outline by:

(a) projecting in two dimensions on said computer-aided design system, said two-dimensional graphical representation of said character having a characteristic outline;

(b) generating from said characteristic outline of said two-dimensional graphical representation of said character, at a



predetermined offset towards the inside of said two-dimensional graphical representation of said character, a plurality of substantially similar outlines of said two-dimensional graphical representation and displaying said plurality of similar outlines on said computer-aided design system;

(c) projecting each of said similar outlines a predetermined distance along the third dimension of the coordinate system of said computer-aided design system;

(d) introducing in said three-dimensional coordinate system, a plurality of points at locations corresponding to points along a three-dimensional tool path of an axially rotating carving tool of predetermined carving dimensions which, when moved along said three-dimensional tool path, forms in said signboard a desired three-dimensional carved pattern having three-dimensional surfaces corresponding to said three-dimensional surfaces of said three-dimensional graphical surfaces of said alphanumerical character, and

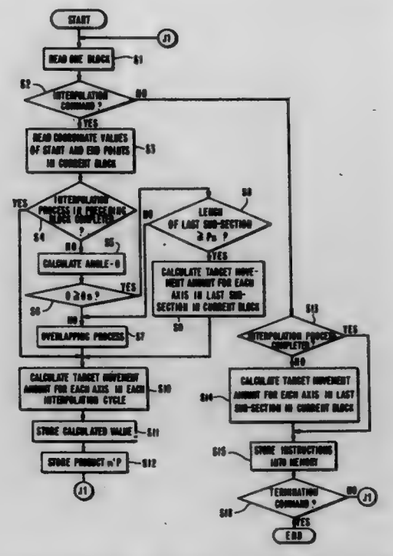
(e) interpolating said plurality of points to render the coordinates of said three-dimensional tool path.

5,197,014

INTERPOLATION METHOD IN AUTOMATIC PROGRAMMING

Masaki Seki, Sagami; Takashi Takegahara, Hachioji, and Koichi Ito, Oshino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP89/01194, § 371 Date Jul. 10, 1990, § 102(e) Date Jul. 10, 1990, PCT Pub. No. WO90/06545, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 22, 1989, Ser. No. 536,546
Claims priority, application Japan, Nov. 29, 1988, 63-299646
Int. Cl.[5] G05B *19/415*
U.S. Cl. 364—474.31 **5 Claims**



1. An interpolation method for automatic programming associated with a numerically controlled machining apparatus, comprising the steps of:

(a) deriving target movement amounts for individual axes corresponding to a plurality of sub-sections which are obtained by dividing a section from a starting point to a target end point of each of blocks constituting a numerical control program, and which have lengths defined by a product of a target moving speed of the numerically controlled apparatus and an interpolation period;

(b) determining whether the length of a last sub-section in each of the blocks is smaller than the target movement amount;

(c) determining whether a predetermined condition for permitting execution of an overlapping process is satisfied for each of the last sub-sections which are determined to have a length smaller than the target movement amount in said step (b);

(d) effecting the overlapping process to derive target movement amounts for individual axes in each of those last sub-sections for which said determining of said step (c) establishes that the predetermined condition is satisfied;

(e) deriving target movement amounts for the individual axes in each of those last sub-sections for which said determining in said step (c) establishes that the predetermined condition is not satisfied, without performing said step (d); and

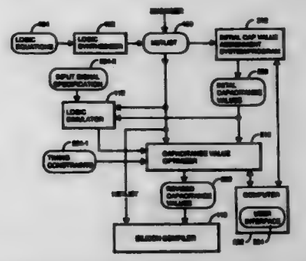
(f) machining a workpiece using the numerically controlled machining apparatus, based on said steps (d)–(e).

5,197,015

SYSTEM AND METHOD FOR SETTING CAPACITIVE CONSTRAINTS ON SYNTHESIZED LOGIC CIRCUITS

Mark R. Hartoog, Los Gatos; Thomas J. Schaefer, Cupertino, and Robert D. Shur, Los Altos, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 20, 1990, Ser. No. 631,600
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—490 **8 Claims**



1. A method of synthesizing an integrated circuit, the steps of the method comprising:

receiving and storing in a computer memory a netlist denoting a list of components in an integrated circuit and a set of nodes interconnecting said components; each said component of said integrated circuit having at least one input port and at least one output port, said set of nodes including a set of circuit input nodes and circuit output nodes for said integrated circuit;

assigning a time delay value and a corresponding maximum capacitance value to each said node;

computing a routing difficulty value, comprising a sum of routing difficulty values associated with each of said nodes in said integrated circuit;

repeating the following steps until changes in said computed routing difficulty value meet predefined criteria:

selecting one of said components;

decreasing said time delay and maximum capacitance value associated with a node coupled to an output port of said component and increasing by corresponding amounts said time delay and maximum capacitance value associated with nodes coupled to input ports of said component;

recomputing said routing difficulty value; and

retaining said changed time delay and maximum capacitance values only if said recomputed routing difficulty value is smaller than its previous value; and

passing said netlist and maximum capacitance values to a silicon compiler and automatically placing/routing an integrated circuit having said components and interconnection nodes with capacitance values not exceeding said maximum capacitance values;

whereby said maximum capacitance values for said integrated circuit are automatically adjusted so as to reduce the difficulty of routing connections between said integrated circuit's components.

5,197,016

INTEGRATED SILICON-SOFTWARE COMPILER

Tai Sugimoto; Hideaki Kobayashi, both of Columbia, S.C.; Masahiro Shindo, and Haruo Nakayama, both of Osaka, Japan, assignors to International Chip Corporation, Columbia, S.C. and Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 143,821, Jan. 13, 1988, Pat. No. 4,922,432. This application Jul. 14, 1989, Ser. No. 380,079
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—490 **32 Claims**

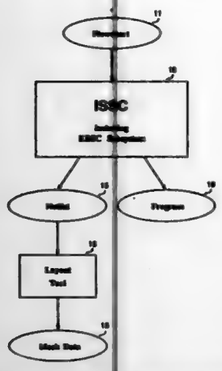
1. A computer-aided design system for designing an application specific integrated circuit from architecture independent

functional specifications for the integrated circuit, whose intended function is implemented by both a hardware subsystem including hardware elments on the integrated circuit and by a software subsystem including software instructions executed by a microprocesor on the integrated circuit, comprising

input means operable by a user for defining architecture independent functional specifications for the application specific integrated circuit wherein at least one of said architecture independent functional specifications is free of indication that an intended function of said integrated circuit is implanted on said hardware subsystem or said software subsystem, and

computer operated means for translating the architecture independent functional specifications into an architecture specific structural level definition of the integrated circuit, said computer operated translating means comprising

means defining software instructions of the software subsystem from the architecture independent functional specifi-



cations, at least one of which is free of indication that an intended function of said integrated circuit is implemented on said hardware subsystem or said software subsystem,

means defining a microprocesor for executing the software instructions of the software subsystem from the architecture independent functional specifications, at least one of which is free of indication that an intended function of said integrated circuit is implemented on said hardware subsystem or said software subsystem,

means defining hardware elements for executing the hardware functions of the hardware subsystem from the architecture independent functional specifications, at least one of which is free of indication that an intended function of said integrated circuit is implemented on said hardware subsystem or said software subsystem, and

means defining interconnections between the microprocesor for executing the software instructions of the software subsystem and the hardware elements of the hardware subsystem.

5,197,017
POTENTIOPHOTOMETRIC FIBRINOGEN DETERMINATION

Wallace E. Carroll, and R. David Jackson, both of 1556 San Leandro La., Santa Barbara County, Santa Barbara, Calif. 93108

Filed Sep. 27, 1990, Ser. No. 589,317
Int. Cl.[5] G01N *33/86*; C12Q *1/56*
U.S. Cl. 364—497 26 Claims

14. Apparatus for measuring the optical density of a liquid sample comprising:

means including a light source, test tube, photocell, battery, and variable resistor for developing an analog electrical voltage signal having an amplitude proportional to the optical density of the liquid sample,

means including an A/D converter and digital recorder and computer for converting the developed analog signal into a series of digital voltage signal values each spaced apart by a short, equal, selected time interval,

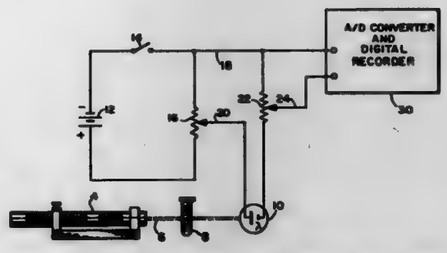
means including the computer for recording the successive digital voltage value signals in successive lines in which each line consists of a selected equal number of digital voltage value signal totaling a selected time duration,

means for injecting a coagulant into the liquid sample, thereby producing a minimum significant change of at least a preselected amount in the voltage values of the recorded digital voltage value signal,

means including said computer for allowing a preselected short time delay after said significant change of a preselected amount in the voltage values of the recorded digital signal resulting from the injection and means for identifying the voltage value of the digital signal at the end of the delay,

means including said computer for thereafter comparing said identified voltage value with succeeding voltage values and for detecting a voltage change which exceeds a preselected amount of voltage change within a preselected time period Ta,

means including said computer for identifying the voltage value of the recorded digital signal at the beginning of said preselected time period Ta and denoting the beginning voltage value x,



means including said computer for identifying the voltage value of the recorded digital signal at the end of a preselected time period Tb following the time of recording voltage value x and denoting the ending voltage value voltage value y,

means including said computer for determining the differential in voltage value between voltage value x and voltage value y and identifying the differential in voltage value between voltage value x and voltage value y as a delta voltage signal,

means for using the foregoing steps to develop a delta voltage signal for each of two calibrating samples having known values of optical density, in units of mass,

a chart showing a calibration curve which passes through said delta voltage signals of said two calibrating samples,

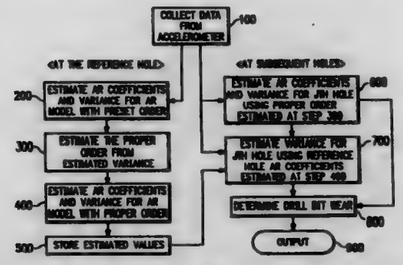
and means including said light source, test tube, photocell, battery and variable resistor for developing a delta voltage signal for a test sample having unknown value of optical density, in units of mass, using the steps indicated hereinabove, and

whereby the relationship between the two calibrating samples of known optical density in units of mass and the voltage values of the developed delta signals corresponding thereto is used to derive from the delta voltage signal developed for the test sample of unknown optical density the value of optical density in units of mass of the unknown sample.

5,197,018
APPARATUS AND METHOD FOR DRILL WEAR PREDICTION

Sang G. Oh, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 26, 1991, Ser. No. 675,391
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—508 31 Claims



1. A method for detecting drill bit wear comprising the steps of:

drilling a reference hole into a workpiece;

collecting vibratory data during such drilling;

applying an autoregressive model to such vibratory data to determine reference hole characteristic parameters for the drill bit;

drilling a subsequent hole into said workpiece;

collecting vibratory data during the drilling of such subsequent hole;

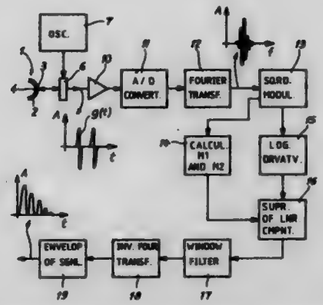
applying the autoregressive model to the vibratory data collected during the drilling of the subsequent hole to determine subsequent hole characteristic parameters for the drill bit; and

comparing the reference hole characteristic parameters with the subsequent hole characteristic parameters to detect drill bit wear.

5,197,019
METHOD OF MEASURING DISTANCE USING ULTRASONIC WAVES

Chantal Delon-Martin, Grenoble, France; marcel Arditi, Genève, Switzerland; Pierre-André Farine, Neuchâtel, Switzerland; Jean-Jacques Meister, Epalinges, Switzerland, and Yanik Tardy, Lausanne, Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Jul. 19, 1990, Ser. No. 554,420
Claims priority, application France, Jul. 20, 1989, 89 09926
Int. Cl.[5] G01B *17/00*; G06F *15/42*
U.S. Cl. 364—563 16 Claims



1. A method for measuring the distance e separating two faces of an object which method comprises:

emitting an ultrasonic wave propagating at a velocity c toward the object;

detecting by a sensor echoes generated by reflection of said wave from the faces of said object, said sensor delivering a composite electrical signal g(t) having an amplitude varying as a function of time;

processing said composite electrical signal by the following sequence of steps:

a) transferring the composite electrical signal g(t) coming from the sensor into a frequency spectrum G(f) the amplitude of which is a function of the frequency, said spectrum exhibiting a real part Re (G(f)) and an imaginary part Im(G(f)),

b) calculating the order n modulus of the frequency spectrum $|G(f)|^n=\{Re(G(f))^2+Im(G(f))^2\}^{n/2}$,

c) calculating the logarithmic derivative $(|G(f)|^n)'/|G(f)|^n$ of the modulus calculated in step b) in order to separate the existing echoes from the composite electrical signal, said logarithmic derivative exhibiting a useful part centered substantially on the frequency of the ultrasonic wave and a part having noise located on either side of the useful part, said useful part comprising a periodic signal onto which a substantially linear signal is superposed,

d) applying a frequency window to the logarithmic derivative in order to isolate the useful part thereof and to eliminate the part having noise;

e) applying a transformation inverse to that of step a) at least to the periodic signal of said useful part,

f) determining the envelope of the inverse transformation, said envelope exhibiting a series of variable amplitude peaks spaced out over time,

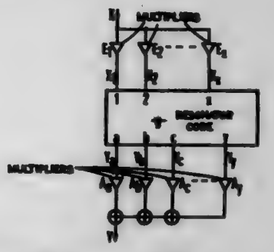
g) determining the temporal speed Δt separating the time origin from the peak showing the greatest amplitude due to the contribution of the periodic signal from the useful part, and

h) determining the distance e separating the two faces of the object according to the relation $e=c\cdot\Delta t/2$.

5,197,020
WAVE DIGITAL FILTER COMPOSED OF DELAYS AND N-PORT ADAPTORS

Hans-Dieter Schwartz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 22, 1991, Ser. No. 644,117
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 40005320
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.14 8 Claims



1. A wave digital filter, comprising:

wave digital filter circuit means comprising interconnected adaptors, delays, multipliers, and adders for defining an arbitrary transfer function, said circuit means corresponding in order and values to intrinsic values of the transfer function;

a filter input to which a filter input signal is applied and a filter output at which a filter output signal is available;

said filter input being connected to a plurality of inputs of said wave digital filter circuit means by respective multi-

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plier means for individually weighting the input signal to create weighted input signals at each of said wave digital filter circuit means inputs; and

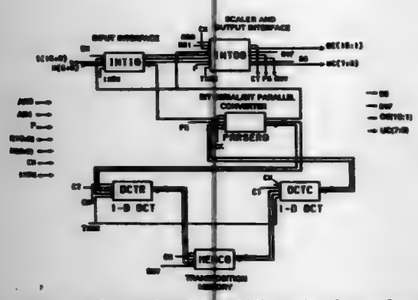
said filter output being connected by respective multiplier means to said wave digital filter circuit means individual outputs for weighting individual output signals from the wave digital filter circuit means.

5,197,021

SYSTEM AND CIRCUIT FOR THE CALCULATION OF THE BIDIMENSIONAL DISCRETE TRANSFORM

Silvio Cucchi, and Marco Fratti, both of Milan, Italy, assignors to Telettra-Telefonia Elettronica e Radio s.p.a., Milan, Italy

Filed Jul. 11, 1990, Ser. No. 551,628
Claims priority, application Italy, Jul. 13, 1989, 21420/89[U]
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—725 2 Claims



1. A circuit for performing a bidimensional transform of dimension M*M, comprising:

means for converting incoming words in the form of parallel bits into words represented by coupled bits serially distributed over the time;

means for applying a monodimensional transform onto the lines of a block of M*M data, treating the data in the form of serially distributed bits;

means for transposing from lines to columns the elements of said block of M&M data;

means for carrying out a monodimensional transform onto the columns of said block of M*M data; and

means for carrying out a conversion from serial bit couples to words in the form of parallel bits.

5,197,022

OVERFLOW DETECTION CALCULATOR AND METHOD OF OVERFLOW DETERMINATION

Hiroshi Ushiki, Hiratsuka; Tetsuaki Iwasaki, Yokohama, and Akira Masuda, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1990, Ser. No. 574,733
Claims priority, application Japan, Aug. 30, 1989, 221717
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—745 5 Claims

1. A calculator comprising:

input means for inputting data;

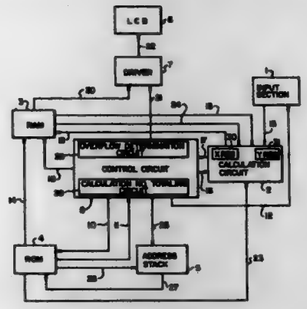
calculation mens for performing a predetermined number of a specified calculation on said data;

overflow determination means for determining whether or not a calculation result that is the result of said specified calculation has overflowed;

calculation number totalling means for totalling the number of calculations to determine whether or not said calculation has been performed said predetermined number of times;

memory means for storing said calculation result obtained by said calculation means; and

control means for controlling transfer of said calculation result to said memory means wherein said calculation result is transferred to said memory means if the number obtained by said calculation totalling means has reached said predetermined number and said calculation result has not overflowed, and wherein said calculation result is



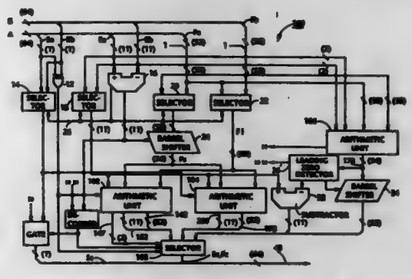
prohibited from being transferred to said memory means if the number obtained by said calculation totalling means has not reached said predetermined number or if said calculation result has overflowed.

5,197,023

HARDWARE ARRANGEMENT FOR FLOATING-POINT ADDITION AND SUBTRACTION

Takashi Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1991, Ser. No. 786,335
Claims priority, application Japan, Oct. 31, 1990, 2-296067
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 7 Claims



1. A hardware arrangement for executing floating-point execution of addition and subtraction, which is supplied with two floating-point numbers each of which includes an exponential, a fraction represented by an absolute value and a sign bit indicating a sign of the fraction, the hardware arrangement implementing rounding on an execution result, the hardware arrangement comprising:

first means for implementing a floating-point execution wherein no bit shifting is needed for normalization on the execution result of the two floating-point numbers, said first means determining either round-down or round-up prior to implementation of addition and subtraction of fractions and then carrying out addition and subtraction of the fractions and simultaneously rounding;

second means for implementing a floating-point execution wherein one bit shifting to the right or the left is required for normalization on the execution result of the two floating-point numbers, said second means determining either round-down or round-up prior to implementation of addition and subtraction of fractions and then carrying out

addition and subtraction of the fractions and simultaneously rounding;

third means for implement a floating-point execution wherein two bits or more that two bits shifting to the left is required for normalization on the execution result of the two floating-point numbers; and

a selector being arranged to select an output of one of the first, second and third means;

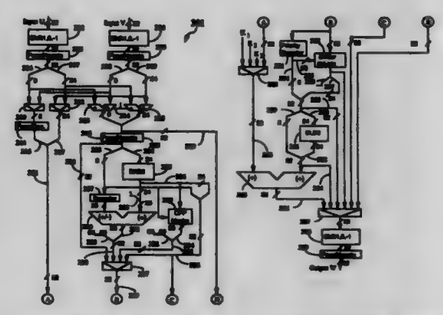
wherein the first, second and third means concurrently implement floating-point executions on the two floating-point numbers applied to the hardware arrangement, and wherein the selector carries out the selection according to upper bits of a result derived from executing the fractions at the first means.

5,197,024

METHOD AND APPARATUS FOR EXPONENTIAL/LOGARITHMIC COMPUTATION

Lester C. Pickett, 178 Centre, Suite 21, Mountain View, Calif. 94041

Continuation of Ser. No. 598,185, Oct. 12, 1990, abandoned, which is a continuation of Ser. No. 366,080, Jun. 14, 1989, abandoned. This application Apr. 3, 1992, Ser. No. 863,218
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748.5 27 Claims



1. In a number processor for processing exponential floating point (E-FLP) numbers wherein a representation of a represented E-FLP number comprises an exponent signal comprising a logarithmic function of said represented E-FLP number, apparatus for extracting a portion of an input E-FLP operand, which is related to a ratio of integers, to produce an E-FLP output, comprising:

means coupled to receive an input exponent signal comprising said logarithmic function of a magnitude of said input E-FLP operand for routing in accordance with a partitioning between a first characteristic signal and a first mantissa signal;

exponential function signal generator coupled to receive said first mantissa signal to produce a first significand signal comprising an exponential function, corresponding to said logarithmic function, of said first mantissa signal;

means comprising combinatorial logic coupled to receive a most significant portion of said input exponent signal and said first significant signal for selectively altering digits of said first significand signal to produce a first interim signal;

logarithmic function signal generator coupled to receive said first interim signal to produce a second interim signal comprising said logarithmic function of said first interim signal; and

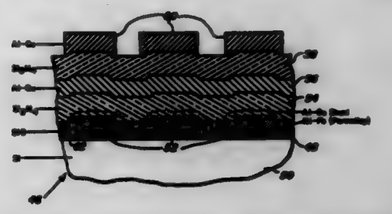
means coupled to receive said first characteristic signal and said second interim signal for adding to produce an output exponent signal comprising said logarithmic function of a magnitude of said E-FLP output and thus to produce said E-FLP output.

5,197,025

CROSSTIE RANDOM ACCESS MEMORY ELEMENT AND A PROCESS FOR THE FABRICATION THEREOF

Leonard J. Schwee, and Paul E. Hunter, both of Burtonsville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 386,389, Jun. 8, 1982, abandoned. This application Nov. 19, 1990, Ser. No. 615,728
Int. Cl.[5] G11C *19/08*
U.S. Cl. 365—87 17 Claims



1. A crosstie random access memory element, comprising:

a substrate;

a first level of polycrystalline magnetic material configured into a plurality of juxtaposed columns of memory cells to form an array thereof; each one of said plurality of juxtaposed columns of memory cells being configured into a wiggle pattern;

a second level of insulating material having vias for connection to each of aid plurality of juxtaposed columns of memory cells;

a third level of conducting material configured into a plurality of juxtaposed row conductors perpendicular to said plurality of juxtaposed columns of memory cells, each one of said plurality of juxtaposed row conductors being disposed above corresponding memory cells of said plurality of juxtaposed columns of memory cells;

a fourth level of insulating material having vias for connection to each one of said plurality of juxtaposed row conductors; and

a fifth level of conducting material configured into a plurality of juxtaposed column conductors which meander above corresponding columns of said array traversing each memory cell therein in the same direction, said levels of the magnetic, insulating and conductivity materials being located in stacked relation to each other on the substrate.

5,197,026

TRANSPARENT EEPROM BACKUP OF DRAM MEMORIES

Donald S. Butler, Scottsdale, Ariz., assignor to Microchip Technology Incorporated, Chandler, Ariz.

Filed Apr. 13, 1989, Ser. No. 337,957
Int. Cl.[5] G11C *7/00, 16/06, 14/00*
U.S. Cl. 365—104 14 Claims

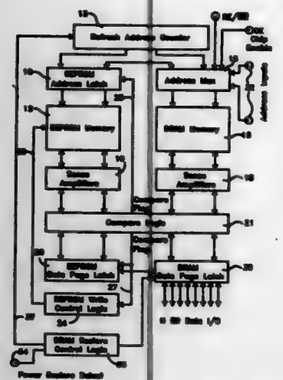
10. A memory system for backing up data in a volatile memory having a refresh logic cycle, with an associated non-volatile memory having a write cycle, which comprises:

means for comparing memory contents at corresponding address locations of said volatile and associated non-volatile memories;

means for selectively activating said comparing means to commence sequential comparison of the respective memory contents at said corresponding address locations through the refresh logic cycle of said volatile memory and the write cycle of said non-volatile memory, in a sequence and at a speed dictated by said refresh logic cycle; and

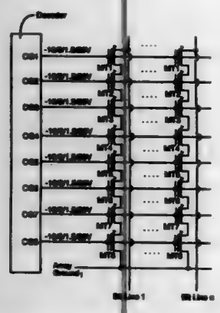
writing means responsive to the comparing means detection of a difference between the respective memory contents

from said comparison for writing data into the address location of one of said memories for equivalence with the



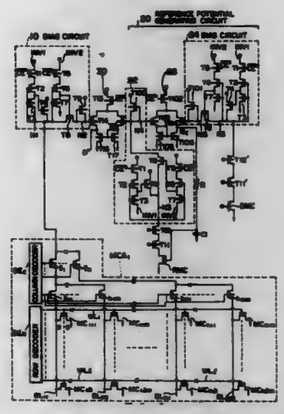
contents of the corresponding address location of the other of said memories.

5,197,027
SINGLE TRANSISTOR EEPROM ARCHITECTURE
Nagesh Challa, Sunnyvale, Calif., assignor to Nexcom Technology, Inc., Sunnyvale, Calif.
Filed Jan. 24, 1991, Ser. No. 645,507
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 19 Claims



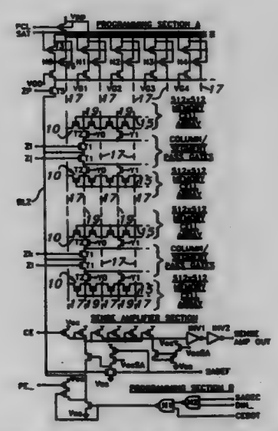
1. A memory device, comprising:
a plurality of strings each having a plurality of memory transistors with their sources and drains connected in series, each memory transistor having a respective source, drain, channel, control gate, and floating gate;
a plurality of bit lines each having a respective string connected at one end of the string to the bit line, the bit lines connected to respective sensing amplifiers;
a decoder having a plurality of outputs respectively connected to said control gates of said memory transistors within their respective strings, the decoder having both negative and positive voltage outputs;
means for erasing such that a selected memory transistor will have its floating gate charged in a first direction by Fowler-Nordheim tunneling to a value that causes the V_{th} of the memory transistor to be approximately +2 V;
means for writing such that a selected memory transistor will have its floating gate charged in a second direction by Fowler-Nordheim tunneling to a value that causes the V_{th} of the memory transistor to be approximately −2 V; and
means for reading such that a selected memory transistor will be responsive to said control gate when V_{th} is within the range of approximately −2 V to +2 V.

5,197,028
SEMICONDUCTOR MEMORY DEVICE WITH DUAL REFERENCE ELEMENTS
Hiroto Nakai, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 16, 1990, Ser. No. 568,034
Claims priority, application Japan, Aug. 18, 1989, 1-212177
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—185 8 Claims



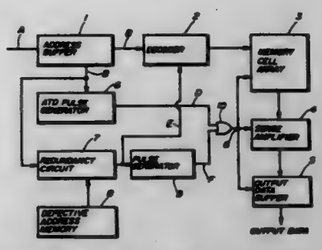
1. A semiconductor memory device comprising:
a memory cell having a drain, a gate and a source, said source of said memory cell being connected to a ground line, said gate of said memory cell being supplied with a predetermined potential for reading memory cell data;
a bit line connected to said drain of said memory cell for receiving said memory cell data;
a bit line potential setting means connected between said bit line and a memory cell data detecting terminal for setting a potential value of said bit line lower than that of a power source line;
a load transistor connected between said memory cell data detecting terminal and said power source line;
a first reference cell having a drain, a gate and a source, said gate of said first reference cell having applied thereto said predetermined potential, said source of said first reference cell being connected to said ground line;
a first reference line connected to said drain of said first reference cell for receiving first reference cell data;
first reference line potential setting means connected between said first reference line and a first reference cell data detecting terminal for setting a potential value of said first reference line lower than that of said power source line;
a first reference load transistor connected between said first reference cell data detecting terminal and said power source line, said first reference load transistor having a lower conductance value than that of said load transistor;
a second reference cell having a drain, a gate and a source, said source of said second reference cell being connected to said ground line;
a second reference line connected to said drain of said second reference cell for receiving second reference cell data;
second reference line potential setting means connected between said second reference line and a second reference cell data detecting terminal for setting a potential value of said second reference line lower than that of said power source line;
a second reference load transistor connected between said second reference data detecting terminal and said power source line, said second reference load transistor having a conductance value equal to that of said load transistor;
gate potential generating means having an output terminal connected to said gate of said second reference cell for controlling a gate potential of said second reference cell, so as to make a potential value at said first reference cell data detecting terminal equal to the potential value at said second reference cell data detecting terminal; and
data detecting means for reading out said memory cell data in accordance with a comparison result between a potential value at said memory cell data detecting terminal and said potential value at said second reference cell data detecting terminal.

5,197,029
COMMON-LINE CONNECTION FOR INTEGRATED MEMORY ARRAY
John F. Schreck, and Phat C. Truong, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 7, 1991, Ser. No. 651,817
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—189.01 19 Claims



1. A common connection for an integrated-circuit memory, said memory having a control circuit, at least one memory cell array having column lines, and a programming circuit including at least first and second parts, comprising:
at least one column of said at least one memory array selectively connected to a common conductor upon receiving at least a first signal from said control circuit;
said first part of said programming circuit selectively connected to said common conductor upon receiving at least a second signal from said control circuit; and
said second part of said programming circuit connected to said common conductor upon receiving at least a third signal from said control circuit.

5,197,030
SEMICONDUCTOR MEMORY DEVICE HAVING REDUNDANT MEMORY CELLS
Takao Akaogi, Inagi, and Mitsuo Higuchi, Nakamachi, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Aug. 20, 1990, Ser. No. 570,057
Claims priority, application Japan, Aug. 25, 1989, 1-219973
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—200 11 Claims



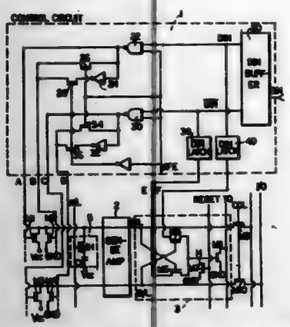
1. A semiconductor memory device comprising:
a memory cell array having memory cells which include memory cells and redundant memory cells;
data readout means, coupled to said memory cell array, for reading out data from said memory cell array;
decoder means, coupled to said memory cell array, for decoding an input address signal and generating a decoded address signal which identifies at least one of said memory cells;
address transition detecting means for detecting an address transition of said input address signal and for generating an address transition detection pulse;
redundancy circuit means, coupled to said decoder means, for determining whether or not said input address signal indicates a defective memory cell which is one of said memory cells and for outputting a redundancy signal to said decoder means so that said decoder means selects one of said redundant memory cells in place of said defective memory cell; and
pulse generating means, coupled to said redundancy circuit means and said address transition detecting means, for generating a pulse signal having a duration sufficient to reset said memory cell array, wherein said pulse has a greater duration than said address transition detection pulse when said redundancy circuit means outputs said redundancy signal, and said pulse has a duration equal to said address transition detection pulse when said redundancy circuit means does not output said redundancy signal, the pulse duration time of said pulse signal starting from a time when said address transition detecting means generates said address transition signal.

5,197,031
METHOD FOR WRITING DATA IN TESTING MEMORY DEVICE AND CIRCUIT FOR TESTING MEMORY DEVICE
Hoon Choi, Taegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Continuation-in-part of Ser. No. 768,455, Sep. 27, 1991, which is a continuation of Ser. No. 470,119, Jan. 24, 1990, abandoned.
This application Jan. 29, 1992, Ser. No. 827,578
Claims priority, application Rep. of Korea, Jun. 10, 1989, 89-8002
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—201 4 Claims

1. A circuit for testing a memory device of the type including a plurality of sense amplifiers connected to a pair of bit lines, a plurality of memory cells connected to the bit lines and a word line, a plurality of first MOS transistors turned on by a

column selecting signal to connect I/O lines to a pair of bit lines, the testing circuit comprising:

means for providing a preselected one of a Vcc-level or a GND-level provided at terminals of a voltage source to one line of the pair of bit lines and the other of said levels to the other of said bit lines by using a plurality of second MOS transistors connected between said terminals and the pair of bit lines for providing a preselected voltage differ-



ence between the bit lines, said sense amplifiers being responsive to said voltage difference for writing and storing preselected data corresponding to said preselected voltage difference in said memory cells; and

data reading means connected to each of the sense amplifiers for reading the data stored in said memory cells and for determining if the read-out data corresponds to said preselected data.

5,197,032

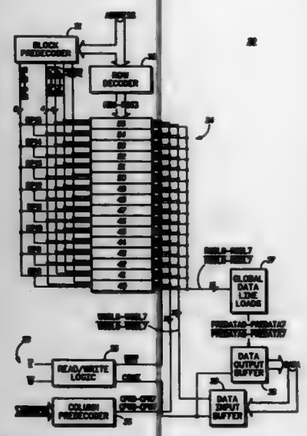
BICMOS BIT LINE LOAD FOR A MEMORY WITH IMPROVED RELIABILITY AND A METHOD THEREFOR

Scott G. Nogle, Austin, Tex., assignor to Motorola, Schaumburg, Ill.

Division of Ser. No. 548,809, Jul. 6, 1990, Pat. No. 5,155,703. This application Apr. 28, 1992, Ser. No. 874,866

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—207 12 Claims



1. A bit line load coupled to a differential bit line pair in a block of a memory, the memory for performing read cycles and write cycles, comprising:

bias means for providing an equalization signal at a logic low voltage when the memory block is selected during the write cycle, and for providing said equalization signal at a logic high voltage otherwise;

a first transistor having a collector for receiving a first reference voltage, a base for receiving said equalization signal, and an emitter coupled to a bit line;

a second transistor having a collector for receiving said first reference voltage, a base for receiving said equalization signal, and an emitter coupled to a complementary bit line;

a third transistor having a first current electrode for receiving a second reference voltage, a control electrode coupled to a negative power supply voltage terminal, and a second current electrode coupled to said bit line; and

a fourth transistor having a first current electrode for receiving said second reference voltage, a control electrode coupled to said negative power supply voltage terminal, and a second current electrode coupled to said complementary bit line;

wherein a difference between said logic high voltage of said equalization signal and said logic low voltage of said equalization signal is limited to a predetermined voltage.

5,197,033

SEMICONDUCTOR DEVICE INCORPORATING INTERNAL POWER SUPPLY FOR COMPENSATING FOR DEVIATION IN OPERATING CONDITION AND FABRICATION PROCESS CONDITIONS

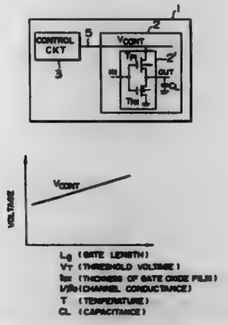
Takao Watanabe, Kokubunji; Ryoichi Hori; Goro Kitsukawa, both of Tokyo; Yoshiki Kawajiri, Hachioji; Takayuki Kawahara, Kokubunji, and Kiyoo Itoh, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 608,640, Nov. 5, 1990, Pat. No. 5,086,238, which is a continuation of Ser. No. 196,743, May 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,485, Nov. 30, 1987, Pat. No. 4,873,673, and a continuation-in-part of Ser. No. 130,640, Dec. 9, 1987, Pat. No. 4,837,462, which is a division of Ser. No. 886,816, Jul. 18, 1986, Pat. No. 4,730,132. This application Dec. 18, 1991, Ser. No. 808,878

Claims priority, application Japan, May 22, 1987, 62-123797; Sep. 9, 1987, 62-223921; Nov. 27, 1987, 62-297546

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—226 26 Claims



1. A semiconductor circuit device comprising:

a load; and

an internal power supply circuit, the internal power supply circuit comprising:

a reference voltage generator to generate a first reference voltage from an external voltage;

means for converting said first reference voltage into a second reference voltage; and

a circuit means, provided between said converting means and said load, including:

mean for supplying an internal supply voltage to said load; and

means for buffering a change of current consumed in said load, wherein said reference voltage generator includes at least two MOS transistors, having different threshold voltages, and a means for generating the first reference voltage based on a difference between the threshold voltages of said MOS transistors.

5,197,034

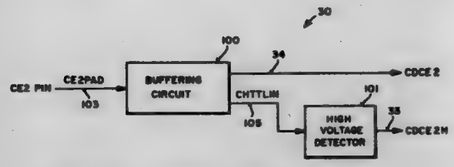
FLOATING GATE NON-VOLATILE MEMORY WITH DEEP POWER DOWN AND WRITE LOCK-OUT

Mickey Lee Fandrich, Placerville; Virgil N. Kynett, El Dorado Hills, and Kurt B. Robinson, Newcastle, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 698,546, May 10, 1991. This application Oct. 9, 1991, Ser. No. 773,247

Int. Cl.[5] G11C *11/00*

U.S. Cl. 365—227 9 Claims



1. A non-volatile memory, comprising:

(a) a memory array that includes

(1) a main block; and

(2) a boot block;

(b) a control input for receiving a control signal, wherein the control signal can be in a first voltage state, a second voltage state, and a third voltage state; and

(c) circuitry means coupled to receive the control signal at the control input for (1) allowing the boot block to be updated when the control signal is in the first state and

(2) for generating a power off signal to switch the memory into a substantially powered off state when the control signal is in the third voltage state.

5,197,035

SEMICONDUCTOR MEMORY

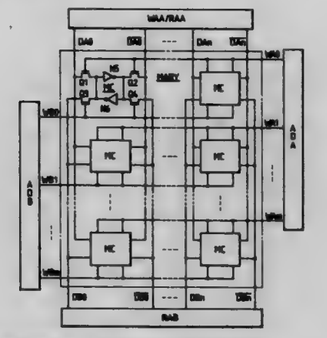
Akira Ito, Kunitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,731

Claims priority, application Japan, Nov. 6, 1987, 62-280750

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—230.05 37 Claims



1. A semiconductor memory comprising:

a memory array having a plurality of memory cells, a plurality of first and second word lines, and a plurality of pairs of data lines which are respectively arranged so that each of said memory cells is coupled to a first word line, a second word line and a corresponding pair of data lines;

first decode means for selecting one of said plurality of first word lines in accordance with first address signals being supplied at inputs thereof, wherein when said one first word line is selected, the memory cells coupled thereto are supplied with data to-be-written through data input means;

second decode means for selecting one of said plurality of second word lines in accordance with second address signals being supplied at inputs thereof;

comparing means being responsive to said first and second address signals for providing at an output thereof a comparison signal indicative of either agreement or disagreement between said first and second address signals received;

data output means being coupled to receive said comparison signal such that when said comparison signal is indicative of an agreement between the first and second address signals, said data to-be-written is outputted therefrom; and

bypass means, coupling said data input means and said data output means, for supplying said data to-be-written from said data input means to said data output means, wherein in response to said comparison signal being indicative of an agreement between said first and second address signals, said data to-be-written is outputted from said data output means, bypassing said memory array.

5,197,036

SONAR ARRAY MOUNTING FOR SONOBUOY

David E. J. Buckingham, Middlesex, Great Britain, assignor to Dowty Maritime Limited, Feltham, England

PCT No. PCT/GB91/00403, § 371 Date Jan. 13, 1992, § 102(e) Date Jan. 13, 1992, PCT Pub. No. WO91/14259, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 15, 1991, Ser. No. 773,616

Claims priority, application United Kingdom, Mar. 15, 1990, 9005863

Int. Cl.[5] H04R *1/00;* G10K *11/00*

U.S. Cl. 367—4 5 Claims

1. A sonobuoy comprising a sonar array mounted on a plurality of arms that are pivotally connected together on a central support so that they can pivot downwards and outwards from an upwardly extending, non-deployed orientation, an outer housing being provided which contains the nondeployed arms and which is adapted to move axially to uncover the arms when the array is to be deployed, each arm being connected via a tie to the outer housing so that such axial movement of the housing positively moves the arms to their radially deployed orientation, said outer housing depending downwardly from the arms in their deployed state.

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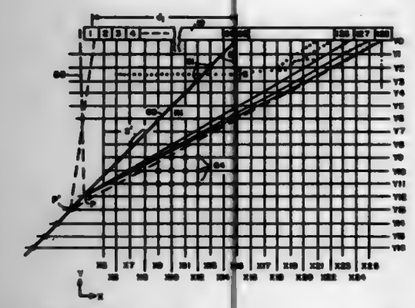
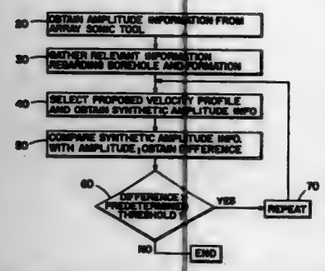
5,197,037
METHOD AND APPARATUS FOR THE SIMULTANEOUS PERFORMANCE OF THE BEAM FORMATION AND SCAN CONVERSION IN A PHASED ARRAY SYSTEM
Steven C. Leavitt, Hampstead, N.H., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 31, 1991, Ser. No. 785,669
Int. Cl.[5] G01N *29/04*; G03B *42/06*
U.S. Cl. 367—11 24 Claims



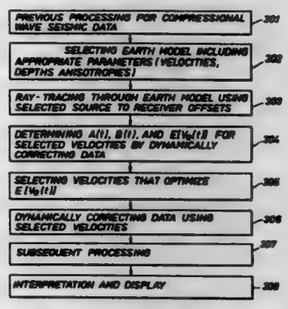
1. A digital front end for a phased array system which utilizes N channels of the array to generate successive scan lines at predetermined angles θ, echoes received by channel elements being utilized to control a pixel matrix display, the front end comprising:
means for sampling the echo signals from each of the N channels at selected points along the echo signals for each scan line;
first means for utilizing the samples at the selected points to determine values for the N channels at points related in a predetermined way to pixel locations;
means for summing the values for the N channels at each of said points to obtain a sample value for the point; and
second means for utilizing the sample values for the points to store sample values for each pixel.

5,197,038
METHOD AND SONIC TOOL APPARATUS FOR INVESTIGATING PROPERTIES OF EARTH FORMATIONS TRANSVERSED BY A BOREHOLE
Shu K. Chang, West Redding, Conn., and Michel Gouilloud, Paris, France, assignors to Schlumberger Technology Corporation, New York, N.Y.
Filed Jun. 21, 1991, Ser. No. 719,227
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—28 30 Claims



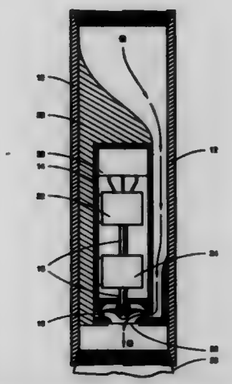
1. A method for investigating properties of a formation traversed by a borehole along a length of said borehole by using a sonic borehole tool, said formation having an altered zone adjacent said borehole and an unaltered zone beyond said altered zone, said method comprising:
a) obtaining amplitude information of a compressional headwave via use of said sonic borehole tool;
b) selecting a proposed radial velocity profile for said formation, said radial velocity profile including as parameters a radius of said altered zone, and acoustic velocities of said altered zone, and obtaining synthetic amplitude information corresponding to said selected proposed radial velocity profile;
c) comparing said compressional headwave amplitude information with said synthetic amplitude information to obtain an amplitude difference;
d) adjusting values for said radial velocity profile parameters until said amplitude difference is less than a predetermined threshold, wherein a quantitative determination of said parameters is thereby made to provide a determined radial velocity profile of said formation.

5,197,039
METHODS FOR PROCESSING SEISMIC DATA
Chris T. Corcoran, and Aaron J. Seriff, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Mar. 29, 1988, Ser. No. 174,658
Int. Cl.[5] G01V *1/36*
U.S. Cl. 367—52 12 Claims



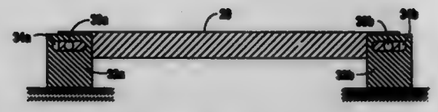
7. A method for processing seismic data, comprising:
developing an initial velocity model having known or estimated parameters,
performing raytracing through said model to determine reflection angles, θ, and values of $\sin^2\theta$ for a plurality of offsets and travel time,
dynamically correcting said data with a plurality of selected moveout velocity functions,
determining fitting coefficients corresponding to normal incidence reflection amplitude, A, and amplitude variation with offset, B, for each zero offset travel time of said data by fitting the amplitudes of said seismic data to a form $A+B\sin^2\theta$ using a least-squared-error fitting technique,
calculating a quality of fit coefficient for said least-squared-error fitting,
selecting a moveout velocity function that maximizes the quality of fit coefficient for a plurality of travel times,
interpolating a continuous moveout velocity function between said plurality of travel times, and then
determining fitting coefficient traces from said fitting coefficients corresponding to said interpolated moveout velocity function.

5,197,040
BOREHOLE DATA TRANSMISSION APPARATUS
Oleg M. Kotlyar, 1739 Grandview #2, Idaho Falls, Id. 83402
Filed Mar. 31, 1992, Ser. No. 860,882
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—84 4 Claims



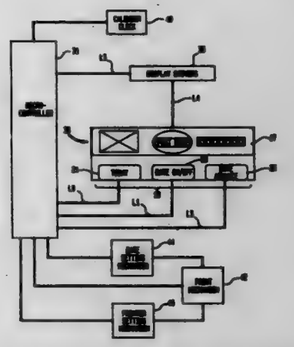
1. A downhole data transmission device for use in an earth drilling apparatus comprising:
a housing positioned in a drill string, said drill string receiving a flow of drilling fluid,
a shaft journaled in said housing;
means for directing said drilling fluid between said housing and drill string to rotating impellers mounted on said shaft and driven by said flowing drilling fluid, said rotating impellers directing the drilling fluid radially inward in said drill string to a drill bit positioned below said housing, said rotating impellers having a pressure response characteristic related to its rotational speed;
means for changing the rotational speed of said rotating impellers while said drilling fluid flows therethrough in order to generate a pressure pulse which is transmitted through said drilling fluid.

5,197,041
PIEZOELECTRIC MUD PULSER FOR MEASUREMENT-WHILE-DRILLING APPLICATIONS
William T. Balogh, 6119 Windbrooke, San Antonio, Tex. 78249
Filed Jan. 23, 1991, Ser. No. 645,027
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—160 7 Claims



1. A transducer, comprising:
first and second piezoelectric elements, said piezoelectric elements bonded together in a bender bar configuration;
first and second end units each having an aperture, one end unit located at each end of said bonded piezoelectric elements;
first and second metallic plates bonded to said first and second piezoelectric elements, respectively, and to said first and second end units;
one or more electrodes located between said first and second piezoelectric elements, and
first and second mounting blocks, each of said mounting blocks being provided with a mounting aperture, wherein said first and second end unit apertures and said first and second mounting apertures may be aligned such that first and second mounting rods may be inserted through each of said first and second end unit apertures and said first and second mounting apertures and further wherein said first and second mounting apertures are of a geometry which provides two degrees of freedom for said first and second mounting rods.

5,197,042
POSTAGE METER HAVING AUTO DATING DEVICE
George M. Brookner, Norwalk; Jacqueline Collins, Bridgeport, and Terrance M. Doeberl, West Redding, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Oct. 31, 1991, Ser. No. 786,317
Int. Cl.[5] G04B *47/00*, *19/24*; G06F *15/20*
U.S. Cl. 368—10 6 Claims



1. An improved postage metering combination having a date setting means and printing means for printing postage or other information on an envelope and having a calendar clock module, a microcomputer connected to receive current date information from said calendar clock module, and a date printing means having a date printing mechanism for selectively printing posting date information in response to said date setting means or ducking the printing of date information on said envelope, said date printing means being connected to said microcomputer for receiving information advancing the date to be printed or causing said date printing means to duck printing of said date information wherein said improvement comprises:
date entry means for having a first, second and third date entry mode,
said microcomputer being connected to said data entry means and being programmed to respond to said first mode to cause said microcomputer to inform said date setting means to set said date printing means to print the current date information, said second mode to cause said date printing means to duck printing of said current date information, and said third mode to cause said date printing means to incrementally advance in selectable increments.

5,197,043
NIGHT AND DAY EARTH CLOCK CALENDAR
Verne A. Strader, 3307 92nd Ave. Ct., E, Puyallup, Wash. 98371
Filed Mar. 29, 1991, Ser. No. 677,497
Int. Cl.[5] G04B *19/22*
U.S. Cl. 368—27 6 Claims

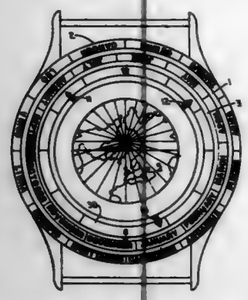
1. A world clock comprising:
a clock frame having a center;
a single rotating map disc being a dimensionally accurate

polar projection of the earth's continents, including twenty-four symbolic lines radiating from the earth's pole and said lines representing the earth's twenty four meridians, said map having a diameter representing the equator;

a stationary time scale disc surrounding said rotating map, said time scale containing discrete units representing hours of the day, the months of the year and the signs of the zodiac, whereas these discrete symbols allow the user to readily tell the time of day, the day of the year, the month of the year and the sign of the zodiac;

a stationary apertured disc having an aperture with the same diameter as the equator, said stationary apertured disc being mounted above the map disc;

a rotating transparent disc mounted above the stationary apertured disc and above the rotating map disc, said transparent disc having light and dark semicircles printed thereon, said semicircles representing daylight and nightfall, said transparent disc further having a marker on its surface that points to the day of the month of the year along with the sign of the zodiac;



a set of symbols representing the locations of the major cities of the world and the earth's poles are printed on the rotating map disc;

a drive mechanism rotating said map disc at least once every twenty four hours; and wherein the center of the clock frame and the center of the time disc and the center of the transparent disc are coaxial and aligned; and wherein the map disc has the earth's pole at its center, said pole being offset from and not coincident with the aligned and coaxial centers.

5,197,044

LOW ENERGY ANIMATED TIME PIECE

Harold D. Pierce, Woodland Hills, Calif.; Stephen C. Jacobsen, and William B. Lee, both of Salt Lake City, Utah, assignors to Sarcos Fun, Inc., Westlake Village, Calif.

Filed Dec. 11, 1990, Ser. No. 625,485
Int. Cl.[5] G04B *21/08*
U.S. Cl. 368—63 9 Claims

1. An animated time piece comprising:

a housing;

a figure mounted on said housing and including stationary and moveable figure parts;

an elongated pivotable member mounting said movable figure part on one extremity thereof and cooperating therewith to form a figure part center of mass, said pivot member being configured on the opposite extremity with an armature portion having an armature center of mass;

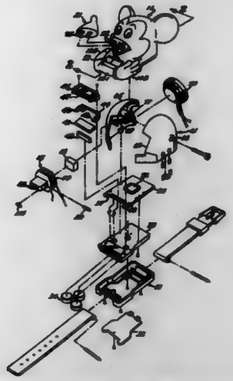
a laterally projecting pivot pin interposed between said centers of mass for mounting said pivotable member from said housing so as to balance said centers of mass on the opposite sides of said pivot pin;

a magnet mounted on said housing;

said pivot member being pivotable about said pivot pin and said armature being operative to, upon application of a predetermined electrical signal, cooperate with said magnet to pivot said pivot member to shift said moveable figure part from a first to a second position;

means coupled with said pivot member for normally urging said moveable figure part to said first position;

electrical means, including a battery, timing means and signal generating means operative to periodically generate



said predetermined electrical signal to thereby selectively energize said armature to cause said figure part to shift from said first to said second position; and

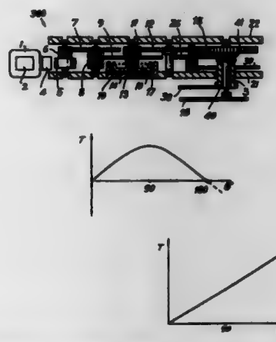
means for displaying time disposed in said housing and means for synchronizing movement of said pivot member with time annunciating means.

5,197,045

ELECTRONIC WATCH

Osamu Miyazawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 114,315, Oct. 28, 1987, Pat. No. 4,885,730. This application May 17, 1989, Ser. No. 353,294
Claims priority, application Japan, May 19, 1988, 63-122582
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] G04C *30/00*; H02K *49/19*
U.S. Cl. 368—157 18 Claims



1. A timepiece comprising:

motor means for producing a mechanical driving force;

storage means for storing energy associated with said mechanical driving force and for producing a driving torque based on said stored energy;

control means for producing a load torque and for controlling the production of said driving torque at a relatively constant level based on said load torque, said control means including a rotor immersed in viscous fluid;

indicator means for rotatingly indicting the time based on said driving torque, said indicator means having a first spindle about which said indicators means rotates; and

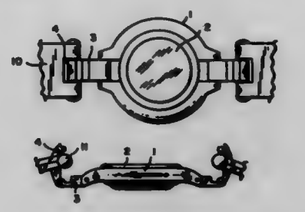
a second spindle means operatively coupling said storage means and said rotor of said control means for common rotation, said storage means and said rotor of said control means having a common axis and being spaced along the length of said second spindle means, said second spindle means being laterally offset from said first spindle.

5,197,046

WRIST WATCH AND WRIST WATCH STRAP COMBINATION

Leung-Cheung Siu, Tsuen Wan, Hong Kong, assignor to Siu Win Holding Co. Ltd., Tsuen Wan, Hong Kong

Filed Feb. 20, 1992, Ser. No. 839,306
Int. Cl.[5] G04B *37/00*; A44C *5/00*
U.S. Cl. 368—282 2 Claims



1. A wrist watch and wrist watch strap combination including a pair of manually operable securing means for securing the ends of the watch strap to the watch, wherein the wrist watch includes hinged extension flaps at the 6 o'clock and the 12 o'clock positions, and hinged closure flaps mounted at the end of each extension flap which may be closed over the extension flap into snap fitting engagement with the extension flap, and the wrist watch ends each include an eye for receiving a hinged flap so that when the hinged closure flaps are passed through the eyes and closed down over the hinged extension flaps into snap fitting engagement, the ends of the wrist watch strap are secured in position, but are readily releasable by manually disengaging the hinged closure flaps.

5,197,047

AUTOMATIC TRANSMISSION SYSTEM MULTI-CHANNEL SCHEDULING

Neil Witheridge, Glebe, and Tapas K. Debray, Seven Hills, both of Australia, assignors to Sony (Australia) Pty. Limited, North Ryde, Australia

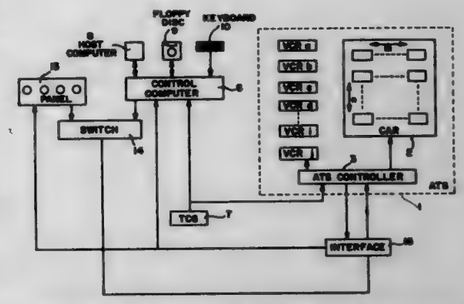
Filed Oct. 2, 1991, Ser. No. 769,648
Claims priority, application Australia, Oct. 23, 1990, 2987
Int. Cl.[5] H04B *1/20*; H04N *5/76*
U.S. Cl. 369—4 4 Claims

1. A method by which a plurality of playlists representing respective sequences of events of video/audio signals stored on respective cassettes, and in which each of said events has a respective time duration and the total time duration for each of the sequences is the same as for the other sequences, are transmitted as a single combined playlist by a multi-channel automatic transmission system operative to simultaneously broadcast each of said sequences of events over a respective transmission channel, said method comprising the steps of:

determining, from said playlists, the number of times said cassettes need to be changed in said multi-channel automatic transmission system;

determining, from said playlists, the maximum number of times said cassettes are allowed to be changed; and

combining said playlists if the required number of times said cassettes are to be changed for said playlists is less than or equal to the maximum allowable number of times said cassettes are allowed to be changed, and, if, for each of the



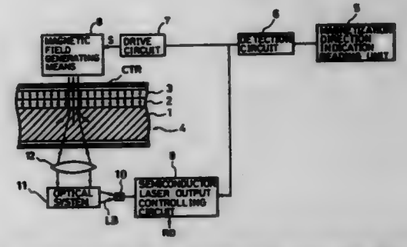
events to be broadcasted over each of the respective channels other than the first event, the sum of thread, cue and pre-roll times and the time required for the respective changes is less than or equal to the total event time durations including the current event less the total of the previous event time durations for the respective channel.

5,197,048

MAGNETO-OPTIC RECORDING MEDIUM, MAGNETO-OPTIC RECORDING SYSTEM AND MAGNETO-OPTIC RECORDING METHOD

Kyosuke Yoshimoto; Osamu Ito; Kunimaro Tanaka; Koichi Takeuchi; Isao Watanabe, and Kenshiro Tsutsumi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

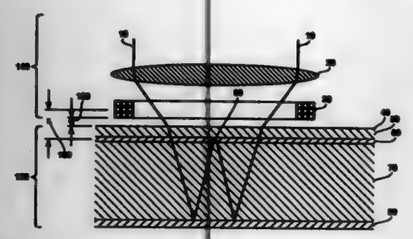
Division of Ser. No. 591,610, Oct. 2, 1990. This application Oct. 3, 1991, Ser. No. 770,602
Int. Cl.[5] G11B *13/04*, *11/12*, *11/10*
U.S. Cl. 369—13 4 Claims



1. A magneto-optic recording system for recording information by irradiating a light beam and applying a magnetic field to a magneto-optic recording medium, said system comprising said recording medium having a first magnetic layer for information to be recorded thereon and a second magnetic layer superposed on said first magnetic layer, having a magnetization direction being fixed in one direction for effecting the recording of information in said first magnetic layer, wherein magnetization information on the magnetization direction of said second magnetic layer is recorded in said first magnetic layer, means for reading the magnetization information on the magnetization direction of said second magnetic layer in the first magnetic layer; means for detecting the magnetization direction of said second magnetic layer from the output of said reading means; magnetic field generating means, including a drive circuit means responsive to said detecting means, for

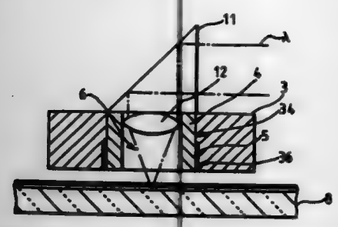
generating said magnetic field and adjusting the direction of said magnetic field opposite to the detected magnetization direction of said second magnetic layer; and optical means for irradiating said light beam to said medium.

5,197,049
HEAD AND MEDIA FOR OPTICAL DATA STORAGE
Paul J. Wehrenberg, Palo Alto, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Continuation of Ser. No. 392,750, Aug. 11, 1989, abandoned. This application Nov. 21, 1991, Ser. No. 796,857
Int. Cl.[5] G11B *11/00*
U.S. Cl. 369—13 **4 Claims**



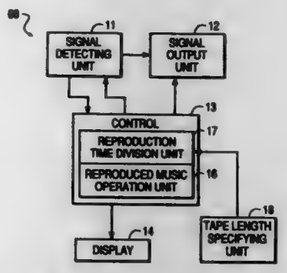
3. A method of using a layered optical data storage media comprising:
- receiving a relatively wide entering and converging light beam through a partially light transmissive recording layer;
- converging said relatively wide entering and converging beam to a substantially narrower entering and converging beam as the beam passes through a transparent substrate layer;
- reflecting said substantially narrower entering and converging beam from a reflecting layer as a substantially narrower reflected and converging beam;
- returning said substantially narrower reflected and converging beam through said substrate layer in the opposite direction of the path of said relatively wide entering and converging beam; and
- converging said substantially narrower reflected and converging beam to a point of focus on said recording layer for reading and writing of data on said recording layer at said point of focus.

5,197,050
FLYING HEAD FOR A MAGNETO-OPTICAL RECORDING DRIVE
Akemi Murakami; Shoji Yamaguchi; Kaoru Yasukawa; Takashi Nomiyama, and Daisuke Iguchi, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Oct. 9, 1990, Ser. No. 594,915
Claims priority, application Japan, Oct. 6, 1989, 1-260125
Int. Cl.[5] G11B *13/04*
U.S. Cl. 369—13 **11 Claims**



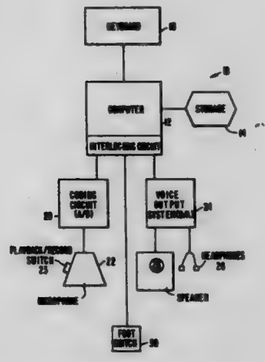
1. A flying head assembly for a magneto-optical recording drive which floats on an air stream above a rotating optical recording medium, the assembly comprising:
- a flying head, including a first head portion formed of a nonmagnetic material having opposite ends, a lower surface proximate the optical recording medium and an opposite upper surface, an aperture disposed proximate one end and having an inlet at the upper surface and an outlet at the lower surface, and a second head portion formed of a magnetic material disposed with its outer peripheral surface abutting the inner peripheral surface of said aperture, said second head portion and said aperture defining a generally annular path through said first head portion;
- light source means for generating a laser light beam;
- a light reflecting element disposed on said upper surface of said first head portion above said aperture for reflecting said light beam into the annular path through said aperture;
- a lens disposed within said aperture for focusing said reflected light beam onto the optical recording medium; and
- magnetic field generating means concentrically mounted with said aperture and second head portion spaced from the inlet and proximate to the outlet of said aperture, for forming a magnetic field directed towards a focusing plane of the optical recording medium.

5,197,051
DEVICE FOR SPECIFYING AND CALCULATING A PLAY TIME OF AN OPTICAL DISK PLAYER
Harukiss Tomoda, Neyagawa, and Yasunori Shimada, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Continuation of Ser. No. 128,912, Dec. 4, 1987, abandoned. This application Nov. 26, 1991, Ser. No. 800,897
Claims priority, application Japan, Jan. 20, 1987, 62-10604
Int. Cl.[5] G11B *13/00, 13/04, 11/12, 7/28*
U.S. Cl. 369—14 **5 Claims**



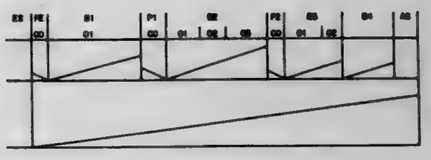
1. A device for specifying and calculating a reproduction time of an optical disk player such that the reproduction time is specified and calculated to coincide with a recording length of one side of a magnetic tape, the optical disk player reproducing information stored on an optical disk, the information being stored in the form of a plurality of recorded segments and including index information regarding the plurality of recorded segments, at least one of the plurality of recorded segments reproduced by the optical disk player being recorded on said magnetic tape by a tape recorder, said device comprising:
- a recording length specifying means for specifying a recording length of the magnetic tape;
- a display means, coupled to said recording length specifying means, for displaying said recording length specified by said recording length specifying means;
- a reproduction time calculating means, coupled to said recording length specifying means, for calculating the recording length of one side of the magnetic tape by multiplying the recording length specified by the recording length specifying means by one-half; and
- a segment determining means, coupled to the reproduction time calculating means and said optical disk player, for determining and selecting based on the index information, a number of the plurality of recorded segments which can be reproduced within the recording length of the one side of the magnetic tape, and for storing an identification of said number of plurality of recorded segments thus selected.

5,197,052
PERSONAL COMPUTER DICTATION SYSTEM WITH VOICE ANAD TEXT STORED ON THE SAME STORAGE MEDIUM
Günter Schröder, Oberasbach; Helmut Abraham, Pyrbaum, and Kazimir Arcimowski, Munich, all of Fed. Rep. of Germany, assignors to Grundig E.M.V., Fuerth/Bay, Fed. Rep. of Germany
Continuation of Ser. No. 319,635, Mar. 6, 1989, abandoned. This application May 23, 1991, Ser. No. 707,203
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807851
Int. Cl.[5] G11B *19/02*
U.S. Cl. 369—25 **7 Claims**



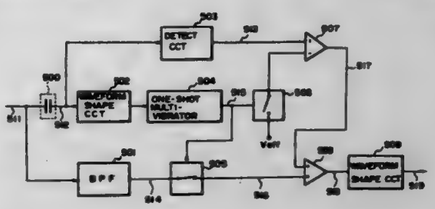
1. An integrated dictation device comprising a computer including a keyboard and a non-volatile storage device, said storage device being responsive to said keyboard, said storage device further being responsive to a voice input/output system through which application-specific text can e input via an input port by a microphone including a playback/record switch, and output via an output port by a listening device proximate to said keyboard, wherein a coding circuit converts commands entered through said playback/record switch and said microphone into digital format to which said storage device is responsive, wherein sequencing between said input port and said output port is controlled by said playback/record switch, said voice input/output system further including analog-to-digital and digital-to-analog means, and said coding circuit including means for a user to listen to output from said storage device through said output port substantially simultaneously with entering data into said keyboard eventually bound for said storage device via said input port.

5,197,053
COMPACT DISK READER
Dieter Baus, Kehl, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
PCT No. PCT/EP88/00488, § 371 Date Feb. 9, 1989, § 102(e) Date Feb. 9, 1989, PCT Pub. No. WO88/09993, PCT Pub. Date Dec. 15, 1988
Continuation of Ser. No. 328,078, Feb. 9, 1989, abandoned. This PCT application Jun. 1, 1988, Ser. No. 684,137
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1987, 3719217
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 **7 Claims**



1. A compact-disk player for playing a compact disk carrying data in a plurality of program blocks recorded on said disk, said program blocks being dividable into sections by indices, comprising: storage means for storing all indices of each program block, each of said indices having starting and ending times; said storage means also storing said starting and ending times; means for selecting any index within any program block; an optical scanner for scanning a compact-disk to be played; and means for calculating an amount to be skipped by said optical scanner dependent on the index selected and from stored starting and ending times of selected indices upon selecting a desired index within a desired program block, storing said indices and calculating said amount to be skipped by said optical scanner providing substantially rapid and precise skipping from one program block to another selected program block with predetermined index.

5,197,054
SUM SIGNAL PROCESSING DEVICE FOR AN OPTICAL DISK DRIVE
Toshihisa Harada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed May 17, 1990, Ser. No. 524,530
Claims priority, application Japan, May 18, 1989, 1-125607
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 **2 Claims**



1. A sum signal processing device for an optical disk drive using an optical disk medium having concentric or spiral guide grooves for producing a groove-crossing signal having a minimum value in response to light reflected from the guide grooves and a maximum value in response to light reflected from between the guide grooves, said optical disk drive comprising photodetector means for producing a sum signal repre-

sentative of an intensity of light reflected from said optical disk medium, said device comprising:

data portion detecting means for detecting a presence or absence of a data portion in said sum signal by detecting high-frequency components in said sum signal;

envelope detecting means for producing an envelope signal of high-frequency components out of said sum signal; and

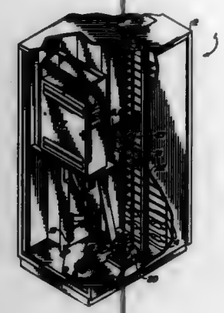
means for combining, when said data portion detecting means detects the absence of a data portion, said sum signal and said envelope signal and for outputting the resulting combined signal as said groove-crossing signal and for outputting, when said data portion detecting means detects the presence of a data portion, only said envelope signal as said groove-crossing signal.

5,197,055

IDLE DEMOUNT IN AN AUTOMATED STORAGE LIBRARY

Joseph C. Hartung; David L. Patton; Dennis L. Wilson, and Daniel J. Winarski, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1990, Ser. No. 526,483
Int. Cl.[5] G11B *15/00, 7/00*
U.S. Cl. 369—34 12 Claims



1. A method for selecting a data storage medium for demount in an idle automated storage library including a plurality of internal peripheral storage devices, the automated storage library having a plurality of data storage media therein, the method comprising the machine-executed steps of:

determining if all of the internal peripheral storage devices are occupied;

if all of the internal peripheral storage devices are occupied, determining if any internal peripheral storage device has been inactive for a first predetermined time;

if any internal peripheral storage device has been inactive for the first predetermined time, demounting the least recently used data storage medium;

determining if any of the occupied peripheral storage devices have been inactive for a second predetermined time, the second predetermined time significantly longer than the first predetermined time; and

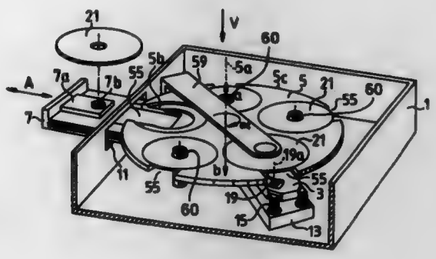
if any of the occupied peripheral storage devices have been inactive for the second predetermined time, demounting the data storage medium in each of the occupied peripheral storage devices determined to have been inactive for the second predetermined time.

5,197,056

DISC RECORD PLAYER

Omar P. L. P. Van Heusden, and Jozef H. M. R. Verheyen, both of Hasselt, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 547,744, Jul. 3, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 794,345
Claims priority, application Netherlands, Jul. 4, 1989, 8901699
Int. Cl.[5] G11B *25/04, 17/22*
U.S. Cl. 369—37 25 Claims



1. A disc-record player comprising:

a housing, and a stationary frame accommodated in said housing,

a scanning device for scanning a positioned information disc which is in a scanning position in said housing, said device comprising a turntable which is rotatable about a turntable axis and which has a supporting surface for supporting said positioned information disc in said scanning position,

a disc support which has a plurality of supporting surfaces spaced around a support axis, adapted to support a corresponding plurality of information discs,

means for mounting said disc support for rotation about said support axis in said stationary frame, and for retaining said disc support permanently inside said housing,

a loading device, comprising: a drawer which is movable through an opening in the housing, and has a supporting surface for moving information discs into and out of the housing; and loading means for moving the respective supporting surfaces of the disc support and the drawer relative to each other in a direction parallel to said support axis, and

a positioning device comprising a movable drive member for positioning the scanning device and the disc support relative to one another about said support axis, to bring a selected information disc into said scanning position, relative rotation of said disc support being responsive to movement of said member in at least a given direction,

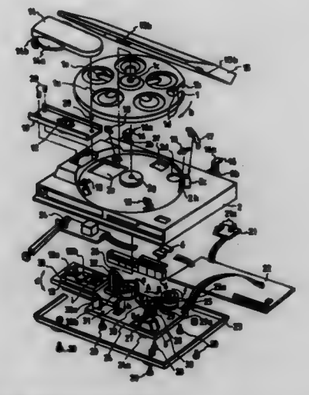
characterized in that the positioning device comprises a lifting mechanism for moving the disc support and the scanning device relative to one another parallel to said support axis, between a first scanning device position in which the disc support can be rotated by said positioning device free from interference with said scanning device, and a second scanning device position in which an information disc can be transferred between the supporting surface of the turntable and one of said supporting surfaces of the disc support, movement of said member in at least one direction causing relative movement from said second to said first scanning device positions.

5,197,057

DISC CHANGER WITH DUST COVER

Yasukata Iyama, Osaka; Shuji Sakamoto, Ikoma; Masahiko Kajitani, Osaka; Soichi Kimura, Osaka, and Tadashi Yoshikawa, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 6, 1990, Ser. No. 488,894
Claims priority, application Japan, Mar. 7, 1989, 1-54034; Mar. 20, 1989, 1-68201
Int. Cl.[5] G11B *17/22, 33/02, 17/04, 17/08*
U.S. Cl. 369—37 6 Claims



1. A disc changer comprising:

a base;

a tray rotatably mounted on said base for supporting a plurality of optical discs replaceably mounted on a horizontal surface;

a drive mechanism for rotating said tray and stopping said tray to position one of the optical discs in a playback position;

an optical pickup means for reproducing a recorded signal from the optical disc in said playback position;

a pickup cover mounted on said base and covering completely said optical pickup means and the optical disc in said playback position at all times irrespective of whether the recorded signal is reproduced from the optical disc in said playback position by said optical pickup means;

a clamp means mounted on said base for clamping the optical disc in said playback position;

a lifting/lowering mechanism for vertically moving said optical pickup means and stopping said optical pickup means in a predetermined vertical position in signal reproducing relationship to the optical disc in said playback position; and

a dust cover supported on said base and movable to at least an opened and a closed position, said dust cover covering said tray and said pickup cover when it is at its closed position.

5,197,058

ELECTRONIC OFFSET COMPENSATION OF THE CONTINUOUS COMPOSITE TRACK ERROR SIGNAL IN OPTICAL RECORDING

Bernard W. Bell, Jr.; David K. Campbell, both of Boise, Id., and Henryk Birecki, Palo Alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

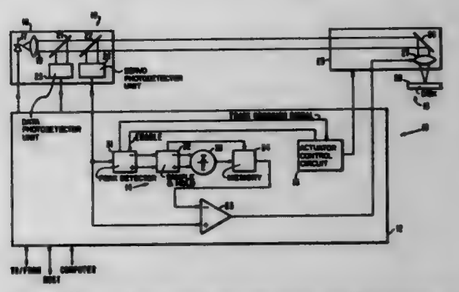
Filed Mar. 5, 1991, Ser. No. 664,881
Int. Cl.[5] G11B *7/085*
U.S. Cl. 369—44.28 5 Claims

1. In an optical disk recording system comprising an optical disk having a plurality of lands separated by grooves, a reading and writing mechanism adapted to read and write data from and to the disk by means of an optical beam, and a controller coupled to the reading and writing mechanism and the disk for controlling the reading and writing of data from and to the disk, and having a servo mechanism optically coupled to the disk and electronically coupled to the controller for providing feedback data indicative of the position of the optical beam relative to the lands of the disk, wherein the improvement comprises:

a peak detector coupled to the servo mechanism and adapted to detect the voltage levels of respective positive and negative peaks in the feedback data output from the servo mechanism;

a sample and hold circuit coupled to the peak detector for sampling and holding the voltage levels of respective positive and negative peaks;

summing means coupled to the sample and hold circuit for finding a midpoint voltage level between the voltage levels of respective positive and negative peaks;



memory means coupled to the sample and hold circuit and to the summing means for storing the midpoint voltage level as a tracking error offset signal;

a sector address detector coupled to the reading and writing mechanism for obtaining sector information derived from the optical disk; and

electronic means coupled to the servo mechanism and the memory means for combining the feedback data with a correlated tracking error offset signal to produce an offset error signal that is coupled to the servo mechanism to control the position of the reading and writing mechanism,

wherein the controller correlates the tracking error offset signal with the sector information to produce the correlated tracking error offset signal.

5,197,059

LASER DIODE CURRENT SUPPLY INCLUDING A THRESHOLD CURRENT COMPONENT SUBJECT TO AUTOMATIC POWER CONTROL

Akira Minami, Inagi, and Masataru Sasaki, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 2, 1991, Ser. No. 739,504
Claims priority, application Japan, Aug. 2, 1990, 2-205549
Int. Cl.[5] G11B *7/125*
U.S. Cl. 369—116 26 Claims

19. An apparatus supplying a current to a laser diode emitting light onto an optical storage medium for reading said data during a read mode from and writing write data during a write mode to the optical storage medium, the light having a mean value output and the write mode having a minimum light output, said apparatus comprising:

supply means for supplying to the laser diode a predetermined current, a read current during the read mode and a write current during the write mode;

adjusting means for adjusting the predetermined current

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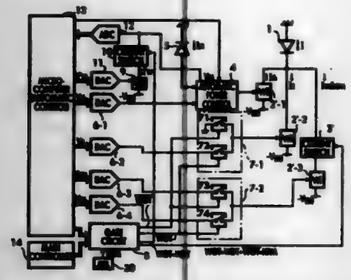
resulting in the light approximately the minimum light output; and



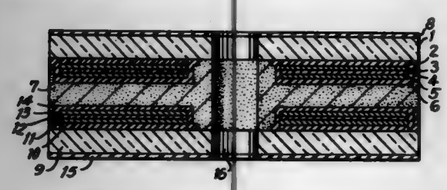
switching means for switching between the read and write modes.

5,197,060

DUAL SUBSTRATE OPTICAL RECORDING MEDIUM

Masahiro Yatake, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP90/00025, § 371 Date Sep. 11, 1990, § 102(e) Date Sep. 11, 1990, PCT Pub. No. WO90/08382, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 11, 1990, Ser. No. 576,490
Claims priority, application Japan, Jan. 11, 1989, 1-4040; Jan. 24, 1989, 1-14413; Jan. 30, 1989, 1-20134; Feb. 13, 1989, 1-33126; Dec. 11, 1989, 1-321000
Int. Cl.[5] G11B *7/24, 11/10*
U.S. Cl. 369—283 4 Claims



1. An optical disk, comprising:

a first substrate for supporting a first recording layer and a second substrate for supporting a second recording layer;

each substrate having a first protecting layer formed on a portion thereof, a recording layer formed on the first protecting layer, a second protecting layer formed on the recording layer, and a reflective layer formed on the second protecting layer to form an annular layered structure of each of the substrates;

each of the layered structures on the substrates having a top, an outer side and an inner side and disposed on a portion of both the first and second substrates so that an annular outer portion and an annular inner portion of the substrates is adjacent to and not covered by the layers thereon;

a ceramic layer formed on each said reflective layer and the annular outer portions of the substrates, the outer sides, tops and inner sides of the layered structures and on the inner portions of the substrates; and

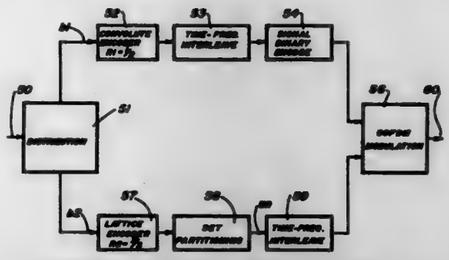
the ceramic layers facing each other and an adhesive between and adhering the ceramic layers.

5,197,061

DEVICE FOR THE TRANSMISSION OF DIGITAL DATA WITH AT LEAST TWO LEVELS OF PROTECTION AND CORRESPONDING RECEPTION DEVICE

Roselyne Halbert-Lassalle; Jean-Francois Helard, and Bernard Le Floch, all of Rennes, France, assignors to Etat Francais and Telediffusion de France, France

Filed Mar. 19, 1991, Ser. No. 671,483
Claims priority, application France, Mar. 23, 1990, 90 03927
Int. Cl.[5] H04J *9/00*
U.S. Cl. 370—11 14 Claims



1. A device for transmission of digital data in the form of a series of data elements, said device comprising:

distributing means for distributing said data elements into at least two sets of data elements, a first of the sets of data elements requiring a first level of protection and at least one second set of data elements requiring a second level of protection;

at least two distinct modulation means, each modulation means being coupled to the distributing means to receive only one of the sets of data elements, each modulation means using a distinct type of modulation employing a different modulation alphabet made of modulation symbols to supply a series of modulation symbols corresponding to the set of data elements being selectively fed to each modulation means;

at least two distinct interleaving means coupled to the modulation means, each interleaving means being supplied a plurality of orthogonal frequency carriers, each of the frequency carriers being allocated with a distinct succession of modulation symbols picked out of one of said series of modulation symbols, for interleaving in both time and frequency all of said modulation symbols in each of said series to form interleaved signals wherein no two successive modulation symbols of any series of modulation symbols is associated with the same frequency carrier; and

processing means coupled to all of the interleaving means for processing the interleaved signals to form an output signal suitable for transmission incorporating said sets of data elements in a form including differing levels of protection.

5,197,062

METHOD AND SYSTEM FOR SIMULTANEOUS ANALYSIS OF MULTIPLEXED CHANNELS

David D. Pickleseimer, 78 Annin Rd., West Caldwell, N.J. 07006

Filed Sep. 4, 1991, Ser. No. 755,037
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—13 36 Claims

20. A system for producing generated time division multiplexed (TDM) test data independently for multiple channels simultaneously having:

1) means for producing generated test data which, when controlled by a means for generating state machine control signals, produces said generated TDM test data as an output;

2) means for generating a position address corresponding to each bit in said generated TDM test data;

3) means for storing contents of said means for producing generated test data for each of said channels and later recalling said contents, connected to said means for producing generated test data;

4) means for generating a shuffle address based on said position address, connected to said means for storing for addressing said means for storing;

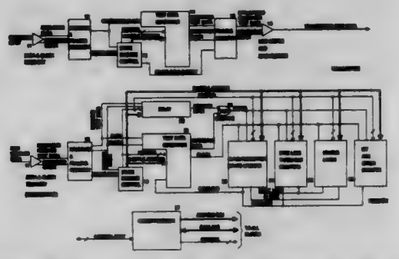
5) means for generating state machine control signals addressed by said position address for: controlling said means for generating a shuffle address, controlling said means for generating a position address and controlling transferring of contents of said means for producing generated test data between said means for storing and said means for producing generated test data, said means for generating state machine control connected to said means for generating a position address, said means for generating a shuffle address, said means for storing and said means for producing generated test data;

6) means for generating a TDM bit rate clock connected to said means for generating a position address, said means for producing generated test data and said shuffle address generating means.

28. A system for synchronizing to and testing time division multiplexed (TDM) test data independently for multiple channels simultaneously having:

1) means for recovering a TDM bit rate clock and recovered test data from a TDM input signal to be tested;

2) means for recovering TDM structuring information from said recovered test data for synchronizing a position address to said recovered test data, connected to said means for recovering clock and data;



3) means for generating a position address synchronized to said TDM structuring information which corresponds to each bit in said recovered test data, connected to said means for recovering clock and data, and said means for recovering TDM structuring;

4) means for generating state machine control signals addressed by said position address for: controlling said means for generating a position address, controlling a means for generating a shuffle address, controlling transfer of contents of a means for producing reference data between a means for storing said contents of said means for producing reference data and said means for producing reference data, controlling transfer of contents of a means for accumulating results between a means for storing said contents of a means for accumulating results and said means for accumulating results, said means for generating state machine control connected to said means for generating a position address, said means for generating a shuffle address, said means for storing said contents of said means for producing reference data, said means for storing said contents of said means for accumulating results, said means for accumulating results, and, said means for producing reference data;

5) means for producing said reference data which, when controlled by said means for generating state machine control signals, produces said reference data, connected to said means for recovering clock and data;

6) means for analyzing said recovered test data by comparison to said reference data, said results from said analyzing being sent to said means for accumulating results, said means for analyzing being connected to said means for recovering clock and data, said means for producing reference data, and said means for accumulating results;

7) means for accumulating said results connected to said means for recovering clock and data;

8) means for storing contents of said means for producing reference data for each of said channels and later recalling said contents, connected to said means for producing reference data;

9) means for storing contents of said means for accumulating results for each of said channels and later recalling said contents, connected to said means for accumulating results;

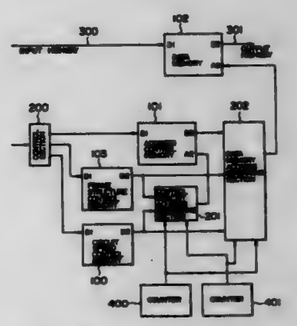
10) means for generating a shuffle address based on said position address, connected to said means for recovering clock and data, said means for storing contents of said means for producing reference data and said means for storing contents of said means for accumulating results for addressing said means for storing contents of said means for producing reference data and said means for storing contents of said means for accumulating results.

5,197,063

CIRCUIT SWITCHING METHOD AND APPARATUS FOR TIME DIVISION NETWORK WITH VARIOUS TRANSMISSION SPEEDS

Yukio Nakano, Hachioji; Tadayuki Kamae, Yokohama; Masahiro Takatori, Kokubunji, and Hiromi Ueda, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Jan. 16, 1991, Ser. No. 641,928
Claims priority, application Japan, Jan. 19, 1990, 2-008120
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—58.1 9 Claims



7. A circuit switching apparatus for time division multiplexed signals according to claim 6, wherein said data memory is a memory having an input port and an output port which are accessible independently of each other.

5,197,064

DISTRIBUTED MODULAR PACKET SWITCH EMPLOYING RECURSIVE PARTITIONING

Hung-Hsiang J. Chao, Lincroft, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 26, 1990, Ser. No. 618,119
Int. Cl.[5] H04L *12/56*
U.S. Cl. 370—60 4 Claims

1. A grouping network for a packet switch, said grouping network having N input lines and a plurality of output lines and responsive to incoming packets appearing on said input lines for routine packets from said input lines to one of said output

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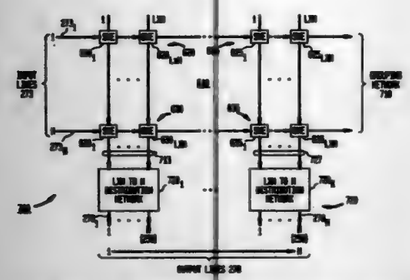
lines, wherein N is an integer value and said grouping network comprising:

K groups of shared output lines which collectively form said plurality of output lines, each of said groups having L×M shared output lines and a common destination address associated therewith, wherein K, L and M are pre-defined numerical values such that K=N/M and values of L and M are selected so as to provide a pre-determined packet loss probability for more than L×M simultaneously occurring packets being applied over said N lines for routing to any one of said K groups; and

means for logically connecting said N input lines to all of said K groups of output lines, said logically connecting means comprising K substantially identical means, each of which is responsive to the incoming packets appearing on said N input lines, for providing a corresponding group of said L×M shared output lines and for routing packets appearing on said N input lines and having an address which matches the address associated with said corresponding group of output lines to output lines in said corresponding group of output lines; and

each one of said providing and routing means comprising a matrix of N rows by L×M columns of substantially identical switching elements so as to form a plurality of matrices of said switching elements in said grouping network, each one of said matrices being responsive to the incoming packets appearing on said N input lines and connected to



all of said L×M output lines in an associated one of said groups, for filtering packets addressed to the associated group from said incoming packets appearing on said N input lines so as to provide filtered packets and for routing the filtered packets to individual ones of the L×M output lines in said associated group of shared output lines;

each individual one of said switching elements in each one of said matrices being connected to horizontally and vertically adjacent ones of said individual switching elements so as to form rows and columns of daisy-chained switching elements in said one matrix; and

wherein said grouping network further comprises a separate delay element, associated with each one of said rows of switching elements in each one of said matrices, for delaying timing signals applied thereto so as to form delayed timing signals and for providing the delayed timing signals to a first one of the switching elements in each one of said rows, and wherein each of said switching elements in each one of said rows further comprise means for applying delayed timing signals to a next successive one of the switching elements in said one row so as to apply timing signals on a daisy-chained basis throughout each one of said rows and wherein each of said delay elements applies delayed timing signals as input to a delay element associated with a next successive one of said rows so as to inter-connect all delay elements associated with each matrix of switching elements in said grouping network on a daisy-chained basis.

5,197,065

DISTRIBUTION MECHANISM FOR ESTABLISHING COMMUNICATIONS BETWEEN USER INTERFACES OF A COMMUNICATION SYSTEM

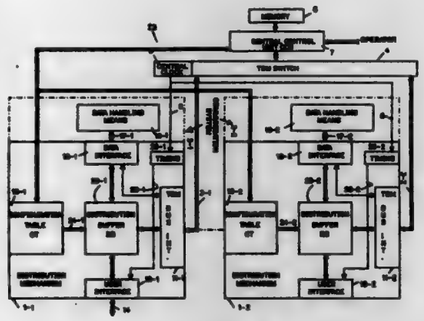
Jean Calvignac; Jacques Ferraud, both of La Gaude; Jean-Pierre Lips, Cagnes-sur-Mer; Bernard Naudin, St. Laurent du Var, and Eric Saint-George, La Gaude, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 4, 1990, Ser. No. 576,876

Claims priority, application European Pat. Off., Sep. 26, 1989, 89480154.7

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—79 12 Claims



10. A distribution device comprising:

a scheduling means which subdivides a common timing signal with a period T into n slots of subtiming period t;

a configuration table having n addressable locations with each of the n addressable locations being operable to store communication control information and addressable by slot numbers generated by the scheduling means; and

a distribution buffer means with n addressable locations addressed by control information provided by the configuration table during each slot period to cause an interface to write the information to be transmitted in a location of said distribution buffer means or the information to be received by said interface to be read from another location of said distribution buffer means.

5,197,066

COLLISION DETECTION CIRCUIT FOR COMMUNICATIONS NETWORK

Philip H. Sutterlin, 1103 Happy Valley Ave., San Jose, Calif. 95129

Filed Mar. 28, 1991, Ser. No. 678,524

Int. Cl.[5] H04J *3/02*

U.S. Cl. 370—85.3 23 Claims

1. In a data communication system facilitating communication among a plurality of nodes distributed along a common network, said common network employing a type of shared media access protocol, a circuit for detecting a collision on said common network between first and second message packets sent by respective first and second transmitting nodes, said circuit comprising:

means for directionally coupling said first node to said common network, said coupling means discriminating between the outgoing power associated with said first message packet and the incoming power associated with said second message packet;

sensing means for sensing a signal at a collision detection port of said directional coupling means during the transmission of said first message packet, said signal being produced by said incoming power and indicating that said collision is occurring.

5,197,067

PACKET COMMUNICATION SYSTEM USING A TELEPHONE SWITCHING NETWORK AND A DATA FLOW CONTROL METHOD

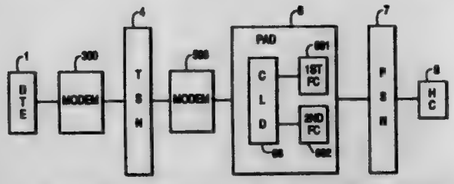
Akio Fujimoto, Yokohama, and Nobuo Shirai, Hino, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 584,147, Sep. 18, 1990, abandoned. This application May 4, 1992, Ser. No. 879,457

Claims priority, application Japan, Sep. 18, 1989, 1-241439

Int. Cl.[5] H04L *12/56*

U.S. Cl. 370—94.1 13 Claims



1. A packet communication system including a packet switching network and a telephone switching network operatively connected to each other, for performing data communication between data communication equipment connected to the packet switching network having a function of correcting errors, and data terminal equipment connected to the packet switching network having no function of correcting errors, and transmitting data between data communication equipment connected to a packet switching network in which data flow is controlled by "0" and "1" signals and connected to a packet switching network in which data flow is controlled by specific control word signals, said packet communication system comprising:

a communication line connecting the data terminal equipment and the packet switching network through the telephone switching network;

a first modulator and demodulator, first MODEM, provided on said communication line and connected to the data terminal equipment;

a first connecting line provided on said communication line, for connecting said first MODEM to the telephone switching network;

a second modulator and demodulator, second MODEM, provided on said communication line and connected to the packet switching network;

a second connecting line provided on said communication line, for connecting said second MODEM to the telephone switching network; and

a packet assembly and disassembly equipment, PAD, provided on said communication line and in the packet switching network and connected to said second MODEM, said PAD comprising:

a PAD buffer memory for storing data sent from the data terminal equipment for assembling the data in a packet in the packet switching network and for storing data obtained by dissembling packet data sent from the packet switching network;

a plurality of control means for performing data flow control through said communication line in response to a plurality of control procedures; and

selecting means for selecting one of said control means in accordance with whether a designated response signal is transferred through said communication line, said designated response signal being a signal teaching that designated data flow control is performed on said communication line independently from the data flow control performed by said plurality of control means.

5,197,068

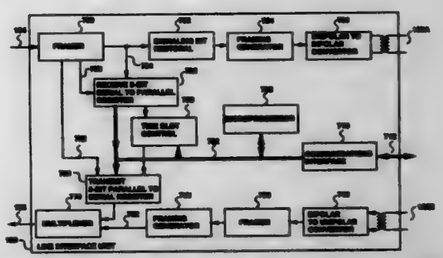
INTRA CHANNEL BANK COMMUNICATION PROTOCOLS BETWEEN CHANNELS AND THE LINE INTERFACE UNIT OF A TELEPHONE SYSTEM

David L. Holien, Parker; Joseph M. Elder, Boulder, and David J. Farrell, Lafayette, all of Colo., assignors to XEL Communications, Inc., Aurora, Colo.

Filed Aug. 23, 1990, Ser. No. 574,440

Int. Cl.[5] H04J *3/12*

U.S. Cl. 370—110.4 12 Claims



1. A method of communicating data from a line interface unit to an identified channel unit in a channel bank containing a plurality of channel units over the receive PCM communications bus carrying PCM voice data in time slots, said method comprising the steps of:

increasing the bandwidth of only the voice data region in the time slot corresponding to the identified channel unit,

superposing the data in the time slot with the PCM voice data without interfering with the voice data, and

delivering the time slot having the increased bandwidth and containing the superposed data with the PCM voice data to the identified channel unit.

5,197,069

METHOD AND SYSTEM FOR DETECTING AND RECOVERING FROM SWITCHING ERRORS

Thomas E. Cook, Hyde Park; Mark J. Fontecone, Wappingers Falls; Iwao Hatanaka, Poughkeepsie, and Harry M. Yudenfriend, Wappingers Falls, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 434,456, Oct. 20, 1989, Pat. No. 5,107,496. This application Dec. 9, 1991, Ser. No. 805,263

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—7 7 Claims

1. In a data processing system having a host system with attached peripheral subsystems including a plurality of addressable devices, a switching error handling mechanism comprising:

A) configuration definition means for uniquely defining said addressable devices and paths thereto, said configuration definition means comprising configuration data;

B) reset event trigger means for causing a reset event on the occurrence of a switching action affecting one of said addressable devices;

C) reset event processing means for performing data integrity error recovery on detection of said reset event, said reset event processing means comprising:

i) read configuration data means for reading said configu-

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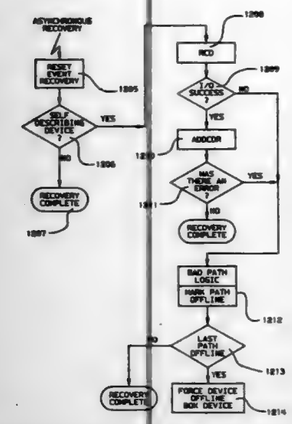
ration data associated with said one of said addressable devices, and



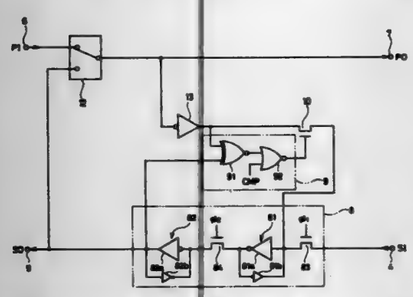
ii) recovery action means for preventing loss of data integrity if said configuration data does not match a prior version of said configuration data.

5,197,070

SCAN REGISTER AND TESTING CIRCUIT USING THE SAME

Hideshi Maeno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 588,877
Claims priority, application Japan, Sep. 29, 1989, 1-255924
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.3 **22 Claims**



11. A testing circuit comprising a plurality of scan registers individually provided between each of parallel outputs of a first semiconductor device and each of parallel inputs of a second semiconductor device,

said scan register comprising:

register means for holding expected value data for testing said first semiconductor device or test data to be supplied to said second semiconductor device;

selector means for selecting either the data held by said register means and corresponding output data of said first semiconductor device and outputting the same to said second semiconductor device;

determination mean for comparing the data held by said register means and the output data of said first semiconductor device supplied through said selector means and determining whether their logical values coincide with each other;

inverting means for inverting the logical value of the data held by said register means in response to the determination output of said determination means; and wherein

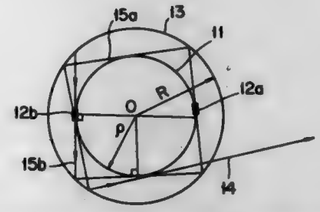
said register means is connected in series with a register means provided in a respective adjacent scan register.

5,197,071

PHOTON STORAGE RING

Hironari Yamada, Tokyo, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP89/00271, § 371 Date Aug. 8, 1990, § 102(e) Date Aug. 8, 1990, PCT Pub. No. WO90/07856, PCT Pub. Date Jul. 12, 1990
PCT Filed Mar. 14, 1989, Ser. No. 555,473
Claims priority, application Japan, Dec. 23, 1988, 63-323716; Mar. 13, 1989, 1-60479
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—2 **13 Claims**



1. A synchrotron radiation light source for use in an apparatus for generating synchrotron radiation light by making charged particles move along an orbit of a predetermined curvature at a speed close to a light velocity within a hollow space, said synchrotron radiation light being generated in a tangential direction of said orbit, said synchrotron light source comprising:

reflection means, at least partly surrounding said orbit in said hollow space, for reflecting said synchrotron radiation light within said hollow space; and

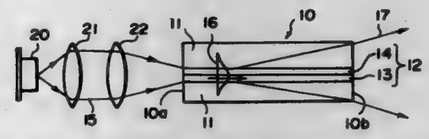
output means for guiding said synchrotron radiation light outside of said hollow space after being reflected.

5,197,072

OPTICAL WAVELENGTH CONVERTING DEVICE, AND LASER DIODE PUMPED SOLID LASER

Akinori Harada; Nobuharu Nozaki; Yoji Okazaki, and Horoaki Hyuga, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1991, Ser. No. 714,530
Claims priority, application Japan, Jun. 13, 1990, 2-154475; Aug. 6, 1990, 2-208744
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—21 **10 Claims**



1. An optical wavelength converting device, which comprises an optical waveguide device provided with:

i) a waveguide means, which is constituted of a solid laser medium doped with a rare earth metal and a nonlinear optical material for converting a wavelength, said solid laser medium and said nonlinear optical material being overlaid one upon the other, and

ii) a cladding means, which is formed of a material having a lower refractive index than said waveguide means and which accommodates said waveguide means therein,

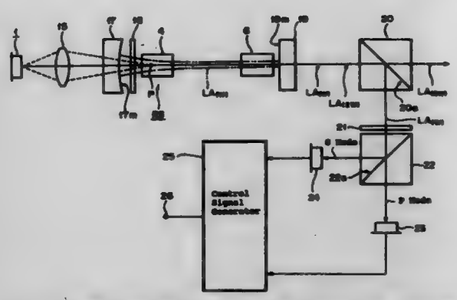
wherein two edge faces of said optical waveguide device serve as a resonator for a laser beam, which has been produced by said solid laser medium.

5,197,073

SOLID-STATE LASER IN WHICH THE TWO POLARIZATION MODES OF THE FUNDAMENTAL WAVE LASER BEAM OSCILLATE IN A SINGLE LONGITUDINAL MODE

Michio Oka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,506
Claims priority, application Japan, May 16, 1990, 2-125854
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—22 **11 Claims**



1. In a solid state laser apparatus in which a fundamental wave laser beam generated in a laser medium is resonated and passes through a nonlinear optical crystal element provided within a resonator to thereby generate a secondary harmonic laser beam and in which first optical means is provided in said resonator for suppressing a coupling caused by a sum-frequency generation between two polarization modes of said fundamental wave laser beam, the improvement comprising:

second optical means for causing said two polarization modes of said fundamental wave laser beam to respectively oscillate in a single longitudinal mode; and

control means for controlling an effective resonator length of said resonator, whereby said two polarization modes of said fundamental wave laser beam have the same oscillation intensity.

5,197,074

MULTI-FUNCTION INTRA-RESONATOR LOSS MODULATOR AND METHOD OF OPERATING SAME

Donald R. Emmons, Jr.; Curtis J. Gouverneur, and Terri J. Irland, all of Beaverton, Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Dec. 26, 1991, Ser. No. 814,420
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—26 **20 Claims**

1. A laser system for generating laser output for impingement upon a target, comprising:

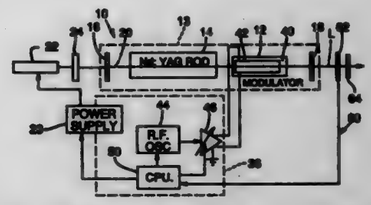
light-amplifying and optical media positioned within a laser resonator;

pumping means for pumping the light-amplifying medium to generate energy build-up within the light-amplifying medium;

modulator means including a transducer and the optical medium interacting with the light-amplifying medium to provide a first state in which no laser output takes place and to provide a second state in which laser output takes place such that it has selectable amplitude within a relatively wide amplitude range and has selectable duration within a relatively wide duration range; and

modulator control means operatively associated with the modulator means for providing a first signal characterized by a predetermined parameter to switch the modulator means to the first state and thereby prevent laser output and for changing the first signal to a second signal characterized by a selectable parameter to switch the modulator means to the second state so that the modulator means produces a laser output having preserved mode quality, waist position, and divergence, and an amplitude that is responsive to the parameter of the second signal.

11. A method for operating a laser having a light-amplifying medium and an optical modulator positioned within a laser resonator to generate laser output having selectable amplitude and duration comprising:



pumping the light-amplifying medium to generate energy build-up within the medium;

providing a first signal characterized by a predetermined parameter to a transducer of the modulator to switch the modulator to a first state and thereby prevent laser output;

changing the first signal to a second signal characterized by a selectable parameter to switch the modulator to a second state to generate laser output having good mode quality, waist position, and divergence; and

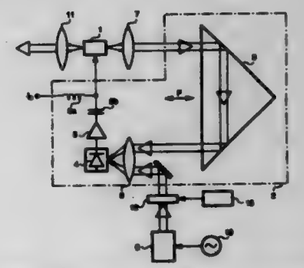
selecting the parameter characterizing the second signal substantially to determine the amplitude of laser output from a relatively wide amplitude range such that the mode quality, waist position, and divergence of the laser output is substantially preserved independent of the output amplitude selected.

5,197,075

APPARATUS AND METHOD FOR THE GENERATION OF MODULATED OPTICAL SIGNALS USING A SEMICONDUCTOR LASER

Fortunato T. Arecchi; Massimo Calzavara, Turai, and Giovanni Giacomelli, Florenca, all of Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 10, 1991, Ser. No. 805,863
Claims priority, application Italy, Dec. 21, 1990, 68036 A/90
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—28 **12 Claims**



1. A method of generating amplitude-modulated optical signals, comprising the steps of:

(a) superimposing upon a bias current of a semiconductor laser variations of an electrical signal obtained by combining and converting into electrical form a fraction of an output signal of the laser; and

(b) delaying said electrical signal with respect to said output signal in an opto-electronic feedback circuit having a presettable delay (τ) and a presettable low frequency gain (b) lower than but close to a critical value (Bc), and an optical signal amplitude modulated at a first modulation frequency (f2), said frequency belonging to a discrete set of frequencies at which the intensity of the beam outgoing from the laser can be modulated owing to the presence of the feedback circuit and being the modulation frequency of said intensity when the variations of an electrical signal obtained by conversion of the only feedback signal are superimposed to the bias current and the low-frequency gain is higher than the critical value.

5,197,076

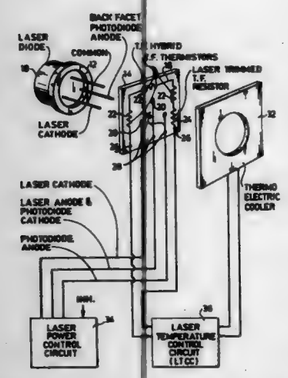
TEMPERATURE STABILIZABLE LASER APPARATUS

James G. Davis, 259 Sherwood Ave., Rochester, N.Y. 14619; Gregory N. Heller, 212 Buttonwood Dr., Hilton, N.Y. 14468, and Mark D. Bedzyk, 124 Rye Rd., Rochester, N.Y. 14626

Filed Nov. 15, 1991, Ser. No. 792,844

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—34 **17 Claims**



1. Temperature stabilizable laser apparatus which comprises a housing, an electrically driven laser device in said housing, a thick film hybrid circuit having a substrate of thermally conductive and electrically insulating material, said substrate having opposite sides with a plurality of conductive paths, ends of said paths defining a plurality of terminals of said hybrid circuit, said hybrid circuit being in thermal contact with said housing and sections of said plurality of paths being in electrical contact with said laser, others of said plurality of paths extending in a circuit distributed about said substrate, said distributed circuit containing temperature sensitive material extending along different areas of said substrate which are spaced from each other, and a thermo-electric cooler having opposite sides, one of which is disposed in contact with said substrate over the areas along which said temperature sensitive material is distributed.

5,197,077

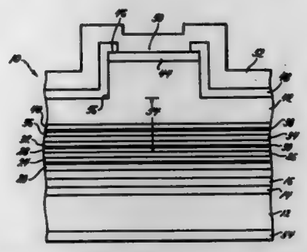
LOW DIVERGENCE LASER

Charlton M. Harding, Lake Peekskill; Ying-Chih Chen, Scarsdale; Richard J. Dalby, Peekskill, and Robert G. Waters, Highland Falls, all of N.Y., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 28, 1992, Ser. No. 843,018

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **10 Claims**



1. A semiconductor laser diode, comprising:

(a) a semiconductor substrate;

(b) a plurality of semiconductor layers, positioned upon said semiconductor substrate, comprising:

(1) a center quantum well for propagating optical signals along an axis of propagation, said center quantum well having a PN junction proximate thereto;

(2) first and second quantum wells symmetrically disposed about said center quantum well for propagating optical signals along an axis of propagation; and

(3) a plurality of semiconductor layers having a graded index of refraction, said graded index layers disposed adjacent to each of said quantum wells such that the propagating optical signals within each of said quantum wells are confined in a direction transverse to said axes of propagation;

(c) a ridge structure formed upon said plurality of semiconductor layers for providing confinement to said propagating optical signals in a direction lateral to said axes of propagation, said ridge structure having an upper mesa and a base; and

(d) a means for supplying electrical current between said upper mesa of said ridge structure and said substrate such that optical signals will be propagated within each of said quantum wells; wherein the transverse distance between said PN junction and said base of said ridge structure is sufficient to allow significant spreading of said electrical current.

5,197,078

GAS LASER APPARATUS

Mitsugu Terada; Ken Ohmata; Michito Uehara; Hideaki Shibata; Yasuo Ooda, and Yuichiro Terashi, all of Sodegaura, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,498

Claims priority, application Japan, Jun. 1, 1990, 2-143447; Jul. 20, 1990, 2-192156

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—55 **7 Claims**

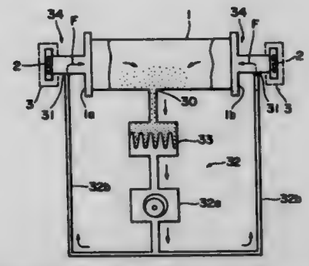
1. A gas laser apparatus comprising:

a hollow laser chamber body having a first open end and a second open end and a central portion connecting said first open end and said second open end, said hollow laser chamber body being receivable of a gaseous medium;

first closure means for hermetically sealing said first open end, said first closure means including a first laser window means for allowing a laser beam to pass through said first closure means;

second closure means for hermetically sealing said second open end, said second closure means including a second laser window means for allowing a laser beam to pass through said second closure means;

gas circulation means, operatively connected to said hollow laser chamber body, said first closure means and said second closure means, for removing a gas from said central portion of said hollow laser chamber body and returning said gas to said hollow laser chamber body proximate said first open end and proximate said second open end, said gas circulation means including filter means for removing particulate solids from said gas withdrawn from said central portion of said hollow laser chamber.



5,197,079

HIGH-POWER STRIPLINE LASER

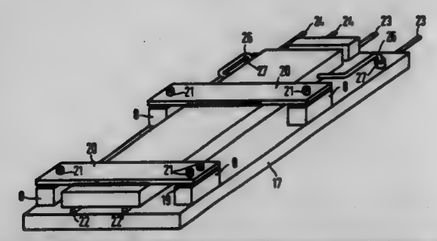
Hans Krueger, Munich, and Walter Kirschner, Unterfoehring, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 26, 1991, Ser. No. 749,692

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1990, 4030441

Int. Cl.[5] H01S *3/097*

U.S. Cl. 372—87 **13 Claims**



1. A high-power stripline laser having two metal electrodes between which a discharge gap is formed, the electrodes having waveguide surfaces facing toward the discharge gap, and resonator mirrors of an unstable resonator immediately adjoining one electrode of the two metal electrodes, comprising: the two electrodes forming an electrode assembly; and means for adjusting the position of the electrode assembly in a longitudinal direction and in a transverse direction of the discharge gap and for setting the position to a desired value.

5,197,080

END CAP FOR COOLING COILS FOR AN ARC FURNACE

Eric N. Johnson, Clinton; Roger E. Johnson, Comanche, and Craig S. Johnson, Clinton, all of Iowa, assignors to J. T. Cullen Co., Inc., Fulton, Ill.

Filed Jul. 22, 1991, Ser. No. 733,431

Int. Cl.[5] F27D *15/02*

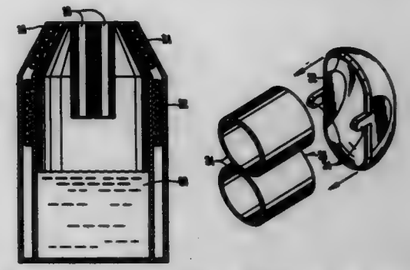
U.S. Cl. 373—76 **20 Claims**

1. In an electric arc furnace having a cooling system with a plurality of pipes through which a liquid coolant flows, an improved end cap for closing the open ends of adjacent pipes, the end cap comprising:

opposite side walls;

a curved end portion interconnecting the side walls;

a perimeter edge defined by the side walls and end portion; and



a pair of tabs extending from the perimeter edge adjacent each side wall so as to extend along opposite sides of the pipes and partially fill a crevice between the adjacent pipes.

5,197,081

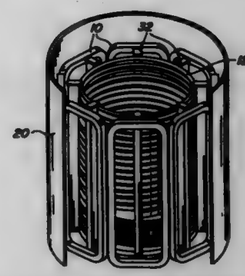
MAGNETIC RETURN APPARATUS FOR CORELESS INDUCTION FURNACES

Oleg Fishman, Maple Glen, Pa., assignor to Inductotherm Corp., Rancocas, N.J.

Filed May 24, 1990, Ser. No. 528,663

Int. Cl.[5] H05B *6/22*

U.S. Cl. 373—152 **10 Claims**



1. Apparatus for directing electromagnetic flux adjacent a generally cylindrical induction coil having a central axis, comprising a member in the shape of a closed loop, disposed entirely external to the circumference of said cylindrical induction coil, and adapted to conduct electromagnetic flux, the member extending along an axis parallel to the central axis of the induction coil and extending substantially the axial length of the coil.

5,197,082

DIGITAL SIGNAL REGENERATOR

Yoshihiro Uda, and Nobuaki Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed May 10, 1989, Ser. No. 349,641

Claims priority, application Japan, May 10, 1988, 63-112785

Int. Cl.[5] H04L *25/20*

U.S. Cl. 375—4 **5 Claims**

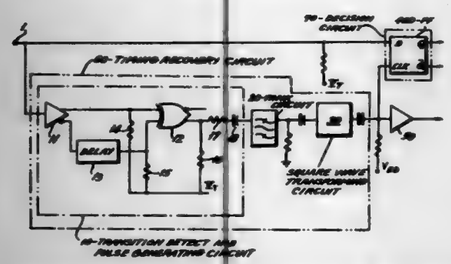
1. A digital signal regenerator responsive to a data bit stream having a predetermined bit rate for generating a retimed data bit stream, the digital signal regenerator comprising:

transition detect and pulse generating means responsive to the data bit stream for detecting transition positions be-

tween two different states of the data bit stream and for generating respective width-variable pulses at the transition position;

filtering means responsive to a sequence of said width variable pulses for extracting a timing wave from the data bit stream whose phase changes in response to the width of said width-variable pulses;

clock-pulse generating means responsive to the timing wave for generating a clock pulse sequence; and



discriminating means responsive to the clock pulse sequence for discriminating between levels "1" and "0" of the data bit sequence to generate the retimed data bit stream;

wherein an appropriate pulse width of said width-variable pulse is set by said transition detect and pulse generating means so that said discriminating means can discriminate between said levels at an appropriate timing.

5,197,083

MULTIMEDIA PROTOCOL INTERFACE FOR 64 KBIT/S DATA FLOW

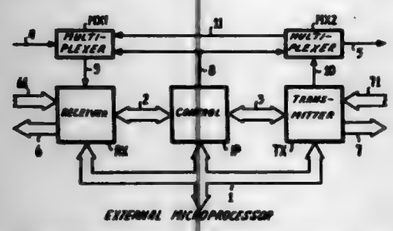
Marco Gandini, Turin; Giovanni Ghigo, Luserna San Giovanni, and Mauro Marchisio, Turin, all of, assignors to Sip-Societa' Italiana per l'Esercizio Delle Telecomunicazioni P.A., Turin, Italy

Filed Nov. 28, 1990, Ser. No. 619,307

Claims priority, application Italy, Nov. 30, 1989, 68058 A/89

Int. Cl.[5] H04B *3/46*

U.S. Cl. 375—10 **15 Claims**



1. A multimedia protocol interface for 64 kbit/s data flow organized according to the frame structure as defined in Rec. H221 of CCITT, and emitted and received according to standard 64 kbit/s protocol or according to 10M 256 kbit/s protocol, which is capable of operating autonomously or aided by an external microprocessor, comprising a receiver, a transmitter, a control block and means for the local test of the interface itself, and said receiver comprising:

a first block which generates internal timing signals relevant to a 64 kbit/s operating mode, on the basis of the clock and synchronism signals received with said data flow;

a second block which generates internal timing signals relevant to an operating mode according to the 256 kbit/s IOM protocol, on the basis of clock and synchronism signals received with said data flow;

a third block, consisting of a multiplexer, which selects a reception protocol forwarding timing signals supplied by the first block or by the second block;

a fourth block searching in the data flow a synchronism word for aligning a received octet, on the basis of clock signals received from the third block;

a fifth block which performs frame and multiframe alignment generating suitable signals and correction of errors of a word BAS;

a sixth block (RM), comprising a read only memory, which, on the basis of a possible erroneous word received from said fifth block, generates a signal on a position of possible bits of the word to be corrected or emits a signal indicating the impossibility of the correction owing to an excessive number of errors;

a seventh block for counting an octet number inside a submultiframe, and generating frame synchronism signals and generating "interrupt" signals relevant to the receiver and to the presence of errors in the receiver;

an eighth block implementing an error signalling protocol based on code CRC, received together with data from the fourth block, on the basis of timing signals received from the third block;

a ninth block converting into serial form data received from the fourth block;

said transmitter comprising:

a tenth block generating internal timing signals relevant to the 64 kbit/s operating mode, on the basis of clock and synchronism signals;

an eleventh block generating internal timing signals relevant to the operating mode according to 256 kbit/s 10M protocol, on the basis of clock and synchronism signals;

a twelfth block selecting a transmission protocol by forwarding timing signals supplied by the tenth block or eleventh block;

a thirteenth block, which counts an octet number inside a submultiframe, generates frame synchronism signals and generates interrupt signals;

a fourteenth block which implements an error signalling protocol calculating code CRC on data to be transmitted, on the basis of the timing signals received from the twelfth block;

a fifteenth block which converts into parallel form data of subchannels 1 to 7 received in serial or parallel form and data of subchannel 8;

a sixteenth block for mixing information relevant to CRC, FAS, BAS, and a channel AC received or generated to form a channel 8, on the basis of timing signals received from the thirteenth block;

a seventeenth block which converts data arriving from the fifteenth block and from the sixteenth block into serial form for the transmission;

said control block comprising:

an eighteenth block, generating address and control signals for internal registers on the basis of address and control signals supplied by said external microprocessor or on the basis of signals, non microprocessor-controlled, for the choice of the interface operation between autonomous operation or microprocessor-controlled operation, mixes interrupt signals of the receiver and and of the transmitter and sends them to the external microprocessor and renders available outside a few bits of protocol H221; and

a nineteenth block containing the data for tests, the type of test and the configuration relevant to the type of operation;

said means for the local test enabling connection of an output of the transmitter to an input of the receiver.

5,197,084

AUTOMATIC INFORMATION ACQUISITION SYSTEM

Thomas A. Fuhrman, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

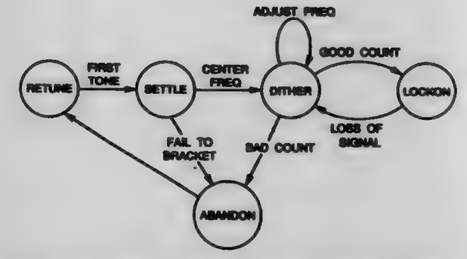
Filed Jan. 31, 1991, Ser. No. 648,247

Int. Cl.[5] H04L *27/14*

U.S. Cl. 375—88 **1 Claim**

MICROFICHE APPENDIX INCLUDED

(36 Microfiche, 36 Pages)



1. An information acquisition process of scanning a range of radio frequency signals to identify and store frequency shift key signals which are transmitted on a particular radio frequency signal, said information acquisition process comprising the steps of:

retuning an adjustable radio receiver incrementally within said range of radio frequency signals until a radio signal with a strong signal tone is located;

a first evaluation step in which said radio signal is measured to determine if it has any frequency shift key characteristics;

a first abandoning step in which said radio signal is abandoned and said retuning step is reachieved, said first abandoning step being performed only when said radio signal is determined not to have any frequency shift key characteristics in said first evaluation step;

a dither step in which said radio receiver marginally adjusts its frequency reception in order to maximize the signal tone of the radio signal, said dither step including a second evaluation step in which mark and space signal characteristics are counted in order to determine if there is a frequency shift key signal transmitted within the radio signal;

a lockon step in which said radio receiver is directed to terminate scanning and lock onto the radio signal, said lockon step being performed when said second evaluation step indicates that there is a frequency shift key signal transmitted in said radio signal; and

a second abandoning step in which said radio signal is abandoned and said retuning step is reachieved, said second abandoning step being performed only when said radio signal determined not to have frequency shift key characteristics in said second evaluation step.

5,197,085

RADIO RECEIVER

Gwilym F. Luff; John F. Wilson, and Richard J. Youell, all of Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1990, Ser. No. 545,303

Claims priority, application United Kingdom, Jun. 30, 1989, 8915063

Int. Cl.[5] H04L *27/14*

U.S. Cl. 375—88 **9 Claims**

1. A receiver for FSK signals, comprising:

means for receiving the FSK signals and producing quadrature related first and second frequency down-converted difference signals,

means for amplitude limiting each of the first and second difference signals to form respective first and second square wave signals,

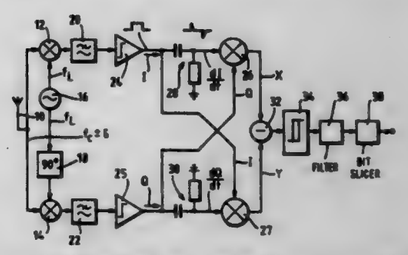
means for producing first and second pulse sequences corresponding respectively to successive changes in polarity of the first and second square wave signals, respectively,

means for combining said pulse sequences to form a combined signal, and

means for simulating an analog output representative of the FSK signal,

characterized in that said means for combining comprises:

means for multiplying the first square wave signal by pulses in the second pulse sequence to produce a first product signal,



means for multiplying the second square wave signal by pulses in the first pulse sequence to produce a second product signal, and

means for combining said first and second product signals; and

said means for simulating comprises memory means responsive to a change in polarity in the combined signal for producing a first substantially constant dc output until the next following change inpolarity is detected, and responsive to detection of said next following change inpolarity, producing a second substantially constant dc output.

5,197,086

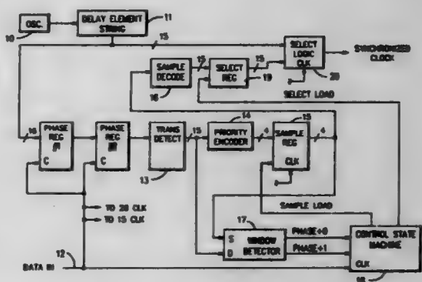
HIGH SPEED DIGITAL CLOCK SYNCHRONIZER

Frederick E. Jackson, Apalachin; Bernard J. Letner, Johnson City, and Nhiem T. Nguyen, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1990, Ser. No. 636,632

Int. Cl.[5] H03D *3/24*

U.S. Cl. 375—119 **9 Claims**



1. In a device for synchronizing a digital data signal with a local clock, the combination comprising

means for generating a family of delayed digital clock waveforms each clock waveform having a phase separated by a preselected delay time,

means responsive to a digital data signal for capturing the phases of said clock waveforms,

transition detection means for detecting transitions in said captured phases of said clock waveforms and providing as

VOL 1148 ISS 4 MR 23 1993 UMI

outputs bit patterns that correspond directly to phases of said clock waveforms which are in synch with said digital data signal,

selection means including storage means for storing a first bit pattern output from said transition detection means corresponding to a particular clock waveform which is in synch with said digital data signal,

window detecting means responsive to said storage means and said transition detection means for determining whether successive bit pattern outputs from said transition detection means are the same or different from said first bit pattern stored in said storage means, and

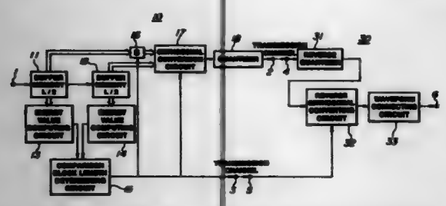
control means including first means responsive to said window detecting means and said digital data signal for first storing in said storage means a second bit pattern determined by said window detecting means to be different from said first bit pattern and second means operable for selecting the clock waveform corresponding to said second bit pattern for closing said digital data signal after said window detecting means determines that a predetermined plurality of consecutive bit patterns from said transition detection means correspond with said second bit pattern in said storage means.

5,197,087

SIGNAL ENCODING APPARATUS

Naoto Iwahashi; Masayuki Nishiguchi; Makoto Akune; Kenzo Akagiri, and Yoshihito Fujiwara, all of c/o Sony Corporation 7-35, Kitashinagawa 6-Chome, Shinagawa-Ku, Tokyo, Japan

Filed Jul. 18, 1990, Ser. No. 553,608
Claims priority, application Japan, Jul. 19, 1989, 1-186603
Int. Cl.[5] H04B *1/66*
U.S. Cl. 375—122 4 Claims



1. A signal encoding apparatus for efficient transmission of input signals, wherein the input signals are grouped as signal blocks at a predetermined time interval and the signals of each signal block are converted based on mutually independent conversion axes and subjected to encoding, said apparatus comprising:

computing means for computing values of a predetermined property of said input signals;

means for varying block time lengths of said input signals as a function of the computed values of said computing means;

storage means for storing the input signals in signal blocks of at least two different time lengths in response to said means for varying; and

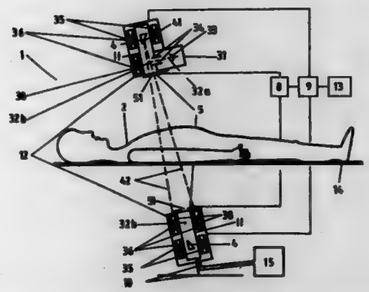
means for converting the signals in the form of the signal blocks of at least two different time lengths based on mutually independent conversion axes.

5,197,088

ELECTRON BEAM X-RAY COMPUTER TOMOGRAPHY SCANNER

Paul Vincent, Karlsruhe, and Günther Laukien, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Analytic, Fed. Rep. of Germany

Filed May 3, 1991, Ser. No. 695,578
Int. Cl.[5] H05G *1/60*
U.S. Cl. 378—10 16 Claims



1. An x-ray computer tomography system for generating an image of an object, the system comprising:

a stationary, planar anode ring positioned around the object, the anode ring having a radius;

an electron beam source for generating an electron beam, said electron beam source being constructed and arranged to generate the electron beam in a direction substantially perpendicular to the planar anode;

means for deflecting the electron beam into a path which is substantially parallel to the planar anode;

means for guiding the deflected electron beam in a circulating electron beam path, the path lying in a plane substantially parallel to the anode ring plane and having a radius less than the anode ring radius;

means for deflecting electrons out of the circular path so that the deflected electrons strike the anode to generate x-ray radiation;

means for detecting the x-ray radiation which has passed through the object; and

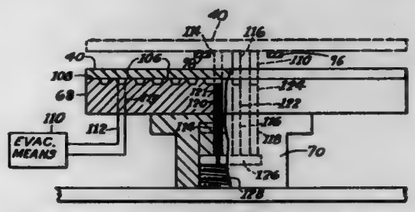
means responsive to the detected x-ray radiation for generating the image.

5,197,089

PIN CHUCK FOR LITHOGRAPHY SYSTEM

David G. Baker, Shrewsbury, Mass., assignor to Hampshire Instruments, Inc., Rochester, N.Y.

Filed May 21, 1990, Ser. No. 526,565
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—34 15 Claims



1. In a lithography system, an apparatus for holding and transporting a wafer shaped device comprising:

a platform sized and shaped to receive and hold said wafer shaped device;

at least three posts, the ends of which are selectively movable between a home position within said platform and an extended position above said platform; and

a radially, rotationally and vertically movable arm having a pair of spaced apart fingers at an end thereof, said fingers being spaced by a sufficient amount to fit around said posts when said posts are in said extended position, said arm being operated to support a wafer shaped device being transported from beneath, to place said wafer shaped device on said extended posts, and to remove said wafer shaped device from said extended posts;

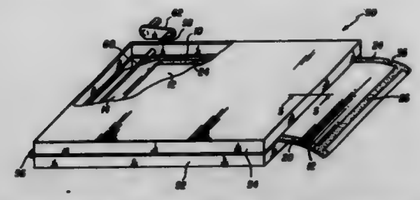
said posts being movable to lower a wafer shaped device placed thereon to a position to be held by said platform and to raise such wafer shaped device to permit its removal by said arm.

5,197,090

FILM PACKAGE HAVING A POUCH AND LEADER WITH DIFFERENT COEFFICIENTS OF FRICTION

Matthew DiPietro, Webster; Thomas J. Kausch, and Vincent B. Dethler, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 6, 1991, Ser. No. 802,964
Int. Cl.[5] G03B *42/02*
U.S. Cl. 378—174 6 Claims



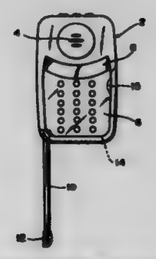
1. In a package for a stack of film sheets, such as a stack of x-ray film sheets, the package having a pouch enclosing the stack of sheets, and a leader secured to the pouch, the leader being engageable with a mechanism for removing the pouch from the stack of sheets by pulling the leader away from the stack, the improvement wherein the pouch comprises a material having a low coefficient of friction to enable the pouch to be pulled from around the stack of sheets, and wherein the leader comprises a material different from the pouch and having a higher coefficient of friction than the pouch.

5,197,091

PORTABLE TELEPHONE HAVING A PIPE MEMBER WHICH SUPPORTS A MICROPHONE

Hisamitsu Takagi, Inagi; Masashi Tomura, Tokyo; Akihide Nishiyama, Yokohama; Hideharu Suzuki, Kawasaki, and Yukio Murayama, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 19, 1990, Ser. No. 615,402
Claims priority, application Japan, Nov. 20, 1989, 1-299711
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—58 14 Claims



1. A portable telephone including a power source, a transmission/reception circuit, a speaker, and an antenna matching circuit, said portable telephone comprising:

a main body;

a pipe member formed of metallic material slidably attached to said main body;

a slide groove formed in said body for slidably receiving said pipe member whereby said pipe member may be retracted into said groove during non-use of the telephone and extended outwardly from said groove during use of the telephone;

a microphone attached to an end portion of said pipe member;

first connection means for connecting said microphone, when said pipe member is pulled out of said main body, with said transmission/reception circuit;

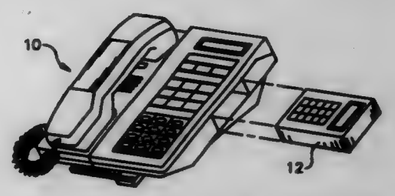
second connection means for connecting said pipe member with said antenna matching circuit; and said second connection means including a terminal block on a base end of said pipe member which contacts an elongated antenna element on one wall of said groove.

5,197,092

LOCATION REGISTRATION SYSTEM FOR A PERSONAL COMMUNICATOR SUCH AS A CELLULAR TELEPHONE

Michael D. Bamburak, Columbia, Md., assignor to McCaw Cellular Communications, Inc., Kirkland, Wash.

Filed Oct. 31, 1990, Ser. No. 606,523
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—59 11 Claims



1. A location registration system for personal communicators within a personal communications network, comprising:

a personal communicator unit, which is part of a personal communications network, the personal communicator unit being capable of direct, two-way communication with the personal communications network and with other personal communicator units within the personal communications network via said network, the personal communications network having the capability of maintaining a call forwarding number for the personal communicator, wherein the personal communicator includes information for contact with the personal communications network;

at least one receiving station positioned at a selected location, for receiving the personal communicator, wherein the receiving station includes a particular call forwarding number associated therewith;

means in the personal communicator and the receiving station for two-way communication with each other; and

means for automatically communicating the particular call forwarding number to the personal communications network which will in operation maintain the particular call forwarding number for communication with said personal communicator, in response to said personal communicator being operatively positioned in said receiving station.

5,197,093

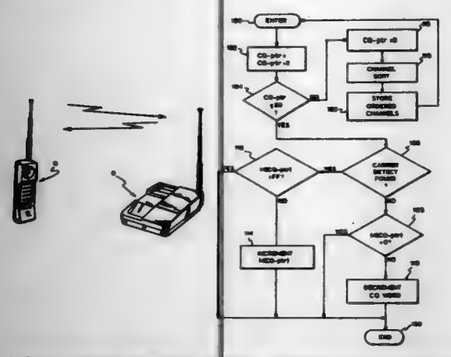
ENVIROMENTAL ADAPTIVE MECHANISM FOR CHANNEL UTILIZATION IN CORDLESS TELEPHONES

Stephen B. Knuth, Mission Viejo; Oded Yossifor, Torrance, and Kenneth R. Core, Cypress, all of Calif., assignors to Phone-Mate, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 508,663, Apr. 13, 1990, abandoned. This application Apr. 12, 1991, Ser. No. 686,018

Int. Cl.[5] H04M *11/00*; H04Q *7/00*; H04B *00/00*

U.S. Cl. 379—61 10 Claims



1. In a cordless telephone having a handset and a base unit, said cordless telephone having multiple channels of reception and transmission, sampling means for sampling the presence of interference from other electromagnetic sources during the standby mode of operation, and channel selection means including storage means for storing an ordered list representing interference associated with each of said channels, the method of selecting a relatively interference-free channel comprising the steps of:

repeatedly sampling each of the channels;

storing the number of occurrences of interference associated with each of said channels when sampled and assigning to said channel of cumulative value associated with the likelihood of interference being found on said channel; and

selecting a channel for receiving or transmitting most likely to not have interference on said selected channel based on said assigned cumulative values.

5,197,094

SYSTEM FOR REMOTELY CREDITING AND BILLING USAGE OF ELECTRONIC ENTERTAINMENT MACHINES

Michael L. Tillery; Eugene G. Harlan; John Martin; Samuel N. Zammuto, and Marcio Bonilla, all of Rockford, Ill., assignors to Arachnid, Inc., Rockford, Ill.

Filed Jun. 15, 1990, Ser. No. 538,837

Int. Cl.[5] H04M *11/00*; G06F *15/28*

U.S. Cl. 379—91 17 Claims

1. An apparatus for remotely crediting and billing usage of electronic entertainment machines in establishments at different locations, which comprises:

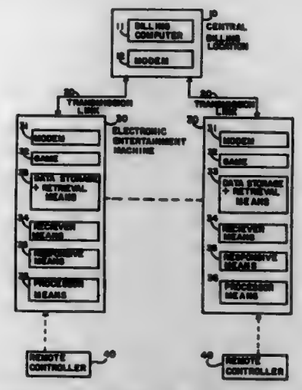
an electronic game located within an electronic entertainment machine;

means for processing located inside the electronic entertainment machine which controls the electronic entertainment machine;

a modem located inside the electronic entertainment machine which enables communication over a transmission link;

means for storing and retrieving data located inside the electronic entertainment machine which stores and retrieves data regarding a number of credits awarded to the electronic game;

a billing computer including a modem at a central billing location, wherein the billing computer polls each electronic entertainment machine via the transmission link to request transmission of the credit data, and after receiving the credit data the billing computer calculates a game usage bill for each establishment based on the credit data



for respective usage of the electronic game as determined by the number of credits awarded thereto; and

wherein the electronic entertainment machine is deactivated if the processor means does not receive a reactivation code via the transmission link during a designated period of time.

5,197,095

SYSTEM FOR REMOTE TRANSFER AND COLLECTION OF DATA, IN PARTICULAR FROM METERS

Jean-Loup Bonnet, Paris; Yves Jurado, Vanves, both of France, and Holger Korner, Oldenburg, Fed. Rep. of Germany, assignors to Schlumberger Industries, Montrouge, France

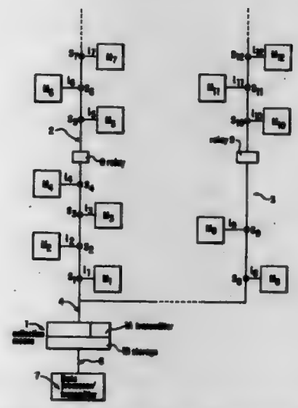
PCT No. PCT/FR89/00529, § 371 Date Apr. 12, 1991, § 102(e) Date Apr. 12, 1991, PCT Pub. No. WO90/04315, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 13, 1989, Ser. No. 678,283

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835145; France, Nov. 24, 1988, 88 15317

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—107 4 Claims



1. A system for remote transfer and collection of data such as quantity of energy or fluid measured by meters, each meter including a data storage and transmission unit, said system comprising:

collection means collected to a common wire connection; and

normally open addressable switch members disposed between said common wire connection and each of said meters, each said switch member including means responsive to a unique interrogation signal sent by the collection means over said common wire connection for closing said switch member and thereby enabling a stream of data to pass from a data transmission unit associated with a meter to said collection means; and

wherein each data storage unit contains data relating to the identity of its associated meter, which data is independent of the address of the associated switch member which address corresponds to the physical address of the switch member, wherein each corresponding data transmission unit includes means for transmitting data indicative of the identity of the meter to said collection means when interrogated.

5,197,096

SWITCHING METHOD AND APPARATUS HAVING SUBSCRIBER STATE MANAGEMENT FUNCTION

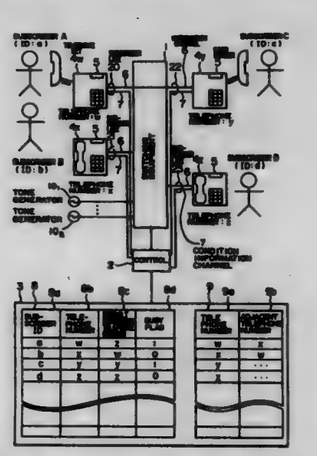
Tetsuo Sakuma, Sagamihara; Noboru Mizuhara, Kawasaki; Tomoaki Tsunoda, Sagamihara, and Junko Yamaguchi, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 540,178

Claims priority, application Japan, Jan. 23, 1989, 1-162269

Int. Cl.[5] H04M *3/42*

U.S. Cl. 379—211 8 Claims



1. A switching system having a subscriber state management function according to which when a calling subscriber inputs an identification (ID) number of a called subscriber to a terminal at the time of making a call, said terminal transmits the ID number of said called subscriber to switching equipment so that said switching equipment receives said ID number and connects between the calling terminal and the called terminal, said switching equipment including:

a subscriber control table having columns for registering a subscriber ID number, a telephone number of a terminal corresponding to said subscriber ID number, a default telephone number which has been registered in advance by a subscriber having said ID number and a busy flag for indicating whether the subscriber having said ID number himself or herself is busy;

means for changing a registration state corresponding to an ID number of said calling subscriber in said subscriber control table from an idle state to a busy state after said calling subscriber has inputted the ID number of the called subscriber together with the ID number of the calling subscriber himself or herself to a terminal and managing the idle and busy states of the subscriber corresponding to the ID number; and

means for retrieving said subscriber control table when the switching equipment has received a call signal which designates the ID number of the called subscriber from the calling subscriber and for generating a signal to forward the call to a default terminal which as been registered in advance by the called subscriber having said ID number when the terminal corresponding to the called subscriber having said ID number is busy and also when the called subscriber having the ID number himself or herself is not busy.

5,197,097

CELL SIGNAL PROCESSING CIRCUIT AND OPTICAL SWITCH APPARATUS USING THE SAME

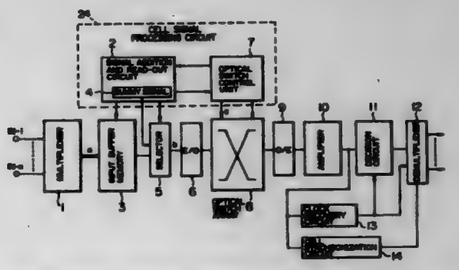
Yasushi Takahashi, Hachioji; Eiichi Amada; Kimiaki Ando, both of Tokyo, and Masanori Miyata, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1991, Ser. No. 638,577

Claims priority, application Japan, Jan. 10, 1990, 2-001505

Int. Cl.[5] H04K *1/02*; H04J *3/24*; H04Q *11/04*

U.S. Cl. 380—6 11 Claims



11. An optical switch apparatus comprising:

a multiplexer for multiplexing a plurality of electronic input cell signals;

a memory for storing the multiplexed cell signals;

a circuit for outputting an electronic dummy signal comprising n "0" bits and n "1" bits, wherein n is an integer greater than one;

a selector for combining the electronic dummy signal with an electronic cell signal read-out from the memory;

an electronic-optical converter for converting the combined electronic signal into a combined optical signal;

an optical switch array for changing a path of the combined optical signal at a "0" bit of the dummy signal;

an optical-electronic converter for converting the combined optical signal from the optical switch array into an electronic output signal;

a clock recovery circuit for extracting a clock signal from the electronic output signal;

a decision circuit for reshaping the electronic output signal as cell signals by use of the clock signal;

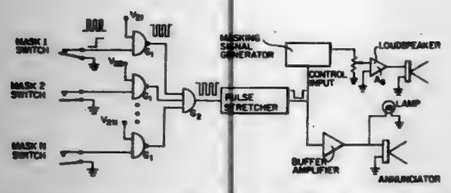
a delay line for applying one bit delay to the cell signals;

a cell synchronization circuit for extracting a cell synchronizing signal from the cell signals using the clock signal;

a delay line for applying one bit delay to the cell signals; and

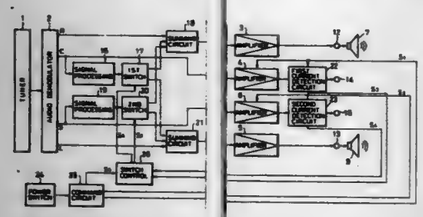
a demultiplexer for demultiplexing the delayed cell signals by use of the cell synchronizing signal and the clock signal.

5,197,098
SECURE CONFERENCING SYSTEM
Raoul E. Drapeau, 2410 Lackett Ave., Vienna, Va. 22180
Filed Apr. 15, 1992, Ser. No. 869,416
Int. Cl.[5] H04K *1/02*
U.S. Cl. 380—6 4 Claims



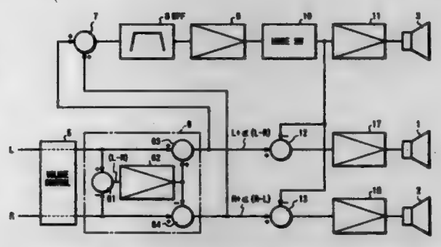
1. An audio conferencing system for insuring that multi-person meetings remain confidential comprising
mask means for silently accepting spoken speech from a number of participants and converting that speech into an electrical signal;
linear mixing means for combining such signals from all participants;
amplifier means for making the mixed speech available to all participants through headphones;
means for controlling the volume of the speech delivered to each participant's headphones;
indicator means for indicating which participant(s) are speaking;
output means to allow modular expansion of the number of participants;
output means to allow recording the mixed signal for later transcription.

5,197,099
MULTIPLE-CHANNEL AUDIO REPRODUCTION APPARATUS
Kazuo Hirasawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1990, Ser. No. 592,777
Claims priority, application Japan, Oct. 11, 1989, 1-264293; Oct. 11, 1989, 1-264294
Int. Cl.[5] H04R *5/00, 29/00*; H03G *3/00*; H03F *21/00*
U.S. Cl. 381—27 17 Claims



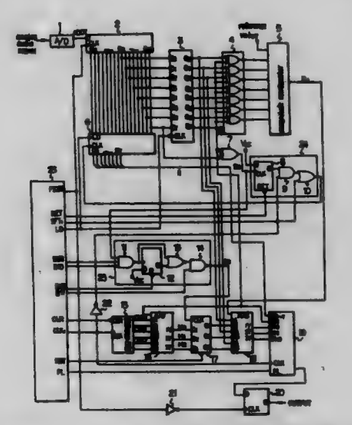
1. A four-channel audio reproduction apparatus, comprising:
an audio demodulator for demodulating an input signal and producing right-channel, center-channel, left-channel, and surround-channel audio signals;
a right-channel output terminal for receiving said right-channel audio signal;
a center-channel output terminal for receiving said center-channel audio signal;
a left-channel output terminal for receiving said left-channel audio signal;
a surround-channel output terminal for receiving said surround-channel audio signal;
a first signal-processing circuit for processing said center-channel audio signal, said first signal-processing circuit outputting a processed center-channel audio signal for reproduction by loudspeakers connected to said right-channel output terminal and said left-channel output terminal;
a first switch connected to said first signal-processing circuit, for feeding the processed center-channel audio signal to said right-channel output terminal and said left-channel output terminal;
a second signal-processing circuit for processing said surround-channel audio signal, said second-processing circuit outputting a processed surround-channel audio signal for reproduction by loudspeakers connected to said right-channel output terminal and said left-channel output terminal;
a second switch connected to said second signal-processing circuit, for feeding the processed surround-channel audio signal to said right-channel output terminal and said left-channel output terminal; and
switch controlling means for turning said first switch on if a loudspeaker fails to be connected to said center-channel output terminal, and otherwise turning said first switch off, and for turning said second switch on if a loudspeaker fails to be connected to said surround-channel output terminal, and otherwise turning said second switch off.

5,197,100
AUDIO CIRCUIT FOR A TELEVISION RECEIVER WITH CENTRAL SPEAKER PRODUCING ONLY HUMAN VOICE SOUND
Takeshi Shiraki, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 14, 1991, Ser. No. 655,046
Claims priority, application Japan, Feb. 14, 1990, 2-31618
Int. Cl.[5] H04N *5/60*
U.S. Cl. 381—27 11 Claims



1. An audio circuit for a television receiver wherein a left-hand speaker is disposed on a left side of a screen of a television receiver, a right-hand speaker is disposed on a right side of the screen, and a central speaker is disposed above or below the screen, and wherein an audio signal accompanies a picture to be displayed on the screen, the audio circuit comprising means for supplying the audio signal to the left-hand, right-hand and central speakers to produce sound, the audio signal supplying means including frequency component extraction circuit means for extracting predetermined frequency components of human voice from the audio signal and for supplying an extracted signal of the human voice frequency components to the central speaker so that the central speaker produces only human voice sound,
wherein the audio signal supplying means includes mode switching means providing variable-gain amplification for amplifying the extracted frequency components of human voice extracted by the frequency component extraction circuit means and for supplying an output signal thereof to the central speaker, first subtraction circuit means for subtracting the output signal of the mode switching means from the audio signal to be supplied to the left-hand speaker and for supplying a resulting subtracted signal to the left-hand speaker, and a second subtraction circuit means for subtracting the output signal of the mode switching means from the audio signal to be supplied to the right-hand speaker and for supplying a resulting subtracted signal to the right-hand speaker, and
wherein the mode switching means providing variable-gain amplification includes means for providing an increased amplification gain during a narration mode of the audio signal accompanying the displayed picture, means for providing an amplification gain which is decreased to zero during a music mode of the audio signal accompanying the displayed picture and means for providing an intermediate amplification gain during a theater mode of the audio signal.

5,197,101
DATA COMPRESSION CIRCUIT OF A DIGITAL AUDIO TAPE RECORDER
Cheolwoong Mok, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 23, 1991, Ser. No. 749,439
Claims priority, application Rep. of Korea, Aug. 24, 1990, 90-13298
Int. Cl.[5] G10L *3/02*; G11B *5/00*; H03M *7/00*
U.S. Cl. 381—29 12 Claims



1. A data compression circuit of a digital audio tape recorder for converting analog audio signal of standard mode into compressed data during an operation mode of the tape recorder is four-channel mode or long play mode, the circuit comprising:
system control means providing a timing pulse;
converting means for receiving said analog audio signal and sequentially outputting 16 bits of digital data;
first shift register means for serially loading the digital data from the converting means synchronously with an external clock from a terminal of the control means and outputting in parallel said digital data simultaneously as parallel data;
second shift register means for loading in parallel said parallel data from the first shift register means in response to a load control signal from a load terminal of the control means and outputting said parallel data in parallel;
first flip-flop means for latching eight high-order bits of the stored information synchronously with the load control signal;
means for providing an absolute value based upon the stored eight high-order bits from the first flip-flop means said providing means comprising a plurality of exclusive OR gates for inputting each of the eight high-order bits and a most significant bit of said eight high-order bits;
magnitude comparator means for comprising the absolute value with reference value;
an exclusive OR gate for receiving the most significant bit and the most significant bit of the eight high-order bits applied from the first shift register means;
shift clock producing means for producing clock signals for shifting the input data of the second shift register means, the producing means comprising second flip-flop means for loading a high level signal synchronously with the output of the exclusive OR gate and being reset by a reset signal from the control means, an AND gate for receiving the output signal of the second flip-flop means and the output clock from the control means and an OR gate for receiving the output signal from the AND gate and an output signal from the control means;
three-bit binary counter means for counting up and down by a clear signal and clock signal from the control means;
first multiplexer means for selectively outputting the counted data of the binary counter in accordance with the most significant bit of the output data of the first flip-flop;
latching clock generator means for producing clock to latch the output data of the first multiplexer means, the generator means comprising a first NAND gate for receiving two control signals from the control means and said output signal of the exclusive OR gate, a flip-flop for loading a high level signal synchronously with the output of the first NAND gate and being reset by a control signal of the control means, a NOR gate for receiving the output signal of the first NAND gate and the output signal of the flip-flop and a second NAND gate for receiving the output of the NOR gate and a control signal applied from the control means;
a second flip-flop for latching said output data of the first multiplexer synchronously with the output signal of the binary counter;
a second multiplexer for selectively outputting the output signals of the second flip-flop and three low-order bits of the output data of the first flip-flop;
a third shift register receiving in parallel eight bits applied from the second shift register, the most significant bit of the output information of the first flip-flop and three bits applied from the second multiplexer, and serially outputting said input data; and
a third flip-flop for latching the output signal of the third shift register synchronously with the external clock to be inverted by a inverter.

5,197,102
AUDIO POWER AMPLIFIER SYSTEM WITH FREQUENCY SELECTIVE DAMPING FACTOR CONTROLS
Jack C. Sondermeyer, Meridian, Miss., assignor to Peavey Electronics Corporation, Meridian, Miss.
Filed Jan. 14, 1991, Ser. No. 641,731
Int. Cl.[5] H04R *3/00*
U.S. Cl. 381—96 16 Claims

1. A power amplifier having a frequency selective variable damping factor, said amplifier having an input, an output and a feedback circuit coupled therebetween, the amplifier for driving a load in the feedback circuit having an impedance which varies with frequency between a high frequency cut-off and a low frequency resonance about a selected frequency comprising:
current feedback means in the feedback circuit;
first variable impedance means in the feedback circuit to ground for varying overall feedback to the amplifier input as the frequency increases above the selected frequency; and
second variable impedance means in the feedback circuit between the input and the output for varying overall feedback to the amplifier input as the frequency decreases below the selected frequency, said first and second variable impedance means being independently operative with respect to each other to selectively reduce feedback delivered to the load in said feedback circuit in accordance with its respective impedance and said current feedback

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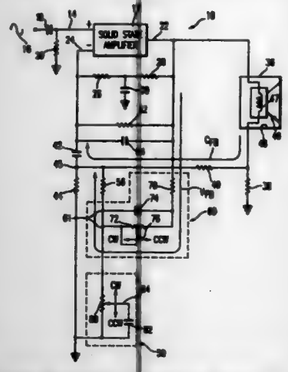
means being operative to selectively increase power delivered to the load with changing frequency above and



below said selected frequency at the load resonance and the high frequency cut-off.

5,197,103

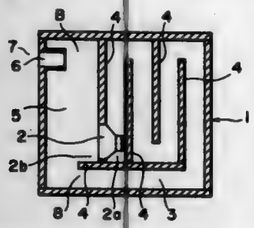
LOW SOUND LOUDSPEAKER SYSTEM

Junichi Hayakawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Continuation of Ser. No. 593,698, Oct. 5, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 845,841

Int. Cl.[5] H04R *1/02, 25/00*; H05K *5/00*

U.S. Cl. 381—159 **11 Claims**



1. A low frequency loudspeaker system comprising:
a tuned acoustic pipe extending along its length in a sound propagation direction from the back side of a loudspeaker unit;
an air chamber provided at the front side of said loudspeaker unit; and
a bass reflex port provided within said air chamber to constitute a bass reflex system with a specific bass reflex resonance frequency;
said acoustic pipe extending to said air chamber via an aperture of said acoustic pipe, and having a cross-section that is substantially constant over its length and said length being equal to half the wavelength of the specific bass reflex resonance frequency.

5,197,104

ELECTRODYNAMIC LOUDSPEAKER WITH ELECTROMAGNETIC IMPEDANCE SENSOR COIL

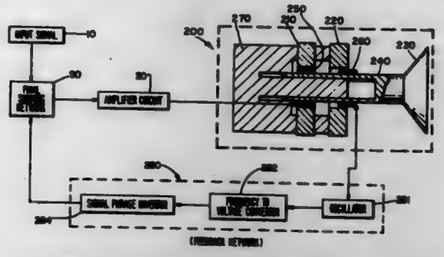
Gyula Padi, Lancaster, Calif., assignor to Josef Lakatos, Brunoy, France, a part interest

Filed Apr. 18, 1991, Ser. No. 687,435

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—192 **41 Claims**

1. An electrodynamic loudspeaker apparatus, comprising:
a. an electrodynamic loudspeaker having a housing, a pole piece, a primary magnet, a secondary ion core and a diaphragm connected with a coil support;
b. said loudspeaker also comprising a voice coil, the voice coil being wound on said coil support and aligned with said primary magnet for driving said diaphragm according to an input signal;
c. said loudspeaker further comprising an electromagnetic impedance sensor coil, the impedance sensor coil being wound on said coil support and partially offset with said



secondary iron core, causing said impedance sensor coil to have an electromagnetic impedance which is a function of both the displacement and the speed of said diaphragm; and
d. means for measuring said electromagnetic impedance of said impedance sensor coil to provide a feedback signal;
e. whereby said feedback signal can be combined with said input signal to effectuate the elimination of the distortion of said electrodynamic loudspeaker.

5,197,105

METHOD OF READING OPTICAL IMAGE OF INSPECTED SURFACE AND IMAGE READING SYSTEM EMPLOYABALE THEREIN

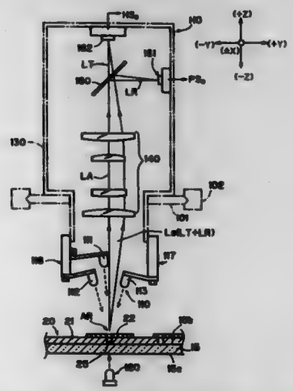
Haruo Uemura, and Tetsuo Hoki, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co. Ltd., Japan

Filed May 29, 1991, Ser. No. 706,801

Claims priority, application Japan, May 30, 1990, 2-142889; May 30, 1990, 2-142890; Apr. 11, 1991, 3-033354

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—8 **47 Claims**



1. A method of reading an image of an object with an imaging optical system having a respective angular aperture associated therewith and with an image sensor, comprising the steps of:
(a) providing a light source at a position located within only a portion of said angular aperture of said imaging optical system;
(b) locating said object in a visual field of said imaging optical system;
(c) applying illumination light from said light source to said object, wherein said illumination light reflects on said object to obtain a reflected light; and
(d) receiving said reflected light by said image sensor through said imaging optical system to thereby obtain an image of said object.

5,197,106

Patent Not Issued For This Number

5,197,107

CHARACTER RECOGNITION APPARATUS

Yutaka Katsuyama, Machida; Hiroshi Iwaki; Takafumi Edanami, both of Yokohama, and Noriyuki Fukuyama, Hachioji, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

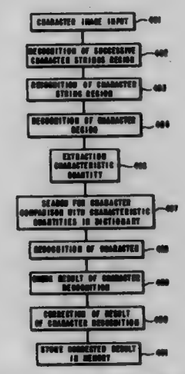
PCT No. PCT/JP89/00728, § 371 Date Mar. 20, 1990, § 102(e) Date Mar. 20, 1990, PCT Pub. No. WO90/01198, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 20, 1989, Ser. No. 474,767

Claims priority, application Japan, Apr. 26, 1988, 63-186048; Jul. 20, 1988, 63-179157; Jul. 20, 1988, 63-179158; Nov. 8, 1988, 63-283379; Nov. 21, 1988, 63-295642; Dec. 28, 1988, 63-332393; Apr. 20, 1989, 1-100844

Int. Cl.[5] G06K *9/62*

U.S. Cl. 382—30 **21 Claims**



1. A character recognition apparatus supplied with image data, comprising:
a dictionary for memorizing characteristic quantities of characters;
characteristic quantity extracting means for extracting a characteristic quantity of a character included within the image data;
character search means for determining the character included within the image data by comparing the characteristic quantity which is extracted from the image data with the characteristic quantities of characters which are memorized in the dictionary; and
characteristic quantity magnification/reduction means for carrying out a modification of said characteristic quantity which is extracted from said image data, where said modification corresponds to at least one of magnification and reduction operations of said image data to equalize the scale of the character included within the image data with the scale of at least one of the characters of which the characteristic quantities are memorized in said dictionary, before said comparison,
said at least one of magnification and reduction operations of the image data by said characteristic quantity magnification/reduction means including the use of one or more parameters which correspond to the at least one of magnification and reduction operations, said character recognition apparatus further comprising:
optimum parameter determining means for obtaining an optimum parameter of a modification by carrying out a modification of a characteristic quantity which is extracted from a known image data, where said modification corresponds to at least one of the magnification and reduction operations of said known image data using each of a predetermined number of parameters, and then comparing the modified characteristic quantity with characteristic quantities which are memorized in the dictionary and which correspond to said known image data,
said comparison by said character search means being carried out by obtaining a plurality of values which indicate degrees of similarity between said characteristic quantity extracted from said image data and respective characteristic quantities memorized in said dictionary,
said determination of the character by said character search means being carried out by obtaining a character among the characters in the dictionary which has the highest similarity to the character included within the image data based on said plurality of values, and
said character search means further determining a recognition reliability based on the similarity of the determined character,
said character recognition apparatus further comprising:
low recognition reliability determining means for determining whether a recognition reliability of a determined character is equal to or below a first threshold value; and
optimum parameter determination starting means for obtaining an optimum parameter by restarting said optimum parameter determining means when the recognition reliability of the determined character is equal to or below said first threshold value.

5,197,108

SMOOTHING METHOD AND APPARATUS FOR SMOOTHING CONTOUR OF CHARACTER

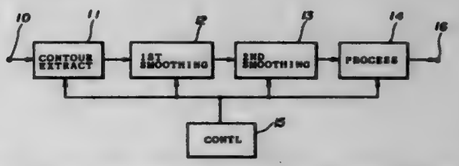
Sumio Watanabe, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Division of Ser. No. 327,749, Mar. 23, 1989, Pat. No. 5,093,870. This application Sep. 27, 1991, Ser. No. 753,309

Claims priority, application Japan, Mar. 31, 1988, 63-76515

Int. Cl.[5] G06K *9/44*

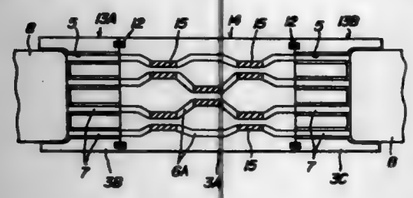
U.S. Cl. 382—47 **4 Claims**



1. A smoothing method for smoothing a contour of a dot pattern of a character, the smoothing method comprising the steps of:
a) extracting a contour of a dot pattern of a character to be smoothed;
b) smoothing the contour of the dot pattern by the substeps of:
1) extracting corner points of interest along the contour of the dot pattern; and
2) determining a curve point for each corner point of interest, based on (i) a direction and (ii) a distance, of each corner point of interest from previous and succeeding corner points, the curve points constituting a smoothed contour of the character, the curve point disposed on the corner point of interest or between the corner point of interest and an adjacent corner point in a scanning direction by which the dot pattern was formed; and

c) carrying out a rectilinear interpolation and a corner rounding process on the smoothed contour.

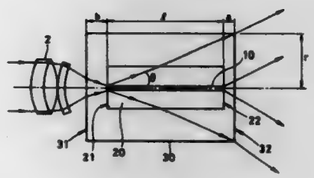
5,197,109
METHOD OF MANUFACTURING ASSEMBLY OF OPTICAL WAVEGUIDE SUBSTRATE AND OPTICAL FIBER ALIGNING SUBSTRATE
Takaaeri Ichigi; Akira Hamajima, both of Nagoya; Tetsuhisa Abe, Kawana, and Atsuo Kondo, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Apr. 9, 1992, Ser. No. 865,973
Claims priority, application Japan, Apr. 15, 1991, 3-108318
Int. Cl.[5] G02B 6/00, 6/32
U.S. Cl. 385—50 18 Claims



1. A method of manufacturing an assembly of at least one optical waveguide substrate and at least one optical fiber aligning substrate comprising the steps of:
preparing a starting block having a plurality of outer surfaces;
selecting at least one outer surface as a reference surface from said plurality of outer surfaces of the starting block;
dividing the starting block into a main body of optical waveguide substrate and at least one main body of optical fiber aligning substrate along at least one dividing surface which intersects with said reference surface, said main bodies having end faces which are formed by dividing the starting block;
forming at least one optical waveguide in said main body of the optical waveguide substrate, while a part of said reference surface which remains on the main body of the optical waveguide substrate is utilized as a positional reference;
forming at least one guide groove in a surface of the main body of the optical fiber aligning substrate, while a part of said reference surface which remains on the main body of the optical fiber aligning substrate is used as a positional reference;
inserting an optical fiber into said guide groove; and
coupling said main body of the optical waveguide substrate and said main body of the optical fiber aligning substrate with each other by adjoining said end faces of said main bodies such that said reference surface is reconstructed.

5,197,110
WAVELENGTH CONVERTING DEVICE HAVING A SURROUNDING RESIN LAYER
Kiyofumi Chikuma, and Seta Okamoto, both of Iruma, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 4, 1991, Ser. No. 755,017
Claims priority, application Japan, Nov. 30, 1990, 2-337303
Int. Cl.[5] G02B 6/34, 6/10
U.S. Cl. 385—122 7 Claims

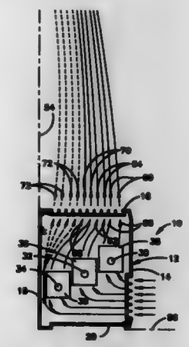
1. A wavelength converted device using Cerenkov radiation-type phase matching, comprising:
a cylindrical core made of a non-linear optical material and having a longitudinal length "l";
a cylindrical clad layer radially surrounding the cylindrical core and having the same longitudinal length "l"; and
a transparent resin portion formed integrally so as to completely surround the cylindrical core and the cylindrical clad layer, said transparent resin portion comprising:
a surrounding layer radially surrounding the cylindrical clad layer and having the same longitudinal length "l",
an incoming axial end surface layer having a thickness "b" and provided on one common end of the cylindrical core, the clad layer, and the surrounding layer, and
an outgoing axial end surface layer having a thickness "a" and provided on the other common end of the cylindrical core, the clad layer, and the surrounding layer;
wherein the outgoing axial end surface layer has a radius "γ" which satisfies the relation:



$$\gamma = \tan\Theta \cdot (l + a)$$

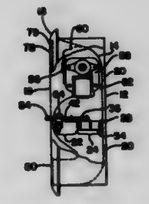
where Θ is the Cerenkov radiation angle; and
wherein the surrounding layer has a thickness such that a cross-sectional radius through the core, the clad layer, and the surrounding layer is equal to the radius "γ" of the outgoing axial end surface layer, thereby causing secondary harmonics light to pass through an interface between the clad layer and the surrounding layer and exit through the outgoing axial end surface layer.

5,197,111
CONVECTION HEATER WITH HEATING ELEMENTS ARRANGED IN A STAIR STEP CONFIGURATION
David S. Mills, II; Robert D. Rendel, both of Laurinburg, and Carl P. Hinesley, Pinehurst, all of N.C., assignors to The Marley Company, Mission Woods, Kans.
Filed Aug. 19, 1991, Ser. No. 746,694
Int. Cl.[5] F24H 3/00, 9/02; F24D 13/00, 19/06
U.S. Cl. 392—347 3 Claims



1. A convection heating unit comprising:
a housing having front and back portions and a top portion presenting a plurality of outlets for discharging heated air from the housing, said housing having air inlet means for admitting ambient air to the housing at a location below the outlets;
a plurality of heating elements spaced apart in the housing between said front and back portions, said elements including a front element near said front portion and a rear element near said back portion and said elements being arranged with each element located at a higher elevation than the element immediately behind it to provide a stair step configuration of the elements;
means for energizing said heating elements to draw air into the housing through said inlet means by convection, heat the air in the housing and discharge the heated air through said outlets; and
said outlets occupying a front to back dimension on said top portion which exceeds the distance between the front and back elements and said outlets being located directly above each of said elements, whereby the air rising above the front element induces the air heated by the rear element in a direction toward the front portion of the housing prior to discharge through the outlets.

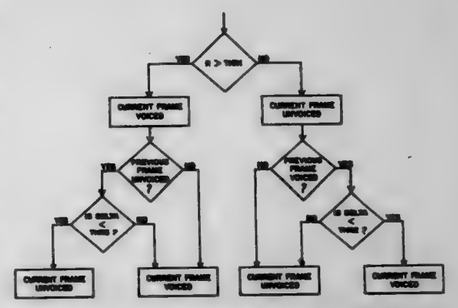
5,197,112
FIXED VOLUME PTC AIR HEATER WITH HEAT OUTPUT ADJUSTED BY A DAMPER CONTROLLING AIR FLOW OVER THE PTC ELEMENT
David M. Cameron, 1003 Black Oak Ct., Apex, N.C. 27502
Filed Dec. 24, 1990, Ser. No. 633,137
Int. Cl.[5] H05B 3/14; F24H 3/04; F28F 27/02; H01C 7/02
U.S. Cl. 392—360 16 Claims



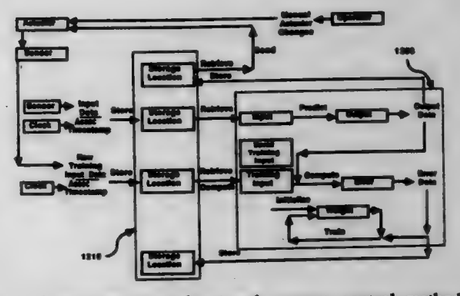
1. An electric air heating device comprising
a. a heat transfer body,
b. means for inletting air into said body and means for outletting air from said body,
c. heat transfer means located in said body, said heat transfer means comprising
i. means defining a pair of separate and distinct air paths in said heat transfer body,
ii. a fixed PTC heating means located in one of said air paths across said one air path, and
iii. means proximate said PTC heating means and spaced a fixed distance therefrom for controlling airflow through said air paths, said airflow controlling means including an adjustable, shiftable regulator which when adjusted increases airflow in one of said air paths and decreases airflow in the other of said air paths, and
d. means in said heat transfer body for supplying a constant fixed volume of air to said separate air paths.

5,197,113
METHOD OF AND ARRANGEMENT FOR DISTINGUISHING BETWEEN VOICED AND UNVOICED SPEECH ELEMENTS
Enzo Mumolo, Pomezia, Italy, assignor to Alcatel N.V., Amsterdam, Netherlands
Filed May 15, 1990, Ser. No. 524,297
Claims priority, application Italy, May 15, 1989, 20505 A/89
Int. Cl.[5] G10L 9/00
U.S. Cl. 395—2 14 Claims

1. Method of distinguishing between voiced and unvoiced speech elements in a sequence of successive speech elements, wherein for each speech element a measure of the location of a spectrum is determined, characterized in that for successive speech elements a measure of the magnitude of the shift between the spectra is additionally determined, and that for the decision between voiced and unvoiced speech elements, both measures are used and a voiced or unvoiced decision is outputted.



5,197,114
COMPUTER NEURAL NETWORK REGULATORY PROCESS CONTROL SYSTEM AND METHOD
Richard D. Skeirik, Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.
Filed Aug. 3, 1990, Ser. No. 562,462
Int. Cl.[5] G06F 15/18
U.S. Cl. 395—22 44 Claims



1. A computer neural network process control method adapted for predicting output data provided to an actuator used to control a process for producing a product having at least one product property, said method allowing the process to be controlled without a human operator, the computer neural network process control method comprising the steps of:
(1) configuring the neural network by specifying at least one input, at least one output, at least one training input, and at least one specified interval;
(2) training the neural network to produce a trained neural network comprising the substeps of:
(a) retrieving a first raw training input data;
(b) retrieving a second raw training input data;
(c) computing a corresponding first training input data based on said first raw training input data and said second raw training input data, said first training input data indicative of the action of a human operator of the process;
(d) retrieving a first input data;
(e) predicting a first output data using said first input data;
(f) computing a first error data in accordance with said first training input data and said first output data; and
(g) training the neural network to produce said trained neural network in accordance with said first error data;

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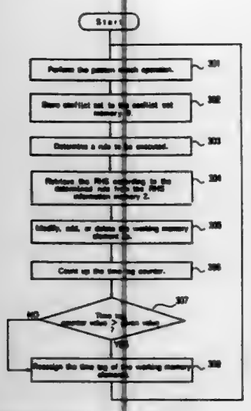
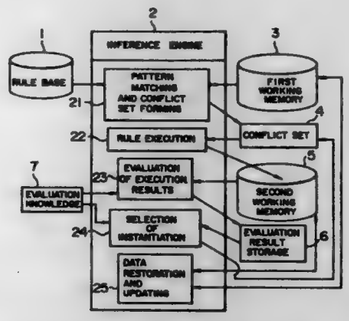
(3) at said at least one specified interval, retrieving a second input data and predicting, with said trained neural network weights, second output data using said second input data;
(4) retrieving said second output data; and
(5) changing a state of the actuator in response to said second output data of step (4).

5,197,115
INFERENTIAL SYSTEM AND INFERENTIAL METHOD
Naomichi Sueda, Ieehara, and Junzo Suzuki, Yamato, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 25, 1990, Ser. No. 514,267
Claims priority, application Japan, Apr. 25, 1989, 1-105529
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—50 **4 Claims**



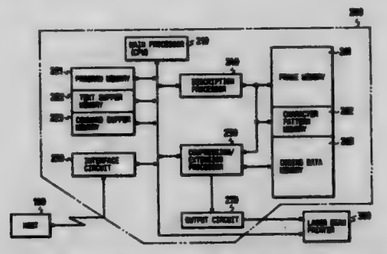
3. An inferential system comprising:
a production memory;
means for storing rules in said production memory, each of the rules having a condition part and an action part;
a working memory;
means for storing working memory elements in said working memory, each working memory element including fact information and a time tag having a number indicating a creation order of the working memory element;
means for executing a pattern match of the working memory elements and the condition parts to generate a conflict set constituted by matched rules;
means for selecting one rule out of the conflict set by a conflict resolution strategy which prioritizes the matched rules in the conflict set according to the numbers of the time tags of the working memory elements when the conflict set includes a plurality of matched rules;
means for executing the action part of the selected rule, said means for executing the action part of the selected rule comprising means for deleting a working memory element including its time tag or creating a new working memory element including a new time tag; and
means for changing the numbers of the time tags of the working memory elements when the number of the new time tag exceeds a given number so as to avoid an overflow of the time tags, the changed numbers remaining in a relationship reflecting the creation order of the working memory elements.

5,197,116
METHOD OF RESOLUTION FOR RULE CONFLICT IN A KNOWLEDGE BASED SYSTEM
Naoki Katoh, and Masato Mogaki, both of Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 5, 1990, Ser. No. 548,075
Claims priority, application Japan, Jul. 10, 1989, 1-175467
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—51 **7 Claims**



1. A method of operating a computer to resolve a rule conflict in a knowledge based system using an inference engine, the method comprising the steps of:
(a) inputting form a rule base, rules, each composed of a condition clause and an action clause which is executed if the condition clause is satisfied;
(b) inputting form a first working memory a data group describing an inference object to which a rule is applied;
(c) checking a pattern matching between the condition clause of said rule and the data in sad first working memory to form an instantiation composed of an applicable rule and data, and to form a conflict set composed of a plurality of instantiations;
(d) executing a process of changing said data in accordance with the action clause of the applicable rule of each said instantiation through the sub-steps of,
(d1) selecting one of said plurality of instantiations from said conflict set,
(d2) executing the action clause of the applicable rule for said selected instantiation, wherein said rule is executed with respect to a second working memory having the same contents as said first working memory;
(e) inputting an evaluation knowledge defining an evaluation method for evaluating the results of execution in step (d) of the applicable rule in accordance with the action clause, wherein the execution results are stored in said second working memory;
(f) evaluating the execution results sorted in said second working memory by using said evaluation knowledge;
(g) updating data stored in said second working memory according to the execution results and copying said updated data from said second working memory to said first working memory, if an evaluation value of the execution results in equal to or larger than a threshold value predetermined as one of said evaluation knowledge, and jumping to step (a); and,
(h) recovering data stored in said second working memory by copying data stored in said first working memory in accordance with said updated data from said first working memory to said second working memory and deleting form said conflict set said instantiation executed by the step (d), if an evaluation value of the executing results is smaller than a threshold value predetermined as one of said evaluation knowledge, and jumping to step (d).

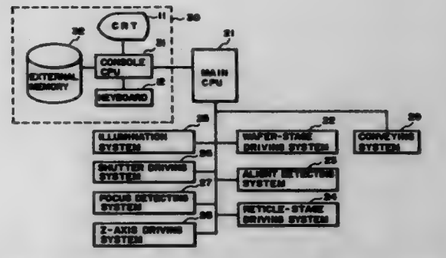
5,197,117
TEXT INFORMATION PROCESSING APPARATUS HAVING PRINTER AND PRINTING DOT SIGNAL GENERATING APPARATUS FOR THE SAME
Takashi Kato, Hitachi, and Shouji Saitoh, Takahagi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 723,565
Claims priority, application Japan, Jul. 6, 1990, 2-177421
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—105 **12 Claims**



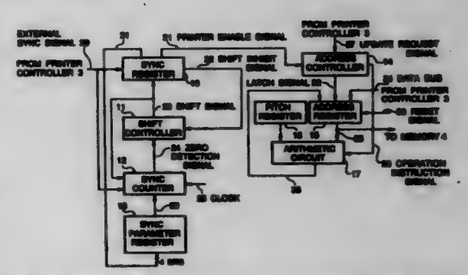
1. In a text information processing apparatus comprising a text data preparation means for preparing a text data including a character description data and a figure description data, a memory means for storing a dot data to be printed, a description means for developing said text data prepared by said text data preparation means to said dot data to be printed and for storing said dot data to be printed into said memory means, and a printer for printing said dot data stored in said memory means, the processing apparatus characterized of further comprising;
a dot data compression means for carrying out a coding processing for compressing a redundancy degree by reading out said dot data to be printed stored in said memory means and for storing said encoded data in said memory means,
an encoded data extension means for reading out said encoded data stored in said memory means from said memory means in response to a printing motion of said printer and for carrying out an extension processing for decoding to said dot data, and
a dot data output means for giving said dot data prepared by said encoded data extension means to said printer.

5,197,118
CONTROL SYSTEM FOR A FINE PATTERN PRINTING APPARATUS
Ryuichi Sato; Masanori Numata; Bunei Hamasaki, all of Yokohama, and Naoki Ayata, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 637,941, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 888,490, Jul. 23, 1986, abandoned. This application Sep. 3, 1991, Ser. No. 752,986
Claims priority, application Japan, Jul. 25, 1985, 60-164798; Jul. 25, 1985, 60-164799; Jul. 25, 1985, 60-164800; Jul. 25, 1985, 60-164801; Jul. 25, 1985, 60-164802; Jul. 25, 1985, 60-164803; Jul. 25, 1985, 60-164804
Int. Cl.[5] G06F *15/62*; H01J *37/304*
U.S. Cl. 395—105 **18 Claims**

1. A fine pattern printing apparatus for use in the manufacture of semiconductor microcircuits, for printing fine patterns on different shot areas on a workpiece in accordance with one of a plurality of processes, said apparatus comprising:
printing means for printing fine patterns on the shot area on the workpiece in a predetermined order in accordance with one of a plurality of processes;
parameter setting means for setting a plurality of operational parameters related to the printing operation of said printing means;
file setting means for setting a plurality of files each including a selective combination of the operational parameters, (i) wherein the operational parameters are hierarchically classified into different classes with respect to the pattern, the process and the shot area, (ii) wherein the operational parameters in each class are further classified into different subclasses on the basis of a corresponding one of the difference in type, the difference in process and the difference in shot area, and (iii) wherein said file setting means registers the operational parameters in each subclass in the form of a file; and
job setting means for selectively combining files, set by said file setting means, to determine a job to be executed by said printing means.



5,197,119
EXTERNAL SYNCHRONISM CONTROL CIRCUIT
Mitsuru Ohuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 26, 1990, Ser. No. 633,376
Claims priority, application Japan, Dec. 25, 1989, 1-337460
Int. Cl.[5] G06K *15/00*
U.S. Cl. 315—115 **9 Claims**



1. An external synchronism control circuit triggered in synchronism with an external synchronous signal so as to successively generate addresses to a memory storing image information, comprising:
synchronism register means for receiving said external synchronous signal and capable of holding a plurality of set values, a content of said synchronism register being set to an initial value of said plurality of set values when said external synchronous signal is applied;
synchronism parameter register means for holding a plurality of preset count values and receiving, as an address, one of said set values output from said synchronism register means so as to output one preset count value designated by said received address;
synchronism counter means coupled to said synchronism parameter register means and being set with the one preset count value from said synchronism parameter register means in response to said external synchronous signal, said synchronism counter means being decremented by a clock signal and operating to generate a zero detection signal

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when a content of said synchronism counter means becomes zero;

shift controller means coupled to said synchronism counter means for receiving said zero detection signal and operating to output a shift for receiving said zero detection signal and operating to output a shift signal to said synchronism register means so as to cause the one of said set values output from said synchronism register means to be shifted to another one of said set values, said synchronism register means operating to output an shift inhibit signal to said shift controller means when said synchronism register means holds said final value of said plurality of set values, said shift controller means updating the content of said synchronism register means from one set value to another set value when a predetermined period of time has elapsed; and

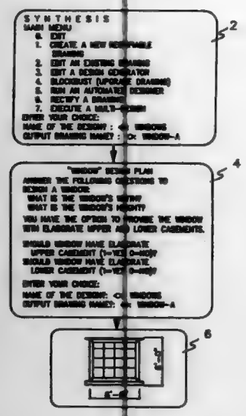
address updating means coupled to said synchronism register means for sequentially updating said address from a period in which said synchronism register means holds a predetermined set value of said plurality of set values until a period in which said synchronism register means is in a condition of holding said final value, said address updating means supplying the updated address to said memory.

5,197,120

METHODS AND SYSTEMS FOR GENERATING PARAMETRIC DESIGNS

Jay R. Sexton, Bellingham; Andrew J. Sodt, Seattle, and Dan J. Suzio, Bellingham, all of Wash., assignors to Synthesis, Inc., Bellingham, Wash.

Division of Ser. No. 925,278, Oct. 30, 1986, Pat. No. 4,882,692.
This application Jan. 16, 1990, Ser. No. 439,869
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—139 32 Claims



1. A method of employing a general purpose interactive system which includes a computer with a memory means, a monitor coupled to said computer for displaying data outputted from the computer, and a data entry device coupled to said computer for inputting data to the computer to create an accomplished design by first engineering said design and then portraying said design in the form of electronically storable data, said method comprising the steps of:

employing said data entry device to establish a multiplicity of design plans, each comprising a two-dimensional array of cells;

editing one of said design plans by employing said computer to write a value defined in a cell of one of said design plans from said one design plan into a cell of a second of those design plans;

employing said computer to update the value of all related cells in said multiplicity of design plans; and

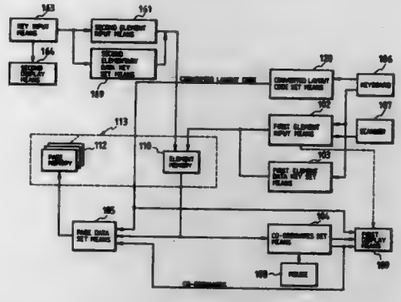
electronically storing in said computer data representing said accomplished design and generated by using said computer to output at least one of said updated values to said computer memory.

5,197,121

DATA PROCESSING SYSTEM AND EDITING DEVICE AIDED THEREBY

Akito Miyoshi, and Hiromitsu Terai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00810, § 371 Date Mar. 27, 1989, § 102(e) Date Mar. 27, 1989, PCT Pub. No. WO89/02116, PCT Pub. Date Sep. 3, 1989
PCT Filed Aug. 17, 1988, Ser. No. 360,913
Claims priority, application Japan, Aug. 28, 1987, 62-216231; Oct. 15, 1987, 62-258292
Int. Cl.[5] G06F *15/20*
U.S. Cl. 345—146 8 Claims



1. An editing device comprising a host computer to which a data base is connected, editing means connected to the host computer, and a personal computer connected to one of said host computer and said editing means, said editing means comprising first input means for inputting element data, and first setting means for setting an element data key corresponding to the element data input by said first input means,

said personal computer including second input means for inputting element data constituting a page, and second setting means for setting an element data key corresponding to the element data input by said second input means; and,

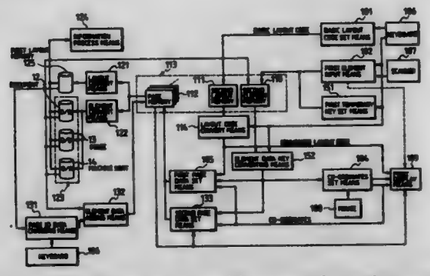
said editing means further including means for setting a converted layout code by which a basic layout of a page to be edited is designated; means for setting positional coordinates of each of said element data on the basic layout; and means for setting one page data by employing said converted layout code, element data used for an editing operation, the element data keys corresponding to said element data, and the positional coordinates of said element data.

5,197,122

DATA PROCESSING SYSTEM AND EDITING APPARATUS AIDED THEREBY

Akito Miyoshi, and Hiromitsu Terai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00830, § 371 Date Mar. 29, 1989, § 102(e) Date Mar. 29, 1989, PCT Pub. No. WO89/02117, PCT Pub. Date Mar. 9, 1989
PCT Filed Aug. 22, 1988, Ser. No. 355,742
Claims priority, application Japan, Aug. 24, 1987, 62-209776; Aug. 24, 1987, 62-209777; Aug. 28, 1987, 62-216231; Aug. 28, 1987, 62-216232; Aug. 28, 1987, 62-216235; Sep. 24, 1987, 62-239679; Sep. 24, 1987, 62-239680; Oct. 2, 1987, 62-250497; Oct. 15, 1987, 62-258293; Oct. 15, 1987, 62-258294; Oct. 15, 1987, 62-258295; Oct. 15, 1987, 62-258296
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—146 10 Claims



1. An editing apparatus comprising means for setting a converted layout code designating a basic layout of a page to be edited, means for setting an element data key corresponding to element data, means for introducing element data forming each page subsequently to said element data key, means for setting positional coordinates of each element data on the basic layout, and means for setting a layout on editing based on the positional coordinates and the element data key of element data corresponding to the positional coordinates, setting a group of element data based on the element data key forming the layout on editing and the element data corresponding to the element data key, and setting data for one page based on the converted layout code, the layout on editing, and the group of element data.

5,197,123

CONTROL APPARATUS FOR SETTING A RECORDING FORMAT FOR A RECORDING APPARATUS

Satoshi Nagata, Tama, and Masaru Igarashi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 517,405, May 2, 1990, Pat. No. 5,058,035, which is a continuation of Ser. No. 89,339, Aug. 25, 1987, abandoned. This application Jul. 26, 1991, Ser. No. 736,751
Claims priority, application Japan, Aug. 30, 1986, 61-202715; Aug. 30, 1986, 61-202720
The portion of the term of this patent subsequent to Oct. 15, 2008, has been disclaimed.
Int. Cl.[5] G06F *15/00*
U.S. Cl. 395—148 10 Claims

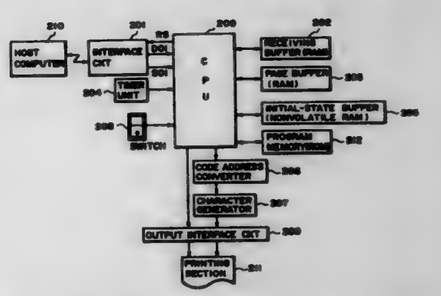
5. A control apparatus which controls a recording apparatus, said control apparatus comprising:

input means for inputting recording format information for use in recording of information by the recording apparatus;

a non-volatile memory for storing the recording format information input by said input means;

a first memory for storing a default format;

setting means for setting a recording format for actual use by the recording apparatus, wherein said setting means operates based on whether or not recording format information for the recording format has been stored in said non-volatile memory, and wherein said setting means sets the recording format on the basis of the recording format information stored in said non-volatile memory when recording format information for the recording format has



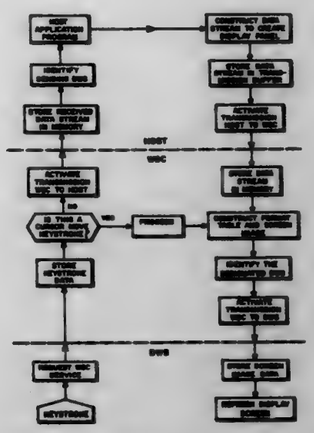
been stored in said non-volatile memory, and sets the recording format on the basis of the default format stored in said first memory when recording format information for the recording format has not been stored in said non-volatile memory.

5,197,124

METHOD FOR CONSTRUCTING SELECTION CURSORS ON DEPENDENT WORKSTATIONS

Leah J. H. Busboom, Oronoco; Stephen T. Eagen; Harvey G. Kell, both of Rochester; Raymond F. Romon, Oronoco, and David G. Wenz, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1990, Ser. No. 466,537
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—155 7 Claims



1. A method of processing in a workstation controller, including controlling and displaying selection cursors in a plurality of dependent workstations remotely connected to said workstation controller, comprising the steps of

a) prestoring, in said workstation controller, format tables to describe cursorable panel items, including selection cursor attributes, selection field constructs and entry field constructs, relating to cursor position and display, for each of said plurality of dependent workstations;

b) asynchronously receiving a cursor keystroke signal in said

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workstation controller from any of said plurality of dependent workstations;

c) retrieving, from said format table associated with the dependent workstation initiating said cursor keystroke signal, the current cursor position for said dependent workstation;

d) comparing the current cursor position with the direction of cursor movement associated with the received cursor keystroke signal, and selecting a new cursor target position according to one of the following steps:

1) if the current text cursor position is in an entry field and the direction of cursor movement is within the same entry field, set the text cursor target position to the next position in the entry field;

2) if the current cursor position is not in an entry field and the direction of cursor movement is not in an entry field, set the cursor target position to the next cursorable item in the direction of movement;

e) if step d) 1) is performed, turning on a text cursor display and commanding the dependent workstation to move the text cursor to the cursor target position;

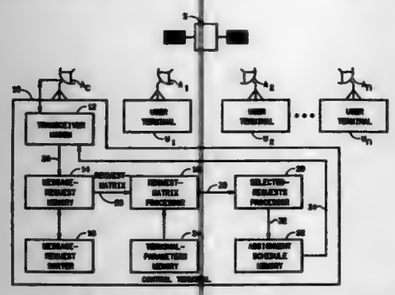
f) if step d) 2) is performed, saving the starting display attribute of the cursable item in the direction of cursor movement, and commanding the dependent workstation to move the selection cursor display to the cursor target position.

5,197,125

ACCESS ASSIGNMENT IN A DAMA COMMUNICATION SYSTEM

Gernot M. Engel, Del Mar; Dwight R. Bean, San Diego, and Edward F. Smith, Escondido, all of Calif., assignors to The Titan Corporation, San Diego, Calif.

Filed Dec. 18, 1990, Ser. No. 629,668
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—200 **10 Claims**



1. A system for assigning to given user terminals in a multiple-user communication system access to time slots of a time frame within which to transmit messages identified in message-access requests from different given user terminals, comprising

means for storing a plurality of message-access requests from different given user terminals;

means for first processing the stored message-access requests to schedule the identified messages for transmission in accordance with predetermined priority constraints, in accordance with information contained in the message-access requests identifying transmission parameters of the respective identified messages and in accordance with the number of available time slots to thereby select a set of the respective messages for access-assignment to the available time slots; and

means for subsequently processing the message-access requests for the selected set of messages to assign access to different combinations of the time slots for respectively transmitting the different messages of the selected set of messages;

wherein the user terminals are associated with different organizations, with some organizations being associated with more than one of the user terminals and wherein the message-access requests identify the organization associated with the user terminal and indicate a priority set by the organization for processing the message-access requests of the identified organization;

wherein the processing means sort the message-access requests and arranges the sorted requests for storage in the storing means in accordance with said indicated priorities; and

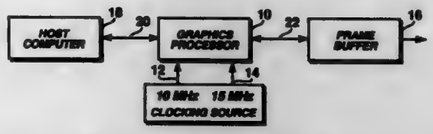
wherein the processing means process a matrix of the highest priority stored message-access requests from the different identified organizations when selecting the set of the respective messages that are selected for access-assignment to the available time slots.

5,197,126

CLOCK SWITCHING CIRCUIT FOR ASYNCHRONOUS CLOCKS OF GRAPHICS GENERATION APPARATUS

Chandlee B. Harrell, Mountain View, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Continuation of Ser. No. 244,401, Sep. 15, 1988, abandoned. This application Oct. 10, 1991, Ser. No. 777,422
Int. Cl.[5] G06F *15/20*
U.S. Cl. 395—200 **6 Claims**



1. A graphics generation apparatus comprising:

a graphics processor being coupled to receive from a clock source a first and a second asynchronous clocking signal wherein the rising edge of said first clocking signal and the rising edge of said second clocking signal are not correlated with some reference to time;

said graphics processor being coupled through a first bus to a frame buffer of said graphics generation apparatus such that said processor can communicate data with said frame buffer of said graphics generation apparatus at said frequency of said first clocking signal, said graphics processor being coupled through a second bus to a host computer of said graphics generation apparatus such that data can be communicated between said host computer and said frame buffer through said graphics processor at said frequency of said second clocking signal; and

circuit means for providing switching between said first and second clocking signals such that said circuit means prevents the formation of clocking signals which have a period, (i) shorter than the period of said first clocking signal when switching from said second clocking signal to said first clocking signal and, (ii) shorter than the period of said second clocking signal when switching from said first clocking signal to said second clocking signal;

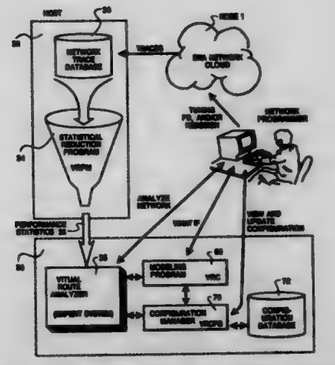
said circuit means preventing said shorter periods by providing a first dead time in the clocking signals when switching from said first clocking signal to said second clocking signal and by providing a second dead time when switching from said second clocking signal to said first clocking signal.

5,197,127

EXPERT SYSTEM METHOD FOR PERFORMING WINDOW PROTOCOL-BASED DATA FLOW ANALYSIS WITHIN A DATA COMMUNICATION NETWORK

John G. Waclawsky, Frederick; Raymond F. Daugherty, Mt. Airy, both of Md., and Robert H. Springsteen, Reston, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1990, Ser. No. 586,828
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—200 **21 Claims**



1. An expert system method for analysing the window protocol-based data flow in a data communications network over which data packets are transmitted, said data packets including a data portion and a header portion, comprising:

setting a packet transmission window to have a maximum quantity of N packets which can be transmitted within an interval from a node in the network;

setting a queued packet threshold value to a quantity of C packets which may be held in a queue during an interval at the node;

defining a data flow efficiency state variable S as a binary number having at least three bits, with a first bit B1;

counting the number of packets transmitted from the node during a measurement interval and setting B1 if the number of packets transmitted is equal to N;

setting B2 if any packet is held in the queue during the measurement interval;

setting B3 if more than C packets are held in the queue during the measurement interval;

determining the value of said data flow efficiency state variable S from values of B1, B2 and B3 set by said counting and setting steps;

accessing a knowledge base containing network problem determination recommendations which are accessible with said value of said data flow efficiency state variable S;

outputting a problem determination recommendation for optimizing data flow efficiency in said network in response to accessing said knowledge base with said value of S.

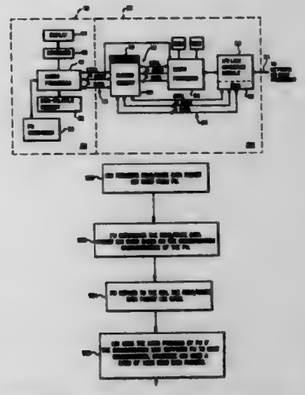
5,197,128

MODULAR INTERFACE

Russell Campbell; Todd A. Fischer; Patrick W. Fulghum, all of Boise, Id.; Paul R. Sorenson, San Diego, and James G. Wendt, Auburn, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1991, Ser. No. 663,977
Int. Cl.[5] G06F *13/12*
U.S. Cl. 395—275 **15 Claims**

1. In a packet-based communications system for linking a peripheral unit (PU) to an external system via a communications link, a modular interface unit (MIU) coupled between said PU and said communications link, said MIU including memory shared by processors in both said PU and MIU, said system employing control packets, read packets for transferring data from said external system to said PU and write packets for transferring data from said PU to said external system, and performing a method for allocating space within said shared memory for storage of said read and write packets, said method comprising:



(a) determining a ratio of read to write packets required in the operation of said PU and whether said communications link will transmit write packets; and

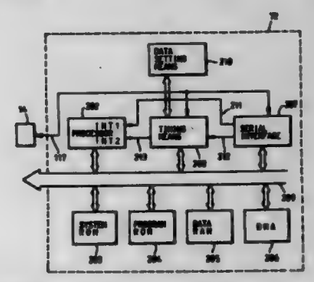
(b) ignoring the ratio determined in (a) if said communications link will not transmit write packets and, in such case, allocating space within said shared memory without regard to said determined ratio, but if said communications link will transmit write packets, allocating space within said shared memory for storage of said read and write packets in accordance with said determined ratio.

5,197,129

INPUT/OUTPUT DEVICE AND A CONTROL SYSTEM INCORPORATING SUCH A DEVICE

Masahiro Kayama; Yasuo Morooka, both of Hitachi; Takayuki Oshiga, Narashino, and Katsuhiro Fujiwara, Sakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,772
Claims priority, application Japan, Sep. 14, 1989, 1-237251
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—275 **32 Claims**



6. An input/output device comprising:

input means for receiving sequentially a plurality of data strings;

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a processor for processing said plurality of data strings received by said input means;

a memory for storing at least part of a data string;

determination means for determining a length of each of said plurality of data strings relative to a predetermined length; and

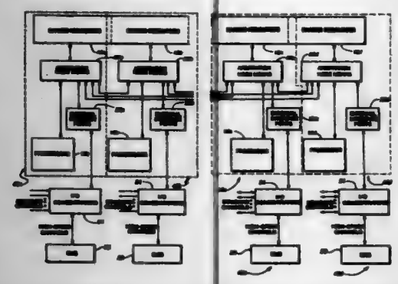
means, connected to said input means, for transmitting one of said plurality of data strings to said processor for processing by said processor when the length of said one of said plurality of data strings, as determined by said determination means, is less than said predetermined length, and for transmitting to said memory at least a part of said one of said plurality of data strings when the length of said one of said plurality of data strings, as determined by said determination means, is at least equal to said predetermined length.

5,197,130

CLUSTER ARCHITECTURE FOR A HIGHLY PARALLEL SCALAR/VECTOR MULTIPROCESSOR SYSTEM

Steve S. Chen, Chippewa Falls; Frederick J. Simmons, Neillsville; George A. Spix, Eau Claire; Jimmie R. Wilson, Eau Claire; Edward C. Miller, Eau Claire; Roger E. Eckert, Eau Claire, and Douglas R. Beard, Eleva, all of Wis., assignors to Supercomputer Systems Limited Partnership, Eau Claire, Wis.

Filed Dec. 29, 1989, Ser. No. 459,083
Int. Cl.[5] G06F *15/16*
U.S. Cl. 395—325 19 Claims



1. A high parallel computer processing system, comprising:

C multiprocessor clusters operably connected to one another, where C is an integer between 2 and 256, inclusive, each multiprocessor cluster comprising:

a shared memory means for physically storing and retrieving data and instructions to be executed by the computer processing system as part of a single common logical address space without duplicate address spaces that includes all of said shared memory means of all of said C multiprocessor clusters;

P processors means for executing said instructions and directly operating on said data in said shared memory means of any of said C multiprocessor clusters, where P is an integer between 4 and 256, inclusive;

Q distributed external interface means for transferring said data and said instructions between said shared memory means and one or more external data sources, where Q is an integer between 2 and 256, inclusive;

Z arbitration node means, each arbitration node means having one or more unique direct connection paths between said shared memory means in this multiprocessor cluster and a unique two or more of said processor means, and a unique one or more of said distributed external interface means, for symmetrically multiplexing said processor means and said distributed external interface means with said shared memory means, where Z is an integer between 2 and 128, inclusive; and

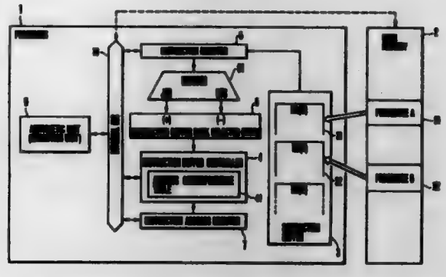
remote cluster adapter means operably connected to each of said Z arbitration node means and to said shared memory means in this multiprocessor cluster and to a remote cluster adpater means in all other of said multiprocessor clusters for allowing said Z arbitration node means of this multiprocessor cluster to access said shared memory means of all other of said multiprocessor clusters and for allowing all other of said multiprocessors to access said shared memory means of this multiprocessor cluster.

5,197,131

INSTRUCTION BUFFER SYSTEM FOR SWITCHING EXECUTION OF CURRENT INSTRUCTION TO A BRANCH OR TO A RETURN FROM SUBROUTINE

Noriyasu Mori, Yokohama, and Hiroshi Tomita, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,501
Claims priority, application Japan, Feb. 10, 1988, 63-27741
Int. Cl.[5] G06F *9/38*
U.S. Cl. 395—375 13 Claims



1. An apparatus in a computer system having a process and a main memory comprising:

(a) an instruction buffer divided into a plurality of buffer banks for storing instructions to be executed by an execution unit in said processor;

(b) an instruction register coupled to said instruction buffer for storing an instruction read out from said instruction buffer;

(c) an instruction decoder coupled to said instruction buffer for decoding the instruction stored in said instruction register;

(d) an instruction buffer bank selector coupled to said instruction decoder for changing a designation of one of said buffer banks to be used responsive to an output from said instruction decoder specifying that said instruction stored in said instruction register is a program branch, and for outputting a bank number of the designated bank;

(e) an instruction address register for storing an address of an instruction to be executed after said instruction of said instruction register is executed; and

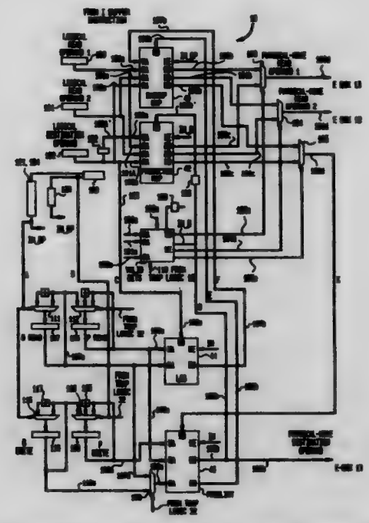
(f) an instruction buffer controller, coupled to said instruction buffer bank selector and said instruction address register, having an address table which specifies a relation between a main memory address and a bank number of said instruction buffer for selecting said address in said instruction address register as an address of said instruction buffer to be read out when said bank number outputted from said instruction buffer bank selector is included in said address table and said address in said instruction address register is included in a buffer bank specified by the bank number stored in said address table and for reading out the address specified by said instruction address register from said instruction buffer and for storing the read out address in said instruction register.

5,197,132

REGISTER MAPPING SYSTEM HAVING A LOG CONTAINING SEQUENTIAL LISTING OF REGISTERS THAT WERE CHANGED IN PRECEDING CYCLES FOR PRECISE POST-BRANCH RECOVERY

Simon C. Steely, Jr., Hudson, N.H., and David J. Sager, Acton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 29, 1990, Ser. No. 546,411
Int. Cl.[5] G06F *9/00, 11/30*
U.S. Cl. 395—375 10 Claims



1. An arrangement for mapping m logical registers used in the execution of instructions processed through a computer pipeline, comprising:

a register file having n locations for storing values, said locations being physical homes of the m logical registers, where m<n; and

a register map coupled to the register file and receiving instructions as input and generating mapped instructions as output to the register file, the register map comprising:

a free list that contains a number of locations p, each said free list location containing a register file location, the free list indicating which of said register file locations are free for use in a current cycle;

a log that contains a sequential listing of which of the m logical registers were changed in each of t cycles preceding a current cycle;

a backup map that contains a map associating m of the n physical homes to the m logical registers at a backup point, wherein the backup point is a preselected number of cycles preceding the current cycle and wherein the preselected number of cycles is equal to, or less than, t;

a predicted map that contains a map associating m of the n physical homes to the m logical registers during the current cycle; and

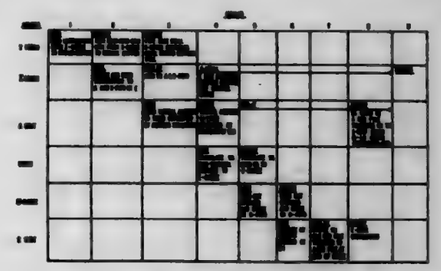
a register map control device coupled to each of the free list, log, backup map, and predicted map, the register map control device receiving the instructions input to the register map, maintaining the free list, log, backup map and predicted map, the backup map being maintained using the sequential listing of the log, the register map control device generating the mapped instructions output by the register map.

5,197,133

CONTROL STORE ADDRESSING FROM MULTIPLE SOURCES

Jian-Kuo Shen, Belmont, Mass.; Richard P. Kelly, Nashua; Robert V. Lodoux, Litchfield, both of N.H., and Deborah K. Staplin, Chelmsford, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 19, 1988, Ser. No. 286,578
Int. Cl.[5] G06F *9/22, 9/38*
U.S. Cl. 395—375 8 Claims



1. A data processing system having a plurality of series connected pipeline stages arranged to form a production line, each stage performing a different operation on each of a plurality of instructions applied to said pipeline stages, said system comprising:

memory means for storing a plurality of instructions and operands;

an instruction stage coupled to said memory means and having memory address generating means for fetching each of said plurality of instructions, said instruction stage having first address generating means responsive to a first type of instruction for generating first control store address signals and stalling means responsive to said first type of instruction for generating a stall signal for stalling said instruction stage of said production line and generating a select signal in a first state, and multiplexer means responsive to said select signal in a first state for selecting said second control store address signals;

an address stage coupled to said instruction stage and having first control store means for fetching a first firmware word stored at a location specified by said first control store address signals, said address stage including first logic means responsive to signals from said first firmware word and said first type of instruction for generating an operand address;

said memory means coupled to said address stage for reading out an operand at a location specified by said operand address;

an execution stage coupled to said instruction stage, said address stage and said memory means and having first executing means responsive to said first type of instruction and said operand for executing a first portion of said first type of instruction, said execution stage further having second address generating means for generating second control store address signals, and said execution stage further having firmware means for generating a done signal;

said address stage having said first control store means coupled to said multiplexer means responsive to said select signal in said first state for reading out a second firmware word at a location specified by said second control store address signals, said address stage further having second executing means responsive to signals from said second firmware word for executing a second portion of said first type of instruction; said instruction stage having said second means responsive to said done signal for restarting said instruction stage of said production line.

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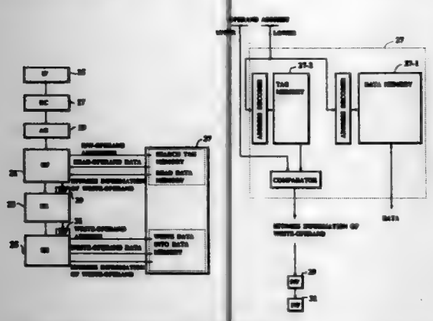
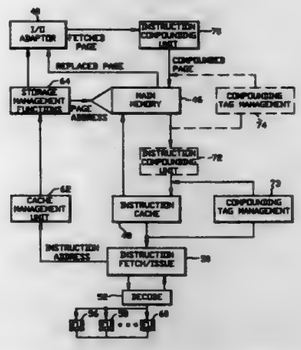
5,197,134
PIPELINE PROCESSOR FOR PERFORMING WRITE INSTRUCTION BY REFERRING TO CACHE MEMORY SEARCH RESULT OBTAINED DURING IDLING STATE OF OPERAND READING CYCLE
Kiyotaka Sassi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 21, 1990, Ser. No. 525,774
Claims priority, application Japan, May 19, 1989, 1-124533
Int. Cl.[5] G06F *9/30, 9/38*
U.S. Cl. 395—375 2 Claims



1. A pipeline processor comprising:
an instruction fetching part for fetching a machine language instruction;
a decoding part receiving the fetched instruction and outputting a decoded instruction, indicative of the type of instruction fetched;
an address generating part receiving said decoded instruction and outputting an address;
an operand accessing part for accessing operand data from a cache memory according to the address generated by said address generating part, said operand accessing part searching a tag storing area of the cache memory for the generated address where data is to be written, when the machine language instruction is a write instruction;
a first flag memory for holding a result of the search;
an executing part for executing the instruction;
a second flag memory for holding the contents of said first flag memory; and
a writing part for writing data into the cache memory after referring to the contents of said second flag memory.

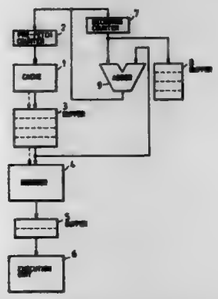
5,197,135
MEMORY MANAGEMENT FOR SCALABLE COMPOUND INSTRUCTION SET MACHINES WITH IN-MEMORY COMPOUNDING
Richard J. Eickemeyer, Endicott; Stamatis Vassiliadis, Vestal, and Bartholomew Blaner, Newark Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 26, 1990, Ser. No. 543,458
Int. Cl.[5] G06F *9/38*
U.S. Cl. 395—375 15 Claims

1. In a computer system capable of concurrently executing up to N instructions in a sequence of scalar instructions, the sequence including compounding tags associated with the scalar instructions, the compounding tags having values conditioned to indicate how many instructions are to be concurrently executed, a mechanism for managing compounding tag values of scalar instructions which are stored in a real memory of the computer system, the mechanism comprising:
a merging means connected to the real memory for merging a modified instruction from the real memory with non-modified instructions in the real memory; and
a tag reduction unit connected to the merging means and to the real memory for reducing the values of the compounding tags of the modified instruction and up to N−1 of the



instructions in the real memory with which the modified instruction could be compounded.

5,197,136
PROCESSING SYSTEM FOR BRANCH INSTRUCTION
Kozo Kimura; Tokuzo Kiyohara, and Toshimichi Matsuzaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 269,171, Nov. 9, 1988, abandoned. This application Nov. 19, 1990, Ser. No. 614,680
Claims priority, application Japan, Nov. 12, 1987, 62-286065; Nov. 12, 1987, 62-286066
Int. Cl.[5] G06F *9/40*
U.S. Cl. 395—375 4 Claims

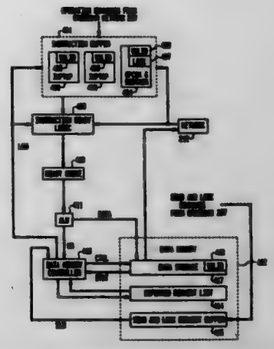


1. A processing system for executing a stored program of instructions including dedicated decoding and execution means for processing branch instructions, comprising:
a memory for storing instructions including a branch instruction and a branch destination instruction and responsive to first and second address signals for supplying said instructions;
an instruction pre-fetch address register storing a periodically-updated first address and supplying said first address to said memory for reading the instructions from the memory;
a branch instruction pre-fetch address register storing a second address and supplying said second address to said memory and to said instruction pre-fetch address register for reading the branch destination instruction from the memory;
a first execution unit including an instruction decoder for providing execution control signals in response to decoding said instruction;

an instruction buffer receiving said instructions from said memory and sequentially storing the instructions from the memory by use of the periodically-updated address in the instruction pre-fetch address register, the instruction buffer supplying the sequentially stored instructions to the first execution unit, the first execution unit decoding the instructions supplied by the instructions buffer to supply decoded instruction commands;
a branch instruction buffer receiving one of said instructions from said memory and storing the instruction which is read from the memory by use of the branch destination address in the branch instruction pre-fetch address register, the branch instruction buffer supplying the branch destination instruction to the first execution unit, the first execution unit decoding the instruction supplied by the branch instruction buffer to supply said control signals;
a calculator for calculating the branch destination address;
said decoder including an instruction control circuit for decoding instructions supplied by said instruction buffer and, detecting a branch instruction and, in response, selectively supplying commands for transferring said instruction to a second execution unit and supplying a control signal to said second execution unit for calculating said branch destination address; and
said second execution unit for executing the commands generated by the instruction control circuit;
wherein the instruction control circuit is operative to detect a conditional branch instruction;
wherein when the instruction control circuit detects the conditional branch instruction, the instruction control circuit
(i) prevents a command of the conditional branch instruction from being transferred to the second execution unit,
(ii) enables the calculation of the branch destination address by the calculator,
(iii) stores a result of the calculation into the branch instruction pre-fetch address register,
(iv) reads the branch destination instruction corresponding to the branch destination address from the memory,
(v) stores the branch destination instruction into the branch destination buffer,
(vi) interrupts decoding until execution of the instructions decoded prior to the conditional branch instruction is completed,
(vii) waits for a determination of a result of calculation,
(viii) determines whether establishment of a branch is present or absent after the result is determined, and
(ix) selectively (a) disables (I) the decoded instructions which follow the conditional branch instruction and (II) generation of a command after decoding of the branch destination instruction stored in the branch destination instruction buffer and (III) transfer of the command to the execution unit in cases where the branch is established, or (b) causes execution of the commands of the decoded instructions which follow the branch instruction by the second execution unit in cases where the branch is not established.

5,197,137
COMPUTER ARCHITECTURE FOR THE CONCURRENT EXECUTION OF SEQUENTIAL PROGRAMS
Manoj Kumar, Yorktown Heights, and Ambuj Goyal, Amawalk, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 28, 1989, Ser. No. 387,552
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—375 10 Claims

1. A computer system for concurrently processing a sequence of program instructions of mixed first and second types, comprising:
instruction memory means for holding said sequence of program instructions and for providing successive instructions from said sequence in groups of M instructions where M is an integer greater than one;
M instruction dispatch means, coupled to receive respectively different ones of the M instructions provided by said instruction memory means, for executing each respective one of the instructions of said first type directly and for generating a respective plurality of primitive operations representing each respective one of the instructions of said second type;
N instruction operation execution means, where N is an integer greater than one, for concurrently executing ones of the primitive operations provided by said M dispatch means; and



network means, coupled to each of said M instruction dispatch means and to each of said N instruction operation execution means, for distributing the primitive operations provided by any of said M instruction dispatch means among selected ones of said N instruction operation execution means;
wherein each of said M instruction dispatch means directs each of said plurality of primitive operations generated from one of said instructions of said second type to a respective one of said N instruction operation executions means via said network means, responsive to said one instruction of said second type.

5,197,138
REPORTING DELAYED COPROCESSOR EXCEPTIONS TO CODE THREADS HAVING CAUSED THE EXCEPTIONS BY SAVING AND RESTORING EXCEPTION STATE DURING CODE THREAD SWITCHING
Steven O. Hobbs, Westford, Mass., and Hai Huang, Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Dec. 26, 1989, Ser. No. 457,144
Int. Cl.[5] G06F *9/00, 9/46, 15/16, 15/347*
U.S. Cl. 395—375 25 Claims

22. A data processing system comprising:
(a) a main processor including means for executing instructions, wherein said mean for executing instruction includes means for issuing coprocessor instructions;
(b) a coprocessor coupled to said main processor to receive the issued coprocessor instructions, said coprocessor including means for executing said coprocessor instructions on an asynchronous basis with respect to said main processor such that the coprocessor executes issued coprocessor instructions simultaneously while the main processor executes further instructions; said means for executing coprocessor instructions including means for generating coprocessor exceptions; and coprocessor further including means for disabling execution of further issued coprocessor instructions in response to a coprocessor excep-

tion, and means for transmitting to said main processor a coprocessor disabled fault signal upon receipt of a coprocessor instruction issued form said main processor when execution of further issued coprocessor instructions is disabled; said coprocessor being coupled to said main processor for transmission of said disabled fault signal from said coprocessor to said main processor and for permitting said main processor to read exception state information from said coprocessor;

wherein said main processor includes exception reporting means for reporting said exception state information to a code thread having an instruction having caused said exception to be generated when said instruction is executed by said coprocessor, said exception reporting means including:

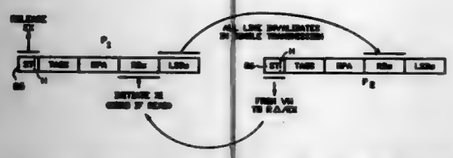
(i) disabled fault processing means responsive to said disabled fault signal for reporting said exception information to said code thread from a thread descriptor area of memory allocated to said code thread when said exception is indicated in said thread descriptor during execution of said code thread by said main processor, and when said exception information is not indicated in said thread descriptor area of memory during execution of said code thread by said main processor, reporting said exception information by reading said exception information from said coprocessor.

5,197,139

CACHE MANAGEMENT FOR MULTI-PROCESSOR SYSTEMS UTILIZING BULK CROSS-INVALIDATE

Philip G. Emma, Danbury, Conn.; Joshua W. Knight, Mohegan Lake; James H. Pomerene, Chappaqua, both of N.Y.; Thomas R. Puzak, Ridgefield, Conn.; Rudolph N. Rechtschaffen, Scarsdale, N.Y., and Frank J. Sparacio, Sarasota, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1990, Ser. No. 505,198
Int. Cl.[5] G06F *12/10, 12/16*
U.S. Cl. 395—400 7 Claims



1. A store through cache architecture for a tightly coupled multi-processor system comprising a plurality of processors and a main storage, each of said processors having a cache comprising:

a dynamic lookaside table storing a plurality of virtual address translations, said dynamic lookaside table being addressed by a virtual address and providing as an output a real page address;

said dynamic lookaside table having a plurality of entries, each of said entries including, in addition to a real page address, status bits recording read only, exclusive, invalid, and valid nonresident status, residence bits recording residence of individual lines in a page, and local change bits recording those lines in the page which have been written to during exclusive resident status; and

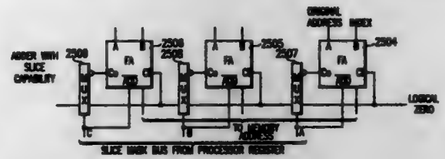
transmission means connecting each of said caches for transmitting a single word containing said local change bits upon release of exclusivity by one processor for invalidating corresponding residence bits in the dynamic lookaside table entices in dynamic lookaside tables in other processors.

5,197,140

SLICED ADDRESSING MULTI-PROCESSOR AND METHOD OF OPERATION

Keith Balmer, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 17, 1989, Ser. No. 437,946
Int. Cl.[5] G06F *12/00, 15/00, 7/33, 7/50*
U.S. Cl. 395—400 13 Claims



1. A multi-processing system comprising:

m memories, each memory having a unique addressable space, said unique addressable spaces of said m memories being adjacent with the total addressable space of said m memories defined by a single address word having n bits;

addition circuitry for generating a next address word for access to said m memories from said single address word and an index value, said addition circuitry including

n one bit adder circuits disposed in order from a least significant bit to a most significant bit, each of said one bit adder circuit having a first input for receiving a corresponding bit of said single address word, a second input for receiving a corresponding bit of said index value, a carry-out output, a carry-in input, and a resultant output, the resultant outputs of said n one bit adder circuits forming corresponding bits of said next address word

n multiplex circuits, one said multiplex circuit associated with each said one bit adder circuit, each said multiplex circuit having two inputs and a single output, one of said inputs connected to said carry-out output of said associated one bit adder circuit, the other of said inputs connected to said carry-in input of said associated one bit adder circuit and said output connected to the carry-in input of the next most significant one bit adder circuit.

5,197,141

SOFTWARE CONTROLLED METHOD OF ISSUING HARDWARE CONTROL COMMANDS TO MEMORY CONTROLLER FROM PREFETCH UNIT BY COMBINING REQUEST CODE AND ADDRESS SPECIFIED IN PROGRAM INSTRUCTIONS

Mikio Ito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

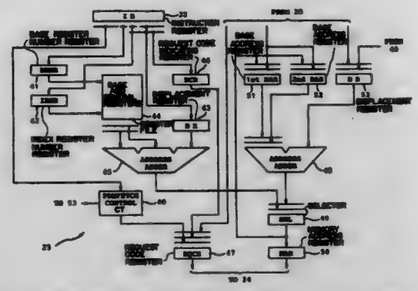
Continuation of Ser. No. 302,347, Jan. 27, 1989, abandoned. This application Oct. 28, 1991, Ser. No. 785,229
Claims priority, application Japan, Jan. 30, 1988, 63-18550; Jan. 30, 1988, 63-18554
Int. Cl.[5] G06F *9/40, 9/44, 12/00*
U.S. Cl. 395—425 9 Claims

1. A method of issuing a request to a memory buffer control unit from a prefetch control unit, for use in a data processing system, which allows hardware control software to perform

hardware/firmware functions, said hardware control software comprising ordinary instructions available to usual software and hardware control support instructions which said usual software cannot use, said hardware control support instructions comprising a request code set instruction containing a request code field for making said memory buffer control unit carry out a specific process and a specific access instruction containing an address syllable, said request comprising a request code and a memory address, said method comprising the steps of:

(a) executing said request code set instruction in said prefetch control unit, said request code set instruction being supplied from a memory buffer control unit;

(b) generating said request code based on said request code set instruction;



(c) preliminarily holding said request code in a register in said prefetch control unit on execution of said request code set instruction;

(d) executing said specific access instruction in said prefetch control unit, said specific access instruction being supplied from said memory buffer control unit;

(e) generating said memory address based on said address syllable; and

(f) delivering said memory address and said request code as said request from said prefetch control unit to said memory buffer control unit;

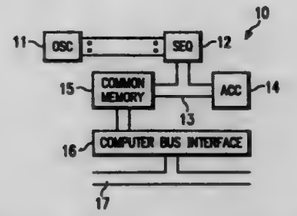
whereby a user has more flexible access to said memory buffer control unit by utilizing hardware control software.

5,197,142

MEMORY ARBITRATION BETWEEN TIMEKEEPING CIRCUITRY AND GENERAL PURPOSE COMPUTER

Clark R. Williams, and William J. Podkowa, both of Plano, Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Continuation of Ser. No. 208,890, Jun. 17, 1988, abandoned. This application Jan. 22, 1991, Ser. No. 644,413
Int. Cl.[5] G06F *13/14*
U.S. Cl. 395—425 37 Claims



1. A method for sharing time data, between a general-purpose computer system and a timekeeping system, in a common memory, comprising the steps of:

periodically performing memory access cycles from said timekeeping system, each of said memory access cycles comprising at least one write operation which writes a value corresponding to the current time, said memory access cycles being separated by periods of non access to said common memory by said timekeeping system, and

a) intermittently writing data from said general-purpose system into a first memory section of said common memory;

b) after each said step a), performing a block transfer of the data written during said step a) from said first memory section, to a second memory section in said common memory;

c) during said memory access cycles, writing data from said timekeeping system to said second memory section if said general-purpose system has not written data into said first memory section during the present memory access cycle; and

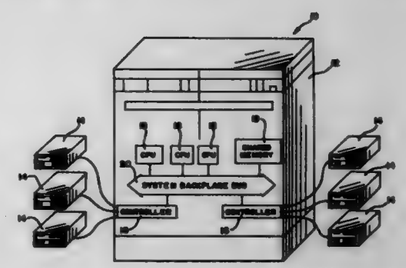
d) after said step c), performing a block transfer of the data written during said step c) from said second memory section to said first memory section.

5,197,143

DEVICE AND METHOD FOR DISTRIBUTING INFORMATION IN A COMPUTER SYSTEM

Richard F. Lary, Colorado Springs, Colo.; William R. Biedermann, Sudbury, Mass.; Timothy E. Nerger, Colorado Springs, and John C. Lyle, Manitou Springs, both of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 1, 1990, Ser. No. 591,088
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—425 10 Claims



3. A multistaged pipeline logic control device for distributing information in a computer system having a controller and a plurality of drive ports connected to a plurality of data storage devices, said controller including an internal communications bus for transmitting information through said controller to a selected one of said plurality of data storage devices, said multistaged pipeline logic control device comprising:

a first plurality of drive ports, each having an in use and an available status and each connected to a respective one of said plurality of data storage devices;

a second plurality of drive ports, each having an in use and an available status and each connected to a respective one of said plurality of said data storage devices;

first interface means coupled to said first plurality of drive ports for directing information to one of said first plurality of drive ports;

second interface means coupled to said second plurality of drive ports for directing information to one of said second plurality of drive ports;

first validation means for affirming a transferral of information through said controller to said data storage devices and for monitoring the status of said first plurality of drive ports, said first validation means coupled to said internal communications bus and having a first data line and a second data line, said first data line connected to said first interface means and said second data line connected to said second interface means, said first and second data lines used for transmitting information between said first

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validation means and said first and second interface means respectively;

second validation means for affirming a transferral of information through said controller to said data storage devices and for monitoring the status of said second plurality of drive ports, said second validation means coupled to said internal communications bus and having a third data line and a fourth data line, said third data line connected to said second interface means and said fourth data line connected to said first interface means, said third and said fourth data lines used for transmitting information between said second validation means and said second and first interface means respectively; and

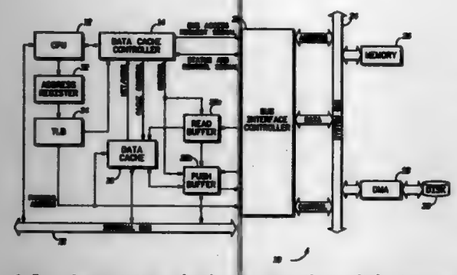
selected drive port status line means connecting said first validation means to said second validation means for communicating the status of said selected one of said plurality of drive ports between said first and said second validation means, said first and said second validation means operating on said status of said requested drive port to affirm a transferral of information to said selected drive port.

5,197,144

DATA PROCESSOR FOR RELOADING DEFERRED PUSHES IN A COPY-BACK DATA CACHE

Robin W. Edenfield, and William B. Ledbetter, Jr., both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1990, Ser. No. 484,592
Int. Cl.[5] G06F *12/12*
U.S. Cl. 395—425 **10 Claims**



1. In a data processor having an execution unit for generating requests for a plurality of addressable data entries and a bus interface controller, coupled to a main memory, via a system bus, said bus interface controller retrieving said plurality of addressable data entries from said main memory and loading said plurality of addressable data entries into a copy-back cache memory, in response to a request for a line read transfer generated by a cache controller, and transferring a dirty addressable data entry, selected for replacement by said cache controller, from a first cache memory temporary holding register to said main memory, a method for reloading said cache memory with said dirty addressable data entry, upon an occurrence of an abnormal termination of said line read transfer, comprising the steps of:

providing, via said cache controller, said request for said line read transfer, and simultaneously transferring a first read address provided by said execution unit, to said bus interface controller, at such a time as said dirty addressable data entry is invalidated in said cache memory by said cache controller, and written from said cache memory into said holding register, said first read address corresponding to a first addressable data entry requested by said execution unit;

commencing transfer of said first addressable data entry, corresponding to said first read address, from said main memory to said bus interface controller, via said system bus; and

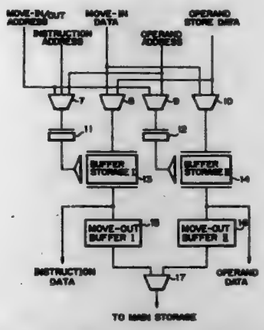
reloading said dirty addressable data entry from said first holding register into said cache memory, if said bus interface controller indicates said abnormal termination of said line read transfer of said first addressable data entry, and revalidating, via said cache controller, said dirty addressable data entry in said cache memory.

5,197,145

BUFFER STORAGE SYSTEM USING PARALLEL BUFFER STORAGE UNITS AND MOVE-OUT BUFFER REGISTERS

Yoshimoto Kitamura, Tokyo, and Seishi Okada, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1989, Ser. No. 409,711
Claims priority, application Japan, Sep. 20, 1988, 63-233702
Int. Cl.[5] G06F *13/28*
U.S. Cl. 395—425 **13 Claims**



1. A buffer storage system provided between a main storage and an instruction executing portion, the instruction executing portion fetching data consisting of instructions and operands and executing the instructions, said buffer storage system comprising:

a plurality of buffer storage units each storing the data consisting of the instructions and the operands, the data stored in each of the plurality of buffer storage units being identical;

move-out buffer register means, provided between said plurality of buffer storage units and the main storage; and

buffer storage control means, coupled to said plurality of buffer storage units and said move-out buffer register means, for controlling transfer of a part of the data required to be moved out from each of said plurality of buffer storage units to a corresponding portion of said move-out buffer register means, and then controlling transfer of the data from said move-out buffer register means to the main storage, when the data held in said buffer storage units is required to be moved out to the main storage,

the transfer of the parts of the data from said plurality of buffer storage units to the corresponding portions of said move-out buffer register means being concurrently carried out, and the parts of the data concurrently transferred from all of said buffer storage units constituting the whole of the data required to be moved out.

5,197,146

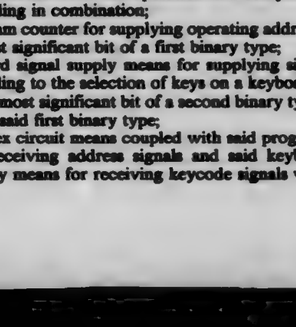
METHOD FOR MAINTAINING CACHE COHERENCE IN A MULTIPROCESSOR COMPUTER SYSTEM

Ross V. LaFetra, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 21, 1989, Ser. No. 369,152
Int. Cl.[5] G06F *12/00, 13/00*
U.S. Cl. 395—425 **12 Claims**

1. A method for maintaining cache coherence in a multiprocessor computer system having a potential for duplication of data in a plurality of storage locations identifiable as coherence blocks, said multiprocessor computer system employing double-linked lists for identifying a previous master of said data and a next master of said data, said method comprising the steps of:

passing a current address of a current master from the current master to the previous master, wherein the current address is the location to which the current master will respond;



passing the current address of the current master from the current master to the next master;

passing a current index of the current master from the current master to the previous master, wherein the current index is a collection of information needed by the current master to use one of the coherence blocks; and

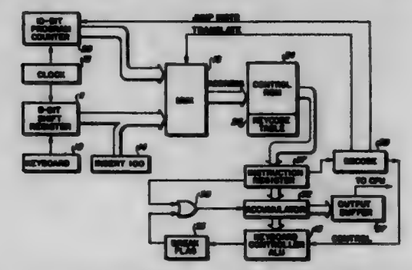
passing the current index of the current master from the current master to the next master.

5,197,147

KEYCODE TRANSLATION SYSTEM FOR PRODUCING TRANSLATED KEYCODE SIGNALS RESPONSIVE TO KEYBOARD SIGNALS WHICH ACT AS A POINTER TO KEYCODE TRANSLATION TABLE

Marty L. Long, Mesa, and Henry Wurzburg, Chandler, both of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 5, 1990, Ser. No. 474,917
Int. Cl.[5] G06F *15/02*
U.S. Cl. 395—500 **11 Claims**



1. A keycode translation system for receiving keycode signals in one form from a keyboard and translating such keycode signals to another form for operation in a computer, said system including in combination;

a program counter for supplying operating addresses having a most significant bit of a first binary type;

keyboard signal supply means for supplying signals corresponding to the selection of keys on a keyboard and having a most significant bit of a second binary type different from said first binary type;

multiplex circuit means coupled with said program counter for receiving address signals and said keyboard signal supply means for receiving keycode signals which act as pointers to a keyboard translation table and for producing address signals on the output thereof;

accumulator means for storing translated signals;

control ROM means connected to the output of said multiplex circuit means;

decoder means coupled with said control ROM means for supplying translate instruction signals to said multiplex circuit means to produce address signals on the output thereof corresponding to signals from said keyboard signals supply means;

a keycode translation table means appended to said control ROM means, wherein address signals having a most significant bit of said second binary type appearing on the output of said multiplex circuit means cause said control ROM means to select translated keycode signals from said keycode translation table means corresponding to said translated keycode signals for supplying such translated keycode signals corresponding to signals from said keyboard signal supply means to said accumulator means for temporary storage therein; and

means for receiving said translated keycode signals for operation in response thereto.

5,197,148

METHOD FOR MAINTAINING DATA AVAILABILITY AFTER COMPONENT FAILURE INCLUDED DENYING ACCESS TO OTHERS WHILE COMPLETING BY ONE OF THE MICROPROCESSOR SYSTEMS AN ATOMIC TRANSACTION CHANGING A PORTION OF THE MULTIPLE COPIES OF DATA

Marion L. Blount, Mahopac; Anthony Cocchi, Larchmont; Mark F. Mergen, Mount Kisco, all of N.Y.; Stephen P. Morgan, and Katalin A. V. Rader, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 126,820, Nov. 30, 1987, abandoned.
This application Jul. 18, 1990, Ser. No. 554,105
Int. Cl.[5] G06F *15/00*
U.S. Cl. 395—575 **3 Claims**

1. A method for managing multiple copies of data, one of said multiple copies of data defining a state, in a computerized processing system comprising the computer implemented steps of:

establishing a plurality of microprocessor systems each having a corresponding virtual memory management facility;

interconnecting said microprocessor systems in a cluster configuration with a plurality of communication links;

maintaining said state of one of said multiple copies of data at each of said plurality of microprocessor systems by message communications through said communications links from at least one of said microprocessor systems;

completing with at least one of said microprocessor systems an atomic transactions changing portion of said multiple copies of data in one of said microprocessor systems, thereby establishing a commit of said transaction; and

preventing access to said portion of data by any of said microprocessor systems other than said at least one of said microprocessor systems completing said atomic transaction until said completing of said atomic transaction.

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DESIGN PATENTS

GRANTED Mar. 23, 1993

ERRATA

For CLASS	See PATENT NO.
D18-012	334,203
D18-024	334,203
D18-039	334,205

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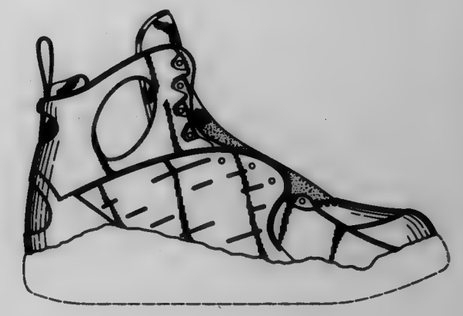
DESIGNS

MARCH 23, 1993

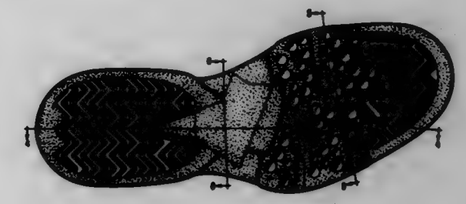
334,088
SHOE UPPER
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 12, 1992, Ser. No. 881,830
Term of patent 14 years
U.S. Cl. D2—314

334,089
SHOE UPPER
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,716
Term of patent 14 years
U.S. Cl. D2—314

334,090
SHOE UPPER
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 12, 1992, Ser. No. 881,836
Term of patent 14 years
U.S. Cl. D2—314



334,091
SHOE OUTSOLE
Steven McDonald, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,717
Term of patent 14 years
U.S. Cl. D2—320



334,092
BOTTOM OF A SHOE SOLE
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 12, 1992, Ser. No. 881,833
Term of patent 14 years
U.S. Cl. D2—320

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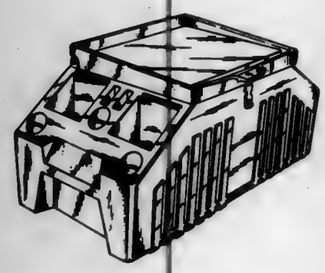
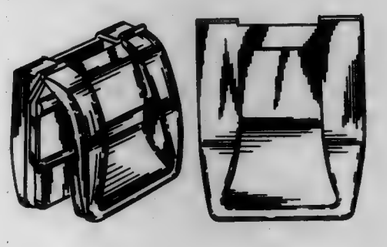
334,093
GAME CARRIER
Scott J. Frodeman, 4 Balfour Dr., Wappingers Falls, N.Y. 12590-4802
Filed Aug. 9, 1990, Ser. No. 564,554
Term of patent 14 years
U.S. Cl. D3—36

334,094
STORAGE CONTAINER FOR FISHING GEAR
Dennis G. Braid, 30035 Grandi Floras, Canyon Country, Calif. 91351
Filed Feb. 26, 1991, Ser. No. 661,451
Term of patent 14 years
U.S. Cl. D3—78



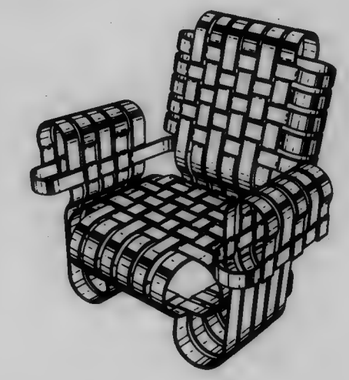
334,095
POWERED SCRUBBER
Eleanor A. Beets, and Claude A. Beets, both of 300 Walker Springs Rd., Apt. 19B, Knoxville, Tenn. 37923
Filed Nov. 29, 1990, Ser. No. 619,689
Term of patent 14 years
U.S. Cl. D4—102

334,096
CLAMP BODY
Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.
Filed Jan. 31, 1991, Ser. No. 648,347
Term of patent 14 years
U.S. Cl. D6—328



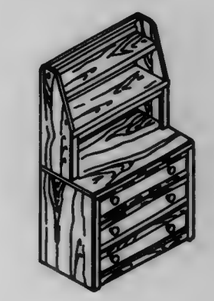
334,097
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex SARL, Oyonnax, France
Filed Oct. 17, 1990, Ser. No. 599,232
Claims priority, application Int'l Pat. Institute, Apr. 17, 1990, DMA/001223
Term of patent 14 years
U.S. Cl. D6—370

334,098
CHAIR
Frank O. Gehry, Santa Monica, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 24, 1990, Ser. No. 587,367
Term of patent 14 years
U.S. Cl. D6—369



334,099
CHAIR
Michael Yeh, Hacienda Heights, Calif., assignor to Coaster Co. of America, Inc., Santa Fe Springs, Calif.
Filed May 16, 1990, Ser. No. 523,923
Term of patent 14 years
U.S. Cl. D6—370

334,100
COMBINED DRAWER CHEST AND HUTCH
Carol B. Wheeless, and Harold Van Ambert, both of High Point, N.C., assignors to Ladd Furniture, Inc., High Point, N.C.
Filed Jan. 3, 1992, Ser. No. 816,940
Term of patent 14 years
U.S. Cl. D6—438



334,101
COMPUTER SUPPORT STAND
Edward Moore, L'Acadie, Canada, assignor to 2749394 Canada Inc., Montreal, Canada
Filed Sep. 6, 1990, Ser. No. 578,176
Term of patent 14 years
U.S. Cl. D6—462

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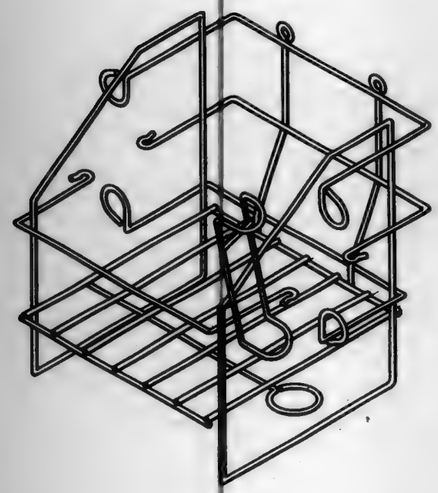
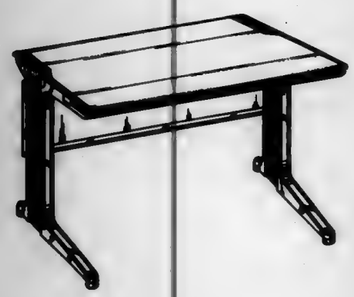
334,102
RACK FOR SUPPORTING JANITORIAL CLEANING SOLUTION CONCENTRATE CONTAINERS AND SPRAY GUN APPLICATOR
John R. Spriggs, Minneapolis; James D. Decker, Apple Valley, and James L. Copeland, Burnsville, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.
Filed Oct. 23, 1991, Ser. No. 781,288
Term of patent 14 years
U.S. Cl. D6—462

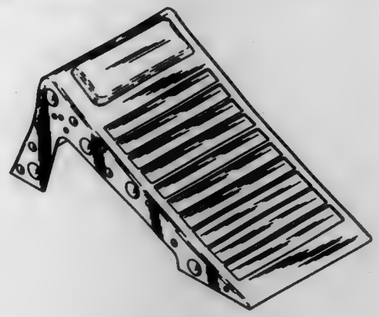


334,103
DESK
Seiji Koguma, Warabi, Japan, assignor to Okamura Corp., Yokohama, Japan
Filed Nov. 16, 1989, Ser. No. 438,153
Claims priority, application Japan, Sep. 1, 1989, 1-31692
Term of patent 14 years
U.S. Cl. D6—484

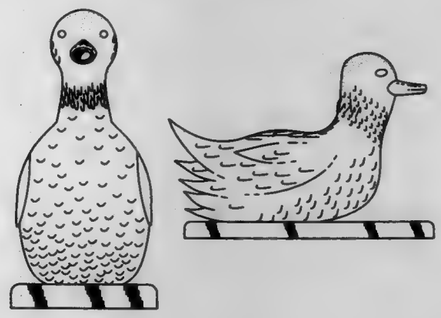


334,104
TABLE BASE
Edsel E. Murry, Coldwater, Miss., assignor to Chromcraft Furniture Corporation, Scanlobia, Miss.
Filed Nov. 27, 1991, Ser. No. 800,402
Term of patent 14 years
U.S. Cl. D6—499

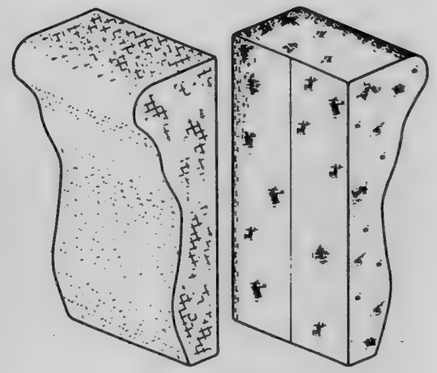
334,105
BATHTUB RECLINER
Timothy C. Bridges, 1625 Sunset Ave., Henderson, N.C. 27536
Filed Oct. 19, 1990, Ser. No. 600,075
Term of patent 14 years
U.S. Cl. D6—502



334,106
HAND LOTION DISPENSER
Cherrie J. Piper, 206 Rte. 4, Costley Rd., LaGrange, Ga. 30240
Filed Oct. 4, 1990, Ser. No. 592,878
Term of patent 14 years
U.S. Cl. D6—542

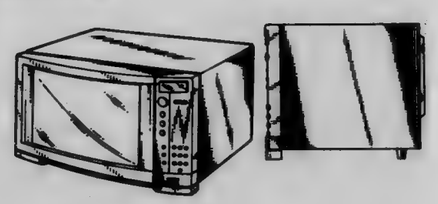


334,107
COMBINATION CERVICAL PILLOW AND COVER THEREFOR
Larry A. Johnson, 10741 Adams Cir., Orange, Calif. 92669
Filed Dec. 27, 1990, Ser. No. 634,315
Term of patent 14 years
U.S. Cl. D6—601

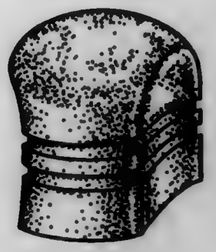


334,108
FOOD WARMER
John W. Fisher, 197 Nichols St., Gardner, Mass. 01440
Filed Jun. 27, 1990, Ser. No. 544,476
Term of patent 14 years
U.S. Cl. D7—323

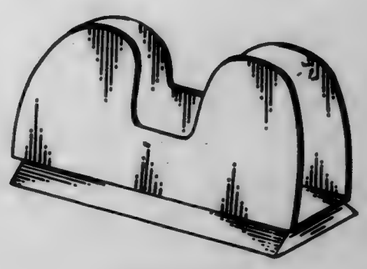
334,109
MICROWAVE OVEN
Chun S. Kim, Kyungki, Rep. of Korea, assignor to Gold Star Co. Ltd., Seoul, Rep. of Korea
Filed Jul. 1, 1992, Ser. No. 907,212
Claims priority, application Rep. of Korea, Feb. 19, 1992, 20282/1992[U]
Term of patent 14 years
U.S. Cl. D7—351



334,110
HANDLE FOR COOKWARE
George Schmidt, Douglaston, N.Y., assignor to Estia Corp., Lyndhurst, N.J.
Filed Dec. 20, 1991, Ser. No. 810,923
Term of patent 14 years
U.S. Cl. D7—393



334,111
TACO HOLDER
Timothy I. Yockey, and Susan B. Yockey, both of 722-A Ohio Pike, Cincinnati, Ohio 45245
Filed Mar. 15, 1990, Ser. No. 494,262
Term of patent 14 years
U.S. Cl. D7—504



334,112
COMBINED CUP AND PLATE HOLDER
Gary J. Carter, 3222 S. 28 St., #303, Alexandria, Va. 22302
Filed Oct. 31, 1990, Ser. No. 607,872
Term of patent 14 years
U.S. Cl. D7—616

334,118

334,120

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334,113
FOOD CONTAINER
Rodney Lewis, New Rochelle, and John Watson, Salem, both of N.Y., assignors to Slim Fast Foods Company, New York, N.Y.
Filed Jun. 13, 1991, Ser. No. 715,117
Term of patent 14 years
U.S. Cl. D7—629

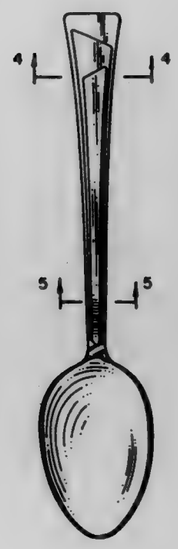
334,114
CONTAINER
JoEllen N. Narsutis, Oak Park, Ill., assignor to Kraft General Foods, Inc., Northfield, Ill.
Filed Apr. 12, 1991, Ser. No. 694,991
Term of patent 14 years
U.S. Cl. D7—629

334,115
SPOON
Colin B. Richmond, Vernon Center, N.Y., assignor to Oneida Limited, Oneida, N.Y.
Filed Jan. 11, 1991, Ser. No. 713,333
Term of patent 14 years
U.S. Cl. D7—660

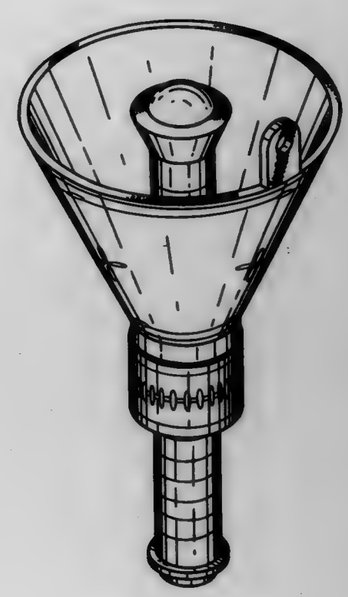
334,116
SPOON
Colin B. Richmond, Vernon Center, N.Y., assignor to Oneida Limited, Oneida, N.Y.
Filed Jun. 10, 1991, Ser. No. 712,630
Term of patent 14 years
U.S. Cl. D7—661

334,117
SPOON
Diane Shane-Schuldt, Sherrill, N.Y., assignor to Oneida Limited, Oneida, N.Y.
Filed Jan. 9, 1991, Ser. No. 639,162
Term of patent 14 years
U.S. Cl. D7—662

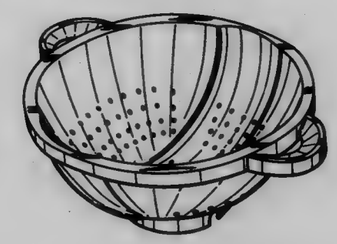
334,118
SPOON
Paul E. Gebhardt, Oneida, N.Y., assignor to Oneida Limited, Oneida, N.Y.
Filed Jul. 15, 1991, Ser. No. 730,253
Term of patent 14 years
U.S. Cl. D7—662



334,120
FUNNEL WITH OVERFLOW PREVENTING MEANS
Edward N. Faught, P.O. Box 332, Pinconning, Mich. 48650
Filed Jan. 8, 1991, Ser. No. 638,655
Term of patent 14 years
U.S. Cl. D7—709



334,119
COLANDER FOR PASTA
Giorgetto Giugiaro, Turin, Italy, assignor to Fratelli Guzzini, S.p.A., Recanati, Italy
Filed Feb. 5, 1991, Ser. No. 650,650
Claims priority, application Italy, Aug. 8, 1990, 21635/90[U]
Term of patent 14 years
U.S. Cl. D7—667



334,121
SET OF RAILROAD TIE CLAMPS FOR USE IN LANDSCAPING
William Van Handel, III, 55 Norwood Ave., Clifton, N.J. 07011
Filed Aug. 7, 1990, Ser. No. 563,337
Term of patent 14 years
U.S. Cl. D8—1

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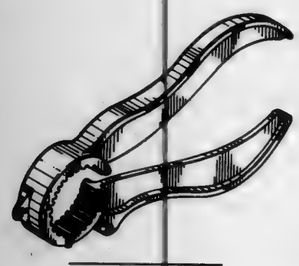
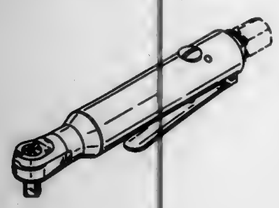
334,122
SOCKET WRENCH
Can Bang, 2001 Jane Street Apt. 812, Toronto Ontario, Canada M3N 2H8
Filed Dec. 20, 1990, Ser. No. 630,940
Term of patent 14 years
U.S. Cl. D8—21

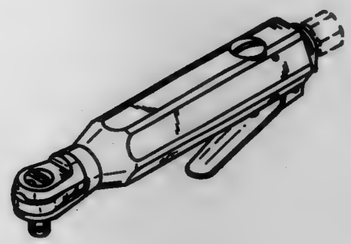
334,123
BEVERAGE CONTAINER OPENER
Walter P. Barclay, and D. C. Caldwell, both of Kelowna, Canada, assignors to Caldwell Construction Corporation, Kelowna, Canada
Filed Mar. 19, 1981, Ser. No. 672,721
Term of patent 14 years
U.S. Cl. D8—39



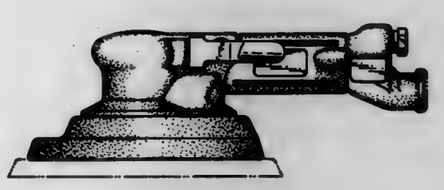
334,124
PNEUMATIC SOCKET WRENCH
Osamu Izumisawa, Tokyo, Japan, assignor to Shinano Pneumatic Industries, Inc., Kamiminochi, Japan
Filed Aug. 27, 1990, Ser. No. 573,668
Term of patent 14 years
U.S. Cl. D8—61



334,125
PNEUMATIC SOCKET WRENCH
Osamu Izumisawa, Tokyo, Japan, assignor to Shinano Pneumatic Industries, Inc., Kamiminochi, Japan
Continuation-in-part of Ser. No. 573,668, Aug. 27, 1990. This application Jan. 23, 1991, Ser. No. 645,007
Term of patent 14 years
U.S. Cl. D8—61



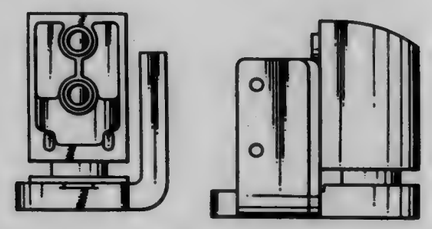
334,126
ORBITAL SANDER
Paul W. Huber, Lancaster, and Eugene G. Jarembek, Cheektowaga, both of N.Y., assignors to Dynabrade, Inc., Clarence, N.Y.
Filed Feb. 1, 1991, Ser. No. 649,687
Term of patent 14 years
U.S. Cl. D8—62



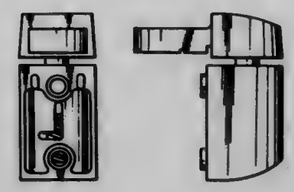
334,127
GAVEL
Robert N. Nellis, 4663 Hessen Rd., Richmond, Mich. 48062
Filed Jan. 15, 1991, Ser. No. 641,578
Term of patent 14 years
U.S. Cl. D8—77

334,128
SCREW DRIVER
Hervé G. Gomas, Evry, France, assignor to Facom (societe anonyme), Morangis, France
Filed Apr. 15, 1991, Ser. No. 685,556
Claims priority, application France, Oct. 17, 1990, 90 6490
Term of patent 14 years
U.S. Cl. D8—83

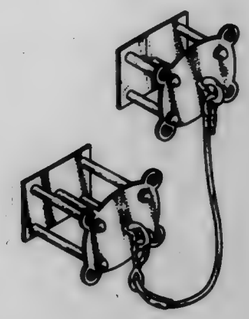
334,129
PIVOT HINGE
Masayoshi Ishikawa, Kurobe, Japan, assignor to YKK Architectural Products, Inc., Tokyo, Japan
Filed Sep. 17, 1990, Ser. No. 583,719
Claims priority, application Japan, Mar. 22, 1990, 2-9641
Term of patent 14 years
U.S. Cl. D8—323



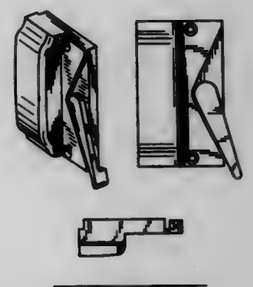
334,130
PIVOT HINGE
Masayoshi Ishikawa, Kurobe, Japan, assignor to YKK Architectural Products, Inc., Tokyo, Japan
Filed Sep. 17, 1990, Ser. No. 583,361
Claims priority, application Japan, Mar. 22, 1990, 2-9640
Term of patent 14 years
U.S. Cl. D8—323



334,131
LOCK ATTACHABLE TO DOOR AND WALL
Ben S. Spaulding, 1274 Grant Rd., Beaver, Wash. 98305
Filed Dec. 7, 1990, Ser. No. 624,265
Term of patent 14 years
U.S. Cl. D8—331



334,132
WINDOW SASH LOCK
Greg R. Wobschall, and Marvin G. Root, both of Owatonna, Minn., assignors to Truth Div. of SPX Corp., Owatonna, Minn.
Filed Aug. 16, 1991, Ser. No. 746,509
Term of patent 14 years
U.S. Cl. D8—337



334,133
SUPPORT FOR METAL REINFORCEMENTS IN POURED CONCRETE
George Hartshaim, P.O. Box 3396, Orange, Calif. 92665
Continuation of Ser. No. 95,993, Sep. 14, 1987, abandoned. This application Dec. 26, 1991, Ser. No. 814,011
Term of patent 14 years
U.S. Cl. D8—354

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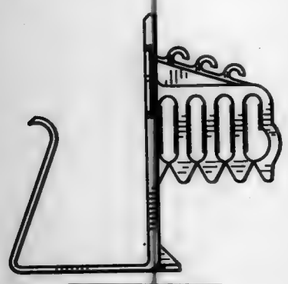
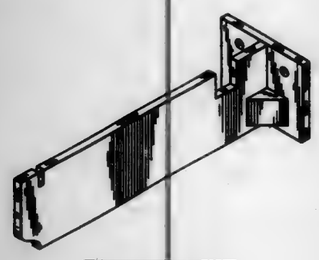
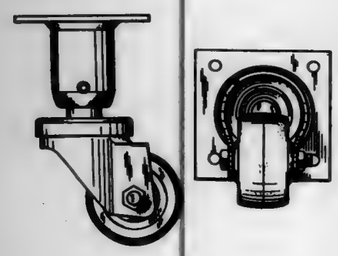
334,134
STUD CLIP FOR ELECTRICAL WIRING
Charles H. Newcomer; Alan K. Caledrige, and Richard N. Sayler, all of P.O. Box 134, Grants Pass, Oreg. 97526
Filed Jun. 27, 1991, Ser. No. 722,245
Term of patent 14 years
U.S. Cl. D8—356



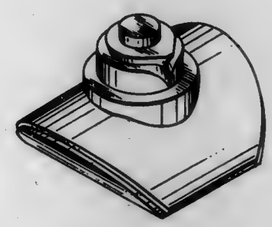
334,135
SUPPORT BRACKET FOR DRAPERY RINGS
Stuart R. Fraker, Arlington; Michael R. Loupe, Fort Worth, and Kitty M. Milliorn, Arlington, all of Tex., assignors to Home Furnishing Discount Club of America, Inc., Arlington, Tex.
Filed Jul. 18, 1991, Ser. No. 734,321
Term of patent 14 years
U.S. Cl. D8—363



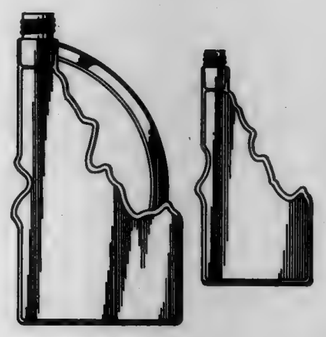
334,136
LEG AND CASTER
Robert C. McCord, Florence, and Raymond G. Couture, Chicopee, both of Mass., assignors to Standex International Corporation, Salem, N.H.
Filed Jan. 28, 1991, Ser. No. 646,333
Term of patent 14 years
U.S. Cl. D8—375



334,137
DISPENSING CONTAINER
Nick Petschek, New York, N.Y., assignor to ReSeal International Limited Partnership, New York, N.Y.
Filed Oct. 11, 1990, Ser. No. 596,344
Term of patent 14 years
U.S. Cl. D9—300

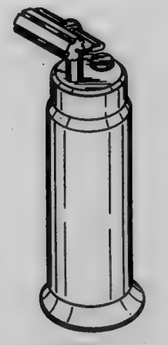


334,138
BOTTLE
Neil H. Larsen, Kimberly, Id., assignor to Idaho Waters Co., Kimberly, Id.
Filed Jan. 10, 1991, Ser. No. 639,697
Term of patent 14 years
U.S. Cl. D9—307

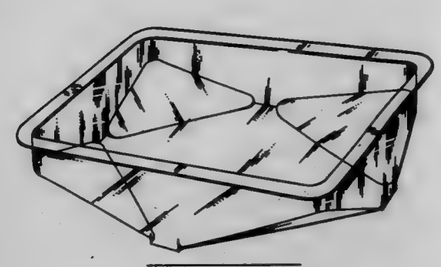


334,139
JAR FOR CONFECTIONERY PRODUCTS
Libero Gozzini, Milan, Italy, assignor to Ferrero Ardennes S.A., Arlon, Belgium
Filed Jan. 18, 1991, Ser. No. 643,646
Claims priority, application Int'l Pat. Institute, Jul. 19, 1990, DMA/001287
Term of patent 14 years
U.S. Cl. D9—318

334,140
COMBINED SHAVING GEL CONTAINER AND APPLICATOR
Lindsey M. Fontenot, 403 Mike St., Houma, La. 70360
Filed Jul. 1, 1991, Ser. No. 723,621
Term of patent 14 years
U.S. Cl. D9—338

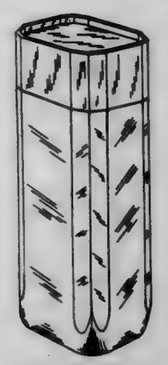


334,141
FOOD TRAY
Angelo Gottofredi, Fidenza, Italy, assignor to Barilla G.E.R. F.LLI - Societa per Azioni, Parma, Italy
Filed Oct. 8, 1991, Ser. No. 773,091
Term of patent 14 years
U.S. Cl. D9—425

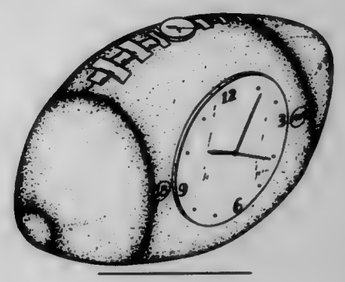


334,142
WATER BOTTLE OPEN-GRIP HANDLE
Paul L. Gagnon, 3714 Via Pacifica Walk, Oxnard, Calif. 93035
Filed Dec. 24, 1990, Ser. No. 633,434
Term of patent 14 years
U.S. Cl. D9—455

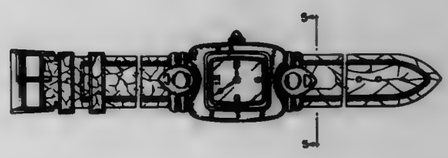
334,143
COMBINED CONTAINER AND CAP
Jan Beerad Rothfos, Hamburg, Fed. Rep. of Germany, assignor to Deutsche Extrakt Kaffee GmbH, Hamburg, Fed. Rep. of Germany
Filed Nov. 27, 1989, Ser. No. 441,439
Term of patent 14 years
U.S. Cl. D9—529



334,144
CALENDAR ALARM CLOCK
Gwo-Jang Chen, No. 53, Tzu Li St., Wu Jih Hsiang, Taichung Hsien, Taiwan
Filed Jul. 30, 1990, Ser. No. 559,928
Term of patent 14 years
U.S. Cl. D10—6



334,145
WRIST-WATCH
Gian F. Zerilli, Milan, Italy, assignor to Giodoro s.r.l., Milan, Italy
Filed Oct. 22, 1990, Ser. No. 600,972
Claims priority, application Italy, May 11, 1990, 21164 B/90
Term of patent 14 years
U.S. Cl. D10—32



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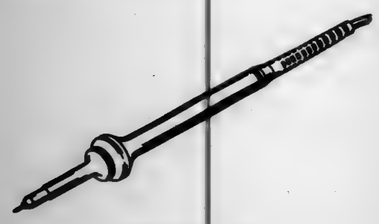
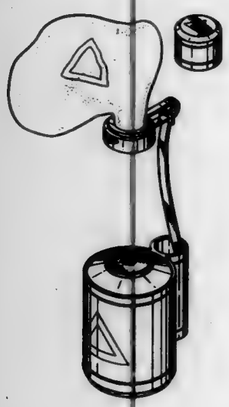
334,146
RULER
James E. Boelling, 1223 SE. Emma Ave., Des Moines, Iowa 50315
Filed Jul. 3, 1991, Ser. No. 725,245
Term of patent 14 years
U.S. Cl. D10—71

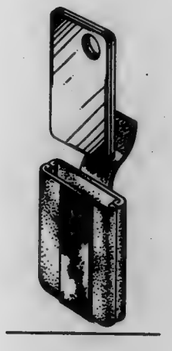
334,147
ELECTRICAL TEST PROBE
Glen Ankstiknaitis, Vancouver, and Mark Nightingale, Camas, both of Wash., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed Jun. 13, 1990, Ser. No. 538,941
Term of patent 14 years
U.S. Cl. D10—80



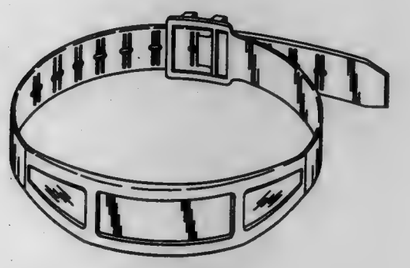
334,148
INFLATABLE DISTRESS SIGNAL
Carol H. McAllister, 8301 Elmcrest La., Huntington Beach, Calif. 92646
Filed Jul. 18, 1991, Ser. No. 731,907
Term of patent 14 years
U.S. Cl. D10—109



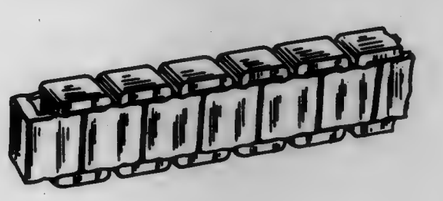
334,149
COMBINED SIGNALING MIRROR AND CARRYING CASE
Danny K. Dobbs, 3115 West Morgan Dr., Tucson, Ariz. 85745
Filed Apr. 1, 1991, Ser. No. 677,960
Term of patent 14 years
U.S. Cl. D10—109



334,150
BRACELET
Jon W. Caddeback, 1632 NE. Perkins Way, Seattle, Wash. 98155, and Mary A. Koehler, 1940 8th Ave. West, Seattle, Wash. 98119
Filed Aug. 22, 1990, Ser. No. 571,436
Term of patent 14 years
U.S. Cl. D11—5



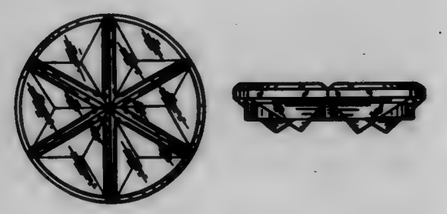
334,151
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A, Zeno, Italy
Filed Jun. 14, 1990, Ser. No. 538,172
Claims priority, application Italy, Dec. 19, 1989, 11776 B/89
Term of patent 14 years
U.S. Cl. D11—12



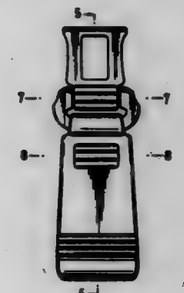
334,152
JEWELRY CHAIN
David Rosenwasser, Savion, Israel, assignor to OroAmerica, Inc., Burbank, Calif.
Filed Jan. 29, 1990, Ser. No. 471,714
Term of patent 14 years
U.S. Cl. D11—13

334,153
EARRING
Jonathan Mandelbaum, Forest Hills, N.Y., assignor to Almond Jewelers Inc., Westbury, N.Y.
Filed Jul. 23, 1992, Ser. No. 919,364
Term of patent 14 years
U.S. Cl. D11—76

334,154
GEMSTONE
David B. Benderly, Roosevelt Island, N.Y., assignor to DBC of New York, Inc., New York, N.Y.
Filed Nov. 19, 1990, Ser. No. 617,043
Term of patent 14 years
U.S. Cl. D11—90

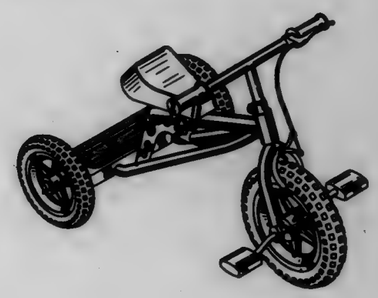


334,155
PULL TAB FOR SLIDE FASTENER
Yasuharu Terada, Ueno, and Chiharu Takemura, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Filed Apr. 24, 1989, Ser. No. 342,564
Claims priority, application Japan, Oct. 24, 1988, 63-41715
The portion of the term of this patent subsequent to Oct. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—221



334,156
COLLAR STAY
Richard H. Sprick, R.R. 3, Box 185, Lake City, Minn. 55041
Filed Nov. 8, 1990, Ser. No. 611,356
Term of patent 14 years
U.S. Cl. D11—222

334,157
TRICYCLE
Roger Tonelli, Elmwood Park, Ill., assignor to Radio Flyer Inc., Chicago, Ill.
Filed Feb. 21, 1991, Ser. No. 658,571
Term of patent 14 years
U.S. Cl. D12—113



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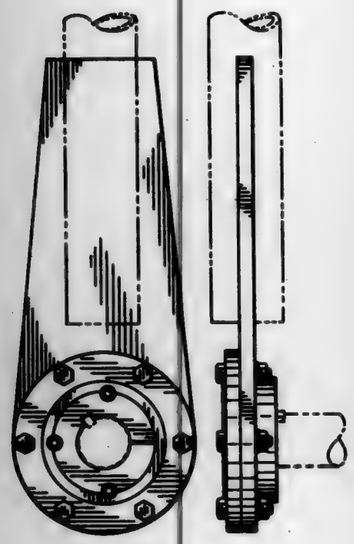
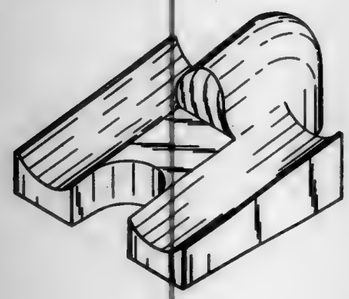
334,158
CONNECTOR ARM FOR JOINING A PIVOT SHAFT MOUNTED TO A HAULAGE VEHICLE AND AN ACTUATION ARM OF A TARP COVER
LeRoy G. Hagenbuch, 4602 N. Rosemead, Peoria, Ill. 61614
Filed Mar. 28, 1991, Ser. No. 676,420
Term of patent 14 years
U.S. Cl. D12—15



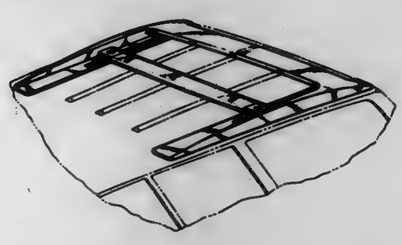
334,159
SEAT CUSHION
Gail Mulligan, 1008 Montecito, Milton, Fla. 32583
Continuation-in-part of Ser. No. 663,633, Mar. 1, 1991. This application Jul. 1, 1991, Ser. No. 723,541
Term of patent 14 years
U.S. Cl. D12—133



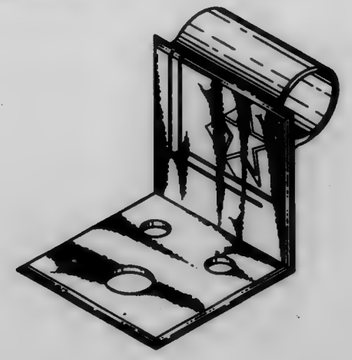
334,160
TIRE
Byung I. Woo, Taejon, Rep. of Korea, assignor to Hankook Tire Mfg. Co., Ltd., Rep. of Korea
Filed Feb. 4, 1991, Ser. No. 650,709
Term of patent 14 years
U.S. Cl. D12—146

334,161
DOUBLE BLADE WINDSHIELD WIPER
Shu-Chen Wu, No. 211-1, Chung Cheng Rd., Chu Hsiang Vill, Lu Ku Hsiang, Nantou Hsien, and Chang Shu-Yun, No. 2-11, Ding Liau Rd., Long Tuan Vill, Ba Li Hsiang, Taipei Hsien, both of Taiwan
Filed Mar. 13, 1991, Ser. No. 669,306
Term of patent 14 years
U.S. Cl. D12—155

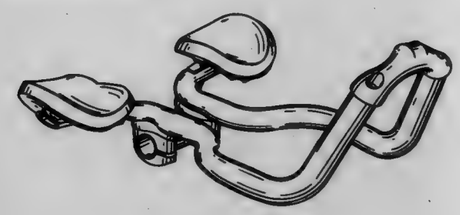
334,162
VEHICLE LUGGAGE CARRIER
John S. Cacheran, Lake Orion, and Jon D. Sparham, Waterford, both of Mich., assignors to John A. Bott, Grosse Pointe Farms, Mich.
Filed Apr. 19, 1991, Ser. No. 687,540
Term of patent 14 years
U.S. Cl. D12—157



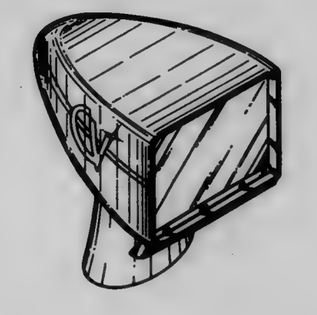
334,163
MOTORCYCLE TOWING HITCH
Scot C. McVey, R.R. 2 Box 116, Herrin, Ill. 62948
Filed Oct. 16, 1990, Ser. No. 598,326
Term of patent 14 years
U.S. Cl. D12—162



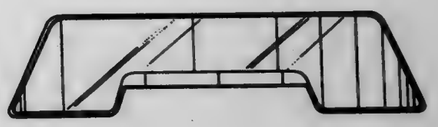
334,164
CLIP-ON AEROBAR FOR BICYCLES
Jochen Klieber, Dammweg 1 D-8221, Tacherting, Fed. Rep. of Germany
Filed Jul. 10, 1991, Ser. No. 728,254
Term of patent 14 years
U.S. Cl. D12—178



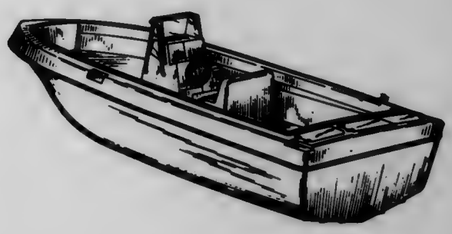
334,165
SELF-CLEARING SIDE VIEW MIRROR
John C. Carter, Jr., 8285 Hidden Pines Rd., Ft. Pierce, Fla. 34945
Filed Aug. 7, 1991, Ser. No. 741,157
Term of patent 14 years
U.S. Cl. D12—187



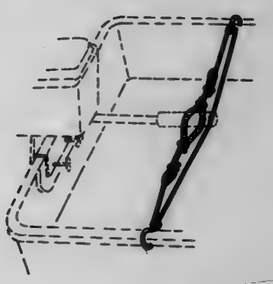
334,166
AUXILIARY REARVIEW MIRROR
Andy Rolph, Cobourg, Canada, assignor to The Lanechanger Inc., Quyon, Canada
Continuation of Ser. No. 441,090, Nov. 22, 1989, abandoned. This application Aug. 26, 1991, Ser. No. 754,241
Claims priority, application Canada, Oct. 26, 1989, 26-10-89-1
Term of patent 14 years
U.S. Cl. D12—187



334,167
RECREATIONAL BOAT
William D. Riley, Sarasota, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 14, 1991, Ser. No. 655,903
Term of patent 14 years
U.S. Cl. D12—314



334,168
BOAT TILLER HOLDER
Eldon Baker, 923 Grouse Dr., Redding, Calif. 96003
Filed Mar. 29, 1991, Ser. No. 677,280
Term of patent 14 years
U.S. Cl. D12—317



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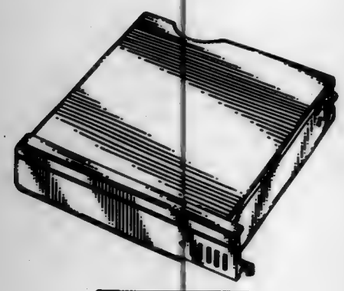
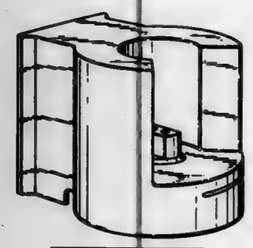
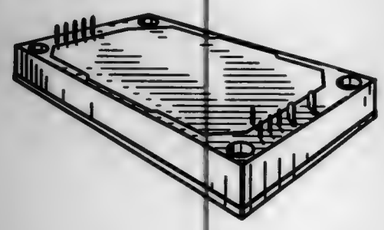
334,169
BATTERY PACK FOR A PERSONAL LAPTOP COMPUTER
Michael J. Antonczak, Santa Cruz, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Oct. 2, 1991, Ser. No. 770,944
Term of patent 14 years
U.S. Cl. D13—103



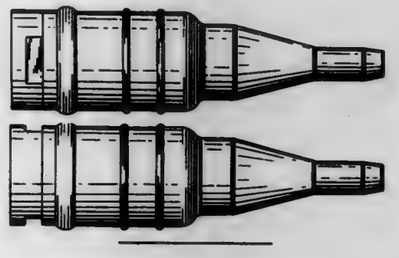
334,170
CHARGER UNIT FOR AN ELECTRIC SHAVER
Dieter Rams, Kronberg, and Peter Eckart, Frankfurt, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Mar. 21, 1991, Ser. No. 673,219
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1990, 9006407
Term of patent 14 years
U.S. Cl. D13—108



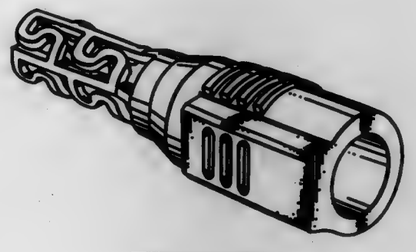
334,171
DC TO DC CONVERTER
John E. McDonnal, San Jose, Calif., assignor to Ro Associates, Sunnyvale, Calif.
Filed Dec. 31, 1991, Ser. No. 815,373
Term of patent 14 years
U.S. Cl. D13—110



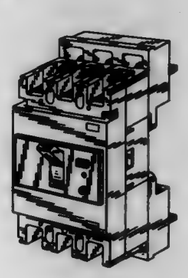
334,172
ELECTRICAL CONNECTOR
Fred C. Wilcoxon, Gaithersburg, Md., assignor to Wilcoxon Research, Inc., Gaithersburg, Md.
Filed Apr. 27, 1990, Ser. No. 515,267
Term of patent 14 years
U.S. Cl. D13—133



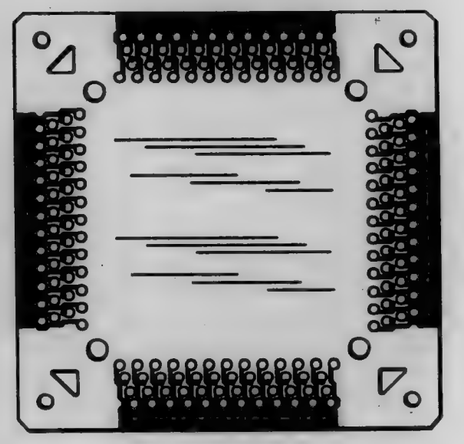
334,173
PLASTIC OUTER SHELL FOR A COMPUTER CONNECTOR
Yun-Yu Liu, Taipei, and Ming-Shing Laiw, Yun Lin, both of Taiwan, assignors to Pan-International Industrial Corp., Taipei, Taiwan
Filed Jul. 17, 1991, Ser. No. 731,083
Term of patent 14 years
U.S. Cl. D13—133



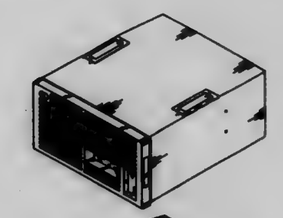
334,174
RESIDUAL CURRENT OPERATED CIRCUIT-BREAKER
Setsuo Hosogai; Hiroshi Fujii; Yoshiaki Matsumoto; Kazuyoshi Sugihara; Shingo Maeda; Shinji Yokota, all of Fukuyama, and Masakatsu Suzuki, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda, Japan
Filed Oct. 9, 1991, Ser. No. 774,284
Claims priority, application Japan, Apr. 10, 1991, 3-10634
Term of patent 14 years
U.S. Cl. D13—160

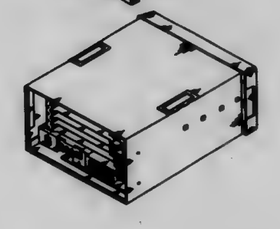


334,175
PROBE INTERFACE TEST BOARD
Nasser Barabi, and Iraj Barabi, both of Oakland, Calif., assignors to Oz Technologies, Inc., Hayward, Calif.
Filed Apr. 12, 1991, Ser. No. 684,356
Term of patent 14 years
U.S. Cl. D13—182

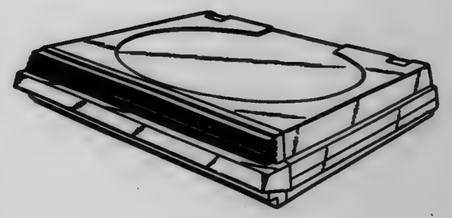


334,176
RACK MOUNTED CONTROLLER FOR DATA PROCESSING EQUIPMENT
Robert E. Steinbugler, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 26, 1990, Ser. No. 605,871
Term of patent 14 years
U.S. Cl. D14—100

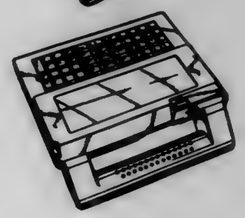




334,177
COMPUTER TERMINAL
Keun S. Kim, Euiwang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 4, 1991, Ser. No. 637,504
Claims priority, application France, Jul. 9, 1990, 90-9678
Term of patent 14 years
U.S. Cl. D14—100



334,178
DATA PROCESSING TERMINAL
Alan P. Learney, Stockport, United Kingdom, assignor to Distribution Systems & Computers Limited, Derbyshire, United Kingdom
Filed Jan. 10, 1991, Ser. No. 639,717
Claims priority, application United Kingdom, Jul. 17, 1990, 2008351
Term of patent 14 years
U.S. Cl. D14—100



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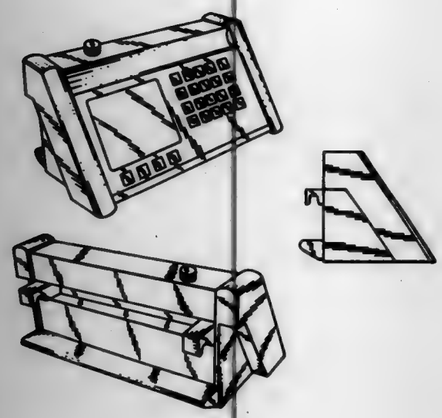
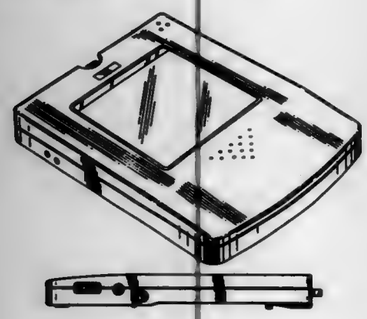
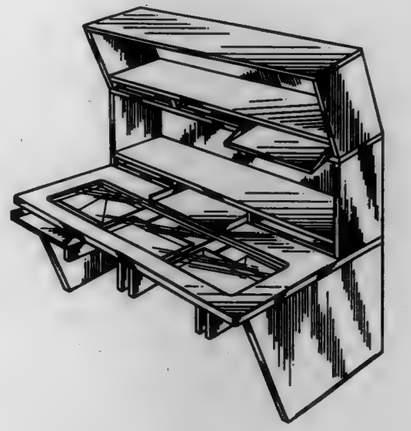
334,179
HAND HELD TERMINAL
Carl-Goran Crafoord, Bromma, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.
Filed Feb. 22, 1991, Ser. No. 660,573
Claims priority, application Sweden, Mar. 26, 1990, 90-0694
Term of patent 14 years
U.S. Cl. D14—100



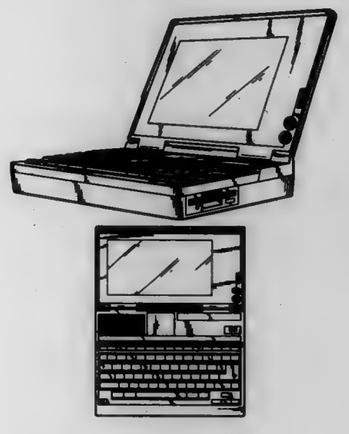
334,180
NOTEBOOK PERSONAL COMPUTER
Thomas A. Tedham, Topsfield, Mass., and Peter S. MacDonald, Menlo Park, Calif., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed May 15, 1991, Ser. No. 700,633
Term of patent 14 years
U.S. Cl. D14—100



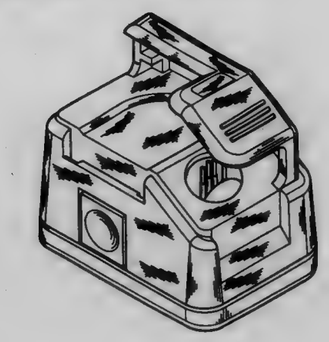
334,181
CABINET FOR HOLDING A PLURALITY OF CATHODE RAY TUBE COMPUTER TERMINALS
Daniel Starkey, Englewood, and Macy J. Price, Jr., Louisville, both of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.
Filed Aug. 13, 1990, Ser. No. 566,814
Term of patent 14 years
U.S. Cl. D14—103



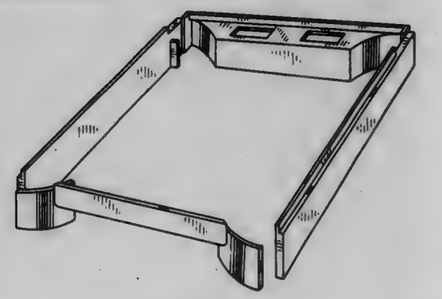
334,182
COMPUTER
Kanji Mizusugi; Kensho Tsuji, and Hiroshi Yamamizu, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 26, 1991, Ser. No. 691,320
Claims priority, application Japan, Oct. 26, 1990, 2-35875
Term of patent 14 years
U.S. Cl. D14—106



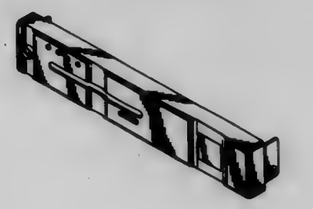
334,183
INTERFACE FOR A WRIST WATCH PAGER
Mark R. Malon, North Palm Beach, and Chuck Weyant, Lake Worth, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 6, 1990, Ser. No. 624,174
Term of patent 14 years
U.S. Cl. D14—107



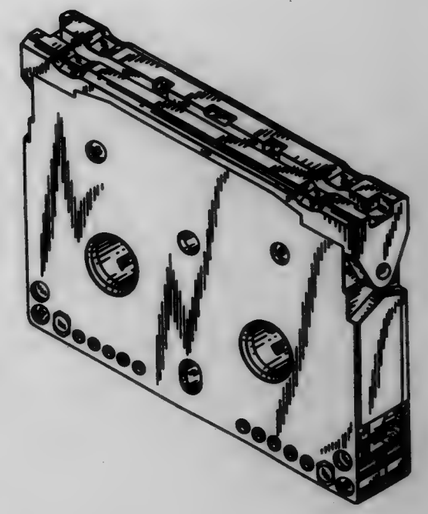
334,184
BASE FOR A COMPUTER HOUSING
Allan E. Weaver, Hollis, N.H.; John N. Benson, Westwood, Mass., and J. John Schrenk, Pasadena, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Aug. 20, 1990, Ser. No. 569,547
Term of patent 14 years
U.S. Cl. D14—114



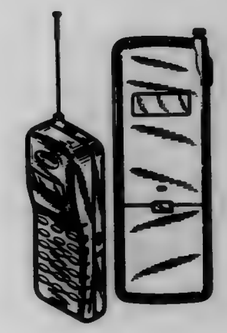
334,185
COMPUTER FRONT PANEL
Tai-Seng Lam, Taipei, Taiwan, assignor to Flytech Technology Co., Ltd., Taipei, Taiwan
Filed Jan. 22, 1991, Ser. No. 643,812
Term of patent 14 years
U.S. Cl. D14—115



334,186
MAGNETIC TAPE CASSETTE
Masato Tanaka, and Kiyotaka Yanaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 25, 1990, Ser. No. 603,194
Claims priority, application Japan, Apr. 28, 1990, 2-14556
Term of patent 14 years
U.S. Cl. D14—121



334,187
CELLULAR HANDSET TELEPHONE
Hari Matsuda, Evanston, Ill., assignor to Mitsubishi International Corporation, Wood Dale, Ill.
Filed Feb. 6, 1991, Ser. No. 651,484
Term of patent 14 years
U.S. Cl. D14—138



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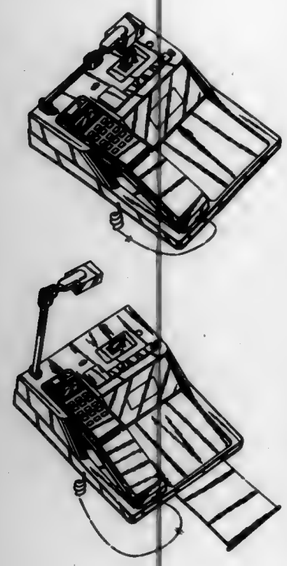
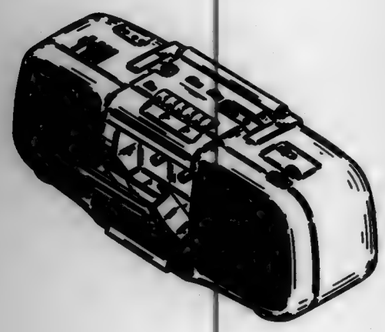
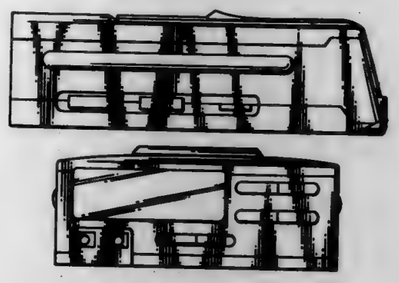
334,188
COMBINATION TELEPHONE, CLOCK, RADIO, LAMP AND MEMO TRAY
Harry Lau Woon, Fo Tan Shatin, Hong Kong, assignor to Kum Kong Technological Industrial Limited, Shatin, Hong Kong
Filed Apr. 24, 1991, Ser. No. 690,764
Term of patent 14 years
U.S. Cl. D14—144



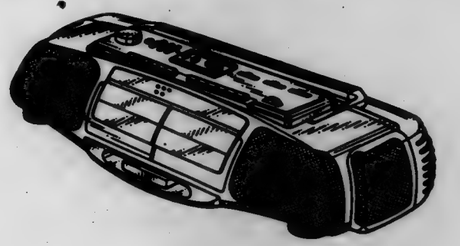
334,189
COMBINED RADIO TUNER AND TAPE RECORDER
Makoto Takimoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 13, 1990, Ser. No. 612,715
Claims priority, application Japan, May 16, 1990, 2-16565
Term of patent 14 years
U.S. Cl. D14—163



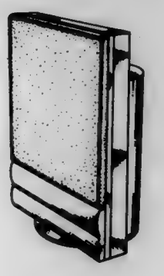
334,190
DIGITAL AUDIO TAPE RECORDER
Satoshi Oka, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 6, 1990, Ser. No. 625,165
Claims priority, application Japan, Jun. 6, 1990, 2-19236
Term of patent 14 years
U.S. Cl. D14—164



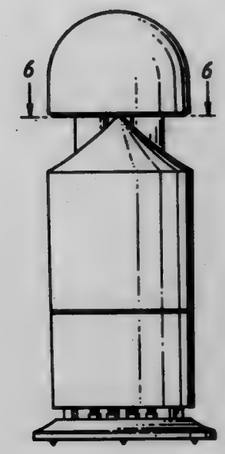
334,191
CASSETTE TAPE RECORDER
Jin S. Yun, Inchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 13, 1990, Ser. No. 566,709
Claims priority, application Japan, Feb. 13, 1990, 2-1601
Term of patent 14 years
U.S. Cl. D14—165



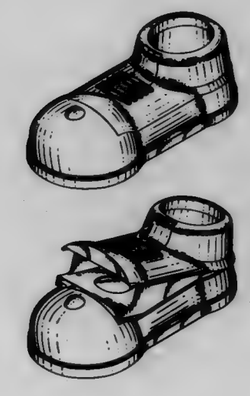
334,192
AUDIO SPEAKER
John P. Lizars, Los Angeles, Calif., assignor to Nakamichi Corporation, Tokyo, Japan
Filed Sep. 27, 1991, Ser. No. 767,249
Claims priority, application Japan, May 29, 1981, 15633/91
Term of patent 14 years
U.S. Cl. D14—211



334,193
LOUDSPEAKER
Michael D. G. Jewitt, Woking, and Allen Boothroyd, Little Shelford, both of United Kingdom, assignors to Canon Research Centre Europe Limited, Surrey, England
Filed Dec. 16, 1991, Ser. No. 807,559
Claims priority, application United Kingdom, Jun. 21, 1991, 2015519
Term of patent 14 years
U.S. Cl. D14—213

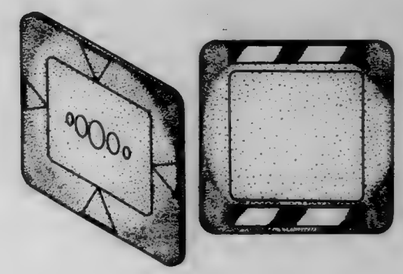


334,194
VIDEO CASSETTE REWINDER
David Tai, 1st Floor, No. 17, Lane 180, Ho Chiang Street, Taipei City, Taiwan
Filed Aug. 6, 1990, Ser. No. 563,545
Term of patent 14 years
U.S. Cl. D14—217



334,195
AUTOMOBILE ANTENNA
Igor J. Philipps, R.R. #1, Caledon East, Ontario, Canada L0N 1E0
Division of Ser. No. 530,945, May 30, 1990. This application Jun. 19, 1992, Ser. No. 901,664
Term of patent 14 years
U.S. Cl. D14—232

334,196
TELEPHONE HANDSET EAR PAD
Myron D. Seggerman, 628 8th St. N. Apt. #20, Naples, Fla. 33940
Filed Dec. 20, 1990, Ser. No. 630,948
Term of patent 14 years
U.S. Cl. D14—249



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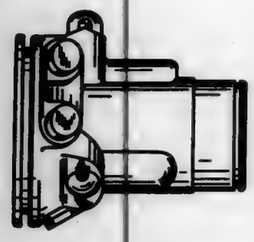
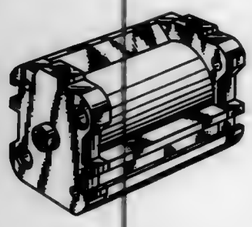
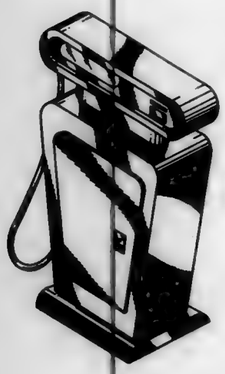
334,197
CLUTCH RETAINER
Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed May 15, 1990, Ser. No. 523,659
Term of patent 14 years
U.S. Cl. D15—5



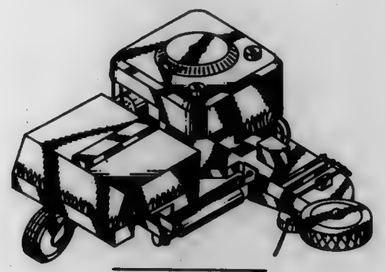
334,198
AIR CYLINDER
Akira Ainawa, Soka, Japan, assignor to SMC Corporation, Tokyo, Japan
Filed Feb. 28, 1990, Ser. No. 487,162
Claims priority, application Japan, Aug. 30, 1989, 1-31572
Term of patent 14 years
U.S. Cl. D15—7



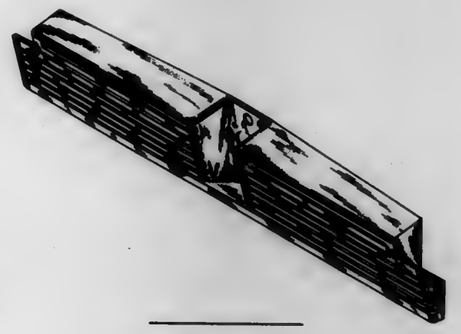
334,199
FUEL DISPENSER
Edward W. Ballew, 242 Blackberry Valley Rd., Greenville, S.C. 29611
Filed Jan. 21, 1991, Ser. No. 718,829
Term of patent 14 years
U.S. Cl. D15—9.1



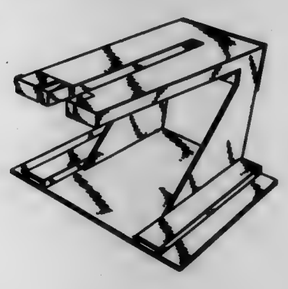
334,200
LAWN TRIMMER ATTACHMENT FOR A RIDING LAWN MOWER
Robert W. Clifton, Rte. 1, Box 296, Mechanicsville, Va. 23111
Filed Aug. 8, 1990, Ser. No. 564,293
Term of patent 14 years
U.S. Cl. D15—17



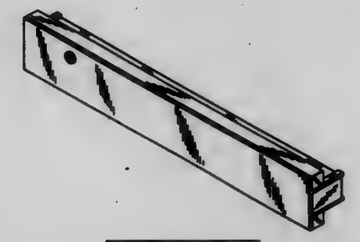
334,201
REFRIGERATOR GRILL
Emerson J. Purkapile, Chicago, Ill., assignor to U-Line Corporation, Milwaukee, Wis.
Filed Dec. 28, 1990, Ser. No. 637,566
Term of patent 14 years
U.S. Cl. D15—89



334,202
PALLET REPAIRING STAND
Paul Harder, Arlington, Tex., assignor to Alpine Engineered Products, Inc, Pompano Beach, Fla.
Filed Aug. 27, 1990, Ser. No. 573,658
Term of patent 14 years
U.S. Cl. D15—140

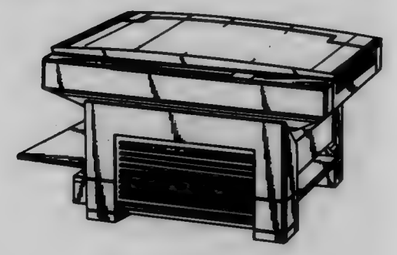


334,203
INK RIBBON CASSETTE FOR AN ELECTRONIC COMPUTER
Akio Tajima, and Hiroyuki Harada, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1990, Ser. No. 570,645
The portion of the term of this patent subsequent to Jan. 5, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—11

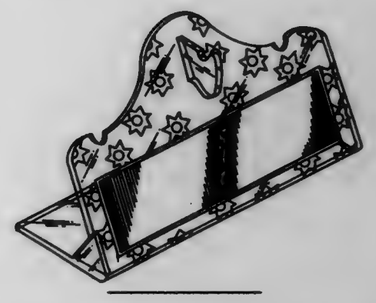


334,204
FONT OF TYPE
Mikhail Leznikov, 2007 Balboa St., San Francisco, Calif. 94121
Filed Jul. 31, 1990, Ser. No. 560,313
Term of patent 14 years
U.S. Cl. D18—24

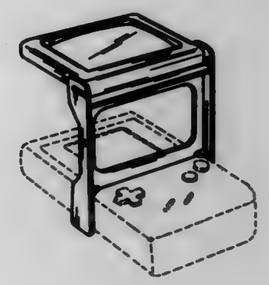
334,205
COPIER
Jorg Ratzlaff, Altensteig, Fed. Rep. of Germany, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 6, 1991, Ser. No. 802,751
Term of patent 14 years
U.S. Cl. D18—39



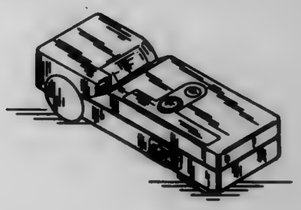
334,206
SUNGLASSES HOLDER
Joseph Ballard, 277 Rte. 32, Central Valley, N.Y. 10917
Filed Oct. 23, 1990, Ser. No. 601,571
Term of patent 14 years
U.S. Cl. D16—129



334,207
PORTABLE MAGNIFIER FOR VIDEO SCREEN OF HAND HELD COMPUTER
Gregory A. Iaquinto, Keene, N.H., and Louis J. Bukanowsky, III, Fitchburg, Mass., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.
Filed Jan. 8, 1991, Ser. No. 639,713
Term of patent 14 years
U.S. Cl. D16—135



334,208
PORTABLE PRINTER
James Barbookles, Jr., Malden; Jeffrey S. Cohen, Wilmington; Laura Brockway, Charlestown; Thomas Paquette, Shrewsbury; Paul Sydlowski, Wakefield, all of Mass.
Filed May 10, 1990, Ser. No. 521,536
Term of patent 14 years
U.S. Cl. D18—50



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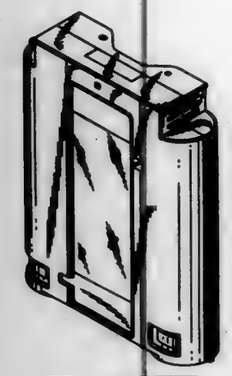
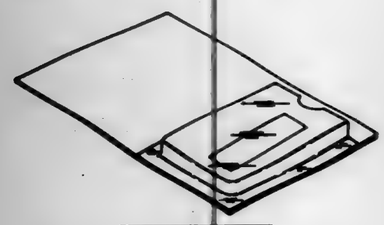
334,209
INK RIBBON CASSETTE FOR VIDEO PRINTER
Hiroshi Katsuno, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 506,235
Claims priority, application Japan, Oct. 18, 1989, 1-38019
Term of patent 14 years
U.S. Cl. D18—56

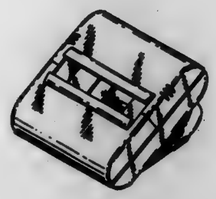


334,210
COMBINED DISPLAY CARD AND TAPE HOLDER
Emilio N. Menchetti, Noranda, Australia, assignor to Family Reflections Pty Ltd., Western Australia, Australia
Filed Oct. 4, 1990, Ser. No. 592,893
Claims priority, application Australia, Apr. 4, 1990, 1018/90
Term of patent 14 years
U.S. Cl. D19—2



334,211
EDUCATIONAL WORD FORMING UNIT
Shinpei Shimizu, 4031 Applewood B-5, Erlanger, Ky. 41018
Filed May 16, 1991, Ser. No. 700,913
Term of patent 14 years
U.S. Cl. D19—59

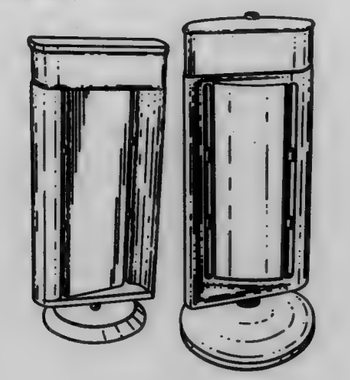
334,212
NOTE DISPENSER
Perry S. Dotterman, Maplewood, and Kenneth J. Kirchhoff, Gem Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 2, 1990, Ser. No. 518,096
The portion of the term of this patent subsequent to Nov. 17, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—86



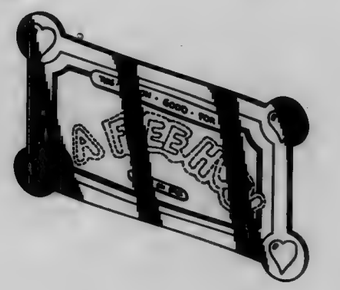
334,213
COMBINED CLIPBOARD AND CLAMP
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jun. 12, 1990, Ser. No. 536,489
Term of patent 14 years
U.S. Cl. D19—88

334,214
COMBINED CLIPBOARD AND CALCULATOR
John Gonzales, 1301 S. 60th Ct., Cicero, Ill. 60650
Filed Aug. 7, 1991, Ser. No. 741,161
Term of patent 14 years
U.S. Cl. D19—88

334,215
ROTATABLE DISPLAY STAND
Martyn O. Rowlands, Epping, England, assignor to A C Edwards PLC, Waltham Cross, England
Filed Aug. 16, 1990, Ser. No. 568,328
Claims priority, application United Kingdom, Feb. 16, 1990, 2004754
Term of patent 14 years
U.S. Cl. D20—21

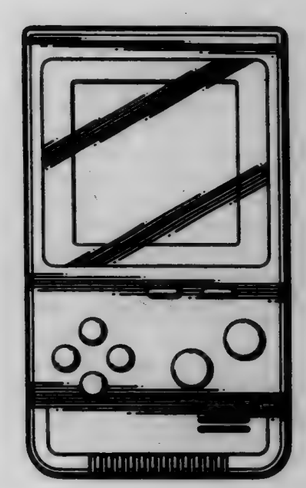


334,216
COUPON HOLDER
Blane A. Bacon, 1 Barbara La., Binghamton, N.Y. 13903-2755
Filed Jul. 18, 1990, Ser. No. 553,685
Term of patent 14 years
U.S. Cl. D20—40



334,217
SIGN HOLDER
John J. Minehart, R.R. #1, Box 812, Cambridge, Vt. 05444
Filed Jul. 8, 1991, Ser. No. 726,529
Term of patent 14 years
U.S. Cl. D20—41

334,218
HAND-HELD ELECTRONIC GAME HOUSING
Chun-Wing Lee, Fo Tan, Hong Kong, assignor to Firtron Limited, Tortola, British Virgin Isls.
Filed Nov. 18, 1991, Ser. No. 793,718
Term of patent 14 years
U.S. Cl. D21—13



334,219
INFANT MOBILE
Susumu Matsumoto, and Chino Sugiyama, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed May 17, 1991, Ser. No. 702,285
Claims priority, application Japan, Feb. 12, 1991, 3-3832
Term of patent 14 years
U.S. Cl. D21—63

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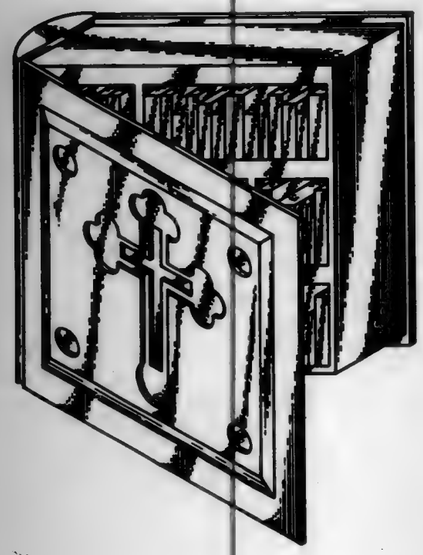
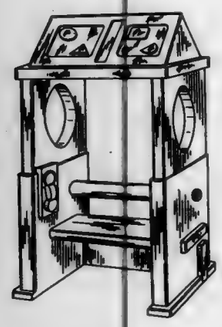
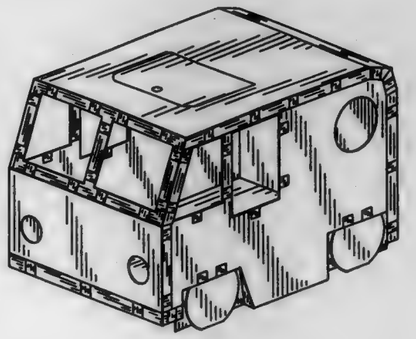
334,220
PUZZLE
Kenneth E. Logsdon, 6801 S. Peach Ave., Broken Arrow, Okla. 74011
Filed Nov. 1, 1990, Ser. No. 607,493
Term of patent 14 years
U.S. Cl. D21—104



334,221
COMBINED TOY BOOTH AND DISPLAY UNIT
Elaine G. Swanger, St. Joseph, Mich., assignor to Today's Kids, Inc., Booneville, Ak.
Filed Oct. 17, 1991, Ser. No. 779,483
Term of patent 14 years
U.S. Cl. D21—114



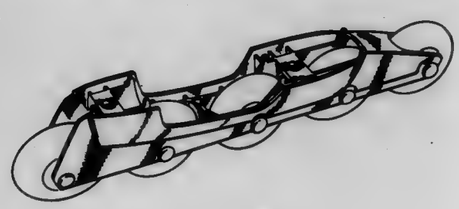
334,222
TOY VAN
T. A. Krebs, Englewood, Fla., assignor to Brown Box Too, Inc., Englewood, Fla.
Filed Sep. 4, 1991, Ser. No. 754,685
Term of patent 14 years
U.S. Cl. D21—140



334,223
PAPER DOLL
Janet M. Finerfrock, 1725 Bradshaw La. N., St. Petersburg, Fla. 33710, and Janet F. Pritts, 7038 39th Ave. N., St. Petersburg, Fla. 33709
Filed Dec. 6, 1991, Ser. No. 803,370
Term of patent 14 years
U.S. Cl. D21—169

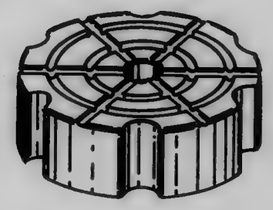
334,224
GOLF CLUB GRIP
Philip Downey, Pomona, Calif., assignor to Robert A. Paley, Inc., Pomona, Calif.
Filed Apr. 29, 1991, Ser. No. 692,508
Term of patent 14 years
U.S. Cl. D21—222

334,225
LONG BLADE ROLLER SKATE
Douglas H. Graham, Boonton, N.J., assignor to Rollerblade, Inc., Minneapolis, Minn.
Filed Jun. 13, 1991, Ser. No. 714,735
Term of patent 14 years
U.S. Cl. D21—226

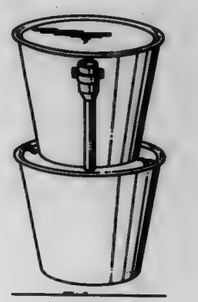


334,226
FISHING ROD HOLDER
Arnold R. Eagle, Portland, Oreg., assignor to Quick Set Pole Holder Company, Portland, Oreg.
Filed Sep. 7, 1990, Ser. No. 580,295
The portion of the term of this patent subsequent to Apr. 10, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—147

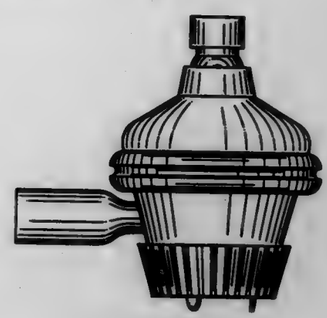
334,227
CHEMICAL DETERGENT BLOCK
Elizabeth J. Gladfelter, Falcon Heights; Tina O. Outlaw, Inver Grove Heights; James L. Copeland; Rhonda K. Schulz, both of Burnsville; Daniel K. Boche, Eagan, and Jeff W. Peterson, Minnetonka, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.
Filed May 14, 1991, Ser. No. 699,943
Term of patent 14 years
U.S. Cl. D23—207



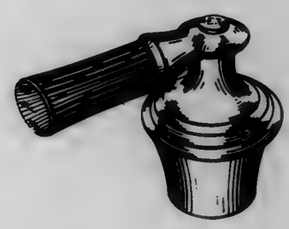
334,228
VACUUM FILTER FOR THICK LIQUIDS
Brian W. Gern, 25 & 28 Sages Lane, Walton Peterborough PE4 6AT, England
Filed Jan. 30, 1990, Ser. No. 472,476
Term of patent 14 years
U.S. Cl. D23—209



334,229
SHOWER HEAD
Joe B. Hiller, 5329 Waits Ave., Fort Worth, Tex. 76133
Filed Nov. 4, 1991, Ser. No. 786,970
Term of patent 14 years
U.S. Cl. D23—213



334,230
PLUMBING FIXTURE HANDLE
Thomas A. Bonnell, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Division of Ser. No. 639,954, Jan. 11, 1991, Pat. No. Des. 332,135. This application Sep. 30, 1992, Ser. No. 954,853
Term of patent 14 years
U.S. Cl. D23—252



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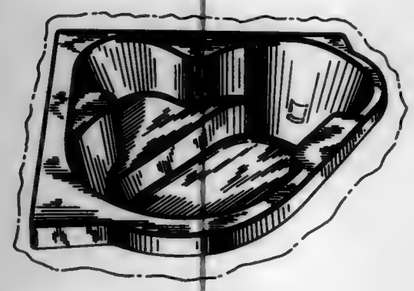
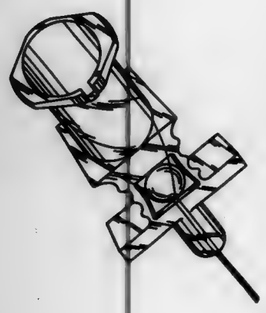
334,231
BATHTUB
Herbert V. Kohler, Jr., Kohler, and Todd D. Dannenberg, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1990, Ser. No. 466,572
Term of patent 14 years
U.S. Cl. D23—281

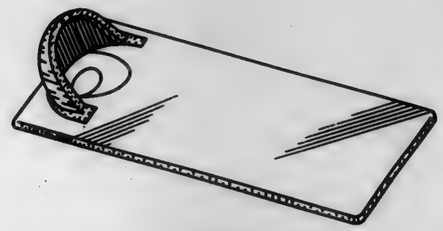


334,232
CEILING FAN
Scott Searle, Los Angeles, Calif., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 6, 1992, Ser. No. 817,406
Term of patent 14 years
U.S. Cl. D23—377

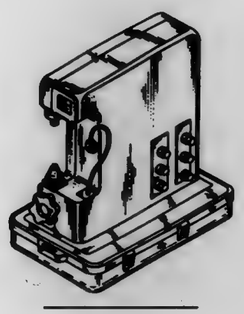
334,233
CANNULA HUB BODY WITH VIEWING LENS
Ronald Schaechter, Los Angeles, Calif., assignor to Baxter International Inc., Deerfield, Ill.
Filed Jul. 8, 1990, Ser. No. 727,799
Term of patent 14 years
U.S. Cl. D24—112



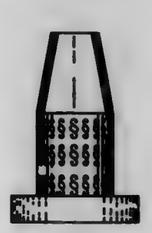
334,234
COLONIC ENEMA BOARD
Curtis D. Williams, 107 Cambridge Pl., Brooklyn, N.Y. 11238
Filed Jan. 31, 1990, Ser. No. 473,186
Term of patent 14 years
U.S. Cl. D24—132



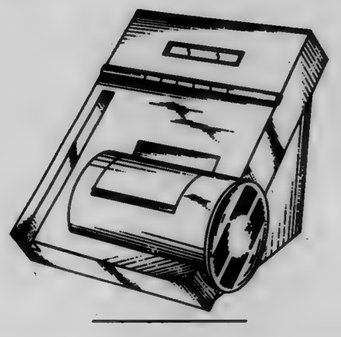
334,235
PORTABLE OXYGEN FLOW METER
Krzysztof Stachowiak, Venice, and Zdenek F. Lebis, Castaic, both of Calif., assignors to American Safety Flight Systems, Inc., Glendale, Calif.
Filed Sep. 19, 1990, Ser. No. 585,351
Term of patent 14 years
U.S. Cl. D24—164



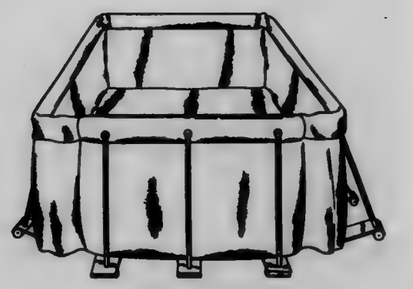
334,236
DISPOSABLE BOTTLE AIR REMOVER
James E. Turknett, 13 S. Stillwood Ct., Savannah, Ga. 31419
Filed Nov. 2, 1990, Ser. No. 608,315
Term of patent 14 years
U.S. Cl. D24—197



334,237
DRAGNOSTIC IMMUNOASSAY ANALYZER
Kenneth D. Collister, Elkhart, Ind., and Michael Paloian, Babylon Village, N.Y., assignors to Miles Inc., Elkhart, Ind.
Filed Feb. 26, 1991, Ser. No. 661,101
Term of patent 14 years
U.S. Cl. D24—232

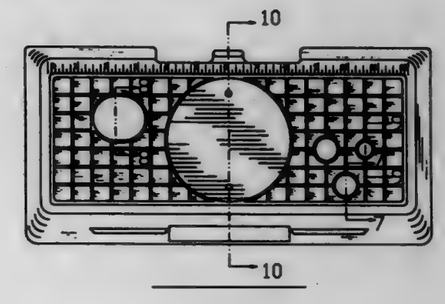


334,238
SELF SUPPORTING ABOVE GROUND SWIMMING POOL
Luigi Spedini, Cremona, Italy, assignor to Agrindies dei F.LLI Giacomo e Luigi Spedini & C.S.n.c., Cremona, Italy
Filed Dec. 11, 1990, Ser. No. 625,985
Claims priority, application Italy, Jul. 18, 1990, 2150190[U]
Term of patent 14 years
U.S. Cl. D25—2

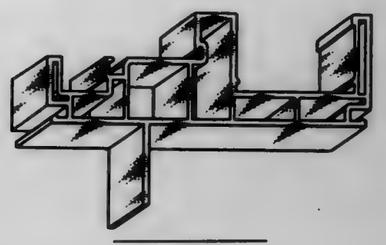


334,239
OIL SPILL BARRICADE
John Lihan, 564 Heidelberg Ave., Woodbridge, N.J. 07095
Filed Aug. 20, 1990, Ser. No. 569,277
Term of patent 14 years
U.S. Cl. D25—39

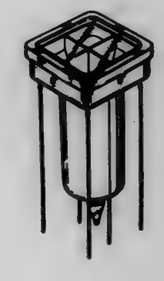
334,240
LADDER TOP COVER
Anthony R. Huffine, Louisville, Ky., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Feb. 8, 1991, Ser. No. 652,907
Term of patent 14 years
U.S. Cl. D25—68



334,241
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Milkron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,096
Term of patent 14 years
U.S. Cl. D25—124



334,242
FLUORESCENT LAMP UNIT FOR LARGE SCREEN INFORMATION DISPLAY
Hitoshi Imamura, and Junichi Nakajima, both of Yokohama, Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan
Filed Apr. 27, 1990, Ser. No. 515,516
Claims priority, application Japan, Oct. 30, 1989, 1-39576
Term of patent 14 years
U.S. Cl. D26—1



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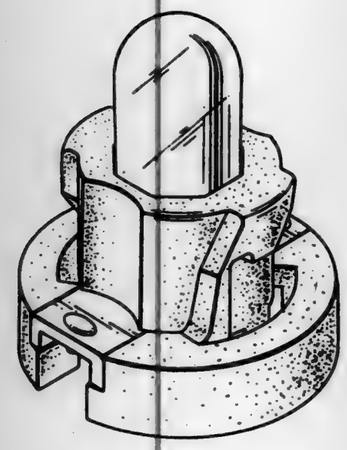
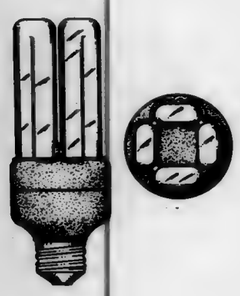
334,243
ELECTRIC LAMP
Masato Higano, Tochigi; Masakazu Yanagiya, Utsunomiya; Tetsuya Sato, Utsunomiya, and Munehiko Yanagida, Utsunomiya, all of Japan, assignors to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 19, 1991, Ser. No. 672,593
Term of patent 14 years
U.S. Cl. D26—2

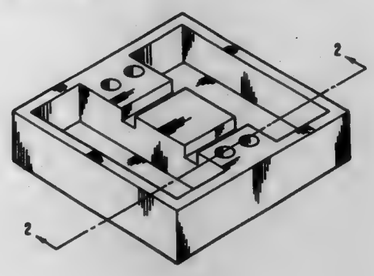


334,244
FLUORESCENT LAMP
John W. Shaffer, Danvers, and Julian N. Wierzbicki, Peabody, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Dec. 26, 1991, Ser. No. 813,428
Term of patent 14 years
U.S. Cl. D26—3



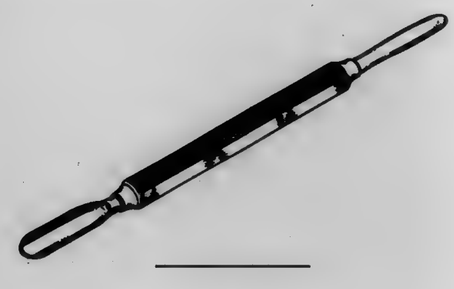
334,245
FLUORESCENT LAMP
Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Mar. 4, 1991, Ser. No. 665,141
Term of patent 14 years
U.S. Cl. D26—3

334,246
ASHTRAY
Garey H. Baker, 4301 Blake SW., Space 63, Albuquerque, N. Mex. 87120
Filed Jun. 17, 1991, Ser. No. 717,727
Term of patent 14 years
U.S. Cl. D27—129

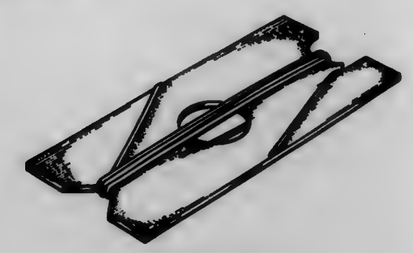


334,247
HAIR FROSTING CAP FOR THE HEAD
Chris C. Scianna, 29 Johnson Ave., Medford, Mass. 02155
Filed Jul. 20, 1990, Ser. No. 559,555
Term of patent 14 years
U.S. Cl. D28—20

334,248
CUTICLE PUSHER
Antoine Odabach, 2580 Santa Ynez, Los Olivos, Calif. 93441
Filed Oct. 4, 1990, Ser. No. 592,890
Term of patent 14 years
U.S. Cl. D28—57

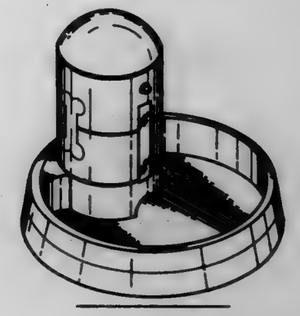


334,249
DENTAL FLOSS SPINDLE
Dale Whittaker, 1329 Quail Run Cir., Bentonville, Ark. 72712
Filed Oct. 30, 1990, Ser. No. 607,056
Term of patent 14 years
U.S. Cl. D28—64

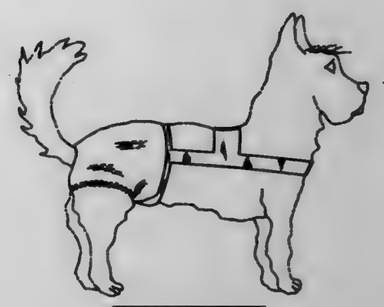


334,250
MOTORCYCLE HELMET
Adrien Gallet, Chatillon sur Chalaronne, France, assignor to Gallet S.A., Chatillon sur Chalaronne, France
Filed Jan. 17, 1990, Ser. No. 466,671
Claims priority, application Int'l Pat. Institute, Jul. 24, 1989, DM/014,169
Term of patent 14 years
U.S. Cl. D29—15

334,251
AUTOMATIC PET FEEDER
Romy Tin, 3067 Olivewood Pl., San Jose, Calif. 95124
Filed Jun. 21, 1991, Ser. No. 722,235
Term of patent 14 years
U.S. Cl. D30—122



334,252
SANITARY GARMENT FOR ANIMALS
Inez J. Stubbs, 10024 Hipkins Rd. S.W., Tacoma, Wash. 98498
Filed Jan. 23, 1990, Ser. No. 468,989
Term of patent 14 years
U.S. Cl. D30—144



334,253
PET CARRIER
Joan Balzarini, 1533 South Riverton Lane #203, Boise, Id. 83706
Filed Mar. 27, 1990, Ser. No. 499,677
Term of patent 14 years
U.S. Cl. D30—144

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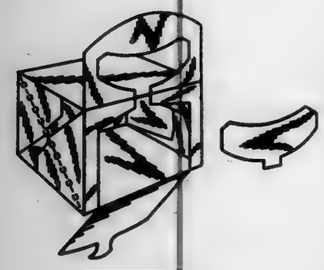
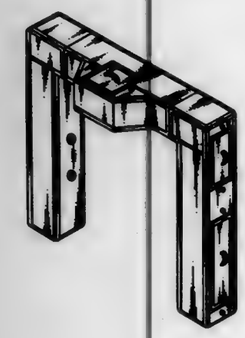
334,254
COMBINED CAT PLAYGROUND, SCRATCHING POST, EXERCISER AND PERCH
Arthur Mitchell, 4 Sequoia La., Plaistow, N.H. 03865
Filed Oct. 7, 1991, Ser. No. 771,960
Term of patent 14 years
U.S. Cl. D30—160

334,255
COMBINED CONTAINER AND POOP-SCOOP
Robert J. Nelson, Atlantic Beach, Fla., assignor to Dirty Business Deals, Inc., Bridgehampton, N.Y.
Filed Jan. 3, 1991, Ser. No. 637,011
Term of patent 14 years
U.S. Cl. D30—162

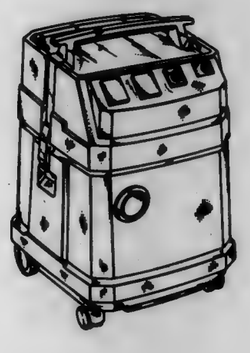


334,256
AUTO WASH AIR DRYER
Kirk Jackson, 500 Queens Mirror Cir., Casselberry, Fla. 32707, and Dan Jackson, 404 Meadowood Blvd., Fern Park, Fla. 32730
Filed Feb. 23, 1990, Ser. No. 483,776
Term of patent 14 years
U.S. Cl. D32—4

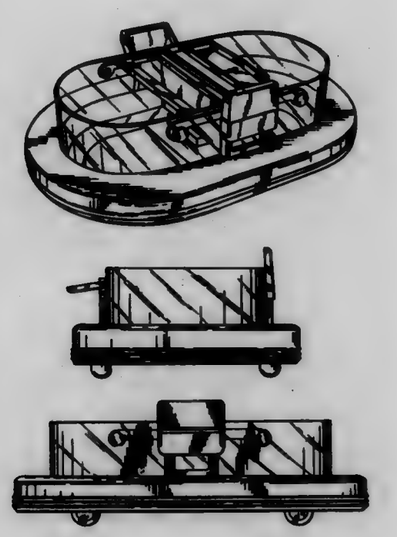


334,257
VACUUM CLEANER WITH HEADLIGHT
Randall K. Lawrence, Bristol, Tenn., and Joel S. Bennett, Greensboro, N.C., assignors to Electrolux Corporation, Marietta, Ga.
Filed Aug. 27, 1991, Ser. No. 750,548
Term of patent 14 years
U.S. Cl. D32—22

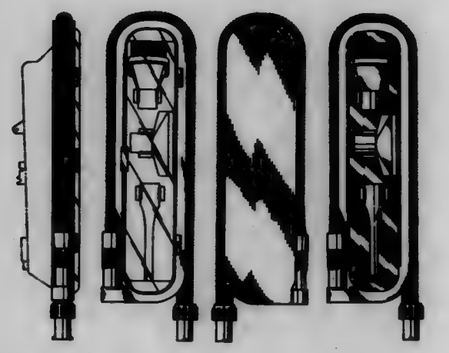
334,258
VACUUM CLEANER
Rainer Oberdorfer-Bogel, Kirchberg/Iller, Fed. Rep. of Germany, assignor to Wap Reinigungssysteme GmbH & Co., Bellenberg, Fed. Rep. of Germany
Division of Ser. No. 524,098, May 10, 1990. This application Mar. 3, 1992, Ser. No. 847,239
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, M89997254.5
Term of patent 14 years
U.S. Cl. D32—23



334,259
COMBINED RESERVOIR AND WHEELED BASE ASSEMBLY FOR A VACUUM CLEANER
Giovanni Pino, Kentwood, Mich., assignor to Bissell Inc., Grand Rapids, Mich.
Filed Feb. 13, 1990, Ser. No. 479,582
Term of patent 14 years
U.S. Cl. D32—31



334,260
VACUUM CLEANER HOSE RACK WITH TOOL STORAGE
Milton G. Kieft, North Canton, and Darwin T. McKnight, Louisville, both of Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed May 9, 1991, Ser. No. 697,472
Term of patent 14 years
U.S. Cl. D32—31



334,261
COMBINED VACUUM CLEANER HOSE AND RACK
Darwin T. McKnight, Louisville, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed May 22, 1991, Ser. No. 704,019
Term of patent 14 years
U.S. Cl. D32—31

334,262
VACUUM CLEANER NOZZLE WITH HEADLIGHT
Randall K. Lawrence, Bristol, Tenn., and Joel S. Bennett, Greensboro, N.C., assignors to Electrolux Corporation, Marietta, Ga.
Filed Aug. 27, 1991, Ser. No. 750,547
Term of patent 14 years
U.S. Cl. D32—32

334,263
VACUUM CLEANER
Randall K. Lawrence, Bristol, Tenn., and Joel S. Bennett, Greensboro, N.C., assignors to Electrolux Corporation, Marietta, Ga.
Filed Aug. 27, 1991, Ser. No. 750,546
Term of patent 14 years
U.S. Cl. D32—22

334,264
VACUUM CLEANER
Randall K. Lawrence, Bristol, Tenn., and Joel S. Bennett, Greensboro, N.C., assignors to Electrolux Corporation, Marietta, Ga.
Filed Aug. 27, 1991, Ser. No. 750,545
Term of patent 14 years
U.S. Cl. D32—22

334,265
VACUUM CLEANER
Randall K. Lawrence, Bristol, Tenn., and Joel S. Bennett, Greensboro, N.C., assignors to Electrolux Corporation, Marietta, Ga.
Filed Aug. 27, 1991, Ser. No. 750,544
Term of patent 14 years
U.S. Cl. D32—22

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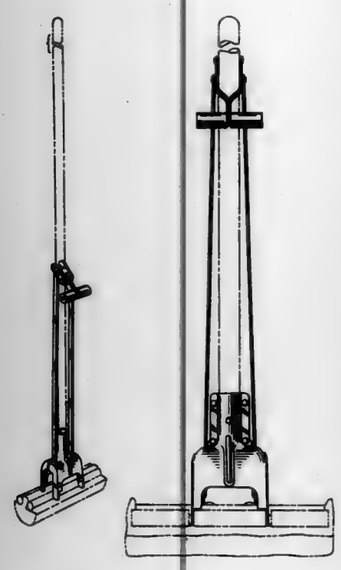
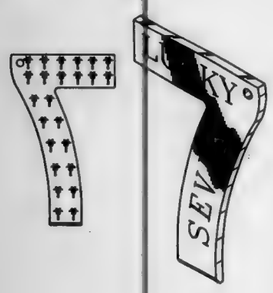
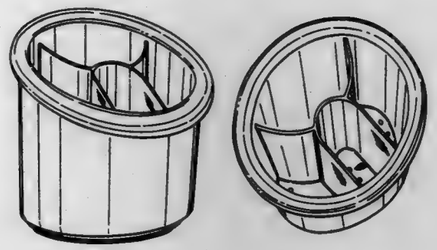
334,263
COMBINED WRINGER LEVER WITH CONNECTING RODS AND HOUSING FOR A ROLLER SPONGE MOP
Boniface Torres, Matteson, Ill., assignor to M. B. Walton, Inc., Chicago, Ill.
Continuation of Ser. No. 258,721, Dec. 22, 1988, abandoned. This application Aug. 7, 1991, Ser. No. 742,581
Term of patent 14 years
U.S. Cl. D32—44



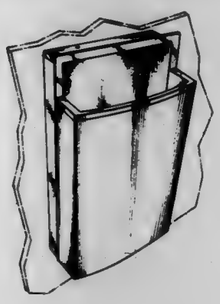
334,264
LOTTERY TICKET SCRAPER
Robert M. Albanese, 40 Main St. Unit 107, Stoneham, Mass. 02180
Filed Jan. 18, 1991, Ser. No. 643,058
Term of patent 14 years
U.S. Cl. D32—46



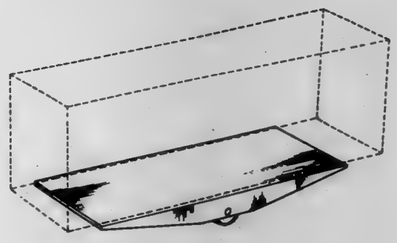
334,265
DRAINING HOLDER FOR CUTLERY
Giorgetto Giugiaro, Turin, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 9, 1991, Ser. No. 727,154
Claims priority, application Italy, Jan. 18, 1991, MI91000034
Term of patent 14 years
U.S. Cl. D32—55



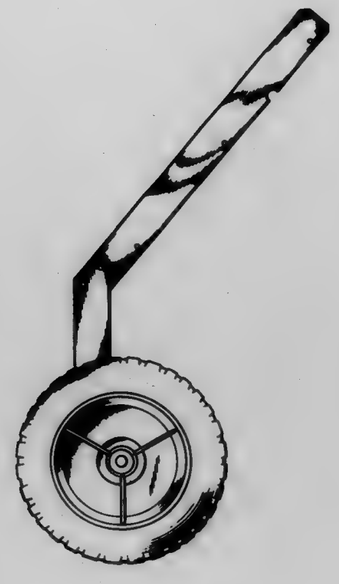
334,266
WASTE RECEPTACLE
David M. Hines, Santa Ana, Calif., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Nov. 15, 1991, Ser. No. 792,772
Term of patent 14 years
U.S. Cl. D34—6



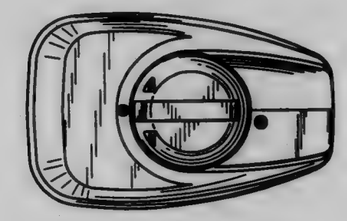
334,267
DOLLY
Earle R. Vickery, III, 7301 Don Diego, NE., Albuquerque, N. Mex. 87109
Filed Jun. 5, 1991, Ser. No. 711,432
Term of patent 14 years
U.S. Cl. D34—23



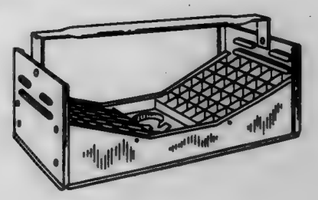
334,268
DETACHABLE FRONT WHEEL FOR A BOAT
David R. Hayes, 6677 Evergreen La., Paradise, Calif. 95969
Filed Jul. 2, 1991, Ser. No. 724,965
Term of patent 14 years
U.S. Cl. D34—28



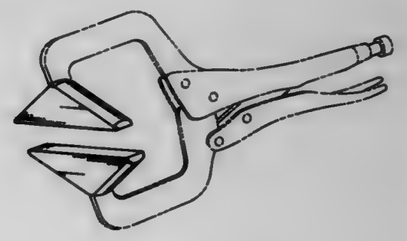
334,269
ROPE-CHAIN WINDLASS
Stephen K. Jones, Stratford, and Willfred Goldschmidt, Weston, both of Conn., assignors to Campbell Hausfeld/Scott Fetzer Company, Westlake, Ohio
Filed Jun. 4, 1991, Ser. No. 710,301
Term of patent 14 years
U.S. Cl. D34—33



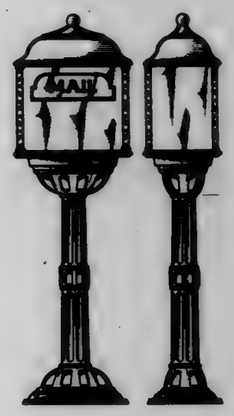
334,270
TRAY FOR CARRYING PIPE NIPPLES
William Benjamin, 10408 Stonebank St., Bellflower, Calif. 90706
Filed May 20, 1991, Ser. No. 702,674
Term of patent 14 years
U.S. Cl. D34—45



334,271
CLAMPING JAWS
Joseph L. Ellis, 235 N. Perry St., Johnstown, N.Y. 12095
Filed Feb. 11, 1991, Ser. No. 653,114
Term of patent 14 years
U.S. Cl. D99—29



334,272
MAILBOX
Donald B. Gaines, 3050 Bayshore Ave., Ventura, Calif. 93001
Filed Sep. 25, 1989, Ser. No. 411,616
Term of patent 14 years
U.S. Cl. D99—32



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Rohe GmbH: *See*—
 Bux, Hermann; and Ross, Peter, 5,195,369, Cl. 73-457.000.
Abatjoglou, Anthony G., to Union Carbide Chemicals & Plastics Technology Corporation. Higher aldehyde separation process. 5,196,596, Cl. 568-492.000.
ABB Environmental Services, Inc.: *See*—
 Moore, Alan T.; Leahy, Maureen C.; Findlay, M. Margaret; and Fogel, Sam, 5,196,121, Cl. 210-603.000.
ABB Process Automation Inc.: *See*—
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ABB Vetco Gray (Brasil) S.A.: *See*—
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Abbiate, Jean-Claude; and Richter, Gerard, to International Business Machines Corp. Sigma delta converter insensitive to asymmetrical switching times. 5,196,853, Cl. 341-143.000.
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Abbott Laboratories: *See*—
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Abe, Katsumi; and Takie, Akinori, to U.S. Philips Corporation. Power on/off circuit with lock function. 5,196,731, Cl. 307-142.000.
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Abe, Michiharu; and Umehara, Masaakira, to Ricoh Company, Ltd. Optical information recording medium. 5,196,250, Cl. 428-64.000.
Abe, Tetsuhisa: *See*—
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Abe, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Electrostatic levitation furnace. 5,196,999, Cl. 364-400.000.
Abe, Tsutomu: *See*—
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Ables, Wallace H.; Howie, Dwight R.; Humphrey, John S.; Raines, Robert G.; Reich, Richard A.; Sorensen, Robert A.; Valdez, Robert; and Zamani, Abdoul R., to International Business Machines Corporation. Thermally stable water soluble solder flux and paste. 5,196,070, Cl. 148-23.000.
Abraham, Bernard M.; and Cornfield, Joel Z., to Adastra Corporation. Meatal guard. 5,195,998, Cl. 604-351.000.
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 Schroder, Gunter; Abraham, Helmut; and Arciszewski, Kasimir, 5,197,052, Cl. 369-25.000.
Abraham, Paul A.: *See*—
 Leeves, Geoffrey G.; and Abraham, Paul A., 5,195,679, Cl. 238-283.000.
Abrams, Michael J.: *See*—
 Bradley, Fontaine C.; Giandomenico, Chris M.; Abrams, Michael J.; Frost, Danielle T.; and Vollano, Jean F., 5,196,412, Cl. 514-184.000.
ABX: *See*—
 Lefevre, Didier; and Champseix, Henri, 5,196,346, Cl. 436-63.000.
Achmad, Muchlis. Adjustable low frequency hydrofluidic oscillator. 5,195,560, Cl. 137-826.000.
Achtenberg, Theo: *See*—
 Weber, Wilhelm; Achtenberg, Theo; Sockel, Karl-Heinz; and Sattlegger, Hans, 5,196,497, Cl. 528-14.000.
Ackerson, Michael D.; Arabshahi, Seyed-Hamid; and Babcock, Robert E., to University of Arkansas; and Diversified Petroleum Recovery, Inc. Process for petroleum - wax separation at or above room temperature. 5,196,116, Cl. 208-33.000.
Ackland, Martin R.; and De'Ath, Roderick M., to CMB Foodcan plc. Apparatus for detecting micro-organisms. 5,196,341, Cl. 435-291.000.
Adachi, Kazuyosi: *See*—
 Matsuo, Yutaka; Suda, Yoshitaka; Suda, Nobuo; Isobe, Takeshi; and Adachi, Kazuyosi, 5,196,163, Cl. 420-422.000.
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 Taverne, Thierry; Lesieur, Isabelle; Depreux, Patrick; Caignard, Daniel H.; Guardiola, Beatrice; Adam, Gerard; and Renard, Pierre, 5,196,434, Cl. 514-278.000.
Adam, Jean-Marie: *See*—
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Adams, James C. Cleaning device. 5,195,549, Cl. 134-188.000.
Adaptec, Incorporated: *See*—
 Collantes, Patricio J., Jr.; Highland, Marilyn S.; and Kazarian, Sam, 5,195,302, Cl. 53-442.000.
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 Schweighardt, Frank K.; and Rubertone, Joseph A., 5,196,348, Cl. 436-173.000.
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 Kawabata, Yasuhiro; Hara, Soichi; Kageyama, Hiroshi; Konomi, Toshiaki; and Murakami, Motoichi, 5,195,478, Cl. 123-193.400.
 Saitou, Yoshitami; Isono, Nobuyuki; Suzumura, Nobuyasu; and Inoue, Makoto, 5,197,006, Cl. 364-424.100.
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Akaogi, Takao; and Higuchi, Mitsuo, to Fujitsu Limited. Semiconductor memory device having redundant memory cells. 5,197,030, Cl. 365-200.000.

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Akiyama, Hiroyuki, to JSP Corporation. Cushioning material. 5,196,254, Cl. 428-178.000.

Akkerman, Neil H., to AVA International Corporation. Fail safe valve actuator. 5,195,721, Cl. 251-129.130.

Aknin, Jacques D.: *See*—
Moscrief, Rick L.; Behenaky, Max L.; Durfy, Érik J.; and Aknin, Jacques D., 5,197,003, Cl. 364-410.000.

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Akune, Makoto: *See*—
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Akutagawa, Hitoshi: *See*—
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Guajaca, Nora B. Tamale steamer. 5,195,424, Cl. 99-418.000.

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Guymon, E. Park. Process for cleaning drilling mud contaminated with hydrocarbons. 5,195,847, Cl. 405-128.000.

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Inoue, Kazuhiko, to TEAC Corporation. Magnetic disk apparatus having head arm elastically supported on head carriage. 5,196,975, Cl. 360-105.000.

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Inoue, Michitaka; Ikeda, Kazuo; Tsutagawa, Wataru; Oda, Yoshida; and Nobumoto, Shoji, to Mazda Motor Corporation. Rear body structure of automotive vehicle. 5,195,780, Cl. 280-834.000.

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Moncrief, Rick L.; Behensky, Max L.; Durfy, Erik J.; and Aknin, Jacques D., to Atari Games Corporation. Gearshift for a vehicle simulator having a solenoid for imposing a resistance force. 5,197,003, Cl. 364-410.000.

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Morgan, Richard; and Zhou, Bing, 5,196,330, Cl. 435-199.000.

Zickefoose, Charles R.: *See*—
Davis, Thomas L.; Elliott, Robert N., III; and Zickefoose, Charles R., 5,195,850, Cl. 406-92.000.

Ziegenhorn, Joachim: *See*—
Town, Michael-Harold; Siedel, Joachim; and Ziegenhorn, Joachim, 5,196,314, Cl. 435-25.000.

Zielinski, Erich: *See*—
Ferschl, Michael S.; Cutaia, James A.; Kemp, Eileen M.; Kaukeinen, Joseph Y.; and Zielinski, Erich, 5,196,866, Cl. 346-108.000.

Zierke, Thomas; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. 3-substituted pyridinemethanols and fungicides containing them. 5,196,433, Cl. 514-277.000.

Zimmer, Inc.: *See*—
Atkinson, Robert W.; McDougall, John P.; and Donizetti, William J., 5,196,020, Cl. 606-132.000.

Zimmerman, Daniel; Milks, John; Binder, Sidney; Card, Roger J.; Wunderlich, Winfried; and Siol, Werner, to American Cyanamid Company. Rubber compositions with a high elastic modulus. 5,196,483, Cl. 525-310.000.

Zimmern, Bernard; and Picouet, Jean L, to Zimmern, Bernard. Method of using a thermal expansion valve device, evaporator and flow control means assembly and refrigerating machine. 5,195,331, Cl. 62-202.000.

Zinberg, Benson E. Combination of thematically related decorative objects. 5,195,638, Cl. 206-457.000.

Zito, Richard R. Electronic devolatilizer. 5,195,250, Cl. 34-1.00H.

Zlotnick, Gary W.: *See*—
Anilionis, Algis; Seid, Robert C., Jr.; Deich, Robert A.; Zlotnick, Gary W.; and Green, Bruce A., 5,196,338, Cl. 435-252.300.

Zona, Mauro; and Bettinardi, Mauro, to Comau SpA. Articulated robot. 5,195,388, Cl. 74-479.000.

Zorner, Paul S.: *See*—
Caulder, Jerry; Crowley, R. Hugh; Zorner, Paul S.; and Evans, Steven L., 5,196,044, Cl. 71-86.000.

Zsolnay, Denes L., to TRW Inc. Rigid circuit board structure using impingement cooling. 5,196,989, Cl. 361-383.000.

Zuraski, Jeffrey A.: *See*—
Voigt, Ronald W.; Zuraski, Jeffrey A.; McDonald, Brian P.; Babineau, James W.; and Morrison, Scott D., 5,195,601, Cl. 180-79.100.

Zurner, Hans-Jurgen; and Henkel, Dietmar, to MAN Nutzfahrzeuge Aktiengesellschaft. Fuel injection system for air-compressing internal combustion engines. 5,195,487, Cl. 123-300.000.

Zushi, Takayasu: *See*—
Sawada, Masami; Nanbu, Yuichi; and Zushi, Takayasu, 5,195,773, Cl. 280-728.000.

Zwicker, Harry R.: *See*—
White, Danny R.; Aghajanian, Michael K.; and Zwicker, Harry R., 5,196,271, Cl. 428-545.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anaquest, Inc.: *See*—
Bagley, Jerome R.; Lalinde, Nhora L.; Huang, Bao-Shan; and Spencer, H. Kenneth, Re. 34,201, Cl. 514-259.000.

Asakura, Toshimitsu; and Tagami, Tomoyuki. Motorcycle. Re. 34,199, Cl. 180-68.300.

Bagley, Jerome R.; Lalinde, Nhora L.; Huang, Bao-Shan; and Spencer, H. Kenneth, to Anaquest, Inc. N-aryl-N-[4-(1-heterocyclicalkyl)-piperidinyl]amides and pharmaceutical compositions and methods employing such compounds. Re. 34,201, Cl. 514-259.000.

Buros, Douglas J.: *See*—
Vogi, Allen W.; Poe, Steven C.; MacNeill, John H.; and Buros, Douglas J., Re. 34,200, Cl. 379-145.000.

Gate Pallet Systems, Inc.: *See*—
Quasnick, Robert J., Re. 34,198, Cl. 108-51.300.

Huang, Bao-Shan: *See*—
Bagley, Jerome R.; Lalinde, Nhora L.; Huang, Bao-Shan; and Spencer, H. Kenneth, Re. 34,201, Cl. 514-259.000.

International Teleservice, Inc.: *See*—
Vogi, Allen W.; Poe, Steven C.; MacNeill, John H.; and Buros, Douglas J., Re. 34,200, Cl. 379-145.000.

Lalinde, Nhora L.: *See*—
Bagley, Jerome R.; Lalinde, Nhora L.; Huang, Bao-Shan; and Spencer, H. Kenneth, Re. 34,201, Cl. 514-259.000.

MacNeill, John H.: *See*—
Vogi, Allen W.; Poe, Steven C.; MacNeill, John H.; and Buros, Douglas J., Re. 34,200, Cl. 379-145.000.

Poe, Steven C.: *See*—
Vogi, Allen W.; Poe, Steven C.; MacNeill, John H.; and Buros, Douglas J., Re. 34,200, Cl. 379-145.000.

Quasnick, Robert J., to Gate Pallet Systems, Inc. Corrugated construction pallet. Re. 34,198, Cl. 108-51.300.

Spencer, H. Kenneth: *See*—
Bagley, Jerome R.; Lalinde, Nhora L.; Huang, Bao-Shan; and Spencer, H. Kenneth, Re. 34,201, Cl. 514-259.000.

Tagami, Tomoyuki: *See*—
Asakura, Toshimitsu; and Tagami, Tomoyuki, Re. 34,199, Cl. 180-68.300.

Vogi, Allen W.; Poe, Steven C.; MacNeill, John H.; and Buros, Douglas J., to International Teleservice, Inc. Coin fraud preventing unit and modular configurations for pay telephone stations. Re. 34,200, Cl. 379-145.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bayer Aktiengesellschaft: *See*—
Rosen, Winfried; Fiedler, Paul-Christian; and Blume, Gotz, B1 5,099,040, Cl. 549-519.000.

Blume, Gotz: *See*—
Rosen, Winfried; Fiedler, Paul-Christian; and Blume, Gotz, B1 5,099,040, Cl. 549-519.000.

Dow Corning Corporation, The: *See*—
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, B1 4,749,631, Cl. 428-704.000.

Fiedler, Paul-Christian: *See*—
Rosen, Winfried; Fiedler, Paul-Christian; and Blume, Gotz, B1 5,099,040, Cl. 549-519.000.

Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, to Dow Corning Corporation, The. Multilayer ceramics from silicate esters. B1 4,749,631, 3-23-93, Cl. 428-704.000.

Illinois Tool Works Inc.: *See*—
Rogers, Eugene A., B1 4,494,897, Cl. 410-154.000.

Michael, Keith W.: *See*—
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, B1 4,749,631, Cl. 428-704.000.

Morita, Shigenari, to Pack Kabushiki Kaisha, The. Shopping bags. B1 4,895,456, 3-23-93, Cl. 383-20.000.

Pack Kabushiki Kaisha, The: *See*—
Morita, Shigenari, B1 4,895,456, Cl. 383-20.000.

Rogers, Eugene A., to Illinois Tool Works Inc. Damage prevention void filler for separating loads during transit. B1 4,494,897, 3-23-93, Cl. 410-154.000.

Rosen, Winfried; Fiedler, Paul-Christian; and Blume, Gotz, to Bayer Aktiengesellschaft. Process for the preparation of intermediates. B1 5,099,040, 3-23-93, Cl. 549-519.000.

Tarhay, Leo: *See*—
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, B1 4,749,631, Cl. 428-704.000.

Younger, Gilbert W. Throttle valve system for automatic transmissions. B1 4,711,140, 3-23-93, Cl. 74-865.000.

LIST OF DESIGN PATENTEES

A C Edwards PLC: *See*—
Rowlands, Martyn O., 334,215, Cl. D20-21.000.

Agrisilos dei F.LLI Giacomo e Luigi Spedini & C.S.n.c.: *See*—
Spedini, Luigi, 334,238, Cl. D25-2.000.

Aizawa, Akira, to SMC Corporation. Air cylinder. 334,198, 3-23-93, Cl. D15-7.000.

Albanese, Robert M. Lottery ticket scraper. 334,264, 3-23-93, Cl. D32-46.000.

Almond Jewelers Inc.: *See*—
Mandelbaum, Jonathan, 334,153, Cl. D11-76.000.

Alpine Engineered Products, Inc: *See*—
Hurder, Paul, 334,202, Cl. D15-140.000.

American Safety Flight Systems, Inc.: *See*—
Stachowiak, Krzysztof; and Lebis, Zdenek F., 334,235, Cl. D24-164.000.

Antoaczak, Michael J., to Apple Computer, Inc. Battery pack for a personal laptop computer. 334,169, 3-23-93, Cl. D13-103.000.

Apple Computer, Inc.: *See*—
Antoaczak, Michael J., 334,169, Cl. D13-103.000.

Aukstikalnis, Glen; and Nightingale, Mark, to Tektronix, Inc. Electrical test probe. 334,147, 3-23-93, Cl. D10-80.000.

Bacon, Blane A. Coupon holder. 334,216, 3-23-93, Cl. D20-40.000.

Bakanowsky, Louis J., III: *See*—
Isquinto, Gregory A.; and Bakanowsky, Louis J., III, 334,207, Cl. D16-135.000.

Baker, Eldon. Boat tiller holder. 334,168, 3-23-93, Cl. D12-317.000.

Baker, Garey H. Ashtray. 334,246, 3-23-93, Cl. D27-129.000.

Ballard, Joseph. Sunglasses holder. 334,206, 3-23-93, Cl. D16-129.000.

Ballew, Edward W. Fuel dispenser. 334,199, 3-23-93, Cl. D15-9.100.

Balzarini, Joan. Pet carrier. 334,253, 3-23-93, Cl. D30-144.000.

Bang, Can. Socket wrench. 334,122, 3-23-93, Cl. D8-21.000.

Barabi, Iraj: *See*—
Barabi, Nasser; and Barabi, Iraj, 334,175, Cl. D13-182.000.

Barabi, Nasser; and Barabi, Iraj, to Oz Technologies, Inc. Probe interface test board. 334,175, 3-23-93, Cl. D13-182.000.

Barbookles, James, Jr.; Cohen, Jeffrey S.; and Brockway, Laura, to Copeland, James L.: *See*—

Isquinto, Gregory A.; and Bakanowsky, Louis J., III, to Curtis Mann-

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Barbookles, James, Jr.; Cohen, Jeffrey S.; and Brockway, Laura, to Orion Research, Inc. Portable printer. 334,208, 3-23-93, Cl. D18-50.000.

Barclay, Walter P.; and Caldwell, D. C., to Caldwell Construction Corporation. Beverage container opener. 334,123, 3-23-93, Cl. D8-39.000.

Barilla G.E.R. F.LLI - Societa per Azioni: *See*—
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Beets, Claude A.: *See*—
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Beets, Eleanor A.; and Beets, Claude A. Powered scrubber. 334,095, 3-23-93, Cl. D4-102.000.

Benderly, David B., to DBC of New York, Inc. Gemstone. 334,154, 3-23-93, Cl. D11-90.000.

Benjamin, William. Tray for carrying pipe nipples. 334,270, 3-23-93, Cl. D34-45.000.

Bennett, Joel S.: *See*—
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Benson, John N.: *See*—
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Bichi, Pasquale, to MGZ S.p.A. Ornamental chain. 334,151, 3-23-93, Cl. D11-12.000.

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Blaisdell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Fluorescent lamp. 334,245, 3-23-93, Cl. D26-3.000.

Blanchard, Russell O., to Batts, Inc. Clamp body. 334,096, 3-23-93, Cl. D6-328.000.

Bobrick Washroom Equipment, Inc.: *See*—
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Boche, Daniel K.: *See*—
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Boelling, James E. Ruler. 334,146, 3-23-93, Cl. D10-71.000.

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Bott, John A.: *See*—
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Bridges, Timothy C. Bathtub recliner. 334,105, 3-23-93, Cl. D6-502.000.

Brockway, Laura: *See*—
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Carter, Gary J. Combined cup and plate holder. 334,112, 3-23-93, Cl. D7-616.000.

Carter, John C., Jr. Self-clearing side view mirror. 334,165, 3-23-93, Cl. D12-187.000.

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Clifton, Robert W. Lawn trimmer attachment for a riding lawn mower. 334,200, 3-23-93, Cl. D15-17.000.

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Cucheran, John S.; and Sparham, Jon D., to Bott, John A. Vehicle luggage carrier. 334,162, 3-23-93, Cl. D12-157.000.

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Dirty Business Deals, Inc.: *See*—
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Dobbs, Danny K. Combined signaling mirror and carrying case. 334,149, 3-23-93, Cl. D10-109.000.

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Fraker, Stuart R.; Loupe, Michael R.; and Milliorn, Kitty M., to Home Furnishing Discount Club of America, Inc. Support bracket for drapery rings. 334,135, 3-23-93, Cl. D8-363.000.

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Gonzales, John. Combined clipboard and calculator. 334,214, 3-23-93, Cl. D19-88.000.

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Grosfillex, Raymond, to Grosfillex SARL. Armchair. 334,097, 3-23-93, Cl. D6-370.000.

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Hayes, David R. Detachable front wheel for a boat. 334,268, 3-23-93, Cl. D34-28.000.

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Hiller, Joe B. Shower head. 334,229, 3-23-93, Cl. D23-213.000.

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Van Aubert, Harold: *See*—
Wheeless, Carol B.; and Van Aubert, Harold, 334,100, Cl. D6-438.000.
Van Handel, William, III. Set of railroad tie clamps for use in landscaping. 334,121, 3-23-93, Cl. D8-1.000.
Vickery, Earle R., III. Dolly. 334,267, 3-23-93, Cl. D34-23.000.
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Watson, John: *See*—
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Weaver, Allan E.; Benson, John N.; and Schrenk, J. John, to Digital Equipment Corporation. Base for a computer housing. 334,184, 3-23-93, Cl. D14-114.000.
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Weyant, Chuck: *See*—
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Whittaker, Dale. Dental floss spindle. 334,249, 3-23-93, Cl. D28-64.000.
Wierzbicki, Julian N.: *See*—
Shaffer, John W.; and Wierzbicki, Julian N., 334,244, Cl. D26-3.000.
Wilcoxon, Fred C., to Wilcoxon Research, Inc. Electrical connector. 334,172, 3-23-93, Cl. D13-133.000.
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Williams, Curtiss D. Colonic enema board. 334,234, 3-23-93, Cl. D24-132.000.
Wobschall, Greg R.; and Root, Marvin G., to Truth Div. of SPX Corp. Window sash lock. 334,132, 3-23-93, Cl. D8-337.000.
Woo, Byung I., to Hankook Tire Mfg. Co., Ltd. Tire. 334,160, 3-23-93, Cl. D12-146.000.
Wu, Shu-Chen; and Shu-Yun, Chang. Double blade windshield wiper. 334,161, 3-23-93, Cl. D12-155.000.
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Yeh, Michael, to Coaster Co. of America, Inc. Chair. 334,099, 3-23-93, Cl. D6-370.000.
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Yun, Jin S., to Gold Star Co., Ltd. Cassette tape recorder. 334,191, 3-23-93, Cl. D14-165.000.
Zerilli, Gian F., to Giodoro s.r.l. Wrist-watch. 334,145, 3-23-93, Cl. D10-32.000.
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LIST OF PLANT PATENTEES

Carruth, Thomas F., to Weeks Wholesale Rose Grower, Inc. Hybrid Floribunda rose plant named Weeaz. 8,183, 3-23-93, Cl. 27.000.

Laboratoire de Physiologie Vegetale: *See*—
Negre, Yvon, 8,185, Cl. 70.500.

Negre, Yvon, to Laboratoire de Physiologie Vegetale. Spray carnation named Opale. 8,185, 3-23-93, Cl. 70.500.

Nobbio, Giacomo, to Selecta Klemm KG. Carnation named Nobgiac. 8,186, 3-23-93, Cl. 73.100.

Nor'East Miniature Roses, Inc.: *See*—
Saville, F. Harmon, 8,181, Cl. 7.100.
Saville, F. Harmon, 8,182, Cl. 7.100.

Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Miniature rose plant named Savarn. 8,181, 3-23-93, Cl. 7.100.

Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Miniature rose plant named Savafire. 8,182, 3-23-93, Cl. 7.100.

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Sun World, Inc.: *See*—
Weinberger, John H., 8,184, Cl. 39.000.

Weeks Wholesale Rose Grower, Inc.: *See*—
Carruth, Thomas F., 8,183, Cl. 27.000.

Weinberger, John H., to Sun World, Inc. Apricot cv. Suspriflve. 8,184, 3-23-93, Cl. 39.000.

CLASSIFICATION OF PATENTS

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311.2 5,195,711
430 5,195,712
441.1 5,195,713
448 5,195,714
526 5,195,715
632 5,195,716
638 5,195,717

CLASS 249

121 5,196,127

CLASS 250

203.6 5,196,688
206.1 5,196,689
207 5,196,690
208.1 5,196,691
5,196,692
214 B 5,196,693
227.16 5,196,694
227.17 5,196,695
236 5,196,696
5,196,697
262 5,196,698
282 5,196,699
288 5,196,700
306 5,196,701
327.2 5,196,702
332 5,196,703
337 5,196,704
372 5,196,705
396 R 5,196,706
398 5,196,707
423 R 5,196,708
458.1 5,196,709
492.1 5,196,710
548 5,196,711
551 5,196,712
561 5,196,713
5,196,714
562 5,196,715
572 5,196,716

CLASS 251

30.02 5,195,718
56 5,195,719
129.04 5,195,720
129.13 5,195,721
199 5,195,722
282 5,195,723

CLASS 252

8.8 5,196,128
49.5 5,196,129
49.9 5,196,130
89.1 5,196,131
90 5,196,132
95 5,196,133
103 5,196,134
106 5,196,135
170 5,196,136
172 5,196,137
182.12 5,196,138
186.25 5,196,139
299.6 5,196,140
299.61 5,196,141
311 5,196,142
315.5 5,196,143
500 5,196,144
511 5,196,145
542 5,196,146
589 5,196,147

CLASS 254

28 5,195,724

266 5,195,725
325 5,195,726

CLASS 256

13.1 5,195,727

CLASS 257

21 5,196,717
88 5,196,718
233 5,196,719
254 5,196,720
292 5,196,721
304 5,196,722
489 5,196,723
530 5,196,724
672 5,196,725
737 5,196,726

CLASS 261

76 5,196,148

CLASS 264

4.3 5,196,149
40.5 5,196,150
46.7 5,196,151
163 5,196,152
263 5,196,153

CLASS 266

78 5,196,154
99 5,196,155
106 5,196,156
143 5,196,157

CLASS 267

140.13 5,195,728

CLASS 269

21 5,195,729
303 5,195,730

CLASS 270

55 5,195,731

CLASS 271

3.1 5,195,733
9 5,195,734
11 5,195,732
21 5,195,735
22 5,195,736
35 5,195,737
111 5,195,738
207 5,195,739
277 5,195,740
303 5,195,741

CLASS 273

1.5 R 5,195,742
26 D 5,195,744
32 B 5,195,743
65 EG 5,195,745
148 B 5,195,746
170 5,195,747
186.2 5,195,748
187.4 5,195,749
241 5,195,750
349 5,195,751
374 5,195,752
429 5,195,753

CLASS 277

27 5,195,754
92 5,195,755
106 5,195,756
134 5,195,757
140 5,195,758
215 5,195,759

CLASS 279

60 5,195,760
90 5,195,761

CLASS 280

5.28 5,195,762
32.6 5,195,763
43.23 5,195,764
47.26 5,195,765
276 5,195,766
414.1 5,195,767
428 5,195,768
478.1 5,195,769
648 5,195,770
704 5,195,771
707 5,195,772
728 5,195,773
731 5,195,774
732 5,195,775
5,195,776
736 5,195,777
770 5,195,778
784 5,195,779
834 5,195,780
842 5,195,781

CLASS 281

48 5,195,782

CLASS 283

75 5,195,783

CLASS 285

61 5,195,784
80 5,195,785
190 5,195,786
252 5,195,788
319 5,195,787
331 5,195,789

CLASS 290

48 5,196,727

CLASS 292

201 5,195,790
298 5,195,791
341.16 5,195,792

CLASS 293

155 5,195,793

CLASS 294

94 5,195,794

CLASS 296

65.1 5,195,795
76 5,195,796
77.1 5,195,797
146 L 5,195,798
180.1 5,195,799
181 5,195,800

CLASS 297

301 5,195,801
335 5,195,802
365 5,195,803
460 5,195,804

CLASS 299

81 5,195,805

CLASS 301

108 R 5,195,807

CLASS 303

9.67 5,195,806
113 TR 5,195,808
5,195,809
116 R 5,195,811
116 SP 5,195,810

CLASS 307

10.1 5,196,728
116 5,196,729
132 EA 5,196,730
142 5,196,731
227 5,196,732
243 5,196,733
247.1 5,196,734
260 5,196,735
263 5,196,736
279 5,196,737
296.1 5,196,738
5,196,739
303 5,196,740
353 5,196,741
355 5,196,742
443 5,196,743
540 5,196,744

CLASS 310

12 5,196,745
54 5,196,746
89 5,196,747
90.5 5,196,748
217 5,196,749
239 5,196,750
254 5,196,751
260 5,196,752
313 B 5,196,753
324 5,196,754
5,196,755
328 5,196,756
358 5,196,757
361 5,196,758

CLASS 312

257.1 5,195,812

CLASS 313

112 5,196,759
142 5,196,760
402 5,196,761
414 5,196,762
468 5,196,763
477 HC 5,196,764

CLASS 315

39.3 5,196,765
115 5,197,119
241 R 5,196,766
349 5,196,767
368.28 5,196,768

CLASS 318

39 5,196,769

135 5,196,770
254 5,196,771
434 5,196,772
561 5,196,773
569 5,196,774
638 5,196,775
660 5,196,776
696 5,196,777
807 5,196,778

CLASS 320

14 5,196,779
40 5,196,780
61 5,196,781

CLASS 323

320 5,196,782

CLASS 324

110 5,196,783
117 R 5,196,784
158 F 5,196,785
158 P 5,196,789
158 R 5,196,786
5,196,787
5,196,788
177 5,196,790
207.13 5,196,791
207.16 5,196,792
207.25 5,196,793
251 5,196,794
309 5,196,795
322 5,196,796
5,196,797
388 5,196,798
557 5,196,799
662 5,196,800
663 5,196,801
5,196,802
713 5,196,803

CLASS 330

133 5,196,804

CLASS 330

54 5,196,805
137 5,196,806
254 5,196,807
298 5,196,808
307 5,196,809

CLASS 331

49 5,196,810
135 5,196,811

CLASS 333

113 5,196,812
206 5,196,813
254 5,196,814

CLASS 335

16 5,196,815
78 5,196,816
202 5,196,817
285 5,196,818

CLASS 337

297 5,196,819
368 5,196,820

CLASS 338

32 R 5,196,821
328 5,196,822

CLASS 340

310 R 5,196,823
450.3 5,196,824
539 5,196,825
554 5,196,826
568 5,196,827
571 5,196,828
574 5,196,829
584 5,196,830
638 5,196,831
663 5,196,832
5,196,833
703 5,196,834
712 5,196,835
5,196,836
723 5,196,837
724 5,196,838
793 5,196,839
825.3 5,196,840
825.31 5,196,841
825.44 5,196,842
825.52 5,196,843
870.29 5,196,844
870.31 5,196,845
933 5,196,846
970 5,196,847

CLASS 341

58 5,196,848
59 5,196,849
76 5,196,850
140 5,196,851
143 5,196,852
5,196,853

213.11 5,196,939
228 5,196,940
242 5,196,941
298 5,196,942
403 5,196,943
404 5,196,944
426 5,196,945
433 5,196,946
441 5,196,947
446 5,196,948
469 5,196,949
475 5,196,950

CLASS 309

13 5,196,951
51 5,196,952
73 5,196,953
75 5,196,954
100 5,196,955
198 5,196,956
206 5,196,957
344 5,196,958
415 5,196,959
453 5,196,960
522 5,196,961
686 5,196,962
699 5,196,963
800 5,196,964
841 5,196,965
896 5,196,966

CLASS 360

66 5,196,967
69 5,196,968
75 5,196,969
77.03 5,196,970
85 5,196,971
94 5,196,972
103 5,196,973
5,196,974
105 5,196,975
113 5,196,976
130.220 5,196,977
133 5,196,978
137 5,196,979

CLASS 361

11 5,196,980
56 5,196,981
93 5,196,982
154 5,196,983
191 5,196,984
220 5,196,985
306 5,196,986
334 5,196,987
362 5,196,988
383 5,196,989
386 5,196,990
392 5,196,991
5,196,992
393 5,196,993
395 5,196,994

CLASS 362

18 5,195,814
61 5,195,813
5,195,815
71 5,195,816
72 5,195,817
224 5,195,818
253 5,195,819
259 5,195,821
296 5,195,822
387 5,195,823
523 5,195,820

CLASS 363

16 5,196,995
60 5,196,996

CLASS 364

152 5,196,997
167.01 5,196,998
400 5,196,999
401 5,197,000
403 5,197,001
406 5,197,002
410 5,197,003
419 5,197,004
5,197,005
424.05 5,197,007
424.1 5,197,006
426.01 5,197,008
443 5,197,009
463 5,197,010
468 5,197,011
470 5,197,012
474.24 5,197,013
474.31 5,197,014
490 5,197,015
5,197,016
497 5,197,017
508 5,197,018
563 5,197,019
724.14 5,197,020
725 5,197,021
745 5,197,022

748 5,197,023
748.5 5,197,024

CLASS 365

87 5,197,025
104 5,197,026
185 5,197,027
5,197,028
189.01 5,197,029
200 5,197,030
201 5,197,031
207 5,197,032
226 5,197,033
227 5,197,034
230.05 5,197,035

CLASS 366

131 5,195,824
213 5,195,825

CLASS 367

4 5,197,036
11 5,197,037
28 5,197,038
52 5,197,039
84 5,197,040
160 5,197,041

CLASS 368

10 5,197,042
27 5,197,043
63 5,197,044
157 5,197,045
282 5,197,046

CLASS 369

4 5,197,047
13 5,197,048
5,197,049
5,197,050
14 5,197,051
25 5,197,052
32 5,197,053
5,197,054
34 5,197,055
37 5,197,056
5,197,057
44.28 5,197,058
116 5,197,059
283 5,197,060

CLASS 370

11 5,197,061
13 5,197,062
58.1 5,197,063
60 5,197,064
79 5,197,065
85.3 5,197,066
94.1 5,197,067
110.4 5,197,068

CLASS 371

7 5,197,069
22.3 5,197,070

CLASS 372

2 5,197,071
21 5,197,072
22 5,197,073
26 5,197,074
28 5,197,075
34 5,197,076
45 5,197,077
55 5,197,078
87 5,197,079

CLASS 373

76 5,197,080
152 5,197,081

CLASS 374

142 5,195,826
172 5,195,827

CLASS 375

119 5,197,086
122 5,197,087

CLASS 376

216 5,196,158
221 5,196,159
260 5,196,160
272 5,196,161

CLASS 378

10 5,197,088
34 5,197,089
174 5,197,090

CLASS 379

58 5,197,091
59 5,197,092
61 5,197,093
91 5,197,094
107 5,197,095

145 Re.34,200
211 5,197,096

CLASS 380

6 5,197,097
5,197,098

CLASS 381

27 5,197,099
5,197,100
29 5,197,101
96 5,197,102
159 5,197,103
192 5,197,104

CLASS 382

8 5,197,105
30 5,197,107
47 5,197,108

CLASS 383

4 5,195,828
20 B1 4,895,456
100 5,195,829

CLASS 384

448 5,195,830
5,195,831

CLASS 385

50 5,197,109
122 5,197,110

CLASS 392

347 5,197,111
360 5,197,112

CLASS 395

2 5,197,113
22 5,197,114
80 5,197,115
81 5,197,116
105 5,197,117
5,197,118
139 5,197,120
146 5,197,122
148 5,197,123
155 5,197,124
200 5,197,125
5,197,126
5,197,127
275 5,197,128
5,197,129
325 5,197,130
375 5,197,131
5,197,132
5,197,133
5,197,134
5,197,135
5,197,136
5,197,137
5,197,138
400 5,197,139
5,197,140
425 5,197,141
5,197,142
5,197,143
5,197,144
5,197,145
500 5,197,147
575 5,197,148

CLASS 400

120 5,195,832
185 5,195,833
202 5,195,834
207 5,195,835
354 5,195,836
719 5,195,837

CLASS 403

5 5,195,838
12 5,195,839
339 5,195,840

CLASS 404

72 5,195,841

CLASS 405

60 5,195,842
63 5,195,843
69 5,195,844
74 5,195,845
108 5,195,846
128 5,195,847
202 5,195,848
282 5,195,849

CLASS 406

92 5,195,850
121 5,195,851
153 5,195,852

CLASS 408

137 5,195,853

CLASS 410

154 B1 4,494,897

CLASS 411

43 5,195,855
55 5,195,856
344 5,195,857
353 5,195,858
427 5,195,854
510 5,195,859
526 5,195,860

CLASS 414

296 5,195,861
416 5,195,862
694 5,195,863
699 5,195,864
723 5,195,865
749 5,195,866

CLASS 415

005 5,195,870
111 5,195,867
177 5,195,868
213.1 5,195,869

CLASS 416

13 5,195,871
111 5,195,872

CLASS 417

18 5,195,873
27 5,195,874
282 5,195,875
307 5,195,876
356 5,195,877
393 5,195,878
521 5,195,879

CLASS 418

5 5,195,880
97 5,195,881
171 5,195,882

CLASS 420

418 5,196,162
422 5,196,163

CLASS 422

1 5,196,164
26 5,196,165
45 5,196,166
56 5,196,167
64 5,196,168
81 5,196,169
83 5,196,170
121 5,196,171
144 5,196,172
249 5,196,173
300 5,196,174

CLASS 423

213.5 5,196,175
242 5,196,176
335 5,196,177
395 5,196,178
588 5,196,179
593 5,196,180
613 5,196,181

CLASS 424

3 5,196,182
9 5,196,183
45 5,196,184
5,196,185
54 R 5,195,688
69 5,196,186
70 5,196,187
71 5,196,188
72 5,196,189
78.06 5,196,190
85.5 5,196,191
85.8 5,196,192
5,196,193
89 5,196,194
94.6 5,196,195
94.64 5,196,196
195.1 5,196,197
5,196,198
401 5,196,199
411 5,196,200
422 5,196,201
448 5,196,202
469 5,196,203
538 5,196,204
653 5,196,205

CLASS 428

28.1 5,196,206
72.2 5,196,207
90 5,196,208
111 5,196,209
116 5,196,210
131.5 5,196,211
174.8 R 5,196,212
536 5,196,213

262 5,195,987
338 5,195,996

CLASS 406

46 5,196,011
130 5,196,019
195 5,195,984

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CLASS 426

52 5,196,214
94 5,196,215
112 5,196,216
144 5,196,217
241 5,196,218
302 5,196,219
329 5,196,220
332 5,196,221
482 5,196,222
503 5,196,223
535 5,196,224
560 5,196,225
564 5,196,226

CLASS 427

44 5,196,227
53.1 5,196,228
66 5,196,229
96 5,196,230
164 5,196,231
180 5,196,232
213 5,196,234
214 5,196,235
265 5,196,236
288 5,196,237
347 5,196,238
348 5,196,239
389.9 5,196,240
444 5,196,241

CLASS 428

11 5,196,242
29 5,196,243
35.2 5,196,244
35.5 5,196,245
39 5,196,246
43 5,196,247
46 5,196,248
60 5,196,249
64 5,196,250
76 5,196,251
102 5,196,252
138 5,196,253
178 5,196,254
188 5,196,255
220 5,196,257
224 5,196,258
245 5,196,259
290 5,196,260
310.5 5,196,261
315.5 5,196,262
327 5,196,263
328 5,196,264
332 5,196,265
355 5,196,266
404 5,196,267
458 5,196,268
513 5,196,269
523 5,196,270
545 5,196,271
557 5,196,272
614 5,196,273
704 B1 4,749,631

CLASS 429

13 5,196,274
27 5,196,275
52 5,196,276
104 5,196,277
144 5,196,280
194 5,196,278
5,196,279
211 5,196,281

CLASS 430

2 5,196,282
5 5,196,283
19 5,196,284
30 5,196,285
126 5,196,286
138 5,196,287
5,196,288
192 5,196,289
204 5,196,290
264 5,196,291
5,196,292
5,196,293
270 5,196,294
273 5,196,295
288 5,196,296
338 5,196,297
440 5,196,298
567 5,196,299
568 5,196,300
617 5,196,301

CLASS 431

3 5,195,883
8 5,195,884
25 5,195,885
30 5,195,886

CLASS 432

14 5,195,887
64 5,195,888

CLASS 433

40 5,195,889
172 5,195,890
173 5,195,891
174 5,195,892

CLASS 434

11 5,195,893
114 5,195,894
236 5,195,895
265 5,195,896

CLASS 435

4 5,196,302
5 5,196,303
6 5,196,304
5,196,305
7.21 5,196,308
5,196,309
7.24 5,196,310
7.9 5,196,306
5,196,307
7.94 5,196,311
13 5,196,312
15 5,196,314
29 5,196,315
32 5,196,313
69.1 5,196,316
5,196,317
5,196,318
69.3 5,196,319
69.51 5,196,323
69.7 5,196,321
69.8 5,196,322
70.21 5,196,324
106 5,196,326
128 5,196,327
172.3 5,196,328
5,196,329
199 5,196,330
5,196,331
5,196,332
240.1 5,196,333
240.2 5,196,334
5,196,335
240.27 5,196,337
240.4 5,196,336
252.3 5,196,338
262 5,196,339
288 5,196,340
291 5,196,341
320.1 5,196,342
697 5,196,320

CLASS 436

8 5,196,343
11 5,196,344
55 5,196,345
63 5,196,346
127 5,196,347
173 5,196,348
500 5,196,349
501 5,196,350
5,196,351
5,196,352

CLASS 437

8 5,196,353
17 5,196,354
24 5,196,355
31 5,196,356
40 5,196,357
5,196,358
5,196,359
5,196,360
5,196,361
5,196,362
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5,196,364
5,196,365
5,196,366
5,196,367
5,196,368
5,196,369
5,196,370
5,196,371
5,196,233
5,196,372
5,196,373
5,196,374
5,196,375
5,196,376
5,196,377
5,196,378

CLASS 439

67 5,195,897
77 5,195,898
101 5,195,899
131 5,195,900
147 5,195,901
188 5,195,902
266 5,195,903
349 5,195,904
352 5,195,905
394 5,195,906
410 5,195,907
422 5,195,908
465 5,195,909
578 5,195,910
607 5,195,911
685 5,195,912
748 5,195,913

CLASS 440

56 5,195,914

CLASS 441

79 5,195,915

CLASS 446

46 5,195,916
97 5,195,917
227 5,195,918
397 5,195,919
409 5,195,920

CLASS 452

4 5,195,921
64 5,195,923
149 5,195,924
166 5,195,925

CLASS 454

57 5,195,922
143 5,195,926
271 5,195,927
352 5,195,928

CLASS 460

48 5,195,929

CLASS 464

180 5,195,930

CLASS 470

40 5,195,931

CLASS 474

135 5,195,932

CLASS 475

206 5,195,933
227 5,195,934

CLASS 482

70 5,195,935
112 5,195,936
119 5,195,937
131 5,195,938

CLASS 494

60 5,195,939

CLASS 501

10 5,196,381
12 5,196,382
5,196,383
32 5,196,384
87 5,196,385
88 5,196,386
89 5,196,387
134 5,196,388

CLASS 502

4 5,196,380
178 5,196,389
251 5,196,390

CLASS 503

200 5,196,391
209 5,196,394
227 5,196,392
5,196,393

CLASS 505

1 5,196,379
5,196,395
5,196,396
5,196,397
5,196,398
5,196,399
5,196,400

CLASS 507

120 5,196,401

CLASS 514

9 5,196,402
12 5,196,403
13 5,196,404
53 5,196,405
58 5,196,406
63 5,196,407
80 5,196,408
108 5,196,409
159 5,196,410
169 5,196,411
184 5,196,412
185 5,196,413
206 5,196,414
210 5,196,415
212 5,196,416
226.5 5,196,417
230.8 5,196,418
241 5,196,419
250 5,196,420
5,196,421
252 5,196,422
253 5,196,428
255 5,196,423
258 5,196,424
5,196,425
5,196,426
259 Re.34,201
5,196,427
263 5,196,429
5,196,430
272 5,196,431
274 5,196,432
277 5,196,433
278 5,196,434
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577 5,196,452
614 5,196,453
654 5,196,454

CLASS 521

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CLASS 522

11 5,196,456
103 5,196,457

CLASS 523

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CLASS 524

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300 5,196,469
379 5,196,470
406 5,196,471
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445 5,196,473
502 5,196,474
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769 5,196,476
863 5,196,477

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67 5,196,479
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310 5,196,483
314 5,196,484
327.3 5,196,485
328.8 5,196,486
343 5,196,487
439 5,196,488

CLASS 526

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160 5,196,490
185 5,196,491
210 5,196,492
245 5,196,493
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264 5,196,495
282 5,196,503
318.4 5,196,504
348.6 5,196,496

CLASS 528

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125 5,196,500
171 5,196,501
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CLASS 540

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300 5,196,529
310 5,196,530

CLASS 544

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114 5,196,532
118 5,196,533

CLASS 546

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209 5,196,535
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379 5,196,546
453 5,196,547
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402 5,196,575
427 5,196,576
490 5,196,577
493 5,196,590
531 5,196,578
580 5,196,579
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8 5,196,581
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305 5,196,583
331 5,196,591
415 5,196,592
418 5,196,584
437 5,196,585
442 5,196,586
451 5,196,587
452 5,196,594
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309 5,196,606
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684 5,196,600
697 5,196,612
730 5,196,605
817 5,196,601
819 5,196,613
864 5,196,602
917 5,196,603

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168 5,196,615
178 5,196,616
204 5,196,617
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361 5,196,621
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440 5,196,632
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725 5,196,628
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CLASS 588

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CLASS 600

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CLASS 602

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CLASS 604

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385.2 5,196,000
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891.1 5,196,002

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37 5,196,010
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130 5,196,019
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133 5,196,021
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148 5,196,023
159 5,196,024
182 5,196,025
195 5,195,984

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5 5,196,026
5,196,027
6 5,196,028
16 5,195,951

CLASS 800

205 5,196,636

CLASSIFICATION OF DESIGNS

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CLASSIFICATION OF DESIGNS

D2—	314	334,088		667	334,119	D11—	5	334,150		103	334,181		86	334,212		2	334,243
		334,089		700	334,120		12	334,151		106	334,182		88	334,213		3	334,244
		334,090	D8—	1	334,121		13	334,152		107	334,183			334,214			334,245
	320	334,091		21	334,122		76	334,153		114	334,184	D20—	21	334,215	D27—	129	334,246
		334,092		39	334,123		90	334,154		115	334,185		40	334,216	D28—	20	334,247
D3—	36	334,093		61	334,124		221	334,155		121	334,186		41	334,217		37	334,248
	78	334,094			334,125		222	334,156		138	334,187	D21—	13	334,218		64	334,249
D4—	102	334,095		62	334,126	D12—	15	334,158		144	334,188		63	334,219	D29—	15	334,250
D6—	328	334,096		77	334,127		113	334,157		163	334,189		104	334,220	D30—	122	334,251
	369	334,098		83	334,128		133	334,159		164	334,190		114	334,221		144	334,252
	370	334,097		323	334,129		146	334,160		165	334,191		140	334,222			334,253
		334,099			334,130		155	334,161		211	334,192		169	334,223		160	334,254
	438	334,100		331	334,131		157	334,162		213	334,193		222	334,224		162	334,255
	462	334,101		357	334,132		162	334,163		217	334,194		226	334,225	D32—	4	334,256
		334,102		354	334,133		178	334,164		232	334,195	D22—	147	334,226		22	334,257
	484	334,103		356	334,134		187	334,165		249	334,196	D23—	207	334,227		23	334,258
	499	334,104		363	334,135			334,166	D15—	5	334,197		209	334,228		31	334,259
	502	334,105		375	334,136		314	334,167		7	334,198		213	334,229			334,260
	542	334,106	D9—	300	334,137		317	334,168		9.1	334,199		252	334,230			334,261
	601	334,107		307	334,138	D13—	103	334,169		17	334,200		281	334,231		32	334,262
D7—	323	334,108		318	334,139		108	334,170		89	334,201		377	334,232		44	334,263
	351	334,109		338	334,140		110	334,171		140	334,202	D24—	112	334,233		46	334,264
	393	334,110		425	334,141		133	334,172	D16—	129	334,206		132	334,234		55	334,265
	504	334,111		455	334,142			334,173		135	334,207		164	334,235	D34—	6	334,266
	616	334,112		529	334,143		160	334,174	D18—	12	334,203		197	334,236		23	334,267
	629	334,113	D10—	6	334,144		182	334,175		24	334,204		232	334,237		28	334,268
		334,114		32	334,145	D14—	100	334,176		39	334,205	D25—	2	334,238		33	334,269
	660	334,115		71	334,146			334,177		50	334,208		39	334,239		45	334,270
	661	334,116		80	334,147			334,178		56	334,209		68	334,240	D99—	29	334,271
	662	334,117		109	334,148			334,179	D19—	2	334,210		124	334,241		32	334,272
		334,118			334,149			334,180		59	334,211	D26—	1	334,242			

CLASSIFICATION OF PLANTS

P.—	7.1	8,181		8,182	27	8,183	39	8,184	70.5	8,185	73.1	8,186

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01 :	5,195,257	5,195,469	5,196,024	5,196,789	5,195,664	10 :	5,195,493
	5,195,502	5,195,499	5,196,028	5,196,797	5,195,705		5,195,851
	5,196,025	5,195,500	5,196,044	5,196,798	5,195,869		5,196,053
	5,196,174	5,195,512	5,196,056	5,196,802	5,195,920		5,196,136
	5,196,269	5,195,514	5,196,061	5,196,812	5,196,065		5,196,137
	5,196,533	5,195,521	5,196,098	5,196,814	5,196,068		5,196,271
	5,196,565	5,195,522	5,196,101	5,196,818	5,196,741		5,196,381
02 :	5,195,591	5,195,525	5,196,106	5,196,826	5,196,781		5,196,408
04 :	5,195,260	5,195,526	5,196,113	5,196,827	5,196,833		5,196,462
	5,195,282	5,195,531	5,196,134	5,196,829	5,197,068		5,196,491
	5,195,655	5,195,538	5,196,144	5,196,838	5,197,143		5,196,494
	5,195,656	5,195,541	5,196,190	5,196,839	09 : 5,195,223		5,196,498
	5,195,719	5,195,560	5,196,191	5,196,852	5,195,267		5,196,549
	5,195,777	5,195,568	5,196,194	5,196,871	5,195,331		5,196,551
	5,195,813	5,195,595	5,196,196	5,196,872	5,195,444		5,196,569
	5,195,984	5,195,596	5,196,219	5,196,901	5,195,450		5,196,604
	5,195,997	5,195,599	5,196,220	5,196,905	5,195,475		5,196,615
	5,196,036	5,195,628	5,196,222	5,196,919	5,195,489		5,197,114
	5,196,095	5,195,642	5,196,228	5,196,938	5,195,505	11 :	5,196,199
	5,196,304	5,195,646	5,196,240	5,196,939	5,195,588	12 :	Re.34,198
	5,196,376	5,195,657	5,196,242	5,196,946	5,195,614		Re.34,200
	5,196,380	5,195,662	5,196,249	5,196,949	5,195,616		5,195,197
	5,196,447	5,195,668	5,196,259	5,196,951	5,195,638		5,195,217
	5,196,713	5,195,702	5,196,282	5,196,953	5,195,700		5,195,234
	5,196,784	5,195,718	5,196,285	5,196,957	5,195,714		5,195,277
	5,196,805	5,195,729	5,196,309	5,196,981	5,195,737		5,195,315
	5,196,808	5,195,745	5,196,336	5,196,989	5,195,831		5,195,417
	5,196,828	5,195,820	5,196,357	5,196,993	5,195,891		5,195,441
	5,196,904	5,195,823	5,196,361	5,196,998	5,195,907		5,195,504
	5,196,985	5,195,827	5,196,395	5,197,003	5,196,079		5,195,609
	5,197,026	5,195,836	5,196,448	5,197,004	5,196,083		5,195,620
	5,197,055	5,195,852	5,196,452	5,197,015	5,196,109		5,195,650
	5,197,147	5,195,878	5,196,504	5,197,017	5,196,152		5,195,660
05 :	5,195,205	5,195,887	5,196,511	5,197,024	5,196,214		5,195,684
	5,196,116	5,195,894	5,196,523	5,197,027	5,196,251		5,195,699
06 :	5,195,189	5,195,895	5,196,536	5,197,034	5,196,286		5,195,707
	5,195,190	5,195,897	5,196,624	5,197,044	5,196,410		5,195,872
	5,195,196	5,195,935	5,196,625	5,197,049	5,196,426		5,195,938
	5,195,231	5,195,940	5,196,639	5,197,066	5,196,428		5,195,953
	5,195,250	5,195,952	5,196,652	5,197,093	5,196,469		5,195,983
	5,195,270	5,195,955	5,196,664	5,197,104	5,196,483		5,196,119
	5,195,299	5,195,958	5,196,690	5,197,125	5,196,548		5,196,125
	5,195,302	5,195,963	5,196,699	5,197,126	5,196,607		5,196,248
	5,195,305	5,195,964	5,196,701	5,197,146	5,196,698		5,196,280
	5,195,368	5,195,968	5,196,707	4,711,140	5,196,817		5,196,281
	5,195,390	5,195,971	5,196,710	08 : 5,195,218	5,196,831		5,196,329
	5,195,393	5,195,974	5,196,712	5,195,321	5,196,902		5,196,373
	5,195,405	5,195,978	5,196,724	5,195,333	5,196,924		5,196,382
	5,195,424	5,195,982	5,196,739	5,195,510	5,196,987		5,196,458
	5,195,439	5,195,987	5,196,742	5,195,561	5,197,005		5,196,612
	5,195,448	5,195,991	5,196,748	5,195,569	5,197,038		5,196,649
	5,195,453	5,196,005	5,196,776	5,195,573	5,197,042		5,196,655
	5,195,457	5,196,014	5,196,785	5,195,661	5,197,139		5,196,774

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on March 27, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,910,802 through 4,912,776
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 25, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,577,346 through 4,578,820
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity($ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 17, 1993 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,753	06/937,211	9/20/88
(4,493,417)	(06/565,120)	(1/15/85)
4,493,119	06/456,406	1/15/85
4,493,128	06/506,284	1/15/85
4,493,133	06/464,577	1/15/85
4,493,134	06/443,393	1/15/85
4,493,135	06/479,755	1/15/85
4,493,136	06/373,086	1/15/85
4,493,141	06/460,065	1/15/85
4,493,143	06/315,296	1/15/85
4,493,148	06/538,157	1/15/85
4,493,150	06/439,411	1/15/85
4,493,153	06/540,096	1/15/85
4,493,156	06/508,822	1/15/85
4,493,159	06/502,405	1/15/85
4,493,160	06/516,719	1/15/85
4,493,162	06/453,797	1/15/85
4,493,163	06/364,180	1/15/85
4,493,166	06/432,475	1/15/85
4,493,170	06/323,017	1/15/85
4,493,171	06/244,228	1/15/85
4,493,172	06/408,899	1/15/85
4,493,178	06/525,235	1/15/85
4,493,179	06/352,749	1/15/85
4,493,186	06/403,793	1/15/85
4,493,189	06/327,409	1/15/85
4,493,190	06/483,954	1/15/85
4,493,191	06/579,928	1/15/85
4,493,194	06/553,619	1/15/85
4,493,195	06/493,461	1/15/85
4,493,196	06/532,551	1/15/85
4,493,197	06/426,462	1/15/85
4,493,206	06/378,537	1/15/85
4,493,208	06/454,434	1/15/85
4,493,209	06/491,171	1/15/85
4,493,211	06/527,918	1/15/85
4,493,213	06/439,618	1/15/85
4,493,214	06/433,106	1/15/85
4,493,222	06/370,593	1/15/85
4,493,226	06/398,146	1/15/85
4,493,229	06/498,097	1/15/85
4,493,231	06/396,907	1/15/85
4,493,237	06/503,529	1/15/85
4,493,238	06/458,236	1/15/85
4,493,239	06/369,377	1/15/85
4,493,241	06/463,926	1/15/85
4,493,243	06/499,251	1/15/85
4,493,253	06/554,743	1/15/85
4,493,254	06/546,879	1/15/85
4,493,255	06/460,498	1/15/85
4,493,263	06/426,613	1/15/85
4,493,264	06/453,670	1/15/85
4,493,266	06/383,819	1/15/85
4,493,271	06/468,417	1/15/85
4,493,275	06/534,586	1/15/85
4,493,277	06/537,768	1/15/85
4,493,279	06/550,722	1/15/85
4,493,281	06/481,520	1/15/85
4,493,282	06/476,677	1/15/85
4,493,284	06/468,648	1/15/85
4,493,286	06/516,679	1/15/85
4,493,289	06/241,684	1/15/85
4,493,292	06/502,576	1/15/85
4,493,293	06/550,131	1/15/85
4,493,294	06/449,987	1/15/85
4,493,297	06/424,856	1/15/85
4,493,301	06/552,659	1/15/85
4,493,308	06/366,026	1/15/85
4,493,312	06/342,247	1/15/85
4,493,337	06/450,147	1/15/85
4,493,338	06/449,770	1/15/85
4,493,340	06/430,179	1/15/85
4,493,343	06/484,464	1/15/85
4,493,350	06/479,784	1/15/85
4,493,351	06/429,433	1/15/85
4,493,352	06/456,744	1/15/85
4,493,353	06/580,564	1/15/85
4,493,354	06/582,294	1/15/85
4,493,355	06/338,356	1/15/85
4,493,358	06/255,332	1/15/85
4,493,365	06/494,146	1/15/85
4,493,367	06/544,927	1/15/85
4,493,369	06/478,596	1/15/85
4,493,370	06/461,320	1/15/85
4,493,372	06/493,468	1/15/85
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Patent Number	Serial Number	Issue Date
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4,493,382	06/526,378	1/15/85
4,493,385	06/497,884	1/15/85
4,493,387	06/407,534	1/15/85
4,493,389	06/382,429	1/15/85
4,493,392	06/537,276	1/15/85
4,493,394	06/381,021	1/15/85
4,493,396	06/475,253	1/15/85
4,493,402	06/350,347	1/15/85
4,493,403	06/382,435	1/15/85
4,493,410	06/453,875	1/15/85
4,493,412	06/392,393	1/15/85
4,493,416	06/505,887	1/15/85
4,493,425	06/493,879	1/15/85
4,493,426	06/310,768	1/15/85
4,493,434	06/472,061	1/15/85
4,493,438	06/396,622	1/15/85
4,493,443	06/508,045	1/15/85
4,493,446	06/519,282	1/15/85
4,493,447	06/493,608	1/15/85
4,493,460	06/363,232	1/15/85
4,493,461	06/503,283	1/15/85
4,493,466	06/617,139	1/15/85
4,493,467	06/361,656	1/15/85
4,493,468	06/510,727	1/15/85
4,493,471	06/466,059	1/15/85
4,493,473	06/569,236	1/15/85
4,493,478	06/445,833	1/15/85
4,493,486	06/476,048	1/15/85
4,493,489	06/359,124	1/15/85
4,493,495	06/362,021	1/15/85
4,493,498	06/431,517	1/15/85
4,493,499	06/438,131	1/15/85
4,493,502	06/529,526	1/15/85
4,493,509	06/451,655	1/15/85
4,493,514	06/588,182	1/15/85
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4,493,541	06/499,082	1/15/85
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4,493,553	06/383,086	1/15/85
4,493,556	06/467,957	1/15/85
4,493,560	06/392,637	1/15/85
4,493,561	06/486,305	1/15/85
4,493,568	06/447,486	1/15/85
4,493,569	06/290,301	1/15/85
4,493,570	06/432,622	1/15/85
4,493,572	06/446,249	1/15/85
4,493,573	06/476,222	1/15/85
4,493,575	06/437,104	1/15/85
4,493,577	06/410,096	1/15/85
4,493,580	06/616,623	1/15/85
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4,493,593	06/393,353	1/15/85
4,493,599	06/446,234	1/15/85
4,493,601	06/354,938	1/15/85
4,493,602	06/288,379	1/15/85
4,493,607	06/450,442	1/15/85
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4,493,613	06/567,006	1/15/85
4,493,619	06/315,875	1/15/85
4,493,621	06/425,964	1/15/85
4,493,624	06/527,664	1/15/85
4,493,632	06/452,864	1/15/85
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4,493,640	06/544,203	1/15/85
4,493,641	06/569,500	1/15/85
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4,493,647	06/362,710	1/15/85
4,493,648	06/493,718	1/15/85
4,493,650	06/581,399	1/15/85
4,493,656	06/589,952	1/15/85
4,493,659	06/326,553	1/15/85
4,493,660	06/275,607	1/15/85
4,493,664	06/373,943	1/15/85
4,493,667	06/359,467	1/15/85
4,493,671	06/260,588	1/15/85
4,493,679	06/436,745	1/15/85
4,493,682	06/337,167	1/15/85
4,493,684	06/511,696	1/15/85
4,493,686	06/438,655	1/15/85
4,493,693	06/403,362	1/15/85
4,493,696	06/608,257	1/15/85
4,493,699	06/366,889	1/15/85
4,493,704	06/445,276	1/15/85
4,493,705	06/406,962	1/15/85
4,493,710	06/550,803	1/15/85
4,493,713	06/400,627	1/15/85
4,493,717	06/375,536	1/15/85
4,493,723	06/461,123	1/15/85
4,493,724	06/537,593	1/15/85
4,493,725	06/495,531	1/15/85
4,493,727	06/438,746	1/15/85
4,493,741	06/488,249	1/15/85
4,493,748	06/568,814	1/15/85
4,493,761	06/558,093	1/15/85
4,493,762	06/490,905	1/15/85
4,493,765	06/501,197	1/15/85
4,493,768	06/527,563	1/15/85
4,493,769	06/527,564	1/15/85
4,493,774	06/349,951	1/15/85
4,493,775	06/537,887	1/15/85
4,493,776	06/429,959	1/15/85
4,493,782	06/511,690	1/15/85
4,493,785	06/482,714	1/15/85
4,493,790	06/541,263	1/15/85
4,493,791	06/541,264	1/15/85
4,493,795	06/542,633	1/15/85
4,493,797	06/564,500	1/15/85
4,493,804	06/617,844	1/15/85
4,493,805	06/456,015	1/15/85
4,493,809	06/355,361	1/15/85
4,493,810	06/415,616	1/15/85
4,493,812	06/340,621	1/15/85
4,493,813	06/418,165	1/15/85
4,493,814	06/377,117	1/15/85
4,493,816	06/441,027	1/15/85
4,493,818	06/574,315	1/15/85
4,493,821	06/345,589	1/15/85
4,493,823	06/319,915	1/15/85
4,493,826	06/466,998	1/15/85
4,493,828	06/402,018	1/15/85
4,493,832	06/391,918	1/15/85
4,493,837	06/435,518	1/15/85
4,493,840	06/314,558	1/15/85
4,493,844	06/409,751	1/15/85
4,493,849	06/544,330	1/15/85
4,493,850	06/608,935	1/15/85
4,493,851	06/410,248	1/15/85
4,493,863	06/568,733	1/15/85
4,493,873	06/480,627	1/15/85
4,493,875	06/559,965	1/15/85
4,493,877	06/231,829	1/15/85
4,493,886	06/593,773	1/15/85
4,493,889	06/573,181	1/15/85
4,493,891	06/402,442	1/15/85
4,493,892	06/451,526	1/15/85
4,493,893	06/472,646	1/15/85
4,493,897	06/281,217	1/15/85
4,493,898	06/488,133	1/15/85
4,493,899	06/312,159	1/15/85
4,493,907	06/478,167	1/15/85
4,493,910	06/507,729	1/15/85
4,493,914	06/468,902	1/15/85
4,493,930	06/311,371	1/15/85
4,493,931	06/393,383	1/15/85
4,493,939	06/547,066	1/15/85
4,493,947	06/309,227	1/15/85
4,493,955	06/486,203	1/15/85

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4,493,961	06/367,957	1/15/85
4,493,966	06/376,999	1/15/85
4,493,970	06/458,600	1/15/85
4,493,974	06/457,021	1/15/85
4,493,986	06/508,756	1/15/85
4,493,987	06/462,612	1/15/85
4,493,988	06/275,713	1/15/85
4,493,991	06/395,232	1/15/85
4,493,994	06/436,920	1/15/85
4,493,998	06/364,837	1/15/85
4,493,999	06/329,441	1/15/85
4,494,003	06/472,441	1/15/85
4,494,005	06/584,386	1/15/85
4,494,008	06/471,751	1/15/85
4,494,009	06/533,237	1/15/85
4,494,012	06/549,721	1/15/85
4,494,023	06/555,413	1/15/85
4,494,025	06/603,235	1/15/85
4,494,030	06/318,231	1/15/85
4,494,031	06/475,800	1/15/85
4,494,034	06/448,402	1/15/85
4,494,036	06/590,934	1/15/85
4,494,039	06/435,155	1/15/85
4,494,047	06/387,174	1/15/85
4,494,051	06/354,963	1/15/85
4,494,054	06/484,178	1/15/85
4,494,057	06/446,318	1/15/85
4,494,062	06/384,948	1/15/85
4,494,063	06/452,773	1/15/85
4,494,065	06/440,007	1/15/85
4,494,067	06/425,919	1/15/85
4,494,069	06/302,150	1/15/85
4,494,072	06/410,374	1/15/85
4,494,079	06/328,892	1/15/85
4,494,084	06/353,752	1/15/85
4,494,094	06/438,940	1/15/85
4,494,096	06/608,597	1/15/85
4,494,099	06/575,955	1/15/85
4,494,101	06/470,253	1/15/85
4,494,107	06/250,482	1/15/85
4,494,110	06/354,410	1/15/85
4,494,115	06/283,418	1/15/85
4,494,117	06/399,519	1/15/85
4,494,129	06/446,821	1/15/85
4,494,132	06/340,733	1/15/85
4,494,144	06/392,745	1/15/85
4,494,155	06/440,144	1/15/85
4,494,158	06/353,885	1/15/85
4,494,160	06/323,618	1/15/85
4,494,166	06/421,000	1/15/85
4,494,176	06/589,903	1/15/85
4,494,177	06/486,741	1/15/85
4,494,178	06/442,266	1/15/85
4,494,181	06/449,757	1/15/85
4,494,198	06/352,696	1/15/85
4,494,206	06/359,672	1/15/85
4,494,209	06/385,423	1/15/85
4,494,216	06/451,093	1/15/85
4,494,224	06/398,972	1/15/85
4,494,227	06/363,354	1/15/85
4,494,231	06/339,880	1/15/85
4,494,242	06/413,157	1/15/85
4,797,961	07/100,272	1/17/89
4,797,964	07/065,232	1/17/89
4,797,965	07/184,270	1/17/89
4,797,973	07/038,769	1/17/89
4,797,974	07/114,728	1/17/89
4,797,975	07/002,910	1/17/89
4,797,976	07/046,868	1/17/89
4,797,985	06/927,556	1/17/89
4,797,988	06/844,841	1/17/89
4,797,989	07/011,146	1/17/89
4,797,992	07/137,997	1/17/89
4,797,994	07/172,982	1/17/89
4,797,996	07/088,310	1/17/89
4,798,002	07/105,154	1/17/89
4,798,007	07/054,999	1/17/89
4,798,009	07/174,035	1/17/89
4,798,012	07/035,765	1/17/89
4,798,014	07/014,294	1/17/89
4,798,016	06/848,029	1/17/89
4,798,018	07/092,462	1/17/89
4,798,019	07/153,990	1/17/89
4,798,022	07/211,882	1/17/89
4,798,024	07/005,349	1/17/89
4,798,029	07/126,882	1/17/89
4,798,033	07/069,166	1/17/89
4,798,035	06/918,540	1/17/89
4,798,038	07/152,704	1/17/89
4,798,045	07/105,531	1/17/89
4,798,046	06/882,681	1/17/89
4,798,051	07/208,531	1/17/89
4,798,052	07/047,952	1/17/89
4,798,053	07/101,510	1/17/89
4,798,056	06/450,326	1/17/89
4,798,062	07/187,294	1/17/89
4,798,063	07/123,727	1/17/89
4,798,070	06/509,932	1/17/89
4,798,075	06/888,468	1/17/89
4,798,083	07/043,430	1/17/89
4,798,094	07/142,893	1/17/89
4,798,104	07/115,047	1/17/89
4,798,107	07/047,266	1/17/89
4,798,116	07/186,769	1/17/89
4,798,119	07/113,053	1/17/89
4,798,125	07/116,206	1/17/89
4,798,126	07/029,001	1/17/89
4,798,132	06/908,294	1/17/89
4,798,133	06/874,126	1/17/89
4,798,136	06/927,885	1/17/89
4,798,137	06/876,293	1/17/89
4,798,139	06/559,039	1/17/89
4,798,143	07/046,921	1/17/89
4,798,144	06/904,031	1/17/89
4,798,147	07/041,176	1/17/89
4,798,149	06/446,195	1/17/89
4,798,151	07/092,180	1/17/89
4,798,154	06/932,723	1/17/89
4,798,157	06/945,059	1/17/89
4,798,161	07/192,226	1/17/89
4,798,163	07/190,725	1/17/89
4,798,169	06/787,792	1/17/89
4,798,178	06/833,558	1/17/89
4,798,181	07/030,564	1/17/89
4,798,191	07/144,879	1/17/89
4,798,196	06/942,394	1/17/89
4,798,198	07/141,634	1/17/89
4,798,214	07/125,633	1/17/89
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4,798,217	06/913,957	1/17/89
4,798,218	06/867,766	1/17/89
4,798,222	07/118,070	1/17/89
4,798,224	07/150,072	1/17/89
4,798,225	07/099,340	1/17/89
4,798,228	07/114,212	1/17/89
4,798,230	07/088,963	1/17/89
4,798,233	07/020,727	1/17/89
4,798,234	07/126,112	1/17/89
4,798,237	06/934,657	1/17/89
4,798,243	07/119,714	1/17/89
4,798,265	07/117,474	1/17/89
4,798,270	07/128,191	1/17/89
4,798,279	06/935,290	1/17/89
4,798,282	07/121,650	1/17/89
4,798,283	06/648,813	1/17/89
4,798,286	07/088,906	1/17/89
4,798,292	07/034,821	1/17/89
4,798,298	07/114,507	1/17/89
4,798,306	07/021,765	1/17/89
4,798,307	07/143,757	1/17/89
4,798,310	07/005,276	1/17/89
4,798,313	07/078,176	1/17/89
4,798,319	07/101,268	1/17/89
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4,798,358	07/073,366	1/17/89
4,798,360	07/074,577	1/17/89
4,798,365	07/052,106	1/17/89
4,798,366	06/671,088	1/17/89
4,798,372	07/093,729	1/17/89
4,798,380	07/063,209	1/17/89
4,798,382	07/003,687	1/17/89
4,798,387	07/004,294	1/17/89
4,798,399	07/182,415	1/17/89
4,798,402	06/899,238	1/17/89
4,798,405	07/099,853	1/17/89
4,798,406	07/086,474	1/17/89
4,798,407	07/101,270	1/17/89
4,798,409	06/915,402	1/17/89
4,798,414	07/161,352	1/17/89
4,798,418	07/022,029	1/17/89
4,798,419	07/078,580	1/17/89
4,798,421	07/106,831	1/17/89
4,798,432	06/905,220	1/17/89
4,798,441	07/023,176	1/17/89
4,798,442	07/072,704	1/17/89
4,798,452	06/784,379	1/17/89
4,798,454	07/112,249	1/17/89
4,798,455	07/152,446	1/17/89
4,798,460	06/928,481	1/17/89
4,798,478	07/155,918	1/17/89
4,798,481	07/003,939	1/17/89
4,798,490	07/057,286	1/17/89
4,798,492	07/129,245	1/17/89
4,798,497	07/093,767	1/17/89
4,798,498	07/048,821	1/17/89
4,798,500	06/547,290	1/17/89
4,798,502	07/088,999	1/17/89
4,798,503	07/152,881	1/17/89
4,798,504	06/855,622	1/17/89
4,798,506	07/146,329	1/17/89
4,798,510	07/143,749	1/17/89
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4,798,516	06/887,058	1/17/89
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4,798,544	07/112,815	1/17/89
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4,798,553	07/105,736	1/17/89
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4,798,571	07/109,998	1/17/89
4,798,573	07/039,055	1/17/89
4,798,575	07/032,728	1/17/89
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4,798,577	06/862,301	1/17/89
4,798,582	07/113,947	1/17/89
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4,798,599	06/567,646	1/17/89
4,798,606	06/900,776	1/17/89
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4,798,637	06/471,618	1/17/89
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4,798,672	07/077,665	1/17/89
4,798,673	07/069,863	1/17/89
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4,798,707	07/036,387	1/17/89
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4,798,747	07/107,557	1/17/89
4,798,752	06/794,911	1/17/89
4,798,756	07/140,771	1/17/89
4,798,801	06/540,952	1/17/89
4,798,817	07/069,696	1/17/89
4,798,819	06/845,721	1/17/89
4,798,825	07/098,849	1/17/89
4,798,829	06/896,664	1/17/89
4,798,838	06/913,722	1/17/89
4,798,839	06/586,961	1/17/89
4,798,842	07/121,558	1/17/89
4,798,843	07/071,515	1/17/89
4,798,870	06/937,911	1/17/89
4,798,872	06/856,550	1/17/89
4,798,878	06/756,626	1/17/89
4,798,899	06/879,662	1/17/89
4,798,900	06/917,773	1/17/89
4,798,905	07/087,056	1/17/89
4,798,906	07/083,942	1/17/89
4,798,908	06/901,842	1/17/89
4,798,930	07/035,095	1/17/89
4,798,931	07/074,864	1/17/89
4,798,933	07/068,087	1/17/89
4,798,936	06/896,770	1/17/89
4,798,937	07/023,536	1/17/89
4,798,939	06/847,161	1/17/89
4,798,955	07/100,226	1/17/89
4,798,956	07/073,496	1/17/89
4,798,959	07/001,330	1/17/89
4,798,960	07/165,426	1/17/89
4,798,963	06/893,365	1/17/89
4,798,970	07/137,211	1/17/89
4,798,971	07/038,041	1/17/89
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4,798,998	06/941,596	1/17/89
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4,799,006	07/062,501	1/17/89
4,799,017	07/024,814	1/17/89
4,799,019	07/020,873	1/17/89
4,799,024	07/021,598	1/17/89
4,799,025	07/102,812	1/17/89
4,799,046	07/009,267	1/17/89
4,799,063	07/095,705	1/17/89
4,799,067	07/118,725	1/17/89
4,799,070	07/031,028	1/17/89
4,799,094	06/809,508	1/17/89
4,799,106	06/897,858	1/17/89
4,799,109	07/149,981	1/17/89
4,799,125	07/092,833	1/17/89
4,799,129	06/945,810	1/17/89
4,799,133	07/123,484	1/17/89
4,799,149	06/681,993	1/17/89
4,799,154	06/798,800	1/17/89
4,799,168	06/815,050	1/17/89
4,799,169	07/161,429	1/17/89
4,799,184	06/898,375	1/17/89
4,799,190	07/006,342	1/17/89
4,799,213	06/648,127	1/17/89
4,799,232	07/078,185	1/17/89
4,799,234	07/095,886	1/17/89
4,799,263	07/027,344	1/17/89
4,799,264	07/101,395	1/17/89

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,212,942, Re. S.N. 08/010,786, Filed Jan. 29, 1993, Cl. 435/119, METHOD OF PRODUCING SALINOMYCIN ANTIBIOTICS, Yokio Miyyazaki, et. al., Owner of Record: *Kaken Pharmaceutical Co., Ltd., Tokyo, Japan*, Attorney or Agent: Hormon F. Oblon, Ex. Gp.: 1804

4,636,901, Re. S.N. 07/963,669, Filed Oct. 20, 1992, Cl. 360/126, THIN FILM MAGNETIC HEAD HAVING MAGNETIC LAYERS OF DIFFERENT THICKNESS AND MANUFACTURING METHOD THEREOF, Masaki Ohura, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Melvin Kraus, Ex. Gp.: 2512

4,675,515, Re. S.N. 07/897,308, Filed June 16, 1992, Cl. 235/381, DRIVE-THROUGH CREDIT CARD PAYMENT DEVICE, James L. Lucero, Owner of Record: *Inventor*, Attorney or Agent: Ivan S. Kavrukov, Ex. Gp.: 2505

4,715,879, Re. S.N. 07/927,545, Filed Aug. 6, 1992, Cl. 65/602, METHOD FOR THE MANUFACTURE OF A TEMPERED AND/OR CURVED GLASS PANE WITH REDUCED TRANSMISSION, Franz-Josef Schmitte, et. al., Owner of Record: *Flachglas Aktiengesellschaft, Furth, West Germany*, Attorney or Agent: Gerald S. Geren, Ex. Gp.: 1303

4,757,833, Re. S.N. 08/014,476, Filed Feb. 3, 1993, Cl. 137/13, METHOD FOR IMPROVING PRODUCTION OF VISCOUS CRUDE OIL, Dennis E. Danley, Owner of Record: *Pfizer Inc., New York, N.Y.*, Attorney or Agent: Gregg C. Benson, Ex. Gp. 2203

4,901,719, Re. S.N. 07/838,375, Filed Feb. 19, 1992, Cl. 606/49, ELECTROSURGICAL CONDUCTIVE GAS STREAM EQUIPMENT, Robert Paul Trenconsky, et. al., Owner of Record: *Birtcher Medical Systems, Inc., El Monte, Calif.*, Attorney or Agent: John R. Ley, Ex. Gp.: 3309

4,902,179, Re. S.N. 07/839,361, Filed Feb. 20, 1992, Cl. 411/21, DRYWALL FASTENER, Brian G. Harker, Owner of Record: *Hilti Aktiengesellschaft, Furstentum, Liechtenstein*, Attorney or Agent: David Toren, Ex. Gp.: 3508

4,928,999, Re. S.N. 07/936,921, Filed Aug. 26, 1992, Cl. 285/113, ELASTIC GUARD SEAL FOR TUBULAR CONNECTIONS, Steven L. Landriault, et. al., Owner of Record: *Baker Hughes Inc., Houston, Tex.*, Attorney or Agent: Frank S. Vaden III, Ex. Gp.: 3501

4,956,302, Re. S.N. 07/942,493, Filed Sept. 9, 1992, Cl. 436/161, LATERAL FLOW CHROMATOGRAPHIC BINDING ASSAY DEVICE, Julian Gordon, et. al., Owner of Record: *Abbott Laboratories, North Chicago, Ill.*, Attorney or Agent: Lawrence S. Pope, Ex. Gp.: 1801

4,967,262, Re. S.N. 08/010,022, Filed Jan. 28, 1993, Cl. 257/678, GULL-WING ZIG-ZAG INLINE LEAD PACKAGE HAVING END-OF-PACKAGE ACHORING PINS, Warren M. Farnsworth, Owner of Record: *Micron Technology, Inc., Boise, Idaho*, Attorney or Agent: Angus C. Fox III, Ex. Gp.: 2508

4,987,486, Re. S.N. 08/007,288, Filed Feb. 17, 1993, Cl. 358/86, AUTOMATIC INTERACTIVE TELEVISION TERMINAL CONFIGURATION, Lee R. Johnson, et. al., Owner of Record: *Scientific-Atlanta, Inc., Atlanta, Ga.*, Attorney or Agent: Thomas H. Jackson, Ex. Gp. 2611

4,993,543, Re. S.N. 08/012,390, Filed Feb. 2, 1993, Cl. 198/834, LINK CHAIN BELT, James M. Lapeyre, Owner of Record: *The Laitram Corp., New Orleans, La.*, Attorney or Agent: Laurence R. Brown, Ex. Gp.: 3101

5,003,576, Re. S.N. 08/013,022, Filed Feb. 1, 1993, Cl. 379/88, ANALOG/DIGITAL VOICE STORAGE CELLULAR TELEPHONE, Richard J. Helferich, et. al., Owner of Record: *Inventors*, Attorney or Agent: James B. Bear, Ex. Gp.: 2601

5,013,918, Re. S.N. 07/885,044, Filed May 18, 1992, Cl. 250/338, MULTICOLOR PHOTODETECTOR, Kwong-Kit Choi, Owner of Record: *The United States of America as represented by the Secretary of the Army, Washnington, D.C.*, Attorney or Agent: Michael Zelenka, Ex. Gp.: 2506

5,036,029, Re. S.N. 08/012,949, Filed Feb. 3, 1993, Cl. 501/121, SPRAYABLE INSULATING LINER COMPOSITIONS FOR METAL VESSELS, Howard B. Johnson, Owner of Record: *Consolidated Ceramic Products, Inc., Blanchester, Ohio*, Attorney or Agent: David J. Josephic, Ex. Gp.: 1108

5,036,966, Re. S.N. 08/011,292, Filed Jan. 29, 1993, Cl. 194/217, NEWSPAPER VENDING RACK COIN BOX INCORPORATING A RETROFIT ELECTRONIC COIN MECHANISM, Douglas D. Kaspar, et. al., Owner of Record: *Kaspar Wire Works, Inc., Shiner Tex.*, Attorney or Agent: Mark A. Kammer, Ex. Gp.: 3107

5,046,746, Re. S.N. 08/013,681, Filed Feb. 2, 1993, Cl. 280/11.220, FRAME FOR A SKATE, METHOD FOR THE MANUFACTURE THEREOF, SKATING AND SKATE, Johan Gierveld, Owner of Record: *Gierveld Beheer B.V., Wierden, The Netherlands*, Attorney or Agent: Roy W. Butrum, Ex. Gp.: 3104

5,079,417, Re. S.N. 08/012,638, Filed Feb. 3, 1993, Cl. 250/221, FAILSAFE SENSING EDGE FOR AUTOMATIC DOORS AND GATES, Charles G. Strand, Owner of Record: *Link Controls, Ronkonkoma, N.Y.*, Attorney or Agent: Thomas M. Galgano, Ex. Gp.: 2509

5,104,150, Re. S.N. 08/013,617, Filed Feb. 4, 1993, Cl. 285/12, MULTIPLE PURPOSE IRRIGATION FITTING, Shannon Bard, et. al., Owner of Record: *Aquapore Moisture Systems, Inc., Phoenix, Ariz.*, Attorney or Agent: Marvin E. Jacobs, Ex. Gp.: 3501

5,110,117, Re. S.N. 08/012,499, Filed Feb. 2, 1993, Cl. 482/54, TREADMILL WITH PIVOTING HANDLES, Milton W. Fisher, et. al., Owner of Record: *Glen E. Henson, Kansas City, Mo.*, Attorney or Agent: Allen C. Turner, Ex. Gp.: 3302

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,203,880, Reexam. No. 90/002,956, Requested Feb. 11, 1993, Cl. 260/023X, LUBRICANT COMPOSITIONS FOR HALOGEN-CONTAINING POLYMERS, Alfred Stoloff, Owner of Record: *M & T Chemicals, Inc., Stamford, Conn.*, Attorney or Agent: Kenneth G. Wheelers, Rahway, N.J., Ex. Gp.: 1204, Requester: The Dow Chemical Corp. Midland, Mich.

4,424,446, Reexam. No. 90/002,948, Requested Jan. 28, 1993, Cl. 250/363.6, GAMMA CAMERA CORRECTION SYSTEM AND METHOD FOR USING THE SAME, Dan Inbar, et. al., Owner of Record: *Elscint Ltd., Haifa, Israel*, Attorney or Agent: Neil F. Greenblum, Sandler, Greenblum & Bernstein, Arlington, Va., Ex. Gp.: 2506, Requester: Sopha Medical Systems, Inc., Columbia, Md.

4,483,723, Reexam. No. 90/002,972, Requested Feb. 17, 1993, Cl. 148/230, STEEL WITH ANTIMONY ADDITION, Grigory Lyudkovsky, Owner of Record: *Inland Steel Corp., Chicago, Ill.*, Attorney or Agent: Alvin D. Shulman, Marshall, O'Toole, Gerstein, Murray & Bicknell, Chicago, Ill., Ex. Gp.: 1101, Requester: LTV Steel Co., Inc., Cleveland, Ohio

4,791,708, Reexam. No. 90/002,970, Requested Feb. 25, 1993, Cl. 024/033, ABRASION AND HYDROLYSIS RESISTANT JOINING MEANS FOR FABRIC SEAMS, H. Dana Smolens, Owner of Record: *Asten Group, Inc., Devon, Pa.*, Attorney or Agent: Anthony S. Volpe, Volpe & Koenig, Philadelphia, Pa., Ex. Gp.: 3507, Requester: Huyck USA, Wake Forest, N.C.

4,913,396, Reexam. No. 90/002,969, Requested Feb. 26, 1993, Cl. 248/649, ADJUSTABLE INCLINE SYSTEM FOR EXERCISE EQUIPMENT, William T. Dalebout, et. al., Owner

Reg. Number Serial Number Reg. Date

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of Record: *Weslo, Inc., Logan, Utah*, Attorney or Agent: Thomas J. Rossa, Trask, Britt & Rossa, Salt Lake City, Utah, Ex. Gp.: 3505, Requester: Mark C. Bach, Willian, Brinks, Olds, Hofer, Gilson & Lione, Chicago, Ill.

5,051,114, Reexam. No. 90/002,953, Requested Feb. 4, 1993, Cl. 055/016, PERFLUORODIOXIDE MEMBRANES, Stuart M. Nemser, et. al., Owner of Record: *E. I. DuPont de Nemours & Co., Wilmington, Del.*, Attorney or Agent: Craig H. Evans, Westmont, N.J., Ex. Gp.: 1305, Requester: Owner

5,135,337, Reexam. No. 90/002,973, Requested Mar. 1, 1993, Cl. 407/119, LIGHTWEIGHT METAL CLUTTER, Thomas Adamson, Owner of Record: *Inventor, Mishawaka, Ind.*, Attorney or Agent: James D. Hall, Baker & Daniels, South Bend, Ind., Ex. Gp.: 3203, Requester: Clapp & Haney Tool Co., Whitehouse, Ohio

5,154,447, Reexam. No. 90/002,949, Requested: Feb. 5, 1993, Cl. 281/21.100, BINDING FOR SOFT COVER BOOKS, John C. Tooker, Owner of Record: *Inventor, Medford, Oreg.*, Attorney or Agent: Robert L. Harrington, Portland, Oreg., Ex. Gp.: 3206, Requester: Robert J. Patch, Arlington, Va.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADMARK REGISTRATIONS
WHICH EXPIRED FEB. 08, 1993
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
37,939	70/037,939	5/11/1902
86,520	71/061,131	5/14/1912
293,831	71/320,620	5/10/1932
293,873	71/316,817	5/10/1932
293,881	71/319,058	5/10/1932
293,891	71/322,063	5/10/1932
293,904	71/322,251	5/10/1932
293,906	71/322,261	5/10/1932
293,916	71/322,359	5/10/1932
293,917	71/322,361	5/10/1932
293,929	71/322,563	5/10/1932
293,934	71/322,778	5/10/1932
293,961	71/323,265	5/10/1932
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293,984	71/317,938	5/10/1932
293,986	71/320,205	5/10/1932
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558,605	71/555,444	5/13/1952
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558,610	71/562,791	5/13/1952
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558,616	71/566,864	5/13/1952
558,626	71/571,385	5/13/1952
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558,702	71/596,868	5/13/1952
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558,731	71/601,575	5/13/1952
558,732	71/601,596	5/13/1952
558,737	71/602,543	5/13/1952
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558,740	71/602,852	5/13/1952
558,741	71/602,973	5/13/1952
558,743	71/603,223	5/13/1952
558,745	71/603,232	5/13/1952
558,746	71/603,235	5/13/1952
558,751	71/603,708	5/13/1952
558,762	71/605,174	5/13/1952
558,763	71/605,301	5/13/1952
558,776	71/606,655	5/13/1952
558,779	71/607,256	5/13/1952
558,801	71/611,248	5/13/1952
558,803	71/611,381	5/13/1952
558,806	71/611,771	5/13/1952
558,811	71/611,964	5/13/1952
558,813	71/612,171	5/13/1952
558,815	71/612,241	5/13/1952
558,818	71/612,702	5/13/1952
558,819	71/612,916	5/13/1952
558,820	71/612,994	5/13/1952
558,825	71/613,422	5/13/1952
558,826	71/613,507	5/13/1952
558,831	71/613,848	5/13/1952
558,832	71/613,859	5/13/1952
558,839	71/614,786	5/13/1952
558,844	71/615,092	5/13/1952
558,851	71/615,608	5/13/1952
558,856	71/616,181	5/13/1952
558,871	71/620,482	5/13/1952
558,878	71/610,027	5/13/1952
558,880	71/615,697	5/13/1952
558,881	71/618,395	5/13/1952
558,893	71/590,066	5/13/1952
558,895	71/594,183	5/13/1952
558,897	71/595,055	5/13/1952
558,900	71/598,911	5/13/1952
558,905	71/605,244	5/13/1952
933,444	72/369,811	5/09/1972
933,445	72/370,287	5/09/1972
933,450	72/381,185	5/09/1972
933,453	72/359,169	5/09/1972
933,458	72/374,799	5/09/1972
933,468	72/347,277	5/09/1972
933,474	72/392,055	5/09/1972
933,475	72/394,889	5/09/1972
933,476	72/296,583	5/09/1972
933,477	72/397,965	5/09/1972
933,479	72/363,735	5/09/1972
933,480	72/363,736	5/09/1972
933,489	72/351,216	5/09/1972
933,491	72/367,231	5/09/1972
933,492	72/371,544	5/09/1972
933,496	72/381,971	5/09/1972
933,498	72/389,485	5/09/1972
933,504	72/340,616	5/09/1972
933,507	72/347,955	5/09/1972
933,508	72/353,475	5/09/1972
933,510	72/360,772	5/09/1972
933,514	72/380,854	5/09/1972
933,518	72/383,749	5/09/1972
933,519	72/384,365	5/09/1972
933,520	72/389,984	5/09/1972
933,522	72/355,241	5/09/1972

Reg. Number	Serial Number	Reg. Date
933,523	72/358,768	5/09/1972
933,526	72/365,460	5/09/1972
933,527	72/366,364	5/09/1972
933,532	72/373,919	5/09/1972
933,533	72/375,837	5/09/1972
933,539	72/392,870	5/09/1972
933,544	72/391,320	5/09/1972
933,547	72/390,344	5/09/1972
933,551	72/391,092	5/09/1972
933,553	72/391,097	5/09/1972
933,556	72/392,192	5/09/1972
933,558	72/402,023	5/09/1972
933,560	72/372,019	5/09/1972
933,562	72/382,839	5/09/1972
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933,570	72/375,286	5/09/1972
933,575	72/388,361	5/09/1972
933,576	72/388,362	5/09/1972
933,577	72/388,363	5/09/1972
933,579	72/388,978	5/09/1972
933,580	72/390,021	5/09/1972
933,583	72/359,689	5/09/1972
933,588	72/386,601	5/09/1972
933,594	72/368,418	5/09/1972
933,596	72/384,339	5/09/1972
933,603	72/385,131	5/09/1972
983,609	72/387,147	5/09/1972
933,610	72/387,378	5/09/1972
933,612	72/388,689	5/09/1972
933,614	72/389,243	5/09/1972
933,615	72/389,712	5/09/1972
933,616	72/358,083	5/09/1972
933,619	72/389,790	5/09/1972
933,623	72/387,401	5/09/1972
933,624	72/388,698	5/09/1972
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933,660	72/393,106	5/09/1972
933,662	72/395,303	5/09/1972
933,665	72/367,678	5/09/1972
933,666	72/367,706	5/09/1972
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933,672	72/374,395	5/09/1972
933,673	72/381,166	5/09/1972
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933,675	72/349,470	5/09/1972
933,684	72/347,071	5/09/1972
933,688	72/327,112	5/09/1972
933,689	72/341,708	5/09/1972
933,692	72/346,344	5/09/1972
933,694	72/345,003	5/09/1972
933,704	72/390,332	5/09/1972
933,707	72/327,763	5/09/1972
934,017	72/358,275	5/16/1972

Errata

"All reference to Patent No. 5,190,949 to Ann C. King of N.C. for 'AGENTS FOR POTENTIATING THE EFFECTS OF ANTITUMOR AGENTS AND COMBATING MULTIPLE DRUG RESISTANCE' appearing in the *Official Gazette* of Mar. 2, 1993 should be deleted since no patent was granted."

"All reference to Patent No. 5,190,885 to Douglas A. Pike, Jr., of Bend, Oreg., et. al., for 'IGBT PROCESS TO PRODUCE PLATINUM LIFETIME CONTROL' appearing in the *Official Gazette* of Mar. 2, 1993 should be delted since no patent was granted."

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These patent search tools were originally developed by the Patent and Trademark Office for use in the network of Patent and Tradmark Depository Libraries, and replaced the Classification and Search Support Information System (CASSIS) on-line system used at these libraries. They are now available to anyone on a subscription basis.

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Manual of Classification
Index to the U.S. Patent Classification
Manual of Patent Examining Procedure
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Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from Jan. through Mar. 1993. Information includes:

- subclasses established or abolished (major changes)
- subclass title, indent, or position change
- changes to existing class and subclass definitions (minor changes)

This Reclassification Alert Report may appear from time-to-time in the *Official Gazette* and is intended to provide an interim notice of classification changes pending publication of the Manual of Classification and revisions thereto.

The general public may purchase copies of the Classification Orders or Classification Definitions by contacting the Editorial Division at 703-305-6101 or 703-305-5099. Payment can be made through a Deposit Account or by check made payable to "Commissioner of Patents and Trademarks" and sent to:

Chief, Editorial Division
Office of Classification Support
U.S. Patent and Trademark Office
Crystal Mall 2, Room 309
Washington, D.C. 20231

Mar. 2, 1993

WILLIAM S. LAWSON
Administrator for Search and Information Resources

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	NUMBER
004			DEFN CHANGE	1445
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049	081.1		ESTABLISH	1445
049	082.1		ESTABLISH	1445
049	086.1		ESTABLISH	1445
049	087.1		ESTABLISH	1445
049	089.1		ESTABLISH	1445
049	090.1		ESTABLISH	1445
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049	483.1		ESTABLISH	1445
049	484.1		ESTABLISH	1445

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052	027.5		ESTABLISH	1445
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052	036.1	036.6	ESTABLISH	1445
052	080	081	ABOLISH	1445
052	080.1	080.2	ESTABLISH	1445
052	081.1	081.6	ESTABLISH	1445
052	090	093	ABOLISH	1445
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052	092.1	092.3	ESTABLISH	1445
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052	095		TITLE CHANGE	1445
052	169.5		TITLE CHANGE	1445
052	173		ABOLISH	1445
052	173.1	173.3	ESTABLISH	1445
052	198	200	TITLE CHANGE	1445
052	204		ABOLISH	1445
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052	204.5		ESTABLISH	1445
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052	207		TITLE CHANGE	1445
052	207		INDENT CHANGE	1445
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052	210	212	TITLE CHANGE	1445
052	214		POSITION CHANGE	1445
052	220	221	ABOLISH	1445
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052	223	230	ABOLISH	1445
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052	223.11	223.14	ESTABLISH	1445
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052	250		TITLE CHANGE	1445
052	254	255	TITLE CHANGE	1445
052	254	257	POSITION CHANGE	1445
052	261		TITLE CHANGE	1445
052	263		TITLE CHANGE	1445
052	272		TITLE CHANGE	1445
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052	286		TITLE CHANGE	1445
052	289		TITLE CHANGE	1445
052	292		TITLE CHANGE	1445
052	293		ABOLISH	1445
052	293.1	293.3	ESTABLISH	1445
052	302	305	ABOLISH	1445
052	302.1	302.7	ESTABLISH	1445
052	311		ABOLISH	1445
052	311.1	311.3	ESTABLISH	1445
052	397	401	POSITION CHANGE	1445
052	398		TITLE CHANGE	1445
052	514.5		ESTABLISH	1445
052	776		POSITION CHANGE	1445
052	DIG.016	DIG.017	ESTABLISH	1445
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057			DEFN CHANGE	1440
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065			DEFN CHANGE	1445
065	370.1		ESTABLISH	1442
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071	065	128	ABOLISH	1441
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073			DEFN CHANGE	1444
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073	012.01	012.09	ESTABLISH	1443
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073	053.06		TITLE CHANGE	1443
073	061.43	061.44	TITLE CHANGE	1443
073	061.56		TITLE CHANGE	1443
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073	170	171	ABOLISH	1443
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073	188	189	ABOLISH	1443
073	379	381	ABOLISH	1443
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073	625		TITLE CHANGE	1443
073	628	629	TITLE CHANGE	1443
073	865.4		TITLE CHANGE	1443
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445			DEFN CHANGE	1442
454			DEFN CHANGE	1445
455			DEFN CHANGE	1444
460			DEFN CHANGE	1442
464			DEFN CHANGE	1442
474			DEFN CHANGE	1442
475			DEFN CHANGE	1440
475			DEFN CHANGE	1442
476	001	073	ESTABLISH	1440
476	900		ESTABLISH	1440
482			DEFN CHANGE	1443
492	001	060	ESTABLISH	1442

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	NUMBER
501			DEFN CHANGE	1441
504	100	357	ESTABLISH	1441
514			DEFN CHANGE	1439
520			DEFN CHANGE	1441
523			DEFN CHANGE	1441
536	001.1		ABOLISH	1439
536	001.11		ESTABLISH	1439
536	022	029	ABOLISH	1439
536	022.1		ESTABLISH	1439
536	023.1	023.2	ESTABLISH	1439
536	023.4	023.5	ESTABLISH	1439
536	023.51	023.53	ESTABLISH	1439
536	023.6	023.7	ESTABLISH	1439
536	023.71	023.72	ESTABLISH	1439
536	023.74		ESTABLISH	1439
536	024.1	024.3	ESTABLISH	1439
536	024.31	024.33	ESTABLISH	1439
536	024.5		ESTABLISH	1439
536	025.1	025.3	ESTABLISH	1439
536	025.31	025.34	ESTABLISH	1439
536	025.4		ESTABLISH	1439
536	025.41	025.42	ESTABLISH	1439
536	025.5	025.6	ESTABLISH	1439
536	026.1		ESTABLISH	1439
536	026.11	026.14	ESTABLISH	1439
536	026.2		ESTABLISH	1439
536	026.21	026.26	ESTABLISH	1439
536	026.3	026.4	ESTABLISH	1439
536	026.41	026.44	ESTABLISH	1439
536	026.5	026.7	ESTABLISH	1439
536	026.71	026.74	ESTABLISH	1439
536	026.8	026.9	ESTABLISH	1439
536	027.1		ESTABLISH	1439
536	027.11	027.14	ESTABLISH	1439
536	027.2		ESTABLISH	1439
536	027.21	027.23	ESTABLISH	1439
536	027.3		ESTABLISH	1439
536	027.31		ESTABLISH	1439
536	027.4	027.6	ESTABLISH	1439
536	027.61	027.63	ESTABLISH	1439
536	027.7	027.8	ESTABLISH	1439
536	027.81		ESTABLISH	1439
536	028.1	028.5	ESTABLISH	1439
536	028.51	028.55	ESTABLISH	1439
536	028.6	028.9	ESTABLISH	1439
536	029.1		ESTABLISH	1439
536	029.11	029.13	ESTABLISH	1439
536	029.2		ESTABLISH	1439
536	123.1		ESTABLISH	1439
536	123.12	123.13	ESTABLISH	1439
585			DEFN CHANGE	1441
800			DEFN CHANGE	1441
901			DEFN CHANGE	1442
935			DEFN CHANGE	1439
935			DEFN CHANGE	1441

A practitioner recently noted that the current cover sheets for both patent and trademark assignments are not clear as to the proper

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Status of PTO Services

The following is an update of the status of PTO services for Feb. 1993:

Service Item	FY 1993 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	35
Trademarks	30	65
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	6 Hours
Window Coupons	5	2
Mail Coupons	12	5
Letter Orders	16	27
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	8
Patent Applications-As-Filed	17	16
Patent Applications Expedited	7	8
Patent File-Wrapper/Contents	N/A	27
TM Applications-As-Filed	17	8
TM Applications Expedited	7	6
Patent Copies	17	10
Trademark Search Library:		
Filing Pending Marks	23	59
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	22
Assignments:		
Recording Patents-New Applications	20	41
Recording Patents-Mail Room Recpts.	20	35
Return Patents-New Applications	34	45
Return Patents-Mail Room Recpts.	34	45
Recording Trademarks	20	41
Returning Trademark Documents	34	56
Avg. Days from Issue Fee Payment to Issue Date	90-100	116
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	99% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.

• IMPROVEMENT TO SERVICES

Delays in Services

Days to process filing receipts, letter orders for copies, and assignments have been exceeding goals due to a backlog in the PTO's central mail processing area. The backlog began developing in the fall as a result of a large personnel turnover concurrent with the implementation of fee changes and construction in the area. The backlog began to be reduced in mid-January and is almost eliminated. Although the delay has delayed the timeliness of various services, by the end of February, processing times were showing improvement.

Mar. 30, 1993

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

• HELPFUL HINT

Assignment Cover Sheets

The Office developed PTO Form 1594, Recordation Form Cover Sheet (Trademarks), and PTO Form 1595, Recordation Form Cover Sheet (Patents), to facilitate submitting data required to record an assignment. The first versions of these forms have been available since Sept. 1992, and most assignments are now received with them. Both forms and their instructions will be updated later this year to remove ambiguities and incorporate suggestions received from customers. Until the revisions are completed, the Office will continue to work with practitioners to improve the utility of the current forms.

A practitioner recently noted that the current cover sheets for both patent and trademark assignments are not clear as to the proper entry of different execution dates (Item 3) when there are multiple assignors shown (Item 1). Pending redesign of the forms, the Office suggests when there are multiple assignors named in Item 1, number each assignor, and in Item 3, preface each execution date with the corresponding number. if all assignor information cannot be entered in the space provided for Item 1, enter "See Attached List" and proceed in the same manner. This will enable Assignment Branch staff to associate the correct date with the appropriate assignor.

Another practitioner called to our attention the fact that although the forms indicate "Total number of pages comprising cover sheet" (Item 9), Assignment Branch staff frequently cross out that entry and replace it with the total number of pages submitted, both in cover sheets and the assignment instrument itself. Soon after the forms were printed, Assignment Branch staff found they were better able to verify document integrity by using the total number of pages per submission. This number is then used as a cross-check as the assignment moves through the recordation process, receives reel and frame numbers, is microfilmed, and returned to the customer. Pending revisions to the forms, the preferred procedure is to indicate the total number of pages submitted, both in cover sheets and the attached assignment.

Additional comments or suggestions for improving either or both assignment cover sheets should be directed to Audrey Britt, Chief, Assignment Branch, at (703) 308-9706.

Mar. 8, 1993

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT NOTICES

SPECIAL BOXES FOR MAIL

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PATENT NOTICES

Certificates of Correction For Week of March 30, 1993

D. 299,911	5,001,116	5,040,060	5,057,236
D. 320,009	5,002,680	5,040,067	5,057,250
PP. 7,528	5,002,937	5,040,482	5,057,258
4,546,362	5,003,046	5,041,162	5,057,318
4,590,052	5,003,602	5,041,327	5,058,068
4,790,921	5,005,765	5,041,377	5,058,153
4,796,567	5,006,054	5,042,753	5,058,231
4,796,777	5,006,460	5,042,847	5,058,343
4,818,937	5,006,539	5,042,912	5,058,344
4,830,799	5,008,271	5,042,965	5,058,393
4,835,304	5,009,172	5,043,170	5,058,458
4,846,998	5,011,998	5,043,198	5,058,800
4,849,794	5,012,919	5,043,265	5,058,820
4,850,927	5,012,946	5,043,328	5,058,891
4,851,943	5,013,410	5,043,770	5,059,094
4,853,352	5,013,839	5,043,902	5,059,248
4,867,163	5,014,438	5,044,100	5,059,258
4,867,861	5,015,180	5,044,155	5,059,470
4,881,901	5,016,702	5,045,091	5,059,578
4,884,060	5,017,620	5,045,106	5,059,618
4,884,510	5,018,171	5,045,185	5,059,760
4,891,792	5,019,967	5,045,867	5,059,775
4,892,081	5,019,968	5,046,360	5,059,921
4,895,901	5,019,980	5,046,486	5,059,973
4,897,284	5,020,164	5,046,615	5,060,124
4,900,934	5,020,223	5,046,826	5,060,460
4,902,100	5,020,510	5,046,834	5,060,492
4,902,421	5,021,740	5,046,839	5,060,509
4,908,171	5,021,837	5,046,930	5,060,680
4,910,543	5,021,899	5,047,286	5,060,767
4,920,066	5,021,981	5,047,565	5,060,768
4,923,549	5,022,167	5,048,066	5,060,886
4,924,665	5,023,071	5,048,144	5,060,888
4,938,595	5,023,146	5,048,183	5,061,344
4,938,976	5,023,493	5,048,302	5,061,710
4,945,833	5,024,622	5,048,334	5,062,073
4,946,073	5,024,777	5,048,647	5,062,137
4,949,108	5,024,798	5,048,665	5,062,202
4,950,156	5,024,987	5,048,805	5,062,366
4,951,517	5,025,026	5,049,126	5,062,561
4,952,027	5,025,036	5,049,152	5,062,610
4,952,049	5,026,266	5,049,228	5,062,838
4,956,288	5,027,101	5,049,241	5,062,865
4,956,816	5,027,160	5,049,274	5,063,097
4,957,564	5,029,121	5,049,292	5,063,154
4,960,126	5,030,746	5,049,447	5,063,231
4,961,752	5,030,830	5,049,695	5,063,281
4,962,162	5,030,899	5,049,835	5,063,443
4,965,807	5,032,302	5,050,022	5,063,683
4,966,727	5,032,437	5,050,166	5,063,803
4,969,220	5,032,948	5,050,174	5,064,064
4,969,833	5,033,001	5,050,313	5,064,369
4,970,071	5,034,069	5,050,798	5,064,564
4,973,271	5,034,077	5,051,178	5,064,650
4,973,953	5,034,172	5,051,216	5,064,792
4,974,259	5,034,269	5,051,553	5,064,820
4,974,736	5,034,275	5,051,678	5,064,831
4,975,813	5,034,327	5,051,704	5,064,848
4,977,899	5,034,524	5,052,820	5,065,082
4,977,964	5,034,946	5,052,976	5,065,297
4,979,023	5,035,045	5,053,284	5,065,354
4,979,197	5,035,140	5,053,900	5,065,844
4,980,372	5,035,273	5,054,315	5,066,213
4,985,802	5,035,928	5,054,517	5,066,458
4,987,837	5,036,832	5,054,536	5,066,663
4,991,203	5,036,999	5,054,593	5,066,948
4,992,775	5,037,316	5,054,703	5,067,024
4,995,057	5,037,352	5,055,079	5,067,050
4,996,513	5,037,968	5,055,201	5,067,077
4,997,981	5,038,222	5,055,647	5,067,148
4,998,945	5,038,507	5,055,829	5,067,200
4,999,026	5,038,660	5,055,865	5,067,339
4,999,175	5,038,797	5,056,076	5,067,530
4,999,319	5,039,208	5,056,391	5,067,539
5,000,265	5,039,542	5,056,453	5,067,877
5,000,549	5,039,733	5,056,695	5,067,958
5,068,374	5,071,166	5,074,780	5,079,094
5,068,413	5,071,258	5,074,920	5,079,147
5,068,498	5,071,300	5,075,002	5,079,495
5,068,574	5,071,477	5,075,116	5,079,502
5,068,687	5,071,487	5,075,213	5,080,387
5,069,086	5,071,557	5,075,273	5,081,096
5,069,265	5,071,592	5,075,276	5,082,571
5,069,273	5,071,634	5,075,390	5,082,898
5,069,274	5,071,642	5,075,402	5,083,221
5,069,348	5,071,761	5,075,515	5,084,255
5,069,446	5,072,210	5,075,633	5,084,845
5,069,509	5,072,697	5,075,660	5,091,231
5,069,516	5,072,716	5,075,838	5,091,633
5,069,545	5,072,767	5,075,954	5,099,167
5,069,563	5,072,971	5,076,079	5,107,112
5,069,583	5,073,028	5,076,132	5,116,346
5,069,673	5,073,282	5,076,175	5,126,697
5,069,971	5,073,661	5,076,217	5,147,833
5,070,185	5,073,769	5,076,387	5,153,929
5,070,457	5,073,904	5,076,590	5,158,859
5,070,660	5,074,143	5,076,606	5,166,376
5,070,792	5,074,161	5,077,862	5,168,810
5,070,898	5,074,425	5,078,094	5,178,059
5,070,981	5,074,516	5,078,338	5,178,197
5,070,995	5,074,580	5,078,416	5,186,508
5,071,017	5,074,708	5,078,417	
5,071,165	5,074,716	5,078,787	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Washington, D.C. 20231

Box 3	Mail for the Office of Personnel for NFC
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents except: trademark registrations and assignments.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Deposit Account Replenishment Checks
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box ITU	All intent to use documents, excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

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Reference Collections of U.S. Patents and Trademarks
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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PDTLs have both the patent and trademark sections of the *Official Gazette of the U. S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
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Delaware	Newark: University of Delaware Library	(302) 831-2965
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	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
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Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Siegesmund Engineering Library, Purdue University	(317) 494-2873
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Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 930-8574
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
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	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
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Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

REEXAMINATIONS

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PATENT EXAMINING CORPS

STEPHEN G. KUNIN, Acting Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	3/28/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	6/25/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — EDWARD E. KUBASIEWICZ, Director	308-0651	5/22/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	5/22/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Director	308-0196	8/22/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	9/03/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	8/17/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	11/21/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	3/06/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	8/10/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	11/04/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	2/01/92
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	5/26/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	5/05/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	5/29/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	2/18/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during February 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

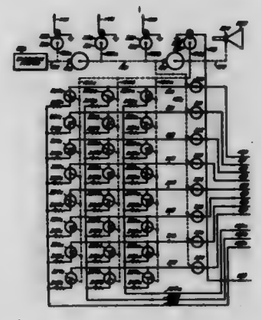
Patents ..... Numbers 3,935,596 to 3,946,800 inclusive
Plant Patents ..... 3,828 to 3,830

REEXAMINATIONS

MARCH 30, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,713,099 (1957th)
METHOD AND APPARATUS FOR IDENTIFYING LETTERS, CHARACTERS, SYMBOLS AND THE LIKE
Harold S. Hemstreet, P.O. Box 438, Rye Beach, N.H. 06897, assignor to Harold S. Hemstreet, Wilton, Conn.
Reexamination Request Nos. 90/001,049, Jul. 2, 1986 and 90/002,037, Jun. 4, 1990.
Reexamination Certificate for Patent No. 3,713,099, issued Jan. 23, 1973, Ser. No. 831,599, Aug. 4, 1959.
Int. Cl.[5] G06K *9/68*
U.S. Cl. 382—34



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–5, 11–13, 15–17, 20–73, 75–84, 88, 90 and 92–96 is confirmed.

Claims 6–10, 14, 18, 19, 74, 85–87, 89 and 91 are cancelled.

[1. Pattern recognition apparatus, comprising, in combination: sensing means for sensing an area encompassing a graphic item to be identified along a plurality of scan lines of a first scanning pattern which encompasses said area to derive a first multi-bit electrical signal characteristic of said item encompassed within said area, and for sensing said area along a plurality of scan lines of a second scanning pattern which encompasses said area to derive a second multi-bit electrical signal characteristic of said item encompassed within said area; and recognition circuit means for comparing received signals simultaneously with each datum of a group of stored data representing characteristics of a plurality of known graphic items to provide an output signal identifying said graphic item to be identified, said recognition circuit means being connected to receive said first and second signals one after the other.]

B1 4,437,122 (1958th)
LOW RESOLUTION RASTER IMAGES
Brian F. Walsh, Etna, and David E. Halpert, Enfield, both of N.H., assignors to Xerox Corporation, Stamford, Conn.
Reexamination Request No. 90/002,532, Dec. 5, 1991.
Reexamination Certificate for Patent No. 4,437,122, issued Mar. 13, 1984, Ser. No. 303,742, Sep. 21, 1981.
Claims priority, application Japan, Oct. 5, 1985, 60-222059
Int. Cl.[5] H04N *1/38, 5/14*
U.S. Cl. 358—166

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–5, 11–13, 15–17, 20–73, 75–84, 88, 90 and 92–96 is confirmed.

Claims 6–10, 14, 18, 19, 74, 85–87, 89 and 91 are cancelled.

New claims 28–57 are added and determined to be patentable.

1. A method of enhancing the reproduction of images represented by a plurality of pixels comprising the steps of:

holding in a first storage consecutive lines of an image to be reproduced, the pixels of the image being represented by digital signals,

isolating a predetermined portion of the signals of each of the image lines into a second storage means,

forming a pixel pattern from the isolated digital signals including a center pixel signal surrounded by neighboring pixel signals including pixel signals from the same line of the image as the center pixel as well as pixel signals from the lines above and below the center pixel,

generating an identifier uniquely describing the isolated pixel pattern,

comparing the identifier with identifiers representing a plurality of standard pixel formats, and

enhancing the central pixel in accordance with the particular match of the isolated pixel pattern with a standard pixel *pattern* format *by expanding the center pixel into a matrix of pixels.*

B1 4,512,616 (1959th)
SLIDING GUIDE
Shigemi Suzuki, Chigasaki, and Masahiro Mizukasa, Yokohama, both of Japan, assignors to Toto Ltd., Kitakyushyu, Japan
Reexamination Request No. 90/002,065, Jun. 25, 1990.
Reexamination Certificate for Patent No. 4,512,616, issued Apr. 23, 1985, Ser. No. 590,821, Mar. 19, 1984.
Claims priority, application Japan, Mar. 25, 1983, 58-43050; Mar. 25, 1983, 58-43051
Int. Cl.[5] F16C *29/02*
U.S. Cl. 384—42

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 7–14 is confirmed.

Claim 1 is determined to be patentable as amended.

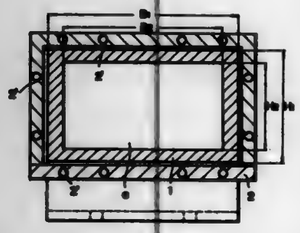
a piston reciprocally movable within said tubular member;

alarm circuit when the alarm circuit is connected to the

B1 4,790,698 (1963rd)

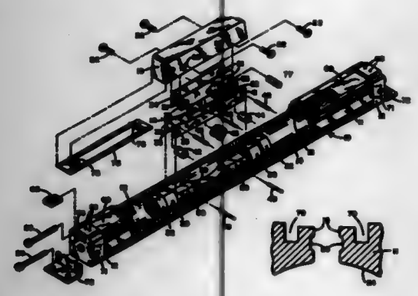
Claims 2–6 dependent on an amended claim, are determined to be patentable.

New claims 15–22 are added and determined to be patentable.



1. A sliding guide comprising a guide body made of a ceramic material of a hollow body whose sectional dimension ratio is less than 0.8 in [an] a section perpendicular to a sliding direction of said sliding guide, *said sliding direction being along the length of said guide body.*

B1 4,545,290 (1960th)
PRESSURE CYLINDER
Walter G. Lieberman, Minneapolis, Minn., assignor to Tol-O-Matic, Inc., Minneapolis, Minn.
Reexamination Request No. 90/002,642, Feb. 19, 1992.
Reexamination Certificate for Patent No. 4,545,290, issued Oct. 8, 1985, Ser. No. 564,990, Dec. 23, 1983.
Int. Cl.[5] F01B *29/00*
U.S. Cl. 92—88



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

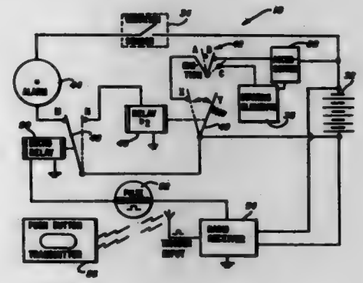
The patentability of claims 32–34 is confirmed.

Claims 1, 4–6, 27, 31, 35–36, 43 and 45 are determined to be patentable as amended.

Claims 2–3, 7–26, 28–30, 37–41 and 43–44, dependent on an amended claim, are determined to be patentable.

1. A pressure cylinder comprising:
an elongated tubular member having a side wall, a pair of pressure chambers and an elongated slot extending through said side wall and defined by opposed edge portions of said side, *said slot having a narrow portion with a width defined by first corresponding opposed edge portions and a wider portion with a width defined by second corresponding opposed edge portions;*
a piston reciprocally movable within said tubular member; and
means for successively sealing said slot during movement of said piston including an elongated seal member having a first portion for sealing engagement with a portion of the inner surface of said tubular member on each side of said elongated slot and a second portion for insertion into said elongated slot,
said second portion including a retaining portion with a width greater than the width [between corresponding side wall portions of said elongated slot] *of said narrow portion* so that upon insertion of said second portion into said elongated slot, said second portion will be retained therein as a result of engagement between the retaining portion of said second [piston] *portion* and said [side wall portions of said elongated slot] *narrow portion.*

B1 4,740,775 (1961st)
AUTOMOBILE BURGLAR ALARM
Reese Price, 319 E. 79th St., Chicago, Ill. 60619
Reexamination Request No. 90/002,671, Mar. 20, 1992.
Reexamination Certificate for Patent No. 4,740,775, issued Apr. 26, 1988, Ser. No. 115,798, Jan. 28, 1980.
The portion of the term of this patent subsequent to Feb. 26, 1998, has been disclaimed.
Int. Cl.[5] B60R *25/10*
U.S. Cl. 340—429



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

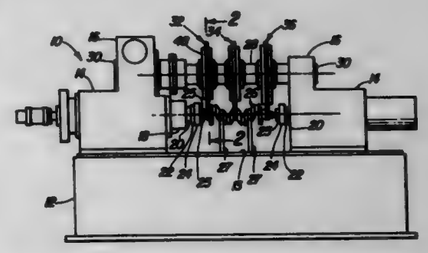
Claim 1 is cancelled.

Claims 2, 4, 6, 7 and 8 are determined to be patentable as amended.

Claims 3 and 5, dependent on an amended claim, are determined to be patentable.

7. [A device as in claim 1 wherein the automobile operating circuit further includes] *An automobile burglar alarm and theft prevention device for use in an automotive vehicle, the vehicle including a battery, electrically powered automotive starting elements and electrically powered automotive accessories, a selectively positionable ignition switch, the ignition switch adapted to draw power from the battery to start the automobile and operate the automotive accessories when in a first position and the ignition switch adapted to draw power from the battery to operate the automotive accessories without starting the automobile when in a second position; the automobile burglar alarm and theft prevention device comprising, in combination:*
an alarm circuit;
an automobile operating circuit;
switch means for selectively connecting either the alarm circuit or the automobile operating circuit to the battery of the automobile; the alarm circuit including the battery, alarm means, and vibration detection means for sensing automobile tampering and operative upon sensing vibrations to close the alarm circuit when the alarm circuit is connected to the battery;
the automobile operating circuit including the battery and the electrically powered automotive starting elements and electrically powered automotive accessories, the accessories being operable whenever either the alarm circuit or the automobile operating circuit is connected to the battery; *and*
means (a) for switching the switch means to connect the alarm circuit to the battery while disconnecting the automobile operating circuit and the battery and (b) for switching the switch means to connect the automobile operating circuit to the battery while disconnecting the alarm circuit and the battery, thereby disabling the electrically powered automotive starting elements at all times that the alarm circuit is connected to the battery.

B1 4,790,698 (1963rd)
MONOTONIC CUTTING MACHINE
Allan J. Heffron, Midland, Mich., assignor to Ingersoll CM Systems, Incorporated, Midland, Mich.
Reexamination Request No. 90/002,258, Jan. 23, 1991.
Reexamination Certificate for Patent No. 4,790,698, issued Dec. 13, 1988, Ser. No. 49,607, May 13, 1987.
Int. Cl.[5] B23C *1/00*
U.S. Cl. 409—200



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 6–7 and 10 is confirmed.

Claims 1, 3, 8, 9, 11 and 12 are cancelled.

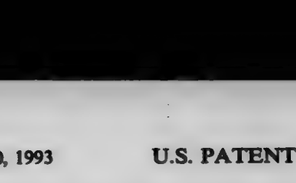
Claim 2 is determined to be patentable as amended.

Claims 4–5, dependent on an amended claim, are determined to be patentable.

New claims 13–16 are added and determined to be patentable.

2. The invention as defined in claim 1, wherein said means for rotating said arbor comprises means for rotating said arbor at a variable rotational speed during a single [machining operation] *rotation of said arbor.*

B1 4,746,635 (1962nd)
HIGH STRENGTH AND HIGH HARDNESS ALUMINA-ZIRCONIA-SILICON CARBIDE SINTERED CERAMIC COMPOSITE AND ITS MANUFACTURING PROCESS
Sigeo Inoue; Tetsuo Uchiyama, both of Kumayaya; Toshio Hirai, Izumi, and Koichi Niihara, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Rikea, Tokyo; Toshio Hirai, Izumi and Koichi Niihara, Yokosuka, all of Japan
Reexamination Request No. 90/002,498, Nov. 4, 1991.
Reexamination Certificate for Patent No. 4,746,635, issued May 24, 1988, Ser. No. 864,353, May 19, 1986.
Claims priority, application Japan, May 25, 1985, 60-112744; Feb. 28, 1986, 61-43519
Int. Cl.[5] C04B *35/56*
U.S. Cl. 501—89



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 6–11 are cancelled.

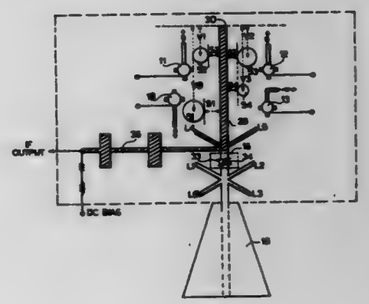
Claims 1, 4 and 5 are determined to be patentable as amended.

Claims 2 and 3, dependent on an amended claim, are determined to be patentable.

New claims 12–18 are added and determined to be patentable.

1. An alumina-zirconia-silicon carbide sintered ceramic composite having high strength and high hardness, said sintered ceramic composite being prepared [from] *by hot-pressing at a temperature between 1400° and 1700° C.* a mixture consisting essentially of 5 to 50 volume percent of partially stabilized zirconia powder of mean particle size between 0.1 and 1.0 μm, 3 to 40 volume percent of silicon carbide whiskers of 1 μm or less in diameter with an aspect ratio between 3 and 200, said aspect ratio being the ratio of the length of a whisker to its diameter, the balance of said mixture being substantially alumina powder, wherein the sum of the amounts of zicronia and silicon carbide *whiskers* accounts for 55 volume percent at most of the total powder mixture.

B1 4,952,936 (1964th)
MULTIBAND RADAR DETECTOR HAVING PLURAL LOCAL OSCILLATORS
Glen Martinson, Oakdale, Canada, assignor to B.E.L-Tronics Limited, Mississauga, Canada
Reexamination Request No. 90/002,705, Apr. 27, 1992.
Reexamination Certificate for Patent No. 4,952,936, issued Aug. 28, 1990, Ser. No. 242,533, Sep. 12, 1988.
Int. Cl.[5] G01S *7/285;* H04B *1/28*
U.S. Cl. 342—20



AS A RESULT OF REEXAMINATION, IT HAS BEEN

ing a logic circuit output signal, and having a base coupled

first input signal to be of a logic state opposite that of said

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 and 3–5 is confirmed.

Claim 2 is determined to be patentable as amended.

Claims 6 and 7, dependent on an amended claim, are determined to be patentable.

2. A Multi-Band Radar detector comprising:
a broad band antenna;
a plurality of dielectric resonator local oscillators, each having an output at a respective first predetermined frequency;
a mixer having a radar signal input port, a local oscillator signal input port, and an intermediate frequency signal output port;
means to feed a signal from the antenna to the radar signal input port;
means to feed signals sequentially from said dielectric resonator local oscillators directly to said local oscillator signal input port of said mixer for mixing, each in its turn, with the signal from said antenna; and
means to feed an intermediate frequency signal from said intermediate frequency signal output port of said mixer to signal processing circuitry for actuating an alarm in response to detected radar;
wherein said means to feed signal sequentially from said dielectric resonator local oscillators directly to said local oscillator signal input port of said mixer comprises a feedline for said signals from said dielectric resonator local oscillators together with means to effect electromagnetic coupling between said dielectric resonator local oscillators and said feedline;
wherein said means for effecting electromagnetic coupling of said dielectric resonator local oscillators with said feedline *comprises a dielectric resonator, and* is achieved by positioned each said dielectric resonator a distance from said feedline so as to effect electromagnetic coupling between each said dielectric resonator and said mixer; and
wherein each dielectric resonator is positioned at a distance that is measured from the centre of the respective resonator to an end of said feedline, which distance is equal to an odd number of quarter wave lengths of the frequency of each respective dielectric resonator.

B1 5,034,830 (1965th)

IDLING ROTATION MECHANISM USED IN THE HOUSING OF A VIDEO CASSETTE TAPE RECORDER

Jung-Jae Lee, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Reexamination Request No. 90/002,749, Jun. 9, 1992.
Reexamination Certificate for Patent No. 5,034,830, issued Jul. 23, 1991, Ser. No. 454,464, Dec. 21, 1989.
Claims priority, application Rep. of Korea, Jun. 9, 1989, 89-8076
Int. Cl.[5] G11B *15/675, 15/665*
U.S. Cl. 360—85

As A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

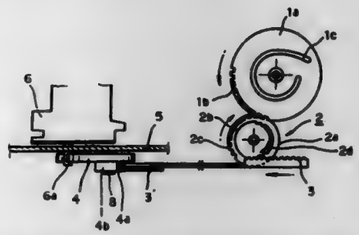
Claim 6 is cancelled.

Claims 1–5, 7–11 and 13 are determined to be patentable as amended.

Claims 12 and 14–16, dependent on an amended claim are determined to be patentable.

New claims 17–30 are added and determined to be patentable.

1. An idling rotation mechanism in a housing of a video cassette tape recorder, comprising:
cassette loading means for loading and unloading a cassette into and out of a deck part within said housing;
tape loading means for moving a tape, within said cassette loaded into said deck, into contact with a drum;
a single motor for driving said cassette loading means and



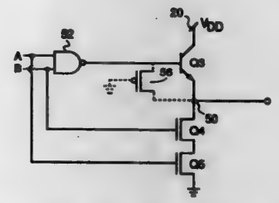
said tape loading means, said motor being able to rotate in clockwise and counterclockwise directions; *and*
a single loading cam [means] *including a first portion thereof* for preventing said tape loading means from being driven during operation of said cassette loading means[; and], *and a second* [idling rotation means] *portion thereof* for preventing said cassette loading means from being driven during operation of said tape loading means after completion of the cassette loading.

B1 5,068,548 (1966th)

BICMOS LOGIC CIRCUIT FOR ASIC APPLICATION

Abbas El Gamal, Palo Alto, Calif., assignor to SIArc, Palo Alto, Calif.

Reexamination Request No. 90/002,603, Feb. 14, 1992.
Reexamination Certificate for Patent No. 5,068,548, issued Nov. 26, 1991, Ser. No. 524,207, May 15, 1990.
Int. Cl.[5] H03K *19/01, 19/003, 19/082, 19/094*
U.S. Cl. 307—446



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 23–26 is confirmed.

Claims 12 and 17–20 are cancelled.

Claims 1, 13–15 and 21 are determined to be patentable as amended.

Claims 2–11, 16 and 22, dependent on an amended claim, are determined to be patentable.

1. A BiCMOS binary logic circuit [for performing logical operations] *within a programmed gate array, said gate array comprising a plurality of cells, said logic circuit* comprising:
a pull-up bipolar transistor having a collector coupled to a first power supply terminal, having an emitter for providing a logic circuit output signal, and having a base coupled to receive a first input signal;
one or more pull-down N-channel transistors, each of said N-channel transistors having its drain coupled to said emitter of said bipolar transistor and its source coupled to a second power supply terminal, a gate of each of said N-channel transistors being coupled to receive a second input signal; and
a CMOS binary logic circuit having one or more input terminals and coupled to said base of said bipolar transistor and to said gate of each of said N-channel transistors, said CMOS binary logic circuit operating to cause said first input signal to be of a logic state opposite that of said second input signal,
[said BiCMOS binary logic circuit being connected within an integrated circuit so as not to buffer input signals applied to terminals of said integrated circuit or buffer output signals applied to terminals of said integrated circuits]
said bipolar transistor and said one or more N-channel transistors being formed in substantially each cell internal to said gate array in an Application Specific Integrated Circuit, said one or more N-channel transistors being substantially larger than any other MOS transistors in said cell.

REISSUES

VOL 1148 ISS 5 MR 30 1993 UMI

REISSUES

MARCH 30, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,202

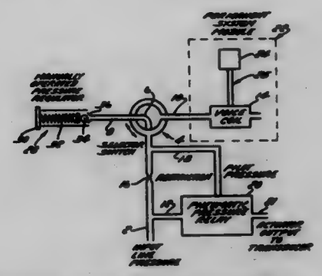
DUAL MODE PNEUMATIC CONTROL SYSTEM

Thomas O. Kautz, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Original No. 4,953,578, dated Sep. 4, 1990, Ser. No. 430,716, Nov. 2, 1989. Application for reissue Apr. 21, 1992, Ser. No. 871,941

Int. Cl.[5] G05D *16/00*

U.S. Cl. 137—14 17 Claims



1. A pneumatic control system, comprising:

input means for supplying pressurized pneumatic fluid to the system;

an operational mode selector for operating the system in a selected operating mode, the selector means being adapted to divert the pneumatic fluid to a flow path within the system associated with the mode selected;

pressure regulating means within each flow path;

a pneumatic relay for receiving pneumatic fluid from the associated flow path and providing a pneumatic fluid output in response to the pressure level of the fluid received; and

a module containing the mode selector means, [each] *at least one* pressure regulating means and the pneumatic relay.

Re. 34,203

DOUBLE WALL STORAGE TANK AND METHOD OF MAKING SAME

David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Original No. 4,817,817, dated Apr. 4, 1989, Ser. No. 194,387, May 16, 1988. Continuation-in-part of Ser. No. 105,881, Oct. 7, 1987, Pat. No. 4,780,946, and a continuation-in-part of Ser. No. 105,890, Oct. 7, 1987, Pat. No. 4,780,947, which is a continuation-in-part of Ser. No. 43,634, Apr. 28, 1987, Pat. No. 4,744,137, which is a division of Ser. No. 884,481, Jul. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,140, Sep. 12, 1985, Pat. No. 4,640,439, which is a continuation-in-part of Ser. No. 818,258, Jan. 18, 1986, Pat. No. 4,644,627. Application for reissue Jan. 10, 1991, Ser. No. 639,914

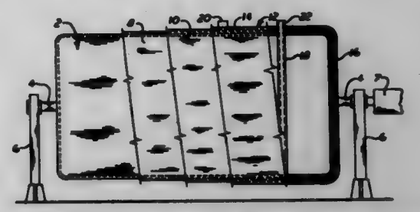
Int. Cl.[5] B65D *25/18, 87/24*

U.S. Cl. 220—445 10 Claims

1. A method of manufacturing a double wall tank from a *rigid* single wall inner tank for storage of liquids, said inner tank including a generally cylindrical sidewall and pair of end walls, said method comprising;

applying to at least a portion of the exterior surface of said rigid inner tank a release agent for substantially preventing bonding of a curable synthetic resin to said inner tank exterior surface portion;

applying over said inner tank exterior surface and said release agent a substantially rigid outer sheath of [a] *said* curable synthetic resin that, when cured, is substantially fluid tight; and



breaking engagement between said inner tank exterior surface and said outer sheath, whereby is formed a double wall tank in which said inner tank defines an inner wall and said outer sheath defines an outer wall.

Re. 34,204

PRESSURE REGULATION DEVICE FOR VEHICLE SAFETY AIR BAG

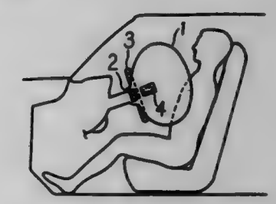
Juichiro Takada, 3-12-1, Shin-machi, Setagaya-ku Tokyo, Japan

Original No. 4,805,930, dated Feb. 21, 1989, Ser. No. 89,581, Aug. 26, 1987. Application for reissue Feb. 20, 1991, Ser. No. 658,760

Claims priority, application Japan, Aug. 26, 1986, 61-128870[U]

Int. Cl.[5] B61R *21/16, 21/28*

U.S. Cl. 280—739 6 Claims



5. In a vehicle safety air bag having an envelope of fabric coated with a polymeric film to make it gas tight and inflatable by pressurized gas from an inflator, the improvement wherein the envelope includes at least one fabric element consisting of a woven fabric and a lining film coating of silicone rubber on the inner surface of the woven fabric.

Re. 34,205

ADAPTIVE RECOGNIZING DEVICE

Robert D. Johnston, Woodbridge, England, assignor to British Telecommunications public limited company, London, England

Original No. 4,782,459, dated Nov. 1, 1988, Ser. No. 790,931, Oct. 24, 1985. Application for reissue Oct. 30, 1990, Ser. No. 605,844

Claims priority, application United Kingdom, Oct. 26, 1984, 8427165

Int. Cl.[5] G06F *7/38;* H04B *3/00*

U.S. Cl. 364—724.19 35 Claims

1. An electronic adaptive recognizing device comprising:

a device input;

an input store, connected to said device input, having a plurality of storage locations allowing data representative of elements of a signal pattern to be recognized to be

stored at locations related to the positions of the elements

sampling means for sampling a received four-level substan-

the second airfoil cavity being positioned adjacent to the

and said second, movable mass having an outer width w,

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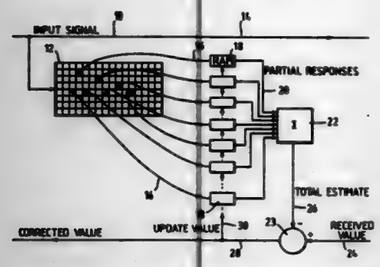
stored at locations related to the positions of the elements in said pattern;

plurality of addressable stores each having only one address line specifying one or more store locations therein, each of said addressable store locations being capable of containing a word of at least one bit, said address lines each being connected to a respective location in said input store such that the contents of said input store are capable of specifying a store location in each of said addressable stores;

means for deriving a common value dependent on the contents of the store locations specified by the contents of said input store;



means for receiving values related to said signal pattern;

calculating means for calculating a [corrected] *calculated* value dependent on said common value and a corresponding one of said received values; *and*

[an output coupled to said calculating means for outputting said corrected values; and]

updating means for applying an update value dependent on said [corrected] *calculated* value to the contents of said specified store locations.

Re. 34,206

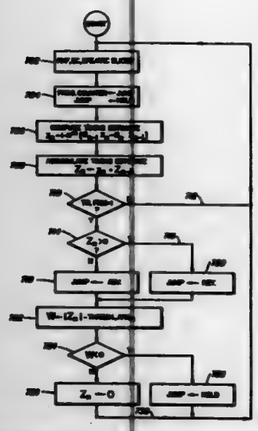
METHOD AND APPARATUS FOR TIMING RECOVERY

Babak Sayar, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Original No. 4,896,334, dated Jan. 23, 1990, Ser. No. 261,134, Oct. 24, 1988. Application for reissue Mar. 8, 1991, Ser. No. 666,728

Int. Cl.[5] H04L *25/49*

U.S. Cl. 375—20 22 Claims



1. A receiver suitable for a loop interface circuit for a digital data transmission system, said receiver comprising:

sampling means for sampling a received four-level substantially randomized digital signal;

multilevel decision or slicing means for comparing samples of such received signal selectively with a plurality of thresholds to extract its four symbols;

timing recovery means for determining a sampling instant as a function of a precursor sample and a main pulse sample one baud apart, according to the timing function:

$$f(t)=(1/r)h(t)-h(t-T)$$

where 1/T is the baud rate, h(t) and h(t−T) denote the main pulse sample and precursor sample, respectively, r is the ratio between the main pulse sample and the precursor pulse sample, and t is the sampling instant;

said timing recovery means including a timing estimator responsive to baud rate samples (x_n and a_n) of the received signal before and after slicing, respectively, by said slicing means for deriving a precursor estimate (z_n) of the difference between an actual sampling instant and a desired sampling instant with reference to the ratio between the main sample pulse and said precursor sample one baud earlier, and means for generating a baud rate clock signal variable in dependence upon said estimate (z_n) the index n denoting the current baud interval;

said sampling means being responsive to said baud rate clock to vary said sampling instant;

wherein said timing estimator derives said precursor timing estimate z_n in accordance with the expression:

$$z_n=(-1)^m.(a_{n-1}x_n-a_nx_{n-1})$$

where m represents the magnitude bit of the 2B1Q symbol [(n=0] (m=1 for magnitude 1, [m=1] *m=0* for magnitude 3).

Re. 34,207

COUNTERROTATING AIRCRAFT PROPULSOR BLADES

Joey L. Nelson; Sidney B. Elston, III, both of Cincinnati; Wu-Yang Tseng, West Chester, and Martin C. Hemsworth, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Original No. 4,784,575, dated Nov. 15, 1988, Ser. No. 157,179, Feb. 12, 1988. Continuation of Ser. No. 932,427, Nov. 19, 1986, abandoned. Application for reissue Feb. 26, 1991, Ser. No. 660,459

Int. Cl.[5] F01D *5/14*

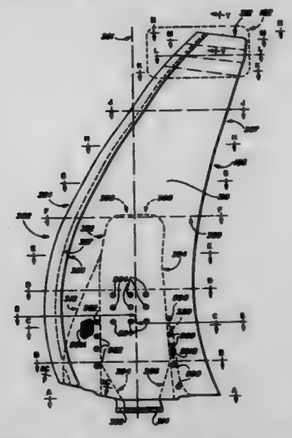
U.S. Cl. 416—226 16 Claims

1. A propulsor blade comprising:

an airfoil section having a top end, a root end, a first and second surface therebetween defining a convex shaped leading edge and a concave shaped trailing edge, said first surface being essentially convex and said second surface being essentially concave, each surface being formed of a plurality of angle plied composite laminates bonded together;

a metallic blade spar interposed between said first and second surfaces and bonded to said surfaces for connecting said surfaces to said root end;

a plurality of airfoil cavities interposed between said first and second surfaces and positionally adjacent to said blade spar for effecting a desired weight of said blade, said plurality of airfoil cavities including at least a first and a second airfoil cavity, the first airfoil cavity being positioned adjacent to the leading edge of said blade spar and the second airfoil cavity being positioned adjacent to the trailing edge of said blade spar; *and*



a first balance weight and a second balance weight in said root end for statically balancing said blade about a chordwise moment axis and a radial moment axis.

Re. 34,208

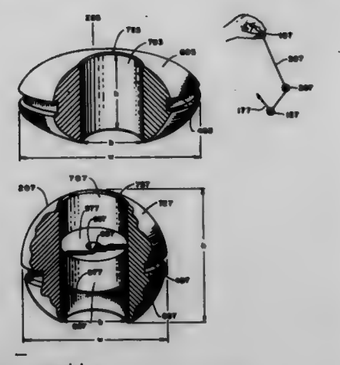
SWINGING BOB TOY

Laurence J. Shaw, 595 Fairway Dr., Novato, Calif. 94947

Original No. 4,878,868, dated Nov. 7, 1989, Ser. No. 339,340, Apr. 17, 1989. Application for reissue Apr. 30, 1990, Ser. No. 516,785

Int. Cl.[5] A63H *33/00*

U.S. Cl. 446—75 30 Claims



1. A toy comprising:

(a) a flexible elongated tethering means,

(b) a first mass [secured] *constrained* to said tethering means, [and]

(c) a second, movable mass, having a bore with a height h and a width b, the bore of said movable mass allowing said movable mass to move freely along said tethering means, and said second, movable mass having an outer width w, such that

$$0.2<h/w$$

and

$$(h/w)-(b/w)<0.8,$$

whereby the operation of said toy is smooth and the tangling of said tethering means is infrequent, *and*

(d) *a third mass constrained to said tethering means so as to constrain said second, movable mass between said first and third masses, said first, second and third masses having substantially equal weight, shape and size, thereby permitting the performance of trick midair maneuvers.*

Re. 34,209

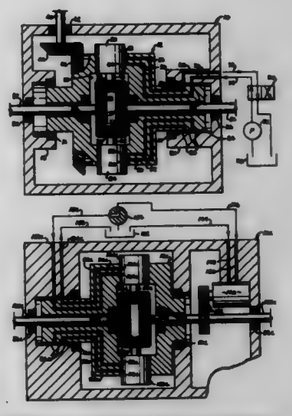
VARIABLE SPEED TRANSMISSION

Clifford B. McGarraugh, Rte. 2, Box 5–A, Perryton, Tex. 79070

Original No. 4,867,012, dated Sep. 19, 1989, Ser. No. 198,139, May 24, 1988. Division of Ser. No. 50,402, May 18, 1987, abandoned. Application for reissue Sep. 3, 1991, Ser. No. 753,824

Int. Cl.[5] F16H *1/445*

U.S. Cl. 475—89 5 Claims



1. In a variable speed transmission apparatus:

a rotatable carrier;

a pinion gear *carried by said carrier;*

a fluid pump unit [carried by said carrier and] having a rotatable operating shaft [to which said pinion gear is fixed,] and [further having] fluid inlet and outlet means;

means connecting said operating shaft to said pinion gear;

a pair of rotatable, input and output shafts having inner ends provided with gear means engaging said pinion gear;

controllable, variable displacement fluid motor means independent of said carrier and connected with said output shaft; and

means communicating said fluid inlet and outlet means of the pump unit with said motor means, whereby the fluid displaced by said motor means determines the speed difference between the input and output shafts.

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PLANT PATENTS

GRANTED MARCH 30, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,187

APPLE TREE: DULCET CULTIVAR

L. James Bailey, 3900 Mylius Rd., Wenatchee, Wash. 98801

Filed May 9, 1991, Ser. No. 697,881
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—34.1 1 Claim

1. A new and distinct variety of apple tree substantially as shown and described.

8,188

PLUM TREE CALLED 'EMPEROR'

James F. Doyle, Clovis, and Theodore M. De Jong, Davis, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 12, 1991, Ser. No. 758,037
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38.1 1 Claim

1. The new and distinct variety of plum tree herein described and illustrated and identified by the characteristics above enumerated.

8,189

AUTUMN BEAUT

Chris F. Zaiger, 537 Rossmore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95351

Filed Feb. 3, 1992, Ser. No. 829,225
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—38.1 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by its large size, vigorous, upright growth and a productive and regular bearer of large size, firm, late maturing, clingstone fruit and in comparison to the late maturing Roysum Plum (U.S. Plant Pat. No. 2,619) the fruit ripens approximately 6 days earlier, is not susceptible to skin cracking or preharvest drop of immature fruit.

8,190

AFRICAN VIOLET PLANT NAMED LITTLE COMANCHE GIRL

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,640
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—69.2 1 Claim

1. A new and distinct cultivar of African violet named Little Comanche Girl, as described and illustrated, and particularly characterized by its mid-size growth habit (13–15 cm in diameter); purplish blue, single violet-shaped flowers; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse flowering; medium green, spear- to heart-shaped, slightly serrated leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

8,191

ORCHID 'PINK DAWN'

Ernest E. Hetherington, Arcadia, Calif., assignor to Stewart Orchids, Carpenteria, Calif.

Filed Apr. 8, 1991, Ser. No. 682,133
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.3 1 Claim

1. A new and distinct variety in the hybrid genus Cymbidium substantially as described and illustrated herein which was discovered as a superior variety in the grex Cymbidium 'Bangkok Beauty' named 'Pink Dawn' characterized by a combination of clearness of coloring, superior flower substance, size, shape and further characterized by its exceptional vigor, reliability of bloom and lasting qualities.

8,192

VARIETY OF GERANIUM NAMED ELIZABETH

Douglas Holden, Solvang, Calif., assignor to Bodger Seeds, Ltd., So. El Monte, Calif.

Filed Jan. 31, 1992, Ser. No. 830,235
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct variety of Geranium plant, substantially as shown and described.

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PATENTS

GRANTED Mar. 30, 1993

ERRATA

For CLASS	See PATENT NO.
492-007	5,197,174
051-163	5,197,249
051-163	5,197,271
108-044	5,197,381
105-149	5,197,390
280-011	5,197,572
194-217	5,197,588
194-248	5,197,589
472-118	5,197,730
514-496	5,198,011
504-344	5,198,012
504-225	5,198,013
504-225	5,198,014
424-085	5,198,420
525-332	5,198,531
435-069	5,198,541
435-069	5,198,542
568-619	5,198,599
355-211	5,198,852
355-244	5,198,853
257-020	5,198,879
257-214	5,198,880
257-219	5,198,881
257-156	5,198,882
257-676	5,198,883
257-760	5,198,884
257-701	5,198,885
257-727	5,198,886
257-686	5,198,888
257-678	5,198,889
360-099	5,198,933
360-104	5,198,934
379-098	5,199,071

PATENTS

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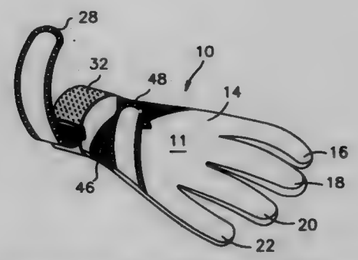
PATENTS

GRANTED MARCH 30, 1993

GENERAL AND MECHANICAL

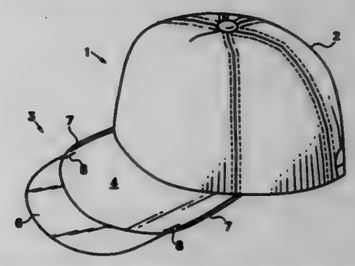
5,197,149
ATHLETIC GLOVE WITH BACKHAND SUPPORT
V. Parker Overton, P.O. Box 8228, Greenville, N.C. 27834
Filed Feb. 7, 1992, Ser. No. 832,450
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 A **21 Claims**



1. A glove having an integral wrap around back strap, comprising:
a) a central portion including a back side and a palm side defining a hand-receiving pocket therebetween;
b) a plurality of finger stalls secured to the central portion for receiving respective fingers and thumb of the user's hand;
c) a hand opening in the central portion for inserting the user's hand into the hand-receiving pocket;
d) a wrist cuff area encircling the user's wrist and bordering the hand opening;
e) backhand support means for compressing and supporting muscles in the back of the user's hand including:
1) a backhand strap having one end integral with the glove for wrapping around the user's hand including an intermediate portion and a free end portion, said backhand strap being fixedly secured to the central portion of the glove and extending diagonally backward across and adjacent the back side of the glove towards the user's wrist, said strap further encircling the underside of the user's wrist and extending from the user's wrist diagonally forward back across the back side of the glove so that the free end portion of the backhand strap extends over and intersects the intermediate portion thereof;
2) an intermediate fastener secured to the intermediate portion of the backhand strap and outwardly exposed on the back side of the glove when the backhand strap is appropriately wrapped around the user's hand; and
3) a cooperative fastener secured to the free end of the backhand strap for connecting to the exposed fastener on the intermediate portion of the backhand strap.

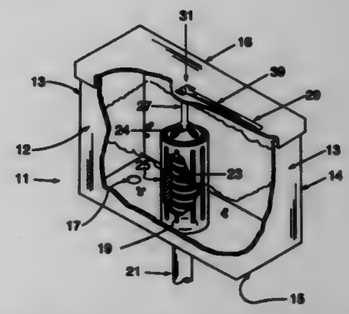
5,197,150
VISOR CAP WITH RETRACTABLE PROTECTIVE VISOR AND METHOD OF CONSTRUCTION THEREFORE
Jack Bedient, 2217 E. Tudor #19, Anchorage, Ak. 99507
Filed Feb. 3, 1992, Ser. No. 829,436
Int. Cl.[5] A42B *1/02*
U.S. Cl. 2—195 **13 Claims**

1. A cap having a movable visor comprising:
a) a crown;
b) an upper brim, being generally rectangular and having a front, a back and two oppositely disposed sides, said upper brim being fixedly attached to said crown and extending outwardly therefrom perpendicular to the crown:
c) a lower brim, being generally rectangular and having a front, a back, and two oppositely disposed sides, and being of the same general configuration as the upper brim, said lower brim being fixedly attached to said crown and extending outwardly therefrom perpendicular to the crown, said lower brim being positioned below said upper brim and also being connected to said upper brim at the sides of said brims, such that said upper brim and said lower brim form a pocket therebetween with the front of the pocket being open;
d) a movable brim, having two sides and being generally shaped the same as the upper and lower brims, but being sized slightly smaller to permit said movable brim to be



placed inside the pocket formed by the upper and lower brims, such that said movable brim can be extended from said pocket or retracted into said pocket as desired;
e) a first ear, fixedly attached to one side of the movable brim and a second ear fixedly attached to the second side of said movable brim, said ears being oppositely disposed on said movable brim; and
f) means to restrain said ears, said means being formed in the upper and lower brims, to prevent the movable brim from being completely removed from the pocket formed by the upper brim and the lower brim.

5,197,151
VARIABLE VOLUME FLUSHING DEVICE FOR WATER CONSERVATION
Louis J. Jasper, Jr., 12389 Kendrup Dr., Fulton, Md. 20759
Filed Jul. 1, 1991, Ser. No. 724,251
Int. Cl.[5] E03D *5/09*
U.S. Cl. 4—378 **15 Claims**



3. A toilet flushing apparatus, said apparatus comprising:
a tank having two side walls, a front wall, a back wall, and a bottom wall, said bottom wall provided with separate water supply and water outlet openings for the introduction and expulsion of water into and from said tank;

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means for filling said tank with a predetermined volume of water;

a collapsible tube having two open ends and a length no greater than the height of said tank, one end of said tube being disposed over said water outlet opening and sealed in a water-tight manner to the bottom of said tank, said tube further provided with means to effect complete recovery of its length after said tube has been compressed lengthwise and released;

means to limit lateral motion of said tube during compression, said motion limiting means defining a vertical cavity in which said tube is located, and further allowing the flow of water into said cavity;

means to compress said tube lengthwise, whereby a volume of water approximately equal to the cross sectional area of said tank multiplied by the vertical distance said tube has been compressed, will enter the free end of said tube and be expelled from said tank causing the toilet to flush;

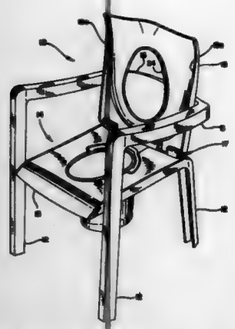
wherein said tank is provided with a cover, and said compression means comprises a rigid cap which is fixedly attached to the free end of said tube, said cap being provided with openings to allow the flow of water into said tube; a rigid rod which is fixedly attached to said cap, and which extends vertically through an opening in said cover; and a handle which is pivotally ad removably attached to said rod at a location outside of said tank and said tank cover, whereby said handle may be rotated into a vertical position and depressed to effect compression of said tube, thereby flushing said toilet.

5,197,152

COMMODE OF UNITARY CONSTRUCTION

Eric P. Rose, Van Nuys, and David Hodge, El Granada, both of Calif., assignors to Guardian Products, Inc., Arleta, Calif.

Filed Jan. 30, 1991, Ser. No. 648,236
Int. Cl.[5] A47K *11/00*
U.S. Cl. 4—479 **8 Claims**



1. A commode chair comprising:

a unitary molded plastic structure in the form of a chair comprising a plurality of generally vertical legs, a generally horizontal seat with a front and rear supported by said legs and a chair back extending upward from said seat at the rear thereof;

said seat comprising a seat pan and a toilet seat hingedly connected to the seat pan at the rear thereof such that said toilet seat is pivotable from a generally horizontal position wherein it is supported by the seat pan to a generally vertical position wherein it can rest against said chair back;

said seat pan and toilet seat having aligned central openings said seat pan having an integrally molded recess surrounding the opening therein;

the toilet seat having an upper seating surface sculpted and configured in molded form to comfortably accommodate and support the posterior of the human anatomy in the seating position including a downwardly curved front portion for supporting the user's legs, and a contoured area surrounding the central opening on the sides and rear of the toilet seat, said contoured area being generally depressed into the toilet seat;

a removable commode bucket with an open top supported by said seat pan, said bucket depending downwardly from the recess in said seat pan through the central opening in the seat pan, the commode bucket having a flange on the periphery of the open top that nests in the recess surrounding the central opening in the seat pan; and

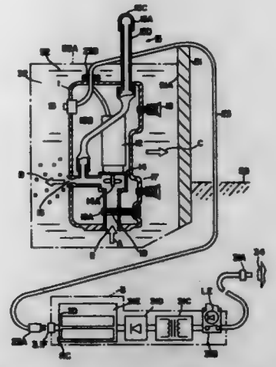
a commode bucket lid correspondingly shaped to the opening in the toilet seat and commode bucket for sealing the opening in the toilet seat when the commode is not in use and adapted to sealing the open top of the bucket upon removal of the bucket from the commode chair.

5,197,153

BUBBLE GENERATING DEVICE FOR BATHTUBS

Zenzaburo Hara, 31-1 Kamiyamacho, Shibuya-ku, 150, Tokyo, Japan

Filed Jan. 10, 1991, Ser. No. 639,906
Claims priority, application Japan, Jan. 12, 1990, 2-5862; Jan. 12, 1990, 2-5863; Feb. 8, 1990, 2-30047
Int. Cl.[5] A61H *33/02*
U.S. Cl. 4—541.4 **4 Claims**



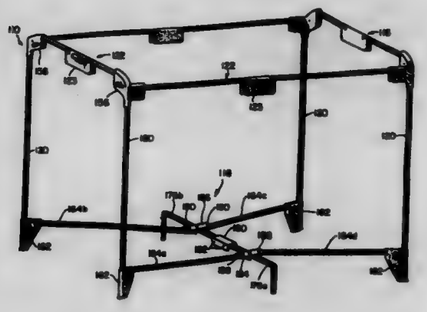
1. An air bubble generating device for use in a bathtub comprising the combination of a casing having an electric pump operative to take in and pressurize water from a bathtub, an air inlet operative to take in air from a region above the water in a bathtub, and a nozzle operative to jet a mixture of the air taken in by the air inlet and water taken in and pressurized by the pump into the water in the bathtub, said casing being provided with means for gripping the casing by hand, and a plurality of suction cups provided on a rear side of the casing opposite said nozzle for attaching the casing to an inner wall surface of the bathtub and further including a power source unit for driving said electric pump separately provided from said casing, and wherein said power source unit is operative to convert power from a commercial power source to a DC current, and said power source unit is provided with an idling prevention circuit which essentially suspends output current from the power source unit when the pump is in an idle state, and a rush current reducing circuit which reduces the rush current when the electric pump is actuated.

5,197,154

FOLDABLE PLAYPEN

Louis Shamie, 972 Dean St., Brooklyn, N.Y. 11238

Continuation-in-part of Ser. No. 868,452, Apr. 14, 1992. This application Jan. 22, 1992, Ser. No. 901,738
Int. Cl.[5] A47D *13/06*
U.S. Cl. 5—99.1 **14 Claims**



1. A foldable playpen comprising:

a) a frame including:

i) an upper frame assembly having a plurality of collapsible upper rails and securing means for releasably maintaining said upper rails in a non-collapsed position,

ii) a lower frame assembly including:

A) first and second auxiliary lower floor support legs,

B) pivoting means for pivotally connecting said first and second lower floor support legs at an inner end thereof to permit said legs to be pivoted in a first plane between a first substantially in-line position and a second folded position in which the legs are substantially parallel to each other,

C) a plurality of lower floor support rails having inner and outer ends, the inner end of each said lower floor support rail being pivotally connected to one said auxiliary lower floor support leg at a position spaced from said pivoting means for movement in a second plane substantially transverse to said first plane;

iii) a plurality of corner legs, each leg having an upper end and a lower end,

iv) connecting means for interconnecting said upper rails of said upper frame assembly to the upper ends of said corner legs and for interconnecting the outer ends of said lower floor support rails of said lower frame assembly to the lower ends of said corner legs; and

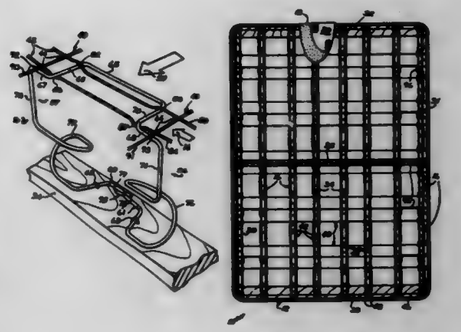
b) a fabric enclosure surrounding a bottom and all sides of said frame.

5,197,155

FOUNDATION UNIT WITH SNAP-FIT MODULAR SPRINGS

Steven E. Ogle, and Danny L. Wylie, both of Carthage, Mo., assignors to L&P Property Management Company, Chicago, Ill.

Continuation-in-part of Ser. No. 786,021, Oct. 31, 1991, Pat. No. 5,142,716. This application Jan. 28, 1992, Ser. No. 827,006
The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.
Int. Cl.[5] A47C *23/04, 23/053*
U.S. Cl. 5—247 **31 Claims**



1. A bedding foundation unit comprising:

(a) a frame;

(b) a planar top portion spaced above said frame, and comprising a first plurality of spaced parallel grid wires and a second plurality of spaced parallel grid wires lying perpendicular to and connected to said first plurality of spaced parallel grid wires;

(c) a plurality of modular springs extending between said planar top portion and said frame, each said modular spring comprising a planar top section, two vertical legs, and two foot sections, each of said vertical legs comprising a vertical straight portion and at least one arcuate portion having an arc of at least about 180 , said planar top section comprising a centermost longitudinal section and two longitudinal end sections, each said longitudinal end section being generally parallel to and offset from said centermost longitudinal section and being connected thereto by a transverse straight portion, each said longitudinal end section being connected to one of said vertical legs, each of said vertical legs being connected to said frame by one of said foot sections, and each of said vertical legs being located beneath said planar top section; and

(d) snap-fit means securing each said modular spring to said planar top portion, said snap-fit means comprising a first parallel grid wire from said second plurality of spaced parallel grid wires extending over both transverse straight portions of said modular spring, a second parallel grid wire from said second plurality of spaced parallel grid wires extending under both transverse straight portions of said modular spring, and a pair of parallel grid wires from said first plurality of spaced parallel grid wires, wherein one of said pair of parallel grid wires extends over one of said longitudinal end sections of said modular spring and another of said pair of parallel grid wires extends over another of said longitudinal end sections of said modular spring.

25. A modular spring, for use in a bedding foundation unit, comprising:

(a) a planar top section comprising a centermost longitudinal section and two longitudinal end sections, each said longitudinal end section being generally parallel to and offset from said centermost longitudinal section and being connected thereto by a transverse straight portion;

(b) two vertical legs, each of said vertical legs comprising a vertical straight portion, at least three horizontal straight torsion portions, and at least two arcuate portions, each arcuate portion having a continuous arc of at least about 180° interconnecting two of said three horizontal straight torsion portions, and each of said longitudinal end sections being connected to one of said vertical legs; and

(c) two foot sections, each of said foot sections being connected to one of said vertical legs.

5,197,156
TRANSFER BOARD SUPPORT LEVER AND SUPPORT POST

Martin W. Stryker, Kalamazoo Township, Kalamazoo County, and Jeffry L. Lewandowski, Schoolcraft Township, Kalamazoo County, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Jul. 31, 1991, Ser. No. 738,531
Int. Cl.[5] A61G 7/06
U.S. Cl. 5—428 27 Claims

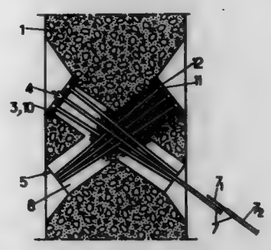
1. An apparatus comprising: a bed having an upwardly facing surface; a support member having thereon a support surface; support means supporting said support member on said bed for movement between a retracted position in which said support member is disposed below said surface on said bed and an operational position in which said support member is disposed in the region of an edge portion of said surface on said bed and is oriented so that said support surface thereon is facing upwardly and is at approximately the same vertical level as said surface on said bed, said support surface including a portion which is disposed horizontally outwardly beyond said edge portion of said surface on said bed when said support member is in said operational position, wherein as said support member moves from said retracted position to said operational position said support means causes said support member to move upwardly adjacent said edge portion of said surface on said bed with said support member oriented so that said support surface thereon extends approximately vertically, and wherein as said support member moves from said retracted position to said operational position said support member moves through a further position; and selectively actuable holding means for holding said support member in said further position when actuated, said holding means including a holding part supported on said bed for manual movement between first and second positions, wherein when said holding part is respectively in said first and second positions said holding means respectively permits and prevents movement of said support member from said further position toward said retracted position.

5,197,157
CABLE-STAYED BRIDGES AND MORE PARTICULARLY TO THEIR PYLONS AND STAY CABLES

Carlos De La Fuente, Nanterre, France, assignor to Freyssinet International et Compagnie, Marseille, France

Filed Jun. 26, 1991, Ser. No. 719,716
Claims priority, application France, Jun. 29, 1990, 90 08250
Int. Cl.[5] E01D 11/00; E04C 3/26
U.S. Cl. 14—18 11 Claims

1. Cable-stayed bridge comprising:
at least one pylon including opposite vertical sides having faces;
a respective block for each respective said vertical side of said pylon which bears on an associated said face of the respective said vertical side; and
a pair of stay cables which are anchored to said pylon and which extend from respective said opposite vertical sides, wherein each said stay cable is formed by a bundle of strands,
wherein each said stay cable includes a main portion extending from one said vertical side of said pylon, an upper portion passing through said pylon from the one said vertical side to the other with said upper portion slightly flared from the one said side into strand sections, and free ends of said strand sections which are

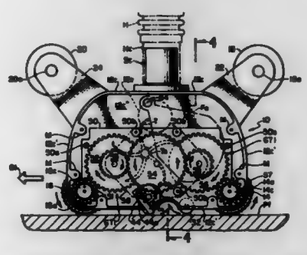


anchored to an associated said block located at the other said side, and
wherein said strand sections of said pair of stay cables are crossed with mutual imbrication in said pylon so that mean center lines of said flared upper portions of said stay cables are anchored in a same vertical plane of said pylon which is parallel to a longitudinal direction of the bridge.

5,197,158
SWIMMING POOL CLEANER

Siamak Moini, Encino, Calif., assignor to Philip L. Leslie, Tarzana, Calif.

Filed Apr. 7, 1992, Ser. No. 864,641
Int. Cl.[5] E04H 3/20
U.S. Cl. 15—1.7 16 Claims



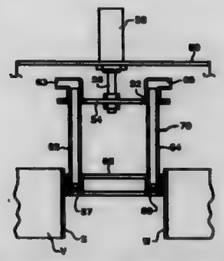
1. A vacuum powered automatic swimming pool cleaning device for cleaning the bottom and side walls of a swimming pool comprising:
a) a hollow housing supported on two pairs of reversible device mover wheels, said housing including
i) a central water suction chamber in water flow inlet communication with a water suction trough spanning the bottom of said housing and in water flow outlet communication with an external vacuum line,
ii) a first outboard chamber containing a first gear train interconnecting said pairs of mover wheels and a first pivoted directional control float, and
iii) a second outboard chamber containing a second gear train with its power output end positioned to reversibly drive one of said pairs of mover wheels and a second pivoted directional control float coupled to said first float by a common pivot rod traversing the upper portion of said water suction chamber and maintaining said floats in parallel pivot orientation;

b) a turbine wheel bearing water driven vanes and mounted on a turbine shaft operatively disposed and positioned within said water suction chamber whereby with the passage of water through said chamber in contact with said vanes said wheel rotates in a single direction, said turbine shaft extending into the second outboard chamber of said housing and bearing a turbine drive gear;
c) a transmission shift plate pivotally mounted within the second outboard chamber of said housing and bearing first and second shift gears in intermeshed relationship with each other, said second shift gear being in intermeshed drive relationship with a first drive gear at the power input end of said second gear train, said shift plate being pivotal to a first position whereat said first shift gear is intermeshed with said turbine drive gear whereby the gears of said second gear train are driven via said first shift gear through said second shift gear in one rotational direction and pivotal to a second position whereat said second shift gear is intermeshed with said turbine drive gear whereby the gears of said second gear train are driven only by said second shift gear in a reverse rotational direction; and
d) means operable by said second pivoted float to move the pivotally mounted transmission shift plate between its first pivotal position and its second pivotal position in response to a swing shift in the position of said coupled first pivoted float and second pivoted float caused by the impact of the pool cleaning device on an obstruction to its path of travel whereby said shift plate reverses the rotational direction of the gears of said second gear train and thereby the direction of rotation of the mover wheels and the direction of travel of the pool cleaning device.

5,197,159
CLEANING APPARATUS FOR PRODUCT SORTER VIEWING WINDOW

Thuan V. Truong, Houston, Tex., assignor to Delta Technology Corporation, Houston, Tex.

Filed Jan. 10, 1991, Ser. No. 639,289
Int. Cl.[5] B06B 1/00, 5/00
U.S. Cl. 15—304 8 Claims

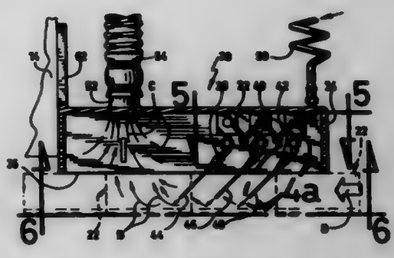


1. Apparatus for cleaning an object sorter viewed window having a tubular viewed surface, the apparatus comprising
a movable body member receivable within and movable adjacent the viewed window,
a moving means for moving the movable body member,
the body member having pressurized air conducting means extending therethrough, the pressurized air conducting means comprising a plurality of hollow tubes each extending from a top to a bottom of the body member, the plurality of hollow tubes each having an inlet opening for receiving air under pressure, and
air exit aperture means in the body member in communication with the pressurized air conducting means, the air exit aperture means providing pressurized air flow to the viewer surface to clean it,
the air exit aperture means comprising a plurality of nozzles, each of said plurality of nozzles being directed at a corresponding portion of the viewer surface, the nozzles being at a bottom end of each of the plurality of hollow tubes.

5,197,160
CLEANING DEVICE FOR CLEANING CARPETS

Alexander L. Smith, 24, Terragone, Kirkland, Quebec, Canada H9J 1R6

Filed Jan. 21, 1992, Ser. No. 822,711
Claims priority, application United Kingdom, Feb. 4, 1991, 9102381
Int. Cl.[5] A47L 5/38
U.S. Cl. 15—306.1 6 Claims



1. A cleaning device for removing debris from between a plurality of adjacent rows of vertically upstanding stiff bristles of a carpet of a garment cutting table, said carpet having a perforated base surface holding the bristles upwardly projecting from said surface, said bristles having a top end defining a flat horizontal resting surface, said cleaning device comprising,
a casing having a top wall and a peripheral wall defining a peripheral edge adapted to sit on said resting surface of said bristles,
a set of elongated nozzles adapted to be connected to an air blower, a hollow cylindrical shaped needle fixed to each nozzle downwardly projecting inside said casing and extending below said peripheral edge, said needles having an outer diameter for projecting between adjacent rows of said bristles without substantial shifting of the bristles, said nozzles adapted to project air through said needles between said bristles for dislodging said debris between said bristles,
said casing being provided with an aperture adapted to be connected to a suction device,
whereby said debris are sucked out of said casing through said aperture after they have been removed from between the bristles.

5,197,161
FRICTION FIT KNOB FOR SHAFT WITH END OF U-SHAPED CROSS-SECTION

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Jun. 9, 1992, Ser. No. 895,645
Int. Cl.[5] A47B 95/02; G05G 1/10; B25G 3/02
U.S. Cl. 16—121 4 Claims

1. A molded knob of the type which frictionally engages and fits over the distal end of a shaft having a generally U-shaped, transverse cross-section,
a hub formed as part of said knob,
a shaft-receiving socket formed in said hub,
said socket being of generally circular transverse cross-section, and

a pair of generally L-shaped fingers formed as part of said

tween said first and second ends and at a predetermined

ment exiting from said internal cavity and extending through

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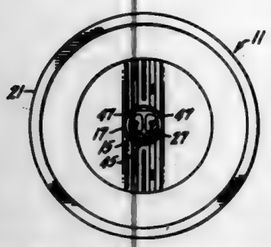
a pair of generally L-shaped fingers formed as part of said hub and extending into said socket,



said L-shaped fingers being positioned back-to-back to define a U-shaped slot between said fingers and said hub to receive said U-shaped end section of said shaft.

5,197,162

APPARATUS HAVING PARTIAL EXHAUST CONDUIT FIBER COMPACTING AIR FLOW

Akiva Pinto, Duesseldorf-Witthaer, and Guenter Lacassen, Haltern, both of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Fed. Rep. of Germany

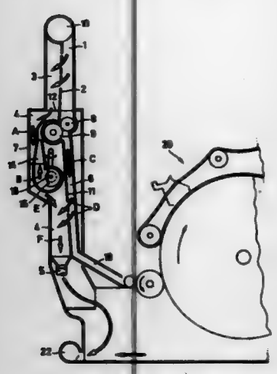
PCT No. PCT/EP90/00568, § 371 Date Oct. 7, 1991, § 102(e) Date Oct. 7, 1991, PCT Pub. No. WO90/12909, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 10, 1990, Ser. No. 768,846

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912565

Int. Cl.[5] D01G *15/40, 23/02*

U.S. Cl. 19—105 4 Claims



1. A device for feeding flocculent fiber material to fiber processing machines, comprising an upper filling chute arranged within a housing, means for providing a fiber transport air flow in said device, a feeding roll adapted to cooperate with an opening roller at a lower end of said filling chute, a feeding chute branching tangentially from said opening roller, the filling cute and the feeding chute each having at least one at least partially air-permeable wall, means for providing a pneumatic fiber compacting air flow in the feeding chute, and said transport air flow being discharged through the air-permeable chute wall of the filling chute, wherein:

the flow of transport air (A) discharge within the housing (7) through said air-permeable filling chute wall thereafter being directed through an exhaust air chute (3,4), said exhaust air chute (3,4) being substantially parallel to and co-extensive with the filling and feeding chute (1,6) and substantially parallel to an exhaust air connecting member (5) for exhausting transport air from the device, said exhaust air connecting member (5) being arranged downstream of the air-permeable feeding chute wall (11);

transport air flow dividing means; and

said compacting air flow (C) consisting of:

a partial air flow (B) being divided from the flow of transport air (A) by said flow dividing means, and means for directing said partial air flow into the feeding chute (6) at the branching point between the filling chute (1) and the feeding chute (6); and

said compacting air flow thereafter passes through the air-permeable feeding chute wall (11) of the feeding chute (6 at D) and is guided into the exhaust air chute (4) downstream of the branching point.

5,197,163

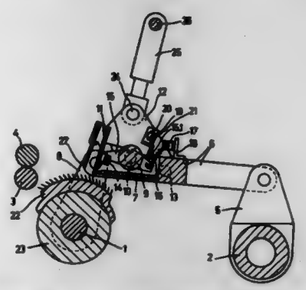
NIPPER UNIT FOR A COMBING MACHINE

Andreas Jörg, Neftenbach, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jun. 1, 1992, Ser. No. 890,816

Int. Cl.[5] D01G *19/16*

U.S. Cl. 19—225 15 Claims



1. A nipper unit for a combing machine comprising

a lower nipper;

an upper nipper;

means for moving said upper nipper relative to said lower nipper between a closed position for engaging a tuft therebetween and an open position for removal of a combed tuft from between said nippers;

an auxiliary nipper disposed for movement relative to said lower nipper between a closed position for engaging a lap therebetween and an open position for movement of the lap therebetween;

a spring for biasing said auxiliary nipper into said closed position thereof; and

coupling means for selectively coupling said upper nipper to said auxiliary nipper during movement of said upper nipper in a path from said open position thereof to said closed position thereof to cause said auxiliary nipper to move against said spring from said closed position thereof to said open position thereof, said coupling means uncoupling said upper nipper from said auxiliary nipper during movement of said upper nipper to said open position thereof from said closed position thereof.

5,197,164

QUICK RELEASE STRAP CONNECTOR

Terrence P. Meier, Naperville, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Jun. 1, 1992, Ser. No. 891,820

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—16 PB 14 Claims

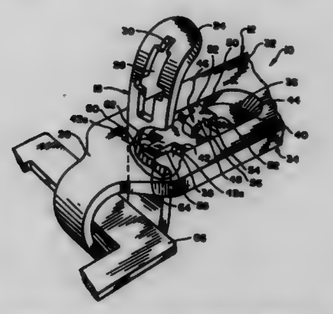
1. A quick release connector, comprising:

an elongate strap member having first and second ends;

a first aperture formed through said first end of said strap member and having a predetermined configuration;

a second aperture formed through said strap member between said first and second ends and at a predetermined distance away from said first end of said strap member for insertably receiving said first end of said strap member;

first engagement means connected to said strap member proximate said second aperture for releasable locking engagement with said first aperture after insertion of said first end of said strap member through said second aperture along a first insertion direction and upon movement



of said first end of said strap member through said second aperture along a second opposite direction; and

second engagement means connected to said strap member and extending toward said second aperture for releasable locking engagement with said first aperture after insertion of said first end of said strap member through said second aperture along said first insertion direction and upon movement of said first end of said strap member through said second aperture along said second opposite direction.

5,197,165

LEVER STRUCTURE PARTICULARLY FOR SKI BOOTS

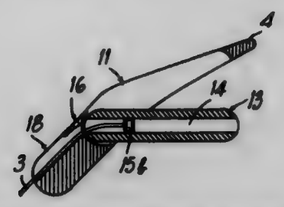
Claudio Zorzi, Silea; Valerio Tonel, Biadene, and Giuseppe De Bortoli, Montebelluna, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Aug. 22, 1991, Ser. No. 748,719

Claims priority, application Italy, Aug. 30, 1990, 59377/90[U]

Int. Cl.[5] A43C *11/00*

U.S. Cl. 24—68 SK 9 Claims



1. Lever structure particularly usable for securing a ski boot, comprising:

a lever arm which is pivotally connectable to a portion of the ski boot and which is pivotally movable between an open and a closed position;

at least one traction element; and

at least one adjustment device for finely adjusting the working length of said at least one traction element,

said adjustment device comprising a knob element which is provided with an internal threaded cavity and a pawl element which is externally threaded and which is movably screwed in said internal threaded cavity, said at least one traction element being rigidly connected to said pawl element and exiting from said internal cavity thereof, said lever arm being provided with an accommodation seat for accommodating said knob element, said lever arm further being provided with a channel extending from said accommodation seat, said at least one traction element exiting from said internal cavity and extending through said channel, said knob element being lodged in said accommodation seat when said lever arm is in said closed position thereof without being connected to said lever arm, and said knob element being freely rotatable to adjust the working length of said traction element when said lever arm is in said open position thereof.

5,197,166

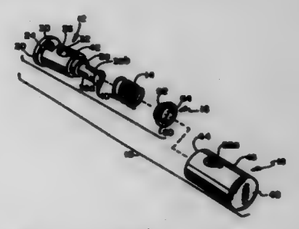
CORD CLOSURE

Terrence P. Meier, Naperville, and Kurt H. Landstedt, Long Grove, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed May 6, 1992, Ser. No. 880,096

Int. Cl.[5] F16G *11/00*

U.S. Cl. 24—115 G 20 Claims



1. A cord closure comprising:

a body housing having an open end, a surrounding outer side wall, and a closed end to form a cavity therein, said housing having a pair of holes formed on the outer side wall at diametrically opposed positions for receiving a cord;

a plunger member having a head, a body portion, and a stem portion, said body portion joining said head to said stem portion and having a transverse throughhole extending diametrically therethrough;

a compression spring being positioned over the stem portion and having a first end thereof engaging the body portion and a second end;

a retaining ring having an upstanding portion positioned into the second end of said compression spring;

means formed on said stem portion for releasably locking said compression spring in a compressed state between said body portion of said plunger member and said retaining ring to define a pre-assembled position for a sub-assembly of said plunger member, spring, and retaining ring; and

said sub-assembly being inserted telescopingly into said cavity of said body housing so as to coaxially align the throughhole of said plunger member with said pair of holes of said body housing for receiving the cord,

whereby when said head of said plunger member is depressed downwardly and released said locking means becomes disengaged so as to allow said spring to expand and urge said plunger member to move up axially to lock the cord between said plunger member and said body housing.

5,197,167

TRIM FASTENINGS

Albert C. Marler, Solihull, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Filed Jan. 31, 1992, Ser. No. 830,116

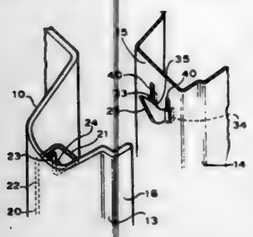
Claims priority, application United Kingdom, Feb. 12, 1991, 9102869

Int. Cl.[5] A44B *21/00*

U.S. Cl. 24—296 4 Claims

1. A fastening for securing a trim panel to a support panel comprising an elongate element, said elongate element being formed from wire, the wire being bent transversely of the elongate element to form a plurality of detent members spaced

along the length of the elongate member, the detent members being interconnected by longitudinally extending lengths of wire, the longitudinally extending lengths of wire being adapted to be secured to the trim panel so that the detent member are spaced away from the trim panel on the inside thereof, a plurality of clips being provided on the support



panel, each clip corresponding to one of the detent members, the clips defining a surface for engagement by the detent member, said surface diverging away from the support panel, so that movement of the trim panel longitudinally of the elongate member will cause each detent member to move along said surface of an associated clip, the detent members and trim panel being drawn towards the support panel.

5,197,168

MAGNETIC JEWELRY CLOSURES WITH WIRE SAFETY CLASP

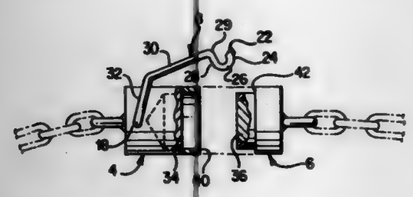
Davida Levy, 1340 Biscaya Dr., Surfside, Fla. 33154

Continuation-in-part of Ser. No. 688,102, Apr. 19, 1991, Pat. No. 5,092,019, which is a continuation-in-part of Ser. No. 536,777, Jun. 12, 1990, Pat. No. 5,008,984. This application Jan. 8, 1992, Ser. No. 818,266

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—303 **16 Claims**



1. A jewelry closure comprising:

a magnetic closure comprising first and second closure members for engaging together magnetically, wherein at least one of said first and second closure members comprises a magnet;

a mechanical closure pivotally engaged with said first closure member for engaging adjacent said second closure member when said second closure member is held by magnetic attraction to said first closure member wherein said mechanical closure comprises a wire member pivotally engaged with said first closure member;

whereby said magnetic closure cannot be released until after said mechanical closure is released from engagement with said second closure member.

5,197,169

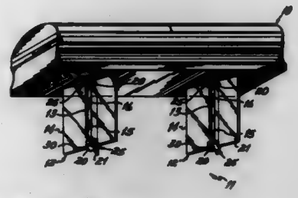
STABILIZER FOR CASKED BIER PEDESTAL

Ronald B. Gordon, Batesville, Ind., assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Apr. 9, 1990, Ser. No. 506,268

Int. Cl.[5] A61G *17/00*

U.S. Cl. 27—27 **3 Claims**



1. A casket bier pedestal comprising:

two rigid plastic vertical sheets each having a vertical slot bisecting the sheet and extending from a horizontal edge to about the center of the sheet;

said sheets being joined at said slots perpendicular to each other;

and a rigid plastic cap at each end of said sheets, said cap having a cruciform slot that receives and holds the horizontal edges of said sheets perpendicular to each other.

5,197,170

METHOD OF PRODUCING AN LC COMPOSITE PART AND AN LC NETWORK PART

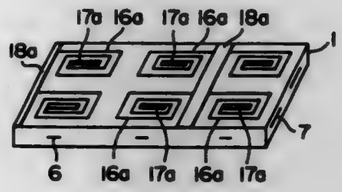
Atsuo Senda, Otsu; Osamu Kano, Nagaokakyo, and Yasuo Fujiki, Takefu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Nov. 15, 1990, Ser. No. 613,071

Claims priority, application Japan, Nov. 18, 1989, 1-300593; Nov. 18, 1989, 1-300594

Int. Cl.[5] C04B *37/00*; B23B *31/00*

U.S. Cl. 29—25.42 **16 Claims**



1. A method of producing an LC composite part, comprising the steps of:

forming a substrate having a capacitor section including a plurality of capacitor units by laminating ceramic sheets having capacitor electrode layers formed thereof such that said capacitor electrode layers and said ceramic sheets alternate;

sintering the substrate;

forming a coil section including a plurality of spiral coil patterns on the sintered substrate by a thin film forming method;

dividing the laminated substrate having the capacitor section and the coil section into LC composite parts; and

connecting the capacitor electrode with the spiral coil pattern by electrical connection means in each of the LC composite parts.

5,197,171

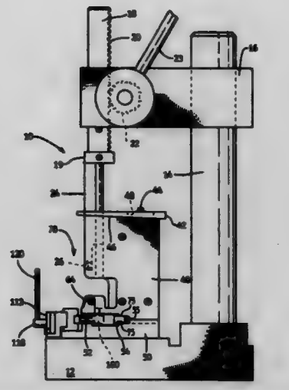
CABLE TERMINATING TOOL AND JIG

John G. Hatfield, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1990, Ser. No. 496,745

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—33 M **17 Claims**



1. In combination, a tool and jig for terminating wires in terminals of a series of electrical connectors of different sizes defined by numbers of terminals and connector length, the tool including wire guide means to receive and hold a wire for insertion into a given terminal, an inserter operable to insert a wire into a give terminal, and a base positioned beneath said wire guide means and said inserter, said base of jig including guide surfaces adapted to support and position said jig in sliding engagement in top or bottom oriented positions and align said jig relative to said inserter, the tool including indexing means having a detent operable to index said jig in said sliding engagement on said base when said jig is in top or bottom positions, said jig including a frame having a connector locator including a series of projections adapted to engage and precisely position any one of the series of connectors of different lengths within said jig and further an adjustable clamping and holding means to position a cable and the wires thereof on said jig, the said jig further including projecting along one edge engaging the index means of said tool to align a given terminal in a connector in either the top or bottom positions of said jig relative to the said inserter and tool for wire termination.

5,197,172

MACHINING SYSTEM

Masayoshi Takagi, Kariya; Takehito Aikawa, Toyokawa; Takanori Ohta, Nishio; Ryoichi Takami, Chiryu, and Hiroki Onada, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 29, 1992, Ser. No. 890,146

Claims priority, application Japan, May 31, 1991, 3-129710; May 31, 1991, 3-157622

Int. Cl.[5] B23Q *41/08*

U.S. Cl. 29—33 P **6 Claims**

1. A machining system comprising:

a plurality of different kinds of single purpose machining units arranged at plural machining stations located along a transfer path;

a general purpose machine tool capable of carrying out plural kinds of machinings which are not carried out by said single purpose machining units;

a first transfer apparatus for transferring plural kinds of workpieces along said transfer path so as to position each of said workpieces at said plural machining stations successively so that each of said workpieces is machined by said single purpose machining units at said plural machining stations; and

a second transfer apparatus for selectively transferring some of said workpieces requiring machinings which are not

EDT

WORKPIECE NUMBER	STATION	MACHINING CYCLE
2	3	3
.	.	.
.	.	.
.	.	.

carried out by said single purpose machining units from said transfer path to said general purpose machine tool whereby said some workpieces are additionally machined by said general purpose machine tool.

5,197,173

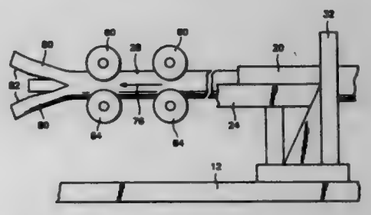
METHOD FOR RECLAIMING INTERNAL PIPE MINERAL BUILDUP

Bennie R. Stokes, Sr., 114 N. Gulf Blvd., Freeport, Tex. 77541, and Michael L. Hartmann, 127 Otter Trail, Lake Jackson, Tex. 77566

Filed Feb. 7, 1992, Ser. No. 832,356

Int. Cl.[5] B23D *79/00*

U.S. Cl. 29—81.021 **6 Claims**



1. The method of removing hardened mineral material buildup from the interior of a pipe section constructed of bendable material, said method including the steps of forming cuts through a plurality of circumferentially spaced wall portions of said pipe section along and for the full length of said pipe section from one end thereof to the other end with said cuts lying generally along radii of said pipe section, thereby forming cut segments of said pipe section, and thereafter vibrating the cut segments of said pipe section, thereby loosening therefrom any material buildup remaining clinging thereto.

5,197,174

CONTROLLED DEFLECTION ROLL

Rolf Lehmann, Rudolfstetten, Switzerland, assignor to Sulzer Escher Wyss AG, Zurich, Switzerland

PCT No. PCT/EP90/01254, § 371 Date Mar. 29, 1991, § 102(e) Date Mar. 29, 1991, PCT Pub. No. WO91/02173, PCT Pub. Date Feb. 21, 1991

PCT Filed Aug. 1, 1990, Ser. No. 663,829

Claims priority, application Switzerland, Aug. 4, 1989, 02891/89

Int. Cl.[5] B21B *13/02*

U.S. Cl. 492—7 **11 Claims**

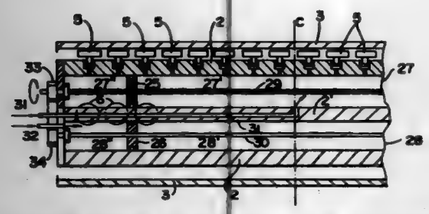
1. A controlled deflection roll, comprising:

a rotatable roll shell having oppositely situated and regions;

a non-rotatable carrier;

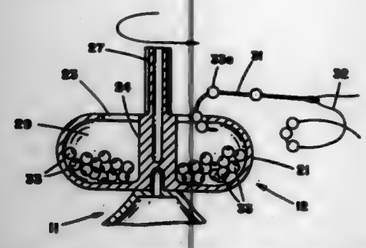
a row of neighboring hydraulic support elements for sup-

porting the rotatable roll shell in relation to the non-rotatable carrier in a predetermined pressing plane;
infeed lines for supplying from the carrier row of neighboring hydraulic support elements with hydraulic pressurized medium exerting a pressing force at the roll shell;
a control device for selectively controlling the supply of the hydraulic pressurized medium to only a predetermined part of the row of neighboring support elements;
hydraulic spreading elements for further supporting the roll shell at least in said oppositely situated end regions in relation to the carrier;



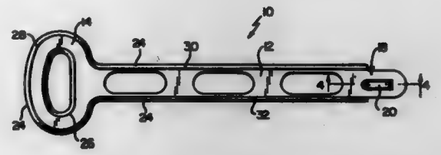
means for supplying the hydraulic spreading elements with hydraulic pressurized medium for exerting a force effective essentially in an operating plane disposed substantially perpendicular to the predetermined pressing plane; and
the control device controlling the selective supply of hydraulic pressurized medium to the hydraulic spreading elements located only in predetermined axial sections of the controlled deflection roll where associated hydraulic support elements in said predetermined axial sections are devoid of a supply of hydraulic pressurized medium.

5,197,175
ROTATING BEAD STRINGING APPARATUS
Po-Ling Yuen, Johan de Wittlaan 46, 1421 XD Uithoorn, Netherlands
Filed Mar. 2, 1992, Ser. No. 844,282
Int. Cl.[5] B25A *19/04*
U.S. Cl. 29—241 4 Claims



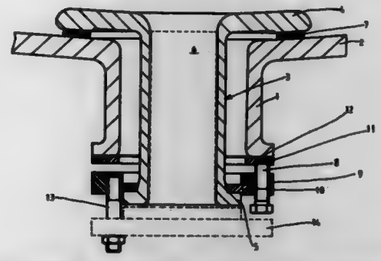
1. A device for assembling beads having holes extending therethrough, comprising rotatable bowl means for containing a plurality of beads, said bowl means having a closed curved sidewall defining a bowl opening extending upwardly, means for rotating said bowl means manually to circulate the beads annularly in said bowl, said means for rotating said bowl means including a mandrel extending from said bowl coaxially with said closed curved sidewall, and hook means extendable into said opening for hooking some of the beads as the beads circulate past said hook means.

5,197,176
SEAT BELT GUIDE USEFUL IN SECURING A CHILD SAFETY RESTRAINT
David M. Reese, 7245 Blaney Rd., Delaware, Ohio 43015
Filed May 1, 1991, Ser. No. 694,129
Int. Cl.[5] B25B *27/14*
U.S. Cl. 29—278 2 Claims



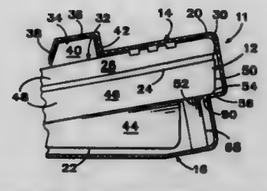
1. A seat belt guide tool for guiding a male seat belt end through at least one child safety restraint to connect said male end to a female seat belt end and thereby secure said restraint to a seat of a vehicle, said tool comprising:
an elongated shank having first and second lateral edges and first and second ends;
a handle formed on an end of said shank and having exterior and interior edges for gripping by a user;
a lip portion at a said second end including clasping means having a flange shaped to engage and hold said male end;
said shank being sufficiently rigid to support itself yet sufficiently flexible to be guided around said restraint by a user grasping said handle; and
a bead formed about peripheries of said shank and said exterior and interior edges of said handle, said lip portion being free of said bead.

5,197,177
DEVICE FOR REPAIRING OR RENEWING CONTAINER NOZZLES OF ENAMELLED APPARATUS
Eckhard Gieger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 526,200, May 21, 1990, abandoned.
This application Mar. 25, 1992, Ser. No. 857,703
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3917989
Int. Cl.[5] B23P *6/00*
U.S. Cl. 29—402.15 1 Claim



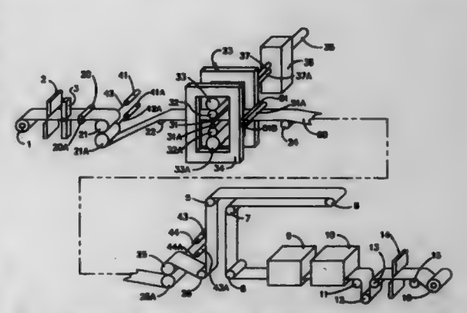
1. A method of repairing or renewing an original nozzle (1) of a container (2), said original nozzle being formed of a first tube with a central longitudinal axis and having a first, inner diameter and an axial length that is substantially greater than the total thickness of the wall, said original nozzle thus extending substantially beyond the outer surface of the wall of the container that surrounds said nozzle, said method comprising the steps of:
a) passing a surface-protected replacement nozzle (3) formed of a second tube with an inner flange (4) and an outer flange (5) at opposite ends thereof, through the original nozzle (1) to be repaired so that the inner flange (4) annularly overlaps the inner surface of the wall that surrounds the original nozzle (1) and the outer flange (5) protrudes out the original nozzle opening, said replacement nozzle being aligned coaxially with the original nozzle, said second tube and said outer flange having a second, outer diameter which is less than said first diameter;
b) arranging a sealing ring (7) between the inner flange (4) and the inner container wall; and
c) fixing the replacement nozzle (3) to the container (2) by means of a clamping device (8,9,10) which is supported on one side of the outer surface of the container wall or by the original nozzle (1) and, on the other side, by the outer flange (5) of the replacement nozzle (3) and which presses the inner flange (4) against the sealing ring (7) and the inner container wall.

5,197,178
SEALED COMPUTER TERMINAL KEYBOARD
Leo J. Lichte, Riverside, Calif.; Robert H. Leith, Sherwood, Oreg.; Meryl E. Miller, Rancho Palos Verdes; Leroy N. Nopper, Jr., Irvine, both of Calif., and Terrance K. Jones, Portland, Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Continuation of Ser. No. 118,843, Jan. 9, 1987, which is a continuation-in-part of Ser. No. 89,812, Aug. 27, 1987, Pat. No. 5,021,638. This application Aug. 2, 1990, Ser. No. 562,510
Int. Cl.[5] B21D *39/00*
U.S. Cl. 29—428 5 Claims



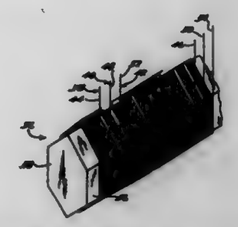
1. A method for sealing a computer terminal keyboard for use in a spill- and debris-prone environment, the keyboard having a base and a top plate which are fitted together to form an elongate keyboard housing of generally rectilinear shape and an array of keys mounted in a keyboard assembly within the keyboard housing including a plurality of closely spaced key caps protruding upward through openings in the top plate a predetermined distance above a top face of the top plate; the method comprising:
molding a top cover of a resilient, waterproof material shaped to conform to the top place and key caps with elevated individual key covers integrally formed in the top cover to cover the key caps separately so that the keys can be individually actuated;
forming a wraparound margin in the top cove including a periphery flange sized to extend around a side of the keyboard housing and a predetermined distance beneath a portion of the keyboard base to cover a margin of an underside of the keyboard housing;
fitting the top cover over the keyboard housing with the key caps nested within the individual key covers and the wraparound margin enclosing sides of the keyboard housing with the periphery flange extending beneath the keyboard housing; and
securing the top cover to the underside of the keyboard housing along the periphery flange by compressing the flange against the underside of the housing.

5,197,179
MEANS AND A METHOD OF IMPROVING THE QUALITY OF COLD ROLLED STAINLESS STEEL STRIP
Michael G. Sendzimir, Woodbury, and John W. Turley, Oxford, both of Conn., assignors to T. Sendzimir, Inc., Waterbury, Conn.
Filed Apr. 18, 1991, Ser. No. 687,321
Int. Cl.[5] B22D *11/126*; B23P *23/04*
U.S. Cl. 29—527.4 12 Claims



1. A method of converting hot rolled stainless steel strip to a condition suitable for subsequent cold rolling to final gauge comprising in one continuous line the steps of cold rolling to reduce the thickness of said strip, annealing said reduced thickness strip, and pickling said annealed strip.

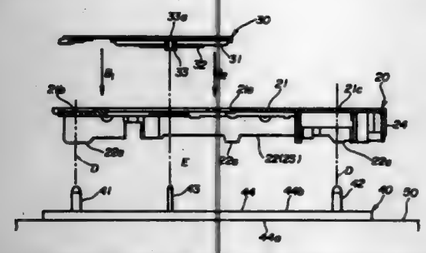
5,197,180
METHOD FOR MAKING AN ELECTRIC MOTOR WINDING
Emil S. Mihalko, Lansdale, Pa., assignor to Faraday Energy Foundation, Atlanta, Ga.
Filed Sep. 13, 1991, Ser. No. 759,228
Int. Cl.[5] H02K *15/06*
U.S. Cl. 29—596 29 Claims



1. A method of making a wound field for an electric motor, generator or alternator, said method comprising the steps of:
continuously winding an insulated conductor about a mandrel to obtain a coil having a first plurality of individual windings wound in a first direction about said mandrel, and a second plurality of windings wound in a second direction about said mandrel opposite the first direction thereabout;
flattening said coil to obtain a substantially flat, two-layered web having a first end and a second end, wherein a peripheral section of one of said first plurality of windings overlies a corresponding diametrically-opposite peripheral section of one of said second plurality of windings; and joining
the first end of said web to the second end thereof so that a peripheral section of another of said second plurality of windings overlies a corresponding diametrically-opposite peripheral section of another of said first plurality of windings.

VOL 1148 ISS 5 MR 30 1993 UMI

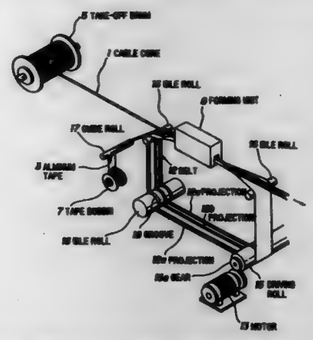
5,197,181
MOTOR POSITIONING METHOD
Yohji Abe, Kiyose; Takahiro Sakaguchi, Kodaira; Daihachiro Takasu, Niiza, and Hiroshi Sugahara, Tokyo, all of Japan, assignors to TEAC Corporation, Japan
Filed May 6, 1992, Ser. No. 879,743
Claims priority, application Japan, May 8, 1991, 3-102787
Int. Cl.[5] H02K *15/14*
U.S. Cl. 29—596 10 Claims



1. A method of positioning a shaft of a drive motor in a disk drive apparatus, said method comprising steps of:
providing the apparatus with a frame having a plurality of locating holes spaced apart from each other, said locating holes being located within the frame in accordance with a predetermined positional relationship between said locating holes and a desired target position of the shaft of the drive motor within the apparatus;
placing a positioning jig on a base surface, said positioning jig including a first connecting portion with a diameter corresponding to a reference opening, and a plurality of second connecting portions with diameters corresponding to respective ones of said locating holes, said second connecting portions and said first connecting portion being located within the positioning jig in accordance with said positional relationship;
placing said frame onto said positioning jig so that said second connecting portions are fitted into said locating holes; and
placing said drive motor and said shaft with said reference opening at said target position, onto said frame attached to said positioning jig so that said first connecting portion is fitted into said reference opening, thus positioning said shaft at said target position within said apparatus.

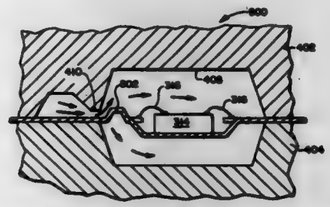
5,197,182
APPARATUS FOR MANUFACTURING AN ELECTRIC CABLE
Yasuhiko Mizuo, 5-29-7 Honta, Kokubunji-shi, Tokyo, Japan
Filed Jul. 31, 1991, Ser. No. 739,830
Claims priority, application Japan, Aug. 22, 1990, 2-220703
Int. Cl.[5] H01B *13/22*
U.S. Cl. 29—745 5 Claims

1. An apparatus for manufacturing an electric cable comprising:
means for advancing a cable core covered with an insulation layer at a predetermined speed;
means for supplying a conductive tape having a wavy pattern;
a flexible belt having a plurality of longitudinal projections formed on one surface thereof, and being in contact with said conductive tape at the other surface thereof;
mans for carrying said flexible belt along said cable core at the same speed as said cable core; and
means for forming said conductive tape around said cable core;
wherein said forming means includes a plurality of forming rolls which support said flexible belt so as to engage with said plurality of projections, and said conductive tape is formed by said rolls to surround said cable core by a radial directional force applied via said projections to said flexible belt, when said cable core and said conductive tape are



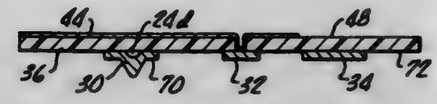
passed through said forming rolls together with said flexible belt.

5,197,183
MODIFIED LEAD FRAME FOR REDUCING WIRE WASH IN TRANSFER MOLDING OF IC PACKAGES
Chok J. Chia, Campbell, and Seng-Sooi Lim, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.
Filed Nov. 5, 1991, Ser. No. 787,848
Int. Cl.[5] B29C *45/02, 53/02*
U.S. Cl. 29—827 6 Claims



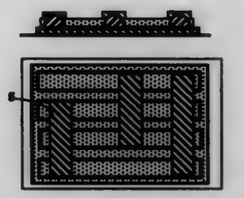
1. Method of forming plastic IC packages, comprising:
providing a mold set, including a top mold half having a top recess and a bottom mold half having a bottom recess, together the top and bottom recesses forming a cavity for molding a body about a substrate-mounted semiconductor die;
providing a gate in at least one of the mold halves for transferring molding compound into the cavity;
mounting a semiconductor device to a die paddle of a leadframe, said leadframe including a tiebar extending outward from the die paddle to an outer ring of the leadframe, said tiebar being initially in a plane of conductive leads extending from near the die paddle to the outer ring of the leadframe, said tiebar extending from a corner of the die paddle to a corner of the mold cavity;
modifying a portion of the structure of the tiebar by kinking the tiebar in the direction of the gated mold half at a point within the cavity just interior of the gate to form a baffle integral with the tiebar, said baffle extending out of a the plane defined by the conductive leads;
disposing said leadframe in the mold so that said baffle extends to within the mold gate in the direction of the gate;
transferring molding compound through the gate into the cavity by injecting a stream of molding compound through the gate and
deflecting the stream of molding compound with the baffle thereby preventing wire wash.

5,197,184
METHOD OF FORMING THREE-DIMENSIONAL CIRCUITRY
William R. Crumly, Anaheim; Christopher M. Schreiber, Newport Beach, and Haim Feigenbaum, Irvine, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Sep. 11, 1990, Ser. No. 580,758
Int. Cl.[5] H05K *3/02*
U.S. Cl. 29—846 23 Claims



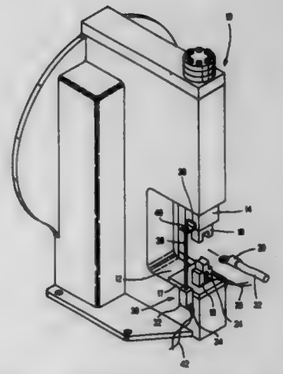
1. A method of additively forming three-dimensional electrical circuitry having raised contact buttons without employing circuit etching processes, said method comprising the steps of:
providing a mandrel having an electrically conductive pattern on a surface thereof that defines a configuration of an electrical circuit, and having at least one electrically conductive mandrel feature projecting from said surface in a first direction and a second feature projecting from said surface in a second direction opposite said first direction;
electrodepositing circuit traces on said pattern and features to define a three-dimensional electrically conductive circuit configured in said pattern and having contact buttons projecting therefrom;
laminating a dielectric substrate upon said mandrel and said circuit traces; and
separating said substrate and said circuit traces from said mandrel to provide a dielectric substrate having a pattern of circuit traces thereon, including rigid projecting conductive contact buttons configured and arranged to be pressed against contact of another electrical circuit.

5,197,185
PROCESS OF FORMING ELECTRICAL CONNECTIONS BETWEEN CONDUCTIVE LAYERS USING THERMOSONIC WIRE BONDED BUMP VIAS AND THICK FILM TECHNIQUES
Dirk D. McCoy, Batavia, and Scott W. Johansen, Barrington, both of Ill., assignors to AG Communication Systems Corporation, Phoenix, Ariz.
Filed Nov. 18, 1991, Ser. No. 794,097
Int. Cl.[5] H05K *3/40, 3/46*
U.S. Cl. 29—848 10 Claims



1. A method of electrically connecting a first conductive layer with a second conductive layer using a thick film technique, said first conductive layer being on a substrate, said method comprising the steps of:
forming said first conductive layer on said substrate;
bonding conductive bumps to said first conductive layer, said conductive bumps having a height, said step of bonding being accomplished by use of a thermosonic wire bonder;
coating said first conductive layer with a nonconductive layer, said nonconductive layer having a thickness less than said height of said conductive bumps, said nonconductive layer coating around said conductive bumps; and
depositing said second conductive layer over said nonconductive layer, said second conductive layer making electrical contact with said conductive bumps thereby electrically connecting said second conductive layer to said first conductive layer.

5,197,186
METHOD OF DETERMINING THE QUALITY OF A CRIMPED ELECTRICAL CONNECTION
Michael D. Strong, Mechanicsburg, and Michael A. Yeomans, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 29, 1990, Ser. No. 529,036
Int. Cl.[5] H01R *43/04*
U.S. Cl. 29—863 15 Claims



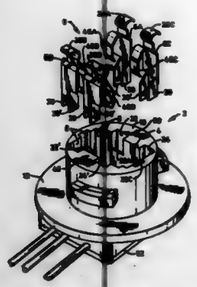
1. In a method of determining the quality of the crimp of an electrical terminal crimped onto a wire utilizing crimping apparatus which includes a press having a base and a ram arranged for opposing relative reciprocating motion, said base and ram each carrying a mating half of a crimping die set, the steps comprising:
(a) placing a terminal and wire in crimping position within said crimping apparatus;
(b) causing at least one of said base and said ram to undergo relative motion so that said die set engages, crimps said terminal onto said wire, and disengages;
(c) during said engaging, crimping, and disengaging of step (b), simultaneously measuring both the distance between the terminal engaging portions of said die set and the force applied to said terminal by said die set for a plurality of different relative positions of said mating halves of said die set thereby defining a plurality of measured force and position data element pairs having a force value and a position value respectively;
(d) providing a plurality of standard data element pairs corresponding to a known quality of crimp; and
(e) relating selected ones of said plurality of measured data element pairs to corresponding ones of said plurality of standard data element pairs thereby determining the quality of crimp of said crimped terminal.

bonding said root portion of said box to one of said blade operating member in the form of a membrane, a chamber

5,197,187
LAMP SOCKET AND METHOD FOR FABRICATING SAME

Ronald E. Thomas, Warren, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Division of Ser. No. 767,181, Sep. 30, 1991, Pat. No. 5,156,560.
This application May 11, 1992, Ser. No. 880,825
Int. Cl.[5] H01R *43/04*
U.S. Cl. 29—863 8 Claims

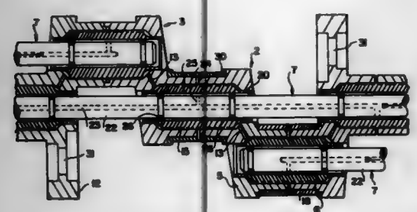


1. A method for fabricating a lamp socket which includes a housing having a cavity into which a lamp base can be disposed, , said cavity being formed by at least one wall and having an open upper end and a closed lower end, said closed lower end being formed by a base surface which includes a plurality of slits extending therethrough and an upper base surface and a lower base surface, comprising the steps of:
inserting at least one contact having a pair of integral legs into said cavity and also inserting each leg of said pair of integral legs through a respective slit of said plurality of slits;
bending a portion of one leg of each pair of integral legs substantially parallel to and into engagement with said lower base surface;
feeding a wire into contact with said portion and adjacent to said one leg; and
crimping said one leg relative to said wire and said another leg thereby clamping said wire between said one leg and said another leg to effect an electrical connection between said contact and said wire.

5,197,188
PROCESS FOR PRODUCING ASSEMBLED CRANKSHAFTS BY EXPANDING SLEEVES ARRANGED IN DIVIDED JOURNALS

Wolfgang Maus, and Helmut Svars, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 268,229, Nov. 7, 1988, abandoned. This application Feb. 27, 1991, Ser. No. 662,392
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737600
Int. Cl.[5] B21D *31/00*
U.S. Cl. 29—888.08 2 Claims

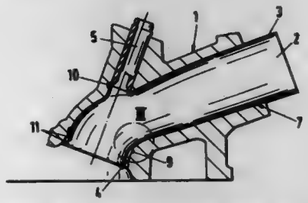


1. A process for producing a crankshaft for a piston engine from formed pieces each comprising a crank web and part of a journal, said crankshaft having journals which are axially aligned, the process consisting essentially of:
sliding the journal parts of a plurality of pairs of adjoining formed pieces onto respective common sleeves;
inserting a single probe into all sleeves of those journals which are axially aligned;
plastically deforming the respective sleeves radially inside the length of the journal parts and elastically deforming the journal parts radially through hydraulic expansion, thereby forming a friction locking connection between said journal parts and said sleeves; and
simultaneously effecting said plastic deformation of the sleeves of said axially aligned journals by hydraulic pressure applied from said probe.

5,197,189
METHOD OF MAKING A CYLINDER HEAD WITH A PORT LINER

Klaus-Hagen Schreiber, Meine, and Fred Thiele, Braunschweig, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Aug. 28, 1991, Ser. No. 751,125
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1990, 4028219
Int. Cl.[5] B23P *15/00*
U.S. Cl. 29—888.061 4 Claims



1. A method for making a cylinder head for an internal combustion engine including a valve guide, a valve seat ring and a compression change passage with a port liner which includes at least one tube extending over the entire length of the compression change passage, said method comprising providing as separate parts a port liner tube, a valve guide, and a valve seat ring formed with grooves on its external surface, joining the valve seat ring and the valve guide to the port liner tube to form a unitary gas-passage-casting member, and forming the cylinder head about the unitary gas-passage-forming member.

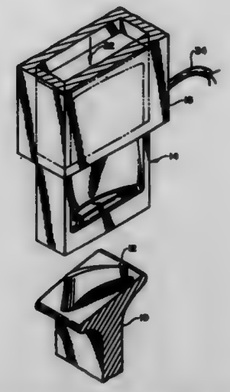
5,197,190
FABRICATION OF REPAIR METHOD FOR AN INTEGRALLY BLADED ROTOR

Kenneth D. Coolidge, Hobe Sound, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 4, 1991, Ser. No. 664,149
Int. Cl.[5] B21K *3/04*
U.S. Cl. 29—889.1 8 Claims

1. A method of bonding an airfoil blade to a rotor comprising:
forming a rotor disk;
forming a plurality of blade stubs around the periphery of said disk;
forming a blade within a solid stock of blade material, leaving a box of stock material surrounding said blade, said box having a root portion, two side portion and a tip portion;

bonding said root portion of said box to one of said blade stubs;

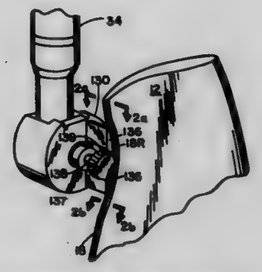


thereafter separating said box, except for a bonded section of said root portion of said box, from said blade; and
final machining said blade.

5,197,191
REPAIR OF AIRFOIL EDGES

Dewey D. Dunkman, Cincinnati; Warren D. Grossklaus, Jr., Westchester, and Petra Bracko, Norwood, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 4, 1991, Ser. No. 663,506
Int. Cl.[5] B21D *1/00, 3/16;* B23P *6/00*
U.S. Cl. 29—889.1 4 Claims



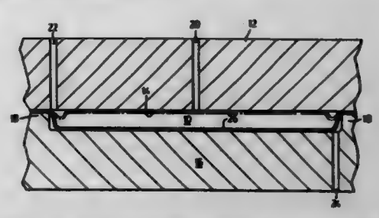
1. An airfoil spanwise edge repair method comprising:
delineating a curved area of the edge to be removed that includes a damage area,
cutting away the curved, delineated area to be removed creating a portion of concavely curved, repaired airfoil edge,
forming a repaired airfoil edge radius along the concavely curved, repaired airfoil edge portion.

5,197,192
METHOD OF MAKING A FLUID CONTROL VALVE

David A. Wylie, Unionville; Richard C. Leveson, Willowdale; Paul C. P. Thomson, Weston, and Donald S. N. Bray, Toronto, all of Canada, assignors to Photovac Incorporated, Markham, Canada

Division of Ser. No. 561,103, Aug. 1, 1990, Pat. No. 5,083,742.
This application Dec. 26, 1991, Ser. No. 815,012
Int. Cl.[5] F16K *7/14*
U.S. Cl. 29—890.13 4 Claims

1. A process of making a flow control valve which has an operating member in the form of a membrane, a chamber defined by an upper wall, a lower wall and a peripheral rim, a gas inlet port and a gas outlet port both extending through the upper wall into the chamber, which comprises:
clamping the membrane in sealing engagement between the rim and the upper wall;

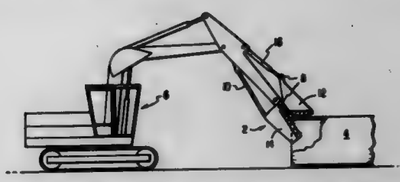


applying gas pressure through a port in the upper wall so as to permanently deform the membrane to a dome shape substantially conforming to the shape of the chamber, while maintaining said sealing engagement of the membrane; and
releasing the applied gas pressure, said membrane remaining in said dome shape after the gas pressure is released.

5,197,193
APPARATUS FOR CUTTING AN ARTICLE INTO SHEETS

Lawrence E. Smith, 5463 U.S. Highway 64, Farmington, N. Mex. 87401

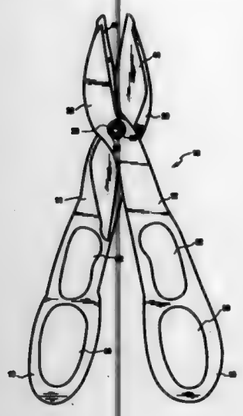
Filed Sep. 13, 1991, Ser. No. 759,918
Int. Cl.[5] B23P *19/00*
U.S. Cl. 30—134 3 Claims



1. Apparatus for cutting an article into sheets comprising first jaw means and second jaw means for movement with respect to each other for engaging and cutting said article, said first jaw means comprising facing first longitudinal cutting elements and a first end cutting element extending transversely of respective adjacent ends of said first longitudinal cutting elements, said second jaw means connected to said first jaw means at a pivotal connection and comprising facing second longitudinal cutting elements and a second end cutting element extending transversely of respective adjacent ends of said second longitudinal cutting elements, wherein one of said adjacent ends of said second longitudinal cutting elements id displaced from a plane containing the other of said adjacent ends and opposite ends of said second longitudinal cutting elements, and said second end cutting element lies at an angle with respect to said first end cutting element and includes a curved cutting edge positioned with respect to said pivotal connection such that said first end cutting element lies tangent to a path on which said cutting edge of said second end cutting element moves as said first jaw means moves with respect to said second jaw means.

VOL 1148 ISS 5 MR 30 1993 UMI

5,197,194
SHEARS WITH REMOVABLE BLADES
Joseph A. Sorensen, 6533 Sundance Ct., Lincoln, Nebr. 68512, and Anthony B. Fuller, 302 S. Pear St., DeWitt, Nebr. 68341
Filed Mar. 31, 1992, Ser. No. 860,975
Int. Cl.[5] B26B *13/04*
U.S. Cl. 30—260 8 Claims



1. A hand tool comprising two cooperating members, and interconnecting means, each said member having at least a jaw section and a handle, said interconnecting means being provided for interconnecting said members in mutually overlapping relationship so as to permit movement of said members relative to one another by said handles,

at least one said jaw section having receiving means adapted to movably receive blade means, said receiving means being defined by at least an interior part thereof,

said blade means comprising an elongated body having a central portion, first and second cutting portions, said first cutting portion defined by at least a first cutting edge and a first rear portion, said second cutting portion defined by at least a second cutting edge and a second rear portion, said first and said second cutting edges extending longitudinally and outwardly in opposite directions from said central portion,

whereby said blade means being positioned within said receiving means in such a manner that said first cutting edge faces the other cooperating member and said second cutting edge faces said interior part of said receiving means.

5,197,195
CUTTING GUIDE APPARATUS
John S. Aikens, 2633 W. Regal Ct., Lawrenceville, Ga. 30244
Filed Feb. 24, 1992, Ser. No. 840,042
Int. Cl.[5] B26B *29/00, 11/00;* B43L *13/02*
U.S. Cl. 30—293 5 Claims

1. A cutting guide apparatus, comprising,

an elongate longitudinally aligned handle member, the handle member including a guide plate fixedly and orthogonally mounted to a forward distal end of the handle member spaced from a rear distal end of the handle member, and

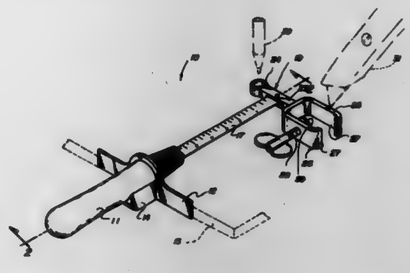
a flexible measuring web extending orthogonally and forwardly of the guide plate, and

the flexible measuring web including a measuring web outer distal end, the measuring web outer distal end including a support mount secured thereto, wherein the support mounts includes a central support plate orthogonally and fixedly mounted to the measuring web outer distal end, and

the support plate including a support plate first end and a support plate second end, wherein the first end and the second end are spaced on opposed sides of the flexible measuring web, and the first end including an alignment cylinder fixedly mounted to the support plate, wherein the alignment cylinder includes an alignment cylinder axis, wherein the axis is arranged parallel to the guide plate, and

a clamp assembly mounted to the support plate second distal end, and the clamp assembly is arranged for securing a cutting instrument therewithin, and

the clamp assembly includes a "C" shaped yoke, the "C"



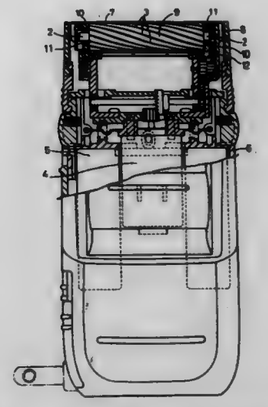
shaped yoke includes parallel plates, the parallel plates arranged parallel to the guide plate, and a clamping rod orthogonally and rotatably directed through one of the clamp plates, wherein the clamping rod includes a clamping rod flange orthogonally mounted to the clamp rod between the clamp plates, and

the central support plate includes a support plate slot, the slot receives the measuring web outer distal end therewithin, and a fastener member arranged orthogonally through the support plate slot to secure the measuring web outer distal end therewithin.

5,197,196
SPIRAL CUTTER FOR USE IN AN ELECTRIC RAZOR AND A METHOD FOR MANUFACTURING THE CUTTER
Isao Imagawa; Hiroshi Takahashi, and Masahiko Ochiai, all of Noogata, Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan
Filed Sep. 19, 1991, Ser. No. 762,493
Claims priority, application Japan, Sep. 22, 1990, 2-253918; Apr. 20, 1991, 3-116742; May 8, 1991, 3-133523
Int. Cl.[5] B26B *19/04, 19/00;* B22D *19/00;* B29C *33/40*
U.S. Cl. 30—346.51 20 Claims

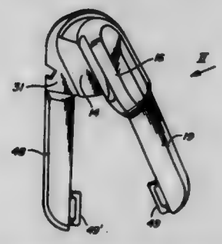
1. A molding die to be used for manufacturing a spiral cutter for use in an electric razor, said molding die being cylindrical and adapted to mold a band-shaped blade by inserting said band-shaped blade into the peripheral surface of a body with said band-shaped blade torsionally deformed, and said molding die having a cavity for molding said body and a plurality of spiral grooves, provided in the inner peripheral surface of said cavity, into which the upper end portion of said band-shaped

blade is inserted with torsional load applied to said band-shaped blade,



said molding die comprising two or more blocks divided in the circumferential direction thereof along lines conforming to the spirality of said spiral grooves.

5,197,197
HAND-HELD SQUEEZE LEVER OR PINCER-TYPE CAN OPENER
Dieter Himmighofen, Roth, and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit AG, Nassau/Lahn, Fed. Rep. of Germany
Filed Feb. 13, 1992, Ser. No. 835,205
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1991, 4105022
Int. Cl.[5] B67B *7/32, 7/10;* B26B *13/100, 13/20*
U.S. Cl. 30—416 10 Claims



1. Hand-held squeeze lever or pincer-type can opener having:

first (11) and second (12) metal levers, said levers being pivotably connected at one end;

handle means (39, 40) secured to said levers;

a first one (11) of said levers forming a can feed lever, said can feed lever having:

a feed arm portion (14);

a feed wheel shaft (20);

a feed wheel; (15) and a twist knob (16) coupled to said feed wheel shaft (20) for rotation therewith;

the second (12) of said levers forming a can cutter lever having:

a cutting portion (31);

a rotatable cutter wheel (36) and a cutter wheel shaft retaining said cutter wheel on said cutter portion; and

a bearing bushing (21) retaining said feed wheel shaft (20) and said feed wheel (15) thereon;

wherein, in accordance with the invention;

the handle means (39, 40) comprise:

two handle shells (18, 19) formed of a molded plastic material fitted against each other with a respective metal lever (11, 12) therebetween;

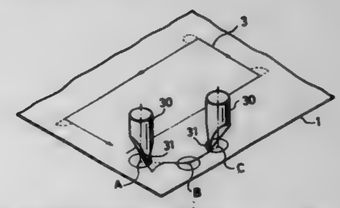
one of the handle shells forming an upper handle shell (18) and the other handle shell forming a lower handle shell (19); and

interlocking means (43, 44) formed on said handle shells, to retain said handle shells together, with the respective metal handle locked therebetween;

wherein a counter or guide surface means (24) is provided, and said counter or guide surface means (24), said upper bearing bushing (21) and the upper handle shell (18) of the feed arm, together, form a single unitary cast or molded body; and

the mating lower handle shell (19) is formed with an opening (27) into which an end portion (28) of the bearing bushing (21) is fitted, said bearing bushing passing through an opening formed in the metal lever of the feed arm portion (14).

5,197,198
ANGULAR INITIALIZATION METHOD FOR ORIENTATING A CUTTING EDGE PORTION IN A CUTTING PLOTTER
Takashi Onozato, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Oct. 11, 1991, Ser. No. 774,670
Claims priority, application Japan, Oct. 31, 1990, 2-294350
Int. Cl.[5] B43L *13/00;* B26D *5/00*
U.S. Cl. 33—18.1 4 Claims

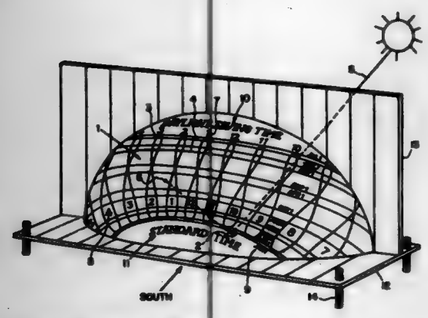


1. An angular initialization method for orientating a direction of a cutting edge portion in a cutting plotter wherein a cutter member comprising a cutter with a cutting edge portion supported to be freely rotatable and a pointed end thereof is disposed offset from a rotational axis of the cutter, is shifted along an X-direction or a Y-direction in an X-Y coordinates defined in a mutual relationship with respect to a cutting medium so as to cut out a desired shape from the cutting medium, the method comprising the steps of:

setting first and second line segments, which are connected to intersect with each other at a predetermined angle and are located out of the desired shape on the cutting medium said second line segment pointing in a predetermined cutting direction; and

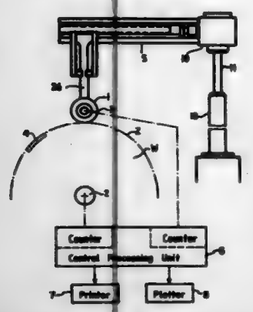
shifting the cutter member along the first and second line segments to cut the cutting medium, thereby initializing a direction of the cutting edge portion to coincide with the predetermined cutting direction.

5,197,199
REFLECTED SPOT SUNDIAL
William W. Shrader, 144 Harvard Rd., Stow, Mass. 01775-1070
Filed Feb. 6, 1992, Ser. No. 831,973
Int. Cl.[5] G04B *49/02*
U.S. Cl. 33—270 10 Claims



1. A sundial comprising:
(a) a translucent dial face having a front and back with time indicia, in said dial face placed to have the back of the dial face positioned toward the sun; and
(b) means placed behind said translucent dial face for reflecting a sun beam received from the sun in back of said sundial as a spot onto the back of said translucent dial face so that time can be ascertained by observing on the front of said translucent dial face the location of said reflected spot with respect to lines of said time indicia.

5,197,200
DEVICE FOR THE MEASUREMENT OF THE DIAMETER OF CYLINDERS
Theodor Bahr, Heidenheim; Peter Biener, Herbrechtingen, and Gerd Krattenmacher, Stuttgart-Weilimdorf, all of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany
Filed Jan. 10, 1992, Ser. No. 819,271
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1991, 4100615
Int. Cl.[5] G01B *3/12, 7/28*
U.S. Cl. 33—555.1 11 Claims

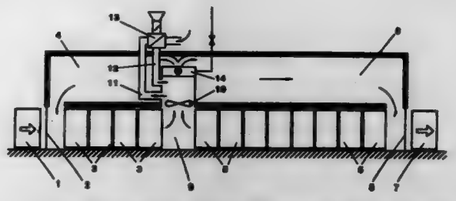


1. A device for the measurement of the diameter of a body such as a cylinder, more particularly in the form of a workpiece, on a roll grinding machine, the device comprising:
a contact wheel adapted to run on the surface of the body,
a first rotational pickup having a high pulse rate and centrally coupled with or provided with the contact wheel; and
a second rotational pickup having a high pulse rate which is adapted to indicate at least full revolutions of the body;
wherein each measurement operation involves the use of a respective start pulse and end pulse of one of said pickups in order to calculate the diameter of the body;
whereby for each measurement operation the respective start pulse and end pulse of said one of said pickups is utilized with corresponding pulses of the other of said pickups, and in that a computer is provided which, by interpolation in each measurement operation of the registered pulses of said other of said pickups produces at least one intermediate pulse series with increments which are respectively smaller than fixed increments of said one of said pickups, of which one pulse corresponds with such accuracy to the one end pulse received approximately simultaneously of the intermediate pulse or normal pulse series of the other of said pickups that for the input into a central processing unit of the computer a degree of progression, constituted by angle increments of the roll and relating to the roll periphery on the one hand and on the other hand a peripheral extent corresponding to this degree of progression, constituted by angle increments (i_r) of the first rotational pickup, multiplied by a peripheral extent (s_r) corresponding to one of these angle increments (i_r) of the same are provided for the calculation of the cylinder diameter on the basis of local peripheral velocity (v), so determined, of the cylinder surface, of the angular velocity of the cylinder, and of the known contact wheel diameter in accordance with the equation;

$$D = i_r s_r / \pi \cdot \omega_w \Delta t$$

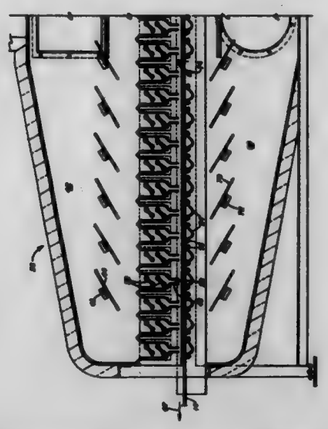
wherein i_r is equal to the number of the measurement increments of the contact wheel in the time period Δt, and ω_w is equal to the angular velocity of the body in the respective individual measurement operation.

5,197,201
PROCESS FOR DRYING TIMBER
Jarl-Gunnar Salin, Esbo, Finland, assignor to Ekono Oy, Esbo, Finland
Continuation of Ser. No. 671,347, Mar. 19, 1991, which is a continuation-in-part of Ser. No. 476,366, Jul. 23, 1990, abandoned. This application Sep. 11, 1992, Ser. No. 944,014
Claims priority, application Finland, Sep. 27, 1988, 884428
Int. Cl.[5] F26B *5/04, 21/06*
U.S. Cl. 34—16.5 9 Claims



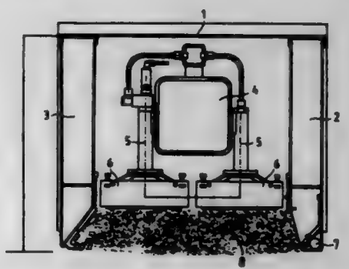
1. A process for drying timber prone to checking caused by shrinkage induced stress in a drying tunnel, having an inlet and outlet, a first section adjacent the inlet of the tunnel and a second longer section adjacent the outlet of the tunnel through which each of said sections the timber is fed forward through a plurality of steps while being permeated by a drying air with a temperature below 80° C. transported primarily in the longitudinal direction of the tunnel, said drying tunnel provided with a drying medium divided into circulating substreams passing through each of said sections with the speed of the stream passing through the first section being higher than the speed of the stream passing through the second section, characterized in that one of said substreams is caused to flow through the first section of the tunnel in the direction of motion of the timber so that said one substream initially contacts the timber last fed into the tunnel and thereafter successively contacts timber that has dried a longer period and the other substream flows through the second section of the tunnel counter to the direction of motion of the timber so that said other substream initially contacts timber that has been dried the longest period and thereafter successively timber that has been dried a shorter period and the speed at which the timber flows through the drying tunnel is set so that when the timber reaches the juncture of the sections where the air streams meet there is a relatively low psychrometric difference between the timber and the air streams compared to the increasing psychrometric differences on either side of this juncture resulting in lower stress peaks and increased quality of timbers without change in drying time after which said substreams are thereafter conditioned and recirculated.

5,197,202
METHOD AND APPARATUS FOR DRYING AND CURING A COATED STRAND
Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sep. 26, 1990, Ser. No. 589,223
Int. Cl.[5] F26B *3/00*
U.S. Cl. 34—23 19 Claims



1. A method of drying a coated strand comprising:
conveying a coated strand in a generally linear horizontal direction;
directing a plurality of high velocity, heated gas streams passed said strand to impact the upper surface of said strand;
redirecting said gas streams upon passing said strands so as to immediately impact the lower surface of said coated strand whereby said redirected gas stream has a component parallel to said strand in a direction opposite to the conveyed direction of said strand; and
supporting said strands at locations intermediate of their ends during said conveying, impacting and redirecting steps by directing additional streams of gas upward against said lower surfaces of said strands to support said strands.

5,197,203
DRYING EQUIPMENT HAVING A FIRE PREVENTION SYSTEM
Patrick Lenoir, Villeneuve, France, assignor to Solaronics Vanoecke, Armentieres, France
Filed Jul. 22, 1991, Ser. No. 734,268
Claims priority, application France, Jul. 23, 1990, 90 09388
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—90 5 Claims



1. Drying equipment comprising a battery of radiant heaters for drying a webform material moving past a radiant surface formed by said radiant heaters, a suction hood and a blower hood disposed on respective sides of the battery of radiant heaters in the direction of movement of the webform material to delimit a volume between the radiant surface, the surface of the webform material to be dried and the hoods, and a spraying system for producing a flow of steam to prevent fire, wherein said spraying system comprises a spraying manifold adapted to feed steam directly into said volume during a spraying cycle in response to detection of stopping of movement of the webform material in order to prevent fire, wherein said spraying cycle also includes means for the addition of water to the steam during at least part of the spraying cycle.

5,197,204
ROTARY DRYER AND ASSOCIATED DRYING PLANT
Jørgen S. Christensen, Farum, Denmark, assignor to Atlas Industries A/S, Ballerup, Denmark
PCT No. PCT/DK89/00246, § 371 Date May 10, 1991, § 102(e) Date May 10, 1991, PCT Pub. No. WO90/05272, PCT Pub. Date May 17, 1990
PCT Filed Oct. 19, 1989, Ser. No. 681,521
Claims priority, application Denmark, Nov. 10, 1988, 6288/88
Int. Cl.[5] F26B *11/02*
U.S. Cl. 34—135 8 Claims

1. A rotary dryer for drying hydrous masses, the rotary dryer comprising an elongated rotatable drum with a drum casing;
a plurality of radially disposed vane elements arranged on an inner side of said drum casing and extending into an interior of the drum casing, said elements being arranged to lift the hydrous mass when the drum is rotated, at least some of the vane elements are fashioned as rake elements including a plurality of ribs extending in a radial direction and at least one bridge-like connecting element extending substantially parallel to a longitudinal axis of the drum, said at least one connecting element connecting free ends of the ribs to form openings,
wherein the ribs are fashioned as rods having a round cross-

sectional profile, said at least one connecting element is heel bone of the wearer; and wherein the surface area of the

ing a surface area for adsorption of about 1300 sq. meters/gram

a spring bias tab disposed within said slot;

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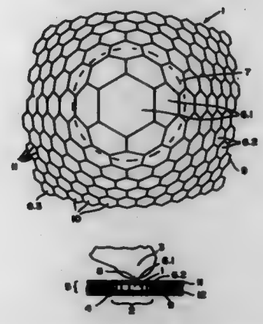
sectional profile, said at least one connecting element is fashioned as a flat bar, and said openings and ribs in adjacent vane elements are offset from one another in a direction of rotation of the rotatable drum.

5,197,205
CONTINUOUS DRYER
Massimiliano Spada, and Gilberto Garbagnati, both of Milan, Italy, assignors to VRV S.P.A., Milan, Italy
Filed Jun. 19, 1991, Ser. No. 717,668
Int. Cl.[5] F26B *11/12*
U.S. Cl. 34—182 15 Claims

1. A continuous dryer for a product, said dryer comprising:
a) a substantially horizontal static cylinder, having product loading and discharge apertures in said static cylinder and heating means associated with said static cylinder for heating a cylindrical inner surface of said static cylinder;
b) a substantially cylindric rotor in said static cylinder and defining a substantially cylindrical gap with said inner surface;
c) at least two angularly displaced blade arrangements on said rotor, each arrangement extending along a generatrix of the substantially cylindric rotor and for substantially the whole length of the rotor and each arrangement comprising a plurality of spaced blade means (16) inclined with respect to a plane perpendicular to said rotor and extending within said gap for a certain radial height;
d) driving means for transmitting rotation to said rotor;
e) at least one centrifuging means (13) extending between the two blade arrangements along a generatrix of the substantially cylindric rotor and for substantially the whole length of the rotor and extending within said gap for a radial height less than said certain radial height of said plurality of blade means.

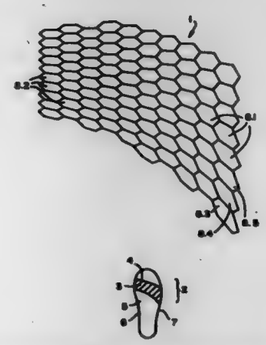
5,197,206
SHOE, ESPECIALLY A SPORT OR REHABILITATION SHOE
Martyn R. Shorten, Portland, Oreg., assignor to Tretorn AB, Helsingborg, Sweden
Filed May 31, 1991, Ser. No. 707,872
Claims priority, application Fed. Rep. of Germany, May 31, 1990, 9006176
Int. Cl.[5] A43B *13/20, 13/18*
U.S. Cl. 36—29 19 Claims

1. A shoe comprising at least one sole layer with at least one insert part in the form of a honeycomb body made of elastic compressible material, and having honeycomb cells with central axes running at least approximately perpendicular to a plane parallel to said sole layer; wherein the honeycomb body is provided in the sole layer in an area positioned under the heel bone of the wearer; and wherein the surface area of the honeycomb cells progressively decreases in radial directions



outwardly from a center area of the honeycomb body toward a peripheral area of the honeycomb body.

5,197,207
SHOE, ESPECIALLY A SPORT OR REHABILITATION SHOE
Martyn R. Shorten, Portland, Oreg., assignor to Tretorn AB, Helsingborg, Sweden
Filed May 31, 1991, Ser. No. 707,861
Claims priority, application Fed. Rep. of Germany, May 31, 1990, 9006186
Int. Cl.[5] A43B *13/20, 13/18*
U.S. Cl. 36—29 19 Claims

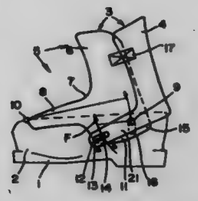


1. A shoe comprising at least one sole layer with at least one insert part in the form of a honeycomb body of elastic compressible material, and having honeycomb cells with central axes running at least approximately perpendicular to a plane parallel to said sole layer; wherein the honeycomb body is provided in an area under a flexible zone of a forefoot area and the surface area of the honeycomb cells increases from one side edge to an opposite side edge of the sole, as seen in a top view.

5,197,208
ODOR-ADSORBENT ACTIVATED CHARCOAL
Herbert Lapidus, Ridgefield, Conn., assignor to Combe Incorporated, White Plains, N.Y.
Continuation-in-part of Ser. No. 649,651, Feb. 6, 1991, abandoned. This application Aug. 1, 1991, Ser. No. 739,252
Int. Cl.[5] A43B *13/38*
U.S. Cl. 36—43 5 Claims

1. An improved body odor absorbing activated charcoal comprising finely divided particles of activated charcoal having a surface area for adsorption of about 1300 sq. meters/gram and critically having about 2.5% by weight of zinc oxide impregnated thereon.

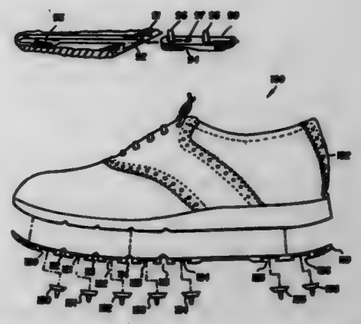
5,197,209
DEVICE FOR OPENING AND CLOSING A SKI BOOT
James Rolland, Saint Jorioz; Jean-Marie Begey, Bonne; Eric Marguet, Annecy, and Michel Mabboux, Seynod, all of France, assignors to Salomon S. A., Chavanod, France
Filed Feb. 5, 1991, Ser. No. 650,609
Claims priority, application France, Feb. 5, 1990, 90 01286
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 12 Claims



1. Device for opening and closing a rear-entry ski boot comprising a sole and a shell base surmounted by an upper extending from an end of said shell base to an area enclosing a lower leg of a skier, said upper comprising at least one front piece (5) extending over a front portion of a foot and a rear cover (4), or spoiler, enclosing a rear portion of said lower leg and articulated to said shell base (2), said spoiler (4) being mounted for rotation on said shell base (2) about a hinge pin (9), said front piece (5) being articulated to a front end of said shell base (2) about a pivot pin (10), and comprising means forming a connection between said spoiler and said front piece in such a way that pivoting movement of said spoiler (4) and of said front piece (5), respectively, causes reverse pivoting movement of said front piece (5) and of said spoiler (4), said spoiler (4) and said front piece (5) being prolonged on each side of said boot by partly overlapping lateral extensions (11, 12), said extensions (11, 12) comprising respectively on overlapping portions of said spoiler and said front piece an oblong slot (13) and a connection finger (14) forming said connection between said spoiler (4) and said front piece (5), and said shell base comprising laterally, on each side, at least one stop (20) restricting pivoting of elements of said upper (4, 5) and preventing said connection (4, 5) from entraining said elements from reverse pivoting during front-to-back flexion.

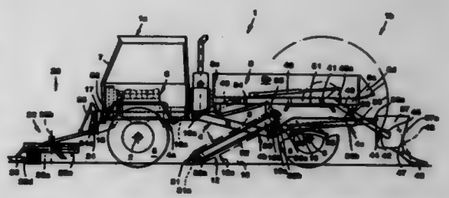
5,197,210
ATHLETIC SHOE
Jeffrey A. Sink, 154 Santiago Ave., Redwood City, Calif. 94061
Continuation of Ser. No. 774,176, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 700,940, May 13, 1991, abandoned, which is a continuation of Ser. No. 634,960, Jan. 2, 1991, abandoned, which is a continuation of Ser. No. 436,472, Nov. 20, 1989, abandoned. This application Mar. 2, 1992, Ser. No. 844,975
Int. Cl.[5] A43B *5/00*
U.S. Cl. 36—127 21 Claims

1. An athletic shoe comprising:
an upper portion;
a sole affixed to said upper portion;
a slot formed laterally across a bottom portion of said sole;
a spring bias tab disposed within said slot;
a slide, slidably received within said slot;
a locking notch disposed on said slide; and



wherein said spring bias tab and said locking notch engage to lock said slide within said slot.

5,197,211
VEHICLE FOR BEACH CLEANING
Walter Haag, Blaustein, Fed. Rep. of Germany, assignor to Karl Kässbohrer Fahrzeugwerke GmbH, Fed. Rep. of Germany
PCT No. PCT/EP90/00402, § 371 Date Sep. 12, 1991, § 102(e) Date Sep. 12, 1991, PCT Pub. No. WO90/10754, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 13, 1990, Ser. No. 761,904
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1989, 8903085[U]
Int. Cl.[5] E01H *12/00*
U.S. Cl. 37—8 21 Claims



1. A self-propelled utility vehicle (1) for cleaning a ground surface comprising:
a vehicle frame (4) having a centric, rectangular opening (9) which has a loading area (8) disposed thereon and at least one front (2) and at least one rear axle (3) each equipped with at least one wheel (5);
an object pickup member (12), including a pickup V-ledge (31) for picking up objects and an elevator (32) for moving the objects, said pickup member pivotably coupled to said vehicle frame (1) proximate to said rectangular opening (9) so as to be adjustable between an operating position such that said pickup member (12) is in contact with the ground surface (13) and a ready position such that said pickup member (12) is above the ground (13) surface;
a collecting receptacle (37) disposed at the rear of said vehicle (1) and operable for collecting the objects which have been picked up and emptying same into said loading area (8); and
conveying means (36), disposed between said pickup member (12) and said collecting receptacle (37), for conveying objects which have been picked up rearwardly into said collecting receptacle (37).

a second nut, affixed to said bolt rearward of said cylinder to

different display units in such a way that said face is turned

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5,197,212

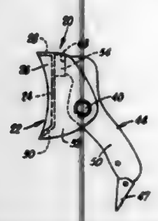
AUXILIARY RIPPER TOOTH ATTACHMENT FOR USE IN CONJUNCTION WITH A BACKHOE

Donald E. Vail, Rte. #3, Box 222, Enid, Okla. 73703

Continuation-in-part of Ser. No. 723,793, Jul. 1, 1991, Pat. No. 5,115,583. This application Apr. 20, 1992, Ser. No. 871,056

Int. Cl.[5] E02F *3/76, 5/02*

U.S. Cl. 37—103 **5 Claims**



1. A ripper tooth attachment assembly for a backhoe comprising:

a mounting base adapted for attachment to a backhoe bucket, which base includes:

a generally rectangular base plate;

a pair of spaced attaching plates secured to one side of said base plate and projecting outwardly therefrom, each of said side plates having a concave free edge adapted to mate with the convex arcuate rear side of a backhoe bucket;

a pair of spaced, parallel, apertured tooth-mounting ears secured to the opposite side of said base plate from said attaching plates and having a pair of aligned pin-receiving apertures therethrough;

an impact pad secured to said base plate on the same side thereof as said tooth-mounting ears between said mounting ears and spaced along said base plate from said pin-receiving apertures;

an elongated ripper tooth including a point at one end, an impact surface at the other end and a shank portion therebetween, said shank portion having a pin opening therethrough aligned with said pin-receiving apertures when said shank portion is located between said tooth-mounting ears with said impact surface contacting said impact pad;

a pivot pin extending through said pin opening and through said aligned pin-receiving apertures to pivotally mount said ripper tooth between said tooth-mounting ears for pivoting movement to swing said impact surface into and out of contact with said impact pad; and

means for detachably retaining said pivot pin extended through said pin-receiving apertures and said pin opening to pivotally mount said ripper tooth.

5,197,213

DECORATIVE FRAMING BORDER OR ENCLOSURE DEVICE

Mary E. Borden, 88 Hawthorne, Akron, Ohio 44303

Continuation-in-part of Ser. No. 660,649, Feb. 25, 1991, abandoned. This application Feb. 27, 1992, Ser. No. 842,946

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—152 **17 Claims**

1. An apparatus for framing objects comprising:

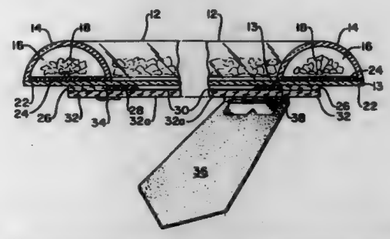
(a) an essentially transparent base frame member having a first and a second surface, each surface having a peripheral region and an interior region;

(b) a plurality of enclosing frame members, at least one frame member having a longitudinal channel open along a substantial portion of a length of the channel, at least one frame member being transparent;

(c) an appearance altering material disposed within the open channel of at least one frame member;

(d) a means for attaching the frame members about a portion of the peripheral region of the first surface of the base frame member to define the interior region by having an interior and exterior peripheral edge of the frame members contacting the first surface of the base frame member thereby creating an enclosed longitudinal channel;

(e) a backing member having peripheral sides and at least one essentially planar side, the backing member adapted to repeatedly receive and remove an object to be framed through at least one gap created between one peripheral side of the backing member and the second surface of the base frame member; and



(f) a securing means affixing at least two opposed peripheral locations of the backing member to the second surface of the base frame member, the gap created between the backing member and the second surface of the base frame member being of a sufficient width to repeatedly receive and remove an object to be framed such that changing the framed object will not correspondingly affect the positioning of the appearance-altering material disposed within the open channel of at least one frame member on the first surface of the base frame member.

5,197,214

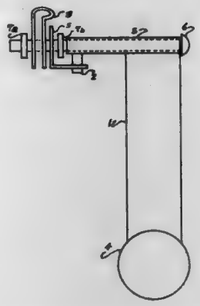
PENDULOUS SECURITY DEVICE

Robert Boeilis, 6894 Louis Dupire, Montreal H1M-3A6, Canada

Filed Apr. 19, 1991, Ser. No. 688,159

Int. Cl.[5] G09F *7/22*

U.S. Cl. 40—617 **1 Claim**



1. A pendulous security device, designed for a vehicle, comprising:

a bolt, having a head at a forward end thereof and a first nut at a rearward end thereof;

a hollow cylinder, surrounding and freely rotatable about said bolt rearward of said head, said cylinder having forward and rearward ends and including a plate having upper and lower ends, the upper end of said plate being affixed to the forward end of the cylinder and the lower end of the plate being affixed to a reflector;

a rectangular tooth, attached to and hanging from said rearward end of said cylinder so as to hang parallel to said plate, said plate, tooth and cylinder being of a single piece construction;

a second nut, affixed to said bolt rearward of said cylinder to control the axial movement thereof;

a stopper, comprising a rectangular plate having a central hole receiving said bolt, and two horizontal elements parallel to each other and protruding perpendicularly from said plate, said stopper receiving the bolt rearward of the second nut such that the tooth swings between and is restrained by the horizontal elements;

and a bracket comprising a U-shaped upper portion, for attaching the device to a vehicle, and two legs, one extending from each side of the U-shaped upper portion so as to be parallel to each other, each leg including a hole which receives the bolt rearward of said stopper and forward of said first nut.

5,197,215

LABEL HOLDER DEVICE FOR GOODS DISPLAY UNITS

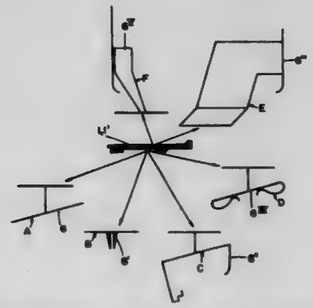
Jorgen F. Torsleff, Paris, France, assignor to Label Plastic Holders, International, Inc., France

Continuation of Ser. No. 616,902, Nov. 21, 1990, abandoned. This application Dec. 18, 1991, Ser. No. 810,442

Claims priority, application Switzerland, Nov. 24, 1989, 4225/89

Int. Cl.[5] G09F *3/18*

U.S. Cl. 40—642 **8 Claims**



1. A label holder system for a plurality of different display units, said display units including shelves and rods, the system comprising:

a universal label holder, said label holder being a one-piece sectional plastic having a face spaced from a back support, said face being a semi-rigid transparent part, said face and back support being sized to hold a label therebetween, and said face and said back support having a profile of a planar pocket holding the label between said face and said back support, a first assembly means extending from a backside of said back support,

a first and second attachment means, said first and second attachment means having extending from one end thereof a second assembly means, said second assembly means being attachable to said first assembly means to attach said first or second attachment means to said label holder and said first assembly means fitting the second assembly means by interlocking and lateral sliding of their corresponding surfaces,

a first fixing means extending from another end of said first attachment means, said first fixing means being attached to a first display unit in form of a rod,

a second fixing means extending from another end of said second attachment means, said second fixing means being different than said first fixing means, said second fixing means being attached to an edge rail of a second display unit in form of a shelf

wherein said label holder may be used with a plurality of different display units in such a way that said face is turned towards the eye of the observer.

5,197,216

COMBINED CAMOUFLAGE AND DECOY DEVICE

Raymond E. Norris, P.O. Box 39, Mannford, Okla. 74044

Filed Oct. 18, 1991, Ser. No. 780,701

Int. Cl.[5] A01M *31/06*

U.S. Cl. 43—1 **4 Claims**

1. A combined camouflage and decoy device which comprises:

suspension means receivable on the head of a hunter, said suspension means including a cap having a flexible top;

a cape suspended from and hanging freely from said suspension means;

a decoy extending outward from said suspension means, said decoy including a flexible outer shell and loose packed stuffing within said shell, wherein said stuffing is in communication with said flexible top;

whereby the movement of said hunter imparts movement to said decoy, and wherein flexing of said top inwardly will allow partial displacement of said stuffing from said shell for packing or storage of said device.

5,197,217

LINE TO LURE RIGGING SYSTEM

Charles W. Browning, Afton, Okla., assignor to Duane S. Colby, Afton, Okla.

Filed Jan. 21, 1992, Ser. No. 823,359

Int. Cl.[5] A01K *97/06*

U.S. Cl. 43—4 **8 Claims**

1. A rigging system to attach a fishing line to a lure or hook, which system comprises:

a doubled length of said line terminating in a loop; said loop having a loop end,

knot tying means having an elongated body and two identical ends, each end having a recess enclosed by a jaw extending from said body;

whereby a knotted loop can be formed by wrapping said double length of line twice around said body forming two circular wrappings, passing said loop end across said

hook means pivotally secured to said lure body, and

5,197,223

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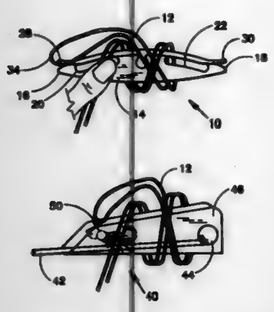
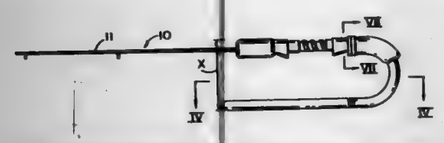
wrappings, and then pulling said knot tying means away from said wrappings;



lure connection means to connect said knotted loop to said lure or hook.

5,197,218
ICE FISHING POLE
Robert L. Legard, 335 Ruddiman, N. Muskegon, Mich. 49445
Filed Feb. 4, 1992, Ser. No. 830,724
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—23 **5 Claims**



1. A pole for ice fishing having a rod portion, a rod support portion and a base portion, said base and rod support portions being joined by a U-shaped portion, said rod support, U-shaped portion and said base portion all being integral portions of a single length of plastic tubing with said rod support and base portions being substantially parallel, said rod support portion having means at its end remote from said U-shaped portion for securing the end of said rod portion, said rod support and base portions being vertically spaced a distance such that a line reel can be mounted on and suspended from and beneath said rod support portion above said base portion and vertically spaced from said base portion, said base portion having a stabilizing portion extending laterally on both sides of said base portion to resist lateral tipping of the pole.

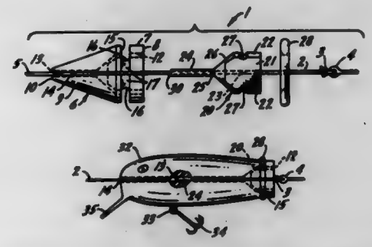
5,197,219
ARTIFICIAL BAIT FOR FISH AND SHELLFISH
Harold T. Cook, Jr., Bainbridge Island, and Mimi S. Fielding, Gig Harbor, both of Wash., assignors to Marco Seattle, Inc., Seattle, Wash.
Continuation-in-part of Ser. No. 543,117, Jun. 22, 1990, Pat. No. 5,062,235. This application May 30, 1991, Ser. No. 707,470
The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42 **19 Claims**

1. An artificial bait comprising:
an attractant;
a gellable binder comprising a mixture of carrageenan and locust bean gum, said binder being permeable to said attractant when in contact with water; and
short fibers randomly and evenly dispersed throughout the binder, the fibers being present in an amount sufficient to provide strength to the binder while allowing the binder, attractant, and fibers to be readily mixable and flowable prior to gelling of the binder,
the components being present in the following proportions:

a mixture of carrageenan and locust bean gum	2% to 8%
fiber	1% to 4%
attractant	trace to 40%
water	balance,

all percentages by weight based on the total weight of the composition.

5,197,220
CHANGEABLE FISHING LINE ATTACHMENTS
Louie W. Gibbs, Clermont, and Michael D. Kelly, Groveland, both of Fla., assignors to Classic Manufacturing Co., Inc., Clermont, Fla.
Filed Apr. 28, 1992, Ser. No. 874,691
Int. Cl.[5] A01K *95/02, 85/00*
U.S. Cl. 43—42.09 **21 Claims**

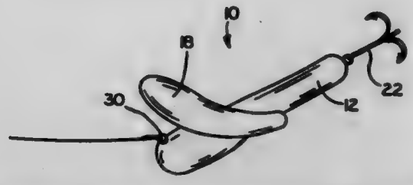


1. Changeable fishing tackle for attachment to a fishing line, comprising:
A. first member having an internal cavity and a circumferential groove around said cavity in the outer periphery of said first member, there being a hole through said groove exposing said cavity through said groove;
B. a second member shaped to fit into said cavity, said second member having a grooved portion in its outer periphery, said grooved portion being aligned with said hole so as to expose said grooved portion through said hole when said second member is in said cavity;
C. removable means for holding said first and second members together when said removable means is placed in said groove so as to contact said grooved portion of said second member; and
D. there being an access passage in said second member for threading said fishing line through said second member, said fishing line being freely movable through said access passage.

5,197,221
VERTICALLY OSCILLATING FISHING LURE
Leon Kreal, 3902 Cass St., Omaha, Nebr. 68131
Continuation-in-part of Ser. No. 385,677, Jul. 26, 1989, abandoned. This application Jul. 25, 1990, Ser. No. 557,593
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.47 **20 Claims**

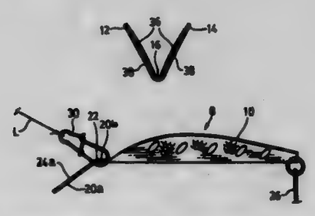
1. A vertically oscillating fishing lure adapted for connection to a fishing line, comprising,
an elongated lure body having forward and rearward ends,
a transversely extended wing secured to said body, said wing being generally transversely centered relative to said lure body and a substantial portion of said wing being positioned longitudinally forwardly of the center of gravity of said lure,

hook means pivotally secured to said lure body, and
an attachment eye secured to said lure body adjacent the forward end thereof,
said wing being positioned such that at least seventy percent (70%) of the total wing area is located longitudinally rearwardly of the attachment eye, and said wing having an angle of attack within a range from plus forty degrees to minus forty degrees,



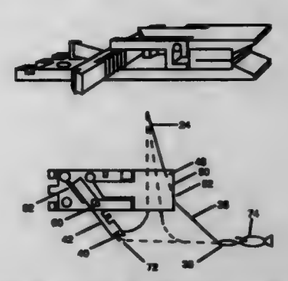
the position of the attachment eye relative to the wing, the wing angle of attack, and the position of the wing relative to the center of gravity being combined such that a vertically oscillating generally sine wave action is imparted to the lure in response to forward advancement through the water by a line attached to eye.

5,197,222
ARTIFICIAL FISH LURE
Joseph M. Gugelyk, 15 Hunter Rd., Grimsby, Ontario, Canada L3M 4A3
Filed Feb. 13, 1992, Ser. No. 837,637
Claims priority, application Canada, Apr. 3, 1991, 2039689
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.47 **10 Claims**



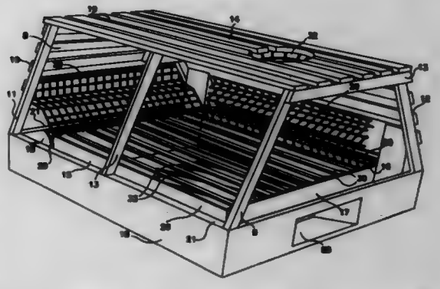
1. An artificial underwater fish lure comprising an elongated body having front and rear ends and a cross section of two body plates rising in proportional lengths symmetrically about a first line of juncture, the body decreasing in cross sectional size from a medial portion forwardly through a head portion and rearwardly through a rear portion; a thin substantially flat head plate affixed on the front end of the body about a second line of juncture and projecting freely forwardly and downwardly of the body in a first plane; apertured means in the head portion of the body at the first line of juncture of the two body plates and adjacent the head plate; a line-fastening attachment received through the apertured means swivelly connected beyond the first plane and on which the body is adapted to swing; and whereby when the lure is normally drawn horizontally through the water at the end of fish line, water pressure variations against the top side of the head plate, and the interior and exterior portions of the body plates, will cause the lure to wobble from side to side, exposing the interior and exterior surfaces of the body plates, when viewed stationary from a reasonable distance, horizontally and to either side of the lure, the majority of the interior surface being displayed intermittently of the exterior surface.

5,197,223
DOWNRIGGER LINE TENDER CONTROL
Cecil R. Spurgeon, 5610 Tehama Ave., Richmond, Calif. 94804
Filed Jul. 15, 1991, Ser. No. 730,068
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—43.12 **3 Claims**



1. A fishing line release for downrigger trolling comprising a base having risers and a downrigger cable attachment means, a compression plate pivotally mounted parallel to said base and attached to said risers, a compression pad mounted between said base and said compression plate, a pivotally mounted trip lever mounted orthogonally to said base between said base and one end of said compression plate, a recoil plate pivotally attached perpendicular to said base such that said trip lever contacts said recoil plate, whereby a fishing line is inserted between said compression pad located between said compression plate and said base and said fishing line is attached to said trip lever so that a pull on said fishing line will pivot said trip lever from under said compression plate to release said fishing line.

5,197,224
LOBSTER OR LIKE MARINE CRUSTACEA TRAP
Robert J. Anischbrook, Hilton, Australia, assignor to Aquamarine Technologies Pty. Ltd., Perth, Australia
Filed Dec. 21, 1990, Ser. No. 632,365
Claims priority, application Australia, Dec. 22, 1989, PJ7943; Jan. 26, 1990, PJ8342
Int. Cl.[5] A01K *69/08*
U.S. Cl. 43—100 **16 Claims**



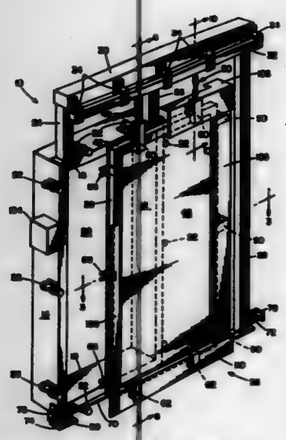
1. A combined trap for crustacea and cephalopods comprising integrally constructed respective marine crustacea and cephalopod enclosures with a barrier therebetween to prevent the passage of cephalopods from one enclosure to the other enclosure, the marine crustacea enclosure being constructed to permit the viewing from externally thereof of bait or crustacea in the crustacea enclosure, and independent entry openings to the respective enclosures and at least the entry port to the cephalopod enclosure being adapted to occlude exit therethrough from the cephalopod enclosure of cephalopods.

the longitudinal axis of the handle; wherein said machine com-

chuck mechanism and an adaptor for mounting said com-

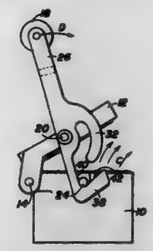
14. A crustacea trap having superimposed integral upper and lower enclosures, the upper enclosure having an opening for the entry thereto of crustacea, a separation structure between the enclosures forming the floor of the upper enclosure and the roof of the lower enclosure, said separation structure being constructed such that an opening into the lower enclosure from the upper enclosure is smaller than the opening into the upper enclosure to permit only crustacea within the upper enclosure and below a preselected physical size to pass through the opening of the separation structure into the lower enclosure.

5,197,225
RADIATION RESISTANT SLIDING DOOR
Robert Yff, Norwalk, Conn., assignor to Panashield, RF and Audio Shielding, Inc., Norwalk, Conn.
Filed Aug. 20, 1992, Ser. No. 932,665
Int. Cl.[5] E05D *15/10*
U.S. Cl. 49—223 14 Claims



1. A door closure mechanism comprising:
a door frame defining a doorway;
a track secured above said door frame;
a door having peripheral frame members;
means connected to the upper portion of the door and slidable in the track whereby the door hangs from the track and is slidable to a first position coinciding with the door frame and to a second position to open the doorway;
a plurality of movable means secured to the door frame on the periphery thereof;
a plurality of cooperating means equal in number to the movable means secured to the periphery of the door and adapted to cooperate with the plurality of movable means when the door is in the said first position;
resilient strip means secured to the periphery of the door; and
means to activate the movable means to engage the cooperating means on the door to move the door laterally against the door frame whereby the resilient strip means is gripped between the door and the door frame to provide a radiation resistant joint.

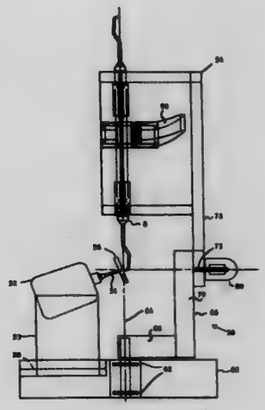
5,197,226
ACCESS DOOR WITH SAFETY LATCH FOR PRESSURIZED AIR CHAMBERS
Edward E. Gayhart, Jr., North Canton; John W. Coursen, Copley, and Dwight R. Kirk, Massillon, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Jul. 25, 1991, Ser. No. 735,568
Int. Cl.[5] E05B *65/06*
U.S. Cl. 49—394 3 Claims



1. An access door assembly for a boiler windbox, comprising:
a door frame defining an opening;
a post connected to the door frame;
a door pivotally mounted to the door frame at a hinge and movable along an arcuate path between a closed position, closing the opening, and an open position, spaced away from the opening; and
a latch pivotally mounted to the door at a pivot connection which is spaced away from the hinge, the latch being movable in a first direction between a locked position which engages the post when the door is in the closed position, and an unlocked position which disengages the post allowing the door to move away from the closed position, the latch including a catch member for engaging the post as the door moves along the path with the latch in an unlatched position for stopping the door at an intermediate, partly open position, the latch being further movable in an opposite direction to said first direction to disengage the catch member from the post to allow the door to continue its movement toward the open position, the latch including a hook defining an arcuate locking recess for receiving the post in the locked position of the latch, the catch member defining a catch recess with an inclined surface spaced away from the arcuate locking recess and for receiving the post, the hook and catch members being spaced from each other and defining an exit passage through which the post is movable with movement of the latch in the opposite direction, to disengage the latch and catch members completely from the post.

5,197,227
DENTAL CURET AND SHARPENING MACHINE SYSTEM
Gunnar K. Svanberg, 2814 NW. 58th Blvd., Gainesville, Fla. 32606
Continuation-in-part of Ser. No. 407,688, Sep. 14, 1989, Pat. No. 5,030,091, which is a continuation of Ser. No. 92,887, Sep. 4, 1989, abandoned. This application Jul. 8, 1991, Ser. No. 726,618
Int. Cl.[5] B24B *9/04*
U.S. Cl. 51—125 1 Claim

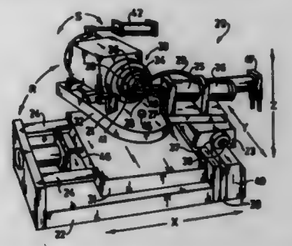
1. A machine for sharpening any one of a series of dental curets which has a longitudinally extending handle which connects two cutting blades, each cutting blade having a face with a cutting edge formed by substantially parallel side edge portions and a substantially semi-circular distal end edge portion wherein the curets of said series differ from each other with respect to the rake angle between the face of the curet and the longitudinal axis of the handle; wherein said machine comprises the following elements:
(a) a base;
(b) an instrument guide unit attached to said base such that said instrument guide unit may rotate about a vertical axis, said instrument guide unit comprising a fixture portion with placement means for holding a curet in a fixed position relative to said fixture portion, said instrument guide unit further comprising means for disposing said fixture portion at any one of several angles by rotating said fixture portion about a horizontal axis, the angle at which said fixture portion is disposed for a given curet is selected so that said curet face is in the horizontal plane defined by said horizontal axis;



(c) a sharpening element movably attached to said base such that said sharpening element may be brought into contact with, or moved away from, a curet held by said placement means in said fixture portion;
(d) a means for rotating said instrument guide about said vertical axis while said fixture portion remains at said selected angle so as to expose each edge portion of said curet face to said sharpening element,
wherein said elements function together to:
(i) place the arc center of said cutting blade's semi-circular distal end portion in said instrument guide unit's vertical rotation axis;
(ii) place said cutting blade's face perpendicular to said instrument guide unit's vertical rotation axis; and
(iii) place the cutting blade's face in said fixture portion's horizontal rotation axis.

5,197,228
METHOD OF AND MACHINE FOR GRINDING A WORKPIECE
John F. Sharkey, III, Camillus; Robert J. Back, Holland Patent, and Lawrence C. Baltazar, Schenectady, all of N.Y., assignors to Constant Velocity Systems, Inc., Ballston Spa, N.Y.
Continuation-in-part of Ser. No. 367,890, Jun. 19, 1989, abandoned. This application Feb. 20, 1991, Ser. No. 658,178
Int. Cl.[5] B24B *49/00*
U.S. Cl. 51—165.71 1 Claim

1. A machine for regrinding a component part of a constant velocity universal joint, said constant velocity universal joint having ball bearings, an outer housing with an outer ball race member and an inner ball race member, said members provided with curved ball receiving grooves, and a ball cage between said members having ball containing grooves, comprising:
(a) means for holding said component part, comprising a chuck mechanism and an adaptor for mounting said component in said chuck mechanism;
a grinding bit comprised of a grinding tip, wherein said grinding tip comprises boron nitride;
(c) rotatable support means for supporting said chuck mechanism, wherein said rotatable support means is comprised of means for disposing said component part so that at least one surface of said component part contacts said grinding tip of said grinding bit in such a manner that said tip contacts said surface at a specified angle of incidence;
(d) means for rotating said rotatable support means in order to change said angle of incidence between said grinding tip and said surface of said component part;



(e) a motorized grinding tool comprised of said grinding bit, wherein said grinding bit has a head larger than the diameter of the original ball bearings;
(f) means for adjusting the position of said motorized grinding tool in the Z axis to move said motorized grinding tool up and down;
(g) means for adjusting the position of said motorized grinding tool in the Y axis to move said grinding tool in and out;
(h) a lubricating fluid injection system for lubricating said component part and said grinding tool during the grinding operations; and
(i) a protective enclosure surrounding the grinding machine components for containing lubricating fluid during grinding operations.

5,197,229
NUMERICALLY CONTROLLED CHAMFERING APPARATUS FOR A GLASS PLATE
Shigeyuki Kanamaru, Tokyo, and Koichiro Nakai, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan
PCT No. PCT/JP88/00331, § 371 Date Jan. 24, 1990, § 102(e) Date Jan. 24, 1990, PCT Pub. No. WO89/09113, PCT Pub. Date Oct. 5, 1989
Continuation of Ser. No. 444,131, Jan. 24, 1990, abandoned. This PCT application Mar. 31, 1988, Ser. No. 762,259
Claims priority, application Japan, Sep. 26, 1986, 61-227512
Int. Cl.[5] B24B *9/10*
U.S. Cl. 51—165.77 7 Claims

1. A numerically controlled chamfering apparatus for a glass plate wherein a numerical instruction indicating a shape resembling the shape of the peripheral edge of a glass plate is previously given, and a chamfering wheel is moved along the peripheral edge of the glass plate on the basis of the numerical instruction to grind the peripheral edge of the glass plate to thereby perform chamfering, said numerically controlled chamfering apparatus comprising:
a base;
a fitting holder provided on the base to hold the glass plate;
an X-axis moving means for moving a chamfering wheel on the base in the direction of an X axis;
a Y-axis moving means for moving the chamfering wheel on the base in the direction of a Y axis which intersects the X axis at a right angle;
a turning means for turning the chamfering wheel on the base;

surface is seated against said inner wall surface and said

an outermost radial edge and an adjacent surface having

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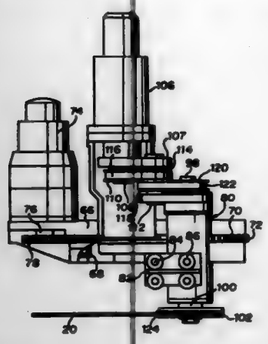
a pushing force applying means which slidably supports the chamfering wheel on the base in the direction of the normal line of the peripheral edge of the glass plate so as to cause advance and retreat movements of the chamfering wheel relative to the peripheral edge of the glass plate; and

a control section for calculating a target value of wheel



torque and for adjusting a quantity of the advance or retreat movement of the chamfering wheel by controlling the pushing force applying means until said target value of wheel torque is achieved, said control section calculating said target value of wheel torque based upon the composite speed of the chamfering wheel along the X and Y axes, previously sampled pushing force values, and previously sampled wheel torque values

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5,197,230

FINISH-MACHINING MACHINE

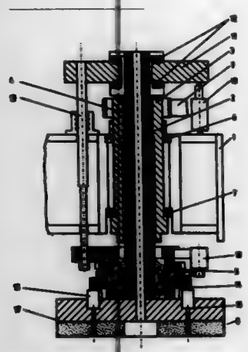
Dieter Stupfunikfer, Mühlheim/Main; Alexander Hofsess, Dreieich, and Klaus Biebesheimer, Frankfurt, all of Fed. Rep. of Germany, assignors to Diskus Werke Frankfurt am Main Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 16, 1990, Ser. No. 553,727

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1989, 3925274; May 9, 1990, 9015458

Int. Cl.[5] B24B *49/16, 57/02*

U.S. Cl. 51—165.77 20 Claims



1. In a finish-machining machine comprising

an upper annular finishing disk, which is mounted to be rotatable on a vertical axis,

a lower annular finishing disk, which is mounted to be rotatable on said axis and spaced below and defines a working gap with said upper disk,

separate disk drive means for rotating said upper and lower disks, respectively, about said axis,

an inner annular series of pins, which is centered on said axis and extends in said working gap adjacent to said lower disk and mounted to be rotatable about said axis,

pin drive means for rotating said inner series of pins about said axis,

an outer annular series of pins, which is centered on said axis and extends in said working gap adjacent to said lower disk radially outwardly of said inner series of pins,

an annular series of workpiece holders, which are disposed between said inner and outer series of pins in said working gap generally in a plane which is at right angles to said axis and are formed with teeth meshing with said inner and outer series of pins,

pin drive means for rotating said inner series of pins about said axis to impart a planetary motion to said workpiece holders,

holding-down means for acting on said upper disk to exert on said lower disk an axial force, and

a feedback control system for controlling said axial force,

the improvement residing in that

an underframe is provided, in which said lower disk is mounted for rotation on said axis, and

said feedback control system comprises force pickups which are angularly spaced apart about said axis and support said lower disk on said underframe and are adapted to sense said axial force and

said holding-down means comprise fluid-operable means for exerting said axial force on said upper disk in dependence on the axial force sensed by said force pickups.

5,197,231

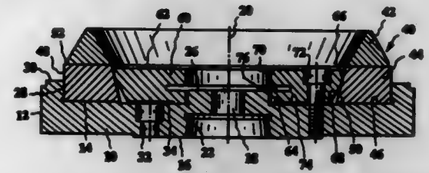
ROTARY CUTTER HAVING EXPANDED CUTTING RING

Harry Pedersen, Penfield; Richard Johnstone, Fairport, and Richard L. Kitchen, East Rochester, all of N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Dec. 11, 1991, Ser. No. 805,125

Int. Cl.[5] B24D *17/00*

U.S. Cl. 51—204 38 Claims



1. A rotary cutter for cutting gears and the like, said rotary cutter having an axis of rotation and comprising:

a generally disc-shaped cutter head comprising a circumferential edge surface, a first surface located on one side of said cutter head and a second surface located on the other side of said cutter head with said axis of rotation extending from said one side to said other side through the center of said cutter head, said first and second surfaces being parallel to one another and perpendicular to said axis, said cutter head further including an inner wall surface located on said one side, said inner wall surface being located radially inwardly with respect to said edge surface and being concentric about and extending parallel to said axis of rotation,

a cutter ring having a slit therethrough, said cutter ring being located adjacent said one side of said cutter head, said cutter ring having at least one stock removing surface located on a base portion with said base portion having a tapered inside ring surface, an outside ring surface, and a base surface with said outside ring surface being perpendicular to said base surface, said cutter ring being in a radially expanded condition whereby said outside ring surface is seated against said inner wall surface and said base surface is seated against said first surface,

a circular disc having a base and a tapered outer side surface concentric with said axis, said circular disc being located within said cutter ring and secured to said cutter head via securing means, said tapered outer side surface contacting said tapered inside ring surface, said circular disc effecting and maintaining said cutter ring in said radially expanded position whereby said cutter ring is centered on said cutter head concentrically about said axis.

5,197,232

UNIVERSAL SHARPENER FOR ICE SKATES

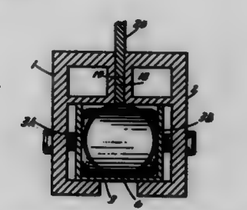
Everett M. Ellestad, Grösviksvägen 107, S-161 40, Bromma, Sweden

Filed Sep. 30, 1991, Ser. No. 769,189

Claims priority, application Sweden, Oct. 9, 1990, 9003211-1

Int. Cl.[5] B24D *15/00*

U.S. Cl. 51—205 WG 3 Claims



2. A device for sharpening a skate blade, said skate blade having a concave surface situated between two generally parallel side walls, which comprises

skate blade sharpening means, said skate blade sharpening means including a flexible hollow sharpening cylinder, said hollow sharpening cylinder having an abrasive outer surface and being functionally adapted to conform to the shape of said concave skate blade surface,

skate blade guide mans, said skate blade guide means including two generally parallel and movable side elements functionally adapted to guide the parallel side walls of aid skate blade therebetween, and

mean for variably adjusting said guide means to allow for the sharpening of blades of various thicknesses, said adjusting means including two manually rotatable knobs connected to said side elements and being functionally adapted to move said side elements simultaneously and uniformly way from and toward each other.

5,197,233

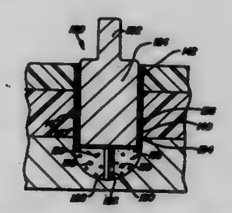
CUTTING TOOL WITH POLYCRYSTALLINE DIAMOND SEGMENT AND ABRASIVE GRIT

Ronald C. Wiand, 1494 Heatherwood Dr., Troy, Mich. 48098

Division of Ser. No. 579,869, Sep. 6, 1990, Pat. No. 5,052,153. This application Jun. 6, 1991, Ser. No. 711,220

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—281 R 2 Claims



1. A process for cutting of a composite work piece comprising the steps of:

a) providing a cutting tool having a first cutting edge having an outermost radial edge and an adjacent surface having an abrasive grit material attached thereof, said abrasive grit material being radially set back from said outermost radial edge of said cutting edge wherein said cutting edge is in a direction ahead of the abrasive grit during a cutting stroke of said tool;

b) moving said tool relative to said work piece such that said cutting edge cuts a large turn the work piece which is thereafter reduced in size by said abrasive grit material whereby improved cutting of the work piece is accomplished.

5,197,234

ABRASIVE ENGRAVING PROCESS

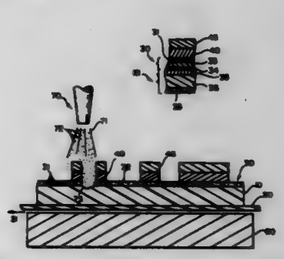
R. Lee Gillenwater, 6250 NE. 198th St., Seattle, Wash. 98155

PCT No. PCT/US91/01370, § 371 Date Dec. 26, 1991, § 102(e) Date Dec. 26, 1991

Continuation-in-part of Ser. No. 485,467, Feb. 27, 1990, Pat. No. 5,069,004. This PCT application Feb. 2, 1991, Ser. No. 675,910

Int. Cl.[5] B24C *1/04, 9/00*

U.S. Cl. 51—310 4 Claims



1. A method of abrasively engraving a work substrate, the method comprising the steps of: a) applying a topical magnetically interactive coating to an upper surface of said substrate; b) disposing atop said surface a stencil cut from a magnetic material; and c) exposing said stencil and said surface to abrasive etching; wherein said magnetically interactive coating is comprised of a double-sided film, one side of which is coated with a coating of atomized iron suspended in a coating medium, and the other side of the film is coated with a mild adhesive.

5,197,235

ANCILLARY DEVICE FOR REMOVING ABRASIVE FROM LARGE SAND BLASTED WORKPIECES

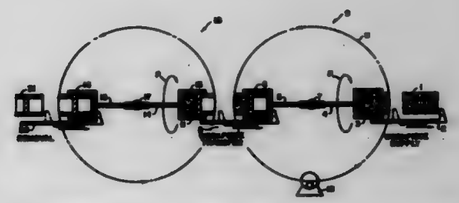
Horst-Dieter Schlick, Metelen, Fed. Rep. of Germany, assignor to Schlick-roto-jet Maschinenbau GmbH, Metelen, Fed. Rep. of Germany

Filed May 29, 1991, Ser. No. 706,918

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1990, 4017677

Int. Cl.[5] B08B *9/02*

U.S. Cl. 51—419 6 Claims



1. In apparatus for removing abrasive from external accessi-

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ble cavities inside a large workpiece subsequent to sand blasting in a centrifugal-jet system, the improvement comprising first and second cleaning stations (9 and 10) for removing the abrasive, and a workpiece transfer station (8) interposed between the first and second cleaning stations to reorient and transfer workpieces (1, 11, 21) from one cleaning station to the other, each cleaning station including the following components:

(1) at least two shafts, each having a workpiece holder at one end and each adapted to rotate along with the workpiece holder about a single horizontal axis, and

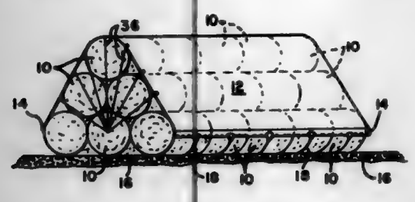
(2) a rotary drive mechanism coupled to the opposite end of each shaft, with said shafts mounted symmetrically on said drive mechanism, said drive mechanism having a transmission for rotating said shafts about their horizontal axes.

5,197,236

WATERPROOF COVER FOR PILES OF BALES OF HAY AND THE LIKE

Leonard Calhoun, Box 453 - R.R. 2, Chesley, Ontario, Canada, and Ivan W. Martin, R.D. 2 - Box 52, Millersburg, Pa. 17061

Filed Jan. 15, 1992, Ser. No. 820,799
Int. Cl.[5] A01F *25/13*
U.S. Cl. 52—4 9 Claims



1. A waterproof bale cover for covering and maintaining piled bales of forage material of predetermined size relatively free from contact by weather elements when piled on a field surface, said cover being commensurate in size with a generally peaked arrangement of a plurality of bales and covering the uppermost portion and opposite sides of said arrangement of bales and said cover comprising a generally rectangular or square sheet of flexible waterproof material, a pair of opposite edges of said sheet material each being formed with a hem of adequate width to receive in longitudinally-spaced relationship a series of segment members of stiff rod-like material which are disposed in a spaced longitudinal series within said hem, each of said members having midway of the ends thereof a U-shaped attaching member, each of said members projecting through one of a series of openings in said hem and said U-shaped members being adapted to be connected to the opposite ends of a tie strand disposed beneath and anchored relative to said pile of bales by the weight thereof upon said strand.

5,197,237

HOME GUTTER SYSTEMS

Gregory O. Owens, 118 Lynn Ave., Clarksburg, W. Va. 26301

Filed Jan. 25, 1991, Ser. No. 720,394
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—11 8 Claims

1. An improved gutter system for receiving water run off from a roof of a home and conducting said run off to ground level comprising a plurality of gutter supports attached to said roof to support an assembly of a plurality of gutter lengths of arcuate cross-section, said gutter lengths being separatively and selectively rotatable within said gutter supports to enable the discharge of such debris as may have accumulated therein, an end cap assembly for at least one end of said gutter length assembly, said end cap assembly having a cylindrical portion which encompasses said at least one end of said gutter length and is removable from such encompassing position, said end cap assembly being joined to a downwardly extending rectilinear sleeve which surrounds at least in part an opening in said cylindrical portion under surface, said sleeve having a flexible

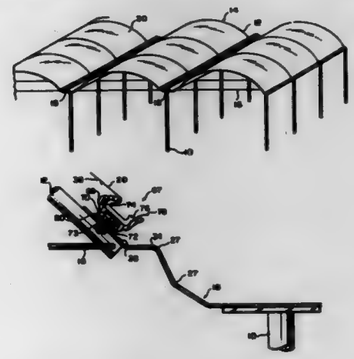
mid portion which terminates in a lower sleeve connectable to sleeve-like gutter elements to conduct run off received by said roof attached gutter system to ground level.

5,197,238

ENCLOSED STRUCTURES

Alexander Peleg, Moshav Betzaron, Israel

Continuation-in-part of Ser. No. 537,666, Jun. 1, 1990, abandoned. This application Dec. 14, 1990, Ser. No. 627,522
Claims priority, application Israel, Jun. 15, 1989, 90627
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—13 3 Claims



1. A plastic-covered, gutter-connected sheltering horticultural structure essentially constructed of a framework and flexible cover sheet material, said sheltering horticultural structure comprising:

a plurality of gutters (18) each having a bottom wall and two side walls forming a concave channel along a length of each of said plurality of gutters;

said each of said plurality of gutters (18) being parallel to each other and supported above ground by a plurality of spaced posts (10);

each of a plurality of arched roof trusses (12, 16) connected at their ends between one of said two side walls of a consecutive pair of said plurality of gutters (18); at least one anchor means joined to each of said plurality of gutters (18) for detachably engaging longitudinal edges of said flexible covering sheet material and maintaining said flexible covering sheet material in a tensioned state over said plurality of roof trusses (12, 16);

said at least one anchor means being located over and within said concave channel;

a plurality of fastening means spaced at intervals along a length of said each of said plurality of gutters (18) for engaging and maintaining said one of said two side walls and said anchor means spaced apart to provide unobstructed passages between said anchor means and said one of said two side walls;

wherein condensation fluids generated within said structure travel down an underside of said flexible covering sheet material, over said anchor means, through said unobstructed passages into said plurality of gutters (18); and

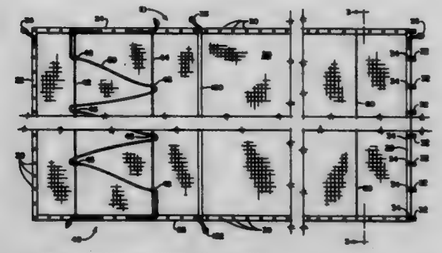
fluid precipitation generated exterior to said structure falls on said flexible covering sheet material and travels down directly into said plurality of gutters (18).

5,197,239

CONTAINMENT SYSTEM

William T. Glynn, West Suffield; John Rexroad, Lyme, and David S. Denny, Middle Haddam, all of Conn., assignors to SINCO Incorporated, East Hampton, Conn.

Filed May 14, 1991, Ser. No. 699,963
Int. Cl.[5] E04G *21/00*
U.S. Cl. 52—63 20 Claims



1. A containment system comprising:

flexible containment panel means having a first end and an opposing laterally spaced second end;

first web means mounted to said panels means and extending generally transversely to said panel means, said first web means defining a first plurality of eyelets;

second web means mounted to said panel means and laterally spaced from said first web means, said second web means extending generally transversely to said panel means and defining a second plurality of eyelets; and

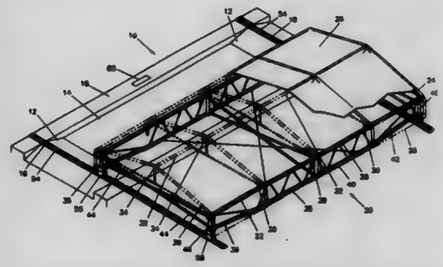
a cord receivable through said first and second eyelets in alternating fashion wherein the effective lateral dimension of said panel means may be adjusted by pulling on said cord to thereby selectively adjust the lateral spacing between said first and second web means.

5,197,240

TRANSFER PAD COVER

N. Dennis Eryou, 8 Ivy Pl., Huntington, N.Y. 11743

Filed Sep. 24, 1991, Ser. No. 764,446
Int. Cl.[5] E04B *1/343*
U.S. Cl. 52—66 15 Claims



1. A cover for protecting a transfer pad from precipitation, said transfer pad having an raised perimeter, said cover comprising:

a movable cover portion having a water-proof sheet material secured thereto, said movable cover portion extending substantially over the entire surface of said pad when the cover portion is in a first position;

a support portion positioned below said cover portion and supporting said cover portion, said support portion having longitudinal ends and a midsection;

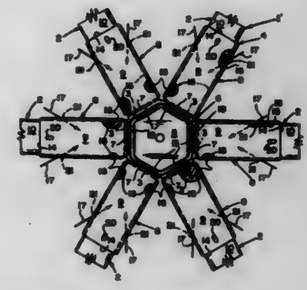
level tracks mounted on said pad and extending to an area adjacent to said pad, said tracks positioned under said longitudinal ends of said support portion, said support portion being movably engaged to said tracks only at said longitudinal ends, said midsection of said support portion being entirely raised above said raised perimeter, whereby said cover may be moved laterally between said pad and said area adjacent said pad without engaging said pad.

5,197,241

GAZEBO TOP CONNECTION

Ernest A. Romeo, Healdsburg, and Tyrell T. Gilb, Berkeley, both of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Dec. 16, 1991, Ser. No. 808,217
Int. Cl.[5] E04B *1/347*
U.S. Cl. 52—82 5 Claims



1. A gazebo top connection comprising:

a. at least three wood rafters having upper and lower edges and opposed sides inclined and radially disposed and having upper ends arranged in close association and their longitudinal axes substantially intersecting a common point;

b. a first gazebo top connector constructed from a single element sheet metal member and including:

(1) a hub member having a perimeter formed by multiple generally straight bend line edges and formed with a compression ring member along said entire perimeter of said hub member;

(2) at least three arms radiating from said hub member connected to said hub member only along said straight bend line edges permitting field bending of said plurality of arms angularly to said hub member;

(3) each of said arms are formed with an elongated seat member having a width selected for receiving said upper edge of one of said wood rafters, a proximal end connected only to said hub member along one of said bend lines, a distal end disposed from said proximal end, lateral side edges, and first and second side flanges integrally attached to said lateral side edges of said seat member and extending at generally right angles to said seat member and dimensioned for registration with said opposed sides of one of said wood rafters;

c. a first plurality of side flange fasteners attaching each of said wood rafters to each of said first and second side flange members; and

d. a first plurality of seat fasteners attaching each of said wood rafters to each of said seat members.

5,197,245

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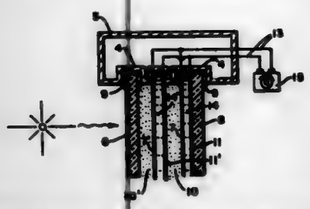
5,197,242
DUAL-PANE THERMAL WINDOW WITH LIQUID CRYSTAL SHADE

Ray H. Baughman, Morris Plains; Ernest D. Buff, Far Hills; Helmut Eckhardt, Madison, and Gerhard H. Fuchs, Far Hills, all of N.J., assignors to Allied-Signal Inc., Morristownship, Morris County, N.J.

Filed Jul. 17, 1992, Ser. No. 914,124
Int. Cl.[5] E04C *2/54*; G02F *1/133*
U.S. Cl. 52—171 2 Claims

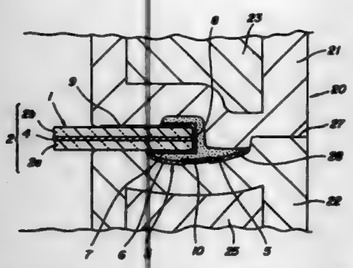


1. A method for decreasing radiative and conductive heat transfer between the exterior and the interior of a building, comprising the steps of:
(a) mounting within a window frame a plurality of spaced window panes;
(b) affixing between said panes a plurality of liquid crystal cells, at least one of said cells being affixed to one of said panes; and
(c) delimiting within said window frame a plurality of spaces providing a plurality of thermal breaks, each of said spaces being delimited between a wall of one of said cells and a wall of another of said cells.

5,197,243
WINDOW FOR AUTOMOBILES OR THE LIKE, AND METHOD OF MANUFACTURING THE SAME

Toshiyuki Mozawa, and Tetsuya Tamura, both of Yokohama, Japan, assignors to Hashimoto Forming Industry Co., Ltd., Japan

Filed Nov. 29, 1989, Ser. No. 442,642
Claims priority, application Japan, Nov. 30, 1988, 63-303632; Nov. 30, 1988, 63-303633; Nov. 30, 1988, 63-303636; Nov. 30, 1988, 63-303637
Int. Cl.[5] B60J *1/00*
U.S. Cl. 52—208 16 Claims

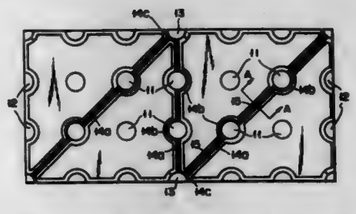


1. A window for automobiles or the like, including a window plate and a frame member formed into a predetermined shape to be integral with the window plate along at least one edge thereof, wherein said frame member comprises a profiled main portion, having a lower leg and a top, for covering a gap between said window plate and an automobile body panel, the lower leg of the main portion being shaped to fit into said gap and the top of the main portion having a first lip section for covering said body panel and a second lip section for covering a peripheral portion of said window plate, said main portion having at least an outer side thereof extending over said first and second lips, said main portion being formed of a non-injection molded foamed thermoplastic synthetic resin material; a surface layer on at least said outer side and having inner and outer surfaces, the inner surface of said surface layer being bonded to the outer side of said main portion for covering the outer side of said main portion and preventing any bubbles formed by the foaming action of a heat-foamable agent in said main portion form affecting the appearance of said outer surface of said surface layer, said surface layer comprising a non-foamed thermoplastic synthetic resin material.

5,197,244
INTERIOR PANEL UNIT FOR PERMITTING ARRANGEMENT OF CABLES AND DEVICES ON ROOM FLOOR

Fumio Takeda, Hachiooji; Yoshio Kojima, Yokohama; Tsuneo Kaneko, Narashino; Yutaka Ishibashi, Tokyo; Naoto Sasaki, Yokohama, and Isako Tsushima, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 429,552, Oct. 31, 1989. This application Oct. 11, 1991, Ser. No. 775,015
Claims priority, application Japan, Oct. 31, 1988, 63-142055[U]; Oct. 31, 1988, 63-275609; Oct. 31, 1988, 63-275610; Oct. 31, 1988, 63-275614; Oct. 31, 1988, 63-275617; Oct. 31, 1988, 63-275618; Oct. 31, 1988, 63-275619; Oct. 31, 1988, 63-275620
Int. Cl.[5] E04B *5/48*
U.S. Cl. 52—221 3 Claims



1. An interior panel unit for permitting an arrangement of cables and devices on the floor of a room, for installation on a foundation floor of the room, said panel unit comprising:
a floor base member to be installed on a foundation floor of the room;
a plurality of fundamental support members fixed to an upper surface of each of said floor base member, and having upper surfaces located at the same height from said upper surface of each floor base member;
a plurality of connecting support members fixed to peripheral portions of each floor base member, and having upper surfaces located the same height as those of said fundamental support members;
base joint members for connecting said connecting support members arranged on a plurality of said floor base members in a state wherein the floor base members are installed on the same surface; and
floor panel members brought into contact with said upper surfaces of said plurality of fundamental support members and said upper surfaces of said connecting support members to form a surface of the room floor and cooperating with said floor base members to define an internal space for installing cables and devices therein; and
further comprising leakage water guide grooves formed on said floor base member along lines obtained by connecting said fundamental support members or said connecting support members.

5,197,245
STRUCTURAL WALL REINFORCEMENT APPARATUS AND METHOD

Edgar A. Davis, San Jose, Calif., assignor to VSL Corporation, Campbell, Calif.

Filed Aug. 13, 1990, Ser. No. 566,612
Int. Cl.[5] E04B *2/00*
U.S. Cl. 52—223 R 9 Claims

1. A structure for reinforcing a brick or block wall or the like comprising:
a plurality of cable assemblies, each of said cable assemblies comprising a lower anchor plate, an upper anchor plate, a cable duct which extends between said lower and said upper anchor plates and a tendon which extends through said cable duct having an upper end anchored in said upper anchor plate and a lower end anchored in said lower anchor plate, said upper anchor plate comprising means for allowing said tendon to be placed under tension;
reinforcing wire mesh;
means for anchoring said wire mesh to said wall at selected positions in such a manner that said plurality of cable assemblies is located between said wire mesh and said wall; and
means for vertically anchoring each of said plurality of cable assemblies to said wall at selected positions thereon, said means for anchoring said cable assemblies comprising a block of concrete-like material in which said upper anchor plate is embedded, a portion of which rests on and is rigidly affixed to at least a portion of said wall, a plurality of segments of reinforcing bar having lower end portions thereof which are embedded in and rigidly attached to a foundation underlying said wall and upper portions thereof which extend over the top of said lower anchor plate, and a layer of concrete-like material which extends between said block of concrete-like material and said foundation for embedding said cable assemblies, said wire mesh, said lower anchor plate and said upper portions of said reinforcing bar.

5,197,246
PANEL

Brian P. Hill, 715 W. Fifth St., Erie, Pa. 16507

Filed Apr. 13, 1992, Ser. No. 867,445
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—235 9 Claims

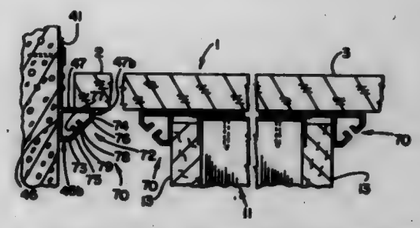
1. In combination a building structure comprising a frame and a panel;
said frame comprising frame studs, a lower plate, an upper plate, an upper bracket and a lower bracket;
said frame studs having an upper end and a lower end;
said lower end of said frame studs having said lower plate fixed thereto;
said upper end of said frame studs having said upper plate fixed thereto;
said upper bracket being supported on said frame studs and said lower bracket being supported on said frame studs in spaced relation to said upper bracket;
said panel including panel studs;
an upper elongated member fixed to said panel stud which is generally perpendicular thereto;

a lower elongated member fixed to said panel stud generally perpendicular thereto and spaced from said upper elongated member;
said panel adapted to be supported on a wall with said upper elongated member received in said upper bracket and said lower elongated member adapted to be received in said lower bracket on said frame studs whereby said panel is held in place on said wall.

5,197,247
COMBINATION BEAD/MOLD FOR SUSPENDED CEILINGS AND THE LIKE

William L. Elderson, 6675 Crenshaw Dr., Parma Heights, Ohio 44130

Continuation-in-part of Ser. No. 280,319, Dec. 6, 1988, abandoned. This application Dec. 3, 1990, Ser. No. 621,590
Int. Cl.[5] E04B *5/00*
U.S. Cl. 52—288 4 Claims



1. A bead/mold used at intersections to trim and support abutting walls, ceilings and the like, comprising:
a mounting arm extending into an area formed between abutting wall and ceiling surfaces and being concealed therein when such bead/mold is installed with respect to a ceiling and a wall;
trim/support means extending from said mounting arm for providing both trim and support functions when said mounting arm is oriented vertically or horizontally, said trim/support means including a pair of symmetrical legs which are oriented at a right angle to each other, each leg being generally parallel with a respective ceiling or wall surface, thereby supporting such ceiling surface and con-

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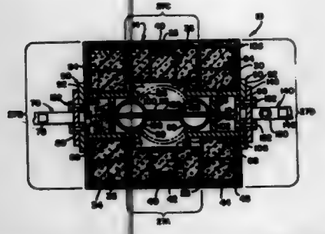
cealing the area of abutment of such abutting wall and ceiling surfaces, said trim/support means presenting a substantially identical visual image with respect to the trim of both abutting surfaces when viewed from the room where such bead/mold is installed when said mounting arm is oriented vertically as it does when said mounting arm is oriented horizontally.

5,197,248
PREFABRICATED COLUMN ASSEMBLY
George D. Kruse, Folsom, Calif., assignor to PPA Industries, Inc., Dallas, Tex.
Filed Sep. 15, 1992, Ser. No. 945,154
Int. Cl.[5] E04C *1/00*
U.S. Cl. 52—309.4 12 Claims

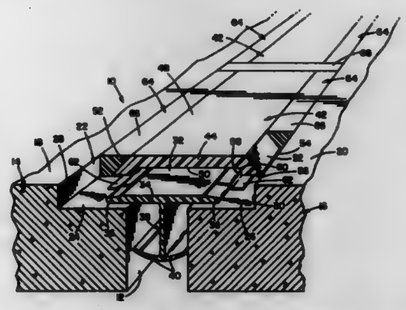


1. A column assembly for supporting an article, said column assembly comprising:
a tube having an interior surface and an exterior surface, said tube including an axial bore;
a wire frame disposed within a wall of said tube, said frame having an interior side and an exterior side, spaced from said interior;
a filler means disposed between said interior side and said exterior side of said frame;
a rigid coating provided on said exterior side of said frame; and
mounting means positioned between said interior and exterior sides of said frame adapted to provide a mounting surface for attachment of articles to be supported to said column assembly.

5,197,249
DIAMOND TOOL WITH NON-ABRASIVE SEGMENTS
Ronald C. Wiand, 1494 Heatherwood Dr., Troy, Mich. 48098
Continuation of Ser. No. 651,808, Feb. 7, 1991, abandoned. This application Apr. 27, 1992, Ser. No. 875,209
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—397 8 Claims

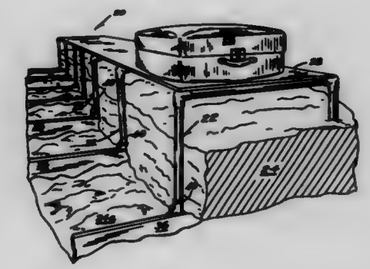
1. An abrasive pad comprising:
a backing substrate including a means for attachment to a rotary tool;
a plurality of abrasive segments having a thickness attached to the backing substrate, said plurality of abrasive segments being spaced about the pad and being raised from said backing substrate, and each of said abrasive segments having an abrasive surface for defining a co-planar abrasive surface during rotation of the pad;
a plurality of non-abrasive segments attached to said backing substrate, said plurality of non-abrasive segments positioned between said abrasive segments, said plurality of non-abrasive segments having a thickness and being raised from said backing substrate, and each of said non-abrasive segments having a face surface which is co-planar with said co-planar abrasive surface;
and a gap between adjacent abrasive and non-abrasive segments;
whereby the load imposed on the abrasive pad is distributed between said abrasive surface and said non-abrasives surfaces for reducing frictional wear on said abrasive segments.

5,197,250
WIDE EXPANSION JOINT SYSTEM
Fred Kramer, Hales Corners, Wis., assignor to Tremco Incorporated, Cleveland, Ohio
Filed May 12, 1992, Ser. No. 881,901
Int. Cl.[5] E01C *11/10*
U.S. Cl. 52—396 9 Claims



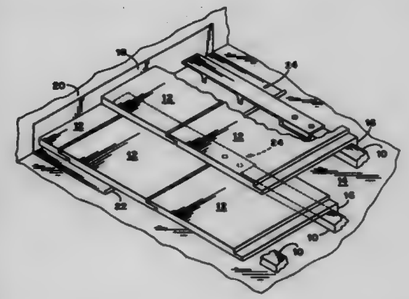
1. An expansion joint system for a slot extending between adjacent slabs of relatively rigid material, said slabs including a boxed out area adjacent the slot, said boxed out area bounded by generally horizontally extending surfaces adjacent the slot and upward extending surfaces disposed from the slot, said slabs each having traffic bearing upper surfaces generally at the same vertical level,
said expansion joint system comprising:
a plate member extending across the slot and supported on the horizontally extending surfaces;
a preformed pad of resilient material, said pad of sufficient width to traverse said plate member, said pad including in cross section:
a central portion bounded by an upper wall generally at the vertical level of the upper surfaces of the slabs, and an intermediate wall vertically below the upper wall; and
end portions at opposed ends of said central portion, said end portions bounded by depending side walls extending downward and outward at an obtuse angle relative of said upper wall, said side walls terminating at lower points, and bottom end walls extending toward said slot from said lower points, said bottom end walls vertically below said intermediate wall and generally parallel and at the vertical level of the horizontally extending surfaces of the slabs; and
nosings comprised of resilient material positioned between the side walls of the pad and the upward extending surfaces of the boxed out area, said nosings bonded to the side walls of the pad and the horizontally extending surfaces and the upward extending surfaces of the boxed out area, the nosings having a top surface substantially at the level of the upper surfaces of the slabs.

5,197,251
INSULATION PROTECTION SYSTEM
Jerry J. Krysak, 1723 N. 27th Pl., Sheboygan, Wis. 53081
Filed Jan. 9, 1989, Ser. No. 294,355
Int. Cl.[5] E04B *1/62*
U.S. Cl. 52—407 6 Claims



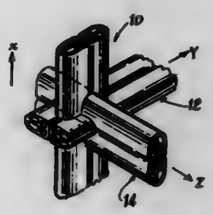
1. A system for protecting insulation on a base, said system comprising:
a support surface above said base and said insulation;
a plurality of means for supporting said surface, each said supporting means comprising:
first and second vertical tubes secured to said base; and
a horizontal tube connecting said vertical tubes.

5,197,252
BATTEN EXTENDER
Daniel Tiscareno, 2900 Seven Springs Dr., Placerville, Calif. 95667
Filed May 24, 1991, Ser. No. 705,351
Int. Cl.[5] E04D *1/30*
U.S. Cl. 52—553 8 Claims



1. A batten extender for extending rectangular cross sectioned battens that are attached to the top surface of a roof and have top surfaces that support the tiles in a tile roof across flashings located at the intersection of adjoining roof sections and the intersection of roof sections and abutting walls, said batten extender comprising:
(a) an elongate plate;
(b) said plate having a support element that extends across the flashing and an attachment element that overlies a portion of the top surface of the batten:
(c) means for supporting said support element in a spaced-apart relationship above the flashing approximately coplanar with the top surface of the batten, without obstructing flow of water along the flashing; and
(d) means for attaching said attachment portion to the batten.

5,197,253
INTERLOCKING JOINT PULTRUSION CONSTRUCTION
David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103
Filed Dec. 31, 1990, Ser. No. 636,489
Int. Cl.[5] E04H *12/18*
U.S. Cl. 52—646 9 Claims



1. A three-dimensional joint defining X, Y, and Z directions comprising:
(a) a plurality of elongated structural member pairs formed into an X-directional parallel contiguous pair, a Y-directional parallel contiguous pair, and a Z-directional parallel contiguous pair;
(b) said parallel contiguous pairs intersecting one another to define said joint between said six elongated structural members such that said joint has:
(1) three elongated structural members comprising full-notched members that are only fully notched, said full notch being of length substantially equal to twice the thickness of said structural members and of depth substantially equal to half the thickness of said structural members such that when paired with an oppositely-directed full notch defines a paired pass-through opening for a pair of members which pair will snugly fit into the paired pass-through opening when inserted transversely therethrough;
(2) two of said members being modified notched members having similar full notches to said full-notched members and also having an additional half notch, said half notch being formed transversely of the full notch and substantially at mid-span of the full notch; and,
(3) the sixth elongated structural member having no notches at said joint and being the key post that holds the remaining five members together as a joint:
(c) a reference plane established by two pairs extended in two of said directions and at least one of said pairs which extends in one of said directions being an angulated pair extending obliquely to said reference plane; and,
(d) said joint comprising an interlocking joint held together by the interlocking configurations of the elongated structural members themselves such that said joint is rigid and completely integral.

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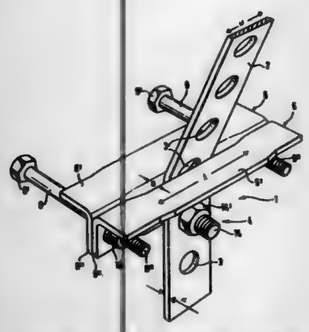
5,197,254
WOVEN WIRE STRUCTURES
Bradford L. Smith, Santa Fe, N. Mex., assignor to Sally Mayer, Santa Fe, N. Mex.
Continuation-in-part of Ser. No. 319,653, Mar. 2, 1989, Pat. No. 4,927,674, and a continuation-in-part of Ser. No. 466,041, Jan. 17, 1990, Pat. No. 5,114,300. This application May 17, 1990, Ser. No. 525,404
The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.
Int. Cl.[5] E04H *12/00*
U.S. Cl. 52—653.1 53 Claims

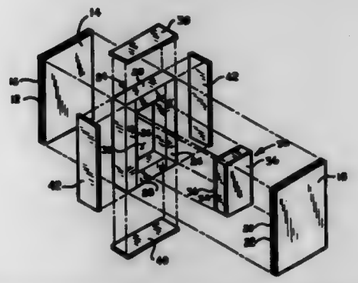
1. A woven wire structural unit comprising:
at least two bundles, each said bundle comprising a plurality of intersecting multi-stranded wire elements comprising two ends;
connecting means for connecting respective ends of said bundles; and
fixing means for imparting rigidity to said woven wire structural unit.

5,197,255
ANCHORING DEVICE FOR FASTENING CLADDING PANELS TO A WALL
Siegfried Fricker, Heimsheim, Fed. Rep. of Germany, assignor to Unistrut Europe PLC, Bedford, United Kingdom
Filed Jan. 25, 1991, Ser. No. 645,789
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002420
Int. Cl.[5] E04B *1/38*
U.S. Cl. 52—703 29 Claims



1. In an anchoring device for fastening cladding panels to a wall, said anchoring device comprising a flat band of a rectangular cross-section that is provided with spaced holes arranged one after another in a longitudinal direction, and with an upper end and thereof being connected to a fastening part, with a first bolt being inserted into one of said holes for fastening said band to a fastening element that is to be connected to said cladding panel, the improvement wherein:
said fastening element comprises a supporting member and an essentially parallel counter member, with said supporting member and said counter member being spaced from one another at a distance over at least a portion of a respective longitudinal dimension of said supporting member and said counter member, with said distance corresponding at least to a thickness of said band, with said band being passed through a space corresponding to said distance and with a section of said band being bendable directly above said supporting member; and
said supporting member is formed as a first angled piece having a respective essentially horizontal leg and a respective essentially vertical leg having a recess corresponding to said distance and extending over a portion of said longitudinal dimension of said supporting member.

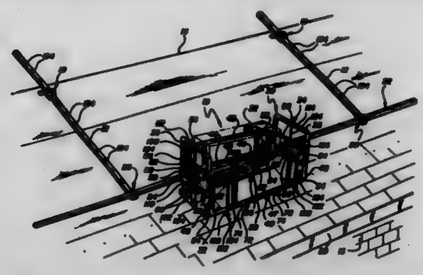
5,197,256
PANEL CONSTRUCTION
David B. Martin, Jenison, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Continuation of Ser. No. 524,323, May 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 336,850, Apr. 12, 1989, abandoned. This application Jun. 7, 1991, Ser. No. 713,033
Int. Cl.[5] E04C *2/36*; B32B *3/12*
U.S. Cl. 52—808 16 Claims



1. In a structural panel comprising a frame, a core and facing means, said frame defining an opening and having opposite frame sides and pairs of vertical and horizontal frame ends, said core being positioned in said opening, having opposite core sides and having four peripheral edges, said facing means being mounted on said opposite frame and core sides for providing opposite front and rear surfaces of said panel; the area defined by the peripheral edges of said core is sufficiently less than that defined by said frame opening so that at least two peripheral edges of said core are spaced inwardly from said frame, the thickness of said core is substantially equal to that of said frame, so that said frame sides are positioned in the same planes as said core sides, and said core is secured to said facing means, the improvement which comprises:
said core comprises a honeycomb center and metal skins on opposite sides of the honeycomb center; and
wherein said core is fixed relative to said frame solely by said facing means.

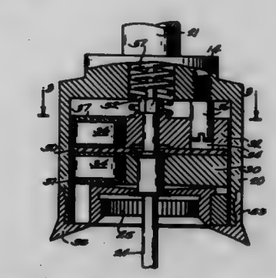
5,197,257
APPARATUS FOR APPLYING SHINGLES TO A ROOF
Roger J. Nietling, 8869 Peet Rd., Chesaning, Mich. 48616
Filed May 28, 1992, Ser. No. 890,037
Int. Cl.[5] E04D *15/00*
U.S. Cl. 52—749 31 Claims

1. Apparatus for applying shingles to a roof comprising track means for defining a substantially horizontal guide path across the surface of the roof; carriage means for supporting a supply of roofing shingles to be applied to the roof and engageable with said track means for movement along said guide path; track support means coupled to said track means for supporting said track means on the roof; adjusting means having at least one bracket member adapted to be fixed to the roof near the vicinity of its peak and slideably accommodating said track support means for enabling said track support means and said



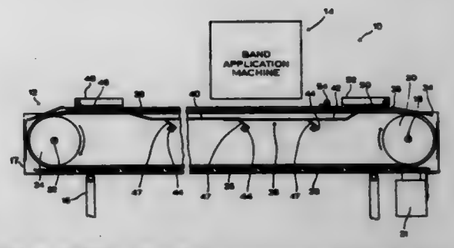
track means to move as a unit relative to said bracket member for positioning said track means in any selected one of a plurality of adjusted positions; and releasable retaining means for releasably retaining said track means in said selected position of longitudinal adjustment.

5,197,258
SCREWCAPPING DEVICE WITH TORQUE LIMITING MAGNETIC CLUTCH
Frank M. Johanek, Elm Grove, Wis., assignor to Federal Manufacturing Co., Milwaukee, Wis.
Filed Oct. 24, 1991, Ser. No. 782,503
Int. Cl.[5] B65B *7/28*
U.S. Cl. 53—317 13 Claims



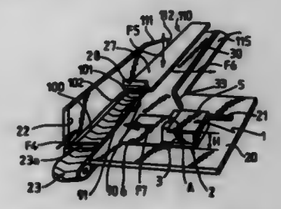
1. A clutch including a driving component and a driven component adapted for use in a screwcapping device to apply a preselected amount of torque to the driven component thereof comprising
a pair of axially aligned circular cylinders of equal diameter each having a generally smooth engaging surface facing the other clutch cylinder of said pair,
said pair of cylinders comprising a driving cylinder and a driven cylinder,
means to rotate the driving cylinder about its axis,
each of said cylinders having a plurality of cavities therein radially spaced around the axis thereof, said cavities containing permanent magnets,
means securing said magnets in said cavities, and,
a removable non-magnetic spacer disk of a diameter approximately equal to that of said cylinders positioned between and in frictional contact with the engaging surfaces thereof.

5,197,259
CONVEYOR SYSTEM AND MACHINE FOR APPLYING TAMPER-EVIDENT BANDS TO CONTAINERS
Victor V. Meunyan, 103 Rothschild Pl., Cary, N.C. 27511
Filed Jan. 31, 1992, Ser. No. 830,186
Int. Cl.[5] B65B *53/02*
U.S. Cl. 53—399 17 Claims



16. A method of inputting containers onto a conveyor and applying a heat shrinkable band to the containers as they are conveyed on the conveyor, comprising the steps of:
(a) inputting respective containers onto an input section of the conveyor by inserting the respective containers into container openings formed by a band support plate;
(b) moving the containers generally horizontally from the input section towards a heat shrinkable band application point;
(c) also moving the containers vertically within the container openings relative to the band support plate as the containers are being moved and conveyed generally horizontally from the input section towards the band application point;
(d) vertically stationing each container with respect to the adjacent band support plate before the application of a heat shrinkable band such that each container extends a selected and fixed distance above the band support plate prior to a band being applied to the container; and
(e) transferring a heat shrinkable band onto respective support plates and around said containers as they pass the band application point.

5,197,260
METHOD FOR PACKING ARTICLES, AND MACHINE FOR PERFORMING THE METHOD
Pierre Chevalier, Boulogne sur Seine, and Gilbert E. Venard, Paris, both of France, assignors to LEmballage Carton Sa (Societe Anonyme), Bretigny Sur Orge, France
Continuation of Ser. No. 429,459, Oct. 31, 1989, abandoned. This application Apr. 22, 1991, Ser. No. 688,703
Claims priority, application France, Oct. 31, 1988, 88 14214
Int. Cl.[5] B65B *11/18*
U.S. Cl. 53—461 35 Claims



1. A method for packaging articles having opposed, parallel surfaces in containers formed from plates of pliable material containing a base portion, a flap portion and a closure panel in integral, coplanar relation on apparatus having a working

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surface, a conveyor movable with respect to said working surface, and a guiding obstruction substantially coextensive with, and extending vertically with respect to, said conveyor, comprising the steps of:

a) forming a set on said working surface by placing an article to be packaged on the facing surface of said base portion of a plate and folding said flap portion across the exposed surface of said article to form a receptacle portion;

b) moving said set onto said conveyor by placing said receptacle portion of said set in engagement with one side of said guiding obstruction with the closure panel extended beyond the other side of said guiding obstruction;

c) moving said set by said conveyor along said guiding obstruction while folding mechanically said closure panel first from the plane of said base portion and thereafter across the opposed surface of said plate;

d) applying adhesive to either one of said closure panel and said opposed plate surface while conveying said set along said obstruction; and

e) pressing said closure panel against said opposed surface to effect an adhesive bond therebetween.

5,197,261

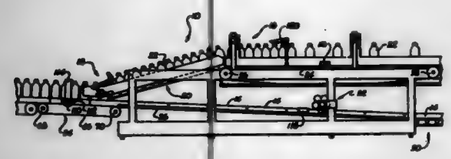
CONTINUOUS CASE LOADING MACHINE

Thomas S. Hartness, and Thomas P. Hartness, both of Greenville, S.C., assignors to Hartness International, Inc., Greenville, S.C.

Continuation of Ser. No. 602,855, Oct. 24, 1990, abandoned. This application Sep. 23, 1991, Ser. No. 764,055

Int. Cl.[5] B65B *5/10, 35/30*

U.S. Cl. 53—534 **13 Claims**



1. An apparatus for depositing individual articles into sockets of containers from a substantially continuous flow of articles, comprising:

an article feed station;

an article loading station;

an unobstructed inclined slide extending from said feeding station to said loading station;

means for successively feeding said articles in aligned rows to an upper end of said inclined slide so that said articles slide down said slide in an abutting relationship while being supported solely on their bottoms to said loading station;

an elongated tray positioned below said inclined slide for guiding said containers to said loading station;

means for feeding said containers into said tray for supplying a successive flow of containers to said loading station directly below said lower end of said inclined slide so that said individual articles can be successively dropped off the end of said slide into successive sockets in said containers;

a container feeding device carried adjacent said tray engaging said containers and forcing said containers towards said loading station in an end to end abutting relationship at a preset feed rate;

a container braking means carried adjacent said loading station for applying a retarding force to said containers while said container feeding device feeds said containers towards said loading station at said loading station for preventing said containers from being separated from their abutting relationship by said articles being deposited into said sockets of said containers and allowing said articles to be fed freely into said sockets at a rate dependent only upon the speed of said containers passing under said lower end of said slide at said loading station.

5,197,262

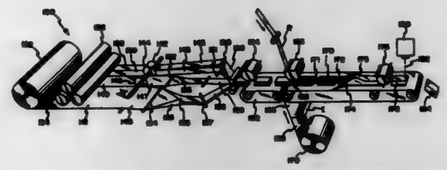
ASSEMBLY FOR PRODUCING A MASS DISTRIBUTABLE PRINTED PACKET

Robert E. Katz, Florham Park; John H. Jones, Westfield; George P. Hipko, Milltown; Stanford Silverschotz, Livingston, all of N.J.; James Hoffman, Doylestown, Pa., and Gerard Wollaer, East Brunswick, N.J., assignors to Webcraft Technologies, Inc., North Brunswick, N.J.

Division of Ser. No. 550,744, Jul. 10, 1990, Pat. No. 5,107,656, which is a continuation-in-part of Ser. No. 360,040, Jun. 1, 1989, Pat. No. 4,939,888, which is a continuation-in-part of Ser. No. 430,869, Oct. 31, 1989, Pat. No. 5,087,805. This application Mar. 10, 1992, Ser. No. 848,162

Int. Cl.[5] B65B *9/06, 35/50*

U.S. Cl. 53—550 **8 Claims**



1. An assembly for producing a packet containing inserts, said assembly comprising:

a) means for forming a set of inserts and placing said inserts on a moving web,

b) banding means for retaining said inserts in place on the moving web,

c) said banding means including a length of ribbon and first crimper means for sealing said ribbon to said web,

d) means for folding said web about said set of inserts,

e) second crimper means for sealing said folded web about said set of inserts to form a series of packets, and

f) cutter means for separating each of said packets in said series from each other.

5,197,263

METHOD AND APPARATUS FOR HARVESTING AQUATIC PLANTS

Brian J. Midtling, Glencoe; Lawrence J. DeVore, Minneapolis, and Victor V. Sygen, West St. Paul, all of Minn., assignors to The Lemna Corporation, Mendota Heights, Minn.

Filed Sep. 13, 1991, Ser. No. 759,488

Int. Cl.[5] A01D *44/00*

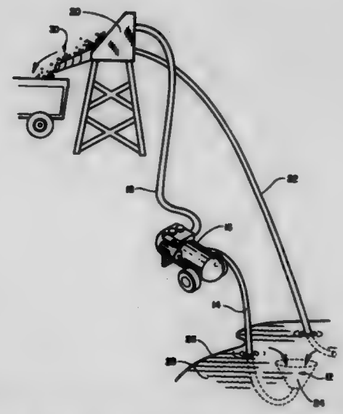
U.S. Cl. 56—8 **28 Claims**

1. A method of harvesting duckweed from a body of water, the method comprising:

recovering a duckweed slurry from the body of water by adjusting a feed head having a mixing chamber, the feed head being proximate the surface of the body of water so duckweed from the surface of the body of water, and water from the body of water flow into the feed head and the mixing chamber, producing the duckweed slurry comprising duckweed and water from the body of water;

transporting the duckweed slurry to a land-based dewatering station;

removing a majority of the water from the duckweed slurry at the dewatering station; and



returning the water removed from the duckweed slurry to the body of water.

5,197,264

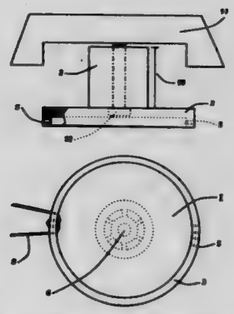
UNIVERSAL FILAMENT TRIMMER CUTTING HEAD

Paul Lacey, Tarbell Hill Rd., Morish, N.Y. 12960

Filed May 21, 1991, Ser. No. 703,466

Int. Cl.[5] A01D *34/73, 50/00*

U.S. Cl. 56—12.1 **10 Claims**



1. A one piece cutting head for vegetation comprising:

a solid dislike body having two planar surfaces;

a drive mounting portion of said head with means, attached to the first planar surface, for positively engaging and securing said head to a drive means; and

a filament mounting portion, on the second planar surface, comprising a wall extending downwardly from the second planar surface around the periphery of the solid dislike body and substantially perpendicular to said second planar surface with filament attachment means comprising an even plurality of holes in said wall.

5,197,265

MULCHING TYPE POWER LAWN MOWER

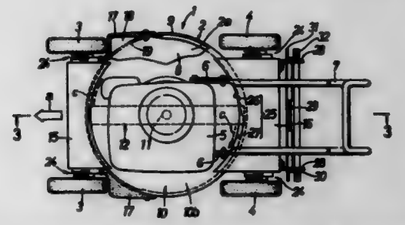
Kenjiro Hiratsuna; Masatoshi Haramatsu, and Kazuhiro Sakamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1991, Ser. No. 813,747

Claims priority, application Japan, Apr. 1, 1991, 3-20625

Int. Cl.[5] A01D *34/63, 67/00*

U.S. Cl. 56—12.9 **10 Claims**



8. A power lawn mower of a mulching type with no opening for releasing mowed lawn pieces sidewardly comprising:

a housing having a short cylindrical peripheral wall defining a lawn drop opening at a lower edge thereof, and

a cutter rotatably driven within said peripheral wall, wherein

said peripheral wall is provided, at a rear substantial half portion of the lower edge thereof, in a direction of forward movement of said lawn mower, with an inwardly protruding portion which projects into the housing substantially parallel to a rotary plane of the cutter for temporarily retaining mowed lawn pieces in a region within a radius of rotation of said cutter.

5,197,266

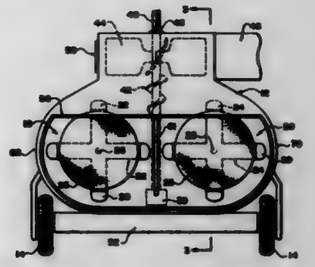
VACUUM FOR COMBINE HARVESTER

Ben Kambeitz, Box 93, Richmond, Saskatchewan, Canada S0N 2E0

Filed Jan. 22, 1991, Ser. No. 643,325

Int. Cl.[5] A01D *46/00*

U.S. Cl. 56—13.1 **14 Claims**



1. An airflow pick up apparatus for lifting crop materials from the ground for transportation to a harvesting machine, the apparatus comprising a housing, means for supporting the housing for movement across the ground in a working direction, a first and a second fan member mounted in the housing in a common horizontal plane each for rotation about a vertical axis with the vertical axis being arranged at transversely spaced positions on either side of the central line of the housing parallel to the working direction and a common plane at right angles to the working direction, means driving the first and second fan members in opposed directions about said vertical axis so as to move the crop material inwardly towards the central line and rearwardly from said common plane, a third fan member positioned in the housing rearwardly of the first

means for allowing the vine reel to rotate around an axis

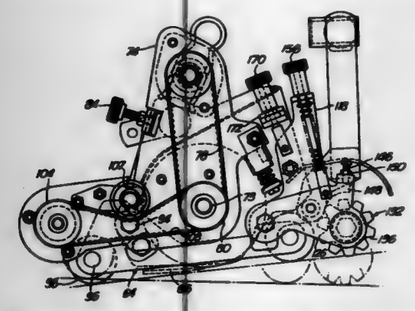
three dowel supports, and

and second fan members for receiving the crop material from the first and second fan members, means for rotatingly driving the third fan member and duct means connected to the housing at the third fan member for receiving the crop material from the third fan member, said third fan member being mounted on a horizontal shaft lying substantially on said central line, the duct member extending from the housing in a direction radial to the horizontal shaft.

5,197,267
GRASS CUTTING UNIT

Edward J. Aldred, and Graham E. Gaskin, both of Suffolk, Great Britain, assignors to Ransomes, Sims & Jefferies Limited, Suffolk, England

Filed Feb. 9, 1990, Ser. No. 479,673
Claims priority, application United Kingdom, Feb. 9, 1989, 8902933
Int. Cl.[5] A01D *34/62*
U.S. Cl. 56—249 **10 Claims**



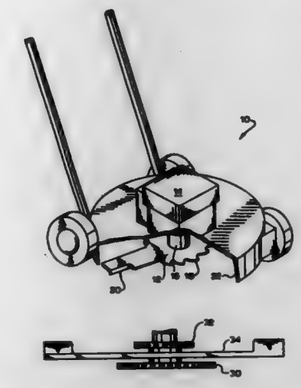
8. A grass cutting unit for a powered and riden grass cutting machine, the unit comprising a frame adapted to be supported on the machine for movement relative thereto in following ground contours; a cutter reel mounted in the frame for driven rotation; a bed knife supported on the frame and having a transverse cutting edge for cooperation with the cutter reel; front and rear rollers extending transversely and disposed respectively in front of and behind the cutter reel; a pair of cantilevered knife roller support arms; and a knife roller supported between said knife roller support arms extending parallel with and immediately in front of the front roller and providing a plurality of axially spaced, vertically extending thatch cutting blades.

5,197,268
MULCHING BLADE

Severo Barrera, 15961 Woodbine Cir., Mundelein, Ill. 60060

Continuation-in-part of Ser. No. 800,214, Nov. 29, 1991, abandoned. This application Sep. 2, 1992, Ser. No. 942,721
Int. Cl.[5] A01D *34/68*
U.S. Cl. 56—255 **1 Claim**

1. Mulching apparatus for a mower having a rotary driven shaft comprising:
an elongated cutting member adapted to be mounted to the rotary driven shaft of the mower;
a primary central disk member having a plurality of mulching teeth defined along the peripheral edge thereof and spaced below said elongated cutting members, wherein the diameter of said central portion is less than 55% of the length of said elongated cutting member; and
a secondary disk member having mulching teeth defined on the periphery thereof mounted above said cutting member, and wherein the diameter of said secondary disk

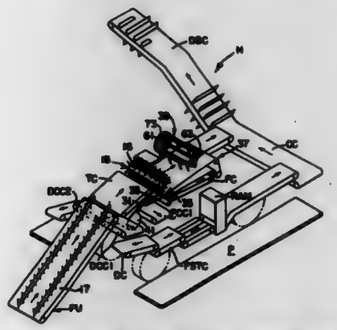


member is less than 70% of the diameter of said primary disk member.

5,197,269
VINE SEPARATION SYSTEM

David J. Meester, Fresno, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 3, 1991, Ser. No. 725,709
Int. Cl.[5] A01D *46/00*
U.S. Cl. 56—327.1 **15 Claims**



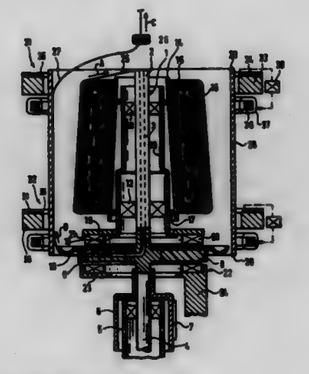
1. A harvester for harvesting and separating fruits from vines, comprising:
means for cutting the vines;
means for disengaging the fruits from the vines;
a separation conveyor for conveying disengaged fruits and vines in a first direction;
a vine reel located above the separation conveyor for providing separations between vines, comprising:
a reel frame wherein the reel frame comprises
a first reel arm on the first side of the separation conveyor, wherein the first reel arm rotates around the axis;
a second reel arm on the second side of the separation conveyor, wherein the second reel arm rotates around the axis; and
a plurality of bats that extend substantially from the first reel arm to the second reel arm; and
a plurality of tines, wherein the tines are connected to the bats and wherein the bats are able to rotate with respect to the first and second reel arms;

means for allowing the vine reel to rotate around an axis extending from a first side of the separation conveyor to a second side of the separation conveyor; and
means for driving the vine reel to rotate around the axis.

5,197,270
MAGNETIC BEARING SYSTEM FOR A SPINNING MACHINE ROTOR

Gerd Stahlecker, Eislingen/Fils, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, Fed. Rep. of Germany

Filed May 15, 1991, Ser. No. 700,397
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1990, 4018541
Int. Cl.[5] D01H *7/86, 13/00*
U.S. Cl. 57—58.83 **4 Claims**



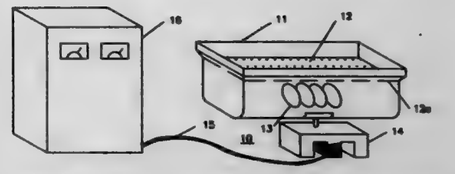
1. An assembly comprising:
a spinning or twisting spindle,
a rotor in the form of a cylindrical yarn balloon limiting device arranged centrically with respect to the spindle, said rotor comprising magnetizable material,
an axially magnetized permanent magnet ring surrounding and axially supporting the rotor,
sensors for detecting radial deviations of the rotor from a predetermined desired radial position,
electromagnetic devices arranged around the rotor for controlling radial movement of the rotor, and
an electronic control device for controlling the electromagnetic devices to radially stabilize the rotor at its predetermined radial position in response to signals from the sensors,
wherein the spinning or twisting assembly is a double or two for one spinning or twisting assembly is a double or two for one spinning or twisting spindle assembly including a disk, and wherein the rotor rotates independently of the disk in response to frictional force of the yarn acting thereon.

5,197,271
METHOD AND APPARATUS FOR BACK SIDE DAMAGE OF SILICON WAFERS

John Robbins, Sherman, and Ricky L. Boston, Denison, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 378,632, Jul. 12, 1989, Pat. No. 5,006,475. This application Mar. 22, 1991, Ser. No. 674,822
Int. Cl.[5] B24B *1/04*
U.S. Cl. 51—163.1 **7 Claims**

1. A fixture for holding semiconductor wafers during backside damaging of the wafers, comprising;
two side pieces,
three dowel supports, and
a handle,
the three dowel supports connected to the two side pieces and rigidly supporting the semiconductors wafers be-



tween the three dowel supports, such that the wafers are rigidly secured between the dowel supports when the dowel supports are in place between the two side pieces, and the handle is pivotally connected to the two side pieces.

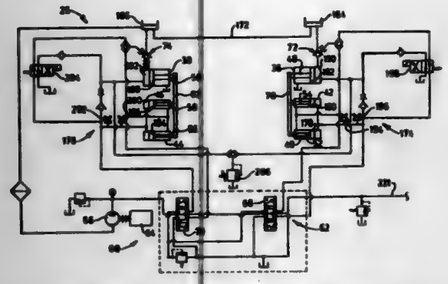
5,197,272
APPARATUS FOR THE AUTOMATIC REMOVAL OF BOBBINS FROM A BANK OF SPINDLES FOR LONG FIBERS AND SHORT FIBERS AND PROCESS FOR USING THIS APPARATUS

Michel Frey, Mulhouse, France, assignor to N. Schlumberger et Cie, S.A., Guebwiller, France

Filed Jul. 30, 1991, Ser. No. 738,739
Claims priority, application France, Jul. 30, 1990, 90 09675
Int. Cl.[5] D01H *9/00, 9/10*
U.S. Cl. 57—267 **6 Claims**

1. Apparatus for the automatic removal of bobbins from a bank of spindles, comprising a transporting fork (1) having a plurality of recesses for simultaneously handling a plurality of spindles, the transporting fork being movable in a vertical direction and in at least one horizontal direction parallel to a bank of spindles on a spindle carrying carriage, a cup through which each spindle is insertable for the support and manipulation of bobbins, a conveyor for the evacuation of full bobbins and for the supply of empty bobbins, and means on the transporting fork for releasably retaining a said cup in each said recess whereby each cup is seized by and disengaged from said fork upon movement of said fork in said at least one horizontal direction, the fork with cups in said recesses being upwardly movable to lift full bobbins from said spindles and to engage said full bobbins on said conveyor for removal, said fork then being downwardly movable to disengage the cups from the full bobbins and movable upwardly to engage the cups with empty bobbins on said conveyor and then movable downwardly to remove empty bobbins from the conveyor and to cause the spindles to be inserted through the cups and into the empty bobbins.

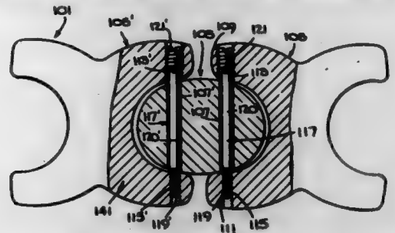
5,197,273
FLUID CONTROL SYSTEM FOR A TRACK PRESS
Richard E. Livesay, Peoria, Ill., and Owen R. Thompson, Louisville, Ky., assignors to Caterpillar Inc., Peoria, Ill.
Filed Mar. 24, 1992, Ser. No. 856,609
Int. Cl.[5] B21L 9/06
U.S. Cl. 99—7 16 Claims



1. A fluid control system for a track press comprising:
a source of pressurized fluid;
a first fluid work circuit for receiving said pressurized fluid and performing a first work function;
a second fluid work circuit for receiving said pressurized fluid and performing a second work function;
first and second control valves for selectively controlling flow of said pressurized fluid to said respective first and second work circuit;
said first work circuit including first and second dual acting slave cylinders and a first single acting master cylinder, each master cylinder having a working chamber, each of said slave and master cylinder having a piston and a rod, said rods of said slave and master cylinders being connected to a first reaction bar;
said second work circuit including third and fourth dual acting slave cylinders and a second single acting master cylinder, each of said slave and master cylinders having a piston and a rod, said rods of said slave and master cylinders being connected to a second reaction bar;
said first work circuit including a first fluid reservoir, a pilot operated first high flow capacity control valve in direct communication with said first fluid reservoir and with the working chamber of said first master cylinder; and
said second work circuit including a second fluid reservoir, a pilot operated second high flow capacity control valve in direct communication with said second fluid reservoir and with the working chamber of said second master cylinder.

5,197,274
LINK ASSEMBLY FOR A WATCH BRACELET
Rafael Braun, Flushing, N.Y., assignor to E. Gluck Corporation, Long Island City, N.Y.
Filed Oct. 15, 1991, Ser. No. 775,858
Int. Cl.[5] F16G 13/00
U.S. Cl. 59—80 33 Claims

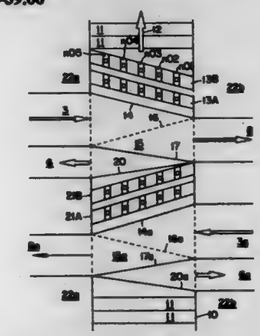
1. A link assembly for a link bracelet comprising:
first link member having a first bore therethrough, and a second link member having a second and third bore therethrough, said second bore and said third bore disposed on opposite sides of and axially aligned with said first bore;
a longitudinal pin extending through said first bore and rotatable therein, said pin also extending through a first portion of said second bore and at least a portion of said third bore for enabling said first link member to pivotally rotate with respect to said second link member; and



a threaded member occupying a second portion of the second bore for maintaining the pin within said bores.

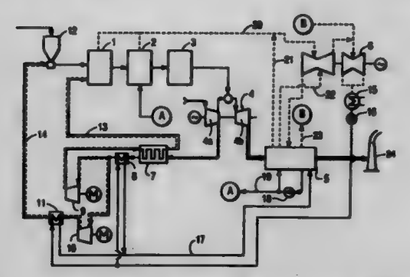
5,197,275
Patent Not Issued For This Number

5,197,276
METHOD FOR PREPARING THE WORKING GAS IN A GAS TURBINE INSTALLATION
Jakob Keller, Dottikon, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Jul. 11, 1991, Ser. No. 728,712
Claims priority, application European Pat. Off., Jul. 27, 1990, 90114429
Int. Cl.[5] F02C 3/02
U.S. Cl. 60—39.06 5 Claims



1. A method for preparing the working gas in a gas turbine installation which essentially comprises a compressor, a pressure wave machine connected downstream of the compressor and a gas turbine connected downstream of the pressure wave machine, essentially comprising a cell rotor with rotor cells, a housing surrounding the cell rotor at the circumference and at the front sides, which housing is connected via at least one pressure wave machine inlet duct to the compressor and via at least one pressure wave machine outlet duct to the gas turbine, wherein the air prepared in the compressor is mixed with a fuel prior to entry into the pressure wave machine, wherein the fuel/air mixture is introduced into the rotor cells revolving past the end of said at least one pressure wave machine inlet duct, wherein the fuel/air mixture is brought to ignition in the condition of a constant volume indicated by the size of the rotor cells and wherein the gas turbine is acted upon by a working gas forming from the combustion in the rotor cells, wherein a high pressure portion of said working gas exits from said rotor cells through said at least one pressure wave machine outlet duct in a direction opposite to a direction of said fuel/air mixture entering said rotor cells.

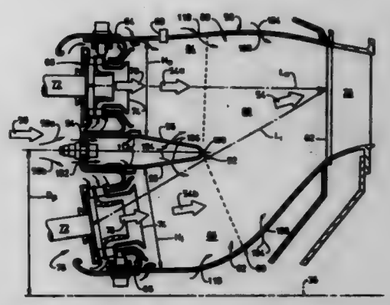
5,197,277
GASIFICATION-TYPE COMBINED ELECTRIC POWER GENERATING PLANT
Shigeyasu Ishigami, and Takaaki Furuya, both of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1992, Ser. No. 849,335
Claims priority, application Japan, Mar. 11, 1991, 3-44884
Int. Cl.[5] F02B 43/00; F02G 3/00
U.S. Cl. 60—39.12 3 Claims



1. A gasification-type combined electric power generating plant comprising a gasifying furnace for partially oxidizing a carbon-containing fuel under high-temperature and high-pressure conditions using an oxygen-containing gas, a heat exchanger for recovering the sensible heat of a high-temperature fuel gas generated in the gasifying furnace, a gas purifying device for eliminating minor pollutive gas components and dust out of the fuel gas passed through the heat exchanger, a gas turbine driven upon combustion of the gas purified in the gas purifying device, a gas turbine compressor connected to the gas turbine, an exhaust heat recovering boiler for recovering heat from high-temperature gas at the outlet of the gas turbine, and a steam turbine driven by steam generated by the recovered heat, said gasification-type combined power generating plant further including:
a regenerative heat exchanger which cools oxygen-containing gas bled from the gas turbine compressor,
a cooler which cools the oxygen-containing gas from said regenerative heat exchanger,
a primary air booster which boosts a part of the oxygen-containing gas from said cooler to deliver a primary air,
a secondary air booster which boosts the remainder of the oxygen-containing gas from said cooler to deliver a secondary air, and
a passage through which the secondary air from said secondary air booster is supplied to said regenerative heat exchanger, whereat the secondary air is heated and then passed to the gasifying furnace.

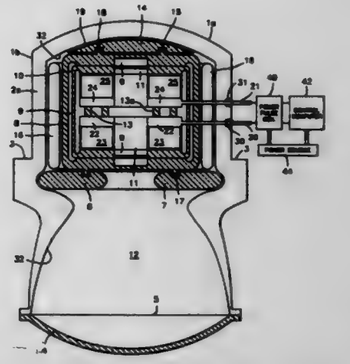
5,197,278
DOUBLE DOME COMBUSTOR AND METHOD OF OPERATION
Paul E. Sabla, Cincinnati; Willard J. Dodds, West Chester, and Donald W. Bahr, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 17, 1990, Ser. No. 628,290
Int. Cl.[5] F02C 7/22
U.S. Cl. 60—39.02 14 Claims

1. A method of operating a double dome combustor having a longitudinal centerline axis at and above an idle power condition to a full power condition, said combustor having spaced apart radially outer and inner liners, and radially outer and inner domes joined to upstream ends of said outer and inner liners for defining outer and inner combustion zones extending downstream from said outer and inner domes, respectively, said combustor being provided with fuel and with compressed airflow, having a dome total airflow flowrate, to both said outer and inner domes, said method comprising:
channeling an outer portion of said compressed airflow having a first portion of said total dome flowrate through said outer dome into said outer combustion zone for generating outer combustion gases having an outer reference velocity effective for obtaining ignition and flame stability at and above said flight idle power condition;
channeling through said inner dome into said inner combustion zone above said flight idle power condition and up to said full power condition an inner portion of said compressed airflow having a second portion of said total dome



flowrate for generating inner combustion gases having an inner reference velocity greater than said outer reference velocity;
diffusing said outer combustion gases in said outer combustion zone in longitudinal section from said outer dome; and
diffusing said inner combustion gases in said inner outer combustion zone in longitudinal section from said inner dome.

5,197,279
ELECTROMAGNETIC ENERGY PROPULSION ENGINE
James R. Taylor, 1907 May Cir., Fultondale, Ala. 35068
Continuation-in-part of Ser. No. 459,441, Jan. 2, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 847,684
Int. Cl.[5] F03H 5/00
U.S. Cl. 60—203.1 26 Claims



1. An electromagnetic propulsion engine comprising:
a hollow housing having a central axis, a forward wall, a side wall portion, and a magnetically transparent rear wall;
a forward electromagnetic field generating means within said housing for generating a rearwardly directed magnetic field toward said rear wall and parallel to said central axis;

into the pump chamber of the diaphragm pump means, duplic mates from said hydraulic pump, wherein the system

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a rearward electromagnetic field generating means between said forward generating means and said rear wall for producing a forwardly directed magnetic field parallel to said central axis and opposing said rearwardly directed magnetic field, said rearwardly directed magnetic field repelling forwardly directed pulses of said forwardly directed magnetic field generated by said rearward magnetic field generating means;

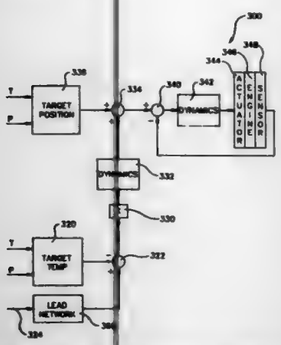
means for providing controlled pulses of electric power having predetermined durations to said field generating means, so that sudden reduction of electrical current conduction in said rearward field generating means during continuing rearward directed magnetic field force of said forward magnetic field generating means causes a pulse of magnetic field energy of said rearward magnetic field generating means to be transmitted from the rear of the propulsion engine as said magnetic field of said forward field generating means is projected with a sudden action through said magnetically transparent rear wall, producing a rapid reduction of magnetic field intensity inside said housing and a corresponding combined forward thrust to said housing.

5,197,280

CONTROL SYSTEM AND METHOD FOR CONTROLLING A GAS TURBINE ENGINE

R. Sheldon Carpenter, Lynn, and William L. Gazzola, Salem, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 325,723, Mar. 20, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 607,786
Int. Cl.[5] F02K *1/15*
U.S. Cl. 60—204 11 Claims



1. A control system for a gas turbine engine having a variable exhaust nozzle comprising:

means for receiving a signal representative of a target engine temperature;

means for receiving a signal representative of actual engine temperature;

difference means for producing an error signal representative of the difference between said target temperature signal and said actual engine temperature signal;

gain means for adjusting the gain of said error signal to be equal to the desired change in the position of a variable exhaust nozzle;

means for receiving a signal representative of a target position for said variable exhaust nozzle; and

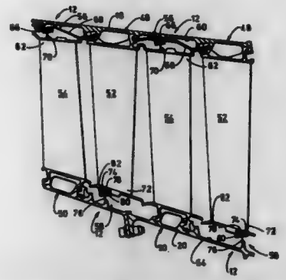
means for combining the output of said gain means to the output of said means for receiving a signal representative of a target position for said variable exhaust nozzle and said combined gain means and said variable exhaust nozzle target means are coupled to an activator of the engine which controls the variable exhaust nozzle.

5,197,281

INTERSTAGE SEAL ARRANGEMENT FOR AIRFOIL STAGES OF TURBINE ENGINE COUNTERROTATING ROTORS

James C. Przytulski, Fairfield; Richard L. Horvath, Hamilton, and Robert J. Corsmeier, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 3, 1990, Ser. No. 505,120
Int. Cl.[5] F02K *3/02*
U.S. Cl. 60—226.1 6 Claims



1. In a gas turbine engine having outer and inner counterrotatable annular turbine rotors and first and second pluralities of turbine blades disposed in alternating rows and mounted on and extending between the respective rotors, an interstage seal arrangement comprising:

(a) an annular honeycomb components attachable to inner ends of said blades in said first plurality thereof mounted at their outer ends to an interior side of said outer rotor;

(b) means for attaching said honeycomb component to said blade inner ends, comprising:

an elongated backing member;

means defining a slot in said blade inner ends into which said backing member is slidably fit in an interlocking relation;

means defining at least one notch in said blade inner ends which intersects said slot therein; and

at least one bendable tab connected to said backing member and being deformable to fit into said notch for restarting movement of said backing member also said slot during counterrotation of said rotors; and

(c) at least one annular seal element mounted on an exterior side of said inner rotor and projecting radially outwardly therefrom for sealably interfacing with said honeycomb component concurrently as said outer and inner rotors counterrotate relative to one another.

5,197,282

SECONDARY AIR SUPPLY SYSTEM FOR ENGINE UNIT

Taketsugu Kume, Shizuoka, Japan, assignor to Suzuki Kabushiki Kaisha, Japan

Filed Nov. 21, 1991, Ser. No. 795,816
Claims priority, application Japan, Nov. 22, 1990, 2-316046
Int. Cl.[5] F01N *3/32*
U.S. Cl. 60—307 5 Claims

1. A secondary air supply system for use with a vehicle having an engine unit having a crank chamber which has a reed valve for controlling gas mixture flow and being connected to an air cleaner and an exhaust system including an exhaust pipe, the secondary air supply system comprising:

diaphragm pump means provided with an inner chamber means and having an air inlet port and an air outlet port both being communicated with the inner chamber means;

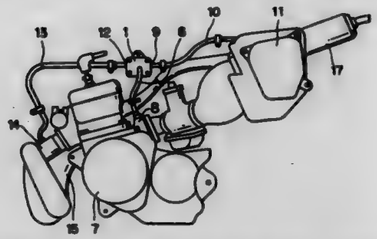
a diaphragm disposed in the inner chamber means to divide the inner chamber means into a diaphragm chamber and a pump chamber;

first hose means connecting the air inlet port and the air cleaner to introduce a secondary air from the air cleaner into the pump chamber of the diaphragm pump means through the inlet port;

second hose means connecting the air outlet port and the exhaust pipe to supply the secondary air from the diaphragm pump means into the exhaust pipe through the outlet port;

third hose means having one open end opening into the diaphragm chamber of the diaphragm pump means and another open end opening into the crank chamber at a location near the reed valve in a direction normal to gas mixture flow at that location;

wherein the secondary air is supplied into the exhaust pipe through the diaphragm pump by an amount in proportion to an oscillation of the diaphragm caused in accordance with a pressure variation in the crank chamber caused in proportion to an engine revolution speed.

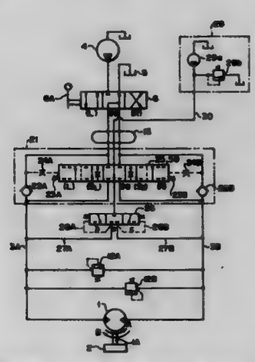


5,197,283

HYDRAULIC-MOTOR DRIVE CIRCUIT SYSTEM WITH ANTI-CAVITATION CONTROL

Hitoshi Kagiwada, Ibaraki, and Tomohiko Yamaoka, Toride, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/01571, § 371 Date Apr. 1, 1991, § 102(e) Date Apr. 1, 1991, PCT Pub. No. WO91/08395, PCT Pub. Date Jun. 13, 1991
PCT Filed Dec. 4, 1990, Ser. No. 667,403
Claims priority, application Japan, Dec. 4, 1989, 1-314699; Dec. 4, 1989, 1-314700; Aug. 30, 1990, 2-228835
Int. Cl.[5] F16D *31/02, 39/00*
U.S. Cl. 60—464 16 Claims



1. A hydraulic-motor drive circuit system comprising a hydraulic motor for rotatively driving an inertia load, a hydraulic pump serving as a main hydraulic source, a reservoir, a pair of main lines through which said hydraulic motor is connected to said hydraulic pump and said reservoir, and a directional control valve arranged in said pair of main lines for switching a direction of hydraulic fluid supplied to said hydraulic motor from said hydraulic pump, wherein the system comprises:

an auxiliary hydraulic source;

an auxiliary line having one end thereof connected to said auxiliary hydraulic source;

low-pressure selecting means connected to the other end of said auxiliary line and said pair of main lines for causing the other end of said auxiliary line to communicate with one of said pair of main lines on a low pressure side during rotation of said hydraulic motor;

switching control means arranged in said auxiliary line for supplying the hydraulic fluid from said auxiliary hydraulic source to the other end of said auxiliary line when said directional control valve is at least in a neutral position, and cutting off the supply of the hydraulic fluid from said auxiliary hydraulic source to the other end of said auxiliary line when said directional control valve is in an operative position; and

a counter balance valve arranged in said pair of main lines at a location between said directional control valve and said hydraulic motor, wherein said low-pressure selecting means is connected to said pair of main lines at a location between said counter balance valve and said hydraulic motor,

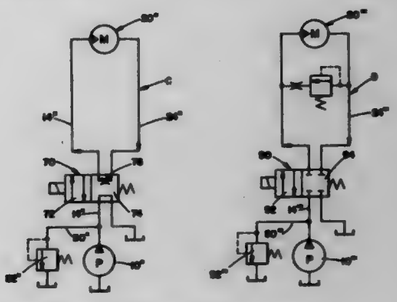
wherein said switching control means includes first valve means arranged in said auxiliary line for supplying, responsive to operation of said counter balance valve, the hydraulic fluid from said auxiliary hydraulic source to the other end of said auxiliary line when said counter balance valve is at least in a neutral position, and cutting off the supply of the hydraulic fluid from said auxiliary hydraulic source to the other end of said auxiliary line when said counter balance valve is in an operative position.

5,197,284

HYDRAULIC MOTOR DECELERATION SYSTEM

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Continuation of Ser. No. 453,412, Dec. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 383,795, Jul. 21, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,714
Int. Cl.[5] F16D *31/02, 39/00*
U.S. Cl. 60—466 12 Claims



1. A hydraulic control system comprising:

a pump;

a hydraulic motor; and

a motor hydraulic circuit interconnecting said pump and said motor, said circuit comprising:

a first hydraulic fluid line extending between said pump and an inlet of said motor,

a first control valve located in said fluid line for selectively allowing the flow of fluid between said pump and said motor inlet, said first control valve comprising a first envelope which allows a flow of fluid from said pump to said motor and a second envelope which prevents a flow of fluid from said pump to said motor,

a second hydraulic fluid line extending from an outlet of said motor to said first control valve,

a means for allowing a circulation of fluid through said motor and between said first and second fluid lines when said pump is disconnected from said motor, wherein said means for allowing circulation comprises a fluid path in said second envelope of said first control valve which fluid path allows a flow of fluid therethrough without fluid loss, and

a means for slowing a flow of fluid between said first and second fluid lines, wherein said means for slowing comprises a flow control orifice located in said fluid path in said second envelope of said first control valve.

12. A method for decelerating a hydraulic motor when the motor is disconnected from a hydraulic pump, said method comprising:

providing a hydraulic circuit interconnecting the motor and the pump, said hydraulic circuit including first and second hydraulic fluid lines which communicate, respectively, with an inlet and an outlet of said motor and a first valve which controls a flow of hydraulic fluid from said pump to said motor through at least one of said first and second fluid lines;

blocking a flow of fluid from said motor to said pump;

allowing a flow of fluid between said first and second fluid lines without a loss of fluid thereby enabling said motor to continue turning; and

allowing the speed of rotation of said motor by restricting the rate of flow of fluid through said first and second fluid lines wherein said step of slowing comprises the subsidiary steps of:

providing a third hydraulic fluid line which selectively communicates said first and second fluid lines as regulated by a relief valve; and

providing a flow control orifice in said third fluid line, said flow control orifice being constantly operative to throttle fluid flow through said third fluid line.

5,197,285

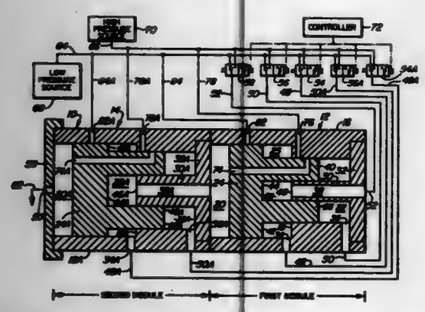
MODULAR DIGITAL ACTUATOR

Andrew B. Dunwoody, Richmond, Canada, assignor to The University of British Columbia, Vancouver, Canada

Continuation-in-part of Ser. No. 585,524, Sep. 20, 1990, Pat. No. 5,062,268, and a continuation-in-part of Ser. No. 632,944, Dec. 24, 1990, Pat. No. 5,058,384, which is a continuation of Ser. No. 473,748, Feb. 2, 1990, Pat. No. 5,011,180. This application Sep. 6, 1991, Ser. No. 756,332

Int. Cl.[5] B60T *11/20*

U.S. Cl. 60—562 **4 Claims**



1. A module for use in a digital actuator, said module comprising a housing having a pair of axially extending cylinder forming sections, a first section of said pair of sections having a first cross sectional area and a second section of said pair of said sections having a second cross sectional area, said first cross sectional area being different from said second cross sectional area, piston means, said piston means forming a first piston axially slidable in and mating with said first section, said piston means also including an extension, said extension forming a second piston rigidly connected with said first piston and axially slidable in and mating with said second section, an axially extending cavity in said piston means, said cavity forming a cylinder extending axially of said housing, a shaft forming a third piston extending axially of said housing and axially slidable in and mating with said cavity, an end closure closing the end of said second section remote from said first section, said third piston being connected to said end closure, an axial passage for fluid flow to and from said cavity extending through said end closure and said shaft and leading into said cavity, a first passage through said housing leading into said first section adjacent to a line of demarkation between said first and second sections in said housing for flow of fluid therethrough to and from said first section and a second passage through said housing leading into said second section adjacent to said end closure for flow of fluid to and from said second section, a plurality of said modules axially positioned so that said end closure of a second module closes the end of said second cylinder forming section of said second module and said first cylinder forming section of a first module and said axial passage in said second module interconnects the end of said first cylinder section remote from said second cylinder section in said first module with said cavity in said second module.

5,197,286

Patent Not Issued For This Number

5,197,287

EXHAUST CONTROL SYSTEM FOR ENGINE WITH TURBOCHARGERS

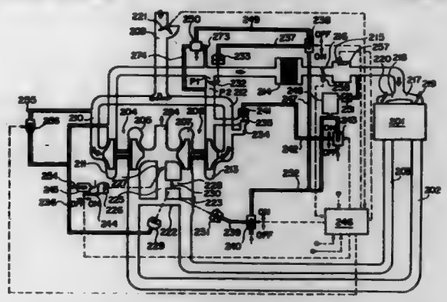
Haruo Okimoto; Seiji Tashima; Akiharu Nakamoto, and Ikuo Onimura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 30, 1990, Ser. No. 575,008

Claims priority, application Japan, Aug. 31, 1989, 1-227910

Int. Cl.[5] F02B *37/12*

U.S. Cl. 60—612 **8 Claims**



1. An exhaust control system for an engine for a vehicle provided with at least one primary turbocharger and at least one secondary turbocharger, the primary turbocharger and the secondary turbocharger having blowers disposed in the intake passage of the engine in parallel to each other and turbines disposed in the exhaust passage of the engine in parallel to each other, an air mass flow detecting means which detects air mass flow into the engine, and with an exhaust cutoff valve which is disposed in the exhaust passage, a control means which opens the exhaust cutoff valve in accordance with output of the air mass flow detecting means to feed exhaust gas to the turbine of the secondary turbocharger only when a large intake air mass range is detected by the air mass flow detecting means, and a waste gate vale which opens and closes a waste gate passage between upstream and downstream ends of the turbines according to the supercharging pressure and ones to relive exhaust gas fed to the turbochargers when the supercharging pressure exceeds a predetermined value, characterized by having

a relief inhibiting means which prohibits the waste gate valve from opening for a predetermined time after the operating condition of the engine shifts into the large intake air mass range and the exhaust cutoff valve opens when shift of the operating condition of the engine form a small intake air mass range to the large intake air mass range is required.

5,197,288

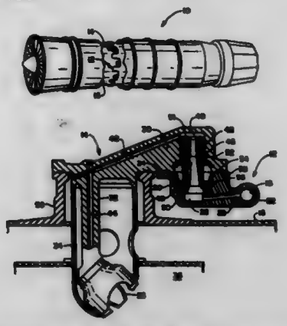
DETACHABLE FUEL MANIFOLD FOR GAS TURBINE ENGINES

Allan B. Newland, St. Lambert; Ronald Portanier, Longueuil, and Jan H. Stastny, St. Bruno, all of Canada, assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1991, Ser. No. 804,647

Int. Cl.[5] F02C *1/00*; F02G *3/00*

U.S. Cl. 60—734 **8 Claims**



1. An apparatus for distributing fuel from a fuel control system into a gas turbine engine comprising:

a fuel manifold having a means for carrying fuel around a support casing of the gas turbine engine; and

a plurality of fuel injectors each having a nozzle portion joined in fluid communication with a means for discharging the fuel into a combustion chamber of the gas turbine engine;

characterized in that

said fuel manifold further includes a first means for connecting said carrying means in fluid communication with each of said fuel injectors, said first connecting means being disposed adjacent to said nozzle portion;

each of said fuel injectors further includes a second means for connecting said nozzle portion in fluid communication with said first connecting means, said first and second connecting means being releasably connected and said fuel injector being removable without moving said carrying means and said first connecting means; and

further comprising a means for sealably connecting said first connecting means in fluid communication with said second connecting means;

wherein said second connecting means is disposed adjacent to said nozzle portion and includes a radially inward facing surface interfacing with said first connecting means;

wherein said second connecting means is further characterized by:

an interfacing portion joining said nozzle portion in fluid communication with said first connecting means;

said interfacing portion being disposed adjacent to said nozzle portion;

said interfacing portion including said radially inward facing surface abutting said first connecting means;

lock nuts and studs fastening said first connecting means to said interfacing portion; and

lock nuts and studs fastening said interfacing portion to a boss disposed on the casing.

5,197,289

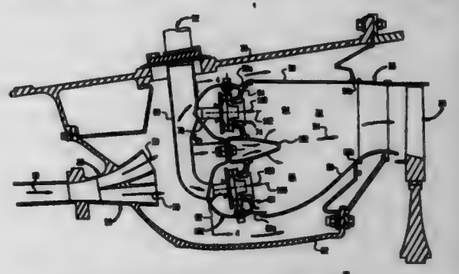
DOUBLE DOME COMBUSTOR

Mark M. Glevicky; Hubert S. Roberts, Jr.; Steven C. Steffens, and Kevin W. Pendery, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 26, 1990, Ser. No. 617,760

Int. Cl.[5] F02C *01/00*

U.S. Cl. 60—746 **24 Claims**



1. For a gas turbine engine having a compressor providing compressed airflow, a double annular combustor comprising:

an outer liner;

an inner liner spaced from said outer liner;

an outer annular combustor including;

a first dome having an outer end fixedly joined to said outer liner, an inner end spaced from said outer end, and a plurality of circumferentially spaced first holes disposed therein;

an inner annular combustor including;

a second dome spaced from said first dome and having an outer end, an inner end spaced from said second dome outer end and fixedly joined to said inner liner, and a plurality of circumferentially spaced second holes disposed therein;

said outer and inner liners defining therebetween first and second combustion zones disposed downstream of said first and second domes, respectively; and

means for joining together said first dome and said second dome by two load transmitting structural paths for providing rigidity of said first and second domes for accommodating pressure loading from said compressed airflow.

5,197,290

VARIABLE AREA COMBUSTOR AIR SWIRLER

Fei P. Lee, Novi; Theodore R. Koblish, and Robert M. Halverson, both of Birmingham, all of Mich., assignors to Fuel Systems Textron Inc., Zeeland, Mich.

Filed Mar. 26, 1990, Ser. No. 499,023

Int. Cl.[5] F02C *1/00*

U.S. Cl. 60—748 **21 Claims**

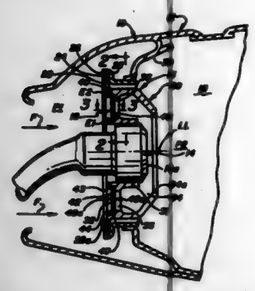
1. In combination, a gas turbine engine combustor having an inlet, a fuel nozzle cooperatively disposed relative to the inlet for supplying fuel to the combustor and a variable area air swirler cooperatively disposed relative to the inlet for admitting air to the combustor from a compressor, said swirler comprising a swirler member having a plurality of air control doors so formed therein as to have a side integrally and resiliently pivotally connected to said swirler member to define a door hinge axis such that said doors are progressively canted

than said first target temperature of the room by a prede-

a detector assembly directly mounted on top of the second

VOL 1148 ISS 5 MR 30 1993

relative to said swirler member for providing a predetermined air flow rate and air swirl angle in response to varistions in air



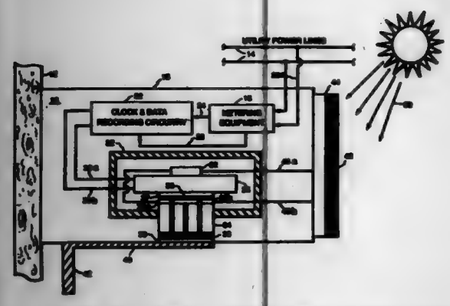
pressure differential across the swirler resulting from variations in fuel flow through the nozzle.

5,197,291

SOLAR POWERED THERMOELECTRIC COOLING APPARATUS

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1990, Ser. No. 611,566
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.
Int. Cl.[5] G01R *21/06*
U.S. Cl. 62—3.2 9 Claims



1. Apparatus for cooling an electric battery exposed to heating due to incident solar irradiation, comprising: a solar cell for generating direct current electric power responsive to said solar irradiation, the amount of electric power generated by said solar cell corresponding to the intensity of said incident solar irradiation; a thermoelectric module electrically coupled to receive said direct current electric power from said solar cell, said module being thermally coupled to said electric battery to directly extract heat therefrom in dependence upon the amount of electric power generated by said solar cell in a self regulating manner such that the amount of heat extracted corresponds with the intensity of said incident radiation.

5,197,292

COOLING CAP FOR ATHLETES

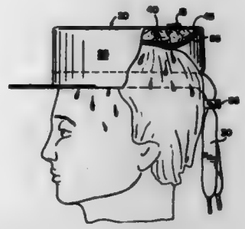
Paul R. McPherson, 929 Middleton Ave., Lisle, Ill. 60532

Filed Jul. 15, 1991, Ser. No. 729,629
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—56 21 Claims

21. A method of cooling a wearer, using a cap having an interior surface and exterior surface, said cap having at least one opening to at least one defined compartment chamber within, said chamber formed therewithin by the interior surface of said cap and an exterior surface of said cap, said chamber further having an access and sad chamber interior having at least one means for transmitting fluid from said chamber interior through said caps interior surface onto the wearer, comparing the steps of:

opening said access;

depositing ice within the at least one defined compartment chamber;



closing said access;

allowing the ice to melt; and

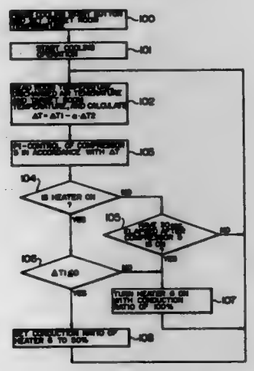
passing the melted ice through said at least one mean for transmitting fluid and dripping it onto the head of the wearer.

5,197,293

METHOD OF CONTROLLING AN AIR CONDITIONING APPARATUS AND AIR CONDITIONING APPARATUS USING THE METHOD

Tetsunobu Okamura; Kiyoshi Nagasawa, both of Tochigi, and Kuniyuki Yamada, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1992, Ser. No. 841,542
Claims priority, application Japan, Feb. 26, 1991, 3-053267
Int. Cl.[5] F25B *1/00*
U.S. Cl. 62—228.4 6 Claims



1. A method of controlling a cooling operation in an air conditioning apparatus including a compressor for a room, comprising the steps of:

suctioning and cooling air in said room;

measuring a first air temperature of said room and a second temperature of cooled air discharged from said air conditioning apparatus to said room;

determining a first difference value corresponding to a difference between the measured first air temperature of said room and a first target temperature of the room;

determining a second difference value corresponding to a difference between a second target temperature of the discharged air from said air conditioning apparatus less than said first target temperature of the room by a predetermined value and the measured second temperature of the cooled discharged air from said air conditioning apparatus;

generating a control signal corresponding to a difference between said first difference value and said second difference value; and

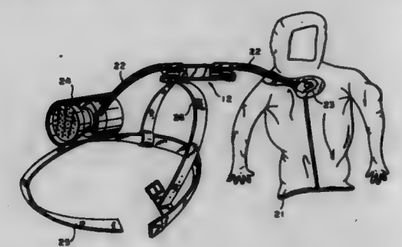
controlling a rotational speed of said compressor of said air conditioning apparatus in accordance with said control signal and the measured first air temperature of said room, so as to maintain the difference between said first target temperature of the room and said second temperature to be a predetermined constant value.

5,197,294

MINIATURIZED THERMOELECTRIC APPARATUS FOR AIR CONDITIONING A PROTECTIVE BODY SUIT

Dino Galvan, Rome; Gianfranco Marcosldi, Bracciano; Pierluigi Gennaiti, Rome, and Paolo Amadesi, Bologna, all of Italy, assignors to Comitato Nazionale Per La Ricerca E Per Lo Sviluppo Dell'Energia Nucleare E Delle Energie Alternative, Rome RM and Grenfil S.r.L., Imola BO, both of Italy

Filed Sep. 7, 1990, Ser. No. 578,824
Claims priority, application Italy, Sep. 8, 1989, 48349 A/89
Int. Cl.[5] F25B *21/02*
U.S. Cl. 62—3.62 9 Claims



1. A miniaturized apparatus for air-conditioning comprising:

a heat-exchanger unit formed of a thermoelectric Peltier effect device, in which the application of a voltage difference creates a cold surface and hot surface opposite each other, and a first and a second contact heat-exchanger for thermic exchange respectively with said cold and said hot surfaces of said thermoelectric device; a low voltage D.C. power source feeding said thermoelectric device;

a system of channels suitable to allow respective distinct and separate flows of air through said first and said second heat-exchanger, said apparatus being interposed between the ends of a flexible tube feeding air to a protective total insulation suit, said flexible tube having one end sealingly connected to an air filter device and the other end sealingly connected to manifold sealingly fixed on said suit, capable of distributing filtered and conditioned air to the various internal areas of said suit by means of a system of flexible tubes.

5,197,295

STIRLING MINIATURE INTEGRAL COOLER/DEWAR ASSEMBLY

Nachman Pundak, Kibbutz Eyn Charod, Israel

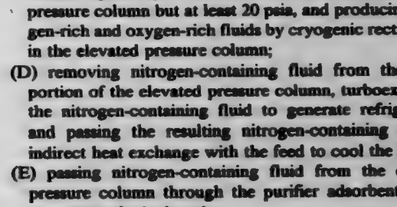
Filed Nov. 4, 1991, Ser. No. 786,820
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—6 1 Claim

1. A cryogenic Stirling two stage cooler for cooling of focal plane array type infra red sensors, said cooler comprising:

a first stage,

a second stage expander,

a detector assembly directly mounted on top of the second stage expander, and



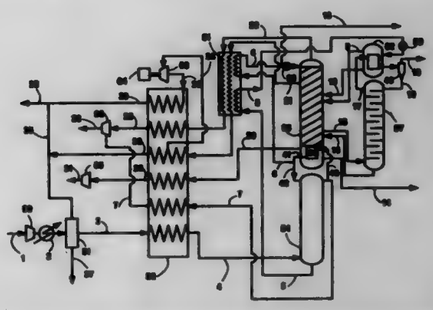
a radiation shield assembly mechanically mounted and thermally grounded to the first stage.

5,197,296

CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING ELEVATED PRESSURE PRODUCT

Neil M. Prosser, East Amherst, and Mark J. Roberts, North Tonawanda, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jan. 21, 1992, Ser. No. 823,685
Int. Cl.[5] F25J *3/00*
U.S. Cl. 62—39 16 Claims



1. A cryogenic rectification method for producing elevated pressure product comprising:

(A) passing a feed comprising oxygen and nitrogen through a purifier adsorbent bed and removing adsorbable contaminants from the feed to the bed to produce clean feed;

(B) cooling the clean feed, passing the cooled, clean feed into a high pressure column, and separating the feed by cryogenic rectification into nitrogen-enriched and oxygen-enriched fluids;

(C) passing nitrogen-enriched and oxygen-enriched fluids from the high pressure column into an elevated pressure column operating at a pressure less than that of the high pressure column but at least 20 psia, and producing nitrogen-rich and oxygen-rich fluids by cryogenic rectification in the elevated pressure column;

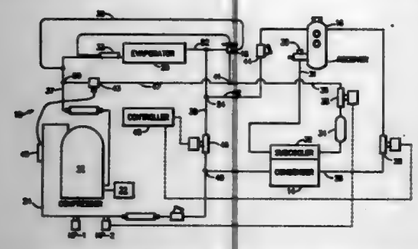
(D) removing nitrogen-containing fluid from the upper portion of the elevated pressure column, turboexpanding the nitrogen-containing fluid to generate refrigeration, and passing the resulting nitrogen-containing fluid in indirect heat exchange with the feed to cool the feed;

(E) passing nitrogen-containing fluid from the elevated pressure column through the purifier adsorbeat bed to regenerate the bed; and

(F) recovering at least one of the nitrogen-rich and oxygen-rich fluids from the elevated pressure column as elevated pressure product.

movement of said extrusion head at an upper dead point

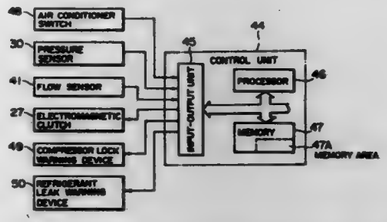
5,197,297
TRANSPORT REFRIGERATION SYSTEM HAVING COMPRESSOR OVER-TEMPERATURE PROTECTION IN ALL OPERATING MODES
Thomas E. Brendel, Fayetteville, and L. Thomas Lane, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Jul. 29, 1991, Ser. No. 736,887
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—81 **13 Claims**



1. A transport refrigeration system of the type which holds a set point temperature by way of heating and cooling cycles including a closed refrigerant circuit comprising;
compressor means for compressing gaseous refrigerant delivered thereto, said compressor having a suction port and a discharge port;
condenser means for withdrawing heat from refrigerant passing therethrough, said condenser means having an inlet and outlet;
first conduit means for interconnecting said discharge port of said compressor with said inlet of said condenser;
a receiver having an inlet and an outlet;
second conduit means for interconnecting said outlet of said condenser with said inlet of said receiver;
first valve means, operable between an open and closed condition, disposed in said second conduit means;
an evaporator having an inlet and an outlet;
third conduit means for interconnecting said outlet of said receiver with said inlet of said evaporator;
fourth conduit means for interconnecting said outlet of said evaporator with said suction port of said compressor means;
fifth conduit means for interconnecting said first conduit means and said third conduit means;
second valve means, operable between an open and closed condition, disposed in said fifth conduit;
sixth conduit means for interconnecting said, fifth conduit means, at a location intermediate said second valve means and said third conduit means, with said inlet of said receiver;
check valve means disposed in said sixth conduit for allowing flow only in the direction from said fifth conduit to said receiver;
seventh conduit means for interconnecting said outlet of said receiver with said fourth conduit means; and
means for controlling the flow of refrigerant through said seventh conduit.

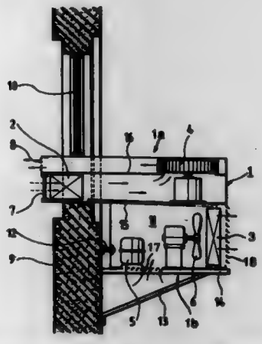
5,197,298
SENSOR AND CONTROL SYSTEM FOR AN AUTOMOTIVE AIR CONDITIONING SYSTEM
Kazumitsu Kobayashi, Isesaki; Masaru Kuribara, Tatebayashi, and Toru Takeshita, Isesaki, all of Japan, assignors to Sanden Corporation and Japan Electronic Control Systems Company, Ltd., both of Japan
Filed Nov. 12, 1991, Ser. No. 789,991
Claims priority, application Japan, Nov. 9, 1990, 2-304483
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—115 **9 Claims**

9. A method of controlling an air conditioning system including a refrigerant circuit for circulating refrigerant, said refrigerant circuit including a compressor, said method comprising the steps of:
determining whether said refrigerant in a predetermined portion of said refrigerant circuit is in a vapor phase,
measuring pressure of a refrigerant in said predetermined portion of refrigerant circuit,
determining the presence of a refrigerant leak if said refrigerant in said predetermined portion of refrigerant circuit is determined to be in a vapor phase and said pressure of said refrigerant in said predetermined portion of refrigerant circuit exceeds a predetermined pressure,



determining the presence of compressor lock if said refrigerant in said predetermined portion of said refrigerant circuit is determined to be in a vapor phase and said pressure of said refrigerant in said predetermined portion of said refrigerant circuit does not exceed a predetermined pressure,
actuating a warning device in response to the determination of either a refrigerant leak or compressor lock, and
deactivating said compressor in response to the determination of either a refrigerant leak or compressor lock.

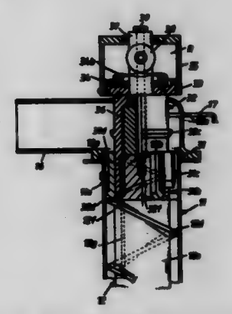
5,197,299
WINDOW-TYPE AIR CONDITIONER
Myung D. Sohn, Kwachun, and Kyeng H. Ro, Suweon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea
Continuation of Ser. No. 451,341, Dec. 18, 1989, abandoned. This application Sep. 12, 1991, Ser. No. 759,719
Claims priority, application Rep. of Korea, Dec. 17, 1988, 88-20905
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—262 **4 Claims**



1. A window type air conditioner mountable in a window for cooling air contained in an indoor space, comprising:
a first portion adapted and dimensioned to be mounted in a window including:
a first duct having an inlet end positioned adjacent to the indoor space,

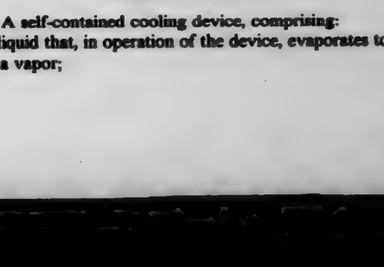
a second duct having an outlet end portion positioned adjacent to the indoor space, said second duct being adapted to allow air to freely flow therethrough to said outlet end,
a fan having a motor portion and a blade portion, said fan disposed between said first and second duct, and
an evaporator coil positioned at the inlet end of said first duct, said fan being configured to draw the air in the indoor space through the inlet end of said first duct into contact with said evaporator coil and then into said second cut where the air is returned to the indoor space through said outlet portion of said second duct;
a second portion having a compressor and a condenser coil; and
a partition disposed between and completely isolating said first and second portions from each other, said partition being configured to have no openings or moving parts therein to thereby reduce noise that is generated by the compressor in said second portion from passing through said first portion and into the indoor space;
wherein said motor portion is mounted on said partition such that said fan is remotely mounted away from said inlet end and said outlet end, and said blade portion of said fan rotates in a plane parallel to said partition and is positioned inside said second duct.

5,197,300
AUGER TYPE ICEMAKER
Shigetoshi Sakamoto, Nagoya; Sokichi Kawanami, Toyoake, and Junichi Hida, Nagoya, all of Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan
Filed Jan. 17, 1992, Ser. No. 822,019
Claims priority, application Japan, Jan. 18, 1991, 3-5441[U]
Int. Cl.[5] F05C *1/14*
U.S. Cl. 62—354 **5 Claims**



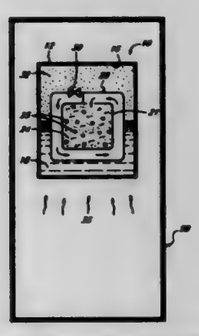
1. An auger type icemaker including an evaporator housing having a cylindrical inner freezing surface on which ice crystals may form, an auger mounted for rotary movement within said housing to be driven to scrape ice crystals off said freezing surface and to advance the scraped ice crystals toward an upper end of said housing, an extrusion head formed with a plurality of ice extruding passages and coupled within an annular space between the upper end portion of said housing an upper shaft portion of said auger, and means for stationarily mounting said extrusion head at the upper end portion of said housing,
wherein said extrusion head is axially slidably coupled within the annular space between the upper end portion of said housing and the upper shaft portion of said auger, and wherein said mounting means comprises means for restricting rotary movement of said extrusion head at the upper end portion of said housing and a cam mechanism mounted on the upper shaft portion of said auger to effect axial movement of said extrusion head in accordance with rotary movement of said auger and to restrict upward movement of said extrusion head at an upper dead point thereof.

5,197,301
ICE COOLED AIR CONDITIONER AND METHOD
Jack N. Holcomb, 1400 NW. 62nd St., Fort Lauderdale, Fla. 33307
Filed Oct. 15, 1991, Ser. No. 775,482
Int. Cl.[5] F25D *3/02*
U.S. Cl. 62—457.1 **10 Claims**



1. An air conditioning apparatus comprising:
at least one vessel for containing frozen material having a bottom face and a side face,
duct means in thermal communication with the at least one vessel through said bottom face and said side face, having a discharge port and extending along said bottom face where frozen material contact is assured and up said side face to permit further thermal communication while positioning said discharge port at a convenient elevation,
fan means for propelling air through said duct means,
at least one battery for powering said fan means.

5,197,302
VACUUM INSULATED SORBENT-DRIVEN REFRIGERATION DEVICE
Cullen M. Sabin, San Diego; Dennis A. Thomas, Los Angeles, and Gary V. Steidl, Encinitas, all of Calif., assignors to International Thermal Packaging, Inc., Westlake Village, Calif.
Continuation of Ser. No. 539,330, Jun. 13, 1990, Pat. No. 5,048,301, which is a continuation of Ser. No. 293,812, Jan. 5, 1989, abandoned. This application Jan. 8, 1991, Ser. No. 639,636
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] F25B *17/00*
U.S. Cl. 62—477 **4 Claims**



1. A self-contained cooling device, comprising:
a liquid that, in operation of the device, evaporates to form a vapor;

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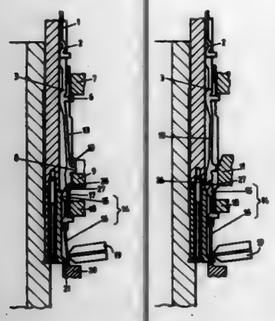
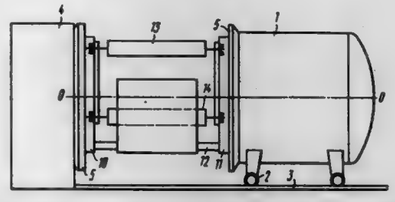
a first chamber containing a sorbent for receiving the vapor;
a second chamber into which said liquid evaporates during operation of said cooling device, and second chamber substantially surrounding and thermally enclosing the first chamber, the second chamber adapted to serve as a thermal insulator of the first chamber when the second chamber is substantially evacuated; and
means for preventing flow of vapor into said first chamber until commencement of operation of said cooling device.

5,197,303
NEEDLE SELECTION DEVICE IN A CIRCULAR KNITTING MACHINE WITH ELASTIC JACKS
Piero Aria, Florence, Italy, assignor to Savio S.p.A., Pordenone, Italy
Filed Sep. 26, 1991, Ser. No. 766,417
Claims priority, application Italy, Oct. 5, 1990, 21646 A/90; Jan. 6, 1991, MI 91A 001560
Int. Cl.[5] D04B *15/78, 9/00*
U.S. Cl. 66—217 13 Claims



1. A device for selecting needles in a circular knitting machine having a needle cylinder, comprising:
a) a first jack for activating a corresponding needle, wherein said first jack is slidably housed in a groove of the cylinder;
b) a first cam for moving said first jack between an active and inactive position;
c) a second jack corresponding to said first jack, wherein said second jack is slidably housed in the same groove as corresponding first jack, wherein said second jack engages the corresponding first jack when said first jack is held in said inactive position, and wherein said second jack comprises:
1. a rigid portion for moving axially in the grove; and
2) a flexible portion for moving axially in the groove and for moving radially with respect to the needle cylinder;
d) a first contour for providing said radial movement of said flexible portion to a radial position;
e) a second contour spaced apart from said first contour for proving said axial movement of said flexible portion of said second jack and said engagement with the corresponding first jack; and
f) actuation means interposed between said first contour and said second contour for retaining said flexible portion in said radial position so that when said first jack activates a corresponding needle said flexible portion is not engaged by said second contour so that said second jack does not axially move and does not engage the corresponding first jack.

5,197,304
DEVICE FOR TREATMENT OF TEXTILE MATERIALS
Evgeny V. Karetnikov, ulitsa 4 Kuryanovskaya, 21, kv. 5; Valentin M. Spitsin, ulitsa 4 Volgogradskaya, 22, kv. 1; Sergei F. Grishin, prospekt Textilschikov, 117 B, kv. 36; Boris L. Gorberg, ulitsa Polka "Normandia Neman", 86, kv. 259, and Andrei A. Ivanov, ulitsa Rabfakovskaya, 18, kv. 2, all of Ivanovo, U.S.S.R.
Filed May 3, 1991, Ser. No. 695,589
Int. Cl.[5] D06B *3/32*
U.S. Cl. 68—5 C 4 Claims

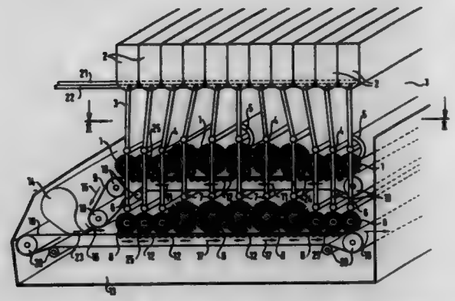


1. A device for treatment of textile materials, comprising: a base; a cover fixedly mounted on said base; a hollow housing having a horizontal longitudinal axis and installed so it can be displaced on said base along said longitudinal axis in relation to said cover; technological equipment for the treatment of textile materials accommodated in said hollow housing; a first support secured on said cover; a second support movably mounted in said hollow housing so it can be displaced in relation to the first support; two doffers to carry rolls of textile materials, each having two ends installed so that one end is mounted on bearings in the first support, while the other end is mounted on bearings in the second support; means for concurrent parallel displacement of said doffers with respect to said supports so as to enable said doffers to be selectively placed in one of at least two positions within said housing, said rolls carried on said doffers being spaced from said technological equipment with said doffers in either of said at least two positions and said technological equipment and said doffers being arranged inside said hollow housing on different sides of an imaginary axial plane extending through the longitudinal axis of said hollow housing with said doffers in either of said at least two positions, whereby the means can be used to displace the doffers to enable the housing to accommodate variations in diameters of the rolls.

5,197,305
EQUIPMENT FOR DYEING TEXTILES
Hans-Jorg Hamann, Langenhagen, Fed. Rep. of Germany, assignor to Kekko-Mode, Langenhagen, Fed. Rep. of Germany
Division of Ser. No. 713,378, Jun. 13, 1991. This application Mar. 23, 1992, Ser. No. 856,120
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018835
Int. Cl.[5] D06B *1/12*
U.S. Cl. 68—205 R 18 Claims

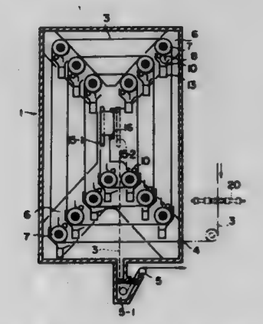
1. An apparatus for dyeing textiles pieces comprising:
brush means for emulating a washed-out effect on said textile pieces, said brush means adapted to deposit a limited quantity of dye liquor on said textile pieces, said brush means including a plurality of bristle brushes, said bristle brushes adapted to impart wear on said textile pieces to soften said textile pieces, and

dye liquor supply means for feeding said dye liquor to said brush means,



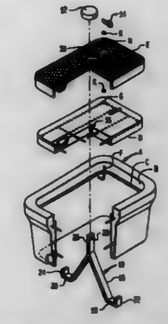
wherein said brush means further include a plurality of sponge brushes, said sponge brushes adapted to crumple said textile pieces.

5,197,306
STEAMER FOR PROCESSING DYED LONG STRIP OF FABRIC
Yoshimichi Yamakita, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Oct. 18, 1991, Ser. No. 778,656
Claims priority, application Japan, Oct. 19, 1990, 2-280637
Int. Cl.[5] D06B *23/30*
U.S. Cl. 68—5 D 3 Claims



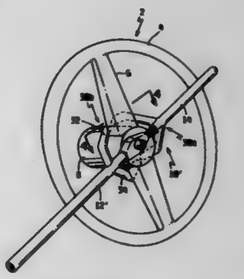
1. A steamer for processing long strip of fabric to develop and set dye colors, comprising:
(a) a housing having an inlet and an outlet for bringing in and out a dyed long strip of fabric;
(b) a plurality of guide rollers arranged in said housing to spirally guide the dyed long fabric strip between said inlet and said outlet;
(c) a plurality of washing nozzles respectively mounted below and above said guide rollers to confront said guide rollers, being adapted to apply washing liquid and to wash surfaces of said rollers when the fabric strip dyed in one color is changed to another color or at a preset timing;
(d) a plurality of squeeze rollers positioned in close contact with said guide rollers; and
(e) a plurality of troughs for receiving the washing liquid, being positioned under said rollers and washing units, and discharging the used washing liquid outwardly.

5,197,307
PULL BOX LOCK
Merle L. Abbott, Jr., Rte. 1, Box 905-75, Myakka City, Fla. 34202
Filed Apr. 7, 1992, Ser. No. 864,512
Int. Cl.[5] B65D *55/14*
U.S. Cl. 70—164 4 Claims



1. A securing device for a cover of a utility wire pull box open at each end, said securing device comprising:
an inverted Y-shaped member having outwardly extending portions formed at the distal ends of each leg thereof;
a main upright portion of said Y-shaped member having a hole therethrough;
said upright portion passing upwardly through a slot formed centrally through said cover;
said outwardly extending portions spaced apart horizontally a distance similar to the distance between opposite lower margins of said pull box;
said hole and said outwardly extending portions spaced apart vertically a distance similar to the height of said pull box wherein a locking means may be secured through said hole with said upright portion extending upwardly through said slot for preventing removal of said cover from said pull box:
said securing device, when properly installed, requiring removal of said pull box with said securing device to remove said cover.

5,197,308
STEERING WHEEL SECURITY DEVICE
John A. Pazik, Rte. 1, Box 152, Clearwater, Minn. 55320
Filed May 29, 1992, Ser. No. 890,134
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 6 Claims



1. An improved vehicle security device suited to be attached to the steering wheel of a vehicle, the steering wheel having a peripheral rim, at least one reinforcing crossmember which extends inwardly from the rim in a generally radial direction,

said collar device to provide for relative movement be- be juxtaposed and positioned next to one another in order

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and a central hub beneath the crossmember for rotatably mounting the steering wheel on the vehicle, wherein the security device is of the type having two separable bar sections which may be connected and locked together to form an elongated security bar that extends across the steering wheel with the bar being long enough to extend beyond the rim of the steering wheel on at least one side of the bar, each bar section having a forked attachment means for preventing the security bar from being lifted off the steering wheel when the bar sections have been connected and locked together, wherein the improvement relates to a configuration of the forked attachment means of each bar section which comprises:

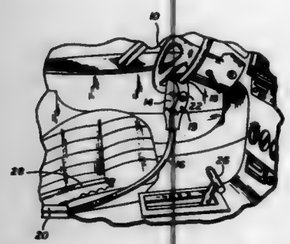
an inner forked section connected to and extending beneath a radial inner end of the bar section, wherein the inner forked section is formed by at least one fork tine which extends radially inwardly from its point of connection to the bar section to point towards the steering wheel hub with the fork tine being long enough to allow the fork tine to pass around at least a portion of the steering wheel hub and to be located beneath the reinforcing crossmember.

5,197,309

VEHICLE LOCK WITH FLEXIBLE CABLE

Luis Del Rosario, 4524 Brazil St., Los Angeles, Calif. 90039

Filed Jun. 20, 1991, Ser. No. 719,225
Int. Cl.[5] B60R *25/02*
U.S. Cl. 70—209 5 Claims



1. A locking device for locking the steering wheel of a motor vehicle comprising:

a clamp device including a head member having an outboard end and an attachment end, said outboard end including a first jaw member for engaging said steering wheel and a centrally located slot, said first jaw member including a receptacle;

a mating member having an outboard end and an attachment end carried in said slot and having a jaw member at its outboard end cooperating with said first jaw member, said first jaw member and said mating jaw member being pivotally connected at said attachment end to permit said jaw members to open and close around said steering wheel, said mating jaw member including a longitudinal bore;

latch means including a generally cylindrical lock mechanism carried in said bore of said mating jaw member including a bolt and cooperating with said first jaw member to hold said jaw members closed, and means moving said bolt into and out of said receptacle for engaging and disengaging said latch means;

anchor means secured to the body of the vehicle; and

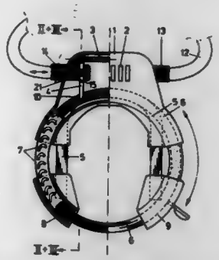
an armored flexible cable secured at one end to said anchor means and at the other end to said lock mechanism within said bore.

5,197,310

LOCK FOR LOCKING A SPOKED WHEEL OF A BICYCLE

Poul D. Pedersen, Smorum, Denmark, assignor to Basta Laasfabrik A/S, Korsor, Denmark

PCT No. PCT/DK89/00196, § 371 Date Feb. 15, 1991, § 102(e) Date Feb. 15, 1991, PCT Pub. No. WO90/02074, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 17, 1989, Ser. No. 655,402
Claims priority, application Denmark, Aug. 18, 1988, 4652/88
Int. Cl.[5] B62H *5/00*
U.S. Cl. 70—227 3 Claims



1. Device for the dual locking of a spoked wheel in a dual leg fork of a vehicle comprising:

a lock housing mounted to said fork, a main locking means in the form of a ring housed in said housing movable between a releasing position and a ring blocking position around spokes of the wheel,

a locking element engaging part on said ring,

a locking element in said housing to be secured to said locking element engaging part of the ring,

a supplemental lock comprising a flexible member having one end attached to said housing and a locking piece on the other end to be introduced into said housing and secured by said locking element, and

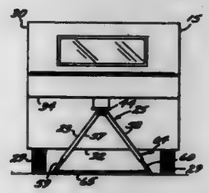
means for operating said locking element to secure the flexible member locking piece only upon the ring locking element also being secured by said locking element with the ring in its blocking position.

5,197,311

FIFTH WHEEL JACK STAND LOCK

Barney E. Clark, La Pine, Oreg., assignor to Norco Industries, Inc., Compton, Calif.

Filed Feb. 24, 1992, Ser. No. 840,156
Int. Cl.[5] B60R *25/02*; F16B *41/00*
U.S. Cl. 70—232 8 Claims



1. Stabilizing apparatus for engagement with a king pin of a towable recreational vehicle and of the type formed with a peripheral groove defining a central shaft and comprising:

a collar device for engaging said king pin;

a shackle device carried from said collar device and engageable in the opposite sides of said groove;

wobble means interposed between said shackle device and said collar device to provide for relative movement between said collar device and said king pin; and

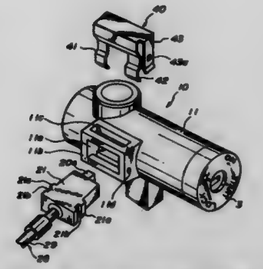
support legs attached at their respective upper ends to the opposite sides of said collar device and diverging downwardly to engage their bottom ends with the underlying ground surface whereby said collar device may be engaged with said king pin to be held captive thereto by receipt of said shackle device in said groove to cause said legs to diverge downwardly to engage the bottom ends thereof with the ground and said wobble means will provide for wobble of said collar device relative to said king pin to thereby accommodate support of said legs on uneven underlying ground surface.

5,197,312

CABLE CONNECTOR FOR STEERING LOCK DEVICE

Shoji Akutsu, Kanagawa, Japan, assignor to Alpha Corporation, Kawagawa, Japan

Filed Oct. 22, 1991, Ser. No. 780,515
Claims priority, application Japan, Feb. 28, 1991, 3-23896[U]
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—247 15 Claims



1. A steering lock system including a shift lever device in which a shift lever is operatively installed and a steering lock device in which a key cylinder is operatively disposed, comprising:

mouth means defining an opening in a housing of said steering lock device;

a plug detachably fitted into said opening;

a slider movably disposed in said plug in a manner to be projectable into said housing through said opening, said slider being movable between a blocking position wherein said slider blocks rotation of said key cylinder of the steering lock device and a release position wherein said slider fails to block the rotation of said key cylinder;

a resiliently flexible clip detachably fixed to said mouth means for achieving a tight connection between said plug and said mouth means;

a control member arranged to control movement of said shift lever of the shift lever device; and

a cable member connected at a first end to the slider, extending between said slider and said control member and connected at a second end to the control member to be moved in correspondence therewith.

5,197,313

LEVER-ACTUATED COMBINATION LOCKING APPARATUS

Roy L. Chandler, Arlington, Tex., and Richard P. McCullough, 1410 Rankin, Ashdown, Ark. 71822, assignors to Richard P. McCullough, Ashdown, Ark.

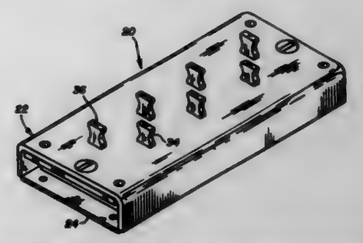
Filed Feb. 1, 1990, Ser. No. 473,536
Int. Cl.[5] E05B *37/16*
U.S. Cl. 70—288 25 Claims

1. A locking apparatus having a locked mode in which it is closed and an unlocked mode in which it may be opened, and having an interior and an exterior, comprising:

a) first and second structural elements which are adapted to be juxtaposed and positioned next to one another in order to place the apparatus in its locked mode, and said structural elements being separable from one another when the apparatus is in its open mode, and the second structural element being mounted interiorly of the apparatus;

b) a plurality of levers mounted for rocking movement with respect to said first structural element, each of said levers having a first end which is configured so as to be manipulable by a person's fingers, and each of the levers having a second end which is sized and shaped so that it may be engaged with a lip surrounding an associated aperture in the second structural element, and the first and second structural elements being locked against separation when at least one of the lever second ends is engaged with the lip of an associated aperture;

c) means mounted on the first structural element for continuously biasing each of the levers to a rest position; and



d) a plurality of apertures in the second structural element, including an aperture for each of the levers, and the apertures being aligned with respective ones of the levers on the first element, and at least one of the plurality of apertures being located such that the second end of one of the levers is normally in a locking position with respect to its associated aperture at the same time that all of the levers are biased to their rest positions, and each of the levers being temporarily movable in order to position the second end of each lever so that it will be disengaged from its associated aperture, whereby the locking apparatus will be in its open mode and the two structural elements may be separated whenever the levers are correctly positioned so that their second ends will not engage the lips of their associated apertures.

5,197,314

DOOR LATCH WITH LOCK AND RELEASE FOR VENDING MACHINES AND THE LIKE

Woodrow C. Stillwagon, Fulton County, Ga., and Donald Embry, Breckinridge County, Ky., assignors to Star Lock Systems, Inc., Columbus, Ohio

Continuation of Ser. No. 557,305, Jul. 23, 1990, Pat. No. 5,050,413, which is a continuation of Ser. No. 358,886, May 30, 1989, Pat. No. 5,027,630, which is a continuation-in-part of Ser. No. 327,250, Mar. 22, 1989, Pat. No. 4,900,182. This application May 13, 1991, Ser. No. 698,917
The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.
Int. Cl.[5] E05B *25/00*
U.S. Cl. 70—386 15 Claims

1. A latching apparatus for releasably latching a first element to a second element, said apparatus comprising:

a post member for attachment to a first element, wherein said post member includes, at least,

a first axially extending arcuate surface define by a first radius from a central axis of said post member, and

a second axially extending surface arranged in succession circumferentially about said post member and defined by at least one radius, each of said at least one radius being smaller than said first radius of said first surface;

5,197,317

regularly spaced-apart upstanding fins along a web of metallic

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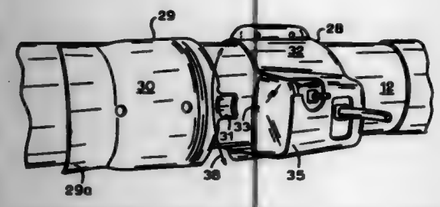
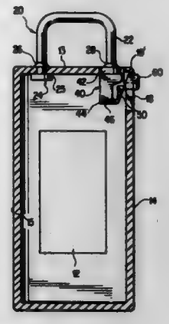
a collar assembly for attachment to a second element, said collar assembly comprising
an outer sleeve,
an inner sleeve defining a cylindrical passage for receipt of said post member, and
a detention means for preventing movement of said post member in at least one axial direction relative to said collar assembly,
wherein the first element becomes releasably latched to the second element upon operation of said detention means in preventing movement of said post member in at least one axially direction relative to said collar assembly, wherein interaction between said detention means and said first axially extending arcuate surface prevents movement of said post member is one axial direction relative to said collar assembly, and wherein interaction between said detention means and said second axially extending surface allows movement of said post member in both directions; and
a control means for selectively obviating the effect of said detention means.

5,197,315
AUTOMOBILE ANTI-THEFT DEVICE
Dimiter S. Zagoroff, Cambridge, Mass., assignor to Steadfast Corporation, Chelsea, Mass.
Filed Aug. 15, 1991, Ser. No. 746,222
Int. Cl.[5] E05B *17/00*
U.S. Cl. 70—417 **4 Claims**



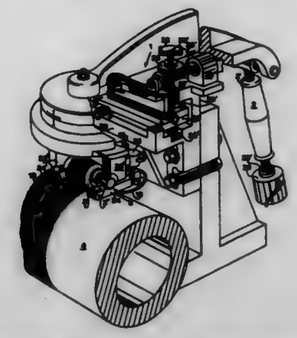
1. An automobile anti-theft device for covering a steering column which includes an enlarged portion incorporating controls levers for the operation of devices such as directional signals, the automobile anti-theft device comprising:
A. a first member shaped to cover a portion of the steering column;
B. a second member for connecting to the first member to form a collar which encircles the steering column, the second member including a first section and a second section—
i. the first section including an arcuate body shaped to fit a portion of the steering column on a side opposite the first member and a projection connected to the arcuate body, the projection extending radially out from the arcuate body;
ii. the second section including a body shaped to fit a portion of the steering column which is opposite the first member and contiguous to the portion of the steering column which the first section covers, the body including—
i. a raised section shaped to fit the enlarged portion of the steering column and having apertures that accommodate the controls, the raised section including an end wall, the end wall being positioned to enclose and end surface of the enlarged column portion and having an inner surface which faces the enlarged portion and an outer surface which faces away from the enlarged portion; and
ii. a retainer, the retainer being attached to the inner surface of the end wall, and with said end wall forming a recess shaped to receive the projection;
the first section and the second section connecting together to form the second member by positioning the recess relative to the projection, such that the first section and the second section may rotate relative to one another to accommodate movement of the steering column, the second member connecting to the first member by securing the second section to the first member.

5,197,316
LATCHABLE RETAINER FOR KEYS AND THE LIKE
Mark Gottlieb, Annandale, Va., and Roderick F. Bunyea, Westminster, Md., assignors to The Black & Decker Corporation, Towson, Md. and Designtech International, Inc., Springfield, Va.
Filed Nov. 14, 1990, Ser. No. 612,492
Int. Cl.[5] A44B *15/00*
U.S. Cl. 70—456 R **5 Claims**



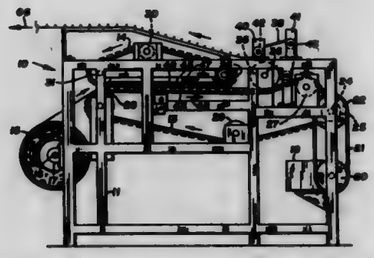
1. A latchable retainer comprising:
a rigid housing having at least a top, two side surfaces and two end surfaces;
an opening in said top adjacent one of said end surfaces and extending into said housing;
a slot extending into said housing from said one of said end surfaces, said slot communicating said one of said end surfaces with said opening and having a first predetermined width;
two opposing projections extending toward one another from walls of said slots to form a passage of a reduced second predetermined width;
a flexible retainer member having one end fixed in said housing; and
a latch fittable in said opening and comprising:
a) an elongate latch body shaped to fit longitudinally in said opening, said latch body having a proximal end to which another end of said retainer member is fixed and a distal end, and
b) an elongate flexible cam body having a proximal end fixed to said distal end of said latch body, said cam body having a width less than said first predetermined width and greater than said second predetermined width, and extending to a distal end projecting back towards said proximal end of said latch body, said cam body having a cam surface sloping at an acute angle from the longitudinal direction of said latch body such that said distal end extends into said slot to engage said projections with said cam surface when said latch is inserted in said opening,
whereby said cam body resiliently deforms to permit full insertion of said latch into said housing, and whereby said cam body resiliently rebounds after passing said projections so that said projections retain said latch in said housing.

5,197,317
PROCESS AND MEANS FOR AUTOMATICALLY MATCHING AT LEAST TWO SUBSTANTIALLY CYLINDRICAL SURFACES, ENGAGING EACH OTHER, PARTICULARLY FOR MECHANICAL EMBOSS ENGRAVING, AND ENGRAVED PLATES OBTAINED WITH SUCH PROCESS AND MEANS
Renato Della Torre, Via Di Vittorio 9, I-21057 Olgiate Olona, Varese, Italy
PCT No. PCT/EP88/01150, § 371 Date Aug. 13, 1990, § 102(e) Date Aug. 13, 1990, PCT Pub. No. WO90/06856, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 13, 1988, Ser. No. 572,995
Int. Cl.[5] B21H *7/14*
U.S. Cl. 72—102 **12 Claims**



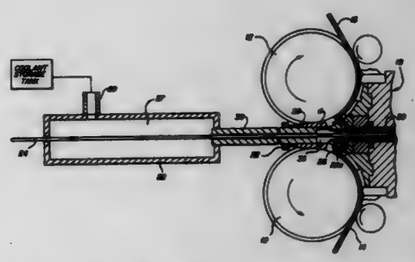
1. A process for automatically matching at least two substantially cylindrical surfaces, for engaging each other, for mechanical embossed engraving of a roll with an engraving tool, using ranges of freedom of a knurling tool, said process comprising starting, repetitive and final steps, including:
mechanizing and subjecting said ranges of freedom to electronic control, by providing a hardware structure, available to materialize a software which, each time, can understand the design being engraved, and
controlling the starting, repetitive and final steps, complying with spaces and times, in an automatic mode, said step of controlling including the step of braking of said knurling tool between each repetitive step to maintain a pattern in said knurling tool aligned with a pattern engraved on said roll.

5,197,318
METAL FORMING METHOD AND APPARATUS
Roger L. Joyce, New Brighton, and Ron Westby, Anoka, both of Minn., assignors to Exaire Co., New Brighton, Minn.
Filed Jan. 27, 1992, Ser. No. 826,146
Int. Cl.[5] B21B *1/24*; B30B *3/04*
U.S. Cl. 72—187 **6 Claims**



1. Apparatus for the formation of a plurality of generally regularly spaced-apart upstanding fins along a web of metallic material, said apparatus comprising:
(a) frame means, first and second endless chains operatively coupled to said frame means with each of said endless chains including operative flights arranged in generally opposed disposition and creating a metallic material work zone along a plane arranged midway between said operative flights, means for continuously driving said endless chains each along a predetermined path;
(b) said first endless chain having a plurality of generally equally spaced-apart work supporting anvil links arranged in operative relationship with said second endless chain;
(c) said second endless chain having a plurality of generally spaced-apart links having work-engaging fin-forming lugs extending outwardly therefrom and arranged to enter spaces between adjacent anvil links to create fin pre-forms along said metallic web while passing through said work zone;
(d) a path-defining chain-deflecting idler roll operatively coupled to said frame means and arranged to deflect said first endless chain arcuately away from the plane of said work zone to effectively reduce the spacing between adjacent anvil links and to create a web back-breaking zone along said first endless chain; and
(e) said first and second endless chains being arranged to maintain said pre-forms within the spaces between adjacent anvil links until said first endless chain passes through said back-breaking zone for firmly crimping said fin pre-forms.

5,197,319
EXTRUSION APPARATUS FOR SHEATHING A TEMPERATURE SENSITIVE CORE MATERIAL
Eugene A. Beckel, and Stephen L. Hickman, both of Adrian, Mich., assignors to Braseway, Inc., Adrian, Mich.
Filed Dec. 5, 1991, Ser. No. 802,538
Int. Cl.[5] B21C *23/30*
U.S. Cl. 72—268 **10 Claims**



1. An apparatus for extruding a sheath about a temperature sensitive core material traveling along a feed path comprising an extrusion die assembly located along the feed path and having a die ring and a hollow mandrel coacting with said die ring to form an annular path for the extrusion of the sheath about the core material passing through said mandrel; means defining a bath located along said path upstream of the extrusion die assembly and including a cooling chamber containing a cooling fluid; and means for passing the core material immersibly through the bath so that the cooling fluid surrounds, contacts, and cools the core material prior to entering the extrusion die assembly.

said driven pressure vessel including a diaphragm for sealing, leakage paths present in the internal components of said valve

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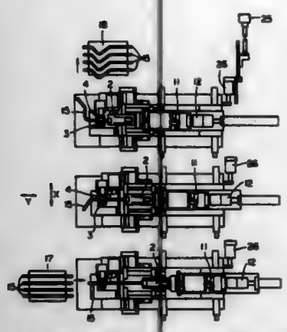
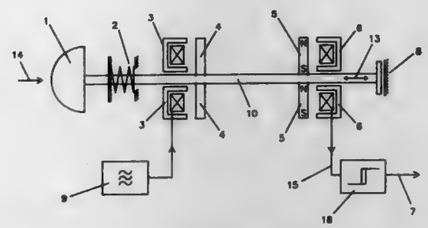
5,197,320
METHOD OF AND APPARATUS FOR BENDING A METAL TUBE OF A SMALL DIAMETER
Shigeru Saegusa, Shizuoka Prefecture, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan
Filed Jul. 25, 1991, Ser. No. 736,036
Claims priority, application Japan, Jul. 26, 1990, 2-198717
Int. Cl.[5] B21D *7/022, 43/10*
U.S. Cl. 72—307 9 Claims



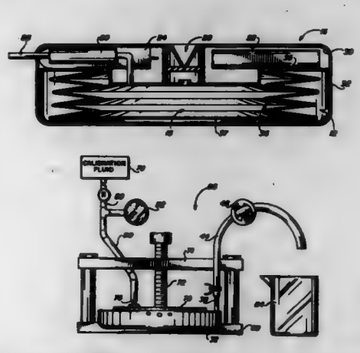
1. Apparatus for placing a plurality of bends in each of a plurality of small diameter pipes, said apparatus comprising a first bend station and a plurality of subsequent bend stations disposed such that each said bend station has at least one other of said bend stations adjacent thereto for defining pairs of adjacent bend stations, each said bend station including a for gripping one said pipe substantially at an end thereof and a bender spaced from the chuck, each said bender including a receiving roller and a bending roller movable toward and away from the pipe for selectively engaging and disengaging the pipe, said bending roller being rotatable a selected amount about the receiving roller for bending the pipe around the receiving roller, the chuck of each said subsequent bend station being rotatable for rotating each said pipe to a predetermined bend orientation relative to the bend made by the first bend station, at least one chuck in each said pair of adjacent bend stations being movable in a reciprocatory manner to and from the adjacent bend station in the pair for sequentially transferring each said pipe to the adjacent subsequent bend station after completion of each said bend.

5,197,321
CONTROL DEVICE WITH MONITORED OPERATING ELEMENT
Helmut Both, Gartenstrasse 4, D-6501 Ludwigshöhe, Fed. Rep. of Germany
PCT No. PCT/DE90/00317, § 371 Date Jan. 3, 1991, § 102(e) Date Jan. 3, 1991, PCT Pub. No. WO90/13822, PCT Pub. Date Nov. 15, 1990
PCT Filed May 3, 1990, Ser. No. 646,754
Claims priority, application Fed. Rep. of Germany, May 4, 1989, 3914704
Int. Cl.[5] G01P *21/00*
U.S. Cl. 73—1 D 10 Claims

1. A control device having a movable operating element for introducing and forwarding an input command to control systems of machines or plant, characterized in that an oscillating movement (13) is imparted to the operating element (1,10,11) by a drive (3,4), this movement is forwarded by the operating element (1,10,11) to a sensor (5,6) and is detected by the latter, in which arrangement the introduction of an input command (14) damps the oscillating movement (13), wherein the operating element is constructed of several parts, and wherein the operating element possesses a push button and a button rod connected to the latter, the button rod being connected at the drive end to an armature and at the sensor end to a permanent magnet.



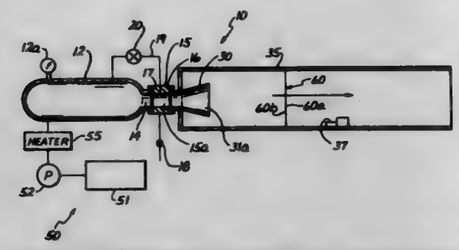
5,197,322
PRESSURE RESERVOIR FILLING PROCESS FOR AN IMPLANTABLE MEDICATION INFUSION PUMP
Virote Indravudh, Saugus, Calif., assignor to Minimed Technologies, Ltd., Sylmar, Calif.
Filed Nov. 29, 1990, Ser. No. 619,858
Int. Cl.[5] G01F *25/00;* A61M *37/00*
U.S. Cl. 73—3 23 Claims



15. A method of filling a pressure reservoir of an implantable medication infusion pump with a selected pressure fluid, wherein the pressure reservoir is separated from a medication chamber by a movable wall, said method comprising the steps of:
drawing a vacuum in the pressure reservoir;
connecting the pressure reservoir to a supply of the pressure fluid to vacuum-draw the pressure fluid for flow into and to fill the pressure reservoir;
calibrating the quantity of the pressure fluid within the pressure reservoir by subjecting the pressure reservoir to a predetermined pressure to expel excess pressure fluid therefrom and to calibrate the quantity of pressure fluid therein; and
sealing the pressure reservoir.

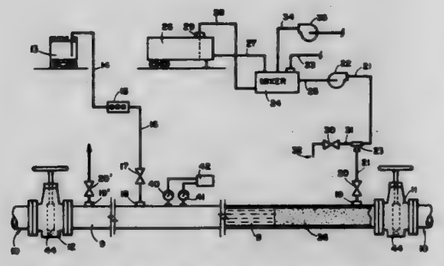
5,197,323
PEBBLE-BED HEATER AND SHOCK TUBE ASSEMBLY
Irving B. Osofsky, Rancho Palos Verdes, Calif., assignor to Sparta, Inc., Torrance, Calif.
Filed Jul. 13, 1990, Ser. No. 552,862
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—12.01 13 Claims

1. A shock tube assembly of the type described, comprising:
a driver pressure vessel having an open end for containing a gas under pressure and at a predetermined temperature,
said driver pressure vessel including a diaphragm for sealing the open end of said driver pressure vessel,
said diaphragm also being rupturable above a predetermined pressure to suddenly release the gas containing in the driver pressure vessel,
expander nozzle means connected to receive gas released from said driver pressure vessel and to effect supersonic expansion thereof for producing a shock wave,
elongated expression tube means cooperating with said expander nozzle means for passage of a shock wave generated by the expansion of said gas by said expander nozzle means for generating static and dynamic pressure conditions representative of a high energy detonation,



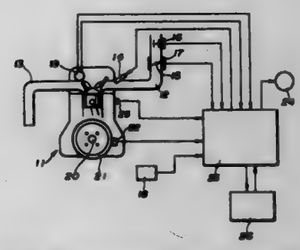
means to supply gas under pressure and at a predetermined temperature to said driver pressure vessel,
said means to supply gas under pressure including gas storage means, and a pebble-bed superheater and evaporator,
said pebble-bed superheater and evaporator having an inlet, and an outlet for exit of gas at a first predetermined pressure and temperature, and
mixer means connected to said outlet of said pebble-bed heater and evaporator for admixing gas from said gas storage means with the heated and pressurized gas exiting from said outlet whereby the temperature of said gas is reduced to said predetermined temperature from said first predetermined temperature.

5,197,324
METHODS AND APPARATUS USING A GEL TO ISOLATE MAINLINE VALVES IN A PIPELINE DURING A HYDROTEST
Mark S. Keys, Missouri City, Tex., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Feb. 12, 1992, Ser. No. 835,695
Int. Cl.[5] G01M *3/02*
U.S. Cl. 73—40.5 R 27 Claims



1. A method of sealing off a valve at one end of a segment of a pipeline which carries a product, to thereby enable said segment to be hydrotested, comprising the steps of: filling said segment with water and then closing said valve; injecting a selected quantity of a highly viscous gel having a lost-circulation material suspended therein into said segment adjacent said valve; squeezing said gel and lost-circulation material into any leakage paths present in the internal components of said valve; and applying test pressure to said water over a period of time to determine whether there are leaks in said segment of said pipeline.

5,197,325
MISFIRING DETECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES
Hideyuki Tamura, and Takashi Aramaki, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Jun. 4, 1991, Ser. No. 709,573
Claims priority, application Japan, Jun. 5, 1990, 2-59554[U]; Jun. 5, 1990, 2-146610
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 11 Claims



1. A misfiring detection system for an internal combustion engine, comprising:
means for generating a reference pulse in synchronization with a reference crank angle position in each cylinder of the engine;
means for monitoring a magnitude of crank angle rotated from said reference crank angle position so as to define a first crank angle position required for starting an angular velocity measurement for an engine crankshaft and a second crank angle position required for ending said angular velocity measurement;
means for monitoring and deriving a measuring time necessary to reach from said first crank angle position to said second crank angle position;
means for determining an engine misfiring state on the basis of fluctuations in said monitored measuring times; and
means for variably setting said first and second crank angle positions in response to changes in an ignition timing of the engine.

5,197,326
ARRANGEMENT FOR MONITORING ROTATIONAL SPEED SENSOR
Hermann Palm, Waiblingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed May 24, 1991, Ser. No. 705,333
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1990, 4026232
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 12 Claims

1. An arrangement for monitoring a rotational speed sensor of an internal combustion engine having a starter and a rotational speed sensor which supplies an output signal in dependence on a rotational speed, the arrangement comprising means for measuring a vehicle electrical system voltage; a control device in which an output signal of the rotational speed sensor is related to a vehicle electrical system voltage; and means for recognizing an error operation of the rotational speed sensor so that a course of the vehicle electrical system voltage is evaluated during a starting process of the internal

response to said dynamic input to said valve assembly, secondary pressure, and an abnormality alarm section for

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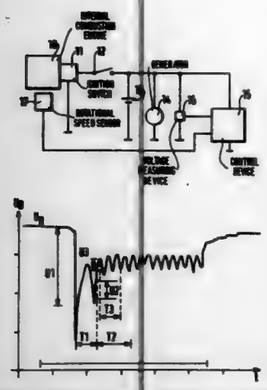
combustion engine, and an error recognition is released only when a typical course of a starting process for the vehicle

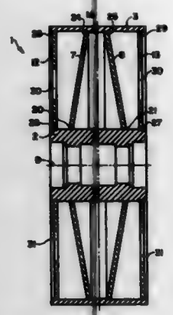


electrical system voltage is recognized and simultaneously no output signal of the rotational speed sensor is recognized.

5,197,327
ROTOR WHEEL ASSEMBLY FOR A TIRE TESTING MACHINE

Franz Ruppert, Heppenheim, and Joachim Schwab, Fulda, both of Fed. Rep. of Germany, assignors to Hofmann Maschinenbau GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Mar. 1, 1991, Ser. No. 663,162
Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014558
Int. Cl.[5] G01M *17/02*
U.S. Cl. 73—146 11 Claims

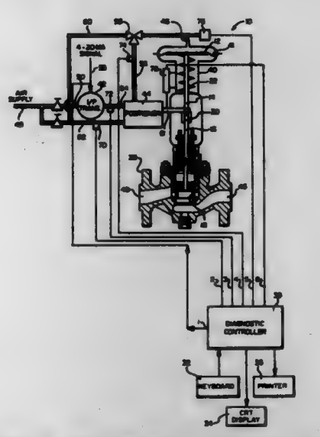


1. A rotor wheel assembly for a tire testing machine comprising:
a hub;
a hollow-cylindrical testing drum portion, said testing drum portion and said hub having equal axial length, and
means for supporting the testing drum portion relative to the hub, the support means being disposed between the hub and the testing drum portion, the support means comprising:
at least first and second discs of conical configuration being disposed substantially symmetrical with respect to a central plane extending radially through the assembly, and
at least one flat disc being disposed parallel to said plane, each of the first and second conical discs having inner and outer peripheries, each of the inner perpheries being directly connected to the hub, each of the outer peripheries being directly connected to the testing drum portion, each of the connections of the inside peripheries to the hub being further outward relative to said plane than each of the connections of the outside peripheries to the testing drum, each direct connection of the inner and outer peripheries being displaced inwardly with respect to axial ends of said testing drum portion toward said central plane.

5,197,328
DIAGNOSTIC APPARATUS AND METHOD FOR FLUID CONTROL VALVES

William V. Fitzgerald, McKinney, Tex., assignor to Fisher Controls International, Inc., Clayton, Mo.

Division of Ser. No. 605,130, Oct. 24, 1990, Pat. No. 5,109,692, which is a division of Ser. No. 512,095, Apr. 10, 1990, Pat. No. 4,976,144, which is a continuation of Ser. No. 236,602, Aug. 25, 1988, abandoned. This application Jan. 9, 1992, Ser. No. 818,289
The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.
Int. Cl.[5] G01M *19/00*; F16K *37/00*; G01L *5/00*
U.S. Cl. 73—168 6 Claims

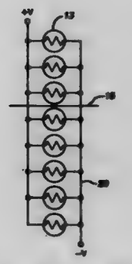


1. A method for diagnostically dynamic testing and determining the dynamic operating condition of a pneumatically operated fluid control valve assembly having a valve actuator connected to a valve flow control member for movement between respective closed and open valve positions, and a valve positioner pneumatically coupled to said valve actuator, said method comparing a dynamic output of said valve assembly in response to a dynamic input to said valve assembly comprising the step of:
providing a controlled variable pneumatic pressure to the input of the valve positioner forming a dynamic input to said valve assembly to operate the valve in a dynamic test operation cycle defined by removing the flow control member between said respective closed and open valve positions;
providing a pressure sensor to sense said controlled varying pressure at the input of the valve positioner;
providing a position sensor to sense movement of the flow control member representing a dynamic output of said valve assembly;
obtaining a first signal from the pressure sensor corresponding to said controlled varying pressure at the valve positioner input during the dynamic test operation cycle;
obtaining a second signal from the position sensor corresponding to movement of the flow control member in response to said dynamic input to said valve assembly during the dynamic test operating cycle;
processing said first signal and said second signal to derive valve diagnostic data representing the movement of the flow control member during the dynamic test operation cycle as a function of the variation in said controlled variable pneumatic pressure to the input of the valve positioner; and
displaying said valve diagnostic data for enabling determination of the dynamic performance of said valve assembly positioner under test.

5,197,329
PTC WATER LEVEL SENSOR AND CONTROL

Andrew G. Grundy, Webster City, Iowa, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 22, 1992, Ser. No. 888,339
Int. Cl.[5] G01F *23/24*
U.S. Cl. 73—295 16 Claims



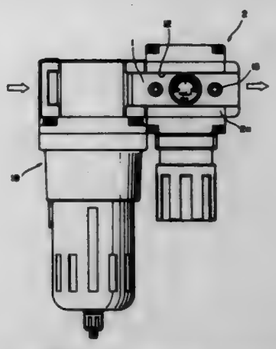
1. A circuit for sensing the level of a liquid in a container, comprising:
a positive temperature coefficient resistive strip installable on a wall of the container, so that liquid in proximity to the strip can carry away heat to reduce the resistance of the strip, and adapted to have a voltage supplied to it when the circuit is energized;
means to selectively vary a voltage drop between two reference points; and
means to compare the voltage across the PTC strip with the voltage between the two points so that when the liquid in the container reaches a level where the voltage drop across the PTC strip is approximately equal to the voltage drop between the two points, an output of the comparison means indicates that the liquid is at a specified level.

5,197,330
REGULATOR

Atsushi Onodera, Hohya, Japan, assignor to Koganei, Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,349
Claims priority, application Japan, Jul. 19, 1990, 2-76983[U]; Jul. 19, 1990, 2-76984[U]; Sep. 5, 1990, 2-93489[U]
Int. Cl.[5] G01L *7/00*
U.S. Cl. 73—431 6 Claims

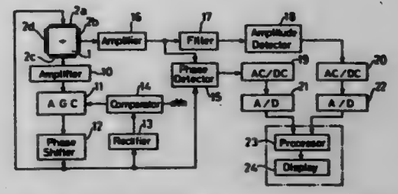
5. A regulator for pneumatic systems, the regulator comprising: a regulator body; and a connecting bracket for connecting air conditioning units other than the regulator to said regulator body, said connecting bracket being provided with a bracket body having pressure-gage accommodating recess and a pressure-gage incorporated in said pressure-gage accommodating recess, wherein pneumatic pressure within said regulator body is supplied to said pressure gage incorporated in said connecting bracket, and wherein said pressure-gage detects a pressure value of secondary pneumatic pressure within said regulator body and wherein said pressure-gage comprises a pressure detecting section for detecting the secondary pressure of the regulator, a pressure display section for displaying the detected secondary pressure, a pressure setting section for setting said secondary pressure, and an abnormality alarm section for providing an alarm for abnormal deviations from a set pressure, wherein a structure for connection of said air conditioning units to said regulator body is modularized by said connecting brackets.



5,197,331
OSCILLATORY ANGULAR SPEED DETECTING APPARATUS

Takahiro Oikawa, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Continuation-in-part of Ser. No. 486,414, Feb. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 372,896, Jun. 28, 1989, abandoned, which is a division of Ser. No. 139,593, Dec. 30, 1987, abandoned. This application Mar. 13, 1992, Ser. No. 850,159
Int. Cl.[5] G01P *9/04*
U.S. Cl. 73—505 9 Claims



1. An oscillatory angular velocity detecting apparatus, comprising:
a pillar-shaped oscillator body;
means for applying a drive signal to a transducer mounted to a first side surface of the oscillator body, said transducer comprising means for applying a driving force to said oscillator body;
means, mounted to a second side surface substantially perpendicular to the first side surface of the oscillator body, i) for producing a first readout signal when no rotational force is added to the oscillator body and ii) for producing a second readout signal when a rotational force is added to the oscillator body;
phase detecting means, i) for a first comparison of the respective first and second readout signals with the drive signal to obtain first and second compared readout signals, and ii) for a second comparison between the respective phases of the first and second compared readout signals to obtain a first DC angular signal having a voltage level;
means for conducting amplitude detection by comparison between amplitudes of the first readout signal and the

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5,197,335

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second readout signal to obtain a second DC angular signal having a voltage level; and

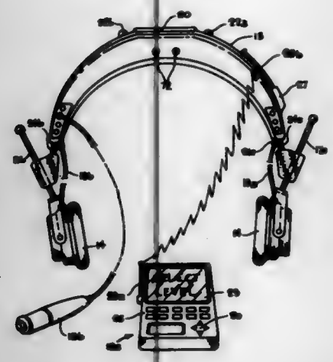
means for deriving a strength value and a direction value, respectively, of angular velocity from the voltage level of the first DC angular signal.

5,197,332

HEADSET HEARING TESTER AND HEARING AID PROGRAMMER

Adnan A. Shennib, Fremont, Calif., assignor to CalMed Technology, Inc., Union City, Calif.

Filed Feb. 19, 1992, Ser. No. 838,542
Int. Cl.[5] A61B *1/22*
U.S. Cl. 73—585 **19 Claims**



1. A hearing tester comprising,

a headband shaped electronic module with circuitry configured as a self-contained audiometer, with audiometer circuitry having means for producing electrical signals representing sound stimuli and means for recording a sequence of patient responses,

acoustic transducer means mechanically connected to the electronic module for receiving said electrical signals and producing said sequence of sound stimuli, and

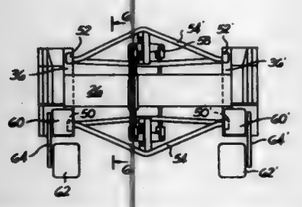
a patient input signaling means connected to the audiometer for transmitting a sequence of patient responses to the audiometer.

5,197,333

APPARATUS TO TEST THE RESISTENCE TO VIBRATION OF BRAKE BEAMS FOR RAILWAY CAR TRUCK ASSEMBLIES

Jesus E. Garcia-Gardea, Ave. Junco de la Vega #208, Col. Roma 64700, Monterrey, Nuevo León, Mexico

Filed Jul. 22, 1991, Ser. No. 733,312
Int. Cl.[5] B06B *1/010*
U.S. Cl. 73—666 **3 Claims**



1. Vibration generating equipment for use in testing brake beams for railway car truck assemblies under conditions simulating conditions encountered on railroad tracks, comprising in combination:

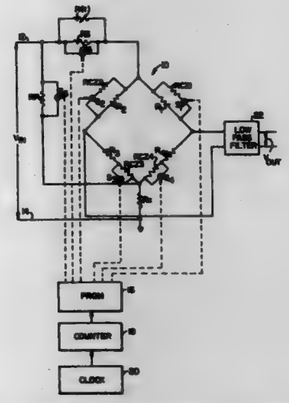
an assembly for simulating a railway car truck assembly with a pair of brake beams (54, 54') mounted at opposite ends into beam carriers (36, 36') extending from the ends of a bolster (26), and a set of two independently operable vibrators (60, 60') coupled to the respective beam carriers (36, 36') for imposing vibratory movement at the opposite ends of the brake beams.

5,197,334

PROGRAMMABLE COMPENSATION OF BRIDGE CIRCUIT THERMAL RESPONSE

Robert A. Guziak, Thousand Oaks, Calif., assignor to Schlumberger Industries, Inc., Norcross, Ga.

Filed Jun. 4, 1991, Ser. No. 710,215
Int. Cl.[5] G01L *9/04, 19/04*
U.S. Cl. 73—708 **5 Claims**



5. A bridge circuit pressure transducer comprising:

four pressure sensitive resistors coupled in a bridge formation with first and second opposite resistors increasing in resistance with pressure and third and fourth opposite resistors decreasing in resistance with pressure;

a source resistor coupled between a junction of said first and fourth resistors and an input terminal;

a parallel resistor coupled between said input terminal and a junction of said second and third resistors;

first and fourth control resistors coupled in parallel with said first and fourth resistors;

second and third control resistors coupled in series with said second and third resistors;

first and fourth switching means coupled in series with said first and fourth control resistors;

second and third switching means coupled in parallel with said second and third control resistors;

fifth switching means coupled in parallel with said source resistors;

sixth switching means coupled in parallel with said parallel resistor;

programmable memory having a plurality of bit outputs, each bit output being coupled to a control input of a different one of said switching means;

a counter having an output coupled to said programmable memory;

a clock having an output coupled to an input of said counter; and

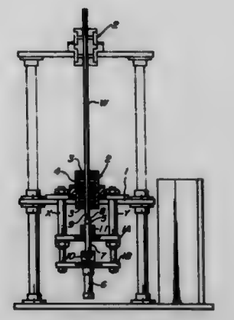
a low-pass filter having a first input coupled to a junction of said first and second resistors and a second input coupled to a junction of said third and fourth resistors.

5,197,335

APPARATUS FOR INSPECTING MECHANICAL STRENGTH OF BOTTOM PORTIONS OF BOTTOM-CLOSED HOLLOW PIPES

Satoru Yamada, and Koji Tanaka, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 15, 1991, Ser. No. 685,144
Claims priority, application Japan, Apr. 21, 1990, 2-105748
Int. Cl.[5] G01N *3/10*
U.S. Cl. 73—825 **2 Claims**



1. A bottom strength-inspecting system for bottom-closed hollow pipes, said system comprising:

an air chuck for holding an outer peripheral surface of the bottom-closed hollow pipe;

pressing means longitudinally coaxially provided with the air chuck, said pressing means provided for contacting a bottom surface of the bottom-closed hollow pipe and for pressing the bottom surface by given forces, said pressing means including an elastic pressing element; and

a load cell for detecting the forces by which the pressing means press the bottom surface of the bottom-closed hollow pipe.

2. A bottom strength-inspecting system for bottom-closed hollow pipes, said system comprising;

an air chuck for holding an outer peripheral surface of the bottom-closed hollow pipe;

pressing means longitudinally coaxially provided with the air chuck, said pressing means provided for contacting a bottom surface of the bottom-closed hollow pipe and for pressing the bottom surface by given forces, said pressing means comprising:

(a) an air cylinder;

(b) a pressing rod fitted to the air cylinder at one end; and

(c) an elastic pressing element attached to the other end of the pressing rod, wherein the air cylinder is actuated to make said elastic pressing element press the bottom surface of the hollow pipe by said given forces.

5,197,336

KARMAN VORTEX FLOW METER

Michihiko Tsuruoka; Wataru Nakagawa; Osamu Kashimura, and Naohiro Kounosu, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1991, Ser. No. 647,225
Claims priority, application Japan, Jan. 29, 1990, 2-18451
Int. Cl.[5] G01F *1/32*
U.S. Cl. 73—861.24 **10 Claims**

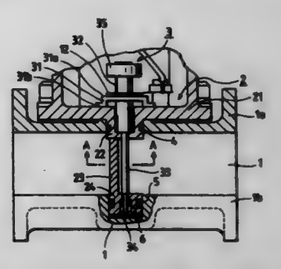
1. A Karman vortex flow meter for measuring the flow rate of a fluid under test, in a pipeline containing the fluid and having a longitudinal axis along which the fluid flows in a selected direction, comprising:

a base secured to said pipeline abut an opening therein; and a vortex detector having a detector axis generally perpendicular to the longitudinal axis of the pipeline, said detector including:

a post supported by the base and aligned with the detector axis,

a balance weight aligned with and at least partially surrounding the post, said balance weight being movable along the axis of the post,

a detector flange supported by the base and substantially coaxial with and at least partially surrounding said post, said detector flange having a flexible surface orthogonal to the post,



a columnar force receiving part axially aligned with the post and extending from the bottom of said post into the pipeline, said receiving part shaped for producing a Karman vortex when inserted into the pipeline, wherein the Karman vortex applies a force to the force receiving part, and

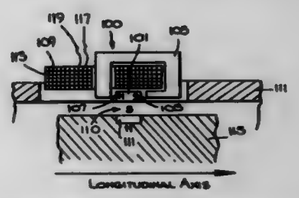
a strain detecting element coupled to said flexible surface of the detector flange for detecting the Karman vortex force applied to the force receiving part and for producing an output signal corresponding to the detected Karman vortex.

5,197,337

LOW FORCE FLOWMETER PICK-OFF

William M. Glasheen, Derry, N.H., assignor to Ametek, Wilmington, Mass.

Filed Apr. 3, 1991, Ser. No. 679,953
Int. Cl.[5] G01F *15/06*; G01P *3/487*
U.S. Cl. 73—861.78 **6 Claims**



1. A pick-off assembly for sensing the passage of a rotating member relative to a stationary housing comprising:

a) a magnetic assembly positioned on the rotating member proximate to the outer periphery of said rotating member, said magnetic assembly having a north and south pole oriented radially with respect to the axis of said rotating member;

b) a stationary sensor mounted on said housing including a stationary magnet located to interact with the magnetic field produced by said rotating magnetic assembly, said magnet having its north and south poles oriented generally parallel to the axis of said rotating member, a coil having a central opening and one or more turns of a conductor material and a magnetic field guide magnetically coupling the magnetic field of said stationary magnet with said coil, whereby the passage of said magnetic assembly

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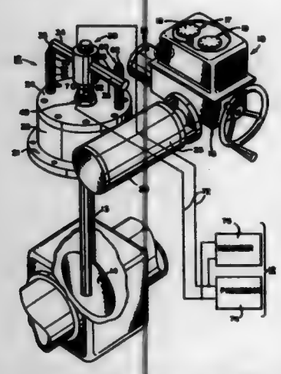
proximate to said sensor induces a voltage in said coil indicative of the passage of said rotating magnetic assembly.

5,197,338

SYSTEM AND METHOD FOR DETERMINING TORQUE OUTPUT OF MOTOR ACTUATED VALVE OPERATORS

Stephen M. Holman, Exton, and Michael J. Delzingaro, Glenside, both of Pa., assignors to Liberty Technology Center, Inc., Conshohocken, Pa.

Filed Jul. 22, 1991, Ser. No. 734,378
Int. Cl.[5] G01L *3/02*
U.S. Cl. 73—862.29 17 Claims



8. A method of determining torque supplied by a motorized partial rotation operator to a valve stem coupled with the operator, the operator including a rotary drive member in a housing, the drive member being coupled with the valve stem, comprising the steps of:

frictionally coupling a torque plug with the drive member for movement with the drive member and the valve stem coupled with the drive member;

activating the motor to transmit a torque through the drive member to the valve stem and frictionally to the torque plug;

applying the torque transmitted frictionally between the drive member and the torque plug to the housing at at least a pair of points on the housing spaced from one another on opposite sides of the drive member; and

generating a signal proportional to the torque being applied by the drive member and the torque plug to the housing.

5,197,339

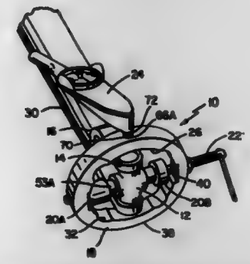
DEVICE FOR MEASURING TORQUE IN A UNIVERSAL JOINT AND METHOD THEREFOR

Jeffrey A. Dutkiewicz, and James T. Reynolds, both of Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 27, 1991, Ser. No. 768,375
Int. Cl.[5] G01L *3/02*
U.S. Cl. 73—862.191 7 Claims

6. A method for determining the amount of torque required to rotate a cross member journalled for rotation in a universal joint in a drive line assembly, including the steps of:

positioning and clamping a surrounding member having means for clamping a universal joint in relation to the cross member of said universal joint;



applying torque to the surrounding member until said cross member rotates within said universal joint; and

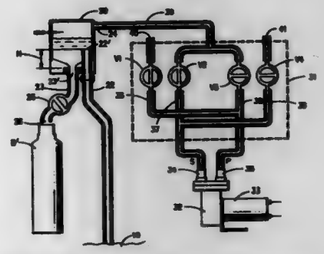
measuring the torque required to initiate the rotation.

5,197,340

METHOD AND APPARATUS FOR SAMPLING LIQUID

Richard W. Jones, Warren Jones Engineering Limited, 120-124 Churchill Rd., Bicester, Oxfordshire OX6 7XD, United Kingdom

PCT No. PCT/GB90/01509, § 371 Date Jul. 31, 1991, § 102(e) Date Jul. 31, 1991, PCT Pub. No. WO91/05234, PCT Pub. Date Apr. 18, 1991
PCT Filed Oct. 2, 1990, Ser. No. 687,886
Claims priority, application United Kingdom, Oct. 2, 1989, 8922118; Mar. 30, 1990, 9007189
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—864.35 6 Claims



1. An apparatus for liquid sampling comprising a housing provided with a sample inlet branch and a sample outlet branch characterized by:

1) a pressurizible sample chamber (20) communicating with the inlet and the outlet branches;

2) an air displacer (32) adapted to generate

a) a sub-atmospheric pressure in a vacuum duct (34); and

b) a super-atmospheric pressure in a pressure duct (35);

3) an array of four branches (36, 37, 38, 39) made up of:

a) a first branch (36) linking the pressure duct (35) to an atmospheric outlet (40) and incorporating a first valve (V1);

b) a second branch (37) linking the vacuum duct (34) to the sample chamber (20) by way of pressure control port (24) and incorporating a second valve (V2);

c) a third branch (38) linking the pressure duct (35) to the sample chamber (20) by way of pressure said control port (24) and incorporating a third valve (V3); and

d) a fourth branch (39) linking the vacuum duct (34) to an atmosphoric inlet (41) and incorporating a fourth valve (V4);

4) the first valve (V1) and the second valve (V2) comprising a first cam (46), a first anvil (57) and flexible sections of

each of the first branch (36) and of the second branch (37) passing between the first cam (46) and the first anvil (57); the third valve (V3) and the fourth valve (V4) comprising the first cam (46) and a second anvil (56) and flexible sections of each of the third branch (38) and of the fourth branch (39) passing between the first cam (46) and the second anvil (56); the first cam (46) being operable to deform and release from deformation the flexible sections of pairs of the first to the fourth branches (36–39) so that:

a) in a first operating mode, the first valve (V1) and the second valve (V2) are each open, and the third valve (V3) and the fourth valve (V4) are each closed to provide for the pressure duct (35) to vent to atmosphere by way of the first branch (36) and the outlet (40) and for the vacuum duct (34) to communicate with the sample chamber (20) by way of the second branch (37);

b) in a second operating mode, the first valve (V1), the second valve (V2), the third valve (V3) and the fourth valve (V4) are all open to allow the vacuum duct (34) to be open to atmosphere by way of the fourth branch (39), the pressure duct (35) to be open to atmosphere by way of the first branch (36) and the sample chamber (20) to vent to atmosphere;

c) in a third operating mode, the third valve (V3) and the fourth valve (V4) are each open and the first valve (V1) and second valve (V2) are each closed, to provide for the vacuum duct (34) to be vented to atmosphere by way of the fourth branch (39) and the inlet (41) and the pressure duct (35) to communicate with the sample chamber (20) by way of the third branch (38); and

d) in a fourth operating mode, the first valve (V1), the second valve (V2), the third valve (V3) and the fourth valve (V4) are all open to provide for the vacuum duct (34) to open to atmosphere by way of the fourth branch (39), the pressure duct (35) to be open to atmosphere by way of the first branch (36) and the sample chamber (20) to vent to atmosphere;

5) the sample outlet branch (23) including a delivery valve (25), disposed in the outlet branch (23), for regulating liquid flow there along from the sample chamber (20); the delivery valve (25) comprising a clamping device made up of a pinch cam (49) driving a clamp (50, 51), and a flexible section of the outlet branch (23) extending through the clamp (50, 51); the delivery valve (25) being operable, in relation to a state of the first, the second, the third and the fourth valves (V1 to V4), between:

i) a closed position in which the clamp (50, 51) serves to clamp the flexible section of the outlet branch (23) to inhibit the flow of liquid along the outlet branch (23) from the sample chamber (20) to a sample collection device; and

ii) an open position in which the clamp (50, 51) does not inhibit the passage of liquid through the outlet branch (23) to the sample collection device; and

6) a prime mover (45) coupled to drive both the first cam (46) and the pinch cam (49) providing for operation of the first, the second, the third and the fourth valves (V1, V2, V3, V4) and the delivery valve (25) to be mechanically related.

5,197,341

PAYLOAD ATTITUDE CONTROL TESTER

Russell G. Steeves, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

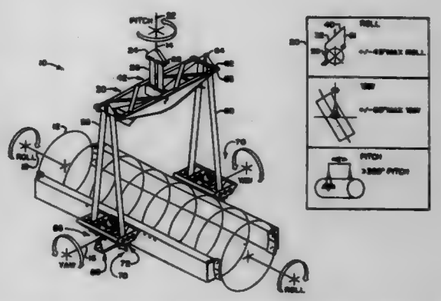
Filed Jun. 20, 1991, Ser. No. 721,855
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—865.3 13 Claims

1. A test device, said test device being able to hold a payload thereon, the payload being able to move with three degrees of freedom about three orthogonal axes being along a gravity vector, said test device comprising:

a means for moving the payload about a pitch axis being along a gravity vector, said means including a high tensile strength, low cross sectional area line;

a means for moving the payload about a roll axis, said means for moving about a roll axis including a plurality of roll axis joints, said roll axis joints forming a parallelogram, said roll axis joints including high tensile strength straps,

a means for moving the payload about a yaw axis, said means for moving about a yaw axis including a plurality of yaw axis joints, said yaw axis joints including high tensile strength straps; and



a means for connecting the payload to said test device; said test device simulating a zero-gravity environment for the payload wherein said joints are substantially frictionless;

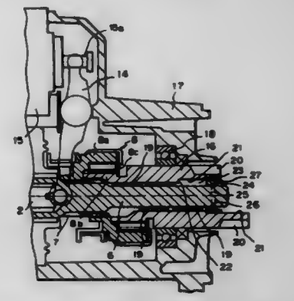
whereby each axis joint is capable of rotation by flexing a thin, high strength strap in bending, said strap providing a very low static friction and elastic stiffness, said joint elastic stiffness and apparent shift in center of rotation being essentially negated after the system is statically balanced over the range of angular excursions.

5,197,342

PINION STOPPER FOR STARTER

Taiichi Nakagawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 453,050, Dec. 13, 1989, abandoned, which is a continuation of Ser. No. 166,635, Mar. 11, 1988, abandoned. This application Apr. 25, 1991, Ser. No. 692,952
Claims priority, application Japan, Mar. 12, 1987, 62-37723[U]; Oct. 28, 1987, 62-165631[U]
Int. Cl.[5] F02N *15/06*
U.S. Cl. 74—7 A 29 Claims



1. In a starter motor having a housing with an opening therein, a motor with an output drive shaft, said output drive shaft having an end proximal to and driven by said motor and a distal end extending through said housing opening, and a mechanical stop ring on said output drive shaft distal end, a pinion drive gear supported by a pinion driving shaft, said pinion drive gear and said pinion driving shaft having a cylin-

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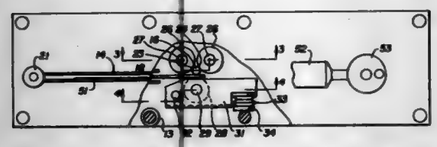
drical bore with a first diameter therethrough so that said pinion gear drive gear and said pinion driving shaft are slidable over said output drive shaft towards said distal end, and an annular bearing mounted in said housing opening for supporting said pinion drive gear and said pinion driving shaft, said cylindrical bore having a section thereof facing said output drive shaft distal end and disposed concentric with and having a second diameter less than that of at least said pinion drive gear with said second diameter larger than said first diameter so that said larger second diameter bore section is slidable over said mechanical stop ring, said pinion drive gear being located about said larger second diameter bore section, said larger second diameter bore section constituting at least an inner diameter of said pinion drive gear, said first and second diameter bore sections defining therebetween a step portion against which the stop ring may be urged, said step portion formed longitudinally between said pinon drive gear and a portion of said pinion driving shaft, said pinion drive gear and said pinion driving shaft having alternate position including a withdrawn position in which said mechanical stop ring is positioned substantially within said larger second diameter bore section and said pinion drive gear is substantially withdrawn within said housing and does not substantially extend from said housing opening, and a projected position in which said pinion drive gear extends at least partially beyond said mechanical stop ring and extends in its entirety through and beyond said bracket opening, said pinion drive gear and said pinion driving shaft being translationally displaceable between the withdrawn position and the projected position.

5,197,343

FRICTION DRIVE FOR ROTARY TO LINEAR MOTION

Jerry E. Rochte, 196 Sunkist La., Los Altos, Calif. 94022

Filed Nov. 13, 1991, Ser. No. 791,966
Int. Cl.[5] F16H *13/10*
U.S. Cl. 74—89 **4 Claims**



1. A friction drive converting rotary to linear motion comprising

a housing, a drive roller mounted in said housing, first and second back-up rollers mounted in said housing bearing against said drive roller on first and second lines, respectively, each parallel to the other and located on opposite sides of said drive roller, said drive roller and said back-up rollers having opposite ends rotatably mounted in said housing about axes fixed relative to each other, drive means for turning said drive roller,

pressure roller having opposite ends,

a driven member having at least one flat surface perpendicular to a line joining the axes of rotation of said drive roller and said pressure roller and parallel to said first and second lines and a second surface opposite said one flat surface, said drive roller frictionally engaging said one flat surface and said pressure roller engaging said second surface to cause reciprocable motion of said housing and said driven member relative to each other as said drive means turns said drive roller,

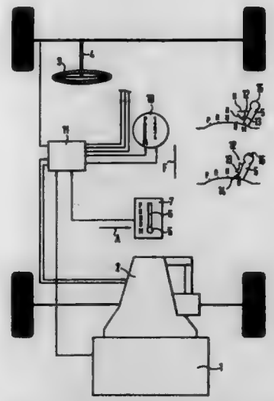
a yoke within said housing having a pair of parallel arms in which said opposite ends of said pressure roller are rotatably mounted, pivot means pivoting said yoke to said housing about a single pivot axis parallel to the axis of rotation of said pressure roller, and resilient means comprising a single spring applying substantially equal pressure against both arms of said yoke at points remote from said pivot means.

5,197,344

SHIFTING ARRANGEMENT FOR AN AUTOMATIC TRANSMISSION

Ulrich Maier, Freiberg/N.; Robert Mueller, Moensheim, and Heinz Stehle, Weissach, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1991, Ser. No. 648,289
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1990, 4005588
Int. Cl.[5] B60K *20/00*
U.S. Cl. 74—335 **14 Claims**



1. A shifting arrangement for an automatic transmission of a motor vehicle controlled by an electronic control unit, comprising:

a shifting channel;

a selector lever in said shifting channel that is movable in the shifting channel to select different transmission gears, said selector lever being movable in said shifting channel into a predetermined position in which a manual gear selecting device can trigger shifting commands; and

a manual gear selecting device coupled to the electronic control unit which triggers shifting commands for shifting forward gears of the transmission, said manual gear selecting device being activated by movement of said selector lever into said predetermined position in said shifting channel;

wherein the manual gear selecting device is a rocker switch arranged on the selector lever; and

wherein the shifting channel has the positions (P, R, N, D), and a second switch is arranged on the selector lever, wherein the transmission is shiftable by the rocker switch only in the D-position of the selector lever after the actuating of the second switch.

5,197,345

TAPER BUSHED SCREW CONVEYOR DRIVE AND METHOD WITH DEMOUNT FEATURE

Max H. Rose, Greenville, S.C., assignor to Reliance Electric Industrial Company, Greenville, S.C.

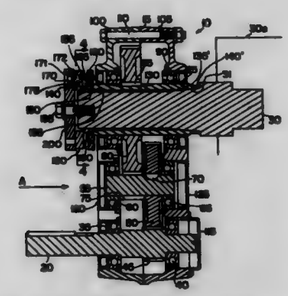
Filed Nov. 15, 1991, Ser. No. 792,431
Int. Cl.[5] F16H *1/20*; F16D *1/06*; B23P *19/06*
U.S. Cl. 74—421 R **14 Claims**

1. An improved speed reducer, said speed reducer comprising:

a housing including an input means and an output means, said input and output means being operatively connected by gears within said housing;

said output means including a sleeve defining a bore in said housing for receiving a portion of an output shaft therein, said sleeve having a first side and a second side, and comprising a substantially cylindrically shaped central portion and tapered end portions on said first side and said second side formed by outwardly flaring inner walls;

said output means being adapted to receive a shaft within said sleeve from said second side, with a portion of said shaft extending through said sleeve to said first side, said shaft including a tapered portion adapted for engagement



with the corresponding tapered portion of said sleeve on said second side of said housing when said shaft is inserted into the bore;

said output means further comprising a split bushing for receipt within said sleeve at said first side of said sleeve, said split bushing including a substantially cylindrical inner surface for receipt on said shaft and tapered outer surface for mating engagement with the tapered end portion on the first side of said sleeve; and

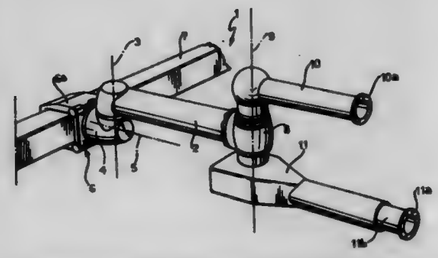
means for maintaining said bushing in place on said shaft, so that said shaft will be securely maintained in said speed reducer by said sleeve and bushing.

5,197,346

ARTICULATED ROBOT WITH TWO FOREARMS

Mauro Zona, and Marco Bettinardi, both of Turin, Italy, assignors to Comau S.p.A., Turin, Italy

Filed Jan. 29, 1992, Ser. No. 827,754
Claims priority, application Italy, Feb. 15, 1991, T091A000112
Int. Cl.[5] B25J *17/00*
U.S. Cl. 74—479 **6 Claims**



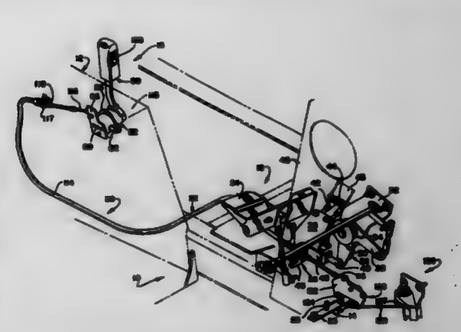
1. An articulated robot including an arm having a distal end, a first forearm which is articulated to the arm about an articulation axis and is intended to have an articulated wrist, and means for rotating the first forearm relative to the arm, said robot including a second forearm which is articulated to the arm about the same articulation axis as the first forearm and means for rotating the second forearm which are independent of the means for rotating the first forearm, wherein the distal end of the arm supports for rotation a structure which is fixed to the second forearm and also rigidly supports an electric motor for rotating the first forearm.

5,197,347

HAND AND FOOT CONTROL SYSTEM FOR AN OFF-HIGHWAY IMPLEMENT

John M. Moffitt; Marvin L. Morris, and David E. Johnson, all of Wichita, Kans., assignors to Case Corporation, Racine, Wis.

Filed Jan. 17, 1992, Ser. No. 822,068
Int. Cl.[5] G05G *1/24, 11/00*
U.S. Cl. 74—481 **16 Claims**



1. A control system for an off-highway implement, comprising:

movable regulator means operably movable to either side of a neutral position for influencing implement operation as a function of the position thereof;

hand control means for selectively moving said regulator means into position to condition the implement for operation and comprising a pivotal hand control connected to said regulator means through motion transmitting means including an elongated flexible conduit having a first end secured against movement and a second end with an elongated flexible motion transmitting core element movably supported by said conduit and whose ends extend beyond said ends of the conduit, a first end of said core element being connected to aid hand control and a second end being connected to said regulator means whereby pivotal movement of said hand control translates into movement of said regulator means; and

foot control means for selectively moving said regulator means into position to condition the implement for operation independently of said hand control means, said foot control means including a positionable foot pedal connected through said motion transmitting means to said regulator means and means for connecting said foot pedal to said flexible conduit of said motion transmitting means, said connecting means including linkage means for supporting and positioning the second end of said flexible conduit relative to said regulator means for all settings thereof thereby inhibiting binding stresses between said core element and said flexible conduit of said motion transmitting means as said regulator means is moved through a range of positions.

5,197,351

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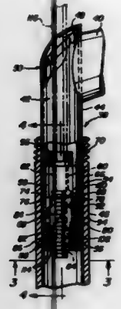
5,197,348
SERPENTINE TUBE INSPECTION POSITIONING SPINE
Robert E. Womack, Forest, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.
Filed Oct. 7, 1991, Ser. No. 773,425
Int. Cl.[5] F16C *1/28*
U.S. Cl. 74—502.3 7 Claims

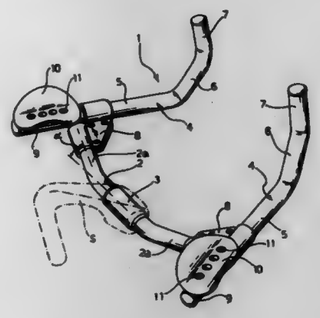
1. A positioning spine, comprising:
a. a helical extension spring;
b. a plurality of wheeled carriers attached to said spring at selected intervals, each of said wheeled carriers having wheels rotatably mounted thereon that rotate in planes radial to said spring; and
c. each of said wheeled carriers formed from two body sections having a semicircular cutout sized to fit around said spring and being fastened together around said spring.

5,197,349
EXPANDER NUT STRUCTURE FOR A HANDLEBAR STEM
William P. Herman, Marblehead, Mass., assignor to Hsin Lung Accessories Co., Ltd., Taiwan
Filed Apr. 11, 1991, Ser. No. 684,019
Int. Cl.[5] B62K *21/12, 21/16*
U.S. Cl. 74—551.1 15 Claims



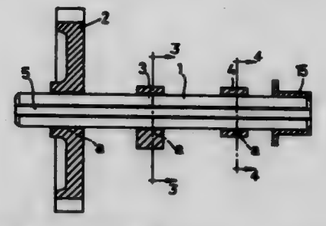
1. A handlebar stem having a quill tube and an expander nut structure comprising:
an insert selectively positioned within an end of a cylindrical quill tube adapted to be inserted into a steering tube, the insert having a narrowed cylindrical section disposed within the quill tube and a cylindrical external section having a sidewall aligned with the quill tube and of substantially equal outer diameter to an outer diameter of the quill tube;
the external section of the insert joining the quill tube at a joint substantially perpendicular relative to the sidewall of the insert, the insert having a lowermost edge defining a plane, the plane being slanted with respect to the sidewall so that an angle between the sidewall and the plane taken from a lowermost point of the lowermost edge is less than a right angle, the plane passing through the perpendicular joint and upwardly into a part of the quill tube sidewall, the part of the quill tube sidewall being shaped to lie within the plane and forming a part of the plane;
an expander nut having a cylindrical sidewall substantially equal in outer diameter to the outer diameter of the insert sidewall and having an upper surface that defines a slanted non-perpendicular plane relative to the sidewall of the expander nut, the slanted plane being constructed and arranged so that the sidewall of the expander nut is substantially concentric and aligned with the sidewall of the insert and the quill tube when the upper surface of the expander nut mates in a face-to-face relationship with a surface defined by the plane of the lowermost edge of the insert and the quill tube; and
a bolt passing through the insert and engaging a threaded hole in the expander nut when the surfaces thereof mate in the face-to-face relationship, the bolt aligned along a direction substantially parallel to the sidewalls of the insert and the expander nut and the bolt having a head abutting an uppermost surface of the insert disposed within the quill tube so that compression applied by the bolt between the insert and the expander nut causes the expander nut to displace relative to the insert along the mating surfaces in opposite directions to bear against inner walls of the steering tube.

5,197,350
HANDLEBAR, PARTICULARLY FOR CYCLES, SUCH AS, FOR EXAMPLE, BICYCLES
Lucio Borromeo, Turin, Italy, assignor to 3 T S.p.A., Turin, Italy
Filed Mar. 26, 1992, Ser. No. 858,188
Claims priority, application Italy, Jul. 15, 1991, 000553 A/91
Int. Cl.[5] B62K *21/12*; F16B *1/00*
U.S. Cl. 74—551.8 4 Claims



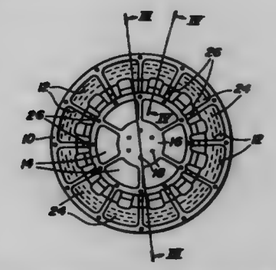
1. A handlebar for a cycle comprising a cross member having a central portion adapted to be connected to a steering column of the cycle, two side elements connected to opposite ends of the cross member respectively in a T-shaped configuration with each side element having a front portion projecting forwardly of the cross member and a rear portion projecting rearwardly of the cross member and two support formations for supporting the elbows of a cycle rider, each connected to the rear portion of each side element wherein said support formations are located substantially rearwardly of the cross member and wherein the cross member has a given length and a distance between the support formations is at least slightly greater than the given length.

5,197,351
CAM SHAFT AND PROCESS FOR MANUFACTURING THE SAME
Tadashi Hishida, Sakai, Japan, assignor to Viv Engineering Inc., Osaka, Japan
Division of Ser. No. 708,066, May 30, 1991, Pat. No. 5,136,780, which is a continuation-in-part of Ser. No. 561,506, Jul. 30, 1990, abandoned. This application Apr. 1, 1992, Ser. No. 861,455
Claims priority, application Japan, Feb. 28, 1989, 1-49359
Int. Cl.[5] F01L *1/04*; F16H *53/00*
U.S. Cl. 74—567 1 Claim



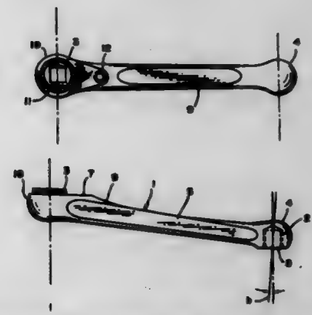
1. A cam shaft comprising:
a shaft member made of steel and having an axial groove on the outer periphery thereof; and
a cam made of a sintered alloy and having an axial hole to receive said shaft member and having a protrusion on a wall defining said axial hole, said cam being mounted on said shaft member with said protrusion on said cam engaged in said axial groove in said shaft member, said shaft member being provided with a copper plating layer on the outer periphery thereof at a joint area where said cam is secured to said shaft member, said cam being impregnated with copper, said copper and said copper plating layer being heat fused to join said cam to said shaft member.

5,197,352
FLYWHEEL FOR AN INTERNAL COMBUSTION ENGINE
Yuji Haikawa, Yokohama, Japan, assignor to ISP Corporation, Tokyo, Japan
Continuation of Ser. No. 809,779, Dec. 17, 1985, abandoned. This application Dec. 21, 1990, Ser. No. 631,447
Claims priority, application Japan, Dec. 21, 1984, 59-270370
Int. Cl.[5] F16F *15/10*
U.S. Cl. 74—574 18 Claims



1. A flywheel connected to an internal combustion engine having n cylinders to absorb vibrations of the engine, the flywheel comprising:
a base which can be secured to a rotating portion of the engine, the base having a plurality of constant volume chambers formed therein; and
a liquid which is sealed within the base and partially fills each of the chambers, the liquid in each chamber having a characteristic frequency of oscillation ω_0 when the flywheel is rotated which is a constant multiple of the rotational speed ω_e of the flywheel over the entire rotational speed range of the flywheel.

5,197,353
CRANK AND SPIDER ASSEMBLY FOR BICYCLE
John Trenerry, and Phillip Trenerry, both of 10885 Kalama River, Unit "E", Fountain Valley, Calif. 92708
Filed Jul. 31, 1991, Ser. No. 738,602
Int. Cl.[5] G05G *1/14*
U.S. Cl. 74—594.1 14 Claims



1. A crank for a bicycle or like vehicle, the crank having on one end fastening means including threads for connecting it to a spider or sprocket, said threads having an axis of rotation durign connection to the spider, the crank having an opposite end including a passage for connection to a pedal, said passage being closed at one end and having a central axis extending longitudinally of the passage at an acute angle and in non-parallel relationship with respect to said axis of the threads, and wherein said means is a threaded boss to be received byh the spider and includes an aperture located within the threaded boss for receiving a drive shaft to be coanected to an opposite crank, and wherein said crank ha a solid body extending between and formed integral with said ends of the crank.

5,197,354
ANGULAR DRIVE INTERMITTENT MOTION MECHANISM
Henry G. Mohr, and Randall L. Sparks, both of Carthage, Mo., assignors to Leggett & Platt Incorporated, Carthage, Mo.
Continuation of Ser. No. 612,184, Nov. 13, 1990, abandoned. This application Apr. 21, 1992, Ser. No. 873,585
Int. Cl.[5] F16H *27/06, 27/08, 35/02*
U.S. Cl. 74—820 21 Claims

1. An indexing mechanism for rotatably driving an output shaft intermittently with respect to the rotation about an input axis of an input shaft, and about an output axis which intersects the input axis at an intersection point, the mechanism comprising:
a driving element mounted on the input shaft to rotate therewith about the input axis, the driving element including a pair of drive pins spaced from each other and both at the same distance from the input axis, the pins being mounted on the driving element to move therewith in a plane perpendicular to the input axis and in a circle on the surface of an imaginary sphere centered at said intersection point;
a driven element mounted on the output shaft to rotate therewith about the output axis, the driven element having at least one pair of curved cam channels formed thereon, each pair of channels including a first channel and a second channel, the channels lying on and being carved along the surface of said imaginary sphere about center points spaced from the center of the sphere and positioned so as to matingly engage the drive pins for intermittent drive of the driven element as the driving element rotates;

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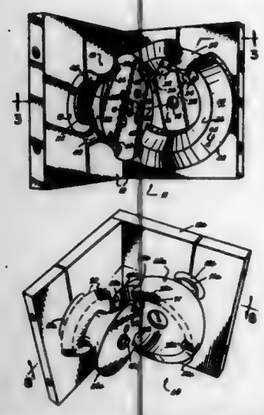
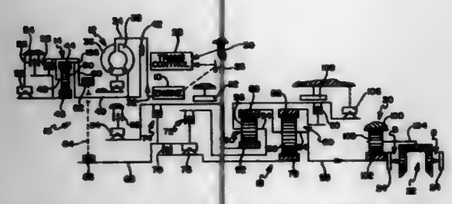
the pair of drive pins including a first pin moveable in the first channel of one of the channels of a pair for engaging and angularly accelerating the driven element from a zero angular velocity to a maximum angular velocity with an acceleration that increases from a low initial magnitude to a moderately low maximum and then decreases to zero,



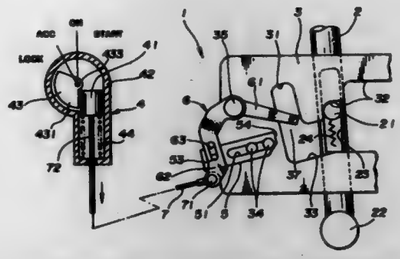
and a second pin moveable in the second channel of one of the channels of a pair for engaging and angularly decelerating the driven element from the maximum angular velocity to the zero angular velocity with a deceleration that increases in magnitude from zero to the maximum and then decreases to a low final magnitude.

5,197,355
POWER TRANSMISSION AND CONTROL
James F. Sherman, Brighton, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 19, 1992, Ser. No. 901,474
Int. Cl.[5] F16H *61/00*
U.S. Cl. 74—866 **2 Claims**



1. A multi-speed power transmission in a vehicle having an engine for delivering power to the transmission and brakes for retarding motion of the vehicle, said transmission comprising: a torque converter connected to receive power from the engine; a planetary gear set connected to receive torque from the torque converter and including means selectively controllable to establish a first ratio for increasing the torque from the torque converter and to establish a second ratio for providing a 1:1 torque transfer; planetary gear means connected between said planetary gear set and at least one drive wheel of the vehicle for providing at least four torque ratios between the engine and the drive wheel, said drive wheel being retarded by operation of the brakes; and control means for shifting said planetary gear set from the first ratio to the second ratio in response to operation of the brakes to thereby reduce the torque transmitted to the planetary gear means.

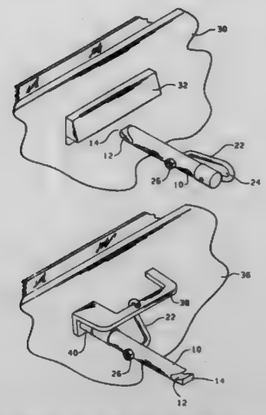
5,197,356
VEHICLE IGNITION LOCK AND TRANSMISSION SHIFT LOCK CONTROL MECHANISM
Satoshi Kobayashi; Takashi Maruta; Hiroshi Yamazaki, all of Kanagawa, and Yasushi Asano, Shizuoka, all of Japan, assignors to Nissan Motor Co., Ltd.; Ohi Seisakusho Co., Ltd., both of Yokohama; Fuji Kiko Co., Ltd., Tokyo and Nissan Shatai Company, Limited, Hiratsuka, all of Japan
Filed Mar. 27, 1992, Ser. No. 859,029
Claims priority, application Japan, Mar. 29, 1991, 3-66111
Int. Cl.[5] B60K *41/26*
U.S. Cl. 74—878 **9 Claims**



1. A vehicle ignition lock and transmission shift lock control mechanism comprising:
a shift lever movable into a plurality of gear positions including a Park position;
shift lock means connected to said shift lever for preventing shifting of said shift lever from the Park position;
said shift lock means having a position plate formed with a detent cam defining the gear positions, a position pin movably installed on said shift lever and engageable with the detent cam for positioning said shift lever in one of the gear positions, and a lock member for movement between a lock position for preventing shifting of said position pin from the Park position and an unlock position for permitting the same;
ignition lock means for locking vehicle ignition;
said ignition lock means having a key rotor rotatable into a lock position for locking vehicle ignition, and a stopper movable between a lock position for preventing rotation of said key rotor into the lock position and an unlock position for allowing the same;
an operating member pivotally installed on said position plate and having a first arm movable in unison with said position pin when said position pin moves upward and downward in the Park position and a second arm connected to said lock member for driving the same into the lock position when said position pin moves upward in the Park position;
cable means interconnecting said stopper and said operating member for allowing them to move in unison such that movement of said lock member into the lock position causes said stopper to move into the unlock position and movement of said stopper into the lock position causes said lock member to move into the unlock position; and
biasing means for urging said stopper into the lock position.

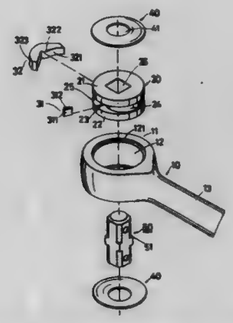
5,197,357
DOOR HANDLE ASSIST—MULTI-USE
David A. Cote, 13 Cote Ave., S. Ashburnham, Mass. 01430
Filed Jul. 17, 1992, Ser. No. 914,515
Int. Cl.[5] B25B *9/00*
U.S. Cl. 81—15.9 **2 Claims**

1. A universal tool for opening doors of automobiles, said tool comprising a body portion in a form of a short member adapted to fit the hand, a slot at one end of said member, said slot extending inwardly and downwardly thereof for a short distance inwardly from said end, and a hook-like member pivotally mounted on said body member at a point spaced from said slot, said hook being freely rotatable,
the hook being adapted to be placed over the fixed handle of the door at the outside aspect thereof and the portion of the body member adjacent the slot being adapted to be positioned to engage the latch releasing button for opening the automobile door



and wherein the slot is alternatively adapted to be positioned on a movable automobile door handle so as to receive the same providing easier pivoting of the handle,
the hook having a bight that is directed up or down according to need.

5,197,358
SOCKET WRENCH
C. C. Frank Hsu, No. 28, Chung-Hsing E. Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan
Filed Sep. 11, 1992, Ser. No. 943,636
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—60 **3 Claims**



1. A wrench used with a socket member, said wrench comprising:
a handle having a box end with an internal wall that confines a central bore through said box end;
a pair of identical rollers having a diameter smaller than that of said internal wall and being disposed in said central bore of said box end, said pair of identical rollers having an eccentric shaft fixed therebetween and a central rectangular opening passing through said eccentric shaft, an annular space being formed around said eccentric shaft between said pair of identical rollers and being confined by said internal wall, said annular space having a widest portion formed on one side of said eccentric shaft and a narrowest portion formed on the other side of said eccentric shaft opposite to said widest portion thereof, and a resilient member provided between said pair of identical rollers;
a pair of retaining plates mounted to said box end respectively on both sides of said pair of identical rollers so as to retain said pair of rollers in said box end, each of said retaining plates having a circular hole formed therethrough and aligned with said central rectangular opening of said pair of identical rollers, said circular hole having a diameter which is smaller than a diagonal length of said central rectangular opening of said pair of identical rollers;
a drive shaft disposed in said central rectangular openings of said pair of identical rollers and provided with two end portions which respectively protrude out of said circular holes of said retaining plates such that said end portions can be inserted in said socket member to rotate a nut, said drive shaft having a rectangular shoulder formed at an intermediate portion thereof and fittingly held in said rectangular opening so as to permit rotation of said drive shaft with said rollers, said drive shaft being prevented by said retaining plates from falling out of said rectangular opening of said pair of identical rollers;
an inverted V-shaped rigid pawl member disposed around said eccentric shaft and including a first section and a second section, each of said first and second sections having a free end which extends from said widest portion toward said narrowest portion, said first section having a curved first side formed adjacent to said internal wall of said box end, a straight second side forming a first clearance between said straight second side and said eccentric shaft, said free end of said first section interconnecting said curved first side and straight second side and being resiliently biased by said resilient member such that at least a portion of said curved first side adjacent to said resilient member frictionally abuts with said internal wall of said box end, said second section having a straight third side connected to said curved first side and a curved fourth side interconnecting said free end of said second section and said straight second side of said first section, and a second clearance being formed between said straight third side and said internal wall of said box end, said curved fourth side being adjacent to said eccentric shaft, a protrusion portion being formed between said straight second side and said curved fourth side and abutting said eccentric shaft so that said pawl member can pivot about said protrusion;
when said handle is rotated in a first direction, friction between said curved first side of said rigid pawl member and said internal wall of said box end of said handle causes said first section of said rigid pawl member to pivot about said protrusion in said first section, and further allowing said first section of said pawl member to wedge into said narrowest portion of said annular space, and allowing said curved fourth side to frictionally engage said eccentric shaft;
when said handle is rotated in a second direction opposite to said first direction, said friction causes said first section of said rigid pawl member to rotate in said second direction and move toward said widest portion, thereby permitting said curved first side of said first section of said pawl member to disengage said internal wall of said box end and simultaneously permit said curved fourth side of said second section of said pawl member to disengage said eccentric shaft.

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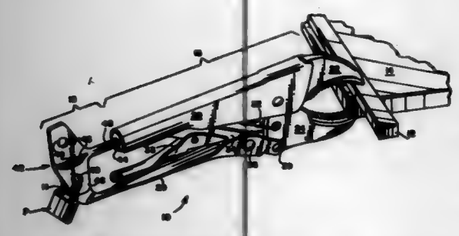
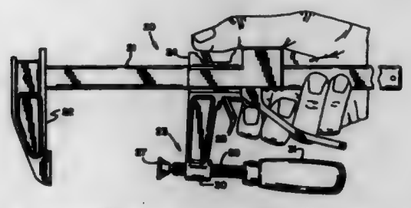
5,197,359
LOCKING WRENCHES
J. David Mills, Dauphin Island, Ala., assignor to Blue Water Holding Company, Inc., Dauphin Island, Ala.
Continuation of Ser. No. 726,658, Jul. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 583,977, Sep. 18, 1990, Pat. No. 5,052,251, which is a continuation-in-part of Ser. No. 571,202, Aug. 23, 1990, abandoned. This application Aug. 18, 1992, Ser. No. 929,492
Int. Cl.[5] B25B 7/14
U.S. Cl. 81—324 18 Claims



1. A locking wrench comprising
upper and lower handles respectively having upper and lower jaws;
said upper handle having a fixed upper jaw;
said lower handle having a lower jaw movably connected to said lower handle and to said fixed upper jaw so as to be in opposition to said fixed upper jaw such that a clamping force is exerted therebetween, wherein movements of said lower handle between opened and closed states relative to said upper handle causes said lower jaw to be moved relative to said opposing upper jaw between unclamped and clamped conditions, respectively;
a toggle lever pivotally coupled at one end to said lower handle and coupled at another end to said upper handle for axial movements relative to said upper handle;
a release lever having a forward operating end portion and a rearward grip end portion disposed between said upper and lower handles and pivotally connected to said toggle lever for facilitating movement of said lower handle from said closed to said opened states;
an adjustment screw having a rear head portion and a forward threaded shank which is threadably engaged to a rear end of said upper handle to cause axial reciprocal movements of said head portion between greater and lesser positions relative to said rear end of said upper handle in response to turning movements being applied to said adjustment screw,
said shank portion of said adjustment screw having a forward end in operative coaction with said another end of said toggle lever such that, in response to axial movement of said adjustment screw between said greater and lesser positions, said operative coaction between said forward end of said adjustment screw and said another end of said toggle lever (i) varies the clamping force exerted between said opposed upper and lower jaws and (ii) causes the lower handle to move axially substantially in unison with said axial movements of said adjustment screw; and
a handle retraining system to restrain said lower handle against movement into said opened state when in said closed state, said handle-restraining system including:
(a) an extension flange integral with said lower handle, said extension flange extending upwardly from said lower handle towards said upper handle at a position rearwardly of said grip end portion of said release lever such that a terminal end of said extension flange is in substantial opposed alignment with said head portion of said adjustment screw and such that said extension flange restricts access to said grip end portion of said release lever from a rearward direction; and
(b) a restraining element integral with one of said extension flange and said head portion of said adjustment screw; wherein
(c) said restraining element and a terminal end of said extension flange remain in said substantial opposed alignment with one another throughout axial movements of said head portion of said adjustment screw between said greater and lesser positions relative to said rear end of said upper handle; and wherein
(d) said restraining element and said terminal end of said extension flange are lockably engagable with one another when said lower handle is moved into said closed state relative to said upper handle thereby to positionally restrain said lower handle against movement into said opened state, whereby the clamping force exerted between said upper and lower jaws is maintained.

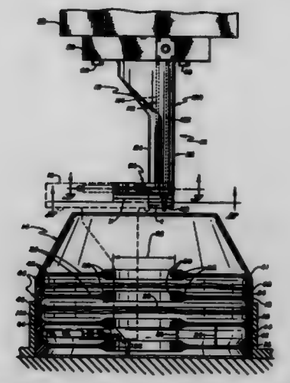
5,197,360
ADJUSTABLE CLAMP
Robert D. Wooster, Jr., Crystal Lake, Ill., assignor to Adjustable Clamp Co., Chicago, Ill.
Filed Feb. 28, 1992, Ser. No. 841,719
Int. Cl.[5] B25B 5/02
U.S. Cl. 81—487 9 Claims



1. In a bar clamp having a bar and a pair of opposed work-engaging jaws mounted thereon with at least one of the jaws mounted on a jaw carrier slidable on the bar, at least one jaw carrier brake key apertured for both sliding and tilting movement on the bar and mounted on the bar in braking relationship with said jaw carrier; and spring means biasing said jaw carrier brake key into a tilted braking position on the bar in which it grips the bar and brakes the jaw carrier against sliding movement in one direction on the bar while permitting said jaw carrier to slide on the bar in the opposite direction, said jaw carrier brake key being manually tiltable so as to temporarily release its grip on the bar,
the improvement which comprises, a one-way jaw carrier drive mechanism comprising, a jaw carrier drive lever having an apertured jaw carrier drive portion slidably and tiltably mounted on the bar independently of said jaw carrier and an operating handle, an apertured carrier drive lever brake key tiltably disposed on the bar in braking relationship with said apertured jaw carrier drive portion, a compression spring surrounding the bar and slidable thereon with one end engageable with said carrier drive lever brake key, and a compression spring retainer having a portion which engages the end of said compression spring opposite said first-mentioned one end thereof and an attaching portion which removably attaches said retainer to said jaw carrier and retains said compression spring in a compressed condition against said carrier drive lever brake key and thereby biases said apertured jaw carrier drive portion of said jaw carrier drive lever against said jaw carrier, said apertured jaw carrier drive portion being pivotable on the bar by means of its operating handle between a non-operating position into which it is biased by said compression spring and pivoted driving positions in which it drives said jaw carrier to shift on the bar, the compression spring biasing said carrier drive lever brake key into a tilted gripping relationship with the bar in which it brakes said jaw carrier drive lever from shifting

o the bar when said jaw carrier drive lever is in its pivoted driving positions, said bar clamp being operable as a bar clamp when said jaw carrier drive lever, said apertured carrier drive lever brake key, said compression spring and said compression spring retainers are removed therefrom.

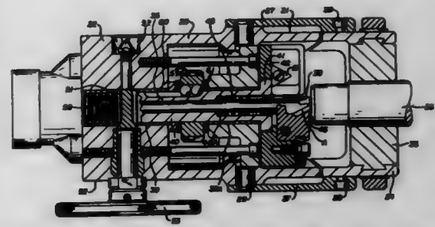
5,197,361
SURFACE CONTOURING TOOL
Charles W. Carrier, West Chester, and Frank W. Gorsler, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Oct. 11, 1991, Ser. No. 774,907
Int. Cl.[5] B23B 41/12
U.S. Cl. 82—1.2 19 Claims



1. Apparatus for providing a desired contour to the inner surface of a gas turbine engine rotor having an inner, working surface, said apparatus comprising:
a tool body having first and second tool body sections, said first and second tool body sections being angularly disposed with respect to each other, said tool body being insertable into the interior of the rotor;
a machining head means for contouring the inner surface of the rotor, said machining head means being disposed at the free end of said second body section and extendable from a first position to a second position;
means for extending said machining head means from said first position to said second position whereat said head means is capable of contouring the inner surface of the rotor;
wherein said tool body can be inserted into the rotor and said head means can be extended from said first position to said second position for contouring the inner surface of the rotor and retracted to said first position for movement within said rotor; and
means for rotating said machining head means about an axis lying substantially parallel to a direction of extension and retraction of said head means.

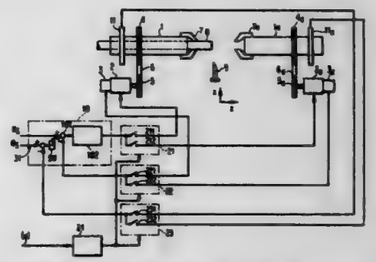
5,197,362
TUBE AND ROD END SHAPING AND FINISHING MACHINE
Orville J. Birkestrand, 2705 Lee Ave., El Monte, Calif. 91733
Filed Nov. 21, 1990, Ser. No. 616,963
Int. Cl.[5] B23B 5/16
U.S. Cl. 82—113 3 Claims

1. A tube an rod end shaping and finishing machine comprising:
a housing;
a tubular spindle rotatably mounted therein;
a hollow cylindrical cutter cartridge assembly carried on one end of said spindle; said spindle and cutter cartridge assembly being mounted for axial movement with respect to said housing;
a workpiece stop carried by said spindle and extending generally axially thereof through said hollow cylindrical cutter cartridge assembly when the latter is fully retracted;
means for holding a workpiece positioned against said workstop in position for engagement by tooling carried by said cutter cartridge assembly;



means for advancing and retracting said cutter cartridge assembly with respect to said workpiece stop and said holding means; and
said cutter cartridge assembly including tooling engageable, upon such advancement, with a portion of an end of, and other tooling engagement with a portion of the periphery of, a workpiece held by said holding means.

5,197,363
SPINDLE DRIVING DEVICE FOR A MACHINE TOOL
Hiroaki Okachi; Takahiro Hayashida, and Mahito Uano, all of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Jun. 14, 1990, Ser. No. 537,737
Claims priority, application Japan, Jun. 15, 1989, 1-152971
Int. Cl.[5] B23B 3/06; B23Q 5/10
U.S. Cl. 82—118 8 Claims



1. A spindle driving system for a machine tool having plural operational modes, the system comprising:
first and second rotatable spindles;
first and second drive motors for respectively rotating said first and second spindles;
a single drive controller for controlling the operation of said motors in accordance with an operational mode, wherein in a first operational mode said single drive controller controls operation of said first drive motor so as to cause said first rotatable spindle to rotate, in a second operational mode said single drive controller controls operation of said second drive motor so as to cause said second rotatable spindle to rotate, and in a third operational mode said single drive controller simultaneously controls operation of both said first and second drive motors so as to cause both first and second spindles to simultaneously rotate;

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a switchover unit for selectively connecting said drive controller to said motors in accordance with an operational mode;

speed detectors associated with each of said motors; and

speed detector output change-over unit for selectively coupling the output of at least one of said speed detectors to an input of said drive controller, to establish a speed control loop in accordance with an operational mode.

5,197,364

METHOD OF AND APPARATUS FOR TRIMMING LATERAL MARGINAL PORTIONS OF SHEETS IN A STREAM OF PARTLY OVERLAPPING SHEETS

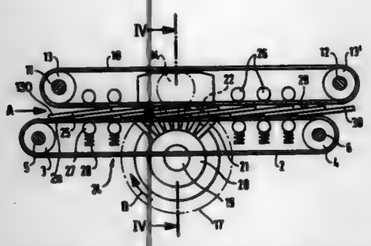
Kurt Heutschi, Wikon, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland

Continuation of Ser. No. 673,734, Mar. 22, 1991, abandoned. This application Jun. 5, 1992, Ser. No. 895,152

Claims priority, application Switzerland, Apr. 2, 1990, 1093/90

Int. Cl.[5] B26D 7/06

U.S. Cl. 83—29 **5 Claims**



1. A method of trimming at least one lateral marginal portion of each of a series of successive sheets in a stream of partly overlapping sheets which have leaders and trailing ends, comprising the steps of transporting the stream in a predetermined direction along an elongated path with the leaders of partly overlapping sheets located at one side and with the trailing ends of partly overlapping sheets located at the other side of the path opposite the one side; positioning a counterknife at the one side of the path; and positioning a rotary holder with a plurality of knife blades extending from the rotary holder at the other side of the path opposite the counterknife so that the blades and the counterknife define a severing plane, said transporting step including advancing the at least one marginal portion of each sheet at one side and advancing the remainder of each sheet at the other side of the severing plane so that the at least one marginal portion is separated from the remainder of the sheet.

5,197,365

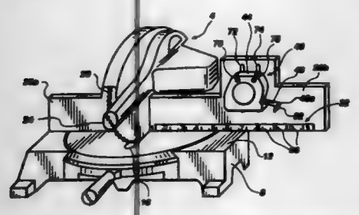
MEASURING APPARATUS FOR MITRE SAWS, CUT-OFF SAWS, AND THE LIKE

Norman L. Clifton, 49 S. 875 West, Orem, Utah 84058-5267

Filed Aug. 15, 1991, Ser. No. 745,502

Int. Cl.[5] B26D 7/28

U.S. Cl. 83—468 **2 Claims**



1. In combination in machinery for sawing with a saw blade disposed in a fixed position in the machinery, a support surface for supporting an elongate piece of material, apparatus for measuring the length of at least one of the two pieces of material resulting from sawing the elongate piece of material comprising

a measuring implement disposed above the support surface to extend laterally in one direction from adjacent the saw blade so that the elongate piece of material being cut lies adjacent the measuring implement, said measuring implement including means for measuring the distance from the saw blade to an end of the piece of material positioned in said one direction from the saw blade;

wherein said measuring implement comprises

a backstop disposed to extend upwardly from the support surface at a position laterally in said one direction from the saw blade,

a coilable tape measure including

a casing mounted on the backstop for holding a coiled tape and for allowing the pulling of one end of the tape in said one direction above the support surface, and

the coiled tape being disposed in the casing so that a free end thereof is graspable to allow pulling the tape outwardly from the casing in said one direction away from the saw blade to affix said free end with said end of the elongate piece of material, said tape including indicia for indicating the distance from the saw blade of said end of the elongate piece of material when said end is aligned with the free end of the tape, and

means for joining the coilable tape measure to the backstop so that the tape, when pulled from the casing, is generally parallel with the support surface to overlie the elongate piece of material, wherein said joining means includes means for adjusting the height of the coilable tape measure above the support surface.

5,197,366

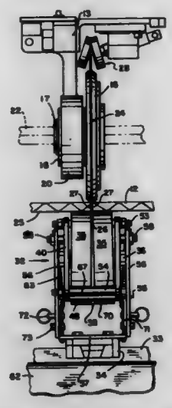
ROLLER ASSEMBLY FOR PAPERBOARD SLITTING APPARATUS

Richard F. Paulson, and Kent L. Ross, both of Phillips, Wis., assignors to Marquip, Inc., Phillips, Wis.

Filed Jul. 29, 1992, Ser. No. 921,811

Int. Cl.[5] B26D 1/22

U.S. Cl. 83—498 **9 Claims**



1. A roller assembly for an apparatus for slitting a running web of paperboard, said apparatus including a thin annular rotary cutting blade positioned with its axis of rotation over the web and having a peripheral cutting edge defined by opposite blade faces extending downwardly through the path of the

web to slit the web in the direction of web travel, said roller assembly positioned to support the web at the point of the slit and including a slot positioned to receive the blade edge therein, said roller assembly further comprising:

a pair of rollers rotatably mounted to provide tangent contact with the underside of the web and to define therebetween said slot;

said rollers mounted on separate rotational axes to present adjacent roller faces which define therebetween a downwardly divergent slot; and,

means for biasing said rollers toward one another to cause the axially adjacent radial edge portions of the rollers at the point of web contact to bear against the blade faces.

5,197,367

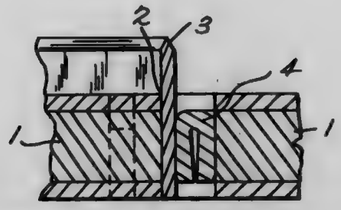
STEEL RULE DIE RETAINING BOARD AND DIE LOCK

Ken Holliday, Decatur, Ga., assignor to Southeastern Die Company, Inc., Decatur, Ga.

Filed Oct. 4, 1991, Ser. No. 771,238

Int. Cl.[5] B26D 7/26

U.S. Cl. 83—698 **6 Claims**



1. In combination, a retaining board having formed therein an elongated die slot including opposite sides, a lock slot intersecting one side of said die slot, a die disposed within said die slot, and a die lock disposed within said lock slot and engaging said die to resiliently urge said die into engagement with the other side of the die slot to maintain the die in operative position, wherein said die lock comprises a generally n-shaped member having a support arm and a resilient arm each of which has a top portion and a bottom portion, said support arm and said resilient arm being connected at the top portions by a bridge to resiliently support said resilient arm from said support arm for movement of said resilient arm toward and away from said support arm, said resilient arm having a dimension perpendicular to said die slot which dimension narrows from the bottom portion of said resilient arm towards the bridge of said die lock, said resilient arm contacting said die when said die is in said die slot so that said resilient arm is displaced toward said support arm, said resilient arm extending into said die slot upon removal of said die from said die slot.

5,197,368

PUNCH AND DIE RETAINER AND RELEASE MECHANISM

David G. Meyer, Centerville, and Robert L. Shadowens, West Carrollton, both of Ohio, assignors to Dayton Progress Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 751,875, Aug. 28, 1991, abandoned. This application Oct. 15, 1992, Ser. No. 961,461

Int. Cl.[5] B26F 1/14

U.S. Cl. 83—698 **5 Claims**

1. An improved ball type punch retainer for holding the shank of a punch and for releasing the same, comprising:

a retainer body having a bottom face surface, side walls and a top mounting surface,

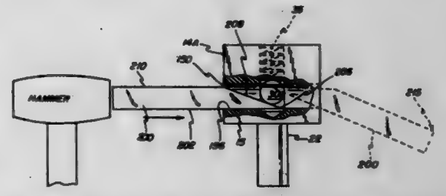
a punch shank receiving opening extending into said body through said bottom face surface for receiving a shank of a punch,

said retainer body having an elongated locking ball receiving hole aligned along an axis which intersects the axis of said shank opening,

a locking ball in said hole movable into locking position with a tear-drop shaped ball-receiving recess formed in the outer periphery of the punch shank,

spring means in said hole urging said ball into said locking position,

said ball in said locking position engaging said recess at two angularly spaced-apart contact positions on the shank and engaging said retainer body at a third contact position opposite the tool shank recess,



a ball release access slot extending transversely completely through said body in generally normal relation to the axis of said shank-receiving so that it is accessible from two opposite of said side walls of said body and in non-intersecting relation to said contact positions, a portion of said slot closest to said bottom face surface being located between said ball in its locking position and said bottom face surface, to provide access for a ball release tool inserted through said slot from either of opposite said side walls and into engagement with a portion of said locking ball closest to said bottom face surface, for lifting said locking ball against said spring means out of engagement with the punch shank.

5,197,369

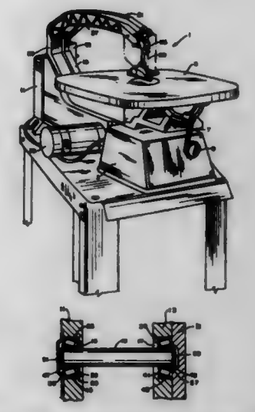
SCROLL SAW BEARING COMPENSATING MECHANISM

Robert E. Steiner, Chesterfield, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 25, 1991, Ser. No. 797,178

Int. Cl.[5] B23D 49/00

U.S. Cl. 83—782 **3 Claims**



1. In a scroll saw including a table mounted on a supporting frame, a generally C-shaped member with a curved inner bight portion and upper and lower outer free ends above and below the table respectively, a saw blade extending between the upper and lower outer ends of said C-shaped member and

through said table, a horizontal pivot shaft extending through the curved inner bight portion of said C-shaped member for mounting the C-shaped member to said supporting frame, said supporting frame including upstanding bearing support members for receiving a pair of tapered roller bearings in spaced relationship on said horizontal pivot shaft therein, and means for reciprocating said C-shaped member and said horizontal pivot shaft to effect movement of said saw blade, the improvement comprising: a self-contained bearing assembly in which said bearings are mounted on the horizontal pivot shaft between inner and outer stop means thereof for limiting axial inward and outward movement of said bearings, said outer stop means including a pair of slip rings each mounted on said horizontal pivot shaft in outer contacting engagement with one of said bearings, said inner stop means including a pair of spaced shoulder means each formed on one of said upstanding bearing support members in inner contacting engagement with one of said bearings, an resilient means positioned between one of said bearings and its associated inner stop for applying an outwardly directed force against said one bearing and its associated slip ring, said resilient means also applying an inwardly directed force through said horizontal pivot shaft and said other slip ring to the other of said bearings in order to maintain said other bearing and its associated slip ring in outer contacting engagement while its associated inner stop is in inner contacting engagement with said other bearing.

5,197,370

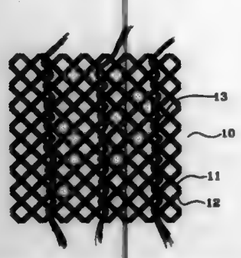
ABRASION RESISTANT BRAIDED SLEEVE

Harry F. Gladfelter, Phoenixville, Pa., assignor to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Continuation of Ser. No. 689,116, Apr. 22, 1991, abandoned, which is a continuation of Ser. No. 372,878, Jun. 28, 1989, abandoned. This application Feb. 27, 1992, Ser. No. 845,509

Int. Cl.[5] D04C *1/02*

U.S. Cl. 87—7 **9 Claims**



1. A positionable tubular sleeve comprising braided, resilient strands, wherein each resilient strand is comprised of 1 to 10 monofilaments of an engineering plastic material having a modulus of elasticity of at least 100,000 psi, said braided resilient strands defining a plurality of pair of cross over points within said sleeve, said braided sleeve further comprising uniformly distributed, flexible and substantially nonresilient relatively limp warp yarns interthreaded into said braid, said sleeve having at least a first and second position, whereby:

a portion of said braided, resilient strands in said first position are longitudinally compressed and radially expanded and said limp warp yarns tend to uniformly form very small loops between each of the pairs of cross over points where said warp yarns are located in said longitudinally compressed and radially expanded portion of said braided resilient strands; and

in said second position, said portion of said braided resilient strand is longitudinally extended and radially compressed, and said limp warp yarns are substantially straightened so as to substantially retract said loops.

5,197,371

FORCE LIMITER AND ULTRASONIC DEVICE PROVIDED WITH A FORCE LIMITER

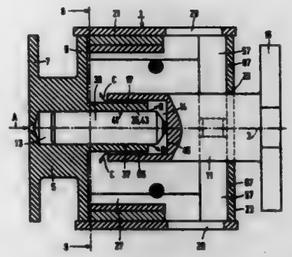
Franciscus J. M. van der Heijden, and Johan M. Bos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 328,927, Mar. 27, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 686,864

Claims priority, application Netherlands, Mar. 28, 1988, 8800768

Int. Cl.[5] F01B *31/00*; B32B *31/00*

U.S. Cl. 92—162 P **6 Claims**



1. A force limiter comprising a control member displaceable with respect to a holder and said force limiter being provided with a chamber, the shape of which chamber is determined at least partially by the holder and the control member and which chamber is located between a gas supply and a leakage control, said leakage control comprising a gap, said gap being connected to said chamber, located between at least one circular cylindrical inner surface of said control member and at least one circular cylindrical outer surface of said holder and is annular transverse to the direction of displacement of the control member and said gap having a gas resistance which is substantially constant upon relative displacement of the holder and the control member in the axial direction of said displacement.

3. A device for ultrasonically deforming an article made of a synthetic material, said device comprising a sonotrode that can be pressed against the article by a displacement device, characterized in that the displacement device is provided with a force limiter comprising a control member displaceable with respect to a holder and said force limiter being provided with a chamber, the shape of which chamber is determined at least partially by the holder and the control member and which chamber is located between a gas supply and a leakage control, said leakage control comprising a gap, said gap being connected to said chamber, located between at least one circular cylindrical inner surface of said control member and at least one circular cylindrical outer surface of said holder and is annular transverse to the direction of displacement of the control member and said gap having a gas resistance which is substantially constant upon relative displacement of the holder and the control member in the axial direction of said displacement.

5,197,372

DEVICE FOR THE PREPARATION OF HOT BEVERAGES BY EXTRACTION

Gerhard Schaeeberger, Bulach, Switzerland, assignor to Prodiana AG, Switzerland

Filed Jul. 22, 1991, Ser. No. 734,196

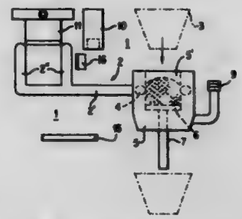
Claims priority, application Switzerland, Jul. 23, 1990, 02432/90

Int. Cl.[5] A47J *31/00*

U.S. Cl. 99—287 **5 Claims**

1. In a device for preparing hot beverages by extraction having a beverage powder processing and metering unit (3), a hot water heater (10) with a metering pump and expulsion means for removing the used beverage powder from a movable

extraction cup (5), the improvement comprising: an extraction cup (5) detachably secured to a movable holder (4), said movable holder (4) guided in a control track (2) having two end positions whereby the extraction cup (5) executes a horizontal motion (2') and a vertical (2'') motion, a filter (6) displaceably supported in the extraction cup (5), a permanently mounted scraper (16) positioned between the end positions of the control track (2) and outside said control track (2) a hot water inlet



neck (8) permanently secured to the extraction cup (5), said hot water inlet neck (8) provided with a seal (9) and sealingly engaging a coupling socket in the hot water heater (10) whenever said extraction cup (5) is in an extraction position, and an extraction piston (11) cooperating with said extraction cup (5) permanently mounted whereby, in an extraction position, said extraction piston (11) protrudes sealingly into said extraction cup (5) and compresses the beverage powder disposed therein.

5,197,373

APPARATUS FOR PREPARING BEVERAGES, SUCH AS COFFEE OR TEA, BY EXTRACTION

Adam De Jong, Ottoland, Netherlands, assignor to J. M. De Jong Duke Automatenfabriek B.V., Sliedrecht, Netherlands

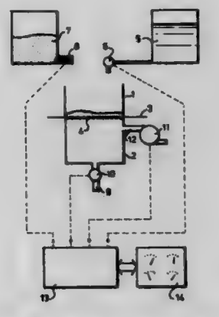
PCT No. PCT/NL90/00103, § 371 Date Jan. 14, 1992, § 102(e) Date Jan. 14, 1992, PCT Pub. No. WO91/01673, PCT Pub. Date Feb. 21, 1991

PCT Filed Jul. 25, 1990, Ser. No. 793,449

Claims priority, application Netherlands, Jul. 28, 1989, 8901968

Int. Cl.[5] A47J *31/32*

U.S. Cl. 99—283 **6 Claims**



1. In an apparatus for preparing beverages such as coffee or tea, comprising:

a filter unit including a filter paper web,

an extraction chamber having a bottom wall and being positioned above said filter unit, said bottom wall being at least partly permeable, and adapted to be pressed against the filter unit,

a reception chamber having an upper wall, a bottom part and being positioned underneath the filter unit, said upper wall being at least partly permeable and positioned in contact with the filter unit, said reception chamber including at its bottom part a discharge channel for discharging a prepared beverage,

supply means for supplying coffee or tea powder and hot water in the extraction chamber to prepare an extract during a predetermined extraction period,

a pump unit connected to the reception chamber by a conduit to suck the prepared extract through the filter unit in the reception chamber,

a control unit for controlling the supply means, the pump unit and the discharge channel such that after activating said means for supplying predetermined amounts of hot water in coffee or tea powder in the extraction chamber, an extraction period is measured during which the extraction process is completed, after which the pump unit is activated to suction the prepared extract through the filter paper web, the improvement wherein the pump unit is connected through suitable piping to a side wall of the reception chamber at a level above a maximum fluid level in said reception chamber, a discharge valve is provided in the bottom part of the reception chamber or in said discharge channel, and the control unit is embodied such that during the extraction period the discharge valve is closed and the pump unit is activated during at least part of the extraction period to press air at a predetermined rate into the reception chamber causing such an overpressure that an air stream is created through the filter unit and through the mixture of water and coffee or tea powder, thereby agitating said mixture, and that at the end of the extraction period, still with the discharge valve being closed, the action of the pump unit is reversed to suction air at a predetermined rate from the reception chamber causing such an underpressure that the prepared extract will be suctioned through the filter unit into the reception chamber.

5,197,374

APPARATUS FOR EXTRACTING CARTRIDGES CONTAINING COFFEE

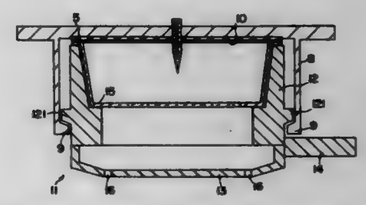
Olivier Fond, Yverdon, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Jul. 2, 1991, Ser. No. 724,605

Claims priority, application European Pat. Off., Jul. 27, 1990, 90114405.5

Int. Cl.[5] A47J *31/06*

U.S. Cl. 99—295 **13 Claims**



1. A device for extraction of coffee contained in a cartridge comprising:

a sealing member having a surface having a size sufficient to overlay and cover a surface of a cartridge containing coffee to be extracted;

an injector member which extends through the sealing member and sealing member surface and which has outlets disposed for directing water ejected from the injector at an angle less than 90° with respect to the sealing member surface;

a holder member for holding a cartridge containing coffee to be extracted having

a first portion for enveloping and containing sides of a cartridge for supporting a cartridge, for enabling positioning a cartridge surface adjacent the sealing member

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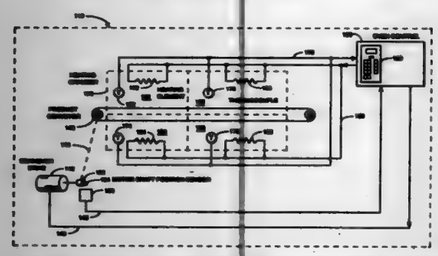
surface and for enabling fluid-tight sealing of an edge of a cartridge surface to the sealing member surface;
a base portion extending from the first portion having openings for enabling extracted coffee to flow out of the holder, and
lugs extending from an outer periphery of the holder member; and
a tightening ring which surrounds the first portion of the holder member and has ramps positioned for engaging and supporting the holder member lugs for supporting the holder member and compressing and fluid-tight sealing a cartridge edge to the sealing member surface.

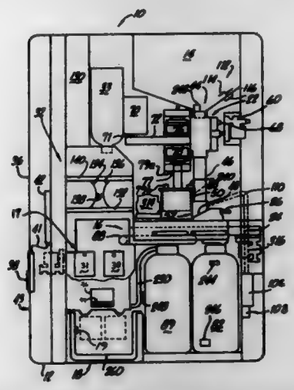
5,197,375
CONVEYOR OVEN CONTROL
Richard Rosenbrock, Bluffton, Ind.; Ralph A. Chrzastek, Warrenville, and William S. Schjerven, Sr., Schaumburg, both of Ill., assignors to The Middleby Corporation, Rosemont, Ill.
Filed Aug. 30, 1991, Ser. No. 753,426
Int. Cl.[5] A21B *1/40, 1/42*; H05B *1/02*
U.S. Cl. 99—328 **27 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 59 Pages)



1. A hysteresis-less control device for an oven having at least one cooking region and at least one means for heating said region; said control device comprising:
means for receiving from a user a desired temperature selection to be produced by said heating means in said cooking region;
means for measuring a temperature in said cooking region;
means for supplying heating energy to said heating means;
and means operating over a continuous range of cooking region temperatures extending from above to below said desired temperature selection, in response to said temperature measurement means and to said temperature selection means, to adjust the average amount of heating energy supplied to said heating means so as to produce a temperature closely approximating said desired temperature selection.

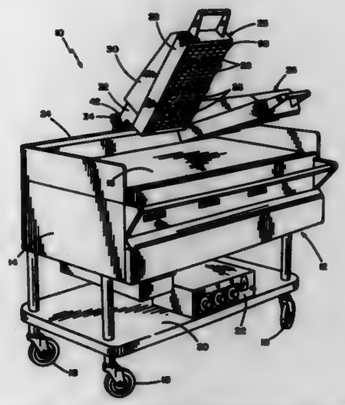
5,197,376
APPARATUS FOR DISPENSING A COOKED FOOD PRODUCT
E. Frederick Bird, Verdugo City, and Ray N. Dushane, Fullerton, both of Calif., assignors to Services Alimentaires, S.A., Geneva, Switzerland
Filed Sep. 17, 1990, Ser. No. 583,806
Int. Cl.[5] A47J *37/12*
U.S. Cl. 99—330 **25 Claims**

1. An apparatus for dispensing a cooked food product, comprising:
reservoir means, for storing a quantity of dehydrated food material, having an outlet;
material dispensing means for measuring out a predetermined amount of food material from the reservoir means;
holding cup means for accepting food material from the material dispensing means and containing it therein in a product shape of predetermined thickness;
rehydration means for adding a predetermined amount of liquid to the food material in the holding cup means and providing a rehydrated material;
pressing means including forming means for forming the rehydrated food material, piston means for longitudinally moving a piston relative to the forming means to force the rehydrated food material from the holding cup means through the forming means, and means for laterally moving the piston relative to the forming means while the



piston is engaged with the rehydrated material, to ensure dislodgement of the rehydrated material from the forming means and to provide a formed food material;
transport means, including cooking means, for accepting the formed food material and for cooking it and providing a cooked food product;
product dispensing means for emptying the transport means and dispensing the cooked food product; and
control means for controlling the operation of the apparatus.

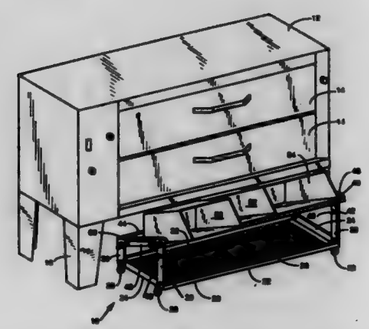
5,197,377
APPARATUS FOR TWO-SIDED COOKING
Ralph E. Jeanings, Stanton; Robert R. Rossa, Long Beach, and Manuel M. Expeleta, Los Angeles, all of Calif., assignors to Premark FEG Corporation, Wilmington, Del.
Filed Jan. 8, 1991, Ser. No. 638,584
Int. Cl.[5] A47J *37/06*
U.S. Cl. 99—347 **6 Claims**



1. Apparatus for converting a single-sided cooking grill

having an upwardly facing cooking surface to a two sided cooker comprising:
a housing;
a platen mounted in said housing;
an electric heating element for heating said platen;
a hinge provided on said housing;
a pair of spaced horizontally extending bayonette members extending from said hinge, each of said bayonette members tapering to a smaller vertical dimension away from said hinge;
a tang projecting upwardly at the distal end of each bayonette member;
a bracket having a pair of spaced through holster slots for receiving said bayonetee members and defining a pair of rear edges, said bracket being connectible to the rear of said grill with said holster slots extending generally horizontally and parallel to the surface of said grill;
whereby said horizontally extending bayonette members may be selectively inserted into and removed from said holster slots and cocked to a seated position wherein said tangs engage the rear edges of said holster slots such that withdrawal of said bayonette members from said slots is prevented.

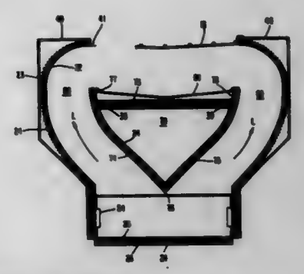
5,197,378
PIZZA SCREEN OR PAN RECEIVING AND HOLDING ASSEMBLY
Guy G. Scalise, 22 Oakland Sq., Pittsburgh, Pa. 15213
Filed Sep. 8, 1992, Ser. No. 941,728
Int. Cl.[5] A47J *37/00*
U.S. Cl. 99—357 **10 Claims**



1. In combination with a pizza baking oven having one or more baking sections and a support structure elevating the baking sections above floor level and providing open space between the lowermost baking section and floor level, a pizza screen or pan receiving and holding assembly, comprising:
a main frame formed of side and end rails interconnected in a generally rectangular pattern;
upright members extending upwardly from the front side of said main frame and at substantially right angles thereto;
a box support frame formed of side and end shaft members interconnected in a generally rectangular pattern to form a box-supporting surface having the forward sections of the end shaft members secured to upper end sections of said upright members and the rear side shaft member engaged by the rear end rail of said main frame whereby said box-supporting surface is inclined rearwardly and downwardly;
a plurality of pizza screen receiving boxes removably received on the box-supporting surface of said box support frame, said boxes having open forward ends and closed rearward ends;
said main frame, box support frame and pizza screen receiving boxes being sized and shaped such that the entire assembly is received in the open space beneath the baking

sections of a pizza baking oven in position to have pizza screens deposited into said pizza screen receiving boxes; and
positioning means for positioning said main frame beneath the lowermost baking section of a pizza baking oven in a location for said pizza screen receiving boxes to have pizza screens deposited therein.

5,197,379
OUTDOOR COOKER
Gustav Leonard, Jr., 4208 Braeburn Dr., Fairfax, Va. 22032
Filed Jan. 7, 1992, Ser. No. 817,717
Int. Cl.[5] A47J *37/07*
U.S. Cl. 99—446 **18 Claims**



18. A cooker, comprising:
end walls and side walls partially defining cavity;
a tray for holding a burning fuel to generate cooking heat, supported in a lower portion of said cavity of said cooker;
a grill for supporting food, supported at an opening formed in an upper portion of said cavity of said cooker above said tray; and
a closed deflector positioned within said cavity and interposed between said tray and said grill, said deflector having a top and two sides fixedly attached between and to said end walls to form a closed space beneath said opening with each side positioned facing a corresponding side wall of said housing and sized to extend above said top by a predetermined distance to form two opposed flanges, wherein
each of the top and two sides of said closed deflector is double-walled, and
each side of said closed deflector and the corresponding facing side wall of said housing are arcuate, spaced apart and cooperate to enable a laminar flow of hot products a combustion from said burning fuel to cook food placed on said grill.

5,197,380
EGG BREAKING MACHINE
Patrick T. Fisher, 10251 Green Ash Rd., Dallas, Tex. 75243
Continuation of Ser. No. 717,627, Jun. 19, 1991, abandoned. This application Jun. 12, 1992, Ser. No. 898,021
Int. Cl.[5] A23J *1/00, 1/08*
U.S. Cl. 99—580 **11 Claims**

1. Apparatus for breaking eggs comprising:
(a) a pan with raised side portions for holding a plurality of eggs with upper portions such that the upper portions of the eggs extend above the raised side portions of said pan,
(b) guide means attached to said pan, said guide means having an upper and a lower surface and a plurality of apertures formed therethrough, said guide means vertically hingedly connected to the pan such that the eggs extend

wheels and a rotary sleeve carrying said print drum at a

5,197,385

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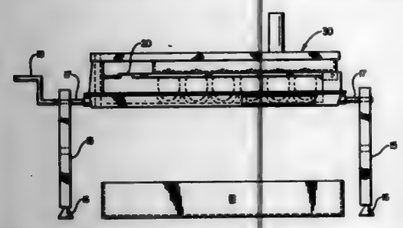
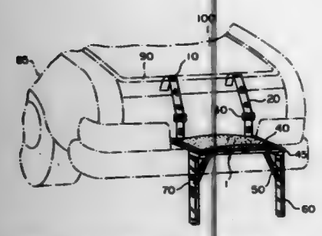
through said apertures and have their upper portions extend above the upper surface of said guide means, and



(c) cutting means rotatably attached to said pan to slide across the upper surface of said guide means for cutting off the upper portions of eggs above said guide means.

5,197,381
VEHICLE SUPPORTED, COLLAPSIBLE PORTABLE SEATING DEVICE
Henry M. Mells, 110 Jackson Moss Rd., Tuskegee, Ala. 36088
Filed Feb. 16, 1990, Ser. No. 480,894
Int. Cl.[5] A47B *23/00*
U.S. Cl. 108—44 5 Claims



1. A vehicular wall supported collapsible and portable seating device having integral storage spaces for small articles, comprising:

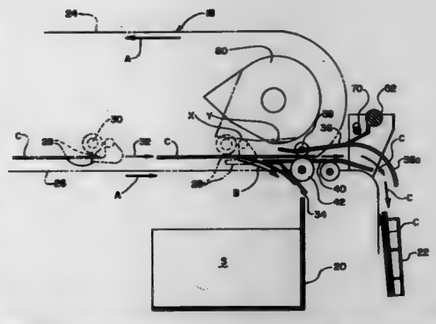
a horizontal, planar seating platform supported on a forward edge by two vertically extending ground contacting foldable legs, and on a rearward edge by support means defined by two permanently attached flexible straps having arcuate shaped rigid hooks that are attachable over said vehicular wall to support said seating device; said

legs each being hingedly connected to separate corners of said seating platform; said straps being located at coplanar corners of said seating platform, whereby, the platform establishes a stable seat capable of supporting an adult when said legs are unfolded and positioned on a ground surface and when said hooks of said straps are securely attached over a vehicular wall; and wherein said device further comprises a retaining band and fastener riveted to a bottom surface of said platform to secure said flexible straps in a folded position so that said seating device may be easily transported or stored when said legs are folded.

5,197,382
COPY SHEET PROOFING SYSTEM
Eber L. Goodwin, Arlington Heights, Ill., assignor to AM International, Inc., Chicago, Ill.
Filed Oct. 13, 1989, Ser. No. 420,944
Int. Cl.[5] B41F *13/24*; B41K *1/16*
U.S. Cl. 101—72 3 Claims

1. In a printing, duplicating and like machine wherein sheets are delivered seriatim by conveyor means from a printing couple in a path over a receiving tray whereat the sheets drop onto a stack of sheets in the tray, with releasable sheet gripping means on and movable with the conveyor means for gripping and selectively releasing the sheets, and stripping means located along the path of movement of the conveyor means for stripping each released sheet from the conveyor means and directing the sheet into the tray, a sheet proofing mechanism, comprising:

deflecting means along said path spaced from the stripping means for deflecting a released sheet from the conveyor means to a proofing station, including at least one deflecting finger movable mounted on the machine for movement in response to jamming of multiple sheets thereagainst;

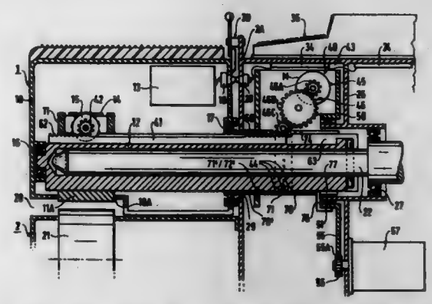


first switch means operatively associated with the deflecting finger for actuation in response to movement of the deflecting finger to deactivate the machine;

a safety rod movably mounted on the machine laterally across said path above said deflecting means for movement in response to a stray sheet jamming against the rod; and

second switch means operatively associated with the safety rod for actuation in response to movement of the safety rod to deactivate the machine.

5,197,383
PRINT WHEEL LOCKING DEVICE FOR FRANKING MACHINES
Jean-Pierre Grégoire, Bagneux, and Jean-Claude Maroutel, Orsay, both of France, assignors to Alcatel Satmam, Bagneux, France
Filed Aug. 6, 1991, Ser. No. 740,690
Claims priority, application France, Aug. 7, 1990, 90 10063
Int. Cl.[5] B41L *47/46*
U.S. Cl. 101—91 9 Claims



1. Print wheel locking device for franking machines with a print head removably mounted on a base unit and print wheel adjustment means, wherein:

the print head comprises a print drum carrying said print wheels and a rotary sleeve carrying said print drum at a front end with its rear end projecting from the print head,

the base unit comprises at least a control circuit board, drive means coupled to the control circuit board and a rotary shaft coupled to drive means and accessible on the base unit for interengagement with the sleeve and driving the sleeve in rotation with it,

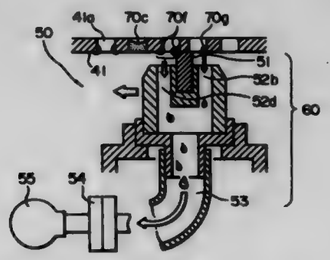
and the print wheel adjustment means comprise rods with front and rear racks mounted side by side and slidably along the sleeve and coupled by said front racks to the various print wheels, and an adjustment control system mounted to oscillate about the sleeve and the rear rack and coupled to the control circuit board for selectively coupling it to at least one group of rear racks, the locking device being characterized in that it comprises:

a first ring (70) mounted on the rear end part of the sleeve (12) and the rear racks (60), fixed in the axial direction with respect to the sleeve and rotatable thereon, and providing access (74) for said adjustment control system to the group of rear racks for adjustment of the print wheels concerned,

a first annular inner member (71) in the first ring and first outer complementary means (72) on the sleeve, engaged one with the other, said first semi-peripheral member having a cross-section complementary to any tooth segment of the rear racks, for their interengagement,

and means (76, 77) for rotationally coupling said ring and said adjustment control system (40) for relative driving of the first ring with said system relative to the sleeve.

5,197,384
SCREEN PRINTER
Satoshi Yawata, Tsuchiura, and Haruo Mishina, Ushiku, both of Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan
Filed May 24, 1991, Ser. No. 705,532
Claims priority, application Japan, May 25, 1990, 2-133830
Int. Cl.[5] B41L *13/18*
U.S. Cl. 101—123 19 Claims



7. A screen printer comprising:

a mask having at least a hole of a printing pattern;

squeegee means, movable in contact with a first surface of said mask, for printing a pattern of ink on a substrate by causing ink to be squeezed through said hole of said mask;

spatula means, movable in contact with a second surface of said mask, opposite said first surface, for removing ink adhered to said second surface of said mask; and

means, movable with said spatula means, for generating an airstream passing through said hole of said mask to remove ink within said hole;

wherein said airstream generating means comprises air spray means which is disposed on an opposite side of said mask with respect to said spatula means.

5,197,385
MODULAR, SELECTIVELY EXPANDABLE MULTI-COLOR PRINTING SYSTEM
Rainer Burger, Augsburg, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany
Filed Apr. 10, 1992, Ser. No. 867,158
Claims priority, application Fed. Rep. of Germany, May 18, 1991, 4116415
Int. Cl.[5] B41F *5/22*, *5/08*
U.S. Cl. 101—177 6 Claims

1. Modular, selectively expandable multi-color printing system, for printing, selectively, in

(a) double prime and verso mode or

(b) double prime, double verso mode,

comprising

a base printing group (1) including two base plate cylinder-blanket cylinder printing couples (6, 4; 7, 5), and an expansion printing group (2) having, selectively,

(a) a first expansion printing couple (8) for printing in mode (a) and

(b) for printing in mode (b), said first expansion printing couple (8) and a second expansion printing couple (11),

wherein said first expansion printing couple includes a first expansion plate cylinder (10) and a first expansion blanket cylinder (9) and said second expansion printing couple (11) includes a second expansion plate cylinder (13) and a second expansion blanket cylinder (12);

said expansion printing group (2) being positioned above the base printing group (1) and separable therefrom along an essentially horizontal separating plane (3),

wherein the base blanket cylinders (4, 5) are so positioned that the axes of rotation of the base blanket cylinders of the base group (1) are spaced from the separating line (3) by different distances;

the expansion printing group (2) is devoid of impression cylinders;

means for selectively printing in mode (a) wherein

the axis of rotation of the first expansion blanket cylinder (9) of the first expansion printing couple (8) is positionable

to place said first expansion blanket cylinder (9) in blanket-to-blanket printing engagement with the substrate web (W) therebetween for blanket-to-blanket printing with that one (5) of the base blanket cylinders of the first group (1) which has its axis of rotation at a smaller distance to said separating plane (3);

the circumference of said first expansion blanket cylinder (9) is placed above that one base blanket cylinder (5) to form printing lines for prime and verso printing between said base blanket cylinder (5) and said expansion blanket cylinder (9);

wherein the base blanket cylinders (4, 5) of the base printing couples are in engagement with a substrate web (W) therebetween, and define at least one printing line; and

means for selectively printing in mode (b) wherein the surfaces of the expansion blanket cylinder (9, 12) of the first and second expansion printing couples are placed in blanket-to-blanket printing engagement, with the substrate web (W) therebetween,

wherein the axis of rotation of the second expansion blanket cylinder (12) is spaced by a larger distance from said

separating plane (3) than the distance of the axis of

5,197,387
PRINTING PUSH PLATE FOR A PRINTING DEVICE
Hans Kaufmann, Zurich, Switzerland, assignor to Trodat AG, Wels, Austria
Filed Jan. 31, 1992, Ser. No. 828,966
Claims priority, application Switzerland, Feb. 1, 1991, 00 291/91
Int. Cl.[5] B41K *1/38*
U.S. Cl. 101—327 5 Claims

1. A printing push plate, a fastening element, and a return spring,

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5,197,388

to receive a tie previously placed above said main frame

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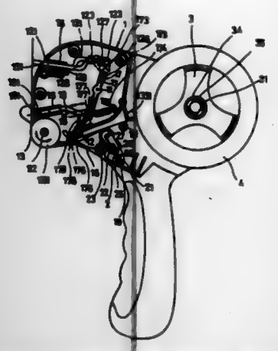
separating plane (3) than the distance of the axis of rotation of the first expansion blanket cylinder (9) from said separating plane (3),

the first expansion blanket cylinder (9) of the first expansion printing couple (8) is is placed above that one (4) of the base blanket cylinders (4, 5) of the base printing group (1) which has the larger distance from said separating plane (3), and is circumferentially spaced and is out of engagement with the base blanket cylinder (5) of the base printing group (1) having the smaller distance to said separating plane (3);

said first and second base blanket cylinders (4, 5) of the base printing group (1) are in prime and verso printing engagement, with the web (W) therebetween, and defining prime and verso printing lines therebetween; and

wherein the circumferences of the first and second expansion blanket cylinders (9, 12) are in printing engagement with the substrate web (W) therebetween to define additional prime and verso printing lines.

5,197,386
HAND-HELD TYPE PACKAGING TAPE DISPENSER WITH PRINTING MECHANISM
Sherman Lin, P.O. Box 3-81 Yung Ho, Taipei Hsien, Taiwan
Filed Apr. 10, 1992, Ser. No. 866,502
Int. Cl.[5] B41F *17/06*
U.S. Cl. 101—213 1 Claim



1. A hand-held packaging tape dispenser, the improvement comprising:

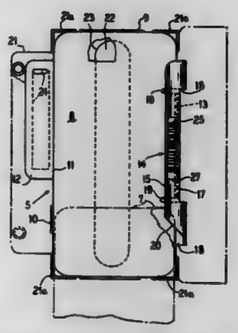
(a) a rotary tape holder having packaging tape, a post, a housing, spring means, and an adjusting nut, said rotary tape holder being mounted on said post at one end of said housing and revolvably secured by said spring means and said adjusting nut for holding and letting off said packaging tape;

(b) a packaging tape guide roller for guiding a leading end of said packaging tape external said housing;

(c) a cutting mechanism fastened in said housing being located in front of said rotary tape holder and being controlled to selectively cut a leading end of said packaging tape being delivered out of said housing, said cutting mechanism having a pressure plate, spring means, a pressure plate outlet hole, a cutter holder, a cutter blade, a swing block, and a cutter blade outlet hole, said pressure plate being controlled by said spring means of said cutting mechanism and extending out of said pressure plate outlet hole, said swing block being rotated by said pressure plate and moving said cutter blade out of said cutter blade outlet hole for cutting off said packaging tape, said pressure plate outlet hole and said cutter blade outlet hole having sliding ways respectively disposed in line with said outlet holes for moving said cutter holder and said pressure plate, said cutter holder having a side post linked to said swing block, said pressure plate having a lug, a swinging push plate, a fastening element, and a return spring, said lug holding said swinging push plate to one side by said fastening element and said return spring, said swinging push plate having a notch, a peripheral edge and a pin, with said notch located on said peripheral edge and stopped by said pin located on said lug, said swinging push plate moving said pressure plate into said pressure plate outlet hole and moving said cutter blade out of said cutter blade outlet hole via said swing block, said pressure plate being released and causing said cutter holder to move said cutter blade back into said cutter blade outlet hole; and,

(d) a printing mechanism for printing on said packaging tape, said printing mechanism comprising a printing plate cylinder, spring means, an ink roller, an ink fountain having printing ink therein, said printing plate cylinder being controlled by said spring means of said printing mechanism to hold the printing plate cylinder in contact with said packaging tape while printing, said ink roller being supported by said spring means of said printing mechanism to hold the ink roller in contact with said printing plate cylinder, said ink fountain distributing printing ink to said ink roller.

5,197,387
CARD HOLDER JACKET
Rodney G. Lacy, 1221 Heatherton Dr., Naperville, Ill. 60563
Filed Jul. 15, 1991, Ser. No. 729,991
Int. Cl.[5] B41L *47/02*
U.S. Cl. 101—368 9 Claims

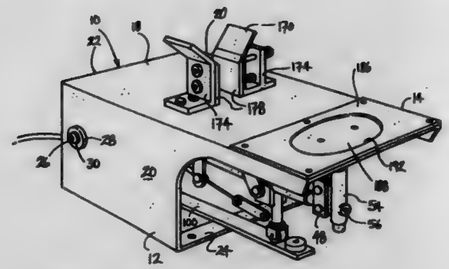


1. A new and improved card holder or jacket of the kind adapted for supporting a hospital patient identification card on a printer anvil, and comprising:

an upwardly facing card supporting base panel on which the card lies in face to face contact, and having on a margin along one edge of the panel upstanding flange means for guiding an edge of the card against sliding displacement toward said edge of the panel, said flange means abutting against said edge of said card; and

said panel also having, along said one edge a formation separate and spaced from said flange means and providing a lip overlying said margin and under which lip said edge of the card is received by a simple sliding maneuver for holding said card down on said panel and said formation protecting said flange means against printer imposed damage.

5,197,388
CLAMPING APPARATUS
Francis E. Keast, 2 Ellice Street, Embleton, Western Australia 6062, and Nigel A. Tucker, 39 Church Street, Wanneroo, Western Australia, 6065, both of Australia
Filed Aug. 19, 1991, Ser. No. 747,014
Claims priority, application Australia, Aug. 20, 1990, PK1824
Int. Cl.[5] B41F *1/28*
U.S. Cl. 101—474 7 Claims



1. A clamping apparatus comprising;

a holding means having a first, upper, stationary plate and a second, lower, moveable plate;

said first plate including an aperture;

said aperture having a continuous, endless boundary and being contained wholly within said first plate;

support means for mounting said second plate;

said support means including means for enabling said second plate to move reciprocally between a first position in which said second plate is engaged with said first plate and a second position in which said second plate is disengaged from said first plate;

said second plate being of larger size than said aperture of said first plate so that, when said second plate is in said first position, said second plate closes off said aperture;

said support means further including means for locking said support means against downward pressure on said second plate when said second plate is in said first position and for holding said second plate in said second position without the need for application of external force when said second plate is in said second position.

5,197,389
TIE REPLACER
Krzysztof E. Glowski; G. Robert Newman, both of Fairmont, Minn., and Harry Madison, Germantown, Tenn., assignors to Harsco Corporation, Wormleysburg, Pa.
Continuation-in-part of Ser. No. 512,206, Apr. 20, 1990, Pat. No. 5,048,424. This application Sep. 9, 1991, Ser. No. 756,984
The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.
Int. Cl.[5] E01B *29/10*
U.S. Cl. 104—9 24 Claims

4. A tie replacement vehicle comprising:

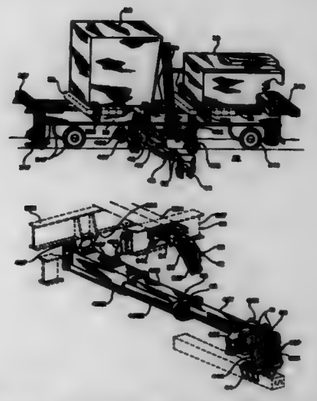
(a) a main frame having a pair of front wheels and a pair of rear wheels;

(b) a lifting means having a portion disposed at rail level corresponding to a pair of rails upon which said wheels are supported, said lifting means, mounted at a first end of said main frame, provided for lifting ties from said pair of rails to above said main frame;

(c) a lowering means having a portion disposed at said rail level, said lowering means, mounted at a second end of said vehicle opposite said first end, provided for lowering ties from above said main frame to on top of the pair of rails;

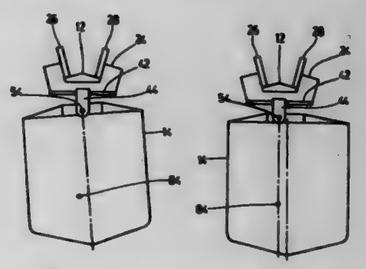
(d) movement means to selectively move ties over said main frame from said lifting means to said lowering means;

(e) a tie inserter supported by said main frame and including a first tie clamp for clamping ties, said tie inserter arranged to receive a tie previously placed above said main frame by said lifting means and to insert the tie under the pair of rails while the tie is clamped by said first tie clamp; and



(f) a tie feeding arm mounted to said main frame and having a feed gripper, and said tie inserter receiving a tie from above said main frame by way of said tie feeding arm.

5,197,390
SUSPENDED VEHICLE WITH ORIENTATION ADJUSTMENT BY HORIZONTALLY TRANSLATING THE PIVOT POINT RELATIVE TO THE VERTICAL AXIS
Lyman Richardson, Thornhill, Canada, assignor to Transyt Canada Inc., Concord, Canada
Filed Jan. 30, 1992, Ser. No. 828,302
Int. Cl.[5] B61B *3/00*
U.S. Cl. 105—149.1 8 Claims



1. A vehicle adapted for travel suspended below an overhead track, comprising:

a carriage;

means for mounting the carriage to the track for travel along the track with the carriage suspended below the track;

a container;

suspension means for suspending the container from the carriage, the suspension means comprising a pivot joint permitting the container to pivot about a generally horizontal pivot axis that aligns with the direction of an immediately overhead portion of the track, the pivot joint comprising connecting means connecting the container to the pivot joint and permitting horizontal translation of the container transverse to the horizontal pivot axis; and,

controllable displacing means for displacing the container selectively in opposing horizontal directions, the displacing means cooperating with the connecting means during

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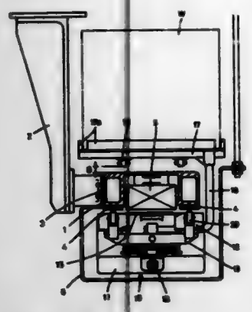
such displacing to translate the container horizontally and transversely relative to the pivot axis.

5,197,391
MAGNETICALLY FLOATING CARRIER SYSTEM WITH CARRIAGE BELOW RAIL SUPPORT STRUCTURE AND LOAD ABOVE SUPPORT STRUCTURE WITH BALANCES BETWEEN CARRIAGE AND LOAD

Toshiro Shimada; Toshio Minakata, both of Osaka; Tsuneyuki Hayashi, and Hiroaki Matsuoka, both of Tokyo, all of Japan, assignors to Sony Corporation, Osaka and Sumitomo Electric Industries, Ltd., Tokyo, both of Japan

Filed Nov. 20, 1991, Ser. No. 794,882
Claims priority, application Japan, Nov. 20, 1990, 2-318855
Int. Cl.[5] B60L *13/06*
U.S. Cl. 104—284 20 Claims



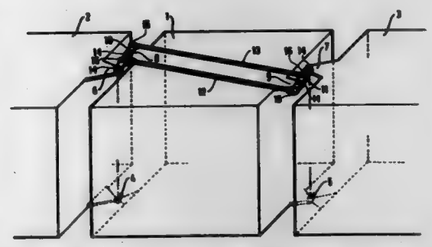
1. A carrier system comprising:
a longitudinally extending framework defining a track of the system;
a support structure disposed to one side of said framework and supporting said framework as a cantilever;
rail structure mounted on said framework and extending longitudinally along the bottom of said framework;
a carriage body disposed directly beneath and confronting said framework;
magnets mounted to said carriage body at front and rear portions thereof, said magnets facing said rail structure and cooperable therewith to cause the carriage body to be floatingly supported on said framework;
a linear motor associated with said carriage body and operable to drive said carriage body along the track defined by said framework;
a support member extending upwards from said carriage body at the other side of said framework, opposite the side at which the support structure is disposed, to a location above said framework; and
a pallet supported by said support member and disposed directly above said framework;
said carriage body being moveable transversely of the framework in a direction away from the support structure so that the carriage body can be moved sideways off of said track.

5,197,392
LINKAGE FOR ARTICULATED VEHICLES, IN PARTICULAR RAIL VEHICLES

Sylvie Jeanshomme, La Jarne, France, assignor to GEC Alsthom SA, Paris, France

Filed Jan. 19, 1992, Ser. No. 901,019
Claims priority, application France, Jun. 20, 1991, 91 07603
Int. Cl.[5] B60D *7/00*
U.S. Cl. 105—3 5 Claims

1. A linkage for articulated rail vehicles, the linkage serving to provide connection between an intercommunication tunnel and the ends of adjacent cars supported by the intercommunication tunnel, the cars and the intercommunication tunnel being coupled together near the bottoms of the cars and the tunnel, the linkage being characterized in that the end of each

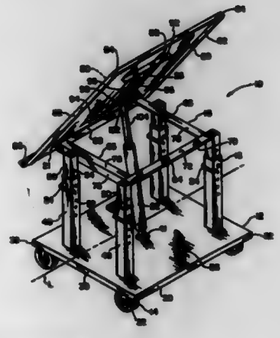


car (2, 3) is connected to the tunnel (1) near the tops of the car and the tunnel by means of a connection rod (10, 11), with the connection rods being interconnected by link elements, and the connection rods and the link elements form a deformable parallelogram.

5,197,393
LIFT AND TILT POST TABLE

William H. Yeakle, Angola, Ind., assignor to Vestil Manufacturing Company, Angola, Ind.

Filed May 21, 1991, Ser. No. 703,602
Int. Cl.[5] A47F *5/12*
U.S. Cl. 108—10 20 Claims



1. A table comprising:
a base;
a frame disposed above said base;
a plurality of adjustable-length support posts disposed between said base and said frame, one end of each support post being affixed to said base and the other end of each support post being affixed to said frame;
post lock means on at least one of said plurality of support posts for selectively locking said support post at a selected length;
a table top disposed above and supported by said frame;
hinge means for hingedly attaching said table top to said frame;
table lock means for selectively locking said table top to said frame to prevent tilting of said table about said hinge means;
lift means disposed between and connected directly to said table top and said base for lifting said table top relative to said base;
said lift means raising said table top and said frame together when said table lock means is locked and said post lock means is unlocked, and said lift means tilting said table top about said hinge means without raising said frame when said table lock means is unlocked and said post lock means is locked.

5,197,394
GARDEN UMBRELLA

Brigitta C. Schmidt, Kurfurstenstr. 14, 6000 Frankfurt/Main 90, Fed. Rep. of Germany

Filed Dec. 10, 1990, Ser. No. 624,103
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1989, 89145127[U]
Int. Cl.[5] A47B *35/00*
U.S. Cl. 108—50 6 Claims

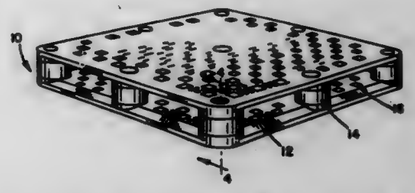
1. A garden umbrella including a plurality of removable plate elements, an umbrella canopy which is movable by a opening linkage assembly between a collapsed, closed state and an erected, open state, and a pole which can be fixed in the ground or inserted into a stand, said umbrella comprising, disposed beneath the area occupied by the opening linkage assembly in the closed state of the umbrella canopy, a second opening linkage assembly comprising a plurality of supporting members disposed in a spaced relation around the pole and having innermost and outermost ends and means, including support stays connected to the support members, for providing pivoting of said members from a folded position in engagement with the pole and an erected position wherein the support members extend radially outwardly relative to the pole so as to positively engage and support said plate elements so that the plate elements, as supported by said supporting members, constitute a table; said umbrella further comprising a sleeve mounted on said pole so as to be slidable therealong and said stays being pivotably connected at the upper ends thereof to the supporting members and at the lower ends thereof to said sleeve, said umbrella further comprising retaining means for retaining the second opening linkage assembly in a state wherein said supporting members are in the erected position thereof, a further sleeve being mounted on said pole and connected to the innermost ends of said support members.

5,197,395
PLASTIC PALLET WITH DECK ASSEMBLY

Maurice J. Pigott, 591 Cherry St., Winnetka, Ill. 60093; Brandon L. Pigott, 1017 Elmwood Ave.; Peter S. Pigott, 803 Elmwood Ave., both of Wilmette, Ill. 60091, and Schuyler F. Pigott, 1122 N. Patton St., Arlington Heights, Ill. 60004

Filed Jan. 23, 1991, Ser. No. 644,928
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] B65D *19/12*
U.S. Cl. 108—56.1 15 Claims

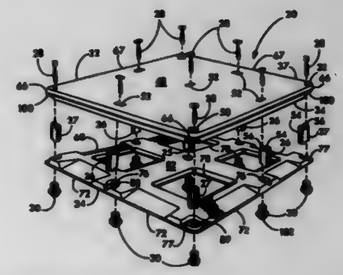
1. A plastic pallet comprising a pair of substantially identical decks interconnected by a plurality of connectors with aperture means at at least each corner of said decks receiving said connectors, each said deck including a one-piece molded, generally rectangular structure having spaced, generally parallel surfaces surrounded by peripheral reinforcing means, said peripheral reinforcing means including a plurality of substantially identical hollow rectangular segments defined by opposed end walls and opposed side walls with a connecting wall joining one edge of each of said end and side walls, said connecting wall being inclined with respect to said deck surfaces, having a slope from one said end wall to said other end wall and having drainage means therein, and reinforcing gussets integral with said connecting wall and respective ones of said opposed side walls.



5,197,396
DOUBLE DECK PLASTIC PALLET

Harlon W. Breezer; William Price, both of Portage, Wis.; Kenneth C. Wilken, Minneapolis, Minn., and Michael J. Wolfe, Pardeeville, Wis., assignors to Penda Corporation, Portage, Wis.

Filed Aug. 5, 1991, Ser. No. 740,374
Int. Cl.[5] B65D *19/32*
U.S. Cl. 108—56.3 9 Claims



1. A pallet comprising:
a) a twin-sheet thermoformed top deck having an upper thermoplastic sheet and a lower thermoplastic sheet fused to the upper sheet at a plurality of pinch points;
b) a plurality of bolt holes extending through the top deck, each bolt hole defined by portions of a top deck pinch point;
c) a reinforcing metal substrate located within the top deck between the upper and lower sheets;
d) a twin-sheet thermoformed bottom deck spaced beneath the top deck and having an upper thermoplastic sheet and a lower thermoplastic sheet fused to the upper sheet at a plurality of pinch points;
e) a plurality of bolt holes extending through the bottom deck beneath the top deck bolt holes, each bolt hole defined by portions of a bottom deck pinch point;
f) a plurality of plastic posts extending between the top deck and the bottom deck, wherein each post has a support member engaged against the lower sheet of the top deck beneath the metal substrate in load-bearing relation and a

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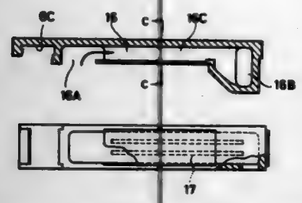
sleeve portion is integrally formed with the support member, the sleeve portions having portions defining bolt holes which are horizontally spaced from the substrate; and

g) a plurality of fasteners extending through the bolt holes to connect the upper and lower decks.

5,197,397
GRATE STRUCTURE FOR A HORIZONTAL TYPE INCINERATOR

Miki Yamaguchi; Sadao Suzuki, and Shigeyuki Doi, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Apr. 11, 1991, Ser. No. 683,433
Claims priority, application Japan, May 21, 1990, 2-52232
Int. Cl.[5] F23B *1/22*
U.S. Cl. 110—281 12 Claims



1. A grate structure for a horizontal type incinerator, comprising:

a plurality of rows of grates arranged in parallel in perpendicular X and Y directions of the incinerator;

each X-direction row including a plurality of immovable grates in series in the X direction; and a plurality of movable grates arranged in series in the X direction alternating with the immovable grates;

an immovable support member for the immovable grates;

a movable support member for the movable grates;

a bearing member, for each Y-direction row of grates positioned between the grates and an axle extending in the Y-direction and which is common to each of the grates in the Y-direction row, the bearing member and axle supporting back ends of the respective grates, front ends of the respective grates being supported on grates of an adjacent Y-direction row;

a driving member for reciprocating each movable supporting member in the X-direction;

bearing means for supporting each movable support member;

said immovable grates and movable grates supported at a predetermined angle of θ relative to a surface of the immovable supporting member;

said immovable grates and said movable grates being freely rotational around the respective axles; and

the grates each having a recess formed by a front protrusion and a rear protrusion on a lower surface of the grate, each said recess engaging the respective bearing member through a polygonal surface on the bearing member.

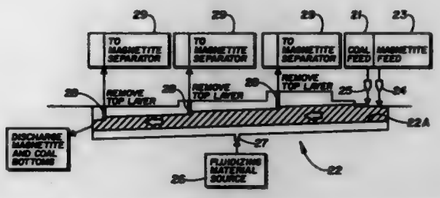
5,197,398
SEPARATION OF PYRITE FROM COAL IN A FLUIDIZED BED

Edward K. Levy, Bethlehem; D'Agostini Mark, Macungie, both of Pa.; Damir Latkovic, Zabreb, Yugoslavia, and James W. Parkinson, Indiana, Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Apr. 16, 1991, Ser. No. 686,182
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—347 27 Claims

1. In a process for the separation of pyrite from coal in a fluidized bed for providing coal having a reduced pyrite content, the process being of the type having the steps of feeding magnetite and coal including pyrite into a bed vessel, whereby a bed of a layer of magnetite and coal including pyrite is formed, fluidizing the bed of magnetite and coal including pyrite, whereby the pyrite is substantially separated from the coal and a coal having a reduced pyrite content is formed, and further whereby a fluidized bed of fluidized material is formed, wherein the solids are stratified in the vertical direction so that a top layer of coal substantially free of pyrite is formed at the very top thereof and with the pyrite being distributed vertically throughout the fluidized bed from the top to the bottom thereof, whereby the fluidized bed has a top layer of fluidized material comprised substantially of coal having a reduced pyrite content is provided and a bottom layer of fluidized material comprises substantially of coal having a higher pyrite content is provided and removing the fluidized material from the fluidized bed, whereby coal having a reduced pyrite content is provided, the improvement thereupon comprised of:

feeding the magnetite free of coal including pyrite into the bed vessel before the coal including pyrite, whereby a bed of a layer of magnetite free of coal including pyrite is formed;



feeding the coal including pyrite and free of magnetite into the bed vessel and on top of the bed of the layer of coal including pyrite and free of magnetite disposed on top of a layer of magnetite free of coal including pyrite is formed;

the bed of magnetite and coal including pyrite, being fluidized until bed-bubbling separation occurs, such that a fluidized bed is formed wherein the solids are stratified in the vertical direction so that a top layer of coal substantially free of pyrite is formed at the very top thereof and with the pyrite being distributed vertically throughout the fluidized bed from the top to the bottom thereof, whereby the fluidized bed has a top layer of fluidized material comprised substantially of coal having a reduced pyrite content is provided; and

separating the product coal in the top layer of fluidized material from the refuse coal in the bottom layer of fluidized material, whereby a product including coal having a reduced pyrite content is provided.

5,197,399
PULSE COMBUSTED ACOUSTIC AGGLOMERATION APPARATUS AND PROCESS

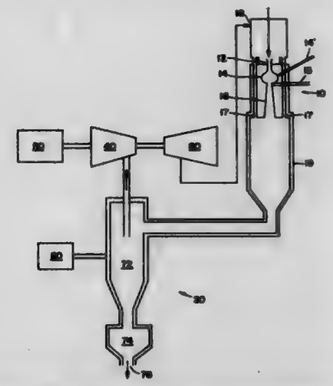
Montaz N. Maasour, Columbia, Md., assignor to Manufacturing & Technology Conversion International, Inc., Columbia, Md.

Filed Jul. 15, 1991, Ser. No. 730,245
Int. Cl.[5] F23J *11/00, 15/00*
U.S. Cl. 110—345 39 Claims

1. Improved apparatus for removal of particulates entrained in a gas stream comprising:

means for receiving a gas stream having particulates therein for passage of said gas stream therethrough;

pulse combustor means in communication with said gas stream receiving means for producing a pulsating stream of hot combustion products and an acoustic wave having a frequency within the range of from about 20 to about 1500 Hz which acts on said gas stream, said pulse combustor means further including means for introducing a second particulate into said gas stream so that acoustically-enhanced bimodal agglomeration of particulate materials

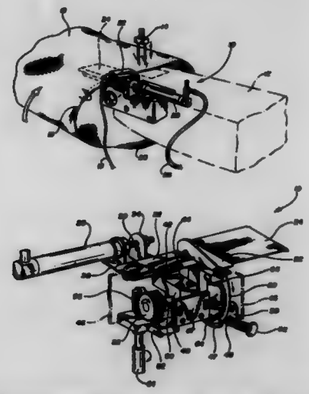


entrained in said gas stream occurs permitting enhanced removal of said agglomerated particulate materials.

5,197,400
TRIMMING APPARATUS FOR USE IN MAKING A HEM

Eugene R. Prais, West Milford, N.J., assignor to Kansai Special USA Corp., Carlstadt, N.J.

Filed Oct. 30, 1991, Ser. No. 785,619
Int. Cl.[5] D05B *37/08, 35/02*
U.S. Cl. 112—122.3 20 Claims



1. An apparatus adapted to be used with a sewing machine having stitching means for sewing an edge of a garment in order to form a hem, said apparatus comprising:

a support member upon which said edge of said garment can be fed, said support member being positioned upstream from said stitching means;

folder means for folding said edge over an end of said support member such that said edge is in alignment with said stitching means as said garment is fed along said support member;

a stationary blade mounted below and adjacent said end of said support member, said stationary blade being aligned with said stitching means;

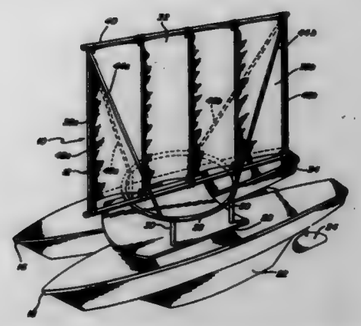
a rotatable blade positioned adjacent to said stationary blade and cooperating with said stationary blade to trim a predetermined portion of said edge as said edge is folded; and

rotation means for rotating said rotatable blade to permit said rotatable blade to cooperate with said stationary blade such that said predetermined portion of said edge is trimmed as said edge is folded.

5,197,401
ROTATING RING MAST SAILING VESSEL AND A METHOD OF VESSEL OPERATION

Warren Finley, 564 Vista La., Laguna Beach, Calif. 92651, and John E. Duquette, Laguna Niguel, Calif, assignors to Warren Finley, Laguna Beach, Calif.

Filed Sep. 4, 1991, Ser. No. 754,741
Int. Cl.[5] B63H *9/06*
U.S. Cl. 114—39.1 26 Claims



1. A system for powering a water vessel, said system comprising:

a plurality of spaced supports rigidly mounted to a support surface on the vessel and extending upwardly therefrom;

an annular mast rotatably supported by the supports;

a frame supported by the annular mast and secured thereto comprising a lower boom extending across and fixed to said mast, generally perpendicular to an axis of rotation of said mast, and an upper boom spaced upwardly from and generally parallel to the lower boom;

at least one sail extending between and secured to the booms; and

a plurality of stabilizing braces on opposite sides of the upper and lower booms, the braces having a lower end secured to said annular mast and extending upwardly at an angle to said frame and secured to an upper portion of said frame adjacent the ends of said upper boom.

5,197,402
SAILBOARD HARNESS SECURING ASSEMBLY

Rick E. Hunts, 8525 Camino Santa Fe, San Diego, Calif. 92121

Filed Jun. 24, 1991, Ser. No. 719,415
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—39.2 7 Claims

1. In combination with a substantially cylindrical boom, a lineyard assembly which comprises:

a length of webbing of constant width and thickness, said length of webbing having a distal end fold backed and secured upon itself to form a closed loop;

a cinching buckle comprising:

a pair of parallel side members;

a first cross-member bridging first ends of said side-members, said first cross member being engaged through said closed loop;

a first one of said pair of parallel side-members being arcuate along a substantially portion of tis longitudinal dimension within a first plane;

a second one of said parallel side-members being arcuate along a substantial portion of its longitudinal dimension within a second plane;

termin transportation, launching, and recovery of a boat, said

bottom support portion positioned substantially flush with

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said first and second planes being substantially perpendicular to said first cross-member;

a second cross-member spaced apart from, and parallel to, said first cross-member, and bridging said two side-members; and

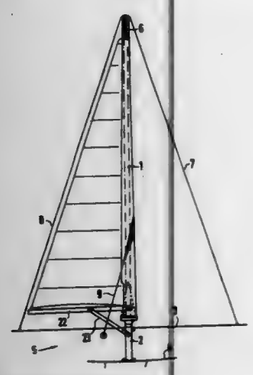
a third cross-member parallel to said first and second cross-members and bridging the opposite ends of said side-members.

5,197,403

SAILING VESSEL AND PROFILE MAST FOR SAILING VESSELS

Rolf Hatlapa, Theodor-Storm Allee 24 b, 2082 Uetersen, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 733,723
Int. Cl.[5] B63B *15/00*
U.S. Cl. 114—90 11 Claims



1. A sailing vessel comprising:

a hull with a keel and a deck;

a profile mast rotatably mounted on said hull;

said profile mast comprising a mast body having aerodynamic sides, said aerodynamic sides forming an aerodynamic forward portion and said aerodynamic sides extending rearward from said forward portion, said aerodynamic sides having end strips at the rear edges, and said aerodynamic sides converging towards each other rearward to form a slot at the rear of said profile mast;

means for retracting and paying out a sail through said slot;

means within said mast body for receiving said means for retracting and paying out a sail through said slot;

a sail disposed on said means for retracting and paying out a sail through said slot;

a boom disposed on said profile mast for supporting said sail;

said aerodynamic sides of said mast body having elastic wall parts being configured to press said end strips towards on another for providing an aerodynamically favorable transition area between said profile mast and said sail;

wherein said end strips are designed with a raised profile on the sides of said end strips facing one another;

wherein said end strips have beads which continue into the vicinity of said means for retracting and paying out a sail through said slot, said beads being configured to form a passage for said sail; and

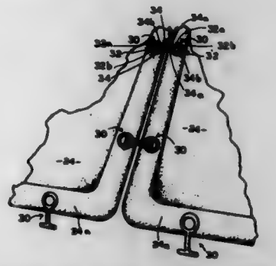
wherein each of said aerodynamic sides is formed by a stiffened shell made of carbon fiber reinforced plastic (CFK), said stiffened shells are rigidly connected by at least one of spars and a web, and said elastic walls parts are formed by reducing the thickness of the rear portions of said stiffened shells.

5,197,404

RAFT FASTENER

David J. Haley, 1600 First Ave. W. #406, Bradenton, Fla. 34205, and Marsden W. Simmons, 4014 Bayshore Rd., Sarasota, Fla. 34234

Filed Oct. 25, 1991, Ser. No. 782,600
Int. Cl.[5] A47G *9/06*
U.S. Cl. 114—267 3 Claims



1. A raft having an integral fastener attachable to a like fastener of another raft for coupling two rafts comprising:

(a) a first raft having an outer border;

(b) a series of raft fasteners incorporated into the border of the first raft;

(c) each fastener including an eyelet having an eyelet border integrally mounted in the raft border and surrounding an eyelet opening, and an eyelet engaging means connected to the raft border and extending therefrom for coupling to a like eyelet;

(d) the eyelet engaging means of the raft fastener being insertable into the eyelet opening of a second raft and the eyelet engaging means of the second raft being insertable into the eyelet opening of the first raft to form a fastener unit that effectively couples the first raft with the second raft; and

(e) the eyelet engaging means including a series of T-shaped connectors each having a flexible connecting line and a flexible and resilient securing line extending from the connecting line to form a hook, the flexible securing line normally assuming an elongated position and being insertable within an eyelet opening by bending the same after which the flexible securing line returns to its normal elongated position where the same extends across the eyelet opening and is secured therein whereby the first raft can be connected to a second raft by interconnecting the respective T-shaped connectors with respective eyelets.

5,197,405

AUXILIARY BOAT WHEEL APPARATUS

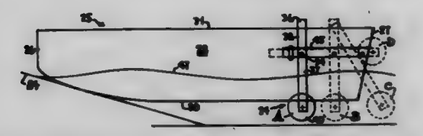
William C. King, Mercersburg, Pa., assignor to Tuscarora Designs, Inc., Mercersburg, Pa.

Filed Dec. 23, 1991, Ser. No. 814,412
Int. Cl.[5] B63B *21/64*
U.S. Cl. 114—344 21 Claims

1. An auxiliary deployable boat wheel apparatus for all terrain transportation, launching, and recovery of a boat, said boat having front and rear longitudinal end portions, first and second lateral sides and a bottom, the apparatus comprising:

a first upright member and a second upright member for the respective lateral sides of the boat, each said upright member having a pivot point, each said pivot point being defined by a mounting means with the two pivot points being coaxial and defining a pivot axis along a lateral line through the boat, each said pivot point separating the respective upright member into an upper portion and a lower portion, said lower portion having a distal end for carrying a wheel, said mounting means being adjustable whereby the upright members can be set at least to one of a substantially vertical position and a substantially horizontal position;

means for securing each said upright members in at least one of said substantially vertical position and said substantially horizontal position;



a first wheel and a second wheel rotatably mounted to said distal end of said lower portion of each said upright member;

a horizontal connecting member, said horizontal connecting member being rigidly attached between the lower portions of each said upright member;

a first longitudinal adjusting means and a second longitudinal adjusting means, each said longitudinal adjusting means being rigidly secured to said boat above a water-line and extending in a forward and a rearward direction along a span preferably encompassing a longitudinal center of gravity of said boat on said lateral sides, each said longitudinal adjusting means adjustably securing said mounting means along a substantial part of its length;

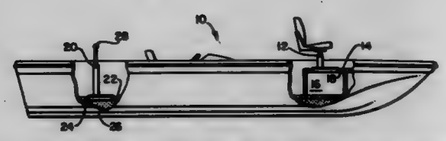
whereby each said upright member is adjustable to keep each said wheel in an operating position at said center of gravity of said boat when in said substantially vertical position and is adjustable to place each said wheel in a storage position above said water-line at said rear longitudinal end of said boat.

5,197,406

FLUSH SLIDE MOUNT FOR DETACHABLE ATTACHMENT TO A BOAT DECK

Clifford R. Rabal, Wills Point, and Robert R. Rabal, Terrell, both of Tex., assignors to Rabal Enterprises, Terrell, Tex.

Filed Apr. 22, 1991, Ser. No. 689,466
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—363 17 Claims



1. A pedestal mount assembly for detachably holding a boat seat pedestal vertically disposed from a boat deck having a thickness between top and bottom surfaces, said pedestal mount comprising:

(a) a shallow channel having a top plate and a bottom support portion and mounted with said top plate substantially flush with said top surface of said boat deck and said bottom support portion positioned substantially flush with said bottom surface of said boat deck;

(b) a vertical boat seat pedestal;

(c) a base plate attached horizontally to said vertical boat seat pedestal, said base plate sized for insertion into said shallow channel and for sliding therealong into rigid engagement in said shallow channel between said top plate and said bottom portion; and

(d) latch means for detachably holding said base plate in rigid engagement in said shallow channel.

5,197,407

SECURITY DEVICE FOR ATTACHMENT TO THE RAILS A MOVABLE DOOR OR WINDOW

James K. Sims, Scottsdale, Ariz., assignor to Emma A. MacDowell, Scottsdale, Ariz. rt interest

Filed Apr. 10, 1992, Ser. No. 866,425
Int. Cl.[5] G08B *13/08*
U.S. Cl. 116—86 5 Claims

1. A security device for attachment to doors or windows to prevent the opening thereof and to sound an alarm in the event an unauthorized opening is attempted comprising:

a container of pressurized gas having a discharge end,

a normally closed valve at said discharge end,

a valve actuator extending from said valve,

a gas actuated sound generator movably mounted on said discharge end of said container and engageable with said valve actuator,

an elongated housing means comprising a first housing containing said container, and a second housing containing said valve actuator,

the bottom of said housing means being contoured for selective slidable movement on a rail of the door or window to one of a plurality of preselected positions on the rail, and

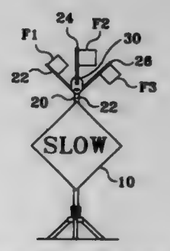
means for selectively clamping said housing means to one of the preselected positions on the rail.

5,197,408

INTEGRATED, SELF-STORING FLAG HOLDER

Theodore L. Stoudt, Lake Oswego, Oreg., assignor to Sign-Up Corporation, Portland, Oreg.

Filed Feb. 24, 1992, Ser. No. 840,396
Int. Cl.[5] G09F *7/20*
U.S. Cl. 116—173 9 Claims



1. An integrated self-storing flag holder assembly comprising:

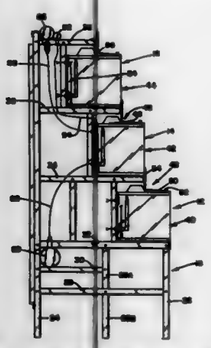
a plurality of flags on flagstaffs, each of the flagstaffs having formed proximate the distal end thereof an elongate slot therethrough;

a main support plate having a plurality of positioning means so constructed and adapted as to engage the elongate slot of the respective flagstaffs;

a plurality of elongate fasteners extending through the slots of the respective flagstaffs for securing the flagstaffs to the main support plate and for permitting the respective flagstaffs to pivot about the respective elongate fastener; and

means for locking the respective flagstaffs to the main support plate with the respective positioning means in engagement with the slots of the flagstaffs at a location spaced from the respective elongate fasteners, the positioning means and elongate fasteners cooperating to fix the orientation of the flagstaff relative to the main support plate, said locking means being releasable to permit the respective flagstaffs to be moved to disengage the respective slots from the respective positioning means.

5,197,409
AQUATIC TANK DISPLAY SYSTEM
Daniel S. Hammond, 1236 Wooded Way, West Chester, Pa. 19380
Filed Mar. 23, 1992, Ser. No. 854,722
Int. Cl.[5] A01K *63/00, 63/06*
U.S. Cl. 119—5 16 Claims



1. A system for displaying a plurality of aquatic tanks, such as for an aquarium or pet store, comprising:

a first tank support frame portion which defines a first support surface for supporting a plurality of aquatic tanks at a first level;

a second tank support frame portion which defines a second support surface for supporting a second plurality of aquatic tanks at a second level, said first support surface being positioned beneath said second support surface and being overlapped with said second support surface so that an aquatic tank on said first surface will have a portion which is directly beneath an aquatic tank on the second surface; and

a plurality of cover members movably mounted to said second tank support frame portion for covering upper ends of individual aquatic tanks that are supported on said first support surface, whereby the display system is visually appealing and provides convenient access to tanks on said first support surface without requiring excessive vertical spacing between the first and second support frame portions.

5,197,410
RELEASABLE TETHER
Comer J. Wilson, and Wayne A. Wilson, both of 147 Verde Cir., Rohnert Park, Calif. 93928
Filed Aug. 18, 1992, Ser. No. 931,633
Int. Cl.[5] A01K *3/00*
U.S. Cl. 119—114 21 Claims

1. A releasable tether comprising:

a strap having a handle end, a tether end, and an intermediate portion extending therebetween, said intermediate portion having a longitudinally extending interior channel portion;

a first cable slidably located in said interior channel portion of said strap and having a first end and a second end;

substantially inextensible reinforcing means extending between said handle end and said tether end of said strap;

a release clip coupled to said reinforcing means adjacent the tether end of said strap, said release clip having a housing with an opening, a longitudinally extending bore and a release bolt slidably received in said bore for controlling access to said opening;

means for normally biasing said bolt to a position blocking said opening;

a swivel member having a first portion coupled to said bolt and a second portion coupled to said first end of said first cable so as to permit said release clip to freely rotate with respect to said first cable; and

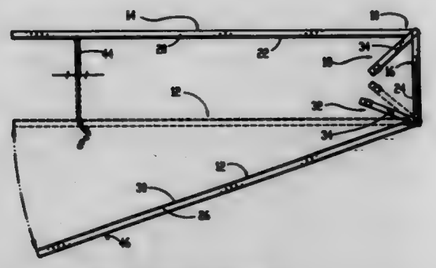
manually actuatable releasing means located adjacent said handle end of said strap and coupled to said second end of said first cable for enabling a user to retract said bolt to a release position by sliding said cable along said interior channel portion.

5,197,411
PET BED
Cheryl A. Schwarzenbart, 714 Pebble Beach Dr., Madison, Wis. 53717
Filed Sep. 30, 1991, Ser. No. 767,833
Int. Cl.[5] A01K *1/035*
U.S. Cl. 119—28.5 2 Claims

2. A pet bed for draping on and protecting furniture or a

floor, comprising: a bed body having a continuous peripheral edge and including a polyester batting material and a nonremovable roll having a relatively uniform cross section and including a padding material, extending around a major portion of said edge to enclose a major portion of said bed body, said major portion of said edge being circular and a minor portion of said edge being rectilinear, defining said pet bed as substantially semicircular, and said extending around only said major portion.

5,197,412
CALF CHUTE APPARATUS
Freddie E. Wade, Rte. 4, Box 674, Warrensburg, Mo. 64093
Filed Jul. 31, 1992, Ser. No. 922,802
Int. Cl.[5] A61D *3/00*
U.S. Cl. 119—99 5 Claims



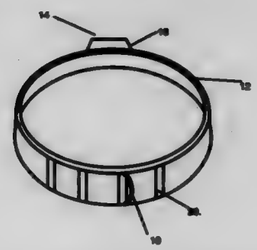
1. A calf chute apparatus comprising:

a frame including a first side panel;

a second side panel having a forward end connected for pivotal movement relative to the frame about a vertical axis so that the second side panel is movable between open and closed positions; and

a neck restraining means for restraining the neck of a calf positioned in the apparatus when the second side panel is in the closed position, the restraining means including a first neck restraint fixed relative to the frame and a second neck restraint fixed relative to the second side panel, the second neck restraint and second side panel being movable together relative to the frame so that when the second side panel is moved between the open and closed positions, the second neck restraint moves between a releasing and a restraining position relative to the first neck restraint.

5,197,413
TANGLE-LIMITING PET COLLAR
Kaj Gyr, 1807 NE. 52nd Ave., Portland, Oreg. 97213
Filed Oct. 26, 1990, Ser. No. 604,053
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 4 Claims



1. A pet collar comprising a length of flexible material with a focus of weight attached to the perimeter of the collar, a

5,197,414
ANIMAL PROTECTIVE COLLAR
Yuhko Kanakura, 21-14, 3-chome, Yamafutatsu, Niigata-shi 951, Japan
Filed Apr. 16, 1992, Ser. No. 869,492
Claims priority, application Japan, Jul. 29, 1991, 3-87627[U]
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 9 Claims

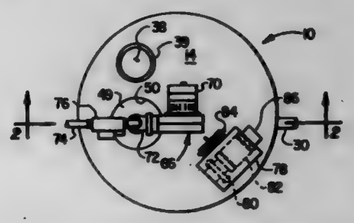
1. An animal collar assembly for shower treatment of an animal, the collar assembly being fittable on a neck of the animal, the collar assembly comprising:

a body of reticulated material, said body being cut in part to form a truncated cone;

male and female locking means attached to respective ends of said body for holding the body in a shape of said cone; and,

a handle provided on said body.

5,197,415
WET-BASE, DOWN-FIRED WATER HEATER
Gordon W. Stretch, and Wilbur L. Haag, Jr., both of Montgomery, Ala., assignors to Rheem Manufacturing Company, New York, N.Y.
Filed Apr. 2, 1992, Ser. No. 862,366
Int. Cl.[5] F22B *5/00*
U.S. Cl. 122—17 18 Claims



1. A forced draft, fuel-fired water heater comprising:

vertical tank having an internal chamber adapted to hold a quantity of water, said tank having a top end, a bottom end, an inlet for receiving pressurized water to be heated within said internal chamber, and an outlet for discharging pressurized heated water from said internal chamber;

a vent plenum structure formed within a top end portion of said tank, downwardly adjacent the underside of said top end thereof, and defining a top end boundary of said internal chamber, said vent plenum structure having an

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outlet passage extending outwardly through said tank and connectable to an external combustion product vent pipe;

an enclosed, hollow turn bowl structure disposed within a lower end portion of said internal chamber and having a top side wall;

a vertically oriented burner tube extending through said internal chamber, said burner tube having a closed upper end positioned adjacent said top end of said tank, and an open lower end portion extending downwardly through said top side wall of said turn bowl structure and opening into the interior of said turn bowl structure;

a spaced plurality of vertically oriented flue tubes extending through said internal chamber, said flue tubes having open upper end portions extending through the underside of said vent plenum structure and opening into the interior of said vent plenum structure, and open lower end portions extending through said top side wall of said turn bowl structure and opening into the interior of said turn bowl structure,

each of said flue tubes, said burner tube and said turn bowl structure, during operation of said water heater, being submerged in and in intimate heat transfer contact with water within said internal chamber of said tank;

a vertically elongated hollow burner structure supported within and extending along a major upper longitudinal portion of said burner tube, said hollow burner structure having a perforated vertical side wall portion spaced horizontally inwardly from the interior surface periphery of said burner tube;

fuel/air delivery means for receiving fuel and air from sources thereof, creating a pressurized fuel/air mixture, and forcing the fuel/air mixture downwardly through the interior of said burner structure and outwardly through the side wall perforations thereof; and

igniter means, associated with said burner structure, for igniting the pressurized fuel/air mixture exiting said burner structure to thereby create a pressurized flow of hot combustion products that sequentially flow downwardly through said burner tube into said turn bowl structure, upwardly through said flue tubes into said vent plenum structure, and then outwardly through said outlet passage of said vent plenum structure.

5,197,416

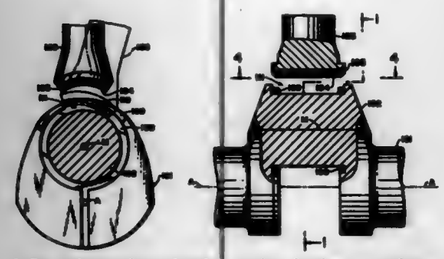
RADIAL INTERNAL COMBUSTION ENGINE

Michael Zoche, Keferstr. 13, D-8000 Munich 40, Fed. Rep. of Germany

Filed Jul. 24, 1992, Ser. No. 919,816

Int. Cl.[5] F02B *75/22*

U.S. Cl. 123—55 A **4 Claims**



1. In an internal combustion engine, having a crankcase, a crankshaft, cylinders, connecting rods on the crankshaft, and pistons attached to the connecting rods and arranged to reciprocate within the cylinders, wherein each connecting rod (1) is attached with one bearing face on one journal in the crankshaft, (2) has webs on each side of the bearing face, and (3) is attached to the journal by strips that enclose the webs, the improvement wherein each strip enclosing a web on one connecting rod is part of a groove in the journal, wherein space is left, once the respective connecting rod has been inserted, between the webs and the strips, and wherein an aperture is provided in the strips for inserting the webs, and hence the connecting rods, large enough to allow insertion of the connecting rods at an angle to their operating states while permitting maintenance therein by the strips that enclose them.

5,197,417

FUEL INJECTION PUMP FOR A TWO-STROKE ENGINE IN A WORK APPARATUS SUCH AS A MOTOR-DRIVEN CHAIN SAW

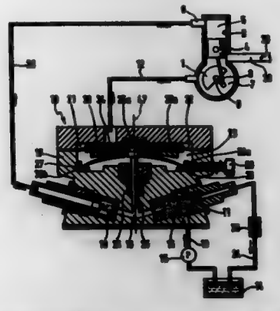
Ralf Tuckermann, Stuttgart, and Werner Geyer, Waiblingen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 3, 1992, Ser. No. 923,583

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1991, 4125593

Int. Cl.[5] F04B *43/06*

U.S. Cl. 123—73 C **10 Claims**



1. A fuel injection pump for a two-stroke engine, especially for handheld portable tools such as motor-driven saws or the like, the engine having a piston and a cylinder conjointly defining a combustion chamber and having a crankcase wherein pressure is developed in response to the movement of the piston, the fuel injection pump comprising:

a housing defining an enclosed work space;

a membrane partitioning said work space into a pulse chamber and a return chamber;

leaf spring means mounted in said return chamber for applying a resilient biasing force to said membrane to bias said membrane into a rest position;

a pump chamber arranged in said housing;

fuel supply means connected to said pump chamber for supplying fuel to the latter;

fuel metering line means for conducting the fuel from said pump chamber to the engine;

a pump cylinder communicating with said pump chamber;

a pump piston connected to said membrane and being slideably mounted in said cylinder so as to be reciprocally movable through a piston stroke away from a start position corresponding to said rest position of said membrane and back to said start position;

a connecting line connecting said pulse chamber to the crankcase for charging said pulse chamber with the pressure present in the crankcase for actuating said membrane to develop an actuating force against said biasing force of said leaf spring means for driving said pump piston into said pump chamber to pump the fuel therein through said fuel metering line means and for then charging said pulse chamber with an underpressure for withdrawing said pump piston away from said pump chamber to draw in a fresh quantity of fuel from said fuel supply means; and,

said leaf spring means including a packet of individual leaf springs mounted in said return chamber.

5,197,418

FUEL INJECTION PUMP FOR A TWO-STROKE ENGINE

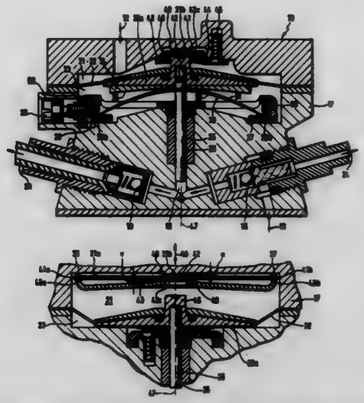
Michael Wiesmann, Mettmann; Hans Nickel, Cottesweiler; Ralf Tuckermann, Stuttgart, and Werner Geyer, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Sep. 4, 1992, Ser. No. 940,995

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1991, 4129574

Int. Cl.[5] F04B *43/06*

U.S. Cl. 123—73 C **21 Claims**



1. A fuel injection pump for a two-stroke engine, especially for handheld portable tools such as motor-driven saws or the like, the engine having a piston and a cylinder conjointly defining a combustion chamber and having a crankcase wherein pressure is developed in response to the movement of the piston, the fuel injection pump comprising:

a housing defining an enclosed work space;

a membrane partitioning said work space into a pulse chamber and a return chamber;

a spring mounted in said return chamber for applying a resilient biasing force to said membrane to bias said membrane into a rest position;

a pump chamber arranged in said housing;

fuel supply means connected to said pump chamber for supplying fuel to the latter;

fuel metering line means for conducting the fuel from said pump chamber to the engine;

a pump cylinder defining a longitudinal axis and communicating with said pump chamber;

a pump piston connected to said membrane and being slideably mounted in said cylinder so as to be reciprocally movable through a piston stroke along said axis away from a start position corresponding to said rest position of said membrane and back to said start position;

a connecting line connecting said pulse chamber to the crankcase for charging said pulse chamber with the pressure present in the crankcase for actuating said membrane to develop an actuating force against said biasing force of said spring for driving said pump piston into said pump chamber to pump the fuel therein through said fuel metering line means and for then charging said pulse chamber with an underpressure for withdrawing said pump piston away from said pump chamber to draw in a fresh quantity of fuel into said pump chamber from said fuel supply means;

stop means for determining said start position of said piston; and,

displacing means for displacing said stop means along said axis in dependence upon temperature thereby adjusting the length of said stroke and the amount of fuel drawn into said pump chamber.

5,197,419

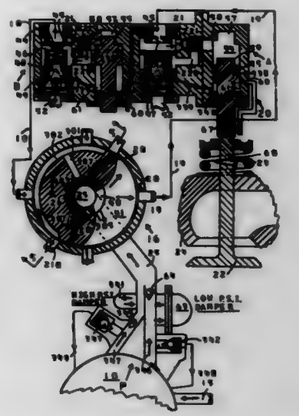
INTERNAL COMBUSTION ENGINE HYDRAULIC ACTUATED AND VARIABLE VALVE TIMING DEVICE

Billy E. Dingess, 117 Railroad Ave., Ferrellsburg, W. Va. 25524

Continuation-in-part of Ser. No. 788,762, Nov. 7, 1991, which is a continuation-in-part of Ser. No. 696,166, May 6, 1991. This application Feb. 3, 1992, Ser. No. 829,446

Int. Cl.[5] F01L *9/02*

U.S. Cl. 123—90.130 **12 Claims**



1. An internal combustion engine having hydraulically actuated poppet valves comprising in combination:

a hydraulic pump having a hydraulic linkage with a hydraulic reservoir, and driven from an engine power shaft, a rotary vane hydraulic valve timing distributor timed and driven by said engine power shaft, and having a vane rotor, said rotor having a presurized cavity on one side, and a bleeder cavity on said rotor's opposite side and, further comprising: a hydraulic line linkage with said hydraulic pump, a plurality of shuttle release valves having hydraulic linkage with said hydraulic distributor, a plurality of hydraulic actuator lifter apparatus having hydraulic linkage with said shuttle release valves and further linked with said engine valves.

5,197,420

CAMSHAFT ADJUSTER AND TENSIONER

Gerd Arnold, Nauheim; Markus Lienkamp, Bad Schwalbach, and Albert Schweikard, Appenheim, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1991, Ser. No. 808,514

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1990, 4041785

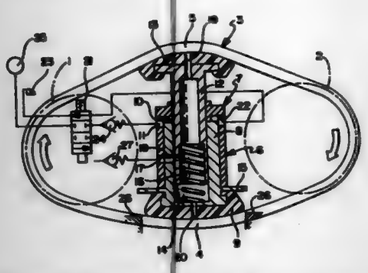
Int. Cl.[5] F01L *1/34, 1/04*

U.S. Cl. 123—90.15 **8 Claims**

1. A camshaft adjuster and tensioner for a drive chain having taut and slack strands driven by a first camshaft and driving a second parallel camshaft, said adjuster being mounted between the two strands of the chain and having two tensioning shoes that press against the chain from the inside, wherein one of the

339-701 O.G.-93-5

shoes is rigidly connected to a piston movable transversely to the chain by hydraulic pressure applied to a pressure chamber



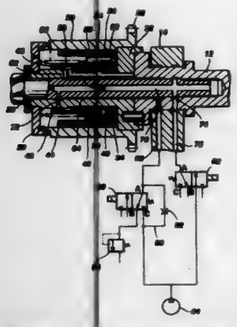
and the second tensioning shoe is urged by a spring acting against the piston carrying the first tensioning shoe.

5,197,421

VALVE TIMING CONTROL APPARATUS

Seinosuke Hara, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Atsugi, Japan

Filed Jul. 27, 1992, Ser. No. 919,741
Claims priority, application Japan, Jul. 31, 1991, 3-191759
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 11 Claims



1. A valve timing control apparatus for use in an internal combustion engine having a crankshaft driven by the engine and a camshaft adapted to drive at least one valve, the valve timing control apparatus comprising:

a rotary member drivingly connected to the crankshaft for rotation with the crankshaft;

a drive mechanism for transmitting rotation of the rotary member to the camshaft, the drive mechanism including a piston member provided for reciprocation to rotate the camshaft with respect to the rotary member, the piston member having a fixed volume pressure chamber formed therein, the piston member being urged resiliently in a first direction, the piston member being movable in a second direction opposite to the first direction in response to a pressure introduced into the pressure chamber;

a first conduit having a first outlet for connection to the pressure chamber;

a second conduit having a second outlet for connection to the pressure chamber, the second outlet being spaced away from the first outlet in the first direction of movement of the piston member; and

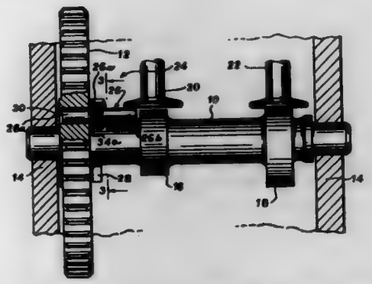
a control unit including means for producing first and second command signals according to engine operating conditions, means responsive to the first command signal for introducing a pressure through the first conduit, and means responsive to the second command signal for introducing a pressure through the second conduit.

5,197,422

COMPRESSION RELEASE MECHANISM AND METHOD FOR ASSEMBLING SAME

Paul D. Oleksy, Shorewood, and Gene V. Fliss, Colgate, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 19, 1992, Ser. No. 854,582
Int. Cl.[5] F01L *13/08*
U.S. Cl. 123—182.1 29 Claims



1. A compression release assembly that relieves pressure in an engine combustion chamber during engine starting, comprising:

a compression release shaft;

a centrifugally-responsive flyweight having an aperture therein that receives a portion of said compression release shaft;

a torsional spring; and

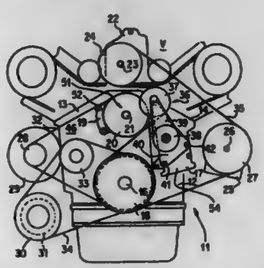
a spring retainer adapted to being received within said flyweight aperture and having a flange, said spring being retained between retaining surfaces of said spring retainer and said flyweight.

5,197,423

ARRANGEMENT FOR DRIVING AT LEAST ONE SUPPLEMENTAL APPARATUS OF A V-TYPE ENGINE

Hidesaku Ebesu; Toshimichi Akagi, and Naoki Nagano, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 12, 1992, Ser. No. 834,208
Claims priority, application Japan, Feb. 18, 1991, 3-043938
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 A 9 Claims



1. An arrangement for driving at least one supplemental apparatus driven by an engine crankshaft through a drive belt placed in front of a front end of a cylinder block of a V-type internal combustion engine, said engine including a pair of cylinder banks, each cylinder bank being formed with a row of cylinders, one row of said cylinders being offset forward in an axial direction of said engine crankshaft with respect to another row of said cylinders, and fluid supply means for supplying at least one of an engine coolant and an engine lubrication oil into said engine, said fluid supply means being installed in a front end portion of the cylinder bank in which the other row of said cylinders is formed, said arrangement comprising:

casing means for covering said fluid supply means;

securing means for securing said casing means to a front end of said front end portion; and

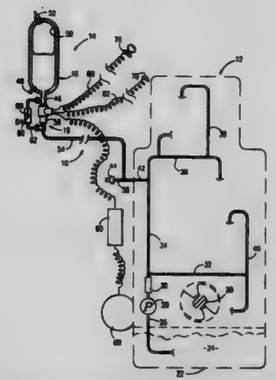
tensioning means, supported by said securing means, for applying a tension to said drive belt.

5,197,424

PRE-LUBRICATION SYSTEM FOR REDUCING ENGINE WEAR

Kenneth J. Blum, 5790 NW. Ward Rd., Parkville, Mo. 64152

Filed Mar. 5, 1992, Ser. No. 846,629
Int. Cl.[5] F01M *5/00*
U.S. Cl. 123—196 S 1 Claim



1. In combination with an internal combustion engine having an engine block with structure therein defining a pressurized lubrication system for circulating lubricant therethrough, a pressure sensing device, structure for normally mounting said pressure sensing device on said block in communication with said system for monitoring the pressure conditions therein including a passageway through a wall of said block communicating with said system and receiving said sensor, an ignition switch, and a starter for cranking the engine electrically connected with said ignition switch, a pre-lubrication assembly for said engine and comprising:

an accumulator vessel including an inlet for receiving engine lubricant therein and having a bladder positioned within said vessel and filled with fluid under positive pressure, a filling nipple in operative fluid communication with said bladder and extending through the wall of said vessel for selectively charging said bladder with fluid, said bladder serving to subject engine lubricant contained in said vessel to positive pressure, said accumulator vessel further including a selectively openable drain plug for draining the contents of said vessel;

a tee fitting including first, second and third intercommunicated tubular legs, said first leg being operatively received within said engine block passageway in lieu of said sensor for communication with said system, said pressure sensor being secured to said second leg for monitoring pressure conditions within said system;

means for operably coupling said vessel and said system for at least partially filling said vessel with lubricant during operation of said pressurized lubrication system following an initial ignition sequence, for maintaining lubricant within said vessel when engine operation ceases, and for conveying lubricant from said vessel back to said system during a subsequent ignition sequence of said engine, said coupling means including a lubricant-conveying conduit operatively connected between said vessel inlet and said third tee leg, valve means interposed within said conduit for permitting selective flow of lubricant from said engine system to said vessel during engine operation, and for alternately permitting the flow of lubricant from the vessel to the system during said subsequent ignition sequence, said valve means comprising a solenoid-operated valve, there being means for operating said solenoid valve to permit said flow of lubricant from the vessel to the system during said subsequent ignition sequence, and a check valve in parallel with aid solenoid valve for permitting said flow of lubricant from said system to said vessel during operation of said engine; and

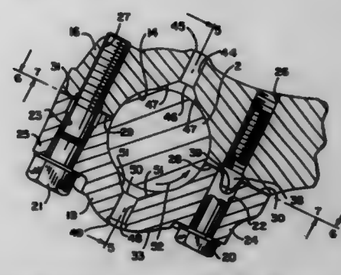
an electronic timing device operably connected between said starter and said solenoid valve for opening said solenoid valve for a preselected period at the outset of said initial ignition sequence in order to deliver engine lubricant from said vessel to said engine, and for thereafter closing the solenoid valve after said preselected period has elapsed for maintaining the solenoid valve in a closed condition until a subsequent ignition sequence.

5,197,425

CRANKPIN BEARING FOR CONNECTING ROD OF INTERNAL COMBUSTION ENGINE

John Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Aug. 4, 1992, Ser. No. 925,801
Int. Cl.[5] F02B *25/32*
U.S. Cl. 123—197.3 20 Claims



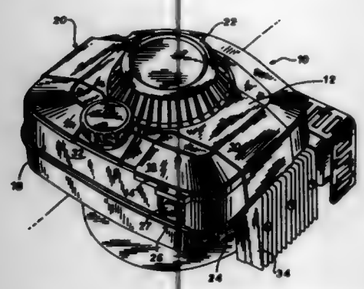
1. A connecting rod for connecting a piston to a crankshaft of an internal combustion engine, comprising:

a rigid beam member having an elongate body including a piston pin bearing at one end of said body defining a piston pin bearing hole having a first axis, and an arcuate-shaped crankpin bearing portion at its other end defining part of a crankpin bearing hole and a second axis parallel to said first axis;

an arcuate-shaped cap member adapted to mate with said crankpin bearing portion to define a crankpin bearing having an inner circumferential surface, an outer circumferential surface and a crankpin bearing hole when assembled together, said crankpin bearing adapted to receive a crankpin in said crankpin bearing hole rotating in a direction about said second axis; and

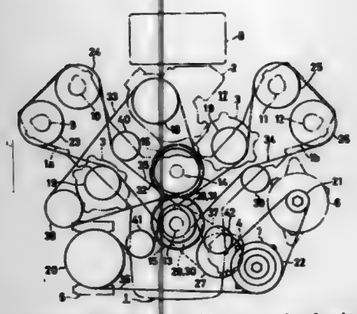
means for providing low thermal conductivity from the inner circumferential surface to the outer circumferential surface of said crankpin bearing so that when a sufficient temperature differential develops between the inner circumferential surface and outer circumferential surface said crankpin bearing expands a sufficient amount radially inwardly to seize on the crankpin before reaching the yield temperature of said crankpin bearing.

5,197,426
INTEGRAL ENGINE HOUSING
Richard Frangesch, Elm Grove, and Scott Funke, New Berlin, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed May 5, 1992, Ser. No. 878,552
Int. Cl.[5] F02R 77/00
U.S. Cl. 123—198 E 30 Claims



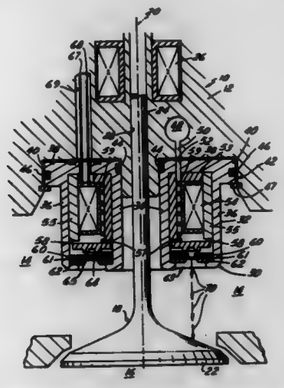
1. An integral housing for an internal combustion engine, comprising:
a fuel tank;
a blower housing that includes an air passageway;
an air filter housing having an inlet opening and an outlet;
a top wall that forms at least a part of an upper side of each of said fuel tank, said blower housing, and of said air filter housing; and
an exterior side wall that forms at least a part of a lateral side wall of each of said fuel tank, said blower housing, and of said air filter housing.

5,197,427
ACCESSORY DRIVE DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Shunji Masuda, Hiroshima; Tatsuya Uesugi, Higashi-Hiroshima; Toshimitsu Tanaka, Ohtake, and Naoyuki Yamagata, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 2, 1991, Ser. No. 800,978
Claims priority, application Japan, Nov. 30, 1990, 2-340086
Int. Cl.[5] F02B 77/00
U.S. Cl. 123—198 R 21 Claims



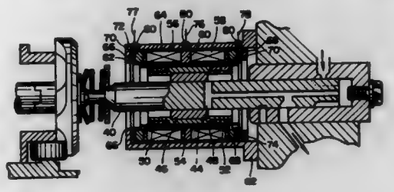
1. In an internal combustion, V-type engine having a first bank and a second bank, wherein the second bank is opposed to the first bank at a predetermined angle, and wherein bores of the first bank are offset from bores of the second bank so that the first bank is recessed relative to the second bank, an accessory drive device comprising:
an accessory mechanism positioned in a space formed between the first bank and the second bank, and
a drive belt for the accessory mechanism disposed on a side of the first bank which is recessed relative to the second bank.

5,197,428
FUEL INJECTOR SURROUNDING INTAKE VALVE STEM
Michael J. Hornby, Williamsburg, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.
Filed Aug. 4, 1992, Ser. No. 925,709
Int. Cl.[5] F02M 57/04; F01L 9/04
U.S. Cl. 123—296 13 Claims



12. An internal combustion engine comprising an intake valve that controls the introduction of combustible air-fuel mixture from an intake system into a combustion chamber space and that is actuated by the electrical energization and de-energization of a first tubular solenoid coil that is disposed about its own axis, and an electromechanical fuel injector disposed to inject fuel into said intake system toward said intake valve, said fuel injector comprising a second tubular solenoid coil that is disposed around its own axis and that is electrically energized and de-energized to control fuel injections from said fuel injector, characterized in that said axis of said first solenoid coil and said axis of said second solenoid coil are disposed on a co-axis.

5,197,429
POSITION SENSING ARRANGEMENT FOR USE IN FUEL INJECTION PUMP OR THE LIKE
Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Co. Ltd., Japan
Filed Dec. 1, 1983, Ser. No. 557,102
Claims priority, application Japan, Dec. 27, 1982, 57-227139
Int. Cl.[5] F02D 31/00; H01G 5/04
U.S. Cl. 123—357 5 Claims

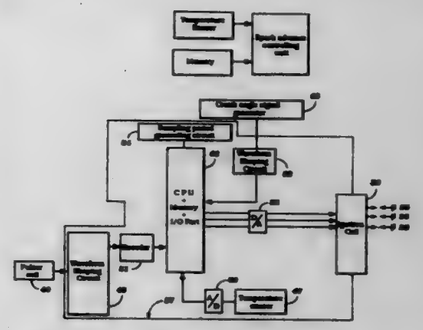


1. In a device
a movable member; and
an arrangement for sensing the position of said member, said arrangement comprising:

a first electrode disposed in close proximity to said movable member and in a manner that the interfacial area defined between said first electrode and said member remains constant irrespective of the position of said member;
a second electrode disposed in close proximity to said member and in a manner that the interfacial area defined between said second electrode and said member varies with the position of said member;
a third electrode disposed in close proximity to said member and in a manner that the interfacial area defined between said third electrode and said member varies with the position of said member, said second and third electrodes being arranged so that as the interfacial area defined between said second electrode and said member increases the interfacial area defined between said third electrode and said member decreases, and vice versa; and
a first circuit for outputting a signal indicative of the position of said member, said circuit being responsive to a capacitance which varies with the difference in interfacial area defined between (a) said first electrode and said member (b) said second electrode and said member, (c) said first and second electrodes and said member, and (d) said first and third electrodes and said member and wherein the first circuit comprises:
a bridge circuit, said bridge circuit including first and second resistors and first and second capacitors, said second resistor being manually variable, said first capacitor being defined by said first and second electrodes and said movable member, and said second capacitor being defined by said second and third electrodes and said movable member;
a source of alternating current, said source of alternating current being connected to a first terminal of said bridge circuit located between said first resistor and said first capacitor; and
a full wave rectifier, said full wave rectifier being operatively connected to a second terminal of the bridge circuit which is located between said first and second resistors and to a third terminal located between said first and second capacitors, said full wave rectifier producing a signal indicative of the difference in capacitance between said first and second capacitors.

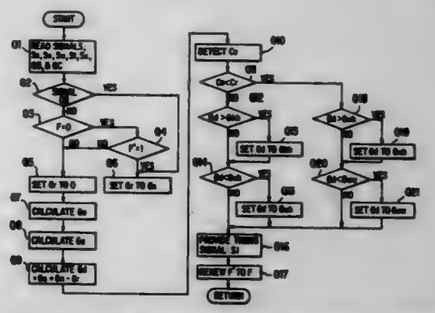
5,197,430
IGNITION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE
Akihiko Hoshibe, and Hitoshi Motose, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Jan. 16, 1992, Ser. No. 822,174
Claims priority, application Japan, Jan. 17, 1991, 3-16966
Int. Cl.[5] F02P 5/15
U.S. Cl. 123—421 4 Claims

1. An electronic ignition control device for an internal combustion engine comprising a spark advance control circuit for controlling the ignition timing of the engine during low temperature operation after the start of the engine, a temperature sensor for sensing temperature at the start of the engine and transmitting a signal to said control circuit indicative of the sensed temperature at the start of the engine, said control circuit including a central processing unit and a memory wherein the central processing unit computes optimum ignition timing after the start of the engine during low temperature operation of the engine based on the temperature sensed only at the start of the engine and a preprogrammed relationship stored in the memory between the sensed temperature where the temperature sensor is located and the actual temperature of



the engine at predetermined time periods after the start of the engine and ignition timing control characteristics.

5,197,431
IGNITION TIMING CONTROL SYSTEM FOR ENGINE
Tetsuro Takabe; Tetsushi Hosokai, both of Kure; Toshihiro Ishihara, Saka, and Hideki Kobayashi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 10, 1991, Ser. No. 804,661
Claims priority, application Japan, Dec. 10, 1990, 2-401181
Int. Cl.[5] F02P 5/14
U.S. Cl. 123—423 7 Claims



1. An ignition timing control system for an internal combustion engine, comprising;
operating condition detecting means for detecting at least an intake air charging level;
torque drop demand detecting means for detecting a demand for dropping output torque from said engine;
ignition timing control means for correcting an ignition timing advance so as to retard ignition when said torque drop demand detecting means detects the demand for dropping output torque and limiting the ignition timing advance, after it is corrected, so that it stays above a specific lower ignition timing advance limit, and providing an ignition timing signal corresponding to the larger of an eventual ignition timing advance and the lower ignition timing advance limit when the intake air charging level is lower than a specific intake air charging level; and
ignition means for producing ignition based on said ignition timing signal.

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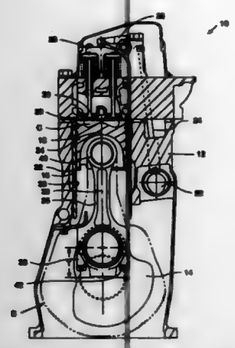
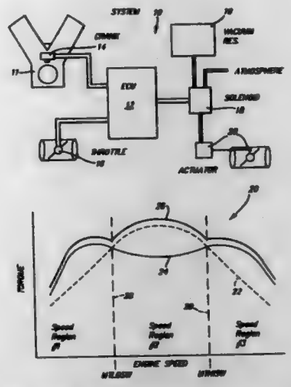
5,197,432
METHOD OF OBTAINING A LONGER STROKE ON AN EXISTING ENGINE
Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed May 5, 1992, Ser. No. 878,590
Int. Cl.[5] F02B *75/04*
U.S. Cl. 123—48 C 11 Claims



1. A method of obtaining a longer stroke of an existing engine having a cylinder block defining at least one cylinder bore which has an axis, a cylinder head mounted to the block, a crankshaft rotatably mounted within the block, a cylinder liner disposed within the cylinder bore and having a liner bore, a piston which reciprocates in the cylinder liner along the axis of the cylinder bore, the piston having a combustion crater and defining a stroke between a top dead center position and a bottom dead center position of the crankshaft, a combustion volume within the liner bore, a clearance volume within the liner bore, a connecting rod removably attached to the crankshaft and the piston, comprising the steps of:
replacing the existing crankshaft with a crankshaft having a larger throw; and
increasing the clearance volume at the top dead center position within the liner bore in proportion to the increased combustion volume created by the crankshaft having the larger throw in order to maintain a substantially equivalent compression ratio as the existing engine.

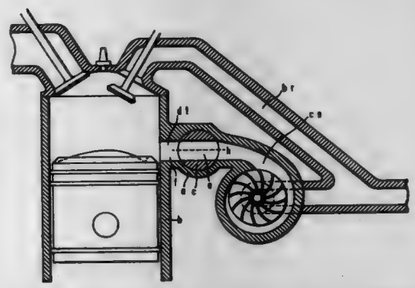
5,197,433
ANTICIPATORY INTAKE MANIFOLD TUNING VALVE CONTROL
Gregory J. Dykstra, 1611 Anita, and Glen E. Tallarek, 1774 Aline Dr., both of Grosse Pointe Woods, Mich. 48236
Filed Apr. 30, 1992, Ser. No. 876,632
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MB 13 Claims

1. A method of controlling an intake manifold tuning valve (MTV) for an internal combustion engine, said method comprising the steps of:
sensing the position of the throttle;
determining whether the throttle position is greater than or equal to wide open throttle (WOT);
opening the intake MTV if the throttle position is not greater than or equal to WOT;
sensing the speed of the engine if the throttle position is greater than or equal to WOT;
determining whether the engine speed is outside a range between first and second predetermined speeds;
closing the intake MTV if the engine speed is outside the range between first and second predetermined speeds; and



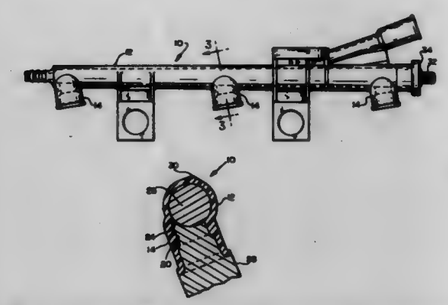
opening the intake MTV if the engine speed is not outside the range between first and second predetermined speeds.

5,197,434
I.C. ENGINES
Ariel P. Contreras Orellana, Buenos Aires, Argentina, assignor to Jaime Suquet, Adrogue, Argentina, a part interest
Filed Sep. 4, 1990, Ser. No. 577,309
Claims priority, application Argentina, Sep. 1, 1989, 314828
Int. Cl.[5] F02B *75/00*
U.S. Cl. 123—433 11 Claims



1. A four-stroke internal combustion engine, comprising: one or more cylinders each with a piston movable therein to define a combustion chamber; inlet valve means associated with each cylinder for controlling the ingress of air or fuel/air mixture to the combustion chamber during each cycle; and exhaust valve means associated with each cylinder for controlling the egress of exhaust gases from the combustion chamber during each cycle; wherein a port is provided in a wall of each cylinder, the port being openable independently of the inlet valve means and the exhaust valve means to provide an additional route for the ingress of air or fuel/air mixture, and/or to provide an additional route for the egress of exhaust gases, to or from the combustion chamber during each cycle;
wherein the piston has one or more sealing rings positioned to seal the port from the engine's crankcase when the piston is at TDC, the opening of the port is governed by auxiliary valve means and a piston skirt, the auxiliary valve means comprises a rotary valve member rotatably mounted to control flow along a duct, with the rotary valve member having at least one passage therein with passage openings situated to permit flow along the duct intermittently as the rotary valve member rotates in use, and the rotary valve member has at least one exhaust passage for exhaust gases and at least one inlet passage for air or fuel/air mixture, to control flow along both an exhaust duct and an inlet duct.

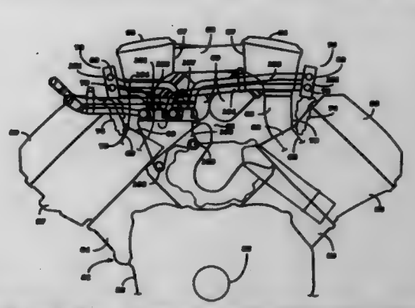
5,197,435
MOLDED FUEL INJECTION RAIL
Richard J. Mazur, Sylvania, Ohio; James D. Taylor, Temperance, Mich., and George H. Bucci, Tolland, Conn., assignors to Walbro Corporation, Cass City, Mich.
Filed Aug. 13, 1992, Ser. No. 929,783
Int. Cl.[5] F02M *55/02*
U.S. Cl. 123—456 19 Claims



18. A molded fuel injection rail for an internal combustion engine, said injection rail comprising: an elongated rail barrel having a hollow interior with a longitudinal central axis, a plurality of laterally disposed injector sockets positioned at spaced locations along said rail barrel for supplying fuel to a like plurality of fuel injectors through socket apertures communicating with said interior, said sockets each having a body portion with cylindrical cavity and a central axis disposed at an acute angle relative to said barrel axis, said sockets axes being offset laterally and downwardly from said rail barrel axis, said sockets each have a hollow cylindrical body merging at a shoulder with a hollow neck section of a reduced internal diameter, said hollow interior of said neck section terminates short of said hollow interior of said rail barrel on one side of said socket neck such that an occlusive protuberance is produced along said side only to reduce the level of that side of the aperture.

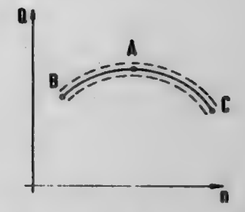
5,197,436
FUEL DELIVERY SYSTEM FOR V-TYPE ENGINE
Toshikazu Ozawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Continuation of Ser. No. 500,364, Mar. 28, 1990, abandoned. This application Dec. 20, 1991, Ser. No. 812,871
Claims priority, application Japan, Mar. 31, 1989, 1-83664
Int. Cl.[5] F02M *55/02*
U.S. Cl. 123—456 4 Claims

1. A fuel supply system for an internal combustion engine having a pair of angularly related cylinder banks, a pair of cylinder heads each affixed to a respective one of said cylinder banks, an air manifold for drawing atmospheric air and delivery to each of said cylinder heads through respective inlet pipes, a pair of sets of fuel injectors for supplying fuel to the cylinder heads of the respective cylinder banks on the outer sides of the respective inlet pipes, and a pair of fuel rails, each associated with a respective one of said cylinder heads and disposed outwardly of said air manifold for supplying fuel to the respective cylinders thereof, each of said rails having an opening to receive and supply fuel to the respective fuel injectors of the respective cylinder banks said fuel injectors being mounted on said cylinder heads, the improvement comprising each of said fuel rails having delivery path and a return path positioned vertically above each other and aligned above said openings, delivery conduit means for delivering fuel from a fuel tank in parallel paths to each of said fuel rail delivery paths at one end thereof, return conduit means for returning fuel in



parallel paths from the return paths of said fuel rails at said one end thereof to a common conduit, a pressure regulator valve in said common conduit for regulating the pressure in each of said fuel rails, and a relief conduit leading from said pressure regulator to said fuel tank.

5,197,437
FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE WITH AN INJECTION PUMP HAVING SEVERAL HIGH-PRESSURE OUTLETS
Gerd-Uwe Dahlmann, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany
Continuation of Ser. No. 403,122, Sep. 5, 1989, abandoned. This application Sep. 17, 1991, Ser. No. 760,826
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829823
Int. Cl.[5] F02M *41/00*
U.S. Cl. 123—467 11 Claims



1. A fuel injection apparatus for an internal combustion engine comprising an injection pump common to a plurality of fuel injection valves and having a plurality of high-pressure outlets, each connected to one of the fuel injection valves through flow passages providing different fuel flow characteristics, and a plurality of individually adjustable volumetric injection-quantity adjustment devices, each of which includes individually selectable choke means and is connected to one of the high-pressure outlets of the injection pump in the downstream direction therefrom and is selectively adjustable in accordance with the flow characteristics of the corresponding fuel flow passage to compensate for different characteristics of the flow paths and provide the same fuel volume for injection in response to the same type of injection pump operation.

when the device is subjected to emergent and in the support for

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5,197,438

VARIABLE DISCHARGE HIGH PRESSURE PUMP

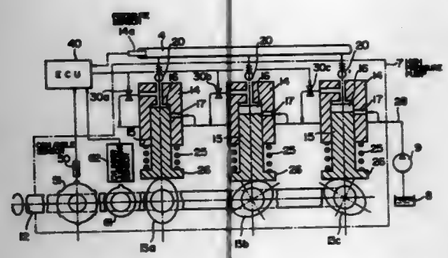
Yoshihisa Yamamoto, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 462,870, Jan. 8, 1990, Pat. No. 5,094,216, which is a continuation of Ser. No. 244,823, Sep. 15, 1988, abandoned. This application May 14, 1991, Ser. No. 699,589

Claims priority, application Japan, Sep. 16, 1987, 62-231349; Oct. 12, 1987, 62-256826; Oct. 12, 1987, 62-256827

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—506 3 Claims



1. A variable discharge high pressure pump for a fuel injection system of an engine, said high pressure pump discharging fuel into a common rail for accumulating a fuel pressure therein, said high pressure pump including:

a cylinder having formed therein at least one cylinder

a plunger reciprocally disposed in said cylinder bore, and having an end face cooperating with an inner peripheral surface of said cylinder bore to define a pumping chamber, having a forward stroking movement starting at a starting point, extending through an initial stage, through a later stage and then through a final stage which extends to an end of the movement where the plunger is as far forward as possible;

a cam driven by the engine to reciprocally drive said plunger;

a low pressure passage providing the only communication path between said pumping chamber and a low pressure side of said pump;

a valve including a valve member which opens and closes said low pressure passage, said valve member opening said low pressure passage between the starting point until a period extending from a predetermined time point after the starting point of the forward stroking movement of said plunger, and closing said low pressure passage to block all communication between the pumping chamber and the low pressure side of the pump, through the later stage of the forward stroking movement of said plunger, at least until the end of the forward stroking movement of said plunger, to thereby block any flow of fuel from said pumping chamber through said low pressure passage to said low pressure side of said pump during said later stage of the forward stroking movement of said plunger, said predetermined time point being adjustable to control a quantity of fuel discharged from said pumping chamber;

said cam having a cam profile shaped to provide a non-uniform speed characteristic such that the cam speed is low in the initial stage of the forward stroking movement of said plunger and is higher at the later stage of the forward stroking movement of said plunger.

5,197,439

METHOD AND DEVICE FOR OPEN-LOOP CONTROL OF A SOLENOID-VALVE REGULATED FUEL-METERING SYSTEM

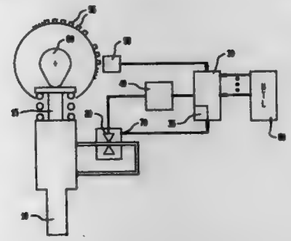
Roland Gronenberg, and Joachim Tauscher, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1992, Ser. No. 893,340

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1991, 4120461

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—506 20 Claims



1. A method for controlling a fuel-metering system regulated by a solenoid valve, comprising the steps of:

(a) determining an angular position of a predetermined rotating engine component for the start of delivery of fuel to the engine;

(b) determining an angular displacement of the predetermined rotating engine component over which fuel will be delivered to the engine;

(c) determining the angular position of the predetermined rotating engine component for the end of fuel delivery to the engine;

(d) determining switching times needed for the solenoid valve to close and to open;

(e) computing an instant for triggering the solenoid valve to close based on the angular position of the predetermined rotating engine component for the start of fuel delivery and the switching time to close the solenoid valve; and

(f) computing an instant for triggering the solenoid valve to open based on the angular position of the predetermined rotating engine component for the start of fuel delivery, the angular displacement of the predetermined rotating engine component over which fuel will be delivered, and the switching time to open the solenoid valve.

5,197,440

PRESSURE-CONTROLLED VALVE DEVICE FOR ENGINE RADIATOR

Georg Georgs, Stuttgart, Fed. Rep. of Germany, and Peter Grasser, Graz, Austria, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Jul. 2, 1992, Ser. No. 907,529

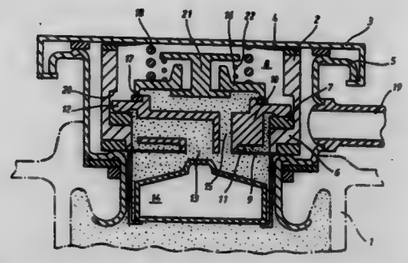
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1991, 4124182

Int. Cl.[5] F07P *3/22*

U.S. Cl. 123—41.54 4 Claims

1. A pressure-controlled valve device with an opening pressure switchable to a low pressure and to a high pressure in an internal combustion engine cooling fluid circuit and adapted to be arranged inside a cooling fluid container so as to be subjected to pressure, depending on an operating condition of an engine, by one of an emergent from cooling fluid and by the cooling fluid itself, comprising a float which can be raised with an increasing cooling fluid level so that the device opens at a higher pressure when subjected to fluid pressure than when subjected to emergent pressure and two spring-loaded moving closing bodies, wherein one of the bodies is configured as a low-pressure closing body arranged to determine a function

when the device is subjected to emergent and is the support for the other of the bodies which is a high-pressure closing body, whereby when the float is raised, a flow path having flow controlled by the low-pressure closing body is shut off and a flow path leading through the low-pressure closing body to the high-pressure closing body is open, a closing pressure to which



the closing bodies are subjected is introduced exclusively via the high-pressure closing body, a resultant effective area determining opening of the low-pressure closing body taking place under the control pressure is, under all operating conditions, greater than that for opening of the high-pressure closing body, and when the high-pressure closing body is open, the low-pressure closing body has a defined open position.

5,197,441

FUEL INJECTION PUMPING APPARATUS

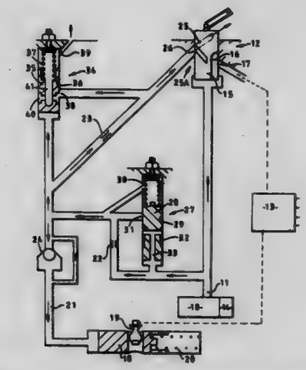
Alan C. Green, Maidstone, England, assignor to Lucas Industries, Birmingham, England

Continuation of Ser. No. 532,220, Jun. 1, 1990, abandoned. This application Sep. 16, 1991, Ser. No. 759,850

Claims priority, application United Kingdom, Jun. 3, 1989, 8912823

Int. Cl.[5] F02M *39/02;* F04B *3/00*

U.S. Cl. 123—502 3 Claims



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine, comprising:

an injection pump for delivering fuel in timed relationship to an associated engine,

a feed pump for supplying fuel to the injection pump during the filling periods thereof, the outlet pressure of said feed pump varying in accordance with the speed of the associated engine,

throttle means for adjusting the amount of fuel supplied by the feed pump to the injection pump, and,

fluid pressure operable means for adjusting a component of the injection pump to vary the timing of delivery of fuel to the associated engine,

a first fixed orifice connected in a first fuel path extending between the outlet of the feed pump and said fluid pressure operable means,

a second fuel path extending from downstream of said first fixed orifice to a drain, said second fuel path incorporating a variable orifice the size of which is determined by the setting of said throttle means and a second fixed orifice connected in series, so that all the fuel which flows through the second fixed orifice flows through the variable orifice, and,

a valve responsive only to the pressure drop across the first fixed orifice and operable after the pressure drop has attained a predetermined value, to maintain the pressure drop across the first fixed orifice substantially constant.

5,197,442

TANK-VENTING ARRANGEMENT AND METHOD OF OPERATING THE SAME

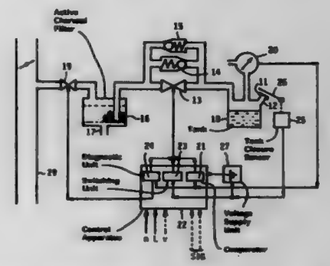
Andreas Blumenstock, Ludwigsburg; Helmut Denz; Ulrich Steinbrenner, both of Stuttgart, and Ernst Wild, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 20, 1991, Ser. No. 811,294

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1990, 4040895

Int. Cl.[5] F02M *33/02;* F02B *77/00*

U.S. Cl. 123—520 8 Claims



1. A method for operating a tank-venting arrangement on a motor vehicle having an engine, the tank-venting arrangement including a tank having a tank closure, an adsorption filter and check valve interconnecting the tank and the adsorption filter, the method comprising the steps of:

measuring the pressure difference between the pressure in the tank and the ambient pressure at least when the engine is running;

keeping the check valve closed to maintain an overpressure in the tank in a predetermined interval during running of the internal combustion engine when no indication is present that the tank may be opened;

opening the check valve when one of the following occurs: the pressure difference increases beyond an upper threshold valve and an indication is present that the tank may be opened; and,

closing the check valve when one of the following occurs: the pressure difference drops below a lower threshold value and an indication is present that the tank may be closed.

5,197,443

FUEL SYSTEM FOR DIESEL TRUCK

David H. Hodgkins, Modesto, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Jun. 13, 1991, Ser. No. 714,959

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—514 17 Claims

1. A fuel system for a vehicle which includes an engine

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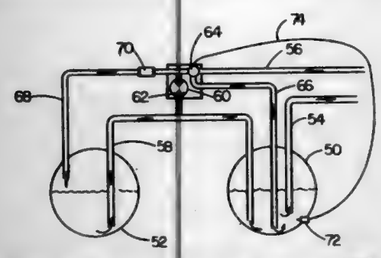
which consumes fuel, said fuel housed in a plurality of tanks, comprising:

a first fuel tank, having a first interior portion, said first interior portion having a first upper portion and a first lower portion;

conduit means for conducting fuel from said first interior portion of said first tank to said engine;

a second fuel tank disposed on said vehicle from said first tank, said second fuel tank having a second interior portion, said second interior portion having a second upper portion and a second lower portion, said first and second upper portions generally the same vertical elevation;



first fluid passage means extending between said first and second lower portions, said first fluid passage means extending vertically above said upper portions of said fuel tanks; and

pumping means for removing air from said first fluid passage means, and wherein said first fluid passage means is filled with fuel and fuel is enabled to be siphoned from said second fuel tank to said first fuel tank and vice versa, through said first fluid passage means to equalize the levels in said first and second tanks.

5,197,444

FUEL-SUPPLY SYSTEM AND TANK ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

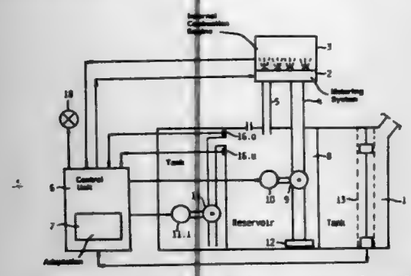
Ernst-Walter Lang, Gerlingen; Nikolaus Benninger, Vaihingen/-Enz; Wolfgang Boerkel, Ruelzheim; Günther Plapp, Filderstadt, and Rainer Schillinger, deceased, late of Freiburg, all of Fed. Rep. of Germany by Wolfgang Schillinger, legal representative , assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,768

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4027948

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—514 **8 Claims**



1. A system for supplying fuel to an internal combustion engine having an air intake and being adapted to burn different kinds of fuel, the system comprising:

a tank for receiving fuel from outside of said system;

a metering device for metering fuel to the intake air;

a reservoir separate from said tank and being configured to prevent fuel from entering said reservoir while said tank receives fuel from outside of said system;

fuel pump means for pumping fuel from said reservoir to said metering device;

control means for driving said fuel pump means and said metering device; and,

transfer means for continuously transferring fuel from said tank into said reservoir when the engine is running so that only that amount of fuel is refilled from the tank which was supplied by the metering device.

5,197,445

FUEL-SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

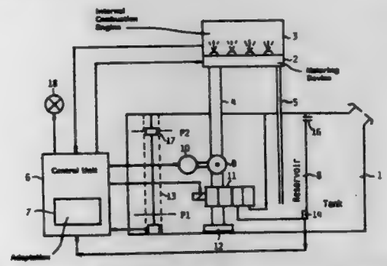
John Casari, Manchester, Mich., assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,674

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4027947

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—514 **6 Claims**



1. A system for supplying fuel to an internal combustion engine having an air intake, the system comprising:

a metering device for metering fuel to the intake air;

a tank for receiving fuel from outside of said system;

a reservoir for fuel including means to prevent fuel from entering said reservoir while said tank receives fuel from outside of said system;

fuel pump means for pumping fuel to said metering device,

switchover valve means movable between a first position wherein said valve means connects said reservoir to said fuel pump means so as to permit fuel to be pumped from said reservoir to said metering device and a second position wherein said valve means connects said tank to said fuel pump means so as to permit fuel to be pumped from said tank to said metering device;

control means for driving said fuel pump means and said metering device; and,

said control means being adapted for actuating said switchover valve means into said first position when the engine is cold and for actuating said switchover valve means into said second position when said engine is warm.

5,197,446

VAPOR PRESSURE ENHANCER AND METHOD

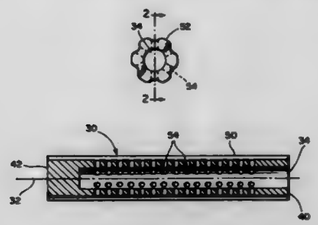
Clark L. Daywalt, 6703 E. 27th St., Tulsa, Okla. 74129, and Richard D. Collins, 302 W. Quanah Ct., Broken Arrow, Okla. 74011

Continuation-in-part of Ser. No. 502,265, Mar. 29, 1990, Pat. No. 5,048,499. This application Mar. 26, 1991, Ser. No. 674,749

Int. Cl.[5] F02M *27/00*

U.S. Cl. 123—538 **5 Claims**

1. A treatment device for enhancing the vapor pressure of liquid hydrocarbons comprising an element consisting essentially of from at least 68% to 100% copper, from 0% to about 30% zinc, from 0% to about 15% tin and from 0% to about 30% nickel alloyed together for the treatment of liquid hydrocarbons including fuels, motor oils, and transmission fluids by turbulent flow of the liquid in contact with the device.



5,197,447

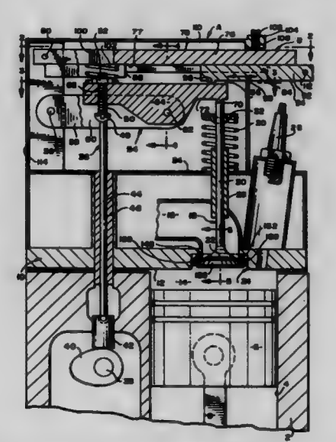
ENGINE HAVING VALVE STROKE ADJUSTER AND FUEL PREHEATER

Leon B. Dick, P.O. Box 1037, Willow, Ak. 99688

Filed Apr. 14, 1992, Ser. No. 868,400

Int. Cl.[5] F02M *31/16*; F01L *1/18*

U.S. Cl. 123—557 **34 Claims**



1. A valve stroke adjustment means for use in conjunction with an internal combustion engine provided with engine cylinder means and comprising:

a) a valve means, said valve means reciprocating along a valve stroke path between open and closed positions to said cylinder means;

b) floating rocker arm means having a top surface, bottom surface, first end, second end and pivot therebetween, said floating rocker arm second end engagible with said valve means to cause reciprocation;

c) linkage means having first and second ends, said linkage means first end pivotally mounted to a fixed point and said linkage means second end pivotally mounted to said floating rocker arm pivot;

d) actuator cam means engagible with said floating rocker arm first end to provide reciprocating movement thereto causing said floating rocker arm to arc about said floating rocker arm means pivot and thereby urge reciprocation of said valve means along said valve stroke path; and,

e) variable position fulcrum means engagible against said floating rocker arm means top surface whereby selective positioning of said fulcrum means along said top surface will vary the arc of movement of said floating rocker arm and proportionally modify the length of valve means reciprocation and engine power.

5,197,448

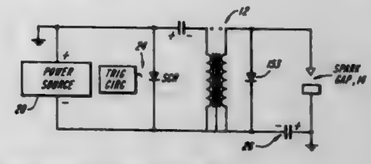
DUAL ENERGY IGNITION SYSTEM

Paul J. Porreca, Medway, and Edward A. VanDuyne, Framingham, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 23, 1991, Ser. No. 748,834

Int. Cl.[5] F02P *15/00*

U.S. Cl. 123—620 **11 Claims**



1. An ignition system comprising:

a step-up transformer having a primary and secondary winding;

a first energy source electrically connected to said primary winding;

a spark gap electrically connected in parallel with said secondary winding of said step-up transformer, in such a way that energy released from said first energy source provides energy to said spark gap of sufficient strength and duration to create a spark across said spark gap; and

a second energy source electrically connected in series with said spark gap and secondary winding in such a way that coupling between said second energy source and said primary winding and charging of said second energy source by energy discharged from said secondary winding are minimized, but in such a way that energy released from said second energy source provides energy to said spark gap via a low resistance path, the energy of sufficient strength and duration to sustain an arc across said spark gap.

5,197,449

IGNITION SYSTEM FOR AN ENGINE

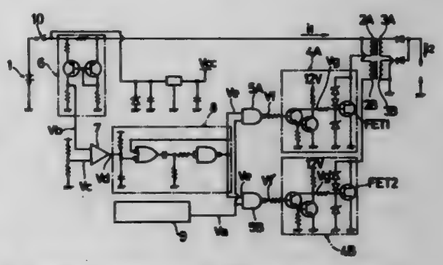
Yoshiyuki Okamoto, and Nobuyuki Oota, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 6, 1992, Ser. No. 846,944

Claims priority, application Japan, Mar. 6, 1991, 3-63686

Int. Cl.[5] F02P *3/04*

U.S. Cl. 123—622 **2 Claims**



1. An ignition system for an automobile comprising:

coil means having a plurality of primary and secondary coils;

ignition timing means for providing an ignition timing signal;

current supply means for supplying a current to said primary coils in response to said ignition timing signal; and

current detecting means for detecting said current level for

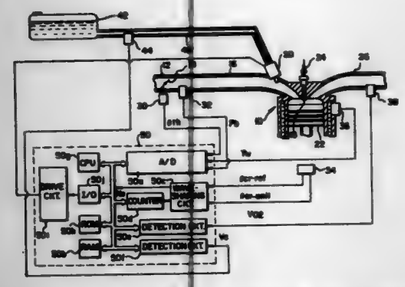
switching said current supply means off when said current level is higher than a predetermined level.

5,197,450

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shinichi Kitajima, Wako, and Yoshihiko Kobayashi, Haga, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1991, Ser. No. 810,598
Claims priority, application Japan, Dec. 21, 1990, 2-404929
Int. Cl.[5] F02D *19/08, 41/14*
U.S. Cl. 123—685 9 Claims



1. A system for controlling an air-fuel ratio for an internal combustion engine provided with a blended flue of gasoline and alcohol, the system having first means for detecting alcohol concentration in the fuel to obtain an alcohol correction factor, and control means for correcting an amount of fuel supply at least in response to the obtained alcohol correction factor,

wherein the improvement comprises:

second means for detecting oxygen content of the engine exhaust gas to obtain an air-fuel ratio correction factor;

third means for determining an average value of the air-fuel ratio correction factor; and

fourth means for correcting the alcohol correction factor in response to the determined average value when the first means has been found to fail.

5,197,451

METHOD FOR DETECTING FUEL BLENDING RATIO

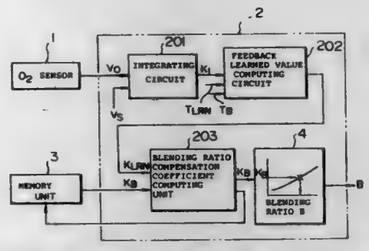
Masato Yoshida, Kyoto; Takanao Yokoyama, Nagaokakyo; Muneyoshi Naaba, Kyoto; Yoshihiko Kato, Kyoto; Kazumasa Iida, Kyoto, and Katsuhiko Miyamoto, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP91/00034, § 371 Date Sep. 26, 1991, § 102(e) Date Sep. 26, 1991, PCT Pub. No. WO91/10824, PCT Pub. Date Jul. 25, 1991
PCT Filed Jan. 16, 1991, Ser. No. 752,449
Claims priority, application Japan, Jan. 19, 1990, 2-11517
Int. Cl.[5] F02D *45/00, 19/08, 41/14*
U.S. Cl. 123—696 9 Claims

1. A fuel blending ratio detecting method for an internal combustion engine having a fuel feed system feeding a mixed fuel of gasoline and methanol to the internal combustion engine, an O_2 sensor generating information of an air/fuel ratio in exhaust gases from the internal combustion engine, the O_2 sensor output being increased or decreased with time relative to a rich/lean decision voltage, a memory for storing an initial blending ratio compensation coefficient as a current blending ratio compensation coefficient, and control means computing an air/fuel ratio feedback compensation coefficient by a method including at least an integral control of the output of said O_2 sensor thereby regulating the quantity of supplied fuel so that an air/fuel ratio of the fuel supplied to the internal combustion engine corresponds to a target value, comprising the steps of:

computing a feedback learned value on the basis of said air/fuel ratio feedback compensation coefficient at intervals of a predetermined period;

reading out the current blending ratio compensation coefficient from the memory;



multiplying the current blending ratio compensation coefficient by said feedback learned value to compute the next blending ratio compensation coefficient; and

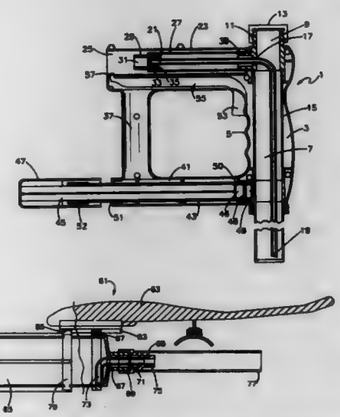
storing the next blending ratio compensation coefficient in the memory as the current blending ratio compensation coefficient.

5,197,452

LIQUID JET PROPELLED TRANSPORTER AND LAUNCHER TOY

Lonnie G. Johnson, 4030 Ridgehurst Dr., Smyrna, Ga. 30080, and Bruce M. D'Andrade, 3 Ten Eyck Rd., Whitehouse Station, N.J. 08889

Filed Feb. 3, 1992, Ser. No. 829,771
Int. Cl.[5] F41B *11/08;* A63H *27/26*
U.S. Cl. 124—57 20 Claims



1. A liquid jet propelled transporter and launcher toy, which comprises:

(a) a launcher having a housing which includes a reservoir for holding liquid therein, a reservoir fill port, and a cap, and said housing having a jet tube receiver adapted to receive a jet tube of a transporter;

(b) a pump connected to said housing, said pump being connected for and capable of pumping air to said reservoir;

(c) a one way valve connected to said pump and permitting flow of air only from said pump to said reservoir and not vice versa;

(d) a transporter latch mechanism located on either of said housing or said transporter set forth below;

(e) means for releasing said latch mechanism;

(f) transporter which includes a propulsion container for receiving liquid and air under pressure from said reservoir of said housing, a jet tube extending from said propulsion container and adapted to fit onto the aforesaid jet tube receiver located in said housing, and a simulated transporter structure attached to said propulsion container;

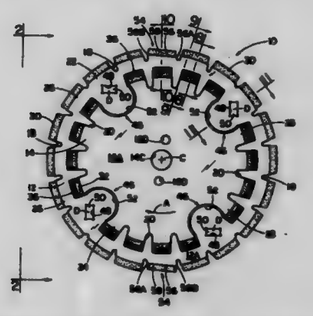
wherein said container and jet tube may be attached to said housing with said jet tube located over said jet tube receiver and said latch holding said transporter in place thereon in a releasable fashion, further wherein liquid may be stored within said reservoir, and pumped from said reservoir to said propulsion container of said transporter by means of actuating said pump and further wherein a substantial positive air pressure may be created within said reservoir and within said propulsion container, after which said transporter may be released by said release means and may advance away from said housing by propulsion of said liquid and air contained within said propulsion container and said jet tube and said launcher.

5,197,453

TWO-TIER GROOVE CUTTING CIRCULAR SAW BLADE WITH MULTIPLE CORE ASSEMBLY

Romolo Messina, Exton, Pa., assignor to Sanders Saws, Inc., Honey Brook, Pa.

Filed Aug. 28, 1992, Ser. No. 937,635
Int. Cl.[5] B28D *1/04;* E01C *23/09*
U.S. Cl. 125—15 34 Claims



1. A circular saw blade for cutting a two-tier groove in a concrete surface, comprising:

(a) a substantially circular middle core having a center, a periphery and a pair of opposite surfaces, said middle core including a plurality of sectors defined in circumferentially spaced relation to one another relative to said center and along said periphery of said middle core;

(b) a plurality of outer cutting segments secured to said respective sectors of said middle core, each said outer cutting segment having a width greater than the thickness of said middle core between said opposite surfaces thereof such that said outer cutting segments extend beyond said opposite surfaces of said middle core and are operable for cutting a first tier of a groove in a concrete surface;

(c) a pair of substantially circular side cores, each said side core having a center, a periphery and a pair of opposite surfaces, each said side core being disposed adjacent to one of said opposite surfaces of said middle core, each said side core including a plurality of lands defined in circumferentially spaced relation to one another relative to said center and along said periphery of said side core, each said side core being smaller in diameter than said middle core such that said lands of said side cores are displaced radially inwardly from said sectors of said middle core;

(d) a plurality of inner cutting segments secured to said respective lands of each said side core, each of said inner cutting segments on one of said side cores being aligned with one of said inner cutting segments on the other of said side cores, each pair of said aligned inner cutting segment having a width greater than the width of each said outer cutting segments and greater than the thickness of each said side core between said opposite surfaces thereof such that said inner cutting segments extend beyond said ones of said opposite surfaces of said side cores that face away from said middle core and are operable for cutting a second tier of the groove in the concrete surface being superimposed on and shallower than the first tier of the groove;

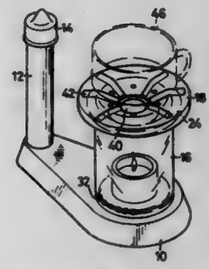
(e) said middle core having a plurality of windows defined therethrough adjacent to and extending radially outwardly from said respective lands of said side cores, said aligned inner cutting segments on said respective side cores projecting toward one another into said windows of said middle core.

5,197,454

CANDLE HOLDER

Hung H. Lee, No. 77, Lane 508, Chung Cheng Pei Rd., San Chung City, Taipei Hsien, Taiwan

Filed Feb. 6, 1992, Ser. No. 832,032
Int. Cl.[5] F24C *1/16*
U.S. Cl. 126—9 R 11 Claims



1. A candle holder comprising a base having a positioning seat formed thereon for receiving a candle thereon, a wind shield being placed on said seat, venting means for introducing fresh air into said wind shield being formed in said base, a supporting means for supporting an article to be heated having a first opening formed therein and being placed on a top of said wind shield, and a bowl placed between said wind shield and said supporting means for holding fragrance to be volatilized by heat from said candle, said bowl having a second opening communicating with said first opening of said supporting means, whereby when said candle is lit, fresh air is introduced into said wind shield by convention through said venting means and heat from said candle warms the article.

5,197,455

CHARCOAL STARTER

Ross Tessien, Grass Valley, Calif., assignor to Steven G. Frost-Ruebling, San Jose, Calif., a part interest

Filed Mar. 6, 1992, Ser. No. 847,353
Int. Cl.[5] F24B *13/00*
U.S. Cl. 126—25 B 6 Claims

1. In a tubular chimney style charcoal starter having an elongated tubular housing with an interior and an exterior surface, the improvement comprising an air and hot gas permeable grate, wherein said grate has means for supporting charcoal briquettes in the shape of an inverted cavity constructed of a spiral coil of wire, and said spiral coil of wire consists of a

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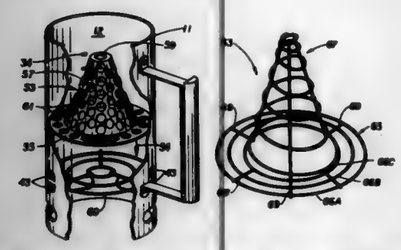
first disk portion formed of a horizontal radially decreasing spiral, and a second conical extension which continues spiraling radially inward and as well, extends in the vertical direction.

4. An air and hot gas permeable inverted cavity creating, charcoal briquette supporting grate where said grate is open to



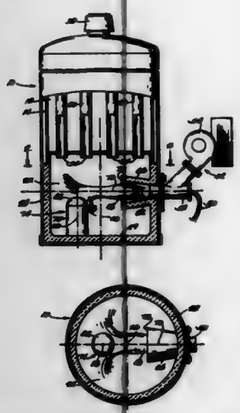
the bottom, and is intended to be disposed within a tubular chimney style charcoal starter having both an interior and an exterior surface wherein said grate is constructed of a spiral coil of wire, and said spiral coil of wire consists of a first disk portion formed of a horizontal radially decreasing spiral, and a second conical extension which continues spiraling radially inward and as well, extends in the vertical direction.

5,197,456

GAS WATER HEATER WITH IMPROVED EXHAUST DISTRIBUTION IN MULTIPLE FLUES

Robert W. Ryno, El Paso, Tex., assignor to AOS Holding Company, Wilmington, Del.

Filed Jun. 25, 1991, Ser. No. 720,342
Int. Cl.[5] F24H *1/00*
U.S. Cl. 126—350 R **19 Claims**



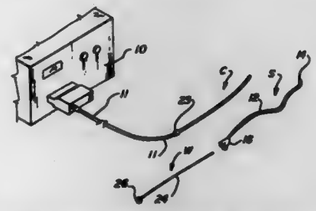
1. A water heater comprising a tank defining a water chamber, a combustion chamber located beneath said water chamber, a plurality of flues communicating with said combustion chamber and extending through said water chamber, a power burner for directing a flame into said combustion chamber, and a flame deflector which is located in said combustion chamber and which has a substantially hemispherical upper portion.

5,197,457

DEFORMABLE AND REMOVABLE SHEATH FOR OPTICAL CATHETER

Edwin L. Adair, 99 Inverness Dr. East, Englewood, Colo. 80112

Continuation of Ser. No. 581,591, Sep. 12, 1990, abandoned. This application Feb. 4, 1992, Ser. No. 831,071
Int. Cl.[5] A61B *1/06*; A61M *5/178, 25/00*
U.S. Cl. 128—7 **7 Claims**



1. Apparatus having a deformable and removable sheath, for use with an optical catheter wherein said sheath with a catheter therein is to be positioned in a passageway leading to a body cavity of a patient for observation and/or treatment, said apparatus comprising:

an elongated, deformable, hollow body forming said sheath and having a normal predetermined shape which is compatible with its intended use in situ, said body having a distal end, a proximate end and a plurality of channels extending from said proximate end to said distal end;

an optical catheter extendable through a first of said channels in said body, having a distal end aligned with said distal end of said body and a proximate end extending outwardly beyond said proximate end of said body, said catheter assuming the normal shape of said body;

a substantially rigid guide wire extendable through a second of said channels to straighten said body during insertion of said sheath in the passageway of the patient and removable from said body after insertion so that said body resumes its normal predetermined shape in the passageway;

a third channel for insertion of additional instruments; and

a lock coupler attached to said proximate end of said body for attachment to a fitting to properly align and connect said sheath and its catheter and the additional instruments with external instrumentation.

5,197,458

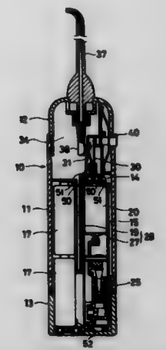
MOUTH CAVITY SANITARY DEVICE

Kazumasa Ito, Tajimi; Toshio Makino, Ena; Masaki Ohbayashi, Tajimi; Shoji Koike, Nagoya, and Jun-ichi Yoshida, Ena, all of Japan, assignors to Ricoh Elemex Corporation, Aichi, Japan

Division of Ser. No. 538,277, Jun. 13, 1990, abandoned. This application Aug. 30, 1991, Ser. No. 753,655
Claims priority, application Japan, Jun. 23, 1989, 1-73685[U]; Jun. 26, 1989, 1-74682[U]; Jun. 26, 1989, 1-74683[U]; Jun. 26, 1989, 1-74684[U]; Jun. 26, 1989, 1-74685[U]; Jun. 30, 1989, 1-77099[U]; Dec. 20, 1989, 1-146909[U]; Dec. 21, 1989, 1-147494[U]; Dec. 21, 1989, 1-147495[U]; Dec. 21, 1989, 1-147496[U]
Int. Cl.[5] A61G *17/02*
U.S. Cl. 128—66 **1 Claim**

1. A mouth cavity sanitary device for cleaning the mouth cavity or the like with liquid jetted out through a nozzle from a reservoir by a pump operated by a motor, said mouth cavity sanitary device comprising:

a drive unit comprising a unit case and drive portions comprising said motor and said pump provided integrally in said unit case, said drive unit being secured to the inside of



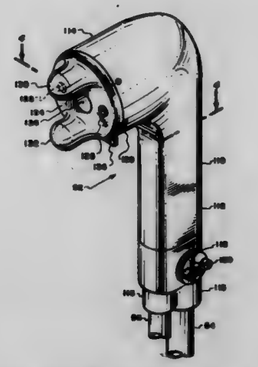
said outer case via a vibration isolating member provided between said unit case and said outer case.

5,197,459

ELECTRIC PUMP POWERED SUBMERGIBLE HAND HELD HYDROTHERAPY APPARATUS

Melvyn L. Heaklin, 5011 Doana Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Filed Apr. 19, 1991, Ser. No. 688,043
Int. Cl.[5] A61H *9/00*
U.S. Cl. 128—66 **9 Claims**



1. Hydrotherapy apparatus suitable for use in a water tub having an electric pump for supplying a pressurized water flow, said apparatus including:

a housing configured to be held in a user's hand, said housing having a water supply inlet, and a discharge orifice oriented to discharge a water stream in a substantially forward direction exteriorly of said housing;

connecting means for coupling said pump pressurized water flow to said water supply inlet, said connecting means including a flexible hose;

means in said housing coupled said water supply inlet to said discharge orifice for enabling said discharge orifice to discharge said substantially forward directed water stream, said discharge orifice being mounted for movement along a travel path as said water stream is discharged therefrom;

protuberance means fixedly mounted on said housing projecting therefrom substantially in said forward direction, said protuberance means having a contact surface displaced forwardly from said discharge orifice for engaging a user's body to space said discharge orifice from said body, whereby a water stream discharged from said discharge orifice will produce a reaction force on said housing to cause said protuberance means contact surface to mechanically massage said user's body;

a rigid conduit including a tubular supply section defining a supply orifice and a tubular discharge section defining said discharge orifice; and

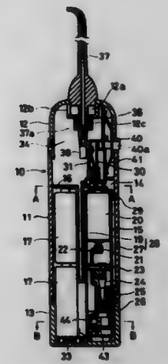
means mounting said conduit with said supply orifice opening to said cavity whereby water supplied from said jet will flow through said conduit to said discharge orifice, said mounting mean including means supporting said conduit for rotation about an axis displaced from said discharge orifice whereby said discharge orifice will translate along a circular path.

5,197,460

MOUTH CAVITY SANITARY DEVICE

Kazumasa Ito, Tajimi; Toshio Makino, Ena; Masaki Ohbayashi, Tajimi; Shoji Koike, Nagoya, and Jun-ichi Yoshida, Ena, all of Japan, assignors to Ricoh Elemex Corporation, Aichi, Japan

Division of Ser. No. 538,277, Jun. 13, 1990, abandoned. This application Aug. 30, 1991, Ser. No. 753,430
Claims priority, application Japan, Jun. 20, 1989, 1-77099[U]; Jun. 23, 1989, 1-73685[U]; Jun. 26, 1989, 1-74682[U]; Jun. 26, 1989, 1-74683[U]; Jun. 26, 1989, 1-74684[U]; Jun. 26, 1989, 1-74685[U]; Dec. 20, 1989, 1-146909[U]; Dec. 21, 1989, 1-147494[U]; Dec. 21, 1989, 1-147495[U]; Dec. 21, 1989, 1-147496[U]
Int. Cl.[5] A61H *9/00*
U.S. Cl. 128—66 **3 Claims**



1. A mouth cavity sanitary device having a pump means for discharging, through a discharge port, liquid sucked into its cylinder through a suction port with opening/closing a stopper valve by reciprocating a piston with a motor, said mouth cavity sanitary device comprising:

a structure arranged such that said pump means is arranged such that said discharge port is disposed higher than said suction port and the suction port is disposed lower than both said motor and said piston.

5,197,461

POWER ADJUSTABLE ORTHOPEDIC PILLOW

Jack H. Petajan, and Stephen R. Topaz, both of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Filed Aug. 12, 1991, Ser. No. 743,730
Int. Cl.[5] A61F *5/34*
U.S. Cl. 128—118.1 **17 Claims**

1. A method of cyclically extending and collapsing an inflatable bladder under the weight of a patient's limb disposed

adjacent the bladder for therapeutic purposes comprising the steps of:

coupling a gas feedline to the inflatable bladder;

directing a stream of gas through the gas feedline into the bladder to generate pressure in the inflatable bladder, thereby inflating the bladder and moving the patient's limb in a first direction;

coupling pressure sensitive switching means in line with the gas feedline;

continuously sensing the pressure of the bladder;

reversing the stream of gas when a predetermined pressure is sensed and thereby deflating the inflatable bladder and moving the patient's limb in a second direction without respect to time.

5,197,462

ANESTHETIC METERING DEVICE

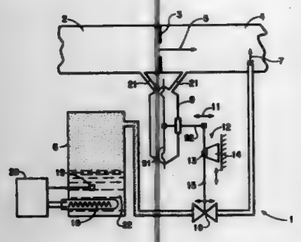
Wolfgang Falb, Krummesse; Karl-Ludwig Gippert; Ulrich Heim, both of Lübeck; Uvo Hölscher, Stockelsdorf; Siegfried Kiske, Gross Gröaas; Götz Kullik, Lübeck; Ralf-Ernst Löser, Kreuzkamp, and Christoph Maurer, Bad Schwartau, all of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany

Filed Feb. 10, 1992, Ser. No. 833,328

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1991, 4105148

Int. Cl.[5] A61M *16/01*

U.S. Cl. 128—203.14 **4 Claims**



1. Anesthetic metering device, comprising:

a bypass stream flowing from a gas inlet opening via a bypass valve to gas discharge opening;

a temperature-stabilized vaporizer chamber partially filled with liquid anesthetic, said vaporizer chamber including temperature stabilizing means for maintaining said vaporizer chamber at least at a saturation vapor pressure of the anesthetic corresponding to a temperature T to provide vapor anesthetic in said temperature stabilizer vaporizer chamber, above said liquid anesthetic;

a vaporizer chamber stream means for flow of vapor anesthetic from said temperature-stabilized vapor chamber to said bypass stream, down stream of said bypass valve; and

adjusting means including a differential pressure transducer connected on both sides of said bypass valve for generating an output and metering means in said vaporizer chamber stream, said metering means being actuated by said output of said differential pressure transducer via a proportional member having a variable setting, for metering of vapor anesthetic into said bypass stream for adjusting concentration of vapor anesthetic in said bypass stream based on said variable setting of said proportional member.

5,197,463

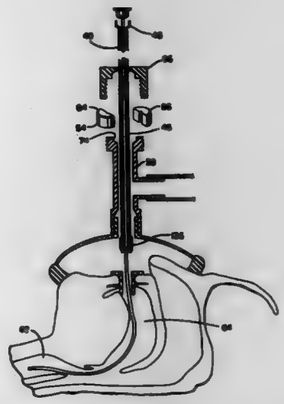
SINGLE STAGE SEAL ADAPTOR FOR ENDOTRACHEAL INTUBATION AND REMOVAL OF ANESTHESIA MASK

Winston R. Jeshuran, 615 Riverside Dr., Cheshire, Conn. 06410

Filed Dec. 10, 1991, Ser. No. 805,290

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 **5 Claims**



1. An adaptor for use with an anesthesia mask for intubation of a patient by line means such as a fiberoptic line, an endotracheal tube, and the like, through said adaptor and said mask, said adaptor comprising:

a body comprising a first passageway from a first opening in said body, through said body, to a second opening in said body,

said first opening being for receiving a line means for delivery to a patient by way of said passageway through said second opening and through a mask to said patient, and

a seal core comprising a plurality of unitary sections which when assembled together about a common axis form said seal core and form a second passageway comprising a first end and a second end, through said seal core, said second passageway being for sealing around said line means when said sections are assembled into said seal core,

said seal core comprising compressible material,

said body's first opening comprising a first seat adapted for receiving said seal core so that said second end of said seal core's passageway is in communication with said body's passageway,

a head including an opening through said head, adapted for joining with said body,

said head comprising a second seat, said second seat being adapted for receiving said seal core so that said first end of said seal core's passageway is in communication with the opening through said head, and

means for moving said first and second seats toward one another, for compressing said seal core for adjustably sealing said core around said line means.

5,197,464

CARBON DIOXIDE DETECTION

Albert L. Babb; Michael P. Hlastala, and Gary L. Tarbox, all of c/o Meridian Medical Corporation 5025 - 25th Ave. NE., Ste. 204, Seattle, Wash. 98105

Continuation of Ser. No. 464,709, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 315,730, Feb. 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 160,863, Feb. 26, 1988, abandoned. This application Dec. 14, 1990, Ser. No. 629,055

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 **8 Claims**

1. A method of determining whether an airway tube has been placed in the trachea or esophagus of a patient, said method comprising the steps of:

directing gases discharged from said tube into a controlled environment where carbon dioxide can be reversibly hydrated to produce an excess of H^{30} ions;

providing in said environment, in an effective amount and in solution, an indicator which will: (a) rapidly change character in the presence of a concentration of said H^{30} ions capable of triggering the change in character and indicative of a concentration of carbon dioxide consistent with tracheal intubation being present in said sample and (b) revert to its original character at a slower rate once the concentration of carbon dioxide in the controlled environment decreases to a level below that concentration;

isolating said indicator solution from said controlled environment with a barrier through which carbon dioxide can diffuse while substances that might affect the activity of the indicator are excluded from the controlled environment;

adding to the indicator solution a catalyst which is effective to so promote the reversion of the indicator to its orginal character that the reversions of the indicator to its original character will occur at a speed approaching that with which the indicator changes character in the presence of a concentration of H^{30} ions capable of effecting the change in character of the indicator, thereby insuring that such changes and reversions of the indicator to its original character are essentially time-limited only by the rate at which carbon dioxide can diffuse across said barrier and that the indicator will change character with each exhalation of the patient and will revert to its original character between the exhalations of the patient;

so observing the indicator by direct visual observation over a series of exhalations as to determine whether: (a) there is only a change of character and subsequent reversion that may be attributable to the presence of carbon dioxide in the esophagus, or (b) a series of character changes and reversions coincident with the exhalations of the patient; and

employing a change in character of said indicator and a reversion of the indicator to its original character coincident with each of exhalations in said series as an indication of tracheal intubation.

5,197,465

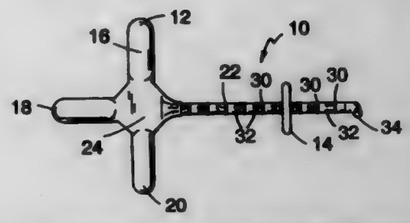
GAUGE FOR MEASURING TRACHEOTOMY STOMA

Stuart K. Montgomery, Needham, Mass., assignor to Boston Medical Products, Inc., Waltham, Mass.

Filed Dec. 17, 1991, Ser. No. 809,728

Int. Cl.[5] A61M *16/04*

U.S. Cl. 128—207.29 **16 Claims**



1. A tracheotomy stoma measuring gauge for measuring a tracheotomy stoma for proper fitting of a tracheotomy tube having a circular section and an outer diameter comprising

an integral member having three legs that extend from it, each said leg having a free end and a base end secured to other legs, each said leg being sufficiently long to extend from the outside of a patient's skin to inside the patient's tracheal passage, each said leg being spaced from other legs by at least about 90° or more so as to not interfere with insertion into said tracheotomy stoma, each said leg having a length between 30 mm and 60 mm, said legs having blunt ends, each said leg being generally cylindrical over most of its length and having a diameter that corresponds to said tracheotomy tube outer diameter and is different than the diameters of other legs, said legs having diameters between 6 mm and 12 mm.

5,197,466

METHOD AND APPARATUS FOR VOLUMETRIC INTERSTITIAL CONDUCTIVE HYPERTHERMIA

J. Alexander Marchosky, Creve Coeur; Christopher J. Morse, Town and Country, both of Mo., and Neal E. Fearnot, West Lafayette, Ind., assignors to MED Institute Inc., West Lafayette, Ind.

Division of Ser. No. 593,103, Oct. 5, 1990, abandoned, which is a division of Ser. No. 193,167, May 2, 1988, Pat. No. 4,961,422, which is a continuation of Ser. No. 112,628, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 697,697, Feb. 4, 1985, Pat. No. 4,719,919, which is a continuation of Ser. No. 459,708, Jan. 21, 1983, abandoned. This application Jan. 7, 1992, Ser. No. 818,738

The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.[5] A61F *7/12*

U.S. Cl. 128—399 **29 Claims**

1. A system for producing volumetric, thermally conductive hyperthermia for the treatment of a tissue mass in a patient, comprising:

an implantable, heat-emitting source responsive to power applied thereto for producing thermally conductive heat in a predetermined thermally conducted temperature distribution in said tissue mass when implanted in said tissue mass;

temperature sensor means for measuring temperature thereabout when implanted in said tissue mass; and

temperature sensor means for measuring temperature thereabout when implanted in said tissue mass; and

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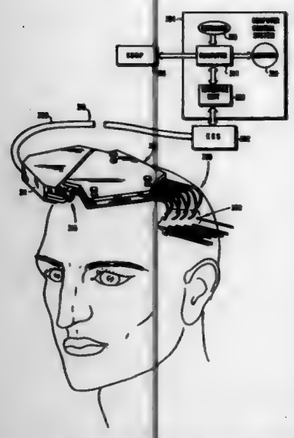
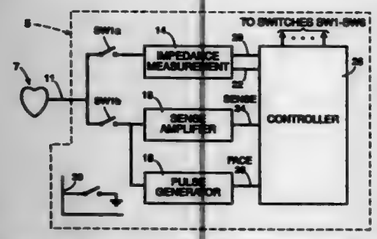
control means responsive to the temperature measured about said sensor means and the power applied to said heat-emitting source for controlling the power applied to said heat-emitting source.

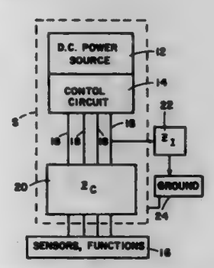


5,197,467
MULTIPLE PARAMETER RATE-RESPONSIVE CARDIAC STIMULATION APPARATUS
Bruce M. Steinhaus, Parker; Tibor A. Nappholtz, Englewood; James A. Nolan, Conifer; Robert A. Morris, Palmer Lake, and Ken Koestner, Englewood, all of Colo., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.
Filed Jun. 22, 1992, Ser. No. 902,242
Int. Cl.[5] A61N *1/368*
U.S. Cl. 128—419 PG **44 Claims**



1. A metabolic demand rate-responsive cardiac stimulation apparatus, comprising:
means for pacing a patient's heart at a controlled rate;
means for measuring impedance within the patient's body, said impedance measuring means including means for applying multiple fixed frequencies of measuring currents between two points within said apparatus and means for measuring voltages in response to the application of said measuring currents, said measuring currents having frequency components within a range of from approximately 10 kilohertz to approximately 1000 megahertz;
means for controlling said impedance measuring means to limit the frequency components of the applied measuring currents to lie within at least one predetermined subrange of frequencies such that the measured voltage within each subrange of frequencies corresponds to a measurement of a metabolic demand parameter;
means for deriving at least one metabolic demand parameter from the measured voltage corresponding to each of said at least one predetermined subrange of frequencies; and
means for determining said controlled pacing rate in relation to the values of said at least one derived metabolic demand parameter.

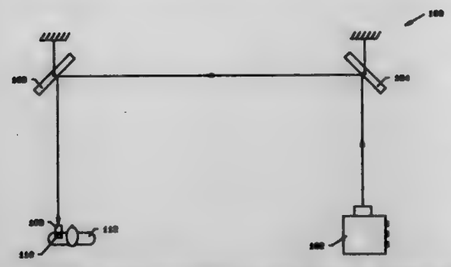
5,197,468
DEVICE FOR PROTECTING AN ELECTRONIC PROSTHESIS FROM ADVERSE EFFECTS OF RF AND/OR ELECTROSTATIC ENERGY
Paul W. Proctor, Rte. 2, Kathy La., White Plains, Md. 20695, and Robert L. Dow, Rte. 5, Box 415, LaPlata, Md. 20646
Continuation-in-part of Ser. No. 866,512, Apr. 10, 1992, and Ser. No. 794,126, Nov. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 584,045, Sep. 18, 1990, which is a continuation-in-part of Ser. No. 479,117, Nov. 12, 1991, Pat. No. 5,036,768, said Ser. No. 866,512, is a continuation-in-part of Ser. No. 584,045, Nov. 12, 1991. This application May 27, 1992, Ser. No. 888,870
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 PG **21 Claims**



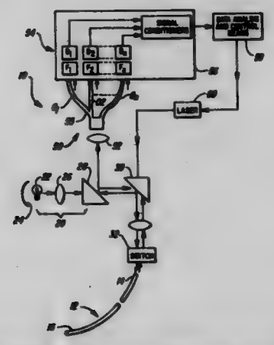
1. An electronic prosthesis that is implantable into a user's body including:
A) an electronic device that is implantable into a user's body and includes a dc power source, electronic control elements, tissue stimulating elements and an electronic lead wire electrically connecting said power source, said electronic control elements and said tissue stimulating elements; and
B) a protective device for protecting said electronic device from undesired RF energy induced operation and from undesired electrostatic energy induced operation, said protective device including
(1) a ground element having a first impedance and electrically separated from said lead wire be said first impedance, and
(2) an impedance element in said lead wire connected between said dc power source and said tissue stimulating elements having an impedance that is greater than said first impedance when exposed to RF energy.

5,197,469
STERILIZABLE PROGRAMMER REPEATER
Theodore P. Adams, Edina, Minn., assignor to AngeMed, Inc., Plymouth, Minn.
Filed Apr. 10, 1991, Ser. No. 682,966
Int. Cl.[5] A61N *1/08*
U.S. Cl. 128—419 R **7 Claims**

1. A medical repeater system for transmitting data to a medical device adapted for placement in a patient, comprising:
a. programmer means positioned remote from said patient, including data transmitting means for transmitting data from said programmer means;
b. sterilizable external programmer repeater means placed in proximity to said medical device in said patient for receiving said data transmitted from said remote programmer means and re-transmitting the same to said medical device; and,
c. reflecting means positioned remote from said programmer means and said programmer repeater means for reflecting said data transmitted from said programmer means to said programmer repeater means wherein said reflecting means comprises a plurality of mirrors.

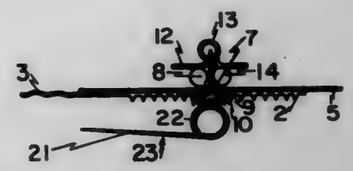


5,197,470
NEAR INFRARED DIAGNOSTIC METHOD AND INSTRUMENT
Jeffrey L. Helfer, Webster; Steven C. Switalski, and Hsue-Yang Liu, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 16, 1990, Ser. No. 568,452
Int. Cl.[5] A61B *5/00, 17/00*
U.S. Cl. 128—634 **20 Claims**



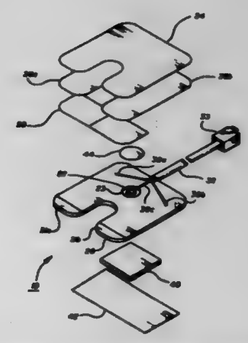
1. An instrument for detecting diseased portions of body tissue, said instrument comprising
a) means for illuminating portions of said body tissue with light energy of predetermined wavelengths selected from the range of between about 1000 and 2500 nm, said predetermined wavelengths being effective to be selectively absorbed by a preselected component of said tissue,
b) means for collecting the light at said predetermined wavelengths that is not absorbed by said tissue portions,
c) means for determining from said collected light the amounts of absorbance of said light by illuminated body tissue, and
d) discriminating means for discriminating one illuminated tissue component from another illuminated tissue component at said wavelengths,
said discriminating means comprising i) means for converting said absorbance amounts into first or second derivative values, ii) storage means for storing a disease index equation, iii) means for solving this equation using said first or second derivative values to produce a disease index value, and iv) comparing means for comparing said disease index value against a threshold value for diseased and healthy conditions of said tissues,
whereby certain illuminated portions of the body tissue are identified and located as being diseased.

5,197,471
DRY MEDICAL ELECTRODE
Servio T. A. Otero, P.O. Box 17212, Caracas 1015-A, Venezuela
Filed May 24, 1990, Ser. No. 527,811
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—640 **11 Claims**



1. A medical electrode comprising:
a circular, flexible, electroconductive first plate having a tongue-shaped radial extension, said plate having top and bottom faces, said bottom face having a plurality of radially aligned sharp end bosses;
a second plate of greater radius than said first plate and having a surface covered with a fastening adhesive adapted for contacting skin oriented in the same direction as said bosses, said top face contacting said second plate, with said adhesive surrounding the periphery of said first plate;
a first orifice passing through said first and second plates and in the center of said first plate; and
a second orifice passing through said first and second plates and in the radial extension of said first plate;
said electroconductive plate being adapted for contacting a penetrating skin needle through a connector passing through said first orifice or said second orifice, or connected to said radial extension.

5,197,472
DISPOSABLE LEG PLATE ELECTRODE ASSEMBLY
David M. DiSabito, Clarence, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.
Filed Jul. 26, 1991, Ser. No. 736,473
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—644 **27 Claims**



1. A disposable electrode assembly for contacting a patient and for receiving electrical signals from at least one remotely

means for positioning the apparatus in proximity to a surface puter, and monitoring the second plurality of radiation emit-

located electrode through a lead connected to each remotely located electrode, said assembly comprising:

a) a first thin, flexible, non-conductive pad having a lower surface for contacting said patient without adhesive and an upper surface having an adhesive;

b) a body electrode carried by said first pad and adapted to be in electrical contact with said patient through a skin-contacting surface when said assembly is secured to said patient;

c) a second thin, flexible, non-conductive pad having a lower surface with an adhesive facing said upper surface of said first pad and an upper surface;

d) a separate, electrically isolated conductive plate for each lead, said plate attached to said lower surface of said second pad having adhesive and adapted to electrically engage said lead when said lead is inserted between said plate and said upper surface of said first pad and is thereafter adhesively secured between said upper surface of said first pad having adhesive and said plate;

e) separate, insulated wires electrically engaging each said plate and said body electrode;

f) a cable assembly joining said separate wires and providing electrical connections to an external monitoring device; and

g) means for securing said assembly to said patient, said securing means being carried by said upper surface of said second pad.

5,197,473

OCULAR TONOMETER FOR ESTIMATION OF INTRAOCULAR PRESSURE USING FREE-FALLING BALL

Svyatoslav N. Fedorov, pereulok Dostoevskogo, 1/21, kv. 32, Moscow; Mikhail P. Kozin, prkt Maslennikova, 19, kv. 15, Samara; Nikolai V. Kudashov, prospekt Lenina, 1, kv. 96, Samara, and Jury I. Sakharov, Galaktionovskaya, 130, kv. 40, Samara, all of U.S.S.R.

Division of Ser. No. 722,664, Jun. 28, 1991. This application Aug. 20, 1992, Ser. No. 899,346

Int. Cl.[5] A61B *3/16*

U.S. Cl. 128—645 **4 Claims**

1. An ocular tonometer, comprising in combination an oblong hollow tubular housing having a first end and a second end, which are essentially opposite to each other;

a ball disposed within said housing whose diameter is smaller than the inside diameter of the tubular housing to permit said ball to free fall inside said tubular housing along a free falling pathway from its first end towards its second end,

a holder means situated at the first end of the oblong housing for preventing the ball from falling and for releasing said ball for its free falling inside the tubular housing; and

an indicator means for measuring the amount of ball rebound after its free falling onto an eyelid covering a cornea, of a patient's eye as a result of reaction thereof, wherein said indicator means comprises a graduated scale provided on the oblong housing and is subdivided into three portions along its length, said portions corresponding to the amounts of ball rebound that are characteristic of a reduced intraocular pressure, a normal pressure, and an increased pressure.

5,197,474

PATIENT BED IN A MAGNETIC RESONANCE IMAGING APPARATUS

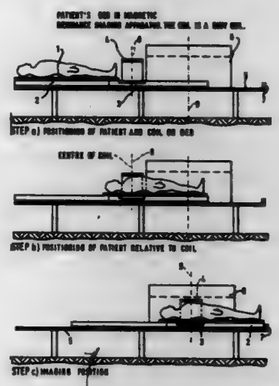
Rurik Englund, Espoo; Pentti Nummi, Kerava; Maija Nurmirinta, Hyvinkää ; Markku Seppänen, Helsinki; Matti Smalén, Klaukkala; Juha Virtanen, Helsinki, and Yrjö Yrjölä, Vantaa, all of Finland, assignors to Instrumentarium Corp., Finland

Filed Apr. 30, 1991, Ser. No. 693,665

Claims priority, application Finland, Jun. 14, 1990, 902978

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653.5 **6 Claims**



1. A magnetic resonance unit, comprising a supporting structure, a magnet mounted on the supporting structure and having a central bore, a lower bed, a coil assembly mounted in fixed relation to the upper surface of said lower bed, means for mounting said lower bed for movement relative to said supporting structure from a first location where the coil assembly is outside of said bore to a second location where the coil assembly is located within the bore of a magnet, an upper bed to support a patient, means for mounting the upper bed for movement relative to the upper surface of the lower bed whereby the upper bed can be moved relative to the lower bed when the lower bed is in the first location to position the patient in registry with the coil assembly, and means for moving the lower bed with the associated coil assembly along with the upper bed and the patient supported thereon in unison to the second location in the bore of the magnet.

5,197,475

METHOD AND APPARATUS FOR ANALYZING MATERIAL PROPERTIES USING ULTRASOUND

Peter P. Antich, Richardson; James E. Dowdey, Arlington, and Robert C. Murry, Jr., Irving, all of Tex., assignors to The Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 230,845, Aug. 10, 1991, Pat. No. 5,038,787. This application Jun. 18, 1991, Ser. No. 717,025

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—660.01 **38 Claims**

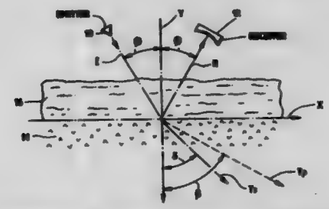
1. Apparatus for investigating the mechanical properties of a solid material, including:

means for positioning the apparatus in proximity to a surface of a solid material;

at least one emitting ultrasound transducer positioned for emitting an ultrasound wave towards a surface of the material;

at least one receiving ultrasound transducer positioned for receiving an ultrasound wave that has been emitted and has contacted the surface of the material;

means for varying the angle of incidence of the emitted ultrasound wave towards the surface of the material;



means responsive to the received ultrasound wave for determining the alignment of the surface of the material with respect to the emitting and receiving ultrasound transducers; and

signal analyzer means coupled to the at least one receiving ultrasound transducer for determining at least one characteristic of the received ultrasound wave which is indicative of a mechanical property of the material.

5,197,476

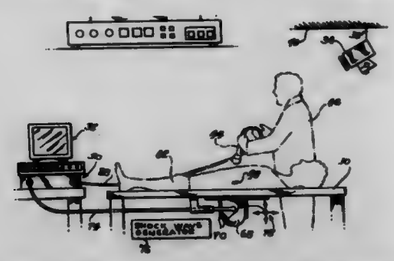
LOCATING TARGET IN HUMAN BODY

Christopher Nowacki, 1552 Chickamauga, Long Grove, Ill. 60047, and Mart T. Horbal, 2 S. 530 Iroquois Ctr. West, Warrenville, Ill. 60555

Continuation of Ser. No. 320,110, Mar. 16, 1989, abandoned. This application Oct. 11, 1991, Ser. No. 777,432

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—660.03 **14 Claims**



1. The method of locating an ultrasonic probe in order to locate a target in a living body which comprises disposing a plurality of first electrically operated radiation emitting devices about a reference volume, monitoring said devices with three-dimensional camera means sensitive to the radiation emitted by said devices, strobing said first radiation emitting devices with a computer to cause said devices to emit radiation sequentially, storing information from said camera means in said computer as to respective positions of said radiation emitting devices, removing said first radiation emitting devices from their disposition about said reference volume, placing a living body having the target therein at least in part in said reference volume and holding the ultrasonic probe substantially within said volume and scanning said living body ultrasonically with said probe, displaying the scanned portion of the body including the target on a display screen and observing the display, said probe having a second plurality of electrically operated radiation emitting devices thereon, strobing said second plurality of radiation emitting devices with said computer, and monitoring the second plurality of radiation emitting devices with said three-dimensional camera means to detect the position of said probe within said volume.

5,197,477

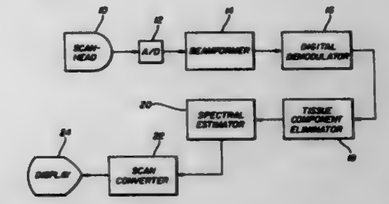
ULTRASONIC DOPPLER FLOW MEASUREMENT SYSTEM WITH TISSUE MOTION DISCRIMINATION

Roy B. Peterson, Redmond, and Jeffry E. Powers, Lake Stevens, both of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Filed Oct. 12, 1990, Ser. No. 596,838

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—661.08 **20 Claims**



1. In an ultrasonic diagnostic system, including means for receiving Doppler information signals from a subject which may include signal components from substantially stationary tissue and/or tissue motion components, which tissue does not flow through the subject, means for developing Doppler velocity information signals of materials capable of flowing through the subject in response to said received Doppler information signals, and means for formatting said Doppler velocity information signals for display, a method of removing effects of tissue motion from the information to be displayed comprising the steps of:

(a) demodulating said received Doppler information signals to produce demodulated Doppler information signals;

(b) discriminating said demodulated Doppler information signals for tissue motion signal components prior to the formatting of said Doppler velocity information signals for display;

(c) eliminating said discriminated tissue motion signal components from said discriminated signals; and

(d) providing velocity information signals to said formatting means from which effects of tissue motion have been removed.

5,197,478

AUTOMATIC SPHYGMOMANOMETER FOR PREDICTIVELY MEASURING PRESSURE BY SAMPLING PULSE WAVE SIGNAL

Takahiro Souma, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 362,445, May 18, 1989, abandoned. This application May 5, 1992, Ser. No. 879,695

Claims priority, application Japan, Nov. 19, 1986, 61-274087

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—681 **13 Claims**

1. An automatic sphygmomanometer, comprising:

pressure detecting means for detecting a cuff pressure;

first pressure-increasing means for increasing said cuff pressure at a high pressure-increasing rate;

pulse-wave signal detecting means for detecting the amplitude of a pulse-wave signal of a subject while said first pressure-increasing means is increasing said cuff pressure;

predicting means for predicting predicted maximal and minimal blood pressures from the amplitude of said pulse-wave signal;

first determining means for determining whether said cuff

pressure has increased to a predetermined level below said

5,197,481

equal number of turns per centimeter, said end portion further

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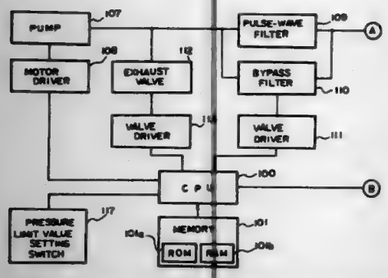
pressure has increased to a predetermined level below said predicted maximal blood pressure;

second pressure-increasing means for increasing said cuff pressure at a low pressure-increasing rate slower than said high pressure-increasing rate of said first pressure-increasing means when said first determining means has determined that said cuff pressure is at least as high as the predetermined level below said predicted maximal blood pressure;

maximal blood pressure measuring means for measuring a measured maximal blood pressure while said second pressure-increasing means is increasing said cuff pressure;

first pressure-reducing means for reducing said cuff pressure at a high pressure-reducing rate immediately after said measured maximal blood pressure has been measured;



second determining means for determining whether said cuff pressure has decreased to a predetermined level above said predicted minimal blood pressure;

second pressure-reducing means for reducing said cuff pressure at a low pressure-reducing rate slower than said high pressure-reducing rate of said first pressure-reducing means after said second determining means has determined that said cuff pressure is at least as low as a predetermined level above said predicted minimal blood pressure; and

minimal blood pressure measuring means for measuring a measured minimal blood pressure while said second pressure-reducing means is reducing said cuff pressure.

5,197,479

AUTOMATIC ELECTRODE CHANNEL IMPEDANCE MEASUREMENT SYSTEM FOR EGG MONITOR

Mark Habelbank, Sudbury; David Shadmon, Brookline, both of Mass., and Mark J. Leversault, Derry, N.H., assignors to Mortara Instrument, Milwaukee, Wis.

Filed May 13, 1991, Ser. No. 699,483
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—696 **8 Claims**

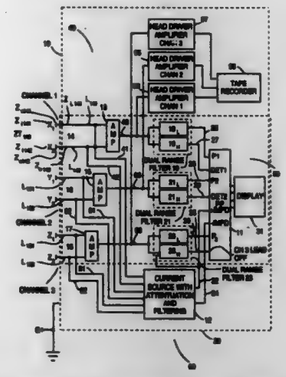
1. An impedance measurement system for measuring impedance of at least one electrode channel for use in a recorder of signals comprising:

means for generating complementary oscillating signals, said complementary oscillating signals defining at each transition of said oscillating signals an assertion time, said recorder having at least one pair of electrodes, said at least one pair of electrodes being connectably applied to a subject's body, said subject's body and said at least one pair of electrodes defining said at least one electrode channel, said at least one electrode channel cooperating with said means for generating complimentary oscillating signals to monitor and record said signals;

conditioning means for producing a pair of attenuated and filtered complementary oscillating signals based upon the complementary oscillating signals;

signal generating means for converting said pair of attenuated and filtered signals into oscillating load-independent currents and applying said oscillating load-independent currents to said electrode channel to produce a responsive signal representative of impedance of said electrode channel;

amplification and filtering stage means for amplifying and filtering said responsive signal for generating a time-dependent signal;



threshold means for ascertaining a reset time at which said time-dependent signal crosses a threshold level;

timing means for measuring a time interval between said assertion time and said reset time; and

converting means for converting said time interval into an impedance value.

5,197,480

SYSTEM AND METHOD FOR MONITORING HEART TRANSPLANT REJECTION

Ursala Gebhardt, Huissen, Netherlands, assignor to Vitatron Medical, B.V., Dieren, Netherlands

Filed Jun. 8, 1990, Ser. No. 535,336
Int. Cl.[5] A61B *5/0452*
U.S. Cl. 128—697 **20 Claims**

1. A method of diagnosis of cardiac allograft rejection comprising:

a) coupling a lead to a patient's heart, and obtaining heartbeat signals from said leads;

(b) analyzing selected portions of the heartbeat signals, which portions include T-waves, and determining at least one characteristic of said T-waves;

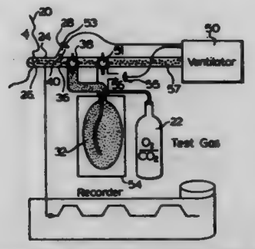
(c) determining from the characteristic the status of cardiac allograft rejection in the patient.

5,197,481

NON-INVASIVE METHOD AND APPARATUS FOR MEASURING MIXED VENOUS BLOOD PRESSURE ($PVCO_2$) AND OTHER PHYSIOLOGICAL VARIABLES

Joseph Fisher, 113 Franmore Cir., Thornhill, Ontario, Canada LAJ 3B9

Division of Ser. No. 912,969, Sep. 29, 1986, Pat. No. 4,947,860. This application Oct. 4, 1989, Ser. No. 417,070
Claims priority, application Canada, Oct. 10, 1985, 492766
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—719 **25 Claims**



1. An apparatus for use in determining the mixed venous PCO_2 ($PvCO_2$) comprising:

(a) means permitting gases to be inhaled and exhaled by a patient;

(b) means for measuring the PCO_2 of the gases inhaled and exhaled by the patient under controlled conditions without rebreathing

(c) means for permitting the patient to inhale test gases containing at least a small concentration of CO_2 without rebreathing and means for measuring the PCO_2 of the inspired gases and the end tidal PCO_2 of the expired gases that result from breathing the test gases

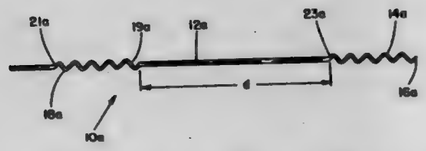
(d) a reservoir for the test gases to be inhaled, the test gases containing at least a small concentration of CO_2, the reservoir being in communication with the means permitting the gases to be inhaled.

5,197,482

HELICAL-TIPPED LESION LOCALIZATION NEEDLE DEVICE AND METHOD OF USING THE SAME

William R. Raak, Gretna; Ronald L. Nichols, and Stephanie G. Schoenberger, both of New Orleans, all of La., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 367,405, Jun. 15, 1989, Pat. No. 5,018,530. This application Apr. 2, 1991, Ser. No. 679,464
Int. Cl.[5] A61B *17/34*
U.S. Cl. 128—749 **1 Claim**



1. A marking device for marking lesions within the body comprising shaft having a helically coiled end portion, a first straight section and a helically coiled body portion remote from said end portion separating a second straight section from said first straight section, said end portion and said body portion being coiled in equal diameter helixes, said helixes each having a constant diameter along their lengths, said constant diameters and lengths being equal such that each helix has an equal number of turns per centimeter, said end portion further having a sharpened tip remote from said first straight section.

5,197,483

TISSUE DISAGGREGATOR

Vitaly Rogalsky, and Alena Rogalsky, both of 186 Pinehurst Ave., New York, N.Y. 10033

Filed Aug. 6, 1990, Ser. No. 562,807
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—749 **7 Claims**

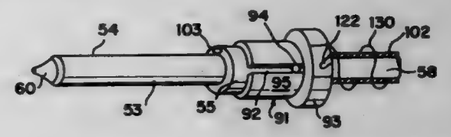
1. A device for disaggregating tissues, comprising a pestle having a working end provided with a net; and at least one additional net communicating with a source of vacuum, so that a tissue placed on said additional net can be desegregated by rubbing said net of said pestle against said additional net under vacuum pulling separated tissues through said additional net.

5,197,484

METHOD AND DEVICE FOR PRECUTANEOUS EXCISIONAL BREAST BIOPSY

Elliot Kornberg, Cocoa Beach, Fla., and William R. Tarello, Bethesda, Md., assignors to PEB Biopsy Corporation, Cocoa Beach, Fla.

Continuation-in-part of Ser. No. 584,614, Sep. 18, 1990, Pat. No. 5,111,828. This application May 8, 1992, Ser. No. 880,208
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **25 Claims**



1. An apparatus for removing suspect breast tissue, comprising:

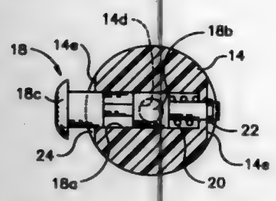
a stylet having an open forward end, a rear end and an exterior surface;

a cannula having an internal cavity defined by an interior surface, an open front end and a rear end, and said stylet extending within said internal cavity;

driving means in driving contact with said cannula for driving said cannula forward of the opened forward end of said stylet such that suspect breast tissue is receivable within said internal cavity;

cutting means for cutting suspect breast tissue positioned within said internal cavity, said cutting means being positioned at the front end of said cannula for implementing a cut essentially transverse to the forward direction of driving such that a removable plug of suspect tissue is formed.

5,197,485
METHOD AND APPARATUS FOR SAMPLING AORTIC PLAQUE
Ronald K. Grooters, Fort Washington, Pa., assignor to Pilling Co., Fort Washington, Pa.
Filed Oct. 15, 1991, Ser. No. 776,825
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—758 13 Claims

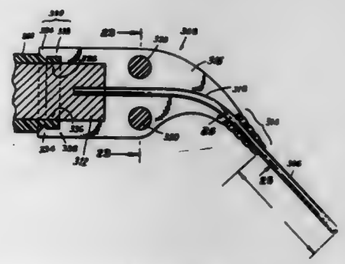


1. Surgical apparatus for sampling the aorta for atherosclerotic buildup, comprising:
handling means having distal and proximal ends and having a continuous passage extending from said distal end of the handle means to said proximal end thereof;
means at said proximal end of the handle for connecting said continuous passage to a vacuum pump;
cannula means for insertion into the aorta, said cannula means having proximal and distal ends and being connected at its proximal end to said handle, and said cannula means having an inlet opening at its distal end and an internal passage providing communication between said inlet opening and the continuous passage;
means within said continuous passage forming a filter chamber;
removable filter means located in said filter chamber for trapping particulate matter carried with any fluid drawn through said handle by the vacuum pump;
valve means in said continuous passage for controlling the flow of the fluid drawn through said handle; and
check valve means within said continuous passage and in the distal direction from said filter chamber, for preventing fluid flow from said filter chamber to said cannula means.

5,197,486
DETACHABLE GUIDEWIRE EXTENSION
James J. Frassica, Chelmsford, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Continuation of Ser. No. 343,482, Apr. 25, 1989, abandoned. This application Apr. 3, 1991, Ser. No. 681,438
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 8 Claims

1. A guidewire for use with a catheter and an extension for the guidewire for enabling multiple catheter exchanges comprising:
a guidewire having a proximal end and a distal end;
an extension wire having a proximal end and a distal end;
said proximal end of the guidewire and distal end of the extension wire comprising mating ends;
one of the mating ends of the guidewire or the extension wire having a rod extending axially therefrom, the rod being of a diameter smaller than the wire from which it extends;
a connector carried by the other of the mating ends, the connector being adapted to receive the rod to become securely attached to the rod while permitting the rod and connector to be detached, the connector comprising a helical coil having proximal and distal ends, one of which being attached to its respective wire and the other end being open;
means for precluding substantial axial extension of the helical coil;
the inner diameter of the helical coil being slightly less than the other diameter of the rod;
whereby the rod may be inserted into the open end of the helical coil, the helical coil expanding to receive the rod and securely gripping the rod.

5,197,487
MEASURING PROBE
Jerome B. Ackerman, 155 W. 13 St., New York, N.Y. 10011; Thomas T. Ackerman, Fairfield, Conn.; Mitchell N. Ackerman, Providence, R.I., and Herbert J. Hedberg, Attleboro, Mass., assignors to Jerome B. Ackerman, New York, N.Y.
Continuation of Ser. No. 24,991, Mar. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 846,180, Mar. 3, 1986, Pat. No. 4,665,621. This application Dec. 13, 1990, Ser. No. 627,887
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—776 7 Claims



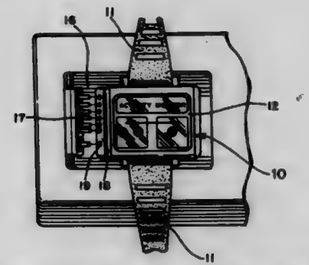
1. An apparatus useful for diagnosis and treatment comprising:
a housing means;
actuating means disposed within the housing means and moveable therein;
means coupled to the actuating means for providing a signal which is related to displacement of the actuating means;
tip means removably coupled to the housing means and responsive to displacement of the actuating means to perform a function in at least one of diagnosis and treatment;
the tip means being provided with a means for coupling the tip means to the housing means, whereupon removal the coupling means breaks causing the tip means to be inoperable after the first use.

5,197,488
KNEE JOINT LOAD MEASURING INSTRUMENT AND JOINT PROSTHESIS
Nebojsa Kovacevic, Plymouth, Minn., assignor to N. K. Biotechnical Engineering Co., Minneapolis, Minn.
Filed Apr. 5, 1991, Ser. No. 681,099
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—782 21 Claims

1. A system for measuring forces applied to a joint prosthesis and adapted to be located between a first bone and a second bone that form an articulation joint, the system comprising:
a first member adapted to be attached to an outer surface of the first bone;
a second member adapted to be attached to an outer surface of the second bone; and

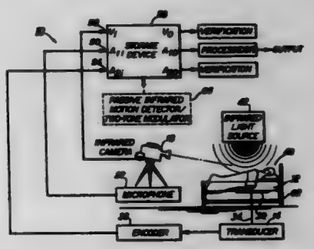
a transducer interposed and engaging the first member and the second member and having a plurality of spaced-apart force sensors on the transducer for measuring forces exerted between the first member and the second member as the joint is articulated, wherein each force sensor provides a representative force output signal.

5,197,489
ACTIVITY MONITORING APPARATUS WITH CONFIGURABLE FILTERS
Robert W. Conlan, Niceville, Fla., assignor to Precision Control Design, Inc., Fort Walton Beach, Fla.
Filed Jun. 17, 1991, Ser. No. 716,853
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—782 33 Claims



1. An activity monitor responsive to body motion for detecting and recording the occurrence of predetermined body movements in a human subject wherein each said predetermined body movement has a characteristic frequency spectrum, said activity monitor comprising: a motion detector for producing a detector output signal in response to body movements of the subject; highpass filter means for attenuating the spectrum of said detector output signal below a predetermined lower threshold frequency; lowpass filter means for attenuating the spectrum of said detector output signal above a predetermined upper threshold frequency; said detector output signal being filtered by said highpass and lowpass filter means whereby the spectrum of said signal corresponds to the characteristic frequency spectrum of the predetermined body movement; memory means of finite capacity; conversion means for sampling said detector output signal and storing the resulting sample signals in said memory means; said upper threshold frequency and said lower threshold frequency each being configurable in response to an applied configuration control signal; and said activity monitor further including a processor circuit having a plurality of selectable operating modes, each mode corresponding to at least one said predetermined body movement, said processor circuit applying configuraton control signals to each said filter means to obtain a frequency spectrum in said detector output signal corresponding to the characteristic frequency spectrum of the predetermined body movement selected by selection of a said operating mode.

5,197,490
INFORMATION PROCESSING SYSTEM FOR COUNTING COUGHS OR EVALUATING OTHER ACTIVITIES OF A PATIENT
Solomon S. Steiner, Mt. Kisco; Bruce J. Albala, South Salem, and Robert Feldstein, Pelham, all of N.Y., assignors to CTA Bio Services, Inc., Elmsford, N.Y.
Filed Apr. 19, 1990, Ser. No. 510,936
Int. Cl.[5] A61B *5/0205*
U.S. Cl. 128—782 32 Claims

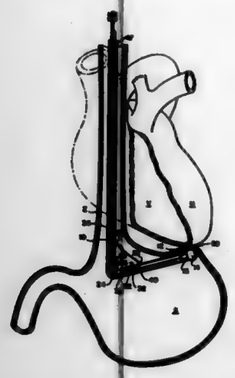


1. A system for counting coughs emitted by a patient recumbent upon a mattress, comprising:
a. an air mattress positionable beneath the mattress for sensing pressure changes caused by the emitted coughs;
b. a pressure transducer connectable to the air mattress for converting the pressure changes to a first series of electrical signals;
a microphone remote from the patient for sensing sounds caused by the emitted coughs and converting the sounds to a second series of electrical signals; and
d. a recorder having first and second inputs for receiving the first and second series of electrical signals, respectively.

5,197,491
ESOPHAGEAL-STOMACH DISPLACEMENT ELECTRODE
John Anderson, Holywood, Ireland; Carl E. Hewson, Marshfield, Mass., and David Cochran, Lisburn, Ireland, assignors to Brunswick Biomedical Technologies, Inc., Wareham, Mass.
Continuation of Ser. No. 589,995, Sep. 28, 1990. This application Feb. 12, 1991, Ser. No. 654,227
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 19 Claims

15. An esophageal-stomach displacement electrode comprising:
a flexible tubular member having proximal and distal ends adapted to be inserted through the esophagus into the stomach;
an electrode carried by the tube in the region of its distal end;
said tube having hinge means enabling the distal end of the tube to angularly displace in the stomach and contact and displace the stomach when the distal end of the tube is fully displaced;
and displacement means disposed in the tube and controlled

from a point externally of the body for causing the distal end of the tube to angularly displace, and engage and



displace the stomach when the distal end is fully angularly displaced.

5,197,492

FOCUSED MAGNETIC DIRECTIONAL POLARITIES

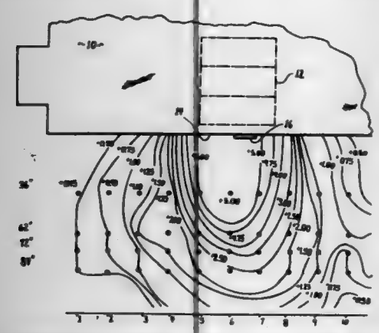
Walter C. Rawls, Jr., Jacksonville, Fla., and Gregory J. Provell, Somerset, N.J., assignors to Bio Magnetics Systems Inc., Newark, N.J.

Continuation-in-part of Ser. No. 380,873, Jul. 17, 1989, Pat. No. 5,002,068. This application Mar. 26, 1991, Ser. No. 674,923

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[5] A61F *5/37*; A61B *19/00*

U.S. Cl. 128—846 **15 Claims**



1. A method of regulating a first magnetic field emanating from a first source, which process comprises interposing between a subject and said first source, a second magnetic field emanating from a second source, said second source being disposed with respect to the orientation of the first source, so that the polarity of the second magnetic field is such as to counteract at least some of the magnetic field strength emanating from said first source, whereby said subject is shielded from said first magnetic field emanating from said first source by said second magnetic field emanating from said first source by said second magnetic field emanating from said second source.

5,197,493

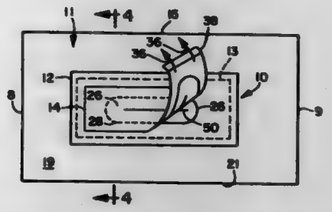
INCISE SYSTEM

Carletta Grier-Idris, Acworth, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 450,878, Dec. 14, 1989, abandoned. This application Mar. 13, 1992, Ser. No. 852,915

Int. Cl.[5] A61B *19/08*

U.S. Cl. 128—853 **9 Claims**



1. An incise system for use in surgical procedures comprising:

a first layer of incise material having a first length and a second width, a top surface and a bottom surface, said first layer of incise defining a fenestration area removably attached to the remainder of said first layer of incise by a line of perforations, and

a second layer of incise releasably attachably to said top surface of said first layer of incise, said second layer of incise having a second length and a second width sufficient to cover said fenestration area in said first layer of incise, said second layer of incise having an adhesion to said top surface of said first layer of incise sufficient to detach said fenestrated area from said first layer of incise when said second layer is released from said first layer of incise,

said first layer of incise having a first peel strength and said second layer of incise having a second peel strength, said second peel strength being greater than said first peel strength so that said fenestrated area is separated from said first layer of incise.

5,197,494

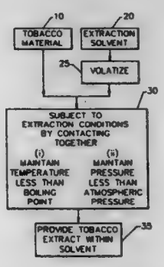
TOBACCO EXTRACTION PROCESS

Anatoly I. Kramer, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 4, 1991, Ser. No. 709,959

Int. Cl.[5] A24B *15/18*

U.S. Cl. 131—298 **26 Claims**



1. A process for providing a tobacco extract, the process comprising:

(a) providing a tobacco material and an extraction solvent physically separate from each other;

(b) volatizing the extraction solvent; and

(c) subjecting the tobacco material to extraction condition by contacting the tobacco material with the volatized extraction solvent to provide a tobacco extract within the volatized extraction solvent, the extraction conditions including

(i) maintaining the pressure of the tobacco material and extraction solvent at less than 10 mm of Hg and

(ii) maintaining the tobacco material and extraction solvent at a temperature of greater than 30° C. and less than the boiling point at atmospheric pressure of the extraction solvent.

5,197,495

MAKE-YOUR-OWN SYSTEM FOR MAKING A CIGARETTE, ESPECIALLY A FILTER-TIPPED CIGARETTE

Heinrich W. Ruppert, and Klaus G. Gätschmann, both of Troisingen, Fed. Rep. of Germany, assignors to Efka-Werke Fritz Kiehn GmbH, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,821

Claims priority, application Canada, Apr. 28, 1988, 565438

Int. Cl.[5] A24C *5/40*, *5/00*; A24F *47/00*; A24D *1/02*

U.S. Cl. 131—328 **6 Claims**

1. A "make-your-own" system for making a cigarette, comprising a hollow tube cigarette paper wrapper (11), a dimensionally stable tobacco portion (10) matched with the tobacco receiving volume (16) of the cigarette and said cigarette paper wrapper whereby said paper wrapper closely envelopes the tobacco portion (10) when said tobacco portion has been inserted into said hollow tube cigarette wrapper, and said tobacco portion (10) including an outer air impervious wrapper of tobacco and being directly smokeable, said tobacco portion including a smokeable product selected from the group of tobacco, a tobacco blend or other natural products, said tobacco portion and said paper wrapper having the taste and flavor of a factory-made cigarette including tobacco particles compacted within a paper wrapper or a cigarillo wrapped in said paper wrapper.

5,197,496

METHOD FOR PRODUCING A MAKEUP APPLICATOR

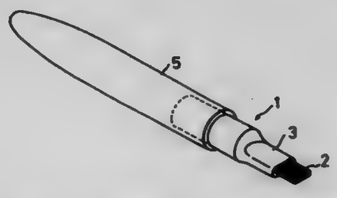
Kenji Nakamura, Osaka, Japan, assignor to Kessak U.S.A., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 521,153, May 9, 1990. This application Mar. 18, 1991, Ser. No. 670,976

Claims priority, application Japan, Mar. 16, 1990, 2-66033

Int. Cl.[5] A45D *24/00*

U.S. Cl. 132—200 **4 Claims**



1. A method for producing an applicator for makeup use comprising:

preparing an elongated bundle of fibers of a predetermined length having a core portion consisting of a plurality of straight fibers and a sheath portion wrapped around said core portion consisting of crimped thermoplastic fibers adhering partially to each other;

removing a longitudinal section of said fibers of said sheath portion at one end of said bundle from about said fibers of said core portion to expose an end portion of said fibers of said core portion;

applying heat and pressure to said thermoplastic fibers over a region adjacent said exposed end portion of said core portion to heat-soften, radially compact, and bond together the thermoplastic fibers in said region about said core fibers.

5,197,497

PROCESS FOR MANUFACTURE OF A COSMETIC BRUSH

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 3, 1991, Ser. No. 753,999

Claims priority, application France, Nov. 13, 1990, 90 14033

Int. Cl.[5] A45D *40/26*

U.S. Cl. 132—218 **12 Claims**

1. A process for the manufacture of a brush of the type having a plurality of bristles implanted on a twisted metal spiral core with at least some of the bristles being formed of a mixture of bristles of relatively large section and bristles of relatively small section and wherein at least one zone of the brush has bristles of relatively large section longer in length than the bristles of relatively small section and wherein the outer ends of the bristles display a bulge, the steps comprising:

first assembling a brush with said bristles of relatively large section together with bristles of relatively small section with the said bristles having the same length relative to the perpendicular axis of the brush, with the bristles of relatively large section being adapted to display greater heat-resistance than the bristles of relatively small section; and

exposing at least part of the brush to a source of heat sufficiently strong to result in melting and shrinkage of the ends of the bristles, with the bristles of relatively large section undergoing less shrinkage than the bristles of relatively small section, said exposure to heat creating bulges due to the melting of the ends of the bristles of both said small section and large section.

5,197,498

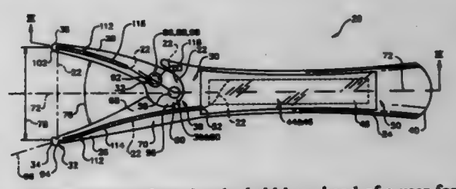
DENTAL FLOSS HOLDING APPARATUS

Jeffrey A. Stewart, 1801 South Highland, Tacoma, Wash. 98465

Filed Oct. 3, 1991, Ser. No. 771,155

Int. Cl.[5] A61C *15/00*

U.S. Cl. 132—325 **35 Claims**



1. An apparatus adapted to be held by a hand of a user for holding and manipulating a length of dental floss under tension

to abrade and remove plaque and food particles from inter-

5,197,501

ductive contact element when said handle portion is

VOL 1148 ISS 5 MR 30 1993 U.M.I.

to abrade and remove plaque and food particles from interproximal surfaces of teeth, comprising:

(a) an elongated handle configured for hand manipulation, said handle having a fore end and an aft end;

(b) an elongated, outwardly-projecting stationary tong contiguous with said handle, said stationary tong having a fixed end and an outwardly-projecting terminal end, said fixed end being formed integrally with or fixedly secured to said handle, said stationary tong generally maintaining a fixed orientation with respect to said handle;

(c) an elongated, outwardly-projecting pivotal tong contiguous with said handle, said pivotal tong having a pivotal end and an outwardly-projecting terminal end, said pivotal end being selectively pivotally or fixedly secured to said handle;

(d) means for selectively pivotally or fixedly securing said pivotal end to said handle, said securing means defining a pivot point about which said pivotal tong may rotate, said stationary tong and said pivotal tong generally extending divergently from said fore end of said handle, said securing means permitting selective adjustment of a generally acute angle between said stationary tong and said pivotal tong, said securing means permitting selective adjustment of a distance between said terminal ends of said stationary tong and pivotal tong, said securing means permitting said pivotal tong to be fixedly secured to said handle to generally maintain a fixed orientation with respect to said handle and with respect to said stationary tong; and

means for removably anchoring the length of dental floss near or against said terminal ends of said stationary tong and said pivotal tong, said securing means and said anchoring means permitting the length of dental floss to be stretched taught and span a distance between said terminal ends of said stationary tong and said pivotal tong, said pivotal end of said pivotal tong and said fore end of said handle being each provided with raised ridges radially extending from said pivot point, said raised ridges being positioned and juxtaposed to interlock one another between said handle and said pivotal tong, said interlocking raised ridges assisting said pivotal tong to assume one of a plurality of angular orientations or positions with respect to said handle and said stationary tong.

5,197,499

PROCESS FOR THE CARE OF MEDICAL AND DENTAL INSTRUMENTS AND MAINTENANCE LOCALE FOR IMPLEMENTING THIS PROCESS

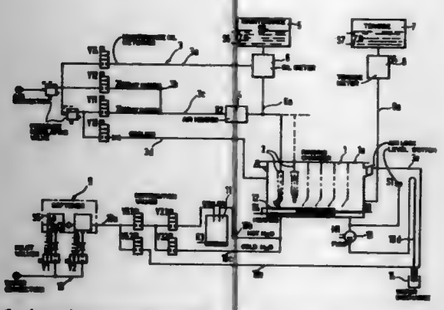
Anton Bodenmiller, and Pius Steinhauser, both of Leutkirch, Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach/Riss, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,726

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1990, 4024171

Int. Cl.[5] B08B *3/10*

U.S. Cl. 134—95.2 **7 Claims**



1. A maintenance locale for the care and maintenance of medical or dental instruments, comprising a rinsing chamber for the instruments, holders in the rinsing chamber for supporting the instruments, a water supply inlet conduit communicating with the rinsing chamber, a water discharge conduit for discharging water from the rinsing chamber, a heating device for heating the water supplied to said rinsing chamber, supply conduits communicating with the interior of the instruments being associated with said instrument holders, an oil container including oil dosing means which is operatively connected with the supply conduits, a source for pressurized air being connected with the supply conduits, and control means including valves for selectively connecting the oil container and the oil dosing means with the supply conduits.

5,197,500

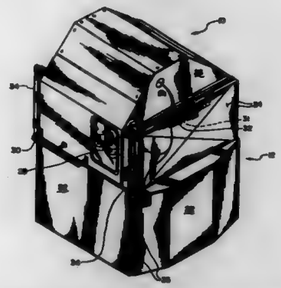
COMBUSTION CHAMBER CLEANING MACHINE

Edward M. Diamond, Ellenwood, Ga., assignor to Northwest Airlines, Inc., Eagan, Minn.

Filed Oct. 11, 1990, Ser. No. 596,202

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—142 **10 Claims**



1. A combustion chamber cleaning machine for cleaning each of a plurality of combustion chambers, said machine comprising:

a frame;

a major, generally planar turntable rotatably supported by the frame;

a plurality of minor turntables rotatably connected to said major turntable, said combustion chambers being carried by said minor turntables;

means for rotating the minor turntables;

means for directing material at the combustion chambers; and

indexing means for intermittently rotating the major turntable, said indexing means comprising an indexing gear operably connected to said major turntable, said gear having an axis of rotation coaxial with the axis of rotation of said major turntable, and an operator means for incrementally turning and locking said gear, said operator means pivotally coupled to said frame and comprising a reciprocating ram having a first and second end, the first end received in means for extending and retracting the ram and the second end carrying rounded tip means for contacting said indexing gear, said indexing gear having rounded lobes complimenting said rounded tip means, whereby each of the chambers is revolved successively into proximity with said means for directing material and alignment of a minor turntable with said means for rotating the minor turntables is achieved, said rounded lobes of said indexing gear and said rounded tip means comprising complimentary engagement means for locking the indexing gear in a fixed position when a minor turntable is aligned with said means for rotating the minor turntables.

5,197,501

MULTI-PURPOSE CANE

Henry Ragatz, 2469 E. "F" St., Moscow, Id. 83843

Filed Sep. 26, 1991, Ser. No. 768,057

Int. Cl.[5] A45B *3/00*

U.S. Cl. 135—66 **11 Claims**

1. A multi-purpose cane comprising:

A) a shaft portion that includes

(1) a plurality of sections, including a first section having first and second ends, a second section having first and second ends, with said first section having a screw thread on said first section first end, and said second section having screw threads on said second section first end and on said second section second end,

(2) first coupling means coupling said first section second end to said second section second end, and

(3) a surface-engaging tip on said first section second end;

B) a hollow handle portion that includes

(1) first and second ends, said handle second end being coupled to said shaft portion second section first end,

(2) second coupling means releasably coupling said handle portion to said shaft portion,

(3) a battery unit located inside said handle portion, said battery unit including a positive side and a negative side,

(4) a first electrically conductive contact located inside said handle portion to be in electrical contact with one side of said battery unit and extending outwardly of said handle unit second end,

(5) a second electrically conductive contact located inside said handle portion and spaced from said first electrically conductive contact and extending outwardly of said handle unit second end, and

(6) a switch element mounted on said handle portion and including

(i) a manually operated element that is slidably mounted on said handle portion to slide between an "on" position and an "off" position,

(ii) a first electrically conductive element connected to said manually operated element and being in electrical contact with another side of said battery unit, and

(iii) a second electrically conductive element connected to said manually operated element and being in electrical contact with said first electrically conductive element and being in electrical contact with said second electrically conductive contact when said manually operated element is in said "on" position, and being electrically insulated from said second electrically conductive contact when said manually operated element is in said "off" position;

C) a shaft-portion electrical circuit in said shaft portion and including

(1) a first lead having one end thereof located adjacent to said shaft portion second section first end in position to be electrically engaged with said first electrically conductive contact element when said handle portion is engaged on said shaft portion, and having a second end,

(2) a second lead having one end thereof located adjacent to said shaft portion second section first end in position to be electrically engaged with said second electrically conductive contact element when said handle portion is engaged on said shaft portion, and having a second end;

D) a light generating unit mounted on said shaft portion second section and including

(1) a mounting shaft rotatably mounted on said shaft portion second section,

(2) a first electrical contact slip ring mounted on said mounting shaft and being in electrical contact with said first shaft portion electrical circuit lead,

(3) a second electrical contact slip ring mounted on said mounting shaft and being in electrical contact with said second shaft portion electrical circuit lead,

(4) a light emitting element mounted on one end of said mounting shaft,

(5) two electrical line conductors in said mounting shaft and each being connected at one end thereof to said light emitting element, one of said line conductors being connected to said first electrical contact slip ring and a second one of said line conductors being connected to said second electrical slip ring,

(6) an electrically insulating case encasing said light emitting element, and

(7) an electrically insulating knob attached to said mounting shaft for rotating said mounting shaft about its longitudinal axis;

E) a jack connection unit mounted on said shaft portion, said jack connection unit including electrical connection means electrically connecting said jack connection unit to said shaft portion electrical circuit;

F) a signaling unit having a jack connection unit engaging jack thereon; and

G) a battery unit recharging means having a jack connection unit engaging jack thereon.

5,197,502

WALKING STICK

Lee M. Wang, No. 95, Chu Wei Wei, Chiao Nan Li, Yen Shui Chen, Tainan Hsien, Taiwan

Filed Feb. 1, 1991, Ser. No. 648,959

Int. Cl.[5] A61H *3/02*

U.S. Cl. 135—69 **3 Claims**

1. A walking stick comprising:

a pipe frame having an upper portion and a lower portion, said pipe frame formed of a pair of closed contour pipe members, each of said closed contour pipe members having an arcuate wall member and an inner wall member having a planar section, said lower portion of said pipe frame having said closed contour pipe members fixedly coupled each to the other by a rib member fixedly secured

to each of said pipe member planar sections on opposing

hinge and an opposite end connected to said angle connec-

lar to the plane of at least one pole, each pole being oriented

5,197,507

LINEAR SOLENOID VALVE APPARATUS AND

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to each of said pipe member planar sections on opposing ends thereof, said upper portion of said pipe frame being bifurcated whereby each of said closed contour pipe members are displaced each from the other;

a support cushion mounted on an upper end of each of said closed contour pipe members;

a holding member mounted between said closed contour pipe members of said upper portion of said pipe frame; said holding member secured to each of said closed contour pipe members by a pair of pin members insertable through a pair of aligned openings formed through each of said closed contour pipe members;

a hollow shaft for insert of said lower portion of said pipe frame; said hollow shaft and said lower portion of said pipe frame having cooperating through openings; and,

resilient clamp means having a pin member extending between a pair of C-shaped arms, said pin member passing through said cooperating through openings, said C-shaped arms substantially encircling said hollow shaft.

5,197,503

MOTORCAR SUN-SHADE

Y. L. Chen, No. 18, Lane 123, Sec. 2, Sing Sheng N. Rd., Taipei, Taiwan

Filed Sep. 13, 1991, Ser. No. 759,232
Int. Cl.[5] E04H *15/06*
U.S. Cl. 135—88 **1 Claim**

1. A motorcar sun-shade comprising a covering supported on the body of a motorcar by a supporting frame assembly, said covering comprised of a main panel covering over the top of the body of said motor car and two side panels attached to said main panel at two opposite sides by hook and loop bands for covering the two opposite sides of the body of said motorcar, said supporting frame assembly comprised of a front supporting frame and a rear supporting frame, said front and rear supporting frames each comprising two parallel extension tubes connected at two opposite ends by two link assemblies, said two parallel extension tubes being respectively attached to said main panel at the bottom by loops and secured to the body of said motorcar by fastening members, and characterized in that:

said two parallel extension tubes each is comprised of a main tube at the middle and two auxiliary tubes inserted in said main tube at two opposite ends, said main tube having two opposite peripheral end edges respectively projecting inwards at two opposite ends, said auxiliary tubes each having a peripheral end edge projecting outwards at one end and retained by the peripheral end edge at either end of said main tube; and

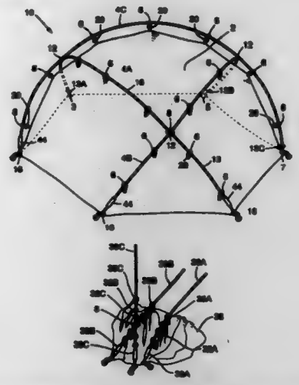
said link assemblies each is comprised of a first connecting rod, a second connecting rod and an angle connector, said first connecting rod having one end connected to one of the two parallel extension rods at one end by a hinge and an opposite end connected to said angle connector at one end, said second connecting rod having one end connected to the other parallel extension rod at one end by a hinge and an opposite end connected to said angle connector at an opposite end, said angle connector comprising a first socket at one end for revolvably fastening said first connecting rod by a bush and a retainer ring, a second socket at right angle relative to said first socket with a screw rod fastened therein for connecting said second connecting rod by a lock nut and a rivet, and a pivot coupler on the outer wall surface thereof for securing a suction disc by a link and a pressure disc.

5,197,504

SELF-CONTAINED TENT SYSTEM

Robert Howe, Oakland, Calif., assignor to The North Face, Berkeley, Calif.

Continuation of Ser. No. 557,162, Jul. 23, 1990, abandoned. This application Jul. 19, 1991, Ser. No. 732,773
Int. Cl.[5] E04H *15/36*
U.S. Cl. 135—102 **17 Claims**



1. A self-contained and collapsible tent comprising:

a membrane, having a plurality of O-rings attached thereto and distributed along the outer surface of said membrane in at lest one path;

a continuous elongate flexible pole extending slidably and continuously through the O-rings of said path, said pole having oppositely disposed ends and said rings being freely slidable over the pole to positions closely adjacent each other at one end of the pole in the unassembled and collapsed state;

means for attaching the oppositely disposed ends of the pole to said membrane to maintain the pole in an arcuate condition with the membrane suspended therefrom such that said pole exerts a radially outward force on said membrane when said tent is assembled and erected and such that said one end of said pole remains attached to said membrane while said other end of said flexible pole is detached from said membrane when the tent is in the unassembled and collapsed state for storage.

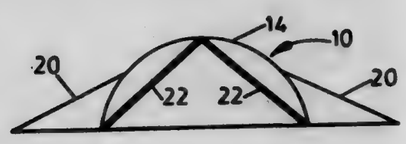
5,197,505

TENTS

Aarn Tate, 24 Rowan Lane, Woodley Park, Skelmersdale Lancashire, WN8 6UL, United Kingdom

Filed Nov. 9, 1990, Ser. No. 611,254
Claims priority, application United Kingdom, Nov. 11, 1989, 8925555
Int. Cl.[5] E04H *15/36*
U.S. Cl. 135—102 **9 Claims**

1. A tent comprising a fabric layer over one or more flexible resilient poles having opposed pole ends, each pole being arched and defined within a respective generally vertical plane, the tent having a longitudinal axis generally perpendicular to the plane of at least one pole, each pole being oriented such that the pole ends define lower points and a region of the pole intermediate the pole ends defines an upper point; a pair of tensioning members connected to at least one of said poles, each tensioning member having opposed ends connected at



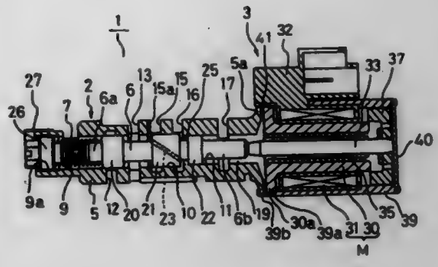
one end to said upper point of the pole and at the other tensioning member end to one or the other of the lower points of the pole to be in the same plane as the pole whereby the tensioning member is positioned within the tent and distortion of pole shape laterally to the longitudinal axis of the tent is resisted.

5,197,507

LINEAR SOLENOID VALVE APPARATUS AND METHOD ASSEMBLING

Nobuaki Miki, Kariya; Masao Saito, Nishio; Takeya Oka, Nagoya; Kunihiro Iwatsuki; Hideaki Otsubo, both of Toyota; Yasuo Hojo, Nagoya, and Yutaka Taga, Aichi, all of Japan, assignors to Aisin AW Co., Ltd. and Toyota Jidosha Kabushiki Kaisha, both of Japan

Filed Nov. 5, 1991, Ser. No. 786,810
Claims priority, application Japan, Nov. 5, 1990, 2-300354
Int. Cl.[5] F15B *13/044*
U.S. Cl. 137—1 **6 Claims**



1. A linear solenoid valve apparatus comprising:

an electromagnetic operator including:

a hollow, cylindrical core;

a push rod slidably mounted within the hollow of said core;

a coil assembly surrounding said core for applying a magnetic force for driving said push rod in a first direction, said magnetic force being proportional to electric current supplied to said coil; and

a modulator valve coupled to said electromagnetic operator and including:

a valve sleeve having a supply port, an output port and an exhaust port;

a valve spool slidably mounted in said sleeve, said valve spool abutting said push rod in axial alignment therewith for movement by said push rod in the first direction;

a spring mounted in said sleeve for biasing said valve spool in a second direction, opposite said first direction;

a feedback pressure chamber for modulating fluid pressure received through the supply port to provide a modulated pressure at the output port by providing a feedback pressure to balance said magnetic force with the biasing force of said spring; and

at least one spacer provided between said electromagnetic operator and said modulator valve, said spacer separating said core from said valve sleeve by a distance providing a sloped linear relationship between the position of said push rod and said magnetic force, said spacer having an annular configuration with a central opening, said push rod extending through said central opening spaced from said spacer to define an open annular space therebetween, with no connection between said push rod and said spacer.

5,197,506

TENT STAKE COVER APPARATUS

Daniel B. Morin, 6 Townview Cir., E. Longmeadow, Mass. 01028

Filed Oct. 7, 1991, Ser. No. 772,555
Int. Cl.[5] E04H *15/62*
U.S. Cl. 135—118 **5 Claims**

1. A tent stake cover apparatus in combination with a tent stake and a tent stake rope, wherein the apparatus includes the cover formed with a hemispherical cover upper portion, the hemispherical cover upper portion includes a rope receiving opening directed therethrough, and

the upper portion further includes a cylindrical cover skirt, and

a cylindrical lower body includes a coaxially aligned cylindrical body extension receiving the cylindrical cover skirt, wherein the cylindrical lower body and the hemispherical cover upper portion receive the tent stake therewithin, and the tent rope is fixedly secured to an upper terminal end of the tent stake and is directed through the rope receiving opening of the hemispherical cover upper portion wherein the hemispherical cover upper portion includes a plurality of spring finger flanges projecting downwardly relative to an interior surface of the hemispherical cover upper portion in a spaced parallel relationship relative to the cylindrical body axis for clamping of the tent stake within the spring finger flanges.

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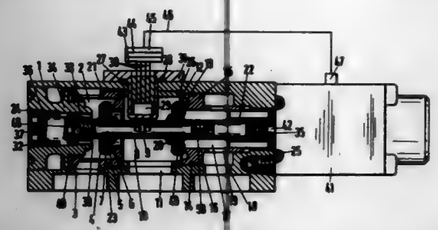
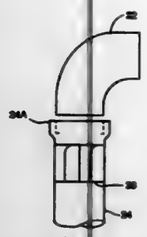
5,197,508
VALVE APPARATUS AND METHOD FOR CONTROLLING FLUID FLOW
Helmut Göttling, Isernhagen; Rudolf Möller, Gehrden; Reinhard Mauentübben, Hanover; Gerhard Scharnowski, Gehrden; Dieter Meisoll, Hanover, and Hun-Tri Nguyen, Lehrte, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany
Filed Feb. 21, 1992, Ser. No. 840,910
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1991, 4105705
Int. Cl.[5] F16K *31/06, 1/44*
U.S. Cl. 137—1 13 Claims



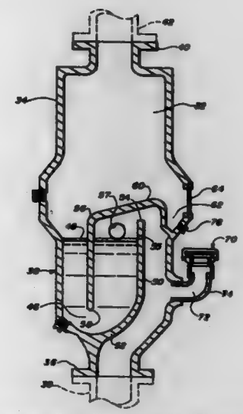
1. A proportionally acting solenoid valve device, operable by a proportionally acting solenoid, comprising:
a valve housing having a wall and a pressure fluid chamber provided with a pressure fluid connection;
a valve rod having an axis of displacement, being disposed in said housing and displaceable by an action of the proportionally acting solenoid;
two valves, for selectively forming a fluid communication path with said pressure fluid chamber, each disposed in said valve housing and comprising a displacable valve member connected in fixed relation to and actuable simultaneously with displacement of said valve rod;
a permanent magnet (9), having a predetermined position with respect to said valve rod, and being arranged in proximity to said valve rod (20) in such orientation that a range of a displacement path of said permanent magnet (9) produced by a displacement of said valve rod lies within said pressure fluid chamber (10); and
a magnetic field sensor (29), on said wall of said valve housing and disposed in a region of said pressure fluid chamber (10) for detecting a change of a field of said permanent magnet (9) as a displacement of said valve rod changes.

5,197,509
LAMINAR FLOW ELBOW SYSTEM AND METHOD
Dah Y. Cheng, 12950 Cortez La., Los Altos Hills, Calif. 94022
Filed Jun. 6, 1990, Ser. No. 534,146
Int. Cl.[5] F17D *1/20*
U.S. Cl. 137—13 18 Claims



16. A method of reducing fluid turbulence in a fluid flow path as the fluid flows in a curved pipe section, which method comprises:
imparting sufficient rotation prior to the fluid before passing through the curved pipe section to minimize turbulence while providing that the imparted fluid rotation substantially terminates upon exiting from the curved pipe section.

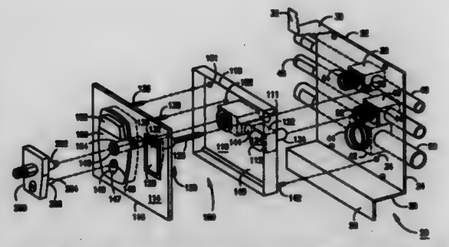
5,197,510
APPARATUS FOR CHECKING BACK PRESSURE
Leo J. Kozlowski, Napa, Calif., assignor to Nsertaseal Corporation, Richmond, Calif.
Filed Jul. 16, 1992, Ser. No. 913,623
Int. Cl.[5] F16K *24/00, 37/00*
U.S. Cl. 137—216.2 14 Claims



1. Apparatus for use in a drain system including a drain line and for monitoring gas pressure in said drain line, said apparatus comprising, in combination:
housing means defining an interior for communication with said drain line;
liquid trap means within said housing means interior defining a trap sump for retaining liquid therein to impede the flow of gas in the said housing means interior;
liquid collector means in operative association with said liquid trap means and defining a space separated from said trap sump for collecting liquid displaced from said trap sump when gas in said drain line exceeds a predetermined pressure; and
valve means for allowing passage of air from the ambient atmosphere into said drain line when a negative gas pressure exists in said drain line.

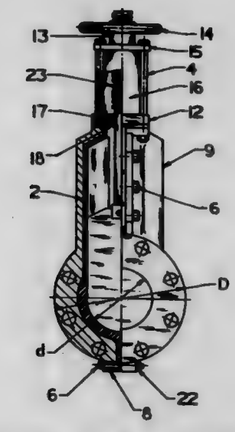
5,197,511
FLUID OUTLET SYSTEM
Gabriel S. Kohn; Eldon P. Rosentrater, and Gregory A. Svolopoulos, all of St. Louis County, Mo., assignors to Allied Healthcare Products, Inc., St. Louis, Mo.
Filed Jan. 30, 1992, Ser. No. 828,144
Int. Cl.[5] F16L *5/00*
U.S. Cl. 137—360 10 Claims

1. A fluid outlet system, comprising:
supplying means for supplying a plurality of different fluids at each of a plurality of locations;
accessing means for accessing a first one of said fluids at a first one of said locations; and
access inhibiting means for inhibiting access to a second one of said locations;
wherein said supplying means includes: a housing; a plurality of valves located within said housing, said plurality of valves including a valve for each of said plurality of fluids at each of said plurality of locations; and a multi-fluid distribution system for supplying said plurality of fluids to said plurality of valves; and
wherein said accessing means includes a first fluid-specific active fascia assembly for opening the valves for said first



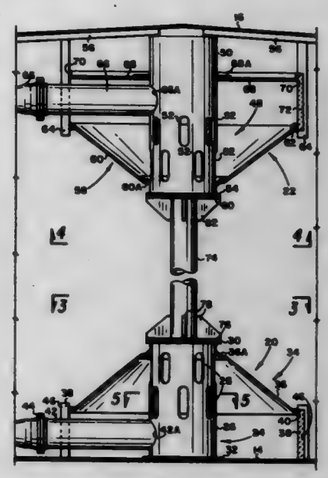
fluid and for simultaneously covering the valves for the fluids other than said first fluid, and wherein said first fluid-specific active fascia assembly includes a face plate for covering the valves for the fluids other than said first fluid.

5,197,512
HIGH PRESSURE SLUICE KNIFE GATE VALVE
Yury Lev, 830 Holmes Ave., Deerfield, Ill. 60015
Filed Jul. 25, 1990, Ser. No. 557,690
Int. Cl.[5] F16K *3/02, 3/316*
U.S. Cl. 137—375 6 Claims



1. A high pressure sluice knife gate valve assembly comprising:
two identical body housing members each having a semicircular end and a bonnet-like portion extending upwardly from the said semicircular end;
means securing said housing members together in a side-to-side ralation with means therebetween to define a lined chest cavity through which a blade is dropped in a blade passageway with opposing sidewalls spaced from the opposing surfaces of the blade itself, having a knife-shaped semicircular lower end, and an upper rectangular cross section extending upwardly into the said chest cavity, where a threaded rod is attached to the said blade, with an annular lined through passage extending downwardly from the said chest cavity, eliminating the traditional bonnet structure.

5,197,513
STRATIFIED CHAMBER SYSTEM FOR RECEIVING, STORING AND DISPENSING TWO DIFFERENT DENSITY LIQUIDS
Lorin R. Todd, Atascadero, and Siavash Noorafshani, Templeton, both of Calif., assignors to San Luis Tank Piping Construction Co. Inc., Paso Robles, Calif.
Filed Apr. 3, 1992, Ser. No. 862,959
Int. Cl.[5] F17C *13/00*
U.S. Cl. 137—592 5 Claims



1. A stratified chamber system for receiving, storing and dispensing higher and lower density liquids comprising:
a tank having a bottom, a sidewall and a top and having a higher density liquid opening and a lower density liquid opening therein;
an enclosed upright higher density liquid distributor vessel supported by said tank bottom having a vertical circumferential sidewall with a plurality of spaced apart openings therein;
an enclosed upright lower density liquid distributor vessel supported adjacent said tank top and elevationally positioned above said higher density liquid distributor vessel;
a frustroconical lower flow diverter means supported at said higher density liquid distributor vessel and above said openings therein and extending downwardly and outwardly and having a lower circumferential edge spaced from and above said tank bottom;
an upper flow diverter means extending from said lower density liquid distributor vessel, the upper flow diverter being spaced from and below said tank top;
a first conduit connected to said tank higher density liquid opening and extending between said lower flow diverter means lower circumferential edge and said tank bottom and connected to said higher density liquid distributor vessel below said openings therein; and
a second conduit connecting said tank lower density liquid opening to said lower density liquid distributor vessel,
whereby higher density liquid is conveyed into said tank by liquid flow upwardly within said higher density liquid distributor and out through said openings therein and thence radially outwardly below said diverter lower circumferential edge and is withdrawn from said tank in the opposite direction, and wherein lower density liquid is conveyed into and withdrawn from said tank through said lower density liquid distributor vessel.

tion of said control signal; a fluid valve stage including a spool whereas fluid entering the outlet duct is caused to form into a

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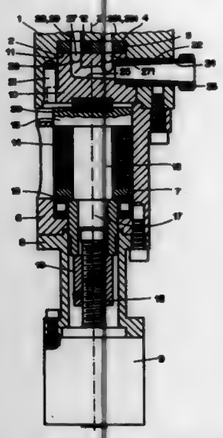
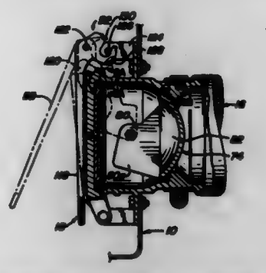
5,197,514
FLOW DISTRIBUTOR
Hans Jons, La Conversion, Switzerland, assignor to Nokia-Maillefer, Ecublens, Switzerland
Filed Mar. 28, 1991, Ser. No. 676,339
Claims priority, application Switzerland, Apr. 3, 1990, 1118/90
Int. Cl.[5] F16K *3/10, 11/074*
U.S. Cl. 137—597 15 Claims



1. A distributor for distributing a flow of liquid material under conditions of high temperature and high pressure, comprising:
a distributor cylinder;
at least one intake duct and at least one outlet duct provided in the distributor cylinder, wherein the distributor cylinder has an inside surface, said at least one intake duct and said at least one outlet duct each having one end opening to the inside surface;
a cylindrical distributor body rotatable about an axis of the distributor cylinder, having at least one distributor duct, each at least one distributor duct able to selectively connect one of said at least one intake duct with one of said at least one outlet duct;
pressure means rotatably movable with said distributor body for pressing the distributor body against the inside surface of the distributor cylinder to counteract a pressure of the liquid material against the distributor body; and
drive means for rotating the distributor body about the axis, comprising a motor having a rotor coaxial with said distributor cylinder and an extensible connection means disposed between said rotor and said distributor body.

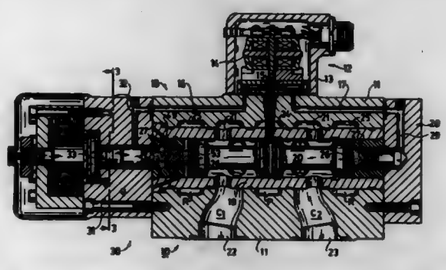
5,197,515
AIRCRAFT WASTE SYSTEM DRAIN VALVE
Eric J. Saville; Raymond S. Hunt, Jr., both of Alta Loma, and William R. Dunn, Upland, all of Calif., assignors to Pneu-Draulics, Inc., Rancho Cucamonga, Calif.
Filed Jun. 14, 1991, Ser. No. 715,676
Int. Cl.[5] F16K *11/00*
U.S. Cl. 137—613 13 Claims

1. A drain valve assembly for sealing an aircraft waste system drain line, comprising:
a valve body containing a drain passage having an inlet end and an opposite outlet end and adapted to be mounted on an aircraft for receiving waste from said drain line through said inlet end, whereby waste flow through said passage occurs in a direction toward said passage outlet end,
first sealing means including a first valve seat on said valve body about said passage, and a first sealing member movable between a fully closed position of fluid sealing contact with said valve seat wherein said sealing means blocks flow through said passage and an open position whereby said sealing means permits flow through said passage,
second sealing means along said passage between said first sealing means and said passage inlet end including a second valve seat on said valve body about said passage, and a second sealing member movable between a fully closed position of fluid sealing contact with said second valve seat wherein said second sealing means blocks flow through said passage and an open position wherein said



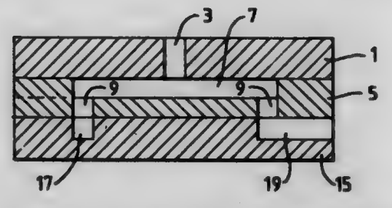
second sealing means permits flow through said passage, and wherein
said second sealing means includes means totally independent of said first sealing means for moving said second sealing member to and retaining said second sealing member in its fully closed position without closing said first sealing member and without contact of said first sealing member with said second sealing member, and
said first and second sealing means include cooperating means which permit movement of said first sealing member to its fully closed position only when said second sealing member occupies its fully closed position.

5,197,516
HYDRAULIC SERVO VALVE WITH CONTROLLED DISENGAGEMENT FEATURE
James M. Smietana, West Seneca, N.Y., assignor to Moog Controls, Inc., East Aurora, N.Y.
Filed May 1, 1992, Ser. No. 877,530
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—625.62 6 Claims



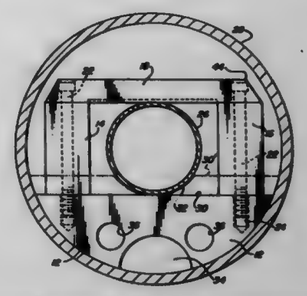
1. A hydraulic servo valve arrangement comprising a hydraulic amplifier stage supplied with a control signal and having a high-pressure port coupled to a source of hydraulic fluid provided at a high pressure and a return port coupled to a drain which withdraws the hydraulic fluid therefrom at a low pressure, and first and second amplifier ports which provide hydraulic fluid at respective controlled amplifier pressures between said high and low pressures and which vary as a function of said control signal; a fluid valve stage including a spool member slidably disposed within a bushing member that has a generally cylindrical interior surface and which is penetrated by a plurality of openings through which fluid selectively flows depending on position of said spool member within said bushing member, the spool member including a plurality of lands that define, in conjunction with said openings, metering orifices to control flow of said fluid, and a valve body containing said bushing member and having pressure and return channels formed therein which couple respective ones of said openings in said bushing member to said source and said drain, first and second control channels coupled to other respective openings in said bushing member to deliver said fluid at respective first and second control fluid pressures which depend on the position of said spool member within said bushing member and wherein, in a central null position of said spool member, the first and second control fluid pressures are in balance, and first and second amplifier fluid channels which communicate the control amplifier fluid pressure from said first and second amplifier ports to respective first and second ends of said spool member to urge said spool member to move in a fashion to follow said amplifier fluid pressures; and a deceleration control mechanism interposed in said first amplifier fluid channel including positioner means having first and second positions respectively permitting and blocking flow of said fluid between said first amplifier port and said first end of said spool, hydraulic actuator means for urging said positioner means into its first position, resilient biasing means for urging said positioner means into its second position; solenoid valve means having a control signal input, an input port coupled through a dropping orifice to said supply and a second port coupled to said drain, such that in an actuated condition the input port is at said supply pressure but in an unactuated condition the input pressure port drops to a low pressure; said hydraulic actuator being in fluid communication with said solenoid valve input port; and at least one relief channel disposed in fluid communication with said first end of said spool member and with said solenoid valve input port, each said relief channel having a metered orifice to limit flow of said hydraulic fluid between said first end of the spool member and said solenoid valve input port to achieve smooth transition of said spool to its null position.

5,197,517
VALVE DEVICES
Gurage E. L. Perera, Wembley, England, assignor to GEC-Marconi Limited, England
Filed Jan. 13, 1992, Ser. No. 819,851
Claims priority, application United Kingdom, Jan. 11, 1991, 9100679
Int. Cl.[5] F15C *1/16*
U.S. Cl. 137—813 6 Claims



1. A miniature, non-return valve, comprising: a layer structure having an inlet in a first layer; a circular recess in a second layer and substantially coaxially aligned with the inlet; an annular groove in a third layer and substantially coaxially aligned with the recess and communicating with the recess through a plurality of apertures spaced apart around the groove; and an outlet duct communicating with the groove, whereby fluid entering the inlet passes through the recess, the annular groove and the outlet duct substantially unimpeded, whereas fluid entering the outlet duct is caused to form into a vortex in said recess, and flow of that fluid to the inlet is thereby substantially inhibited.

5,197,518
CENTERING SUPPORT ASSEMBLY FOR DOUBLE CONTAINMENT PIPE SYSTEMS
Christopher G. Zin, Somerville, Mass., assignor to Double Containment Systems, Monroe, Conn.
Filed Jun. 27, 1991, Ser. No. 722,063
Int. Cl.[5] F16L *3/10*
U.S. Cl. 138—113 19 Claims



1. A centering support for a double containment pipe assembly comprising:
a half moon shaped base support adapted to have seated on one surface thereof at least one inner pipe of a double containment pipe assembly, the opposite surface of said half moon shaped base being arcuate and having a diameter adapted to approximate the inner diameter of an outer containment pipe of said double containment pipe assembly;
a pair of spaced stanchions mounted on said one surface of said base support on either side of said at least one inner pipe relative to each other, at least one of said stanchions being spaced apart from said at least one inner pipe to permit lateral movement of said inner pipe in at least one direction; and
a crosspiece clamp supported on the spaced stanchions mounted on said base support to substantially prevent vertical movement of said at least one inner pipe and including means for adjusting the position of said crosspiece clamp relative to said at least one inner pipe for permitting longitudinal movement of said at least one inner pipe on said support base surface between said stanchions.

5,197,519

Patent Not Issued For This Number

5,197,520
CLEANING SYSTEM FOR LOOM AIRJET NOZZLE
Heinz Reimertz, Heiligenhaus, Fed. Rep. of Germany, assignor to Picanol, n.v., Belgium
Filed Sep. 19, 1991, Ser. No. 762,483
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1990, 4029743
Int. Cl.[5] D03J *1/00*
U.S. Cl. 139—1 C 11 Claims

1. A method of cleaning an airjet nozzle and an airjet loom of type in which the airjet nozzle communicates with a source of compressed air in order to cause insertion of a pick, compris-

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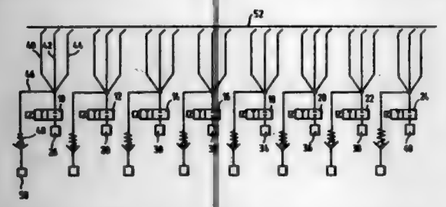
ing the step of periodically causing a cleaning fluid other than said compressed air which causes insertion of the pick to pass

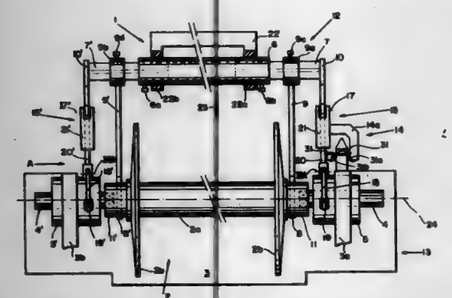


from a source of the cleaning fluid, for purposes of cleaning the airjet nozzle, through the airjet nozzle.

5,197,521
WARP BEAM LIFTING CARRIAGE FOR LOOM INSERTION

Helmut Graser, Riederich, and Armin Hiemer, Lindau, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Feb. 24, 1992, Ser. No. 840,864
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1991, 4105824
Int. Cl.[5] D03D *49/20*
U.S. Cl. 139—1 R **14 Claims**

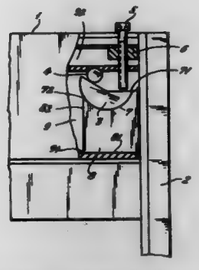


1. A lifting carriage for exchanging a warp beam having floating axle stubs in a loom having floating bearings through which said floating axle stubs extend into respective sockets in ends of a warp beam shaft, comprising a carriage frame, carrier transom means operatively mounted in said carriage frame, adjustable transom sections mounted to said carrier transom means and being adjustable in length to the length of said warp beam, each adjustable transom section comprising an insertion stop mechanism for limiting an insertion depth of said lifting carriage horizontally into said loom, warp beam carrier arms operatively mounted to said transom sections, warp beam gripper means secured to free ends of said carrier arms, said insertion stop mechanism extending in parallel to said carrier arms carrying said gripper means, means for vertically leveling and axially aligning said gripper means with said warp beam shaft, said leveling means cooperating with said insertion stop mechanism in an aligning operation, and means for laterally restraining said lifting carriage horizontally in a direction of a longitudinal axis of said warp beam.

5,197,522
CONNECTING DEVICE FOR A HEALDFRAME IN A WEAVING MACHINE

Jan Bilek, Na okruhu; Emil Špidlen, Kralov Haj, and Jan Nechanický, Arbesova, all of Czechoslovakia, assignors to Tovarny textilnich potreb, Elitex, a.s. Jablonec na Nisou, Czechoslovakia

Filed Mar. 3, 1992, Ser. No. 844,859
Claims priority, application Czechoslovakia, Mar. 6, 1991, 575-91
Int. Cl.[5] D03C *9/06*
U.S. Cl. 139—91 **4 Claims**



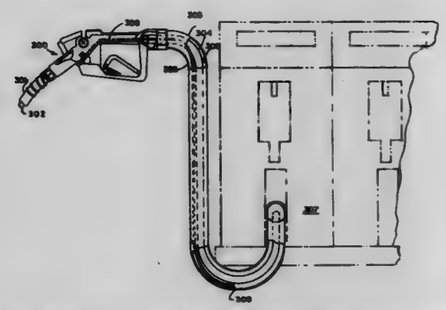
1. A healdframe for a weaving machine comprising:
a heald rod which defines a hollow internal area which is accessible from the exterior;
an edge piece having a protrusion for being inserted into said hollow internal area; and
securing means for securing the protrusion in the hollow internal area of the heald rod so as to secure the edge piece to the heald rod, said securing means comprising:
recess means formed in said protrusion; and
clamping means in said recess means for engaging said heald rod and thereby clamping said protrusion in said hollow area;
wherein said recess means comprises a recess having a predetermined shape formed in a first side of said protrusion which faces in a first direction, and
said clamping means comprises:
a clamping segment having an outer contour corresponding to the shape of the recess so as to be rotatable along said outer contour, said clamping segment having at least first and second faces facing generally in said first direction and defining between them an angle;
pressure means in said heald rod for bearing on said first face to urge rotation of said clamping segment; and
rest means fixed in the heald rod for being engaged by said second face in response to said rotation, said rest means preventing said protrusion from being withdrawn from said heald rod when said rest means and second face are engaged.

5,197,523
DISPENSING NOZZLE IMPROVEMENT FOR EXTRACTING FUEL

Arthur C. Fink, Jr., Lonedell, and Thomas O. Mitchell, Maryland Heights, both of Mo., assignors to Husky Corporation, Pacific, Mo.

Filed Aug. 5, 1991, Ser. No. 740,062
Int. Cl.[5] B67D *5/06*
U.S. Cl. 141—206 **7 Claims**

1. In a nozzle assembly for dispensing fuel from a source thereof into a container such as a fuel tank, the assembly having a body in which is defined a fuel flow passage, a spout attached to the body and in fluid communication therewith for directing fuel into the tank, a variable venturi capable of providing for the unified flow of fuel therethrough, said variable venturi interposed in the passage for producing a partial vacuum which is used to automatically shut-off fuel flow when the tank is full, and a vapor return path for capturing fuel vapors and returning them to the source, said vapor return path susceptible of inadvertently accumulating fuel at a low point, the improvement comprising, means for extracting fuel from the vapor return path, said means including means for generating a second vacuum at the variable venturi which is applied to the location of the vapor return path to draw any fuel out of the path, the assembly including an extraction means, one end of which is in fluid communication with the variable venturi and capable of conducting the second vacuum generated therein, the variable venturi having at least one port therein defining a vacuum generation area for generating the second vacuum therein, and the extraction means includes at least one passage extending through the venturi and opening to the vapor return



path at the location of the fuel, there being at least one second port extending through the venturi and opening into another passage, said at least one second port allowing the partial vacuum created by the venturi to be communicated to that portion of the assembly controlling automatic fuel flow shut-off, said variable venturi including means for isolating the produced partial vacuum and the second vacuum while allowing the unified flow of fuel therethrough for its dispensing into a tank, said variable venturi incorporating a circumferential groove formed therein defining a vacuum generating area, said one port and said second port communicating with said circumferential groove, and said one port and said second port extending through the venturi and communicating, respectively, with the vapor return path, and that portion of the assembly controlling automatic fuel flow shut-off.

5,197,524
APPARATUS AND METHOD FOR FEEDING STEAM INTO THE HOLLOW LONGITUDINAL STAVES OF A DEBARKING DRUM

Ian J. H. Clarke-Pounder, Nashua, and Donald B. Johnson, Bedford, both of N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 4, 1992, Ser. No. 833,833
Int. Cl.[5] B27L *1/00*
U.S. Cl. 144—342 **14 Claims**

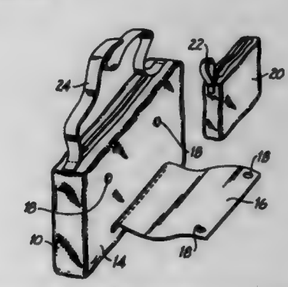
1. A valve for introducing steam axially into ends of hollow longitudinal log-tumbling staves in a rotatable debarking drum, comprising:
manifold means at a log feed end of said debarking drum arranged for sequentially providing pressurized steam communication with an open end of one or more of said staves;

means for providing freedom of movement for said manifold means parallel tot he axis of rotation of said rotatable debarking drum; and
steam feeding means for pressurizing said manifold means.

5,197,525
ANTI-THEFT HANDBAG

Joseph L. Cantor, 31 Canfield Rd., E. Hanover, N.J. 07936

Continuation-in-part of Ser. No. 368,412, Jun. 16, 1989, Pat. No. 4,995,436. This application Feb. 25, 1991, Ser. No. 660,666
Int. Cl.[5] A45C *1/02, 3/06, 13/18, 13/22*
U.S. Cl. 150—102 **10 Claims**



1. An anti-theft handbag device comprising a first handbag segment, a second handbag segment and a means for detachably securing said first handbag segment adjacently to said second handbag segment, said means for detachably securing comprising a break-away pocket exteriorly mounted to said second handbag segment said break-away pocket being adapted to receive said first handbag segment, and further adapted to open and release said first handbag segment upon extraordinary pulling.

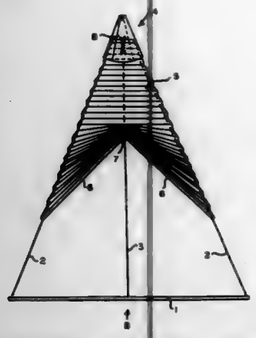
5,197,526

fixing the foam block to a second workpiece mount base;

movement therepast of a workpiece on the conveyor

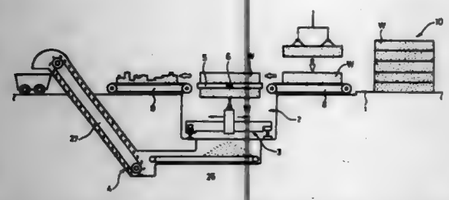
during said casting operation and at the start of solidifi-

5,197,526
DEVICE FOR THE INTERNAL SHADING OF GLASS AREAS WITH A HANGING MEANS
Siegfried J. Schön, Meer, Belgium, assignor to Schon B.V., Breda, Netherlands
Filed Dec. 26, 1990, Ser. No. 632,389
Claims priority, application European Pat. Off., Dec. 27, 1989, 89123962
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 20 Claims



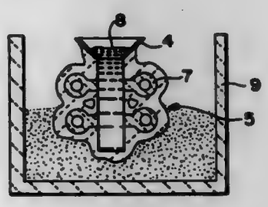
1. A device for shading an area having a geometric shape, said device comprising an extendable-retractable drape having an extended shape corresponding to the shape of said area and a displaceable edge for extending and retracting the drape, the displaceable edge comprising a profile strip and the drape having side edges adjoining the displaceable edge, the side edges being guided by elongate holding means, wherein the profile strip is divided lengthwise into at least two substantially rigid strip portions and interconnecting means between the strip portions for providing articulation of said portions.

5,197,527
METHOD OF MANUFACTURING LOST FOAM PATTERN FOR USE IN FULL-MOLD CASTING
Takaoki Namba, and Teruo Kamada, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 23, 1992, Ser. No. 872,441
Claims priority, application Japan, Apr. 23, 1991, 3-119510; Jul. 3, 1991, 3-189366
Int. Cl.[5] B22C *7/02*; B23Q *3/08*
U.S. Cl. 164—45 3 Claims



1. A method of machining a foam block into a lost foam pattern for use in full-mold casting, said method comprising the steps of:
fixing a foam block to a first workpiece mount base in a first machining station;
inverting said workpiece mount base;
cutting one side of the foam block fixed to the first workpiece mount base;
transferring the foam block from said first machining station to a second machining station;
fixing the foam block to a second workpiece mount base;
inverting said workpiece mount base in the second machining station; and
cutting another side of the foam block fixed to the second workpiece mount base.

5,197,528
INVESTMENT CASTING TECHNIQUE FOR THE FORMATION OF METAL MATRIX COMPOSITE BODIES AND PRODUCTS PRODUCED THEREBY
John T. Burke, Hockessin, Del., assignor to Lanxide Technology Company, LP, Newark, Del.
Continuation of Ser. No. 269,302, Nov. 10, 1988, Pat. No. 5,010,945. This application Apr. 29, 1991, Ser. No. 692,764
The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.
Int. Cl.[5] B22D *11/14*
U.S. Cl. 164—97 12 Claims

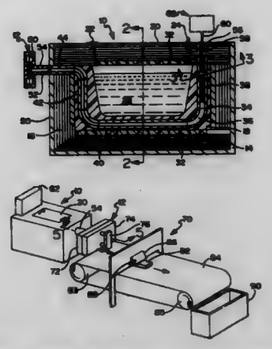


1. A method for forming a metal matrix composite body comprising:
forming an investment shell having a cavity therein;
providing a barrier material in at least a portion of said cavity;
providing a substantially non-reactive filler material in said cavity;
contacting an infiltrating atmosphere with said filler material for at least a portion of the process;
contacting molten matrix metal with said filler material;
providing an infiltration enhancer precursor in at least one of said filler material and said matrix metal;
spontaneously infiltrating molten matrix metal into at least a portion of the filler material up to said barrier material; and
cooling said matrix metal within said filler material, thereby forming a shaped metal matrix composite body corresponding substantially in shape to at least a portion of said cavity.

5,197,529
METHOD AND APPARATUS FOR DIE CASTING METAL
Bill Caugherty, 10605 Oak Valley Rd., Fort Wayne, Ind. 46845
Filed Oct. 2, 1989, Ser. No. 415,572
Int. Cl.[5] B22D *17/02, 17/12*
U.S. Cl. 164—113 3 Claims

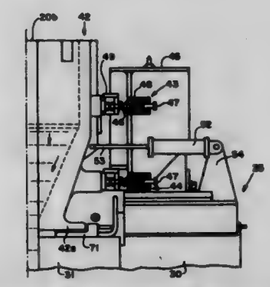
1. A die casting system, comprising:
(a) means for injecting molten metal into a die;
(b) means for ejecting the metal from the die in the form of a workpiece after the metal has substantially solidified;
(c) means for conveying the workpiece to a collection container;
(d) a signalling door interposed the ejecting means and the collection container, the signalling door operable by

movement therepast of a workpiece on the conveyor means;



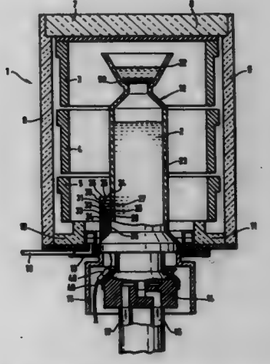
(e) a switch on the signalling door to signal the passage therethrough of a workpiece.

5,197,530
METHOD AND APPARATUS FOR PRESSURE CASTING FLAT METAL PRODUCTS
Robert A. Vatant, Saint-Chamond, and Michel F. Corubier, LeBreuil, both of France, assignors to Creusot-Loire Industrie and Clecim, Puteaux and Cergy Pontoise, France
PCT No. PCT/FR90/00034, § 371 Date Sep. 10, 1991, § 102(e) Date Sep. 10, 1991, PCT Pub. No. WO90/07996, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 16, 1990, Ser. No. 721,579
Claims priority, application France, Jan. 16, 1989, 89 00457
Int. Cl.[5] B22D *18/04*
U.S. Cl. 164—119 4 Claims



1. A method for pressure casting a flat metal product from a ladle of molten metal in a mould, said mould comprising:
two lateral walls including graphite blocks and spacers defining a cavity for receiving the molten metal, and
two half-shells being open towards a top and a bottom surface thereof, said half-shells being supported by a portion of said graphite blocks so as to be disposed above said lateral walls, said half-shells being clamped against one another and being disposed above a channel, said channel being defined by said spacers, said channel connecting said cavity with an interior volume of said half-shells permitting access of the molten metal to the interior volume of said half-shells so as to form a header of molten metal therein, said method comprising the steps of:
introducing the molten metal into said half-shells in a casting operation so as to fill said cavity and form said header,
maintaining a large clamping force on said half-shells during said casting operation and at the start of solidification of the molten metal, and
reducing said clamping force when a surface skin of said heater becomes solidified so as to eliminate any resistance to contraction of said cast flat product.

5,197,531
METHOD OF MANUFACTURING DIRECTIONALLY SOLIDIFIED CASTINGS
Franz Hugo, Aschaffenburg, and Harald Bittenbrünn, Hanau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany
Continuation of Ser. No. 561,198, Aug. 1, 1990, abandoned. This application Apr. 15, 1992, Ser. No. 869,906
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018924
Int. Cl.[5] B22D *25/00, 46/00*
U.S. Cl. 164—122.1 5 Claims



1. Method of manufacturing at least one of the group consisting of directionally solidified and monocrystalline castings in a vacuum furnace having a stationary insulating member comprising:
utilizing a plurality of sensors at different mold heights for sensing temperatures in metal or alloy melts contained in a mold, including a plurality of thermoelements each equipped with a heat resistance coating, by introducing said thermoelements into the melt,
determining the position of the interface between liquidus and solidus from the measured temperatures by means of interpolation,
controlling the withdrawal speed of the casting such that during the withdrawal of the casting, the interface is always located in a desired area of the stationary insulating member which is slightly above a cooling head 14 when the cooling head is in an upper position, and
storing in a data storing unit all data, including at least one of the groups consisting of the withdrawal speed profile over time and data on heating temperature as a function of the distance covered by the mold when the latter exits the heating zone for subsequent casting methods;
casting a molten metal in a subsequent casting process by utilizing the stored data as a process parameter.

3. Device for the manufacture of at least one of the group consisting of directionally solidified and monocrystalline castings in a vacuum furnace having a stationary insulating member comprising: a plurality of sensors introduced into a mold at different heights of the mold for sensing temperatures in metal and alloy melts, a data acquisition unit 55, a process computer 56 for determining the position of the interface between liquidus and solidus from the measured temperatures by means of interpolation, a control unit 57 for controlling the withdrawal of the mold from a heating zone such that during the with-

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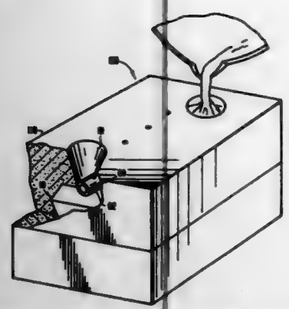
drawal of the casting, the interface is always located in a desired area of the stationary insulating member which is slightly above a cooling head when the cooling head is in an upper position and a data storing unit 58 for storing all data including at least one of the group consisting of the withdrawal speed profile over time and the function of the distance covered by the mold when the latter exits the heating zone.

5,197,532
CYLINDER HEAD CASTING APPARATUS AND METHOD

Billy J. Cagle, Indianapolis, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.
Division of Ser. No. 490,809, Mar. 7, 1990, Pat. No. 5,119,881. This application Feb. 28, 1992, Ser. No. 843,786
Int. Cl.[5] B22C 9/10, 9/22
U.S. Cl. 164—137 **4 Claims**



1. A method of forming an elongated, narrow open cavity within a cylinder head casting, comprising

providing a closed mold or a cylinder head having two widely spaced wall portions, at least one of said widely spaced wall portions being in communication with the atmosphere through an opening in the closed mold, said widely spaced wall portions defining the ends of a long open cavity within the mold and providing core supporting portions for a long, narrow core element adapted to form an elongated, narrow open cavity within the casting;

providing a long, narrow core element extending between the core supporting portions of widely spaced wall portions of the mold without intervening support, said long, narrow core element comprising an outer portion of casting sand adapted to form the walls of the elongated, narrow open cavity of the casting extending between said core supporting portions and further comprising an inner portion for supporting said long, narrow core element and for providing gas passage extending to said one wall portion; and

pouring molten metal into the closed mold and the long open mold cavity while permitting as emitted from the casting sand to escape to the atmosphere by carrying the gas to the atmosphere with said inner portion of said long, narrow core element and the opening in the closed mold.

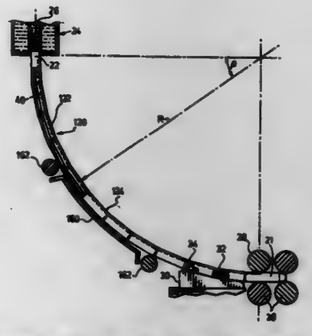
4. A closed mold assembly for casting an internal combustion engine cylinder head, comprising:

a first mold portion and a second mold portion, said first and second mold portions having internal cavity portions for forming, at least in part, a cavity for the surfaces at an internal combustion engine cylinder head and further having two widely spaced wall portions within the cavity with core supporting portions; and

a long, narrow mold element for casting a long, narrow open cavity without the use of mold element supports, comprising end portions shaped to engage and be supported by said core supporting portions of the widely spaced wall portions, a long inner portion adapted to support said long, narrow mold element, and an outer portion of casting sand surrounding said inner portion and adapted to form the walls of the long, narrow open cavity, said inner portion providing means for transmitting gas released in the long, narrow open cavity during casting to adjacent end portions, said first mold portion having an opening to the atmosphere for the release of said gas.

5,197,533
SELF-SUPPORTING, FLEXIBLE CONTINUOUS CASTING STARTER BAR

Gunther Behrends, 1 Birchcrest Ave., Danbury, Conn. 06811
Continuation-in-part of Ser. No. 617,324, Nov. 23, 1990, Pat. No. 5,135,042. This application Nov. 25, 1991, Ser. No. 795,878
The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.
Int. Cl.[5] B22D 11/08
U.S. Cl. 164—446 **5 Claims**



1. A starter bar for closing a mold used in a continuous casting machine and for guiding the leading end of a strand from the mold in a curved path, the starter bar having a head at one end of the bar for attachment to the leading end of the strand, a tail at the other end of the bar for guiding the bar between rollers forming part of the continuous casting machine, and a body disposed between the head and the tail comprising a bottom portion adjacent the tail and a self-supporting top portion adjacent the head, the body comprising:

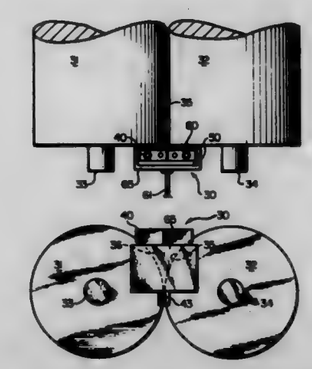
a flexible substantially planar spine on an operatively inner side of the body, the spine extending longitudinally between the head and the tail, and defining an inner radius of curvature for the starter bar lying in said curved path;

a series of blocks on an operatively outer side of the body arranged end to end and attached on one side thereof to the operatively outer surface of the spine, the blocks thereby defining an outer radius of curvature for the starter bar; and

in the self-supporting top portion, a plurality of retractable block support means each disposed between adjacent pairs of blocks and adapted to protrude from one block of a pair a pre-determined distance x so as to lie in abutting and supporting relationship with a bearing surface on the other block of said pair and thereby increase the effective length of the operatively outer side of the body so that the starter bar may assume a curved configuration and be self-supporting, said block support means being retractable to shorten the effective length of the operatively outer side of the body so that the starter bar may assume a straight configuration.

5,197,534
APPARATUS AND METHOD FOR MAGNETICALLY CONFINING MOLTEN METAL

Howard L. Gerber, Park Forest, and Richard T. Gass, Chicago, both of Ill., assignors to Inland Steel Company
Continuation of Ser. No. 739,223, Aug. 1, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 902,559
Int. Cl.[5] B22D 27/02, 11/06
U.S. Cl. 164—467 **81 Claims**



1. A magnetic confining apparatus employing the proximity effect for preventing the escape of molten metal through the open side of a vertically extending gap between two horizontally spaced members and between which said molten metal is located, said apparatus comprising:

electrically conductive coil means, adjacent the open side of said gap, for directly generating a horizontal magnetic field which extends through the open side of said gap to said molten metal;

said coil means being sufficiently proximate to said open side of the gap so that said directly generated horizontal magnetic field has a strength sufficient to exert a confining pressure against the molten metal in the gap;

said coil means having a surface portion facing the open side of said gap;

magnetic means, associated with said coil means, and comprising means for concentrating the flow of electric current in said surface portion of the coil means which faces the open side of the gap;

and non-magnetic, electrical conductor means in electrically conductive relation with said surface portion;

said non-magnetic, electrical conductor means facing said open side of the gap and comprising means sufficiently proximate to said open side of the gap to confine said magnetic field substantially to said open side of the gap.

54. A magnetic confining method employing the proximity effect for preventing the escape of molten metal through the open side of a vertically extending gap between two horizontally spaced members and between which said molten metal is located, said method comprising the steps of:

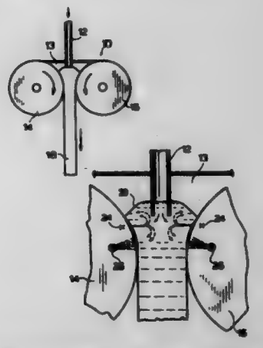
directly generating, at a location adjacent the open side of said gap, a horizontal magnetic field which extends through the open side of said gap to said molten metal;

generating said horizontal magnetic field sufficiently proximate to said open side of the gap so that said directly generated horizontal magnetic field has a strength sufficient to exert a confining pressure against the molten metal in said gap;

confining said magnetic field to said open side of the gap.; and providing a low reluctance return path, composed of magnetic material, for said directly generated magnetic field which extends through said open side of the gap.

5,197,535
LIQUID METAL STIRRING DURING CASTING

Joseph A. Mulcahy, Brooklin, Canada, assignor to J. Mulcahy Enterprises Inc., Whitby, Canada
Filed Sep. 17, 1991, Ser. No. 761,315
Int. Cl.[5] B22D 11/06, 27/02
U.S. Cl. 164—468 **5 Claims**



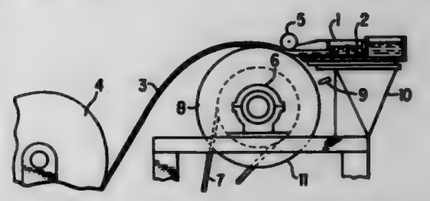
1. In the twin-roll casting of molten metal by pouring a molten metal into the nip between a pair of counter-rotating casting drums to form a pool of molten metal upstream of said nip and having a longitudinal dimension parallel to said nip and removing a solidified strand of metal from the nip, the improvement which comprises:

electromagnetically stirring said molten metal in said pool along said longitudinal dimension in the region immediately upstream of the nip to provide a substantially homogenized melt of substantially uniform temperature upstream of the nip.

4. In a twin-roll caster comprising a pair of counter-rotating drums, the improvement which comprises electrically-conducting path means extending between the longitudinal extremities of and located in the outer surface of each said drums immediately upstream of the nip between said drums.

5,197,536
POLYMER LAMINATED DRAG CAST CAN STOCK AND METHOD

Rodney E. Hanneman, Midlothian, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed May 13, 1991, Ser. No. 699,415
Int. Cl.[5] B22D 11/06
U.S. Cl. 164—476 **17 Claims**



1. A method of making a polymer laminated drag cast aluminum alloy container sheet material for deep drawing use comprising the steps of:

a) providing a source of molten aluminum alloy in an open tundish;

(b) drag casting said molten aluminum alloy in the form of a sheet by pouring said molten aluminum alloy from said open tundish onto a chilled rotating casting roll to solidify said molten aluminum alloy into said sheet;

forcement plates fixed to each other to secure said auxil-

disposed to be sidably movable along the inner surface of

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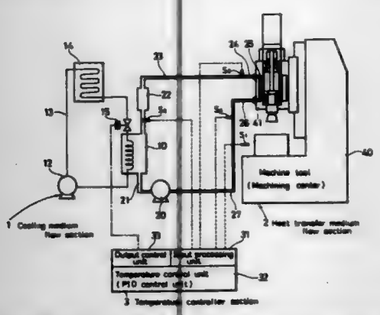
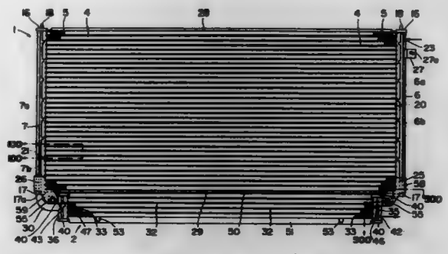
c) cold rolling said sheet;
d) pretreating at least one surface of said sheet to improve adhesion properties of said sheet; and
e) laminating a polymer material to at least one surface of said sheet to produce a polymer laminated drag cast aluminum alloy beverage container sheet material for deep drawing use.

5,197,537
APPARATUS FOR CONTROLLING TEMPERATURE OF MACHINE TOOL
Junji Chigira, and Koichi Urano, both of Maebashi, Japan, assignors to Kanto Seiki Co., Ltd., Gunma, Japan
PCT No. PCT/JP89/00553, § 371 Date Oct. 2, 1990, § 102(e) Date Oct. 2, 1990, PCT Pub. No. WO89/12527, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 1, 1989, Ser. No. 423,469
Claims priority, application Japan, Jun. 20, 1988, 63-150054
Int. Cl.[5] F28F *27/00*; B23Q *11/14*
U.S. Cl. 165—32 **4 Claims**



1. A temperature control apparatus for a machine tool which includes a constituent element having a heat generating source, a heat transfer fluid brought into contact with the constituent element cool it, and a heat exchanger for cooling the heat transfer fluid with a cooling medium to control temperature of said heat transfer fluid connected to a heat transfer fluid outlet of said constituent element to maintain a set temperature difference between a reference temperature and said temperature of said heat transfer fluid at said outlet, wherein the improvement comprises:
a reference temperature sensor for detecting, said reference temperature;
a heat exchanger outlet temperature sensor for detecting temperature of said heat transfer fluid at an outlet of said heat exchanger;
a constituent element inlet temperature sensor for detecting temperature of said heat transfer fluid at an inlet of said constituent element;
a constituent element outlet temperature sensor for detecting temperature of said heat transfer fluid at the heat transfer fluid outlet of said constituent element;
differential temperature detecting means constituted by said reference temperature sensor, said heat exchanger outlet temperature sensor, said constituent element inlet temperature sensor and said constituent element outlet temperature sensor; and
control means activated in accordance with a value of an output signal from said differential temperature detecting means to control the temperature of said heat transfer fluid;
wherein a differential temperature between said heat exchanger outlet temperature and said constituent element input temperature operates in said output signal provided to said control means such that both transient deviations of heat transfer fluid temperature and steady-state deviations of machine tool body temperature are minimized.

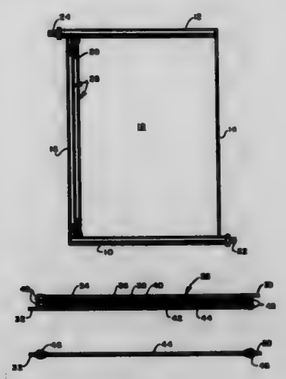
5,197,538
HEAT EXCHANGER APPARATUS HAVING FLUID COUPLED PRIMARY HEAT EXCHANGER UNIT AND AUXILIARY HEAT EXCHANGER UNIT
Yoshikiyo Nagasaka; Takashi Sugita, and Tadaaki Ishikawa, all of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan
Filed Apr. 17, 1992, Ser. No. 870,425
Claims priority, application Japan, Apr. 22, 1991, 3-117959; Sep. 13, 1991, 3-234337
Int. Cl.[5] F28F *9/26*
U.S. Cl. 165—144 **15 Claims**



1. A heat exchanger apparatus comprising:
a primary heat exchanger having a first multi-layer structure of alternately stacked first tube and fin members, and first and second header pipes respectively coupled to opposite ends of said first tube members along opposite edges of said first multi-layer structure;
an auxiliary heat exchanger having a second multi-layer structure of alternately stacked second tube and fin members and third and fourth header pipes respectively coupled to opposite ends of said second tube members along opposite side edges of said second multi-layer structure, wherein the distance between said first and second header pipes of said primary heat exchanger is greater than the distance between said third and fourth header pipes of said auxiliary heat exchanger;
a first bracket member extending between said first and third header pipes, and a second bracket member extending between said second and fourth header pipes, said first and second bracket members securing said auxiliary heat exchanger to said primary heat exchanger; and,
a tubular member extending between said primary heat exchanger and said auxiliary heat exchanger for providing fluid communication therebetween.

8. A heat exchanger apparatus comprising:
a primary heat exchanger having a first multi-layer structure of alternately stacked first tube and fin members and first and second header pipes respectively coupled to opposite ends of said first tube members along opposite side edges of said first multi-layer structure;
an auxiliary heat exchanger having a second multi-layer structure of alternately stacked second tube and fin members and third and fourth header pipes respectively coupled to opposite ends of said second tube members along opposite side edges of said second multi-layer structure, wherein the distance between said first and second header pipes of said primary heat exchanger is greater than the distance between said third and fourth header pipes of said auxiliary heat exchanger; and,
a first reinforcement plate mounted to and along a bottom edge of said first multi-layer structure and a second reinforcement plate mounted to and along a top edge of said second multi-layer structure, said first and second reinforcement plates fixed to each other to secure said auxiliary heat exchanger to said primary heat exchanger.

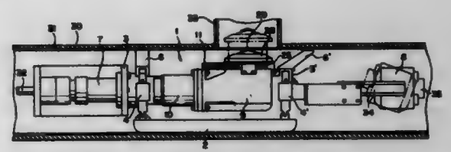
5,197,539
HEAT EXCHANGER WITH REDUCED CORE DEPTH
Gregory G. Hughes, Milwaukee; John E. Munch, Jr., Racine; C. James Rogers, Racine, and Rodney A. Struss, Racine, all of Wis., assignors to Modine Manufacturing Company, Racine, Wis.
Filed Feb. 11, 1991, Ser. No. 653,691
Int. Cl.[5] F28F *1/10*; F28D *1/047*
U.S. Cl. 165—172 **8 Claims**



1. A heat exchanger comprising:
A pair of generally parallel headers;
an area of one side of each of said headers defining a gas flow plane for a first, gaseous heat exchange fluid;
a plurality of second heat exchange fluid conduits in side by side relation and each having a first port in fluid communication with one of said headers, a second port in communication with the other of said header and means comprising an elongated tube bent upon itself defining a serpentine fluid flow path extending between said ports and having a plurality of passes in fluid series with each other and each extending from one side of said area across the area to the opposite side thereof, each of the passes of each said tube being in abutment with at least one other pass of the associated tube, the passes of each said tube further being arrayed in side by side relation and such that the associated conduit is nominally transverse to said plane; and fins embracing said conduits within said area.

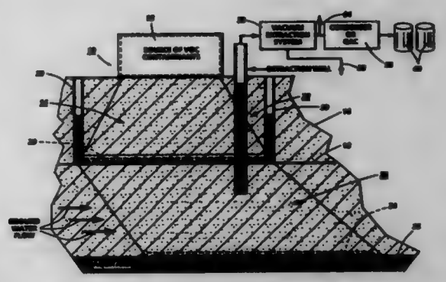
5,197,540
BORING DEVICE FOR LINING MATERIAL IN BRANCHED PORTIONS OF LINED CONDUIT
Isaburo Yagi, Amagasaki; Hideo Maruyama, Osaka; Masaru Yamakawa, Kobe, and Yoshifumi Osaka, Settsu, all of Japan, assignors to Ashimori Kogyo Kabushiki Kaisha, Osaka, Japan
PCT No. PCT/JP88/00372, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/07919, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 14, 1988, Ser. No. 283,598
Claims priority, application Japan, Apr. 14, 1987, 62-56380[U]; Apr. 14, 1987, 62-56382[U]; Apr. 14, 1987, 62-56383[U]; Apr. 14, 1987, 62-56384[U]
Int. Cl.[5] E03F *3/06*
U.S. Cl. 166—55.8 **7 Claims**

1. A boring device for removing a lining material applied to the inner surface of a pipeline and which covers a branched portion of said pipeline, said boring device comprising:
a body member mounted on associated frame members which in turn are supported on a skid member which is disposed to be slidably movable along the inner surface of the pipeline in the longitudinal direction thereof,
outrigger members attached to said frame members,
means for moving said body member, frame members and associated outrigger members in the up and down direction, radially of the pipeline, whereby said outrigger members are adapted to be thrust against the upper, inner surface of the pipeline thereby securing the boring device against the inner surface of the pipeline,



actuator means operatively connected to said frame members for turning said body member about its axis of rotation which extends in parallel with the central axis of the pipeline, and
a rotary borer means adapted to be rotated about an axis of rotation which extends in a direction perpendicular to the central axis of the pipeline, said rotary borer means being mounted to be slidably moveable along the axis of rotation.

5,197,541
APPARATUS FOR TWO PHASE VACUUM EXTRACTION OF SOIL CONTAMINANTS
Ronald E. Hess, Webster; Albert A. Hooper, Pittsboro, both of N.Y.; Steven R. Morrow, Hatboro, Pa.; Dianne J. Walker, Norristown, Pa., and Erich Zimmerman, Collegeville, Pa., assignors to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 413,273, Sep. 27, 1989, Pat. No. 5,050,676.
This application Jul. 15, 1991, Ser. No. 729,652
Int. Cl.[5] E21B *43/34*
U.S. Cl. 166—67 **7 Claims**



3. An apparatus for removing contaminants from a contaminated area of the ground having a water table and a vadose zone above the water table which comprises a perforated riser pipe extending downwardly from the surface of the ground of a level below the water table, wherein at least some of the perforations of the riser pipe are disposed below the water table, vacuum means for forming a zone of reduced pressure around said extraction well, for drawing soil gases and liquids into the extraction well, and for conveying said soil gases and liquids to the surface as a common stream, said vacuum means being in fluid communication with said perforated riser pipe, and means for receiving the common stream and separating the common stream into separate gas and liquid streams above ground.

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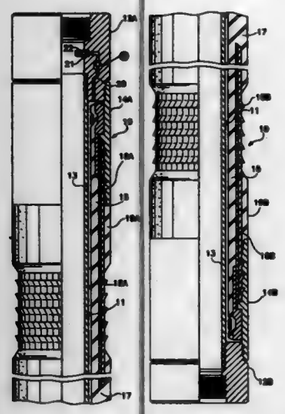
5,197,542
WELL PACKER
Malcolm G. Coone, Katy, Tex., assignor to Davis-Lynch, Inc., Pearland, Tex.
Filed Mar. 31, 1992, Ser. No. 861,299
Int. Cl.[5] E21B *33/127, 33/128*
U.S. Cl. 166—122 **3 Claims**



1. A packer for use in closing off the annulus between a casing string and a well bore in which the casing string is suspended, comprising

a tubular mandrel adapted to be connected as part of the casing string and having a head at each end,

a sleeve of elastomeric material surrounding an intermediate portion of the mandrel and anchored at its upper and lower ends to the upper and lower heads, respectively,

means by which fluid under pressure may be introduced into the annular space between the mandrel portion and sleeve so as to inflate the sleeve into engagement with the well bore,

upper and lower sets of substantially flat, relatively rigid, overlapping strips having their upper and lower ends, respectively, anchored to the upper and lower heads, and extending therefrom for disposal about only upper and lower portions of the sleeve,

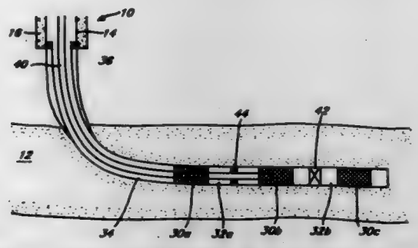
an outer layer of elastomeric material covering the free ends of the strips, and

means on the outer surfaces of the uncovered portions of both sets of strips for gripping the well bore following inflation of the mid portion of the sleeve intermediate the free ends of the strips against the well bore, so as to prevent the upper and lower portions of the sleeve from being folded back over the ends of the mandrel.

5,197,543
HORIZONTAL WELL TREATMENT METHOD
Gerald R. Coulter, Plano, Tex., assignor to Oryx Energy Company, Dallas, Tex.
Filed Mar. 16, 1992, Ser. No. 851,316
Int. Cl.[5] E21B *33/13, 37/08, 43/27, 49/00*
U.S. Cl. 166—250 **19 Claims**

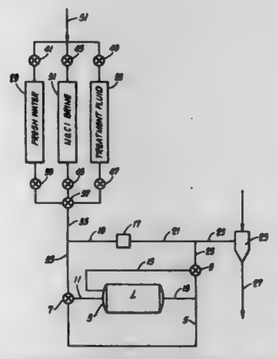
12. A method for improving the production from a horizontal well drilled through an unconsolidated formation and having in the horizontal portion of the wellbore at least two segments of screen separated by segments of blank pipe comprising:

(a) placing packers in blank pipe segments to isolate a selected segment of screen for injection of fluid through the screen segment; and



(b) injecting a treating fluid through the selected segment of screen.

5,197,544
METHOD FOR CLAY STABILIZATION WITH QUATERNARY AMINES
Ronald E. Himes, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Continuation of Ser. No. 657,700, Feb. 28, 1991, Pat. No. 5,097,904. This application Dec. 18, 1991, Ser. No. 809,783
Int. Cl.[5] E21B *33/138, 43/26, 43/27*
U.S. Cl. 166—294 **16 Claims**



1. A method of treating a subterranean formation comprising contacting said formation with an aqueous treatment fluid containing a formation control additive in an amount effective to stabilize said formation, said additive comprising a quaternary ammonium compound selected from compounds of the general formulas:

R_1BR_1Z,
$R_1BR_2BR_1Z$,

R_1DR_1Z and
R_1

R_1
R_1FR_1Z
R_1

wherein

B represents the group

D represents the group

and
F represents

and further wherein:

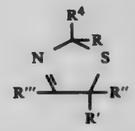
R_1 is selected from the groups $—CH_2COOH$, $—CH_2CH_2OH$, $—CH_2CH_2CH_2OH$ and $—CH_2CHOHCH_3$;

R_2 is selected from the groups $—CH_2CH_2—$, $—CH_2CHOHCH_2—$, $—CH_2CH_2CH_2—$, $—CH_2CH_2CH_2CH_2—$, and $—CH_2CH_2OCH_2CH_2—$, and

Z is an anion selected from halides, nitrates, nitrites, sulfites, sulfates and carboxylates.

5,197,545
VOLATILE CORROSION INHIBITORS FOR GAS LIFT
Bernardus A. M. Oude Alink; Richard L. Martin, both of St. Louis; James A. Dougherty, Manchester, and Benjamin T. Outlaw, St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.
Filed Oct. 1, 1991, Ser. No. 769,313
Int. Cl.[5] E21B *43/00*
U.S. Cl. 166—372 **13 Claims**

1. A method for vapor phase corrosion and transport a of corrosion inhibitor in a vapor phase to subsequent liquid corrosion sites in a gas lift process in which a lift gas is pumped into a well to facilitate petroleum production of the well, comprising introducing to the lift gas a corrosion-inhibiting amount of an inhibitor comprising a dihydrothiazole of the formula



wherein R, R′, R″, R‴ and R^4 are independently selected from the group consisting of hydrogen and alkyl groups of up to about 3 carbon atoms, provided that the total number of carbon atoms of R, R′, R″, R‴ and R^4 does not exceed about 14.

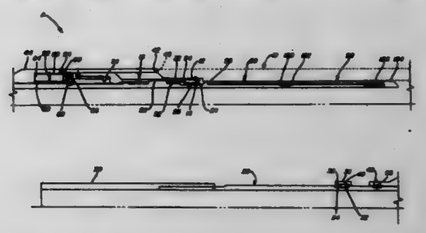
5,197,546
SNAP-IN/SNAP-OUT ANCHOR
Donald Murray, Aberdeen, Scotland, assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Jul. 18, 1991, Ser. No. 732,472
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—382 **20 Claims**

1. An apparatus for selective anchoring to a downhole tool having a gripping surface comprising,

a body,

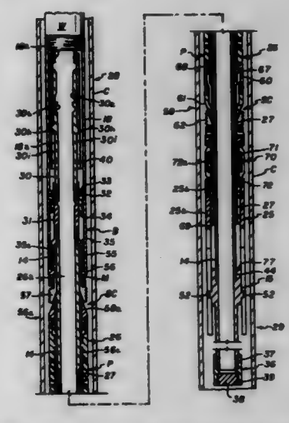
gripping means on said body for selective secured engagement to the gripping surface on the downhole tool,

securing means on said body operable on said gripping



means to selectively sustain said gripping means secured with the gripping surface, in a first position, or, to facilitate unsecured contact between said gripping means and the gripping surface in a second position.

5,197,547
WIRELINE SET PACKER TOOL ARRANGEMENT
Allen B. Morgan, Box 1708, Jena, La. 71342
Filed May 18, 1992, Ser. No. 884,955
Int. Cl.[5] E21B *33/12*
U.S. Cl. 166—387 **19 Claims**



1. A wireline set packer tool for use with a wireline pressure setting assembly to engage and releasably secure a packer with the surface which defines an opening in a well bore, the wireline set packer tool including:

a mandrel;

said mandrel having a longitudinal bore therein and an upper and a lower end;

a packer support on said mandrel;

a packer on said packer support;

said packer support having an upper end;

said packer support having a lower end;

said packer support lower end including an end portion movable relative to said packer support to expand and engage the packer with the surface which defines the opening in the well bore;

a spring support body on said mandrel;

said spring support body having a lower end;

a collapsed spring supported by said spring support body;

a frangible member releasably securing said spring support body with said collapsed spring thereon on said mandrel;

a member surrounding a portion of said mandrel;

said member having an upper end adjacent said packer support movable end portion;

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5,197,553

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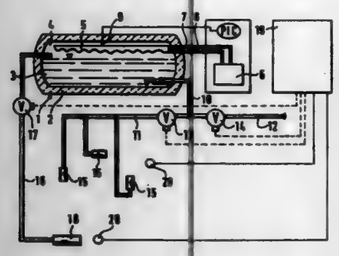
said member having a lower end;
a J slot on said member having longitudinally extending main slot portion communicating with a circumferentially offset slot portion at each end of said main slot portion to provide upper and lower slot portions on said member;
lug means on said mandrel in said lower slot portion on said member; and
first cooperating surfaces on said upper end of said packer support and on said lower end of said spring support body and second cooperating surfaces on said lower movable end portion of said packer support and on said upper end of said member to releasably secure said packer engaged with the surface defining the opening in the well bore.

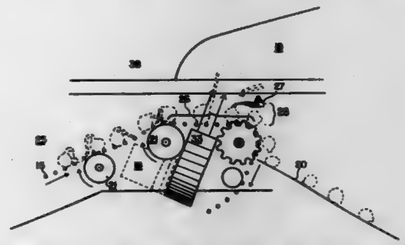
5,197,548
FIRE EXTINGUISHING DEVICE WITH STORAGE TANK FOR A LOW-BOILING LIQUEFIED GAS WHICH SERVES AS EXTINGUISHING AGENT
Wolfgang Volker, Toulsvorst, and Karl F. Striewisch, Essen, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany
Filed Jan. 21, 1992, Ser. No. 823,712
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1991, 4101668
Int. Cl.[5] A62C *35/13*
U.S. Cl. 169—11 **12 Claims**



1. In a fire extinguishing device with a storage tank for a low-boiling liquefied gas which serves as an extinguishing agent, at least one connection line equipped with shut-off valves and outlet nozzles leading from the storage tank into the area to be protected, and a fire monitoring device which actuates the shut-off valves and which has sensors in an area to be protected, the improvement being said storage tank having a head space and a liquid space, a cryo-compressor being located in said head space of said storage tank, said cryo-compressor being connected with an external cooling mechanism, and said extinguishing agent in said storage tank being argon.

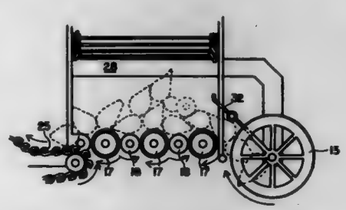
5,197,549
ONION TOPPER
David Shuff, Parma, Id., assignor to Specialized Parts & Manufacturing Co., Parma, Id.
Filed Nov. 7, 1991, Ser. No. 789,255
Int. Cl.[5] A01D *21/04, 33/02*
U.S. Cl. 171—17 **4 Claims**

1. In an onion harvesting and topping machine comprising:
a front-end onion gathering and lifting assembly;
an onion transport assembly connected to said gathering and lifting assembly for moving the onions upwardly and backwardly within said topping machine;
a substantially horizontal cutting table connected to said transport assembly for receiving the onions, said cutting table being pervious to air;
a fan for blowing air under positive pressure upwardly through said cutting table, said fan being spaced apart from beneath said cutting table and being connected to beneath said cutting table by suitable ductwork;
a cutting assembly for receiving onion tops of onions on said cutting table, said cutting assembly being spaced apart above said cutting table;
a discharge chute for receiving cut onion tops from said cutting assembly; and
a discharge assembly connected to said cutting table for receiving onions with their tops removed,



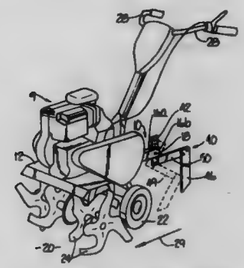
the improvement which comprises the fan being positioned on the machine so that the ductwork connecting the outlet of the fan to beneath the cutting table extends first down from the fan and then passes up to beneath the cutting table.

5,197,550
MECHANIZED BEET HARVESTER
W. Teanan Barnard, Wilder, Id., assignor to PARMA Company, Parma, Id.
Filed Nov. 20, 1991, Ser. No. 794,963
Int. Cl.[5] A01D *25/04*
U.S. Cl. 171—58 **1 Claim**



1. A mechanized beet harvester comprising
a. a front-end beet digging and lifting assembly for working a plurality of beet rows, said front-end assembly consisting of one set of lifter wheels and one set of paddles for each row of beets to be worked;
b. a grabroll assembly for receiving beets directly from the said digging and lifting assembly, without an additional conveying means between said digging and lifting assembly and said grabroll assembly, which grabroll assembly directs the beets inwardly from both ends of the grabroll assembly towards the center of the harvester and backwardly towards the back of the harvester, said grabroll assembly comprising alternating spiral and smooth grabrolls with their axes aligned in respective level planes, and;
c. an elevator assembly for receiving beets directly from the said grabroll assembly, which elevator assembly is without an additional conveying means between it and said grabroll assembly, which elevator assembly has a pick-up level lower than the top of the said grabroll assembly, and which elevator assembly lifts the beets to a storage and discharge assembly.

5,197,551
EXTENDED DRAG TOOL FOR A FRONT TINE TILLER
John L. Farley, 2908 Messanie St., St. Joseph, Mo. 64501
Filed Sep. 16, 1991, Ser. No. 760,882
Int. Cl.[5] A01B *33/04, 33/16*
U.S. Cl. 172—42 **10 Claims**

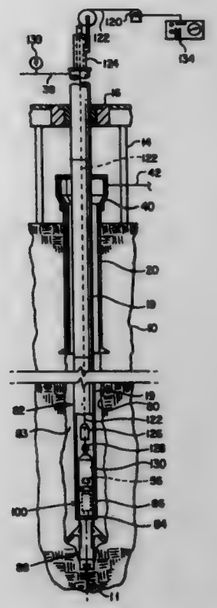


6. In a tiller having a frame with ground engaging wheels thereon defining forward and rearward directions of movement, and a plurality of earth-tilling rotary tines forward of said wheels, wherein said frame has a rearwardly extending portion, the combination therewith of:
a support element depending from said frame portion,
means on said portion substantially preventing movement of said support element relative to said frame to the right or the left of said directions of movement,
a control arm attached to said support element, extending generally rearwardly therefrom and having means for receiving directional forces applied thereto by a user, and
a drag tool extending downwardly from said control arm to engage and penetrate the ground whereby user applied directional force on said control arm changes the angle and depth of engagement of said drag tool with the ground to alter the direction of movement and rate of travel of the tiller.

5,197,552
COLLAPSIBLE BAR ASSEMBLY FOR AGRICULTURAL EQUIPMENT
Philip Di Maria, 18 Catherine Street, Morwell, Victoria, 3840, Australia
Filed Oct. 18, 1991, Ser. No. 779,243
Claims priority, application Australia, Oct. 19, 1990, PK2911/90; Mar. 6, 1991, PK4952/91
Int. Cl.[5] A01B *61/00*
U.S. Cl. 172—264 **9 Claims**

6. A collapsible bar assembly comprising a first bar, a second bar pivotally connected to the first bar by first pivot means, second and third pivot means for establishing pivotal connections of the ends of the bar assembly to other bodies, the pivot axis of the first pivot means being laterally offset relative to a line passing through the pivot axes of the second and third pivot means and restraining means for holding the assembly in an expanded condition until compressive forces applied via the second and third pivot means exceed a predetermined value whereupon the restraining means yields to permit pivotal movement of the first and second bars about the first pivot axis, and wherein said restraining means comprises a roller which is resiliently biased into contact with a tongue member affixed to the second bar.

5,197,553
DRILLING WITH CASING AND RETRIEVABLE DRILL BIT
Richard E. Leturno, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Aug. 14, 1991, Ser. No. 744,859
Int. Cl.[5] E21B *7/00*
U.S. Cl. 175—57 **3 Claims**



1. A method of drilling a well with a well casing as an elongated tubular drillstem and a motor and bit assembly retrievable from the lower distal end of said drillstem without withdrawing said drillstem from a wellbore being formed by said motor and bit assembly and said drillstem, said method comprising the steps of:
providing said casing as said drillstem including a sub disposed at said lower distal end and including means on said sub for engaging said motor and bit assembly to lock said motor and bit assembly to said drillstem to provide for drilling operations;
providing a motor as a pressure fluid operated motor including means for rotating a bit without rotating said drillstem;
providing a bit including cutter means radially movable with respect to the central longitudinal axis of said drillstem under the urging of pressure fluid to provide for cutting said wellbore and to provide for inserting and retrieving said bit through said sub;
inserting said drillstem and said motor and bit as said motor and bit assembly into said wellbore and introducing pressure fluid into said drillstem to act on said motor and bit assembly to effect rotation of said bit and to extend said cutter means into a position for cutting said wellbore to a diameter greater than the diameter of said drillstem;
removing said motor and bit assembly from said distal end of said drillstem upon completion of said wellbore without removing said drillstem from said wellbore; and
leaving said drillstem in said wellbore to serve as said casing for said well.

proper thickness, having four equal columns vertically
pivoting the guide body and the handle and for holding

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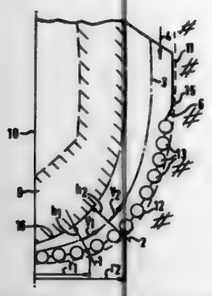
5,197,554
ROTARY DRILL BIT FOR DRILLING THROUGH STICKY FORMATIONS

Djurre H. Zijsling, Assen, Netherlands, assignor to Shell Internationale Research Maatschappij B.V. The Netherlands, The Hague, Netherlands

Filed Oct. 19, 1989, Ser. No. 422,885
Claims priority, application United Kingdom, Oct. 20, 1988, 8824546
Int. Cl.[5] E21B *10/60*
U.S. Cl. 175—393 5 Claims



1. A rotary bit for drilling through sticky formations, the bit comprising:
a bit body on which a plurality of cutting wings are mounted, said wings extending along the bit body from a central axis of the bit towards the gauge of the bit, and
a plurality of waterways for transporting drilling fluid and rock flour to the gauge of the bit, each waterway being formed between a pair of adjacent wings and having at each point along its length a cross-sectional area A measured in a plane perpendicular to the central chord of the waterway, wherein a cross-sectional area A_2 of the waterway in a second plane and a cross-sectional area A_1 of the same waterway in a first plane satisfy the relation: $A_2 \geqq A_1(r_2/r_1)^2$, where r_1 is the average radius at which said first plane crosses the tips of adjacent cutting wings, said radius being measured from the central axis of the bit, r_2 is the average radius at which said second plane crosses the tips of adjacent cutting wings, said radius being measured from the central axis of the bit, and r_2 is larger than r_1.

5,197,555
ROCK BIT WITH VECTORED INSERTS

Roy D. Estes, Weatherford, Tex., assignor to Rock Bit International, Inc., Fort Worth, Tex.

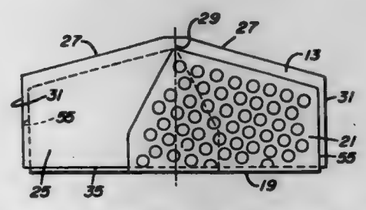
Filed May 22, 1991, Ser. No. 704,056
Int. Cl.[5] E21B *10/52*
U.S. Cl. 175—431 24 Claims

1. An improved roller cone cutter, the cutter being adapted for mounting on a bearing pin shaft on a roller cone rock drill bit, the axis of rotation of the improved cutter extending inwardly and through the center of the bearing pin shaft toward and offset from the axis of rotation of the drill bit, the improved roller cone cutter comprising:
a circumferential outermost heel row of wear resistant chisel shaped inserts with elongated crests;
the chisel shaped inserts in the heel row being oriented with the elongated crests at an azimuth direction from about 30 to 60 degrees from the axis of rotation of the cone cutter;
a circumferential second row of wear resistant chisel shaped inserts with elongated crests, the second row being adjacent to the inward side of the heel row;
the chisel shaped inserts in the second row being oriented with the elongated crests at an azimuth direction from about 300 to 330 degrees from the axis of rotation of the cone cutter; and
a plurality of circumferential inner rows of wear resistant chisel shaped inserts, the inner rows being adjacent to the inward side of the second row of inserts.

5,197,556
ROOF DRILL BRAZING SHIM

William M. Jordan, Abingdon, Va., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Jun. 17, 1991, Ser. No. 716,199
Int. Cl.[5] E21B *10/58*
U.S. Cl. 175—432 2 Claims



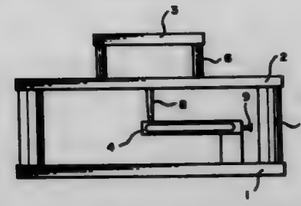
1. A butterfly-type shim locateable in a groove in a drill bit body in surrounding relation to the edge area of a plate-type cutter insert seated within the groove; said shim being formed out of a metallic sheet bent into a U cross-sectional configuration; said U cross-sectional configuration comprising an elongated flat web wall having a width dimension that is the same as the width of the plate-type cutter insert, and a length dimension that is the same as the length dimension of the groove in the drill bit body; said U cross-sectional configuration further comprising two flat flange walls bent at ninety degrees to the web wall to lie against opposite side faces of the plate-type cutter insert; each flange wall having a side edge (55) extending normal to the longitudinal axis of the web wall for alignment with a side surface of the bit body and a side edge of the cutter insert; said shim being dimensioned so that its flange walls tightly grip opposite side faces of the plate-type cutter insert when said web wall of the shim is engaged with an edge surface of the cutter insert; said metallic sheet having a series of closely spaced perforations extending therethrough; said perforations covering the entire surface of the sheet except for a peripheral area of the sheet along its edges; the sheet edges being smooth and uninterrupted, so that the sheet metal shim can be manipulated and adjusted relative to the cutter insert and drill bit body without cutting the person's fingers.

5,197,557
ELECTRONIC WEIGHING SCALE

Li-Hsiang Yaah, No. 22-3, Hao Chin Road, San Shen Village, Pu Yuan Hsiang Changhua, Taiwan

Filed Dec. 10, 1991, Ser. No. 804,404
Int. Cl.[5] G01G *3/14, 3/08*
U.S. Cl. 177—210 R 1 Claim

1. An electronic scale, the improvement comprising:
a base board made from a flat, rectangular or square plate in proper thickness, having four equal columns vertically fastened in the four corners thereof at the top;
an induction board made from a flat plate in size and shape corresponding to said base board and supported on said four equal columns above said base board;
a load board spaced from and supported on said induction board by four posts at the four corners thereof;
an inductor suspended above said base board, said inductor having a suspension end disposed right below the center of gravity of said induction board;

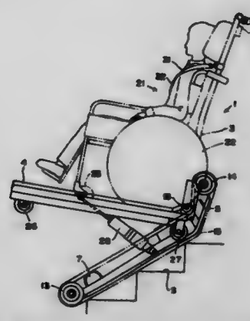


a pressure rod extending from the center of gravity of said induction board, said pressure rod having a free end stopped at the suspension end of said inductor;
wherein any load which is placed on said load board for weighing causes said pressure rod to move down the suspension end of said inductor and, the downward displacement of the suspension end of said inductor is calculated by an electronic circuit and converted into corresponding digital signals for display.

5,197,558
STAIR-CLIMBING WHEELCHAIR CARRIER

Rintaro Misawa, Saitama, Japan, assignor to Sanwa Shayo Manufacturing Co., Ltd., Japan

Filed Jul. 30, 1991, Ser. No. 737,864
Claims priority, application Japan, Oct. 18, 1990, 2-280049
Int. Cl.[5] B62B *5/02*; A61G *5/06*
U.S. Cl. 180—8.2 4 Claims

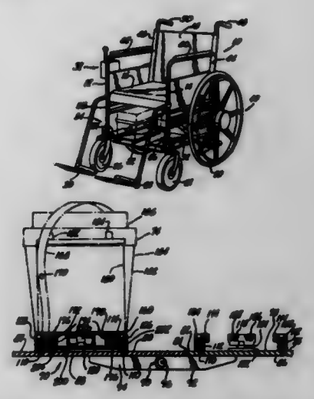


1. A stair-climbing wheelchair carrier having a carrier portion comprising a frame, a pair of endless belt crawlers and a driving motor, each of the endless belt crawlers having a span extending over two steps and an oblique overhang portion at one end of the frame which has a height higher than a usual height of a step of a stair, a handle rotatably mounted on the frame of the carrier portion, the carrier comprising:
a guide body provided to mount wheels of a wheelchair and secured to the handle so as to be pivoted together with the handle, said guide body having a caster on the underside thereof at a front portion and a pair of wheels at a rear portion so as to enable the carrier to move on the ground; and
a jack provided between the frame and the guide body for pivoting the guide body and the handle and for holding the guide body at a desired position.

5,197,559
FOLDABLE WHEELCHAIR WITH OPTIONAL POWER OR MANUAL DRIVE

Paul V. Garin, III, Clovis, and Donald E. Lusk, Fresno, both of Calif., assignors to Fortress Life-Style, Inc., Calif.

Filed Sep. 4, 1990, Ser. No. 579,156
Int. Cl.[5] B60K *1/00*
U.S. Cl. 180—65.1 3 Claims



1. A foldable motor driven wheelchair comprising:
a first and a second side frame, parallel to each other and extending in vertical and longitudinal directions;
a foldable seat carried by and extending transversely between the side frames;
a supporting structure connecting the side frames for motion between an unfolded position in which the side frames are spaced sufficiently apart to accommodate an occupant with the seat unfolded thereunder and a folded position in which the side frames are relatively closer together in side-by-side relation with the seat folded therebetween;
a motor controller supported on at least one of said side frames;
at least one electric motor supported by at least one of the side frames and electrically coupled to the motor controller;
a foldable baseplate pivotably connected to and extending between the wheelchair side frames wherein said foldable baseplate includes a first plate and a second plate movably connected to each other by a hinge assembly having a pivot point and at least one first hinge member and at least one second hinge member extending outward from said pivot plant, wherein said at least one first hinge member is attached to said first plate and said at least one second hinge member is attached to said second plate;
means of mechanically affixing said removable battery unit to said foldable baseplate;
means attached to said foldable baseplate of electrically connecting said removable battery unit to said motor controller;
wherein said first plate, having a first and a second longitudinal edge, said first longitudinal edge terminating at said first side frame and said second longitudinal edge terminating at a location between said hinge assembly and said second side frame and said second plate, having a first and a second longitudinal edge, said first longitudinal edge terminating at said second side frame and said second longitudinal edge terminating at a location between said hinge assembly and said second said frame; and
wherein, when the wheelchair is in the unfolded position,

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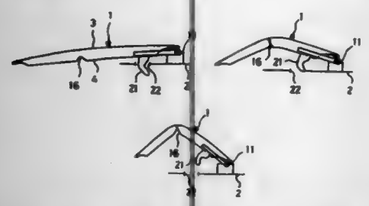
said baseplate is positioned sufficiently beneath the seat to permit at least on removable battery unit to be accommodated between said baseplate and the seat, said hinge assembly is in a first position and said first and said second plates are longitudinally adjacent to each other, and wherein, when the wheelchair is in the folded position and said removable battery unit is removed, said hinge assembly is moved to a second position located relatively above said first position and said first and said second plates are moved to an angle relative to each other, approaching parallel positions in longitudinal planes.

5,197,560
SAFETY STOP MECHANISM FOR HOOD OF AUTOMATIVE VEHICLE

Yoshio Oda, Kure, and Wataru Tsutagawa, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 29, 1991, Ser. No. 798,726
Claims priority, application Japan, Nov. 30, 1990, 2-130446[U]
Int. Cl.[5] B62D *25/12*
U.S. Cl. 180—69.21 **11 Claims**



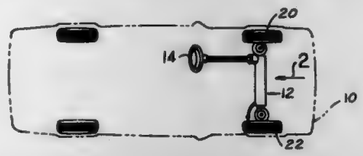
1. A hood safety stop mechanism for restricting backward movement of a hood relative to a car body during a front-end collision of an automotive vehicle, said hood being pivoted at a rear end thereof by a hinge mechanism secured to said car body, said hood safety stop mechanism comprising:
bending means, provided in said hood, for allowing said hood to bend convexly upward at approximately an intermediate portion, said car body including an opening, defined by an elongated hole; and
a hook, secured to said hood, formed with a concavely curved rear edge aligned with an edge of said elongated hole, said hook being located within said opening without any engagement between said concavely curved rear edge and said edge of said hole, said hook initially being brought into engagement with said edge of said hole when said hood begins to pen and starts to bend at said bending means due to a front-end collision, then being disengaged from said edge of said hole when said hood is opened to a predetermined disengaging angle, said hook then escaping from said hole as said hood further bends at said bending means during further opening of said hood, said hood finally being fully bent.

5,197,561
OFFSET STEERING GEAR ASSEMBLY

Thomas C. Holka, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 594,903, Oct. 9, 1990, Pat. No. 5,082,077. This application Nov. 12, 1991, Ser. No. 802,805
Int. Cl.[5] B62D *3/12*
U.S. Cl. 180—79.3 **8 Claims**

1. A steering system for use in a vehicle comprising:
a pinion gear operatively connected to a steering wheel through a linkage;
an elongate rack member operative to meshingly engage said pinion gear and move reciprocally in response to rotation of said steering wheel;
a rack housing for a supporting a said rack member for reciprocal movement therein;
a pair of tie rods, each one of said pair being operatively associated with a steerable road wheel of said vehicle; and
gear means meshingly engageable with said rack member and directly drivingly engageable with said tie rod to

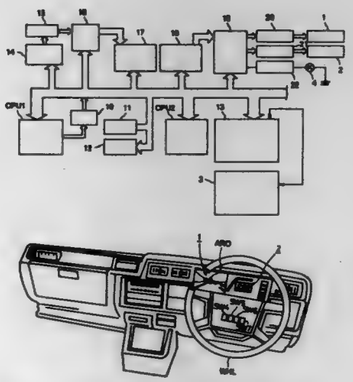


effect reciprocal movement thereof in response to reciprocal movement of said rack member, said gear means comprising a pair of articulated gears, each one of said pair of articulated gears being associated with each one of said pair of tie rods, and each one of said pair of articulated gears being pivotally attached to said rack housing between said rack member and said tie rod.

5,197,562
VEHICLE CRUISING CONTROL DEVICE

Toshiaki Kakinami, Ibaraki; Takashi Hida, Aichi; Jun Sato, and Mitsuyoshi Saiki, both of Ibaraki, all of Japan, assignors to Aisin Seiki K.K., Kariya, Japan

Filed Apr. 29, 1991, Ser. No. 693,261
Claims priority, application Japan, Apr. 28, 1990, 2-112336
Int. Cl.[5] B60T *7/16*; B60K *31/02*
U.S. Cl. 180—169 **6 Claims**

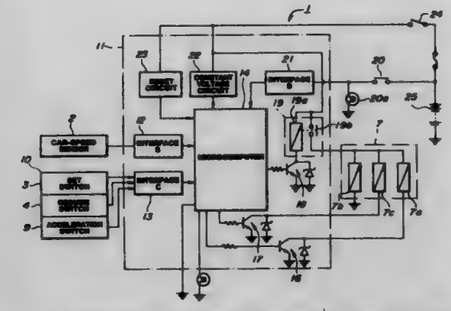


1. A vehicle cruising control device comprising:
detecting means for detecting the current speed of a first vehicle;
measuring means for measuring current inter-vehicle distance between said first vehicle and a second advance vehicle;
calculating means for calculating the relative speed between the first vehicle and the second advance vehicle and for calculating a degree of danger based on said distance and said relative speed;
inter-vehicle distance control means for maintaining the inter-vehicle distance between the first vehicle and the second advance vehicle at a predetermined distance based on an output from said measuring means when said degree of danger determined by said calculating means exceeds a predetermined value;
constant speed control means for maintaining the speed of the first vehicle at a selected speed based on an output from said detecting means when said degree of danger is less than said predetermined value;
control means for operating one of said inter-vehicle distance control means and said constant speed control means exclusive of the other based on said degree of danger; and
switching means for selectively activating either one of said constant speed control means and said inter-vehicle distance control means regardless of said degree of danger.

5,197,563
CONSTANT-SPEED CRUISING CONTROL SYSTEM FOR VEHICLES

Kazutaka Sakonju, and Eisaku Hori, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Yokohama, Japan

Filed Jun. 7, 1991, Ser. No. 711,849
Claims priority, application Japan, Jun. 8, 1990, 2-150183
Int. Cl.[5] G10K *11/00*
U.S. Cl. 180—176 **2 Claims**

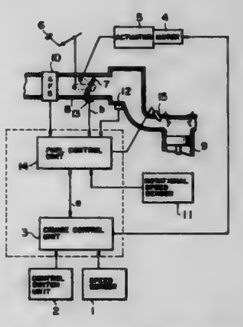


1. A constant-speed cruising control system for a vehicle comprising:
a car-speed sensor for detecting a running speed of a vehicle and generating car-speed data proportional to the running speed of the vehicle;
command switch means including a set switch for generating a setting signal and a resume switch for generating a resuming signal;
car-speed data memorizing means for storing the car-speed data supplied from said car-speed sensor as cruising speed data in response to the operation of said set switch of said command switch means;
a cancelling switch for producing a cancelling signal responding to braking means of the vehicle;
an actuator for driving a throttle of the vehicle;
controlling means connected to said car-speed sensor, said command switch means, said car-speed data memorizing means, said cancelling switch and said actuator; said controlling means being responsive to a first setting signal from said set switch of said command switch means for controlling the running speed of the vehicle under a first cruising control state so as to coincide with a cruising speed defined as a first stored cruising speed data in said car-speed data memorizing means in response to a first operation of said set switch of said command switch means, the cancelling signal from said cancelling switch for cancelling the first cruising control state, the resuming signal from said resume switch of said command switch means for controlling the running speed of the vehicle under a resuming control state so as to resume the running speed of the vehicle to the cruising speed of the first cruising control state, and a second setting signal generated from said set switch of said command switch means for controlling the running speed of the vehicle under the resuming control state so as to coincide with a cruising speed defined as a second stored cruising speed data in said car-speed data memorizing means in response to second operation of said set switch of said command switch means; said control means generating a first set initializing signal in proportion to the running speed of the vehicle at the time of said first operation of said set switch of said command switch means to supply the first set initializing signal to said actuator for driving the throttle of the vehicle, a resume initializing signal in proportion to the running speed of the vehicle at the time of operation of said resume switch of said command switch means to supply the resume initializing signal to said actuator for driving the throttle of the vehicle, and a second set initializing signal in proportion to the running speed of the vehicle at the time of said second operation of said set switch of said command switch means;
wherein said controlling means includes:
counter means for counting the sum total of duration time of signals supplied to said actuator during the resuming state by which the throttle of the vehicle is driven in an acceleration direction of the vehicle;
subtracting means for subtracting the duration time of the second set initializing signal from the sum total of duration time counted in said counter means and for generating a subtracting signal; and
reset initializing signal generating means for generating a reset initializing signal of duration time determined from the subtracting signal generated in said subtracting means to supply the reset initializing signal to said actuator for driving the throttle of the vehicle in a deceleration direction of the vehicle.

5,197,564
CRUISE CONTROL APPARATUS FOR A VEHICLE

Yukinobu Nishimura, and Kazuyori Katayama, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

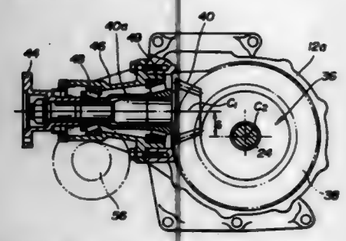
Filed Nov. 5, 1991, Ser. No. 787,821
Claims priority, application Japan, Nov. 7, 1990, 2-305045; Nov. 7, 1990, 2-305046
Int. Cl.[5] B60K *31/04*
U.S. Cl. 180—179 **2 Claims**



1. A cruise control apparatus for a vehicle with an internal combustion engine comprising:
cruise control means adapted to be actuated by a driver of the vehicle for automatically controlling the opening degree of a throttle valve so that the speed of the vehicle is maintained at a predetermined target speed;
fuel control means for controlling fuel supply to the vehicle engine such that the fuel supply is cut off when the throttle valve is moved to a fully closed position thereof with the number of revolutions per minute of the engine being equal to or greater than a predetermined value during cruise control; and

means for cancelling the fuel cut-off when the speed of the vehicle decreases below a predetermined lower limit for the target speed during cruise control, and at the same time, temporarily interrupting cruise control for a predetermined length of time.

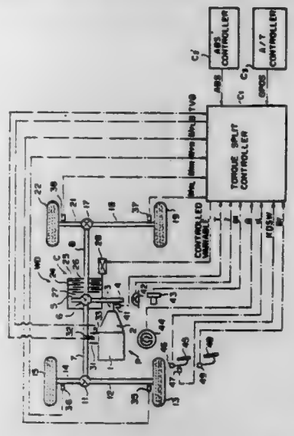
5,197,565
TRANSFER FOR FOUR-WHEEL DRIVE VEHICLES
Hideki Sudo, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 8, 1991, Ser. No. 696,573
Claims priority, application Japan, May 10, 1990, 2-120334
Int. Cl.[5] B60K *17/34, 17/344*
U.S. Cl. 180—248 **7 Claims**



1. A vehicle comprising:
two wheel axles;
a transfer having a center differential disposed concentric with one of the wheel axles, a first transfer shaft disposed concentric with the one wheel axle for transmitting engine power from said center differential to the one wheel axle, a second transfer shaft disposed concentric with the one wheel axle and said first transfer shaft for transmitting engine power from said center differential to the other of the wheel axles, a ring gear drivingly connected to said second transfer shaft for rotation therewith, and a pinion gear meshed with said ring gear in such a manner that a center axis of said pinion gear intersects a center axis of said ring gear at right angles and that a place where said pinion gear and said ring gear are meshed with each other is located higher than the center axis of said ring gear; and
a steering gear rack disposed under said pinion gear.

5,197,566
DIFFERENTIAL CONTROL SYSTEM FOR FOUR-WHEEL DRIVE VEHICLE
Kenichi Watanabe; Eizi Nishimura; Kaoru Sotoyama; Mitsuru Nagaoka, and Osamu Kameda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jan. 18, 1991, Ser. No. 642,975
Claims priority, application Japan, Jan. 19, 1990, 2-11059
Int. Cl.[5] B60K *17/35*
U.S. Cl. 180—249 **9 Claims**

1. A differential control system for a four-wheel drive vehicle comprising:
a center differential gear for continuously transmitting output torque of a power plant to both front and rear wheels in such a manner as to permit the front and rear wheels to rotate at different speeds,
a rotational speed detecting means for detecting the rotational speeds of the front and rear wheels of the vehicle,
a differential rotation limiting means for controlling the center differential gear to limit differential rotation of the front and rear wheels to a degree which is increased as the difference in rotational speed between the front and rear wheels increases, and
a steering angle determining means for determining a steering angle of the vehicle;
wherein the degree of limitation on the differential rotation of the front and rear wheels is changed according to predetermined characteristics which provides a gain in a range where the difference in rotational speed being relatively large, said gain is reduced when a steering angle of the vehicle is not less than a predetermined value the gain

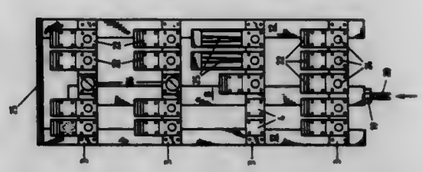


reduction based on the steering angle of the vehicle is cancelled when a vehicle speed is greater than or equal to a predetermined vehicle speed.

5,197,567
REPLACEMENT DRAIN HOLE CLOSURE
Keith J. Rabalais, Alexandria, La., assignor to R & B, Inc., Colmar, Pa.
Filed May 10, 1991, Ser. No. 698,153
Int. Cl.[5] F16N *33/00*
U.S. Cl. 184—1.5 **20 Claims**

1. A removable replacement closure assembly for the drain hole of an engine fluid reservoir, said assembly comprised of:
a shaft with a threaded portion at a first end thereof and an end cap at the other end;
a generally rectangular clamping member sized to pass through the drain hole and into the reservoir and including a threaded portion that mates with the threaded portion of the shaft, the clamping member has a length which is greater than the maximum dimension of the drain hole and pivots on the shaft, the clamping member is retained on the shaft by a modification of the first end which prevents complete unthreading of the shaft from the clamping member;
a resilient sealing member having a sealing surface area which is greater than the area of the drain hole and a central aperture through which the shaft passes, the material of the sealing member withstands continuous heat of at least 250 degrees Fahrenheit; and
a backing member attached to the shaft at a position spaced from the clamping member and below the sealing member so that the sealing member is positioned between the backing member and the clamping member and the end cap of the shaft contacts the backing member.

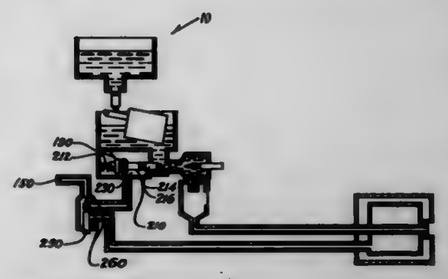
5,197,568
ASSEMBLING SERIES OF DISTRIBUTION AND MEASURING UNITS FOR A LUBRICATING OIL SYSTEM AND FOR MANUFACTURING THE PRINCIPAL COMPONENTS OF THE SERIES
Kalevi V. Horttonen, Vuorenjuuri 5, SF-40950 Muurame, Finland
PCT No. PCT/FI89/00116, § 371 Date Dec. 12, 1990, § 102(e) Date Dec. 12, 1990, PCT Pub. No. WO89/12779, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 15, 1989, Ser. No. 623,760
Claims priority, application Finland, Jun. 16, 1988, 882870
Int. Cl.[5] F16N *27/00*
U.S. Cl. 184—7.4 **4 Claims**



1. An assembling series of distribution and measurement unit for a lubricating oil system for machinery consisting of several bearings, said series includes at least two distribution beams of different sizes, each beam being equipped with a longitudinal channel and input connections, which has two or more output connections located at right-angles to the channel for flowmeters and other components, and the purpose of said series is to achieve a lubricating oil distribution and measurement unit for various cases, characterized in that the longitudinal channels are otherwise unrestricted and the series includes at least two feed beams of different sizes, said feed beams being connected to said distribution beams and extending in a transverse direction in relation to said distribution beam to feed the distribution beams and which variously-sized distribution beams are equipped with a plurality of output connections, each defined by a opening in which each opening is surrounded by a gasket against which a gasket surface of the component to be connected is compressed, and said series includes a blind plate or other standard plug to close surplus output connections wherein said distribution and feed beams include attachment holes spaced in said beams, wherein the spacing of the output connections and the attachment holes is standard in most of the distribution beams of the series and that the input connection can be staggered between two output connections on the opposite side of the beam, wherein both the distribution and feed beams have a generally squared cross sectional shape defining a central passageway which forms the oil channel and an end hole of the beams of which are equipped with an input connection plug or feed pipe connector for installation and in both of which a similar output connection is used.

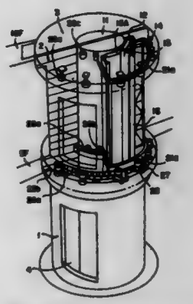
5,197,569
CONSTANT DEPTH RESERVOIR
David A. Roessler, Hartland; Donald R. Jung, Oconomowoc; Robert D. Jung, Brookfield; Charles F. Pace, Waukesha, and Michael J. Doperalski, Sussex, all of Wis., assignors to Trico Mfg. Corp., Pewaukee, Wis.
Filed May 26, 1992, Ser. No. 888,955
Int. Cl.[5] F16N *7/30*
U.S. Cl. 184—55.1 **5 Claims**

3. An apparatus for regulating an amount of a friction reducing lubricant applied to a surface of a workpiece, the apparatus comprising:
a primary reservoir, for containing the friction reducing lubricant, having an opening;
a constant depth reservoir connected to said primary reservoir through said opening for receiving the lubricant;
said constant depth reservoir including a liquid drop control valve, an orifice and a valve and float assembly;
said liquid drop control valve capable of opening and closing said orifice;
said valve and float assembly capable of opening and closing said opening;



a sight feed having an inlet connected to said constant depth reservoir through said orifice, an outlet connected to a venturi nozzle chamber having a nozzle, and an atmospheric vent;
a means for supplying compressed air to said nozzle through said nozzle chamber for dispersing the lubricant from said outlet.

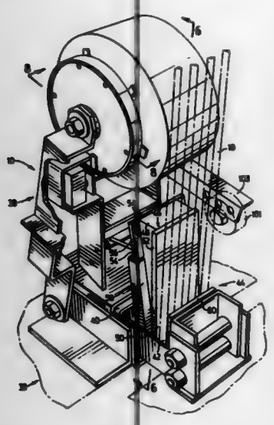
5,197,570
LINEAR MOTOR DRIVEN ELEVATOR WITH PASSING FUNCTION
Nobuyuki Matsui, Ichikawa, Japan, assignor to Kajima Corporation, Tokyo, Japan
Filed Apr. 7, 1992, Ser. No. 864,762
Claims priority, application Japan, Apr. 16, 1991, 3-83728
Int. Cl.[5] B66B *9/16*
U.S. Cl. 187—16 **1 Claim**



1. An elevator system having a substantially cylindrical elevator shaft comprising therein:
a fixed shaft portion;
a lower turning portion disposed adjacent a lower part of said fixed shaft portion;
an upper turning portion disposed adjacent an upper part of said fixed shaft portion;
a center core extending axially through each of said fixed shaft portion, lower turning portion and upper turning portion;
an ascending passage formed on a first side of said center core and extending axially adjacent thereto;
a descending passage formed on a second side of said center core opposite to said first side and extending axially adjacent thereto;
a local line, a passing line and a siding area sectionally pro-

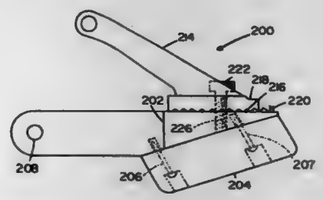
vided and axially extending within both said ascending and descending passages;
a plurality of cages disposed within at least one of said ascending and descending passages for moving axially in a first direction in said ascending passage and for moving in an opposite direction in said descending passage;
wherein said plurality of cages are provided with permanent magnets;
wherein said center core is provided with linear motor primary coils for interacting with said magnets provided on said cages;
a plurality of switch frames axially and turnably disposed along at least one of said ascending and descending passages, each of said switch frames comprising a frame, a linear motor primary coil and a turning means for turning the frame; and
locking means for selectively locking a cage of said plurality of cages to a respective frame of a switch frame of said plurality of switch frames.

5,191,571
SELF CENTERING ELEVATOR CABLE SAFETY BRAKE
Michael P. Barrell, 135 Ormont Drive Unit #5, Weston, Ontario, Canada M9L 1N6, and Ryszard J. Ambrozy, 2415 Jane St. Apt. 606, Downsview, Ontario, Canada M3M 1A9
Continuation of Ser. No. 709,731, Jun. 3, 1991, Pat. No. 5,101,937. This application Mar. 26, 1992, Ser. No. 858,365
The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.
Int. Cl.[5] B66B *5/00*
U.S. Cl. 187—74 **24 Claims**



1. A safety braking device for use on elevator cables which extend between an elevator car and counterweight, said device comprising:
a first brake pad mounted adjacent one side of said elevator cables;
a second brake pad mounted adjacent the opposite side of said elevator cables, at least one of said first and second brake pads being moveable between a free-running position and a braking position;
a biaser mounted between a stop and one of said brake pads for urging at least one of said first and said second brake pads toward said elevator cables, said biaser being compressed as at least one of said first and second brake pads moves to said braking position;
means for compressing the biaser independent from displacement of said elevator cables; and
means for releasing at least one of said first and said second brake pads from said free-running position;
wherein after at least one of said brake pads is released by said release means, said released brake pad frictionally engages said elevator cables which move said released brake pad to said braking position, increasingly compressing said biaser, thereby continually increasing the force of said released brake pad against said elevator cables until said elevator cables are stopped.

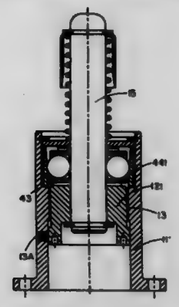
5,197,572
IN-LINE SKATE BRAKE SYSTEM
Jeffrey A. Roberts, 12851 Floral Ave., Apple Valley, Minn. 55124
Continuation-in-part of Ser. No. 691,450, Apr. 25, 1991. This application Sep. 6, 1991, Ser. No. 756,155
Int. Cl.[5] A63C *17/14*
U.S. Cl. 280—11.2 **2 Claims**



1. In combination, a cast member and a rubber pad for an in-line skate having a plastic brake support mounted on a rear axle, comprising:
a. a cast metal member including a lower member and an upper geometrically configured member having a top surface at an acute angle to the lower member with at least two raised edges and a rear edge for engaging with the brake support and with a first screw hole for receiving a screw for attaching the member to the brake support, and the lower member have a rear portion extending to the rear of the brake support and having second and third screw holes for receiving two pad screws; and,
b. a rubber pad including two pad screw holes for receiving two pad screws for attaching the pad onto said lower member.

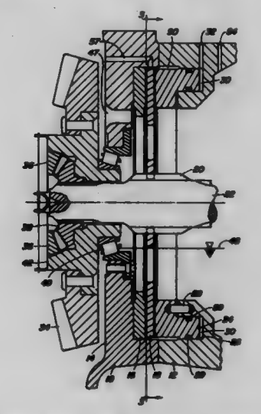
5,197,573
ENERGY DISSIPATOR
Horacio M. De La Fuente, Boulder, Colo.; Kornel Nagy, Houston, and Clarence J. Wesselski, Alvin, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Feb. 15, 1991, Ser. No. 656,925
Int. Cl.[5] F16D *63/00*
U.S. Cl. 188—67 **6 Claims**

1. An energy dissipator system for absorbing kinetic energy between relatively movable elements at a constant rate, said energy dissipator system including:
a hollow support housing;
an energy rod member, said rod member being slidably disposed in said support housing and defining an annular recess with said support housing;
said rod member and said support housing being relatively displaceable and adapted for independent connection to external relatively moveable elements;
energy dissipator means disposed in said annular recess and including an elastically expandable sleeve member having an internal frusto conical tapered surface disposed at an angle relative to the outer surface of said rod member



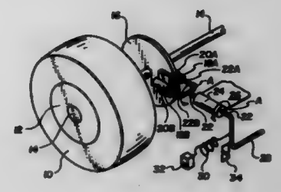
which angle is less than a locking taper angle and including rolling members disposed in contacting relationship between the outer surface of said rod member and said tapered surface; and
a stop portion disposed in said housing providing means for limiting travel of said rolling members upon movement of said rod member relative to said tapered surface in a first direction of relative movement said stop portion being adjustable relative to said housing for changing the spacing between said rolling members and said stop portion for developing a constant sliding friction force on said rod member during such relative movement.

5,197,574
OIL SYSTEM FOR A BRAKE DISK
Hissam Al-Deen, Heidelberg; Martin Hofer, Mannheim, and Jürgen Gärther, Worms, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.
Filed Jun. 27, 1991, Ser. No. 722,623
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1990, 4021188
Int. Cl.[5] F16D *65/78*
U.S. Cl. 188—71.6 **14 Claims**



1. An oil system for a disk brake, comprising:
a brake disk having brake linings which are provided with generally radially directed grooves through which oil flows from the radially inner portion of the brake lining to the radially outer portion of the brake lining, said brake disk having a maximum intended rotational operating speed;
an oil supply for the brake disk providing oil to said grooves;
at least one oil collection channel located radially out from the brake linings for collecting oil expelled from said grooves; and
at least one oil return passage through which oil is returned to said oil supply, said return passage being sized to throttle the flow of oil at least when said brake disk is rotating at a high speed less than said maximum intended rotational operating speed.

5,197,575
SMALL VEHICLE BRAKING SYSTEM
U. Stancel Mangum, 838 E. 6600 South; Kim S. Mangum, 375 E. Brahma Dr., both of Murray, Utah 84107; Michael L. Mangum, 7270 Nina Cir., and Kent B. Mangum, 7504 Blackfriars Cir., both of West Jordan, Utah 84084
Filed Oct. 29, 1991, Ser. No. 783,939
Int. Cl.[5] F16D *55/08*
U.S. Cl. 188—72.9 **12 Claims**



1. A braking system for small vehicles having a plurality of wheels, the braking system comprising:
a disc connected to at least one of the wheels so that the disc rotates in a substantially parallel plane to the plane of rotation of the wheel, the disc having a first side and a second side;
a first friction pad;
a second friction pad;
means for simultaneously moving the first friction pad and the second friction pad in a motion about an axis perpendicular to the axis about which the disc rotates and positioned in substantially the same plane as the axis about which the disc rotates such that the first friction pad and the second friction pad move in a substantially circular path from a released position where they do not contact the disc to a second position where the first friction pad applies pressure to the first side of the disc and the second friction pad applies pressure to the second side of the disc, the means for simultaneously moving the first friction pad and the second friction pad comprising a fork structure having a first tine and a second tine, the first tine and the second tine positioned in substantially the same plane;
actuation means for allowing a user of the vehicle to manually actuate the means for simultaneously moving the first friction pad and the second friction pad; and
release means for returning the first and second friction pads to their released position when the user releases the actuation means.

a pair of castered wheels mounted on said bottom wall, nected thereto, said transmission having a plurality of gears

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5,197,576

Patent Not Issued For This Number

5,197,577

PARKING BRAKE LOCK FOR A GROUND-MOBILE IMPLEMENT

James S. Hayek, Racine, Wis., assignor to Textron, Inc., Providence, R.I.

Filed Jul. 15, 1991, Ser. No. 729,597
Int. Cl.[5] F16D *69/00*; B60T *1/00*
U.S. Cl. 188—265 13 Claims

1. A parking brake lock for a ground-mobile implement, comprising a ground wheel, a movable brake operatively associated with said ground wheel, a handle for guiding the implement through operative association with said wheel, a connector operatively connected with said brake for moving said brake into and out of braking position and having a connector end remote from said brake, and a parking lock-lever movably mounted on a pivot axis on said handle and operatively associated with said connector end for moving said connector into said braking position, said lock-lever and said connector end being interconnected in said braking position for releasably retaining said connector in said braking position and said lock-lever including a slot with an arcuate length relative to said pivot axis and terminating in two oppositely disposed ends, and with one of said oppositely disposed ends being closer to said pivot axis than is the other of said oppositely disposed ends to thereby present a cam surface to said connector end when said brake is in said braking position.

5,197,578

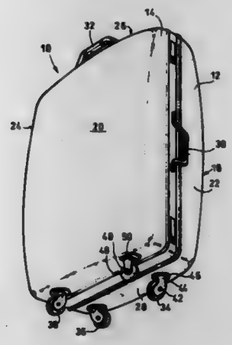
LUGGAGE WITH FOUR ROLLING ELEMENTS

Godwin Van Hooreweder, Brugge, Belgium, assignor to Samsonite Corporation, Denver, Colo.

Filed Feb. 3, 1992, Ser. No. 830,085
Claims priority, application France, Feb. 4, 1991, 91 01230
Int. Cl.[5] A45C *13/00*
U.S. Cl. 190—18 A 3 Claims

1. A luggage case having a handle attached thereto adjacent to an upper end of the luggage case and at least one bottom face which is generally parallel to a surface supporting the luggage case when the case is upright, at least four rolling elements, each equipped with an axle, the four rolling elements being positioned such that the axles are substantially parallel to said bottom face, the improvement comprising

three of said four rolling elements have mounting means for permitting the rolling elements to swivel around axes generally perpendicular to the bottom face and to each said axle, and wherein the fourth rolling element is attached to the luggage case by attachment means for holding its axle in a fixed relationship to said bottom face, whereby said three of the four rolling elements are capable of swiveling about said perpendicular axes and said fourth element is fixed relative to said bottom face.

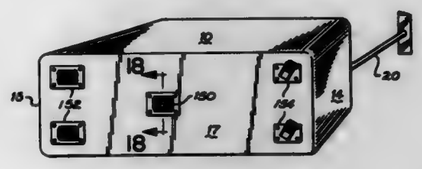


5,197,579

LUGGAGE WITH PULL HANDLE

David Bieber, East Greenwich, R.I., and Shaumin Liu, Portsmouth, Va., assignors to American Tourister, Inc., Batesville, Ind.

Continuation-in-part of Ser. No. 487,459, Mar. 2, 1990, Pat. No. 5,048,649. This application Apr. 29, 1991, Ser. No. 692,593
Int. Cl.[5] A45C *5/14, 13/26*
U.S. Cl. 190—18 A 9 Claims



1. In luggage having a bottom wall, a top wall, opposed front and rear end walls and opposed side walls a wheel system comprising:

a major wheel rotatably mounted on a transverse axle adjacent said bottom wall and projecting below said bottom wall, said major wheel being centered longitudinally between said front and rear end walls,

means for fixing said axle to said luggage,

a pair of castered wheels mounted on said bottom wall adjacent at least one end wall,

a pair of wheels mounted adjacent the other end wall,

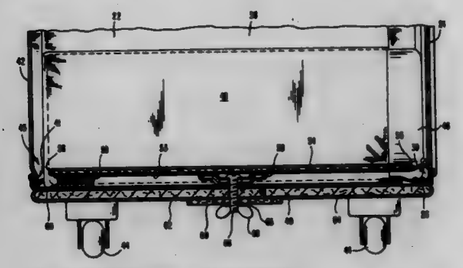
and elongated means attached to the luggage adjacent to the upper end of said front end wall for pulling said luggage at its rolls primarily on its major wheel, said major wheel, being on said fixed axle, maintaining the luggage tracking in the direction in which it is pulled while said wheels adjacent said end walls provide low friction ground support for the forward and rearward ends of said bottom wall.

5,197,580

COLLAPSIBLE STRUCTURED LUGGAGE

Joseph J. Berman, 55 Mountain View Ter., Hillsdale, N.J. 07642, and S. J. Chang, 13-3, Samjung-Dong Joon-Ku Buchun City Kyunggi-Do, Rep. of Korea

Filed Jan. 7, 1991, Ser. No. 638,379
Int. Cl.[5] A45C *7/00, 5/14, 13/36*
U.S. Cl. 190—107 7 Claims



1. An article of luggage comprising:

a bottom enclosure having a top opening, a bottom and sides which meet at corners;

a cover member for the opening;

an interior stiffening member;

means for pivotally attached the interior stiffening member along an edge of the cover member;

means for removably securing the interior stiffening member to the interior of a side of the bottom enclosure for stiffening the side;

an exterior stiffening member;

means for pivotally attaching the exterior stiffening member to the edge of the cover member;

means for removably securing the exterior stiffening member to the exterior of the side of the bottom enclosure for stiffening the side;

a continuous first zipper element surrounding and mounted along the edges of the cover member;

a continuous second zipper element for mating with the first zipper element surrounding and mounted along the edges of the opening;

wherein the first and second zipper elements are secured to each other to fasten the cover member to the opening of the bottom enclosure, and

wherein a portion of the zipper elements are fastened together to prevent removal of the cover element from the bottom enclosure.

5,197,581

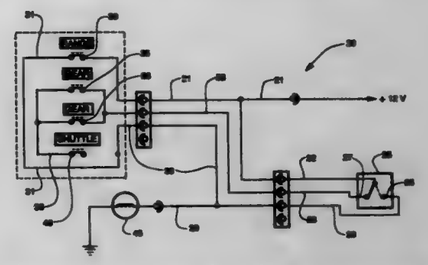
CREEPER GEAR INTERLOCK FOR TRACTORS

John A. Czarnecki, Cornwall, Pa., and Garry L. Ball, Middlesex, England, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Jul. 1, 1992, Ser. No. 907,343
Int. Cl.[5] B60K *41/28, 41/08*
U.S. Cl. 192—0.062 12 Claims

1. An interlock mechanism operably interconnecting a tractor engine and a transmission having a creeper range connected thereto, said transmission having a plurality of gears selectively cooperable in an intermeshed condition to provide a corresponding plurality of speeds of operation, a range control for selectively engaging said creeper range and a shuttle control for controlling the forward and reverse direction of operatiqn of the transmission, said gears being positionable in a neutral state in which none of said gears are intermeshed, said shuttle control also being provided with a neutral state in which neither said forward or reverse direction of operation is selected, a clutch being operably interposed between said tractor engine and said transmission for selectively coupling therebetween, said clutch being positionable in a disengaged state in which operative power is prevented from being transmitted to said transmission, comprising:

range sensor means operably associated with said range control to sense the selection of the creeper range;



transmission sensor means for sensing the neutral state of said transmission;

shuttle sensor means for sensing the neutral state of said shuttle control;

clutch sensor means for sensing the disengaged state of said clutch;

engine control means for controlling the operation of said tractor engine; and

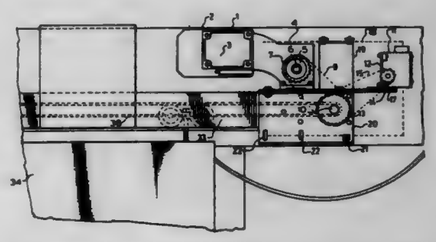
connecting means interconnecting each of said sensor means and said engine control means to stop the operation of said engine under conditions where said creeper range has been selected and at least one of said transmission sensor means and said shuttle sensor means senses a corresponding neutral state.

5,197,582

ELECTRIC DOOR OPENER FOR SLIDING DOORS

L. Eric Cropley, King City, Canada, assignor to Northern Eureka Refrigeration Co. Limited, Downview, Canada

Filed Apr. 2, 1991, Ser. No. 679,545
Claims priority, application Canada, Apr. 3, 1990, 2013683
Int. Cl.[5] B60K *41/20*; E05F *15/10*
U.S. Cl. 192—1.37 7 Claims



1. An electric operator for a sliding door mounted for sliding

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movement along a track with respect to a horizontal reference surface, comprising:

a) a motor having an iron cooling flywheel disposed on a drive shaft thereof, said motor during energization imparting a rotational acceleration to said drive shaft and during stopping imparting a rotational deceleration to said drive shaft, said flywheel imparting a predetermined amount of inertia to oppose said rotational acceleration and said rotational deceleration;

b) a worm gear reducer connected to said drive shaft for effecting a predetermined reduction ratio of rotation of said drive shaft;

c) a limit switch coupled to said reducer for limiting rotation of said drive shaft to a predetermined number of rotations; and

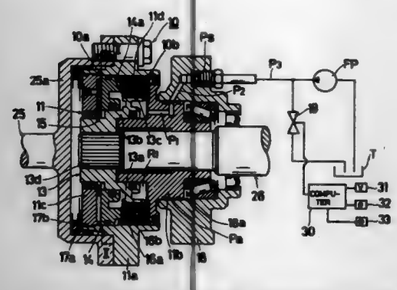
d) means for coupling rotation of said drive shaft to linear movement of said sliding door along said track, said means for coupling further comprises a drive chain connected to said motor and a limit chain connected to said limit switch, each said drive chain and limit chain being disposed at approximately 45° to said horizontal reference surface and connected via a sprocket.

5,197,583

TORQUE TRANSMISSION DEVICE

Toshifumi Sakai, and Hiroshi Takuno, both of Aichi, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 19, 1991, Ser. No. 762,459
Claims priority, application Japan, Oct. 11, 1990, 2-276619
Int. Cl.[5] F16D *43/28*, *25/0638*; B60K *17/35*
U.S. Cl. 192—35 5 Claims



1. A torque transmission device for transmitting a rotational torque comprising:

a cylindrical housing rotatable about an axis;

a rotary member coaxially received in the cylindrical housing for rotation about the axis;

an actuation piston axially slidably received in said cylindrical housing and defining a clutch chamber between said cylindrical housing and said rotary member;

a friction clutch assembled within said clutch chamber and transmitting rotational torque between said cylincrical housing and said rotary member in response to a thrust force transmitted from said actuation piston;

means for generating a pressure in response to relative rotation between said cylindrical housing and said rotary member to move said actuation piston in a direction toward said clutch chamber;

a fluid filled within said clutch member; and

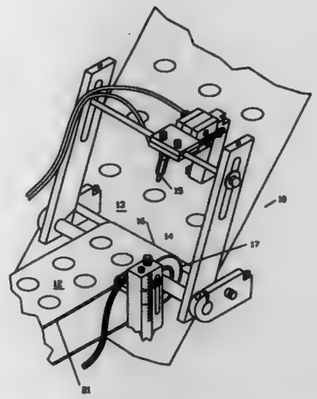
means responsive to at least one detected condition and including at least one fluid passage connected to said clutch chamber for controlling the preasure of said fluid in said clutch chamber to change to characteristic in torque transmission.

5,197,584

METHOD AND APPARATUS FOR ORIENTING PREDOMINATELY FLAT ARTICLES

Donald L. Powell, Fort Collins; Daniel W. Buehler, Windsor, and David E. Carson, Fort Collins, all of Colo., assignors to CBW Automation, Inc., Fort Collins, Colo.

Filed Jun. 14, 1991, Ser. No. 715,570
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—380 43 Claims



1. A method of automatically orienting a plurality of predominately flat articles having two opposed sides comprising the steps of:

a. determining the desired orientation for said articles; then

b. automatically feeding each article onto a first surface; then

c. detecting improperly oriented articles; then

d. moving each said article to a second surface; while

e. selectively changing the orientation of each said article which is improperly oriented, wherein said step of selectively changing comprises the steps of:

(1) receiving a signal communicating an improper orientation of said article; then

(2) flipping said article; while

f. stabilizing properly oriented articles, wherein said step of stabilizing comprises utilizing an air flow from below said article.

5,197,585

OBJECT SORTING APPARATUS WITH OBJECT HOLDER FACILITATING LATERAL TRANSFER

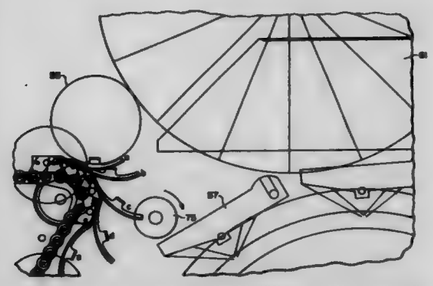
Roger Blood, Linden, Va., assignor to Agri-Tech Incorporated, Woodstock, Va.

Filed Mar. 6, 1992, Ser. No. 846,235
Int. Cl.[5] B65G *17/32*
U.S. Cl. 198—384 14 Claims

1. An apparatus for transferring objects between conveyors, said apparatus comprising:

a first endless conveyor having a finger shaped object holder, said object holder having an extended distal end, a central cup shaped portion to hold a said object and a proximate end with a pivoting attachment to a conveying mechanism, said distal end of each said object holder extending a lateral distance beyond a first conveyor when said object holder is transported to a return point where said first endless conveyor returns on itself, until said pivoting attachment of said finger shaped object holder travels laterally to about said first conveyor return point;

a second conveyor having a receiving holder positioned laterally of said first conveyor return point to receive a said object from said first conveyor as said object transitions off said first conveyor when said finger shaped object holder pivots at said first conveyor return point; and



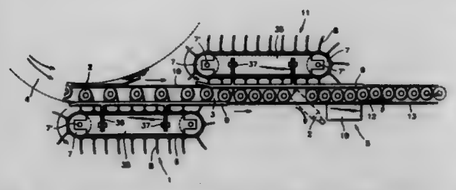
a transfer roll positioned between the first and second conveyors, said transfer roll receiving objects from said finger-shaped object holder and transferring said objects to said receiving holder.

5,197,586

AUTOMATIC MACHINE FOR UPRIGHTLY POSITIONING AND FEEDING CONTAINERS

Jaime Marti Sala, c/Emancipación, 8, 08017 Barcelona, Spain

Filed Aug. 9, 1991, Ser. No. 742,765
Claims priority, application France, Aug. 10, 1990, 90 10491
Int. Cl.[5] B65G *47/31*
U.S. Cl. 198—462 21 Claims



1. In an automatic machine for uprightly positioning and feeding containers, such as lightweight plastic bottles, including a plurality of discharge chutes moving along an enclosed circuit in a path for uprightly positioning and feeding said containers, and an exit portion through which said containers pass, and a linear moving conveyor means adjacent to and associated with said exit portion and oriented along a path substantially aligned with the path of movement of the chutes and containers therein at said exit portion for receiving said containers thereon, the improvement comprising:

first braking means for braking and dragging containers on said conveyor means and having a linear translation movement located on the run of said containers along a first portion of said moving conveyor means proximate said positioning machine for decreasing the output and forward speed on the conveyor means of said containers so that said containers move relatively toward each other; and

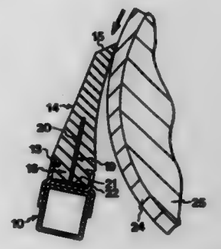
second braking means located downstream of said first braking means for braking containers and operating transversely and laterally on the run of said containers on said moving conveyor means to effect further relative movement of said containers into contacting relationship with each other and to allow passage of said contacting containers downstream of said second braking means.

5,197,587

CONVEYOR BELT SCRAPING APPARATUS

Mats A. Malmberg, Trelleborg, Sweden, assignor to Trellex AB, Sweden

Filed Feb. 26, 1992, Ser. No. 841,413
Claims priority, application Sweden, Jan. 2, 1992, 9200013-2
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—497 8 Claims



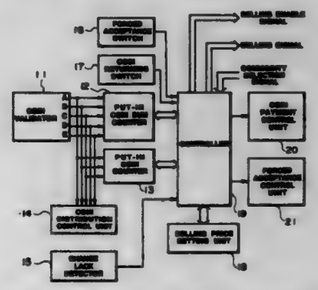
1. A conveyor belt scraper device, comprising a support element having a longitudinal undercut mounting recess with a longitudinal opening defined by two inwardly directed flanges, at lest one scraper blade mounted in said mounting recess, said scraper blade having a first end forming a scraper tip and a second end inserted in the mounting recess, said second end having a shape which is substantially complementary to said mounting recess, said scraper blade having long sides formed with mounting grooves which receive said flanges, said scraper blade having a longitudinal slot extending from the second end of the scraper blade, said longitudinal slot extending substantially beyond the flanges of the mounting recess toward the scraper tip, and a T-shaped stiffening member inserted in said longitudinal slot for stiffening the scraper blade.

5,197,588

CONTROLLER FOR VENDING MACHINE

Yonezo Furuya, Hatoyama, and Shusuke Sumi, Tsurugashima, both of Japan, assignors to Kabushiki Kaisha Nippon Conlux, Tokyo, Japan

Filed Apr. 1, 1991, Ser. No. 678,514
Claims priority, application Japan, Apr. 4, 1990, 2-89542
Int. Cl.[5] G07F *5/16*
U.S. Cl. 194—217 4 Claims



1. A controller for a vending machine comprising:

a forced acceptance switch for setting a forced acceptance mode;

change lack detecting means for detecting lack of change in a vending machine;

control means for, in an ordinary mode in which the forced acceptance switch is inoperative, generating a selling enable signal when the amount of money of inserted coins

coincides with a price of desired commodities or when the

paper past the transverse member to the transverse aper-

opening nestable segments to allow nesting thereof in a direction generally perpendicular to said rods with similar

offset rows such that the forward end of a first bar is disposed adjacent the rearward end of a preceding bar

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coincides with a price of desired commodities or when the amount of money of inserted coins exceeds the price of the desired commodities and the change lack detecting means does not detect lack of change, and in the forced acceptance mode set by the operation of the forced acceptance switch, generating a selling enable signal when the amount of money of inserted coins coincides with or exceeds the price of the desired commodities irrespective of whether or not the change lack detecting means detects lack of change;

change paying means, when commodities are sold in response to the sell enable signal, for paying change corresponding to the amount of money of the inserted coins from which the price of the desired commodities is substracted, and in the forced acceptance mode, paying change as much as possible but not exceeding the amount of money of the inserted coins from which the price of the desired commodities is substracted.

5,197,589

SINGLE PAPER DISPENSER

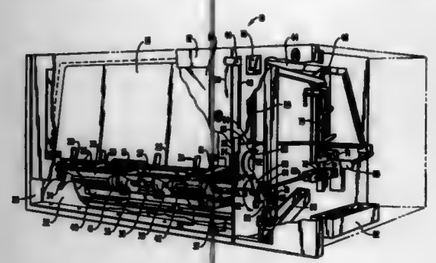
Roger G. Gordon, Richmond, Calif., assignor to Unirac Corporation, Richmond, Calif.

Continuation of Ser. No. 559,529, Jul. 19, 1990, Pat. No. 5,067,605, which is a continuation of Ser. No. 327,367, Mar. 22, 1989, abandoned, which is a continuation of Ser. No. 185,254, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 877,917, Jun. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 789,343, Oct. 16, 1985, Pat. No. 4,667,803, which is a continuation of Ser. No. 598,646, Apr. 10, 1984, abandoned. This application May 7, 1991, Ser. No. 696,682

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[5] G07F *11/58*

U.S. Cl. 194—248 **14 Claims**



1. A single paper dispenser comprising:

an enclosure having a forward transverse aperture at one end and a discontinuous transverse member proximate the transverse aperture;

means within the enclosure for moving a horizontal stack of papers forwardly toward said transverse member and for biasing said stack of papers against said transverse member;

cam means rotatable about an axis parallel to the transverse aperture, said cam means having tongue means movable upwardly through the discontinuities in the transverse member and then forward relative to the transverse member upon rotation of the cam means;

means for intermittently disabling the biasing and moving means to prevent forward movement of said stack of papers towards said transverse member upon rotation of the cam means; and

means for simultaneously rotating the cam means and disabling the moving and biasing means so that the cam means engages the forwardmost paper in the stack with the tongue means while the remainder of the stack is immobilized to lift and separate the forwardmost paper from the remainder of the stack and drop the separated paper past the transverse member to the transverse aperture.

5,197,590

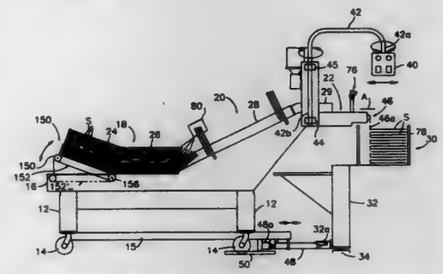
HOPPER LOADER

John E. Prim, West Chazy; David Hall, Plattsburgh; Robert Kinson, Plattsburgh, and Cyrus Myers, Plattsburgh, all of N.Y., assignors to Prim Hall Enterprises Inc., Plattsburgh, N.Y.

Filed Apr. 30, 1991, Ser. No. 693,638

Int. Cl.[5] B65G *41/00*

U.S. Cl. 198—300 **16 Claims**



1. Positioning apparatus comprising:

feeder means for feeding a stream of signatures to an output utilization device;

said output utilization device having a support frame;

said feeder means including conveyor means for advancing said signature stream to said output utilization device and a support structure for supporting said conveyor means;

said support structure including wheel means rollingly engaging a supporting surface for moving said feeder means;

said output utilization device support frame having a clevis bracket assembly provided with substantially V-shaped guide means;

positioning actuator means coupled to said feeder support structure including bidirectional motor means and an arm movable relative to said feeder support structure, said arm having a free end;

the free end of said arm extending into said clevis bracket assembly;

said clevis bracket assembly having an opening substantially conforming to the cross-sectional shape of said arm free end;

a pin provided on said arm a spaced distance inward from the free end thereof;

locking mans arranged on the clevis bracket assembly for embracing said pin when the free end of said positioning actuator arm extends a predetermined distance into said clevis bracket assembly; and

means for operating said motor means to adjust the position of said feeder means relative to said output utilization device.

5,197,591

REPLACEABLE SNAP-ON MODULAR OVERLAY FOR ROD AND LINK TURN-CURVE CONVEYOR BELTS

Gerald C. Roinestad, Williamsburg, Va.; Michael R. Straight, Jefferson, La., and John G. Kucharski, Winchester, Va., assignors to Ashworth Bros., Inc., Fall River, Mass.

Continuation-in-part of Ser. No. 658,638, Feb. 22, 1992, abandoned. This application Feb. 11, 1992, Ser. No. 833,658

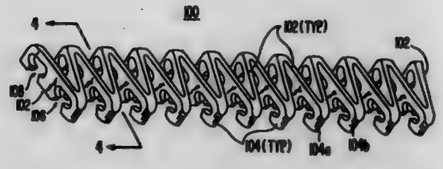
Int. Cl.[5] B65G *29/00*

U.S. Cl. 198—803.01 **96 Claims**

77. A ware transport overlay for use on a conveyor belt having a plurality of spaced transverse rods, said overlay comprising:

an elongated zig-zag member forming alternating oppositely

opening nestable segments to allow nesting thereof in a direction generally perpendicular to said rods with similar zig-zag members of overlays immediately ahead and behind said overlay on said belt, said zig-zag member having a lower surface; and



a plurality of downwardly opening snap-on retaining devices on said lower surface and configured to releasably snap said overlay down onto one of said rods of said conveyor belt so as to releasably retain said zig-zag member thereto and to substantially longitudinally orient said zig-zag member relative to said rods.

5,197,592

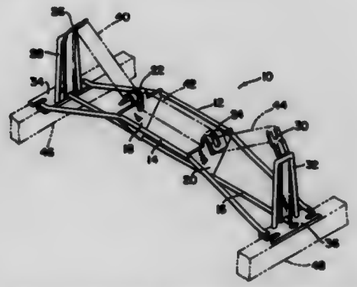
WIRE FRAME IDLER ROLL SUPPORT

Charles F. East, Van Fleet, Miss., assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 5, 1991, Ser. No. 740,750

Int. Cl.[5] B65G *15/08*

U.S. Cl. 198—830 **9 Claims**



1. An idler roll supporting frame for supporting a plurality of idler rolls, the improvement comprising:

a compression member comprising a first rod-like member extending from one end of said idler roll supporting frame to a second end of said idler roll supporting frame and having a width dimension similar to the dimension of its thickness;

a tension member comprising a second rod-like member;

center brackets attached to said compression member and to said tension member;

means provided on said center brackets to support said idler rolls.

5,197,593

ROD AND EDGE LINK FIXATION FOR CONVEYOR BELTS

William F. Funkhouser, Mt. Jackson, Va., assignor to Ashworth Bros., Inc., Fall River, Mass.

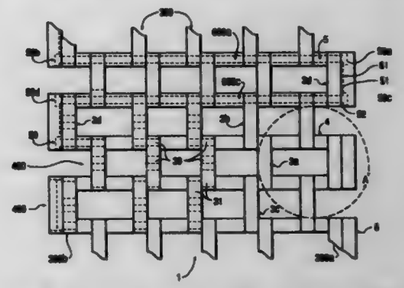
Filed Feb. 10, 1992, Ser. No. 833,026

Int. Cl.[5] B65G *17/38*

U.S. Cl. 198—851 **14 Claims**

1. A ceramic conveyor belt comprising:

a plurality of ceramic bars including at least a forward round hole and a rearward longitudinal hole disposed therethrough in opposite ends of said bars, said bars disposed in offset rows such that the forward end of a first bar is disposed adjacent the rearward end of a preceding bar with the forward hole of said first bar aligned with the rearward hole of the preceding bar, and the rearward end of said first bar is disposed adjacent the forward end of a proceeding bar with the rearward hole of said first bar aligned with the forward hole of said proceeding bar to thereby form a column of bars, said belt comprising a plurality of columns of bars and said aligned holes creating a plurality of cross-channels through said columns;



a plurality of ceramic connector rods, one said rod disposed through each said cross-channel and having ends extending beyond the outermost of said columns on either side of said belt, said rods including an indentation formed in each said extending end thereof;

a plurality of ceramic edge links disposed adjacent the outermost of said bars, said edge links having a longitudinal channel disposed therethrough, said channel defined by a ledge and including an enlarged opening through which the ends of said rod may be passed to allow said edge links to be disposed on said rod, said ledge fitting within said indentation to retain said edge links on said rods.

5,197,594

ARRANGEMENT FOR COUPLING AN AUXILIARY SWITCH MECHANISM

Johann Drexler, Schwandorf; Erwin Flierl, Kuemmersbruck, and Werner Harbauer, Schwandorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 494,823, Mar. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 157,075, Feb. 3, 1988, abandoned, which is a continuation of Ser. No. 821,563, Jan. 22, 1986, abandoned. This application Sep. 24, 1991, Ser. No. 765,402

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1985, 3503292

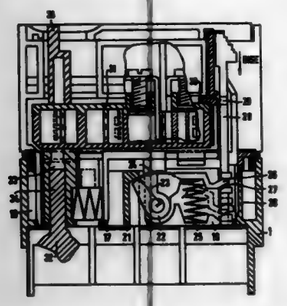
Int. Cl.[5] H01H *3/20*

U.S. Cl. 200—318 **41 Claims**

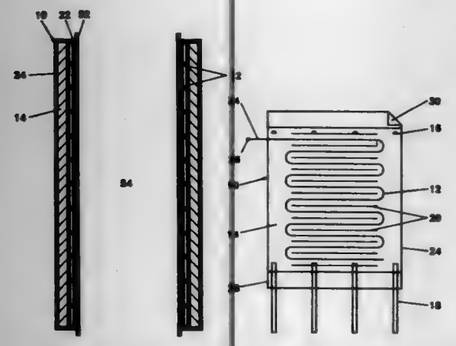
1. An arrangement including a contactor, further including an auxiliary switch mechanism and means for coupling said auxiliary switch mechanism to said contactor, said auxiliary switch mechanism having an auxiliary contact slide piece onto which moving auxiliary contact pieces are mounted and a switchgear contact slide piece onto which switchgear moving contact pieces are mounted, and said arrangement including an auxiliary housing holding an auxiliary, fixed-mounted contact piece and a switchgear housing holding a switchgear fixed-mounted contact piece having a cutout therein, further characterized by having the contact slide pieces in said contactor and in said auxiliary switch mechanism slidably mounted for sliding transversely to the direction of connection, wherein said housings and slide pieces form a positive connection when plugged in by means of an extension which can be inserted in the cut-out, and wherein a lock connected to the switchgear unit is coupled to the auxiliary contact slide piece of said auxiliary switch mechanism for preventing movement of said contact

VOL 1148 ISS 5 MR 30 1993 U.M.I.

slide pieces into a working position when coupling between said slide pieces and said housings is incomplete and for preventing coupling when said contact slide pieces of said contactor are already in a working position.

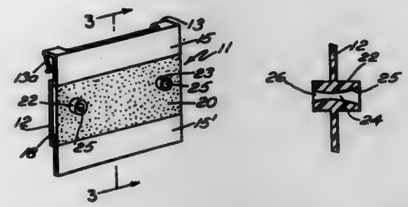


5,197,595
FLEXIBLE SELF-REGULATING HEATING PAD FOR COMPRESSED GAS CYLINDERS
Jamie A. Coultas, 7211 Les Brisas, Houston, Tex. 77083
Filed Sep. 6, 1990, Ser. No. 578,745
Int. Cl.[5] H05B *1/00*
U.S. Cl. 206—0.6 3 Claims



1. A heating pad apparatus in combination with a compressed gas cylinder; wherein, the heating pad apparatus consists of:
- a flexible heating unit that consists of a flexible self-regulating heating element and an electrical input and output member; an insulation unit adjacent to one side of the flexible heating unit; wherein the insulation unit consists of a generally rectangular mat of insulation material; a housing unit consisting of a fabric envelope that surrounds the insulation unit and an attached fabric cover that encloses the flexible heating unit, and
- a releasable system of attachment located at opposite ends of the housing unit; whereby, the housing unit may be installed around the circumference of said compressed gas cylinder.

5,197,596
DISPLAY CARD
Richard S. Garganese, P.O. Box 323, East Greenwich, R.I. 02818
Continuation-in-part of Ser. No. 516,974, Apr. 30, 1990, abandoned. This application Jan. 7, 1991, Ser. No. 637,710
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—6.1 21 Claims



1. A display card comprising a card formed with means for suspending the card from a display rack, the card having a plate like face area and having at least one integrally formed post member protruding perpendicularly therefrom, all made only from a single material, said member having means for gripping jewelry pin stems.

2. A display card as in claim 1 wherein the cylindrical post members have integral hook ends.

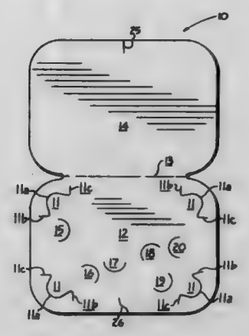
9. A display card as in claim 1 wherein an integral compartment is formed in the plate like face area with an open top and a pair of hinged doors defining a rear wall.

13. A method of carding pierced earrings comprising the steps of:
- assembling clutches into a compartment integral with a display card which is of the type that is adapted to be suspended from a display, said card having a face portion with a pair of posts molded integral therewith that have a bore therein with an open mouth and a tapering section, closing the compartment,
- inserting the pin portion of the ear ring into the tapering bore in the posts.

5,197,597
SUTURE RETAINER
Craig W. Leary, Bridgeport, and Christopher M. Scanlon, Milford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Continuation-in-part of Ser. No. 533,461, Jun. 5, 1990, Pat. No. 5,092,455. This application Jan. 15, 1992, Ser. No. 821,002
The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.
Int. Cl.[5] A61B *17/06*
U.S. Cl. 206—63.3 15 Claims

1. A suture retainer comprising
- a base panel possessing two spaced-apart suture-engaging tabs defined thereon,
- each said suture-engaging tab comprising at least one pair of opposing elements, with one element of said pair being elevated above a plane of said base panel and said other element of said pair being depressed below said base panel plane, when said suture retainer is in packaged condition, and

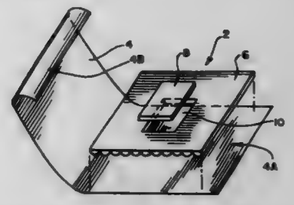
at least two spaced-apart needle-engaging tabs defined upon the base panel, the number and distribution of the needle-engaging tabs being such as to accommodate a variety of needle sizes or configurations.



5,197,598
ENCLOSED BOTTLE CARRIER
James T. Stout, Acworth, and James B. DeMaio, Marietta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Jul. 30, 1992, Ser. No. 922,571
Int. Cl.[5] B65D *65/12, 5/02, 5/44*
U.S. Cl. 206—141 8 Claims

1. A bottle carrier comprising top, bottom, and side walls, each side wall having a bottom portion and an inwardly inclined top portion, said top, bottom and side walls being interconnected to form a tubular structure, said top wall being rectangular, a top end panel foldably joined to each end edge of said top wall, a web structure foldably joined to each end edge of each of said top end panels and to an adjacent end edge of each of said inwardly inclined top wall portions, each of said webs structures having a yieldable fold line extending from an adjacent corner of said top wall and disposed in angular relation to the adjacent end edge of the associated inwardly inclined top wall portion so as to grip the necks of the corner bottles in a taut fashion, and a bottom end panel foldably joined to each end edge of said bottom wall and secured in overlapping relation with the associated top end panel.

5,197,599
SAMPLE PACKET ADAPTED FOR INSERTION INTO A NEWSPAPER
Colleen H. Dolan, Chicago, Ill., assignor to Chicago Tribune Company, Chicago, Ill.
Continuation-in-part of Ser. No. 504,965, Apr. 5, 1990, Pat. No. 5,105,941. This application Oct. 18, 1991, Ser. No. 779,379
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—232 24 Claims



1. A package for a product sample suitable for insertion between pages of a printed publication, comprising:
- a flexible, substantially planar substrate having a thickness approximating the thickness of a product sample and at least one aperture in said substrate nestling said product sample therein;
- an at least partially opaque outer sheath, wrapped around at least one edge of said substrate, for completely enveloping said substrate and product sample and cloaking said product sample; and
- said substrate comprising a fluted material having flutes substantially parallel to opposite edges of said substrate.

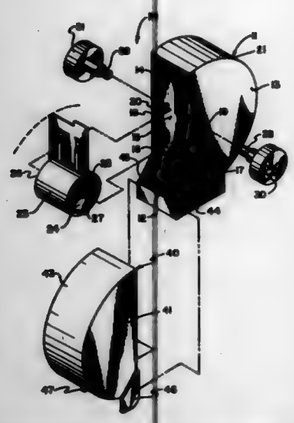
13. A package for a product sample suitable for insertion between pages of a printed publication, comprising:
- a flexible, substantially planar substrate having a thickness approximating the thickness of a product sample and at least one aperture in said substrate nestling said product sample therein;
- an at least partially opaque outer sheath, wrapped around at least one edge of said substrate, for completely enveloping said substrate and product sample and cloaking said product sample; and
- said substrate comprising a fluted material having flutes substantially parallel to the direction of the fold of said outer sheath.

5,197,600
DISC STORAGE APPARATUS
Felix D. Garcia, 5520 W. 96th St., Los Angeles, Calif. 90045
Filed Apr. 23, 1992, Ser. No. 872,843
Int. Cl.[5] B65D *85/30*
U.S. Cl. 206—444 4 Claims

1. A disc storage apparatus, comprising,
- a support housing, the support housing including a housing floor, and a first side wall spaced from, parallel to, and coextensive with a second side wall, with the first and second side walls orthogonally mounted to the floor extending upwardly thereof, and
- the housing including a housing rear wall, and a semi-cylindrical cavity defined within the housing between the rear wall and the first side wall and the second side wall, and
- the first side wall including a first side wall forward edge, the second side wall including a second side wall forward edge, with the first side wall forward edge and the second side wall forward edge arranged in a coextensive parallel relationship defining a cavity entrance therebetween, and
- the first side wall including a first side wall bore, the second side wall including a second side wall bore, with the first side wall bore and the second side wall bore coaxially aligned, and

a rotatable drum, the rotatable drum having a drum axle bore, the drum axle bore coaxially aligned with the first side wall bore and the second side wall bore, and the drum including at least one holder means for mounting a computer disc therewithin, and

the drum means includes a cylindrical drum having a first end wall spaced from and parallel to a second end wall, with the first end wall and the second end wall orthogonally oriented relative to the axle bore, and a first axle directed through the first side wall bore into the axle bore, and a second axle directed through the second side wall



bore into the axle bore, the first axle having a first handle mounted thereto exteriorly of the first side wall, the second axle having a second handle fixedly mounted thereto exteriorly of the second side wall, wherein the first axle and the second axle are rotatably mounted within the respective first side wall bore and the second side wall bore, and fixedly mounted within the axle bore of the drum, and

the first end wall and the second end wall each include a concentric array of mounting bores directed therewithin, and wherein the mounting bores of the first end wall and the second wall pivotally mount said holder.

5,197,601

FLUID CONTAINER

Robert A. Sterett, Jackson, Miss., assignor to Aeroquip Corporation, Maumee, Ohio

Filed Oct. 21, 1991, Ser. No. 780,112

Int. Cl.[5] B65D *21/02*

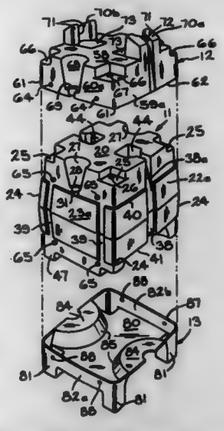
U.S. Cl. 206—511 **52 Claims**

1. A container comprising:

(a) a tank for containing liquids having a generally rectangular cross-sectional configuration including a bottom, a top, a pair of end panels and a pair of side panels joined at corners, said end panels and said side panels extending between said bottom and said top; at least one well extending downwardly from said top; said well having an opening communicating with the interior of said tank, said well extending to one of said side panels, at least one set of said end panels and said side panels having central portions extending outwardly beyond portions above and below said central portion and cooperating therewith to define upper and lower abutments;

(b) a top member engaged to said tank including a top contacting said tank top and having an aperture opening to said well, side panels and end panels joined together at corners and depending from said top to an abutting edge engaged to said tank upper abutment, a first post extending upwardly from said top adjacent said aperture and a second post extending upwardly from said top on the opposite side of said aperture from said first post; and

(c) a bottom member engaged to said tank including a bottom contacting said tank bottom, a plurality of legs extending downwardly from said bottom and end panels extending upwardly from said bottom to an abutting edge engaged to said tank lower abutment.



5,197,602

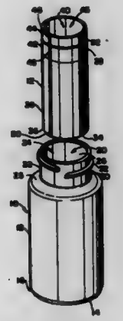
PACKING SYSTEM COMPRISING A PLURALITY OF OUTER CONTAINERS HAVING CONTAINER INSERTS THEREIN FOR HOLDING A PREDETERMINED VOLUME OF MATERIAL

Lissa B. Biesecker, Boyertown; Glenn J. Forte, Coatesville; Justin P. Boyle, Audobon, and Norris W. Matthews, Stowe, all of Pa., assignors to Drug Plastics & Glass Company, Inc., Boyertown, Pa.

Filed May 30, 1991, Ser. No. 707,489

Int. Cl.[5] B65D *1/10, 77/04, 85/82*

U.S. Cl. 206—514 **6 Claims**



1. A packaging system comprising:

a plurality of substantially uniformly shaped outer containers, each outer container comprising a container bottom having a periphery and a container wall extending generally upwardly from said periphery, said container bottom and said container wall defining an interior container portion having a first volume, said interior container portion being sized to accommodate a container insert, said container wall comprising a mouth defining an opening,

said mouth having an interior surface and including means for preventing removal of said insert;

a plurality of first container inserts, each first container insert being positioned within an interior container portion of one of said plurality of outer containers, each first container insert comprising a bottom having a periphery and a wall extending generally upwardly from said periphery, said bottom and said wall of each first insert defining an interior portion having a second volume, said second volume being less than said first volume, said interior container portion being entirely filled with a gas between said outer container and said first container insert, said wall of said first insert comprising an upper portion spaced apart from said bottom, said upper portion having an exterior surface dimensioned for complementary engagement with said interior surface of said mouth; and

a plurality of second container inserts, each second container insert being positioned within an interior container portion of one of said plurality of outer containers, each second container insert comprising a bottom having a periphery and a wall extending generally upwardly from said periphery, said bottom and said wall of each second insert defining an interior portion having a third volume, said third volume being less than said second volume, said interior container portion being entirely filled with a gas between said outer container and said second container insert, said wall of said second insert comprising an upper portion spaced apart from said bottom, said upper portion having an exterior surface dimensioned for complementary engagement with said interior surface of said mouth, wherein at least one of said outer container and said contains inserts includes a vent for allowing said gas to pass from said interior container portion to atmosphere when one of said container inserts is positioned within said outer container.

5,197,603

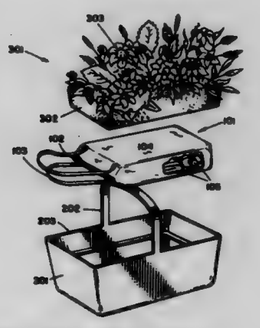
DECORATIVE BASKET-TYPE STORAGE UNIT

Larry E. Lundberg, 1018-138 E. La Habra Blvd., La Habra, Calif. 90631

Continuation of Ser. No. 692,947, Apr. 29, 1991. This application Jul. 23, 1992, Ser. No. 917,307

Int. Cl.[5] B65D *71/00*

U.S. Cl. 206—570 **3 Claims**



1. A decorative storage unit comprising,

receptacle means,

said receptacle means comprises a basket means,

package means to be stored within said receptacle means,

said package means comprises a container means and at least one useful article stored in said container means for selective use,

said package means includes closure means at one end thereof,

at least one strap means which extends outwardly from one end of said container means,

a decorative component movably mounted within aid receptacle means and overlying said package means to thereby substantially conceal said package means within said receptacle means,

said decorative component includes a support layer and an ornamental layer mounted thereon,

said support layer is formed of a cellular polystyrene material,

said ornamental layer includes artificial flowers,

said strap means extending between and beyond said receptacle means and said decorative component, and

bearing means for supporting said decorative component,

said bearing means comprises a ledge formed in said receptacle means above said package means.

5,197,604

HIGH-VOLTAGE CHANGE-OVER SWITCH WITH LINEAR MOVEMENT

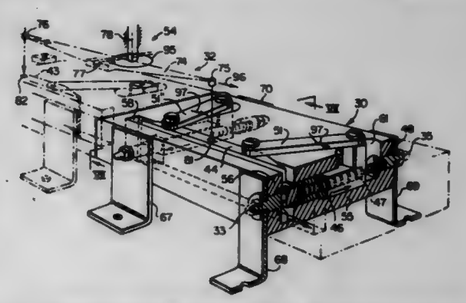
Hans Jedlitschka, Chatillon, and Jacques Sireul, Wissous, both of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France

Filed Feb. 7, 1992, Ser. No. 832,466

Claims priority, application France, Feb. 8, 1991, 91 01441

Int. Cl.[5] H01H *15/06*

U.S. Cl. 200—572 **15 Claims**



1. A high-voltage change-over switch with linear movement for the alternate application of a high voltage either to a first X-ray tube or to a second X-ray tube, said device comprising a change-over switch assembly having two identical half change-over switches, each half change-over switch comprising an insulation device, two input terminals wherein the insulation devices are mechanically linked and two output terminals, and each input terminal being connected to only one respective output terminal by means of a contact device that comprises a fixed contact element and a movable contact element shifting in a linear movement so as to come into contact with said fixed contact element or to move away from it, said linear movement of the two movable contacts of each half change-over switch being obtained by the linear shifting of said insulation device in a direction perpendicular to the movement of the movable contact elements, wherein for each half change-over switch said insulation device works together with the two movable contact elements in such a way that, in a first position of the insulation device, a first contact device is open while the second one is closed and that, in a second position of the insulation device, the first contact device is closed while the second one is open, the contact elements facing each open contact device being separated by a strip made of insulating material that constitutes the insulation device.

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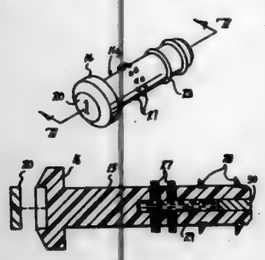
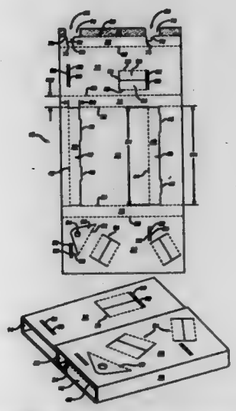
5,197,605
VACUUM LINE MARKER KIT
James M. Hampton, 215 Baird Cover Rd., Franklin, N.C. 28734
Filed Jun. 24, 1991, Ser. No. 719,620
Int. Cl.[5] B65D *85/16*
U.S. Cl. 206—582 3 Claims



1. A vacuum line marker kit, comprising in combination,
a support housing, the support housing including plural pairs of opposing cavities contained therewithin, and a lid overlying the cavities mounted to the support housing, and
each pair of cavities includes a first plug member and a second plug member defining a plug pair, the first plug member defined by a first cylindrical body, and the second plug member defined by a second cylindrical body, the first cylindrical body and the second cylindrical body defined by a predetermined diameter, and
the first cylindrical body including a first head mounted thereon, the second cylindrical body including a second head mounted thereon, the first head including a first cylindrical cavity, and the second head including a second cylindrical cavity, the first and second head including a removably mounted marker cylinder contained therewithin, the marker cylinders defining a predetermined coloration and predetermined indicia, and each said plug pair of said each pair of cavities of a contrasting coloration relative to said predetermined coloration and of contrasting indicia relative to said predetermined indicia, and
the first cylindrical body includes a plurality of concentric ribs integrally mounted to said first cylindrical body, and
the first cylindrical body further includes a central fluid reservoir contained within the first cylindrical body, the first cylindrical body including a lower terminal end spaced from said first head, and a removable plug removably mounted through the lower terminal end of the first cylindrical body to effect replenishment of the fluid reservoir, and the first cylindrical body including a plurality of bristle brush rings, wherein each of the rings includes a plurality of bristle members, wherein each of the bristle members is in fluid communication with the fluid reservoir to direct fluid contained within the fluid reservoir through the bristles.

5,197,606
CUSHION MEMBER FOR USE IN A SHIPPING CONTAINER
Gary D. Lancaster, 950 W. Marietta St., N.W., Atlanta, Ga. 30318
Filed Jul. 1, 1992, Ser. No. 907,073
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—594 11 Claims

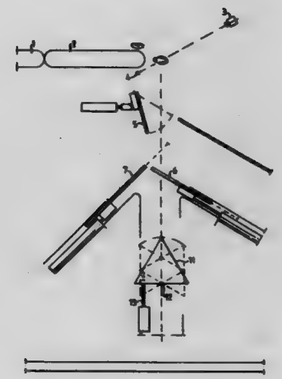
1. A cushioning member for placement into a shipping container, comprising:
a bottom panel;
a pair of spaced parallel side panels foldably joined to said bottom panel along first fold lines;
a top panel disposed in a spaced parallel relation to said bottom panel, said top panel including a pair of panel portions foldably joined respectively to said side panels along second fold lines, said panel portions overlapping each other and being secured together in a flat face contacting relation, said first and second fold lines being parallel to one another whereby said cushioning member may be collapsed along said first and second fold lines, one of said panel portions defining a free edge opposite said second fold line along which said one panel portion is joined to the adjacent one of said side panels;
retaining means for holding said cushioning member in a squared, set-up condition, said retaining means comprising a retaining flap struck from said bottom panel, said retaining flap being foldably joined to said bottom panel along a crease line and being folded into said cushioning member



to extend between said side panels whereby said retaining flap holds said cushioning member in a set-up condition; and
keel means substantially centrally disposed between said side panels and extending in a direction parallel to said first and second fold lines, said keel means comprising a center panel and a glue flap, said center panel being foldably joined to said free edge of said one panel portion and extending parallel to said side panels toward said bottom panel, said glue flap being foldably joined to said center panel along a fold line parallel to said first and second fold lines and being secured to said bottom panel.

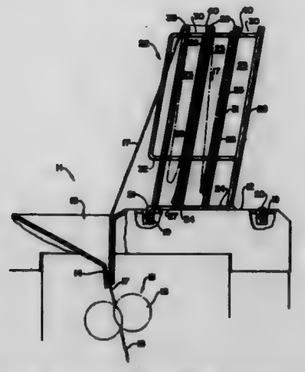
5,197,607
METHOD AND APPARATUS FOR GRADING OBJECTS IN ACCORDANCE TO SIZE
Reinhold Hakansson, Box 183, Jularp, Sweden
Continuation of Ser. No. 467,120, Jan. 19, 1990, Pat. No. 5,092,470. This application Sep. 9, 1991, Ser. No. 756,559
The portion of the term of this patent subsequent to Mar. 3, 2009, has been disclaimed.
Int. Cl.[5] B07C *5/04, 5/36*
U.S. Cl. 209—586 6 Claims

1. A method for grading impact sensitive objects, according to their size which are advanced along a broad, conveyor path, comprising the steps of:
obtaining, with the aid of a camera scanning against a light source, image data relating to the size of respective objects falling freely from the conveyor path;
positioning a plurality of groups of object directing members at a distance from each other along the path of fall of said objects, each group consisting of a plurality of members placed next to one another in a row, each member in the row of the group being individually movable, at least some of these members being longitudinally movable into the path of fall in an upwardly inclined direction;
activating, in response to control signals based on said image data, means for movement of the appropriate members in the rows at a preselected moment in time whereby said predetermined number of object directing members move into said path of fall, and are placed below respective falling objects before said falling objects reach said members; and
guiding said objects over said object directing members away from said path of fall;



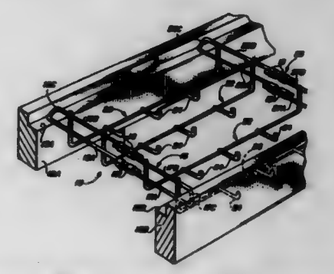
retracting said object directing members in the direction of movement of said guided objects;
wherein said plurality of groups of object directing members are controlled to enable a plurality of objects to be graded simultaneously into a plurality of mutually different, individually selective sizes.

5,197,608
FEED MECHANISM TO A DOCUMENT SHREDDER
Hartmut Stangenberg, Owingen, and Rolf Gasteier, Markdorf, both of Fed. Rep. of Germany, assignors to Schleicher & Co. International Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 15, 1991, Ser. No. 669,762
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1990, 4008653
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—50 14 Claims



1. An assembly for shredding a plurality of flat material webs collected from several stacks of folded layers, said assembly comprising:
a document shredder having an insertion slot;
a feed mechanism adjacent said insertion slot, said feed mechanism including:
a plurality of compartments for separately storing each of the several stacks of folded layers, each compartment having a bottom surface, a forward surface and a rearward surface, said forward surface being closest to the shredder insertion slot, each compartment having an opening at its top between said forward and rearward surfaces, said bottom surface and said rearward surface supporting the stack with a flat side of the stack leaning against the rearward surface; and
a web guide for guiding the web pulled off of the stack, said web guide being located atop the forward surface of said compartment near its opening, whereby the web guide of a first of said compartment guides all webs collected from the plurality of compartments.

5,197,609
MERCHANDISE RACK FOR SUPPORTING PRODUCT DISPLAY CARDS BENEATH HORIZONTAL STORE SHELF SUPPORTS
Gerald Siegel, 12261 N. 74th St., Scottsdale, Ariz. 85260
Filed Jul. 28, 1992, Ser. No. 921,299
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—57.1 7 Claims



1. A rack for supporting a plurality of product cards, each having a hole therein, beneath a shelf or frame including first and second spaced horizontal beams, each beam including a recessed shoulder, the rack comprising in combination:
(a) a horizontal first cross member having a first end portion resting on the shoulder of the first beam and a second end portion resting on the shoulder of the second beam;
(b) a horizontal second cross member generally parallel to and spaced from the second cross member and having a first end portion resting on the shoulder of the first beam and a second end portion resting on the recess surface of the second beam;
(c) a plurality of prongs extending through the holes in the product cards to support them; and
(d) means connected to the first and second cross members for supporting the prongs lower than lower surfaces of the first and second beams.

5,197,610
DISPLAY RACK
Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Continuation-in-part of Ser. No. 66,986, Jun. 24, 1987, Pat. No. 4,809,855. This application Feb. 8, 1988, Ser. No. 153,142
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 43 Claims

1. A gondola display rack for merchandising products supported upon said rack, said rack comprising
a fixed base,
at least one upright extending vertically from the rear of said fixed base, said upright having at least two parallel columns of vertically spaced slots therein,

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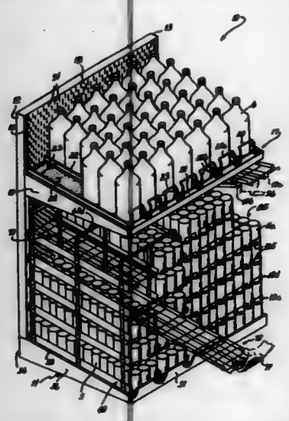
at least one shelf,

shelf supporting bracket means engageable with said slots of said upright to support said shelf from said upright in a position cantilevered over said fixed base,

both said fixed base and said shelf having a product supporting top surface,

stop means at the front edge of said top surface of said base and said shelf,

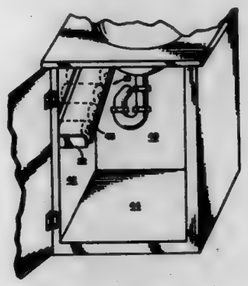
both said shelf and said base having a top surface angled downwardly and forwardly at a sufficient slope so as to enable products supported upon said top surface to slide by gravity of their own weight forwardly and downwardly over said top surface into engagement with said stop means on the front edges of said base and shelf, and



additional spring-up shelf means attached to said upright and extending forwardly from said upright over said base, said additional spring-up shelf means sloping downwardly and forwardly from said upright when loaded with products atop said spring-up shelf means, said spring-up shelf means sloping forwardly and upwardly to expose products mounted beneath said spring-up shelf means when all products mounted beneath said spring-up shelf means when all products are removed from atop said spring-up shelf means, said spring-up shelf means having product supporting surfaces formed by a plurality of longitudinally extending and transversely extending rods, which rods are welded at their points of intersections.

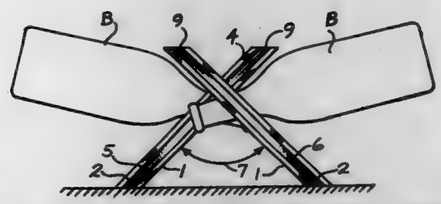
5,197,611
TISSUE PAPER ROLL STORAGE AND GRAVITY FEED
Donald L. Walton, 8502 Woodside Ct., Lanham, Md. 20706
Filed Jul. 6, 1992, Ser. No. 908,037
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—59.2 **13 Claims**

1. A holder and dispenser for a plurality of rolls of tissue paper, said holder comprising side members, an end member, a bottom, and stop means for holding the rolls in position, said side members and said end member being attached to said bottom to form an open ended tray with two sides and an end, said bottom having an extension at the open end of said tray extending outwardly and connected to said stop means, said stop means being spaced from the open ended tray and extends upwardly to a sufficient height for stopping and holding rolls of tissue paper in position in said tray, said sides being provided with means for mounting said rack to a wall, said means for



mounting is provided by openings in the side members through which screws may be fitted.

5,197,612
FREESTANDING BOTTLE STAND
Jonathan L. Thomson, P.O. Box 82808, Kenmore, Wash. 98028
Filed May 29, 1992, Ser. No. 891,371
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—74 **16 Claims**



1. A freestanding bipod bottle stand comprising a pair of bottle-holding legs rigidly connected in crossed relationship symmetrical about a vertical plane through the crossing for effecting mutual bracing, said legs having apertures therethrough for receiving the neck of a bottle to support the bottle from a leg in cantilever fashion.

5,197,613
MULTIPLE LAUNDRY BASKET APPARATUS
Mark A. Kotlowski, 1009 Smedal Dr., Stoughton, Wis. 53589
Filed Jun. 24, 1991, Ser. No. 719,640
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—133 **3 Claims**

1. A multiple laundry basket apparatus, comprising,

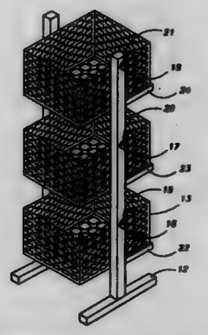
a plurality of spaced parallel support posts arranged coextensively relative to one another, with each support post including a support post pedestal fixedly and orthogonally mounted to a lower terminal end of each support post, the support posts spaced apart a predetermined spacing, and

a plurality of basket members pivotally mounted between the support post, the basket members defined by a predetermined width substantially equal to or less than the predetermined spacing, and

each basket including mounting means for pivotally mounting each basket between the support posts, and

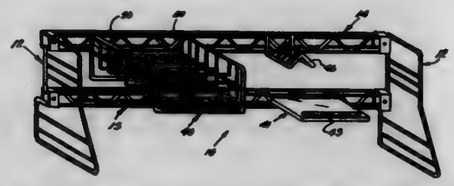
the mounting means includes a tubular cross brace orthogonally and fixedly mounted between the support posts, wherein the plurality of baskets is defined by a predetermined number, and a predetermined number of tubular cross braces are provided to accommodate the predetermined number of baskets, and

the tubular cross braces and the support posts are hollow, and each tubular cross brace includes a plurality of upper and lower ventilation apertures diametrically opposed relative to one another directed across the top and bottom surfaces of each tubular cross brace and one of said sup-



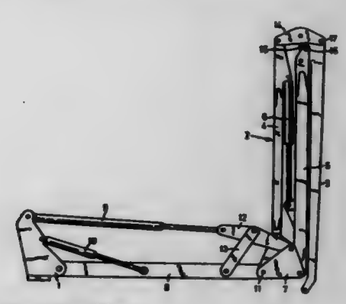
port posts includes a flexible connecting conduit connecting an upper terminal end of the at least one support post in pneumatic communication with an exhaust fan, wherein the exhaust fan is directed to effect ventilation through the support posts and in surrounding relationship relative to each tubular cross brace.

5,197,614
FREESTANDING ORGANIZER
Suzanne Dalton, and Clyde Foles, both of Ellsworth, Mich., assignors to Wolff Wire Corporation, Ludington, Mich.
Filed Nov. 25, 1991, Ser. No. 797,295
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—181 **8 Claims**



1. An organizer rack for use on a desk surface, said rack having a pair of parallel spaced legs; a rigid beam secured to both of said legs and holding them in spaced parallel vertical position extending generally normal to said beam; said beam having a plurality of upwardly opening pockets for securing and supporting accessory elements; said beam having an anchor bracket at each end, each of said anchor brackets having front and rear vertical portions which portions are seated around an end portion of the beam; each of said legs having a vertical member, said vertical member having an offset portion extending lengthwise of the beam and telescoped into the end portion of the beam enclosed by an anchor bracket, means for compressing the front and rear vertical portions of each anchor bracket toward each other to clamp said offset portion of said vertical member therebetween.

5,197,615
CRANE
Wiking Gunnarson, Dals Långed, Sweden, assignor to Mo-Trac Gunnarson & Larsson Handelsbolag, Dals Langed, Sweden
PCT No. PCT/SE90/00294, § 371 Date Nov. 13, 1991, § 102(e) Date Nov. 13, 1991, PCT Pub. No. WO90/14302, PCT Pub. Date Nov. 29, 1990
PCT Filed May 7, 1990, Ser. No. 736,231
Claims priority, application Sweden, May 16, 1989, 8901734
Int. Cl.[5] B66C 23/34
U.S. Cl. 212—185 **5 Claims**



1. A crane comprising:

a rigid column pivotally mounted on a support structure, an arm section connected to said column and comprising first and second arm portions which extend substantially parallel with one another, said first and second arm portions each having first ends distal from said column and second ends, a manoeuvering device which acts between said first and second arm portions, a rocker arm which is mounted for pivotal movement in one plane on the distal end of each of said first and second arm portions, said rocker arm having a free end intended to carry a lifting device, wherein the second ends of the mutually parallel first and second arm portions are mutually spaced apart and are connected by means of journal shafts with a yoke for pivotal movement in said plane;

a carrier arm having two ends, one end of said carrier arm is connected to the column for pivotal movement in said plane and the other end of said carrier arm is connected to the arm section for pivotal movement in said plane by means of a second journal shaft separate from the journal shafts of the parallel first and second arm portions on the yoke;

a first piston cylinder manoeuvering device mounted between the column and the yoke; and

a second piston-cylinder manoeuvering device mounted between the column and the carrier arm.

5,197,616
CHILD-RESISTANT CLOSURE WITH AUDIBLE CLICK CLOSE INDICATOR
Caetano Buono, Staten Island, N.Y., assignor to Van Blarcom Closures, Inc., Brooklyn, N.Y.
Filed Jun. 23, 1992, Ser. No. 902,949
Int. Cl.[5] B65D 55/02
U.S. Cl. 215—220 **15 Claims**

1. A child-resistant closure for use on a container having a threaded portion threadedly engageable with the closure, the closure producing an audible closure-state indicating signal when closed, comprising:

an inner cap having a circular top wall portion and a cylindrical skirt depending from said top wall portion, an inner surface of said skirt being threaded for threaded engagement with the threaded portion of said container when said inner cap is rotated in a closing direction and disengageable therefrom when said inner cap is rotated in an opening direction;

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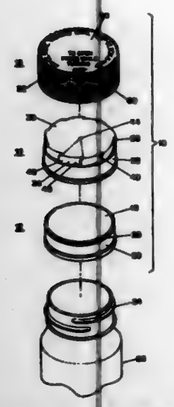
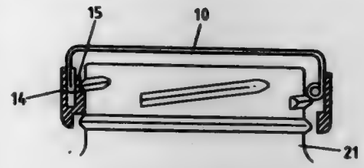
a middle cap comprising:
a circular top wall portion,
a cylindrical skirt arranged coaxial with and peripherally surrounding said cylindrical skirt portion of said inner cap, said middle cap being axially displaceable relative to said inner cap, and
a cam surface having a front end and a trailing end, with respect to the closing direction, being arranged along the circumference of an outer portion of said skirt of said middle cap, said front end being at a greater radial distance from a center axis of said middle cap than said trailing end and an abutment edge defined by the intersection of said trailing end and said front end of said cam surface;
an outer cap arranged for rotation relative to said middle and inner caps and having a circular top, a cylindrical skirt coaxially arranged and peripherally surrounding said skirt of said middle cap, means for frictional engagement with said cam surface of said middle cap for providing a progressively increasing frictional engagement between said middle and outer caps as said outer cap is rotated in the closing direction for permitting the rotation of said outer cap relative to said middle cap until said frictional engagement means frictionally engages said cam surface to transmit torque thereto and until said frictional engagement means is rotated past said front end of said cam surface, over said abutment edge and onto said trailing end to produce the audible closure-state indicating signal; and
one-way torque transmitting means for causing said middle cap and said inner cap to rotate concurrently in the closing direction and for preventing concurrent rotation of said inner and middle caps in the opening direction in the absence of an application of axial force thereto, whereby rotation of said outer cap in the closing direction will cause like rotation of said middle and inner caps so that the threaded portion of the inner cap engages with the threaded portion of the container, and thereafter, said outer cap moves relative to said middle and inner caps causing said means for frictional engagement to ride on said cam surface of said middle cap increasing said frictional engagement and to ride past said front end of said cam surface, over said abutment edge and onto said trailing end for producing the audible closure-state indicating signal and when said outer cap is rotated in the opening direction with both rotational and axial forces applied to said outer cap, said outer cap first moves relative to said inner cap allowing said means for frictional engagement to abut said abutment edge wherein the closure is disengaged from said container.



5,197,617
LOCKABLE CLOSURE FASTENING AND TAMPER EVIDENT CLOSURE
Cyril K. Edwards, Oadby, United Kingdom, assignor to Ariel Industries plc, Leicester, United Kingdom
Filed Oct. 12, 1990, Ser. No. 595,866
Claims priority, application United Kingdom, Oct. 13, 1989, 8923118; Jul. 3, 1990, 9014752
Int. Cl.[5] B65D 55/02, 41/34
U.S. Cl. 215—221 **10 Claims**

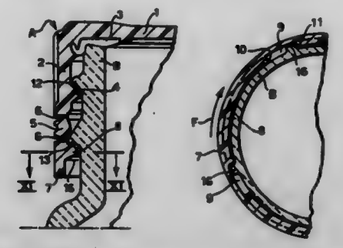


1. A lockable closure for a container having a neck portion formed with a plurality of radially outwardly projecting arcuate thread portions, comprising a rotary cap provided with internal threads configurated to mesh with said arcuate thread portions; a tamper indicative locking element engageable with said rotary cap for relative axial movement with said rotary cap and including first means for preventing relative rotation between said rotary cap and said locking element when axially engaged, said locking element further including at least one thread runner arranged to engage an arcuate thread portion, said closure cap and locking element each being threadedly engageable with the thread portions of the container, said at least one thread runner being resilient so that once said at least one thread runner has traversed an associated thread portion it is movable out of alignment with the associated thread portion to obstruct unthreading of said closure cap from the container, said thread runner being constrained by said cap and locking element, to thereby also prevent removal of said rotary cap once said internal thread thereof and said at least one thread runner have fully engaged the arcuate thread portions, said locking element further including breaking means for permanently breaking said locking element when locked to the container thereby releasing said at least one thread runner from locking engagement with the arcuate thread portion thereby permitting rotation and removal of said rotary cap from the container and providing a positive indication of tampering with the closure.

5,197,618
TAMPER-EVIDENT FUSION BONDED PULL-TAB INDUCTION FOIL LINING SYSTEM FOR CONTAINER CLOSURES
Thomas P. Goth, Scottsdale, Ariz., assignor to Top Seal, Inc., Tempe, Ariz.
Filed Oct. 15, 1991, Ser. No. 776,185
Int. Cl.[5] B65D 43/02, 53/04
U.S. Cl. 215—232 **11 Claims**

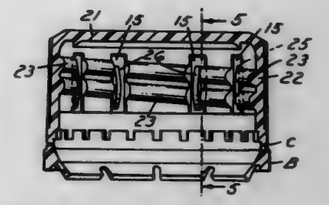
1. A liner for use in closing a container opening in induction-sealed systems, said liner including in combination:
a fusion-bond heat seal polymer layer for fusion bonding to a container opening;
a relatively high-strength backing layer; and
a relatively low-cohesive strength layer between, and bonded to, said polymer layer and said backing layer, said low-cohesive strength layer shearing, upon removal of said backing layer by mechanical forces, to separate said backing layer, with a first portion of the low-cohesive strength layer adhering thereto, from said polymer layer, with a second portion of the low-cohesive strength layer adhering to said polymer layer as a relatively low pressure rupturable tamper-evident cover over the container opening.

5,197,619
DEVICE FOR CLOSING, WITH A SECURITY SEAL, A CONTAINER OF A RIGID MATERIAL, SUCH AS GLASS, BY MEANS OF A SCREW CAP OF RIGID THERMOPLASTICS MATERIAL
Mario Margaria, San Damiano D'Asti, Italy, assignor to Alplast S.p.A., Asti, Italy
PCT No. PCT/EP90/00561, § 371 Date Sep. 30, 1991, § 102(e) Date Sep. 30, 1991, PCT Pub. No. WO90/11944, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 10, 1990, Ser. No. 768,210
Claims priority, application Italy, Apr. 13, 1989, 67271 A/89
Int. Cl.[5] B65D 41/34, 41/04
U.S. Cl. 215—256 **4 Claims**



1. A closure device comprising in combination a container of a rigid material and a screw cap of rigid thermoplastics material, said container having a neck with a cylindrical outer surface provided with a multiple thread and an annular rib of substantially triangular cross-section below said thread, the rib comprising a downwardly-divergent frusto-conical lateral surface and a substantially-radial, annular, flat base surface,
said cap having a horizontal end wall with an annular plastisol sealing ring disposed on an inner surface thereof and a cylindrical skirt with a corresponding internal multiple thread on an upper part, the cylindrical skirt having an intermediate part connected to the skirt by means of weakened zones and constituting an opening tear-strip and a lower part with an annular engagement rib on an inner surface which snap-engages beneath the triangular rib of the neck of the container when the cap is first screwed on, so as to form a security seal,
wherein the threaded neck of the container has a plurality of equiangularly-spaced projections below the triangular rib each having a circumferential extent and projecting radially from said cylindrical outer surface of said neck and extending axially downwards from the base surface of the triangular rib,
wherein the annular engagement rib of the cap is interrupted in a plurality of zones equal in number to the projections of the neck of the container, each of the interrupted zones having a circumferential extent substantially greater than the circumferential extent of each of the projections and each interrupted zone being defined by two radial stop walls and wherein the projections and the interrupted zones are angularly positioned relative to the threads of the neck and of the cap respectively, so that upon completion of the first screwing on of the cap, each projection is in one of the interrupted zones of the engagement rib of the cap and cooperates with one of the radial walls to prevent the cap from subsequently being partially unscrewed so as to compromise the seal of the closure, and in that the other radial wall of each interrupted zone of the cap constitutes a stop which reacts against the respective projection to prevent the cap from being accidentally overtightened such as to compromise the seal of the closure during its first screwing on.

5,197,620
VENTING CLOSURE
James L. Gregory, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio
Filed Apr. 27, 1992, Ser. No. 874,488
Int. Cl.[5] B65D 51/16
U.S. Cl. 215—307 **8 Claims**

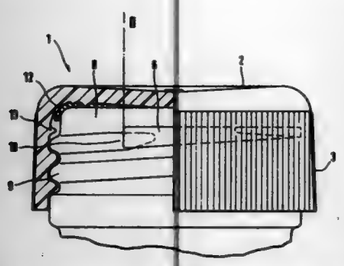


1. A plastic venting closure comprising
a base wall,
a peripheral skirt having internal threads adapted to engage the threads of a container and wherein the threads are interrupted at circumferentially spaced points to define axial venting passages for dissipating pressure of the contents as the closure is unthreaded from a container,
at least some of the passages have an integral rib thereon spaced from the threads and extending axially, and
the radial thickness of each rib being less than that of the threads,
the circumferential width of each rib being less than the circumferential width of the respective venting passage.

5,197,621
SCREW CAP MADE OF PLASTICS MATERIAL
Franz T. Bartl, Allschwil, and Hans-Werner Breuer, Laufen, both of Switzerland, assignors to Crown Cork AG, Reinach, Switzerland
PCT No. PCT/CH90/00060, § 371 Date Oct. 30, 1990, § 102(e) Date Oct. 30, 1990, PCT Pub. No. WO90/10581, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 9, 1990, Ser. No. 598,709
Claims priority, application Switzerland, May 17, 1989, 1841/89
Int. Cl.[5] B65D 41/04
U.S. Cl. 215—331 **12 Claims**

1. A screw cap made from the plastic material, for application to a container neck having an external helical thread, said screw cap comprising
a base and an annular cap wall extending from the periphery of the base, said wall having both an internal screw thread for engaging the external screw thread on the container and a brake element on the inside of the annular wall, adjacent the base, said brake element lying at least partly in the path of the external screw thread, and having an

override ramp surface which is inclined relative to the path of the external screw thread, whereby the brake element ascends over the helical thread on the bottle neck,



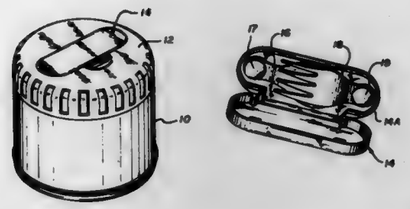
displacing a portion of the annular wall of the cap radially outward, and thus progressively retards cap movement, without abruptly halting such movement, when the cap is screwed onto the container.

5,197,622
VENT PRESSURE RELIEF DEVICE
John R. Anderson, Sandy Hook, Conn., assignor to GTE Products Corporation, Stamford, Conn.
Filed Aug. 17, 1992, Ser. No. 931,223
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—89.2 **3 Claims**

1. In a vent pressure device for a substantially cylindrical container having at least one closed end, said device comprising:
- at least two arcuate concavities formed in said one closed end of said container, said concavities extending upwardly into the interior of the container;
- at least two diametrically opposed bridges formed in said one closed end of said container which interrupt said at least two arcuate concavities; and
- at least two diametrically opposed score lines, said score lines formed to span said bridges and interconnect said arcuate concavities, the improvement comprising:
- at least two re-enforcing members formed in the said one closed end, said re-enforcing members being formed in planes that intersect at their mid-points at the center of said one closed end.

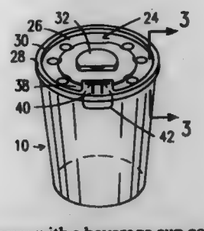
5,197,623
THERMAL SNACK JAR
Paul S. Wang, 13620 Benson Ave., Chino, Calif. 91710
Filed Sep. 18, 1992, Ser. No. 946,564
Int. Cl.[5] B65D *51/24*; A47J *43/28*
U.S. Cl. 220—212 **6 Claims**

1. A container assembly including an open top jar and a cover removably attached to the jar, said cover having an upper surface and having a channel formed in said upper surface; a receptacle for at least one utensil removably received in said channel in a snap-fit relationship, said receptacle having a top hinged thereto, said top having an underside, at least one utensil pivotally mounted to said underside of said top and angularly moveably between a first position in which it extends inwardly along said underside of said top and a second position



in which it protrudes beyond one end of said top to permit the top to be closed down on the receptacle to hold the utensil in place in its second position.

5,197,624
CUP LID
Tony Dodaro, Scarborough, Canada, assignor to M&N Plastics, Inc., Tampa, Fla.
Continuation-in-part of Ser. No. 729,395, Jul. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 676,324, Feb. 28, 1991. This application Feb. 21, 1992, Ser. No. 839,939
Int. Cl.[5] B65D *41/56*
U.S. Cl. 220—254 **12 Claims**



1. A cup lid for use with a beverage cup comprising a reclosable access closure flap including a hinge formed on an inner end portion of said reclosable access closure flap, whereby said reclosable access closure flap is selectively movable between a closed and open position, a first retainer element disposed on said cup lid to engage and releasably retain said reclosable access closure flap when in said open position and a bias ramp disposed on said cup lid axially above said hinge and located as to apply an upward force on said reclosable access closure flap when said reclosable access closure flap is in said open position to bias said closure flap toward said closed position.

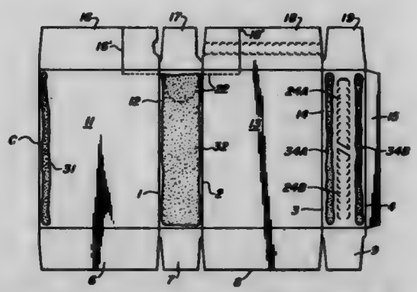
5,197,625
CARTON
Ronald F. Mullaney, Pennington, N.J., assignor to American Packaging Corporation, Philadelphia, Pa.
Filed Jun. 14, 1991, Ser. No. 715,901
Int. Cl.[5] B65D *5/54, 5/56*
U.S. Cl. 220—418 **6 Claims**

1. A lined carton having a top and a boxed-shaped configuration and including an outer carton and a liner secured within said outer carton defining an interior of the carton, said outer carton having an upper and a lower end and including a pair of opposing sidewalls and a pair of opposing endwalls, said sidewalls and said endwalls having upper and lower ends and interior surfaces facing the interior of said carton, said outer carton including top closure flaps formed at the upper end thereof, said liner being made of a see-through material and being constructed and arranged to extend along the interior

surfaces of said sidewalls and said endwalls to define an enclosed interior of the carton, said carton comprising

means for providing windows in one of said endwalls of said outer carton through which the interior of the carton is visible through said see-through liner, said window providing means comprising a pair of tear strips formed in one of said endwalls of said outer carton to extend along said one endwall in the direction between the upper and lower ends thereof and adapted to be removable to provide a pair of windows,

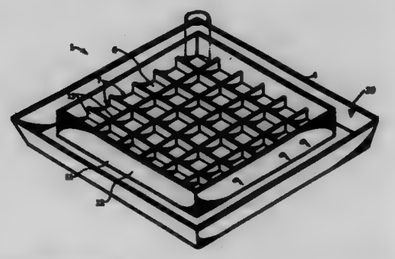
means for securing said liner to the inner surface of said one endwall, said liner securing means comprising a pair of



adhesive strips located to extend along opposite sides of each of said tear strips closely adjacent to said tear strips throughout the length of said tear strips to secure said liner against the inner surface of said one endwall so that said liner extends across said tear strips to closely overlie the same,

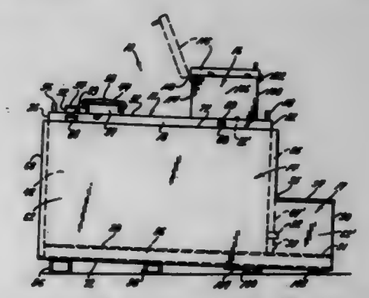
and means for securing said liner to the inner surface of said other endwall opposite said one endwall, said last-named liner securing means comprising a third adhesive strip located to extend along said other endwall in the direction between the upper and lower ends thereof to secure said liner against the inner surface of said other endwall.

5,197,626
COMPARTMENTALIZED WAITER TRAY
David T. Bernstein, 1089 Oakland Trace, Atlanta, Ga. 30319
Filed Jul. 2, 1992, Ser. No. 907,559
Int. Cl.[5] B65D *5/26*
U.S. Cl. 220—507 **11 Claims**



1. In Combination:
- a plurality of drink receptacles, each receptacle of said plurality of drink receptacle comprising at least a bottom side, a body portion defining a drink cavity and an upper edge defining a mouth for access to said drink cavity;
- an industry standard dishwashing rack, comprising at least a top surface, a bottom surface, and segmented into a plurality of compartments defined by internal partitions and outside perimeter partitions, arranged in a pre-defined pattern, for removably retaining said plurality of drink receptacles, each said drink receptacle of said plurality of drink receptacles being removably retained by said industry standard dishwashing rack with said mouth oriented downward and said bottom side oriented upward;
- a compartmentalized waiter tray comprising at least an upper surface, a bottom surface, a raised bevelled edge slanting upward and outward from said upper surface, a plurality of compartments defined by internal partitions and perimeter partitions, arranged in a predefined pattern for removably retaining said plurality of drink receptacles, each said drink receptacle of said plurality of drink receptacles being removably retained by said compartmentalized waiter tray with said mouth oriented for vertical access from above, and a refuse bin defined by said bevelled edge, said upper surface, and said perimeter partitions for containing debris found in said plurality of drink receptacles after said plurality of drink receptacles have been used;
- wherein said upper surface of said compartmentalized waiter tray engages each said bottom side of said drink receptacle of said plurality of drink receptacles and said plurality of compartments of said compartmentalized waiter tray provides alignment means for maintaining said mouth of each said drink receptacle of said plurality of drink receptacles in alignment with the respective said compartment of said plurality of compartments of said industry standard dishwashing rack.

5,197,627
DOUBLE WALLED STORAGE TANK
Dan M. Diabato, St. Louis, and James E. Davis, Pacific, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.
Filed Mar. 8, 1991, Ser. No. 666,828
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—571 **13 Claims**



1. A container for storage of materials, the container comprising:
- a tank assembly having double walls and a top surface;
- an access opening through the top surface, the access opening providing access to an interior volume of the tank assembly;
- a first spill box secured to the top surface, the first spill box having at least one wall surrounding the access opening and defining an interior of the first spill box;
- a second spill box secured to one side of the tank assembly, the second spill box having at least one side wall defining an interior of the second spill box; and,
- a communication means extending between the tank assembly and the second spill box and providing fluid communication between the interior volume of the tank assembly and the interior of the second spill box.

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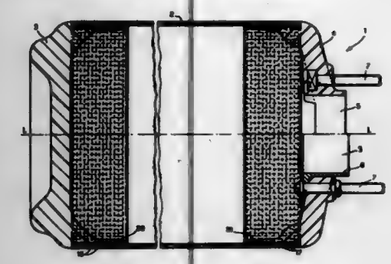
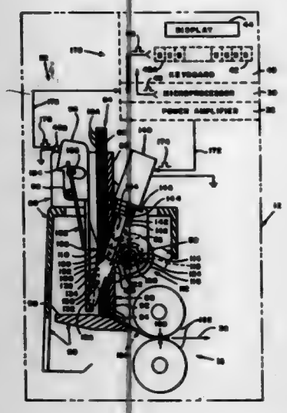
5,197,628
RESERVOIR FOR STORING A PRESSURIZED FLUID AND A METHOD OF MANUFACTURING SAME
Albert Plaus, Saint-Medard-En-Jalles; Jean-Louis Tisne, Martignas, and Serge Guihou, Bordeaux, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed May 29, 1991, Ser. No. 706,660
Claims priority, application France, Jun. 12, 1990, 90 07268
Int. Cl.[5] B65D *1/16*
U.S. Cl. 220—589 6 Claims



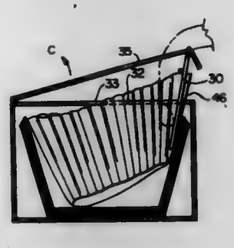
1. Reservoir for storing a pressurized fluid having a longitudinal axis and comprising a central tubular portion closed at its ends by two bottoms, one at least of which bulges outwardly and is provided with a neck, which reservoir is formed by a tubular shell of a composite fiber-thermoplastic binder material and two end pieces made from a thermoplastic material strengthened with reinforcement fibers, said shell and said end pieces being secured solidly together by local heat-melted zones, each local heat-melted zone providing fixing between said shell and one of said end pieces being tubular and coaxial to said longitudinal axis.

5,197,629
MAILING MACHINE CUT TAPE DISPENSING APPARATUS
Jose R. Sanchez, Briarcliff Manor, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Oct. 28, 1991, Ser. No. 783,585
Int. Cl.[5] B65H *3/00*
U.S. Cl. 221—15 13 Claims



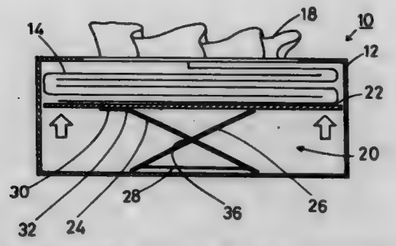
1. Apparatus for dispensing a cut tape comprising:
a. means for receiving a cut tape;
b. means for feeding the cut tape from the receiving means, the feeding means including a solenoid operable for causing the feeding means to feed the cut tape, the feeding including a roller disposed in feeding engagement with the cut tape, the feeding means including a pinion gear, the feeding means including a one-way clutch connected between the pinion gear and roller, the feeding means including a rack gear connected to the solenoid and disposed in meshing engagement with pinion gear for rotation thereof but not of the roller when the solenoid is energized; and
c. means for controlling the feeding means, the controlling means including a microprocessor, the solenoid electrically connected to the microprocessor, the controlling means including a switch electrically connected to the microprocessor, and the microprocessor programmed for causing the solenoid to operate in response to actuation of the switch.

5,197,630
DISPENSER FOR NESTED CONICAL ARTICLES
Stanley J. Kirin, 81 River Rd., Deep River, Conn. 06417
Filed Nov. 25, 1991, Ser. No. 797,046
Int. Cl.[5] B65H *3/00*
U.S. Cl. 221—37 14 Claims



1. A device for dispensing nested conical articles comprising a container for holding nested conical articles in an interior space thereof with concave article ends facing the container top;
a cover attached to the top of the container, having an opening through which filters can be drawn;
a tang attached to the cover, projecting into the cover opening toward the center of the opening;
a lid, pivotably attached to the top of the container at the same side from which the tang projects, adapted to pivotably lie across the cover opening; and
a tab, having a free end with conical article gripping means, pivotably attached to the lid free end, fitting within a tab opening in the lid when parallel thereto, pivoting oppositely to the lid pivot, the tab free end manually pivotable through the cover opening and into the interior space when the lid lies across the cover opening to engage by its free end the uppermost nested conical article within the container, the tab having a length sufficient to engage the tang;
the tab and tang in combination being elastically deflectable so that when the lid lies on the cover the tang urges the tab into the tab opening in the lid until or unless the tab is manually forced past the tang to cause the tab free end to engage a nested conical article, whereafter lifting of the lid causes an article to be dispensed through the opening.

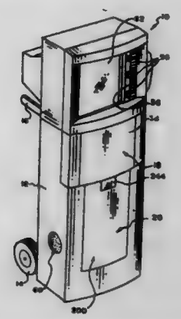
5,197,631
MECHANISM FOR AUTOMATICALLY PUSHING UP TISSUES
Eiichi Mishima, 1688-57 Yuge, Tatsuta-machi, Kumamoto-shi, Kumamoto, Japan 860
Filed May 7, 1992, Ser. No. 879,276
Claims priority, application Japan, Dec. 6, 1991, 3-108939[U]
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—52 9 Claims



1. A mechanism for automatically pushing up tissues, comprising:
a box for storing the tissues in layers, said box having a top wall with an opening formed therein for picking up tissues therethrough;
a pusher disposed under the tissue in said box for pushing up the tissues, said pusher including,
a flat base having a lower face and an upper face on which the tissues are placed in layers,
a main leg having a lower end and an upper end, the upper end fixed to the lower face of the base so that the main leg may be freely folded relative to the base,
a subleg connected to the main leg and having a lower end and an upper end, the upper end of the subleg contacting the lower face of the base, the upper end of the subleg displaced from the upper end of the main leg for supporting the base in a substantially horizontal state, and
a force member attached to the main leg and subleg for forcing the main leg and subleg to push up the base.

5,197,632
INTERACTIVE MEDICATION DELIVERY SYSTEM FOR INDIVIDUAL PILLS AND CAPLETS
Stephen B. Kaufman, Highland Park; Alexandro DiGianfilippo, Crystal Lake; Tamara L. Seger, Libertyville, all of Ill., and Ralph J. DeVito, Stanhope, N.J., assignors to Healthtech Services Corp., Northbrook, Ill.
Continuation of Ser. No. 414,921, Sep. 29, 1989, Pat. No. 5,148,944. This application Jul. 29, 1991, Ser. No. 737,206
Int. Cl.[5] B65H *1/00*
U.S. Cl. 221—197 9 Claims

1. A medication delivery system for individual pills/caplets comprising
a first cassette and a second cassette, each cassette including
a housing, with the first cassette housing being a different size than the second cassette housing,
a storage chamber within the housing for holding at least one pill/caplet,
a dispensing chamber within the housing, and
a self contained shuttle member carried for movement within the housing for dispensing a pill/caplet from the dispensing chamber,
a medication dispenser including
a dispensing station,
first slot means having a first predetermined dimension for releasably inserting the housing of the first cassette into the dispensing station for use and for removal and replacement after use, the first predetermined dimension blocking the insertion of the housing of the second cassette into the first slot means,
a second slot means having a second predetermined dimension different than the first predetermined dimension for releasably inserting the housing of the second cassette into the dispensing station for use and for removal and replacement after use, the second predetermined dimension blocking the insertion of the housing of the first cassette into the second slot means,
first and second self contained linkage means associated with the first and second slot means, respectively, and



being independently operative, when the first or second cassette is inserted into its respectively slot means, for engaging the associated shuttle member of the inserted cassette to move the associated shuttle member, the first and second linkage means being operative, when the first or second cassette is subsequently removed from its respective slot means, for disengaging the associated shuttle member, and
control means for independently actuating the first and second linkage means to dispense medication from the inserted respective first and second cassettes according to predetermined medication criteria.

5,197,633
MATERIAL METERING APPARATUS
Gordon E. Hines, Ann Arbor, Mich.; Myles K. Jakubowski, Baxter, Tenn., and Patrick D. Hill, Belleville, Mich., assignors to Hines Industries, Inc., Ann Arbor, Mich.
Filed Jan. 21, 1992, Ser. No. 823,124
Int. Cl.[5] B67D *5/30*
U.S. Cl. 222—14 11 Claims

1. A material metering apparatus comprising, in combination:
a tank assembly having a material containment chamber of known volume and means for pressurizing said material containment chamber;
a cutter assembly in communication with said tank assembly for receiving extruded material of a known specific gravity under pressure from said material containment chamber through an orifice of fixed diameter, said cutter assembly including a shear blade having a mating surface for engaging with and sealing said orifice to prevent the extrusion of such material, means for moving said shear blade out of such engagement position with said orifice, whereby when said shear blade is returned to such position of engagement with said orifice it shears off any material extending from said orifice; and

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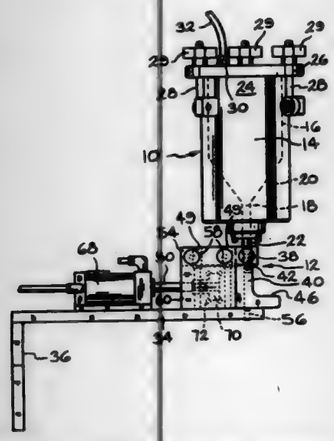
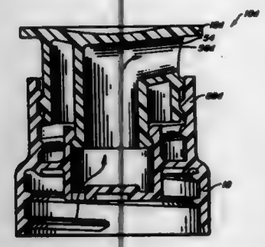
timing means for determining the time it takes such material to travel a preknown distance after extrusion from said orifice, whereby a flow rate for said material is established.

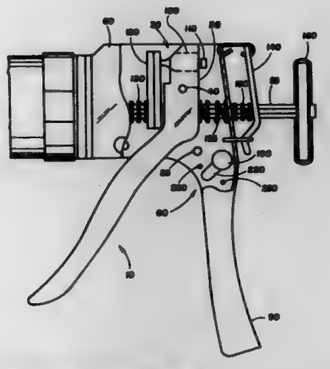


5,197,634
SIDE ORIFICE DISPENSING CLOSURE
James M. Beck, Carol Stream, Ill., assignor to Creative Packaging Corp., Wheeling, Ill.
Division of Ser. No. 442,849, Nov. 29, 1989, Pat. No. 5,016,767, which is a continuation-in-part of Ser. No. 349,158, May 9, 1989, abandoned. This application Feb. 6, 1991, Ser. No. 651,320
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—109 1 Claim



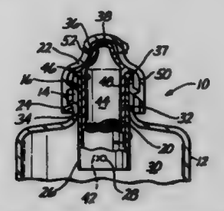
1. A dispensing closure for directing the contents out of a container comprising:
a body portion having a cylindrical recess, said recess being defined by a bottom surface and a substantially cylindrical imperforate peripheral wall upstanding from said bottom surface and with an opening to said bottom surface for metering the contents to be dispensed;
a spout body mounted within said recess and having an outer periphery, said spout body cooperating with said bottom surface and said outer periphery engaging said peripheral wall of said recess to form a variable opening between said spout body and said body portion to provide a closed position and a plurality of dispensing positions for dispensing the contents of said container at a plurality of different rates as said spout body is moved in said recess away from said closed position, said spout body including an orifice in operable communication with said opening to said bottom surface for directing the contents out of the container in a plurality of directions around the periphery of and substantially normal to the central longitudinal axis of said recess; and
said spout body being mounted within said recess by threads and upon rotation between said spout body and said recess said spout body is moved between said closed position through a plurality of dispensing positions to a fully open position where said spout body is rotatable in said recess in said closed position and said fully open position for directing the contents out of said orifice in said plurality of directions.

5,197,635
VARIABLE THRUST CAULK DISPENSING DEVICE
Peter J. Y. Chang, 11001 Petersborough Dr., Rockville, Md. 20852
Filed Nov. 16, 1990, Ser. No. 614,238
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—137 9 Claims



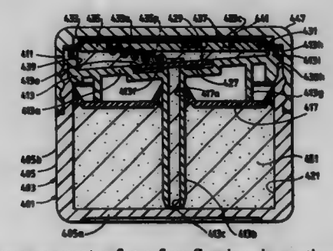
1. A caulking gun, comprising:
a frame;
a plunger including a plunger shaft for forwardly urging a caulking composition;
plunger driving means, said plunger driving means further comprising,
a housing having a downwardly extending handle,
a first grip enclosed within said housing, said first grip being linked to the plunger shaft and protruding upwardly beyond the plunger shaft;
a trigger pivot located above said plunger shaft;
a trigger extending upwardly within the housing and pivoting about said trigger pivot;
a bearing bit mounted on a portion of said trigger above said trigger pivot, said bearing bit providing a direct slidable engagement along a face of said first grip, and said bearing bit operating to cam the first grip as said trigger is pivoted to grip and advance the plunger;
adjustable mounting means for adjustably retaining said bearing bit on said trigger, said mounting means allowing said bearing bit to be positioned and secured along said portion of said trigger above said trigger pivot;
a first compression spring oppositely biasing said first grip against the operative engagement with said bearing bit; and
plunger pressure retaining means including a second grip and second spring, the second grip being biased by the second spring and having a portion operable for releasing plunger pressure to allow manual retraction of said plunger.

5,197,636
FAST ACTIVATION CHLORINE DIOXIDE DELIVERY APPARATUS
David W. Mitchell, Orange; John Baker, Irvine; Hampar Karageozian, Laguna Hills, and Daniel F. Smith, Irvine, all of Calif., assignors to Allergan, Inc., Irvine, Calif.
Filed Feb. 3, 1992, Ser. No. 830,387
Int. Cl.[5] B67D *5/58*
U.S. Cl. 222—190 30 Claims



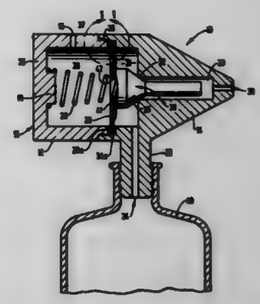
1. An apparatus for dispensing a liquid medium containing chlorine dioxide comprising:
a reservoir defining a receptacle adapted for holding a precursor liquid medium having chlorine dioxide precursor therein; and
a tip assembly into which the precursor liquid medium passes after the precursor liquid medium exits said receptacle, said tip assembly comprising:
a chamber in which is located a promoter component effective to promote the generation of chlorine dioxide from the chlorine dioxide precursor in the liquid medium present in said chamber;
an outlet providing a path for the liquid medium containing chlorine dioxide to exit said chamber; and
isolation means acting to effectively separate the precursor liquid medium in said receptacle from said promoter component when it is desired that the precursor liquid medium in said receptacle be separated from said promoter component.

5,197,637
PUMP APPARATUS FOR A FREE-FLOWING, IN PARTICULAR PASTY AND/OR LIQUID, PRODUCT, AND DISPENSER HAVING SUCH A PUMP APPARATUS
Wilhelm K. Naumann, Gaggenau, Fed. Rep. of Germany, assignor to Compagnie Francaise des Matières Plastiques PLASCO, Hunigue, France
Filed Apr. 5, 1991, Ser. No. 680,749
Claims priority, application Switzerland, Apr. 9, 1990, 1200/90
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—207 20 Claims



1. A pump apparatus for a free-flowing, in particular pasty or liquid, substance, comprising:
a support part;
a pump element which has an elastically deformable membrane and can be pressed against said support part in opposition to a restoring force; and
a pump chamber, disposed between said pump element and the support part, fluidly connected to an inlet valve and to an outlet aperture by an outlet valve, wherein the outlet aperture passes through the membrane;
wherein, on a side of said membrane which faces the pump chamber, a disk is provided, the disk together with the membrane forming the outlet valve, the disk being connected to the membrane so that in a closed position the membrane rests against the disk in an area enclosing the outlet aperture, and so that in an open position the membrane is arched upward partly away from the disk by a pressure exerted on it by the free-flowing substance, thereby forming an open connection between the outlet aperture and the pump chamber,
wherein the membrane is firmly connected to the disk in a connecting sector enclosing the outlet aperture of said membrane, at least around the major part of the circumference of the aperture of the membrane;
wherein the disk has at least one passage which passes therethrough and connects the pump chamber to a surface area of the disk, which surface area is at least partially enclosed by the connecting sector and faces the membrane; and
wherein the aperture of said at least one passage which terminates at the surface area of the disk is located a distance away from the outlet aperture in a plan view of the membrane.

5,197,638
SELF SEALING PRODUCT DELIVERY SYSTEM
Robert Wood, Garden Grove, Calif., assignor to Allergan, Inc., Irvine, Calif.
Filed Oct. 30, 1991, Ser. No. 785,588
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—212 5 Claims



1. A self-sealing nozzle assembly in combination with a manually squeezable container which receives sterile product from said manually squeezable container and to dispense such sterile product, the nozzle assembly comprising:
a nozzle assembly body defining first, second and third chambers, an inlet and an outlet, the inlet being in communication with the second chamber and coupled to said squeezable product container, the outlet providing communication between the third chamber and ambient atmosphere, and the second and third chambers defining between them a first sealing surface;
a flexible diaphragm;
a piston having a base connected to the diaphragm, the piston base and diaphragm hermetically separating the first and second chambers, said piston defining a second sealing surface adapted to engage the first sealing surface, engagement of said sealing surfaces hermetically sealing the second chamber from the third chamber and disengagement of said sealing surfaces bringing the second and third chambers into communication with each other; and
a compression spring enclosed in said first chamber and

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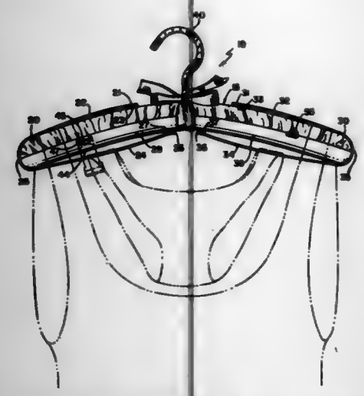
coupled to the piston base for resiliently biasing the piston toward said outlet to a position in which said sealing surfaces are in engagement, said sealing surfaces being disengaged in response to the admission of product into the second chamber under sufficient pressure to overcome the bias of said compression spring thereby permitting product to flow from said second chamber into said third chamber and to be discharged from said outlet at a flow rate dependent upon the magnitude of the manual pressure applied to the squeezable container.

5,197,639

SLIP-FREE GARMENT HANGER WITH FABRIC STRAPS

Rafael Jerman, and Vivian L. Ruiz, both of 235 SW. Le Jeune Rd., Miami, Fla. 33134

Filed Oct. 21, 1991, Ser. No. 780,069
Int. Cl.[5] A47G *25/30, 25/14*
U.S. Cl. 223—88 **8 Claims**



1. A garment hanger, comprising:

A. an elongated body member having two ends defining two arms each having an underside and an upperside;

B. hook means centrally mounted to said elongated body member;

C. two flexible first fabric strap means for securing said garment each having two ends and one of said ends of each of said first strap members being mounted substantially adjacent to one of said elongated body member ends; and

D. two first means for removably attaching the other ends of said first strap members to the uppersides of said arms at points substantially adjacent to said hook means.

5,197,640

BICYCLE BASKET APPARATUS

James J. Hurley, and Michael F. Wood, both of 208 Oak St., Corinth, N.Y. 12822

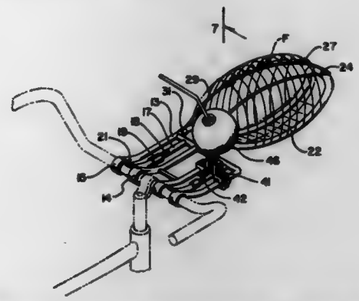
Filed Jan. 23, 1992, Ser. No. 824,375
Int. Cl.[5] B62J *7/00*
U.S. Cl. 224—30 A **5 Claims**

1. A bicycle basket apparatus arranged for securement to an associated bicycle handlebar, wherein the apparatus comprises,

a support frame, the support frame including a first rigid leg having a distal end, the first leg being spaced from, parallel to, and coextensive with a second rigid leg having a distal end, the first rigid leg and the second rigid leg each include a respective first and second "C" shaped hook integrally mounted at a first distal end of the first and second rigid legs respectively, and

the first "C" shaped hook defines a first "C" shaped hook opening oriented in a first direction and the second "C" shaped hook defines a second "C" shaped hook opening oriented in a first direction and

a first cross brace connected to and extending orthogonally between the first rigid leg and the second rigid leg, wherein a first lock leg is mounted to the first cross brace and extends orthogonally therefrom to a first free end such that the first lock leg extends parallel to and is positioned between the first rigid leg and the second rigid leg, the first lock leg includes a first lock sleeve adjustably mounted to the first end and a second lock leg rotatably mounted at one end to the first lock sleeve and the second lock leg includes a second lock leg "C" shaped pressure hook mounted to another end of the second lock leg and



being spaced from the first lock sleeve, wherein the second lock leg "C" shaped pressure hook defines a second lock leg "C" shaped pressure hook opening oriented in a second direction wherein the second direction is opposite to the first direction whereby the first and second "C" shaped hooks and the "C" shaped pressure hook are adapted to be releasably secured to the handle bar and

a first support leg extending rearwardly and longitudinally of the first rigid leg, and a second support leg extending rearwardly and longitudinally of the second rigid leg, and,

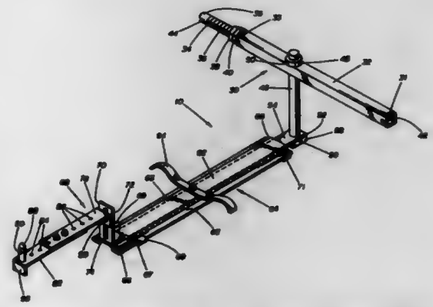
a second cross brace connected to and extending orthogonally between the first support leg and the second support leg for supporting a transport item therebetween.

5,197,641

SPARE TIRE CARRIER APPARATUS

Mike E. Montgomery, Jr., Houston, Tex., assignor to L & M Sales, Inc., LaGrange, Tex.

Continuation-in-part of Ser. No. 656,859, Feb. 19, 1991. This application Oct. 2, 1991, Ser. No. 770,223
Int. Cl.[5] B62D *43/00*
U.S. Cl. 224—42.021 **18 Claims**



1. A carrier apparatus for use on a motor vehicle to store a spare tire mounted on a rim, the vehicle having an undercarriage, the carrier apparatus storing the spare tire beneath the undercarriage of the vehicle, comprising:

a spring rod having an upper end and a lower end;

means for mounting said upper end of said spring rod to the vehicle;

a cradle bar having a forward end attached to said lower end of said spring rod;

a cradle receiver member receiving said cradle bar to form a telescoping cradle, said cradle receiver member having a rear end; and

a bracket assembly having a first end connected to said rear end of said cradle receiver member and a second end adapted to be secured to the vehicle,

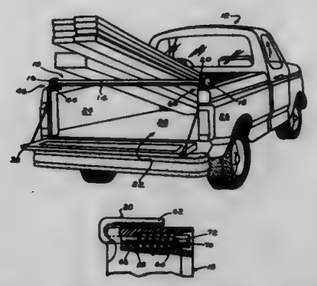
wherein said spring rod deflects as said cradle receiver member telescopingly extends from said cradle bar and returns to a substantially undeflected position as said cradle receiver member substantially receives said cradle bar.

5,197,642

FREIGHT STACKING SUPPORT APPARATUS

David P. Cortelli, 1036 East St. North, Suffield, Conn. 06078

Filed Jul. 22, 1991, Ser. No. 733,862
Int. Cl.[5] B60R *11/00*
U.S. Cl. 224—310 **10 Claims**



1. A freight stacking support apparatus for facilitating handling and transportation of freight in freight supporting beds of pickup trucks, said beds having two parallel, vertical, opposing side walls extending from a passenger compartment to a tailgate, said tailgate extending between and being pivotably mounted to ends of said side walls, said apparatus comprising:

a. a support beam having a first end and a second end;

b. a pair of first and second opposing brackets, which are adapted to be secured to said side walls of said pickup truck adjacent said tailgate, wherein sad first opposing bracket includes an arcuate portion for receiving and releasably securing said first end of said support beam, and wherein said second opposing bracket includes an arcuate portion for receiving and securing said second end of said support beam, wherein said arcuate portions extend above said side walls and are in open-facing relationship when said first and second opposing brackets are secured to said opposing sidewalls of said pickup truck; and

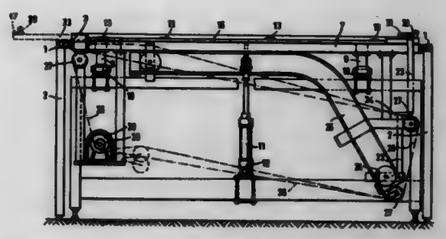
c. a locking means slidably and pivotally mounted to said arcuate portion of said first opposing bracket having a first released position and a second activated position, so the when said locking means is in said first released position said first end of said support beam can be freely inserted into or out of said arcuate portion of said first bracket, and when said locking means is in said second activated position said first end of said support beam is secured in said arcuate portion of said first bracket, whereby said locking means is activated by an operating button means for releasing and securing said locking means, wherein said operating button means comprises a free end of said spring-biased rod located in a throughbore, and wherein said free end is exposed through a face of said securing bracket for access by a user who is adjacent to the securing bracket.

5,197,643

TEXTILE RIPPING MACHINE

Werner Augustin, Uerdinger Strasse 2-8, D-4150 Krefeld, Fed. Rep. of Germany

Filed Mar. 31, 1992, Ser. No. 860,993
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1991, 9104073
Int. Cl.[5] B26D *1/10, 7/02*
U.S. Cl. 225—93 **11 Claims**



1. An apparatus device for ripping woven textile goods, the apparatus comprising:

a table having an upper surface, near and far longitudinal edges, and a transversely elongated slot extending between the edges and having transversely spaced near and far slot ends, the goods normally lying on the table extending across the slot;

at least one outer rail extending transversely along the slot;

at least one inner rail riding on the at least one outer rail and displaceable therealong between a far end position projecting past the far slot end and a near end position projecting past the near slot end;

a carriage displaceable substantially the full length of the at least one inner rail and also displaceable between a far end position past the far slot end and a near end position past the near slot end;

a ripping element on the carriage; and

drive means for displacing the carriage and at least one inner rail between their end positions for ripping the goods lying on the table across the slot.

5,197,644

FILM CABINET WITH ROLLER ATTACHMENT AND FILM TRANSFER MECHANISMS

Jack J. Gillett, Canoga Park, Calif., and John A. Outten, St. Cloud, Fla., assignors to The Walt Disney Company, Burbank, Calif.

Division of Ser. No. 622,384, Nov. 30, 1990, abandoned, which is a continuation of Ser. No. 277,340, Nov. 29, 1988, abandoned. This application Feb. 5, 1991, Ser. No. 652,300
Int. Cl.[5] B65H *75/00*
U.S. Cl. 226—118 **12 Claims**

1. A film cabinet, comprising:

(a) a cabinet housing having a floor, a ceiling and sidewalls extending substantially from the floor to the ceiling;

(b) a plurality of rollers connected to the housing for transporting film through the cabinet;

(c) drive means for engaging the film and moving it through the cabinet around the rollers;

(d) tension means for applying tension to the film; and

(e) roller attachment means for attaching the rollers to the cabinet housing, the roller attachment means comprising: an arm having one end rotatably connected to the roller and a free end having a narrow slotted entrance leading

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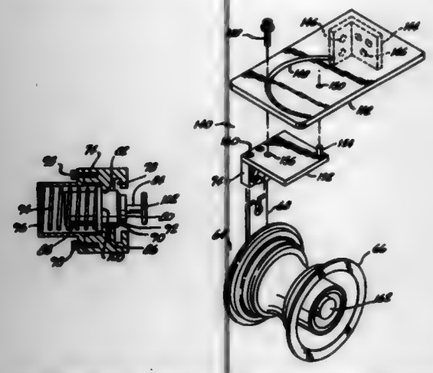
to an enlarged notch positioned inwardly from the free end;

a housing having a base for connection to the cabinet, and a channel adapted to slidably receive the free end of the arm and prevent pivoting of the arm with respect to the housing; and

a pin slidably receivable within a bore of the housing having a narrow outer portion adapted to fit within the slotted entrance of the free end and an enlarged inner portion adapted to fit within the notch of the free end, the pin being movable in the bore transversely into the channel from a normal portion in which the enlarged inner portion is within the channel to a retracted position in which only the narrow outer portion is within the channel.

10. A directionally adjustable film transfer mechanism for transferring film from one location to another, comprising:



(a) a substantially planar base for connection to a structure and having a semi-circular slot and a hole corresponding to the center of the semi-circular slot;

(b) a swivel plate having

a pin projecting from its upper surface adapted to be received within the hole of the base, and

a hole positioned such that, when the pin is received in the base hole and the plate is rotated with respect to the base, the plate hole will be aligned with and follow the path defined by the semi-circular slot;

(c) a fastener received within the plate hole and the semi-circular slot for connecting the plate to the base and enabling rotation of the plate with respect to the base until the fastener is tightened to secure the plate to the base; and

(d) a film roller connected to the swivel plate such that, at all times during rotation of the swivel plate with respect to the base, the axis of the pin substantially intersects a plane defined by the film at the point where the film is supported by the roller.

5,197,645

ROLL TYPE STOCK FEED APPARATUS WITH PNEUMATICALLY ACTUATED ROLL RELEASE

Richard D. Nordlof, 3312 Crest Rd., Rockford, Ill. 61107

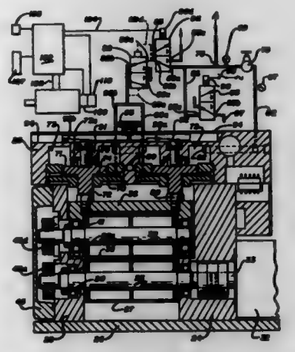
Continuation-in-part of Ser. No. 404,118, Sep. 7, 1989, Pat. No. 5,033,342. This application Apr. 5, 1991, Ser. No. 681,985

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.[5] B65H *20/00*

U.S. Cl. 226—154 **13 Claims**

1. A roll type stock feed apparatus for intermittently advancing strip stock to a power press in timed relation with successive operating cycles of the press, the stock feed apparatus including rigid frame means; first feed roll means mounted on the frame means, second feed roll means mounted on a movable roll support means for movement toward and away from the first feed roll means, roll drive means drivingly connected to at least one of the feed roll means and actuatable to drive said one of the feed roll means to advance a preselected length of stock, means including pneumatic actuator means for moving said second feed roll means toward and away from the first feed roll means respectively into and out of feeding engagement with strip stock therebetween, said pneumatic actuator means including piston means having first and second piston faces at opposite sides and piston rod means extending from the second face and operatively engaging the movable roll support means, said pneumatic actuator means including means on the frame means defining a first actuator chamber means at the first face of the piston means and second actuator chamber means at the second face of the piston means, first air pressure supply means for supplying and maintaining pressurized air in said first actuator chamber means under a substantially constant first pressure sufficient to move the piston means in a first direction and press said second feed roll means toward the first feed roll means into feeding relation with strip stock between the first and second feed roll means when the second actuator



chamber means is communicated to atmosphere, second air pressure supply means including valve means selectively operable to first and second conditions for controlling air pressure in the second actuator chamber means while said first air pressure supply means maintains the first actuator chamber means under said substantially constant first pressure, said second air pressure supply means in the first condition of the valve means supplying pressurized air at a second pressure sufficient for moving the piston means in a second direction against the first pressure in the first actuator chamber means to a stock release position, said valve means in the second condition shutting off pressurized air to the second actuator chamber means and communicating the latter to atmosphere to rapidly exhaust air from the second actuator chamber means and allow the piston means to move in the first direction under the substantially constant first pressure in the first actuator chamber means, and means including press cycle sensing means for actuating said roll drive means to advance a preselected length of stock and for operating said valve means between said first and second conditions in timed relation with the actuating of said feed roll drive means during each press operating cycle.

5,197,646

COMBUSTION-POWERED TOOL ASSEMBLY

Milovan A. Nikolich, Wilmette, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 9, 1992, Ser. No. 848,277

Int. Cl.[5] B25C *1/08*

U.S. Cl. 227—8 **17 Claims**

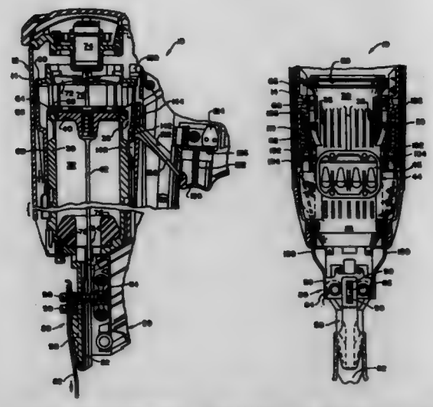
1. A combustion-powered tool for driving fasteners, comprising:

a housing;

a cylinder body disposed within said housing and having a gas inlet and outlet passage, and defining a longitudinal axis of said tool;

a nosepiece disposed externally of said housing;

a valve sleeve movably disposed around said cylinder body and within said housing for opening and closing said gas passage; and



a valve sleeve-actuating mechanism comprising a collar movably mounted on said nosepiece, and a pair of arms integrally connected at first end portions thereof to said collar and extending alongside said cylinder body so as to be directly connected at second opposite end portions thereof to said valve sleeve and thereby provide a simple, compact, lightweight tool.

5,197,647

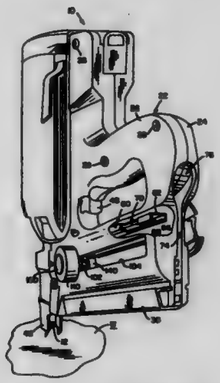
FASTENER-DRIVING TOOL WITH IMPROVED FEEDING MECHANISM

Scott A. Howell, Crystal Lake, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Oct. 21, 1991, Ser. No. 779,892

Int. Cl.[5] B25C *1/00*

U.S. Cl. 227—126 **15 Claims**



1. A fastener-driving tool comprising a housing, a nosepiece, means for driving a fastener from said nosepiece into a workpiece, and means for feeding an elongate strip of collated fasteners, including a leading fastener and a trailing fastener, in such a manner that said fasteners are successively fed into said nosepiece, said feeding means comprising:

means comprising an elongate tract, having an inlet end, and an outlet end which communicates with said nose-piece, for admitting said elongate strip of fasteners into said inlet end with said leading fastener preceding said trailing fastener and for guiding said elongate strip of fasteners along said elongate track in such a manner that said leading fastener is positioned so as to enter said nosepiece from said outlet end of said track;

pusher assembly means comprising a support member longitudinally movable upon said housing; and a pusher member which is longitudinally movable along said elongate track over a range of operative positions, including a retracted position and an advanced position, for pushing said elongate strip of fasteners longitudinally along said elongate track when said pusher member is disposed within said range of operative positions, and which is laterally movable relative to said support member of said pusher assembly means between said retracted position and an inoperative position at which said pusher member is laterally displaced with respect to said support member of said pusher assembly means so as to permit said elongate strip of fasteners to be admitted into said inlet end of said elongate track;

means for biasing said pusher member longitudinally toward said advanced position;

biasing means mounted upon said pusher assembly means for biasing said pusher member, relative to said support member of said pusher assembly means, laterally toward said inoperative position; and

means for releasably latching said pusher member at the inoperative position.

5,197,648

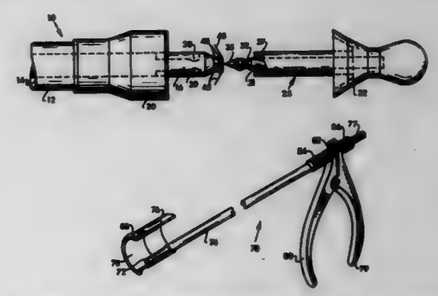
SURGICAL STAPLING APPARATUS

Bruce S. Gingold, 36 Seventh Ave., New York, N.Y. 10011

Continuation of Ser. No. 277,656, Nov. 29, 1988, abandoned. This application Dec. 3, 1991, Ser. No. 803,671

Int. Cl.[5] A61B *17/00*

U.S. Cl. 227—179 **4 Claims**



1. In combination circular anastomosis surgical stapling instrument for joining hollow tubular organs, said instrument including a body having a staple-holding and ejecting assembly at its distal end, a centered longitudinally-extensible main shaft and an anvil opposed to said staple-holding and ejecting assembly, the improvement which comprises a separate shaft segment frictionally connectible with the end of said main shaft, said shaft segment having a free end and an end carrying said anvil, the end of said main shaft being provided with a plurality of radially-extending arms positioned to overlie said main shaft but said arms having spring hinges biasing them radially outwardly away from said main shaft.

4. In combination with a circular anastomosis surgical stapling instrument for joining hollow tubular organs, said instrument including a body having a staple-holding and ejecting assembly at its distal end, a centered longitudinally-extensible main shaft and an anvil opposed to said staple-holding and ejecting assembly, and a separate shaft segment frictionally

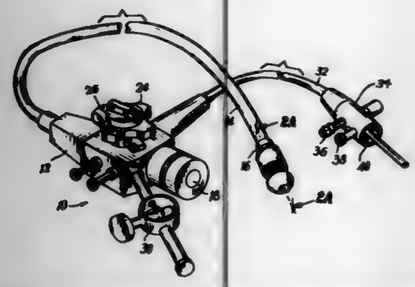
connectible with the end of said main shaft, said shaft segment having a free end and an end carrying said anvil; a band-attaching device comprising two telescopically related shells, and means for extending and retracting one of said shells relatively to the other, said shells being dimensioned to enclose the end of said shaft and of said shaft segment and having an internal diameter somewhat smaller than the outside diameter of said anvil.

5,197,649

GASTROINTESTINAL ENDOSCOPTIC STAPLER

Marc Bessler, and Michael R. Treat, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Oct. 29, 1991, Ser. No. 783,909
Int. Cl.[5] A61B *17/00*
U.S. Cl. 227—179 58 Claims



1. An intestinal endoscopic stapler for tubular surgical tissue, comprising:
an anvil member having a ringed anvil stapling surface and a ringed cutting block surface inwardly of said stapling surface;
a head assembly having a staple driver for driving staples in an array corresponding to said anvil surface and a cutting blade corresponding to said cutting block;
means for operatively connecting said anvil member to said head assembly;
a flexible tube having a distal end connected to said head assembly, and a handpiece end;
scope means, in one of said anvil member and head assembly, for viewing, from said handpiece end, a region of space beyond said head assembly;
means for pulling said anvil member and said head assembly toward each other; and
stapler activating means located at the handpiece end, and operatively connected to said anvil member and said head assembly, for driving staples from said had assembly toward said anvil member and for driving said cutting blade toward said cutting block, whereby two ends of tubular tissue may be joined by a ringed array of staples and excess tubular tissue ends may be trimmed off with the cutting blade.

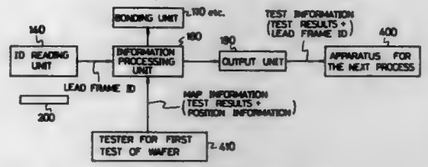
5,197,650

DIE BONDING APPARATUS

Masahiko Monzen; Akio Shimoyama, both of Tenri, and Noriki Iwasaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 753,901, Sep. 3, 1991, abandoned. This application Apr. 2, 1992, Ser. No. 862,181
Claims priority, application Japan, Sep. 18, 1990, 2-249406
Int. Cl.[5] B23K *31/12*
U.S. Cl. 228—6.2 12 Claims

1. A die-bonding apparatus comprising:
means for emitting a first laser beam scanning a region on a metal lead frame to etch a coarse surface in the region;
means for emitting a second laser beam scanning the region to etch an identifier into the coarse surface region;
test means for testing a wafer at positions corresponding to the prospective chips and generating test data;
dividing means for dividing the wafer into chips;
storage means for storing information about positions of the chips on the wafer and the test data;
die-bonding means removing divided chips from the wafer and die-bonding the chips to the lead frame;



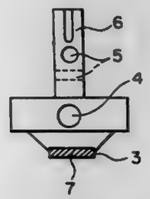
reading means for reading the identifier of the lead frame to which the chips are die-bonded;
information processing means for correlating information from the identifier with the test data and position information about each of the chips to generate test information; and
output means for outputting the test information.

5,197,651

BONDING TOOL

Tsutomu Nakamura; Katsuyuki Tanaka; Tetuso Nakai; Takahiro Imai; Akihiko Ikegaya, and Naoji Fujimori, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 24, 1990, Ser. No. 573,062
Claims priority, application Japan, Dec. 20, 1989, 1-332328; May 18, 1990, 2-129924
Int. Cl.[5] B23K *37/00*
U.S. Cl. 228—44.7 19 Claims



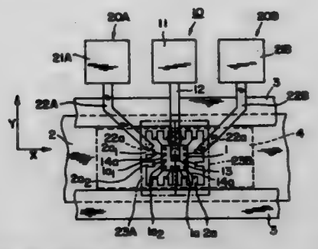
1. A bonding tool comprising a tool end part and a shank, bonded with each other, the tool end part consisting of a substrate consisting of a member selected from the group consisting of sintered compacts of Si or Si_3N_4 as a predominant component, sintered compacts of SiC as a predominant component, sintered compacts of AlN as a predominant component and composite compacts thereof, the substrate being coated with polycrystalline diamond deposited by gaseous phase synthesis method, and the shank partially or wholly consisting of at least one member selected from the group consisting of metals and alloys having a coefficient of linear expansion of at most 7.5×10^{-6}/°C. at a temperature of from room temperature to 600° C.

5,197,652

WIRE BONDING METHOD AND APPARATUS WITH LEAD PRESSING MEANS

Nobuto Yamazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Oct. 23, 1990, Ser. No. 601,518
Claims priority, application Japan, Oct. 23, 1989, 1-275157
Int. Cl.[5] H01L *21/60*
U.S. Cl. 228—44.7 2 Claims



1. A bonding apparatus, in which electrodes on pellets and leads on lead frames are individually bonded to each other by means of a wire bonder, characterized in that said apparatus compriaes a lead-pressing means which has at least two pressing arms with a corresponding pressing section at the end wherein one of said at least two pressing sections presses against a portion of said lead that is away from a bonding point thereof, a lead-pressing head for each of said at least two pressing arms which drives said at least two pressing arms in X and Y directions and in a vertical direction, so that bonding is performed while said portion of said lead that is away from said bonding point thereof is pressed down by said pressing section.

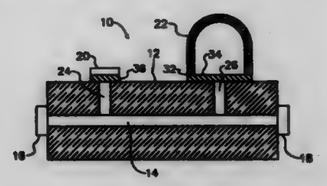
2. A wire bonding method in which electrodes on pellets and leads on lead frames are individually bonded to each other during a bonding step using a wire bonder, said method comprising pressing down during said bonding step a portion of said lead that is away from a bonding point of said lead by one of at least two pressing arms with each having a corresponding pressing section, and driving said at least two pressing arms and corresponding pressing section individually in X and Y directions and in a vertical direction.

5,197,653

METHOD OF SEALING TWO ARTICLES TOGETHER WITH AN INDIUM PREFORM SEAL

Timothy A. Beckwith, Coon Rapids, and Theodore J. Podgorski, St. Paul, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 27, 1992, Ser. No. 859,192
Int. Cl.[5] B23K *20/02, 20/24*
U.S. Cl. 228—116 3 Claims



1. A method of sealing a mounting surface of a first article to a mounting surface of a second article, the method comprising:
placing a preform seal of a selected shape and material on a support means having a plurality of flow through apertures passing through a plate member thereof such that said apertures are located to be in alignment with and under at least portions of said preform to permit the passage of a fluid through said apertures and around at least selected portions of said preform;
coupling a motion limiting means to said support means, the combination of said support means and said motion limiting means serving to limit the freedom of motion of said preform relative to said plate member;
subjecting the combination of said support means, said motion limiting means, and said preform as a unit to a selected one or more cleaning or deoxidizing agents by handling the combination of said plate member and said motion limiting means without handling said preform and allowing said preform to have freedom of movement bounded by said plate member and said motion limiting means;
decoupling and removing said motion limiting means from said support means;
placing said first article mounting surface in juxtaposition with and centrally aligned with said preform, and sufficiently pressing said first article against said preform such that said preform sticks to said first article mounting surface;
removing said combination of said preform and said first article away from said plate member; and
pressing said first article mounting surface with said preform against said second article mounting surface with sufficient pressure to seal together said mounting surfaces of said first and second articles.

5,197,654

BONDING METHOD USING SOLDER COMPOSED OF MULTIPLE ALTERNATING GOLD AND TIN LAYERS

Avishay Katz, 720 Saint Marks Ave., Westfield, N.J. 07090; Chien-Hsun Lee, 375 N. Drive, B7, North Plainfield, N.J. 07060; King L. Tai, 95 Highland Cir., Berkeley Heights, N.J. 07922, and Yiu-Man Wong, 5001 Maranatha Way, Wescosville, Pa. 18106

Filed Nov. 15, 1991, Ser. No. 792,559
Int. Cl.[5] H01L *21/58*
U.S. Cl. 228—124 14 Claims

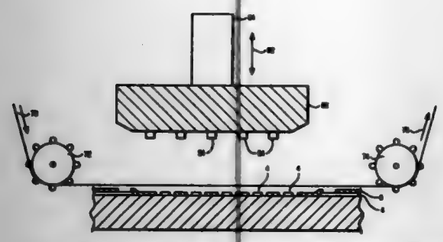
1. A method of bonding together first and second bodies comprising forming a first solder composite layer for the first body in accordance with the steps of
sequentially depositing a plurality of alternating layers of gold and tin, the number of such layers being equal to at least three, on a top surface of the first body or on a top surface of an auxiliary layer located on the surface of the first body, whereby the first composite layer is formed with a top layer of gold, an intermediate layer of tin being located in direct physical contact with a bottom surface of the top layer of gold, the composition of the composite layer averaged over the number of layers being a tin-rich

eutectic of gold and tin such that the first solder composite layer has an overall average content of gold in the approximate range of 75 to 78 percentum by weight, and the top layer of gold and the next-to-top layer of tin having respective thickness in a ratio that is less than approximately 0.8.

5,197,655
FINE PITCH SOLDER APPLICATION

Arthur L. Leerssen, Austin; Everitt W. Mace, Hutto, both of Tex.; Issa S. Mahmoud, Apalachin; Charles T. Randolph, Vestal, both of N.Y.; John Reepe, Endicott, N.Y.; Gaston G. Settle, Georgetown, Tex.; Phong T. Truong, Round Rock, Tex., and Srini V. Vasan, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1992, Ser. No. 894,491
Int. Cl.[5] H01L *21/58*
U.S. Cl. 228—254 8 Claims

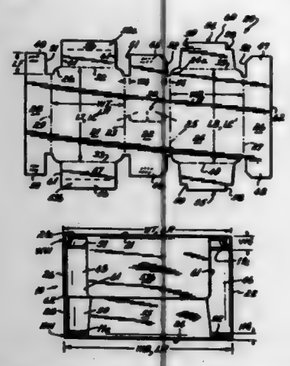


1. A method of applying solder onto fine pitch conductive lands on circuit substrates comprising the steps of:
screening solder through a stencil having at least one aperture corresponding to a plurality of lands; and
contacting the solder with a heated solder non-wettable platen corresponding substantially in size and shape to said at least one aperture for reflowing said solder.

5,197,656
SLEEVE STYLE CARTON

Norbert Hoell, Southgate, Ky., and Charles A. Miller, Williamsburg, Ohio, assignors to The C.W. Zumbiel Co., Cincinnati, Ohio

Filed Sep. 4, 1991, Ser. No. 754,649
Int. Cl.[5] B65D *5/42, 65/22*
U.S. Cl. 229—40 50 Claims

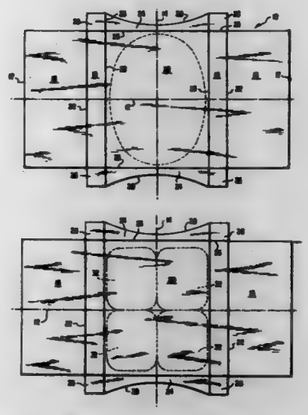


1. A sleeve style closed end carton for a can matrix having a corner can at each corner of said matrix, each corner can having a head, a body, and a heel, each corner can's head and heel having a rim of an outside diameter less than the outside diameter of said body, and each corner can's head and heel including a tapered portion by which said head and heel rims, respectively, are connected with said corner can's body, said carton comprising
top, bottom and opposed side walls, said walls being foldably connected one to the other, and each of said walls having opposed ends,
curved corner structure defined by each of said top and bottom walls, each top and bottom wall having each corner configured proximately to overlie but not extend substantially beyond a corner can's head and heel rims, respectively, so that said tapered portion of each corner can's head and heel is partially visible when said carton is filled with said can matrix and is viewed in top plan view and bottom plan view, respectively,
a corner flap formed integral with each side wall at each end of each side wall, each corner flap being wrapped around a corner can, each corner flap having a top edge spaced from said top wall so as to define an upper gap between said corner flap and said top wall, and also having a bottom edge spaced from said bottom wall so as to define a lower gap between said corner flap and said bottom wall, so that said tapered portion of each corner can's head and heel is partially visible when said carton is filled with said can matrix and is viewed in side or end elevation view, said upper gaps being wider than said lower gaps, and said upper gaps being of a width about equal to the height of a can's head and said lower gaps being of a width about equal to the height of a can's heel,
top and bottom end panels foldably connected to opposed ends of said top and bottom walls, respectively, at least one of said top and bottom end panels being connected to said corner flaps at each end of said carton, and said top and bottom end panels being connected to each other at each end of said carton, to effect closure of said carton.

5,197,657
WRAPPER FOR A FLANGED TRAY

Benjamin J. Cassidy, Waldwick, N.J., and Gerald F. Justice, Washingtonville, N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 795,355, Nov. 20, 1991, abandoned. This application Jun. 16, 1992, Ser. No. 899,058
Int. Cl.[5] B65D *65/12*
U.S. Cl. 229—40 12 Claims

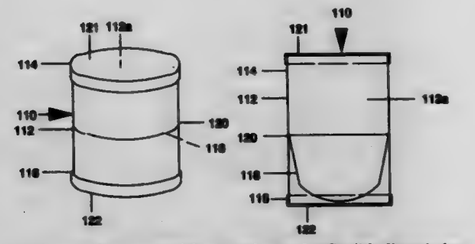


1. A package including a flanged tray and a wrapper snugly surrounding the tray, the wrapper formed of a unitary paperboard blank folded to the form of a tube having open ends, the tube having top, bottom, and side walls, the top wall having a respective flap at each respective open end of the tube, each flap having two ends, each flap foldably joined to a respective end of the top wall, each flap having a free edge engaging respective lower, opposite portions of the flange of said flanged tray, and also engaging opposite portions of the tray, the flaps forming an angle of less than 90 degrees with said top wall, each end of each flap foldably joined to a respective tab, each tab extending at least partially from the top wall to the bottom wall, opposite ends of the blank joined to form said bottom wall, whereby movement of the tray from either open end of the wrapper is prevented.

5,197,658
EXPANDABLE AND REVERSIBLE CONTAINERS

Powell L. Sprunger, 20 Woodview La., Algonquin, Ill. 60102

Continuation-in-part of Ser. No. 530,570, May 30, 1990, abandoned. This application Oct. 30, 1990, Ser. No. 605,505
Int. Cl.[5] B65D *5/56*
U.S. Cl. 229—93 15 Claims

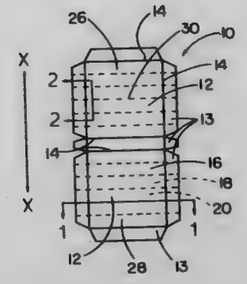


1. A container comprising, a tube, and a flexible liner being secured to a central portion of the tube such that the liner may flex about the central portion of the tube and move between positions adjacent opposed ends of the tube, with the length of the liner from the central portion of the tube to the opposed ends of the tube being approximately the same.

5,197,659
DISPOSABLE BOX BY FOLDING INTO A LOG-SHAPED CONFIGURATION

Eustathios Vassiliou, Newark, Del., assignor to WTPA, Incorporated, Newark, Del.

Filed Jul. 21, 1992, Ser. No. 917,159
Int. Cl.[5] B65D *5/36, 5/42*
U.S. Cl. 229—117.01 15 Claims

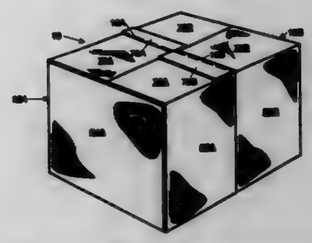


1. A foldable box comprising:
a first end, a second end, and a longitude having a direction from the first end toward the second end;
an inside skin portion between the two ends;
an outside skin portion opposite the inside skin portion;
a middle portion comprising corrugations, the corrugations having a direction parallel to the direction of the longitude, the middle portion having a thickness and being sandwiched between the inside skin portion and the outside skin portion;
segments which remain substantially flat in both a folded and unfolded form of the box;
a plurality of primary folding lines serving to form the box by folding the flat segments around said primary folding lines;
a plurality of latent score lines on at least a part of the flat segments, the latent score lines origination at the inside skin portion, extending partly through the middle portion, and having a direction substantially perpendicular to the longitudinal direction of the box, the latent score lines having an effective degree of higher resistance to folding than the primary folding lines, so that they
present no interference with the formation and function of the box; and
facilitate irreversible destruction of at least some of the flat segments of the box after the function of the box has been ceased, the destruction being caused by propagation of the majority of the latent score lines toward the outside skin portion of the box, when the box is folded from the first end toward the second end in a manner that the box forms a log-like structure with at least part of the inside skin portion of the box becoming an exterior of the log-like structure.

5,197,660
TWIN PACKAGE CARTON

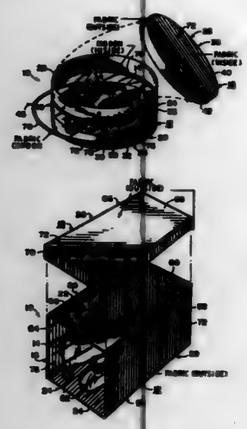
Keith J. Colling, Brownsburg, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.

Continuation-in-part of Ser. No. 765,851, Sep. 9, 1991, abandoned. This application May 5, 1992, Ser. No. 880,305
Int. Cl.[5] B65D *5/54*
U.S. Cl. 22.9—120.011 13 Claims



1. Carton apparatus, comprising: first and second compartment members each having a plurality of sidewalls, bottom flaps and top flaps and defining a substantially enclosed interior volume;
said first and second compartment members each comprising a tab extending from at least one said top flap and joined to the at least one said top flap with a line of weakness so as to be manually severable therefrom;
the tab of one of said compartment members in overlapping relationship with a top flap of the other of said compartment members and secured thereto with securement means; and the lines of weakness of the first and second compartment members being aligned end-to-end.

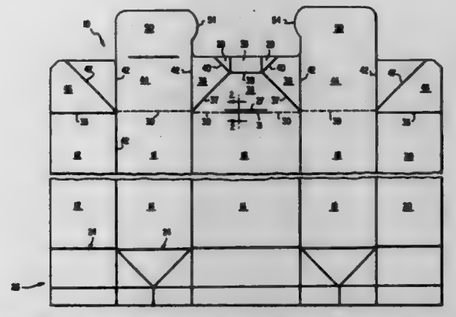
5,197,651
SEE-THROUGH STORAGE CONTAINER
Martha L. Sanchez, 41-07 Bowne St.; Apt. 4A, Flushing, N.Y. 11355
Filed Jun. 3, 1992, Ser. No. 893,032
Int. Cl.[5] B65D 5/42
U.S. Cl. 229—162 2 Claims



1. An improved see-through storage container which comprises:
a) means for holding at least one article therein; said holding means comprising a receptacle having an open top, so that the at least one article can be inserted within the receptacle, said receptacle being a round box with a disc-shaped bottom wall and an upwardly extending circular side wall to hold the at least one article therein which is a hat;
b) means on a portion of said holding means for transmitting light, so that the at least one article can be seen within said holding means as if there is no intervening material, said means for transmitting light comprising a clear band extending about a center of said side wall of said round box;
c) means for covering said holding means to protect the at least one article, said covering means comprising a lid to be removably placed upon the open top of said receptacle, said lid being a round cover including a disc-shaped top wall and a downwardly extending annular flange to fit over an upper edge of said side wall of said round box; and
d) means on said side wall for carrying said round box from place to place, said carrying means including a first elastic cord having each end affixed oppositely to said side wall of said round box and a second elastic cord having each end affixed on a same side of said side wall diagonally across said clear band, so that a person can grip by hand said first elastic cord to carry said round box horizontally and so that the person can grip by the hand said second elastic cord to carry said round box vertically with said first elastic cord retaining said round cover thereto.

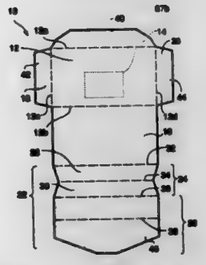
5,197,652
PAPERBOARD CARTON FOR FROZEN FOODSTUFFS
Paul D. Rosas, Saugerties, and Robert L. Gordon, Monroe, both of N.Y., assignors to International Paper Company, Purchase, N.Y.
Filed Mar. 16, 1992, Ser. No. 851,703
Int. Cl.[5] B65D 5/54
U.S. Cl. 229—244 9 Claims

1. A carton in the shape of a rectangular parallelepiped having a central longitudinal axis, the carton formed from a unitary paperboard blank and having an interior surface, the carton having a top end closure and four substantially rectangular sidewalls, each sidewall having an uppermost edge foldably joined to said top end closure, at least three of said sidewalls provided with a respective frangible line across their respective widths, said frangible lines each located contiguous to an end of a said respective sidewall panel, a frangible barrier layer coating the interior surface of said carton, said coating covering the carton interior surface portions of said three frangible lines, means carried by the carton to facilitate manual rupture of said frangible lines by pulling the top end closure away from the remainder of the carton to permit said top end closure to be displaced from the remainder of the carton, so



that any carton contents can be emptied without interference from said top closure, said means including at least one fin carried by the top closure and extending beyond one of said sidewalls of the carton to permit manual grasping of the fin, and wherein said means includes a cutout extending completely through said paperboard blank but not through said barrier layer and bordering on at least one of said frangible tear lines, said frangible barrier layer on the interior surface covering said cutout, whereby a fingernail or other edge can be inserted into said cutout to rupture said barrier layer covering said cutout sand assist in displacing said top closure.

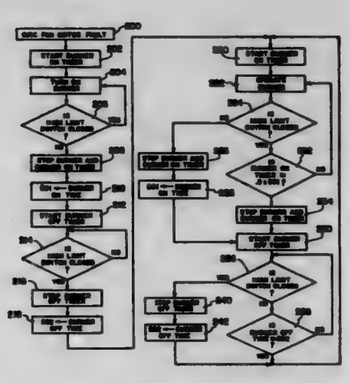
5,197,663
REUSABLE MAILING ENVELOPE
Michael Stude, 1021 S. Grove Ave., Barrington, Ill. 60010
Filed Apr. 23, 1992, Ser. No. 872,545
Int. Cl.[5] B65D 27/06
U.S. Cl. 229—303 16 Claims



1. A reusable mailing envelope made from a blank comprising:
a front panel,
a rear panel connected at a fold line to the front panel opposite the seal flap and first and second side flaps connected at fold lines to said front panel or to said rear panel, said side flap being folded over and fixed to said front panel or said rear panel, and when used said seal flap is folded over and sealed to said front panel or said rear panel to form a closed envelope with a back side and a front side, and

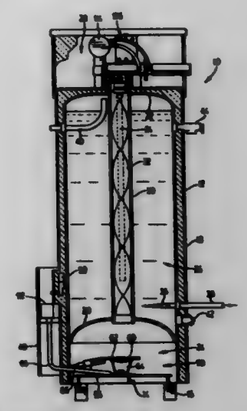
reusable structure (22), for allowing the envelope (11) to be reused as a mailing envelope, connected to the rear panel (16) along a first connecting fold line (32),the reusable structure (22) including a foldable panel (24) and a reusable closure flap (26) connected along a second connecting line (36) to the foldable panel (24), said foldable panel (24) including a center fold line (34) extending laterally thereacross forming a first panel section (28) adjacent and hingeably connected to said rear panel along said first connecting fold line (32) and a second panel section (30) adjacent and hingeably connected to said reusable closure flap along said second connecting line (36) to form a separate flap structure (28, 30), so that when the envelope is first used, said reusable structure (22) is folded into the envelope with said reusable closure flap (26) being folded along a center fold line (38) toward said foldable panel (24) and said foldable panel (24) is folded inwardly of the envelope with panel section (30) overlying an outer portion of said folded reusable closure flap (26) and so that when the envelope is reused said foldable panels (24 and 30) forming said closure flap structure are first folded outwardly and then over said back side of said envelope and fixed thereto, and said folded reusable closure flap (26) is pulled out, the envelope filled, followed by sealing said unfolded closure flap (26) to said front side of said envelope.

5,197,664
METHOD AND APPARATUS FOR REDUCING THERMAL STRESS ON HEAT EXCHANGERS
Gregory A. Lynch, Murfreesboro, Tenn., assignor to Inter-City Products Corporation (USA), LaVergne, Tenn.
Filed Oct. 30, 1991, Ser. No. 784,770
Int. Cl.[5] F23N 5/00
U.S. Cl. 236—11 24 Claims



17. A method of operating a furnace, the furnace including a heating element, a heat exchanger, a circulator fan, and a control unit, said method comprising the steps of:
providing a high temperature indicating device which indicates when the heat exchanger exceeds a predetermined temperature;
providing a fault indicating device which indicates when the circulator fan has a fault condition;
operating the heating element to warm the heat exchanger;
sensing a motor fault condition and measuring a first time period in which the heating element warms the heat exchanger;
alternately disabling the heating element to allow the heat exchanger to cool and operating the heating element for said first time period to heat the heat exchanger.

5,197,665
WATER HEATER
Maurice Jenson, Mississauga, and Theodore Slone, Etobicoke, both of Canada, assignors to Rheem Canada Ltd., Hamilton, Canada
Filed Nov. 29, 1990, Ser. No. 619,938
Int. Cl.[5] F22B 35/00
U.S. Cl. 236—26 D 40 Claims



1. A water heater comprising:
a tank adapted to hold water;
temperature sensing means associated with said tank for detecting the temperature of water held therein;
a burner receiving fuel to be combusted; control means responsive to said temperature sensing means and operating said burner to ignite said fuel when the temperature of water held in the tank falls below a first predetermined temperature;
vent means for discharging combustion gases, said vent means including blowing means responsive to said control means for mixing a cooling medium with said combustion gases at least while said fuel is ignited;
pressure sensing means for detecting the pressure in said vent means and being in communication with said control means, said control means further initiating said blowing means when the temperature of water held in said tank falls below said first predetermined temperature to establish at least a predetermined pressure in said vent means as detected by said pressure sensing means prior to operating said burner.

5,197,666
METHOD AND APPARATUS FOR ESTIMATION OF THERMAL PARAMETER FOR CLIMATE CONTROL
Gilbert L. Wedekind, 698 McGill, Rochester Hills, Mich. 48309
Division of Ser. No. 670,718, Mar. 18, 1991, Pat. No. 5,115,967.
This application Jan. 2, 1992, Ser. No. 816,876
Int. Cl.[5] F23N 5/20; G04D 23/00
U.S. Cl. 236—46 R 24 Claims

1. A parameter estimation assembly (16) for determining, utilizing inside air and outside air, the thermal and thermodynamic parameters of an enclosure (30) defining a conditioned space (28) and of a climate control system (18) associated with the conditioned space (28) controlling the temperature of the conditioned space (28) as a function of time defined by an occupancy comfort (39) and thermostat setback (80) schedule, said assembly (16) comprising:
inside sensing means (34) for measuring the temperature of air inside a conditioned space (28) while the conditioned space (28) is caused to undergo a temperature change

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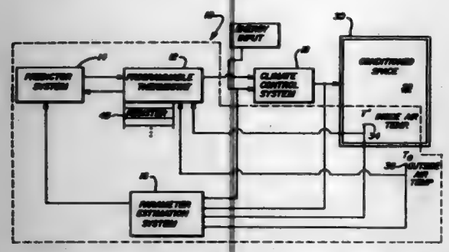
defined by an occupancy comfort (39) and thermostat setback (80) schedule;

outside sensing means (36) for measuring the temperature of outside the conditioned space (28) while the conditioned space (28) is caused to undergo a temperature change defined by the occupancy comfort (39) and thermostat setback (80) schedule;

energy sensor means (46) for measuring the energy consumption rate of a climate control system (18) while the conditioned space (28) is caused to undergo a temperature



change defined by the occupancy comfort (39) and thermostat setback (80) schedule, said assembly (16) characterized by

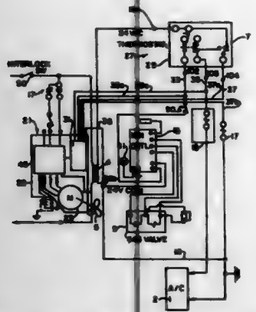
processing means (44) for storing a non-linear model and for receiving the temperatures of the air inside the conditioned space (28) and the air outside the conditioned space (28) and the energy consumption rate and for calculating the thermal and thermodynamic parameters of the enclosure (30) and the climate control system (18) associated therewith utilizing said non-linear model.

5,197,667

HVAC LOW POWER USAGE CIRCULATION BLOWER

Benjamin Bowsky, Ballwin; Jerry D. Lloyd, Florissant; Bernard Brown, and Pradeep K. Sood, both of St. Louis, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 18, 1991, Ser. No. 643,180
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.3 **20 Claims**



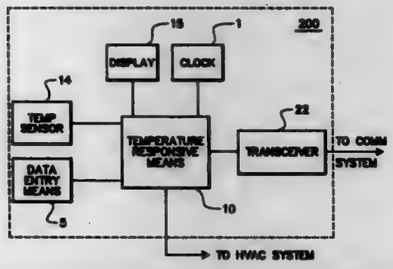
1. In a heating and/or air conditioning system employing an electric motor driven blower fan capable of running within a range of speeds, the system having a plurality of operating modes with the speed of the fan depending upon which operating mode is selected at a particular time, a first of the modes being a thermal mode which includes use of the fan, and a second of the modes being a circulate mode which also includes use of the fan but without heating or cooling, apparatus for controlling the speed of the motor for the fan to run at a first speed when the first mode is selected, and at a second and substantially slower speed when the seconds mode is selected, said second speed being less than seven hundred revolutions per minute, the apparatus comprising pole switching motor means for running the fan at different speeds within its range of speeds, means for detecting the condition of the environment on which the system operates, switch means for selecting a particular system operating mode, logic means responsive to the switch means for determining in which operating mode he system is, and means responsive to the logic means for selecting the speed of the motor and hence that of the fan as determined by the mode selected such that said motor automatically starts at said first speed.

5,197,668

COMMUNICATING THERMOSTAT

James W. Ratz, Bloomington; Robert J. Schnell, Plymouth, and Daniel T. Uhrich, Mayer, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1991, Ser. No. 811,503
Int. Cl.[5] G05D *23/00*
U.S. Cl. 236—51 **3 Claims**



1. A thermostatic control system for controlling the temperature in first and second spaces in a building, each space having its own means for conditioning the temperature of the space, comprising:

a first thermostat located in the first space, said first thermostat having a setpoint and a transceiver for transmitting said setpoint; and

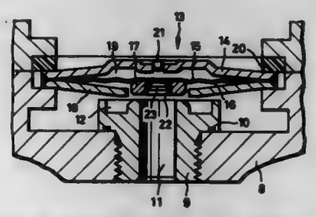
a second thermostat located in the second space and connected to said first thermostat, said second thermostat having a setpoint, a transceiver and an external temperature responsive means, said setpoint of said second thermostat being modified by said external temperature responsive means as a function of a difference in setpoints between said first and second thermostats.

5,197,669

THERMALLY-ACTUATED STEAM TRAP

Hideaki Yamoto, Kakogawa, Japan, assignor to Tlv Co., Ltd., Kakogawa, Japan

Filed Mar. 12, 1992, Ser. No. 851,388
Claims priority, application Japan, Mar. 15, 1991, 3-76781
Int. Cl.[5] F16T *1/10*
U.S. Cl. 236—58 **3 Claims**



1. A thermally-actuated steam trap comprising:

a valve casing having an inlet, a valve chest, and an outlet,

a valve seat member having a discharge passage between the valve chest and the outlet,

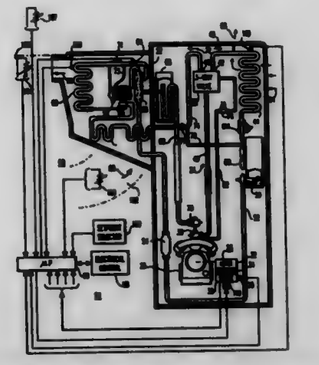
a temperature control element disposed in the valve chest and including a cover member, a first diaphragm, a second diaphragm and a single-separate valve member, said control element containing an expansible medium, the second diaphragm and the valve member each having a through hole formed therein and being connected to one another at the through holes, and a face of the first diaphragm being exposed to the discharge passage.

5,197,670

METHOD OF OPERATING A TRANSPORT REFRIGERATION UNIT

Jay L. Hanson, Bloomington, and Romuald M. Jurewicz, St. Louis Park, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Oct. 24, 1991, Ser. No. 782,187
Int. Cl.[5] F25B *29/00*
U.S. Cl. 236—78 D **9 Claims**



1. A method of operating a transport refrigeration unit which includes a refrigerant circuit having a compressor, a condenser, and an evaporator, a prime mover for driving the compressor, and electrical control, with the electrical control automatically starting and stopping the prime mover to control the temperature of a load in a conditioned space to a selected set point temperature via heating, cooling and null cycles, comprising the steps of:

sensing the temperature of the conditioned space,

providing an error temperature responsive to the difference between the sensed temperature of the conditioned space and the selected set point temperature,

stopping the prime mover at a predetermined error temperature,

sensing the ambient temperature,

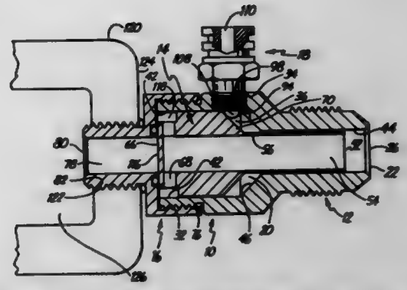
and providing a dynamic prime mover restart error temperature in response to the magnitude of the difference between the temperature of the conditioned space and the ambient temperature.

5,197,671

PRESSURE RELIEF VALVE WITH THERMAL TRIGGER AND MOVABLE SEAL PLUG

Lloyd G. Wass, 1670 Blackhawk Cove, Eagan, Minn. 55122, and Michael R. Baird, 8310 Cypress La., Eden Prairie, Minn. 55347

Continuation-in-part of Ser. No. 707,596, May 30, 1991, Pat. No. 5,161,738. This application Dec. 19, 1991, Ser. No. 811,461
Int. Cl.[5] G05D *27/00*
U.S. Cl. 236—92 C **27 Claims**



17. A thermally activated pressure relief valve for use with a high pressure compressed gas receptacle, comprising:

a valve housing, for coupling to the receptacle, having a communication passage with an inlet for positioning within an interior of the receptacle and an outlet to an exterior of the housing, and a radial shoulder framing the passage;

a seal plug, movable within the passage, with a first side exposed to the interior of the receptacle and sealed against the shoulder, and a second biased side, the seal plug comprising:

a cylindrical-shaped member having a hollow cavity opposite the first side and generally longitudinally aligned with the passage, the cavity open to a first end of the passage; and

an exhaust port between the first side and the cavity and communicating with the cavity, the exhaust port further communicating with a second end of the passage; and

thermal trigger means, operably contacting the second biased side of the seal plug, for holding the first side of the seal plug against the shoulder while the thermal trigger means is below a predetermined temperature threshold, and for releasing the seal plug when the predetermined temperature threshold is reached to allow gas pressure to move the first side of the seal plug away from the shoulder to establish a flow path from the inlet through the passage to the outlet.

5,197,672

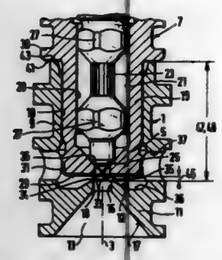
FUEL INJECTION VALVE AND ADJUSTABLE GAS SLEEVE FORMING AN ANNULAR METERING GAS GAP

Uwe Gryte; Waldemar Haas, both of Bamberg, and Frank Rudolf, Neustadt/Coburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1992, Ser. No. 871,141
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1991, 4112853
Int. Cl.[5] F02M *57/00, 69/04, 65/00*
U.S. Cl. 239—1 **13 Claims**

1. A method for adjusting a narrow annular gas gap, which meters a set-point quantity of a gas, of a device for injecting a fuel-gas mixture, said device comprising a fuel injection valve with a nozzle body with a retaining shoulder on its circumference pointing radially outward with a face end, and a cup-shaped gas enveloping bushing with a stop face end and with

a mixture injection port in a bottom part, said mixture injection port extending concentrically with a longitudinal axis, said bushing encompassing a valve end of the fuel injection valve at least partly axially with a cylindrical portion and at least partly radially with a face end of the bottom part, forming a narrow annular gas gap between the face end of the bottom part and the valve end of the fuel injection valve, with the stop face end (43) of the gas enveloping bushing (1) resting on the face end



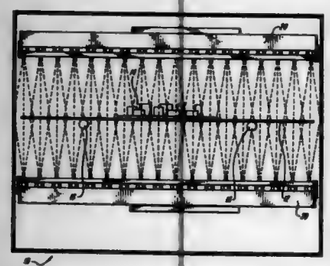
(41) of the retaining shoulder (39), the method comprising the steps of measuring an actual quantity of the gas flowing through the annular gas gap (35), adjusting the quantity of the gas flowing through the annular gas gap (35) by adjusting an axial spacing (47) between the face end (41) of the retaining shoulder (39) and the face end (12) of the bottom part (11) in the region of the annular gas gap (35) until the measured actual quantity of the gas matches a predetermined set-point quantity.

5,197,673

RECIPROCATING NOZZLE ASSEMBLY

William S. Sullivan, Nashua, N.H., assignor to Vitronics Corporation, Newmarket, N.H.

Filed Jan. 6, 1992, Ser. No. 817,147
Int. Cl.[5] B05B *3/14*
U.S. Cl. 239—102.1 9 Claims



1. A nozzle assembly for spraying a fluid on a surface comprising:

a nozzle manifold;

a plurality of nozzles, each nozzle having a distal tip spaced from said manifold, each of said nozzles including an upper portion securely affixed to said manifold, said tip of each of said nozzles including a ball portion which is adapted to seat in a cooperatively formed internal recess in an associated upper portion of said nozzle upon the application of fluid pressure thereto, each of said nozzle tips being pivotally mounted with respect to said associated upper portion;

means for engaging each of said nozzle tips; and

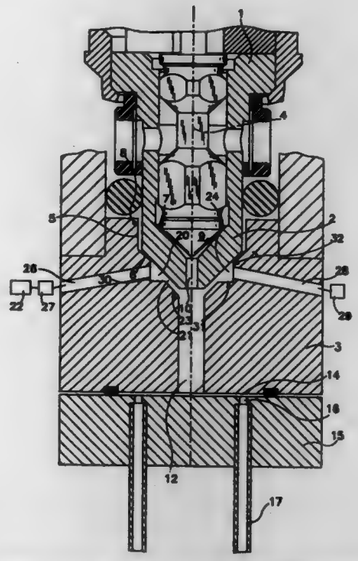
means coupled to said engaging means for producing oscillatory motion of each of said nozzle tips.

5,197,674

APPARATUS FOR INJECTING A FUEL-GAS MIXTURE INTO AN INTERNAL COMBUSTION ENGINE

Wolfgang Ketterer, Ladwigsburg; Uwe Liskow, Kornwestheim, and Harald Kalup, Bamberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE91/00046, § 371 Date Oct. 22, 1991, § 102(e) Date Oct. 22, 1991, PCT Pub. No. WO91/13253, PCT Pub. Date Sep. 5, 1991
PCT Filed Jan. 19, 1991, Ser. No. 768,703
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1990, 4005734
Int. Cl.[5] F02M *69/04*
U.S. Cl. 239—408 20 Claims



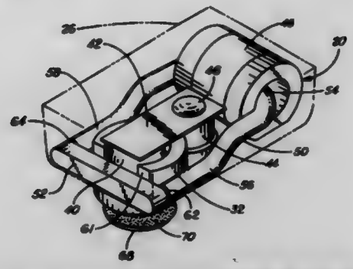
1. An apparatus for injecting a fuel-gas mixture into an intake tube of an internal combustion engine, having a fuel injection valve that includes a valve closing body, a fixed valve seat cooperating with said valve closing body, and downstream of the valve seat said fuel injection valve has at least one injection port at one injection end, a valve holder which embraces the fuel injection valve at least in a region of the injection end, the valve holder having a stepped longitudinal bore extending concentrically with a longitudinal valve axis, a mixing chamber is embodied downstream of the injection end in said valve holder, fuel is injected through the fuel injection valve into said mixing chamber, and said mixing chamber communicates upstream via an annular gas gap formed between the injection end and the stepped longitudinal bore, an annular gas conduit that communicates with a gas source and said annular gas gap, the injection end (2, 41) of the fuel injection valve (1, 42) rests on a bearing face (6) of the stepped longitudinal bore (5, 52) upstream of said annular gas conduit, said bearing face (6) of the stepped longitudinal bore (5, 52) and the injection end (2, 41) of the fuel injection valve (1, 42) are embodied as tapering frustoconically radially with respect to the longitudinal axis (4) of the valve, said annular gas conduit (20, 45) is embodied between the bearing face (6) and the mixing chamber (12) and said annular gas gap (21, 43) is formed between the frustoconical injection end (2, 41) and an oblique segment (23, 55) of the stepped longitudinal bore (5, 52) that tapers conically.

5,197,675

FUEL RAIL HAVING ROLLING BALL FUEL INJECTORS

Paul D. Daly, Troy, Mich., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Continuation-in-part of Ser. No. 653,598, Feb. 11, 1991, abandoned. This application Feb. 4, 1992, Ser. No. 830,101
Int. Cl.[5] F02M *51/06*; F16K *31/10*
U.S. Cl. 239—585.2 37 Claims



1. In a fuel injector which is operated by electric operating means and comprises body structure having a fuel inlet, a fuel outlet, and a frusto-conical seat that circumscribes an orifice and is disposed between said fuel inlet and said fuel outlet, a sphere that is disposed for coaction with said seat to selectively open and close said orifice to fuel flow between said fuel inlet and said fuel outlet, resilient means acting to resiliently urge said sphere along an imaginary axis about which said frusto-conical seat is a surface of revolution toward concentrically seating on said seat and thereby closing said orifice, the improvement which comprises sphere-actuating means comprising a movable bar that is disposed along side said sphere and operated by said electric operating means to execute motion that is predominantly along the direction of an imaginary line that intersects said axis, said bar executing such motion toward and from said axis in accordance with an electric control signal applied to said electric operating means, such motion of said bar toward said axis creating a force acting on said sphere at the end of a radial of said sphere which radial, when viewed along said axis, is essentially coincident with said imaginary line, and such force created by such motion of said bar along said imaginary line being effective, in cooperation with said seat and resilient means, to cause said sphere to be bodily displaced from concentricity with said axis to eccentricity with said axis and thereby open said orifice to flow, and such motion of said bar away from said axis being effective to allow said resilient means, in cooperation with said seat, to cause said sphere to be bodily displaced from eccentricity with said axis to concentricity with said axis and thereby close said orifice to flow.

5,197,676

APPARATUS FOR DISPENSING CONDUCTIVE COATING MATERIALS

Ronald D. Kosiecynski, North Royalton; Bruce C. Hills, Amherst, and Kenneth J. Cooling, Westlake, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 618,089, Nov. 26, 1990, which is a continuation-in-part of Ser. No. 554,795, Jul. 18, 1990, Pat. No. 5,078,168. This application Sep. 27, 1991, Ser. No. 766,796
Int. Cl.[5] B05B *5/02*
U.S. Cl. 239—690 20 Claims

1. Apparatus for dispensing electrically conductive coating material, comprising:

at least one source of electrically conductive coating material;

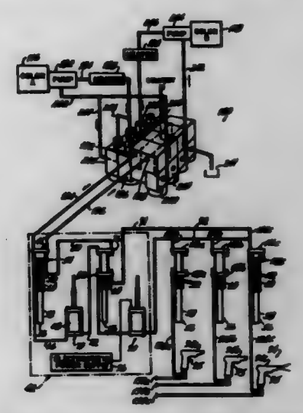
a number of coating dispensers each operative to dispense coating material when opened and to terminate the flow of coating material when closed;

first transfer means for receiving coating material from said at least one source;

second transfer means for receiving coating material from said first transfer means, and for transmitting the coating material to said coating dispensers;

electrostatic charging means for applying an electrostatic charge to the coating material which is supplied to said coating dispensers from said second transfer means;

first voltage block means for electrically isolating said first transfer means from said electrostatic charging means while said first transfer means receives coating material



from said at least one source, and for electrically isolating said second transfer means from said at least one source of coating material while said second transfer means receives coating material from said first transfer means;

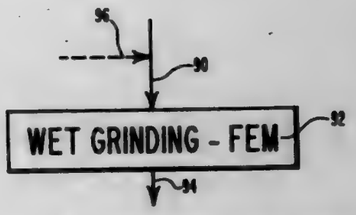
a second voltage block means connected between each of said coating dispensers and said electrostatic charging means for supplying charged coating material to a respective coating dispenser when said coating dispenser is opened to dispense coating material, and for electrically isolating said respective coating dispenser from said charged coating material when said coating dispenser is closed to terminate the flow of coating material.

5,197,677

WET GRINDING OF CRYSTALLINE ENERGETIC MATERIALS

Lee C. Estabrook, and Carlos Semcon, both of Minden, La., assignors to Thiokol Corporation, Ogden, Utah

Filed Apr. 26, 1991, Ser. No. 692,192
Int. Cl.[5] B02C *19/06*
U.S. Cl. 241—5 23 Claims



20. A process for grinding a slurry of solid particulate energetic material, said slurry comprising less than 40 percent solids comprising:

continuously introducing a slurry of solid particulate energetic material into at least one high velocity stream of

inert elastic fluid in a fluid energy mill wherein interparticle collision of wet particles reduces the mean particle size; and

continuously separating and collecting wet particulate energetic material of a reduced particle size.

5,197,678

POLYSTYRENE RECYCLING PROCESS

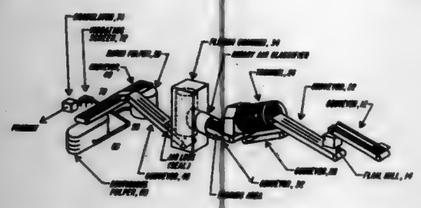
George Trenek, Danville, Calif.; Martin Stanczyk, Tuscaloosa, Ala., and Michael R. Grubbs, Hayward, Calif., assignors to WTE Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 563,835, Aug. 3, 1990, Pat. No. 5,060,870, which is a continuation of Ser. No. 376,746, Jul. 7, 1989, abandoned. This application Jul. 18, 1991, Ser. No. 732,052

The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] B02C *19/12*

U.S. Cl. 241—21 14 Claims



1. A method of recovering and cleaning foamed polystyrene from a stream of waste comprising foamed polystyrene particles and other types of waste particles, said method comprising the steps of:

milling said waste particles to reduce said particles to be within a predetermined size range,

mixing said milled waste particle with a liquid to form a mixture of said waste particles and said liquid,

agitating said mixture so as to fiberize any paper waste particles and other waste particles which can be fiberized,

separating and recovering said milled foamed polystyrene waste particles from said mixture.

5,197,679

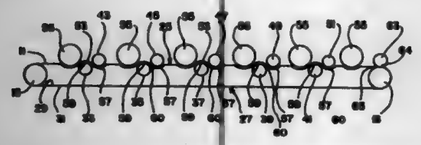
CORE STRIPPER

Rex E. Burner, Des Moines; Larry C. Kisting, Grimes, and David Fehrer, Indianola, all of Iowa, assignors to R.R. Donnelley & Sons Company, Chicago, Ill.

Filed Apr. 30, 1991, Ser. No. 693,673

Int. Cl.[5] B02C *15/00*

U.S. Cl. 241—36 15 Claims



1. An apparatus for stripping material from a material core, comprising:

a. a frame;

b. a belt attached to the frame;

c. means for rotationally driving the belt; and

d. means for biasing material to be stripped against the belt, said biasing means including a plurality of positioning members attached to the frame and spaced at intervals such that the distance between each positioning member is greater than the diameter of the material core to be stripped, wherein each of the positioning members frictionally engages the belt to form a nip.

5,197,680

BALL MILL FOR THE MANUFACTURE OF GOODS FORMED BY THE SUSPENSION OF SOLID PARTICLES IN A FATTY CARRIER

Jean-Marie Chauveau, Gorgier, Switzerland, assignor to Servco S.p.A., Italy

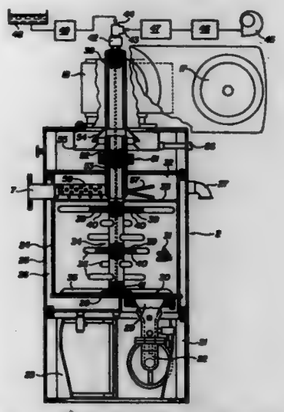
PCT No. PCT/CH90/00176, § 371 Date Mar. 25, 1991, § 102(e) Date Mar. 25, 1991, PCT Pub. No. WO91/01648, PCT Pub. Date Feb. 21, 1991

PCT Filed Jul. 19, 1990, Ser. No. 656,147

Claims priority, application France, Jul. 26, 1989, 89 10278

Int. Cl.[5] B02C *17/16*

U.S. Cl. 241—57 6 Claims



1. A ball mill for the manufacture of a product formed from one of a paste and a liquid suspension of solid particles in a fat vehicle, said ball mill comprising:

a vat (24) supporting unattached and freely movable crushing means (31) therein for crushing the suspended solid particles, said ball mill being appropriately sized to contain a suitable quantity of a mixture formed from one of a paste and a liquid suspension of solid particles in a fat vehicle and being provided with a mixture inlet (29) and a mixture outlet (7);

a rotating shaft (34) extending inside said vat and supporting agitating elements (36) positioned to activate said crushing means during rotation of said rotating shaft (34);

drive means for driving said rotating shaft; and

means (38–48) for introducing fluid into said vat (24);

wherein said means for introducing fluid comprises an air blowing device (45–47), for introducing pressurized air, communicating with an inlet conduit (38) located within said rotating shaft, at least one distribution orifice (40) formed in at least one of the agitating elements (36), and a distribution conduit (39) interconnecting said at least one distribution orifice with said inlet conduit (38); during use, said agitating elements (36) and said at least one distribution orifice are immersed in the mixture so as to distribute the fluid into areas where said crushing means (31) are set in motion by said agitating elements upon rotation of said rotating shaft;

said means for introducing fluid further comprises at least one reservoir (48) containing a liquid to be dispensed into the mixture and dispenser means (49) interconnecting said reservoir with said inlet conduit (38) for dispensing the liquid; and

said air blowing device (45–47) further comprises means (67) for sterilizing the air.

5,197,681

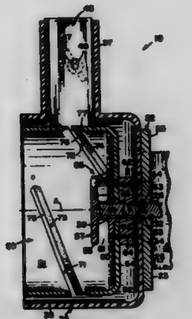
APPARATUS FOR SAFE HIGH SPEED SLICING/SHAVING OF A FOOD PRODUCT

Benno E. Liebermann, Louisville, Ky., assignor to Beltec International, Louisville, Ky.

Filed Dec. 3, 1990, Ser. No. 621,136

Int. Cl.[5] B02C *23/02*

U.S. Cl. 241—65 19 Claims



1. Apparatus for slicing/shaving a food product comprising a drum having a curved peripheral surface surrounding a central longitudinal axis of rotation, a slicing/shaving edge carried on the peripheral surface of said drum and extending longitudinally along the drum, said drum having a slot extending therethrough with said slicing/shaving edge along and facing said slot, means for rotating said drum about said axis so that longitudinally spaced segments of said edge move along circular paths of travel not radially beyond the path of travel of the peripheral surface of the drum, said peripheral drum surface opposite said edge being recessed to provide a relief area located only contiguous to the side of said slot opposite the side where said edge is located and extending radially inwardly of said slicing/shaving edge governing thereby the sliced/shaved product thickness by the distance between the slicing/shaving edge and the recessed portion of the drum, and feed tube means for guiding a food product toward said slicing/shaving edge along a food product feed path disposed generally transversely to said slicing/shaving edge, whereby continuous rotation of said slicing/shaving edge along said circular paths effect continuous slicing/shaving of the food product pressed against said drum, said feed tube means terminating in a curved surface closely enveloping the peripheral surface of the drum so that food does not drag along the drum surface thereat and the food being fed against said drum and edge thereon passes through said slot into said drum.

5,197,682

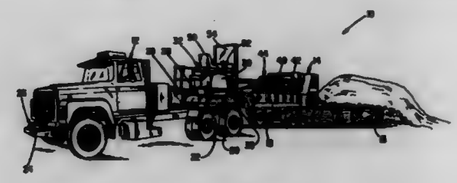
PORTABLE HYDRAULIC SHREDDER

William M. Del Zotto, 2300 Commonwealth Ave., Duluth, Minn. 55808-1699

Filed Dec. 31, 1991, Ser. No. 815,391

Int. Cl.[5] B02C *21/00*

U.S. Cl. 241—101.7 14 Claims



1. Shredder apparatus comprising:

a) a transport vehicle including hydraulic pump means coupled to a drive engine and a plurality of conduits for pressurizing a fluid within the conduits; and

b) trailer means detachably coupling to said transport vehicle and including (1) an operator platform having a collection hopper for receiving work materials and wherein said hopper includes at least one movable wall, (2) cutter-head means coupled to said conduits and having a hydraulically driven cutter-head containing a plurality of teeth for shredding the work materials, (3) means for extending and retracting said movable wall to direct the work materials into contact with the cutter head, (4) a reduction channel defined between said cutter head and an adjacent portion of a floor of said hopper and wherein the work materials are shredded; and (5) means for controlling the separation between the cutter head and the adjacent floor portion and thereby the size of shredded particulate.

5,197,683

OIL MILL/CRUSHER

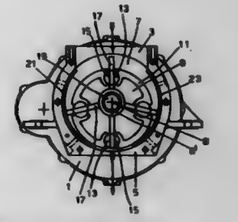
Michele Cravero, Strada Valentino-Fraz. Macellai, 12060 Pocapaglia; Emilio Gilardi, Via Martiri d'Italia 51, 10014 Caluso, and Alberto Bertolo, Via Altinetti 3, 10040 Almese, all of Italy

Filed Feb. 18, 1992, Ser. No. 837,479

Claims priority, application Italy, Feb. 20, 1991, TO91-1A000117

Int. Cl.[5] B02C *13/282*

U.S. Cl. 241—189.1 3 Claims



1. An oil mill/crusher comprising:

an external casing having an axis and including a load hopper, an axial pin, a product output opening, and a substantially cylindrical chamber, said chamber having an internal wall;

a substantially cylindrical rotor positioned inside the casing and having an axis of rotation parallel to the axis of the casing so that the rotor is eccentrical to the axis of the casing and is in a substantially internally tangent position to said chamber, said rotor including a circumferential part having an external wall and a shank;

a plurality of rotating blades;

a plurality of constrained support means rotating on the circumferential part of the rotor and each having a radial slit to slidingly house a respective blade;

said plurality of blades being hinged-constrained to the axial pin of the casing at one end thereof and passing through said circumferential part due to radial slits provided in said constrained support means, said blades being substantially as long as a radius of the cylindrical chamber of the casing;

two knurled arcs provided on the internal wall of the cylindrical chamber of the casing and extending from an opening end of the load hopper to the product output opening, said arcs forming with said external wall and the blades, a working chamber of the mill/crusher;

the blades being of a width which is substantially less than a width of the cylindrical chamber where they rotate, the blades being alternatively assembled, one adherent to a right side, the other one adherent to a left side of said chamber;

said blades being at least three in number;

the constrained support means being at least three in number;

said two knurled arcs being provided with triangular grooves, one of the knurled arcs having triangular grooves for a fine crushing and another of said arcs having triangular grooves for a coarse crushing;

rotation control means for the rotor, said rotation control means including a motor, a wheel gear coupling comprised of a sprocket wheel and a wheel gear coupled to the sprocket wheel, a coupling bush, the sprocket wheel being connected to said motor through a pulley, the wheel gear being integrally connected to said shank of the rotor and extending normally thereto on said coupling bush;

said coupling bush connecting said shank with said wheel gear and being internally coupled through a key with said shank and externally coupled with the wheel gear through another key; and

a removable cover;

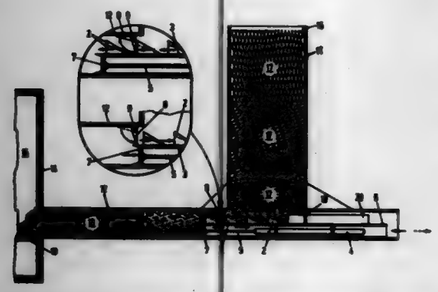
said coupling bush having a through-groove extending along a generatrix thereof and having support projections extending outwardly thereof toward the casing, said projections and said through-groove enabling, once said cover has been removed from the casing and the blades have been withdrawn from the axial pin, a quick withdrawal of the shank from the bush, thus allowing quick cleaning and washing operations.

5,197,684

DEVICE FOR TEARING-UP AND STOKING STRAW

Klaus Bilslet, Gjerlev J., and Jorgen Pedersen, Mariager, both of Denmark, assignors to Licencia Holding S.A., Luxembourg

Filed Feb. 21, 1991, Ser. No. 659,021
Claims priority, application Denmark, Feb. 21, 1990, 0462/90
Int. Cl.[5] B02C *19/12*
U.S. Cl. 241—283 8 Claims



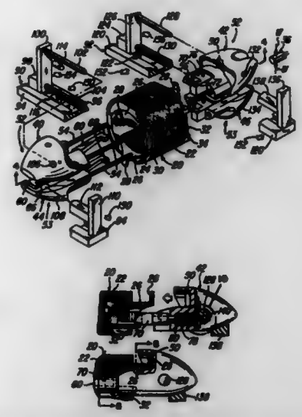
1. A device for tearing up and stoking straw into a combustion chamber, comprising an essentially vertical magazine shaft for straw bales, an essentially horizontal slide means located below and in communication with said shaft, said slide means including means for linear reciprocating motion from a first position vertically below the shaft to a second position into a stoking channel for conveyance of shredded straw and back again, the slide means including tooth means having single upward-facing elements mounted on the slide means, the tooth means being mutually staggered in the direction of movement of the slide means, and including first retaining means at a lower edge of the shaft closest to the stoking channel in the shape of stops projecting down towards the slide means and located such that the tooth means can pass between the stops.

5,197,685

STATOR WINDING METHOD AND APPARATUS INCLUDING WINDING FORMS MOUNTED ON COIL SUPPORT EXTENSIONS

Alvin C. Bauser, Kettering, Ohio, assignor to Globe Products Inc., Huber Heights, Ohio

Filed Jan. 30, 1991, Ser. No. 648,172
Int. Cl.[5] B65H *81/06*
U.S. Cl. 242—1.1 R 15 Claims



1. In a stator winding apparatus for winding a field coil onto a two pole stator core of the type having pole pieces with coil support extensions that support the end turns of the stator coils, said coil support extensions having outwardly extending coil retaining fingers, said apparatus being of the type comprising a winding head assembly that reciprocates and oscillates to draw wire from a source of wire under tension to wind said coils and having two pairs of interfitting winding forms located on opposite sides of the stator core for guiding the wire over said coil support extensions and around said pole pieces, the improvement wherein said winding forms are constructed to be mounted on said coil support extensions and have surfaces engaging the outermost surfaces of said coil retaining fingers so that said winding forms are prevented from moving radially inwardly of said stator core, each pair of said winding forms having a latch mechanism interconnecting them, and each pair of said winding forms having spring means coacting between one of said winding forms and said latch mechanism for biasing said winding forms against said coil support extensions.

5,197,686

SPOOL STORAGE RACK WITH REMOVABLE SUPPORTING PARTITIONS

Yozo Okada, Toyama; Akiyoshi Kando, Uozu, and Kazuki Kuse, Toyama, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,070
Claims priority, application Japan, Aug. 4, 1989, 1-92392[U]
Int. Cl.[5] B65H *16/02*
U.S. Cl. 242—55.3 4 Claims

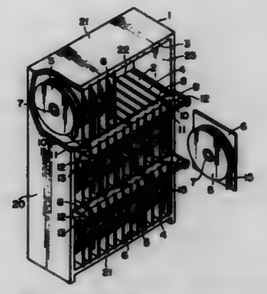
3. A rack for storing a plurality of spools with elongated strips wound therearound, the rack comprising:

a box-like frame including a pair of parallel spaced plates;

a plurality of partitions having lateral edges, each of which has on one of its surfaces a support axle for rotatably and releasably holding a spool; and means for releasably fastening the partitions in a parallel spaced relation to each other between the plates;

the means for releasably fastening comprising a first series of ridges in a first plate of said parallel spaced apart plates and a second series of ridges in a second plate of said parallel spaced apart plates, the ridges of said first series arranged and spaced apart to align in facing relationship with the ridges of said second series forming a plurality of corresponding ridge pairs across the distance between said parallel plates, each partition having grooves in and along its lateral edges and having its grooves come into slidable engagement with one ridge pair; and

an elongated rectangular lock plate having a plurality of slots formed in and arranged at uniform intervals longitudinally of the lock plate and a series of notches formed in and along a side edge thereof so as to be arranged at the same intervals as the first series of ridges, the lock plate being mounted slidably on and along the front side of the first plate, the first plate providing a pin means protruding outward into each slot for slidably mounting the lock plate to the first plate, so that the lock plate is slidable between the first position in which the notches come into registry with the ridges and the second position in which the notches comes out of registry with the ridges.

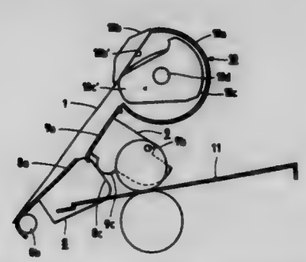


5,197,687

AUTOMATIC ROLL-IN TAKE-UP REEL AND MULTI-COLOR IMAGE RECORDING APPARATUS USING THE SAME

Masao Yamada, Yokohama; Yoshihiro Ikeda, and Hiroku Yamamoto, both of Chigasaki, all of Japan, assignors to Matsushita Graphic Communications Systems, Inc., Tokyo, Japan

Division of Ser. No. 757,410, Sep. 10, 1991. This application Jul. 9, 1992, Ser. No. 910,916
Claims priority, application Japan, Sep. 10, 1990, 2-240914; Mar. 20, 1991, 3-56609
Int. Cl.[5] B65H *18/10, 75/28*
U.S. Cl. 242—67.1 R 7 Claims



1. A take-up roller for winding up a continuous recording medium, which comprises:

a hollow cylindrical body having a longitudinal slit for receiving therein a leading end of the recording medium, said hollow cylindrical body including a first peripheral wall portion extending from a side edge of said slit over a predetermined angular range of the full circumference of said hollow cylindrical body and a second peripheral wall portion extending over the remaining angular range of the full circumference of said hollow cylindrical body, said first peripheral wall portion having an inside diameter larger than the inside diameter of said second peripheral wall portion;

a plurality of concentric cams disposed for oscillation within said hollow cylindrical body about a longitudinal axis of said hollow cylindrical body, each of said cams includingg a first arm having a length greater than a half of the diameter of said second peripheral wall portion and smaller than a half of the diameter of said first peripheral wall portion, and a second arm integral with said first arm and engageable with an inside surface of said second peripheral wall portion, said first arm being engageable with said inside surface of said second peripheral wall portion with the leading end of the recording medium disposed therebetween to grip the leading end within said hollow cylindrical body, said second arm being disposed at such a position relative to said first arm that said first arm is held out of register with said slit and thereby opens said slit when said second arm is in engagement said second peripheral wall portion;

a first rotating drive unit drivable to oscillate said cams and capable of slipping relative to said cam when a torque on said cams exceeds a first predetermined value; and

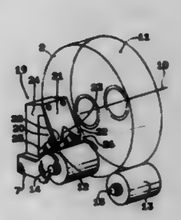
a second rotating drive unit drivable to rotate said hollow cylindrical body and being capable of slipping relative to said hollow cylindrical body when a torque on said hollow cylindrical body exceeds a second predetermined value, said second predetermined torque value being greater than said first predetermined torque value.

5,197,688

METHOD AND DEVICE FOR CUTTING AN ADHESIVE BAND SEALING A REEL OF WEB MATERIAL

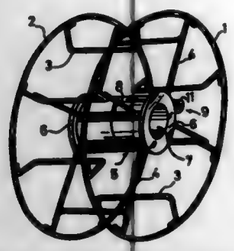
Vaccari Giorgio, and Alessandro Minarelli, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Feb. 11, 1992, Ser. No. 833,989
Claims priority, application Italy, Feb. 26, 1991, BO91 A 000051
Int. Cl.[5] B65H *19/18*
U.S. Cl. 242—78.8 10 Claims



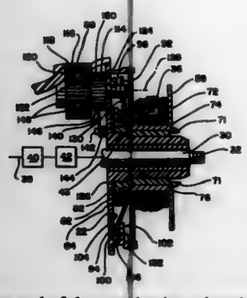
5. A device for cutting an adhesive sealing band (4) on a reel (2) of web material (3), said band (4) securing the free end edge (6) of the initial turn (5) of the reel (2) in position, characterised by comprising a support (8) for said reel (2); a motorized unwinding device (7) for rotating the reel (2) about its axis (10); a sensor (17) which faces the outer peripheral surface (11) of the reel (2) at a sensing station (18) to sense the passage of said free edge (6) in front of the sensor (17) and cause the motorized unwinding device (7) to rotate the reel (2) in the normal unwinding direction (27) in order to move said initial turn (5), with said free edge (6) leading, towards a fixed cutting member (20) for said band (4); a cutting member (21) positioned at said cutting station (20) and comprising two appendices (22) facing the sensing station (18) and joined together by a concave cutting edge (23); and pusher means (25) cooperating with said appendices (22) to urge the appendices (22) into contact with the outer peripheral surface (11) of the reel (2).

5,197,689
SPOOL FOR WINDING FILIFORM ELEMENTS AND THE LIKE
Mario Barone, Buenos Aires, Argentina, assignor to Conarco Alambres y Soldaduras Sociedad Anonima, Provincia de Buenos Aires, Argentina
Filed Oct. 30, 1991, Ser. No. 784,774
Claims priority, application Argentina, Mar. 22, 1991, 319295
Int. Cl.[5] B65H *75/20, 75/30*
U.S. Cl. 242—118.7 4 Claims



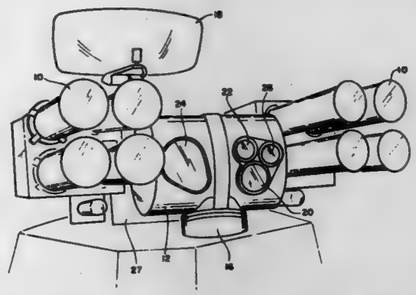
1. Apparatus for winding filiform elements comprising a spool and a central element for mounting the spool on a winding support,
wherein said spool comprises first and second generally parallel rings spaced in a longitudinal direction, a plurality of brace means for receiving said filiform elements, each of said brace means extending between said first and second rings, and a plurality of accessory means secured to selected ones of said brace means for connecting said first and second rings to said central element and having substantially linear, flat bottom segments,
wherein said central element is generally cylindrical and includes an outer surface with grooves extending longitudinally along the length of said central element, each of said grooves receiving a respective one of said linear, flat bottom segments, and
wherein said central element further comprises first and second flange means at respective opposite ends thereof for preventing longitudinal movement of said bottom segments in said grooves, each of said flange means comprising a peripheral annulus extending radially outward from said central element for engaging respective ends of said bottom segments.

5,197,690
DRAG ACTUATION STRUCTURE FOR FISHING REEL
Lorens G. Hlava, Tulsa, Okla., assignor to Zebco Corporation, Tulsa, Okla.
Filed Jul. 2, 1990, Ser. No. 547,632
Int. Cl.[5] A01K *89/027*
U.S. Cl. 242—244 16 Claims



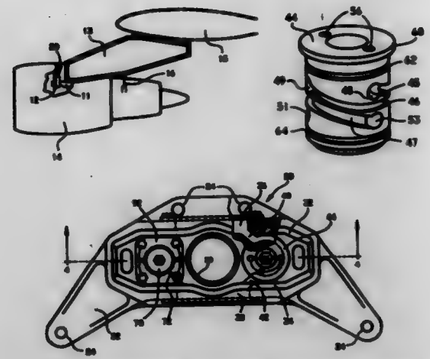
1. In a fishing reel of the type having a housing with a deck plate and a spool support sleeve projecting from the deck plate, a line carrying spool assembly mounted on the support sleeve and having a central axis and an associated flange with an axially facing surface, said spool assembly being rotatable relative to the housing to allow payout of line from said spool assembly, and means for producing a variable drag force on the spool assembly to control the torque that must be exerted on the spool assembly to effect rotation thereof relative to the frame, said drag producing means comprising:
a clutch ring having an axially facing surface;
means for mounting the clutch ring to the deck plate so that the spool assembly flange resides between the deck plate and at least a first part of the clutch ring; and
means for urging the first part of the clutch ring selectively towards and away from the spool assembly flange to selectively increase and decrease a captive force on the spool assembly flange developed between the spool assembly flange and first part of the clutch ring to thereby vary torque that must be exerted on the spool assembly to effect rotation thereof,
wherein the clutch ring surface faces axially rearwardly, the clutch ring mounting means include a wall defining a clutch ring slot and an axially rearwardly facing slot surface and a second part of the clutch ring resides in the slot axially rearwardly of the rearwardly facing slot surface.

5,197,691
BORESIGHT MODULE
Max Amon, Maitland, Fla., and Nicholas B. Saccketti, Tucson, Ariz., assignors to Martin Marietta Corporation, Bethesda, Md.
Filed Sep. 16, 1983, Ser. No. 532,885
Int. Cl.[5] F41G *7/24, 3/06;* G01B *11/26*
U.S. Cl. 244—3.13 13 Claims



1. An optical arrangement for use in boresighting a plurality of optical paths utilized in a missile beam guidance system, to a target tracker used therewith, comprising a first mounting means for supporting a plurality of retro-reflective optical assembles in a closely spaced array, and a second mounting means in which is supported an integrated laser system for providing beam guidance to a missile, said second mounting means also supporting at least one optical target tracker, said second mounting means having a first operational mode in which its integrated laser system is successively utilized in conjunction with at least one of said retro-reflective optical assemblies for boresighting said tracker, and having a second operational mode in which a target is acquired and thereafter tracked.

5,197,692
ADAPTIVE FLUID MOUNT
Peter J. Jones, Erie, Pa., and Marshall W. Downing, Chambourcy, France, assignors to Lord Corporation, Erie, Pa.
Filed May 29, 1991, Ser. No. 706,622
Int. Cl.[5] B64D *27/00*
U.S. Cl. 244—54 15 Claims



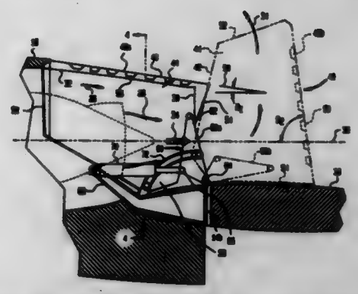
1. A resilient hydraulic mount for use as a component in a system for connecting a vibrating member such as an engine to a support, said resilient mount comprising:
a) a rigid frame member adapted to be attached to said support;
b) a rigid connector for supporting said vibrating member;
c) an elastomeric element for isolating said rigid connector from said rigid frame member, said elastomeric element including
i) a first fluid chamber having a first ingress/egress port;
ii) a second fluid chamber having a second ingress/egress port;
iii) a plurality of fluid inertia tracks which can be selectively interconnected between said first and second ingress/egress ports, each of said fluid inertia tracks including a first terminal end portion connectable with said first ingress/egress port and a second terminal end portion which is simultaneously connectable with said second ingress/egress port; and
d) means to select which of said plurality of fluid inertia tracks is interconnected with said first and second ingress/egress ports without a need to break down the system into its components thereby avoiding a resultant loss of hydraulic fluid.

5,197,693
AIRCRAFT TURBINE ENGINE THRUST REVERSER WITH SLIDING HINGE ACTUATOR
Jihad I. Rouhana, Oceanside, Calif., assignor to Rohr, Inc., Chula Vista, Calif.
Filed Aug. 15, 1991, Ser. No. 745,533
Int. Cl.[5] B64C *33/04;* F02K *3/02*
U.S. Cl. 244—110 B 7 Claims

1. A thrust reverser system for fan jet type aircraft engines which comprises:
a plurality of radially arranged openings through the engine nacelle near the aft end of the nacelle and having nacelle islands therebetween;
a blocker door filling each of said openings and having inner and outer surfaces substantially corresponding to the adjacent inner and outer nacelle surfaces;
an extensible drive means operatively connected between said nacelle and said door to selectively translate said door rearwardly from a stowed to a deployed position and forwardly from said deployed position to said stowed position;
cooperatively located outwardly extending pins secured to the longitudinal edges of each of said doors and tracks secured to the adjacent islands; and
hinged bar means located at each longitudinal door edge having a first end pivotably secured to the door edge and the second end pivotably connected to the adjacent island;

whereby as said drive means translates said door rearwardly said pins move along said tracks and said hinged bars rotate to a position in which said door is near the aft end of said opening, the aft end of said door is near said core and the forward end of said door extends outwardly and forwardly of the aft end of said opening.

5,197,694
OVERWING THRUST REVERSER
Dudley O. Nash, Cincinnati, and Donald F. Kack, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Apr. 27, 1990, Ser. No. 516,015
The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.
Int. Cl.[5] B64D *33/04*
U.S. Cl. 244—110 B 25 Claims



1. For a gas turbine engine exhaust nozzle having an axial centerline axis and supported by a wing for discharging exhaust gases from an outlet thereof over a surface of said wing, a thrust reverser assembly comprising:
a generally U-shaped deflector having first and second spaced-apart sides joined together by a base, and spaced-apart open forward and aft ends, said deflector being positionable in a stowed position where said deflector is aligned generally with the nacelle of said engine to provide an aerodynamically smooth outer contour and around said exhaust nozzle so that said first and second sides extend adjacent to said wing surface and said aft end is aligned generally with said nozzle outlet for allowing substantially unobstructed discharge of said exhaust gases from said nozzle outlet, and in a deployed position for changing direction of said exhaust gases for thrust reversal;
a pair of bellcranks each positioned adjacent to a respective one of said first and second deflector sides, each bellcrank

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including a distal end pivotally joined to a respective deflector side adjacent to said aft end, a proximal end pivotally supported adjacent to said wing surface, and an intermediate end disposed between said distal and proximal ends;

means for rotating each of said bellcranks about said proximal end from a first position wherein said deflector is in said stowed position to a second position wherein said deflector is in said deployed position;

positioning means for controlling angular orientation of said deflector as said deflector is positioned from said stowed position to said deployed position; and

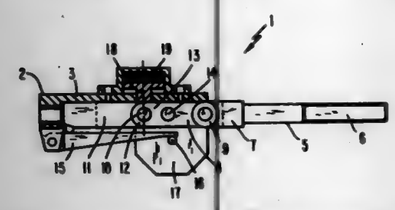
wherein said bellcranks and positioning means are effective for positioning said deflector from said stowed position to said deployed position so that said aft end is disposed against said wing surface and said base extends outwardly from said wing surface for deflecting said exhaust gases upwardly and out from said forward end.

5,197,695

LOCKING DEVICE FOR A BAND OR THE LIKE, SUBJECT TO A TENSILE FORCE

Torbjorn Andersson, Vikingstad; Ingvar Bengtsson, Linkoping; Orjan Arulf, Linoping, and Johan Ohlin, Rimforsa, all of Sweden, assignors to SAAB Space Aktieboleg, Sweden

Filed Mar. 4, 1992, Ser. No. 845,421
Claims priority, application Sweden, Mar. 4, 1991, 9100609
Int. Cl.[5] B64G *1/64*
U.S. Cl. 244—129.1 **4 Claims**



1. A locking device for band means for fastening satellite means to adapter means on a launch vehicle characterized in the combination of:

a housing fastened at a first end to a first portion of said band, said housing being formed with an elongated dimension and axis extending in the direction of a tensile force in said band, said housing including guide means and link means disposed to be guided by said guide means, which link means comprises a fastening element arranged to be attached at its first end to a second part of said band, said fastening element being pivotally connected at its second end to said first link at its first end, which link at its second end is pivotally connected to a second link at a distance from its first end, said second link being journaled at its first end around an axis transverse to the longitudinal direction of the housing;

third link means journaled at the first end of the housing;

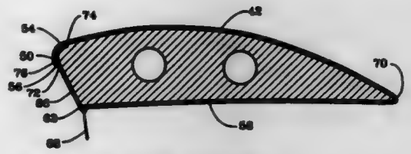
a first dowel element in a first position locking the second link via the third link means from turning around said axis and in a second position releasing the second link to be turned around said axis to a position where the second link is disposed to be released from said transverse axis 14 so that the fastening element under influence of the tensile force moves away from said housing.

5,197,696

LEADING EDGE CANOPY

William J. Coe, Deland, Fla., assignor to P.D. of Miami, Inc., Deland, Fla.

Filed Mar. 27, 1991, Ser. No. 675,739
Int. Cl.[5] B64D *17/02*
U.S. Cl. 244—145 **2 Claims**



1. An improved canopy, comprising:

(a) a conventional top surface having a leading edge and a trailing edge, said top surface having a leading edge reinforcement;

(b) a conventional bottom surface having a leading edge and a trailing edge, said bottom surface connected to said top surface at said trailing edges, said bottom surface having a leading edge reinforcement;

(c) a plurality of rib members extending from said trailing edge to said leading edge, said rib members connected to said top surface and said bottom surface to define a plurality of air chambers, said rib members having a top and bottom end, said rib members having a rib leading edge reinforcement;

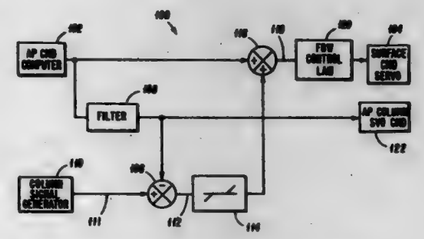
wherein the leading edge reinforcement of said top surface overlaps and is attached to a top portion of the rib leading edge reinforcement of said rib members to define a means for reducing inlet air flow at the leading edge of the canopy.

5,197,697

FLY BY WIRE/FLY BY LIGHT CONTROL SYSTEM WITH MANUAL OVERRIDE

Woon Lyloe, and David C. Pattison, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Feb. 8, 1991, Ser. No. 652,849
Int. Cl.[5] B64C *13/18*
U.S. Cl. 244—197 **3 Claims**



1. An improved flight control system comprising:

autopilot means for generating command signals;

means coupled with the autopilot means, for transmitting the command signal;

yoke signal generator means for generating a yoke signal corresponding to the orientation of a yoke in an aircraft cockpit;

means coupled with said yoke signal generator means, for transmitting the yoke signal;

comparator means, coupled with said means coupled with the autopilot means and the means coupled with said yoke signal generator means, for generating a deviation signal corresponding to the difference between said command signal and the yoke signal;

means for generating a modified command signal as a function of the deviation signal;

control surface servo means coupled with the means for generating a modified command signal for manipulating an aircraft control surface;

yoke servo means coupled with a yoke in an aircraft cockpit and further coupled with said means coupled with the autopilot means for transmitting the command signal, the yoke servo means for physically manipulating the yoke in response to the command signal;

means for modifying the deviation signal and thereby generating a deadened deviation signal where the deadened deviation signal corresponds to that portion of the deviation signal which exceeds a predetermined threshold;

wherein the means coupled with the autopilot means for transmitting the command signal comprises a conducting wire;

wherein the means coupled with said yoke signal generator means for transmitting the yoke signal comprises a conducting wire;

wherein the comparator means comprises an operational amplifier configured as a summer;

wherein the means for generating a modified command signal as a function of the deviation signal comprises an operational amplifier configured as a summer; and

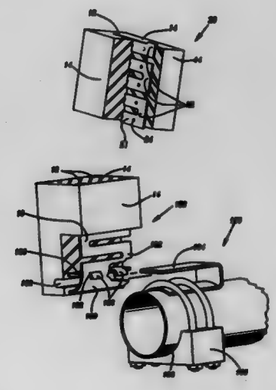
wherein the means for modifying the deviation signal comprises an operational amplifier configured as a dead zone.

5,197,698

METHOD OF MOUNTING AND ISOLATING AUTOMOTIVE EXHAUST SYSTEMS

Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Mar. 25, 1991, Ser. No. 674,199
Int. Cl.[5] E21F *17/02*
U.S. Cl. 248—60 **11 Claims**



1. A method of hanging an exhaust system including pipes, mufflers, catalytic convertors or the like to a vehicle, the method comprising:

providing an exhaust system including a pipe, muffler, catalytic convertor, or exhaust component;

providing a plurality of hangers comprised of flat serpentine spring means which provides a suspension member between mounting points which carries the pipe, muffler, catalytic converter or exhaust component at rest and which resists further accelerations during movement, said serpentine spring means encased by an elastomeric material;

attaching one end of said hangers to said exhaust system at predetermined position on said exhaust system;

attaching the other end of said hangers to the underside of the vehicle;

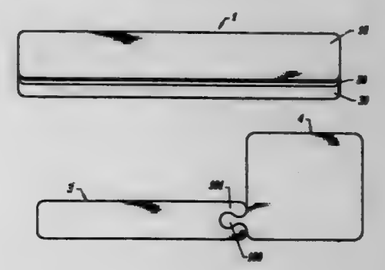
hanging the exhaust system on the vehicle.

5,197,699

WRIST REST

Mark R. Smith, Palo Alto, and Philip G. Wessels, Menlo Park, both of Calif., assignors to Silicon Sports, Menlo Park, Calif.

Filed Apr. 24, 1991, Ser. No. 690,742
Int. Cl.[5] B68G *5/00*
U.S. Cl. 248—118 **11 Claims**



1. A wrist rest having a length, depth, and thickness, comprising

a) a support layer;

b) a low friction surface layer bonded to the support layer; and

c) an interlocking contour by means of which it is attachable to an extension pad, wherein the interlocking contour is shaped by three arc segments from circles of the same radius,

wherein the thickness of the wrist rest is about from ¼ to 1 inches.

5,197,700

CAMERA PEDESTAL

Leonard T. Chapman, North Hollywood, Calif., assignor to Leonard Studio Equipment, Inc., North Hollywood, Calif.

Filed Oct. 1, 1990, Ser. No. 591,525
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—125 **14 Claims**

1. An adjustable camera pedestal comprising:

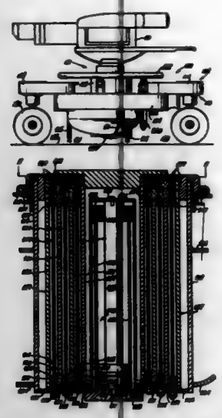
a hollow, tapered cylinder having a first end and a second end having a cross section area greater than that of said first end;

a solid cylindrical piston slidably displaceable within said cylinder and having a first piston end facing a drive cham-

acting against the cam element so as to give the desired vertical positioning to the suspension arm;

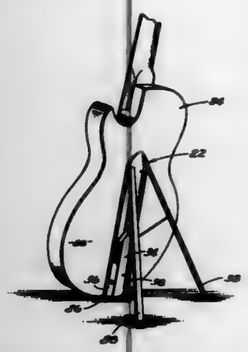
position and a closed position, said clip means engaging

ber within said tapered cylinder for containing compressed gas;



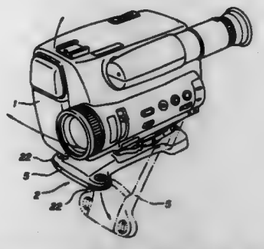
a seal on said piston expandable to substantially seal said piston against said tapered wall at all positions between said first and second ends of said cylinder; and
at least one column section attached to said piston.

5,197,701
STAND FOR SUPPORTING A MUSICAL INSTRUMENT
Mark T. Olson, Venice, Calif., assignor to Joel William Vuylsteke, Marina del Rey, Calif., a part interest
Filed Mar. 17, 1992, Ser. No. 853,077
Int. Cl.[5] F16M *11/38*
U.S. Cl. 248—166 10 Claims



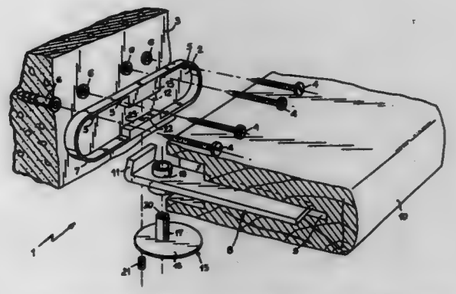
1. A musical instrument stand for an instrument having a longitudinal axis, the instrument body having a front surface across which playing strings are located, a rear surface and a bottom surface, said stand comprising:
a main housing having a first surface adjacent to and secured to the rear surface of said instrument and extending along the instrument lengthwise axis from the bottom surface of said instrument; and
a pair of retractable legs secured to said main housing and movable from a flush position in grooves formed in said housing when said stand is not in use to an erect position where the legs and a portion of said main housing adjacent said instrument bottom surface act to support said instrument.

5,197,702
COMBINED UNIVERSAL HEAD AND GRIP
Hideni Suzuki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 24, 1991, Ser. No. 734,996
Claims priority, application Japan, Aug. 22, 1990, 2-218990
Int. Cl.[5] F16M *11/04*
U.S. Cl. 248—178 12 Claims



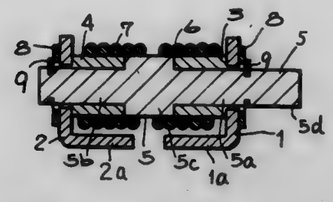
1. A combined universal head and grip for driving a camera horizontally and vertically, said combined universal head and grip being attached at a lower surface of a body of the camera and comprising:
a grip body, wherein a width of one part of said grip body is smaller than a width of a remaining portion of said grip body to allow said grip body to serve as a base for a universal head, and
a driving source for driving the camera horizontally and vertically, said driving source being installed in a tip portion of said grip body.

5,197,703
CONCEALED SUPPORT DEVICE TO FASTEN A SHELF TO A WALL
Modesto Pratolongo, Milan, Italy, assignor to Lesa S.P.A., Como, Italy
Filed Apr. 24, 1991, Ser. No. 690,653
Claims priority, application Italy, May 4, 1990, 20209 A/90
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—225.1 10 Claims



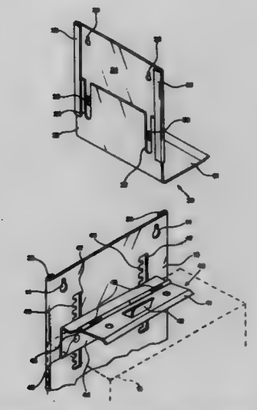
1. A concealed support device to fasten a shelf to a wall, comprising:
a plate designed to be fastened to a wall;
a supporting arm longitudinally insertable in a housing provided in a shelf and having a hooking end oscillatably fixed to an engagement recess offered by the plate;
an adjusting member comprising a cam element rotatably engaged to the arm and designed to act against said plate to restrain the angular displacement of the arm (8) about the hooking end (11); and
a vertical set screw operatively engaged to the plate and acting against the cam element so as to give the desired vertical positioning to the supporting arm.

5,197,704
ANGLE ADJUSTING DEVICE FOR A DISPLAY DEVICE
Yoshiharu Kitamura, Komagane, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan
Filed Dec. 27, 1990, Ser. No. 634,233
Claims priority, application Japan, Dec. 28, 1989, 1-151155[U]
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—292.1 6 Claims



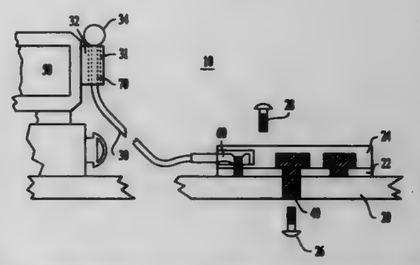
1. An angle adjusting device for a display device comprising a pair of relatively movable bearings, a pair of bushings of like outer diameter fixed coaxially on the respective bearings, an axle rotatably received within said bushings, said axle having an enlarged central portion between the bushings of like outer diameter to that of the bushings, the axle further having one end extending outwardly beyond one of said bearings for application of torque to the axle, and a pair of coil springs frictionally fitted over the respective bushings and each extending over a part of said enlarged central portion of the axle.

5,197,705
HOLDER FOR BOX DISPENSER
Morris J. Baskas, Bronxville, N.Y., assignor to Unique Barrier Products Inc., New Rochelle, N.Y.
Filed Feb. 11, 1992, Ser. No. 833,959
Int. Cl.[5] A47G *1/10*
U.S. Cl. 248—316.7 15 Claims



1. A holder for a box dispenser comprising:
a generally L-shaped member having a lower shelf portion and an upstanding wall portion, said L-shaped member being one piece and having vertical slots in its upstanding wall portion.
means for mounting the L-shaped member on a wall,
clip means located over the shelf portion and having an open position and a closed position, said clip means engaging the slots for movement up and down within the slots.
said clip means in its open position defining with the shelf portion beneath a box receiving region.

5,197,706
SECURITY MOUNT
Robert F. Braithwaite, Levittown; Lawrence E. Schoenfelder, West Islip, and Sheldon Wiederman, Setauket, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Jun. 7, 1991, Ser. No. 711,898
Int. Cl.[5] E05B *73/00*
U.S. Cl. 248—499 7 Claims



1. A security mount for securing at least one piece of equipment to a surface, comprising:
a first plate having a mounting aperture and a plurality of retaining apertures;
a second plate having a complementary mounting aperture;
means defining at least one cutout portion in at least one of said two plates for receiving connecting means for connecting the at least one piece of equipment to said first and second plates, said cutout portion being disposed to be in communication with the retaining apertures in said first plate and having a mouth which extends outwardly therefrom and opens along a peripheral edge of said at least one of said two plates;
plate attachment means extending through said surface for attaching said first and second plates to each other and to the surface;
securing means extending through said retaining apertures for securing said connecting means to said first plate;
wherein said securing means is sandwiched between said first and second plates, said connecting means extending through said mouth; and
wherein said securing means can be accessed by loosening said plate attachment means to thereby detach said second plate from said first plate.

5,197,707
ISOLATION PLATFORM AND METHOD
Barry A. Kohan, 5024 Beckley Ave., Woodland Hills, Calif. 91364
Filed Jul. 29, 1991, Ser. No. 737,381
Int. Cl.[5] F16M *1/00*
U.S. Cl. 248—638 14 Claims

1. An isolation platform for use with an entertainment system component comprising, in combination:
means for supporting said entertainment system component, said supporting means having a continuous solid surface;
granular means for dissipating mechanical vibrations, said granular dissipating means in direct contact with said

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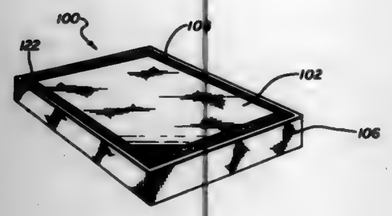
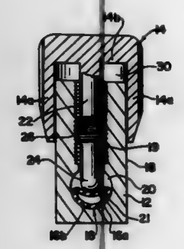
supporting said supporting means for isolating said system component from mechanical vibrations; and

means for containing said granular dissipating means,



said isolation platform isolating said system component from mechanical vibrations to prevent degradation of performance of said system component.

5,197,708
TUBING PINCH VALVE DEVICE
Daniel N. Campau, Grand Rapids, Mich., assignor to Flow-Rite Controls, Ltd., Grand Rapids, Mich.
Filed Aug. 11, 1992, Ser. No. 928,511
Int. Cl.[5] F16K 7/06
U.S. Cl. 251—8 14 Claims



1. An apparatus for controlling the flow of liquid through a flexible wall tube, comprising:

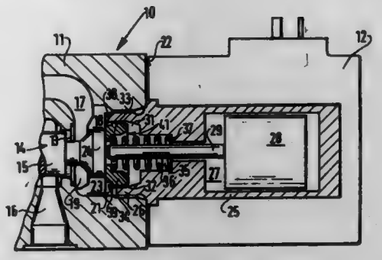
an externally threaded valve stem having first and second ends said first end having a tube contact surface;

a valve cap integrally connected to said second end for rotation of said valve stem, said valve cap having a depending peripheral wall thereby defining an annular recess between said wall and said valve stem;

a cylindrical saddle having a longitudinal bore internally threaded to receive said valve stem, a tube receiving slot extending from an open top end of said saddle to a cylindrical tube receiving passageway; and

said annular recess being adapted to receive said top end of said saddle with the inside diameter of said wall being sized to provide, a sliding fit between said cap wall and said saddle to thereby constrain movement of the saddle when subjected to lateral forces.

5,197,709
ELECTROMAGNETIC DIRECTIONAL CONTROL VALVE
Peter Kroll, Gemmrigheim; Günter Neumann, Freiberg-Beihingen, and Volkmar Leutner, Friolzheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE90/00327, § 371 Date Oct. 29, 1991, § 102(e) Date Oct. 29, 1991, PCT Pub. No. WO90/13749, PCT Pub. Date Nov. 15, 1990
PCT Filed May 9, 1990, Ser. No. 773,903
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915223
Int. Cl.[5] F16K 31/06; F15B 13/044
U.S. Cl. 251—129.15 3 Claims



1. An electromagnetically actuated directional control valve, comprising a housing having a chamber; a control slider guided in said housing so as to be longitudinally movable; a restoring device centering said control slider and including a restoring spring and a spring plate; a magnet mounted on said housing and having an armature which can deflect said slider into a working position against a force of said restoring spring; webs mounted on said housing and extending into said chamber; a pressure tube communicating with said chamber in said housing via a pressure medium and receiving said armature, said pressure tube receiving said restoring spring and said spring plate in its interior, said pressure tube having a support which prevents said spring plate from falling out, said pressure tube having a sleeve-shaped portion which projects into said housing and also having a hollowed-out portion in which said spring plate is guided with its outer circumference, said spring plate having a collar serving as a stop and being at a distance from said support when said spring plate abuts against said webs which are mounted on said housing and extend into said chamber.

5,197,710
CRASH PROOF SOLENOID CONTROLLED VALVE FOR NATURAL GAS POWERED VEHICLES
Lloyd G. Wass, 1670 Blackhawk Cove, Eagan, Minn. 55122, and Peter R. Nelson, Bloomington, Minn., assignors to Lloyd G. Wass, Eagan, Minn.
Filed May 30, 1991, Ser. No. 707,584
Int. Cl.[5] F16K 31/06
U.S. Cl. 251—129.15 15 Claims

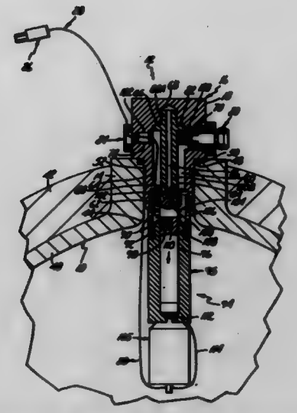
1. A valve for controlling flow of compressed gas from a pressure vessel, the valve comprising:

a valve body having a head and a neck; the head having an outlet port; the neck having external threads for engagement with the pressure vessel, having an inner end, and having a bore which extends from the inner end to the outlet port;

a valve seat mounted in the bore and having an orifice at an inner end and a flow passage extending between the orifice and the outlet port;

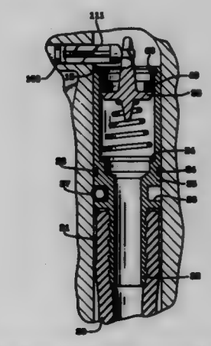
a solenoid valve mounted to the inner end of the neck, the solenoid valve including a seal for closing the orifice,

means for biasing the seal toward the seat to close the orifice, a plunger connected to the seal, and a solenoid coil



for moving the plunger so that the seal moves out of engagement with the orifice.

5,197,711
FLUID CONNECTION AND CONTROL DEVICE FOR FLUID MACHINES
Robert E. Geiger, and John M. Clapp, both of Sayre, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Continuation-in-part of Ser. No. 723,770, Jul. 1, 1991, abandoned. This application Dec. 13, 1991, Ser. No. 809,109
Int. Cl.[5] F16K 51/00
U.S. Cl. 251—152 13 Claims



1. A fluid connection and control device for assembly within a fluid channel bore of a pressure fluid operated machine comprising:

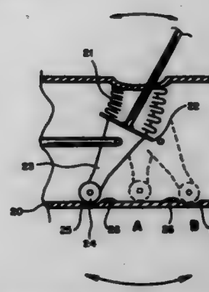
a radially symmetrical body having first and second ends and a central axial fluid passage therebetween;

means at the first end of said body for connecting to a pressure fluid carrying hose and defining a connection, said connection being within the confines of said bore;

means at the second end of said body for selectively permitting or preventing flow of fluid therethrough; and

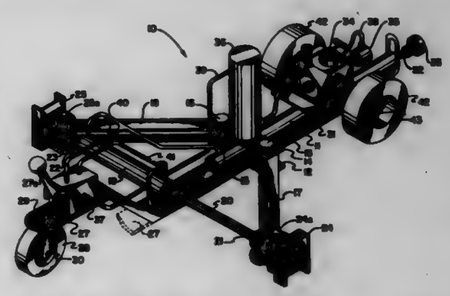
means for capturing said body within said fluid channel bore of said pressure fluid operated machine.

5,197,712
LEAKAGE FREE BUSHING
Reiner Engelhardt, Munich, Fed. Rep. of Germany, assignor to ZEO-TECH, Unterschleissheim, Fed. Rep. of Germany
Filed Feb. 13, 1992, Ser. No. 834,937
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1991, 4105944
Int. Cl.[5] F16K 31/00
U.S. Cl. 251—335.3 10 Claims



1. A leakage free bushing for placement through an exterior and interior surface of a fitting body, the leakage free bushing having flexible bellows, the flexible bellows having a first connected end and a second moveable end, the first connected end being attached to the fitting body so that the attachment is leakage free, the second moveable end being capable of performing an angular tilt movement with respect to a vertical axis of the flexible bellows, deflecting means being attached to the second moveable end so that the attachment is leakage free, the deflecting means permitting the mechanical deflection of the flexible bellows, transmission means being located within an inner area along the vertical axis of the flexible bellows, the transmission means being coupled to the deflecting means, the transmission means transmitting the mechanical deflection caused by said deflecting means, the leakage free bushing including first arresting means attached to the second moveable end, the fitting body having second arresting means on the interior surface of the fitting body adjacent to the flexible bellows, the first arresting means being capable of engaging the second arresting means so that the mechanical deflection of the leakage free bushing is temporarily fixed in a specified orientation.

5,197,713
PIPE PUSHING APPARATUS
Greg Stroemider, 254 Flower Dr., Folsom, Calif. 95630
Filed May 7, 1992, Ser. No. 879,290
Int. Cl.[5] E21B 19/00
U.S. Cl. 254—29 R 4 Claims



1. A pipe pushing apparatus, comprising,

an elongate base plate, the base plate having first wheel

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members rotatably mounted relative to the base plate, with the first wheel members including a first axle, the first axle arranged parallel to and below the base plate, and the first wheel members positioned adjacent a forward end of the base plate, and

a steerage wheel support flange mounted to and positioned adjacent a rear end of the base plate, with the steerage wheel support flange having a steerage wheel pivotally mounted below the steerage wheel support flange and below the base plate, with a steerage wheel bracket having a steerage wheel pivot axle mounted therebetween, with the steerage wheel rotatably mounted about the steerage wheel axle, and

a steerage wheel support pivot axle rotatably mounted through and orthogonally directed through the steerage wheel support flange permitting pivotment of the steerage wheel relative to the steerage wheel support flange, and

a first cylinder orthogonally oriented relative to and positioned above the base plate adjacent the steerage wheel support flange, and

clamp means secured relative to the first cylinder for projecting the clamp means laterally relative to the base plate for clamping opposed side walls of a trench receiving the base plate, and

a second cylinder longitudinally aligned relative to the base plate mounted above the base plate in a fixed relationship thereto, with the second cylinder having a second cylinder piston rod, with the second cylinder piston rod projecting forwardly of the base plate forward end for directing pipe members forwardly of the base plate, and

hydraulic means selectively operative to effect simultaneous actuation of the first cylinder and the second cylinder.

5,197,714

CAR LIFT

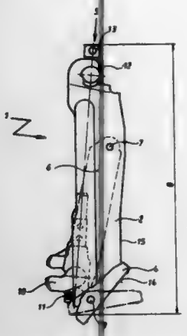
Wolfgang Metzen, Kell, Fed. Rep. of Germany, assignor to August Bilstein GmbH & Co. KG, Ennepetal, Fed. Rep. of Germany

Continuation of Ser. No. 773,038, Oct. 8, 1991, abandoned. This application Sep. 3, 1992, Ser. No. 939,589

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1990, 9015483

Int. Cl.[5] B66F *3/12*

U.S. Cl. 254—126 **8 Claims**



8. An automotive jack comprising: an upright member with a bottom; a base plate with a sole pivotable about a first pivot on said bottom of said upright member; a supporting arm pivotable about a second pivot on said upright member; actuating means for pivoting said supporting arm about said second pivot; spring means for pivoting said sole of said plate about said first pivot to a position wherein said sole and said plate lies along a length of said upright member; a stop fastened to said base plate; said supporting arm having at one end a load carrying interception head for abutting said stop and pivoting said base plate against a force of said spring means into a position wherein said base plate and sole are inclined at an angle to said length of said upright member when the jack is folded together, said sole of said base plate having an entire surface abutting against a base support due to said pivoting of said base plate about said first pivot for any load carried by said jack and any load-carrying position of said jack; a clip for attaching said stop to said base plate, said stop being a separate element attached to said base plate; a shaft extending through a bore in said stop for forming said first pivot between said upright member and said base plate; said stop having a hook engaging a rear side of said supporting arm when said jack is folded up, said hook being resilient.

5,197,715

METHOD FOR PULLING PLUG FOR INSTALLING A CABLE IN A CABLE CONDUIT

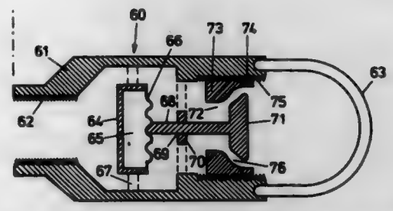
Willem Griffioen, Ter Aar, Netherlands, assignor to Koninklijke PTT Nederland N.V., Groningen, Netherlands

Continuation of Ser. No. 659,825, Feb. 22, 1991, abandoned. This application Jul. 31, 1992, Ser. No. 924,373

Claims priority, application Netherlands, Feb. 27, 1990, 9000462

Int. Cl.[5] B65H *59/00*

U.S. Cl. 254—134.4 **12 Claims**



1. A method of installing a cable into a conduit with the aid of drag forces of a fluid medium which is inserted at the feed-in end of the conduit and which flows rapidly along the cable to a removal end of the conduit, comprising the steps of:

connecting to an end of said cable, by means of a coupling of high tensile strength, a leaky pulling plug of a design permitting said fluid medium to leak therethrough with creation of a pressure difference between forward and rear faces of said pulling plug during said rapid flow of said fluid medium;

inserting said leaking pulling plug and said forward cable end into said feed-in end of said conduit, and

pulling said cable into said conduit by generating a rapid flow of said fluid medium from said feed-in end of said conduit along said cable through said leaky plug and out through said removal end of said conduit, while thereby exerting said drag forces on the cable in the conduit and exerting tensile force on said cable end as a consequence of said pressure difference at said pulling plug, which tensile force assists said drag forces and inhibits buckling of the cable.

5,197,716

SEISMIC CABLE DEPLOYMENT APPARATUS

Anthony M. Zibilich, Jr.; Garron J. Chaisson, both of Mandeville, La., and Marcel C. Beam, Sante Fe, Tex., assignors to Shell Offshore Inc., Houston, Tex.

Filed Apr. 22, 1991, Ser. No. 688,399

Int. Cl.[5] B63B *35/03*

U.S. Cl. 254—134.3 SC **28 Claims**

1. A method for deploying marine cable from on board a ship which reduces a longitudinal tension force on the cable at the cable storage reel when the cable storage reel in winding out the cable, comprising the steps of:

(a) attaching a collar to the cable;

(b) utilizing a cable deployment tool adjacent to the collar;

(c) utilizing a line connected between the ship and the cable deployment tool;

(d) engaging the collar with the cable deployment tool by applying a tension force on the line such that the cable deployment tool exerts an opposing force on the collar to the longitudinal tension force on the collar of the cable trailing behind the collar, whereby between the collar and the cable storage reel a portion of cable is isolated from the longitudinal tension force of the cable trailing behind the collar;

(e) deploying the isolated portion of the cable from the cable storage reel while maintaining the opposing tension force at the collar;

(f) preventing kinking of the deployed portion of cable during deployment by using a sleeve which is a part of the cable deployment tool to prevent kinking damage to the cable; and

(g) releasing the opposing tension force so that the deployed portion of isolated cable is subjected to the longitudinal tension force of the cable trailing behind the collar.

5,197,717

SAFETY DEVICE FOR PROTECTING PERSONNEL AGAINST FALLING FROM A PLATFORM OF A PRINTING PRESS

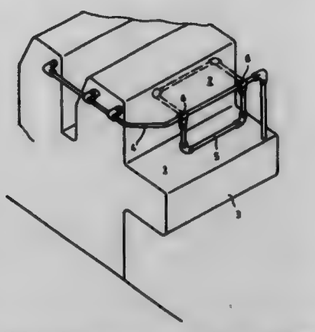
Michael Gund, Plankstadt, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 29, 1992, Ser. No. 905,476

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1991, 4121992

Int. Cl.[5] E04H *17/14*

U.S. Cl. 256—59 **6 Claims**



1. Safety device for protecting personnel against falling from a platform of a printing press having a handrail anchored to the printing press, and a kneerail located below said handrail, comprising means for swiveling the kneerail and means for releasably locking the kneerail both in an inwardly swiveled position wherein it blocks access to the platform, and in a normal position wherein it is disposed below the handrail.

5,197,718

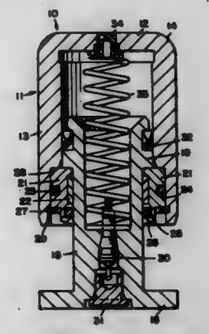
SELF-CONTAINED GAS SPRINGS INTERCHANGEABLE WITH COIL SPRINGS

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Filed Dec. 14, 1990, Ser. No. 627,699

Int. Cl.[5] F16F *9/02, 9/34*

U.S. Cl. 267—119 **13 Claims**



1. A self contained gas spring comprising

a one-piece upper cylindrical body having a base wall and a peripheral wall having an outer diameter, said peripheral wall having an inside surface,

a rod extending upwardly into the cylindrical body,

said rod having an upper end within said body and a lower end exteriorly of said body and having an integral enlarged base having an outer diameter such that the upper body completely encircles and encloses the upper end of the rod,

said base of said rod having a flat bottom surface of engaging a flat surface of the apparatus in which it is used for transferring forces therebetween,

the outer diameter of the peripheral wall of said cylindrical body and the outer diameter of the base having substantially the same diameter,

said cylindrical body and said rod including interengaging means limiting axially outwardly movement of said cylindrical body relative to said rod,

said cylindrical body further including a charging valve through which gas may be introduced for charging the space between the cylinder and the rod.

5,197,719

REFERENCE JIG FOR USE IN MOUNTING LENS COMPONENTS IN POSITIONS, AND LENS MOUNTING METHOD USING SUCH JIG

Syuzo Kimura, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 18, 1991, Ser. No. 779,258

Claims priority, application Japan, Oct. 20, 1990, 2-280569

Int. Cl.[5] B25B *1/20*

U.S. Cl. 269—40 **3 Claims**

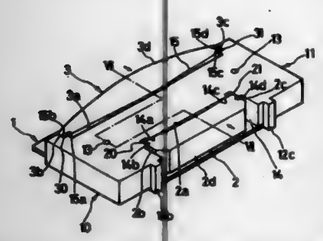
1. A reference jig for positioning and fixing one or more lenses in predetermined positions on a lens support structure, said reference jig comprising, for positioning and fixedly bonding a plural number of lens components on a lens mounting surface of said support structure:

a plate-like main body having a predetermined thickness and which is detachably fixable on said lens mounting surface of said support structure;

registration members provided contiguously to said main body and engageable with reference walls of said lens support structure to hold said main body in registered position relative to said lens support structure; and

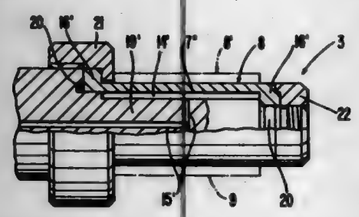
notched positioning wall portions each formed in said main body and abuttingly engageable with at least two trans-

versely opposite corner portions of a lens component to hold same in a predetermined position on said lens support structure; and



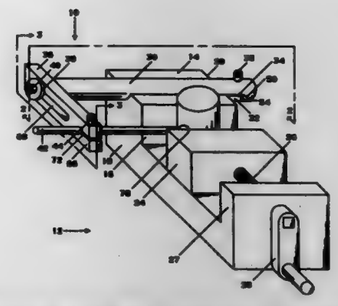
fixing means for stationarily fixing said jig to said lens support structure.

5,197,720
CLAMPING TOOL FOR NON-POSITIVE AND HIGH-PRECISION CLAMPING OF WORKPIECES
Rainer Renz, Stuttgart, and Johann Krämer, Leonberg, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany
Filed Mar. 22, 1990, Ser. No. 497,186
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909630
Int. Cl.[5] B23Q *3/14*
U.S. Cl. 269—48.1 13 Claims



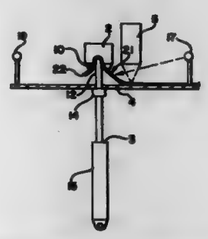
1. Clamping tool for frictional, high-precision clamping of a workpiece at defined machined bearing surfaces of the workpiece, comprising a metallic expansion element configured with a region of precisely machined clamping surfaces so as to come into contact with the workpiece in a clamped state, as a complementary shape of the bearing surfaces of the workpiece, and in an unclamped state, the clamping surfaces are sized relative to the bearing surfaces of the workpiece to minimize minimum play therebetween, and to which on a rear side of the metallic expansion element opposite the clamping surfaces force is applied over a large area transverse to the clamping surfaces such that a wall of the metallic expansion element is reversibly deformed and the clamping surfaces bear against the bearing surfaces of the workpiece to clamp the workpiece frictionally in place, wherein the expansion element is an alloy composition with shape-memory capacity such that a region of reversible stress-inducible austenitic/martensitic microstructural transformation occurs at a temperature at which the clamping tool is used for clamping the workpiece.

5,197,721
DEVICE FOR POSITIONING WORKPIECES IN A MILLING MACHINE VISE
Mark Ruberg, P.O. Box 290, Miamitown, Ohio 45041
Filed Jun. 26, 1992, Ser. No. 905,032
Int. Cl.[5] B23Q *3/18*
U.S. Cl. 269—315 8 Claims



1. A device for positioning a workpiece in a milling machine vise jaw opening, said device comprising:
a) a rigid bar removably attachable to a jaw of milling machine vise, said bar having an alignment surface and an outer end surface parallel to said alignment surface, said alignment surface spacing said outer end surface a predetermined distance from the side of the vise when said alignment surface is secured to the side to the vise;
b) means for attaching said alignment surface of said bar to the side of a vise in a manner that avoids modification to a vise surface and holds said alignment surface parallel to the side of the vise;
c) a rigid intermediate member having a flat machined surface adjustably connected to said outer end surface of said bar; and
d) a rigid contact rod adjustably connected to said intermediate member, said rod having a workpiece contact surface, a longitudinal axis perpendicular to said machined surface of said intermediate member, and said workpiece contact surface of said rod is machined square to said longitudinal axis of said rod to maintain said contact surface substantially parallel to said alignment surface of said bar.

5,197,722
CLOTH FOLDING DEVICE WITH AIRBLOWER FOR UNCURLING ENDS
Maximilian Adamski, Jr., Palatine, and Paul A. Berg, Crystal Lake, both of Ill., assignors to Union Special Corporation, Chicago, Ill.
Filed Oct. 28, 1991, Ser. No. 783,275
Int. Cl.[5] B41L *43/00*; B31F *1/00*
U.S. Cl. 270—32 11 Claims

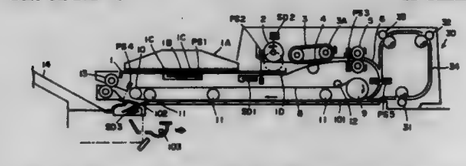


6. A device for folding and turning over a cloth that is

continuously carried by a moving conveyor, said device comprising:
a stationary jaw located above the upper surface of the conveyor;
means for sensing at least one edge of the cloth carried by the conveyor;
a lifting blade located in line with the jaw below the lower surface of the conveyor, the lifting blade operable in response to the sensing means to raise a leading portion of the cloth toward the jaw;
a first blower located before the jaw in the line of feed for the conveyor having at least one nozzle directed toward the area below the jaw, the first blower operable in response to the sensing means to assist in starting and maintaining a smooth rolling action of the cloth as the cloth is carried under the jaw by the conveyor; and
a second blower located after the jaw in the line of feed for the conveyor having at least one nozzle directed toward the area below the jaw, the second blower operable in response to the sensing means to uncurl the leading portion of the cloth.

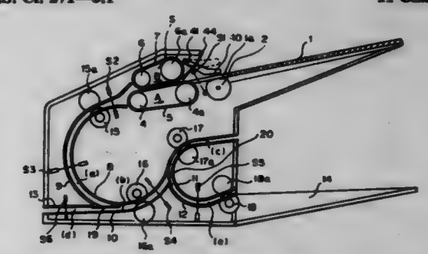
11. A method for turning over and folding a cloth that is continuously carried by a moving conveyor, said method comprising:
sensing first edge of the cloth and generating a first edge signal;
picking up and holding a leading portion of the cloth in response to said first edge signal;
blowing air onto a top side of the cloth as the conveyor continues to carry the cloth to assist in starting and maintaining a smooth rolling action of the cloth;
sensing a second edge of the cloth and generating a second edge signal;
releasing the leading portion of the cloth in response to the second edge signal; and
blowing air onto a bottom side of the cloth to uncurl the leading portion of the cloth.

5,197,723
AUTOMATIC DOCUMENT FEEDING APPARATUS
Yasushi Yamada; Yoshikazu Maekawa; Osamu Murata; Yoshio Ueda, and Masanobu Kawano, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Continuation of Ser. No. 557,315, Jul. 23, 1990, abandoned. This application Mar. 25, 1992, Ser. No. 857,706
Claims priority, application Japan, Jul. 29, 1989, 1-197622; Sep. 19, 1989, 1-244543
Int. Cl.[5] B65H *83/00*
U.S. Cl. 271—3 12 Claims



1. An automatic document feeding apparatus for sequentially feeding a plurality of documents to an image exposure section of an electrophotographic recording machine, said apparatus comprising:
a document stacker for holding a stack of documents;
a feed belt for sequentially transporting said documents from said document stacker;
a single carrying belt for carrying said documents from said feed belt through said image exposure section;
a document holding roller for pressing said carrying belt to a platen;
a controller for controlling feeding;
a detector for detecting a size of a fed document;
at least two stop positions upstream of said image exposure section corresponding to different sized documents,
an ejector for ejecting said documents after image exposure, said controller controlling feeding whereby, before completion of an exposure of a foregoing document, a following document is fed to one stop position of said at least two stop positions by said feed belt and temporarily stopped thereat, said one stop position being selected in accordance with a document size detecting signal from said detector so that a distance between the trailing end of said foregoing document and the leading end of said following document temporarily stopped at said stop position remains constant irrespective of the size of said document, said following leading end of said document, at said one stop positions being located between feed belt and said document holding roller.

5,197,724
IMAGE FORMING DEVICE HAVING ORIGINAL DOCUMENT FEEDER
Tadayuki Kitajima, Yokohama, and Makoto Kitahara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 820,805, Jan. 15, 1992, which is a continuation of Ser. No. 746,183, Aug. 15, 1991, abandoned, which is a continuation of Ser. No. 473,108, Jan. 30, 1990, abandoned, which is a continuation of Ser. No. 905,935, Sep. 10, 1986, abandoned. This application Jul. 21, 1992, Ser. No. 916,351
Claims priority, application Japan, Sep. 13, 1985, 60-203030
Int. Cl.[5] B65H *83/00*
U.S. Cl. 271—3.1 11 Claims



1. An image forming device comprising:
an original document feeder A including first stacker means for stacking original documents, said first stacker means being adapted to receive manually-set original documents; first feed means for one-by-one feeding of the stacked original documents; means defining a first sheet path for guiding the original document fed by said first feed means; means defining a second sheet path for guiding an original document from said first sheet path means to a process unit; and means defining a third sheet path for guiding the original document from either said first sheet path means or said process unit to a document receiver means;
an original document feeder B including second stacker means for stacking original documents, said second stacker means being adapted to receive manually-set original documents; second feed means for one-by-one feeding of the stacked original documents; means defining a fourth sheet path for guiding an original document fed by said second feed means to the process unit; and means defining a fifth sheet path for guiding the original document discharged from the process unit to said second stacker means;
control means for advancing the original document from said document feeder A to said document feeder B when a process in said document feeder B is to be performed; and
image forming means for forming an image.

5,197,725
Patent Not Issued For This Number

to the stacking site (1) such that it is spaced from such seat for one or more years, a plurality of support links each

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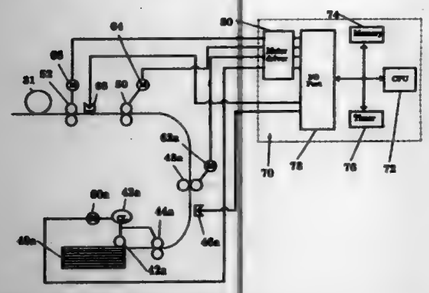
5,197,726

SHEET FEEDER

Yutaka Negami, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1992, Ser. No. 896,382
Claims priority, application Japan, Sep. 26, 1991, 3-274634
Int. Cl.[5] B65H 3/06
U.S. Cl. 271—110 10 Claims



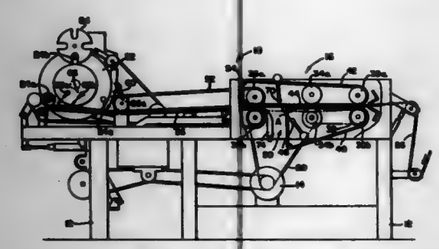
1. A sheet feeder comprising:
a sheet feed tray on which sheets are stored;
a feed means for feeding out sheets one at a time from the sheet feed tray;
a separating means for separating sheets when a plurality of sheets are fed out at a time from the sheet feed tray by the feed means, to feed the sheets one at a time;
a transporting means for transporting the sheet delivered from the separating means to a image forming means;
a sheet detecting means for detecting the passage of the leading edge of the sheet past a first position in the transporting means;
a calculation means which, based on the behavior of a sheet which is fed by the feed means, but is then detained by the separating means, determines a target time at which a sheet should arrive at a second position downstream of said first position, and calculates from the detection result provided by the sheet detecting means the deviation from said target time of the sheet; and
control means for varying the sheet transport speed on the basis of the results of calculation made by the calculation means so that the sheet arrives at the second position at the preset desired time.

5,197,727

INTERLEAVING APPARATUS FOR ROLLED UP SEGMENTS

Ronald L. Lotto, Bondsel; Ernest H. Teske, Green Bay, and Peter Hatchell, New Franken, all of Wis., assignors to FMC Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 651,676, Feb. 6, 1991. This application Aug. 14, 1991, Ser. No. 744,779
Int. Cl.[5] B65H 29/66
U.S. Cl. 271—183 18 Claims



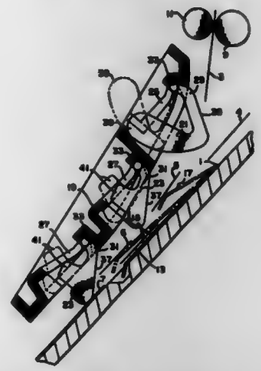
1. An interleaving and roll forming apparatus for overlapping successive individual web segments from a continuous roll of web segment material and forming a roll of interleaved web segments, comprising:
means (30a, 30b) for advancing a leading end portion of each incoming web segment (26) from the roll at a first speed;
means (36a, 36b) for slowing the advancing leading end portion (26a) and forming a loop between opposite ends of each incoming web segment;
a vacuum manifold means (76) positioned in an overlap forming zone (50) for receiving the loop and for retaining a trailing end portion (26b) of each incoming web segment taut while the incoming web segment in drawn by the slowing means;
means (34a, 34b) between the advancing and slowing means for tensioning each incoming web segment and separating it from a successive incoming web segment;
means for advancing the leading end portion of the successive incoming web segment at the first speed to the slowing means and overlapping it over the trailing end portion of the leading web segment before the taut trailing end portion is drawn from the vacuum manifold means by the slowing means;
means for receiving and winding the overlapping web segments into a roll, and
means for forming a subsequent roll of overlapping web segments without interruption of feed into the receiving and winding means upon completing of the first mentioned roll.

5,197,728

GUIDING DEVICE FOR SHEETS SUPPLIED TO A STACKING SITE

Manfred Radtke, Korb, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 27, 1991, Ser. No. 799,213
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1991, 4101612
Int. Cl.[5] B65H 31/26
U.S. Cl. 271—220 3 Claims



1. Guiding device for sheets (3) supplied to a stacking site (1), said sheet-guiding device comprising:
at least two guide elements (21, 23), arranged one behind the other in the entrance direction, pivoted about an upper journal (33), said guide elements having a respective abutment surface (35, 37) for the front edges of the sheets (3) arriving in an entrance direction, said abutment surface being downwardly inclined with respect to said entrance direction, each of said guide elements (21, 23) shaped such that its abutment surface (35, 37) encloses a predetermined acute angle with the plane defined by said journal (33) for said guide element (21, 23) and its center of gravity, at least the first guide element (21) being suspended relative to the stacking site (1) such that it is spaced from such stacking site.

5,197,729

DOCUMENT TRANSPORT TRACK DRIVE MECHANISM

John Couper, Scotland, United Kingdom, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 15, 1991, Ser. No. 792,826
Claims priority, application United Kingdom, Nov. 15, 1990, 9024906
Int. Cl.[5] B65H 9/16
U.S. Cl. 271—248 7 Claims

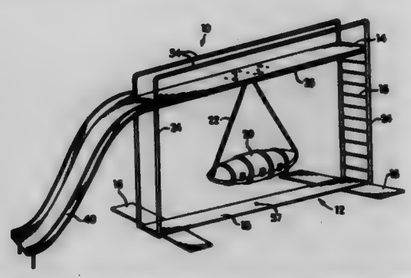
1. A roller drive system for use in a document transport system for transporting a document along a transport track, said system having a common drive motor and a common drive shaft and comprising:
a plurality of drive pulleys mounted on said drive shaft in spaced relationship,
said drive shaft being arranged in a plane parallel to the document plane of transport and said drive pulleys being rotatable in a plane orthogonal thereto,
a document drive roller driven by a first drive pulley of said drive pulleys and rotatable in a plane orthogonal to the plane of rotation of said drive pulleys,
a first idler pulley driven by said first drive pulley and rotatable in a plane orthogonal to the plane of rotation of said first drive pulley and said document drive roller,
a second idler pulley driven by said first drive pulley and rotatable in a plane orthogonal to the plane of rotation of said first drive pulley and said document drive roller, and
a flexible drive belt coupled to said first drive pulley in one plane and coupled to said document drive roller in a plane orthogonal thereto and directed over said first idler pulley and said second idler pulley to change the belt's plane of rotation on said first drive pulley substantially ninety degrees.

5,197,730

MULTI-USE SWING APPARATUS

J. Fredrik Ask, 600 Raleigh Rd., Glenview, Ill. 60025

Filed Jul. 25, 1990, Ser. No. 577,339
Int. Cl.[5] A63G 9/00
U.S. Cl. 472—118 21 Claims



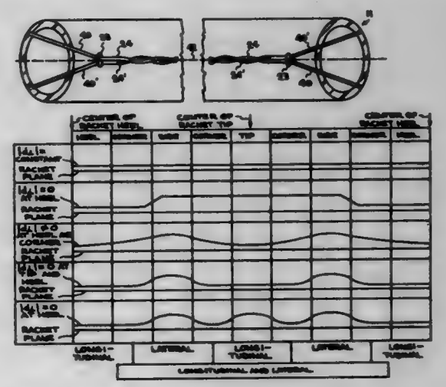
15. A multi-use swing includes a stabilized support frame, a seat for one or more users, a plurality of support links each having a first and second end, a plurality of connectors on the first end of said support limbs for connecting the support links to the frame; and a plurality of quick release connectors for connecting the second end of the support links to the seat whereby a plurality of combinations of one or more suspension links between the frame and the seat provide for a large number of configurations and uses of the swing whereby the seat will travel in different paths.

5,197,731

STRING SUSPENSION AND FRAME CONSTRUCTION FOR SPORTS RACKETS

Rodney Svoma; James Speros, both of 1210 E. Northern, Phoenix, Ariz. 85020, and Gene A. Broadman, 4051 East Ave., Livermore, Calif. 94550

Continuation of Ser. No. 233,228, Aug. 18, 1988, Pat. No. 5,037,097. This application Aug. 5, 1991, Ser. No. 740,336
The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.
Int. Cl.[5] A63B 51/06
U.S. Cl. 273—73 C 7 Claims



1. In a sports racket having a peripheral frame defining a center plane, a handle, and a first and second plurality of string segments extending in a first and second direction between opposed locations on said frame and interwoven to define a ball contact area in said center (central) plane of said racket, the improvement comprising:
that at least a part of said (strings) string segments are interwoven to form nodes near said peripheral frame, and that the ends of string segments leading from said nodes to said frame are splayed to alternately contact said frame in front of and behind said center plane.

5,197,732

TENNIS RACKET

Paul A. Lanctot, 520 Sand Hill Rd., Scotts Valley, Calif. 95066

Filed Oct. 15, 1991, Ser. No. 776,613
Int. Cl.[5] A63B 49/08
U.S. Cl. 273—735 16 Claims

1. A tennis racket comprising:
a striking surface, a shaft portion, and a handle portion,
a tubular member inserted into said handle portion of said tennis racket, having a first end and a second end, said first end having an opening therein,
a hollow spine member secured within said tubular member by a compression nipple,

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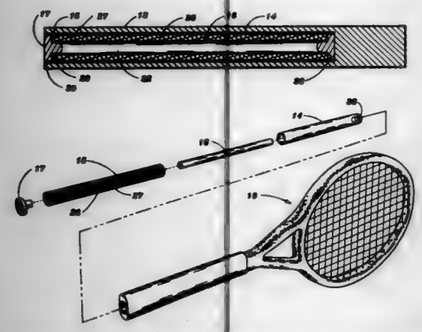
a plurality of particles interiorly disposed within said tubular member,

a fluid interiorly situated within said tubular member, and



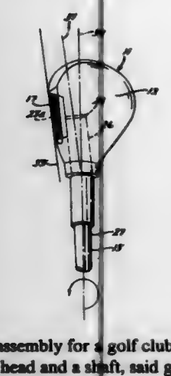
means for sealing said opening in said first end of said tubular member.

5,197,733

GOLF CLUB

Edward W. Schroder, 37832 N. Laurel Park Dr., Livonia, Mich. 48152

Filed Dec. 24, 1990, Ser. No. 633,263
Int. Cl.[5] B01D *27/04*; A63B *53/02*, *53/06*
U.S. Cl. 273—80 C 5 Claims



1. A method of assembly for a golf club, said golf club comprising a golf club head and a shaft, said golf club head having a convex-curved striking face and a hole for receiving the shaft extending inwardly at an angle, said golf club head having a forwardmost part substantially at the center of said striking face, the center axis of said hole lying in a vertical plane substantially parallel with a second vertical plane tangent to the forwardmost part of said golf club head, said shaft having a main elongated shaft portion at one end, a lower shaft portion at the other end and a bend therebetween, said bend angularly offsetting said lower shaft portion from said main elongated shaft portion by 10–15 degrees, the steps of assembly comprising:

(a) Applying a viscous adhesive to said lower shaft portion,

(b) Inserting said lower shaft portion into said hole of said golf club head while maintaining said bend external of said golf club head,

(c) Rotating said main elongated shaft portion slightly while the adhesive is still viscous to cause pivotal movement of said lower shaft portion about said bend, said pivotal movement causing said golf club head to swivel about said forwardmost part to move the face angle of said striking face to a pre-selected open or closed position, and

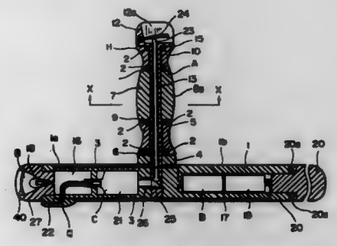
(d) Maintaining said golf club head and shaft firmly in the pre-selected position until the adhesive sets up to interconnect said shaft to said golf club head with the face angle of said striking face in the pre-selected position.

5,197,734

CROSSHANDED GUARD BATON (A)

Hideyuki Ashihara, 360-1, 8-chome, Sanbancho, Matsuyama-shi, Ehime-ken, Japan

Continuation of Ser. No. 601,617, Oct. 24, 1990, abandoned, which is a continuation of Ser. No. 593,716, Oct. 4, 1990, abandoned, which is a continuation of Ser. No. 394,031, Aug. 15, 1989, abandoned. This application Jan. 17, 1992, Ser. No. 821,883
Claims priority, application Japan, Jan. 20, 1989, 1-12994
The portion of the term of this patent subsequent to Mar. 9, 2010, has been disclaimed.
Int. Cl.[5] F41B *15/02*
U.S. Cl. 273—84 R 11 Claims



1. A crosshandled guard baton which comprises:

a club having a longitudinal axis and at least one hollow internal space;

a crosshandle transversely branched on the club at a place located toward one end of said club, said crosshandle having a branching length substantially equal to the width of a man's palm;

said crosshandle comprising three portional members including a lower grip, a central grip, and an upper grip which are stacked on one another with rotary interalidability therebetween;

a tubular shaft provided internally of said crosshandle and extending through a longitudinal length of said crosshandle, said tubular shaft being secured at one end to said club and secured to said central grip and rotatably mounted internally of said upper grip and said lower grip;

a rod provided internally of said tubular shaft and axially movable relative to said tubular shaft;

an illuminating device or a gas ejecting device accommodated in said hollow internal space of said club; and

a trigger means for operating at least one of said illuminating device or gas ejecting device by axial movement of said rod actuated by a lever provided on top of said crosshandle and engaging said rod.

5,197,735

GAME PIECE RANDOMIZER

Larry D. Land; Marie A. Land, and Melissa L. Land, all of 1946 Edgerton, St. Paul, Minn. 55117

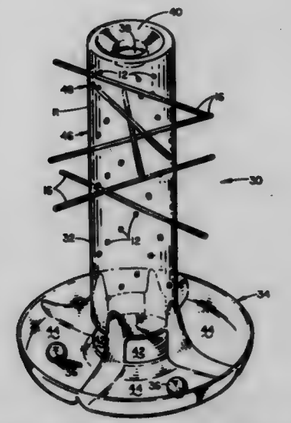
Continuation-in-part of Ser. No. 477,551, Feb. 9, 1990, abandoned. This application Jun. 14, 1991, Ser. No. 715,844
Int. Cl.[5] A63F *9/04*
U.S. Cl. 273—138 R 11 Claims

7. Game apparatus comprising:

a) a game piece;

b) a multi-walled housing including an entrance aperture whereat said game piece is admitted to play, a bottom tray, a free fall column defined by a plurality of walls extending between the entrance aperture and bottom tray and containing a plurality of apertures through the walls and distributed over the length of the free fall column;

c) a plurality of obstruction members shaped to deflect said game piece upon contact and selectively mountable through ones of said apertures into and over the length of the free fall column to define a plurality of alternative pathways at the interstices between the obstruction members, wherein the apertures are arranged such that none of the obstruction members can be individually positioned to



permanently obstruct movement of said game piece through the column, wherein ones of said apertures are arranged over a first portion of said column to define a predetermined geometrical pattern and others of said apertures are arranged over a second portion to define a random pattern, whereby said game piece upon traversing the free fall column deflects from ones of said obstruction members to randomly follow one of the pathways; and

d) means at said tray for randomly directing said game piece to one of a plurality of partitioned tray compartments, wherein each compartment is assigned a unique scoring value for any entering game piece.

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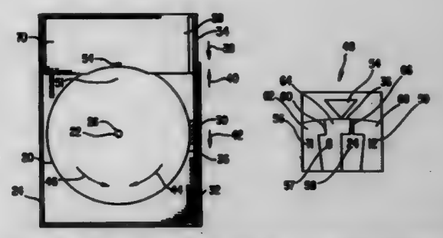
peripheral indices being determined by said set of statistical data, and



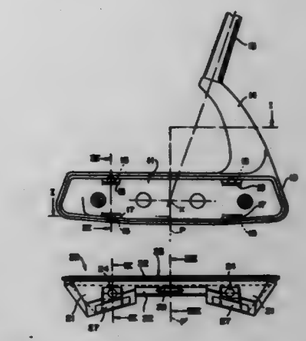
indicator means identifying at least one of said bounded field after termination of said rotary motion by said means to randomly terminate.

5,197,737

PUTTER HEAD

Jacques Deshiolles, Annecy, and Andre Parnelle, Seynod, both of France, assignors to Taylor Made Golf Company, Carlsbad, Calif.

Filed May 31, 1990, Ser. No. 531,052
Claims priority, application France, Jun. 1, 1989, 89 07248
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—169 40 Claims



1. A putter head comprising:

(a) an elongated element having a vertical plane of symmetry, said elongated element comprising:

(i) two laterally spaced masses, each of said two laterally spaced masses comprising a shape having an increasing dimension with respect to a direction normal to and away from said vertical plane of symmetry and a predetermined density;

(ii) a linking portion extending between said two laterally spaced masses; and

(iii) a generally planar front surface constituting a golf ball striking surface;

(b) a shell adapted to have a shaft extending therefrom, said shell having a front portion, said front portion of said shell having an opening for receiving and seating said elongated element, while leaving said generally planar front surface exposed, said shell comprising a material having a density lower than said predetermined density of either of said masses, wherein said masses provide an increased moment of inertia for said elongated element so as to prevent undesirable rotation of the putter head at the moment of contact with a golf ball; and

(c) means for affixing said elongated element to said shell comprising means for directly securing at least one of (i)

5,197,736

ROTARY LOTTERY NUMBER GENERATING MEANS HAVING PERIPHERAL FIELDS PROPORTIONATELY SIZED

Alan L. Backus, 1550 Centinela Ave., No. 210, Los Angeles, Calif. 90025, and Scott Blum, 750 N. Shoreline #36, Mountain View, Calif. 94043

Filed Nov. 22, 1989, Ser. No. 440,600
Int. Cl.[5] A63F *5/04*
U.S. Cl. 273—142 R 6 Claims

1. In combination, a set of statistical data and an apparatus for enhancing chance predictions of a lottery outcome,

said set of statistical data being a set of information indicative of past lottery game outcomes, said set of information being collected by monitoring a repetitive lottery game over a set period of time; and

said apparatus comprising:

a structural base supporting a rotary member, said rotary member having at least part of its periphery exposed,

means to initiate rotary motion in said rotary member,

means to randomly terminate said rotary motion in said rotary member,

bounded fields marked on said rotary member,

each of said bounded fields being defined by differential peripheral indices on said rotary member, said differential

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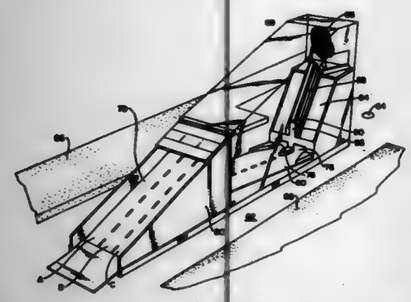
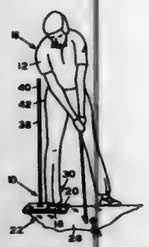
said laterally spaced masses and (ii) said linking portion to said shell.

5,197,738
MINIATURE GOLF COURSE
David C. Hartman, Sr., 50 Stage Rd., Tuckerton, N.J. 08087
Filed Mar. 9, 1992, Ser. No. 849,626
Int. Cl.[5] A63B 67/02
U.S. Cl. 273—176 FA 3 Claims



1. A miniature golf course comprising at least one elongated surface including a tee area and a scoring hole spaced a predetermined distance therefrom, an obstacle positioned between said tee area and scoring hole, said obstacle including a solenoid-controlled plunger, a golf ball responsive switch means for causing said plunger to propel a golf ball upwardly a predetermined height above said surface, said obstacle including means for forming a putting path to said switch means, and means for retrieving said upwardly propelled golf ball and directing same to said surface in a predetermined direction relative said scoring hole.

5,197,739
GOLF TRAINING DEVICE
James M. Johnson, III, 11545 SW. Beef Bend Rd., Apt. 65, Tigard, Oreg. 97224
Continuation of Ser. No. 735,902, Jul. 25, 1991, abandoned. This application May 15, 1992, Ser. No. 884,620
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—187 B 10 Claims

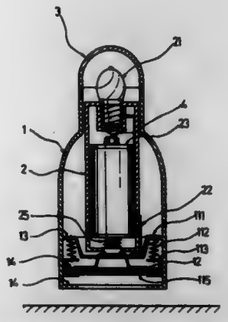


5. A golf training device, in combination with a shoe adapted to be worn on the rear foot of a golfer in a normal pre-swing stance, with the rear foot being the foot on the side of the golfer opposing the intended direction of flight of a golf ball to be hit, comprising:
a. said shoe having an outside edge, a longitudinal center line, and an inside edge;
b. said golf training device having a base member which includes two horizontal shoe-engaging levels, an upper level and a lower level, said levels being vertically offset and mutually adjoining at a step, said upper level at said step forming an elongated pivotal edge;
c. said lower level engaging said inside edge of said shoe from beneath, said elongated pivotal edge engaging proximate said longitudinal center line of said shoe from beneath, and said upper level being vertically spaced beneath said outside edge of said shoe;
d. said shoe pivoting about said elongated pivotal edge, thus lifting and disengaging said inside edge of said shoe from said lower level when actuated by an incorrect weight-shifting golf swing.

5,197,740
GOLF BALL HAVING IMPROVED COVER COMPOSITION
Terence W. Pocklington, and Terry R. Balch, both of Tupelo, Miss., assignors to Ram Golf Corporation, Melrose Park, Ill.
Filed Aug. 2, 1990, Ser. No. 561,773
Int. Cl.[5] A63B 37/12; C08L 33/02
U.S. Cl. 273—235 R 5 Claims

1. A golf ball comprising a core and a cover, wherein said cover comprises a blend of about 20–40% of a first ionic copolymer of an olefin having from 2 to 5 carbon atoms and a sodium salt of an unsaturated carboxylic acid having from 3 to 8 carbon atoms, about 20–40% of a second ionic copolymer of an olefin having from 2 to 5 carbon atoms and a zinc salt of an unsaturated carboxylic acid having from 3 to 8 carbon atoms, and about 20–40% of a third ionic copolymer of an olefin having from 2 to 5 carbon atoms and a lithium salt of an unsaturated carboxylic acid having from 3 to 8 carbon atoms.

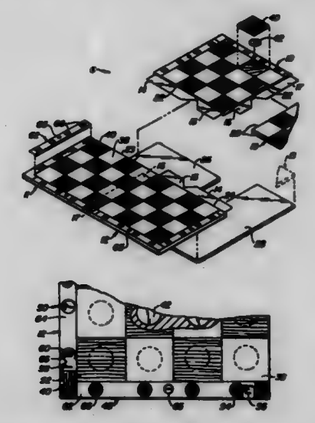
5,197,741
ELECTRICALLY LIGHTABLE CHESS PIECE
Liung M. Wu, No. 22, Yun Ler Street, Inn Ko, Taoyuan, Taiwan
Filed May 19, 1992, Ser. No. 885,373
Int. Cl.[5] A63F 3/00
U.S. Cl. 273—237 1 Claim



1. An electrically lightable chess piece capable of being lit when mounted on a chessboard comprising:
(a) a chess piece body having an internal chamber for insert of a battery housing containing a battery for electrical contact with a light bulb;
(b) a transparent cap having inner cap threads for threaded engagement with cooperative threads formed on an upper end of said chess piece body;
(c) a middle plate member secured to an internal surface of said chess piece body, said middle plate member having a first pair of openings formed through a base thereof and a second pair of openings formed through a shoulder section thereof;
(d) a metallic piece member having a substantially U-shaped contour defining a pair of metallic piece leg members extending through said first pair of openings;

(e) an electrically connective member mounted to an upper surface of said middle plate member;
(f) a pair of U-shaped metallic elements displaceable within said chess piece body;
(g) a pair of springs secured to a leg member of each of said U-shaped metallic elements on one end thereof and to said middle plate member on an opposing end thereof; at least one of said spring members passing through one opening of said second pair of openings for contacting said electrically connective member;
(h) a magnet having an insulated plate member fixedly secured to an upper surface thereof, said magnet being displaceable between opposing leg members of said U-shaped metallic members; and,
(i) a conductive rod member positioned on said battery housing for contacting a metal lead on said light bulb and said electrically connective member at opposing ends thereof, whereby when said chess piece is mounted on said chessboard said magnet displaces said U-shaped metallic elements into contact with said metallic piece member to complete an electrical circuit between said battery and said light bulb.

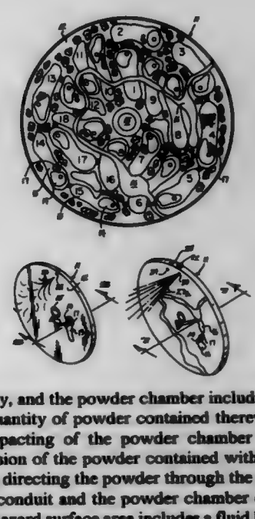
5,197,742
CHESS SET GAME
Kurt J. Bendit, 3919 19th Ave., San Francisco, Calif. 94114
Filed May 14, 1992, Ser. No. 882,795
Int. Cl.[5] A63F 3/02
U.S. Cl. 273—239 7 Claims



1. A game board comprising:
first, second, third and fourth game board quadrants each having a ferromagnetic layer and edges, said quadrants positionable with two of said edges of each said quadrant abutting to form a rectangular game board with an upper, playing surface and lower, support surface; and
a magnetic material spanning the abutting edges on the lower surface of the game board which secures the board quadrants to one another.

5,197,743
GOLFING DART GAME APPARATUS
Howard J. Hanson, Jr., Box 3425, Lacombe, Alberta, Canada T0C 1S0
Filed Dec. 16, 1991, Ser. No. 808,473
Int. Cl.[5] F41J 3/00
U.S. Cl. 273—378 3 Claims

1. A golfing dart game apparatus, comprising in combination,
a game board, the game board including a top wall, the top wall including a polymeric covering coextensive with the top wall, and
the game board including a plurality of target fairway surface areas, each fairway surface area of said fairway surface areas formed at the top wall includes a green, and
the game board including a coaxially aligned central bull's-eye, and
at least one water hazard surface area formed about the top wall and at least one of said target fairways including a sand trap area portion contiguous therewith, and
a plurality of dart projectiles, and
the game board includes a powder chamber exit port directed through the top wall, the powder chamber exit port in communication with the powder chamber exit conduit, and the powder chamber exit conduit in communication with a powder chamber formed within the game board below the top wall, and a piston cavity in communication between the powder chamber and the top wall, and a powder chamber piston slidably mounted within the piston cavity, and the powder chamber including a predetermined quantity of powder contained therewithin, whereupon impacting of the powder chamber piston effects compression of the powder contained within the powder chamber directing the powder through the powder chamber exit conduit and the powder chamber exit port, and
the water hazard surface area includes a fluid bladder spaced from the powder chamber positioned below the top wall, and a second piston cavity in communication with the fluid bladder and the water hazard surface area positioned therebelow, with a fluid chamber piston slidably mounted within the second piston cavity, and the piston in contiguous communication with the fluid bladder, whereupon impacting of one of said dart projectiles with said fluid chamber piston effects compression of the bladder, and a fluid bladder conduit in fluid communication with the bladder and the top wall, with an exit port directed through the top wall in fluid communication with the fluid chamber conduit to direct fluid from the bladder through the fluid chamber conduit and the fluid chamber exit port.



5,197,744
SOCCER-AM
George Nanau, 87-15 37th Ave., Apt. 4J, Jackson Heights, New York, N.Y. 11372
Filed Nov. 7, 1991, Ser. No. 789,007
Int. Cl.[5] A63B 63/00
U.S. Cl. 273—396 1 Claim

1. An additional soccer goal, installed on top of a regular soccer goal, comprising;
an additional goal frame connected to said regular goal

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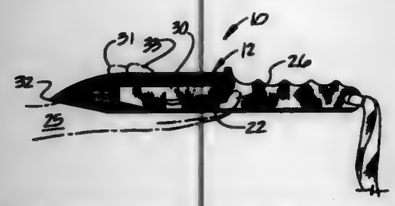
frame above the crossbar of said regular goal frame and defining a second goal space;

a net connected to said additional goal frame to stop and initially retain a soccer ball which enters said second goal space;

said net being tapered toward the crossbar of said regular goal frame to permit a soccer ball which enters said second goal space to roll down toward said crossbar and then fall back upon the field of play.

5,197,745
THROWING KNIFE
Roger D. Whiteley, 426 S. Lecolne St., Wichita, Kans. 67213
Filed Dec. 12, 1990, Ser. No. 626,014
Int. Cl.[5] A63B 65/02; B26B *11/00*
U.S. Cl. 273—420 **1 Claim**



1. The method of throwing a knife having a pointed blade and pair of wings including the following steps:

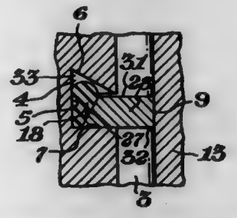
positioning a hand in a starting position, gripping the knife in the hand with the knife gripped between the index and middle finger of the throwing hand with the blade resting on the palm and finger tips of the index and middle fingers contacting a bearing surface of the wings with the blade point pointed at the thrower;

rotating the throwing arm and knife through a power stroke to a release position while rotating the throwing hand relative to the knife about the wings so that during the power stroke the knife is point-first just prior to release;

driving the knife through the power stroke with the index and middle fingers only in contact with the wings just prior to release.

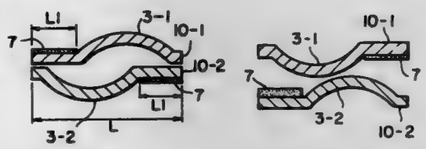
5,197,746
SUBSTANTIALLY ZERO LEAKAGE PATH SEALING ASSEMBLY WITH EXPANDER VOID
Frederick L. J. Rehfeld, Saginaw, Mich., assignor to Leber Corporation, Midland, Mich.
Division of Ser. No. 331,303, Mar. 31, 1989. This application Jun. 18, 1990, Ser. No. 539,924
Int. Cl.[5] F16J *15/46*
U.S. Cl. 277—144 **2 Claims**

1. A sealing assembly for internal combustion engines and other high speed reciprocating devices such as compressors, fluid motors, fluid pumps, and other devices which require sealing which comprises: an assembly of members to be sealed, one member axially centered over another member with a clearance passage between the assembled members, capable of allowing the assembly of members to move in relation to one and the other; said clearance passage being capable of transmitting a fluid under pressure; one of the members having one or more grooved openings to the clearance passage between the assembly of members, said groove openings having side walls and a bottom; positioned within and at the bottom of said groove openings is a continuous, resilient, elastomeric, expander seal; positioned within said groove openings is an expander void, said expander void being capable of accommodating any expansion of said continuous, resilient, elastomeric expander seal; positioned within said groove openings and biassed to said



expander seal is a gapped sealing band having a circumference of greater than 360 degrees; the one gapped sealing band having a circumference of greater than 360 degrees has an inclined surface that engages the expander seal and said incline surface is in the direction of a fluid source under pressure; a means for actuating the fluid under pressure whereby the fluid under pressure engages the gapped sealing band and engages and activates the expander seal causing said expander seal to pressurize and expand against the inclined surface of the gapped sealing band thereby forcing said gapped sealing band against the ungrooved member and against wall of said groove opening thereby causing a seal.

5,197,747
METALLIC GASKET WITH CYLINDER BEADS ON SEPARATE PLATES TO ALLOW FOR MINIMAL INTERCYLINDER SPACE
Kosaku Ueta, and Ikkoh Ueta, both of Kumagaya, Japan, assignors to Nihon Metal Gasket Co., Ltd., Kumagaya, Japan
Filed Jul. 5, 1991, Ser. No. 726,425
Claims priority, application Japan, Jul. 5, 1990, 2-178423; May 23, 1991, 3-147780
Int. Cl.[5] F16J *15/08*
U.S. Cl. 277—235 B **13 Claims**



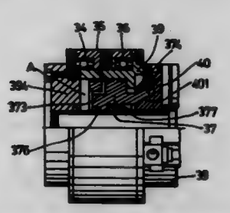
1. A metallic gasket comprising first and second elastic metal base plates, each said base plate having openings corresponding to combustion chamber bores, said openings having a predetermined distance therebetween,

said first base plate having first flat segments arranged around and adjacent to odd number cylinder openings and first arched beads arranged around said first flat segments,

said second base plate having second flat segments arranged around and adjacent to even number cylinder openings and second arched beads arranged around said second flat segments,

wherein said first and second base plates are laminated together with said predetermined distance between said openings having said first and second beads respectively overlapping said second and first flat segments.

5,197,748
HYDRAULIC CHUCK ASSEMBLY
Shui-Lai Wu, No. 83-18, Lane 162, Chen-Hsing Rd., Taichung City, Taiwan
Filed Dec. 4, 1991, Ser. No. 802,272
Int. Cl.[5] B23B *31/177, 31/30*
U.S. Cl. 279—4.12 **4 Claims**



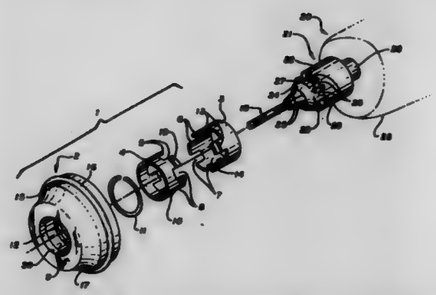
4. A hydraulic chuck assembly to be provided on one end of a shaft of a lathe, comprising:

a hollow main chuck body having a front head being formed with a plurality of radially extending and angularly spaced seat retaining slide grooves;

a tubular plunger movably provided inside said main chuck body, said plunger having a rear end portion and a gradually expanding and forwardly extending funnel-shaped cam portion extending into said front head; and

a plurality of grip seats each being slidably retained in a respective one of said slide grooves, each of said grip seats having a rear side formed with an inclining groove, said inclined grooves of said grip seats cooperatively receiving said funnel-shaped cam portion, said plunger being movable forward or rearward, and said funnel-shaped cam portion camming said inclining grooves of said grip seats so as to move said grip seats toward or away from each other along said slide grooves.

5,197,749
KEYLESS CHUCKING DEVICE
Sidney D. Moore, 2173 N. Wilkes Ct., Claremont, Calif. 91711, and Kenneth T. Stump, 1845 Wanamaker Dr., Covina, Calif. 91723
Filed Mar. 20, 1992, Ser. No. 853,990
Int. Cl.[5] B25B *13/44*
U.S. Cl. 279—147 **11 Claims**



1. A selectively removable apparatus for use with a gear tightening chuck of a rotary power tool including jaws and outer sleeve to assist said chuck in gripping and releasing auxiliary tools selectably carried in the jaws of said chuck whenever the chuck includes jaws and an outer sleeve rotatable to open and close the jaw, comprising:

a body including an outer grippable surface;

an opening defined in said body sized for slidably receiving the outer sleeve portion of said chuck whereby said body covers at least the gear portion of the chuck; and

dog means on said body and within said opening and extending rearward toward said outer sleeve for engaging the outer sleeve of the chuck to cause rotational dependence between the outer sleeve and said body of said apparatus to prevent rotation of the outer cylindrical sleeve when said apparatus is held in engagement upon the chuck by an operator and power is applied to the power tool to cause rotation of the remaining portions of the chuck whereby actuation of its jaws is effected to grip or release said auxiliary tools carried thereby, depending upon the direction of rotation of the chuck.

5,197,750
INCLINE CLIMBING BRAKE FOR WHEELCHAIRS
Michael A. DiGeorge, P.O. Box 563, Sulphur, La. 70664-0563
Filed Jun. 24, 1991, Ser. No. 719,503
Int. Cl.[5] B62M *1/14*
U.S. Cl. 280—250.1 **12 Claims**

1. An incline climbing brake for a large supporting wheel on a wheelchair, said brake comprising a ratchet assembly including a ratchet gear, means supporting the ratchet gear from the wheelchair and preventing rotational movement of the ratchet gear, a pair of pawls engageable with the ratchet gear, means supporting the pawls from the wheel for rotational movement with the wheel and pivotal selective engagement with the ratchet gear to permit rotational movement of the wheel in one selected rotational direction in relation to the ratchet gear thereby locking the wheelchair wheel against rotational movement in an opposite rotational direction, said means supporting the pawls including a housing enclosing the ratchet gear and pawls with the pawls being pivotally mounted in the housing and including external handle means to selectively engage the pawls with the ratchet gear and radially extending means rigid with the housing for mounting the housing rigidly with respect to the wheelchair wheel.

5,197,751
REAR WHEEL TRACKING DEVICE
Richard C. Rankel, 2010 Willow Wisp La., Spring, Tex. 77388
Filed Jul. 12, 1991, Ser. No. 729,035
Int. Cl.[5] B62D *53/06*
U.S. Cl. 280—426 **9 Claims**

1. A method of rotating the rear wheel assembly of a trailer of the type having a bottom surface and a rear wheel assembly including a horizontal trunion shaft beneath the bottom surface about the vertical axis of the trunion shaft in the opposite direction from the turning direction of the front end of the trailer as it turns a corner comprising the steps of:

affixing a top ring gear on the bottom surface of the trailer above the center of the trunion shaft, said top ring gear

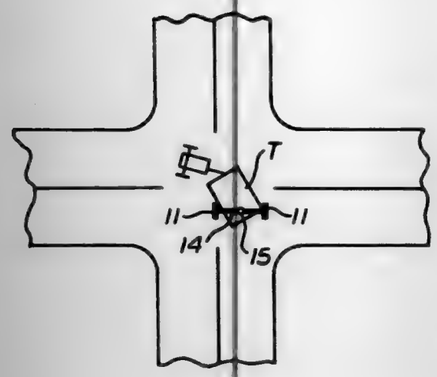
having a central vertical axis and a downwardly facing toothed surface encircling its vertical axis,

affixing a bottom ring gear on the top surface of the horizontal trunion shaft member of the rear wheel assembly of the trailer at its center, said bottom ring gear having a central vertical axis and an upwardly facing toothed surface encircling its vertical axis in vertically opposed relation to said top ring gear,

securing a hollow inner cylindrical member vertically between said top and bottom ring gear,

securing a hollow outer cylindrical member vertically between said top and bottom ring gears concentric with said inner cylindrical member to form an annulus therebetween, and

a plurality of pinion gears interposed and rotatably secured in the annulus between said inner and outer cylindrical members in circumferentially spaced relation with their toothed surfaces rotatably engaged between the opposed toothed surfaces of said top and bottom ring gear with their axis of rotation extending radially from the vertical axis of said inner cylindrical member and having a predetermined gear ratio such that said top and bottom ring



gears will rotate relative to one another in opposite directions about their vertical axis, whereby

interposing a plurality of pinion gears between the opposed circular toothed surfaces of said top and bottom ring gears in the annulus between said inner and outer cylindrical members in circumferentially spaced relation with their toothed surfaces in rotary engagement with said top and bottom ring gear toothed surfaces,

said pinion gears and said top and bottom ring gears being rotatably engaged and having a predetermined gear ratio, such that

when the rear wheels of the trailer are turning about their axles and as the front end of the trailer pivots in one direction about the center vertical axis of the trunnion shaft said top ring gear affixed to the bottom surface of the trailer will rotate about its vertical axis in the direction of the turning trailer and its rotary motion will be transmitted through said rotatably engaged pinion gears to rotate said bottom ring gear and the horizontal trunnion shaft to which it is affixed in the opposite direction causing the rear wheel assembly to turn in the opposite direction from the turning direction of the front end of the trailer.

5,197,752

SKI

Spitaler Engelbert, Wr. Neudorf; Wittmann Heinz, Vienna; Alois Himmetsberger, Vienna; Henry Freisinger, Vienna; Helmut Wladar, Vienna; Andreas Janisch, Oeyenhausen; Karl Stritzl, Vienna, and Roland Erdei, Weigelsdorf, all of Austria, assignors to HTM Sport- und Freizeitgeraete Gesellschaft m.b.H., Schwechat, Austria

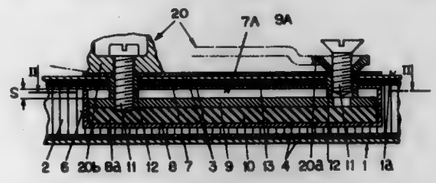
PCT No. PCT/EP91/00076, § 371 Date Sep. 25, 1991, § 102(e) Date Sep. 25, 1991, PCT Pub. No. WO91/12056, PCT Pub. Date Aug. 22, 1991

PCT Filed Jan. 17, 1991, Ser. No. 768,064

Claims priority, application Austria, Feb. 8, 1990, 267/90

Int. Cl.[5] A63C *5/00*

U.S. Cl. 280—610 5 Claims



1. A ski comprising a core having at least one upper surface layer thereon and one lower surface layer thereon, plural recesses in the core in a binding area, a hollow container fixedly received in each recess, said container having a bottom wall and upstanding sidewalls and a lid an insert received in each said hollow container for connection to end sections of fastening screws extending through means defining an opening in said lid and which are used for fastening a ski binding to the binding area of the ski, each said insert being composed of at least first and second layers, said first layer consisting of an elastomer material and said second layer consisting of a solid material, wherein said first layer of elastomer material is oriented below said second layer of solid material, said elastomer material being fixedly connected to both said bottom wall of said container and also said second layer of solid material, each said second layer is supported for movement in said container toward and away from said bottom wall, wherein said fastening screws are connected solely to said second layer of solid material, and wherein means defining a free space is provided between said second layer and said lid so as to facilitate said movement of said second layer toward and away from said bottom wall and a subjection of said first layer of elastomer material to compressive and tension forces in response to the ski binding being forced to move relative to the ski.

5,197,753

FOLDING BABY BUGGY FRAME ASSEMBLY

Kun-Hei Liu, 2 F., No. 32, Lane 200, Tung Hwa Street, Taipei, Taiwan

Filed May 29, 1992, Ser. No. 890,124

Int. Cl.[5] B62B *7/08*

U.S. Cl. 280—642 5 Claims

1. A folding baby buggy frame assembly comprising:

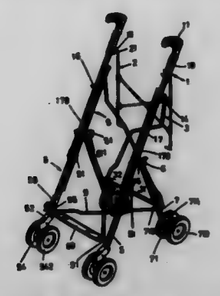
two symmetrical handlebars, said handlebars each comprised of a hooked handhold and an extension rod extensibly connected to said hooked handhold by a lock switch, said hooked handholds respectively comprising a hole for fastening a folding canopy frame and a projecting rod to support said folding canopy frame; said extension rods respectively comprising a connecting tab for connecting a back frame, an inner projection for connecting a seat frame, a rear wheel frame holder for holding a rear frame by an adjusting screw, and a bottom connected to a handlebar holder of a front wheel frame; one of said extension rods having a locating block at an outer side thereof;

two seat frames respectively connected to said inner projection of each extension rod to hold a seat, said seat frames each comprising an outer projection and an adjustment sheet, said adjustment sheet comprising an elongated slot connected to said rear wheel holder of either extension rod by said adjusting screw;

two front wheel frames respectively connected to said handlebars and supported on two front wheel assemblies; said front wheel frames each comprising said handlebar holder at a top thereof to hold either extension rod, an L-shaped connecting plate to hold a bottom frame, a front wheel holder connected to a bottom end thereof by a link to hold a front wheel assembly by a front wheel axle; said two front wheel frames including one having a positioning plate retained in place by said locating block of said one extension rod after said folding baby buggy frame assembly has been folded up;

two curved back frames pivoted together at respective centers thereof and respectively connected to said handlebars, said curved back frames each having one end pivoted to said connecting tab of said extension rod of either handlebar and an opposite end formed into a L-shaped connecting plate connected to each other by a folding connection, said L-shaped connecting plate of each back frame having an opposite end connected to a rear wheel frame;

two rear wheel frames respectively connected to said handlebars and respectively supported on two rear wheel assemblies; said rear wheel frames each having a top end



connected to said rear wheel holder of said extension rod of either handlebar by said adjusting screw, and a bottom end connected to a rear wheel holder to hold a rear wheel assembly by a rear wheel axle; said rear wheel frames each comprising an L-shaped connecting plate to hold a bottom frame and a rear brake controlled to stop said rear wheel assembly;

two bottom frames pivoted together at respective centers thereof and respectively connected between said front wheel frames and said rear wheel frames, said bottom frames each having one end pivoted to said L-shaped connecting plate of either rear wheel frame and an opposite end formed into a L-shaped connecting plate pivoted to said L-shaped connecting plate of either front wheel frame; and

a foot plate made of a resilient material having two opposite ends respectively connected to said L-shaped connecting plate of either bottom frame;

wherein said hooked handhold of each handlebar is made of a plastic material with said projecting rod thereof directly molded thereon; said extension rod of each handlebar is made from a plastic material with said inner projection and said rear wheel frame holder thereof directly molded thereon, said one of said extension rods having said locating block molded thereon; each seat frame is made from a plastic material with said outer projection and said adjustment sheet thereof directly molded thereon; each rear wheel frame is made from a plastic material with said rear wheel holder thereof directly molded thereon; each front wheel frame is made from a plastic material with said link and said front wheel holder directly molded thereon.

5,197,754

COLLAPSIBLE BEACH CART

Lyla B. Ward, 29 Woodbine Rd., Stamford, Conn. 06903

Filed Jul. 29, 1991, Ser. No. 712,519

Int. Cl.[5] B62B *1/12*

U.S. Cl. 280—655 8 Claims

1. A cart comprising:

a rigid frame having an axle extending transversely across a lower end of said rigid frame,

a pair of wheels releasably mounted on the ends of said axle,

article carrier means formed of flexible material mounted on said rigid frame,

a rigid member supporting the lower portion of the article carrier means hingedly secured to the lower end of said frame,

a flexible member supporting the upper portion of said article carrier means in an extended position when said rigid member is extended substantially perpendicular to said rigid frame,

a pair of vertical members forming the sides of said rigid frame,

a first horizontal member joining the upper ends of said pair of vertical members,

a second horizontal member forming a part of said frame extending between said pair of vertical members below said first horizontal member, and having a pair of studs projecting perpendicularly outward from said second horizontal member comprising means for releasable mounting said pair of wheels for storage.

5,197,755

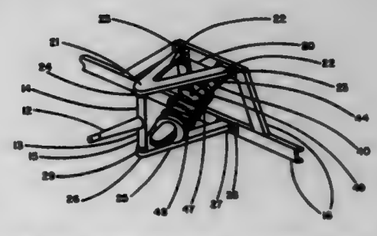
INDEPENDENT WHEEL SUSPENSION SYSTEM FOR VEHICLES

Dallas W. Quick, 108 Buckboard Trail, Flagstaff, Ariz. 86004

Filed Feb. 10, 1992, Ser. No. 833,365

Int. Cl.[5] B60G *3/00*

U.S. Cl. 280—690 6 Claims



1. An independent wheel suspension system for a vehicle comprising:

a) an upper A-arm comprising a pair of legs attached together at one end of each leg to form an apex with the

VOL 1148 ISS 5 MR 30 1993 U.M.I.

opposite leg ends spaced apart, the upper A-arm lying in an approximately horizontal plane; and

b) a lower A-arm comprising a pair of legs attached together at one end of each leg to form an apex with the opposite leg ends spaced apart, the upper A-arm lying in an approximately horizontal plane and lying below and aligned with the upper A-arm; and

c) a vertically oriented upright member having an upper end and a lower end, the upper end being swivelably attached to the apex of the upper A-arm and the lower end being swivelably attached to the apex of the lower A-arm; and

d) a horizontally oriented wheel spindle attached to the vertically oriented upright; and

e) the opposite leg ends of the upper A-arm being pivotally attached to a vehicle frame and the opposite leg ends of the lower A-arm being pivotally attached to the vehicle frame below the opposite leg ends of the upper A-arm; and

f) a vertically oriented A-arm comprising a pair of legs attached together at one end of each leg to form an apex with the opposite leg ends spaced apart, the vertically oriented A-arm lying in an approximately vertically oriented plane, the opposite leg ends of the vertically oriented A-arm being attached to the opposite leg ends of the upper A-arm so that the opposite leg ends of the vertically oriented A-arms are pivotally attached to the vehicle frame and rigidly attached to the opposite leg ends of the upper A-arm, and further having the apex of the vertically oriented A-arm lying in or near the approximately horizontal plane of the lower A-arm; and

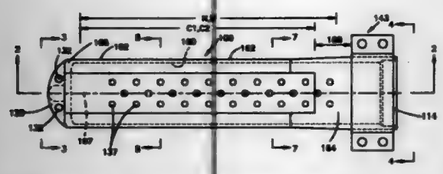
g) a coil spring having a substantially horizontally oriented longitudinal axis and having a first end and a second end, the first end being attached to the lower A-arm near the apex of the lower A-arm and the second end being attached to the vertically oriented A-arm at or near the apex of the vertically oriented A-arm.

5,197,756

AIR BAG INFLATOR AND METHOD OF ASSEMBLY

Patrick G. Jarboe, Shelby Township, Macomb County; Steven W. Maurer, Fraser, and Joseph J. Miha, North Branch, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Apr. 12, 1991, Ser. No. 684,664
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—728 **30 Claims**



1. An air bag inflator structure comprising:

a housing member having a substantially cylindrical wall circumscribing a longitudinal axis, said housing member including gas dispensing nozzles extending through at least a portion of said cylindrical wall,

said housing member also having an end wall integral with one longitudinal end of said substantially cylindrical wall, said cylindrical wall and said end wall co-operating to define a cavity for a gas generant,

said housing member further having a tongue integral with and projecting outwardly from said end wall, said tongue adapted to be coupled to a surface of a component of an air bag module; and

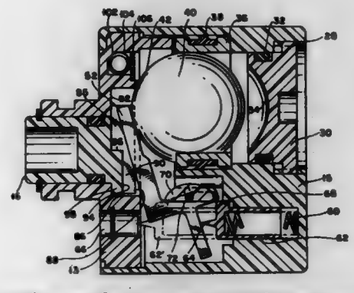
a sleeve at least partially surrounding and connected with said cylindrical wall at a location axially spaced from said end wall, said sleeve including at least one flange extending radially outwardly from said cylindrical wall, said at least one flange adapted to be coupled to a surface of the component of the air bag module.

5,197,757

MECHANICAL CRASH SENSOR

Allen Breed, Boonton Township, Morris County, and Torbjorn Thuen, Morris Plains, both of N.J., assignors to Breed Automotive Technology, Inc., Boonton Township, Morris County, N.J.

Filed Jun. 14, 1991, Ser. No. 715,493
Int. Cl.[5] B60R *21/32*
U.S. Cl. 280—734 **14 Claims**



1. A crash sensor for a passenger restraint system comprising:

a tubular body open at one end and defining a path of movement between a first position and a second position;

cap means for closing said one end;

an inertial mass disposed in said path;

biasing means for biasing said inertial mass, said inertial mass moving to said second position in response to an acceleration by overcoming said biasing means;

priming means disposed on said cap and including a first and second primer; and

triggering means disposed in said body and including a triggering device in contact with said inertial mass at least in said second position and arranged for triggering said first and second primers when said inertial mass is in said second position.

5,197,758

NON-AZIDE GAS GENERANT FORMULATION, METHOD, AND APPARATUS

Gary K. Lund, Ogden, Utah; Mikel R. Stevens, Fayetteville, Ark.; W. Wayne Edwards, Tremonton, and Graham C. Shaw, III, Garland, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Oct. 9, 1991, Ser. No. 774,755
Int. Cl.[5] G60Q *21/28*
U.S. Cl. 280—741 **20 Claims**

1. A solid composition for generating a nitrogen-containing gas including a non-azide fuel and an oxidizer therefor, wherein said non-azide fuel comprises a transition metal complex of an aminoarazole.

5,197,759

AIR BAG COLLISION SAFETY DEVICE

Alfred Kroiss, Eichenstrasse 15a, and Heinz Methfessel, Eichenstrasse 31, both of 8059 Wartenberg, Fed. Rep. of Germany

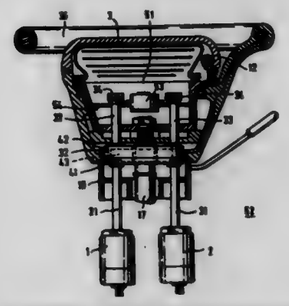
Filed Apr. 8, 1991, Ser. No. 682,184
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1990, 4011493; Sep. 10, 1990, 4028715
Int. Cl.[5] B60R *21/26, 21/28*
U.S. Cl. 280—736 **23 Claims**

1. Collision safety device for a vehicle, which comprises:

a) an air bag inflatable by means of compressed gas;

b) means for inflating said air bag including at least one compressed gas source, and

c) outlet valve means communicating the interior of said air bag with the outside atmosphere, said outlet valve means being adapted to be opened and to be closed, said outlet valve means being initially closed and further being adapted to be opened at a predetermined time after said means for inflating said air bag is actuated and if the pressure difference between the interior of said air bag and the outside atmosphere exceeds a predetermined value, said outlet valve means adapted to be closed when said pressure difference between the interior of said air bag and the outside atmosphere no longer exceeds said predetermined value.

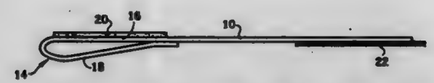


5,197,760

SKI TYING BAND

Peter K. Schollenberger, 2273 Cambridge Ave., Cardiff, Calif. 92007

Filed Apr. 9, 1991, Ser. No. 682,466
Int. Cl.[5] A63C *11/02*
U.S. Cl. 280—814 **17 Claims**



1. A ski tying band for binding together a pair of skis in running base to running base relationship comprising:

a flexible strap having a thickness sufficient to space the running bases of the skis from one another, said strap having an effective length approximately equal to four times the sum of the width and thickness dimensions of one of the skis,

a portion of said strap at one end thereof being folded upon itself and having said one end thereof secured to said strap at a location intermediate the ends of said strap,

said folded end portion of said strap forming a two ply loop of a size to be slipped over one end of one of the skis, said loop comprising a first ply for engagement with the running base of the one ski and a second ply for engagement with the upper surface of the one ski, said second ply having an inner surface for engagement with the upper surface of the one ski and an outer exposed surface,

a first fastening means located on the exposed surface of said second ply,

the portion of said strap from said loop to the other end of said strap being adapted to be wrapped tightly about the other one of the skis when the skis are in base to base relationship to bring the other end of said strap into overlying abutting relationship with said first fastening means on the exposed surface of said second ply of said loop, and

second fastening means on the surface of said other end of said strap abutting against said first fastening means and cooperative with said first fastening means for securing said other end of said strap to said second ply of said loop for binding the two skis together with said first ply of said loop positioned between and separating the running bases of the two skis.

5,197,761

BOOK PULLER AND METHOD OF MAKING SAME

Hossain A. Shirdavani, 14425 NE. 37th Pl., Bellevue, Wash. 98007

Continuation-in-part of Ser. No. 542,881, Jun. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 419,468, Oct. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 342,022, Apr. 24, 1989, abandoned. This application Apr. 11, 1991, Ser. No. 683,992
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—15.1 **3 Claims**

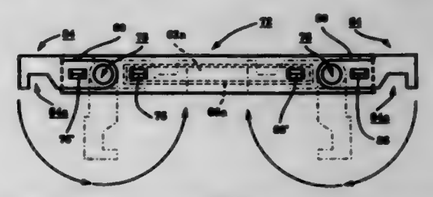
1. A book puller comprising a flexible planar main body having an elongated inner face coated with a pressure sensitive adhesive and a coextensive opposite outer face, said inner face having opposite end portions and a center portion extending between and connecting said end portions, said body having an essentially smooth continuous outer edge extending around and defining said end portions and said center portion, said outer edge having opposite sides, each of which includes a straight portion along each of said end portions and a concavely curved portion along said center portion joining said straight portions at respective junctures which are visually and tactilely perceptible; and a separate flexible planar reinforcing layer coextensive with and adhered to said center portion of said inner face; said center portion being dimensioned to form, when said end portions are adhered to front and back surfaces of a book, respectively, with said junctures positioned at opposite spine edges of the book, an arcuate handle extending around the book between said junctures and spaced from the book a distance sufficient to allow insertion of a finger between the book and said handle.

5,197,762

BOOKLET AND DOCUMENT FILING DEVICE

Igor Abramov, 501 Esplanade Ave., #226, Redondo Beach, Calif. 90277

Filed Aug. 5, 1991, Ser. No. 740,502
Int. Cl.[5] B42D *17/00*
U.S. Cl. 281—43 **14 Claims**



1. In a rail-based suspension filing system, a booklet suspension device comprising an essentially flat elongated body member, said body member comprising:

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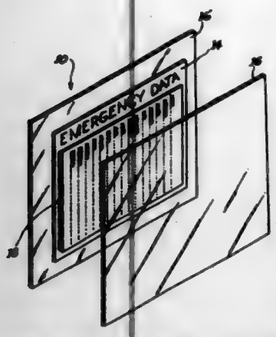
(a) front surface,
(b) back surface,
said front surface essentially parallel to said back surface, said body member further having suspension members on opposite ends, said suspension members interfaceable with supporting rails, said suspension members pivotable around axes perpendicular to said front surface of said body member between (1) a first deployed position, and (2) a second stowed position, said suspension members having essentially hooked end sections.

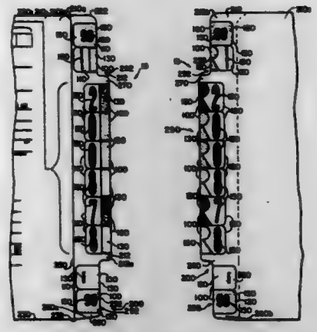
5,197,763
BIOMEDICAL INFORMATION CARD AND METHOD OF MAKING
Thomas E. Whalen, 221 NW. 120th St., Miami, Fla. 33168
Filed Jan. 10, 1992, Ser. No. 820,286
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—76 4 Claims



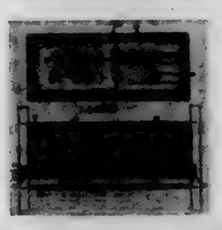
1. An emergency medical data card that is wallet sized that contains an individual's personal medical information comprising:
a rigid plastic thin credit card sized card for receipt into a wallet or the like;
a form beginning with a letter size sheet of paper containing indicia and blank lines for completion, relating to specific information of an individual, including name, address, and medical information, the indicia including lines to be filled in by an individual, said sheet being reduced, by a conventional copier, in a copy reproduction size to a specific size in accordance with said rigid plastic sized card after it has been filled in for attachment to said rigid plastic card, the indicia and filled in information after reduction being readable to a human eye without machine intervention; and
a means for attaching said sheet of paper after it has been reduced to said plastic card.

5,197,764
ALPHANUMERIC COLOR-CODED FILING METHOD AND SYSTEM THEREFOR
Joseph S. Hicinbothem, Kettering, and Jack W. Jeter, Akron, both of Ohio, assignors to The Reynolds and Reynolds Company, Dayton, Ohio
Filed Jul. 11, 1991, Ser. No. 727,848
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 9 Claims

1. A coded filing system comprising:
a plurality of coded labels of different sizes, said labels having a front section and a back section, said labels having visually-perceptible characteristics corresponding to specific alphanumeric information; and
a folder having a front cover and a back cover, each of said covers having an inner face, an outer face, opposed top and bottom edges and opposed side edges, three of said edges of said back cover being aligned with the corresponding edges of said front cover, and the other of said edges of said back cover having a unitary flap extending substantially the entire length thereof outwardly of the corresponding edge of said front cover, said flap having front and back faces unitary with said inner and outer faces, respectively, of said back cover, a unitary tab extending outwardly therefrom along a portion of its length, and a plurality of placement guide means marked on said front face thereof corresponding in size to said front section of said labels for guiding placement of said front section of said labels on said front face of said flap, said front and back faces of said flap having sufficient widths to receive said front and back sections, respectively, of said labels, and at least some of said placement guide means being positioned on said tab;
wherein said tab defines a location for the placement of primary information, and the remaining portions of said flap define locations recessed from said tab for the placement of supplemental information.

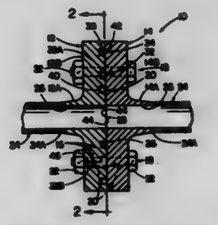


5,197,765
VARYING TONE SECURING DOCUMENT
William H. Mowry, Jr., Dayton, Ohio; Alan L. Sink, Rocky Mount, Va.; George W. Stubbs, Beavercreek, Ohio; John S. Simpson, and John F. Kane, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio
Filed Jul. 12, 1991, Ser. No. 729,363
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—93 45 Claims



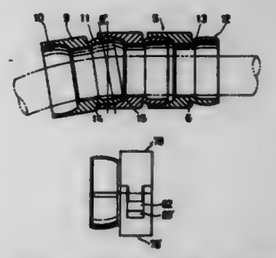
1. An improved security document, comprising:
a substrate having a surface for carrying indicia;
background printed matter on said surface, said background printed matter made up of a pattern of elements of a first size and a first frequency; and
a cancellation term printed on said surface, said cancellation term made up of a pattern of elements of a second size and a second frequency, elements of one of said first size of said second size being sufficiently small such that they are not reproduced by a color copier and elements of the other of said first size of said second size being sufficiently large such that they are reproduced by a color copier, so that a copy made of said security document on a color copier displays said cancellation term, the frequencies of said elements of said first and said second frequency varying across said surface such that the tone of said background printed matter and the tone of said cancellation term vary together across said surface in a visually apparent manner, thereby impending copying said security document without said cancellation term being apparent on at least some portion of the copy.
11. An improved security document, comprising:
a substrate having a surface for carrying indicia;
a first background printed matter on a first part of said surface, said first background printed matter made up of a pattern of elements of a first size and of a first frequency;
a first cancellation term printed on said first part of said surface, said first cancellation term made up of a pattern of elements of a second size and of a second frequency, the tone of said first background printed matter substantially equaling the tone of said first cancellation term;
a second background printed matter on a second part of said surface, said second background printed matter made up of a pattern of elements of a third size and of a third frequency;
a second cancellation term printed on said second part of said surface, said second cancellation term made up of a pattern of elements of a fourth size and of a fourth frequency, the tone of said second background printed matter substantially equaling the tone of said second cancellation term; and
a camouflage pattern on said first and said second parts of said surface to disguise said first and said second cancellation terms on the security document.

5,197,766
FLUID-CARRYING TUBE COUPLING ASSEMBLY WITH INTERNAL SEAL AND DRAIN ARRANGEMENT
Jeffrey Glover, Cincinnati, and Scott A. Jones, Middletown, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Oct. 28, 1991, Ser. No. 783,601
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—14 16 Claims



1. A fluid-carrying tube coupling assembly for use in a gas turbine engine, said tube coupling comprises:
(a) a pair of fitting members each including an inner hub portion and an outer flange portion, said inner hub portions being attachable to ends of at least a pair of respective fluid-carrying hollow tubes and being disposed relative to one another so as to define at least one flow passage for providing fluid communication between the hollow tubes, said outer flange portions being attached to and extending radially outwardly from said respective inner hub portions and disposed relative to one another so as to define an annular interface region between said fitting members which provides a path of potential fluid leakage from said flow passage to the exterior of said fitting members;
(b) a seal and drain arrangement located at said interface region between said outer flange portions of said fitting members, said seal and drain arrangement including an inner annular primary seal encircling said flow passage so as to obstruct the path of potential fluid leakage from said flow passage to the exterior of said fitting members and a drain channel encircling said inner annular primary seal so as to intersect the path of potential fluid leakage from said flow passage to the exterior of said fitting members in the event said primary seal should fail; and
(c) means for releasably clamping said fitting members to one another at said outer flange portions thereof; and
(d) wherein said seal and drain arrangement also includes an outer annular secondary seal encircling said drain channel so as to obstruct the path of potential fluid leakage from said flow passage to the exterior of said fitting members in the event both said primary seal and said drain channel should fail;
(e) wherein said clamping means includes:
(i) a plurality of aligned apertures defined through said outer flange portions of said fitting members between locations of said inner annular primary seal and outer annular secondary seal; and
(ii) a plurality of fasteners being removably installed through said aligned apertures and tightened to clamp said fitting members together; and
(f) wherein said inner annular primary seal includes an annular groove formed in an axially facing surface of one of said fitting members and an annular o-ring disposed in said groove.

5,197,767
FLEXIBLE SUPPORTING SHEATH FOR CABLES AND THE LIKE
Akira Kimura, Kyoto; Nobuo Kitao, Yamatokouriyama; Hiroshi Yasuda, Takatsuki; Kiyoshi Isozaki; Hiroshi Nishimura, both of Osaka, and Yoshimasa Shimomura, Tokyo, all of Japan, assignors to Tsubakimoto Chain Co., Japan
Division of Ser. No. 508,938, Apr. 12, 1990, Pat. No. 5,069,486, which is a division of Ser. No. 177,526, Apr. 4, 1988, abandoned, which is a division of Ser. No. 849,829, Apr. 7, 1986, Pat. No. 4,739,801. This application Dec. 2, 1991, Ser. No. 800,525
Claims priority, application Japan, Apr. 9, 1985, 60-75698; Apr. 22, 1985, 60-86983; Feb. 15, 1986, 61-29917; Feb. 17, 1986, 61-30951; Feb. 18, 1986, 61-31932; Feb. 19, 1986, 61-32879
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—39 13 Claims



1. A flexible supporting sheath for cables and the like comprising a series of interconnected links, each link having an internal passage extending through it from one end to the other, an inner concave spherical surface formed in the passage adjacent to one end of the link, an external surface surrounding said inner concave spherical surface, and an outer convex spherical surface formed on the outer surface of the link adjacent to its opposite end, in which, for at least two adjoining links of the sheath, the convex surface of one of said two links is engaged with a concave surface of the other one of said two links, in which the centers of the engaged convex and concave surfaces coincide, and in which the concave surface of said other link overlaps the convex surface of said one link to an

surface, the outer surface being externally threaded at one first leaf frame member (14y) and the second leaf frame (16)

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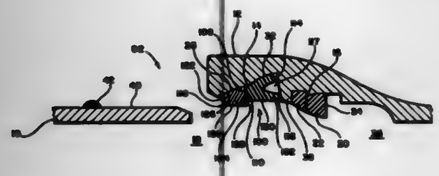
extent such as to prevent separation of the links, in which each of said links is split longitudinally into halves and each of said halves is provided with two longitudinal faying surfaces, and including means for holding said halves together with said faying surfaces in contact with each other, in which said means for holding said halves together comprises means projecting from at least one of said halves, and a recess in the external surface of the link on the other of said halves for receiving said projecting means, said projecting means having an end remote from said one of said halves, said projecting means and said recess having cooperable surface means, interengageable with each other to provide a snap-in connection for holding the faying surfaces of said halves in contact with each other, and said recess in said external surface of the link on said other of said halves extending beyond said remote end of said projecting means to provide a slot for receiving a prying instrument to release said snap-in connection, whereby said halves of the link can be disconnected with ease.

5,197,768
RESTRAINED JOINT HAVING ELASTOMER-BACKED LOCKING SEGMENTS

Randall C. Conner, Warrior, Ala., assignor to American Cast Iron Pipe Company, Birmingham, Ala.

Filed Oct. 10, 1991, Ser. No. 774,351
Int. Cl.[5] F16L *21/02*
U.S. Cl. 285—105 **36 Claims**



33. A locking member for axially restraining a spigot end of a piping element in fluid sealed engagement with a bell end of another piping element, said locking member being an element separate from a fluid seal means operating between said spigot end and said bell end, the locking member comprising:

an arcuate elastomeric backing member adapted to seat in an annular recess in said bell end and against a radially inwardly protruding shoulder in said bell end; and

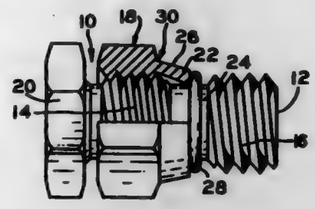
at least one arcuate locking segment bonded to and extending axially outwardly of said elastomeric backing member when said elastomeric backing member is seated in said annular recess, said locking segment having means for engaging said spigot end to retain said spigot and within said bell end;

wherein said elastomeric backing member of said locking member is so constructed and arranged to urge an outer radial surface of said at least one locking segment into contact with a tapered wall at a front axial portion of said annular recess when said elastomeric backing member is seated against said shoulder in said bell end.

5,197,769
ADJUSTABLE O-RING PORT FITTING FOR A HYDRAULIC COUPLING

Nigel D. L. Williamson, Ecclesall, England, assignor to NWD International, Inc., Fort Wayne, Ind.

Division of Ser. No. 533,124, Jun. 5, 1990, Pat. No. 5,115,550, which is a continuation-in-part of Ser. No. 293,392, Jan. 4, 1989, Pat. No. 4,934,742, which is a continuation-in-part of Ser. No. 148,846, Jan. 27, 1988, abandoned. This application Jan. 22, 1992, Ser. No. 823,894
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] F16L *5/02*
U.S. Cl. 285—212 **22 Claims**



1. A fluid coupling assembly comprising:

a female port member having an outer face and an axial bore extension inwardly from said outer face, said female member having an internal annular tapered locking surface;

a male fitting member having a base portion disposed within said bore and means for connecting said base portion to said female member, said base portion including a bearing surface in facing relationship with said internal annular tapered locking surface, said internal annular tapered locking surface and said bearing surface defining a tapered annular pocket;

said male member including a lock nut disposed around said base portion and being threadedly connected to said base portion, said lock nut including an annular skirt portion wedged into said tapered pocket, said annular skirt portion of said lock nut forming a corner with said internal tapered locking surface and with said bearing surface; and

an O-ring disposed in said pocket adjacent an axial end portion of said skirt portion, said O-ring being of a durometer and size smaller in volume than said pocket permitting said O-ring to move axially in said pocket and to deform into sealing engagement with said corners in response to fluid pressure, said internal tapered locking surface extending into said pocket past said O-ring;

said annular skirt portion of said lock nut having an internal surface disposed at an angle relative to the axis of said base portion, said angle being in the range of about 25° to about 50°.

5,197,770
COUPLING PART

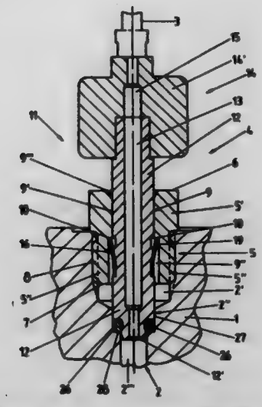
Jurgen Knapp, Lappersdorf, Fed. Rep. of Germany, assignor to Knapp Mikrohydraulik KG, Fed. Rep. of Germany

Filed Apr. 11, 1991, Ser. No. 683,989
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1990, 4011756; Nov. 13, 1990, 4036016; Feb. 9, 1991, 4104009
Int. Cl.[5] F16L *41/08*
U.S. Cl. 285—353 **18 Claims**

1. Coupling part to make a hydraulic connection between a first and a second hydraulic component, the coupling part being attachable to said first component (3, 29, 30) and releasably securable in a receptacle provided on said second component (1), the coupling part comprising:

an outer element (5, 5*a*) and an inner element (11, 11*a*, 11*b*, 11*c*), the outer element (5, 5*a*) being sleeve-like with a through opening (9), the outer element having an outer surface, the outer surface being externally threaded at one end for connecting to the second hydraulic component (1) and the outer surface having a tool hold surface (5'),

the inner element (11, 11*a*, 11*b*, 11*c*) at least in a portion (12, 33) constituting one end (12', 33') of said inner element being likewise of sleeve-like configuration, the inner element having a passage (13, 14) open at said one end (12', 33') and open also at the other end of the inner element (11, 11*a*, 11*b*, 11*c*), the first hydraulic component (3, 29, 30) being attachable to the other end of the inner element, the inner element (11, 11*a*, 11*b*, 11*c*) being introducible by its sleeve-like portion (12, 33) into the opening (9) of the outer element (5, 5*a*) from the other end (6) of the outer element, and



spring fingers (19, 41) for resiliently snapping behind a catch surface (10) of the outer element (5) thereby locking the inner element to outer element, the spring fingers being formed on a catch sleeve (16, 37) which is fixed to the inner element (11, 11*a*, 11*b*, 11*c*), the spring fingers standing off from the catch sleeve in a direction inclined from the centerline of the catch sleeve, the spring fingers (19, 41) being forced radially outward by their own natural resilience,

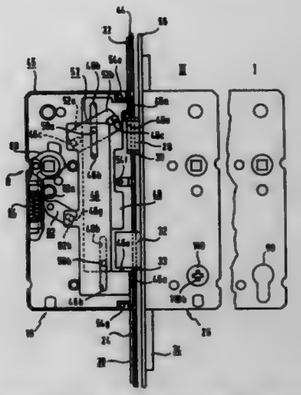
the inner element (11, 11*a*, 11*b*, 11*c*) having a contact surface, the contact surface being formed in the shape of a conical taper (21''', 44') for the support of the spring fingers (19, 41), the spring fingers (19, 41) extending beyond said conical taper (21''', 44').

5,197,771
LOCKING SYSTEM

Ludger Kaup, Everswinkel, and Renate Berning, Ostbevern, both of Fed. Rep. of Germany, assignors to Aug. Winkhaus GmbH & Co. KG, Telgte, Fed. Rep. of Germany

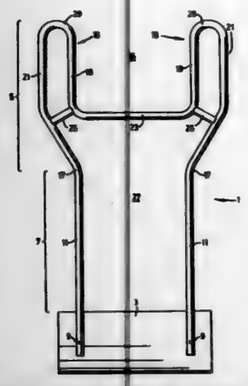
Filed Apr. 12, 1991, Ser. No. 686,022
Claims priority, application European Pat. Off., Aug. 31, 1990, 90116771.8
Int. Cl.[5] E05C *9/04*
U.S. Cl. 292—45 **19 Claims**

1. A locking system for use on a window or a door, this window (10) or this door, respectively, comprising a stationary frame (12) and two leaf frames (14, 16) mounted on this frame (12) so that they pivot about mutually parallel pivot axes (S1, S2), a first leaf frame (14) of these two leaf frames (14, 16) being intended for frequent pivoting movement about a first pivot axis (S1) between an open position and a closed position, a second leaf frame (16) being intended for less frequent pivoting movement about a second pivot axis (S2) between a closed position and an open position, each of the two leaf frames (14, 16) comprising a leaf frame member (14*a*, 16*a*) remote from the respective pivot axis (S1, S2), the first leaf frame (14) having a first leaf frame member (14*a*) and the second leaf frame (16) having a second leaf frame member (16*a*), said first leaf frame member (14*a*) and said second leaf frame member (16*a*) being in the closed position of the respective leaf frames (14, 16) directly opposite each other, i.e. without the interposition of an intermediate member which is rigid with the stationary frame (12), said second frame (16) being, in the region of the second leaf frame member (16*a*), lockable by second locking means (22*a*, 22*a*) with respect to transverse members (12*a*, 12*b*) of the stationary frame (12) which extend substantially at right-angles to the first and second leaf frame members (14*a*, 16*a*), said first leaf frame (14) being lockable in the region of the first leaf frame member (14*a*) by first locking means (28, 32, 36, 38) with respect to the second leaf frame member (16*a*), said second locking means comprising, for being mounted on the second leaf frame member (16*a*) between the two transverse members (12*a*, 12*b*) a second drive unit (18), a second drive rod assembly (46, 48) for being mounted on and parallel with the second leaf frame member (16*a*) and having two second drive rod elements (22, 24) adapted for movement in opposition to each other and parallel with the second leaf frame member (16*a*) as a result of actuation of the second drive unit (18), a respective second drive rod end lock element (22*a*, 24*a*) being provided at respective ends of both said second drive rod elements (22, 24) for



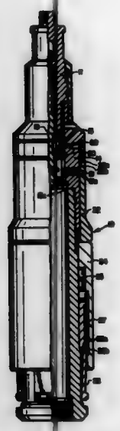
engagement in respective second drive rod end lock element receiver means (12*c*, 12*d*) allocated to respective transverse members (12*a*, 12*b*), said locking system further comprising a first drive unit (26) for being mounted on the first leaf frame member (14*a*) between said two transverse members (12*a*, 12*b*), said first drive unit (26) being adapted for controlling transverse latch means (28) having at least one transverse latch (28) having at least one transverse latch (28) crossing a leaf frame middle gap and engageable with latch receiving means (30) to be provided on the second leaf frame member (16*a*), said first drive unit (26) being further adapted to control transverse bolt means (32, 36, 38) which cross the leaf frame middle gap and are engageable with respective transverse bolt receiving means (33, 40, 42) to be provided on the second leaf frame member (16*a*), a first drive rod assembly (34) being provided for being fastened to said first leaf frame member, (14*a*), said first drive rod assembly (34) extending over a major part of the length of the first leaf frame member 914*a*) and being adapted for movement by the first drive unit (26) in a longitudinal direction of the first leaf frame member (14*a*), said transverse bolt means (32, 36, 38) comprising a plurality of transverse bolts (32, 36, 38), at least a part (36, 38) of said transverse bolts of said plurality of transverse bolts (32, 36, 38) being controlled via said first drive rod assembly (34) and being situated outside said first drive unit (26).

5,197,772
SHOVEL
John Stecyk, Box 335, Cobourg, Ontario, Canada K9A 4K8
Filed Nov. 15, 1991, Ser. No. 792,585
Claims priority, application Canada, Nov. 21, 1990, 2030452-9
Int. Cl.[5] A01B *1/22*; E01H *5/02*
U.S. Cl. 294—57 11 Claims



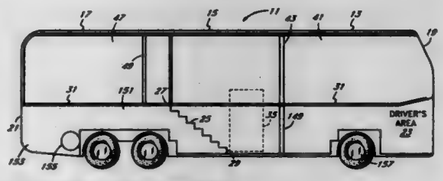
1. A shovel having a blade, a handle portion and connecting means connecting said handle portion to said blade, said handle portion comprising two side parts spaced laterally apart to define a space between them in which a user's body may be located, said side parts defining an opening into said space at an end of said handle portion remote from said blade to allow a user to move into said space, each side part including two members spaced laterally apart and extending parallel to each other and being adapted to underlie a user's arm from at least the user's elbow to the user's hand.

5,197,773
RUNNING AND PULLING TOOL
James D. Vick, Jr., Red Oak, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Filed Oct. 15, 1991, Ser. No. 775,578
Int. Cl.[5] E21B *23/00*
U.S. Cl. 294—86.18 6 Claims



1. An improved running pulling tool connectable to a fishing neck comprising:
(a) a lower body having an upper body slidably mounted therein, said upper body connectable to well servicing tools;
(b) a spool slidably mounted in said lower body;
(c) means for releasably positioning said upper body and spool in said lower body;
(d) a rod slidably mounted in said upper body and spool;
(e) means for releasably connecting said rod in said upper body;
(f) a core connected to and extending from said lower body;
(g) means slidably mounted around said lower body and said core for automatically connecting to and releasing from a fishing neck; and
(h) means releasably positioning said connecting and releasing means in automatic connecting position on said lower body and core, said connecting and releasing means moveable on release of said positioning means to a position releasing said connecting and releasing means from said fishing neck.

5,197,774
MOBILE OFFICE
Victor M. Diaz, Chula Vista, Calif., assignor to Californula del Nor Oeste, Tijuana, Mexico
Filed Apr. 9, 1992, Ser. No. 865,963
Int. Cl.[5] B62D *31/04*
U.S. Cl. 296—24.1 23 Claims

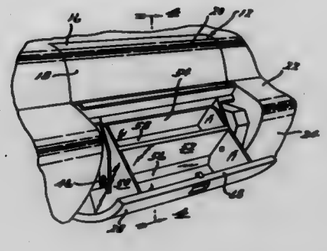


1. A motor coach, comprising:
a motor vehicle including a body having a front, a middle, a back, an upper level and a lower level;
a driver's station on said lower level from which a driver can pilot said coach;
a stairway connecting said lower level to said upper level, said stairway located in the middle of said body;
a partition separating said driver's station from said upper level;
a first door providing outside access to said driver's station;
a second door providing outside access to said stairway;
a landing on said upper level surrounding said stairway;
a forward compartment and a rear compartment on said upper level, each said compartment isolated from said landing by a door and a bulkhead; and,
furnishings including a desk, a chair, and a cabinet for electronic equipment in each said compartment.

5,197,775
GLOVE COMPARTMENT
Francis G. Reeber, Carleton, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 13, 1991, Ser. No. 806,175
Int. Cl.[5] B60R *7/06*
U.S. Cl. 296—37.12 8 Claims

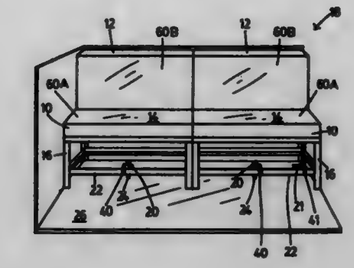
1. A glove compartment in an instrument panel of a vehicle comprising:
an upper lid having a closed position forming a generally horizontal surface with the instrument panel and pivotally mounted thereto;
a lower door having a closed position forming a generally vertical surface of the instrument panel abutting the lid to close the glove compartment and pivotally mounted thereto;

vertically spaced pin means disposed in said instrument panel;
lid arms carried with said lid and pivotally engaged with one of said pin means;



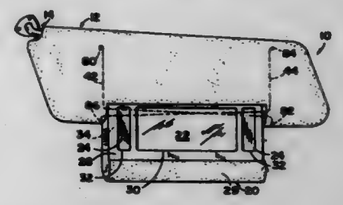
door arms carried with said door and pivotally mounted on another of said pin means; and
cooperative linkage means disposed between said lid arms and said door arms to effect opening movement of said lid upon opening movement of said door.

5,197,776
SEATING/BED ARRANGEMENT FOR RECREATIONAL VEHICLES
Thomas H. Brown, 77 Lorne Avenue, Newmarket, Ontario, Canada
Filed Mar. 10, 1992, Ser. No. 848,201
Int. Cl.[5] B60N *1/08*
U.S. Cl. 296—65.1 19 Claims



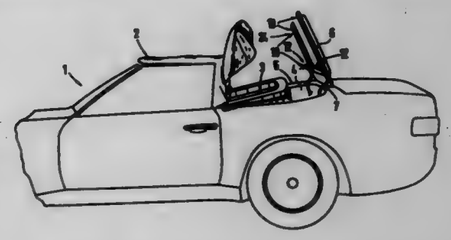
1. A seating arrangement for a recreational vehicle having at least one freestanding seat provided with means for individually re-positioning and securing the seat within the vehicle, the seat comprising a seat portion, a back, and a frame; comprising
means for individually repositioning and securing the seat comprising a latch to releasable secure each seat to a fixed member of the vehicle, each fixed member comprising a post upstanding from the floor located to be engagable with the latch;
means to open the latch to release the seat for movement to a new position; and
means to close the latch to secure the seat in a closed position.

5,197,777
VISOR WITH EXTENDABLE PANEL
Michael L. Lasser; Steven E. VanderVeen, and David J. Becker, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Continuation of Ser. No. 604,680, Oct. 26, 1990, Pat. No. 5,067,764. This application Oct. 1, 1991, Ser. No. 769,535
The portion of the term of this patent subsequent to Nov. 26, 2008, has been disclaimed.
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.8 3 Claims



1. A vehicle visor comprising:
means for defining a slot for receiving a slide-out visor panel;
said slide-out visor panel shaped to slidably fit within said slot;
means for mounting said panel within said slot to allow said panel to move between a stored position within said slot and a use position extended from said slot, said mounting means including a pair of spaced parallel guide tracks mounted to one of said visor panel and means for defining a slot and co-operating with the other of said visor panel and means for defining a slot, and stabilizing means extending between said visor panel and said mounting means, wherein said visor panel includes guide means for movably receiving said stabilizing means, wherein said stabilizing means comprises at least one cord means having opposite ends anchored to said means for defining a slot to be stationery with respect to said means for defining a slot, said cord means extending to spaced edges of said visor panel and movably engaging said guide means for controlling the sliding motion of said visor panel as it is extended and retracted to and from said slot.

5,197,778
VEHICLE FOLDING TOP
Hermann Burst, Rutesheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Mar. 2, 1992, Ser. No. 843,059
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1991, 4106732
Int. Cl.[5] B60J *7/12*
U.S. Cl. 296—136 15 Claims



1. A vehicle folding top configured to be deposited in an assigned folding top compartment of a vehicle when the top is open, comprising a hinged folding top compartment lid operatively associated with the compartment, wherein, at least one device operatively arranged on the folding top compartment

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lid which, when the folding top compartment lid is closed, supportingly interacts with a folding top structure of the folding top in a deposited position disposed therebelow.

5,197,779
POWER SLIDING SUNROOF

Eiichi Mizuno; Koji Kishino; Kenji Matsumoto, all of Hiroshima, and Toshio Hanaike, Iwakuni, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 543,962, Jun. 27, 1990, abandoned.
This application Oct. 9, 1991, Ser. No. 772,125
Claims priority, application Japan, Jun. 27, 1989, 1-164896; Aug. 4, 1989, 1-92099; Aug. 9, 1989, 1-93665
Int. Cl.[5] B60J 7/047
U.S. Cl. 296—220 11 Claims

1. A sliding sunroof for opening and closing a skylight window formed between a front stationary roof and a rear stationary roof of a car body of an automotive vehicle, comprising:

a front sliding roof, having a front end and a rear end, movable between a front roof closed position and a front roof open position;

a rear sliding roof movable independently of said front sliding roof between a rear roof closed position and a rear roof open position, said front sliding roof being located between said front stationary roof and said rear sliding roof in said front roof closed position, said rear sliding roof being located between said front sliding roof and said rear stationary roof in said rear roof closed position;

front roof guide means for moving and guiding said front sliding roof between said front roof closed position and said front roof open position and locating said front sliding roof over said rear stationary roof in said front roof open position so that the front end of said front sliding roof is located substantially right above a front end of said rear stationary roof, said front roof guide means comprising a pair of guide tracks disposed on opposite sides of said skylight window, each guide track including at least a guide track section extending to a position vertically higher than said rear sliding roof in said rear roof closed position; and

rear roof guide means for moving and guiding said rear sliding roof between said rear roof closed position and said rear roof open position and locating said rear sliding roof under said rear stationary roof in said rear roof open position so that a front end of said rear sliding roof is located substantially right under said front end of said rear stationary roof.

5,197,780
TRANSMISSION DEVICE FOR CABLE CONTROL OF LUMBAR SUPPORT MECHANISM

Craig J. Coughlin, Detroit, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Feb. 20, 1991, Ser. No. 658,108
Int. Cl.[5] A47C 3/00
U.S. Cl. 297—284.7 20 Claims

1. A transmission device for independently adjusting first and second comfort features of a comfort mechanism integrated into a seat assembly, said transmission device comprising:

a housing assembly located remotely from the comfort mechanism;

a gear drive assembly having first and second gear means supported for rotation within said housing assembly;

an elongated rod partially supported for rotation within said housing assembly, said elongated rod being movable with respect to said housing assembly between a first position and a second position;

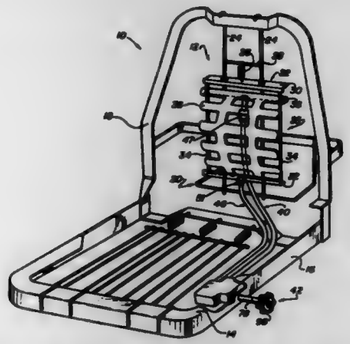
first spool means operable to be rotatably driven by said first gear means;

first actuation means coupled at one end to said first spool means and adapted to be coupled at its other end to the first comfort feature of the comfort mechanism;

second spool means operable to be rotatably driven by said second gear means;

second actuation means coupled at one end to said second spool means and adapted to be coupled at its other end to the second comfort feature of the comfort mechanism;

coupling means for coupling said rod to said first gear means



when said rod is in said first position so as to actuate said first actuation means in response to rotation of said rod for selectively adjusting the first comfort feature, and wherein said coupling means is operable for coupling said rod to said second gear means when said rod is in said second position so as to actuate said second actuation means in response to rotation of said rod for selectively adjusting the second comfort feature;

manually operable means for permitting a seat occupant to selectively move said rod between said first and second positions, and said manually operable means being operable for permitting said seat occupant to selectively rotate said rod for independently adjusting the first and second comfort features; and

retaining means for positively retaining said rod in one of said first and second positions so as to prevent said rod from positively locating in an intermediate position between said first and seconds positions.

5,197,781
RECLINING APPARATUS

Hirofumi Tada, Higashizakura Building 606, 31-14 Izumi 3-chome, Higashi-ku, Nagoya-shi, Aichi-ken 461, Japan

Continuation of Ser. No. 474,778, Mar. 15, 1990, abandoned.
This application Jan. 31, 1992, Ser. No. 828,740
Claims priority, application Japan, Jul. 18, 1988, 63-180130; Apr. 18, 1989, 1-99679
Int. Cl.[5] A47C 1/02
U.S. Cl. 297—323 2 Claims

1. An adjustable chair for supporting a human body, said chair comprising:

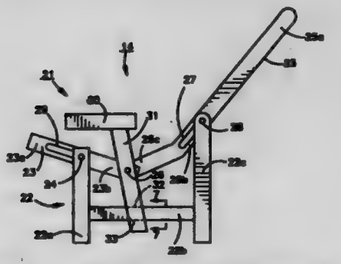
a seat member for supporting a lumbar portion of the human body, said seat member having front and rear portions, said seat member having surfaces defining a first elongate slot, said first elongate slot having a longitudinal extent substantially parallel to a direction extending from said front portion of said seat member to said back portion of said seat member;

a back member connected to said seat member for supporting a back portion of the human body, said back member having upper, middle and lower portions, said middle portions of said back member having surfaces defining a second elongate slot, said second elongate slot having a longitudinal axis substantially parallel to a direction extending from said upper portion of said back member to said lower portion of said back member;

a support member connected to said seat member and said back member for supporting said seat member and said back member, said support member having front, middle and rear portions;

first shaft means extending from said front portion of said support member through said first elongate slot in said seat member for transmitting a portion of a weight force applied against said seat ember to said support member, said first shaft means connecting said seat member to said support member, said first shaft means extending substantially perpendicular to the longitudinal extent of said first elongate slot, said seat member being pivotable relative to said support member about said first shaft means, said first shaft means being slidable along the longitudinal extent of said first elongate slot to permit sliding movement of said seat ember relative to said support member;

second shaft means extending from said rear portion of said support member through said second elongate slot in said back member for transmitting a portion of a weight force



applied against said back member to said support member, said second shaft means connecting said back member to said support member, said second shaft means extending substantially perpendicular to the longitudinal extent of said second elongate slot, said back member being pivotable relative to said support member about said second shaft means, said second shaft means being slidable along the longitudinal extent of said second elongate slot to permit sliding movement of said back member relative to said support member;

third shaft means extending from said rear portion of said seat member to said lower portion of said back member, said third shaft means connecting said seat member to said back member, said third shaft means extending substantially perpendicular to the direction extending from said front portion of said seat member to said back portion of said seat member and extending substantially perpendicular to the direction extending from said upper portion of said back member to said lower portion of said back member, said seat member being pivotable relative to said back member about said third shaft means; and

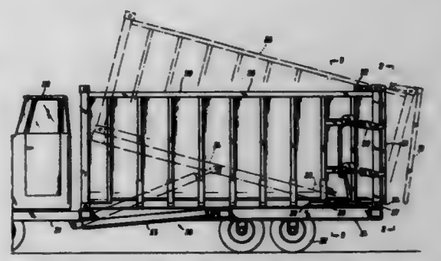
a lock member for preventing relative movement of said seat member, said back member and said support member, said lock member being attached to said third shaft means, said third shaft means connecting said lock member to said seat member and said back member, said lock member having first and second surfaces positioned adjacent to first and second surfaces, respectively, of said middle portion of said support member, said middle portion of said support member being partially interposed between said first and

second surfaces of said lock member, said lock member transferring a portion of weight force applied against said seat member and a portion of weight force applied against said back member to said support member, said first and second surfaces of said lock member being spaced apart a sufficient distance to permit said lock member to slightly tilt from a first tilt position to a second tilt position relative to said middle portion of said support member.

5,197,782
APPARATUS INCLUDING A VEHICLE AND A CONTAINER FOR USE IN HAULING AND DUMPING MATERIAL

Robert A. May, and Patrick T. Earp, both of Beeville, Tex., assignors to May Fabricating Company, Beeville, Tex.

Filed Jul. 5, 1991, Ser. No. 725,982
Int. Cl.[5] B60P 1/26
U.S. Cl. 298—23 M 11 Claims



1. Apparatus for use in hauling and dumping material, comprising:

a vehicle having a bed which can be tilted between substantially horizontal and inclined positions and a cab,

a container for holding material, said container having an open end and a gate which swings between a first position covering the open end and a second position away from the open end, said gate occupying the first position when the bed is in the substantially horizontal position and said gate occupying the second position when said bed is tilted into said inclined position to permit the material to be dumped from said container,

means mounted on said bed and on said container which are cooperable with one another for removably securing said container to said bed in a predetermined position on said bed when said container is lowered onto said bed,

latch means mounted on said container, said latch means being movable between a position holding said gate in the first position and a position releasing said gate for swinging into said second position,

an actuator assembly including a means which is mounted on said vehicle to move between first and second positions, and

operating means mounted on said container, said operating means including a part which is positioned to be engaged by said movable means of said actuator assembly when said container is in said predetermined position on said bed, said part of said operating means moving said latch means from said holding position to said releasing position a said movable means of said actuator assembly is moved from the first position to the second position, said part of said operating means moving said latch means from said releasing position to said holding position as said movable means of said actuator assembly is moved from the second to the first position.

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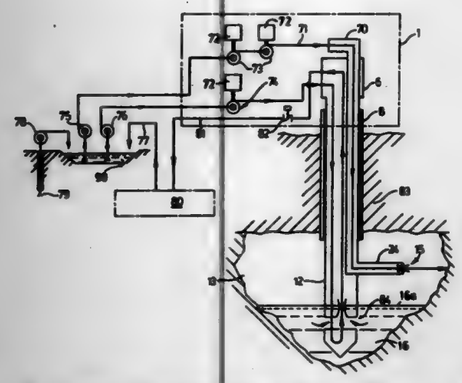
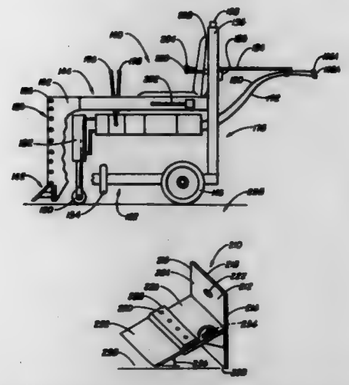
5,197,783
EXTENDABLE/ERECTABLE ARM ASSEMBLY AND METHOD OF BOREHOLE MINING
Kenneth J. Theimer, Auburn; Michael McDonald, Sumner; Gerald S. Kasbo, Kent, all of Wash., and Raj Paul, Calgary, Canada, assignors to ESSO Resources Canada Ltd., Alberta, Canada
Filed Apr. 29, 1991, Ser. No. 692,864
Int. Cl.[5] E21B *7/08*; E21C *25/60*
U.S. Cl. 299—17 30 Claims



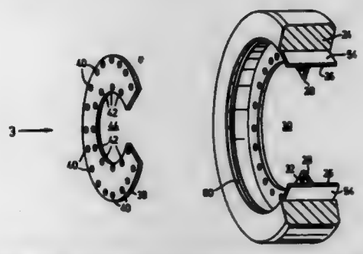
28. A method of borehole mining subterranean ore deposits which comprises the following steps:
a) placing a mining rig on a surface at a collar of a borehole drilled for mining purposes, said rig includes a mining tool including a water cutting jet nozzle, a pressurized water source for a mining tool and means for rotating a mining tool about its central axis;
b) inserting the mining tool and a slurry pump from the mining rig into the borehole and lowering the mining tool to the top of an ore zone located in the borehole;
c) reducing ore contained in the ore zone to a slurry by the cutting action of a high pressure jet of water emitted from said mine tool's water cutting jet nozzle, said water cutting jet nozzle being directed at the side of the borehole;
d) supporting the mining tool water cutting jet nozzle for semi-flexible movement in all horizontal and vertical directions as it extends and retracts and bends from, to, and through a generally vertical, stowed position to a generally horizontal, mining position by employing an extendable, retractable, erectable arm assembly, said arm assembly comprises a plurality of interlocking arm segments having integral, separable hinges with interlocking means, said arm segments supplying sufficient rigidity to support the water cutting jet nozzle to insure that the cutting action continues and that the water cutting jet nozzle remains in close proximity with the ore's retreating surface;
e) forming a mining cavity by rotating the water cutting jet nozzle about the mining tool's axis and raining and lowering the water cutting jet nozzle's position relative to the ore's surface, said water cutting jet nozzle being rotated, raised and lowered by a launching means designed to turn and lift the arm assembly;
f) remotely controlling, sensing and positioning the water cutting jet nozzle for mining action;
g) removing from the mining cavity water expelled from the water cutting jet nozzle such that the water cutting jet nozzle operates in air; and
h) removing the slurry from the mining cavity.

5,197,784
APPARATUS FOR REMOVING FLOOR COVERING
Tommie Holder, 306 7th St., Snyder, Okla. 73566
Continuation-in-part of Ser. No. 638,284, Jan. 7, 1991, Pat. No. 5,082,330. This application Oct. 25, 1991, Ser. No. 783,449
Int. Cl.[5] B32B *31/18*; E21C *47/00*
U.S. Cl. 299—37 16 Claims



11. An apparatus for removing floor covering comprising:
a frame having a front end;
a tool pivotally connected to the frame wherein the tool may pivot along an axis generally perpendicular to the front side of the frame;
a lift cylinder connected to said frame for lowering and raising said tool wherein the lift cylinder is connected to one or more wheels; and
a plurality of wheels for driving said frame.

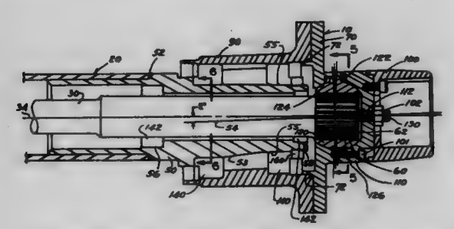
5,197,785
TWO PIECE ADAPTER RIM FOR WHEEL ASSEMBLIES
Verne H. Berry, Weston, Canada, assignor to Industrial Tires Limited, Mississauga, Canada
Filed Dec. 9, 1991, Ser. No. 803,831
Claims priority, application Canada, Jul. 15, 1991, 2047019
Int. Cl.[5] B60B *3/00*
U.S. Cl. 301—63.1 10 Claims



1. A wheel rim assembly for mounting a wheel onto different pieces of equipment, each having a hub, wherein each hub has a fixed pattern of attachments for mounting a ground engaging wheel thereon, said wheel rim assembly comprising:
an outer support band formed generally into a circle having inner and outer surfaces, wherein the outer surface is for carrying a rubber tire,
an outer disc mounted within the band on the inner surface, the outer disc having a central first opening and a plurality of second openings located around the periphery of the first opening,

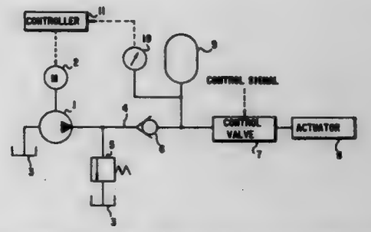
a replaceable inner adaptor disc, the adaptor disc having a plurality of third openings registering with said second openings of said outer disc, and a plurality of fourth openings registering with said fixed pattern of attachments of one of said hubs, and
a means for releasably securing said inner adapter disc to said outer disc,
wherein said wheel assembly may be mounted on different hubs having different fixed patterns of attachment by replacing said inner adapter disc.

5,197,786
RIGID DRIVE AXLE WITH CAMBERED WHEEL HUBS
Rodney Eschenburg, San Diego, Calif., assignor to National Racing Products, Inc., Milwaukee, Wis.
Filed Oct. 4, 1991, Ser. No. 771,596
Int. Cl.[5] B60B *37/00*
U.S. Cl. 301—124.1 5 Claims



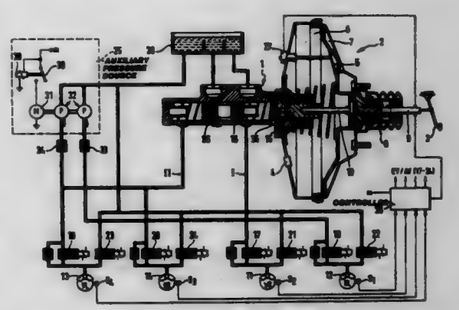
1. An improved cambered axle assembly including a wheel hub, a drive plate connected to the wheel hub, a direction changing joint, and a plurality of bearings having bearing surfaces, the improvement comprising:
a hollow cambered spindle means, having a first longitudinal axis and a inside surface and an outside surface, for providing a predetermined degree of camber to the wheel hub;
a drive axle means, connected to the direction changing joint and extending through the hollow cambered spindle means along a second longitudinal axis at a fixed angle to said first longitudinal axis, for driving the drive plate through the direction changing joint;
the first longitudinal axis intersecting the second longitudinal axis;
a portion of the inside surface of the hollow cambered spindle means including a first journal means for receiving a first portion of the plurality of bearings;
the first journal means being generally concentric to the second longitudinal axis of the drive axle means and the first portion of bearings being seated in the first journal means and in rolling contact with the drive axle;
a portion of the outside surface of the hollow cambered spindle means including a second journal means for receiving a second portion of the plurality of bearings;
the second journal means being generally concentric to the first longitudinal axis of the hollow cambered spindle means and the second portion of bearings being seated in the first journal means and in rolling contact with the wheel hub;
whereby the wheel hub is cambered with respect to the drive axle means.

5,197,787
PRESSURE SUPPLY SYSTEM HAVING MEANS FOR CONTROLLING AN OUTPUT PRESSURE THEREOF
Shohei Matsuda; Kazutoshi Tashima; Kohichi Furuya, and Masaaki Myoi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1991, Ser. No. 721,802
Claims priority, application Japan, Aug. 3, 1990, 2-206314
Int. Cl.[5] B60T *8/32, 17/02*
U.S. Cl. 303—10 9 Claims



1. A pressure supply system for on-board equipment of a vehicle, comprising:
a pump actuated by power drive means;
an output conduit connected to an output end of said pump;
an accumulator connected to said conduit;
a pressure sensor for detecting an inner pressure of said accumulator;
a speed sensor for detecting a traveling speed of said vehicle; and
a control unit for controlling operation of said pump according to an output of said pressure means so as to maintain the inner pressure of said accumulator as detected by said pressure sensor within a prescribed range, the range being made higher as the vehicle speed as detected by said speed sensor is increased.

5,197,788
CIRCUIT CONFIGURATION FOR AN ANTI-LOCK BRAKE SYSTEM
Helmut Fennel, Bad Soden; Gunther Buschmann, Griesheim; Norbert Ehmer, Bad Orb, and Frank Jourdan, Buettelborn, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed May 14, 1991, Ser. No. 699,862
Claims priority, application Fed. Rep. of Germany, May 17, 1990, 4015866
Int. Cl.[5] B60T *8/32, 8/44, 8/48, 8/60*
U.S. Cl. 303—100 5 Claims



1. An anti-lock brake system for an automotive vehicle having a plurality of wheels, said system comprising:
a brake pedal;

a plurality of wheel brakes associated with said wheels of

adjustably establishing the force necessary to move said

an elongated shaped component including top and bottom

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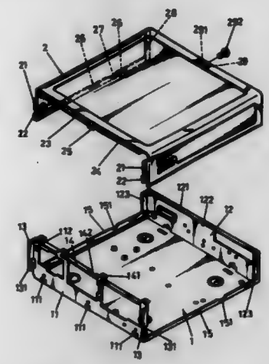
a plurality of wheel brakes associated with said wheels of said automotive vehicle;
an auxiliary-pressure source for supplying pressure fluid;
a master cylinder in fluid communication with said auxiliary-pressure source and having a piston coupled to said brake pedal which is displaceable in a first direction in response to actuation of said brake pedal and in a second direction, opposite to the first direction, in response to pressure fluid supplied by said auxiliary-pressure source;
valve means for selectively:
(a) supplying pressure fluid to said wheel brakes to increase fluid pressure in said wheel brakes, and
(b) releasing pressure fluid from said wheel brakes to decrease fluid pressure in said wheel brakes;
first sensing means for sensing the rotational behavior of said wheels of said vehicle and for generating wheel behavior signals representative of the rotational behavior of said wheels;
second sensing means for sensing the position of said piston of said master cylinder and for generating a position signal upon a prescribed displacement of said piston in the first direction in response to actuation of said brake pedal;
and circuit means responsive to said wheel behavior signals and said position signal for:
(a) determining an imminent wheel lock condition and initiating anti-lock control,
(b) controlling said valve means during anti-lock control to selectively:
(i) supply pressure to said wheel brakes to increase fluid pressure in said wheel brakes, and
(ii) release pressure fluid from said wheel brakes to decrease fluid pressure in said wheel brakes,
(c) determining during anti-lock control:
(i) an instantaneous friction value based on the road coefficient of friction, and
(ii) a control frequency based on the stable control phases of the wheel for which the imminent wheel lock condition has been determined,
(d) summing during anti-lock control the fluid pressure increases in said wheel brakes and summing the fluid pressure decreases in said wheel brakes, and
(e) actuating during anti-lock control said auxiliary-pressure source to supply pressure fluid to said master cylinder in response to at least one of:
(i) actual pressure fluid requirements during anti-lock control dependent upon:
(1) the instantaneous friction value,
(2) the control frequency, and
(3) the sum of the fluid pressure increases in said wheel brakes and the sum of the fluid pressure decreases in said wheel brakes, and
(ii) the presence of said position signal.

5,197,789
CONNECTING STRUCTURE FOR A COMPUTER CASING
Chung H. Lin, 5F-23, 70, Fu-Shing Road, Taoyuan, Taiwan
Filed Dec. 2, 1991, Ser. No. 800,992
Int. Cl.[5] H05K *5/00*
U.S. Cl. 312—223.2 **5 Claims**

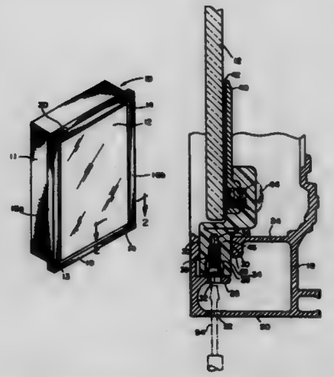
1. A connecting structure for a computer casing comprising:
A) a base including:
1) a front plate having an outwardly bent side support at each of two front lateral sides, a first fixing hole at each lateral side, a second fixing hole positioned above each first fixing hole, an outwardly bent upper support with a hole in a middle portion and a plurality of spaced retaining elements, and a plurality of slots spaced along a bottom portion thereof,
2) a back plate having an inwardly bent stop element at each of two back lateral sides, a hole in a middle portion, and an inwardly bent top support,
3) a step element extending along each of two intermediate lateral sides, each step element having a recess formed therein;
B) an upper cover including
1) a side support and a stop element at each of two front lateral sides for engagement with the side supports and first fixing holes of the front plate,
2) a pair of spaced pushing elements along a top front edge, and a stop element disposed between the pushing elements for engagement with the hole in the upper support of the front plate,
3) a plurality of spaced retaining elements and a block along a lower edge of each of two intermediate lateral sides, each retaining element including an elastic curved plate for engagement with a step element of the base and the block being engageable within the recess of the step element,



4) a bent elastic tab at each of two back lateral sides for engagement with the stop elements of the back plate,
5) a hole in a back middle portion of the upper cover;
C) a surface panel including:
1) a plurality of connector elements spaced along a top portion for engagement with the retaining elements of the front plate,
2) a fixing element on each of two lateral sides for engagement with the second fixing holes of the front plate,
3) a plurality of hook elements spaced along a bottom portion for engagement with the slots of the front plate; and
D) a fastener engageable through the holes of the back plate and the upper cover.

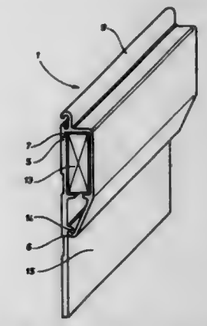
5,197,790
CABINET HAVING AN ADJUSTABLE HINGE FOR MOUNTING A CABINET DOOR
Howard S. Katz, Riegelsville, Pa., assignor to Robern, Inc., Bensalem, Pa.
Filed Jan. 24, 1991, Ser. No. 645,368
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—329 **12 Claims**

1. A cabinet having an adjustable hinge for mounting a cabinet door, the cabinet comprising:
a cabinet body having an internal storage area for receiving items to be stored and an opening for accessing said storage area;
a cabinet door pivotally mounted to the cabinet body;
adjustable hinge means interconnected between the cabinet door and the cabinet body for supporting the cabinet door and allowing the cabinet door to pivot with respect to the cabinet body between a first position such that the cabinet door is positioned proximate the cabinet opening for closing the opening and a second position such that the cabinet door is positioned away from the opening and for adjustably establishing the force necessary to move said cabinet door between said first and second positions, wherein said adjustable hinge means provides a controlled amount of friction for holding said cabinet door in a desired position, the hinge means comprises:
a first channel member mounted on said cabinet body, said first channel member including a first wall, a second wall and a third wall, all of said walls extending generally parallel with respect to each other and being spaced apart, said first wall including a generally circular pivot aperture having a bearing surface;
a generally cylindrical expandable member extending from said cabinet door and having an expandable radially outer surface, said expandable member being positioned within said pivot aperture and being complimentarily sized to rotate with respect thereto, said expandable member being supported by the second wall of said first channel member, said second wall and third wall of said first channel member each including an access aperture, an expanding means accessible through said access aperture for expanding said expandable outer surface radially outwardly and into engagement with said bearing surface to inhibit said expandable member and cabinet door from moving with respect to said first channel member and cabinet body whereby when said expandable outer surface is expanded into engagement with said bearing surface, force due to gravity is insufficient to move said cabinet door with respect to said cabinet body.



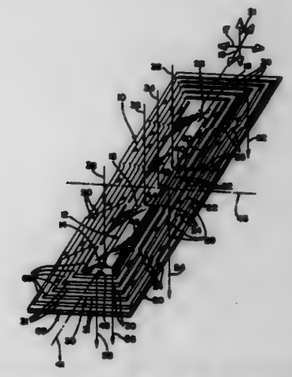
5,197,791
DRAWER WITH TRIM SHAPE
Georg Domenig, Kernersville, N.C., assignor to Grass AG, Hochst/Vlbg., Austria
Filed Mar. 5, 1991, Ser. No. 665,012
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1990, 4007850; May 22, 1990, 4016452
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—348.1 **7 Claims**

1. A drawer having a front and a back connected by opposing sidewalls defining a drawer interior, each said sidewall comprising:
a drawer side member including top and bottom edges and interior and outer faces, said top edge having a shoulder and said outer face having a groove;
an elongated shaped component including top and bottom portions, said top portion having an overlap releasably



engagable with said shoulder and said bottom portion having a catch releasably engagable with said groove; and
a filler attached to said sidewall by said shaped component.

5,197,792
ILLUMINATOR DEVICE FOR A DISPLAY PANEL
Jianzhong Jiao, and Jeffrey J. Calderas, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 21, 1992, Ser. No. 871,789
Int. Cl.[5] F21V *5/00*
U.S. Cl. 362—31 **24 Claims**



1. An apparatus comprising a light transmitting member including:
means for receiving light from a light source and reflecting that light within the light transmitting member in at least a first direction parallel to a first axis and parallel to a plane of the light transmitting member;
a plurality of first reflecting means for reflecting a first portion of the light from at least the first direction into an exit direction orthogonal to the plane of the light transmitting member and for reflecting a second portion of the light from the at least first direction into a second direction parallel to the plane of the light transmitting member and parallel to a second axis that is perpendicular to the first axis, wherein each of the plurality of first reflecting means includes at least a first reflecting surface for reflecting light into the exit direction and at least a second reflecting surface reflecting light into the second direction; and
a plurality of second light reflecting means for reflecting the light from the second direction to the exit direction, the

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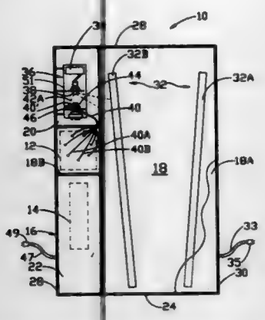
second light reflecting means comprising a third reflective surface.

5,197,793
VENDING MACHINE WITH SAFETY ELECTRICAL BACK LIGHT SIGN ASSEMBLY AND METHOD
David H. Stone, Delavan, Wis., assignor to Glo-Max Fiber Optic Systems, Inc., Walworth, Wis.
Continuation-in-part of Ser. No. 771,258, Oct. 4, 1991. This application Nov. 27, 1991, Ser. No. 800,145
Int. Cl.[5] G09F *13/04*
U.S. Cl. 362—32 17 Claims

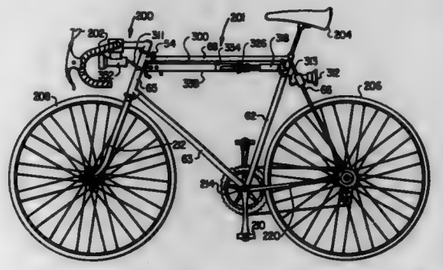


1. In a vending machine having a dispenser mechanism for dispensing a food item and a controller responsive to receipt of payment for actuating the dispenser mechanism, all contained within a main housing, the improvement being a safety electrical back light sign assembly, comprising:
a sign panel assembly including
a translucent sign panel,
a fiber optic sign panel, and
means for securing together the translucent sign panel and the fiber optic sign panel to define a substantially coplanar closure for the main housing;
a translucent back light assembly including
a translucent back light source for providing back light to the translucent sign panel,
means for mounting the translucent back light source within the main housing, and
means for providing power from without the main housing to a fluorescent light source within the main housing; and
a fiber optic back light assembly including
a fire resistant, fiber optic, back light source housing,
a fiber optic light source assembly including a fiber optic light source protectively contained within the fire resistant, fiber optic, back light source housing,
a fiber optic cable assembly including a fiber optic cable for receiving light from the fiber optic light source within the fire resistant, fiber optic, back light source housing and conveying light to the fiber optic sign panel without the fire resistant, fiber optic, back light source housing, and
means for mounting the fire resistant, fiber optic back light source housing within the main housing, and
another means for providing power from outside of both the fire resistant, fiber optic, back light source housing and the main housing to the fiber optic light source within the fire resistant, fiber optic, back light source housing.

5,197,794
VEHICLE LAMP AIMING DEVICE
Michael T. Scott, Columbus; Robert L. King, Seymour, both of Ind., and Hugh T. Bradley, Northville, Mich., assignors to GTE Products Corporation, Danvers, Mass.
Filed Dec. 24, 1990, Ser. No. 632,571
Int. Cl.[5] F21M *3/20*
U.S. Cl. 362—66 22 Claims

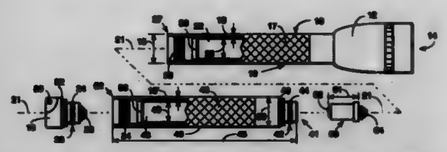
1. A vehicle lamp aiming device comprising:
a) an adjusting shaft having a first coupling, a threaded portion, and at least one shaft calibration mark
b) a mounting nut, with an internal threaded passage threaded to the adjusting shaft, a mounting face in contact with an element fixed to a vehicle, and a marker support, and
c) a marker positioned on the mounting nut having at least one location mark whereby the marker may be registered with respect to the shaft calibration mark to mark the threading of the adjusting shaft with respect to the mounting nut.

5,197,795
ADJUSTABLE-LENGTH REMOVABLY-MOUNTABLE HOLDER SYSTEM
George Mudrovich, Richardson, Tex., assignor to Gruha USA, Inc., Richardson, Tex.
Continuation-in-part of Ser. No. 374,456, Jun. 30, 1989, Pat. No. 4,970,630. This application Oct. 31, 1990, Ser. No. 606,445
The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.
Int. Cl.[5] B62J *6/00*
U.S. Cl. 362—72 33 Claims



1. An adjustable-length removably-mountable holder system for a bicycle comprising:
an elongate hollow assembly for receiving an object, said elongate hollow assembly having a forward portion and a rearward portion;
an ancillary lighting member in communication with said elongate hollow assembly;
means for removably securing said elongate hollow assembly to a structural frame unit of said bicycle, said removably securing means being characterized as comprising an anterior and a posterior engaging block for wedgedly securing said holder system to said structural frame unit of said bicycle; and
said adjustable-length removably-mountable holder system being characterized as having the length adjustable longitudinally in the direction of said elongate hollow assembly.

5,197,796
FLASHLIGHT AND EXTENSION THEREFORE
Larry Moore, c/o Adventurer's Outpost, P.O. Box 70, Cottonwood, Ariz. 86326
Filed Jul. 2, 1992, Ser. No. 907,857
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—202 20 Claims

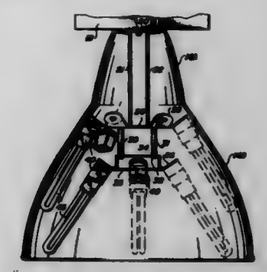


1. An extender for use with a flashlight housing which has one or more batteries and a base end with a removable base cap, comprising:
a substantially cylindrical barrel for holding at least one battery, wherein the barrel has a first attachment means of a first type at a first end which mates with the base end of the flashlight housing and a second attachment means of an opposite type at an opposed second end of the barrel for receiving the base cap of the flashlight housing; and
an electrical connection block fitted to the first end of the barrel for providing electrical connection between a first pole of a first battery mounted in the barrel and a first pole of a second battery mounted in the flashlight housing so that the first and second batteries are electrically in series.

5,197,797
MINIATURIZED SELF-CONTAINED TUBULAR LIGHTING FIXTURE
Milenko Jaksich, Camarillo, Calif., assignor to Thin-Lite Corporation, Camarillo, Calif.
Continuation-in-part of Ser. No. 684,832, Apr. 15, 1991, abandoned. This application Jan. 15, 1992, Ser. No. 821,184
Int. Cl.[5] F21L *3/00*
U.S. Cl. 362—219 19 Claims

1. A miniaturized self-contained tubular electrical light fixture comprising:
an elongated hollow transparent open ended horizontally disposed housing tube formed with an interior chamber of predetermined cross section;
an elongated channel shaped rail for telescopical receipt in said housing and formed on its bottom side for fitting against the bottom of said chamber and on its top side with opposed inturned flanges, terminating in respective edges spaced apart to form therebetween a pathway;
an elongated tubular lamp disposed in overlying relationship on said rail for nesting on its bottom side in said pathway between said edges and including plug terminals on the opposite ends thereof and cooperating with said rail to define a low profile;
brackets on the opposite ends of said lamp, each including a foot formed with laterally outwardly projecting sliders received under the respective flanges and an upstanding mounting plate;
sockets mounted on the respective mounting plates for receipt of said plug terminals to hold said lamp on said rail with said lower periphery nested in said pathway;
electrical circuit means connected with said sockets for supplying electrical current to said lamp whereby said lamp may be mounted from said sockets to cooperate with said rail in defining said low profile and said rail, brackets and lamp inserted as a unit into said tube to be retained therein.

5,197,798
LIGHTING APPARATUS
Jerold A. Tickner, Scottsdale, Ariz., assignor to Sportlite, Inc., Phoenix, Ariz.
Filed Apr. 3, 1992, Ser. No. 863,094
Int. Cl.[5] F21S *5/00*
U.S. Cl. 362—235 16 Claims



1. Lighting apparatus including in combination:
reflector means having a base end and a light-emitting end;
lamp support means located within said reflector means, and attached to the base end of said reflector means and extending toward the light-emitting end thereof for supporting a plurality of compact fluorescent lamps within said reflector means between the base end and the light-emitting end thereof, said lamps being substantially equally angularly displaced around a center line extending from the center of the base to the center of the light-emitting end of said reflector means;
said lamp support means comprising a central support member located between approximately one-fourth and one-half of the distance from the base end of said reflector to the light-emitting end thereof, and further including at least two lamp support extensions on said central support member on opposite sides thereof for causing compact fluorescent lamps supported thereby to extend outwardly at an angle along a line generally parallel to the surface of said reflector means; and
means for supplying operating electric power to lamps supported by said lamp support means.

5,197,799
HEADLAMP HAVING BEAM ORIENTATION ADJUSTING MEANS
Guy Dehaese, Bagnolet, France, assignor to Valeo Vision, Bobigny Cedex, France
Filed Jul. 18, 1991, Ser. No. 732,068
Claims priority, application France, Jul. 23, 1990, 90 09373
Int. Cl.[5] B60Q *1/06*
U.S. Cl. 362—420 7 Claims

1. A motor vehicle headlamp comprising a fixed part, a reflector defining an application point of the reflector, means mounting the reflector in a fixed position with respect to the said fixed part, for substantially linear movement of the said

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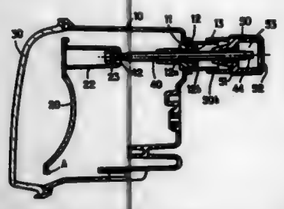
application point with respect to the fixed part, and adjusting means for adjusting the orientation of the reflector with respect to the fixed part, the adjusting means comprising a threaded rod mounted in the said fixed part with a first degree



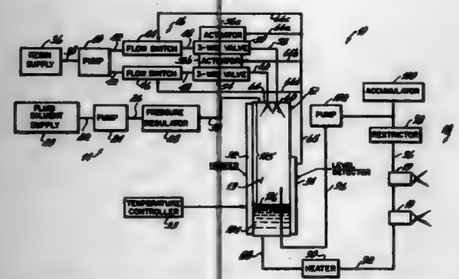
of friction, the threaded rod having a first end coupled with the reflector at the said application point and a second end having an adjusting head, and an adjusting cap, the threaded rod being threadedly engaged in the adjusting cap with a second degree of friction greater than the said first degree of friction.

5,197,800

METHOD FOR FORMING COATING MATERIAL FORMULATIONS SUBSTANTIALLY COMPRISED OF A SATURATED RESIN RICH PHASE

Lawrence B. Saidman, Avon Lake, and James C. Smith, Amherst, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Jun. 28, 1991, Ser. No. 723,468
Int. Cl.[5] B01F *15/02*; B67D *5/08*; A62C *5/02*
U.S. Cl. 366—136 **39 Claims**



1. The method of forming a coating material formulation for deposition onto a substrate, comprising:

exposing a liquid coating composition to a fluid diluent within a closed, pressurized vessel so that at least a portion of the fluid diluent is dissolved within the liquid coating composition to form a liquid coating composition rich phase and a fluid diluent rich phase;

separating the liquid coating composition rich phase and fluid diluent rich phase within the vessel to permit the withdrawal from the vessel of a coating material formulation consisting substantially entirely of the liquid coating composition rich phase for transmission to one or more dispensers for deposition on a substrate.

5,197,801

TUMBLER

Max B. Swisher, Box 67, Warrensburg, Mo. 64093

Filed Aug. 13, 1991, Ser. No. 744,494
Int. Cl.[5] B01F *9/02*
U.S. Cl. 366—167 **2 Claims**

1. A compost tumbler for connection to a water source, which includes:

(a) a support frame;

(b) a drum assembly including:

(1) a drum body with a generally rectangular cross-sectional configuration;

(2) said drum body having opposite, generally square end walls;

(3) said drum body having first, second, third and fourth generally rectangular sidewalls, said first sidewall having a door opening with a threshold adjacent to and substantially flush with said second sidewall;

(4) a door subassembly including a door panel with proximate and distal edges, a hinge mechanism hingedly mounting said door panel at its proximate edge to said first body sidewall adjacent to said door opening and a latch mechanism mounted on said door panel distal edge for selectively connecting said door panel adjacent to its distal edge to said first body sidewall;

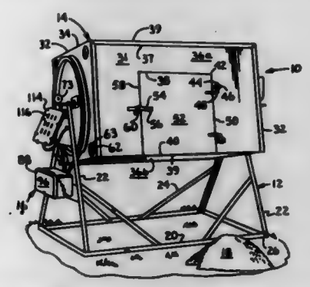
(5) a pair of bearings each mounted on a respective end wall;

(6) a generally horizontal rotational axis coaxial with said bearings;

(7) a hollow, tubular axle with: a first, closed end; a second, open end; a bore extending between said ends; and a plurality of apertures communicating with said bore and with said body interior;

(8) a body interior enclosed by said sidewalls and said end walls;

(9) said pipe being journaled in said bearings in proximity to said pipe first and second ends respectively;



(10) said pipe first and second ends being mounted on said support frame; and

(11) water connection means for fluidically connecting said pipe bore to the water source; and

(c) a drive assembly including:

(1) a large, body sheave comprising a channel member formed in a circular configuration and mounted on one of said body end walls coaxial with said body rotational axis;

(2) an electric motor mounted on said support frame;

(3) a motor sheave mounted on said motor and having a smaller diameter than a diameter of said body sheave;

(4) an endless belt reaved on said body and said motor sheaves;

(7) a battery electrically coupled to said motor;

(8) a photovoltaic panel including a photovoltaic cell electrically connected to said battery;

(9) a photovoltaic panel mounting bracket assembly including a support frame connector connected to said support frame, a photovoltaic panel connector connected to said photovoltaic panel, and a universal joint mechanism interconnecting said support frame connector and said panel connector for pivotal movement therebetween about multiple pivotal axes;

(10) a timer switch; and

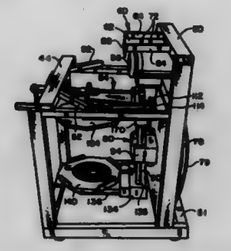
(11) electrical wire connection means interconnecting said motor, said battery, said photovoltaic panel, and said timer switch.

5,197,802

MIXING APPARATUS

William A. Miller, Buffalo Grove, and Daniel E. Molter, Schaumburg, both of Ill., assignors to Fluid Management Limited Partnership, Wheeling, Ill.

Filed Sep. 18, 1991, Ser. No. 762,325
Int. Cl.[5] B01F *9/00*
U.S. Cl. 366—217 **16 Claims**



1. Mixing apparatus for pulverulent materials having a forward end for loading items to be mixed and a rearward end, comprising:

guide rod means extending in a first plane;

first rotating means for rotating the guide rod means in the first plane;

a pair of opposed pressure plates having centers;

slidable mounting means carried by said guide rod means for cantilever mounting of the pressure plates so as to align said pressure plates along a common axis generally parallel to said first plane and passing generally through the centers of the pressure plates, and so as to mount said pressure plates for sliding movement toward each other to engage and retain a container filled with the pulverulent materials during a mixing operation and said pressure plates movable away from each other to release the container;

second rotating means for rotating said pressure plates and container about the common axis while said pressure plates, guide rod means and container are rotated in the first plane;

electric motor means for driving at least one of said first and said second rotating means;

operator means including screw shaft means threadingly engageable with said pressure plates for moving said pressure plates toward and away from each other as said screw shaft means is rotated in opposite directions, and a transmission shaft for rotational drive of said screw shaft means; and

pressure plate locking means engageable with said transmission shaft to prevent rotation of said screw shaft means to lock said pressure plates in a desired position, said pressure plate locking means including a locking plate keyed to said transmission shaft for movement along a central axis of said transmission shaft between a locked position preventing rotation of said transmission shaft and an unlocked position where said transmission shaft is free to rotate.

5,197,803

MIXER WITH MOVABLE WIPER

Joseph E. Wall, 9051 Whirlaway Ct., Alta Loma, Calif. 91701, and John F. Tobin, P.O. Box D 1641, 23050 Ponderosa Dr., Crestline, Calif. 92325

Filed Dec. 5, 1991, Ser. No. 803,114
Int. Cl.[5] B01F *7/04*
U.S. Cl. 366—309 **19 Claims**

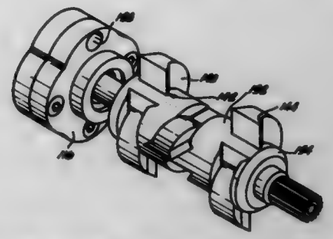
1. A mixer comprising:

a housing substantially defining a mixing chamber having inner chamber walls;

a mixer head rotatably supported within the housing, the mixer head having at least one mixing protrusion;

means for extending and retracting the at least one protrusion from the mixer head;

a wiper positioned within the housing the wiper having an outer wiper surface slidably engageable to the inner chamber walls, and having an inner wiper surface slidably



engageable over the mixer head when said at least one protrusion is in a retracted position; and

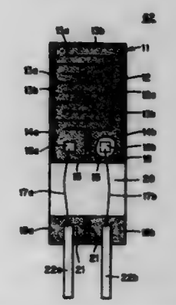
means for longitudinally moving the wiper through the mixing chamber in between the mixer head and the housing.

5,197,804

RESISTANCE TEMPERATURE SENSOR

Hiroji Tani; Tsutomu Yokoi, and Tohru Kanamaki, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 16, 1990, Ser. No. 614,623
Claims priority, application Japan, Nov. 17, 1989, 1-300087; Nov. 17, 1989, 1-300088; Nov. 17, 1989, 1-300089
Int. Cl.[5] H01C *7/00*; G01K *7/18*
U.S. Cl. 374—185 **18 Claims**



1. A resistance temperature sensor, comprising:

an insulating substrate;

a resistance film formed on said insulating substrate divided by a groove passing therethrough to form a zigzag resistance circuit pattern;

a pair of terminal electrodes formed on said insulating substrate and connected to a pair of external terminals formed on said insulating substrate;

means for electrically connecting each of said pair of terminal electrodes to a respective end portion of said resistance circuit pattern; and

means for forming at least one gap on said insulating substrate between each of the pair of terminal electrodes and said resistance circuit pattern to stop heat conduction between each of said pair of terminal electrodes and said resistance circuit pattern.

VOL 1148 ISS 5 MR 30 1993 U.M.I.

5,197,805
TEMPERATURE SENSOR PROTECTION TUBE
Richard F. Wilson, Fort Wayne, Ind., assignor to Pyromation, Inc., Fort Wayne, Ind.
Filed Sep. 30, 1991, Ser. No. 767,983
Int. Cl.[5] G01K *1/12*
U.S. Cl. 374—208 24 Claims

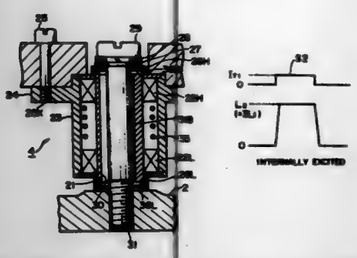
1. A protective tube for a temperature sensor, the protective tube comprising

means for containing a temperature sensor, the containing means including a thermally conductive plug formed to include an inner bore sized to receive a temperature sensor therein and an inner metal tube formed to include an internal passageway sized to receive temperature sensor lead wires therein and coupled to the thermally conductive plug to cause the internal passageway to open into the internal bore, the inner metal tube being made of a metal having a first coefficient of thermal expansion,

outer refractory sleeve means for surrounding the thermally conductive plug and at least a portion of the inner metal tube, the outer refractory sleeve means being made of a ceramic refractory material having a second coefficient of thermal expansion that is different than the first coefficient of thermal expansion, and

buffer means for establishing a buffer between the outer refractory sleeve means and the inner metal tube to separate the outer refractory sleeve means and the inner metal tube and permit expansion and contraction of the outer refractory sleeve means and the inner metal tube with changing temperature so that each of the inner metal tube and the outer refractory sleeve means can expand and contract independently upon exposure to changing temperature without rupturing the outer refractory sleeve means to accommodate the differential thermal expansion rates of the inner metal tube and the outer refractory sleeve means.

5,197,806
BEARING SYSTEM
Kanji Murano, Tokyo; Tetsuo Sekiya, Kanagawa; Akihiko Ohashi, Saizuoka, and Takehisa Ishida, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Division of Ser. No. 587,041, Sep. 24, 1990. This application Mar. 11, 1992, Ser. No. 849,535
Claims priority, application Japan, Sep. 25, 1989, 1-249507
Int. Cl.[5] F16C *32/00*
U.S. Cl. 384—1 3 Claims

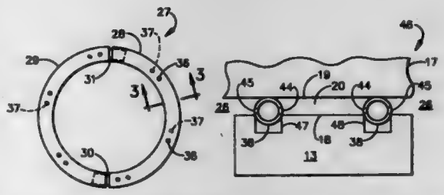


1. A rotational bearing system incorporating a ball bearing to support for relative rotation a shaft and a housing through rolling contact with said ball bearing, said shaft being fixed, said bearing system comprising:

a plurality of vibratory elements for exciting in resonance the housing in contact with said ball bearing to lower the frictional rolling resistance of said ball bearing;

wherein said fixed shaft is formed with a bore extending axially therethrough, and said vibratory elements are mounted on inner wall surfaces of said bore of said fixed shaft, thereby creating nodes of resonant vibration of said inner wall surfaces.

5,197,807
SQUEEZE FILM DAMPER SEAL RING
Ronald J. Kuznar, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Continuation of Ser. No. 638,582, Jan. 8, 1991, abandoned. This application Mar. 10, 1992, Ser. No. 847,879
Int. Cl.[5] F16C *27/00*
U.S. Cl. 384—99 20 Claims



13. In a squeeze film shaft damper in which a rotary bearing supported shaft has an annular bearing support fitted in an annular chamber formed in a bearing housing, the annular bearing support and an opposed circumferential wall of the annular chamber being spaced from one another to define a thin annular squeeze film space therebetween for containing a damper fluid, the improvement comprising:

a pair of spaced fluid reservoir means each having a hollow interior for containing a volume of damper fluid, each reservoir means being disposed between the annular squeeze film space and a sump region;

a plurality of entrance orifices formed in each of said fluid reservoir means for permitting fluid flow from the squeeze film space into each fluid reservoir means at a substantially undisrupted pressure;

a plurality of exit orifices formed in each of said fluid reservoir means adjacent to said sump region for metering a desired fluid flow rate and pressure transition of the fluid between the squeeze film space and said sump region; and

said volume of contained fluid within each fluid reservoir means acts to interdict direct fluid flow between the squeeze film space and said sump region to minimize excess loss of damper fluid in the squeeze film space with a concurrent loss of damper effectiveness.

5,197,808
DEVICE FOR MOUNTING ANNULAR BODY
Hirotoshi Takata, Kanagawa, Japan, assignor to NSK Ltd., Tokyo, Japan
Filed Mar. 6, 1992, Ser. No. 846,927
Claims priority, application Japan, Mar. 8, 1991, 3-43372; Apr. 17, 1991, 3-85174; Sep. 13, 1991, 3-234845
Int. Cl.[5] F16C *19/15, 43/04*
U.S. Cl. 384—493 16 Claims

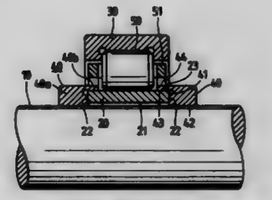
1. A device for mounting an annular body being fitted onto the outer periphery or inner periphery of a mating member and having a linear expansion coefficient different from that of said mating member, said device comprising:

a supporting means for supporting axial outer side end surfaces of said annular body, said supporting means including;

a cylindrical portion having a peripheral surface fitted onto said axial side end portion of said outer peripheral surface of said annular body opposite to said peripheral surface thereof fitted onto said mating member, and

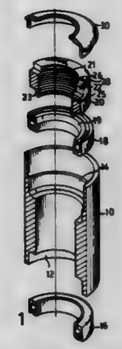
an annular portion having an inner side end surface clamping a vertical axial side end surface of said annular body,

in which said supporting means supports said annular body with respect to said mating member elastically in a radial direction.



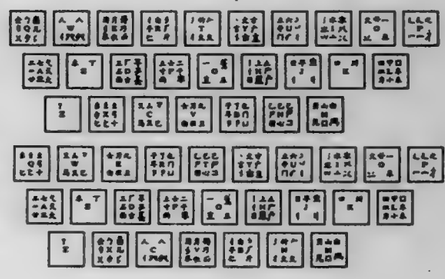
wherein said supporting means is made from a material whose radial linear expansion coefficient from a portion contacting said mating member to a portion contacting said annular body changes continuously or gradually in a radial direction common with radial directions in which radial linear expansion coefficients of said mating member and said annular body change, respectively.

5,197,809
JOURNAL FOR A FRAME FORK OF A BICYCLE
Yi-Chen Chi, No. 139-5, An Mei Rd., Mei Shan Village; Hou Li Hsiang, Taichung Hsien, Taiwan
Filed Apr. 2, 1992, Ser. No. 861,770
Int. Cl.[5] F16C *19/18*
U.S. Cl. 384—617 3 Claims



1. A journal for a frame fork of a bicycle comprising a sleeve engaged on said frame fork and including a shoulder formed in an upper portion and a lower portion thereof respectively, a bearing engaged in each of said shoulders, said frame fork including an upper end having an outer thread formed thereon, a member threadedly engaged on said upper end of said frame fork and pressing against one of said bearings, said member including a cut laterally formed therein such that said member is separated into a first portion located above said cut and a second portion located below said cut, an aperture formed in said member and perpendicular to said cut, and a bolt threadedly engaged in said aperture for coupling said first portion and said second portion of said member together, whereby said frame fork is rotatably and stably supported in said sleeve, and said member is stably retained in place by said bolt.

5,197,810
METHOD AND SYSTEM FOR INPUTTING SIMPLIFIED FORM AND/OR ORIGINAL COMPLEX FORM OF CHINESE CHARACTER
Daozheng Zhang, and Nian R. Liang, both of 14 Dongtaiping Street, Xicheng District, Beijing, China, assignors to Daozheng Zhang; Nian R. Liang and Beijing Stone Office Equipment Technology Co. Ltd., all of Beijing, China
Filed Jun. 19, 1990, Ser. No. 540,491
Claims priority, application China, Jun. 19, 1989, 89103862.0
Int. Cl.[5] B41J *5/00*
U.S. Cl. 400—110 8 Claims



1. A Chinese character inputting system for computers or the like comprising:

means for processing and inputting Chinese character information including a standard English keyboard on which a plurality of keyboard pages are defined in multiple levels, said keyboard pages being adjusted alternatively onto the surface of the keyboard and each taking at least a part of the keyboard, said keyboard pages including at least one character-radical keyboard page, wherein radicals of Chinese characters are selected according to conventional way of disassembling Chinese characters and are allocated on key positions of said radical keyboard page but changeable upon frequency of use of each radical and user's habit;

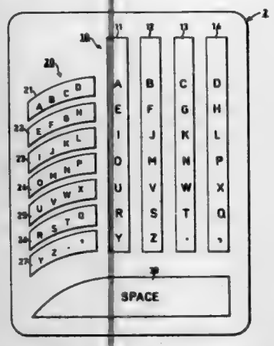
means for converting the Chinese character information inputted through the keyboard into internal codes of the Chinese characters, said converting means including a plurality of Chinese character encoding methods corresponding to at least some of the keyboard pages;

means for displaying instantly Chinese characters, having a screen composed of a common editing area and a Chinese character prompt area, said prompt area being automatically generated when it is needed and eliminated thereafter, said prompt area having at least one line and being alternatively positioned on any portion of the screen without interferring with editing work of the editing area, and being distinguishable from the editing area and characters by using different colors therefor; and

a set of Chinese character dot matrix libraries including at least a dot matrix library for simplified form Chinese characters and a dot matrix library for original complex form Chinese characters;

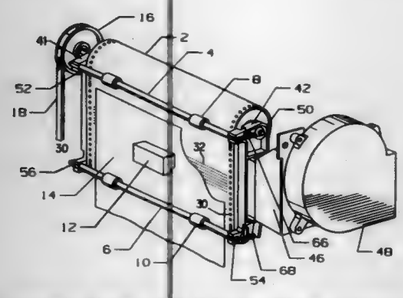
wherein said keyboard pages comprise at least a keyboard page for single solid line form-making symbols and a keyboard page for double solid line form-making symbols which are defined on nine numeral keys of the number 1 through 9 on the right side of the keyboard so as to constitute a " " shape, wherein a vertical line symbol is defined on a zero key, a horizontal line symbol is defined on a minus key, and a cross line symbol is defined on a plus key.

5,197,811
KEYBOARD
Maxim D. Levitarad, P.O. Box 808, 42107 Natania, Israel
Filed May 26, 1992, Ser. No. 887,944
Claims priority, application Israel, May 31, 1991, 98329
Int. Cl.[5] B41J *5/08*
U.S. Cl. 400—489 10 Claims



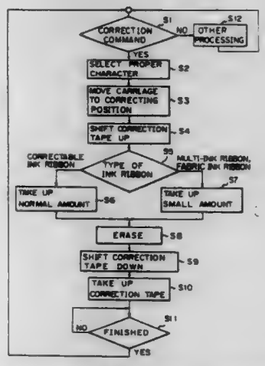
1. A keyboard operable by one hand, comprising: a first group including four elongated finger keys extending generally vertically in parallel spaced relation so as to be accessible by the four fingers of a user's hand; and a second group of keys extending in horizontal alignment with and laterally of the first group and spaced vertically with respect to each other so as to be accessible by the user's thumb such as to permit a selected finger key and he thumb key aligned therewith to be simultaneously depressed by he user's hand to select a character of the keyboard.

5,197,812
HIGH ACCURACY VACUUM BELT AND PINCH ROLLER MEDIA TRANSPORT MECHANISM
A. Justine Worley, Chino Hills, and Harold R. Berrey, Moorpark, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Continuation of Ser. No. 581,771, Sep. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 433,931, Nov. 9, 1989, abandoned. This application Feb. 14, 1992, Ser. No. 837,532
Int. Cl.[5] B41J *13/08*
U.S. Cl. 400—635 9 Claims



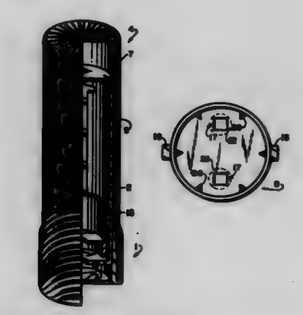
1. A printer having a print head for printing a pattern onto a sheet of media having a direction of travel through said printer and a width dimension transverse to said direction of travel, said printer comprising:
(a) a vacuum belt having a front face;
(b) means for advancing the vacuum belt along said direction of travel;
(c) two pinch roller assemblies disposed in spaced-apart relation along said direction of travel and across said front surface of the vacuum belt, each pinch roller assembly including a plurality of pinch rollers, said pinch roller assemblies defining between them a printing area along the front surface of the vacuum belt within which area said print head is adapted to print onto said sheet of media;
(d) means for biasing the plurality of pinch rollers against the vacuum belt; and
(e) means for providing a vacuum hold-down force for holding the sheet of media flat against the front surface of the vacuum belt; wherein the sheet of media is gripped by the vacuum belt along substantially the entire width dimension of the sheet of media and by the pinch rollers of at least one pinch roller assembly.

5,197,813
CONTROL OF RIBBON FEED DURING ERASING IN AN IMPACT PRINTER
Shinya Asano, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 471,070, Jan. 29, 1990, abandoned, which is a continuation of Ser. No. 138,043, Dec. 28, 1987, abandoned. This application Jul. 20, 1992, Ser. No. 915,863
Claims priority, application Japan, Jan. 7, 1987, 62-464; Feb. 27, 1987, 62-42786
Int. Cl.[5] B41J *29/26*
U.S. Cl. 400—697.1 10 Claims



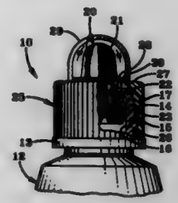
1. A printer using an ink ribbon and a correction ribbon for recording onto and correcting a recording medium, comprising:
ink ribbon mounting means for mounting the ink ribbon for recording onto a recording medium;
first conveying means for conveying the ink ribbon;
a correction ribbon mounting section capable of mounting the correction ribbon for erasing an image recorded on the recording medium;
second conveying means for conveying the correction ribbon;
displacing means for displacing the correction ribbon mounted on said correction ribbon mounting section between a correction position where the image is erased and a retracted position retracted from the correction position, said displacing means placing the correction ribbon between the recording medium and the ink ribbon when erasing the image;
impact means for impacting the correction ribbon against the recording medium through the ink ribbon to effect image erasing;
memory means having a first table for storing a feeding amount of the ink ribbon based on the type of ink ribbon during a recording operation, a second table for storing a feeding amount of the ink ribbon based on the type of ink ribbon during an erasing operation and a third table for storing a feeding amount of the correction ribbon during an erasing operation; and
selecting means for selecting the feeding amount of the ink ribbon from the first table during the recording operation and conveying the ink ribbon by said first conveying means based on the feeding amount selected from the first table, and for selecting the feeding amount of the ink ribbon from the second table during the erasing operation and conveying the ink ribbon by said first conveying means based on the feeding amount selected from the second table and selecting the feeding amount of the correction ribbon from the third table during the erasing operation and conveying the correction ribbon by said second conveying means based on the feeding amount selected from the third table, wherein
the feeding amount of the ink ribbon is less during the recording operation than during the erasing operation, and the feeding amount of a multi-ink ribbon or a fabric ink ribbon is less than that of a correctable ink during both the recording and erasing operations.

5,197,814
LIPSTICK ARTICLE
Michael H. Lombardi, and John Vaccaro, both of Stamford, Conn., assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.
Filed Jun. 24, 1991, Ser. No. 720,112
Int. Cl.[5] A45D *40/04*
U.S. Cl. 401—78 1 Claim



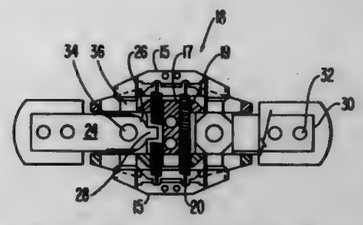
1. A lipstick article comprising:
(i) a lipstick with a water content of from about 0.5 to about 30% by weight;
(ii) a package base;
(iii) an elongated cylindrical inner body having a lower portion received in said package base and said lipstick being received in said inner body, said inner body including a cup bearing said lipstick, said cup having at least one aperture in a bottom thereof;
(iv) a means for elevating and retracting said lipstick within said inner body, and said means being formed therewithin;
(v) a hollow elongated cap fitting over and covering said inner body;
(vi) a hollow elongated plug sleeve inserted within said cap and formed of a material more flexible than a material forming said cap, said plug sleeve sealingly contacting an outer wall of said inner body to prevent evaporation of said water from said lipstick; and
(vii) a means below said aperture for sealing said aperture when said cup is in a retracted position, said means for sealing being a body of hot melt adhesive.

5,197,815
CONTACT LENS CLEANING SYSTEM
Murray J. Sibley, Westerville, Ohio, assignor to Abbott Laboratories, Abbott Park, Ill.
Continuation-in-part of Ser. No. 637,586, Jan. 4, 1991, abandoned. This application Sep. 30, 1991, Ser. No. 767,610
Int. Cl.[5] G02C *13/00*
U.S. Cl. 401—202 2 Claims



1. A contact lens cleaning system comprising: (a) a squeezable container which is suitable for containing contact lens cleaning solution and has an opening through an upper surface thereof; a first replaceable porous, soft tip applicator having a protruding upper surface which is shaped complementary to the inner surface of a contact lens and a flange that is engaging the upper surface of the container; a cap that is releasably fastened to the container, the flange of the applicator being interposed between the cap and the upper surface of the container, said cap having an opening through which the protruding upper surface of the replaceable applicator extends; and a dust cover which is removably attached to the cap and encloses the applicator and is spaced apart therefrom; and (b) at least one additional sterile applicator that is substantially identical to said first applicator.

5,197,816
LOCKING DOUBLE U-JOINT ASSEMBLY
Larry E. McDonald, Houston, Tex., assignor to Tuboscope Vetco International, Inc., Houston, Tex.
Filed Aug. 7, 1992, Ser. No. 925,921
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—24 11 Claims



1. A flexible double U-joint comprising two opposed locking members mounted in spaced-apart relation, extension spring means connected to and between said locking members and normally urging said locking members along an axis thereof toward each other, two opposed connectors adapted for axial movement normal to said axis of said locking members, said connectors having means for permitting individual rotation thereof about a first axis along a plane normal to a plane of said axis of said locking members and about a second axis along a plane coextensive with a plane of said axis of said locking members, each of said connectors having engaging means for selectively engaging said locking members to move said locking members against said normal urging of said extension spring means and away from each other along said axis thereof to a first position when said engaging means are in engagement with said locking members and to permit said locking members to move toward each other along said axis thereof to a second

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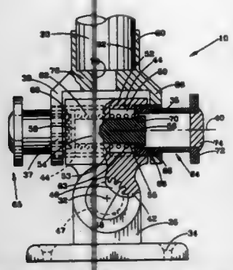
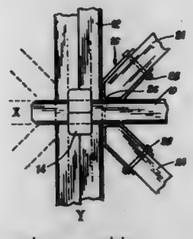
position when said engaging means are out of engagement with said locking members, and means for preventing said rotation of said connectors about said second axis when said locking members are in said first position thereof and for permitting rotation of said connectors about said second axis when said locking members are in said second position thereof.

5,197,817
QUICK ACTING GIMBAL JOINT
William B. Wood, League City, and Gary D. Krch, Friendswood, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Jun. 16, 1992, Ser. No. 899,536
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—93 **16 Claims**



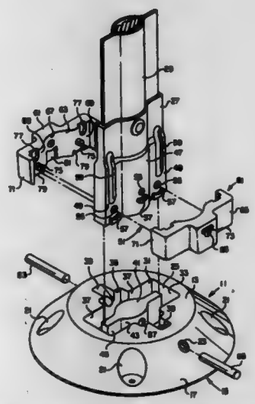
1. An adjustable linkage assembly for selectively retaining the position of a first member rotatable about an axis with respect to a second member, the assembly comprising:
the first member including a pair of spaced apart support flanges each having a flange through aperture therein defining a flange female spline;
the second member having a pivot end positioned between the pair of support flanges and an opposing end extending from the first member, the pivot end including a second member through aperture therein defining a pair of second member female splines each adjacent a respective end of the second member through aperture, the second member being rotatable about an axis with respect to the first member;
a pair of control members each slidably moveable within the second member through aperture and each extending through a respective flange through aperture, each control member having a male splined portion and an outer end extending outward from a respective one of the first member support flanges;
each of the pair of control members normally having its male splined portion in mating engagement both with a respective one of the pair of flange female splines and with a respective one of the pair of second member female splines to lock the rotatable position of the first member with respect to the second member, and each of the pair of control members being slidably moveable inward such that the male spline disengages the respective flange female spline to permit rotation of the first member about the axis with respect to the second member;
a biasing member for biasing at least one of the pair of control members outwardly with respect to its respective first member support flanges; and a retaining pin
positioned within the second member through aperture for guiding slidable movement of each of the pair of control members with respect to the second member, the second member having a center support for supporting the retaining pin within the second member through aperture; and the biasing member includes a pair of springs each acting between the center support and a respective one of the control members.

5,197,818
TOWER CONSTRUCTED OF PULTRUDED COMPOSITES
David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103
Continuation-in-part of Ser. No. 541,547, Jun. 21, 1990, Pat. No. 5,024,036. This application Jun. 14, 1991, Ser. No. 715,910
Int. Cl.[5] F16D *1/00*
U.S. Cl. 403—217 **5 Claims**



1. A joint construction comprising:
(a) a plurality of interlocking joint members defining an interlocking joint with at least a first and second of said joint members extending out from said joint different directions to define a plane;
(b) said first joint member defining said interlocking joint at least in part by passing through an opening in said second joint member;
(c) said first member and the opening of said second member together defining a narrow passageway through said opening alongside said first joint member;
(d) a bracket having a backing strap passing through said narrow passageway and defining a diagonal brace mount in said plane substantially at the intersection of said first and second joint members at said joint; and,
(e) a diagonal brace positively secured to said mount to provide bracing strength for both longitudinal compression and tension forces exerted along said brace and said mount.

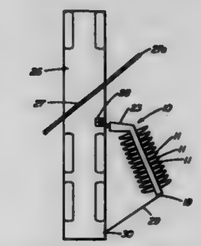
5,197,819
MOUNTING BASE FOR HIGHWAY MARKERS
Robert K. Hughes, Fort Meyers, Fla., assignor to Flexstake, Inc., Fort Meyers, Fla.
Filed Aug. 31, 1991, Ser. No. 744,384
Int. Cl.[5] E01F *9/01*
U.S. Cl. 404—13 **19 Claims**



1. A mounting base for supporting a marker support shaft of a highway marker comprising in conjunction:

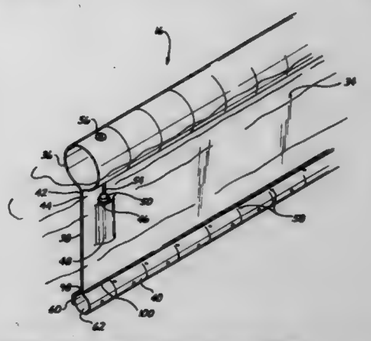
a base plate having a top surface and a bottom surface, the bottom surface suitable for attaching the base plate to a road surface;
a marker shaft cavity extending from the top surface and having a plurality of cavity walls;
an upward protruding mandrel joined to the base plate and located within the marker shaft cavity, the exterior of the mandrel defining a clearance between the mandrel and the marker shaft cavity wall, the clearance being of suitable shape as to receive the marker support shaft, the marker support shaft having a lower end with a receptacle which slides over the mandrel and locates in the cavity;
a locking pin hole extending through the base plate, into the marker shaft cavity, and into the mandrel, the lower end of the marker support shaft having a locking pin hole that registers with the locking pin hole of the base and mandrel; and
a locking pin passing through the locking pin holes of the base, lower end of the marker support shaft, and the mandrel, for locking the marker support shaft to the base plate.

5,197,820
ROADWAY CONDITIONING APPARATUS
Eric T. Skibsted, P.O. Box 626, Rosebud, Alberta, Canada T0N 2T0
Continuation of Ser. No. 639,350, Jan. 10, 1992, Pat. No. 5,108,221. This application Apr. 22, 1992, Ser. No. 872,145
Claims priority, application Canada, Sep. 11, 1990, 2029695
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] E01C *19/26*; A01B *23/06, 5/00*
U.S. Cl. 404—128 **7 Claims**



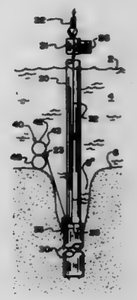
1. A surface conditioning attachment for use in surface maintenance operations on a gravel roadway, said attachment comprising:
a gang of dished, harrow disks rotatably supported at uniform spacing on a support shaft:
a support structure carrying said support shaft;
means for mounting said support structure generally at the side of an associated carrying vehicle to deploy the shaft generally parallel to the surface to be conditioned, and oblique to the direction of travel of the vehicle so that said shaft diverges from the vehicle in a rearward direction;
brace means extending between the associated vehicle and a portion of said support structure spaced from said vehicle, for thereby maintaining such shaft in said generally oblique orientation relative to the direction of travel of the vehicle;
said concave sides of said disks oriented toward the direction of travel of said associated vehicle and said attachment, such that in use the apparatus will engage and condition a swath of roadway to the outboard side of the associated vehicle, with surface material from said swath being conditioned and displaced in the direction of the middle of the roadway.

5,197,821
LIGHTWEIGHT, RAPID DEPLOYMENT OIL SPILL CONTAINMENT BOOM
Richard E. Cain, Santa Ana, and Nathan B. Jones, Long Beach, both of Calif., assignors to Spill Management, Inc., Stanton, Calif.
Filed Aug. 16, 1991, Ser. No. 746,313
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—68 **10 Claims**



1. A marine containment system comprising:
a boom curtain of a predetermined length formed from a single continuous flexible sheet comprising a lightweight flotation chamber extending to form a depending curtain and terminating in a sea-filled ballast chamber wherein said flotation chamber, depending curtain and ballast chamber are formed from a single ply of lightweight oil resistant sheet material, said predetermined length being defined as a length at least as long as that needed in a practical deployment of said boom curtain; and
containment means for storing and deploying said boom curtain, said boom curtain being folded flatly within said containment means,
whereby said marine containment system is lightweight, compact and readily deployed with a minimum of equipment and personnel.

5,197,822
EMPLACEMENT OF FORAMINOUS PIPING IN NON-COHESIVE SUBSOILS
James M. Parks, 3509 Merrick Ct., #210, Lexington, Ky. 40502
Filed Nov. 9, 1990, Ser. No. 610,906
Int. Cl.[5] E02B *3/02*
U.S. Cl. 405—73 **11 Claims**



1. Apparatus for placement of foraminous piping along a route in subsoil adapted to become non-cohesive when fluidized, comprising
a plurality of open-ended tubular stanchions adapted for use

stantially vertical legs and a generally horizontal pontoon

(2) providing each of said pile holes with a poured-concrete

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as underwater earth anchors and having lateral piping-attachment means,

a placement pipe removably engageable at its lower end with the upper end of any stanchion while leaving a sidewise opening thereat,

water-supplying means removably engageable with the upper end of such placement pipe while leaving a sidewise opening thereat,

a cable extending lengthwise through such placement pipe and sidewise through such openings to the exterior and being removably attachable at its lower end to the foraminous piping outside, and

winding means nearer the upper end of such placement pipe and adapted to unwind the cable for attachment to the foraminous piping and to wind the cable to pull such foraminous piping to a stanchion so engaged by the placement pipe for attachment to such stanchion.

5,197,823

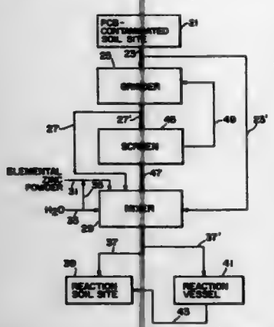
METHOD AND APPARATUS FOR TREATING PCB-CONTAINING SOIL

Eule R. Cutshall, Colbert County; Gregory Felling, Lauderdale County; Sheila D. Scott, Lauderdale County, and Gary S. Tittle, Lauderdale County, all of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 818,198, Jan. 8, 1992, abandoned. This application Aug. 10, 1992, Ser. No. 926,362

Int. Cl.[5] A62D *3/00*; B01J *8/00*

U.S. Cl. 405—128 **10 Claims**



1. A method of treating polychlorinated biphenyl-containing soil comprising:

a) providing a moistened soil containing an amount of polychlorinated biphenyls therein;

b) adding an amount of elemental zinc in powder form to said moistened soil as the sole material added thereto;

c) mixing said elemental zinc in powder form with said moistened soil to provide a mixture thereof; and

d) reacting said elemental zinc in powder form with said polychlorinated biphenyls at ambient temperature and pressure over a predetermined period of time, said elemental zinc powder being in an amount effective to at least partially dechlorinate said polychlorinated biphenyls in said moistened soil.

5,197,824

SYSTEM FOR PROTECTING GROUND WATER UNDER A DUMP

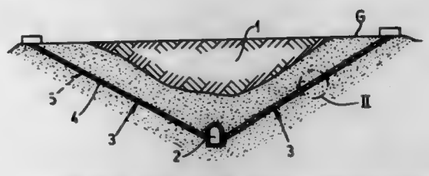
Friedrich W. Paurat, Kasselweg 29, D-4230 Wesel 1, and Roland Paurat, Blumenstrasse 11, D-4230 Wesel 13, both of Fed. Rep. of Germany

Filed Aug. 15, 1991, Ser. No. 746,646

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1990, 4026048; Nov. 13, 1990, 4036103

Int. Cl.[5] B09B *1/00*; E02D *31/00*

U.S. Cl. 405—128 **7 Claims**



1. An installation for protecting ground water underneath a dump, the installation comprising:

at least one tunnel driven longitudinally through the ground underneath the dump;

an array of casing pipes passing through the ground, each having a lower end opening into the tunnel, and each formed with a multiplicity of throughgoing holes, the casing pipes being longitudinally spaced to receive liquid from their surroundings into their holes and conduct it to the tunnel; and

respective inner tubes generally permanently mounted in the casing pipes, spacedly received int eh casing pipes, and each formed with radially throughgoing holes each aligned with a respective hole of the respective casing pipe.

5,197,825

TENDON FOR ANCHORING A SEMISUBMERSIBLE PLATFORM

Jens Rasmussen, Partille, Sweden, assignor to Gotaverken Arendal AB, Gothenburg, Sweden

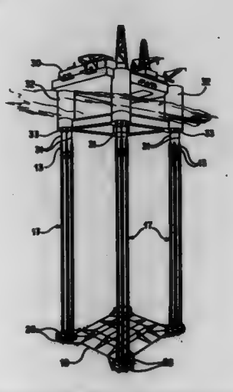
Division of Ser. No. 114,763, Oct. 30, 1987. This application Aug. 23, 1988, Ser. No. 235,157

Claims priority, application Sweden, Nov. 12, 1986, 8604835-2

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] E02D *23/02*

U.S. Cl. 405—206 **2 Claims**



1. A method for installation of tendons for anchoring a semisubmersible platform to a sea bed foundation having substantially vertical legs and a generally horizontal pontoon frame, said method comprising the steps of: prefabricating the tendons in full-length with connector means for said foundation and connector means for the corners of said platform in the respective ends; connecting the tendons in groups via frame means, wherein the number of tendons in each group corresponding to the number of tendons to be installed at each of said corners; and disposition of each tendon in each of said groups corresponding to the configuration of installed tendons; towing said groups to a foundation site; lowering and connecting one end of each group to the sea bed foundation, and thereafter engaging the opposite end of said group.

5,197,826

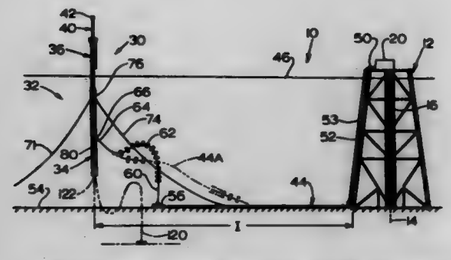
OFFSHORE GAS FLARE SYSTEM

Jafar Korloo, Moorepark, Calif., assignor to Imodco, Inc., Calabasas Hills, Calif.

Filed Oct. 22, 1992, Ser. No. 964,666

Int. Cl.[5] E02B *17/00*; B63B *22/20*

U.S. Cl. 405—224 **14 Claims**



1. Apparatus useful with an offshore production platform which lies in a sea and produces hydrocarbons from at least one well extending into the sea floor, for flaring a natural gas component of the produced hydrocarbon, comprising:

a spar buoy structure which has a substantially vertical axis and includes a lower part which lies under the sea surface but floats above the seafloor, a middle part that extends up from the lower part and through the sea surface, and a top flare device that extends up from the middle part and that has a flare at the top, said structure having a buoy pipe extending from a location along said lower part and up to said flare to carry gas therealong;

an undersea conduit extending from said platform to said location along said structure lower part and connected to said buoy pipe at said location, for carrying gas thereto;

said structure lower part floats above the seafloor, and said lower part has a bottom portion that is ballasted and an upper portion that is buoyant to keep said structure upright wherein said axis is substantially vertical;

a plurality of catenary chain devices extending in catenary curves from an underwater location on said structure to the seafloor.

5,197,827

METHOD FOR LOWERING A BASEMENT STRUCTURE

Yuan-Ho Lee, 7F-3, No. 8, Lane 390, Sec. 1, Chien-Kang Rd., Tainan, Taiwan

Filed Feb. 4, 1992, Ser. No. 830,662

Int. Cl.[5] E02D *29/00*

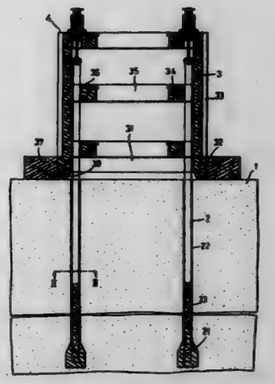
U.S. Cl. 405—229 **14 Claims**

1. A method for lowering a basement structure into a ground, the basement structure being constructed on the ground in advance, the method comprising the following steps:

(1) drilling into the ground to form several upright pile holes in a region in which the basement structure is to be installed;

(2) providing each of said pile holes with a poured-concrete pile;

(3) providing several vertical guide holes and an excavation passage which are formed through the basement structure, said guide holes being respectively aligned with said pile holes;



(4) equipping each of said guide holes with an impelling device which is coupled with one of said piles;

(5) excavating soil below the basement structure; and

(6) activating said impelling devices to lower the basement structure into the ground in such a manner that said piles extend through said guide holes of the basement structure.

5,197,828

METHOD OF FORMING MODIFIED GROUND

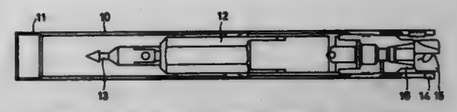
Wataru Nakanishi, Machida, and Shiro Nakashima, 3-1-5, Satakedai, Suita-shi, Osaka-fu, both of Japan, assignors to Shiro Nakashima, Osaka and N.I.T. Co., Ltd., Tokyo, both of Japan, a part interest to each

Filed Oct. 15, 1991, Ser. No. 775,761

Claims priority, application Japan, Aug. 14, 1991, 3-288248

Int. Cl.[5] E02D *3/12*

U.S. Cl. 405—269 **14 Claims**



1. A method of forming modified ground, comprising:

a) drilling a hole in the ground with a drilling machine of the type having a rotatable outer casing and an outer metal bit provided on a tip end section of the outer casing, a casing advancer inserted in the outer casing, and the casing advancer including a tip end having an inner bit and a rear end engageable by a casing advancer receiving and recovering device;

b) said drilling being performed by the outer metal bit and the inner bit;

c) said drilling being performed until a target point for forming modified ground is reached;

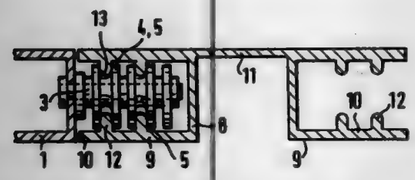
d) retracting the casing advancer after said drilling has reached the target point;

e) said retracting being performed by the casing advancer receiving and recovery device engaging the rear end of the casing advancer;

f) leaving the outer casing in the ground while said retracting is being performed;

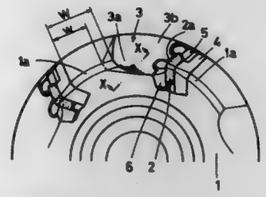
g) inserting a hardening agent injection rod into the outer casing, the hardening agent injection rod being of the type having a tip end section, a hardening agent injection pipe, an air injection pipe, a high pressure water injection pipe, an airjet hole, a slim discharge pipe, a slime suction hole disposed rearwardly of the tip end section, and a pressure monitor disposed adjacent the tip end section;
h) withdrawing the outer casing after the hardening agent injection rod reaches the tip end section of the outer casing, said withdrawing of the outer casing continuing until the slime suction hole is exposed;
i) initiating a hardening agent jet from a jet nozzle on the hardening agent injection pipe;
j) initiating rotating, shaking, and lifting of the hardening agent injection rod;
k) monitoring a slurry pressure in the vicinity of the hardening agent jet nozzle by a pressure sensor provided on the tip end section of the hardening agent injection rod; and
l) maintaining the slurry pressure substantially constant by adjusting one of an air jet hole on the air injection pipe and a clean water jet hole on the high pressure water injection pipe for discharging slime through the slime suction hole and the slime discharge pipe according to changes in the slurry pressure measured by the pressure sensor.

5,197,829
SUPPORT DEVICE FOR LINING DITCHES
Josef Kringe, Heinsberg, Fed. Rep. of Germany, assignor to Teska Verbautechnik GmbH, Oberhausen, Fed. Rep. of Germany
Filed Feb. 28, 1992, Ser. No. 843,395
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1991, 4106698; Dec. 11, 1991, 4140815
Int. Cl.[5] E02D *17/08*
U.S. Cl. 405—282 **7 Claims**



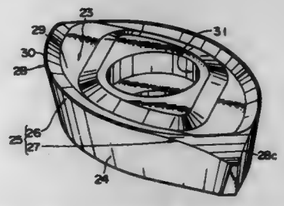
1. A support device for lining ditches, comprising:
braces for extending across the ditch;
vertically extending guiding uprights which are supported by said braces and include a U-shaped rail with leg members, and two parallel guide ridges extending in the vertical direction located on each of said leg members on the inner portion of said U-shaped rail; and
lining plates with vertically extending end faces, including a plurality of axles with guide rollers rotatably mounted thereon, said axles projecting outwardly from said end faces and being alternately displaced on either side of a vertically extending line disposed along the center of said end faces, wherein said lining plates are guided by alternating contact of said guide rollers with said parallel guide ridges of each of said leg members.

5,197,830
THROW AWAY CUTTER
Shigenori Emoto, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Sep. 24, 1991, Ser. No. 765,033
Claims priority, application Japan, Oct. 4, 1990, 2-267785
Int. Cl.[5] B23C *5/20*
U.S. Cl. 407—42 **4 Claims**



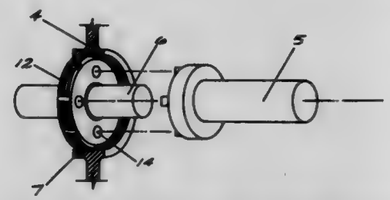
1. A cutter comprising:
a substantially cylindrical cutter body adapted to be rotated about its central axis in a rotational direction;
a plurality of disposable cutting inserts mounted to an upper end face of said substantially cylindrical cutter body, said cutting inserts having rake faces and having cutting edges which extend obliquely relative to radial lines radiating from said central axis of said cutter body and intersecting said cutting edges, respectively; and
wherein chip pockets are formed in said upper end face of said cutter body adjacent said rake faces of said cutting inserts, respectively, each of said chip pockets opening substantially radially outwardly through an outer circumferential sidewall of said substantially cylindrical cutter body and having a radially inner portion bounded by a back wall which is substantially spherically concave shaped and faces substantially radially outwardly and rearwardly with respect to the rotational direction of said cutter body.

5,197,831
CUTTING INSERT FOR BALL END MILL
Hidehisa Shiratori; Tatsuo Arai, and Masayuki Okawa, all of Ibaraki, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Feb. 11, 1992, Ser. No. 833,652
Claims priority, application Japan, Mar. 15, 1991, 3-15494
Int. Cl.[5] B23C *5/20*
U.S. Cl. 407—114 **4 Claims**



1. A cutting insert for a ball end mill comprising a plate-like insert body having a front face and a side face extending from said front face, said insert body having a generally convexly curved marginal ridge defined by the intersection of said front face with said side face, said marginal ridge serving as a cutting edge, said front face serving as a rake surface for said cutting edge while said side face serves as a relief surface for said cutting edge, said cutting edge having a convexly curved leading portion to be indexed in an end cutting position and a trailing portion to be indexed in a peripheral cutting position, said insert body having a land formed on said rake surface so as to extend along said cutting edge, said land having a width gradually increasing in a direction from said leading portion of said cutting edge to said trailing portion thereof, said insert body having a chip breaking portion defined by a groove formed in said rake surface so as to extend along said cutting edge, said chip breaking portion having a width gradually decreasing in a direction from said leading portion of said cutting edge to said trailing portion thereof.

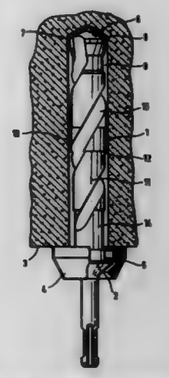
5,197,832
PORTER HOUSING TAP
John C. Porter, Jr., 4026 E. Roberts Pl., Tucson, Ariz. 85711
Filed Apr. 20, 1992, Ser. No. 872,679
Int. Cl.[5] B23G *5/06*
U.S. Cl. 408—222 **3 Claims**



1. A tool for removing corrosion and buildup from internal machine threads comprising:
a disk having a center bore through the disk thickness, smaller holes through the disk thickness spaced symmetrically between the center bore and the outer diameter of the disk; and
a plurality of symmetrically spaced grooves extending inward along the thickness of the disk circumference from the front surface to the back surface of the disk at spaced intervals, the outer periphery defining a circular surface for aligning the grooves with corresponding external grooves on an inverted circular surface to remove corrosion and debris.

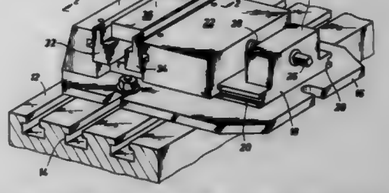
5,197,833
DRILL TOOL FOR MAKING A DRILLED HOLE WITH AN UNDERCUT
Burkhard Mayer, Herrenberg, and Harmut Hoppe, Horb a. N., both of Fed. Rep. of Germany, assignors to fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal 3/Tumlingen, Fed. Rep. of Germany
Filed Mar. 13, 1992, Ser. No. 855,054
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1991, 9103015[U]
Int. Cl.[5] B23B *51/02*
U.S. Cl. 408—226 **3 Claims**

1. A drill tool for drilling a drilled hole with an undercut in a wall, said drill tool comprising a drill tool shaft having a drill head at a free end of the drill tool shaft, a depth insertion stop formed on the drill tool shaft and spaced from the free end to limit an insertion depth of the drill tool in the drilled hole and a plurality of cutting elements projecting laterally from the drill head for making the undercut, said drill tool shaft (15) having an enlarged portion (10) acting as a pivot bearing for making the undercut, said enlarged portion being spaced approximately equally from the insertion depth stop (4) and the drill head (6) and said drill tool shaft (15) also having a cylindrical step portion (11) connected to the enlarged portion (10) and located between the enlarged portion (10) and the insertion depth stop (4), a discontinuous transition between said enlarged portion (10) and said cylindrical step portion (11) forming a scraping edge (12) and said cylindrical step portion



(11) having a diameter less than a diameter of said enlarged portion (10).

5,197,834
WORK PIECE VICE ENABLING PARALLEL MOVEMENT IN A MILLING MACHINE
Russell C. Chase, 6626 Guhn, Houston, Tex. 77040; Donald C. Chase, 11507 Easterling, Houston, Tex. 77065; Robert D. Chase, 6626 Guhn, Houston, Tex. 77040, and R. Lee Chase, 16531 Wilderness, Cypress, Tex. 77429
Filed Nov. 18, 1991, Ser. No. 793,655
Int. Cl.[5] B23Q *3/06*; B25B *1/00*
U.S. Cl. 409—131 **15 Claims**



1. A method of registering blank work pieces on a table relative to a cutter wherein the cutter defines a reference orthogonal axis system and the method comprises the steps of:
(a) placing blank soft jaws in a vice having master jaws and attaching the vice on a table movable relative to the cutter and the defined reference orthogonal axis system;
(b) machining the soft jaws to form blank work piece supporting shoulders to support and hold at the same location work pieces repetitively registered to enable duplicate work piece conversion into a machined part;
(c) during the step of placing the blank soft jaws, positioning the soft jaws at a specific location relative to the vice master jaws, this step including the steps of:
(1) placing both of the soft jaws at fixed locations on the master jaws;
(2) registering the soft jaws on the master jaws with respect to a reference system; and
(3) clamping the soft jaws to prevent movement by positioning a registration pin to hold a soft jaw against movement in a certain direction, and also positioning a second registration pin to also hold the soft jaw against

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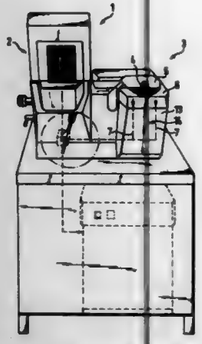
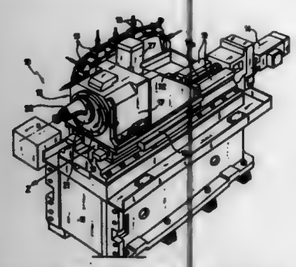
movement in a direction opposite to the certain direction.

5,197,835
WORK-BENCH WITH A SAFETY DEVICE
Hans-Walter Lang, and Josef Wenger, both of Leutkirch, Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany
Filed Jul. 10, 1991, Ser. No. 728,115
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021954
Int. Cl.[5] B23C 9/00
U.S. Cl. 409—134 12 Claims



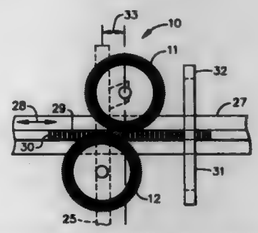
1. A work-bench for machining dental elements such as denture models and the like, comprising a housing, a driving motor located in said housing, a milling cutter driven by said motor and projecting upwardly from said housing, and a bearing member for said dental element to be machined that is arranged above said cutter and movable relative thereto, wherein said bearing member is mounted to be pivotable about a vertical axis above said milling cutter and pivotably mounted to be swung away from said milling cutter about a horizontal axis, said support being a pivotable and L-shaped lever in cross-section, said lever having a lower flange serving as the bearing member for said workpiece.

5,197,836
MACHINE TOOL SPINDLEHEAD WITH THREE DEGREES OF FREEDOM
Lorenzo Crivellin, Borgaro Torinese, Italy, assignor to Vigel S.p.A., Borgaro Torinese, Italy
Filed Nov. 15, 1991, Ser. No. 792,825
Claims priority, application Italy, Nov. 23, 1990, 67922 A/90
Int. Cl.[5] B23C 7/02
U.S. Cl. 409—200 5 Claims



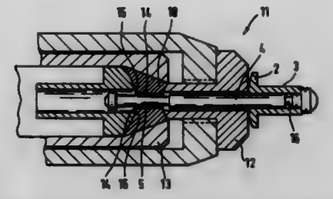
1. A chip-forming machine tool with at least one spindlehead having three degrees of freedom, comprising:
a rigid frame and means for sliding said rigid frame along a first direction;
a first central support rotatably supported by said rigid frame about a first axis parallel to said first direction;
means for rotating said first central support about said first axis;
a second planetary support eccentrically rotatably supported by said first central support about a second axis parallel to said first direction;
means for rotating said second planetary support about said second axis;
a spindle for carrying a tool and eccentrically rotatably supported by said second planetary support about a third axis parallel to said first direction; and
means for rotating said spindle about said third axis; said means for rotating the first central support comprising a first helical gear provided peripherally on said first central support and a first worm screw meshing with said first helical gear and driven by a first positioning motor, said means for rotating the second planetary support comprising a second helical gear provided peripherally on said second planetary support and a second worm screw meshing with said second helical gear and driven by a second positioning motor, said second positioning motor being a planetary positioning motor supported by said first central support and moving in rotation therewith.

5,197,837
BROACH TOOL CHIP REMOVER
Paul C. Brown, Columbus, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Feb. 24, 1992, Ser. No. 840,216
Int. Cl.[5] B23Q 11/00; B23D 39/00
U.S. Cl. 409—249 11 Claims



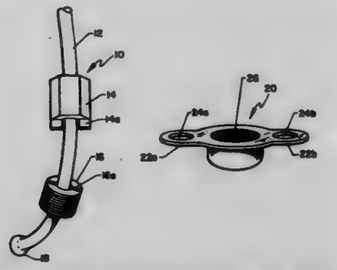
1. An automatically self-adjusting metal cutter tool chip removal assembly comprising in combination,
(a) a dual opposed wire brush wheel assembly,
(b) a support structure for mounting said dual opposed wire brush wheels in said chip removal assembly in spaced apart opposed peripheral coplanar relationship for bi-directional free rotation and for movement towards and away from each other to change said spaced apart peripheral relationship,
(c) biasing means biasing said wheels towards each other, and
(d) a mounting assembly attached to said support structure for mounting said support structure adjacent a linearly moving metal cutter tool for said tool to pass between and engage said wire brush wheels for rolling contact of said brushes on said passing tool to remove metal chips from said tool, each of said dual opposed wire brush wheels having an axis of rotation substantially perpendicular to a direction of movement of said linearly moving cutter tool.

5,197,838
BLIND RIVET WITH AN APPARATUS ENGAGEABLE WITH CONICAL SHAPED RIVET PIN AND APPARATUS FOR SETTING SUCH BLIND RIVETS
Manfred Schwab, Adolfstrasse 4B, D-6204 Taunusstein 4, Fed. Rep. of Germany
Filed Mar. 8, 1991, Ser. No. 666,855
Int. Cl.[5] F16B 13/04
U.S. Cl. 411—43 9 Claims



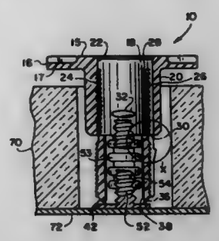
1. A blind rivet having a blind rivet body which comprises a rivet head with hollow shank formed thereon and through which extends a rivet pin which carries a thickening portion which is arranged at the end of the hollow shank outside the rivet body, characterized in that the end of the rivet pin (4), which is remote from the rivet head (2), has a pull portion (5) which continuously decreases towards the rivet head (2), preferably a cone portion (5), said pull portion (5) being an end portion (6) with an outside diameter which corresponds to the outside diameter of the rivet pin (4), said cone portion (6) forming a projection (7), and a plurality of inclinedly extending side surfaces being provided on the rivet pin (4) in the region of the clamping chuck (10) which engages same in the setting operation.

5,197,839
BLIND FASTENING APPARATUS
Norman F. Willey, Virginia Beach, and James F. Linker, Hampton, both of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.
Filed Aug. 8, 1991, Ser. No. 743,485
Int. Cl.[5] F16B 21/00
U.S. Cl. 411—340 26 Claims



1. A blind fastening apparatus for installing an anchor nut fixture with an internally threaded receptacle, the blind fastening apparatus comprising:
an anchor nut insert having external threads for engaging the internally threaded receptacle of the fixture;
an insert driver for driving said anchor nut insert to engage and disengage the internally threaded receptacle of the fixture, said insert driver and said anchor nut insert being discrete;
a guide member passing through said anchor nut insert and said insert driver, said guide member having first and second terminal ends, said anchor nut insert being located between said insert driver and the first terminal end of said guide member; and
means for preventing said anchor nut insert and said insert driver from sliding off the first terminal end of said guide member.

5,197,840
INSULATION RETAINER
Brian R. Peek, Mokena, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Apr. 3, 1991, Ser. No. 680,083
Int. Cl.[5] F16B 37/08
U.S. Cl. 411—433 20 Claims



1. An insulation retainer adapted for mounting upon the threads of a threaded stud so as to retain insulation of various thicknesses upon a substrate to which said stud is secured, comprising:
an outer body member including a head portion and a shank portion;
said head portion being formed with a front surface and a back surface and having a central opening defined therethrough;
said shank portion extending axially from said back surface of said head portion and having an inner body receiving bore which is in communication with said central opening defined within said head portion;
an inner body member comprising a cylindrical body portion and having a threaded element receiving bore extending between an upper open end and a lower open end, said inner body member being telescoped within said outer body member so that said threaded element receiving bore is disposed coaxially with respect to said inner body member receiving bore of said shank portion;
said cylindrical body portion of said inner body member having a pair of diametrically opposed resilient web sections, each of said web section comprising a plurality of spaced apart arcuate-shaped wing members extending between said upper and lower ends of said cylindrical body portion, each of said arcuate-shaped wing members having its opposite ends thereof formed integrally with an axially extending cylindrical wall section;
said cylindrical body portion of said inner body member also having retaining means formed internally thereof for ratcheting over said threads of said threaded stud when said retainer is being pressed onto said stud and thereafter threadingly engaging said threads thereof; and
adjustment means formed upon an interior surface portion of said shank portion of said outer body member and upon exterior surface portions of said cylindrical wall sections of said inner body member for permitting axial movement of said outer body member relative to said inner body member in a first axial direction and for preventing relative axial movement thereof in a second opposite axial direction,
whereby multiple engagement points are provided for allowing small increments of adjustment of said outer body member in a sliding mode downwardly upon said inner body member for accommodating various thicknesses of said insulation to be secured to said substrate.

(40), said respective distance being variable as a function
tainer support rack including articulated attachment

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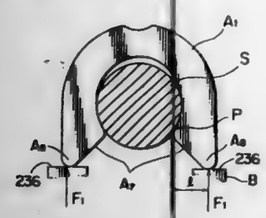
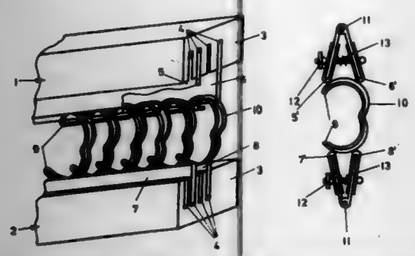
5,197,841
E-SHAPED RETAINER RING
Koichi Tanaka, Nagoya, Japan, assignor to Chubu Bearing Kabushiki Kaisha, Japan
Continuation of Ser. No. 487,087, Mar. 2, 1990, abandoned. This application Mar. 16, 1992, Ser. No. 851,118
Claims priority, application Japan, Mar. 8, 1989, 1-53683; Jul. 4, 1989, 1-78327[U]; Jul. 18, 1989, 1-183603
Int. Cl.[5] F16B *21/18*
U.S. Cl. 411—522 2 Claims



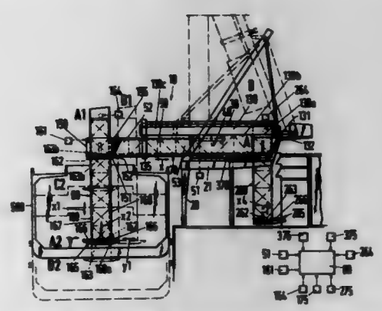
1. A generally flat E-shaped retainer ring comprising:
a) an inner circumferential surface which engages a retainer ring accommodating groove formed around a circumference of a shaft;
b) an outer circumferential surface which defines an outer diameter, said inner and outer circumferential surfaces defining a generally curved continuous shape;
c) an opening through which a said shaft passes when said retainer ring is mounted or removed from said shaft;
d) protruding front end portions formed on each side of said opening, each said protruding front end portion having an outer side, and an inner face, each said inner face diverting outwardly from said opening, each said protruding front end portion being configured such that said outer sides are spaced apart a distance approximating said outer diameter;
e) said inner circumferential surface, said outer circumferential surface, each said protruding front end portions and said flat E-shaped retainer lying in the same plane; and
f) whereby said generally flat E-shaped retainer ring is removed through elastic deformation from a said shaft by pressing a tool against said protruding end portions of said retainer ring.

5,197,842
CLOSING DEVICE FOR BINDING COMBS
Gert Broos, Waldstetten, Fed. Rep. of Germany, assignor to Chr. Renz GmbH & Co., Waldstetten, Fed. Rep. of Germany
Filed Jan. 11, 1991, Ser. No. 639,855
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1990, 4002144
Int. Cl.[5] B42B *5/10*
U.S. Cl. 412—39 15 Claims



1. A closing device for the bending closure of binding combs having generally C-shaped perforating members for the comb binding of single sheets, comprising: an upper and a lower opposing bending die, wherein each of said bending dies are provided with a pair of contact elements which provide support for the perforating members of the binding comb, wherein said upper contact elements have a greater static friction with respect to the perforating members than said lower contact elements.

5,197,843
DEVICE FOR LOADING AND UNLOADING UNITARY CARGO ONTO AND FROM SHIPS
Wilfried Eckel, Berlin, Fed. Rep. of Germany, assignor to ATEBA Automatisieren-Technik Bauen für Gewerbe und Industrie GmbH, Konigstein, Fed. Rep. of Germany
Continuation of Ser. No. 461,427, Jan. 5, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 803,790
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 87109924
Int. Cl.[5] B65G *67/60*
U.S. Cl. 414—140.8 19 Claims

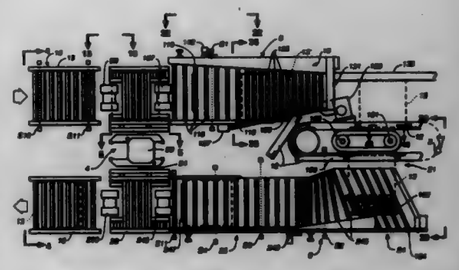


1. A device for loading and unloading ships carrying bulk goods, including loaded pallets, comprising:
a vertically slewable jib (30) mounted on said gantry, said jib (30) comprising a supporting arm (130) having one end (130*a*) secured to said gantry (20) so as to vertically pivot around a horizontal swivel axis (132);
a stationary supporting frame (40);
a horizontally displaceable and telescoping supporting frame (50) secured in said stationary supporting frame (40), said stationary supporting frame (40) being rigidly connected to an underside (130*b*) of said supporting arm (130) so as to be a guide path for said displaceable supporting frame (50), said displaceable supporting frame (50) having a free front end (52);
first drive means (51) for horizontally displacing said displaceable supporting frame (50) in a telescope-like manner so that said displaceable supporting frame (50) is movable into and out of said stationary supporting frame (40);
supply and discharge belt means (70) mounted on said jib (30) for conveying goods, and having a free end, said supply and discharge belt means (70) including a first conveyer belt (170) and drive means stationarily disposed in said displaceable supporting frame (50), a second conveyer belt (270) and drive means stationarily disposed in said stationary supporting frame (40), a third, horizontally displaceable conveyer belt (370) arranged between said first and second conveyer belts (170, 270) and having a length that corresponds to at least the length or width of a pallet, and third belt drive means (376) for horizontally displacing said third conveyer belt (370), said first, second and third conveyer belts (170, 270, 370) having respective upper running belt portions (170*a*, 270*a*, 370*a*) that are located in a single plane, said third conveyer belt (370) being displaceable between said first and second conveyer belts (170, 270) within an area defined by a respective distance of said first conveyer belt (170) from said second conveyer belt (270) in said stationary supporting frame

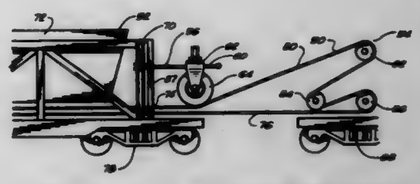
(40), said respective distance being variable as a function of the displacement of said displaceable supporting frame (50) relative to said stationary supporting frame (40);
a vertical conveyer (60) supported on the free end of said supply and discharge belt means (70) and the free front end (52) of said displaceable supporting frame (50) so as to interact with said supply and discharge belt means (70);
a receiving and delivering device (165) for the goods, said receiving and delivering device (165) being carried by a lower end of said vertical conveyer (60), said vertical conveyer (60) including a carrying framework (160) that is vertically displaceable inside said displaceable supporting frame (50) within the free front end (52) of said displaceable supporting frame (50), said vertical conveyer (60) further including second drive means (161) for vertically displacing said carrying framework (160), a vertically displaceable lifting platform (162) having a conveying platform (63) arranged therein, and third drive means (164) for vertically displacing said lifting platform (162), said conveying platform (163) of said lifting platform (162) being movable to a position adjacent said receiving and delivering device (165) in dependence upon a conveyance range length when said carrying framework (160) is in a lowered position, said conveying platform (163) also being movable into a position adjacent said supply and discharge belt means (70); and
means for controlling the third drive means (164) of said lifting platform (162), the drive means of said first conveyer belt (170), the drive means of said second conveyer belt (270), and the drive means (376) of said third conveyer belt (370), so that, for an unloading operation, when an item to be conveyed reaches the end of said first conveyer belt (170), said third conveyer belt (370) is moved into a transfer position adjacent said first conveyer belt (170) and, following transfer of the item to said third conveyer belt (370), said third conveyer belt (370) is displaced to a position adjacent said second conveyer belt (270) and, after the item is delivered onto said second conveyer belt (270), said third conveyer belt (370) is displaced again to said first conveyer belt (170), while for a loading operation, said third conveyer belt (370) is displaced oppositely to the manner in which it is displaced during the unloading operation and the rotational directions of said first, second and third conveyer belts (170, 270, 370) are reversed, the rotational speed of said first, second and third conveyer belts (170, 270, 370) and the speed of displacement of said third conveyer belt (370) being set to certain values in response to movement and speed of movements of said lifting platform (162) and distance displaced by said third conveyer belt (370).

5,197,844
ORGANIZER SYSTEM FOR A ROTATABLE STORAGE STRUCTURE
Robert Lichti, Sr., Lake Almanor Peninsula, and Clay Bernard, II, Pt. Richmond, both of Calif., assignors to Computer Aided Systems, Inc., Hayward, Calif.
Continuation of Ser. No. 482,088, Feb. 16, 1990, abandoned, which is a division of Ser. No. 192,019, Apr. 29, 1988, Pat. No. 4,983,091, which is a continuation-in-part of Ser. No. 31,989, Mar. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 732,927, May 13, 1985, abandoned, and Ser. No. 824,718, Jan. 31, 1986, abandoned, and Ser. No. 821,257, Jan. 22, 1986, Pat. No. 4,752,175. This application Nov. 14, 1991, Ser. No. 794,316
Int. Cl.[5] B65G *1/10*
U.S. Cl. 414—331 23 Claims

1. A storage system for storage and retrieval of material goods, the storage system comprising:
a rotary storage carousel including a multiplicity of container support racks arranged in side by side fashion, means forming a continuous track having a major longitudinal extension, and means for rotating the container support racks about the continuous track, each said container support rack including articulated attachment means for releasably securing a container thereto, the container adapted to receive material goods;
a multiplicity of said containers, each said container having container attachment means for cooperating with the articulated attachment means for releasably securing the container to a particular support rack in a cantilevered manner; and
an extractor assembly disposed adjacent the carousel for disengaging selected containers from their corresponding racks, the extractor assembly including a selectively operable detaching means for disengaging the selected containers from their associated racks by operation upon said articulated attachment means while the carousel remains in continuous motion, means for synchronizing operation of said detaching means with movement of the carousel to facilitate extraction of the selection containers, and an extractor holding sections for temporarily holding an extracted container in a position clear from interference with the carousel and wherein the extracted container is supported on its bottom and moved away from the carousel in a direction substantially parallel to the major longitudinal extension of the continuous track.



5,197,845
CONVEYOR SYSTEM FOR SELF-UNLOADING TRAIN
Edwin D. Snead, 701 E. University Ave., Georgetown, Tex. 78626
Filed Feb. 19, 1991, Ser. No. 657,411
Int. Cl.[5] B61D *7/00*
U.S. Cl. 414—339 18 Claims



1. A self-unloading train for transfer of bulk material comprising:
a plurality of hopper cars, each of said plurality of hopper cars having a bottom hopper discharge opening, each of said plurality of hopper cars having means thereon for closing said opening;
a coupling means formed on said plurality of hopper cars for joining said plurality of hopper cars together;
a train conveyor comprising an endless belt having a upper troughed configuration to contain the material, said hopper cars having means thereon for supporting at least a portion of said endless belt beneath said hopper discharge opening in a position so as to receive material discharged from said hopper cars, said train conveyor

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extending for a length of said plurality of said hopper cars, said train conveyor having a discharge end extending outwardly from said plurality of hopper cars, said discharge end positioned above a level of said hopper discharge openings; and

rotatable conveyor guide means positioned adjacent said discharge end, said conveyor guide means for exerting a downward force onto an upper surface of said train conveyor sufficient to resist an upward deflection of said endless belt between said discharge end and said portion beneath said hopper discharge opening and to enhance the troughed configuration.

5,197,846

SIX-DEGREE-OF-FREEDOM ARTICULATED ROBOT MECHANISM AND ASSEMBLING AND WORKING APPARATUS USING SAME

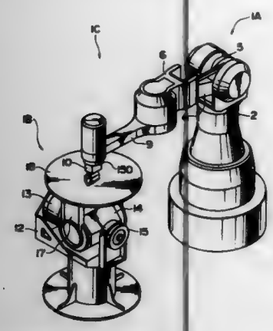
Masahito Uno, Kanagawa; Koichi Sugimoto, Hiratsuka; Ichiro Taniguchi, Yokohama, and Katuhisa Tanaka, Ayase, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1990, Ser. No. 630,189

Claims priority, application Japan, Dec. 22, 1989, 1-331371; Mar. 2, 1990, 2-049331; May 11, 1990, 2-119801

Int. Cl.[5] B25J *9/16*

U.S. Cl. 414—731 **8 Claims**



1. A robot system comprising:

a three-degree-of-freedom translation movement unit and a three-degree-of-freedom rotation movement unit;

said three-degree-of-freedom translation movement unit including:

a first base member;

a first motor having a vertical output shaft;

a turning post mounted on said first base member for rotation about a vertical axis and directly connected to the vertical output shaft of the first motor;

a third motor having a vertical output shaft;

an arm member directly connected to the vertical output shaft of the third motor so that said arm member is pivotally moved about said vertical output shaft of said third motor;

a fourth motor having an output shaft;

a wrist member connected to a distal end of said arm member and having an end effector rotatable about a vertical axis by being connected to the output shaft of the fourth motor;

link means for operably connecting said turning post to said arm member, including a second motor mounted on an upper end portion of said turning post and having a horizontal output shaft, a first link directly connected to the horizontal output shaft of the second motor so that said first link is pivotally moved about said horizontal output shaft of said second motor, a second link pivotally mounted on said turning post about a horizontal axis in parallel with said first link, and an up-down member pivotally connected to distal ends of said first link and said second link, said arm member being mounted to said up-down member; and

gravity balancing means for applying a force to said first link to balance a gravitational load applied to said link means;

said three-degree-of-freedom rotation movement unit including:

a second base member;

a fifth motor having a vertical output shaft;

a first rotation part mounted on said second base member for rotation about a vertical axis and directly connected to the vertical output shaft of the fifth motor;

a sixth motor mounted on said first rotation part and having a horizontal output shaft;

a second rotation part directly connected to the horizontal output shaft of the sixth motor so that said second rotation part is rotated about said horizontal output shaft of said sixth motor;

a seventh motor mounted on said second rotation part and having a horizontal output shaft; and

a table for supporting a workpiece, said table being directly connected to the horizontal output shaft of the seventh motor so that said table is rotated about said horizontal output shaft of said seventh motor, said horizontal output shafts of said sixth and seventh motors being substantially perpendicular with each other and having horizontal axes of rotation which intersect with said vertical axis of said first rotation part at a single point, so that operations are effected by said wrist member of the three-degree-of-freedom translation movement unit to a workpiece located on said table of the three-degree-of-freedom rotation movement unit.

5,197,847

DEVICE FOR AUTOMATIC HANDLING OF OBJECTS

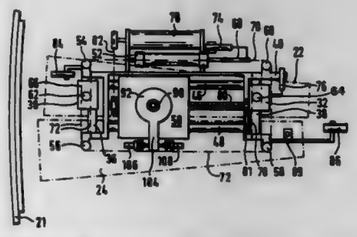
Norbert Kremer, Dudelange; Georges Beck; Andre Bock, both of Luxembourg, and Charles Hennico, Useldange, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Aug. 1, 1991, Ser. No. 739,284

Claims priority, application Luxembourg, Sep. 26, 1990, 87812

Int. Cl.[5] B65G *35/00*

U.S. Cl. 414—752 **16 Claims**



1. A device for the automatic handling of an object, comprising:

suction means for supporting the object, said suction means comprising:

a suction plate for gripping the object;

carriage means for supporting the plate;

first mounting means for transversely slideably mounting the plate on the carriage means;

central support means for angularly and linearly displaceably supporting the carriage means on an operating arm;

second mounting means for longitudinally slideably mounting the carriage on the central support means; and

displacement means for displacing said suction plate relative to the operating arm;

sensor means disposed at said carriage means for monitoring the position of the suction means; and

control means, responsive to the sensor means, for automatically controlling the displacement means in order to grip the object and place the object in a predetermined location.

5,197,848

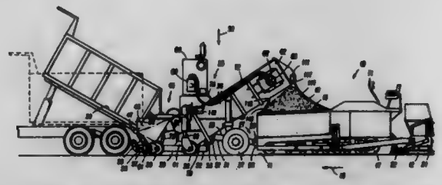
METHODS OF AND APPARATUS FOR TRANSFERRING MATERIALS

Joseph E. Musil, Ely, and Jon D. Goodwin, Cedar Rapids, both of Iowa, assignors to Cedarapids, Inc., Cedar Rapids, Iowa

Division of Ser. No. 730,371, Jul. 11, 1991, Pat. No. 5,100,277, which is a continuation of Ser. No. 448,057, Dec. 8, 1989, abandoned. This application Mar. 13, 1992, Ser. No. 850,512

Int. Cl.[5] B65G *67/02*

U.S. Cl. 414—786 **6 Claims**



1. A method of transferring material from a bed of a supply truck to a feed hopper of a road finishing machine comprising:

mounting a material transfer machine to a front end of the road finishing machine, with a discharge end of the material transfer machine disposed above a feed hopper of the road finishing machine;

dumping material from the bed of the supply truck into a hopper disposed at a front end of the material transfer machine;

transferring the material in a single transfer operation from the hopper at the front end of the material transfer machine to the discharge end thereof; and

discharging the material by gravity into the feed hopper of the road finishing machine.

5,197,849

STACK SQUARING DEVICE

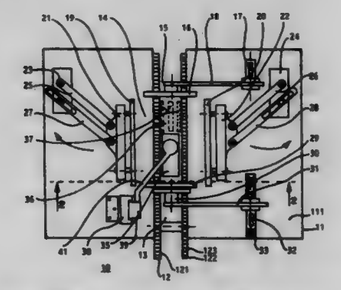
Axel B. Tübke, Berlin, Fed. Rep. of Germany, assignor to System GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 2, 1991, Ser. No. 635,193

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1990, 4000263

Int. Cl.[5] B65H *31/38*

U.S. Cl. 414—788 **10 Claims**



1. A stack squaring device for squaring a stack consisting of a plurality of thin sheets, comprising:

a horizontal conveyor to transport a stack along a conveyance path in a direction from a reception area, via a squaring area into a discharge area;

a stack stop extending in a direction perpendicular to the direction of conveyance of a stack, disposed in said discharge area and movable into the conveyance path;

two side contact plates disposed opposite one another on respective sides of the conveyance path for engagement with sides of a stack, at least one of said side contact plates constituting a vibrator plate;

a vibrator drive unit connected to said one vibrator plate;

bearing means, including a piston plate for supporting a stack from beneath and a piston drive unit coupled to said piston plate, for displacing said piston plate vertically in an upwards direction;

pressing means, including a press plate and a guide unit coupled to said press plate, for guiding said press plate in a vertical direction for lowering said press plate onto a stack positioned in the squaring area, said press plate and said piston palte being guided relative t one another along parallel axes, said press plate and said piston plate having dimensions that are smaller than a respective surface area of a stack to be conveyed, said bearing means and said pressing means cooperating to adjust a squared stack to a desired height; and

gripping means comprising tines disposed for grabbing a squared stack, said gripping means being received in an engagement area which allows free access from one side of a squared stack so that the tines of said gripping means can engage a squared stack disposed between said press plate and said piston plate at the desired height and from underneath and above the squared stack without hinderance in a horizontal direction.

5,197,850

CROSS FLOW FAN SYSTEM

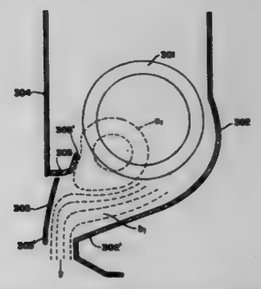
Yoshiharu Shinobu, Kashiharashi, and Akira Takushima, Kitakatsuragi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 676,354, Mar. 28, 1991, abandoned, which is a division of Ser. No. 390,833, Aug. 8, 1989, Pat. No. 5,056,987, which is a division of Ser. No. 150,390, Jan. 29, 1988, Pat. No. 4,913,622. This application Jan. 3, 1992, Ser. No. 816,259

Claims priority, application Japan, Jan. 30, 1987, 62-20890; Mar. 10, 1987, 62-54693; Mar. 10, 1987, 62-55067; Oct. 20, 1987, 62-160608[U]

Int. Cl.[5] F04D *5/00*

U.S. Cl. 415—53.1 **20 Claims**



1. A cross flow type fan having a tongue section provided between a rear guide surrounding a cross flow fan, a back side and bottom side thereof and a front side of the fan, at a discharge opening section formed by a stabilizer of the front panel and the rear guide surrounding the cross flow fan an air flow direction control blade being provided, the air flow direction control blade being rotatably disposed and having opposed sides with one side being curved and one side being concave such that the air flow direction control blade is curved in one direction, the concave side of the air flow direction control blade facing the cross flow fan when the air flow direction control blade is rotated to a generally vertical position.

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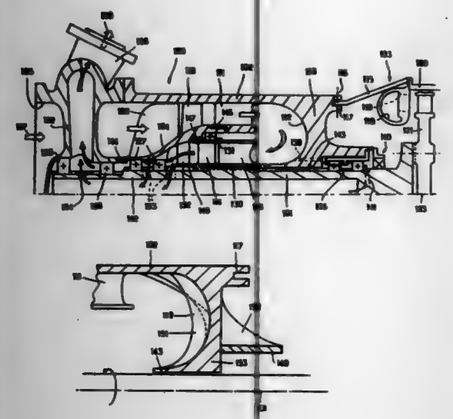
5,197,851
AXIAL FLOW TURBOPUMP WITH INTEGRATED BOOSTING
Jean-Philippe N. Girault, Tourny, France, assignor to Societe Europeenne de Propulsion, Suresnes, France
Filed Dec. 27, 1991, Ser. No. 815,125
Claims priority, application France, Dec. 31, 1990, 90 16548
Int. Cl.[5] F01D *1/12*
U.S. Cl. 415—58.5 17 Claims



1. An axial flow turbopump with integrated boosting for pressurizing a fluid, comprising within a single casing:
a main shaft driven by a turbine;
a secondary shaft coaxial with the main shaft;
at least one low pressure inducer mounted inside the casing on the secondary shaft in the vicinity of an inlet for low pressure working fluid;
at least one low pressure boost impeller mounted on the secondary shaft downstream from the low pressure inducer;
a low pressure baffle secured to the casing and disposed downstream from the low pressure impeller to restore the medium pressure fluid flow parallel to the axis of the turbopump; and
a return channel for deflecting the medium pressure fluid flow from the baffle through 180° and for returning said flow parallel to the axis of the turbopump towards a high pressure impeller mounted on the main shaft inside the secondary shaft in such a manner as to deliver the entire high pressure centrifugal flow formed by the high pressure impeller axially towards a boost turbine secured to the secondary shaft and to the low pressure boost impeller and disposed between the main shaft and the secondary shaft, through orifices and an axial channel being formed in the main shaft to pass a flow of high pressure fluid leaving the boost turbine inside the main shaft and then to exhaust the high pressure fluid towards a delivery channel secured to the casing via radial arms situated at the inlet of the turbopump;
the high pressure impeller constituting a high pressure pump coupled to a low pressure boost pump constituted by the low pressure inducer and the low pressure impeller and constituting a unitary assembly.

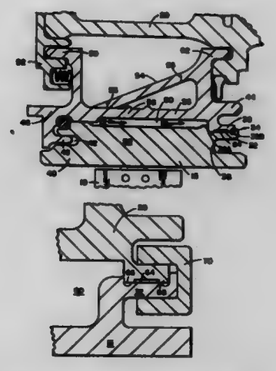
5,197,852
NOZZLE BAND OVERHANG COOLING
Alan Walker, Wyoming; Dean T. Lenahan, Cincinnati; Gary M. Itzel, Mason, all of Ohio, and Andrew P. Elovic, Rishon Lezion, Israel, assignors to General Electric Company, Cincinnati, Ohio
Filed May 31, 1990, Ser. No. 531,413
Int. Cl.[5] F01D *9/02, 25/08*
U.S. Cl. 415—115 19 Claims

1. A nozzle assembly for a gas turbine engine, comprising:
a plurality of circumferentially spaced vanes;
a nozzle band to support said vanes and including a mounting flange extending radially from said nozzle band and adapted to be secured to the gas turbine engine, said nozzle band having a gas path side for partially defining a hot core gas flowpath during engine operation, a back side, and a cast overhang portion axially downstream of said mounting flange;
said overhang portion having a gas path wall and a back side wall;
a pin fin bank means cast within said overhang portion radially spacing said gas path wall and said back side wall for allowing cooling fluid to flow therethrough to cool said overhang portion by convection to the cooling fluid flow and for allowing heat conduction from said gas path side through said gas path wall and said pin fin bank means to said back side wall; and
a thermal barrier coating on said gas path wall having a surface on the gas path side continuous with the axially upstream nozzle band gas path side, wherein said thermal barrier coating is disposed above said pin fin bank means.

5,197,853
AIRTIGHT SHROUD SUPPORT RAIL AND METHOD FOR ASSEMBLING IN TURBINE ENGINE
Clifford S. Creevy, Mainesville, and Terry T. Eckert, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Aug. 28, 1991, Ser. No. 750,993
Int. Cl.[5] F01D *9/04*
U.S. Cl. 415—115 3 Claims

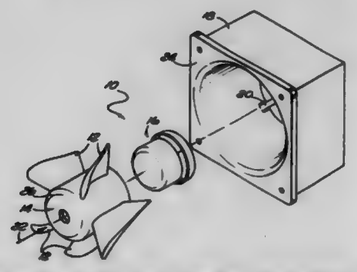
2. A plurality of shroud supports connected circumferentially in an engine, said plurality of shroud supports supporting a plurality of shrouds which are located radially outward from a plurality of rotor blades, each shroud support of said plurality of shroud supports forming a plenum area with an individual shroud of said plurality of shrouds, each said shroud support having a foot section for interfacing with a foot section of the individual shroud of said plurality of shrouds, said foot seciton of each shroud support and the foot section of the individual shroud being exposed to a cooling air flow, each shroud support of said plurality of shroud supports comprising:
two continuous, circumferential rails defining an annular gap therebetween for circumscribing the engine, wherein said two continuous, circumferential rails reduce heat conduction between each said shroud support and shroud and make planar contact with said shroud for forming an airtight seal between said shroud and said shroud support to preventing the cooling air from leaking from the plenum area formed by each said shroud support to a position to the aft of said plurality of shroud supports through the interface at said foot section of said shroud and said shroud support.

3. A method of assemblying a gas turbine engine, the gas turbine engine including a plurality of circumferentially connected shroud supports with each shroud support of the plurality of shroud supports to be used to support at least one shroud of a plurality of circumferentially connected shrouds, each shroud support of said plurality of shroud supports having a



foot section having two rails which extend in a circumferential manner defining a gap therebetween, said method comprising the step of:
associating and making planar contact between said foot section of each said shroud support and a foot section of the at least one shroud such that an annular gap is formed between the two rails and an airtight seal is formed between the shroud and shroud support.

5,197,854
AXIAL FLOW FAN
Lynvel R. Jordan, Monterey, Calif., assignor to Industrial Design Laboratories, Inc., Chula Vista, Calif.
Filed Sep. 5, 1991, Ser. No. 755,433
Int. Cl.[5] F04D *29/66, 19/00, 29/26*
U.S. Cl. 415—119 16 Claims



1. An axial flow fan having a plurality of fan blades mounted on a rotatable hub that is turned by a motor to move air from in front of the fan toward the blades and past the fan, the fan further comprising:
a shroud that circumferentially surrounds the hub and fan blades and that extends from the front surface of the hub to beyond the rear edge of the blades;
a shroud bellmouth around the front surface of the shroud that directs the air moving from in front of the fan into the fan shroud in a smooth flow;
wherein the shroud bellmouth has an outer surface that is defined substantially by the relationship

$$y=(2px)^{\frac{1}{2}}$$

where
x=axial distance along the inner cylindrical surface of the shroud from the forward edge of the shroud
y=radial distance perpendicular from the plane of the shroud inner cylindrical surface to the curved surface of the shroud bellmouth
p=predetermined constant that corresponds to the value for the equivalent parabola that coincides with the airflow pattern for air entering the shroud; and
a generally cylindrical hub having a relatively flat center front surface and a curved surface from the hub center to the hub side surface that is defined substantially by the relationship

$$y=(2px)^{\frac{1}{2}}$$

where
y=axial distance along the outer surface of the hub to the curved surface
x=radial distance perpendicular to the y-axis from the front surface of the hub
p=predetermined constant equal to approximately 1.00.

9. An axial flow fan having a plurality of fan blades that are attached to a rotatable hub coupled to a motor such that air is moved from in front of the fan toward the blades and past the fan when the motor rotates the hub, wherein:
each blade has a leading edge that represents the stagnation point of the blade which is set to zero in a plot of pressure distribution of the blade, a top surface extending rearwardly from the leading edge, a bottom surface extending rearwardly from the leading edge, the top surface and the bottom surface meeting at a trailing edge surface that is flat and squared off, a chord axis that extends in a straight line from the leading edge to the trailing edge surface and a front portion of the blade that is canted downward with respect to the chord axis;
each blade is further configured such that the pressure distribution around the bottom surface varies continuously from zero at the leading edge to a positive value for the full length of the bottom surface, and the pressure distribution around the top surface varies continuously from zero at the leading edge, increasing in magnitude to a peak negative value in the forward third of the blade chord, decreasing in magnitude over the upper surface of the rear two-thirds of the blade chord from the peak negative value to zero and then increasing to a positive value at the trailing edge; and
each blade has a blade root mounted to the hub and a blade tip wherein each blade is twisted from the blade root to the blade tip.

5,197,855
ENGINE EXHAUST/BLADE INTERACTION NOISE SUPPRESSION
Bernard Magliozzi, West Suffield, and Donald B. Hanson, Broad Brook, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Jul. 1, 1991, Ser. No. 727,258
Int. Cl.[5] F01B *25/02*
U.S. Cl. 415—167 5 Claims

1. A method for reducing noise generated on an aircraft propulsion system of the type having a gas turbine engine, a plurality of exhaust nozzles disposed at circumferentially spaced intervals about an aft portion of the engine, each said nozzle discharging a stream of exhaust in a generally axial direction, and a propeller mounted to said engine aft of said exhaust nozzles, said propeller having a plurality of blades, each blade alternately passing as said propeller rotates into and out of the circumferentially spaced exhaust streams discharging from said nozzles, characterized by:
selectively directing each of the exhaust streams away from the axial direction toward said rotating blades whereby

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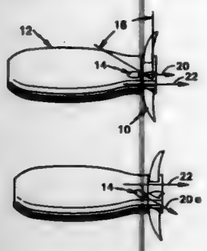
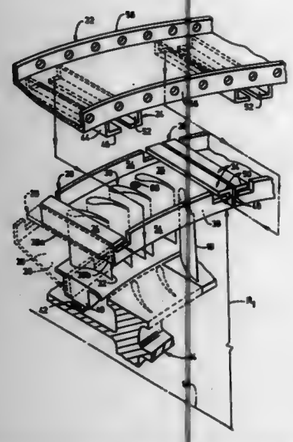
each blade is impacted by said exhaust streams at an effective angle of attack which remains relatively constant as



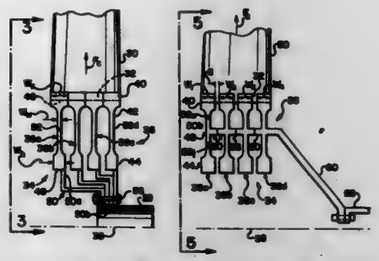
said blades pass through and between the circumferentially spaced exhaust streams.

5,197,856
COMPRESSOR STATOR
Thomas S. Koertge, Norwood, Ohio; Mohammad Ehteshami, Fontainebleau, France; Ambrose A. Hauser, Wyoming, and James W. Tucker, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Jun. 24, 1991, Ser. No. 719,424
Int. Cl.[5] F04D *29/60*
U.S. Cl. 415—209.3 **15 Claims**



1. A compressor stator having an axial centerline axis comprising:
a unitary annular outer case disposed coaxially with said centerline axis and having a plurality of circumferentially spaced outer hooks extending radially inwardly therefrom and axially parallel to said centerline axis;
a circumferentially segmented inner case disposed radially inwardly of said outer case and coaxially with said centerline axis, and having a plurality of circumferentially abutting, arcuate inner case segments, each of said inner case segments including an arcuate shroud having outer and inner surfaces, and at least one inner hook extending radially outwardly from said shroud outer surface and axially parallel to said centerline axis; and
said outer and inner hooks being complementary in shape, with respective ones of said outer and inner hooks being axially slidably joined to each other for radially supporting said shroud inner surfaces at a common radius.

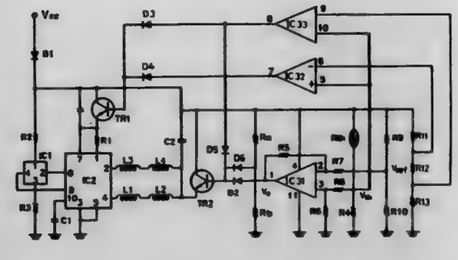
5,197,857
MULTIPLE ROTOR DISK ASSEMBLY
Christopher C. Glynn, Hamilton, and Martin C. Hemsworth, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Jun. 6, 1991, Ser. No. 710,989
Int. Cl.[5] B63H *1/20, 5/00*
U.S. Cl. 416—204 A **21 Claims**



1. A rotor assembly for supporting a plurality of circumferentially spaced rotor blades each having an axial dovetail comprising:
a plurality of axially adjoining discrete disks each having a radially outer rim, an imperforate web extending radially inwardly from said rim, and a hub extending radially inwardly from said web;
each of said rims including a plurality of circumferentially spaced, axial dovetail grooves, adjacent ones of said dovetail grooves of adjacent disks being axially aligned for collectively supporting a respective one of said blade dovetails with each disk supporting a share of centrifugal load from said blades;
adjacent ones of said webs being axially spaced apart;
each of said hubs having a central bore and being imperforate from said bore to said web;
each disk including at least one axially extending, annular arm joined integrally with said disk and having a distal end fixedly joined to a respective distal end of an adjacent arm of an adjacent disk; and
said disks being fixedly joined together solely by said blade dovetails in said rim dovetail grooves and by said arms so that upon a crack failure of one of said disks, said load share from said failed disk is transferred to an adjacent disk through at least one of said blade dovetail and adjacent ones of said arms.

5,197,858
THERMAL CONTROL VARIABLE SPEED DC BRUSHLESS FAN
Rex Cheng, Taoyuan, Taiwan, assignor to Delta Electronics, Inc., Taiwan, Taiwan
Filed Oct. 23, 1991, Ser. No. 780,984
Int. Cl.[5] F04D *27/02*
U.S. Cl. 417—14 **7 Claims**

1. A variable speed fan, comprising:
an impeller;
a thermal sensor;
means responsive to the thermal sensor for rotating the impeller at a speed which varies in response to changes in temperature sensed by the sensor;
means for detecting a malfunction in the sensor;

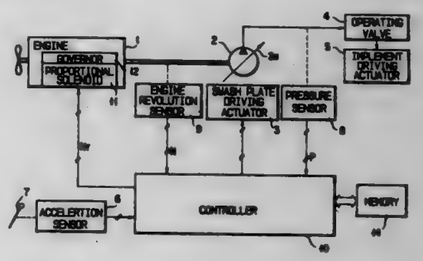


means for causing high-speed operation of the fan in response to detection of the malfunction.

5,197,859
WELL PUMP SYSTEM
Elliott J. Siff, 15 Broadview Rd., Westport, Conn. 06880
Filed Nov. 29, 1970, Ser. No. 619,581
Int. Cl.[5] F04D *15/00*
U.S. Cl. 417—19 **13 Claims**

1. A pumping system for liquid supply, comprising:
a) a source of liquid;
b) a liquid/utilization conduit having an inlet and an outlet;
c) pump means operatively disposed in flow communication between said source and said conduit whereby liquid is supplied to said conduit in response to operation of said pump means;
d) unidirectional flow valve means to prevent reverse flow in said conduit;
e) means for detecting at least one flow parameter associated with, and dependent on the rate of flow through, said inlet and outlet, and utilizing said parameter to control the rate of flow into said conduit, so that the rates of flow into and out of said conduit are substantially equal and said pump runs substantially continuously during water usage for all but the smallest rates of such usage; and
f) said pump includes a housing and said bypass conduit is included in said housing to supply liquid to the pump upstream of said source of liquid.

5,197,860
HYDRAULIC APPARATUS FOR CONSTRUCTION MACHINES
Kimio Nishida, 23-16, Ikenomiya 2-chome, Hirakata-shi, Osaka-fu 573; Toshio Yokoyama, 53-4, Obiraki, Hirono-cho, Uji-shi, Kyoto-fu 611; Yukio Moriya, 4-1-1-1307, Nishimakino, Hirakata-shi, Osaka-fu 573, and Takeshi Kobayashi, 3-28-7, Higashikori, Hirakata-shi, Osaka-fu 573, all of Japan
PCT No. PCT/JP87/01036, § 371 Date Jul. 27, 1989, § 102(e) Date Jul. 27, 1989, PCT Pub. No. WO88/05869, PCT Pub. Date Aug. 11, 1988
PCT Filed Dec. 25, 1987, Ser. No. 391,557
Claims priority, application Japan, Jan. 30, 1987, 62-19767
Int. Cl.[5] F04B *49/06*
U.S. Cl. 417—34 **1 Claim**



1. A hydraulic apparatus for a construction machine wherein at least one variable displacement hydraulic pump driven by an engine is controlled in accordance with equi-horsepower characteristics and with means for determining when the delivery pressure of the pump reaches or exceeds a preset value, control means cuts off the flow of the fluid discharged by the pump wherein means is provided for preventing the number of revolutions of the engine from increasing when the flow of the fluid discharged by the pump is cut off, said means for preventing the number of revolutions from increasing comprising a proportional solenoid connected to a fuel supply control lever of a governor so as to vary the horsepower characteristics of the engine, which are set by the action of the governor based on manipulated variable of the fuel supply control lever, and a controller for controlling the proportional solenoid, the arrangement being such that when the flow of the fluid discharged by the pump is cut off, the controller functions to compute a decrement in a target number of revolutions per minute of the engine, which is obtained by subtracting a target number of revolutions per minute of the engine at desired engine horsepower characteristics from a target number of revolutions per minute of the engine at the initial engine horsepower characteristics, and said proportional solenoid is operated in accordance with this decrement.

5,197,861
FLUID ROTATING APPARATUS
Teruo Maruyama, Hirakata; Tatsuhisa Taguchi, Katano; Yoshikazu Abe, and Mikio Hasegawa, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 1, 1991, Ser. No. 738,902
Claims priority, application Japan, Aug. 1, 1990, 2-204912; Sep. 25, 1990, 2-255798; Nov. 28, 1990, 2-332358
Int. Cl.[5] F04C *23/00*; F04D *19/04*
U.S. Cl. 417—42 **26 Claims**

1. A fluid rotating apparatus comprising
a housing;
a plurality of rotors accommodated in said housing in such a manner that said rotors do not come into contact with one another;
bearings rotatably supporting said rotors;

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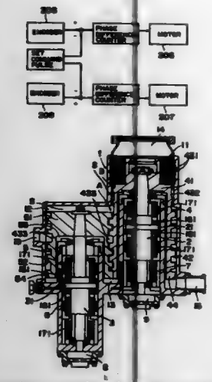
a fluid suction port and a fluid discharge port formed in said housing;

a plurality of motors respectively operably connected to said rotors for driving said rotors, respectively; and



means for detecting rotational angles and numbers of rotations of said motors, and controlling said motors to drive said rotors synchronously on the basis of the rotary angles and the numbers of rotations detected.

5,197,862

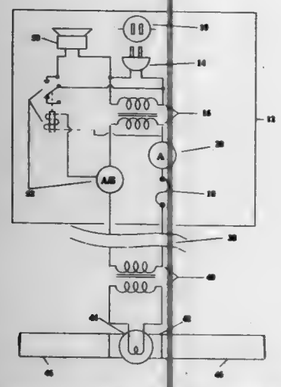
METHOD AND DEVICE FOR MONITORING RADON MITIGATION SYSTEM

Douglas L. Kladder, 222 E. Dale, Colorado Springs, Colo. 80903

Filed Feb. 10, 1992, Ser. No. 833,097

Int. Cl.[5] F04D *25/08*

U.S. Cl. 417—53 **9 Claims**



1. A device for monitoring whether a fan is generating air flow within a predetermined range of acceptable air flows, which predetermined range of acceptable air flows corresponds proportionally to an acceptable range of fan current draw, which device receives electric current from an external source of 120 volt electric current, comprising:

a. an electric plug capable of receiving 120 volt electric current,

b. a reduction transformer for reducing 120 volt current to 24 volts, connected to said electric plug so that electric current is routed through and transformed to 24 volts by said reduction transformer,

c. a performance indicator connected to and receiving electric current from said reduction transformer, which performance indicator measures fan current draw of the fan, and indicates whether said fan current draw corresponds to the predetermined range of acceptable air flows, and

d. a fan voltage booster connected to and receiving electric current from said performance indicator, which booster transforms 24 volt current to 120 volt current, which booster is connected to the fan so that 120 volt current from said booster is routed to and empowers the fan.

5,197,863

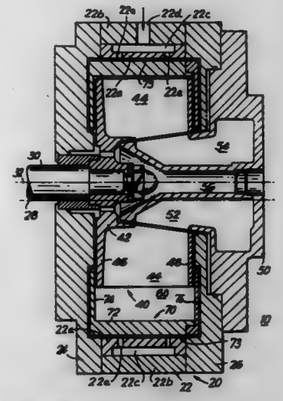
BEARING FLUID DISTRIBUTION SYSTEMS FOR LIQUID RING PUMPS WITH ROTATING LOBE LINERS

Thomas R. Dardis, Stamford; Douglas E. Bissell, Bridgeport, and Harold K. Haavik, Norwalk, all of Conn., assignors to The Nash Engineering Company, Norwalk, Conn.

Continuation-in-part of Ser. No. 635,233, Dec. 28, 1990, Pat. No. 5,100,300. This application Jan. 22, 1992, Ser. No. 824,187

Int. Cl.[5] F04C *19/00*

U.S. Cl. 417—68 **26 Claims**



1. A liquid ring pump comprising:

a stationary annular housing having a central longitudinal axis surrounded by said housing;

a rotor disposed in said housing for rotation about a rotation axis which is substantially parallel to said longitudinal axis;

an annular liner member disposed in said housing concentric with said longitudinal axis, the radially outer surface of said liner member being spaced from the adjacent inner surface of said housing by an annular clearance;

means for maintaining a quantity of pumping liquid in said housing, said pumping liquid being formed into a recirculating annular ring inside said liner member by rotation of said rotor; and

means for introducing a bearing fluid into said annular clearance so that said liner member rotates on said bearing fluid about said longitudinal axis as a result of recirculation of said pumping liquid in said annular ring, said means for introducing comprising at least two circumferentially spaced apertures in said inner surface of said housing, a channel extending through and enclosed within said housing between said at least two apertures, and means for supplying bearing fluid to said channel so that said bearing fluid flows through said channel and enters said annular clearance via said apertures.

5,197,864

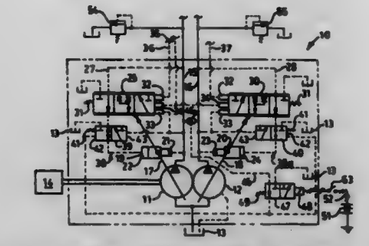
ON-OFF PRESSURE CUTOFF CONTROL FOR A VARIABLE DISPLACEMENT HYDRAULIC PUMP

Stephen V. Lanzman, Chillicothe; John J. Krone, and Lonnie J. Devier, both of Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jan. 16, 1992, Ser. No. 821,203

Int. Cl.[5] F04B *1/26*

U.S. Cl. 417—218 **4 Claims**



2. An on-off high pressure cutoff control for a variable displacement hydraulic pump having an output port, a swash plate movable between minimum and maximum displacement settings, an actuator connected to the swash plate and having an actuating chamber, and a first pilot passage connecting the outlet port with the actuating chamber comprising:

a two position high pressure cutoff valve disposed in the first pilot passage and movable between a first position establishing communication through the first pilot passage from the output port to the actuating chamber and a second position blocking communication through the first pilot passage, the cutoff valve having first and second ends and a spring disposed at the first end resiliently urging the cutoff valve to the first position; the second end being connected to the output port for moving the cutoff valve to the second position when the pressure in the output port exceeds a predetermined level;

a second pilot passage connecting the output port to the first end of the cutoff valve; and

an two position on-off valve disposed in the second pilot passage and selectively movable between a first position establishing communication through the second pilot passage from the output port to the first end of the cutoff valve and a second position blocking communication through the second pilot passage.

5,197,865

INTEGRAL ELECTRONICALLY COMMUTATED DRIVE SYSTEM

Christophe J. Sevrain, Vancouver, Wash.; Joseph J. Stupak, Jr., Portland, Oreg.; Kevin D. O'Hara, and Kurt T. Liebezeit, both of Vancouver, Wash., assignors to Micropump Corporation, Concord, Calif.

Continuation of Ser. No. 598,217, Oct. 16, 1990, This application Feb. 6, 1992, Ser. No. 832,041

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—420 **6 Claims**

1. A pump assembly with an integral electronically commutated drive system, the assembly comprising;

a pump head having a rotatable drive shaft extending therefrom, the pump serving to transport a fluid from an inlet port to an outlet port;

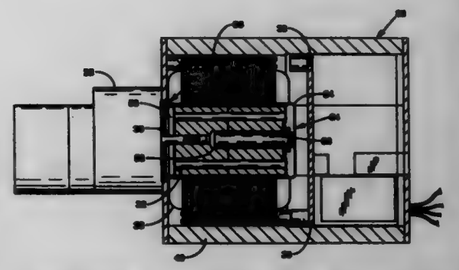
a permanent magnet rotor having an axis of rotation, the rotor being coupled to the drive shaft of the pump head, the rotor providing rotary motion to the pump head drive shaft;

a fluid-tight cup having a cylindrical side wall and a closed end, the cup defining an enclosure having an open first end and a closed second end, said cup enclosure defining a cavity within which the rotor is disposed, said cavity being in fluid connection with the pump head through its open first end, said cup having a uniform wall thickness along both its cylindrical side wall and its closed end wall;

a plurality of electrical stator windings disposed about the outside of the cup enclosure, adjacent thereto;

a metal housing within which the cup enclosure and the stator windings are disposed; and

a printed circuit board disposed within the housing and having circuitry that is electrically coupled to the electrical stator windings and that is electrically coupled to a plurality of wires that exit the housing for external connection, said circuitry including a plurality of current switching transistors for controlling and driving the electrical windings, the circuit board being disposed within the housing in a plane orthogonal to the drive shaft of the pump head and in a space defined between the second end of the cup enclosure and the housing;



wherein the permanent magnet rotor has first and second ends, the drive shaft of the pump head being connected to the first end of the rotor at the axis of rotation, the second end of the rotor defining an axial bore extending at least partially therethrough;

the cup enclosure defines a post extending into the bore from the second end thereof; and

the post and the bore define a bearing at the second end of the rotor about which the rotor can rotate to thereby drive the pump drive shaft.

5,197,866

AIR PUMP FOR A NATURAL MINERAL WATER BOTTLE

Cheong-Ho Kim, Seoul Garden Apt. 3-603, 555 Dobong-dong, Dobong-gu, Rep. of Korea

Filed Apr. 19, 1991, Ser. No. 687,797

Claims priority, application Rep. of Korea, Apr. 21, 1990, 90-4952

Int. Cl.[5] F04B *43/08*; B65D *83/14*

U.S. Cl. 417—472 **3 Claims**

1. An air pump for a natural mineral water bottle, said pump comprising:

a cover member comprising an upper cylinder having a top and bottom with an annular flange defined on the top thereof and inner threads at the bottom thereof, a lower cylinder having an upper end threadably connected to the bottom end of the upper cylinder, the lower cylinder having an outlet communicating with one side wall of an outer peripheral surface positioned at a bottom surface thereof, a connecting pipe extending downwardly from said outlet, a circular guide groove formed in a circular in the bottom surface, an air intake opening communicating with both ends of said groove so as to communicate with the atmosphere, a snap ring formed in a central portion of said groove, said snap ring being penetrated by an air outlet opening and being connected upward slopingly by an elbow pipe to said outlet of the outer peripheral surface

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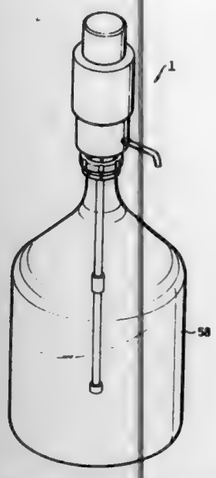
of said lower cylinder, and a head formed with an annular flange portion, said head being inserted from the inside of said upper cylinder to project through the annular flange at the top of the upper cylinder;

a bellows member including a spiral spring disposed therein and an input and output plate fitted hermetically by way of adhesion in a lower end thereof, said input and output plate having an input and an output annular wall on a top surface thereof so that two annular walls are communicated vertically, a guide pipe projecting from a lower surface of said output annular wall, axial valve openings formed in the center of two annular walls, a circular input valve plate and a circular output valve plate in each of which include a plurality of apertures arranged in a circle, the input and output valve plates being inserted and fixed respectively into the two annular walls, an input valve being positioned at the top of said input valve plate so as to be conversely operated thereagainst, the input valve being always opened with a partial aperture of said input plate by forming a cut portion in said input valve, a press valve being inserted into said air outlet opening for communication therewith, said bellows member being disposed within said cover member such that said bellows is received in a bottom portion of said head with said input and output plate abutting the bottom surface of said lower cylinder, said input valve of said plate being in communication with said air guide groove, and



a stopper member comprising a bottle stopper having a threaded portion and an annular protrusion in which an annular groove is formed in a lower end thereof, the stopper member including an annular flange in which a plurality of coinciding holes are constantly spaced and a plurality of cut-out slots constantly spaced in an outer peripheral surface thereof; a locking nut threaded to said threaded portion of said bottle stopper, said bottle stopper of said stopper member being threaded in a stopper fixing annular wall of the lower cylinder with a packing member made of a rubber disposed so as to retain airtightness therebetween, one end of an inflow pipe being connected to said outlet at the bottom surface of said lower cylinder and the other end of the inflow pipe, the bottle stopper and the sealing cap being mounted on the mouth of the bottle and being fixed hermetically by screwing said locking nut down on the threaded portion.

5,197,867

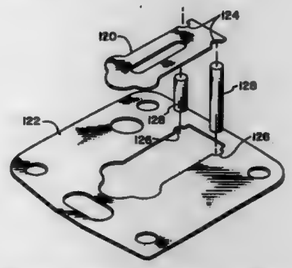
PLATE SUCTION VALVE

Tara C. Kandpal, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 744,080, Aug. 12, 1991, Pat. No. 5,140,748. This application Jun. 10, 1992, Ser. No. 896,238

Int. Cl.[5] **F04B** *21/02;* **F16K** *15/16*

U.S. Cl. 417—571 **15 Claims**



1. A reciprocating piston compressor, comprising:

a crankcase including a cylinder having a cylinder side wall and a cylinder opening on a top surface of said crankcase;

a valve plate having a suction opening, said valve plate mounted to said top surface of said crankcase and covering said cylinder opening;

a piston reciprocatingly disposed in said cylinder;

a two-piece suction valve assembly comprising a valve spacer and a separate valve leaf both disposed intermediate said valve plate and said crankcase, said suction valve being disposed over said suction opening in said valve spacer opening; and

attaching means for attaching and locating said valve spacer and separate valve leaf between said top surface of said crankcase and said valve plate.

5,197,868

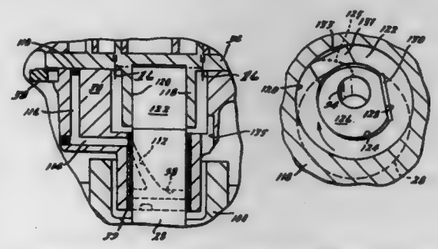
SCROLL-TYPE MACHINE HAVING A LUBRICATED DRIVE BUSHING

Jean-Luc M. Caillat; Roger C. Weatherston, both of Dayton, and James W. Bush, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 649,001, Jan. 31, 1991, Pat. No. 5,114,322, which is a division of Ser. No. 387,699, Jul. 31, 1989, Pat. No. 4,992,033, which is a division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382, which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Mar. 13, 1992, Ser. No. 850,893

Int. Cl.[5] **F01C** *1/04, 21/02, 21/04;* **F16C** *33/10*

U.S. Cl. 418—55.5 **9 Claims**



1. A drive for a scroll-type machine comprising a pair of meshing scroll members mounted for relative orbital movement, means operatively associated between the scroll members to prevent rotation of the scroll members and allow said relative orbital movement, a motor, a crankshaft rotatable by said motor about a substantially vertical axis and a source of lubricating oil, said drive comprising:

(a) means defining a first circular cylindrical axial bore in one of said scroll members;

(b) a drive bushing rotatably journalled in said first bore and having a second cylindrical axial bore therethrough;

(c) a crank pin on said crankshaft drivingly disposed in said second bore whereby rotation of said crankshaft will cause said one scroll member to move in an orbital path;

(d) means defining an oil feed passage in said shaft for delivering lubricating oil from said oil source to the top of said crank pin, from which it is thrown outwardly by centrifugal force upon rotation of said crankshaft; and

(e) means defining a recess in the top of said bushing for collecting said thrown lubricating oil so that it can flow into said first and second bores for lubricating purposes.

5,197,869

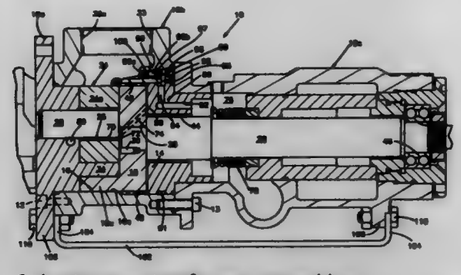
ROTARY GEAR TRANSFER PUMP HAVING PRESSURE BALANCING LUBRICATION, BEARING AND MOUNTING MEANS

Milton N. Hansen, and Steven D. McMahon, both of Mansfield, Ohio, assignors to The Gorman-Rupp Company, Mansfield, Ohio

Filed Mar. 22, 1991, Ser. No. 673,948

Int. Cl.[5] **F04C** *2/10, 15/00*

U.S. Cl. 418—77 **21 Claims**



1. A rotary, gear transfer pump, comprising:

(a) a pump housing defining a circular pumping chamber communicating with a first port and a second port;

(b) a rotor rotatable within said chamber including:

(i) a plurality of spaced apart teeth extending axially from a skirt portion of said rotor;

(ii) a drive shaft extending axially from said skirt portion and defining a rotational axis for said rotor;

(c) a seal chamber defined by said housing spaced axially from said pump chamber;

(d) a bushing for supporting said drive shaft located intermediate said pump chamber and said seal chamber;

(e) an idler gear rotatable on an idler pin extending into said pumping chamber and positioned such that said idler gear is in meshing engagement with said rotor and is driven thereby; and,

(f) a non-elastomeric annular bearing means mounted in said housing and in confronting relation with said skirt portion of said rotor, said baring being substantially coextensive with said skirt portion.

3. A rotary, gear transfer pump, comprising:

(a) a pump housing defining a circular pumping chamber communicating with a first port and a second port;

(b) a rotor rotatable within said chamber including:

(i) a plurality of spaced apart teeth extending axially from a skirt portion of said rotor;

(ii) a drive shaft extending axially from said skirt portion and defining a rotational axis for said rotor;

(c) a seal chamber defined by said housing spaced axially from said pump chamber;

(d) an idler gear rotatable on a fixed idler pin extending into said pumping chamber and positioned such that said idler gear is in meshing engagement with said rotor and is driven thereby; and,

(e) fluid circuit means for lubricating and cooling said idler pin during pump operation including means communicating fluid from one of said ports to a passage means defined by said idler pin, said passage means including an axially extending flat formed on said idler pin, one of said flat communicating with said one port.

7. A rotary, gear transfer pump, comprising:

(a) a pump housing defining a circular pumping chamber communicating with a first port and a second port;

(b) a rotor rotatable within said chamber including:

(i) a plurality of spaced apart teeth extending axially from a skirt portion of said rotor;

(ii) a drive shaft extending axially from said skirt portion and defining a rotational axis for said rotor;

(c) a seal chamber defined by said housing spaced axially from said pump chamber;

(d) an idler gear rotatable on a idler pin extending into said pumping chamber and positioned such that said idler gear is in meshing engagement with said rotor and is driven thereby;

(e) an annular bearing means mounted in said housing and in confronting relation with a peripheral surface of said rotor; and,

(f) said pump housing further including a pair of spaced apart mounting lugs depending from said housing;

(g) a removable mounting bracket supporting said pump housing such that a centerline of said transfer pump is maintained at a desired operating height determined by a selected mounting bracket, said mounting bracket including mounting elements attachable to said mounting lugs.

8. A rotary, gear transfer pump, comprising:

(a) a pump housing defining a circular pumping chamber communicating with a first port and a second port;

(b) a rotor rotatable within said chamber including:

(i) a plurality of spaced apart teeth extending axially from a skirt portion of said rotor;

(ii) a drive shaft extending axially from said skirt portion and defining a rotational axis for said rotor;

(c) a seal chamber defined by said housing spaced axially from said pump chamber;

(d) a bushing for supporting said drive shaft located intermediate said pump chamber and said seal chamber;

(e) an idler gear rotatable on an idler pin extending into said pumping chamber and positioned such that said idler gear is in meshing engagement with said rotor and is driven thereby; and,

(f) pressure balancing means for reducing axial loading of said rotor including passage means communicating fluid under pressure from one of said ports to a backside region of said rotor such that forces generated by said fluid under pressure on said backside region oppose, at least partially, axial forces exerted on said rotor by fluid in said pumping chamber;

(g) said pressure balancing means defined in part by an axially extending flat formed on the exterior of said idler pin, one end of said flat in fluid communication with said fluid under pressure and the other end of said flat communicating with a front side region defined between an inner end of said pin and a central portion of said rotor;

(h) said pressure balancing means further including a passage extending through said rotor from said front side region and said backside region.

11. A rotary, gear transfer pump, comprising:

(a) a pump housing defining a circular pumping chamber communicating with a first port and a second port;

(b) a rotor rotatable within said chamber including:

(i) a plurality of spaced apart teeth extending axially from a skirt portion of said rotor;

(ii) a drive shaft extending axially from said skirt portion and defining a rotational axis for said rotor;—

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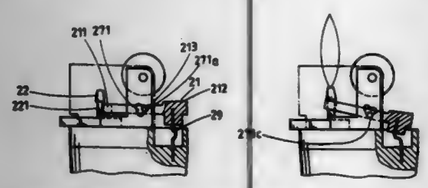
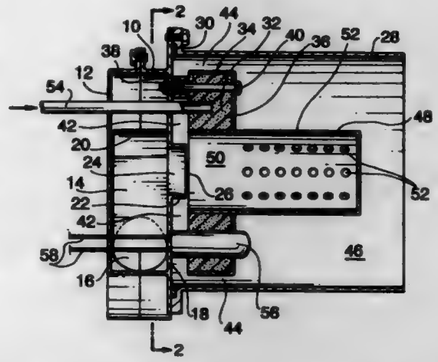
(c) a seal chamber defined by said housing spaced axially from said pump chamber;
(d) a bushing for supporting said drive shaft located intermediate said pump chamber and said seal chamber;
(e) an idler gear rotatable on an idler pin extending into said pumping chamber and positioned such that said idler gear is in meshing engagement with said rotor and is driven thereby; and,
(f) pressure balancing means for reducing axial loading of said rotor including passage means communicating fluid under pressure from one of said ports to a backside region of said rotor such that forces generated by said fluid under pressure on said backside region oppose, at least partially, axial forces exerted on said rotor by fluid in said pumping chamber; and
(g) a non-elastomeric annular bearing means mounted in said housing and in confronting relation with said skirt portion of said rotor, said bearing means being substantially coextensive with said skirt portion;
(h) said skirt portion of said rotor defining a trimmed region defined by a reduced diameter section on said skirt portion for providing a predetermined clearance between said trimmed region of said skirt portion and said annular bearing means that is greater than a clearance between peripheral surfaces on said rotor teeth and said pump housing.

5,197,870
SAFETY LIGHTER
James C. H. Yang, 1425 W. 139th St., Gardena, Calif. 90249
Filed Jan. 29, 1992, Ser. No. 827,720
Int. Cl.[5] F23D *11/36*
U.S. Cl. 431—153 8 Claims



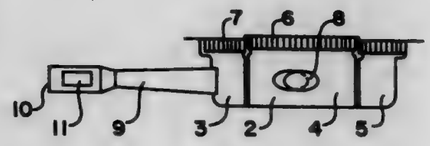
1. In a gas lighter comprising a lighter body, a gas pipe mounted on the body for up and down movement to open and close a gas valve in the lighter body, mounting means on the body for an operating lever, an operating lever pivotally mounted on the mounting means, the lever having a pressure plate at one end and a groove at the opposite end for engaging a neck portion of the gas pipe and lifting the gas pipe to open the gas valve when the pressure plate is depressed, and a striker wheel and flint for creating a spark to ignite gas issuing from the gas pipe when the striker wheel is rotated and the pressure plate is depressed, the improvement wherein the operating lever is mounted on the mounting means for movement between first and second positions wherein said groove is respectively out of engagement with and in engagement with said neck portion of the gas pipe, and the lighter includes resilient means urging the lever to said first position whereby to operate the lighter, the lever must be moved to the second position causing the groove to engage the gas pipe and the pressure plate must be depressed to raise the gas pipe, and whereby when the lever is released the resilient means returns the lever to the first position disengaging the groove from the neck portion of the gas pipe.

5,197,871
VAPORIZING TYPE BURNER
Yuuzou Yamamoto, Yaita; Katsuji Sawada, Tochigi, and Hisashi Fukunaga, Yaita, all of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Japan
Filed Jun. 25, 1992, Ser. No. 903,763
Claims priority, application Japan, Aug. 6, 1991, 3-219399
Int. Cl.[5] F23Q *7/08*
U.S. Cl. 431—262 8 Claims



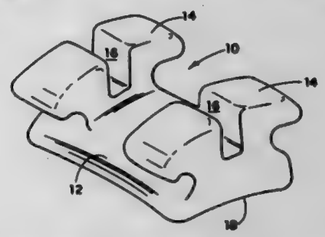
1. In a vaporizing type burner wherein a fuel contained in a fuel absorbing section is vaporized, the vaporized fuel is mixed with a combustion air to prepare a mixture gas and the resultant mixture gas is then ignited by activating an igniting plug in a combustion chamber defined by a cylindrical body, the improvement comprising;
a supporting member for accommodating said fuel absorbing section in said cylindrical body in such a manner as not to allow said fuel absorbing section to be exposed directly to said combustion chamber, said supporting member having a heat receiving plate arranged at the fore end of said fuel absorbing section, said heat receiving plate being exposed to said combustion chamber,
a vaporizing chamber arranged adjacent to said fuel absorbing section and said supporting member exclusive of said heat receiving plate while establishing communication with said combustion chamber so as to allow a part of the combustion gas generated in said combustion chamber to be introduced into said vaporizing chamber without any burning flame,
an air swirling chamber including means for imparting a swirling force to said combustion air,
a mixer tube communicated not only with said air swirling chamber but also with said vaporing chamber while forming a mixing passage therein, said mixer tube being protruded into said combustion chamber, and
a number of ejection holes formed over the outer surface of said mixer tube in the region protruded into said combustion chamber from said heat receiving plate to establish communication between said mixing passage and said combustion chamber,
whereby said fuel is vaporized from said fuel absorbing section by the heat of the combustion gas thermally conducted via said heat receiving plate and the heat derived from a part of the combustion gas introduced into said vaporizing chamber, the vaporized fuel and the swirling combustion air are mixed with each other in said mixing passage, the resultant mixture gas is radially ejected into said combustion chamber through said ejection holes, and the ejected mixture gas is then ignited by activating said igniting plug to form plural array of burning flames.

5,197,872
CONCENTRIC BURNER SET FOR GLASS-CERAMIC GAS COOKER TOP
Francisco Bertomeu Martinez, Valencia, Spain, assignor to Catalana de Gas, S.A., Barcelona and Sergio Vidal Sospedra, Valencia, both of Spain
Filed Dec. 11, 1990, Ser. No. 628,953
Claims priority, application Spain, Dec. 11, 1989, 8904177
Int. Cl.[5] F23Q *9/00*
U.S. Cl. 431—284 1 Claim



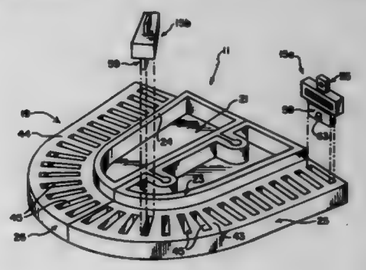
1. A concentric burner set for a glass-ceramic gas cooker top, comprising:
a first, radially inner burner unit comprising:
a generally circular disk-shaped plate, as seen in top plan, having a generally horizontal, upwardly presented radiating surface, said plate being made of ceramic material, upwardly through which gas-air mixture and combustion products thereof can diffuse,
wall means defining a first cavity, which is generally circular disk-shaped in horizontal cross-sectional shape and has an upper side thereof in communication with an underside of said generally circular disk-shaped plate,
a first venturi tube communicating with said first cavity, said first venturi tube having an upstream end adapted for connection with a selectively variable supply of gas, and a lateral opening arranged for entrainment of air, for providing said first cavity with a supply of gas and air, to be mixed in said first cavity and diffused into said first plate for combustion so as to provide radiant energy emanating from said radiating surface; and
a second, radially outer burner unit, comprising:
an annular plate, as seen in top plan, having a generally horizontal, upwardly presented radiating surface, said annular plate being made of ceramic material, upwardly through which gas-air mixture and combustion products thereof can diffuse,
wall means defining a second cavity, which is annular in horizontal cross-sectional shape and has an upper side thereof in communication with an underside of said annular plate,
a second venturi tube communicating with said second cavity, said second venturi tube having an upstream end adapted for connection with a selectively variable supply of gas, and a lateral opening arranged for entrainment of air, for providing said second cavity, independently of said first cavity, with a supply of gas and air, to be mixed in said second cavity and diffused into said second plate for combustion so as to provide radiant energy emanating from said radiating surface of said second plate;
said second, radially outer burner unit being coaxially arranged with said first, radially inner burner unit so as to circumferentially surround said first, radially inner burner unit;
said radiating surface of said first plate being disposed at a higher level than said radiating surface of said second plate.

5,197,873
ORTHODONTIC BRACKET AND METHOD
Rayond F. Wong, Chino; Patrick D. Kidd, San Dimas, and Farrokh Farzin-Nia, Inglewood, all of Calif., assignors to Ormco Corporation, Glendora, Calif.
Continuation of Ser. No. 677,377, Mar. 27, 1991, Pat. No. 5,071,344, which is a continuation-in-part of Ser. No. 241,193, Sep. 7, 1988, abandoned. This application Dec. 9, 1991, Ser. No. 804,806
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—9 41 Claims



1. An orthodontic bracket having a base portion for attachment to a tooth, said base portion being made of a ceramic material and having a tooth contact surface, said base portion having particles made of a ceramic material diffusion bonded to said tooth contact surface with an activator which reduces the temperature at which said particles are diffusion bonded to said tooth contact surface, said particles having a size in the approximate range of 20–200 microns to provide mechanical undercuts to produce void spaces between the particles which can be penetrated by flowable cement to establish mechanical retention interlocks when the particle-covered tooth contact surface of the base portion is cemented to a tooth and said particles having sufficient size uniformity to avoid substantial filling of said void spaces with small particles.

5,197,874
METHOD AND APPARATUS FOR FABRICATING DENTAL MODELS
Deborah Silva, P.O. Box 245, Ferndale, Calif. 95536, and Robert G. Lowry, 302 Mountain Cloud Cir., Highlands Ranch, Colo. 80126
Filed Jun. 19, 1992, Ser. No. 901,203
Int. Cl.[5] A61C *19/00*
U.S. Cl. 433—74 25 Claims



1. Apparatus for use in making a dental replica, comprising:
a) base plate having a plan-form configuration commensurate with at least one quadrant of a person's dental structure, said base plate including a flange portion having an arcuate planar upper surface with a plurality of transverse,

elongate sockets arranged therealong in spaced-apart relationship; and

b) a plurality of mounting blocks releasably attached to said flange upper surface, each said block having a planar lower surface adapted to engage said flange upper surface, and a downward projection adapted to make releasable friction engagement within a corresponding one of said sockets, and an anchor tab projecting upwardly from the top of each said block.

5,197,875

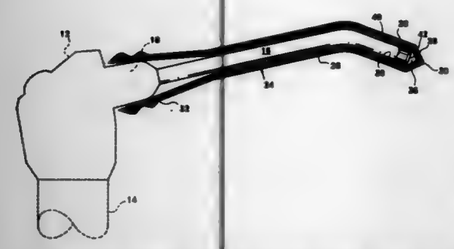
DENTAL SYRINGE COVERS

Robert A. Nerli, 15 El Quanito Way, Burlingame, Calif. 94010

Continuation-in-part of Ser. No. 667,422, Mar. 11, 1991, abandoned, which is a continuation of Ser. No. 373,507, Jun. 30, 1989, Pat. No. 4,998,880, which is a continuation-in-part of Ser. No. 118,170, Nov. 9, 1987, Pat. No. 4,859,182. This application Dec. 13, 1991, Ser. No. 806,481

Int. Cl.[5] A61G *17/02*; A61C *1/16*

U.S. Cl. 433—80 **18 Claims**



1. A hygienic syringe cover for a rigid dental syringe used for delivering liquid and/or air into a patient's mouth, comprising:

a generally cylindrical shank of non-rigid material, having a liquid delivery end which tapers to a smaller diameter and an opposite, enlarged end of larger diameter,

an enlarged portion at the opposite end with means for gripping the enlarged portion to install the syringe cover on a dental syringe and to rotate the syringe,

a tip on the shank at said liquid delivery end, the tip including a flow restrictor orifice through which liquid and/or air is delivered from the dental syringe, and

means associated with the shank for preventing backflow of liquids along the exterior surface of the dental syringe, between the dental syringe and the syringe cover.

5,197,876

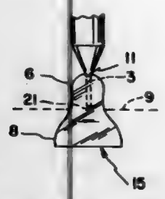
SPLATTER GUARD FOR AIR POLISHING DENTAL DEVICE

Pamela Coston, 4132 Maple Ln., Powder Springs, Ga. 30073

Continuation-in-part of Ser. No. 645,619, Jan. 25, 1991, abandoned. This application Apr. 10, 1992, Ser. No. 866,346

Int. Cl.[5] A61C *1/16*; A61G *17/02*

U.S. Cl. 433—116 **4 Claims**



1. A splatter guard in combination with a fluid polishing dental device, said dental device having an outlet conduit extending from a distal end thereof terminating at an outlet nozzle, said splatter guard comprising:

a) a flexible generally bell-shaped member having an internal chamber with a smaller diameter proximal end merging with a larger diameter distal end at an interface plane, said distal end having an enlarged opening; and

b) means for attaching said bell-shaped member adjacent said distal end of said fluid polishing dental device, said means for attaching comprising an attachment opening in said smaller diameter proximal end sized to closely receive and engage a periphery of a proximal portion of said outlet conduit with said enlarged opening facing away from said dental device and with said outlet conduit extending within said chamber, said interface plane being located approximately equidistant from said attachment opening and said enlarged opening, said outlet conduit and outlet nozzle being located proximal of said interface plane;

c) said bell-shaped member shielding said nozzle of said fluid polishing dental device and preventing fluid emanating from said nozzle from contacting a patient or operator in undesired locations.

5,197,877

IMPLEMENT FOR EXTRACTING DENTAL CROWNS, BRIDGES AND THE LIKE

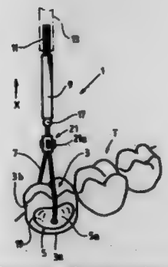
Vladimir Andrew, 39, Allée Robertsau, F-6700 Strasbourg, France

Filed Aug. 15, 1991, Ser. No. 745,599

Claims priority, application Switzerland, Aug. 15, 1990, 02657/90; Jul. 26, 1991, 02252/91

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—153 **19 Claims**



1. An implement for extracting dental prostheses of the type affixed to at least one tooth and having at least one portion spaced apart from the gums of the wearer, comprising a first unit including two extracting elements engageable with the at least one portion of the prosthesis to be extracted, each of said extracting elements including a jaw and each of said jaws having an elongated arm; and a second unit including means for applying to said extracting elements a force in a direction away from the gums of the wearer to thereby separate the prosthesis from the at least one tooth, said force applying means including means for moving said jaws between first positions in which said jaws provide room for the at least one portion of a prosthesis therebetween and second positions in which the jaws clamp the at least one portion of the prosthesis between them, said moving means comprising a sleeve which surrounds and is slidable along said arms.

5,197,878

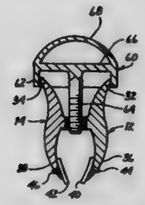
CLAMP FOR REMOVING A DENTAL PROSTHETIC

Stephen P. Lukase, Glendale, Ariz., and Thomas A. Lukase, 2670 Greentree La., La Jolla, Calif. 92037, assignors to Thomas A. Lukase, Glendale, Ariz.

Continuation of Ser. No. 603,879, Oct. 23, 1990, abandoned. This application Nov. 4, 1991, Ser. No. 787,590

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—158 **24 Claims**



1. An extraction tool for removing a dental prosthetic device, said tool comprising in combination:

a) an opposed pair of clamp arms for gripping opposed sides of the dental prosthetic device, each clamp arm of said pair of clamp arms including an upper end and a lower end;

b) means for pivotally interconnecting said pair of clamp arms;

c) means for limiting outward pivotal movement of said upper ends of said pair of clamp arms;

d) means for urging pivotal movement of said pair of clamp arms and movement of said lower ends toward one another in response to outward limited pivotal movement of said upper ends and away from one another to grip and release, respectively, the dental prosthetic device, said urging means including means for relocating the pivotal interconnection between said pair of clamp arms to urge movement of said lower ends; and

e) means for accommodating application of a pulling force upon said tool to cause said tool to extract the dental prosthetic device gripped by said pair of clamp arms.

5,197,879

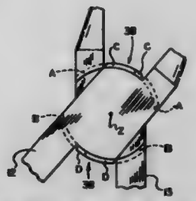
ORTHODONTIC, MEDICAL, DENTAL TOOL

Hudson D. Fowler, III, Battles Rd., Gates Mills, Ohio 44040; Robert E. Cherry, 8732 E. Field Ct., Pickerington, Ohio 43147; William E. Flasche, 2618 Glenchester, Wexford, Pa. 15090; Russell J. Logan, 2870 Chatham, Pepper Pike, Ohio 44124, and Gary Worner, 8211 West Hill Dr., Chagrin Falls, Ohio 44020

Filed Sep. 6, 1991, Ser. No. 756,326

Int. Cl.[5] A61C *3/14, 3/16*; B25B *7/06*

U.S. Cl. 433—159 **12 Claims**



1. A separable hinged orthodontic, medical or dental tool, comprising a pair of scissor halves, each scissor half having a handle portion, a nose portion and a substantially identical pinless hinge portion without any central axial projections or mating recesses; said hinge portion including at least one planar, solid female mating section and at least one male mating section for engagement with a corresponding male and female mating section, respectively, on the other scissor half, said at least one female mating section being a female dovetail slot, and said at least one male mating section being a male dovetail protrusion.

5,197,880

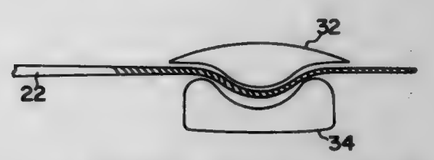
TOOL FOR CRIMPING ENDODONTIC FILES

Leeland M. Lovaas, 40 Via Larga Vista, Bonsall, Calif. 92003

Division of Ser. No. 275,213, Nov. 23, 1988, Pat. No. 4,889,487. This application Dec. 1, 1989, Ser. No. 444,760

Int. Cl.[5] A61C *3/14, 3/16, 5/02, 3/00*

U.S. Cl. 433—159 **9 Claims**



1. A tool for crimping a substantially straight filing shaft of an endodontic file comprising a pair of opposite crimping members a first of said members having a first crimping surface and a second of said members having a second crimping surface, said first and second crimping surfaces facing one another,

and a spring connector extending between and attached to each of said crimping members and biased for holding said first and second crimping surfaces spaced apart,

said first surface having a convex arch-shaped ridge tapered along its length in the shape of a section of a cone having an increasing radius between a first and second end thereof, and said second surface having a concave arch-shaped cavity tapered along its length in the concave shape of a section of a cone for receiving said ridge, said first surface having recurve forming surfaces extending on opposite sides of said ridge said first and second surfaces capable forming a bow-shaped bend along a filing shaft of an endodontic file placed therebetween when said crimping members are urged together against the bias of said spring connector.

5,197,881

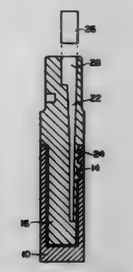
DENTAL IMPLANT SYSTEM AND APPARATUS

Paul R. Chalifoux, Wellesley, Mass., assignor to Wellesley Research Associates, Inc., Wellesley, Mass.

Filed Dec. 30, 1991, Ser. No. 814,507

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—173 **10 Claims**



1. A dental system for insertion into a bore of a jaw bone of a patient which comprises:

a dental implant adapted to fit in a bore of said jaw bone, said dental implant having a central hole extending from a top

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surface of said implant through a portion of the vertical height of said implant,

at least one slot in a wall of said implant and said at least one slot open to said central hole,

a dental post having a stem section shaped to fit into said central hole and at least one wing extending radially from said stem section and shaped to fit into one of said slots, and

means for positioning said at least one of said wings into one of said slots, said at least one wing and said at least one slot being shaped to prevent rotation of said post in at least one direction after said positioning.

5,197,882

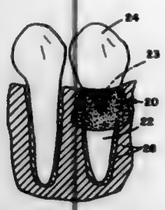
PERIODONTAL BARRIER AND METHOD FOR AIDING PERIODONTAL TISSUE REGENERATION AGENTS

Gary R. Jernberg, 99 Navaho Ave., Suite 102, Mankato, Minn. 56001, assignor to Gary R. Jernberg, Mankato, Minn.

Continuation of Ser. No. 522,999, May 14, 1990, abandoned. This application Feb. 20, 1992, Ser. No. 840,616

Int. Cl.[5] A61C *5/00*

U.S. Cl. 433—215 **21 Claims**



1. A method for aiding and guiding periodontal tissue regeneration, comprising the steps of:

incorporating time-release microshapes encapsulating at least one chemotherapeutic agent into a biocompatible periodontal barrier so as to provide for sustained, controlled delivery of said at least one chemotherapeutic agent to a localized periodontal regeneration site in a mammalian body, said incorporating step is selected from the group consisting of extruding said microshapes into a microstructure of said barrier, weaving said microshapes into the microstructure of said barrier, mixing said microshapes with a fluid or gel and flowing them into the microstructure of said barrier, placing said microshapes between one or more layers of said barrier and positioning said microshapes between said barrier and an elastomer coating covering said barrier; and

implanting said barrier at said localized periodontal regeneration site, wherein said time-release microshapes will begin to release said at least one chemotherapeutic agent at said localized periodontal regeneration site in a sustained controlled manner.

5,197,883

SOUND-CODED READING

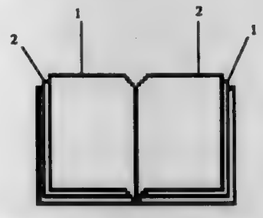
Louise D. Johnston, 336 Turley Falls Rd., Hendersonville, N.C. 28739

Continuation-in-part of Ser. No. 798,661, Nov. 26, 1991. This application Jul. 23, 1992, Ser. No. 919,169

Int. Cl.[5] G09B *1/00*

U.S. Cl. 434—167 **5 Claims**

3. A book comprising alternating opaque pages and transparent pages wherein said opaque page comprises text; wherein said transparent pages comprise sound descriptors which overlay said text of said opaque page; said sound descriptors comprise five marks wherein one said mark indicates the long vowel sound; one said mark indicates the two-letter digraph forming a single sound; one said mark indicates a silent letter;



one said mark indicates the sound made with a slight throat utterance; one said mark indicates a misleading letter.

5,197,884

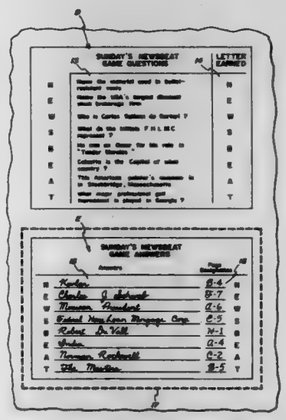
QUESTION AND ANSWER GAME FOR STIMULATING INTEREST IN NEWS PERIODICALS

James W. Roemer, Jr., East Berne, and Paul V. Tymchyn, Altamont, both of N.Y., assignors to Tymroe Venture Partners, Albany, N.Y.

Filed May 14, 1991, Ser. No. 699,603

Int. Cl.[5] G09B *17/00*

U.S. Cl. 434—178 **31 Claims**



31. A question and answer game for stimulating interest in news periodicals, comprising:

a) news periodical having at least one section, said at least one section including a plurality of printed indicia therein; and,

b) inquiry means for causing an individual to review at least a portion of said at least one section of said news periodical, said inquiry means consisting of a plurality of questions, the answer to which is found in the printed indicia in said at least one section, each of said plurality of questions being free from indicia which identify to the player the location in said at least one section where the answer can be found.

5,197,885

THERAPEUTIC DOLL AND METHOD OF OPERATION

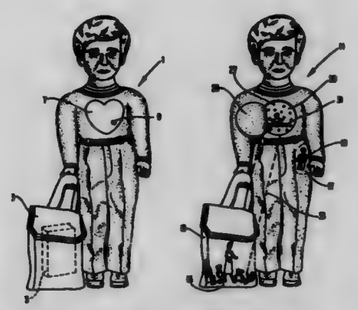
Joan Friedel, 219 Northway, Baltimore, Md. 21218

Continuation of Ser. No. 669,625, Mar. 14, 1991, Pat. No. 5,094,621. This application Jan. 29, 1992, Ser. No. 827,316

The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.

Int. Cl.[5] G09B *19/00*; A63H *3/00*

U.S. Cl. 434—236 **23 Claims**



1. A therapeutic doll comprising a body having a head; a torso having an outer surface, two arms and two legs, a cavity within said torso, means for opening and closing a portion of said torso to access said cavity, a shelf disposed within said cavity, a translucent area defined by at least a portion of the outer surface of said torso, means within said torso for illuminating said translucent area, and means for activating said illuminating means to illuminate said translucent area.

5,197,886

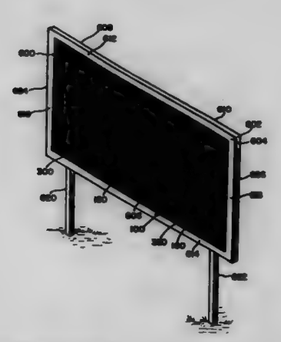
PROCESS AND DISPLAY WITH MOVEABLE IMAGES

Yoshi Sekiguchi, 437 Marshman, Highland Park, Ill. 60035

Division of Ser. No. 447,064, Dec. 7, 1989, Pat. No. 5,098,302. This application Dec. 31, 1991, Ser. No. 815,420

Int. Cl.[5] G09B *19/00*

U.S. Cl. 434—365 **4 Claims**



1. A display, comprising:

a sign for advertising and displaying information;

said sign having a billboard comprising a substantially planar and rectangular stationary rearward web, a substantially stationary front web spaced in front of and substantially parallel to said rearward web, a frame assembly having a front frame section with substantially horizontal top and bottom beams fixedly secured to said front web, and at least one upright post connected to said bottom beam for elevating said webs above the ground;

said rearward web having first and second superimposed striped images thereon;

said front web comprising a substantially transparent viewable portion with a set of aliquot slit-like spaces providing a series of substantially rectangular transparent windows for viewing only said first superimposed images from first angular position and for viewing only said second superimposed images from a second angular position, and said grid-like pattern comprising a set of aliquot spaced opaque bars with substantially rectangular portions positioned between said rectangular windows for substantially blocking the view of said second superimposed image from said first angular position and for substantially blocking the view of said first superimposed image from said second angular position;

said first superimposed image on said rearward web having viewable first opaque portions and substantially rectangular obstructed invisible first spacer portions, said viewable first opaque portions comprising an array of aliquot spaced substantially rectangular first strips with first indicia thereon comprising some of said information, said first strips having a width less than said windows and being aligned in registration with said windows for viewing in said first angular position, and said first spacer portions spanning a width less than said bars and being substantially obstructed and blocked from view by said bars in said first angular position;

said second superimposed image on said rearward web having viewable second opaque portions and substantially rectangular obstructed second spacer portions, said viewable second opaque portions comprising an array of aliquot spaced substantially rectangular second strips with second indicia thereon comprising some of said information, said second strips having a width less than said windows and being aligned in registration with said windows for viewing in said second angular position, and said second spacer portions spanning a width less than said bars and being substantially obstructed and blocked from view by said bars in said second angular position; and

at least a portion said first opaque strips of said first superimposed image being positioned in at least a part of said second spacer portions of said second superimposed image on said rearward web, and at least a part of said second opaque strips of said second superimposed image being positioned in said at least a part of said first spacer portions of said first superimposed image or said rearward web.

5,197,887

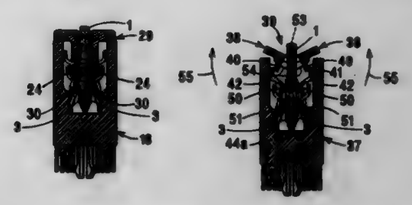
HIGH DENSITY CIRCUIT CONNECTOR

Ronald V. Davidge, Coral Springs; Todd A. McClurg, Boca Raton; Jay H. Neer, Boca Raton; Darryl C. Newell, Boca Raton, all of Fla.; Heinz Piorunneck, Trumbull; Rocco J. Noschese, Wilton, and Ronald P. Sidor, Stratford, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1992, Ser. No. 858,802

Int. Cl.[5] H01R *23/70*

U.S. Cl. 439—60 **17 Claims**



1. Apparatus for removably receiving a card interface surface of a daughter card and for electrically connecting various conductive portions of said card interface surface with contact terminals extending from said apparatus, said apparatus comprising:

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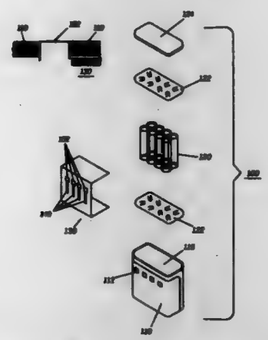
an electrically insulative connector housing having an outer surface and a housing interface surface;
a plurality of spring contacts mounted within said connector body extending individually between said housing interface surface and said contact terminals;
travel limiting means for limiting engagement of said card interface surface with said housing interface surface to a level of full engagement; and
interposing means separating certain of said spring contacts from certain of said conductive portions of said card interface surface as said card interface surface is brought into said level of full engagement with said housing interface surface and holding said certain of said spring contacts in separation with said conductive portions of said card interface surface as said card is held at said level of full engagement;
wherein others of said spring contacts extend to electrically engage said card interface surface as said card is brought into and held at said level of full engagement.

5,197,888
METHOD OF POSITIONING FLEXIBLE CIRCUIT MEMBERS ON A COMMON CIRCUIT MEMBER
William L. Brodsky, Binghamton, and Donald P. Seraphim, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 25, 1992, Ser. No. 841,120
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—67 **18 Claims**

1. A method of precisely positioning a plurality of flexible circuit members each having at least one contact array on a rigid, common circuit member having a plurality of contact arrays such that each of said contact arrays of said flexible circuit members aligns with and engages a respective one of said contact arrays of said rigid, common circuit member, said method comprising:
providing a plurality of flexible circuit members each including a flexible circuitized substrate having a contact array thereon and a holder member having at least two locating elements located at precise dimensions with respect to said contact array;
providing a rigid, common circuit member having a plurality of contact arrays;
establishing first and second reference points;
determining from said reference points the precise location of each of said contact arrays on said rigid, common circuit member;
determining the location of a pair of location apertures relative to each of said contact arrays on said rigid, common circuit member based on the dimensions between said two locating elements located at said precise dimensions with respect to each of said contact arrays of said flexible circuit members;
providing said pair of location apertures within said rigid, common circuit member relative to each said contact arrays on said rigid, common circuit member; and
positioning said locating elements on each of said flexible circuit members within respective pairs of said location apertures to thereby align said contact arrays of said flexible circuit members to respective ones of said contact arrays of said rigid, common circuit member.

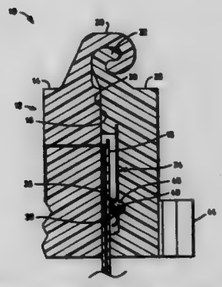
5,197,889
ELECTRICAL CONTACT FOR BATTERY PACKAGE OR SIMILAR DEVICE
Matthew Rizzo, Plantation, and Mark S. Bresin, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 3, 1992, Ser. No. 829,642
Int. Cl.[5] H05K *1/18*
U.S. Cl. 439—76 **19 Claims**



1. An assembly including an electrical contact, comprising:
a housing having multiple walls and having at least one opening in at least one of said walls; and
a circuit assembly situated within said housing, the circuit assembly comprising:
a substrate material having two major opposed faces;
a conductive circuit pattern on at least one face of said substrate material; and
a conductive member having first and second portions, said first portion bonded to said substrate with a polymeric, non-conductive adhesive and electrically connected to said conductive circuit pattern by means of a plated through hole, said second portion having a shape substantially the same as said housing opening and situated within said opening to form an electrical contact in said housing wall.

5,197,890
HYDRODYNAMIC ELECTRICAL CONNECTOR
Douglas G. Seymour, Warren, Pa., assignor to GTE Products Corporation, Danvers, Mass.
Filed Jan. 10, 1992, Ser. No. 818,937
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—77 **4 Claims**

1. An electrical connector assembly comprising:
a first body part having a first surface and a second surface normal thereto, said second surface containing a plurality of electrically conductive traces thereon in a particular spacing array;
a first hinge half projecting from said first surface;
a flexible printed circuit board having a plurality of electrically conductive ribs in said particular spacing array adjacent said second surface, said ribs being in contact with said traces;
a second body part having a third surface and a fourth surface normal thereto, said third surface carrying a second hinge half in mating engagement with said first hinge half; said fourth surface carrying a plurality of springs in substantially the same particular spacing array as said traces and ribs, each of the springs of said plurality of springs presenting a protuberant portion extending toward said flexible printed circuit board whereby a concavity exists on the side of said springs away from said flexible printed

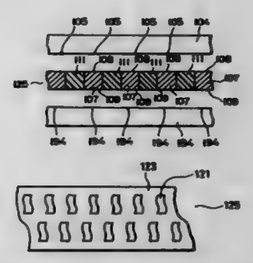


circuit board; a fluid filled bladder positioned in said concavity; a Hertz dot positioned at the apex of each of said protuberant portions of each of said springs of said plurality of springs; and locking means maintaining said second body part in engagement with said first body part.

5,197,891
THROUGH BOARD SURFACE MOUNTED CONNECTOR
Junichi Tanigawa, Kawasaki, and Shoji Kikuchi, Hiratsuka, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 15, 1992, Ser. No. 884,092
Claims priority, application Japan, Jun. 14, 1991, 3-53173
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—83 **10 Claims**

1. An electrical connector for mounting in an aperture of a circuit board, comprising:
a dielectric housing having a main body portion with a substantially flat bottom surface, an upper section for being disposed within the aperture of the circuit board so as to extend above the upper surface thereof, and a lower section having a substantially flat bottom surface extending outwardly from at least one side of said housing;
electrical contacts secured in contact-receiving passageways of said housing including contact sections located in said upper section and termination sections disposed in said housing lower section, said termination sections having a substantially flat bottom surface, and further having upper exposed surfaces for electrical connection to circuit pads disposed along the lower surface of the circuit board adjacent the aperture; and
wherein said main body, said housing lower section, and said termination sections bottom surfaces are in substantial flush alignment across the surfaces thereof, thereby permitting close stacking of a plurality of said circuit boards.

5,197,892
ELECTRIC CIRCUIT DEVICE HAVING AN ELECTRIC CONNECTING MEMBER AND ELECTRIC CIRCUIT COMPONENTS
Tetsuo Yoshizawa, Yokohama; Yoshimi Tarayama, Odawara; Hiroshi Kondo, Yokohama; Takashi Sakaki, Tokyo; Shunichi Haga, Yokohama; Yasutoru Ichida, Machida, and Masaki Konishi, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 359,169, May 30, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 677,379
Claims priority, application Japan, May 31, 1988, 63-133396; May 31, 1988, 63-133397
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—91 **7 Claims**



1. An electric circuit device comprising:
an electric connecting member having a support member made of an electrically insulating material and a plurality of electrically conductive members, having first and second ends, buried in said support member and being isolated from one another, with said first ends of said electrically conductive members being exposed at a first surface of said support member, and said second ends of said electrically conductive members being exposed at a second surface of said support member;
a first electric circuit component having connecting regions connected to said first ends of said electrically conductive members; and
a second electric circuit component having connecting regions connecting to said second ends of said electrically conductive members, wherein
the first and second exposed ends of at least one electrically conductive member is wave-like or S-like in shape along a surface substantially parallel to said first surface of said support member, and said ends of said electrically conductive members are diffused so as to exchange atoms with said connecting regions of said electric circuit components.

5,197,893
CONNECTOR ASSEMBLY FOR PRINTED CIRCUIT BOARDS
Danny L. C. Morlion, Ghent; Luc Jonckheere, Louvain, and Geert A. Lips, Oostduinkerke, all of Belgium, assignors to Burndy Corporation, Norwalk, Conn.
Continuation of Ser. No. 666,835, Mar. 8, 1991, abandoned. This application Mar. 2, 1992, Ser. No. 844,992
Claims priority, application Netherlands, Mar. 14, 1990, 9000578
Int. Cl.[5] H01R *13/652, 13/658*
U.S. Cl. 439—101 **20 Claims**

20. A connector assembly comprising:
a first connector element having a first housing with first signal and ground contacts; and
a second connector element having a second housing with second signal and ground contacts and a plurality of outer conductors, the second connector element being removably connected to the first connector element with the first signal contacts contacting the second signal contacts

opening into said mating face; the housing further comprising;

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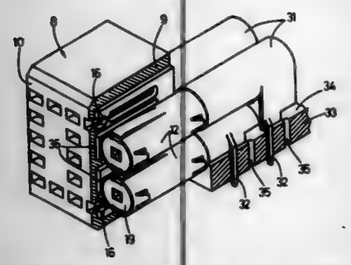
and at least some of the first ground contacts contacting the second ground contacts, each of the outer conductors substantially entirely circumferentially enclosing at least



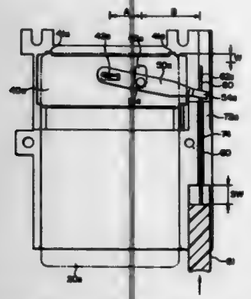
one of the second contacts and having contact spring sections at opposite sides of the outer conductor contacting the first ground contacts located at the opposite sides of the outer conductor.

5,197,894

ELECTRICAL CONNECTOR EQUIPPED WITH A RELEASE MECHANISM

Kazunaga Koike, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Limited, Tokyo, Japan

Filed May 27, 1992, Ser. No. 889,156
Claims priority, application Japan, May 30, 1991, 2-48270[U]
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—159 **12 Claims**



1. An electrical connector equipped with a release mechanism for use in engagement of a plurality of mating elements, comprising:

an insulator frame body having hollow portions and a plurality of conductive fixed contacts arranged in said hollow portions, said hollow portions having an open end to allow reception of a plurality of said mating elements,

each of said mating elements having a plurality of mating contacts to be brought into electrical contact with said fixed contacts in one-to-one correspondence while said mating element is coupled with said frame body,

a release mechanism being formed in said frame body to move said mating elements in a releasing direction along which said mating contacts are released from engagement with said fixed contacts,

said release mechanism comprising a plurality of flat plates inserted into said hollow portions in parallel to one another and in one-to-one correspondence to a plurality of said mating elements and movable in said releasing direction, a plurality of lever means for respectively moving a plurality of said flat plates in said releasing direction, and one manually operated means for rotating a plurality of said lever means,

each of said flat plates having hook means for catching an engaging end face of a corresponding one of said mating elements to mechanically move the corresponding one of said mating elements in said releasing direction,

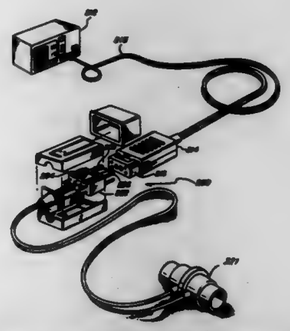
each of said lever means being located in the midst of a travelling path of said manually operated means and having an end portion coupled to a corresponding one of said flat plates, an intermediate portion pivotally and rotatably supported on a support formed inside said frame body in the vicinity of said open end, and an opposite end portion coupled to a top end of said manually operated means.

5,197,895

DISPOSABLE ELECTRO-FLUIDIC CONNECTOR WITH DATA STORAGE

Josef J. Stupecky, Laguna Niguel, Calif., assignor to Bicore Monitoring Systems, Irvine, Calif.

Filed May 10, 1991, Ser. No. 698,589
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—194 **16 Claims**



12. A multiple connector for medical apparatus for rapidly connecting and disconnecting with a single male and female connector a plurality of fluid lines while maintaining consistent, bubble-tight fluid interconnection thereof, said connector having a male configuration comprising:

male tubular hollow fluidic pins, corresponding to the number of fluid connections, extending from the end of said male connector, the external wall of said fluidic pins having a tapered angle throughout most of their length and merging into a cylindrical portion;

and said connector having a female configuration comprising:

a female fluidic receptacle having female fluidic socket openings corresponding to said male fluid pins, said female fluidic socket tapering to a narrower internal cylindrical portion having an internal diameter slightly smaller than the outer diameter of the cylindrical portion of the male fluidic pin so that an interference fluid-tight fit is created when said male fluidic tubular pins are inserted into said female receptacle fluidic sockets.

5,197,896

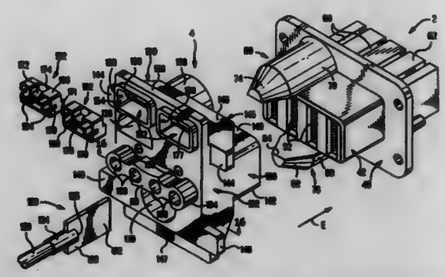
FLOAT MOUNTING AN ELECTRICAL CONNECTOR

John M. Landis, Camp Hill, and George H. Douty, Mifflintown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 28, 1992, Ser. No. 843,788
Int. Cl.[5] H01R *13/64, 13/74*
U.S. Cl. 439—247 **12 Claims**

1. An electrical connector housing for float mounting in a T-shaped cut out in an adapted panel, the cut out having a transverse part extending beyond a perpendicular part, the housing comprising: a forward mating face, a rear face, an upper face, opposite side walls connecting said forward and rear faces and at least one contact receiving through cavity

opening into said mating face; the housing further comprising; a pair of upper flanges projecting laterally beyond respective ones of said walls proximate to said upper face, a pair of lower flanges projecting laterally beyond respective ones of said side walls proximate to said lower face, and a top flange projecting from said upper face above said upper flanges, each of said flanges having a panel engaging face, the panel engaging faces of the top flange and the lower flanges facing forwardly and the panel engaging faces of the upper flanges facing rear-



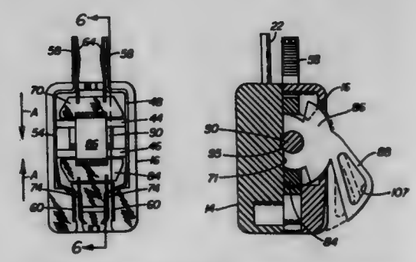
wardly and being positioned forwardly of the panel engaging faces of said top flange and said lower flanges, whereby upon insertion of said housing into said cut out with said mating face leading and said upper flanges projecting through the transverse part of said cut out and beyond the front surface of the panel, and the panel engaging faces of said top flange and said lower flanges engaging a rear surface of the panel, and the housing can be moved along the perpendicular part of the cut out so that the panel engaging faces of the upper flanges engage said front surface of the panel.

5,197,897

LOCKING CORD CONNECTOR AND METHOD OF LOCKING AN ELECTRICAL PLUG AND RECEPTACLE TOGETHER

Dale W. Torok, 1105 North Broadway, Lexington, Ky. 40505

Continuation-in-part of Ser. No. 664,456, Feb. 28, 1991, Pat. No. 5,108,301, which is a continuation of Ser. No. 482,075, Feb. 16, 1990, abandoned. This application Apr. 27, 1992, Ser. No. 874,726
The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.
Int. Cl.[5] H01R *13/15, 13/635*
U.S. Cl. 439—263 **17 Claims**



1. A locking electrical cord connector, comprising:

a housing of electrically non-conductive material;

a male electrical contact held in said housing;

first means cooperating with said male electrical contact for positively binding said male electrical contact in a standard receptacle as defined by NEMA/ANSI specifications;

a female electrical contact held in said housing;

a second means cooperating with said female electrical contact for positively binding said female electrical contact to a standard plug of another electrical appliance, said standard plug being defined by NEMA/ANSI specifications; and

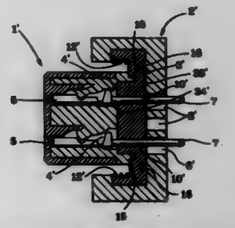
means for selectively actuating said first and second binding means whereby said electrical cord connector may be relatively easily connected to said receptacle and plug while following actuation, positive binding action is provided to resist inadvertent disconnection that might otherwise occur during normal use of said electrical appliance.

5,197,898

MULTI-CONTACT ELECTRICAL CONNECTOR WITH ONE-PIECE SEAL

Akira Nagamine, Kanagawa, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 21, 1992, Ser. No. 886,993
Claims priority, application Japan, Jun. 28, 1991, 3-158968
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—271 **17 Claims**



1. A sealed connector matable along a given axis with a further connector comprising a first dielectric housing including a plurality of contact-receiving cavities, the housing having front and rear faces with the cavities opening to said faces, said rear face comprising one wall of a recess in said first housing, a second dielectric housing having a plurality of openings leading to a forward face to receive electric wires terminated to contacts inserted in the cavities of the first housing, the first housing having a peripheral geometry to fit within the second housing, a seal including apertures to receive the wires in a tight sealing engagement with the seal fitted between the first and second housings, the seal having a planar radially inner surface geometry engaged and surrounded by a peripheral wall of said recess to be engaged by the rear face of the first housing and the forward face of the second housing and having a peripheral radially outer geometry to be engaged peripherally by the housing of the further connector extended within the second housing and over the first housing with the seal being compressed transversely to the axis of mating thereby providing a sealing action for the connector.

5,197,899

WATER-PROOF CONNECTOR

Nobuyuki Akeda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Apr. 23, 1992, Ser. No. 872,505
Claims priority, application Japan, Apr. 30, 1991, 3-98637
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—271 **11 Claims**

1. A water-proof connector, comprising:

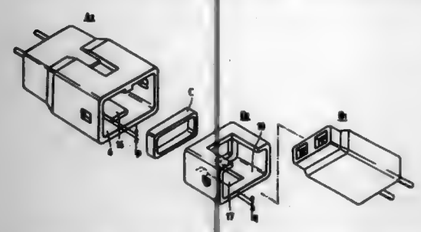
a female connector housing having an opening at one end thereof and including an expanding key on an inner surface thereof;

a male connector housing insertable into the opening of said female connector housing;

a sealing ring disposed within the said female housing so as to be positioned between said male and female connector housings; and

a retaining member for retaining said sealing ring within said

female connector housing, said retaining member being hollow and having a longitudinally extending slot provided in an outer wall thereof, wherein said expanding key



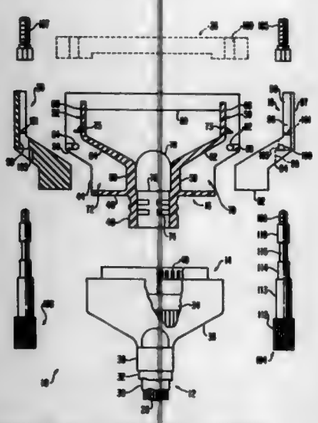
is forced into said slot causing said retaining member to expand outwardly against said female connector housing so as to frictionally retain said retaining member to said female connector housing.

5,197,900

ENERGY TRANSMISSION CABLE CONNECTOR WITH INTERCHANGEABLE LOCKING MECHANISMS

J. Scott Ellis, and Keith R. Carver, both of Milpitas, Calif., assignors to Icontec, Inc., Milpitas, Calif.

Filed Dec. 21, 1990, Ser. No. 631,879
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 **33 Claims**



1. A connector, the combination comprising:

an energy transmission cable having a connector housing coupled thereto;

an outer housing enclosing said connector housing and coupled to said energy transmission cable;

a pair of locking means for locking said outer housing to another device, each of said locking means having a bore therethrough for receiving a fastener; and

coupling means, coupled to said outer housing and said pair of locking means, for removably coupling said pair of locking means to said outer housing,

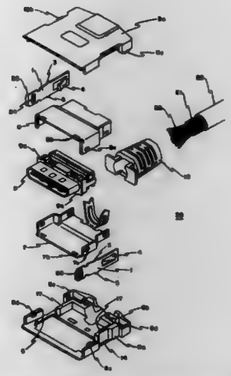
said outer housing having a longitudinal axis and a pair of cavities, each of said cavities being laterally-facing and outwardly-opening, and adapted to receive one of said locking means therein upon sliding of said locking means in the lateral direction substantially perpendicular to said longitudinal axis.

5,197,901

LOCK-SPRING AND LOCK-EQUIPPED CONNECTOR

Osamu Hashiguchi, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Limited, Tokyo, Japan

Filed Oct. 29, 1991, Ser. No. 784,248
Claims priority, application Japan, Oct. 30, 1990, 2-113054[U]; Jan. 10, 1991, 3-3331[U]
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 **7 Claims**



4. A lock-equipped connector which has a lock spring to engage a counterpart connector having a hook section comprising:

a connector body for connecting one electric wire with another electric wire via said counterpart connector;

a pair of hood members for hooding said connector body therebetween, each of said hood member comprising a movable operating section for operating said lock spring to release said hook section from said lock spring, said lock spring comprising a lock body shaped like a plate, said lock body comprising a front portion, a middle portion, and rear portion, successively; said lock spring comprising:

a spring member disposed on said rear portion for biasing said rear portion against said movable operating section towards one direction;

a pivot member disposed on said middle portion for operating as a fulcrum in cooperation with said spring member; and

a lock member disposed on said front portion and having a hole defined by at least one linear edge to be hooked by said hook section.

5,197,902

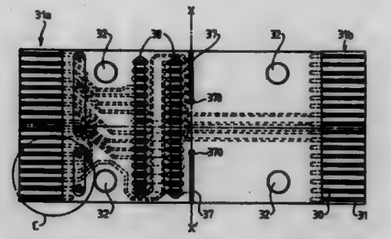
TERMINATION ADAPTOR CONNECTOR DEVICE

Charles Cesar, Saint Martin d'Heres, France, assignor to Bull S.A., Paris, France

Filed May 24, 1991, Ser. No. 705,653
Claims priority, application France, May 30, 1990, 90 06692
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—492 **20 Claims**

1. A termination adaptor connector, comprising a connector of a first type secured in a housing and adapted to be connected to the end of a line over which signals travel of an electronic system having a connector of a second, complementary type, for adapting said line or simulating the connection between the line and an external device, flexible printed circuit means disposed in said housing having exposed conductor sites for supporting and linking adaptation or simulation elements to the connector of the first type, said flexible printed circuit means having a plurality of conductive ends, each of said plurality of conductive ends having two vertical sides, and self-stripping

slit connections, each said self-stripping slit connection being carried by said connector of the first type for linking said connector of the first type and the flexible printed circuit means, said self-stripping connections being disposed orthogo-



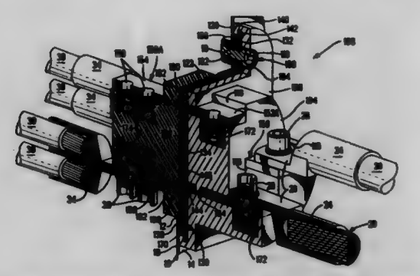
nally to the flexible printed circuit in order to clasp on both vertical sides of each conductive end of the flexible printed circuit and to capture said conductive ends in associated slits of said self-stripping connections.

5,197,903

FIREWALL CONNECTOR

Daniel T. Casey, Harrisburg; William T. Glenwright, York, and Eric T. Green, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 2, 1992, Ser. No. 840,801
Int. Cl.[5] H01R *9/24, 13/74*
U.S. Cl. 439—564 **20 Claims**



1. An electrical connector adapted for bulkhead mounting, for extending through a bulkhead opening and interconnecting associated cables on opposed sides of a bulkhead, comprising:

at least one bus bar having a body section extending between first and second contact sections at first and second ends thereof;

first and second housing portions adjacent said first and second ends of said at least one bus bar and insulatively surrounding said body section thereof while at least exposing said first and second contact sections of each said bus bar for electrical connection to complementary electrical connecting means, at least one of said first and second housing portions including a mounting portion adapted to coextend along a surface of said bulkhead peripherally surrounding said bulkhead opening; and

a transverse substrate embedded within at least one of said first and second housing portions shaped and dimensioned to include a transverse flange within said housing mounting portion and having a transverse bulkhead proximate surface thereof exposed to coextend along a surface of said bulkhead peripherally surrounding said bulkhead opening;

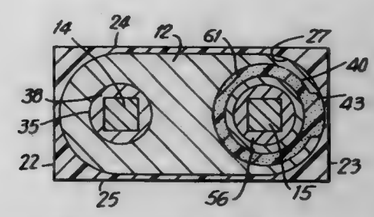
said substrate including at least one bar-receiving aperture axially therethrough for each said bus bar to extend therethrough, and said transverse flange and said housing mounting portion including a plurality of mounting apertures for mounting bolts to extend therethrough for connector mounting to said bulkhead.

5,197,904

CONNECTOR FOR COAXIALLY SHIELDED CABLES

Michael Gold, 80 Oak Dr., Roslyn, N.Y. 11576

Filed Sep. 4, 1992, Ser. No. 941,235
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—581 **7 Claims**



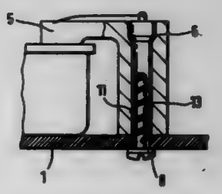
1. A termination connector for a coaxial cable having a signal conductor and a coaxial metallic sleeve comprising: An outer synthetic resinous shell forming a housing element having an insulative outer surface, having a transversely extending wall at a first longitudinal end thereof, and a continuous side wall defining a cavity; a solid metallic core element having first and second end surfaces and a continuous longitudinal side surface corresponding to the internal configuration of said cavity and positioned therein; said core having first and second longitudinal through bores extending in spaced parallel relation between said first and second ends, said end wall of said shield element having openings therethrough corresponding to said bores; said first longitudinal bore having a female contact fitted therein and electrically communicating therewith; said second bore forming a surface at a first end thereof for the electrical interconnection of an exposed segment of said shield of the coaxial cable whereby said signal conductor of said cable projects into said bore; a second female contact assembly soldered to a free end of said signal conductor and having a free end thereof positioned adjacent to the opposite end of said second bore; and a layer of insulative material surrounding the outer surfaces of said second female contact assembly and said signal conductor, said layer being injected into said second bore and cured in place.

5,197,905

CONTACT SLEEVE FOR A MEASUREMENT MOVEMENT

Bernard Tröschel, Oberursel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 781,754
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1990, 4039625
Int. Cl.[5] H01R *13/42*
U.S. Cl. 439—737 **14 Claims**



1. A contact sleeve for installation of a measurement movement to a support element, the sleeve comprising means for

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receiving an attachment screw with electrical connection to the support element;

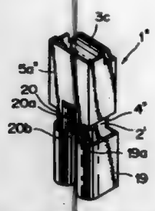
wherein the sleeve is a sheet-metal part rolled into a cylinder which has at least one inwardly directed projection to serve as said receiving means for engagement into the thread of the attachment screw; and

the sleeve includes a twist-preventing means operative with at least one projection directed radially with respect to an axis of the sleeve.

5,197,906
RESILIENT TERMINAL WITH BUCKLING PREVENTION MECHANISM

Mitsugu Watanabe; Nozomi Kawasaki; Masaki Sugiyama, and Yoshihisa Natsume, all of Kosai, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 698,346, May 7, 1991, Pat. No. 5,122,083, which is a continuation of Ser. No. 460,498, Jan. 3, 1990, abandoned. This application Mar. 13, 1992, Ser. No. 817,506
Claims priority, application Japan, Jan. 25, 1989, 1-6399; Nov. 10, 1989, 1-130553
Int. Cl.[5] H01R *13/11*
U.S. Cl. 439—787 **2 Claims**



1. A resilient terminal with a buckling prevention mechanism comprising:

a resilient joint portion formed at the middle of a conductive thin plate;

a resilient contact piece formed by folding an end portion of the conductive thin plate on a first side of said resilient joint portion;

a terminal accommodating case extending from a base portion of the conductive thin plate on said first side of the resilient joint portion so as to enclose the resilient contact piece;

a resilient contact portion formed at the other end of the conductive thin plate on a second side of the resilient joint portion, the resilient contact portion being formed by curling toward each other side pieces that extend from both sides of the conductive thin plate at the second end; and

an abutment piece formed on said terminal accommodating case, the abutment piece being disposed in very close facing relation to the resilient contact portion to almost touch the resilient contact portion.

5,197,907
LEAD TERMINATION DEVICE

Jerome P. Hurtgen, Ft. Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 652,164, Feb. 7, 1991, Pat. No. 5,090,123, which is a division of Ser. No. 381,854, Jul. 19, 1989, Pat. No. 5,007,156, which is a division of Ser. No. 213,720, Jun. 30, 1988, Pat. No. 4,880,391. This application Nov. 13, 1991, Ser. No. 791,942
Int. Cl.[5] H01R *4/36*
U.S. Cl. 439—810 **14 Claims**

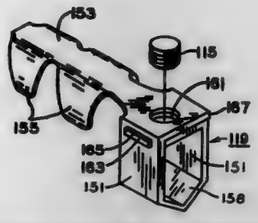
1. A lead termination device formed from a generally thin electrical conductive sheet material and adapted for electrically interconnecting a winding lead of a dynamoelectric machine with a power lead therefor, the lead termination device comprising:

an elongate strip having a pair of generally opposite side edges interposed between a pair of generally opposite end edges, said strip being predeterminately bent generally lengthwise thereof into a multi-sided closed loop adapted to receive a part of the power lead;

a pair of opposite end sections on said strip respectively adjacent said opposite end edges and arranged in overlaid relation with each other thereby to define one side of said multi-sided closed loop, and one of said end edges on one of said opposite end sections extending beyond another side of said multi-sided closed loop adjacent said one side thereof;

a slot through said strip in a third side of said multi-sided closed loop adjacent said one side and generally opposite said another side and said slot being spaced adjacent the other of said opposite end sections;

a flange on said other opposite end section extending beyond the other of said opposite end edges and received in said slot, said other opposite end edge being abutted against



said third side of said multi-sided closed loop when said flange is received in said slot, and said flange having a distal portion extending beyond said third side of said closed loop at least when said other opposite end edge is abutted against said third side;

a pair of openings through said strip in said opposite end sections, respectively, and aligned with each other so as to extend through said one side of said multi-sided closed loop;

a screw threadedly received in said aligned openings to retain said opposite end sections against displacement from the overlaid relation thereof in the closed loop and adapted to engage the power lead part when it is received in the multi-sided closed loop;

means integral with one of said opposite side edges of said strip and extending generally perpendicularly therefrom for defining a set of deformable tabs; and

at least one lead means for connection with the winding lead and having a part gripped in electrical contacting engagement by said deformable tabs upon the deformation thereof.

5,197,908
CONNECTOR

Gunnar Nelson, P.O. Box 32817, Palm Beach Gardens, Fla. 33420

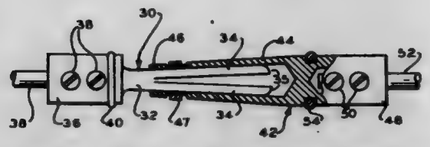
Filed Nov. 29, 1991, Ser. No. 800,092
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—825 **23 Claims**

1. A connector pair comprising:

a receptacle having a sleeve with an outer mouth, said sleeve converging towards its outer mouth; and

a plug comprising a prong having a longitudinal axis and terminating in a graded tip, said prong diverging towards said tip and being sized to fit snugly inside said sleeve for preventing angular displacement of said axis of said prong, said prong further having a base and pair of tines cantilevered from said base, said pair of tines partially dividing said prong lengthwise, said pair of tines both diverging

and touching the inside of said sleeve along a length from the junction of said base and said tines up to said graded

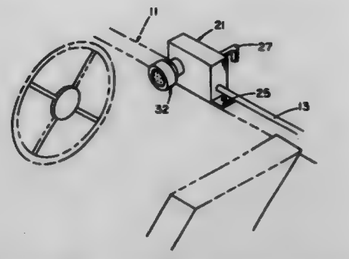


tip, so that the outside of said tines can make intimate electrical contact with the inside of said sleeve.

5,197,909
OUTBOARD MOTOR WATER PUMP INDICATOR APPARATUS

Hugo Rosaitto, 611 - 7th St., Lake Charles, La. 70601

Filed Dec. 30, 1991, Ser. No. 814,595
Int. Cl.[5] B63H *21/38*
U.S. Cl. 440—2 **3 Claims**



1. An outboard motor water pump indicator apparatus for use in combination with an outboard motor mounted to a boat member, wherein the apparatus comprises,

an adapter member arranged for projection within an exit port of an outboard motor, wherein the adapter member includes a first conduit arranged for projection within the exit port, with an abutment ring projecting radially and exteriorly of the first conduit at a forward distal end of the first conduit, and a second conduit projecting from the abutment ring coaxially aligned with the first conduit, wherein the first conduit and second conduit are in fluid communication relative to one another, and

a flexible directional conduit, including a first distal end mounted to the second conduit, and

a second distal end projecting forwardly of the outboard motor for directing water flow from the outboard motor through the second distal end, and

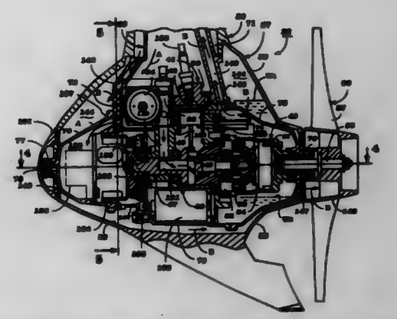
a plurality of mounting brackets secured to the boat member receiving the flexible conduit therewithin, wherein each mounting bracket includes a concave recess arranged for receiving the flexible conduit, and

an indicator assembly, wherein the indicator assembly includes an indicator lower housing, the indicator lower housing including a mounting plate, the mounting plate arranged for securement to the boat member, and the lower housing including a first conduit directed through a side wall of the lower housing, the first conduit in fluid communication with the second distal end of the directional conduit, and the lower housing including a first chamber contained within the lower housing, the first chamber including a spoked paddle wheel rotatably mounted within the first chamber, the spoked paddle wheel includes a plurality of paddle plates, and the paddle plates are positioned adjacent to and in confrontation with the first conduit directed into the first chamber to effect rotation of the spoked paddle wheel, and an audio housing mounted to a front wall of the lower housing, the audio housing including an audio housing first chamber positioned exteriorly of the lower housing rearwardly of a speaker grill and positioned forwardly of a flexible membrane, and coaxially aligned when the audio housing first chamber is an audio housing second chamber projecting into the first chamber of the lower housing, and the audio housing further including a flexible abutment flange mounted to a rear distal end of the audio housing within the first chamber, wherein the abutment flange is arranged for abutment with the spoked paddle wheel for impact of the abutment flange by the paddle wheel, wherein audio resonance is directed through the audio housing and the flexible membrane and the speaker grill.

5,197,910
OUTBOARD MOTOR

Nobuyuki Kanno, and Yoshiharu Yokoyama, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 1, 1991, Ser. No. 723,840
Claims priority, application Japan, Jul. 2, 1990, 2-175811; Jul. 2, 1990, 2-175812; Jul. 7, 1990, 2-180255
Int. Cl.[5] B63H *21/00*
U.S. Cl. 440—89 **32 Claims**



1. An outboard motor having an upper portion adapted to be affixed to the hull of an associated watercraft, a lower unit comprised of an outer housing adapted to be at least partially submerged in a body of water in which the watercraft is operated, a propulsion device carried by said lower unit for powering said watercraft, an internal combustion engine contained entirely within said lower unit outer housing for driving said propulsion device, said engine having a housing defining at least in part a combustion chamber, said lower unit housing defining a cavity surrounding said engine housing, said internal combustion engine having an exhaust port for discharging exhaust gases from said engine into said surrounding lower unit outer housing cavity for circulating the exhaust gases from said exhaust port around at least a portion of said engine for preventing excess cooling of said engine, and an exhaust system for discharging the exhaust gases from said surrounding cavity externally of said outboard motor.

5,197,911
AUTOMATIC RELEASE MECHANISM

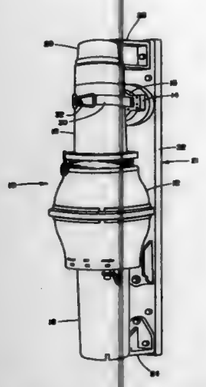
Robert F. Wilson, Vancouver, Canada, assignor to MPR Teltech Ltd., Burnaby, Canada

Filed Aug. 28, 1991, Ser. No. 750,583
Int. Cl.[5] B63B *22/14*
U.S. Cl. 441—10 **11 Claims**

1. An emergency position indicating radio beacon locator, comprising:

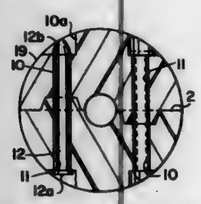
(a) a buoy having a power source radio transmitter and a strobe light;

(b) a mounting bracket assembly affixable to a support surface and having buoy support couplings;
(c) a release mechanism coupled to said buoy, said mechanism having
(i) a strap wrapped at least partially around the said buoy so as to hold it against said mounting bracket assembly;



(ii) engaging means for releasably engaging both ends of said strap; and
(iii) means for actuating release of both ends of said strap by said engaging means in response to an increase in water pressure.

5,197,912
BUOY FOR ATTACHMENT TO THE NET LINE OF A FISHING NET
Ralf M. Lengefeld, Olgastrasse 149, 7301 Deizisau, Fed. Rep. of Germany
Filed Aug. 29, 1991, Ser. No. 751,341
Int. Cl.[5] B63B *22/00*
U.S. Cl. 441—133 **5 Claims**

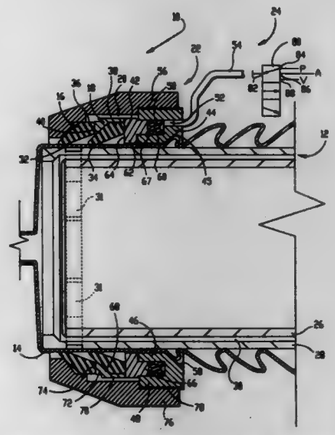


1. A barrel-shaped buoy for a net line of a fishing net, comprising a body made of two identical C-shaped members releasably connected together to form a passage longitudinally through the body for holding the net line, each C-shaped member having two surfaces that engage with corresponding surfaces of the other C-shaped member, each of the surfaces having a frustoconical protrusion and a complementary depression located so that the protrusions on each C-shaped member are arranged diagonally opposite one another and so that the depressions on each member are diagonally opposite one another, the protrusions and depressions of the two C-shaped members engaging with one another when the members are connected together.

5,197,913
METHOD AND APPARATUS FOR CONTROLLING PITCH ATTITUDE OF A TOY IN A FLUID
Toshio Suzuki, Tokyo, Japan, assignor to Toybox Corporation, Tokyo, Japan
Filed Apr. 11, 1991, Ser. No. 683,884
Claims priority, application Japan, Apr. 11, 1990, 2-38934[U]
Int. Cl.[5] A63H *23/00*; A63B *71/00*
U.S. Cl. 446—156 **16 Claims**

1. An apparatus for changing a pitch attitude of a body in a fluid, comprising:
a first float housed within the body; and
a motorized driver coupled to said first float and the body, which changes the pitch attitude of the body in the fluid by changing a positional relationship between said first float and the body.

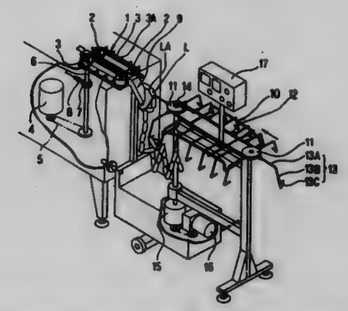
5,197,914
CASING BRAKE MECHANISM FOR STUFFING APPARATUS
Richard G. Powers, Overland Park, Kans., assignor to Marlen Research Corporation, Overland Park, Kans.
Continuation-in-part of Ser. No. 818,339, Jan. 9, 1992, abandoned. This application Apr. 24, 1992, Ser. No. 873,377
Int. Cl.[5] A22C *11/02*
U.S. Cl. 452—32 **17 Claims**



1. A casing brake mechanism adapted for selectively engaging and braking a casing positioned over an elongated, tubular casing horn presenting a longitudinal axis, said mechanism comprising:
a resilient annular ring positioned about said horn and including an inner surface for engaging said casing, and an opposed, outer, enlarged shoulder region;

a substantially rigid, annular retainer disposed about said ring and including an inner face proximal to said shoulder region;
a movable thrust element adjacent said ring and presenting a first ring-engaging face and a second trailing face remote from said ring-engaging face; and
means for selectively moving said thrust element in a direction generally parallel with said horn longitudinal axis for alternately compressing said ring and causing the ring to engage said casing, and for releasing said ring,
said thrust element being movable relative to said annular retainer,
said element-moving means including a source of pressurized fluid for selective action against said trailing face in order to effect said ring compression, and means for selectively relieving pressure exerted against said trailing face.

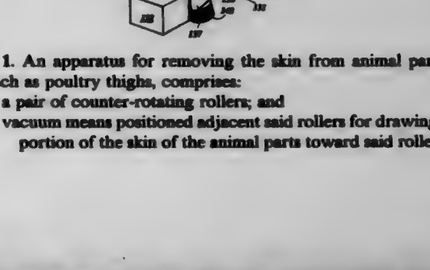
5,197,915
METHOD AND APPARATUS FOR SUSPENDING A CHAIN OF LINKED
Minoru Nakamura, Tokyo; Nobuo Kimura, Sagamihara, and Minoru Kasai, Ebina, all of Japan, assignors to Hitec Co., Ltd., Japan
Filed Jan. 23, 1992, Ser. No. 824,286
Claims priority, application Japan, Jan. 25, 1991, 3-023892
Int. Cl.[5] B65G *37/00*; A22C *11/00*
U.S. Cl. 452—51 **8 Claims**



1. A method of suspending a chain of products wherein the chain of products in which a material is stuffed in a casing is conveyed by a conveying device, and the movement of an endlessly traveling member with a plurality of suspending members disposed thereon is controlled such that the chain of products sent from the conveying device is consecutively retained by each of the suspending members for each predetermined number of links, comprising the steps of:
detecting an amount of displacement of said conveying device and generating a signal of a value proportional to said amount of displacement; and
controlling said suspending members on the basis of the signal in such a manner that the chain of products is suspended from said each of said suspending members for each predetermined number of links.

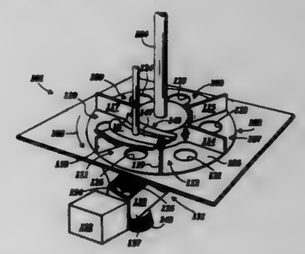
5,197,916
FISH SKINNER
Franklin P. Orlando; Thomas Franco, both of Morgan Hill; Mark P. Parker, San Jose, and Allen C. Thompson, Hayward, all of Calif., assignors to Star-Kist, Inc., Long Beach, Calif.
Filed Jun. 23, 1992, Ser. No. 902,859
Int. Cl.[5] A22C *25/17*
U.S. Cl. 452—125 **13 Claims**

1. A process for skinning fish comprising:
precooking and cooling the fish until the temperature thereof is such that the skin thereof is amenable to removal by brushing contact with minimum damage to the meat of the fish thereunder;
placing said fish on conveyor means moving, toward a series of rotating brushes above and adjacent to the belly and back of said fish so that the bristles on the brushes contact the fish and remove the skin from the side, belly and back of each said fish without tearing the meat adjacent thereto;
spraying water on said rotating brushes at the fish-brush interface and said belt conveyor means to assist in washing way loosened skin;
passing each said fish into turn-over means wherein said fish



is turned over to expose the opposite side thereof for delivery to second conveyor belt means;
passing said over-turned fish on said second conveyor belt means toward a second series of rotating brushes above said over-turned fish so that the bristles on the brushes contact said opposite unbrushed side of each said fish and remove the skin from said opposite side thereof without tearing the meat adjacent thereto;
further spraying water at the fish-brush interface between said opposite side and said second brushes; and
thereafter recovering said washed and deskinned fish from said second conveyor belt.

5,197,917
APPARATUS FOR REMOVING SKIN FROM ANIMAL PARTS
Godefridus W. Verbakel; Thomas G. Jacobs, both of Gainesville; Robert J. Conklin, Buford, and Raymond F. Strawn, Flowery Beach, all of Ga., assignors to Stork Gamco, Inc., Gainsville, Ga.
Filed Oct. 11, 1991, Ser. No. 776,596
Int. Cl.[5] A22B *5/16*
U.S. Cl. 452—131 **26 Claims**



1. An apparatus for removing the skin from animal parts, such as poultry thighs, comprises:
a pair of counter-rotating rollers; and
vacuum means positioned adjacent said rollers for drawing a portion of the skin of the animal parts toward said rollers.

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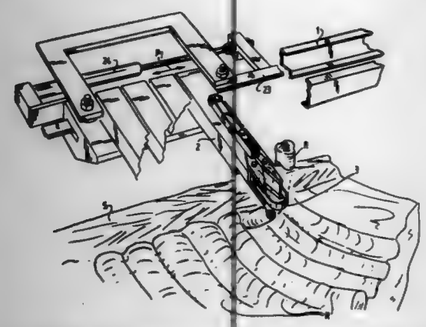
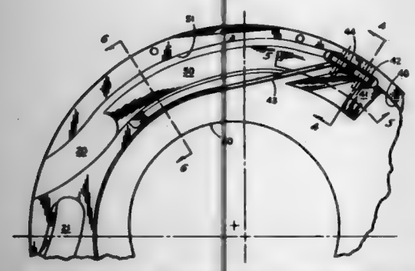
5,197,918
DEVICE FOR SEPARATING BONY MATERIAL FROM A MEAT PIECE
Lambertus G. M. Klaassen, Roosendaal, Netherlands, assignor to Stork Protecon B.V., Oss, Netherlands
Filed Jul. 31, 1991, Ser. No. 738,253
Claims priority, application Netherlands, Aug. 1, 1990, 9001746
Int. Cl.[5] A22C *17/00*
U.S. Cl. 452—171 17 Claims



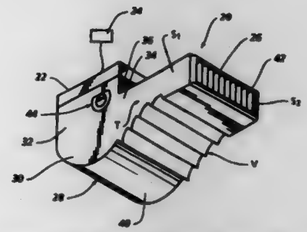
1. A device for separating bony material, such as a rib, from a meat piece, for example a half belly piece, comprising a frame, wherein the meat piece is fixed;
at least one carrier supported by the frame;
an elongate element formed into one or more loops, a portion of which is arranged movably in the carrier;
drive means connected to the carrier for setting the element into movement relative to the carrier;
wherein the carrier is provided with means for adjusting the loop shape of the elongate element.

5,197,919
DISC-TYPE COIN SORTER WITH MOVABLE BEARING SURFACE
Joseph J. Geib, DesPlaines, and Rasmussen M. James, Chicago, both of Ill., assignors to Cummins-Allison Corporation, Mt. Prospect, Ill.
Filed Jun. 21, 1991, Ser. No. 719,518
Int. Cl.[5] G07D *3/00*
U.S. Cl. 453—10 7 Claims



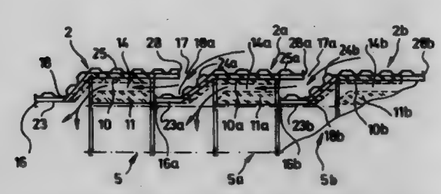
1. A disc-type coin sorter for sorting coin mixtures which include at least one coin denomination made of a soft metal such as as aluminum, said sorter comprising:
a rotatable disc having a resilient top surface,
means for rotating said disc,
a stationary head having a lower surface positioned over and closely adjacent to the upper surface of said disc and having an opening in said central region thereof for feeding coins between the opposed surfaces of said disc and sorting head,
the lower surface of said sorting head being contoured to align said coins in a single file and single layer of coins, said contoured lower surface having at least one region located close enough to said resilient top surface to press said soft-metal coins into said resilient surface, whereby said resilient surface urges said soft-metal coins upwardly against said sorting head, said pressing region including a gaging recess for aligning the edges of all the single-file coins at a common radius, and
at least one rotatable non-driven bearing member mounted at the upstream end of said pressing region of said sorting head for engaging soft-metal coins passing thereunder so as to provide a rotatable bearing surface which eliminates or reduces galling of the soft metal of the coin on that region of the sorting head.

5,197,920
ELEMENT FOR USER IN A HEATING AND AIR CONDITIONING DUCTWORK SYSTEM
Thomas Ganse, 1025 Oakdale La., Lemoore, Calif. 93245
Filed Sep. 23, 1991, Ser. No. 764,230
Int. Cl.[5] F24F *13/06*
U.S. Cl. 454—228 4 Claims



1. An element for use in a heating and air conditioning ductwork system comprising:
(A) an intake section having an intake cross-sectional area and being fluidically connected to a source of heated or cooled air;
(B) an exhaust section having an exhaust cross-sectional area that is less than said intake cross-sectional area;
(C) a body fluidically connecting said intake section, to said exhaust section, said body having an shaped portion and converging in cross-sectional area from said intake section to said exhaust section and forming a throat section adjacent to said exhaust section and converging to said throat section, air flow through said body being subsonic and establishing a negative pressure gradient that varies according to an area/pressure relationship of $(dA)/A=[V^2][1-M^2]$, where A=area; p=pressure; V=air flow velocity; and M=the mach number;
(D) a plurality of vents defined in said arcuate shaped portion of said body, each vent having a cross-sectional area that differs from the cross-sectional area of adjacent vents, said vent cross-sectional areas decreasing from said intake section to said exhaust section according to said/pressure relationship.

5,197,921
CONSTRUCTION ELEMENT FOR A NOISE-SUPPRESSION SHED
Gerd De Lank, Heddesheim, and Klaus-Peter Labien etzki, Dossenheim, both of Fed. Rep. of Germany, assignors to Werner Genest und Partner Ingenieurgesellschaft mbH, Ludwigshafen am Rhein, Fed. Rep. of Germany
Filed Mar. 28, 1991, Ser. No. 676,551
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1990, 4010329
Int. Cl.[5] F24F *7/02*
U.S. Cl. 454—254 22 Claims



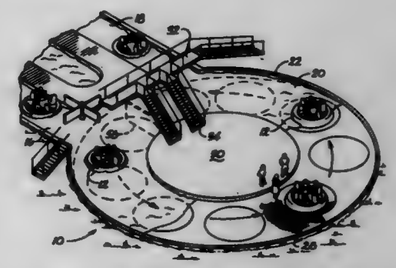
1. A construction element for forming the roof of a noisesuppression shed from a plurality of said elements connected together in the transverse and longitudinal directions of the shed, said roof having a plurality of transversely extending air inlets distributed along the longitudinal length of the roof, each construction element comprising a frame structure, a cover panel mounted on said frame structure and having two opposite spaced ends that, when said elements are connected together to form said roof, extend in the transverse direction of the shed, a first one of said ends overlapping, in the longitudinal direction of the shed and in a spaced manner, the opposite end of an adjacent construction element to form a transversely extending air inlet gap therebetween, a first liner of sound-absorbing material carried on the under side of said cover panel and a second liner of sound absorbing material carried by said frame structure and spaced from said first liner to form an air passage gap therebetween that communicates said air inlet gap with the interior of the shed.

5,197,922
METHOD AND APPARATUS FOR PRODUCING TWO-SIDED CARBONLESS COPIES OF BOTH SIDES OF AN ORIGINAL DOCUMENT
Keith E. Schubert, 4 Timothy Rd., W. Norwalk, Conn. 06850
Continuation-in-part of Ser. No. 334,183, Apr. 6, 1989, Pat. No. 5,127,879. This application Nov. 13, 1989, Ser. No. 436,189
Int. Cl.[5] B41L *1/26*
U.S. Cl. 462—2 37 Claims

1. A single sheet of Carbonless copy paper, consisting essentially of:
a single sheet of paper having a front surface and a back surface and delineated into two portions;
carbonless CB treatment applied to the front and back surfaces of one of the two portions; and
carbonless CF treatment applied to the front and back surfaces of the other of the two portions;
wherein:
writing on one surface of the one portion is carbonless imaged onto one surface of the other portion when the sheet is folded one way;
writing on an opposite surface of the one portion is carbonless imaged onto an opposite surface of the other portion when the sheet is folded an opposite way; and
the sheet is of uniform thickness when folded either way.

35. A method of reproducing onto a copy panel of a single sheet of paper information written or printed on both sides of an original panel of the same single sheet of paper, comprising:
providing a single sheet of paper having a front surface and a back surface and delineated into two panels, one of the two panels serving as an original panel and the other of the two panels serving as a copy panel, wherein a carbonless treatment has been applied to at least the front and back surfaces of the copy panel;
folding the single sheet of paper in one direction so that the copy panel is aligned in back-to-back relationship with the original panel;
entering, by printing or writing, first information on the front surface of the original panel, which first information is reproduced onto the back surface of the copy panel;
folding the single sheet of paper in an opposite direction so that the copy panel is aligned in front-to-front relationship with the original panel; and
entering, by writing or printing, second information on the back surface of the original panel, which second information is reproduced onto the front surface of the copy panel.

5,197,923
FLOATING AND DISEMBARKING PLATFORM
Gerald L. Barber, 10 Whittington Ct., Greenville, S.C. 29615
Filed Sep. 30, 1991, Ser. No. 768,381
Int. Cl.[5] A63G *3/00*
U.S. Cl. 472—13 2 Claims



1. A loading platform for loading and disembarking passengers from floating carriers forming part of an amusement ride comprising:
(a) a circular container filled with water to a predetermined level;
(b) a large disk carried in said circular container, said disk having a support surface constructed of water permeable material;
(c) means for rotating said disk at a predetermined speed;
(d) a large hole provided in the center of said disk;
(e) a stationary loading and disembarkation platform positioned in the center of said disk;
(f) means for supporting said disk at an angle permitting said water level to extend a predetermined distance over said support surface of said disk;
(g) an entrance and exit opening provided in said circular container;
(h) flumes connected to said entrance and exit openings providing ingress and egress to said supporting surfaces of said rotating disk carried in said container;
(i) means for supplying a flow of water to said entrance opening of said circular container; and
(j) partitions provided in said container for directing said flow of water from said entrance opening around said stationary loading and disembarkation platform and out said exit opening, said predetermined level of water being of sufficient height so that said moving water flows through a portion of said rotating platform for loading said carriers on said inclined supporting surface as they pass through said entrance opening into said circular container and are removed from said supporting surface adjacent said exit opening permitting passengers access to said carriers as they are rotated on said disk.

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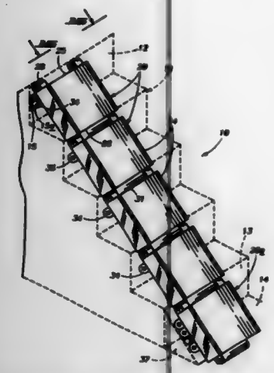
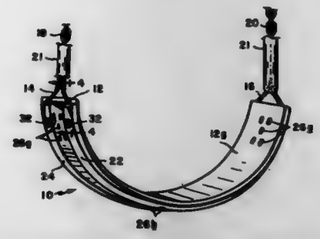
5,197,924
TOY STAIRWAY SLIDE APPARATUS
Kristie Gerrelis, Rte. 5, Box 7, Devils Lake, N. Dak. 58301
Filed Oct. 18, 1991, Ser. No. 779,056
Int. Cl.[5] A63H *29/08, 33/00*
U.S. Cl. 472—116 6 Claims



1. A toy stairway slide apparatus arranged for mounting to a stairway, wherein the stairway includes an uppermost stair vertical wall and a lowermost stair vertical wall in association with a floor surface, wherein the apparatus comprises,
a first anchor member arranged for securement to the uppermost stair vertical wall, and
a second anchor member arranged for securement to the lowermost stair vertical wall and the floor surface, and
at least one slide block pivotally mounted to the first anchor member, and
a lowermost slide block, the lowermost slide block pivotally mounted to the slide block and the second anchor member, and
the slide block includes a block top wall spaced from a block bottom wall, and spaced side walls, and a block front wall spaced from a block rear wall, the block rear wall includes a plurality of rear wall flanges spaced apart a predetermined spacing, each flange of the rear wall flanges includes a rear wall flange bore directed through each rear wall flange, wherein the rear wall flange bores are coaxially aligned relative to one another, and the first anchor member includes a first anchor boss defined by a predetermined length substantially equal to the predetermined spacing defined between the rear wall flanges, and the first anchor boss includes a first anchor boss bore coextensive through the first anchor boss, and the first anchor boss bore and each rear wall flange bore are coaxially aligned, and a first anchor pin is directed through the first anchor boss bore and each rear wall flange bore to pivotally mount the slide block to the first anchor member.

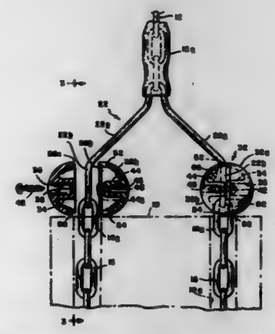
5,197,925
FLEXIBLE SWING SEAT AND METHOD OF ASSEMBLING SAME
Joel C. Cunard, Bedford, Pa., assignor to Hedstrom Corporation, Bedford, Pa.
Filed Dec. 17, 1991, Ser. No. 808,910
Int. Cl.[5] A63G *9/00*
U.S. Cl. 472—118 10 Claims

1. A swing seat comprising
a generally rectangular strap-like seat having a generally flat flexible main body and a pair of tubes extending along the underside of said body adjacent to the longitudinal edges thereof;
a pair of hangers projecting slightly from the opposite ends of said pair of tubes, each hanger having a pair of arms which diverge a distance comparable to the spacing of the tubes and parallel end segments which extend an appreciable distance from said arms into the ends of the tubes;
a pair of flexible connector segments positioned in the pair of



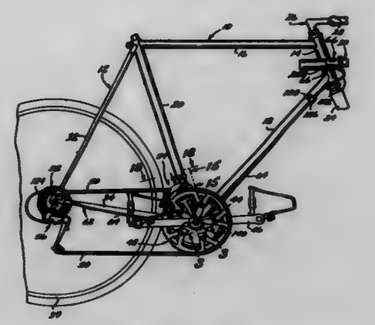
tubes, said connector segments being shorter than the tubes, and
means for attaching the opposite ends of said connecter segments to adjacent ones of said hanger end segments within the pair of tubes.

5,197,926
SWING CONNECTION GUARD
Joel C. Cunard, Bedford, Pa., assignor to Hedstrom Corporation, Bedford, Pa.
Filed Feb. 18, 1992, Ser. No. 838,878
Int. Cl.[5] A63G *9/04*
U.S. Cl. 472—118 21 Claims



1. A guard for a swing connection composed of a connector member having an eye and a hook which hooks through the eye, said guard comprising
a dished shell having an edge defining a plane and an axis extending generally perpendicular to said plane;
at least two slots extending into said shell from said edge, said slots being angularly displaced about said axis so that a first slot can receive the hook and a second slot can receive the connector member enabling adjacent portions of the hook and connector member to be recessed into said shell;
a cover member for engagement to the edge of the shell so as to cover said adjacent recessed portions of the hook and connector member, and
means for securing the cover member to the shell.

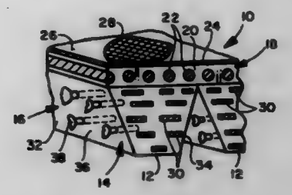
5,197,927
BICYCLE DERAILLEUR CABLE ACTUATING SYSTEM
Sam H. Patterson, Agoura Hills, Calif.; John D. Cheever, and Jeffery M. Shupe, both of Chicago, Ill., assignors to Sram Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 672,431, Mar. 20, 1991, Pat. No. 5,102,372. This application Mar. 18, 1992, Ser. No. 853,442
Int. Cl.[5] F16H *7/00*
U.S. Cl. 474—80 108 Claims



1. A bicycle gear shifting system, which comprises:
derailleur shifting means having return spring means operatively associated with the rear wheel of the bicycle;
handgrip shift actuator means mounted on the handlebar of the bicycle;
said shift actuator means comprising manually actuated shifter rotator means rotatable about a first axis generally coaxial of the handlebar,
said rotator means being selectively rotatable one way in a down-shifting direction and the opposite way in an up-shifting direction;
said shift actuator means further comprising jack spool means rotatable about a second axis that is angularly offset from said first axis;
control cable means having one end secured to said jack spool means and the other end operatively connected to said derailleur shifting means, said control cable means being biased toward said derailleur shifting means by said return spring means;
said jack spool means being rotatable one way in a down-shifting direction in which said jack spool means pulls said control cable means for down-shifting said derailleur shifting means, and the opposite way in an up-shifting direction in which said jack spool means releases said control cable means for up-shifting said derailleur shifting means; and
an operative connection between said rotator means and said jack spool means such that down-shifting rotation of said rotator means will cause synchronous down-shifting rotation of said jack spool means, and up-shifting rotation of said rotator means will cause synchronous up-shifting rotation of said jack spool means.

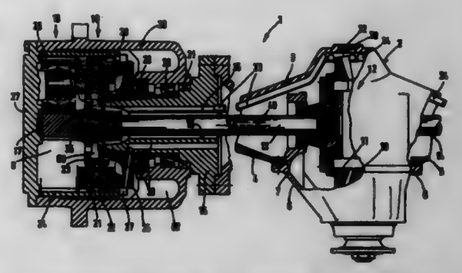
5,197,928
V-RIBBED BELT HAVING PROTRUDING FIBERS
Kyoichi Mishima; Toshimi Kumazaki, both of Kobe, and Masahiko Kawashima, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan
Filed Nov. 19, 1990, Ser. No. 615,225
Claims priority, application Japan, Nov. 20, 1989, 1-302442
Int. Cl.[5] F16G *5/08*
U.S. Cl. 474—263 18 Claims

1. A power transmission belt comprising:
a belt body defining laterally spaced, oppositely facing flank surfaces for engagement with a pulley for said power transmission belt; and
at least one fiber within said belt body and extending in a lateral direction,
said fiber having a cross-sectional area taken transversely of its length,
said fiber having a surface exposed at at least one said flank surface,



said exposed fiber surface being flared by melting to have an exposed cross-sectional area that is greater than the cross-sectional area of the fiber,
said exposed fiber area reducing noise generation as the one flank surface engages and separated from a pulley during operation of the power transmission belt.

5,197,929
DRIVE SHAFT
Friedrich Schefler, Tiefenbach; Waldemar Bier, Passau; Hermann Sonnleitner, Hauzenberg; Karl Kühner, and Albrecht Lommel, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany
PCT No. PCT/EP90/00536, § 371 Date Aug. 26, 1991, § 102(e) Date Aug. 26, 1991, PCT Pub. No. WO90/11907, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 5, 1990, Ser. No. 752,635
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911518
Int. Cl.[5] F16H *1/40*
U.S. Cl. 475—160 20 Claims



1. A drive shaft (1) having an axle body (2) at both ends of which are fastened gear heads (9) and in which an axle housing (3) surrounds a differential gear (12) which is operatively connected with a drive pinion (10) via a bevel wheel (11), differential and bevel gears and axle half shafts (13, 14) with wheel hubs (28) which define said gear heads (9), and a communicating connection exists, between said wheel hubs (28) and said axle housing (3), for the exchange of coolant, characterized by collection and guide elements (32) in the area of said bevel wheel (11) through which, during rotation of said bevel wheel (11), coolant from said axle housing (3) is shifted into said gear heads (9) by lowering the coolant level (40).

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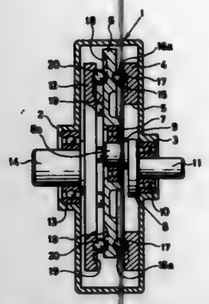
5,197,930

GEARLESS DIFFERENTIAL SPEED REDUCER DEVICE

Kenji Imase, No. 1166 Hajioka-cho, Mitsukuri, Nishikamo-gun, Japan

Filed Apr. 29, 1991, Ser. No. 692,591
Claims priority, application Japan, Dec. 27, 1990, 2-418853
Int. Cl.[5] F16H *1/28, 13/06*
U.S. Cl. 475—168 12 Claims



1. A gearless differential speed reducer device comprising:
first and second discs located to oppose each other through their opposing surfaces;
a plurality of semi-spherical recesses circumferentially provided on the opposing surface of one of the first and second discs along a certain pitch circle;
a groove provided on the opposing surface of the other of the first and second disc, the groove defined as a cycloidal-based curve running along a pitch circle, a radius of which is the same as that of the semi-spherical recesses;
a rollable ball, one semi-spherical portion of which is generally placed at the recess while other semi-spherical portion of the ball placed at the groove, the ball rolling within the recess, and at the same time, rolling along the groove when a rotational movement is transmitted to the second disc to impart the second disc with a nutational movement; and
a rectifier member provided to pick up a rotational movement from the nutational movement of the second disc.

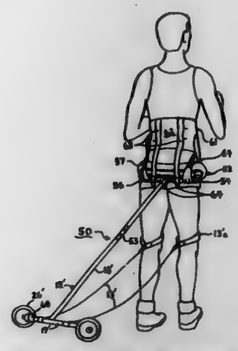
5,197,931

EXERCISE APPARATUS

Solomon Wroclawsky, 1393 Newport #4, Long Beach, Calif. 90804

Continuation-in-part of Ser. No. 678,673, Apr. 1, 1991, abandoned. This application Sep. 27, 1991, Ser. No. 767,046
Int. Cl.[5] A63B *71/00*
U.S. Cl. 482—74 11 Claims

11. An exercise apparatus comprising, a frame wherein rollable means are mounted to the frame in a ground engaging location to allow the device to be used as an interactive exercise trailing device when the use is mobile along a surface, and a harness of elastomeric elements secured to the frame, the frame being arranged to extend predominantly aft of the user's legs and including an abutment member service to engage the user's legs in the upper region thereof, the frame including a base and strut means connecting the abutment member to the base in a spaced apart relationship, the harness including at least one pair of elements mounted upon the frame and extending for engagement with the user's legs in a manner such that in a running motion the legs will alternately stretch first one and then the other of the pair of elastomeric elements, and
means for coupling said abutment member to the user and including a flexible member adapted to encircle the user's waist and having readily releasable fastener means thereon so that the flexible member may be quickly mounted and dismounted with respect to the user's body,
said coupling means including strap means connected at one end portion to the waist encircling flexible member and having a length sufficient to wrap around an end portion of the abutment member and to attach at another end portion to another location on said flexible member, and



second fastener means on said last mentioned end portion serving to secure such end portion releasably to said flexible member. r

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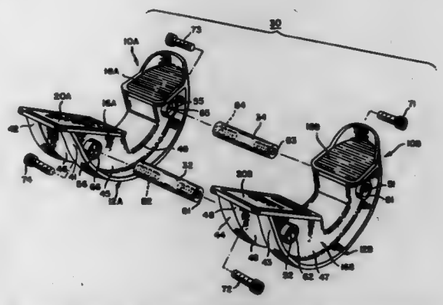
5,197,932

GANGED EXERCISE SHOES

Christopher J. B. Smith, IV, Oceanport, N.J., assignor to Proetretch, Inc., Little Silver, N.J.

Filed Jun. 27, 1991, Ser. No. 722,605
Int. Cl.[5] A63B *23/08*
U.S. Cl. 482—79 2 Claims



1. Apparatus for simultaneously producing plantarflexion and dorsiflexion in both lower legs and both feet of a person, comprising:
a pair of exercise shoes for receiving both feet of said person, each exercise shoe including a generally semi-circular base for engaging a support surface on which said shoes rock forwardly and rearwardly;
ganging means for ganging said exercise shoes together to cause said exercise shoes to be rocked forwardly together to simultaneously produce plantar flexion in both legs and both feet of said person and to cause said exercise shoes to be rocked rearwardly together to simultaneously produce dorsiflexion in both said lower legs and both feet of the said person, sand ganging means including connecting bars extending transversely with respect to said exercise shoes and said connecting bars including end portions interconnecting said shoes together and parallel with respect to each other;
each of said exercise shoes further including a ball platform

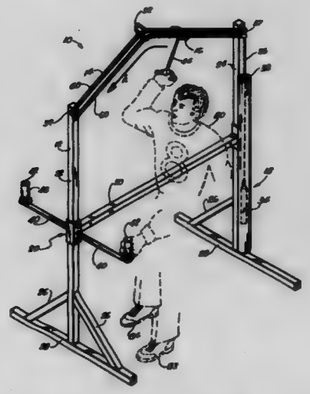
for receiving the ball of said person's foot and a heel platform for receiving the heel of said person's foot, said ball and heel platforms being substantially flat and oriented at an including acute angle with respect to each other, said connecting bars also for interconnecting said shoes together with the ball platform of each shoe parallel with respect to the ball platform of the other shoe and with the ball platforms of both shoes lying in a common plane extending therethrough and with the heel platform of each shoe parallel with respect to the heel platform of the other shoe and with the heel platforms of both shoes lying in a common plane extending therethrough an with the generally semi-circular base of one shoe parallel with the semi-circular base of the other shoe and with the semi-circular bases of both shoes lying in a common semi-circular plane extending therethrough; and
four threaded bolts, each connecting bar including opposed end portions provided with threaded bores for receiving two of said threaded bolts, said base of each exercise shoe comprising a pair of spaced apart, parallel semi-circular members for engaging said support surface, each exercise shoe including a pair of spaced apart and parallel support members extending upwardly from said semi-circular members, each support member having opposite end portions and each end portion provided with an opening for receiving one of said threaded bolts, upon said exercise shoes being placed in spaced apart and parallel relationship, openings formed in the opposite end portions of one of said support members of each pair of exercise shoes being aligned and upon said connecting bars being aligned with said aligned openings, said aligned openings for receiving said threaded bolts to permit said threaded bolts to be threaded into said threaded bores to bolt said exercise shoes together whereby said exercise shoes are ganged.

5,197,933

THROWING ARM EXERCISING MACHINE

Tommy R. Waters, 5003 37th Ave., Meridian, Miss. 39305

Filed Aug. 26, 1991, Ser. No. 749,699
Int, Cl.[5] A63B *21/062*
U.S. Cl. 482—101 12 Claims



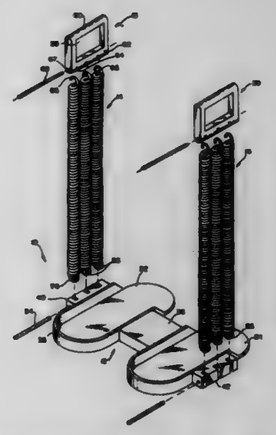
1. An arm exercising machine comprising:
(a) a frame member having spaced apart front and rear upright members and an arcuate overhead track therebetween;
(b) means partially secured within said track for movement therealong, a portion thereof being adapted to be grasped by the throwing hand of the user;
(c) means secured to and positioned adjacent said rear upright members for selectively applying a counterweight to said means for movement secured within said track, said means for applying said counterweight comprising:
(i) a cable, having proximate and distal ends, mounted over a pulley, said means for movement being securable to to said proximate end of said cable and said counterweight, which comprises one of a series of removable weights, being securable to said distal end of said cable; and,
(ii) a cylindrical sleeve within which said counterweight is housed; and,
(d) means secured to said front upright member and extending generally perpendicular thereto and adapted for gripping by the other hand of said user, whereby said user grasps said portion of said means secured within said track and, against the bias of said counterweight, moves said means secured within said track along said track.

5,197,934

ELASTIC EXERCISE DEVICE

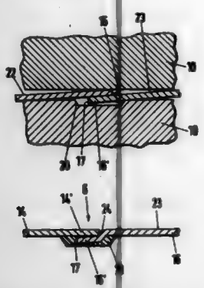
Donald E. Wirtz, 914 N. M St., Tacoma, Wash. 98403

Filed Jan. 17, 1991, Ser. No. 642,679
Int. Cl.[5] A63B *21/02*
U.S. Cl. 482—123 6 Claims



1. An exercise device, comprising:
rigid foot board member, including first and second foot portions adapted to receive the feet of the user, each foot portion having a width approximately equal to that of a human foot and at least partially bounded by a short wall portion preventing movement of the foot therein, the foot board member further including a rigid connecting member, extending between the first and second foot portions for separating the foot portions by a selected distance, and elastic member receiving elements located substantially immediately outboard of the foot portions, at approximately shoulder width of the user;
elastic members connected to, and extending upwardly from, the elastic member receiving means; and
handle means connected to the upper ends of said elastic members.

5,197,935
PACKAGE FOR FLOWABLE CONTENTS WITH AN EXTERNALLY SMOOTHLY CONSTRUCTED SEALING SEAM, A METHOD OF PRODUCING SUCH A PACKAGE AND AN APPARATUS FOR CARRYING OUT THE METHOD
Benedikt Schweri, Romont, Switzerland, assignor to Tetra Alpha Holdings S.A., Pully, Switzerland
Division of Ser. No. 612,078, Nov. 9, 1990, abandoned. This application Feb. 19, 1992, Ser. No. 838,485
Int. Cl.[5] B31B *1/74*
U.S. Cl. 493—85 2 Claims



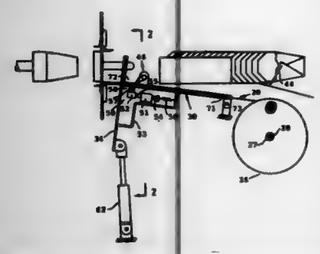
1. A method of producing a package for flowable contents, particularly contents such as milk, juices and the like, consisting of

providing a carton blank having side walls (1, 2), an upper wall (3) providing a top, and a lower wall providing a bottom, at least one side wall (1 or 2) having edges of the blank adjoining to form a sealing seam (6, 6') extending along the edges of the side walls (14, 16);

errecting the package from the blank, including overlapping such edges (14, 16) into juxtaposition, with the edge on the exterior of the package being flush with the adjoining side wall;

then injection molding a synthetic plastics material onto the seam (6, 6') along the surface thereof which is on the inside of the package while backing the seam at the exterior of the package, thereby forming a bead (21) of the synthetic plastics material along the sealing seam (6, 6'') at the interior of the package and leaving the seam flush with adjoining walls at the package exterior.

5,197,936
PAIL BOX MACHINE
Abram Fainberg, 7 Roger Williams Green, Providence, R.I. 02904
Continuation-in-part of Ser. No. 697,254, May 8, 1991, Pat. No. 5,123,888. This application Nov. 18, 1991, Ser. No. 793,124
Int. Cl.[5] B31B *3/44, 3/86*
U.S. Cl. 493—88 2 Claims



1. An automatic machine for producing pail boxes from pre-made blanks of paper and pre-made blank handles comprising:

a frame that defines a box blank storage, a box blank feeding means for feeding the box blanks from the storage to position for folding, a folding means for folding said box blanks in form of a box, a conveyor means for conveying the blank handles, a clinching means for attaching said handles to the folded boxes, and a receiver means for receiving made boxes, wherein the improvement comprises:

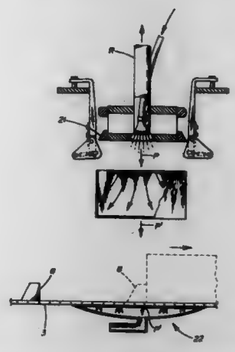
A. means for accepting a removable spool with a flexible strip of said blank handles joined together by readily severable adhesive tapes, said blank handles being straight or having bent ends,

B. said clinching means comprising a pair of clinching mechanisms rigidly attached to the forward end of said conveyor, said clinching mechanisms each including gauged groove and clincher for selecting and pushing through the groove only one leading blank handle per cycle and attaching it to the folded box, said clinching mechanisms including also a pair of hollows, anvils, and teeth for bending the ends of the following blank handle in the same cycle, if said blank handles are straight, and a pair of slots for passing said blank handles with preliminarily bent ends.

C. a feed means for feeding said flexible strip of blank handles to the position for attaching said handles to the folded boxes, said feed means comprising a first solenoid fixed to said conveyor with an extension core slidable in plane parallel to said conveyor, a spring for holding said core of said first solenoid in an extended position, and a second solenoid fixed to a free end of said first solenoid's core, said second solenoid having a core with a friction surface on its end directed to said flexible strip and slidable in plane perpendicularly to said conveyor, said first and second solenoids being energized and de-energized in timed relationship, and

D. an anti-retraction means secured to said conveyor, said anti-retraction means including a plurality of pawls and springs for urging the pawls against said flexible strip to prevent retrograde movement of said strip during operation.

5,197,937
DIFFERENTIAL AIR PRESSURE CARTON TRANSFER APPARATUS AND METHOD
Bruce H. Dalrymple, Decatur, Ga., assignor to Kliklok Corporation, Decatur, Ga.
Continuation of Ser. No. 727,670, Jul. 9, 1991, abandoned. This application Sep. 8, 1992, Ser. No. 941,858
Int. Cl.[5] B31B *3/44, 1/48*
U.S. Cl. 493—167 7 Claims



1. In an apparatus including a plunger and die at a forming station for forming carton blanks into erect cartons having side and end panels attached to a bottom panel along fold lines therebetween, and a takeaway conveyor for transporting said erect cartons for further processing, the improvement comprising:

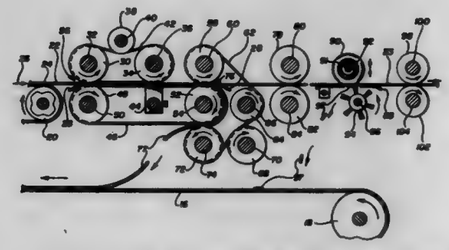
means to transfer the erect carton in ambient air along a defined path including dropping by gravity onto said conveyor from the forming station,

a differential air pressure source,

means to generate from said pressure source a flow of air extending from the direction of the plunger to the conveyor to facilitate carton transfer along the transfer path in ambient air and toward said conveyor, and means on said takeaway conveyor for positively transporting and spacing said cartons,

whereby to assist the erected carton in a positive manner to move along said path from the forming station and to firmly seat said carton on said conveyor and resist substantial tipping so that said carton may be transported for further processing.

5,197,938
WASTE REMOVER FOR DIE CUT BLANKS
Jan Chmielewski, Brooklyn, N.Y., assignor to International Stripping & Die Cutting Corp., Brooklyn, N.Y.
Filed Oct. 31, 1991, Ser. No. 786,013
Int. Cl.[5] B26D *7/18;* B31B *1/20*
U.S. Cl. 493—373 14 Claims



1. A waste remover for automatically removing waste from usable portions of a previously die-cut blank, said waste remover being arranged in a planar arrangement on a frame, said waste remover having means for automatically conveying said blank through an input end of said waste remover, then into a waste removal portion of said waste remover, and finally into a discharge end of said waste remover wherein said blank is discharged from said waste remover by means for discharging said blank from said waste remover, said blank being conveyed in a generally planar plane of travel from said input end of said waste remover to said discharge end of said waste remover, said waste removal portion comprising: stripping means for removing said waste, said stripping means including means for supporting said blank having sufficient open areas to permit said waste to be driven downward and away from said plane of travel of said blank, said stripping means having at least two stripping belt systems adapted to be independently positioned one from another, each of said stripping belt systems comprising a positioning pulley and a stripping belt, said positioning pulley being positioned above said plane of travel of said blank, said positioning pulley being in vertical alignment with a first permanently positioned roller positioned below and transverse to said plane of travel of said blank, so that as said blank is conveyed to said waste removal portion said blank is caused to pass through a nip area formed by said positioning pulley and said first permanently positioned roller, said pulley being positioned above said first permanently positioned roller, so that said stripping belt, which rotates around said pulley and around a second permanently positioned roller positioned below said first permanently positioned roller and transverse to said plane of travel of said blank, contacts only loosely held waste material connected to said blank at said nip area, and said loosely held waste material is caused to be stripped away from said blank, said waste removed blank now being conveyed to said discharge end of said waste remover, wherein said waste removed blank is discharged from said waste remover by said discharging means.

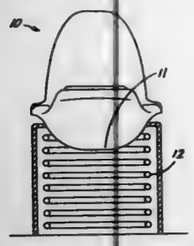
5,197,939
DECANTER CENTRIFUGE
Jan Cederkvist, Bagsvaerd, and Bjarne Goddik, Lyngby, both of Denmark, assignors to Alfa-Laval Separation A/S, Soborg, Denmark
PCT No. PCT/DK89/00151, § 371 Date Feb. 5, 1991, § 102(e) Date Feb. 5, 1991, PCT Pub. No. WO89/12506, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 19, 1989, Ser. No. 623,794
Claims priority, application Denmark, Jun. 21, 1988, 3384/88
Int. Cl.[5] B04B *1/20, 3/04, 9/08*
U.S. Cl. 494—53 1 Claim

1. A decanter centrifuge (1) comprising a rotatable bowl (2) and a screw conveyor (7) rotatable within said bowl, journal means for rotatably supporting said bowl and said screw conveyor including bearings (5, 6) for rotatably supporting said bowl and means for journalling said screw conveyor within said bowl for rotation relative thereto, said centrifuge further being of the type in which the screw conveyor (7) is connected with the bowl (2) through a reduction gear (22) having a housing co-rotating with the bowl (2), a driven shaft connected with the screw conveyor (7) and a drive shaft whose number of revolutions determines the relative number of revolutions of the screw conveyor (7) with respect to the bowl (2), characterized in that the reduction gear is rotatably supported by bearings (25, 26) forming journal means independent from the bowl and from journal means rotatably supporting said bowl (2) and said screw conveyor (7) and that the housing of said reduction gear (22) is connected with the bowl (2) through a flexural, but torsionally stiff, coupling (28), and in that the driven shaft of the reduction gear (22) and the screw conveyor (7) are likewise connected through a flexural, but torsionally stiff coupling (29).

5,197,940
LOCAL APPLICATION TUMOR TREATMENT APPARATUS
Chester E. Sievert, Mahtomedi, Minn.; Robert D. Tucker, North Liberty, and Stefen Loening, Iowa City, both of Iowa, assignors to Hyperthermia Corp., Mahtomedi, Minn.
Filed Jan. 29, 1990, Ser. No. 471,498
Int. Cl.[5] A61B *17/52*
U.S. Cl. 600—9 8 Claims

1. An apparatus for the treatment of prostate cancer, said apparatus comprising a platform for the support of a person having a prostate tumor and a coil formed of electrically conductive tubing, said platform having a seat with an upper

surface, said upper surface being positioned within 4 cm of the uppermost turn of said coil, said upper surface being contoured



for reproducibly receiving the buttocks of a person in alignment with the axis of said coil.

5,197,941
PORTABLE DEVICE FOR CONTROLLING CIRCADIAN RHYTHM DISORDERS
Barbara Whitaker, 526 Meadows Dr., Glendale, Calif. 91202
Filed Jul. 30, 1991, Ser. No. 737,670
Int. Cl.[5] A61M *21/00*
U.S. Cl. 600—27 **2 Claims**

1. A system for programmably varying the levels of light, sound, and airborne negative ions exposed to an individual for the therapeutic purpose of modifying the individual's Circadian Rhythms, said system comprised of the following elements:

a) power supply means adapted to receive line current input voltages to be used throughout said system,

b) a clock module having an operator adjustable wake time at which said clock module initiates a light output cycle,

c) an up ramp module having current input and output means and adapted to be initiated by the light output cycle of said clock module, said up ramp module adapted to controllably increase its output means from zero to 100% of said input current, over an operator adjustable wake duration,

d) a sleep function module activated by said individual at the beginning of the desired sleep period, and having a sleep cycle output interactive with a down ramp module,

e) said down ramp module having current input and output means and adapted to be initiated by said sleep cycle output, said down ramp module adapted to controllably decrease its output means from 100% of said input current to zero over an operator adjustable sleep function duration,

f) a lamp control module having an input terminal adapted to receive line current, and a control terminal adapted to receive current from said up ramp and down ramp modules, said lamp control module adapted to vary the line current in response to current received from said up and down ramp modules,

g) a lamp receiving current from said lamp control module and providing light exposure to said individual,

h) a sound generator module adapted to receive line current and be activated by control signals from the output means of said up and down ramp modules, said sound generator creating an audio output signal,

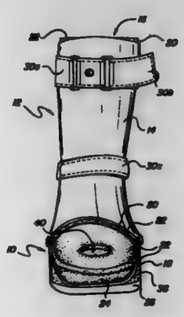
i) speaker means receiving said audio output signal and generating audible sound,

j) an ion generator module having a line input and activated by a control signal from said clock module or said sleep function module, and thereby toggle an ion generator output signal on and off,

k) ion generator means adapted to be toggled on and off by said ion generator output signal, said ion generator means adapted to provide exposure of said individual to a stream of ionized air, and

l) housing means for protectively enclosing the aforesaid elements a through k.

5,197,942
CUSTOMIZED FOOT ORTHOSIS
Harold Brady, 18429 Robson, Detroit, Mich. 48235
Filed Jan. 13, 1992, Ser. No. 819,864
Int. Cl.[5] A61F *5/00, 5/37*
U.S. Cl. 602—5 **7 Claims**



1. A customized foot orthosis to assist in the healing of an ulcerated site located on the sole of a patient's foot, said orthosis comprising:

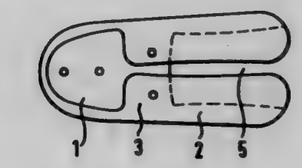
an individually-fitted one-piece brace having a back portion and a sole portion, the back portion of said brace extending form the posterior aspect of the patient's leg below the knee to the back of the patient's heel, and the sole portion of said brace covering the sole of the patient's foot;

a flexible inner lining disposed within and conforming to said brace;

fastening means to securely hold the patient's leg and foot within said brace; and

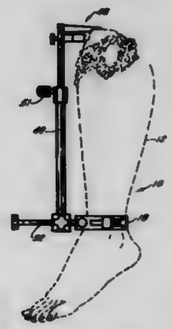
an aperture including a first portion extending through the sole portion of said brace, and a second portion extending through said lining, the perimeter of said second portion of said aperture being greater than the perimeter of the ulcerated site, said aperture being positioned to correspond to the location of the ulcerated site when the patient's foot and leg are securely positioned within said orthosis, whereby the aperture in the sole portion of the orthosis permits the patient to walk and engage in other weight-bearing activities without applying pressure to the ulcerated site and also aerates the ulcerated site, thus promoting healing thereof.

5,197,943
FINGER SPLINT
Helmut D. Link, Hamburg, Fed. Rep. of Germany, assignor to Waldemar Link GmbH & Co., Hamburg, Fed. Rep. of Germany
PCT No. PCT/EP90/00743, § 371 Date Jan. 15, 1991, § 102(e) Date Jan. 15, 1991, PCT Pub. No. WO90/14057, PCT Pub. Date Nov. 29, 1990
PCT Filed May 9, 1990, Ser. No. 635,113
Claims priority, application Fed. Rep. of Germany, May 19, 1989, 8906213[U]; Dec. 13, 1989, 8914648[U]
Int. Cl.[5] A61F *5/00*; A41D *45/10*
U.S. Cl. 602—5 **18 Claims**



1. Finger splint for fixing a distal finger joint in an extended position, the splint having a length, the distal finger joint joining a distal phalanx and a middle phalanx, each of the distal finger joint, distal phalanx, middle phalanx and finger splint having an upper side and an under side, the upper side and under side being generally opposite each other in a direction which is perpendicular to the length of the splint, the splint comprising a first shell on the under side thereof for supporting the distal finger joint and the distal phalanx on the under side and a second shell on the upper side of the finger splint for supporting the distal finger joint and the middle phalanx on the upper side, the first and second shells being connected to one another near the distal finger joint by means of an annular part, wherein the second shell includes an opening on the under side of the finger splint and has a substantially longitudinal slot on the upper side of the finger splint, and wherein the splint consists essentially of at least one of elastically and plastically flexible material.

5,197,944
ANKLE CLAMP
John Steele, Germantown, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.
Filed Mar. 30, 1992, Ser. No. 859,666
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—27 **27 Claims**



1. An ankle clamp for supporting tibial cutting instruments, comprising:

a) an ankle clamp frame comprising a pair of angularly intersecting fixed appendage portions with a gap therebetween that accepts a patient's ankle during use, and an elongated rod with upper and lower end portions and the rod attaching at its lower end portion to the fixed appendage portions at a position therebetween;

b) a pair of pivots mounted on the frame and respectively at the free end of each fixed appendage portion;

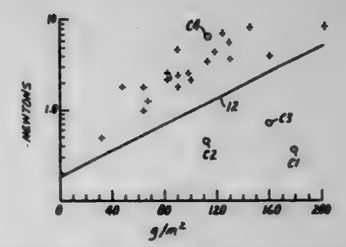
c) a pair of movable arms, each with an outer free end portion and an inner attachment end portion, and the arms are pivotally attached respectively to the free end of the fixed appendage portions at said pivots, and movably between open and closed positions, the frame and arms defining an assembly during use;

d) latch means carried by the assembly of the frame and the attached arms for holding the arms in the open position;

e) the latch means including spring loaded quick release means for moving a selected arm to the closed position; and

f) tibial cutting block assembly positioned during use at the upper end portion of the rod, for providing an alignment guide during cutting of the tube.

5,197,945
ALGINATE WOUND DRESSING OF GOOD INTEGRITY
Susan M. Cole, Minneapolis, and David L. Nelson, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 622,433, Dec. 5, 1990, which is a continuation-in-part of Ser. No. 484,068, Feb. 23, 1990, abandoned, which is a continuation of Ser. No. 200,711, May 31, 1988, abandoned. This application Jan. 14, 1992, Ser. No. 820,343
Int. Cl.[5] A61F *13/00, 15/00*
U.S. Cl. 602—49 **21 Claims**



1. A wound dressing comprising a nonwoven fabric consisting of at least 35% by weight of alginate staple fibers, which fabric is substantially free from any adhesive binder or of interfusing of fibers at their crossing points, said fibers being sufficiently entangled that a plot of the fabric's tensile strength vs. basis weight lies above line 12 of FIG. 1 of the drawing when the fabric is dry and lies above line 22 of FIG. 2 when the fabric is saturated with saline water.

5,197,946
INJECTION INSTRUMENT WITH ULTRASONIC OSCILLATING ELEMENT
Shunro Tachibana, 6-18, Kusagae 1-chome, Chuo-ku, Fukuoka-shi, Fukuoka-ken, Japan, assignor to Shunro Tachibana, Fukuoka and Sumitomo Electric Industries, Ltd., Osaka, both of Japan
Continuation-in-part of Ser. No. 544,309, Jun. 27, 1990, abandoned. This application Jul. 10, 1991, Ser. No. 727,777
Int. Cl.[5] A61M *5/14*
U.S. Cl. 604—22 **4 Claims**

1. A medicinal injection instrument for injecting a medicinal medium into body tissue of a living body comprising a tubular means for conducting a medicinal medium to an injection site, said tubular means having a distal end portion, said distal end portion having a terminating end, an ultrasonic means comprising an ultrasonic oscillator element means disposed at said

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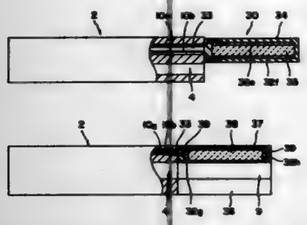
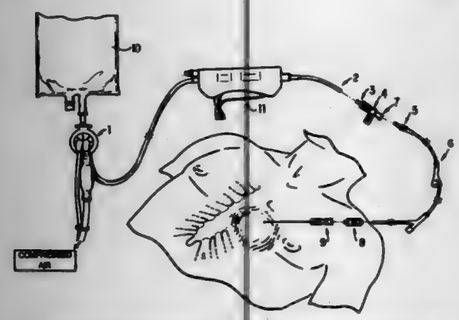
distal end portion and extending to said terminating end such that when the instrument is inserted into a living body with said distal end portion disposed juxtaposed to an injection site, said ultrasonic oscillator element means is also disposed juxtaposed to the injection site to thereby enhance diffusion and



penetration of said medicinal medium into body tissue of said living body, said ultrasonic oscillating element means comprising a hollow cylindrical oscillating member having inner and outer cylindrical walls and cylindrical electrodes disposed on said inner and outer cylindrical walls.

5,197,947
POWERED CLYSIS AND CLYSER
Vaughn Harris, Albuquerque, N. Mex., assignor to University of New Mexico, Albuquerque, N. Mex.
Filed Oct. 24, 1991, Ser. No. 780,991
Int. Cl.[5] A61B *10/00*
U.S. Cl. 604—28 **4 Claims**



1. A method for harvesting skin for grafts comprising the steps of:
(a) rapidly and pneumatically pumping an infiltrate through a tube; and
(b) infusing said infiltrate into a desired subcutaneous area, wherein said infiltrate is rapidly and pneumatically pumped through a tube and infused into a desired subcutaneous area via a sterile disposable injection system comprising:
(1) a pneumatic pulse lavage;
(2) a three-way stopcock connected to said lavage;
(3) extension tubing connecting said stopcock to a Luer-Lock adaptor; and
(4) a spinal needle connected to said Luer-Lock adaptor for insertion into a desired area for infusing a desired infiltrate therein.

5,197,948
INTRA-ABDOMINAL ORGAN MANIPULATOR, IRRIGATOR AND ASPIRATOR
Kamran Ghodsian, 1522 Valencia, Newport Beach, Calif. 92660
Filed Jan. 3, 1991, Ser. No. 637,592
Int. Cl.[5] A61M *1/00, 29/00*
U.S. Cl. 604—30 **11 Claims**

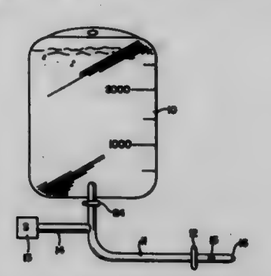
5. A surgical instrument for enabling a user to manipulate organs or parts thereof within the abdominal cavity and irrigate and/or aspirate the surgical area comprising:
a) a tubular probe member having distal and proximal ends and a through lumen, the distal end being open, the tube wall adjacent the distal end defining a plurality of holes through which fluid may pass from the through lumen to the outside of the probe and visa versa;
b) a handle member releasably secured to the proximal end of the probe member whereby the probe member may be disposed of after use, the handle member including a central passageway therein in fluid communication with the through lumen in the probe member, the handle member defining an irrigation port and an aspiration, each of the ports being connected to the central passageway, the irrigation port being adapted to be connected to a source of fluid under pressure for supplying irrigating fluid to the surgical area and the aspiration port being adapted to be connected to a vacuum source for aspirating fluid from the surgical area;
d) the irrigation an aspiration ports including manually operable valves responsive to finger pressure applied laterally of the longitudinal axis of the handle whereby the user may manipulate the probe member and irrigate and/or aspirate the surgical area with one hand;
e) an inflatable balloon secured to the exterior of the probe member adjacent to and on the proximal side of said holes so that the interior of the balloon is isolated from the through lumen; and
f) the probe member including an auxiliary lumen extending along its length and in fluid communication with the interior of the balloon whereby fluid may be supplied to or removed from the interior of the balloon to inflate and deflate the same.

5,197,949
SUCTION IRRIGATION DEVICE WITH A SCRAPER
Kraivit Angsupanich, 801 11th St., Lakeport, Calif. 95453
Filed Jan. 22, 1991, Ser. No. 643,739
Int. Cl.[5] A61M *3/00*
U.S. Cl. 604—35 **1 Claim**

1. A device for the irrigation and suction removal of bodily fluids and debris primarily during surgical procedure comprising an elongated substantially hollow tube sized to be comfortably held by the human hand, said tube having an upstream end configured to be attached to a vacuum hose and a downstream end, said upstream and downstream ends being connected by a longitudinally extending interior bore and a secondary channel also contained within said substantially hollow tube characterized as having an upstream end attached to a source of water and a downstream end configured to discharge said source of water within said longitudinally extending interior bore proximate its downstream end and further comprising a scraper means located proximate the downstream end of said elon-

gated substantially hollow tube for facilitating traction of an opening or wound, said scraper means comprising a substantially planar extension to said hollow tube pivotable so as to be capable of being both parallel to and perpendicular to said longitudinally extending interior bore.

5,197,950
SCHEDULED BOWEL MANAGEMENT SYSTEM
Ralph S. Clayton, 305 W. Water St., Ripley, Miss. 38663
Continuation of Ser. No. 555,033, Jul. 20, 1990, Pat. No. 5,074,842. This application Dec. 23, 1991, Ser. No. 811,676
The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.
Int. Cl.[5] A61M *3/00*
U.S. Cl. 604—28 **11 Claims**



1. A method of scheduling the function of the bowel so as to minimize or eliminate fecal incontinence, comprising the steps of:
a) inducing constipation in a patient for a multi-day period;
b) taking isotonic fluid of sufficient volume to substantially fill the entire large intestine of the patient completely from colon elimination orifice to the cecum, said isotonic liquid containing a laxative and being of a controlled salt and electrolyte composition so as to be isotonic with the patient's body tissues to avoid drawing bodily fluids into the large intestine or permitting fluids to pass from the large intestine into the patient's bloodstream or body tissues;
c) inserting into the patient's colon elimination orifice the distal end of a tube to deliver liquid into the patient;
d) delivering the liquid at a relatively slow rate so as to avoid rapid filling and distension of the walls of the large intestine and taking positive steps to assure retention of the liquid within the colon;
e) positioning the patient so as to facilitate the isotonic fluid filling the patient's entire large intestine; and
f) removing the tube and allowing expulsion from the colon of the isotonic liquid and contents of the large intestine which have accumulated during the multi-day period of induced constipation.

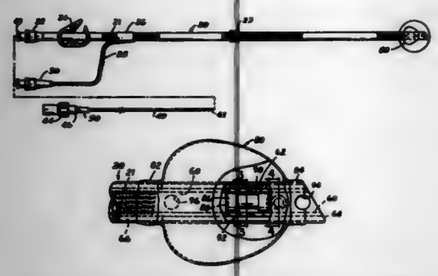
5,197,951
SIMPLE DOUBLE LUMEN CATHETER
Sakharam D. Mahurkar, 6171 N. Sheridan Rd. - #1112, Chicago, Ill. 60660
Continuation of Ser. No. 561,480, Dec. 14, 1983, abandoned. This application Feb. 27, 1986, Ser. No. 834,202
Int. Cl.[5] A61M *11/00*
U.S. Cl. 604—93 **13 Claims**

1. A double lumen catheter comprising an elongated cylindrical tube of substantially uniform diameter having unitary outer walls and enclosing first and second lumens separated by a planar axial internal divider, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens, the first lumen extending from the proximal end of said elongated tube to a first opening at the distal end of said elongated tube, and the second lumen extending from the proximal end of said elongated tube to a second opening formed in the side wall of said tube and spaced in the longitudinal direction away from said first opening, the distal end portion of said tube beyond the distal end of said second lumen being formed so that no voids are present in the flow path and continuing the uniform diameter cylindrical configuration of said tube to the distal end of said first lumen so as to form a blunt circular end on the tube, and said blunt circular end being completely closed except for said first opening, to prevent the end of the catheter from traumatizing or becoming caught in the walls of a vessel into which the catheter is inserted.

5,197,952
AUTO-INFLATING CATHETER CUFF
Stuart J. Marcadis, Wyoming, and James H. DeVries, Grand Rapids, both of Mich., assignors to DLP, Inc., Grand Rapids, Mich.
Filed Jun. 13, 1990, Ser. No. 537,566
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 **12 Claims**

1. A perfusion catheter which is to be used for introduction into a body cavity comprising:
(a) a proximal end for introduction of fluid,
(b) a distal end for introduction into a body cavity,
(c) a connecting tube between said proximal and distal ends comprised of a flexible material having a central lumen connecting said ends,
(d) an inflatable cuff enclosing part of said tube adjacent the distal end of the catheter and sealed at each end of said tube,
(e) a non-removable lumen plug in said central lumen positioned axially within that part of said tube enclosed by said cuff and between the ends of said cuff,

(f) respective openings in said lumen within and at the proximal and distal ends of said cuff to allow flow from said



lumen through said cuff to the distal end of said lumen, and means distally of said cuff to restrict the flow through said cuff to create inflating pressure in said cuff.

5,197,953
CAP ASSEMBLY
John Colonna, 1183 Coquille St., Sarasota, Fla. 34242
Filed Jul. 8, 1991, Ser. No. 727,013
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **31 Claims**

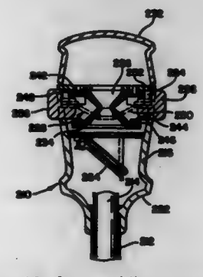
1. A capping assembly for a needle, said assembly comprising:
a first member adapted to be mounted to said needle;
a second member slidably mounted to said first member such that it can be moved axially with respect to said first member, said second member being adapted to slide along said first member to shield said needle;
locking means for interlocking said first member and said second member at a predetermined relative position;
said locking means including a projection on one of said first or second members said projection is a ring extending outwardly from said one of said first or second members; and a capturing means mounted on the other of said first or second members for capturing said projection after said second member has moved a predetermined distance;
said capturing means is at least one locking tang formed in the wall of said one of said first or second members.

5,197,954
HYPODERMIC SYRINGE HAVING FOLDING NEEDLE
Robert W. Cameron, 1321 King St., Bellingham, Wash. 98226
Filed Oct. 9, 1991, Ser. No. 774,566
Int. Cl.[5] A61M *5/00, 5/32*
U.S. Cl. 604—110 **22 Claims**

1. A hypodermic syringe comprising:
a tubular barrel having an upper end and a lower end;
a plunger member mounted in said tubular barrel for ejecting fluid from said barrel;
a hypodermic needle for injecting into a person said fluid ejected from said barrel;
connecting means for connecting said hypodermic needle to said lower end of said tubular barrel so that said needle extends outwardly from said lower end of said barrel and is in fluid communication therewith during an initial use of said syringe, and for selectively disconnecting said needle from said lower end of said barrel after said initial use;
hinge means for retaining said disconnected needle to said barrel so as to permit said needle to be folded back against a side of said barrel; and

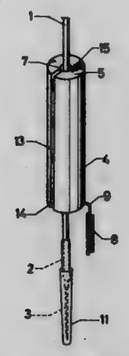
receiving means mounted to said side of said barrel for receiving said needle which is folded back against said side of said barrel and for retaining said needle therein.

5,197,955
UNIVERSAL SEAL FOR TROCAR ASSEMBLY
Randy R. Stephens, Fairfield, Ohio; John M. Collins, Ipswich; Robert Farra, Leominster, and Dean Pichon, Concord, both of Mass., assignors to Ethicon, Inc., N.J.
Filed Oct. 18, 1991, Ser. No. 781,026
Int. Cl.[5] A61M *29/02*
U.S. Cl. 604—167 **26 Claims**



1. A trocar assembly for providing communication into an anatomical cavity, comprising:
(a) a trocar tube defining an interior lumen having an open distal end portion and an open proximal end portion for accommodating axial reciprocation of an elongate implement of lesser cross-sectional dimension therethrough;
(b) means adjoining said proximal end portion of said trocar tube defining a chamber having open distal and proximal end portions that communicate with said lumen and permit axial reciprocation of an elongate implement therethrough;
(c) seal means positioned in said chamber, said seal means defining a constricted center bore portion allowing an elongate implement to pass therethrough in sealing engagement therewith, said seal means sealing said proximal end portion of said chamber, said seal means has a generally hourglass shape defining generally converging and diverging side walls that form said constructed center bore portion at the intersection thereof; and
(d) expanding means for enlarging said center bore portion so as to increase the inner diameter thereof, said expanding means deflects said seal means in an axial direction.

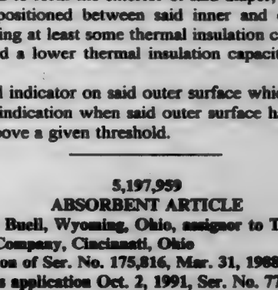
5,197,956
PROTECTING DEVICE FOR GUIDE TUBES USED WITH BLOOD AND SERUM BAGS AND THE LIKE
Ricardo A. Briznela, Diagonal 76 No 27, La Plata, Argentina
Filed Sep. 28, 1989, Ser. No. 413,952
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—171 **8 Claims**



1. A fluid transferring assembly comprising:
a hollow needle;
a plastic tube connected at one end to said needle;
a fluid container connected to the other end of said tube; and
a needle protecting device comprising
a hollow cylindrical body wherein said body is slidably mounted about said tube, said body is longer than said needle and has a first end distal to said needle and a second open end proximate to said needle and said body has a longitudinal open slot wherein the width of said longitudinal slot is narrower than the diameter of said tube,
a fixed first cap covering said first end wherein said first cap has a hole through which said tube is mounted, said hole is coaxial with the axis of said body and said first cap has a first open cap slot connecting said longitudinal slot to said hole, said longitudinal and first slots allowing said device to be attached on said tube by inserting said tube through the longitudinal slot and first slot, and
a second cap hinged to said body by a tongue piece such that said second cap can close the open end of the device and enclose said needle.

5,197,957
MALE URINE COLLECTION DEVICE
Henrik G. Wendler, Frederiksberg, Denmark, assignor to Coloplast A/S, Denmark
Filed Jun. 22, 1992, Ser. No. 901,756
Claims priority, application Denmark, Jun. 21, 1991, 1217/91
Int. Cl.[5] A61F *5/458*
U.S. Cl. 604—352 **14 Claims**

1. A device suitable for the collection of urine from a male, which device comprises a sheath (1) suitable for being fitted about a flaccid penis and comprising a thin flexible member of elastic material which is open at one end and is joined at the other end with a drainage tube portion (4) for connection with a collecting means, said sheath having an inner surface of which at least an annular portion is provided with a layer (3) of pressure sensitive adhesive and an outer surface and being rolled outwardly upon itself towards the drainage tube end with successively larger turns, to form a torus (5), and a separate thin flexible band (2) interposed between successive turns of said rolled torus and having an adhesive rejecting surface facing the layer of pressure sensitive adhesive, c h a r a c t e r i z e d in that a portion (2a, 8) of the band (2) extends outwardly from the turns of said rolled torus so as to provide a free edge



forming a gripping portion of the band and that the band is in substantially non-adhering contact with the outer surface of the sheath, so that upon the sheath being unrolled onto a penis, the band (2) is removed from the sheath (1).

5,197,958
WETNESS INDICATING DIAPER
Wesley A. Howell, 6926 Dohesy, Unit D, Alto Loma, Calif. 91701
Filed Apr. 1, 1992, Ser. No. 861,475
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—361 **23 Claims**

17. A diaper for indicating wetness, comprising:
an inner surface adapted to be positioned against the skin of a baby;
an outer surface generally opposed to said inner surface adapted to form the exterior of said diaper;
a layer positioned between said inner and outer surface providing at least some thermal insulation capacity when dry and a lower thermal insulation capacity when wet; and,
a thermal indicator on said outer surface which provides a visual indication when said outer surface has a temperature above a given threshold.

5,197,959
ABSORBENT ARTICLE
Kenneth B. Buell, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 175,816, Mar. 31, 1988, abandoned.
This application Oct. 2, 1991, Ser. No. 770,736
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—385.1 **24 Claims**

1. A disposable absorbent article comprising:
a liquid pervious topsheet;
a liquid impervious backsheet joined with said topsheet; and

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an absorbent element disposed between said topsheet and

wardly toward a point adjacent said upper area of each leg

conductive predetermined region for contact with flesh or

a lumen extending therebetween, and having a longitudi-

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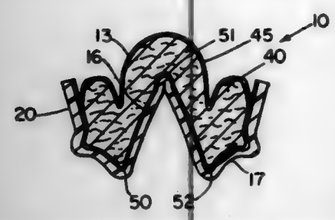
an absorbent element disposed between said topsheet and said backsheet;

wherein said backsheet comprises a flexure-resistant deformation element, said deformation element having a flexure



means for inducing bending of said deformation element in a preconceived way into a preconceived convex upward geometric configuration when the absorbent article is subjected to lateral compressive forces.

5,197,960

DISPOSABLE GARMENTS

Hironori Nomura; Hirofumi Ohnishi, both of Iyomishima; Yoshinori Matsura, Kasouji, and Tohru Sasaki, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

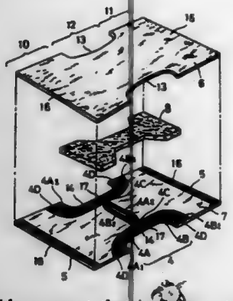
Continuation of Ser. No. 626,783, Dec. 13, 1991, Pat. No. 5,055,103. This application Jul. 31, 1991, Ser. No. 738,447

Claims priority, application Japan, Dec. 18, 1989, 1-328022

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—385.2 **3 Claims**



1. A disposable garment that includes a topsheet and an overlying backsheet that together in a folded state for wearing define

(a) a front section,

(b) a rear section,

(c) a crotch area connecting said front and back sections,

(d) a waist opening, and

(e) two spaced apart leg openings, each leg opening including a front half, a rear half, a lower area adjacent said crotch area and an upper area opposite said lower area on said leg openings,

(f) elastic means surrounding each of said leg-openings comprising first and second elastic members,

(g) said first elastic member being positioned along most of the front half of each leg opening, and

(h) said second elastic member being positioned along most of the rear half of each leg opening,

(i) said first and second elastic members intersecting each other adjacent said lower area of each said leg opening,

(j) the tensile strength of said first and second elastic members gradually decreasing from their point of intersection adjacent said lower area of each said leg opening upwardly toward a point adjacent said upper area of each leg opening.

5,197,961

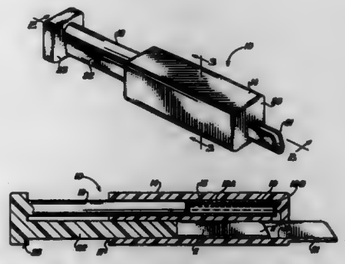
TOENAIL EXTENDER

Tris S. Castle, 2652 S. Cottonwood Dr., Tempe, Ariz. 85282

Filed May 12, 1992, Ser. No. 889,614

Int. Cl.[5] A45D *29/00, 31/00*

U.S. Cl. 606—1 **6 Claims**



1. A dual purpose prosthetic device for treating ingrown toenails comprising:

a housing,

a pair of channels extending longitudinally in said housing,

said housing having a cannula extending outwardly thereof from one end of one of said channels,

said cannula comprising a track for receiving therein a nail extender,

the other of said channels being provided for receiving an adhesive,

means for providing an opening from said other of said channels into said one of said channels for movement of said adhesive therethrough,

a nail extender for positioning in said one of said channels within said housing, and

plunger means for simultaneously moving said extender positioned in said housing in said one of said channels into said cannula and an adhesive from said other of said channels into said extender.

5,197,962

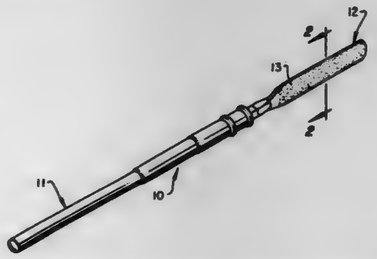
COMPOSITE ELECTROSURGICAL MEDICAL INSTRUMENT

Matthias R. Sansom, Sandy, and Richard L. Ellingson, Draper, both of Utah, assignors to MegaDyne Medical Products, Inc., Murray, Utah

Continuation of Ser. No. 711,618, Jun. 5, 1991, abandoned. This application Jul. 22, 1992, Ser. No. 918,936

Int. Cl.[5] A61B *17/35*

U.S. Cl. 606—45 **6 Claims**



1. An electrosurgical instrument to which electric current can be applied for causing hemostasis, having an electrically conductive predetermined region for contact with flesh or tissue, said instrument being coated over at least a portion of said predetermined region by a composite coating consisting essentially of a nickel-phosphorous matrix having particles of polytetrafluoroethylene distributed substantially uniformly therethrough.

5,197,963

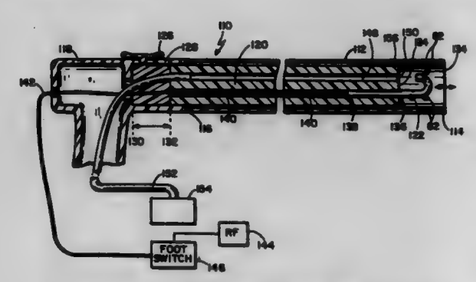
ELECTROSURGICAL INSTRUMENT WITH EXTENDABLE SHEATH FOR IRRIGATION AND ASPIRATION

David J. Parins, Columbia Heights, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.

Filed Dec. 2, 1991, Ser. No. 801,385

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—46 **15 Claims**



1. An electrosurgical instrument comprising:

(a) an elongated tubular member having proximal end, a distal end and a lumen extending therebetween;

(b) electrode means affixed to said distal end of said tubular member and projecting distally therefrom for electrosurgical cutting of tissue;

(c) means for creating a suction force at the distal end of said elongated tubular member by applying a negative pressure at the proximal end of said lumen; and

(d) means for selectively extending said suction force beyond said distal end of said elongated tubular member comprising a tubular sheath having a distal end coaxially disposed relative to said elongated tubular member, and a means for retracting said elongated tubular member from a first position wherein said electrode means is exposed and projects distally relative to said distal end of the sheath, to a second position wherein said electrode means is retracted to lie in covered relation to said sheath, said tubular sheath including at least one pressure relief port.

5,197,964

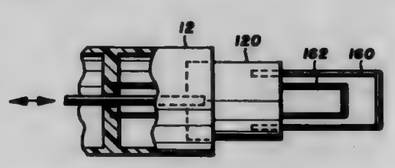
BIPOLAR INSTRUMENT UTILIZING ONE STATIONARY ELECTRODE AND ONE MOVABLE ELECTRODE

David J. Parins, Columbia Heights, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.

Filed Nov. 12, 1991, Ser. No. 790,490

Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—48 **7 Claims**



1. An electrosurgical instrument for the removal of tissue polyps, comprising:

(a) a tubular member having a distal end, a proximal end, and a lumen extending therebetween, and having a longitudinal axis extending between said distal and proximal ends;

(b) an insulating plug mounted generally perpendicular to said longitudinal axis at said distal end of said tubular member and extending partially therefrom and having a distal surface;

(c) a first generally U-shaped electrode extending from said distal surface;

(d) a second generally U-shaped electrode extending from said distal surface along an axis parallel to said longitudinal axis and having a distal end and a proximal end;

(e) a pair of flexible conductive wires extending through said tubular member and affixed individually to said first and second electrodes, for allowing electrical energization of said first and second electrodes; and

(f) an actuator means, extending through said tubular member, for effecting translational movement to one of said first and second electrodes along said longitudinal axis, for bringing said first and second electrodes into a predetermined distance from one another.

5,197,965

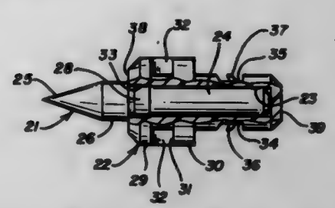
SKULL CLAMP PIN ASSEMBLY

Joseph A. Cherry, Mansfield; Victor B. Agbodoe, Boston; Raphael F. Meloul, Randolph, and Jose E. Lizardi, Medfield, all of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Jul. 29, 1992, Ser. No. 921,866

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—54 **4 Claims**



1. A pin assembly for use in a skull clamp comprising;

a cylindrical non-metallic housing having a first end and a second end and having an axially extending bore, said bore having an enlarged diameter at said first end, a plurality of spaced apart circumferential ribs surrounding the bore at said first end,

a rigid pin having a conical point at a first end attached to a shank which extends to a second end of the pin, a shoulder portion between the conical point and the shank, an undercut in the shank adjacent the shoulder portion, a step in said shank having a diameter larger than the shank adapted to fit into the enlarged diameter of said bore,

at least one transverse cavity in the outer surface of said non-metallic housing, a finger extending from the base of said cavity, said finger being positioned set in said cavity and extending at an angle toward said first end of said housing.

5,197,966

RADIODORSAL BUTTRESS BLADE PLATE IMPLANT FOR REPAIRING DISTAL RADIUS FRACTURES

T. Greg Sommerkamp, 273 Springside Dr., Crestview Hills, Ky. 41017

Filed May 22, 1992, Ser. No. 887,735

Int. Cl.[5] A61B *17/56, 17/58*

U.S. Cl. 606—69 **12 Claims**

1. An implantable radiodorsal buttress blade plate assembly for repairing a distal radius fracture, comprising:

a) an elongated side plate extending in a first direction between first and second longitudinal ends, said side plate

having an abutment surface that is configured to match the anatomical contours of a distal radiodorsal portion of a radius bone, said side plate having a first enlarged portion proximal to one of its longitudinal ends in which the side plate extends in a second direction perpendicular to the first direction for a distance greater than the corresponding extension in the second direction of a second adjacent portion of the side plate;

b) a plurality of openings extending through said side plate,

each of said openings being spaced from each other in the first direction and being dimensioned and configured to accommodate a screw for securing the side plate to the radius bone;

c) a pair of elongated blades rigidly secured to and extending outwardly from the abutment surface at the enlarged portion of the side plate, each of said blades extending in a third direction generally perpendicular to both the first and second directions, said blades being spaced from each other in the both the first and second directions.

5,197,967

TREPHINE INSTRUMENT AND METHOD FOR CUTTING ANNULAR HOLES

Frank Wilson, Prospect Park, Pa., assignor to Synthes (U.S.A.), Paoli, Pa.

Filed Apr. 2, 1991, Ser. No. 679,259
Int. Cl.[5] A61F *17/00*
U.S. Cl. 606—79 **16 Claims**

1. A trephine instrument for cutting an annulus into a material, which is accurately guided in a pre-determined path through said material, comprising:

a hollow housing, having a cutting head at a first end;

a piston disposed in said housing adapted for linear movement inwardly and outwardly of said first end of said housing;

a cannulation extending through the length of said piston to accommodate a guide wire attached to material to be cut; and

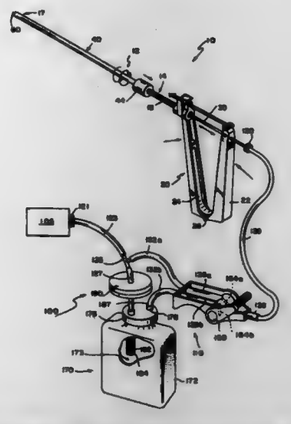
resilient means urging said piston toward said first end of the housing to eject out material from said housing.

5,197,968

DISPOSABLE TISSUE RETRIEVAL ASSEMBLY

Thomas P. Clement, Bloomington, Ind., assignor to Mectra Labs, Inc., Bloomfield, Ind.

Filed Aug. 14, 1991, Ser. No. 745,252
Int. Cl.[5] A61B *17/00, 17/36*
U.S. Cl. 606—115 **20 Claims**



1. An instrument for dissecting and removing tissue from a patient's body, the instrument comprising

a collapsible basket formed to define a basket cavity to contain tissue, the collapsible basket being positionable in a patient's body to entrap said tissue,

means attached to the collapsible basket for collapsing the collapsible basket to allow insertion of the collapsible basket into a patient's body,

a cannula having means for cutting tissue at its distal end, the cutting means being movable to pass through the means for collapsing the basket to a distal end of the collapsible basket and to cut any tissue contained in the basket cavity,

means attached to the cutting means for moving the cutting means to cut tissue, and

means connected to the basket cavity for withdrawing cut tissue from the basket cavity.

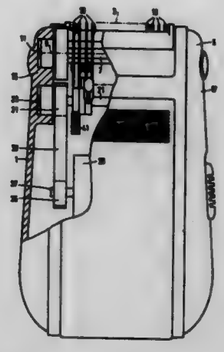
5,197,969

DEPILATION APPARATUS WITH THRUST COGS

Albert Visscher, and Marinus P. Koster, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 4, 1991, Ser. No. 754,880
Claims priority, application European Pat. Off., May 13, 1991, 91201157.4
Int. Cl.[5] A45D *26/00*
U.S. Cl. 606—133 **7 Claims**

1. A depilation apparatus having at least four disc-shaped pinching plates, which plates are coupled to a drive shaft which is rotatable relative to a housing and are each tiltable by displacement means mounted on an auxiliary shaft about a tilting axis which extends transverse to the drive shaft from a catching position, in which the pinching plate is transverse to the drive shaft, into a pinching position, in which the pinching plate exerts a pinching force on an adjacent pinching plate tilted into the pinching position near a depilation opening of the housing, the auxiliary shaft extending parallel to the drive shaft at a side of the drive shaft remote from the depilation opening, characterized in that the displacement means comprise a unique displacement member for each pair of pinching plates arranged next to one another, each pinching plate positioned between two other pinching plates being common to two consecutive pairs, while the auxiliary shaft and the drive shaft are rotatable with equal rotation speeds and each displacement member comprises a cog extending perpendicular to the auxiliary shaft, each cog having a longitudinal axis extending perpendicular to the auxiliary shaft and a plane of reference extending perpendicular to the auxiliary shaft, which cogs form with one another consecutively equal angles α which satisfy the following condition:



$$\phi < \alpha < \pi - \tfrac{1}{2}\phi,$$

where α is the angle formed between the longitudinal axes of two consecutive cogs on said plane of reference, and ϕ is a rotation angle of the drive shaft at which each pair of pinching plates is in the pinching position.

said pusher bar proximally in response to movement of said at least one handle towards said closed position; and

second means connected to said at least one handle for moving said channel assembly distally upon movement of said at least one handle towards said closed position to thereby close said jaws;

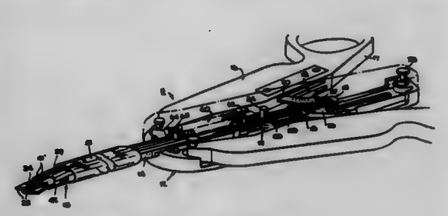
wherein said pusher bar feeds a clip to said jaws upon movement of said at least one handle from said closed position to said open position.

5,197,970

SURGICAL CLIP APPLICATOR

David T. Green, and Richard A. McGarry, both of Norwalk, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 635,219, Dec. 27, 1990, Pat. No. 5,030,226, which is a continuation of Ser. No. 144,486, Jan. 15, 1988, abandoned. This application Jun. 28, 1991, Ser. No. 723,067
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] A61M *17/08*
U.S. Cl. 606—158 **13 Claims**



1. A surgical clip applicator comprising:

a housing;

at least one handle pivotably mounted to said housing for movement between an open position and a closed position;

a jaw blade assembly extending from said housing and including a pair of jaws for receiving and deforming a clip;

a channel assembly slidably mounted in at least a portion of said housing for movement between a proximal position and a distal position for enveloping said pair of jaws;

a pusher bar slidably mounted within at least a portion of said housing for feeding a clip to said jaws;

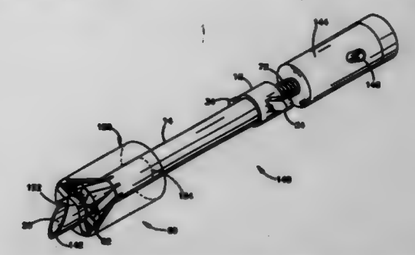
first means connected to said at least one handle for moving

5,197,971

ARTHROSCOPIC RETRACTOR AND METHOD OF USING THE SAME

Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401

Continuation-in-part of Ser. No. 609,341, Nov. 5, 1990, abandoned, and a continuation-in-part of Ser. No. 487,645, Mar. 2, 1990. This application Dec. 18, 1990, Ser. No. 631,740
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—192 **10 Claims**



1. An expandable cannula for moving tissue such as bone, cartilage, tendon, and/or muscle to create an actual space within such tissue at a location, not within a normal body cavity such as inside an artery or vein, and not inside an existing body passage such as an alimentary passage, said cannula comprising:

a rigid longitudinally extending tubular body member having a rigid tubular wall with an outer cylindrical surface and an inner cylindrical surface,

said inner cylindrical surface defining a central instrument passage extending longitudinally through the entire length of said body member,

said tubular body member having proximal and distal ends defining the proximal and distal termini of the central instrument passage,

the central instrument passage having a diameter sufficiently large to receive therethrough surgical instruments of the type commonly used in endoscopic surgery, such instruments including but not limited to endoscopes, drills, reamers and other surgical instruments commonly used in arthroscopic surgery of joints such as a knee joint or a shoulder joint,

said tubular body member being strong and rigid enough to move tissue such as bone, cartilage, tendon, and/or muscle to create an actual space within such tissue both when (i) said expandable cannula is first inserted into such tissue and when (ii) said expandable cannula is already inserted into and is being moved around in the tissue such as bone, cartilage, tendon, and/or muscle by a surgeon using said expandable cannula during endoscopic surgery or arthroscopic surgery,

said expandable cannula including a sleeve member circumscribing said tubular body member, said sleeve member including a mechanical expanding portion intermediate said proximal and distal ends of said tubular body member and capable of expanding radially outwardly against tissue such as bone, cartilage, tendon, and/or muscle tissues and move such tissue away from the central instrument passage when said retractor is in use, to create an actual space therein; and

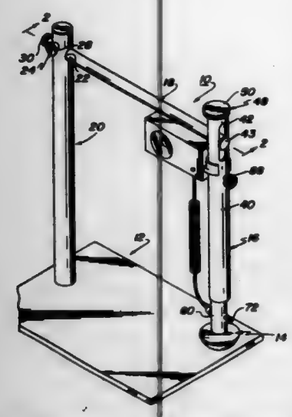
said sleeve member including a fluid-operated expanding portion intermediate said proximal and distal ends of said tubular body member and capable of expanding radially outwardly against tissue such as bone, cartilage, tendon, and/or muscle tissues and move such tissue away from the central instrument passage when said retractor is in use, to create an actual space therein;

said mechanical expanding portion being axially co-extensive with said fluid-operated expanding portion.

5,197,972
ARTERIAL MANOMETRIC DRESSING

A-Hamid Hakki, 2530 Gary Cir., No. 304, Dunedin, Fla. 34698-1770

Filed Mar. 25, 1991, Ser. No. 674,837
Int. Cl.[5] A61B *17/12*
U.S. Cl. 606—201 9 Claims



1. An arterial manometric dressing including a pressure applying assembly having a Doppler probe and a pressure pad, said Doppler probe having a sensor means at a lower end thereof for detecting the flow of blood through a blood vessel, said pressure pad being at a lower end of the assembly, characterized in that said pressure pad includes a pliable shell having an interior compartment, a fluid for transmitting ultrasonic signals therethrough, to and from said Doppler probe, fililng said interior compartment, said shell including an upper wall means for engaging the lower end the Doppler probe when sid probe is attached to said pressure pad, and a lower wall measn for engaging a patient in a region and for applying pressure to an underlying artery, said pressure pad including a substantially rigid member secured to the upper wall means of the pad and including a threaded peripheral surface providing a threaded passageway therethrough, said passageway communicating with the upper wall means of the pad, said lower end of the Doppler probe being threaded for threadably engaging the threads on the peripheral surface defining the passageway to thereby removably attach the pad to the Doppler probe.

5,197,973
SYNTHETIC BIOADHESIVE

Roy H. L. Pang; Charles M. Cohen, both of Medway, and Peter C. Keck, Millbury, all of Mass., assignors to Creative BioMolecules, Inc., Hopkinton, Mass.

Filed Dec. 14, 1990, Ser. No. 627,323
Int. Cl.[5] A61B *17/08*
U.S. Cl. 606—214 8 Claims

1. A method of bonding two surfaces comprising the steps of:

A. forming interchain crosslinks between synthetic, alpha-helical polypeptide chains to form a cohesive matrix, the polypeptide chains comprising apolar and polar amino acids;

the apolar and polar amino acids being arranged to define apolar and polar longitudinal spiral stripes on the helix surface, the polar stripes being interposed between the apolar stripes, at least two apolar stripes together being capable of sufficient hydrophobic interaction with the

corresponding apolar stripes of at least one other polypeptide chain to aggregate the chains in a superhelical structure; and

each polar stripe comprising surface adherable amino acids adapted to form interchain crosslinks within and between the aggregated polypeptide chains;

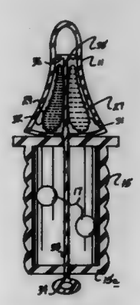
B. applying said matrix to one or both surfaces; and

C. contacting said surfaces.

5,197,974
PACIFIER APPARATUS WITH HEATING OR COOLING CAPABILITIES

Elizabeth J. Scarpelli, and Christian M. Scarpelli, both of 2155 Federal Rd., Roswell, Ga. 30075

Filed Dec. 2, 1991, Ser. No. 801,409
Int. Cl.[5] A61J *17/00*
U.S. Cl. 606—235 3 Claims



1. A pacifier apparatus, comprising,

a resilient nipple, the resilient nipple including an enclosed cavity therewithin, wherein the nipple includes a base, and the base is fixedly mounted to a support plate, and

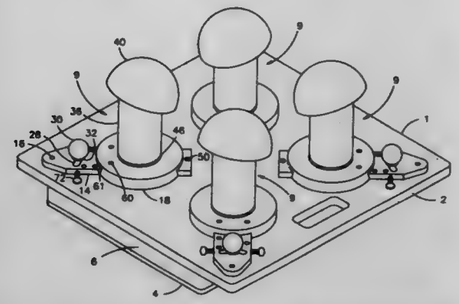
the support plate includes a housing mounted to the support plate, and wherein the nipple is mounted to a top surface of the support plate and the housing is mounted to a bottom surface of the support plate, wherein the housing and the nipple are coaxially aligned, and the housing includes a housing cavity, the housing cavity includes a plurality of spheres contained therewithin, and

a first flexible fluid pouch contained within the nipple cavity containing a first fluid, and a second fluid pouch contained within the nipple cavity containing a second fluid, the first fluid pouch and the second fluid pouch positioned in contiguous relationship relative to one another, said first fluid when mixed with said second fluid producing either an exothermic or endothermic reaction, depending on the composition of the fluids, soothing an infants teething gums.

5,197,975
RADIOLUCENT SPINE SUPPORT FRAME

Bruno Mombrinie, 5110 Gravenstein Hwy. North, Sebastopol, Calif. 95472

Continuation-in-part of Ser. No. 295,253, Jan. 9, 1989, Pat. No. Des. 322,312, and a continuation-in-part of Ser. No. 488,966, Mar. 6, 1990. This application Jul. 9, 1991, Ser. No. 727,575
Int. Cl.[5] A47C *27/08*; A61H *7/00*
U.S. Cl. 606—238 14 Claims



1. A frame for supporting a patient during medical proceedings comprising:

a. a radiolucent base;

b. a plurality of adjustable height columnar means for supporting said patient above and spaced from said base;

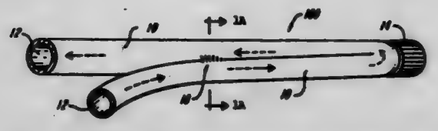
c. means for adjustably positioning said columnar means along the surface of said base;

d. means for releasably fixing said columnar means to said base within a continuum of positions.

5,197,976
MANUALLY SEPARABLE MULTI-LUMEN VASCULAR GRAFT

Steve A. Herweck, Nashua; Theodore Karwoski, Hollis, and Paul Martakos, Pelham, all of N.H., assignors to Atrium Medical Corporation, Hollis, N.H.

Filed Sep. 16, 1991, Ser. No. 760,716
Int. Cl.[5] A61F *2/04*
U.S. Cl. 623—1 25 Claims



1. An implantable vascular prosthesis comprising plural longitudinally parallel tube structures, each of said tube structures comprising a wall defining a longitudinally extending biocompatible exterior surface and an interior lumen of predetermined diameter for channeling fluid flow therethrough, said parallel tube structures being releasably connected to one another via a thickened wall portion extending over at least a portion of the longitudinal extent of said exterior surfaces to permit manual spatial separation of said tube structures.

5,197,977
DRUG DELIVERY COLLAGEN-IMPREGNATED SYNTHETIC VASCULAR GRAFT

Harmon Hoffman, Jr., Wyckoff, N.J.; Kemal Schankereli, Stillwater, Minn., and Miles Chvapil, Tucson, Ariz., assignors to Meadox Medicals, Inc., Oakland, N.J.

Continuation of Ser. No. 680,029, Mar. 28, 1991, abandoned, which is a continuation of Ser. No. 455,866, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 51,188, May 14, 1987, abandoned, which is a continuation of Ser. No. 575,091, Jan. 30, 1984, abandoned. This application Apr. 30, 1992, Ser. No. 877,344
Int. Cl.[5] B61F *2/06*
U.S. Cl. 623—1 16 Claims

1. A synthetic vascular graft comprising:

a tubular flexible porous graft substrate of a synthetic fiber having a porosity of less than about 3,000 ml/min cm^2 (purified water at 120 mm Hg);

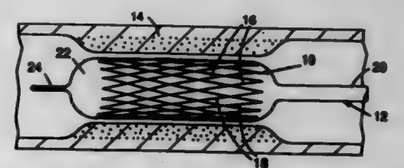
the graft substrate having on the inner surface and extending through the porous substrate to the outer surface crosslinked water insoluble collagen fibrils complexed with an effective amount of a drug and admixed with a plasticizer for rendering the graft blood-tight and flexible and providing for substained release of the drug portion of the complex after immplantation,

the collagen fibrils applied by application of an aqueous slurry of water-insoluble collagen fibrils which has been massaged through the substrate and dried and crosslinked.

5,197,978
REMOVABLE HEAT-RECOVERABLE TISSUE SUPPORTING DEVICE

Robert L. Hess, Portola Valley, Calif., assignor to Advanced Coronary Technology, Inc., Menlo Park, Calif.

Filed Apr. 26, 1991, Ser. No. 691,823
Int. Cl.[5] A61F *2/06*; A61M *29/00*
U.S. Cl. 623—1 20 Claims



1. A tissue supporting device comprising an undeformed, recoverable member of generally tubular shape of nickel-titanium shape-memory alloy, said alloy having martensitic and austenitic metallurgical states and a transition temperature therebetween, the transition temperature being higher than body temperature, said recoverable member being insertable within a patient while in said undeformed, martensitic state and being elastically deformable from a first configuration while in said martensitic state to a second configuration in the martensitic state, said recoverable member providing tissue support while in said second configuration and being recoverable to said first configuration upon heating of said recoverable member above said transition temperature to said austenitic state for removal of said recoverable member from a patient.

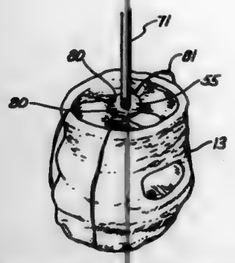
5,197,979

provided on said inner surface of the body along the entire

5,197,982

5,197,984

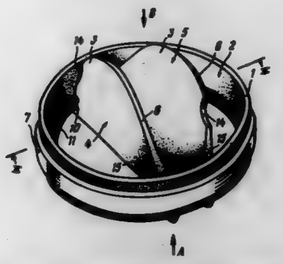
5,197,979
STENTLESS HEART VALVE AND HOLDER
Lillian J. Quintero, Laguna Niguel, Calif.; Delos M. Cosgrove, Hunting Valley, Ohio, and Diana Nguyen-Thien-Nhon, Santa Ana, Calif., assignors to Baxter International Inc., Deerfield, Ill.
Filed Sep. 7, 1990, Ser. No. 579,464
Int. Cl.[5] A61F 2/24
U.S. Cl. 623—2 33 Claims



1. A combination valve holder and prosthetic aortic segment comprising:
(a) a stentless aortic valve prosthesis comprising a low-pressure tanned animal aortic segment having intact the aortic valve, the aortic valve having left and right coronary arteries, a right coronary septal shelf, an inflow rim, an outflow rim and a pseudoannulus line, the aortic valve retaining its natural shape and flexibilty;
and coronary openings formed by cutting away the left and right coronary arteries while leaving intact a band of aortic wall at least about 2 millimeters wide surrounding the coronary openings; and
a suturable covering provided with edges and affixed along the entire right coronary septal shelf externally, the inflow rim both internally and externally, and covering at the outflow rim an area running internally directly above the pseudoannulus line and along the coronary openings, leaving uncovered a portion of aortic wall from 2 to 3.5 millimeters in width between the edges of the covering and each valve commissure;
(b) a disposable holder body having an elongate detachable handle; and
(c) a plurality of means for detachably attaching the holder body to the covering on the aortic segment.

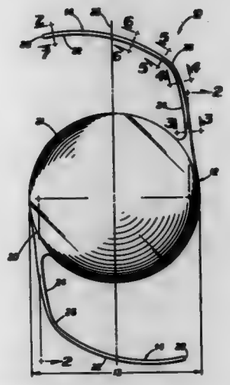
5,197,980
CARDIAC VALVE PROSTHESIS
Jury V. Gorshkov, prospekt Mira, 17, kv. 9; Sergei V. Evdokimov, ulitsa Chepetskaya, 20, kv. 70, and Alexandr P. Melnikov, ulitsa Sosnovaya, 22, korpus 2, kv. 54, all of Kirovo-Chepetsk, Kirovskaya oblast,, U.S.S.R.
Filed Aug. 13, 1991, Ser. No. 744,329
Claims priority, application U.S.S.R., Aug. 14, 1990, 4858589
Int. Cl.[5] A61F 2/24
U.S. Cl. 623—2 6 Claims

1. A cardiac valve prosthesis comprising:
an annular body having an inner surface which defines a passage for the forward blood flow along the body axis;
a closure member formed by first and second cusps, each of which has an ascending surface facing the ascending forward blood flow, a descending surface facing the descending blood backflow, and a lateral surface which serves as a surface of revolution and contacts said inner surface of said body in the closed position of the prosthesis to check said blood backflow;
said first cusp and said second cusp secured inside said body to turn from the closed position to the open position and back by means of a device consisting of two engageable members;
a first of said two engageable members of said device being provided on said inner surface of the body along the entire circumferential length thereof;
a second of said two engageable members being provided on the opposite sides of said lateral surface of each said cusp; and



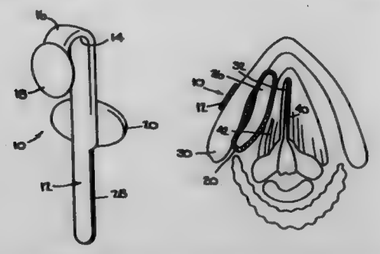
a recess provided on said lateral surface of at least one said cusp to produce a controlled blood backflow through said cardiac valve prosthesis.

5,197,981
INTRAOCULAR LENS HAVING HAPTIC OF SPECIFIC CURVATURE AND PROPORTION
Michael A. Southard, Arlington, Tex., assignor to Alcon Surgical, Inc., Fort Worth, Tex.
Filed Apr. 23, 1992, Ser. No. 872,937
Int. Cl.[5] A61F 2/16
U.S. Cl. 623—6 33 Claims



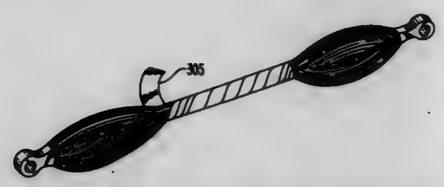
1. An intraocular lens, comprising:
a. an optic having a width and a length perpendicular to said width; and
b. at least one haptic extending from the optic such that it does not intend beyond the width of the optic, the at least one haptic having
i. a proximal segment having a first length and a radius of curvature of approximately 21.5 millimeters,
ii. a distal segment having a second length that is approximately 2.8 times the first length and having a radius of curvature of between 4.5 millimeters and 5.0 millimeters and
iii. a medial segment of varying cross-sectional area having a radius of curvature of approximately 1.3 millimeters.

5,197,982
ADJUSTABLE PROSTHETIC DEVICE FOR VOCAL CORD AND METHOD
Manning M. Goldsmith, III, Suite 103, 4750 Waters Ave., Savannah, Ga. 31404, and Bruce W. Pearson, 4500 San Pablo Rd., Jacksonville, Fla. 32225
Filed Oct. 15, 1991, Ser. No. 776,822
Int. Cl.[5] A61F 2/20, 2/04
U.S. Cl. 623—9 36 Claims



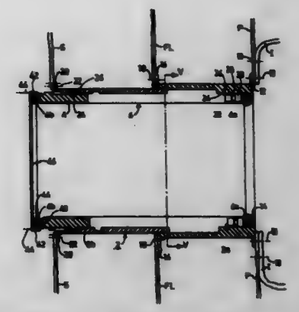
1. A prosthetic device for treating vocal cord paralysis comprising,
a) movable actuating means for locating a paralyzed vocal cord in a first predetermined phonation position, said actuating means having a free contact surface adapted to contact said paralyzed vocal cord to move said paralyzed vocal cord to said first predetermined phonation position,
b) support means adapted to support said actuating means on a thyroid cartilage proximate the paralyzed vocal cord, and
c) a fluid receiving station for inputting fluid to the actuating means to adjust the movement of the actuating means to change the location of the paralyzed vocal cord from said first predetermined phonation position to another selected position.

5,197,983
LIGAMENT AND TENDON PROSTHESIS
Andrew B. Berman; William C. Bruchman, and Stanislaw L. Zakowski, all of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Continuation-in-part of Ser. No. 184,470, Apr. 19, 1988, abandoned. This application Aug. 20, 1991, Ser. No. 747,595
Int. Cl.[5] A61F 2/08
U.S. Cl. 623—13 6 Claims



1. A prosthetic ligament comprising a plurality of load-bearing members of expanded porous polytetrafluoroethylene, said ligament having two fixation sites at opposite ends of the prosthetic ligament and further having at least one unification site having a length located along a longitudinal axis of the prosthetic ligament between said two fixation sites, wherein at least a portion of the length of the at least one unification site is located in a bone contacting region of the prosthetic ligament, said at least one unification site comprising gathered members helically-wrapped with a narrow film of expanded porous polytetrafluoroethylene and an outermost wrap of a wide film of expanded porous polytetrafluoroethylene surrounding said helically-wrapped, gathered members.

5,197,984
SHUT-OFF DEVICE PARTICULARLY AS AN ARTIFICIAL SPHINCTER
Dan Kedem, Rehovot, Israel, assignor to Du-Kedem Technologies (Ltd.), Rehovot, Israel
Filed Jun. 26, 1991, Ser. No. 721,078
Int. Cl.[5] A61F 2/08
U.S. Cl. 623—14 18 Claims



1. A shut-off device for shutting-off the flow of a material form a passage in a body, comprising:
a conduit assembly attachable to said body with its inner end in alignment with said passage;
a ring rotatably mounted in the outer end of said conduit assembly;
and a pliable sleeve passing through said conduit assembly and said ring, with the inner end of the sleeve attached to the inner end of said conduit assembly, and the outer end of the sleeve attached to said ring;
said pliable sleeve being of a length such that said ring may be rotated with respect to said conduit assembly to twist the pliable sleeve from an untwisted open condition permitting the flow of the material therethrough from said passage in the body, to a twisted closed condition shutting-off the flow of the material therethrough;
said ring being rotatably mounted with respect to said conduit assembly so as to move axially away from the outer end of the conduit assembly when the ring is rotated to the open untwisted condition of the pliable sleeve, to thereby increase the tension therein when in said open untwisted condition.

5,197,985
METHOD FOR ENHANCING THE IMPLANTATION AND DIFFERENTIATION OF MARROW-DERIVED MESENCHYMAL CELLS
Arnold I. Caplan, 1300 Oakridge Dr., Cleveland Heights, Ohio 44121, and Stephen E. Haynesworth, 3643 Antisdale Rd., Cleveland Heights, Ohio 44118
Filed Nov. 16, 1990, Ser. No. 614,915
Int. Cl.[5] A61F 2/28; A61K 35/12
U.S. Cl. 623—16 15 Claims

1. A method for inducing human marrow-derived mesen-

chymal stem cells to differentiate into bone-forming cells, comprising:

a) providing human marrow-derived mesenchymal stem cells that have been isolated, purified and culturally expanded from a bone marrow specimen by adding the bone marrow specimen to a medium which contains factors which stimulate mesenchymal cell growth without differentiation and allows, when cultured, for selective adherence of only the mesenchymal stem cells to a substrate surface;

b) applying the isolated, purified and culturally expanded human marrow-derived mesenchymal stem cells to a porous carrier; and,

c) implanting the porous carrier containing the culturally expanded human marrow-derived mesenchymal stem cells into an environment containing factors necessary for differentiating the human mesenchymal stem cells into bone cells.

5,197,986

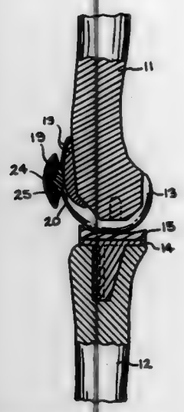
RECESSED PATELLAR PROSTHESIS

W. E. Michael Mikhail, 4203 Shamley Green, Toledo, Ohio 43623

Continuation-in-part of Ser. No. 508,088, Apr. 11, 1990, abandoned. This application Oct. 18, 1990, Ser. No. 599,432

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 **19 Claims**



15. A patellar prosthesis comprising

(a) a central post extending along a longitudinal axis and

(b) a body portion extending from said central post, said body portion having

(i) a first side extending outwardly from said longitudinal axis and tapering away from said central post to an outer peripheral edge, said first side having grooves extending in a direction radial to said longitudinal axis; and

(ii) a second side having a domed surface, convexly curved throughout, with an apex lying on said longitudinal axis, said apex being spaced axially from said central post further than any other portion of said domed surface.

5,197,987

KNEE JOINT PROSTHESIS

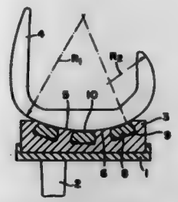
Rudolf Koch, Frauenfeld, and Robert M. Streicher, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 14, 1992, Ser. No. 820,357

Claims priority, application Switzerland, Jan. 18, 1991, 00144/91

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 **10 Claims**



1. A knee joint prosthesis comprising

a femur part having at least one condyle with a first bearing surface including a double convex curve in an anterior/-posterior direction formed from at least two circular sectors having different radii of curvature and center points;

a tibia part having a plastic part with a second bearing surface receiving said at least one femur condyle thereon; and

a plurality of support members in said plastic part of a harder material than said plastic part, each said support member having a support surface lying in said bearing surface of said plastic part and including double concave curves, wherein each support surface has two different concave curves with radii of curvature correspondign to said radii of said convex anterior/posterior curves of said at least one femur condyle.

5,197,988

FEMORAL PROSTHESIS

Lorenzo Spotorno, Finale Ligure, Italy, and Otto Frey, Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur and Protek AG, Berne, both of Switzerland

Filed May 23, 1990, Ser. No. 528,108

Claims priority, application Switzerland, Jun. 21, 1989, 2316/89

Int. Cl.[5] A61F *2/36*

U.S. Cl. 623—23 **2 Claims**

1. A prosthesis comprising

a stem for implanting in a femur including a medial surface;

a neck for receiving a femoral head;

a collar between said stem and said neck for bearing on a femur;

a slot in said medial surface of said stem adjacent said collar;

a throughbore extending from said medial side laterally to a longitudinal center plane of said stem and in said stem and communicating with said slot, wherein said throughbore is oval-shaped; and

a resilient filling in said throughbore.

5,197,989

TWO STAGE JOINT PROSTHESIS

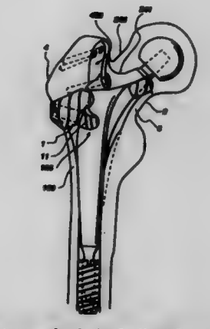
Bruce W. Hinchfuss, 246 La Trobe Terrace, Geelong, Victoria; Rodney B. Brink, 337 Ryrie Street, Geelong, Victoria 3220, and Gregory Saposhnikov, 5/308 Hampton Street, Hampton, Victoria, all of Australia

Continuation of Ser. No. 240,141, Sep. 2, 1988, abandoned. This application Jan. 17, 1991, Ser. No. 642,713

Claims priority, application Australia, Sep. 3, 1987, P14135/87

Int. Cl.[5] A61F *2/34*

U.S. Cl. 623—23 **13 Claims**



1. A hip joint prosthesis including femoral and acetabular articular parts characterized in that the femoral part comprises:

three first stage components for implantation at a first stage operation without opening the hip joint,

a second stage component for implantation at a second stage operation, and

a head component to articulate with the acetabular part;

said first stage components consisting of an elongated neck component for insertion in the lateral cortex of the femur below the femoral head and transverse to the femoral shaft, said neck component including an insert housing portion, comprising an internally directed bore, and a recessed support portion configured to engage the femur below the greater trochanter through the neck of the femur along the inferior cervical cortical bone said neck component being shaped to define a projected tubular surface; an insert of the neck component housed within the neck component and turnable therein so that a support portion of said insert lies outside said projected tubular surface, and a shaft component for insertion in the medullary cavity of the femoral shaft remote from said neck component and said insert of the neck component;

said second stage component comprising (i) a tail portion complementing the first stage shaft and neck components so as to be supported by said first stage shaft component, (ii) a collar portion complementing the first stage neck components so as to be supported by said first stage neck components; (iii) a stem portion connecting the tail portion and the collar portion by merging at its opposite ends with said tail portion and said collar portion, and (iv) a neck portion merging with said collar portion transversely to the merger of said collar portion through the stem portion with said tail portion and connectable to said head component.

5,197,990

PROSTHETIC INTRAMEDULLARY FEMORAL PROSTHESIS WITH PREFORMED SHEATH

Peter Lawes, Maidenhead, and Jacques Vanderlinden, London, both of England, assignors to Howmedica International, Inc., Shannon, Ireland

Filed May 16, 1991, Ser. No. 701,556

Claims priority, application United Kingdom, May 17, 1990, 9011132

Int. Cl.[5] A61F *2/36*

U.S. Cl. 623—23 **11 Claims**

1. A prosthetic intramedullary femoral prosthesis comprising a stem and a separate preformed sheath made from an acrylic material which is dimensioned to encloae the prosthesis stem from the distal tip to a location on the stem which will be adjacent the proximal cut end of the femur with which it will be used, said preformed sheath having a shape substantially the same as the stem but extending further in the distal direction to produce a void between the distal tip thereof and the distal tip of the stem, said preformed sheath slidably receiving said stem to allow axial movement therebetween over the length of said stem after implantation, said sheath having a thickness of between 0.5 mm and 2 mm.

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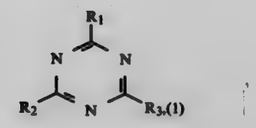
5,197,991

PROCESS FOR THE PHOTOCHEMICAL STABILIZATION OF WOOL WITH TRIAZINYL ULTRA-VIOLET ABSORBING COMPOUND

Manfred Rembold, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

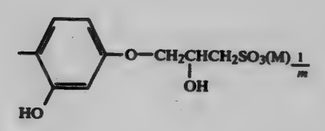
Filed Sep. 6, 1991, Ser. No. 755,714
Claims priority, application Switzerland, Sep. 13, 1990, 2973/90
Int. Cl.[5] D06M *13/35, 13/358;* D06P *1/64, 3/14*
U.S. Cl. 8—490 10 Claims

1. A process for the photochemical stabilisation of wool or wool containing fibres, which comprises treating the wool or the wool containing fibre material with an aqueous solution comprising at least one UV absorber of the formula



(1)

in which at least one of the substituents R_1, R_2 and R_3 is a radical of the formula



(2)

in which

M is hydrogen; sodium; potassium; calcium; magnesium; ammonium; mono-, di-, tri-or tetraalkylammonium; mono-, di- or trihydroxyalkylammonium; or ammonium that is independently substituted two or three times by hydroxyalkyl and alkyl;

m is 1 or 2, and

the remaining substituent(s), independently of one another, are unsubstituted or substituted C_1–C_{12}alkyl, C_1–C_{12}alkylthio, mono-C_1–C_{12}alkylamino or di-C_1–C_{12}alkamino; unsubstituted or substituted phenyl, phenoxy, phenylthio, anilino or N-phenyl-N-C_1–C_4-alkylamino.

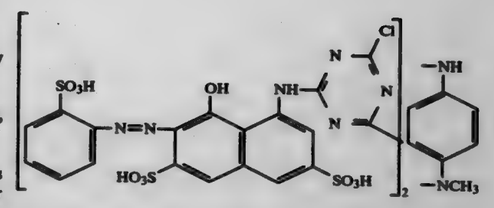
5,197,992

REACTIVE DYES

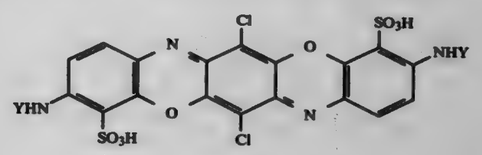
John A. Taylor, Prestwich; Duncan A. S. Phillips, Greenmount, both of England; Chu K. Yung, Taikoo Shing, and Gerard Ellis, Hong Kong, both of Hong Kong, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 472,407, Feb. 1, 1990, Pat. No. 5,059,681, which is a continuation of Ser. No. 84,097, Aug. 11, 1987, abandoned. This application Jan. 30, 1991, Ser. No. 648,517
Claims priority, application United Kingdom, Aug. 15, 1986, 8619914
Int. Cl.[5] D06P *3/68*
U.S. Cl. 8—549 6 Claims

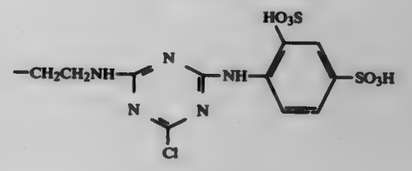
1. A reactive dye mixture containing from 2 to 20% by weight of a reactive dye having the following formula:



and from 98 to 80% by weight of the dye of the formula:



where Y is

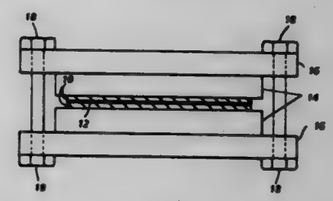


5,197,993

LIGHTWEIGHT BATTERY ELECTRODE AND METHOD OF MAKING IT

William A. Ferrando, Arlington, and Amarnath P. Divecha, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1991, Ser. No. 728,915
Int. Cl.[5] B05D *3/00*
U.S. Cl. 29—2 11 Claims



1. A process for producing a lightweight electrode grid comprising:

A. heating a mat of dense graphite fibers to a temperature at which $Ni(CO)_4$ decomposes;

B. exposing the heated mat of graphite fibers to $Ni(CO)_4$ gas which is at a temperature above the vaporization temperature of $Ni(CO)_4$ but below the decomposition temperature of $Ni(CO)_4$,

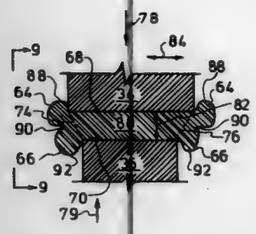
wherein the $Ni(CO)_4$ decomposes when it contacts the heated graphite fibers and deposits nickel metal on the graphite fiber surfaces;

C. removing the heated graphite fiber mat from the $Ni(CO)_4$ gas when the desired thickness of nickel metal coating has been produced on the graphite fiber mat; and

D. sintering the nickel coated graphite fiber mat in a reducing atmosphere under heat and pressure to compress the

mat to a desired thickness and to fuse the nickel metal coated graphite fibers together.

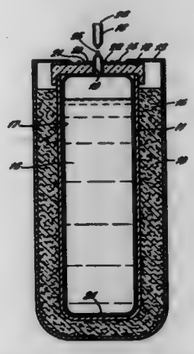
5,197,994
METHOD OF HEAT SEALING A BATTERY
Donald E. Brocksmith, Plaquemine, La., assignor to Daniell Battery Manufacturing Co., Inc., Baton Rouge, La.
Filed Nov. 26, 1990, Ser. No. 618,073
Int. Cl.[5] H01M *2/08*
U.S. Cl. 29—623.2 7 Claims



1. A method for sealing a battery top cover, having a sealing surface, to a battery case, having a sealing surface, the top cover and the case having sides thereon, comprising the steps of:
(a) providing a battery top cover and case along with a battery heat sealing device having a heating platen for heating the sealing surfaces of the top cover and case;
(b) positioning the sealing surfaces of the top cover and the case against the heating platen with a force and heating the surfaces with the heating platen for a time to soften the surfaces to a near liquid state, the positioning of the sealing surfaces against the heating platen causing heated rollover of the softened surfaces on the sides of the top cover and the case;
(c) removing the heating platen from the sealing surfaces;
(d) bringing the heated sealing surfaces of the top cover and the case into contact with each other with at least a first contact force;
(e) holding the first contact force for a time to allow the heated rollover on the sides of the top cover and the case to solidify while the space between the sealing surfaces and the rollover remains molten;
(f) applying at least a second contact force for a time to the top cover and the case to mix and to physically bond the molten polymers from the sealing surfaces of the top cover and the case, with the solidified rollover preventing further rollover from forming on the sides of the top cover and the case during application of the second contact force; and
(g) releasing the contact forces from the top cover and the case thereby providing a sealed battery having increased bursting strength.

5,197,995
METHOD OF MAKING AN ALKALI METAL CELL
Ronald P. Lowton, Warrington; Ian M. Lewis, Widnes; Alan Sykes, and Michael F. Stackpool, both of Cheshire, all of Great Britain, assignors to Chloride Silent Power Ltd., Cheshire, England
Division of Ser. No. 488,025, Jun. 28, 1990. This application Jun. 23, 1992, Ser. No. 902,695
Claims priority, application United Kingdom, Dec. 3, 1987, 8728301
Int. Cl.[5] H01M *6/00*
U.S. Cl. 29—623.2 6 Claims

1. A method of making an alkali metal cell of the type having an outer container, a solid electrolyte cup within the container dividing the container into an anode region inside the cup and a cathode region outside the cup, and, bonded around the lip of the cup, an electrically insulating ceramic closure having an aperture therein, and further having an alkali metal reservoir fitted inside the electrolyte cup to form an active region between the electrolyte cup and the reservoir with flow means allowing metal to flow from within the reservoir to the active region, the reservoir being provided with an aperture corresponding to and aligned with the aperture in the ceramic closure, the method comprising the steps of:
introducing a deformable metal ferrule rivet into the aperture in the ceramic closure and the reservoir to seal together the reservoir and the ceramic closure and to provide a gas tight connection to the interior of the reservoir through the aperture in the ceramic closure, said rivet being effective, during construction of the cell, as a filling tube extending from the reservoir at least into the aperture;



introducing molten alkali metal into the reservoir through said connection;
providing an overpressure within the reservoir to force molten alkali metal through the flow means in the reservoir to fill and fully wet said active region; and
subsequently sealing off the anode region.

5,197,996
METHODS AND COMPOSITIONS FOR COLOR STABILIZED DISTILLATE FUEL OILS
Dwight K. Reid, Houston, and Spencer S. Awbrey, Spring, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.
Filed Jun. 25, 1992, Ser. No. 904,228
Int. Cl.[5] C10L *1/22, 1/30*
U.S. Cl. 44—317 27 Claims

1. A method for color stabilizing distillate fuel oil comprising adding to said fuel oil an effective color stabilizing amount of a combination of (a) a boron hydride-amine compound and (b) an organic silicon compound wherein the weight ration of (a):(b) is from about 10:1 to about 1:10.

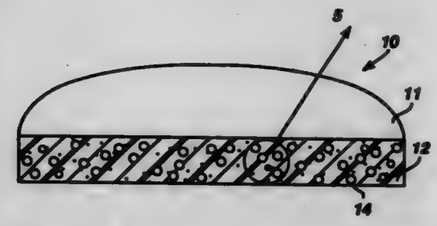
5,197,997
COMPOSITION FOR USE IN DIESEL POWERED VEHICLES
Edward C. Mozdzen, Willoughby; William B. Chamberlin, III, Kirkland, and Barbara A. Saiter, Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio
Filed Nov. 29, 1990, Ser. No. 619,849
Int. Cl.[5] C10L *1/18, 1/22*
U.S. Cl. 44—386 40 Claims

1. A fuel additive composition comprising:
(A) an alkylene oxide condensate or the reaction product thereof and an alcohol,
(B) a monocarboxylic fatty acid, and;
(C) the reaction product of a hydrocarbyl substituted amine and formaldehyde.

5,197,998
METHOD OF MAKING A FOLDED ABRASIVE ARTICLE
Conrad M. Germain, White Bear Lake Township, Ramsey County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 828,410, Jan. 31, 1992, Pat. No. 5,142,829. This application Jun. 15, 1992, Ser. No. 898,846
Int. Cl.[5] B24D *13/08*
U.S. Cl. 51—297 3 Claims

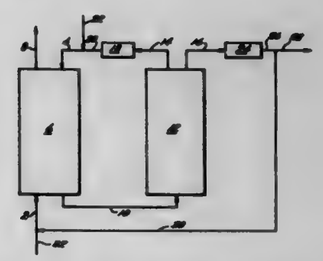
1. A method of making an easily formed abrasive article, comprising the steps of:
(a) providing a continuous sheet of material having first and second major surfaces, one of said surfaces having an abrasive thereon;
(b) cutting from said sheet an aligned row of connected abrasive sheet members, said abrasive sheet members each having a main portion, a center point, and a plurality of arm portions radially projecting from said main portion, each respective arm portion perimetrically spaced from said adjacent arm portion by a constant angle with respect to said center point, said abrasive sheet members connected at two junctions joining one of said arm portions of said respective sheet member to two adjacent arm portions of each immediately adjacent sheet member;
(c) forming an aperture in each abrasive sheet member, said apertures of each adjacent pair of abrasive sheet members equidistant from said junctions joining said pair; and
(d) Z-folding said aligned row such that said apertures are substantially in register and said arm portions of each respective sheet member are angularly offset about said center point one-half of said constant angle with respect to said arm portions of each immediately adjacent sheet member.

5,197,999
POLISHING PAD FOR PLANARIZATION
Michael E. Thomas, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Sep. 30, 1991, Ser. No. 767,690
Int. Cl.[5] C09K *3/14*
U.S. Cl. 51—298 19 Claims



1. A pad for planarization by mechanical polishing of a dielectric layer formed over features on a wafer in the manufacture of semiconductor devices, said pad having a substantially planar polishing face, said pad comprising a soft matrix material having a modulus of elasticity below 5 million psi, and stiffening means for stiffening said soft matrix material, said stiffening means comprising a hard substance distributed in said pad, no material of said pad protruding substantially beyond said polishing face.

5,198,000
METHOD AND APPARATUS FOR REMOVING GAS PHASE ORGANIC CONTAMINANTS
Domenic Grasso, Dayville, and George E. Hoag, Storrs, both of Conn., assignors to The University of Connecticut, Storrs, Conn.
Continuation-in-part of Ser. No. 579,893, Sep. 10, 1990, abandoned. This application Jul. 1, 1991, Ser. No. 723,484
Int. Cl.[5] B01D *53/14*
U.S. Cl. 55—20 13 Claims

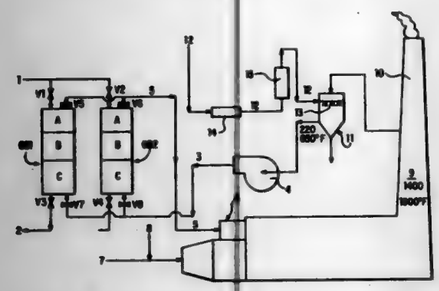


1. A method for removing a volatile organic compound from a gas stream contaminated therewith, consisting essentially of:
contacting a volatile organic compound contaminated gas stream with an organic solvent up to the point when the solvent becomes saturated with the volatile organic compound, said organic solvent consisting essentially of a nonvolatile organic liquid;
controlling the temperature or pressure or both of the gas stream and organic solvent to maintain a temperature and pressure range effective to optimize or at least increase the solubility of the gas stream in the solvent;
separating the volatile organic compound from the solvent;
collecting the separated volatile organic compound; and
recovering the separated solvent.

5,198,001
APPARATUS AND PROCESS FOR REMOVING ORGANIC COMPOUNDS FROM A GAS STREAM
William J. Knebel, Mars; Utpal Sengupta, Wexford; N. R. Pollack, and Gilbert Palmgren, both of Pittsburgh, all of Pa., assignors to Calgon Carbon Corporation, Pittsburgh, Pa.
Filed Sep. 13, 1991, Ser. No. 759,029
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—28 29 Claims

1. A method for removing volatile organic compounds from a gas stream containing such compounds, said method comprising:
a. passing said gas stream through at least two beds of adsorbent material, each of said beds being different from each other in physical or chemical properties, said properties being selected for effectively removing each organic compound in said gas stream;
b. discontinuing the passage of said gas stream when volatile organics contained in said stream exits said beds in greater than selected amounts;
c. regenerating said beds by passing a heated gas therethrough in a counterflow direction to desorb organic

compounds contained thereon and produce an effluent gas containing desorbed organic compounds; and



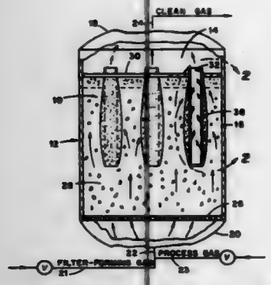
d. collecting said effluent gas to provide a collected effluent gas.

5,198,002

GAS STREAM CLEAN-UP FILTER AND METHOD FOR FORMING SAME

Joseph S. Mei, Morgantown; James DeVault, Fairmont, both of W. Va., and John S. Halow, Waynesburg, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 12, 1992, Ser. No. 850,478
Int. Cl.[5] B01D *53/06*
U.S. Cl. 55—77 **28 Claims**



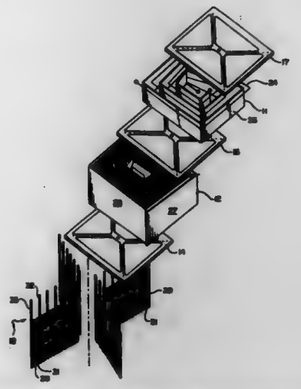
21. A method for forming in situ a filter for filtering particulate material from a particulate laden gas stream, comprising the steps of exposing a surface region of a relatively porous ceramic or metal membrane to a bed of fluidizable granular material, passing a stream of gas through the bed of granular material for fluidizing the bed and entraining granular material therefrom and contacting the exposed surface region of the membrane with the gas stream laden with granular material from said bed for removing all but a minor portion of the granular material from the gas stream as it passes through the membrane to effect and maintain the deposit of granular material removed from the gas stream on the surface region of the membrane, contacting the surface region of the membrane for a sufficient duration to form in situ a layer of granular material on the surface region of the membrane with said layer being of a porosity substantially less than that of the membrane so as to form in combination with the membrane a particulate filter capable of removing virtually all particulate material and granular material from said bed borne by a particulate-laden bed-fluidizing gas stream as it flows from said bed of granular material through said filter and contacts and passes through the filter.

5,198,003

SPIRAL WOUND ELECTROSTATIC AIR CLEANER AND METHOD OF ASSEMBLING

Charles A. Haynes, Seymour, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1991, Ser. No. 724,650
Int. Cl.[5] B03C *3/41*; B23P *21/00*; B29C *53/56*
U.S. Cl. 55—138 **7 Claims**



1. In an improved electrostatic air cleaner having an ionizer section which includes a plurality of alternately arranged, positively and negatively charged, elements for ionizing particles contained in the air flowing therethrough, and having axially spaced from the ionizer section, a collector section which includes a plurality of alternately arranged, positively and negatively charged elements for attracting or repelling the ionized particles, wherein the improvement comprises:

each of said collector negatively charged elements and said collector positively charged elements being continually wound in an outwardly expanding spiral fashion around a central axis aligned in the direction of air flow, and being supported by a plurality of non-electrically conductive rods extending in the direction of air flow wherein said plurality of non-conductive rods extend axially into the ionizer section, and further wherein said negative and positive charged ionizer elements are supported by said rods.

4. A method of assembling an electronic air cleaner having adjacent ionizer and collector sections arranged in serial flow relationship along a central axis, comprising the steps of:

providing first and second axially spaced support plates, said plates having a peripheral framework surrounding a generally open inner area and having a rib structure extending generally radially inwardly with spaced holes formed therein;

placing a pair of non-conductive rods between the support plates and inserting each into a radially inner hole of the rib structure in each of said plates;

connecting one end of a negative charge conductor element to one of said rods;

connecting one end of a positive charge conductor element to the other of said rods; and

continuing to add non-conductive rods between said plates, progressively inserting them into the holes towards the peripheral framework, while simultaneously winding said negative and positive charged elements around said insulator rods in a spiral fashion, such that a spiral wound negative charge conductor element intermeshes with a radially spaced, spiral wound, positive charge conductor element, and is electrically insulated therefrom, to jointly form a section of an electronic air cleaner, wherein a number of said non-conductive rods are long enough that they extend beyond said second plate to comprise an ionizer section, and including the steps of;

connecting one end of a negative ionizer element to one of said extended rods;

connecting one end of a positive ionizer element to another of said extended rods; and

as the extended rods are progressively added to extend beyond the second plate, simultaneously winding said negative and positive ionizer elements around said extended rods in a spiral fashion, such that a spiral wound negative ionizer element intermeshes with the radially spaced, spiral wound positive ionizer element and is electrically insulated therefrom, to jointly form an ionizer section.

5,198,005

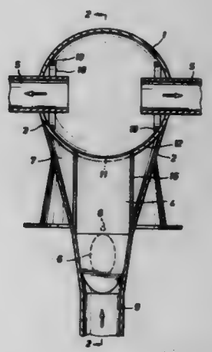
APPARATUS FOR SOLIDS-FLUID SEPARATION

Gregorius T. de Kruijff, The Hague, and Arie van Hattem, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 19, 1990, Ser. No. 554,490
Claims priority, application United Kingdom, Oct. 20, 1989, 8923684
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—459.1 **8 Claims**

1. In an apparatus suitable for solids-fluid separation comprising (1) an upwardly directed feed inlet means of which the upper part cooperates substantially tangentially with (2) a housing comprising (3) at least a domed upper section, (4) at least one fluid outlet means which is in fluid communication with (5) a central section of the housing, and (6) downwardly directed solids outlet means in communication with at least (7) one solids outlet opening in (8) a lower section of the housing, the improvement which comprises:

at least one fluid directing means is mounted on the inner surface of the housing and encircles the fluid outlet means.



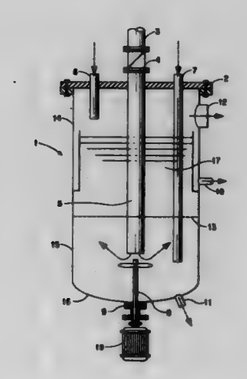
5,198,004

ACTIVATED CARBON FILTER FOR REMOVING TOXIC SUBSTANCES, E.G., DIOXINS AND FURANS, FROM FLUE GASES PRIOR TO ENTRY INTO THE SMOKESTACK

Frohmut Vollhardt, Oberhausen, Fed. Rep. of Germany, assignor to MAN Gutehoffnungshutte, Oberhausen, Fed. Rep. of Germany

Filed Dec. 11, 1991, Ser. No. 805,087
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1990, 4039989; Sep. 5, 1991, 4129483
Int. Cl.[5] B01D *53/10, 47/14*
U.S. Cl. 55—227 **11 Claims**

1. An activated carbon filter for removing toxic substances from flue gases prior to the glue gas entering a smoke stack,



comprising: a filter vessel; a gas feed pipe entering an upper portion of the filter vessel; means for providing a metered feed of activated carbon into the vessel; water feed means for providing a metered feed of water into the vessel; a drainage device provided at a vessel bottom for draining activated carbon sludge saturate with toxic substances; a gas discharge pipe arranged at an upper part of said vessel; overflow means for drawing off saturated activated carbon-water mixture arranged at an upper portion of the vessel; and perforated partition means, positioned above an outlet of said flue gas feed pipe for distributing said gas.

5,198,006

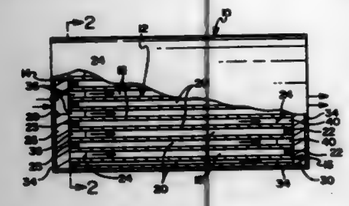
CERAMIC FILTER FOR A DUST-CONTAINING GAS AND METHOD FOR ITS PRODUCTION

Takashi Mimori, Takasago; Hiroshi Maeno, Tokyo; Tashiko Endo, Yokohama, and Tomokiro Morishita, Kakogawa, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 505,169, Apr. 5, 1990, Pat. No. 5,073,178. This application Aug. 16, 1991, Ser. No. 745,839
Claims priority, application Japan, Apr. 7, 1989, 1-86907; Apr. 25, 1989, 1-103537; May 1, 1989, 1-109189
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] B01D *46/24*
U.S. Cl. 55—523 **19 Claims**

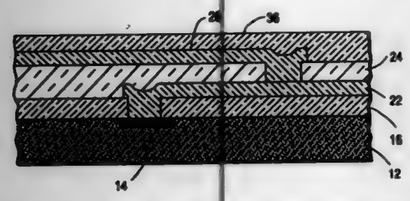
1. A ceramic filter for a dust-containing gas, which comprises a filter base having an average pore size of from 10 to 100 μm, and a filter layer having an average pore size of from 0.2 to 10 μm fixed at least to the filtering side surface of the filter base so that the filter layer substantially fills the pores open on the surface of the filter base.

5,198,007
FILTER INCLUDING A POROUS DISCRIMINATING LAYER ON A FUSED SINGLE CRYSTAL ACICULAR CERAMIC SUPPORT, AND METHOD FOR MAKING THE SAME
John R. Moyer, and Neal N. Hughes, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 5, 1991, Ser. No. 803,292
Int. Cl.[5] B01D *39/20*
U.S. Cl. 55—523 36 Claims



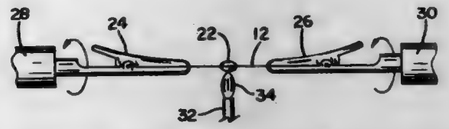
1. A filter useful for separating at least one contaminant from a fluid passed through said filter, comprising:
a porous support composed of a fused interlocked single crystal acicular ceramic material having properties sufficient to provide high mechanical strength, high impact strength, heat resistance and good resistance to thermal cycling; and
a porous discriminating layer on at least part of said support.

5,198,008
METHOD OF FABRICATING AN OPTICAL INTERCONNECT STRUCTURE
Michael E. Thomas, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Division of Ser. No. 611,909, Nov. 9, 1990, Pat. No. 5,123,078. This application Jun. 9, 1992, Ser. No. 895,670
Int. Cl.[5] C03C *25/02*; G02B *6/12*
U.S. Cl. 65—3.11 18 Claims



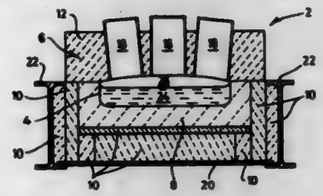
1. A method of fabricating an optical interconnect structure for optically interconnecting optoelectronic transmitting and receiving devices, said method comprising the steps of:
a) forming a first cladding layer on a substrate, said first cladding layer comprising a material having a first predetermined index of refraction;
b) forming vias in said cladding layer, each via exposing at least a portion of contact of an optoelectronic device;
c) forming a core layer over said cladding layer into contact with the exposed portions of said contacts of said optoelectronic devices, said core layer comprising a material having a second predetermined index of refraction of a magnitude which is greater than the magnitude of said first predetermined index of refraction;
d) forming said core layer into a predetermined pattern of optical interconnects; and
e) forming a second cladding layer over said predetermined pattern of optical interconnects, said second cladding layer comprising a material having an index of refraction of a magnitude substantially equal to the magnitude of said first predetermined index of refraction.

5,198,009
METHOD OF MANUFACTURING GLASS BEADS FOR USE IN THERMIONIC GAS CHROMATOGRAPHIC DETECTORS
John E. Purcell, New Milford, and Richard Dang, Stamford, both of Conn., assignors to The Perkin Elmer Corporation, Norwalk, Conn.
Filed Nov. 22, 1991, Ser. No. 796,497
Int. Cl.[5] C03C *27/02*
U.S. Cl. 65—59.220 14 Claims



1. The method of manufacturing an alkali metal-containing bead for use as a detector source in gas chromatography which comprises:
providing an electrically conductive support wire;
providing a capillary tube formed of a glass containing said alkali metal in a preselected uniform desired concentration, said tube having an inside diameter capable of receiving said support wire therethroguh and having a glass volume substantially equivalent to that of the desired bead to be manufactured;
threading said tube onto said support wire; and
melting said tube to form a substantially symmetrical bead having said preselected uniform concentration of alkali metal throughout the bead adhered to said support wire.

5,198,010
METHOD AND APPARATUS FOR CONVEYING MOLTEN GLASS
Clive Ward, 9 Bell's Court, Pottergate, Helmsley, Yorkshire Y06 5DQ, Great Britain
Filed Oct. 31, 1991, Ser. No. 786,079
Claims priority, application United Kingdom, Oct. 31, 1990, 9023638
Int. Cl.[5] C03B *5/16*
U.S. Cl. 65—135 8 Claims



1. A molten glass conveying apparatus comprising:
channel means having a base and side structures for housing molten glass to be conveyed;
roof means connected to said side structures and extending over the channel means;
at least two nozzle means provided in the roof means for the purpose of heating the molten glass wherein the nozzle means are located so that fluid flowing from the nozzle means is made to strike the outermost portions of the molten glass and so then flow along the channel.

5,198,011
METHODS FOR INHIBITING RUST INFECTIONS OF PLANTS
Robert E. Wilkinson, and John J. Roberts, both of Griffin, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Aug. 1, 1988, Ser. No. 226,608
Int. Cl.[5] A01N *55/06, 41/04*; A61K *31/305*; C12N *9/99*
U.S. Cl. 514—496 5 Claims

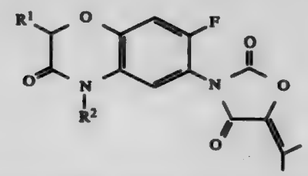
3. A method for inhibiting rust infection of plants comprising providing a non-membrane penetrating compound which disrupts extracellular sulfhydryl bonds in leaf rust proteins involved in utilization and transport of epicuticular wax components by leaf rust germ tubes.

5,198,012
PHOSPHATE ACTIVATORS FOR CYCLOHEXENONE HERBICIDES
Tetsuji Iwasaki, Wakayama, Japan, assignor to Kao Corporation, Tokyo, Japan
Division of Ser. No. 428,072, Oct. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 42,545, Apr. 24, 1987, abandoned, which is a continuation of Ser. No. 725,028, Apr. 19, 1985, abandoned. This application May 21, 1991, Ser. No. 703,366
Claims priority, application Japan, Apr. 23, 1984, 59-81538
Int. Cl.[5] A01N *57/00, 31/04*
U.S. Cl. 504—344 9 Claims

1. An agricultural herbicidal composition which consists essentially of an effective amount of an agricultural chemical herbicide and an effective amount of a substance for increasing the herbicidal rate of said herbicide, said herbicide being selected from the group consisting of (E,E)-(+)-2-[1-(3-chloro-2-propenyl)-(oxyimino)propyl]-5-[2-(ethylthio)-propyl]-3-hydroxy-2-cyclohexen-1-one and 2-[1-ethoxyimino)butyl]-5-[2(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one and said substance being selected from the group consisting of alkyl phosphates, alkenyl phosphates, hydroxyalkyl phosphates, and polyoxyalkylene hydroxyalkyl ether phosphates and salts thereof, said substance having from 1 to 22 carbon atoms in the alkyl, alkenyl or hydroxyalkyl group thereof, the weight ratio of said substance/said herbicide being in the range of 1/1 to 15/1.

5,198,013
BENZOXAZINONE COMPOUNDS AND HERBICIDAL COMPOSITION CONTAINING THE SAME
Kenji Hirai, Kanagawa; Atsuko Fujita, Chiba; Hiroshi Sato, Chiba; Hiroaki Hirose, Chiba; Masahiro Yokota, Chiba, and Shoin Nagato, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo; Chisso Corporation, Osaka and Kaken Pharmaceutical Co., Ltd., Tokyo, all of Japan
Filed Jan. 25, 1989, Ser. No. 301,419
Claims priority, application Japan, Feb. 5, 1988, 63-25492; Feb. 5, 1988, 63-25493; Jan. 17, 1989, 1-7942; Jan. 17, 1989, 1-7943
Int. Cl.[5] A01N *43/84*; C07D *413/04*
U.S. Cl. 504—225 9 Claims

1. A benzoxazinone compound represented by the formula (I):

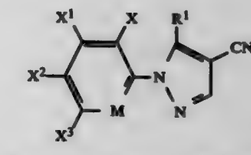


(I)

wherein R^1 represents a hydrogen atom or an alkyl group, and R^2 represents a hydrogen atom, an alkyl group, a cyanoalkyl group, an alkenyl group, an alkynyl group or an aralkyl group.

5,198,014
HERBICIDAL BETA-PYRAZOLYLACRYLIC ACID COMPOUND
Lester L. Maravetz, Westfield, N.J., assignor to FMC Corporation, Philadelphia, Pa.
Filed Nov. 20, 1991, Ser. No. 795,403
Int. Cl.[5] A01N *43/56*; C07D *231/38*
U.S. Cl. 504—225 11 Claims

1. A herbicidal compound of the formula



wherein X is chlorine or fluorine, X^1 is hydrogen, chlorine, or fluorine, X^2 is chlorine, fluorine, trifluoromethyl, or ethoxy, and X^3 is hydrogen, chlorine, fluorine, or CH_2—N(CH_3(CH_2C═CH); M is —N—; and R^1 is —CH═C(—R^2)—C(═O)—Z—[S(O)$_2$]$_n$—R^3 wherein R^2 is hydrogen or methyl; Z is —O—, —S— or —NR^4; and n is 0 or 1;
when Z is —O— or —S— and n is 0, R^3 is hydrogen, sodium, lower alkyl, cyanomethyl, propargyl, yl, phenylmethyl optionally substituted in the 4-position with methylthio, and —R^5—COR^6, where R^5 is a divalent alkylene of 1 to 3 carbons and R^6 is hydrogen, amino, dimethylamino, methylsulfonylamino, or an alkoxy of 1 to 4 carbons; p1 when Z is NR^4— and n is 0, R^3 is hydrogen, lower alkyl, methoxy, 1-cyanoethyl, 1-(ethoxycarbonyl)-methyl, phenylmethyl, and phenyl; and R^4 is hydrogen, methyl, or —$C_2H_5OC_2H_5$— taken with R^3 to form a morpholine ring;
when Z is —NR^4— and n is 1, R^3 is lower alkyl, trifluoromethyl, cyclohexylmethyl, 2-phenylethyl, 2-phenylethenyl, amino, d-10-camphoryl, 3,5-dimethylisoxazol-4-yl, phenylmethyl optionally substituted with one or more of chlorine, bromine, fluorine, or methyl, and phenyl optionally substituted with chlorine or methyl; and R^4 is hydrogen; in addition, when R^2 is hydrogen and R^3 is lower alkyl or phenylmethyl, R^4 may be sodium.

5,198,015
SILVER BASE ELECTRICAL CONTACT MATERIAL AND METHOD OF MAKING THE SAME
Koji Tsuji; Yoshinobu Takegawa, both of Nara; Hayato Inada, Ibaraki, and Shuji Yamada, Ashiya, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jan. 20, 1991, Ser. No. 718,035
Claims priority, application Japan, Jan. 21, 1990, 2-164839; May 14, 1991, 3-139826
Int. Cl.[5] C22C *5/06*
U.S. Cl. 75—247 2 Claims

1. A silver based electrical contact material consisting essentially of 0.5 to 39.9 wt % nickel, 0.14 to 7.0 wt % nickel oxides, and balance silver, said nickel being in the form of essentially pure nickel particles and said nickel oxides being in the form of separate essentially pure particles of nickel oxides, both said particles being dispersed in a silver matrix for strengthening said material,
said nickel particles being micron nickel particles having a

particle size of 1 to 10 μm and submicron nickel particles

5,198,019

5,198,021

means for cooling the nozzle body to form a metal skull on

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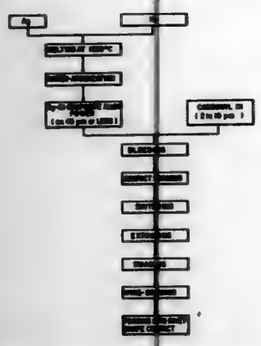
particle size of 1 to 10 μm and submicron nickel particles having a particle size of not more than one μm and said



nickel oxide particles being submicron particles having a particle size of not more than 1 μm.

5,198,016

PRODUCT FOR THE DESULPHURIZATION OF MOLTEN PIG IRON OR STEEL BASED ON COATED MAGNESIUM

Paul H. Galvin, Le Fayet, France, assignor to Pechiney Electrometallurgie, France

Filed Nov. 5, 1991, Ser. No. 788,022
Claims priority, application France, Nov. 5, 1990, 90 14092
Int. Cl.[5] C21C *7/02*
U.S. Cl. 75—303 10 Claims

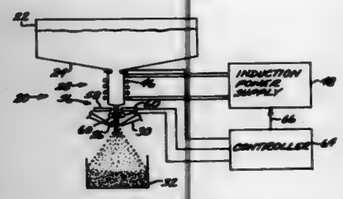
1. A product for desulphurizing molten pig iron or steel comprising magnesium grains, an organic material coating said magnesium grains, and a refractory powder adhering to said organic material, wherein said organic material is selected from saturated aliphatic acids and estes of said aliphatic acids, said organic material being solid at room temperature.

5,198,017

APPARATUS AND PROCESS FOR CONTROLLING THE FLOW OF A METAL STREAM

David P. Mourer, Danvers, and Roy W. Christensen, North Borough, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 11, 1992, Ser. No. 833,866
Int. Cl.[5] B22D *41/60*
U.S. Cl. 75—345 22 Claims



1. Apparatus for controlling the flow of a metal stream, comprising:

a frustoconical metallic nozzle body having a hollow wall, the hollow wall having an inner surface and an outer surface and extending from a first base to a second base, the body further having at least one slit extending from the first base to the second base so that the wall lacks electrical continuity across the slit;

means for cooling the nozzle body to form a metal skull on the inner surface of the nozzle body hollow wall;

an induction heating coil surrounding the nozzle body;

a sensor that measures at least one performance characteristic of the apparatus selected from the group of performance characteristics including

a diameter of the metal stream,

a volume flow rate of the metal stream,

a temperature of the nozzle body,

a temperature of the metal skull;

a controllable induction heating power supply connected to the induction heating coil; and

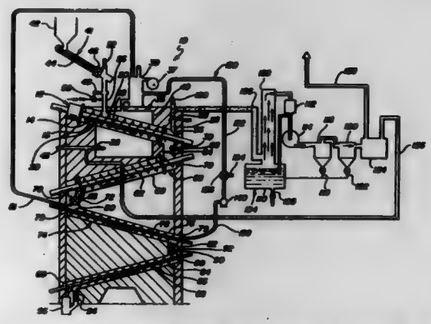
a controller that controls the power provided to the induction heating coil by the induction heating power supply responsive to an output signal of the sensor, to maintain the selected performance characteristic of the apparatus.

5,198,018

PYROLYSIS PROCESS AND APPARATUS

Kedar B. Agarwal, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 655,920, Feb. 14, 1991, Pat. No. 5,129,995. This application Jun. 29, 1992, Ser. No. 905,710
Int. Cl.[5] B09B *3/00*
U.S. Cl. 75—401 27 Claims



1. A method of continuously recovering an inorganic filler material of substantially known composition from a mixture of said filler and a polymer matrix for said filler comprising the steps of:

a) mechanically conveying said mixture progressively through a continuous pyrolyzer to progressively heat and pyrolyze the polymer component of the mixture as it traverses slowly from an inlet end of said pyrolyzer to an exit end of said pyrolyzer so as to form a first gaseous effluent stream comprising volatile decomposition products of said polymer and a second solid effluent stream comprising said filler contaminated with carbon, said mixture being essentially free of other extraneous organic material during pyrolysis;

b) externally heating said pyrolyzer to a first predetermined superambient temperature selected on the basis of the compositions of the polymer component of the mixture and such that said mixture progressively decomposes from a polymer-rich mixture at said inlet end to an essentially polymer-free carbon contaminated filler at said exit end with a minimum of charring of said polymer;

c) mechanically conveying said polymer-free filler from said pyrolyzer to and through a heated oxidizer adapted to react said carbon contaminant with oxygen to form carbon dioxide and substantially carbon-free residue reusable as a filler for said polymer as well as other materials; and

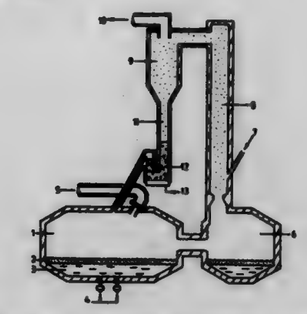
d) comminuting said residue to a desired particle size suitable to the intended reuse of said carbon free fillers.

5,198,019

MANUFACTURE OF IRON AND STEEL IN A DUPLEX SMELTER AND SOLID STATE OXIDE SUSPENSION PREREDUCER

Rodney J. Dry, Glen Waverley, and Robert La Nauze, Camberwell, both of Australia, assignors to CRA Services Limited, Australia

PCT No. PCT/AU89/00544, § 371 Date Jun. 20, 1991, § 102(e) Date Jun. 20, 1991, PCT Pub. No. WO90/07010, PCT Pub. Date Jun. 28, 1990
PCT Filed Dec. 20, 1989, Ser. No. 688,540
Claims priority, application Australia, Dec. 20, 1988, PJ2047/88
Int. Cl.[5] C21B *13/06*
U.S. Cl. 75—500 12 Claims



1. A process for supplying pre-reduced iron oxides to a smelting vessel which comprises directing a hot reducing offgas from the vessel into a vertical riser duct without substantial cooling of the offgas and conducting the reducing offgas upwardly through the riser duct, entraining particulate iron oxide containing material in the hot reducing offgas in the riser duct thereby cooling the offgas and simultaneously partially reducing the material as it is conveyed by the offgas through the riser duct, separating the partially reduced material from the offgas and introducing at least a portion of said separated reduced material into the smelting vessel.

5,198,020

REMOVAL OF ZINC FROM PHOSPHATING PROCESS SLUDGES

Wolfgang Feuerstein, Karben; Rolf Kola, W-Düsseldorf, and Dieter Jentsch, Langen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 8, 1992, Ser. No. 818,011
Claims priority, application Fed. Rep. of Germany, May 30, 1991, 4117716
Int. Cl.[5] C22B *19/04*
U.S. Cl. 75—658 14 Claims

1. A process of removing zinc from a phosphating process sludge comprising:

forming a mixture of the sludge with an additive, said additive being a substance capable of forming a solid non-volatile compound of iron, calcium and/or barium with a phosphorus component of the sludge at an elevated temperature; and

reacting the mixture at a temperature of at least 800° C. under reducing conditions whereby zinc is removed from said mixture and the phosphorus component is converted to said non-volatile compound of iron, calcium and/or barium.

5,198,021

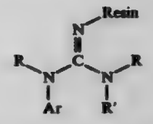
RECOVERY OF PRECIOUS METAL

Michael J. Virnig, Santa Rosa, Calif., assignor to Henkel Corporation, Ambler, Pa.

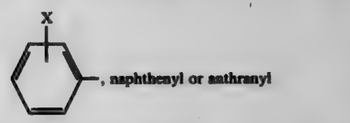
Filed Mar. 18, 1992, Ser. No. 853,197
Int. Cl.[5] C22B *11/04*
U.S. Cl. 75—744 32 Claims

1. A process for the recovery of a precious metal from aqueous alkaline cyanide solution containing said metal comprising:

(A) contacting said aqueous solution containing said precious metal with an ion exchange resin carrying aryl guanidine functionality of an aryl guanidine compound having a pKa of less than 13 as determined in water at 25° C. wherein said precious metal value is extracted from said aqueous solution, said ion exchange resin carrying said aryl guanidyl functionality having the formula:



where R is H or an alkyl group having from 1 to about 4 carbon atoms, R' is Ar, H or an alkyl group having from 1 to about 4 carbon atoms and Ar is



where X is H, R'', Cl, F, Br, NO_2, —O—R'', —O—phenyl, R''—C(O)—O—, R''—C(O)— or R''O—C(O)—, where R'' is an alkyl group containing from 1 to about 4 carbon atoms.

(B) separating said aqueous solution from said ion exchange resin carrying said aryl guanidyl functionality; and

(C) eluting said precious metal from said ion exchange resin with an aqueous, alkaline, eluant solution having a pH above about 12; and

(D) recovering said precious metal from said eluant solution.

5,198,022

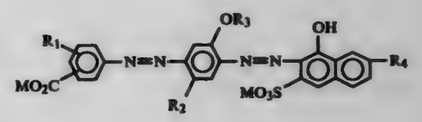
WATERFAST DYE AND AQUEOUS INK

Rodney O. Aulick; Bradley L. Beach; Donald L. Elbert; Terence E. Franey, all of Lexington, Ky.; James F. Feeman, Wyomissing, Pa.; John M. Olson, Boulder, Colo.; Allen C. Sanders, Winchester, Ky., and Robert L. Vollmer, Boulder, Colo., assignors to Lexmark International, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 782,684, Oct. 25, 1991, abandoned. This application Jan. 17, 1992, Ser. No. 822,251
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 K 39 Claims

15. A waterfast ink comprising by weight:

(a) at least 1% of dye of the structural formula:

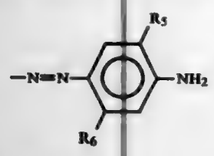


where;

R_1 is —H, —CO_2M, —CH_3, —OR_3, Cl;

R_2 is -lower alkyl having 1–4 C atoms, -lower alkoxy having 1–4 C atoms, —CH_2CO_2M;

R_3 is -lower alkyl having 1-4 C atoms,
R_4 is —NH_2, —NHR_3, —$NHCH_2CO_2H$,



R_5 is —H, -lower alkyl having 1-4 C atoms, —CO_2M;
R_6 is —H, —NH_2;
M is H, NH_4, Na, K, Li
and wherein the total number of —CO_2M groups is 1 to 3;
(b) at least 2% of a cosolvent, and
(c) water and ammonium ion bringing said ink to an alkaline pH sufficient to dissolve said dye in said ink.

5,198,023
CATIONIC DYES WITH ADDED MULTI-VALENT CATIONS TO REDUCE BLEED IN THERMAL INK-JET INKS
John L. Stoffel, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 26, 1992, Ser. No. 904,752
Int. Cl.[5] C07D *11/02*
U.S. Cl. 106—22 R 16 Claims

1. An ink-jet ink set for thermal ink-jet printing comprising cyan, magenta, yellow, and black inks, wherein said black ink includes at least one anionic dye and wherein said yellow ink includes (a) at least one cationic dye and (b) about 1 to 10 wt % of a multi-valent precipitating agent.

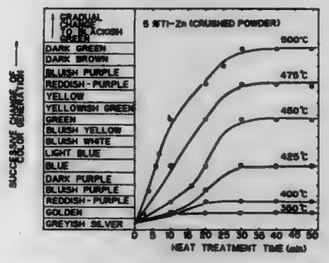
5,198,024
PRINTING INK
Juhani Taovinen, Steinfurt, Fed. Rep. of Germany, and Markku Sjöstedt, Rajamäki, Finland, assignors to Yhtyneet Paperitehtaat Oy, Valkeakoski, Finland
PCT No. PCT/FI90/00270, § 371 Date Jul. 12, 1991, § 102(e) Date Jul. 12, 1991, PCT Pub. No. WO91/07471, PCT Pub. Date May 30, 1991
PCT Filed Nov. 13, 1990, Ser. No. 721,522
Claims priority, application Finland, Nov. 13, 1989, 895391
Int. Cl.[5] C09D *11/06*
U.S. Cl. 106—28 R 6 Claims

1. A printing ink for newsprint, comprising pigment and binder portions, wherein the entire binder portion for effective de-inking and pulping of said newsprint consists of at least two tall oil based agents which are formed by chemical processing of tall oil by at least one process selected from the group consisting of polymerization, esterification, fortification, phenolation and mixtures thereof to provide tall oil based agents for said binder portion; wherein said at least two tall oil based agents have different viscoelastic properties, the characteristics of the printing ink being produced by a proper selection of said at least two tall oil based agents and a mixing ratio in order to achieve suitable printing properties together with effective de-inking and pulping properties.

5,198,025
PREPARATION OF METAL OXIDE-DOPED ZINC OXIDE PIGMENTS
Wilma M. Deusch, Limburgerhof, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Sep. 19, 1991, Ser. No. 762,371
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1990, 4033417
Int. Cl.[5] C04B *14/00*
U.S. Cl. 106—429 4 Claims

1. A process for preparing a metal oxide-doped zinc oxide pigment, which comprises processing an oxide, carbonate, hydroxide or hydroxycarbonate of zinc in the presence of water and an oxide, carbonate, hydroxide, hydroxycarbonate, oxalate or formate of a doping metal into a paste using formic acid or oxalic acid in an amount which is at least sufficient for converting the oxides, carbonates, hydroxides or hydroxycarbonates mentioned into formates or oxalates, drying, grinding and calcining at from 700° to 1100° C. in an inert gas atmosphere.

5,198,026
COLORED ZINC POWDER, ITS METHOD OF PRODUCTION AND METHOD FOR PRODUCING COLORED ARTICLE
Eiji Nishimura, Saitama; Chikara Tominaga, Kanagawa; Yusaku Masuda, Toyama, and Hiroshi Tasaki, Saitama, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan
Filed Sep. 25, 1991, Ser. No. 765,410
Claims priority, application Japan, Apr. 27, 1989, 1-105819; Aug. 10, 1990, 2-210282
Int. Cl.[5] C09C *1/04, 1/62;* C04B *14/34*
U.S. Cl. 106—430 17 Claims

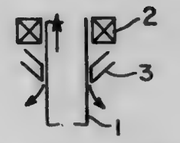


1. A colored zinc powder comprising particles of zinc containing a coloring element and having a surface layer of colored oxide thereon formed by oxidizing the surface of said particles at a temperature of from 350° to 700° C. of 3 seconds to 100 minutes without melting the particles.

5,198,027
ARTICLE FOR RURAL BUILDING CONSTRUCTION AND ROAD BUILDING AND A PROCESS AND A MIXTURE FOR PREPARING THE ARTICLE
Maria P. Contento, and Flavio Cioffi, both of Udine, Italy, assignors to Contento Trade s.a.s. di Cioffi Ilaria, Udine, Italy
Filed Apr. 18, 1991, Ser. No. 686,628
Claims priority, application Italy, Apr. 18, 1990, 20067
Int. Cl.[5] C04B *7/32, 7/36, 40/00, 9/11*
U.S. Cl. 106—692 11 Claims

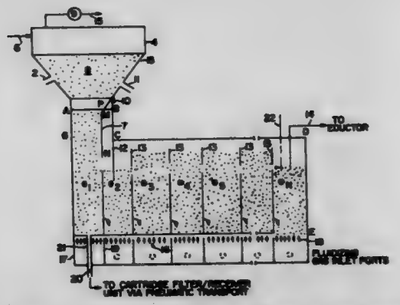
1. A mixture for use in rural building construction and road building comprising:
(a) 20–80% by weight of an altered silicate containing alumina and calcium;
(b) 80–20% by weight of a carbonatic rock;
(c) 0.1–15% by weight with respect to a+b of a crystallization accelerator; and
(d) optionally 0.1–15% by weight of a basicity regulator selected from the group consisting of metamorphic rocks, lime, soda and ammonia.

5,198,028
PHOTORECEPTOR-DRUM-POSITIONING APPARATUS
Nakaya Nakano; Hitoshi Mitake; Takeshi Tanaka, and Kazuyuki Shimizu, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Mar. 14, 1991, Ser. No. 669,383
Claims priority, application Japan, Mar. 26, 1990, 2-76341; Mar. 26, 1990, 2-76342; Mar. 26, 1990, 2-76345
Int. Cl.[5] B05C *5/02, 13/02*
U.S. Cl. 118—62 17 Claims



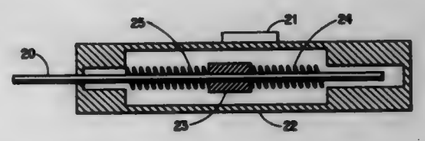
1. An apparatus for positioning and uniformly coating a drum to produce a photoreceptor drum, comprising:
means for holding and for sliding the drum vertically in an upwardly axial direction of the drum;
positioning means for positioning the drum at a desired position for uniform coating thereof, said positioning means comprising fluid outlet means circumferentially positioned around the drum for jetting pressurized fluid directly onto only uncoated portions of the drum so as to maintain the drum at said desired position thereof; and
coating means for uniformly coating a coating solution on an external surface of the positioned drum;
wherein said fluid outlet means of said positioning means are arranged to jet said pressurized fluid in a direction so that said pressurized fluid flows downward after contacting the uncoated portions of the drum, thereby preventing damage to coated portions of the drum.

5,198,029
APPARATUS FOR COATING SMALL SOLIDS
Arunava Dutta, Danvers; Leonard V. Dullea, Peabody, and Ernest A. Dale, Hamilton, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 557,894, Jul. 25, 1990, abandoned, which is a division of Ser. No. 388,187, Aug. 1, 1989, Pat. No. 4,990,371. This application Feb. 19, 1992, Ser. No. 839,744
Int. Cl.[5] B05C *5/00*
U.S. Cl. 118—303 48 Claims



1. Apparatus for fluidizing small particulate solids having a diameter of less than about 50 microns in average particle size, and at least partially enveloping these small solids with a coating material or a precursor thereto, said apparatus comprising in combination:
a cross-current multi-stage fluid bed reactor having N fluid beds, separated by main baffles, said beds being in flow communication with one another, wherein N≧2;
a hopper for introducing small solid particles having a diameter of less than about 50 microns in average particle size, to a first bed of said N beds of the reactor, said hopper having an upper section and a lower section having an inclined sidewall for promoting the flow of phosphor into said first bed, at least one duct connected to said lower section for feeding a mixture of gas and small particulate solids into said hopper, means for the exit of gas from the upper section, said gas exit means including a filter for separating gas to be discharged from said small particulate solids;
means for introducing a fluidizing gas to the N beds of the reactor, thereby promoting a flow of the small solid particles across the tops of the beds, from the first bed through bed N of the multi-stage fluid bed reactor;
means for introducing the coating material or a precursor thereto, to one or more of the N beds of the reactor;
means for distributing the coating material or precursor thereto throughout the cross-section of the reactor beds containing the same;
means for controlling the residence or contact time of the small particulate solids in the beds containing the coating material or the precursor thereto, including means for maintaining a gas flow across the inner surface of the roof of the apparatus, keeping said roof substantially free of deposited solids, such that the small particulate solids therein are at least partially enveloped by the coating material or precursor thereto; and
means for removal of the fluidizing gas and the small solid particles at least partially enveloped by coating material or precursor thereto.

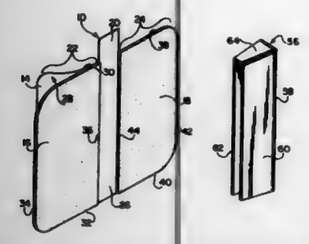
5,198,030
BEAD EDGE GUIDE FOR USE IN SLIDE-BEAD COATING
Mark D. Franke, Greenville, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jun. 18, 1991, Ser. No. 717,233
Int. Cl.[5] B05C *3/00*
U.S. Cl. 118—411 9 Claims



1. In a slide bead coating apparatus for coating a moving substrate with a plurality of layers of flowing liquids comprising a drive mechanism for moving said substrate at a desired speed, a coating efflux means having a surface with a coating lip at a terminus of said coating efflux surface, a mechanism for supplying a plurality of said flowing liquids to said coating efflux surface and said coating lip allowing the plurality of liquids to traverse a gap between said coating lip and said moving substrate, means for applying differential pressure to a top and a bottom of said flowing liquids thereby forming a bead within said gap, edge guides located on edges of said coating efflux surface capable of controlling a width of said flowing liquid on said coating efflux surface wherein the improvement comprises a bead edge guide positioned in the gap between said coating lip and said moving substrate with the edge guides contacting only a lateral edge portion of the flowing liquids traversing the gap prior to coating the moving substrate.

VOL 1148 ISS 5 MR 30 1993 UMI

5,198,031
MASK FOR DOOR HINGES
Russell L. Derstine, Rte. 1, Box 143-1, Dayton, Va. 22821
Filed Aug. 21, 1991, Ser. No. 747,947
Int. Cl.[5] B05C *21/00*
U.S. Cl. 118—505 7 Claims

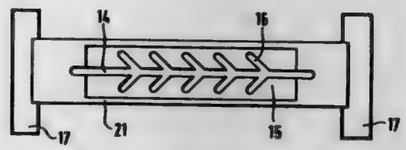


1. For use in painting a door supported from a frame by door hinges which comprise magnetically attractive butt plates and hinge pin cylinders, a reusable mask to provide protection against paint being placed on said butt plates and hinge pin cylinders, said mask comprising a sheet having first and second outer external regions each of size and shape which approximates the size and shape of each of said butt plates, said sheet comprising a flaccid intermediate region between said external regions, said intermediate region being of a size and shape so as to be coextensive with the hinge pin cylinder when applied to said hinge, magnetic means extending only over said outer external regions of said sheet for attaching said sheet only to the hinge butt plates by magnetic attraction forces, and means for securing said magnetic means to said outer external regions of said sheet, said magnetic means and said securing means comprising means for attaching said mask to said hinge without restricting angular movement of the door to which said mask is attached.

7. A reusable pin cylinder mask to provide protection against paint being placed on the hinge pin cylinders, said mask being of resilient material and being elongated and of U-shaped transverse cross section, said pin cylinder mask having a back, the length of said back approximating the length of said pin cylinder and the width of said back approximating the outer diameter of the hinged pin cylinder, said pin cylinder mask having two sides each formed at an acute angle to the back and converging from said back toward each other to engage and cover the hinge pin cylinder, the length of said sides approximating the length of said back and the width of said sides approximating the outer diameter of said hinge pin cylinder, and a top of said pin cylinder mask substantially perpendicular to said back and whose length corresponds to the width of said sides and whose width corresponds to the width of said back.

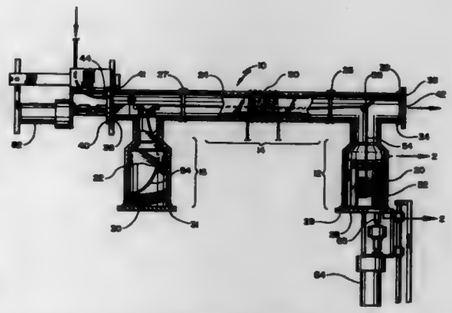
5,198,032
APPARATUS FOR VAPOR DEPOSITING ON TAPE HAVING GROOVED EVAPORATOR CELL
Siegfried Kleyer, Hainburg, and Jochen Heinz, Leigestern, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany
Filed Oct. 3, 1991, Ser. No. 770,854
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1991, 4128382
Int. Cl.[5] C23C *14/00*
U.S. Cl. 118—718 9 Claims

1. Tape vapor coating apparatus for the production of film webs coated in a vacuum, comprising: a coating chamber for the accommodation and advancing of a film web, an evaporation source in the chamber and having at least one evaporating cell, at least one recess being in the evaporating cell to accommodate the substance to be evaporated, at least one additional recess leading into the recess of the evaporating cell for the accommodation of the substance to be evaporated, the additional recess being configured as a first groove which runs



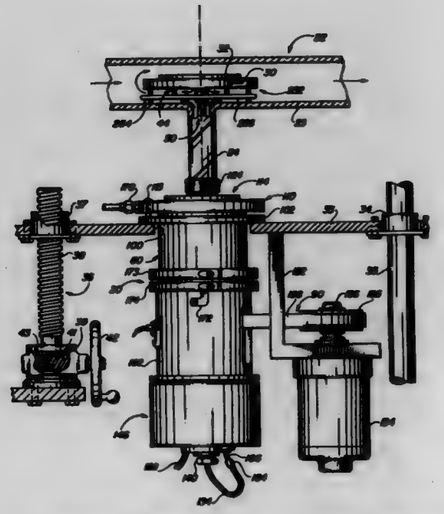
lengthwise of the evaporating cell, at least one additional groove branching off from the first groove.

5,198,033
CONTINUOUS PLASMA SURFACE TREATMENT APPARATUS FOR RUNNING LENGTH POLYMERIC TUBING
James Kelley, St. Paul; Paul Rudolph, Minneapolis; Gordon R. Helmer, Blaine; Daniel C. Haeg, Anoka, and Roger C. Erickson, Ham Lake, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Oct. 31, 1991, Ser. No. 785,857
Int. Cl.[5] C23C *16/50, 16/54*
U.S. Cl. 118—718 11 Claims



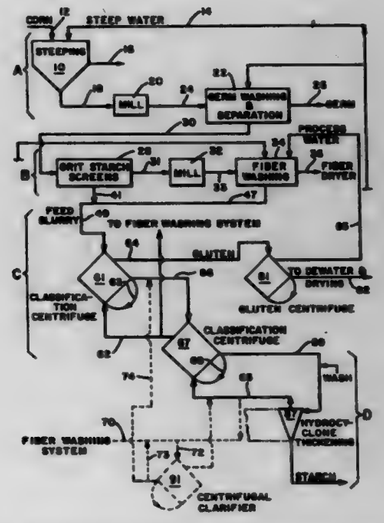
2. A plasma treatment apparatus comprising:
a vacuum chamber including a polymeric tubing storage region, a treated tubing receiving area and a plasma treatment area between said storage and receiving areas;
evacuation means for substantially evacuating the vacuum chamber;
gas supply means for supplying a plasma generating gas to the plasma treatment region of the vacuum chamber;
plasma generating means for generating a plasma in the plasma treatment region to the receiving area;
moving means for moving an elongated flexible polymeric tubing from the storage area through the plasma treatment region to the receiving area;
tension maintenance means for maintaining tension on the polymeric tubing below a predetermined maximum as the polymeric tubing is moved through the plasma treatment region; and
means in the treated tubing receiving area for relaxing the polymeric tubing to an unstressed condition.

5,198,034
ROTATABLE SUBSTRATE SUPPORTING MECHANISM WITH TEMPERATURE SENSING DEVICE FOR USE IN CHEMICAL VAPOR DEPOSITION EQUIPMENT
Wiebe B. deBoer, Eersel, Netherlands, and Albert E. Ozias, Aumsville, Oreg., assignors to Epsilon Technology, Inc., Tempe, Ariz.
Division of Ser. No. 330,200, Mar. 29, 1989, Pat. No. 4,996,942, which is a division of Ser. No. 32,474, Mar. 31, 1987, Pat. No. 4,821,674. This application Mar. 4, 1991, Ser. No. 664,867
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—725 16 Claims



1. A mechanism for demountably supporting a single substrate in the reactant gas flow path of a chemical vapor deposition reaction chamber, which reaction chamber has a bottom surface and a tubular shaft depending from the bottom surface, said mechanism comprising in combination:
a) drive shaft means defining a rotational axis, said drive shaft means being coaxially located within the tubular shaft and having a top end extending upwardly from the tubular shaft into the reaction chamber and having a lower end depending from the tubular shaft;
b) drive means coupled to the lower end of said drive shaft means for rotating said drive shaft means;
c) a susceptor defining a top surface for demountably and concentrically receiving the substrate, said susceptor being coupled to said drive shaft means to rotate in response to rotation of said drive shaft means and supported in a position wherein the rotational axis of said drive shaft means is normal with respect to the center of said susceptor, said susceptor having a central aperture;
d said drive shaft means including an axial bore for receiving radiant heat through the aperture of said susceptor when the substrate is mounted upon said susceptor and for transmitting the radiant heat through the axial bore;
e) window means disposed on the lower end of said drive shaft means for sealingly closing the lower end, said window means being transparent to the wavelengths of the radiant heat transmitted through the axial bore; and
f) a radiation pyrometer for sensing the temperature of the radiant heat transmitted through said window means and for producing a signal indicative of the sensed temperature sensed.

5,198,035
CORN WET MILLING PROCESS FOR MANUFACTURING STARCH
Chie-Ying Lee, Milford, and Robert W. Honeychurch, Stamford, both of Conn., assignors to Dorr-Oliver Incorporated, Milford, Conn.
Filed Mar. 29, 1991, Ser. No. 677,072
Int. Cl.[5] C08B *30/08*
U.S. Cl. 127—67 8 Claims



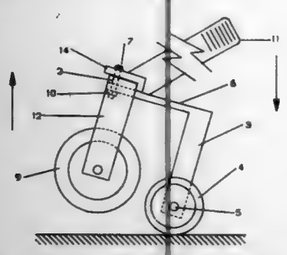
1. In the treatment of corn by the corn wet milling process including the stations of:
A. Steeping and Germ Separation
B. Fiber Washing and Dewatering
C. Starch-Gluten Separation and
D. Starch Washing and Thickening
the improvement in the Starch-Gluten Separation Station which comprises directing the mixed starch-containing feed flow stream having a density of from 6°Be to 12°Be from the attrition mill of Station A and the Fiber Washing Station B directly to a first high wash rate classification centrifuge capable of classifying the feed stream into a gluten-rich overflow stream which includes soluble protein and an underflow starch-rich stream, the flow of wash in said centrifuge being substantially completely countercurrent to the flow of feed solids to effect separation of the gluten and starch components, forwarding the gluten-rich stream to a gluten-thickening centrifuge in which the overflow is process water and the gluten-rich underflow exits the Station for dewatering and further treatment, forwarding the starch-rich underflow stream of said first classification centrifuge to a second high wash rate classification centrifuge wherein the wash, supplied in a wash liquid to draw-off volume ratio in the range of 1 to 2, is countercurrent to flow of feed solids and wherein the overflow stream thereof contains a minor protein component and is in part returned to said first classification centrifuge as wash liquid and in part is returned to the Fiber Washing Station as process water and the starch-rich underflow at a density of from 14°Be to 22°Be is forwarded to the Starch Washing and Thickening Station where it is subjected to treatment in multistage hydrocyclones with the overflow from the hydrocylone stages injected as wash liquid into said second classification centrifuge and the underflow constituting the starch product.

5,198,036

drive means for driving the master carriage along the main

5,198,041
SHAPE MEMORY STAINLESS STEEL EXCELLENT IN

5,198,036
LIFTING WHEELED ARRANGEMENT FOR ROLLERS
Enrique I. Sotolongo, 10 Bandick Ct., Kenner, La. 70065
Continuation-in-part of Ser. No. 96,375, Sep. 14, 1987, abandoned. This application Mar. 1, 1989, Ser. No. 317,298
Int. Cl.[5] B08B *1/00, 7/00*
U.S. Cl. 134—6 2 Claims

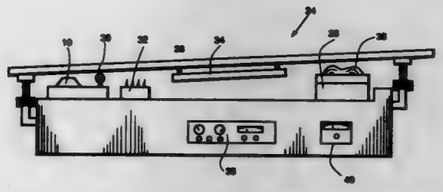


1. A method of removing liquids from a flat surface, for example, a tennis court, utilizing a device including
a laterally extended water absorbing head,
a carriage attached to said head,
a long extended handle attached to said carriage, and
a lifting roller arrangement attached directly to said carriage below said handle; said method further comprising the following steps:
a) pushing the water off the surface by pushing said head via said handle to the edge of said surface;
b) lowering said handle until said lifting roller arrangement contacts the surface and lifts said head;
c) conveying said lifted head off the surface by rolling said lifting roller arrangement to the next desired area to have the water removed; and
d) lifting said handle until said lifting roller arrangement no longer contacts the surface and said head recontacts said surface.

5,198,037
METHOD FOR UNCLOGGING A PIPE CARRYING DANGEROUS SUBSTANCES
Alain Guyonnet, Montebourg, and Eric Lestournel, Martinvast, both of France, assignors to Cogema-Compagnie Generale Des Matieres Nucleaires, Velizy Villacoublay Cedex, France
Filed May 14, 1991, Ser. No. 699,910
Claims priority, application France, May 18, 1990, 90 06263
Int. Cl.[5] B08B *9/02*
U.S. Cl. 134—22.11 9 Claims

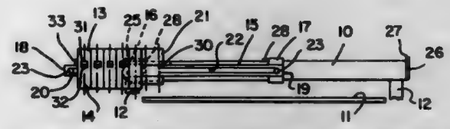
1. Method for unclogging a pipe carrying dangerous substances, this pipe opening into a tubular body normally blocked off by a movable member, this method including the following stages:
removing said movable member from the tubular body;
placing a guiding member in the tubular body;
introducing under pressure into the pipe through a sealed box docked onto the tubular body and through a passage formed in the guiding member an hydraulic shuttle so as to unclog the pipe via the erosion of a plug blocking up the latter;
simultaneously recovering erosion effluent by a drain circuit opening into said sealed box;
removing the shuttle in a conditioning winder docked onto the sealed box;
simultaneous rinsing of the shuttle on leaving the guiding member inside the sealed box.

5,198,038
FOAMING FLUX FOR AUTOMATIC SOLDERING PROCESS
Raymond L. Turner, La Habra, and Robert F. Munion, Corona, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Continuation-in-part of Ser. No. 705,858, May 28, 1991, abandoned, which is a division of Ser. No. 607,200, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,765, May 15, 1990, Pat. No. 5,085,365. This application Oct. 21, 1991, Ser. No. 780,169
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 9 Claims



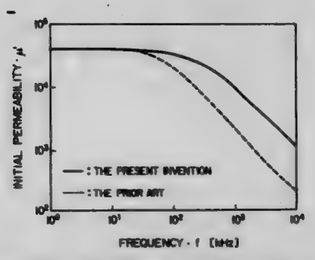
1. A method for soldering a metal comprising applying to a surface a foaming soldering flux, heating said metal to a desired soldering temperature, and applying solder to said surface, said soldering flux consisting essentially of (a) at least about 5 wt % of citric acid, (b) water, and (c) a mixture of foaming agents comprising about 0.0022 to 0.0032 wt % sodium 1-octane sulfonate, about 0.0020 to 0.0030 wt % N-octyl-2-pyrrolidone, and about 0.0002 to 0.0004 wt % fluoroalkyl sulfonate.

5,198,039
APPARATUS AND METHOD FOR AUTOMATICALLY POSITIONING AND OPERATING NON-CONTACT TOOL HOLDERS
Thomas W. Rogers, Germantown, Wis., assignor to Messer Griesheim Industries, Inc., Valley Forge, Pa.
Filed May 7, 1992, Ser. No. 879,482
Int. Cl.[5] B23K *7/10*
U.S. Cl. 148—194 7 Claims



1. An apparatus for mounting and spacing a plurality of tool holders along a main beam disposed above and spanning a work table having an effective work space between the ends of the beam, said apparatus comprising:
a tool bar mounted parallel to and for movement along the main beam;
first stop means for limiting movement of the tool bar beyond one end of the beam to position one end portion of the tool bar in a tool storing position laterally beyond the table work space;
first clamping means for releasably clamping the tool bar to the main beam;
a master carriage mounted for movement along the main beam;
drive means for driving the master carriage along the main beam;
said master carriage mounted for movement along the tool bar in response to clamping said first clamping means and operation of said drive means;
second clamping means for releasably clamping the master carriage to the tool bar;
band means having opposite band ends secured to the master carriage and wrapped intermediate said band ends around bearing means mounted on the ends of the tool bar to provide movement of the band means with the master carriage along said tool bar;
said tool holders mounted for movement along the tool bar and the band means between the master carriage and the end of said tool bar defining said one end portion;
third clamping means for releasably clamping each of the tool holders to the tool bar;
fourth clamping means for releasably clamping each of the tool holders to the band means; and,
control means for selectively operating the drive means and each of said clamping means to position the master carriage and the tool holders on the tool bar between a stored position with the tool holders on the end portion of the tool bar and an operating position with the master carriage and at least one tool holder spaced along the tool bar away from said end portion, and to move the tool bar along the main beam between the tool storing position and an operative position with the tool bar entirely above the work space.

5,198,040
VERY THIN SOFT MAGNETIC FE-BASED ALLOY STRIP AND MAGNETIC CORE AND ELECTROMAGNETIC APPARATUS MADE THEREFROM
Takao Sawa, Yokohama, and Masaaki Yagi, Sendai, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 401,418, Sep. 1, 1989, Pat. No. 5,096,513. This application Dec. 11, 1991, Ser. No. 804,697
Int. Cl.[5] H01F *1/147*
U.S. Cl. 148—304 9 Claims



1. An extremely thin soft magnetic alloy strip, comprising a Fe-based soft magnetic alloy substantially represented by the general formula:

$$Fe_{100-c-d}D_cX_d$$

wherein
D denotes at least one element selected from the class consisting of the elements of Group IVa, the elements of Group Va, the elements of Group VIa, the rare-earth elements, Cu, Au, the platinum-group elements, Mn, Al, Ga, Ge, In, and Sn,
X denotes at least one element selected from the class consisting of Si, B, C, N, and P,
$0 \leqq c \leqq 15$, and
$15 \leqq d \leqq 30$ where c and d denote atomic percent; and wherein the alloy strip possesses a thickness of not more than 10 μm.

5,198,041
SHAPE MEMORY STAINLESS STEEL EXCELLENT IN STRESS CORROSION CRACKING RESISTANCE AND METHOD THEREOF
Toshihiko Takemoto, Tokuyama; Mamyuki Kinugasa, Hiroshima; Teruo Tanaka, Kure, and Takashi Igawa, Yamaguchi, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan
PCT No. PCT/JP90/01001, § 371 Date Feb. 25, 1992, § 102(e) Date Feb. 25, 1992, PCT Pub. No. WO91/02827, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 4, 1990, Ser. No. 835,433
Claims priority, application Japan, Aug. 25, 1989, 1-217498
Int. Cl.[5] C21D *8/00*; C22C *38/38*
U.S. Cl. 148—402 4 Claims

1. A shape memory stainless steel excellent in resistance to stress corrosion cracking, which comprises, by weight, up to 0.10% of C, 3.0 to 6.0% of Si, 6.0 to 25.0% of Mn, up to 7.0% of Ni, more than 10.0% and not more than 17.0% of Cr, 0.02 to 0.3% of N, 2.0 to 10.0% of Co and more than 0.2% and not more than 3.5% of Cu, the balance being Fe and unavoidable impurities, the alloying components being adjusted so that a D value is not less than −26.0, wherein the D value is defined by the following equation:

$$D = Ni + 0.30 \times Mn + 56.8 \times C + 19.0 \times N + 0.73 - \times Co + Cu - 1.85 \times (Cr + 1.6 \times Si).$$

5,198,042
ALUMINUM ALLOY POWDERS FOR COATING MATERIALS, AND COATING MATERIALS CONTAINING THE ALLOY POWDERS
Tsuyoshi Masumoto, 8-22, Uesugi 3-chome, Aoba-ku, Sendai-shi, Miyagi-ken, Japan; Akihisa Inoue; Kazuhiko Kita, both of Sendai; Yoshio Harakawa, and Masahiro Oguchi, both of Tokyo, all of Japan, assignors to Tsuyoshi Masumoto, Sendai; Yoshida Kogyo K.K., Miyagi and Teikoku Piston Ring Co., Ltd., Tokyo, all of Japan
Filed Nov. 12, 1991, Ser. No. 791,572
Claims priority, application Japan, Nov. 16, 1990, 2-310935
Int. Cl.[5] C22C *45/08*
U.S. Cl. 148—403 20 Claims

8. A coating material comprising a coating material resin component and an amorphous aluminum alloy consisting essentially of from 83 to 91% of Al, from 0.5 to 5% of Ca and from 8 to 12% of Ni, all in atom %, and comprising a leaf-shaped particle having a thickness of 0.3 to 3 μm, a minor axis

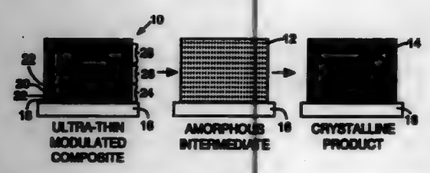
of from 10 to 150 μm, a ratio of the minor axis to a major axis of from 1 to 3, and an aspect ratio which is the ratio of the minor axis to the thickness of from 3 to 100, said aluminum alloy powder being contained in an amount of from 5 to 25 parts by weight based on 100 parts by weight of the total weight of (i) the coating material resin component and (ii) aluminum alloy powder, and said coating material resin component being at least one selected from the group consisting of a vinyl chloride resin, a vinyl acetate resin, an acrylic resin, a polyurethane resin, an epoxy resin and a polyester resin.

5,198,043

MAKING AMORPHOUS AND CRYSTALLINE ALLOYS BY SOLID STATE INTERDIFFUSION

David C. Johnson, Eugene, Oreg., assignor to The State of Oregon Acting by and Through the State Board of Higher Education on Behalf of the University of Oregon, Eugene, Oreg.

Filed Jul. 22, 1991, Ser. No. 734,186
Int. Cl.[5] C22C *1/00, 33/00*
U.S. Cl. 148—512 20 Claims



17. A method for synthesizing a solid-state crystalline alloy, comprising:

(a) providing a solid substrate;

(b) forming a layer of a first solid-state reactant on a surface of the substrate;

(c) forming a layer of a second solid-state reactant superposedly on the layer of the first reactant;

(d) forming a layer of the first reactant superposedly on the layer of the second reactant;

(e) repeating steps (d) and (c) a sufficient number of times to form a plural number of repeat units on the surface of the substrate, each repeat unit comprising a layer of the first reactant and a layer of the second reactant, thereby forming on the substrate a modulated composite of the reactants, wherein the reactants are present in the repeat units in a stoichiometric ratio corresponding to a solid compound of the reactants found on a phase diagram of the reactants, and each layer has a thickness greater than zero up to about 200 Å;

(f) heating the modulated composite to an interdiffusion temperature for the reactants;

(g) maintaining the interdiffusion temperature until the reactants have interdiffused sufficiently to form an amorphous alloy of the reactants having said stoichiometric ratio;

(h) heating the amorphous alloy to a nucleation temperature so as to initiate crystallization of the amorphous alloy; and

(i) allowing crystallization of the amorphous alloy to progress until the amorphous alloy has become substantially completely crystallized, thereby forming a crystalline alloy of the reactants having a stoichiometry substantially the same as the amorphous alloy.

5,198,044

COPPER ALLOY AND PROCESS FOR ITS PREPARATION

Jeroen Coltjs; Gerrit J. H. Mol; Piet Krahmer, and Allan D. Steele, all of Arnhem, Netherlands, assignors to Shell Research Limited, United Kingdom

Filed Apr. 9, 1991, Ser. No. 682,212
Claims priority, application United Kingdom, Apr. 20, 1990, 9008957
Int. Cl.[5] B22F *1/00*
U.S. Cl. 148—514 25 Claims

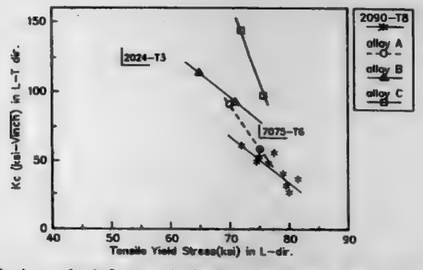
1. Process for the preparation of a substantially homogeneous alpha phase copper-nickel-tin alloy comprising copper and 4–18% by weight of nickel and 3–13% by weight of tin, comprising atomizing a stream of molten alloy having the aforementioned composition by the impact of a high velocity atomizing gas, collecting atomized particles on a collecting surface in such a way that solid collected material is obtained having a temperature of at least 700° C. and cooling the collected material to a temperature below 300° C., at a cooling rate sufficiently rapid such that said solid collected material is substantially in the alpha phase.

5,198,045

LOW DENSITY HIGH STRENGTH AL-LI ALLOY

Alex Cho, Richmond, Va., and Joseph R. Pickens, Beltsville, Md., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 14, 1991, Ser. No. 699,540
Int. Cl.[5] C22F *1/04;* C22C *21/12*
U.S. Cl. 148—552 13 Claims



7. A method for producing an aluminum alloy product which comprises the following steps:

a) casting an alloy of the following composition as an ingot or billet:

$$Cu_aLi_bMg_cAg_dZr_eAl_{bal}$$

wherein a, b, c, d, e and bal indicate the amount of each alloying component in weight percent and wherein $2.4<a<3.5$, $1.35<b<1.8$, $6.5<a+2.5b<7.5$, $2b-0.8<a<3.75b-1.9$, $0.25<c<0.65$, $0.25<d<0.65$ and $0.08<e<0.25$, the alloy having a density ranging from 0.0945 to 0.0960 lbs/in^3, the Li-Cu atomic ratio being maintained between about 3.58 and about 5.8 and the Cu content being less than the non-equilibrium solubility limit at a given Li:Cu atomic ratio, said alloy when processed to the T8 temperature containing a minimum of δ′ phase precipitates so that the fracture toughness properties of the alloy are at least as good as the plane stress fracture toughness properties of 7075-T6;

b) relieving stress in said ingot or billet by heating;

c) homogenizing said ingot or billet by heating, soaking at an elevated temperature and cooling;

d) rolling said ingot or billet to a final gauge product;

e) heat treating said product by soaking and then quenching;

f) stretching the product to 5 to 11%; and

g) aging said product by heating.

5,198,046

STABLE, NITROGEN-RICH COMPOSITION

Klaus M. Bucerius, Karlsruhe; Friedrich-Wilhelm Wassmann, Pfinztal, and Klaus Menke, Bruchsal, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft Zur Forderung Der Angewandten Forschund e.V., Munich, Fed. Rep. of Germany

Filed Mar. 10, 1992, Ser. No. 848,929
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1991, 4108225
Int. Cl.[5] C06B *31/02*
U.S. Cl. 149—61 14 Claims

1. A pyrotechnic mixture for generating environmentally friendly, non-toxic gases, comprising diguanidinium-5,5′-azotetrazolate (GZT) mixed with a pulverulent, chemically stable oxidizer.

5,198,047

WINTER TYPE TIRE TREAD

Maurice Grass, Reichlange, Belgium, and Jan H. Van Tuyl, Ettelbruck, Netherlands, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 14, 1990, Ser. No. 612,366
Int. Cl.[5] B60C *11/06*
U.S. Cl. 152—209 R 9 Claims

1. A tread for a directional winter type tire comprising an elastomeric substance extending circumferentially about the axis of rotation of the tire, said tread having:

a pair of shoulders which flank the lateral edges of a ground engageable surface;

an uneven number of, but at least three, circumferentially extending axially spaced straight grooves;

a plurality of zig-zag shaped grooves disposed circumferentially about the tire in a repetitive manner and extending across the tread from the equatorial plane EP towards the lateral edges of the tire, the zig-zag shaped grooves situated on one side of the equatorial plane being substantially symmetrical to those situated on the opposite side of the equatorial plane, each zig-zag shaped groove having a first leg, originating in a circumferentially extending center groove, and every second leg substantially coincident with the respective circumferentially extending groove, apart from the shouldermost legs, the centerlines of the different legs forming with the equatorial plane angles having a magnitude below or equal to 80°, apart from the centerlines of the shouldermost legs which have magnitudes ranging between 90° and 100°, said circumferentially extending and zig-zag shaped grooves defining block elements, arranged in circumferentially extending axially innermost center rows and axially outermost shoulder rows;

a plurality of zig-zag sipes includes in each block element each sipe zig-zag having a straight line first, a straight line second and a middle portion connecting them, the first portion entering the footprint of the tire before the middle and the second portion, the second portion leaving the footprint of the tire after the first and middle portion; and

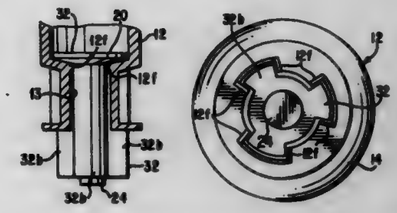
the block elements in the center rows have substantially the shape of a parallelogram, each parallelogram having two acute and two obtuse angles joined respectively by a large and a small diagonal, the large diagonal of the parallelograms forming with the equatorial plane an angle comprised between 30° and 60° on one side of the equatorial plane and an angle comprised between −30° and −60° on the opposite side of the equatorial plane.

5,198,048

STUD UNIT AND SKID-PROOF TIRE HAVING THE SAME

Hiroo Hojo, 16-14, Miwa 8-chome, Nagano-shi, Nagano 380, Japan

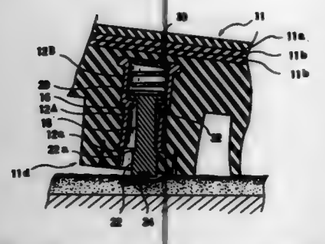
PCT No. PCT/JP90/00217, § 371 Date Oct. 11, 1990, § 102(e) Date Oct. 11, 1990, PCT Pub. No. WO90/09899, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 22, 1990, Ser. No. 596,135
Claims priority, application Japan, Feb. 23, 1989, 1-44275
Int. Cl.[5] B60C *11/16*
U.S. Cl. 152—210 2 Claims



1. A cylindrical stud unit adapted to be fixed in a cylindrical hole in a tread of a tire with the hole and the stud unit radially oriented with respect to the tire, comprising a stud inserted in a hollow cylinder, the cylinder having a closed end and an open end and an axially extending section the internal circumference of which is non-circular and is defined by alternating axially extending projections and grooves, the cylinder including means for axially fixing it in the hole in the treads with the closed end being the radially inner end with respect to the tire, and elastic means positioned with one extremity thereof engaging the closed end of the cylinder and an opposite extremity thereof engaging the inner end of the stud to bias the stud outwardly, the cylinder and the stud being provided with means defining surfaces which mutually engage to prevent further outward projection of the stud when the stud has been projected by the force of the elastic means so that the outer end of the stud projects slightly outwardly beyond the tread, the stud having an axially extending section substantially axially coextensive with the non-circular internal circumference section of the cylinder, the external circumference of the axially extending section of the stud being non-circular and being defined by alternating axially extending projections and grooves wherein the projections of the stud are between corresponding projections of the cylinder, the stud being received in the cylinder with play sufficient not only to enable the stud to reciprocate in the cylinder but to permit the stud to incline discernibly when a horizontal force is applied to the outer end of the stud due to its being in contact with a road surface upon which the tread is sliding, the horizontal force being applied to the end of the stud in a direction opposite to the direction of sliding of the tread, the inclination of the stud bringing a portion of the outer end of the section of the stud of non-circular circumference into engagement with a portion of the outer end of the section of the internal circumference of the cylinder which is non-circular thereby to retain the stud with its outer

end projecting outwardly beyond the tread and biting into the road surface.

5,198,049
STUD UNIT AND SKID-PROOF TIRE HAVING THE SAME
Hiroo Hajo, 16-14, Miwa 8-chome, Nagano-shi, Nagano-ken, Japan
Filed Jun. 4, 1990, Ser. No. 533,267
Claims priority, application Japan, Jun. 10, 1989, 1-147184
Int. Cl.[5] B60C *11/16*
U.S. Cl. 152—210 2 Claims

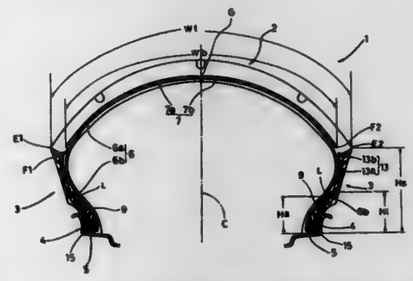


1. A cylindrical stud unit adapted to be fixed in a cylindrical hole in a tread of a tire with the hole and the stud unit radially oriented with respect to the tire, comprising a stud having a radially inner and a radially outer end with respect to the tire a hollow cylinder having a closed end and an open end, the cylinder including a rim defining the periphery of the opening of the open end, the cylinder including means for fixing it in the hole in the treads axially with respect to the cylinder with the closed end being the radially inner end with respect to the tire, and a spring positioned with one extremity thereof engaging the closed end of the cylinder and an opposite extremity thereof engaging the inner end of the stud to bias the stud outwardly, the cylinder and the stud each being provided with engagement means defining surfaces which mutually engage to prevent further outward projection of the stud when the stud has been projected by the force of the spring so that the outer end of the stud projects outwardly beyond the tread, the engagement means of the stud comprising a portion of the stud at the inner end of the stud and having a larger diameter than a shaft portion of the stud, located between the inner and outer ends of the stud the engagement means of the cylinder comprising an annular flange formed on an inner wall of the cylinder, extending radially inwardly with respect to the cylinder and having a hole formed axially therethrough, the axial hole being of smaller diameter than the enlarged inner end portion of the stud and having a larger diameter than the shaft portion of the stud, the enlarged inner end portion of the stud being received in the cylinder with only a slight radial clearance, the shaft portion of the stud extending to the opening of the cylinder and a portion of the stud at the outer end thereof being radially enlarged and defining a its juncture with the shaft; an annular surface extending radially with respect to the stud, the shaft being received in the cylinder with play sufficient to permit the stud to incline discernibly when a horizontal force is applied to the outer end of the stud, when said horizontal force is substantial due to the stud being in contact with a road surface upon which the tread is sliding, the consequent inclination of the stud holding said annular surface of the stud against the rim of the opening with sufficient force that the weight of a vehicle does not cause the stud to retract but inclination of the stud by a lesser horizontal force permitting the stud to retract under the weight of a vehicle due to the tendency of the stud to assume an orientation such that it is coaxial with the cylinder.

5,198,050
COMPOSITE COMBINATION BEAD AND BEAD FILLER
James H. Gifford, Orange, Conn., assignor to Pirelli Armstrong Tire Corporation, New Haven, Conn.
Filed Apr. 18, 1989, Ser. No. 339,647
Int. Cl.[5] B60C *15/04, 15/06, 17/00*
U.S. Cl. 152—517 32 Claims

1. A pneumatic tire having a bead and a sidewall portion, the bead and sidewall portion reinforced by an annular band, the annular band comprising:
- a plurality of filaments having a high extensional modulus of elasticity and a high tenacity bonded together in a matrix of resin;
- the filaments arranged to provide the annular band with a tapering configuration from the bead to the sidewall portion; and
- wherein the resin is taken from the group consisting of epoxies, polyesters, nylons, and polphenylene ethers and the filaments are taken from the group of aramid, fiberglass, carbon, and polyesters.

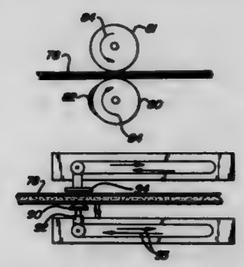
5,198,051
RADIAL TIRE FOR MOTORCYCLE WITH TWO RUBBER LAYERS IN THE SIDEWALLS
Shigehiko Suzuki, Amagasaki; Itsuo Yasui, Nishinomiya, and Sadaaki Naito, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Apr. 12, 1991, Ser. No. 684,384
Claims priority, application Japan, Apr. 20, 1990, 2-106244
Int. Cl.[5] B60C *9/22, 9/24, 13/00, 13/04*
U.S. Cl. 152—524 1 Claim



1. A radial tire and rim combination for motorcycles, the tire having a maximum cross section width lying between tread edges, comprises:
- a pair of bead cores disposed one in each bead portion of the tire;
- a carcass extending between the bead portions through sidewall portions and a tread portion of the tire, the carcass having at least one ply of organic fiber cords arranged radially at angle of 60 to 90 degrees to the tire equator and turned up around the bead cores to form two turned up portions and a main portion therebetween;

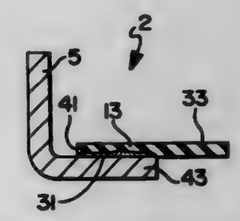
- a tread disposed radially outside the carcass to define the tread portion;
- sidewalls disposed axially outside the carcass to define the sidewall portions;
- a belt disposed radially outside the carcass and inside the tread;
- a bead apex disposed between the carcass main portion and each carcass turned up portion and extending radially outwardly and taperingly from the bead core;
- the radial height of the radially outer edge of each carcass turned up portion being 0.3 to 0.5 times the radial height of the tread edge, both from the bead base;
- the radial height of the radially outer edge of each bead apex from the bead base being 0.3 to 0.5 times said radial height of the tread edge;
- said belt composed of at least one spirally wound cord having an elastic modulus of not less than 600 kgf/sq.mm, and formed by winding spirally a ribbon of rubber in which said at least one cord is embedded; and
- each sidewall composed of an axially inner hard rubber layer having a JIS A hardness of 65 to 75 and an axially outer soft rubber layer disposed on the axially outside of the inner layer, the axially outer soft rubber layer having a JIS A hardness of not more than 60 and the axially inner hard rubber layer being extended from the tread edge to the bead base along the axially outer side of the carcass, and the axially outer soft rubber layer being extended from the tread edge to a position radially outward of the radially outer edge of a flange of its regular rim.

5,198,052
METHOD OF RESHAPING A GYPSUM BOARD CORE AND PRODUCTS MADE BY SAME
Mohammad H. Ali, Ypsilanti, Mich., assignor to Domtar, Inc., Montreal, Canada
Filed Oct. 22, 1990, Ser. No. 602,419
Int. Cl.[5] B32B *31/06, 31/22*
U.S. Cl. 156—45 15 Claims



1. A method of producing a gypsum board comprising the steps of:
- mixing a slurry comprising calcined gypsum and water in which, over time, said calcined gypsum hydrates;
- forming a continuously advancing board of a face paper and a back paper bonded to a core of said slurry therebetween with said face paper being wrapped over the two longitudinal edges of said board, said board adjacent said longitudinal edges having a paper to decrease the thickness of said board at said longitudinal edges, said face and back papers being substantially parallel to one another between said tapers at said edges;
- permitting said gypsum slurry to set sufficiently to provide enough stiffness to allow compression of said gypsum without lateral movement of said gypsum;
- moving a press member spaced from said continuously advancing board at the same longitudinal speed as said continuously advancing board;
- applying a compressive load to at least a portion of said face paper and said slurry of said continuously advancing board by pressing said press member into said face paper and slurry while said press member is moving at the same speed as said continuously advancing board to compress and densify the stiffened gypsum without generating such a force ion said gypsum or said face paper adequate to cause relative movement therebetween that would disturb the bond between said face paper and said gypsum to which said compressive load is applied, and thereafter;
- cutting said continuously advancing board into individual boards of desired lengths each having cut ends transverse to said longitudinal edges.

5,198,053
METHOD AND APPARATUS FOR BONDING POLYTETRAFLUOROETHYLENE TO A METAL SUBSTRATE AND ARTICLES THEREBY PRODUCED
Eugene A. Duncan, Saline, Mich., assignor to Mather Seal Company, Milan, Mich.
Continuation of Ser. No. 259,068, Oct. 18, 1988, abandoned.
This application Aug. 8, 1991, Ser. No. 741,929
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—64 16 Claims



1. A method for bonding a first seal element comprising polytetrafluorethylene having predetermined physical properties to a second element capable of being heated by an induction heating apparatus so as to form a radial lip seal, wherein said method comprises:
- providing a layer of a fluorinated resin adhesive having a melting point lower than said polytetrafluorethylene between said first and second elements;
- contacting said first and second elements;
- induction heating said second element to a temperature of at least the melting temperature of polytetrafluoroethylene in less than about 60 seconds so as to melt said resin;
- maintaining said second element at said temperature of at least the melting temperature of polytetrafluoroethylene for a time period in which only a minor portion of said polytetrafluoroethylene is melted, said melting of said minor portion of said polytetrafluorethylene being insufficient to significantly alter the predetermined physical properties of unmelted portions of said first element;
- controlling said induction heating with a temperature signal representing the temperature of said second element; and
- cooling said first and second elements so as to form a bond therebetween.

5,198,054
METHOD OF MAKING COMPENSATED COLLINEAR READING OR WRITING BAR ARRAYS ASSEMBLED FROM SUBUNITS
Donald J. Drake, Rochester, and Peter J. Nystrom, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 12, 1991, Ser. No. 743,647
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—64 23 Claims

1. A method for fabricating a pagewidth linear array for use as a pixel reading and/or writing bar, the array being assembled by the end-to-end abutment of subunits, each subunit

having a plurality of equally spaced, linearly arranged discrete

5,198,056

5,198,058

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having a plurality of equally spaced, linearly arranged discrete reading and/or writing elements, comprising the steps of:

(a) providing at least two supplies of substantially identical fully functional subunits having opposing ends wherein said supplies comprise

(i) a supply of shorter subunits having a predetermined shorter length plus or minus a predetermined tolerance and

(ii) a supply of longer subunits having a predetermined longer length plus or minus a predetermined tolerance, wherein said predetermined shorter length is smaller than said predetermined longer length by a predetermined amount;

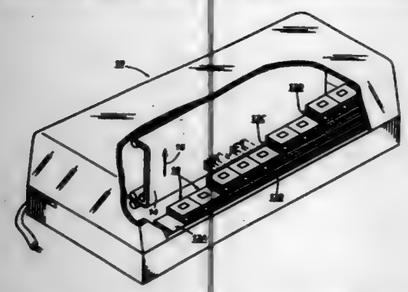
(b) mounting a first subunit from a selected one of the supplies on an alignment fixture and in alignment with a predetermined location point on said fixture;

(c) mounting additional subunits one at a time on the alignment fixture in an end-to-end abutting relationship until the array is completed with a final subunit;

(d) measuring the distance between the location point on the alignment fixture and a registration point on each subunit immediately after it is mounted on said fixture and before a next subunit is mounted;

(e) determining a stackup error by comparing the measured distance between the location point on the alignment fixture and the registration point on the last mounted subunit with a desired distance; and

(f) correcting the stackup error if the stackup error is outside



a range of plus or minus a predetermined tolerance stackup from said desired distance by replacing the last mounted subunit with a subunit selected from one of said supplies other than the supply from which said last mounted subunit was selected.

23. A method for fabricating a pagewidth linear array for use as a printbar, the array being assembled by the end-to-end abutment of fully functional printhead subunits, each subunit having a plurality of equally spaced, linearly arranged discrete nozzles, comprising the steps of:

(a) providing at least one supply of substantially identical fully functional longer printhead subunits, each having opposing ends adopted for abutment with each other, the distance between opposing ends of each printhead subunit being within a predetermined distance plus or minus a predetermined tolerance, so that the distance between adjacent nozzles in two separately abutted printhead subunits are within the same spacing as the nozzles in the printhead subunits plus or minus the predetermined tolerance.

(b) providing at least one supply of fully functional shorter printhead subunits that are substantially identical to the longer printhead subunits, except for the distance between opposing ends which is slightly smaller than the distance between the opposing ends of the longer printhead subunits by at least a predetermined amount;

(c) mounting a first printhead subunit from one of the supplies with one end on a contact surface of an alignment fixture;

(d) mounting a second printhead subunit from the same supply as the first printhead subunit on the alignment fixture in an end-to-end abutting relationship with the first printhead subunit;

(e) measuring the distance of the last nozzle of a last mounted printhead subunit from the contact surface on the alignment fixture before a next printhead subunit is mounted;

(f) comparing the measured distance between the last nozzle of the last mounted printhead subunit from the contact surface on the alignment fixture with a desired distance;

(g) mounting only printhead subunits from the same supply as the last mounted printhead subunit until the distance separating the contact surface of the alignment fixture and the last nozzle of the last mounted printhead subunit is outside a range of plus or minus a predetermined stackup error from said desired distance;

(h) replacing the last mounted printhead subunit with a printhead subunit from the other supply only if the measured distance exceeds a range of plus or minus a predetermined stackup error from the desired distance;

(i) repeating steps (e) through (g) after each printhead is abuttingly mounted on the alignment fixture; and

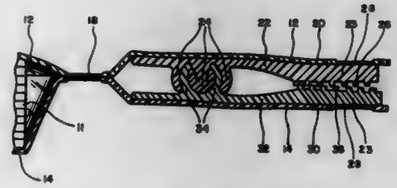
(j) continually mounting printheads until the pagewidth array is completed with a final printhead subunit which is within the range of plus or minus the predetermined stackup error from said desired distance.

5,198,055

METHOD OF FORMING RECLOSEABLE PACKAGES, PROFILES USED THEREIN, AND PACKAGES PRODUCED THEREBY

Lawrence W. Wirth, Neenah; Wayne M. Wegner; Mladomir Tomic, both of Appleton; Raymond Buchko, Appleton, all of Wis., and Johann Natterer, Bavaria, Fed. Rep. of Germany, assignors to Reynolds Consumer Products, Inc., Appleton, Wis.

Division of Ser. No. 342,257, Apr. 24, 1989, Pat. No. 5,067,822.
This application Nov. 8, 1991, Ser. No. 789,282
Int. Cl.[5] B65D *33/16*
U.S. Cl. 156—66 17 Claims



1. A method of producing a recloseable package comprising film walls and recloseable profile strips, the method comprising the steps of:

a) providing a mated first and second profile strip, each strip having a front side and a back side and comprising a flange element having a front side and a back side and a recloseable element on the front side of the profile strip for forming a recloseable seal, said mated profile strips further comprising a heat barrier means forming a part of the recloseable profile strips and associated with the front side of the flange element of at least the first profile strip;

b) providing a film on the back side of at least one of the mated first and second profile strips;

c) applying heat and pressure to the film adjacent the mated profile strip flanges while the heat barrier is adjacent the flange element of the second profile strip or another heat barrier associated therewith, the heat and pressure being sufficient to form a heat seal between the film and the adjacent flange, the heat barrier means preventing the flanges from fusing together; and

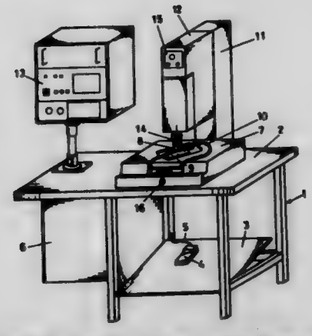
d) forming additional seals to complete the formation of the package.

5,198,056

METHOD AND DEVICE FOR ULTRASONIC WELDING OR PRINTING RIBBONS

Xaver Stöckli, Richterswil, and Jürg Messerli, Samstagern, both of Fed. Rep. of Germany, assignors to SM Engineering AG, Wollerau, Switzerland

Continuation of Ser. No. 502,527, Mar. 30, 1990, abandoned.
This application May 22, 1992, Ser. No. 888,265
Claims priority, application Switzerland, Apr. 5, 1989, 01254/89
Int. Cl.[5] B31F *5/06*; B32B *31/16*
U.S. Cl. 156—73.1 7 Claims



5. A method for joining ends of a printing ribbon, comprising the steps of positioning first and second ribbon ends in parallel, non-collinear positions on first and second plates in a common plate, said plates having adjacent spaced edges, said ribbon ends being further positioned at an oblique angle to said edges; cutting the ribbon ends at an oblique angle; rotating one of said plates out of the plane; repositioning said rotated plate by a combination of axial and rotational movement such that the ribbon ends overlap by a predetermined amount and the plates reside in a common plane; and welding the ribbon ends together.

5,198,057

REBULKABLE NONWOVEN FABRIC

David D. Newkirk, Greer, and Henry S. Ostrowski, Simpsonville, both of S.C., assignors to Fiberweb North America, Inc., Simpsonville, S.C.

Division of Ser. No. 288,834, Dec. 23, 1988, Pat. No. 5,143,779.
This application Jun. 10, 1992, Ser. No. 896,321
Int. Cl.[5] B32B *31/20, 31/26, 35/00*; D04H *1/54*
U.S. Cl. 156—83 12 Claims

1. A process for making bulky nonwoven fabric suitable for use as coverstock or spacer fabric that comprises the steps of:

(a) forming an initial web of one or more layers comprised of thermoplastic bicomponent fibers,

(b) bonding said web by means of a thru-air system,

(c) compressing the resulting bonded web to increase its density,

(d) transporting and/or otherwise manipulating the compressed web, and

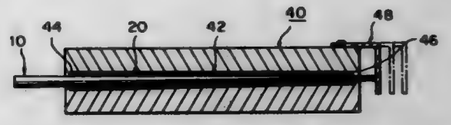
(e) subsequently transforming said compressed web, by means of exposure to heat, into low density nonwoven fabric.

5,198,058

METHOD OF MAKING GOLF CLUB OF PLASTIC COMPOSITE MATERIAL

Chin-San You, No. 3, Lane 1029, Feng-Shyn Road, Feng Yuan City, Taichung Hsien, Taiwan

Filed Aug. 20, 1992, Ser. No. 933,134
Int. Cl.[5] B29C *43/02*
U.S. Cl. 156—173 8 Claims



1. A method of making a golf club of plastic composite material, in which a thermoplastic plastic material is used as a matrix, and in which a long fiber material is used as a reinforcing material, comprising the steps of:

(a) making use of a tapered mandrel;

(b) using an inner tube of an elastic and refractory material to fit over said mandrel;

(c) wrapping orderly onto said inner tube with at least a matrix layer of said thermoplastic plastic material, and with at least a reinforcing layer of said long fiber material;

(d) withdrawing said mandrel from said inner tube so that said inner tube having a laminated outer shell formed by said matrix layer and said reinforcing layer becomes a hollow tubular body, which has an end that is sealed and which is subsequently arranged in a molding tool;

(e) heating said molding tool up to a temperature corresponding to the melting point of said thermoplastic material so that said thermoplastic plastic material becomes a molten thermoplastic plastic material;

(f) introducing, under the condition that said temperature is maintained, a pressurized gas having a pressure into said tubular body in such a manner that said pressure of said gas is increased progressively and stepwise so as to force said molten thermoplastic plastic material to permeate uniformly the interstices of fiber bundles making up said long fiber material;

(g) cooling said molding tool to bring about the completion of a curing process of said molten thermoplastic plastic material which fills the interstices of said fiber bundles; and

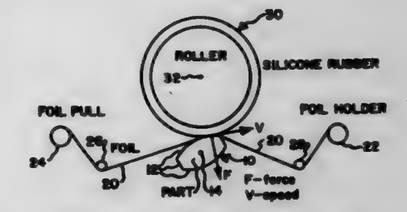
(h) opening said molding tool to remove therefrom said golf club.

5,198,059

METHOD AND APPARATUS FOR DECORATING ARTICLES OF NON-CIRCULAR CROSS-SECTION

Donato Curcio, Williamsville, and Andrzej Aderek, Depew, both of N.Y., assignors to United Silicone Inc., Lancaster, N.Y.

Filed Jun. 14, 1991, Ser. No. 715,567
Int. Cl.[5] B65C *9/00*
U.S. Cl. 156—230 14 Claims



1. A method for decorating or finishing the external surface of an article having a non-circular cross-sectional configura-

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tion wherein a roller is employed for applying a decorating medium to the article surface, said method comprising the steps of:

a) applying a constant force by means of the roller to the article surface while rotating the article at a constant speed about a fixed axis during a teaching mode to obtain information relating to the shape of the surface; and

b) controlling the force applied by the roller to the article surface and the speed of rotation of the article according to a trajectory generated from said information obtained during said teaching mode to provide constant pressure and constant linear speed between the article and the decorating medium during a finishing mode.

5,198,060

METHOD FOR REPLICATING SOLVENT-SENSITIVE IMAGES

Stephen Kurtin, 3835 Kingswood Rd., Sherman Oaks, Calif. 91403

Division of Ser. No. 352,126, May 15, 1989. This application Sep. 10, 1990, Ser. No. 580,080
Int. Cl.[5] B32B *3/26*; B44C *1/16*
U.S. Cl. 156—230 **13 Claims**

1. A method of reproducing a xerographic image which comprises the steps of:

covering a xerographic image to be reproduced with an image receiving surface;

breaking solvent filled microcapsules and wetting said image with said solvent, said solvent being a solvent for fused xerographic toner whereby solvated toner will migrate to said image receiving surface; and

removing said image receiving surface and attaching it to a destination surface.

5,198,061

MULTICOLOR THERMOSENSITIVE IMAGE TRANSFER SHEET AND RECORDING METHOD USING THE SAME

Akira Suzuki, Mishima; Nobuo Mochizuki, Shizuoka, and Kunichika Morohoshi, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 397,871, Aug. 23, 1989, Pat. No. 5,039,369, which is a continuation of Ser. No. 94,876, Sep. 10, 1987, Pat. No. 4,871,609. This application Jan. 15, 1991, Ser. No. 642,047
Claims priority, application Japan, Sep. 10, 1986, 61-211511; Jul. 15, 1987, 62-174907
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] B41M *5/34*
U.S. Cl. 156—234 **3 Claims**

1. A method of providing multicolored images by a multicolor thermosensitive image transfer process which employs at least three thermosensitive image transfer sheets, each thermosensitive image transfer sheet having a thermosensitive ink layer on a substrate, each ink layer having a different color and a different critical surface tension, and comprising a thermofusible ink component having a different color and a different critical surface tension from the colors and surface tensions of the ink components of the other thermofusible ink layers, comprising:

repeating a cycle consisting of the steps of bringing the ink layer of one of said thermosensitive image transfer sheets into contact with a receiving sheet, and then transferring the thermofusible ink component of the ink layer by application of heat thereto to said receiving sheet, and the cycle being repeated in a sequential decreasing order of critical surface tension of the thermofusible ink component in the thermosensitive ink layer of each thermosensitive image transfer sheet.

5,198,062

METHOD OF MAKING GOLF CLUB HEAD

Archer C. C. Chen, 35 Yichaong e. road, taipin, taichung county, Taiwan

Filed Jul. 2, 1992, Ser. No. 908,147
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—245 **13 Claims**

1. A method of making golf club head comprising steps of:

(a) making a metal head body having a neck portion intended to fasten thereto said golf club;

(b) prefabricating a ball-striking plate of a hardness, with said ball-striking plate having scoring lines disposed on a face thereof;

(c) placing said head body in a molding tool;

(d) placing a fiber bulk molding compound, which is preimpregnated in an epoxy resin, in a predetermined location of said head body inside said molding tool;

(e) placing said ball-striking plate on said fiber bulk molding compound in such a manner that it is positioned at a ball-striking face of said golf club head;

(f) closing said molding tool, which is subsequently subjected to a pressure so as to make said fiber bulk molding compound to fill in a space between said head body and said ball-striking plate to form an attachment layer, with said ball-striking plate embedded in said attachment layer in such a manner that it is located at the position of said ball-striking face of said golf club head, and with said face having scoring lines of said ball-striking plate attached directly to a wall of a mold cavity of said molding tool without being covered by said attachment layer; and

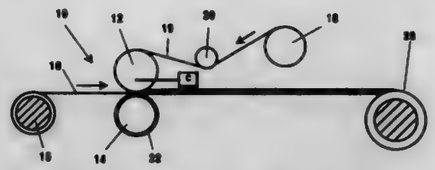
(g) heating said molding tool to reach a predetermined temperature for a predetermined period of time so as to cause said fiber bulk molding compound to cure, and subsequently removing said golf club head from said molding tool.

5,198,063

METHOD AND ASSEMBLY FOR REINFORCING FLEXIBLE GRAPHITE AND ARTICLE

Ronald A. Howard, Brook Park, and Robert A. Mercuri, Seven Hills, both of Ohio, assignors to UCAR Carbon Technology Corporation, Danbury, Conn.

Filed Jun. 3, 1991, Ser. No. 709,214
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—282 **10 Claims**



1. A method for reinforcing a pre-formed and self-supporting flexible graphite sheet to improve its tensile strength comprising the steps of: superimposing a thin pre-formed unsoftened film of a thermoplastic polymer having substantially parallel spaced apart first and second opposed surfaces and a predetermined softening point over said sheet of flexible graphite, and establishing an interface contact between said sheet of pre-formed flexible graphite and a first one of said surfaces of said superimposed film and fusion bonding said thin film of thermoplastic polymer to said sheet of flexible graphite by raising the temperature of said thin film at the interface contact between the sheet of flexible graphite and said first one of said film surfaces to a temperature corresponding to said softening point while maintaining the opposed second surface of said thin film not in contact with said flexible graphite at a temperature below said softening point so that the first one of said film surfaces softens and bonds to the flexible graphite sheet while the opposed second surface of said pre-formed film remains in its unsoftened condition.

5,198,064

PROCESS FOR PREPARING A PERMEABLE ADHESIVE TAPE

Naoyuki Tani, Hiranomiya, and Kusutaro Yoshida, Sakai, both of Japan, assignors to Sankyo Chemical Co., Ltd., Osaka, Japan

Filed May 8, 1990, Ser. No. 520,458
Claims priority, application Japan, May 10, 1989, 1-118276
Int. Cl.[5] B05D *5/10*; A61L *15/00*
U.S. Cl. 156—289 **22 Claims**

1. A process for preparing a permeable adhesive tape, comprising:

preparing a dispersion, the dispersion containing (a) an organic solvent, (b) a member selected from the group consisting of a natural rubber pressure sensitive adhesive agent, a synthetic rubber pressure sensitive adhesive agent, and an acrylic pressure sensitive adhesive agent, (c) a polyfunctional isocyanate compound, (d) water, and (e) hydrophobic inorganic fine particles, the hydrophobic inorganic particles being present in the dispersion in an effective amount to restrain or prevent the reaction of the polyfunctional isocyanate compound with water; and

applying said dispersion to a porous material.

5,198,065

METHOD FOR BONDING STEEL TO WOOD USING AN EPOXY PRIMER AND ADHESIVE

Rajan Eadara, East Lansing, Mich., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 25, 1991, Ser. No. 660,510
Int. Cl.[5] C09J *5/04*
U.S. Cl. 156—315 **19 Claims**

1. A method for bonding steel to wood comprising

(a) preparing a low viscosity primer component (A) by admixing a resin component (a) comprising diglycidyl ether of Bisphenol A, diglycidyl ether of butanediol, and epoxy silane with a hardener component (b) comprising an aliphatic amine;

(b) pretreating the wood by applying said low viscosity primer component thereto;

(c) preparing an adhesive component (B) by admixing a resin component (a) comprising diglycidyl ether of Bisphenol A, a diluent, a filler, and epoxy silane; and a hardener component (b) comprising a combination of (i) an aliphatic or aromatic amine and (ii) a polyamide or an adducted amine with diglycidyl ether of Bisphenol and a filler, and wherein a flexibilizer is present in either component (a) or component (b) of said adhesive component;

(d) applying said adhesive component to said pretreated wood;

(e) adhering said steel to said wood; and

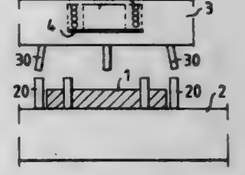
(f) curing said adhesive at room temperature thereby bonding said steel to said wood.

5,198,066

MOUNTING OF THE LIDS OF CAPSULES FOR SOLID STATE INTEGRATED CIRCUITS

Jan Cederström, Box 52, S-133 01 Saltsjöbaden, Sweden

PCT No. PCT/SE90/00434, § 371 Date Dec. 27, 1991, § 102(e) Date Dec. 27, 1991, PCT Pub. No. WO91/01045, PCT Pub. Date Jan. 24, 1991
PCT Filed Jun. 19, 1990, Ser. No. 781,145
Claims priority, application Sweden, Jul. 7, 1989, 8902471
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—538 **9 Claims**



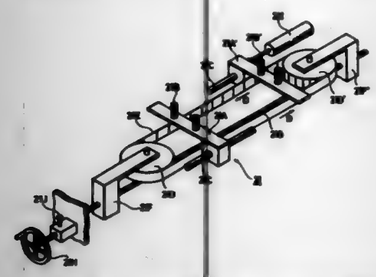
1. Device for mounting capsule covers of ferromagnetic material on capsules for semiconductor components, whereby a capsule cover (4) is applied over an opening in a capsule (1) with a conductor-bonded circuit mounted therein, there being between the capsule and the cover a fusible film of soldering metal or other fusible means, the cover being soldered to the capsule by the capsule provided with the cover being heated in a protective gas atmosphere in an oven, characterized by a lower portion (2) for placing the open capsules in predetermined positions and a cover portion (3) intended for application onto the lower portion, the cover portion having firstly holder means for mounting the capsule covers, arranged so that, as the cover portion is applied, they are centered on the capsules placed in the lower portion, said holding means comprising magnets, and secondly releasing means comprising means of memory metal or bimetal arranged through shape-change to act on the capsule covers mounted in the cover portion to move upon heating from a first position where a gap is created between the capsule and the capsule cover, to a

second position of contact between the capsule and the capsule

(b) fabricating infrared detector arrays on the layer of infra-

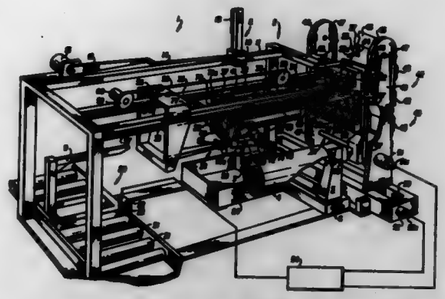
second position of contact between the capsule and the capsule cover.

5,198,067
APPARATUS FOR CONVEYING BASE WITH CROSSWISE BASE SLIDING DEVICE
Shigeo Sumi, Saitama, and Fumio Hamamura, Kanagawa, both of Japan, assignors to Somar Corporation, Tokyo, Japan
Continuation of Ser. No. 929,538, Nov. 12, 1986. This application Jan. 25, 1989, Ser. No. 685,705
Claims priority, application Japan, Nov. 12, 1985, 60-253433
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—538 18 Claims



1. An apparatus for conveying a board from an input position to a holding position comprising:
conveying means for transporting said board in a conveying direction toward said holding position, said conveying means comprising conveyor rollers for conveying said board in the conveying direction, said conveyor roller shaving a rotation axis extending horizontally and transversely to the conveying direction, and guide members provided above said conveyed board, said guide members extending horizontally and transversely across said conveyed board to the conveying direction, and aligned with opposed respective ones of said conveyor rollers;
means for forming a predetermined gap between said guide members and said conveyor rollers for preventing warping of the board conveyed on said conveyor rollers and held between said conveyor rollers and said guide members in said predetermined gap, said predetermined gap being correlated with a thickness of said board; and
a crosswise base sliding means disposed in a path of said board along said conveying means between said input position and said holding position for sliding said board transversely to the conveying direction to thereby aligning a predetermined position of said board with another predetermined position of said apparatus as said board is being transported by said conveying means,
said base sliding means comprising a threaded rod extending generally perpendicular to the conveying direction of said board and lying in a plane generally parallel to a plane of said board, first and second pulley support members threadedly engaged with said threaded rod to move together in the same direction perpendicular to said conveying direction when said rod is rotated, a pulley rotatably mounted on each of said pulley support members, an endless belt entrained between said pulleys, a support rod mounted generally parallel to said threaded rod, a pair of slide member supports slidably mounted on said support rod and connected on opposite sides to said endless belt so that said slide member supports move toward or away from one another as said endless belt is moved, and a pair of slide members mounted on respective ones of said slide members supports and disposed in a said path of said board.

5,198,068
PROCESS AND APPARATUS TO APPLY IDENTIFICATION INSCRIPTIONS ON SLEEVES MADE OF ELASTOMERIC MATERIAL IN THE MANUFACTURE OF DRIVING BELTS
Fulvio Franchino, Francavilla a Mare; Giovanni Alberti, Milan, and Alessandro Pisoni, Pescara, all of Italy, assignors to Pirelli Transmissioni Industriali S.p.A., Chieti, Italy
Filed Nov. 21, 1991, Ser. No. 792,876
Claims priority, application Italy, Nov. 21, 1990, 22121 A/90
Int. Cl.[5] B44C *1/00*
U.S. Cl. 156—542 14 Claims

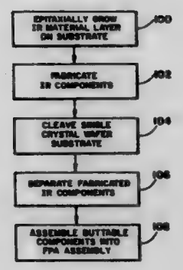


1. An apparatus for applying identification inscriptions to elastomeric sleeves which will later be cut to form a plurality of driving belts, said apparatus comprising:
a guide and support framework;
a supporting board connected to said framework and positioned to support a sleeve longitudinally fitted on the board
set up means acting on a ribbon-like manufactured article wound in a roll, said roll being adapted to longitudinally unroll and extend the manufactured article onto an outer surface of the sleeve supported on said board, said manufactured article having a paper substrate to which a transferable film is applied, said film being oriented towards the sleeve and carrying said identifying inscriptions;
a main carriage slidably guided by the framework and longitudinally movable over the sleeve fitted on the supporting board;
a heated presser roller rotatably supported by the main carriage on an axis at right angles to the longitudinal axis of the sleeve and mounted to act by a thrust action on the ribbon- manufactured article lying over the sleeve so that, following a movement by the main carriage, said roller may cause the transferring of said transferable film onto the sleeve surface and the simultaneous detachment of the paper substrate from said film.

5,198,069
METHOD FOR FABRICATING BUTTABLE EPITAXIAL INFRARED DETECTOR ARRAYS BY DIMENSIONALLY CONTROLLED CLEAVING OF SINGLE CRYSTAL SUBSTRATES
Peter H. Zimmermann, Lexington, and Paul A. McDonald, N. Billerica, both of Mass., assignors to Loral Infrared & Imaging Systems, Inc., Lexington, Mass.
Filed Dec. 4, 1989, Ser. No. 445,030
Int. Cl.[5] B44C *1/22*
U.S. Cl. 156—600 17 Claims

1. A method for fabricating buttable infrared detector arrays by dimensionally controlled cleaving of a single crystal wafer substrate having well defined cleavage planes comprising the steps of:
(a) epitaxially growing a layer of infrared sensitive material on the single crystal wafer substrate;

(b) fabricating infrared detector arrays on the layer of infrared sensitive material;
(c) cleaving the single crystal wafer substrate along its natural cleavage planes so as to form a plurality of cleavage lines defining rectangular detector array regions; and

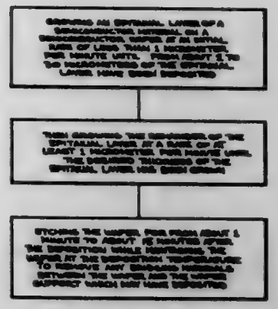


(d) separating the fabricated infrared detector arrays at the cleavage lines so as to form individual buttable infrared detector arrays.

5,198,070
JOINING DIAMOND BODIES
Barbara L. Jones, 80 Chisbury Close, Forest Park, Bracknell RG12 3TX, England
Continuation-in-part of Ser. No. 411,100, Sep. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 343,912, Apr. 26, 1989, abandoned. This application Feb. 25, 1991, Ser. No. 660,544
Claims priority, application United Kingdom, Apr. 28, 1988, 8810113
Int. Cl.[5] C30B *29/04*
U.S. Cl. 156—612 12 Claims

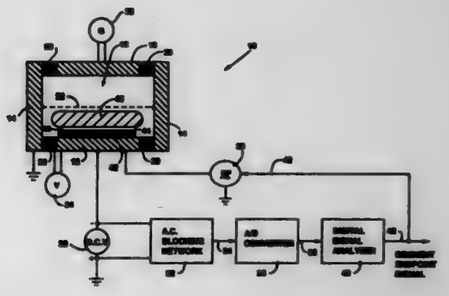
1. A method of joining diamond bodies comprising the steps of:
(a) positioning the bodies such that a surface of one body is close to a surface of the other body and a space is provided therebetween, said surfaces being (111) or (110) planes or planes within 3° of said (111) or (110) planes,
(b) growing diamond on the surfaces by chemical vapour deposition and
(c) continuing the growth until the surfaces are joined by grown diamond.

5,198,071
PROCESS FOR INHIBITING SLIP AND MICROCRACKING WHILE FORMING EPITAXIAL LAYER ON SEMICONDUCTOR WAFER
Lance Scudder, Mountain View, and Norma Riley, Pleasanton, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Filed Nov. 25, 1991, Ser. No. 797,614
Int. Cl.[5] B44C *1/22*
U.S. Cl. 156—625 24 Claims



1. A process for inhibiting thermal stress in a semiconductor wafer during a process for forming an epitaxial layer thereon which comprises post etching said wafer after growth of said epitaxial layer thereon, but prior to cooling of said wafer below the epitaxial deposition temperature, to thereby remove any materials capable of inducing thermal stress in said wafer as said wafer subsequently cools.

5,198,072
METHOD AND APPARATUS FOR DETECTING IMMINENT END-POINT WHEN ETCHING DIELECTRIC LAYERS IN A PLASMA ETCH SYSTEM
Calvin T. Gabriel, Cupertino, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.
Filed Jul. 6, 1990, Ser. No. 549,511
Int. Cl.[5] H01L *21/306*
U.S. Cl. 156—627 20 Claims



1. A method for detecting imminent end-point of a dielectric etching process in a plasma etch system comprising the steps of:
placing a substrate having a dielectric layer to be etched within a plasma etch chamber proximate a cathode;
etching said dielectric layer,
detecting the direct current (D.C.) bias voltage on said cathode; and
determining imminent end-point of said etching of said dielectric layer by comparing a change in said D.C. bias voltage, caused by a change in the impedance of said

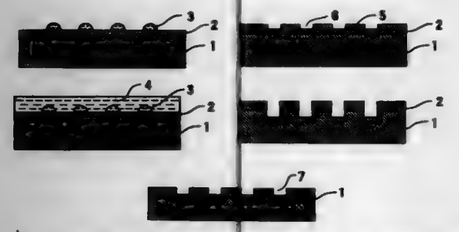
substrate as said dielectric layer thins, against a predetermined criteria.

5,198,073

METHODS FOR TREATING THE SURFACE OF A SOLID BODY

Kazuo Ishibashi, Yokohama, Japan, assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 22, 1991, Ser. No. 733,546
Claims priority, application Japan, Jul. 24, 1990, 2-195996
Int. Cl.[5] B44C *1/22*; C09C *15/00*; C23F *1/00*
U.S. Cl. 156—659.1 **12 Claims**



1. A method for treating the surface of a solid body by forming a large number of tiny indented points, comprising the steps of:
dispersing a large number of tiny liquid droplets over said surface;
forming a layer of a diluted solution of a plastic dissolved in a volatile solvent on said surface;
evaporating the volatile solvent, forming a plastic film containing a large number of tiny holes on said surface of the solid; and
etching said surface using said plastic film as a mask.

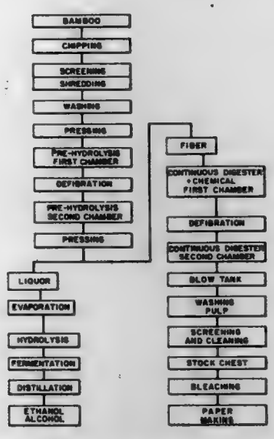
5,198,074

PROCESS TO PRODUCE A HIGH QUALITY PAPER PRODUCT AND AN ETHANOL PRODUCT FROM BAMBOO

Eduardo J. Villavicencio, Mexico City, Mexico, and Jose B. Dos Santos, Recife, Brazil, assignors to Companhia Industreas Brasileiras Portela, Recife, Brazil

Filed Nov. 29, 1991, Ser. No. 800,414
Int. Cl.[5] D21C *1/02, 3/26*
U.S. Cl. 162—15 **16 Claims**

1. A process for producing ethanol and a high quality pulp for papermaking comprising:
(a) deaggregating bamboo pieces into a fibrous mass by shredding;
(b) washing the deaggregated fibrous mass with water containing enzymes suitable to assist with sugar and starch solubilization;
(c) removing wash water from the washed fibrous mass and flowing and retaining the remainder of the wash water for fiber washings;
(d) conveying the fibrous mass at a pH of greater than about 6 to a first stage of continuous prehydrolysis with steam at a pressure of about 7.5 to 12 kg/cm^2 for a first period of time;
(e) discharging said fibrous mass from the first stage of prehydrolysis and rapidly decreasing the pressure on said fiber at least about 0.5 to 3 kg/cm^2;
(f) flowing said fiber mass into a second stage of continuous prehydrolysis at a pressure greater than about 7 kg/cm^2 for a second and longer period of time;
(g) decreasing the pressure on a prehydrolized fiber to atmospheric pressure and recovering (i) a liquid stream which contains substances for the production of ethanol, (ii) a fiber for papermaking and (iii) steam containing furfural;
(h) processing said liquid stream by concentrating the substances for the production of ethanol and by contact with enzymes capable of converting such substances to ethanol, thereby converting substantial amounts of such substances to ethanol;



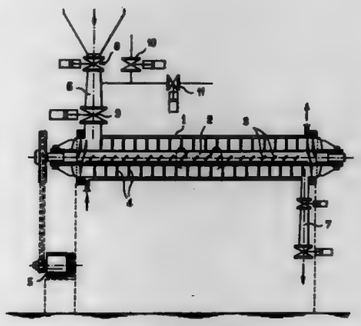
(i) processing said fiber for papermaking by means of at least two stages of chemical digestion with a step of rapidly reducing the pressure between steps of digestion to produce a paper pulp; and
(j) recovering a useful ethanol product and a pulped fiber useful in papermaking.

5,198,075

DIGESTION METHOD AND INSTALLATION WITH PREHEATING OF LIGNOCELLULOSE MATERIALS IN SOLID PHASE

Patrick Nivelleau de La Brunière, and Jean P. Galichon, both of Paris, France, assignors to Tag Pulp Industries S.A., France

Filed May 3, 1991, Ser. No. 695,619
Claims priority, application France, May 7, 1990, 90 05701
Int. Cl.[5] D21C *1/02, 1/06, 7/06, 7/08*
U.S. Cl. 162—19 **3 Claims**



1. A method for the pulping of raw lignocellulose material which consist essentially of the steps of:
impregnating said lignocellulose material with a solution of hydroxides or salts of alkali or alkaline-earth metals;
adjusting the weight of liquid retained in said lignocellulose material, so that the ratio of the weight of said retained liquid to the dry weight of said lignocellulose material does not exceed 2;

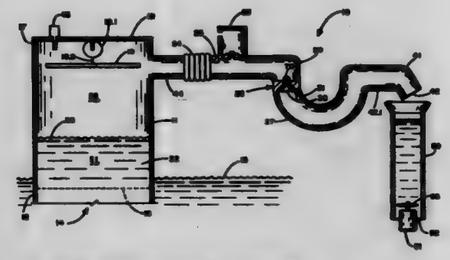
introducing the impregnated material into an air lock, introducing live steam into said air lock to contact said impregnated material in a precooking step, transferring the steam treated material from said air lock into an externally heated closed cylindrical digestion vessel provided with a central screw having blades or vanes for transporting said treated material through the vessel, transporting the treated material through said vessel while cooking it by externally applied heat, and withdrawing the cooked material from said digestion vessel via a second air lock;
the pressure of the live steam in said precooking step being equal to or greater than in the cooking step.

5,198,076

LOW-PRESSURE DESALINIZATION DEVICE

Peter M. Borgren, Duluth, Minn., assignor to Bowpec Incorporated, Duluth, Minn.

Continuation-in-part of Ser. No. 509,366, Apr. 16, 1990, Pat. No. 5,064,505. This application Jul. 29, 1991, Ser. No. 737,438
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] B01D *3/10*
U.S. Cl. 202—202 **11 Claims**



1. A distillation apparatus comprising:
(a) a water chamber with a closed upper portion and a lower portion for engaging a water source;
(b) a condensation and collection pipe section affixed to and extending from the upper portion of the water chamber for receiving water vapor and and collecting condensed water;
(c) means for exhausting air from the water chamber to create a low-pressure condition therein at less than atmospheric pressure to decrease surface tension of water in the water source and to thereby facilitate the generation of vapor in the water chamber;
(d) means connected in the condensation and collection pipe section for condensing the vapor;
(e) collection means comprising a collection trap connected in the pipe for collecting water condensed by the condensing means, the collection means including a level control means;
(f) distilled water conveying means for conveying the water from the collection means to a turbine, the distilled water conveying means having an upper end and a lower end, the upper end being connected to the collection means and disposed at approximately the height of the closed upper portion of the water chamber, the lower end of the distilled water conveying means disposed adjacent the turbine, the distilled water conveying means being curved between its upper and lower ends;
(g) the turbine being driven by water flowing from the lower end of the distilled water conveying means; and
(h) flexible water absorbent means partially immersed in the water source in the water chamber for drawing water upwardly from the water source to increase the surface area of the water source being subjected to the low-pressure condition whereby water vapor is generated directly from water in the water source and from water drawn up the flexible absorbent means and whereby the water vapor thus generated is subsequently condensed and thereby distilled.
6. A distillation apparatus comprising:
(a) a water chamber with a closed upper portion and a lower portion for engaging a water source;
(b) a condensation and collection pipe affixed to and extending from the upper portion of the water chamber;
(c) means for exhausting air from the water chamber to create a low-pressure condition therein at less than atmospheric pressure to decrease surface tension of water in the water chamber and to thereby facilitate the generation of vapor in the water chamber;
(d) means connected in the condensation and collection pipe for condensing vapor generated from the water chamber;
(e) collection means comprising a collection trap connected in the condensation and collection pipe for collecting water condensed by the condensation means, the collection means including a level control means;
(f) distilled water conveying means for conveying the water from the collection means to a turbine, the distilled water conveying means having an upper end and a lower end, the upper end being connected to the collection means and disposed at approximately the height of the closed upper portion of the water chamber, the lower end of the distilled water conveying means disposed adjacent the turbine, the distilled water conveying means being curved between its upper and lower ends;
(g) the turbine being driven by water flowing from the lower end of the distilled water conveying means; and
(h) the means for exhausting air comprising a pump with an inlet and outlet, the inlet opening in the direction of the water chamber, the outlet opening in the direction of the collection trap.

5,198,077

RECOVERY OF GLYCERINE FROM MANNITOL, LACTOSE OR LACTITOL BY AZEOTROPIC DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 19, 1991, Ser. No. 794,877
The portion of the term of this patent subsequent to Mar. 2, 2010, has been disclaimed.
Int. Cl.[5] B01D *3/36*; C07C *29/82*
U.S. Cl. 203—60 **3 Claims**

1. A method for recovering glycerine from a mixture of glycerine and mannitol which comprises distilling a mixture of glycerine and mannitol in a distilling column in the presence of an azeotrope forming agent, recovering the glycerine and the azeotrope forming agent as overhead product, separating the glycerine from the azetrope forming agent and obtaining the mannitol from the stillpot, wherein said azeotrope forming agent comprises one material selected from group consisting of 1-methyl naphthalene, biphenyl, isobornyl acetate, benzyl benzoate, dimethyl phthalate and ethyl salicylate.

5,198,078

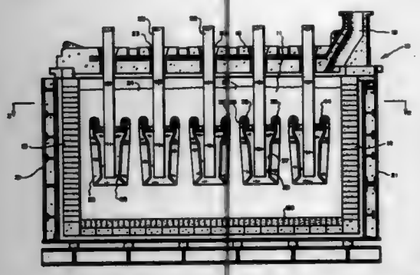
PROCEDURE FOR ELECTROLYTE PRODUCTION OF MAGNESIUM

Charles O. Gale, Ogden, Utah, and Clarence R. Townsend, Jefferson, Oreg., assignors to Oregon Metallurgical Corporation, Albany, Oreg.

Filed Jul. 29, 1991, Ser. No. 737,437
Int. Cl.[5] C25C *3/04*
U.S. Cl. 204—70 **8 Claims**

1. A procedure for electrolysis of magnesium chloride to produce free magnesium metal, including the steps:
maintaining, in an enclosed cell, a molten electrolytic bath containing magnesium chloride for electrolysis, the density of said bath being greater than that of free magnesium metal;
passing direct electric current through the bath between at

least one anode and at least one cathode plate in contact with the bath for depositing free magnesium metal at the cathode plate for upward flow therealong, and evolving chlorine gas at the anode for upward travel through the electrolytic bath, wherein the cathode plate has a major active surface that faces and slants upwardly away from a portion of the surface of the anode, the cathode plate sloping relatively abruptly away from the anode above the major surface, and having an uppermost edge which slopes upwardly parallel to the anode face beneath the surface of the bath; wherein



an inverted steel magnesium transfer trough is provided extending to a magnesium collection chamber in the cell, the trough having a downwardly open magnesium flow channel, and being mounted above, along and straddling the uppermost edge of the cathode plate, so that the magnesium flow channel comprises a portion nearer to, and a portion farther from, the anode than the uppermost edge of the cathode plate; and

cross flow passage means connecting the flow channel portions.

5,198,079

CONSTRUCTION AND WAY OF OPERATION OF A GAS DIFFUSION ELECTRODE FOR THE ELECTROCHEMICAL DISCOVERY OF MATERIALS FROM AQUEOUS SOLUTIONS

Jürgen Müller, Am Kirchfeld 8, 6367 Karben 2, Fed. Rep. of Germany

Filed May 9, 1990, Ser. No. 521,254

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1989, 3918378

Int. Cl.[5] C25B *1/14, 11/00; C25C 1/00*

U.S. Cl. 204—98 **5 Claims**

1. A vertical overvoltage—eliminating and voltage—gaining fuel gas diffusion electrode assembly of mechanically compressed dismountable sandwich construction for immersion in an aqueous electrolyte solution in an electrolysis cell, said assembly comprising in succession a structural plastic sheet, a metal sheet, a gas chamber containing a graphite fabric, a catalyst bearing carrier and a hydrophilic microporous separator, and said gas chamber comprising gas supply means to the top of the face of said metal sheet in contact with said graphite fabric, discharge means from the deepest point of said catalyst-bearing carrier and control means to hold said gas under a weak vacuum.

2. The method of operating the assembly of claim 1 comprising the steps of immersing said assembly in an aqueous electrolyte solution in an electrolysis cell and supplying gas to, and discharging gas from said assembly from said top to said deepest point under a weak vacuum such that said assembly is under compression by the hydrostatic pressure of said solution.

5,198,080

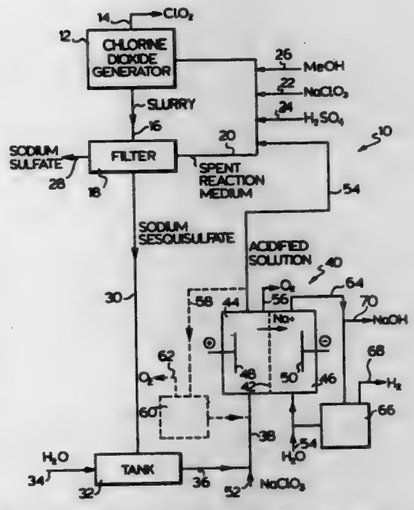
ELECTROCHEMICAL PROCESSING OF AQUEOUS SOLUTIONS

Gerald Cowley, Mississauga; Marek Lipsztajn, Rexdale; Zbigniew Twardowski, Mississauga; Richard Swindells, Caledon, and Edward J. Bechberger, Etobicoke, all of Canada, assignors to Teaneco Canada Inc., Islington, Canada

Continuation-in-part of Ser. No. 535,165, Jun. 8, 1990, Pat. No. 5,122,240. This application Apr. 19, 1991, Ser. No. 687,741

Int. Cl.[5] C25B *1/16, 1/22, 1/26*

U.S. Cl. 204—101 **76 Claims**



66. A method for the production of chlorine dioxide, which comprises:

providing an aqueous acid chlorine dioxide-generating reaction medium containing sulfuric acid and alkali metal ions in a reaction zone,

forming an aqueous solution of at least one alkali metal salt from solid phase alkali metal salt selected from the group consisting of alkali metal chlorate, alkali metal sulfate and mixtures of alkali metal chlorate and alkali metal sulfate,

electrochemically acidifying said aqueous solution of at least one alkali metal salt,

electrochemically removing alkali metal ion from said aqueous solution to produce an acidified alkali metal salt solution,

when said alkali metal salt is selected from the group consisting of alkali metal chlorate and mixtures of alkali metal chlorate and alkali metal sulfate, forwarding said acidified alkali metal salt solution as an acidified chlorate ion-containing solution to said reaction zone to provide chlorate ion and hydrogen ion reactants to said aqueous acid chlorine dioxide-generating reaction medium,

when said alkali metal salt is alkali metal sulfate, adding alkali metal chlorate to said acidified alkali metal salt solution and then forwarding the resulting aqueous acidified chlorate ion-containing solution to said reaction zone to provide chlorate ion and hydrogen ion reactants to said aqueous acid chlorine dioxide-generating reaction medium, and

recovering from said reaction zone an alkali metal sulfate in the solid phase,

wherein the electrochemical steps are conducted at current efficiencies of 70% or greater.

5,198,081

METHOD AND ELECTRODE FOR ELECTROCHEMICAL RECOVERY OF LITHIUM VALUE FROM AQUEOUS SOLUTION

Hirofumi Kanoh, Takamatsu; Kenta Ooi, Kagawa; Yoshitaka Miyai, Takamatsu, and Shunsaku Katoh, Kagawa, all of Japan, assignors to Japan as represented by Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 26, 1992, Ser. No. 841,562

Claims priority, application Japan, Mar. 4, 1991, 3-123190

Int. Cl.[5] C25F *1/22*

U.S. Cl. 204—105 R **11 Claims**

1. A method for the recovery of lithium value from an aqueous solution containing lithium ions and other kinds of metallic ions as impurities, which comprises the steps of:

(a) applying a direct-current voltage in the range from 0 to 0.7 volt versus a saturated calomel electrode to a working electrode as the cathode opposed to a counterelectrode made from a metal or carbonaceous material as the anode in an aqueous solution containing lithium ions and metallic impurity ions to effect selective adsorption of the lithium ions on the working electrode;

(b) transferring the working electrode bearing the lithium ions adsorbed thereon into an aqueous desorption medium containing an electrolyte dissolved therein; and

(c) applying a direct-current voltage in the range from 0.7 to 1.2 volts versus a saturated calomel electrode to the working electrode as the anode opposed to a counterelectrode made from a metal or carbonaceous material as the cathode in the aqueous desorption medium to effect desorption of the lithium ions from the working electrode into the aqueous desorption medium, at least the surface layer of the working electrode being formed from an oxide of manganese having a structure of spinel.

5,198,082

PROCESS FOR REHABILITATING INTERNALLY REINFORCED CONCRETE BY REMOVAL OF CHLORIDES

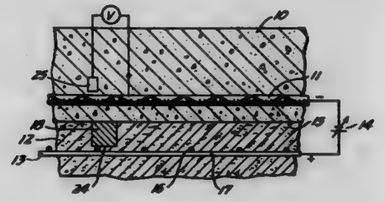
Oystein Vennesland, Trondheim; Ole A. Opsahl, Drammen, and John B. Miller, Oslo, all of Norway, assignors to Norwegian Concrete Technologies A/S, Oslo, Norway

Continuation-in-part of Ser. No. 352,266, May 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 100,834, Sep. 25, 1987, Pat. No. 4,832,803. This application Jun. 9, 1989, Ser. No. 366,204

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] C25B *1/26; C23F 13/00*

U.S. Cl. 204—130 **3 Claims**



1. Process for rehabilitating internally reinforced concrete by removal of chlorides therefrom, which comprises

(a) applying to an exterior surface of said concrete a temporary coating of an electrolytic material self-adherent to surfaces of said concrete facing in any direction,

(b) embedding in said coating a distributed electrode,

(c) applying a DC voltage between the internal reinforcement of said concrete and said distributed electrode to effect chloride migration from said concrete into said electrolytic material,

(d) discontinuing said voltage when sufficient chloride removal has been effected, and

(e) removing said distributed electrode and said adherent coating.

5,198,083

ELECTROCHEMICAL CELL AND METHOD OF TREATING WASTE MATERIAL THEREWITH

John D. Thornton, Evesham, United Kingdom, assignor to United Kingdom Atomic Energy Authority, Harwell, England

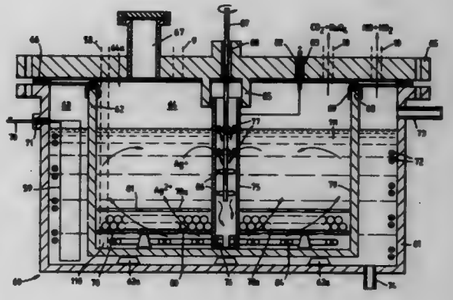
PCT No. PCT/GB90/00019, § 371 Date Apr. 1, 1991, § 102(e) Date Apr. 1, 1991, PCT Pub. No. WO90/08107, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 8, 1990, Ser. No. 669,417

Claims priority, application United Kingdom, Jan. 11, 1989, 89 00557.3

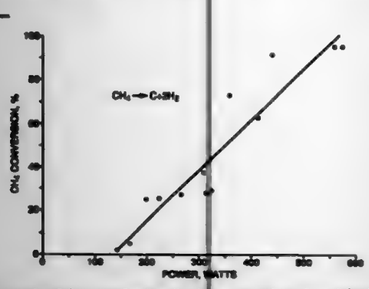
Int. Cl.[5] C02F *1/461; C25B 9/00, 7/00*

U.S. Cl. 204—149 **19 Claims**



7. A method of treating waste material, the method comprising the steps of (a) using an electrochemical cell having an electrode chamber, an electrode in the chamber, the electrode comprising a plurality of elements that divide the electrode chamber into two parts, and means for circulating electrode liquor from the one part to the other part over and between the elements, the circulating means comprising an impeller, which impeller is in a tube having a liquor inlet in the other chamber part and an outlet in the one chamber part at a different level than the inlet, whereby electrode liquor flows from the outlet through the elements into the other chamber part, (b) disposing the waste material in the other chamber part, and (c) adding waste material to the other chamber part at a rate compatible with the decomposition rate of previously added said waste material.

5,198,064
LOW-COST PROCESS FOR HYDROGEN PRODUCTION
Chang Y. Cha, Golden, Colo.; Hans F. Baser, Morgantown, W. Va., and Robert W. Grimes, Laramie, Wyo., assignors to Western Research Institute, Laramie, Wyo.
Continuation-in-part of Ser. No. 343,728, Apr. 26, 1989, abandoned. This application Jul. 17, 1989, Ser. No. 380,408
Int. Cl.[5] C01B *3/24, 31/00*
U.S. Cl. 204—157.47 11 Claims

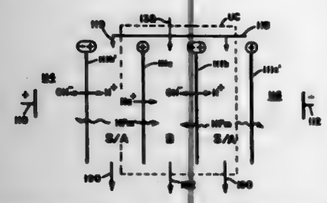


1. A method for producing hydrogen and carbon black from hydrocarbon gases comprising mixing said hydrocarbon gases with a source of pyrolytic carbon and applying radiofrequency energy to the mixture.

5,198,065
RESTORATION OF ALKALI HYDROXIDE ETCHANTS OF ALUMINUM
Daniel J. Vaughan, 36 Paxon Dr., Wilmington, Del. 19803
Filed Apr. 12, 1990, Ser. No. 508,201
The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.
Int. Cl.[5] B01D *61/00*
U.S. Cl. 204—182.4 21 Claims

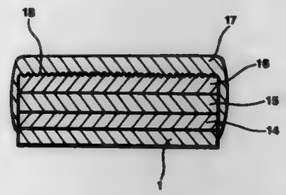
1. A method for insolubilizing a metal hydroxide in a solution of an alkali hydroxide, comprising the steps of feeding alkali hydroxide solution heavy metal hydroxide to an anolyte compartment of an electrodialysis cell containing an electrolyte having a soluble anion of an acid, and applying electrical energy to the cell to electrotransport alkali cations from the said electrolyte to a catholyte compartment of the cell containing an alkali hydroxide catholyte through a cation permeable membrane separating said compartments, at a rate to control the pH of said electrolyte and to cause said heavy metal hydroxide to separate as a solid in said electrolyte, and to produce an alkali hydroxide in the catholyte.

5,198,066
ELECTRODIALYSIS OF SALTS OF WEAK ACIDS AND/OR WEAK BASES
Frederick P. Chlanda, Rockaway, and Krishnamurthy N. Mani, Basking Ridge, both of N.J., assignors to Allied-Signal, Morristown, N.J.
Filed Dec. 21, 1990, Ser. No. 632,264
Int. Cl.[5] B01D *61/00*
U.S. Cl. 204—182.4 10 Claims



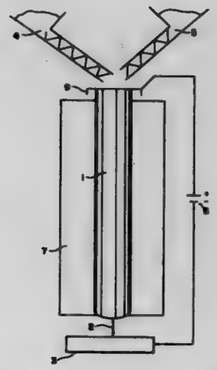
1. A method for reducing diffusion of neutral weak acid across cation membranes of an electrodialysis apparatus which from a salt of a weak acid, produces a base having an increased base to salt concentration ratio which is greater than the base to salt concentration ratio of a base product not so produced, the apparatus comprising at least one cell comprising at least one water splitter means to convert water to H^+ and OH and a cation selective membrane adjacent to the water splitter means, there being a base compartment (B) between the cation selective membrane and water splitter means located to receive OH from the water splitter means and a salt feed compartment adjacent to the cation membrane opposite the base compartment (B), the cation selective membrane having an outer surface facing away from the base compartment (B), comprising the steps of:
contacting the outer surface of the cation membrane with a solution of a salt of a weak acid,
feeding an aqueous stream to the base compartment (B),
applying a sufficient electrical potential across the cell to cause introduction of OH from the means for splitting water into the base compartment (B), and transport of cations from the salt solution across the cation membrane into the solution (B) to form base, the anions remaining in the salt compartment (S) forming acid with H^+ passing into the salt compartment (S);
monitoring the concentration in the base compartment (B) of base formed and weak acid which leaks into the base compartment (B);
maintaining the base concentration in the base compartment (B) at a concentration sufficient to reduce the diffusion of said weak acid across said cation membrane thereby increasing said concentration ratio of base to salt in the base compartment (B).

5,198,067
METHOD OF MAKING MAGNETO-OPTICAL RECORDING MEDIUM
Jo Yung-Kuk, Chungnam; Jo Yong In, Kyongki, and Yang Chang Sun, Chungnam, all of Rep. of Korea, assignors to SKC Limited, Kyongki, Rep. of Korea
Filed Oct. 25, 1990, Ser. No. 603,950
Claims priority, application Rep. of Korea, Oct. 31, 1989, 89-15747
Int. Cl.[5] C23C *14/34;* G11B *7/26*
U.S. Cl. 204—192.3 1 Claim



1. A method for manufacturing a magneto-optical recording medium which performs data writing, erasing, and rewriting by means of light, comprising the sequential steps of:
placing into a vacuum chamber a polycarbonate substrate, a TbFeCo alloy, and a composition selected from at least one of the group consisting of metal and semi-metal oxides, nitrides, and sulphides;
exhausting any air from the vacuum chamber and maintaining pressure within the vacuum chamber at between about 1–8 mTorr by the injection of argon into the vacuum chamber;
forming an interfering layer to a thickness of about 500–900 Å on the substrate by sputtering composition;
forming a recording layer having a thickness of between about 400–1000 Å on the interfering layer by sputtering said TbFeCo alloy;
forming a protective film layer of a thickness between about 600–1000 Å on the recording layer by sputtering said composition;
roughening the surface of the protective film layer with an argon plasma produced by the application of between about 100–500 W of electric power; and,
applying a photosetting resin layer of a thickness between about 30–80 μm on the protective film layer in a spin coating process.

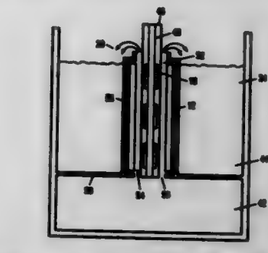
5,198,068
APPARATUS FOR THE PREPARATION OF ALKALI METAL MONOFLUORHOSPHATES
Armin Etzel, Hemsbach; Richard Taeuzler, Ludenbach; Alexander Maurer, Mannheim; Gerhard Schoenmann, Ludwigshafen, and Hans-Georg Steinert, Eschelbronn, all of Fed. Rep. of Germany, assignors to BK Ladenburg GmbH Gesellschaft fuer Chemische Erzeugnisse, Ladenburg, Fed. Rep. of Germany
Filed Jan. 16, 1991, Ser. No. 640,797
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1990, 4001430
Int. Cl.[5] C23F *13/00*
U.S. Cl. 204—196 5 Claims



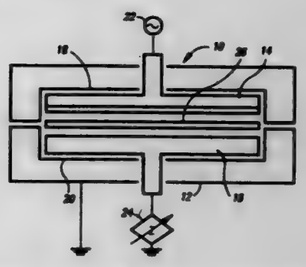
1. An apparatus for the preparation of alkali metal monofluorophosphate, comprising:
a melting crucible of a platinum/rhodium alloy, said crucible having an upper part and a bottom;
a heating jacket surrounding the crucible;
means for feeding alkali metal fluoride and alkali metal metaphosphate or alkali metal polyphosphate raw materials into the upper part of the crucible;
an outflow orifice for molten alkali metal fluorophosphate in the bottom of the crucible;
cooling means for cooling alkali metal fluorophosphate discharged from the crucible; and
a means for applying a direct voltage between the cooling means and the melting crucible, in which the cooling means is connected as a cathode and the crucible is connected as an anode.

5,198,069
PLATING TANK
Michael A. Bruggman, Mountain View, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Oct. 29, 1991, Ser. No. 784,533
Int. Cl.[5] C25D *17/00, 17/04, 21/06*
U.S. Cl. 204—240 18 Claims

1. An electroplating tank containing solution to electroplate one or more semiconductor wafers having a cathodic surface, said tank comprising:
an upper tank;
a lower tank; and
a chamber located in said upper tank for encasing one or more racks for supporting said wafers, wherein said chamber comprises:
an inner surface, said inner surface having one or more anodes, said anodes facing said plurality of wafers supported on said one or more racks; and
a fluid passage between said lower tank and said upper tank to allow a flow of said solution from said lower tank through said chamber, laterally across a surface of said anodes and a surface of said plurality of wafers, and into said upper tank.
3. An electroplating tank of claim 1 wherein said lower tank further comprises filtering means.



5,198,090
SPUTTERING APPARATUS FOR PRODUCING THIN FILMS OF MATERIAL
Arkadi Gelicki, Cupertino; Chang T. Horng, and Robert O. Schwenker, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 576,254, Aug. 31, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 807,766
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—298.11 13 Claims



1. Sputtering apparatus for coating a substrate with a chosen material comprising:
a first electrode and means for supporting a target member of said chosen material on said first electrode, said target member having a substantially planar surface;
a second electrode and means for supporting a plurality of substrates on said second electrode adjacent to and in alignment with said first electrode, said substrates being located substantially equidistant from the center of the substrate supporting means;
means for producing relative rotational motion between said first and second electrodes about an axis through the center of the substrate supporting means;
a source of power arranged to impose a voltage across said first and second electrodes to produce a glow discharge in

a known equivalent ion concentration and a measured

entrance and said exit of said passage which exits an ion-

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the space between substantially the entire surface of said planar target member and said second electrode, said glow discharge having a peak distribution of sputtered atoms in a direction normal to said first electrode; and

shutter means positioned between substantially the entire surface of said planar target member and said second electrode, said shutter means having means for blocking a substantial part of the sputtered atoms from said target member traveling at or near normal incidence to said substrates and at least one opening shaped to permit a substantial part of the sputtered atoms from said target member traveling at an oblique angle to impinge upon said substrates to produce a substantially uniformly thick coating of said chosen material upon substantially the entire surface of said substrates.

5,198,091

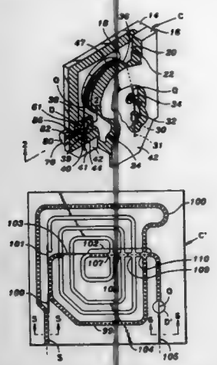
CAPILLARY CARTRIDGE FOR ELECTROPHORESIS

Victor P. Borolla, Livermore, and Ian K. Glasgow, Palo Alto, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 188,282, Apr. 29, 1988, abandoned. This application Nov. 13, 1990, Ser. No. 614,059

Int. Cl.[5] G01N *27/26, 27/447*

U.S. Cl. 204—299 R **33 Claims**



1. A cartridge for electrophoresis between two fluid reservoirs comprising in combination:

a portable cartridge body having a bottom surface;

a capillary having a predetermined length and two distal ends for placement in said cartridge body;

said cartridge body defining at the bottom surface thereof first and second space apart exits for disposing the distal ends of said capillary in depending relation from said body;

said cartridge body having means for accommodating a capillary between said first and second spaced apart exit paths;

said capillary disposed in the cartridge body with the distal ends of said capillary in depending relation from said body through the bottom of said body a distance below the bottom surface of said body to enable the penetration of the capillary ends into fluid reservoirs for the communication of said capillary to said fluid reservoirs;

said cartridge body also having a detection path defined therein for detecting electrophoretic separation including at least one aperture from the exterior of said cartridge body to the interior of said cartridge body; and

means for registering said capillary with said detection path to facilitate detection of electrophoretic separation in said capillary.

5,198,092

ELECTROCHEMICAL MEASURING CELL FOR DETERMINING AMMONIA OR HYDRAZINE IN A MEASURING SAMPLE

Herbert Kiesele, Lübeck; Uwe Kühn, Wesenberg, and Stephan Haupt, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

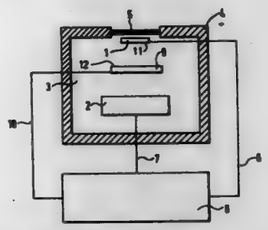
Continuation-in-part of Ser. No. 507,755, Apr. 12, 1990, Pat. No. 5,076,904. This application May 6, 1991, Ser. No. 696,089

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914284

The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.[5] G01N *27/404*

U.S. Cl. 204—402 **18 Claims**



1. An electrochemical measuring cell for determining ammonia or hydrazine in a fluid measuring sample, the measuring cell comprising:

a housing having an opening directed toward the sample to be measured and defining an electrolyte chamber;

a soluble electrolyte mixture comprising a cobalt salt dissolved therein to produce cobalt ions and being contained in said chamber;

a permeable membrane mounted on said housing for closing off said chamber;

a measuring electrode and a counter electrode disposed in said chamber so as to be in spaced relationship to each other;

said measuring electrode having a coating containing cobalt oxide and said coating being formed on said measuring electrode so as to be in direct contact with said electrolyte;

a reference electrode disposed in said electrolyte and having a coating formed thereon which likewise contains cobalt oxide; and,

voltage supply means for applying a voltage across said electrodes.

5,198,093

PH AND CONCENTRATION METER

Paul Sydlowski, Wakefield; Steven West, Hull; Chin-I Shyr; Christopher McIntre, both of Newton; Jeffrey S. Cohen, Wilmington; James Barbookles, Malden; Loren Somes, Haverhill; Thomas Paquette, Shrewsbury, and Laura Brockway, Charlestown, all of Mass., assignors to Orion Research, Inc., Boston, Mass.

Division of Ser. No. 521,731, May 10, 1990. This application Jan. 17, 1992, Ser. No. 803,326

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—406 **3 Claims**

1. Apparatus for measuring the equivalent ion concentration of a sample solution, comprising:

a. an electrode means that responds to a potential difference representative of the concentration of ionic species in solution;

b. a display means;

c. memory means to store sets of values, each set comprising

a known equivalent ion concentration and a measured potential difference at such concentration;

d. processor means to calculate a baseline standard cell potential from each of these sets of values according to the Nernst equation; and

e. input means to receive electrode signals representative of the potential difference of a sample solution and to transfer the signals to the processor means for calculation of the equivalent ion concentration of the solution and display thereof on the display means,

wherein the processor means comprises means to calculate the equivalent ion concentration based on the baseline standard cell potential associated with the measured potential difference that is closest to the potential difference of the sample solution.

5,198,094

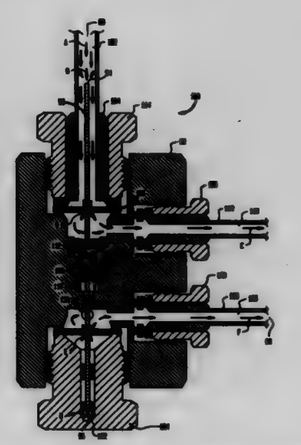
COUNTERFLOW DEVICE TO REDUCE THE NEGATIVE IMPACT OF CONTAMINATING MATERIALS USED IN MOISTURE SENSITIVE APPARATUSES OR PROCEDURES

Jacob Mettes, Doylestown, Pa., assignor to Meece, Incorporated, Warrington, Pa.

Filed Dec. 18, 1990, Ser. No. 629,439

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—430 **16 Claims**



1. A counterflow device for an analyzer engaging a gas stream and having a sensor including an entrance, an exit, and means for measuring a component of said gas stream, said device comprising:

a housing having an inlet for said gas stream and an outlet for said gas stream;

means fixing said sensor within said housing, said housing and said sensor defining a cavity therebetween;

at least one element disposed in said cavity between said entrance and said exit of said sensor which emits an impurity; and

means for directing a portion of said gas stream into said cavity as a counterflow toward said at least one impurity-emitting element and out said outlet, said counterflow flowing against movement of impurities from said element toward at least one of said entrance and said exit of said sensor.

5,198,095

METHOD FOR CONTINUOUSLY MANGANESE-ELECTROPLATING OR MANGANESE-ALLOY-ELECTROPLATING STEEL SHEET

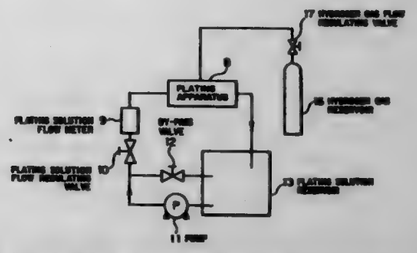
Takayuki Urakawa, and Yoshiharu Sugimoto, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Aug. 13, 1991, Ser. No. 743,407

Claims priority, application Japan, Dec. 29, 1989, 1-344598; PCT Int'l Appl., Dec. 28, 1990, PCT/JP90/01738

Int. Cl.[5] C25D *7/06*

U.S. Cl. 205—138 **11 Claims**



1. A method for continuously electroplating manganese or a manganese alloy on a steel sheet, which comprises the steps of:

causing a DC electric current to flow between a hydrogen gas diffusing insoluble anode (1) and a steel sheet travelling through a manganese electroplating solution or a manganese alloy electroplating solution while replenishing said manganese electroplating solution or said manganese alloy electroplating solution with manganese ions or manganese alloy ions, thereby forming a manganese plating layer or a manganese alloy plating layer on at least one surface of said steel sheet; and continuously supplying a hydrogen gas to said hydrogen gas diffusing insoluble anode (1), while forming said manganese plating layer or said manganese alloy plating layer, to cause an oxidation reaction of said hydrogen gas at said hydrogen gas diffusing insoluble anode (1), thereby preventing the production of at least trivalent manganese in the solid state or the ionic state in said manganese electroplating solution or said manganese alloy electroplating solution; and

wherein:

said hydrogen gas diffusing insoluble anode (1) comprises a porous water-repellent layer (4) having a mesh-shaped electric-conductive substrate (7) therein and a reaction layer (6) formed on one surface of said porous water-repellent layer (4), said hydrogen gas is continuously supplied to a side of said porous water-repellent layer (4) of said hydrogen gas diffusing insoluble anode (1), and a side of said reaction layer (6) of said hydrogen gas diffusing insoluble anode (1) is immersed in said manganese electroplating solution or said manganese alloy electroplating solution.

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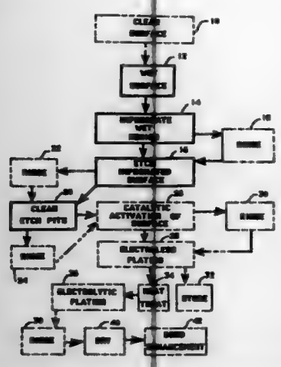
5,198,096

METHOD OF PREPARING POLYCARBONATE SURFACES FOR SUBSEQUENT PLATING THEREON AND IMPROVED METAL-PLATED PLASTIC ARTICLES MADE THEREFROM

Donald F. Foust, Scotia, and Lewis A. Bernstein, North Tonawanda, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1990, Ser. No. 618,808
Int. Cl.[5] C25D 5/56
U.S. Cl. 205—210 **9 Claims**



1. A method of metallizing a polycarbonate surface comprising:
exposing said polycarbonate surface to actinic light to wet said surface;
impregnating said wetted surface with a diffuser comprising an aqueous solution of a compound selected from the group consisting of hydrogen halide, ammonia, nitric acid mixed with sulfuric acid, and nitric acid mixed with orthophosphoric acid;
etching said impregnated surface with a base;
cleaning said etched surface with a cleansing agent; and
applying a metal layer on said cleaned surface.

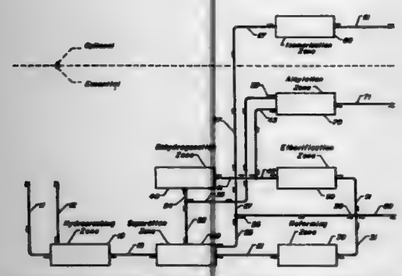
5. The method of claim 1 wherein said metal layer is applied on said surface to form an electromagnetic interference shield.

5,198,097

REFORMULATED-GASOLINE PRODUCTION

Paula L. Bogdan, Des Plaines; R. Joe Lawson, Palatine, and J. W. Adriaan Sachtler, Des Plaines, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 21, 1991, Ser. No. 796,101
Int. Cl.[5] C10G 59/00, 59/06
U.S. Cl. 208—79 **19 Claims**



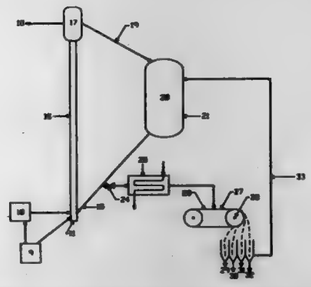
1. A process combination for producing a gasoline component from a naphtha feedstock comprising the steps of:
(a) selectively synthesizing isoparaffins from the naphtha feedstock using a selective isoparaffin-synthesis catalyst at selective-isoparaffin-synthesis conditions in the presence of hydrogen to form a synthesis effluent with a higher isoparaffin/n-paraffin ratio than that of the naphtha feedstock;
(b) separating the synthesis effluent in a separation zone to obtain an isobutane-rich stream, a light naphtha and a reforming feed;
(c) dehydrogenating a first portion of the isobutane-rich stream in a dehydrogenation zone at dehydrogenation conditions using a dehydrogenation catalyst and recovering an isobutene-containing stream;
(d) contacting a first portion of the isobutene-containing stream with an alcohol in an etherification zone at etherification conditions to obtain an ether and a hydrocarbon raffinate;
(e) contacting a second portion of the isobutane-rich stream and a second portion of the isobutene-containing stream in an alkylation zone at alkylation conditions to obtain an alkylate;
(f) contacting the reforming feed in a reforming zone at reforming conditions using a reforming catalyst to obtain a reformate; and,
(g) blending the gasoline component comprising at least a portion of each of the light naphtha, ether, alkylate and reformate.

5,198,098

MAGNETIC SEPARATION OF OLD FROM NEW EQUILIBRIUM PARTICLES BY MEANS OF MANGANESE ADDITION

William P. Hettinger, Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 19, 1990, Ser. No. 602,455
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[5] C10G 59/04; B01J 37/34, 20/34, 38/72
U.S. Cl. 208—85 **30 Claims**



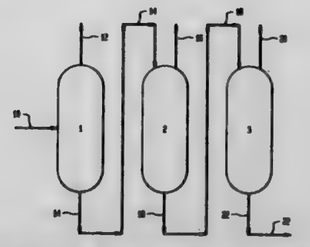
1. A hydrocarbon feedstock conversion process which utilizes magnetic separation for removal of cracking catalyst and/or sorbent particles in a circulating particle conversion system, said process comprising:
a. adding over time a magnetic manganese-containing compound to the circulating particles whereby manganese accumulates on individual particles in amounts proportional to the time that the respective particle has been circulating in the system;
b. separating particles containing magnetically active manganese by magnetic means; and
c. recycling at least a portion of particles comprising manganese concentrations lower than those of said separated particles and having higher activity than said separated particles, back to said conversion system.

5,198,099

THREE-STAGE PROCESS FOR PRODUCING ULTRA-CLEAN DISTILLATE PRODUCTS

Kenneth L. Trachte, Baton Rouge, La.; William Lasko, Flanders; Edward Effron, Springfield, both of N.J.; Gordon F. Stuntz, Baton Rouge, La., and Karl D. Chomyn, Denville, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 12, 1991, Ser. No. 743,958
Int. Cl.[5] C10G 69/00, 69/02
U.S. Cl. 208—89 **7 Claims**



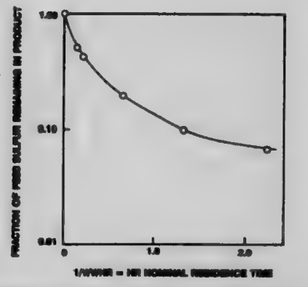
1. A process for producing naphtha and distillate products which are substantially free of heteroatoms and aromatics, from heteroatom and aromatic containing distillate feedstocks, which process comprises:
(a) hydrotreating the feedstock in a first stage at conditions which include the presence of hydrogen, temperatures within the range of about 200° C. to 400° C.; and a catalyst comprised of at least one Group VIII metal, and a Group VI metal, on an inorganic oxide support;
(b) further hydrotreating the effluent from the first stage, in a second stage, at a temperature ranging from about 195° C. to 360° C., in the presence of hydrogen and a noble metal containing zeolite catalyst; such that substantially no cracking occurs; and
(c) hydrocracking the effluent from the second stage in a third stage at a temperature from about 200° C. to 370° C., in the presence of hydrogen and a noble metal containing zeolite catalyst, with the proviso that the temperature of this third stage be at least 15° F. higher than that of the second stage and that it be high enough to cause cracking, wherein no products from this thrid stage are recycled.

5,198,100

HYDROTREATING USING NOVEL HYDROTREATING CATALYST

Clyde L. Aldridge, and Kenneth L. Riley, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 24, 1990, Ser. No. 632,723
Int. Cl.[5] C10G 45/08; B01J 27/047
U.S. Cl. 208—99 **16 Claims**



1. A process for removing heteroatoms from a hydrocarbonaceous feedstock which process comprises treating the feedstock at hydrotreating conditions including a temperature in the range of about 75° C. to about 450° C. at a pressure from about 10 to 2500 psig, and in the presence of hydrogen, with a non-calcined sulfided catalyst composition comprised of a salt or a complex of: (a) a salt of one or more Group VIII metals selected from the group consisting of Fe, Ni, and Co; and (b) a Group VI heteropolyacid composition selected from the group consisting of phosphomolybdic acid, phosphotungstic acid, silicomolybdic acid, and silicotungstic acid, wherein the Group VIII is incorporated into the catalyst composition as a metal salt of an acid which has an acidity less than that of the Group VI heteropolyacid; and an inorganic oxide support material, wherein the concentration of Group VIII metal ranges from about 4 to 12 wt. %, and the concentration of Group VI metal ranges from about 10 to 40 wt. %, which percents are on support, and which catalyst is substantially free of free water.

5,198,101

PROCESS FOR THE PRODUCTION OF MESOPHASE PITCH

Walter M. Kalback, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 13, 1991, Ser. No. 806,683
Int. Cl.[5] C10C 3/00
U.S. Cl. 208—39 **25 Claims**

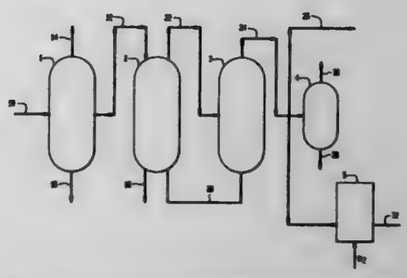
1. A process which comprises heating a carbonaceous heavy aromatic and/or heavy hydrocarbon feedstock substantially free of mesophase pitch, containing an amount of a metal alkylaryl sulfonate, which provides at least 10 ppm metal to the feedstock where the metal is any metal from Group I through VIII of the Periodic Table capable of complexing with alkylaryl sulfonates, wherein said heating of said feedstock takes place in the presence of a sparging gas for a period of time sufficient to obtain a mesophase pitch suitable for carbon fiber manufacture.

5,198,102

BENZENE REMOVAL FROM A HEARTCUT FRACTION OF GASOLINE BOILING RANGE STREAMS

Bal K. Kaul, Randolph; Joseph T. O'Bara, Parsippany; David W. Savage, Lebanon, and J. Patrick Dennis, Chatham, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 15, 1991, Ser. No. 729,679
Int. Cl.[5] C07C 7/12; C10G 25/00, 25/03
U.S. Cl. 208—310 Z **16 Claims**



1. A process for selectively separating benzene from gasoline boiling range process streams to produce substantially benzene free motor gasoline, the process comprising:
(a) fractionating a gasoline boiling range hydrocarbonaceous process stream such that one of the fractions is a heartcut fraction, having an average boiling point from about 120° F. to about 190° F., and which contains a higher concen-

tration of benzene than the original stream or any of the other fractions;

(b) passing said heartcut fraction to an adsorption zone containing a solid adsorbent comprised of a cation- exchanged zeolite having; (i) silicon to aluminum ratio of less than about 10; (ii) an average pore diameter greater than the size of the benzene molecule; and (iii) a selectivity for benzene over toluene;

(c) passing a desorbent having a boiling point at least 10° F. different from the boiling point of benzene through the bed of benzene-containing adsorbent in the adsorption zone, thereby desorbing benzene from the adsorbent;

(d) passing the benzene-containing desorbate to a separation zone to separate benzene from the desorbent, thereby resulting in a benzene rich stream and a desorbent stream; and

(e) recycling the desorbent stream back to the adsorption zone.

5,198,103

METHOD FOR INCREASING LIQUID YIELDS FROM SHORT RESIDENCE TIME HYDROPYROLYSIS PROCESSES

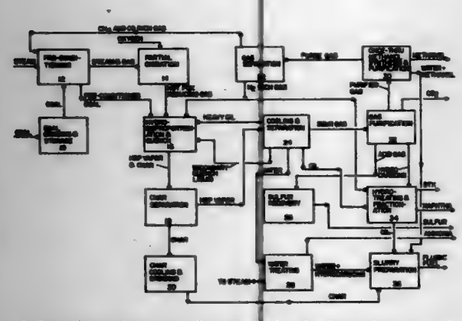
Lee G. Meyer, and Gerald F. Cavaliere, both of Englewood, Colo., assignors to Carbon Fuels Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 385,528, May 23, 1989, Pat. No. 5,021,148, which is a continuation-in-part of Ser. No. 277,603, Nov. 28, 1988, Pat. No. 4,938,782, which is a continuation-in-part of Ser. No. 84,270, Aug. 11, 1987, Pat. No. 4,787,915, which is a continuation-in-part of Ser. No. 59,288, Jun. 8, 1987, Pat. No. 4,832,831. This application Jul. 3, 1990, Ser. No. 547,559

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—431 11 Claims



1. In a thermal process for producing hydrocarbon-containing liquids by volatilization of a volatile-containing carbonaceous material in the presence of hydrogen donor-rich gas to produce hydrocarbon-containing vapor and solid char as reaction products wherein the volatilization reaction is essentially terminated by a final quench of said reaction products, the improvement which comprises:

partially quenching said reaction products prior to said final quench using at least one quench step with at least one quench medium to effect a hydrogenation temperature for a hydrogenation residence time to increase the quantity and quality of hydrocarbon containing liquids produced in said thermal process.

5,198,104

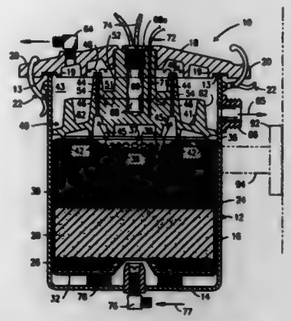
APPARATUS FOR REMOVING SOLID AND VOLATILE CONTAMINANTS FROM LIQUIDS

W. R. Mesyhert, St. Petersburg Beach, Fla., assignor to Lubrication Technologies, Inc., Tampa, Fla.

Filed Mar. 12, 1991, Ser. No. 667,949

Int. Cl.[5] B01D *3/28, 27/08*

U.S. Cl. 210—149 17 Claims



1. A fluid reclamation device, comprising:

a canister having an open top;

a closure means for closing said open top of said canister;

a filter housing positioned within said canister, said filter housing containing filter media therein;

said canister including means for directing said fluid into said filter housing;

an evaporation plate positioned within said canister in overlying relation to said filter housing;

means for heating said evaporation plate;

said evaporation plate having a top surface adjacent said open top and there being a space between said evaporation plate and said filter housing;

an evaporation chamber between said closure means and said evaporation plate;

said closure means including vapor outlet means for venting vapor from said evaporation chamber;

said canister including outlet means for directing fluid out of said evaporation chamber;

a first fluid passageway means formed in said filter housing;

said first fluid passageway means interconnecting said filter housing and said space below said evaporation plate;

a second fluid passageway means formed in said evaporation plate;

said second fluid passageway means interconnecting said space and said top surface of said evaporation plate;

a chimney means formed in said evaporation plate and projecting upwardly therefrom towards said open top, said second passageway means being formed in said chimney means so that fluid exiting said chimney means flows in a thin film over side walls of said chimney means and over said evaporation plate, thereby enhancing evaporation of volatile contaminants in said fluid;

means for increasing the surface area of said evaporation plate, said surface area increasing means comprising a pair of insert members, each of which has an apex adjacent said open top and sloping side walls that descend from said apex to said top surface of said evaporation plate, each of said insert members being positioned adjacent said chimney means so that fluid flowing out of said second passageway is constrained to flow over said insert members prior to flowing onto said top of said evaporation plate;

said chimney means comprising a pair of semicircular in configuration chimney members that are positioned in concentric relation to a center of said evaporation plate;

said evaporation plate including a central hub protruding upwardly towards said open top that is positioned radially inwardly of said pair of chimney members and wherein said insert members are diametrically opposed to one another and are positioned radially inwardly of said chimney members and radially outwardly of said central hub.

5,198,105

DEVICE FOR SOLIDS RECYCLE IN LONGITUDINAL-FLOW FLUID-BED REACTORS FOR EFFLUENT TREATMENT WITH CARRIER PARTICLES

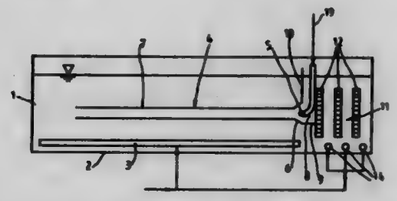
Jörg Kauling, Cologne; Hans-Jürgen Heinzler, Solingen; Imre Pascik, Monheim, and Georg Lamp, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1991, Ser. No. 671,280

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1990, 4009180

Int. Cl.[5] C02F *3/08, 3/22*

U.S. Cl. 210—151 8 Claims



1. In a fluid bed reactor for biological effluent treatment with the aid of carrier particles suspended in the effluent, said reactor comprising an elongated tank with an inlet and outlet of the effluent, gassing means for aerating the effluent in the tank, and separation means is the outlet for retaining the particles in the tank, the improvement comprising a jet ejector including a propulsion nozzle, an intake cone surrounding the propulsion nozzle and defining a suction chamber and an elongate mixer tube coupled to the intake cone and arranged horizontally within the tank, the intake cone with its associated suction chamber adjoining the separation means for collecting carrier particles accumulated in the region of the separating means, the propulsion nozzle being connected to the effluent inlet for charging the jet ejector with the effluent stream.

5,198,106

UNPOTTED APPARATUS FOR MAGNETICALLY TREATING FLOWING LIQUIDS

Roland K. Carpenter, 251 W. Canal Dr., Palm Harbor, Fla. 34684

Continuation-in-part of Ser. No. 105,818, Aug. 14, 1991, which is a continuation of Ser. No. 568,771, Aug. 17, 1990, Pat. No. 5,078,870. This application Feb. 21, 1992, Ser. No. 839,803

The portion of the term of this patent subsequent to Jan. 7, 2009, has been disclaimed.

Int. Cl.[5] C02F *1/48*

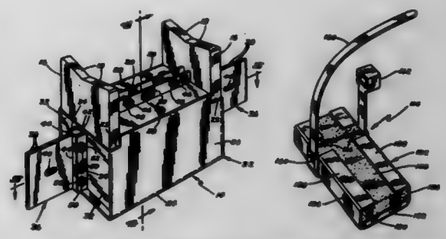
U.S. Cl. 210—222 18 Claims

1. Magnetic unit comprising, in combination:

permanent magnet means;

housing means generally enclosing said permanent magnet means;

and means for attaching said housing to a pipe for use in retaining the permanent magnet means against the pipe, in which said housing means is formed from a flat sheet including a base panel, first and second side panels connected to and extending generally perpendicularly in a first direction from the base panel, first and second top panels connected to the first and second side panels, respectively, said first and second side panels extending toward each other generally perpendicularly from the first and second side panels and parallel to and spaced from the base panel, and first and second end panels extending generally perpendicular to the first and second side panels, said first and second end panels extending generally perpendicular to the base panel in said first direction, said first and second end panels connected to one of the base panel or first and second side panels,



respectively, with the base, side, top, and end panels contacting the permanent magnet means, said magnet means being magnetically accessible via at least one opening through said housing means, said at least one opening being located adjacent the first and second top panels.

5,198,107

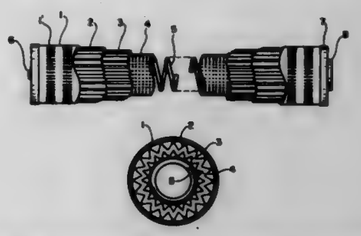
FILTERS FOR HEAVY DUTY INTERNAL COMBUSTION ENGINES

Jose A. G. Ponce, Enrique Wallon 417, 11580 Mexico, D.F., Mexico

Continuation of Ser. No. 536,407, Jun. 11, 1990, abandoned. This application Nov. 25, 1991, Ser. No. 799,025

Int. Cl.[5] B01D *27/06*

U.S. Cl. 210—232 14 Claims



1. A filter used in heavy duty internal combustion engine, comprising: an exterior tube with perforations concentric to an axis of said filter, an interior tube with perforations concentric with said axis, a spring concentric with said axis located inside said interior tube with perforations, a lower cap and an upper cap attached to first and second ends of said interior and exterior tubes, respectively, and two pleated layers of filtering means concentric with said axis and located between said exterior and interior concentric tubes without any stabilizing means extending between said layers and said end caps; said two layers of filtering means being concentric to said axis and radially spaced apart from each other to avoid radial overlapping of said layers of filtering means when viewed in an axial direction; said end caps and said layers of filtering means defining a space therebetween, the portions of said end caps defining said space being imperforate to fluid material, whereby said fluid material flows radially through said exterior tube, each said layers of filtering means and interior tube, said two layers of filtering means being of equal or different porosity and including a substantial portion of pulp of fibers that contain lignin, derived from disc type refining chips of woods that have a lignin content of at least 10 percent, with steam pressures in the range of 6.3 to 8.4 kg/cm^2 at temperatures between 165° and 176.5° C., and using energy levels in the range of

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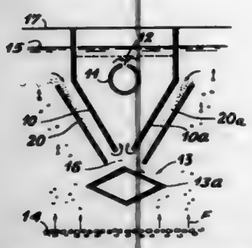
approximately 8 to 35 brake horsepower days/air dry ton of raw material.

5,198,108
ASSEMBLY FOR REMOVING WATER FOR WASHING FILTERS

Vincent Savall, Velizy Villacoublay, and Marie-Pierre Gaudin, Saint-Germain En Laye, both of France, assignors to Degremont, Rueil-Malmaison, France

Filed Jan. 17, 1991, Ser. No. 716,117
Claims priority, application France, Jan. 20, 1990, 90 07718
Int. Cl.[5] B01D *24/46*
U.S. Cl. 210—265 **10 Claims**



1. An assembly for removing backwash water used for washing filters containing granular filter material, which are backwashed simultaneously with water and air, and recovering particles of granular filter material entrained by the backwash water during the washing which comprises:
a collection member for collecting and removing dirty backwash water, said collection member being provided with a plurality of calibrated openings in a wall thereof;
an internal and an external partition placed on each side of said collection member, defining a water recovery zone inside the internal partitions, and, between said internal and external partitions, flow-tranquil zones for promoting the separation, by downward concurrent settling, of the particles of granular material and of the dirty backwash water to be removed; and,
a baffle adapted to avoid disturbing said water recovery zone and said quiecent zone by a water/air/granular material three-phase mixture formed during a backwash step, said baffle being positioned under said zones and directing said three-phase mixture towards an external degassing zone for removing air before the mixture, which has become two-phase, enters the tranquil settling zones.

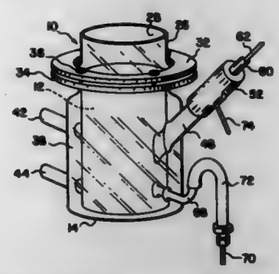
5,198,109
DIFFUSION CELL

William A. Hanson, Westlake Village, and Steven W. Shaw, Thousand Oaks, both of Calif., assignors to Hanson Research Corp., Chatsworth, Calif.

Filed Mar. 23, 1992, Ser. No. 856,350
Int. Cl.[5] G01N *13/00*
U.S. Cl. 210—321.75 **8 Claims**

1. A diffusion cell comprising:
a chamber divided by a membrane into a donor chamber and a receptor chamber, a liquid filling said receptor chamber and being in contact with said membrane, a media to be supplied into said donor chamber with said media being permitted to diffuse through said membrane and mixed with said liquid;
a sample port connecting with said receptor chamber, said sample port permitting removal of a quantity of said liquid;
a refilling port connecting with said receptor chamber, said refilling port permitting supplying of an additional quantity of said liquid into said receptor chamber; and
said receptor chamber including a mixing device, said mixing device to be operated to effect even mixing of said liquid within said receptor chamber, said mixing device comprising a helical coil of a length equal to at least one half the length of said receptor chamber.

6. A diffusion cell comprising:
a chamber divided by a membrane into a donor chamber and a receptor chamber, a liquid filling said receptor chamber and being in contact with said membrane, a media to be supplied into said donor chamber with said media being permitted to diffuse through said membrane and mixed with said liquid;
a sample port connecting with said receptor chamber, said sample port permitting removal of a quantity of said liquid; and

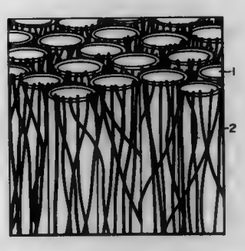


a refilling port connecting with said receptor chamber, said refilling port permitting supplying of an additional quantity of said liquid into said receptor chamber,
a sample tube mounted in conjunction with said sample port, said sample tube being movable between an inward position and an outward position, with said sample tube in said inward position said sample tube is located within said receptor chamber thereby facilitating removal of a quantity of said liquid, with said sample tube in said outward position said sample tube being spaced from said receptor chamber thereby not being usable to remove a quantity of said liquid.

5,198,110
BUNDLE OF PERMSELECTIVE HOLLOW FIBERS AND A FLUID SEPARATOR CONTAINING THE SAME

Tomoji Hanai, Nobeoka; Yoshiaki Nitadori, Fuji; Joji Nishikido, and Tetsuo Watanabe, both of Nobeoka, all of Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1991, Ser. No. 718,975
Claims priority, application Japan, Jul. 2, 1990, 2-172692
Int. Cl.[5] B01D *63/00, 39/00*
U.S. Cl. 210—321.79 **8 Claims**



1. A bundle of permselective hollow fibers comprising:
a plurality of porous hollow fibers extending substantially in-parallel; and
a plurality of filaments which intermingle with said hollow fibers substantially lengthwise over the length of said hollow fibers, each filament having a fineness of from 0.05 to 20 denier;

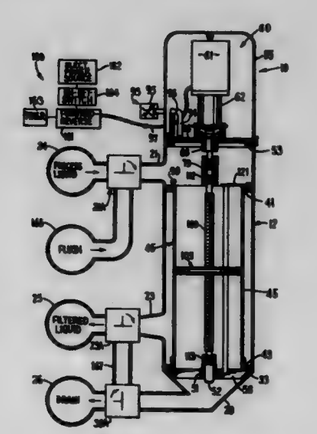
the ratio of the number of said filaments to said hollow fibers being from 2 to 3000;
substantially all of said filaments each engaging with at least one of said hollow fibers, thereby placing said hollow fibers extending substantially in-parallel into an inseparable bundle by means of said filaments while leaving spacings between said hollow fibers.

5,198,111
FILTER WITH RECIPROCATING CLEANER UNIT

Scott J. Davis, Kalamazoo, Mich., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Jan. 10, 1991, Ser. No. 639,518
Int. Cl.[5] B01D *29/64*
U.S. Cl. 210—408 **20 Claims**

1. A self-cleaning filter, comprising:
a housing having an inlet port for process liquid to be filtered and an outlet port for filtered liquid;

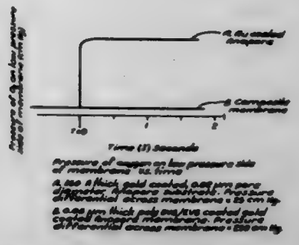


a filter element in said housing, said filter element having an inflow face communicating with said inlet port and an outflow face communicating with said outlet port;
a cleaning unit comprising an annular cleaning member movable axially along said filter element and having an annular cleaning edge movable therewith in cleaning engagement with said inflow face of said filter element to remove collected solids therefrom;
drive means drivable for moving said annular cleaning member axially back and forth along said filter element;
motor means actuable to drive said drive means, said cleaning member being a disk-like annulus and comprising two annular plates fixedly sandwiching a ring member therebetween, said ring member having attached to it said annular cleaning edge, and carrying resilient means radially backing said cleaning edge and resiliently axially compressible between said plates for resiliently radially outwardly expanding said annular cleaning edge against said inflow face of said filter element.

5,198,112
ULTRATHIN-FILM COMPOSITE MEMBRANE

Charles R. Martin, Bryan, and Mark W. Espenscheid, College Station, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 12, 1990, Ser. No. 463,767
Int. Cl.[5] B01D *53/22*
U.S. Cl. 210—490 **18 Claims**

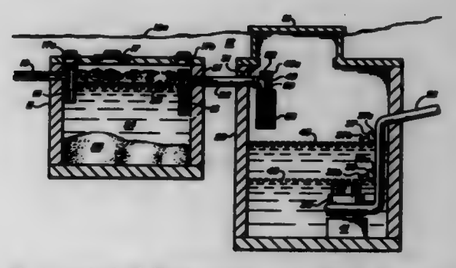


1. A composite membrane comprising a porous support and an electrochemically-initiated polymerized discriminating layer.

5,198,113
SEPTIC SYSTEM FILTERING ARRANGEMENT, FILTER MATERIAL AND METHOD OF USING

Byron C. Daniels, R.D. #1-Box 269-2, Effort, Pa. 18330

Filed Oct. 23, 1990, Ser. No. 601,985
Int. Cl.[5] C02C *3/00*
U.S. Cl. 210—608 **32 Claims**



28. A method of filtering septic tank effluent between a septic tank and a ground disposal means comprising:
(a) passing the septic effluent into a filtering chamber through conduit means leading directly into the upper portion of an open-topped, generally U-shaped, perforate filtering means at least lined with an open-cell polymeric replaceable filtering material,
(b) passing the septic effluent through the open-cell polymeric material to filter solid materials more than a predetermined diameter from the septic effluent,
(c) collecting the filtered effluent in the lower portion of the filter chamber and conducting to said ground disposal means,
(d) refraining from actively inhibiting unfiltered septic effluent overflowing from the top of the U-shaped filtering means if such filtering means should become at least partially occluded,
(e) monitoring the build-up of solid materials upon the inside of the filter medium, and
(f) upon the deposit of sufficient solid material upon the inside of the filter medium to detrimentally decrease filtering to a degree which may cause detrimental build up of the normal level of effluent in the U-shaped filtering during filtering, removing the used polymeric replaceable

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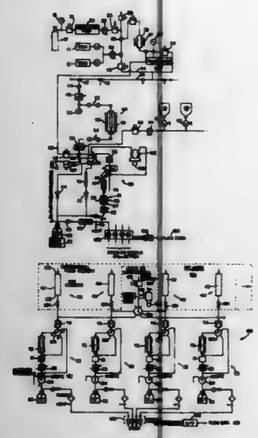
filtering material and replacing with fresh polymeric filtering material.

5,198,114
DOLOMITIC ACTIVATED CARBON FILTER
David L. Lewis, 110 Honey Tree Dr., Athens, Ga. 30605, and Gene E. Michaels, 1945 Cherokee Rd., Winterville, Ga. 30683
Filed Feb. 6, 1989, Ser. No. 306,104
Int. Cl.[5] C02F *1/28, 3/00*
U.S. Cl. 210—610 8 Claims

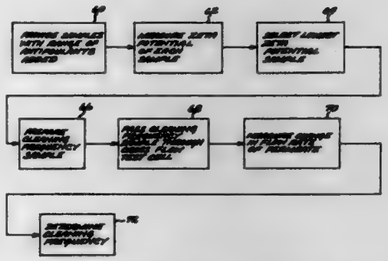
1. A water filter, for providing potable water substantially free of harmful bacteria, said filter comprising a filter medium and a nutrient in said filter medium for promoting bacterial colonization of a selected species of bacteria, said nutrient consisting of dolomite, and a colony of said selected species of bacteria in said filter, said selected species of bacteria consisting of a harmless microorganism normally surviving in the human gut, the arrangement being such that said harmless microorganism is nourished by said dolomite to exclude harmful bacteria from said filter medium through natural competition.

5,198,115
INTEGRATED INSTRUMENT FOR SUPERCRITICAL FLUID SAMPLE EXTRACTION, SAMPLE SEPARATION AND CONCENTRATION
David L. Stalling, and Said Saim, both of Columbia, Mo., assignors to Analytical Bio-Chemistry Laboratories, Inc., Columbia, Mo.
Filed Jul. 9, 1991, Ser. No. 727,464
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 50 Claims



1. An apparatus for supercritical fluid extraction of a sample from a bulk matrix, followed by supercritical fluid separation of the extracted sample into its constituents, comprising a number of separate supercritical fluid extraction modules with independent temperature, pressure, and flow rate control, said apparatus further comprising:
supply means for supply of a supercritical fluid,
a plurality of supercritical fluid sample extraction columns, each having an inlet and an outlet, and being constructed to contain said supercritical fluid,
means for individually establishing fluid flow communication between the inlets of individual ones of said extraction columns and said supply means in order to extract a sample from a matrix disposed in the sample extraction column; and
a like plurality of sample separation means, each having an inlet in fluid flow communication with the outlet of a corresponding respective sample extraction column, for separating the extracted sample into its constituents.

5,198,116
METHOD AND APPARATUS FOR MEASURING THE FOULING POTENTIAL OF MEMBRANE SYSTEM FEEDS
Daniel L. Comstock, Escondido, and Lee A. Durham, Oceanside, both of Calif., assignors to D.W. Walker & Associates, San Marcos, Calif.
Filed Feb. 10, 1992, Ser. No. 832,941
Int. Cl.[5] B01D *65/10*
U.S. Cl. 210—636 13 Claims

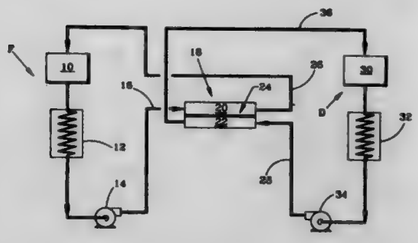


1. A method of determining the optimum cleaning approach for a reverse osmosis membrane, comprising the steps of:
providing a set of samples of a liquid to be purified in a reverse osmosis system, the samples having a range of antifoulant concentrations added;
measuring the zeta potential for each sample; and
selecting the concentration of antifoulant that provides the lowest (most negative) zeta potential as the preferred antifoulant concentration and determining the optimum cleaning approach for a reverse osmosis membrane in response to a parameter measured by passing a sample having said preferred antifoulant concentration through a membrane.

5,198,117
METHOD AND APPARATUS FOR PREPARING AN EPOXIDE BY ANIONIC DIALYSIS
Jeffery G. Grierson, Angleton, and Dorothy L. Roerden, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 2, 1991, Ser. No. 801,303
Int. Cl.[5] B01D *61/24*
U.S. Cl. 210—638 20 Claims

1. A method for producing an epoxide from a halohydrin, comprising the steps of:
(a) feeding a halohydrin solution into a first compartment of a dialysis cell, wherein said solution in said first compartment is separated from a hydroxide dialyzing solution in a second compartment by an anionic membrane which inhibits halohydrin migration from said first to said second compartments;

(b) inducing exchange of anions in said first compartment for hydroxyl anions in said second compartment by maintaining an effective hydroxide concentration differential between compartments, wherein said hydroxyl anions migrate to said first compartment, react with said halohydrin



to produce byproduct anions and said byproduct anions migrate to said second compartment to maintain a neutral charge differential between said compartments; and
(c) withdrawing epoxide dialysate solution from said first compartment having a low byproduct salt concentration.

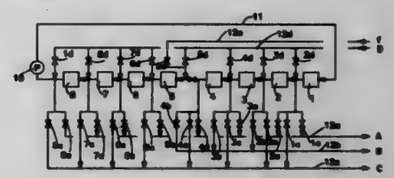
5,198,118
METHOD FOR TREATING FLUIDS
Don E. Heskett, Constantine, Mich., assignor to KDF Fluid Treatment, Inc., Constantine, Mich.
Continuation of Ser. No. 506,582, Apr. 9, 1990, abandoned, which is a continuation of Ser. No. 352,719, May 12, 1989, abandoned, which is a continuation of Ser. No. 205,628, May 31, 1988, abandoned, which is a continuation of Ser. No. 70,591, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 779,226, Sep. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 605,652, Apr. 30, 1984, abandoned. This application Jun. 15, 1992, Ser. No. 899,106
The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.
Int. Cl.[5] C02F *1/50*
U.S. Cl. 210—638 6 Claims

1. A method for treating drinking water to kill and inhibit undesirable bacterial constituents contained therein, said method comprising killing and inhibiting said constituents by passing said water containing said bacterial constituents through a bed of metal particles, said metal particles being comprised of a metal alloy of copper and zinc and wherein the ratio of copper to zinc is at least approximately 1:1, said alloy and bed being formed in a manner such that water passing through the bed meets 1984 United States Environmental Protection Agency standards for copper and zinc.

5,198,119
CONCENTRATION OR SEPARATION METHOD, COPOLYAMIDES AND COPOLYIMIDE AMIDES AND THE USE THEREOF
Joseph Berger, Basel, Switzerland, and Wolfgang Wernet, Kobe, Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Aug. 12, 1991, Ser. No. 744,622
Claims priority, application Switzerland, Aug. 17, 1990, 2675/90-6
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—654 17 Claims

1. A process for concentrating or separating salts of organic mono-, di, tri or tetracarboxylic acids from organic compounds of non-salt character with the aid of a semipermeable membrane, said organic compounds of non-salt character being selected from the group consisting of esters of carboxylic acids containing a total of 2 to 16 carbon atoms, ethers containing 2 to 12 carbon atoms, ketones containing 3 to 16 carbon atoms, and alcohols containing 5 to 16 carbon atoms, which process comprises contacting a solution of the salts and organic compounds in an in a substantially anhydrous solution of unsubstituted or C_1–C_3alkoxy substituted C_1–C_4alkoxy substituted C_1–C_4alkanol, mixtures of such alkanols or mixtures of such alkanols with ethers, with one side of the membrane, the pure solvent being present on the other side of the membrane, and said membrane is made from a copolyamide or copolyamide-amide of (a) at least one aromatic dicarboxylic acid radical of 8 to 20 carbon atoms and/or (b) at least one trivalent aromatic tricarboxylic acid radical of 9 to 20 carbon atoms, each of which radicals is unsubstituted or substituted by halogen, nitro, C_1–C_4alkyl or C_1–C_4alkoxy, (c) at least one first divalent and/or trivalent mononuclear or binuclear aromatic diamine radical and (d) at least one second divalent and/or trivalent aromatic mononuclear or binuclear diamine radical containing at least one —SO_3M group, each of which radicals is unsubstituted or substituted by halogen or C_1–C_4alkyl, and M is $H^{\oplus}$, a mono- to trivalent metal cation, $NH_4^{\oplus}$ or an organic ammonium cation of 1 to 30 carbon atoms, whereby the compounds of non-salt character are concentrated or separated in the permeate.

5,198,120
PROCESS FOR FRACTIONAL SEPARATION OF MULTI-COMPONENT FLUID MIXTURE
Takayuki Masuda, Tokyo; Toharu Sonobe; Fumihiko Matsuda, both of Toda, and Masaharu Horie, Tokyo, all of Japan, assignors to Japan Organo Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1990, Ser. No. 629,702
Claims priority, application Japan, Dec. 26, 1989, 1-337248; Dec. 1, 1990, 2-400062
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—659 6 Claims



1. A process for fractional separation of a fluid mixture comprising a number of components into three or more components, which process is carried out in a system wherein a number of bed units packed with an adsorbent are linked with each other in continuous series in such a way as to form a circulatory channel capable of circulation and shutoff, and wherein a fluid feed, or mixture, comprising three or more components having mutually different affinities for said adsorbent is flowed through said number of said bed units to form adsorption zones of the respective components separated from

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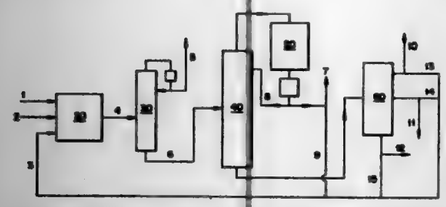
each other in the serial order of the weak to strong affinities thereof for said adsorbent; and which process comprises repeating a cycle comprising the step (1) of shutting off fluid circulation of said system at a position ("shutoff position") located upstream of an adsorption zone of a predetermined component having a weak affinity for said adsorbent and feeding fresh fluid feed into said system at a position downstream of said shutoff position while withdrawing from said system a fraction enriched with a predetermined component present in adsorption zones located upstream of said shutoff position; and the step (2) of separately withdrawing enriched fractions of the components from the adsorption zones from which said predetermined component has not been withdrawn in the step (1) by feeding a fluid desorbent into said system from the upstream side of said adsorption zones with sequentially shifting the position of feeding said fluid desorbent and the positions of withdrawing enriched fractions, corresponding to migration of the respective adsorption zones in the downstream direction of circulation, while circulating internal fluid throughout said system and feeding no fresh fluid feed into said system.

5,198,121

DRYING OF HYDROCARBON/HYDROCHLORIC ACID/WATER ADMIXTURES

Jean-Jacques Maniat, Chaponost; Elie Ghenassia, Grenoble; Raymond Commandeur, Vizille; Rene Clair, Martignas, and Jean-Louis Guillaumeng, Port De Bouc, all of France, assignors to Atochem, Puteaux, France

Continuation of Ser. No. 480,964, Feb. 16, 1990, abandoned. This application Nov. 26, 1991, Ser. No. 797,159
Claims priority, application France, Feb. 16, 1989, 89 02024
Int. Cl.[5] C02F 1/28
U.S. Cl. 210—689 1 Claim



1. A process for recovering halogenated hydrocarbons comprising:

a. treating a mixture of at least one halogenated hydrocarbon, water and hydrochloric acid to remove a major amount of aid hydrochloric acid and to produce a stream comprising said halogenated hydrocarbon, water and a minor amount of said hydrochloric acid;

b. treating said stream produced in step (a) to produce a stream comprising said halogenated hydrocarbon, less than about 1% water and less than about 1000 ppm hydrochloric acid and;

c. intimately contacting said stream produced in step (b) with an effective drying amount of an essentially anhydrous drying agent which comprises (i) a metal sulfate, chloride or perchlorate or (ii) phosphorous pentoxide without concomitantly removing the hydrochloric acid.

5,198,122

METHOD OF DETOXIFICATION OF SUBSTANCES BY UTILIZATION OF ULTRASONIC ENERGY

Duane P. Kosanke; James F. Soodsma, and Rebecca A. Bever, all of Mound Valley, Kans., assignors to Trinity Environmental Technologies, Inc., Mound Valley, Kans.

Continuation of Ser. No. 681,715, Apr. 8, 1991, abandoned. This application Aug. 10, 1992, Ser. No. 927,878
Int. Cl.[5] C02F 1/36
U.S. Cl. 210—748 16 Claims

1. A method of detoxifying liquid and solid materials containing organic halides, comprising the steps of:

a) adding to the materials to form a mixture an effective amount of sodium borohydride to act as a catalyst for converting said organic halides into less hazardous substances, said sodium borohydride being present in the mixture in an amount that is at least stoichiometrically as great as the organic halides equivalent in the material; and

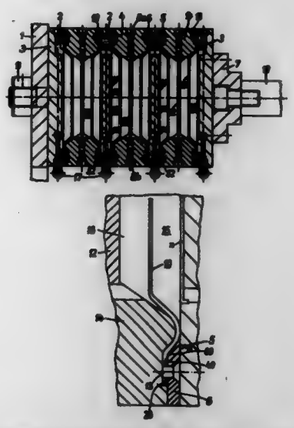
b) applying ultrasonic radiation to the material in a sufficient amount to cause cavitation in the mixture.

5,198,123

PLATE FILTER PRESS

Hans-Martin Stöver, Buchholz; Günther Suhr, Seevetal, and Thomas Willner, Hamburg, all of Fed. Rep. of Germany, assignors to Krupp Maschinentechnik GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 589,633
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1989, 39 32 422
Int. Cl.[5] B01D 25/168, 25/32
U.S. Cl. 210—791 7 Claims



1. A plate filter press for the mechanical separation of solids from a liquid suspension, comprising:

a plurality of vertical membrane plates and filter plates, alternatingly arranged one behind the other to define a plurality of filter chambers each disposed between an adjacent membrane plate and filter plate and which can be opened by moving said plates apart, said filter plates and said membrane plates each being circular, each said membrane plate having an edge region with a recess; and

an impermeable and flexible circular membrane disposed in each filter chamber and sealed to a peripheral area of the adjacent membrane plate defining a pressure medium chamber between said membrane and said adjacent membrane plate for receiving a pressure medium and a suspension chamber between said membrane and said adjacent filter plate for receiving the suspension, each said membrane having an outer edge portion which is disposed in

and has a shape complementary to the recess in the respective membrane plates;

each of said filter plates including opposite sides and a woven metal fabric filter covering each of said opposite sides to form a planar surface with an interior region being defined between the respective fabric filters covering the opposite sides of each said filter plate for allowing liquid filtered from the suspension to discharge toward said interior region; and

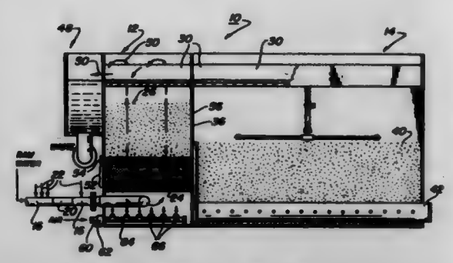
clamping rings each disposed between respective filter plates and membrane plates in said edge region, each clamping ring having an outer face facing an adjacent filter plate and an inner face facing the edge region of an adjacent membrane plate for clamping, in a sealing manner, a respective membrane at its outer edge portion to the membrane plate within said recess, said inner face being tapered radially inwardly toward said outer face, the membrane being held by the inner face of said clamping ring up to the height of the outer face of said clamping ring.

5,198,124

UPFLOW FILTER AND METHOD OF WASHING SAME

Annabelle Kim, Rosemont, and R. Lee Roberts, Boothwyn, both of Pa., assignors to Roberts Filter Manufacturing Company, Darby, Pa.

Division of Ser. No. 576,023, Aug. 31, 1990, Pat. No. 5,080,808, which is a continuation-in-part of Ser. No. 561,030, Aug. 1, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 819,916
The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.
Int. Cl.[5] B01D 37/03, 24/46
U.S. Cl. 210—792 17 Claims



1. A method of washing an upflow filter between service runs, said upflow filter including a filter bed having a non-buoyant particulate media filter layer through which influent to be filtered is directed in an upward direction during each service run for causing floc in said influent to be retained in said layer, said method of washing including the steps of:

(a) directing a combination of air and liquid in an upflow direction through the filter layer with the velocity of the liquid being less than one-half the minimum fluidization velocity of the filter layer for disrupting only some floc retained in said layer during a previous service run, while leaving some floc attached to said particulate media in said filter layer; and thereafter

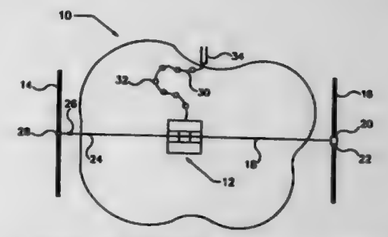
(b) directing only liquid in an upflow direction through the filter layer at a velocity less than one-half the minimum fluidization velocity of the filter layer for removing disrupted floc from the filter while leaving in said layer floc attached to said particulate media of said filter layer.

5,198,125

METHOD AND APPARATUS FOR SLUDGE COLLECTION

Lawrence A. Coudriet, 202 Trail Side Dr., Sewickley, Pa. 15143, and Thomas B. Zagates, 417 Oaklawn Dr., Pittsburgh, Pa. 15241

Filed Apr. 3, 1991, Ser. No. 679,726
Int. Cl.[5] B01D 21/04
U.S. Cl. 210—803 24 Claims



22. A method for removing sludge from a settling tank comprising the steps of:

suspending a scraper assembly submerged at a preselected depth in the settling tank from a floating carriage;

adjusting the suspension of the submerged scraper assembly to vertically raise and lower the scraper assembly to a desired depth in the settling tank in relation to a fixed bed of the sludge present in the settling tank;

transversing the submerged scraper assembly in contact with the sludge to shear successive layers of sludge from the bed;

collecting the sheared sludge at a preselected depth in the settling tank in a sludge collector positioned at the center of the scraper assembly;

pumping sludge from the sludge collector as the scraper assembly traverses the fixed sludge bed at a preselected depth in the settling tank; and

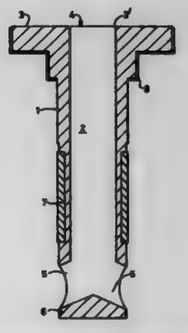
translating the floating upper carriage in both directions along the length of the settling tank.

5,198,126

TUBULAR REFRACTORY PRODUCT

Stephen J. Lee, Cardross, Scotland, assignor to Thor Ceramics Limited, Clydebank, England

Continuation-in-part of Ser. No. 399,453, Oct. 27, 1989, abandoned. This application Mar. 12, 1991, Ser. No. 667,985
Claims priority, application United Kingdom, Feb. 28, 1987, 8704764
Int. Cl.[5] B22D 41/08
U.S. Cl. 222—606 11 Claims



1. A refractory pouring assembly component comprising a

composite component having a slide plate surface having a bulk density in the range of about 3.05 to about 3.15 g/ml, an apparent porosity in the range of about 5 to 20%, a cold crushing strength in the range of about 137 to about 157 MN/m^2, a modulus of rupture in the range of about 45.7 to 52.3 MN/m^2 at normal temperatures and at 1500° C. in the range of about 12.7 to 15.7 MN/m^2, and a thermal expansion in the range of about 0.9 to 1.3% at 1500° C., the said composite component further having a sub-entry pouring tube portion having a bulk density in the range of about 2.15 to about 2.40 g/ml, an apparent porosity in the range of about 14 to 20%, a cold crushing strength in the range of about 20.6 to about 28.5 MN/m^2, a modulus of rupture in the range of about 6.0 to 9.5 MN/m^2 at normal temperatures and at 1500° C. in the range of about 6.0 to 8.8 MN/m^2, and a thermal expansion in the range of about 0.2 to 0.4% at 1500° C.

5,198,127
MOULD
Gregory C. Tilley, Warilla, and John Hanna, Strathfield West, both of Australia, assignors to Anchieta Pty. Limited, Strathfield West, Australia
Filed Mar. 1, 1991, Ser. No. 662,912
Claims priority, application Australia, Mar. 2, 1990, PJ8888
Int. Cl.[5] B28B *7/24*
U.S. Cl. 249—92 **7 Claims**

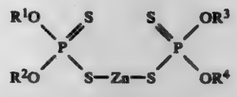
9. A kit of parts for assembly into a removable core for use with a cup to define a confectionary mould, said kit including:
a plurality of core formers each including mutually interengageable assembly formations for assembling the formers into a predetermined form for close engagement with the cup to define a plurality of mould segments;
a retainer including locking formations for engaging the formers and holding said formers in the predetermined form, said retainer also including means for supporting handle strips wherein each strip corresponds to a different mould segment, the core formers being planar sheets with side walls conforming with said cup, and at least one of the core formers incorporating a handle which projects upwardly away from the core former that incorporates such handle, and the handle being disposed to project substantially midway along such cup former so that, during assembly of the core formers with the retainer, the handle passes through a handle slot which is centrally located in the retainer.

5,198,128
WASTE DISPOSAL SITE, IN PARTICULAR FOR THE ULTIMATE DISPOSAL OF RADIOACTIVE SUBSTANCES
Hellmuth Beyer, Erlangen, and Ernst Haas, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 215,215, Jul. 5, 1988, abandoned. This application Jun. 5, 1991, Ser. No. 711,367
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722122
Int. Cl.[5] G21F *9/16*
U.S. Cl. 252—628 **14 Claims**

1. Ultimate disposal site for radioactive waste, comprising containers containing the radioactive waste, said containers being installed in a cave and defining hollow spaces remaining in the cave, and a mixture filling said hollow spaces, said mixture including at least one packing material and at least one substance to which radioactive gaseous substances adhere.

5,198,129
LUBRICATING OIL COMPOSITION CONTAINING ZINC DITHIOPHOSPHATE
Hitoshi Hata, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 542,434, Jun. 22, 1990, abandoned. This application May 21, 1991, Ser. No. 707,982
Claims priority, application Japan, Jul. 13, 1989, 1-178937
Int. Cl.[5] C10M *105/04*
U.S. Cl. 252—32.7 E **21 Claims**

1. A lubricating oil composition, comprising:
(A) a major amount of at least one lubricating base oil;
(B) from 0.05 to 5% by weight of at least one zinc dithiophosphate having a structure represented by the following formula (1)

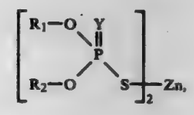


(1)

wherein each of R^1, R^2, R^3, and R^4 is independently a primary alkyl group of from 2 to 30 carbon atoms; and
(C) from 0.01 to 10% by weight of at least one unsaturated aliphatic alcohol of from 16 to 24 carbon atoms,
wherein the weight ratio of the unsaturated aliphatic alcohol to the zinc dithiophosphate, (C)/(B), is from 0.1 to 10.

5,198,130
LUBRICANT COMPOSITIONS
Rolf Schumacher, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 6, 1992, Ser. No. 817,184
Claims priority, application Switzerland, Jan. 8, 1991, 33/91
Int. Cl.[5] C10M *133/28, 137/04*
U.S. Cl. 252—32.7 E **13 Claims**

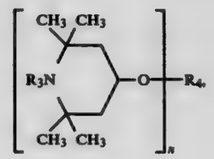
1. A composition free of barium salt and comprising
A) a lubricant,
B) at least one compound of the formula I



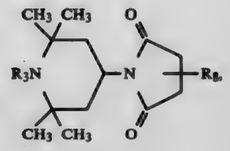
(I)

in which R_1 and R_2, independently of one another, are C_1–C_{20}alkyl, C_3–C_{18}alkenyl, phenyl, phenyl substituted by C_1–C_{20}alkyl, phenyl-C_1–C_4alkyl, C_2–C_{12}hydroxyalkyl, C_5–C_{12}cycloalkyl, C_5–C_{12}cycloalkyl substituted by C_1–C_4alkyl, or naphthyl and Y represents O or S, and

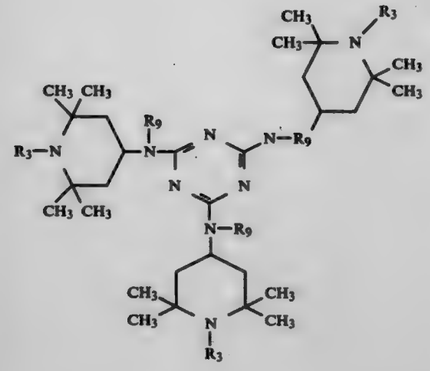
C) at least one compound of the formula II, III, or IV



(II)



(III)



(IV)

in which n is a number from 1 to 4, R_3 is hydrogen, oxyl, hydroxyl, C_1–C_{12}alkyl, C_3–C_8alkenyl, C_3–C_8alkynyl, phenyl-C_1–C_4alkyl, C_1–C_{18}alkoxy, C_5–C_8cycloalkoxy, C_7–C_9phenylalkoxy, C_2–C_8alkanoyl, C_3–C_5alkenoyl, C_2–C_{18}alkanoyloxy, benzyloxy, glycidyl or a group $-CH_2CH(OH)-Z$, in which Z is hydrogen, methyl or phenyl, and, if n is 1 R_4 is hydrogen, C_1–C_{18}alkyl or C_2–C_{18}alkyl which is interrupted by one or more oxygen atoms, C_3–C_8alkenyl, cyanoethyl, benzyl, glycidyl, a monovalent radical of an aliphatic or cycloaliphatic, araliphatic or aromatic carboxylic acid, carbamic acid or phosphorus-containing acid or a monovalent silyl radical, if n is 2 R_4 is C_1–C_{12}alkylene, C_4–C_{12}alkenylene, xylylene, a divalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic dicarboxylic acid, dicarbamic acid or a phosphorus-containing acid or a divalent silyl radical, if n is 3 R_4 is a trivalent radical of an aliphatic, cycloaliphatic or aromatic tricarboxylic acid, an aromatic tricarbamic acid or a phosphorus-containing acid or a trivalent silyl radical, and, if n is 4, R_4 is a tetravalent radical of an aliphatic, cycloaliphatic or aromatic tetracarboxylic acid, and R_8 is C_1–C_{18}alkyl or a polyisobutylene radical, and R_9 is C_1–C_8alkyl, subject to the proviso that the composition does not contain any aromatic amine.

5,198,131
DIALKANO- AND TRIALKANOL AMINE-DERIVED THIOESTER MULTIFUNCTIONAL ANTIWEAR ADDITIVES
Shih-Ying Hsu, Morrisville, Pa., and Andrew G. Horodysky, Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.
Filed Dec. 27, 1991, Ser. No. 815,018
Int. Cl.[5] C10M *135/26*; C07C *323/52*
U.S. Cl. 252—47.5 **16 Claims**

1. An improved lubricant composition comprising a major proportion of said lubricant and a minor proportion of a multifunctional antiwear additive product of reaction prepared from the reaction of a suitable sulfur-containing compound selected from the group consisting of mercaptans and mercapto-derived compounds which contain at least one carboxylic functionality and an alkanol amine in molar ratios varying from 1:10 to 10:1 of alkanol amine to sulfur compound at temperatures varying from ambient to about 300° C. under pressures varying from ambient to 10 atm for a time sufficient to obtain an amine-derived thioester additive product of reaction.

5,198,132
ANTIOXIDANT PRODUCTS
Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wick[illegible]e, Ohio
Filed Oct. 11, 1[illegible]. Ser. No. 595,904
Int. Cl.[5] C1[illegible] *135/22, 135/24*
U.S. Cl. 252—48.2 **12 Claims**

1. A composition which is the reaction product of (A) a beta-thiodialkanol, (B) a mercaptan, and (C) a polyol alcohol wherein the polyol is of the formula $R^1(OH)_a$ where a is greater than 1 and R^1 is aliphatic.

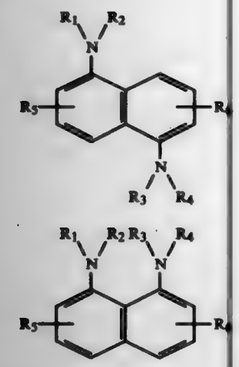
11. A composition comprising a major amount of an oil of lubricating viscosity and/or water, or a grease and a minor amount of the composition of claim 1.

5,198,133
MODIFIED SUCCINIMIDE OR SUCINAMIDE DISPERSANTS AND THEIR PRODUCTION
Andrew G. Papay, Manchester, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.
Continuation of Ser. No. 601,240, Oct. 22, 1990, abandoned, which is a division of Ser. No. 313,021, Feb. 21, 1989, Pat. No. 5,164,103, which is a continuation-in-part of Ser. No. 167,875, Mar. 14, 1988, Pat. No. 4,855,074. This application Jun. 22, 1992, Ser. No. 901,949
Int. Cl.[5] C10M *137/00*
U.S. Cl. 252—49.9 **21 Claims**

1. A process which comprises forming a blend comprising a water-hydrolyzable phosphorus ester, an alkenyl succinimide or succinamide ashless dispersant and at least about 0.1 part by weight of water per part by weight of said ester, and heating said blend such that said phosphorus ester is partially hydrolyzed, and said partially hydrolyzed phosphorus ester product so formed reacts with the amine portion of the succinimide or succinamide.

5,198,134
SUBSTITUTED NAPHTHALENEDIAMINE STABILIZERS
David H. Steinberg, Bronx, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation-in-part of Ser. No. 696,694, May 7, 1991, abandoned. This application Oct. 28, 1991, Ser. No. 783,953
Int. Cl.[5] C10M *105/64*; C07C *211/58*
U.S. Cl. 252—50 **15 Claims**

1. An N-substituted 1,5- or 1,8-naphthalenediamine of formula I or II



wherein

R_1, R_2, R_3 and R_4 are independently hydrogen, alkenyl of 3 to 18 carbon atoms or $—CH_2—S—E_1$ or $—CH_2—S—C_nH_{2n}—S—E_1$ where n is 2 to 6, E_1 is alkyl of 1 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, aryl of 6 to 10 carbon atoms, or said aryl or said phenylalkyl substituted on the aryl or phenyl moiety by one or two alkyl of 1 to 8 carbon atoms or by hydroxy and by one or two alkyl of 1 to 8 carbon atoms, with the proviso that all of R_1, R_2, R_3 and R_4 are not hydrogen at the same time, and with the further proviso that in formula II, none of R_1, R_2, R_3 and R_4 is $—CH_2S—E_1$ or $—CH_2—S—C_nH_{2n}—S—E_1$ or, and

R_5 and R_6 are independently hydrogen, alkyl of 1 to 12 carbon atoms, alkenyl of 3 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms or aryl of 6 to 10 carbon atoms.

5,198,135

ANTIEMULSION/ANTIFOAM AGENT FOR USE IN OILS

Mary Galic, Euclid; Scott T. Jolley, Mentor, and Mary F. Salomon, Cleveland Heights, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 586,469, Sep. 21, 1990, Pat. No. 5,084,197. This application Aug. 6, 1991, Ser. No. 740,694

The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.

Int. Cl.[5] C10M *145/00*

U.S. Cl. 252—52 A **17 Claims**

1. A crankcase lubricating oil composition containing as an antiemulsion agent an effective amount of about 50 ppm to about 2,500 ppm by weight of the composition of a butylene oxide containing polymer.

5,198,136

IODINE-CONTAINING COMPOUND, PREPARATION THEREOF AND BLOCK COPOLYMER COMPRISING THE SAME

Masayoshi Tatemoto; Yuji Yutani, and Koji Fujiwara, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Division of Ser. No. 345,571, May 1, 1989, Pat. No. 4,962,236, which is a division of Ser. No. 136,916, Dec. 22, 1987, Pat. No. 4,861,836. This application Mar. 5, 1990, Ser. No. 487,865

Claims priority, application Japan, Dec. 23, 1986, 61-310397; Dec. 23, 1986, 61-310398

Int. Cl.[5] C10M *105/54*; C07C *43/16*

U.S. Cl. 252—54 **9 Claims**

1. A grease which comprises a block copolymer comprising at least two kinds of blocks at least one of which consists of a homopolymeric or random copolymer block which acts as a viscous liquid component comprising at least one block selected from the group consisting of:

(I) (a) a block consisting of at least two repeating units selected from the formulae:

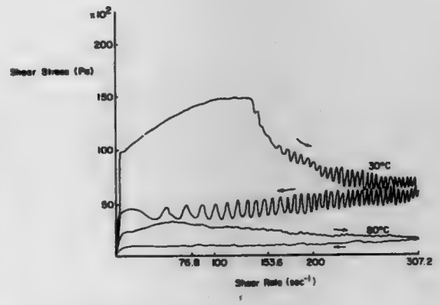
$—(CH_2CF_2CF_2O)_a—$

$—(CHClCF_2CF_2O)_b—$

$—(CCl_2CF_2CF_2O)_c—$

$—(CHFCF_2CF_2O)_d—$

(II) $—(CFClCF_2CF_2O)_e—$



$—(CF_2CF_2CF_2O)_f—$

a, b, c, d, e and f are each 0 or a positive integer and satisfy the following equations:

$$2 \leqq a+b+c+d+e+f \leqq 200$$

and

$$1 \leqq a+c+d+f$$

(b) a block consisting of the repeating units of the formula:

$$—(CFCF_2O)_p—(CF_2CF_2O)_q—(CF_2O)_r—$$
(with CF_3)

wherein p, q and r are each 0 or a positive integer and satisfy the following equations:

$$2 \leqq p+q+r \leqq 200$$

and

$$1 \leqq p+q$$

(c) a block consisting of the repeating units of the formula:

$$—(CF_2CF_2)_k—(CF_2CF)_m—$$
(with $(OCF_2CF)_n—OR_{f2}$ and R_{f1})

wherein R_{f1} and R_{f2} are the same or different and C_1–C_3 perfluoroalkyl, k and m are each a positive integer and satisfy the equations:

$$2 \leqq k+m \leqq 50$$

and

$$0.2 \leqq m/(k+m),$$

and n is an integer of 0 to 10, and

(d) a block consisting of repeating units of the formula:

$—(CF_2CFCl)_x—$

wherein x is an integer of 2 to 11 and at least one of other of which consists of a homompolymeric or random copolymeric block bonded to the former block to make the block copolymer solid or semi-solid.

5,198,137

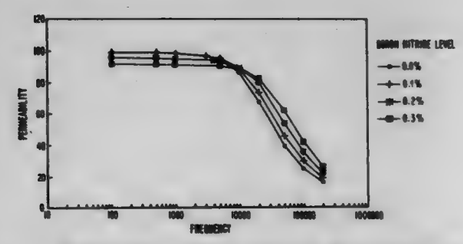
THERMOPLASTIC COATED MAGNETIC POWDER COMPOSITIONS AND METHODS OF MAKING SAME

Howard G. Rutz, Newtown, Pa.; Christopher Oliver, Burlington, and Brooks Quin, Marlton, both of N.J., assignors to Hoeganaes Corporation, Riverton, N.J.

Filed May 17, 1991, Ser. No. 701,776

Int. Cl.[5] H01F *1/26*

U.S. Cl. 252—62.54 **14 Claims**



1. A ferromagnetic powder composition for molding magnetic components comprising

iron core particles having a substantially uniform coating of a thermoplastic material surrounding the iron particles, said thermoplastic material constituting from about 0.001% to about 15% by weight of the iron particles as coated; and

boron nitride powder admixed with said coated particles in an amount up to about 1% by weight of the coated particles.

5,198,138

SPHERICAL FERRITE PARTICLES AND FERRITE RESIN COMPOSITE FOR BONDED MAGNETIC CORE

Shigehisa Yamamoto, and Masaru Kawabata, both of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Continuation-in-part of Ser. No. 506,608, Apr. 10, 1990, abandoned. This application Oct. 11, 1991, Ser. No. 773,329

Claims priority, application Japan, Apr. 19, 1989, 1-101204; Feb. 28, 1990, 2-50715; Oct. 18, 1990, 2-280967; Oct. 18, 1990, 2-280968

Int. Cl.[5] C04B *35/04, 35/26, 35/64*; H01F *1/00*

U.S. Cl. 252—62.54 **10 Claims**

1. Ferrite spherical particles for a bonded magnetic core comprising crystal gains of 5 to 15 μm in average diameter, having an average particle diameter of 20 to 150 μm and a magnetic permeability of not less than 24, and consisting essentially of 47 to 58 mol % of Fe_2O_3, 10 to 30 mol % of nickel oxide, manganese oxide or nickel.manganese oxide (calculated as NiO, MnO or NiO.MnO) and 15 to 40 mol % of zinc oxide (calculated as ZnO).

5,198,139

USE OF CHLOROFLUOROPOLYMERS AS LUBRICANTS FOR REFRIGERANTS

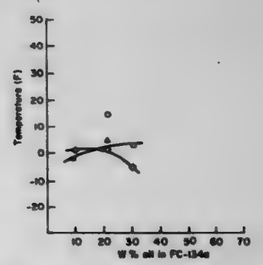
Thomas R. Bierschenk; Timothy J. Juhlke, both of Roundrock; Richard J. Lagow, and Hajimi Kawa, both of Austin, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Continuation of Ser. No. 528,027, May 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 355,771, May 23, 1989, Pat. No. 4,931,199. This application Jan. 24, 1991, Ser. No. 719,673

The portion of the term of this patent subsequent to Jan. 5, 2007, has been disclaimed.

Int. Cl.[5] C09K *5/04*; C10M *105/54, 107/38*

U.S. Cl. 252—68 **27 Claims**



1. A refrigerant composition, comprising a fluorocarbon refrigerant selected from the group consisting of hydrofluorocarbon, chlorofluorocarbon, chlorofluorohydrocarbon and mixtures thereof and an amount of a perchlorofluoropolyether lubricant miscible therewith, sufficient to impart lubricity thereto, and wherein the perchlorofluoropolyether contains about 5 to about 50 weight percent chlorine and has a molecular weight of from about 500 to about 5000 a.m.u.

5,198,140

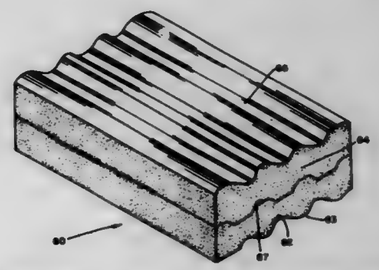
DUAL COMPOSITION SOAP OR DETERGENT BAR CONTAINING CONVOLUTED SURFACES AND TONGUE AND GROOVE INTERLOCK

David Joshi, Plainfield, N.J., and Jose Sanabria, Cali, Guatemala, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 265,989, Nov. 2, 1988, abandoned. This application Mar. 13, 1991, Ser. No. 668,752

Int. Cl.[5] C11D *17/00*

U.S. Cl. 252—90 **2 Claims**



1. A dual composition soap or detergent bar comprising two separately extruded bar portions of different compositions, said

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bar including a convoluted upper and a convoluted lower surface and a tongue and groove interlock between said bar portions, said tongue and groove interlock including a plurality of tongues and grooves in each of said bar portions, said convolutions in said upper and lower surfaces being sinusoidal in configuration, said bar portions being co-extruded and pressed together compressing said bar portions together forcing said tongues and grooves to interlock.

5,198,141

PROCESS FOR CLEANING A PHOTOGRAPHIC PROCESS DEVICE

Charles M. Darmon, Spencerport; William G. Henry, Caledonia, and Paul A. Schwartz, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 615,562, Nov. 19, 1990, Pat. No. 5,118,356. This application Nov. 20, 1991, Ser. No. 795,353

Int. Cl.[5] C23F *3/06*; C23G *1/08*; C11D *7/08, 7/10*

U.S. Cl. 252—142 **2 Claims**

1. A composition suitable for cleaning a stainless steel surface by removal of a silver-containing deposit from such surface without the formation of a brown stain, said composition comprising:

water	87–93%
Soluble cerium(IV) salt	3–7%
nitric acid	2–3%
acetic acid	2–3%

5,198,142

SEAM CLEANING COMPOSITION

Wendell A. Ehrhart, Red Lion; William T. Sigman, Quarryville, and Albert C. Weidman, East Petersburg, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 29, 1991, Ser. No. 737,216

Int. Cl.[5] C11D *7/50*

U.S. Cl. 252—163 **17 Claims**

1. A seam cleaning composition consisting essentially of hydrocarbon solvent and a finely divided inorganic powder, the hydrocarbon solvent being predominately a branched aliphatic having a boiling point between about 90° C. and about 260° C., the inorganic powder having a mean particle size of less than about 100 microns and a Moh's hardness of about 1 to about 8.

5,198,143

COMPOSITION FOR THE TREATMENT OF OVERSPRAY IN PAINT SPRAY BOOTHS CONTAINING SECONDARY ALCOHOL ESTERS AND SURFACTANTS

Edwin C. Zaerner, Troy; Robert A. Patzelt, and Norman Foster, both of Bloomfield Hills, all of Mich., assignors to Nortru, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 790,650, Nov. 8, 1991. This application Mar. 31, 1992, Ser. No. 861,091

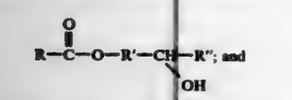
Int. Cl.[5] C11D *7/50*

U.S. Cl. 252—170 **18 Claims**

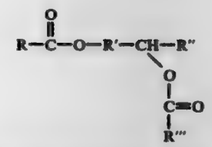
1. A composition for treating oversprayed paints consisting essentially of:

between about 5 and about 50 percent by volume of a carbonyl compound selected from the group consisting of

a. alcohol esters having the general formula:



b. condensation products of alcohol esters and carboxylic acids having the general formula:



and mixtures thereof, wherein R′ and R″ is chosen from the group consisting of substituted alkyl groups, unsubstituted alkyl groups and mixtures thereof, said substituted and unsubstituted alkyl groups having from 1 to 8 carbon atoms, wherein R and R‴ are chosen from the group consisting of linear alkyl groups having from 1 to 10 carbon atoms, branched alkyl groups having from 1 to 10 carbon atoms, R and R‴ being either identical or different alkyl functionalities, said carbonyl compound being capable of dissolving paint while remaining essentially insoluble in and non-reactive with an aqueous media;

between about 0.1 about 10% by volume of a surfactant selected from the group consisting of ethoxylated alkyl phenols having an average ratio of moles of ethylene oxide to moles of alkyl phenol between about 4:1 and about 8:1;

between about 0.1 and about 20% by volume of an emulsifier; and

water.

5,198,144

BATHING PREPARATION

Yuji Ichii; Hidenori Yoroza, both of Tochigi; Kazuyuki Fukuda, and Yu Izumi, both of Chiba, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 331,207, Mar. 31, 1989. This application Jul. 26, 1991, Ser. No. 735,666

Claims priority, application Japan, Apr. 1, 1988, 63-80451

Int. Cl.[5] C11D *3/50*

U.S. Cl. 252—174.11 **16 Claims**

1. A bathing preparation comprising:

(A) fumaric acid in combination with at least one other organic acid, wherein fumaric acid is present in amounts of 20% by weight or more of the total of said fumaric acid and said at least one other organic acid, wherein said fumaric acid is surface-treated with a water-soluble polymer, a hydrophilic nonionic surfactant or mixture thereof,

(B) at least one carbonate in an amount effective to yield sufficient carbonic acid gas to promote blood circulation,

(C) at least one perfume selected from the group consisting of terpene hydrocarbons having 10 carbon atoms and formates, acetates and propionates of an alcohol having from 5 to 10 carbon atoms, in an amount effective to impart sufficient aroma to the bathing preparation wherein said terpene hydrocarbons having 10 carbon atoms are selected from the group consisting of α-pinene, β-pinene, camphene, limonene, terpinolene, myrcene, and p-cymene; wherein said formates of an alcohol are selected from the group consisting of geranyl formate, benzyl formate and phenylethyl formate; wherein said acetate of an alcohol is selected from the group consisting of isoamyl acetate, citronellyl acetate, geranyl acetate, benzyl acetate, linalyl acetate, phenylethyl acetate, methyl acetate, bornyl acetate, terpenyl acetate, cinnamyl acetate, anisyl acetate and myrcenyl acetate; and wherein said propionates of an alcohol are selected from the group consisting of linalyl propionate, cintronellyl propionate, geranyl propionate, benzyl propionate, terpenyl propionate and cinnamyl propionate,

(D) wherein the water-soluble polymer is used in an amount of 0 to 40% by weight based on the fumaric acid and the hydrophilic nonionic surfactant is used in an amount of 0 to 5% by weight based on the fumaric acid.

5,198,145

DRY DETERGENT COMPOSITIONS

Walter Lobunez, Princeton, and David Goldstein, Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 610,668, Nov. 8, 1990, abandoned. This application Dec. 6, 1991, Ser. No. 802,918

Int. Cl.[5] C11D *11/00, 3/10, 7/12, 17/06*

U.S. Cl. 252—174.14 **18 Claims**

1. In the process of making dry-blended detergent formulations of the type in which liquid surfactant is absorbed on absorptive soda ash, the improvement wherein the soda has employed has elevated surfactant absorptivity and is produced by dehydrating sodium carbonate decahydrate crystals recovered from alkali liquors at a temperature below their melting point to give a partially dehydrted product containing the equivalent of from about 1 to 5 moles of bound water, and which is free of amounts of sodium bicarboante that inhibit said elevated surfactant absorptivity, and optionally in a second stage heating the so-obtained partially dehydrated product until the equivalent bound water content thereof is from about 0 to 1 moles.

5,198,146

HOMOGENEOUS ACCELERATOR SYSTEM FOR EPOXY RESINS

John A. Shomer, 19 Hareuth Street, Hod Hasharon, Israel

Filed Jul. 24, 1991, Ser. No. 735,415

Claims priority, application Israel, Jul. 25, 1990, 095186; Nov. 13, 1990, 096338

Int. Cl.[5] C08G *59/62, 59/68*

U.S. Cl. 252—182.24 **11 Claims**

1. A homogeneous accelerator system, having improved efficacy for curing epoxy resins, which comprises:

(a) at least one inorganic salt which contains nitrate ion,

(b) at least one aliphatic hydroxy compound selected from the group consisting of monohydric alcohols containing 1 to 10 carbon atoms in the molecule, polyhydric alcohols containing 2 to 10 carbon atoms and 2 to 4 hydroxy groups in the molecule, and poly(C_{2-5}-alkylene) glycols, and

(c) an aminophenol accelerator.

5,198,147

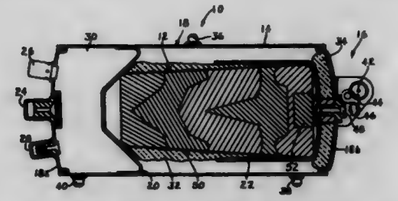
CHEMICAL OXYGEN GENERATOR

Yunchang Zhang, Lenexa, and James C. Cannon, Olathe, both of Kans., assignors to Puritan-Bennett Corporation, Lenexa, Kans.

Filed Apr. 10, 1991, Ser. No. 683,276

Int. Cl.[5] C01B *11/14, 11/18*

U.S. Cl. 252—187.31 **13 Claims**



1. In an oxygen-generating candle for producing a breathable gas and including therein an amount of an oxygen source which upon ignition and decomposition thereof will yield oxygen and residual chlorine, the improvement which comprises from about 0.5–15% by weight of a metal powder fuel, from about 20–99% by weight of an oxygen source selected from the group consisting of sodium chlorate, potassium chlorate, lithium chlorate, sodium perchlorate, potassium perchlorate and lithium perchlorate and from about 0.05–10% by weight of a nontoxic additive incorporated into said candle for suppression of said residual chlorine and smoothing the decomposition of said candle, said additive being selected from the group consisting of: (1) the oxides, hydroxides and carbonates of calcium and the rare earth elements; (2) the hydroxides and carbonates of magnesium; and (3) mixtures of the foregoing, said additive being in intimate admixture with said fuel and oxygen source for suppressing the formation of free chlorine and smoothing the decomposition of said candle upon said ignition thereof, said candle being operable for producing said breathable gas over a period of several minutes.

5,198,148

CHOLESTERIC LIQUID CRYSTAL COMPOSITION, COLOR-FORMING LIQUID CRYSTAL COMPOSITE PRODUCT, METHOD FOR PROTECTING LIQUID CRYSTAL AND COLOR-FORMING LIQUID CRYSTAL PICTURE LAMINATED PRODUCT

Seisuke Nakano, Niigata, Japan, assignor to Shinko Electric Works Co., Ltd., Niigata, Japan

Filed Jan. 14, 1990, Ser. No. 537,679

Claims priority, application Japan, Jun. 17, 1989, 1-155186; Jul. 17, 1989, 1-184234

Int. Cl.[5] C09K *19/52, 19/36*

U.S. Cl. 252—299.01 **8 Claims**

1. A cholesteric liquid crystal composition comprising:

(A) 3.00 to 47.0 wt % of cholesteryl pelargonic acid;

(B) 8.0 to 19.0 wt % of cholesteryl lauryl carbonate;

(C) 6.0 to 13.0 wt % of cholesteryl benzoic acid;

(D) 3.0 to 12.0 wt % of one or more compound selected from the group consisting of cholesteryl 2-ethylhexanoate, cholesteryl 2-ethylbutyl carbonate, and cholesteryl 2-ethylhexyl carbonate;

(E) 5.0 to 10.0 wt % of a compound selected from the group consisting of cholesteryl caproic acid, cholesteryl n-butyl carbonate, and a cholesteryl benzyl carbonate;

(F) 0 to 30.0 wt % of cholesteryl oleyl carbonate; and

(G) one or more compounds selected from the group consisting of (a) to (i), wherein the content thereof is equal to 100% minus the sum of (A) to (F), and wherein

(a) is a cholesteryl alkyl carboxylate represented by the general formula $C_nH_{2n+1}COO.Ch$, wherein n is an integer of 4 to 11,

(b) is a cholesteryl alkenyl carboxylate represented by the general formula $C_nH_{2n-1}COO.Ch$, wherein n is an integer of 4 to 17,

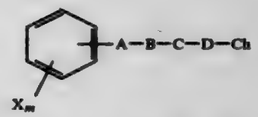
(c) is a cholesteryl 3-chloropropionate,

(d) is a cholesteryl halogen,

(e) is a cholesteryl alkyl carbonate represented by the general formula $C_nH_{2n+1}OCOO.Ch$, wherein n is an integer of 3 to 18,

(f) is a cholesteryl alkenyl carbonate represented by the general formula $C_nH_{2n-1}OCOO.Ch$, wherein n is an integer of 3 to 18,

(g) is a carboxylate and carbonate of cholesteryl aromatic compound represented by the general formula:



wherein A is $(C_nH_{2n})_P$, B is $(CH{=}CH)_Q$, C is $(COO)_S$, D is $(O.COO)_T$, P is 0 or 1, Q is 0 or 1, P+Q is 0,1 or 2, S is 0 or 1, T is 0 or 1, S+T is 1, n is 0 or an integer of 1 to 6, m is 0, 1 or 2, X is an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 3 carbon atoms, a nitro group, an amino group, a carboxyl group, or a halogen group,

(h) is cholesteryl carboxylates of carbon 4 to 7 member alicyclic compound, and

(i) is cholesteryl monoesters which are hydrogen dicarboxylates of carbon 4 to 7 member alicyclic compound;

wherein the cholesteryl in (A) to (G) is represented by a formula of $C_{27}H_{45}$ and contains cholestanyl esters.

5,198,149

SMECTIC LIQUID-CRYSTAL MEDIUM

Volker Reiffenrath, Rossdorf; Joachim Krause, Dieburg; Andreas Wächtler, Griesheim; Thomas Geelhaar, Mainz, all of Fed. Rep. of Germany; David Coates, Wimborne, United Kingdom; Ian Sage, Broadstone, United Kingdom, and Simon Greenfield, Poole, United Kingdom, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00177, § 371 Date May 15, 1989, § 102(e) Date May 15, 1989, PCT Pub. No. WO89/08690, PCT Pub. Date Sep. 21, 1989

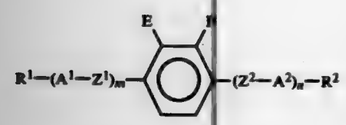
PCT Filed Feb. 27, 1989, Ser. No. 362,469

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807862

Int. Cl.[5] C09K *19/34, 19/32, 19/30, 19/20*

U.S. Cl. 252—299.61 14 Claims

1. A chiral, tilted smectic liquid-crystal medium comprising an achiral base material and at least one chiral doping agent, wherein said achiral base material of said medium contains at least one achiral compound having the structural unit 2,3-difluoro-1,4-phenylene, and said at least one achiral compound is a compound of formula I



(I)

wherein

R^1 and R^2 are each independently alkyl having 1 to 15 C atoms or alkenyl having 3-15 C atoms, wherein in each case a CH_2 group can be replaced by —O—, —CO—, —O—CO, —CO—O— or —O—CO—O—;

A^1 and A^2, independently of one another, are each 1,4-phenylene wherein one or two CH groups can also be replaced by N, 1,4-cyclohexylene wherein one or two adjacent CH_2 groups can also each independently be replaced by O or S, piperidine-1,4-diyl, 1,4-bicyclo(2,2,2)-octylene, 1,3,4-thiadiazole-2,5-diyl, naphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthalene-2,6-diyl, each of which is unsubstituted or substituted by one or two F and/or Cl atoms and/or CH_3 groups and/or CN groups;

Z^1 and Z^2 are each —CO—O—, —O—CO , $—CH_2CH_2—$, $—OCH_2—$, $—CH_2O—$, —C≡C— or a single bond;

m and n are each 0, 1 or 2; and

(m+n) is 1 or 2, subject to the proviso that one or two of the groups Z^1 and/or Z^2 present in the molecule of the formula I are —CO—O—, —O—C)—, $—CH_2CH_2—$, $—OCH_2—$, $—CH_2O—$ or —C≡C—, if A^1 and A^2 independently of one another are each 1,4-phenylene which is unsubstituted or substituted by one or two F atoms.

5,198,150

FERROELECTRIC LIQUID CRYSTAL COMPOSITION

Fumyuki Takeshita; Makoto Kikuchi; Mitsuyoshi Ichihashi; Kazutsugu Terashima, all of Chiba, and Kenjii Furukawa, Kanagawa, all of Japan, assignors to Chisso Corporation, Osaka, Japan

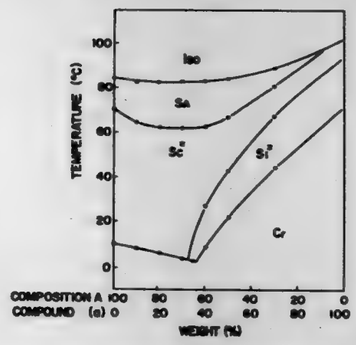
PCT No. PCT/JP88/01295, § 371 Date Aug. 16, 1989, § 102(e) Date Aug. 16, 1989, PCT Pub. No. WO89/06265, PCT Pub. Date Jul. 13, 1989

PCT Filed Dec. 23, 1988, Ser. No. 397,428

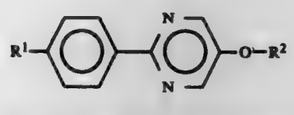
Claims priority, application Japan, Dec. 25, 1987, 62-329058

Int. Cl.[5] C09K *19/12, 19/20;* G02F *1/13;* G09K *19/34*

U.S. Cl. 252—299.61 14 Claims

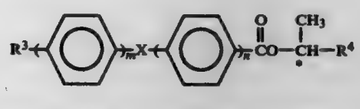


1. A ferroelectric liquid crystal composition comprising at least one achiral compound represented by formula (I)



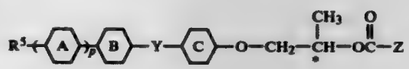
(I)

wherein each of R^1 and R^2 is an alkyl group having 1 to 18 carbon atoms, and at least one optically active compound represented by formula (II)



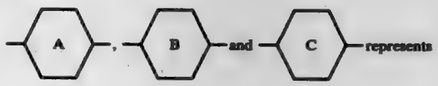
(II)

wherein R^3 is an alkyl group or an alkoxy group having 1 to 18 carbon atoms, R^4 is an alkyl group having 2 to 18 carbon atoms, X is a single bond, —COO—, —OCO—, —N=CH—, —CH=N—, $—OCH_2—$ or $—CH_2O—$, each of m and n is an integer of 1 or 2, and the symbol * is an asymmetric carbon atom and at least one compound represented by formula (III)



(III)

wherein each of



represents

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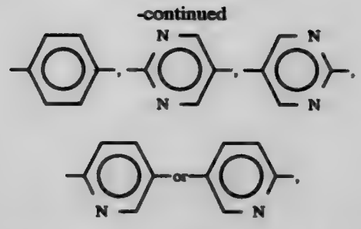


R^5 is an alkyl group or an alkoxy group having 1 to 18 carbons atoms, Y is a single bond, $—CH_2O—$ or $—OCH_2—$, p is an integer of 0 or 1, and Z is an alkyl group having 1 to 18 carbon atoms or $—C^*H(CH_3)—O—R^6$ wherein R^6 is an alkyl group having 1 to 18 carbon atoms and the symbol * represents an asymmetric carbon atom.

5,198,151

FERROELECTRIC LIQUID CRYSTAL COMPOSITION

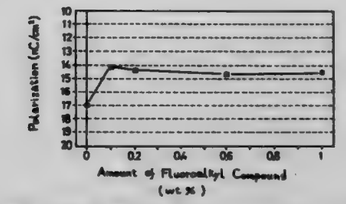
Tomoaki Kuratate; Mitsuhiro Kodea, both of Nara, and Fumiaki Funada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 6, 1990, Ser. No. 505,697

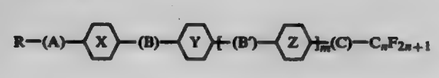
Claims priority, application Japan, Apr. 10, 1989, 1-90935; Jul. 31, 1989, 1-200047

Int. Cl.[5] C09K *19/12;* C07C *69/76*

U.S. Cl. 252—299.66 4 Claims



1. A ferroelectric liquid crystal composition comprising from 0.01 to 1% by weight of a liquid crystal or liquid-crystal compatible compound having a fluoroalkyl group in ferroelectric liquid crystals exhibiting a smectic C phase, said liquid crystal or liquid crystal-compatible compound having the formula (I):



(I)

where , and

each represents a benzene ring, in which one or more of the hydrogen atoms may be substituted by a substituent selected from the group consisting of CH_3 and OCH_3O,

R represents a linear or branched alkyl or perfluoroalkyl group containing 1 to 12 carbon atoms;

A is —O—;

B and B′ each represents a single bond;

C is $—COOR_1—$, in which R_1 represents a linear alkylene group containing 1 to 8 carbon atoms;

m is an integer of 0 or 1; and

n is an integer of 1 to 10.

5,198,152

PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS WITH AN UNSATURATED ORGANIC OR ORGANOSILICON COMPOUND

Eric W. Lilmatta, and Yuan-Fu Yu, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 15, 1991, Ser. No. 647,530

Int. Cl.[5] C09K *3/00;* C04B *35/52*

U.S. Cl. 252—389.31 20 Claims

1. A crosslinkable preceramic composition comprising about 75–99% by weight of a low molecular weight polysilazane and about 1–25% by weight of an unsaturated organic or organosilicon compound containing at least two alkenyl groups.

5,198,153

ELECTRICALLY CONDUCTIVE POLYMERIC

Marie Angelopoulos, Briarcliff Manor; Wu-Song Huang, Poughkeepsie; Richard D. Kaplan, Wappingers Falls, all of N.Y.; Marie-Annick Le Corre, St. Fargeau Ponthierry, France; Stanley E. Perreault, Wappingers Falls, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Michel R. Tissier, Noisy Sur Ecole, France, and George F. Walker, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1989, Ser. No. 357,565

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—500 16 Claims

1. A composition of matter comprising:

a polymeric body;

said polymeric body containing a material selected from the group consisting of substituted and unsubstituted polyparaphenylenevinylenes, polyanilines, polyazines, polythiophenes, poly-p-phenylene sulfides, polyfurans, polypyrroles, polyselenophene, polyacetylenes formed from soluble precursors and combinations thereof;

said polymeric body having electrically conductive regions;

said polymeric body having electrically non-conductive regions;

said electrically conductive regions contain disassociated forms of a dopant precursor selected from the group consisting of onium salts, borate salts, tosylate salts, triflate salts and sulfonyloxyimides, said doping precursor being dissociated into a cationic and anionic species to form said disassociated form;

said disassociated forms of said dopant precursors doping said material to the conductive state;

said material contains molecules having a partially conjugated π system;

said disassociated forms of said dopant being in an amount sufficient for said partially conjugated π system of said molecule to be extended to be adjacent to said partially conjugated π system of an adjacent molecule to induce electrical conductivity in said material;

said conductive regions having a property of being significantly less soluble in organic and aqueous solvents as compared to said electrically non-conductive regions;

said electrically non-conductive regions having a property of being substantially soluble in said organic and aqueous solvents.

5,198,154

HIGH TEMPERATURE BAKING PASTE

Akinori Yokoyama, Kurashiki; Tsutomu Katsumata, and Hitoshi Nakajima, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP91/00363, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO91/15018, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 18, 1991, Ser. No. 773,927

Claims priority, application Japan, Mar. 19, 1990, 2-067197

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—514 13 Claims

1. A composition, comprising 100 parts by weight of copper

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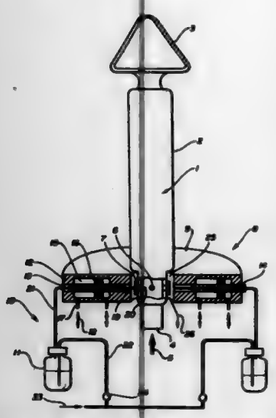
alloy powder represented by a general formula $Ag_xCu_yM_z$ (where $0.001 \leq x \leq 0.4$, $0.6 \leq y \leq 0.999$, $0.000003 \leq z \leq 0.05$, $x+y+z=1$; where M represents one or more metals selected from the group consisting of Pb, Bi and Zn; and x, y and z are atomic ratio values, respectively) particles of which have a particle surface silver concentration higher than the average silver concentration thereof and a region in which a silver concentration increases toward the particle surface, 0.1 to 50 parts by weight of glass frit and an organic vehicle.

5,198,155
APPARATUS FOR THE ADMIXING OF GASEOUS OR VAPOROUS SUBSTANCES

Franz Etzweiler, Greifensee, and Norbert Neuner-Jehle, Jona, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Jul. 17, 1991, Ser. No. 731,678
Claims priority, application Switzerland, Jul. 31, 1990, 2517/90
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—18.1 **9 Claims**



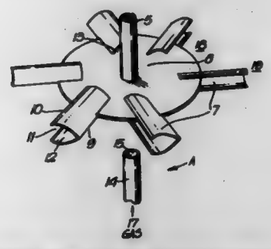
1. An apparatus for the admixing of a gaseous or vaporous substance into a gas stream in a mixing chamber (1), wherein the gaseous or vaporous substance is fed by means of a carrier gas (23) via a line (10), characterized in that said line contains a capillary (19), wherein said capillary is arranged in an advancing device (9) with two defined positions, such that in a first position said capillary extends through an opening (6) of said mixing chamber into the interior of said mixing chamber and in a second position said capillary opens outside said mixing chamber in a suction removal space (25) surrounding said mixing chamber.

5,198,156
AGITATORS

John C. Middleton, Daveaham, and Colin Ramshaw, Norley, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 11,285, Feb. 5, 1987, abandoned. This application May 6, 1992, Ser. No. 878,908
Claims priority, application United Kingdom, Feb. 17, 1986, 8603904
Int. Cl.[5] B01F *3/04, 5/10*
U.S. Cl. 261—87 **12 Claims**

1. A turbine agitator assembly for mixing a less dense fluid into a more dense liquid contained in a reservoir, comprising:
a rotor including an axially-extending shaft, means for rotating the rotor, in a predetermined direction, a plurality of radially-extending blades arranged in at least one series extending in a circumferential direction about said shaft, and means mounting said blades to said shaft for rotation therewith;
each said blade:
being hollow, having an outer surface which is discontinuous circumferentially of a longitudinal axis of the blade whereby the blade is scoop-shaped, with a mouth forming a leading side of the blade when the rotor is rotated in said predetermined direction,
having an open outer end,
having only one trailing edge, at which portions of said outer surface approach one another at an acute angle,

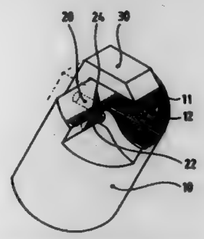


said trailing edge of each said blade having said portions of said outer surface approaching one another at said acute angle along substantially the whole length of said trailing edge, and
having said outer surface be free of external concavity;
a reservoir for containing a quantity of said more dense liquid, in which said blades, in use, are submerged; and
means for sparging said less dense fluid into the more dense liquid in said reservoir adjacent said at least one series of blades for dispersal into said more dense liquid by said blades as said rotor is rotated about a longitudinal axis of said shaft.

5,198,157
ULTRASONIC DEVICE FOR THE CONTINUOUS PRODUCTION OF PARTICLES

Louis Bechet, Sciez, France, assignor to Dynamad S. A. R. L., Gaillard, France

Filed Aug. 20, 1991, Ser. No. 747,314
Claims priority, application France, Aug. 20, 1990, 90 10608
Int. Cl.[5] B29B *9/10*
U.S. Cl. 264—9 **13 Claims**



1. An ultrasonic device for the continuous production of microdroplets of uniform particle size distribution, said device comprising:
a piezoelectric transducer extended by a heat-regulated concentrator having an end surface which defines a vibrating surface for producing an orthogonal ultrasonic vibratory mode;
an internal intermediate flow-regulating chamber disposed within said concentrator subjacent with respect to said vibrating surface and for holding a material in a liquid state, said internal intermediate flow-regulating chamber serving as a crucible; and
at least one channel for connecting said internal intermediate flow-regulating chamber to said vibrating surface thereby to permit distribution of said material in said liquid state over said vibrating surface, whereby said orthogonal ultrasonic vibratory mode of said vibrating surface atomizes said material in said liquid state which is distributed over said vibrating surface.

13. A process for the production of microbeads from thermofusible material with an ultrasonic device, said ultrasonic device comprising a vibrating surface; and an internal intermediate flow and heat regulating chamber disposed subjacent to and connected with said vibrating surface and for holding said thermofusible material in a liquid state, said process comprising the steps of:
a) vibrating said vibrating surface thereby producing an orthogonal ultrasonic vibratory mode;
b) bringing said thermofusible material in the liquid state from said intermediate flow and heat regulating chamber to said vibrating surface; and
c) atomizing said thermofusible material in the liquid state with said vibrating surface.

5,198,158
METHOD OF MANUFACTURING FREE STANDING PEROVSKITE LEAD SCANDIUM TANTALATE FILM

Anil Patel, Leicester, and Roger W. Whatmore, Milton Keynes, both of England, assignors to GEC-Marconi Limited, England

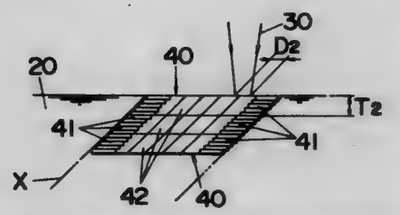
Filed Nov. 19, 1991, Ser. No. 794,443
Claims priority, application United Kingdom, Nov. 23, 1990, 9025547
Int. Cl.[5] B29C *41/00, 33/40, 33/76*
U.S. Cl. 264—22 **9 Claims**

1. A method of manufacturing a free standing perovskite lead scandium tantalate film, the method comprising forming a film of a perovskite lead scandium tantalate on a layer of magnesium oxide deposited on a sapphire or gadolinium gallium garnet (GGG) substrate and etching said magnesium oxide layer to release said perovskite lead scandium tantalate film from the substrate.

5,198,159
PROCESS OF FABRICATING THREE-DIMENSIONAL OBJECTS FROM A LIGHT CURABLE RESIN LIQUID

Yoshimitsu Nakamura, Settsu; Teruyoshi Kuribayashi, Neyagawa; Yoshiyuki Utinono, Yawata; Yoshikazu Higashi, Kadoma; Syungo Ozawa, Uji, and Shinobu Ikeno, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 9, 1990, Ser. No. 594,018
Int. Cl.[5] B29C *35/08, 41/02, 41/04*
U.S. Cl. 264—22 **13 Claims**

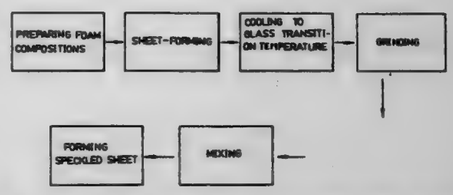


1. In a process of forming a three-dimensional object from a light curable liquid resin by radiating a light to a surface of said light curable liquid resin to form successive cross-sectional layers of the cured resin and superimposing said layers on each other, an improvement comprising:
forming a plurality of said layers to include successive thin outer laminae of the cured resin at a peripheral portion defining an outer perimeter of said three-dimensional object and a relatively thick inner lamina at an other portion defining a core of said three-dimensional object, said successive thin laminae cooperating with said center lamina to compose one of said layers.

5,198,160
PROCESS FOR MAKING SPECKLED AND FOAMED PLASTIC ARTICLE

Ou-Yang Chiu, No. 31, Cheng-Kung San Rd., Nan-Kang Industrial Park, Nantu City, Taiwan

Continuation-in-part of Ser. No. 598,897, Oct. 16, 1990, abandoned. This application Feb. 18, 1992, Ser. No. 837,167
Int. Cl.[5] B29C *43/30, 67/20*
U.S. Cl. 264—28 **1 Claim**

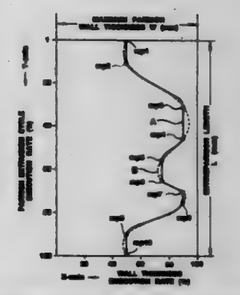


1. A process for making speckled and foamed articles, comprising the steps of:
preparing at least two differently colored thermoplastic foam compositions including polyethylvinylacetate;
separately forming at least two differently colored sheets from said foam compositions;
cooling said sheets to below −60 deg C. which is the glass-transition temperature of polyethylvinylacetate;
separately grinding each of said sheets to form fine particles when the temperatures of said sheets are about equal to the glass-transition temperatures thereof;
sifting the ground fine particles through 20-40 mesh screens;
mixing said sifted particles of said differently colored sheets in an appropriate ratio to form a desired pattern; and
forming the mixture of said sifted particles into a sheet.

5,198,161
PARISON THICKNESS CONTROL METHOD

Masashi Ogura; Yutaka Saito; Masayuki Akimoto, all of Tochigi, and Minoru Oizumi, Tokyo, all of Japan, assignors to Kao Corporation and Tahara Machinery Ltd., Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 664,823
Claims priority, application Japan, Mar. 7, 1990, 2-55759; Mar. 13, 1990, 2-62204
Int. Cl.[5] B29C *49/04, 47/16, 49/78*
U.S. Cl. 264—40.5 **6 Claims**



1. A parison thickness control method in which a gap defined between a die and a mandrel is adjusted by a gap adjust-

ing means so as to control thickness of a parison extruded through said gap, comprising the steps of:

defining a parison forming time and a target parison thickness value on two axes intersecting in perpendicular to each other;

setting master points at a plurality of points which are determined by considering a thickness variation of the parison;

forming a smooth, curved pattern by interpolating between said master points using a method of spline interpolation and further by interpolating to make the maximum or minimum value of the master points a limit value to thereby obtain said smooth, curved pattern;

setting cycle points which divide a parison forming cycle time into a predetermined number of equal time intervals;

deriving a target parison thickness value for a corresponding parison forming time for each of said cycle points using said smooth, curved pattern; and

controlling a position of said mandrel based on said derived target parison thickness value for each cycle point so as to provide a controlled thickness distribution for the parison during the parison forming cycle time.

5,198,162

MICROPOROUS FILMS

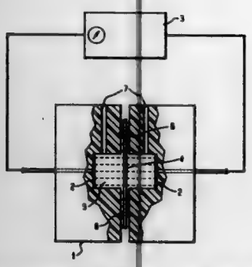
George B. Park, Wiltshire; John A. Cook, Oxfordshire; Mike G. L. Dorling, Wiltshire; David J. Barker, Oxford, and Robert H. McLoughlin, Wiltshire, all of England, assignors to Scimat Limited, England

Continuation-in-part of Ser. No. 809,097, Dec. 16, 1985. This application Jun. 13, 1989, Ser. No. 367,740

Claims priority, application United Kingdom, Dec. 19, 1984, 8432048; Jun. 13, 1988, 8813932

Int. Cl.[5] B29C *67/20*

U.S. Cl. 264—49 18 Claims



1. A method of making a polymeric film which comprises melt processing into a film of polymer composition comprising:

(a) a halopolymer in which the repeat units are $-(C_nH_{2n})-$ and $-(C_mX_{2m})-$ where each X independently represents fluorine or chlorine and the values of n and m are greater than one and less than six; and

(b) an extractable component comprising an extractable salt and an extractable polymer which are substantially insoluble in said halopolymer, said extractable polymer migrating preferably toward the surface of said film during said melt processing;

and subsequently extracting at least some of the extractable component so as to produce a film having a porosity of not less than about 20% by volume, said extraction of said extractable polymer imparting surface porosity to said film.

5,198,163

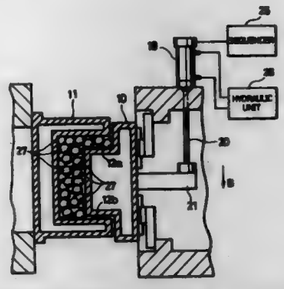
EXPANSION MOLDING METHOD

Ken Yamamoto; Masaru Harao, both of Koga, and Hideo Takamatsu, Ibaraki, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Oct. 7, 1991, Ser. No. 772,089

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—51 5 Claims



1. An expansion molding method for producing molded articles of expandable thermoplastic resin beads, comprising the steps of:

providing a compression mold having a movable mold and a fixed mold, said molds being movable relative to each other in a closing direction and movable in orthogonal directions relative to said closing direction such that a distance in an orthogonal direction between opposed surfaces of the movable mold and surfaces of the fixed mold can be varied;

moving said movable mold and said fixed mold relative to each other in said closing direction to a first position to form a cavity having at least one circumference section where said distance is smaller than a diameter of the expandable thermoplastic resin beads;

filling the cavity except said at least one circumference section with the expandable thermoplastic resin beads;

moving at least one of said movable and fixed molds from said first position in at least one direction orthogonal to said closing direction within said cavity so that said distance in said at least one circumference section is greater than the diameter of the expandable thermoplastic resin beads;

filling the circumference section with the expandable thermoplastic resin beads;

moving at least one of said movable and fixed molds in a direction opposite from said at least one direction orthogonal to said closing direction wherein said molds are returned to said first position, thereby compressing the expandable thermoplastic resin beads in said circumference section; and

expanding the expandable thermoplastic resin beads by heating to produce a molded article.

5,198,164

METHOD OF FIRING CERAMIC BUILDING MATERIALS

Yuji Hayashi; Hiroshi Mori, and Keisuke Katayama, all of Tokoname, Japan, assignors to Inax Corporation, Tokoname, Japan

PCT No. PCT/JP91/00223, § 371 Date Jul. 26, 1991, § 102(e) Date Jul. 26, 1991, PCT Pub. No. WO91/13039, PCT Pub. Date May 9, 1991

PCT Filed Feb. 22, 1991, Ser. No. 721,567

Claims priority, application Japan, Feb. 27, 1990, 2-46840

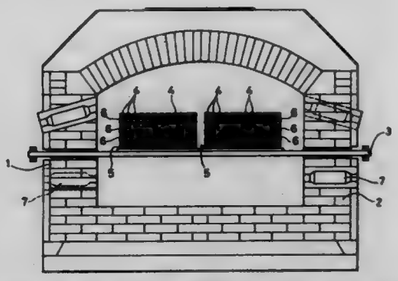
Int. Cl.[5] C04B *35/64*

U.S. Cl. 264—58 4 Claims

1. A method of firing ceramic building materials, comprising:

providing roller hearth kiln including a tunnel-shaped body, a plurality of rollers made of reaction sintered silicon carbide having a high mechanical strength, said rollers being arranged horizontally and parallel to one another to move along the body, and burners for heating interior of the body, said body having an inlet, an outlet, a preheating zone near the inlet, a firing zone in a middle of the body and a cooling zone near the outlet,

placing setters on the rollers to be carried by the rollers, said setters being made of a material selected from the group consisting of silicon carbide and mullite,



stacking tiles for ceramic building materials on the setters to form a plurality of layers of the tiles so that a spacer is interposed between adjoining layers of the tiles to separate the layers, said spacer being made of a material selected from the group consisting of silicon carbide and mullite, and

moving the rollers with the tiles thereon through the kiln at a constant speed to allow the tiles to stay in the kiln for at least three hours so that the tiles are processed at the preheating zone, the firing zone and cooling zone.

5,198,165

SINTERED SILICON CARBIDE AND SIALON COMPOSITE

Yoshio Akimune, and Naoto Hirosaki, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 13, 1991, Ser. No. 714,526

Claims priority, application Japan, Jun. 19, 1990, 2-158599

Int. Cl.[5] C04B *35/58*

U.S. Cl. 264—65 11 Claims

1. A method for producing a sintered silicon carbide and sialon composite, comprising the following steps in the sequence set forth:

sintering a mixture including α-sialon powder, α-silicon nitride powder and β-silicon carbide powder by hot pressing at a first predetermined temperature; and

resintering the sintered mixture at a pressure of nitrogen gas ranging from 100 to 2000 atmosphere and at a second predetermined temperature 100° to 200° C. higher than said first predetermined temperature.

5,198,166

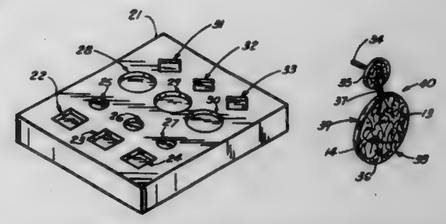
METHOD OF CONSTRUCTING JEWELRY ARTICLES OF COTTON THREAD FRAGMENTS

Trudie Bordelon, 3529 Pasadena Dr., Baton Rouge, La. 70814

Filed May 20, 1992, Ser. No. 886,650

Int. Cl.[5] B29C *67/00*

U.S. Cl. 264—73 12 Claims



1. A method of forming jewelry articles comprising the steps of:

a) providing a denim fabric portion having multiple thread colors;

b) separating the denim fabric portion into individual threads;

c) cutting the threads into a desired length;

d) preparing a liquid portion that includes a combination of a liquid glue and a fabric stiffener;

e) combining the chopped threads, glue, and fabric stiffener in a container;

f) mixing the threads, glue, and fabric stiffener in the container until blended;

g) forming the blended threads, glue, and fabric stiffener into a desired shape using a mold; and

h) allowing the formed molded article to dry.

5,198,167

PROCESS FOR PRODUCING FIBER MOLDING FOR FIBER-REINFORCED COMPOSITE MATERIALS

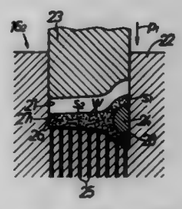
Tohru Ohta; Akimasa Daimaru; Masao Ichikawa; Hideyuki Fujishiro; Ryuichi Kubota; Takeyoshi Nakamura; Hisayoshi Harada; Hirotaka Koshitani; Tatsuya Suzuki, and Teruo Hoshino, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,839

Claims priority, application Japan, Oct. 31, 1988, 63-275506; Nov. 2, 1988, 63-278077; Nov. 2, 1988, 63-278078; Nov. 2, 1988, 63-278081; Dec. 29, 1988, 63-333426

Int. Cl.[5] B29C *43/02*; D21J *3/00*

U.S. Cl. 264—86 14 Claims



1. A process for molding a fiber molding for a fiber-reinforced composite material, the fiber molding having a semi-annular portion, comprising

a first step of pouring a slurry molding material, which comprises short fibers dispersed in a liquid, into a first mold and then applying a primary pressing force to the molding material while removing the liquid to form an intermediate product having a semi-annular portion, wherein a direction of application of the primary pressing

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force is established parallel to a direction of a center line of the semi-annular portion, and

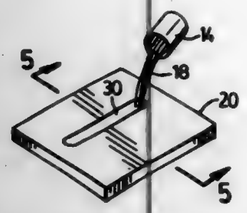
a second step of placing the intermediate product into a second mold with a semi-circular float fitment being fitted in a semi-circular recess defined in the semi-annular portion of the intermediate product, and they applying a secondary pressing force to the intermediate product in a direction substantially perpendicular to the direction of the primary pressing force, while removing the liquid and permitting the float fitment to slide on the second mold, to thereby form the fiber molding comprising the semi-annular portion.

5,198,168

METHOD FOR PROVIDING AN INLAY ON A SUBSTRATE

Royce N. Thurston, 1523 Upper James, Hamilton, Ontario, Canada L9B 1K2

Filed Jan. 13, 1992, Ser. No. 819,848
Claims priority, application Canada, May 29, 1991, 2043471
Int. Cl.[5] C04B *41/00*
U.S. Cl. 264—132 **13 Claims**



1. In a method of providing an inlay on a substrate which includes the steps of:

a) providing a recess on the substrate,

b) mixing an epoxy resin with an epoxy hardener,

c) and placing the mixture resulting from b) into the recess, so that the mixture hardens in the recess,

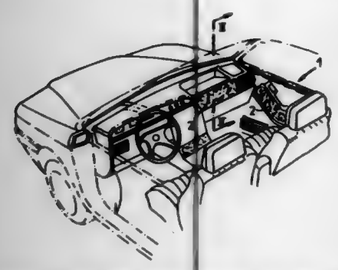
the improvement consisting of preheating the substrate to a temperature at least as high as 140° F., prior to placing said mixture into the recess, whereby the heat stored in the substrate aids in the removal of bubbles from the mixture.

5,198,169

PROCESS FOR THE FORMING OF A COVERING ELEMENT FOR VEHICLE INTERIORS

Ettorè Abeltino, Chiasso-Vacallo, Switzerland, assignor to Ordinan Trading Ltd., London, Great Britain

Filed Jan. 23, 1991, Ser. No. 645,026
Claims priority, application Italy, Jan. 30, 1990, 19198 A/90
Int. Cl.[5] B29C *67/14*
U.S. Cl. 264—137 **11 Claims**



1. A process for forming a covering element, for a vehicle interior, said process comprising the steps of:

(a) impregnating at least one inner layer of fabric with an epoxy resin based product;

(b) drying said inner layer impregnated with said product in an oven at a first predetermined temperature and for a period sufficient to form a malleable inner dry support

(c) thereafter applying an outer rigid plate to said malleable support and shaping said plate simultaneously with said support upon pressing said plate against said support at a preset pressure and a second temperature higher than said first temperature and for a period of time not exceeding four minutes to form said covering element with a given configuration and with a required rigidity and said plate bonded to said support to conform an outer contour of the vehicle interior for imparting an aesthetic appearance thereto.

5,198,170

METHOD FOR EXTRUSION OF POWERED PVC COMPOUNDS

Roman B. Hawrylko, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Brecksville, Ohio

Continuation of Ser. No. 762,293, Sep. 19, 1991, abandoned. This application Aug. 17, 1992, Ser. No. 930,972
Int. Cl.[5] B29B *11/10*
U.S. Cl. 264—141 **8 Claims**

1. In a method for the preparation of pelletized PVC compound from powder, comprising the steps of mixing a polyvinyl chloride resin to form a powder blend and extruding said blend, the improvement comprising employing a PVC resin having a weight average particle size in a range of from 50 microns to 125 microns, a DOP porosity in a range of from about 0.27 cc per gram (cc/gm) of said resin to 0.50 cc/gm, and a resin friability rating of from 0 to 5 and extruding said compound to form pellets at a stock temperature of from about 315° F. to about 350° F.

5,198,171

PROCESS FOR CONTINUOUSLY PRODUCING HEAT-VULCANIZABLE SILICONE RUBBER COMPOUND

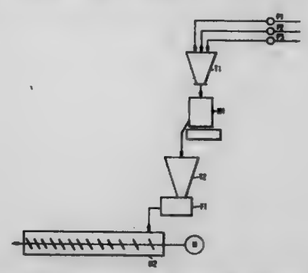
Yutaka Kasahara; Hironori Amano; Shigeru Wada, and Junichiro Watanabe, all of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 672,755, Mar. 22, 1991, which is a continuation of Ser. No. 418,610, Oct. 10, 1989, abandoned. This application Apr. 6, 1992, Ser. No. 864,134
Claims priority, application Japan, Oct. 11, 1988, 63-255382
Int. Cl.[5] B29B *7/48*
U.S. Cl. 264—211.23 **30 Claims**

1. A process for continuously producing a heatvulcanizable silicone rubber compound which exhibits reduced plasticization reverse/crepe hardening which consists essentially of the steps of:

(i) mixing (A) a diorganopolysiloxane having a viscosity as measured at 25° C. of 1×10^5 cP or more, (B) an inorganic filler and (C) a processing aid, as basic ingredients, by a high-speed mechanical shearing means, thereby to obtain a flowable particulate mixture which does not contain a vulcanizing agent and in which each ingredient is present in a substantially uniformly and finely dispersed state, and

(ii) continuously feeding, at a constant feed rate, said particulate mixture to a continuously kneading and extruding machine through a feed opening thereof, which machine has two screws rotating in the same direction, thereby to obtain a homogeneous silicone rubber compound from a discharge opening of said kneading and extruding machine, wherein said flowable particulated mixture is



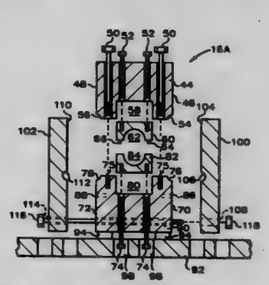
kneaded in the continuously kneading and extruding machine while the mixture is heated at 100 to 300° C. and wherein cooling is conducted at the rear stage of the kneading step with the kneading and extruding machine, whereby the cooling diminishes the plasticization reverse/crepe hardening of the discharged silicone rubber compound.

5,198,172

METHOD OF PULTRUDING UTILIZING A DIE WITH CHANGEABLE DIE INSECTS

Kevin J. Spoo; Vergil H. Rhodes, Jr, and Bill W. Dodd, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 556,679, Jul. 23, 1990, Pat. No. 5,116,450. This application May 22, 1992, Ser. No. 887,979
Int. Cl.[5] B32B *27/04*; B29C *33/22*
U.S. Cl. 264—219 **31 Claims**



1. A molding method comprising:

(a) assembling a die set comprising at least one die by positioning, with respect to any one die of said die set, first and second mold base sections relative to one another so as to form a mold base defining a channel therethrough in which a mold insert, having an inlet end and an outlet end and defining a mold cavity which extends completely therethrough from said inlet end to said outlet end, is removably mounted in a mounted position, whereby the thus assembled die set comprising said at least one die defines at least one corresponding mold cavity;

(b) removably clamping said die set between a first clamp member and a second clamp member in a clamped position so as to allow removal of one of said mold base sections of any one die of said die set from between said first and second clamp members while in said clamped position; and

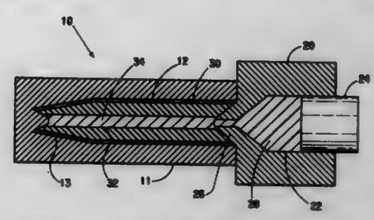
(c) passing resin impregnated fibers, after steps (a) and (b), through said at least one mold cavity from said inlet end to said outlet end so as to at least partially consolidate the resin impregnated fibers.

5,198,173

PROCESS FOR PREPARING ADVANCED COMPOSITE STRUCTURES

ALbert Terzian, Ridley Park, Pa., and Joseph D. Trentacosta, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1990, Ser. No. 626,886
Int. Cl.[5] B29C *45/16*
U.S. Cl. 264—257 **16 Claims**



1. A method of making a composite structure comprising:

providing a preform for disposition within a mold cavity, said preform having a hollow core portion and further having an external configuration which is undersized relative to the cavity of the mold;

introducing said preform into said cavity having an internal configuration appropriate to the configuration of a finished part;

plugging one or more openings to the core of said preform with one or more plugs to prevent polymer flow from these openings;

introducing polymer into the core of the preform;

heating the preform together with the polymer in the core so as to melt the polymer in the preform in the core;

applying pressure to the polymer in the core of the preform via one or more remaining unplugged openings to the core of the preform to cause expansion of the preform against the internal configuration of the mold cavity and to consolidate the preform to form a finished part;

cooling the finished part while maintaining pressure on the core; and

removing the finished part from the mold.

5,198,174

METHOD FOR PRODUCING A HOLLOW PLASTIC PRODUCT HAVING A RADIALLY EXTENDING PORTION

Tatsuya Nakagawa, Matsudo, and Yasuo Esaki, Nitta, both of Japan, assignors to Excell Corporation, Chiba, Japan

Filed Jan. 10, 1992, Ser. No. 818,949
Int. Cl.[5] B29C *49/04, 49/20*
U.S. Cl. 264—512 **11 Claims**

1. A method for producing a plastic product having an axially extending portion and a radially extending portion, comprising the steps of:

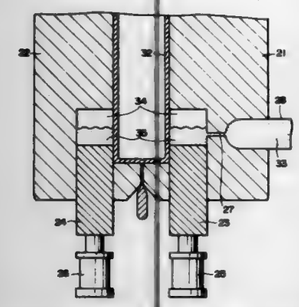
(a) placing a parison of a first plastic material in a first mold cavity defined by bringing into contact a plurality of mold sections, at least one of which includes a movable mold segment at a first predetermined position;

(b) introducing a pressurized gas into the interior of said parison to blow mold said parison to thereby form said axially extending portion;

(c) moving said movable mold segment to a second predetermined position to define a second mold cavity adjacent to a part of an outer peripheral surface of said axially extending portion;

(d) supplying a predetermined amount of a second plastic material into said second mold cavity; and

(e) moving said movable mold segment to a third predetermined position to thereby have said second plastic material in said second mold cavity pressurized to thereby form



said radially extending portion, said radially extending portion being integrated with said axially extending portion.

5,198,175

PROCESS FOR PRODUCING DEEP-DRAWN PLASTIC CONTAINER

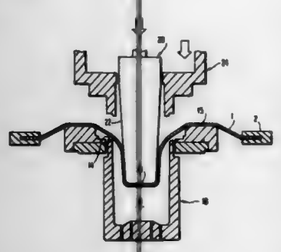
Nobuyuki Kato; Hisakazu Yasumuro, and Ken Takenouchi, all of Yokohama, Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Continuation of Ser. No. 415,221, Aug. 15, 1989, abandoned. This application Jul. 22, 1991, Ser. No. 734,087

Claims priority, application Japan, Dec. 15, 1987, 62-315377

Int. Cl.[5] B29C *51/10, 51/38*

U.S. Cl. 264—512 **13 Claims**



1. A process for producing a deep-drawn plastic container by plug assist vacuum and/or pressure forming of a plastic sheet in a molten state, which comprises

arranging a plug and, in a spaced-apart relationship an upper mold and a mold having a cavity inside and an opening at the upper end and having an annular member with heat insulating property and slipperiness which is positioned above, and diametrically outwardly of, the opening of the mold;

wherein the angle (θ) of the tangent contacting an inner circumference of the annular member and the opening of the mold with respect to a plane containing the annular member is from 20 to 70 degrees;

feeding a plastic sheet in a molten state supported by a fixing member between the mold and the plug;

moving the mold toward the molten plastic sheet so that the annular member engages an undersurface of the molten plastic sheet;

moving the plug toward the mold in a closing direction while maintaining direct contact of the annular member with the molten plastic sheet thereby creating a positive pressure between the mold and the molten sheet by the movement of the plug toward the mold;

drawing the molten sheet into the cavity in a state that the molten plastic sheet is wrapped along a large length about a side wall portion of the plug while allowing the molten plastic sheet to slide over the annular member;

clamping the drawn, molten sheet between the mold having a cavity inside and the upper mold to effect sealing in the mold;

expanding the drawn molten plastic sheet into contact with the surface of the mold having a cavity; and

cooling the plastic sheet by contact with the surface of the mold having a cavity.

5,198,176

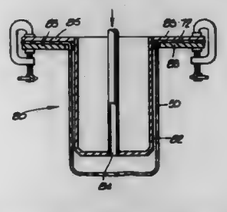
METHOD FOR THE MANUFACTURE OF SHAPED PRODUCTS OF BIAXIALLY ORIENTED POLYMER MATERIAL

John K. Fortin, Niwot, Colo., assignor to Fortex, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 578,818, Sep. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 489,809, Mar. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 320,699, Mar. 8, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 674,761

Int. Cl.[5] B29C *35/04, 51/10, 51/42, 61/02*

U.S. Cl. 264—522 **16 Claims**



6. A method for producing biaxially oriented, thermoplastic, container-shaped articles from a biaxially oriented container shaped intermediate, comprised of a thermoplastic material, comprised of:

placing said intermediate on a heated male form of a predetermined size, shape and texture;

heating said intermediate above the orientation temperature of said thermoplastic material with heated air exiting said male form to heat shrink said intermediate onto the surface of said form to create said article; and

removing said article from said form.

5,198,177

METHOD OF MAKING A HOLLOW MOLDED PRODUCT

Kenji Sugiyama, Aichi; Hidetaka Fukamachi, and Atsuo Kikuchi, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 17, 1991, Ser. No. 731,254

Claims priority, application Japan, Jul. 18, 1990, 2-189738; Mar. 22, 1991, 3-83498

Int. Cl.[5] B29C *45/00;* **B29D** *22/00*

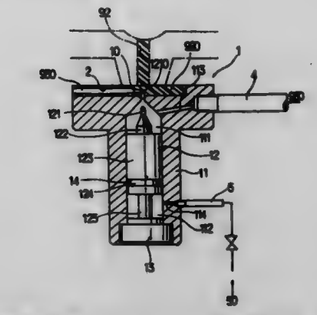
U.S. Cl. 264—572 **7 Claims**

1. A method for making a hollow molded product using a mold for hollow injection molding having a cavity for making a hollow molded product from a synthetic resin, a sprue for injecting the resin in a molten state into said cavity, a fluid inlet for admitting a fluid into the injected resin for forming a hollow interior in the product, and pin means movable longitudinally with respect to said fluid inlet to advance and close the same and project therefrom into the resin when it is injected and to retract and open said fluid inlet, comprising the steps of:

closing the mold;

advancing the pin means to close the inlet and to project from the inlet into the mold cavity into which the resin is to be injected;

injecting molten resin into the mold;



retracting the pin means to open the fluid inlet and to form a short passageway for the fluid in the injected resin; and

admitting fluid through the fluid inlet and the passageway into the injected resin.

5,198,178

CONTINUOUS STRAND CASTING PLANT WITH SLAB CUTTING ROLLER TABLE

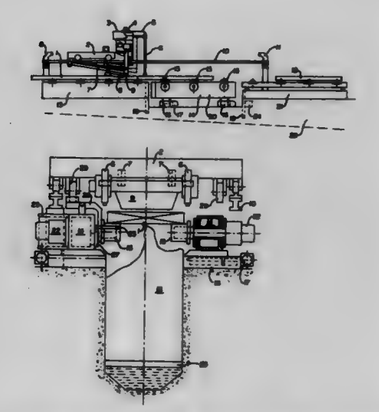
Horst K. Lotz, Hofheim-Wallau, Fed. Rep. of Germany, and Glyndwr Manning, Blackfordby, Great Britain, assignors to GeGa Corporation, Carnegie, Pa.

Filed Oct. 18, 1990, Ser. No. 599,794

Claims priority, application European Pat. Off., Oct. 19, 1989, 89119388.0

Int. Cl.[5] B23K *7/00*

U.S. Cl. 266—50 **15 Claims**



1. A continuous casting slab cutting apparatus comprising a strand support and conveying means and a strand cutting means operated in conjunction therewith, said strand cutting means being adapted for synchronized travel and cutting with respect to a strand being conveyed along said strand support and conveying means, frame means positioned adjacent each side of the strand, slab roller means carried by each frame means and supporting the strand along the adjacent edge as said strand is being cut by said cutting means, said cutting means being synchronized and said slab roller means being positioned such that as said strand is being cut, said cutting means avoids cutting into said slab roller means.

5,198,179

GAS INJECTOR

Kenneth W. Bates, Chesterfield, England, assignor to Injectall Limited, Sheffield, England

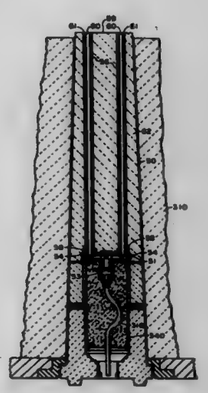
PCT No. PCT/GB90/00626, § 371 Date Dec. 14, 1990, § 102(e) Date Dec. 14, 1990, PCT Pub. No. WO90/12895, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 24, 1990, Ser. No. 623,437

Claims priority, application United Kingdom, Apr. 24, 1989, 8909290; Jul. 31, 1989, 8917457

Int. Cl.[5] C21C *7/072*

U.S. Cl. 266—217 **3 Claims**



1. A gas injector for a molten vessel, comprising a gas inlet chamber in the form of a metal enclosure having an inlet port and at least one outlet port; and an extruded rod which extends to a gas discharge end of the injector, the extruded rod being formed of a substantially gas-impermeable refractory material and comprising a plurality of passages in the form of capillary bores or narrow slots, the passages communicating with the gas inlet chamber, and being of such small dimensions that in use, melt is substantially unable to intrude into the passages; the extruded rod being secured gas-tightly to the outlet port of the gas inlet chamber and being embedded in a refractory body of the injector save for the discharge end of the rod.

5,198,180

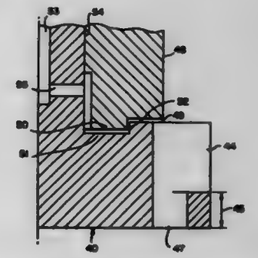
GAS DISPERSION APPARATUS WITH ROTOR AND STATOR FOR MOLTEN ALUMINUM REFINING

John F. Peltos, Yorktown Heights, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Division of Ser. No. 656,849, Feb. 19, 1991. This application Mar. 3, 1992, Ser. No. 845,324

Int. Cl.[5] C21C *5/32*

U.S. Cl. 266—225 **18 Claims**



1. An improved vaned rotor for incorporation in a spinning

nozzle assembly adapted for the injection of sparging gas into molten aluminum present in a refining chamber during aluminum refining operations therein, said vaned rotor having a rotor periphery containing alternate vanes and slots around the periphery thereof, said slots extending only in a portion of the rotor in a downward direction, with the portions of the rotor beneath said slots containing openings therein for the passage of molten aluminum therethrough upon use of said rotor for aluminum refining operations, whereby said portions of the rotor and the openings therein provide for a control of the upward flow of molten aluminum in a refining chamber, so as to enable higher gas flows and/or nozzle rotating speeds to be employed without excessive surface turbulence of the molten aluminum being refined.

5,198,181

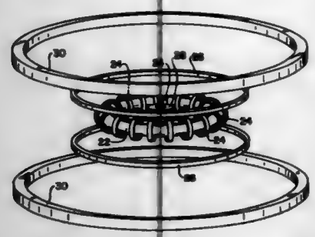
STABILIZING PLASMA IN THERMONUCLEAR FUSION REACTIONS USING RESONANT LOW LEVEL ELECTROMAGNETIC FIELDS

Jerry I. Jacobson, 153 Raintree Trail, Jupiter, Fla. 33458

Continuation of Ser. No. 506,946, Apr. 9, 1990, abandoned. This application Apr. 27, 1992, Ser. No. 875,534

Int. Cl.[5] G21B *1/00*

U.S. Cl. 376—132 **6 Claims**



1. In a thermonuclear fusion reactor of the type which heats a plasma and confines the plasma in a substantially toroidal shaped volume disposed in a plane, the improvement comprising:

conductive coils disposed adjacent said plasma and being shaped to produce a magnetic field which passes through said plasma when a current is applied thereto; and

means for applying a current to said conductive coils such that the flux density (B) of their magnetic field as it passes through the plasma is less than 10^{-10} gauss and satisfies the equation $m_1c^2 = Bvl$ coulomb, where m_1 is the mass of a particle in the plasma, c is the velocity of light, v is the mean orbital velocity of the earth about the sun, and l is the circumference of the toroidal shaped plasma.

5,198,182

PRODUCTION OF NEUTRON-SHIELDING TUBES

William Herrick, Livonia, and Randell Elliott, Novi, both of Mich., assignors to AAR Corp., Elk Grove Village, Ill.

Filed Apr. 17, 1992, Ser. No. 870,555

Int. Cl.[5] G21C *21/18*

U.S. Cl. 376—260 **20 Claims**

15. The method of making a neutron-absorbing tube, comprising the steps of

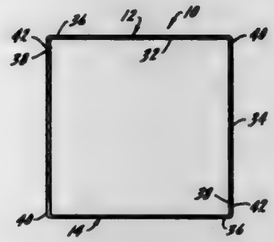
a. forming an elongate, generally rectangular metal ingot having a hollow interior,

b. installing a series of elongate metal dividers in said interior to form at least four chambers in said interior,

c. filling said chambers with a substantially uniformly dispersed mixture of a finely divided neutron-absorbing boron compound and a finely divided metal powder,

d. soaking the ingot to bring it to an elevated temperature below the melting temperature of the metal powder,

e. hot rolling the ingot to reduce its thickness to form a thin, rigid neutron-absorbing sheet having opposite metal edge portions and an elongated metal spacer portion at each metal divider,



f. longitudinally bending the sheet at each spacer portion, and

g. joining said metal edge portions to form a tube.

5,198,183

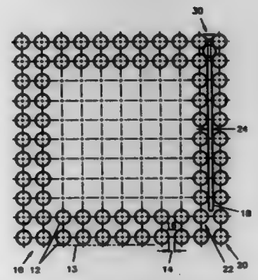
METHOD AND APPARATUS FOR CLOSE PACKING OF NUCLEAR FUEL ASSEMBLIES

Darrell F. Newman, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Mar. 6, 1992, Ser. No. 847,456

Int. Cl.[5] G21C *7/06*

U.S. Cl. 376—272 **8 Claims**



7. An apparatus for close packing of nuclear fuel assemblies, wherein a nuclear fuel assembly has an array of nuclear fuel rods spaced within an envelope with narrow spaces and wider spaces therebetween, said apparatus comprising:

(a) a plate having an effective amount of neutron absorbing material,

(b) a releasable lock having

(c) an elongated member having first and second ends, said first end having a key, said second end rotatably attachable to said plate,

(d) a locking disk attached on said elongated member between said key and said second end, and having a thickness less than said narrow space between said fuel rods and having a width greater than said narrow space,

(e) whereby said plate is placed within said envelope and said thickness of said locking disk permits said disk to be inserted between said nuclear fuel rods then locked between said nuclear fuel rods by rotating said locking disk with said key so that said width of said locking disk prevents removal of said locking disc between said nuclear fuel rods.

5,198,184

REACTOR CONTAINMENT VESSEL

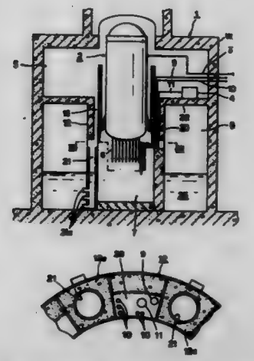
Makoto Hiramoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 8, 1992, Ser. No. 910,510

Claims priority, application Japan, Jul. 8, 1991, 3-166621

Int. Cl.[5] G21C *13/024*

U.S. Cl. 376—283 **4 Claims**



1. A reactor containment vessel having an outer wall structure an inside of which is divided into upper and lower drywells by means of a diaphragm floor and in which a suppression chamber is arranged, a reactor pressure vessel is supported by a pedestal and a line, a cable and a duct are disposed in and between the upper and lower drywells, said pedestal having a cylindrical structure surrounding the reactor pressure vessel,

said pedestal comprising a plurality of concrete wall sections and a plurality of connecting vent sections which are arranged alternately along a circumferential direction of the cylindrical pedestal, wherein the line, the cable and the duct are arranged in each of the connecting vent sections and a vent pipe is arranged in each of the concrete wall sections so that the line, the cable and the duct and the vent pipe occupy different positions in their cross sections, said vent pipe having an open end opened to the drywell.

5,198,185

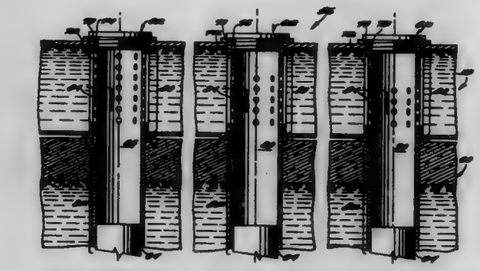
NUCLEAR REACTOR FLOW CONTROL METHOD AND APPARATUS

John P. Church, 1204 Woodbine Rd., Aiken, S.C. 29803

Filed Apr. 23, 1991, Ser. No. 689,425

Int. Cl.[5] G21C *15/00*

U.S. Cl. 376—399 **10 Claims**



1. In a nuclear reactor having fuel in the form of a core and a plenum above said core, said core having a center and a periphery, said plenum receiving coolant, apparatus comprising:

a plurality of hollow sleeves for housing said fuel, said sleeves having an upper portion and a lower portion, said upper portion in said plenum, said lower portion below said plenum, said fuel positioned in said lower portion, said sleeves having holes formed in said upper portion to admit said coolant to the interior of said sleeves, said holes admitting varying amounts of coolant from sleeve to sleeve, said amount being greater in sleeves located toward said center of said core than toward said periphery of said core.

5,198,186

FUEL ASSEMBLY FOR NUCLEAR REACTOR

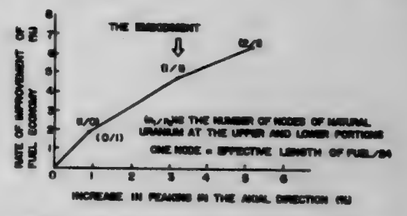
Shunsuke Ogiya; Toru Yamamoto, both of Yokohama; Katsumasa Haikawa, and Akira Nishimura, both of Hitachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed May 10, 1990, Ser. No. 521,709

Claims priority, application Japan, May 10, 1989, 1-116771

Int. Cl.[5] G21C *3/32*

U.S. Cl. 376—435 **11 Claims**



1. A fuel assembly for a nuclear reactor comprising:

a plurality of fuel rods each of which is filled with a fuel material;

a large-diameter water rod which occupies a space substantially equal to that occupied by a plural number of fuel rods,

said plurality of fuel rods defining a section filled with a fuel material comprising a natural uranium section located at least at the upper or lower end of each of said fuel rods and an enriched uranium section consisting of an upper section, an intermediate section and a lower section, each of which have an average enrichment across the cross section of the fuel assembly, wherein said average enrichment in the cross section of the fuel assembly at the upper and lower sections is less than that at the intermediate section, and

said enriched uranium section having at least two sections which include a burnable poison, wherein the respective amounts of the burnable poison per unit length in the axial direction are different such that the amount of said burnable poison per unit length in the axial direction in said upper section is less than the amount of said burnable poison per unit length in the axial direction in said lower section, and

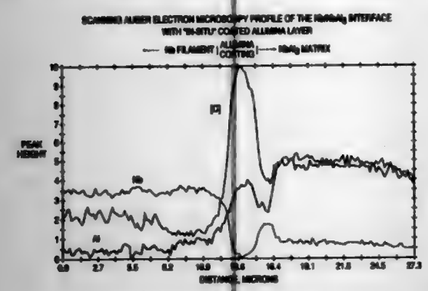
wherein said plurality of fuel rods comprise fuel rods without poison having variations in enrichment between natural uranium sections located at the upper and lower ends of these fuel rods, and fuel rods with poison having the same enrichment between natural uranium sections located at the upper and lower ends of these fuel rods.

5,198,187

METHODS FOR PRODUCTION OF SURFACE COATED NIOBIUM REINFORCEMENTS FOR INTERMETALLIC MATRIX COMPOSITES

Lixion Lu, DeLand; Atul B. Gokhale, and Reza Abbaschian, both of Gainesville, all of Fla., assignors to University of Florida, Gainesville, Fla.

Filed Nov. 20, 1991, Ser. No. 794,944
Int. Cl.[5] B22F *1/02*
U.S. Cl. 419—35 16 Claims



1. In a self-propagating, high-temperature synthesis, molten metal or powder metallurgical method of forming a composite body comprising a metal, intermetallic or ceramic matrix reinforced with a member selected from the group consisting of filaments, particles, platelets and mixtures thereof composed of a material containing elemental niobium, said method comprising admixing said reinforcing member with powders of said matrix component elements, forming said admixture into a desired shape and subjecting said shaped admixture to temperature and pressure conditions sufficient to convert said powders to a metal, intermetallic or ceramic matrix reinforced with said reinforcing member, the improvement wherein:

said reinforcing member admixed with said powders has a surface coating thereon of a compound Nb_2O_5, wherein said compound Nb_2O_5 reacts in situ during formation of said matrix with a portion of at least one of said powdered elements according to the equation $Nb_2O_5+Z \rightarrow ZO+Nb$, wherein Z is said at least one powdered element and the reaction product ZO forms as a barrier layer at the reinforcing member/matrix interface to prevent further reaction between said reinforcing member and said matrix component elements.

8. The product produced by the method of claim 1.

5,198,188

COMBUSTION SYNTHESIS METHOD AND PRODUCTS

J. Birch Holt, San Jose, Calif., and Michael Kelly, West Alexandria, Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1991, Ser. No. 641,977
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] B32B *9/00*; B05D *1/00*; B22F *1/00*
U.S. Cl. 419—45 10 Claims

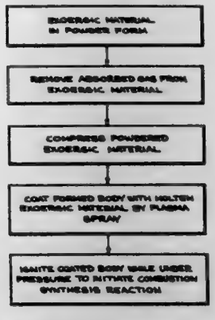
1. A method of producing combustion synthesis products which comprises:

(a) obtaining a quantity of exoergic material in powder form capable of sustaining a combustion synthesis reaction;

(b) removing absorbed water vapor therefrom;

(c) cold-pressing said material into a formed body;

(d) plasma spraying said formed body with a molten exoergic material capable of being rendered molten to form a coat thereon; and



(e) igniting said exoergic coated formed body under an inert gas atmosphere and pressure to produce self-sustained combustion synthesis.

5,198,189

LIQUID METAL MATRIX THERMAL PASTE

Richard B. Booth, Wappingers Falls; Gary W. Grube, Washingtonville; Peter A. Gruber, Mohegan Lake; Igor Y. Khandros, Peekskill, and Arthur R. Zingher, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 389,131, Aug. 3, 1989. This application Apr. 13, 1992, Ser. No. 870,152
Int. Cl.[5] C22C *28/00*
U.S. Cl. 420—555 20 Claims

1. A liquid metal matrix thermal paste comprising a dispersion of thermally conductive particles disposed in a liquid metal matrix selected from the group consisting of liquid gallium and its alloys, said particles being non-reactive with said liquid metal matrix at a temperature below approximately 100° C., whereby the fraction and dispersion of the particles in the liquid metal matrix are such that the resulting paste has a predetermined thermal conductivity and permanently remains compliant.

5,198,190

METHOD OF RECYCLING HAZARDOUS WASTE

Carl T. Philipp, and Bobby H. Sims, both of Hot Springs, Ark., assignors to Enviroscience, Inc., Little Rock, Ark.

Filed Dec. 21, 1990, Ser. No. 632,000
Int. Cl.[5] C22C *33/04*
U.S. Cl. 420—582 4 Claims

1. A process for recycling hazardous and non-hazardous wastes containing residues of iron, chromium, copper, nickel and/or zinc, the process comprising the steps of:

a) collecting wastes comprising said residues of iron, chromium, copper, nickel and/or zinc from the group consisting of:

i) emission control dust and sludge from production of steel in electric furnaces;

ii) wastewater treatment sludges from electroplating;

iii) wastewater treatment sludges from the chemical conversion coating of aluminum; and,

iv) spent pickle liquor from steel finishing operations which use Chlorine;

b) blending the wastes of step (a) with at least one liquid into a homogeneous mass;

c) forming the mass of step (b) into briquettes;

d) curing said briquettes to a moisture content of about five percent;

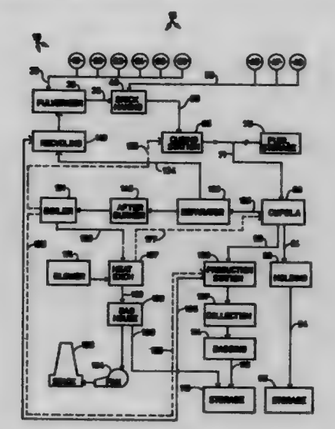
e) charging a furnace with the briquettes of step (d) and coke in a 2:1 charge to fuel ratio;

f) heating the briquettes of step (e) in said furnace to approximately about 3100 degrees Fahrenheit to reduce the iron, chromium, copper, and nickel of said wastes of step (a) to a metallic state, and to reduce the zinc of said wastes of step (a) to a volatile state, and to produce slag and exhausts comprising gas and particles;

g) drawing off the metallic iron, chromium, copper, and nickel of step (f) as an alloy;

h) drawing off the slag of step (f) and forming said slag into mineral wool and shot and returning said shot to step (a);

i) collecting the zinc of step (f);



j) separating the exhausts of step (f) into said gas, particles sized less than one micron and particles larger than one micron, and returning particles larger than one micron to said step (a);

k) mixing the gases and particles smaller than one micron of step (j) with air, carbon dust, carbon monoxide, and natural gas to form a mixture, and then burning the mixture in an afterburner; and

l) cooling the burnt mixture of step (k) and separating it into recoverable solids and nonhazardous gaseous wastes.

5,198,191

Patent Not Issued For This Number

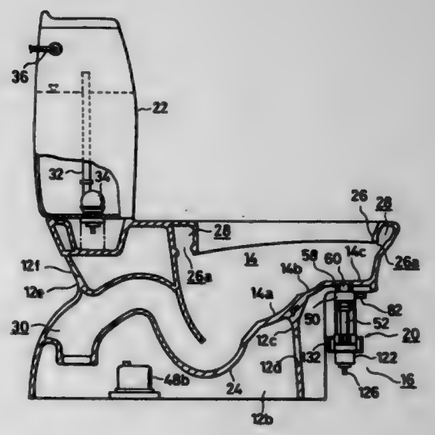
5,198,192

APPARATUS FOR DETECTING INGREDIENT IN URINE, A TOILET STOOL EQUIPPED WITH A URINE DETECTING DEVICE AND A ROOM FOR URINE DETECTING FACILITY

Shiro Saito; Ryuichi Kawamoto; Mineharu Kondo, and Shigeru Sakakibara, all of Tokoname, Japan, assignors to Inax Corporation, Tokoname, Japan

Continuation-in-part of Ser. No. 195,557, May 18, 1988, Pat. No. 4,982,741. This application May 31, 1989, Ser. No. 359,168
Claims priority, application Japan, Jun. 9, 1988, 63-75801[U]; Jun. 9, 1988, 63-75802[U]; Jun. 9, 1988, 63-75803[U]; Jun. 9, 1988, 63-75804[U]; Jun. 9, 1988, 63-75805[U]; Jun. 9, 1988, 63-75806[U]; Jun. 9, 1988, 63-75807[U]; Jun. 9, 1988, 63-75808[U]; Jun. 9, 1988, 63-75809[U]; Jun. 9, 1988, 63-75810[U]; Jun. 9, 1988, 63-75811[U]
The portion of the term of this patent subsequent to Jun. 8, 2008, has been disclaimed.
Int. Cl.[5] A61B *5/00*; G01N *21/00*; E03D *1/00*
U.S. Cl. 422—68.1 19 Claims

18. An apparatus for detecting an ingredient in urine comprising:



a toilet stool comprising a bowl having an outer surface and a urine receiving surface, a through hole formed at the urine receiving surface of the bowl, a supporting portion surrounding the outer surface of the bowl, an opening formed at a supporting wall portion and a closure member for closing the opening;

cylinder means vertically disposed along its axial direction and attached to the bowl, said cylinder means including an upper end opening defining an inlet for urine a diametrically enlarged upper portion and a lower portion, said diametrically enlarged upper portion having an inside diameter larger than that of the lower portion;

piston means fitted in said cylinder means, said piston means being movable between the upper and lower portions of the cylinder means, said piston means, when located in the lower portion, fitting in the lower portion without a space, and when located in the diametrically enlarged upper portion, said piston means forming a space between the piston means and the diametrically enlarged upper portion;

driving means for vertically moving said piston means between the upper and lower portions of said cylinder means;

an electrode extending through a wall of said cylinder means in said diametrically enlarged upper portion and having a forward end to contact with a liquid in said cylinder means for detecting concentration of an ingredient of the liquid in said cylinder means, and a rear end directed to the opening in the supporting wall portion;

reagent supplying means having an opening extending to the diametrically enlarged upper portion of the cylinder means, a reagent reservoir, a pipeline and a pump located between the reagent reservoir and said opening, and a valve disposed in said pipeline so that a reagent is supplied into the cylinder means when said valve is opened; and

water supplying means having an opening extending to the diametrically enlarged upper portion of said cylinder means, a water supplying source, a pipeline connected between the opening and the water supplying source and a valve disposed in said pipeline so that water is supplied into said cylinder means when said valve is opened.

5,198,193

LIQUID TRANSFER DEVICES

Roger A. Bunce, 117 Berberry Close, Bournville, Birmingham B30 1TB; Gary H. G. H. Thorpe, 84 Newcombe Road, Handsworth, Birmingham B21 8BX; John E. C. Gibbons, 40 St Peters Close, Hall Green, Birmingham B28 0EF; Louise J. Keen, 30 Alpha Close, Balsall Heath, Birmingham B12 9HE, and Matthew R. Walker, 51 Frederick Road, Selly Oak, Birmingham B29 6NX, all of England

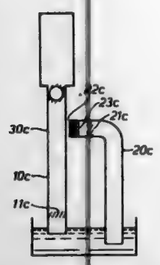
PCT No. PCT/GB90/00441, § 371 Date Oct. 29, 1990, § 102(e) Date Oct. 29, 1990, PCT Pub. No. WO90/11519, PCT Pub. Date Oct. 4, 1990

PCT Filed Mar. 23, 1990, Ser. No. 601,697

Claims priority, application United Kingdom, Mar. 23, 1989, 8906833; Oct. 6, 1989, 8922513

Int. Cl.[5] G01N *30/00*

U.S. Cl. 422—100 **8 Claims**



1. A liquid transfer device for use in assay procedures comprising:

a first and second liquid flow channel leading from a respective pair of channel ends to a common site, said channels having mutually different structural forms to cause respective simulataneously-initiated liquid flows therethrough to arrive at said site one after the other; and

an element of porous material connected with one portion of said first or second channel, said element swelling upon liquid flow thereinto from said one portion to engage another portion of said first or second channel not normally engaged by said element.

5,198,194

APPARATUS FOR SIMULTANEOUS HEATING AND COOLING A FAST FLUIDIZED BED CATALYST REGENERATOR

Hartley Owen, Belle Meade, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 535,459, Jun. 8, 1990, Pat. No. 5,066,627. This application Nov. 18, 1991, Ser. No. 793,914

Int. Cl.[5] B01J *8/26*

U.S. Cl. 422—144 **6 Claims**

1. An apparatus for the simultaneous heating and cooling of coked fluidized catalytic cracking catalyst during high efficiency regeneration in a fluidized bed regeneration zone which comprises:

a coke combustor vessel having an inlet for coked fluidized catalyst cracking catalyst, a first inlet for oxygen-containing regeneration gas, an inlet for a recycled regenerated catalyst stream, and an outlet in an upper portion thereof for discharging a dilute phase mixture of catalyst and regeneration gas from said coke combustor;

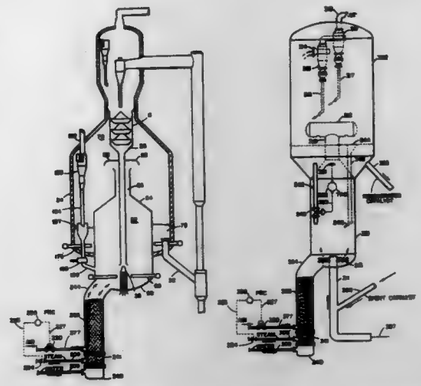
a dilute phase transport riser having an inlet and lower portion thereof connected to said coke combustor outlet and an outlet in an upper portion thereof connected with a catalyst/gas separation means;

a collection vessel above said coke combustor enclosing said riser;

said catalyst/gas separation means receiving and separating said dilute phase catalyst/gas stream discharged from said transport riser and discharging resulting separated catalyst into said collection vessel, said collection vessel having means for maintaining said separated catalyst as a fluidized bed of catalyst;

a catalyst recycle means for recycling separated catalyst from said fluidized bed in said collection vessel to said first inlet; and

a generally vertical extrinsic heat removal means, having an equivalent diameter, beneath and in open fluid communication with said coke combustor, said heat removal means connected to said coke combustor by an inlet tube having an inlet tube equivalent diameter equal to at least 75% of the equivalent diameter of said extrinsic heat removal means, said heat removal means further comprising at least one fluidizing gas inlet means in a flower portion thereof for adding fluidizing gas to said extrinsic heat removal means to fluidize and displace catalyst from said heat removal means up into said coke combustor via said inlet tube.



5,198,195

DEVELOPER TREATMENT APPARATUS

Akira Yoda; Yoshimitsu Sato, and Shuichi Ohtsuka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 287,380, Dec. 21, 1988, abandoned. This application Sep. 27, 1991, Ser. No. 766,915

Claims priority, application Japan, Dec. 28, 1987, 62-335063; Jan. 14, 1988, 63-6402; Jan. 18, 1988, 63-7820; Jan. 22, 1988, 63-12100

Int. Cl.[5] B01J *8/02, 35/02*

U.S. Cl. 422—199 **15 Claims**

1. In a developer treatment apparatus for treating excess developer after development of a film in a development chamber with said developer which contains a solvent composed of a hydrocarbon as a main component and a pigment dispersed in said solvent, the improvement of said developer treatment apparatus comprising:

a tank for receiving said excess developer, said tank having an opening for receiving an inflow of said excess developer exhausted from said development chamber;

a passage connected between said development chamber and said tank opening through which said excess developer is supplied to said tank after development in said development chamber;

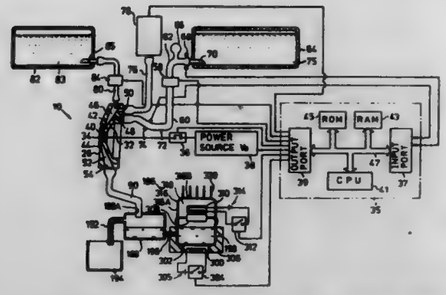
a catalyst for oxidizing said excess developer received in said tank by converting said excess developer into gases made of water vapor and carbon dioxide and discharging said gases;

a vaporization means for vaporizing said excess developer

received in said tank, and for supplying vapor of said excess developer to said catalyst;

a catalyst igniting heater for first oxidizing said vaporized excess developer;

means for intermittently supplying new developer to said development chamber;



means for supplying electricity to said catalyst igniting heater after said new developer, which has been supplied to said development chamber by said developer supplying means, flows into said tank through said passage and said tank opening, such that the vapor of said excess developer is spontaneously combustible even when said development treatment apparatus, said vaporization means and said catalyst igniting heater are turned off.

5,198,196

METHOD FOR REMOVING AND REPLACING CATALYST IN A DISTILLATION COLUMN REACTOR

Edward M. Jones, Jr., Friendswood, Tex., assignor to Chemical Research & Licensing Company, Pasadena, Tex.

Division of Ser. No. 362,494, Jun. 7, 1989, Pat. No. 5,133,942. This application Jul. 22, 1991, Ser. No. 733,654

Int. Cl.[5] B01J *8/08*

U.S. Cl. 422—219 **3 Claims**

1. A method of operating a distillation column reactor containing trays loosely supporting a solid particulate catalyst, comprising the steps of:

(a) providing

(i) a distillation column reactor containing a plurality of suitable liquid-vapor contact trays, each of said trays having a downcomer and weir associated therewith said downcomer connecting each said tray to the tray below each said tray;

(ii) a solid particulate catalyst supported on at least a portion of said trays to approximately the depth of a liquid on said trays;

(iii) first means connected to each of said portion of said trays supporting said solid particulate catalyst to withdraw the liquid on said trays carrying said catalyst from said trays;

(iv) second means connected to said first means to separate said catalyst from said liquid and return said liquid less said catalyst to said trays;

(v) third means connected to said portion of trays supporting said solid particulate catalyst to replace said catalyst with a second catalyst and mix said second catalyst with said liquid and to return said liquid with said second catalyst to said trays;

(b) periodically replacing the solid particulate on each tray as needed by

(i) drawing liquid carrying the catalyst through said first means from any of the trays to said second means so as to separate the solid particulate catalyst from the liquid as by settling to define a clear liquid and recirculate the clear liquid to the tray until all of the solid particulate catalyst has been removed from the tray;

(ii) drawing clear liquid from any of the trays in which catalyst has been separated through said third means so as to form a slurry of replacement catalyst and recirculate the slurried catalyst and liquid to the tray until all the catalyst has been replaced on the tray; and

(c) withdrawing a stream from near the bottom of the distillation column reactor to remove any catalyst fines which have accumulated.

5,198,197

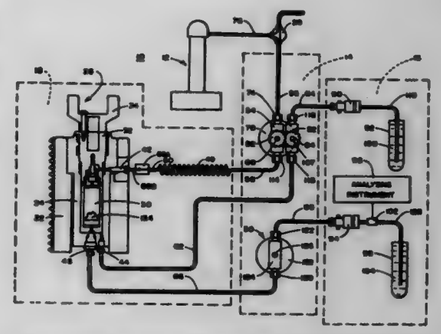
APPARATUS AND METHOD FOR SUPERCRITICAL FLUID EXTRACTION

Dale L. Clay, and Robert W. Allington, both of Lincoln, Nebr., assignors to Isco, Inc., Lincoln, Nebr.

Division of Ser. No. 795,987, Nov. 22, 1991, which is a continuation-in-part of Ser. No. 553,119, Jul. 13, 1990, Pat. No. 5,094,753. This application Jul. 6, 1992, Ser. No. 908,458

Int. Cl.[5] B01D *11/00*

U.S. Cl. 422—256 **5 Claims**



1. Apparatus comprising: means for supercritical fluid extraction including,

a breech plug adapted to fit and be fastened sealingly over the open side of an extraction pressure vessel;

first fastening means for fastening the breech plug to the pressure vessel;

mounting means adapted to removably connect a sample holding cartridge to the breech plug;

said breech plug including a wall adapted to receive a latch whereby said breech plug may be fastened and unfastened from the pressure vessel; and

second fastening means for fastening the breech plug permanently to means for moving it from a transport means that positions sample cartridges on it to a pressure vessel, wherein the breech plug may automatically receive sample cartridges and move them into a pressure vessel.

5,198,198

ARTICLE COMPRISING A WATER SOLUBLE BAG CONTAINING A MULTIPLE USE AMOUNT OF A PELLETIZED FUNCTIONAL MATERIAL AND METHODS OF ITS USE

Elizabeth J. Gladfelter, Falcon Heights, and Sheryl D. Slocumb, New Brighton, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Division of Ser. No. 368,085, Jun. 16, 1989, abandoned, which is a continuation of Ser. No. 104,458, Oct. 2, 1987, abandoned. This application Nov. 21, 1989, Ser. No. 439,796

Int. Cl.[5] B01D *12/00*; C11D *17/00*

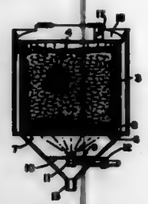
U.S. Cl. 422—264 **21 Claims**

1. An article of manufacture which comprises:

(a) a dispenser containing an aqueous liquid spray means;

(b) a sealed water soluble container; and

(c) an institutional multiple use amount of greater than about 200 grams of a pelletized water soluble or dispersible functional composition contained within said water soluble container, wherein said water soluble container fits within said dispenser and is capable of forming an aqueous solution by action of said liquid spray on said pelletized functional composition, and said pelletized functional composition comprises:



(i) about 10–34 wt-% of a sequestering agent;
(ii) about 10–70 wt-% of a conductive filler;
(iii) about 1–5 wt-% of a nonionic surfactant; and
(iv) about 1–5 wt-% water;
whereby said conductive filler provides electrical conductivity to an aqueous solution or dispersion of said functional composition.

5,198,199

PROCESS FOR THE RECOVERY OF ANTIMONY-BASED CATALYSTS USED FOR THE FLUORINATION OF HALGENATED HYDROCARBONS

Eric LaCroix, Lyons, and Andre Lantz, Vernaison, both of France, assignors to ELF Atochem S.A., France

Filed Jan. 29, 1992, Ser. No. 827,775
Claims priority, application France, Jan. 30, 1991, 91 01031
Int. Cl.[5] C01B *29/00*
U.S. Cl. 423—88 **10 Claims**

1. Process for recovering the antimony contained in a solution of used antimony-containing catalyst, emanating from units for the fluorination or chlorofluorination of halogenated hydrocarbons comprising at least two carbon atoms, said solution of used catalyst containing, in addition, various organic compounds consisting essentially of olefins and/or olefin precursors, consisting of:

(a) concentrating the solution of seed catalyst to the limit of distillation of antimony trichloride, at a temperature of between 70 to 140° C., with a mole ratio of (olefins+olefin precursors)/antimony V of greater than 1 and without the addition of intermediary substances, then

(b) adding chlorine to the concentrated solution to convert $SbCl_3$ to $SbCl_5$, this chlorination being performed at a temperature of between 75 to 120° C. and with a mole ratio $Cl_2/SbCl_3$ equal to at least 1.3, and finally

(c) distilling the antimony pentachloride under reduced pressure (1 to 14 kPa) at a temperature not exceeding 120° C.

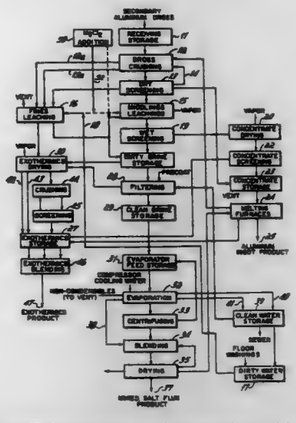
5,198,200

PROCESS FOR THE RECOVERY OF VALUES FROM SECONDARY ALUMINUM DROSS

Daniel Yerushalmi, Cleveland, Ohio; Gerald E. Carkin, Jr., Tarentum, Pa.; Donald L. Stewart, Jr., Greenburg, Pa., and Jan H. L. Van Linden, Allison Park, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 683,091, Apr. 10, 1991, abandoned, which is a continuation of Ser. No. 451,298, Dec. 15, 1989, abandoned. This application Sep. 9, 1991, Ser. No. 756,359
Int. Cl.[5] B01F *1/00*; C22B *21/00, 26/00*; C01D *3/24*
U.S. Cl. 423—131 **10 Claims**

1. In a process for the recovery of metallic aluminum, mixtures of sodium and potassium chlorides, and an aluminum oxide-metallic aluminum product having high aluminum and low chloride contents from secondary aluminum dross, said process including the steps of providing a secondary aluminum dross feed containing aluminum, aluminum oxide and salts, separating the feed dross by particle size into at least a first dross portion and a second dross portion, treating the first dross portion with leach water to dissolve the salt content thereof wherein the improvement comprises:



adding a sufficient amount of magnesium chloride to the leach water to maintain the pH of the leach water at a level between about 7–9 during the treating step, thereby reducing the production of ammonia in the treating step and enhancing recovery of metallic aluminum.

5,198,201

REMOVAL OF SULPHUR AND NITROGEN OXIDES FROM FLUE GASES

Arthur F. Johnson, 240 Fox Dr., Boulder, Colo. 80303

Continuation-in-part of Ser. No. 567,492, Aug. 14, 1990, Pat. No. 5,122,352, which is a continuation-in-part of Ser. No. 372,492, Jun. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 165,312, Mar. 8, 1988, Pat. No. 4,874,585. This application Jul. 16, 1991, Ser. No. 731,830
The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.
Int. Cl.[5] C01B *21/00, 17/00, 17/69*
U.S. Cl. 423—235 **15 Claims**

14. A method for removing pollutants from boiler plant flue gas, comprising:

indirectly cooling the flue gas with a first fluid to cool the flue gas to a first temperature and combine substantially all SO_3 in the flue gas with H_2O;

condensing the SO_3 and H_2O from the flue gas as a first condensate to form sulfuric acid;

collecting the first condensate;

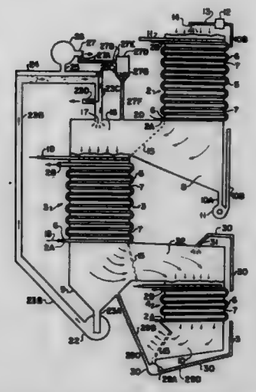
indirectly cooling the flue gas with a second fluid to cool the flue gas to a second temperature, after the first indirect heat exchange step, to condense H_2O from the flue gas as a second condensate and dissolve SO_2 in the flue gas in the second condensate to form sulfurous acid;

collecting the second condensate;

extracting the SO_2 from the second condensate;

collecting the SO_2 extracted from the second condensate;

reacting at least a portion of the extracted SO_2 with water and oxygen to form sulfuric acid; and



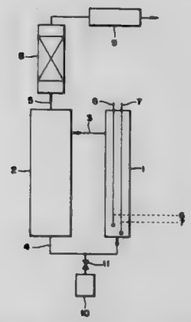
adding ammonium hydroxide to at least a portion of the sulfuric acid produced during said combining step to produce $(NH_4)_2SO_4$.

5,198,202

CONTINUOUS PRODUCTION OF TETRAPHOSPHORUS POLYSULFIDES

Philippe Engel, Villeurbanne, and Alain Courant, Vienne, both of France, assignors to ATOCHEM, Puteaux, France

Filed Jan. 24, 1991, Ser. No. 645,418
Claims priority, application France, Jan. 24, 1990, 90 00789
Int. Cl.[5] C01B *25/14*
U.S. Cl. 423—303 **15 Claims**



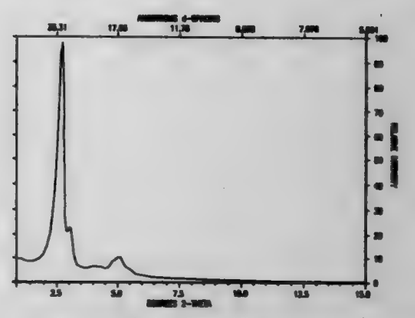
1. A process for the continuous preparation of a tetraphosphorus polysulfide having the formula P_4S_x, wherein x is equal to at least 3, comprising (a) establishing a continuously circulating closed loop of a liquid reaction mixture which comprises desired final product tetraphosphorus polysulfide, (b) continuously introducing liquid phosphorus and liquid sulfur into said continuously circulating reaction mixture and therein continuously reacting said phosphorus with said sulfur, and (c) continuously separating desired final product tetraphosphorus polysulfide, in gaseous state, from said continuously circulating reaction mixture.

5,198,203

SYNTHETIC MESOPOROUS CRYSTALLINE MATERIAL

Charles T. Kresge, West Chester, Pa.; Michael E. Leonowicz, Medford Lakes, N.J.; Wieslaw J. Roth, Sewell, N.J.; Kirk D. Schmitt, Pennington, N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 470,008, Jan. 25, 1990, Pat. No. 5,102,643. This application Jul. 24, 1991, Ser. No. 734,825
The portion of the term of this patent subsequent to Oct. 5, 2008, has been disclaimed.
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—718 **47 Claims**



1. A composition of matter comprising an inorganic, porous crystalline phase material exhibiting after calcination an X-ray diffraction pattern including values substantially as shown below:

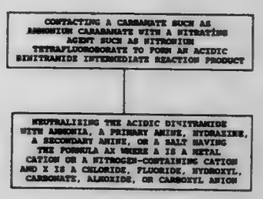
d-spacing, d_n, Angstroms	d_n/d_1	Relative Intensity
d_1, ≧ ~18	1.0	100
d_2	0.87 ± 0.06	w–m.

5,198,204

METHOD OF FORMING DINITRAMIDE SALTS

Jeffrey C. Bottaro, Mountain View; Robert J. Schmitt, Redwood City; Paul E. Penwell, Menlo Park, and David S. Ross, Palo Alto, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jun. 18, 1990, Ser. No. 539,647
Int. Cl.[5] C01B *21/20*; C07C *241/00, 243/00*
U.S. Cl. 423—385 **22 Claims**



1. A method of making a N,N-dinitramide salt having the formula $MN(NO_2)_2$ where M is a cation selected from the class consisting of a metal ion and a nitrogen-containing ion which comprises:

a) contacting a carbamate with a nitrating agent to form an acidic dinitramide intermediate reaction product having the formula $HN(NO_2)_2$; and

b) neutralizing the acidic dinitramide intermediate reaction product by contacting it with a compound selected from the class consisting of ammonia (NH_3), hydrazine (N_2H_4), a primary amine having the formula RNH_2, a secondary

amine having the formula RR'NH, and a salt having the formula AX; where R and R' are the same or different 1–6 carbon alkyls, A is a metal ion or a nitrogen-containing ion, and X is an anion selected from the class consisting of a fluoride, chloride, hydroxyl, carbonate, alkoxide, and carboxyl.

5,198,205

CARBON BLACK FOR TIRE TREAD RUBBER

Yasuharu Yoshii; Shinji Misono, and Hitoshi Ue, all of Gotenba, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 373,973, Jun. 30, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,378
Claims priority, application Japan, Jul. 21, 1988, 63-182378
Int. Cl.[5] C09C *1/48*
U.S. Cl. 423—445 **1 Claim**

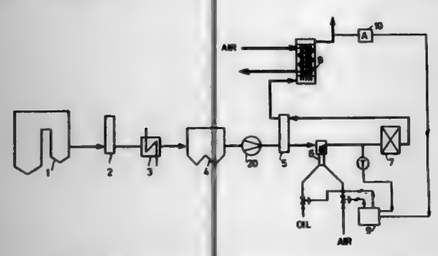
1. Carbon black for a tire tread rubber which has a nitrogen adsorption specific surface area (N_2SA) of 60 to 160 m^2/g and a dibutyl phthalate absorption (DBP) of 90 to 150 ml/100 g and an intraaggregate void volume Vp (ml/g) at least equal to the value calculated according to the equation: $(0.00976 \times DBP - 0.0358)$.

5,198,206

CONDENSING SULFURIC ACID VAPORS TO PRODUCE SULFURIC ACID

Peter Schoubye, Horsholm, Denmark, assignor to Haldor Topsoe A/S, Denmark

PCT No. PCT/DK89/00133, § 371 Date Dec. 6, 1990, § 102(e) Date Dec. 6, 1990, PCT Pub. No. WO89/12025, PCT Pub. Date Dec. 14, 1989
PCT Filed May 22, 1989, Ser. No. 623,409
Claims priority, application Denmark, Jun. 9, 1988, 3125/88
Int. Cl.[5] C01B *17/74, 17/82*
U.S. Cl. 423—522 **19 Claims**



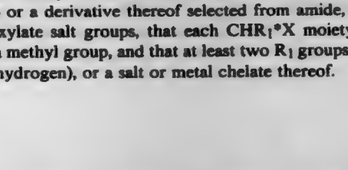
1. A process for producing sulfuric acid comprising condensing sulfuric acid vapors from a gas mixture containing 0.01 to 10% by vol. of H_2SO_4 vapor, calculated under the assumption that SO_3 is fully hydrated, and 0 to 50% by vol. of aqueous vapor, by direct or indirect cooling in a sulfuric acid tower, including the step of adding before inflow of the gas into the tower a smoke or an aerosol of solid particles having a content of 10^9 to 10^{12} solid particles per Nm^3 per 0.1% H_2SO_4 vapor in the gas at entry thereof into the tower, calculated under the assumption that SO_3 in the tower is completely hydrated to H_2SO_4.

5,198,207

METHOD FOR THE PREPARATION OF ACTIVE MAGNESIUM HYDRIDE-MAGNESIUM HYDROGEN STORAGE SYSTEMS, WHICH REVERSIBLY ABSORB HYDROGEN

Wilfried Knott, Essen; Klaus-Dieter Klein, Mulheim an der Ruhr, and Götz Koerner, Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Oct. 30, 1991, Ser. No. 785,298
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1990, 4039278
Int. Cl.[5] C01B *6/04, 3/00*; B01J *31/12*
U.S. Cl. 423—647 **2 Claims**



1. A method for the preparation of an active magnesium hydride-magnesium-hydrogen storage system, which reversibly absorbs hydrogen, with addition of a catalyst for the absorption of hydrogen under formation of hydride, which comprises adding to finely divided magnesium to be initially hydrogenated, magnesium hydride particles of ≧400 μm in diameter as the catalyst in an amount of at least 1.2% by weight, based on the magnesium to be initially hydrogenated and carrying out the hydrogenation at a temperature of ≧250° C. and a pressure of between about 0.5 to 5 MPa.

5,198,208

AMINOPOLYCARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Arne Berg, Blommenholm, Norway; Torsten Almen, Malmo, Sweden; Jo Klaveness, Oslo, Norway; Pal Rongved, Hellvik, Norway, and Terje Thomassen, Oslo, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

PCT No. PCT/GB88/00572, § 371 Date Mar. 16, 1990, § 102(e) Date Mar. 16, 1990, PCT Pub. No. WO89/00557, PCT Pub. Date Jan. 26, 1989
PCT Filed Jul. 15, 1988, Ser. No. 457,717
Claims priority, application United Kingdom, Jul. 16, 1987, 8716778; Jul. 17, 1987, 8716914
Int. Cl.[5] C07C *101/26*; C07D *285/00, 273/00*; A61K *49/00, 31/195, 31/555*
U.S. Cl. 424—1.1 **12 Claims**

1. A compound of formula I

$$(X—CHR_1{}^*)_2—N—(CHR_1)_n(NY—(CHR_1)_m)_x—N—(CHR_1{}^*—X)_2 \quad (I)$$

(wherein x is 0 or 1; each Y, which may be the same or different, is a group $(CHR_1)_p)_p—N(CHR_1{}^*—X)_2$ or a group $—CHR_1{}^*X$; each X, which may be the same or different, is a group $R_1{}^*$ or a carboxyl group or a derivative thereof selected from amide, ester and carboxylate salt groups; each group R_1 or $R_1{}^*$, which may be the same or different, is a hydrogen atom, a hydroxyalkyl group or an optionally hydroxylated alkoxy or alkoxyalkyl group each having 1–8 carbon atoms; n, m and p are each 2, 3 or 4; with the provisos that at least two nitrogen carry a $CHR_1{}^*X^4$ moiety wherein X^4 is a carboxyl group or a derivative thereof selected from amide, ester and carboxylate salt groups, that each $CHR_1{}^*X$ moiety is other than a methyl group, and that at least two R_1 groups are other than hydrogen), or a salt or metal chelate thereof.

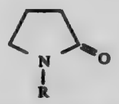
5,198,209

CONDITIONING SHAMPOO

Jingshi Zhou, Kentwood, and David J. Fochtman, Comstock Park, both of Mich., assignors to Amway Corporation, Ada, Mich.

Filed Feb. 11, 1992, Ser. No. 833,991
Int. Cl.[5] A61K *7/11*
U.S. Cl. 424—71 **20 Claims**

1. A stable conditioning shampoo composition comprising by weight:
A. From about 8% to about 20% anionic surfactant;
B. From about 0.1% to about 5% cationic surfactant;
C. From about 0.1% to about 8% insoluble, non-volatile silicone;
D. From about 0.5% to about 5% of an N-alkylated-2-pyrrolidone having a structure:



(III)

wherein R is an alkyl moiety, straight chain or branched chain, including from about 8 to about 16 carbon atoms; and
E. Sufficient water to 100%.

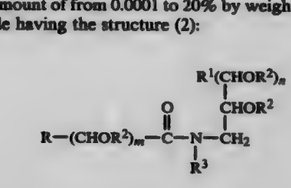
5,198,210

COSMETIC COMPOSITION

Peter Critchley, Bedford; Desmond B. Hagan, South Wirral; Susan E. Kirsch, St. Albans; David T. Parrot, Oxtos; Anthony V. Rawlings, Northants, all of England; Ian R. Scott, Allendale, N.J., and Anthony P. Taylor, Wirral, England, assignors to Elizabeth Arden Company, Division of Conopco, Inc., N.Y.

Filed Oct. 21, 1991, Ser. No. 781,052
Claims priority, application United Kingdom, Oct. 22, 1990, 9022922; Dec. 20, 1990, 9027708
Int. Cl.[5] A61K *31/74, 7/04, 7/06*
U.S. Cl. 424—78.03 **6 Claims**

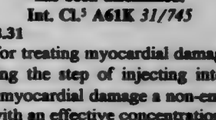
1. A composition suitable for topical application to skin, hair or nails, which comprises:
(i) an amount of from 0.0001 to 20% by weight of a pseudoceramide having the structure (2):



(2)

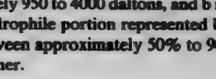
where
R represents a linear or branched, saturated or unsaturated, hydroxylated or non-hydroxylated, phosphorylated or non-phosphorylated, sulphated or non-sulphated aliphatic hydrocarbon group having from 1 from 49 carbon atoms or the sub-group Y—O—(C_aH_b)—;
R^1 represents a linear or branched, saturated or unsaturated, hydroxylated or non-hydroxylated, phosphorylated or non-phosphorylated, sulphated or non-sulphated aliphatic hydrocarbon group having from 1 to 28 carbon atoms;
R^2 represents H, a sugar residue, a sulphate residue or a phosphate residue P_f;
P_f represents the group:

R^3 represents H, or the sub group (3):



(3)

X^1, X^2 and X^3 each individually represent H, C_{1-5} alkyl or C_{1-5} hydroxyalkyl;
Y represents H or a residue of a C_{14-22} fatty acid having the structure (4):



(4)

z represents —OH —OP_f, —$OSO_3\ominus$ or an epoxy oxygen,
a is an integer of from 7 to 49
b is an integer of from 10 to 98
c is 0 or an integer of from 1 to 4
d is 0 or 1
x is an integer of from 12 to 20
y is an integer of from 20 to 40
z is 0 or an integer of from 1 to 4
n is 0 or 1
m is 1
provided that when the R group has from 9 to 49 carbon atoms, then n+m is 1 or 2; and
(ii) a cosmetically acceptable vehicle for the pseudoceramide.

5,198,211

METHOD OF TREATING MYOCARDIAL DAMAGE

Robert L. Hunter, Tucker, and Alexander Duncan, Dunwoody, both of Ga., assignors to Emory University, Atlanta, Ga.

Continuation of Ser. No. 522,206, May 11, 1990, Pat. No. 5,078,995, which is a continuation of Ser. No. 403,017, Sep. 5, 1989, abandoned, which is a continuation of Ser. No. 303,791, Jan. 30, 1989, abandoned, which is a division of Ser. No. 45,459, May 7, 1987, Pat. No. 4,801,452, which is a continuation-in-part of Ser. No. 43,888, Apr. 29, 1987, abandoned, which is a continuation of Ser. No. 863,582, May 15, 1986, abandoned. This application Dec. 4, 1991, Ser. No. 802,331
The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.
Int. Cl.[5] A61K *31/745*
U.S. Cl. 424—78.31 **12 Claims**

1. A method for treating myocardial damage in a human or animal comprising the step of injecting into the human or animal with the myocardial damage a non-emulsion, homogeneous solution with an effective concentration of a surface-active copolymer with the following general formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein a is an integer such that the hydrophobe represented by (C_3H_6O) has a molecular weight of between approximately 950 to 4000 daltons, and b is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes between approximately 50% to 90% by weight of the copolymer.

VOL 1148 ISS 5 MR 30 1993 UMI

5,198,212

METHOD AND COMPOSITIONS FOR TREATMENT OF TRAUMA-ASSOCIATED SEPSIS WITH GAMMA INTERFERON

Hiram C. Polk, Jr., Louisville, Ky.; Gerald Sonnenfeld, Pittsburgh, Pa., and Christopher D. George, Earlsfield, London, Great Britain, assignors to University of Louisville Research Foundation Incorporated

Continuation of Ser. No. 265,411, Oct. 31, 1988, abandoned. This application Jul. 12, 1991, Ser. No. 730,017

Int. Cl.[5] A61K *37/66*

U.S. Cl. 424—85.5 17 Claims

1. A method for the prophylaxis or treatment of trauma-associated sepsis comprising the steps of:

identifying a subject as having been exposed to trauma or about to be exposed to trauma; and

administering a plurality of applications of a therapeutically effective dose comprising 750 units of IFN-γ to the patient.

5,198,213

METHOD OF DISEASE TREATMENT UTILIZING AN IMMUNOLOGICALLY WHEY FRACTION

Gerald H. Stott, Emmett, Id., and David O. Lucas, Plymouth, Minn., assignors to Protein Technology, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 306,817, Feb. 3, 1989, Pat. No. 5,066,491, which is a continuation-in-part of Ser. No. 946,435, Dec. 24, 1986, Pat. No. 4,834,974, which is a continuation-in-part of Ser. No. 818,610, Jan. 13, 1986, Pat. No. 4,816,252, which is a continuation-in-part of Ser. No. 723,612, Apr. 15, 1985, abandoned. This application Oct. 16, 1991, Ser. No. 777,194

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] A61K *35/395, 35/20*

U.S. Cl. 424—85.8 27 Claims

1. A process for transferring passive immunity to a neonate animal during a critical absorption period and for enhancing the initiation of active immunity in the animal comprising:

a. providing whey concentrate derived from ordinary milk, the whey concentrate having an effective concentration of immunologically active immunoglobulin; and

b. feeding a predetermined quantity of the whey concentrate to the animal during the critical absorption period such that the animal's blood serum immunoglobulin concentration is elevated to a level of about 1 mg/ml in response to ingestion of the predetermined quantity of the whey concentrate.

5,198,214

ANTI-MASTITIS POLYVALENT VACCINE, METHOD OF ADMINISTRATION AND METHOD FOR PRODUCTION THEREOF

Ralph J. Stolle, Oregonia, Ohio, and Lee R. Beck, Birmingham, Ala., assignors to Stolle Research & Development Corporation, Cincinnati, Ohio

Continuation of Ser. No. 528,132, Aug. 31, 1983, Pat. No. 4,762,712. This application Mar. 18, 1988, Ser. No. 170,020

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[5] A61K *39/02, 37/00*

U.S. Cl. 424—92 10 Claims

1. The polyvalent vaccine produced according to the process comprising the steps of:

(1) culturing pathogens present in the milk of a plurality of bovine animals exhibiting clinical mastitis;

(2) incorporating non-virulent forms of each strain of said pathogens in an appropriate pharmacological carrier in a biologically effective concentration; and

(3) repeating said step (1) periodically and incorporating in said carrier any pathogenic strains cultured in said repeated step (1) not previously incorporated in said carrier.

5,198,215

COMPOSITION FOR CONTROLLING MASTITIS IN RUMINANTS, METHOD FOR ITS PREPARATION AND METHOD OF TREATMENT OF RUMINANTS

Bernard J. C. H. De Cueninck, Brugge, Belgium, assignor to Noordzee Laboratorium N.V., Brugge, Belgium

Continuation of Ser. No. 206,887, Jun. 15, 1988, abandoned. This application Sep. 17, 1991, Ser. No. 762,726

Claims priority, application Netherlands, Jun. 22, 1987, 8701451

Int. Cl.[5] A61K *39/02, 39/40*

U.S. Cl. 424—92 4 Claims

1. A composition for inducing, in ruminants, cell-dependent acquired mammary hypersensitive against Gram-positive bacteria which cause mastitis comprising at least one soluble exoantigen of said bacteria or immunochemical homologue thereof, in a modified form to create or enhance the capacity of said soluble exoantigen to induce cell-dependent acquired mammary hypersensitivity in said ruminants.

5,198,216

PERFORMANCE ENHANCING COMPOSITIONS OF MATTER, AND METHODS OF PREPARING AND UTILIZING SAME

David M. McGee, Grosse Pointe Park, Mich., assignor to Daliff Corporation, Miami, Fla.

Filed Jul. 30, 1990, Ser. No. 559,661

Int. Cl.[5] A61K *37/62, 35/78, 35/42, 35/23, 35/48, 35/55, 35/34, 35/28, 33/24, 33/14, 33/06, 33/08, 31/70, 31/495, 31/50, 31/51, 31/44, 31/34, 31/195, 31/14, 31/07*

U.S. Cl. 424—94.2 20 Claims

1. A composition for use in improving an animal's performance, comprising:

adrenal and pituitary raw tissue concentrates, vitamin C, bioflavonoid complex, pantothenic acid, methionine, choline, vitamin B1, vitamin B2, vitamin B6, niacinamide and magnesium; and

said composition is composed entirely of natural substances.

5,198,217

TOPICAL DEMULCENT FOR VIRAL AND INFLAMMATORY DISEASES OF THE SKIN

Neylan A. Vedros, Alameda, Calif., assignor to Choice Pharmaceuticals, San Leandro, Calif.

Filed Sep. 24, 1991, Ser. No. 764,486

Int. Cl.[5] A61K *35/78, 31/715*

U.S. Cl. 424—195.1 13 Claims

1. A composition suitable for providing a topical dermatological spray comprising

tannic acid, licorice root extract, carrageenan, and a pharmacologically acceptable fluid carrier,

wherein the concentration of tannic acid is in the range of approximately 0.8% to 1.5% w/v, licorice root extract is in the range of approximately 0.025% to 0.75% w/v, and carrageenan is in the range of approximately 0.1% to 1.5% w/v.

5,198,218

CLEAR COSMETIC STICKS WITH COMPATIBLE FRAGRANCE COMPONENTS

Matthew Kuzaitz, Branford; David A. Brewster, Shelton; Joseph R. Faryniarz, Oxford; Lewis Cancro, Trumbull, all of Conn., and Hifzur R. Ansari, Old Tappan, N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Division of Ser. No. 652,856, Feb. 8, 1991, Pat. No. 5,114,717. This application Mar. 11, 1992, Ser. No. 850,185

Int. Cl.[5] A61K *7/00*

U.S. Cl. 424—401 12 Claims

1. A clear stick composition comprising:

(i) from about 10 to about 90% of a polyhydric alcohol having from 2 to 6 carbon atoms and from 2 to 6 hydroxyl groups;

(ii) from about 1 to about 40% of a soap which is a C_{12}–C_{22} fatty acid of a salt selected from the group consisting of sodium, potassium and alkanolammonium salts;

(iii) from about 1 to about 40% of an alkoxylate copolymer having the following formula:

$$R_f[(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_c(C_3H_6O)_d]_e[H]_g$$

wherein R is selected from the group consisting of hydrogen, a C_{10}–C_{22} fatty alkoxide chain, ethylenediamine and combinations thereof;

a, b, c and d are independently selected integers ranging from 0 to 200 with proviso that sum of a, b, c and d is at least 5 and no higher than 95;

e is an integer from 1 to 4;

f is an integer from 0 to 1;

g is an integer from 0 to 4; and

(iv) an effective amount of a fragrance to impart a pleasant odor to said composition, said fragrance including from 25% down to 0.1% of total ester compounds by weight of said fragrance.

5,198,219

ATTRACTIONS FOR THE ROSE CHAFTER *MACRODACTYLUS SUBSPINOSUS* (F.)

Roger N. Williams, Wooster; Dan S. Fickle, Burbank, both of Ohio, and Terrence P. McGovern, deceased, late of Bowie, Md. by Mary Jo McGovern, sole heir , assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1990, Ser. No. 626,934

Int. Cl.[5] A01N *25/00*

U.S. Cl. 424—405 12 Claims

1. A composition for attracting insects comprising a mixture of (1) trans-2-nonenol, and (2) an organic acid component selected from the group consisting of valeric acid, hexanoic acid mixtures thereof and wherein the concentration of trans-2-nonenol is between about 0.1 and 99.9%.

5,198,220

SUSTAINED RELEASE COMPOSITIONS FOR TREATING PERIODONTAL DISEASE

Nalinkant C. Damani, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 439,066, Nov. 17, 1989, abandoned. This application Aug. 24, 1990, Ser. No. 573,604

Int. Cl.[5] A61K *47/22, 47/34*

U.S. Cl. 424—426 7 Claims

1. A liquid, semi-solid or solid composition suitable for insertion into or around the periodontal pocket of a person or lower animal suffering from diseases of the oral cavity comprising a copolymer of lactide and glycolide in a concentration from about 10% to about 90% wherein the molar percentage centage of lactide units is from about 15% to about 85%, a active drug selected from the group consisting of antiinflammatory agents, antimicrobials, antibiotics, peroxides, anesthetic agents and vitamins in a concentration from about 1% to about 90% and propylene carbonate in a concentration from about 0.1% to about 90%, the ratio of the components being such that the drug active is released at a rate to provide steady state number average concentrations of from about 10 micrograms to about 2000 micrograms per milliliter of the gingival crevicular fluid of a treated periodontal pocket.

5,198,221

PHARMACEUTICAL COMPOSITION

Andrew R. Clark, Loughborough, and Anne M. Hollingworth, Shepshed, both of England, assignors to Fisons plc, England

Continuation of Ser. No. 522,998, May 14, 1990, abandoned. This application Feb. 12, 1992, Ser. No. 835,014

Claims priority, application United Kingdom, May 17, 1989, 8911259

Int. Cl.[5] A61K *9/14, 9/16, 9/48*

U.S. Cl. 424—434 11 Claims

1. A pharmaceutical inhalation composition comprising particulate medocromil sodium with a mass median diameter of from 5 to 10 μm and a particle size geometric standard deviation of from 1.5 to 3.0 in admixture with a solid pharmaceutically acceptable carrier having an effective particle size of from 30 to 120 μm.

5,198,222

TIME RELEASE BOLUS

Marian O. Scully, Estancia, and David Woodling, Albuquerque, both of N. Mex., assignors to AgriBioTech, Inc., Las Vegas, Nev.

Filed Aug. 31, 1990, Ser. No. 575,583

Int. Cl.[5] A23K *1/18*

U.S. Cl. 424—438 14 Claims

1. A bolus adapted to contain and release over an extended period of time a composition, the bolus comprising:

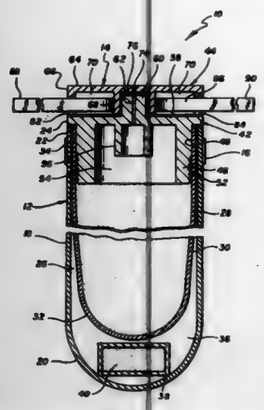
a tubular member having a side wall, a closed end, and an open end;

an inner containment member adapted to be located within the tubular member, the inner containment member adapted to contain the composition;

an end cap member sealingly fixed to the open end of the tubular member, the end cap member having an outer wall and a passage means therethrough to permit a flow of the composition from the tubular member to the outside of the bolus, the end cap member further comprising ridges on the outer water to facilitate fixing of the end cap member to the tubular member;

pressure means inside the tubular member and outside the inner containment member for pressure the composition thereby urging the composition towards the passage means;

flow restraint means for controlling flow rate of composition from the end cap member, the flow restraint means including a flow mesh located in the end cap in a path of the passage means;
radial arms on the end cap member.



5,198,223
TRANSDERMAL FORMULATIONS, METHODS AND DEVICES
Robert M. Gale; Diane E. Nedlerge, both of Los Altos, and Linda E. Atkinson, Portola Valley, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Continuation-in-part of Ser. No. 605,726, Oct. 29, 1990, Pat. No. 5,122,382. This application Mar. 9, 1992, Ser. No. 848,578
The portion of the term of this patent subsequent to Jun. 6, 2009, has been disclaimed.
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—449 **21 Claims**

1. A composition of matter for the transdermal administration of a drug formulation comprised of an estrogen and ST-1435, the composition comprising, in combination, an amount of the drug formulation to deliver at least 10 g/day of estrogen and at least 20 μg/day of ST-1435 and a skin permeation-enhancing amount of a suitable permeation enhancer, the permeation enhancer being selected from C_{2-4}alcohols, polyethylene glycol monolaurate, polyethylene glycol-3-lauramide, dimethyl lauramide, esters of fatty acids having from about 10 to about 20 carbon atoms, diglycerides of fatty acids, triglycerides of fatty acids, and monoglycerides or mixtures of monoglycerides of fatty acids having a total monoesters content of at least 51% where the monoesters are those with from 10 to 20 carbon atoms.

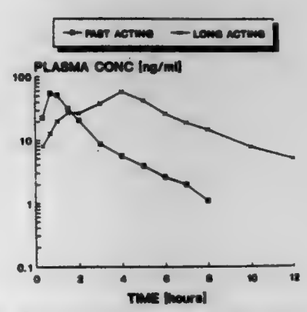
5,198,224
POLYPEPTIDE THIN FILM
Mitsunori Ono, and Naoyuki Nishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 16, 1990, Ser. No. 614,484
Claims priority, application Japan, Nov. 17, 1989, 1-299160
Int. Cl.[5] A61K *9/127*; C08G *69/10*; C07F *9/10*
U.S. Cl. 424—450 **8 Claims**

1. A polypeptide thin film comprising a monomolecular film or a built-up film comprising an amphipathic phospholipid compound, wherein said amphipathic phospholipid compound has: (a) a hydrophobic portion comprising an organic group having only single bonds in the backbone, and (b) a hydrophilic portion having an amino acid ester structure in the molecule, said amino acid ester structure containing a splitting-off group with a pKa value of the conjugated acid thereof being 16 or below, wherein said amphipathic phospholipid compounds are joined covalently by amino bonding between the amino acid residues.

5,198,225
HYDRATED LIPIDIC LAMELLAR PHASES OR LIPOSOMES BASED ON ECDYSTEROIDS
Alain Meybeck, Courbevoie, and Frederic Bonte, Boulogne, both of France, assignors to LVMH Recherche, Colombes Cedex, France
PCT No. PCT/FR89/00507, § 371 Date Mar. 22, 1991, § 102(e) Date Mar. 22, 1991, PCT Pub. No. WO90/03778, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 2, 1989, Ser. No. 671,682
Claims priority, application France, Oct. 3, 1988, 88 12909
Int. Cl.[5] A61K *9/127*
U.S. Cl. 424—450 **46 Claims**

1. A composition comprising hydrated lipidic lamellar phases or liposomes containing at least one ecdysteroid in a concentration ranging between 0.0001 and 5% by weight of the composition.

5,198,226
LONG ACTING NICARDIPINE HYDROCHLORIDE FORMULATION
Calum B. MacFarlane, Linlitchgow; Alastair B. Selkirk, Edinburgh, and Michael J. Dey, East Calder, all of Scotland, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Continuation of Ser. No. 526,862, May 22, 1990, abandoned, which is a division of Ser. No. 57,469, Jul. 26, 1987, Pat. No. 4,940,556, which is a continuation-in-part of Ser. No. 940,878, Dec. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 823,896, Jan. 30, 1986, abandoned. This application Nov. 12, 1991, Ser. No. 794,356
Int. Cl.[5] A61K *9/52, 31/44*
U.S. Cl. 424—457 **10 Claims**



1. A long acting sustained release pharmaceutical composition for administration of a therapeutically effective amount of non-amorphous nicardipine hydrochloride, which comprises essentially spherical, non-coated, non-rugose particles having diameters of about 0.5 millimeters to 1.2 millimeters, comprised of about 10 to 25 weight percent of said non-amorphous nicardipine hydrochloride in intimate admixture with about 5 to 25 weight percent of a pH-dependent binder which is less soluble at lower pH and more soluble at higher pH.

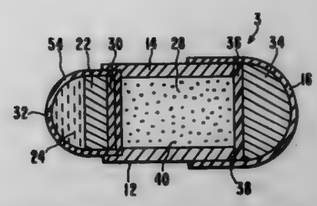
5,198,227
DUAL SUBCOATED SIMULATED CAPSULE MEDICAMENT
Marli F. Batista, Gwynedd, and Thomas J. Markley, Lansdale, both of Pa., assignors to McNeil-PPC, Inc., Milltown, N.J.
Filed Jan. 22, 1990, Ser. No. 468,434
Int. Cl.[5] A61K *9/48*
U.S. Cl. 424—463 **9 Claims**

1. A process for preparing a simulated capsule medicament comprising the steps of: granulating and compressing a mixture of medicament and excipients to form a solid caplet core; then applying a dual subscoating comprising initial coating containing povidone then a second coating containing povidone, hydroxypropyl methylcellulose, or a mixture of both and castor oil to the solid caplet core thereby providing a subcoated caplet core; thereafter applying a smooth outer gelatinous contain to the subcoated caplet core to provide a smooth, uniform and substantially bubble free outer coating appearance to the capsule medicament.

5,198,228
DIRECT DRY COMPRESSIBLE ACETAMINOPHEN TABLET
Joseph J. Urban, Richboro, Pa., and Richard R. Makowski, South Plainfield, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.
Division of Ser. No. 407,047, Sep. 14, 1989, Pat. No. 5,037,658. This application May 15, 1991, Ser. No. 700,735
Int. Cl.[5] A61K *31/05, 9/26*
U.S. Cl. 424—469 **3 Claims**

1. An analgesic tablet comprising discretely bound granules, which granules comprise:
(a) from about 70 percent to about 94 percent by dry weight of the tablet of acetaminophen;
(b) from about 1.7 to about 9.0 percent by dry weight of the tablet of a metal carboxymethyl starch;
(c) from about 3.0 percent to about 6.0 percent by dry weight of the tablet of pregelatinized starch;
(d) from about 1.0 percent to about 10.0 percent by dry weight of the tablet of an ungelatinized starch;
(e) up to about 2.5 percent by dry weight of the tablet of an auxiliary binder selected from the group consisting of a homopolymer of vinyl acetate and vinyl pyrrolidone, a copolymer of vinyl acetate, vinyl pyrrolidone, cellulose acetate, and mixtures of the foregoing,
(f) up to about 2.5 percent by dry weight of the tablet of an auxiliary lubricant; and which granules have,
(i) a central core comprising (a), about two-thirds of the total amount of (b), which functions at least as a disintegrating agent, (c) and (e); and
(ii) an external layer, comprising (d) and about one-third of the total amount of (b), where each at least functions as a disintegrating agent, covering at least a portion of said central core and, wherein the mixture comprising acetaminophen, pregelatinized starch, and metal carboxymethyl starch, prior to addition of ungelatinized starch, has a moisture content within the range of 0.8 percent to 2.3 percent of the dry weight of said mixture wherein said mixture has fines of not more than 20 percent of which pass through a 140-mesh screen.

5,198,229
SELF-RETAINING GASTROINTESTINAL DELIVERY DEVICE
Patrick S. L. Wong, Palo Alto; Felix Theeuwes, Los Altos, and Steven D. Larsen, Dublin, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Filed Jun. 5, 1991, Ser. No. 710,607
Int. Cl.[5] A61K *9/24*
U.S. Cl. 424—473 **6 Claims**



1. A fluid-imbibing delivery device for dispensing an active agent to the stomach environment over a predetermined prolonged period of time of from several hours to months, wherein the device has a first, low density relative to the stomach environment of from about 0.5 to about 0.7 such that it floats in the stomach contents for the predetermined prolonged period of time, during which prolonged period of time it dispenses the active agent to the stomach, and has a second, higher density of from about 1.2 to about 1.4 such that the device sinks in and exits the stomach at the end of the predetermined prolonged period of time, the device comprising:
(a) a housing comprising at least a first wall section and a second wall section, the first and second wall sections being in reversibly sliding telescoping arrangement with each other, the first wall section having an open end adapted to fit within the second wall section, which housing maintains its integrity in the stomach environment;
(b) an active agent delivery chamber within the housing comprising
(i) at least one active agent formulation,
(ii) a first expansion means comprising an osmopolymer, an osmagent, or a mixture of an osmopolymer and an osmagent, and
(iii) an exit means;
(c) a bouyancy chamber within the housing, the bouyancy chamber having an open end defined by the open end of the first wall section; and
(d) an expansion chamber within the housing for separating apart the first and second wall sections after the predetermined prolonged period of time, the expansion chamber comprising
(i) a second expansion means comprising an osmopolymer, an osmagent, or a mixture of an osmopolymer and an osmagent, and
(ii) a push plate adjacent the open end of the first wall section.

5,198,230
COMPOSITION CALLED DTS (DEITIES) FOR THE TREATMENT OF ADDICTIVE DISEASE
Liu C. Wen, Flat A2, 6/F., Flora Garden, 50, Cloud View Road, Hong Kong, Hong Kong
Filed Jan. 8, 1991, Ser. No. 638,780
Claims priority, application China, Jan. 8, 1990, 90100203.8
Int. Cl.[5] A61K *35/12, 35/78, 33/36*
U.S. Cl. 424—525 **8 Claims**

1. A composition for treating the symptoms of withdrawal from addictive substances comprising 25% Zanthoxylum nitidum or Cordyceps powder, 15% Datura stramonium or Flos Daturae Powder, 10% Aconitine powder, 10% Cystine powder, 10% Bungarus powder, 6.5% Scolopendra powder, 5% Scorpions powder, 4.5% Officinale baill powder, 4% Bismuthi

subnitras powder, 3% Realgar powder, 2.5% Licorice root acid, 2% Angelica siniensis powder, 1% Ox gallstone or Bilirubin powder, 0.5% Toad powder, 0.5% Miskone, 0.3% Aeropinum, and 0.2% D. Camphora colebr.

5,198,231

FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

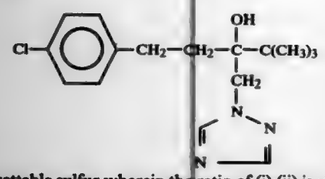
Division of Ser. No. 762,274, Sep. 19, 1991, Pat. No. 5,137,903, which is a division of Ser. No. 587,193, Sep. 24, 1990, Pat. No. 5,082,895, which is a division of Ser. No. 487,680, Mar. 2, 1990, Pat. No. 4,990,527, which is a division of Ser. No. 330,331, Mar. 29, 1989, Pat. No. 4,933,337, which is a division of Ser. No. 193,437, May 12, 1988, Pat. No. 4,845,111, which is a continuation of Ser. No. 89,698, Aug. 26, 1987, abandoned, which is a division of Ser. No. 801,549, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 646,591, Aug. 31, 1984, abandoned. This application Apr. 8, 1992, Ser. No. 865,008

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333411

Int. Cl.[5] A01N *43/64, 59/02*

U.S. Cl. 424—713 **2 Claims**

1. A synergistic fungicidal composition comprising a synergistic fungicidally effective amount of



and (ii) wettable sulfur wherein the ratio of (i):(ii) is about 1:50.

5,198,232

INJECTION MOULDING APPARATUS

John B. Thorathwaite, and Robert Naismith, both of Nottingham, England, assignors to Games Workshop Limited, Nottinghamshire, United Kingdom

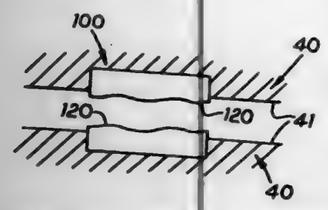
Continuation of Ser. No. 652,670, Feb. 8, 1991, Pat. No. 5,151,232, which is a division of Ser. No. 551,647, Jul. 12, 1990, Pat. No. 5,013,228, which is a continuation of Ser. No. 248,068, Sep. 23, 1988, abandoned. This application May 17, 1991, Ser. No. 701,856

Claims priority, application United Kingdom, Jul. 26, 1987, 8722668

The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.

Int. Cl.[5] B29C *45/46, 45/40*

U.S. Cl. 425—2 **11 Claims**



1. A mold for a thermoplastics injection molding machine, comprising:

a first mold part having a relatively rigid body portion and an abutment face within said rigid body portion;

at least one additional mold part having a relatively rigid body portion and an abutment face within said rigid body portion of said additional mold part which may abut said abutment face of said first mold part;

said relatively rigid body portion of said first mold part further having a recess within its said abutment face and a mold insert being made of resilient material and having a contact face and positioned with said recess and said contact face projecting above said abutment face such that when the first and at least one additional mold part are positioned against one another the contact face of said mold insert first contacts the abutment face of said additional mold part and is compressed by said additional mold part and, upon further closing, the abutment face of said first mold part abuts the abutment face of said additional mold part and a mold cavity is formed by the mold insert of the first mold part, said mold cavity being suitable for forming a molded article by thermoplastics injection molding and when the first and at least one additional mold part are moved away from one another they permit removal of said molded article;

an injection means for injecting thermoplastics fluids under pressure; and

an inlet channel open at one end to said injection means and open at the other end to said mold cavity.

5,198,233

APPARATUS FOR PRODUCING GRANULES OR PASTILS FROM FLOWABLE MATERIAL

Herbert Kaiser, Friedenstr. 241, Krefeld, Fed. Rep. of Germany

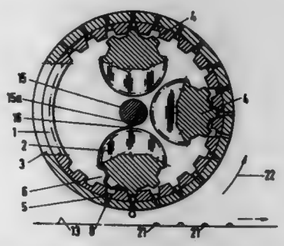
PCT No. PCT/EP89/01212, § 371 Date Dec. 5, 1990, § 102(e) Date Dec. 5, 1990, PCT Pub. No. WO90/03839, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 12, 1989, Ser. No. 623,949

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834785; Feb. 1, 1989, 3902957

Int. Cl.[5] B29B *9/00*

U.S. Cl. 425—6 **16 Claims**



1. Apparatus for producing granules from flowable materials of different viscosities in which the material is supplied to a pressing nip formed between a rotating hollow roll and an ejection roll, said apparatus comprising a hollow roll having an inner peripheral area provided with internal toothing and an outer peripheral area; an ejection roll having an external toothing in engagement with said internal toothing; bores extending from teeth bottoms of the internal toothing of said hollow roll to the outer peripheral area thereof and through which the material is ejected on engagement with said ejection roll causing said material to be deposited in the form of granules on a cooling surface; and, a jacket tube releaseably secured over said outer peripheral area of said hollow roll, said jacket tube comprising bores which align with said bores of said hollow roll, said bores of said jacket tube having a predetermined diameter; further wherein said jacket tube is readily interchangeable with at least one other jacket tube having bores of another predetermined diameter selected to process material having a different viscosity.

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5,198,234

VEHICLE TIRE LOADING-UNLOADING AND STABILIZING DEVICE

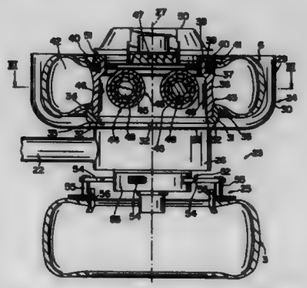
Karl J. Siegenthaler, Rome-Ostia, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jul. 3, 1991, Ser. No. 725,847

Claims priority, application Italy, Jul. 27, 1990, 67593 A/90

Int. Cl.[5] B29C *35/02*

U.S. Cl. 425—28.1 **11 Claims**



1. A device for loading-unloading and stabilizing vehicle tires comprising a mobile loading-unloading unit having an upper unit for supporting a first tire, and a lower unit having means whereby to support a second tire; said upper unit being a stabilizing unit including means for supplying pressurized fluid inside said first tire and inflating same to a given pressure; said supply means including a closed circuit means for circulating said pressurized fluid, said circuit means being defined at least partially by said first tire and including heat exchange means located outside said first tire, for cooling said pressurized fluid.

5,198,235

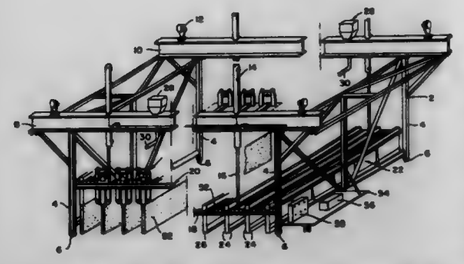
APPARATUS FOR VERTICAL SLIPFORMING OF CONCRETE WALLS

Stuart W. M. Reichstein, and Gerals R. Goldgraben, both of 14808 Keeneland Cir., North Potomac, Md. 20878

Continuation-in-part of Ser. No. 674,143, Mar. 25, 1991, abandoned. This application Nov. 12, 1991, Ser. No. 790,069

Int. Cl.[5] E04G *11/22*

U.S. Cl. 425—62 **7 Claims**



1. Apparatus for vertical slipforming of concrete walls, comprising

(a) a mobile rigid integral frame;

(b) at least one strongback assembly suspended from said frame;

(c) a plurality of slipform assemblies connected with said strongback assembly, each of said slipform assemblies comprising a pair of spaced adjustable vertical forms having opposed planar surfaces defining a cavity;

(d) concrete supply means connected with said frame for delivering concrete to said cavities of said slipform assemblies;

(e) means for vertically displacing said slipform assemblies incrementally relative to said frame as the concrete sets within said cavities and further concrete is supplied thereto, thereby to continuously and simultaneously cast a plurality of concrete panels having a vertical orientation;

(f) means for controlling said concrete supply means and said vertical displacing means in accordance with progressive setting of the concrete within said cavities, thereby to continuously and simultaneously cast a plurality of concrete panels having a vertical orientation with maximum efficiency;

(g) means for sensing the position of said vertical displacing means and said slipform assemblies and for sensing the condition of the concrete during the slipforming operation, said sensing means producing output signals to said controlling means which processes said signals and adjusts said concrete supply means and said vertical displacing means responsive to said signals, thereby to automate the slipforming operation; and

(h) a plurality of ground-engaging wheels connected with a bottom portion of said frame enabling said frame to be transported to and positioned along the ground at a job site for forming vertical walls at a desired location.

5,198,236

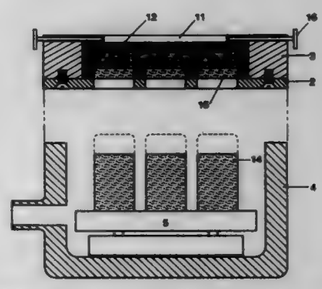
APPARATUS FOR FORMING STRUCTURAL COMPONENTS FROM DRY WOOD FIBER FURNISH

Dennis E. Gunderson, Madison, and Roland L. Gleisner, Jefferson, both of Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 25, 1991, Ser. No. 675,979

Int. Cl.[5] B27N *3/08*

U.S. Cl. 425—80.1 **8 Claims**



1. Apparatus for forming a product of pretreated wood fiber from a mat of air-laid wood fiber, said product having non-uniform cross-sectional shapes and a substantially uniform density, comprising molding apparatus means, movable rigid porous mandrel means operatively associated within said molding apparatus means having at least one mandrel, means to mount said mandrel means within said molding apparatus means, removable perforated plate means operatively associated within said molding apparatus means, means to mount said plate means in said molding apparatus means so that said mandrel means may move through openings in said plate means, frame means mounted to said plate means, removable rib compacting grid means operatively associated with said mandrel means, means to flow air through said molding apparatus means and said mandrel means, means to supply said wood fiber in a dry condition into said air flow to cause said wood fibers to deposit in spaces around said mandrel means on said plate means while said mandrel means are in a first position in said molding apparatus means, platen means for compacting said deposited wood fiber to form a mat, said frame means, said plate means and said platen means together with said mat being

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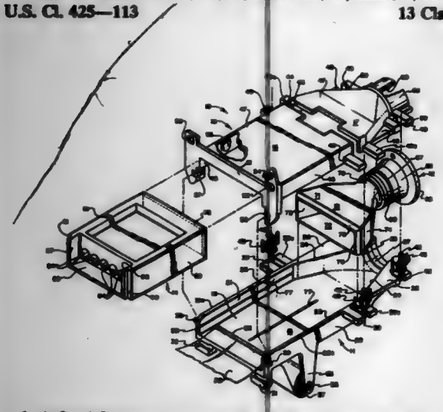
removeable as a unit from said molding apparatus means to allow formation of additional mats, resilient pillow means attached to rigid block means adapted to fit into cavities formed by said mandrel means in said mat, means for applying mat consolidation force onto said platen means to urge said block means into the corresponding openings in said plate means, means for applying increased mat consolidation force onto said platen means to cause said pillow means to deform to thereby apply substantially equal pressure in all directions throughout said mat, and means for heating said mat to cure said wood fiber.

5,198,237

EXTRUSION DIE ARRANGEMENT FOR ATTACHMENT TO A FOOD GRINDER

Ernest Colosimo, 3336 S. 8280 West, Salt Lake City, and Gabriel A. Colosimo, 8480 W. 3500 South, Magna, both of Utah 84044

Filed Nov. 26, 1990, Ser. No. 617,687
Int. Cl.[5] B29C *47/12, 47/08;* A23N *15/00;* A22C *7/00*
U.S. Cl. 425—113 **13 Claims**



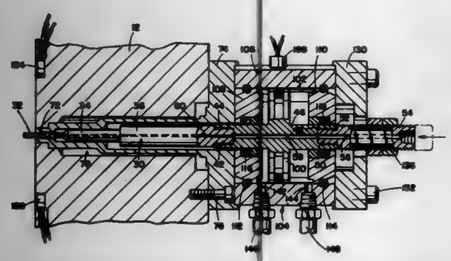
1. A food forming apparatus comprising a housing; a forming block having at least one passage therethrough insertable into and removable from the housing; an adapter releasably coupled to the housing; and means connected to the adapter for releasably connecting said adapter to the discharge of a food grinder or extruder.

5,198,238

APPARATUS HAVING AN IN-THE-MOLD GAS INJECTION PIN

Indra R. Baxi, Solon, Ohio, assignor to Nitrojection Corporation, Middlefield, Ohio

Filed May 16, 1991, Ser. No. 701,122
Int. Cl.[5] B29C *45/76*
U.S. Cl. 425—130 **24 Claims**



1. An apparatus for use in gas-assisted injection molding of plastic material so as to form an injection molded product, the apparatus comprising:

a pair of mold members defining, when closed, a sealed cavity;

a means for supplying a pressurized plastic material;

a first opening provided in one of said mold members for allowing the injection of the plastic material into said cavity;

a means for supplying a pressurized gas;

a second opening provided in one of said mold members, for allowing the injection of the pressurized gas into said cavity;

a probe located in said second opening and reciprocated therein from a retracted position to an extended position, said probe comprising:

a first end, adapted to selectively extend into said cavity,

a second end, and

a first longitudinally extending bore which terminates in a port located adjacent said first end, said first bore being used to guide the gas into said cavity; and,

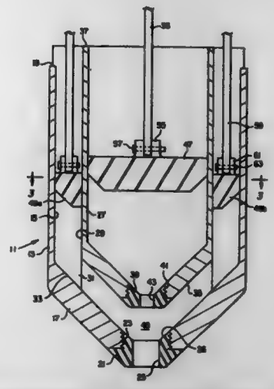
a piston and cylinder construction for reciprocating said probe in relation to said cavity, said construction comprising a piston and a piston rod mounted for reciprocating movement in a cylinder, said probe being secured to an end of said piston rod, a second bore extending longitudinally through said piston rod and communicating with said first bore wherein said probe is connected to said means for supplying said pressurized gas so that said gas passes through said first and second bores of said probe when in said extended position.

5,198,239

APPARATUS FOR CO-EXTRUDING TWO FOOD PRODUCTS

Charles T. Beavers, 621 Worthview, Fort Worth, Tex. 76114

Filed Jul. 8, 1991, Ser. No. 726,911
Int. Cl.[5] B29C *47/06, 47/26*
U.S. Cl. 425—133.1 **14 Claims**



1. An apparatus for co-extruding inner and outer food products, comprising in combination:

a tubular outer housing having a longitudinal axis and an outer housing outlet port located on a forward end of the outer housing on the longitudinal axis, the outer housing having a cylindrical inner wall;

a tubular inner housing having an inner housing outlet port located on a forward end of the inner housing, the inner housing having a cylindrical inner wall and a cylindrical outer wall;

mounting means for mounting the inner hosing within the outer housing concentrically on the axis of the outer housing with the inner housing outlet port located on the longitudinal axis;

the inner housing having a lesser outer diameter than the inner diameter of the outer housing, defining an annular passage between the outer wall of the inner housing and the inner wall of the outer housing;

an inner portion reciprocally carried within the inner wall of the inner housing;

an outer piston reciprocally carried within the annular passage; and

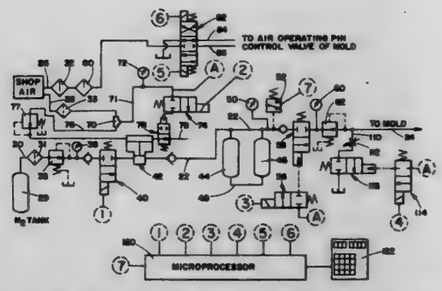
actuator means for pushing the pistons forward simultaneously to extrude the inner and outer food products through the inner and outer housing outlet ports, with the outer food product forming a layer around the inner food product wherein the mounting means comprises at least two centralizers located within the annular passage, each centralizer being a thin flat extending from the outer wall of the inner housing to the inner wall of the outer housing.

5,198,240

PRESSURIZATION CONTROL UNIT FOR A GAS-ASSISTED INJECTION MOLDING MACHINE

Indra R. Baxi, Solon, Ohio, assignor to Nitrojection Corporation, Middlefield, Ohio

Continuation of Ser. No. 555,239, Jul. 19, 1990, abandoned. This application Oct. 24, 1991, Ser. No. 782,908
Int. Cl.[5] B29C *45/77*
U.S. Cl. 425—145 **25 Claims**



1. A pressurization control unit for use in a gas-assisted injection molding process, comprising:

a housing;

a gas inflow conduit located in said housing and having one end extending to an outer periphery of said housing;

a pump, located in said housing and in fluid communication with another end of said gas inflow conduit, for pressurizing a gas;

a gas storage means, located in said housing and in fluid communication with said pump, for storing the pressurized gas;

a gas outflow conduit located in said housing and having one end extending to an outer periphery of said housing, another end of said gas outflow conduit being in fluid communication with said gas storage means;

a valve means provided in said gas outflow conduit for selectively allowing an outflow of the pressurized gas from said gas storage means; and,

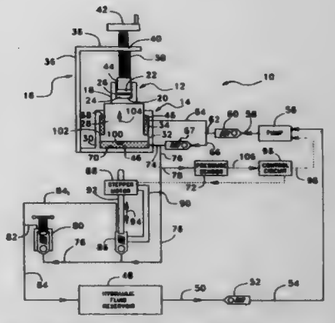
a first control means comprising a microprocessor, located in said housing, for directly actuating said pump and controlling an operation of said valve means.

5,198,241

APPARATUS FOR PREPARATION OF SAMPLES FOR SPECTROGRAPHIC ANALYSIS

Joseph Marcovecchio, Berkeley Heights, and Joseph M. Katzenberger, Lebanon, both of N.J., assignors to Spex Industries, Inc., Edison, N.J.

Filed Jan. 29, 1991, Ser. No. 647,419
Int. Cl.[5] B29C *43/00*
U.S. Cl. 425—149 **6 Claims**



1. Sample pelletization apparatus for compressing a sample by hydraulic pressure said apparatus including automated pressure control means and comprising:

a) a die for receiving said sample in compressible form;

b) an abutment for holding said sample in a fixed position against said hydraulic pressure;

c) hydraulic piston-and-cylinder means positioned to drive said die in a direction toward said abutment;

d) a pump for feeding hydraulic fluid to pressurize said piston-and-cylinder means to a working pressure; and

e) a pressure control valve coupled to said piston-and-cylinder means for controlling the working pressure in said hydraulic cylinder, said pressure control valve comprising:

i) a sealing member;

ii) a valve seat defining an outlet configured, dimensioned and positioned to engage said sealing member with said sealing member closing said outlet;

iii) compressible spring means for urging said sealing member towards said seat, closing said outlet;

iv) a backing member putting said spring means under compression by maintaining a distance between said backing member and said seat;

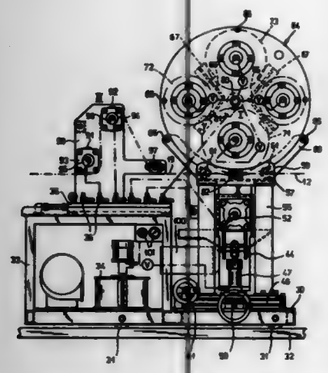
v) mechanical structure for adjusting said distance to actuate said pressure control valve, said mechanical structure comprising a stepper motor rigidly mounted with respect to said seat, said stepper motor having a shaft engageable with said backing member and indexable to move said backing member toward and away from said valve seat whereby the compression of said spring means is adjustable;

f) means for detecting the pressure of hydraulic fluid in said hydraulic cylinder and means for controlling said stepper motor in response thereto; and

g) manually settable control circuit means programmed to cause said shaft of said stepper motor to pull away in a first direction from said seat by a first number of steps which is less than that needed to cause a desired change in said working pressure in the hydraulic cylinder and then proceed in a second direction opposite to said first direction a second number of steps smaller than said first number of steps and then alternate in the first direction and the second direction with numbers of steps resulting in net movement in a desired direction, said control circuit being programmed to cause said shaft to alternately move in said

first direction and in said second direction until pressure is reduced to a desired value.

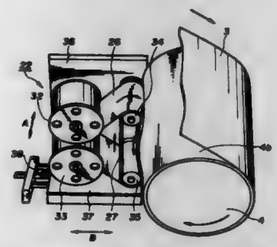
5,198,242
ROTARY TURRET EMBOSSER
Hans Groeblacher; Horst Eigruber, and Ludwig Reisinger, all of McPherson, Kans., assignors to American Maplan Corporation, McPherson, Kans.
Filed Dec. 10, 1991, Ser. No. 805,862
Int. Cl.[5] B29C *59/04*
U.S. Cl. 425—150 12 Claims



1. In an extrusion line for producing a sheet extrusion of a plastic material, an embossing apparatus comprising:
a base;
a backing roll mounted on said base for rotation about a substantially horizontal backing-roll axis;
means on said base operatively connected with said backing roll for driving said backing roll;
a revolver mounted on said base above said backing roll and rotatable about a substantially horizontal revolver axis, said revolver comprising:
a rotatable support, and
a plurality of embossing rolls angularly spaced on said support about said revolver axis and journaled in said support for rotation about respective embossing-roll axes; and
indexing means on said base and said support for indexing said embossing rolls selectively in positions wherein said embossing rolls are individually positioned above said backing roll to emboss an extrusion advanced through a gap between the backing roll and a selected embossing roll positioned thereabove by rotation of said backing roll.

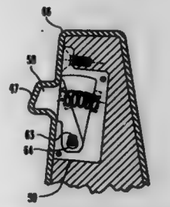
5,198,243
CALENDERING ROLL CLEANING APPARATUS
Tatsuo Shimizu; Osamu Yamaura; Toshio Soneta, and Takashi Aoya, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 1, 1991, Ser. No. 723,602
Claims priority, application Japan, Jul. 2, 1990, 2-175115; Apr. 19, 1991, 3-113830
Int. Cl.[5] B29C *37/00*
U.S. Cl. 425—230 5 Claims

1. A cleaning apparatus for cleaning the surface of a calendering roll comprising
a cleaning tape for wiping off foreign matter which has become affixed to the surface of the calendering roll, a cleaning tape running mechanism for running the cleaning tape in sliding contact with the surface of the calendering roll, and a elastic belt for pressing the cleaning tape into contact with the surface of the calendering roll,
wherein at least the surface of said elastic belt facing said cleaning tape is roughened, and said elastic belt has an A



hardness as measured by the spring type hardness test of JIS K6301 as 40° to 90°.

5,198,244
RETRACTABLE MOLD PROTRUSION ASSEMBLY
Keith A. Rice, Henderson, Ky., assignor to American Sheet Extrusion Corporation, Evansville, Ind.
Filed Apr. 27, 1992, Ser. No. 874,021
Int. Cl.[5] B29C *33/02, 33/34*
U.S. Cl. 425—383 17 Claims

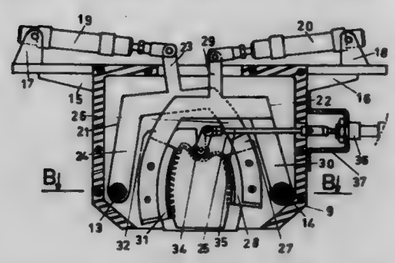


1. A retractable mold protrusion assembly comprising:
a housing having a molding surface, a cavity therein, and an opening into said cavity through said molding surface;
a protrusion molding member mounted to said housing and having a protrusion, said protrusion molding member being movable with respect to said housing between:
a locked configuration in which said protrusion molding member is securely held in a protruding position such that said protrusion protrudes away from said molding surface of said housing and wherein a piece may be molded about said protrusion to form a desired protrusion in the piece being formed, and a pivoting configuration in which said protrusion molding member is pivotable about a pivot axis with respect to said housing to a retracted position such that at least a part of said protrusion is received within said cavity when said molding member is pivoted to said retracted position; and
biasing means for returning said molding member to said locked configuration from said retracted position.

5,198,245
APPARATUS FOR THE MANUFACTURE OF EXTRUDED CAKES
Alain Daouse, Noailles, France, assignor to Nestec S.A., Vevey, Switzerland
Filed Feb. 21, 1990, Ser. No. 482,830
Claims priority, application European Pat. Off., Mar. 2, 1989, 89103603.0
Int. Cl.[5] A01J *11/00*; B29C *59/00*
U.S. Cl. 425—385 7 Claims

1. An apparatus for producing decorative extruded cakes comprising:
a nozzle having a passage and discharge opening in a shape

of an arch having curved lateral parts and a curved upper part having teeth forming a toothed profile;
movable curved comb parts having toothed profiles positioned adjacent each lateral part and the upper part of the arch at the nozzle discharge passage opening so that the comb parts pivot and reciprocate about eccentric axes

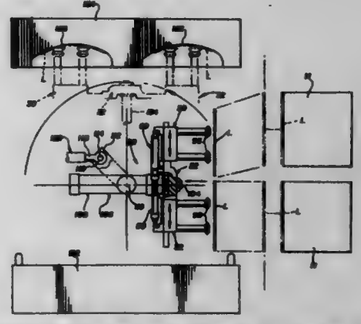


relative to a central axis of the arch with an alternating rotational movement so that the comb parts follow a curvature of the lateral and upper parts of the nozzle arch passage; and
at least one jack connected to the movable comb parts for actuating movement of the parts.

5,198,246
CONCRETE MOLDING DEVICE
Kenneth T. Bowen, Frederick, Md., assignor to Monoform, Inc., Frederick, Md.
Filed Sep. 27, 1990, Ser. No. 588,839
Int. Cl.[5] E02D *29/12*
U.S. Cl. 425—432 6 Claims

1. A concrete molding device for settling poured concrete comprising a form comprised of a cylindrical portion and a conical portion, the base of said conical portion being secured to the top of said cylindrical portion, each of said cylindrical and conical portions being comprised of a plurality of segments stacked one on top of the other, each of said segments including inwardly directed strengthening flanges at the top and bottom of the inner surfaces thereof, means joining together the flange of one segment to the flange of an adjacent segment to provide joined flanges which secure said one segment to said adjacent segment, and vibratory means for settling concrete poured around the outside of the form, said vibratory means comprising a vibratory unit including a base portion including a slot therein in which is received said joined flanges and the internal shape of which conforms and mates with the external shape of the joined flanges received therein so as to provide a tongue and groove mount for said vibratory unit, and at least one connector bolt securing the base portion of the vibratory unit to said joined flanges.

5,198,247
IN-MOLD LABELLERS FOR A DUAL CAVITY MOLD
George F. Bartimes, Chicago, Ill., and Leonard A. Blomquist, Williamsburg, Va., assignors to Continental Plastic Containers, Inc., Norwalk, Conn.
Filed Oct. 31, 1990, Ser. No. 607,041
Int. Cl.[5] B29C *49/24*
U.S. Cl. 425—503 9 Claims

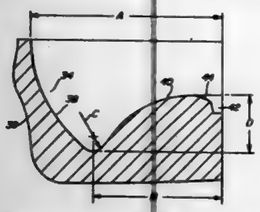


1. An in-mold labeller for applying two labels simultaneously to two cavities of a mold half of a dual cavity mold having two mold halves wherein the total width of two labels in said dual cavity mold is greater than a spacing of said mold halves when open, said labeller comprising a dual stack label magazine, and a transfer device for transferring labels from said magazine to each cavity of said dual cavity mold half, said transfer device comprising a support member, an extensible fluid motor supporting said support member for retraction and projection, pivot support means mounting said extensible fluid motor for selectively presenting said support member to said magazine and to a mold half, pivot means for pivoting said extensible fluid motor, a pair of separate carriers guidedly mounted on said support member for movement together and apart, separate actuator means carried by said support member and coupled to said carriers for effecting controlled movement of said carriers on said support member, and each carrier carrying label pickup heads.

5,198,248
BLOW MOLD FOR FORMING A REFILLABLE POLYESTER CONTAINER
Suppayan M. Krishnakumar, Nashua; Wayne N. Collette, Merrimack, and Thomas E. Nahill, Amherst, all of N.H., assignors to Continental Pet Technologies, Inc., Florence, Ky.
Continuation of Ser. No. 758,800, Sep. 12, 1991, abandoned, which is a division of Ser. No. 488,247, Mar. 5, 1990, Pat. No. 5,066,528. This application Sep. 3, 1992, Ser. No. 939,662
Int. Cl.[5] B29C *49/20*
U.S. Cl. 425—522 2 Claims

1. A blow mold for blow molding a heated preform to form a container having an internally domed base, said blow mold defining a cavity including a base forming portion, and said base forming portion having a central substantially hemispheri-

cal dome portion and, at the center of the dome portion, a gradually sloping inverted portion with a central substantially



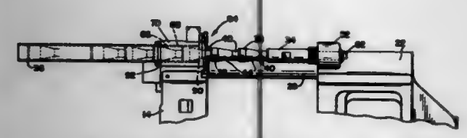
axial recess matching an intended shape of an original depending axial portion on an intended preform.

5,198,249

MOLD CLAMPING SYSTEM

Jerry Westerkamp, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 1, 1991, Ser. No. 679,209
Int. Cl.[5] B29C *45/64*
U.S. Cl. 425—589 **3 Claims**



1. In an injection molding machine including a pair of mold-supporting platens adapted for relative movement toward and away from each other, one of the platens being a movable platen and securely supporting an elongated guide bar and the other platen being a stationary platen and having an opening for slidably receiving and supporting the guide bar and carrying a blocking apparatus engageable with the guide bar for preventing axial movement of the platens toward each other, the improvement comprising the guide bar including a plurality of axially spaced first cylindrical portions, second cylindrical portions positioned between successive pairs of first cylindrical portions, the second cylindrical portions having a smaller outer diameter than that of the first cylindrical portions to define at an end of each first cylindrical portion an annular shoulder to permit engagement with an annular shoulder of a radially inwardly movable blocking gate carried by the stationary platen to block movement of the guide bar and of the movable platen, a tubular bushing carried in the stationary platen, the bushing including a bore through which the guide bar is adapted to slidably pass when the blocking apparatus is disengaged and the platens are moved toward and away from each other, the bushing bore having a size and cross section corresponding substantially with the size and cross section of the first cylindrical portions of the guide bar, wherein the bushing is formed from ultra-high molecular weight polyethylene to eliminate the need for lubrication, to minimize noise as the stepped bar passes through the bushing bore, and to eliminate the generation of metallic dust based upon relative sliding movement of the guide bar and the bushing.

5,198,250

FOOD AND PHARMACEUTICAL COMPOSITIONS CONTAINING SHORT CHAIN MONOUNSATURATED FATTY ACIDS AND METHODS OF USING

Donald D. Brillhart, Cleveland, and Gerald L. Maurer, Cincinnati, both of Ohio, assignors to Lipotech Partners Limited Partnership, Cleveland, Ohio

Filed Jul. 16, 1990, Ser. No. 552,588
Int. Cl.[5] A23K *1/00*; A23L *1/00*
U.S. Cl. 426—2 **41 Claims**

21. A method of improving the metabolic processing of lipids in an animal comprising

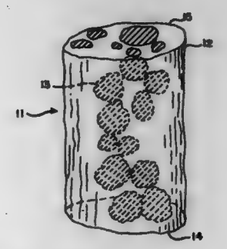
systematically administering to an animal a composition comprising at least one lipid species containing at least one short chain monounsaturated fatty acid selected from the group consisting of C16:1n-7, C16:1n-6, C16:1n-5, C16:1n-4, C6:1n-3, C14:1n-5, C14:1n-4, C14:1n-3, and C12:1n-3, or salts or esters of said monounsaturated fatty acids, and mixtures thereof, said lipid species present in said composition in amounts sufficient to improve the metabolic processing of lipids within said animal.

5,198,251

GRADUAL RELEASE STRUCTURES FOR CHEWING GUM

Joo H. Song, Northbrook; Charles M. Copper, Westmont, and Daniel R. Spisiak, Jr., Elmhurst, all of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation-in-part of Ser. No. 781,006, Oct. 18, 1991, which is a continuation-in-part of Ser. No. 606,044, Oct. 30, 1990, Pat. No. 5,108,762, which is a continuation-in-part of Ser. No. 340,384, Apr. 19, 1989, Pat. No. 4,978,537. This application Dec. 16, 1991, Ser. No. 809,468
Int. Cl.[5] A23G *3/30*
U.S. Cl. 426—5 **100 Claims**



1. A chewing gum which comprises:

a gum base;

a water soluble bulk portion; and,

a gradual release structure formed by extruding a mixture of active agent and polymeric wall material having more than zero but less than about 55 percent by weight active agent.

5,198,252

METHOD FOR THE MANUFACTURE OF FODDER AND/OR SOIL IMPROVING AGENTS FROM WASTE MATERIAL

Peter Simas; Jenó Tóth; Lajos Czakó, and Pál Miháltz, all of Budapest, Hungary, assignors to Henri-Davis Gutmans, Binningen, Switzerland

Filed Aug. 23, 1990, Ser. No. 571,259
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843670
Int. Cl.[5] A23K *1/02, 1/22*
U.S. Cl. 426—53 **8 Claims**

1. A method for the manufacture of fodder and/or soil improving agents from waste material comprising, harvesting environmentally disturbing aquatic plants, comminuting the harvested plants, and mixing the resulting pieces thereof with:

a) about 20 to about 70 percent by weight of organic waste material of the food industry, agriculture industry or both, said organic waste having a dry substance content of at least 20 percent by weight:

b) an inoculating agent selected from the group consisting of a pectin cleaving enzyme, a thermophilic lactic acid bacteria culture having an activity of about 10^6 to about 10^{10} cells per gram dry substance, or a mixture thereof;

c) biological degradation agents selected from the group consisting of molasses, urea, organic carboxylic acids having 1 to 5 carbon atoms or mixtures thereof; and

d) a starter culture having a high cellulase activity selected from the group consisting of *Trichoderma viridae, Chaetonium globusum* and Actinomycetes or mixtures thereof; and subsequently anaerobically fermenting the mixture for about 2 to about 45 days, said aquatic plants being optionally comminuted, pressed or both prior to mixing.

5,198,253

COMPOSITION AND METHOD FOR CONDITIONING GRAINS

Robert M. Roskowiak, St. Paul, and Michael J. Chanen, St. Louis Park, both of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 633,809, Dec. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 413,870, Sep. 28, 1989, Pat. No. 4,986,993. This application Sep. 25, 1991, Ser. No. 765,458
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] A23B *9/00*
U.S. Cl. 426—93 **19 Claims**

1. A grain conditioner composition for treating grain prior to rolling the grain into flakes or prior to milling the grain to increase water uptake and gelatinization consisting essentially of

an aqueous solution of a propylene glycol nonionic surfactant and a water soluble base, said base being present at a level sufficient to provide a pH of from about 9 to about 12.

5,198,254

COMPOSITION AND METHOD OF INCREASING STABILITY OF FRUITS, VEGETABLES OR FUNGI

Myrna O. Nisperos-Carriedo, and Elizabeth A. Baldwin, both of Winter Haven, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 3, 1991, Ser. No. 679,849
Int. Cl.[5] A23B *7/16*
U.S. Cl. 426—102 **23 Claims**

1. A semipermeable edible composition for use in coating a fruit, vegetable or fungus, comprising

from about 0.1 weight percent to about 4 weight percent of at least one polysaccharide polymer;

from about 0.01 weight percent to about 1.0 weight percent of a preservative;

from about 0.01 weight percent to about 1.5 weight percent of an acidulant;

from about 0.1 weight percent to about 3 weight percent of a first emulsifier which is lecithin;

from about 0.1 weight percent to about 2.0 weight percent of a second emulsifier other than lecithin; and

from about 88.5 weight percent to about 99.68 weight percent of water, said amounts being selected in amounts effective to provide a semipermeable coating that will improve the shelf life of the fruit, vegetable, or fungus.

5,198,255

STABILITY IMPROVEMENTS OF OAT R-T-E CEREALS BY HIGH INTENSITY MICROWAVE HEATING

Edward C. Schwab, New Brighton, and George E. Brown, Edina, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 726,591, Jul. 8, 1991, abandoned. This application Jun. 18, 1992, Ser. No. 899,577
Int. Cl.[5] A23L *1/00*; A21D *15/00*
U.S. Cl. 426—241 **66 Claims**

1. A method for improving the shelf life of a cereal oil containing R-T-E cereal, comprising the steps of:

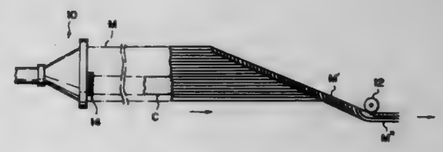
subjecting a finished R-T-E cereal or cereal base containing a cereal oil to a high intensity microwave field for a sufficient time to increase the fat stability of the cereal oil, wherein the microwave field has a field strength of at least 150 V/cm.

5,198,256

PROCESS FOR PRODUCING FISH PASTE PRODUCT AND COLORING NOZZLE FOR USE IN THIS PROCESS

Kazuo Yamada, Cary, N.C., assignor to Kabushikikaisha Kibun, Tokyo, Japan

Filed Aug. 7, 1991, Ser. No. 741,619
Claims priority, application Japan, Oct. 30, 1990, 2-293241
Int. Cl.[5] A23L *1/325*; A23P *1/00*
U.S. Cl. 426—250 **5 Claims**



1. In a method of producing a fish paste product having the steps of: forming a fish paste material into an elongated sheet having opposite sides; scoring at least one of said opposite sides of the sheet with parallel cuts in the direction of elongation of said sheet so as to define a plurality of fiber-shaped portions in the sheet between said parallel cuts; winding the scored sheet into a rod-like shape material with the fiber-shaped portions extending in the axial direction of the rod-like shape material; and cutting the rod-like shape material into predetermined lengths; the improvement comprising:

a step of, prior to said winding step, applying a dye to one of said opposite sides of said sheet along the length, thereof and in a predetermined width to form a dyed portion; and

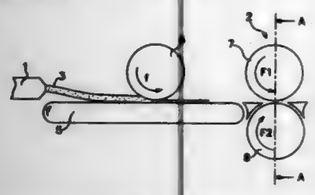
in carrying out the winding of said scoring sheet, placing said dyed portion of the side of the sheet to which the dye has been applied on the outside of the rod-like shape material.

5,198,257

CUTTING COEXTRUDED THERMOPLASTIC FOOD PRODUCTS

Ernst Heck, Vuffiens-la-Ville, and Jean Horisberger, Ecublens, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Nov. 5, 1991, Ser. No. 787,937
Claims priority, application European Pat. Off., Nov. 26, 1990, 90122501.1
Int. Cl.[5] A21C 5/00; A23P 1/00
U.S. Cl. 426—282 8 Claims



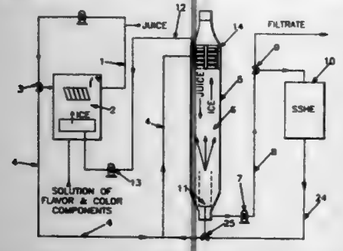
1. A process for preparing a coextruded cooked food product comprising coextrusion-cooking a food product to obtain a product having an extruded outer thermoplastic envelope based on cereals and an inner edible filling, and while the outer envelope is still thermoplastic, stamping the product between two parallel counter-rotating cylindrical surfaces which define male and female impression elements configured and positioned so that upon rotation, the impression elements of one surface converge with the elements of the outer surface in a male to female relation to cooperate to cause shearing to cut the product into pieces.

5,198,258

SYSTEM FOR AVOIDING LOSS OF FLAVOR COMPONENTS FROM JUICES IN CONNECTION WITH CONCENTRATION PROCESSES

Harold R. Heath, Houston, Tex., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Jan. 3, 1992, Ser. No. 816,913
Int. Cl.[5] A23L 2/08
U.S. Cl. 426—384 20 Claims



1. A process for separating from a quantity of juice a flavor fraction, the flavor fraction containing a high concentration of the insoluble flavor components of said quantity of juice, for use in connection with a concentration process, comprising the steps of:

feeding a stream of a juice through a column in a first direction;

urging a filtration stream of ice crystals through said column in a second direction which is countercurrent to said first direction so that said stream of juice passes through said stream of ice crystals, whereby insoluble flavor components of said stream of juice become substantially occluded in said filtration stream of ice crystals to yield a stream of ice crystals having occluded flavor components and a stream of juice filtrate;

recovering the stream of juice filtrate as a serum fraction of the juice;

recovering the stream of ice crystals having occluded flavor components, and separating said occluded flavor components from said ice crystals as a flavor fraction of the juice.

5,198,259

CONCENTRATED TEA EXTRACT

Bruin Hoogstad, Bedford, United Kingdom, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 120,518, Nov. 13, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 312,330
Claims priority, application United Kingdom, Nov. 14, 1986, 8627290
Int. Cl.[5] A23F 3/22
U.S. Cl. 426—435 5 Claims

1. A process for the preparation of a concentrated tea extract comprising the steps of:

(a) extracting tea-leaves with water having a temperature between 15° and 50° C. to form a first extract and separating the first extract from the tea-leaves;

(b) extracting tea-leaves which have previously been extracted with water between 15° and 50° C. for a second time, with water having a temperature of more than 50° C. to form a second extract and separating the second extract from the tea-leaves;

(c) concentrating said first extract by reverse osmosis at a temperature between 20° and 50° C. to obtain a first concentrate;

(d) concentrating said second extract at a temperature between 50° and 100° C. to obtain a second concentrate; and

(e) combining said first and second concentrates.

5,198,260

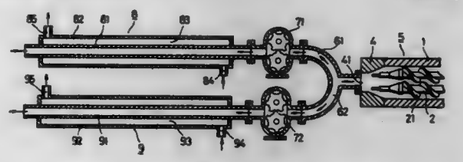
Patent Not Issued For This Number

5,198,261

METHOD OF MANUFACTURING A FIBROUS FISH OR SHELLFISH NERISEIHIN PRODUCT

Isamu Sasaki, Tokyo, and Takeya Yoshioka, Fukuoka, both of Japan, assignors to Nippon Suisan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 524,116, May 16, 1990, abandoned. This application Sep. 16, 1992, Ser. No. 945,593
Claims priority, application Japan, May 16, 1989, 1-123980
Int. Cl.[5] A23L 1/325
U.S. Cl. 426—643 3 Claims



1. A method of manufacturing a fibrous neriseihin of fish or shellfish with a fibrous structure, in which a plurality of fibrous filaments of fish or shellfish are respectively extended and aligned in a certain direction, without forming a net-work structure of a protein contained in each of said fibrous filaments, and covered with a thin surface layer of fish or shellfish, comprising the steps of:

feeding a raw material consisting of fish or shellfish into an inlet of a twin screw extruder having an outlet nozzle connected to an elongated cooling zone;

kneading, pressurizing and thermally fusing said raw material in said extruder, in a manner, such that the resultant fused material is in a gel state and has a temperature ranging from 150° to 260° C.;

passing said fused material from the outlet nozzle of said extruder into and through at least one coupling tube, said coupling tube having at least one feed pump connected to an outlet thereof;

applying to said fused material, passing through said coupling tube, a momentary stay to eliminate intermittent flow of said fused material passing through said outlet nozzle of said extruder;

passing said fused material through said feed pump and into said elongated cooling zone having a length in the range of 3 to 7 m;

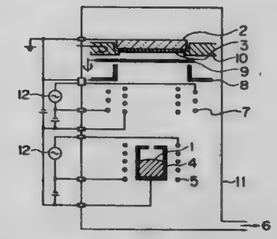
gradually cooling said fused material in said elongated cooling zone, with a temperature gradient of 0.05° to 0.35° C./cm along an entire lengthwise direction thereof, to a temperature within the range of from 60° to 110° C., controlling the revolution rate of said feed pump and the degree, to which said fused material is cooled as it flows through said elongated cooling zone, and removing the resultant cooled material, which is in a solidified state, from said cooling zone thereby resulting in the fibrous neriseihin with said fibrous structure.

5,198,262

METHOD OF FORMING MIRROR FOR ELECTROMAGNETIC RADIATIONS OF SHORT WAVELENGTHS

Isao Yamada, Kyoto, and Yoichi Hashimoto, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,536
Claims priority, application Japan, Mar. 16, 1990, 2-66298
Int. Cl.[5] B05D 3/06; G21K 7/00
U.S. Cl. 427—527 7 Claims



1. A method of making a mirror for electromagnetic radiations of short wavelengths using a cluster ion beam vacuum deposition apparatus,

the method comprising forming a film on a substrate having a surface roughness smaller than 5 Å by bombardment with a noble metal, which is at least partly in the form of cluster ions, in a vacuum chamber under the conditions that an accelerating voltage applied to an accelerating electrode is of 3–7 kv, a temperature of the substrate is kept at 0°–60° C., a pressure in the vacuum chamber is kept below 1×10^{-7} Torr, and the film is formed at a rage of 0.5–5 Å/s to be 50–1000 Å thick and of adhesion strength greater than 430 kg/cm^2.

5,198,263

HIGH RATE CHEMICAL VAPOR DEPOSITION OF CARBON FILMS USING FLUORINATED GASES

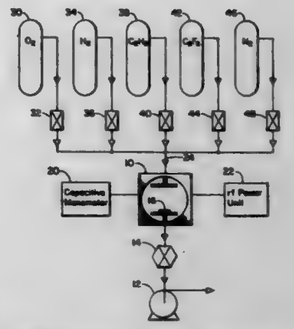
Byron L. Stafford, Arvada; C. Edwin Tracy; David K. Benson, both of Golden, and Arthur J. Nelson, Longmont, all of Colo., assignors to United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1991, Ser. No. 669,718
Int. Cl.[5] B05D 3/06; C23C 16/26
U.S. Cl. 427—577 9 Claims

1. A process of depositing an amorphous diamondlike carbonaceous film on a substrate, comprising the steps of:

positioning said substrate in a chemical vapor deposition chamber;

flowing hydrocarbon and halide gases into said chamber in respective quantities that provide a ratio of halogen species to carbon (F/C) present in a plasma in a range of about 0.1 to 2.5; and



igniting a plasma reaction of said hydrocarbon and halide gases in said chamber to produce chemically active carbon and halogen species in said plasma in the chamber while maintaining the chamber and the substrate at ambient temperatures so as to deposit said amorphous diamondlike carbonaceous film on said substrate.

5,198,264

METHOD FOR ADHERING POLYIMIDE TO A SUBSTRATE

Leonard F. Altman, Daytona Beach; Jill L. Flaugher, Margate, and Barry M. Miles, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 429,294, Oct. 30, 1989, abandoned. This application Sep. 19, 1990, Ser. No. 584,958
Int. Cl.[5] B05D 3/10
U.S. Cl. 427—96 4 Claims

1. A method of adhering polyimide to a printed circuit substrate comprising the steps of:

applying a layer of palladium and tin colloid to the substrate by immersing the substrate in a solution comprising palladium and a stannous chloride colloid;

substantially removing the stannous chloride colloid from the substrate by immersing the substrate in a solution of dilute acid;

drying the substrate;

applying a layer of liquid polyimide on the palladium and tin colloid layer; and

curing the liquid polyimide to form a dry film.

5,198,265

METHOD OF COATING AN ALUMINUM COMPOUND SUBSTRATE WITH A COMPOSITION OF ELEMENTAL TITANIUM AND AN ALKALI METAL HALIDE, MELTING THE COATING, AND RINSING THE COATED SUBSTRATE

Charles D. Iacovangelo, Schenectady, and Randall N. King, St. Johnsville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

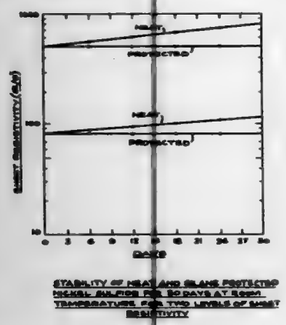
Division of Ser. No. 678,401, Apr. 1, 1991, abandoned. This application Jan. 23, 1992, Ser. No. 824,269
Int. Cl.[5] B05D 5/12
U.S. Cl. 427—126.2 13 Claims

1. A method for preparing an adherent layer comprising elemental titanium on a ceramic substrate comprising an aluminum compound, said method comprising:

coating at least a portion of said substrate with a coating mixture comprising (1) at least one finely divided metal

comprising elemental titanium and (2) a substantially anhydrous salt composition comprising at least one alkali metal halide, said salt composition having a melting point no higher than about 850° C.;
heating the coated substrate at a temperature and for a time sufficient to melt said salt composition and produce the desired layer; and
removing said salt composition by water washing.

5,198,266
STABILIZING SHELF LIFE CONDUCTIVITY OF CONDUCTIVE COATINGS
Edward F. Witucki, Van Nuys, Calif.; William P. Moran, Tulsa, Okla.; Patricia H. Cunningham, Thousand Oaks, Calif., and Lyle V. Mooney, Bixby, Okla., assignors to Rockwell International Corporation, Seal Beach, Calif.
Filed Apr. 29, 1991, Ser. No. 693,259
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—126.2 **15 Claims**



STABILITY OF HEAT AND SLAKE PROTECTED NICKEL SULFIDE FILM AT 90 DAYS AT 5,000 TEMPERATURE FOR TWO LEVELS OF SHELF SENSITIVITY

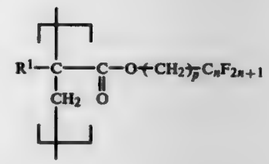
1. A method for stabilizing shelf life conductivity of conductive coatings on a substrate which comprises
incorporating on a conductive coating selected from the group consisting of polypyrrole and nickel sulfide, a protective coating selected from the group consisting of a polyphenol and polysiloxane.

5,198,267
FLUOROPOLYMER BLEND ANTI-REFLECTION COATINGS AND COATED ARTICLES
Shaul M. Aharoni, Morris Plains; Ajay Nahata, Chatham, and James T. Yardley, Morristown, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Division of Ser. No. 796,516, Nov. 21, 1991, Pat. No. 5,118,579, which is a continuation-in-part of Ser. No. 762,998, Sep. 20, 1991, Pat. No.
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—162 **6 Claims**

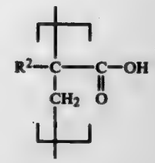
1. The method of making an anti-reflection coated body having a reflective surface which comprises applying a solution of a polymeric composition comprising a blend of
(a) from about 1 to about 95 percent by weight of amorphous fluoropolymer, with
(b) from about 5 to about 99 percent by weight of a fluorinated copolymer having a polymer chain composed of

$$\left[X_s\text{—}Y_t\text{—}Z_u\right]$$

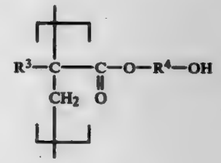
units, wherein
s, t and u represent weight proportions of the respective X, Y and Z units, and have values within the ranges of
s=from about 0.5 to about 0.995;
t=from about 0.0025 to about 0.4975; and
u=from about 0.0025 to about 0.4975;
with the sum of s+t+u being 1;
X represents units of the composition



wherein
R^1 is H, —CH_3, or mixtures thereof;
p is 1 or 2;
n is an integer of from about 1 to about 40;
Y represents units of the composition



wherein
R^2 is H, —CH_3 or —CH_2COOH;
Z represents units of the composition



wherein
R^3 is H, —CH_3, or $CH_2COOC_mH_{2m+1}$, wherein m is an integer of from about 1 to about 4, and
R^4 is an alkylene bridging group, straight chain, branched or cyclic, having from 1 to about 8 carbon atoms;
wherein the X, Y and Z units may be arranged in any sequence.

5,198,268
METHOD FOR PREPARING A FEED SCREW FOR PROCESSING PLASTICS
David Grossman, Epping, N.H., assignor to Xaloy, Incorporated, Pulaski, Va.
Filed Nov. 14, 1991, Ser. No. 791,510
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—190 **10 Claims**

1. A method for coating the wear surfaces of a feed screw for injection molding or extruding plastic with a nickel-based alloy containing carbide particles dispersed within the matrix of the alloy, the method comprising the steps of:
(a) spraying the alloy onto the feed screw, the alloy forming a mechanical bond to the feed screw;

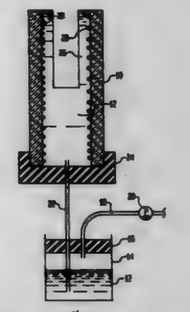
(b) heating the feed screw having the alloy sprayed thereon, the heating being controlled to cause even temperature buildup over the length of and through the feed screw;
(c) fusing the alloy to the feed screw to transform the mechanical bond between the alloy and the feed screw into a metallurgical bond between the alloy and the feed screw; and
(d) heating the metallurgically bonded alloy and feed screw and cooling the metallurgically bonded alloy and feed screw to produce a crack-free coating of the alloy on the feed screw, wherein the step of heating and cooling the metallurgically bonded alloy and feed screw comprises heating the alloy and feed screw to a temperature within the range of about 850 degrees F. to about 900 degrees F. for about two to about four hours and cooling the metallurgically bonded alloy and feed screw at a rate of about 100 degrees F. to about 150 degrees F. heat reduction per hour.

5,198,269
PROCESS FOR MAKING SOL-GEL DEPOSITED FERROELECTRIC THIN FILMS INSENSITIVE TO THEIR SUBSTRATES
Scott L. Swartz, Dublin, and Peter J. Melling, Worthington, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio
Continuation-in-part of Ser. No. 342,272, Apr. 24, 1989, abandoned. This application Aug. 28, 1989, Ser. No. 399,724
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—226 **24 Claims**

1. A method for producing a thin film of a ferroelectric perovskite material comprising:
a. providing a first substrate;
b. selecting a first sol-gel perovskite precursor material wherein the crystallization of the first sol-gel perovskite precursor material to the perovskite phase is insensitive to the first substrate and wherein after heat treatment the material is isostructural to the second ferroelectric perovskite thin-film material of step (g);
c. depositing a first layer of the selected first sol-gel perovskite precursor material;
d. heat-treating the first deposited layer to form a first ferroelectric perovskite thin-film material;
e. selecting a second sol-gel perovskite precursor material wherein the crystallization of the second sol-gel perovskite precursor material to the perovskite phase is sensitive to the first substrate;
f. depositing a second layer of the selected second sol-gel perovskite precursor material;
g. heat-treating the second deposited layer to form a second ferroelectric perovskite thin-film material; and whereby the second layer of the second sol-gel perovskite precursor material after heat treatment has better perovskite crystallinity when deposited on the first layer than if the second layer had been deposited directly on the first substrate and heat treated.

5,198,270
METHOD OF FORMING A FIBER PREFORM WITH DOPANTS DISSOLVED IN A LIQUID
Matthew J. Andrejco, Clinton, and Brian G. Bagley, Watchung, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.
Filed Nov. 8, 1991, Ser. No. 789,734
Int. Cl.[5] B05D *7/22, 5/06, 3/02*
U.S. Cl. 427—230 **13 Claims**

1. A method of fabricating a silicate fiber preform, comprising the steps of:
preparing a liquid precursor solution comprising a solvent, an elemental precursor soluble in said solvent, and an organosilicon polymer soluble in said solvent, said elemental precursor comprising an element for modification of a composition of a silicate glass formed at least partially from said organosilicon polymer;
coating an inside of a silicate tube with said liquid precursor solution to thereby form a liquid coating; and

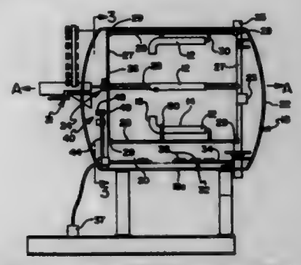


oxidizing and fusing said coating at an elevated temperature to thereby form said silicate glass.

5,198,271
METHOD FOR PRODUCING POLYOLEFIN FOAM SHEET
Seiji Ishii; Tokuo Okada; Hiroshi Ohta; Hiroya Fukuda; Takashi Ohashi, and Osamu Kondo, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Oct. 24, 1990, Ser. No. 602,682
Claims priority, application Japan, Nov. 6, 1989, 1-288155; Feb. 8, 1990, 2-29256
Int. Cl.[5] B05D *3/02, 5/00*
U.S. Cl. 427—244 **5 Claims**

1. The method for producing a polyolefin foam sheet, comprising: heating a foamable base sheet, wherein said foamable base sheet comprises a polyolefin resin, a foaming agent, and a resin varnish, said foaming agent being capable of decomposing and generating gas during heating, and the resin of the varnish being selected from the group consisting of rosin, cumarone-indene resin, phenolic resin, alkyd resin, and shellac resin.

5,198,272
THERMAL EVAPORATION IN TWO PLANES
Richard C. Eisfeller, Greenland, N.H., assignor to Davidson Textron Inc., Dover, N.H.
Filed Mar. 24, 1992, Ser. No. 856,713
Int. Cl.[5] C23C *14/24*
U.S. Cl. 427—251 **5 Claims**

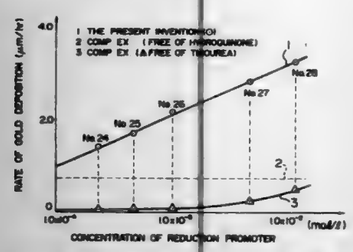


1. A metallizing apparatus for vacuum metallizing an object having a horizontal surface and a vertical surface, said assembly comprising:
a vacuum chamber,
rotatable means within said vacuum chamber and having a

horizontal axis therethrough and adapted to rotatably support an object to be metallized,
first evaporation means connected horizontally below the rotatable means within said vacuum chamber for thermally evaporating metal vertically toward the object to the horizontal surface thereof,
and characterized by including second evaporation means connected vertically to the rotatable means within said vacuum chamber for thermally evaporating metal horizontally toward the object to the vertical surface thereof.

5. A method of vacuum metallizing an object having a horizontal surface and a vertical surface, the method including the steps of:
rotating the object in a vacuum chamber about a horizontal axis with the horizontal surfaces and the vertical surfaces of the object maintained with respect to the horizontal axis,
vacuum metallizing the horizontal surface of the object by directing thermally evaporated metal in the vertical direction, and
the method characterized by vacuum metallizing the object by separately directing thermally evaporated metal in a horizontal direction to metallize the vertical surfaces of the object.

5,198,273
ELECTROLESS GOLD PLATING SOLUTION AND METHOD FOR PLATING GOLD THEREWITH
Setsuo Ando, Kawasaki; Jiro Ushio, Yokohama; Takashi Inoue, Yokohama; Hiroshi Okudaira, Yokohama; Takeshi Shimazaki, Hitachi, and Hitoshi Yokono, Fujisawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan
Filed Sep. 11, 1990, Ser. No. 580,877
Claims priority, application Japan, Sep. 18, 1989, 1-240229
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—437 **14 Claims**



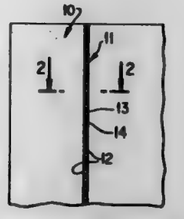
9. A process for conducting electroless gold plating by bringing a substrate into contact with an electroless gold plating solution comprising gold ions, a complexing agent, a reducing agent, and a reduction promoter which has a function of giving electrons to an oxidant, said oxidant being produced from oxidation of said reducing agent with said gold ions being reduced, to restore said oxidant to the original reducing agent.

5,198,274
TIE ASSEMBLY FOR ORNAMENT
Rafael Etzion, 15 Hemlock Rd., Great Neck, N.Y. 11024
Filed Dec. 9, 1991, Ser. No. 803,619
Int. Cl.[5] D04D *7/10*
U.S. Cl. 428—5 **16 Claims**

9. A bow ornament comprising:
a plurality of ornament elements each comprising an elongated strip of material, said ornament elements having central regions arranged in abutting relationship;
a tie assembly comprising: a strip of material having first and second ends, said strip of material being folded over to place said first and second ends in abutting dove-tail relationship; a tie element having a central portion joined to and extending along the length of at least one of said first and second ends and having third and fourth ends extending beyond said length;
said tie assembly being arranged with said joined first and

second ends and said tie element extending along and around said abutting central regions of said ornament elements and with said third and fourth ends of said tie element joined to hold said tie assembly and said ornament elements together to form said bow ornament.

5,198,275
CARD STOCK SHEETS WITH IMPROVED SEVERANCE MEANS
Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020
Filed Aug. 15, 1991, Ser. No. 745,078
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—43 **10 Claims**

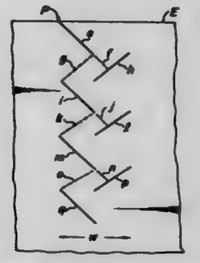


1. In a paper stock, a severance line comprising a score cut extending part way into the paper stock and a line of closely spaced perforations coinciding with the score cut line extending from the inner end of the score cut to the opposite side of the paper stock, whereby to permit the severance line to be severed by separation of stock portions at the perforations, and to provide smooth severed edges.

5,198,276
PAPER PRODUCTS HAVING PERFORATIONS AND PERFORATE PATTERN
Fujio Nakajima, Hosoi Mansion 303, 26-15, Ogikubo 2 chome, Suginami-ku, Tokyo 167, Japan
Filed Feb. 14, 1992, Ser. No. 837,834
Claims priority, application Japan, Feb. 15, 1991, 3-032927[U]
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—43 **1 Claim**

1. Paper products having perforations and perforate pattern, comprising;
a paper surface;
an initial first notch obliquely provided at upper an end portion of the paper surface;
a plurality of first subsequent notches substantially parallel

to the initial first notch, each of said first notches at an approximately given distance from its adjacent first notch;
a plurality of second notches in an orientation oppositely oblique to orientation of said first notches so as to intersect an extension line of said respective first notches at substantially the center portion of said second notches wherein a respective lower end of any of the first notches and the

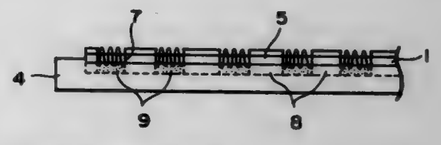


upper ends of an adjacent second notch are positioned on a horizontal line;
first perforations on the respective extension lines of the first notches (e, i, m, . . .); and
second perforations between the lower end of any of the first notches and the upper end of the next adjacent one of the following first notches.

5,198,277
PATTERN-TUFTED, FUSION-BONDED CARPET AND CARPET TILE AND METHOD OF PREPARATION
Wayne M. Hamilton, and Larry E. Mullinax, both of Lagrange, Ga., assignors to Interface, Inc., Lagrange, Ga.
Filed Oct. 7, 1991, Ser. No. 774,049
Int. Cl.[5] B32B *3/02, 33/00, 5/00*
U.S. Cl. 428—92 **29 Claims**

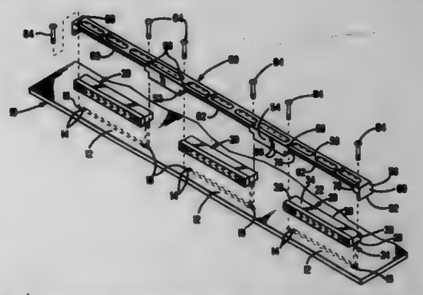
1. A pattern-tufted, fusion-bonded carpet having a fibrous pile face wear surface with a tufted pile pattern thereon, wherein the carpet comprises:
a) a woven synthetic fiber sheet material;
b) a nonwoven glass fiber fleece sheet material adjacent to the woven synthetic fiber sheet material;
c) a primary adhesive layer formed from a water-based polymeric latex material, which polymeric latex material bonds the synthetic fiber sheet material impregnates and the glass fiber fleece sheet material together, and forms a primary adhesive layer on the surface of the synthetic fiber sheet material;
d) a plurality of fibrous yarns bonded to and extending generally upright from the primary adhesive layer, to form a fibrous pile face were surface; and
e) a plurality of tufted yarns extending from the pile face wear surface through the primary adhesive layer, the synthetic sheet material and the glass fiber fleece sheet material, the tufted yarns forming a selected tufted pattern on the face wear surface, and with the other end of the tufted yarns extending outwardly from the back surface of the glass fiber fleece sheet material.

5,198,278
SERVICE MAT WITH DIFFERENTIAL BONDING BETWEEN BACKING AND BASE CLOTH
Kazushi Sumimoto, and Yuji Nagahama, both of Saita, Japan, assignors to Duskin Co., Ltd., Osaka, Japan
Filed May 14, 1991, Ser. No. 699,652
Claims priority, application Japan, Jul. 10, 1990, 2-180491
Int. Cl.[5] B32B *3/02, 27/14*
U.S. Cl. 428—95 **9 Claims**



1. A dusting mat comprising:
a base cloth having a first surface and a second surface;
a mat pile tufted to said first surface of said base cloth;
a rubber backing applied to said second surface of said base cloth;
said base cloth being a composite of (i) a woven cloth of a polyester yarn non-adherent to said rubber backing and (ii) a web of fiber adherent to said rubber backing;
said web being needle-punched through said woven cloth;
whereby an adhesive surface between said base cloth and said rubber backing has a structure wherein weak adhesion occurs where said woven cloth contacts said rubber backing and strong adhesion occurs wherein said needle-punched web contacts said rubber backing.

5,198,279
CIRCUIT BOARD STIFFENER
Ernest L. Beinhaur, and Daniel T. Casey, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 28, 1991, Ser. No. 662,541
Int. Cl.[5] B32B *3/06*; H01R *13/66*
U.S. Cl. 428—99 **5 Claims**



1. An article for minimizing warping of large circuit boards to which are to be soldered electrical articles of selected shapes and dimensions and in an elongated array, comprising:
an integral elongate member having a bottom surface, side surfaces and a board-remote surface with said bottom surface including board-proximate surface portions disposed in a common plane, said bottom surface including article-receiving receases having shapes and dimensions complementary to said electrical articles, said member including means for mounting to a circuit board at a plu-

rality of locations therealong spaced closely to respective said article-receiving recesses,

said member adapted to be mounted firmly onto said board by receiving said articles into said article-receiving recesses and with wall portions of said article-receiving recesses abutting at least board-remote surfaces of said electrical articles prior to soldering contact sections of said electrical articles to corresponding contact means of said board,

at least said bottom surface of said member includes a plurality of channels therealong permitting flow of solvent during flux-cleaning procedures following soldering of said electrical articles to said board,

surfaces of said article-receiving recesses include channels therealong permitting flow of solvent therealong between adjacent surfaces of said member and said electrical articles, and

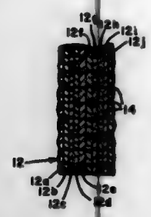
said member being formed of especially heat resistant material to retain the integrity of its shape and dimension at elevated temperatures sufficient to minimize warping of a circuit board to which it is mounted.

5,198,280

THREE DIMENSIONAL FIBER STRUCTURES HAVING IMPROVED PENETRATION RESISTANCE

Gary A. Harpell, and Dusan C. Prevorsek, both of Morristown, N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 25, 1990, Ser. No. 603,063
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—102 **39 Claims**



1. An improved penetration resistant layered composite article comprising a plurality of flexible fibrous layers, each of said layers comprising a network of fibers wherein the fibers in each layer are arranged in a fiber array parallel or substantially parallel to one another along a common longitudinal fiber direction in the absence or substantial absence of a polymer matrix material and wherein adjacent layers are positioned such that the common fiber direction in each layer is at an angle with respect to the common fiber direction of the fibers in adjacent layers, and wherein at least two adjacent layers are secured together by a plurality of first fiber stitches extending along all or a portion of at least two adjacent paths wherein the fiber forming said stitches has a tenacity of at least 15 grams/denier and a tensile modulus of at least about 200 grams/denier.

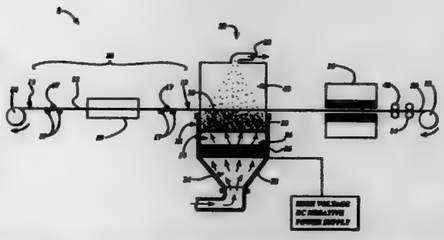
5,198,281

NON-WOVEN FLEXIBLE MULTIPLY TOWPREG FABRIC

John D. Muzzy, and Jonathan S. Colton, both of Atlanta, Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 339,297, Apr. 17, 1989, Pat. No. 5,094,883, and a continuation-in-part of Ser. No. 700,559, May 15, 1991. This application Mar. 9, 1992, Ser. No. 848,093
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—102 **31 Claims**

1. A non-woven towpreg fabric comprising a plurality of flexible, multiply towpregs, comprising towpreg plies, said towpregs comprising reinforcing filaments and matrix forming material, said reinforcing filaments being substantially wet-out by said matrix forming material while said towpregs remain substantially unconsolidated, wherein said towpregs are arranged in overlapping layers comprising at least one towpreg and are bonded together resulting in said non-woven towpreg fabric.

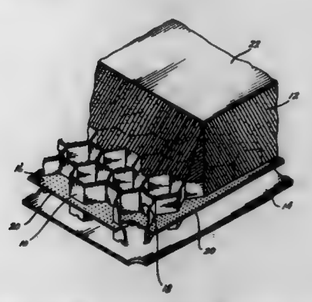


5,198,282

TANDEM CERAMIC COMPOSITE

Anna L. Baker, Seattle, and Kristina S. Preedy, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 698,496, Feb. 5, 1985, Pat. No. 5,041,321, which is a continuation-in-part of Ser. No. 667,568, Nov. 2, 1984, abandoned. This application Oct. 8, 1987, Ser. No. 106,746
Int. Cl.[5] G32G *5/12*
U.S. Cl. 428—114 **25 Claims**



1. A tandem ceramic composite comprising a fiberformed ceramic insulation bonded to a fiber reinforced ceramic cementaceous matrix laminate.

5,198,283

BACKLIT BUTTON BY THERMOFORMED CAP PROCESS

Ralph A. Hausler, Plymouth, Wis.; Lawrence Share, Skokie, and Ghazi Khattab, Glenview, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 496,524, Mar. 19, 1990, Pat. No. 5,098,633. This application Dec. 4, 1991, Ser. No. 802,390
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—195 **28 Claims**

1. A backlit button produced within a thermoforming die comprising a female mold by performing the following sequence of method steps of:

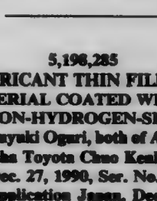
providing a sheet of thermoformable material having a first side and a second side;

providing a graphic display upon one of said first and second sides of said thermoformable sheet;

introducing said thermoformable sheet into said thermoforming die and securing said thermoformable sheet within said die such that said graphic display is disposed at a predetermined position within said die;

preheating said thermoformable sheet;

evacuating said female mold of said thermoforming die, toward which one side of said thermoformable sheet is disposed, so as to reduce the gas pressure therein and cause movement of said thermoformable sheet into said female mold of said die, and elevating the gas pressure upon the other opposite side of said thermoformable sheet so as to assist said movement of said thermoformable sheet into said female mold of said die and thereby cause formation of a thermoformed cap of said backlit button from said thermoformable sheet;



retaining said thermoformed cap within said die until cooled;

transferring said thermoformed cap into an injection molding apparatus;

inserting a light pipe into said thermoformed cap; and

injection molding a resin compound into said thermoformed cap and about said light pipe so as to integrally bond said light pipe and said thermoformed cap together;

said thermoformed cap, said light pipe, and said resin compound comprising said backlit button.

5,198,284

THERMAL TRANSFER RECORDING MEDIUM

Shigehiro Kitamura, Hachioji; Hiroshi Watanabe; Masataka Takimoto, both of Hino, and Atsushi Nakajima, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,520
Claims priority, application Japan, Apr. 3, 1990, 2-88908; Apr. 3, 1990, 2-88909
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 **12 Claims**

1. A thermal transfer recording medium comprising a support, provided thereon a thermosoftening layer, an intermediate layer interposed between the support and the thermosoftening layers, and a colorant in at least one of the thermosoftening or intermediate layers, wherein the thermosoftening layer contains a binder comprising an olefin resin, a polyurethane resin, and at least one of an acrylic resin and a polyester resin.

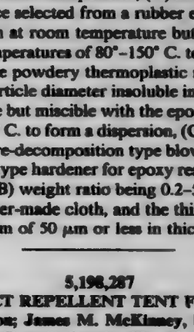
5,198,285

HARD AND LUBRICANT THIN FILM OF IRON BASE METALLIC MATERIAL COATED WITH AMORPHOUS CARBON-HYDROGEN-SILICON

Tohru Arai, and Kazuyuki Oguri, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 27, 1990, Ser. No. 634,506
Claims priority, application Japan, Dec. 28, 1989, 1-340858; Dec. 28, 1989, 1-340860; Sep. 7, 1990, 2-237767
Int. Cl.[5] B32B *9/00*; C23C *16/26*
U.S. Cl. 428—216 **4 Claims**

1. A hard and lubricating thin film of amorphous carbon-hydrogen-silicon, which consists essentially of: carbon, hydrogen and silicon, wherein the content of said hydrogen is from 30 to 50 atomic % and the content of said carbon is from 70 to 90 atomic % with respect to the total composition except said hydrogen, and the thin film contains diamond-like carbon, and is from 0.5 μm to 10 μm in thickness.



5,198,286

PANEL REINFORCING-SHEET MATERIAL AND VEHICLE OUTER PANEL STRUCTURE USING THE SAME

Yutaka Kagoshima, Yokohama; Toshio Nagase, Tsukuba, and Takeo Kobayashi, Yokohama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1992, Ser. No. 896,576
Claims priority, application Japan, Jun. 11, 1991, 3-166441
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—246 **3 Claims**

2. A panel-reinforcing sheet material having a three-layered structure consisting of a first layer, a second layer and a third layer, the first layer consisting of a foamable composition comprising, as essential components, (A) an epoxy resin, (B) at least one substance selected from a rubber elastomer insoluble in the epoxy resin at room temperature but miscible with the epoxy resin at temperatures of 80°–150° C. to form a dispersion and a halogen-free powdery thermoplastic resin of 150 μm or less in average particle diameter insoluble in the epoxy resin at room temperature but miscible with the epoxy resin at temperatures of 80°–150° C. to form a dispersion, (C) a plasticizer, (D) a high-temperature-decomposition type blowing agent and (E) a heat-activation type hardener for epoxy resin, the component (A)/component (B) weight ratio being 0.2–5, the second layer consisting of a fiber-made cloth, and the third layer consisting of a thin metal film of 50 μm or less in thickness.

5,198,287

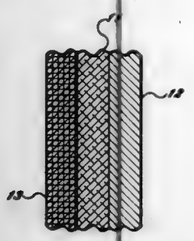
INSECT REPELLENT TENT FABRIC

Richard D. Samson; James M. McKinney, both of North Augusta, and John Russell, Graniteville, all of S.C., assignors to Graniteville Company, Graniteville, S.C.

Filed Apr. 1, 1991, Ser. No. 678,061
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—248 **5 Claims**

1. A coated tent fabric having a fabric substrate with a coated outer surface normally exposed to degrading elements of the atmosphere and a coated inner surface normally shielded by the fabric substrate from the degrading elements of the atmosphere, the coatings on the outer and inner surfaces of said

fabric substrate each containing a polymeric binder, flame retardant chemicals and water repellent chemicals, wherein the improvement comprises the addition of permethrin as an insect repellent to the coating on the inner surface of the fabric substrate, whereby the fabric substrate acts as a barrier that

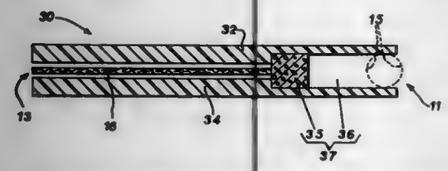


inhibits migration of the permethrin to the outer surface of the fabric and consequently inhibits exposure of the permethrin to the degrading elements of the atmosphere, thereby increasing the length of time the permethrin is an effective insect repellent.

5,198,288
KNIT FABRIC WITH ELASTIC COMBINATION YARN
Albert J. Grunfeld, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 26, 1992, Ser. No. 841,808
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—253 5 Claims

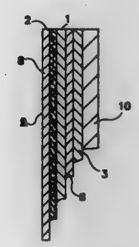
1. An improved weft knit or circular knit fabric, particularly suited for use as a sweater fabric or a sock fabric, comprising inelastic yarn and elastic combination yarn, characterized in that the elastic combination yarn has an elastic stretch in the range of 10 to 70% and comprises in the range of 95 to 80 weight percent inelastic fiber and 5 to 20% elastic fiber.

5,198,289
ULTRASONICALLY CUT FIBROUS MATERIAL
Neal A. Siegel, Deerfield; Edward S. Tripp, Park City; Diane L. Annet, Waukegan, and Gradimir G. Georgevich, Mundelein, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Division of Ser. No. 335,006, Apr. 7, 1989, Pat. No. 5,073,216.
This application Aug. 21, 1991, Ser. No. 747,828
Int. Cl.[5] B32B *1/00, 27/10*
U.S. Cl. 428—286 12 Claims



1. A shaped article prepared from a fibrous material of measurable, non-zero elastic limit chemically modified with an oxidizing or hydrolyzing agent under conditions effective to and for a length of time sufficient to reduce the elastic limit of the fibrous material substantially to zero, thereby rendering the chemically modified material's cutability by ultrasonic energy facile, wherein said material was shaped by directing ultrasonic energy through the modified fibrous material along a selected line of cut to effect a predetermined shape.

5,198,290
ELECTROMAGNETIC WAVE SHIELDING MATERIAL
Yoshio Niioka, 40, Oaza-kusotsuboyama, Nishiharu-cho, Nishikasugai-gun, Aichi, Japan, assignor to Yoshio Niioka, Aichi, Japan and Marvin Gottlieb, Ill.
Filed Nov. 14, 1990, Ser. No. 614,265
Claims priority, application Japan, Nov. 14, 1989, 1-296746
Int. Cl.[5] B32B *15/00, 7/00;* B27N *9/00;* H05K *9/00*
U.S. Cl. 428—263 2 Claims

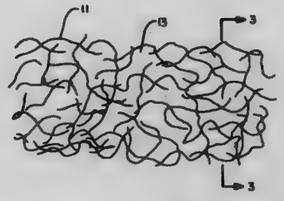


1. An electromagnetic wave shielding material comprising:
a flexible base fabric made of glass cloth;
a first metallic film made of zinc formed on one side of said base fabric by flame spraying;
felt sound insulation members provided on an other side of said base fabric and on an outer surface of said first metallic film, respectively; and
a second metallic film member made of a metal selected from the group consisting of foil and lead plate bonded on an outer surface of the sound insulation member provided on said first metallic film.

5,198,291
HIGH PERFORMANCE REINFORCED INSULATION JACKETING/BLANKETING MATERIAL
Thomas M. Kloss, Jr., Tempe, Ariz., assignor to Tomark Industries, Inc., Tempe, Ariz.
Filed May 25, 1990, Ser. No. 529,181
Int. Cl.[5] D04H *1/58;* B32B *27/06*
U.S. Cl. 428—288 3 Claims

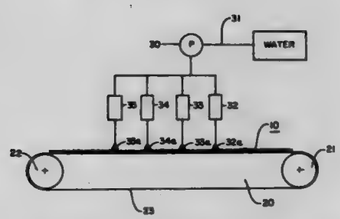
1. A reinforced jacketing material for bagging insulation comprised of an oriented fluoropolymer film, of 5 microns up to 20 microns in thickness, providing an increased resistance to the harsh chemical and thermal environment it is exposed to, and a layer of multidirectional fiber threads for reinforcement to prevent tear propagation.

5,198,292
TACK CLOTH FOR REMOVING SOLID PARTICLES FROM SOLID SURFACES AND METHOD FOR ITS MANUFACTURE
Peter Lerner, North Attleboro, Mass., and Dennis Metrick, Cumberland, R.I., assignors to International Paper Company, Purchase, N.Y.
Continuation-in-part of Ser. No. 560,477, Jul. 27, 1990, which is a continuation of Ser. No. 184,991, Jun. 15, 1988, abandoned.
This application May 8, 1992, Ser. No. 880,762
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—290 23 Claims



1. A cleaning cloth for removing particles from a surface, comprising a material made of fibers and a composition applied to said fibers, said composition comprising a tackifier, a pressure-sensitive adhesive and a slip agent.

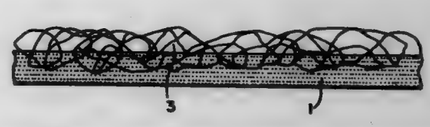
5,198,293
NON-WOVEN CLEANING CLOTH
Dennis Metrick, Cumberland, R.I., assignor to International Paper Company, Purchase, N.Y.
Continuation of Ser. No. 184,991, Jun. 15, 1988, abandoned.
This application Jul. 27, 1990, Ser. No. 560,477
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—290 14 Claims



1. A non-woven cleaning cloth comprising an array of hydroentangled fibers and means for adhering dust and particles to said array, wherein said entangled fibers are completely impregnated by said adhering means, said adhering means comprising a pressure sensitive adhesive and a tackifier.

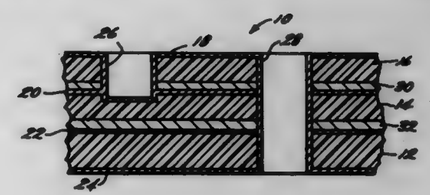
5,198,294
COMPOSITE AIR-FILTERING MATERIAL
Takuichiro Masuda, Saitama; Norio Umeza, Fukaya, and Yutaka Saisho, Asaka, all of Japan, assignors to Dynic Corporation, Kyoto, Japan
Filed Jul. 18, 1991, Ser. No. 732,070
Int. Cl.[5] B32B *5/06, 5/32;* B01D *39/16*
U.S. Cl. 428—300 3 Claims

1. Air-filtering material for use in an air filter, comprising at least one nonwoven fabric wherein fiber staples are interlocked with each other by water jet method and at least one fiber assembly, said nonwoven fabric being laminated on said fiber



assembly by needle punching and positioned on an air outlet side of the air filter.

5,198,295
CERAMIC FILLED FLUOROPOLYMERIC COMPOSITE MATERIAL
David J. Arthur, Norwood; Gwo S. Swei, Northboro, both of Mass., and Allen F. Horn, III, Danielson, Conn., assignors to Rogers Corporation, Rogers, Conn.
Continuation-in-part of Ser. No. 367,241, Jun. 16, 1989, Pat. No. 5,061,548, which is a continuation-in-part of Ser. No. 15,191, Feb. 17, 1987, Pat. No. 4,849,284, and a continuation-in-part of Ser. No. 483,501, Feb. 21, 1990, Pat. No. 5,024,871. This application May 22, 1991, Ser. No. 704,303
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—323 17 Claims

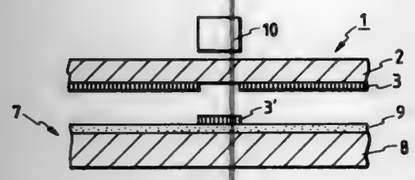


1. A nonconductive electrical substrate material comprising:
fluoropolymeric material;
ceramic filler material, said filler material being in an amount of at least about 45 to less than 50 volume percent of the total substrate material; and
said ceramic filler being coated by a titanate or zirconate coating.

5,198,296
THERMO-TRANSFER SHEET
Takeo Suzuki; Hideichiro Takeda; Shigeki Umise, and Keiichi Ogawa, all of Tokyo, Japan, assignors to Dai Nippon Insatsu K.K., Tokyo, Japan
Filed Oct. 30, 1989, Ser. No. 428,674
Claims priority, application Japan, Oct. 28, 1988, 63-139977[U]; Nov. 28, 1988, 63-298336; Jan. 31, 1989, 1-19859
Int. Cl.[5] B32B *27/06*
U.S. Cl. 428—336 3 Claims

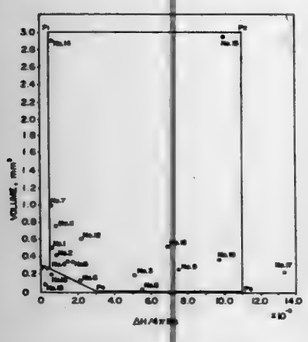
1. A thermo-transfer sheet to be laminated on a thermo-transfer image receiving sheet and heated by a thermal head from a rear side of the thermo-transfer sheet to print an ink image having a predetermined area on the thermo-transfer image receiving sheet, comprising:
a base film;
a release layer formed on one surface of said base film;

a transfer ink layer formed on a surface of said release layer; and



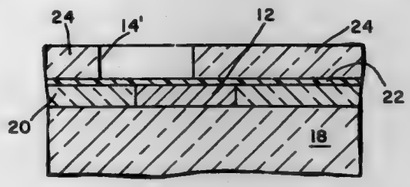
a temperature-sensitive adhesive layer formed on a surface of said transfer ink layer, wherein said transfer ink layer contains polymethylpentene as a binder.

5,198,297
MAGNETOSTATIC-WAVE CHIP AND DEVICE COMPRISING A RARE EARTH IRON-BASED OXIDE GARNET
Masayuki Tanno, and Toshihiko Ryuo, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Oct. 22, 1991, Ser. No. 781,100
Claims priority, application Japan, Oct. 25, 1990, 2-287794
Int. Cl.[5] B32B *9/00*; H01P *7/00, 1/18, 1/20*
U.S. Cl. 428—336 **8 Claims**



1. A magnetostatic-wave chip which comprises:
(a) a substrate; and
(b) a film of rare earth-iron-based oxide garnet having a thickness of 10 to 200 μm formed as the magnetostatic-wave material on the surface of the substrate and having a volume and value of $\Delta 7/4\pi Ms$, which is the ratio of the half-value width of magnetic resonance peak ΔH at a frequency of 9.2 GHz to the saturation magnetization $4\pi Ms$, satisfying a relationship so as to fall within the pentagonal area surrounded by the lines connecting the five points P1, P2, P3, P4 and P5 in the diagram of FIG. 1 of the accompanying drawing, each point having coordinates of P1 (0.5×10^{-3}, 3.0 mm³), P2 (11.0×10^{-3}, 3.0 mm³), P3 (11.0×10^{-3}, 0.01 mm³), P4 (3.0×10^{-3}, 0.01 mm³) or P5 (0.5×10^{-3}, 0.25 mm³), all taking $\Delta H/4\pi Ms$ as the abscissa and the volume as the ordinate, the chip being capable of treating a relatively large electric power of at least 0 dBm, at a frequency of 0.8 GHz or higher, when the insertion loss is 3 dB.

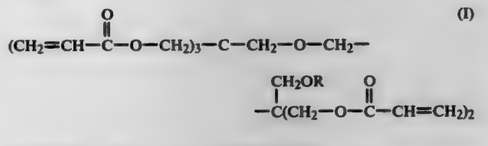
5,198,298
ETCH STOP LAYER USING POLYMERS
Jacob D. Haskell, Palo Alto, and Subhash Gupta, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Oct. 24, 1989, Ser. No. 426,147
Int. Cl.[5] B32B *33/00*
U.S. Cl. 428—336 **3 Claims**



1. An etch stop layer for use in semiconductor processing consisting essentially of a silicon-oxyhalide polymer layer formed between two similar dielectric layers by the reaction of SiX_4 and oxygen, wherein X is halogen and the amount of oxygen ranges from about 5 to 90 volume percent, and wherein said silicon-oxyhalide polymer has a much lower etch rate than said dielectric layers.

5,198,299
RELEASE SHEET
Takahisa Kato, and Seigo Ebato, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Japan
Filed Jul. 22, 1991, Ser. No. 733,611
Claims priority, application Japan, Jul. 27, 1990, 2-200843
Int. Cl.[5] B32B *7/06*
U.S. Cl. 428—340 **6 Claims**

1. A release sheet which comprises a support and a layer provided on at least a side thereof comprising a dispersion comprising a compound of the general formula



(I)

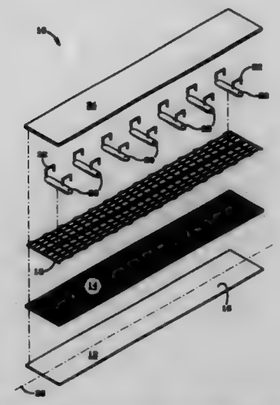
$$(CH_2{=}CH{-}\overset{O}{\overset{\|}{C}}{-}O{-}CH_2)_3{-}C{-}CH_2{-}O{-}CH_2{-}\underset{}{\overset{CH_2OR}{\overset{|}{C}}}(CH_2{-}O{-}\overset{O}{\overset{\|}{C}}{-}CH{=}CH_2)_2$$

where R is hydrogen or $-COCH{=}CH_2$,
and an electron beam curable silicone resin, the layer being cured by irradiation with electron beam.

5,198,300
HEAT BOND SEAMING TAPE
James Matthews, 1532½ Woodland NW., Canton, Ohio 44703, and Nicholas H. Shaheen, Jr., 7644 Onyx Ave., NW., Massillon, Ohio 44646
Continuation-in-part of Ser. No. 611,985, Nov. 13, 1990, abandoned. This application Aug. 8, 1991, Ser. No. 742,400
Int. Cl.[5] B32B *7/12, 15/02*
U.S. Cl. 428—354 **10 Claims**

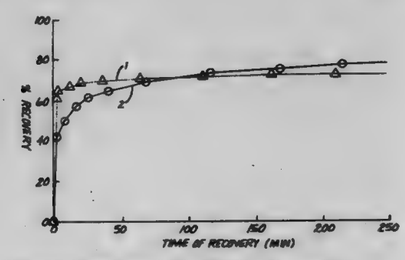
1. A seam tape for connecting adjoining edges of carpet at a seam thereof to reduce buckling of said edges along said seam including:
a base strip of flexible sheet material;
a strip of open mesh material having a longitudinal axis secured in an overlying relationship to the base strip;
a plurality of rigid flat toothless brace members secured to the base strip and spaced along the longitudinal axis of the mesh material, with each of said brace members extending

generally transversely across the longitudinal axis of said mesh material;
means for securing the brace members to the base strip; and



a thermoplastic adhesive material applied to and overlying the mesh material and brace members for bonding said mesh material and the brace members to a backing of the carpet.

5,198,301
FLEXIBLE AND CONFORMABLE IONOMERIC RESIN BASED FILMS
Patrick J. Hager, Woodbury; Del A. Kaus, Maplewood, and Janet T. Keller, Eagan, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 17, 1991, Ser. No. 702,065
Int. Cl.[5] C08L *33/02*; B32B *5/16, 7/12*
U.S. Cl. 428—355 **22 Claims**



1. A flexible and conformable film comprising:
a) about 60–98% by weight ionomer resin that is a copolymer of ethylene and acrylic acid or methacrylic acid neutralized by a metal cation, said resin having a melt flow index greater than about 10 and
b) about 2–40% by weight of a filler material, wherein said film has a thickness of between 0.050 and 0.127 mm wherein said film is substantially free of migrating plasticizers or leachable additives and wherein said film has an Elmendorf tear strength in excess of 280 grams/ply.

5,198,302
COATED INORGANIC FIBER REINFORCEMENT MATERIALS AND CERAMIC COMPOSITES COMPRISING THE SAME
Kenneth Chyung, Painted Post; Steven B. Dawes, and Dale R. Wexell, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Filed Apr. 23, 1990, Ser. No. 512,392
Int. Cl.[5] D02G *3/00*; B32B *9/00*
U.S. Cl. 428—375 **19 Claims**

1. A silicon nitride fiber comprising a surface coating of boron nitride.

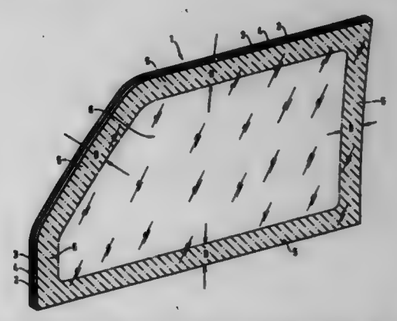
5,198,303
PAINTABLE HIGH SPECIFIC ADHESION POLYVINYL HALIDE COPOLYMER COMPOSITIONS
William S. Greenlee; Josef C. Vyvoda, both of Avon Lake, and John L. Seiniger, Westlake, all of Ohio, assignors to The BFGoodrich Company, Brecksville, Ohio
Filed Jun. 25, 1991, Ser. No. 720,559
Int. Cl.[5] B32B *15/08*
U.S. Cl. 428—463 **16 Claims**

1. A flexible or semi-rigid article comprising a substrate of metal, plastic or wood contacted with a melt-processed compound devoid of plasticizers, comprising a: copolymer of vinyl halide monomer and at least one adhesion-promoting comonomer having the formula:

$$H_2C{=}C(R^1)C(O)OR^2$$

wherein R^1 is selected from the group consisting of hydrogen, an aromatic group having from 6 to 18 carbon atoms, and an aliphatic group having from 1 to 18 carbon atoms; R^2 is selected from the group consisting of an alkyl, an aromatic, an alkyl hydroxyl and a hydrocarbyl ether group.

5,198,304
VERTICALLY ADJUSTABLE SIDE GLAZING FOR MOTOR VEHICLES
Franz Krämling, and Friedrich-Wilhelm Bernadsen, both of Aachen, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France
Filed Aug. 27, 1991, Ser. No. 750,540
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1990, 4027035
Int. Cl.[5] B32B *9/06*
U.S. Cl. 428—437 **6 Claims**



1. A vertically adjustable composite car glazing consisting of two thermally tempered single glazings of 1.5 mm to 3.5 mm thickness interconnected by a thermoplastic intermediate layer, each of said single glazings consisting of a central zone and a marginal area all around said central zone, said central zones and marginal areas of said glazings arranged opposite to one another when said glazings are interconnected, said glazings having a tempering which differs over the glazing surface

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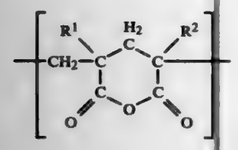
such that the average tensile stress in the core of the central zone of the glazing is 5 to 35% lower than the average tensile stress in the core of the marginal area of the glazing, the tensile stress in the core of the marginal area of the glazing being 5 to 15% lower than the tensile stress in the core of a standard uniformly tempered glazing having the same thickness as the single glazing necessary to create from 40 to 400 glass crumbs upon destruction of a 5 cm×5 cm square portion thereof.

5,198,305
OPTICAL ELEMENT SUBSTRATE

Akihiro Wada, Inagi, and Rin-ichi Kakuta, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 481,694, Feb. 20, 1990, abandoned, which is a continuation of Ser. No. 136,917, Dec. 22, 1987, abandoned. This application Dec. 23, 1991, Ser. No. 814,229
Claims priority, application Japan, Dec. 25, 1986, 61-308041
Int. Cl.[5] B32B *15/08*; C08F *20/10*
U.S. Cl. 428—463 **11 Claims**

1. An optical disc substrate comprising a tetrapolymer of (A) a methyl methacrylate unit, (B) an aromatic vinyl compound unit, (C) an unsaturated aliphatic acid unit and (D) a hexagonal acid anhydride unit of the formula:



(I)

wherein R^1 and R^2 each independently represent a hydrogen atom or a methyl group,

the weight proportions of said units (A), (B), (C), and (D) relative to the total weight of said units (A), (B), (C), and (D) being defined as a, b, c and d, respectively, which satisfy the formulae:

$a+b+c+d=100$,

$88.9 \geqq a \geqq 50$,

$56 \geqq b \geqq 1$,

$10 \geqq c \geqq 2$, and

$50 \geqq d \geqq 10$,

and wherein sand random copolymer has a viscosity of from 2 to 10 cps as measured at 25° C. with respect to a 10% by weight solution of the random copolymer in methyl ethyl ketone.

5,198,306
RECORDING TRANSPARENCY AND METHOD

Jurgen M. Kruse, Clinton, Conn., assignor to Xaar Limited, Cambridge, England

Continuation-in-part of Ser. No. 231,656, Aug. 10, 1988, abandoned, which is a continuation of Ser. No. 17,784, Feb. 24, 1987, abandoned. This application Jun. 29, 1990, Ser. No. 545,849
Int. Cl.[5] B41M *5/00*
U.S. Cl. 428—481 **48 Claims**

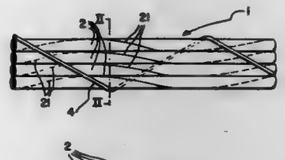
1. A recording transparency comprising:

(a) a substantially transparent substrate having a hydrophilic surface; and

(b) a substantially transparent hydrophilic coating applied to said surface by coating said surface with an aqueous coating solution followed by evaporation of the water from said solution, said solution comprising a polymeric sorbent dissolved in water and a multi-component surfactant composition comprising a nonionic detergent, an anionic detergent and a complexing agent, said polymeric sorbent being selected from transparent synthetic cellulosic polymers other than hydroxyethyl cellulose polymers and the concentration, average molecular weight and molecular weight distribution of said polymeric sorbent being selected such that said coating solution has a viscosity so as to be readily coatable on said surface and said coating provides a desired high rate of sorption and drying of indicia applied thereto.

5,198,307
STEEL STRIP AND METHOD OF MAKING

Luc Bourgois, Desselgem; Urbain D'Haene, Ingooigem, and Daniël Van Wassenhove, Merelbeke, all of Belgium, assignors to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Nov. 20, 1991, Ser. No. 794,896
Claims priority, application European Pat. Off., Dec. 21, 1990, 90203483.4
Int. Cl.[5] B60C *9/16*; B65G *15/36*; B21F *17/00*; D07B *1/00*
U.S. Cl. 428—589 **10 Claims**

1. A steel strip (1) comprising

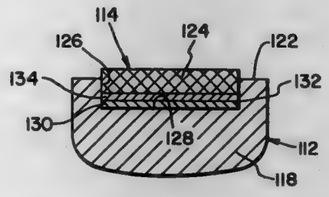
two to seven round steel filaments (2) lying in parallel adjacent to one another and in contact with one another so as to form a single plane of core filaments and one or more filaments (4) which are wrapped around the core filaments in one single wrapping direction wherein

one or more core filaments, individually, or the plane of the core filaments as a whole, have residual elastic torsions to such an extent that the strip remains substantially flat over the whole length of the strip if the strip is not subjected to external forces.

5,198,308
TITANIUM POROUS SURFACE BONDED TO A COBALT-BASED ALLOY SUBSTRATE IN AN ORTHOPAEDIC IMPLANT DEVICE

H. Ravindranath Shetty, Warsaw; Mark A. Heldreth, Mentone, and Jack E. Parr, North Webster, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Dec. 21, 1990, Ser. No. 633,597
Int. Cl.[5] A61F *2/28, 2/30*; B32B *15/14*
U.S. Cl. 428—608 **10 Claims**



1. An orthopaedic implant device having enhanced corrosion resistance properties, comprising:

a substrate of a cobalt-based alloy;

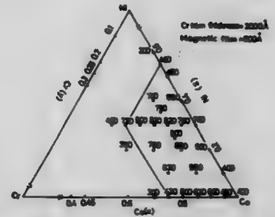
a porous structure of titanium or a titanium alloy; and

an interlayer, intermediate said substrate and said porous structure, comprising a cobalt-based alloy including nickel in an effective amount to enhance bonding strength and corrosion resistance.

5,198,309
MAGNETIC RECORDING MEMBER

Kyuzo Nakamura; Yoshifumi Ota; Taiki Yamada; Michio Ishikawa, and Noriaki Tani, all of Yachimata, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Continuation of Ser. No. 798,067, Nov. 14, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 89,022
Claims priority, application Japan, Nov. 14, 1984, 59-238627
Int. Cl.[5] B32B *11/00*
U.S. Cl. 428—667 **2 Claims**

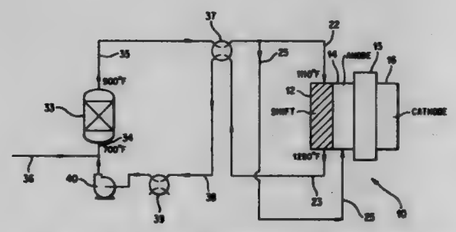


1. In a magnetic recording member comprising a magnetic metallic film formed on a Cr film provided on a surface of a non-magnetic substrate, the improvement wherein said magnetic metallic film consists essentially of Co, Cr and Ni in the proportions represented by $Co_xCr_yNi_z$ wherein x, y and z are atomic ratios and $0.45 \leqq x < 0.85$; $0.05 \leqq y \leqq 0.25$; $0.1 < z \leqq 0.5$; and $x+y+z=1$.

5,198,310
THERMAL MANAGEMENT IN FUEL CELL SYSTEM BY FEED GAS CONDITIONING

Donald K. Fleming, Park Ridge, and Raymond C. Rex, Jr., Dolton, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Sep. 11, 1991, Ser. No. 757,718
Int. Cl.[5] H07M *8/04*
U.S. Cl. 429—17 **19 Claims**



1. A process for thermal management in high temperature molten alkali metal carbonates fuel cell systems by anode feed gas conditioning comprising:

chemically reacting at least a portion of a anode fuel gas feed stream in an exothermic chemical reaction in an external zone thermally separated from said fuel cell system;

passing at least a portion of the products of said exothermic chemical reaction to an internal reaction zone adjacent an anode and in indirect thermal exchange relation with said fuel cell system;

chemically reacting at least a portion of said products of said exothermic chemical reaction in an endothermic chemical reaction in said internal reaction zone in indirect thermal exchange relation with said fuel cell, thereby absorbing heat from exothermic electrochemical reaction within said fuel cell system producing a higher thermal energy process stream from said internal endothermic chemical reaction;

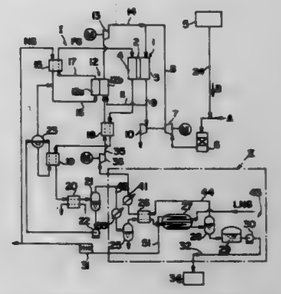
passing a first portion of said higher thermal energy stream of an anode as fuel; and

removing a second larger portion of said higher thermal energy process stream directly from said fuel cell system.

5,198,311
LNG CRYOGENIC POWER GENERATION SYSTEM USING MOLTEN CARBONATE FUEL CELLS

Kenzo Nakazawa; Hiroyoshi Uematsu, both of Yokohama, and Satoshi Hatori, Ibaraki, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,078
Claims priority, application Japan, May 30, 1990, 2-140398
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—20 **28 Claims**



1. A power generation system using a molten carbonate fuel cell, comprising:

a fuel cell having a reformer, a cathode chamber, an anode chamber and an electrolyte tile impregnated with molten carbonate, LNG being transformed to gaseous form and then reformed by the reformer, reformed NG being fed to the anode chamber and oxidizing gas being fed to the cathode chamber, the reformer having a reforming chamber and the reforming chamber having an inlet; and

a CO_2 separator unit for liquefying CO_2 contained in gases discharged from the anode chamber using cryogenic LNG so as to separate CO_2 from the gases.

5,198,312
POWER GENERATION SYSTEM WITH FLAT FUEL CELLS OF SOLID ELECTROLYTE

Mitsuhiro Irino, Takasago; Tokuki Satake, Kobe; Hiroshi Sakai, Kobe; Masayuki Funatsu, Kobe; Hisao Haseda, Kobe; Masaru Ishibashi, Takasago; Koichi Takenobu, Kobe; Kiyoshi Watanabe, Kobe; Kazumi Ogura, Kobe, and Shigeru Ohkura, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1991, Ser. No. 669,019
Claims priority, application Japan, Mar. 13, 1990, 2-61679; Mar. 30, 1990, 2-83864
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—26 **12 Claims**

1. A power generation system with flat fuel cells of solid electrolyte comprising:

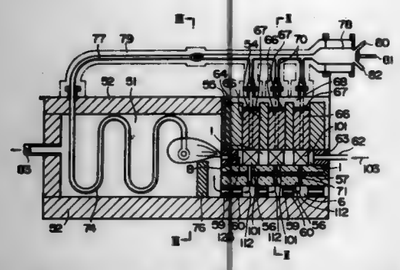
(a) a plurality of pile units of flat fuel cells of solid electrolyte disposed in a row in a horizontally extending fuel gas duct adapted to supply to said plurality of pile units of flat fuel cells fuel gas,

(b) each of said pile units of flat fuel cells having;

(b) each of said pile units of flat fuel cells having;

(1) a plurality of horizontal flat flow paths, each with a first and second end for fuel gas, each disposed above each fuel-side porous electrode sheet and opening freely at both path ends on the opposing side faces of the pile unit; and,

(2) a plurality of horizontal flat flow paths each with a first and second end for oxidant gas each disposed beneath each oxygen-side porous electrode sheet and separated from the fuel gas flow paths, and a first path end connected to a supply line and a second path end connected to an exhaust line for the oxidant gas,



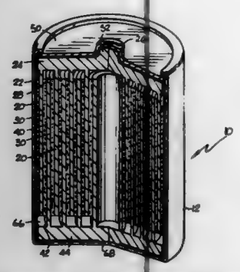
(c) an after-burning region disposed downstream of said plurality of pile units of flat fuel cells for burning at least a part of the spent fuel gas which has passed through the fuel cell using at least a part of the spent oxidant gas which has passed through the fuel cell, for generating a heat of combustion for use for preheating at least the feed gases to be supplied to the fuel cell; and

(d) an assembly for electric current output for each of the fuel cell pile units, disposed in the stream of fuel gas, so that the assembly will not be subject to oxidation.

5,198,313
BATTERY END CONNECTOR

Tristan E. Juergens, Black Hawk, Colo., assignor to Bolder Battery, Inc., Wheatridge, Colo.

Continuation-in-part of Ser. No. 364,867, Jun. 14, 1989, Pat. No. 5,047,300. This application Sep. 10, 1991, Ser. No. 757,447
Int. Cl.[5] H01M *2/28*
U.S. Cl. 429—94 41 Claims

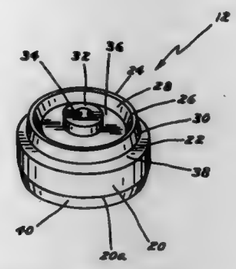


1. A battery, comprising a first electrical plate having a first electrical polarity, a first electrical battery terminal, and a first end connector connected to the first terminal and cast onto the first plate with no discontinuities between the first end connector and first plate for establishing electrical communication between the first plate and first terminal.

5,198,314
SEAL FOR CELLS CONTAINING ALKALINE ELECTROLYTE

Dennis J. Gordy, Mason City, Iowa, assignor to Alexander Manufacturing Company, Mason City, Iowa

Division of Ser. No. 293,499, Jan. 4, 1989, Pat. No. 5,057,386. This application Jul. 23, 1991, Ser. No. 734,763
Int. Cl.[5] H01T *2/08*
U.S. Cl. 429—174 10 Claims



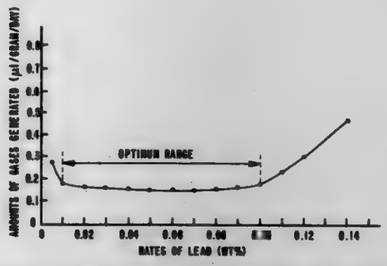
1. A seal for a battery cell comprising:

a cylindrically shaped member formed of polyphenylene sulfide and having a central annular body member with a vertically aligned annular circumferential surface; a horizontally aligned planar surface intersecting said annular circumferential surface; a cylindrical inner member extending upwardly from said horizontally aligned planar surface; and an annular ring member concentrically aligned about said cylindrical inner member and extending upwardly from said horizontally aligned planar surface and including a top surface, an inner sloped wall and an outer sloping wall; said cylindrical inner member and said annular ring member intersecting said horizontally aligned member to define an inner annular ring surface and an outer annular ring surface.

5,198,315
ZINC ALKALINE CELLS

Kinya Tada; Masaaki Kurimura; Mutsumi Yano, all of Osaka; Eiichiro Mieno, Gunma; Wataru Sekiguchi, Gunma; Junzo Nakagawa, Gunma, and Takanori Akazawa, Gunma, all of Japan, assignors to Sanyo-Ekuseru Kabushikigaisha; Toho-Aen Kabushikigaisha and Sanyo-Denki Kabushikigaisha, all of Japan

Filed Aug. 21, 1991, Ser. No. 748,008
Claims priority, application Japan, Mar. 12, 1991, 3-72336
Int. Cl.[5] H01M *4/42*
U.S. Cl. 429—209 5 Claims



1. A zinc alkaline cell comprising an anode active material which comprises a non-amalgamated zinc alloy powder having a bulk specific gravity ranging from approximately 2.90 to 3.50 (grams per cm^3) and containing indium coated on a surface of the non-amalgamated zinc alloy powder.

5,198,316
COPOLYIMIDES, THEIR PREPARATION AND THE USE THEREOF

Wolfgang Wernet, Kobe, Japan, and Joseph Berger, Basle, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 744,620, Aug. 12, 1991, Pat. No. 5,145,940. This application Jun. 17, 1992, Ser. No. 899,401
Claims priority, application Switzerland, Aug. 17, 1990, 2674/90
Int. Cl.[5] G03G *17/04*; C08G *8/02*
U.S. Cl. 430—32 19 Claims

1. A process for the production of relief images, which comprises irradiating a copolyimide layer on a support through a photomask, said copolyimide having an inherent viscosity of 0.2 to 3.0 dl/g, measured at 25° C. in a solution of 0.5% by weight of said process in N-methylpyrrolidone, and comprising

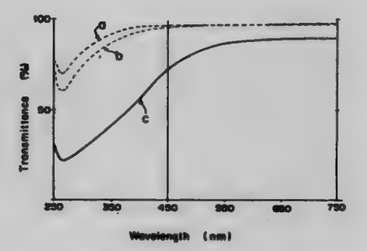
A) at least one structural repeating unit of aromatic tetracarboxylic acid radicals (a) which contain 10 to 30 carbon atoms and which are unsubstituted or substituted by halogen, nitro, C_1–C_4alkyl, C_1–C_4alkoxy or phenacyl, and aromatic diamine radicals (b) which contain 6 to 30 carbon atoms and which are unsubstituted or substituted by C_1–C_4alkyl or halogen; and at least one additional optional structural repeating unit of aromatic tricarboxylic acid radicals (c) of 9 to 30 carbon atoms, which radicals are unsubstituted or substituted as for (a), and of identical or different diamine radicals (b), and

B) at least one structural repeating unit of identical or different tetracarboxylic acid radicals (a) and aromatic diamines (d) which contain 6 to 30 carbon atoms and which are unsubstituted or substituted by C_1–C_4alkyl, and which contain at least one —SO_3M group attached to the aromatic nucleus, wherein M is $H^{\oplus}$, a mono- to trivalent metal cation, $NH_4^{\oplus}$ or an organic ammonium cation of 1 to 30 carbon atoms; and additional optional structural repeating units of identical or different aromatic tricarboxylic acid radicals (c) and identical or different diamine radicals (d), with the proviso that at least one of said diamine radicals (b) or (d) is substituted by C_1–C_4alkyl in both ortho-positions to at least one N atom, and thereafter developing the image so produced in an aqueous alkaline medium by dissolving out the unexposed areas.

5,198,317
ORGANIC PHOTOSENSITIVE MEMBER COMPRISING A CHARGE TRANSPORT LAYER WITH A BINDER RESIN AND A SOLVENT

Izumi Osawa, Ikeda; Shuji Iino, Hirakata; Isao Doi, Toyonaka, and Kenji Masaki, Ibaraki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1991, Ser. No. 652,646
Claims priority, application Japan, Feb. 9, 1990, 2-30207
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—58 7 Claims

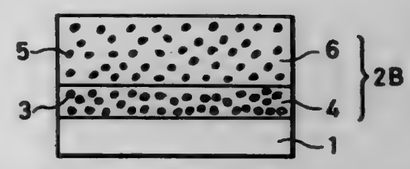


1. A photosensitive member comprising a conductive substrate; an organic photosensitive layer formed on the conductive substrate, which comprises an organic charge-generating material, an organic charge-transporting material, a binder resin and a solvent at a content of 2,500 to 20,000 ppm; and a surface protective layer formed on the organic photosensitive layer, which comprises an amorphous hydrocarbon having an absorptivity coefficient of 400 to 5,000 cm^{-1} with respect to light of 450 nm wavelength.

5,198,318
BISAZO PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

Masami Kuroda; Masuyo Amano, and Noboru Furusho, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

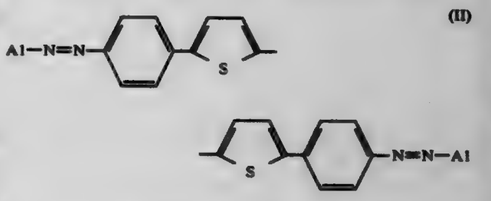
Division of Ser. No. 530,088, May 31, 1990, Pat. No. 5,087,541. This application Nov. 27, 1991, Ser. No. 799,601
Claims priority, application Japan, Jun. 6, 1989, 1-143523
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—58 3 Claims



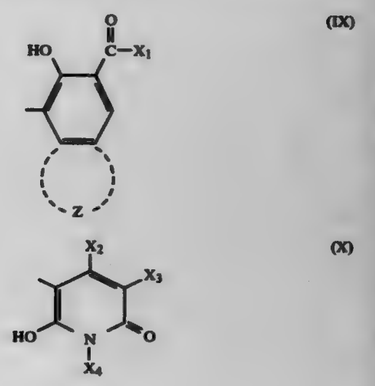
1. A photoconductor for electrophotography, comprising:

an electroconductive substrate; and

a photosensitive layer formed on said electroconductive substrate and including a charge transporting substance and a charge generating substance which is at least one disazo compound represented by general formula (II):



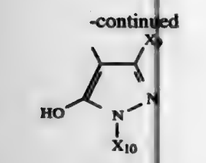
wherein A_1 is a coupler residual group represented by one of general formulae (IX) to (XIV):

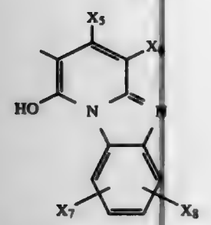


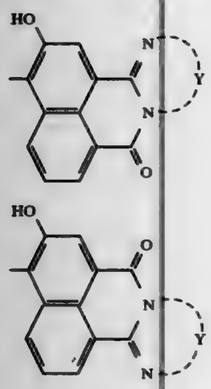
molecular weight of 5×10^4 or more, containing a repeating

5,198,322

-continued







wherein Z is a residual group which condenses with a benzene ring to form an aromatic polycycle or heterocycle, X_1 is one of OR_1 and NR_2R_3, each of R_1, R_2 and R_3 is selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group and a heterocycle group, which groups may be substituted, each of X_2 and X_5 is selected from the group consisting of an alkyl group, an aryl group and a heterocyclic group, which groups may be substituted, each of X_3 and X_6 is selected from the group consisting of a hydrogen atom, a cyano group, a carbamoyl group, a carboxyl group, an ester group and an acyl group, each of X_4 and X_{11} is selected form the group consisting of a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an aryl group and a heterocyclic group, each of X_7 and X_8 is selected from the group consisting of a hydrogen atom, a halogen atom, a nitro group, an alkyl group and an alkoxy group, the alkyl group and the alkoxy group of which may be substituted, X_9 is selected from the group consisting of an alkyl group, an aryl group, a carboxyl group and an ester group, X_{10} is one of an aryl group and a heterocyclic group, which groups may be substituted, and Y is a residual group which forms an aromatic ring or a heterocycle.

3. The photoconductor as claimed in claim 1, wherein said photosensitive layer comprises a laminate of a charge transporting layer mainly composed of the charge transporting substance and a binder, and a charge generating layer including the charge generating substance and a binder.

5,198,319

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

(XI) **Filed May 21, 1991, Ser. No. 703,651**
Claims priority, application Japan, May 21, 1990, 2-129264
Int. Cl.[5] G03G *5/087*
U.S. Cl. 430—96 **16 Claims**

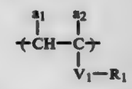
1. An electrophotographic light-sensitive material comprising a support having provided thereon a photoconductive layer containing at least an inorganic photoconductive substance and a binder resin, wherein the binder resin comprises

(XII) (1) at least one graft type copolymer (Resin (A)) having a weight average molecular weight of from 1×10^3 to 2×10^4 and formed from, as a copolymerizable component, at least one mono-functional macromonomer (M) comprising an AB block copolymer composed of an A block comprising at least one polymer component containing at least one acidic group selected from $-PO_3H_2$, —COOH, $-CO_3H$, a phenolic hydroxyl group

(XIII)

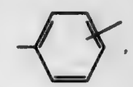
(wherein R represents a hydrocarbon group or —OR' (wherein R' represents a hydrocarbon group)) and a cyclic acid anhydride-containing group, and a B block containing at least one polymer component represented by the general formula (I) described below and having a polymerizable double bond group bonded to the terminal of the main chain of the B

(XIV) block polymer;

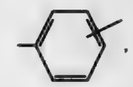
(I) 

wherein a_1 and a_2 each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, $-COOZ_1$ or $-COOZ_1$ bonded via a hydrocarbon group (wherein Z_1 represents a hydrocarbon group); V_1 represents —COO—, —OCO—, $-CH_2)_{l1}OCO-$, $-CH_2)_{l2}COO-$ (wherein l_1 and l_2 each represents an integer of from 1 to 3), —O—, $-SO_2-$, —CO—,

(wherein P_1 represent a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH—, or

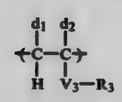


and R_1 represents a hydrocarbon group, provided that when V_1 represents



R_1 represents a hydrogen atom or a hydrocarbon group; and

(2) at least one resin (Resin (B)) having a weight average molecular weight of 5×10^4 or more, containing a repeating unit represented by the general formula (III) described below, as a copolymer component, and having a crosslinked structure formed before the preparation of a dispersion for forming the photoconductive layer;

(III) 

wherein V_3 represents —COO—, —OCO—, $-CH_2OCO-$, $-CH_2COO-$, —O—, or $-SO_2-$, R_3 represents a hydrocarbon group having from 1 to 22 carbon atoms; and d_1 and d_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group having from 1 to 8 carbon atoms, $-COOZ_3$, or $-COOZ_3$ bonded through a hydrocarbon group having from 1 to 8 carbon atoms, wherein Z_3 represents a hydrocarbon group having from 1 to 18 carbon atoms.

5,198,320

ELECTROSTATOGRAPHIC TONER COMPRISING BINDER POLYMER CONTAINING CHARGE-CONTROL MOIETIES AND THEIR PREPARATION

William B. Vreeland, Webster; Dinesh Tyagi, Fairport, and Zona R. Pierce, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 30, 1991, Ser. No. 814,152
Int. Cl.[5] G03G *9/097*
U.S. Cl. 430—110 **7 Claims**

1. An electrostatographic toner comprising binder polymer particles and charge-control moieties, the improvement wherein the binder polymer particles have a surface layer of smaller polymeric particles that are covalently bonded through a plurality of oxygen linkages to polyorganoxiloxane oligomer containing pendant charge-control moieties.

5,198,321

IMAGE FORMING METHOD

Noriyaki Hosoi, and Kotaro Nakamura, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1991, Ser. No. 770,212
Claims priority, application Japan, Oct. 3, 1990, 2-265551
Int. Cl.[5] G03C *1/72, 5/56*
U.S. Cl. 430—138 **10 Claims**

1. A method for forming an image which comprises

bringing a transparent heat-sensitive recording material comprising a transparent support made of a synthetic polymer having thereon a transparent heat-sensitive recording layer into contact with a light-absorbing material, at least at the time of effecting recording,

irradiating said light-absorbing material with a laser beam to heat said transparent heat-sensitive recording layer and to cause color formation therein, and

separating the light-absorbing material and the heat-sensitive recording material from each other after irradiation.

5,198,322

POSITIVELY OPERATING RADIATION-SENSITIVE MIXTURE CONTAINING A POLYFUNCTIONAL α-DIAZO-β-KETO ESTER AND RADIATION-SENSITIVE RECORDING MATERIAL CONTAINING THIS MIXTURE

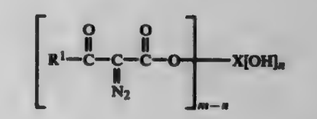
Peter Wilhelm, Wiesbaden; Hans-Joachim Merrem, Seeheim-Jugenheim; Georg Pawlowski, Wiesbaden, and Ralph Dammel, Mainz-Bretzenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 12, 1990, Ser. No. 466,007
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1989, 3900736
Int. Cl.[5] G03F *7/023*; C07C *245/18*
U.S. Cl. 430—189 **37 Claims**

1. A positively operating radiation-sensitive mixture comprising:

a) a binder which is insoluble in water but soluble or at least swellable in aqueous alkaline solution, and

b) as a photactive component a polyfunctional α-diazo-β-keto ester of the general formula I

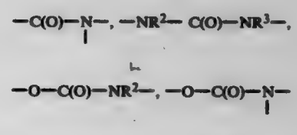
(I) 

in which

R^1 denotes an aliphatic, cycloaliphatic or araliphatic or aromatic radical having 4 to 20 carbon atoms, in which individual CH_2 groups can be replaced by oxygen or sulfur atoms or by

or NH groups and/or contain keto groups,

X denotes an aliphatic, cycloaliphatic, carbocyclic, heterocyclic or araliphatic radical having 2 to 22 carbon atoms, in which individual CH_2 groups can be replaced by oxygen or sulfur atoms or by the groups $-NR^2-$, $-C(O)-O-$, $-C(O)-NR^2-$,



or —O—C(O)—O—, or CH groups can be replaced by

in which R^2 and R^3 independently of one another represent hydrogen or an aliphatic, carbocyclic or araliphatic radical,

m denotes an integer from 2 to 10 and

n denotes an integer from 0 to 2,

wherein

m−n is ≧2.

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5,198,323

RESIST COMPOSITION CONTAINING ALKALI-SOLUBLE RESIN, 1,2-QUINONE DIAZIDE COMPOUND AND ANTI-HALATION COMPONENT

Teijiro Kitao, Tondabayashi; Masaru Matsuoka, Tsuri; Ryotaro Hanawa, Ibaraki; Yasunori Uetani, Toyonaka; Naoki Takeyama, Settsu; Takeshi Hioki, Tondabayashi, and Hiroshi Takagaki, Higashiosaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

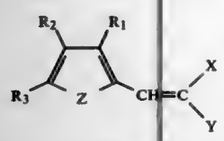
Filed Apr. 30, 1991, Ser. No. 694,372

Claims priority, application Japan, May 2, 1990, 2-115982; May 2, 1990, 2-115983; May 2, 1990, 2-115984

Int. Cl.[5] G03F *7/023*; G03C *1/61*

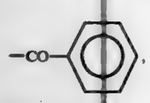
U.S. Cl. 430—191 **13 Claims**

1. A resist composition comprising, in admixture, an alkali-soluble resin, a 1,2-quinone diazide compound and a compound of the general formula (I):



(I)

wherein Z is an oxygen or sulfur atom or a group of the formula: >N—R_4 in which R_4 is a hydrogen atom or an alkyl group; R_1, R_2 and R_3 are the same or different and independently a hydrogen atom, a substituted or unsubstituted alkyl group, a halogen atom, a hydroxyl group, a cyano group or a group of the formula: —OCOR″ in which R″ is a substituted or unsubstituted alkyl group; and X and Y are independently a cyano group or a group of the formula:



—COOR or —CONHR′ in which R is an alkyl group and R′ is a hydrogen atom or an aryl group, wherein an amount of said alkali-soluble resin is larger than 30% by weight, an amount of said 1,2-quinone diazide compound is from 5 to 50% by weight, and an amount of said compound of the general formula (I) is from 0.1 to 25% by weight based on a total weight of solid components in the resist composition.

5,198,324

METHOD FOR MAKING LITHOGRAPHIC PRINTING PLATE

Shigeru Iguchi; Kiyoshi Futaki; Koichi Torizuka, and Shozi Oka, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,093

Claims priority, application Japan, Dec. 8, 1988, 63-311321

Int. Cl.[5] G03C *1/43*

U.S. Cl. 430—265 **7 Claims**

1. A method for making a lithographic printing plate which comprises subjecting a photographic photosensitive material comprising a support and, provided thereon, an unfogged internal latent image type silver halide emulsion layer to scanner-exposing, subjecting the exposed photosensitive material to non-tanning development in the presence of a nucleating agent, and then subjecting the silver halide portion of the emulsion layer to an oleophilizing treatment.

5,198,325

PHOTOPOLYMERIZABLE MIXTURE, COPYING MATERIAL CONTAINING SAME AND PROCESS FOR PRODUCING HIGHLY HEAT-RESISTANT RELIEF STRUCTURES WHEREIN A TRIHALOMETHYL IS THE PHOTOINITIATOR

Bernd Hupfer, North Kingstown, R.I.; Gerhard Buhr, Koenigstein, and Charlotte Eckes, Mainz-Gonsenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 199,296

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717933

Int. Cl.[5] G03F *7/037, 7/031*

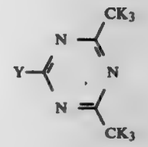
U.S. Cl. 430—283 **20 Claims**

1. A negative-working photopolymerizable mixture for producing a relief structure comprising highly heat-resistant polymers, said mixture consisting essentially of:

a soluble polymer precursor with a molecular weight (Mn) of about 2,000 to 100,000 having at least one unsaturated radial bound by an ester-linkage to a carboxyl group of the polymer precursor;

at least one monomer comprising a polyfunctional acrylic compound; and

a photoinitiator having at least one trihalomethyl group that reacts on exposure to light represented by a compound of the type A



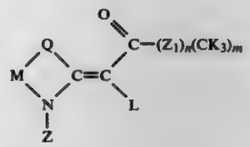
A

wherein

Y denotes an optionally substituted aromatic or heterocyclic aromatic, optionally partially hydrogenated radical optionally bound via a conjugated alkenylene chain, in particular (C_2–C_6)-alkenylene, or preferably via an unsaturated ring carbon atom, and

K is a chlorine, bromine or iodine atom.

or a compound of the type B



B

wherein

L denotes a hydrogen atom or a substituent of the formula $CO—(Z_1)_n(CK_3)_m$,

M denotes a substituted or unsubstituted alkylene radical or alkenylene radical or a 1,2-arylene radical,

Q denotes a sulfur, selenium or oxygen atom, a dialkylmethylene group, an alken-1,2-ylene radical, a 1,2-phenylene radical or an N-Z group,

M+Q together forming 3 or 4 ring members,

Z denotes an alkyl, aralkyl or alkoxy radical,

Z_1 denotes a carbocyclic or heterocyclic aromatic group,

K denotes a chlorine, bromine, or iodine atom and

n=0 and m=1 or

n=2 and m=1 or 2.

5,198,326

PROCESS FOR FORMING FINE PATTERN

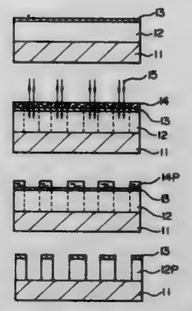
Kazuhiko Hashimoto, Moriguchi, and Noboru Nomura, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1991, Ser. No. 695,328

Claims priority, application Japan, May 24, 1990, 2-135062

Int. Cl.[5] G03F *7/36, 7/40, 7/039*

U.S. Cl. 430—296 **1 Claim**



1. A process for forming a fine pattern, which comprises:

a step of forming a high-molecular organic film on a semiconductor substrate, followed by a heat treatment,

a step of forming an inorganic film on the resulting high-molecular organic film, followed by a heat treatment,

a step of forming, on the resulting inorganic film, a resist film comprising an acid-decomposable polymer, a photo acid generator generating an acid upon irradiation with a charged beam and a conducting polymer, followed by a heat treatment,

a step of irradiating the resulting resist film with a charged beam to write a pattern and generate the acid, followed by a heat treatment to react the generated acid with the acid-decomposable polymer, and then effecting development to form a resist pattern, and

a step of etching the inorganic film and the high-molecular organic film using the resist pattern as a mask.

5,198,327

METHOD OF FORMATION OF PHOTOGRAPHIC IMAGES

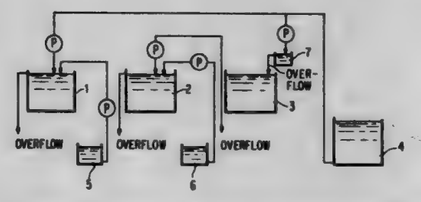
Minoru Yamada; Naoki Arai, and Kazuo Kagawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 488,365, Feb. 16, 1990, abandoned, which is a continuation of Ser. No. 181,991, Apr. 15, 1988, abandoned. This application Dec. 23, 1991, Ser. No. 812,857

Claims priority, application Japan, Apr. 16, 1987, 62-92070

Int. Cl.[5] G03C *5/16*

U.S. Cl. 430—363 **4 Claims**



1. A method of preventing drag streaks which occur in rapid development of 11.5 to 15 seconds by development of a silver halide photographic material with an automatic developing machine such that the dry-to-dry time is 32 to 70 seconds, wherein said silver halide photographic material comprises a combination of (1), (2) and (3) where

(1) represents a silver halide emulsion containing a water-soluble iridium salt such that the amount of iridium ion is from 10^{-8} to 10^{-5} mol per mol of the silver halide in the emulsion;

(2) represents a silver halide emulsion layer with a silver amount from 1 to 3.5 grams/m^2 coated on one surface of said emulsion layer; and

(3) represents silver halide grains wherein the mean grain size is 0.25 μto 1.0 μ;

wherein 11.5 to 15 seconds is set as the development time and when the silver halide photographic material is exposed and developed for a period of one-half of said development time, the exposed silver halide photographic material gives a value of (D—fog) which is 70% or more of the value of $(D_{max}—fog)\times\frac{1}{2}$ obtained by development for said development time.

5,198,328

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

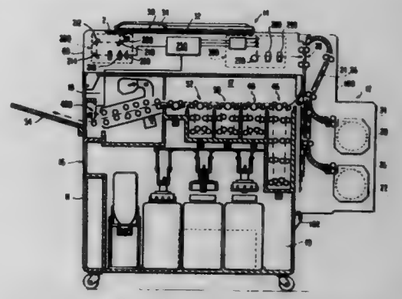
Keisuke Shiba, and Tadashi Ogawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 504,214, Apr. 4, 1990, Pat. No. 5,057,405. This application Aug. 23, 1991, Ser. No. 749,368

Claims priority, application Japan, Apr. 4, 1989, 1-84013; Jun. 5, 1989, 1-141141

Int. Cl.[5] G03C *7/00*

U.S. Cl. 430—363 **11 Claims**



1. A method for forming a color image using a silver halide color photographic material comprising a support having thereon at least three photosensitive layers containing a silver chloride emulsion or a silver chlorobromide emulsion having an average silver chloride content of at least 96 mol % and containing substantially no silver iodide, said at least three photosensitive layers comprising a cyan coupler-containing layer, a magenta coupler-containing layer and a yellow coupler-containing layer, wherein said at least three photosensitive layers each has a different spectral sensitivity peak in the sensitive wavelength regions of 650 to 690 nm, 720 to 790 nm and 770 to 850 nm, respectively, and the total coating weight of silver halide is not more than 0.78 g/m^2 in terms of silver, comprising the steps of exposing the silver halide color photographic material with at least three scanning laser beams each having different light-emitting wavelengths in the wavelength regions of 650 to 690 nm, 720 to 790 nm and 770 to 850 nm, an average exposure time per one picture element of the photographic material is not longer than 10^{-4} seconds, and then subjecting the exposed photographic material to processing comprising color developing and desilvering within 20 seconds after completion of the scanning exposure, wherein the color development time does not exceed 30 seconds, the entire processing time excluding drying time is not longer than 90 seconds, and the drying time is not longer than 30 seconds.

5,198,329
SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING AN ANTIBIOTIC
Yoshihisa Noguchi; Kuniyasu Chiada, and Tuyoshi Sugiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 10, 1991, Ser. No. 774,485
Claims priority, application Japan, Oct. 11, 1990, 2-272812
Int. Cl.[5] G03C *1/76, 1/37*
U.S. Cl. 430—523 5 Claims

1. A silver halide photographic material, which comprises at least one aminoglycoside selected from the group consisting of gentamicins, amikacin, tobramycin, dibekacin, arbekacin, micronomicin, isepamicin, sisomicin, netilmicin, and astromicin, in a hydrophilic colloidal layer on a support.

5,198,330
PHOTOGRAPHIC ELEMENT WITH OPTICAL BRIGHTENERS HAVING REDUCED MIGRATION
Peter A. Martic, and Todd R. Skechdopole, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 11, 1991, Ser. No. 774,955
Int. Cl.[5] B03C *1/85*
U.S. Cl. 430—538 16 Claims

1. A photographic element comprising a paper support, and on at least one side thereof a polyolefin coating containing an inclusion compound of an optical brightener and an α, β, or γ cyclodextrin.

5,198,331
SILVER HALIDE EMULSION CHEMICALLY RIPENED IN THE PRESENCE OF A GOLD-CONTAINING COMPLEX
Hideki Takiguchi; Tomoyuki Nakayama; Nobuaki Kagawa, and Hakuban Ohashi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Jul. 3, 1991, Ser. No. 725,186
Claims priority, application Japan, Jul. 9, 1990, 2-182194
Int. Cl.[5] G03C *1/005, 1/09, 1/34*
U.S. Cl. 430—569 9 Claims

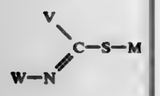
1. A method for preparing a silver halide emulsion containing silver halide grains comprising

(i) preparing a solution by mixing a compound represented by the following Formula (1) or (2), and a gold compound with a solvent; and

(ii) performing chemical ripening of the emulsion by adding said solution thereto:

Formula (1)

Formula (2)

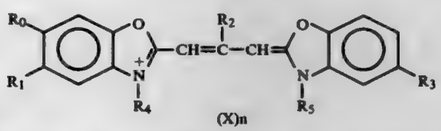


wherein M, R, V and W independently represent a hydrogen atom or a substituent group; V and W may combine with each other to form a ring.

5,198,332
SILVER HALIDE PHOTOGRAPHIC EMULSION
Akihiko Ikegawa; Yuichi Ohashi, and Masaki Okazaki, all of Minami-Ashigara, Japan, assignors to Fuji Photo film Co. Ltd., Japan
Continuation of Ser. No. 124,061, Nov. 23, 1987, abandoned.
This application Apr. 23, 1990, Ser. No. 512,603
Claims priority, application Japan, Nov. 27, 1986, 61-282339; Jan. 7, 1987, 62-1458
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] G03C *1/18*
U.S. Cl. 430—588 18 Claims

1. A silver halide photographic emulsion which has a maximum value of spectral sensitivity at a wavelength ranging from 520 nm to 545 nm, and which contains at least one compound represented by the following general formula (I):

(I)



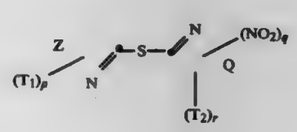
(X)n

wherein R_0 is a hydrogen atom and R_1 is a phenyl group; R_2 represents a hydrogen atom, an unsubstituted or substituted alkyl group, or an unsubstituted or substituted aryl group; R_3 represents an unsubstituted or substituted alkyl group having two or more carbon atoms, an unsubstituted or substituted aryl group, an unsubstituted or substituted aryloxy group, an unsubstituted or substituted acyl group having three or more carbon atoms, an unsubstituted or substituted acyloxy group having three or more carbon atoms, an unsubstituted or substituted alkoxycarbonyl having 4 or more carbon atoms, or an unsubstituted or substituted acylamino group having three or more carbon atoms, and furthermore R_3 is a substituent having such L and B that S value is 544 or less in the equation of $S=3.536L-2.661B+535.4$ wherein L represents a parameter of STERIMOL, and B represents the smaller value among B_1+B_4 and B_2+B_3 which are parameters of STERIMOL, provided that R_0 and R_3, or R_1 and R_3 do not represent unsubstituted or substituted aryl groups at the same time; R_4 and R_5 may be the same or different and represent unsubstituted or substituted alkyl groups; X represents a counter anion; and n is 0 or 1, and when an inner salt is formed, n is 0.

5,198,333
PHOTOGRAPHIC MATERIALS CONTAINING ELECTRON ACCEPTING AGENTS
Jean-Marie O. Dewanckele, Drongen; Paul R. Callant, Edegem; Marc H. Van Bockstaele, Mortsel, and Marc B. Graindourze, Overpelt, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium
Filed Mar. 13, 1991, Ser. No. 668,624
Claims priority, application European Pat. Off., Mar. 19, 1990, 90200646.9
Int. Cl.[5] G03C *1/34*
U.S. Cl. 430—597 8 Claims

1. Photographic material comprising at least one silver halide roomlight emulsion layer containing at least 70 mole % of chloride and at least one compound represented by the following general formula (I):

(I)



wherein: each of Z and Q which may be the same or different represents the atoms necessary to complete an unsubstituted or substituted nitrogen-containing heterocyclic ring; each of T_1 and T_2 which may be the same or different represents alkyl, cycloalkyl, alkoxy, aryl, aryloxy, halogen, cyano, hydroxy, carboxyl, sulfo, carbamoyl, acyl, acylamino, sulfamoyl, or sulfonamido; q=1, 2 or 3, and p and r=0, 1 or 2.

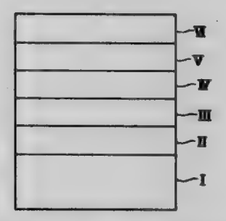
5,198,334
PROTECTION OF NATURAL KILLER CELL CYTOLYTIC ACTIVITY IN PERIPHERAL BLOOD MONONUCLEAR CELLS
Kam H. Leung, Brookhaven, Pa., assignor to Terumo Corporation, Tokyo, Japan
Filed Jul. 21, 1989, Ser. No. 383,222
Int. Cl.[5] A01N *1/02;* A61K *35/14;* C12N *5/08*
U.S. Cl. 435—2 19 Claims

1. A method of preparing peripheral blood mononuclear cells (PBMC) or peripheral blood lymphocytes (PBL) derived therefrom for use in generating LAK cells while retaining natural killer (NK) cell activity in the cells which comprises treating the PBMC or PBL in vitro with

(a) a lower alkyl ester of an amino acid or dipeptide selected from the group consisting of leucine, alanine, aspartic acid, cysteine, glutamic acid, glutamine, phenylalanine, proline, tyrosine, tryptophan, valine and dipeptides composed of residues of one or two of said amino acids, or an amide of an amino acid selected from the group consisting of leucine, isoleucine, phenylalanine and valine, or a pharmaceutically acceptable salt of said ester or amide, and

(b) a member of the group consisting of benzamidine, phenylaninol and leucinol.

5,198,335
INTEGRAL MULTILAYER ANALYTICAL ELEMENT FOR ANALYSIS OF AMMONIA-FORMING SUBSTRATE
Nobuyoshi Sekikawa; Harumi Katsuyama, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 251,933, Sep. 28, 1988, abandoned, which is a continuation of Ser. No. 870,242, Jun. 3, 1986, abandoned. This application Oct. 31, 1990, Ser. No. 608,014
Claims priority, application Japan, Jun. 4, 1985, 60-122348
Int. Cl.[5] C12Q *1/00, 1/32;* G01N *33/52*
U.S. Cl. 435—4 7 Claims



1. An integral multilayer analytical element for the analysis of an ammonia-forming substrate in a liquid sample containing intrinsic ammonia comprising:

(I) a light-transmissive, liquid-impermeable support;

(II) an ammonia indicator layer containing a reagent capable of undergoing a detectable change by gaseous ammonia;

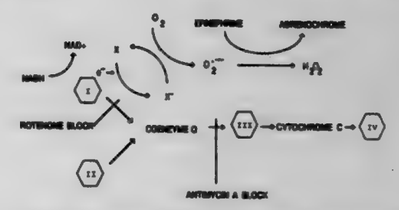
(III) a liquid barrier layer which allows gaseous ammonia passing therethrough;

(IV) an ammonia-forming substrate reaction layer containing a reagent capable of reacting with an ammonia-forming substrate to form gaseous ammonia;

(V) an intrinsic ammonia trapping layer having a thickness in the range of 1 to 20 μm and containing a buffering reagent therein to keep its pH value in the range of from 7.0 to 8.5 and containing a combination of NADH or NADPH, αketoglutaric acid and glutamate dehydrogenase to chemically react with the intrinsic ammonia to convert it into other chemical substance so that the intrinsic ammonia is fixed therein and kept from reaching said reaction layer;

(VI) a porous spreading layer, in a laminate form in this order with the proviso that said (I) is the lowest member and said (VI) is the uppermost layer.

5,198,336
BIOASSAY FOR CHEMICALS WHICH GENERATE PROOXIDANT STATES
Lynda M. Knobeloch; George A. Blondin, and John M. Harkin, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed May 8, 1989, Ser. No. 348,637
Int. Cl.[5] C12Q *1/26, 1/32;* G01N *24/00, 21/00*
U.S. Cl. 435—4 15 Claims



1. A method of assaying for the presence of prooxidant state inducing toxicants in a sample by spectrophotometric analysis comprising the steps of

(a) preparing a suspension including at least portions of mitochondrial membranes having a competent electron transport enzyme complex I thereon;

(b) adding to the suspension an assay medium including buffer salts; a selective mitochondrial enzyme inhibitor to inhibit electron flow to other enzyme complexes; and epinephrine;

(c) adding a quantity of the sample being tested;

(d) taking spectrophotometric baseline samples;

(e) adding a source of electron flow for forward electron transport into the enzyme complex I whereby an excess of electrons is created in enzyme complex I; and

(f) measuring the spectrophotometric response of the reaction to measure any increase in the presence of the reaction product of epinephrine, thus indicating the prooxidant activity of the sample.

5,198,337
ASSAY FOR GENE DELETION OF GST-1 IN HUMAN SAMPLES BASED ON THE POLYMERASE CHAIN REACTION
William D. Henner; Kenine E. Comstock; Barbara J. S. Sanderson, and Virginia J. Claflin, all of Portland, Oreg., assignors to State of Oregon, Portland, Oreg.
Filed Apr. 13, 1990, Ser. No. 509,054
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 2 Claims

1. A method for detecting a homozygous deletion of at least exon 4 through exon 5 in a GST-1 gene in human blood or tissue samples comprising the steps of:

(a) isolating cellular DNA from the human blood or tissue sample;

(b) providing a mixture comprising a DNA polymerase, deoxynucleotide triphosphates, the isolated cellular DNA, and a pair of primers comprising DNA sequences consisting essentially of

5'-CTGCCCTACTTGATTGATGGG-3'

and

5'-CTGGATTGTAGCAGATCATGC-3';

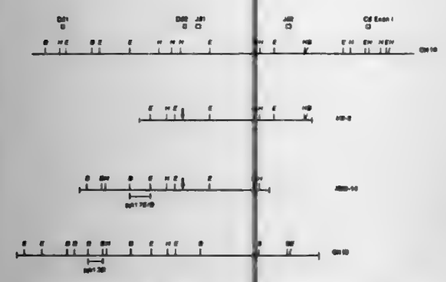
(c) amplifying the DNA by subjecting the mixture to alternating cycles of temperatures which allow denaturation, annealing and DNA synthesis; and

(d) determining whether a product is obtained from amplifying the DNA.

5,198,338

MOLECULAR PROBING FOR HUMAN T-CELL LEUKEMIA AND LYMPHOMA

Carlo M. Croce, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Filed May 31, 1989, Ser. No. 358,808
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **16 Claims**

1. A method for diagnosing a T-cell malignancy in a human comprising:

isolating DNA from T-cells of the human and extracting the DNA from proteins;

determining whether sequences of said DNA isolated from said T-cells diverge from germline sequences at a region of chromosome 10 containing a chromosome breakpoint cluster, said breakpoint cluster being located on a 5.7 kb BamHI fragment which hybridizes to pjk1.7 E/B, divergence of said sequences indicating a T-cell malignancy.

5,198,339

METHOD FOR DETECTION OF GRAM-NEGATIVE BACTERIAL LIPOPOLYSACCHARIDES IN BIOLOGICAL FLUIDS

Eric J. Hansen, Plano; Robert S. Munford, Dallas, both of Tex., and Jussi Mertsola, Kaarina, Finland, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jul. 13, 1990, Ser. No. 553,072
Int. Cl.[5] G01N *33/53, 33/579*
U.S. Cl. 435—7.2 **23 Claims**

1. A method of detecting bacterial endotoxin in a biological fluid, comprising the steps of:

contacting a sample of biological fluid with at least one matrix-bound antibody which specifically binds an epitope of bacterial endotoxin to form a matrix-bound bacterial endotoxin;

washing the matrix-bound bacterial endotoxin;

incubating the matrix-bound bacterial endotoxin with an amoebocyte lysate to activate a protease system of the lysate;

adding, to the lysate, a substrate of the protease system; and

measuring amounts of a product formed from action of said protease system on the added substrate, said amounts being proportional to a level of bacterial endotoxin in the sample.

5,198,340

ASSAY FOR FREE IGF-I, IGF-II, AND GH LEVELS IN BODY FLUIDS

Venkat R. Mukku, Fremont, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Filed Jan. 17, 1991, Ser. No. 642,509
Int. Cl.[5] G01N *33/544, 33/566, 33/567*
U.S. Cl. 435—7.8 **19 Claims**

1. A method for determining levels of free ligand selected from the group consisting of insulin-like growth factor-I (IGF-I), insulin-like growth factor II (IGF-II), and growth hormone (GH) in a body fluid containing a proportion of the ligand bound to a binding protein comprising the steps of:

(a) contacting the body fluid with immobilized, unlabeled capture reagent, which capture reagent is insulin-like growth factor binding protein-3 (IGFBP-3) if the ligand is IGF-I or IGF-II, or growth hormone binding protein (GHBP) if the ligand is GH, under incubation conditions of 4°–10° C. for no greater than about 4 hours to bind the free ligand contained in the body fluid;

(b) separating the fluid from the immobilized capture reagent; and

(c) measuring the level of free ligand bound to the capture reagent.

5,198,341

USEFUL FOR CLEAVAGE OF ORGANIC C-S BONDS BACILLUS SPHAERICUS MICROORGANISM

John J. Kilbane II, Woodstock, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation of Ser. No. 461,265, Jan. 5, 1990, Pat. No. 5,002,888. This application Jan. 14, 1991, Ser. No. 640,931
Int. Cl.[5] C12P *11/00*; C12R *1/07, 1/125*; C10G *32/00*
U.S. Cl. 435—42 **22 Claims**

1. A process for reducing the sulfur content of sulfur-containing organic carbonaceous material comprising, contacting a sulfur-containing organic carbonaceous material with microorganism *Bacillus sphaericus* strain ATCC No. 53969.

5,198,342

DNA ENCODING IGA FC RECEPTORS

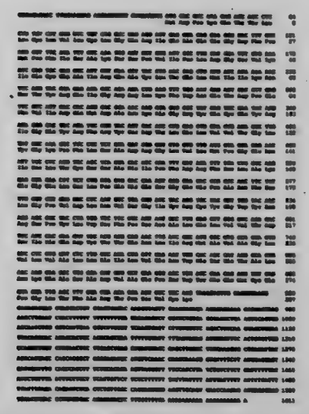
Charles R. Maliszewski, Seattle, Wash., assignor to Immunex Corporation, Seattle, Wash.

Filed Jul. 5, 1990, Ser. No. 548,059
Int. Cl.[5] C12N *15/12*; C07K *13/00*
U.S. Cl. 435—69.1 **11 Claims**

1. An isolated DNA selected from the group consisting of:

(a) cDNA clones having a nucleotide sequence encoding a protein having an amino acid sequence of amino acids 1 through 266 of FIG. 2;

(b) isolated DNA capable of hybridization to a clone of (a) under moderately stringent conditions and which encode biologically active IgA Fc receptor protein; and



(c) isolated DNA which is degenerate as a result of the genetic code to the DNA defined in (a) or (b) and which encode biologically active IgA Fc receptor protein.

5,198,343

METHOD FOR EXPRESSING A HETEROLOGOUS PROTEIN IN A DAPD⁻ MUTANT OF *E. COLI* AND THE STRAIN OBTAINED

Eric DeGryse, Strasbourg, France, assignor to Transgene, S.A., Courbevoie, France

Continuation of Ser. No. 81,447, Aug. 4, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 387,017
Claims priority, application France, Aug. 5, 1986, 86 11311; Jul. 15, 1987, 87 09935
Int. Cl.[5] C12P *21/02, 19/34*; C12N *15/00, 7/00, 1/21*; C07H *15/12*; C07K *3/00*
U.S. Cl. 435—69.1 **6 Claims**

1. An *E. coli* cell wherein the genome comprises a dapD gene inactivated by mutation and which *E. coli* cell is transformed with a plasmid comprising a functional dapD gene.

4. The *E. coli* cell of claim 1, wherein said plasmid further comprises a gene that encodes a heterologous protein operably linked to a promoter.

6. A process for preparing a heterologous protein which comprises the steps of:

culturing the *E. coli* according to claim 4 in a DAP-free medium containing lysine under conditions such that said heterologous protein is produced; and

isolating said protein from the culture.

5,198,344

DNA SEQUENCE THAT ENCODES THE MULTIDRUG RESISTANCE GENE

James M. Croop, Jamaica Plain, Mass.; Philippe Gros, Montreal, Canada, and David E. Housman, Newton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 885,951, Jul. 15, 1986, abandoned. This application Feb. 6, 1991, Ser. No. 652,311
Int. Cl.[5] C12P *21/02, 19/34*; C12N *15/00, 7/00, 5/00*; C07K *3/00*; C07H *15/12*
U.S. Cl. 435—69.1 **5 Claims**

5. A method of increasing expression of a heterologous gene within a cell, comprising the steps of:

a) constructing an expression vector comprising a heterologous gene and a multidrug resistance gene having the sequence set forth in FIG. 8A, 8B and 8C, or a DNA sequence which hybridizes to said sequence under stringent conditions and which confers a multidrug resistance phenotype on a drug-sensitive mammalian cell when introduced and expressed in said cell.

b) transfecting an appropriate host cell with said vector;

c) selecting host cells which contain said vector by culturing said cells in drug-containing media; and

d) culturing cells selected in step c in media, using stepwise increases in the concentration of a drug.

5,198,345

VECTORS IN USE IN FILAMENTOUS FUNGI

David I. Gwynne; Francis P. Buxton; Mark H. Pickett; Roger W. Davies, all of Ontario, Canada, and Claudio Scazzocchio, Bures sur Yvette, France, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Dec. 20, 1985, Ser. No. 811,404
Claims priority, application Canada, Apr. 15, 1985, 479135
Int. Cl.[5] C12P *21/00*; C12N *1/15, 15/80*
U.S. Cl. 455—69.1 **17 Claims**

1. A DNA construct for use in transforming an Aspergillus host to obtain expression therein of a polypeptide foreign thereto, said DNA construct comprising promoter DNA corresponding in sequence to the promoter region of the glucoamylase gene of *Aspergillus niger* operably linked to DNA coding for said polypeptide to enable expression thereof in said Aspergillus host.

5,198,346

GENERATION AND SELECTION OF NOVEL DNA-BINDING PROTEINS AND POLYPEPTIDES

Robert C. Ladner, Ijamsville, Md.; Sonia K. Guterman, Belmont, Mass.; Rachel B. Kent, Boxborough, Mass., and Arthur C. Ley, Newton, Mass., assignors to Protein Engineering Corp., Cambridge, Mass.

Continuation-in-part of Ser. No. 293,980, Jan. 6, 1989, Pat. No. 5,096,815. This application Jul. 26, 1990, Ser. No. 558,011
Int. Cl.[5] C12N *15/63, 15/09*; C12P *21/00*
U.S. Cl. 435—69.1 **48 Claims**

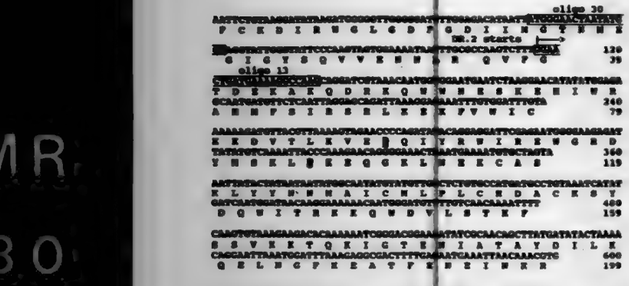
24. A method of obtaining genes encoding a heterooligomeric protein which binds to a predetermined ultimate target double stranded DNA sequence, said sequence being nonpalindromic, said sequence comprising a left target subsequence and a right target subsequence each of at least 4 base pairs lengths, said method comprising:

(a) providing a first gene encoding a first DNA-binding oligomeric protein binding to a first target sequence and a second gene encoding a second DNA-binding oligomeric protein binding to a second target sequence, wherein said first and second DNA-binding proteins each have at least two dyad-symmetric DNA-binding domains, wherein said first and second DNA-binding proteins each have a dimerization interface, where said first target sequence is a palindrome or gaped palindrome and comprises said left target subsequence and a palindrome-completing subsequence, whereby one of the dyad-symmetric DNA-binding domains of the first DNA-binding protein binds to said left target subsequence, and where said second target sequence is a palindrome or gaped palindrome and comprises said right target subsequence and a palindrome completing subsequence, whereby one of the dyad-symmetric DNA-binding domains of the second DNA-binding protein binds to the right target subsequence,

(b) variegating the dimerization interface of the protein encoded by one of said first or second genes to obtain variegants thereof and reverse selecting for expression from said variegant of a first oligomerization mutant protein, encoded by a variegant of said variegated gene, which is no longer capable of forming a homooligomer that can bind to said first or second target sequence, respectively, and verifying that said oligomerization mutant protein maintains a tertiary structure similar to the protein form which is descended,

(c) variegating the dimerization interface of the protein encoded by the other of said first or second genes to obtain variegants thereof,
(d) providing host cells carrying the gene encoding said first oligomerization mutant protein and a variegant gene of step (c), each operably linked to a promoter functional in the host cell, and
(e) forward selecting for expression from a step (c) variegant gene of a second oligomerization mutant protein which is capable of forming a heterooligomer with said first oligomerization mutant protein, said heterooligomer binding said ultimate target DNA sequence, and
(f) isolating the genes encoding said heterooligomer.

5,198,347
DNA ENCODING *PLASMODIUM VIVAX* AND *PLASMODIUM KNOWLESI* DUFFY RECEPTOR
Louis H. Miller; John H. Adams, both of Bethesda; David C. Kaslow, Kensington, and Xiangdong Fang, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Jul. 20, 1990, Ser. No. 554,837
Int. Cl.[5] C12N *15/12, 15/63*
U.S. Cl. 435—69.1 **10 Claims**



1. In selected DNA segment encoding a Duffy receptor of a Plasmodium knowlesi or Plasmodium vivax parasite having an amino acid sequence as defined in FIG. 7 or FIG. 12.

5,198,348
EXPRESSION OF EXOGENOUS POLYPEPTIDES AND POLYPEPTIDE PRODUCTS INCLUDING HEPATITIS B SURFACE ANTIGEN IN YEAST CELLS
Grant A. Bitter, Thousand Oaks, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.
Continuation of Ser. No. 231,599, Aug. 8, 1988, Pat. No. 4,977,092, which is a continuation of Ser. No. 748,712, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 412,707, Aug. 30, 1982, abandoned. This application Sep. 24, 1990, Ser. No. 586,819
The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.
Int. Cl.[5] C12P *21/00*
U.S. Cl. 435—69.1 **1 Claim**

1. A method for securing expression by *Saccharomyces cerevisiae* cells of an exogenous polypeptide sequence, said method comprising the steps of:
transforming *Saccharomyces cerevisiae* cells with a yeast cell transformation vector comprising: (1) a DNA transcription promoter/regulator DNA sequence duplicative of that endogenous to yeast cell synthesis of mRNA coding for glyceraldehyde-3-phosphate dehydrogenase wherein said DNA does not include the 26 base pairs having the sequence

CGAATAAACACACATAAATAAACAAA
GCTTATTTGTGTGTATTTATTTGTTT;

(2) a DNA sequence transcribable into mRNA coding for synthesis of a polypeptide exogenous to yeast cells; (3) a DNA sequence duplicative of that coding for termination of transcription or poly-A addition of mRNA in yeast cells; and (4) a DNA sequence operative in yeast cells to convert to said vector the capacity for autonomous DNA replication; and
growing *Saccharomyces cerevisiae* cells so transformed under suitable nutrient conditions.

5,198,349
METHOD FOR PRODUCING FACTOR VIII:C AND ANALOGS
Randal J. Kaufman, Boston, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.
Continuation of Ser. No. 942,338, Dec. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 816,031, Jan 3, 1986, abandoned. This application May 23, 1991, Ser. No. 707,211
Int. Cl.[5] C12P *21/02;* C12N *15/10, 5/16, 15/85*
U.S. Cl. 435—69.6 **6 Claims**

1. A method of producing Factor VIII:c protein in a serum free medium comprising the steps of:
(1) transfecting mammalian cells with (a) an expression vector containing a gene encoding a Factor VIII:c protein and (b) an expression vector containing a gene encoding VWF, both of said genes being in operative association with an expression control sequence therefor, said transfected mammalian cells being capable of expressing said Factor VIII:c protein and said vWF;
(2) applying both of said genes;
(3) culturing said transferred mammalian cells in a serum-free culture medium under suitable culture conditions; and
(4) recovering said Factor VIII:c protein associated with said vWF from said culture medium.

5,198,350
INTERFERON-INDUCED HUMAN PROTEIN IN PURE FORM, MONOCLONAL ANTIBODIES THERETO AND TEST KITS CONTAINING THESE ANTIBODIES
Michel A. Horisberger, Allschwil; Heinz-Kurt Hochkeppel, Aesch, both of Switzerland, and Jean Content, Rhode-St-Genèse, Belgium, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 497,748, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 37,754, Apr. 13, 1987, abandoned. This application Dec. 19, 1991, Ser. No. 810,580
Claims priority, application United Kingdom, Apr. 15, 1986, 8609162; Oct. 23, 1986, 8625381
Int. Cl.[5] C12P *19/34;* C12N *15/00, 15/12*
U.S. Cl. 435—91 **1 Claim**

1. A process for the preparation of a DNA coding for an essentially pure protein which
(1) is present in human cells induced by interferon α or β,
(2) has a molecular weight of approximately 78 kDa as determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE),
(3) has an isoelectric point of approximately 6.3,
(4) has a partial N-terminal amino acid sequence

5 10
Val—Val—Ser—Glu—Val—Asp—Ile—Ala—Lys—Ala—

comprising the steps of
a) isolating mRNA from human cells, selecting mRNA complementary to said DNA, preparing single-stranded DNA complementary to said selected mRNA (cDNA), then double-stranded cDNA from said single-stranded cDNA, or
b) isolating genomic DNA from human cells and selecting the DNA coding for said protein, using a DNA probe, and
c) incorporating cDNA of step a) or DNA of step b) into an expression vector,
d) transforming host cells with said expression vector,
e) selecting the transformed host cells which contain DNA coding for said essentially pure protein defined hereinabove, and
f) isolating said DNA coding for said protein.

5,198,351
LACTOSE HYDROLYSIS BY MUTANT *STREPTOCOCCUS THERMOPHILUS*
George A. Somkuti, Lansdale, and Dennis H. Steinberg, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Division of Ser. No. 513,480, Apr. 23, 1990, Pat. No. 5,071,763. This application Sep. 12, 1991, Ser. No. 758,154
Int. Cl.[5] C12R *1/46;* C12P *19/14*
U.S. Cl. 435—99 **5 Claims**

1. A method for the hydrolysis of lactose without the concomitant production of lactic acid comprising:
A) Adding to a lactose containing solution an effective amount of decryptified *S. thermophilus* having a phenotype Lac^{31}, $GluS^-$, $SucS^+$ and βgal^+, sufficient to hydrolyze lactose in solution, and
B) incubating for a predetermined amount of time to allow for said hydrolysis to occur.

5,198,352
PREPARATION OF ANTIBACTERIAL COMPOSITIONS FROM GLYCOPEPTIDES
Jean-Richard Neeser, Lausanne, and Pierre Würsch, La Tour-de-Peilz, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland
Continuation of Ser. No. 516,441, Apr. 30, 1990, abandoned, which is a division of Ser. No. 785,914, Oct. 9, 1985, Pat. No. 4,939,123. This application Sep. 25, 1992, Ser. No. 951,933
Claims priority, application Switzerland, Oct. 26, 1984, 5136/84
Int. Cl.[5] C12P *19/04*
U.S. Cl. 435—101 **6 Claims**

1. A process for preparing compounds having antibacterial activity comprising treating a protein isolate with a proteolytic enzyme to obtain a digestate, wherein the protein isolate is selected from the group consisting of protein isolates of defatted soya flour enriched with glycoprotein 7S and defatted kidney bean flour enriched with bean glycoprotein II, isolating glycopeptides from the digestate, treating the isolated glycopeptides with endo-β-N-acetylglucosaminidase H to form a hydrolysate and then isolating oligosaccharides from the hydrolysate.

5,198,353
METHOD FOR PREPARING STABILIZED ENZYME DISPERSION
John Hawkins; Philip Chadwick; Edward T. Messenger, all of Cambria, Great Britain, and Mads Lykke, Copenhagen, Denmark, assignors to Novo Nordisk A/S, Novo Alle, Denmark and Albright & Wilson Limited, Warley, England
PCT No. PCT/DK89/00172, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO90/00593, PCT Pub. Date Jan. 25, 1990
PCT Filed Jul. 11, 1989, Ser. No. 634,890
Claims priority, application United Kingdom, Feb. 11, 1988, 8816443
Int. Cl.[5] C12N *9/96;* C11D *17/00*
U.S. Cl. 435—188 **17 Claims**

1. A method for preparing a stabilized enzyme dispersion, comprising:
(1) precipitating a water-soluble polymer from a single phase, aqueous solution to form an aqueous dispersion, and
(2) before, simultaneously with or after precipitating the polymer, contacting the dissolved or dispersed polymer with an aqueous solution or fine aqueous dispersion of an enzyme without any covalent bonding between the polymer and the enzyme.

5,198,354
CLONING THE BAN I RESTRICTION AND MODIFICATION GENES
Geoffrey G. Wilson, Boxford, Mass., assignor to New England Biolabs, Inc., Beverly, Mass.
Continuation of Ser. No. 323,114, Mar. 13, 1989, Pat. No. 5,180,673, which is a continuation of Ser. No. 826,892, Feb. 6, 1986, abandoned, which is a division of Ser. No. 707,079, Mar. 1, 1985, abandoned. This application May 13, 1991, Ser. No. 699,145
Int. Cl.[5] C12N *9/22, 15/55*
U.S. Cl. 435—199 **8 Claims**

1. Isolated DNA coding for the BanI restriction endonuclease, wherein the isolated DNA is obtainable from ATCC Accession No. 75276.

5,198,355
PURIFICATION OF GLYCOSAMINOGLYCAN DEGRADING ENZYMES WITH A SULFATED POLYSACCHARIDE
Hiroshi Kikuchi, Saitama; Ken-ichi Maeyama, and Keiichi Yoshida, both of Tokyo, all of Japan, assignors to Seikagaku Kogyo Co., Ltd., Tokyo, Japan
Filed Aug. 24, 1989, Ser. No. 397,942
Claims priority, application Japan, Aug. 24, 1988, 63-208154
Int. Cl.[5] C12N *9/88, 11/12, 11/02*
U.S. Cl. 435—232 **14 Claims**

1. A method of purifying glycosaminoglycan degrading enzymes by fractionating the glycosaminoglycan degrading enzymes into individual glycosaminoglycan degrading enzymes which comprises chromatographically treating a solution containing the glycosaminoglycan degrading enzymes with an insoluble sulfated polysaccharide carrier whereby said glycosaminoglycan degrading enzymes are adsorbed onto said insoluble sulfated polysaccharide carrier, produced by sulfination of a polysaccharide whereafter said adsorbed glycosaminoglycan degrading enzymes are desorbed from said insoluble sulfated polysaccharide carrier.

5,198,356
MONOPHENOTYPIC IN VITRO CELL LINES OF MEGAKARYOCYTIC LINEAGE, PRODUCTS PRODUCED THEREBY AND METHODS
Michael A. Lieberman, and Douglas A. Fugman, both of Cincinnati, Ohio, assignors to Children's Hospital Medical Center and University of Cincinnati, Cincinnati, Ohio
Filed Mar. 12, 1990, Ser. No. 493,106
Int. Cl.[5] C12N *5/00*
U.S. Cl. 435—240.2 **9 Claims**

1. A continuous human in vitro cell line derived from cells designated ATCC CRL 9139 comprising monophenotypic cells of megakaryoctic lineage and having a constant karyotype of 50 XY having characteristics similar to colony forming unit megakaryoblasts, and approximately 80% of said cells have the ability to express platelet peroxidase, said cells further having at least one of the following characteristics:
a. granulated cytoplasm, said granules being characteristic for alpha-granules;
b. expresses gpIIbIIIa;
c. expresses Factor VIII; and
d. platelet Factor IV.

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5,198,357
PREPARATION OF A BLOOD PLATELET LYSATE FOR USE IN A CELL CULTURE MEDIUM FOR HYBRIDOMA CELLS

Olov Holmqvist, Lund, and Bengt Westermark, Upsala, both of Sweden, assignors to Elleo Food AB, Kavlinge, Sweden

PCT No. PCT/SE89/00232, § 371 Date Dec. 26, 1990, § 102(e) Date Dec. 26, 1990, PCT Pub. No. WO89/10398, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 26, 1989, Ser. No. 634,113
Claims priority, application Sweden, Apr. 26, 1988, 8801537-5
Int. Cl.[5] C12N *5/00, 1/00*
U.S. Cl. 435—240.26 8 Claims

1. A method for preparing a blood platelet lysate from plasma derived from animal whole blood to which a citrate has been added to avoid coagulation during storage of the blood, which method comprises:
a) centrifuging said plasma so as to obtain a platelet rich paste,
b) adding Ca^{2+} to said paste, in equimolar amounts in relation to the citrate content in the centrifuged plasma to lyse the platelets in said paste and to coagulate fibrinogen to produce a clear, light red liquid consists essentially of lysed platelets,
c) sterile-filtering said clear, light red liquid to produce a liquid filtrate, and
d) collecting the liquid filtrate which consists essentially of lysed platelets.

5,198,358
MICROORGANISM FOR PRODUCING C-31 DESMETHYL FR-900520 CYCLIC HEMIKETAL IMMUNOSUPPRESSANT AGENT

Magda M. Gagliardi, Somerset; Shieh-Shung T. Chen, Morganville, and George M. Garrity, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 28, 1991, Ser. No. 738,974
Int. Cl.[5] C12N *1/00*
U.S. Cl. 435—252.1 1 Claim

1. A biologically pure culture of *Streptomyces lavendulae*, ATCC No. 55209.

5,198,359
RECOMBINANT PROTEIN RECEPTOR FOR IL-2

Tadatsugu Taniguchi, Ibaraki; Masanori Hatakeyama, Suita; Sejiro Minamoto, Minou; Takeshi Kono, Ikeda; Takeshi Doi, Kodaira; Masayuki Miyasaka, Urawa; Mitsuru Tsudo, and Hajime Karasuyma, both of Tokyo, all of Japan, assignors to Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Mar. 5, 1990, Ser. No. 487,059
Claims priority, application United Kingdom, Mar. 7, 1989, 89104023; May 29, 1989, 89109686; Jul. 20, 1989, 89113310
Int. Cl.[5] C12N *15/63, 15/12;* C07K *13/00*
U.S. Cl. 435—252.3 14 Claims

1. A recombinant DNA molecule coding for the β-chain of an IL-2 receptor, or a fragment of said β-chain which binds specifically to IL-2.

5,198,360
DNA SEQUENCE CONFERRING A PLAQUE INHIBITION PHENOTYPE

Margaret M. Ballou; Richard H. Baltz, and Margaret A. McHenney, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 19, 1990, Ser. No. 467,452
Int. Cl.[5] C12N *1/20, 15/11, 15/00*
U.S. Cl. 435—252.3 13 Claims

1. A recombinant DNA vector that comprises the pin sequence of phage FP43, said sequence residing on about an 0.8 kb Sac II restriction fragment of phage FP43, or a subfragment of said restriction fragment which has the plaque inhibition phenotype.

5,198,361
PLASMIDS FOR PRODUCTION OF MET-ASP-GLN BOVINE GROWTH HORMONE, HOSTS CONTAINING THE PLASMIDS, PRODUCTS MANUFACTURED THEREBY AND RELATED METHODS

Haim Aviv; Marian Gorecki, both of Rehovot; Avigdor Levanon, Netania; Amos Oppenheim, Jerusalem; Tikva Vogel, Rehovot; Elisha Zeelon, Hashiva, and Menachem Zeevi, Ramat Gan, all of Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 159,526, Feb. 23, 1988, abandoned, which is a continuation of Ser. No. 514,188, Jul. 15, 1983, abandoned. This application Jan. 3, 1991, Ser. No. 635,413
Int. Cl.[5] C12N *15/00, 15/18, 15/73;* C12P *21/02*
U.S. Cl. 435—252.33 3 Claims

1. A plasmid for the production of met-asp-gln bovine growth hormone designated pRO11 and deposited under ATCC Accession No. 39390.

5,198,362
STERILE AEROBIC FERMENTATION PROCESS

Malcolm W. Forsyth, Cleveland, and Stephen H. Hind, Derbyshire, both of England, assignors to Imperial Chemical Industries, PLC, London, England

Filed May 11, 1989, Ser. No. 350,770
Claims priority, application United Kingdom, May 11, 1988, 8811114
Int. Cl.[5] C12N *1/14, 1/00, 1/32*
U.S. Cl. 435—254 5 Claims

1. A process for the sterile fermentation of a mono-culture with mechanical stirring in a fermenter from which waste gas is continuously emitted, comprising the steps of continuously passing a portion of the culture into a compartment outside the fermenter and injecting substantially pure oxygen into the culture outside the fermenter at the throat of a venturi or before the culture passes through a venturi; after injection, continuously returning the culture to the fermenter, the amount of culture outside the fermenter at any time being not greater than 5% of the total volume of the culture; and injecting into the culture in the fermenter, a volume of air and an inert gas greater than the volume of oxygen injected into the culture outside the fermenter.

5,198,363
DESMUTAGENIC SUBSTANCES AND THEIR PRODUCTION PROCESS

Masayasu Takeuchi, Shizuoka; Saburo Kawamura, Tokyo; Taizo Miwa, Kanagawa Ken, and Tsuneo Kada, Tokyo, all of Japan, assignors to Nihon Shokuhin Kako Co., Ltd., Tokyo, Japan

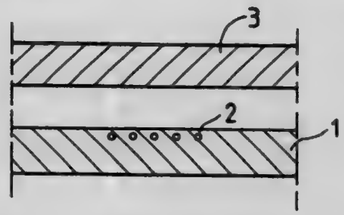
Continuation of Ser. No. 828,489, Feb. 12, 1986, abandoned. This application Aug. 4, 1989, Ser. No. 393,110
Claims priority, application Japan, Feb. 16, 1985, 60-28918
Int. Cl.[5] C12S *3/04*
U.S. Cl. 435—277 3 Claims

1. A non-toxic desmutagenic substance not adversely affected by application of heat in cooking consisting of a fibrous constituent of food having a Neutral Detergent Fiber (NDF) value of 87% or more and a particle size of not larger than 60 mesh which contains as its principal component hardly digestible substances containing hemicellulose, cellulose and lignin which remain after subjecting corn fibers to a combination of both an enzyme treatment and physical treatment thereof, wherein the enzyme treatment uses one or more of amylolytic, proteolytic, lipolytic and cellulolytic enzymes or an enzyme complex, whereby starch, protein and other digestibles are separated from the corn fibers.

5,198,364
METHOD FOR PERFORMING LIQUID SCINTILLATION COUNTING AND DETECTION MATERIAL

Timo Oikari, and Tapio Yrjönen, both of Turku, Finland, assignors to Wallac Oy, Turku, Finland

PCT No. PCT/FI89/00219, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO90/06525, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 1, 1989, Ser. No. 689,764
Claims priority, application Finland, Dec. 1, 1988, 885610
Int. Cl.[5] G01N *23/00*
U.S. Cl. 436—57 12 Claims



1. A method for performing liquid scintillation counting by a liquid scintillation counter comprising the steps of applying radioactive samples to a porous measurement support, associating a detection material in the form of a solid scintillating plate with a surface of the measurement support to which the samples have been applied, melting the solid scintillating plate into the porous measurement support thereafter, cooling the measurement support and scintillating plate so that the scintillating plate becomes solid again after the step of melting, and measuring the radioactivity of the samples on the measurement support with a liquid scintillation counter.

5,198,365
FECAL SAMPLE IMMUNOASSAY METHOD TESTING FOR HEMOGLOBIN

Michael A. Grow, San Jose, and Vipin D. Shah, Saratoga, both of Calif., assignors to International Immunoassay Laboratories, Inc., Santa Clara, Calif.

Continuation of Ser. No. 329,455, Mar. 28, 1989, Pat. No. 5,094,956, which is a continuation-in-part of Ser. No. 10,787, Feb. 4, 1987, abandoned. This application Sep. 23, 1991, Ser. No. 764,012
The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.
Int. Cl.[5] G01N *33/72*
U.S. Cl. 436—66 4 Claims

1. A solid-phase competitive immunoassay for determining hemoglobin in a human stool sample comprising the steps of
a) forming a dispersion of from 1 up to less than 10 wt. % of a stool sample in an aqueous fecal test solution containing a buffer, a biocide in a concentration for inhibiting microbial growth and a proteolytic enzyme inhibitor in a concentration sufficient to inactivate a major proportion of the proteolytic activity;
b) permitting the fecal solids in the dispersion to settle to form a liquid phase substantially free from fecal solids;
c) removing the liquid phase to provide a test sample substantially free from fecal solids;
d) contacting the liquid phase test sample and a known amount of anti-(human hemoglobin) antibody with a solid support to which a known amount of human hemoglobin is adhered for a time sufficient to permit antibody binding to the insoluble support; and
e) determining anti-(human hemoglobin) antibody adhering to the insoluble support.

5,198,366
METHOD FOR THE DETECTION OF PREGNANCY DISORDERS

Michael Silberman, P.O. Box 9697, Haifa 31096, Israel, assignor to Technion Research & Development Foundation Ltd. and Michael Silberman, both of Haifa, Israel

Continuation-in-part of Ser. No. 603,232, Oct. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 24,023, Mar. 10, 1987, abandoned. This application Aug. 16, 1991, Ser. No. 745,894
Claims priority, application Israel, Mar. 23, 1986, 78237
Int. Cl.[5] G01N *33/68*
U.S. Cl. 436—86 13 Claims

1. A method of early screening for high risk pregnancy, comprising the steps of:.
(a) providing a serum sample from a pregnant woman in her 26th to 34th week of gestation;
(b) determining the level of the human placental protein, PP-13, in said sample; and
(c) comparing said level with normal levels for women with the same gestational age; with a statistically significant deviation from normal levels being strongly indicative of a pregnancy-related disorder selected from the group consisting of preeclampsia, intrauterine growth retardation and preterm delivery.

5,198,367
HOMOGENEOUS AMPEROMETRIC IMMUNOASSAY

Masuo Aizawa, 2-19-4 Amanuma, Suginami-ku, Tokyo 167, Japan; Brenda D. Manning, 158 Canton St., North Easton, Mass. 02356; Miki Hidaka, 2040 Pelham Ave., Los Angeles, Calif. 90025, and Laura S. Uretsky, 9-1 Shadowbrook La., Milford, Mass. 01757

Filed Jun. 9, 1989, Ser. No. 364,731
Int. Cl.[5] G01N *33/536, 33/543*
U.S. Cl. 436—518 19 Claims

1. A method for determining the concentration of an analyte present in a sample of biological fluid contained in an electrochemical cell equipped with a set of electrodes, said method comprising the steps of:
a) forming an electroactive complex containing an antigenic analyte covalently bonded to a carrier molecule, said carrier molecule also being covalently bonded to an electroactive molecule capable of transferring a charge to an electrode,
b) adding the biological fluid, predetermined amounts of the electroactive complex, and an antibody to the analyte to the cell,
c) applying a voltage across the electrodes and measuring the current in the fluid at different voltage levels to form a voltage/current relationship for the sample fluid, and
d) comparing the voltage/current relationship for the sample fluid with standard voltage/current relationships generated using known amounts of analytes to determine the concentration of analyte present in the sample.

5,198,368
METHODS FOR PERFORMING A SOLID-PHASE IMMUNOASSAY

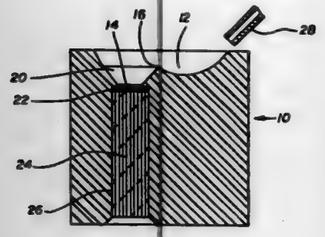
Omar S. Khalil; Charles F. Hanna, both of Libertyville, and Thomas F. Zarek, River Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 184,726, Apr. 22, 1988. This application Jan. 18, 1991, Ser. No. 643,596
Int. Cl.[5] G01N *33/543, 33/546*
U.S. Cl. 436—518 14 Claims

7. A method for performing a solid-phase diagnostic assay in a device having a shallow sample well for receiving a sample and reagents for forming a reaction mixture which produces a detectable component corresponding to an analyte in the sample; a read well positioned adjacent to said sample well comprising (a) an entrance port and wash receiving means for

receiving a quantity of sample and assay reagents from said sample well; (b) a fibrous matrix for retaining and immobilizing said detectable components, said fibrous matrix positioned below and in fluid communication with said wash receiving means; and (c) means positioned below said fibrous matrix for assisting the flow of sample and assay reagents through said fibrous matrix; and said shallow sample well and said wash receiving means are separated by a wall which is constructed and arranged such that when wash fluid is injected into said sample well, sample and reaction mixtures are washed from said shallow sample well, over and into said read well; the steps of said method comprising;

(a) adding a sample to said shallow sample well in the presence of microparticles which have an average diameter smaller than the average spatial separation of the fibers



forming said fibrous matrix and have an analyte binding substance immobilized thereon, and incubating to form a microparticle, analyte complex;

(b) adding to said shallow sample well and thereby to said microparticle, analyte complex an analyte specific conjugate and incubating the mixture to form a microparticle analyte/conjugate complex;

(c) washing said microparticle, analyte/conjugate complex over and into said read well;

(d) adding to said read well an indicator substance capable of forming an assay signal in the presence of said microparticle, analyte/conjugate complex; and

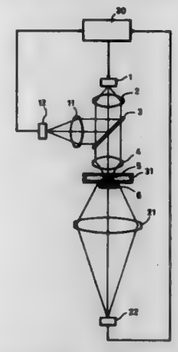
(e) detecting said assay signal produced by said indicator substance in step (d) as a function of the presence or amount of analyte in said sample.

5,198,369
SAMPLE MEASURING METHOD USING AGGLOMERATION REACTION OF MICROCARRIERS
Yuuji Itoh; Michiyo Itoh, both of Chigasaki; Yoshiyuki Touge, Kawasaki; Atsushi Saitou, Yokohama, and Tatsuya Yamazaki, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 19, 1991, Ser. No. 687,627
Claims priority, application Japan, Apr. 25, 1990, 2-109328; May 31, 1990, 2-143729; Jul. 6, 1990, 2-178843
Int. Cl.[5] G01N *33/536, 33/538*
U.S. Cl. 436—534 **20 Claims**

1. A sample processing method comprising:

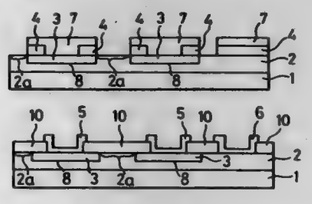
preparing a mixture by mixing carriers to which is adhered a substance that specifically binds to an object substance, with a sample containing said object substance; and

directing light having an intensity gradient onto said mixture to concentrate said carriers at positions irradiated by the



light, thereby increasing the efficiency of an agglomeration reaction of said carriers.

5,198,370
METHOD FOR PRODUCING AN INFRARED DETECTOR
Yuji Ohkura, and Tohru Takiguchi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 4, 1992, Ser. No. 830,852
Claims priority, application Japan, Apr. 17, 1991, 3-115631
Int. Cl.[5] H01L *31/0296, 21/385*
U.S. Cl. 437—3 **6 Claims**



1. A method of producing an infrared detector comprising:

forming on a substrate a first conductivity type compound semiconductor layer, the compound semiconductor layer including an element that is evaporated from the compound semiconductor layer upon annealing to produce lattice vacancies exhibiting the first conductivity type;

depositing an insulating film on the first conductivity type compound semiconductor layer and producing diffusion windows in the insulating film extending to the first conductivity type compound semiconductor layer for diffusing impurities into the first conductivity type compound semiconductor layer;

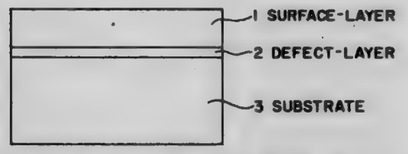
depositing a diffusion source layer comprising a dopant impurity producing a second conductivity type opposite the first conductivity type in the compound semiconductor layer on the insulating film and on the first conductivity type compound semiconductor layer in the windows as a diffusion source;

exposing parts of the surface of the first conductivity type compound semiconductor layer by removing parts of the insulating film and the diffusion layer to form at least two openings having side walls and extending to the first conductivity type compound semiconductor layer with the insulating layer included in the side walls of each opening; and

diffusing the dopant impurity into the first conductivity type compound semiconductor layer from the diffusion source layer through the windows by annealing to form second

conductivity type semiconductor regions in the first conductivity type compound semiconductor layer.

5,198,371
METHOD OF MAKING SILICON MATERIAL WITH ENHANCED SURFACE MOBILITY BY HYDROGEN ION IMPLANTATION
Jianming Li, Beijing, China, assignor to Biota Corp., Locust Valley, N.Y.
Filed Sep. 24, 1990, Ser. No. 587,227
Int. Cl.[5] H01L *21/322*
U.S. Cl. 437—11 **6 Claims**

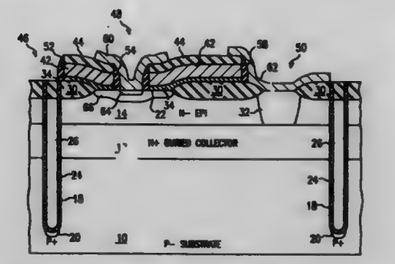


1. A method of forming a buried high-resistivity layer comprising hydrogen bubbles in a region beneath a surface layer of a silicon wafer having a (100) crystal orientation comprising the steps of:

implanting a dose of hydrogen ions into said silicon wafer; and

heating said silicon wafer implanted with hydrogen ions, at a first temperature to form said buried high-resistivity layer comprising hydrogen bubbles.

5,198,372
METHOD FOR MAKING A SHALLOW JUNCTION BIPOLAR TRANSISTOR AND TRANSISTOR FORMED THEREBY
Douglas P. Verret, Sugarland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 213,804, Jun. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 932,752, Nov. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 824,388, Jan. 30, 1986, abandoned. This application Apr. 3, 1991, Ser. No. 679,896
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 **14 Claims**



1. In a process for forming a bipolar transistor at a face of a semiconductor layer of a first conductivity type, the method comprising the steps of:

depositing a refractory metal layer on the face to cover at least a base area thereof;

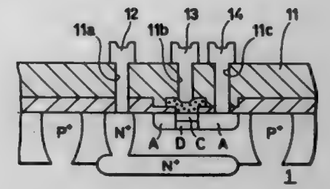
implanting a dopant of a second conductivity type through the metal layer within the base area to penetrate the face;

removing the metal layer only from an emitter area of the face within the base area;

introducing dopant of the first conductivity type into the emitter area; and

annealing the dopants to form a shallow base region of the second conductivity type and an emitter region of the first conductivity type in the semiconductor layer that correspond to the respective base and emitter areas, the base region spacing the emitter region from a collector region in the semiconductor layer of the first conductivity type.

5,198,373
PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE
Kazuhiko Yoshino, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 21, 1992, Ser. No. 886,399
Claims priority, application Japan, May 21, 1991, 3-116157
Int. Cl.[5] H01L *21/265, 29/70*
U.S. Cl. 437—31 **2 Claims**



1. A process for fabricating a semiconductor device, which comprises the steps of:

(i) forming a collector region in a semiconductor substrate covered with a first thin film;

(ii) forming a first opening in the first thin film and implanting boron ions to the semiconductor substrate through the first opening to form a boron implanted layer;

(iii) oxidizing the first opening to cover it with a second thin film, forming a second opening in the second thin film, and implanting fluorine ions to the semiconductor substrate through the second opening so as to lower the boron ion concentration of a region of the boron implanted layer existing beneath the second opening than that of the other region of the boron implanted layer;

(iv) subjecting the semiconductor substrate to a heat treatment to diffuse the implanted ions and cover the substrate surface including the second opening with a third thin film;

(v) etching to remove the third thin film entirely to form a third opening in the same position as the second opening; and

(vi) doping a region defined by the third opening with arsenic ions to form an emitter region in that region while defining an inner base region beneath the emitter region and an outer base region which encompasses the emitter region and the inner base region,

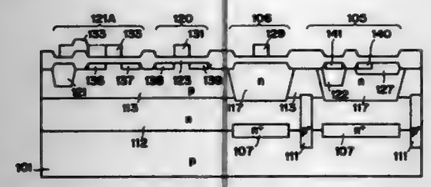
the peak boron ion concentration of said inner base region being made lower than the peak arsenic ion concentration of said inner base region.

5,198,374
METHOD OF MAKING BICMOS INTEGRATED CIRCUIT WITH SHALLOW N-WELLS
Takao Kato, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Division of Ser. No. 675,262, Mar. 27, 1991, Pat. No. 5,099,303. This application Oct. 28, 1991, Ser. No. 783,191
Claims priority, application Japan, Apr. 3, 1990, 2-87358
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 **8 Claims**

1. A method of fabricating an integrated circuit on a p-type semiconductor substrate, comprising steps of:

(a) introducing n-type impurities into at least one first area

and at least one second area of the substrate, thus forming an n^+ buried layer;
(b) introducing p-type impurities into said substrate surrounding said first area, thus forming a p^+ buried layer;
(c) growing an n-type monocrystalline epitaxial layer on said substrate;
(d) growing a p-type monocrystalline epitaxial layer on said n-type monocrystalline epitaxial layer;
(e) introducing n-type impurities into said p-type monocrystalline epitaxial layer above said first area and said second area;

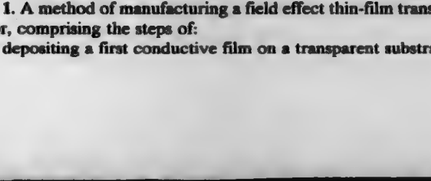


(f) heating said substrate for a time sufficient to cause said n-type impurities introduced in step (e) to form n-wells disposed in said p-type monocrystalline epitaxial layer above said first area and said second area and making contact with said n-type monocrystalline epitaxial layer, and to cause said p^+ buried layer to diffuse upward through said n-type monocrystalline epitaxial layer and make contact with said p-type monocrystalline epitaxial layer; and
(h) forming an NPN transistor in the n-well above said first area and a PMOS transistor in the n-well above said second area.

5,198,375
METHOD FOR FORMING A BIPOLAR TRANSISTOR STRUCTURE
James D. Hayden; Carlos A. Mazuré, and Jon T. Fitch, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.
Filed Mar. 23, 1992, Ser. No. 856,314
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 **17 Claims**

1. A method for forming a bipolar transistor comprising the steps of:
providing a base layer having a surface;
forming a first dielectric layer overlying the base layer;
forming a conductive layer overlying the first dielectric layer;
forming a second dielectric layer overlying the conductive layer;
removing portions of each of the first dielectric layer, the conductive layer, and the second dielectric layer to form both a device opening which exposes the surface of the base layer and a sidewall of the conductive layer;
forming a sidewall dielectric layer adjacent the sidewall of the conductive layer;
forming a conductive region within said device opening, the conductive region being doped to form a base electrode, an emitter electrode, and a collector electrode, said conductive layer being electrically coupled to at least one of a portion of the base electrode, a portion of the emitter electrode, or a portion of the collector electrode;
removing the sidewall dielectric layer;
forming a sidewall spacer overlying the conductive region; and
forming an interconnecting layer of conductive material overlying the sidewall spacer, the interconnecting layer being electrically coupled to the conductive region.

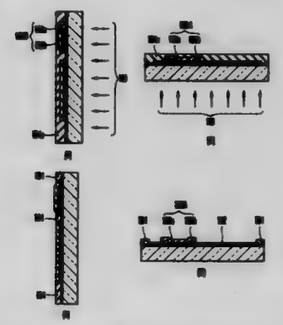
5,198,376
METHOD OF FORMING HIGH PERFORMANCE LATERAL PNP TRANSISTOR WITH BURIED BASE CONTACT
Sridhar Divakaruni, South Burlington, Vt.; Badih El-Kareh, Austin, Tex., and Eric D. Johnson, Westford, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 7, 1992, Ser. No. 909,938
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—32 **7 Claims**



1. A method for forming a PNP lateral transistor in a substrate comprising:
(a) doping a portion of a surface of said substrate with an N-type impurity to form an N^+ layer;
(b) epitaxially growing a lightly P-doped layer on top of said substrate;
(c) implanting a heavily doped N^+ reach-through from the surface of said lightly P-doped layer to said N^+ layer;
(d) providing an oxide layer on the surface of said lightly P-doped layer;
(e) slotting said P-doped layer to provide at least two trenches;
(f) implanting an N-type impurity in the floor of one of said trenches such that the resulting heavily-doped N implant extends to said N^+ layer;
(g) doping the walls of said one trench with an N-type impurity;
(h) filling said trenches with heavily P-doped polysilicon; and
(i) providing electrical connections to said P-doped polysilicon and said N^+ layer by metallizing and patterning.

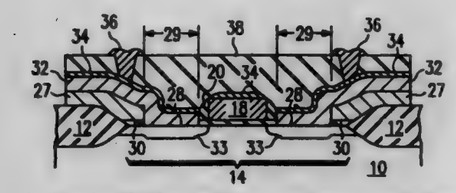
5,198,377
METHOD OF MANUFACTURING AN ACTIVE MATRIX CELL
Kinya Kato, 383-25, Ooza Kamifujisawa, Iruma-shi, Saitama; Nobuhiko Kakuda, 19-5, Sekimachihinami 3-chome, Nerima-ku, Tokyo; Noboru Naito, 6-8, Seanicho 3-chome, Hachioji-shi, Tokyo, and Tsutomu Wada, 6-9, Tenjincho 4-chome, Hachu-shi, Tokyo, all of Japan
Continuation of Ser. No. 321,501, Mar. 9, 1989, abandoned, which is a division of Ser. No. 222,844, Jul. 22, 1988, Pat. No. 4,918,504. This application Jul. 9, 1991, Ser. No. 728,851
Claims priority, application Japan, Jul. 31, 1987, 62-192341; Dec. 22, 1987, 62-322983; Dec. 28, 1987, 62-329956
Int. Cl.[5] H01L *21/336, 21/312*
U.S. Cl. 437—40 **5 Claims**

1. A method of manufacturing a field effect thin-film transistor, comprising the steps of:
depositing a first conductive film on a transparent substrate having a high transparency with respect to a wavelength of exposure light of a negative insulating photosensitive resin, etching said first conductive film in the form of a source and a drain of a field effect thin-film transistor, thereby forming a first conductor group;
forming a two-layered region consisting of a semiconductor film and a first insulating film, said two-layered region connecting said source and said drain, thereby constituting an active region of said field effect thin-film transistor;
applying said negative insulating photosensitive resin;



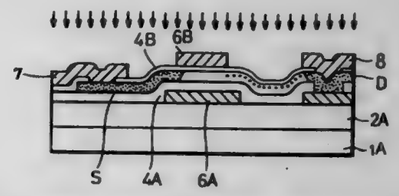
exposing said photosensitive resin from a back side of said transparent substrate by using said two-layered region and said first conductor group as light-shielding masks, developing said photosensitive resin, and forming a second insulating film of said photosensitive resin so as to contact a side surface of said two-layered region in a region excluding said two-layered region and said first conductor group; and
depositing a second conductive film and forming a second conductor group including a gate electrode of said field effect thin-film transistor.

5,198,378
PROCESS OF FABRICATING ELEVATED SOURCE/DRAIN TRANSISTOR
Mark S. Rodder, and Richard A. Chapman, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 265,085, Oct. 31, 1988, abandoned. This application Dec. 10, 1990, Ser. No. 609,969
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—41 **20 Claims**



1. A method for forming a transistor, comprising the steps of:
forming insulating regions surrounding an active device area in a face of a substrate;
forming a gate insulating layer on the surface of said active device area,
forming a gate on said gate insulating layer;
forming sidewall insulating layers on the sidewalls of said gate;
forming at least a first conductive layer on said gate insulating layer, said first conductive layer extending onto said insulating regions;
removing the portion of said gate insulating layer between said first conductive layer and said sidewall insulating layers; and
forming by selective epitaxial deposition a second conductive layer, said selective deposition being selective to the exposed portion of said substrate and said first conductive layer.

5,198,379
METHOD OF MAKING A MOS THIN FILM TRANSISTOR WITH SELF-ALIGNED ASYMMETRICAL STRUCTURE
Alberto O. Adan, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 679,273, Apr. 2, 1991, abandoned. This application Jun. 17, 1992, Ser. No. 899,932
Claims priority, application Japan, Apr. 27, 1990, 2-113833
Int. Cl.[5] H01L *21/335*
U.S. Cl. 437—41 **9 Claims**



1. A method of making a thin film transistor having a self-aligned asymmetrical structure, said method comprising:
forming a semiconductor thin film over a substrate, said thin film being formed to include a drain region, a channel region and a partial source region, said drain and partial source regions being of one conductivity type and said channel region being of another conductivity type;
forming a gate electrode over said channel region and a pair of electrodes including a drain electrode and a source electrode, said drain electrode being concurrently formed with the formation of said gate electrode by the same layer forming said gate electrode, whereby a drain-offset region is formed between said gate electrode and drain electrode;
completing the formation of the source region in a self-aligned manner by ion implantation using said source electrode and gate electrode as a mask.

5,198,380
METHOD OF HIGHLY COMPACT EPROM AND FLASH EEPROM DEVICES
Eliyahou Harari, Los Altos, Calif., assignor to SunDisk Corporation, Santa Clara, Calif.
Division of Ser. No. 204,175, Jun. 8, 1988, Pat. No. 5,095,344. This application Jul. 17, 1989, Ser. No. 381,139
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—43 **52 Claims**

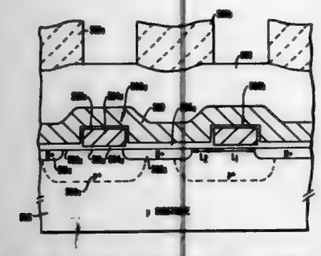
1. A method of forming a split-channel electrically programmable read only memory transistor on a semiconductor substrate surface, comprising the steps of:
forming on said surface a floating gate having a first pair of opposite sidewalls across said floating gate in a first direction and a second pair of opposite sidewalls across said floating gate in a second direction, said first and second directions being substantially perpendicular to each other, said second pair of sidewalls being substantially parallel to each other and separated by a first distance, and said floating gate being electrically isolated by a gate dielectric layer from said substrate,
forming a spacer having one edge immediately adjacent only

one of said first pair of sidewalls of said floating gate and an opposite edge of said spacer being positioned a distance therefrom over said substrate surface that is defined by an etching process without the use of a separate mask,

forming source and drain regions in said substrate by using the adjacent floating gate and spacer as a channel mask, whereby a channel region is formed in the substrate under the masked region between the source and drain regions,

thereafter removing said spacer,

thereafter forming a control gate extending in said first direction over at least a portion of the floating gate and



substrate channel region that was occupied by said spacer, said control gate being electrically insulated from said floating gate and said substrate,

forming regions of a tunnel erase dielectric layer on each of said second pair of floating gate sidewalls, and

forming on the tunnel dielectric layers a pair of parallel erase gates extending in said first direction between the source and drain regions and separated in said second direction by a second distance that is less than said first distance,

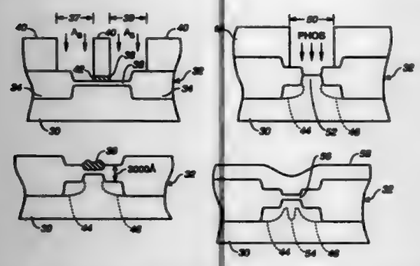
whereby a split-channel electrically programmable read only memory transistor is formed.

5,198,381

METHOD OF MAKING AN E²PROM CELL WITH IMPROVED TUNNELING PROPERTIES HAVING TWO IMPLANT STAGES

Kuang-Yeh Chang, Los Gatos, and Subhash R. Nariani, San Jose, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 12, 1991, Ser. No. 758,554
Int. Cl.[5] H01L *21/266*
U.S. Cl. 437—43 **14 Claims**



10. Method for fabricating a cell for use in a semiconductor memory device comprising the steps of:

forming a first oxide layer on a semiconductor substrate;

defining a first implant region of a tunneling gate in said substrate beneath said first oxide layer;

implanting a first dose of a conductive material within said first implant region;

defining a second implant region of said tunneling gate adjacent said first implant region in said substrate beneath a tunnel area of said first oxide layer;

implanting a second dose of a conductive material within said second implant region;

removing said first layer of oxide from said tunnel area; and

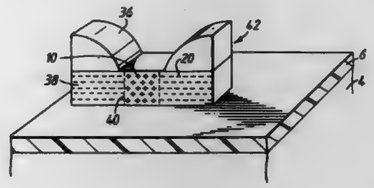
growing a tunnel window oxide layer on said substrate.

5,198,382

SEMICONDUCTOR ELEMENT AND MANUFACTURE THEREOF

Richard N. Campbell, Cwmbran; Michael K. Thompson, Newport, and Elizabeth A. Smith, Malpas, all of United Kingdom, assignors to INMOS Limited, Bristol, England

Filed Apr. 22, 1988, Ser. No. 185,140
Claims priority, application United Kingdom, May 1, 1987, 8710359
Int. Cl.[5] H01L *21/266, 21/283*
U.S. Cl. 437—46 **2 Claims**



1. A method of fabricating a resistive device in polysilicon between two areas of polysilicon in a polycide element, the method comprising the steps of:

(a) forming a lift-off mask on a first region of a layer of p-doped polysilicon;

(b) implanting an n-dopant into second regions of the polysilicon which are adjacent the first region, such that the second regions have a net excess of n-dopant, the first region being masked from dopant implantation by the lift-off mask;

(c) forming a layer of silicide over the implanted regions and the lift-off mask;

(d) removing the lift-off mask and the respective layer of silicide formed thereover thereby to leave two portions of silicide interconnect between which the p-doped first region is located; and

(e) annealing the silicide at an elevated temperature, the annealing step causing diffusion of the n-dopant from the second regions into respective sides of the first region to form two spaced boundaries between the n- and p-doped regions which are located inwardly of the portions of silicide interconnect.

5,198,383

METHOD OF FABRICATING A COMPOSED PILLAR TRANSISTOR DRAM CELL

Clarence W.-H. Teng, and Robert R. Doering, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 25, 1991, Ser. No. 720,541
Int. Cl.[5] H01L *21/265, 21/70*
U.S. Cl. 437—47 **20 Claims**

1. A method of forming a memory cell comprising the steps of:

forming a pillar of a first conductivity type in a semiconductor workpiece;

forming a sidewall insulator on the sidewalls and surrounding said pillar;

forming a first capacitor electrode adjacent and surrounding said sidewall insulator and extending to the top of said pillar, said first capacitor electrode suitable for being biased with a selected voltage relative to said semiconductor pillar;

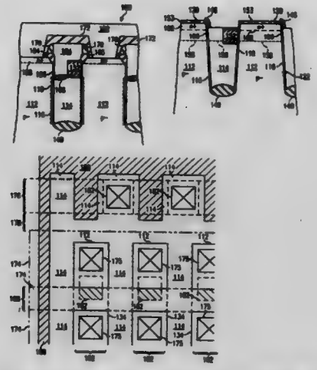
forming a mask over a first portion of said first capacitor electrode;

etching a portion of said first capacitor electrode region which is not beneath said mask to a selected depth;

refilling said etched portion with a first insulating region, said first insulating region having a thickness equal to about said selected depth;

forming a first transistor source/drain region of said second conductivity type in the top portion of said semiconductor pillar;

etching said first portion of said first capacitor electrode region to about said selected depth;



forming a second insulating region adjacent said first insulating region and abutting said pillar, said second insulating region having a thickness substantially less than said selected depth;

forming a gate electrode over said second insulating region and adjacent said sidewall insulator; and

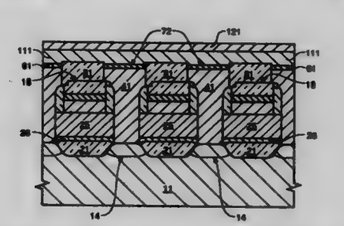
forming an inversion layer in said pillar adjacent said sidewall insulator by biasing said first capacitor electrode with said selected voltage, said inversion layer serving both as a second source/drain region of said transistor and a second capacitor electrode.

5,198,384

PROCESS FOR MANUFACTURING A FERROELECTRIC DYNAMIC/NON-VOLATILE MEMORY ARRAY USING A DISPOSABLE LAYER ABOVE STORAGE-NODE JUNCTION

Charles H. Dennison, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 15, 1991, Ser. No. 700,747
Int. Cl.[5] H01L *21/265, 21/70*
U.S. Cl. 437—47 **32 Claims**



17. A process for fabricating a capacitor having a ferroelectric dielectric layer superjacent the storage-node junction of each cell region within a dynamic random access memory array of stacked-cell design, said process commencing at a stage in the manufacturing process where storage-node contact regions are exposed by masking the array with a storage-node contact photomask and performing an etch to clear the substrate in those regions, and said process comprising the following sequence of steps:

a) conformal deposition of an in-situ-doped storage-node polysilicon layer to a depth greater than that necessary to completely fill any inter-wordline and inter-bitline gaps;

b) planarization of the storage-node poly layer to a level at which poly still covers the entire array;

c) deposition of a conductive barrier layer on top of the planarized storage-node poly layer;

d) deposition of a disposable polymer layer on top of the barrier layer;

e) masking the disposable polymer layer with a photomask which patterns storage-node capacitor plates;

f) anisotropically etching the disposable polymer layer, the barrier layer and the storage-node poly layer in a single step in order to create non-contiguous disposable layer, barrier layer, and storage-node poly layer remnants;

g) blanket deposition of a cell-isolation dielectric layer at a temperature sufficiently low to prevent decomposition of the disposable polymer layer remnants, said cell-isolation layer being of sufficient depth to completely fill gaps between the disposable layer remnants;

h) planarization of the cell-isolation dielectric layer to a level that exposes each disposable polymer layer remnant;

i) removal of the disposable polymer layer remnants;

j) deposition of a ferroelectric dielectric layer;

k) annealing the ferroelectric dielectric layer; and

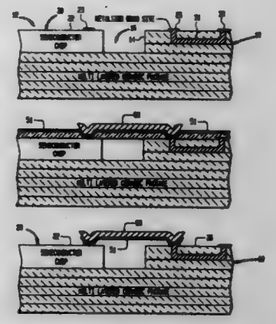
l) deposition of a cell plate layer;

5,198,385

PHOTOLITHOGRAPHIC FORMATION OF DIE-TO-PACKAGE AIRBRIDGE IN A SEMICONDUCTOR DEVICE

Douglas J. Devitt, and Edward S. Wrasmann, both of Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 11, 1991, Ser. No. 640,041
Int. Cl.[5] H01L *21/60, 21/84*
U.S. Cl. 437—51 **10 Claims**



1. A method of providing a conductive interconnection from a first interconnect site on a semiconductor circuit component, that is supported on a support package, to a second interconnect site at a location of said support package spaced apart from said semiconductor circuit component by an air gap therebetween comprising the steps of:

(a) bridging said semiconductor circuit component and said location of said support package with a first layer of masking material, such that the air gap therebetween remains beneath said first layer of masking material;

b) selectively patterning said first layer of masking material so as to form first and second apertures exposing said first and second interconnect sites that are to be conductively interconnected with one another;

from said etch mask to said wafer to form vertical walls

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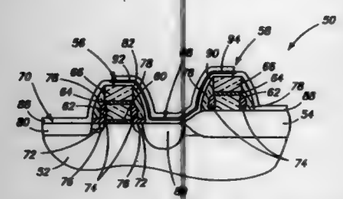
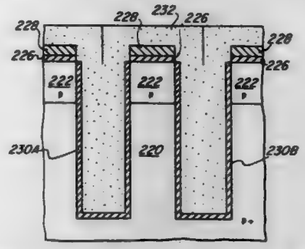
(c) non-selectively forming a first metal layer on the structure resulting from the execution of step (b);
d) selectively forming a second layer of masking material on the structure resulting from step (c) so as to expose that portion of said first metal layer that extends between and conductively interconnects said first and second interconnect sites;
e) forming a second metal layer on the conductively interconnecting portion of said first metal layer exposed by step (d);
(f) removing said second layer of masking material;
(g) using said second metal layer as a mask, removing that portion of said first layer exposed by the removal of said second layer of masking material; and
(h) removing said first layer of masking material, thereby leaving said first and second interconnect sites and said air gap bridged by a metal structure containing said first and second metal layers.

5,198,386
METHOD OF MAKING STACKED CAPACITORS FOR DRAM CELL
Fernando Gonzalez, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Jun. 8, 1992, Ser. No. 895,520
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **19 Claims**



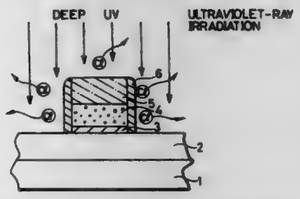
1. A method of forming memory cell capacitors without using a buried capacitor contact mask comprising the following steps:
providing an array of electrically insulated word lines atop a semiconductor wafer;
defining upwardly exposed first active regions adjacent the word lines for connection with memory cell capacitors;
defining upwardly exposed second active regions adjacent the word lines for electrical connection with bit lines;
depositing a layer of polysilicon atop the wafer to cover the upwardly exposed first and second active regions;
depositing a sacrificial layer of a thermal oxidation barrier material atop the polysilicon layer, the oxidation barrier material being selectively etchable relative to the underlying polysilicon;
etching the sacrificial oxidation barrier material selectively relative to the underlying polysilicon to define a selected pattern of masking oxidation barrier material atop polysilicon over the first active regions for formation of capacitor storage nodes;
subjecting the wafer to thermal oxidation conditions to oxidize unmasked areas of the polysilicon layer, the patterned sacrificial masking oxidation barrier material precluding appreciable oxidation of polysilicon thereunder during such oxidation;
after subjecting the wafer to the thermal oxidation conditions, etching remaining sacrificial oxidation barrier material from the wafer to upwardly expose unoxidized polysilicon, such exposed unoxidized polysilicon comprising isolated capacitor storage nodes;
providing a layer of capacitor dielectric atop the isolated capacitor storage nodes; and
providing a layer of cell polysilicon atop the capacitor dielectric layer.

5,198,387
METHOD AND APPARATUS FOR IN-SITU DOPING OF DEPOSITED SILICON
Thomas E. Tang, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 444,900, Dec. 1, 1989, abandoned. This application Aug. 5, 1991, Ser. No. 742,715
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—101 **8 Claims**



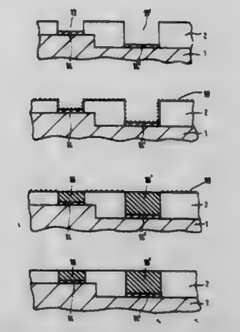
1. A method for the deposition of a doped a silicon film on a surface, comprising the steps of:
a) placing said substrate in a reaction chamber of a reactor;
b) heating said substrate to a temperature between about 550 degrees C. and 600 degrees C.;
c) introducing silane into said reaction chamber and into contact with said substrate;
d) separately preheating a vaporous dopant source above the temperature at which it begins to decompose; and
e) then separately introducing the preheated dopant source into said reaction chamber, whereby the dopant mixes with the silane and passes into contact with said substrate, and a doped silicon film is deposited on the substrate.

5,198,388
METHOD OF FORMING INTERCONNECTION PATTERNS
Kenji Kawai, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 20, 1990, Ser. No. 616,273
Claims priority, application Japan, Jul. 4, 1990, 2-178289
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—173 **12 Claims**



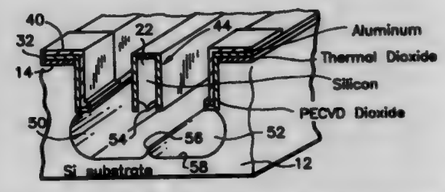
1. A method of forming an interconnection pattern, comprising the steps of:
forming an interconnection layer on a semiconductor substrate;
selectively etching said interconnection layer using a gas comprising halogen atoms to form an interconnection pattern and to form on a surface of said interconnection pattern a protection film comprising said halogen atoms; and
removing said halogen atoms from said interconnection pattern without further etching of said interconnection pattern by irradiating the same with ultraviolet rays in a vacuum of 2×10^{-4} Torr or less.

5,198,389
METHOD OF METALLIZING CONTACT HOLES IN A SEMICONDUCTOR DEVICE
Andreas M. Th. P. van der Putten; Johannes W. G. DeBakker, both of Eindhoven, and Johannes M. G. Rikken, Oss, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Feb. 10, 1992, Ser. No. 834,046
Claims priority, application Netherlands, Feb. 12, 1991, 9100241
Int. Cl.[5] H01L *21/288*
U.S. Cl. 437—190 **4 Claims**



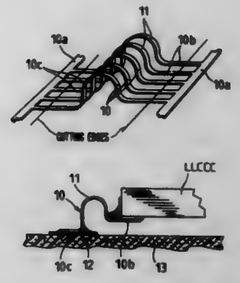
1. A method of manufacturing a semiconductor device comprising a silicon substrate and a dielectric layer which is provided thereon and in which contact holes are etched down to the silicon, after which palladium nuclei are provided in the contact holes and, next, metal plugs are formed in said contact holes by means of an electroless metallization bath, which plugs contact the silicon, characterized in that a stabilizer is added to the electroless metallization bath and in that, prior to the electroless metallization of the contract holes, the silicon of said contact holes is provided with a TiW layer, after which at least said TiW layer is provided with palladium nuclei.

5,198,390
RIE PROCESS FOR FABRICATING SUBMICRON, SILICON ELECTROMECHANICAL STRUCTURES
Noel C. MacDonald, and Zuoying L. Zhang, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Jan. 16, 1992, Ser. No. 821,944
Int. Cl.[5] H01L *21/44, 21/48, 21/90*
U.S. Cl. 437—203 **7 Claims**



1. A reactive ion etching process for the fabrication of submicron, single crystal released structures, comprising:
forming a wafer from which a single crystal structure is to be fabricated;
forming an etch mask on a top surface of said wafer;
transferring to said etch mask by reactive ion etching in a CHF_3 plasma a pattern defining a structure to be formed in said wafer;
transferring said pattern by a Cl_2/BCl_3 reactive ion etching from said etch mask to said wafer to form vertical walls defining trenches and steps in said pattern in said wafer;
selectively masking said vertical walls to define structures to be released in said wafer; and
releasing said selected structures in said wafer using an SF_6/O_2 reactive ion etching process to completely undercut said selected structures.

5,198,391
METHOD FOR BONDING LLCCC-COMPONENTS USING A LEADFRAME
Helmut Rösel, Holzkirchen, and Martin Eck, Egmating, both of Fed. Rep. of Germany, assignors to Deutsche Aerospace AG, Fed. Rep. of Germany
Filed Jun. 15, 1992, Ser. No. 897,933
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1991, 4119741
Int. Cl.[5] H01L *21/58, 21/60*
U.S. Cl. 437—218 **7 Claims**

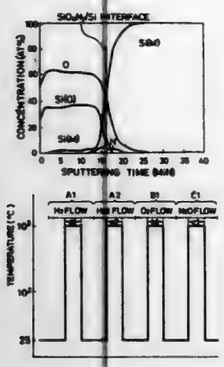


1. A method for electrically bonding a chip carrier component to a printed circuit board by way of bonding elements, said method comprising the steps of:
providing a sheet of foil tinned on both sides thereof, and having a width corresponding to a length of said bonding elements;
forming said bonding elements from said foil sheet by etching a plurality of transverse slots therein, while maintaining first and second cross webs connecting said bonding elements at extremities thereof, along opposite edges of said foil sheet;
bending said bonding element in a semicircular shape at a longitudinally central portion thereof;
severing said first cross web from said bonding elements;
soldering free ends of said bonding elements to the chip carrier component;
severing said second cross web from said bonding elements, and
soldering severed ends of said bonding elements to a strip conductor of said printed circuit board, thereby effecting mechanical and electrical bonding of said leadless ceramic chip carrier component to said circuit board.

5,198,392
METHOD OF FORMING A NITRIDED SILICON DIOXIDE (SiO_xN_y) FILM
Hisashi Fukada, and Tomiyuki Arajawa, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 613,988, Nov. 15, 1990, abandoned. This application Jun. 21, 1991, Ser. No. 718,792
Claims priority, application Japan, Nov. 20, 1989, 1-299546; Feb. 22, 1990, 2-42203
Int. Cl.[5] H01L *21/02*
U.S. Cl. 437—241 **9 Claims**

1. A method of forming an insulating film on a silicon substrate comprising:
the step of forming a silicon dioxide film on said silicon

substrate by performing heat treatment in an oxidizing gas atmosphere which does not contain nitrogen; and



the step of oxynitriding the silicon dioxide film, by performing heat treatment in an atmosphere which consists essentially of nitrous oxide.

5,198,393

RARE EARTH-CONTAINING FRITS HAVING A HIGH GLASS TRANSITION TEMPERATURE AND THEIR USE FOR THE PRODUCTION OF ENAMELS HAVING IMPROVED HEAT RESISTANCE

Vernon J. Grebe, Baltimore; Elie E. Saad, Bartonsville; Derek W. Sproson, and Arthur C. Stidham, both of Baltimore, all of Md., assignors to Miles Inc., Pittsburgh, Pa.

Filed Jul. 23, 1991, Ser. No. 734,389
Int. Cl.[5] C03C 3/089
U.S. Cl. 501—65 8 Claims

5. An alkali borosilicate frit which may be applied by the dry powder electrostatic process at a transfer efficiency of at least 70% by weight, has a glass transition temperature of >525° C., an acid resistance on the PEI scale of AA and consists essentially of, based on the total weight of the frit:

Oxide	Wt %
K_2O	6 to 10
Na_2O	5.5 to 9
Li_2O	0 to 4
ZrO_2	0 to 4
TiO_2	0 to 4
ZnO	0 to 15
B_2O_3	8 to 15
SiO_2	40 to 60
La_2O_3	3 to 9
CaO	0 to 15
F	0 to 2
Fe_2O_3	0 to 3
CoO	0 to 5
NiO	0 to 5

wherein the total weight of CoO plus NiO is at least 1.

5,198,394

SINTERED CERAMIC BODY, A METHOD OF MAKING SAME AND SPARK PLUG INSULATOR MADE THEREFROM

Makoto Sugimoto; Mamoru Musasa; Hiroyuki Tanabe, and Konishi Masahiro, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Oct. 11, 1991, Ser. No. 775,815
Claims priority, application Japan, Oct. 12, 1990, 2-274896
Int. Cl.[5] C04B 35/58
U.S. Cl. 501—98 7 Claims

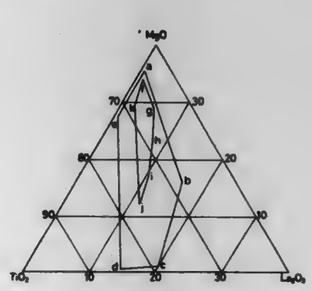
1. A sintered ceramic body comprising magnesium (Mg) uniformly diffused into grains of a nitride-based ceramic body, the amount of the diffused magnesium (Mg) being within a range from 20 ppm to 100 ppm inclusive calculated by reducing the magnesium (Mg) to its oxidized component.

5,198,395

DIELECTRIC CERAMIC COMPOSITION FOR HIGH FREQUENCY USE

Hideki Utaki; Toyomi Nishi, and Nobuyoshi Fujikawa, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Apr. 26, 1991, Ser. No. 692,131
Claims priority, application Japan, Apr. 27, 1990, 2-114123
Int. Cl.[5] C04B 35/46
U.S. Cl. 501—136 16 Claims



1. A dielectric ceramic comprising a composition expressed by the formula which is based on oxides of three components as references,

$$xMgO.yLa_2O_3.zTiO_2 \quad (A)$$

wherein x, y and z are numerals which represent said components in mole % and which further satisfy the equations,

$$x+y+z=100 \quad (1)$$

$$y \leqq -0.79487x+28.718 \quad (2)$$

$$y \leqq -0.26667x+20.267 \quad (3)$$

$$y \leqq 11x+9 \quad (4)$$

$$y \leqq -0.51852x+14.759 \quad (5) \text{ and}$$

$$y \leqq 0.5 \quad (6).$$

5,198,396

MICROWAVE DIELECTRIC CERAMIC COMPOSITION

Fumio Mizuno, Nagoya, Japan, assignor to NGK Spark Plug Company, Ltd., Aichi, Japan

Filed Jan. 24, 1992, Ser. No. 825,078
Claims priority, application Japan, Jan. 26, 1991, 3-25290
Int. Cl.[5] C04B 35/46
U.S. Cl. 501—138 9 Claims

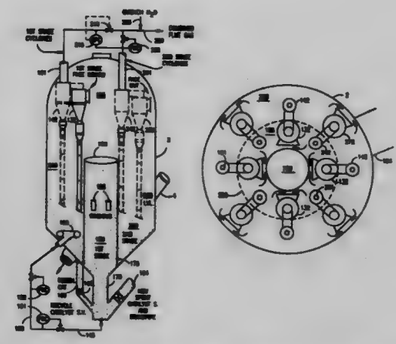
1. A microwave dielectric ceramic composition which comprises a compound represented by the formula $BaO{\cdot}xTiO_2$ where $3.7 \leqq x \leqq 4.5$ which is incorporated with 1.0–10 wt % $Ba_3Ti_{12}Zn_7O_{34}$ and 2–8 wt % Ta_2O_5.

5,198,397

TWO-STAGE FLUID BED REGENERATION OF CATALYST WITH SHARED DILUTE PHASE

Michael F. Raterman, Doylestown, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 25, 1991, Ser. No. 797,678
Int. Cl.[5] C10G 11/05, 11/04; B01J 38/36, 20/20
U.S. Cl. 502—43 16 Claims



1. A process for the multi-stage, fluidized bed regeneration of coke containing fluidized catalytic cracking catalyst in a regenerator vessel having an upper portion and a lower portion, and containing at least on vertical baffle means within said lower portion adapted to separate said lower portion into at least two isolated fluidized beds beneath a shared dilute phase region, said shared dilute phase region being in said upper portion of said regenerator vessel comprising:

partially regenerating said catalyst by discharging said coke containing catalyst into a primary regeneration stage comprising one of said isolated fluidized beds and having a coked catalyst inlet means, an oxygen containing gas inlet means in a lower portion of said isolated fluidized bed, and operating at catalyst regeneration conditions to produce partially regenerated catalyst which is discharged from said primary regeneration stage via a catalyst transfer means connective with a secondary catalyst regeneration stage, and a primary flue gas stream comprising entrained, partially regenerated catalyst and fines which is discharged up into said shared dilute phase region above said primary regeneration stage;

b) completing regeneration of said catalyst in a secondary regeneration stage comprising at least one other of said isolated fluidized beds and operating at catalyst regeneration conditions and receiving catalyst from said primary stage, and having an oxygen containing gas inlet means in a lower portion of said isolated fluidized bed in said secondary regeneration stage, and a regenerated catalyst outlet means to produce regenerated catalyst which is withdrawn via said regenerated catalyst outlet means and a secondary flue gas stream comprising regenerated catalyst and fines which is discharged up into said shard dilute phase region above said secondary regeneration stage;

c) separating said primary flue gas stream in a primary catalyst and flue gas separation means having an inlet for primary flue gas and entrained partially regenerated catalyst, an outlet for recovered partially regenerated catalyst, and an outlet for flue gas having a reduced catalyst content and adapted to remove said primary flue gas from said regenerator vessel as a primary flue gas stream with a reduced catalyst content, and wherein said inlet of said primary catalyst/flue gas separation means is connective with said shared dilute phase region above said primary regeneration zone; and

d) separating said secondary flue gas stream in a secondary flue gas and catalyst separation means having an inlet for secondary flue gas and entrained regenerated catalyst, an outlet for recovered regenerated catalyst, an outlet for secondary flue gas having a reduced catalyst content and adapted to remove said secondary flue gas from said regenerator vessel as a secondary flue gas stream with a reduced catalyst content, and wherein said inlet of said secondary catalyst/flue gas separation means is connective with said shared dilute phase region above said secondary regeneration zone;

e) removing regenerated catalyst from said secondary regeneration stage as a product of said regeneration process; and

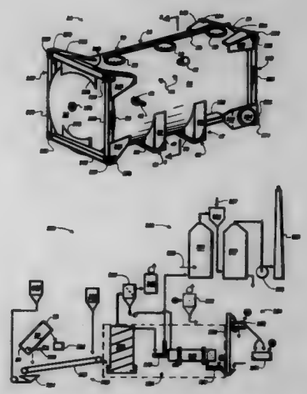
f) removing from, said regenerator vessel said primary and said secondary flue gas streams as isolated streams.

5,198,398

METHOD FOR REGENERATING SPENT ACTIVATED CARBON AND PORTABLE CONTAINER FOR USE THEREIN

Eddy van Duijn, Marshall, Tex., assignor to American Norit Company, Inc., Atlanta, Ga.

Filed Apr. 2, 1991, Ser. No. 678,832
Int. Cl.[5] B01J 20/34, 38/02; B01D 24/44; B65G 65/46
U.S. Cl. 502—56 12 Claims



1. Method of regenerating at least partially spent activated carbon used in an adsorption system, the at least partially spent activated carbon being contained in a portable container defining a filter chamber of the adsorption system, the portable container having a fluid inlet and a fluid outlet connected to the adsorption system so that fluid flows through the fluid inlet into the filter chamber and out of the filter chamber through the fluid outlet, the portable container being sealed so that fluid does not leak from the container, the method comprising the steps of:

disconnecting the portable container from the adsorption

components containing an additional metallic or non-metallic

disconnecting the portable container from the adsorption system;
covering the fluid inlet and outlet so that the at least partially spent activated carbon is held within the portable container;
transporting the portable container containing the at least partially spent activated carbon from the adsorption site to a regeneration site remote from the adsorption site;
at the regeneration site, feeding the at least partially spent activated carbon from the portable container directly to an activated carbon heating zone without the use of liquid to transport the at least partially spent activated carbon to the heating zone, wherein the step of feeding includes the steps of inserting an auger through an opening in the portable container and rotating the auger so as to withdraw the at least partially spent activated carbon from the portable container; and
regenerating the at least partially spent activated carbon in the heating zone.

5,198,399

POLYMERIZATION CATALYST AND METHOD

Raymond E. Hoff, West Chester, Ohio, and Leonard V. Cribbs, Houston, Tex., assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Jan. 17, 1992, Ser. No. 822,440
Int. Cl.[5] C08F *4/02*
U.S. Cl. 502—111 **39 Claims**

1. A solid catalyst component active in the presence of an alkylaluminum cocatalyst in olefin polymerizations prepared by the steps of:
a) contacting the interior and exterior surfaces of a particulate biodegradable substrate having surface hydroxyl groups, a surface area of at least 50 square meters per gram and a pore volume of at least 0.50 milliliters per gram, with an organometallic compound selected from the group consisting of Group IIA organometallic compounds, Group III organometallic compounds, Group IIA-Group III organometallic complexes, and combinations thereof, in the presence of a solvent, to form a modified biodegradable substrate; and
b) contacting the interior and exterior surfaces of the modified biodegradable substrate with a transition metal compound, in the presence of a solvent, whereby catalytically active sites are provided on the interior and exterior surfaces of the biodegradable substrate to form a solid catalyst component susceptible to fragmentation caused by polymer forming on the interior surfaces thereof during polymerization.

5,198,400

MIXED CHROMIUM CATALYSTS AND POLYMERIZATIONS UTILIZING SAME

Stanley J. Katzen, Buffalo Grove; Thomas J. Pullukat, Hoffman Estates; Michael W. Lynch, Schaumburg, all of Ill., and Louis J. Rekers, Wyoming, Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 570,935, Aug. 22, 1990, Pat. No. 5,081,089, which is a division of Ser. No. 338,476, Apr. 14, 1989, Pat. No. 4,981,927, which is a continuation of Ser. No. 52,654, May 20, 1987, abandoned. This application Mar. 26, 1991, Ser. No. 675,378
The portion of the term of this patent subsequent to Jan. 14, 2009, has been disclaimed.
Int. Cl.[5] C08F *4/69*
U.S. Cl. 502—113 **30 Claims**

1. A mixed chromium catalyst composition consisting essentially of a first and second silica-supported chromium catalyst component; said first and second catalyst components present at a weight ratio from 10:1 to 1:10 and each component containing from 0.1 to 2.0 weight percent chromium and thermally activated by heating in a non-reducing atmosphere at a temperature from 450° F. to 1700° F. with at least one of said catalyst components containing an additional metallic or non-metallic element selected from aluminum, titanium, zirconium, boron or phosphorus; and the silica supports of said first and second catalyst components differing in pore volume by at least 0.3 cc/g.

5,198,401

IONIC METALLOCENE CATALYST COMPOSITIONS

Howard W. Turner; Gregory G. Hlatky, and Richard R. Eckman, all of Houston, Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 555,977, Jul. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 133,480, Dec. 22, 1987, which is a continuation-in-part of Ser. No. 8,800, Jan. 30, 1987, abandoned, and a continuation-in-part of Ser. No. 133,052, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 11,471, Jan. 30, 1987, abandoned. This application Jul. 30, 1991, Ser. No. 737,611
Int. Cl.[5] C08F *4/643*
U.S. Cl. 502—155 **54 Claims**

1. A composition of matter comprising a Group IV-B metal cation non-coordination anion, which composition is represented by one of the following general formulae:

$$\{[(A\text{—}Cp)MX_1]^+\}_d[B']^{d-} \quad 1.$$

$$\{[A\text{—}Cp)MX_5L']^+\}_d[B']^{d-} \quad 2.$$

wherein
(A—Cp) is either (Cp)(Cp') or Cp—A'-Cp'; Cp and Cp' are the same or different cyclopentdienyl rings substituted with from zero to five substituent groups S, each substituent group S being, independently, a radical group which is a hydrocarbyl, substituted-hydrocarbyl, halocarbyl, substituted-halocarbyl, hydrocarbyl-substituted organometalloid, halocarbyl-substituted organometalloid or halogen radicals, or Cp and Cp' are cyclopentadienyl rings in which any two adjacent S groups are joined forming a C_4 to C_{20} ring to give a saturated or unsaturated polycyclic cyclopentadienyl ligand; and A' is a bridging group restricting rotation of the Cp and Cp' rings;
M is titanium, zirconium or hafnium;
L' is neutral Lewis base;
X_1 is hydride radical, hydrocarbyl radicals, substituted-hydrocarbyl radicals hydrocarbyl-substituted organometalloid radicals or halocarbyl-substituted organometalloid radical;
X_5 is a hydride radical, hydrocarbyl radical or substituted-hydrocarbyl radical, halocarbyl radical or substituted organometalloid radicals, which radical may optionally be covalently bonded to both M and L'; and
B' is a chemically stable, non-nucleophilic substituted anionic complex having a molecular diameter about or greater than 4 angstroms; and
d is an integer representing the charge of B'.

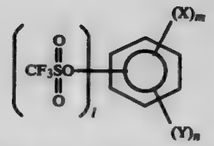
5,198,402

ARYL TRIFLATE COMPOUND, RADIOLOGICALLY ACID PRODUCING AGENT, RADIOLOGICALLY ACID PRODUCING AGENT SYSTEM, AND RADIOSENSITIVE COMPOSITION

Makoto Kaji, Hitachi, Japan, and S. Peter Pappas, West Hartford, Conn., assignors to Hitachi Chemical Company Ltd., Tokyo, Japan

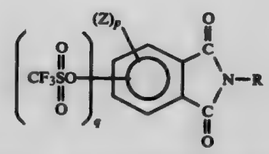
Filed Oct. 18, 1991, Ser. No. 790,169
Int. Cl.[5] B01J *31/00*; C08F *2/50*; G03C *1/675*
U.S. Cl. 502—167 **8 Claims**

1. A radiologically-acid-producing agent system comprising an aryl triflate compound and at least one sensitizer, said aryl triflate compound being selected from the group consisting of an aryl triflate compound of the formula:



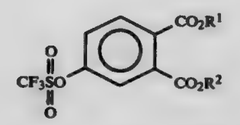
(I)

wherein X is an alkoxycarbonyl group, a cyano group, a nitro group or a trifluoromethyl group; Y is a hydrogen atom, a halogen atom, a linear or branched alkyl group, an aralkyl group, or a substituted or unsubstituted phenyl group; l is an integer of 1 to 5; m is an integer of 1 to 5; and n is zero or an integer of 1 to 4, l, m and n being chosen so that l+m+n=6,
an aryl triflate compound of the formula:



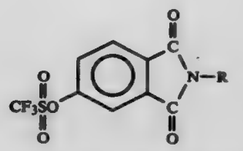
(II)

wherein R is a linear or branched alkyl group having 1 to 22 carbon atoms, an aralkyl group having 7 to 22 carbon atoms, or a substituted or unsubstituted phenyl group; Z is a hydrogen atom, a halogen atom or an alkyl group; q is an integer of 1 to 4; and p is zero or an integer of 1 to 3, p and q being chosen so that p+q=4,
an aryl triflate compound of the formula:



(III)

wherein R^1 and R^2 are independently a linear or branched alkyl group having 1 to 22 carbon atoms, an aralkyl group having 7 to 22 carbon atoms, or a substituted or unsubstituted phenyl group, and
an aryl triflate compound of the formula:



(IV)

wherein R is a linear or branched alkyl group having 1 to 22 carbon atoms, an aralkyl group having 7 to 22 carbon atoms, or a substituted or unsubstituted phenyl group.

5,198,403

PROCESS FOR PRODUCING A CATALYST FOR SELECTIVE REDUCTION OF NITROUS OXIDES WITH AMMONIA

Reinhold Brand; Bernd Engler, both of Hanau; Wolfgang Hoenes, Bruchkoebel; Edgar Koberstein, Alzenau, and Johannes Ohmer, Bad Homburg, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 484,405, Feb. 26, 1990, abandoned. This application Nov. 5, 1991, Ser. No. 787,746
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906136
Int. Cl.[5] B01J *37/04, 21/06, 21/02, 21/04*
U.S. Cl. 502—204 **14 Claims**

1. A process for producing a catalyst for selective reduction of nitrous oxide with ammonia, comprising the following components:
(A) titanium oxide;
(B_1) at least one oxide of tungsten, silicon, boron, aluminum, phosphorus, zirconium, barium, yttrium, lanthanum, and cerium, and
(B_2) at least one oxide of vanadium, niobium, molybdenum, iron, and copper, with an atomic ratio between the elements of components (A) and (B) ranging from about 1:0.001 to 1:1, the process comprising:
intensively prekneading together component (A), in the form of a reactive, high-surface titanium oxide, with a BET surface of 40–500 m^2/g, which is present completely or predominantly in the anatase modification, with component (B_1), and after prekneading, adding component (B_2) and kneading so as to form a homogeneous kneaded mass,
extruding said kneaded mass to form a molded body,
drying the molded body while slowly raising the temperature up to a maximum of about 60° C., and
calcining with the gradual raising the temperature, in ambient air, at final temperatures in the range of about 300°–800° C.

5,198,404

PLATINUM-RHENIUM CATALYST

John H. Arndt, Berkeley, and Robert L. Jacobson, Vallejo, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Filed Nov. 1, 1991, Ser. No. 786,652
Int. Cl.[5] B01J *21/04, 23/36, 27/13*
U.S. Cl. 502—230 **3 Claims**

1. A catalyst composition comprising 0.5 to 2.0 weight percent chlorine, 0.24 to 0.26 weight percent platinum and 0.48 and 0.52 weight percent rhenium disposed on a spheroidal alumina carrier.

5,198,405

CATALYST FOR THE REMOVAL OF HYDROGEN FROM AN ATMOSPHERE CONTAINING HYDROGEN, OXYGEN AND STEAM

Amiya K. Chakraborty, Erftstadt; Jurgen Rohde, Bergisch-Gladbach; Karl-Heinz Klatt, and Helmut Wenzl, both of Julich, and Ralf Konrad, Sinn, all of the Fed. Rep. of Germany, assignors to Forschungszentrum Julich GmbH, Julich and Gesellschaft fur Reaktorsicherheit, Cologne, both of Fed. Rep. of Germany

Filed Jul. 2, 1991, Ser. No. 724,747
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1990, 4022236; Dec. 22, 1990, 4041661
Int. Cl.[5] B01J *32/00*
U.S. Cl. 502—300 **7 Claims**

1. A catalyst for the oxidation of hydrogen in an atmosphere containing hydrogen, oxygen and steam comprising a metal or equivalent metal alloy influencing the oxidation of hydrogen, said catalyst applied as a catalyst layer onto a substrate material, said substrate material being a carrier plate, mesh or granulate resistant to corrosion caused by steam; said catalyst layer

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and said substrate material having linear coefficients of expansion approximately equal to each other.

5,198,406
TRANSPARENT THERMOGRAPHIC RECORDING FILMS

Jonathan M. Mack, Boylston, and Kang Sun, North Attleboro, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 725,433, Jul. 3, 1991, abandoned. This application Dec. 16, 1991, Ser. No. 808,540
Int. Cl.[5] B41M *5/32, 5/30*
U.S. Cl. 503—207 26 Claims

1. A transparent thermographic recording film comprising a transparent support carrying:
(a) a dye image-forming system comprising a di- or triarylmethane thiolactone dye precursor, an organic silver salt, a heat-fusible organic acidic material, and polyvinylbutyral as the binder; and,
(b) a protective topcoat layer positioned above said dye image-forming system and comprising a water-insoluble polymeric binder, a mixture of at least two colloidal silicas having different average particle diameters in the proportion, by weight, of 1 part of larger silica having an average diameter of 50 nm or smaller and 0.3 to 1 part of silica particles having an average diameter no more than 40% of the larger sized silica particles, the ratio of total silica to binder being at least 3 parts per weight silica to 1 part per weight binder.

5,198,407
HEAT-SENSITIVE STENCIL SHEET

Katsumi Motegi; Motoshi Okugawa, and Kouji Masuda, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1990, Ser. No. 531,647
Claims priority, application Japan, Jun. 2, 1989, 1-139027
Int. Cl.[5] B41M *5/30, 5/40*
U.S. Cl. 503—226 4 Claims

1. A heat-sensitive stencil sheet comprising:
a porous sheet having on one side thereof at least an adhesive layer;
a thermoplastic resin film layer fixed on said adhesive layer; and
a heat-sensitive color-forming material contained within at least one of layers constituting said stencil sheet, said heat-sensitive color-forming material comprising a combination of a color former and a color developer, said color former being selected from the group consisting of leuco compounds.

5,198,408
THERMAL DYE TRANSFER RECEIVING ELEMENT WITH BACKING LAYER

Thomas W. Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1992, Ser. No. 838,619
Int. Cl.[5] B41M *5/035*
U.S. Cl. 503—227 20 Claims

1. In a dye-receiving element for thermal dye transfer comprising a support having on one side thereof a polymeric dye image-receiving layer and on the other side thereof a backing layer, the improvement wherein said backing layer comprises a mixture of polyvinyl alcohol as a polymeric binder, submicron colloidal inorganic particles, and polymeric particles of a size larger than the inorganic particles.

5,198,409
THERMAL DYE TRANSFER IMAGED FOCUSSING TOOL

Stephen J. Rowan, Spencerport, and Charles D. DeBoer, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1992, Ser. No. 837,469
Int. Cl.[5] B41M *5/035, 5/38*
U.S. Cl. 503—227 20 Claims

11. A process of forming an imaged focussing tool comprising:
(a) imagewise-heating a dye-donor element comprising a support having thereon a dye layer, and
(b) transferring portions of the dye layer in a pattern corresponding to a desired focussing image to a dye-receiving element suitable for forming a focussing tool comprising a polymeric central dye image-receiving section having a substantially planar image receiving surface and a relatively thicker integral polymeric frame section extending around the periphery of said central section, said image receiving surface being formed at an inclined angle relative to the frame section.

5,198,410
THERMAL DYE TRANSFER RECEIVING ELEMENT WITH BACKING LAYER

Thomas W. Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1992, Ser. No. 838,618
Int. Cl.[5] B41M *5/035*
U.S. Cl. 503—227 20 Claims

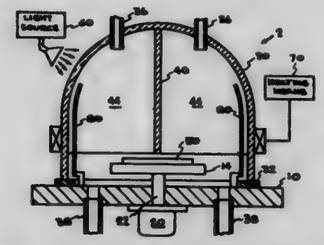
1. In a dye-receiving element for thermal dye transfer comprising a support having on one side thereof a polymeric dye image-receiving layer and on the other side thereof a backing layer, the improvement wherein said backing layer comprises a mixture of an organo-clay binder, submicron colloidal inorganic particles, and polymeric particles of a size larger than the inorganic particles.

5,198,411
CHEMICAL VAPOR PHASE METHOD FOR FORMING THIN FILMS OF HIGH TEMPERATURE OXIDE SUPERCONDUCTORS

Ronald Hiskes, Palo Alto, and Martha L. Narbut, San Mateo, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 2, 1988, Ser. No. 279,465
Int. Cl.[5] H01L *39/00;* H01B *12/00*
U.S. Cl. 505—1 14 Claims

1. A method of forming a thin film of an oxide based superconductor by chemical vapor deposition on a substrate, without post reaction annealing in oxygen, which consists essentially of:
(a) rotating said substrate in a deposition chamber at a speed of from about 50 to about 1500 rpm;
(b) providing a plurality of independent reactant gas sources, each respectively comprising a gaseous form of one of the reactants of the thin film superconductor and an optional carrier gas;
(c) independently delivering said of said reactant gases from said independent reactant gas sources to a reaction zone immediately adjacent to said rotating substrate surface through independent delivery means, including separate exit ports in said deposition chamber, in parallel gas flow directions perpendicular to the plane of said rotating



substrate, to inhibit premature reaction between said gases prior to reaching said reaction zone immediately adjacent said rotating substrate surface and to permit homogeneous mixing of all of said reactant gases in said reaction zone;
(d) reacting said independent reactant gases together in said reaction zone immediately adjacent to said rotating substrate surface; and
(e) depositing said resulting thin film superconductor reaction product on said rotating substrate surface;
whereby buildup of any one of said reactants on said rotating substrate surface, in preference to the desired thin film of superconductor reaction product, is inhibited by said rotation of said substrate surface adjacent said exit ports of said independently delivered reactant gases.

5,198,412
METHOD FOR MAKING SUPERCONDUCTOR FILMS

V. K. Nagesh, Cupertino, and John T. Anderson, Woodside, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

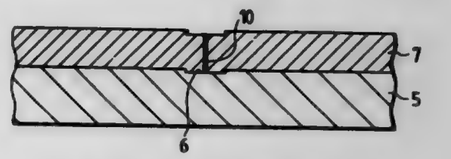
Continuation of Ser. No. 582,266, Sep. 14, 1990, abandoned, which is a continuation of Ser. No. 67,510, Jun. 26, 1987, Pat. No. 5,041,420. This application Dec. 13, 1991, Ser. No. 808,944
The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.
Int. Cl.[5] B05D *3/02, 5/12*
U.S. Cl. 505—1 7 Claims

1. A method for forming a patterned ceramic superconducting film on a surface comprising the steps:
applying a metal precursor film to a surface, said metal precursor film including, in proper stoichiometric proportions, the metallic elements of a ceramic superconducting material;
patterning the metal precursor film to produce a patterned metal precursor film; and
heating the patterned metal precursor film to convert the patterned metal precursor film into a patterned ceramic superconducting film on said surface.

5,198,413
OXIDE-SUPERCONDUCTING TUNNELING DEVICE FORMED ON A SUBMICRON RECESS IN THE SUBSTRATE

Yoshinobu Tarutani, Yamanashi, and Ushio Kawabe, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 214,462, Jul. 1, 1988, abandoned. This application Nov. 13, 1991, Ser. No. 790,085
Claims priority, application Japan, Jul. 3, 1987, 62-165318
Int. Cl.[5] H01B *12/00;* H01L *39/22*
U.S. Cl. 505—1 6 Claims



1. An oxide-superconnecting device comprising:
a substrate which is formed with a recess of submicron width;
an oxide-superconductor film which is provided so as to cover said recess, and which has grain boundaries extending within said recess to a surface of said oxide superconductor film, thereby to be divided into two, first and second electrodes by said grain boundaries; and
a tunnel barrier layer which is formed along said grain boundaries, and which is made of a member selected from the group consisting of any of elements F, Cl, Br, I, C, O, S, P and N, a mixture consisting of such elements, and a compound containing such an element, said member being introduced into, at least, either of said grain boundaries and lattice interstices near said grain boundaries.

5,198,414
IN-SITU GROWTH OF FLOUROUNATED SUPERCONDUCTING, Y-BA-CU-O THIN FILMS ON SAPPHIRE SUBSTRATES WITH A BUFFER LAYER BY LASER ABLATION

Stanford R. Ovshinsky, Bloomfield Hill; Ross Young, Troy; Gerard Van der Leeden, Troy, and Benjamin S. Chao, Troy, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 569,502, Aug. 20, 1990, abandoned, which is a continuation of Ser. No. 402,313, Sep. 5, 1989, abandoned. This application Oct. 1, 1991, Ser. No. 770,733
The portion of the term of this patent subsequent to Jun. 23, 2009, has been disclaimed.
Int. Cl.[5] B05D *5/12, 3/06*
U.S. Cl. 501—1 8 Claims

1. A method of depositing a fluorinated Y-Ba-Cu-O thin film superconductor onto a sapphire substrate, said method including the steps of:
providing said sapphire substrate;
depositing a barrier layer of $BaAl_7O_4$ onto at least one surface of said sapphire substrate;
providing a target, said target including at least the elements fluorine, barium, yttrium, copper and oxygen;
providing a chamber defining a deposition region therewithin;
placing said target into said chamber;
evacuating said chamber to sub-atmospheric pressure;
providing a background atmosphere including at least a partial pressure of O_2 within said deposition region;
heating the sapphire substrate, including the barrier layer, to a temperature above ambient;
providing a laser;
laser ablation depositing the target material, in said back-

ground atmosphere, onto the barrier layer of the heated substrate; and

controlling the partial pressure of O_2 in said background atmosphere within said deposition region and the temperature of said coated sapphire substrate, during laser ablation, such that the as deposited thin film superconductor material is superconductive.

5,198,415

NONTOXIC, NONCHLORIDE, WATER-BASE, INHIBITIVE FLUID TO STABILIZE WATER SENSITIVE SHALES

Ronald P. Steiger, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jan. 15, 1991, Ser. No. 641,415
Int. Cl.[5] C09K 7/02
U.S. Cl. 507—103 **4 Claims**

1. A fluid for use in the drilling of wells, said fluid comprising glycerine and at least one potassium salt wherein said potassium salt is selected from the group consisting of potassium acetate, potassium citrate and potassium tartrate, wherein said glycerine constitutes between about 5 and about 30 volume percent of said fluid, and said at least one potassium salt constitutes between about 2 and about 15 weight percent of said fluid.

5,198,416

ALCOHOL-IN-OIL DRILLING FLUID SYSTEM COMPRISING POLYCYCLIC POLYETHERPOLYOL

Arthur H. Hale, and George C. Blytas, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 671,622, Mar. 19, 1991, Pat. No. 5,072,794, which is a continuation-in-part of Ser. No. 503,497, Mar. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 252,206, Sep. 30, 1988, abandoned. This application Sep. 10, 1991, Ser. No. 757,384
Int. Cl.[5] C09K 7/02
U.S. Cl. 507—136 **4 Claims**

1. An alcohol-in-oil emulsion drilling fluid comprising weighting agent, oil, emulsifier and polycyclicpolyetherpolyol which is at least about 30% by weight of the internal phase of the emulsion and which is characterized by a molecular weight in excess of 50,000.

5,198,417

METHODS OF TREATING PANCYTOPENIA AND AIDS BY CO-ADMINISTERING EPO AND COLONY STIMULATING FACTORS

Robert E. Donahoe, Shirley, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Division of Ser. No. 81,489, Jul. 24, 1987, Pat. No. 4,921,837, which is a continuation-in-part of Ser. No. 802,553, Nov. 27, 1985, abandoned. This application Nov. 7, 1989, Ser. No. 433,054
Int. Cl.[5] A61K 37/02
U.S. Cl. 514—2 **5 Claims**

1. A method of treating a patient exhibiting pancytopenia comprising co-administering to said patient synergistically effective amounts of erythropoietin and a colony stimulating factor selected from the group consisting of GM-CSF, G-CSF and multi-CSF.

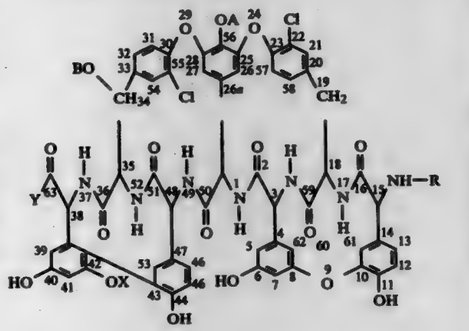
5,198,418

SUBSTITUTED ALKYLAMIDES OF TEICOPLANIN COMPOUNDS

Adriano Malabarba, Rome, and Giorgio Tarzia, Vicolo San Clemente, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Continuation of Ser. No. 382,661, Aug. 11, 1989, abandoned. This application Jan. 21, 1992, Ser. No. 826,198
Claims priority, application United Kingdom, Mar. 2, 1987, 8704847
Int. Cl.[5] A61K 37/02; C07K 1/06, 7/50, 9/00
U.S. Cl. 514—8 **17 Claims**

1. A compound of the formula



wherein:

R represents hydrogen or a protecting group of the amine function;

Y represents a group -NH-alk-W, wherein

-alk- is a linear alkylene chain of 1 to 6 carbon atoms bearing a substituted aminocarbonyl group on one of the alkylene carbons having the formula $CONR^1R^2$ wherein:

R^1 is hydrogen or (C_1–C_4) alkyl;

R^2 is a (C_1–C_6) alkyl substituted with one or two groups selected from the group consisting of:

hydroxy, mercapto, carboxy, (C_1–C_4)alkoxycarbonyl, benzyloxycarbonyl, amino, (C_1–C_4)alkylamino, di-(C_1–C_4) alkylamino, (C_1–C_4)alkoxycarbonylamino, benzyloxycarbonylamino, aminocarbonyl, (C_1–C_4)alkylaminocarbonyl, di (C_1–C_4)alkylaminocarbonyl, hydroxy(C_2–C_4)alkylaminocarbonyl, mercapto(C_2–C_4)alkylaminocarbonyl, amino(C_2–C_4) alkylaminocarbonyl, (C_1–C_4)alkylamino(C_2–C_4)alkylaminocarbonyl, di-(C_1–C_4)alkylamino(C_2–C_4)alkylaminocarbonyl, and a 5–6 membered nitrogen containing heterocyclic ring selected from the group consisting of pyridine, pyrrole, pyrimidine, pyrazine, pyrroline , pyrrolidine, piperidine, piperazine, oxazole, isoxazole, oxazoline, oxazolidine, isoxazolidine, pyrazoline, pyrazolidine, 1,3-thiazole, 1,2-thiazole, 1,3-thiazolidine, 1,2-thiazolidne, morpholine, thiomorpholine, imidazole, imidazoline, imidazolidine, 1,4-oxazine and 1,3oxazine in which one of the nitrogens of the ring is optionally substituted with one (C_1–C_4)alkyl or phenyl (C_1–C_2)alkyl and up to two carbons of said heterocycle are optionally substituted with a C_1–C_4 alkyl substituent, and two of the ring members of said heterocycle are optionally bridged by an alkylene chain of 1 to 3 carbon atoms, thereby forming a bridged heterocyclic ring selected from the group consisting of 1-azabicyclo[2.2.2]octane, 1-azabicyclo [2.2.1]heptane, 1-azabicyclo[3.2.1]octane, 8-azabicyclo [3.2.1]octane, 3-azabicyclo[3.2.1]octane, 1-azabicyclo [3.3.1]nonane, 9-azabicyclo[3.3.1]nonane, 3,8-diazabicyclo [3.2.1]octane, 2-azabicyclo[2.2.1-]heptane, and 2-azabicyclo [2.2.2]octane; or

R^2 is represented by said 5–6 membered heterocyclic ring or said bridged heterocyclic, or R^1 and R^2 taken together with the adjacent nitrogen atom forms a saturated 5–7 membered heterocyclic ring which optionally contains a further hetero group selected form —O—, —S— and —NR^3—, wherein R^3 is selected from the group consisting of:

hydrogen, (C_1–C_4)alkyl, phenyl(C_1–C_2)alkyl, and (C_1–C_6)alkanoyl, optionally substituted with one or two amino groups, in which said 5–7 membered nitrogen containing heterocyclic is selected from the group consisting of pyrrolidine, morpholine, piperidine, piperazine, thiomorpholine, pyrazolidine, 1,3-oxazolidine, 1,3-thiazolidine, and hexahydroazepine in which the carbon skeleton of said heterocycle is optionally substituted with up to 2 (C_1–C_4) alkyl groups;

W is hydrogen, a group NR^4R^5 or a group $CONR^6R^7$ wherein:

R^4 is hydrogen, or (C_1–C_4)alkyl;

R^5 is hydrogen, (C_1–C_4)alkyl, hydroxy(C_2–C_4)alkyl, mercapto(C_2–C_4)alkyl, amino(C_2–C_4)alkyl, (C_1–C_4)alkylamino(C_2–C_4)alkyl, di(C_1–C_4)alkylamino(C_2–C_4)alkyl, (C_1–C_4)alkoxycarbonyl, benzyloxycarbonyl, (C_1–C_6)alkanoyl optionally substituted with one or two amino groups, carbamyl, guanyl, N-nitroguanyl, said 5–6 membered nitrogen containing heterocyclic ring, said bridged heterocyclic, or a (C_1–C_4)alkyl substituted by said 5–6 membered nitrogen containing heterocyclic ring or said bridged heterocyclic ring;

or R^4 and R^5 taken together with the adjacent nitrogen atoms form said saturated 5–7 membered heterocyclic ring;

R^6 is hydrogen or (C_1–C_4)alkyl;

R^7 is hydrogen, (C_1–C_4)alkyl, hydroxy(C_2–C_4)alkyl, mercapto(C_2–C_4)alkyl, amino(C_2–C_4)alkyl, (C_1–C_4)alkylamino(C_2–C_4)alkyl, di(C_1–C_4)alkylamino(C_2–C_4)alkyl, said 5–6 membered nitrogen containing heterocyclic ring, said bridged heterocyclic ring; or a (C_1–C_4)alkyl substituted by said 5–6 membered nitrogen containing heterocyclic ring, or said bridged heterocyclic ring; or

R^6 and R^7 taken together with the adjacent nitrogen atom forms said saturated 5–7 membered heterocyclic ring;

A represents hydrogen or -N[(C_{10}-C_{11})aliphatic acyl]-β-D-2-deoxy-2-amino-glucopyranosyl,

B represents hydrogen or N-acetyl-α-D-2-deoxy-2-amino-glucopyranosyl,

X represents hydrogen or α-D-mannopyranosyl;

with the proviso that B represents hydrogen only when A and X are simultaneously hydrogen and X represents hydrogen only when A is hydrogen and with the further proviso that when W represents a group —NR^4—R^5, the "alk" moiety represents a linear alkylene chain of at least two carbon atoms; or the addition salt thereof.

11. A method for the treatment of bacterial infections comprising administering an effective amount of a compound according to claim 1 to a patient in need thereof.

5,198,419

FORMULATED MEDICINES FOR ENHANCING THE EFFICACY OF BETA-LACTAM ANTIBIOTICS IN PROPHYLAXIS AND TREATMENT AGAINST INFECTIOUS DISEASE DUE TO PATHOGENIC BACTERIA

Kunio Ando, Kawasaki, and Sachiko Goto, Chiba, both of Japan, assignors to Immuno Japan Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 624,229, Dec. 7, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 769,766
Claims priority, application Japan, Dec. 8, 1989, 1-319463
Int. Cl.[5] A61K 37/02, 31/43, 31/545; C07K 13/00
U.S. Cl. 514—8 **20 Claims**

1. A pharmaceutical composition enhancing the efficacy of beta-lactam antibiotics in a mammal in need thereof, comprising lactoferrin, at least one beta-lactam antibiotic, and a pharmaceutically acceptable carrier.

5,198,420

USE OF MULLERIAN INHIBITING SUBSTANCE AND ITS AGONISTS AND ANTAGONISTS IN THE TREATMENT OF RESPIRATORY DISTRESS SYNDROME

Patricia K. Donahoe, Weston, and Elizabeth A. Catlin, Newton, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 416,235, Oct. 2, 1989, abandoned. This application Jan. 30, 1992, Ser. No. 913,789
Int. Cl.[5] A61K 37/04, 37/02
U.S. Cl. 424—85.8 **9 Claims**

1. A method of treating respiratory distress syndrome comprising administering, to an individual in need of such treatment, an effective amount of an antagonist of MIS selected from the group consisting of an antibody capable of binding to MIS, or a fragment of an antibody, which fragment is capable of binding to MIS.

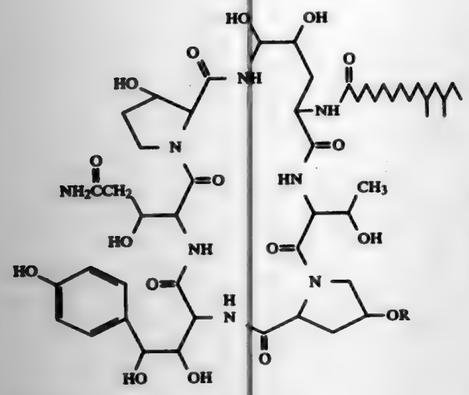
5,198,421

PHOSPHORYLATED CYCLIC LIPOPEPTIDE

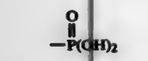
Shieh-Shung T. Chen, Morganville; David J. Mathre, Edison; Brian R. Petuch, Florence, and Robert A. Reamer, Bloomfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 26, 1991, Ser. No. 691,606
Int. Cl.[5] A61K 37/02; C07K 7/54
U.S. Cl. 514—11 **6 Claims**

1. A phosphorylated cyclic lipopeptide compound having the formula SEQ ID NO: 1:



wherein R is



or a cation salt thereof.

5. An antifungal composition comprising an effective amount of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

5,198,422

STABILIZED SOMATOTROPIN FOR PARENTERAL ADMINISTRATION

Michael T. Clark; Robert J. Gyurik, both of Downingtown; Sharon K. Lewis, Coatesville; Marianne C. Murray, Malvern, and Matthew J. Raymond, St. Davids, all of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Jun. 11, 1992, Ser. No. 896,958
Int. Cl.[5] A61K *37/02*; C07K *7/10*
U.S. Cl. 514—12 13 Claims

1. A method for providing a prolonged release of a somatotropin which comprises parenterally administering to an animal organism in an amount sufficient to produce said release a growth promoting agent being a complex of a somatotropin and an aromatic aldehyde having the following formula:

in which X is CHO or CH_2CHO and each of R_1 and R_2 is hydrogen, hydroxy, methoxy, ethoxy, methyl or ethyl in which the aromatic aldehyde is present in the complex in an amount of from about 0.5% to about 10% by weight.

5,198,423

FUNCTIONAL POLYPEPTIDE CONTAINING A CELL BINDING DOMAIN AND A HEPARIN BINDING DOMAIN OF FIBRONECTIN

Yuki Taguchi, Otsu; Yoh'ichi Obdate, Amagasaki; Yasutoshi Kawase, Otsu; Shouichi Goto, Tsubima; Fuzuo Kimizuka, Ohmihachiman; Ikunoshin Kato, Uji; Ikuo Saiki, and Ichiro Azuma, both of Sapporo, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed May 22, 1990, Ser. No. 526,733
Claims priority, application Japan, May 26, 1989, 1-131453; Dec. 1, 1989, 1-310536
Int. Cl.[5] C07K *15/12, 15/14*
U.S. Cl. 514—12 2 Claims

1. A functional polypeptide which has the peptide structure of the following structural formula:

$$C_{277}\text{-}(\text{-Met-})_n H_{271}\text{—X} \qquad [I]$$

wherein C_{277} is a sequence represented by the general formula:

[II]

1239
Pro Thr Asp Leu Arg Phe Thr Asn Ile Gly

Pro Asp Thr Met Arg Val Thr Trp Ala Pro

Pro Pro Ser Ile Asp Leu Thr Asn Phe Leu

Val Arg Tyr Ser Pro Val Lys Asn Glu Glu

Asp Val Ala Glu Leu Ser Ile Ser Pro Ser

Asp Asn Ala Val Val Leu Thr Asn Leu Leu

Pro Gly Thr Glu Tyr Val Val Ser Val Ser

Ser Val Tyr Glu Gln His Glu Ser Thr Pro

Leu Arg Gly Arg Gln Lys Thr Gly Leu Asp

Ser Pro Thr Gly Ile Asp Phe Ser Asp Ile

Thr Ala Asn Ser Phe Thr Val His Trp Ile

Ala Pro Arg Ala Thr Ile Thr Gly Tyr Arg

Ile Arg His His Pro Glu His Phe Ser Gly

Arg Pro Arg Glu Asp Arg Val Pro His Ser

Arg Asn Ser Ile Thr Leu Thr Asn Leu Thr

Pro Gly Thr Glu Tyr Val Val Ser Ile Val

Ala Leu Asn Gly Arg Glu Glu Ser Pro Leu

Leu Ile Gly Gln Gln Ser Thr Val Ser Asp

Val Pro Arg Asp Leu Glu Val Val Ala Ala

Thr Pro Thr Ser Leu Leu Ile Ser Trp Asp

Ala Pro Ala Val Thr Val Arg Tyr Tyr Arg

Ile Thr Tyr Gly Glu Thr Gly Gly Asn Ser

Pro Val Gln Glu Phe Thr Val Pro Gly Ser

Lys Ser Thr Ala Thr Ile Ser Gly Leu Lys

Pro Gly Val Asp Tyr Thr Ile Thr Val Tyr

Ala Val Thr Gly Arg Gly Asp Ser Pro Ala

Ser Ser Lys Pro Ile Ser Ile Asn Tyr Arg

-continued

1515
Thr Glu Ile Asp Lys Pro Ser

n is 1 or 0 and wherein H_{271} is a sequence represented by the general formula:

[III]

1690
Ala Ile Pro Ala Pro Thr Asp Leu Lys Phe

Thr Gln Val Thr Pro Thr Ser Leu Ser Ala

Gln Trp Thr Pro Pro Asn Val Gln Leu Thr

Gly Tyr Arg Val Arg Val Thr Pro Lys Glu

Lys Thr Gly Pro Met Lys Glu Ile Asn Leu

Ala Pro Asp Ser Ser Ser Val Val Val Ser

Gly Leu Met Val Ala Thr Lys Tyr Glu Val

Ser Val Tyr Ala Leu Lys Asp Thr Leu Thr

Ser Arg Pro Ala Gln Gly Val Val Thr Thr

Leu Glu Asn Val Ser Pro Pro Arg Arg Ala

Arg Val Thr Asp Ala Thr Glu Thr Thr Ile

Thr Ile Ser Trp Arg Thr Lys Thr Glu Thr

Ile Thr Gly Phe Gln Val Asp Ala Val Pro

Ala Asn Gly Gln Thr Pro Ile Gln Arg Thr

Ile Lys Pro Asp Val Arg Ser Tyr Thr Ile

Thr Gly Leu Gln Pro Gly Thr Asp Tyr Lys

Ile Tyr Leu Tyr Thr Leu Asn Asp Asn Ala

Arg Ser Ser Pro Val Val Ile Asp Ala Ser

Thr Ala Ile Asp Ala Pro Ser Asn Leu Arg

Phe Leu Ala Thr Thr Pro Asn Ser Leu Leu

Val Ser Trp Gln Pro Pro Arg Ala Arg Ile

Thr Gly Tyr Ile Ile Lys Tyr Glu Lys Pro

Gly Ser Pro Pro Arg Glu Val Val Pro Arg

Pro Arg Pro Gly Val Thr Glu Ala Thr Ile

Thr Gly Leu Glu Pro Gly Thr Glu Tyr Thr

Ile Tyr Val Ile Ala Leu Lys Asn Asn Gln

Lys Ser Glu Pro Leu Ile Gly Arg Lys Lys

1960
Thr

wherein X has the following structural formula:

Asp—Glu—Leu—Pro—Gln—Leu—Val—Thr—Leu—Pro— [IV]

His—Pro—Asn—Leu—His—Gly—Pro—Glu—Ile—Leu—

Asp—Val—Pro—Ser—Thr [IV]

wherein X is either present or absent.

5,198,424

FUNCTIONALLY ACTIVE SELECTIN-DERIVED PEPTIDES

Rodger P. McEver, Oklahoma City, Okla., assignor to Board of Regents of the University of Oklahoma, Norman, Okla.

Continuation of Ser. No. 554,199, Jul. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 320,408, Mar. 8, 1989.
This application Apr. 7, 1992, Ser. No. 867,271
Int. Cl.[5] A61K *37/00, 43/00*; C07K *5/00, 7/00*
U.S. Cl. 514—13 7 Claims

1. An isolated peptide between eight amino acids and 118 amino acids in length comprising an amino acid sequence selected from the group consisting of

C X_1 X_2 X_3 Y T X_4 L V A I Q N K X_5 E,
C X_1 X_2 H_2 Y T X_4 L V A I Q,
Y T X_4 L V A I Q N K X_5 E,
X_2 X_3 Y T X_4 L V A I Q,
X_3 Y T X_4 L V A I Q,
Y T X_4 L V A I Q,
R K X_6 X_7 X_8 X_9 W X_{10} W V. G T X_{11} K X_{12} L T X_{13} E,
R K X_6 X_7 X_8 X_9 W X_{10} W V,
X_{11} K X_{12} L T X_{13} E A X_{14} N W X_{15} X_{16},
A X_{14} N W X_{15} X_{16} X_7 E P N N X_{17} X_{18} X_{19} X_{20} E D,
A X_{14} N W X_{15} X_{16} X_7 E P N N,
A X_{14} N W X_{15} X_{16} X_7 E P N N X_{17} X_{18},
and X_{15} X_{16} X_7 E P N N X_{17} X_{18} X_{19} X_{20} E D,

wherein
X_1=Q or R;
X_2=N, Q, or D;
X_3=R or N;
X_4=D or H;
X_5=N, E or A;
X_6=N, V, or I;
X_7=N or G;
X_8=K, N, or G;
X_9=T, V, or I;
X_{10}=T or V;
X_{11}=K, Q, or N;
X_{12}=A, P, or S;
X_{13}=N or E;
X_{14}=E or K;
X_{15}=A or G;
X_{16}=D or P;
X_{17}=K or R;
X_{18}=R, Q, or K;
X_{19}=N or K;
X_{20}=N, D, or K;
and the peptide inhibits binding of neutrophils and monocytes to GMP-140.

5,198,425

INHIBITORS OF BACTERIAL RIBONUCLEOTIDE REDUCTASE

Sumanas Rakhit, Dollard des Ormeaux; Raymond Plante, Laval, and Gregory P. Cocentino, Montreal, all of Canada, assignors to Bio-Mega, Inc., Laval, Canada

Continuation of Ser. No. 573,095, Aug. 27, 1990, abandoned.
This application Jun. 18, 1992, Ser. No. 900,366
Claims priority, application Canada, Aug. 30, 1989, 609873
Int. Cl.[5] A61K *37/00, 37/02*; C07K *5/00, 7/00*
U.S. Cl. 514—14 9 Claims

1. A peptide consisting essentially of formula 1

$$Y\text{—}R^1\text{—}R^2\text{—}R^3\text{—}R^4\text{—}R^5\text{—}R^6\text{—}R^7\text{—}R^8\text{—}R^9\text{—}Z \qquad 1$$

wherein
R^1 is Thr, Ser or Val,
R^2 is Asp or Glu,
R^3 is Asp or Glu,
R^4 is Leu, Ile or Val,
R^5 is Ser or Thr,

R^6 is Asn or Gln,
R^7 is Phe or (4-halophenyl)methyl,
R^8 is Gln or Asn,
R^9 is Leu, Ile or Phe,
Y is hydrogen or lower alkanoyl, or
Y is the hexapeptide radical W-Ile-R^{10}-Ser-R^{11}-Val-R^{12} wherein W is hydrogen or lower alkanoyl, R^{10} is Asp or Glu, R^{11} is Glu or Gln and R^{12} is Asp or Asn, or
Y is a fragment of said hexapeptide radical wherein W, R^{10}, R^{11} and R^{12} are as defined hereinabove and wherein from one to five of the amino acid residues may be deleted serially from the amino terminus of the hexapeptide radical; and
Z is hydroxy, amino, lower alkylamino or di(lower alkyl-)amino; or a therapeutically acceptable salt thereof.

5,198,426

RENIN INHIBITORS CONTAINING C-TERMINAL DIHYDROXY AMIDES

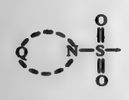
James M. Hamby, Livonia; John C. Hodges, and Sylvester Klutchko, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 292,575, Dec. 30, 1988, abandoned. This application Dec. 4, 1989, Ser. No. 441,704
Int. Cl.[5] A61K *37/02*; C07K *5/06*
U.S. Cl. 514—19 7 Claims

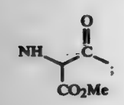
1. A compound of the formula

A-X-Y-W I

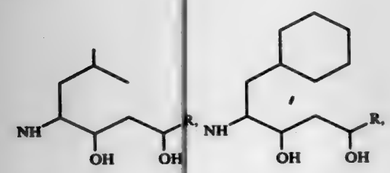
or a pharmaceutically acceptable salt thereof wherein
A is

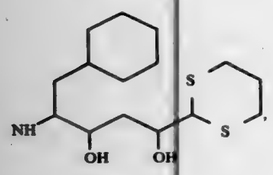


and X is Phe or Tyr(OMe);
Y is His, TZA, Alg, Lys (CSNHMe) or



W is





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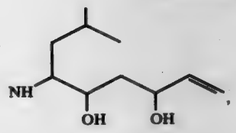
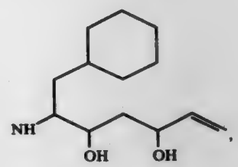
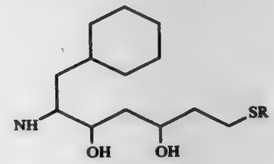
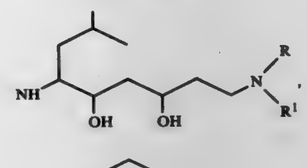
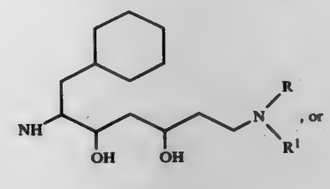
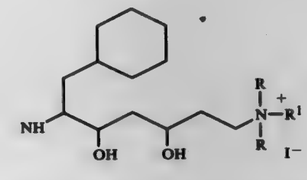












wherein R and R^1 are each independently CH_3 or C_2H_5,

is a saturated ring containing three or four carbon atoms and Q is O, N-BOC or NR with R as defined above.

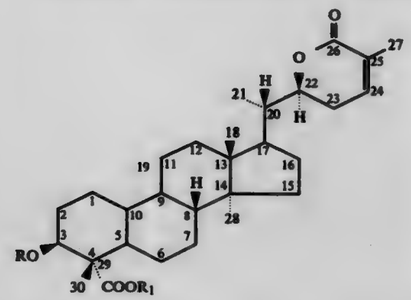
5,198,427

NATURAL INTENSE SWEETENERS

A. Douglas Kinghorn, Chicago, Ill., and Young-Hee Choi, Seoul, Rep. of Korea, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Jul. 9, 1990, Ser. No. 549,776
Int. Cl.[5] A61K *35/00, 31/705*
U.S. Cl. 514—26 22 Claims

1. A substantially pure compound having the formula:



and food-acceptable salts thereof wherein R is beta-glucuronopyranosyl-6-methyl ester[2]betaglucopyranosyl, beta-glucopyranosyl[2]-beta-glucopyranosyl, or beta-glucuronopyranosyl[2]-beta-glucopyranosyl; and R_1 is H or lower alkyl.

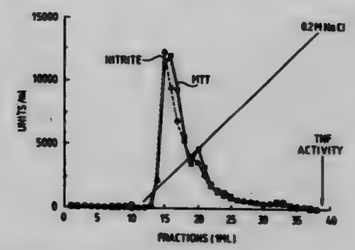
9. A method of sweetening and enhancing the flavor of foodstuffs or medicinal agents, comprising adding to said foodstuffs or medicinal agents a sweetening effective amount of a compound according to any one of claims 1 or 3–5.

5,198,428

MACROPHAGE CYTOTOXIN COMPOSITIONS AND METHODS OF PREPARATION

Mathoor Sivaramakrishnan, The Woodlands; Stanley D. Tucker, Houston; Jim Klostergaard, Kingwood, and Gabriel Lopez-Berestein, Houston, all of Tex., assignors to Board of Regents, The Univ. of TX System, Austin, Tex.

Filed Apr. 5, 1991, Ser. No. 681,867
Int. Cl.[5] A61K *31/715*
U.S. Cl. 514—54 6 Claims



1. An isolated macrophage cytotoxin produced by:
a) culturing macrophage cell line RAW 264.7 having ATCC accession number TIB 71 in EX-CELL 300 medium;
b) adding IFN-γ to the medium in a concentration ranging from about 1 unit/ml to about 100 units/ml;
c) exchanging the medium containing IFN-γ with fresh medium containing lipopolysaccharide in a concentration ranging from about 1.25 nanomolar to about 125 nanomolar, such that no detectable levels of IFN-γ remain;
d) separating the cultured macrophages from the supernatant at least 6 hours after the addition of medium containing lipopolysaccharide;
e) collecting the supernatant; and
f) isolating the macrophage cytotoxin from the supernatant, wherein said macrophage cytotoxin:
i) is a glycoprotein (as determined by binding to lentil lectin sepharose) having a molecular weight of between about 40 kD and about 50 kD as measured by gel filtration and binds to DEAE-5PW or DEAE-sephacel;
ii) inhibits of in vitro mitochondrial respiration independent of nitric oxide production;
iii) has cytotoxic activity independent of the presence of IFN-γ; and
iv) causes in vitro cytostasis.

5,198,429

SUBSTITUTED CYCLODEXTRINS AND PROCESS FOR CHROMATOGRAPHIC SEPARATION OF CHIRAL ORGANIC COMPOUNDS

Wilfried König, Pinneberg; Gerhard Wenz, Mainz; Sabine Lutz, Hamburg, and Eva von der Bey, Mainz, all of Fed. Rep. of Germany, assignors to Macherey-Nagel & Co., Duren-Rolsdorf, Fed. Rep. of Germany

PCT No. PCT/EP89/00332, § 371 Date Dec. 3, 1990, § 102(e) Date Dec. 3, 1990, PCT Pub. No. WO89/09235, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 25, 1989, Ser. No. 585,117
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810737
Int. Cl.[5] C08B *37/16*; C07B *63/00*
U.S. Cl. 514—58 15 Claims

1. A substituted cyclodextrin of the formula

in which
R^2, R^3 and R^6 each independently is an alkyl or alkenyl group having 1 to 8 carbon atoms, or a cycloalkyl group having 5 to 8 carbon atoms, or
R^3 may be an acyl group having 1 to 8 carbon atoms or an acyl group substituted with an aromatic hydrocarbon radical or a saturated or olefinically unsaturated aliphatic or cycloaliphatic radical having 1 to 8 carbon atoms, and n is 6 or 7,
with the exclusion of those compounds wherein $R^2=R^3=R^6$=methyl, n=6 or 7, $R^2=R^3=R^6$=ethyl, n=7, $R^2=R^6$=allyl, R^3=methyl, n=7, $R^2=R^6$=prop-1-enyl, R^3=methyl, n=7, $R^2=R^6$=methyl, R^3=n-butyl, n=7, $R^2=R^6$=methyl, R^3=benzoyl, n=7 and $R^2=R^3$=alkyl or acyl, R^6=C>4-alkyl.

5,198,430

INCLUSION COMPLEXES WITH SILYBININ, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Umberto Valcavi, Milan; Vincenzo Monteroso, Nova Milanese; Roberto Caponi; Enrico Bessone, both of Milan, all of Italy; Wilfried Wächter, Bergisch Gladbach, Fed. Rep. of Germany, and Josef Szajtli, Budapest, Hungary, assignors to Istituto Biochimico Italiano Giovanni Lorenzini SpA, Milan, Italy

Filed Oct. 9, 1990, Ser. No. 593,933
Claims priority, application Italy, Oct. 9, 1989, 21962
Int. Cl.[5] A61K *31/685, 31/70*; C08B *37/16*
U.S. Cl. 514—58 10 Claims

1. An inclusion complex of silybinin and a cyclodextrin

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selected from the group consisting of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin and derivatives thereof, wherein the molar ratio of silybinin to the cyclodextrin is 1:1 to 1:4.

5,198,431

CONCENTRATED AQUEOUS EMULSIONS OF NEOPHANES AND AZANEOPHANES FOR USE IN PLANT PROTECTION

Hans Richling, Bad Soden Im Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

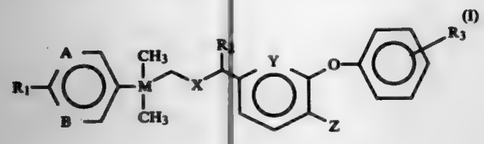
Filed Feb. 15, 1991, Ser. No. 656,409

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1990, 4005155

Int. Cl.[5] A01N 25/00; A61K 31/695

U.S. Cl. 514—63 **7 Claims**

1. A concentrated aqueous emulsion of a compound of the formula I



(I)

in which

A and B independently of one another are CH, CR_4 or n,

X is CH_2, O or S,

Y is CH or N,

Z is H or F,

R_1 and R_4 independently of one another are H, halogen, (C_1–C_3)-alkyl, (C_1–C_3)-haloalkyl, (C_1–C_3)-alkoxy, (C_1–C_3)-haloalkoxy, (C_1–C_4)-alkylthio or (C_1–C_4)-haloalkoxy, or R_1 and R_4 together are —CH_2—O—CH_2—;

R_2 is H, (C_1–C_3)-alkyl, ethynyl, vinyl, halogen or cyano,

R_3 is H, halogen, (C_1–C_4)-alkyl or (C_1–C_3)-alkoxy and

M is Si,

which contains a combination of 1.5–7% by weight of an anionic emulsifier selected from the group consisting of salts of dodecylbenzene sulfonic acid, salts of optionally chlorinated (C_{13}–C_{18})-alkanesulfonic acids, (C_{10}–C_{16})-alkylmono to hexaglycol ether sulfate salts and α-(C_{13}–C_{19})-alkenosulfate salts, 2.5–10% by weight of an n-butanol/-propylene oxide/ethylene oxide block oxalkylate, 0.1–1.5% by weight of a sodium magnesium (and/or aluminum) silicate having a layered structure, and 0.5–80% by weight of the compound of formula I.

5,198,432

METHOD OF PREVENTING CHLOROHYDROCARBON TOXICITY USING STEROL DERIVATIVES

Marc W. Fariss, Manakin-Sabot, Va., assignor to Center for Innovative Technology, Herndon and Virginia Commonwealth University, Richmond, both of Va.

Continuation-in-part of Ser. No. 316,789, Feb. 28, 1989, which is a continuation-in-part of Ser. No. 149,764, Jan. 29, 1988, abandoned. This application Apr. 1, 1991, Ser. No. 678,110

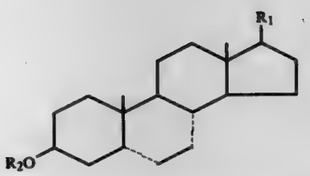
Int. Cl.[5] A61K 31/56; A01N 29/02

U.S. Cl. 514—182 **5 Claims**

1. A method for protecting patients against chemically induced cytotoxic injury from chlorinated hydrocarbons, comprising the steps of:

determining when a patient will be exposed to chemically induced cytotoxic injury from a chlorinated hydrocarbon compound; and

administering to said patient prior to exposure to chemically induced cytotoxic injury an effective amount of an ionizable congener of a sterol compound having the formula



where the dashed lines denote either a single or double bond between the carbons, R_1 is an alkyl moiety, and R_2 is an ionizable moiety selected from the group consisting of succinate, sulfate, and phthalate.

5,198,433

LACTAMIMIDES AS CALCIUM ANTAGONISTS

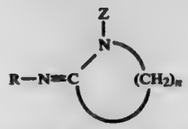
Michael G. Palfreyman; Norbert L. Wieck; Haien C. Cheng, and John M. Kane, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 850,183, Mar. 11, 1992, Pat. No. 5,158,945, which is a division of Ser. No. 763,799, Sep. 23, 1991, Pat. No. 5,128,337, which is a division of Ser. No. 620,226, Nov. 29, 1990, Pat. No. 5,082,837, which is a division of Ser. No. 212,544, Jun. 28, 1988, Pat. No. 5,010,072. This application Jul. 21, 1992, Ser. No. 918,350

Int. Cl.[5] A61K 31/33, 31/40, 31/44, 31/55

U.S. Cl. 514—212 **6 Claims**

1. A method of effecting calcium antagonism in a patient in need thereof which comprises administering to the patient a calcium antagonism effective amount of a compound of the formula

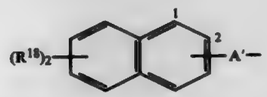


wherein

Z is hydrogen or lower alkyl of from 1 to 4 carbon atoms;

n is an integer of from 3 to 16; and

R is the group



wherein

A′ is a straight or branched alkylene moiety of from 1 to 6 carbon atoms or benzyl and is attached to either the 1- or 2-position of the naphthalene ring, and R^{18} is hydrogen, chlorine, fluorine, bromine, trifluoromethyl, an alkyl group having from 1 to 12 carbon atoms which is straight or branched, an alkoxy group having from 1 to 3 carbon atoms or NO_2;

or a pharmaceutically acceptable acid addition salt thereof or an individual optical or geometric isomer.

5,198,434

ANGIOTENSIN II ANTAGONIZING FUSED PYRIDINYLOXY CONTAINING DERIVATIVES

Robert H. Bradbury, Wilmslow, and David A. Roberts, Congleton, both of England, assignors to Imperial Chemical Industries PLC, London, England

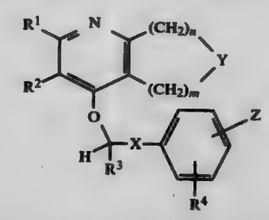
Filed Feb. 11, 1992, Ser. No. 834,031

Claims priority, application United Kingdom, Feb. 11, 1991, 9102804.3

Int. Cl.[5] A61K 31/435; C07D 471/04, 491/052

U.S. Cl. 514—215 **10 Claims**

1. A pyridine derivative of the formula I



I

wherein R^1 is hydrogen, (1-8C)alkyl, (3-8C)cycloalkyl, phenyl or substituted (1-4C)alkyl, the latter containing one or more fluoro substituents or bearing a (3-8C)cycloalkyl, (1-4C)alkoxy or phenyl substituent; R^2 is hydrogen, (1-8C)alkyl, (3-8C)cycloalkyl, (3-8C)cycloalkyl (1-4C)alkyl, carboxy, (1-4C)alkoxycarbonyl, (3-6C)alkenyloxycarbonyl, cyano, nitro, phenyl or phenyl(1-4C)alkyl; R^3 is hydrogen or (1-4C)alkyl, R^4 is independently selected from hydrogen, (1-4C)alkyl, (1-4C)alkoxy, halogeno, trifluoromethyl, cyano and nitro; n and m are independently selected from zero or the integers 1 to 4 such that the number of methylene groups in the ring containing Y is 2, 3 or 4, one of which methylene groups may optionally be replaced by a carbonyl group; Y is an oxygen atom, or a group of the formula —$S(O)_p$— or —NR— in which p is zero or the integer 1 or 2, and R is hydrogen, (1-8C)alkyl, (1-8C)alkanoyl, carbamoyl, N-alkylcarbamoyl and di-(N-alkyl)carbamoyl of up to 7 carbon atoms, phenyl, phenyl(1-4C)alkyl or substituted (1-4C)alkyl, the latter containing one or more fluoro substituents; or R is a group of the formula -A^1.A^2-B wherein A^1 is a direct bond or a carbonyl group; A^2 is (1-6C)alkylene; and B is selected from hydroxy, (1-4C)alkoxy, phenyloxy, phenyl(1-4C)alkoxy, pyridyl(1-4C)alkoxy, 4-morpholino(1-4C)alkoxy, phenylamino, amino, alkylamino and dialkylamino of up to 6 carbon atoms, (1-4C)alkanoylamino, (1-4C)alkylsulphonylamino, phenylsulphonylamino, sulphamoylamino (—$NH.SO_2.NH_2$), carboxamidomethylamino (—$NH.CH_2.CO.NH_2$), (1-4C)alkanoyloxy, phenylcarbonyloxy, aminocarbonyloxy (—$O.CO.NH_2$), (1-4C)alkylaminocarbonyloxy, carboxy, (1-4C)alkoxycarbonyl, carbamoyl, N-alkylcarbamoyl and di-(N-al-kyl)carbamoyl of up to 7 carbon atoms, (1-4C)alkanoyl, 4-morpholino, 1-imidazolyl and succinimido group; or B is a group of the formula -A^3.B^1 wherein A^3 is oxy, oxycarbonyl or imino and B^1 is a 5 or 6-membered saturated or unsaturated heterocyclic ring containing 1 or 2 nitrogen atoms and linked to A^3 by a ring carbon atom; or A^3 is oxycarbonyl and B^1 is a 4-morpholino group or a 5 or 6 membered saturated heterocyclic ring containing 1 or 2 nitrogen atoms, optionally bearing a (1-4C)alkyl group and linked to A^3 by a ring nitrogen atom; and wherein in B^1 the remainder of the ring atoms are carbon; X is phenylene optionally bearing a substituent selected from (1-4C)alkyl, (1-4C)alkoxy, halogeno, trifluoromethyl, cyano and nitro; Z is 1H-tetrazol-5-yl, —CO.NH.(1H-tetrazol-5-yl) or a group of the formula —$CO.OR^5$ or —$CO.NH.SO_2.R^6$ in which R^5 is hydrogen or a non-toxic, biodegradable residue of a physiologically acceptable alcohol or phenol, and R^6 is (1-6C)alkyl, (3-8C)cycloalkyl or phenyl; and wherein any o: said phenyl moieties may be unsubstituted or bear one or two substituents independently selected from (1-4C)alkyl, (1-4C)alkoxy, halogeno, cyano and trifluoromethyl; or an N-oxide thereof; or a non-toxic salt thereof.

5,198,435

AZABICYCLOALKYL AND AZATRICYCLOALKYL AMIDES

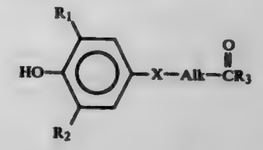
Richard A. Mueller, Glencoe; Richard A. Partis, Evanston, and James R. Deason, Wilmette, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 79,731, Jul. 30, 1987, Pat. No. 5,019,597, which is a continuation of Ser. No. 819,761, Jan. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 809,954, Dec. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 698,050, Feb. 4, 1985, abandoned. This application Mar. 14, 1991, Ser. No. 669,543

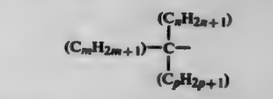
Int. Cl.[5] A61K 31/55, 31/44; C07D 223/02, 453/02

U.S. Cl. 514—216 **11 Claims**

1. A compound of the formula



wherein: R_1 and R_2 are the same or different members of the group consisting of halo, phenyl, substituted phenyl wherein the substituents are selected from the group consisting of halo, hydroxy, alkyl having from 1 to 6 carbon atoms, and alkoxy having from 1 to 6 carbon atoms, and a



group wherein n, m and p are independently an integer of from 1 to 8 provided that n+m+p is equal to or less than 10; X is thio or sulfinyl; Alk is straight or branched chain alkylene having 1 to 6 carbon atoms, and R_3 is selected from the group consisting of [azabicycloalkyl, azatricycloalkyl, azabicycloalkylamino, and azatricycloalkylamino] 3-azabicyclo[3.2.2]nonane; N-[1-azabicyclo[2.2.2]octa-3-ylamine; 3-azabicyclo[3.2.2]nonane; 4-azatricyclo[4.4.0.0.^{3,8}]decane; 4-azatricyclo[4.3.1.1^{3,8}]undecane; 11-azabicyclo[4.4.1]undecane; 3-amino-9-azabicyclo[3.3.1]nonane; and 1-amino-2-azatricyclo[3.3.1.1^{3,7}]decane.

5,198,436

INTRAORAL DOSING METHOD OF ADMINISTERING TRIFLUOROBENZODIAZEPINES

Everett H. Ellinwood, Jr., P.O. Box 2782, Durham, N.C. 27705, and Samir K. Gupta, P.O. Box 3870, Duke University Medical Center, Durham, N.C. 27710

Continuation of Ser. No. 422,992, Oct. 17, 1989, abandoned. This application May 17, 1991, Ser. No. 703,049

Int. Cl.[5] A61K 31/55

U.S. Cl. 514—221 **1 Claim**

1. In a method for administering 1-trifluorobenzodiazepines to the human central nervous system wherein a therapeutically effective amount of said trifluorobenzodiazepine is sublingually or bucally administered to a human, the improvement comprising the steps of:

a. selecting a trifluorobenzodiazepine from the group consisting of 7-chloro-1-(2,2,2-trifluoroethyl)-5-phenyl-1,3-dihydro-2H-1,4-benzodiazepine-2-one, 7-chloro-1-(2,2,-trifluoroethyl)-5-(2-fluorophenyl)-1,3-dihydro-2H-1,4-benzodiazepine-2-thione, 7-chloro-1-(2,2,-trifluoroethyl)-5-(2,fluorophenyl)-1,3-dihydro-2H-1,4-benzodiazepine

-2-one, and 7-chloro-1-(2,2,-trifluoroethyl)-5-(2-fluorophenyl)-1,3-dihydro-3-hydroxy-2H -1,4-benzodiazepine-2-thione that (1) has one or more unwanted or adversive metabolites that are increased by portal vein entry to the liver and that (2) is lipid soluble;

b. placing said trifluorobenzodiazepine in a suitable intraoral formulation;

c. intraorally administering a therapeutically effective amount of said intraoral formulation to a human so as to bypass the portal vein entry to the liver and to thereby decrease the formulation of unwanted metabolites and maintain higher levels of the trifluorobenzodiazepine and metabolites with the trifluoro configuration;

d. increasing the ratio of trifluorobenzodiazepine and metabolites with the trifluoro configuration to unwanted metabolites made available to the central nervous system by at least 100%; and

e. utilizing this intraoral method over a period of one or more doses to achieve sustained high levels of the trifluorobenzodiazepine and metabolites with the trifluoro configuration relative to unwanted metabolites.

5,198,437

1,7-ANNELATED INDOLECARBOXYLIC ACID ESTERS AND AMIDES

Derk Hamminga; Hans H. Haeck; Ineke Van Wijngaarden, and Wouter Wouters, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

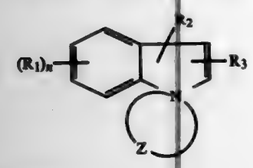
Continuation-in-part of Ser. No. 280,886, Dec. 7, 1988, Pat. No. 4,985,420. This application Dec. 17, 1990, Ser. No. 628,109

Claims priority, application Netherlands, Dec. 10, 1987, 8702981

Int. Cl.[5] C07D *519/00*; A61K *31/54, 31/535, 31/495*

U.S. Cl. 514—224.5 6 Claims

1. An indole derivative of formula 2



(2)

wherein

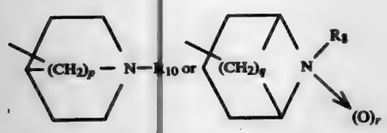
R_1 is halogen;

n has a value of 0–2;

Z together with the carbon atom, the nitrogen atom and the intermediate carbon atom, forms a heterocyclic group consisting of 6 ring atoms in which, besides the nitrogen atom already present, a second hetero atom of S is present, which ring may be annelated with a benzene ring;

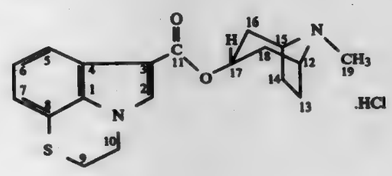
R_3 is hydrogen, halogen, alkyl, alkoxy or alkylthio having 1–4 carbon atoms; and

R_2 is a group —CO—Y—R_7 wherein Y is an oxygen atom, or a group —NR_6, wherein R_6 is hydrogen or alkyl having 1–3 C-atoms, and R_7 represents a group of the formula



wherein p has the value 1 or 2, q has the value 2 or 3, R_8 is hydrogen or alkyl or hydroxyalkyl having 1 or 2 C-atoms, r is 0 or 1, and R_{10} is absent or is an oxygen atom, or a pharmaceutically acceptable acid addition salt thereof.

2. A compound of formula (2,3-dihydro-pyrrolo-[1,2,3-de][1,4]-benzothiazin-6-yl)carbocyclic acid (endo-8-methyl-8-azabicyclo-[3,2,1]-oct-3-yl)ester hydrochloride, of the following structure:



.HCl

5,198,438

ANGIOTENSIN II ANTAGONISTS INCORPORATING A SUBSTITUTED THIOPHENE OR FURAN

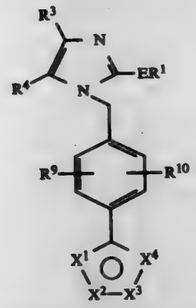
Eric E. Allen, Somerset; Ralph A. Rivero, Tinton Falls, and Nancy Kevin, Clifton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 696,666, May 7, 1991, abandoned. This application Mar. 11, 1992, Ser. No. 846,156

Int. Cl.[5] C07D *405/10, 405/14, 409/10, 409/14*; A61K *31/415*

U.S. Cl. 514—235.8 9 Claims

1. A compound of structural formula I



I

or its pharmaceutically acceptable salt wherein:

R^1 is:

(a) $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl or $(C_2–c_6)$-alkynyl each of which is unsubstituted or substituted with a substituent selected from the group consisting of:
i) aryl as defined below,
ii) $(C_3–C_7)$-cycloalkyl,
iii) Cl, Br, I, F,
iv) OH,
v) NH_2,
vi) $NH(C_1–C_4)$-alkyl,
vii) $N[(C_1–C_4)\text{-alkyl}]_2$,
viii) NHSOhd $2R^2$,
ix) CF_3,
x) $COOR^2$, or
xi) SO_2NHR^{2a};

(b) aryl, wherein aryl is defined as phenyl or naphthyl, unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of:
i) Br, I, Cl, F,
ii) $(C_1–C_4)$-alkyl,
iii) $(C_1–C_4)$-alkoxy,
iv) $(C_3–C_7)$-cycloalkyl,
v) $(C_3–C_{10})$-alkenyl,
vi) $(C_1–C_4)$-alkylthio,
vii) OH,
viii) CO_2H,
ix) CO_2-$(C_1–C_4)$-alkyl,
x) NO_2,
xi) CF_3,

xii) NH_2,
xiii) $NH[(C_1–C_4)\text{-alkyl}]$,
xiv) $N[(C_1–C_4)\text{-alkyl}]_2$, or
xv) $SO_2NR^{2a}R^{2a}$,

(c) heteroaryl, wherein heteroaryl is selected from the group consisting of: pyridyl, thienyl, furyl, imidazolyl and thiazolyl, and wherein the heteroaryl is unsubstituted, monosubstituted or disubstituted with substituents selected from the group consisting of:
i) Cl, Br, I, or F,
ii) OH,
iii) SH,
iv) NO_2,
v) $(C_1–C_4)$-alkyl,
vi) $(C_2–C_4)$-alkenyl,
vii) $(C_2–C_4)$-alkynyl,
viii) $(C_1–C_4)$-alkoxy,
ix) CF_3,
xii) NH_2,
xiii) $NH[(C_1–C_4)\text{-alkyl}]$,
xiv) $N[(C_1–C_4)\text{-alkyl}]_2$,
xv) CO_2H, or
xvi) CO_2-$(C_1–C_4)$-alkyl, or

(d) $(C_1–C_4)$-polyfluoroalkyl;

E is:
(a) a single bond,
(b) —$S(O)_m(CH_2)_x$—, or
(c) —O—;

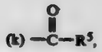
R^2 is:
(a) H, or
(b) $(C_1–C_6)$-alkyl;

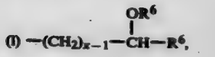
R^{2a} is:
(a) R^2,
(b) CH_2-aryl, or
(c) aryl;

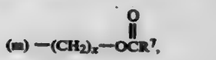
n is 0 to 2;
s is 0 to 5;
m is 1 to 5;
p is 0 to 3;
x is 1 to 10;

R^3 is:
(a) H,
(b) $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl or $(C_2–C_6)$-alkynyl,
(c) Cl, Br, I, F,
(d) NO_2
(e) CF_3,
(f) $(C_1–C_8)$-polyfluoroalkyl,
(g) C_6F_5,
(h) CN,
(j) phenyl-$(C_1–C_3)$-alkyl,
(k) phenyl and phenyl-$(C_1–C_3)$-alkyl substituted on the phenyl ring with one or two substituents selected from:
i) $(C_1–C_4)$-alkyl,
ii) $(C_1–C_4)$-alkoxyl,
iii) F, Cl, Br, I,
iv) hydroxyl,
v) methoxyl,
vi) CF_3,
vii) CO_2R^{2a},
viii) NO_2, or
ix) $SO_2NR^{2a}R^{2a}$;

R^4 is:
(a) H,
(b) CN,
(c) $(C_1–C_8)$-alkyl,
(d) $(C_3–C_6)$-alkenyl,
(e) $(C_1–C_8)$-polyfluoroalkyl,
(f) $(C_1–C_8)$-polyfluoroalkenyl,
(g) CF_2CF_3,
(h) CO_2R^{2a},
(i) phenyl,
(j) phenyl-$(C_2–C_6)$-alkenyl,

(k)  ,

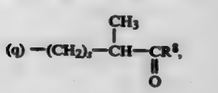
(l)  ,

(m)  ,

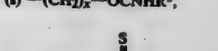
(n) ,

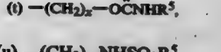
(o) ,

(p) ,

(q)  ,

(r) ,

(s)  ,

(t)  ,

(u) —$(CH_2)_x$-$NHSO_2R^5$,
(v) —$(CH_2)_x$-F,

R^5 is:
(a) $(C_1–C_8)$-alkyl,
(b) $(C_1–C_8)$-polyfluoroalkyl,
(c) 1-adamantyl,
(d) 1-naphthyl,
(e) (1-naphthyl)ethyl, or
(f) —$(CH_2)_p$-phenyl;

R^6 is:
(a) H,
(b) $(C_1–C_6)$-alkyl,
(c) $(C_3–C_6)$-cycloalkyl,
(d) phenyl, or
(e) benzyl;

R^7 is:
(a) H,
(b) $(C_1–C_8)$-alkyl,
(c) $(C_1–C_8)$-polyfluoroalkyl,
(d) $(C_3–C_6)$-cycloalkyl,
(e) phenyl,
(f) benzyl;

R^8 is:
(a) H,
(b) $(C_1–C_6)$-alkyl,
(c) $(C_3–C_6)$-cycloalkyl,
(d) —$(CH_2)_p$-phenyl,
(e) —OR^6,
(F) morpholin-4-yl, or
(g) —$NR^{15}R^{16}$,

R^9 and R^{10} are each independently;
(a) H,
(b) Cl, Br, I, F,
(c) NO_2,
(d) $(C_1–C_6)$-alkyl,
(e) $((C_1–C_6)$-acyloxy,

(1-4C)alkanoyl, N-alkylcarbamoyl and di-(N-alkyl)carbamoyl 5,198,441

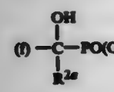
(f) (C_3–C_6)-cycloalkyl,
(g) (C_6–C_6)-alkoxy,
(h) —$NHSO_2R^{2a}$,
(i) hydroxy-(C_1–C_4)-alkyl,
(j) (C_1–C_4)-alkyl-aryl,
(k) $S(O)_n$-(C_1–C_4)-alkyl,
(l) $NR^{2a}R^{2a}$,
(m) CF_3,
(n) —SO_2NHR^{2a},
(o) furyl,
(p) aryl, or
(q) when R^9 and R^{10} are bonded to adjacent carbon atoms, they can be joined to form a phenyl or naphthyl ring;

—X^1—X^2—X^3—X^4— is:
(a) -CR^{11}-Y-CR^{12}-CZ-,
(b) -CR^{11}-CR^{12}-Y-CZ-,
(c) -Y-CR^{11}-CZ-CR^{12}-,
(d) -CR^{11}-Y-CZ-CR^{12}-, or
(e) -CR^{11}-CR^{12}-CZ-Y-;

Y is: O, S, SO, or SO_2;

R^{11} and R^{12} are independently:
(a) H,
(b) Cl, Br, I, F,
(c) NO_2,
(d) NH_2,
(e) NH[(C_1–C_4)-alkyl],
(f) N[(C_1–C_4)-alkyl]$_2$,
(g) SO_2NHR^{2a},
(h) CF_3,
(i) (C_1–C_7)-alkyl,
(j) (C_3–C_7)-cycloalkyl,
(k) (C_3–C_7)-cycloalkyl,
(l) when R^{11} and R^{12} are bonded to adjacent carbon atoms, they can be joined to form a phenyl or naphthyl ring,
(m) $O(CH_2)_{n+1}O(CH_2)_sCH_3$,
(n) $(CH_2)_{n+1}O(CH_2)_sCH_3$,
(o) $(CH_2)N(R^{2a})_2$,
(p) $(CH_2)_nN[CH_2CH_2]_2O$,
(q) $(CH_2)_nN[CH_2CH_2]_2CH_2$,
(r) $CH(OR^{2a})[(C_1$–$C_7)$-alkyl],
(s) CHO,
(t) CO_2R^{2a},
(u) CH═CH-R^{2a},
(t) CH_2CR^{2a}═$C(R^{2a})_2$,
(v) $(CH_2)_nNCOR^{2a}$,
(w) (C_1–C_4)-alkyl-aryl, or
(x) $CH(R^{2a})_2$;

Z is:
(a) -SO_3R^{13},
(b) -$NHSO_2CF_3$,
(c) -$PO(OR^{13})_2$,
(d) -SO_2NHR^{2a},
(e) -$CONHOR^{13}$,



(g) -CN,
(h) -SO_2NH-CO-R^{14},
(i) -CH_2SO_2NH-CO-R^{14},
(j) -CONH-SO_2R^{14},
(k) -CH_2CONH-SO_2R^{14},
(l) -$NHSO_2NHCO$-R^{14}, or
(m) -$NHCONHSO_2$-R^{14};

R^{14} is

(a) aryl,
(b) (C_3–C_7)-cycloalkyl,
(c) (C_1–C_4)-alkyl, unsubstituted or substituted with a substituent selected from the group consisting of: aryl, -OH, -SH, (C_1–C_4)-alkyl, -(C_1–C_4)-alkoxy, -S(C_1–C_4)-alkyl, -CF_3, Cl, Br, F, I, -NO_2, -CO_2H, CO_2-(C_1–C_4)-alkyl, -NH_2, -N[(C_1–C_4)-alkyl]$_2$, -PO_3H or PO(OH)(O-(C_1–C_4)-alkyl),
(d) (C_1–C_7)-alkoxy,
(e) $O(CH_2)_{n+1}O(CH_2)_sCH_3$,
(f) $(CH_2)_{n+1}O(CH_2)_sCH_3$,
(g) $CH(R^{2a})_2$,
(h) (C_1–C_6)-polyfluoroalkyl, or
(i) -NH-(C_1–C_6)-alkyl;

R^{15} *and* R^{16} are independently:
(a) H,
(b) (C_1–C_4)-alkyl,
(c) phenyl,
(d) benzyl, or
(e) α-methylbenzyl;

R^{19} is:
(a) H,
(b) (C_1–C_6)-alkyl,
(c) (C_2–C_4)-alkenyl,
(d) (C_1–C_4)-alkoxy, or
(e) benzyl, wherein the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of: -NO_2, -NH_2, -OH or -OCH_3; and

R^{20} is -CN, -NO_2, -CO_2R^{2a}, or -CF_3.

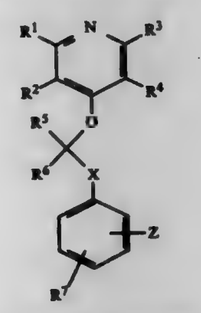
5,198,439

ANGIOTENSION II ANTAGONIZING PYRIDINE DERIVATIVES

David A. Roberts, Congleton; Arnold H. Ratcliffe, Poynton, and Robert H. Bradbury, Wilmslow, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 687,270, Apr. 18, 1991, Pat. No. 5,130,318.
This application Apr. 27, 1992, Ser. No. 874,785
Claims priority, application United Kingdom, Apr. 19, 1990, 9008817; Dec. 7, 1990, 9026617
Int. Cl.[5] C07D *401/10*; A61K *31/44*
U.S. Cl. 514—236.2 11 Claims

1. A pyridine derivative of the formula I



I

wherein R^1 is hydrogen, (1–8C)alkyl, (3–8C)cycloalkyl, phenyl or substituted (1–4C)alkyl, the latter containing one or more fluoro substituents or bearing a (3–8C)cycloalkyl, (1–4C-)alkoxy or phenyl substituent; R^2 is hydrogen, (1–8C)alkyl, (3–8C)cycloalkyl, (3–8C)cycloalkyl-(1–4C)alkyl, carboxy, (1–4C)alkoxycarbonyl, (3–6C)alkenyloxycarbonyl, cyano, nitro, phenyl or phenyl(1–4C)alkyl; R^3 is selected from halogeno, (1–4C)alkoxy, amino, alkylamino and dialkylamino of up to 6 carbon atoms, and any of the values defined for R^1; R^4 is selected from hydrogen, (1–4C)alkyl optionally bearing an amino, (1–4C)alkanoylamino, phenylcarbonylamino, hydroxy or (1–4C)alkoxy substituent, carboxy, (1–4C)alkoxycarbonyl, (3–6)alkenyloxycarbonyl, cyano, nitro, carbamoyl,

(1–4C)alkanoyl, N-alkylcarbamoyl and di-(N-alkyl)carbamoyl of up to 7 carbon atoms, halogeno, amino, alkylamino and dialkylamino of up to 6 carbon atoms, 3-(1–4C)alkylureido and (1–4C)alkanoylamino; or R^4 is a group of the formula -A^1.A^2.B wherein A^1 is carbonyloxy, A^2 is (1–6C)alkylene and B is selected from hydroxy, (1–4C)alkoxy, phenyloxy, phenyl(-1–4C)alkoxy, pyridyl(1–4C)alkoxy, 4-morpholino(1–4C)alkoxy, phenylamino, amino alkylamino and dialkylamino of up to 6 carbon atoms, (1–4C)alkanoylamino, (1–4C)alkylsulphonylamino, phenylsulphonylamino, sulphamoylamino (—NH.SO_2.NH_2), carboxamidomethylamino (—NH.CH_2-.CO.NH_2), (1–4C)alkanoyloxy, phenylcarbonyloxy, aminocarbonyloxy (—O.CO.NH_2), (1–4C)alkylaminocarbonyloxy, carboxy, (1–4C)alkoxycarbonyl, carbamoyl, N-alkylcarbamoyl and di-(N-alkyl)carbamoyl of up to 7 carbon atoms, (1–4C)alkanoyl, 4-morpholino, 1-imidazolyl and succinimido group; or B is a group of the formula -A^3.B^1 wherein A^3 is oxy, oxycarbonyl or imino and B^1 is a 5 or 6-membered saturated or unsaturated heterocyclic ring containing 1 or 2 nitrogen atoms and linked to A^3 by a ring carbon atom; or A^3 is oxycarbonyl and B^1 is a 4-morpholino group or a 5 or 6-membered saturated heterocylic ring containing 1 or 2 nitrogen atoms, optionally bearing a (1–4C)alkyl group and linked to A^3 by a ring nitrogen atom; and wherein in B^1 the remainder of the ring atoms are carbon; R^5 is hydrogen; R^6 is hydrogen or (1–4C)alkyl; R^7 is selected from hydrogen, (1–4C)alkyl, (1–4C)alkoxy, halogeno, trifluoromethyl, cyano and nitro; X is phenylene optionally bearing a substituent selected from (1–4C)alkyl, (1–4C)alkoxy, halogeno, (1–4C)alkanoyl, trifluoromethyl, cyano and nitro; Z is 1H-tetrazol-5-yl, —CO.NH.(1H-tetrazol-5-yl) or a group of the formula —CO.OR^8 or —CO.NH-.SO_2.R^9 in which R^8 is hydrogen or a non-toxic, biodegradable residue of a physiologically acceptable alcohol or phenol, and R^9 is (1–6C)alkyl, (3–8C)cycloalkyl or phenyl; and wherein any of said phenyl moieties may be unsubstituted or bear one or two substituents independently selected from (1–4C)alkyl, (1–4C)alkoxy, halogeno, cyano and trifluoromethyl; or an N-oxide thereof; or a non-toxic salt thereof.

5,198,440

SYNERGISTIC COMBINATIONS OF 2-(THIOCYANOMETHYLTHIO)-BENZOTHIAZOLE WITH HEXAHYDRO-1,3,5-TRIS(2-HYDROXYETHYL)-S-TRIAZINE IN CONTROLLING FUNGAL AND BACTERIAL GROWTH IN AQUEOUS FLUIDS

David Oppong, Memphis, and C. George Hollis, Germantown, both of Tenn., assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Sep. 5, 1991, Ser. No. 799,000
Int. Cl.[5] A01N *43/66, 43/78*
U.S. Cl. 514—241 17 Claims

1. A microbicidal composition comprising (a) hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine and (b) 2-(Thiocyanomethylthio)benzothiazole, wherein (a) and (b) are present in an amount synergistically effective to control the growth of at least one bacterium.

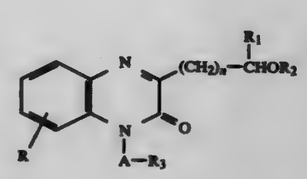
5,198,441

DERIVATIVES OF 1,2-DIHYDRO 2-OXO QUINOXALINES, THEIR PREPARATION AND THEIR USE IN THERAPY

Guy Pitot; Christian Faure, both of Toulouse; Francoise Courot, Carrauanc; Dennis Bigg, and Jean-Pierre Tarayre, both of Castres, all of France, assignors to Pierre Fabre Medicament, Boulogne, France

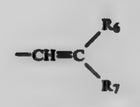
PCT No. PCT/FR90/00752, § 371 Date Jun. 17, 1991, § 102(e) Date Jun. 17, 1991, PCT Pub. No. WO91/05772, PCT Pub. Date May 2, 1991
PCT Filed Oct. 17, 1990, Ser. No. 688,536
Claims priority, application France, Oct. 23, 1989, 89 13961
Int. Cl.[5] C07D *241/44*; A61K *31/495*
U.S. Cl. 514—249 5 Claims

1. 1,2-dihydro 2-oxo quinoxalines selected from those of the formula I:



I

in which:
R represents a hydrogen or halogen atom
R_1 is a hydrogen atom or a straight or branched C_1–C_4 alkyl radical
R_2 is:
a hydrogen atom
a C(O)R_4 radical in which R_4 is a straight or branched C_1–C_4 alkyl group
a C(O)NHR_5 radical in which R_5 is a straight or branched C_1–C_4 alkyl group or a phenyl group
A is a C_1–C_4 alkylene chain
R_3 is:
a hydrogen atom, a C_1–C_4 alkyl radical, a C_3–C_6 cycloalkyl radical, an alkylnyl, nitrile, hydroxyl, carboxamido, pyridyl, phenyl group, or phenyl group substituted by a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a nitro group
an alkenyl radical of the formula:



in which R_6, R_7 may, independently of each other, be a hydrogen atom, a C_1–C_4 alkyl group, a phenyl group or an alkoxycarbonyl group
a radical of the formula:

—OC(O)R_8

in which R_8 represents a C_1–C_4 alkyl radical
a radical of the formula:

—OC(O)NHR_9

in which R_9 represents a straight or branched C_1–C_4 alkyl group or a phenyl group
n may assume values from 2 to 4,
as well as the therapeutically acceptable organic or inorganic salts thereof.

5,198,442

(2-IMIDAZOLIN-2-YLAMINO) QUINOXALINE DERIVATIVES AND METHODS FOR USING SAME

Charles Glachowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 560,776, Jul. 31, 1990, Pat. No. 5,112,822, which is a continuation-in-part of Ser. No. 420,817, Oct. 12, 1989, Pat. No. 5,077,292. This application Feb. 12, 1992, Ser. No. 835,061

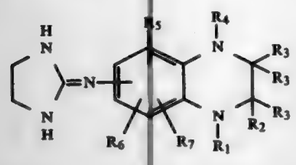
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/495, 31/50*

U.S. Cl. 514—249 **20 Claims**

1. A mediation composition comprising:

an amount of a compound effective to provide a desired therapeutic effect in a mammal to which said amount of said compound is administered, said desired therapeutic effect being selected from the group consisting of an alteration in the rate of fluid transport in the gastrointestinal tract of said mammal, and an increase in the renal fluid flow in at least one kidney of said mammal, said compound being selected from the group consisting of those having the formula



and pharmaceutically acceptable acid addition salts thereof, wherein R_1 and R_4 are independently selected from the group consisting of H and alkyl radicals having 1 to 4 carbon atoms; the R_2s are each H or alkyl radicals having 1 to 4 carbon atoms or are, together, oxo; the R_3s are each H or alkyl radicals having 1 to 4 carbon atoms or are, together, oxo, provided that the R_2s or the R_3s are alkyl radicals; the 2-imidazolin-2-ylamino group may be in any of the 5-, 6-, 7- or 8-positions of the quinoxaline nucleus; and R_5, R_6 and R_7 each is located in one of the remaining 5-, 6-, 7- or 8- positions of the quinoxaline nucleus and is independently selected from the group consisting of Cl, Br, H and alkyl radicals having 1 to 3 carbon atoms; and

a carrier component combined with said compound in an amount effective to facilitate the administration of said amount of said compound to said mammal.

5,198,443

SUBSTITUTED 1,2,3,6-TETRAHYDROPYRIDINES AS CENTRAL NERVOUS SYSTEM AGENTS

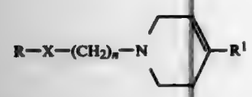
Bradley W. Caprathe, Redford; Juan C. Jaen, Plymouth, and Lawrence D. Wise, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 722,981, Jun. 28, 1991, Pat. No. 5,120,748. This application Mar. 17, 1992, Ser. No. 852,876

Int. Cl.[5] A61K *31/505;* **C07D** *401/4*

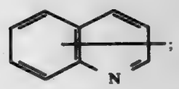
U.S. Cl. 514—252 **4 Claims**

1. A compound of formula I



I

wherein R is



;

X is $—CH_2—S(O)_m—$ wherein m is zero or an integer of 1 or 2, or

$—S(O)_m—CH_2—$ wherein m is as defined above;

n is an integer of 2, 3, or 4;

R^1 is aryl, 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen, 2-or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl substituted by lower alkyl or halogen; and corresponding isomers thereof; or a pharmaceutically acceptable acid addition salt thereof.

5,198,444

METHYL α-(2-SUBSTITUTED)PYRID-3-YL-β-METHOXYACRYLATES, COMPOSITIONS CONTAINING THEM AND THEIR USE AS FUNGICIDES

John M. Clough, Buckinghamshire; Christopher R. A. Godfrey; Stephen P. Heaney, both of Berkshire, and Kenneth Anderton, Lancashire, all of England, assignors to Imperial Chemical Industries PLC, London, England

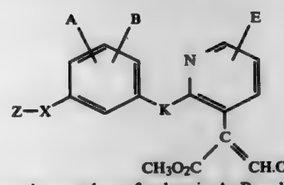
Continuation of Ser. No. 258,742, Oct. 17, 1988, Pat. No. 5,008,276, which is a continuation-in-part of Ser. No. 39,401, Apr. 17, 1987, Pat. No. 4,826,531. This application Oct. 15, 1990, Ser. No. 597,398

Claims priority, application United Kingdom, Oct. 15, 1987, 8724252

Int. Cl.[5] A01N *43/40, 43/54;* **D07D** *213/643;* **C07D** *213/70*

U.S. Cl. 514—269 **5 Claims**

1. A fungicidal compound of the formula (I):



(I)

or a stereoisomer thereof, wherein A, B and E, which are the same or different, are H, halo, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, C_{1-4} alkylcarbonyl, C_{1-4} alkoxycarbonyl, phenoxy, nitro or cyano; K is oxygen or sulphur; X is O; and Z is aryl substituted with one or more of halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, C_{2-4} alkynyloxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4}alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, aryl, pyridinyl or pyrimidinyl, aryloxy, aryl(C_{1-4})alkyl, aryl(C_{1-4})alkyl in which the alkyl moiety is substituted with hydroxy, pyrimidinyl(C_{1-4})alkyl or pyridinyl(C_{1-4})alkyl, aryl(C_{2-4})alkenyl, pyrimidinyl(C_{2-4})alkenyl or pyridinyl(C_{2-4})alkenyl, aryl(C_{1-4})alkoxy, pyrimidinyl(C_{1-4})alkoxy or pyridinyl(C_{1-4})alkoxy, aryloxy(C_{1-4})alkyl, pyrimidinyloxy(C_{1-4})alkyl or pyridinyloxy(C_{2-4})alkyl, carbacyloxy, cyano, thiocyanato, nitro, —NR′R″, —NHCOR′, —NHCONR′R″, —CONR′R″, —COOR′, $—OSO_2R'$, $—SO_2R'$, —COR′, —CR=NR″ or —N=CR′R″ in which R′ and R″ are independently hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, or phenyl or benzyl substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy; the aryl or pyrimidinyl or pyridinyl rings of any of the foregoing substituents being optionally substituted with one or more of halo, hydroxy, mercapto, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, C_{2-4} alkynyloxy, halo(C_{1-4})alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, hydroxy(C_{1-4})alkyl, C_{1-4} alkoxy(C_{1-4})alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, alkanoyloxy, benzoyloxy, cyano, thiocyanato, nitro, —NR′R″, —NHCOR′, —NHCONR′R″, —CONR′R″, —COOR′, $—OSO_2R'$, $—SO_2R'$, —COR′, —CR′=NR″ or —N=CR′R″ in which R′ and R″ have the meanings given above provided that Z is not phenyl substituted only with C_{1-4} alkyl.

5,198,445

COMPOSITION AND USE OF SUBSTITUTED 3-THIO-2-PROPYNENITRILES AS INDUSTRIAL ANTIMICROBIALS

Connie L. Deford; Charles D. Gartner; Kalakota S. Reddy, all of Midland, Mich.; John K. Swayze, Carmel, Ind.; David E. Wallick, Midland, Mich.; Warren L. Treptow, Midland, Mich.; George A. Paul, Midland, Mich., and Billy R. Hardas, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 633,866, Dec. 26, 1990, Pat. No. 5,126,349, which is a continuation-in-part of Ser. No. 464,085, Jan. 12, 1990, abandoned. This application Apr. 20, 1992, Ser. No. 871,260

Int. Cl.[5] A61K *275/00, 31/395*

U.S. Cl. 514—269 **18 Claims**

1. A method for inhibiting microorganisms in a microbial habitat comprising contacting said microbial habitat with an antimicrobially effective amount of a compound corresponding to the formula:

R—S—C≡C—C≡N

wherein R is an alkyl, cyclic alkyl, aryl, or heterocyclo group selected from the group consisting of thiazolyl, triazolyl, imidazolyl and pyrimidyl.

5,198,446

ORGANOSILANE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PROCESS FOR PREPARING SAME

Sandor Farkas, Budapest; Sandor Földeak, Szeged; Egon Karpati, Budapest; Peter Hegyes, Szeged; Janos Kreidl, Budapest; Laszlo Szporny, Budapest; Laszlo Czibula, Budapest, and Szilvia Petofi-Vass, Szeged, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

Filed Jul. 29, 1991, Ser. No. 736,962

Claims priority, application Hungary, Jul. 27, 1990, 4647/90

Int. Cl.[5] C07F *7/10;* **A61K** *31/695*

U.S. Cl. 514—277 **3 Claims**

1. A compound selected from the group consisting of:

N-{[dimethyl-(4-fluorobenzyl)silyl]methyl}piperidine;

N-{[dimethyl-(4-fluorobenzyl)silyl]methyl}pyrrolidine;

N-[benzyl-dimethylsilyl)propyl]piperidine;

N-{[dimethyl-(2,4-dimethylbenzyl)silyl]methyl}piperidine;

N-{[(2-chloro-5-methylbenzyl)-dimethylsilyl]methyl}piperidine;

N-{[dimethyl-(4-fluorobenzyl)silyl]propyl}pyrrolidine; and

N-{[dimethyl-(4-fluorobenzyl)silyl]propyl}imidazole; or a pharmaceutically acceptable salt thereof.

5,198,447

MEDICAMENTS

Michael B. Tyers, Welwyn, England, assignor to Glaxo Group Limited, London, England

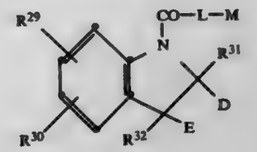
Continuation of Ser. No. 475,010, Feb. 5, 1990, abandoned, which is a division of Ser. No. 246,550, Sep. 9, 1988, Pat. No. 4,948,803. This application Jul. 16, 1991, Ser. No. 734,281

Claims priority, application United Kingdom, Nov. 21, 1986, 8627881; Nov. 21, 1986, 8627883; Nov. 21, 1986, 8627909; Dec. 17, 1986, 8630083; Mar. 25, 1987, 8707177

Int. Cl.[5] A61K *31/44, 31/415*

U.S. Cl. 514—304 **18 Claims**

1. A method of treatment for the relief or prevention of a withdrawal syndrome resulting from addiction to a drug or substance of abuse and/or for the suppression of dependence on drugs or substances of abuse, which comprises administering to a human or animal subject suffering from or liable to suffer from said withdrawal syndrome and/or dependent on a drug or substance of abuse an effective amount of a compound of formula (VIII):



(VIII)

wherein:

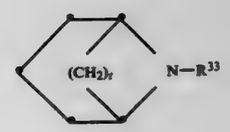
L is NH or O;

R^{29} and R^{30} are independently selected from hydrogen, halogen, CF_3, C_{1-6}alkyl, C_{1-6}alkoxy, C_{1-6}alkylthio, C_{1-7}acyl, C_{1-7}acylamino, C_{1-6}alkylsulphonylamino, N-(C_{1-6}alkylsulphonyl)-N-(C_{1-4}alkylamino, C_{1-6}alkylsulphinyl, hydroxy, nitro or amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-C_{1-4}alkylamino optionally N-substituted by one or two groups selected from C_{1-6}alkyl, C_{3-8}cycloalkyl, C_{3-8}cycloalkylC_{1-4}alkyl, phenyl or phenylC_{1-4}alkyl groups or optionally N-disubstituted by C_{4-5}polymethylene;

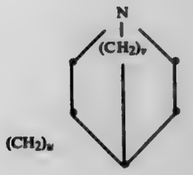
D and E are independently selected from hydrogen or C_{1-4}alkyl, or together are a bond;

R^{31} and R^{32} are independently selected from hydrogen, C_{1-6}alkyl, C_{2-6}alkenylC_{1-4}alkyl, or together are C_{2-4}polymethylene;

M is a group of formula (a), (b) or (c):

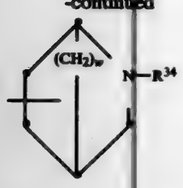


(a)



(b)

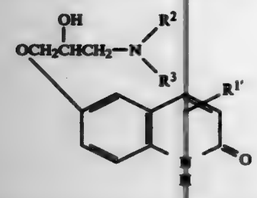
-continued



wherein t is 2 or 3; u is 1 or 2; v is 1 to 3; w is 1 to 3; and R^{33} or R^{34} is C_{1-7}alkyl, C_{3-8}cycloalkyl, C_{3-8}cycloalkylC_{1-2}alkyl or C_{2-7}alkenylC_{1-4}alkenyl; or a pharmaceutically acceptable salt thereof.

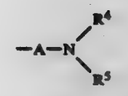
5,198,448
CARDIOTONICS
Takafumi Fujioka, Itano; Shuji Terumoto, Tokushima; Michiaki Tenmoya, Itano, and Yoichi Yabuuchi, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan
Division of Ser. No. 391,305, Aug. 9, 1989, Pat. No. 5,053,514. This application Jul. 24, 1991, Ser. No. 734,957
Claims priority, application Japan, Aug. 10, 1988, 63-200929; Feb. 14, 1989, 1-34688; Jun. 21, 1989, 1-160170
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] C07D *215/227*
U.S. Cl. 514—312 15 Claims

3. A carbostyril compound of the formula:



(III)

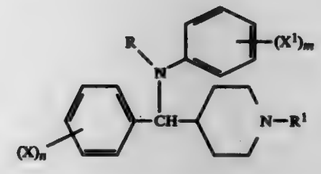
wherein $R^{1'}$ is cyano group, and R^2 and R^3 are the same or different and are each hydrogen atom, a lower alkyl group being optionally substituted by hydroxy group, a cycloalkyl group, a lower alkenyl group, a phenyl group, a phenyl(lower-)alkyl group which has optionally 1 to 3 substituents selected from the group consisting of a lower alkoxy(lower)alkoxy group, a halogen atom, a lower alkoxy group, a nitro group, a lower alkyl group, a cyano group, a lower alkylthio group and a lower alkylsulfinyl group on the phenyl ring and further has optionally a hydroxy substituent on the alkyl moiety, a phenylsulfonyl(lower)alkyl group having optionally 1 to 3 lower alkoxy substituents on the phenyl ring, a phenylthio(lower)alkyl group, a phenylsulfinyl(lower)alkyl group having optionally 1 to 3 substituents selected from the group consisting of a halogen atom and a lower alkoxy group on the phenyl ring, a phenoxy(lower)alkyl group having optionally 1 to 3 substituents selected from the group consisting of a halogen atom and a lower alkoxy group on the phenyl ring, a pyridyl(lower)alkyl group having optionally 1 to 3 substituents selected from the group consisting of a halogen atom and a lower alkoxy group on the pyridine ring, a thienyl(lower)alkyl group, a benzoyl(-lower)alkyl group, an anilinothiocarbonyl group, a benzoyl group, a pyridyl group, a phenyl(lower)alkenyl group, or a group of the formula:



(wherein R^4 and R^5 are the same or different and are each a lower alkyl group or a phenyl group having optionally 1 to 3 substituents selected from the group consisting of a halogen atom and a lower alkoxy group on the phenyl ring, and A is a lower alkylene group which may optionally be interrupted with oxo group), or a pharmaceutically acceptable salt thereof.

5,198,449
N-SUBSTITUTED ALPHA-ARYLAZACYCLOALKYLMETHANAMINES AND THEIR USE AS CARDIOVASCULAR AGENTS
James R. Shanklin, Jr., Richmond, Va., assignor to A. H. Robins Company Incorporated, Richmond, Va.
Filed Apr. 27, 1990, Ser. No. 515,620
Int. Cl.[5] C07D *211/28*; A61K *31/445*
U.S. Cl. 514—317 4 Claims

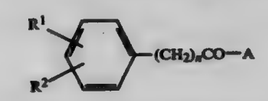
3. A method of treating warm blooded animals for angina which comprises administering thereto a therapeutically effective amount of a compound selected from the group having the formula



wherein
R is selected from H, loweralkyl, $R^2C(O)$—$R^2OC(O)$—, $R^2NHC(O)$—, or $(R^2)^2NC(O)$—;
m=0–2;
X and X' are independently selected from halogen, loweralkyl, trifluoromethyl, or —OR^2;
R^1 is selected from hydrogen, loweralkyl, loweralkylene, cycloloweralkyl, loweralkylcycloloweralkyl, CF_3CH_2—, or -(alk)p—Y where p is 0 or 1, alk refers to hydrocarbon radical, straight or branched, of from one to six carbons and may include one or more double bonds, and Y is —$C(O)NHR_2$, —$C(NH)NH_2$, phenyl, naphthyl, hydroxy, loweralkoxy, loweralkyleneoxy, aryloxy (where aryl is phenyl, naphthyl, 2-methoxy-4-acetylphenyl, 4-loweralkylcarbonylphenyl, or 4-loweralkoxycarbonylphenyl), benzoyl, amino, —NHR^3 (where R^3 is —$C(NH)NH_2$, C(O)NH-loweralkyl or phenyl, phenyl, loweralkylcarbonylphenyl or benzenesulfonyl), benzenesulfonyl, benzenesulfinyl, benzenesulfenyl, —$CH_2CH(OH)CH_2OC_6H_5$, phenylaminocarbonyl, or loweralkylaminocarbonyl;
R^2 is H, loweralkyl, phenyl or phenyl substituted by halogen, loweralkyl, loweralkoxy, trifluoromethyl, loweralkylcarbonyl, or diloweralkylaminoloweralkyl; with a proviso that when—$(Q)_nAr$ is —$CH_2C_6H_5$ or —CH_2CH=CHC_6H_5, X cannot be H and W cannot be 1-methyl-4-piperidinyl;
the stereoisomers thereof; or pharmaceutically acceptable acid addition salts thereof.

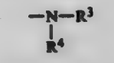
5,198,450
PHENYLALKANOYLAMINE DERIVATIVES, PROCESS FOR PREPARING THE SAME, AND USAGE OF THE SAME
Kuniyoshi Ogura; Tomoji Aotsuka; Motoki Terizaka; Mitsuo Soeda; Yoshiaki Tanaka; Hisayoshi Kato; Naoyoshi Miura; Naoki Nakata; Hikaru Morita, and Akihiro Okubo, all of Konan, Japan, assignors to Zeria Pharmaceutical Co., Ltd., Tokyo, Japan
PCT No. PCT/JP89/00461, § 371 Date Jan. 7, 1991, § 102(e) Date Jan. 7, 1991, PCT Pub. No. WO89/10918, PCT Pub. Date Nov. 16, 1989
PCT Filed May 1, 1989, Ser. No. 601,795
Claims priority, application Japan, May 9, 1988, 63-112067; Mar. 13, 1989, 1-57865
Int. Cl.[5] A61K *31/40, 31/41*; C07D *277/04, 207/04*
U.S. Cl. 514—326 1 Claim

1. A pharmaceutical composition for treating or preventing cerebral circulation disorder, cerebral metabolism disorder, or memory disturbance comprising an effective component a pharmaceutically effective amount of a phenylalkanoylamine derivative represented by the following formula (I),



(I)

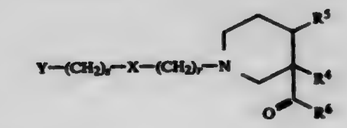
wherein A represents a 1,3-thiazolidin-3-yl group, or a 3-pyrrolin-1-yl group, R^1 and R^2, which may be the same or different, represent a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a nitro group, an amino group, a guanidino group, or a group



(wherein R^3 and R^4 independently represent a lower alkyl group or form in combination 5- or 6-membered heterocyclic group selected from the group consisting of a piperidinyl moiety, and a pyrrolidinyl moiety), and n represents an integer of 2–6, or a salt thereof and a pharmaceutically acceptable carrier.

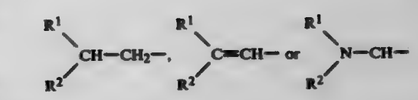
5,198,451
HETEROCYCLIC CARBOXYLIC ACIDS
Knud E. Andersen, Bagsværd; Lars J. Stray Knudsen, Vedbæk; Ursula Sonnewald, Trondheim, and Per O. Sørensen, Frederiksberg, all of Denmark, assignors to Novo Nordisk A/S, Bagsværd, Denmark
Filed Nov. 28, 1990, Ser. No. 616,165
Claims priority, application Denmark, Nov. 22, 1989, 5881/89
The portion of the term of this patent subsequent to Dec. 10, 2008, has been disclaimed.
Int. Cl.[5] C07D *211/60, 211/90*; A61K *31/445, 31/44*
U.S. Cl. 514—330 13 Claims

1. A compound of formula I

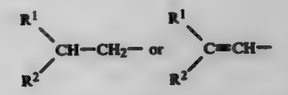


(I)

wherein Y is



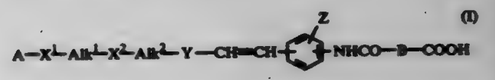
wherein
R^1 and R^2 independently are C_{3-8}-cycloalkyl, phenyl or thienyl, each of which may be optionally substituted with halogen, trifluoromethyl, C_{1-6}-alkyl or C_{1-6}-alkoxy;
X is CH_2 or O;
R^4 and R^5 each represents hydrogen or may together represent a bond; and
R^6 is OH or C_{1-8}-alkoxy;
r is 2, 3 or 4;
s is 1, 2 or 3;
provided that X is not —CH_2— when Y is



or a geometric or optical isomer thereof; or a pharmaceutically acceptable salt thereof.

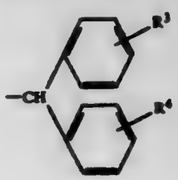
5,198,452
STYRYL PHRIDYL COMPOUNDS AND THEIR PHARMACEUTICAL COMPOSITIONS
Mitsuhiro Kouishi, Nakatsu; Minoru Kawakami, Fukuoka; Michio Terasawa, and Toshio Hamazaki, both of Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan
Filed Jul. 10, 1991, Ser. No. 728,128
Int. Cl.[5] C07D *213/02*; A61K *31/44*
U.S. Cl. 514—357 5 Claims

1. A styryl compound of the formula (I):



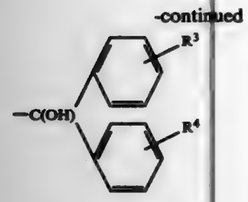
(I)

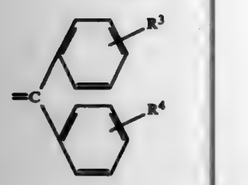
wherein A is phenyl substituted by at least one substituent selected from the group consisting of halogen, nitro, amino, monoalkylamino, dialkylamino, hydroxy, alkyl, cycloalkyl, alkenyl, alkenyloxy, alkynyl, aralkyl, alkoxy, halo-alkyl, cyano, alkanoylamino, alkylthio, alkylsulfonyl, alkylsulfonyl, acyl, carbamoyl, monoalkylcarbamoyl, dialkylcarbamoyl, carboxyalkanoylamino, alkoxycarbonylalkanoylamino, phenylsulfonyl, phenylsulfonylamino and a diphenylmethyl group of the formula (b), (c) or (d):



(b)

-continued





(wherein R^3 and R^4 are the same or different, and respectively represent hydrogen, halogen, halo-alkyl, amino, nitro, cyano, hydroxy, alkyl or aralkyl);

Alk1 is alkylene having 4 carbon atoms, and Alk 2 is alkylene having 1 carbon atom;

X1 is single bond and X2 is oxygen;

Y ring represents pyridyl;

B represents branched-chain alkylene having 6 carbon atoms;

Z represents hydrogen, halogen, alkyl, alkoxy, halo-alkyl, alkylthio, alkylsulfinyl or alkylsulfonyl; a pharmaceutically acceptable salt or an ester thereof.

5,198,453

GLUTARALDEHYDE PLUS 2-(THIOCYANOMETHLTHIO)-BENZOTHIAZOLE AS A BIOCIDE FOR INDUSTRIAL WATERS

Judy LaZonby, Crystal Lake, and Harley R. Melo, Itasca, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Mar. 24, 1992, Ser. No. 856,798

Int. Cl.[5] C02F *1/68*

U.S. Cl. 514—367 **7 Claims**

1. A method of controlling the growth of microorganisms in industrial process waters which comprises treating such waters with a synergistic biocidal amount of a biocidally active composition comprising glutaraldehyde and 2-(thiocyanomethylthio)benzothiazole combined in a weight ratio of from 9:1 to 1:19.

5,198,454

USE OF OB-104 TO TREAT OCULAR INFLAMMATION

George C. Y. Chiou, College Station, Tex., assignor to Texas A&M University System, College Station, Tex.

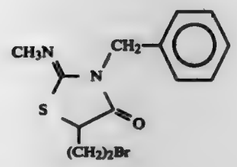
Filed Dec. 3, 1991, Ser. No. 801,890

Int. Cl.[5] A61K *31/425*

U.S. Cl. 514—369 **9 Claims**

1. A method for the treatment and prevention of ocular inflammation in an animal subject, which method comprises administering topically, orally, or parenterally to said animal subject an inflammation-controlling effective amount of a pharmaceutical composition comprising a pharmaceutically acceptable vehicle in admixture with a compound having the formula:

(c)



(d)

5,198,455

ORGANIC STABILIZERS

John R. Mattox, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

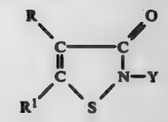
Filed Jan. 3, 1989, Ser. No. 292,681

Int. Cl.[5] A61K *31/425*; C07D *275/02*

U.S. Cl. 514—372 **7 Claims**

1. A stabilized composition comprising

(a) about 0.1 to 99.9 parts by weight of a compound of the formula



Ia

wherein

Y is selected from the group consisting of

an unsubstituted alkyl group of one to 18 carbon atoms;

a substituted alkyl group having at least one hydrogen atom replaced by hydroxy, halo, cyano, alkylamino, dialkylamino, phenylamino, halophenylamino, carboxy, carbalkoxy, alkoxy, acryloxy, morpholino, piperidino, pyrrolidonyl, carbamoxy, or isothiazolonyl, wherein the total number of carbon atoms in the substituted alkyl group does not exceed 18;

an unsubstituted or halo-substituted alkenyl group of two to 18 carbon atoms;

an unsubstituted or halo-substituted alkynyl group of two to 18 carbon atoms;

an unsubstituted or alkyl-substituted cycloalkyl group having a three to six carbon atom ring and up to 12 carbon atoms;

an unsubstituted or a halo-, lower alkyl-, or lower alkoxy-substituted aralkyl group wherein the total number of carbon atoms in the aralkyl group does not exceed 10 or;

an unsubstituted or a halo-, nitro-, lower alkyl-, or lower carbalkoxy-, substituted aryl group wherein the total number of carbon atoms in the aryl group does not exceed 10; and

R and R^1 are hydrogen, halo or alkyl,

(b) about 0.1 to 99.9 parts by weight of an anhydride selected from the group consisting of acetic anhydride, pivalic anhydride, succinic anhydride, maleic anhydride, monochloromaleic anhydride, glutaric anhydride, phthalic anhydride, and pyromellitic anhydride; and

0 to about 99.8% of an organic solvent

wherein said composition is substantially free of water.

5,198,456

FUNGICIDAL ACTIVE COMPOUND COMBINATIONS

Stefan Dutzmann, Hilden; Hans Scheinpflug, Leverkusen, and Hans-Ludwig Elbe, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 29, 1992, Ser. No. 875,504

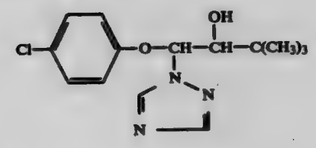
Claims priority, application Fed. Rep. of Germany, May 3, 1991, 4114447

Int. Cl.[5] A01N *43/36, 43/64*

U.S. Cl. 514—383 **6 Claims**

1. A fungicidal composition comprising a synergistic fungicidally effective amount of an active compound combination of

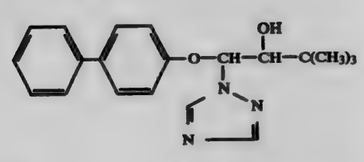
A) at least one of 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)butan-2-ol of the formula



(I)

and

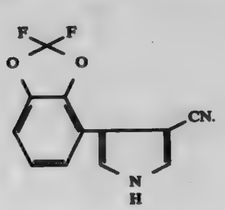
1-(4-phenyl-phenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-ol of the formula



(II)

and

B) 4-(2,2-difluoro-1,3-benzodioxol-7-yl)-1H-pyrrole-3-carbonitrile of the formula



(III)

wherein the synergistic weight ratio of (A) to (B) is between 1:11 and 1:2.

5,198,457

TREATMENT OF HYPERTHYROIDISM WITH 1,3-DIHYDRO-1[2-(2-THIENYL)ALKYL]-2H-IMIDAZOLE-2-THIONES

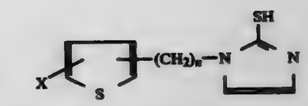
John T. Yarrington, Worthington, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Apr. 17, 1992, Ser. No. 870,527

Int. Cl.[5] A61K *31/415*

U.S. Cl. 514—392 **8 Claims**

1. A method for the treatment of hyperthyroidism which comprises administering to a patent in need thereof an effective dose of a compound represented by the formula:



including the 2-thione tautomers thereof, in which X is hydrogen, halogen or C_{1-6} alkyl and n is 1, 2, 3 or 4.

5,198,458

PYRROLIDINEAMIDE DERIVATIVES OF ACYLAMINO ACID AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Naoki Higuchi; Masayuki Saitoh; Masaki Hashimoto, all of Osaka; Harukazu Fukami, Kyoto, and Takaharu Tanaka, Osaka, all of Japan, assignors to Suntory Limited, Osaka, Japan

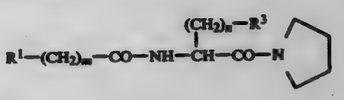
Continuation of application Ser. No. 244,859, Sep. 15, 1988 now abandoned, which is a division of application Ser. No. 010, 490; Feb. 3, 1987, now U.S. Pat. No. 4,826,870. This application filed Jan. 9, 1991, Ser. No. 638,148

Claims priority, application Japan, Feb. 4, 1986, 61-22756; Feb. 28, 1986, 61-43821

Int. Cl.[5] A61K *31/40*; C07D *295/104*

U.S. Cl. 514—397 **4 Claims**

2. A pharmaceutical composition for use in ameliorating cerebral insufficiency which comprises as an active ingredient a pharmaceutically effective amount of a compound of the general formula:



wherein

m is an integer of 1 to 3;

n is 0, 1 or 2;

R^1 is phenyl, phenoxy, mono-substituted-phenyl or -phenoxy wherein the substituents on the substituted -phenyl or -phenoxy are selected from the group consisting of halogen, hydroxy, phenylalkyl having 7 to 10 carbon atoms, styryl, phenoxy, benzoyl and benzyloxy; a straight alkyl having 10 to 16 carbon atoms; or a straight alkenyl having 10 to 16 carbon atoms;

R^3 is H, NH_2, OH, SCH_3, carboxyl, a straight or branched (C_3–C_5)alkyl, phenyl, benzyloxy, benzyloxyphenyl, indolyl, or imidazolyl, together with a pharmaceutical acceptable carrier.

5,198,459

USE OF 5HT-3 ANTAGONISTS IN PREVENTING OR REDUCING DEPENDENCY ON DEPENDENCY-INDUCING AGENTS

Asunta Imperato, Rome, Italy, and Dietmar Rösner, Allschwil, Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

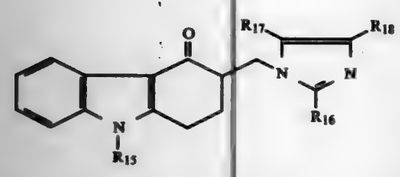
Division of Ser. No. 467,598, Jan. 19, 1990, Pat. No. 5,039,680, which is a continuation of Ser. No. 217,016, Jul. 8, 1988, abandoned. This application Jun. 6, 1991, Ser. No. 711,226

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3722959; Oct. 22, 1987, 3735719; Switzerland, Nov. 19, 1987, 04510/87

Int. Cl.[5] A61K *31/40*

U.S. Cl. 514—397 **5 Claims**

1. A method of avoiding renewed dependency upon nicotine comprising administering to a subject in need of such treatment a therapeutically effective amount of a 5HT-3 antagonist of formula Ia:



Ia

wherein

R_{15} is hydrogen, (C_{1-10})alkyl, (C_{3-9})cycloalkyl, (C_{3-6})alkenyl, phenyl or phenyl(C_{1-3})alkyl, and

one of R_{16}, R_{17} or R_{18} is hydrogen, (C_{1-6})alkyl, (C_{3-7})cycloalkyl, (C_{2-6})alkenyl or phenyl(C_{1-3})alkyl,

and the other substituents are, independently, hydrogen or (C_{1-4})alkyl.

5,198,460

PYROPHEOPHORBIDES AND THEIR USE IN PHOTODYNAMIC THERAPY

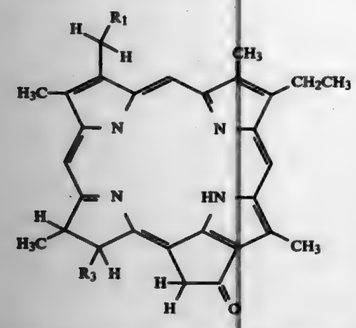
Ravindra K. Pandey, Buffalo, and Thomas J. Dougherty, Grand Island, both of N.Y., assignors to Health Research Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 597,786, Oct. 15, 1990, Pat. No. 5,093,349, which is a continuation of Ser. No. 221,804, Jul. 20, 1988, Pat. No. 5,002,962. This application Jan. 17, 1992, Ser. No. 822,409

Int. Cl.[5] A61K *31/40*; C07D *487/22*

U.S. Cl. 514—410 **18 Claims**

1. A compound of formula I:



I

wherein R_1 is CH_2OR_2 where R_2 is a primary or secondary alkyl containing 1 to 20 carbons; and R_3 is $—CO_2R_4$ where R_4 is H or an alkyl containing 1 to 20 carbons.

5. A method to effect the destruction of target virus, cells or tissue, comprising:

contacting said target with an effective amount of compound of claim 1; and irradiating with light absorbed by said compound.

5,198,461

ISATINE DERIVATIVES, THEIR PREPARATION AND USE

Frank Wätjen, Herlev; Jørgen Drejer, Vaerløse, and Leif H. Jensen, Copenhagen V, all of Denmark, assignors to NeuroSearch A/S, Glostrup, Denmark

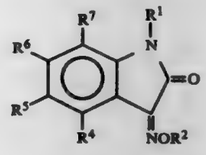
Continuation-in-part of Ser. No. 624,409, Dec. 7, 1990, abandoned. This application Jun. 5, 1991, Ser. No. 710,790

Claims priority, application Denmark, Dec. 11, 1989, 6248/89; Dec. 19, 1989, 6470/89; Jan. 12, 1990, 0085/90; Jan. 12, 1990, 0086/90; Feb. 12, 1990, 0363/90; Aug. 31, 1990, 2093/90

Int. Cl.[5] C07D *209/62*; A61K *31/40*

U.S. Cl. 514—411 **16 Claims**

1. A method of antagonizing the biological effects of an excitatory amino acid of a subject in need of such antagonization comprising the step of administering to said subject an effective excitatory amino acid antagonizing amount of an indole-2,3-dione-3-oxime compound having the formula



wherein

R^1 is hydrogen, C_{1-6}-alkyl which may be branched, C_{3-7}-cycloalkyl, benzyl, and phenyl carboxylic acid acyl, hydroxy, C_{1-6}-alkoxy, CH_2CO_2R' wherein R' is hydrogen or C_{1-6}-alkyl which may be branched, CH_2CN, $CH_2CONR^{IV}R^{V}$ wherein R^{IV} and R^{V} independently are hydrogen or C_{1-6}-alkyl, or $CH_2C(=NOH)NH_2$;

R^2 is hydrogen, benzyl, C_{1-6}-alkyl which may be branched, or C_{3-7}-cycloalkyl;

R^4, R^5, R^6, R^7 independently are hydrogen, C_{1-6}-alkyl which may be branched, phenyl, halogen, C_{1-6}-alkoxy, NO_2, CN, CF_3, OCF_3, or $SO_2NR''R'''$ wherein R'' and R''' independently are hydrogen, aralkoxy, aralkyl, or C_{1-6}-alkyl; or R^6 and R^7 together form an additional 4 to 7 membered ring which may be aromatic or partially saturated and which may be substituted with halogen, NO_2, CF_3, CN, OCF_3, or $SO_2NR''R'''$ wherein R'' and R''' independently are hydrogen, aralkoxy, aralkyl, or C_{1-6}-alkyl, and R^4 and R^5 have the meanings set forth above.

5,198,462

HETEROCYCLIC AMINE, DERIVATIVES, THEIR PRODUCTION AND USE

Hideaki Natsugari, Ashiya; Hiroyuki Tawada, Takatsuki, and Hitoshi Ikeda, Higashiosaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

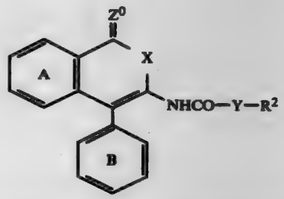
Filed Oct. 16, 1991, Ser. No. 777,169

Claims priority, application Japan, Oct. 16, 1990, 2-278038; Sep. 18, 1991, 3-237983

Int. Cl.[5] A61K *31/38*; C07D *335/06*

U.S. Cl. 514—432 **20 Claims**

1. A compound of the formula:



wherein ring A and ring B stand independently for a benzene ring which may be substituted with 1 to 4 substituents selected from the group consisting of (1) a halogen, (2) a C_{1-6} alkyl group which may be substituted with 1 to 5 halogens, (3) a C_{1-6} alkoxy group which may be substituted with 1 to 5 halogens, (4) a C_{1-6} alkylthio group which may be substituted with 1 to 5 halogens, (5) a C_{1-7} acylamino group, (6) a C_{1-3} acyloxy group and (7) a hydroxyl group, or adjacent carbon atoms on the ring A or B may form a 5- to 7-membered ring together with a group of the formula: $—(CH_2)_r—$ wherein r denotes an integer of 3 to 5, Z^o stands for O or S or

stands for $—CH_2—$, X stands for O, S or NR^1 wherein R^1 stands for a hydrogen atom or a C_{1-6} alkyl group; Y stands for NH, O or $(CH_2)_n$ wherein n denotes 0 to 2; and R^2 stands for a hydrocarbon group selected from the group consisting of (1) a straight-chain or branched C_{1-8} alkyl group, (2) a C_{3-8} cycloalkyl group, (3) a C_{3-8} cycloalkyl-C_{1-4} alkyl group, (4) a C_{6-10} aryl group of (5) a C_{7-16} aralkyl group, each of which may be substituted with 1 to 4 substituents selected from the group consisting of (i) a halogen, (ii) a C_{1-6} alkyl group which may be substituted with 1 to 5 halogens, (iii) a C_{1-6} alkoxy group which may be substituted with 1 to 5 halogens, (iv) a C_{1-6} alkylthio group which may be substituted with 1 to 5 halogens, (v) a C_{1-7} acylamino group, (vi) a C_{1-3} acyloxy group, (vii) a hydroxyl group and (viii) an amino group which may be substituted with one or two C_{1-4} alkyl groups, or a pharmaceutically acceptable salt thereof.

5,198,463

OXYTOCIN ANTAGONISTS

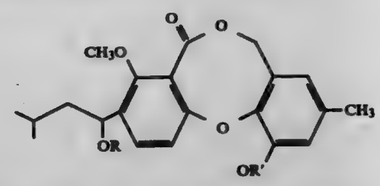
Douglas J. Pettibone, Chalfont, Pa., and Gino M. Salituro, Fanwood, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1992, Ser. No. 860,335

Int. Cl.[5] A61K *31/335*

U.S. Cl. 514—450 **6 Claims**

1. A method for relaxing smooth muscle or reducing contractile activity by inhibiting oxytocin activity comprising administering to a patient an oxytocin inhibiting amount of a penicillide compound having the formula



wherein R is H or $—COCH_3$ and R^1 is H, $—COCH_3$ or $—CH_3$, provided that if R^1 is methyl, R is $COCH_3$.

5,198,464

METHOD AND COMPOSITIONS FOR HELMINTIC, ARTHROPOD ECTOPARASITIC AND ACARIDAL INFECTIONS WITH NOVEL AGENTS

Irwin B. Wood, Yardley, Pa., and John A. Pankavich, Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 617,649, Jan. 5, 1984, Pat. No. 4,869,901. This application May 10, 1985, Ser. No. 732,251

Int. Cl.[5] A61K *35/74*, *31/335*

U.S. Cl. 514—450 **32 Claims**

1. A method for the prevention, treatment or control of helminthic, arthropod ectoparasitic or acaridal infections in warm-blooded animals, said method comprising: orally, parenterally or topically administering to an animal, a prophylactically, therapeutically or pharmaceutically-effective amount of the fermentation broth or whole mash of microorganism *Streptomyces cyaneogriseus noncyanogenus* LL-F28249, having deposit accession number NRRL 15773, or a mutant thereof, containing antibiotic agents produced by the microorganism or the mutant thereof; or the pharmaceutically and pharmacologically-acceptable salts thereof, wherein said agents have characteristic spectra s shown in FIGS. I–LVII of the attached drawings.

5,198,465

COMPOSITIONS BASED ON AMINO ACIDS FOR PREVENTING AND TREATING PRECURSOR DEFICIENCIES IN THE SYNTHESIS OF COLLAGEN

Francesco S. Dioguardi, Via Clovasso, 11, 20121 Milan, Italy

Filed Jan. 19, 1991, Ser. No. 717,464

Int. Cl.[5] A61K *31/34*, *31/19*

U.S. Cl. 514—474 **9 Claims**

1. A composition free from hydroxy-proline and hydroxy-lysine and useful for treating precursor deficiencies in the synthesis of collagen consisting of 10 to 50% proline, 10 to 50% glycine, 10 to 50% lysine, 0.1 to 50% vitamin C, and one or more compounds in amounts of 0.1 to 20% and selected from the group consisting of α-ketoglutaric acid, methionine, cysteine, cystine, and valine, as well as pharmaceutically acceptable diluents and excipients.

5,198,466

OXYSULFONYL UREA ACAT INHIBITORS

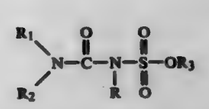
Joseph A. Picard, and Drago R. Siskovic, both of Ypsilanti, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 611,245, Nov. 9, 1990, abandoned. This application Jul. 26, 1991, Ser. No. 736,678

Int. Cl.[5] A61K *31/255*; C07C *309/63*

U.S. Cl. 514—517 **8 Claims**

7. A pharmaceutical composition comprising a compound of

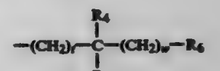


wherein R is hydrogen, a straight or branched alkyl group having from 1 to 8 carbon atoms, or benzyl;

wherein each of R_1 and R_2 is selected from

(a) hydrogen,

(b) the group



wherein t is zero to 4; w is zero to 4 with the proviso that the sum of t and w is not greater than 5; R_4 and R_5 are independently selected from hydrogen or alkyl having from 1 to 6 carbon atoms, or when R^4 is hydrogen, R_5 can be selected from the group defined for R_6; and R_6 is phenyl or phenyl substituted with from 1 to 3 substituents selected from straight or branched alkyl having from 1 to 6 carbon atoms, straight or branched alkoxy having from 1 to 6 carbon atoms, phenoxy, hydroxy, fluorine, chlorine, bromine, nitro, trifluoromethyl, —COOH, COOalkyl wherein alkyl has from 1 to 4 carbon atoms, or $—(CH_2)_qNR_7R_8$ wherein R_7 and R_8 are independently hydrogen or alkyl of from 1 to 4 carbon atoms, and q is zero or one;

(c) a straight or branched hydrocarbon chain having from 1 to 20 carbon atoms and which is saturated or contains from 1 to 3 double bonds;

(d) an alkyl group having from 1 to 6 carbon atoms wherein the terminal carbon is substituted with hydroxy, $-NR_7R_8$ wherein R_7 and R_8 have the meanings defined above, or -COOalkyl wherein alkyl is straight or branched and has from 1 to 4 carbon atoms; or

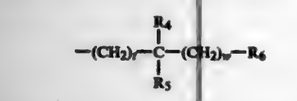
(e) phenyl substituted with from 1 to 3 substituents selected from straight or branched alkyl having from 1 to 6 carbon atoms, alkoxy which is straight or branched and has from 1 to 6 carbon atoms, alkylthio which is straight or

branched and has from 1 to 6 carbon atoms, $-(CH_2)_yNR_7R_8$ wherein, R_7 and R_8 have the meanings defined above, hydroxy, nitro, chlorine, fluorine, bromine, or trifluoromethyl;

wherein R_3 is selected from a straight or branched hydrocarbon chain having from 1 to 20 carbon atoms and which is saturated or contains from 1 to 3 double bonds; or a pharmaceutically acceptable salt thereof with the provisos that

(i) both R_1 and R_2 are not hydrogen at the same time;

(ii) when each of R_1 and R_2 is the group



R_5 is hydrogen or alkyl having from 1 to 6 carbon atoms; and

(iii) the following compound is excluded:

R_1	R_2	R_3
n-C_4H_9	H	$-CH=CH_2$
H	n-C_4H_9	$-CH=CH_2$.

5,198,467

INSECTICIDE FOR IMPORTED FIRE ANTS AND OTHER INSECT PESTS

Robert R. Milks, 1805 Oregon St., Baton Rouge, La. 70802

Continuation-in-part of Ser. No. 142,525, Jan. 11, 1988, abandoned. This application Jul. 27, 1990, Ser. No. 558,753

Int. Cl.[5] A01N *41/04*

U.S. Cl. 514—553 13 Claims

1. A delayed-action insecticide comprising an insecticidal vegetable oil insoluble anionic fluorochemical surfactant, the surfactant being applied in an insecticidal concentration in solution to a carrier in the form of dispersible nonliquid edible food to form a toxic bait.

5,198,468

ESSENTIAL FATTY ACID COMPOSITION

David F. Horrobin, Guildford, England, assignor to Efamol Holdings Plc, Surrey, England

Continuation of Ser. No. 598,782, Oct. 18, 1990, abandoned, which is a continuation of Ser. No. 211,057, Jun. 24, 1988, abandoned. This application Jun. 19, 1991, Ser. No. 717,862

Claims priority, application United Kingdom, Jun. 24, 1987, 8714772

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/20*

U.S. Cl. 514—558 2 Claims

1. A method of improving memory comprising administering to a person suffering from deterioration of memory associated with schizophrenia or with physiological aging as measured by the Sterling or Weschler tests, an n-6 essential fatting acid selected from GLA, DGLA, AA, adrenic acid and the 22:5 n-6 acid and an n-3 essential fatty acid selected from the 18:4 n-3 and 20:4 n-3 acids, EPA, the 22:5 n-3 acid and DHA in an effective amount of each of the n-6 acid and the n-3 acid of 1 mg to 100 g per day.

5,198,469

BATH LOTION AND BODY LOTION WITH PHARMACEUTICAL EFFECT

Shigenobu Sakata, 3-19-102 Shinkanaoka-cho 1-Chome, Sakai-shi, Osaka, Japan

Filed Jun. 10, 1991, Ser. No. 712,814

Claims priority, application Japan, Dec. 11, 1990, 2-410194

Int. Cl.[5] A61K *7/48*; C07G *17/00*; C12P *19/04*

U.S. Cl. 514—777 2 Claims

1. A bath or body lotion consisting essentially of a fermentation product prepared by dissolving 3–4% by weight of xanthan gum in an aqueous solution of a carbohydrate compound, heating the solution with stirring to a temperature of 40°–60° C., fermenting the solution with *Xanthomonas campestris*, cooling the solution to room temperature, filtering the cooled solution, and sterilizing the filtrate with ultraviolet light.

5,198,470

LIPID COMPOUNDS DERIVED FROM SPHINGOSINES, PROCESS FOR PREPARING THESE AND THEIR APPLICATIONS, IN PARTICULAR IN COSMETICS AND IN THE PHARMACY OF SKIN CONDITIONS

Alexandre Zyssman, Paris; Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, all of France, assignors to L'Oreal, Paris, France

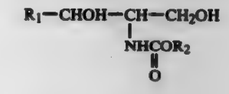
Division of Ser. No. 585,653, Sep. 20, 1990, Pat. No. 5,149,860. This application Jun. 25, 1992, Ser. No. 904,503

Claims priority, application France, Sep. 21, 1989, 89 12423

Int. Cl.[5] A61K *47/00*

U.S. Cl. 514—785 12 Claims

1. A composition for the treatment of the hair and skin comprising in a cosmetically or pharmaceutically acceptable vehicle in an amount effective to treat said hair and skin a lipid compound having the formula



(I)

wherein

R_1 represents a C_{11} to C_{21} alkyl or alkenyl radical optionally bearing a hydroxy group, and

R_2 represents a linear or branched C_8 to C_{30} hydrocarbon radical, saturated or bearing one or more ethylenically unsaturated bonds.

5,198,471

POLYMER RECYCLING BY SELECTIVE DISSOLUTION

E. Bruce Nauman, Schenectady, and Jerry C. Lynch, Scotia, both of N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Sep. 11, 1989, Ser. No. 406,087

Int. Cl.[5] C08J *11/08*; C08F *6/04*

U.S. Cl. 521—46.5 11 Claims

1. A method for separating polymers from a physically commingled solid mixture containing at least three polymers, by selective dissolution, comprising:

dissolving at least one first polymer of the mixture in a selected solvent at a first temperature to form a first solution and a first remaining solid component which contains at least two polymers of the mixture which are insoluble in the selected solvent at the first temperature but soluble in the selected solvent at higher temperatures;

separating the first solution from the first remaining solid component;

separating the at least one first polymer from the selected solvent of the first solution;

dissolving at least one second polymer from the first remaining solid component int eh selected solvent at a second temperature to form a second solution and a second remaining solid component which contains at least one third polymer of the mixture which is insoluble in the selected solvent at the second temperature but soluble in the selected solvent at a third higher temperature;

separating the second solution from the second remaining solid component;

separating the at least one second polymer from the selected solvent of the second solution;

dissolving at least one third polymer from the second remaining solid component int he selected solvent at the third higher temperature to form a third solution;

separating the at least one third polymer from the selected solvent of the third solution;

each of the first, second and third solutions initially containing a solid concentration of polymer of from 5% to about 20% by weight; and

dissolving at least two of the polymers in the solvent at a single temperature simultaneously, one of the simultaneously dissolved polymers being present at concentrations of less than about 10% by weight of the other one of the simultaneously dissolved polymers, the simultaneously dissolved polymers forming a single phase solution.

5,198,472

PROCESS FOR PREPARING EMULSIONS THAT ARE POLYMERIZABLE TO ABSORBENT FOAM MATERIALS

Thomas A. DesMarais, Norwood; Stephen T. Dick, Blue Ash, and Thomas M. Shiveley, Moscow, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 830,159, Feb. 3, 1992, Pat. No. 5,149,720, which is a continuation-in-part of Ser. No. 743,947, Aug. 12, 1991, abandoned. This application Aug. 27, 1992, Ser. No. 935,935

Int. Cl.[5] C08J *9/26, 9/28*

U.S. Cl. 521—63 5 Claims

1. A continuous process for the preparation of an absorbent foam material made from a polymerized high internal phase emulsion, process comprises:

A) providing a liquid feed stream of an oil phase comprising

i) from about 7% to 40% by weight of a substantially water-insoluble, monofunctional glassy monomer component selected from styrene-base-d-monomer types;

ii) from about 27% to 66% by weight of a substantially water-insoluble, monofunctional rubbery comonomer component selected from butylacrylate, 2-ethylhexylacrylate, butadiene, isoprene, and combinations of these comonomers types;

iii) from about 10% to 25% by weight of a substantially water-insoluble, cross-linking agent component comprising a difunctional monomer type selected from divinylbenzene, divinyltolulene, diallylphthalate, one or more diacrylic acid esters of a polyol and combinations of these difunctional monomer types; and

iv) from about 4% to 25% by weight of an emulsifier component which is selected from sorbitan fatty acid esters, polyglycerol fatty acid esters, polyoxyethylene fatty acids and esters and combinations of such emulsifiers;

B) providing a liquid feed stream of a water phase comprising an aqueous solution containing from about 0.2% to 40% by weight of water-soluble electrolyte selected from salts of alkali or alkaline earth metals, and from about 0.02% to 0.4% by weight of a water-soluble, free radical polymerization initiator;

C) simultaneously introducing said liquid feed streams into a dynamic mixing zone at flow rates such the initial weight ratio of water phase to oil phase being introduced ranges from about 2.5:1 to 5:1;

D) subjecting the combined feed streams in said dynamic mixing zone to sufficient shear agitation to at least partially form an emulsified mixture in said zone while maintaining steady, non-pulsating flow rates for the oil and water phase streams;

E) steadily increasing the ratio of water to oil feed streams being introduced into said dynamic mixing zone to within the range of from about 20:1 to 70:1 at a rate of increase which does not destroy the emulsified nature of the contents of said dynamic mixing zone, while maintaining the emulsified contents of said dynamic mixing zone at a temperature of from 35° C. to 65° C., and while subjecting the emulsified contents of said zone to continued shear agitation which is sufficient to eventually form a high internal phase emulsion that, upon subsequent polymerization, provides a foam having an average cell size of from about 10 to 90 microns;

F) continuously withdrawing the emulsified contents of said dynamic mixing zone and continuously introducing said emulsified contents into a static mixing zone wherein said emulsified contents are further subjected to sufficient shear mixing to thereby completely form a stable high internal phase emulsion having a water to oil phase weight ratio of from about 20:1 to 70:1;

G) continuously withdrawing said stable high internal phase emulsion from said static mixing zone; and

H) subjecting said stable high internal phase emulsion withdrawn from said static mixing zone to conditions suitable for effecting polymerization of the polymerizable monomers, comonomers and cross-linking agents in the oil phase of said stable high internal phase emulsion to thereby form upon subsequent dewatering a polymeric absorbent foam material.

5,198,473

POLYURETHANE FOAMS OF INCREASED FLAME RETARDANCY

James A. Gallagher, Grosse Ile; Duane A. Heyman, Monroe, and Steven D. Gagnon, Detroit, all of Mich., assignors to BASF Corporation

Filed Dec. 9, 1991, Ser. No. 803,934

Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—99 16 Claims

1. In a polyol component suitable for the preparation of a flexible polyurethane foam by reacting said polyol component with an isocyanate in the presence of a blowing agent, the improvement comprising incorporating into said polyol component from 1 to about 10 parts per 100 parts of remaining polyol components of a low molecular weight, high primary hydroxyl polyoxypropylene/polyoxyethylene copolymer polyether polyol based on a trifunctional initiator, having a hydroxyl number of from 300 to about 500 and a primary hydroxyl content of greater than 50 percent wherein said polyol component further comprises a polymer modified polyol.

5,198,474

SILICONE SURFACTANTS HAVING T-BUTYL TERMINATED POLYETHER PENDANTS FOR USE IN HIGH RESILIENCE POLYURETHANE FOAM

John A. Kilgour, Putnam Valley, N.Y., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Jun. 30, 1992, Ser. No. 906,505

Int. Cl.[5] C08G *18/00*

U.S. Cl. 521—112 4 Claims

1. A polyurethane foamable composition comprising:

(a) a polyether polyol containing at least an average of 2.4 hydroxyl groups per molecule;

(b) an organic polyisocyanate;

(c) at least one catalyst for production of polyurethane foam;

(d) a blowing agent; and

(e) a siloxane-polyoxyalkylene copolymer having the generalized average formula

$M^eD_xD^e_yM^e$

compound having average functionality of from 2 to 8 or

5,198,477

(A) a compound having at least two epoxy groups in a

wherein
M* represents $R_n(CH_3)_{3-n}SiO_4$;
D represents $(CH_3)_2SiO_{2/2}$;
D* represents $(CH_3)(R)SiO_{2/2}$;
n is 0 to 1;
x is 0 to 8;
y is 0 to 8; and
the sum of n and y is 0.5 to 8; and in the above formulae for M* and D*,
R is a polyether-containing substituent having the general formula

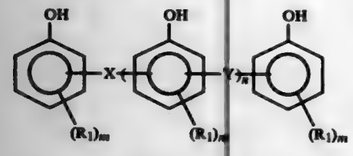
$$-C_{n'}H_{2n'}O(C_2H_4O)_b(C_3H_6O)_cC(CH_3)_3$$

wherein
n' is an integer from 2 to 4;
b is a number from 0 to 10;
c is a number from 0 to 10; and
the sum of b plus c is a number from 1 to 10; or a mixture of such polyether-containing substituents.

5,198,475
POLYOL AND UTILIZATION THEREOF
Masayuki Kimura, Kanagawa; Satoshi Ozaki, Aichi; Tsukuru Izukawa, Aichi; Haruhiko Kawakami, Aichi; Takayoshi Masuda, Aichi, and Mitsuo Kito, Aichi, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Oct. 31, 1990, Ser. No. 606,617
Int. Cl.[5] C08G 8/28, 18/12; C08L 61/06
U.S. Cl. 52—164 **46 Claims**

1. A polyol (D) having a hydroxyl value of from 180 to 700 mgKOH/g which comprises (i) polyol (a), polyol (b) and polyol (d), or(ii) polyol (a), polyol (b), polyol (c) and polyol (d):

said polyol (a) having a hydroxyl value of from 140 to 350 mgKOH/g and being prepared by the addition of from 1.0 to 4.5 moles of an alkylene oxide to one equivalent of hydroxyl of a phenol resin or a mixture hereof having a number average molecular weight of from 650 to 1400, an average functionality of from 3 to 8 and the formula (I):

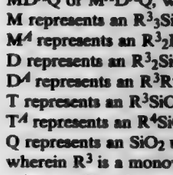


(I)

wherein R_1 is a hydrogen atom, alkyl having from 1 to 9 carbon atoms, halogen atom selected from chlorine, bromine and fluorine, or hydroxyl, m is an integer of from 1 to 3, n is an integer of from 1 to 6, and X and Y are same or different divalent groups selected from the group consisting of an alkylene having from 1 to 10 carbon atoms, xylylene, oxy, thio and sulfoxyl or bonded group of the above-mentioned groups; said polyol (b) having a hydroxyl value of 240 to 800 mgKOH/g and being obtained by adding from 0.5 to 3.0 moles of an alkylene oxide to one equivalent of active hydrogen in an alkanolamine series compound of a mixture thereof having the formula (II):

$$NR_2R_2R_3 \quad \text{(II)}$$

wherein R_2 and R_3 are respectively a hydrogen atom, hydroxyethyl or hydroxyisopropyl, R_2 and R_3 are same or different and excluding the case wherein both R_2 and R_3 are hydrogen atoms; said polyol (c) having a hydroxyl value of 130 to 750 mgkoh/g and being obtained by the addition of from 0.5 to 6.5 moles of an alkylene oxide to one equivalent of hydroxyl group in an active halogen containing compound which is an aliphatic polyhydroxy compound having average functionality of from 2 to 8 or a mixture thereof; and said polyol (d) having a hydroxyl value of from 150 to 700 mgKOH/g and being obtained by adding from 1.0 to 9.0 moles of an alkylene oxide to one equivalent of active hydrogen in an amino phenol series compound or a mixture thereof having a number average molecular weight of from 100 to 200, an average functionality of from 3 to 6, and formula (III):



(III)

wherein R_0 is a hydrogen atom, aliphatic hydrocarbon group having from 1 to 5 carbon atoms, or alicyclic hydrocarbon group, q is an integer of from 1 to 2, and p is an integer of from 1 to 2.

5,198,476
ULTRAVIOLET-CURABLE SILICONE COMPOSITION FOR REGULATING PEEL STRENGTH
Keiji Kobayashi, and Katsuya Kanemaru, both of Tokyo, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan
Filed Jun. 27, 1991, Ser. No. 722,566
Claims priority, application Japan, Jun. 29, 1990, 2-169768; May 18, 1991, 3-142538
Int. Cl.[5] C08F 2/50; C08G 77/20, 77/14
U.S. Cl. 522—31 **9 Claims**

1. An ultraviolet-curable silicone composition comprising
(A) 100 parts by weight of an epoxy-functional polyorganosiloxane which comprises structural units represented by the formula R^1R^2SiO, wherein R^1 represents hydrogen atom or a monovalent hydrocarbon group and R^2 represents hydrogen atom, a monovalent hydrocarbon group, or a monovalent epoxy-functional organic group, and in which at least two of all the organic groups are a monovalent epoxy-functional organic group;
(B) from 1 to 80 parts by weight of at least one copolymer for regulating peel strength, which is soluble in component (A), selected from the group consisting of
(i) a copolymer represented by a unit structure of MQ or M^4Q,
(ii) a copolymer represented by a unit structure of M^4T, MT^4 or M^4T^4, and
(iii) a copolymer represented by a unit structure of M^4DQ, MD^4Q or M^4D^4Q, wherein
M represents an $R^3{}_3SiO_{\frac{1}{2}}$ unit,
M^4 represents an $R^3{}_2R^4SiO_{\frac{1}{2}}$ unit,
D represents an $R^3{}_2SiO$ unit,
D^4 represents an R^3R^4SiO unit,
T represents an $R^3SiO_{3/2}$ unit,
T^4 represents an $R^4SiO_{3/2}$ unit, and
Q represents an SiO_2 unit,
wherein R^3 is a monovalent hydrocarbon group containing no alkenyl group and R^4 is an alkenyl group; and
(C) a catalytically effective amount of an onium salt as a photoinitiator.

5,198,477
CONTACT LENSES MADE FROM THERMOFORMABLE MATERIAL
Harro M. von der Haegen, Laufach, and Bernhard Seiferling, Geisbach, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Feb. 25, 1992, Ser. No. 841,920
Claims priority, application Switzerland, Feb. 28, 1991, 604/91
Int. Cl.[5] C08L 23/00; C08F 38/02
U.S. Cl. 523—106 **14 Claims**

1. A contact lens made from a polymer comprising macrocycles that are made up of units of formula I

$$-(-CR^1{=}CR^2{-}A{-})- \quad \text{(I)}$$

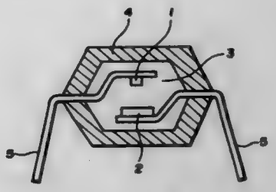
wherein A is alkylene or alkenylene each having from 3 to 10 carbon atoms and each of which may be substituted by one or more R^3 radicals, each of R^1 and R^2, independently of the other, is hydrogen or lower alkyl, and R^3 is lower alkyl, fluorinated lower alkyl or a siloxane radical.

5,198,478
ALKALINE RESOL PHENOL-ALDEHYDE RESIN BINDER COMPOSITIONS
Garry Smith, Sutton Coldfield, and Martin Bradley, Solihull, both of England, assignors to Fosseco International Limited, Birmingham, England
Filed Feb. 11, 1992, Ser. No. 833,697
Claims priority, application United Kingdom, Mar. 13, 1991, 9105314
Int. Cl.[5] C08J 5/14; B22C 1/16, 1/20
U.S. Cl. 523—145 **13 Claims**

1. A binder composition for forming foundry molds and cores, comprising:
an oxyanion;
an alkaline aqueous solution of a resol phenol-aldehyde resin and the alkali being present in an amount to be substantially prevent the formation of stable complexes between the resin and the oxyanion;
a pyrrolidone or an N-substituted pyrrolidone in an amount sufficient to improve foundry mold or core compression strength immediately after gassing with carbon dioxide gas; and
wherein the binder composition produces foundry molds and cores having improved strength, surface finish and edge hardness.

5,198,479
LIGHT TRANSMISSIVE EPOXY RESIN COMPOSITIONS AND OPTICAL SEMICONDUCTOR DEVICES ENCAPSULATED THEREWITH
Toshio Shiobara; Koji Futatsumori, and Kazuhiro Arai, all of Annaka, Japan, assignors to Shin-Etsu Chemical Company Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 651,438, Feb. 7, 1991. This application Aug. 23, 1991, Ser. No. 749,379
Claims priority, application Japan, Aug. 24, 1990, 2-223082
Int. Cl.[5] C08K 9/06
U.S. Cl. 523—214 **9 Claims**

1. A light transmissive epoxy resin composition comprising
(A) a compound having at least two epoxy groups in a molecule,
(B) an acid anhydride curing agent,



(C) an organic phosphorus anti-discoloring agent, and
(D) silica-titania glass beads surface treated with an organic silicon compound.

5,198,480
SUPPRESSANTS FOR UNSATURATED POLYESTER RESINS
K. C. Benton, Macedonia, and R. Weinert, Garfield Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 564,266, Aug. 8, 1990, abandoned. This application Nov. 27, 1991, Ser. No. 800,802
Int. Cl.[5] C08L 67/02
U.S. Cl. 523—500 **18 Claims**

1. A suppressant for unsaturated polyester resins comprising a polyether, polyether block copolymer, polyether-polysiloxane block copolymer and combinations thereof and wherein the polyethylene glycol suppressant has seven or more oxyethylene units and wherein the suppressant has a molecular weight in the range from about 300 daltons to about 25,000 daltons and wherein the resulting material substantially reduces styrene emission or volatile organic emission.

5,198,481
WATER-REDUCIBLE COATING COMPOSITION AND PROCESS OF USE THEREOF
Carroll W. Cope, Marion, Va., assignor to Morley Moulding Inc., Marion, Va.
Division of Ser. No. 285,519, Dec. 15, 1988, Pat. No. 4,980,402. This application Sep. 21, 1990, Ser. No. 586,457
Int. Cl.[5] C08K 11/00; B32B 23/08, 27/30, 15/08
U.S. Cl. 524—9 **2 Claims**

1. A coated product comprising a wood, plastic or metal substrate and a coating over said substrate formed by placing a liquid coating over said substrate, said liquid comprising:

	% by volume
Water	20–30
Organic solvents	1–5
Styrene-maleic anhydride resins	0.5–3
Acrylic resins	45–55
Pigments and inorganic fillers	10–20
Organic thickener	up to 1
Defoaming agents	up to 3
Flow agents	up to 5
Suspension agent	up to 1
Nut shell flour	1–5

and drying said liquid coating to remove volatile solvents.

VOL 1148 ISS 5 MR 30 1993

5,198,482

CORROSION-INHIBITING COATING COMPOSITIONS

Emyr Phillips, Wakefield, England, and Adalbert Braig, Weil-Friedlinger, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 450,647, Dec. 14, 1989, abandoned. This application Jan. 20, 1991, Ser. No. 718,073

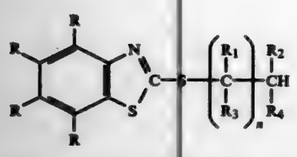
Int. Cl.[5] C08K *5/34, 5/48*

U.S. Cl. 524—94 12 Claims

1. A corrosion-inhibiting coating composition comprising

(a) an acid-sensitive film former selected from the group consisting of an epoxide resin, polyurethane resin, aminoplast resin, or a mixture of such resins or a basic aqueous dispersion or solution of an acidic resin, and

(b) an effective corrosion inhibiting amount of an amine salt of an aliphatic or cycloaliphatic dicarboxylic acid of formula II



II

in which each R independently of the others is hydrogen, alkyl of 1 to 12 carbon atoms, halogenoalkyl of 1 to 4 carbon atoms, alkoxy of 1 to 12 carbon atoms, alkylthio of 1 to 12 carbon atoms, alkylsulfonyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, alkylphenyl of 7 16 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, halogen, —CN, —NO_2, —COOH, —COOalkyl where alkyl is of 1 to 4 carbon atoms, —OH or a primary, secondary or tertiary amino or carbamoyl group of up to 20 carbon atoms;

n is zero or one;

R_1, R_2, R_3 and R_4 independently of one another are hydrogen, alkyl of 1 to 18 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, alkoxyalkyl of 2 to 10 carbon atoms, carboxylalkyl of 2 to 12 carbon atoms, carboxyl, phenyl or phenylalkyl of 7 to 9 carbon atoms, or R_1 and R_2 or R_1 and R_3 together are linear or branched alkylene of 3 to 4 carbon atoms, where two of the substituents R_1, R_2, R_3 and R_4 are carboxyl or carboxyalkyl;

with two molar equivalents of an amine or mixture of amines of the formula N(X)(Y)(Z) in which X, Y and Z are the same or different and each is independently hydrogen, alkyl of 1 to 24 carbon atoms, said alkyl interrupted by one or more oxygen atoms, hydroxyalkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl of 7 to 9 carbon atoms or alkylphenyl of 7 to 16 carbon atoms, and where at least one of X, Y and Z or at least one of X, Y and Z in at least one of the amines when a mixture of amines is used is alkyl of 10 to 24 carbon atoms or said alkyl interrupted by one or more oxygen atoms.

5,198,483

FLAME RETARDANTS

James Gainer, Manchester, England, assignor to FMC Corporation, Philadelphia, Pa.

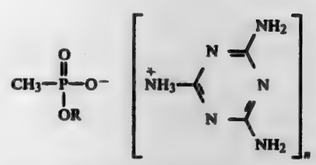
Division of Ser. No. 415,009, Sep. 29, 1989, Pat. No. 5,093,494. This application Dec. 16, 1991, Ser. No. 808,387

Claims priority, application United Kingdom, Oct. 6, 1988, 8823482

Int. Cl.[5] C08K *5/3492, 3/09*

U.S. Cl. 524—100 9 Claims

1. A composition comprising a polymer containing a flame retardant amount of a melamine salt of general formula I



(I)

in which R is hydrogen, methyl or a negative valency bond, and n is 1 when R is hydrogen or methyl, or 2 when R^1 is a negative valency bond.

5,198,484

POLYOLEFIN COMPOSITION CONTAINING ULTRAFINE SORBITOL AND XYLITOL ACETALS

Michael J. Mannion, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

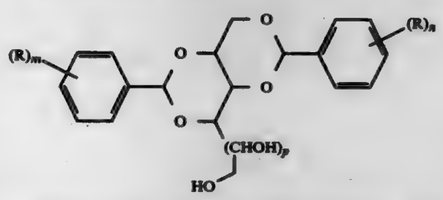
Filed May 1, 1992, Ser. No. 877,405

Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—108 19 Claims

1. A process for incorporating a clarifying agent into a semi-crystalline polyolefin resin, comprising the steps of:

mixing 100 parts by weight of said polyolefin resin and from 0.01 to 100 parts by weight of a clarifying agent selected from compounds of the formula:



wherein p is 0 or 1, m and n are independently 0–3, and R is, at each occurrence, independently selected from C_{1-8} alkyl, C_{1-4} alkoxy, hydroxy, halogen, C_{1-6} alkylthio, C_{1-6} alkylsulfoxy and a 4 or 5 membered alkyl group forming a carbocyclic ring with adjacent carbon atoms of the unsaturated parent ring; further provided that said clarifying agent is in the form of a powder characterized by a d_{97} of 30 microns or less, and a mean particle size of 15 microns or less;

heating said mixture above a melting temperature of said resin and to at least 170° C.; and

blending said mixture while said resin is in a molten state until said clarifying agent is dissolved in said resin.

5,198,485

AQUEOUS COATING COMPOSITION COMPRISING CHLORINATED POLYOLEFIN

Greg A. King, Mt. Carmel; Stephen L. Poteet, Gray; Paul J. Greene; Jonathan E. Lewniczak, both of Kingsport, and James A. Stykes, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1991, Ser. No. 743,666

Int. Cl.[5] C08L *27/04*

U.S. Cl. 524—243 9 Claims

1. A composition comprising

(A) a chlorinated polyolefin having a molecular weight in the range of 9,000 to 45,000, a softening point in the range of 75° to 105° C., and an amount of chlorine in the range of 15 to 35 weight percent, based on the weight of the polyolefin, and

(B) 20 to 40 weight percent, based on the weight of the chlorinate polyolefin, of a cationic surfactant,

(C) from 1.2 to 10 weight percent, based on the weight of the chlorinated polyolefin, of glacial acetic acid,

(D) from 0.2 to 2 weight percent, based on the weight of the chlorinated polyolefin, of a salt of an oxyacid of sulfur, and

(E) water.

5,198,486

S-ALKYLTHIOPROPIONIC ACIDS AND DERIVATIVES

Daniel R. Chisolm, Warwick, N.Y.; Michael H. Fisch, Wayne, N.J.; Mark E. Flanagan, Ft. Collins, Colo., and Richard D. Peveler, Woodcliff Lake, N.J., assignors to Witco Corporation, New York, N.Y.

Continuation of Ser. No. 627,542, Dec. 10, 1990, Pat. No. 5,057,622, which is a continuation of Ser. No. 394,547, Aug. 16, 1989, abandoned. This application Oct. 1, 1991, Ser. No. 770,991

Int. Cl.[5] C08K *5/36;* C07C *323/52*

U.S. Cl. 524—302 4 Claims

1. A stabilized polymer composition comprising an extrudable polymer resin component and a tetraester stabilizer component, wherein said stabilizer component is a pentaerythritol tetraester of a 3-alkylthiopropionic acid product having an alkyl component of from about 4 to about 20 carbon atoms, said tetraester stabilizer component being prepared by a process including:

(a) providing an alkyl mercaptan of the formula RSH, wherein R is an alkyl group having from about 4 to about 20 carbon atoms;

(b) reacting said alkyl mercaptan by a direct addition reaction with acrylic acid or an alkali metal acrylate, said reacting step being carried out in an alkaline reaction solution and in the presence of an aqueous alkaline catalyst that is a strong base which is present in the reaction solution at a molar concentration in excess of that of any acrylic acid in the reaction solution, wherein said reaction solution is at a pH of at least about 11;

(c) acidifying the reaction solution and recovering a water-insoluble phase as 3-alkylthiopropionic acid;

(d) reacting said 3-alkylthiopropionic acid with pentaerythritol in order to form a pentaerythritol tetraester of 3-alkylthiopropionic acid product; and

(e) solvent refining said pentaerythritol tetraester 3-alkylthiopropionic acid product with a blend of organic solvents at a volume ratio between about 9 to 1 and about 1 to 9, wherein said pentaerythritol tetraester 3-alkylthiopropionic acid product is a liquid tetraester of 3-octylthiopropionic acid, with said blend of organic solvents being methanol and isopropanol; or wherein said pentaerythritol tetraester 3-alkylthiopropionic acid product is a crystalline tetraester of 3-dodecylthiopropionic acid, with said blend of organic solvents being isopropanol and isopropyl acetate.

3. A pentaerythritol tetraester with a 3-alkylthiopropionic acid product wherein the alkyl component thereof has from about 4 to about 20 carbon atoms, prepared by the process comprising:

(a) providing an alkyl mercaptan of the formula RSH, wherein R is an alkyl group having from about 4 to about 20 carbon atoms;

(b) reacting said alkyl mercaptan by a direct addition reaction with acrylic acid or an alkali metal acrylate, said reacting step being carried out in an alkaline reaction solution and in the presence of an aqueous alkaline catalyst that is a strong base which is present in the reaction solution at a molar concentration in excess of that of any acrylic acid in the reaction solution, wherein said reaction solution is at a pH of at least about 11;

(c) acidifying the reaction solution and recovering a water-insoluble phase as 3-alkylthiopropionic acid;

(d) reacting said 3-alkylthiopropionic acid with pentaerythritol in order to form a pentaerythritol tetraester of 3-alkylthiopropionic acid product; and

(e) solvent refining said pentaerythritol tetraester 3-alkylthiopropionic acid product with a blend of organic solvents at a volume ratio between about 9 to 1 and about 1 to 9, wherein said pentaerythritol tetraester 3-alkylthiopropionic acid product is a liquid tetraester of 3-octylthiopropionic acid, with said blend of organic solvents being methanol and isopropanol; or wherein said pentaerythritol tetraester 3-alkylthiopropionic acid product is a crystalline tetraester of 3-dodecylthiopropionic acid, with said blend of organic solvents being isopropanol and isopropyl acetate.

5,198,487

PROCESS FOR PREPARING SALT-CONTAINING SURFACE COATING POLYMER COMPOSITIONS

Charles L. Kissel, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 412,839, Sep. 26, 1989, Pat. No. 5,028,489, which is a continuation-in-part of Ser. No. 373,401, Jun. 30, 1989, Pat. No. 5,041,486, which is a continuation-in-part of Ser. No. 345,029, Apr. 28, 1989, Pat. No. 5,004,563, which is a continuation-in-part of Ser. No. 305,451, Feb. 1, 1989, Pat. No. 5,004,562. This application May 22, 1991, Ser. No. 704,286

Int. Cl.[5] C08K *3/10, 3/24*

U.S. Cl. 524—403 45 Claims

1. A method for preparing a product surface coating composition having a corrosion-inhibiting property, said method comprising the step of admixing a sol or gel composition containing a sufficient concentration of a salt in the form of cations, anions, or colloidal salt particulates to inhibit corrosions of a metal-containing substrate with a composition containing a polymer to produce a product surface coating composition or a surface coating precursor composition, said product surface coating composition or a product surface coating composition derived from said surface coating precursor composition both having a corrosion inhibiting property which is greater than that of the same product surface coating composition prepared without said salt from said sol or gel composition.

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PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS WITH SILICON BORIDE

Leonard M. Niebylski, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 151,272, Feb. 1, 1988, abandoned. This application Oct. 24, 1988, Ser. No. 261,612

Int. Cl.[5] C08K *3/38;* B32B *9/09*

U.S. Cl. 524—404 14 Claims

1. An intimate dispersion of about 0.1–4 parts by weight of silicon boride in one part by weight of a polysilazane in solution in organic solvent.

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THERMOPLASTIC COMPOSITIONS FOR PRODUCING METALLIC MOLDINGS

Hans-Josef Sterzel, Dannstadt-Schauernheim, and Johan H. H. ter Maat, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 28, 1991, Ser. No. 662,431

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1990, 4007345

Int. Cl.[5] C08K *3/08*

U.S. Cl. 524—439 16 Claims

1. A thermoplastic composition for producing a metallic molding, containing

A) 40–65% by volume of a sinterable pulverulent metal or of a pulverulent metal alloy or of a mixture thereof,

B) 35–60% by volume of a mixture of

B1) 85–95% by weight of a polyoxymethylene homopolymer or copolymer and

B2) 4–15% by weight of a polymer homogeneously dis-

solved in B1) or dispersed therein with an average particle size of less than1 μm, as binder, and
C) 0–5% by volume of a dispersant,
wherein component B2) is an aliphatic uncrosslinked polyepoxide, an aliphatic polyamide or polyacrylate or a mixture thereof.

5,198,490
AQUEOUS SHEET SILICATE DISPERSIONS, USE OF THESE DISPERSIONS AS COATING ASSISTANTS AND WATER-DILUTABLE COATING COMPOSITIONS CONTAINING SHEET SILICATES
Ralf Berg, Munster, and Bodo Muller, Wurzberg, both of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Munster, Fed. Rep. of Germany
PCT No. PCT/EP88/00155, § 371 Date Oct. 16, 1989, § 102(e) Date Oct. 16, 1989, PCT Pub. No. WO88/07070, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 3, 1988, Ser. No. 399,482
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707388
Int. Cl.[5] C08F 37/18; C09D 17/00
U.S. Cl. 524—443 14 Claims
1. A dispersion comprised of a sheet silicate;
an aqueous dispersant, and
a protective colloid comprised of a poly(propylene oxide) homopolymer having a mean molecular weight of from 400–1,000, composed of straight-chain molecules and containing on average two hydroxyl groups per molecule.

5,198,491
COOKING UTENSILS SURFACE COATED WITH TETRAFLUOROETHLENE BASE POLYMER
Norimasa Honda, Ibaraki; Matsusuke Namba, Settsu, and Yoshiaki Katsuka, Osaka, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan
Continuation of Ser. No. 466,780, Jan. 18, 1990, abandoned, which is a division of Ser. No. 376,230, Jul. 3, 1989, Pat. No. 4,914,146, which is a continuation of Ser. No. 76,020, Jul. 21, 1987, abandoned. This application May 22, 1992, Ser. No. 887,605
Claims priority, application Japan, Jul. 21, 1986, 61-172350; Jan. 5, 1987, 62-642
Int. Cl.[5] C08K 3/34; C08L 27/12; A47J 37/10
U.S. Cl. 524—449 8 Claims
1. A cooking utensil, a surface of which is coated with a layer comprising tetrafluoroethylene base polymer having a molecular weight of at least 5,000,000 and an effective amount of not more than 20% by weight based on the weight of the base polymer of an organic polymer for improving the adhesivity and/or surface smoothness.

5,198,492
LOW VISCOSITY, FAST CURING BINDER FOR CELLULOSE
Dennis P. Stack, Santa Ana, Calif., assignor to Rohm and Haas Company, Philadelphia, Pa.
Division of Ser. No. 310,245, Feb. 13, 1989. This application Sep. 28, 1990, Ser. No. 590,289
Int. Cl.[5] C08J 3/03
U.S. Cl. 524—501 64 Claims
1. A fast curing binder for nonwoven cellulosic materials, said binder comprising an aqueous dispersion of discrete particles of a highly functionalized emulsion copolymer formed by the compolymerization of a mixture of comonomers comprising:
(1) one or more water insoluble polymerizable olefinically unsaturated non-ionic organic compounds;
(2) one or more water soluble olefinically unsaturated organic compounds having at least one carboxylate group therein; and
(3) one or more water soluble olefinically unsaturated carboxylic acid hydroxy esters or water soluble olefinically unsaturated amides or a mixture thereof; said aqueous dispersion of discrete particles of highly functionalized emulsion copolymer being admixed with a latex selected from the group consisting of styrene-butadiene resin (SBR) copolymer latexes, vinyl acetate/acrylate copolymer latexes, and all-acrylate copolymer latexes.

5,198,493
METHOD OF COVALENTLY BONDING BIOPOLYMER TO A SOLID HYDROPHILIC ORGANIC POLYMER
Krister Holmberg, Molndal, and Karin Bergstrom, Kungliv, both of Sweden, assignors to Berol Nobel AB, Stenungsund, Sweden
Filed Sep. 13, 1991, Ser. No. 759,018
Claims priority, application Sweden, Sep. 13, 1990, 9002909
Int. Cl.[5] C08H 5/12; C08L 89/00, 1/00
U.S. Cl. 525—54.1 11 Claims
1. A process for covalently bonding biopolymer to an organic polymer surface coated with a hydrophilic nonionic organic polymer surface having groups reactive with the biopolymer which comprises reacting biopolymer with the reactive groups of the nonionic hydrophilic polymer in a nonpolar reaction medium having a dielectric constant less than 10% of the dielectric constant of water.

5,198,494
ADHESIVE RESIN COMPOSITION, LAMINATE COMPRISING THIS COMPOSITION AS ADHESIVE LAYER
Hideshi Kawachi; Masaharu Mito, and Mikio Nakagawa, all of Kaga, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed May 23, 1991, Ser. No. 704,889
Claims priority, application Japan, May 28, 1990, 2-138023
Int. Cl.[5] C08G 63/91
U.S. Cl. 525—71 8 Claims
1. An adhesive resin composition consisting essentially of 1 to 30 parts by weight of a graft copolymerized polypropylene grafted partially or totally with 0.01 to 15 percent by weight of an unsaturated carboxylic acid or its derivative and 100 parts by weight of a soft polymer, wherein said soft polymer is a styrene elastomer of a block copolymer consisting of ethylene-butylene block as an intermediate segment and polystyrene as a terminal segment.

5,198,495
BLENDS BASED ON VINYL-AROMATIC POLYMERS ENDOWED WITH HIGH MECHANICAL CHARACTERISTICS
Gian C. Fasulo; Dario Ghidoni; Andrea Callaioli, and Andrea Licon, all of Mantova, Italy, assignors to Montedipe S.r.l., Milan, Italy
Filed Oct. 2, 1990, Ser. No. 591,687
Claims priority, application Italy, Oct. 3, 1989, 41008 A/89
Int. Cl.[5] C08L 51/04, 53/00, 53/02, 23/00
U.S. Cl. 525—71 14 Claims
1. A blend based on aromatic vinyl polymers endowed with high mechanical properties even after successive processings at temperatures equal to or higher than 200° C. and unvaried rheological properties, comprising:
from 10 to 90% by weight of a vinyl aromatic polymer (A) containing, as an elastomer component, from 0.5 to 5% by weight of a vinyl aromatic monomer-conjugated linear block copolymer and from 5 to 15% of a dienic rubber;
from 5 to 50% by weight of a polyolefin (B); and
from 5 to 40% by weight of a vinyl aromatic monomer-conjugated diene radial block star-shaped polymer (C) characterized by having a diene amount comprised of between 5 and 35% by weight; the sum of the above three components being equal to 100%.

5,198,496
PROCEDURE FOR THE OBTENTION OF THERMOPLASTIC ELASTOMER MIXTURES
Juan M. A. Alvarez; Eusebio F. Miron, and Jose M. T. Lopez, all of Madrid, Spain, assignors to Pepsol Quimica S.A., Madrid, Spain
Filed Dec. 13, 1990, Ser. No. 627,940
Claims priority, application Spain, Dec. 14, 1989, P8904216
Int. Cl.[5] C08L 23/04, 53/02, 33/06
U.S. Cl. 525—93 8 Claims
1. A process for obtaining thermoplastic elastomer mixtures, characterized by dynamic vulcanization at temperatures between approximately 125° and 250° C., with the aid of a free radical generating agent of a mixture comprising:
a) 95–60% by weight of at least one of several thermoplastic block copolymers of a monoalkenylarene and a coupled diene, having at least two end blocks of monoalkenylarene polymer A and at least a middle block of a polymer of coupled diene D, the content of said block A being within the approximate limits of 8 and 55% by weight with respect to the copolymer, whose flow rate, as determined by ASTM D 1238 (condition B), must exceed 0.01; and
b) 5–40% by weight of at least one of several copolymers of ethylene and vinyl acetate containing approximately between 5 and 50% by weight of vinyl acetate, and with a flow rate, as determined by ASTM D 1238 (condition B), between approximately 0.1 and 50.

5,198,497
POLYOLEFIN, RUBBER AND EVA-MALEIC ANHYDRIDE TERPOLYMER BLEND
Sanbhaya C. Mathur, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 30, 1991, Ser. No. 814,166
Int. Cl.[5] C08L 23/08, 23/14, 23/16; C08K 5/01
U.S. Cl. 525—108 14 Claims
1. A multicomponent blend comprising (a) about 50 to 90 wt. % of a thermoplastic polyolefin; (b) about 5 to 45 wt. % of a rubber other than said thermoplastic polyolefin that does not vulcanize in the presence of epoxy compounds, and (c) about 5 to 30 wt. % of ethylene-vinyl acetate-maleic anhydride terpolymer, all percentages based on the total of (a), (b) and (c) wherein the ethylene-vinyl acetate-maleic anhydride terpolymer has been dynamically vulcanized in the presence of the other components using an epoxy crosslinking agent.

5,198,498
LIGHT-STABILIZED BINDERS FOR COATING COMPOSITIONS
Andreas Valet, Eimeldingen, Fed. Rep. of Germany; Roger Meuwly, Givisiez, and Mario Sloaga, Tafers, both of Switzerland, assignors to Clba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 647,595, Jan. 29, 1991, abandoned. This application Jan. 9, 1992, Ser. No. 815,887
Claims priority, application Switzerland, Feb. 6, 1990, 377/90
Int. Cl.[5] C08F 8/30; C08L 33/08, 33/10, 61/28
U.S. Cl. 525—125 8 Claims
1. A curable composition comprising
(a) a fluorine-containing copolymer,
(b) a (meth)acrylic copolymer, and
(c) at least one curing agent, each of which two said copolymers contains functional groups which are able to react with the curing agent,
wherein only component (a) contains a UV absorber which is a derivative of 2-(2-hydroxyphenyl)benzotriazole or of o-hydroxyphenyl-s-triazine in copolymerised form.

5,198,499
CROSS-LINKED POLYMERS FROM VINYL BENZENE SULFONATE SALTS, ETHYLENIC HYDROXY MONOMERS AND HYDROXYL CONTAINING BINDER POLYMERS
Charles C. Anderson, Rochester, and Raymond T. Jones, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 527,414, May 23, 1990, Pat. No. 5,096,975. This application Nov. 18, 1991, Ser. No. 793,891
Int. Cl.[5] C08L 41/00
U.S. Cl. 525—201 12 Claims
1. A conductive cross-linked polymer comprising from about 20 to about 50 percent by weight of an hydroxyl containing binder polymer, the reaction product of a water-soluble electrically conductive polymer having functionally attached hydroxyl groups and being an addition product of (1) an ammonium or alkali metal salt of a vinylbenzene sulfonic acid and (2) an ethylenically unsaturated monomer containing at least one primary hydroxyl group and a methoxyalkylmelamine. r

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5,198,500
PROCESS FOR PREPARING CROSSLINKED RESIN PARTICLES
Hisaichi Muramoto, Hirakata; Yusuke Ninomiya, Nishinomiya; Keizou Ishii, Ashiya, and Shinichi Ishikura, Tsuzuki, all of Japan, assignors to Nippon Paint Co., Ltd., Japan
Filed Jan. 15, 1991, Ser. No. 641,301
Claims priority, application Japan, Jan. 16, 1990, 2-6576
Int. Cl.[5] C08F 279/02, 255/10; C08L 31/02, 63/00
U.S. Cl. 525—244 15 Claims
1. A process for preparing crosslinked resin particles by a post-emulsion method comprising
(a) dispersing in an aqueous medium a resinous component comprising
(I) a base resin having a glass transition temperature (Tg) of 0 ° C. or less and a polymerizable double bond,
(II) a monomer which, when polymerized, provides a resin of which Tg is 20 ° C. higher than that of said base resin, or a resin of which Tg is 20 ° C. higher than that of said base resin, and
(III) a polyvinyl compound
(b) crosslinking inside the dispersed resinous component and
(c) removing said aqueous medium therefrom.

5,198,501
IN-SITU POLYMERIZED BLENDS OF VINYL ACETATE/ETHYLENE COPOLYMAR AND POLY(VINYL CHLORIDE)
Richard H. Bott; Lloyd M. Robeson, both of Macungie; Hsueh-Chi Lee, Allentown, and Cajetan F. Cordeiro, Kutztown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Aug. 20, 1990, Ser. No. 570,071
Int. Cl.[5] C08L 27/06; C08F 2/18, 114/06, 118/08
U.S. Cl. 525—266 10 Claims
1. A method of making a blend of poly(vinyl chloride) and vinyl acetate/ethylene copolymer which comprises copolymerizing vinyl acetate and ethylene in a suspension or dispersion system in the presence of porous particles of poly(vinyl chloride) under conditions and monomer proportions to form a vinyl acetate/ethylene copolymer containing 60 to 85 weight percent vinyl acetate.

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(a) 80 to 90 weight percent of polypropylene fluff having a

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5,198,502
THERMOPLASTIC ELASTOMER COMPOSITION, METHOD FOR MOLDING THE SAME AND MOLDED ARTICLE OF THE SAME

Masayoshi Tatemoto, Osaka, Japan, assignor to Daikin Industries Ltd., Osaka, Japan

Continuation of Ser. No. 529,569, May 29, 1990, abandoned. This application Apr. 9, 1992, Ser. No. 866,214
Claims priority, application Japan, May 29, 1989, 1-136383
Int. Cl.[5] C08F 259/08, 297/04, 297/08; C08J 3/24
U.S. Cl. 525—276 12 Claims

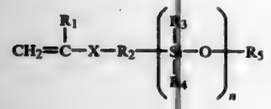
1. A method for molding a thermoplastic elastomer composition comprising a thermoplastic elastomeric block or graft polymer of hydrocarbons or fluorocarbons composed of at least one hard segment and at least one soft segment and a vulcanizing agent, which method comprises treating said composition under a high shearing stress of from 100 to 1000 kg/cm^2 at a temperature lower than a melting or softening point of the hard segments to obtain a molded article having a smooth surface.

5,198,503
CURABLE COMPOSITION

Nobushige Numa, Ebina; Kaoru Morita, and Yasushi Nakao, both of Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

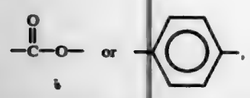
Continuation of Ser. No. 488,446, Feb. 27, 1990, abandoned, which is a continuation of Ser. No. 245,436, Sep. 16, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 617,309
Claims priority, application Japan, Sep. 17, 1987, 62-234508; Oct. 6, 1987, 62-253238
Int. Cl.[5] C08F 255/02
U.S. Cl. 525—288 3 Claims

1. A curable composition comprising:
(a) a nonaqueous dispersion of a particulate polymer insoluble in an organic liquid, wherein said nonaqueous dispersion of said particulate polymer is prepared by polymerization of a radical-polymerizable unsaturated monomer in a liquid phase which comprises said organic liquid and a dispersion stabilizer resin, said polymerization of the radical-polymerizable unsaturated monomer resulting in said particulate polymer which is dispersed in said liquid phase, wherein the stabilizer resin is a copolymer consisting essentially of a hydroxyl-containing unsaturated monomer and an alkoxysilane-containing vinyl monomer which is a compound represented by the formula



(I)

wherein X is



R_1 is a hydrogen atom or methyl, R_2 is a bivalent saturated aliphatic hydrocarbon group having 1 to 6 carbon atoms, R_3 and R_4 are the same or different and are each phenyl, alkyl having 1 to 6 carbon atoms or alkoxyl having 1 to 10 carbon atoms, R_5 is alkyl having 1 to 10 carbon atoms, and n is an integer of from 1 to 100; and
(b) a chelate compound serving as a cross-linking curing agent admixed with the nonaqueous dispersion.

5,198,504
THERMOPLASTIC ELASTOMERS COMPRISING VINYL HALIDE GRAFTED TO CROSSLINKED ACRYLIC LATEXES

Roman W. Wypart, Avon Lake; Vic Stanislawczyk, North Ridgeville; Miles B. Dearth, Brecksville, and Douglas E. Skillicorn, Elyria, all of Ohio, assignors to The B. F. Goodrich Company, Brecksville, Ohio

Division of Ser. No. 546,168, Jun. 28, 1990, Pat. No. 5,175,216. This application Sep. 28, 1992, Ser. No. 931,803
Int. Cl.[5] C08F 265/04, 265/02
U.S. Cl. 525—301 9 Claims

1. A process for preparing a thermoplastic elastomer resin which comprises
(A) preparing a crosslinked acrylic latex by polymerizing in water, a mixture comprising at least 40 parts by weight per 100 weight parts of said latex of one acrylic monomer of formula I

$$CH_2{=}C(R_1)C(O)OR_2 \quad (I)$$

wherein
R_1 is hydrogen or methyl; and R_2 is an alkyl group containing from 1 to 20 carbon atoms, an alkoxy alkyl or alkyl thioalkyl group containing from 2 to about 7 carbon atoms, or a cyano alkyl group containing from 2 to about 7 carbon atoms, at least one multifunctional crosslinking monomer, an initiator, and upto 20 phm of at least one alpha, beta-unsaturated dicarboxylic acid while delaying the addition of at least a portion of the crosslinking monomer until a portion of the acrylate monomers has polymerized;
and when at least a portion of the acrylate monomer has polymerized, adding additional multifunctional crosslinking monomer to the initial mixture as the polymerization procedes to completion;
(B) grafting from about 10 to about 40 weight parts of a vinyl halide monomer to from about 60 to 90 weight parts of the crosslinked latex prepared in step (A) in water in the presence of at least one second initiator to form an aqueous mixture containing the thermoplastic elastomer resin provided that the dicarboxylic acid repeating units are optional when the elastomer resin contains less than about 35% by weight of vinyl halide; and
(C) recovering the thermoplastic elastomer resin from the aqueous mixture.

5,198,505
UNIFORM POLYVINYLIDENE DIFLUORIDE MEMBRANES

Ioannis P. Sipsas, Forest Hills; Isaac Rothmann, Brooklyn, and Irving Joffee, Huntington, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Apr. 11, 1991, Ser. No. 683,817
Int. Cl.[5] C08F 14/22; B01D 71/34
U.S. Cl. 525—326.2 6 Claims

1. A heat-treated, hydrophobic, polyvinylidene difluoride membrane having uniform crystallinity as evidenced by a difference in crystallinity over the membrane of less than about 10 percent.

5,198,506
HIGH ORGANIC PEROXIDE CONTENT POLYPROPYLENE

John D. Adams, Vermillion, Ohio, and Richard H. Dorn, Spring, Tex.; Mark J. King, Elyria, Ohio; Jack L. Kulasa, Houston; Nicholas J. Motto, Spring, both of Tex.; Leonard J. Ostanek, West Chester, Pa.; and Daniel F. Petticord, Lorain, Ohio., assignors to Phillips Petroleum Company, Bartlesville Okla.

Filed May 10, 1991, Ser. No. 698,509
Int. Cl.[5] C08F 8/00
U.S. Cl. 525—333.8 11 Claims

1. A homogeneous, free-flowing, composition of matter consisting essentially of:

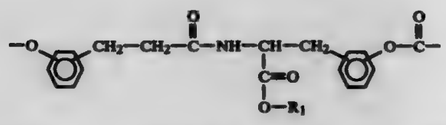
(a) 80 to 90 weight percent of polypropylene fluff having a particle size between 100 and 500 microns; and
(b) 10 to 20 weight percent of a liquid organic peroxide; where the weight percents are based on the weight of (a) plus (b).

5,198,507
SYNTHESIS OF AMINO ACID-DERIVED BIOERODIBLE POLYMERS

Joachim B. Kohn, Highland Park, and Satish K. K. Pulapura, Piscataway, both of N.J., assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.

Division of Ser. No. 536,425, Jun. 12, 1990, Pat. No. 5,099,060. This application Dec. 9, 1991, Ser. No. 804,767
Int. Cl.[5] C08L 69/00, 77/04; C08G 64/12, 69/10
U.S. Cl. 525—432 7 Claims

1. An amino acid-derived polycarbonate comprised of one or more recurring structural units represented by the formula:



wherein R_1 is an alkyl group up to 18 carbon atoms in length.

5. A polymer blend comprising a first polymer comprising a polycarbonate, prepared by polymerizing a diphenol starting material with phosgene, and a second polymer comprising apolyiminocarbonate, prepared by polymerizing a diphenol starting material with a reactant selected from the group consisting of cyanogen bromide and dicyanates, wherein said first and second polymers are derived from the same diphenol starting material and wherein said diphenol is an amino acid derivative.

5,198,508
RESIN COMPOSITIONS AND MOLDED ARTICLES

Hiroshi Ueda, Yokohama; Yoshio Yoshida, Machida; Hiroshi Inoue; Toshikazu Kaneda, both of Yokohama; Toshiaki Moriya, Sagamihara, and Tsutomu Kumazawa, Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Sep. 17, 1991, Ser. No. 760,923
Claims priority, application Japan, Sep. 18, 1990, 2-246282
Int. Cl.[5] C08L 75/00
U.S. Cl. 525—454 20 Claims

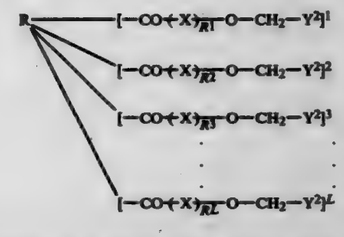
1. A resin composition which comprises a product prepared by the reaction of
(a) a prepolymer prepared by reacting at least one member selected from the group consisting of a hydroxy fatty acid ester and a mixture of a hydroxy fatty acid ester and a polyether polyol with a diisocyanate,
with
(b) a member selected from the group consisting of a polyamine-polyimine component selected from the group consisting of aromatic polyamines, polyether polyamines and polyether polyimines and a mixture of the polyamine-polyimine component and a polyether polyol,
at least two equivalents of component (b) being reacted with one equivalent of component (a).

5,198,509
LACTONE-MODIFIED ALICYCLIC COMPOSITION AND AN EPOXIDIZED COMPOSITION THEREOF

Takaaki Fujiwa; Shin Takemoto, both of Otake; Tomohisa Isobe, Iwakuni, and Yoshiyuki Harano, Otake, all of Japan, assignors to Daicel Chemical Industries, Ltd., Tokyo, Japan

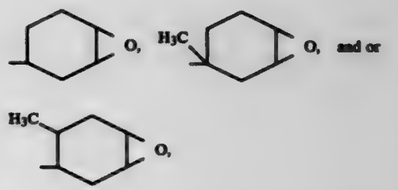
Division of Ser. No. 728,114, Jul. 10, 1991. This application Jun. 8, 1992, Ser. No. 895,360
Claims priority, application Japan, Jul. 10, 1990, 2-182124; Aug. 17, 1990, 2-216569; Nov. 2, 1990, 2-298482; Nov. 9, 1990, 2-305829
Int. Cl.[5] C08G 59/16; C08L 63/00, 63/10; C08F 2/46; C07D 303/00
U.S. Cl. 525—523 8 Claims

1. A curable composition consisting essentially of a composition which comprises a compound of the formula (II):

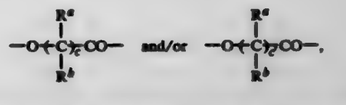


(II)

wherein, R is an alkyl group, an aromatic group or an alkenyl group having carbon number of from 1 to 30, Y^2 is at least one of the structural groups;



X is the structural group derived from a lactone;



R^a and R^b each independently is hydrogen or a methyl group, c and c' is a number of from 4 to 8, from n1 to nL is 0 or a number of more than 0, respectively, n1+n2+n3+ . . . +nL is 1 or a number of more than 1, which corresponds to the total mole numbers of a lactone introduced into one molecule and an epoxy resin curing agent.

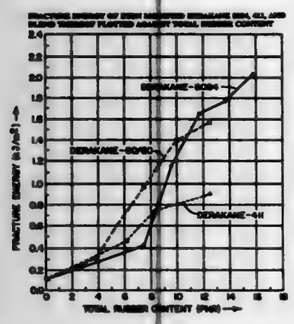
5,198,510
MODIFICATION OF VINYL ESTER RESINS WITH REACTIVE LIQUID POLYMERS

Alan R. Siebert, Orange Village, and C. Dale Gailey, Medina, both of Ohio, assignors to The BF Goodrich Company, Brecksville, Ohio

Continuation-in-part of Ser. No. 515,793, Apr. 27, 1990, Pat. No. 5,053,496. This application Jan. 22, 1991, Ser. No. 641,703
Int. Cl.[5] C08F 283/00; C08G 59/46
U.S. Cl. 525—531 25 Claims

1. A toughened cured vinyl ester resin composition comprising:
a cured admixture of a prereacted vinyl ester base resin

having a reactive liquid polymer reacted into its backbone; and



an effective amount of a reactive liquid polymer additive to improve the fracture energy of the cured vinyl ester resin composition by an amount greater than about 1.2 times the base resin.

5,198,511

POLYMERIZABLE COMPOSITIONS CONTAINING OLEFIN METATHESIS CATALYSTS AND COCATALYSTS, AND METHODS OF USE THEREFOR

Katherine A. Brown-Wensley, Lake Elmo, Wash.; Michael C. Palazzotto, St. Paul, Minn.; William M. Lamanna, Stillwater, Minn.; Larry D. Boardman, Shoreview, Minn.; John E. Gozum, Woodbury, Minn., and Fred B. McCormick, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 20, 1991, Ser. No. 811,785
Int. Cl.[5] C08F *4/06*
U.S. Cl. 526—113 **13 Claims**

1. A polymerizable composition comprising

a) at least one ring-strained non-conjugated cyclic olefin, and

b) a two-part transition metal containing catalyst which is air and moisture stable, which consists of

(1) at least one transition metal-containing catalyst provided that the oxidation state of the transition metal is in the range of +3 to 0,

(2) a cocatalyst selected from the group consisting of oxidative salts and oxidative compounds containing an oxygen to non-oxygen double bond.

5,198,512

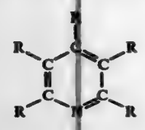
POLYMERIZATION CATALYST AND PROCESS

Margie F. Jackson, Ochelata; Ronald D. Knudsen, and Joseph S. Shveima, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 16, 1991, Ser. No. 808,128
Int. Cl.[5] C08F *4/80*
U.S. Cl. 526—130 **20 Claims**

1. A process comprising contacting, under polymerization conditions, at least one alpha-olefin, with a catalytic mixture resulting from contacting

at least one pyridine compound having the formula



wherein each R is independently selected from the group consisting of hydrogen and —COOH, provided that at least one R group is a —COOH group,

at least one organo-nickel compound wherein the nickel is in the zero valence state or said nickel is able to undergo reduction the zero valence state before formation of the active nickel component, and

at least one clay compound wherein the weight ratio of said clay compound to said nickel is from about 1 to about 500.

5,198,513

REACTIVE COMPOUNDS CONTAINING PERFLUOROVINYL GROUPS

Katherine S. Clement; David A. Babb; Bobby R. Ezzell, and W. Frank Richey, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 364,666, Jun. 9, 1989, Pat. No. 5,037,919.
This application Mar. 12, 1991, Ser. No. 668,294
Int. Cl.[5] C08F *12/20, 12/30, 12/22, 259/08*
U.S. Cl. 526—242 **29 Claims**

1. A reaction product of a compound having a structure represented by Formula I:

$$(G)_n\text{-}R\text{-}(X\text{—}CF\text{=}CF_2)_m$$

wherein R represents an optionally substituted hydrocarbyl group, X represents any group which links R and a perfluorovinyl group; n is the number of G groups, m is the number of —(XCF=CF_2) groups, and G represents any reactive functional group or a group convertible into a reactive functional group and a polymer wherein the reaction between the compound and the polymer takes place at G on the compound.

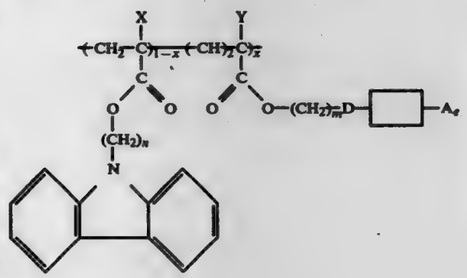
5,198,514

AMORPHOUS COPOLYMERS FOR PHOTOREFRACTIVE COMPOUNDS USED IN OPTICAL SIGNAL PROCESSING

Pierre Le Barny, Orsay; Dominique Broussoux, Marcoussis, and Jean-Claude Dubois, St. Remy les Chevreuses, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Jul. 23, 1991, Ser. No. 734,673
Claims priority, application France, Jul. 31, 1990, 90 09740
Int. Cl.[5] C08F *226/06*
U.S. Cl. 526—259 **2 Claims**

1. An amorphous copolymer for photorefractive compounds having the following chemical formula:



where:

X=H, CH_3, Cl or F

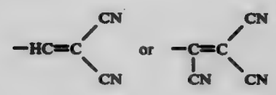
Y=H, CH_3, Cl or F $2 \leq n \leq 4$

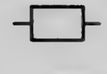
$2 \leq m \leq 4$

D is an electron donor group comprising —O—, —S—,

where $0 \leq p \leq 3$, or —COO—

A_e is an electron-acceptor group comprising —CN, $-NO_2$,

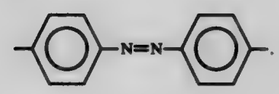




is a system rich in π conjugated electrons comprising:

where: $1 \leq y \leq 3$

or



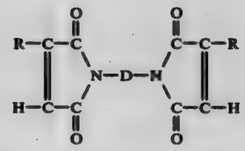
5,198,515

BISCITRACONIMIDE COPOLYMERS WITH OLEFINICALLY UNSATURATED MATERIALS

Andreas P. van Swieten, Velp; Auke G. Talma, Bathmen, and Peter Hope, Twello, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

PCT No. PCT/EP90/01077, § 371 Date Jan. 30, 1992, § 102(e) Date Jan. 30, 1992, PCT Pub. No. WO91/02013, PCT Pub. Date Feb. 21, 1991
PCT Filed Jul. 6, 1990, Ser. No. 828,922
Claims priority, application European Pat. Off., Aug. 3, 1989, 89202023.1
Int. Cl.[5] C08F *22/40*
U.S. Cl. 526—262 **15 Claims**

1. A composition comprising at least one biscitraconimide having the formula



(I)

wherein D is a divalent group, R is CH_2—R_1, and R_1 is selected from the group consisting of hydrogen and alkyl groups having 1 to 18 carbon atoms; at least one olefinically unsaturated material; selected from the group consisting of styrene, α-methyl styrene, β-pinene, indene, divinyl benzene, propenyl benzene, isopropenyl benzene, substituted styrenes, triallyl cyanurate, triallyl isocyanurate, stilbene, dibenzalacetone and mixtures thereof; and from 0–15 mole percent based on the biscitraconimide of the formula I of a cocurable material selected from the group consisting of bismaleimides, citraconic maleimides, and itaconic maleimides; wherein the mole ratio of said biscitraconimide of the formula I, to said olefinically unsaturated material is from 0.12 to 4.0.

5,198,516

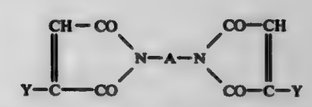
THERMALLY STABLE BISIMIDO/P-ALLYLANILINE COPOLYMERS

Yves Camberlin, Caluire; Rene Dieu, Millery, and Philippe Michaud, Lyons, all of France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 16, 1991, Ser. No. 730,537
Claims priority, application France, Jul. 16, 1990, 90 09271
Int. Cl.[5] C08F *22/40*
U.S. Cl. 526—262 **17 Claims**

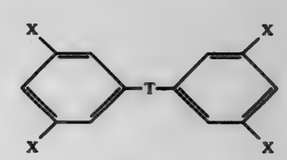
1. A bisimido/allylaniline polymer comprising the copolymerizate of:

(a) at least one N,N'-bisimide having the formula:

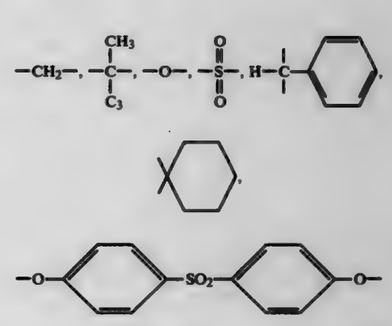


(I)

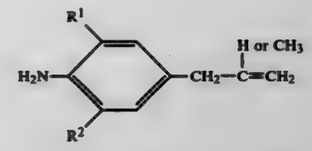
in which the symbol Y is H, CH_3 or Cl; the symbol A is a cyclohexylene, phenylene, 4-methyl-1,3-phenylene, 2-methyl-1,3-phenylene, 5-methyl-1,3-phenylene, 6-methyl-1,3-phenylene, 2,5-diethyl-3-methyl-1,4-phenylene, or a radical of the formula:



in which T is a single valence bond or a group:



and X is a hydrogen atom, a methyl, ethyl or isopropyl radical, with (b) at least one p-allylaniline having the formula:



(II)

in which the groups R^1 and R^2, which may be identical or different, are each a C_1–C_4 alkyl radical.

5,198,517

POLYMERIC SCAVENGERS FOR OXIDIZED DEVELOPING AGENTS AND PHOTOGRAPHIC ELEMENTS CONTAINING THE SAME

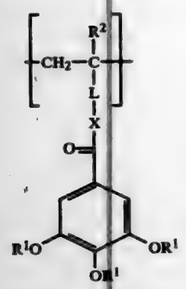
Ralph B. Nelson, Rochester; Lan B. Thai, Penfield, and Hweiling Yau, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1991, Ser. No. 740,732

Int. Cl.[5] C08F *216/10, 230/04, 230/08, 228/02, 220/54*

U.S. Cl. 526—313 **27 Claims**

1. A reducing agent for photographic systems comprising a polymer having at least 1 mol % of a subunit represented by



(I)

wherein R^1 represents a hydrogen atom or a group which may be cleaved to give a hydrogen atom, R^2 is hydrogen, an alkyl group or halogen atom, and X and L together represent a divalent linking group to the polymer.

5,198,518

PREPARATION OF POLYORGANOSILOXANE RESINS

Kenji Yamamoto, and Ken-Ichi Isobe, both of Annaka, Japan, assignors to Shin-Etsu Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1991, Ser. No. 791,673

Claims priority, application Japan, Nov. 15, 1990, 2-309533

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—12 **5 Claims**

1. A method for preparing a polyorganosiloxane resin, and removing by-product alcohol therefrom, comprising the steps of

effecting hydrolytic condensation of an organoalkoxysilane and/or an oligomer thereof, the reaction mixture resulting from the hydrolytic condensation step containing an alcohol by product,

adding a lowly volatile, weakly acidic compound to the reaction mixture for adjusting the reaction mixture to pH 2 to 5, and

distilling off the alcohol by-product from the reaction mixture.

5,198,519

SILAZANE POLYMERS AND METHOD OF MAKING SAME

P. V. Mosher, Redondo Beach, and K. Allen, Long Beach, both of Calif., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 25, 1991, Ser. No. 691,624

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—28 **11 Claims**

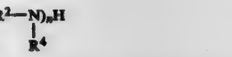
1. A method for preparing silazane polymers which comprises reacting under transamination conditions and in the absence of catalyst or accelerator;

A) one or more silicon amides represented by the general formula:

$((R^1)_2N)_a Si(R)_b$

wherein each R is independently hydrogen or a hydrocarbon group, each R^1 is a saturated hydrocarbon group, a is an integer from two to four, b is an integer from zero to two and the sum of a and b equals four; with

B) one or more polyamines represented by the general formula:



wherein each R^3 and R^4 is independently hydrogen or a hydrocarbon group, R^2 is a divalent hydrocarbon group, and n is at least 1.

5,198,520

POLYSILANES, POLYSILOXANES AND SILICONE RESIST MATERIALS CONTAINING THESE COMPOUNDS

Yasunobu Onishi; Shuji Hayase; Ruruko Horiguchi, all of Kanagawa, and Akiko Hirao, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

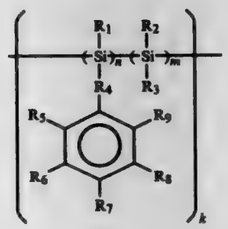
Division of Ser. No. 304,231, Jan. 31, 1989, Pat. No. 5,017,453, which is a continuation of Ser. No. 938,874, Dec. 8, 1986, Pat. No. 4,822,716. This application Mar. 21, 1991, Ser. No. 673,185

Claims priority, application Japan, Dec. 27, 1985, 60-293182; Mar. 31, 1986, 61-71107; May 21, 1986, 61-114673; Jun. 4, 1986, 61-128081

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—33 **8 Claims**

1. An alkaline soluble polysilane that contains a structure shown by the formula



(I)

wherein

substituent groups R_1 and to R_3 may be identical or may be different, each representing a hydrogen atom, an alkyl group with with 1 to 10 carbon atoms, or a nonsubstituted or substituted aryl group with 6 to 14 carbon atoms,

the substituent group R_4 represents an alkylene group with 1 to 10 carbon atoms or a nonsubstituted or substituted phenylene group with 6 to 14 carbon atoms,

and at least one of substituent groups R_5 to R_9 is a hydroxyl group, and the remaining groups other than the hydroxyl group among the substituent group R_5 to R_9 may be identical or may be different, each representing a hydrogen atom, a carboxyl group, alkoxy group with 1 to 10 carbon atoms, an alkyl group with 1 to 10 carbon atoms, or a nonsubstituted or substituted phenyl group with 6 to 14 carbon atoms,

and n and k represent positive integers and m represents zero or a positive integer.

5,198,521

CONDUCTIVE POLYURETHANE-UREA/POLYETHYLENE OXIDE POLYMER

Wendell A. Ehrhart, Red Lion; Nowaf Haiout, Lancaster; Kenneth K. Ko, West Grove, and David A. Smith, York, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 518,248, May 4, 1990, Pat. No. 5,077,330, which is a continuation of Ser. No. 237,315, Aug. 29, 1988, abandoned. This application Oct. 29, 1991, Ser. No. 781,002

The portion of the term of this patent subsequent to Dec. 31, 2006, has been disclaimed.

Int. Cl.[5] C08G *18/48*; C08K *3/10, 5/00*; D01H *5/86*

U.S. Cl. 528—048 **17 Claims**

1. A textile texturing or drafting element comprising a solid, thermoplastic polyurethane-urea/polyethylene oxide polymer which is the reaction product of reactants comprising (a) 30 to 95 parts by weight of polyethylene oxide diol per one hundred parts diol and diisocyanate, (b) 5 to 70 parts by weight of an aliphatic diisocyanate per one hundred parts of diol and diisocyanate and (c) 0.1 to 2,000 parts by weight of water per one hundred parts of diol and diisocyanate.

5,198,522

REACTION INJECTION MOLDING BASED ON DIETHYL METHYLENE DIPHENYL DIISOCYANATE

David D. Steppan, Gibsonia; Robson Mafoti, Pittsburgh, both of Pa., and William E. Slack, Moundsville, W. Va., assignors to Miles Inc., Pittsburgh, Pa.

Filed Dec. 19, 1991, Ser. No. 810,635

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—61 **6 Claims**

1. An improved polyurea system comprising a reaction product of a polyisocyanate and a polyamine and an amine chain extender, the improvement comprising the polyisocyanate containing diethyl methylene diphenyl diisocyanate, a prepolymer thereof or a mixture thereof, in an amount sufficient to slow down the reaction for use in a reaction injection molding.

5,198,523

GLOVE BOX FROM POLYURETHANE

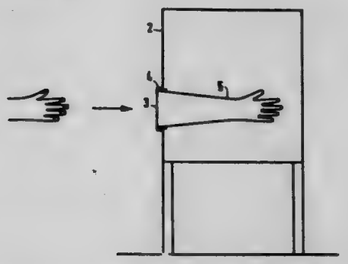
Siegfried Baumann, Karlstein; Wolfgang Dams, Zwingenberg, and Werner Wegner, Hofheim-Marxheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 758,352, Sep. 9, 1991, abandoned, which is a continuation of Ser. No. 222,269, Jul. 21, 1988, abandoned. This application Mar. 6, 1992, Ser. No. 847,794

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 8710058[U]

Int. Cl.[5] C08G *18/06*

U.S. Cl. 528—85 **8 Claims**



1. Glove box, comprising a housing having an opening formed therein, and a bag disposed on said housing covering said opening, said bag being single-layered and formed of weldable thermoplastic polyurethane with physically reversibly cross-linked fusible molecules.

5,198,524

MOISTURE-CURING ACRYLATE/EPOXY HYBRID ADHESIVES

Richard W. Bush, Columbia, and Eugene E. Carney, Sykesville, both of Md., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Apr. 22, 1991, Ser. No. 689,391

Int. Cl.[5] C08G *59/00*

U.S. Cl. 528—87 **10 Claims**

1. An adhesive composition exhibiting rapid moisture cure to provide green strength, comprising a mixture of:

a polyacrylate selected from the group consisting of a polyether urethane triacrylate, ethylene glycol diacrylate, diethylene glycol diacrylate, propylene glycol diacrylate, trimethylene glycol diacrylate, neopentyl glycol diacrylate, 1,3-butylene glycol diacrylate, 1,4-butylene glycol diacrylate, 1,6-hexamethylene glycol diacrylate, 1,10-decamethylene glycol diacrylate, trimethylolpropane triacrylate, pentaerythritol tetraacrylate, pentaerythritol triacrylate, and mixtures thereof;

a polyepoxy resin formed from an epoxy compound selected from the group consisting of monomeric and polymeric compounds and mixtures of compounds having an epoxy equivalent greater than one; and

a ketimine prepared from a polyamine and diisopropyl ketone, the ketimine selected from the group consisting of a triketimine prepared by the reaction of a tris(aminoalkyl-)amine having from 3 to 15 carbon atoms and diisopropyl ketone in a 1:3 molar ratio, a tetraketimine and mixtures thereof;

wherein the adhesive functions as a two-stage adhesive for adhering two substrates, providing an initial adhesive strength at ambient temperature and additional adhesive strength after curing at temperatures above ambient.

5,198,525

AROMATIC COPOLYETHER SULFONES

Knud Reuter, Krefeld; Wolfgang Jilge, Bergisch-Gladbach; Bernd Pittel, Heinsberg, and Günther Weymans, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 525,953

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917648

Int. Cl.[5] C08C *75/23, 8/02, 65/40*

U.S. Cl. 528—171 **5 Claims**

1. Aromatic polyether sulfones containing the following recurring structural unit:

—O—E—O—E'— (VIII)

in which —E'— is a bivalent residue of an aromatic ketone corresponding to formula (IXa)

(IXa)

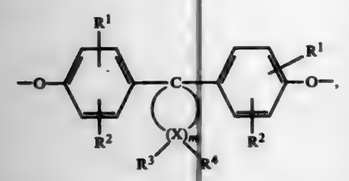
in which

Ar and Ar' are the same or different and represent bivalent aromatic radicals containing from 6 to 50 carbon atoms and in which

—O—E'—O— (Xa)

is a bivalent diphenolate residue, wherein from 5 to 90 mol-%

of the diphenolate residues of the formula (Xa) are those corresponding to formula (Ia)



(Ia)

in which

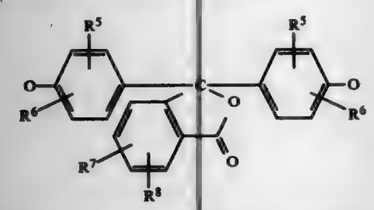
R^1 and R^2 independently of one another represent hydrogen, halogen, C_{1-8} alkyl, C_{5-6} cycloalkyl, C_{6-20} aryl and C_{7-12} aralkyl,

m is an integer of from 4 to 7,

R^3 and R^4 may be individually selected for each X and independently of one another represent hydrogen or C_{1-6} alkyl and

X represents carbon, with the proviso that, at at least one atom X, both R^3 and R^4 are alkyl,

10 to 95 mol-% of the diphenolate residues of the formula (Xa) are those corresponding to formula (IIa)



(IIa)

in which R^5, R^6, R^7 and R^8 have the same meanings as R^1 and R^2, but are independent of R^1 and R^2, and 0 to 85 mol-% of the diphenolate residues of the formula (Xa) are residues of other diphenols,

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5,198,526

HETEROCYCLE OLIGOMERS WITH MULTIDIMENSIONAL MORPHOLOGY

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 762,865, Sep. 18, 1991, Pat. No. 5,126,410, which is a division of Ser. No. 696,492, May 6, 1991, Pat. No. 5,082,905, which is a division of Ser. No. 544,273, Jun. 26, 1990, Pat. No. 5,120,819, which is a division of Ser. No. 116,592, Nov. 3, 1987, Pat. No. 4,965,336, which is a continuation-in-part of Ser. No. 816,490, Jan. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 651,826, Sep. 18, 1984, abandoned. This application Jun. 26, 1992, Ser. No. 904,865

Int. Cl.[5] C08F *283/00*; C08G *69/48, 73/02*

U.S. Cl. 528—183 10 Claims

1. A multidimensional, heterocycle oligomer comprising a compound of the general formula:

$$Ar-(M)_w$$

wherein

Ar=an aromatic hydrocarbon radical of valency w;

w=an integer greater than or equal to 3; and

M=a monovalent hydrocarbon radical having at least one heterocyclic linkage selected from the group consisting of oxazole, imidazole, or thiazole and at least one, terminal crosslinking functionality.

5,198,527

ARYLCYCLOBUTENE TERMINATED CARBONATE POLYMER

Maurice J. Marks; Alan K. Schrock, both of Lake Jackson, Tex., and Thomas H. Newman, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 633,740, Dec. 24, 1990, abandoned. This application Jun. 4, 1992, Ser. No. 894,033

Int. Cl.[5] C08G *64/04*

U.S. Cl. 528—198 40 Claims

1. A carbonate polymer prepared from one or more multihydric compounds and having an average degree of polymerization of at least about 2 based on multi-hydric compound and comprising polymerized therein from about 0.01 to about 1 mole of terminal arylcyclobutene-containing compound per mole of multi-hydric compound.

5,198,528

DIALLYL ETHER HIGH SOLIDS ALKYD

Arthur C. Smith, and Jeffrey H. Dauneman, both of Pensacola, Fla., assignors to Reichold Chemicals, Inc., Durham, N.C.

Filed Jan. 21, 1992, Ser. No. 823,161

Int. Cl.[5] C08G *63/20, 63/28;* C08L *67/08*

U.S. Cl. 528—272 5 Claims

1. An alkyd resin comprising a polymerized product of:

a) from 25 to 40 percent by weight of trimethylolpropane diallyl ether.

b) from 15 to 30 percent by weight of aromatic acid.

c) from 20 to 40 percent by weight drying compound; and

d) from 7 to 16 percent by weight polyol.

5,198,529

HIGH MOLECULAR UNSATURATED POLYESTER

Eiichiro Takiyama, Kamakura, and Yositaka Hatano, Higashikanbaragun, both of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

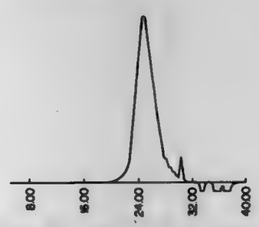
Filed Nov. 18, 1991, Ser. No. 793,135

Claims priority, application Japan, Nov. 16, 1990, 2-308810; Nov. 16, 1990, 2-308811; Nov. 16, 1990, 2-308812

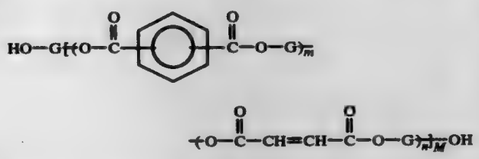
Int. Cl.[5] C08G *63/78*

U.S. Cl. 528—272 8 Claims

Mn = 2800



1. A high molecular weight unsaturated polyester having a number-average molecular weight of 5,000 or greater, said polyester being represented by a general formula:



wherein G denotes a glycol residue, m denotes 1 to 10, n denotes 1, and M denotes a number corresponding to a number-average molecular weight greater than 5,000.

5,198,530

PROCESS FOR CONTINUOUS POLYCONDENSATION OF TEREPHTHALIC ACID AND 1,4-BIS(HYDROXYMETHYL)CYCLOHEXANE

Manfred Kyber, Mainzl; Wolfgang Schmidt, Rodenbach, and Ulrich Thiele, Bruchkoebel, all of Fed. Rep. of Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 20, 1992, Ser. No. 853,974

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1991, 4137842

Int. Cl.[5] C08G *63/02, 63/78, 63/82*

U.S. Cl. 528—279 7 Claims

1. In a process for continuous production of polyesters having at least 80 mol % (1,4-cyclohexanedimethylene) terephthalate units, an intrinsic viscosity of at least 0.60 dL/g, less than 200 meq/kg bromine-titratable double bonds and less than 40 meq/kg free COOH groups, comprising:

a) feeding continuously into an esterification reactor a free flowing paste, at a temperature of 55°–80° C. of 1,4-bis(hydroxymethyl)cyclohexane (diol) and terephthalic acid (diacid), the molar ratio of diol: diacid being 1.0–1.5:1, said diol having a cis/trans isomer ratio of 20–40:80–60,

b) simultaneously feeding 1,4-bis(hydroxymethyl)cyclohexane heated to 50°–80° C. into said esterification reactor so that the total molar ratio of diol to acid is 1.2–2.0:1,

c) esterifying the mixture continuously to a conversion of 98.0 to 99.0% in the presence of 10 to 250 ppm Ti based on the diacid, at a temperature t_a in the range of 265°–305° C. and a pressure p_a in the range of 0.8–2.0 bar and a residence time d_a of 20–100 min. said Ti being in the form of an organic compound,

d) precondensing continuously the esterification mixture to a conversion of 99.4 to 99.7% at a temperature t_b in the range of 290°–305° C., a pressure p_b of 0.01 to 1.5 bar and a residence time d_b of 10–70 minutes,

e) polycondensing said precondensed mixture by adding to said precondensed mixture an additional 60–300 ppm of said Ti based on the diacid at a temperature $t_c \geq t_b$ in the range of 295°–310° C. in the absence of local temperature fluctuations of more than 5° C., a pressure p_c less than 1.5 mbar and a residence time d_c of 20–80 minutes sufficient to achieve a conversion corresponding to 50–95% of the maximum possible viscosity.

5,198,531

POLYMERIC RESIN FOR PEPTIDE SYNTHESIS

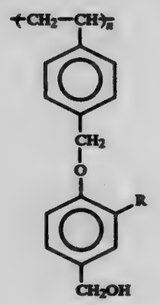
Robert Webber, and Mohandas Pal, both of Berkeley, Calif., assignors to Research Diagnostic Antibodies, Berkeley, Calif.

Filed Jun. 14, 1991, Ser. No. 715,561

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—332.2 8 Claims

1. A polymeric resin suitable for use in peptide synthesis consisting essentially of the formulae:



where "n" is the number of monomer units in the resin matrix, R is an alkyl or alkoxy group.

5,198,532

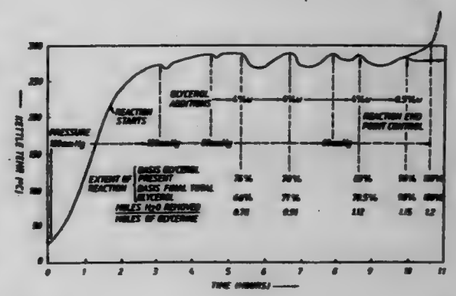
POLYCONDENSATION OF EPIHALOHYDRIN AND POLYHYDRIC ALCOHOLS AND THERMAL CONDENSATION TO FORM POLYETHERCYCLICPOLYOLS

George C. Blytas; Harry Frank, and Anne H. Zasich, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 672,202, Mar. 19, 1991, abandoned. This application Apr. 14, 1992, Ser. No. 869,098

Int. Cl.[5] C08G *65/04, 65/02*

U.S. Cl. 528—421 31 Claims



1. A method for preparing polyethercyclicpolyol by copolymerization and thermal condensation, comprising:

(a) heating a reaction mixture comprising a reactant selected from the group consisting of (1) a polyol having at least three hydroxyl groups of which at least two of the hydroxyl groups are vicinal, (2) precursors of the polyol, (3) cyclic derivatives of the polyol, and (4) mixtures thereof, said heating initiating the thermal condensation;

(b) removing water formed during the thermal condensation;

(c) continuing the thermal condensation until at least 1.05 moles of water per mole of reactant are removed, wherein the condensation goes to completion without incurring substantial undesirable degeneration; and

(d) prior to the condensation going to completion, admixing a epithalohydrin and an alkali metal hydroxide with the reaction mixture.

5,198,533

LHRH ANTAGONISTS

Andrew V. Schally, Metairie, and Sandor Bajusz, New Orleans, La., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation-in-part of Ser. No. 74,126, Jul. 17, 1987, abandoned. This application May 23, 1988, Ser. No. 197,153

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] C07K *7/20*

U.S. Cl. 530—313 2 Claims

1. A peptide having the formula:

$$X-R^1-R^2-R^3-Ser-Tyr-R^6-Leu-Arg-Pro-R^{10}-NH_2$$

wherein

X is acetyl,

R^1 is D-Nal(2),

R^2 is D-Phe(4Cl),

R^3 is D-Trp or D-Pal(3),

R^6 is D-Cit or D-Hci, and
R^{10} is D-Ala
and the pharmaceutically acceptable acid addition salts thereof.

5,198,534
PROCESS FOR PREPARATION OF ACTIVATED PROTEIN C BY IMMOBILIZED APROTININ CHROMATOGRAPHY

Marion Steinbuch, Voisin le Bretonneux; Jacques Chabbat, Paris, and Olivier Taby, Antony, all of France, assignors to Fondation Nationale de Transfusion Sanguine, Paris, France

PCT No. PCT/FR90/00258, § 371 Date Jan. 9, 1991, § 102(e) Date Jan. 9, 1991, PCT Pub. No. WO90/12028, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 10, 1990, Ser. No. 613,843
Claims priority, application France, Apr. 12, 1989, 89 04814; Feb. 20, 1990, 90 02028
Int. Cl.[5] C07K *3/20*
U.S. Cl. 530—381 14 Claims

1. A method for preparing activated protein C from a starting material containing said activated protein C, comprising:
(a) absorbing activated protein C on insolubilized aprotinin;
(b) washing the resulting absorbed activated protein C; and
(c) eluting activated protein C from said insolubilized aprotinin with a solution selected from the group consisting of an acid solution and a solution of a chaotropic agent.

5,198,535
PROTECTIVE MALARIA SPOROZOITE SURFACE PROTEIN IMMUNOGEN AND GENE

Stephen L. Hoffman, Gaithersburg; Yupin Charoenvit, Silver Spring, both of Md.; Richard Hedstrom, Cairo, Egypt; Srisin Khusmith, and William O. Rogers, IV, both of Rockville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1991, Ser. No. 638,431
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—350 2 Claims

1. A protein selected from the group consisting of recombinant and synthetic protein having the amino acid sequence shown in Sequence ID No. 2, fragments of that protein and homologs of that protein in other Plasmodium species selected from the group consisting of *Plasmodium yoelii, Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae,* and *Plasmodium ovale.*

5,198,536
PEPTIDES COMPRISING AN IMMUNOGENIC SITE OF POLIOVIRUS AND DNAS CONTAINING NUCLEOTIDE SEQUENCES CODING FOR THESE PEPTIDES

Marc Girard, and Sylvie Van Der Werf, both of Paris, France, assignors to Institut Pasteur, Paris Cedex, France

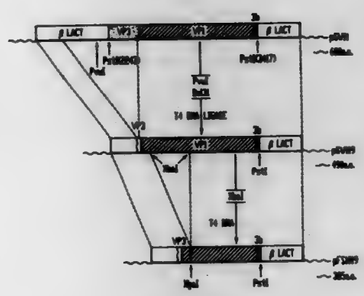
Division of Ser. No. 538,668, Jun. 15, 1990, Pat. No. 5,061,623, which is a division of Ser. No. 222,392, Jul. 21, 1988, Pat. No. 4,940,781, which is a continuation of Ser. No. 84,932, Aug. 13, 1987, abandoned, which is a division of Ser. No. 634,881, Jul. 27, 1984, Pat. No. 4,694,072. This application Jul. 15, 1991, Ser. No. 730,066
Claims priority, application France, Nov. 30, 1982, 82 20115; Jun. 29, 1983, 83 10778
Int. Cl.[5] C07K *17/02, 7/08;* A61K *39/385, 39/13*
U.S. Cl. 530—405 2 Claims

1. An immunogenic conjugate resulting from the covalent coupling of (a) a polypeptide having the sequence

Ser Arg Asp Ala Leu Pro Asn Thr Glu

Ala Ser Gly Pro Thr His Ser Lys Glu Ile

Pro Ala Leu Thr Ala Val Glu Thr Gly Ala



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Thr Asn Pro Leu Val Pro Ser Asp Thr Val

Gln Thr Arg His Val Val Gln His Arg Ser

Arg Ser Glu Ser Ser Ile Glu Ser Phe Phe

Ala Arg Gly Ala Cys Val Thr Ile Met Thr

Val Asp Asn Pro Ala Ser Thr Thr Asn Lys

Asp Lys Leu Phe Ala Val Trp Lys Ile Thr

Thr Lys Asp Thr Val Gln Leu Arg Arg Lys

Leu Glu Phe Phe Thr Tyr Ser

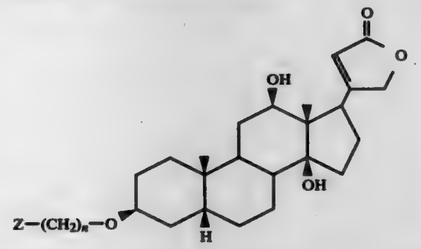
or fragments thereof and which polypeptide or fragments thereof can be recognized by monoclonal antibodies active both against particles "C" and "D" originating from a poliovirus and against the structural polypeptide VP-1 of the capsid of a poliovirus, said polypeptide of fragments thereof containing not more than 105 amino acids with (b) a carrier molecule.

5,198,537
DIGOXIGENIN DERIVATIVES AND USE THEREOF

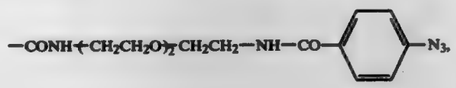
Erasmus Huber, Garching; Klaus Mühlegger, Polling; Herbert von der Eltz, Weilheim, and Bruno Zink, Staffelsee, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 25, 1989, Ser. No. 427,249
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836656
Int. Cl.[5] C07H *21/04;* C07D *41/00, 19/00;* G01N *33/53*
U.S. Cl. 530—406 6 Claims

1. Digoxigenin derivative of formula:



wherein n is a whole number from 1 to 4, and Z is —CN, $-COOC_2H_5$,



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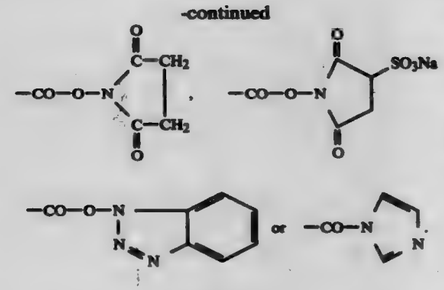
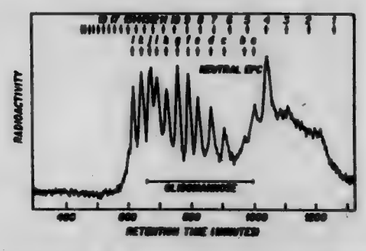


5,198,538
METHOD FOR PRODUCING IMMUNOSUPPRESSIVE AGENTS

Peter D. Arkwright; Raymond A. Dwek; Christopher W. G. Redman, all of Oxford; Graham A. W. Rook, London, and Thomas W. Rademacher, Oxford, all of United Kingdom, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 384,233, Jul. 24, 1989, Pat. No. 5,109,116. This application Dec. 9, 1991, Ser. No. 804,303
Int. Cl.[5] A23J *1/00;* C07K *3/00;* A01N *37/18;* C12P *21/00*
U.S. Cl. 530—417 2 Claims



1. A method for the production of an immunosuppresive agent having activity as measured by suppression of mixed lymphocyte reaction comprising minutely subdividing and solubilizing syncytiotrophoblast microvilli membranes, releasing the unreduced N-linked oligosaccharides from the resulting solubilized preparation, digesting the released oligosaccharides with sialidase, fractionating the oligosaccharides into acidic and neutral fractions as shown in FIG. 5(*a*) and FIG. 5(*b*), respectively, and recovering said neutral fraction as the immunosuppresive agent.

5,198,539
5'-ESTERS OF 2',3'-DIDEOXY-3'-FLUORO-5-ETHYNYLURIDINE

Saad G. Rahim, Beckenham, England, and Thomas A. Krenitsky, Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 394,987, Aug. 17, 1989, Pat. No. 5,157,114. This application Aug. 15, 1991, Ser. No. 745,323
Claims priority, application United Kingdom, Aug. 19, 1988, 8819732.2; Jan. 20, 1989, 8901294.2
Int. Cl.[5] C07H *19/073*
U.S. Cl. 536—26.26 5 Claims

1. A pharmaceutically acceptable carboxylic acid ester of the compound 2',3'-dideoxy-5-ethynyl-3'-fluorouridine or a pharmaceutically acceptable salt of such ester, the non-carbonyl moiety of said ester or salt thereof selected from straight or branched chain alkyl, the alkyl moiety present containing 1 to 4 carbon atoms.

4. A pharmaceutically acceptable L-valyl amino acid ester of the compound 2',3'-dideoxy-5-ethynyl-3'-fluorouridine or a pharmaceutically acceptable salt of said ester.

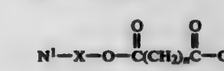
5,198,540
PROCESS FOR THE PREPARATION OF OLIGONUCLEOTIDES IN SOLUTION

Hubert Koster, 1640 Monument St., Concord, Mass. 01742

PCT No. PCT/EP83/00281, § 371 Date Jun. 25, 1984, § 102(e) Date Jun. 25, 1984
Continuation of Ser. No. 861,654, May 5, 1986, abandoned, which is a continuation of Ser. No. 624,672, Jun. 25, 1984, abandoned. This PCT application Oct. 27, 1983, Ser. No. 368,965
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239887
Int. Cl.[5] C07H *21/00;* C07C *69/74*
U.S. Cl. 536—25.3 8 Claims

1. A process of preparing oligonucleotides in a liquid phase reaction mixture, comprising the steps of:
a) reacting a bifunctional carrier molecule, which is soluble in, and chromatographically separable from, the reaction mixture, the carrier molecule having the formula:

wherein:
(i) n is an integer from 2 to 10; and
(ii) X is a trityl halide;
with at least an equimolar amount of a first nucleoside, nucleotide, or oligonucleotide, N^1;
b) separating and purifying the compound formed by the reaction in step (a) by chromatography, said compound having the formula:



c) repeating steps (a) and (b) to add additional nucleotides $N^2 \ldots N^m$ to form an oligonucleotide having the formula:

$$N^m \ldots N^1\text{—}X\text{—}O\text{—}C(CH_2)_nC\text{—}O\text{—}X\text{—}N^1 \ldots N^m$$

wherein m is an integer from 3 to 50 and wherein the oligonucleotide is soluble in and chromatographically separable from the reaction mixture; and
d) releasing the oligonucleotide from the carrier molecule by contacting said oligonucleotide with acetic acid, thereby obtaining an oligonucleotide having the formula:

$N^1, N^2 \ldots N^m$.

5,198,541
DNA ENCODING BACTERICIDAL/PERMEABILITY-INCREASING PROTEINS

Peter Elsbach, and Jerrold Weiss, both of New York, N.Y., assignors to New York University, New York, N.Y.

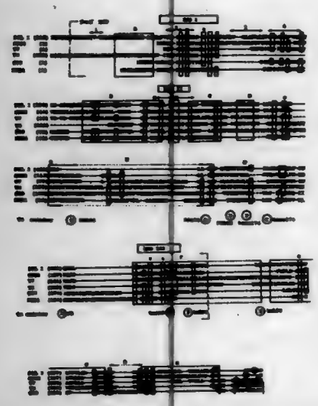
Division of Ser. No. 762,730, Sep. 17, 1991, which is a continuation of Ser. No. 228,035, Aug. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 84,355, Aug. 11, 1987, abandoned. This application Dec. 11, 1991, Ser. No. 805,031
Int. Cl.[5] C07H *15/12;* C12N *15/03;* C07K *13/00*
U.S. Cl. 435—69.1 8 Claims

1. An isolated DNA sequence encoding human bactericidal/permeability-increasing protein or a biologically active polypeptide fragment thereof comprising from about residue 1 to about residue 210.

5,198,542
DNA ENCODING A PITYITARY ADENYLATE CYCLASE ACTIVATING PROTEIN AND USE THEREOF
Haruo Onda, Ibaraki, Japan; Akira Arimura, New Orleans, La.; Chiharu Kimura, Ibaraki, and Chieko Kitada, Osaka, both of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan
Filed Jun. 19, 1990, Ser. No. 540,105
Claims priority, application Japan, Jun. 20, 1989, 1-155791; Oct. 6, 1989, 1-259924; Nov. 2, 1989, 1-284771; Feb. 22, 1990, 2-39841
Int. Cl.[5] C07G *15/12*
U.S. Cl. 435—69.4 18 Claims

1. An isolated DNA comprising a DNA segment coding for PACAP38.

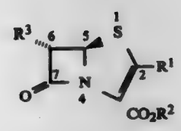
5,198,543
PHI29 DNA POLYMERASE
Luis Blanco; Antonio Bernad, and Margarita Salas, all of Madrid, Spain, assignors to Consejo Superior Investigaciones Cientificas, Madrid, Spain
Filed Mar. 13, 1991, Ser. No. 668,945
Int. Cl.[5] C07H *15/12*
U.S. Cl. 536—23.2 3 Claims



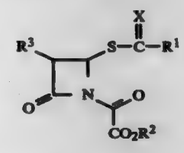
1. A non-naturally occurring DNA fragment consisting essentially of DNA encoding a modified ϕ29-type DNA polymerase, wherein said polymerase comprises sufficient DNA polymerase activity for use in DNA sequencing, and an exonuclease activity which is less than 10% the activity of the corresponding naturally occurring ϕ29-type DNA polymerase.

5,198,544
PROCESS FOR THE PREPARATION OF PENEM COMPOUNDS
Karl-Heinz Budt, Kelkheim/Taunus; Walter Dürokheimer, Hattersheim am Main; Gerd Fischer, Frankfurt am Main; Rolf Hörlein; Reiner Kirrstetter, both of Kelkheim/Taunus, and Rudolf Lattrell, Königstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 515,244, Apr. 27, 1990, abandoned.
This application Feb. 25, 1991, Ser. No. 659,488
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914389; May 27, 1989, 3917287
Int. Cl.[5] C07D *499/00*
U.S. Cl. 540—310 3 Claims

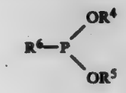
1. A process for the preparation of a penem compound I



in which
R^1 denotes hydrogen, $(C_1–C_4)$-alkyl, $(C_1–C_{12})$-alkoxy, $(C_1–C_{12})$-alkylthio, phenoxy, phenyl (the phenyl rings being unsubstituted or substituted once or twice by carboxyl, $(C_1–C_4)$-alkoxycarbonyl, allyloxycarbonyl, aminocarbonyl, $(C_1–C_4)$-alkylaminocarbonyl, cyano, F, Cl or Br), $(C_3–C_6)$-cycloalkyl, $(C_3–C_6)$-cycloalkyloxy, $(C_5–C_6)$-oxacycloalkyl (saturated or singly or doubly unsaturated), $(C_3–C_6)$-oxocycloalkyl, $(C_3–C_6)$-1,1-bis$(C_1–C_3)$-alkyloxy]-cycloalkyl, $(C_3–C_6)$-[$(C_1–C_3)$-alkylimino]-cycloalkyl, $(C_3–C_6)$-[arylimino]cycloalkyl, $(C_3–C_6)$-hydroxyiminocycloalkyl, $(C_3–C_6)$-$(C_1–C_3$-alkyloxyimino)-cycloalkyl, in which the cycloalkyl radical is unsubstituted or substituted once or twice by $C_1–C_3$-alkyl, by $(C_1–C_3)$-alkoxy, by halogen, or by methylene and is saturated or can contain one or two double bonds,
R^2 denotes hydrogen or a customary carboxyl protective group which can be eliminated by hydrolysis, photolysis, oxidation, reduction or enzymatically,
R^3 denotes hydrogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkenyl, $(C_1–C_4)$-alkoxy,$(C_4–C_7)$-cycloalkyl, phenyl, 2-oxo-1,3-diozolyl, triazolyl, thiazolyl, amino, acylamino or alkoxy,
which comprises reacting at between +10° C. and +70° C. a compound of the formula II



in which
X denotes oxygen or sulfur, and
R^1, R^2 and R^3 have the above meaning, with a trivalent organic phosphorus compound of the formula III



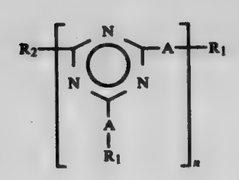
in which
R^6 denotes $(C_1–C_4)$-alkyl, phenyl which can be substituted by $(C_1–C_3)$-alkyl or $(C_1–C_3)$-alkoxy, and
R^4 and R^5 are identical or different and denote $(C_1–C_4)$-alkyl, allyl, benzyl, or phenyl which can be substituted by $(C_1–C_3)$-alkyl or $(C_1–C_3)$-alkoxy.

5,198,545
PHARMACEUTICAL EPINEPHRINE-PILOCARPINE COMPOUNDS AND PROCESS OF PREPARATION THEREOF
Pamela Albaugh, Clinton, Conn., assignor to Allergan, Inc., Irvine, Calif.
Continuation of Ser. No. 434,914, Nov. 13, 1989, Pat. No. 5,055,467. This application Oct. 8, 1991, Ser. No. 773,059
Int. Cl.[5] C07D *23/58*
U.S. Cl. 544—133 3 Claims

1. Process for the preparation of racemic and optically active compounds which comprises linking a first moiety derived from a pilocarpine compound in which the furanone ring of pilocarpine is replaced by a hetero-ring containing a secondary nitrogen hetero-atom, and a second moiety derived from an epinephrine compound or a β-adrenergic blocking compound consisting of timolol, hetaxolol, or bunolol, at said secondary nitrogen atom of the furanone-replacing hetero-ring of said pilocarpine compound and at the hydroxyl group of said epinephrine compound or of said β-adrenergic blocking compound, via a carbonyl linker.

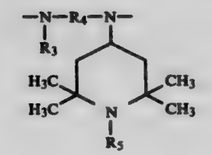
5,198,546
PIPERIDINE-TRIAZINE COMPOUNDS FOR USE AS STABILIZERS FOR ORGANIC MATERIALS
Valerio Borzatta, Bologna, and Giuseppe Cantatore, Bari, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Nov. 2, 1990, Ser. No. 608,408
Claims priority, application Italy, Nov. 10, 1989, 22341 A/89
Int. Cl.[5] C07D *403/00*
U.S. Cl. 544—198 7 Claims

1. A compound of the formula (I)

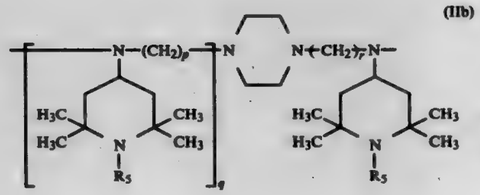


(I)

in which R_1 is $C_1–C_8$alkyl, $C_3–C_6$alkenyl, $C_7–C_9$phenylalkyl, $C_7–C_9$phenylalkyl mono-, di-or tri-substituted on the phenyl by $C_1–C_4$alkyl, $C_1–C_8$acyl or $(C_1–C_8$alkoxy)-carbonyl, A is a group of the formula (IIa) or (IIb)

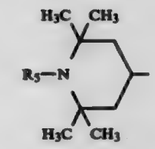


(IIa)



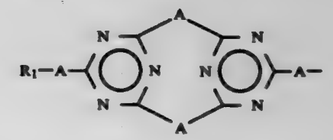
(IIb)

in which R_3 is hydrogen, $C_1–C_8$alkyl, $C_5–C_8$cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by $C_1–C_4$alkyl, $C_7–C_9$phenylalkyl, $C_7–C_9$phenylalkyl mono-, di- or tri-substituted on the phenyl by $C_1–C_4$alkyl, or a group of the formula (III),



(III)

R_5 is hydrogen, $C_1–C_8$alkyl, O, OH, NO, CH_2CN, $C_1–C_{12}$alkoxy, $C_5–C_{12}$cycloalkoxy, $C_3–C_8$alkenyl, $C_7–C_9$phenylalkyl, $C_7–C_9$phenylalkyl mono-, di- or tri-substituted on the phenyl by $C_1–C_4$alkyl, or $C_1–C_8$acyl and R_4 is $C_2–C_{12}$alkylene, cyclohexylene, cyclohexylenedimethylene, methylenedicyclohexylene, xylylene or $C_4–C_{12}$alkylene interrupted by 1, 2 or 3 oxygen atoms or by a group >N—CH_3, p and r which can be identical or different are integers from 2 to 6 and q is zero or 1, and R_2 is OH, ONa, OK, $C_1–C_8$alkoxy, $C_3–C_6$alkenyloxy, $C_7–C_9$phenylalkoxy, $C_1–C_8$acyloxy or a group R_1-A-, with R_1 and A being as defined above, or R_2 can also be a group of the formula (IV)



(IV)

in which R_1 and A are as defined above and when R_2 is a group of the formula (IV), the terminal group R_1 which is outside of the brackets in the formula (I) is additionally a group

in which R_1 and A are as defined above and n is a number from 1 to 20.

5,198,547
PROCESS FOR N5-FORMYLATING TETRAHYDROPTERIDINES
Steven W. Bailey, and June E. Ayling, both of Mobile, Ala., assignors to South Alabama Medical Science Foundation, USA, Mobile, Ala.
Filed Mar. 16, 1992, Ser. No. 851,733
Int. Cl.[5] C07D *475/04*
U.S. Cl. 544—258 4 Claims

1. A process for the selective formylation of nitrogen-5 in a tetrahydropteridine which contains a p-aminobenzoyl moiety as a constituent of said tetrahydropteridine's 6-substituent

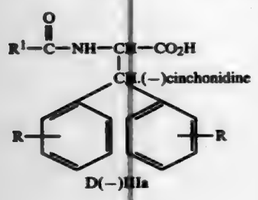
comprising treating a solution of said tetrahydropteridine in a largely aprotic solvent with an imidazole-based formylating reagent.

5,198,548
PROCESS FOR THE PREPARATION OF D(−) AND L(+)-3,3-DIPHENYLALANINE AND D(−) AND L(+)-SUBSTITUTED 3,3-DIPHENYLALANINES AND DERIVATIVES THEREOF

Vladimir Beylin; Huai G. Chen; Om P. Goel, and John G. Topliss, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

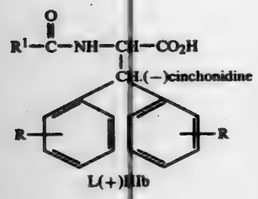
Filed Jan. 30, 1992, Ser. No. 828,399
Int. Cl.[5] C07D 453/02; C07B 57/00; C07C 271/32, 271/54
U.S. Cl. 546—136 12 Claims

8. A compound selected from the group consisting of



D(−)IIIa

and



L(+)IIIb

wherein 'R is
hydrogen
chloro,
bromo,
fluoro,
methyl,
trifluoromethyl,
methoxy,
2,4-dichloro, or
2,4-difluoro and
R^1 is lower alkyl,
CX_3 wherein X is hydrogen or halogen or aryl.

5,198,549
SIDE-CHAIN CHLORINATION OF ALKYLATED NITROGEN HETEROAROMATICS

Andreas Günther, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 13, 1991, Ser. No. 699,059
Claims priority, application Fed. Rep. of Germany, May 19, 1990, 4016175
Int. Cl.[5] C07D 213/26, 213/61, 239/26, 239/30
U.S. Cl. 546—345 3 Claims

1. In the chlorination of the wide chain of an alkylated pyridine or pyrimidine with elemental chlorine, the improvement which comprises effecting the reaction in acetonitrile as solvent in the presence of free radical-initiating radiation or of a chemical free radical initiator selected from the group consisting of azobiscarbonitrile and a diacyl peroxide.

5,198,550
PROCESS FOR THE PURIFICATION OF CRUDE 2-MERCAPTOBENZOTHIAZOLE

Klaus Reinartz, Cologne; Harro Schlesmann, Odenthal, and Stefan Dietl, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

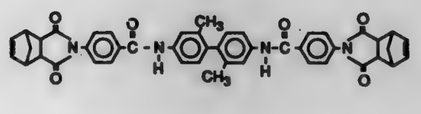
Filed Jan. 1, 1992, Ser. No. 890,764
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1991, 4119184; Aug. 15, 1991, 4126992
Int. Cl.[5] C07D 277/72
U.S. Cl. 548—177 3 Claims

1. A process for the purification of crude 2-mercaptobenzothiazole, characterized in that the crude 2-mercaptobenzothiazole is dissolved in relatively high-boiling aliphatic or cycloaliphatic alcohols or in mixtures of the alcohols mentioned or azeotropes thereof with water at temperatures of 60° C. to 200° C., optionally under elevated pressure, the solution is subsequently cooled and the product precipitating is filtered off and optionally washed.

5,198,551
POLYAMIDE THERMOSETS

Brian C. Benicewicz, and Andrea E. Hoyt, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 506,742, Apr. 10, 1990, abandoned.
This application Jun. 7, 1991, Ser. No. 711,721
Int. Cl.[5] C07D 209/56
U.S. Cl. 548—435 3 Claims



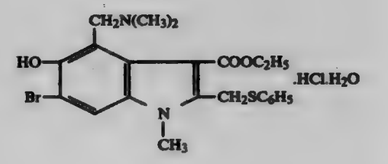
1. A curable polyamide monomer represented by the formula: R^1-A^1-B^1-A^2-B^2-A^3-R^2 wherein R^1 and R^2 are nadimide groups, A^1 and A^3 are 1,4-phenylene, A^2 is a 4,4'-biphenyl group containing a methyl substituent upon each ring, and B^1 and B^2 are —C(O)—N(H)— groups wherein the —C(O)— functionalities of B^1 and B^2 are adjacent to A^1 and A^3, wherein said curable polyamide monomer is characterized as liquid crystalline.

5,198,552
ETHYL 6-BROMO-5-HYDROXY-4-DIMETHYLAMINOMETHYL-1-METHYL-2-PHENYLTHIOMETHYLINDOLE-3-CARBOXYLATE HYDROCHLORIDE MONOHYDRATE, A PROCESS FOR PREPARING THE SAME, AND A PHARMACEUTICAL PREPARATION THEREOF HAVING ANTIVIRAL, INTERFERON-INDUCING AND IMMUNOMODULATORY

Fedor A. Trofimov, prospekt Marxa, 28, kv. 36, Kaluzhskaya oblast, Obninsk; Nina G. Tsyshkova, prospekt Marxa, 54, kv. 17, Kaluzhskaya oblast, Obninsk; Nadezhda S. Bogdanova, ulitsa 26 Bakinskikh Kommisarov, 1, korpus 1, kv. 26, Moscow; Irina S. Nikolaeva, ulitsa Matveevskaya, 1, kv. 179, Moscow; Svetlana A. Zotova, pereulok Obukha, 4, kv. 85, Moscow; Zinaida M. Sakhaschik, ulitsa Sheremetievskaya, 5, korpus 2, kv. 44, Moscow; Elena N. Padeiskaya, Leninsky prospekt, 13, kv. 24, Moscow; Alla N. Fomina, ulitsa Belomorskaya, 8, kv. 2, Moscow; Evgenia A. Svirina, prospekt 50-letia Oktyabrya, 20, kv. 112, Moskovskaya oblast, Klimovsk-3; Dmitry M. Zlydnikov, Nevsky prospekt, 66, kv. 14, Leningrad; Olga I. Kuber, ulitsa Avtovskaya, 2, kv. 102, Leningrad; Evgenia G. Shvetsova, ulitsa Zamshina, 25, korpus 4, kv. 61, Leningrad; Svetlana N. Kutchak, ulitsa Tajurupy, 13, kv. 68, Moscow; Valentina V. Peters, ulitsa Losevskaya, 22, kv. 32, Moscow; Elena A. Bryantseva, prospekt Kima, 28, kv. 275, Leningrad; Anatoly G. Konoplyannikov, prospekt Lenina, 1, kv. 62, Kaluzhskaya oblast, Obninsk; Boris P. Surinov, prospekt Lenina, 90, kv. 1, Kaluzhskaya oblast, Obninsk; Vera A. Yadrovskaya, ulitsa Axenova, 7, kv. 98, Kaluzhskaya oblast, Obninsk; Ljudmila S. Safonova, ulitsa Sofii Kovalevskoi, 5, korpus 7, kv. 89, Leningrad; Nina A. Karpova, ulitsa Marshala Zhukova, 12, kv. 56, Kaluzhskaya oblast, Obninsk; Elena P. Savina, ulitsa Koroleva, 27, kv. 139, Kaluzhskaya oblast, Obninsk; Ljudmila A. Savinova, ulitsa Tipanova, 6, kv. 62, Leningrad; Galina V. Grineva, ulitsa Koshtoyantsa, 21a, kv. 33, Moscow administrator of said Alexei N. Grinev, deceased, and Elina G. Pershina, ulitsa 26 Bakinskikh komissarov, 8, korpus 4, kv. 93, Moscow, all of U.S.S.R. administrator of said Grigory N. Pershin, deceased

PCT No. PCT/SU89/00272, § 371 Date Nov. 12, 1991, § 102(e) Date Nov. 12, 1991, PCT Pub. No. WO90/08135, PCT Pub. Date Jul. 26, 1990
PCT Filed Jan. 12, 1989, Ser. No. 576,444
Int. Cl.[5] A61K 31/405
U.S. Cl. 548—492 12 Claims

1. Ethyl-6-bromo-5-hydroxy-4-dimethylaminomethyl-1-methyl-2-phenylthiomethylindole-3-carboxymate hydrochloride monohydrate of the following formula:



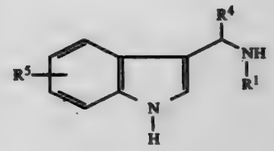
10. A pharmaceutical preparation having the antiviral, interferon-inducing and immunomodulatory effects consisting of an active principle and a pharmaceutically acceptable carrier, wherein the active principle is ethyl 6-bromo-5-hydroxy-4-dimethylaminomethyl-1-methyl-2-phenylthiomethylindole-3-carboxylate hydrochloride monohydrate according to claim 1.

5,198,553
PROCESS FOR THE PRODUCTION OF GRAMINE DERIVATIVES

Wolfgang Kübler; Gregor Haffer; Reiner Wierachowski, and Klaus Nickisch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE91/00353, § 371 Date Dec. 26, 1991, § 102(e) Date Dec. 26, 1991, PCT Pub. No. WO91/16304, PCT Pub. Date Oct. 31, 1991
PCT Filed Apr. 23, 1991, Ser. No. 778,878
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013907
Int. Cl.[5] C07D 209/14
U.S. Cl. 548—504 6 Claims

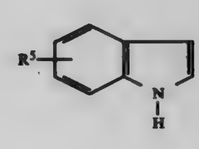
1. A process for the production of a compound of formula I



I

wherein
R^1 is C_{1-4} alkyl;
R^4 is C_{1-4} alkyl or C_{1-4} alkoxy-C_{1-2} alkyl;
R^5 is OR^6 or CHR^7R^8;
R^6 is C_{1-4} alkyl, C_{3-6} cycloalkyl or a hydrocarbon C_{7-8} aralkyl group which is optionally mono- or di-substituted with a halogen, a C_{1-4} alkoxy group, or a C_{1-4} alkyl group;
R^7 is hydrogen or C_{1-4} alkyl;
R^8 is hydrogen, C_{1-4} alkyl, OR^9 or $NR^{10}R^{11}$ with R^9 meaning C_{1-4} alkyl and R^{10} and R^{11} are the same or different and mean hydrogen, C_{1-4} alkyl or together with the nitrogen atom means an optionally saturated heterocyclic 5- or 6-ring containing a heteroatom which is oxygen, nitrogen or sulfur, which is optionally substituted with one to two C_{1-4} alkyl groups, comprising reacting an indole derivative of formula II

II



wherein R^5 has the above-named meaning, with an imine of formula III

R^4—CH=N—R^1 III,

wherein
R^4 and R^1 have the above-named meanings, under acidic catalysis conditions in the presence of an effective amount of a primary amine.

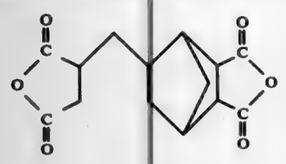
5,198,554

5-(2,4-DIOXOTETRAHYDRO-3-FURANYLMETHYL)-NORBORNANE-2,3-DICARBOXYLIC ACID ANHYDRIDE AND PROCESS FOR PRODUCTION THEREOF

Hiroyuki Inagaki, Kanagawa; Hiroshi Furukawa, Saitama; Takayoshi Kimura, Saitama, and Hiroshi Ueno, Saitama, all of Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Jan. 9, 1992, Ser. No. 819,315
Claims priority, application Japan, Jan. 17, 1991, 3-15763
Int. Cl.[5] C07D *307/77*
U.S. Cl. 549—237 1 Claim

1. 5-(2,4-Dioxotetrahydro-3-furanylmethyl)norbornane-2,3-dicarboxylic acid anhydride of the chemical formula:



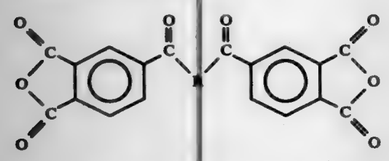
5,198,555

DIANHYDRIDES FROM CATALYZED REACTION OF MONOANHYDIDE MONOACID HALIDES WITH POLYALKYLATED MONONUCLEAR AROMATICS

Vincent F. Smith, Jr., Big Rock, and Gary J. Gadac, Joliet, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

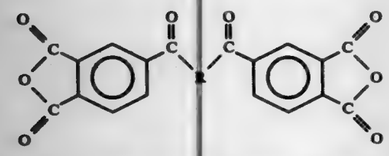
Filed Nov. 15, 1991, Ser. No. 794,992
Int. Cl.[5] C07D *307/80*
U.S. Cl. 549—242 9 Claims

1. A compound of the formula:



wherein R is a polyalkylated mononuclear aromatic radical selected from the group consisting of mesitylene, durene, isodurene and pseudocumene.

8. A process for making a compound of the formula:



wherein R is a polyalkylated mononuclear aromatic radical selected from the group consisting of mesitylene, durene, isodurene and pseudocumene; said process comprising:

(a) mixing a polyalkylated mononuclear aromatic compound selected from the group consisting of mesitylene, durene, isodurene and pseudocumene with a monoanhydride monoacid halide;

(b) adding a Friedel-Crafts catalyst to the reaction mixture; and

(c) isolating the compound by precipitation in an organic solvent.

5,198,556

DIOXOLANE-CONTAINING FLUOROEPOXIDES

Ming-Hong Hung, and Shlomo Rozen, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1991, Ser. No. 746,241
Int. Cl.[5] C07D *317/10, 317/42*
U.S. Cl. 549—448 10 Claims

1. A dioxolane-containing fluoroepoxide of the structure 1,

1

wherein

each A and A′ is independently F or CF_3, provided that both A and A′ are not concurrently CF_3;

R and R′ are independently F, C_1 to C_3 fluoroalkyl or chlorofluoroalkyl with at least one fluorine substituent.

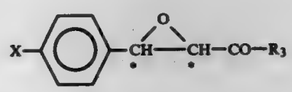
5,198,557

PROCESS FOR THE RESOLUTION OF 3-(4-SUBSTITUTED-PHENYL)-GLYCIDIC ACID DERIVATIVES

Claudio Giordano, Monza, and Roberto Casagrande, Bresso, both of Italy, assignors to Zambon Group S.p.A., Venice, Italy

Filed May 10, 1991, Ser. No. 698,073
Claims priority, application Italy, May 17, 1990, 20349 A/90
Int. Cl.[5] C07D *303/16;* C07C *321/28*
U.S. Cl. 549—513 8 Claims

1. A process for the kinetic resolution of mixtures of cis or trans enantiomers of the compounds of formula



(III-A)

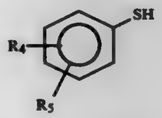
wherein

R_3 represents a linear or branched C_1–C_{18} alkoxy group, a benzyloxy or an amino, mono or dialkylamino group in which the alkyl moiety has from 1 to 6 carbon atoms;

X represents a methoxy group or a group transformable into a methoxy group selected from the group consisting of hydroxy and hydroxy protected as benzyloxy or as an ester with an acid adapted for protecting phenols;

the asterisks mark the asymmetric carbon atoms;

comprising the reaction between a racemic mixture or cis or trans enantiomers of the compounds of formula III-A with a thiophenol of formula



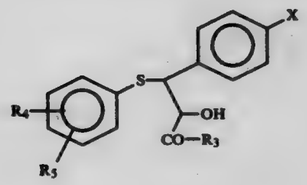
(II-A)

wherein

R_4 and R_5, the same or different, represent hydrogen or chlorine atoms, C_1–C_4 alkyl, amino, acetylamino and nitro groups;

in the presence of a catalytic amount of an optically active tertiary amine in an inert solvent and at a temperature between −20° C. and +30° C., said process allowing one to obtain both

(a) one of the two enantiomers of each couple cis or trans of the compounds of formula (III-A), remained unreacted in solution in high enantiomeric purity, and (b) one compound of formula (IV-A)



(IV-A)

wherein R_3, R_4, R_5 and X have the above meanings, which is the product of the above reaction.

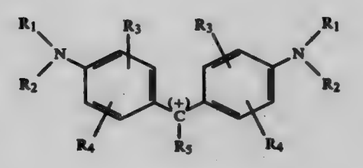
5,198,558

PROCESS FOR THE PREPARATION OF TRIPHENYLMETHANE DYES

Steven P. Rines, Guilderland, and Charles J. Zallig, Schenectady, both of N.Y., assignors to BASF Corporation, Parsippany, N.J.

Filed Dec. 18, 1990, Ser. No. 629,521
Int. Cl.[5] C07C *221/00*
U.S. Cl. 552—108 32 Claims

1. A process for the preparation of triphenylmethane dyes of the formula:



wherein

R_1 and R_2 each denote hydrogen, C_1–C_4 alkyl, benzyl or sulfobenzyl,

R_3 and R_4 each denote hydrogen, C_1–C_4 alkyl or sulfonic acid

R_5 denotes a phenyl, sulfophenyl, dialkylaminophenyl, C_1–C_4 alkylphenyl, C_1–C_4 alkyl-dialkylaminophenyl, halogenophenyl, naphthyl, sulfonaphthyl, disulfonaphthyl, or alkyldisulfonaphthyl

comprising

I. oxidation of the leuco compound of the corresponding triphenylmethane dye with manganese dioxide in the presence of aqueous phosphoric acid at a temperature of about 20° C. to about 100° C.,

II. adding a base selected from the group consisting of ammonia, amines, aminoalcohols, metal hydroxides of Groups IA, IIA, IIIA and mixtures thereof in an amount sufficient to neutralize the aqueous solution,

III. filtration from the precipitate and

IV. isolation of said triphenylmethane dye.

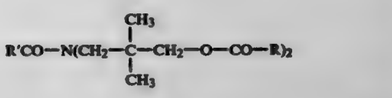
5,198,559

N-ACYL AND O-ACYL DERIVATIVES OF N,N-BIS(2,2-DIMETHYL-3-HYDROXYPROPYL)AMINE, THEIR PREPARATION AND USE

Leila Lahtinen, Kuopio; Sakse Koskimies, Helsinki; Simo Tuominen, Kuopio, and Eija Valtonen, Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Jul. 19, 1990, Ser. No. 554,415
Claims priority, application Finland, Aug. 21, 1989, 893914
Int. Cl.[5] C09F *5/00*
U.S. Cl. 554—35 1 Claim

1. N- and O-acyl derivatives of N,N-bis(2,2-dimethyl-3-hydroxypropyl)amine of the formula:



wherein R and R′ are the same or different C_1–C_{12} alkyl, or C_6–C_{10} aryl groups.

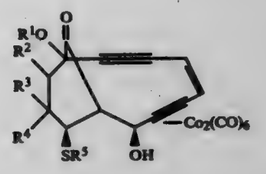
5,198,560

CYTOTOXIC BICYCLO[7.3.1]TRIDEC-4-ENE-2,6-DIYNE COMPOUNDS AND PROCESS FOR THE PREPARATION THEREOF

John F. Kadow, Wallingford, and Mark D. Wittman, Cheshire, both of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 621,503, Nov. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 515,387, Apr. 27, 1990, abandoned. This application Oct. 25, 1991, Ser. No. 782,942
Int. Cl.[5] C07F *7/02, 15/06*
U.S. Cl. 556—12 5 Claims

1. A process for preparing a compound having the formula



wherein

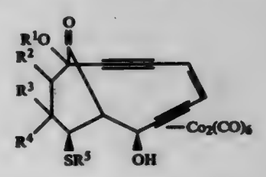
R^1 is hydroxy protecting group;

R^2 is H or protected hydroxy;

R^3 and R^4 are independently H or protected hydroxy, or R^3 and R^4 taken together represent a protected keto group; and

R^5 is $C_{1\text{-}5}$alkyl, $C_{3\text{-}6}$cycloalkyl, $C_{6\text{-}10}$aryl, or $C_{6\text{-}10}$aryl substituted with one or more groups selected from $C_{1\text{-}5}$alkyl and $C_{1\text{-}5}$alkoxy, which comprises the steps of:

a) reacting a compound having the formula



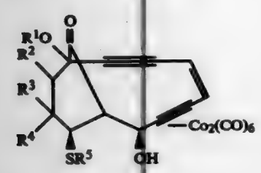
with a compound having the formula

R^5—S—Al(R^6)$_2$

wherein R^1, R^2, R^3, R^4, and R^5 are as defined above and R^6 is C_{1-5}alkyl; and

b) reacting the product of step a with a reagent selected from $Ti[O—(C_{1-5})alkyl]_4$ and $XTi[O—(C_{1-5})alkyl]_3$, wherein X is halogen.

2. A compound having the formula



wherein

R^1 is hydroxy protecting group;

R^2 is H or protected hydroxy;

R^3 and R^4 are independently H or protected hydroxy, or R^3 and R^4 taken together represent a protected keto group; and

R^5 is C_{1-5}alkyl, C_{3-6}cycloalkyl, C_{6-10}aryl, or C_{6-10}aryl substituted with one or more groups selected from C_{1-5}alkyl and C_{1-5}alkoxy.

5,198,561

RUTHENIUM-BINAP ASYMMETRIC HYDROGENATION CATALYST

Albert S. C. Chan, St. Louis, and Scott A. Laneman, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 620,672, Dec. 3, 1990, which is a continuation-in-part of Ser. No. 487,465, Mar. 2, 1990, which is a continuation-in-part of Ser. No. 369,875, Jun. 22, 1989, Pat. No. 4,994,607. This application Mar. 6, 1991, Ser. No. 665,069

Int. Cl.[5] C07F *15/00*

U.S. Cl. 556—13 10 Claims

1. A ruthenium-phosphine complex represented by the formula:

$$[RuXY(BINAP)]_n$$

wherein n is an integer of from 1 to about 10; and X and Y independently represent nonchelating anionic ligands.

5,198,562

RUTHENIUM-PHOSPHINE COMPLEX AND INTERMEDIATE FOR PRODUCING THE SAME

Ryoji Noyori; Masato Kitamura, both of Aichi; Noboru Sayo; Hidenori Kumobayashi, both of Tokyo, all of Japan, and Martin F. Giles, Middlesex, England, assignors to Takasago International Corporation, Tokyo, Japan

Filed Aug. 1, 1991, Ser. No. 739,022

Claims priority, application Japan, Aug. 1, 1990, 2-204166

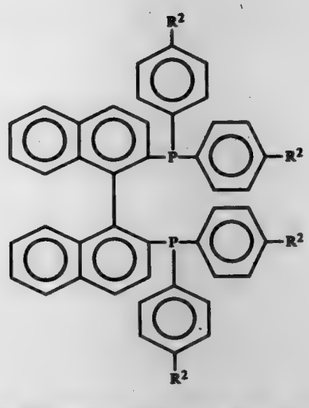
Int. Cl.[5] C07F *15/00*

U.S. Cl. 556—23 2 Claims

1. A ruthenium-phosphine complex represented by formula (I):

(I)

wherein R^2-BINAP represents a tertiary phosphine compound represented by formula (II):



(II)

wherein R^2 represents a hydrogen atom, a methyl group, a methoxy group, or a t-butyl group; X represents a halogen atom; and R and R^1, which may be the same or different, each represent a phenyl group or a substituted phenyl group.

5,198,563

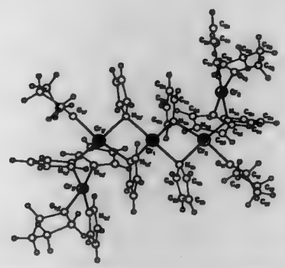
CHROMIUM COMPOUNDS AND USES THEREOF

William K. Reagen, Idaho Falls, Id., and Brian K. Conroy, Batavia, Ill., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 454,554, Dec. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 392,688, Aug. 10, 1989, abandoned. This application May 10, 1991, Ser. No. 698,515

Int. Cl.[5] C07F *11/00*

U.S. Cl. 556—57 36 Claims



1. A composition comprising $Cr_5(C_4H_4N)_{10}(C_4H_8O)_4$.

5,198,564

CIS-PLATINUM-DIAMINE COMPLEXES AND ANTITUMOROUS COMPOSITIONS CONTAINING THEM, AND PROCESS FOR THEIR PREPARATION

Dai Qianshuan, Beijing, China, assignor to Beijing Polytechnic University; Xingsong Technique Development Company and Beijing Agricultural University, all of Beijing, China

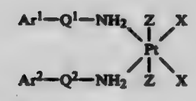
Filed Jun. 6, 1988, Ser. No. 203,041

Claims priority, application China, Jun. 5, 1987, 87104027

Int. Cl.[5] C07F *15/00*

U.S. Cl. 556—137 8 Claims

1. A compound of the formula



wherein

Q^1 and Q^2 may be the same or different and each is a number selected from the group consisting of methylene, ethylidene, dimethylene and substituted dimethylene;

Ar^1 and Ar^2 may be the same or different and each is selected from the group consisting of phenyl and substituted phenyl, or together form a divalent aromatic group selected from the group consisting of phenylene and substituted phenylene;

X is an anion ligand selected from the group consisting of chloride and iodide; and

Z is nothing or hydroxyl.

5,198,565

SILICON AND ALUMINUM N,N-DIALKYLCARBAMATES AND THEIR HYDROLYSIS PRODUCTS AND PROCESS FOR THEIR PREPARATION

Daniela Belli Dell'Amico, Pisa; Fausto Calderazzo, Ghezzano; Michela Dell'Innocenti, Calci, and Pierluigi Robino, Asciano, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Continuation-in-part of Ser. No. 500,997, Mar. 29, 1990, abandoned. This application Sep. 27, 1991, Ser. No. 766,113

Claims priority, application Italy, Apr. 27, 1989, 20284 A/89

Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—420 8 Claims

1. A process for hydrolyzing a N,N-dialkylcarbamate of the general formula (I):

$$M[O_2CNR_2]_n \qquad (I)$$

wherein M is Si or Al; n is 4 when M is Si and 3 when M is Al; R is a C_1–C_6 alkyl group comprising

a) dissolving said compound of formula (I) in an organic solvent up to a concentration of from 0.05 to 2 moles/l,

b) adding H_2O to the obtained solution in such a quantity as to obtain a molar ratio of H_2O to said product (I) of between 2 and 60 and running the hydrolysis at a temperature of from 15° to 40° C. for 0.5–2 hours, under stirring; and

c) recovering the hydrolysis product by filtration and drying it at a reduced pressure at a temperature below 100° C. for a time of from 2 to 12 hours.

5,198,566

N-SUBSTITUTED-3-(SUBSTITUTED HYDRAZINO)-BENZENESULFONAMIDES

Hideo Arabori; Shiro Yamazaki; Masato Arahira, and Aiko Murakami, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

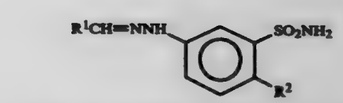
Division of Ser. No. 667,132, Mar. 11, 1991, Pat. No. 5,151,114, which is a division of Ser. No. 473,768, Feb. 2, 1990, Pat. No. 5,059,238. This application Jun. 3, 1992, Ser. No. 892,890

Claims priority, application Japan, Feb. 8, 1989, 1-27369

Int. Cl.[5] C07C *251/76, 251/78, 311/15*

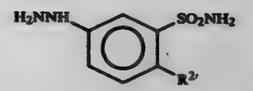
U.S. Cl. 560—13 2 Claims

1. A 3-(substituted hydrazino)benzenesulfonamide derivative of the following formula:



wherein R^1 is CF_3, COOH or CCl=CClCOOH and R^2 is H, Cl, C_1–C_3 alkyl or C_1–C_4 alkoxycarbonyl.

2. A 3-hydrazinobenzenesulfonamide derivative of the following formula:



wherein $R^{2'}$, is H, C_1–C_3 alkyl or C_1–C_4 alkoxycarbonyl.

5,198,567

BENZONORBORNENE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND MEDICINAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Gérard Lang, Saint-Gratien; Jean Maignan, Tremblay les Gonesse; Serge Restle, Aulnay sous Bois, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

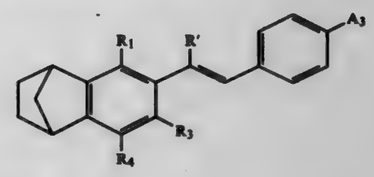
Division of Ser. No. 436,242, Nov. 14, 1989, Pat. No. 5,053,547, which is a division of Ser. No. 218,204, Jul. 12, 1988, Pat. No. 4,931,589, which is a continuation of Ser. No. 772,525, Sep. 4, 1985, Pat. No. 4,783,549. This application Jul. 23, 1991, Ser. No. 734,446

Claims priority, application Luxembourg, Sep. 5, 1984, 85531; Dec. 20, 1984, 85700

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—56 28 Claims

1. A benzonorbornene derivative of formula (I) or an isomer or salt thereof having the formula

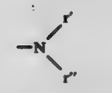


wherein

R_1, R_3 and R_4 each independently represent hydrogen, C_1–C_8 alkoxy, halogen, C_1–C_8 alkyl, C_1–C_8 acyloxy or hydroxyl,

R′ is hydrogen or C_1–C_6 alkyl and

A_3 is $—CH_2OR'$ or $—COR_7$ wherein R_7 is hydroxyl, C_1–C_6 alkoxy, arloxy or



wherein r′ and r″ each independently represent hydrogen, linear or branched C_1–C_6 alkyl substituted or not by one or more hydroxyl groups or r′ and r″ together with the nitrogen atom to which they are attached form a heterocycle,

with the proviso that when R′ represents hydrogen or CH_3 and R_1 equals R_4 equals hydrogen and R_3 equals hydrogen or CH_3 and A_3 is other than $—COR_7$ wherein R_7 is hydroxyl, C_1–C_6 alkoxy, aryloxy or

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wherein r' is linear or branched C_1–C_6 and R'' is hydrogen or linear or branched C_1–C_6 alkyl.

5,198,568

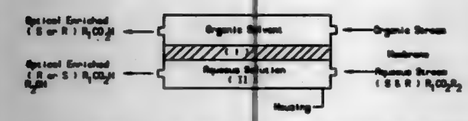
COMPOUNDS USEFUL IN ENZYMATIC RESOLUTION SYSTEMS AND THEIR PREPARATION

Charles M. Zepp, Berlin; Stephen A. Wald, Wayland, and David R. Dodds, Millis, all of Mass., assignors to Sepracor, Inc., Marlborough, Mass.

Division of Ser. No. 178,735, Apr. 7, 1988, abandoned. This application Sep. 9, 1991, Ser. No. 756,950

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—60 **101 Claims**



1. A method for preparing an ester compound of formula (II),

(II)

wherein R' is selected from the group consisting of aryl, aryloxy, alkyl, hydroxyl, protected hydroxyl and halogen, R'' is selected from the group consisting of hydrogen, benzyl, protected thiol and thiol, R is alkyl, Y^2 is $-SO_3H$ and salt thereof, comprising:

a) reacting a compound of formula (III),

(III)

wherein R' is selected from the group consisting of aryl, aryloxy, alkyl, hydroxyl, protected hydroxyl and halogen and R'' is selected from the group consisting of hydrogen, benzyl, protected thiol and thiol, with a base to form the carboxylate ion of a compound of formula III,

b) reacting said carboxylate ion of the compound of formula III formed in step a) with hydroxyalkyl sulfonic acid sultone, and

c) isolating the compound of formula II formed in step b).

5,198,569

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE ALIPHATIC HYDROXYCARBOXYLIC ACIDS

Hans-Ulrich Blaser, Ettingen, Switzerland; Ulrich Pittelkow, Rheinfelden, Fed. Rep. of Germany, and Felix Spindler, Starrkirch-Wil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 11, 1991, Ser. No. 758,927

Claims priority, application Switzerland, Nov. 2, 1990, 3490/90

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—60 **15 Claims**

1. A process for the preparation of an optically active α-hydroxycarboxylic acid ester of formula I

(I),

wherein R is linear or branched C_1–C_{12}alkyl which is unsubstituted or substituted by halogen, —OH, $-CO_2R_1$, $-CO_2N(R_2)_2$, $(R_2)_2N$—, C_1–C_6alkoxy or C_1–C_6alkylthio, C_4–C_8cycloalkyl, C_4–C_8cycloalkoxy, C_4–C_8cycloalkylthio, phenyl, naphthyl, phenoxy, naphthoxy, phenylthio or naphthylthio, and the substituents cycloakyl, cycloalkoxy, cycloalkylthio, phenyl, naphthyl, phenoxy, naphthoxy, phenylthio and naphthylthio are themselves unsubstituted or substituted by halogen, —OH, $-CO_2R_1$, $-CO_2N(R_2)_2$, $(R_2)_2N$—, C_1–C_6alkoxy or C_1–C_6alkylthio; R_1 is C_1–C_6alkyl, phenyl or benzyl; both substituents R_2 are each independently of the other C_1–C_6alkyl, phenyl, benzyl or, when taken together, are tetramethylene, pentamethylene, 3-oxa-1,5-pentylene or N-(C_1–C_6alkyl)-3-aza-1,5-pentylene, and * denotes the predominantly R- or S-configuration, by hydrogenation of an α-ketocarboxylic acid ester of formula II

(II),

wherein R and R_1 are as defined above, in the absence or presence of an inert solvent at a pressure of 0.1 to 15 MPa and in the temperature range from −20° C. to 100° C., and also in the presence of catalytic amounts of a rhodium complex with chiral diphosphine ligands, which rhodium complex has the formula III

(III),

wherein X is two C_2–C_{12}olefins or a C_5–C_{12}diene, Z is Cl, Br or I, and Y is a chiral diphosphine of formula IV

(IV)

wherein R_3 is phenyl, C_1–C_6alkylphenyl or C_1–C_6alkoxyphenyl, and Q is [2,2,1]-bicyloheptan-1,2-ylene or [2,2,1]-bicyclohept-4,5-en-1,2-ylene.

5,198,570

ARYLOXYFLUOROETHER ESTERS, PROCESSES FOR PREPARATION THEREOF, AND ALCOHOLS AND ACIDS FORMED THEREFROM

Andrew E. Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1990, Ser. No. 474,586

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—61 **35 Claims**

1. A process for the production of aryloxyfluoroether esters, comprising, contacting a base, a perfluorovinylether ester of the formula $CF_2{=}CFOR^1CO_2R^2$ and a hydroxyaromatic compound of the formula Ar_p,

wherein:

Ar is an organic radical containing one or more aromatic rings, which remains unchanged during the process;

Z is oxygen;

each R^1 is perfluoroalkyl or ether, thioether, chloro, hydrogen, alkyl, or phenyl substituted perfluoroalkyl; and

p is 1, 2, 3, 4, or 5; and provided, that each Z is bonded to said aromatic rings.

5,198,571

MONOFUNCTIONALIZATION OF PHENOLIC HYDROXY ONTO A POLYPHENOL

Jean-Louis Brayer, Le Haudois; Daniel Calvo, Romainville, and François Ottello, Livry Gargan, all of France, assignors to Roussel Uclaf, Paris, France

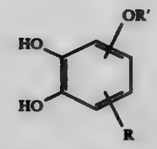
Filed Dec. 16, 1991, Ser. No. 807,982

Claims priority, application France, Dec. 18, 1990, 90 15810

Int. Cl.[5] C07C *69/88*

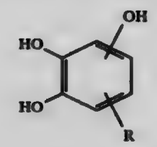
U.S. Cl. 560—70 **9 Claims**

1. A process for the preparation of a compound of the formula



I

wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, —CN, formyl, carboxy, alkoxy carbonyl of up to 9 carbon atoms, aralkoxy carbonyl of up to 12 carbon atoms and halogen and R' is a hydroxy protective group comprising reacting a polyphenol of the formula

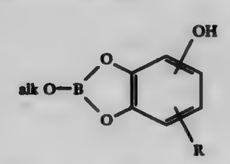


II

wherein R has the above definition with a base to form the corresponding dianion, reacting the latter with a trialkyl borate of the formula

$B(OAlk)_3$

wherein Alk is alkyl of 1 to 6 carbon atoms to form a compound of the formula



III

reacting the latter with a reagent capable of introducing a hydroxy protective group and reacting the latter with a hydrolysis agent for the oxygen-boron bond to obtain the corresponding compound of Formula I.

5,198,572

COPOLYMERS OF DICARBOXYLIC ACIDS AND SALICYLIC ACIDS

Dwain M. White, Schenectady, and Laura A. Socha, Troy, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1991, Ser. No. 650,114

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—86 **5 Claims**

1. A method of making a copolymer of salicylic and dicarboxylic acid comprising:

a. contacting, at a temperature in the range of about 250°–350° C., salicylic acid, at least one dicarboxylic acid, and acetic anhydride wherein the acetic anhydride is in a molar ratio of about 1:1 with respect to the salicylic and dicarboxylic acid present; and

b. distilling off any excess acetic anhydride.

5,198,573

DIESTERS OF HEXENE-1,6-DIOIC ACIDS PRODUCED FROM 1,2-DIALKOXY-3-BUTENES/CO

Helene Deweerdt, Lyon; Jean Jenck, Chassieu; Philippe Kalck, Castanet Tolosane; Sylvain Mutez, Irigny, and Robert Perron, Charly, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 19, 1991, Ser. No. 762,402

Claims priority, application France, Sep. 24, 1990, 90 12042

Int. Cl.[5] C07C *67/37*

U.S. Cl. 560—204 **21 Claims**

1. A process for the preparation of a diester of a hexene-1,6-dioic acid, comprising reacting at least one 1,2-dialkoxy-3-butene with carbon monoxide in the presence of a catalytically effective amount of a palladium-based catalyst and a halogen compound, in liquid phase, at elevated temperature and at superatmospheric pressure.

5,198,574

PROCESS FOR THE IMPROVED PRODUCTION OF (METH)ACRYLIC ACID ESTERS OF POLYHYDRIC ALCOHOLS (II)

Wolfgang Ritter, Haan; Hans-Dieter Sitz, Rommerskirchen, and Ludwig Speitkamp, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP89/01550, § 371 Date Jun. 24, 1991, § 102(e) Date Jun. 24, 1991, PCT Pub. No. WO90/07487, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 15, 1989, Ser. No. 720,445

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843938

Int. Cl.[5] C07C *69/52*

U.S. Cl. 560—224 **22 Claims**

1. In a process for the production of (meth)acrylic acid esters of polyhydric alcohols by reaction of at least one polyhydric alcohol with acrylic acid and/or methacrylic acid in the presence of an acidic esterification catalyst and a polymerization inhibitor in the reaction mixture, the improvement comprising

A. the use of at least one α-unsubstituted phenolic compound as the polymerization inhibitor, and

B. the addition of active carbon to the reaction mixture.

5,198,575

PREPARATION OF NITROBENZOIC AND ANTHRANILIC ACIDS

Helmut Hagen, Frankenthal, and Jacques Dupuis, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

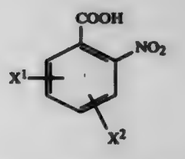
Filed Jul. 13, 1992, Ser. No. 912,196

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1991, 4128351

Int. Cl.[5] C07C *51/16*

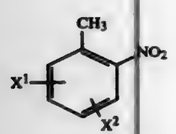
U.S. Cl. 562—410 **2 Claims**

1. A process for preparing nitrobenzoic acids of the general formula I



I

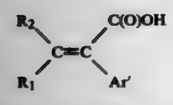
where X^1 and X^2 are each fluorine, chlorine, bromine, hydrogen or nitro, by oxidizing the corresponding nitrotoluene of the general formula II



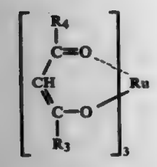
with nitric acid, which comprises carrying out the oxidation in the presence of sulfuric acid and vanadium(V) compounds.

5,198,576
BICYCLOOCTYL PHOSPHINES AND CATALYSTS THEREOF
Ralph T. Scannell, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Aug. 26, 1991, Ser. No. 749,724
Int. Cl.[5] C07C 63/04; C07F 15/00, 15/02
U.S. Cl. 562—493 14 Claims

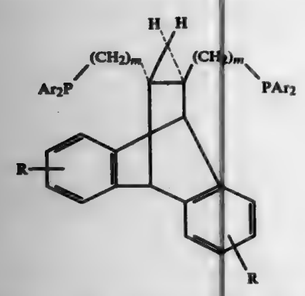
1. A process for preparing optically active α-aryl aliphatic carboxylic acids which comprises catalytically, asymmetrically hydrogenating an olefinic carboxylic acid of the formula:



where R_1 and R_2 are the same or different and are hydrogen, alkyl, cycloalkyl, or haloalkyl; and Ar' is aryl or substituted aryl; by utilizing a mixture of (i) a ruthenium compound of the formula



where R_3 and R_4 are the same or different and are alkyl, haloalkyl, aryl, substituted aryl, phenylalkyl or substituted phenylalkyl; and (ii) a chiral phosphine compound of the formula:



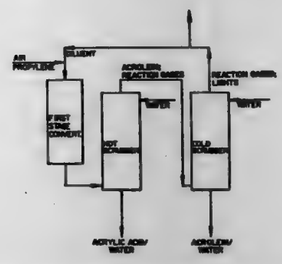
(I)

where R is C_1 to C_6 linear or branched alkyl, phenyl, substituted phenyl, C_1 to C_6 linear or branched alkoxy or halo; Ar is phenyl or substituted phenyl or naphthyl or substituted naphthyl; and m is 0 or 1.

5,198,577
PREPARATION OF ADIPIC ACID BY HYDROCARBONYLATION OF PENTENIC ACIDS
Philippe Denis, Decines, and Jean-Michel Grosselin, Francheville, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Sep. 18, 1991, Ser. No. 761,459
Claims priority, application France, Sep. 18, 1990, 90 11714
Int. Cl.[5] C07C 51/14
U.S. Cl. 562—522 10 Claims

1. A process for the selective preparation of adipic acid, comprising reacting at least one pentenic acid with water and carbon monoxide, the partial pressure of which, measured at 25° C., being less than or equal to 20 bar, in the presence of a catalytically effective amount of a rhodium-based catalyst and at least one iodine-containing promoter therefor, at a temperature ranging from 100° to 240° C. and at super atmospheric pressure, and in a liquid reaction medium which comprises a saturated aliphatic or aromatic carboxylic acid having up to 20 carbon atoms.

5,198,578
ANHYDROUS DILUENTS FOR THE PROPYLENE OXIDATION REACTION TO ACROLEIN AND ACROLEIN OXIDATION TO ACRYLIC ACID
William G. Etzkorn, Cross Lanes, and Gordon G. Harkreader, Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, both of Danbury, Conn.
Continuation-in-part of Ser. No. 239,710, Sep. 2, 1988, abandoned, which is a continuation of Ser. No. 886,562, Jul. 17, 1986, abandoned. This application Jun. 25, 1990, Ser. No. 542,697
Int. Cl.[5] C07C 51/16, 51/00
U.S. Cl. 562—532 14 Claims



1. In a process for producing acrolein by the catalytic oxidation of propylene and a process for producing acrolein and acrylic acid by a two-step catalytic oxidation of propylene, wherein the first-stage reaction produces primarily acrolein and the second stage reaction produces primarily acrylic acid by the oxidation of acrolein, said processes optionally using one or more recycle streams to either or both stages, both stages operating on feed streams containing oxygen and inert diluent gas, the improvement comprising utilizing one or more essentially inert essentially anhydrous diluent gases free of any intentionally added water in a mole ratio of about 2.0 to about 32.0 moles of diluent per mole of propylene as the essentially inert essentially anhydrous diluent feed added to the first stage, said added essentially inert essentially anhydrous gas feed having a composite heat capacity of at least about 7.95 calories/gram-mole (°C.) and an oxygen-containing stream containing from about 1.1 to about 2.1 moles of molecular oxygen per mole of propylene and utilizing one or more essentially inert essentially anhydrous diluent gases as the inert gas feed which is free of any intentionally added water to the second stage, said added essentially inert essentially anhydrous diet comprising one or more inert gases having a composite heat capacity of at least about 7.95 calories/gram-mole (°C.)

5,198,579
CATALYST FOR OXIDIZING METHACROLEIN AND METHOD FOR PREPARING METHACRYLIC ACID
Tadatoshi Honda, Kanagawa; Nobuhiko Horiuchi; Jun Kitagawa, both of Yamaguchi; Masumi Murakami, Kanagawa; Kazunori Kawahara, Yamaguchi, and Hirofumi Ito, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Nov. 12, 1991, Ser. No. 789,926
Claims priority, application Japan, Nov. 14, 1990, 2-306140; Jan. 28, 1991, 3-008049
Int. Cl.[5] C07C 51/16, 51/235
U.S. Cl. 562—535 4 Claims

1. A method for preparing methacrylic acid comprising catalytically oxidizing, in a gas phase, methacrolein with molecular oxygen in the presence of a catalyst, said catalyst having a composition represented by the following formula:

$$(Mo)_a(V)_b(P)_c(X)_d(Y)_e(Z)_f(NH_4)_g(O)_h$$

wherein x represents at least one element selected from the group consisting of Sb, Cu, Co, Bi and As; Y represents at least one element selected from the group consisting of K, Rb, Cs and Tl; Z represents at least one element selected from the group consisting of W, Be, Mg, S, Ca, Sr, Ba, Te, Se, Ce, Ge, Mn, Zn, Cr, Ag, Pb, B, Nb, Cd, Sn, Al, Ti and Si; a to g each represents a relative ratio of each corresponding element wherein if a is assumed to be 12, b=0.1 to 2; c=1 to 3; d=0.01 to 3; e=0.1 to 3; f=0 to 2; and e+g=2 to 6; h is the number of oxygen atoms required to satisfy the atomic valency of the foregoing elements and which is prepared by mixing a uniform solution containing Mo, V, P and X as compositional elements for the catalyst, a uniform solution containing Y as a compositional element for the catalyst, optionally a uniform solution containing Z as a compositional element for the catalyst and optionally ammonia at a temperature ranging from 0° to 25° C. and then drying the resulting product.

5,198,580
PROCESS FOR OXIDATION OF PROPANE
Joseph P. Bartek, Highland Heights; Ann M. Ebner, Lyndhurst, and James R. Brazdil, Mayfield Village, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed Nov. 18, 1991, Ser. No. 793,910
Int. Cl.[5] C07C 51/16
U.S. Cl. 562—542 2 Claims

1. A process for the partial oxidation of propane to yield acrylic acid, propylene, acrolein and acetic acid by contacting propane in admixture with a molecular oxygen-containing gas in a reaction zone with an oxidic solid catalyst that

1) contains the components and proportions represented by the empirical formula

$$Bi_bMo_cV_vA_aD_dE_eO_x$$

wherein
A is one or more of K, Na, Li, Cs and Tl,
D is one or more of Fe, Ni, Co, Zn, Ce and La,
E is one or more of W, Nb, Sb, Sn, P, Cu, Pb, B, Mg, Ca and Sr,
a, d and e are each zero-10
b is 0.1–10
c is 0.1–20
v is 0.1–10
c:b is from 2:1 to 30:1
v:b is from 1.5:1 to 8:1
and

2) is made by preforming a bismuth molybdate containing composition having at least 0.67 atoms of Mo per atom of Bi, before combining with any vanadium compound.

5,198,581
PROCESS FOR PRODUCING UNSATURATED ALDEHYDES AND UNSATURATED ACIDS
Tatsuya Kawajiri; Hideyuki Hironaka; Shinichi Uchida, all of Himeji, and Yukio Aoki, Hyogo, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan
Filed Apr. 2, 1991, Ser. No. 679,319
Claims priority, application Japan, Apr. 3, 1990, 2-87355
Int. Cl.[5] C07C 27/14
U.S. Cl. 562—546 8 Claims

1. A process for producing an unsaturated aldehyde and an unsaturated acid comprising catalytically oxidizing propylene or at least one compound selected from isobutylene, tert.-butyl alcohol and methyl-tert.-butyl ether in a gaseous phase with molecular oxygen or a molecular oxygen-containing gas using a fixed bed multipipe reactor, wherein

(a) a plurality of composite oxides different in occupied volume, represented by formula

$$Mo_aW_bBi_cFe_dA_eB_fC_gD_hO_x \quad (I)$$

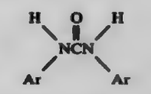
wherein Mo denoted molybdenum; W denotes tungsten; Bi denotes bismuth; Fe denotes iron; A denotes at least one element selected from cobalt and nickel; B denotes at least one element selected from an alkali metal, an alkaline earth metal and thallium; C denotes at least one element selected from phosphorus, tellurium, arsenic, boron, niobium, antimony, tin, lead, manganese, cerium and zinc; D denotes at least one element selected from silicon, aluminum, titanium and zirconium; O denotes oxygen; a, b, c, d, e, f, g, h and x denote numbers of atoms of Mo, W, Bi, Fe, A, B, C, D and O; a=2 to 12, b=0 to 10 and a+b=12, c=0.1 to 10, d=0.1 to 10, e=2 to 20, f=0.005 to 3, g=0 to 4, h=0.5 to 30 and x=value determined by an oxidized state of each element,
are used as catalysts,

(b) a plurality of reaction zones are provided along an axial direction in each reaction pipe of the fixed bed multipipe reactor, and

(c) the plurality of the catalysts different in occupied volume are filled in the plurality of the reaction zones such that the occupied volumes become lower from the starting gas inlet side to the outlet side.

5,198,582
PROCESS FOR PREPARING SYMMETRIC N,N'-DISUBSTITUTED AROMATIC UREA
Jae S. Oh, and Sang M. Lee, both of Daejeon, Rep. of Korea, assignors to Lucky Ltd., Seoul, Rep. of Korea
Continuation-in-part of Ser. No. 606,721, Oct. 31, 1990, Pat. No. 5,091,571. This application Oct. 22, 1991, Ser. No. 780,197
The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.
Int. Cl.[5] C07C 275/28, 275/30
U.S. Cl. 564—52 11 Claims

1. A process for preparing N,N'-disubstituted urea of the following formula (I):



(I)

wherein Ar represents an unsubstituted aromatic radical or an aromatic radical substituted with a halogen atom, an alkyl group or an alkoxy group, which comprises reacting an aromatic mono-nitro compound, an aromatic primary amine, and synthesis gas of carbon monoxide and hydrogen gas mixture in the presence of a catalyst consisting essentially of a divalent palladium compound as a main catalyst component and an ammonium or a phosphonium salt containing halogen atom as a co-catalyst component, and a non-polar solvent.

5,198,583

OPTICALLY ACTIVE CYCLOBUTANE NUCLEOSIDE AND INTERMEDIATES, THEREFOR

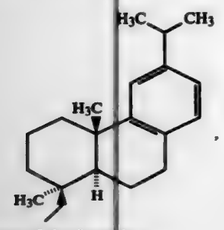
Gregory S. Bisacchi, Lawrenceville, and Toomas Mitt, Plainsboro, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 451,664, Dec. 18, 1989, Pat. No. 5,064,961. This application Oct. 3, 1991, Ser. No. 770,390
Int. Cl.[5] C07C *233/32, 229/34*
U.S. Cl. 564—158 4 Claims

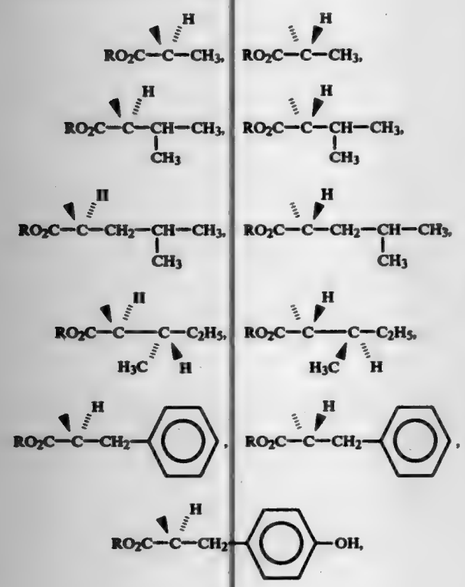
1. A compound having the formula

wherein R^1 is straight or branched chain lower alkyl of 1 to 5 carbons,

R^3 is a chiral straight or branched chain alkyl of up to 10 carbons, a chiral substituted alkyl of up to 10 carbons wherein said substitutents are selected from the group consisting of hydroxy, lower alkoxy of 1 to 5 carbons, lower alkoxycarbonyl of 2 to 6 carbons, phenyl, hydroxyphenyl, dihydroxyphenyl, nitrophenyl, and naphthyl,



or a chiral moiety of the formula



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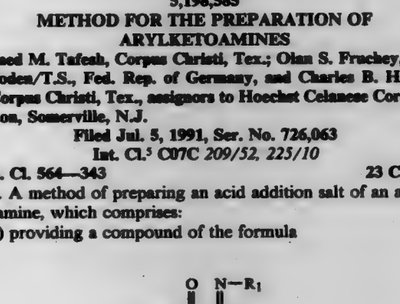


wherein R is straight or branched chain lower alkyl of 1 to 5 carbons.

5,198,584

P-PHENYLENEDIAMINE SUBSTITUTED BY A QUATERNARY AMMONIUM GROUP AND AN ELECTRON WITHDRAWING GROUP

A. C. Chan, Mineola, N.Y.; Y. G. Pan, Stamford, and D. L. Chang, Norwalk, both of Conn., assignors to Clairol Inc., New York, N.Y.

Division of Ser. No. 798,452, Nov. 27, 1991, Pat. No. 5,139,532. This application Jan. 4, 1992, Ser. No. 894,150
Int. Cl.[5] C07C *211/00*; A61K *7/13*
U.S. Cl. 564—289 7 Claims

1. A compound of the formula I:

I

and cosmetically acceptable salts thereof, wherein:
n is an integer from 1 to 6;
X^- is a halide or methylsulfate group;
R′, R″, R‴ are each, independently, $C_{1\text{-}6}$ alkyl or $C_{1\text{-}6}$ (poly)hydroxyalkyl;
R⁗ is hydrogen, $C_{1\text{-}6}$ alkyl or $C_{1\text{-}6}$ (poly)hydroxyalkyl;
R is F, CF_3 or CN; and
R^3 and R^4 are each, independently, hydrogen, $C_{1\text{-}6}$ alkyl, halogen or $C_{1\text{-}6}$ alkoxy.

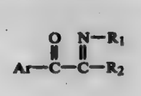
5,198,585

METHOD FOR THE PREPARATION OF ARYLKETOAMINES

Ahmed M. Tafesh, Corpus Christi, Tex.; Olan S. Fruchey, Bad Soden/T.S., Fed. Rep. of Germany, and Charles B. Hilton, Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 5, 1991, Ser. No. 726,063
Int. Cl.[5] C07C *209/52, 225/10*
U.S. Cl. 564—343 23 Claims

1. A method of preparing an acid addition salt of an arylketoamine, which comprises:
a) providing a compound of the formula



wherein,

R_1 = an hydroxyl or C_1–C_8 alkyloxy radical,
R_2 = hydrogen or a C_1–C_8 alkyl or cycloalkyl radical, and
Ar = an unsubstituted phenyl radical, or a phenyl radical substituted at the ortho position, the para position, or both the ortho and para positions, or an unsubstituted naphthyl radical, or a naphthyl radical substituted at one or more of the 1, 3, 6, and 7 positions, wherein the substituents are selected from the group consisting of hydroxyl, alkoxy, alkyl, phenyl, and benzyl radicals, wherein the alkyl component is a branched or unbranched C_1–C_8 alkyl radical, wherein any of said alkyl, phenyl, and benzyl radicals are optionally substituted with one or more substituents selected from hydroxyl, sulfonic acid, and sulfinic acid radicals, and wherein said phenyl and benzyl substituents are optionally substituted with a C_1–C_8 alkyl or C_1–C_8 alkoxy radical, or both; and

b) reacting said compound with hydrogen in a reaction medium comprising a dipolar aprotic solvent and a strong acid and a hydrogenation catalyst comprising a transition metal catalyst on an inert support, to produce a reaction product comprising an arylketoamine as a major compound.

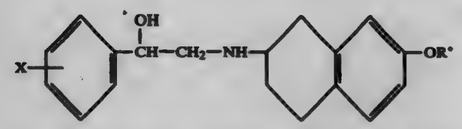
5,198,586

PROCESS FOR THE PREPARATION OF PHENYLETHANOLAMINOTETRALINS

Robert Boigegrain, Castelnau le Lez, France; Roberto Cecchi, Lodi-Milan, and Sergio Beveri, Tortona, both of Italy, assignors to Sanofi, Paris, France

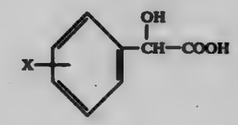
Continuation of Ser. No. 231,374, Aug. 11, 1988, abandoned. This application Oct. 25, 1990, Ser. No. 603,247
Claims priority, application France, Aug. 12, 1987, 87 11497; Mar. 30, 1988, 88 04219; Jun. 14, 1988, 88 07947
Int. Cl.[5] C07C *213/00*
U.S. Cl. 564—356 9 Claims

1. A process for the preparation of phenylethanolaminotetralins of formula



(I)

wherein X is hydrogen, a halogen, a trifluoromethyl group or a lower alkyl group and R° is hydrogen or a methyl group substituted by a carboxy or lower carbalkoxy group; and of their pharmaceutically acceptable salts, which comprises treating a functional derivative of a mandelic acid of formula

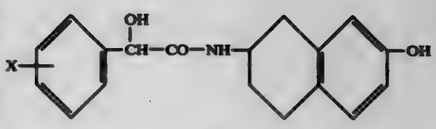


(II)

wherein X is as defined hereinabove, with an aminotetralin of formula

(III)

the mandelamine thus obtained of formula



(IV)

wherein X is as defined hereinabove, is then, submitted to a reduction for the transformation of the amido group into the methyleneamino group or alternatively treated with a lower alkyl haloacetate in the presence of a basic condensation agent, the above mentioned haloacetate being a bromo-, chloro- or iodoacetate; on this second assumption submitting the resulting product, in any order to a reduction for the transformation of the amido group into a methylene amino group and, if desired, to a saponification of the lower carbalkoxy group into the carboxy group; and, if desired, transforming the product thus obtained into one of its pharmaceutically acceptables salts.

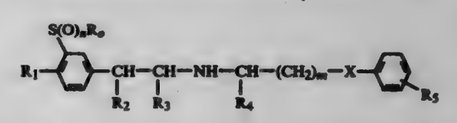
5,198,587

PHENETHYLAMINE DERIVATIVES

Kazuo Imai; Kunihiro Niigata; Takashi Fujikura, all of Saitama; Shinichi Hashimoto, Matsudo; Teichi Takenaka, Tokyo, and Kazuo Honda, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 569,780, Aug. 21, 1990, Pat. No. 5,063,246, which is a continuation of Ser. No. 364,579, Jun. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 253,368, Sep. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 24,605, Mar. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 894,464, Jul. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 690,398, Jan. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 517,734, Jul. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 385,782, Jul. 22, 1981, abandoned. This application Jul. 30, 1991, Ser. No. 737,976
Claims priority, application Japan, Jul. 29, 1980, 55-104175; Jun. 15, 1981, 56-92010
Int. Cl.[5] C07C *217/60*
U.S. Cl. 564—374 3 Claims

1. A phenethylamine derivative of the formula



wherein R_0 represents a lower alkyl group; R_1 represents a lower alkyl group or a lower alkoxy group; R_2 represents a hydrogen atom; R_3 represents a hydrogen atom or a lower alkyl group; R_4 represents a hydrogen atom, R_5 represents a hydrogen atom or a lower alkoxy group: X represents an oxygen atom; m is an integer of 1; and n is an integer of 2 and the pharmacologically acceptable acid addition salts thereof.

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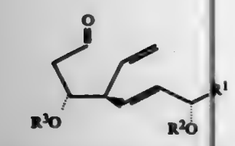
OPTICALLY ACTIVE ISOXAZOLE DERIVATIVES AND INTERMEDIATES FOR PREPARATION THEREOF

Takashi Takahashi, Kanagawa, and Kenshiro Sakaguchi, Osaka, both of Japan, assignors to Daiso Co., Ltd., Osaka, Japan

Filed Jan. 23, 1991, Ser. No. 644,779
Claims priority, application Japan, Jan. 25, 1990, 2-15329
Int. Cl.[5] C07C *47/56*; C07D *261/20*
U.S. Cl. 568—442 3 Claims

1. An optically active aldehyde compound represented by general formula:



[IX]

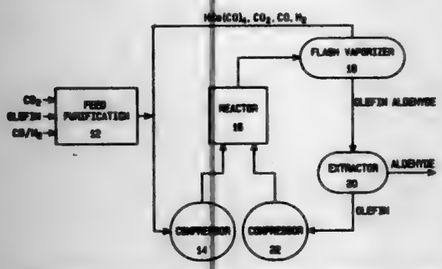
wherein R^1 represents an alkyl group; and R^2 and R^3, which may be the same or different, each represents an aralkyl group.

5,198,589

COBALT CARBONYL CATALYZED OLEFIN HYDROFORMYLATION IN SUPERCRITICAL CARBON DIOXIDE

Jerome W. Rathke, Lockport, and Robert J. Klingler, Westmount, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 28, 1992, Ser. No. 874,897
Int. Cl.[5] C07C 45/50, 29/16
U.S. Cl. 568—454 13 Claims



1. A method of olefin hydroformylation to produce n-isomer aldehydes and n-isomer alcohols comprising:

mixing hydrogen and carbon monoxide each at pressures of between approximately 25 to 300 atm, a concentration of an olefin of the type having the generalized formula C_nH_{2n} at aq concentration ranging from approximately 0.5 to 5 moles per liter and a concentration of between approximately 0.001 to 0.02 moles/liter of a carbonyl catalyst containing a transition metal together to create a mixture;

supplying a supercritical reaction media to the mixture to create and maintain a homogeneous vapor phase reaction fluid at a pressure ranging from approximately 100 to 700 atm; and

extracting the n-isomer aldehydes and n-isomer alcohols from the reaction fluid.

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HYDROCARBON CONVERSION

John A. Sofranko; Glenn E Chenoweth; John C. Jubin, Jr., all of West Chester, and W. Wayne Weatzheimer, Glen Mills, all of Pa., assignors to Arco Chemical Technology, L.P., Wilmington, Del.

Continuation of Ser. No. 826,739, Jan. 28, 1992, abandoned. This application Jul. 30, 1992, Ser. No. 923,018
Int. Cl.[5] C07C 41/66
U.S. Cl. 568—697 4 Claims

1. The process for the production of high octane value alkyl tertiary ethers from low value hydrocarbon feed which comprises reacting the low value feed in a first vertical riser of a fluidized solids catalytic reactor in contact with a fluidized solids catalyst at conditions effective to form iso C_4 and C_5 olefins as well as linear C_4 and C_5 olefins from said feed, separating gaseous products of the reaction including iso and linear C_4 and C_5 olefins from the catalyst, etherifying the iso C_4 and C_5 olefins and recovering product high octane value ethers, passing unreacted linear C_4 and C_5 olefins from the etherification to a second riser of said fluidized solid catalytic reactor, reacting the linear olefins in said second riser with said fluidized solids catalyst at conditions effective to structurally isomerize the linear C_4 and C_5 olefins to iso C_4 and C_5 olefins, separating the iso C_4 and C_5 olefins formed in the second riser from the fluidized solids catalyst, etherifying the iso C_4 and C_5 olefins to form high octane value tertiary alkyl ethers, passing spent catalyst from the first and second risers to a regeneration zone and regenerating the said spent catalyst.

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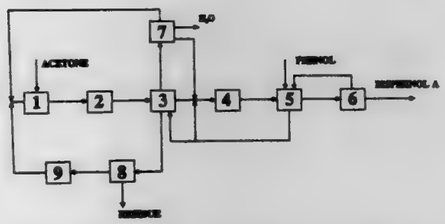
METHOD TO MANUFACTURE BISPHENOL A

Maciej Kiedik, Kedzierzyn-Kozle; Josef Kolt, Zabrze; Jerzy Maraszycki, Kedzierzyn-Kozle; Eugeniusz Zajac, Kedzierzyn-Kozle; Teodor Bek, Kedzierzyn-Kozle; Zbigniew Swiderski, Kedzierzyn-Kozle; Anna Rzedeczko, Kedzierzyn-Kozle; Jerzy Mroz, Kedzierzyn-Kozle, and Janina Olkowska, Kedzierzyn-Kozle, all of Poland, assignors to Instytut Ciezkiej Syntezy Organicznej "Blachownia"; Zaklady Chemiczne "Blachownia", both of Kedzierzyn-Kozle, Poland and ABB Lummus Crest Inc., Bloomfield, N.J.

Filed Nov. 22, 1991, Ser. No. 797,428
Claims priority, application Poland, Nov. 24, 1990, 287944
Int. Cl.[5] C07C 37/20, 37/70
U.S. Cl. 568—727 20 Claims



1. A process to obtain high-purity bisphenol A from a post-reaction mixture resulting from the step of synthesis from phenol and acetone, in the presence of a strong acid cation-exchanger catalyst, by way of crystallization and separation by distillation followed by recovery of bisphenol A from the step of thermal catalytic decomposition of by-products of the principal process technology in a multistage process, the by-products being selected from the group consisting of o,p isomers of bisphenol A, Dianin compound, trisphenols, polyphenols and colored substances, wherein unit (1) of the reaction system is the unit where the following reactions are conducted simultaneously: reaction of phenol with acetone, reaction of phenol with recycled p-isopropenylphenol, and reactions of isomerizational rearrangement of bisphenol A isomers, at a temperature of about 60°–95° C. in the presence of a micro- and macroporous catalyst mixture, whereas the post-reaction mixture is cooled together with acetone and water to obtain a bisphenol-A/phenol slurry adduct in a phenolic solution in unit (2) and the bisphenol-A/phenol slurry adduct in a phenolic solution obtained in unit (2) is separated in unit (3) to obtain crystalline bisphenol-A/phenol adduct and phenol liquor I, whereafter the crystalline adduct is washed with phenolic solution and the crystalline bisphenol-A/phenol adduct obtained in unit (3) is dissolved in at least one of a portion of the phenol liquor I and a phenol liquor II in unit (4) and the mixture is cooled to obtain bisphenol-A/phenol adduct slurry in a phenolic solution, whereafter the slurry obtained in unit (4) is separated in unit (5) into crystalline bisphenol-A/phenol adduct and the phenol liquor II to be sent back to unit (3) while washing the crystalline bisphenol-A/phenol adduct with phenol solution, whereas the high-purity bisphenol A is separated in unit (6) by removing phenol from bisphenol-A/phenol adduct obtained in unit (5), phenol liquor I obtained in unit (3) is distilled in unit (7) by removing water and acetone and part of phenol therefrom, whereas dewartered phenol liquor is sent back to unit (1), whereafter part of the phenol liquor obtained in at least one of unit (3) and unit (7) is decomposed by thermal catalytic decomposition in unit (8) to obtain phenol-containing distillate, p-isopropenylphenol and the process by-products, while reactive components of the distillate obtained in unit (8) are rearranged catalytically in unit (9) leaving the p-isopropenylphenol contained therein substantially intact, and the rearranged distillate is sent back to unit (1) of the process of the invention.

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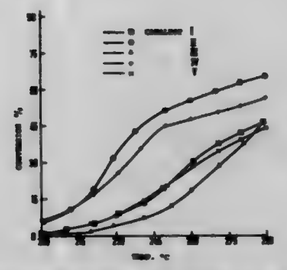
HYDROGENOLYSIS REACTION AND CATALYST SUITABLE THEREFOR

Johannes van Beijnum, Soest; Adrianus J. van Dillen, Culemborg, and John W. Geus, Bilthoven, all of Netherlands, assignors to Engelhard De Meern B.V., De Meern, Netherlands

Continuation of Ser. No. 281,194, Dec. 7, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 597,093
Claims priority, application Netherlands, Dec. 11, 1987, 8703002
Int. Cl.[5] C07C 29/136
U.S. Cl. 568—885 8 Claims



1. A method of hydrogenolysing an ester in the presence of a supported catalyst consisting essentially of carrier material, iron and copper, with copper as the active component and iron as the promoter, the proportion of iron, calculated on the amount of copper and iron jointly, on an atomic basis, being no more than 25%.

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PROCESS FOR PURIFICATION OF ETHYLENE COMPOUND HAVING FLUORINE-CONTAINING ORGANIC GROUP

Hirofumi Kishita; Shinichi Sato; Hideki Fujii, and Takashi Matsuda, all of Aanaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1992, Ser. No. 858,211
Claims priority, application Japan, Mar. 26, 1991, 3-086090
Int. Cl.[5] C07C 17/38; B01J 19/12
U.S. Cl. 570—177 6 Claims

1. A process for purification of a mono or bifunctional fluorine-substituted ethylenically unsaturated compounds which contains molecular iodine or an unsanctioned iodine, which comprises:

(a) mixing said compound with at least one reducing agents selected from the group consisting of an alkali metal hydroxide, alkaline metal carbonate, alkaline metal thiosulfate, and alkaline earth metal hydroxide, and

(b) irradiating the mixture obtained in step (a) with ultraviolet radiation in an amount sufficient to decompose any iodides present, and

(c) removing any water-soluble iodides present by water washing of the mixture.

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ALKYLATION OF ALKYLAROMATICS PROMOTED BY SONICATED ALKALI METAL

Lawrence D. Lillwitz, Glen Ellyn, and Anne M. Karachowski, St. Charles, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 27, 1991, Ser. No. 799,543
Int. Cl.[5] C07C 21/66
U.S. Cl. 585—467 22 Claims

1. A process for alkylating an alkylaromatic compound having at least one benzylic hydrogen atom with an olefinic compound comprising contacting the alkylaromatic compound under liquid phase conditions with the olefinic compound in the presence of at least one alkali metal activated by sonication.

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ALKYLATION OF AROMATIC COMPOUNDS

Gee-shuh J. Lee; Juan M. Garces, both of Midland, Mich.; Garret R. Meima, and Matheus J. M. van der Aalst, both of Terneuzen, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 455,677, Dec. 22, 1989, and a continuation-in-part of Ser. No. 699,441, Apr. 22, 1991, which is a continuation-in-part of Ser. No. 422,187, Oct. 16, 1989, abandoned, which is a division of Ser. No. 323,530, Mar. 14, 1989, Pat. No. 5,004,841, which is a continuation-in-part of Ser. No. 123,741, Nov. 23, 1987, Pat. No. 4,891,448, and Ser. No. 455,677, Nov. 23, 1987, which is a continuation-in-part of Ser. No. 323,530, Mar. 14, 1989, Pat. No. 5,004,841, which is a continuation-in-part of Ser. No. 123,741, Nov. 23, 1987, Pat. No. 4,891,448. This application Jan. 21, 1991, Ser. No. 718,741
Int. Cl.[5] C07C 2/66, 37/48, 209/68
U.S. Cl. 585—467 37 Claims

1. A continuous flow process of alkylating benzene or substituted benzene comprising contacting the benzene or substituted benzene with an alkylating agent having from two to eighteen carbon atoms in the presence of a catalyst in a continuous flow reactor, the catalyst comprising an acidic mordenite zeolite having a silica/alumina molar ratio of at least 160:1 and a Symmetry Index above about 1.0, under conditions sufficient for the formation of an alkylated benzene or an alkylated substituted benzene, the catalyst being prepared by a method which comprises

(i) calcining an acidic mordenite having a Symmetry Index between about 0.50 and about 1.3 and having a silica/alumina molar ratio less than 30:1 in air or heating the acidic mordenite in an inert atmosphere at a temperature in the range from about 300° C. to about 800° C.,

(ii) contacting the calcined or heated acidic mordenite with strong acid, and optionally

(iii) repeating Steps (i) and (ii),

to form an acidic mordenite having a silica/alumina molar ratio of at least 160:1 and having a Symmetry Index of at least about 1.

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HYDROCARBON CONVERSION

Mark P. Kaminsky, Winfield; Mark S. Kleefisch; George A. Huff, Jr., both of Naperville; Don M. Washecheck, Naperville, and Mark K. Barr, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 11, 1991, Ser. No. 775,227
Int. Cl.[5] C07C 2/00
U.S. Cl. 585—500 27 Claims

1. A method for converting lower alkanes to a product composition comprising a higher molecular weight hydrocarbon, said method comprising contacting a feed composition comprising at least one lower alkane material with an oxidative coupling contact material comprising an intimately mixed, mixed oxide of:

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laterally spaced relation, each arm having a first end and a

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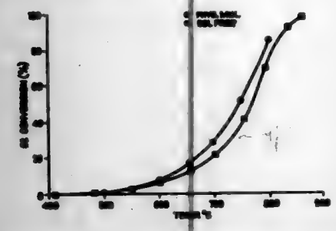
a) at least one cationic species of a naturally occurring Group IIIB element;

b) at least one cationic species of a Group IIA metal selected from the group consisting of magnesium, calcium, strontium and barium; and



c) at least one additional metal cationic species selected from the group consisting of zirconium and hafnium; with the contacting being at oxidative coupling reaction conditions and in the presence of oxygen.

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BIMETALLIC CATALYSTS FOR DEHYDROISOMERIZATION OF N-BUTANE TO ISOBUTENE

Chi-Lin O'Young, Poughkeepsie; James E. Browne, Beacon; John F. Matteo, Wappingers Falls; Robert A. Sawicki, Stormville, and John Hazen, Cragsmoor, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 30, 1991, Ser. No. 738,017
Int. Cl.[5] C07C *5/327, 5/22*
U.S. Cl. 585—654 **1 Claim**

1. A process for producing branched chain olefins which comprises contacting a feedstock comprising at least one component selected from the group consisting of normal alkanes, normal alkenes and branched chain alkanes with a catalyst comprising a boron-substituted zeolite containing sufficient boron to provide sufficient acidity in said zeolite to dehydroisomerize both normal alkanes and alkenes and at least one noble metal, said zeolite being characterized by the topological structure of ZSM-11.

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TELOMERIZATION PROCESS OF A CONJUGATED ALKADIENE WITH A POLYOL

Karlheinz Hill, Erkrath, Fed. Rep. of Germany; Steven D. Axt, Cupertino, and Kenneth J. Weese, Daly City, both of Calif., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 19, 1991, Ser. No. 732,551
Int. Cl.[5] C07C *43/11*
U.S. Cl. 568—619 **18 Claims**

1. A process for the telomerization of a conjugated alkadiene with a polyol comprising the steps of: (a) providing a reaction mixture comprised of at least one polyol reactant, at least one saturated aliphatic secondary alcohol solvent, and a catalyst effective amount of a palladium catalyst and adding a conjugated alkadiene to said mixture, wherein said palladium catalyst is present in a mole ratio of palladium catalyst to total alkadiene of up to about 1:10,000, and wherein said reaction mixture contains from about 5% to about 40% by weight of the total amount of conjugated alkadiene to be added; (b) heating said reaction mixture to from about 40° C. to about 100° C.; (c) continuously adding the remaining amount of said conjugated diene to said reaction mixture at a rate sufficient to maintain a constant pressure or at a constant rate over a period of from about 2 hours to about 10 hours at a temperature of from about 40° C. to about 100° C. to produce a reaction product comprised of less than about 12% by weight alkadiene dimer.

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SULFONYLUREA HERBICIDE RESISTANCE IN PLANTS

Donald C. Thill, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Filed Jun. 5, 1990, Ser. No. 533,497
Int. Cl.[5] A01H *5/00*; C12N *5/00*
U.S. Cl. 800—200 **8 Claims**

1. A *Lactuca sativa* plant selected from the group consisting of (1) a plant retardant to sulfonylurea herbicides, (2) a plant resistant to imidazolinone herbicides, and (3) progeny plants of either of plant (1) or plant (2); wherein said plant or a parent of said plant was grown from seed obtained by crossbreeding a *Lactuca serriola* plant resistant to an herbicide selected from the group consisting of (1) sulfonylurea herbicides and (2) imidazolinone herbicides, with a *Lactuca sativa* plant.

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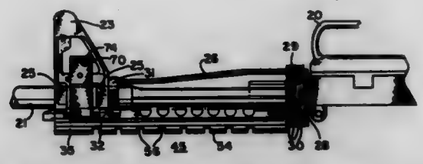
MOUNT FOR RIFLE

David J. E'Nama, Willow Grove, Pa., assignor to Havis-Shields Equipment Corporation, Warminster, Pa.

Filed May 20, 1992, Ser. No. 885,867
Int. Cl.[5] F41C *27/00*
U.S. Cl. 42—90 **2 Claims**



1. In combination with a rifle having a receiver, a barrel engaged in the receiver and retained therein by a barrel nut, a resiliently urged Delta ring outside of and extending over the barrel nut, a front sight assembly on the barrel, a front cap on said barrel, the improvement for mounting accessory items under said barrel which comprises:

a longitudinally extending mount having means engaged with said Delta ring and said barrel,

said means for engaging said barrel is a pair of clamps carried by said mount,

said mount has triangularly shaped side means adapted to receive an accessory item,

said mount has a bottom surface, and

slots in said bottom surface intended to be engaged with latch means on said accessory item.

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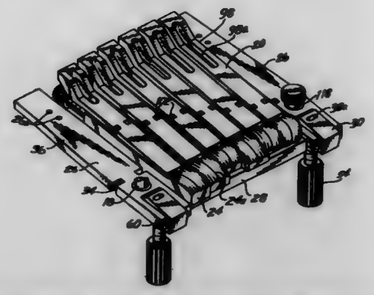
TUNING MEANS FOR STRINGED MUSICAL INSTRUMENT

Geoffrey McCabe, 36 E. 7th St., New York, N.Y. 10003

Filed Oct. 31, 1990, Ser. No. 607,458
Int. Cl.[5] G10D *3/04*
U.S. Cl. 84—298 **42 Claims**



1. Apparatus for controlling vibrations comprising a vibrating object including a first resonant system having a first resonant frequency and a member including a second resonant system and a second resonant frequency, said member being tightly coupled to said vibrating object, and said member having one free-to-vibrate portion comprising at least one arm-like elongated part forming said free-to-vibrate portion and said part having a first end tightly coupled to said vibrating object and a free second end spaced in the elongated direction of said part from the first end with the free-to-vibrate portion extending from the second end toward and spaced from the first end, and said second resonant frequency of said free-to-vibrate portion changing the resonant frequency of said vibrating object, at least one narrow slit being cut in said member transversely of the elongated direction for defining at least one resonant frequency of said free-to-vibrate-portion, said at least one elongated part comprising a part of elongated arms in laterally spaced relation, each arm having a first end and a second end, said first ends of said arms being coupled together and said second ends being free, said elongated arms each forming one said free-to-vibrate portion with said arms each having approximately the same fundamental frequency, each said arm having a pair of opposite surfaces extending in the elongated direction, at least one of said opposite surfaces of each said arm converging toward the other said surface for at least a portion thereof toward the free second end thereof, at least a portion of one of said opposite surfaces being recessed toward the other said opposite surface, said recessed surface comprising a plurality of holes spaced apart in the elongated direction.

5,198,602

SOUND BAR FOR PERCUSSIVE MUSICAL INSTRUMENT

Daleth F. Roper, 418 W. Evergreen Ave., Monrovia, Calif. 91016

Filed Dec. 9, 1991, Ser. No. 806,092
Int. Cl.[5] G10D *13/08*
U.S. Cl. 84—403 **8 Claims**

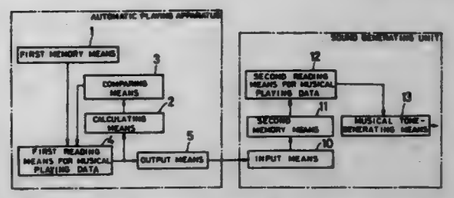
1. A vibratile tone bar for percussive musical instruments comprising a main portion presenting an upper strike face and having side and bottom surfaces, a vibratile tongue projecting from one of said surfaces and having a free end in spaced relation to said one of said surfaces.

5,198,603

AUTOMATIC DATA-PREREADING PLAYING APPARATUS AND SOUND GENERATING UNIT IN AN AUTOMATIC MUSICAL PLAYING SYSTEM

Masashi Nishikawa; Satoshi Otsuka, and Mitsuhiro Umeta, all of Hamamatsu, Japan, assignors to Roland Corporation, Japan

Continuation of Ser. No. 425,038, Oct. 23, 1989. This application Oct. 2, 1991, Ser. No. 769,831
Claims priority, application Japan, Aug. 19, 1989, 1-213898
Int. Cl.[5] G10H *7/00*; G11C *00/00*; H03M *00/00*
U.S. Cl. 84—601 **15 Claims**



1. An automatic playing apparatus for a musical data-preading playing system, the apparatus comprising:

(a) a first memory means for storing musical playing data representative of music to be played in a time sequence arrangement;

(b) output means;

(c) calculating means for calculating an actual quantity of playing information included in preread musical playing data;

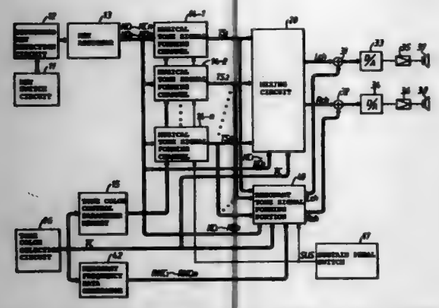
(d) comparing means for determining whether or not the actual quantity of playing information is less than a predetermined quantity of information; and

(e) a first reading means for sequentially prereading musical playing data from the first memory means prior to when the music is to be played, and for applying preread musical playing data to the output means only when the comparing means determines that the actual quantity of playing information is less than the predetermined quantity of information, the quantity of playing information included in the musical playing data increasing as the first reading means prereads musical data, and decreasing as music represented by the preread musical playing data is played.

5,198,604
RESONANT EFFECT APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Iwao Higashi, and Yasuyuki Umeyama, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 12, 1991, Ser. No. 758,675
Claims priority, application Japan, Sep. 12, 1990, 2-242228; Sep. 12, 1990, 2-242229
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—626 **5 Claims**



1. A resonant effect apparatus for providing a resonant effect to a musical tone in an electronic musical instrument, comprising:

a plurality of resonant tone signal forming channels for forming a plurality of resonant tone signals different in their resonant frequency characteristics when applied with a musical tone signal to be generated;

memory means for memorizing a plurality of resonance control parameters for control of each sound localization of the resonant tone signals;

control means for controlling each of the resonant tone signals based on the memorized resonance control parameters; and

a plurality of acoustic conversion means for acoustically converting each of the controlled resonant tone signals to issue the converted resonant tone signals therefrom.

5,198,605
KEY TOUCH DATA GENERATION CIRCUIT OF AN ELECTRONIC MUSICAL INSTRUMENT

Shinya Konishi, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawa Gakki Seisakusho, Shizuoka, Japan

Filed Oct. 11, 1991, Ser. No. 774,833
Claims priority, application Japan, Oct. 12, 1990, 2-274570
Int. Cl.[5] G10H *1/053, 1/18*
U.S. Cl. 84—658 **13 Claims**

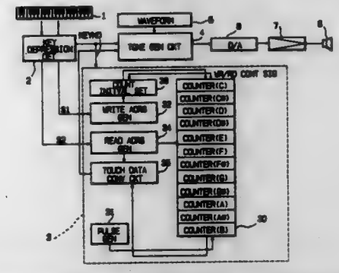
8. A method of generation key touch data in an electronic musical instrument comprising the steps of:

generating respective first and second key signals from a plurality of first and second key switches, respective pairs of the first and second key switches being arranged to generate the first and second key signals for different respective keys of the electronic musical instrument,

the first key signal being generated in accordance with a first depth of depression of a key and the second signal being generated in accordance with a second depth of depression of a key, which is greater than the first depth of depression;

generating count values in counter means for a respective key, the counter means including a plurality of counters, wherein plural respective keys are assigned to each of the counters, said count value generating step including the steps of

setting an initial counter value in a respective counter in



accordance with receipt of a corresponding first key signal from the respective key,

counting clock pulses generated by clock pulse generating means in the respective counter, and

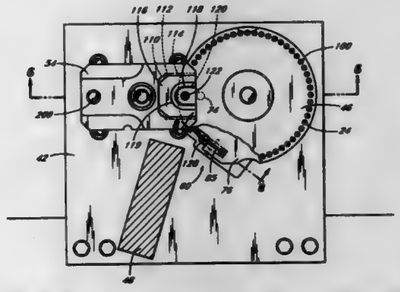
reading out a final count value of the respective counter, for the respective key, upon receipt of a corresponding second key signal; and

generating key touch data, in touch data conversion means, for the respective key in accordance with the final count value.

5,198,606
AMMUNITION PRIMER HANDLING AND SHELL RELOADING SYSTEM

David J. Storstad, 225 Kings Pl., Newport Beach, Calif. 92663, and Gary A. Nagy, Irvine, Calif., assignors to David J. Storstad, Newport Beach, Calif.

Filed Apr. 1, 1992, Ser. No. 861,912
Int. Cl.[5] F42B *33/04*
U.S. Cl. 86—32 **25 Claims**



1. An apparatus for installing primers in ammunition shells, comprising a primer holder having walls defining a pocket opening to an upper surface of the holder for receiving a primer, said pocket having a diameter slightly smaller than the diameter of a primer so that there is an interference fit between the pocket and the primer sufficient to prevent the primer from being inadvertently dislodged from the holder during handling of the holder, said holder having a hole extending from a bottom of said pocket to a bottom surface of said holder for receiving a pin which pushes said primer out of said pocket and

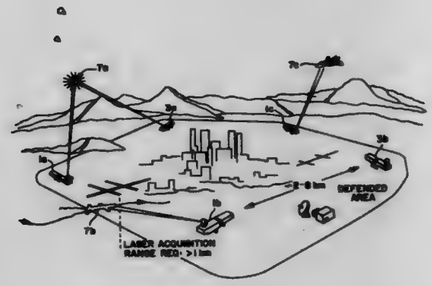
directly into a shell in response to relative movement between the holder and the pin.

5,198,607
LASER ANTI-MISSLE DEFENSE SYSTEM

Peter M. Livingston, Palos Verdes Estates, and Alvin D. Schnurr, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 18, 1992, Ser. No. 836,484
Int. Cl.[5] F41B *15/00*; F41H *11/00, 13/00*
U.S. Cl. 89—1.11 **2 Claims**

2. The method of damaging an airborne moving target from within an atmospheric region, comprising the steps of:



directing and maintaining a first continuous wave laser beam from a chemical laser onto a given area of said target to release radiant heating energy in said given area with said first laser beam originating from said first location; and

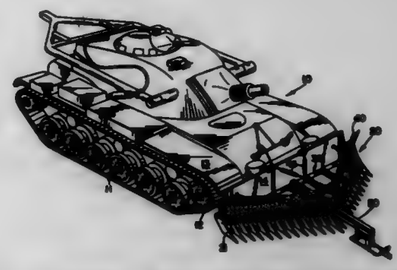
simultaneously directing and maintaining at least a second continuous wave laser beam from a second chemical laser onto said given area of said target to release radiant heating energy in said given area with said second laser beam originating from a second location spaced from said first location, said spacing between said first and second locations being in an amount sufficient to preclude said laser beams from overlapping materially with one another away from the immediate vicinity of said target, wherein said laser beams essentially define two sides of a triangle having an apex at said given area on said target; and wherein said step of directing and maintaining said first laser beam includes the step of focusing a first pointer tracker at said target to aim said first laser beam at a selected position located a distance rewardly of the forward end of said target and said step of directing and maintaining said second laser beam includes the step of focusing a second pointer tracker at said target to aim said second laser beam at said same selected position on said target at which said first laser beam is aimed;

said continuous wave laser beams releasing a combined radiant heating energy on said given area of said target sufficient in amount to at least melt or otherwise damage at least portion of said given area of said target, wherein the effect of said laser beams upon said given area is additive and results in damage to said target.

5,198,608
MINE CLEARING RAKE

Peter J. Cahill, 7208 Cuulking Pl., Burke, Va. 22015; William L. Holland, 4817 Bristow Dr., Annandale, Va. 22003; Sergio A. Sergi, 8570 Kolander Ct., Lorton, Va. 22079; James M. Collins, 2235 Poplar Rd., Stafford, Va. 22554; James M. Dillon, 7202 Valleycrest Blvd., Annandale, Va. 22003; Charles W. Chichester, 14638 Estate Dr., Woodbridge, Va. 22193; Paul T. Kwon, 3850 Appaloosa Dr., Lake Ridge, Va. 22192, and Stephen H. Bennett, 7573 Aspenpark Rd., Lorton, Va. 22079

Filed Oct. 17, 1991, Ser. No. 777,972
Int. Cl.[5] F41H *11/12*
U.S. Cl. 89—1.130 **12 Claims**

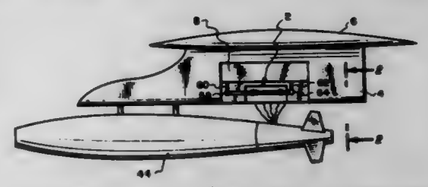


12. A method for clearing surface-laid and larger buried mines from sand and loose earth with a mine clearing device having an open gridwork rake assembly of vertically disposed spaced apart elongated teeth members connected to laterally disposed spaced apart elongated connecting members which form an open gridwork from the top to the bottom of the rake assembly, and where some of the elongated teeth are longer than other elongated teeth for penetrating the earth deeper than the shorter elongated teeth for unearthing buried mines and the mine clearing device also having a skid shoe attached to the rake assembly for controlling the penetration depth of the rake assembly, comprising the steps of pushing the mine clearing device through sand or earth so that the longer elongated teeth penetrate the earth to a predetermined depth to unearth buried mines, moving a portion of the unearthed material away from the path of the mine clearing device and directing the remaining portion of material through the open gridwork of the rake assembly so that blasts from exploding mines are directed through the open gridwork.

5,198,609
AUXILIARY TARGET AREA CHAFF CONTAINER

Charles B. Gilman, Hanford, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1992, Ser. No. 874,155
Int. Cl.[5] B64D *1/02*
U.S. Cl. 89—1.51 **12 Claims**



1. An auxiliary target area chaff container system for mounting in the pylon of an F/A 18 aircraft and for automatically dispensing chaff when a bomb is released comprising:

a) a box shaped housing having an open bottom;

b) at least one chaff canister means located in the housing, each chaff canister means having a discharge end and a

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non-discharge end, the discharge end located proximate the open bottom of said housing;

c) a trigger wire for each said chaff canister means, each trigger wire having a first and second end, the first end of each trigger wire attached to one said chaff canister means and the second end of each trigger wire attached to a bomb located proximate said housing;

d) means for attaching said housing in the pylon of the aircraft;

e) means for retaining said chaff canister means in said housing;

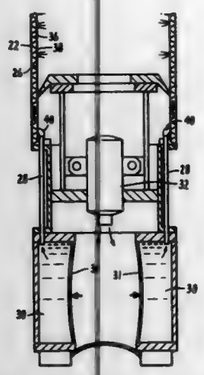
f) means for preventing the side of said housing from contacting a fuel vent line located in said pylon proximate said housing;

g) means for preventing a corner of said housing from contacting the fuel vent line located in said pylon proximate said housing.

5,198,610
SYSTEM AND METHOD FOR QUENCHING A FIRING CONDITION

Robert E. Kennedy, Los Gatos, and Emil F. Klinke, Fremont, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1992, Ser. No. 874,943
Int. Cl.[5] F41F *3/04*
U.S. Cl. 89—1.812 **14 Claims**



13. A method of suppressing heat around a missile housed in a canister during a restrained firing condition comprising the steps of:

providing a missile canister including a hollow wall having an inner side provided with a plurality of dispensing holes, a coolant intake port, and a coolant reservoir communicating with said canister wall via said coolant intake port;

urging coolant from said coolant reservoir into said canister wall and dispensing coolant through said dispensing holes into the canister interior in response to a restrained firing condition.

5,198,611
EXPLOSION SUPPRESSION DEVICE WITH INTRINSICALLY SAFE CIRCUITRY

Theodore E. Larsen, Edina, Minn., assignor to Advanced Innovations, Inc., Minneapolis, Minn.

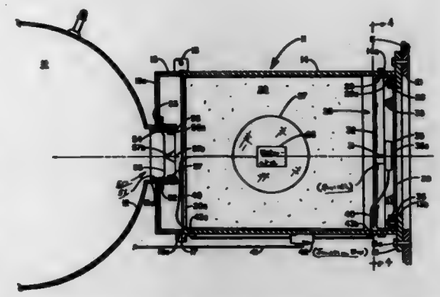
Filed Sep. 23, 1991, Ser. No. 763,978
Int. Cl.[5] A62C *3/04, 37/10*
U.S. Cl. 102—293 **10 Claims**

1. An explosion suppression device for propelling extinguishing materials into a protected volume which volume is normally representative of a structure or other housing, said device including:

a. a propelling cannon providing a barrel having an open end and a closed end, said open end communicating with the housing;

b. a rupturable canister positioned within said barrel arranged and constructed for confining a quantity of extinguishing material;

c. an electrically responsive explosive detonator arranged in rupturing relationship to said canister to cause rupture thereof upon explosion;



d. said open end of said barrel including pressure sensing means responsive to an increase in pressure within said housing;

e. electrical switching means arranged for actuation by said pressure sensing means;

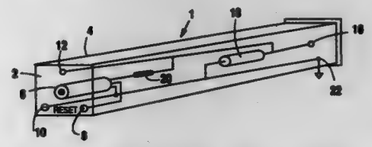
f. an electrical circuit including at least said switch means and said detonator;

g. means for supplying electrical energy to said circuit whereby actuation of said switch means in response to an increase in pressure in said housing provides electrical energy to said detonator for ignition and explosion thereof and propelling of the extinguishing material through said open end of said barrel into the housing.

5,198,612
IN-FLIGHT ELECTRONIC COUNTERMEASURE PAYLOAD SIMULATOR

Thomas R. Myers, Austin, Tex., assignor to Tracor Aerospace, Inc., Austin, Tex.

Filed Apr. 15, 1991, Ser. No. 684,996
Int. Cl.[5] F42C *21/00*
U.S. Cl. 102—293 **18 Claims**



1. An electronic countermeasure payload simulator for use with an electronic countermeasure dispensing system which generates an electrical signal to dispense countermeasures from an electronic countermeasure payload device, said electronic countermeasure payload simulator comprising:

a housing capable of be installed on an aircraft;

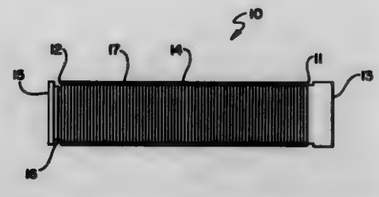
a first magnetic indicator housed by said housing capable of detecting application of the electrical signal generated by the electronic countermeasure dispensing system; and

an electrical circuit to apply the electrical signal generated by the electronic countermeasure dispensing system to the first magnetic indicator instead of the electronic countermeasure payload device.

5,198,613
WATERPROOF DEVICE FOR HOLDING EXPLOSIVES IN A BOREHOLE AND METHOD FOR USING THE SAME

Sanford S. Jenkins, Jr., Lee's Summit, Mo., assignor to Stemlock, Inc., Lee's Summit, Mo.

Filed Feb. 4, 1991, Ser. No. 650,037
Int. Cl.[5] F42B *3/00*
U.S. Cl. 102—313 **26 Claims**



1. A waterproof device for holding explosives in a borehole, comprising:

a tube;

an elongated, flexible, waterproof liner having a first, a second end, and an explosive holding portion wherein the liner is disposed on and about said tube;

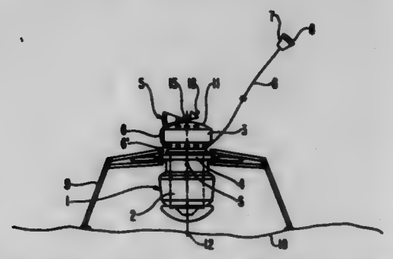
the first end having an aperture through which explosives can be loaded into the liner;

the second end being closed and having sufficient strength to avoid rupturing when a force is exerted against the second end to dispose the liner within and along at least a portion of a borehole.

5,198,614
MINE WITH A LAYING DEVICE FOR A SENSOR LINE

Johannes de la Haye, Kurten, and Franz Strack, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Dec. 23, 1991, Ser. No. 812,008
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1990, 4041767
Int. Cl.[5] F42B *23/16, 23/24*
U.S. Cl. 102—401 **7 Claims**

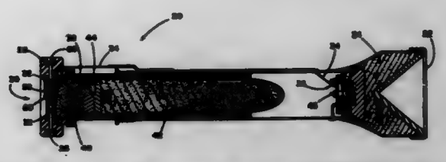


1. A mine comprising a housing with an underside and a topside operatively associated with at least one laying device for the placement of a sensor line after the mine has assumed a predetermined position on the terrain, wherein the sensor line, during a placement step, moves away from the housing at least in an initial phase under an angle of about 45° oriented in the upward direction, characterized in that the housing has mounting means for positioning the laying device so that the device is arranged outside of the housing of the mine and is in contact with the topside of the housing in an initial position, and mounting means including a pivotable support means for said laying device so that the laying device, in its operative position, is splayed away from the housing under an angle of about 45° and is fixed in said operative position.

5,198,615
FUZING SYSTEM FOR TANDEM DEMOLITION WARHEADS

Scott W. Robbie, Brooklyn Center, and William O. Marsaka, Minnetonka, both of Minn., assignors to Alliant Techsystems Inc., Minneapolis, Minn.

Filed Mar. 24, 1992, Ser. No. 856,531
Int. Cl.[5] F42B *12/16*; F42C *15/34, 15/20*
U.S. Cl. 102—476 **20 Claims**



1. A fuzing system for use with tandem demolition warheads to sequentially activate a propellant on the rear of a follow through charge, detonate a forward shaped charge located between the follow through charge and the structure to be demolished and detonate the follow through charge after a brief delay comprising:

means for locating an interface charge proximate to a blasting cap in order to provide a pre-detonation state and for spatially separating said interface charge from the blasting cap providing a safe state;

first arming assembly means containing a first firing pin proximate to the follow through charge for providing a first armed state by interposing a first primary explosive between said first firing pin and the follow through charge;

second arming assembly means containing a second firing pin proximate to the forward shaped charge for providing a second armed state by interposing a second primary explosive between said second firing pin and the forward shaped charge;

first fuzing means responsive to said interface charge for igniting the propellant and for arming said first arming assembly means;

second fuzing means responsive to said interface charge for arming said second arming assembly means, causing the ignited propellant to accelerate the follow through charge into said second firing pin in order to detonate the forward shaped charge and form a hole in the structure to be demolished, and so that the detonation of the forward shaped charge decelerates the follow through charge and causes said first firing pin to impact said first primary explosive activating a fuzing delay means; and

fuze delay means interposed between said first firing pin and the follow through charge, said fuzing delay means comprising means for providing sufficient delay in the detonation of the follow through charge to allow the follow through charge to enter the hole formed by the forward shaped charge before detonation.

5,198,616
FRANGIBLE ARMOR PIERCING INCENDIARY PROJECTILE

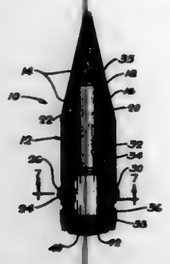
Richard V. Anderson, Arlington, Tex., assignor to BEI Electronics, Inc., San Francisco, Calif.

Filed Sep. 28, 1990, Ser. No. 590,473
Int. Cl.[5] F42B *12/04, 14/02*
U.S. Cl. 102—501 **13 Claims**

1. A frangible ordnance projectile, comprising

a generally cylindrical body having a tapered nose portion thereon,

said body being made of a brittle porous molded sintered powder material consisting predominantly of stainless steel powder for imparting frangibility to the body



whereby the body is frangible into a multitude of granules upon impact of the body with a target,

said powder material comprising a major proportion of stainless steel powder and a minor proportion of substantially pure iron powder.

5,198,617

DUCT LAYING FIXTURE FOR BELLOWS TYPE CABLE DUCT

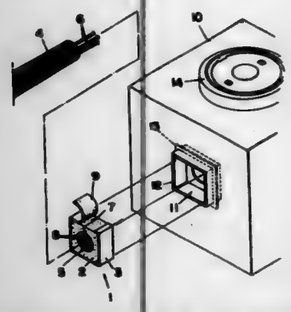
Shotaro Ozaki; Masakazu Kawanabe; Keiji Imamura, and Makoto Nakayama, all of Fukuoka, Japan, assignors to Saito Denki Sangyo Co., Ltd. and Fukuoka Kurosu Kogyo Co., Ltd., both of Fukuoka, Japan

Filed Sep. 18, 1991, Ser. No. 761,725

Claims priority, application Japan, Sep. 21, 1990, 2-253924

Int. Cl.[5] H02G *3/22*

U.S. Cl. 174—65 R 3 Claims



1. A duct laying fixture for a bellows type cable duct, comprising a box shaped barrel which is made of a water-expansible elastic material and which is attached to said bellows type cable duct so as to embrace said duct, and a water-expansible sheet which is stuck on an outer surface of said barrel; said barrel including a duct mounting port in which said bellows type cable duct is mounted, ribs which are formed on a peripheral wall surface of said duct mounting port and which come into close contact with an outer peripheral surface of said bellows type cable duct, and a barrel spreading slit which is formed so as to extend from one side surface of said barrel to said duct mounting port; wherein said sheet is stuck on said outer surface of said barrel after said duct has been passed through said port by spreading said barrel at said slit.

5,198,618

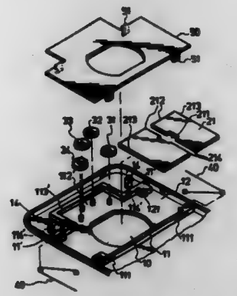
SAFETY COVER PLATE FOR AN ELECTRICAL SOCKET

Gary Shieh, 9-4F, No. 106, Sec. 3, Hsin-I Rd., Taipei City, Taiwan

Filed Feb. 10, 1992, Ser. No. 832,917

Int. Cl.[5] H01R *13/453*

U.S. Cl. 174—67 6 Claims



1. A safety cover plate for covering an electrical socket having a receptacle with slots formed therein, comprising:

an external plate member having a first opening aligned with said receptacle, said external plate member having an outside face and an inside face adjacent to said receptacle, said inside face of said external plate member having a first and a second rail parallel to each other in such a manner that said first opening is located between said first and second rails, said second rail having a discontinuous intermediate section;

a gear assembly mounted to said inside face of said external plate member adjacent to said discontinuous intermediate section of said second rail, said gear assembly having a first and a second gear rotated in opposite directions;

a pair of sliding plates slidably mounted between said first and second rails, each of said sliding plates having a toothed edge adjacent to said discontinuous intermediate section so that said toothed edges of said sliding plates can respectively mesh said first and second gears, said sliding plates shielding said first opening of said external plate member when they engage each other and exposing said first opening of said external plate member when they are moved away from each other, each of said sliding plates having an engaging edge which sealingly contacts the other one of said engaging edges when said pair of sliding plates engage so as to shield said first opening, one of said engaging edges having a notch formed thereon, said notch being staggered with said slots of said receptacle when said sliding plates engage each other;

means for biasing said pair of sliding plates to engage each other so as to shield said first opening; and

an internal plate member detachably connected to said first and second rails which cooperates with said external plate member and said first and second rails to hold said pair of sliding plates in position.

5,198,619

TERMINATION OF MINERAL INSULATED ELECTRIC CABLE

Harry Baker, Knutsford, England, assignor to BICC Public Limited Co., England

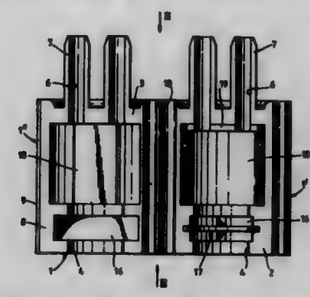
Filed Sep. 10, 1991, Ser. No. 757,226

Claims priority, application United Kingdom, Sep. 20, 1990, 9020556; Apr. 9, 1991, 9107454

Int. Cl.[5] H02G *15/02*

U.S. Cl. 174—74 A 15 Claims

1. A termination of a mineral insulated electric cable comprising at least one conductor insulated from a surrounding metal sheath, and, where there is more than one conductor, from the other conductor or conductors, by compacted mineral insulating powder, which termination comprises a tube of flexible electrically insulating material which at one end of the tube fits over the cut-back metal sheath of the cable and which at the other end of the tube is closed by an end wall spaced from the end face of the cable and having at least one throughbore, said at least one conductor passing through said at least one throughbore in the end wall and, filling the space within the tube between the end face of the cable and said end wall,



waterproof electrically insulating compound which seals the compacted mineral insulating powder exposed at said end face of the cable, wherein at a first position around the circumferential wall of the tube the wall is slit throughout its length and radial thickness and at at least one position circumferentially spaced from said first position circumferentially spaced from said first position the wall is adapted to constitute a hinge extending throughout the length of the wall, the abutting longitudinally extending parts of the wall at said first position being so shaped that one effects a snap-fit with the other throughout the length of the tube.

5,198,620

CAP SLEEVE

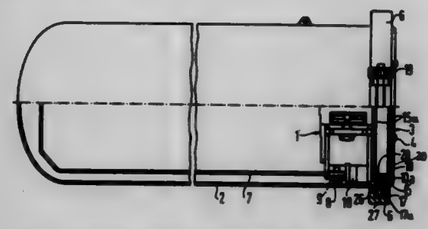
Martin Behrendt, Hagen; Richard Kandt, Bochum, and Peter Steinmetz, Schwerte, all of Fed. Rep. of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Jul. 11, 1991, Ser. No. 728,516

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1990, 4035557

Int. Cl.[5] H02G *15/10*

U.S. Cl. 174—74 R 20 Claims



1. In a cap sleeve, which is composed of an envelope body and at least one actual sealing member arranged to close an opening in the envelope body, said sealing member having cable introduction openings for sealingly receiving cables and having a radially opening, outer circumferential groove receiving a sealing element to form an annular sealing system between the envelope body and an outer circumference of the sealing member, the improvements comprising the sealing system including a ring-shaped shaped adapter for increasing an external groove edge of the circumferential groove, said adapter having a ring-shaped projection on an exterior surface, which has a slanted bevel that flares outwardly, the envelope body having a conically bevelled flange extending radially outward and with a diameter matched to a diameter of the projection, the sealing element being inserted between the flange of the envelope body and the projection of the adapter and the system including a clamp ring with an inwardly directed groove, whose edges have matched conical bevellings receiving the projection and flange in a clamped fashion to exert an axial closing force on the sealing element disposed therebetween.

5,198,621

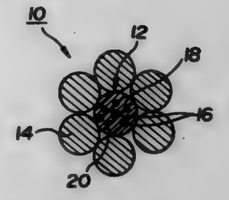
TWISTED CABLE

Toru Kojima, Funabashi, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1992, Ser. No. 816,745

Int. Cl.[5] H01B *5/10*

U.S. Cl. 174—128.1 6 Claims



1. A twisted cable comprising a core and conducting metal wires twisted around said core, said twisted cable characterized by said core including at least one hard steel wire, carbon fibers and resin and said hard steel wire having a ratio of cross section of 10 through 40% based on a total of cross sections of said hard steel wire and said carbon fibers.

5,198,622

CONDENSER BODY FOR THE FIELD CONTROL OF THE CONNECTION OF A TRANSFORMER BUSHING

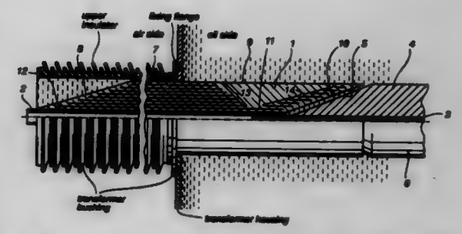
Åsa Hammarsten, Ludvika; Lennart Strandberg, Sunnanäjö, and Bengt-Olof Stenestam, Ludvika, all of Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Continuation of Ser. No. 604,018, Oct. 26, 1990, This application May 12, 1992, Ser. No. 883,919

Claims priority, application Sweden, Oct. 13, 1989, 8903633-9

Int. Cl.[5] H01B *17/28*

U.S. Cl. 174—143 2 Claims



1. In combination, a condenser body and a transformer bushing, the condenser body being for the field control of the connection of a transformer bushing, said condenser body being formed as a solid of revolution with an inner circular-cylindrical opening the radius of which corresponds to the outer radius of a central current-carrying tube of the transformer bushing and which on the air side of the transformer bushing having a circular-cylindrical outer part terminating in a straight outwardly-directed truncated conical part, insulating

material with foil-type condenser layers concentrically laid therein, the condenser body on the oil side of the transformer bushing having a circular-cylindrical inner opening corresponding to the inner opening of the air side and an outer circular-cylindrical part, which from an end thereof is an inwardly-directed straight frustum of a cone facing towards said inner opening, the transformer bushing comprising an energized tube surrounded by said insulating material, said insulating material having a circular-cylindrical part and a straight conical taper towards the end of the tube, said insulating material being positioned around the conductor of the transformer winding, and the conicity of the inwardly-directed straight frustum of a cone of the condenser body being positioned so that the radial cross section area of the gap formed therebetween and the conical part of the insulating material around said energized tube is constant along the entire length of the inwardly-directed cone.

5,198,623

METHOD FOR USE IN A DIGITIZER FOR DETERMINING PEN TILT

Waldo L. Landmeier, Phoenix, Ariz., assignor to CalComp, Inc., Anaheim, Calif.

Filed Nov. 27, 1991, Ser. No. 799,570
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—19 **19 Claims**

1. In a digitizer including a tablet having an array of conductors, and a pen-shaped, coil-containing stylus, a method for determining a pen-tilt indicating value representing the angle of said stylus on said tablet, said method comprising:

A) applying an energizing signal to either said conductors or said stylus, which signal induces voltages in the other corresponding to said conductors;

B) detecting said induced voltages, which define a voltage waveform having a positive peak, a negative peak, and a zero-crossing therebetween;

C) determining a position value for said zero-crossing using voltages in a region between said positive and negative peaks of said waveform; and

D) generating said pen-tilt indicating value using said position value and voltages in a region outside said positive and negative peaks.

5,198,624

AUDIO TRANSDUCER WITH CONTROLLED FLEXIBILITY DIAPHRAGM

Paul W. Paddock, McMinnville, and Steven R. Geist, Portland, both of Oreg., assignors to Linaeum Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 154,945, Feb. 10, 1988, Pat. No. 4,903,308. This application Nov. 14, 1989, Ser. No. 436,914
Int. Cl.[5] H04R *7/00*
U.S. Cl. 181—166 **13 Claims**

1. An audio transducer comprising:

a frame;

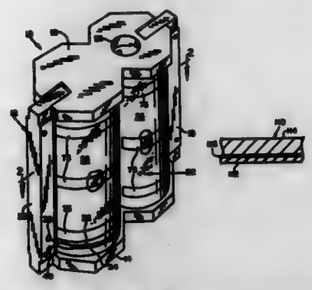
a diaphragm supported by the frame including at least two elongate resilient webs having respective intermediate portions thereof joined together to form a movable expanse extending substantially in a plane, the expanse being movable in the direction of the plane, the webs each having a flexible end portion extending from the expanse in an arc;

coil means attached to the expanse of the diaphragm;

magnetic means for producing a magnetic field extending substantially normal to the expanse;

the diaphragm having a first layer formed of a first sheet of material;

the diaphragm having a second layer formed of a second sheet of material suitable for lamination with the first layer, the second layer being bonded to the first layer, the first layer being formed of a material having a first damping characteristic corresponding to a first rate with which the first layer dissipates resonant energy in the diaphragm,



the second layer being formed of a material having a second damping characteristic corresponding to a second rate with which the second layer dissipates resonant energy in the diaphragm, the second damping characteristic being unequal to the first damping characteristic;

the diaphragm being sufficient flexible to permit movement of the expanse in the plane so as to produce sound, while having sufficiently rigidity to retain the diaphragm's shape at rest; and

connecting means for conducting electrical impulses to the coil means;

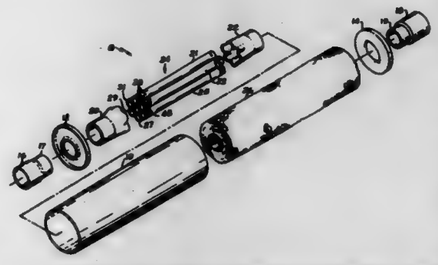
the first layer being a plastic film, and the second layer being a plastic fabric.

5,198,625

EXHAUST MUFFLER FOR INTERNAL COMBUSTION ENGINES

Alexander Borla, 5190 E. Kings Grove Dr., Sonis, Calif. 93066

Filed Mar. 25, 1991, Ser. No. 674,082
Int. Cl.[5] F01N *7/08*
U.S. Cl. 181—248 **25 Claims**



1. A muffler for use with an internal combustion engine comprising:

an outer casing having a generally long and narrow exterior configuration, a hollow interior and first and second end portions disposed respectively at opposite longitudinal ends of said casing,

end caps mounted one at each of said end portions of said outer casing,

frustoconically shaped entrance and exit collars located one at each of said opposite end portions of said outer casing,

entrance and exit ducts connected to and communicating respectively with said entrance and exit collars and protruding from an associated one of said opposite ends of said casing via an associated one of said end caps, respectively,

a nested tube assembly composed of at least three open ended perforated tubes in direct supporting lateral engagement with mutually adjacent ones of said tubes and extending longitudinally between said entrance and exit collars in laterally spaced relation to said casing and each having first and second open end portions disposed respectively at opposite longitudinal ends thereof,

said entrance and exit collars being crimped at their largest ends respectively in surrounding relation to an array of said first and second end portions of said tubes of said tube assembly, and

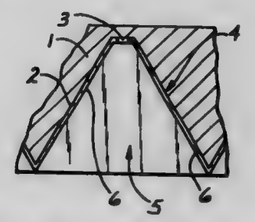
sound absorbing material disposed in the interior of said casing in the space defined between said tube assembly and said outer casing.

5,198,626

HEAT PROTECTIVE, SOUND PERMEABLE LINING

Helmut Pelzer, Neue Strasse 5, D-5804 Herdecke-Ende, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,815
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733285
Int. Cl.[5] E04B *1/82*
U.S. Cl. 181—291 **4 Claims**



1. A lining for component portions of an automobile for protecting said component portions against heat including a sound absorbing fleece part in attachment combination therewith, the lining being comprised of heat reflecting aluminum foil having a corrugated contour and being perforated in peak locations of the corrugation, the peak locations being covered by the fleece.

5,198,627

ELECTRONIC MODULE SWITCH AND POWER AND INTERLOCK SYSTEM

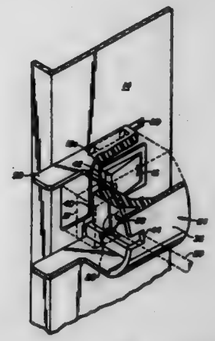
Randall J. Diaz, Gilroy, and Melvin J. Phillips, Cupertino, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Aug. 9, 1991, Ser. No. 743,003
Int. Cl.[5] H01H *9/20*
U.S. Cl. 200—50 B **21 Claims**

1. Interlock apparatus for preventing connection of an electrical cord to a receptacle of an electronic module when in a power-on condition, the interlock apparatus comprising:

switch means mounted to the module, proximate the receptacle, and operable in a first state to place the electronic module in a power-on condition and exposing a switch surface of the switch means, and in a second state to place the electronic module in a power-off condition removing the switch surface from exposure;

guard means mounted to the electronic module for movement between a first position for preventing connection of the power cord to the receptacle, and a second position allowing connection of the power cord, the guard means



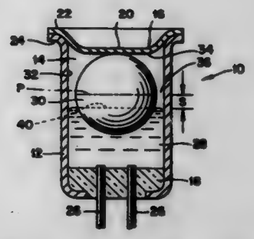
including means for impeding movement of the guard means from the first position to the second position when the guard means is the first state and the switch surface is exposed.

5,198,628

SHOCK INSENSITIVE TILT SWITCH WITH FLOATING SPHERICAL RESTRICTOR TO INHIBIT FLOW OF CONDUCTIVE LIQUID

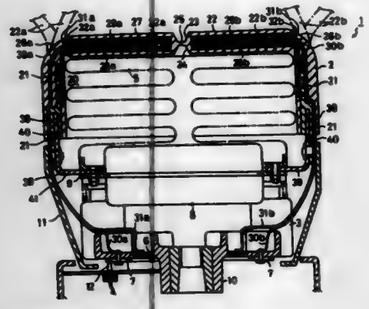
Sheldon S. Bitko, East Brunswick, N.J., assignor to Fifth Dimension, Inc., Trenton, N.J.

Filed Jan. 9, 1992, Ser. No. 895,845
Int. Cl.[5] H01H *35/14*
U.S. Cl. 200—61.47 **13 Claims**



1. A tilt switch comprising a housing forming a closed internal chamber, an electrically conductive liquid of less volume than said chamber disposed within said chamber, and electric terminal means arranged to be electrically interconnected by said liquid when said switch is in a first position relative to vertical, said liquid breaking the electric connection when said switch is tilted to a second position relative to vertical, and a body of less density than said liquid floating on a surface of said liquid and being pushed upwardly against a surface of said chamber by said liquid, said body having a non-electrically conductive outer surface and being of smaller cross section than said chamber to define restriction passage means for inhibiting the flow of said liquid therepast when said switch is subjected to shock.

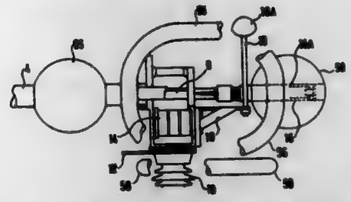
5,198,629
STEERING WHEEL HAVING INSERT MOLDED MEMBRANE SWITCH
Chikahisa Hayashi, Anjo; Yoshio Sano, Gifu; Junichi Mizutani, Inazawa; Takanori Kanbe, Nagoya; Hiroaki Shiota, Toyota, and Sunao Sakaguchi, Aisono, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Continuation of Ser. No. 604,674, Oct. 29, 1990, abandoned. This application Jan. 4, 1992, Ser. No. 892,675
Claims priority, application Japan, Oct. 30, 1989, 1-283654; Oct. 30, 1989, 1-283655; Oct. 30, 1989, 1-283656
Int. Cl.[5] B60R 21/22
U.S. Cl. 200—61.54 15 Claims



1. A steering wheel comprising:
a pad provided at a central portion of the steering wheel;
an air bag device provided under said pad and adapted to separate said pad and expand out of said pad upon receipt of an impact;
two membrane switches disposed in two parts of an upper portion of said pad to be separated by said air bag device;
a conducive supporting member electrically connected to a vehicle and adapted to fix said air bag device to said vehicle body;
a reinforcing core member disposed on or in a side wall of said pad and having a lower end portion exposed from said side wall, said exposed lower end portion being formed with two through-holes;
two earth electrode terminals extending from two earth electrodes of said two membrane switches along an outer wall of said core member to positions of said two through-holes;
two conductive fixing members inserted into said two through-holes, respectively, for fixing said core member to said supporting member and electrically connecting said earth electrode terminals to said supporting member;
two signal electrode terminals extending from two signal electrodes of said two membrane switches along said outer wall of said core member;
a connection wire for connecting said two signal electrode terminals with each other, said connection wire being arranged around said outer wall of said core member; and
a connection terminal extending from one of said signal electrode terminals along said outer wall of said core member to a position of said exposed lower end portion.

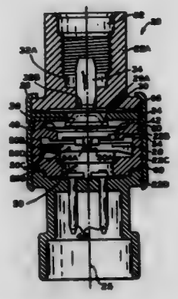
5,198,630
RESISTANCE INSERTION TYPE CIRCUIT-BREAKER
Daniel Dumisy, Montréal; Jean-Guy Chevalier, Anjou; Gaétan Daigneault, St-Hubert, and Hadi Alidou, Montréal, all of Canada, assignors to GEC Alsthom Energie Inc., Canada
Filed Oct. 21, 1991, Ser. No. 783,253
Claims priority, application France, Oct. 26, 1990, 90 13295
Int. Cl.[5] H01H 33/16, 31/00
U.S. Cl. 200—144 AP 2 Claims

1. High-voltage circuit-breaker comprising: a first insulative support column carrying a first current terminal, a pivoting cut-off arm pivotably mounted to said first insulative support column and being provided with a first contact, an insulative column which rotates, a mechanism carried by said insulative column and operatively coupled to said arm to maneuver said cut-off arm, a second insulative support column carrying a second current terminal and a jaw-type second contact engagable with said first contact when said circuit-breaker is closed, said pivoting arm being rotatable about the axis of said arm through 90° at the start at an opening maneuver or at the end of a closing maneuver to close said jaw-type second contact on opening the circuit-breaker and to open said jaw-type second contact, respectively on closing the circuit-breaker, and



wherein said cut-off arm is axially extended by a cylindrical assembly containing a resistance, said cylindrical assembly comprising a metal exterior tubular portion connected electrically to said resistance, said tubular portion being positioned on said arm so as to come into contact, at the end of a circuit-breaker closing maneuver or at the beginning of a circuit-breaker opening maneuver with two pole horns mechanically attached to said second column and electrically connected to said second current terminal, whereby said resistance is inserted into a circuit of said circuit-breaker via said pole horns and said tubular portion, thereby permitting said resistance to be short-circuited when said cut-off arm has rotated 90° about its axis, at the end of a closing maneuver.

5,198,631
PRESSURE RESPONSIVE CONTROL DEVICE
Ronald L. Hogue, Morrison; James P. Frank, Rock Falls, and Donald E. Nice, Morrison, all of Ill., assignors to General Electric Company, Fort Wayne, Ind.
Filed Sep. 11, 1991, Ser. No. 757,821
Int. Cl.[5] H01H 35/34
U.S. Cl. 200—83 P 17 Claims



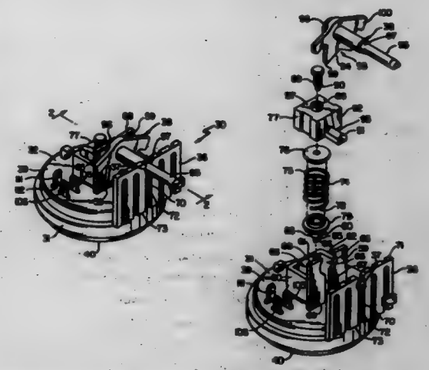
1. A control device comprising:
a housing having a cavity therein and a central longitudinal axis, the housing including first and second housing members having openings therein defining a portion of the cavity, said housing members being generally adjacent each other and selectively positionable relative each other generally axially of the housing at locations from a first position wherein said first and second housing members

are closest together, to a second position in which said first and second housing members are furthest apart;
said first housing member including first spacer means and said second housing member including second spacer means, said first spacer means engaging said second spacer means at a location on said second spacer means selected from a range of possible locations of engagement, said first and second spacer means being constructed and arranged such that said selected location of engagement of said first spacer means with said second spacer means determines the axial position of the first and second housing members relative one another;
a diaphragm disposed in the cavity and dividing the cavity into a pair of chambers;
a control port in one end of the housing opening into one of said chambers, said control port being adapted for the communication of fluid pressure into said one chamber;
a bistable snap-action member operable between a first configuration and a second configuration supported by the housing in the cavity, and spanning at least in part across said other chamber, said snap-action member being adapted for movement conjointly with said first housing member;
a pair of terminal means mounted in the housing generally adjacent the end of the housing opposite the control port;
switch means disposed in the cavity and movable conjointly with said second housing member such that the selected spacing between said first and second housing members corresponds to the spacing between said snap-action means and said switch means, said switch means including a resilient switch blade electrically connected to one of said terminal means and a stationary contact support portion electrically connected to the other terminal means, said switch blade being adapted for motion between a closed position in which the switch blade engages said stationary contact support portion and an open position in which the switch blade does not engage said stationary contact support portion, said switch blade being biased in a normal operating position selected from one of said closed and open positions;
actuator means interposed between said snap-action member and the switch blade and movable generally axially of the housing upon operation of said snap-action member toward said second configuration for moving the switch blade between said normal operating position in which the switch blade is in one of said open and closed positions and a trip position in which the switch blade is in the other of said open and closed positions.

5,198,632
PRESSURE OPERATED SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME
William J. Knigler, North Huntingdon; Thomas M. Buckshaw, Indiana, and David T. Llewellyn, Ebensburg, all of Pa., assignors to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 795,334, Nov. 20, 1991, Pat. No. 5,140,742, which is a division of Ser. No. 479,956, Feb. 14, 1990, Pat. No. 5,136,129. This application Jan. 8, 1992, Ser. No. 895,092
Int. Cl.[5] H01H 35/34
U.S. Cl. 200—83 R 6 Claims

1. In a pressure operated switch construction comprising a housing means having an external surface means and carrying an electrical switch unit and a diaphragm assembly therein, said housing means having an opening means passing through said external surface means thereof, said switch unit having opposed sides and an opening passing therethrough in alignment with said opening means, and a compression spring means carried by said housing means and being operatively associated with said switch unit and said diaphragm assembly to control the operation thereof in relation to the compressive setting of said spring means, said spring means comprising a spring retainer operatively interconnected to said switch unit, an actuator carried by said housing means, and a compression spring having opposed end means respectively bearing against said actuator and said retainer, said actuator being movable relative to said housing means to provide different compressive settings of said spring means, said housing means having an open end chamber therein, said actuator being disposed in said chamber and being adapted to move therein to different positions thereof relative to said housing means, the improvement wherein said chamber means and said actuator respectively have cooperating rectangular cross-sectional configurations whereby rotation therebetween is prevented by said configurations.

4. In a method of making a pressure operated switch construction comprising a housing means having an external surface means and carrying an electrical switch unit and a diaphragm assembly therein, said housing means having an opening means passing through said external surface means thereof, said switch unit having opposed sides and an opening passing therethrough in alignment with said opening means, and a

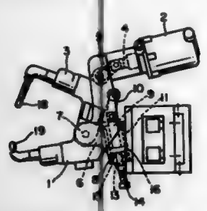


compression spring means carried by said housing means and being operatively associated with said switch unit and said diaphragm assembly to control the operation thereof in relation to the compressive setting of said spring means, said spring means comprising a spring retainer operatively interconnected to said switch unit, an actuator carried by said housing means, and a compression spring having opposed end means respectively bearing against said actuator and said retainer, said actuator being movable relative to said housing means to provide different compressive settings of said spring means, said housing means having an open end chamber therein, said actuator being disposed in said chamber and being adapted to move therein to different positions thereof relative to said housing means, the improvement comprising the step of forming said chamber means and said actuator respectively to have cooperating rectangular cross-sectional configurations whereby rotation therebetween is prevented by said configurations.

5,198,633
STOPPER DEVICE IN A WELDING ROBOT GUN
Shigeru Umeda, Tokyo, Japan, assignor to Obara Corporation, Tokyo, Japan
Filed Sep. 4, 1991, Ser. No. 754,928
Claims priority, application Japan, Jan. 24, 1991, 3-22576
Int. Cl.[5] B23K 11/10, 11/31
U.S. Cl. 219—89 2 Claims

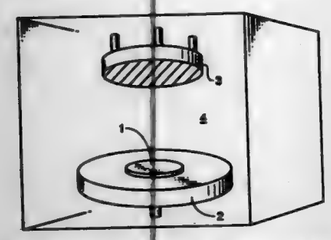
2. A welding gun comprising a cradle adapted to be attached to a robot, a pair of arms pivotably mounted on said cradle for pivoting movement about a first axis and having opposed welding electrodes at corresponding ends thereof, a pressure cylinder for pivoting said arms with respect to said cradle, a stopper cylinder fixed to said cradle, a piston linearly longitudinally slidable in said stopper cylinder and dividing same into first and second chambers, a rod connected to said piston for movement therewith and projecting from said first chamber of

said stopper cylinder toward one of said arms, a link pivotably connected to and extending between said rod and said one arm so that linear movement of said piston will effect pivotal movement of said one arm about said first axis, said stopper cylinder



having a port communicating with said first chamber so that pressure fluid can be supplied to and discharged from said first chamber, and an adjustable stop in said second chamber for engaging said piston and preventing further movement of said piston in one direction.

5,198,634
PLASMA CONTAMINATION REMOVAL PROCESS
Brad S. Mattson, 19251 Black Rd., Los Gatos, Calif. 95030, and Ralph S. Martin, 1582 S. Wolfe Rd., Sunnyvale, Calif. 94087
Filed May 21, 1990, Ser. No. 526,574
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.43 **31 Claims**



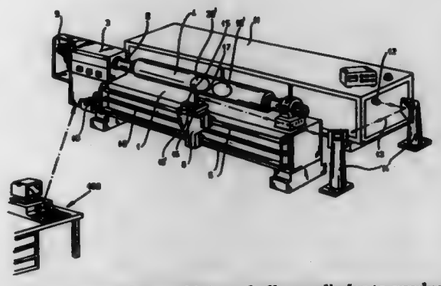
1. A plasma cleaning process for the removal of undesired materials from the surface of a substrate comprising:
(a) disposing a substrate in a reaction chamber, said reaction chamber including a source of electromagnetic radiation;
(b) introducing plasma forming gasses into said chamber;
(c) exposing said gasses to electromagnetic radiation of sufficient power from said source to create a plasma in contact with a face of said substrate; and
(d) maintaining an operating pressure in the chamber such that the ratio of the power used to create said plasma, as measured in watts per cm^3 of said plasma, to said pressure, as measured in torr, is less than about 0.150.

5,198,635
PLASMA ARC WELDING ADAPTED TO ID ELLIPSOID PROCESS
Richard A. Donkovic, Massillon; Gregory P. Zolton, II, Fairlawn; John F. Bushkill, Canton, and Louis S. Slimak, Doylestown, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Jun. 17, 1991, Ser. No. 715,956
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.46 **21 Claims**

1. An apparatus for plasma arc welding a nozzle to a vessel interior comprising:
(a) an elongated plasma arc welding torch configured to fit within but not engage the nozzle to be welded, said plasma arc welding torch having a discharge end oriented approximately 90-degrees with respect to its longitudinal axis for forming a weld bead a preselected distance from the longitudinal axis of both said welding torch and said nozzle;
(b) support means securing said torch within said nozzle from outside said vessel for supporting and co-axially aligning said torch with respect to said nozzle;
(c) linear movement means secured to said torch outside said nozzle for moving said torch along the longitudinal axis of said nozzle;

(d) rotary movement means secured to said torch outside said nozzle for rotating said torch about the longitudinal axis of said nozzle; and,
(e) control means for simultaneously controlling and synchronizing said linear and rotary movement means to move said discharge end of said plasma arc welding torch along the perimeter of the discharge end of said nozzle thereby welding said discharge end of said nozzle to the vessel.

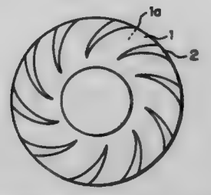
5,198,636
APPARATUS FOR MACHINING A HOLLOW CYLINDER TO PRODUCE A PATTERN DRUM
Erwin Suchan, Thiersee, Austria, assignor to Schablonentechnik Kufstein Gesellschaft mbH, Kufstein-Schaftenau, Austria
Filed Dec. 3, 1991, Ser. No. 802,058
Claims priority, application Austria, Nov. 7, 1989, 2561/89
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.68 **18 Claims**



1. An apparatus for machining a hollow cylinder to produce a pattern drum, in combination with machining means movable along a path parallel to an axis of rotation of said hollow cylinder for machining same, support means defining said axis and

receiving said hollow cylinder for rotating said hollow cylinder about said axis, said support means comprising:
an axially fixed support cone journaled for rotation about said axis and engageable in one end of said hollow cylinder;
an axially movable support cone journaled for rotation about said axis and engageable in an opposite end of said hollow cylinder;
means for axially shifting said axially movable support cone toward said axially fixed support cone to engage said hollow cylinder between said support cones and for withdrawing said axially movable support cone away from said axially fixed support cone to permit release of said hollow cylinder, said means for axially shifting said axially movable support cone including a handwheel, and a spindle driven by said handwheel and operatively connected with said axially movable support cone.

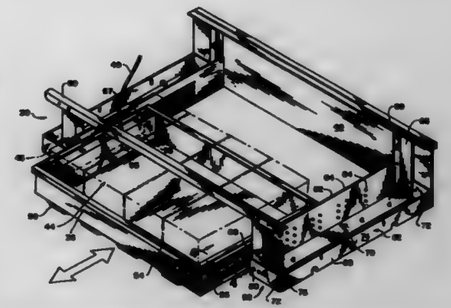
5,198,637
METHOD OF CUTTING GROOVES IN HYDRODYNAMIC BEARING MADE OF CERAMIC MATERIAL
Yumiko Noda, Kanagawa; Ichiro Kamiya, Tokyo; Masaba Toshimitsu, Kanagawa; Yoshio Sato, and Ryoichi Shinjo, both of Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan
Filed Dec. 2, 1991, Ser. No. 801,664
Claims priority, application Japan, Nov. 30, 1990, 2-337846
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 **9 Claims**



1. A method of cutting grooves in a ceramic hydrodynamic bearing, wherein a sliding surface of a bearing base made of a ceramic material is irradiated with an energy beam with a high energy density from an energy beam irradiation device to remove said ceramic material, thereby forming hydrodynamic pressure generating grooves with a predetermined configuration without generating burrs along the grooves, and at the same time, coating the inner surfaces of said hydrodynamic pressure generating grooves with a modification layer that is formed by melting and solidifying said ceramic material of said bearing base.

5,198,638
RETRACTABLE BATTERY TRAY
Peter A. Massacesi, Mt. Prospect, Ill., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.
Filed Nov. 22, 1991, Ser. No. 796,625
Int. Cl.[5] H05B *3/20*
U.S. Cl. 219—209 **16 Claims**

1. An equipment cabinet for use in housing telecommunications equipment including outside plant communications equipment, said cabinet including two pedestal portions and an enclosure portion positioned on and extending between the two pedestal portions, said pedestal portions and said enclosure portion defining a space, a battery tray apparatus being movably retrained in said space, said battery tray apparatus comprising: a tray assembly for carrying at least one battery, and a support assembly attached to said pedestal portions for supporting said tray assembly in said space; said tray assembly being attached to and movable relative to said support assembly, said tray assembly including a tray member and attachment means for operatively attaching said tray member to said support assembly for movement relative to said equipment cabinet between an open position wherein said at least one

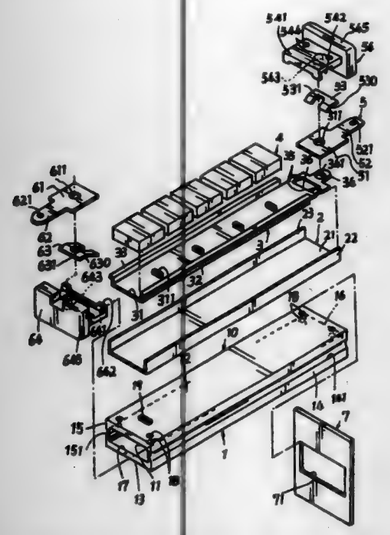


battery is accessible for testing, servicing and replacement and a closed position wherein said at least one battery is enclosed by said tray and said equipment cabinet.

5,198,639
SELF-REGULATING HEATED MIRROR AND METHOD OF FORMING SAME
Jack H. Smuckler, 9 Countryside Ln., Marblehead, Mass. 01945
Filed Nov. 8, 1990, Ser. No. 610,795
Int. Cl.[5] H05B *3/84, 3/14*
U.S. Cl. 219—219 **8 Claims**

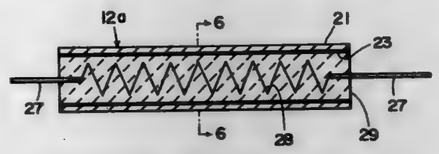
1. A heated mirror assembly, the assembly comprising:
a reflective mirror element having a first side and a second side,
the second side having a reflective coating applied thereto to facilitate viewing, from the first side, of an image reflected from the reflective coating,
the second side also having an electrical heating element coupled intimately therewith, the heating element comprising a temperature self-regulating positive temperature coefficient material,
the material comprising a polymer matrix containing dispersed electrically conductive particulate material, and a polymer-miscible monomeric crystallizable organic compound having a characteristic crystalline melt temperature below about 150° Fahrenheit, the compound being selected from the group consisting of saturated hydrocarbons, organic acids and alcohols,
the compound being added to the polymer matrix in an amount sufficient to set the switching temperature of the resulting composition to a temperature range in the vicinity of the selected characteristic crystalline melt temperature such that the heating element temperature self-regulates in the range of the selected characteristic crystalline melt temperature.

5,198,640
FULLY CLAD ELECTRIC PTC HEATER WITH A FINNED PROTECTIVE CASING
Chiang-hsiang Yang, P.O. Box 55-1670, Taipei (10477), Taiwan
Filed May 28, 1991, Ser. No. 706,170
Int. Cl.[5] H05B *3/10, 1/02;* H01C *7/02;* F24H *1/12*
U.S. Cl. 219—530 10 Claims



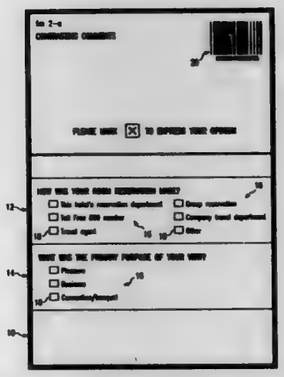
1. A PTC semiconductor heating means comprising:
an elongated thermally and electrically conductive casing made as a hollow column having upper, lower and side portions, a first socket formed in a first end portion of said casing, a second socket formed in a second end portion of said casing opposite to said first socket, and at least a corrugated groove longitudinally recessed in a side portion of said casing;
an electrically insulating plate overlain on a lower portion of said casing within said casing;
an electrically conductive plate overlain on said electrical insulating plate;
a plurality of positive-temperature-coefficient semiconductor heating elements positioned in said casing, each said semiconductor heating element having a lower conducting surface contacting said electrically conducting plate and having an upper conducting surface contacting an upper portion of said casing;
a first pole connector connectable to a first pole of a power source sealing said first socket of said casing and electrically connected to said electrically conductive plate;
a second pole connector connectable to a second pole of the power source sealing said second socket of said casing and electrically connected to the upper portion of said casing; and
a plurality of heat-exchange plates longitudinally juxtapositionally mounted on said casing, thereby forming a PTC semiconductor heating means with all of said heating elements, said conductive plate and said insulating plate fully clad in said casing which is sealed by said first and second pole connectors, and whereby upon a powering of said first and second pole connectors, each said semiconductor heating element is powered to produce heat which is transferred outwardly through said casing and said heat-exchange plates.

5,198,641
SHEATHED HEATER
Shigetoshi Nagano, Tokyo; Akira Takasaka, and Akira Sogabe, both of Chiba, all of Japan, assignors to Sakaguchi Dennetsu Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1992, Ser. No. 839,599
Claims priority, application Japan, Feb. 26, 1991, 3-53256
Int. Cl.[5] H05B *3/48, 3/46*
U.S. Cl. 219—544 21 Claims



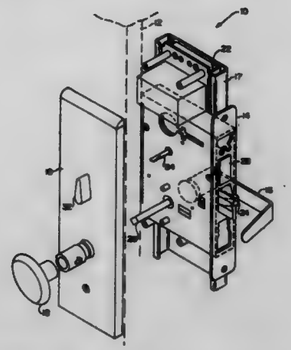
1. A sheathed heater comprising:
a metal pipe of which the entire inner peripheral surface is oxidized, an internal heater inserted into said metal pipe and having opposed ends, lead pins connected to both ends of said heater, respectively, and a heat resistent insulation material member filled in a space formed between said metal pipe and said internal heater, wherein all of said inner peripheral surface of said metal pipe is oxidized to a degree which is sufficient to reduce leakage current, which would otherwise flow from said heater to said metal pipe when the heater is used in a high temperature atmosphere of more than 600° C., by at least ½.

5,198,642
RESPONSE FORM PROCESSING SYSTEM
David B. Deniger, 4050 Cochran Chapel, Dallas, Dallas County, Tex. 75209
Continuation-in-part of Ser. No. 489,009, Mar. 6, 1990, Pat. No. 5,023,435. This application Jun. 3, 1991, Ser. No. 679,933
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] G09F *1/08*
U.S. Cl. 235—375 23 Claims



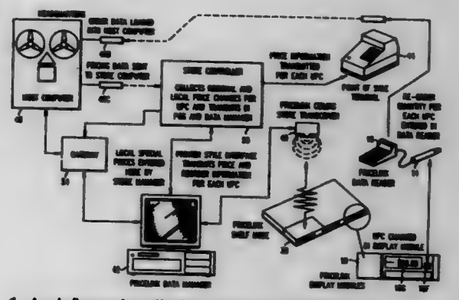
1. A system or processing response forms, comprising:
a group code disposed on each response form;
a response scanner operable to discern the information contained in each of said group codes and to read responses placed on the response forms at particular active locations on the response forms;
said group cods comprising form format information as to which locations on each response form are active locations, said response scanner responsive to aid form format information received from said group codes to scan said active locations such that the system is operable to sequentially process response forms comprising responses located in different locations on said response forms; and
said group codes further comprising information as to which particular questions selected from a large group of questions are present on each response form in order that forms comprising different questions from said large group of questions are operable to solicit answers to said large group of questions.

5,198,643
ADAPTABLE ELECTRONIC KEY AND LOCK SYSTEM
Nancy C. Mirus, Royal Oak, and Vance E. Neff, Birmingham, both of Mich., assignors to Computerized Security Systems, Inc., Troy, Mich.
Filed Feb. 26, 1991, Ser. No. 661,542
Int. Cl.[5] E05B *47/00*
U.S. Cl. 235—382 28 Claims



1. In a locking system of the type comprising:
a lock including a locking means to place the lock in a locked or unlocked condition,
a microcomputer including memory,
a plurality of keys of different types, each key having a key level code stored thereon,
said memory having a control program stored therein for program control of said microcomputer,
a key reader coupled with said microcomputer and being adapted to coact with any one of said keys to read the stored thereon into said microcomputer,
the improvement comprising:
said keys including a selected key having a key record number stored thereon,
said memory being partitioned and including a level storage area therein for storing a plurality of level records each identified by a lock level code and containing operational information for a lock level, and a separate key storage area for storing a plurality of lock key records each identified by a lock record number and associated with at least one of said lock levels for storing key information associated with said record number,
said microcomputer operating under program control for validating said selected key by reading and comparing said key level code to said lock level code to determine the associated lock level of the selected key within the level storage area, and upon a match, comparing said key record number to one of said lock record numbers in said key storage area identified with said lock level code to determine the presence of the key record number associated with the lock level, and if said key record number matches one of said lock record numbers, performing said operational information stored with said lock level.

5,198,644
SYSTEM FOR DISPLAY OF PRICES AND RELATED METHOD
James W. Pfeiffer, Santa Clara; Larry A. Lincoln, Milpitas; Donald E. Pezzolo, Los Altos; Robert F. Garry, Jr., and Kent A. Fritz, both of San Jose, all of Calif., assignors to Diablo Research Corporation, Sunnyvale, Calif.
Continuation of Ser. No. 348,355, May 5, 1989, abandoned. This application Apr. 16, 1992, Ser. No. 870,731
Int. Cl.[5] G06F *15/24*
U.S. Cl. 235—383 39 Claims



1. An information display system comprising:
at least one receiver for receiving transmitted information to be displayed;
means for transmitting information to said at least one receiver;
at least two independent displays each associated with a different product and each being mounted on a shelf and having an address defined by the associated product, and each connected to said one receiver by the same multi-wire parallel bus carrying both power for the displays and information signals for the displays, and each display being capable of displaying selected received information as determined by the address relating to the particular associated product; and means for optically locally programming the address of each display into the display when the display is mounted on the shelf and connected to the parallel lines.

25. A shelf rail assembly for attachment to a shelf comprising:
a shelf rail for attachment to the shelf having a plurality of electrical loads;
at least one display module fitting entirely into a recess in the shelf rail whereby no part of the display module extends out of the recess;
a plurality of springs fitting between the display module and the shelf rail, wherein all of the springs must be compressed simultaneously to release the display module from the shelf rail; and
means for electrically connecting the display module to the plurality of electrical leads.

5,198,645
CHIP CARD RECEIVING AND SENSING ASSEMBLY FOR THICK AND THIN CARDS
Paul-Antoine Martin, Marly-Le-Roi, and Jean Quintane, Cergy, both of France, assignors to Societe D'Applications Generales d'Electricite et de Mecanique A Gam, France
Filed Nov. 3, 1989, Ser. No. 431,349
Claims priority, application France, Nov. 9, 1988, 88 14610
Int. Cl.[5] H01R *23/70;* G06K *7/06, 13/06, 13/24*
U.S. Cl. 235—441 17 Claims

1. A receiver for chip cards having an interface connection terminal, said receiver having a card introduction opening, first mating connector means adapted for cooperating with the interface connection terminal of thick ones of said chip cards having a first substantially pre-determined thickness, and fixed

first guide means for guiding said thick cards until they cooperate with the mating connector, said receiver further comprising second guide means for guiding thin ones of said chip cards of smaller thickness than said thick cards and second mating connector means adapted for cooperating with the interface connection terminal of said thin cards, the second mating

connector spaced from the first connector such that when inserted, the thin cards are positioned away from the first mating connector while cooperating with the second mating connector, and the second guide means being retractable under the action of the introduction of said thick cards against the action of return means.

5,198,646

SYSTEM FOR DETECTING PUNCHED HOLES OF MAGNETIC CARDS

Yukitaka Kanimoto, Tokyo, Japan, assignor to Kabushiki Kaisha CSK, Tokyo, Japan

PCT No. PCT/JP91/00524, § 371 Date Dec. 18, 1991, § 102(e) Date Dec. 18, 1991
PCT Filed Apr. 19, 1991, Ser. No. 778,816
Claims priority, application Japan, Apr. 19, 1990, 2-104202
Int. Cl.[5] G06K 5/00
U.S. Cl. 235—449 5 Claims

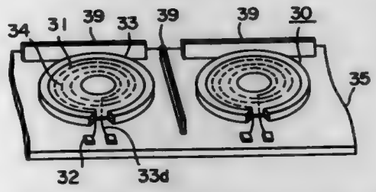
1. A system for detecting punched holes of magnetic cards, comprising:
- magnetic cards in which data is recorded magnetically and holes are punched to indicate incidence of use; and
- a punched hole detection apparatus for detecting punched holes in each of the magnetic cards,
- wherein each of the magnetic cards has a hole punch section in the shape of a strip, wherein said punched hole section has a plurality of small segments in a row which are arranged parallel to the length of the card, and two kinds of ink having different optical characteristics are applied to the small segments according to prescribed rules, and
- wherein the punched hole detection apparatus comprises a light source for shooting rays of light used to distinguish the two kinds of ink onto the punched hole section; a light-receiving section for receiving rays of light reflected by the hole punch section of the magnetic card and for outputting a light reception signal; a pattern storage section for storing predefined signal patterns for normal magnetic cards; and a comparison section for comparing the light reception signal from the light-receiving section with normal signal patterns stored by the pattern storage section.

5,198,647

PLURAL-COIL NON-CONTACT IC CARD HAVING POT CORES AND SHIELDING WALLS

Masaharu Mizuta, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,402
Claims priority, application Japan, Nov. 28, 1989, 1-306713; Dec. 13, 1989, 1-321473; Apr. 12, 1990, 2-94948
Int. Cl.[5] G06K 19/07; H01F 15/02, 15/04
U.S. Cl. 235—449 7 Claims



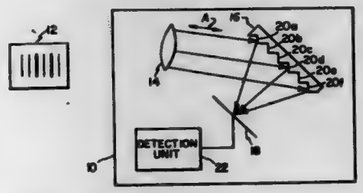
1. A non-contact IC card for transmission and reception of a signal between the card and a terminal unit by electromagnetic induction comprising:
- memory means for storing data;
- first coil means for parallel transfer of N-bit data between the card and the terminal unit by electromagnetic induction, said first coil means including an insulating substrate, N thin-film coils disposed on said substrate, where N is an integer greater than one, a respective ferromagnetic pot core for each of said N thin-film coils, each of said N coils including at least one layer of a spiral electrically conductive thin-film pattern surrounded by the respective pot core, and electrically conducting shielding walls disposed on said substrate between adjacent coils and corresponding pot cores for magnetically shielding said thin-film coils from each other;
- second coil means including a coil for receiving from the terminal unit an instruction signal for parallel reading and writing of data and a respective pot core, said coil of said second coil means including at least one layer of a spiral electrically conductive thin-film pattern surrounded by said pot core;
- control means connected between said first and second coil means and said memory means to control reading and writing of the parallel data to said memory means in accordance with the instruction signal; and
- power supply means for receiving electric power from outside of the card by electromagnetic induction.

5,198,648

CODE SENSOR WITH MULTI-FACETED REFLECTOR FOR SENSING PLURAL IMAGE DISTANCES

Robert H. Hibbard, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1990, Ser. No. 634,638
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 12 Claims



1. A bar code scanner comprising:

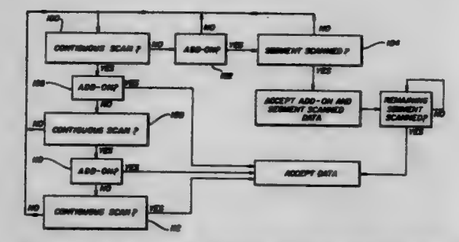
a lens arranged to focus an image of a bar code to be scanned along an image path;
- a reflector in the image path and angled obliquely to the image path so as to reflect images at an angle to the image path, said reflector having a reflector surface shaped so as to provide a plurality of reflected images of the scanned bar code, with one of said reflected images being an in-focus image and a remainder of said reflected images being out-of-focus images;
- a single linear array sensor in the image path onto which said images are reflected and which simultaneously senses the plurality of reflected images and provides a sensor output signal corresponding to the sensed images; and
- a detection unit coupled to the sensor which decodes the sensor output signal and provides a bar code output signal that corresponds to the scanned bar code.

5,198,649

BAR CODE SCANNER AND METHOD OF SCANNING BAR CODES LABELS WITH OR WITHOUT AN ADD-ON CODE

Michael T. Brooks, Veneta, Oreg., assignor to Spectra-Physics, Inc., Wilmington, Del.

Continuation of Ser. No. 387,147, Jul. 31, 1989, abandoned. This application Jun. 27, 1991, Ser. No. 722,597
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 12 Claims



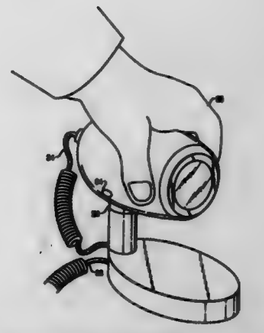
1. A method of scanning bar code labels to determine the bar code data printed thereon by repeatedly sweeping a scanning beam in scan paths across the labels, said bar code labels bearing bar codes of the type which include a primary code portion with or without a separate Add-On code portion spaced a given distance from said primary code portion, comprising the steps of:
- sweeping a scanning beam across the label until the beam sweeps the entire primary code portion in a first scanning pass along a first scan path;
- immediately sweeping the scanning beam across the label in one or more additional scanning passes along additional scan paths adjacent and parallel to each other and to said first scan path;
- if the beam sweeps the entire primary code portion in said one or more additional scanning passes, and an Add-On code portion is not scanned in part during any of said first or additional scanning passes, then accepting the data scanned during said first and additional scanning passes as valid scan data;
- if the beam sweeps the entire primary code portion in said one or more additional scanning passes, and an Add-On code portion is scanned in its entirety during said first and one or more additional scanning passes, then accepting the data scanned during said first and one or more additional scanning passes as valid scan data; and
- if the beam sweeps the entire primary code portion in said one or more additional scanning passes and an Add-On code portion is scanned in part during any of said first or additional scanning passes, then rejecting the data scanned during said first and additional scanning passes as invalid scan data.

5,198,650

HANDS FREE/HAND HELD BAR CODE SCANNER

Charles K. Wike, Jr., Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 24, 1991, Ser. No. 720,109
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—472 2 Claims



1. A system for scanning a bar code label comprising;
- an optical bar code reader having a generally eliptical shaped outer surface forming a housing member which is easily and completely grasped by the hand of an operator and includes an opening at one end of the bar code reader;
- a scanning assembly mounted in said optical bar code reader for projecting scanning light beams through said opening for scanning a coded label positioned adjacent the bar code reader;
- switch means mounted in said outer surface adjacent the opening for operating the scanning assembly when actuated by the hand of the operator while grasping the housing member;
- a vertically oriented support member; and
- magnetic releasable engaging means mounted in said support member and in said optical code reader having complementary mating surfaces for releasably holding the bar code reader in a plurality of free standing scanning positions which orientates the bar code reader around a horizontal axis in a general horizontal or vertical direction when the bar code reader is positioned on the support member allowing hands free scanning of a bar code label which is moved past the opening when the bar code label is either below or above the bar code reader, said releasable engaging means enabling the bar code reader to be easily removed from the support member for use as hand-held scanner in scanning a bar code label.

5,198,651

LASER DIODE DEVICE INCORPORATING STRUCTURE WITH INTEGRAL SCANNING MOTOR

Edward Barkan, Setauket, and Howard Shepard, Great Neck, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed May 3, 1991, Ser. No. 695,075
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—472 23 Claims

1. A laser scanning device for projecting a laser beam against a target having information thereon which is to be scanned by said laser beam, said device comprising: housing means enabling manual handling of said device; and a unitary framework structure insertable into said housing means, and operative for modularly mounting operative components of said laser scanning device, including laser generating means, optical means, photodetector means and a scanning motor for said laser scanning device, said unitary framework structure including flexible external shock-absorbing means integrally formed

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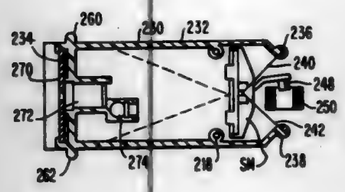
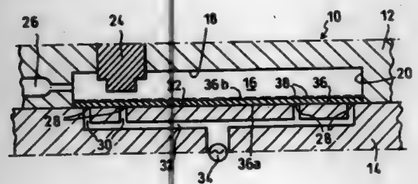
with said structure, and operative for resiliently supportably mounting said scanning motor on said structure against external impacts and shock loads imparted to said device prior to said external impacts and shock loads being transmitted to said scanning motor.

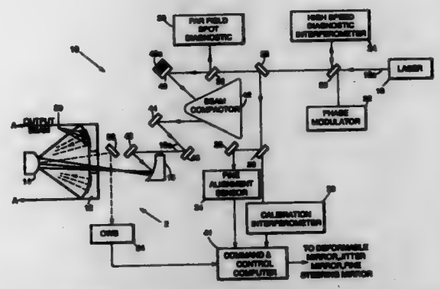


5,198,652
METHOD FOR MANUFACTURING A MEMORY CARD CAPABLE OF RECEIVING A PHOTOGRAPHIC IMAGE, AND CARD THUS OBTAINED
René Rose, Voisin-Le-Bretonneux, France, assignor to Schlumberger Industries, Montrouge, France
Filed Oct. 9, 1991, Ser. No. 774,779
Claims priority, application France, Oct. 19, 1990, 90 13001
Int. Cl.[5] G06K *19/00*
U.S. Cl. 235—492 14 Claims



1. A method for producing a memory card including an electronic module and a card body having first and second main, faces, comprising the steps of:
providing a photographic substrate with the same peripheral dimensions as said main faces and having a sensitive face and an opposed face;
providing a mold with a cavity which has the shape of the card body to be made, and with opposed inner walls of said cavity forming said first and second main faces of the card body;
disposing said photographic substrate in the cavity of said mold in such a manner that its sensitive face is held against the one of said opposed inner walls of the cavity that defines the first main face of the card body;
injecting a plastic material under pressure into the mold in such a manner that it fills the entirety of said cavity and that it adheres to the opposed face of the photographic substrate;
unmolding the object thus obtained; and
affixing an electronic module to the second main face of said card body.

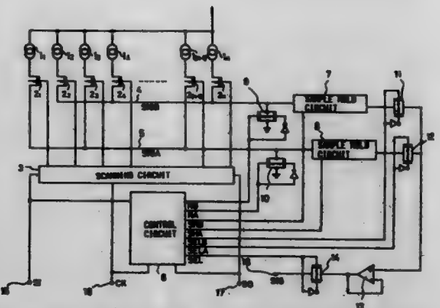
5,198,653
WIDE FOV RETRO-NULL OUTGOING WAVEFRONT SENSOR
Gon Y. Shea, Brookfield; William P. Zmek, Naugatuck, and Ker L. Siu, New Milford, all of Conn., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed May 4, 1992, Ser. No. 878,144
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.9 16 Claims



1. A wavefront sensor, comprising:
a plurality of beam sampling means disposed for intercepting a portion of an optical beam that is incident thereon for providing a plurality of sample beams, said plurality of beam sampling means being located at a pupil;
an optical train for relaying said plurality of sample beams;
transfer lens means disposed for receiving said plurality of sample beams from said optical train, said transfer lens means focussing said sample beams at a focal plane; and
detector means disposed in a plane parallel to and offset from said focal plane for detecting said focussed sample beams;
wherein each of said beam sampling means has an optical power associated therewith for causing an associated one of said sample beams to be focussed by said transfer lens means at the plane of the detector, each of said beam sampling means further having an optical tilt associated therewith for compensating for a distortion of an associated one of said sample beams due to a distortion of said pupil, whereby a combination of the optical power and the optical tilt results in a location of the associated one of the sample beams at the plane of the detector being primarily a function of an aberration of said optical beam, and not primarily a function of a distortion of said pupil.

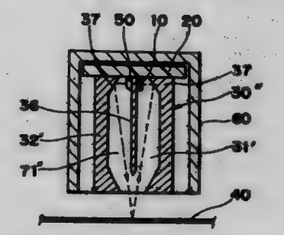
5,198,654
IMAGE READING APPARATUS FOR CONVERTING OPTICAL IMAGE INFORMATION INTO AN ELECTRICAL IMAGE SIGNAL
Hiroshi Mukainakano; Yukito Kawahara, and Satoshi Machida, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan
Filed Mar. 8, 1991, Ser. No. 666,864
Claims priority, application Japan, Mar. 26, 1990, 2-77776
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] H01L *27/146*
U.S. Cl. 250—208.1 10 Claims

1. An image reading apparatus comprising: a plurality of photoelectric conversion elements arranged linearly and integrally with respect to one another; a plurality of first switching elements connected at their one terminals to corresponding photoelectric conversion elements and connected at their other terminals alternately every other one to a pair of separate common lines; a scanning circuit responsive to a scanning start signal for sequentially scanning the first switching elements and outputting a scanning end signal after completion of the scanning; a pair of second switching elements connected between the respective common lines and a ground line; a pair of sample hold circuits having input terminals connected to the respective common lines and output terminals; a pair of third switching elements having one terminals connected to the



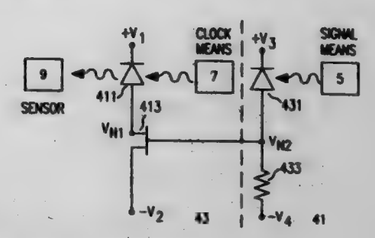
respective output terminals of the sample hold circuits and other terminals; an output terminal commonly connected to the other terminals of the third switching elements; and a control circuit operative according tot he scanning start signal and the scanning end signal for controlling the second and third switching elements and the pair of sample hold circuits.

5,198,655
IMAGE READING DEVICE HAVING A LIGHT WAVEGUIDE MEANS WIDENED TOWARD AN END NEAREST TO AN IMAGE SURFACE
Kenichiro Saetunga, Amagasaki; Tetuso Fukushima, Katano; Tokuhito Hamano, Nara; Junji Ikeda, Ikoma, and Yukio Maeda, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 15, 1991, Ser. No. 642,271
Claims priority, application Japan, Jan. 17, 1990, 2-7395
Int. Cl.[5] H01J *40/14, 5/16*
U.S. Cl. 250—208.10 3 Claims



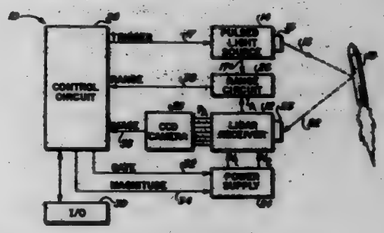
1. An image reading device comprising:
a circuit board;
a light emitting element mounted on said circuit board for irradiating light onto an image surface;
a light receiving element mounted on said circuit board for receiving image information in the form of reflected light from the image surface; and
light waveguide means provided between the light emitting element and the image surface and between the light receiving element and the image surface, respectively, each said light waveguide means having a plurality of light transmitting core portions and a cladding portion covering the light transmitting core portions, each of the light transmitting core portions in said light waveguide means between the light emitting element and the image surface being widened toward an end surface at the image surface to a width greater than at an end surface at the end adjacent said light emitting element.

5,198,656
DYNAMIC OPTICAL LOGIC USING VOLTAGE PULL UP
Leo M. F. Chirovsky, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 6, 1991, Ser. No. 711,682
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—214 LS 25 Claims



1. An optical switch comprising:
a voltage pull-down device;
a voltage controlled optical modulator, said modulator performing voltage pull-up, said pull-down device and said modulator being connected in series;
signal means for enabling and disabling said pull-down device;
optical clock means for illuminating said voltage controlled optical modulator, said optical clock means triggering said voltage pull-up, the optical output from said voltage controlled optical modulator indicating the state of said switch;
and sensor means for receiving said optical output.

5,198,657
INTEGRATED IMAGING AND RANGING LIDAR RECEIVER
Peter K. Trost, Carlsbad, and Albert J. Lieber, Del Mar, both of Calif., assignors to General Atomics, San Diego, Calif.
Filed Feb. 5, 1992, Ser. No. 831,403
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—214 VT 23 Claims



1. An integrated LIDAR receiver comprising:
an image intensifier having an opaque cathode; an anode spaced apart from the cathode; a microchannel plate (MCP) electron multiplier positioned intermediate the cathode and anode; and a phosphor film deposited on a fiber optic substrate on said anode, said phosphor film being coated with a metalized layer;
power supply means for applying a first voltage potential between said MCP and said anode, with said anode being substantially at ground potential, and for selectively applying a second voltage potential between said MCP and said cathode;

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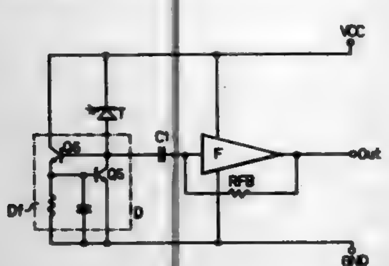
amplifier means coupled to said metalized layer of said anode for converting pulses of electrical current detected at said metalized layer to voltage pulses; and
threshold detection means for detecting when the voltage pulses generated by said amplifier means exceed a prescribed threshold level;
whereby optical pulses striking said cathode are manifested by the emission of electrons, which electrons are multiplied, and accelerated towards said anode, with a fraction of the electrons striking said anode passing through said metalized film into the phosphor film, causing photons to be emitted in proportion to the energy of the electrons, said photons passing through said fiber optic substrate; and with a remaining fraction of the electrons striking said anode serving as a prompt electron current within said metalized layer, which prompt electron current is converted to a voltage pulse by said amplifier means, and detected as a valid optical return pulse when said voltage pulse exceeds said prescribed threshold level.

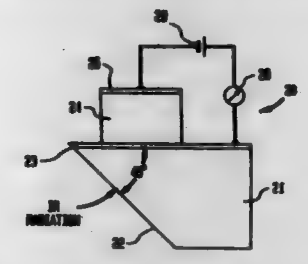
5,198,658
TRANSIMPEDANCE AMPLIFIER-INPUT STAGE FOR AN OPTICAL RECEIVER
Arne Rydin, Snörpvadsgatan, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Jul. 19, 1991, Ser. No. 733,178
Claims priority, application Sweden, Jul. 19, 1990, 9002469
Int. Cl.^{5} **H01J** *40/14;* **H03F** *17/00*
U.S. Cl. 250—214 A **8 Claims**



1. An input stage for an optical receiver comprising:
a PIN photodiode;
a transimpedance amplifier, an output of said PIN photodiode being connected via a capacitor, to an input of said transimpedance amplifier; and
a unit having a resistance dependent on a voltage connected between said output of said PIN photodiode and an earth potential of said transimpedance amplifier, said unit including a feed-back amplifier with a frequency response adapted to a frequency response of said transimpedance amplifier.

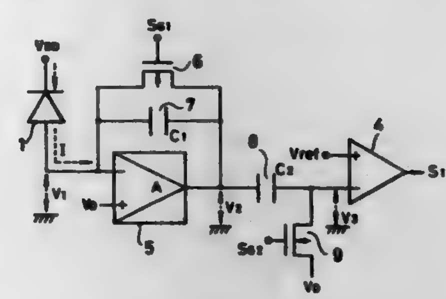
5,198,659
WIDE-RANGE MULTICOLOR IR DETECTOR
Doran D. Smith, Brick; Mitra Dutta, Matawan, and Kwong-Kit Choi, Tinton Falls, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 23, 1992, Ser. No. 867,726
Int. Cl.^{5} **H01J** *40/14*
U.S. Cl. 250—214.1 **8 Claims**

1. A solid-state, IR detector formed from a semiconductor comprising:
a plurality of quantum-well sets, each said set having at least two quantum wells with at least two confined energy levels in each said well;
a plurality of relatively wide potential barriers, each located between adjacent ones of said potential wells; and
a plurality of spike potential barrier, each located at the center of one of said quantum wells in each of said set, each said spike potential barrier being thin enough to permit strong coupling between the energy levels on either side thereof such that the energy levels are common on either side thereof, and wherein the energy-level spac-



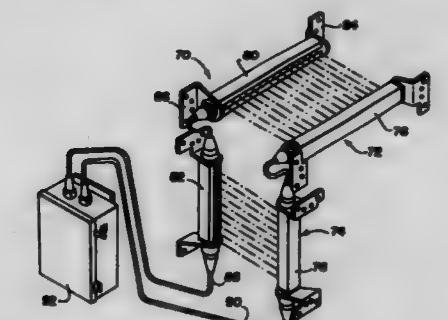
ing between said confined energy levels of each of said wells in said quantum-well sets is different.

5,198,660
OPTICAL SENSING CIRCUIT INCLUDING AN INTEGRAL CAPACITY
Shotaro Yokoyama, and Takashi Nishibe, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Aug. 27, 1991, Ser. No. 750,638
Claims priority, application Japan, Aug. 30, 1990, 2-230289; Dec. 3, 1990, 2-400175; Mar. 13, 1991, 3-48157
Int. Cl.^{5} **H01J** *40/14*
U.S. Cl. 250—214 A **6 Claims**



1. An optical sensing circuit comprising:
photoelectric current generating means for converting light beams into a photoelectric current;
current-to-voltage converting means for converting said photoelectric current into a voltage, said current-to-voltage converting means including:
a differential amplifying circuit which receives at an input terminal said photoelectric current and generates at an output terminal an output voltage; and
an integral capacity connected between the input and output terminals of said differential amplifying circuit;
voltage comparing means for comparing an amplitude of the output voltage of said current-to-voltage converting means with a reference voltage;
switching means connected between the input and output terminals of said differential amplifying circuit, said switching means being turned from on to off to produce a change in the output voltage of said differential amplifying circuit corresponding to said photoelectric current;
a transfer capacity inserted between the output terminal of said differential amplifying circuit and an input terminal of said voltage comparing means; and
voltage setting means connected to the input terminal of said voltage comparing means, said voltage setting means being turned from on to off a predetermined interval after said switching means is turned off thereby initializing an input voltage to said voltage comparing means by coupling the output voltage of said differential amplifying circuit to the input terminal of said voltage comparing means.

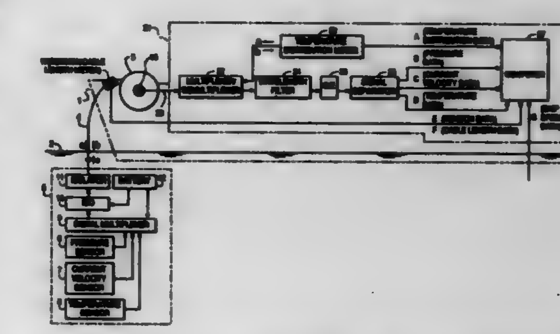
5,198,661
SEGMENTED LIGHT CURTAIN SYSTEM AND METHOD
E. Peter Anderson, Redwood City; James A. Ashford, San Carlos, both of Calif., and Richard Klass, Stevensville, Mich., assignors to Scientific Technologies Incorporated, Hayward, Calif.
Filed Feb. 28, 1992, Ser. No. 843,762
Int. Cl.^{5} **G01V** *9/02;* **G08B** *13/18*
U.S. Cl. 250—221 **7 Claims**



1. A light curtain system of apparatus for use in sensing the intrusion of human limbs or other objects into one or more detection planes which define a protected zone, the system comprising the combination of a plurality of separate light curtain segments; each segment comprising transmitter means for transmitting sequential pulses of light beams along channels which extend across the detection plane which is associated with a respective segment, and receiver means for receiving light beams from the transmitter means and for sensing the presence or absence of the light beams in the channels; elongate flexible connection means for operatively connecting in series the transmitter means of at least two of the segments and for operatively connecting in series the receiver means of such segments; and positioning means for positioning one of said series-connected segments to define a first detection plane which forms a part of said protected zone and for positioning at least another of said series-connected segments to define a second detection plane which intercepts said first plane at a predetermined angular orientation along the protected zone.

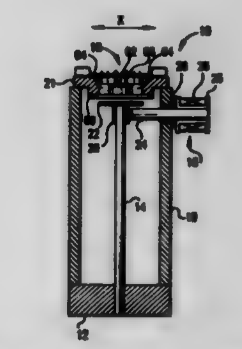
5,198,662
WATER TEMPERATURE DISTRIBUTION MEASUREMENT SYSTEM EMPLOYING OPTICAL CABLE AND MEANS FOR DETERMINING A WATER DEPTH AT VARIOUS POINTS ALONG THE OPTICAL CABLE
Masayoshi Yamaguchi; Tetsuji Ito, both of Osaka; Taro Aoki, and Mutsuo Hattori, both of Zushi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Japan Marine Science and Technology Center, Kanagawa, both of Japan
Filed Aug. 9, 1991, Ser. No. 743,221
Claims priority, application Japan, Aug. 9, 1990, 2-212035
Int. Cl.^{5} **H01J** *5/16*
U.S. Cl. 250—227.18 **12 Claims**

1. A temperature distribution measurement system comprising:
an optical fiber cable suspended from and towed by a ship and extending into a body of water, the length of said optical fiber cable forming an arch when towed by the ship;
optical measuring means for inputting light energy into said optical fiber cable and for detecting with respect to time an intensity of return light energy from said optical fiber cable;
a sensor housing, disposed in the water body and coupled to an end of said optical fiber cable, including at least one sensor which transmits sensor data;
data processing means for determining a temperature along various points of said length of said optical fiber cable based on said intensity of said return light energy and for determining a depth within said water body of said various points of said length of said optical fiber cable based



on said sensor data transmitted by said at least one sensor included in said sensor housing.

5,198,663
ANGULAR VELOCITY SENSOR WITH DISPLACEMENT SCALE AND SENSOR MEANS
Souji Ichikawa, Sagamihara; Mikio Suzuki, Kawasaki; Wataru Ishibashi, Kawasaki; Shingo Kuroki, Kawasaki, and Toshiro Horikawa, Fuchu, all of Japan, assignors to Mitutoyo Corporation, Tokyo, Japan
Filed Mar. 19, 1992, Ser. No. 854,008
Claims priority, application Japan, Apr. 3, 1991, 3-099550; May 13, 1991, 3-138316; May 13, 1991, 3-138317
Int. Cl.^{5} **G01D** *5/34*
U.S. Cl. 250—231.1 **17 Claims**



1. An angular velocity sensor comprising:
a rod-like shaft having a specified portion thereof supported on a housing;
excitation means for vibrating a free end portion of said shaft in an X direction with a lengthwise axis of said shaft set in a Z direction of an XYZ rectangular coordinate system;
displacement sensing means for producing an output by sensing a displacement of the free end portion of said shaft in a Y direction; and
operation means for deriving an angular velocity about said shaft based on the output from said displacement sensing means;
wherein said displacement sensing means includes a main scale fixed on the free end portion of said shaft, an index scale fixed on said housing and confronting said main scale, a light emitting element for emitting light to illuminate said main scale, and a plurality of light sensors for sensing light which is reflected by said main scale and passed through said index scale.

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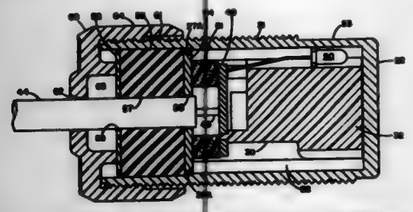
5,198,664

PHOTOELECTRIC SENSOR ASSEMBLY HAVING COMPRESSIBLE AND SEALING MEMBERS

Robert W. Fayfield, Shorewood, Minn., assignor to Banner Engineering Corporation, Minneapolis, Minn.

Filed Jul. 18, 1991, Ser. No. 731,985
Int. Cl.[5] H01J 5/02
U.S. Cl. 250—239 15 Claims



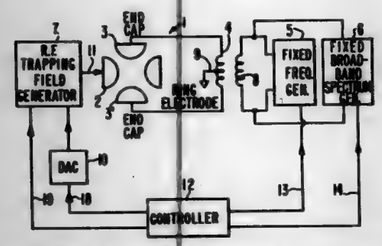
1. An assembly for a photoelectric sensor, comprising:
a molded housing member, having a focus lens formed in a forward end thereof, and having internal spaced and an open rearward end for receiving other components of the assembly;
a circuit module including sensor circuitry and an optoelectronic element, and a cable for external connection for the sensor;
means for mounting said circuit module within said housing with said optoelectronic element positioned with respect to said lens for defining an optical sensing path from the front of the sensor, and said cable extending from the rear of said housing;
a resilient sealing member for positioning within said housing and substantially in contact with the interior wall of said housing and said cable;
a compressible member positioned between said circuit module and said resilient sealing member;
a force transmission member in contact with said resilient sealing member; and,
an end cap and means for attaching it to said housing, said end cap including means for pressing on said force transmission member so that said resilient sealing member is compressed and forced into sealing contact with the interior surface of said housing and said cable, to thereby provide a moistureproof seal for the interior of said sensor assembly.

5,198,665

QUADRUPOLE TRAP IMPROVED TECHNIQUE FOR ION ISOLATION

Gregory J. Wells, Fairfield, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 29, 1992, Ser. No. 890,990
Int. Cl.[5] H01J 49/42
U.S. Cl. 250—282 17 Claims



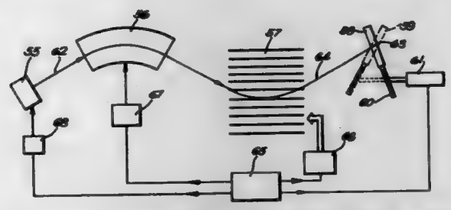
1. In a method for isolating a selected parent ion having a mass m(p) for MS/MS spectroscopy employing a quadrupole ion trap (QIT) system, said QIT system having a ring electrode, a pair of end caps, an RF trapping voltage source having a trapping frequency F connected to said ring electrode, and supplementary RF voltage generator sources connected to said end caps, said method for isolating a selected parent ion including:
(a) establishing said RF trapping voltage at a low value to enable retention of a large mass range of ions in said ion trap;
(b) ionization of a sample in said QIT;
(c) establishing said end caps at a zero DC voltage differential;
(d) ramping up said RF trapping voltage to eject ions;
(e) applying a broadband spectrum RF with a first supplementary RF generator to said end caps to resonantly reject those ions having masses greater than m(p);
(f) reducing said RF trapping voltage to a value to trap daughter ions, if any, produced by disassociation of said parent ion;
THE IMPROVED METHOD COMPRISING:
applying a fixed frequency supplemental excitation to said end caps during at least a portion of the time of step (d).

5,198,666

MASS SPECTROMETER HAVING A MULTICHANNEL DETECTOR

Robert H. Bateman, 15 Lynton Close, Knutsford, Cheshire WA16 8BH, England

PCT No. PCT/GB90/00844, § 371 Date Dec. 2, 1991, § 102(e) Date Dec. 2, 1991, PCT Pub. No. WO90/15433, PCT Pub. Date Dec. 13, 1990
PCT Filed Jun. 1, 1990, Ser. No. 777,355
Claims priority, application United Kingdom, Jun. 1, 1989, 8912580
Int. Cl.[5] H01J 49/02, 49/48
U.S. Cl. 250—294 15 Claims



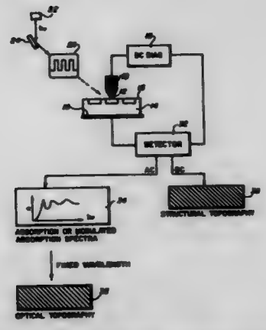
1. A mass spectrometer comprising an ion source, an ion momentum analyzer, an electrostatic ion-energy analyzer and a multichannel detector locatable in the image focal plane of said electrostatic analyzer and capable of recording at least a portion of the mass spectrum of ions entering it, wherein said electrostatic analyzer comprises an upper and a lower group of spaced-apart electrodes respectively disposed above and below the ion beam passing through it, each said group of electrodes comprising a pair of electrodes between which one or more central electrodes are disposed, the potentials of one electrode of the pair being more positive and the other electrode of the pair being more negative than the potential at which ions comprised in said ion beam enter said electrostatic analyzer and the potentials of all the electrodes comprising each said group progressively increasing from one electrode to the next, thereby providing an electrostatic field in a central plane between said groups which is capable of deflecting said ions along different curved trajectories according to their energy, and wherein the potentials of said electrodes are further selected so that said image focal plane is coincident with said multichannel detector over at least a substantial portion of the length of said detector.

5,198,667

METHOD AND APPARATUS FOR PERFORMING SCANNING TUNNELING OPTICAL ABSORPTION SPECTROSCOPY

Orest J. Glembocki, Alexandria, and Eric S. Snow, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1991, Ser. No. 811,378
Int. Cl.[5] G01N 25/00
U.S. Cl. 250—306 2 Claims



1. An apparatus for performing scanning tunneling optical absorption spectroscopy, said apparatus comprising:
a scanning tunneling microscope tip positioned at a tunneling distance over a surface region of a sample to be analyzed;
bias means for producing an electric potential between said scanning microscope tip and said surface region sufficient to cause a tunneling current to flow between said scanning tunneling microscope tip and said surface region;
illumination means for illuminating said surface region with a modulated monochromatic light, said illumination means including:
a monochromatic light source for producing monochromatic light; and
light modulator means for producing said modulated monochromatic light by modulating said monochromatic light produced by said monochromatic light source, said light modulator means including a polarization modulator; and
means for detecting an AC component of said tunneling current resulting from said modulated monochromatic light and for measuring a polarization based absorption coefficient of said surface region based on said AC component.

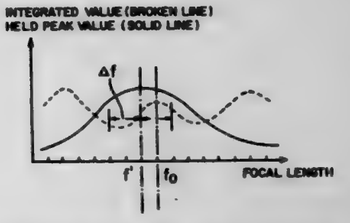
5,198,668

AUTOMATIC FOCUSING APPARATUS FOR SCANNING ELECTRON MICROSCOPE

Atsushi Yamada, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Dec. 23, 1991, Ser. No. 813,907
Int. Cl.[5] H01J 37/26
U.S. Cl. 250—310 2 Claims

1. An automatic focusing apparatus for use in a scanning electron microscope having an electron gun emitting an electron beam and an objective lens for focusing the electron beam onto a specimen, said automatic focusing apparatus comprising:
a means for varying the exciting current supplied to the objective lens in increments at regular intervals of time;
a means for causing the electron beam to scan the specimen at each of different focal lengths determined by the various exciting current values;
a means for detecting a specimen signal from the specimen when it is scanned;
an integrator means for integrating the specimen signal obtained from the specimen whenever a scan is made at each different focal length to produce an integrated scan value;
a means for storing each integrated scan value from the integrator means;
a low-pass filter to which said specimen signal is supplied;



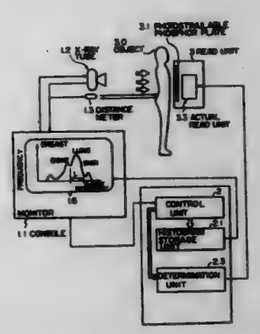
a means for detecting the focal length f' at which the output signal from the low-pass filter assumes its maximum value among all scans at different focal lengths;
a means for comparing the integrated scan values from the integrator means obtained at plural focal lengths sufficiently close to the focal length f' to include a nearby peak of the integrated scan values and selecting the focal length f_0 having the greatest integrated scan value; and
a means for setting the exciting current supplied to the objective lens according to the exciting current corresponding to the selected focal length f_0.

5,198,669

DIGITAL X-RAY IMAGE PROCESSING APPARATUS

Fumihiro Namiki, Machida; Shiro Takeda, Sagamihara; Takaki Shimura, Machida, and Isamu Yamada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 821,902, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 585,630, Sep. 20, 1990, abandoned. This application Jul. 2, 1992, Ser. No. 908,915
Claims priority, application Japan, Sep. 20, 1989, 1-243635; Sep. 20, 1989, 1-243636; Sep. 20, 1989, 1-243637; Nov. 20, 1989, 1-299753
Int. Cl.[5] G01N 23/04
U.S. Cl. 290—327.2 5 Claims



5. A digital X-ray image processing apparatus for exposing an X-ray transmitted through an object onto a photostimulable phosphor plate, for scanning the photostimulable phosphor plate by means of an excitation beam to obtain an X-ray image, and for reading the X-ray image, the digital X-ray image processing apparatus comprising:

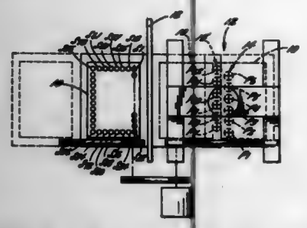
image storing means for storing the X-ray image used for an actual read when diagnosing the object;
histogram storage means for storing a standard histogram of the X-ray image, a standard histogram being formed by data of the photographic conditions from the X-ray including voltage, current, exposure time and distance of an X-ray tube, conditions of the photographic member including bond, skin, lungs and breasts, and conditions of the object to be X-rayed including the thinness or thickness of the object;
first monitor means for displaying the standard histogram read out from said histogram storage means;
read conditions determination means for determining actual read conditions of the X-ray image based on a latitude of the intensity of the X-ray in the standard histogram stored in said histogram storage means, without a pre-scanning operation;
switching means for switching between a pre-scan operation and the actual read operation;
a histogram calculation unit, operatively connected to said switching means, for calculating a pre-scan histogram based on a pre-scan data obtained prior to the actual read in the pre-scan operation, the pre-scan histogram being input to said first monitor means and used instead of the standard histogram;
a correlation analysis unit, operatively connected to said histogram storage means and said histogram calculation unit, for receiving the pre-scan and standard histograms, and calculating a correlation value to move the standard histogram in the direction of the intensity of the X-ray to obtain a maximum correlation value between the histograms; and
a histogram correction unit, operatively connected to said correlation analysis unit, for calculating a difference between the standard histogram and the pre-scan histogram, and correcting the latitude of the intensity of the X-ray used for the actual read operation.

5,198,670

SCINTILLATION COUNTING SYSTEM FOR IN-SITU MEASUREMENT OF RADIOACTIVE SAMPLES IN A MULTIPLE-WELL PLATE

Gustaaf C. VanCauter, Middletown, Conn.; Donald E. Osten, Bolingbrook, and John D. Tomisek, Lombard, both of Ill., assignors to Packard Instrument Company, Downers Grove, Ill.

Filed Sep. 29, 1989, Ser. No. 414,678
Int. Cl.[5] G01N *1/20, 1/204*
U.S. Cl. 250—328 16 Claims



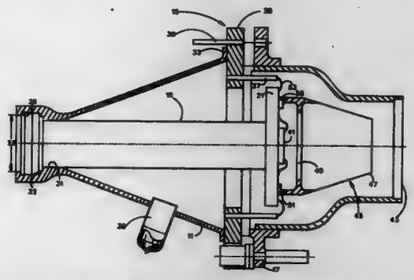
1. A method for in-situ measurement of the radioactivity of multiple beta-emitting samples while the samples are in a multiple-well sample tray in which each well is open at its upper end, said method comprising
providing a scintillator in the lower portion of each sample-containing well where the scintillator is directly exposed to the beta emissions from the respective samples for producing light pulses in response to said beta emissions,
positioning multiple photomultiplier tubes adjacent to the open upper ends of said sample wells containing said scintillator for simultaneously measuring the radioactivity of multiple samples with only a single photomultiplier tube sensing the scintillations from each well and converting the sensed scintillations into corresponding electrical pulses, the face of each photomultiplier tube covering substantially the entire open upper end of the corresponding sample well,
processing the electrical pulses from each photomultiplier tube to discriminate between pulses attributable to sample events within said wells and pulses attributable to non-sample events such as photomultiplier tube noise, said discrimination being effected by determining whether a selected number of electrical pulses occurs within a prescribed time interval, the occurrence of said selected number of pulses within said prescribed time interval signifying a sample event, and
supplying only the electrical pulses attributable to sample events to a pulse analyzer.

5,198,671

APPARATUS FOR LARGE AREA INFRARED FOCAL PLANE

Bert C. Hatch, Yorba Linda; Albert L. Gable, Orange; Leland L. Roberts, Anaheim, and Judith Roberts, Santa Rosa, all of Calif. executor of said Leland L. Roberts, deceased, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 17, 1991, Ser. No. 716,476
Int. Cl.[5] G01J *5/04*
U.S. Cl. 250—352 18 Claims



1. An apparatus for housing a focal plane array, the apparatus comprising:
a tubular metal stem having a first end and a second end;
a hollow conical metal housing having a narrow end and a wide end, wherein said housing has a first opening through said narrow end, and a second opening through said wide end, wherein said first end of said stem is brazed into said first housing opening;
an interconnection assembly comprising a ceramic ring structure rigidly sealed onto said wide end of said housing, said interconnection assembly including internal electrical pins within the circumference of said housing wide end, external electrical pins outside the circumference of said housing wide end, and embedded electrical connections, each of said embedded electrical connections connecting one of said internal pins and a corresponding one of said external pins.,
a ceramic cold plate sealed over said second end of said tubular metal stem;
a mounting ring rigidly sealed to said ceramic ring structure; and
a metal cap having a window through its closed end, and having its open end rigidly sealed onto said mounting ring.

5,198,672

SIGNAL GENERATOR AND METHOD OF GENERATING SIGNAL VOLTAGES USING THE SAME

Tsuyoshi Ohnishi, Kokubunji; Tohru Ishitani, Sayama, and Moritoshi Yasunaga, Kawaguchi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1989, Ser. No. 391,292
Claims priority, application Japan, Sep. 19, 1988, 63-232363; Apr. 28, 1989, 1-107614
Int. Cl.[5] G01T *1/24*
U.S. Cl. 250—376.01 16 Claims

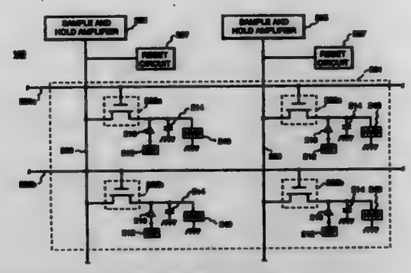
1. In a signal generator for generating voltage signals in a semiconductor device upon irradiation with a charged particle beam, the improvement wherein a circuit that converts a beam current of the irradiated charged particle beam into said voltage signals is comprised of a bipolar transistor having a current amplification function and a load device that are incorporated in said semiconductor device, further comprising means for irradiating a finely focused charged particle beam onto a portion of a line pattern connected to the base of the bipolar transistor to generate said voltage signal.

5,198,673

RADIATION IMAGE DETECTOR WITH OPTICAL GAIN SELENIUM PHOTOSENSORS

Henri M. Rougeot, and George E. Possin, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 23, 1992, Ser. No. 824,270
Int. Cl.[5] G01T *1/24, 1/20*
U.S. Cl. 250—370.11 25 Claims



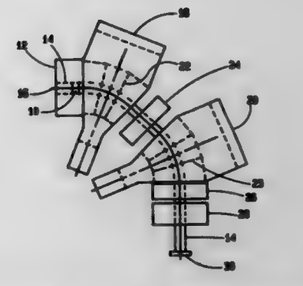
1. A radiation imaging device comprising:
a scintillator;
a large area photosensor optically coupled to said scintillator and comprising an amorphous selenium photosensitive material exhibiting avalanche multiplication gain when a selected high biasing voltage is applied to said photosensor;
a data read and reset circuit electrically coupled to said large area photosensor to selectively read the charge generated in said photosensor in response to incident light; and
a protective thin film transistor (TFT) coupled to said data read and reset circuit to provide overvoltage protection from said selected high biasing voltage, said protective TFT comprising a gate dielectric layer having a thickness selected to cause said protective TFT to become conductive above a selected protective voltage.

5,198,674

PARTICLE BEAM GENERATOR USING A RADIOACTIVE SOURCE

David G. Underwood, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 27, 1991, Ser. No. 798,782
Int. Cl.[5] H01J *37/14*
U.S. Cl. 250—396 ML 13 Claims



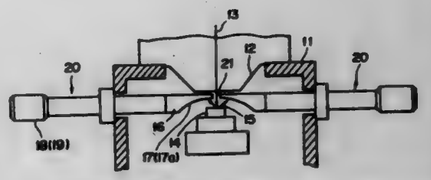
1. An apparatus for generating a charged particle beam using a radioactive source, comprised of:
radioactive source means for producing charged particles having energy of at least 3 MeV,
magnet means disposed toward said charged particles for dispersing into an absorber those particles having momentum outside of a predetermined range,
magnet means for focusing the resultant particle beam comprised of said charged particles having momentum within the predetermined range,
means for attenuating gamma rays from said charged particles, and
demagnification means for reducing at least one cross-dimension of said resultant particle beam.

5,198,675

BACKSCATTERED ELECTRON DETECTOR FOR AN ELECTRON BEAM APPARATUS

Kikuhiro Hikita, Atsugi; Jiro Tsumatori, Isehara, and Shoji Shimakura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 800,570
Claims priority, application Japan, Nov. 30, 1990, 2-333696
Int. Cl.[5] H01J *37/244*
U.S. Cl. 250—397 8 Claims



1. A backscattered electron detector for an electron beam apparatus comprising:
a photomultiplier;
an amplifier; and
a plurality of scintillators disposed in a specimen chamber

dissolving said bulk block member but not said metallic

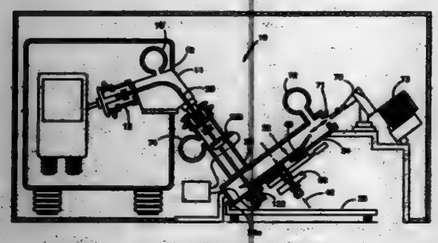
between an objective lens and a specimen in such a way that they are close to or in contact with each other, said scintillators each having a notch formed at closely disposed, facing end portions.

5,198,676

ION BEAM PROFILING METHOD AND APPARATUS

Victor M. Benveniste, Magnolia; Peter L. Kellerman, Essex, and John J. Schauder, Somerville, all of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 27, 1991, Ser. No. 767,027
Int. Cl.[5] G01N 23/00
U.S. Cl. 250—397 15 Claims



1. Ion beam implantation apparatus for monitoring ion beam intensity distributions across an ion beam comprising:
a) an insulating substrate that supports a plurality of charge-collecting zones wherein each charge-collecting zone is defined by a conductive material coupled to the insulating substrate;
b) scanning means for causing different intercept regions of an ion implantation beam to impact the plurality of charge-collecting zones; and
c) circuit means for periodically determining the charge build-up on the charge-collecting zones due to ion bombardment of said charge-collecting zones by discharging the charge-collecting zones; said circuit means including interconnecting means for coupling a plurality of charge-collecting zones to a common circuit output, a charge-determining circuit coupled to the common circuit output of said interconnecting means and storage circuitry for storing signals from the plurality of charge-collecting zones to define an intensity mapping of the intercept region of the ion beam.

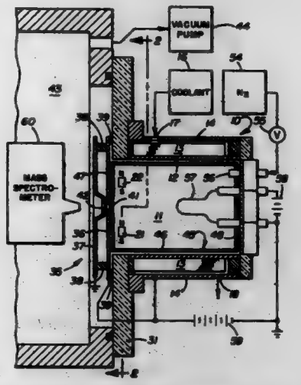
5,198,677

PRODUCTION OF N+ IONS FROM A MULTICUSP ION BEAM APPARATUS

Ka-Ngo Leung, Hercules; Wulf B. Kunkel, Berkeley, both of Calif., and Steven R. Walther, Salem, Mass., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 11, 1991, Ser. No. 774,912
Int. Cl.[5] H01J 37/08
U.S. Cl. 250—424 6 Claims

1. The method of generating a high purity atomic N^+ ion beam using a multicusp ion source having a chamber formed by a cylindrical chamber wall surrounded by a plurality of magnets, a filament centrally disposed in said chamber, a plasma electrode having an extraction orifice at one end of the chamber, a magnetic filter having two parallel magnets spaced from said plasma electrode and dividing the chamber into arc discharge and extraction regions, the method comprising:
(a) causing an electron flow to take place in said arc discharge region from said filament to said chamber wall,
(b) introducing nitrogen gas into said chamber,
(c) maintaining the chamber wall at a positive voltage relative to said filament and at a magnitude for an optimum percentage of N^+ ions in the extracted ion beam,
(d) disposing a hot liner within said chamber and near said chamber wall to limit recombination of atomic N^+ ions into molecular N_2^+ ions,



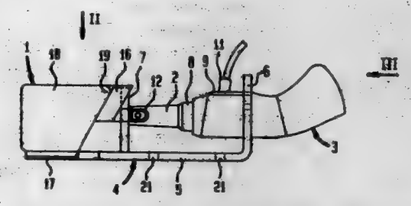
(e) spacing said magnets of said magnetic filter from each other for optimum percentage of N^+ ions in the extracted ion beams, and
(f) maintaining a relatively low operating pressure downstream of said extraction orifice and of a magnitude for an optimum percentage of atomic N^+ ions in the extracted ion beam.

5,198,678

DENTAL PHOTOPOLYMERIZATION DEVICE

Steffen Oppawsky, Bad Homburg, Fed. Rep. of Germany, assignor to Heraeus Kulzer GmbH, Wehrheim/TS, Fed. Rep. of Germany

Filed Sep. 4, 1991, Ser. No. 754,585
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1990, 4028566
Int. Cl.[5] G21K 5/08
U.S. Cl. 250—455.11 13 Claims



1. A photopolymerization device for treating plastic dental parts, having an irradiation space in an irradiation chamber (1), the space being accessible via at least one pivotable or displaceable wall, and having a light conductor (2) and a radiation source unit (3), wherein the light conductor (2) feeds the radiation from the radiation source into the irradiation space of the irradiation chamber (1) and forms a releasable connection between the irradiation chamber and the radiation source unit, wherein
said radiation source unit is a hand-held polymerization unit (3), having a housing part;
said irradiation chamber (1) is coupled to a support frame (4) including a first support (6) and a second support (7), disposed on a support plate (5) forming a part of said support frame (4); and

said hand-held polymerization unit (3) and said support frame (4) are formed with matching shapes adapted for rapid yet form-fitting engagement with one another to provide said releasable connection, said connection being formed upon engagement of said housing part in said first support (6) and of said light conductor (2) in said second support (7), said connection assuring fixation of the relative position of the polymerization unit and the chamber to thereby assure constant radiation conditions in said chamber.

5,198,679

PHOSPHOR AND IMAGE STORAGE PANEL

Takayuki Katoh; Yuichi Hosoi, and Kenji Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 319,855, Mar. 6, 1989, abandoned, which is a continuation of Ser. No. 131,332, Dec. 8, 1987, abandoned, which is a continuation of Ser. No. 797,971, Nov. 14, 1985, abandoned. This application Mar. 6, 1989, Ser. No. 492,436
Claims priority, application Japan, Nov. 16, 1984, 59-240452; Nov. 16, 1984, 59-240453; Nov. 16, 1984, 59-240454; Nov. 16, 1984, 59-240455
Int. Cl.[5] C09K 11/61, 11/66
U.S. Cl. 250—484.1 26 Claims

1. A divalent europium activated alkaline earth metal halide phosphor having the formula:

$$M^{II}X_2 \cdot aM^{II}X'_2 \cdot bSiO:xEu^{2+}$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I, and $X \neq X'$; a and x are numbers satisfying the conditions of $0.1 \leqq a \leqq 10.0$ and $0 < x \leqq 0.2$, respectively; and b is a number satisfying the condition of $0 < b \leqq 3 \times 10^{-2}$.

7. A divalent europium activated alkaline earth metal halide phosphor having the formula:

$$M^{II}X_2 \cdot aM^{II}X'_2 \cdot bSaX''_2 \cdot xEu^{2+}$$

in which M^{II} is at least one alkaline earth metal selected form the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from group consisting of Cl, Br and I, and $X \neq X'$; X'' is at least one halogen selected from the group consisting of F, Cl, Br and I; a and x are numbers satisfying the conditions of $0.1 \leqq a \leqq 10.0$ and $0 < x \leqq 0.2$, respectively; and b is a number satisfying the condition $0 < b \leqq 10^{-3}$.

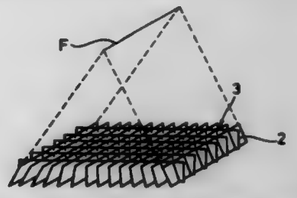
5,198,680

HIGH PRECISION SINGLE FOCUS COLLIMATOR AND METHOD FOR MANUFACTURING HIGH PRECISION SINGLE FOCUS COLLIMATOR

Tadakazu Kurakake, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Mar. 27, 1992, Ser. No. 858,709
Claims priority, application Japan, Mar. 27, 1991, 3-63522
Int. Cl.[5] G21K 1/02
U.S. Cl. 250—505.1 14 Claims

1. A method for manufacturing a single focus collimator, comprising the steps of:
forming grooves on a surface of a bulk block member;
casting a metallic material having a sufficient γ ray shielding property into said grooves formed on said bulk block member; and
immersing said bulk block member with said metallic material casted into said grooves into a solvent capable of dissolving said bulk block member but not said metallic material, such that a collimator body formed by said metallic material in a shape of said grooves is obtained as said bulk block member is dissolved by said solvent.

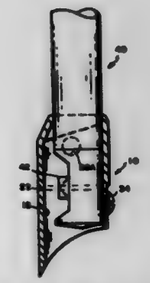


5,198,681

OPTICAL PROBE SHIELD

Robert A. Pontefract, Chelmsford, Mass., assignor to Scully Signal Company, Wilmington, Mass.

Filed Feb. 21, 1991, Ser. No. 658,544
Int. Cl.[5] G01F 23/28
U.S. Cl. 250—577 15 Claims



1. An apparatus for protecting and optically isolating the optical element of a probe used for sensing liquid levels, said apparatus comprising:
a body member adapted to slidably receive said probe through a first end thereof and expose said probe to a liquid through a second end thereof wherein said body member is disposed in close proximity to and along an axis substantially parallel to the face of the optical element and is formed from a non-reflective material; and
means, integrally formed with said body member, for purging liquid disposed intermediate said body member and said probe.

5,198,682

MULTIPLE QUANTUM WELL SUPERLATTICE INFRARED DETECTOR WITH GRADED CONDUCTIVE BAND

Chan-Shin Wu, Torrance, and Cheng P. Wen, Mission Viejo, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 12, 1991, Ser. No. 792,070
Int. Cl.[5] H01L 27/14
U.S. Cl. 257—21 21 Claims

1. A radiation sensitive multiple quantum well (MQW) superlattice structure, comprising:
a set of doped quantum well layers,
a set of barrier layers interleaved with said quantum well layers and having a different composition than said quantum well layers to form a periodic heterostructure therewith, said barrier layers characterized by respective barrier energy levels,
said quantum well layers having a gradient in dopant con-

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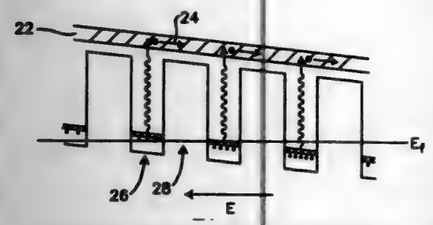
centration across the superlattice to establish an internal electric field within the superlattice, whereby charge



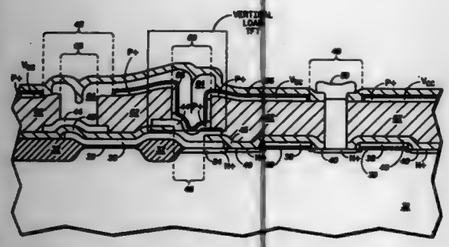
carriers that are photoexcited by radiation are biased to move across said superlattice.

5,198,683

INTEGRATED CIRCUIT MEMORY DEVICE AND STRUCTURAL LAYOUT THEREOF

Richard D. Sivan, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1991, Ser. No. 695,053
Int. Cl.[5] H01L *27/02, 29/10, 29/06*
U.S. Cl. 257—67 25 Claims



8. A structural layout for an integrated circuit memory device having an array of memory cells, at least one cell having a plurality of transistors and at least one data storage node, a minimum feature, and an enclosed area defined by a perimeter of the minimum feature, the enclosed area of the layout comprising:

an active region which functions as a current electrode of a first transistor;

first interconnect means within a portion of the active region;

a first conductive material forming a control electrode of a second transistor and overlapping a portion of the first interconnect means to electrically couple the control electrode of the second transistor to the active region;

second interconnect means overlapping a portion of the first conductive material;

a second conductive material overlapping the second interconnect means, the second conductive material functioning as current electrodes of a third transistor; and

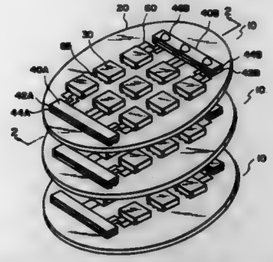
a third conductive material forming a control electrode of the third transistor and contained within the second interconnect means.

5,198,684

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH OPTICAL TRANSMIT-RECEIVE MEANS

Toshio Sudo, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 14, 1991, Ser. No. 744,718
Claims priority, application Japan, Aug. 15, 1990, 2-215485
Int. Cl.[5] H01L *31/12*
U.S. Cl. 257—79 15 Claims



1. A semiconductor integrated circuit device comprising:

a plurality of semiconductor packaging substrates arranged parallel to one another;

at least one opening selectively formed on each of said semiconductor packaging substrates;

a plurality of semiconductor integrated circuits mounted on a portion of each of said semiconductor packaging substrates which excludes said opening;

light transmit-receive means having at least one light emitting element and at least one light receiving element which are formed integral with each other on each opening, for performing optical signal transmission between said semiconductor packaging substrates, said light transmit-receive means converting electric signals output from a semiconductor integrated circuit on one semiconductor packaging substrate to an optical signal and outputting the optical signal to another semiconductor packaging substrate, and converting an optical signal received from another semiconductor packaging substrate to electric signals and outputting the electric signal to said semiconductor integrated circuit; and

wires for electrically connecting said semiconductor integrated circuits on each of said semiconductor packaging substrates with each other and connecting said semiconductor integrated circuits on each thereof to said light transmit-receive means,

wherein said semiconductor integrated circuits perform predetermined batch-process of electric signals, respectively.

5,198,685

PHOTOELECTRIC CONVERSION APPARATUS WITH SHOCK-ABSORBING LAYER

Masashi Kitani, Yokohama; Hisanori Tsuda, Atsugi; Katsunori Terada, Sagamihara; Satoshi Itahashi, Chigasaki, and Tetsuya Shimada, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1991, Ser. No. 737,323
Claims priority, application Japan, Aug. 1, 1990, 2-202380; Aug. 3, 1990, 2-206598
Int. Cl.[5] H01L *27/14*
U.S. Cl. 257—82 20 Claims

1. A photoelectric conversion apparatus comprising on a substrate:

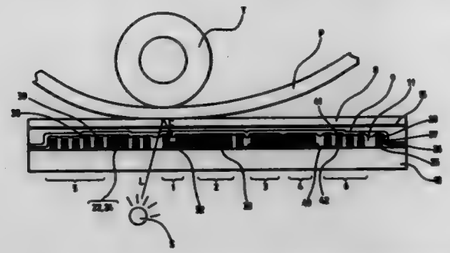
(a) a plurality of photoelectric conversion devices;

(b) electrical connections between said photoelectric conversions devices;

(c) at least one signal line for reading out electric signals transmitted from said photoelectric conversion devices;

(d) a protective layer of an inorganic thin film provided at least on (i) said photoelectric conversion devices, (ii) said electrical connections and (iii) said at least one signal line;

(e) a wear-resisting layer of thin plate glass with an area smaller than an area of said substrate, said wear-resisting layer overlying said photoelectric conversion devices and



a portion of said electrical connections on said substrate; and

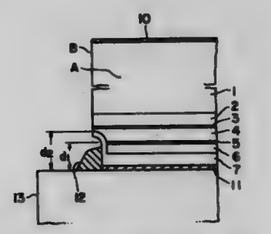
(f) a shock-absorbing layer of an organic thin film spaced between an end of said wear-resisting layer, and at least at a part of an area between said end and said substrate, wherein said inorganic thin film extends to at least said end of said wear-resisting layer.

5,198,686

DOUBLE HETERO-TYPE SEMICONDUCTOR LASER DEVICE

Kimitaka Yoshimura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 13, 1991, Ser. No. 791,172
Claims priority, application Japan, Nov. 13, 1990, 2-306454
Int. Cl.[5] H01L *33/00*
U.S. Cl. 257—94 2 Claims



1. A semiconductor laser device comprising:

a first electrode;

a substrate of a first conductivity type formed on said first electrode;

a first clad layer of said first conductivity type formed on said substrate;

an active layer formed on said first clad layer, said active layer being of either one of said first conductivity type and a second conductivity type, wherein said second conductivity type is opposite to said first conductivity type;

a second clad layer of said second conductivity type formed on said active layer;

a current block layer of said first conductivity type formed on said second clad layer;

an ohmic layer of said second conductivity type formed on said current block layer;

a second electrode formed on said ohmic layer; and

a stem on which said second electrode is mounted with a soldering agent,

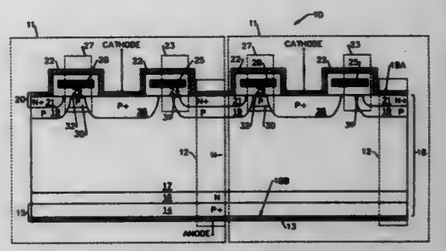
wherein a pair of side faces of each of said ohmic layer, said current block layer and said second clad layer have a concave shape, and end portions of said ohmic layer cover the pair of side faces of said second clad layer respectively, thereby preventing the soldering agent from creeping up and from attaching to said second clad layer.

5,198,687

BASE RESISTANCE CONTROLLED THYRISTOR WITH SINGLE-POLARITY TURN-ON AND TURN-OFF CONTROL

Bantval J. Baliga, Raleigh, N.C., assignor to North Carolina State University at Raleigh, North Carolina

Filed Jul. 23, 1992, Ser. No. 919,161
Int. Cl.[5] H01L *29/74, 29/10, 29/78*
U.S. Cl. 257—137 25 Claims



1. A semiconductor switching device comprising:

a thyristor having an anode region, a first base region, a second base region, and a cathode region in said second base region;

a diverter region in said first base region, outside and adjacent said second base region, and electrically connected to said cathode region; and

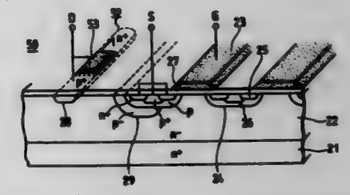
turn-off gating means responsive to a first bias signal for forming an accumulation-layer electrically connecting said second base region to said diverter region to shunt current from said second base region to said cathode region.

5,198,688

SEMICONDUCTOR DEVICE PROVIDED WITH A CONDUCTIVITY MODULATION MISFET

Kazuhiro Tsuchiya, and Yutaka Yoshida, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 682,406, Apr. 8, 1991, abandoned, which is a continuation of Ser. No. 482,851, Feb. 20, 1990, abandoned. This application Jul. 30, 1992, Ser. No. 921,393
Claims priority, application Japan, Mar. 6, 1989, 1-53276
Int. Cl.[5] H01L *29/78, 27/02, 29/04*
U.S. Cl. 257—144 4 Claims



1. A lateral MOSFET semiconductor device, comprising:

a semiconductor substrate including a conductivity modulating layer of first conductivity type having a predetermined impurity concentration and including under the conductivity modulating layer a buried layer of first conductivity type having an impurity concentration higher than the predetermined impurity concentration, wherein a

surface of the conductivity modulating layer comprises a principal surface of the semiconductor substrate;
a second conductivity type minority carrier injection region formed in the principal surface;
a first conductivity type majority carrier extraction region formed in the principle surface adjacent to the minority carrier injection region;
resistive means formed on the principal surface for ohmically bridging the second conductivity type minority carrier injection region and the first conductivity type majority carrier extraction region;
a source disposed on the principal surface;
a gate disposed on the principal surface; and,
a drain disposed on the principal surface, wherein the drain is connected to the resistive means and the second conductivity type minority carrier injection region.

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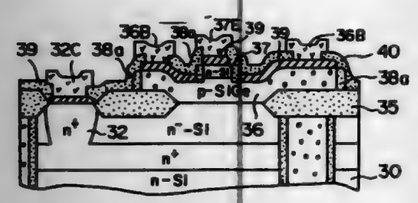
HETEROJUNCTION BIPOLAR TRANSISTOR

Hiroshi Fujioka, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 442,828, Nov. 29, 1989, abandoned. This application May 20, 1991, Ser. No. 704,721
Claims priority, application Japan, Nov. 30, 1988, 63-304503
Int. Cl.[5] H01L *29/161, 29/80, 29/72*
U.S. Cl. 257—197 **18 Claims**



1. A heterojunction bipolar transistor comprising:
a substrate of silicon;
a collector layer of silicon formed on said silicon substrate;
a base layer of silicon-germanium formed on said collector layer, said base layer having a first base portion and a second base portion;
an emitter layer of silicon formed on said second base portion of said base layer, said emitter layer having a vertical wall, a heterojunction being formed at an interface between said second base portion of the base layer and said emitter layer;
a metallic layer selectively formed on said first base portion of said base layer, an edge of said metallic layer being substantially close to said heterojunction, the metallic layer being a member selected from the group consisting of tungsten, molybdenum, tungsten silicide and platinum silicide;
an insulating layer formed on said emitter layer, said collector layer and said metallic layer, said insulating layer having first, second and third contact holes through which said emitter layer, said collector layer and said metallic layer being partially exposed, respectively, said insulating layer having sidewall formed on said second base portion and along said vertical wall of said emitter layer, an end of said metallic layer facing said heterojunction through said sidewall, and said vertical wall of said emitter layer directly facing said second base portion of said base layer and directly facing said metallic layer on an opposite side thereof so that only said vertical wall exists between said second base portion and said metallic layer;
an emitter electrode formed on said emitter layer and formed through said first through hole;
a collector electrode formed on said collector layer and formed through said second through hole; and
a base electrode formed on said metallic layer and formed through said third through hole.

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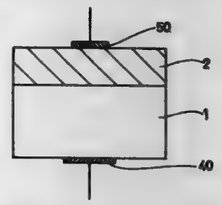
ELECTROLUMINESCENT DEVICE OF II–IV COMPOUND SEMICONDUCTOR

Masahiko Kitagawa, Shiki; Yoshitaka Tomomura, and Kenji Nakanishi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Nov. 25, 1991, Ser. No. 796,684
Claims priority, application Japan, Nov. 26, 1990, 2-324346; Nov. 27, 1990, 2-331909
Int. Cl.[5] H01L *33/00, 27/14;* H01S *3/19*
U.S. Cl. 257—200 **6 Claims**



1. An electroluminescent device of compound semiconductor which is made of II–VI compound semiconductor to be in pn junction type, wherein n layer of the pn junction part comprises a II–VI compound semiconductor layer containing zinc as an essential composite element and p layer of the pn junction part comprises a II–VI compound semiconductor layer having an epitaxial layer containing M, Be and Te (wherein M is a group comprising Cd and Zn) as an essential composite element.

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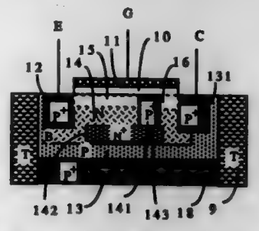
BIMOS DEVICES AND BIMOS MEMORIES

Mia M. Tarag, 1367 Glenmoor Way, San Jose, Calif. 95129

Continuation-in-part of Ser. No. 335,584, Apr. 10, 1989, abandoned. This application Sep. 5, 1990, Ser. No. 577,792
Int. Cl.[5] H01L *27/04*
U.S. Cl. 257—316 **13 Claims**



1. A unitary bipolar/MOSFET transistor structure, comprising:
a first semiconductor region of first conductivity type, said first semiconductor region having a major surface;
second, third, and fourth regions of second conductivity type in said first region, said second, third, and fourth regions each adjoining said major surface, said third region being spaced from said second region by a first channel portion of said first region, said fourth region being spaced from said third region by a second channel portion of said first region, and said second and fourth regions being spaced apart from each other,
a gate electrode insulatingly overlying both said first and said second channel portions,
a substrate region of second conductivity type, said substrate region underlying said first semiconductor region and

being spaced from said second region by a portion of said first region, so that said second region, said portion of said first region, and said substrate region form a bipolar transistor structure, said fourth region adjoining said substrate region so as to form a connection thereto;
means for forming a low impedance connection between said third region and said first region;
an emitter electrode connected to said second region and a collector electrode connected to said fourth region;
whereby said structure forms an equivalent circuit comprising a bipolar transistor having said emitter and collector electrode as its respective main terminal, and with said first region as its base region, with a first effective insulated gate field effect transistor connected between said emitter electrode and said first region, and a second insulated gate field effect transistor connected between said first region and said collector electrode, said gate electrode controlling conduction of both field effect transistors, so that when an input voltage is applied between said gate electrode and one of said emitter and collector electrodes so as to render said first field effect transistor and said second field effect transistor conductive, said first and second insulated gate field effect transistors act as a voltage divider between said emitter and collector electrodes and provide a voltage to said first region with respect to said second region to cause said bipolar transistor to conduct.

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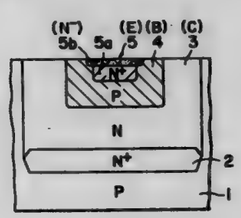
SEMICONDUCTOR DEVICE INCLUDING BIPOLAR TRANSISTOR WITH STEP IMPURITY PROFILE HAVING LOW AND HIGH CONCENTRATION EMITTER REGIONS

Hisayo Momose, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 460,804, Jan. 4, 1990, abandoned. This application Jun. 14, 1991, Ser. No. 714,986
Claims priority, application Japan, Jan. 9, 1989, 1-2460
Int. Cl.[5] H01L *29/00, 29/72, 27/04*
U.S. Cl. 257—591 **9 Claims**



1. A semiconductor device including a semiconductor substrate, and a bipolar transistor formed in said semiconductor substrate,
said bipolar transistor comprising:
a collector region comprising a first conductivity type impurity;
a base region comprising a second conductivity type impurity and formed in the vicinity of the surface of said collector region, and
an emitter region comprising said first conductivity type impurity and formed in the vicinity of the surface of said base region,
said emitter region comprising a high concentration region having a high impurity concentration and a low concentration region having an impurity concentration considerably lower than that of said high concentration region, said high and low concentration regions being in columnar form, said columnar low concentration region having a lateral cross section considerably larger than that of said high concentration region and a depth considerably smaller than that of said high concentration region, said high and low concentration regions being superimposed so that said low concentration region comprises a central columnar portion superposed on a surface portion of said high concentration region and a peripheral annular portion surrounding said central columnar portion and said surface portion of said high concentration region, said peripheral annular portion surrounding the first interface portion, between said high concentration region and said base region, said first interface portion being in the vicinity of the surface of said substrate, said peripheral annular portion not surrounding the second interface portion between said high concentration region and said base region, said second interface portion being adjacent to the first interface portion, said peripheral annular portion being automatically formed by said columnar high and low concentration regions being formed annular in a manner to surround the first interface portion between said high concentration region and said base region, which is in the vicinity of the surface of said substrate and so as not to surround the second interface portion between said high concentration region and said base region, which is adjacent to the first interface portion,
said low concentration region being automatically formed by forming said high concentration region and a columnar low concentration region, said columnar low concentration region having a lateral cross section larger than that of said high concentration region and a depth smaller than that of said high concentration region;
whereby said emitter region essentially comprises high concentration impurities, the volume of said low concentration region being exceedingly smaller than that of said high concentration impurity region.

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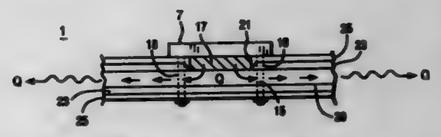
APERTURE FORMATION IN ALUMINUM CIRCUIT CARD FOR ENHANCED THERMAL DISSIPATION

Ronald L. Imken, Round Rock, and Joseph LaTorre, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1992, Ser. No. 831,855
Int. Cl.[5] H01L *23/34, 23/36*
U.S. Cl. 257—720 **6 Claims**



1. An electronic circuit card, comprising:
an aluminum core layer;
an electrically insulating layer disposed adjacent said aluminum core layer and on at least one side thereof;
at least one aperture formed in said electrically insulating layer to expose a corresponding portion of said aluminum core layer;
at least one electronic component device placed in one of said apertures such that a surface of said component is in contact with said aluminum core layer and;
at least one electrical transmission line on an exposed surface of said insulating layer extending into at least one other of said apertures.

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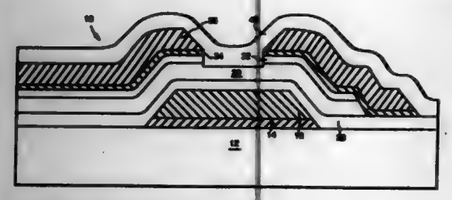
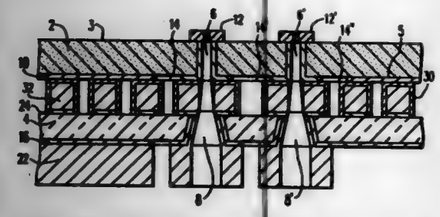
5,198,694
THIN FILM TRANSISTOR STRUCTURE WITH IMPROVED SOURCE/DRAIN CONTACTS
Robert F. Kwasnick; George E. Possin, both of Schenectady, N.Y.; David E. Holden, Grenoble, France, and Richard J. Saia, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 593,419, Oct. 5, 1990, abandoned. This application Jan. 24, 1992, Ser. No. 825,218
Int. Cl.[5] H01L *27/01, 27/13, 29/78*
U.S. Cl. 257—766 8 Claims



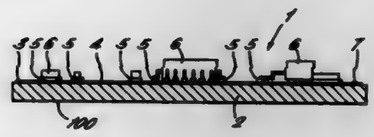
1. A thin film transistor comprising:
a substrate;
gate metallization disposed on said substrate;
a gate dielectric disposed on said gate metallization;
semiconductor material disposed on said gate dielectric; and
source and drain metallization disposed on said semiconductor material so as to form a channel region therebetween in said semiconductor material, said source and drain metallization comprising a first relatively thin layer of a first conductor and a second relatively thick layer of a second conductor, said second conductor being etchable in an etchant to which said first conductor is substantially immune, said second conductor having sloped, dry etched sidewalls with substantially uniform slopes extending toward said channel region so as to facilitate the formation of a high integrity conformal back channel passivation layer;
said first conductor comprising chromium and said second conductor comprising one of the group consisting of molybdenum and tungsten.

5,198,695
SEMICONDUCTOR WAFER WITH CIRCUITS BONDED TO A SUBSTRATE
Maurice H. Hanes, Murrysville; Rowland C. Clarke, Bell Township, and Michael C. Driver, Elizabeth Township, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 10, 1990, Ser. No. 624,783
Int. Cl.[5] H01L *23/48, 29/44, 29/54, 29/60*
U.S. Cl. 257—773 12 Claims



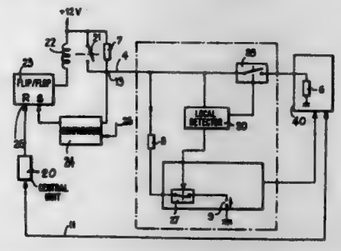
1. A bonded semiconductor wafer device, comprising:
a semiconductor wafer having a top and a bottom surface, said wafer containing circuitry on its top surface;
a substrate having a top and a bottom surface;
a bonding means operable to join the bottom surface of said wafer to the top surface of said substrate, said bonding means further comprising a plurality of individual pads of bonding material separated by spaces and arranged in a predetermined pattern, said pads comprising a layer of refractory metal and a layer of solder material, wherein said spaces contain said solder material when said wafer and said substrate are joined; and
an interconnection means operable to provide electrical connection between said circuitry and a predetermined point of said bottom surface of said substrate.

5,198,696
AUTOMOTIVE ELECTRICAL SYSTEMS
Michael E. Dennis, Wiltshire, United Kingdom, assignor to I.S.T. Laboratories Ltd., Swindon, United Kingdom
Filed Apr. 13, 1990, Ser. No. 508,285
Claims priority, application United Kingdom, Apr. 13, 1989, 8908366
Int. Cl.[5] H05K *7/02*
U.S. Cl. 307—10.1 9 Claims



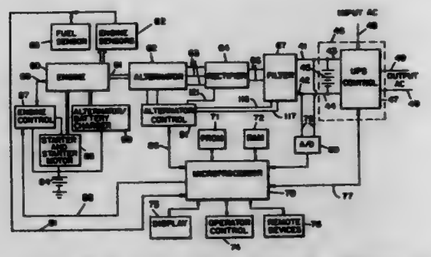
1. An electrical system for an automobile comprising a plurality of slave modules connected to one or more respective loads and/or sensors, a power bus connecting the slave modules to a control module operable to remotely control the switching of power supplied to the loads by the modules and/or the sampling of signals from the sensors, at least one of the slave modules and/or the control means comprising a thick film printed circuit formed on a stainless steel substrate and wherein the circuit comprises a composite layer selectively applied to one or more surface portions of the substrate and is mounted with a remaining uncoated surface portion of the substrate in contact with a body panel of the vehicle.

5,198,697
DEVICE FOR CONTROLLING THE ELECTRICAL POWER SUPPLY OF A PLURALITY OF ELECTRICAL APPARATUSES FROM A DIRECT CURRENT SOURCE
Siri-Yuth Loth, Saint Brice sous Foret, France, assignor to Automobiles Peugeot, Paris; Automobiles Citroen, Neuilly and Regie Nationale des Usines Renault, Boulogne Billancourt, all of France
Filed Jan. 29, 1991, Ser. No. 647,062
Claims priority, application France, Jan. 29, 1990, 90 00996
Int. Cl.[5] H02J *1/00*
U.S. Cl. 307—31 10 Claims



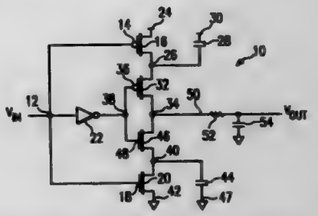
1. Device for control of electrical power supply to a plurality of local electrical apparatuses from a single source of direct current, comprising
a central bistable switch connected between a first terminal of said source and power supply lines of the local electrical apparatuses;
a central resistor connected in parallel with said central switch;
each local electrical apparatus comprising a local resistor and at least one control switch which are connected in series between a power supply line and a second terminal of said source,
each local resistor forming, together with the central resistor, a voltage divider bridge, a center point of which is connected to a central detector controlling said central switch,
each local electrical apparatus generating a reopening information signal which is sent to the central detector,
means for eliminating the current circulating in said local resistor and means for detecting the closure of the central bistable switch which controls the closure of said isolating means and the opening of said current eliminating means when the central bistable switch closes.

5,198,698
AUXILIARY POWER SUPPLY SYSTEM FOR PROVIDING DC POWER ON DEMAND
Steven Paul, Tomah; Murray Leonard, Wisconsin Rapids; Mark Schultz; Kevin Mengelt, both of Mauston, and Robert Colburn, Green Bay, all of Wis., assignors to Best Power Technology, Inc., Necedah, Wis.
Filed Feb. 11, 1991, Ser. No. 653,793
Int. Cl.[5] H02J *3/00*
U.S. Cl. 307—64 29 Claims



1. An auxiliary power supply system for providing DC power to DC bus lines across which a storage battery is connected, comprising:
(a) an internal combustion engine and means for responding to a control signal to start the engine;
(b) an alternator coupled to the engine to be driven by it and having AC output terminals;
(c) a rectifier connected to the output terminals of the alternator for rectifying the AC output of the alternator to a DC voltage which is adapted to be connected to the DC bus lines;
(d) means for controlling the alternator when the engine is running to provide a controlled DC output voltage from the rectifier to the DC bus lines;
(e) control means connected to monitor the voltage on the DC bus lines for providing a control signal to turn on the engine when the voltage across the DC bus lines drops below a predetermined value, for controlling the means for controlling the alternator so as not to supply power to the DC bus lines for a selected period of time after the engine has started to allow the engine to warm up, and for then activating the alternator to provide the DC output power from the rectifier to the DC bus lines.

5,198,699
CAPACITOR-DRIVEN SIGNAL TRANSMISSION CIRCUIT
Masashi Hashimoto, and Ob-Kyong Kwon, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation-in-part of Ser. No. 242,762, Sep. 9, 1988. This application Jan. 7, 1991, Ser. No. 638,267
Int. Cl.[5] H03K *3/01, 17/16, 5/12, 17/687*
U.S. Cl. 307—270 10 Claims



1. A transmission line driver circuit, comprising:
a signal input;
a first discrete capacitor for storing a first voltage level corresponding to a first of two possible bit values of an input signal;
a second discrete capacitor for storing a second voltage level corresponding to a second of said possible bit values of said input signal;
a first voltage supply source selectively coupled to said first discrete capacitor for recharging said first discrete capacitor to said first voltage level;
a second voltage supply source selectively coupled to said second discrete capacitor for recharging said second discrete capacitor to said second voltage level;
a transmission line; and
a switching circuit, an input of said switching circuit coupled to said signal input, an output of said switching circuit coupled to said transmission line, said first and second discrete capacitors coupled to said switching circuit, said switching circuit comprising an inverter coupled to said signal input and having an output, said inverter being operable to invert said input signal to produce an inverted signal on said inverter output having a bit value inverted from the bit value of said input signal, first and second discrete capacitor coupling switches, each having control nodes coupled to said output of said inverter, said first discrete capacitor coupling switch being operable to couple said discrete capacitor to said transmission line in response to a second bit value of said inverter signal on its switch control node, said second discrete capacitor coupling switch being operable to couple said second discrete capacitor to said transmission line in response to a first bit value of said inverted signal on its switch control node, said switching circuit being operable to couple said first discrete capacitor to said output in response to an input signal of a first bit value and being operable to couple said second discrete capacitor to said output in response to an input signal of said second bit value, such that the bit value received on said signal input is transmitted to said transmission line.

5,198,700
DOUBLETPULSE GENERATOR
Frank A. Whiteside, Coppell, Tex., assignor to Dallas Semiconductor Corp., Dallas, Tex.
Filed Nov. 5, 1991, Ser. No. 790,313
Int. Cl.[5] H03K *5/00*
U.S. Cl. 307—273 3 Claims

1. A doublet pulse generator, comprising:
(a) first and second monostable circuits, said first and second

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a resistor, a first end of which is connected to a second end

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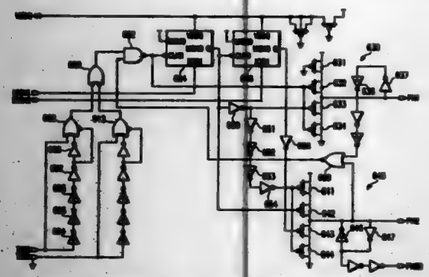
monostable circuits made of matched components, each of said first and second monostable circuits with an input node and an output node, and with said output node of said first monostable circuit connected to said input node of said second monostable circuit;

(b) first and second output devices, each of said output devices with first and second input nodes and an output node;

(c) wherein said input node of said first monostable circuit couples to said first input node of said first output device, said output node of said first monostable circuit couples to



said second input node of said first output device and to said first input node of said second output device, and said output node of said second monostable circuit couples to said second input node of said second output device;

(d) whereby a signal at said input node of said first monostable circuit activates said first output device and said first monostable circuit, next after a time interval said first monostable circuit outputs a signal which deactivates said first output device and activates said second output device and said second monostable circuit, then after another of said time interval said second monostable circuit outputs a signal which deactivates said second output device.

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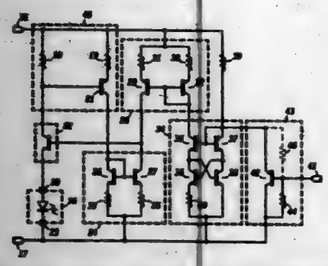
CURRENT SOURCE WITH ADJUSTABLE TEMPERATURE VARIATION

Robert B. Davies, 433 E. McKinley, Tempe, Ariz. 85281; Lloyd H. Hayes, 1064 W. Meseto Ave., Mesa, Ariz. 85210; David M. Hemingar, 1322 W. Ellis St., Mesa, Ariz. 85201, and David F. Mietus, 3501 S. McClintock, #1056, Tempe, Ariz. 85282

Filed Dec. 24, 1990, Ser. No. 632,793
Int. Cl.[5] H03K *3/01, 3/26*
U.S. Cl. 307—296.3 11 Claims



1. A temperature compensated system, comprising:

load means in which a critical operating characteristic varies in proportion to variation of temperature and a controlling current;

a current source which supplies a controlling current to the load means;

a first resistive means coupled to the current source, the first resistive means having a predetermined positive temperature coefficient; and

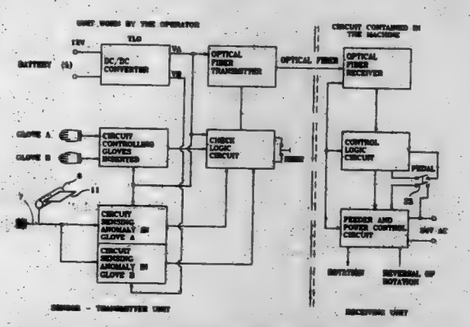
a second resistive means coupled to the current source, the second resistive means having a predetermined positive temperature coefficient larger than the temperature coefficient of the first resistive means, the first and second resistive means being coupled to the current source in such a way that the temperature coefficient of the current source is adjusted solely by variation of the first and the second resistive means, and the variation due to temperature of the controlling current supplied by the current source allows variation due to temperature of the critical operating characteristic to be minimized or adjusted to a desired positive or negative value.

5,198,702

CONTROL AND SAFETY SYSTEM FOR ELECTRICALLY OPERATED DEVICES

Timothy J. McCullough, 833 Aurora Rd., Vermilion, Ohio 44089, and Giorgio Grasselli, Via L. Roversi No 2, 42020 Albinea, Italy

Filed Feb. 19, 1991, Ser. No. 657,208
Claims priority, application Italy, Mar. 7, 1990, 46821 A/90
Int. Cl.[5] F16P *3/00*
U.S. Cl. 307—326 4 Claims



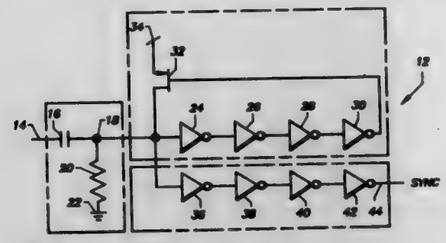
1. A control and safety system for an electrically operated device of the type comprising a cutting tool (9) connected to a reversible electric motor (88), and control means for halting and reversing the movement of said motor, including a pair of electrically conducting gloves (A) and (B) adapted to be worn by an operator and connected by conducting wires (2,3) to a box (4) affixed to the operator's body and containing a rechargeable battery and an electronic sensor-transmitter circuit (120) arranged to emit a light pulse when the gloves are both worn by the operator and to interrupt said light pulse when one of the two gloves or part of the operator's body accidentally makes contact with any metal part of the device (10); an optical fiber (12) arranged to connect said box (4) to a base of the device, where it is connected to a receiving control circuit (121) located thereat; a manually operable reset pushbutton mounted on said box to reset the electronic circuit contained therein after each operation; and a pedal (23) mounted on the base of the device and arranged to energize one or the other or neither of the circuits of the reversible electric motor (88) via a pair relays (R1, R2), of which one is normally closed and the other is normally open.

5,198,703

SYSTEM FOR DETECTING VOLTAGE PULSES OF A PARTICULAR MAGNITUDE

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Continuation of Ser. No. 583,440, Sep. 17, 1990, abandoned, which is a continuation of Ser. No. 333,416, Apr. 3, 1989, abandoned. This application Dec. 3, 1991, Ser. No. 802,072
Int. Cl.[5] H03K *5/153;* H04N *5/08*
U.S. Cl. 307—350 30 Claims



1. In combination,

means for receiving an input voltage pulse,

first inverter means responsive to voltages of at least a first particular magnitude, the first inverter means having an input terminal connected to receive the input voltage pulse and having an output terminal providing control pulses when the input voltage pulse has a magnitude with a particular relationship to a first particular magnitude,

control means responsive to the control pulses from the output terminal of the first inverter means for maintaining the voltage at the input terminal of the first inverter means at the first particular magnitude when the magnitude of the input voltage pulse has the particular relationship to the first particular magnitude, and

second inverter means having an input terminal common with the input terminal of the first inverter means and having an output terminal providing an output voltage pulse of a second particular magnitude when the magnitude of the voltage received at the input terminal of the second inverter means has the particular relationship to a voltage of a third particular magnitude, the third particular magnitude being greater than the first particular magnitude.

5,198,704

BI-CMOS OUTPUT CIRCUIT WITH LIMITED OUTPUT VOLTAGE

Yoshinori Nitta, Tokyo; Takeshi Sagoh, Yokosuka, and Hiroyuki Hara, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

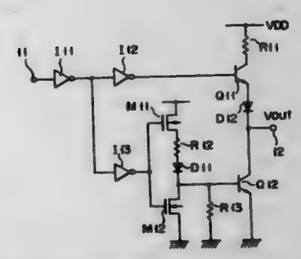
PCT No. PCT/JP90/01277, § 371 Date Jul. 30, 1991, § 102(e) Date Jul. 30, 1991
PCT Filed Oct. 3, 1990, Ser. No. 688,511
Claims priority, application Japan, Oct. 4, 1989, 1-259662
Int. Cl.[5] H03K *19/01*
U.S. Cl. 307—446 9 Claims

1. An output circuit comprising:

first and second bipolar transistors which have output terminals connected to each other and which are alternatively turned on and off in response to an input signal;

a MOS transistor having a gate and a current path, the input signal being supplied to the gate and a first end of the current path being connected to a power source;

a resistor, a first end of which is connected to a second end of the current path of said MOS transistor; and



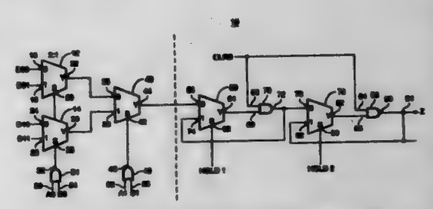
a diode having a current path connected at a first end to a second end of the resister and at a second end to a base of the second bipolar transistor.

5,198,705

LOGIC MODULE WITH CONFIGURABLE COMBINATIONAL AND SEQUENTIAL BLOCKS

Douglas C. Galbraith, Fremont; Abbas El Gamal, and Jonathan W. Greene, both of Palo Alto, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 522,232, May 11, 1990, Pat. No. 5,055,718. This application Oct. 7, 1991, Ser. No. 773,353
The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 5 Claims



1. A universal combinatorial logic module including:

a first multiplexer having a first input connected to a first data node, a second input connected to a second data node, a select input, and an output,

a second multiplexer having a first input connected to a third data node, a second input connected to a fourth data node, a select input, and an output,

a third multiplexer having a first input connected to the output of said first multiplexer, a second input connected to the output of said second multiplexer, a select input, and an output,

a first single logic level gate having a first input connected to a fifth data node and a second input connected to a sixth data node, and an output connected to the select input of said first multiplexer,

a second single logic level gate having a first input connected to a seventh data node, a second input connected to an eighth data node and an output connected to the select input of said third multiplexer.

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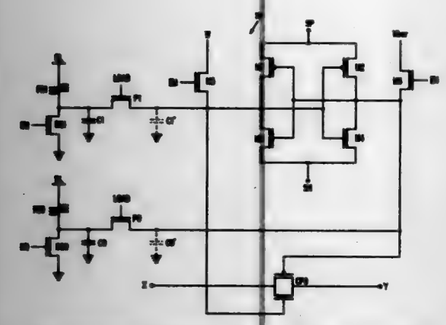
(d) a pair of NAND gates having inputs connected to prede-

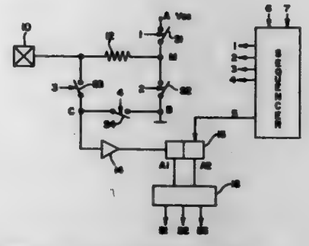
low level is different than the time to propagate a transi-

5,198,706
FERROELECTRIC PROGRAMMING CELL FOR CONFIGURABLE LOGIC
Andreas G. Papaliolios, Sunnyvale, Calif., assignor to National Semiconductor, Santa Clara, Calif.
Filed Oct. 15, 1991, Ser. No. 776,848
Int. Cl.[5] H03K *19/173*, G11C *11/22*
U.S. Cl. 307—465 4 Claims



1. A ferroelectric programming cell, the cell comprising:
(a) a volatile memory cell having a positive power input and a negative power input and first and second internal nodes which are latched in complementary states when the positive power input is held to a maximum allowed voltage level and the negative power input is held at ground, and are not latched when the positive power input is held at ground and the negative power input is held at the maximum allowed voltage level;
(b) a node enabling switching means connected to the volatile memory cell for enabling an external signal generator to set the values of the first and second internal nodes;
(c) a configuration cell having two data terminals and first and second complementary control inputs respectively connected to the first and second internal nodes for causing the two data terminals to be connected when the control inputs are set in one state and the data terminals to be isolated when the control inputs are set to the opposite state;
(d) first and second substantially identical capacitance-dividers, each including a first ferroelectric capacitance means for storing a non-volatile configuration state, with a driving terminal connected to the external signal generator and a measurement terminal connected to a second capacitance means that enables the volatile memory cell to measure the non-volatile configuration state of the first ferroelectric capacitance means, and a measurement clearing switching means for enabling the external signal generator to force the voltage at the measurement terminal to ground and connected to the first ferroelectric capacitance measurement terminal and to ground;
(e) first and second substantially identical loading switching means for enabling the connected external signal generator to transfer the non-volatile configuration state stored in the first and second capacitance dividers to the volatile memory cell, each loading switching means connecting the measurement terminal within a corresponding capacitance divider to one of the complementary internal nodes of the volatile memory cell;
each internal node of the volatile memory cell being connected respectively to one of the complementary control inputs of the configuration cell.

5,198,707
INTEGRATED CIRCUIT WITH MODE DETECTION PIN FOR TRISTATE LEVEL DETECTION
Jean Nicolai, Résidence Laubessane B - Avenue Léo Lagrange, 13090 Aix En Provence, France
Filed May 24, 1991, Ser. No. 705,375
Claims priority, application France, May 30, 1990, 90 06717
Int. Cl.[5] H03K *19/092*, *19/00*
U.S. Cl. 307—475 11 Claims

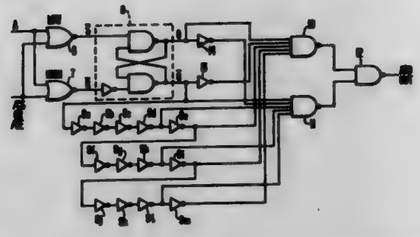


1. A CMOS integrated circuit, comprising:
first and second power supply nodes;
a first input pin;
state detection circuitry, connected to said first input pin, comprising
a single resistor, and
a plurality of switches connected to said first input pin and to said resistor and to a register, and connected to be controlled by sequencing logic such that:
in a first state of said switches,
said resistor is connected between said input pin and said first power supply node, and
said input pin is operatively connected to an input of said register;
in a second state of said switches,
said resistor is connected between said input pin and said second power supply node, and
said input pin is operatively connected to an input of said register; and
in a third state of said switches, said input of said register is connected to said second power supply node and not to the input pin; and
wherein said sequencing logic also controls said register to selectably provide an output corresponding to values received during said first and second states.

5,198,708
TRANSITION DETECTION CIRCUIT
Peter B. Gillingham, Kanata, Canada, assignor to Mosaid Inc., Ontario, Canada
Filed Apr. 5, 1991, Ser. No. 680,745
Claims priority, application United Kingdom, Apr. 6, 1990, 9007786
Int. Cl.[5] H03K *19/00*
U.S. Cl. 307—480 8 Claims

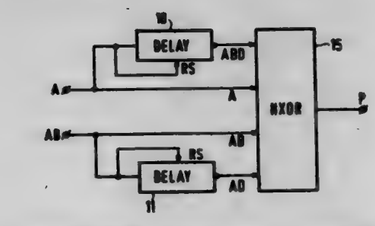
1. An address transition detection (ATD) circuit comprising:
(a) a pair of input NOR gates having different input voltage thresholds connected to receive an address input signal and a chip select (/CS or /CE) input signal for providing a pair of output signals which indicate whether the address input is above both thresholds, below both threaholds, or between the threholds,
(b) a latch, having a pair of inputs for receiving and latching said output signals,
(c) a sequence of fast inverters connected in series from an output of the latch to form a delay line, and

(d) a pair of NAND gates having inputs connected to predetermined ones of said fast inverters for detecting at at least



one point the presence of an address transition resulting from said address input signal.

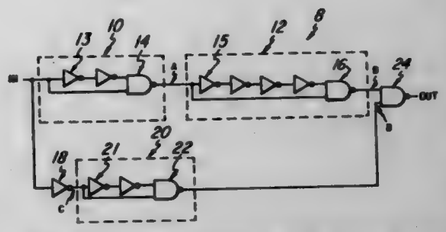
5,198,709
ADDRESS TRANSITION DETECTOR CIRCUIT
Cormac M. O'Connell, Kanata, Canada, assignor to U.S. Philips Corp., New York, N.Y.
Filed Jun. 26, 1991, Ser. No. 721,050
Claims priority, application European Pat. Off., Jun. 29, 1990, 90201733.4
Int. Cl.[5] H03K *19/00*, *19/21*
U.S. Cl. 307—480 7 Claims



1. A semiconductor integrated circuit including a detection circuit for detecting a change of at least one of a first and a second digital input signal on a first and a second input terminal, respectively, the detection circuit delivering an output pulse signal having a predetermined duration in response to said change, the detection circuit comprising:
a first resettable delay circuit having an input terminal for receiving said first input signal, a reset terminal coupled to said input terminal and an output terminal for delivering a first output signal;
a second resettable delay circuit having an input terminal for receiving said second input signal, a reset terminal coupled to said input terminal and an output terminal for delivering a second output signal; and
a gate circuit having input terminals and an output terminal for delivering said output pulse signal on said output terminal; said first and second input terminals and said output terminals of the first and second delay circuits being connected directly to respective input terminals of said gate circuit.

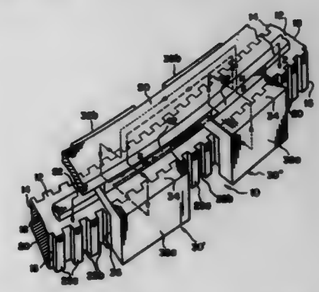
5,198,710
BI-DIRECTIONAL DIGITAL NOISE GLITCH FILTER
Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed May 30, 1991, Ser. No. 707,517
Int. Cl.[5] H03K *5/22*, *17/16*
U.S. Cl. 307—520 9 Claims

1. A digital noise glitch filter which includes an input and an output, comprising:
a first asymmetric delay element with a first delay wherein the time to propagate a transition from a high level to a low level is different than the time to propagate a transition from said low level to said high level, the input of said first asymmetrical delay element is coupled to said glitch filter input;
a second asymmetric delay element with a second delay connected such that the input of said second asymmetric delay element is coupled to the output of said first asymmetric delay element, and wherein said second delay is at least twice said first delay;



a third asymmetric delay circuit with a third delay which is substantially equal to said first delay, the input of said first asymmetrical delay element is coupled to said glitch filter input;
a logic element with at least two inputs wherein the output of said second asymmetric delay element is coupled to an input of said logic element and wherein the output of said third asymmetric delay element is coupled to another input of said logic element and wherein the output of said logic element comprises said glitch filter output.

5,198,711
ELECTRIC MOTOR FOR PROVIDING LIFTING FORCE
Gregory P. Eckersley, Kew, Australia, assignor to Boral Johns Perry Industries Pty. Ltd., Cheltenham, Australia
PCT No. PCT/AU89/00374, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO90/07219, PCT Pub. Date Jun. 28, 1990
PCT Filed Sep. 6, 1989, Ser. No. 700,138
Claims priority, application Australia, Dec. 19, 1988, PJ2019
Int. Cl.[5] H02K *41/02*, *37/04*, *1/17*
U.S. Cl. 310—12 11 Claims



1. A motor comprising:
an elongated first member having a plurality of stepped portions in at least one surface;
a plurality of second members spaced along said first member, said first member being movable relative to the second members and having a migration axis in the direction of the relative movement;
said second members each having at least one surface provided with stepped portions which oppose the surface of the first member having the stepped portions, said second

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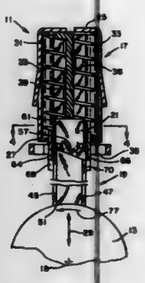
members being formed from laminations wherein said laminations are arranged in a plane extending transverse to said migration axis,

each of said second members having a permanent magnet and a flux path member providing a flux path joining said magnets; and

at least one excitation coil extending solely along the migration axis for establishing a flux path from a portion of one of said second members located on one side of said elongated first member, through the flux path member across said elongated first members to a portion of another of said second members located on a second side of said elongated first member.

5,198,712
CARTRIDGE BRUSH ASSEMBLY
James J. Bolzan, Jr., Baldwin; Douglas L. Kreiser, Towson, and Terry L. Turner, Finksburg, all of Md., assignors to Black & Decker Inc., Newark, Del.
Filed May 8, 1992, Ser. No. 880,812
Int. Cl.[5] H02K *13/00, 5/14*
U.S. Cl. 310—242 9 Claims



1. A brush assembly for a motor having a commutator rotatable about a first axis, the assembly comprising:

an elongated tubular holder having opposed ends, a longitudinal axis extending between the ends, opposed sidewalls spaced transverse to the commutator axis and a mouth at one opposed end;

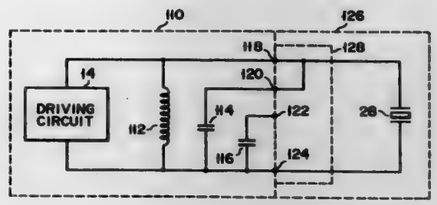
a brush slidably mounted in the holder and protruding through the mouth of the holder for engaging the commutator;

the brush having a pair of sidewalls axially spaced relative to the commutator axis and a pair of sidewalls transversely spaced relative to the commutator axis, a chamfered rear face and a front face for engaging the commutator;

a guide slidably mounted in the holder and comprising a pair of spaced rounded feet slidably and pivotably engaging the chamfered rear face of the brush at spaced locations adjacent to the axially spaced brush sidewalls; and

a helical spring extending between the brush holder end and the guide (1) for biasing one of the transversely spaced brush sidewalls against one of the transversely spaced holder sidewalls and (2) for biasing the brush into engagement with the commutator.

5,198,713
ULTRASONIC TRANSDUCER APPARATUS
Toshihiko Suzuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 462,699, Jan. 9, 1990. This application Jul. 12, 1991, Ser. No. 728,740
Claims priority, application Japan, Apr. 19, 1989, 1-99447; Apr. 25, 1989, 1-105285; Apr. 25, 1989, 1-105286
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—316 14 Claims



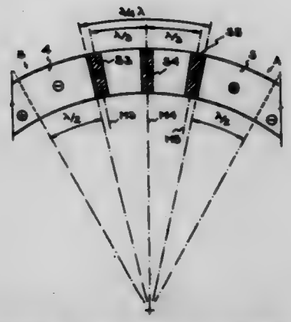
1. An ultrasonic transducer apparatus comprising:

1) a probe including an ultrasonic transducer having:
   a series connection of an inductor, a resistor, and a capacitor; and
   a capacitive component for providing a capacitive susceptance connected in parallel with said series connection;

2) a driving unit separate from said probe and detachably connected to said probe, said driving unit including means for supplying to said ultrasonic transducer a driving signal having a frequency, said driving signal being such that a phase difference between a voltage applied to said ultrasonic transducer and a current supplied through said ultrasonic transducer is substantially zero; and

3) matching means including:
   first means arranged in said driving unit; and
   second means separate from said first means and arranged in said probe for causing varying of an impedance of said first means in accordance with the capacitive susceptance of the probe when said probe is connected to said driving unit;
   said first means of said matching means including a variable impedance component which is variable by means of said second means when said probe is connected to said driving unit so as to have an impedance value corresponding to the capacitive susceptance provided by said capacitive component of said probe;
   said impedance component of said first means comprising an inductive element;
   said first means further including a plurality of capacitors having different capacitances, each capacitor having one terminal connected to one terminal of said inductive element; and
   said second means comprising means for connecting another terminal of one of said capacitors to another terminal of said inductive element in accordance with said capacitive susceptance.

5,198,714
MULTIPLE-SURFACE SENSOR CONTROL FOR A TRAVELING WAVE MOTOR
Bernd Salomon, Frankfurt am Main, and Reinhard Orthmann, Maintal-Grossauheim, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany
PCT No. PCT/EP90/01973, § 371 Date Jul. 15, 1991, § 102(e) Date Jul. 15, 1991, PCT Pub. No. WO91/08594, PCT Pub. Date Jun. 13, 1991
PCT Filed Nov. 19, 1990, Ser. No. 720,827
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1989, 3939419
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 11 Claims



1. An apparatus for evaluating and controlling the driving state of a traveling wave motor composed of a stator having an elastic vibrating body and an excitation system including a plurality of segments and generating ultrasound vibrations as well as a rotor which in a surface region is pressed into contact with the stator and is provided with a sensor device disposed at the vibrating body or at the excitation system, with the signals of the sensor device being fed to the regulating circuit of an evaluation and control unit for controlling the excitation system, the excitation system being composed of two circular ring-shaped partial systems (A, B) which are shifted in space relative to one another by an amount of $(n+\frac{1}{4})\cdot\lambda$, where n is a positive integer and λ is the wavelength of a traveling wave to be excited, the apparatus being characterized in that:

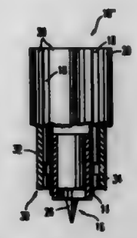
the sensor drive includes first, second and third sensor surfaces (S3, S4, S5) which are disposed on a circular ring segment that is concentric with the two partial systems (A, B) of the excitation system and which are shifted in space relative to one another by $\lambda/3$.

5,198,715
SCANNER FOR SCANNING PROBE MICROSCOPES HAVING REDUCED Z-AXIS NON-LINEARITY
Virgil B. Elings, and John A. Gurley, both of Santa Barbara, Calif., assignors to Digital Instruments, Inc., Santa Barbara, Calif.
Continuation of Ser. No. 527,561, May 23, 1990, abandoned. This application Nov. 12, 1991, Ser. No. 793,245
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 8 Claims

1. In a piezoelectric scanner having first electrodes attached to a first tubular member of a piezoelectric material for creating lateral x and y motion of a scan end and second electrodes attached to a second tubular member of a piezoelectric material for creating z motion of the scan end perpendicular to the x and y motion wherein the first tubular member has a fixed end and a free end, the improvement comprising:

a) the first tubular member and the second tubular member being comprised of two separate sections of substantially equal diameter joined together in end-to-end concentric relationship at the free end of the first tubular member with the scan end being an end of the second tubular member farthest from the fixed end of the first tubular member;

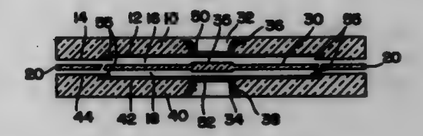
b) said sections being of different piezoelectric materials both being able to produce a respective long range scan;



c) the piezoelectric material of a section comprising the first tubular member being of a type which produces a long range scan longer than that of the second tubular member; and

d) the piezoelectric material of a section comprising the second tubular member being of a type which produces a highly linear response.

5,198,716
MICRO-MACHINED RESONATOR
Ned A. Godshall; Dale R. Koehler; Alan Y. Liang, and Bradley K. Smith, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Dec. 9, 1991, Ser. No. 803,815
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—349 26 Claims



1. A micro-machined resonator, comprising:

(a) an upper micro-machinable support member having an upper well connected to an upper electrode means;

(b) a lower micro-machinable support member having a lower well connected to a lower electrode means, said lower support member opposing said upper support member;

(c) a resonator capacitively coupled to said electrodes, said resonator having a centrally located energy trapping quartz mesa and supported between said upper well of said upper support member and said lower well of said lower support member;

(d) an upper diaphragm interposed between said upper well and said resonator;

(e) a lower diaphragm interposed between said lower well and said resonator;

(f) spacer means for defining a volume between said micro-machinable support members and said resonator; and

(g) support means for supporting said resonator in said volume.

5,198,720

plug sealed to said current lead-in member by a magnesium

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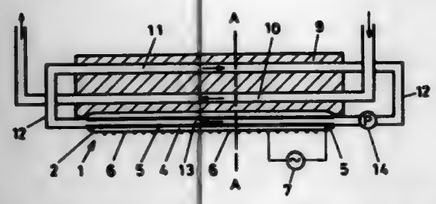
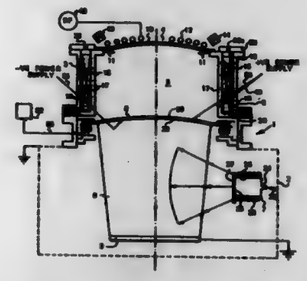
5,198,717
HIGH-POWER RADIATOR
Ulrich Kogelschatz, Hausen, and Christoph von Arx, Olten, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland
Filed Nov. 25, 1991, Ser. No. 797,888
Claims priority, application European Pat. Off., Dec. 3, 1990, 90123090.4
Int. Cl.[5] H01J 7/24
U.S. Cl. 313—17 6 Claims



1. A high-power radiator for radiating ultraviolet light, comprising:
at least one hollow body built of a material which is transparent to ultraviolet radiation;
at least one outer electrode, which is transparent to ultraviolet radiation, disposed outside the hollow body;
at least one first dielectric tube, spaced from an inner wall of the hollow body and disposed inside the hollow body, the first dielectric tube provided with an inner electrode and with a cooling channel;
wherein a discharge space filled with a filler gas which emits ultraviolet radiation upon discharge conditions is formed by a space between the inner wall of the hollow body and an outer wall of the first dielectric tube;
a high-voltage source to feed the discharge, which is connected to the outer and inner electrodes;
a cooling body including a cooling channel connected to the cooling channel of the dielectric tube to form a closed coolant circuit; and
the cooling body having a groove in which said hollow body is saturated in thermal contact with said cooling body, the hollow body being secured to the cooling body;
wherein a cooling liquid having a low electrical conductance can be passed through said cooling channels.

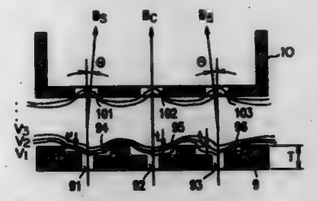
5,198,718
FILAMENTLESS ION SOURCE FOR THIN FILM PROCESSING AND SURFACE MODIFICATION
Mervyn H. Davis, Chichester; Gary Proudfoot, Wantage, and Keith H. Bayliss, Abingdon, all of United Kingdom, assignors to Nordiko Limited, United Kingdom
PCT No. PCT/GB90/00340, § 371 Date May 31, 1991, § 102(e) Date May 31, 1991, PCT Pub. No. WO90/10945, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 6, 1990, Ser. No. 602,254
Claims priority, application United Kingdom, Mar. 6, 1989, 8905073
Int. Cl.[5] H01J 27/16
U.S. Cl. 313—359.1 28 Claims

1. An ion gun for use in ion beam processing comprising:
a) a plasma chamber comprising:
wall means defining an evacuable chamber having a first end and a second end; and
a dielectric member extending across the first end of the evacuable chamber;
b) gas inlet means for admission to the chamber of a plasma forming gas;
c) radio frequency emitter means comprising a substantially flat spirally wound coil positioned adjacent to the plasma chamber for inductively generating a plasma in the gas in the plasma chamber during use of the ion gun;
d) primary magnet means for trapping electrons adjacent the wall of the plasma chamber during use of the ion gun; and
e) a control grid structure for extracting ions from plasma in



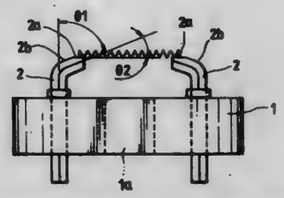
the plasma chamber including a first grid arranged for connection to a positive voltage source and a second grid arranged for connection to ground or a negative voltage source so as to produce an acceleration field for accelerating ions towards and through the second grid of the control grid structure.

5,198,719
ELECTRON GUN FOR COLOR CATHODE-RAY TUBE
Nam J. Koh, Kyungsangbook-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 5, 1991, Ser. No. 802,519
Claims priority, application Rep. of Korea, Dec. 5, 1990, 19955/1990
Int. Cl.[5] H01J 29/51, 29/62
U.S. Cl. 313—414 3 Claims



1. An electron gun for a color cathode-ray tube, comprising:
first and second grid electrodes;
a first accelerating and focusing electrode having first, second and third electron beam passing holes for allowing first, second and third electron beams emitted from cathodes to pass therethrough so as to accelerate and focus the first, second, and third electron beams;
wherein said second electron beam passing hole is centered on a center axis of said color cathode-ray tube;
first and third slots formed around said first and third electron beam passing holes having asymmetrical depth for producing equipotential intervals, on a side closer to the center axis of aid color cathode-ray tube, greater than equipotential intervals, on a side further from the center axis of said cathode-ray tube, said first and third electron beam passing holes being symmetrical to each other with respect to the second electron beam passing hole; and
a second slot formed around said second electron beam passing hole having symmetrical depth to produce a uniform equipotential interval with respect to the center axis of said color cathode-ray tube.

5,198,720
DIRECT HEATING CATHODE STRUCTURE FOR CATHODE RAY TUBES
Kyeong-seok Choi, Ulsan, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea
Filed Nov. 27, 1991, Ser. No. 799,150
Claims priority, application Rep. of Korea, Nov. 27, 1990, 90-18365
Int. Cl.[5] H01J 29/04, 1/18
U.S. Cl. 313—446 4 Claims



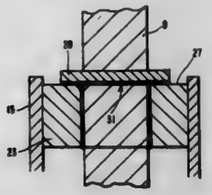
1. A direct heating cathode structure for a miniature cathode ray tube comprising an insulator having a pair of supports secured thereon at a certain distance apart, and a coiled heater in which both ends thereof are welded onto opposing welding portions of said supports, wherein said supports are made of polygonal rods which are bent such that one edge is positioned centrally and higher than other edges, and the leading part of the centrally positioned edge is chamfered to provide a delta-shaped planar welding portion which is substantially parallel with said insulator.

5,198,721
ELECTROLUMINESCENT CELL USING A ZNS HOST INCLUDING MOLECULES OF A TERNARY EUROPIUM TETRAFLUORIDE COMPOUND
Dawon Kahng, Princeton, N.J., and Toshihiro Yoshioka, Kanagawa, Japan, assignors to NEC Research Institute, Inc., Princeton, N.J.
Filed Feb. 24, 1991, Ser. No. 690,587
Int. Cl.[5] H05B 33/14
U.S. Cl. 313—503 1 Claim

1. An electroluminescent display including three arrays of cells superposed on one another, one array being of red light cells provided by a layer of polycrystalline zinc sulfide hosting molecules of lithium europium tetrafluoride as optically active centers, another array being of blue light cells provided by a layer of polycrystalline zinc sulfide hosting molecules of beryllium europium tetrafluoride as optically active centers, and another array being of green light cells provided by a layer of polycrystalline zinc sulfide hosting molecules of terbium trifluoride as optically active centers.

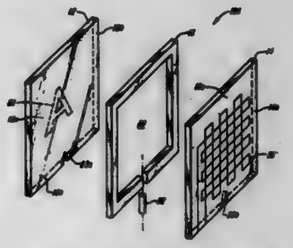
5,198,722
HIGH-PRESSURE DISCHARGE LAMP WITH END SEAL EVAPORATION BARRIER
Dale E. Brabham, Elmira, and Geert Van Bockstal, Lakeville, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Oct. 31, 1990, Ser. No. 607,428
Int. Cl.[5] H01J 61/36
U.S. Cl. 313—623 4 Claims

1. A high pressure gas discharge lamp having an envelope enclosing a discharge space and containing an ionizable filling and consisting of translucent densely sintered aluminum oxide, at least one tubular current lead-in member secured in a gas-tight manner in said envelope, said envelope having a cylindrical part in the area of the current lead-in member, an end plug having an aperture for said current-lead-in member and consisting of translucent densely sintered aluminum oxide, said end plug forming an end plug for said envelope bearing against, and fused to, the cylindrical part of said envelope and said end plug sealed to said current lead-in member by a magnesium oxide containing glass seal provided in said aperture and a



disc-like barrier member, consisting of aluminium oxide, positioned on the outer surface of said end-plug, extending over said glass seal an bonded to said outer surface of said end plug.

5,198,723
LUMINOUS PANEL DISPLAY DEVICE
William P. Parker, P.O. Box 909, Waitsfield, Vt. 05673-0909
Continuation-in-part of Ser. No. 192,225, May 10, 1988, Pat. No. 4,887,003. This application Dec. 11, 1989, Ser. No. 448,693
Int. Cl.[5] H01J 61/30, 17/16; G09G 3/22; G09F 13/26
U.S. Cl. 313—634 5 Claims

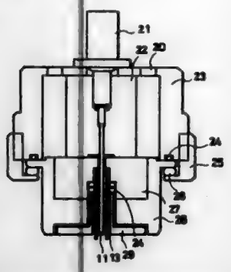


1. A luminous panel display device comprising:
A. a first non-conductive sheet member having front and back surfaces, said first sheet member having a coating region on portions of its front surface, said coating region being adapted to receive a first conductive coating representative of a predetermined image;
B. a second non-conductive sheet member having front and back surfaces, wherein at least one of said first and second sheet members is transparent;
C. spacer means for mutually positioning said first and second sheet members whereby the back surface of said first sheet member is offset by a predetermined separation from and opposite the front surface of said second sheet member;
D. discharge chamber means for establishing a gas impervious seal between portions of the back surface of said first sheet member and the front surface of said second sheet member to define a closed region in the gap between said back surface of said first sheet member and the front surface of said second sheet member and underlying said coating region;
E. electroluminescent gas disposed within said closed region; and
F. a conductive element disposed on a portion of one of the front and back surfaces of, or within, or adjacent to, said second sheet member, wherein said conductive element is a wire positioned on the surface of or within said second sheet member.

5,198,724
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE
Yasuhiro Shimada, Nara, and Yasuhiro Uemoto, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 31, 1991, Ser. No. 648,966
Claims priority, application Japan, Feb. 2, 1990, 2-24000
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—41 3 Claims

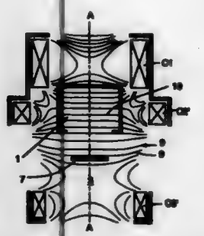
1. A method of manufacturing a semiconductor device comprising the steps of:
forming a gate electrode on a semiconductor substrate;
forming a first insulating film on said gate electrode;
forming a second insulating film on said first insulating film;
forming a third insulating film on said second insulating film;
forming a fourth insulating film on said third insulating film;
forming a fifth insulating film on said fourth insulating film;
forming a sixth insulating film on said fifth insulating film;
forming a seventh insulating film on said sixth insulating film;
forming a resist film on said seventh insulating film;
forming a resist pattern by patterning said resist film;
forming a first opening by etching said seventh insulating film using said resist pattern as a mask;
forming a second opening by etching said sixth insulating film using said seventh insulating film as a mask;
forming a third opening by etching said fifth insulating film using said sixth insulating film as a mask;
forming a fourth opening by etching said fourth insulating film using said fifth insulating film as a mask;
forming a fifth opening by etching said third insulating film using said fourth insulating film as a mask;
forming a sixth opening by etching said second insulating film using said third insulating film as a mask;
forming a seventh opening by etching said first insulating film using said second insulating film as a mask;
forming a source region and a drain region by implanting impurity ions into said semiconductor substrate using said gate electrode as a mask;
forming a source electrode and a drain electrode by depositing a metal film on said semiconductor substrate and said seventh insulating film; and
removing said seventh insulating film, said sixth insulating film, said fifth insulating film, said fourth insulating film, said third insulating film, said second insulating film, and said first insulating film.

5,198,724
PLASMA PROCESSING METHOD AND PLASMA GENERATING DEVICE
Hideomi Koinuma; Shunpei Yamazaki, both of Tokyo; Shigenori Hayashi, Kanagawa; Akiharu Miyanaga, Kanagawa, and Tadashi Shiraishi, Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan
Filed Oct. 21, 1991, Ser. No. 777,708
Claims priority, application Japan, Oct. 23, 1990, 2-286883
Int. Cl.[5] H05H *1/24*
U.S. Cl. 315—111.21 21 Claims



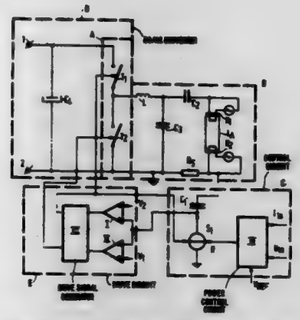
1. A plasma generating device comprising:
a central electrode;
a peripheral electrode surrounding said central electrode;
an insulating cylinder interposed between said central electrode and said peripheral electrode and extending beyond lower ends of both said central electrode and said peripheral electrode in order to prevent direct arc discharge from occurring between said central electrode and said peripheral electrode;
a supporting structure for supporting said central electrode, said peripheral electrode and said insulating cylinder in order to define a discharging space between said central electrode and said insulating cylinder;
an alternating current source operatively connected with said central electrode and said peripheral electrode in order to induce an alternating electric field therebetween; and
a gas supply system for supplying a reactive gas into said discharging space.

5,198,725
METHOD OF PRODUCING FLAT ECR LAYER IN MICROWAVE PLASMA DEVICE AND APPARATUS THEREFOR
Ching-Hwa Chen, Milpitas; Gerald Yin, Cupertino, both of Calif., and Takashi Inoue, Tokyo, Japan, assignors to Lam Research Corporation, Fremont, Calif.
Filed Jul. 12, 1991, Ser. No. 729,211
Int. Cl.[5] H05H *1/18*
U.S. Cl. 315—111.41 21 Claims



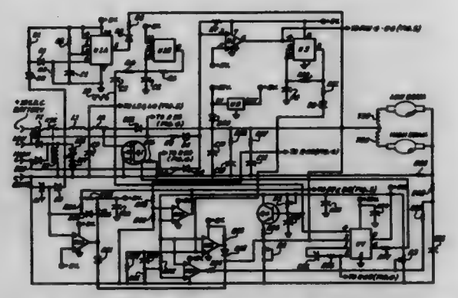
1. A microwave plasma generating device, comprising:
a plasma chamber for generating plasma;
a reaction chamber having a specimen stage on which a specimen is treated with the plasma;
gas supply means for supplying gas to the plasma generating chamber;
means for generating a microwave electric field in the plasma and reaction chambers;
means comprising axially spaced apart and concentric electromagnet coils for generating a magnetic field in the plasma and reaction chambers, the microwave electric field and magnetic field having perpendicularly crossing components of the magnetic field and electric field, respectively, the magnetic field having a strength which decreases in an axial direction from the plasma chamber towards the reaction chamber and having constant strength magnetic flux density lines lying in planes which are substantially parallel to each other and perpendicular to the axial direction, the magnetic field producing a flat ECR condition wherein an ECR layer extends perpendicular to the axial direction over at least 50% of the width of the plasma chamber.

5,198,726
ELECTRONIC BALLAST CIRCUIT WITH LAMP DIMMING CONTROL
Johannes M. Van Meurs, and Josef H. Reinaerts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 30, 1991, Ser. No. 770,059
Claims priority, application Netherlands, Oct. 25, 1990, 9002332
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—224 21 Claims



1. A circuit arrangement for operating a discharge lamp, comprising:
a load branch provided with lamp connection terminals,
a DC-AC converter comprising a branch coupled to the load branch and including at least one switching element for deriving a current of alternating polarity through the load branch by being alternately conducting and non-conducting at a frequency f,
a drive circuit for making the switching element alternately conducting and non-conducting at the frequency f, and
a control circuit coupled to the drive circuit and the discharge lamp for generating a control signal which is dependent on the lamp current and serves to influence the frequency,
characterized in that the control signal is also dependent on a signal S which is a measure of comparatively quick changes in the power consumed by the discharge lamp.

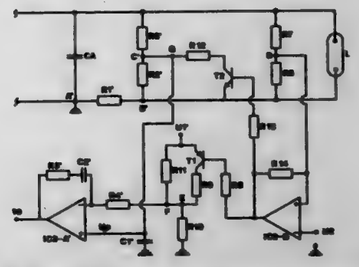
5,198,727
ACOUSTIC RESONANCE OPERATION OF XENON-METAL HALIDE LAMPS ON UNIDIRECTIONAL CURRENT
Gary R. Allen, Chesterland; Joseph M. Allison, Euclid; John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike, and Kenneth S. King, Willoughby, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 482,387, Feb. 20, 1990, Pat. No. 5,047,695. This application Mar. 7, 1991, Ser. No. 665,853
The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.
Int. Cl.[5] H05B *37/00, 41/00*
U.S. Cl. 315—291 15 Claims



1. A method of operating a miniature high pressure metal vapor discharge lamp of a kind comprising:
a vitreous envelope defining a discharge space having a volume not exceeding approximately 1 cubic centimeter,
a cathode and an anode sealed into the envelope and defining an arc gap,
and a fill comprising mercury, metal halides and a radiation-emitting gas in a quantity exerting a partial pressure of at least 25% of the total vapor pressure during continuous operation,
which method comprises:
forcing a unidirectional current having an alternating component in the form of a high frequency ripple imposed thereon causing instantaneous variations in input power across the arc gap,
said variations in power being at a frequency selected in a preferred band within the range from 20 kHz to 200 kHz,
said band being one in which acoustic resonance excites arc-straightening modes which reduce the effects of gravity-induced convection in the fill.

5,198,728
OPERATING CIRCUIT FOR A DISCHARGE LAMP
Franz Beraitz, Unterhaching; Frank Hansmann, Berninghausen, and Andreas Huber, Maisach, all of Fed. Rep. of Germany, assignors to Patent-Treuhand Gesellschaft fur fur elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany
Filed Dec. 17, 1991, Ser. No. 808,665
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1991, 4102069
Int. Cl.[5] H03B *41/36*
U.S. Cl. 315—307 12 Claims

1. Operating circuit for a discharge lamp (L) having a switched mode power supply (SNT) coupled to a source of d-c energy (U_{Batt}) of varying output voltage, said switched mode power supply delivering d-c output energy changeable within wide limits;
a control circuit (ST) connected to and controlling the switching conditions of the switched mode power supply (SNT); and
an ignition circuit coupled to the switched mode power supply and to the lamp (L) for igniting the lamp;
said operating circuit further comprising
means for controlling the power consumption of the lamp, during operation thereof,
said power consumption control means including
an operating control circuit (ADD) which includes lamp voltage sensing means (R2, R3) connected to sense the instantaneous voltage across the lamp, and deriving a voltage signal;

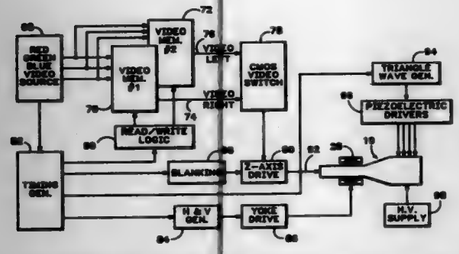


lamp current sensing means (R1) connected to sense the instantaneous electrical current flowing through the lamp and deriving a current signal; and
connection means (c) adding the voltage signal and the current signal and providing a power signal;
reference means (U1) providing a preset reference signal;
comparator means (IC2-A) coupled to receive the power signal and further coupled to the reference means, and providing a comparison control signal;
said operation control circuit (ADD) applying said comparison control signal to the switched mode power supply (SNT) for controlling the switching conditions thereof in accordance with said comparison control signal.

5,198,729
CRT MONITOR WITH ELIMINATION OF UNWANTED TIME VARIABLE ELECTRIC FIELD
Robert J. Powell, St. Charles, Ill., assignor to Display Technologies, Inc., Elgin, Ill.
Filed Jul. 2, 1992, Ser. No. 907,606
Int. Cl.[5] G09G *1/04*; H01J *29/06, 31/00*; H01H *1/00*
U.S. Cl. 315—370 6 Claims

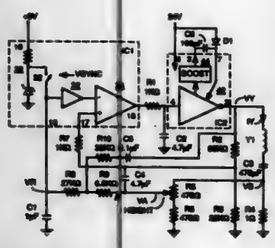
1. An electric field elimination system in a CRT device for cancelling any unwanted field generating voltage at the voltage source, the system comprising:
voltage generating means coupled to the horizontal deflection circuitry for providing voltage pulses essentially equal in amplitude and opposite in polarity to the voltage pulses producing an unwanted electric field; and
coupling means for coupling said provided voltage pulses from said generating means to the inner conductive coating of said cathode ray tube.

5,198,730
COLOR DISPLAY TUBE
Bernard E. Vancil, 21070 SW Tile Flat Rd., Beaverton, Oreg. 97007
Continuation-in-part of Ser. No. 827,760, Jan. 29, 1992. This application Jul. 16, 1992, Ser. No. 915,020
Int. Cl.[5] H01J *29/80*
U.S. Cl. 315—376 29 Claims



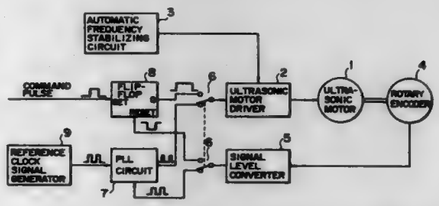
1. A display tube for reproducing color images on a screen in response to color input signal information, comprising:
an electron gun structure for emitting an electron beam directed toward said screen, wherein the intensity of said beam is modulated in accordance with Z-axis image input information;
deflection means for causing said electron beam to scan said screen in accordance with image synchronization input information provided in X and Y axes;
said screen being provided with plural phosphor material areas each adapted to emit light of a selected color when scanned by said electron beam;
a shadowmask interposed between said electron gun structure and said screen, said shadowmask having a multiplicity of openings through which at least a portion of said electron beam may pass to reach areas of phosphor material as an opening in said mask is substantially aligned with an area of phosphor material; and
means for providing lateral relative movement between said shadowmask and said screen to vary the alignment between screen areas and said openings in order to change the color of light in said image.

5,198,731
LINEARIZATION OF VERTICAL REFERENCE RAMP
Chun H. Wu, Singapore, Singapore, assignor to Thomson Consumer Electronics S.A., Paris, France
Filed Jun. 15, 1992, Ser. No. 898,271
Int. Cl.[5] H01J *29/70, 29/72*
U.S. Cl. 315—388 15 Claims



1. A deflection circuit, comprising:
a deflection coil;
an amplifier having an output coupled to the deflection coil for producing a current therein, and having an input coupled to said output to provide degenerative feedback;
a ramp generator coupled to an input of the amplifier and comprising;
a capacitor for producing a ramp voltage by repetitive charge and discharge;
a resistor coupled to said capacitor for providing charge conduction which subjects the ramp voltage to exponential variation;
a source of current operable to provide capacitor charge;
switching means coupled to said capacitor for generating said repetitive charge and discharge of said capacitor;
current sensing means coupled to said deflection coil for producing a current sense signal in accordance with said deflection coil current;
means for coupling said amplifier output to said resistor for linearizing exponential variation of said ramp voltage; and
means coupled to said resistor and responsive to said current sense signal for further linearizing the exponential variation of said ramp voltage.

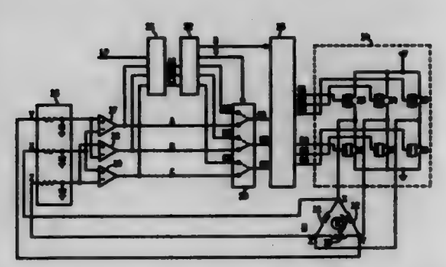
5,198,732
ROTATION CONTROL SYSTEM FOR ULTRASONIC MOTOR
Seiichi Morimoto, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 27, 1991, Ser. No. 750,453
Int. Cl.[5] H01L *41/08*
U.S. Cl. 318—116 4 Claims



1. A control system for a progressive wave type ultrasonic motor, comprising:
an ultrasonic motor driver circuit which supplies driving electric power to an ultrasonic motor;
a rotary encoder which is coupled with an output shaft of the ultrasonic motor, and generates a pulse signal in accordance with rotation of the ultrasonic motor;
a reference clock signal generator which generates a clock signal;
a phase locked loop circuit which transmits a control signal to the ultrasonic motor driver circuit based on the clock signal and a pulse signal from the rotary encoder; and
an automatic frequency stabilizing circuit for inputting a predetermined high frequency signal to the ultrasonic motor driver, said automatic frequency stabilizing circuit comprising:
an analog-to-digital converter which converts an inputted digital value into an analog voltage signal;
a voltage-to-frequency converter which converts an output voltage of the analog-to-digital converter into a frequency;
a frequency measuring circuit which measures an output frequency from the voltage-to-frequency converter at every unit time;
a comparator which compares the result of measurement of the frequency measuring circuit with a preset frequency set value; and
an up-down counter which up-counts or down-counts in accordance with the result of comparison with the comparator;
and said automatic frequency stabilizing circuit controlling said up-down counter so that the frequency of the output signal coincides with said output frequency set

value by using the count value of the up-down counter as an input digital value to said analog-to-digital converter;
wherein the speed of the ultrasonic motor is controlled.

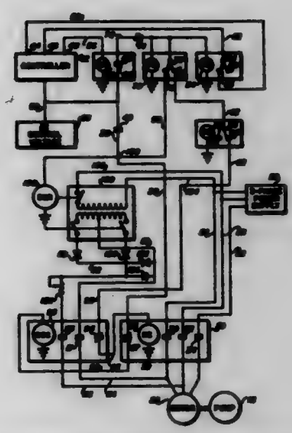
5,198,733
STARTING A BRUSHLESS DC MOTOR
Laurence M. Wright, Southampton, Great Britain, assignor to International Business Machines Corporation, Armonk, N.Y.
PCT No. PCT/GB89/00266, § 371 Date Nov. 13, 1990, § 102(e) Date Nov. 13, 1990, PCT Pub. No. WO90/10973, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 15, 1989, Ser. No. 602,239
Int. Cl.[5] H02P *7/00*
U.S. Cl. 318—254 4 Claims



1. A method of starting a brushless direct current motor (M), including the successive steps of
(a) energising the motor windings (X, Y, Z) to move the rotor to a predetermined position;
(b) applying a drive current pulse to the appropriate winding phase to cause the rotor to turn from the predetermined position in a predetermined direction of rotation;
(c) sampling the back EMFs generated in the motor windings (X, Y, Z) when the current pulse has decayed to a level where the I×R voltage drops in the motor windings are substantially less than the back EMFs in order to indicate whether a change in commutation is required to keep the rotor turning in the predetermined direction; and
(d) applying a drive current pulse to the appropriate winding phase in response to the indication provided by step (c) to keep the rotor turning in the predetermined direction.

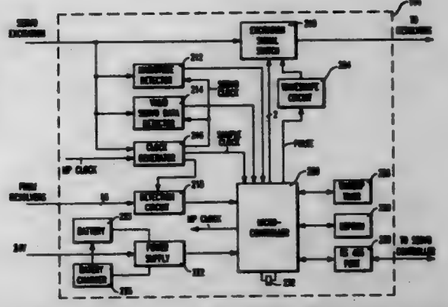
5,198,734
METHOD AND MEANS FOR STOPPING BACKSPINNING MOTOR
Archie C. Johnson, Cody, Wyo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Mar. 9, 1992, Ser. No. 848,624
Int. Cl.[5] H02P *3/00*
U.S. Cl. 318—369 5 Claims

1. In the operation of a rotary submersible pump in a deep well, wherein the pump is powered by a polyphase A.C. motor which has been shut down during a pumping operation and wherein the rotor of the A.C. motor is backspinning due to counter rotation of the pump caused by downward gravity-induced flow of fluid pumped prior to the motor shut-down, the improvement comprising:
applying D.C. voltage to the motor to brake the backspinning of the rotor until the rotor has stopped or until the speed of the backspinning has been reduced to a level determined not to be harmful to the motor or pump if the motor is restarted;
ceasing the application of D.C. voltage; and



applying A.C. operating voltage to the motor to restart the same to continue the pumping operation.

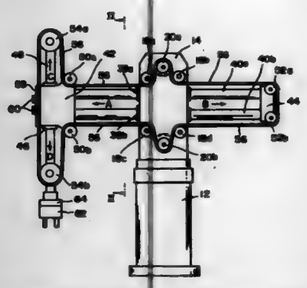
5,198,735
METHOD FOR ELIMINATING POSITION TRACKING ERRORS IN THE PRESENCE OF RESOLVER EXCITATION ERRORS FOR MOTION CONTROL SYSTEMS
Donald K. Taylor, Pinoy Plato; Richard J. Macuka, and Carl H. Russell, III, both of Johnson City, all of Tenn., assignors to Siemens Industrial Automation, Inc., Johnson City, Tenn.
Filed Jan. 30, 1992, Ser. No. 828,336
Int. Cl.[5] G05B *23/02*
U.S. Cl. 318—563 8 Claims



1. In a servomotor control system including a resolver integrally coupled to a servomotor and responsive to an excitation signal to provide a return signal indicating the instantaneous angular position of the servomotor, apparatus comprising:
a source of periodic signal having a predetermined frequency to be used as said excitation signal;
means for monitoring said excitations signal to generate an output signal indicating intervals during which said excitation signal may be invalid;
means for sampling said return signal to generate a sequence of samples representing a respective sequence of angular position measurements for said servomotor; and
means, responsive to the output signal of the monitoring means, for selectively invalidating ones of said samples

generated in intervals during which said excitation signal may be invalid.

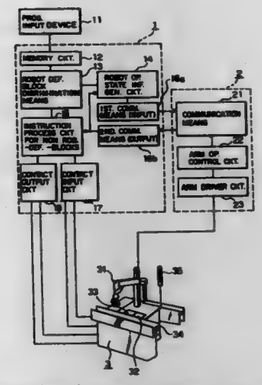
5,198,736
ORTHOGONAL TWO-AXIS MOVING APPARATUS
Yusuke Azuma; Katsumi Ishihara; Takeo Tanita, and Hiroyuki Kigami, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 13, 1991, Ser. No. 791,296
Claims priority, application Japan, Nov. 15, 1990, 2-307247; Jan. 10, 1991, 3-137516; Oct. 14, 1991, 3-264510
Int. Cl.[5] B66C *23/16*
U.S. Cl. 318—568.10 13 Claims



1. An orthogonal two-axis moving apparatus comprising:
a base;
a first block member mounted on said base;
driving force transmitting means mounted on said first block member;
a first slide shaft supported by said first block member and reciprocating in a horizontal direction;
first driven means mounted on one end of said first slide shaft;
a guide block member mounted on the other end of said first slide shaft;
a second slide shaft supported by said guide block member and movable in a vertical direction,
said slide shafts having two ends mounted with second and third driven means; and
means for moving said second slide shaft in the horizontal and vertical directions and a direction oblique to the horizontal direction,
said moving means having:
a driving source for transmitting a driving force to said driving force transmitting means, and
a transmission member for transmitting the driving force from said driving force transmitting means to said first, second, and third driven means.

5,198,737
PROGRAMMABLE CONTROLLER FOR INDUSTRIAL ROBOTS
Taro Harima; Meiko Wakamiya, both of Amagasaki; Yoshitika Takizawa, and Shyuji Mori, both of Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 19, 1990, Ser. No. 600,366
Claims priority, application Japan, Oct. 23, 1989, 1-275178
Int. Cl.[5] G06F *15/46*
U.S. Cl. 318—568.11 3 Claims

1. A programmable controller for a factory cell including a robot having a robot controller controlling the movements of the robot, said programmable controller comprising:
program input means via which a program describing a series of operations of said robot is inputted, wherein the program comprises: robot operation defining instructions defining operations of the robot, and instructions other than the robot operation defining instructions;
memory means, connected to said program input means, for storing the program inputted via the program input means;
discrimination means, coupled to said memory means, for discriminating the robot operation defining instructions from the other instructions of the program stored and read out from the memory means;
information generation means, coupled to the discrimination means, for generating robot operation information in accordance with the robot operation defining instructions discriminated by said discrimination means;



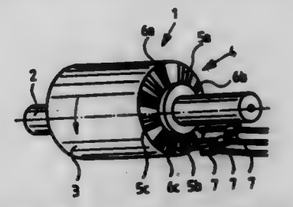
first communication means, coupled to said information generation means, for transmitting to said robot controller of the robot the robot operation information generated by the information generation means;
second communication means, coupled to the robot controller, for receiving information relative to a state of the robot operation from the robot controller; and
instruction execution means, coupled to said discrimination means and said second communication means, for executing the instructions other than the robot operation defining instructions in parallel with the operation state information transmitted from the robot controller via the second communication means.

5,198,738
METHOD OF DETERMINING THE ROTATIONAL SPEED OF A BRUSHLESS DC-MOTOR
Peter T. Blaser, Dielheim; Michael Krüger, Edingen-Neckarhausen; Jürgen Maass, Wiesloch, and Helmut Meyer, Weinheim, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Filed Oct. 30, 1991, Ser. No. 784,758
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1990, 4036024
Int. Cl.[5] G01P *3/36*
U.S. Cl. 318—652 6 Claims

1. Method of determining the rotational speed of a three-phase brushless DC-motor, which comprises the steps of scanning at least one signal trace disposed on a revolving rotor of a three-phase brushless DC-motor by means of three sensors, each sensor emitting a signal having two possible signal states, the signal trace and the sensors being of such construction and arrangement that .eight values are generated by a logical combination of two possible signal states, respectively, of the three sensors; detecting the rotor position with six of the values; and determining the rotor rotational speed with the other two values.

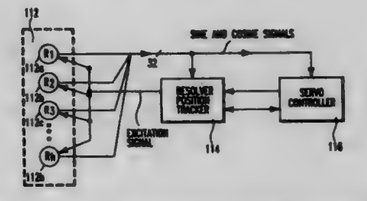
6. Method of determining the rotational speed of a three

phase brushless DC-motor, which comprises the steps of scanning three signal traces disposed on a revolving rotor of a three-phase brushless DC-motor by means of three sensors, each emitting a signal having two possible signal states, the signal traces and the sensors being of such construction and



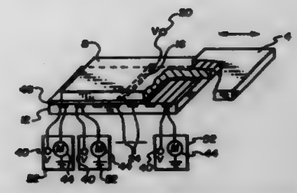
arrangement that eight values are generated by a logical combination of the two possible signal states, respectively, of the three sensors; detecting the rotor position by a combination of pairs of sequential values; and determining the rotor rotational speed by the number of value changes occurring during one revolution of the rotor.

5,198,739
SOFTWARE CONTROLLABLE CIRCUIT FOR RESOLVER EXCITATION SWITCHING IN A MOTION CONTROL SYSTEM
Donald K. Taylor, Pinoy Flatoc; Richard J. Maczuba, and Russell, III; Carl H., both of Johnson City, all of Tenn., assignors to Siemens Industrial Automation, Inc., Johnson City, Tenn.
Filed Jan. 30, 1992, Ser. No. 828,061
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—661 11 Claims



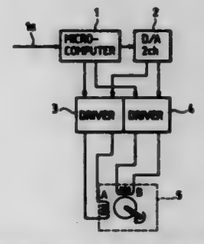
1. In a servomotor control system including a resolver integrally coupled to a servomotor and responsive to an excitation signal to provide an indication of the instantaneous angular position of the servomotor, apparatus comprising:
a source of external excitation signal;
a source of pulse signal having a predetermined frequency;
first controllable switching means, coupled to receive the external excitation signal and responsive to a first control signal for selectively passing said external excitation signal to the resolver;
second controllable switching means, coupled to receive said pulse signal and responsive to a second control signal, for selectively generating, from said pulse signal, an internal signal suitable for use as an excitation signal and for selectively applying the internal signal to the resolver; and
control means responsive to a third control signal for generating the first and second control signals so that only one of the external excitation signal and the internal signal is applied to the resolver at any instant.

5,198,740
SLIDING CONTACT MECHANICAL/ELECTRICAL DISPLACEMENT TRANSDUCER
Stephen C. Jacobsen; Michael G. Mladejovsky, and John E. Wood, all of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah
Continuation-in-part of Ser. No. 417,181, Oct. 4, 1989. This application Feb. 12, 1990, Ser. No. 478,266
Int. Cl.[5] G01R *29/12*; H04R *19/00*
U.S. Cl. 318—687 13 Claims



1. Displacement measuring apparatus comprising
an object whose displacement is to be measured,
sensor means formed with at least one surface area and including means for producing an electrical output signal, the value of the electrical output signal varying with variations in proximity of a field-producing element to said surface area,
a carrying member, including the field-producing element, disposed in contact with said surface area to slide thereover when the object is moved to thereby change the proximity of the field-producing element to the surface area and thus vary the value of the output signal of said sensor means, and
insulative means interposed between the sensor means and the carrying member, the insulative means being substantially electrically insulative and positioned to allow slidable contact between the insulative means and at least one of the sensor means and the carrying member such that the distance between the sensor means and the carrying member remains substantially constant as sliding movement therebetween occurs causing the value of the output signal to vary.

5,198,741
DRIVE CONTROL SYSTEM OF STEPPING MOTOR
Yasuyuki Shinada, Yokohama; Masahiro Sakamoto, and Junnosuke Kataoka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 31, 1990, Ser. No. 560,763
Claims priority, application Japan, Jul. 31, 1989, 1-196781; Mar. 16, 1990, 2-66101; Mar. 16, 1990, 2-66102; Mar. 16, 1990, 2-66103; Mar. 16, 1990, 2-66104
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 8 Claims



1. A drive control system for stepping motors, comprising:
a stepping motor including a plurality of phases adapted to receive an excitation current to drive said motor, said

provement wherein the means for temperature measurement

ductance of the braking resistor assembly responsive to

VOL 1148 ISS 5 MR 30 1993

stepping motor adapted to operate in a micro stepping mode in which each phase is excited simultaneously with an excitation current within the range of a step;

a plurality of drivers adapted to supply the excitation current to each of said phases; and

control means for controlling the excitation current supplied to said plurality of drivers,

said control means having a data table in which a ratio of the excitation current values of the phases at each step is stored, and in which the values of the excitation current flowing in each phase of the motor and their corresponding addresses are stored, said stepping motor being stepwise driven through a rotation angle by an excitation current having a current value is read out of the data table which corresponds to an address, associated with the read out excitation current value stored in the address data table, which is incremented, wherein the data table values are set such that the magnitude of the rotation angle of said motor is always the same each time an address in the data tables is incremented by 1,

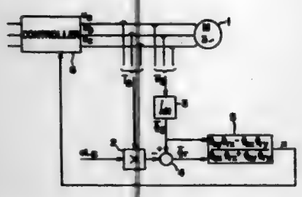
wherein the number of addresses from the address at which the excitation current value of one of the phases is at a peak and the excitation current value of another of the phases is zero to the address at which the excitation current values for the one of the phases and the another of the phases are equal, is different from the number of addresses from the address at which the excitation current values of the one of the phases and the another of the phases are equal to the address at which the excitation current value of the one of the phases is zero and the excitation current value of the another of the phases is at a peak.

5,198,742

METHOD OF PREVENTING THE STALLING OF AN ASYNCHRONOUS MACHINE

Samuli Heikkilä, Helsinki, Finland, assignor to ABB Stromberg Drives OY, Helsinki, Finland

Filed Nov. 16, 1990, Ser. No. 614,244
Claims priority, application Finland, Nov. 20, 1989, 895523
Int. Cl.[5] H02P 5/40
U.S. Cl. 318—803 16 Claims



1. A method of preventing the stalling of an asynchronous machine controlled by a controller affecting the slip and having a response time less than the rotor time constant (τ_r) of the machine, comprising the steps of:

measuring rotational vectors ($\bar{i}_s$, $\bar{u}_s$) for the stator current and stator voltage, respectively, of the machine;

determining, on the basis of the measured rotational vectors ($\bar{i}_s$, $\bar{u}_s$) of the respective stator current and stator voltage and a short-circuit inductance (σL_s) of the machine, two vectors, one of which ($\bar{\Phi}_s$) is parallel to the direction of the stator flux ($\bar{\psi}_s$) and the other is parallel to the direction of the rotor flux ($\bar{\psi}_r$);

determining an angle (γ) between said two vectors parallel to the stator and rotor fluxes; and

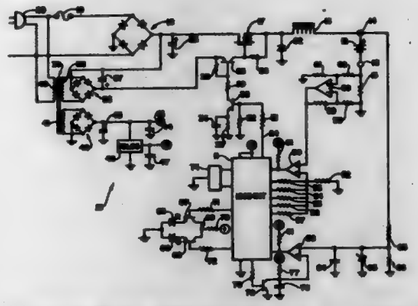
preventing the controller from performing operations tending to increase the torque of the asynchronous machine when said angle (γ) corresponds to a predetermined angle between the stator and rotor flux vectors.

5,198,743

BATTERY CHARGER WITH MICROPROCESSOR CONTROL

Malcolm S. McClure, and Phong B. Chau, both of Indianapolis, Ind., assignors to Span, Inc., Indianapolis, Ind.

Filed Dec. 11, 1990, Ser. No. 626,346
Int. Cl.[5] H02J 7/04
U.S. Cl. 320—31 27 Claims



1. A battery charger for connection to an AC supply of a type provided by a conventional wall outlet, AC supply terminals for connection to said AC supply, battery terminals for connection to a battery, power supply means connected to said AC supply terminals and said battery terminals. for supply of charging current to said battery, and processor means for supply of control signals to said power supply means, voltage sensing means coupled to said battery terminals and to said processor means for monitoring of battery voltage by said processor means, said processor means being operative for performing control functions including determining a full charge condition of said battery through said monitoring of said battery voltage and including control of one of said control signals to said power supply means to terminate application of said charging current upon said determining of said full charge condition of said battery, said processor means in said determining of said full charge condition being operative to detect a peak value of said battery voltage and to thereafter respond to a drop of more than a threshold value below said peak value, and said processor means being operative to avoid said termination of said application of charging current when said detection of said peak value of said battery voltage is followed immediately by a concave upward profile of said battery voltage versus time.

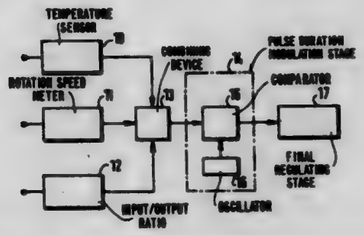
5,198,744

APPARATUS AND METHOD FOR CONTROLLING THE OUTPUT POWER OF A GENERATOR TO MAINTAIN GENERATOR TEMPERATURE BELOW AN ALLOWED LIMITING VALUE

Walter Kohl, Bietigheim; Friedhelm Meyer, Illingen; Rainer Mittag, Korntwestheim, and Guenter Schramm, Vaihingen-Enzweihingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 6, 1991, Ser. No. 712,132
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1990, 4019751; Jun. 26, 1991, 4102335
Int. Cl.[5] H02J 7/14
U.S. Cl. 322—33 19 Claims

1. In an apparatus for controlling a generator having an exciting winding, a standard load, a standard value of an exciting current in the exciting winding, an output power and an output voltage, said apparatus comprising the exciting winding of the generator, a voltage regulator connected to the exciting winding, said voltage regulator controlling the output voltage of the generator by changing an exciting current in the exciting winding, and means for temperature measurement, the improvement wherein the means for temperature measurement measures a temperature T_G at a predetermined location in the generator and comprising means for determining an allowed limiting temperature T_{GMAX} at the predetermined location in the generator, means for increasing the exciting current in the exciting winding of the generator for a predetermined time interval relative to the standard exciting current to operate the generator at a higher load than the standard load and means for lowering the exciting current, I_{Err}, when the temperature T_G determined in the generator by the means for temperature measurement is greater than the allowed limiting temperature T_{GMAX}, and where said generator is dimensioned so that, during a higher load than the standard load the temperature in the generator can be higher than the allowed limiting temperature and wherein the means for lowering the exciting current



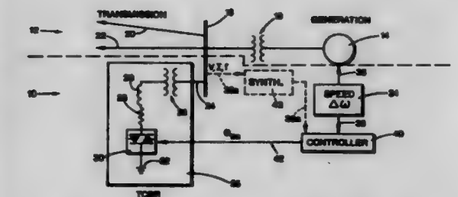
comprises a pulse duration modulation stage (14) connected to a final regulating stage of the voltage regulator to supply an output signal to the voltage regulator to set an input/output ratio of the final regulating stage (17) of the voltage regulator, and wherein said pulse duration modulation stage (14) includes a comparator (15) and an oscillator (16) connected to the comparator, means for measuring a rotation speed of the generator and means for forming a combined signal from a temperature signal generated by the means for temperature measurement, a rotation speed signal generated by the means for measuring the rotation speed and an input/output ratio of the voltage regulator; said means for forming a combined signal being connected to the pulse duration modulation stage (14) to feed the combined signal to the pulse duration modulation stage (14) as an input signal.

5,198,745

DYNAMIC BRAKING RESISTOR SYSTEM

Einar V. Larsen, Charlton, and Ann T. Hill, Ballston Spa, both of N.Y., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Aug. 8, 1991, Ser. No. 742,881
Int. Cl.[5] H02K 11/00
U.S. Cl. 322—58 35 Claims



1. A dynamic braking apparatus for stabilizing a power system during power system disturbances, comprising:

a controller for monitoring a power system parameter to determine a frequency deviation signal of the monitored parameter indicative of a power system disturbance and producing in response a conductance control signal; and

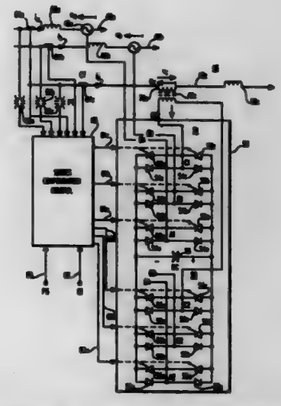
a variable conductance braking resistor assembly for coupling with said power system, the amplitude of the conductance of the braking resistor assembly responsive to the conductance control signal to brake and damp a power system disturbance.

5,198,746

TRANSMISSION LINE DYNAMIC IMPEDANCE COMPENSATION SYSTEM

Laszlo Gyugyi, Penn Hills Twp., Allegheny County, and Colin D. Schauder, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 16, 1991, Ser. No. 760,627
Int. Cl.[5] G05F 1/70
U.S. Cl. 323—207 16 Claims



1. A transmission line impedance compensation system for dynamically balancing a phase-quadrature or reactive voltage component on the transmission line responsive to demand, said system comprising:

compensating means coupled in series with the transmission line and being adapted to introduce or inject a phase-quadrature voltage component, ancillary to the transmission line reactive voltage component for a predetermined operating frequency;

control means for adjusting said compensating means to stabilize the magnitude and phase of a resultant phase-quadrature voltage for the injected voltage component with the transmission line reactive voltage component, substantially in phase quadrature leading or lagging phase angles with respect to transmission line voltage and current parameters,

said compensated transmission line having a corresponding adjustment for the real power (P) and reactive power (Q) components in order to provide transient and dynamic stability without incurring subsynchronous resonance.

5,198,747

LIQUID CRYSTAL DISPLAY DRIVER AND DRIVER METHOD

Michael H. Haight, Pottsboro, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

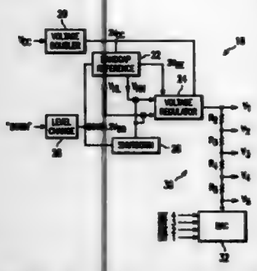
Filed May 2, 1990, Ser. No. 517,989
Int. Cl.[5] G05F 5/08
U.S. Cl. 323—303 19 Claims

1. A circuit for generating a plurality of driving voltages for use with a LCD driver circuit comprising:

a supply voltage source;

a reference voltage source coupled to said supply voltage source, said reference voltage source being substantially independent of supply voltage source variations and sub-

stantially dependent upon temperature variations of a liquid crystal display; and

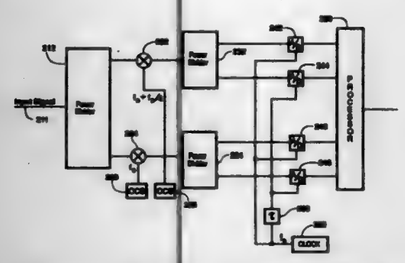


a voltage divider circuit for generating said plurality of driving voltages responsive to said reference voltage.

5,198,748
FREQUENCY MEASUREMENT RECEIVER WITH BANDWIDTH IMPROVEMENT THROUGH SYNCHRONIZED PHASE SHIFTED SAMPLING

James B. Y. Tsui, Dayton, and David L. Sharpin, Springfield, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1991, Ser. No. 783,662
Int. Cl.[5] G01R 23/16
U.S. Cl. 324—76.35 1 Claim



1. A frequency measurement receiver comprising:
first power dividing means coupling a source of signals to inputs of first and second mixers, a first oscillator having a frequency f_o coupled to an input of the first mixer, a second oscillator having a frequency $f_o+f_s/4$ coupled to an input of the second mixer, wherein f_s is a sampling frequency, the first and second mixers having outputs coupled respectively to inputs of second and third power dividing means, first and second analog-to-digital converters having inputs coupled to outputs of the second power dividing means, third and fourth analog-to-digital converters having inputs coupled to outputs of the third power dividing means, means for operating the first, second, third and fourth analog-to-digital converters at said sampling frequency f_s, delay means providing a delay τ between the sampling time of the first and second analog-to-digital converters and also a delay τ between the sampling time of the third and fourth analog-to-digital converters; outputs of the first, second, third and fourth analog-to-digital converters being coupled to processing means;
wherein said processing means comprises means for performing Fourier transforms on signals from the first and second analog-to-digital converters, with the phase and amplitudes calculated, using the expressions:

$$\phi(f)=\tan^{-1}[I(f)/R(f)]$$

$$A(f)=[R^2(f)+I^2(f)]^{\frac{1}{2}}$$

where R(f) and I(f) are respectively the real and imaginary parts of the frequency transform, means for calculating the phase difference between the original and delayed signals and for estimating an approximation to the true frequency for each peak observed in the amplitude spectrum using the expression

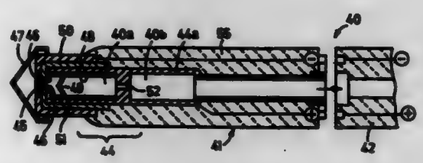
$$\phi=2\pi f\tau;$$

means for inferring a frequency f_{ph} from phase calculations, and using an aliased frequency f obtained from the amplitude spectrum, means for obtaining an estimate of the approximate value of the true frequency of the signal and, thus, determination of the alias which has been mapped to the observed frequency and correction of the observed frequency for aliasing, means for repeatedly subtracting the value of the sampling frequency f_s from the value of the frequency f_{ph} until a value less than $f_s/2$ is obtained, if this value of f_{ph} is less than zero, replacing f by $-f$ and calculating the corrected value of f to be $f_{corr}=f+n\ f_s$
where n is the number of subtractions performed;
and means responsive to the signal resulting from the processing of signals from the first and second analog-to-digital converters falling near an alias zone for processing signals from the third and fourth analog-to-digital converters, as set forth above for signals from the first and second analog-to-digital converters, to determine the value of the true frequency.

5,198,749
SINGLE-USE DISPOSABLE MOLTEN METAL INCLUSION SENSOR

Roderick I. L. Guthrie, Montreal, Canada, and Hidemasa Nakajima, Kashima, Japan, assignors to R. Guthrie Research Associates Inc., Quebec, Canada and Sumitomo Metal Industries Ltd., Osaka, Japan

PCT No. PCT/CA90/00140, § 371 Date Oct. 28, 1991, § 102(e) Date Oct. 28, 1991, PCT Pub. No. WO90/13014, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 27, 1990, Ser. No. 768,714
Claims priority, application Japan, Apr. 27, 1989, 1-108871
Int. Cl.[5] G01N 27/02
U.S. Cl. 324—71.1 17 Claims

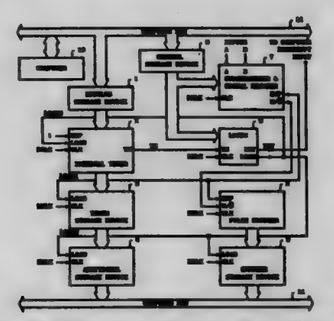


1. A molten metal inclusion sensor of the type which is completely immersed in a molten metal and detects inclusions in the molten metal by the electric sensing zone method, the sensor having a predetermined length and comprising a chamber (*40a*, *40b*) having an orifice (45) in a wall thereof through which molten metal is drawn into the interior of the chamber, electrically conductive electrodes (48, 50) on opposite sides of the orifice, one of said electrically conductive electrodes extending adjacent to the orifice only partly the length of the sensor and means for measuring changes of potential between the electrodes produced by passage through the orifice of relatively non-conducting particles entrained in the molten metal, characterized in that a support (42) for a probe (41), which probe is immersed in the metal and which provides the chamber (*40a*, *40b*), the orifice (45) and at least an inner electrode (48) are detachably connected with one another, and the probe is a single-use, disposable probe.

5,198,750
EXTREMELY WIDE RANGE FREQUENCY MEASUREMENT METHOD

Milan Prokin, Dr. Agostina Neta 76/64, 11070 Belgrade, Yugoslavia

Continuation-in-part of Ser. No. 654,224, Feb. 12, 1991, abandoned. This application Apr. 29, 1992, Ser. No. 875,972
Claims priority, application Yugoslavia, Feb. 12, 1990, 269/90
Int. Cl.[5] G01R 23/02
U.S. Cl. 324—76.47 16 Claims

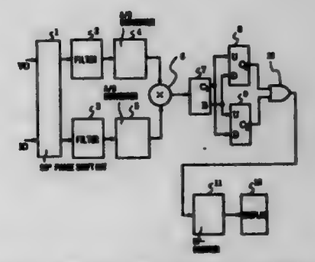


1. A frequency measurement apparatus comprising:
a computer having at least an interrupt input;
a memory having a plurality of pregiven storage locations;
a reference clock of predetermined constant frequency (f_c);
an interval timer for counting, in response to said reference clock, and providing a terminal count signal thereto, in response to a content of said interval timer equal to a predetermined content;
means for the start and stop of said interval timer;
means for providing a load signal, in response to said terminal count signal;
means for providing a sampling clock, in response to said terminal count signal;
means for providing an interrupt request signal, in response to said terminal count signal, wherein said interrupt request signal is coupled to said interrupt input of said computer;
a synchronizer and signal decoder for receiving at least an input signal of unknown frequency (f), synchronizing input signals with said reference clock, and providing a measured clock of measured frequency (f_M), proportional to said unknown frequency (f), according to $f_M=H\cdot f$;
a pulse counter for counting, in response to said measured clock;
means for calculating a modulus value (N_c) on the basis of a desired sampling time (T_s) and said frequency (f_c) of the reference clock;
means for loading said modulus value (N_c) into a modulus storage device, before the start of said interval timer;
said modulus storage device coupled to said interval timer, for storing said modulus value (N_c), and reloading said interval timer by said modulus value (N_c), in response to said load signal;
a timer storage device coupled to said interval timer, for capturing the content of said interval timer, in response to said measured clock;
an additional storage device coupled to said timer storage device, for capturing the content of said timer storage device, in response to said sampling clock;
a counter storage device coupled to said pulse counter, for capturing the content of said pulse counter, in response to said sampling clock;
means for reading and storing the content of said counter storage device, into a second pregiven storage location (B) in said memory after the start of said interval timer, and before first interrupt request signal is activated;
means for reading and storing the content of said additional storage device, into a first pregiven storage location (A) in said memory, in response to said interrupt request signal;
means for reading and storing the content of said counter storage device, into a third pregiven storage location (C) in said memory, in response to said interupt request signal;
means for calculating a pulse difference (N_P) as a difference between the content of said second pregiven storage location (B) and the content of said third pregiven storage location (C) in said memory;
means for calculating a time difference (N_T) as a sum of already existing value of time difference (N_T), and a difference between said modulus value (N_C) and the content of said first pregiven storage location (A) in said memory;
means for calculating said measured frequency (f_M) of the measured clock by determining the quotient of said pulse difference (N_P) and said time difference (N_T), multiplied with said frequency (f_C) of the reference clock;
means for reading and storing the content of said third pregiven storage location (C) into said second pregiven storage location (B) in said memory, after the calculation of said pulse difference (N_P); and
means for calculating said time difference (N_T) as incremented content of said first pregiven storage location (A) in said memory, after the calculation of measured frequency (f_M).

5,198,751
REACTIVE VOLT-AMPERE-HOUR METER

Hidetake Nakamura, Tokyo, Japan, assignor to NEC Corporation and The Tokyo Electric Power Company Incorporated, both of Japan

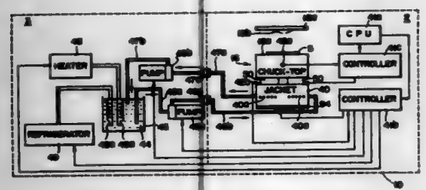
Filed Mar. 23, 1992, Ser. No. 855,288
Claims priority, application Japan, Mar. 22, 1991, 3-81200
Int. Cl.[5] G01R 21/00, 22/00, 21/06
U.S. Cl. 324—141 6 Claims



1. A reactive volt-ampere-hour meter comprising:
a 90-degrees phase shift circuit for receiving a first and a second electric signal representative of, respectively, an AC voltage and an AC current fed to a load and generating a pair of electric signals by shifting the phase of either of said first and second electric signals by 90 degrees;
a multiplier for multiplying said pair of electric signals to thereby produce a third electric signal representative of a product of said pair of electric signals;
a cumulative adder for cumulatively adding the third electric signals and generating a first carry pulse when the cumulative sum reaches a predetermined upper limit or generating a borrow pulse when said cumulative sum reaches a predetermined lower limit;
a first up-down counter for up-counting the first carry pulses and down-counting the borrow pulses to generate a second carry pulse when the count of said first up-down counter reaches a predetermined value;
a second up-down counter for up-counting said borrow

pulses and down-counting said first carry pulses to generate a third carry pulse when the count of said second up-down counter reaches a predetermined value;
an up-counter for up-counting said second and third carry pulses; and
a display for displaying the count of said up-counter.

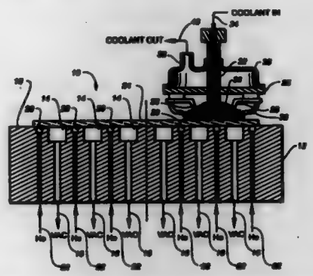
5,198,752
ELECTRIC PROBING-TEST MACHINE HAVING A COOLING SYSTEM
Eiji Miyata, Fuchu; Masahiko Sagiyama, Nirasaki; Masahiko Kohno, and Masataka Hatta, both of Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan
Division of Ser. No. 512,105, Apr. 20, 1990, Pat. No. 5,084,671, which is a continuation-in-part of Ser. No. 298,302, Jan. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 236,749, Aug. 26, 1988, abandoned. This application Jul. 31, 1991, Ser. No. 738,304
Claims priority, application Japan, Sep. 2, 1987, 62-135000[U]
Int. Cl.[5] G01R *1/02*
U.S. Cl. 324—158 F 6 Claims



1. An apparatus for cooling a semiconductor wafer comprising:
a wafer stage on which a semiconductor wafer is placed;
a heat exchange jacket arranged so as to conduct heat exchange between itself and said wafer stage;
a coolant tank in which a coolant is reserved;
a supply passage communicating said heat exchange jacket and said coolant tank;
a return passage communicating said heat exchange jacket and said coolant tank,
a pair of pump means for circulating the coolant between the coolant tank and the heat exchange jacket via the supply and return passages; and
a bypass for returning the coolant from the supply passage directly tot he coolant tank without passing through the return passage;
wherein the discharge opening of said bypass is positioned above the surface level of the coolant housed in the coolant tank.

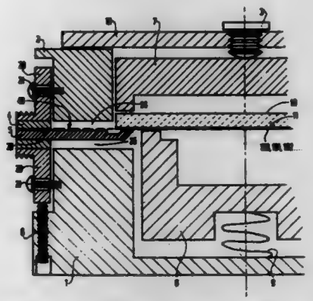
5,198,753
INTEGRATED CIRCUIT TEST FIXTURE AND METHOD
William R. Hamburgen, Menlo Park, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 29, 1990, Ser. No. 546,523
Int. Cl.[5] G01R *35/00, 31/06*
U.S. Cl. 324—158 F 36 Claims

1. An integrated circuit test fixture, which comprises a chuck for holding a wafer containing the integrated circuit, a probe positioned over said chuck and having a plurality of electrically conductive tip elements for supplying electrical signals to and receiving electrical signals from the integrated circuit, a power source connected to said probe for supplying continuous, full operating power to the integrated circuit through selected noes of the electrically conductive tip elements, gas supply means for thermally contacting the integrated circuit and said chuck with a hydrogen or helium high thermal conductivity relative to air heat transfer interface gas to reduce interface thermal resistance between the integrated circuit and said chuck while the integrated circuit is held by



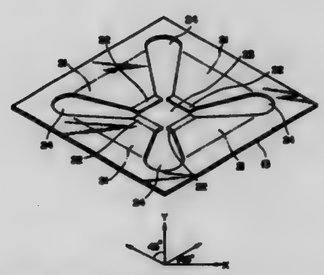
said chuck, and liquid supply means for thermally contacting said integrated circuit with a cooling liquid.

5,198,754
TESTING APPARATUS FOR HIGH FREQUENCY INTEGRATED CIRCUIT CHIP
Michel J. M. Binet, Creteil, France, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 944,923, Dec. 18, 1986, abandoned. This application Jan. 27, 1989, Ser. No. 303,965
Claims priority, application France, Dec. 20, 1985, 85 18921
Int. Cl.[5] G01R *1/04, 31/28, 31/02*
U.S. Cl. 324—158 F 10 Claims



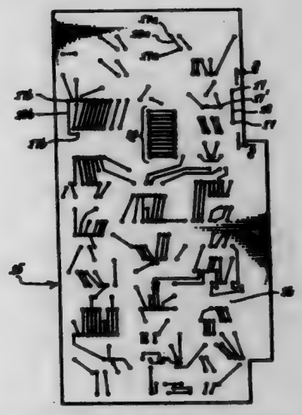
1. A testing apparatus for testing high-frequency integrated circuit chips comprising
a substrate having a space for an integrated circuit chip structure on one surface of said substrate, said substrate being an insulating or dielectric material,
a network of high-frequency lines disposed on said one surface of said substrate, said network extending in a geometric configuration from said space to a peripheral region of said substrate,
structural means having a surface for receiving said substrate and said network, said structural means including first means for producing pressure between said peripheral region of said substrate and said surface of said structural means, and
a plurality of coaxial conductor means attached to said structural means for providing electrical contact to said network of high-frequency lines,
wherein said structural means includes a structural part and a second structural part, said first and second structural parts including a central opening in which said substrate is disposed relatively between said first and second structural parts, wherein each of said first structural part and said second structural part have one flat polished surface, said flat polished surface of said first structural part being disposed in facing relationship to said flat polished surface of said second structural part, said flat polished surface of said first structural part on tending further into said opening than said flat polished surface of said second structural part to form a shoulder, said shoulder being said surface of said structural means, said substrate disposed on said shoulder with said one surface of said substrate bearing on said flat polished surface of said shoulder,
wherein said structural means includes a plurality of openings through both said first and second structural parts at said flat polished surfaces, said plurality of coaxial conductor means extending through said openings to provide central conductors to be coupled to respective high-frequency lines of said network, said plurality of openings being distributed along a periphery of said structural means, and wherein said substrate bears on said shoulder while said high-frequency lines coincide with ends of said central conductors.

5,198,755
PROBE APPARATUS
Towl Ikuta, Kofu; Taruo Iwata, Nirasaki, and Iwai Imahashi, Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan
Filed Aug. 30, 1991, Ser. No. 753,078
Claims priority, application Japan, Sep. 3, 1990, 2-232810; Sep. 3, 1990, 2-232811
Int. Cl.[5] G01R *1/04*
U.S. Cl. 324—158 P 10 Claims



1. A quartz probe, comprising:
a quartz probe body formed of an integral structure including at least two probe rows having a large number of probes corresponding to an electrode array of an object of examination, lead pattern portions respectively connected to said probe rows, and a supporting portion for supporting all the lead pattern portions; and
a metal pattern layer formed on at least that portion of said quartz probe body which is brought into contact with the electrodes of said object;
wherein the quartz probe body is formed by etching the Z plane perpendicular to a crystal axis Z of a quartz plate;
said probe extends into a central opening formed by etching said quartz plate; and
a longitudinal direction of each probe row is inclined relative to at least one of a crystal axis X and a crystal plate axis Y of the quartz.

5,198,756
TEST FIXTURE WIRING INTEGRITY VERIFICATION DEVICE
Jack E. Jenkins, Redwood City, and William R. Moffitt, Fremont, both of Calif., assignors to ntg-electronics Inc., Bethlehem, N.J. and William Moffitt, San Jose, Calif.
Filed Jul. 29, 1991, Ser. No. 737,433
Int. Cl.[5] G01R *1/073, 31/02*
U.S. Cl. 324—158 P 8 Claims



1. In the method of orienting test probes in a wiring test system to engage contact points on a circuit board, the steps that include
a) providing a wiring integrity verification plate means the plate means being a thin insulative base plate, and providing multiple contact pads to have upwardly domed surfaces and the pads and leads attached to the plate,
b) orienting each lead to extend between and interconnect two of the contact pads, whereby multiple circuit sections are formed on the plate, each circuit section including two pads interconnected by a lead,
c) and locating the two pads of each circuit section to be contacted by two probes of the wiring test system for providing an electrical continuity test via that circuit section, when those two probes are correctly located relative to contact points on a production circuit board for testing the production circuit board,
d) and, for the majority of pads, providing the spacing between an interconnected pair of pads to be greater than the spacing between either pad of the pair and another nearby pad on the plate.

5,198,757
METHOD AND APPARATUS FOR TESTING SEMICONDUCTOR INTEGRATED CIRCUIT
Hideo Asanuai, Toyonaka, Japan, assignor to Magnachips Corporation, Osaka, Japan
Filed Jul. 18, 1991, Ser. No. 731,975
Claims priority, application Japan, May 15, 1991, 3-141101
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 R 13 Claims

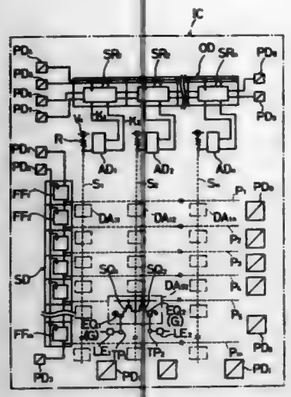
1. A method for obtaining binary signals for test points in a semiconductor integrated circuit for testing the semiconductor integrated circuit through probe lines and sense lines intersecting the probe lines approximately at right angles, which probe lines and sense lines are incorporated in the semiconductor integrated circuit, comprising the steps of;
(a) providing plural electronic switch devices in the integrated circuit so that the electronic switch devices correspond to plural intersections where the probe lines and

sense lines intersect each other so as to be capable of feeding signals to corresponding sense lines in response to selection signals applied to corresponding probe lines, each of the electronic switch devices comprising electronic switches which are connected to test points in the integrated circuit and connected to a corresponding sense line and a corresponding probe line;

(b) applying a selected signal of test pattern signals to input terminals of logic elements in the integrated circuit;

(c) applying a selection signal to a selected one of the probe lines;

(d) generating from each of the electronic switch devices



corresponding to the selected probe line one of plural state indicating analog signals, each of which corresponds to a combination of binary signals on its corresponding test points;

(e) converting each of the state indicating analog signals generated on the sense lines into binary signals corresponding to the combination of the binary signals on corresponding test points and then feeding the converted binary signals;

(f) repeating steps (c) to (e) after selecting another one of the probe lines; and

(g) repeating steps (b) to (f) after selecting another one of the test patter signals.

5,190,758

METHOD AND APPARATUS FOR COMPLETE FUNCTIONAL TESTING OF A COMPLEX SIGNAL PATH OF A SEMICONDUCTOR CHIP

Russell Ilunian, Groton, and Richard B. Watson, Jr., Harvard, both of Mass., assignors to Digital Equipment Corp., Maynard, Mass.

Filed Sep. 23, 1991, Ser. No. 764,314

Int. Cl.[5] G01R *31/28*

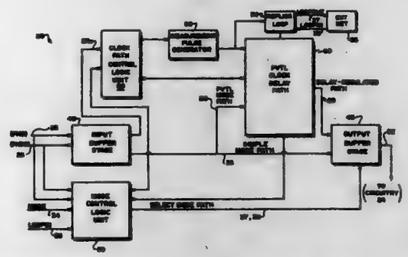
U.S. Cl. 324—158 R **11 Claims**

1. Method for testing logic devices of a complex signal path of a semiconductor chip, said logic devices including at least a measurement latch circuit, said method comprising the steps of:

placing said chip in a test mode in response to first control signals and forcing a sequence of unasserted bits into a measurement delay line circuit having signal outputs connected to said measurement latch circuit, and further placing said chip in a plurality of sub-test modes in response to second control signals to enable complete functional testing of said logic devices of said complex signal path;

shifting a selected pattern of asserted bits into a test register, located on said chip, in response to a clocking signal, said test register being connected to said measurement latch circuit, said selected pattern of asserted bits comprising a test pattern;

loading said test pattern from said test register into said measurement latch circuit and thereafter into said logic devices of said complex signal path when said chip is placed in a measurement test sub-mode of said test mode, said test pattern overriding the signal outputs of said measurement delay line;



generating timing signals with a control logic unit to activate said logic devices of said signal path during said measurement sub-mode; and

sampling an output clock signal of said chip to determine whether said clock signal is present at the output line of said chip, whereby the presence of said output clock signal indicates that said logic devices of said complex signal path exercised by said test pattern are functional.

5,190,759

TEST APPARATUS AND METHOD FOR TESTING DIGITAL SYSTEM

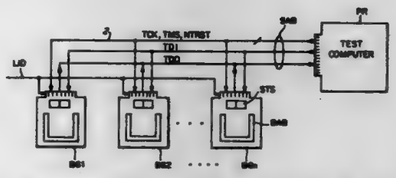
Dieter Ohnesorge, Weil der Stadt, Fed. Rep. of Germany, assignor to Alcatel n.v., Amsterdam, Netherlands

Continuation of Ser. No. 798,630, Nov. 26, 1991, abandoned. This application Jul. 31, 1992, Ser. No. 924,380

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1990, 4037687

Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R **4 Claims**



1. A digital electronic system testing apparatus for testing a plurality of electronic assemblies forming the system, each electronic assembly including a plurality of integrated circuits having leads for connecting the respective integrated circuit in the assembly, said leads respectively having boundary scan cells for testing the integrated circuits, the boundary scan cells of the leads of each integrated circuit being interconnected to form at least one shift register, each shift register having serial input means and serial output means and at least one clock line and one control line connected thereto from a control circuit, wherein the testing apparatus is capable of testing the assemblies even if some of the assemblies are missing or mispositioned, the testing apparatus comprising:

means for interconnecting the at least one shift register of said integrated circuits forming each assembly to form at least one scan bus;

means for interconnecting the thus formed at least one scan bus of at least one assembly together to form at least one assembly scan bus;

a system scan bus;

test computer means connected to said at least one assembly scan bus, via said system scan bus, for writing test data into and for reading test data out of said plurality of integrated circuits of an assembly, and for sending test address data to said assemblies;

an additional control means in each assembly and operating as an interface between said system scan bus and said assembly scan bus, said additional control means being coupled between said at least one assembly scan bus and said system scan bus, said additional control means including:

switching means for controllably disconnecting said system scan bus from said assembly scan bus;

storage means for storing predetermined unique address data which uniquely identifies each assembly in the test apparatus; and

comparing means for comparing said address data stored in said storage means with said test address data sent on said system scan bus;

said switching means including means for connecting said assembly scan bus to said system scan bus when said comparing means determines, at a time when said system scan bus and said assembly scan bus are disconnected, that said address data in said storage means matches test address data.

5,190,760

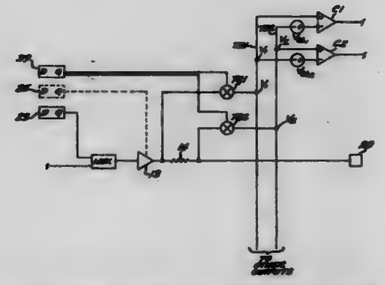
METHOD BY WHICH TO DETECT DIRECTION OF CURRENT FLOW IN OUTPUTS OF INTEGRATED CIRCUITS

William D. Farwell, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 30, 1991, Ser. No. 767,596

Int. Cl.[5] G01R *31/28*; G08B *3/00*

U.S. Cl. 324—158 R **5 Claims**



1. A test circuit for an integrated circuit having output buffer for providing output signal on associated signal pad, comprising:

a first test bus;

a second test bus;

current sensing means connected to said output buffers;

selection means respectively associated with respective current sensing means for controllably coupling said current sensing means to said first and second test busses; and

comparator means responsive to the signals on said first and second test busses for providing an indication of whether the current flow sensed by a selected current sensing means is outside a predetermined range.

5,190,761

TEMPERATURE COMPENSATED MAGNETOSTRICTIVE PISTON POSITION DETECTOR

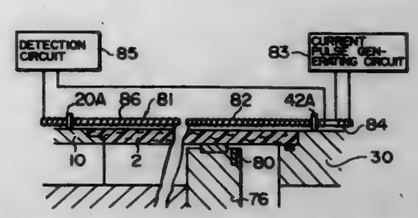
Hisayoshi Hashimoto, Ushiku; Mario Tamura, Tsuchiura, and Ken Ichiryu, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00287, § 371 Date Feb. 28, 1991, § 102(e) Date Feb. 28, 1991

PCT Filed Mar. 6, 1990, Ser. No. 655,369

Int. Cl.[5] G01B *7/14*

U.S. Cl. 324—207.12 **9 Claims**



1. A cylinder apparatus made of a composite material comprising a cylinder tube having an inner cylinder made of a non-magnetic material and an outer cylinder formed on the outer periphery of said inner cylinder and made of a fiber-reinforced resin material, a piston slidably disposed in said cylinder tube, a rod having one end fixed to said piston and the other end outwardly projecting from said cylinder tube, a stroke sensor for detecting the stroke of said piston, said stroke sensor comprising a position indicating magnet provided on said piston and elongated sensor means provided on said cylinder tube, said elongated sensor means having a thin elongated tube extending along said cylinder tube between both ends thereof and containing at least one magnetostriction string having a large coefficient of magnetostriction, a drive coil wound on at least one of both ends of said thin elongated tube for producing magnetostriction phenomenon in said magnetostriction string for generating an ultrasonic wave when a pulsatile input current is applied thereto, a detection coil wound over a predetermined length of said thin elongated tube separately from said drive coil for detecting as a detection signal the induced electromotive force generated by the inverse magnetostriction phenomenon when said ultrasonic wave is passed through the position of said magnetostriction string corresponding to said position indicating magnet, and

at least one pin-like magnet for correcting a measurement error due to a change in temperature of said stroke sensor, said at least one pin-like magnet being provided at each of positions axially inward of both ends of said detection coil and adjacent both ends of said cylinder tube.

5,190,762

MAGNETIC SENSOR HAVING SPACED MAGNETO-RESISTANCE ELEMENTS

Osamu Shimoe, and Yukimasa Shoseowaki, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 9, 1992, Ser. No. 818,340

Claims priority, application Japan, Mar. 8, 1991, 2-69278

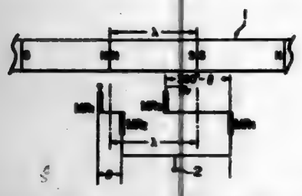
Int. Cl.[5] G01B *7/14*; G11B *5/37*

U.S. Cl. 324—207.21 **3 Claims**

1. A magnetic sensor for detecting a magnetic signal from a magnetic recording medium magnetized periodically in a magnetizing direction at a magnetizing pitch of λ on the basis of variation in resistance value of magneto-resistance effect elements, comprising:

first, second, third and fourth magneto-resistance effect elements disposed in this order in the magnetizing direction of the magnetizing pitch λ of the magnetic recording medium, wherein said first and second magneto-resistance effect elements are disposed spacedly from each other at

an interval corresponding to an electrical angle of θ, based on $\lambda = 360°$, while said third and fourth magneto-resistance effect elements are disposed spacedly from each other at an interval corresponding to an electrical angle of $(360° - \theta)$, and wherein the interval between a center line of said first and second magneto-resistance effect elements and a center line of said third and fourth magneto-resistance effect elements is set to $n\lambda$ (n: an integer), said four



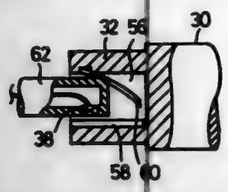
magneto-resistance effect elements being connected to one another in series in the order of said first, second, fourth and third magneto-resistance effect elements and θ being set to a range of $30° \leq \theta \leq 90°$, and wherein a power source terminal is provided at each end of said serially-connected magneto-resistance effect elements and an output terminal is provided at a connection point of said second and fourth magneto-resistance effect elements.

5,198,763

APPARATUS FOR MONITORING THE AXIAL AND RADIAL WEAR ON A BEARING OF A ROTARY SHAFT

Yoshiaki Kouzaki, Tokyo, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 656,282, Feb. 14, 1991, abandoned. This application Jan. 30, 1992, Ser. No. 908,546
Claims priority, application Japan, Feb. 20, 1990, 2-37191
Int. Cl.[5] G01B 7/14, 7/30, 11/14; G01D 5/12
U.S. Cl. 324—207.23 1 Claim



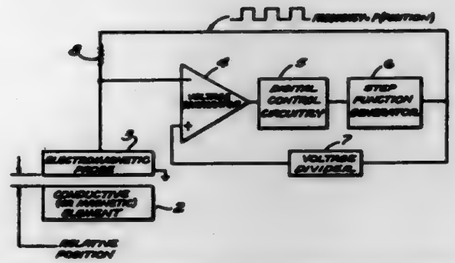
1. Apparatus for monitoring the axial and radial wear on a bearing of a rotary shaft, comprising means supporting a said rotary shaft on a slide bearing for axial movement parallel to an axis of rotation of said shaft in said bearing, single detecting means to detect both an axially displaced position of said rotary shaft and a radially displaced position of said shaft, said single detecting means comprising fixed distance detecting means for detecting a distance between said distance detecting means and said shaft, thereby to detect radial displacement of said shaft, and for detecting, between two non-parallel contours on said shaft, a distance that varies lengthwise of said shaft, thereby to detect axial displacement of said shaft, said two non-parallel contours on said shaft comprising grooves recessed within a cylindrical side wall of a cylindrical recess in an end of said shaft, said single detecting means being fixedly mounted in spaced relation to said side wall on a fixed member disposed within said recess, and means responsive to the detection of said distances by said detecting means simultaneously to display said axial and radial positions of said shaft thereby to indicate axial and radial wear of said bearing.

5,198,764

POSITION DETECTOR APPARATUS AND METHOD UTILIZING A TRANSIENT VOLTAGE WAVEFORM PROCESSOR

Mark E. Spencer, Mesa, Ariz., assignor to Sentech Corp., Tempe, Ariz.

Filed Feb. 22, 1991, Ser. No. 660,518
Int. Cl.[5] G01B 7/14; G01R 33/12; G01N 27/72; G01V 3/10
U.S. Cl. 324—207.26 43 Claims



1. A method for sensing changes in inductance of an electromagnetic probe due to the influence of a magnetic or an electrically conductive element comprising the steps of:

placing said electromagnetic probe in proximity to said element, said electromagnetic probe generating a magnetic field when energized;

energizing said probe with a pulsed electrical waveform to induce a transient signal in said probe in response to the inductance of the probe under the influence of said element;

comparing said transient signal to a reference signal to produce a control signal, said reference signal being derived from said pulsed electrical waveform and representing a degree of decay of said transient signal; and

reenergizing said probe with said pulsed electrical waveform in response to said control signal to generate a plurality of said transient signals at a frequency related to said inductance of the probe, the frequency of said transient signals indicating the changes in inductance of the probe due to the influence of the element.

5,198,765

METHOD OF AND APPARATUS FOR SIMULTANEOUSLY TESTING A WIRE ROPE FOR MULTIPLE DEFECTS

Nicolaas T. Van Der Walt, 21 Dunton Place, Kibler Heights, Johannesburg, Transvaal, South Africa

Filed Nov. 6, 1991, Ser. No. 788,525
Claims priority, application South Africa, Nov. 7, 1990, 90/8910
Int. Cl.[5] G01N 27/72, 27/82; G01R 33/12
U.S. Cl. 324—227 8 Claims

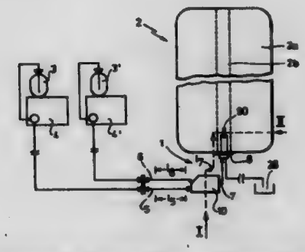
1. Apparatus for simultaneously testing a wire rope for cross sectional area variations and for contact pattern variations which includes a magnetizing head for establishing a magnetic field, means for forming a pathway for the rope which permits the rope to travel in an axial direction through the magnetic field whereby the rope is magnetically saturated in a first sense at a first location, and in a second sense which is opposite to the first sense at a second location and at a third location, the second and third locations being respectively positioned on opposing sides of the first location, a first sensing means positioned at a respective one of the first, second and third locations for detecting a magnetic flux variation in the rope, and second and third sensing means which are positioned between the first and second locations, and the first and third locations, respectively, each of the second and third sensing means being at a respective region where the flux density in the rope is approximately zero and being used for measuring the rate of change of flux density, as a function of rope length.

5,198,766

APPARATUS FOR MEASURING CHEMICAL AND/OR PHYSICAL REACTION SEQUENCES BY NUCLEAR MAGNETIC RESONANCE SPECTROMETRY

Manfred Spraul, Ettlingenweiler, and Martin Hofmann, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Fed. Rep. of Germany

Filed Sep. 26, 1991, Ser. No. 766,652
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1991, 4104076
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—300 7 Claims



1. Apparatus for measuring chemical and/or physical reaction sequences by nuclear magnetic resonance spectrometry (NMR), said apparatus comprising:

an NMR spectrometer including a spectrometer magnet and a spectrometer probe head with a spectrometer measuring cell in a bore of the magnet;

means, defining a reaction path, for premagnetization of reagents, said reaction path including a reaction chamber disposed adjacent said spectrometer probe head and within a magnetic field of the spectrometer magnet, said reaction chamber being supplied with at least one reagent via at least one reagent supply line and means for feeding a reaction product, which is formed in the reaction chamber, to the measuring cell for NMR measurement.

5,198,767

COMPACT NMR PROBE

Henri Gleanat, Corenc, and Nelly Kernevez, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 2, 1991, Ser. No. 679,449
Claims priority, application France, Apr. 4, 1990, 90 04323
Int. Cl.[5] G01V 3/00
U.S. Cl. 324—301 10 Claims

1. A nuclear magnetic resonance probe comprising: first block having a first axis and a first symmetry plane perpendicular to said first axis, said first block having:

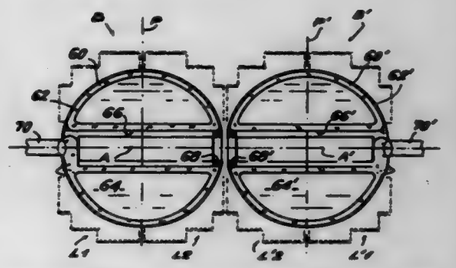
a first bottle having an axis identical with said first axis and a symmetry plane identical with said first symmetry plane, said first bottle containing a first radical solution having a first nuclear polarization,

a first high frequency coaxial resonator surrounding said first bottle,

two first coils surrounding said first high frequency coaxial resonator, said two first coils facing one another on opposite sides of said first symmetry plane, said two first coils being electrically interconnected;

a second block having a second axis and a second symmetry plane perpendicular to said second axis, said second block having:

a second bottle having an axis identical with said second axis and a symmetry plane identical with said second symmetry plane, said second bottle containing a second radical solution having a second nuclear polarization opposite to said first nuclear polarization,



a second high frequency coaxial resonator surrounding said second bottle,

two second coils surrounding said second high frequency coaxial resonator, said two second coils facing one another on opposite sides of said second symmetry plane, said two second coils being electrically interconnected, said two second coils being further electrically connected with said two first coils; and

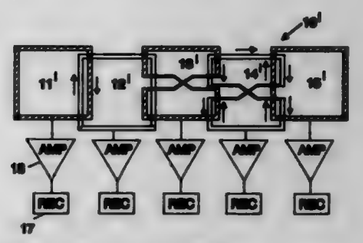
an amplifier having a first input connected to said first coils and a second input connected to said second coils, and having an output connected to said two first and two second coils.

5,198,768

QUADRATURE SURFACE COIL ARRAY

Hasan Keren, Kfar Saba, Israel, assignor to Elscint, Ltd., Haifa, Israel

Filed Sep. 25, 1990, Ser. No. 587,447
Claims priority, application Israel, Sep. 27, 1989, 091805
Int. Cl.[5] G01V 3/00
U.S. Cl. 324—318 9 Claims



1. A surface coil array comprising:

a plurality of adjacent surface coils,

said array extending in a first direction,

said surface coils including:

single loop surface coils,

double loop surface coils,

means for inhibiting cross-coupling between nearest neighbor coils,

5,198,772

capable of causing a continuous electrical discharge in the

means for inhibiting cross-coupling between next nearest neighbor coils,

said means for inhibiting cross-coupling between nearest neighbor surface coils comprising overlapping the ends in said first direction of said adjacent ones of said surface coils,

said means for inhibiting cross-coupling between next nearest neighbor surface coils comprising said double loop surface coils wherein the two loops of said double loop surface coils are in series so as to support only a single current mode.

5,198,769

TESSERAL GRADIENT COIL FOR A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Georg Fuss, Herzogenaurach, and Eckart Stetter, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

Filed Sep. 24, 1990, Ser. No. 586,875

Claims priority, application European Pat. Off., Sep. 29, 1989, 89118095.2

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 8 Claims

1. In a nuclear magnetic resonance tomography apparatus having a fundamental field magnet system having a hollow-cylindrical interior with a cylinder axis disposed in the z-direction of a Cartesian x-y-z coordinate system, the improvement of a tesseral gradient coil comprising:

two segments proceeding in the azimuthal direction connected by conductors, with a first of said azimuthally proceeding segments being disposed on an optimally small radius and a second of said azimuthally proceeding segments disposed on an optimally large radius with respect to said cylinder axis, said segments being disposed in respective planes substantially perpendicular to said cylinder axis.

5,198,770

LOGGING APPARATUS HAVING A WALL ENGAGING PAD WITH LONGITUDINALLY ALIGNED DETECTING DEVICES

Jean-Luc Decorps, Antony; Alain Dumont, Paris, and Alan Sallwasser, Chatenay Malabry, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 18, 1991, Ser. No. 793,742

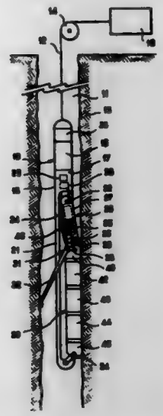
Claims priority, application France, Nov. 23, 1990, 90 14670

Int. Cl.[5] G01V *3/18, 1/40, 5/04;* E21B *49/00*

U.S. Cl. 324—367 7 Claims

1. A logging apparatus for investigating earth formations traversed by a borehole, the apparatus comprising:

an elongate pad adapted to engage the wall of the borehole, the elongate pad comprising a plurality of detecting devices comprising means for detecting earth formation characteristics, the plurality of detecting devices in alignment in the longitudinal direction of the borehole, each of said detecting devices comprising a housing having complementary first and second ends provided with electrical connectors, said first end of one housing longitudinally engaging the second end of an adjacent housing to form a means for preventing rotation of said one housing and said adjacent housing relative to each other; and



fixing means for fixing the first end of said one housing to the second end of said adjacent housing in the longitudinal direction, thereby forming a rigid pad which can be disassembled.

5,198,771

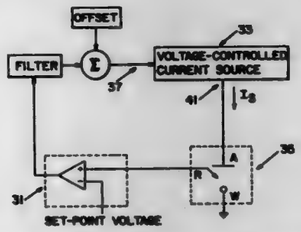
POTENTIOSTATIC APPARATUS AND METHODS

John C. Fidler, DeKalb; James P. Bobis, Downers Grove; William R. Pearson, and Joseph R. Stetter, both of Naperville, all of Ill., assignors to Transducer Research, Inc., Naperville, Ill.

Filed Sep. 3, 1991, Ser. No. 753,835

Int. Cl.[5] G05F *1/46*

U.S. Cl. 324—438 3 Claims



1. A potentiostat circuit for controlling and maintaining a stable potential difference between the working electrode and the reference or counter electrode of an amperometric sensor and for generating an output signal that is substantially proportional to the current flowing through said working electrode, said circuit comprising a voltage-controlled current source whose input is an error voltage generated by an error amplifier and whose output is a current that is proportional to the error voltage, wherein said error amplifier compares the potential of the reference or counter electrode, measured relative to ground potential, to a set-point potential, and wherein the error voltage gives rise to a current that is equal to the current passing through said working electrode when the current flow in said circuit is in a steady state, and wherein the voltage-controlled current source is a variant of the Howland current pump.

5,198,772

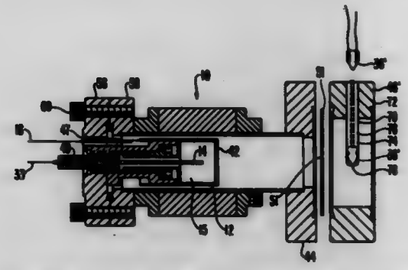
REMOVABLE DISCHARGE INITIATING MEANS FOR COLD CATHODE DISCHARGE IONIZATION GAUGE

Roy N. Peacock, and Neil T. Peacock, both of Lafayette, Colo., assignors to MKS Instruments, Inc., Andover, Mass.

Continuation-in-part of Ser. No. 668,053, Mar. 12, 1991, Pat. No. 5,157,333. This application Feb. 28, 1992, Ser. No. 843,197

Int. Cl.[5] G01L *21/34;* G01N *27/62*

U.S. Cl. 324—463 24 Claims



1. A cold cathode gauge for measuring the pressure of a vacuum within a system where the system is in direct communication with a vacuum space within the gauge, said gauge comprising:

an anode disposed within the vacuum space of the gauge;

a cathode disposed within the vacuum space of the gauge;

magnet means to produce a magnetic field substantially perpendicular to an electric field between the anode and cathode whereby a discharge may be established between the anode and cathode;

means for initiating the discharge, said discharge initiating means being disposed within the vacuum space and emitting electromagnetic radiation directly at at least the cathode where the energy of the electromagnetic radiation is sufficient to release photoelectrons from the cathode to thus initiate the electrical discharge; and

positioning means for removably positioning the discharge initiating means within the vacuum space whereby in the removed position of the discharge initiating means, the gauge is subjected to high temperatures required for bake out, and subsequent thereto, the discharge initiating means is positioned within the vacuum space to effect said discharge whereby the longevity of the discharge initiating means is enhanced due to the removability thereof.

5,198,773

NON-INTRUSIVE GAS-LEVEL MEASUREMENT APPARATUS

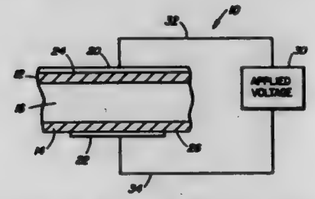
Bryan M. Latta, P.O. Box 328, Wolfville, Nova Scotia, Canada B0P 1X0

Filed Dec. 26, 1990, Ser. No. 634,058

Claims priority, application Canada, Dec. 21, 1990, 2032912

Int. Cl.[5] G01N *27/70*

U.S. Cl. 324—464 15 Claims



1. An apparatus for determining the percentage gas content of an insulating glass window unit, comprising:

means for generating a predetermined electrical voltage capable of causing a continuous electrical discharge in the gas contained within said window unit;

plate electrode means electrically connected to said generating means for connection to the outer surfaces of opposed panes of said window unit;

means for controlling said generating means;

means for monitoring the voltage applied to said electrodes; and

means for converting the monitored voltage into a percent gas content value.

5,198,774

GAS MONITORING APPARATUS

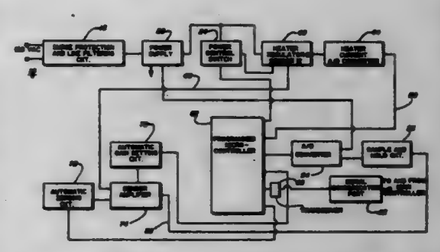
William J. Williams, II, 934 San Carlos Dr., Ft. Myers Beach, Fla. 33931, and Daniel M. Thorsen, 2729 Brattle Ln., Clearwater, Fla. 34621

Continuation of Ser. No. 134,293, Dec. 17, 1987, Pat. No. 4,910,463. This application Mar. 19, 1990, Ser. No. 495,822

The portion of the term of this patent subsequent to Mar. 28, 2007, has been disclaimed.

Int. Cl.[5] G01N *27/62*

U.S. Cl. 324—468 28 Claims



1. Apparatus for detecting an increase of a selected difference in the concentration of a predetermined gas in a gaseous atmosphere from a first level to a second level thereof, said detecting apparatus comprising:

(a) a sensor including a heater/anode element and a collector/cathode element disposed to define a space therebetween through which said gaseous atmosphere flows;

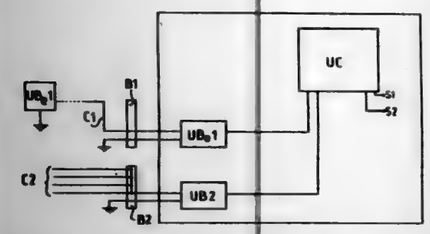
(b) means coupled to said heater/anode element and said collector/cathode element for applying a voltage therebetween, whereby ionization of said predetermined gas causes a current flow between said heater/anode element and said collector/cathode element of a magnitude proportional to the concentration level of said predetermined gas in said gaseous atmosphere;

(c) first control means coupled to one of said elements for detecting an increase in said ionization current flow by a corresponding amount as would indicate that the concentration level of said predetermined gas has increased by said selected difference to provide a manifestation indicative thereof; and

(d) second control means responsive to said increased current manifestation for controlling said voltage supplying means, whereby its voltage is applied between said heater-/anode element and said collector/cathode element is substantially reduced to a magnitude such that said ionization of said predetermined gas and thus said current flow between said collector/cathode element and said heater-/anode element are extinguished so that the life of said sensor is extended.

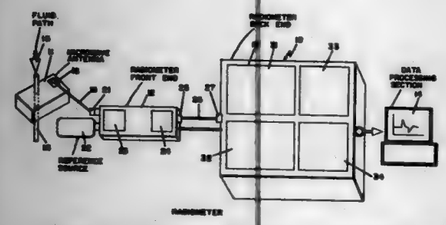
VOL 1148 ISS 5 MR 30 1993

5,198,775
DEVICE FOR VERIFYING THE WATER TIGHTNESS OF METALLICALLY SHEATHED CABLE NETWORKS
Jean Buzinger, La Farlede, and Yves Jacquelin, Meximeux-les-Montrieux, both of France, assignors to Societe Socrat & Balec Sarl, France
PCT No. PCT/FR90/00522, § 371 Date Nov. 9, 1990, § 102(e) Date Nov. 9, 1990, PCT Pub. No. WO91/00990, PCT Pub. Date Jan. 24, 1991
PCT Filed Jul. 11, 1990, Ser. No. 601,830
Claims priority, application France, Jul. 11, 1989, 89 09565; Dec. 4, 1989, 89 16160
Int. Cl.[5] G01N *27/00*
U.S. Cl. 324—544 17 Claims



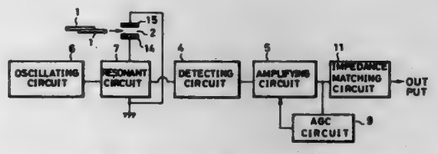
1. A device for verifying the tightness of a plurality of cable assemblies forming a network of cables with a sheathing of metal or a metal part normally connected to ground, comprising:
(a) means for selecting, one by one, the assemblies of cables forming the networks;
(b) means for disconnecting the sheathing of the selected assembly of cables from ground;
(c) means for measuring the insulation resistance of the sheathing of this assembly of cables with respect to ground;
(d) means for comparing said resistance with a predetermined resistance;
(e) means for measuring the electrochemical couple generated by a lack of tightness;
(f) alarm means which go off when a lack of tightness has occurred;
(g) means for recording, processing and supplying all information concerning the said assemblies of cables; and
(h) means for interrogating the system remotely or in-situ.

5,198,776
MICROWAVE SYSTEM FOR DETECTING GASEOUS EMBOLI
Kenneth L. Carr, Harvard, Mass., assignor to Microwave Medical Systems, Inc., Littleton, Mass.
Filed Jun. 26, 1991, Ser. No. 721,107
Int. Cl.[5] G01R *27/04*; A61B *5/05*; A61M *31/00*
U.S. Cl. 324—639 5 Claims



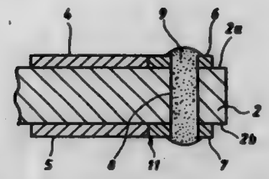
1. A system for detecting the passage of gaseous emboli through a portion of conduit having liquid contents, comprising:
(a) a microwave radiometer which detects energy in the microwave spectrum,
(b) a microwave waveguide which directs emitted microwave energy from the contents of the portion of the conduit to the radiometer,
(c) a signal conversion section which converts the energy at the radiometer into an output signal related to the amplitude of microwave radiation from the contents of the portion of the conduit,
(d) a source of a controlled reference signal,
(e) means of comparing said output signal with said controlled reference signal, and
(f) means of recognizing a change in the results of said comparison indicative of entry of a gaseous embolus into said portion of the conduit.

5,198,777
PAPER THICKNESS DETECTING APPARATUS HAVING A RESONATOR WITH A RESONANCE POINT SET BY A CAPACITANCE DETECTING UNIT
Noboru Masuda, Kawaguchi; Tetsuo Oosawa, Tokyo, and Yasutaka Fujii, Sagamihara, all of Japan, assignors to Murata Mfg. Co., Ltd., Kyoto, Japan
Filed Feb. 12, 1991, Ser. No. 654,425
Claims priority, application Japan, Feb. 14, 1990, 2-13276; Feb. 16, 1990, 2-35571
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—671 9 Claims



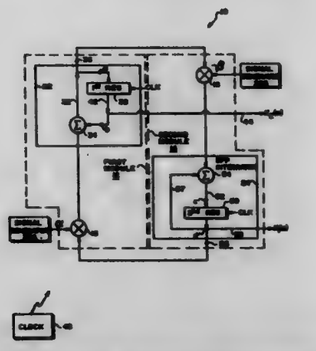
1. A paper thickness detecting apparatus comprising:
an electrode detecting unit constituted by a ground electrode and a detecting electrode arranged in upper and lower positions of a running path of paper to oppose each other;
an oscillating circuit unit for generating an oscillation frequency signal;
a resonant circuit, different from said oscillating circuit unit, for shifting a resonance point in response to a change in electrostatic capacitance corresponding to a change in paper thickness detected by said electrode detecting unit said resonant circuit having a resonator with a first resonance point impedance,
a high-impedance converting circuit which has high impedance to alternating signal current is connected between said oscillating circuit unit and said resonant circuit the impedance of said high-impedance converting circuit being greater than said resonance point impedance of said resonator;
a signal detecting circuit for detecting an output of said resonant circuit for envelope-detecting an output signal from said resonant circuit; and
a high impedance circuit for connecting between said resonant circuit and said signal detecting circuit.

5,198,778
METHOD FOR INSPECTING PRINTED CIRCUIT BOARDS WITH THROUGH-HOLES
Masao Akabane, Iruma, Japan, assignor to Nippon CMK Corp., Japan
Filed Apr. 9, 1991, Ser. No. 682,916
Claims priority, application Japan, Apr. 16, 1990, 2-99859
Int. Cl.[5] G01R *27/08*, *31/02*
U.S. Cl. 324—718 5 Claims



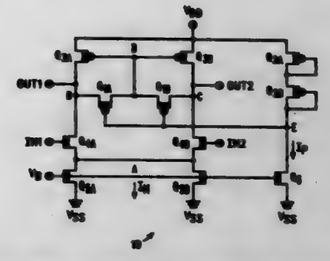
1. A method for inspecting a printed circuit board having through-holes filled with conductive paste between the two sides of the printed circuit board, comprising: providing at least one resistance measurement land on each side and at least one current measurement land on each side of said printed circuit board and forming at least one measurement through-hole adjacent thereto all in a predefined area of the printed circuit board, filling the at least one measurement through-hole with conductive paste during manufacture, and measuring voltage and current through the resistance measurement lands, the current measurement lands and the at least one measurement through-hole with a four-probe method.

5,198,779
DIGITAL OSCILLATOR
Leonard T. Bruton, Alberta, Canada, assignor to NovAtel Communications Ltd., Calgary, Canada
Filed Apr. 29, 1992, Ser. No. 876,804
Int. Cl.[5] G06F *15/34*
U.S. Cl. 328—14 27 Claims



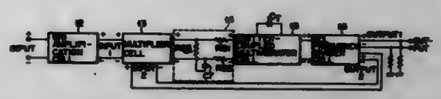
1. A digital oscillator for generating pairs of sampled sinusoidal signals having pre-selected phase relationships, said digital oscillator comprising first and second interconnected multiplying-integrating modules, each module having a multiplier for multiplying an input signal by a first coefficient, and a digital integrator for integrating the product over a period of time and thereby generating a different one of the sampled sinusoidal signals, and generating the input signal for the multiplier of the other module.

5,198,780
ADJUSTABLE GAIN DIFFERENTIAL AMPLIFIER
Kiyoshi Kase, Tokyo, Japan, assignor to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 696,864, May 6, 1991, abandoned. This application Apr. 28, 1992, Ser. No. 876,750
Claims priority, application Japan, May 28, 1990, 2-139333
Int. Cl.[5] H03F *3/45*; H03G *3/30*
U.S. Cl. 330—254 4 Claims



1. An adjustable gain differential amplifier comprising:
a balanced gain amplifier having a plurality of outputs;
said balanced gain amplifier having an output current wherein the value of said output current is equal at each of said plurality of outputs;
a means for controlling gain in said balanced gain amplifier, said means for controlling comprising a voltage generator and a temperature stable variable current source;
said temperature stable variable current source driving a variable current through said voltage generator;
a first control bias (VDD) coupled to said balanced gain amplifier and said voltage generator;
said voltage generator supplying a voltage to said balanced gain amplifier;
said balanced gain amplifier comprising a current generator to generate said output current; and
a gain of said balanced gain amplifier which is output at said plurality of outputs determined according to the ratio of said output current and said variable current from said temperature stable variable current source.

5,198,781
CUSTOM INTEGRATED CIRCUIT COMPOSED OF A COMBINATION OF ANALOG CIRCUIT CELLS DESIGNED TO OPERATE IN CURRENT MODE
Hiromi Kanbashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 17, 1991, Ser. No. 731,329
Claims priority, application Japan, Jul. 19, 1990, 2-189531
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—257 6 Claims



1. A custom semiconductor integrated circuit having an arrangement which is constructed by connecting in cascade a plurality of analog circuit cells, said analog circuit cells having functions different from each other, comprising:
a first analog circuit cell formed as a first-stage of the cascade connected analog circuit cells, and constituting an input interface for receiving a first signal;
a second analog circuit cell formed as a final-stage of the

cascade connected analog circuit cells, and constituting an output interface for outputting a second signal; and

a third analog circuit cell, connected between said first and second analog circuit cells, having a current-sink input terminal and a current-source output terminal in order to thereby facilitate impedance matching between respective input and output terminals of said cascade connected analog circuit cells, said third analog circuit cell operating in a current mode and performing differential input signal processing,

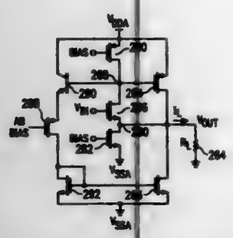
wherein said first analog circuit cell formed as said first-stage of said cascade connected analog circuit cells is connected to said third analog circuit cell at said current-sink input terminal and said second analog circuit cell formed as said final-stage of said cascade connected analog circuit cells is connected to said third analog circuit cell at said current-source output terminal.

5,198,782

LOW DISTORTION AMPLIFIER OUTPUT STAGE FOR DAC

Jeffrey W. Scott, Austin, Tex., assignor to Crystal Semiconductor, Austin, Tex.

Filed Jan. 15, 1991, Ser. No. 641,182
Int. Cl.[5] H03F 3/16
U.S. Cl. 330—277 7 Claims



1. A low distortion output stage for a digital-to-analog convertor for driving a load, comprising:

a source follower transistor having a source/drain path and a gate, the gate for receiving an input voltage and the source thereof connected to one side of the load;

a first constant current source disposed on one side of the source/drain path of said source follower transistor;

a second constant current source disposed on the opposite side of the source/drain path of said source follower transistor, said first and second constant current sources providing a substantially constant drain current through the source/drain of said source follower transistor;

a first variable current source for sourcing current to the load when the voltage on the load requires current to be sourced thereto;

a second variable current source for sinking current from the load when the voltage on the load requires current to be sinked therefrom; and

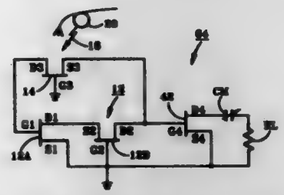
a feedback network for sensing the current through said source follower transistor and controlling said first and second variable current sources to source or sink current, respectively, to the load to substantially eliminate current draw from said source follower transistor to thereby maintain the current through said source follower transistor equal to current through said first and second constant current sources.

5,198,783

OPTICALLY CONTROLLED ACTIVE IMPEDANCE ELEMENT PARTICULARLY SUITED FOR A MICROWAVE OSCILLATOR

William D. Jemison, Ambler, and Peter R. Herczfeld, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1992, Ser. No. 843,677
Int. Cl.[5] H03B 5/00
U.S. Cl. 331—66 6 Claims



1. An optically controlled oscillator comprising:

(a) a cascode arrangement of first and second transistor devices having an input and an output stage;

(b) a third transistor device responsive to an optical signal generated from an optical source having an adjustable light intensity, said third transistor arranged as a feedback element between said input and output stages; and

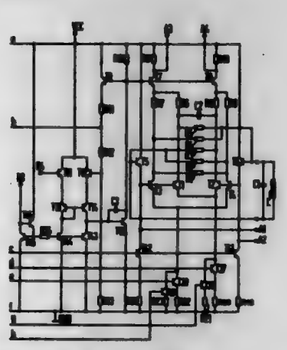
(c) a fourth transistor having input and output stages, the input stage of said fourth transistor connected to the output stage of said first and second transistor, said fourth transistor generating an output signal in response to a signal applied to its input stage.

5,198,784

FREQUENCY MODULATED OSCILLATOR HAVING CONTROLLABLE CURRENT SOURCES

Josef Fenk, Eching/Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1992, Ser. No. 871,043
Claims priority, application European Pat. Off., Apr. 19, 1991, 91 106 336.0
Int. Cl.[5] H03B 5/12; H03C 3/02
U.S. Cl. 331—117 R 5 Claims



1. An oscillator circuit, comprising:

an oscillator stage including a first and a second transistor of a first conduction type having emitters being coupled to one another, collectors and bases,

a third and a fourth transistor of the first conduction type having emitters being coupled to one another, collectors and bases,

the bases of said first and third transistors being coupled to one other, and the bases of said second and fourth transistors being coupled to one another,

a fifth transistor of the first conduction type having an emitter connected to the coupled bases of said first and third transistors, a collector connected to a first supply potential and a base forming a terminal,

a frequency-determining feedback element connected to said terminal,

a sixth transistor of the first conduction type having an emitter connected to the coupled bases of said second and fourth transistors, a collector connected to the first supply potential and a base forming another terminal for said frequency-determining feedback element,

a first resistor connected between the collectors of said third and fourth transistors, a second resistor connected between the base of said fifth transistor and the collector of said fourth transistor, a third resistor connected between the base of said fifth transistor and the collector of said second transistor, a fourth resistor connected between the base of said sixth transistor and the collector of said third transistor, and a fifth resistor connected between the base of said sixth transistor and the collector of said first transistor,

a seventh and an eighth transistor of the first conduction type having collectors connected to the first supply potential, emitters and bases,

a sixth resistor connected between the emitter of said seventh transistor and the collector of said first transistor, and a seventh resistor connected between the emitter of said seventh transistor and the collector of said third transistor,

an eighth resistor connected between the emitter of said eighth transistor and the collector of said second transistor, and a ninth resistor connected between the emitter of said eighth transistor and the collector of said fourth transistor,

a first current source connected between a second supply potential and the emitter of said fifth transistor, and a second current source connected between the second supply potential and the emitter of said sixth transistor,

a ninth transistor of the first conduction type having a collector connected to the first supply potential and a base connected to the bases of said seventh and eighth transistors,

a tenth resistor connected between the first supply potential and the base of said ninth transistor,

a tenth transistor of the first conduction type having a collector connected to the base of said ninth transistor and an emitter connected to the second supply potential,

an eleventh, a twelfth and a thirteenth resistor connected in series between the emitter of said ninth transistor and the second supply potential, said eleventh, twelfth and thirteenth resistors having pickups therebetween,

an eleventh and a twelfth transistor of the first conduction type having coupled collectors connected to the first supply potential and having bases, the base of said eleventh transistor being connected to a first bias potential and the base of said twelfth transistor being connected to the pickup between said twelfth and thirteenth resistors,

a thirteenth and a fourteenth transistor of the second conduction type having emitters, collectors and bases, the emitter of said thirteenth transistor being connected to the emitter of said eleventh transistor and the emitter of said fourteenth transistor being connected to the emitter of said twelfth transistor, and

a third current source connected between the second supply potential and the base and the collector of said thirteenth transistor, and a fourth current source connected between the second supply potential and the collector of said fourteenth transistor and the base of said tenth transistor; and

at least one trigger stage having a first controllable current source connected between the second supply potential and the coupled emitters of said third and fourth transistors, and a second controllable current source connected between the second supply potential and the coupled emitters of said first and second transistors, said first and second controllable current sources having control inputs,

a fifteenth transistor of the first conduction type having a collector connected to the first supply potential, a base forming a signal input, and an emitter,

a sixteenth transistor of the first conduction type having a collector connected to the first supply potential, a base connected to the pickup between said eleventh and twelfth resistors, and an emitter,

a fifth current source connected between the second supply potential and the emitter of said fifteenth transistor, and a sixth current source connected between the second supply potential and the emitter of said sixteenth transistor,

a seventeenth and an eighteenth transistor of the first conduction type having coupled collectors connected to the first supply potential, having emitters each being connected to one of the control inputs of a respective one of said first and second controllable current sources, and having bases,

a nineteenth transistor of the first conduction type having a collector connected to the base and a base connected to the emitter of said seventeenth transistor;

a twentieth transistor of the first conduction type having a collector connected to the base and a base connected to the emitter of said eighteenth transistor;

a twenty-first and a twenty-second transistor of the second conduction type having emitters each being connected to a respective auxiliary potential, bases each being connected to the emitter of a respective one of said fifteenth and sixteenth transistors, and collectors each being connected to the base of a respective one of said seventeenth and eighteenth transistors, and

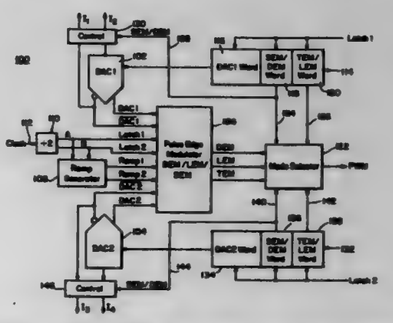
a fourteenth and a fifteenth resistor each being connected between the second supply potential and the emitter of a respective one of said nineteenth and twentieth transistors.

5,198,785

DUAL EDGE PULSE WIDTH MODULATION SYSTEM

Edward P. Jordan, Greensboro, N.C., assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 29, 1992, Ser. No. 890,949
Int. Cl.[5] H03K 7/08
U.S. Cl. 332—109 24 Claims



1. A dual edge pulse width modulation system comprising:

a ramp generator for generating a voltage ramp;

an n bit digital to analog converter having a normal and an inverted output for establishing a leading edge and a trailing edge reference;

comparator means, responsive to said ramp and to said leading edge and trailing edge references, respectively, for defining the leading edge and the trailing edge of a pulse; and

pulse generating means for producing a pulse having the width determined by the defined leading and trailing edge.

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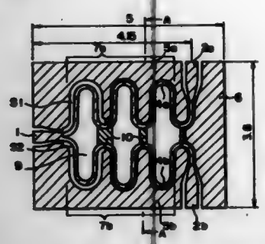
5,198,796
WAVEGUIDE TRANSITION CIRCUIT
Mark E. Russell, Londonderry, N.H., and Dominic V. Restaguo, Waltham, Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Dec. 4, 1991, Ser. No. 803,317
Int. Cl.[5] H01P 5/107
U.S. Cl. 333—26 11 Claims

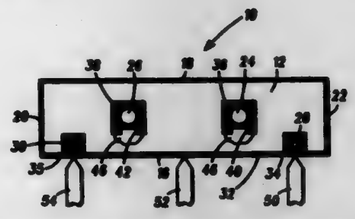
1. A transition circuit comprising:
a section of waveguide transmission line having an inner cavity with a conductive wall, the section of waveguide further having an end wall with a cylindrical void;
a conductive pin;
a first dielectric member disposed about a first portion of said conductive pin and extending within the cylindrical void of the end wall;
a second dielectric member disposed within the inner cavity and disposed about a second, different portion of said conductive pin and having a first surface disposed adjacent to a first surface of said first dielectric member; and
a strip conductor disposed on a second surface of said second dielectric member and coupled between said conductive pin and said conductive wall.

5,198,797
WAVEGUIDE FOR DIVIDING AND COMBINING MICROWAVES
Eiichi Sano, Tokyo; Masahito Aso, Chiba, and Masayuki Nakajima, Tokyo, all of Japan, assignors to Tokimec, Inc., Tokyo, Japan
Filed Sep. 12, 1991, Ser. No. 758,823
Claims priority, application Japan, Nov. 20, 1990, 2-315592
Int. Cl.[5] H01P 3/08, 5/12
U.S. Cl. 333—128 18 Claims



1. A waveguide for dividing and combining microwaves, comprising a first port, a pair of second ports and a pair of quarter-wavelength impedance transformers, each of said quarter-wavelength impedance transformers having the first port as its first terminal and one of the second ports as its second terminal and including:
(a) a strip transmission line connected between the first terminal and the second terminal and having a width progressively increasing from the first terminal toward the second terminal;
(b) a ground conductor located adjacent and spaced from said strip transmission line, said ground conductor serving as a grounded potential mutually to the adjacent strip transmission line; and
(c) a dielectric substrate supporting thereon said strip transmission line and said ground conductor.

5,198,798
LASER TUNING OF CERAMIC BANDPASS FILTER
James R. Phillips; Ali Tootoonchi, and John F. Dalles, all of Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 1, 1991, Ser. No. 786,611
Int. Cl.[5] H01P 1/202
U.S. Cl. 333—207 14 Claims

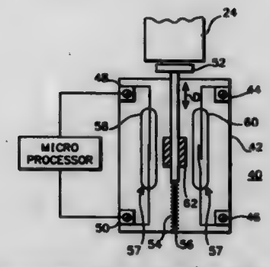


1. A laser tuning method for tuning a ceramic bandpass filter to selectively pass a radio frequency signal having a desired measurable characteristic, said filter comprising a ceramic block having a cavity forming a resonator and at least one element formed of a metal plate applied to a surface region of said block and having a size and shape such that the characteristic is related to the size and shape of the plate, said method comprising the steps of
fabricating an untuned filter comprising said block and an undersized metal plate corresponding generally to said element and having a size and shape insufficient to obtain the desired characteristic,
applying a thick film of a metal powder paste to said block adjacent to the undersized metal plate, said paste being composed of metal particles in an expendable binder,
applying an input signal to the untuned filter,
monitoring an output signal from the filter in response to said input signal to measure a value of the characteristic,
scanning said paste film with an laser beam to vaporize the binder and to sinter the metal particles to form an integral plate, said laser beam scanning a path in contact with the undersized plate to increase the size and shape of the element, and
discontinuing said laser scanning upon achieving a desired measured value for the characteristic and thereby producing a tuned filter.

5,198,789
LOGIC LEVEL ELECTRICAL INTERLOCK DEVICE
Glen D. Taylor, Fayetteville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 25, 1991, Ser. No. 735,600
Int. Cl.[5] H01H 67/02
U.S. Cl. 335—132 16 Claims

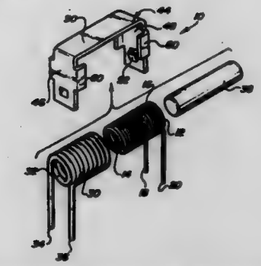
1. An electrical control device used with a motor energized by an electric power source, comprising:
an armature carrying a pair of separable contacts, said armature being movable between open and closed positions to open and close said separable contacts to selectively connect said motor to said electric power source;
a magnetic core having an associated coil means, said coil means when energized, causes said magnetic core to attract said armature to a closed position;
a plunger member movable with said armature between said open and closed positions;
logic level sensing means adjacent said plunger member; and

activation means carried by said plunger member selectively activating said sensing means to generate a logic level



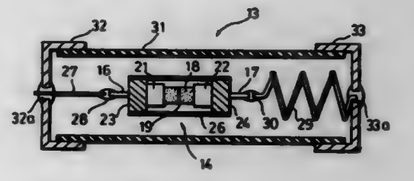
signal representative of the position of said separable contacts, as said plunger member moves with said armature between said open and closed positions.

5,198,790
ELECTRICAL TRANSDUCER
David I. Elow, Owosso, Mich., assignor to Toledo Commutator Co., Owosso, Mich.
Filed Apr. 27, 1992, Ser. No. 874,508
Int. Cl.[5] H01F 15/02, 27/26
U.S. Cl. 336—83 5 Claims



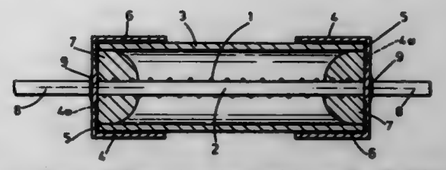
1. A transducer for detecting an electrical pulse from a circuit and for generating an output signal in response to each pulse comprising:
a first electric coil having two ends adapted for connection with the circuit,
a second electric coil having two ends on which said output signal is generated,
a rod constructed of a ferromagnetic material, said rod extending through said coils,
a housing constructed of a ferromagnetic material, said housing having two spaced portions which contact opposite ends of said rod, said housing is generally U-shaped having spaced apart and generally parallel side legs and an intermediate leg, said rod contracting portions being provided on said side legs,
means integral with said housing for attaching said housing and said rod together, and
wherein said attaching means comprises a tab formed on each side leg, said tabs facing towards each other, each tab entrapping its respective end of said rod between said tab and said intermediate leg.

5,198,791
SURGE ABSORBER
Takashi Shibuyama; Kazuyuki Arai, and Fujio Ikeda, all of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan
Filed Feb. 3, 1992, Ser. No. 829,420
Claims priority, application Japan, Feb. 5, 1991, 3-35524
Int. Cl.[5] H01H 83/10; H02H 1/00
U.S. Cl. 337—31 4 Claims



1. A surge absorber comprising:
a) a surge absorbing element;
b) first and second wire means for electrically connecting the surge absorbing element across the input lines of an electronic device, the surge absorbing element being serially connected between the first and second wire means by first and second conductive heat releasable means, respectively;
the second wire means comprising a spring loaded member;
wherein on release of the first or second wire means by the first or second heat releasable means, the connection between the surge absorbing element and the input lines is disrupted; and
wherein the assembly of the surge absorbing element and the first and second wire means is enclosed in a housing of an insulating material, and the first and second wire means extend exterior of the housing to provide connection therefore with the input lines of the electronic device.

5,198,792
ELECTRICAL FUSES AND METHOD OF MANUFACTURE
Martin D. Bacon; Peter J. Drayton, and Reginald R. Peterson, all of Frome, England, assignors to Cooper Industries, Inc., Houston, Tex.
Filed Jan. 12, 1992, Ser. No. 898,054
Int. Cl.[5] H01H 85/143; H01R 43/00
U.S. Cl. 337—251 13 Claims



1. A method of manufacturing a miniature electrical fuse having a fusible element located within a tubular housing made of insulating material, the element being connected between electrically conducting end caps which close off the opposite ends of the housing, and the end caps having electrical lead wires connected thereto to permit the fuse to be connected into a circuit without use of a fuse holder, said method comprising,
forming a sub-assembly by uniting each end of the tubular housing and the element to the end caps with a solder alloy while maintaining an axial force on each end cap to urge each end cap into direct mechanical contact with the pertaining end face of the housing such that solder is substantially absent from the site of said direct mechanical contact,

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and, subsequently to the solder having solidified, simultaneously resistance welding the lead wires directly to the end caps of the sub-assembly using opposed thrust forces which via the end caps are transmitted through the said direct mechanical contacts to the tubular housing,

wherein the end caps are selected to have comparatively thick base portions and thin side walls, the thickness ratio being within the range 1.3 to 1 and 2.1 to 1, and the solder alloy is selected to have a comparatively high melting point, in excess of 180° C., whereby the sub-assembly is sufficiently robust to withstand the forces involved in the resistance welding process, the side walls of the end caps are sufficiently thin and elastic not to damage the housing when they contract in the solder cooling phase after the caps are soldered to the housing, the solder is of sufficiently high melting point to prevent displacement of the fusible element or the solder joints of the sub-assembly during the resistance welding process, and the end faces of the housing are accurately plan-parallel and orthogonal to the axis of the housing.

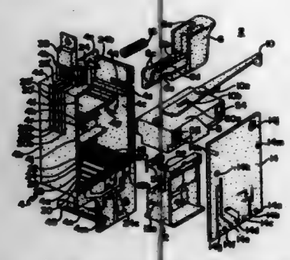
13. A miniature electrical fuse comprising a fusible element (1) located within a tubular housing (3) made of insulating material and connected between electrically conducting end caps (4) which close off the opposite ends of the housing (3), and an electrical lead wire (8) is secured to each end cap (4), wherein the thickness of that part of the base of each end cap (4) to which a lead wire (8) is secured is greater than the thickness of the side wall of the cap (4) in a ratio between 1.3 to 1 and 2.1 to 1.

5,198,793

ELECTRIC CONTROL APPARATUS COMPRISING INTEGRAL ELECTRICAL CONDUCTORS PLATED ON A TWO-SHOT MOLDED PLASTIC INSULATING HOUSING

Denis J. Levesque, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 30, 1991, Ser. No. 737,857
Int. Cl.[5] H01C *10/30*
U.S. Cl. 338—172 34 Claims



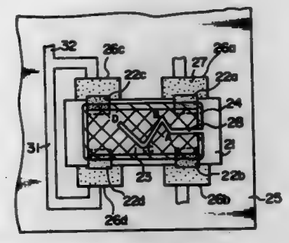
1. A trigger operated electric control comprising an insulating housing comprising a plurality of contiguously arranged walls defining a cavity having an open side and a cover disposed over said open side, switch contacts and a potentiometer located in said cavity, a trigger operator located in part in said cavity and being operably connected to said switch contacts and said potentiometer, terminals connectable to a source of electric power, and a plurality of electrical conductors on surfaces of said walls, said conductors being electrically continuous between surfaces of contiguous said walls and said cover electrically interconnecting said switch contacts, potentiometer and terminals.

5,198,794

TRIMMED RESISTOR

Terahiro Sato, and Tomio Wada, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 21, 1991, Ser. No. 672,935
Claims priority, application Japan, Mar. 26, 1990, 2-73239; Mar. 26, 1990, 2-73240; Jul. 30, 1990, 2-202114
Int. Cl.[5] H01C *10/46*
U.S. Cl. 338—195 17 Claims



1. A trimmed resistor, comprising:

four external electrodes which are arranged at peripheral portions of a rectangular insulation base plate in a point symmetrical distribution about a vertical center line of a main surface of said insulation base plate, and

a film-like resistance body which is formed on said insulation base plate and connected with all of said external electrodes, said resistance body including a cut slit extending along a longituding axis of said resistance body and between two adjacent ones of said external electrodes,

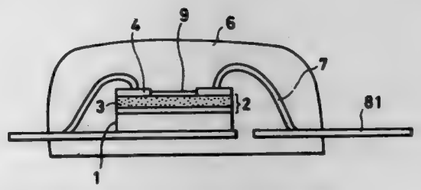
whereby a resistance value of said resistance body between said two adjacent external electrodes is varied by said cut slit as a result of a variation of a sectional area and length of said resistance body between said two adjacent external electrodes.

5,198,795

MAGNETOELECTRIC TRANSDUCER AND PROCESS FOR PRODUCING THE SAME

Ichiro Shibasaki; Takashi Ito, and Yuichi Kanayama, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1991, Ser. No. 679,181
Claims priority, application Japan, Apr. 4, 1990, 2-88190
Int. Cl.[5] H01L *43/02*
U.S. Cl. 328—32 H 20 Claims



1. A magnetoelectric transducer, comprising:

an insulating substrate; and

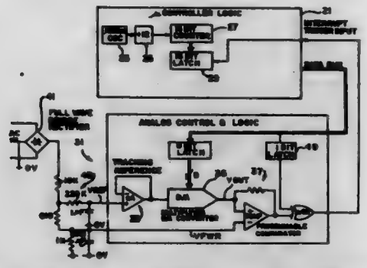
an InAs epitaxial thin film overlaying said insulating substrate as a magneto-sensitive portion, said InAs thin film having a thickness of 0.2 to 1.4 μm and having two portions different in electron mobility with each other, said portions including a higher electron mobility portion and a lower electron mobility portion, said higher electron mobility portion being doped with a donor impurity.

5,198,796

OUTBOUND SIGNAL DETECTOR SYSTEM AND METHOD

John B. Hessling, Jr., St. Charles, Mo., assignor to Distribution Control Systems, Inc., Hazelwood, Mo.

Filed Jan. 27, 1991, Ser. No. 722,134
Int. Cl.[5] H04B *23/00*; H04M *11/00*
U.S. Cl. 340—310 A 33 Claims



1. In a communication system in which outbound information is carried by cyclic waveforms over an electric power distribution network, said information being transmitted in the form of multi-bit messages, a signal detection method for detecting the outbound messages at a location physically separated from the source of the outbound messages, said signal detection method comprising:

(a) obtaining signal data by sampling the cyclic waveform over a predetermined portion of successive cycles;

(b) dividing the predetermined portion into a plurality of predetermined ranges;

(c) from a predetermined number of bits at the start of each message, selecting the particular predetermined range which contains the greatest signal strength;

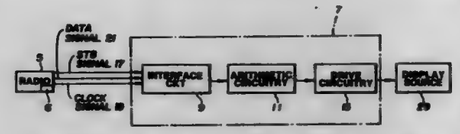
(d) for the remaining bits of the message, analyzing only those samples in the selected range to detect the outbound message.

5,198,797

HEADS-UP DISPLAY ARRANGEMENT FOR VEHICLE

Shigetoshi Daidoji, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Apr. 12, 1991, Ser. No. 684,099
Claims priority, application Japan, May 11, 1990, 2-122351
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—425.5 4 Claims



1. A heads-up display arrangement for a vehicle having a front window panel, and a radio receiver with an automatic tuning mechanism, comprising:

a combiner arranged on the front window panel;

a projector optically connected to said combiner, said projector projecting on said combiner a value provided thereto representing a frequency received by the radio receiver; and

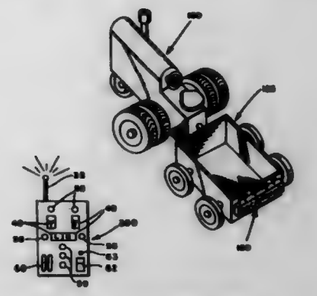
means for canceling provision of said value of frequency to said projector while the automatic tuning mechanism is in operation.

5,198,798

WIRELESS TAILLIGHT SYSTEM

Larry Lietzow, 4713 Walnut St., Mantua, Ohio 44255, and Anthony Dechiara, 8833 Indian Hills Cr., Canal Fulton, Ohio 44614

Filed Mar. 2, 1992, Ser. No. 844,514
Int. Cl.[5] G08B *1/08*; B60Q *1/26*
U.S. Cl. 340—539 18 Claims



1. A wireless taillight system comprising:

a taillight module adapted to be removably mounted on a vehicle, said taillight module including at least one signal lamp selectively illuminable by an electrical power source to provide visual information concerning a particular condition of the vehicle and said taillight module including means for receiving a transmitted wireless control signal and for enabling the power source to illuminate the signal lamp upon receipt thereof;

a portable transmitter module powered by a power source carried thereby independent from the vehicle, said transmitter module selectively operable by an operator to transmit the wireless control signal to the taillight module;

said taillight module including means for transmitting a wireless feedback signal concerning one or more of: a condition of the taillight module signal lamp; a condition of the power source; and whether a function selected by the operator has occurred; and

said transmitter module including means for receiving the feed-back signal and for providing information to the operator derived therefrom.

5,198,799

OPTO-ELECTRONIC SECURITY FENCE

Danny Pascale, Montreal, Canada, assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 26, 1991, Ser. No. 766,500
Int. Cl.[5] G08B *13/18*; H04B *1/38*
U.S. Cl. 340—552 4 Claims

1. A post for use in an electromagnetic security fence comprising;

a plurality of electromagnetic energy beam transmitters;

a plurality of electromagnetic energy beam receivers;

a processing unit for modulating the electromagnetic energy beam transmitted from said transmitters for adding information to the beam;

batteries for providing power for operation;

means for communicating with a computer at a remote surveillance headquarters;

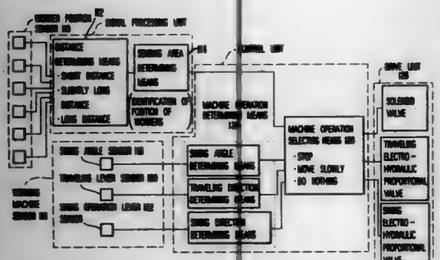
a detector for detecting when the electro-magnetic energy beam to a receiver is interrupted; and

memory means for storing information concerning an interruption in the electromagnetic beam received by one of

VOL 1148 ISS 5 MR 30 1993 UMI

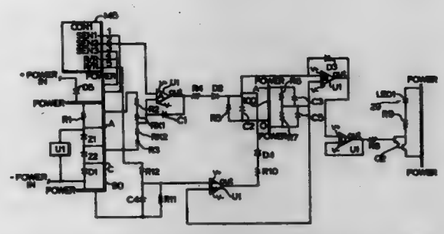
said receivers when such information cannot be communicated to the computer at the remote surveillance headquarters and for sending the information when the communication is reestablished.

5,198,800
ALARM SYSTEM FOR CONSTRUCTIONAL MACHINE
Shoji Tezawa, Kobe; Saburo Tanaka, Ohno, and Makoto Iga, Kakogawa, all of Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan
Filed Jan. 17, 1991, Ser. No. 716,526
Claims priority, application Japan, Jan. 21, 1990, 2-163064
Int. Cl.[5] G08B *23/00*; B66C *13/16*; H04B *1/40*
U.S. Cl. 340—573 9 Claims



1. An alarm system for a constructional machine including an upper structure which is swingably supported by a lower structure, the alarm system comprising:
a worker position sensor for sensing the positions of workers who are working within the working range of the machine, said working range comprising a plurality of predetermined identifying areas;
distance determining means responsive to said worker position sensor for determining the relative distance between each of said workers and said machine;
workers sensing area determining means responsive to said distance determining means for identifying the positions of said workers in said plurality of predetermined identifying areas;
a machine sensor means for sensing the swing angle of said upper structure, the traveling direction of said lower structure, and the swing direction of said upper structure;
machine operation determining means responsive to said machine sensor means for determining said swing angle, said traveling direction, and said swing direction of said machine;
machine operation selecting means responsive to said machine operation determining means for selecting one of three operational modes for said machine (stop, go, slow); and
a drive unit responsive to said machine operation selecting means for driving said machine.

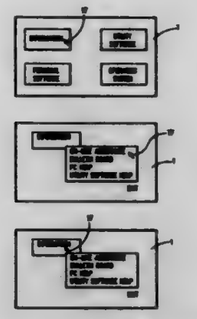
5,198,801
LOW AMPERAGE DUEL SENSING FIRE DETECTOR
Jack Duggan, Markham, and Michael J. Heslop, Rexdale, both of Canada, assignors to Fire Detection Devices Ltd., Markham, Canada
Filed Jan. 18, 1990, Ser. No. 466,864
Int. Cl.[5] G08B *17/06*
U.S. Cl. 340—589 5 Claims



1. A resettable fire detection device comprising in combination a rate of temperature rise sensor, an electronic temperature sensor, and electronic circuitry, said electronic circuitry cooperating with said temperature sensor to define a fixed temperature actuation point, said electronic circuitry being connected to both sensors for producing an alarm signal if either the rate of rise sensor is activated or the fixed temperature actuation point is exceeded and for maintaining said alarm signal once activated until a reset signal is received and wherein said device in use normally has an amperage draw of less than 200 micro-Amps and when actuated, has a large amperage draw, said device being connected between parallel electrical lines, said alarm signal being produced when a substantial drop in voltage occurs caused by said resettable fire detection device detecting a condition actuating said rate of rise sensor or detecting a condition exceeding said fixed temperature actuation point and causing said substantial drop in voltage between the two parallel electrical lines.

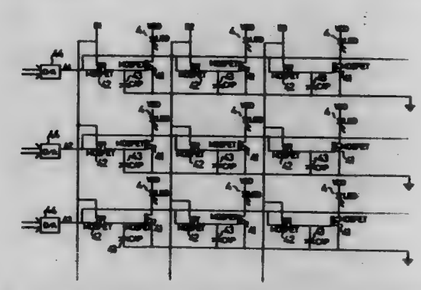
5,198,802
COMBINED KEYBOARD AND MOUSE ENTRY
Randal L. Bertram, Lexington, Ky.; Pedro C. Rodriguez, Delray Beach, and John P. Wright, Boca Raton, both of Fla., assignors to International Business Machines Corp., Armonk, N.Y.
Continuation of Ser. No. 451,388, Dec. 15, 1989, abandoned.
This application Dec. 20, 1991, Ser. No. 814,196
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—709 40 Claims

1. Computing apparatus comprising a microprocessor, means including said microprocessor to execute operating code, means to display symbols and a cursor for selection of certain said operating code, a keyboard to position said cursor, a cursor traversing device to position said cursor, means including either said keyboard or said traversing device for an operator of said computing apparatus to select said certain operating code by positioning said cursor near selected ones of said displayed symbols and activating a selection signal, and said microprocessor comprising a first control means to move said cursor when said display is changed by said selection from



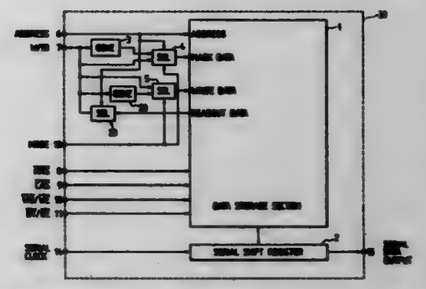
said keyboard and to not move said cursor when said display is changed by said selection from said traversing device.

5,198,803
LARGE SCALE MOVIE DISPLAY SYSTEM WITH MULTIPLE GRAY LEVELS
Jin S. Shie; Jiann C. Horng, both of Hsinchu; Kwang S. Tzeo, Kaohsiung; Kuang C. Tao, Hsinchu; Yann T. Hsieh, Hsinchu; Shou C. Chiou, Hsinchu, and Der C. Yao, Hsinchu, all of Taiwan, assignors to Opto Tech Corporation, Taiwan
Filed Jan. 6, 1990, Ser. No. 533,855
Int. Cl.[5] G09G *3/32*
U.S. Cl. 340—782 2 Claims



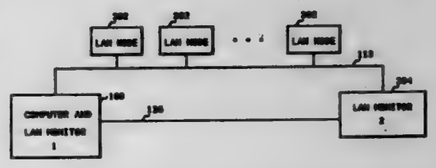
1. A large scale electronic display board system for displaying images in response to an image signal, said system comprising:
light emitting diode (LED) display for displaying images in multiple gray levels, said LED display being an N by M array of LEDs, where N and M are integers greater than or equal to 2, having a common ground and a common voltage source; and
a current image circuit corresponding to each LED in said LED display for linearly controlling a gray level of said LED, each current image circuit comprising:
a MOSFET large channel width transistor connected to said LED for lighting said LED in accordance with said image signal,
a MOSFET control transistor connected to said large channel width transistor for supplying said image signal to said large channel width transistor in response to a control signal,
a holding capacitor connected between a drain of said control transistor and said common ground for refreshing said image signal supplied to said large channel width transistor,
a MOSFET small channel width transistor connected to said control transistor for supplying said image signal to said control transistor, said large channel width transistor having a channel width which is a multiple of a channel width of said small channel width transistor.

5,198,804
VIDEO MEMORY WITH WRITE MASK FROM VECTOR OR DIRECT INPUT
Toshiki Mori, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 29, 1990, Ser. No. 545,782
Claims priority, application Japan, Jul. 17, 1989, 1-184086
Int. Cl.[5] G09G *1/02*
U.S. Cl. 340—799 10 Claims



1. A video memory comprising:
a data storage section having a predetermined bit width of data writing and reading;
a data input terminal having a predetermined bit width and being subjected to input data which represents a write start position and a write end position;
means for generating mask data on the basis of the write start position and the write end position represented by the input data, and for feeding the mask data to the data storage section; and
means for generating write data on the basis of at least part of an input signal, and for feeding the write data to the data storage section;
wherein the bit width of data writing and reading of the data storage section is greater than the bit width of the data input terminal.

5,198,805
METHOD AND APPARATUS FOR MONITORING A NETWORK AND LOCATING A NODE USING SIGNAL STRENGTH CALCULATIONS
Charles H. Whiteside, and Stephen M. Ernst, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 577,396, Sep. 4, 1990, abandoned. This application Feb. 28, 1992, Ser. No. 844,964
Int. Cl.[5] G01R *31/08*; H04J *3/14*
U.S. Cl. 340—825.06 19 Claims



1. A system for determining a location of a node sending a

each including a stand-by interface element and interface closed switch points is connected, and switching means con-

signal through a cable of a local area network, said system comprising:

a first signal level determining means connected at a first end location on said cable, said first signal level determining means producing a first digital signal level for a preamble of said signal when said preamble is detected in said cable, said first signal level determining means comprising

bandpass filter means for removing any components of said signal having a frequency outside a fundamental frequency of said preamble of said signal,

sample and hold means for determining an analog signal level of an output of said bandpass filter means and for maintaining said analog signal level over a period of time, and

analog to digital conversion means for converting said analog signal level to said first digital signal level;

a second signal determining means connected at a second end location on said cable, said second signal level determining means producing a second digital signal level for a preamble of said signal when said preamble is detected in said cable, said second signal level determining means comprising

bandpass filter means for removing any components of said signal having a frequency outside a fundamental frequency of said preamble of said signal,

sample and hold means for determining an analog signal level of an output of said bandpass filter means and for maintaining said analog signal level over a period of time, and

analog to digital conversion means for converting said analog signal level to said second digital signal level;

calculating means connected to said first digital signal level determining means and said second digital signal level determining means for determining said location of said node.

5,198,806

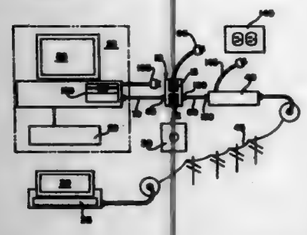
REMOTE CONTROL AND SECURE ACCESS FOR PERSONAL COMPUTERS

John J. Lord, Springfield, Ill., assignor to Lord & Sebastian, Inc., Springfield, Ill.

Filed Dec. 31, 1990, Ser. No. 636,135

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.31 **19 Claims**



1. A secure activator device for use in activating computer equipment remotely, comprising:

a first computer system having an interconnect means for communicating with other computers remotely, said first computer system having a first modem in electrical communication with said interconnect means;

at least one second computer system having an interconnect means for communicating with other computers remotely, said at least one second computer system having a second modem in electrical communication with said interconnect means; and

activator means for providing power to said first computer system, said activator means in electrical communication between said first modem and said second modem by said interconnect means, such that when at least one said second computer system requests data communication with said first computer system by communicating a password to said activator means, which upon recognition thereof said activator means provides power to said first computer system and thereupon authentication of the password by computer software stored in said first computer system, said activator means provides electrical communication access to said first computer system.

5,198,807

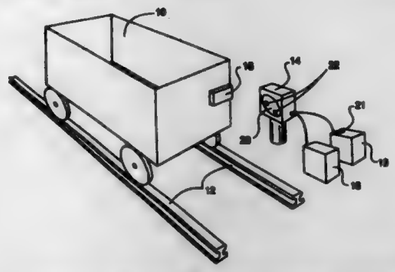
METHOD AND APPARATUS FOR PRODUCING A SUBCARRIER SIGNAL FOR TRANSMISSION BY AN INDUCTIVELY COUPLED TRANSPONDER

Philip R. Troyk, Morton Groves, and Glenn A. DeMichele, Chicago, both of Ill., assignors to Trovan Limited, United Kingdom

Continuation of Ser. No. 420,798, Oct. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 358,310, May 26, 1989, Pat. No. 5,012,236. This application Jan. 5, 1991, Ser. No. 711,358

Int. Cl.[5] H04B *7/00*

U.S. Cl. 340—825.54 **12 Claims**



1. A method of generating an electromagnetic identifying signal in response to receipt of a transmitted electromagnetic interrogating signal alternating at a first frequency, comprising:

converting the received interrogating signal into a power signal and a modulating signal including a series of pulses occurring at a second frequency;

using said power signal to retrieve at a predetermined bit rate a stored identifying digitally coded signal comprised of a string of "1" bits of a first logic state and "0" bits of a second logic state;

using said digitally coded signal to shift the phase of a block of said modulating signal pulses when the state of a particular bit of said coded signal is of said first state, and to not shift the phase of a like block of said modulating signal pulses when the state of a bit is of said second state; and

using the phase-shifted modulating signal to amplitude-modulate said interrogating signal and to cause the resulting electromagnetic identifying signal to be retransmitted in the form of a subcarrier signal the phase of which is shifted by 180° when a "1" bit is retransmitted and is not shifted when a "0" bit is retransmitted.

5,198,808

MATRIX SWITCH APPARATUS WITH A DIAGNOSIS CIRCUIT HAVING STAND-BY PORTS AND REDUCED SIZE MATRIX SWITCHING ELEMENTS

Hirotsugu Kudo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 409,403, Sep. 19, 1989, abandoned. This application Dec. 2, 1991, Ser. No. 799,897

Claims priority, application Japan, Sep. 20, 1988, 63-233685

Int. Cl.[5] H04Q *1/00, 11/04*

U.S. Cl. 340—825.8 **4 Claims**

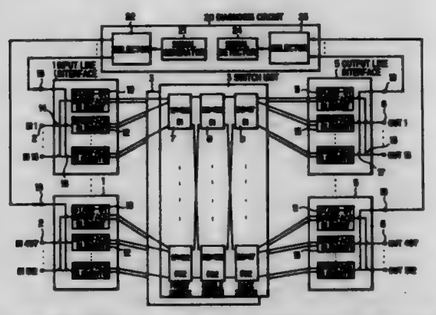
1. A matrix switch apparatus with a diagnosis circuit, comprising:

a predetermined number N of input line interface circuits each including a stand-by interface element and interface elements of M in number to provide a 1:M redundancy structure, where M and N are integers;

a plurality of output line interface circuits each including a stand-by interface element and interface elements of M in number to provide a 1:M redundancy structure;

a switch unit including front switches, middle switches, and back switches, respectively, arranged in rows to be positioned between said input line interface circuits and said output line interface circuits;

a plurality of N stand-by input ports corresponding to said N input line interface circuits, each stand-by input port connected to said stand-by interface element of said corresponding input lie interface circuit;



a plurality of N stand-by output ports corresponding to said N output line interface circuits, each stand-by output port connected to said stand-by interface element of said corresponding output line interface circuit;

a diagnosis circuit for supplying a diagnosis signal to said stand-by interface elements in said input lien interface circuits and receiving said diagnosis signal from said stand-by interface elements in said output line interface circuits to diagnose said input and output stand-by ports;

wherein the number of said front and back switches is equal to said predetermined number N, respectively, each of said front and back switches is provided with input and output ports having a ratio defined by (M+1) and 2M, and the number of said middle switches is 2M, each of said middle switches being provided with input and output ports, respectively, equal in number to 2M.

5,198,809

HARD WIRED PROGRAMMABLE CONTROLLER ESPECIALLY FOR HEATING VENTILATING AND AIR CONDITIONING (HVAC SYSTEMS)

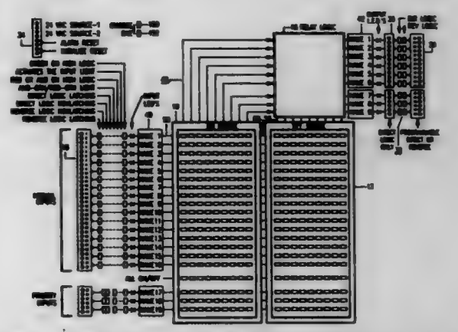
James L. Day, Victor, N.Y., assignor to James L. Day Co. Inc., Victor, N.Y.

Filed Feb. 22, 1991, Ser. No. 658,818

Int. Cl.[5] H02J *3/14*

U.S. Cl. 340—825.160 **17 Claims**

1. Hard wired programmable apparatus for interfacing a plurality of inputs with a plurality of outputs and which comprises first and second matrixes having a plurality of manually connectable switch points which are normally open and selectively and manually closed to program the apparatus, said switch points being arranged in rows and columns, a plurality of first output lines each corresponding to a different one of the columns of said first matrix and connected to the switch points of the column of said first matrix corresponding thereto, a plurality of second output lines each corresponding to a different one of the columns of said second matrix and connected to the column of said second matrix corresponding thereto, each input being connectable to the switch points in a different one of said rows of said first and second matrixes and through said row switch points when closed to the ones of said output lines in the columns of said first and second matrixes to which said closed switch points is connected, and switching means connected to a first group of said output lines corresponding to the first output lines from said first matrix and to a second group of said output lines corresponding to the second output lines from said second matrix for connecting said output lines of said first



group to said outputs and thereby connecting those of said inputs which are connected to the closed ones of said switch points of said first matrix to said outputs under control of the ones of said inputs which are connected to said second group of output lines through the closed switch points of said second matrix.

5,198,810

ONE-WAY DATA TELEMETERING SYSTEM UTILIZING THE POWER SUPPLY MAINS

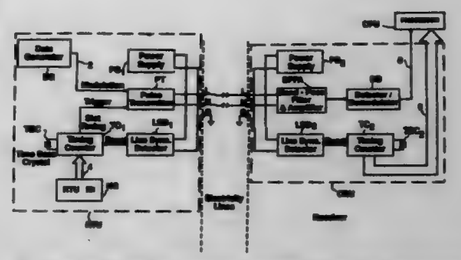
Giora Harel, Givat Avia, Israel, assignor to Unique Technology U.T. Ltd., Petah Tikva, Israel

Filed Nov. 9, 1989, Ser. No. 433,928

Claims priority, application Israel, Nov. 22, 1988, 88443

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—870.13 **20 Claims**



1. A one-way data telemetering system comprising: transmitter apparatus including a plurality of remote transmitter units connected via an alternating current power supply mains to a receiver apparatus including a central receiver unit for receiving data from the remote transmitter units; said transmitter apparatus comprising divider means for dividing each cycle of the line voltage into a plurality of time slots, detector means for detecting a predetermined point of each cycle of the line voltage to determine the start point of the first time slot, and transmitter means for transmitting to the power supply mains the data of each of said remote transmitter units in a separate time slot assigned to the respective transmitter unit; said central receiver unit comprising divider means synchronized by each cycle of the line voltage for dividing each cycle into a plurality of time slots corresponding to those of the transmitter apparatus, detector means for detecting a predetermined point of each cycle of the line voltage to determine the start point of the first time slot, and receiver means for separately receiving the data

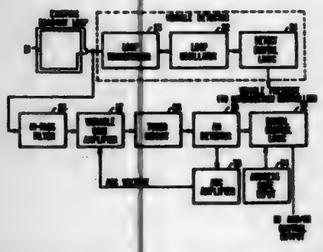
in the time slot of each respective remote transmitter unit; each of said transmitter units transmitting at least one bit of binary multi-bit digital data in its assigned time slot during each cycle of the line voltage of the power supply mains, whereby data may be transmitted one-way from each remote transmitter unit to the central receiver without the need for receiving any synchronization pulse from the receiver.

5,198,811

VEHICLE COMMUNICATION SYSTEM USING EXISTING ROADWAY LOOPS WHEREIN THE PHYSICAL INTEGRITY OF THE LOOP IS KEPT INTACT

Thomas Potter, Los Alamitos, and Thomas W. Seabury, Diablo, both of Calif., assignors to Detector Systems, Inc., Stanton, Calif.

Continuation of Ser. No. 652,890, Dec. 28, 1989, Pat. No. 5,089,815, which is a continuation of Ser. No. 47,833, May 8, 1987, abandoned. This application May 16, 1991, Ser. No. 701,199
Int. Cl.[5] G08G *1/09*
U.S. Cl. 340—905 16 Claims



1. A communication system for enabling transfer of information between a vehicle and a stationary information location having a vehicle detector system with a loop antenna, said loop antenna comprising part of a closed loop circuit containing conventional vehicle detector signals normally lying within a given frequency range, said system comprising:

stationary transmitter means for enabling transmission of a preselected information signal over a relatively small distance range via the vehicle detector system loop antenna; and

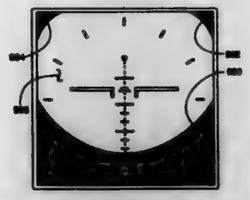
a vehicle mounted receiver means for receiving said preselected information signal transmitted by said stationary transmitter means when within said distance range, said vehicle mounted receiver means including a loop antenna and means for distinguishing said preselected information signal from the conventional vehicle detector signals present in said vehicle detector system loop antenna which lie within the given frequency range, said transmitter means providing transmission of said preselected information signal in a transmitting frequency range different from said given frequency range of said conventional vehicle detector signals; said transmitter means including means for generating a carrier frequency signal lying within a transmitting frequency range different from the frequency range of the conventional vehicle detector signals and containing a preselected information signal, and means for coupling the output of said generating means to said vehicle detector loop antenna without disturbing the physical integrity of said closed loop circuit so that said preselected information signal can be transferred via said vehicle detector loop antenna to the vehicle mounted receiver means without adversely affecting the operation of said vehicle detector system.

5,198,812

AIRCRAFT ATTITUDE INDICATOR DISPLAY

Andrew A. Probert, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 4, 1992, Ser. No. 846,191
Int. Cl.[5] G01C *23/00*
U.S. Cl. 340—975 11 Claims



1. Electronic attitude display apparatus for an aircraft comprising the combination of:

electrically operated blank screen means for generating a plurality of human viewable optically contrasting images;

means for representing said aircraft as a first predetermined optical image symbol on said blank screen means;

means for representing a sky-to-earth junction horizon on said blank screen means by a second predetermined optical image symbol viewable in conjunction with said first optical image symbol;

said second predetermined optical image symbol having a straight line first characteristic shape in response to said aircraft being in a horizontal pitch attitude, a low in the center and high at each end curving second characteristic shape in response to said aircraft being in a nose-up pitch attitude, and a high in the center and low at each end curving third characteristic shape in response to said aircraft being in a nose-down pitch attitude;

said second and third characteristic shapes varying in proportion to degree of nose-up and nose-down pitch attitude respectively of said aircraft;

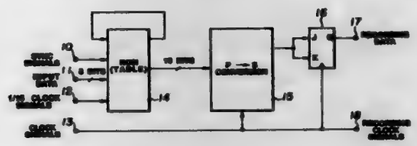
relative positioning of said first and second predetermined optical image symbols being responsive to roll and pitch attitudes of said aircraft.

5,198,813

DIGITAL RECORDING SYSTEM WITH (8,16,2,5) RUN LENGTH LIMITED (RLL) CODE

Masaaki Isozaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1991, Ser. No. 811,972
Claims priority, application Japan, Dec. 27, 1990, 2-414666
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—59 6 Claims



4. A digital modulation apparatus for converting 8-bit data of a binary system, wherein each indicates one of two binary values of '1' or '0', into binary 16-bit data of the same binary system, comprising:

means for sequentially separating 8-bit data words from an input data stream,

means for forming a 16-bit data word consisting of 1st to 16th bits, and satisfying the following conditions (1) to (5), for each of said 8-bit data words,

(1) the number of consecutive '0's or '1's from the second to the 15th bits is two or more;

(2) the number of consecutive '0's or '1's from the first to the 16th bits is five or less;

(3) the absolute value of the code word digital sum (CDS), obtained upon summing scores '+1' and '−1' for said binary values of '1' and '0', respectively, for the 1st to 16th bits, is four or less;

(4) the absolute value of the code word digital sum CDS(k), obtained upon summing scores '+1' and '−1' for said binary values of '1' and '0', respectively, for the 1st to kth bits, where $1 \leq k \leq 16$, is five or less; and

(5) when the 16-bit data are converted into serial data which are then coupled together and outputted, the number of consecutive '0's and '1's in any part of the outputted serial data is not less than two and not more than five, and the absolute value of the digital sum value (DSV), obtained as the sum of scores '+1' and '−1' for said binary values of '1' and '0', respectively, calculated from the beginning of said serial data to any point therein, is not more than three; and

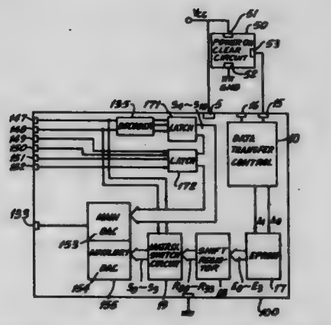
means for converting each said 16-bit data word into serial data and coupling the serial data for outputting as coupled modulated digital data.

5,198,814

DIGITAL-TO-ANALOG CONVERTER WITH CONVERSION ERROR COMPENSATION

Takeshi Ogawara, and Tomio Takiguchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 800,922
Claims priority, application Japan, Nov. 28, 1990, 2-326344
Int. Cl.[5] H03M *1/06*
U.S. Cl. 341—118 7 Claims



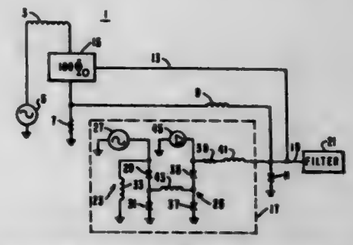
1. A digital-to-analog converter comprising a first converter unit for performing a digital-to-analog conversion operation on input digital data supplied thereto and for generating an output analog signal corresponding to said digital data, a second converter unit receiving an error compensation information supplied thereto and, in response to said error compensation information, reducing a digital-to-analog conversion error between said output analog signal and a desired analog signal, a memory for storing a plurality of error compensation data, a register circuit connected to said memory and having a plurality of sets of output terminals, a writing circuit for writing said plurality of error compensation data stored in said memory into said register circuit, each set of said plurality of sets of output terminals of said register circuit outputting an associated one of said plurality of error compensation data so that said plurality of error compensation data are outputted in parallel with one another, and a selector circuit coupled between said second converter unit and each of said plurality of sets of output terminals of said register circuit for selecting and supplying one of said plurality of error compensation data to said second converter unit in response to said input digital data.

5,198,815

TWO LOOP SUPERCONDUCTING SIGMA-DELTA ANALOG-TO-DIGITAL CONVERTERS

John X. Przybysz, Penn Hills; Donald L. Miller, Penn Township, Westmoreland County, both of Pa., and Eric H. Navisasky, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1991, Ser. No. 807,040
Int. Cl.[5] H03M *3/00*
U.S. Cl. 341—133 6 Claims



1. A two-loop superconducting sigma-delta analog-to-digital converter for converting an analog input signal to a digital output signal, said converter comprising:

a first superconducting inductor to which said analog input signal is applied to produce a first inductor current;

means converting said first inductor current to a voltage signal;

a second superconducting inductor to which said voltage signal is applied to produce a second inductor current;

a Josephson junction quantizer connected to said second superconducting inductor and through which said second inductor current flows, said Josephson junction quantizer emitting a voltage pulse which reduces said second inductor current when current flowing through said Josephson junction quantizer exceeds a critical current of the Josephson junction quantizer;

feedback means connected to said Josephson junction quantizer and feeding back to said first inductor selected multiple feedback pulses for each voltage pulse generated by said Josephson junction quantizer; and

means generating said digital output signal from said voltage pulse generated by said Josephson junction quantizer.

5,198,816

GENERAL PURPOSE SYSTEM FOR DIGITIZING AN ANALOG SIGNAL

John T. Kalinowski, Flemington, and Augustyn Waczynski, Trenton, both of N.J., assignors to EG&G, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 751,837, Aug. 30, 1991, abandoned. This application Sep. 6, 1991, Ser. No. 754,916
Int. Cl.[5] H03M *1/06, 1/22;* H04N *5/335*
U.S. Cl. 341—137 33 Claims

1. A general purpose system for digitizing an optical signal, the system comprising:

multielement light sensing means for converting an optical signal to a first signal;

means for selectively controlling the light sensing means in accordance with a set of instructions;

means, responsive to the first signal, for generating a second signal having a signal component, and a noise component that is mostly shot noise;

means for processing the second signal, with a transfer function characterized by a monotonically decreasing slope, to produce a third signal;

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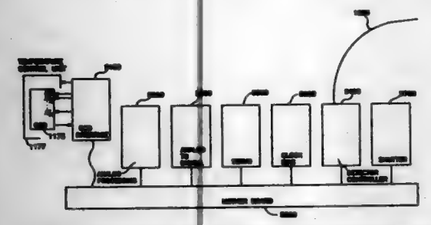
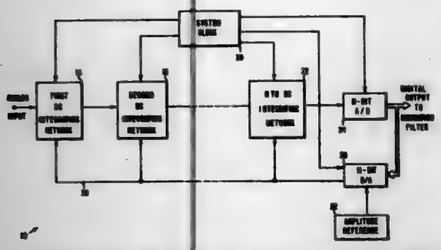
means for converting the third signal to a digital number, wherein, for a majority of the dynamic range, the slope of the transfer function is sufficient such that a change of the second signal equivalent to the standard deviation of the



noise component results in at least a one digit change in the digital number; and

means for converting the digital number to an output using a function corresponding to an inverse function of the transfer function.

5,198,817
HIGH-ORDER SIGMA-DELTA ANALOG-TO-DIGITAL CONVERTER
Robert H. Walden, Newbury Park; Gabor C. Temes, Los Angeles, both of Calif., and Tanju Cataltepe, Red Bank, N.J., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 26, 1990, Ser. No. 514,988
Int. Cl.[5] H03M *7/32, 1/50*
U.S. Cl. 341—143 **8 Claims**



1. An analog-to-digital converter for converting an analog input signal to a stable digital output sequence, comprising:

first integrating network means for generating a first sampled analog signal in response to said analog input signal;

second integrating network means for generating a second sampled analog signal in response to said first sampled analog signal;

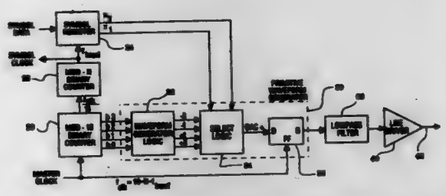
third integrating network means for generating a third sampled analog signal in response to said second sampled analog signal;

multibit quantizer means for generating said stable digital output sequence in response to said third sampled analog signal; and

feedback means operatively coupled to said first, second and third integrating network means for generating an analog feedback signal from said stable digital output sequence,

wherein said second integrating network is coupled to said first integrating network and said third integrating network is coupled to said second integrating network and each of said first, second and third integrating network means includes a switched capacitor input element, a switched capacitor feedback element, and a switched capacitor integrator element, said switched capacitor input element and said switched capacitor feedback element are each operatively coupled to said switched capacitor integrator element, capacitive ratios, respectively, of said switched capacitor input element to said switched capacitor integrator element and of said switched capacitor feedback element to said switched capacitor integrator element being selected to provide a pole pattern having said stable digital output sequence.

5,198,818
OVERSAMPLED DIGITAL-TO-ANALOG CONVERTER FOR MULTILEVEL DATA TRANSMISSION
Henry Samueli, Northridge, and Ralph H. Brachert, Torrance, both of Calif., assignors to PairGain Technologies, Inc., Tustin, Calif.
Filed Nov. 7, 1991, Ser. No. 788,847
Int. Cl.[5] H03M *1/66*
U.S. Cl. 341—144 **16 Claims**



1. Digital to analog converter apparatus responsive to a multibit data input word for producing a multilevel analog output, said apparatus comprising:

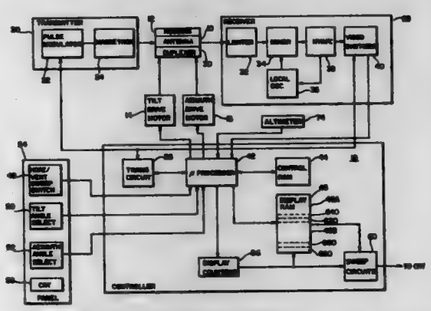
cyclic binary counter means for counting at a clock frequency f_{clk};

generator logic means responsive to said counter means for producing during each counter means cycle multiple primitive binary waveforms, each such waveform defining a different DC component;

select logic means responsive to said data input word for selecting one of said multiple primitive binary waveforms; and

low pass filter means for producing an analog output level related to the DC component of said selected binary waveform.

5,198,819
WEATHER RADAR DISPLAY SYSTEM
Kenneth J. Suanjara, Santa Claus, Ind., assignor to Thermwood Corporation, Dale, Ind.
Filed Mar. 2, 1992, Ser. No. 844,183
Int. Cl.[5] G01S *13/95, 7/20*
U.S. Cl. 342—26 **53 Claims**



1. A weather radar system comprising:

an antenna for radiating pulses and for receiving returned pulses;

a means for housing said antenna;

means for rotating said antenna within said housing means in a horizontal direction for a horizontal radar sweep;

means for tilting said antenna to reposition said antenna at a plurality of tilt angles;

control means for controlling said rotating means and said tilting means to rotate said antenna for a first horizontal sweep at a first tilt angle, to tilt said antenna to a second tilt angle and to subsequently rotate said antenna for a second horizontal radar sweep at the second tilt angle;

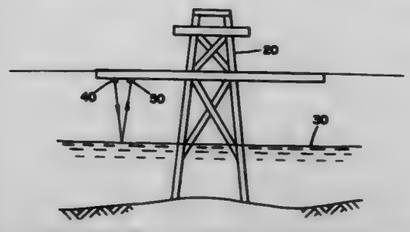
means for storing returned pulses from said first and second horizontal sweeps;

said means for storing comprising a first memory section for storing returned pulses from said first horizontal sweep and a separate second memory section for storing returned pulses from said second horizontal sweep;

display means for displaying said returned pulses stored in said first and second memory sections and wherein

said display means comprises means for displaying a first portion representing said returned pulses stored in said first memory section and a second portion representing said returned pulses stored in said second memory section.

5,198,820
CALIBRATING SATELLITE ALTIMETRY MEASUREMENTS OF GEOIDAL HEIGHT
Peter Graebner, Conifer, Colo., assignor to Chevron Research and Technology Company, San Francisco, Calif.
Filed Sep. 18, 1991, Ser. No. 761,552
Int. Cl.[5] G01S *7/40*; G01V *13/00*
U.S. Cl. 342—165 **6 Claims**



1. A method of calibrating satellite-altimetry measurements of ocean water height comprising:

(a) measuring, at a first location, a first ocean water height by using satellite-altimetry during a time period;

(b) measuring, at a second location that is in close proximity to the first location, a second ocean water height against a known reference point on a fixed offshore structure during the time period of step (a); and

(c) comparing the measurements of steps (a) and (b).

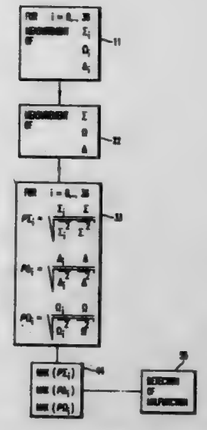
5,198,821
METHOD AND DEVICE FOR THE ON-LINE TESTING OF A MULTIPLE-SOURCE ANTENNA
Jean-Michel Skrzypczak, Paris, France, assignor to Thomson-CSF, Puteaux, France
Filed Mar. 23, 1992, Ser. No. 855,538
Claims priority, application France, Mar. 26, 1991, 91 03623
Int. Cl.[5] H01Q *3/00*; G01R *29/10*
U.S. Cl. 342—360 **10 Claims**

1. A method for the on-line and on-site testing of an antenna comprising a plurality of radiating sources wherein said method consists in:

constituting a library of radiation patterns of the antenna, firstly when all the radiating sources work normally and, secondly, when at least one of said sources is deliberately put into a state of malfunctioning;

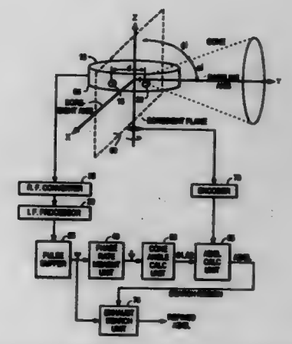
measuring the radiation pattern of the antenna during its on-site operation;

computing the coefficient of correlation of said radiation pattern with each of the radiation patterns contained in said library;



computing the maximum value of the coefficient of correlation so as to detect a malfunction, if any, in one or more of said radiating sources.

5,198,822
METHOD AND APPARATUS FOR DETERMINING THE ANGLE OF ARRIVAL OF A RADAR SIGNAL AT A SPINNING INTERFEROMETER
Mark W. Brown, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 24, 1992, Ser. No. 840,242
Int. Cl.[5] G01S *5/02*
U.S. Cl. 342—424 **9 Claims**



1. A method of determining an angle of arrival of signals at a spinning interferometer having a boresight and a baseline axis, said method comprising the steps of:

(a) receiving signals at multiple headings of the interferometer boresight;

(b) measuring a time of arrival, frequency and a phase difference of signals received at the multiple headings of the interferometer boresight;

(c) determining a set of phase rate of changes between respective ones of the signals received at the multiple headings of the interferometer;

(d) determining a set of complementary cone angles based on the set of phase rate of changes;

matching circuit for forming a low pass filter together

(e) determining an angle of arrival of a signal relative to the baseline axis based on the cone angles and a rotation rate of the spinning interferometer; and

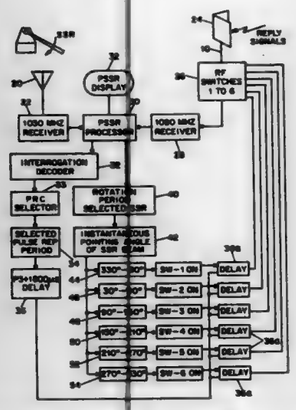
(f) determining an angle of arrival of the signal relative to the boresight axis based on the angle of arrival relative to the baseline axis and one of the set of cone angles.

5,198,823

PASSIVE SECONDARY SURVEILLANCE RADAR USING SIGNALS OF REMOTE SSR AND MULTIPLE ANTENNAS SWITCHED IN SYNCHRONISM WITH ROTATION OF SSR BEAM

George B. Litchford, Northport, and John Keller, Huntington, both of N.Y., assignors to Litchstreet Co., Northport, N.Y.

Filed Dec. 23, 1991, Ser. No. 813,137
Int. Cl.[5] G01S *5/02, 13/00, 5/04*
U.S. Cl. 342—429 11 Claims



1. Apparatus for extending the operational range of a system for indicating the position of a transponder with respect to a reference position at a known location within the service area scanned by the rotating beam of a secondary surveillance radar (SSR) by receiving with a first receiver at said reference position interrogations from said SSR and receiving with a second receiver at said reference position replies from the transponder elicited by said interrogations and determining the position of the transponder from the time relationship between said received interrogations and replies elicited thereby and the scanning period of said rotating beam, said apparatus comprising, at said reference position:

a multiplicity of directive antennas arranged in a stationary circular array and having directive radiation patterns pointing in different directions from the center of said array, each said pattern covering a respective sector of a circle, and

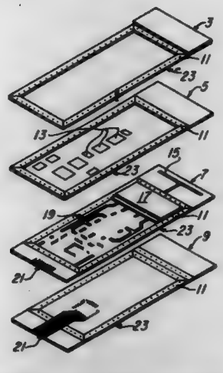
means including switching means responsive to the rotational position of said rotating SSR beam for sequentially coupling to said second receiver the antenna of said array whose radiation pattern is pointed to the sector in which the rotating beam is then pointing, thereby to increase the gain of reply signals received by said second receiver and correspondingly extend the range from which transponder replies can be received at said reference position.

5,198,824

HIGH TEMPERATURE CO-FIRED CERAMIC INTEGRATED PHASED ARRAY PACKAGING

Frank J. Poradish, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 17, 1992, Ser. No. 822,392
Int. Cl.[5] H01Q *23/00*
U.S. Cl. 343—700 MS 16 Claims



1. An integrated package which comprises:

(a) a plurality of high temperature co-fired stacked ceramic layers which have been co-fired at a temperature of from about 1500° C. to about 1800° C. in intimate relation with each other including top and bottom layers and at least one intermediate layer therebetween, each of said layers having a pair of opposing major surfaces;

(b) said at least one intermediate layer including a radiating antenna element disposed on a major surface thereof;

(c) at least one cavity in one of said top, bottom and at least one intermediate layer having a semiconductor chip therein;

(d) metallization disposed on a major surface of said at least one intermediate layer coupling said chip and said antenna element; and

(e) vias extending through the major surfaces of said at least one intermediate layer having electrically conductive material therein for interconnection with a layer intimate with said intermediate layer.

5,198,825

RECEPTION SYSTEM FOR A MOTOR VEHICLE

Kaoru Sakurai, Kawasaki; Harunori Murakami, Machida; Hiroshi Iijima, Yokohama; Masaru Maeda, Kawasaki, and Koji Matsuda, Zama, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Doshomachi, Japan

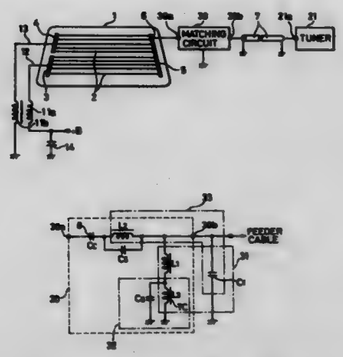
Continuation of Ser. No. 365,049, Jun. 9, 1989, abandoned. This application Feb. 21, 1991, Ser. No. 657,629
Claims priority, application Japan, Jun. 10, 1988, 63-77189[U]
Int. Cl.[5] H01Q *1/320, 1/020, 1/500;* H04B *1/180*
U.S. Cl. 343—713 3 Claims

1. A reception system for a motor vehicle comprising an antenna circuit including an antenna element, a matching circuit having an input connected to the antenna element and a feeder cable connected to an output of said matching circuit for supplying a reception signal to a receiver, wherein said matching circuit comprises:

a series circuit consisting of first and third coils, connected between said output of said matching circuit and ground to form a parallel resonance circuit together with a ground stray capacitance of said feeder cable at a frequency set in a specific band assigned to said receiver;

a second coil connected between the input and output of said matching circuit for forming a low-pass filter together with the ground stray capacitance of said feeder cable;

said third coil having a core member inserted therein, the permeability of the core member having a characteristic curve descending with increase of frequency between lower and upper ends of said specific reception band so that the resonant frequency of said parallel resonance circuit increases as the reception frequency increases to



lower a Q-factor of the parallel resonance circuit for widening the reception frequency band in which the reception system shows good reception sensitivity; and,

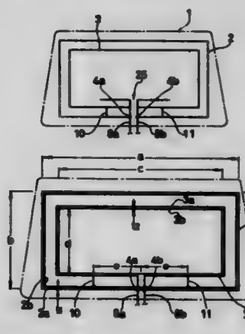
a second parallel resonance circuit comprising a capacitor connected between ground and the junction between said first and third coils, said second parallel resonance circuit being set to resonate at a frequency location on a lower side of the reception band.

5,198,826

WIDE-BAND LOOP ANTENNA WITH OUTER AND INNER LOOP CONDUCTORS

Michiaki Ito, Nagaoka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Sep. 13, 1990, Ser. No. 581,893
Claims priority, application Japan, Sep. 22, 1989, 1-247254; Sep. 27, 1989, 1-251579; Sep. 28, 1989, 1-253158
Int. Cl.[5] H01Q *1/38, 21/00*
U.S. Cl. 343—726 6 Claims



1. A wide-band loop antenna comprising:

a main loop conductor provided on a dielectric plate and extending from a first feed terminal to a second feed terminal to form a one-turn loop;

a subsidiary loop conductor provided on the dielectric plate and extending parallel to the main loop conductor to form a one-turn loop, said main and subsidiary loop conductors being connected to said feed terminals to provide a closed circuit;

a first short-circuit line connected between said main and subsidiary loop conductors at a position adjacent said first feed terminal; and

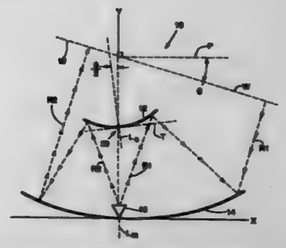
a dipole antenna connected to said feed terminals.

5,198,827

DUAL REFLECTOR SCANNING ANTENNA SYSTEM

Arthur F. Sexton, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 23, 1991, Ser. No. 712,175
Int. Cl.[5] H01Q *3/20*
U.S. Cl. 343—761 6 Claims



1. A dual reflector scanning antenna system comprising:

antenna feed means for emitting electromagnetic radiation;

an antenna subreflector including a first surface of a first shape for redirecting said emitted radiation, said subreflector having a longitudinal axis extending perpendicularly through at a rotation point proximate a vertex thereof;

a main antenna reflector including a second surface of a second shape for projecting said radiation from said subreflector as an antenna beam, said main reflector having a main longitudinal axis extending perpendicularly through a point proximate a vertex thereof, said first shape and said second shape being such that a wavefront from said main reflector forms a scan angle with a perpendicular to said main longitudinal axis when the longitudinal axis of said subreflector intersects said main longitudinal axis at an angle approximately equal to one half of said scan angle; and

means for rotating said subreflector about said rotation point so as to vary the angular orientation between said main longitudinal axis and the longitudinal axis of said subreflector and thereby scan said antenna beam relative to said main longitudinal axis.

5,198,828

MICROWAVE RADAR ANTENNA AND METHOD OF MANUFACTURE

James B. West, Cedar Rapids; Roger D. Anderson, Marengo; Gary Sampson, Cedar Rapids, and Andrew Yarne, Marion, all of Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Aug. 29, 1991, Ser. No. 752,106
Int. Cl.[5] H01Q *13/00*
U.S. Cl. 343—776 3 Claims

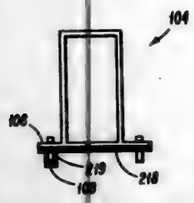
1. An improved radar antenna including:

a ground plane having a plurality of ground plane holes therein at predetermined locations;

a plurality of center fed waveguides, each having a flange on its bottom narrow edge wall;

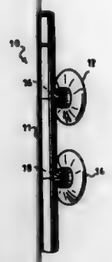
said flange having a plurality of flange holes therein at predetermined locations;

said waveguide means affixed along said flange to said ground plane with a conductive bonding agent;



at least one indexing pin disposed through one of said flange holes and through one of said ground plane holes.

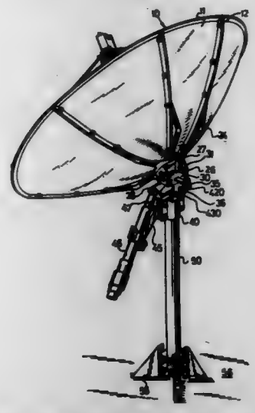
5,198,829
ANTENNA ROD WITH REMOVABLY MOUNTED SUCTION CUPS
Greg Marshall, 5779 Haleola St., Honolulu, HI. 96821
Filed Nov. 7, 1991, Ser. No. 788,857
Int. Cl.[5] H01Q *1/12*
U.S. Cl. 343—878 1 Claim



1. An antenna, comprising:
a) a totally cylindrically molded rod;
b) a first suction cup;
c) a second suction cup; and
d) means for removably mounting said first suction cup and said second suction cup longitudinally to said totally cylindrically molded rod, said means including threaded connectors, said threaded connectors including externally threaded male portions and internally threaded female portions, said female portions of said connectors are integrally molded with said totally cylindrically molded rod forming a homogeneous structure for strength so that when said totally cylindrically molded rod is removed from them old said female portions of said connectors are already fixed in place and cannot be separated from the totally cylindrically molded rod.

5,198,830
DISH ANTENNA
Ming T. Liu, No. 3-1, Tapi Lane, Neiao Li, Nantou City, Nantou Hsien, Taiwan
Filed Nov. 5, 1991, Ser. No. 787,895
Int. Cl.[5] H01Q *1/12, 3/04*
U.S. Cl. 343—882 1 Claim

1. A dish antenna comprising a dish including an outer surface, a plurality of ribs formed on said outer surface of said dish, a base fixed to said outer surface of said dish and including a plurality of ears formed thereon for engagement with a lower end of said ribs of said dish respectively and a pair of lugs extended downward therefrom, each of said lugs including a first curved slot formed therein, a lever having one end fixed to each of said ears and having the other end fixed to a middle portion of a respective rib to stably fix said dish to said base, a guide including a pair of members extended upward therefrom and a pair of elements extended downward therefrom, each of said elements having a second curved slot formed therein, said lugs pivotally coupled to said members on a first pivot axis, said first pivot axis being located at a center of curvature of each of said first curved slots, a first bolt slidably engaged in each of said first curved slots and engaged on each of said members for fixing said lugs to said members to adjust an angular position of said base relative to said guide; a coupler including a pair of flanges extended upward therefrom and pivotally coupled to said elements of said guide at a second

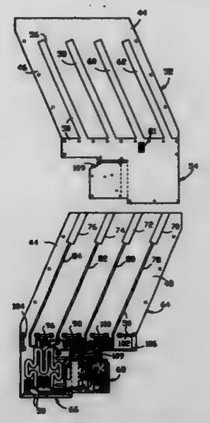


pivot axis, said second pivot axis being located at a center of curvature of said second curved slots, a second bolt slidably engaged in each of said second curved slots of said elements and engaged on said flanges for fixing said elements to said flanges to adjust an angular position of said guide relative to said coupler, said first pivot axis and said second pivot axis being perpendicular with each other; a drag extended from said guide, a support fixed to said coupler, a cylinder fixed to said support and including a piston rod coupled to said drag and arranged such that said guide is rotated about said second pivot axis by said cylinder.

5,198,831
PERSONAL POSITIONING SATELLITE NAVIGATOR WITH PRINTED QUADRIFILAR HELICAL ANTENNA
Gary L. Burrell, Olathe; Min H. Kao, Lenexa, and Paul K. Shumaker, Olathe, all of Kans., assignors to 501 Pronav International, Inc., Lenexa, Kans.
Filed Sep. 26, 1990, Ser. No. 588,358
Int. Cl.[5] H01Q *1/360, 11/080, 23/000*
U.S. Cl. 343—895 8 Claims

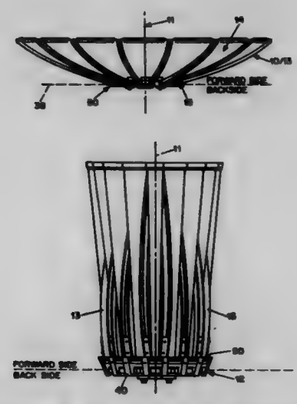
1. An antenna for receiving navigation signals from a source thereof such as global position satellites, said antenna comprising:
a dielectric substrate presenting an elongated, tubular portion having inboard and outboard faces; and
a plurality of elongated, helically configured, antenna filaments supported by said substrate,
each of said antenna filaments including an upper antenna element supported on one of said faces and presenting a lower end, and including a lower antenna element supported on the other of said faces and presenting an upper end, said lower end of said upper antenna element being capacitively coupled through said substrate with said upper end of said lower element,
further including a preamplifier circuit coupled with said antenna filaments for receiving signals therefrom and for amplifying said signals in order to produce antenna output signals, said substrate including a preamplifier section

having additional conductive material printed thereon making up a portion of said preamplifier circuit, said tubular portion presenting a diameter, said preamplifier



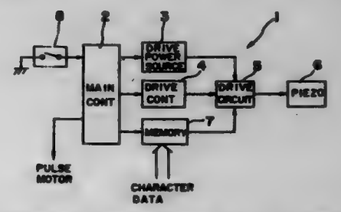
section of said substrate presenting a relatively flat configuration extending across a diameter of said tubular portion.

5,198,832
FOLDABLE REFLECTOR
Glenn F. Higgins, and Douglas L. Toth, both of St. Cloud, Fla., assignors to Comtech Antenna Systems, Inc., St. Cloud, Fla.
Filed Dec. 13, 1991, Ser. No. 807,079
Int. Cl.[5] H01Q *15/20*
U.S. Cl. 343—915 18 Claims



1. A foldable reflector, able to be readily folded or opened, and having a plurality of rib assemblies pivotable to closed positions forward of a base assembly and pivotable to open positions extending substantially radially from said base assembly, comprising:
a base assembly having a plurality of rib mounting locations arranged around a central axis, each said mounting location having a rib assembly pivot axis and an associated rib stop for limiting pivoting of a rib assembly in said open position, the pivot axes of said plurality of rib assemblies defining a pivot plane having a forward side to which said rib assemblies fold when closed and a back side;
a plurality of rib assemblies each pivotally mounted at one of said pivot axes and constrained by one of said rib stops so that in said open position each said rib assembly lies substantially forward of said pivot plane, each rib assembly including a rib portion having at least one longitudinally extending groove and an offset means for providing a bi-stable attachment point which is positioned forward of said pivot plane when said rib assembly is in said closed position and positioned in back of said pivot plane when said rib assembly is in said open position;
a plurality of panels of flexible reflective material, each positioned in said longitudinally extending grooves of two adjacent ones of said rib portions and shaped to extend laterally between said rib portions for forming a dishing reflecting surface when said foldable reflector is opened;
elastic means, coupled to and extending between said bi-stable attachment points of adjacent rib assemblies for biasing said rib assemblies towards the closed positions when said foldable reflector is closed and for biasing said rib assemblies against said rib stops when said foldable reflector is opened; and
locking means, rotatably mounted on said base assembly and having radially extending portions, for holding said rib assemblies in said open position when said locking means is rotated to a first position and for permitting pivoting of said rib assemblies when said locking means is rotated to a second position.

5,198,833
VARIABLE DENSITY INK-JET DOT PRINTER
Hiroshi Kubota, Yamatotakada, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 265,918, Nov. 2, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 542,791
Claims priority, application Japan, Nov. 4, 1987, 62-280144
Int. Cl.[5] B41J *2/205*
U.S. Cl. 346—1.1 4 Claims



1. An ink-jet dot printer for printing an image with a plurality of dots such that under a first mode the image is formed by a first density of dots and under a second mode the image is formed by a second density, which is lower than the first density of dots, said printer comprising:
switch means for selectively switching between said first and second modes;
time setting means for setting a first time period when said first mode is selected and for setting a second time period, longer than said first time period, when said second mode is selected, said time setting means comprising
number setting means, responsive to said switch means, for outputting an initial count value, and
counting means, coupled to said number setting means, for counting up from said initial count value to a predetermined count value in order to generate timing signals indicative of said first and second time periods, said initial count value being smaller for said second mode than for said first mode;
voltage setting means for generating a first voltage when said first mode is selected and for generating a second

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voltage, greater than said first voltage, when said second mode is selected; and

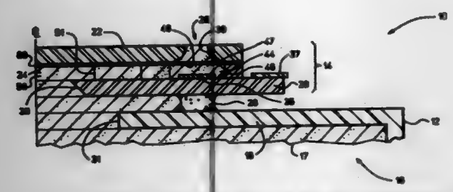
driving means, coupled to said time setting means and said voltage setting means, for providing a pressure to ink, in accordance with drive pulses, during said first mode, which are of duration equal to said first time period and are of said first voltage, and in accordance with drive pulses during said second mode which are of duration equal to said second time period and are of said second voltage, so that ink ejected from the ink-jet dot printer used for depicting a dot is greater in amount under said second mode than that under said first mode in order to control dot size.

5,198,834

INK JET PRINT HEAD HAVING TWO CURED PHOTOIMAGED BARRIER LAYERS

Winthrop D. Childers, and Hai Q. Tran, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 2, 1991, Ser. No. 679,378
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—1.1 23 Claims



1. A pen head for a drop-on-demand ink pen, comprising:

a. a substrate;

b. a member having an orifice therein;

c. a barrier segment formed on the substrate, said segment having an ink conduit and a chamber both formed therein and both in fluid communication, said chamber being connected to an ink reservoir via the ink conduit, said barrier segment having a first layer of a first photoimaged material on the substrate, the first layer having a plurality of substantially planar side walls that constitute the ink conduit and the chamber, and a second layer of a second photoimaged thermoplastic material overlying the first layer and permanently bonding the orifice member to the barrier segment and preventing the orifice member from delaminating after lengthy exposure to inks; and

d. means within the printhead for expelling on demand drops of ink through the orifice from the chamber.

5,198,835

METHOD OF REGENERATING AN INK IMAGE RECORDING MEDIUM

Shigehito Ando; Eiichi Akutsu; Hiroo Soga; Kenji Ogi, and Kazuo Maruyama, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1991, Ser. No. 668,055
Claims priority, application Japan, Mar. 13, 1990, 2-59851
Int. Cl.[5] B41J *2/525*
U.S. Cl. 346—76 PH 24 Claims

11. An ink image recording system comprising:

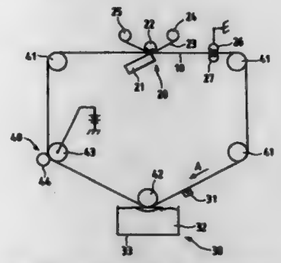
an ink image recording medium, shaped like an endless belt, including an anisotropic conductive layer, a heating resistive layer, a conductive layer, an ink release layer, and a heat-fusible ink surface-layer;

transfer rolls for circulatingly transferring the ink image recording medium;

an ink image recording section for transferring an ink image on the ink image recording medium onto a transfer sheet according to an electric signal;

charging means for uniformly charging the ink image recording medium emanating from the recording section;

an ink supply unit, disposed downstream of the charging means, including a container for containing a liquid ink for regenerating the heat-fusible ink surface-layer of the ink image recording medium, an electrode soaked in said



liquid ink and applied with a bias voltage, and a roll, disposed opposite to the electrode, for transferring the ink image recording medium in contact with said liquid ink through a gap between the electrode and the roll; and

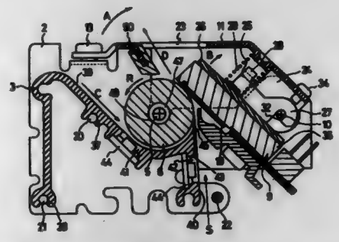
an ink layer smoothing unit for smoothing the ink layer of the ink image recording medium supplied from said ink supply unit.

5,198,836

COMPACT LINE THERMAL PRINTER

Takeo Saito; Noboru Suzuki; Shuichi Ogawa, and Koichi Masuda, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Dec. 11, 1990, Ser. No. 625,851
Claims priority, application Japan, Dec. 11, 1989, 1-321861; Dec. 11, 1989, 1-321862; Dec. 11, 1989, 1-321863; Dec. 11, 1989, 1-321864; Dec. 11, 1989, 1-321865; Dec. 11, 1989, 1-321867
Int. Cl.[5] B41J *2/325*
U.S. Cl. 346—76 PH 26 Claims



1. A line thermal printer comprising:

a pair of side frames opposed to each other a given distance according to a given width size of a printing medium;

a guide frame sandwiched between the pair of side frames for guiding the printing medium;

a platen roller unit detachable disposed between the pair of side frames and pivotably supported relative to the pair of side frames;

a thermal head unit detachably engaged relative to the pair of side frames in opposed relation to the platen roller unit;

a head cover plate disposed between the pair of side frames to cover the thermal head unit and placeable in either of an open position and a closed position relative to the pair of side frames; and

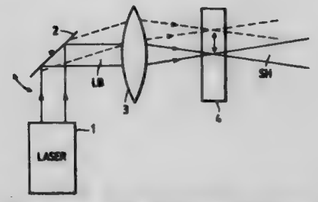
a drive unit detachably mounted on an outer face of one of the side frames for driving the platen roller unit.

5,198,837

LASER BEAM HARMONICS GENERATOR AND LIGHT EXPOSING DEVICE

Shoji Ikuhizaka; Hideo Hara, both of Kawasaki, and Yutaka Ichihara, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 28, 1990, Ser. No. 635,679
Claims priority, application Japan, Jan. 10, 1990, 2-3220
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 10 Claims



1. A laser beam harmonics generator comprising:

a laser beam source for emitting a laser beam;

harmonics generation means for generating harmonics of the laser beam in response to the irradiation of the laser beam; and

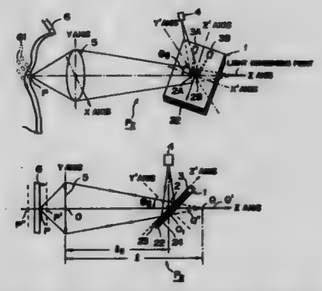
displacement means arranged between said laser beam source and said harmonics generation means for repetitively causing a relative displacement between said harmonics generation means and said laser beam perpendicular to a light path of the laser beam during emission of said laser beam from said laser beam source.

5,198,838

OPTICAL PICKUP DEVICE WHICH GENERATES A FOCUSING CORRECTION SIGNAL

Satoshi Sugiura, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 16, 1991, Ser. No. 686,083
Claims priority, application Japan, Jul. 25, 1990, 2-196708
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 9 Claims



1. An optical pickup device for reproducing information recorded on a recording medium and recording information thereonto, which comprises:

a) a semiconductor substrate disposed opposite to the recording medium through an objective lens and having an optical waveguide thereon;

b) coupling means disposed adjacent to the optical waveguide of the semiconductor substrate and comprising first and second grating elements having first and second coupling conditions, respectively, for guiding a light signal reflected from the recording medium into the optical waveguide, said first and second coupling conditions being prescribed such that a first optimum incident angle of said first grating element is different from a second optimum incident angle of said second grating element;

c) first and second light receiving elements disposed on the semiconductor substrate for respectively receiving beams of light, which are guided by said first and second grating elements and for outputting a signal in response thereto; and

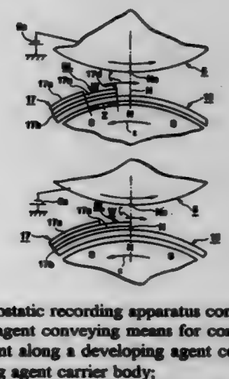
d) a light source for emitting light onto the semiconductor substrate and and the recording medium.

5,198,839

ELECTROSTATIC RECORDING APPARATUS FOR SELECTIVELY TRANSFERRING A DEVELOPING AGENT CONVEYED TO THE SURFACE OF A RECORDING ELECTRODE TO AN OPPOSITE ELECTRODE

Hideki Takahashi, Fuuse; Eiichi Takeuchi; Shigeru Shimizu, both of Iruma; Tadao Yamamoto, Tokyo; Hideaki Inoue, Musashimurayama; Yasuhito Sato, Akishima; Kenji Nakayama, Kodaira; Toshiro Houda, Mitaka, and Kenichiro Asako, Kokubunji, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,142
Claims priority, application Japan, Oct. 12, 1990, 2-274851; Nov. 27, 1990, 2-327614; Dec. 27, 1990, 2-407756
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—155 3 Claims



1. An electrostatic recording apparatus comprising:

developing agent conveying means for conveying a developing agent along a developing agent convey path on a developing agent carrier body;

a plurality of recording electrodes opposing said developing agent conveying means and extending along said developing agent convey path, each of said plurality of recording electrodes having a leading end portion;

an opposite electrode having an opposing portion opposing said plurality of recording electrodes and arranged with a predetermined gap from said plurality of recording electrodes, said opposing portion being movable in a conveying direction of the developing agent; and

voltage applying means for applying a recording voltage corresponding to supplied dot recording information to each of said plurality of recording electrodes to generate a transferring electric field for transferring the developing agent to said opposite electrode between said opposite electrode and said plurality of recording electrodes, thereby forming a dot recording image corresponding to the dot recording information on said opposite electrode,

wherein each of said leading end portions of said plurality of recording electrodes is arranged at a position shifted from a portion where said developing agent carrier body and said opposite electrode are closest to each other to an upstream side of a developing agent convey direction along said developing agent convey path.

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5,198,840
IMAGE FORMING APPARATUS WITH TONER ACCUMULATING PORTION AT RECORDING ELECTRODE PORTION

Toshihiko Gohiel, Tokyo, and Takashi Matoba, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

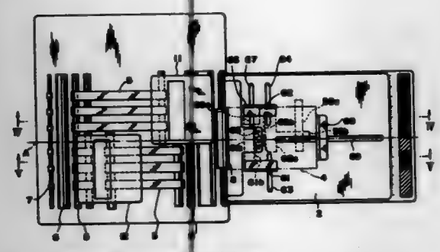
Filed Jun. 24, 1991, Ser. No. 720,192
Claims priority, application Japan, Jun. 25, 1990, 2-164842; May 31, 1991, 3-156119
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—155 25 Claims

1. An image forming apparatus comprising:
a plurality of recording electrodes;
a voltage applying means for applying a signal voltage to said recording electrodes in response to image information;
a recording medium disposed in confronting relation to said recording electrodes;
a means for causing a relative movement between said recording electrodes and said recording medium;
a developer supplying means for supplying developer between said recording electrodes and said recording medium; and
a prevention means disposed proximate said recording electrodes and downstream thereof in a developer moving direction, said prevention means being located at a position nearer to the recording medium than a surface of said recording electrodes, for preventing the developer from shifting.

5,198,841
ELECTRIC PRINTER

Masashi Sakamoto, Toyokashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 7, 1990, Ser. No. 624,329
Claims priority, application Japan, Dec. 8, 1989, 1-320348
Int. Cl.[5] G03G *15/01*
U.S. Cl. 346—157 12 Claims

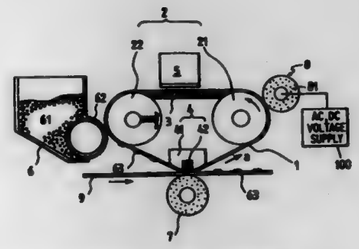


1. An electric printer comprising:
a print head to output images based on image data; and
a plurality of process units each of which integrally accommodates therein at least a photoconductive member, a developing device and a cleaner for forming the images output by said print head on a recording media transported along a transport path within the printer, said plurality of process units being disposed at different positions relative to one another along a direction orthogonally intersecting a transport direction of the recording media so as to form the images thereby on the recording media as it si being transported.

5,198,842
IONOGRAPHIC IMAGE FORMING APPARATUS

Makoto Fujino; Masakazu Shinozuka; Yoshinori Miyazawa, and Hideo Yamazaki, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 18, 1991, Ser. No. 779,242
Claims priority, application Japan, Oct. 24, 1990, 2-286239
Int. Cl.[5] G03G *15/00*
U.S. Cl. 346—159 26 Claims

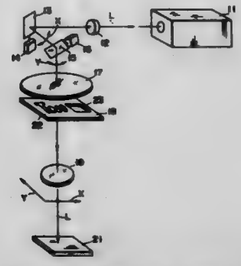


1. An image forming apparatus comprising:
an endless loop of a thin film for bearing a latent electrostatic image, said endless film being made of a material having both heat-resistant and dielectric properties;
a transfer mechanism for driving said endless loop of said thin film along a closed path;
a latent electrostatic image recording head, disposed outside said loop of said thin film, for recording a latent electrostatic image on said thin film;
a developing unit, disposed outside said loop of said thin film, for developing the latent electrostatic image on said endless film by placing toner particles in close proximity to or bringing toner particles into contact with said thin film;
a back electrode disposed inside said loop of said thin film;
a pressure roller disposed outside of said loop of said thin film in opposition to an outside surface of said thin film;
a discharge unit, disposed outside said loop of said thin film, for discharging the latent electrostatic image; and
a heater disposed inside of said loop of said thin film, said heater being in opposition to said pressure roller, said thin film passing between said heater and said pressure roller, a nipped area being defined by an area of contact between a recording sheet and said pressure roller when the recording sheet is passed between said thin film and said pressure roller, said heater being in contact with a portion of an inside surface of said thin film which is in opposition to said nipped area, all other portions of said inside surface being in a non-contact state with respect to said heater.

5,198,843
OPTICAL MARKING SYSTEM HAVING MARKING MODE SELECTING FUNCTION

Hiroshi Ito; Shuichi Ishida, and Yasutomo Fujimori, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 373,172, Jun. 29, 1989, abandoned.
This application Nov. 9, 1990, Ser. No. 611,469
Claims priority, application Japan, Jun. 30, 1988, 63-163973; Mar. 27, 1989, 1-71940
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—1.1 18 Claims



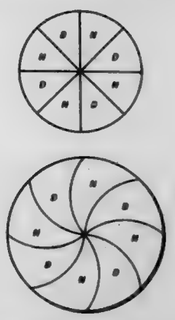
1. A laser marking apparatus for marking a material by selectively removing a surface layer from the material, comprising:
a light source for generating a laser beam of a preset wavelength;
optical means including a relay lens for receiving the laser beam generated by said light source and directing the received laser beam in a preset direction, said optical means including an optical element;
forming means, disposed apart from the material, for forming a pattern, said optical element being positioned between said forming means and said material and converging said directed laser beam onto said material, and said forming means including a pattern forming section and a non-pattern forming section; and
control means connected to said optical means, for controlling said optical means to effect a first mode, in which the received laser beam is directed to said pattern forming section of said forming means, to form a predetermined pattern, and a second mode, in which the received laser beam is directed to said non-pattern forming section of said forming means, said first and second modes being effected in a preset sequence.

5,198,844
SEGMENTED MULTIFOCAL CONTACT LENS

Jeffrey H. Roffman; Edgar Menezes; Robert Labelle, and John Scrivener, all of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Jul. 10, 1991, Ser. No. 728,903
Int. Cl.[5] G02C *7/04*
U.S. Cl. 351—161 12 Claims

1. A non-oriented, multifocal refractive contact lens for focusing light on the retina of the eye comprising:
a plurality of segments where at least one segment has an aspherical surface curvature,
one of said plurality of segments being a first segment having a first, distant optical power,
another of said plurality of segments being a second segment having a second, near optical power,
said second segment located adjacent said first segment and forming a boundary therewith, and

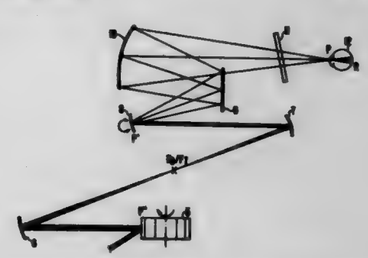


the step height difference along said segment boundaries being less than that formed by two spherical lens surfaces of the same near and distant optical powers.

5,198,845
APPARATUS FOR PRODUCING AN IMAGE OF AN OBJECT (III)

Adolf Triller, Lochham, Fed. Rep. of Germany, assignor to G. Rodenstock Instrument GmbH, Ottobrunn-Riemerling, Fed. Rep. of Germany

PCT No. PCT/DE89/00434, § 371 Date Jul. 2, 1990, § 102(e) Date Jul. 2, 1990, PCT Pub. No. WO90/00026, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 29, 1989, Ser. No. 459,694
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821973
Int. Cl.[5] A61B *3/10, 3/02*
U.S. Cl. 351—221 15 Claims



1. An apparatus for producing an image of an object, comprising:
light source means for producing light for illuminating an object;
scanning means, including at least one image-forming element and at least one scanning element, for focusing the light produced by the light source means on the object and for scanning the focused light across the object, the scanning means producing trapezoidal distortion in the focused light scanned across the object; and
trapezoidal distortion correction means, including at least one aspherical element disposed between the at least one scanning element and the object, for correcting the trapezoidal distortion produced by the scanning means, wherein a refractive power of the at least one aspherical element is substantially zero near an optical axis of the at least one aspherical element;
wherein the object reflects the focused light scanned across the object, and wherein the apparatus further comprises:
detecting means for detecting the light reflected from the

for floating on the free processing liquid surface extending

monitoring means for effecting at least one of

object and for producing an output signal representing the detected light; and

imaging means for producing an image of the object from the output signal of the detecting means.

5,198,846

MANUAL CASSETTE SYSTEM FOR OVERHEAD PROJECTION TRANSPARENCIES

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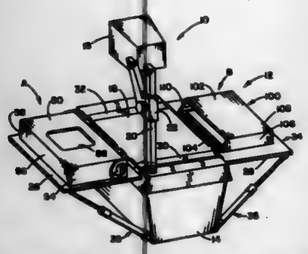
Filed Jun. 23, 1992, Ser. No. 903,242
Int. Cl.[5] G03B *23/04*
U.S. Cl. 353—113 11 Claims



18. A system for facilitating the handling of overhead projector transparencies on an overhead projector of the type including an upwardly facing projector platen, the system comprising:

a frame assembly for providing first and second support surfaces adjacent opposite sides of the projector platen;

a transparency storage cassette supported on the first support surface, the storage cassette including:

a housing including top, bottom, and side walls defining a chamber,

a generally upwardly facing follower plate sized to support a stack of transparencies and located within the chamber with means for biasing the follower plate upwardly, one of the side walls of the housing providing a door being movable from a closed position to an open position for loading a stack of transparencies onto the follower plate within the chamber,

interconnecting means between the movable door and the follower plate for moving the follower plate downwardly against the biasing means when the door is in the open position,

a transparency discharge slot near the top of the housing along the side adjacent the projector platen,

an opening in the top wall of the housing for permitting manual access to the top transparency in the stack on the follower plate to allow the top transparency to be slid from the stack out of the housing through the discharge slot to a projection position on the projector platen, and

retard means adjacent the slot to prevent discharge of more than one transparency at a time through the slot; and

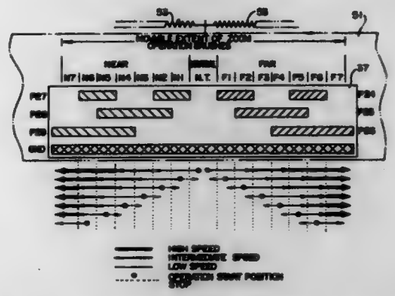
a transparency receiving receptacle on the second support surface for receiving the transparencies after they have been passed over the projector platen, the receptacle including side walls defining a chamber opening toward the projector platen and guide means in the chamber for causing the transparencies placed therein to be stacked slightly out of alignment.

5,198,847

POWER ZOOMING DEVICE

Hiroyuki Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 656,221
Claims priority, application Japan, Feb. 15, 1990, 2-34605
Int. Cl.[5] G03B *1/18*
U.S. Cl. 354—195.12 31 Claims



1. A power zooming device having a zoom lens and an electric drive means for zooming said zoom lens, comprising:

operation means that is movable in opposite directions from a neutral position; and

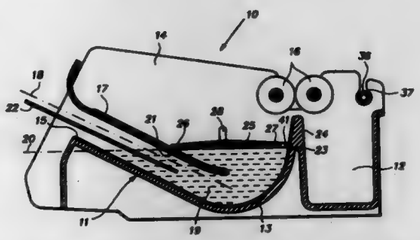
control means for determining a zooming direction and a zooming speed, and for actuating said electric drive means for zooming said zoom lens, when said operation means has been displaced, on the basis of a position of said operation means before and after a displacement thereof.

5,198,848

PROCESSING APPARATUS

Jean-Pierre D. Tahon, Leuven, Belgium; Alfons Kastl, Munich, Fed. Rep. of Germany; Stefan Oslander, Munich, Fed. Rep. of Germany, and Horst Köninger, Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert N. V., Mortsel, Belgium

Filed Apr. 17, 1992, Ser. No. 870,242
Claims priority, application European Pat. Off., Apr. 26, 1991, 91201010.5
Int. Cl.[5] G03D *3/08*
U.S. Cl. 354—320 10 Claims



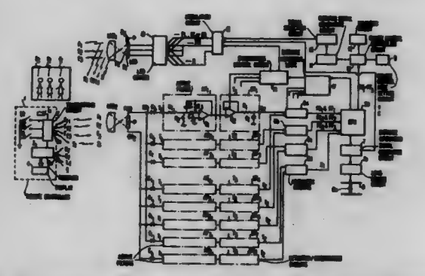
1. Processing apparatus for processing an image-wise exposed silver salt diffusion transfer sheet material comprising a trough (11) for processing liquid, the bottom wall (13) of which is concavely curved to serve as a guide for a sheet through liquid in the trough, the trough being provided with a sloping entry guide plate (17) for guiding a sheet towards its deepest point, a pair of outlet rollers (16) for pulling the sheet at a uniform speed through the apparatus and for squeezing liquid from it and replenishing means for keeping a processing liquid in the trough at a controlled level, characterized in that the apparatus is provided with a floating cover (25) arranged for floating on the free processing liquid surface extending between the rear end (24) of the trough and the guide plate (17), and means for maintaining between the rear side (27) of the floating cover and the corresponding rear end of the trough a spacing (41) with sufficient clearance to allow passage of a sheet along the bottom wall towards the outlet rollers.

5,198,849

REMOTE CONTROLLER FOR A CAMERA

Toshiaki Hirai, Yotsukaido, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,122
Claims priority, application Japan, Mar. 14, 1990, 2-26012[U]; Mar. 8, 1991, 3-43720
Int. Cl.[5] G03B *7/00, 13/20*
U.S. Cl. 354—410 9 Claims



6. A remote control camera system comprising a remote controller and a camera, said controller comprising an information setting switch for selecting target information for a camera, and a remote control beam transmitting circuit comprising means for transmitting a remote control beam that contains selected target data corresponding to the target information selected by the information setting switch, said camera comprising means for receiving a remote control beam transmitted by said controller, means responsive to the receipt of said remote control beam for setting the camera in response to the selected target data, and means for transmitting a return beam containing data corresponding to the setting of the camera in response to said selected target data, said controller further comprising a receiving circuit for receiving said return beam, and a display responsive to signals received by said receiving circuit for displaying said data corresponding to the setting of the camera.

5,198,850

CAMERA HAVING E²PROM

Takashi Saegusa, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 24, 1991, Ser. No. 719,343
Claims priority, application Japan, Jun. 26, 1990, 2-165554
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—412 3 Claims

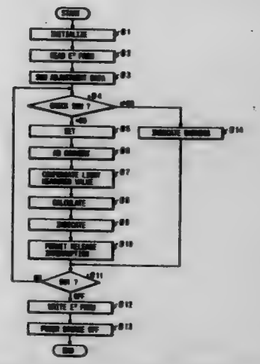
1. A camera including:

E²PROM storing therein set data necessary for the control of the camera, writing data for check sum and a plurality of adjustment data for compensating a control value of said camera to control said camera properly, and capable of electrically rewriting the data, and holding the rewritten data still after a power source switch is opened;

setting means for rewriting said set data;

discriminating means for discriminating the sum total of said writing data for check sum and said adjustment data in response to the closing of the power source switch, and discriminating whether said sum total is equal to a predetermined value; and

monitoring means for effecting at least one of warning and release inhibition when the result of the discrimination by



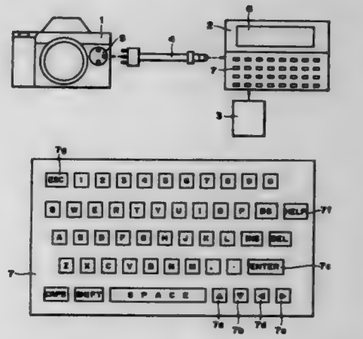
said discriminating means is that said sum total is not equal to said predetermined value.

5,198,851

CAMERA SYSTEM

Hidehiro Ogawa, Funabashi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jan. 27, 1992, Ser. No. 826,535
Claims priority, application Japan, Feb. 6, 1991, 3-035126
Int. Cl.[5] G03B *17/18*
U.S. Cl. 354—412 6 Claims



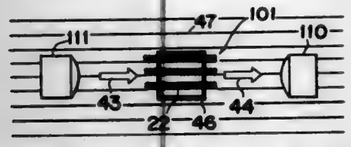
1. A camera system comprising:

a terminal device including an IC card for storing information on a camera, display means for reading and displaying the information of said IC card and communication means for transmitting those of the read information which are necessary to set an operation condition of the camera to the camera;

the camera having a connector for receiving the information necessary to set the operation condition of the camera through the connector; and

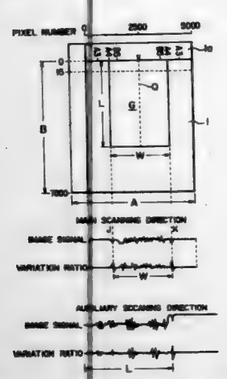
connection means for connecting said communication means for said terminal device and said connector of said camera.

5,198,852
IMAGE FORMING APPARATUS
Tsutomu Mikami, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Feb. 25, 1992, Ser. No. 840,836
Claims priority, application Japan, Mar. 1, 1991, 3-35877
Int. Cl.[5] G03G *5/00*
U.S. Cl. 355—211 3 Claims



1. An image forming apparatus comprising:
a pattern forming means for forming on a photosensitive member, a plurality of patterned images having toner attached thereto;
a light emitting means for irradiating light over the patterned images on said photosensitive member; and
a photosensor means for detecting toner density on the basis of quantity of the light scattered by the patterned images;
wherein an incident plane of said light emitting means relative to said photosensitive member is parallel to a cutting direction of a tubular stock of said photosensitive member.

5,198,853
DOCUMENT SIZE DETECTION APPARATUS
Yoshiyuki Ichihara; Hiroyuki Futami; Toshihiro Motoi; Jun Nakagawa; Noboru Koizumi, and Kouichi Sawada, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Nov. 5, 1991, Ser. No. 788,215
Claims priority, application Japan, Nov. 16, 1990, 2-310234; Nov. 16, 1990, 2-310235; Nov. 16, 1990, 2-310236; Nov. 16, 1990, 2-310237
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—244 10 Claims

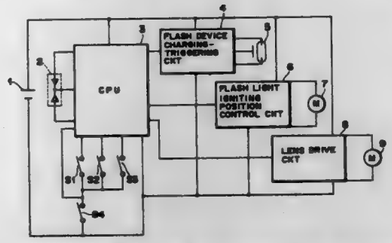


1. A document size detection apparatus for detecting a size of a document provided on document scanning apparatus, comprising:
irradiating means for irradiating said document with a light beam in a primary irradiating direction and in an auxiliary irradiating direction;
covering means for covering said document;
receiving means for receiving a reflection of said light beam reflected from said document and said covering means;
conversion means for converting said reflection to image signals;
detecting means for detecting in said image signals, a shadow cast by said document onto said covering means when the document was irradiated by said light beam of said irradiating means;
determining means for determining said size of said document from said detected shadow of said document;
said detecting means including calculating means for calculating a plurality of variation ratios of said image signals, each variation ratio being represented by the equation

$$\frac{(d_2 - d_1)}{(\text{location value of } d_2 - \text{location value of } d_1)} = d_2 - d_1$$

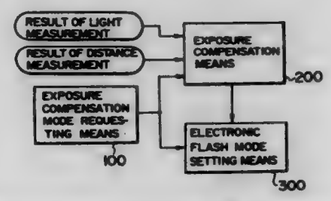
where d_1 represents an image signal value at a location d_1, and d_2 represents an image signal value at a location d_2, and wherein the locations of d_2 and d_1 are a predetermined number of positions apart and wherein the location value of $d_2 - d_1$ in the denominator of said equation equals one;
ascertaining means for ascertaining a first location where at least one of said plurality of variation ratios exceeds a first predetermined value at an outermost side of said document in said primary irradiating direction, and for ascertaining a second location where at least one of said plurality of variation ratios exceeds a second predetermined value at an outermost side of said document in said auxiliary irradiating direction;
changing means for changing said first predetermined value and said second predetermined value; and
wherein said determining means determines said size of said document based upon the ascertained first and second locations.

5,198,854
CAMERA WITH AN ELECTRONIC FLASH LIGHT APPARATUS
Yukikazu Iwase, Kawasaki, and Yoshiaki Ohtsubo, Chiba, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Mar. 9, 1992, Ser. No. 849,094
Claims priority, application Japan, Mar. 13, 1991, 3-021743[U]
Int. Cl.[5] G03B *15/03, 7/08*
U.S. Cl. 354—413 1 Claim



1. A camera system having an electronic flash light apparatus, comprising:
an electronic flash light apparatus for illuminating an object with ignition;
driving means for varying the illuminating angles of said electronic flash light apparatus between the direction of the telescopic side and the direction of the wide angle side;
driving means for moving a phototaking lens to the telescopic side and to the wide angle side;
photometering means for photometering a principal object and the circumference of said main object respectively;
luminance comparison means for comparing the luminance of the main object photometered by said photometering means and the luminance of the circumference of said main object; and
control means for shifting the illuminating angle to the telescopic side by said electronic flash light apparatus driving means if said luminance comparison means determines the light to be a backlight when said phototaking lens is on the wide angle side.

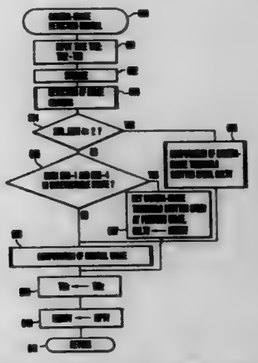
5,198,855
EXPOSURE COMPENSATION DEVICE OF CAMERA
Fumio Iwai, Omiya, Japan, assignor to Fuji Photo Optical Company, Limited, Saitama, Japan
Filed Feb. 24, 1992, Ser. No. 840,176
Claims priority, application Japan, Feb. 26, 1991, 3-53219
Int. Cl.[5] G01B *15/05*
U.S. Cl. 354—414 8 Claims



1. An exposure compensation apparatus of a camera which is used with an electronic flash comprising:
exposure compensation mode requesting means, responsive to an external operation, for requesting an exposure compensation mode;
exposure compensation means having a plurality of exposure compensation modes in which a compensation value for compensating an exposure value and an electroic flashing point are set respectively, said exposure compensation means, being responsive to the request of an exposure compensation mode from said exposure compensation mode requesting means, for
selecting a required exposure compensation mode based on results of a light measurement and a distance measurement, and
compensating an exposure value and an electronic flashing point corresponding to the results of the light measurement and the distance measurement based upon the compensation value of the required exposure compensation mode; and
electronic flash mode setting means, having electronic flash modes corresponding to each of the plurality of exposure compensation modes, said electronic flash mode setting means, being responsive to the required exposure compensation mode from said exposure compensation means, for setting an electronic flash mode corresponding to the required exposure compensation mode.

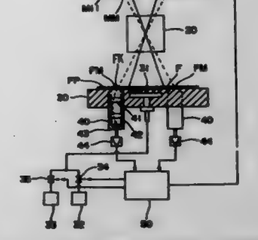
5,198,856
CAMERA HAVING CAMERA-SHAKE DETECTING DEVICE
Yukio Odaka, and Akira Akashi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1991, Ser. No. 648,835
Claims priority, application Japan, Feb. 5, 1990, 2-025482
Int. Cl.[5] G03B *7/08*
U.S. Cl. 354—430 16 Claims

1. A camera having a camera-shake detecting device, comprising:
a) a shake detecting circuit provided with a sensor for detecting a shake of the camera;
b) a determining circuit arranged to determine whether a shake detecting action of said shake detecting circuit can be adequately performed; and
c) indication means for indicating that said shake detecting action is not performed when said determining circuit has



determined that said shake detecting action cannot be adequately performed.

5,198,857
FILM EXPOSURE APPARATUS AND METHOD OF EXPOSURE USING THE SAME
Masabu Goto, Yokohama, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 19, 1991, Ser. No. 671,534
Claims priority, application Japan, Mar. 30, 1990, 2-81336
Int. Cl.[5] G03B *27/42*
U.S. Cl. 355—53 15 Claims



1. A film exposure apparatus in which a plurality of frames arranged in a longitudinal direction of a belt-shaped film are exposed sequentially to light for formation of an image onto each of the frames the film exposure apparatus comprising:
an illumination system;
a photomask disposed at a location to which light from the illumination system is applied;
a photomask position adjusting mechanism;
a projection lens for projecting an image of the photomask formed by said light; and
a film feed mechanism for step-feeding the film one frame by one frame, wherein;
said belt-shaped film is provided with at least two film-side alignment marks on each frame, said film-side alignment marks being formed by at least one of a hole and a transparent portion formed in the film; and
said photomask is provided with a circuit pattern, whose image is to be projected and transferred onto the film, and with photomask-side alignment marks to be projected in

correspondence to the film-side alignment marks, said apparatus further comprising an optical system for projecting a secondary projection image of a primary projection image of at least one of the photomask-side alignment marks to a position of projection of the alignment mark image by the projection lens, and a detector adapted to receive the secondary projection image provided by said optical system.

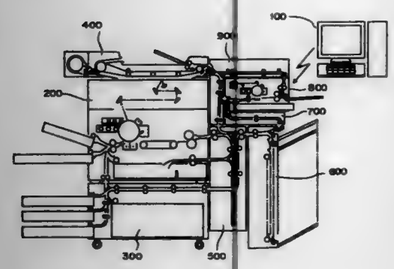
5,198,858

IMAGE FORMING APPARATUS CAPABLE OF MINIMIZING TIME REQUIRED FOR TRANSCRIPTION

Hiroya Sagawa; Kiyoshi Emori, both of Toyokawa; Koji Shakushi, Toyohashi; Takayuki Ariyama, Machida, and Masamichi Kishi, Okazaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1992, Ser. No. 881,884
Claims priority, application Japan, May 13, 1991, 3-107370
Int. Cl.[5] G03G *15/00, 15/22*
U.S. Cl. 355—202 9 Claims

1. An image forming apparatus comprising:
a first image forming means for forming an image on a first sheet upon receipt of image information;
a second image forming means having a document platform for forming on a second sheet an image of a document placed on said document platform;
a document conveying means for conveying to said document platform said first sheet as a document on which the image has been formed by said first image forming means;



a setting means for setting the number of transcripts to be prepared; and
a transcription mode selector means for selecting either a single drive transcription mode or a double drive transcription mode to minimize a time required for preparing a required number of transcripts set by said setting means, said single drive transcription mode being a mode at which all the transcripts are prepared by sole use of said first image forming means, said double drive transcription mode being a mode at which said first sheet having the image formed by said first image forming means is conveyed by said document conveying means so that the rest of transcripts are prepared by said second image forming means.

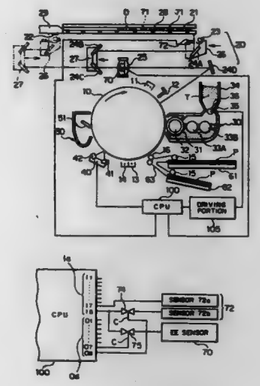
5,198,859

DOCUMENT INFORMATION DETECTING DEVICE FOR A COPYING MACHINE

Utami Soma, and Kazumichi Yamauchi, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 10, 1991, Ser. No. 713,114
Claims priority, application Japan, Jun. 13, 1990, 2-154468; Jul. 6, 1990, 2-178807
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—204 4 Claims

1. An apparatus for use in a copying machine which detects an image on a document, comprising:
a cover for setting said document onto a platen glass;
means for scanning a document and for photoelectrically



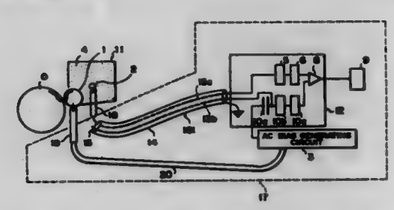
reading said document along a given scan line and for reading both said document and a surface of said cover on said given scan line through said platen glass to detect a boundary line between said document and said cover surface for generating a first analog signal representing the size of said document and a second analog signal representing an image density of the image on said document;
a central processing unit having means for processing said first and second analog signals for determining the size of said document on the basis of the location of said boundary line on said given scan line, and the image density of said document, said central processing unit including:
an input port for receiving both of said first and second analog signals, and
switch means for selectively inputting one of said first analog signal and said second analog signal at a time into said input port, wherein said scanning means scans said cover and said document in sequence, and wherein said switch means inputs said first analog signal and said second analog signal in sequence into said input port.

5,198,860

IMAGE FORMING APPARATUS INCLUDING MEANS FOR DETECTING AMOUNT OF TONER

Hiromichi Yamanaka, Kawasaki; Takeji Gima, Machida; Takashi Soya, Kawasaki, and Akihiro Shibata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 593,646
Claims priority, application Japan, Oct. 4, 1989, 1-260708
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 11 Claims



1. An image forming apparatus, having an image bearing member with an electrostatic latent image formed thereon and a developing unit accommodating toner for developing the electrostatic latent image, said image forming apparatus comprising:
a detecting member for generating a detection signal in accordance with an amount of toner in the developing unit;
a first lead wire;
a reference signal generating means for generating a reference signal;
a second lead wire disposed in parallel with said first lead wire, one end of said second lead wire being connected to said reference signal generating means and a second end thereof being electrically open; and
comparison means for comparing the reference signal and the detection signal transmitted by said first lead wire.

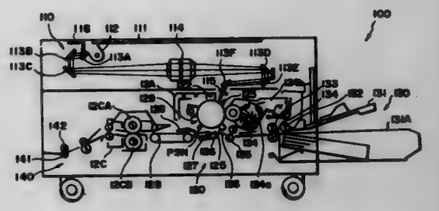
5,198,861

IMAGE DENSITY CONTROL METHOD FOR AN IMAGE FORMING APPARATUS FOR REDUCING BACKGROUND CONTAMINATION OF A PHOTOCONDUCTIVE DRUM

Shin Hasegawa, Kawasaki; Hajime Oyama, Ichikawa; Eiichi Katoh, Tokyo, and Masao Moriya, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1992, Ser. No. 826,619
Claims priority, application Japan, Jan. 28, 1991, 3-9481
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 9 Claims

1. In an image density control method comprising the steps of:
(a) exposing a charged surface of a photoconductive element by a reference pattern having a high density to electrostatically form a corresponding latent image on said photoconductive element;
(b) developing said latent image by a toner stored in a developing unit to convert said toner image to a toner pattern image;
(c) sensing a reflection from said toner pattern image and a reflection from a background area on said photoconductive element by a photosensor; and
(d) controlling the supply of a toner to said developing unit on the basis of a comparison between a first input voltage representative of a toner density of a portion of said photoconductive element where no toner has been applied, and a second input voltage representative of a toner density of said toner pattern image, such that if said first input voltage is less than the second input voltage by a predetermined amount, a microprocessor couples a toner supply clutch to said developing unit in order to supply toner thereto, and if said first input voltage is greater than the second input voltage by said predetermined amount, the microprocessor uncouples said toner supply clutch from said developing unit;
the improvement wherein said pattern image is formed under a particular image forming condition which causes the output of said sensor to lie in a range where a sensed value noticeably changes in response to a change in density, while said background area is formed under another particular image forming condition which contaminates the background area less than said particular image forming condition assigned to said pattern image.



5,198,862

Patent Not Issued For This Number

5,198,863

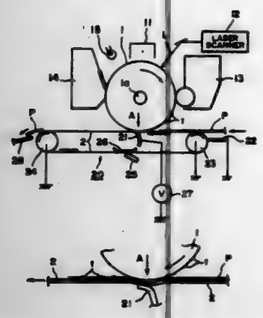
IMAGE FORMING APPARATUS

Masahiro Goto, Kawasaki, and Koichi Hiroshima, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 371,815, Jun. 27, 1989, abandoned.
This application Jun. 17, 1991, Ser. No. 715,702
Claims priority, application Japan, Jun. 29, 1988, 63-161184
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—274 41 Claims

1. An image forming apparatus, comprising:
a movable image bearing member;
means for forming an image on said image bearing member; and
means for transferring the image formed on said image bearing member by said image forming means onto a transfer material, said transfer means including:
a movable transfer member for moving the transfer material while causing the transfer material to contact the surface of said image bearing member at a transfer position, and
an electrode for forming a transfer electric field, said electrode being supplied with a voltage and contacting a surface of said transfer member remote from said image bearing member at said transfer position wherein

$5\times10^{-5}L\times Vp\leq I\leq 1\times10^{-3}\times L\times Vp$



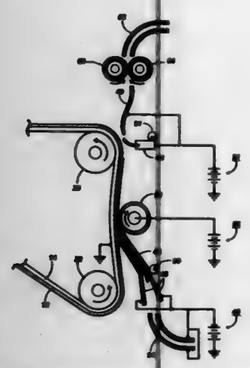
wherein I is a current in micro ampere to said electrode; Vp is a speed in mm/sec. of movement of the transfer material; and L is a width in mm. of a maximum transfer material measure in a direction perpendicular to the movement direction of the transfer material.

5,198,864

TRANSFER SYSTEM WITH FIELD TAILORING

Gerald M. Fletcher, Pittsford, N.Y., assignee to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1991, Ser. No. 812,276
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—274 24 Claims



1. An apparatus for transferring toner particles having a selected polarity charge from an image support surface to a copy substrate, comprising

transfer means positioned adjacent said image support surface to define a transfer zone for transferring the toner particles to the copy substrate and further defining a pre-transfer zone and a post-transfer zone;

means, positioned in the pre-transfer zone, for guiding said copy substrate into the transfer zone, said pre-transfer guide means being electrically biased to a voltage potential having substantially the same polarity as that of the charged toner particles so as to effectively minimize transfer fields in the pre-transfer zone to substantially prevent toner transfer therein; and

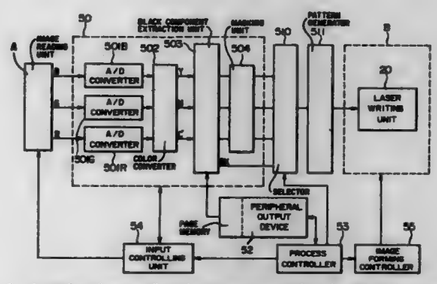
means, positioned in the post-transfer zone, for guiding said copy substrate away from the transfer zone, said post-transfer guide means being electrically biased to a voltage potential having the opposite polarity as that of the charged toner particles so as to effectively enhance transfer fields in the post-transfer zone to substantially enhance toner transfer in the transfer zone adjacent thereto.

5,198,865

COLOR IMAGE FORMING APPARATUS

Satoshi Haseda; Hisao Satoh; Tadayoshi Ikeda; Masakazu Fukuchi, all of Hachioji, and Shizuo Morita, Tachikawa, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 4, 1991, Ser. No. 787,135
Claims priority, application Japan, Nov. 9, 1990, 2-304634; Nov. 9, 1990, 2-304635
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 8 Claims



1. A color image forming apparatus for forming images corresponding to original image data, from at least one document on recording sheets, comprising:

means for scanning the document so that said original image data is obtained;

means for receiving said original image data from peripheral image data generating apparatus;

means for selecting one of a scanning mode, wherein said scanning means obtains said original image data, and a printing mode, wherein said receiving means receives said original image data;

means for obtaining a plurality of color component images corresponding to said original image data;

means for forming a plurality of color toner layers on an image holding means as the image, wherein each of said color toner layers corresponds to one of said color component images, said image holding means, having a rotatable endless surface, for holding said color toner layers thereon; and

means for transferring said color toner layers onto said recording sheet,

wherein, when said scanning mode is selected, said image holding means rotates a predetermined number of times according to the size of said image when forming one of said color toner layers on said image holding means, and, when said printing mode is selected, said forming means forms each of said color toner layers for at least one document according to the size of said image while said image holding means rotates once.

5,198,866

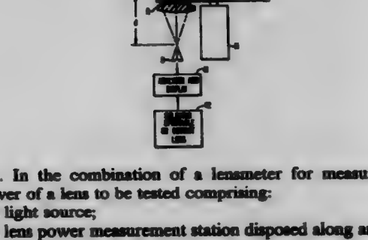
ROTARY DEVELOPING DEVICE HAVING ADJUSTABLE DEVELOPING UNITS FOR IMAGE FORMING EQUIPMENT

Noriyuki Kimura, Kawasaki, and Minoru Suzuki, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 29, 1992, Ser. No. 827,593
Claims priority, application Japan, Jan. 29, 1991, 3-29314
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 4 Claims

1. A rotary developing device incorporated in image forming equipment and having a plurality of developing units rotatably mounted on a rotary shaft and rotating said developing units for sequentially developing latent images electrostatically formed on an image carrier at a developing position where said developing units sequentially face said image carrier, said device comprising:

first side plates formed integrally at least with said rotary shaft;



partitions extending radially away from said rotary shaft for separating said developing units from one another; and

second side plates respectively removably mounted on said first side plates;

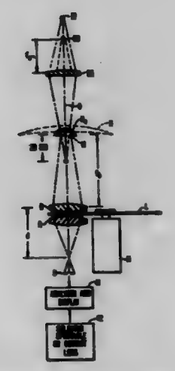
at least a developer carrier included in each of said developing units and a member also included in said developing units and contacting or adjoining said developer carrier in a predetermined positional relation being mounted on said second side plates.

5,198,867

ADAPTION OF LENSMETER OPTICS FOR MINIMIZING CONTACT LENS SPHERICAL ABERRATION

Charles Campbell, Berkeley, Calif., assignor to Allergan Humphrey, San Leandro, Calif.

Filed May 7, 1991, Ser. No. 696,664
Int. Cl.[5] G01B *9/00*
U.S. Cl. 356—125 10 Claims



1. In the combination of a lensmeter for measuring the power of a lens to be tested comprising:

a light source;

a lens power measurement station disposed along an optical axis from said light source, said lens power measuring station including means for registering said lens to be tested at said lens power measurement station for measurement of the power of said lens to be tested;

relay optics on said optical axis between said light source and said lens power measurement station for relaying a light of said light source to said lens power measurement station for incidence on said lens to be tested placed at said station;

a light source observation station for receiving from said lens power measurement station deflected light of said light source to determine the power of said lens to be tested placed at said lens measuring station;

means for receiving a contact lens to be tested at said lens power measurement station, said contact lens to be tested having a convex anterior surface and a concave posterior surface, said means for receiving a contact lens to be tested placed at said lens measuring station on said optic axis for measurement of the power of said lens to be tested and aligning concave posterior surface on one side of said lens power measurement station; and,

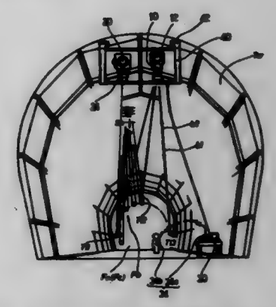
means for causing light to be incident to said means for receiving a contact lens to be tested along a path converging toward the posterior surface of the contact lens to be tested substantially between the second and third mean aplanatic points of said contact lens whereby spherical aberration is minimized with respect to said contact lens.

5,198,868

LASER SURVEYING SYSTEM HAVING A FUNCTION OF MARKING REFERENCE POINTS

Takeo Saito, Tokyo; Yoshiaki Ishida, Chichibu; Nobuyuki Fukunaga, Toyama; Mutsuhiko Kimura, Aichi; Yasuo Meteki, Ushiku, and Kenji Miyahara, Ichikawa, all of Japan, assignors to Sato Kogyo Co., Ltd., Toyama and Mac Co., Ltd., Chiba, both of Japan

Continuation of Ser. No. 793,957, Nov. 15, 1991, abandoned.
This application Jul. 20, 1992, Ser. No. 915,401
Claims priority, application Japan, Nov. 16, 1990, 2-308511
Int. Cl.[5] G01J *40/14*
U.S. Cl. 356—142 4 Claims



1. A laser surveying system comprising:

a laser oscillator for projecting a laser beam toward at least one reflector target;

a laser measuring unit attached to said laser oscillator for receiving a laser beam projected by said laser oscillator and reflected by a laser target and effecting distance and angular measurements with reference to the received laser beam and outputting surveying data based on said measurements;

a laser projector projecting a laser beam to a working face and deflecting the laser beam vertically and horizontally to form a laser spot pattern on the working face so as to optically indicate reference points on the working face, said laser projector being operable independently of said laser oscillator and said laser measuring unit for forming the laser spot pattern on the working face; and

a controller unit operably connected to said laser means and said laser projector for determining spot data from the surveying data outputted from said laser measuring unit and predetermined design data and for controlling said

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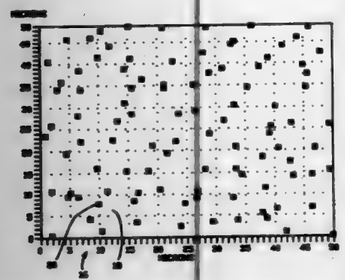
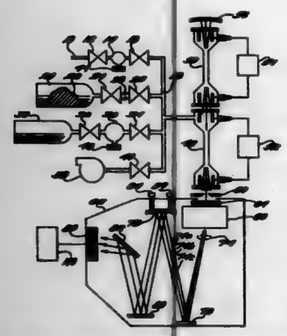
laser projector in accordance with the thus determined spot data.

5,198,869
REFERENCE WAFER FOR HAZE CALIBRATION
Robert J. Monteverde, Cupertino, and Bradley W. Schoer, Sunnyvale, both of Calif., assignors to VLSI Standards, Inc., Mountain View, Calif.
Filed Oct. 15, 1990, Ser. No. 597,788
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—243 19 Claims



1. A reference for haze calibration of a wafer scanner comprising,
a wafer having a plurality of light scattering features fabricated on a substrate thereof within an imaginary regular array of cells such that the position of each of said scattering features coincides with a calculated random location within a cell, each cell having one and only one scattering feature therein, said cells having a maximum size of 100 square micrometers.

5,198,870
ATOMIC LINE EMISSION ANALYZER FOR HYDROGEN ISOTOPES
James W. Kronberg, 108 Independent Blvd., Aiken, S.C. 29801
Filed May 8, 1991, Ser. No. 697,032
Int. Cl.[5] G01J *3/30*
U.S. Cl. 356—311 18 Claims



1. Apparatus for analysis of isotopes of a sample of hydrogen gas, said isotopes characterized by an emission spectrum including Balmer series with beta and gamma lines, said apparatus comprising:
means for exciting at least some electrons in said sample to a higher energy state from a lower energy state so that at least some electrons cause the emission of light when in transition from said higher energy state to said lower energy state;
dispersing means in spaced relation to said exciting means for receiving said light and for dispersing said light according to wavelength, said dispersing means including a prism made of an anomalously dispersing material,
said anomalously dispersing material selected to disperse said light to a greater extent at frequencies near said beta and gamma lines of said Balmer series than at higher and lower frequencies; and
detecting means in spaced relation to said dispersing means for receiving said dispersed light and for detecting the amounts of said light as a function of wavelength, said detecting means producing an output responsive to said amounts,
said output indicating of the quantity and type of said isotopes of hydrogen present in said sample. u

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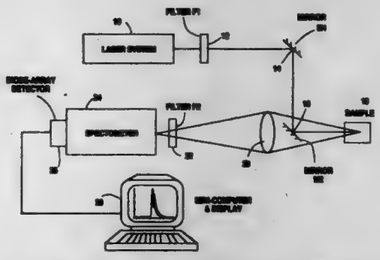
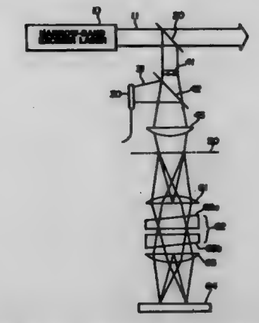
5,198,871
LASER-INDUCED-FLUORESCENCE INSPECTION OF JET FUELS
Ralph H. Hill, Jr., and David W. Naegeli, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.
Filed Jun. 18, 1991, Ser. No. 717,265
Int. Cl.[5] G01N *21/64*
U.S. Cl. 356—318 2 Claims



1. An optical system for inspecting a sample of fuel to determine the existence of contaminants, such as gums, in said sample, comprising:
a laser for illuminating said sample with a quantity of laser light, said laser producing light having a wavelength of approximately 488 nanometers, for causing fuel in said sample to produce fluorescent radiation;
means for detecting said fluorescent radiation and for producing an output data signal in response thereto; and
means for correlating said output data signal with the existence of contaminants, such as gums, in said sample of fuel.

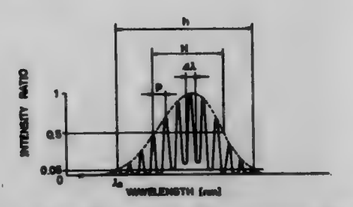
5,198,872
APPARATUS FOR DETECTING THE WAVELENGTH OF LASER LIGHT
Osamu Wakabayashi; Masahiko Kowaka, and Yukio Kobayashi, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
PCT No. PCT/JP90/00640, § 371 Date Apr. 22, 1991, § 102(e) Date Apr. 22, 1991, PCT Pub. No. WO90/14582, PCT Pub. Date Nov. 29, 1990
PCT Filed May 18, 1990, Ser. No. 640,431
Claims priority, application Japan, May 23, 1989, 1-129393
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—352 12 Claims

1. A wavelength detecting apparatus for detecting the wavelength of a first light from a first light source with reference to reference light from a reference light source by allowing said reference light and said first light to be irradiated toward an etalon and then detecting the light which has permeated through said etalon by optical detecting means, wherein said apparatus comprises:
a focal plane toward which said first light an said reference light are irradiated,
collimeter lens means in an optical path between said etalon and said focal plane arranged at a preceding stage relative to said etalon for transforming the light which has been irradiated toward said focal plane into parallel light,



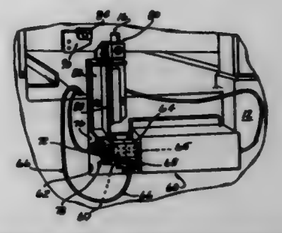
optical path means between said focal plane and said first light source and said reference light source for guiding said reference light and said first light to said focal plane, and
image building means arranged at a subsequent stage relative to the etalon to receive light from said etalon and for guiding light which has permeated through said etalon onto a detecting surface of said optical detecting means.

5,198,873
ENCODER UTILIZING INTERFERENCE USING MULTI-MODE SEMICONDUCTOR LASER
Ko Ishizuka, Urawa; Tetsuharu Nishimura, Kawasaki; Yoichi Kubota, Yokohama; Masaaki Tsukiji, and Satoshi Ishii, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 423,350, Oct. 18, 1989, abandoned.
This application Nov. 12, 1991, Ser. No. 789,633
Claims priority, application Japan, Oct. 19, 1988, 63-264687
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—356 17 Claims



1. An apparatus for measuring the displacement of a diffraction grating, comprising:
a multi-mode semiconductor laser generating a laser beam having at least five vertical modes each having an intensity ratio of at least 0.05 and having an envelop which envelopes peaks of the respective vertical modes each having an intensity ratio of at least 0.05 in oscillation spectrum multi-mode, said envelope having a width of no greater than 6 nm;
interference means for directing the laser beam from said laser to the diffraction grating and causing first and second diffracted light beams generated at the diffraction grating to interfere with each other to generate interference light, with the phase of the interference light changing according to the displacement of the diffraction grating; and
conversion means for converting the interference light supplied by said interference means into an electrical signal to measure the displacement of the diffraction grating.

5,198,874
COORDINATE MEASURING MACHINE WITH LASER INTERFEROMETER AND FIBER OPTIC LASER DELIVERY SYSTEM
Frederick K. Bell; Yosuke Murata, and Freddie L. Raleigh, all of Canterville, Ohio, assignors to Sheffield Measurement Division, Bloomfield Hills, Mich.
Filed Apr. 22, 1991, Ser. No. 688,753
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—358 6 Claims



1. In combination with a coordinate measuring machine (10) having a table (24) for supporting workpieces to be measured, a probe shaft (56), an X carriage (52), a Y carriage (16) having an upper cross beam (48) extending across and above said table (24), and a base (12), means supporting said Y carriage (16) for movement along a first horizontal axis, means supporting said X carriage (52) on said Y carriage upper cross beam (48) for movement along a second horizontal axis orthogonal to said Y axis, said probe shaft (56) supported on said X carriage (52) for movement along a third axis, a Y axis interferometer (80) mounted on said base (12) and an aligned Y axis retroreflector target mounted on said Y axis carriage (16), an X axis interferometer (176) mounted on said X axis carriage (52), a Z axis interferometer (196) mounted on said X axis carriage (52) combined with an aligned Z axis retroreflector target on said probe shaft (56), a laser beam including a laser generator housing mounted to said base generator (60) for generating a laser beam, and laser beam delivery means for directing said laser beam to each of said X,Y, and Z axis interferometers (80, 176, 196), including a fiber optic cable network (66, 72) comprising at least in part said laser delivery means for delivering said laser beam from said laser generator (60) to said X and Z axis interferometers (176, 196) beam splitter means (65, 67) including beam splitter housing means (64) and further including alignment adjustment means (76) for adjustably aligning said fiber optic cables (66, 72) with respect to said housing means (64), said alignment adjustment means comprising an adjustment flexure having three plate sections (120, 122, 124) generally aligned parallel to each other but spaced apart, to form a stack with two outside plate sections (120, 124) and a middle plate section (122) therebetween; a first web (142) connecting one of said outside plate sections (120) and said middle plate section (122) along adjacent sides thereof; adjustment means (148) for adjustably spreading the other sides of said one and middle plate sections (120, 122) apart, locking means for locking said one and middle plate sections (120, 122) in any adjusted position; a second web (164) connecting the other of said outside plate sections (124) and said middle plate section (122) along adjacent sides thereof extending orthogonally to said first web (142); adjustment means (148) for adjustably spreading said other outside and middle plate sections apart; locking means (152, 154) for locking said other outside and middle plate sections (122, 124) in any adjusted position; mounting

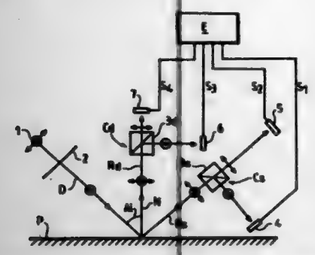
means (166, 114) for mounting said one outside plate section (120) to one of said laser generator (60) or one of said fiber optic cables (66, 72) and said other outside plate section (124) to the other of said laser generator (60) or one fiber optic cables (66, 72) whereby alignment adjustment therebetween about orthogonal axes defined by said first and second webs is enabled.

5,198,875

DEVICE DESIGNED TO ASSESS THE BRIGHTNESS OF A SURFACE MORE PARTICULARLY OF THE SKIN

Roland Bazin, Vitry-sur-Seine; Luc Chommeloux, Antibes; Gérard Obadia, Nice, and Hervé Chardron, Longjumeau, all of France, assignors to L'Oreal, Paris, France

Filed Aug. 9, 1991, Ser. No. 742,754
Claims priority, application France, Aug. 16, 1990, 90 10379
Int. Cl.[5] G01N *21/57, 33/483*
U.S. Cl. 356—369 9 Claims



1. Apparatus, for assessing the brightness of a surface such as skin, comprising

a light source for projecting an incident beam of light on the surface to be examined, means comprising a polarizer and analyzer means for assessing the light reflected from the surface with one of a parallel and a right angle orientation of polarization relative to said polarizer and analyzer means, said polarizer being disposed between said light source and the surface, said incident beam producing reflected beams, said apparatus including a photodetector means sensitive to the light reflected from the surface, said light source being capable of producing a directed beam positioned to impinge on the surface at a selected angle of incidence between 0° and 90°; said incident beam being polarized by said polarizer and being reflected from the surface in at least two directions with one of said directions being symmetrical with the incident beam's direction of propagation relative to a normal axis to the surface; said analyzer means being positioned to intercept beams reflected from the surface in each of said two directions and to provide a differentiation between the reflection with parallel polarization and the reflection with perpendicular polarization with the differences obtained representing an assessment of specular brightness and diffuse brightness.

5,198,876

METHOD OF MEASURING THREE-DIMENSIONAL POSTION OF WORKPIECE

Takashi Anezaki, Hirakata; Hitoshi Kubota, Moriguchi, and Masaho Yamane, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

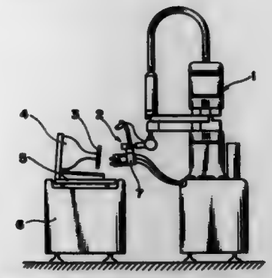
Filed Nov. 13, 1991, Ser. No. 791,223
Claims priority, application Japan, Nov. 13, 1990, 2-307522
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—375 4 Claims

1. A method of measuring a three-dimensional position of a workpiece by using a laser measuring unit provided at a hand portion of an industrial robot, the laser measuring unit including an image recognition camera, a first laser beam source for emitting a lateral slit beam obliquely and forwardly from a vertical axis of a visual coordinate system of the image recognition camera and a second laser beam source for emitting a vertical slit beam obliquely and forwardly from a lateral axis of the visual coordinate system, the method comprising:

the first step of positioning the laser measuring unit such that the laser measuring unit confronts the workpiece;

the second step of emitting the lateral and vertical slit beams towards the workpiece from the first and second laser beam sources, respectively;

the third step of inputting the lateral and vertical slit beams on the workpiece, as first and second slit images, into the image recognition camera, respectively;



the fourth step of detecting a first point of a maximum output of the lateral slit beam at an edge of the workpiece in the first slit image and a second point of a maximum output of the vertical slit beam at another edge of the workpiece in the second slit image; and

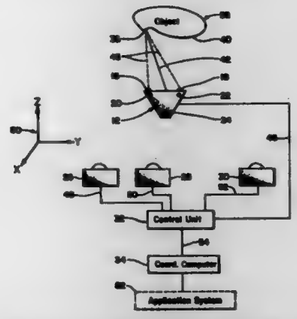
the fifth step of calculating the three-dimensional position of the workpiece based on a first amount of deviation of the first point from a first preset reference point and a second amount of deviation of the second point from a second preset reference point.

5,198,877

METHOD AND APPARATUS FOR THREE-DIMENSIONAL NON-CONTACT SHAPE SENSING

Waldean A. Schulz, Boulder, Colo., assignor to PixSys, Inc., Boulder, Colo.

Filed Oct. 15, 1990, Ser. No. 597,505
Int. Cl.[5] G01B *11/14, 11/24;* G01C *3/08*
U.S. Cl. 356—375 12 Claims



1. Optical mensuration apparatus for mapping and recording the location of points on a surface of a three-dimensional object, comprising:

a mounting structure, and object being positioned in immoveable relation to said mounting structure, and a three-dimensional coordinate system defined in fixed relation to said mounting structure;

scanning means for projecting a scanning beam onto the surface of the object to illuminate a plurality of spots on the surface of the object; said scanning means being handholdable and freely moveable by hand in relation to both said mounting structure and said object and not connected mechanically or structurally to either said mounting structure and said object;

spot detector means mounted to said scanning means for detecting the positions of the illuminated spots on the surface of the object in relation to said scanning means;

position detecting means mounted on said mounting structure and remotely located from both said object and said scanning means for detecting the position of said scanning means in relation to the coordinate system; and

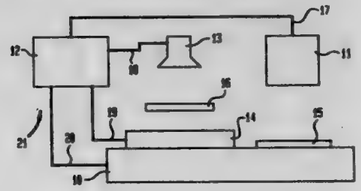
computing means connected to said scanning means and to said position detecting means for determining the recording the positions of said illuminated spots on the surface of the object in relation to the coordinate system by correlating the positions of said illuminated spots in relation to said scanning means with the respective positions of said scanning means in relation to the coordinate system when each respective spot is illuminated.

5,198,878

SUBSTRATE MACHINING VERIFIER

Anthony F. Conesk, Newburgh; Yea-Sen Lin, and George B. VanderGheynst, both of LaGrangeville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1990, Ser. No. 621,698
Int. Cl.[5] G01B *11/00;* H01L *27/14*
U.S. Cl. 356—394 49 Claims



1. A system for verifying substrate machining, comprising:

means for mounting a substrate;

an energy beam source located to impinge upon the substrate;

means for detecting portions of the energy beam impinging on machined features of the substrate, the detecting means comprising a matrix of switching circuits, each switching circuit corresponding to a respective machined feature of substrate, and each switching circuit being responsive to the portion of the energy beam impinging on the respective machined feature for developing an electrical signal characterizing the respective machined feature, wherein the matrix is arranged in rows and columns, wherein the switching circuits have row inputs and column outputs, and wherein each row has at least a single input and each column has at lest two outputs;

means for converting each electrical signal into a string of digital output data; and

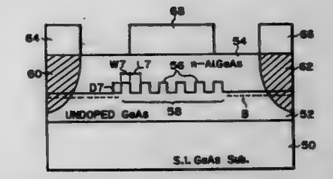
verifier controller means for comparing the digital output data with a predetermined set of data to verify machining accuracy.

5,198,879

HETEROJUNCTION SEMICONDUCTOR DEVICE

Toshio Ohshima, Atsugi, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 19, 1991, Ser. No. 672,025
Claims priority, application Japan, Mar. 19, 1990, 2-68740; Sep. 20, 1990, 2-250679
Int. Cl.[5] H01L *29/80*
U.S. Cl. 257—20 12 Claims



1. A heterojunction semiconductor device, comprising:

a first compound semiconductor layer and a second compound semiconductor layer having an electron affinity different from that of said first compound semiconductor layer, said first and second compound semiconductor layers forming a heterojunction interface therebetween, said first compound semiconductor layer being doped with donor impurities and having an energy at the conduction band bottom thereof higher than that of said second compound semiconductor layer,

wherein said first compound semiconductor layer comprises at least one concave groove portion having a rectangular cross section at the heterojunction interface, and

wherein said second compound semiconductor layer comprises at least one convex projection portion corresponding to said concave groove portion, and

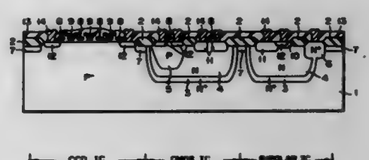
two electrode regions provided in said first and second semiconductor layers outside of said concave groove portion.

5,198,880

SEMICONDUCTOR INTEGRATED CIRCUIT AND METHOD OF MAKING THE SAME

Ginoru Taguchi, Oomiya, and Hiroshi Mochizuki, Musashino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 540,323, Jun. 19, 1990, abandoned.
This application Oct. 28, 1991, Ser. No. 784,605
Claims priority, application Japan, Jun. 22, 1989, 1-160055
Int. Cl.[5] H01L *27/02, 29/72*
U.S. Cl. 357—214 6 Claims



1. An integrated semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

charge coupled device means on the substrate;

a plurality of first buried epitaxial layers, in the substrate, of a second conductivity type and having a first impurity concentration;

a bipolar type circuit in one of the first buried epitaxial layers, the bipolar type circuit including a bipolar transistor having a collector;

a field oxide layer for isolating the buried first epitaxial layers from one another; and

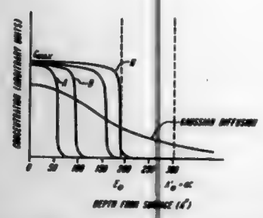
a plurality of second buried layers, interposed between the semiconductor substrate and each of the first buried epitaxial layers, of the second conductivity type and having an impurity concentration higher than the first impurity concentration, wherein the bipolar transistor collector is coupled to one of the second buried layers.

5,198,881

BARRIER LAYER DEVICE PROCESSING

Jammy C. Huang, Andover; Mordechai Rothschild, Newton; Barry E. Burke; Daniel J. Ehrlich, both of Lexington, and Bernard B. Kosicki, Acton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 458,250, Dec. 28, 1989, abandoned.
This application Aug. 7, 1991, Ser. No. 742,274
Int. Cl.[5] H01L 29/78, 27/14, 31/00
U.S. Cl. 257—219 12 Claims



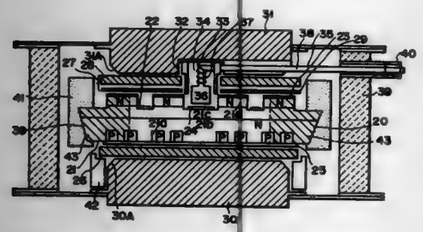
1. An array of semiconductor devices formed on one surface of a common substrate having membrane thickness, and a crystalline impurity layer formed by diffusion into a back surface of said substrate opposite the surface on which said array of semiconductor devices are formed, said impurity layer having a constant impurity concentration and extending only to a depth of under approximately several hundred Angstroms with negligible impurity concentration below said depth and having low electron mobility so that free electrons dislodged by light passing into the substrate cannot reach the back surface whereby charge is efficiently collected by the array of semiconductor devices.

5,198,882

CRIMP-TYPE POWER SEMICONDUCTOR DEVICE

Hideo Matsuda, Yokohama; Susumu Iesaka, Tokyo; Takashi Fujiwara, Yokohama; Michiaki Hiyoshi, Yokohama, and Hisashi Suzuki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1990, Ser. No. 589,600
Claims priority, application Japan, Oct. 2, 1989, 1-257412
Int. Cl.[5] H01L 29/00, 29/74, 29/747, 23/02
U.S. Cl. 357—37 6 Claims



1. A crimp-type semiconductor device comprising:

a disk-shaped semiconductor substrate including first and second major surfaces, a first semiconductor layer of a first conductivity type, and a second semiconductor layer of a second conductivity type;

a plurality of first-conductivity type impurity regions in the second layer and exposed in the first major surface;

a plurality of substantially rectangular second-conductivity type impurity regions radially arranged on the first layer, said second conductivity type impurity regions being arranged as a plurality of arrays, the plurality of arrays being concentric relative to each other around a center, the plurality of arrays including an outermost array;

a first main electrode in contact with the second layer;

a plurality of second main electrodes in contact with the respective second-conductivity type impurity regions;

a first electrode member in contact with the first main electrode;

a second electrode member in contact with the second main electrodes;

a first electrode post for pressing the first electrode member against the semiconductor substrate, said first electrode post being in contact with the first electrode member and having a cutaway section at the periphery of an upper surface thereof;

a second electrode post for pressing the second electrode member against the semiconductor substrate, said second electrode post having a portion contacting the second electrode member and having a cutaway section at the periphery of a lower surface thereof,

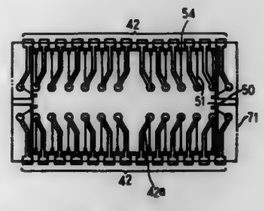
wherein said disk-shaped semiconductor substrate is provided with an annular lifetime-controlled region having an inner diameter, the inner diameter being sufficiently large such that the inner diameter is farther from the center than at least part of each of the second conductivity type impurity regions of the outermost array, and being sufficiently small such that the inner diameter is in vertical alignment with the contacting portion.

5,198,883

SEMICONDUCTOR DEVICE HAVING AN IMPROVED LEAD ARRANGEMENT AND METHOD FOR MANUFACTURING THE SAME

Kenji Takahashi, Tokyo; Yasuhiro Yamaji, Kanagawa; Susumu Harada, Kanagawa; Kazuichi Komesaka, Kanagawa; Mitsugu Miyamoto, Kanagawa; Masashi Muromachi, Kanagawa; Hiroshi Harada, Kanagawa; Kazuo Numajiri, Kanagawa; Haruyuki Shimakawa, Kanagawa, and Toshiharu Sakurai, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 19, 1989, Ser. No. 381,843
Claims priority, application Japan, Aug. 6, 1988, 63-196453
Int. Cl.[5] H01L 21/60, 23/28
U.S. Cl. 257—676 13 Claims



1. A frame assembly body comprising:

a semiconductor chip having a plurality of bonding pads formed along at least a first edge of a main surface of the semiconductor chip;

a first frame including a die pad portion having a main surface supporting the semiconductor chip;

a second frame, integrally attached to the first frame, including a plurality of laterally spaced inner leads, each of the inner leads including an arm portion having edges extending along a longitudinal axis and overlapping said at least first edge and spaced above the main surface of the semiconductor chip, each said arm portion terminating at a head portion disposed inwardly of said at least first edge, each of the arm portions of the inner leads being substantially parallel to one another, and the head portion of each inner lead being laterally offset from the longitudinal axis and edges of the arm portion of that inner lead in alignment with a respective one of the bonding pads; and

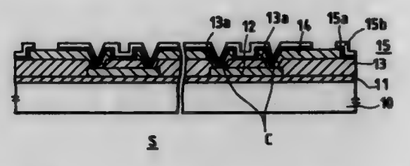
a plurality of bonding wires, each of the bonding wires connecting a respective one of the head portions of the inner leads to the bonding pad with which the respective head portion is aligned and extending along a path offset from adjacent arm portions of the inner leads.

5,198,884

SEMICONDUCTOR DEVICES HAVING A DOUBLE-LAYER INTERCONNECTION STRUCTURE

Kohsaku Yase; Tetsuya Ueda; Teruhito Ohnishi, and Hiroshi Nishimura, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 27, 1991, Ser. No. 675,833
Claims priority, application Japan, Mar. 27, 1990, 2-77863
Int. Cl.[5] H01L 23/48
U.S. Cl. 257—760 7 Claims



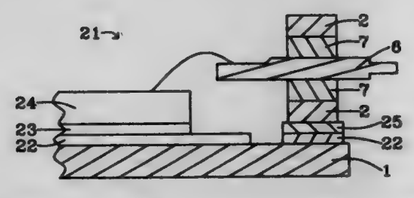
1. In a semiconductor device of the type which comprises a first metal film formed on a semiconductor substrate, an insulating film having openings and formed on the first metal film, a second metal film provided in electric contact with the first metal film through the openings of the insulating film, and a protective layer made of a phosphosilicate glass film and silicon nitride film formed on the second metal film, the improvement in that a value obtained by multiplying a thickness of the silicon nitride film formed on the second metal film layer at the openings by a stress of the film is not larger than 2/5 of a value of a thickness of the silicon nitride film formed on the second metal film on portions other than the openings by a stress of the silicon nitride film on the portions.

5,198,885

CERAMIC BASE POWER PACKAGE

Shawki S. Ibrahim, W. Lafayette, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed May 16, 1991, Ser. No. 701,492
Int. Cl.[5] H01L 23/02, 23/12
U.S. Cl. 257—701 11 Claims



1. An hermetic package for electrical and electronic components, said package configured to be mounted upon a supporting structure, comprising:

a substantially planar electrically non-conductive ceramic substrate having a first electrical conductor patterned thereon;

a covering means adhered to said substrate, said covering means said substrate forming an hermetic enclosure;

a first electrical component, relatively more thermally dissipating than said first electrical conductor, electrically connected to said first electrical conductor and hermetically contained within said covering means and said substrate;

said covering means having flange means extending in a direction parallel to said planar substrate beyond said planar substrate;

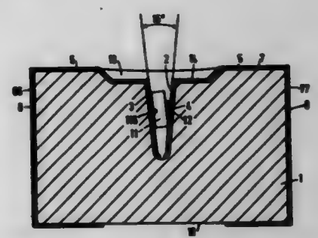
said flange means being configured for securement to said supporting structure, said flange means having a resilient means to deform preferentially to a remainder of said flange means when said package is secured to said supporting structure.

5,198,886

SEMICONDUCTOR DEVICE HAVING A CLAMPING SUPPORT

Johannes M. C. Verspeek; Henricus A. L. Laarhoven; Peter W. M. Van De Water; Jan Van Middendorp, and Kornelis Boer, all of Nijmegen, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,794
Claims priority, application Netherlands, Jan. 23, 1990, 9000161
Int. Cl.[5] H01L 23/12, 23/04, 21/603
U.S. Cl. 257—727 7 Claims



1. A semiconductor device comprising a support provided with a groove having walls on which conductors are present, which conductors extend at least partially around the support, and with a semiconductor element which is present substantially entirely in the groove and makes electrical contact with the conductors on the walls, characterized in that the support comprises means for clamping the semiconductor element in the groove, and making electrical and mechanical contact between the semiconductor element and the conductors on the groove walls.

5,198,887

SEMICONDUCTOR CHIP CARRIER

Vernon L. Brown, Barrington, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1991, Ser. No. 665,058
Int. Cl.[5] H01L 23/02
U.S. Cl. 361—383 4 Claims

1. A semiconductor chip carrier having at least a first surface and which is mountable on a substrate, the semiconductor chip carrier comprising:

means, disposed on the first surface, for coupling electrical signals to the substrate; and

means for physically coupling the semiconductor chip car-

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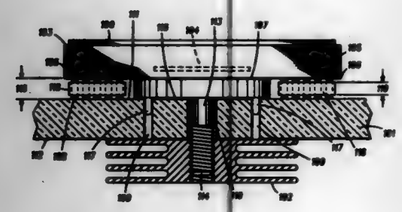
rier to the substrate, said means for physically coupling further comprising at least one stud member and a second surface disposed at a first predetermined distance from the



first surface and arranged to be in physical contact with the substrate, said at least one stud member capable of urging said means for coupling electrical signals to a second predetermined distance from the substrate.

5,198,888

SEMICONDUCTOR STACKED DEVICE

Toshio Sugano, Kokubunji; Kohji Nagaoka, Tobu; Seiichiro Tsukui, Komoro; Yoshiaki Watashima, Kawasaki; Michio Tanimoto, Kokubunji; Masayuki Watanabe, Yokohama; Sagaru Sakaguchi, Chigasaki; Kunihiko Nishi, Kokubunji; Aizo Kaneda, Yokohama; Kohji Seriawa, Fujisawa; Michiharu Honda, Yokohama; Tokio Yoshida, Yamato; Takeshi Komaru, Tachikawa, and Atsushi Nakamura, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Tobu Semiconductor, Ltd., Saitama, both of Japan

Filed Dec. 20, 1990, Ser. No. 631,154

Claims priority, application Japan, Dec. 28, 1987, 62-332126; Feb. 26, 1988, 63-42069; Jun. 8, 1988, 63-139304; Nov. 16, 1988, 63-287658

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] H01L *23/16*

U.S. Cl. 257—686 11 Claims

1. A semiconductor stacked device comprising:

a first semiconductor chip and a second semiconductor chip, each having a main surface, a plurality of electrodes formed on said main surfaces;

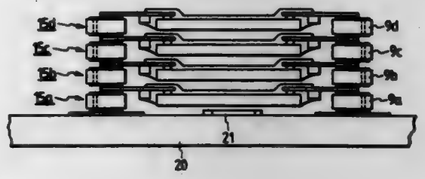
a first means for mounting said first semiconductor chip thereon having a first surface, a second surface and a third surface which is positioned between said first and second surfaces;

a second means for mounting said second semiconductor chip thereon having a first surface, a second surface an a third surface which is positioned between said first and second surfaces;

a plurality of pairs of conductors each formed on said first and second surfaces of each of said first and second mounting means, means for electrically connecting the conductors of each pair to one another;

a plurality of first leads electrically connecting respective ones of said electrodes of said first and second semiconductor chips to corresponding said conductors formed on said first surfaces of said first and second mounting means;

a second lead spaced from said first leads and electrically connecting another one of said electrodes of said first



semiconductor chip and one of said conductors of said first mounting means; and

a third lead spaced from said first leads and electrically connecting another one of said electrodes of said second semiconductor chip and one of said conductors of said second mounting means,

wherein said first leads of said first and second semiconductor chips are electrically connected with each other, said second lead provides a signal for selecting said first semiconductor chip and said third lead provides a signal for selecting said second semiconductor chip.

5,198,889

COOLING APPARATUS

Katsumi Hisano; Tomiya Sasaki, and Masaru Ishizaka, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1991, Ser. No. 723,303

Claims priority, application Japan, Jun. 30, 1990, 2-173342; Mar. 18, 1991, 3-052294

Int. Cl.[5] H01L *25/04, 23/46, 23/42*

U.S. Cl. 257—678 15 Claims

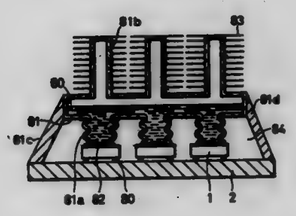
1. A cooling apparatus for cooling a heat generating member by removing heat produced in the member, comprising:

a cooling stud formed from a porous material which is thermally jointed to the heat generating member and is provided with a longitudinal internal hole and a large number of porea penetrating from the longitudinal internal hole to the periphery surface thereof;

a working fluid for removing the heat transmitted to the cooling stud by utilizing vaporization thereof;

a fluid supplier for providing the working fluid in a liquid phase to the longitudinal internal hole of the cooling stud,

the working fluid in the liquid phase passing through the pores while vaporizing; and



a gas supplier for supplying a gas on the periphery surface of the cooling stud to promote the vaporization of the working fluid, the working fluid vaporized on the periphery surface of the cooling stud being carrying away with the gas.

5,198,890

WHITE BALANCE CORRECTING DEVICE FOR AN IMAGE SENSING

Akira Suga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 499,895, Mar. 27, 1990, abandoned.

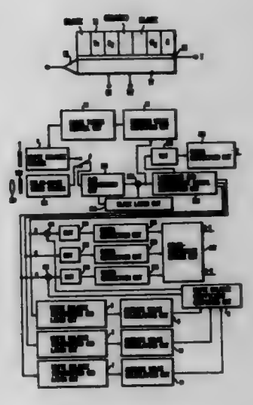
This application Mar. 24, 1992, Ser. No. 857,111

Claims priority, application Japan, Mar. 30, 1989, 1-076569

Int. Cl.[5] H04N *9/73*

U.S. Cl. 358—29 20 Claims

1. An image sensing apparatus comprising an image sensor having a predetermined combination of a plurality of color filters, said image sensor producing a time-sequential image signal which sequentially includes a plurality of color components corresponding to the plurality of color filters, a white balance sensor having the same combination of color filters as that of said image sensor, said white balance sensor producing a time-sequential sensed signal which sequentially includes a plurality of color components corresponding to the plurality of color components of said time-sequential image signal produced by said image sensor, said white balance sensor being independent of said image sensor, signal processing means for inputting and processing the time-sequential image signal produced by said image sensor and the time-sequential sensed signal produced by said white balance sensor in a time-sharing manner, white balance coefficient computing means for computing a white balance coefficient on the basis of a signal output from said white balance sensor and processed by said signal processing means, and correcting means for correcting the white balance of color signals output from said image sensor and processed by said signal processing means on the basis of an output of said white balance coefficient means.



17. An image sensing apparatus comprising:

(a) a color image sensor;

(b) a color temperature sensor;

(c) sweeping means for sweeping away charges of color temperature sensor scanning according to a signal output from said color image sensor which has been obtained through said processing means on the basis of the signal output from said color temperature sensor.

5,198,891

Patent Not Issued For This Number

5,198,892

IMAGE INPUT DEVICE FOR GENERATING A VIDEO SIGNAL FOR AN IMAGE REPRODUCTION APPARATUS

Takeshi Misawa, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1991, Ser. No. 659,166

Claims priority, application Japan, Feb. 22, 1990, 2-39826

Int. Cl.[5] H04N *9/04*

U.S. Cl. 358—41 21 Claims

1. An image input device, comprising:

image pickup means for developing a pixel signal of an object as first, second and third color pixel signals;

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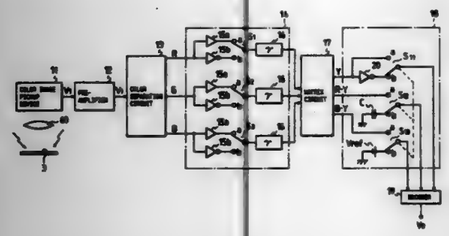
pixel signal processing means for passing through said first, second and third color pixel signals unchanged when a normal positive color image display mode or a blue-back display of a negative image mode is selected by an operator and inverting said first, second and third color pixel signals when a negative color image display mode or a blue-back display of a positive image mode is selected by an operator;

a matrix circuit for developing a luminance signal and first and second color difference signals from said first, second and third color pixel signals outputted by said pixel signal processing means;



blue-back processing means for passing through said luminance and first and second color difference signals unchanged when said normal positive color image display mode or said negative color image display mode is selected by an operator and inverting said luminance signal, changing said first color difference signal to a ground signal and changing said second color difference signal to a predetermined voltage signal when said blue-back display of a positive image mode is selected by an operator, said blue-back processing means comprises an inverter for inverting said luminance signal, a switch for changing said first color difference signal to said ground signal and a predetermined voltage source for changing said second color difference signal to said predetermined voltage signal in said blue-back display of positive and negative image modes and first, second and third display mode switches for simultaneously switching said luminance and first and second color difference signals between said normal positive color image display mode and said negative color image display mode to said blue-back display of positive and negative image modes; and

an encoder for developing a video signal from said luminance signal and said first and second color difference signals outputted by said blue-back processing means.

5,198,893
INTERACTIVE ANIMATED CHARATER IMMEDIATELY AFTER THE TITLE
Victor H. Lang, W. Pueblo, Colo., assignor to Semborg Recrob, Corp., Lansing, Ill.
Continuation of Ser. No. 595,381, Oct. 10, 1990, which is a division of Ser. No. 410,114, Sep. 20, 1989, Pat. No. 5,021,878. This application Dec. 10, 1991, Ser. No. 805,113
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—93 **7 Claims**

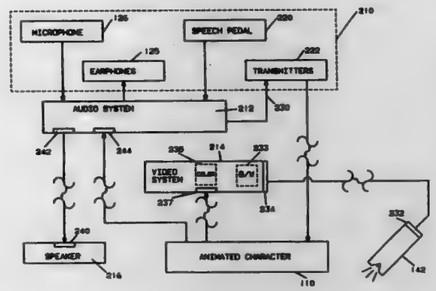
1. An interactive animated character system, comprising:

a control station, responsive to sensor signals, for generating control signals;

an animated character body including

an upper body which is merely controllable in response to the control signals,

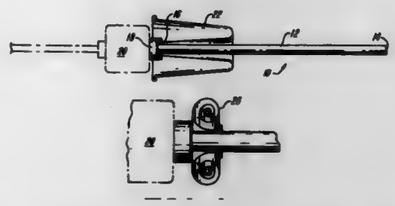
a head which is supported by the upper body and is also movably controllable in response to the control signals and which has a face with synthetic skin, and



sensor means for sensing at least one of the following environmental conditions: sounds and objects;

wherein the sensor means includes means for generating the sensor signals to the control station such that the control station responds to the sensor signals by generating the control signals to interactively move the animated character body.

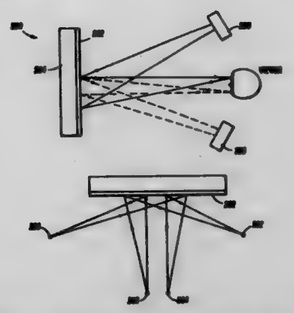
5,198,894
DRAPE FOR ENDOSCOPE
John W. Hicks, 312 Howard St., Northboro, Mass. 01532
Filed Sep. 24, 1991, Ser. No. 764,820
Int. Cl.[5] H04N *7/18*; A51B *1/04*
U.S. Cl. 358—98 **4 Claims**



1. In a system comprising an endoscope having a sheath, a camera in optical communication with the proximal end of the endoscope, and a cable extending from the camera, the improvement which compriaes:

a sterile sleeve-like drape secured at the proximal end of the endoscope, the drape retracted in reference to the camera and adapted to be extended to telescope over and envelope the camera, the interface between the proximal end of the endoscope and the camera being free of sterile material the drape in its retracted position having an outer surface and an inner surface, the inner surface and outer surface of the drape reversing when the drape is in its extended position such that when the drape is moved to its extended position, the outer surface remains sterile.

5,198,895
HOLOGRAPHIC HEAD-UP DISPLAY
Gerald L. Vick, Mt. Vernon, Iowa, assignor to Rockwell International Corporation, Seal Beach, Calif.
Filed Aug. 29, 1991, Ser. No. 751,465
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—103 **3 Claims**



1. An improved head-up display of the type used in an aircraft having a wind screen and further having a cockpit with a predetermined space therein for the pilot to sit and further having a first subspace and a second subspace therein where the pilot's eyes will be located during flight; the improved head-up display comprising:

first video display device for emitting light representative of a predetermined image, located in cockpit;

a second video display device for emitting light representative of said predetermined image located in the cockpit; and

an angularly selective holographic optic element diffraction grating, for reflecting light emitted from said first video display into said first subspace, but not into said second subspace; said diffraction grating further for reflecting light emitted from said second video display device into said second subspace but not into said first subspace; said diffraction grating disposed adjacent said windscreen; so that, a stereoscopic reproduction of said predetermined image is created when said pilot's first eye is disposed in said first subspace and said pilot's second eye is disposed in said second subspace and when said first and second eyes simultaneously view light representative of said predetermined image, from said first video display device and said second video display device respectively.

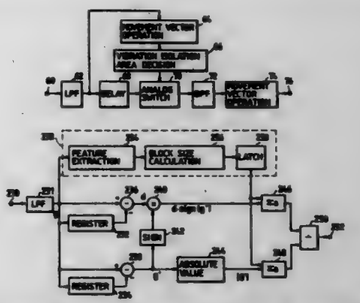
5,198,896
MOVEMENT DETECTION APPARATUS FOR DETECTING MOVEMENT VECTORS FROM AN IMAGE SIGNAL
Toshiaki Kondo, Kanagawa, and Masayoshi Sekine, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 853,896, Mar. 19, 1992, which is a continuation of Ser. No. 601,926, Oct. 23, 1990. This application Jul. 31, 1992, Ser. No. 925,247
Claims priority, application Japan, Oct. 26, 1989, 1-279582; Oct. 26, 1989, 1-279583; Oct. 26, 1989, 1-279584
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—105 **41 Claims**

1. A movement detection apparatus comprising:

A) first filter means;

B) area deciding means for calculating a movement vector from a signal filtered through said first filter means and deciding an image detection area for detecting the movement vector on the basis of the calculated movement vector;

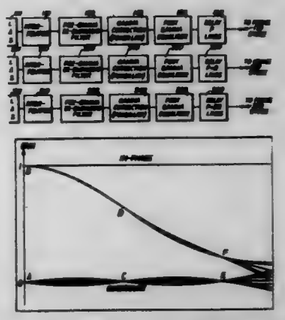
C) second filter means for extracting a predetermined signal component from an image signal extracted on the basis of



the image detection area controlled by said area deciding means; and

D) movement vector operating means for calculating a movement vector associated with the image detection area from a signal filtered through said second filter means.

5,198,897
CONTINUOUS-MOTION LINE-ASSEMBLY TELECINE WITH MISREGISTRATION CORRECTION
John L. E. Baldwin, Eastleigh, United Kingdom, assignor to Rank Cintel Limited, United Kingdom
Filed Nov. 18, 1991, Ser. No. 793,798
Claims priority, application United Kingdom, Nov. 16, 1990, 90242971
Int. Cl.[5] H04N *3/36, 5/253, 9/093*
U.S. Cl. 358—51 **7 Claims**



1. A continuous-motion line-array telecine, comprising a light source, means for continuously driving a cinematographic film through a film gate, means for illuminating at least a part of an aperture in the film gate with light from the light source, line array light sensor means, and a lens system for imaging the illuminated film in the film gate on the line array sensor means, the line array sensor means having multiple line array sensors arranged with their length transverse to the direction of movement of the image of the film for successively providing outputs representing colour components and/or luminance components of a line across the film, characterized by means for compensating vertical misregistration between the outputs of the line array sensors, the compensation means comprising delay means for providing relative delays corre-

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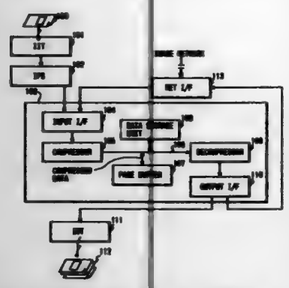
sponding to vertical scan shifts of integral numbers of lines, and vertical interpolation means for interpolating between signals representing a plurality of vertically adjacent line scans for compensating for misregistration equivalent to any residual non-integral vertical scan spacing.

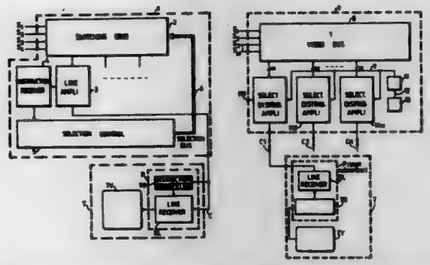
5,198,898
DATA COMPRESSING SYSTEM FOR COMPRESSING SERIAL IMAGE DATA WITH COLOR INFORMATION
Masahiko Miyata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Oct. 10, 1990, Ser. No. 594,129
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 17 Claims



1. An image processing system comprising:
means for generating a first signal corresponding to an image, the first signal including a series of first pixels, each first pixel having one of a plurality of values;
means for generating a second signal corresponding to the image, the second signal including a series of second pixels, each second pixel having one of the plurality of values, the second signal generating means including
means for detecting when a first pixel has a first one of the plurality of values,
means for generating a second pixel having a second one of the plurality of values, when the first pixel has the first one of the plurality of values,
means for detecting when the first pixel has the second one of the plurality of values,
means for generating a second pixel having the first one of the plurality of values, when the first pixel has the second one of the plurality of values, and
means for generating a second pixel having the value of the first pixel, when the first pixel has neither the first one nor the second one of the plurality of values; and
means for run length encoding the second signal.

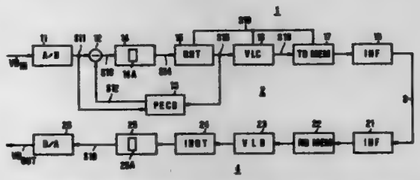
5,198,899
NETWORK FOR INTERACTIVE DISTRIBUTION OF VIDEO, AUDIO AND TELEMATIC INFORMATION
Luc P. V. Cang, Savigny Sur Orge, France, assignor to Thomson Consumer Electronics, Courbevoie, France
Filed Nov. 15, 1990, Ser. No. 603,755
Claims priority, application France, Mar. 21, 1989, 89 03671
Int. Cl.[5] H04N *7/10*; H04H *1/02*
U.S. Cl. 358—86 10 Claims

1. Network for interactive distribution of video, audio and telematic information, with star cabling from a distribution center, including a plurality of subscribers dependent on the distribution center having remote control devices enabling the subscribers to choose one of a plurality of programmes offered by the distribution center, characterized in that the network comprises, in the distribution center, a video bus connected to a plurality of information sources of which a subscriber may or may not be entitled to be connected to, and for each of said plurality of subscribers there is provided a switching module remotely controlled by the subscriber in order to establish a connection to one of said information sources, the switching module being connected to a processor for managing the distribution center, such that if the information source is one to which the subscriber is not entitled to be connected, an output



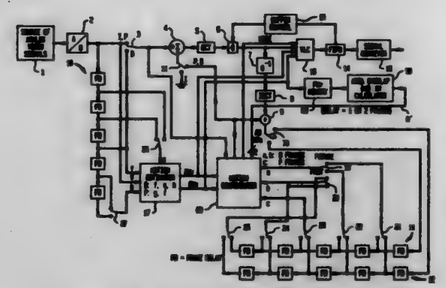
of a detector-decoder circuit is set in a high impedance state by the processor in order to end connection to the information source and then connect the subscriber to a shadow source without video images or a messaging source transmitted through the processor.

5,198,900
VIDEO SIGNAL ENCODING APPARATUS
Ikuo Tsukagoshi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 13, 1991, Ser. No. 714,719
Claims priority, application Japan, Jun. 22, 1990, 2-164467
Int. Cl.[5] H04N *7/133*
U.S. Cl. 358—136 2 Claims



1. Apparatus for encoding a plurality of fields and frames of video data which represent a plurality of video images, said apparatus comprising:
converting means for converting said video data into a plurality of blocks each having a plurality of video data elements;
predicting means for generating blocks of predicted video data elements from previous blocks of said video data elements;
means for detecting motion between video images respectively represented by a current block of said video data elements and a corresponding block of said predicted video data elements;
encoding means for encoding said blocks of video data elements in accordance with an interframe encoding technique when the detected motion is less than a predetermined value and in accordance with one of an intrafield and intraframe encoding technique when the detected motion is at least equal to said predetermined value so as to form blocks of encoded video data elements;
discrete cosine transformation means for generating a plurality of transformation coefficient data from said blocks of said encoded video data elements and for supplying therefrom a transformation encoded signal having a plurality of time slots for each portion of said transformation encoded signal, in which each said portion corresponds to one of said blocks of said encoded video data elements and in which each said transformation coefficient data is supplied in a respective one of said time slots; and
means for adding at least one additional time slot in each said portion of said transformation encoded signal and for inserting therein respective identification flag data indicating the encoding technique utilized by said encoding means for the respective block of said video data elements.

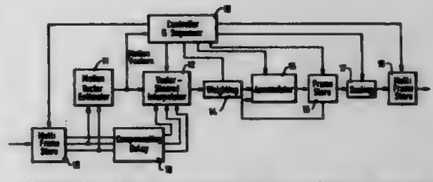
5,198,901
DERIVATION AND USE OF MOTION VECTORS IN A DIFFERENTIAL PULSE CODE MODULATION SYSTEM
William E. Lynch, Ancaster, Canada, assignor to Matsushita Electric Corporation of America, Secaucus, N.J.
Filed Sep. 23, 1991, Ser. No. 764,187
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—136 9 Claims



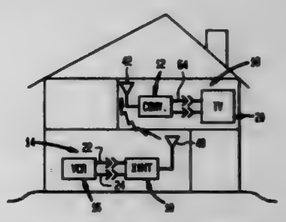
1. In a differential pulse code modulation transmission system utilizing bidirectional motion estimation in the transmission of frames of video information, apparatus for deriving bidirectional frame motion vectors for bidirectionally-predicted frames, B frames, between anchor frames comprising:
means for encoding anchor frames including intraframes I and predicted frames P, said anchor frames having a plurality of B frames between them;
means for partitioning the anchor frames and B frames into a plurality of identical blocks;
means for providing motion vectors for each block in an anchor frame that identify the position of a matching block in a previous anchor frame;
means for defining the area of intersection of the projection of each motion block in an anchor frame along its motion vector with a B frame; and
means for deriving motion vectors for a block in a B frame from the motion vector of a block in an anchor frame whose projection overlaps it the most.

5,198,902
APPARATUS AND METHOD FOR PROCESSING A VIDEO SIGNAL CONTAINING SINGLE FRAME ANIMATION MATERIAL
John W. Richards, Chilbolton, Near Stockbridge; Stephen M. Keating, Reading, both of England, and John Galt, Glendale, Calif., assignors to Sony Broadcast & Communications Limited, Basingstoke, England
Filed Aug. 13, 1991, Ser. No. 744,265
Claims priority, application United Kingdom, Aug. 31, 1990, 9019021
Int. Cl.[5] H04N *5/262, 5/272, 7/18*
U.S. Cl. 358—183 13 Claims

1. A method of processing a first video data signal having a plurality of frames in which said first video data signal is obtained by filming single frame animation material, said method comprising the steps of:
detecting motion of an object having an associated trajectory path in a picture sequence formed from said frames of said first video data signal; and
blurring images represented by said frames of said first video data signal in said picture sequence of the object which is detected as being in motion so as to form a processed video data signal which is suitable for merging with a second video data signal obtained by filming live action or non-single frame animation material.

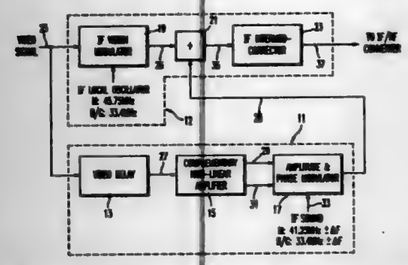


5,198,903
TELEVISION FREQUENCY CONVERTER WITH AUTOMATIC GAIN CONTROL AND OUTPUT TERMINAL ISOLATION
Prapas Tiaoheng, Parsippany, N.J., assignor to Gemini Industries Inc., Clifton, N.J.
Continuation-in-part of Ser. No. 308,937, Apr. 12, 1990, abandoned. This application Oct. 12, 1990, Ser. No. 625,674
Int. Cl.[5] H04N *5/38, 5/40*
U.S. Cl. 358—186 7 Claims



1. A converter for receiving a nonstandard broadcast signal on a nonstandard frequency and recovering a television signal therefrom in a form intelligible to a standard television receiver, said converter including RF amplification means for receiving and amplifying a nonstandard broadcast signal frequency having a nonstandard carrier to provide an amplified RF signal, local oscillator means for providing a local oscillator signal at a local oscillator frequency such that the difference between said local oscillator frequency and a nonstandard carrier frequency corresponds to a standard television carrier frequency and means for mixing said local oscillator signal with said amplifier RF signal to thereby provide a mixed signal incorporating said television signal modulated on a standard television carrier frequency, said converter further including automatic gain control means for monitoring the amplitude of said mixed signal and adjusting the gain of said RF amplification means so as to maintain the amplitude of said mixed signal substantially at a predetermined value, output amplifier means for amplifying said mixed signal to provide an output signal, an output terminal connected to said output amplifier means for conducting said output signal to a television receiver, and isolation means for substantially isolating said automatic gain control means from externally applied signals at said output terminal.

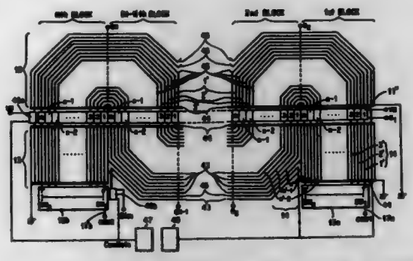
5,198,904
AURAL CARRIER CORRECTION SYSTEM AND METHOD
Hong A. Tu, Montligeon, France, and Raymond C. Kissel, Lansdale, Pa., assignors to Comark Communications, Inc., Colmar, Pa.
Filed Feb. 25, 1991, Ser. No. 660,556
Int. Cl.[5] H04N 5/60, 5/62
U.S. Cl. 358—198 20 Claims



14. A method for reducing unwanted aural carrier modulation caused by a video signal in a common amplification television transmitter which amplifies both an aural signal and a visual signal simultaneously, the method comprising the steps of:
mixing an aural carrier with an amplitude modulated video signal to generate a commonly amplified television transmission signal;
demodulating the commonly amplified television transmission signal to provide a demodulated aural signal;
performing a spectral analysis of the demodulated aural signal to determine the presence and frequency of unwanted aural signal noise resulting from unwanted aural carrier modulation;
generating a non-linear amplitude domain video signal and a non-linear phase domain video signal which respectively having amplitude and phase components that are directly opposite to unwanted amplitude and phase components added to the aural signal by the video signal;
amplitude and phase modulating the aural signal using the non-linear amplitude domain video signal and the non-linear phase domain video signal, respectively, to generate a modified aural signal; and
adding the modified aural signal to the visual signal in the transmitter.

5,198,905
IMAGE SENSOR HAVING AN ELECTRICAL INTERFERENCE REDUCING WIRE STRUCTURE
Hiroyuki Miyake, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Aug. 19, 1991, Ser. No. 746,725
Claims priority, application Japan, Aug. 20, 1990, 2-217092
Int. Cl.[5] H04N 3/14, 5/335
U.S. Cl. 358—213.11 4 Claims

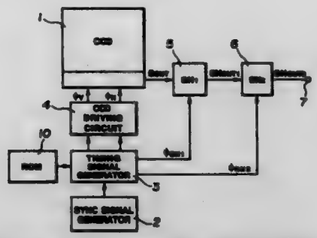
1. An image sensor comprising:
a photodetecting element array including N blocks of photodetecting elements linearly arrayed in a first scan direction and formed on a surface of said image sensor;
a linear array of n photodetecting elements extending in said first scan direction within each of said blocks;
a linear array of n switching elements extending in said first scan direction within each block, each of the switching elements within a given block of said blocks being connected to a respective photodetecting element within said given block for transferring charge generated by said respective photodetecting element;
a drive IC, connected to each of said switching elements, for outputting the transferred charges in the form of an image signal;
a plurality of signal lines, each of said signal liens connecting a switching element of one of said blocks to a respective switching element of a block adjacent to said one block to interconnect switching elements of adjacent blocks in order of linear proximity to each other, said plurality of signal lines being disposed on said surface of said image sensor such that each of said signal lines has a respective length and is located at a respective distance from said photodetecting array, said length and distance being proportional to the proximity of the respective switching elements connected to each other by the signal line, wherein signal liens connecting proximal switching elements are shortest and located closest to said photodetecting array, and signal lines connecting distal switching elements are longest and located farthest from said photodetecting array;



a plurality of first wires at a fixed potential, each of said first wires being disposed on said surface between a respective pair of adjacent signal lines;
a plurality of second wires at the fixed potential, each of said second wires disposed on said surface outside a respective signal line located farthest from the photodetecting element array; and
a dummy wire disposed on said surface outside each of said plurality of second wires, said dummy wire carrying a voltage waveform in synchronism with that on each of said signal lines, the polarity of the voltage waveform of the dummy wire and the voltage waveform on each of said signal lines being the same.

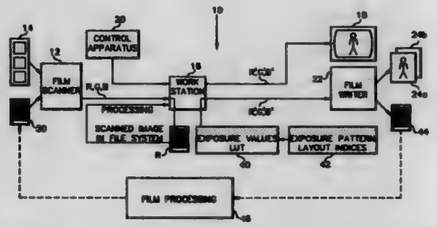
5,198,906
DEFECTIVE PIXEL COMPENSATION WITH MEMORY USING INTERPOLATION VIA PLURAL SAMPLE-AND-HOLD CIRCUITS
Masahiro Yamashita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 21, 1991, Ser. No. 780,176
Claims priority, application Japan, Oct. 25, 1990, 2-285813
Int. Cl.[5] H04N 3/15
U.S. Cl. 358—213.17 4 Claims

1. A defect correcting circuit for a solid-state imaging device comprising
a storage circuit for storing position data indicating the position of a defective pixel among a number of pixels of the solid-state imaging device,
a sampling pulse generator for generating a first sampling pulse timed to the pixels of the imaging device, and
a second sampling pulse phase-shifted by 180° with respect to said first sampling pulse, a first sample-and-hold circuit for sample-holding an imaging output signal from the imaging device by said first sampling pulse, and a second sample-and-hold circuit for sample-holding an output signal of said first sample-and-hold circuit by said second sampling pulse,
characterized in that said sampling pulse generator withholds the outputting of a first sampling pulse associated with the defective pixel among the pixels of the solid-state imaging device, based on said position data read out from said storage means, and in that



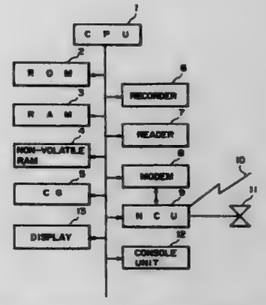
said sampling pulse generator elongates the pulse width of a second sampling pulse associated with the defective pixel as far as at least the trailing edge of a first sampling pulse succeeding said second sampling pulse.

5,198,907
METHOD AND APPRATUS FOR AUTOMATICALLY LOCATING PREDEFINED EXPOSURE AREAS IN A SCANNED IMAGE
Keith A. Walker, Rochester, and Donald A. Koop, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 23, 1991, Ser. No. 749,028
Int. Cl.[5] H04N 1/23, 1/38
U.S. Cl. 358—296 12 Claims



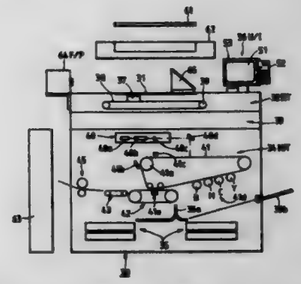
1. Image scanning apparatus for generating image signals from an original, the original including a primary image composed of a plurality of exposure patches and a registration mark comprised of two parts having a predetermined two-dimensional intersecting orientation relative to the primary image, said apparatus compriaing:
means for scanning the original, including both the primary image and the registration mark, and for generating image signals representative of both the primary image and the registration mark;
recognition means operative upon the image signals for distinguishing image signals corresponding to the registration mark, said recognition means further extracting directional coordinates from the dimensional orientation of the parts of the registration mark, thereby defining a two-dimensional coordinate reference for the primary image; and
location means responsive to said directional coordinates for distinguishing image signals corresponding to the exposure patches of the primary image based on their predetermined two-dimensional orientation relative to the coordinate reference, whereby the primary image is automatically located on the original even through the original has not been properly aligned in the scanning apparatus.

5,198,908
IMAGE COMMUNICATION APPARATUS AND METHOD WITH SELECTION OF MAGNIFICATION TRANSMISSION MODE AND SETTING MINIMUM TRANSMISSION TIME
Yuji Kurosawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 8, 1991, Ser. No. 790,391
Claims priority, application Japan, Nov. 13, 1990, 2-304145
Int. Cl.[5] H04N 1/32, 1/393
U.S. Cl. 358—409 5 Claims



1. An image communication apparatus having a mode to transmit image data with unity-magnification and a mode to transmit the image data with size reduction, comprising:
means for selecting one of the unity-magnification transmission mode and the reduced size transmission mode; and
means for setting one of a different minimum transmission times in accordance with a mode selected by said selection means.

5,198,909
DRIVING APPARATUS AND METHOD FOR SCANNING SYSTEM FOR USE IN IMAGE RECORDING APPARATUS
Masuji Ogiwara; Kaninobu Nagano; Kimihito Ohmori, and Harutaka Sudo, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed May 14, 1990, Ser. No. 522,892
Claims priority, application Japan, May 12, 1989, 1-119439
Int. Cl.[5] H04N 1/36
U.S. Cl. 358—412 16 Claims



1. A driving device for a scanning system of an image recording apparatus having an original scan unit, to reciprocatively move the original scan unit in two types of scan modes, a forward scan mode to scan an original read region at a constant speed and a back mode to return the original scan unit to a scan start position at a high speed, said driver comprising:
an original scan means including a stepping motor;
means for driving said stepping motor; and
current control means for changing a drive pulse current fed

from said driving means to said stepping motor, said current control means changing a current applied to said stepping motor from a first current in the back scan mode to a second current in the forward scan mode smaller than the first, said current control means including:

a current detector for detecting the drive pulse current fed to said stepping motor and converting the drive pulse current to an output voltage;

means for generating one of a plurality of reference voltage corresponding to said back scan mode or said forward scan mode, said reference voltage generating means including time constant setting means for gradually changing the output voltage of said reference voltage generating means;

a comparator for comparing said reference voltage from said reference voltage generating means with the output voltage of said current detector; and

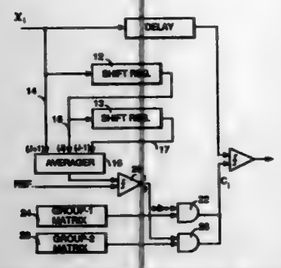
a chopper for determining a duty of the drive pulse to said stepping motor in accordance with the output voltage of said comparator.

5,198,910

MIXED MATRIX IMAGE PROCESSING FOR RENDERING HALFTONE IMAGES WITH VARIABLE DOT SIZES

Yee S. Ng, Fairport, and Hwei T. Tai, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 450,795, Dec. 14, 1989. This application Nov. 13, 1991, Ser. No. 794,367
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—456 8 Claims



1. A document copying apparatus of the type which generates a plurality of electrical image signals which are serial measures of imagewise information of successive picture elements of an original document to be reproduced, said apparatus comprising:

means for comparing input image signals representing low optical density picture elements of the original document to a series of threshold values selected in sequential order from a first two-dimensional matrix halftone cell in which an output signal density pattern grows in a low spatial frequency manner;

means for comparing input image signals representing high optical density picture elements of the original document to a series of threshold values selected in sequential order from a second two-dimensional matrix halftone cell in which an output signal density pattern grows in a high spatial frequency manner; and

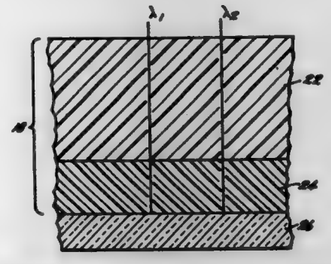
means for comparing input image signals representing mid-optical density picture elements of the original document to a series of threshold values selected in sequential order from said first or said second two-dimensional matrix halftone cells according to the optical density of the picture element such that at least one image signal, representing a first picture element having a higher optical density than a second picture element, is compared to a series of threshold values selected in sequential order from said first two-dimensional matrix halftone cell, and an image signal representing said second picture element is compared to a series of threshold values selected in sequential order from said second two-dimensional matrix halftone cell, whereby image signals representing mid-optical density picture elements compared to threshold values selected from said first cell are interspersed with mid-optical density picture elements compared to threshold values selected from said second cell.

5,198,911

HOLOGRAPHIC OPTICAL NOTCH REFLECTORS

Xiaohui Ning, N. Providence, R.I., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 27, 1990, Ser. No. 633,364
Int. Cl.[5] G02B *5/32*; G02F *1/39*; G03H *1/02*
U.S. Cl. 359—3 17 Claims



9. A method of making a holographic notch reflective filter comprising the step of:

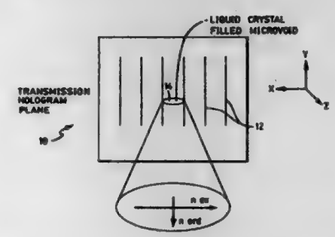
exposing a layer of holographic material to at least two light beams of differing wavelengths to provide said holographic material with a plurality of notch reflections at wavelengths corresponding to the sum and difference frequencies of said two light beams and to define an index variation through said holographic material.

5,198,912

VOLUME PHASE HOLOGRAM WITH LIQUID CRYSTAL IN MICROVOIDS BETWEEN FRINGES

Richard T. Ingwall, Newton; Mark A. Troll, Somerville, and Duncan H. Whitney, Beverly, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 464,427, Jan. 12, 1990, abandoned. This application Jul. 10, 1991, Ser. No. 729,777
Int. Cl.[5] G02B *5/32*; G02F *1/13*; G03H *1/02*
U.S. Cl. 359—3 20 Claims



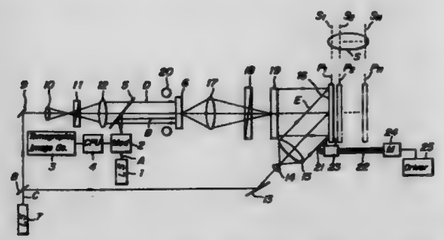
1. A volume phase holographic element, in which information is recorded as a pattern of fringes of a material having a different index of refraction than the material between the fringes, characterized in that microvoids between said fringes are at least partially filled with a liquid crystal.

5,198,913

APPARATUS FOR DISPLAYING THREE-DIMENSIONAL IMAGE BY USING POCKELS READOUT OPTICAL MODULATOR

Shuhei Toyoda, and Yukihisa Osugi, both of Nagoya, Japan, assignors to NGK, Insulators, Ltd., Japan

Filed Feb. 24, 1992, Ser. No. 840,089
Claims priority, application Japan, Mar. 1, 1991, 3-57624
Int. Cl.[5] G03H *1/08*
U.S. Cl. 359—7 11 Claims



1. An apparatus for displaying a three-dimensional image of tomographic images comprising:

a tomographic image producing means for producing pictorial information representing tomographic images of an object under inspection, said tomographic images being taken on a plurality of predetermined sectional planes of the object;

a first light source for emitting a first coherent light beam;

a modulating means for modulating an intensity and a position of said first coherent light beam in accordance with said pictorial information of tomographic images to produce a coherent writing light beam whose intensity and position are modulated in accordance with said pictorial information of tomographic images;

a first optical means for introducing said coherent writing light beam to an image storing plane;

an image information storing means including a Pockels readout optical modulator which is arranged in said image storing plane for storing therein said pictorial information of tomographic images by having said modulated writing light beam emanating from said modulating means irradiated thereon;

an erasing light source for projecting an erasing light beam onto said Pockels readout optical modulator;

a second light source for emitting a second coherent light beam;

a beam splitting means for splitting said second coherent light beam emitted by said second light source into a reference light beam and a coherent reading light beam;

a second optical means for irradiating said coherent reading light beam onto said Pockels readout optical modulator to readout the pictorial information stored in said Pockels readout optical modulator and for introducing the coherent reading light beam transmitted through said Pockels readout optical modulator to one of a plurality of predetermined photographic planes related to said plurality of sectional planes;

a third optical means for introducing said reference light beam to said one of a plurality of photographic planes to form interference fringes between said reference light beam and coherent reading light beam;

a photographic plate which is positioned in said one of a plurality of predetermined photographic planes and is exposed by said interference fringes; and

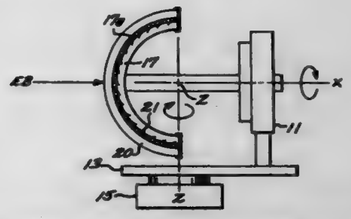
a driving means for positioning said photographic plate at said plurality of predetermined photographic planes in succession.

5,198,914

AUTOMATIC CONSTANT WAVELENGTH HOLOGRAPHIC EXPOSURE SYSTEM

James A. Arns, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 26, 1991, Ser. No. 798,486
Int. Cl.[5] G03H *1/04*
U.S. Cl. 359—8 5 Claims



1. A hologram exposure system for holographically exposing a spherically curved hologram recording layer of a substrate/hologram recording layer assembly wherein the hologram recording layer is supported by a spherically curved substrate, comprising:

a spherically curved mirror surface positioned adjacent the substrate/hologram assembly, said spherically curved mirror surface being concentric with the spherically curved substrate surface;

first means for rotating the curved mirror surface about a first axis that passes through (a) the center of curvature of the spherically curved substrate surface that supports the hologram recording layer, and (b) a point on the hologram recording layer that allows for convenient rotation about said first axis; and

second means for rotating the curved mirror surface about a second axis that is orthogonal to the first axis and intersects the first axis at the center of curvature of the substrate surface that supports the hologram recording layer;

whereby the holographic recording layer is holographically exposed by controllably rotating the mirror/recording layer/substrate assembly about the first and second axes while said assembly is illuminated with an exposure beam that is incident on the recording layer at the intersection of the recording layer with said first axis and passes through the recording layer to be reflected by said mirror surface.

5,198,915

UNDERWATER INSPECTION APPARATUS AND METHOD

John Watson, Alford, Scotland, assignor to National Research Development Corporation, London, England

PCT No. PCT/GB89/00732, § 371 Date Dec. 31, 1990, § 102(e) Date Dec. 31, 1990, PCT Pub. No. WO90/00268, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 30, 1989, Ser. No. 634,122
Claims priority, application United Kingdom, Jul. 1, 1988, 8815658
Int. Cl.[5] G03H *1/04*, *1/10*
U.S. Cl. 359—10 11 Claims

11. A camera for use in holography comprising:

a source of coherent radiation,

means for splitting radiation from said source into a reference and a recording beam,

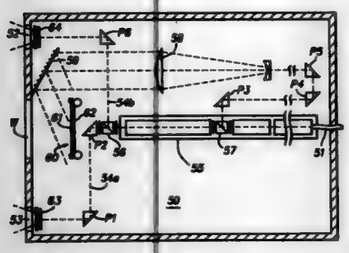
film holder means for holding a recording medium,

means for directing the reference beam on to the recording medium,

means for directing the recording beam onto an object,

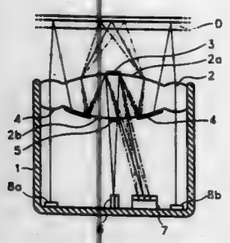
means for combining the recording beam after reflection from the object with said reference beam to form a hologram within said recording medium,

said source of coherent radiation being a frequency-doubled Nd-YAG laser,



a collimating fourier lens of diameter sufficient to illuminate substantially the whole of an exposure area of said recording medium.

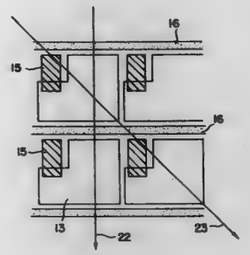
5,198,916
OPTICAL PICKUP
Chun-dong Kim, Kyunggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jan. 27, 1992, Ser. No. 826,112
Claims priority, application Rep. of Korea, May 13, 1991, 91-7716
Int. Cl.[5] G02B *5/32, 3/02*; G11B *7/00*
U.S. Cl. 359—15 **8 Claims**



1. An optical pickup comprising:
an aspherical single lens as a light focusing medium formed with a hologram reflective surface disposed on a center of a medium surface and having a predetermined hologram pattern for reflecting an incident light toward an opposite medium surface and, at the same time, focusing onto points beside the source focal point, a diffracted spherical wave from the reflected light reflected in an optical information medium;
a reflective mirror for partially scanning a light reflected from the hologram reflective surface of said aspherical single lens via the aspherical single lens into said medium and, at the same time, reflecting said reflected light;
a light source for providing said incident light with respect to said hologram reflective surface of the aspherical single lens; and
a photodetector for detecting a light bounced off said hologram reflective surface of the aspherical single lens,
thereby performing a reproducing/recording operation of optical information.

5,198,917
METHOD OF ALIGNING LIQUID CRYSTAL MOLECULES IN AN ACTIVE MATRIX LIQUID CRYSTAL DISPLAY ELEMENT BY TWO ALIGNMENT TREATMENTS
Seigo Togashi, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
PCT No. PCT/JP90/00457, § 371 Date Dec. 4, 1990, § 102(e) Date Dec. 4, 1990, PCT Pub. No. WO90/12340, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 4, 1990, Ser. No. 613,709
Claims priority, application Japan, Apr. 7, 1989, 1-88920
Int. Cl.[5] G02F *1/1337*
U.S. Cl. 359—76 **3 Claims**

1. A method of aligning liquid crystal molecules in an active matrix liquid crystal display element having an active substrate



provided with a switching element at each pixel for driving the picture element, an opposite substrate provided opposite to the active substrate, and a liquid crystal layer having molecules sealed between the substrates comprising the steps of
aligning the liquid crystal molecules at the active substrate by main alignment in a main alignment direction and supplementary alignment in a supplementary alignment direction, both alignments being across the whole substrate, wherein the supplementary alignment direction is determined so as to reduce the area of untreated portions at each pixel, by treating those portions which are not treated by the main alignment because of a projection of the switching element;
aligning the liquid crystal molecules at the opposite substrate in at least one direction which is different from the main alignment direction.

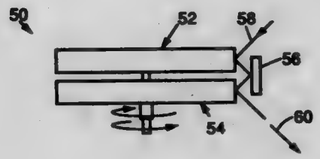
5,198,918

Patent Not Issued For This Number

5,198,919
NARROW FIELD OR VIEW SCANNER
Robin A. Reeder, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 26, 1991, Ser. No. 749,832
Int. Cl.[5] G02B *27/17*
U.S. Cl. 359—216 **3 Claims**

1. A narrow field of view scanner comprising:
a first scanning wheel having a first number of facets;

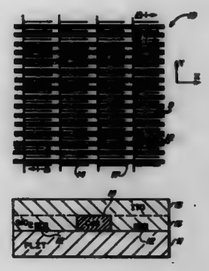
a second scanning wheel having a second number of facets, said second number of facets different than said first number of facets;
first rotating means for rotating said first scanning wheel; and
second rotating means for rotating said second scanning wheel, wherein said first and second rotating means rotates said first and second scanning wheels at a rate such



that a facet of said first scanning wheel moves through a predetermined point in the same time as a facet of said second scanning wheel moves through said point and wherein said first rotating means rotates said first scanning wheel in a direction opposite to the direction said second rotating means rotates said second scanning wheel.

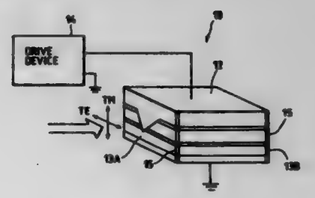
5,198,920
TRANSVERSE PIXEL FORMAT ELECTRO-OPTIC SPATIAL LIGHT MODULATOR
Garth W. Gobeli, Casselberry, and Thomas M. Toor, Orlando, both of Fla., assignors to Pixtech, Inc., Albuquerque, N. Mex.
Filed Nov. 5, 1991, Ser. No. 786,818
Int. Cl.[5] G02F *1/03, 1/29*
U.S. Cl. 359—245 **4 Claims**

1. A light valve for use in a spatial light modulator comprising:
a. a layer of solid state electro-optic material;
b. a two-dimensional pixelized electrode array including
i. a plurality of first electrodes disposed on said layer of electro-optic material wherein the plurality of first electrodes is arranged in a comb configuration deposited on said layer of solid state electro-optic material and comprises first electrode conductive segments spaced from and parallel to each other along a plurality of linear paths;
ii. a plurality of second electrodes disposed on said electro-optic material wherein the plurality of second electrodes comprises second electrode conductive segments deposited on said electro-optic material between and spaced from adjacent conductive segments of said first electrodes;
c. spacing between each first electrode and an adjacent second electrode, the spacing defining a pixel through which light is controlled to pass;
d. means for addressing pixels of said light valve to control the passage of light through selected pixels of said solid state electro-optic layer, including



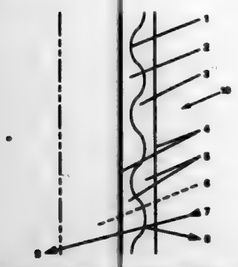
i. a photoconductive switch positioned between each of said first electrode conductive segments and said second electrode conductive segment of each pixel; and
ii. a voltage supply connected to said first and second electrode conductive segments and to said photoconductive switch, said photoconductive switch being responsive to activation illumination projected from a side of said solid state electro-optic layer opposite that which image illumination is projected, whereby each pixel is controlled to allow light to pass therethrough when said photoconductive switch closes in response to said activation illumination.

5,198,921
LIGHT AMPLIFYING POLARIZER
Shinichiro Aoshima; Tsuneyuki Urakami, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan
Filed Nov. 21, 1991, Ser. No. 795,397
Int. Cl.[5] H01L *27/14*
U.S. Cl. 359—248 **7 Claims**



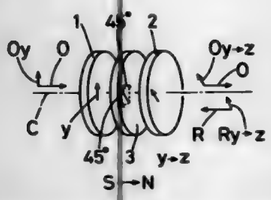
1. A polarizer comprising:
a semiconductor light amplifier for selectively amplifying one of a TM mode component and a TE mode component of input light so that a ratio between amplification factors of the TM mode and TE mode components becomes larger than 10; and
means for driving the semiconductor light amplifier.

5,198,922
SPECULARLY TRANSMITTING AND DIFFUSE REFLECTING OPTICAL SHUTTER
Day Chahroudi, P.O. Box 491, Placitas, N. Mex. 87043
Filed Mar. 19, 1991, Ser. No. 670,784
Int. Cl.[5] G02B *26/00, 27/00, 5/02;* B05D *5/06*
U.S. Cl. 359—290 13 Claims



1. A diffuse reflecting and specularly transmitting optical shutter structure comprising an optically rough layer of optical shutter, and two layers having surfaces disposed on either side of the optical shutter with refractive indices which approximately match the refractive index of the optical shutter, the layer surfaces adjacent to the optical shutter conforming to the optically rough surfaces of the optical shutter and the layer surfaces non-adjacent to the optical shutter being optically smooth.

5,198,923
OPTICAL ISOLATOR
Toshiaki Watanabe, and Toshihiko Ryuo, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jan. 16, 1992, Ser. No. 821,698
Claims priority, application Japan, Jan. 17, 1991, 3-004062; Jan. 31, 1991, 3-011057
Int. Cl.[5] G02F *1/00, 1/09;* G02B *5/30;* H01F *1/00*
U.S. Cl. 359—324 6 Claims

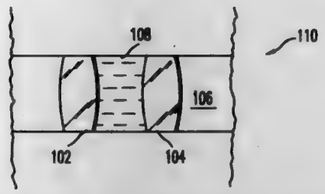


1. An optical isolator which comprises a polarizer, a Farady rotator and an analyzer arranged in this order, wherein the Farady rotator has a garnet crystalline structure represented by the following compositional formula (1):

$$(Tb_{1-(a+b)}La_aBi_b)_3(Fe_{1-c}M_c)_5O_{12} \quad (1)$$

(wherein Ln represents at least one element selected from the group consisting of rare earth elements other than Tb; $0<a\leqq 0.6$; $0<b\leqq 0.2$; M represents at least one element selected from the group consisting of Al and Ga; and $0\leqq c<0.1$).

5,198,924
OPTICAL COMPONENT COUPLING AND COMPOSITION THEREFOR
David Jansson, Los Altos, Calif., assignor to General Signal, Stamford, Conn.
Filed Dec. 4, 1991, Ser. No. 802,414
Int. Cl.[5] C03C *27/00;* G02B *6/34, 13/14*
U.S. Cl. 359—350 10 Claims



1. An optical coupling composition for coupling two optical components comprising a polymerized gel comprised of:
(a) a silicon oil transmissive to light and (b) a silicon gel transmissive to light, said oil and gel being present in amounts sufficient to provide a gel sufficiently soft to allow thermal expansion of said optical components without damage thereto.

5,198,925
α-FLUOROACRYLIC ACID ESTERS AND POLYMERS THEREOF
Rudolf Heumüller, Bad Soden am Taunus; Günter Siegemund, Hofheim am Taunus; Werner Grob; Gerhard Wieners, both of Frankfurt am Main, and Peter Herbrechtsmeier, Königstein/-Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt Main
Continuation of Ser. No. 866,114, May 22, 1986, abandoned.
This application Feb. 18, 1992, Ser. No. 837,768
Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518893; Jan. 25, 1986, 3602275; Apr. 30, 1986, 3614695
Int. Cl.[5] G02B *3/00*
U.S. Cl. 359—356 5 Claims

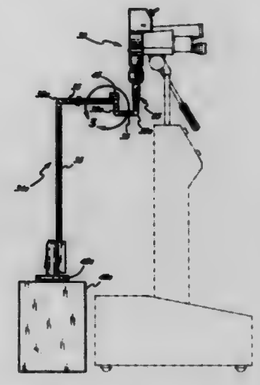
1. A method of forming an optical device which comprises the step of
forming a transparent lens having two surfaces at least one of which is curved so that the lens is capable of spectral transmittance within the wavelength range from 600 to 1300 nm and a high glass transition temperature range from 95° to 150° C., consisting essentially of
a fluorine-containing polymer which is essentially composed of monomer units which are derived from an α-fluoroacrylic acid ester of the following formula (I)

$$, CH_2{=}CF{-}CO{-}O{-}C(CF_3)_2{-}R \quad (1)$$

in which R denotes hydrogen atoms, a deuterium atom, a halogen atom, a n aliphatic atom having 1 to 4 carbon atoms or an aromatic radical having 4 to 10 carbon atoms,
or a fluorine-containing copolymer compound of monomer units derived from formula (1) and also monomer units derived from the fluoroacrylic acid ester of the formula (2)

$$, CH_2{=}CF{-}CO{-}O{-}C(CF_3)_2{-}H \quad (2).$$

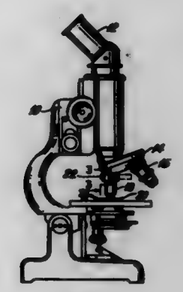
5,198,926
OPTICS FOR MEDICAL LASER
Andrew I. Shehata, Costa Mesa; Colette Cosman, El Toro; John F. Forkner, South Laguna, all of Calif., and M. John Collet, Edinburgh, Scotland, assignors to Premier Laser Systems, Inc., Irvine, Calif.
Filed Jan. 18, 1991, Ser. No. 644,074
Int. Cl.[5] F21V *9/06*
U.S. Cl. 359—356 26 Claims



1. An apparatus, comprising:
an optical system for achromatically focusing light comprised of at least first and second wavelengths such that the light at said first wavelength and the light at the second wavelength are focused substantially at a common location, said optical system comprising an achromatic optical element formed by at least first and second materials, said first and second materials having different dispersions, both of said first and second materials being transmissive to said first and second wavelengths, said first wavelength being in the visible portion of the optical spectrum, said second wavelength being in the infrared portion of the optical spectrum and being on the order of about two and one-half microns or greater, said materials having focusing properties such that said optical element focuses the visible light at said first wavelength and the infrared light at said second wavelength at said common location.

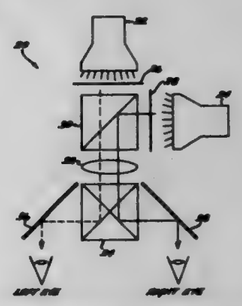
5,198,927
ADAPTER FOR MICROSCOPE
Richard R. Rathbone, Hamden, and Stephen C. Wardlaw, Old Saybrook, both of Conn., assignors to Yale University, New Haven, Conn.
Filed Sep. 20, 1989, Ser. No. 410,163
Int. Cl.[5] G02B *21/06;* G01N *33/15*
U.S. Cl. 359—385 16 Claims

1. A method of adapting a conventional, non-fluorescent microscope into a fluorescent microscope, said conventional microscope comprising a vertical body tube, an eye piece disposed at one end of said body tube, an objective lens disposed at another end of said body tube, and a means for retaining a specimen plate under said objective lens, the method comprising the steps of:
(a) providing an adapter comprising:
a body member having a first coupling means at one end thereof for detachably coupling directly to said objective lens and having a second coupling means at another end thereof for detachably coupling directly to said body tube, said body member having an axial light path running longitudinally therethrough and having a radial light path which intersects the axial light path;
a source of light disposed in the radial light path;
a first filtering means disposed in the radial light path, downstream of the source of light, for passing light at wavelengths which excite fluorescence in a specimen to be examined in the microscope and for blocking light at wavelengths where visible fluorescence emission occurs in the specimen;
a reflecting means disposed at the intersection of the axial light path and radial light path, the reflecting means passing light through the axial light path and reflecting light at excitation wavelengths; and



a second filtering means disposed in the axial light path and disposed between the reflecting means and the eye piece, the second filtering means blocking light at excitation wavelengths which pass through the reflecting means;
(b) attaching said first coupling means to said objective lens of said microscope; and
(c) attaching said second coupling means to said body tube of said microscope, whereby said body member of said adapter is interposed directly between said objective lens and the body tube and the axial light path passing through said body member is in alignment with a light passing through the objective lens and passing through the body tube.

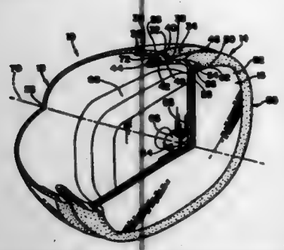
5,198,928
LIGHT WEIGHT BINOCULAR HELMET VISOR DISPLAY
Dewey J. Chauvin, Simi Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 26, 1991, Ser. No. 721,724
Int. Cl.[5] G02B *5/30, 27/26*
U.S. Cl. 359—465 11 Claims



1. A binocular helmet visor display (HVD) for providing the observer with a different image for each eye, comprising:

a first image source means for producing image light which is "p" polarized;
a second image source for producing image light which is "s" polarized;
means for directing said "p" polarized and "s" polarized light onto an input face of a polarization x-prism; and
wherein said x-prism functions as a channel separator to separate said incident "p" and "s" polarized image light into respective right and left eye channels, wherein either the "p" or "s" polarized image light is directed toward the observer's left eye, and the other of the "p" or "s" polarized image light is directed toward the observer's right eye.

5,196,929
FLEXIBLE SEAL FOR ADJUSTABLE SIDE VIEW MIRROR
Eric M. Clough, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 13, 1992, Ser. No. 912,373
Int. Cl.[5] G03B *11/04*; G02B *7/182*
U.S. Cl. 359—513 **8 Claims**



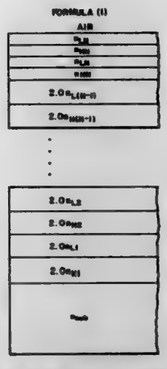
1. An adjustable side view mirror for use on the outside of a vehicle comprising:
a headshell being supported by said vehicle and having a center-line horizontal axis and an open end and a closed end;
a mirror having a periphery and being of substantially a same height and width as said open end of said headshell and being adjustable to various viewing angles;
a means for adjusting said viewing angles of said mirror;
a means for mounting said mirror along said center-line horizontal axis so as to be outside said headshell and in the foreground of said open end of said headshell thereby providing a distance along said center-line horizontal axis between said mirror and said open end of said headshell;
a flexible seal sealing said periphery of said mirror to said headshell, and said flexible seal having the flexibility to maintain said seal during all of said viewing angles of said mirror;
a first means for connecting said flexible seal to said periphery of said mirror; and
a second means for connecting said flexible seal to said headshell.

5,198,930
WIDE-BAND HALF-MIRROR
Keiji Muratomi, Warabi, Japan, assignor to Kabushiki Kaisha TOPCON, Tokyo, Japan
Continuation-in-part of Ser. No. 633,189, Dec. 28, 1990, abandoned, which is a continuation of Ser. No. 476,886, Feb. 8, 1990, abandoned. This application Aug. 12, 1991, Ser. No. 744,600
Claims priority, application Japan, Feb. 14, 1989, 1-34564
Int. Cl.[5] G02B *5/28, 27/14*
U.S. Cl. 359—583 **4 Claims**

1. A wide-band half mirror, comprising:
a transparent substrate; and
dielectric layers successively laminated on the transparent substrate so as to divide incident light into a transmitted light component and a reflected light component, wherein:

$$n_{sub}/(an_{H1}\text{-}an_{L1}\text{-}an_{H2}\text{-}an_{L2}\cdots an_{H(N-1)}\text{-}an_{L(N-1)})(bn_{HN}\text{-}bn_{LN})^2/air$$

wherein:
n represents an index of refraction;
n_{sub} represents the index of refraction of the substrate;
$n_{H\_}$ represents the indices of refraction of dielectric substances in the laminated layers, these indices of refraction being greater than n_{sub};



$n_{L\_}$ represents the indices of refraction of dielectric substances in the laminated layers, these indices of refraction being smaller than n_{sub};

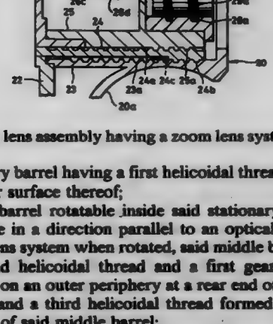
$$n_{sub} \leq n_{H1} \leq n_{H2} \leq \ldots \leq n_{HN};$$

$$n_{sub} \geq n_{L1} \geq n_{L2} \geq \ldots \geq n_{LN};$$

λ_o represents the center wavelength; and
coefficients a and b have values that define dielectric layer thicknesses so that optical paths travelled by light reflected by a front surface, and light reflected by a rear surface, are $\lambda_o/4$ and $\lambda_o/2$, respectively.

5,198,931
OBJECTIVE OPTICAL SYSTEM FOR ENDOSCOPES
Tsutomu Igarashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Division of Ser. No. 510,661, Apr. 18, 1990, Pat. No. 5,087,989. This application Nov. 14, 1991, Ser. No. 792,156
Claims priority, application Japan, Apr. 19, 1989, 1-097600
Int. Cl.[5] G02B *21/02, 13/18, 9/60, 9/34*
U.S. Cl. 359—660 **7 Claims**

1. An objective optical system for endoscopes comprising:
in order from the object side, a first lens component being a negative meniscus lens, an aperture stop, a second lens component being a positive lens component, a third lens component being a positive lens component and a fourth lens component being a positive cemented doublet;

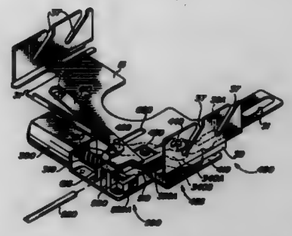


wherein an object side surface of said first lens component and an image side surface of said third lens component are aspherical surfaces.

5,198,932
ZOOM LENS ASSEMBLY
Masashi Takamura, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 14, 1991, Ser. No. 791,317
Claims priority, application Japan, Nov. 14, 1990, 2-307974
Int. Cl.[5] G02B *15/14*
U.S. Cl. 359—694 **34 Claims**

1. A zoom lens assembly having a zoom lens system comprising:
a stationary barrel having a first helicoidal thread formed on an inner surface thereof;
a middle barrel rotatable inside said stationary barrel and movable in a direction parallel to an optical axis of said zoom lens system when rotated, said middle barrel having a second helicoidal thread and a first gear, which are formed on an outer periphery at a rear end of said middle barrel, and a third helicoidal thread formed on an inner surface of said middle barrel;
a movable barrel holding said zoom lens system therein, said movable barrel being rectilinearly movable inside said middle barrel parallel to said optical axis, and having a fourth helicoidal thread formed on an outer periphery at a rear end thereof, said fourth helicoidal thread engaging with said third helicoidal thread; and
driving means for rotating said middle barrel, said driving means having a second gear which meshes with said first gear, said second gear maintaining engagement with said first gear throughout the movement of said middle barrel in a direction parallel to said optical axis.

5,198,933
RECORDING MEDIUM EMERGENCY RELEASE MECHANISM
Hiroshi Matsushita, Atsugi; Keiichiro Nanka, Fujisawa, and Kouji Takahashi, Sagamihara, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 7, 1991, Ser. No. 666,166
Claims priority, application Japan, Mar. 27, 1990, 2-75794
Int. Cl.[5] G11B *17/022*
U.S. Cl. 360—99.06 **9 Claims**



1. An information reproduction apparatus comprising:
supporting means for supporting a recording medium,
drive means for driving said supporting means to move the recording medium between an initial insertion position and a reproduction position,
a gear train for transmitting the driving force of said drive means to said supporting means, said gear train including a gear which is retractable therefrom,
manually activated retraction means operable to force the gear to retract from said gear train and
manually activated motion means operable to force the recording medium to move from the reproduction position to the initial insertion position after said retraction means has forced the gear to retract from said gear train.

5,198,934
MAGNETIC DISK DEVICE INCLUDING A SLIDER PROVIDED WITH A SOLID PROTECTING LAYER WHICH DETERMINES THE DISTANCE BETWEEN A MAGNETIC GAP AND A MAGNETIC DISK RECORDING DEVICE
Masahiro Kubo, Tokyo, and Yasuo Ohtsubo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 707,436, May 28, 1991, abandoned, which is a continuation of Ser. No. 458,404, Dec. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 153,480, Feb. 2, 1988, Pat. No. 4,901,185, Division of Ser. No. 884,098, Jul. 10, 1986, abandoned. This application Jan. 13, 1992, Ser. No. 819,675
Claims priority, application Japan, Jul. 19, 1985, 60-159352; Jul. 19, 1985, 60-159353
Int. Cl.[5] G11B *5/48*
U.S. Cl. 360—104 **10 Claims**

1. A magnetic disk device used with a rotatable disk of a rigid type, which has a magnetic recording surface on at least one side surface thereof, comprising:
a slider including,
(a) a main body with a front surface adjacent to the magnetic disk and a rear surface on the opposite side of the main body with respect to the front surface and positioned furthest from the magnetic disk, and
(b) a solid lubricating protecting layer coated on at least a part of the front surface of the main body, projected away from the front surface of the main body toward the mag-

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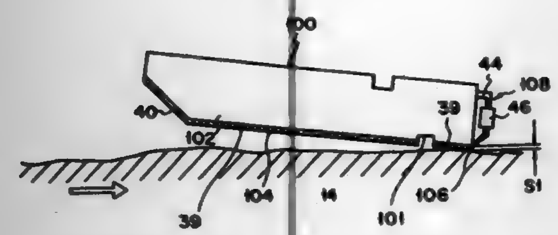
netic disk, and having a flat surface which faces the magnetic recording surface of the rotatable disk and which extends in a rotational direction with respect to said rotatable disk when said slider is located adjacent to the magnetic recording surface of the rotatable disk, said flat surface having a contact region which contacts the magnetic recording surface during read and write operations,

(c) a magnetic head comprising a core member provided in said main body and a magnetic core member which is attached to said main body, and

(d) a magnetic gap formed between one side of the magnetic



core member of the magnetic head and a side of the core member provided in the main body to perform the read and write operations on the magnetic recording surface of the rotatable disk, a distance between a position of the magnetic gap closest to the medium and the contact region of the flat surface being set by the thickness of the solid protecting layer, to a predetermined value in a direction substantially perpendicular to the magnetic recording surface of the rotatable disk; and

contacting means for bringing the contact region of the flat surface into contact with the magnetic recording surface of the rotatable disk during the read and write operations.

5,198,935

LENS BARREL WITH ULTRASONIC WAVE MOTOR

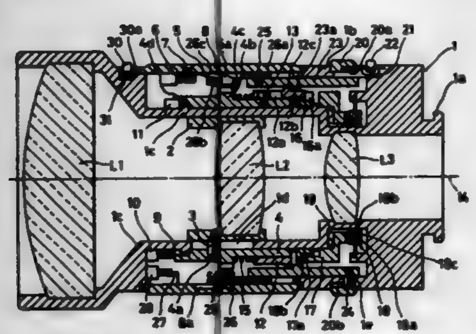
Hitoshi Imanari, Kawasaki; Kunihiro Fukino, Fujisawa, and Hiroshi Tanioka, Kashiwa, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 26, 1990, Ser. No. 498,904

Claims priority, application Japan, Mar. 27, 1989, 1-71916; Dec. 22, 1989, 1-331247

Int. Cl.⁵ G02B *15/14;* **G03B** *13/18;* **H01L** *41/04*

U.S. Cl. 359—698 **6 Claims**



1. A lens barrel having a focusing lens system, comprising:

a moving member rotatable about an optical axis of said focusing lens system, for moving said focusing lens system along the optical axis for focusing;

manual operation means for rotating said moving member;

an ultrasonic wave motor including a stator provided with an elastic member for causing a vibration by an AC voltage, and a rotor capable of rotation about said optical axis according to the vibration of said stator;

mode switching means for selecting either a first focusing mode in which said focusing is conducted by moving said moving member with said ultrasonic wave motor, or a second focusing mode in which said focusing is conducted by rotating said moving member by said manual operation means;

pressuring means for applying a substantially constant pressure between said stator and said rotor; and

clutch means engaged for transmitting the rotation of said rotor to said moving member without increasing said pressure between said stator and said rotor, in response to the selection of said first focusing mode by said mode switching means, and disengaged in response to the selection of said second focusing mode;

wherein said clutch means comprises:

a coupling member prevented from axial movement but rotatable about the optical axis in linkage with the rotation of said rotor;

a clutch member adapted for moving along said optical axis in response to the selecting by said mode switching means, thereby connecting or disconnecting said moving member and said coupling member; and

wherein each of said rotor and said clutch member is provided with a plurality of projections for coupling with said coupling member, and said coupling member is provided with grooves which are capable of engaging with said projections of said rotor and grooves which are capable of engaging with said projections of said clutch member, said projections and grooves being arranged so that said projections of said rotor and those of said clutch member do not interfere with each other.

5,198,936

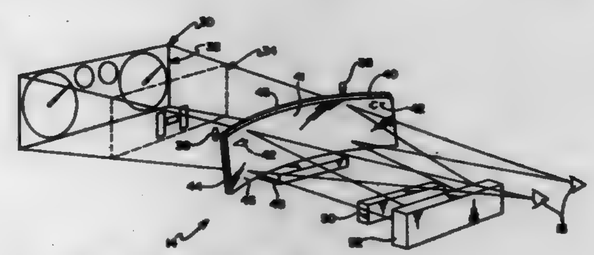
REFLECTIVE CLUSTER DISPLAY

Steven A. Stringfellow, Oakland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 3, 1992, Ser. No. 816,919

Int. Cl.⁵ G02B *27/14, 27/34*

U.S. Cl. 359—831 **7 Claims**



1. A vehicle display device comprising:

an image source displaying information;

a spherical concave mirror, mounted near the image source, reflecting the displayed information to project a virtual image thereof viewable by an operator, the spherical concave mirror comprising (i) a partially transparent mirror with a first surface facing the display source and a second surface opposite the display source and (ii) a mask layer on the second surface of the partially transparent mirror defining display data normally not visible to the operator; and

means, positioned proximate to the partially transparent mirror opposite the image source, for sourcing light onto the defined display data, so that when the defined display data receives the light, the display data becomes visible to the operator.

5,198,937

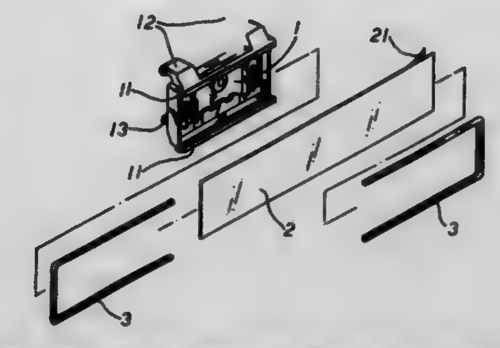
IN-CAR REARVIEW MIRROR STRUCTURE

Jack Shy, Changhwa, Taiwan, assignor to Shin Jye Auto Accessories Co., Ltd., Changhwa, Taiwan

Filed Dec. 13, 1991, Ser. No. 806,186

Int. Cl.⁵ G02B *7/18;* **B60R** *1/04*

U.S. Cl. 359—844 **1 Claim**



1. In an in-car rearview mirror structure comprising a mirror frame seat and a mirror, an upper edge of a back of said mirror frame seat having a pair of fixed claws and a lower edge thereof being provided with a pair of elastic movable claws, said mirror frame seat having a front face with an upper edge and a lower edge, the improvement wherein

the upper edge and lower edge of the front face of said mirror frame seat are formed with grooves, and two C-shaped protecting frames are mounted on two sides of said mirror, the length of said protecting frames being adjustable in accordance with the length of said mirror, said mirror with said protecting frames being fitted into said grooves of said mirror frame seat to form an in-car rearview mirror assembly.

5,198,938

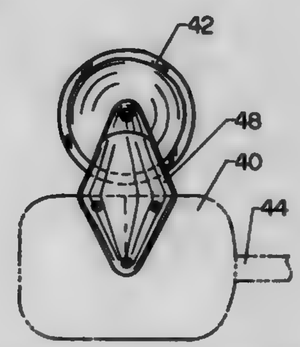
WIDE-ANGLE MIRROR ATTACHMENT FOR A TRUCK OR VAN

Jeffrey L. Ward, 3320 Wall Blvd., 11-102, Gretna, La. 70056

Filed Mar. 20, 1991, Ser. No. 672,489

Int. Cl.⁵ G02B *5/08, 7/18;* **B60R** *1/06*

U.S. Cl. 359—864 **12 Claims**



1. An attachment for a vehicle for adding an auxiliary, wide-angle mirror to a conventional side mirror thereof, said conventional side mirror having an outer convex surface, comprising:

first securing means mounted to an upper portion of the outer convex surface of a conventional side mirror of a vehicle, said first securing means having a concave inner surface for mating with the convex shape of the outer convex surface of the conventional side mirror;

second means projecting upwardly from said first means and having an upper end thereof; and

an auxiliary, wide-angle mirror mounted to said upper end of said second means, whereby said wide-angle mirror is spaced vertically above the conventional side mirror;

said first means and said second means being one integral piece, said first means comprising three securement areas for securing it to the convex outer surface of the conventional mirror, and three securement means for passing through said three securement areas; said upper end of said second means defining an additional fourth securement area, and an additional fourth securement means for securing said addition fourth securement area to said wide angle mirror;

said one integral piece of said first and second means being diamond-shaped, and said four securement areas being approximately constituted by the apices of the diamond-shaped integral piece.

5,198,939

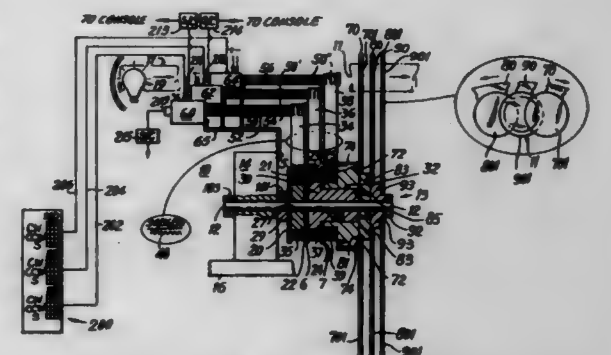
APPARATUS FOR POSITIONING APERTURES OF A DISK ASSEMBLY

Arthur Hewett, Berkeley Heights, N.J., assignor to Altman Stage Lighting Co., Inc., Yonkers, N.Y.

Filed Nov. 21, 1991, Ser. No. 795,537

Int. Cl.⁵ G02B *5/22*

U.S. Cl. 359—889 **15 Claims**



1. Apparatus for positioning media-containing apertures of a rotatable disk assembly for placement to intercept at least a portion of a light beam, said apparatus comprising;

(a) a base member for supporting a longitudinally extending shaft;

(b) a longitudinally extending shaft supported by and extending from said base member;

(c) a plurality of separate disk assembly mounting means having respective concentric mechanically interlockable outer rims for engagement with respective drive means, each said mounting means being supportably mounted on said longitudinally extending shaft and being independently rotatable about the longitudinally extending shaft;

(d) a plurality of adjacent disk assemblies each having media-containing apertures, said disk assemblies being respectively affixed to a plurality of said mounting means to intercept at least a portion of a light beam; and

(e) a plurality of electrically operable drive means respectively interlockingly engaged with a plurality of said mechanically interlockable outer rims for independently and synchronously rotating each of said mounting means about said longitudinally extending shaft and for independently and dynamically holding each of said mounting means in a fixed stationary position when the electrically operable drive means interlocked therewith is not moving, so that media-containing apertures of a plurality of said disk assemblies can be concurrently positioned to intercept at least a portion of said light beam.

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5,198,940

IMAGE SIGNAL RECORDING SYSTEM

Kenichi Nagasawa; Tadayoshi Nakayama; Koji Takahashi, and Masahiro Takei, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 625,627, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 434,532, Nov. 8, 1989, abandoned, which is a continuation of Ser. No. 258,120, Oct. 12, 1988, abandoned, which is a continuation of Ser. No. 881,823, Jul. 3, 1986, abandoned. This application Nov. 20, 1991, Ser. No. 795,035

Claims priority, application Japan, Jul. 4, 1985, 60-148111

Int. Cl.[5] H04N *5/78, 7/12*

U.S. Cl. 360—9.1 11 Claims

1. A image signal recording system for recording an original image signal corresponding to an original picture comprised of m picture elements (m being an integer, $m \geqq 4$) onto a recording medium, in which said original picture is divided into m/n picture element blocks, each comprised of n picture elements (n being a measure, $2 \leqq n < m$), and the image signals corresponding to the respective blocks are sampled on the basis of one kind of sampling mode out of a plurality of sampling modes involving different numbers of sampled picture elements and then recorded on the recording medium, comprising:

(A) image information signal forming means arranged to sequentially receive said original image signal for each of the image signals corresponding to the picture element block, to form a first image information signal by sampling a first picture element among n picture elements, which constitute each received picture element block, on the basis of a first sampling mode and to form second image information signals by sampling second picture elements, different from said first picture element, on the basis of a second sampling mode;

(B) head means arranged to trace said recording medium and to record signals thereon, thereby forming a recording track having first and second areas provided respectively in succession on said recording medium; and

(C) supply means for supplying the first image information signal formed by said image signal information forming means to said head means during a term when said head means is tracing the first area on said recording medium and for supplying the second image information signals formed by said image signal information forming means to said head means during a term when said head means is tracing the second area of said recording medium.

5,198,941

RECORDING OR REPRODUCING APPARATUS

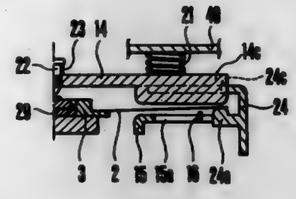
Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,319, Feb. 22, 1991, abandoned, which is a continuation of Ser. No. 544,047, Jun. 25, 1990, abandoned, which is a continuation of Ser. No. 314,248, Feb. 21, 1989, abandoned, which is a continuation of Ser. No. 843,740, Mar. 25, 1986, abandoned. This application Feb. 5, 1992, Ser. No. 831,077

Claims priority, application Japan, Mar. 27, 1985, 60-062712

Int. Cl.[5] H04N *5/781*

U.S. Cl. 360—33.1 24 Claims



1. A recording or reproducing apparatus using a disc-shaped magnetic sheet which is contained within a cassette for recording or reproducing information thereon, comprising:

a recording or reproducing magnetic head;

a stabilizer member closely opposed to said magnetic head via said magnetic sheet for stabilizing said magnetic sheet at said magnetic head;

a lifting member having first and second lifting portions, said first lifting portion lifting up said stabilizer member away from said magnetic sheet and said magnetic head, said second lifting portion lifting up said magnetic sheet away from said magnetic head; and

control means for moving said lifting member, said control means being capable of holding said lifting member in a position where said magnetic sheet and said stabilizer member separate from said magnetic head to prevent said magnetic sheet from contacting with said magnetic head.

5,198,942

DISC DRIVE CONTROL DEVICE WITH ACCESSING AND POWER CONTROL

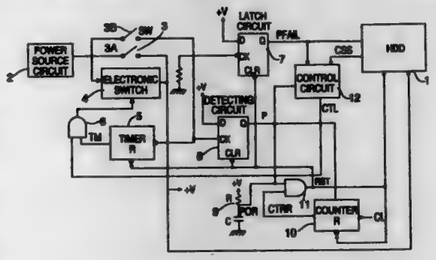
Hajime Iizuka, Tatebayashi, and Zenjiro Uchida, Ashikaga, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 7, 1990, Ser. No. 520,085

Claims priority, application Japan, May 9, 1989, 1-115603

Int. Cl.[5] G11B *5/596, 5/54*

U.S. Cl. 360—78.04 2 Claims



1. A disc drive control device comprising:

a hard disc drive unit;

a power source switch effective for applying external power to said disc drive control device;

an electronic switch bypassing said power source switch;

a first logic device normally providing an access enable signal to said hard disc drive unit when said power source switch is closed;

said first logic device providing an access inhibit signal to said hard disc drive unit when said power source switch is opened;

means for moving a head of said hard disc drive unit to a non-data area;

said hard disc drive unit providing a move termination signal upon completion of a move of said head to said non-data area;

a control circuit including means for producing a control signal in the simultaneous presence of said access inhibit signal and said move termination signal;

means for permitting said electronic switch to continue bypassing said power source switch after said power source switch is opened until said control signal is generated, whereby power is maintained to said hard disc drive unit until head movement is completed;

means for permitting resumption of operation without cutting off power to said hard disc drive unit if said power source switch is closed before the completion of said head movement;

said means for permitting resumption includes a second logic device;

said second logic device including means for producing a reset signal upon the closing of said power source switch before the completion of said head movement; and

said reset signal being applied to reset said first logic device, whereby said access enable signal is again produced.

5,198,943

MAGNETIC-TAPE-CASSETTE APPARATUS COMPRISING A DECK FOR MAGNETIC-TAPE CASSETTES (REVERSING MECHANISM)

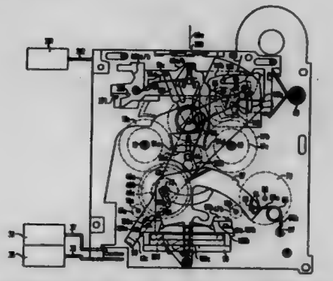
Norbert Kunze, Ehringshausen, and Georg Weber, Lohra, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1990, Ser. No. 614,409

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 3937908; Oct. 15, 1990, 4032638

Int. Cl.[5] G11B *15/32*

U.S. Cl. 360—96.3 19 Claims



1. A magnetic-tape-cassette apparatus, comprising:

a deck for playing and fast-winding a magnetic tape of a magnetic-tape cassette in opposite tape-transport directions, said deck comprising

a) a chassis;

b) first and second reel discs rotatably mounted on said chassis for driving respective winding spools of a tape cassette;

c) first and second capstands for transporting the tape of a tape cassette in opposite directions in a play mode of said apparatus;

d) a first spindle movable mounted on said chassis and an intermediate wheel rotatably mounted on said first spindle;

e) a first switching lever which is pivotable about said first spindle between a forward play and reverse play position;

g) a drive wheel arranged on said first switching lever and drivable in opposite directions of rotation, in each of said play positions of said first switching lever and drive wheel driving a respective one of said reel discs;

f) a fast forward winding wheel and a fast reverse winding wheel selectively engageable with respective ones of said reel discs;

said first switching lever being movable into a fast winding position between said play positions by a movement of said first spindle and a pivoting about said first spindle from either of said play positions, in said fast winding position said drive wheel being disengaged from said reel discs and engaged with said intermediate wheel for selectively driving said intermediate wheel in opposite directions of rotation;

said fast forward winding wheel being drivable by said intermediate wheel and selectively engageable with one of said reel discs for fast winding said reel disc, and said fast reverse winding wheel being pivotable relative to said fast forward winding wheel for being driven by said fast forward winding wheel and selectively engageable with the other said reel disc for fast winding said other reel disc; and

f) control slides for controlling the positions of said first switching lever.

5,198,944

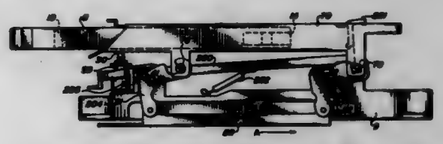
SYSTEM FOR LOCATING AND HOLDING A CARTRIDGE

David P. McReynolds; Thomas J. Schmitt, both of Tucson, Ariz.; Syed T. Shafaat, Clinton, Wash., and Raymond Yardy, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 10, 1991, Ser. No. 757,423

Int. Cl.[5] G11B *17/02*

U.S. Cl. 360—99.06 9 Claims



1. A recording/playback apparatus for use with a standard protective cartridge of the type that holds recording media, said standard cartridge having a locating hole placed a specific standard dimension from the front edge of said cartridge, said apparatus comprising:

a base for locating and holding the mechanisms of said apparatus;

a movable locating pin positioned within a receptacle in said base, said pin having a recessed area and a flange;

a spring located between said flange and said base to urge said pin upwardly away from said base;

a tray mounted with respect to said base, said tray having two sides, a top and a bottom and having an open entrance into which one of said protective cartridges is inserted;

a moveable trip arm not fixedly connected to said tray, said trip arm having a tab at one end thereof, said tab extending upwardly through the bottom of said tray such that the front end of said cartridge pushes against said tab to move said trip arm upon insertion of said cartridge into said tray;

a second tab located on said trip arm;

a second pin located and held on said base;

a catch trip rotatably mounted on said second pin, said catch trip positioned relative to said second tab such that said

second tab bears against said catch trip to rotate said catch trip upon insertion of said cartridge;

a catch rotatably mounted on said second pin, said catch having a lip, said lip positioned within said recessed area of said locating pin to hold said locating pin toward said base, said catch also having a surface positioned relative to said catch trip such that said catch trip bears against said surface of said catch to rotate said catch upon insertion of said cartridge to move said lip from said recessed area to allow said locating pin to move upwardly under the influence of said spring into said locating hole in said cartridge to thereby locate and hold said cartridge relative to said base; and

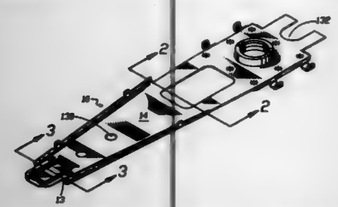
said trip arm, catch trip, catch and locating pin located relative to said base and dimensioned such that said locating pin moves into said locating hole when said hole is positioned directly above said pin, to minimize wear on said locating hole.

5,198,945

MAGNETIC HEAD SUSPENSION

David J. Blaeser; Ryan A. Jurgenson, and Brent Lien, all of Hutchinson, Minn., assignors to Hutchinson Technology Incorporated, Hutchinson, Minn.

Filed Nov. 9, 1990, Ser. No. 612,012
Int. Cl.[5] G11B 5/48
U.S. Cl. 360—104 9 Claims



1. In a magnetic disk drive having a magnetic head suspension for supporting a magnetic head at a fixed distance from an actuator arm, said suspension including a flexure and load beam, an improved attachment means for affixing a load beam to a rigid arm, said attachment means comprising: a band of shrinkable material which at least partially encircles the rigid arm and a proximal portion of the load beam and is shrunk into place after positioning thereby affixing the load beam to the rigid arm.

5,198,946

HEAD DRIVE MECHANISM USING NON-AXIAL LEAD SCREW IMPARTED MOTION

Yuichi Kurosawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

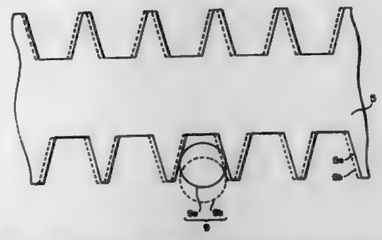
Continuation of Ser. No. 584,048, Sep. 18, 1990, abandoned. This application Aug. 14, 1992, Ser. No. 928,185
Claims priority, application Japan, Sep. 22, 1989, 1-247106
Int. Cl.[5] G11B 5/54; F16H 25/14
U.S. Cl. 360—105 15 Claims

1. A head drive mechanism associated with a disk driving device, a disk being mounted and driven to be rotated on said disk drive device, said head drive mechanism comprising a head member capable of recording signals on said disk and reproducing the same from said disk, said head drive mechanism further comprising:

a rotary shaft extending parallel to the surface of said disk and having a helical groove formed on a circumferential surface of said shaft, said helical groove being provided with an inclined sectional surface;

a support member carrying said head member thereon and provided with an engaging member, said support member being movable in a direction parallel to said surface of said disk, said engaging member being engaged in said helical groove of said rotary shaft in such a fashion that said support member is moved in the direction parallel to said surface of said disk upon rotation of said rotary shaft;

a stopper member for preventing the sliding movement of said support member in the direction parallel to said surface of said disk at a predetermined position; and



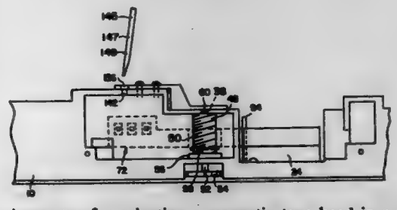
control means for controlling rotation of said rotary shaft in such a fashion that said rotary shaft is further rotated by a predetermined amount after the movement of said support member is stopped by said stopper member so that said support member is forced to be moved away from said disk at said predetermined position due to sliding contact of said engaging member with said inclined sectional surface of said helical groove.

5,198,947

APPARATUS FOR ADJUSTING A TAPE HEAD FOR A MAGNETIC TAPE

Ashok B. Nayak, LaVerne, and Jagmohan S. Kukreja, Claremont, both of Calif., assignors to Archive Corporation, Costa Mesa, Calif.

Filed Jun. 29, 1990, Ser. No. 546,025
Int. Cl.[5] G11B 5/56, 5/55
U.S. Cl. 360—109 24 Claims



1. Apparatus for orienting a magnetic tape head in a tape drive assembly adapted to receive a magnetic tape, the apparatus comprising:

a frame having support means, the support means having first and second portions;

a shaft member mounted for rotation in the support means, the shaft member having a first end pivotably mounted on the first portion of the support means and a second end mounted on the second portion of the support means such that the second end is movably in all directions, the movement causing pivoting of the shaft member at the first end;

a motor for rotating the shaft member;

a head carriage assembly including the magnetic tape head mounted on the shaft member, the head carriage assembly being movable over the shaft member in a direction substantially normal to movement of the magnetic tape; and

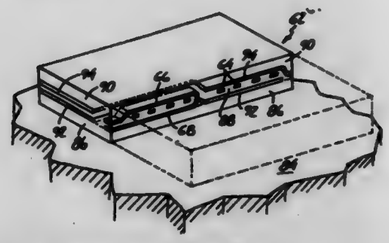
an adjuster member on the support means, the adjuster member having a securing arm movable with respect to the second portion of support means, a connecting arm for engaging and moving the second end of the shaft member, and pivot means between the securing and connecting arms, whereby movement of the securing arm adjusts the position of the connecting arm and orientation of the shaft member and head carriage assembly, the securing arm being secured to the support means when the tape head is in a desired orientation.

5,198,948

SHIELDED SERVO HEADS WITH IMPROVED PASSIVE NOISE CANCELLATION

Lance E. Stover, Minnetonka; Beat G. Keel, Prior Lake; John Bortins, Bloomington, and Gerald L. Weispfenning, St. Paul, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Dec. 5, 1990, Ser. No. 622,558
Int. Cl.[5] G11B 5/17
U.S. Cl. 360—124 21 Claims



1. A data storage system, comprising:

a spindle;

a first magnetic disk mounted on the spindle for storing data;

a second magnetic disk mounted on the spindle for storing servo information;

a data head, positioned between the first and second magnetic disks and adjacent the first magnetic disk, the data head comprising:

a first slider; and

a first thin film transducer mounted on the first slider for writing data to and reading data from the first magnetic disk, the first thin film transducer comprising:

a first essentially planar coil winding having a center and first and second sides;

a first upper pole piece positioned along and covering a portion of the first side of the first essentially planar coil winding; and

a first lower pole piece positioned along and covering a portion of the second side of the first essentially planar coil winding, the first lower pole piece joining the first upper pole piece at the center of the first essentially planar coil winding; and

a servo head, positioned between the first and second magnetic disks and adjacent the second magnetic disk, for producing an output signal as a function of the servo information stored on the second magnetic disk, the servo head comprising:

a second slider; and

a second thin film transducer mounted on the second slider for reading servo information from the second disk, the second thin film transducer comprising:

a second essentially planar coil winding having a center and first and second sides;

a second upper pole piece positioned along and covering a portion of the first side of the second essentially planar coil winding;

a second lower pole piece positioned along and covering a portion of the second side of the second essentially planar coil winding, the second lower pole piece joining the second upper pole piece at the center of the second essentially planar coil;

a first shield covering a portion of the first side of the second essentially planar coil winding not covered by the second upper pole piece; and

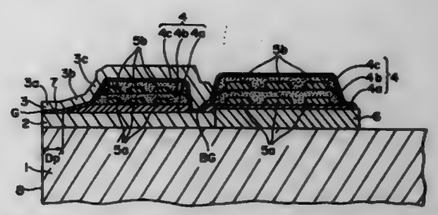
a second shield covering a portion of the second side of the second essentially planar coil winding not covered by the second lower pole piece.

5,198,949

THIN FILM MAGNETIC HEAD WITH SHAPED MAGNETIC LAYER

Hiroaki Narisawa; Norio Saito; Wataru Ishikawa; Jin Sato, and Takashi Watanabe, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,231
Claims priority, application Japan, May 31, 1990, 2-139640
Int. Cl.[5] G11B 5/127, 5/23
U.S. Cl. 360—126 3 Claims



1. A thin film magnetic head having a lower magnetic layer and an upper magnetic layer formed over the lower magnetic layer and a gap film so that a small gap is formed between a first magnetic gap section of the lower magnetic layer near a sliding surface to be brought into sliding contact with a magnetic recording medium and a second magnetic gap section of the upper magnetic layer extending in parallel to the said first magnetic gap section of the lower magnetic layer near the sliding surface;

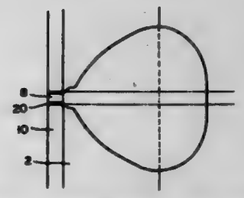
characterized in that the upper magnetic layer has a first sloping section extending from the said second magnetic gap section and inclined at an inclination θ_1 in a range defined by: $2° \leqq \theta \leqq 25°$ to the upper surface of the lower magnetic layer, and a second sloping section extending from the first sloping section at an inclination θ_2 in a range defined by $30° \leqq \theta_2 \leqq 80°$ to the upper surface of the lower magnetic layer.

5,198,950

THIN-FILM PERPENDICULAR MAGNETIC RECORDING AND REPRODUCING HEAD

Toshiaki Wada, Takatsuki, and Hideki Mine, Osaka, both of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Feb. 14, 1991, Ser. No. 655,167
Claims priority, application Japan, Feb. 28, 1990, 2-50292
Int. Cl.[5] G11B 5/147
U.S. Cl. 360—126 12 Claims



1. A thin-film perpendicular magnetic recording and reproducing head including a magnetic member for a return path having a principal surface formed with a first groove extending in parallel to a sliding surface adapted to face a magnetic recording medium, a non-magnetic material filling said groove,

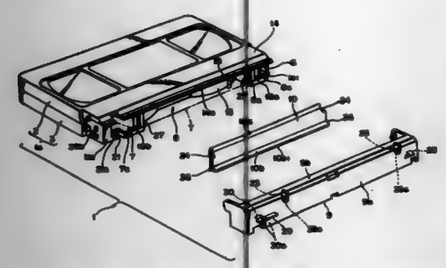
VOL 1148 ISS 5 MR 30 1993 UMI

and at least a thin-film conductor coil, an interlaminar insulating film, a main magnetic-pole film and a protective film formed one upon another, the magnetic member being connected to the main magnetic-pole film through a via hole portion, said head having an exposed laminated surface defining said sliding surface, the improvement wherein said magnetic member has also a second groove formed in said principal surface, crossing said first groove at right angles thereto, and filled with a non-magnetic material, said coil and said films being formed immediately above the intersection of said first and second grooves, said second groove being exposed in said sliding surface, and having a width which is slightly larger than that of said main magnetic-pole film adjacent to its end exposed in said sliding surface, and a depth which is at least equal to that of said first groove, said magnetic member being exposed in said laminated surface in the vicinity of said main magnetic-pole film adjacent to said exposed end thereof.

5,198,951
TAPE CASSETTE WITH MAGNETIC TAPE OUTLETS OPENABLE AND CLOSABLE BY LIDS

Hiroshi Fujii, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 11, 1991, Ser. No. 713,313
Claims priority, application Japan, Jun. 29, 1990, 2-171711
Int. Cl.[5] G11B *23/02*
U.S. Cl. 360—132 5 Claims

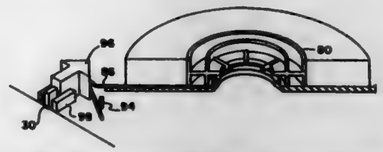


1. A tape cassette for use in a recording and/or reproducing apparatus having a lid opening member, said tape cassette comprising:
- a cassette casing including a front wall having a pair of tape outlets in opposite side portions thereof, a mouth area defined between said tape outlets and a recessing one of said tape outlets for receiving the lid opening member;
- a pair of tape reels rotatably disposed in said cassette casing;
- a magnetic tape wound around said tape reels with a run of the magnetic tape between said reels being led out of said casing through said tape outlets and extending across said mouth area;
- a front lid pivotally mounted on said cassette casing;
- an inner lid pivotally mounted within said front lid;
- said front and inner lids being angularly movable between closed positions in which said front lid covers a front surface of said run of the tape had said tape outlets and said inner lid covers a rear surface of said run of the tape extending across said mouth area, and opened positions in which said front and inner lids are raised relative to said cassette casing and angularly displaced relative to each other for exposing said run of the tape and uncovering said tape outlets;
- said front and inner lids being movable to said open positions in response to said lid opening member extending upwardly through said recess and acting against said front lid when said tape cassette is moved to a tape loading position in said recording and/or reproducing apparatus;
- said front lid having a tongue extending therefrom for closing said recess when said lids are in said closed positions thereof, said tongue being engageable by the lid opening member in a final increment of the angular movement of said front lid to its opened position so that said front and inner lids then fully expose said tape outlets and said mouth area.

5,198,952
ULTRA-COMPACT CASSETTE SYSTEM HAVING A REEL BRAKE MECHANISM

John Y. S. Chan, 24965 Huron St., Loma Linda, Calif. 92345

Division of Ser. No. 724,172, Jul. 1, 1991. This application Jun. 30, 1992, Ser. No. 906,413
Int. Cl.[5] G11B *23/02*
U.S. Cl. 360—132 4 Claims

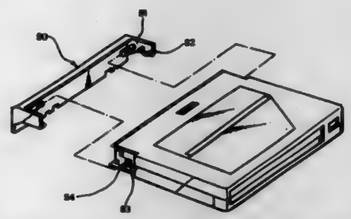


1. An ultra-compact magnetic tape cassette comprising
- a housing having top and bottom panels,
- a pair of tape reels within the housing, on either side of a center plane bisecting the housing,
- a pair of circular flanges formed in at least one panel of the housing, for supporting and centering the respective tape reels,
- a pair of grooves extending along the inner surface of said panel, each groove having a portion formed in said flange, and extending therefrom in a substantially straight line from said flange toward said center plane,
- a pair of elongate members, each extending along and within a respective one of said grooves, and having an upturned end seatable in the portion of the groove formed in the flange,
- means for biasing each elongated member away from its seated position, whereby the upturned end engages a surface of its respective reel, to prevent movement of the same,
- and means within said housing for displacing said elongated members toward their seated position, to release said reels.

5,198,953
DEVICE WHICH OPENS AND CLOSES THE HUB LOCKER OF A DIGITAL AUDIO TAPE CARTRIDGE

Ryu Su Sun, Chungnam, Rep. of Korea, assignor to SKC Limited, Rep. of Korea

Filed Dec. 21, 1990, Ser. No. 631,635
Claims priority, application Rep. of Korea, Dec. 21, 1989, 89-19448
Int. Cl.[5] G11B *23/087, 15/32, 15/22*
U.S. Cl. 360—132 1 Claim

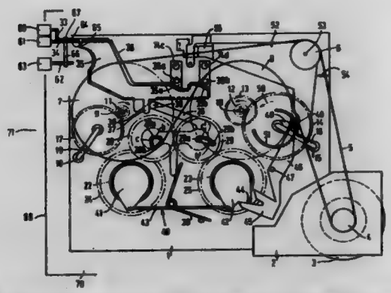


1. A digital audio tape cartridge lid for use on a digital audio tape cartridge wherein a wing having a jaw at a front end of said wing is formed on each of opposite sides of a hub locker which is retractably urged by a spring attached to said cartridge into engagement with saw teeth on a perimeter of at least one of two tape reels disposed in said cartridge, comprising:
- a pair of sidewalls pivotally connected to said audio tape cartridge proximate said jaws, said sidewalls having back edges which face rearwardly when the lid is closed over a front of the audio tape cartridge, said sidewalls being formed to provide grooves extending through said sidewalls, from sides of the sidewalls facing the audio tape cartridge, said grooves having openings in the direction of engagement with said jaws, said grooves being defined by groove walls spaced from the back edges, at least portions of said jaws being inserted into said grooves respectively and urged when said lid is rotated into an open position, whereby said hub locker is disengaged from said saw teeth when said jaws are urged.

5,198,954
MAGNETIC-TAPE-CASSETTE APPARATUS COMPRISING A MANUALLY OPERABLE CASSETTE DRIVE

Norbert Kunze, Ehringshausen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 605,894, Oct. 29, 1990, abandoned. This application Jun. 30, 1992, Ser. No. 908,510
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1989, 3936076
Int. Cl.[5] G11B *15/44*
U.S. Cl. 360—137 17 Claims



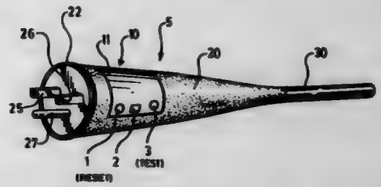
1. Magnetic-tape-cassette apparatus comprising a manually operable cassette drive and including three key buttons each being connected to a respective associated actuating rod which rods respectively actuate the fast forward and reverse functions as well as the eject function for the cassette drive wherein a coupling member couples the actuating rod for the eject function to the actuating rods for the fast forward and reverse functions such that movement of the actuating rod for the eject function in an inwardly direction in the apparatus moves the actuating rods for the fast forward and reverse functions in said inwardly direction, and wherein spring means biases the actuating rods for the fast forward and reverse functions in a direction opposite said inwardly direction, said transverse member moving said actuating rod for the eject function in said opposite direction together with the actuating rods for the fast forward and reverse functions.

5,198,955
SEALED PLUG-IN GFCI

Jonathan Willner, Toronto, Canada, assignor to Nuheat Inc., Toronto, Canada

Filed Jul. 31, 1990, Ser. No. 560,701
Int. Cl.[5] H02H *3/16*
U.S. Cl. 361—42 14 Claims

1. A miniature circuit interrupter for interruption of a primary circuit, the circuit interrupter formed or molded with a plug connector or the like, the plug or connector being non-serviceable and the circuit interrupter therein being sealed and watertight, wherein the interrupter further comprises means to detect a fault to ground, an integrated circuit to detect the fault condition, for example line to line for the powered lines and or line to ground, and means to disconnect the primary circuit from the power source, any fault being communicated to the integrated circuit by the means to detect the fault condition,

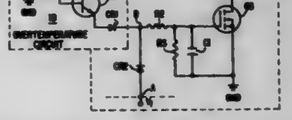


the integrated circuit sensing the fault condition and at a predetermined limit triggering the means to disconnect the primary circuit, wherein the circuit interrupter further comprises an electromagnetic switch which includes increased contact surfaces in order to, dissipate the heat generated, and or reduce the magnitude of a spark or arc which may occur, during normal use of the appliance or when a fault condition occurs.

5,198,956
OVERTEMPERATURE SENSING AND SIGNALING CIRCUIT

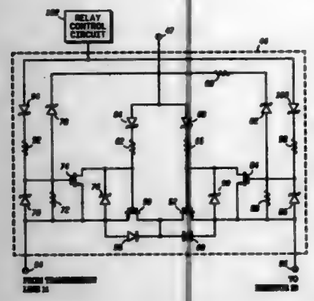
Robert F. Dvorak, Mount Vernon, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Jun. 19, 1992, Ser. No. 901,328
Int. Cl.[5] H02H *5/04*
U.S. Cl. 361—106 14 Claims



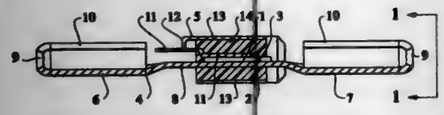
1. An overtemperature sensing and signaling circuit for electronic trip units comprising:
- a voltage divider (16) formed of a first resistor (R1) and positive coefficient resistance means (PT1) for sensing the ambient temperature within a circuit interrupter housing, said positive coefficient resistance means being connected between a first node (C) and a ground potential (GND), said first resistor (R1) having its one end connected to a first power supply potential (V_a) and its other end connected to said first node (C);
- a trigger circuit (18) formed of a first switching transistor (Q1) and a second switching transistor (Q2);
- said first switching transistor having its emitter connected to said first node (C); and
- said second switching transistor (Q2) having its base connected to the collector of said first switching transistor (Q1), its collector connected to the base of said first switching transistor (Q1) and to a second power supply potential ($_{cc}$), and its emitter coupled to a second node (B).

5,198,957
TRANSIENT PROTECTION CIRCUIT USING COMMON DRAIN FIELD EFFECT TRANSISTORS
Dennis L. Welty, Mesa; John Bliss, Tempe; Judith L. Sutor, Chandler; Stephen P. Robb, Tempe; David M. Sasak, Chandler, and Lloyd H. Hayes, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 2, 1990, Ser. No. 547,882
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—18 17 Claims



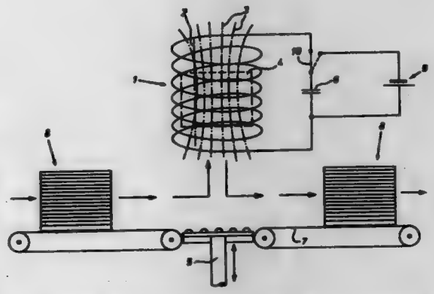
1. A transient protection circuit including a switching circuit having first and second terminals, wherein the switching circuit comprises:
a first transistor having a gate, a drain and a source, said source being coupled to the first terminal of the switching circuit, said gate being responsive to a first control signal, said first transistor including a first diode coupled for providing a unidirectional conduction path from said source to said drain thereof;
a second transistor having a gate, a drain and a source, said drain being coupled to said drain of said first transistor, said gate being responsive to a second control signal, said source being coupled to the second terminal of the switching circuit, said second transistor including a second diode coupled for providing a unidirectional conduction path from said source to said drain thereof; and
first means for sensing a predetermined threshold of a transient signal applied at one of the first and second terminals of the switching circuit and disabling the conduction path through said first and second transistors in response thereto. i

5,198,958
TRANSIENT SUPPRESSION COMPONENT
Leonard A. Krantz, Jr., Sidney, N.Y., assignor to Amphenol Corporation, Wallingford, Conn.
Filed Jan. 3, 1991, Ser. No. 709,152
Int. Cl.[5] H03H *7/00*
U.S. Cl. 361—119 28 Claims



1. An electrical component package, comprising:
a first lead having a first end section and a second end section, said first end section including means for mating said first lead with a first electrical contact positioned in an electrical connector, and said second end section including means for mating said second end section with a second electrical contact also positioned in said electrical connector, said first lead further comprising a main section including a component body mounting surface connecting said first and second end sections;
a component body mounted on one side of said main section; and
a second lead electrically connected to said component body, said second lead substantially surrounding said main section and said body, and separated from said main section by an insulating medium.

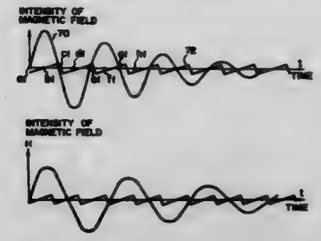
5,198,959
DEMAGNETIZING DEVICE FOR MAGNETIC RECORDING MEDIA
Bernd Scholtysik; José Toral; Hermann Brandstetter, and Manfred Baumann, all of Munich, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen
Filed Mar. 20, 1991, Ser. No. 672,282
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1990, 9003286[U]
Int. Cl.[5] H01F *13/00*
U.S. Cl. 361—149 2 Claims



1. A device for demagnetizing a plurality of magnetic recording tapes in the form of a stack of tapes wound on cores with a common vertical axis consisting essentially of: (1) a lifting means for raising and lowering the magnetic tapes, (2) a conveying means for transporting the magnetic tape to and away from the lifting means, and (3) an alternating current-operated cylindrical coil degaussing means which contains windings exciting a magnetic field, the field distribution of which extends parallel to the axis of the stack of the magnetic recording tapes when the magnetic recording tapes are within the cylindrical coil degaussing means, said cylindrical coil being in the vertical position and directly above the lifting means so that when the magnetic recording tapes are lifted into the cylindrical coil degaussing means the axis of the tapes is lifted in the axial direction of the cylindrical coil degaussing means.

5,198,960
COLOR CATHODE RAY TUBE SET
Kiyoshi Tokita, Fukaya; Kazunori Nakane, Fukiage; Masatsugu Inoue, Fukaya, and Takeshi Fujiwara, Kumagaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 17, 1989, Ser. No. 311,862
Claims priority, application Japan, Feb. 18, 1988, 63-33915
Int. Cl.[5] H01F *13/00*; H04N *9/29*
U.S. Cl. 361—150 16 Claims

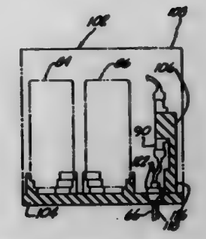
1. A method of degaussing a color cathode ray tube provided with a deflection yoke by using a degaussing coil, the tube comprising a vacuum envelope including a panel, a funnel, a neck and having a tube axis, and a shadow mask facing the panel, the deflection yoke being provided on the vacuum envelope for deflecting an electron beam, said method comprising the steps of:
supplying the deflection yoke with a vertical deflection current having a constant amplitude and whose frequency is constant at M Hz, M being substantially an integer; and
supplying the degaussing coil with a degaussing signal whose frequency is constant at L Hz, simultaneously with supplying of the vertical deflection current, said M and L being determined to effectuate said degaussing such that M/L is substantially not an integer, said degaussing signal being an alternating current, said degaussing signal being simultaneously supplied even when said vertical deflection current is not substantially zero.



5,198,961
CONTROL MODULE FOR ELECTRICAL APPLIANCE
Richard F. Stewart, North Brunswick, N.J., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jan. 13, 1992, Ser. No. 819,770
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—380 2 Claims

1. In an electrical appliance, a control module comprising:
a base member formed of relatively stiff material and being adapted to support electrical control components for said appliance;
means defining a transverse linear zone across said base to divide said base into a rear section and a front section,
manually operable control components mounted on said front section;
control circuit components mounted in said rear section;
said linear zone being of sufficiently reduced thickness compared to the rest of the base member as to provide a hinge means whereby said front and rear sections are pivoted relative to one another up to about 90° between an initial, relatively flat coplanar condition and a final mounting condition with said sections being approximately at right angles and with said manually operable control components being on a face of said front section facing, away from said rear section; and
module support means supporting said module in said appliance in said final mounting condition;
whereby said control module is secured in said appliance with said front section in a generally upright position and provides a manually operable control panel for said appliance.

5,198,962
LIGHTING SYSTEM
Glenn M. Tynan, 5814 Irving Ave., La Crescenta, Calif. 91214
Division of Ser. No. 389,363, Aug. 3, 1989, Pat. No. 5,041,950.
This application Feb. 11, 1991, Ser. No. 653,619
Int. Cl.[5] H02B *1/00*
U.S. Cl. 361—380 4 Claims



1. A closure system comprising
a potting base including one or more sockets;
a harness having slots;
bare electrical connectors having two spaced terminals and being positioned in said slots;
a potting body enclosing said one or more sockets of said potting base, said bare electrical connectors, including said two spaced terminals of each said bare electrical connectors, and said slots of said harness by molding said potting body about at least a portion of said base and at least a portion of said harness.

5,198,963
MULTIPLE INTEGRATED CIRCUIT MODULE WHICH SIMPLIFIES HANDLING AND TESTING
Debabrata Gupta, Scottsdale, and James E. Drye, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 21, 1991, Ser. No. 795,440
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 15 Claims

1. A multiple integrated circuit module which simplifies handling and testing comprising:
a plurality of integrated circuits, each integrated circuit having specific contact points;
a plurality of bridge chips, each bridge chip having a corresponding integrated circuit from the plurality of integrated circuits wherein each bridge chip has a plurality of contact points, some of which correspond to the specific contact points of the corresponding integrated circuit;
a first means for interconnecting predetermined ones of the contact points on each bridge chip;

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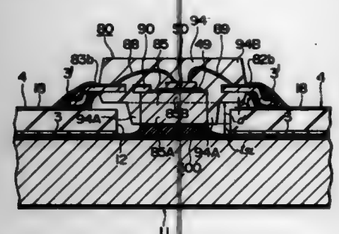
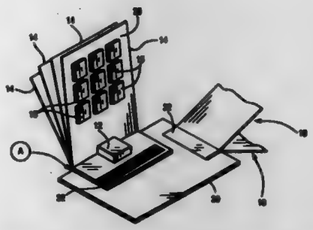
a second means for interconnecting the specific contact points of a corresponding integrated circuit to the contact points corresponding to specific contact points of the bridge chip comprising a plurality of solder bumps of a first thermal melting temperature;
a module substrate for receiving each combination of an integrated circuit interconnected to a corresponding bridge chip, the module substrate having a plurality of contact points corresponding to remaining contact points on each bridge chip;
a third means for interconnecting the contact points on the module substrate; and
a fourth means for interconnecting the contact points of the module substrate to remaining contact points on each bridge chip comprising solder bumps of a second thermal melting temperature.

5,198,964
PACKAGED SEMICONDUCTOR DEVICE AND ELECTRONIC DEVICE MODULE INCLUDING SAME
Mamoru Ito, Gunma; Usuke Enomoto, Isezaki, and Tomoo Sakamoto, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 24, 1991, Ser. No. 765,217
Claims priority, application Japan, Sep. 27, 1990, 2-259575
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—386 7 Claims



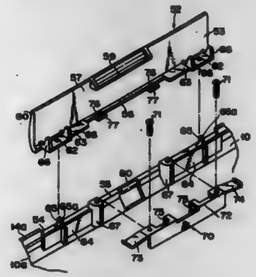
1. A packaged semiconductor device comprising:
a semiconductor chip having first and second main surfaces and electrode pads formed on said first surface;
a plurality of electrode leads;
a plurality of connection conductors for interconnecting said electrode pads and said electrode leads;
a heat sink block attached to said second main surface of said semiconductor chip and consisting of a first portion to which said second main surface of said semiconductor chip is attached and a second portion which extends from said first portion away from said semiconductor chip; and
a mold block having a first mold block portion, which encloses said semiconductor chip including said electrode pads, said plurality of electrode leads, said plurality of connection conductors and said first portion of said heat sink block, and a second mold block portion which encloses said second portion of said heat sink block, said second mold block portion being smaller than said first mold block portion and extending from said first mold block portion to form said mold block which has a "T"-shaped cross-section, with said first mold block portion forming a horizontal segment of "T", wherein said second portion of said heat sink block has an exposed surface which is not enclosed by said second mold block portion.

5,198,965
FREE FORM PACKAGING OF SPECIFIC FUNCTIONS WITHIN A COMPUTER SYSTEM
Stephen A. Curtis, Austin, Tex.; Ronald W. Gedney, Vestal, N.Y., and Gustav Schrottke, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 18, 1991, Ser. No. 809,992
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—386 11 Claims



1. A computer system including a computer and having a circuit board, comprising:
a plurality of functional islands each including a flexible substrate carrier having integrated circuit devices mounted thereon, a reference plane making connections between said integrated circuit devices and circuitized lines transmitting electrical signals between said integrated circuit devices; and
means electrically interconnecting said functional islands to said computer circuit board such that said functional islands are adjacently stacked in layered relation and in physical contact with one another, including a plurality of vias within each said flexible substrate for electrically exposing said circuitized lines and said reference planes and a plurality of connection pads, disposed on said vias, for interconnecting the circuitized lines and the reference planes of respective ones of said adjacently stacked functional islands.

5,198,966
APPARATUS INCLUDING A ROTATABLE LATCH MECHANISM HAVING AN ATTACHING STRUCTURE FOR HOLDING A MOVABLE MEMBER IN A CLOSED POSITION
Takaichi Kobayashi, and Mitsuhiro Yoshida, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 21, 1991, Ser. No. 717,838
Claims priority, application Japan, Jun. 22, 1990, 2-162958
Int. Cl.[5] H05K 7/12, 7/16; E05C 3/30; G06F 1/00
U.S. Cl. 361—395 16 Claims

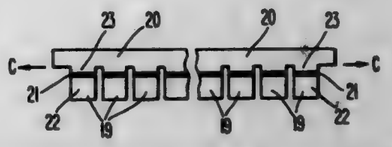


9. A latch device, comprising:

a first unit comprising first and second panels having mutually mating edge portions;
a second unit, rotatably coupled to said first unit, rotating to overlap said first unit;
a latch member, rotatably coupled to said first unit, comprising:
a shaft section rotatably sandwiched between the mating edge portions of said first and second panels to act as a fulcrum when the latch member rotates;
a spring-receiving portion extending from said shaft section into an inside of said first unit; and
a latching hook engaging with an exposed surface of said second unit when said first unit overlaps said second unit; and
a leaf spring urging said latch member to rotate in a direction to engage with said second unit when said first unit overlaps said second unit, said leaf spring comprising:
a fixing section fixed to said first panel;
at least one spring member contacting said spring receiving portion and elastically deforming to press said shaft section against said mating edge portion of said first panel; and
an engaging section engaging with said shaft section to secure the latch to said first panel.
16. A portable computer comprising:
a base unit having a keyboard;
a display unit rotatably connected to said base unit, said display unit rotating between a closed position wherein said display unit overlaps the base unit to cover the keyboard and an open position wherein said keyboard is exposed, said display unit comprising:
a front panel facing the keyboard when said front panel is rotated to the closed position; and
a base panel attached to said front panel, said front panel and said base panel having mutually mating edge portions;
a latch member coupled to said display unit, said latch member comprising:
a shaft section rotatably sandwiched between said edge portions of said front panel and said base panel and acting as a fulcrum when said latch member rotates;
at least one spring receiving portion extending from said shaft section into an inside of said display unit; and
a latching hook engaging with an exposed surface of said base unit; and
a leaf spring urging said latch to rotate in a direction to engage said latch member with said base unit when said display unit is in said closed position, said leaf spring comprising:
a fixing section fixed to said base panel;
at least one spring member contacting said spring receiving said spring receiving portion and elastically deforming to cause said shaft portion to press against the edge portion of said base panel; and
and engaging section enagaging with said shaft section to secure said latch member to said base panel.

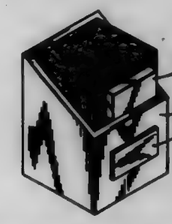
5,198,967
SOLID ELECTROLYTIC CAPACITOR AND METHOD FOR MAKING SAME
Kenji Kuranuki, Uji; Masayuki Tsuiguchi, Tsuzuki; Hironichi Yamamoto, and Shuroo Nakajima, both of Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 11, 1991, Ser. No. 757,745
Claims priority, application Japan, Sep. 13, 1990, 2-245563
Int. Cl.[5] H01G 9/00
U.S. Cl. 361—523 8 Claims

1. A solid electrolytic capacitor comprising an outer molded casing, a plurality of capacitor elements each having a dielectric layer consisting of a positive electrode oxide film on a planar valve metal, a conductive macromolecular layer and a conductive layer overlying the conductive macromolecular layer at a predetermined portion of the dielectric layer, and two pairs of two-terminal external connectors of a plate shape, facing each other and connected to one of the capacitor elements, each having a positive electrode and a negative electrode, each pair of two-terminal external connectors including a positive electrode and a negative electrode, the external



connectors being extending from opposite exposed sides of the outer molded casing and bent over exposed sides of the outer molded casing against a surface of the outer molded casing to position all pairs of the two-terminal external connectors on a side of the outer molded casing between said opposite exposed sides.

5,198,968
COMPACT SURFACE MOUNT SOLID STATE CAPACITOR AND METHOD OF MAKING SAME
John Galvagni, Myrtle Beach, S.C., assignor to AVX Corporation, New York, N.Y.
Filed Jul. 23, 1992, Ser. No. 917,848
Int. Cl.[5] H01G 9/00
U.S. Cl. 361—529 20 Claims



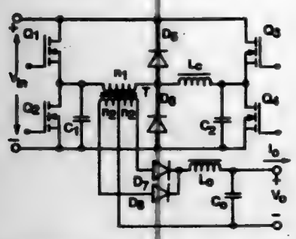
1. The method of manufacturing a solid state tantalum capacitor which comprises the steps of providing a tantalum container having an opening, at least partly filling said container with tantalum powder, thereafter sintering said container and powder to bond said powder into a porous unitary mass mechanically and electrically coupled to said container, thereafter forming a dielectric coating on said porous mass and thereafter forming a cathode coating over said dielectric coating, portions of said cathode coating being exposed through said opening.

5,198,969
SOFT-SWITCHING FULL-BRIDGE DC/DC CONVERTING
Richard Redl, Fribourg, Switzerland, and Laszlo Balogh, Lexington, Mass., assignors to Design Automation, Inc., Lexington, Mass.
Continuation of Ser. No. 553,457, Jul. 13, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 821,324
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—17 1 Claim

1. In a phase-shifted pulse-width-modulated soft-switching full-bridge dc/dc converter having first and second power-supply rails intercoupled by semiconductor switching devices characterized by switching losses and exchanging energy through a transformer coupled to at least one output rectifier and characterized by leakage inductance with the full-bridge

dc/dc converter controlled by a phase-shifted pulse-width modulator, the improvement comprising,

an external commutating inductor connected to said transformer at a junction and characterized by commutating inductance significantly larger than said leakage inductance in circuit arrangement for helping soft-switching of the semiconductor switching devices and reducing the ringing and overshoot across each output rectifier,



and first and second clamp diodes connected respectively from said first and second power-supply rails to said junction coupled to said converter, for reducing said switching losses of said semiconductor switching devices and for reducing the reverse-voltage ringing and overshoot across each output rectifier.

5,198,970

A.C. POWER SUPPLY APPARATUS

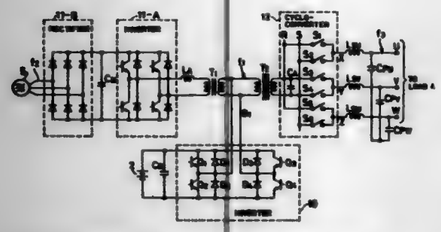
Takao Kawabata, and Nobuo Sashida, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 318,240, Mar. 3, 1989, abandoned. This application Nov. 25, 1991, Ser. No. 798,833

Claims priority, application Japan, Apr. 27, 1988, 63-106987

Int. Cl.[5] H02M *5/45*

U.S. Cl. 363—37 8 Claims



1. An a.c. power supply apparatus, comprising:

a first controllable converting device which receives a.c. power of a first frequency from a power source, converts the frequency of said a.c. power into a second frequency higher than said first frequency, converts the voltage of said a.c. power to a value equal to a demanded system power control signal, thereby providing converted a.c. power, and provides said converted a.c. power to a bus;

a second voltage inverter type converting device which receives d.c. power and converts said d.c. power into a.c. power of said second frequency and provides said converted d.c. power to said bus, and converts a.c. power from said bus into d.c. power to charge a battery, said second converting device being responsive to a voltage control signal for controlling the voltage level of said converted a.c. and d.c. power;

a third converting device which is supplied with a.c. power of said second frequency from one of said first and second converting devices through said bus, converts the supplied power into a.c. power of a third frequency, and provides the a.c. power of said third frequency to a load; and

control means for evaluating demanded system power based on said a.c. power provided to said load and said d.c. power to charge said battery, developing said demanded system power control signal, and supplying said system power control signal to said first controllable converting device.

5,198,971

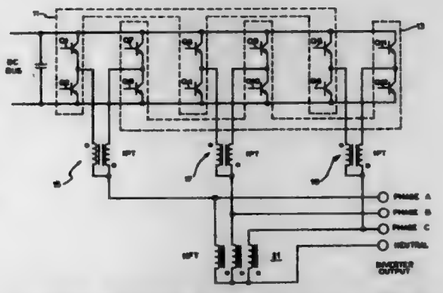
SEPARATION CONTROL FOR MULTIPHASE PLURAL INVERTER SYSTEM

Bradley J. Recker, 5281 Pepper Dr., Rockford, Ill. 61111, and Derrick Roe, 3385 Quiet Valley La., Rockford, Ill. 61109

Filed Aug. 15, 1991, Ser. No. 745,613

Int. Cl.[5] H02M *1/08, 1/12*

U.S. Cl. 363—71 18 Claims



1. A system for receiving DC input and for providing AC output, said AC output having first and second AC output phases, said system comprising:

first inverter means for inverting DC input into a first inverter AC output, said first inverter AC output having at least first and second phases;

second inverter means for inverting DC input into a second inverter AC output, said second inverter AC output having at least first and second phases;

inverter control means connected to said first and second inverter means for controlling said first inverter means such that said first and second phases of said first inverter means are separated by a first number of degrees and for controlling said second inverter means such that said first and second phases of said second inverter means are separated by a second number of degrees and such that said first and second phases of said second inverter means are separated from said first and second phases of said first inverter means respectively by a third number of degrees selected to suppress harmonics in said AC output;

first-phase combining means connected to said first inverter means and to said second inverter means for combining said first phases of said first and second inverter means into said first AC output phase; and,

second-phase conbining means connected to said first inverter means and to said second inverter means for combining said second phases of said first and second inverter means into said second AC output phase.

5,198,972

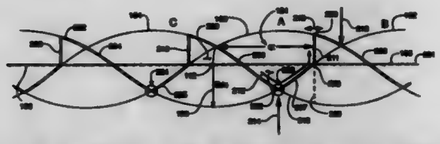
TURN-OFF SWITCH PHASE CONTROL WITH IMPROVED RIPPLE AND POWER FACTOR

David L. Lafuse, Waynesboro, Va., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 3, 1992, Ser. No. 815,081

Int. Cl.[5] H02M *5/257*

U.S. Cl. 363—138 20 Claims



1. The method for achieving improved source machine power factor and output energy waveform ripple from a power inverter commutating apparatus having on and off controllable switching elements and multiple-phased energy input waveforms from said source machine, said method comprising the steps of:

segregating the commutation operation of said switching elements into a first operating mode for generating input waveform samples contributing to large amplitude portions of said output waveform and a second operating mode for generating input waveform samples contributing to small amplitude portions of said output waveform;

selecting first operating mode commutation samples from said multiple phased input waveforms in the sequence of each phase sample being succeeded by a sample from the next lagging input phase, for fabricating said output waveform large amplitude portions; and

choosing second operating mode commutation samples from said multiple phased input waveforms in the sequence of each phase sample being succeeded by a sample from the next leading input phase for fabricating said output waveform small amplitude portions.

5,198,973

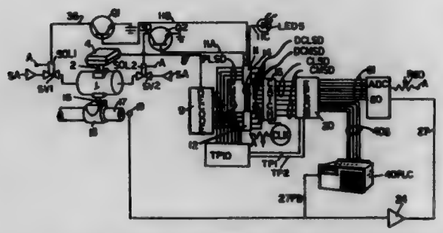
SELECT-A-RANGE CONTROL DEVICE

Edward M. Steutermann, 13305 Laurel Ct., Prospect, Ky. 40059

Continuation-in-part of Ser. No. 407,962, Sep. 14, 1989. This application Apr. 19, 1990, Ser. No. 511,052

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—167.01 25 Claims



1. A control device to position shaft means operated by actuator means and moveable between first and second limits to operate process regulator means to control a process condition including;

a. process transducer means to provide a process signal indicative of the status of the process condition to be controlled;

b. position indicator means to generate binary coded position signals in selected format to indicate the position of said shaft means between said first and second limits in increments of the travel path of said shaft where a different binary coded position signal is generated for each segment of travel path and the binary coded position signals are incremented as said shaft moves in said travel path in first direction toward said first limit to operate said process regulator means to adjust said process condition in a first direction and said binary coded postion signals are decremented as said shaft moves in said travel path in a second direction toward said second limit to operate said process regulator means to adjust said process condition in a second direction;

c. digital process signal generator means having input means to receive said process signal and output means to provide binary coded process signals in sequential order in the same range as said binary coded position signals where said binary coded process signals each indicates a position are indicative of the magnitude of said process signal;

d. binary coded number comparator means having first signal input means to receive said binary coded process signal, second signal input means to receive said binary coded position signals, first output means to provide an equal comparator signal when said binary coded process signal received at said first signal input means and said digital binary coded position signal received at said second signal input means are equal, first mismatch signal means to provide first mismatch signal when said binary coded process signal received at said first signal input means exceeds said binary coded position signal received at said second signal input means and second mismatch signal means to provide second mismatch signal when said binary coded position signal received at said second signal input means exceeds said binary coded process signal received at said first signal input means;

e. register means to receive said binary coded process signal with clock means to select the frequency at which said process signal is supplied to said first input of said comperator means;

f. motive supply means to provide motive means to operate said actuator means to move said shaft and regulator means in said first and second directions;

h. motive means control means to receive said equal signal, said first mismatch signal and said second mismatch signal and operate said actuator means to move said element in said first direction in response to said first mismatch signal and operate said actuator means to move said element in said second direction in response to said second mismatch signal.

5,198,974

SAFETY DEVICE FOR MOTORIZED ROLLING SHUTTER

Jean-Michel Orsat, Cluses, France, assignor to Somfy, Cluses, France

Filed Jan. 23, 1991, Ser. No. 644,543

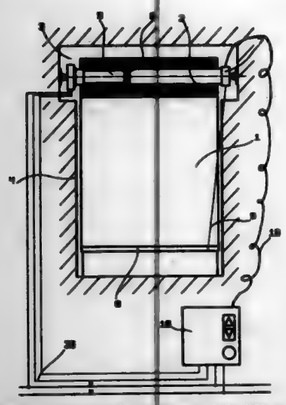
Claims priority, application France, Jan. 26, 1990, 90 00939; Sep. 3, 1990, 90 10936

Int. Cl.[5] G06F *15/20*; E05F *15/10*

U.S. Cl. 364—167.01 22 Claims

1. A safety device for a motorized rolling shutter (1) or similar comprising means (7) supplying an electrical signal representing the displacement of the rolling shutter (1) and a logic processing unit (20) capable of working in learning mode and in operating mode, by sampling, and comprising means (29) of storing, in learning mode, value samples corresponding to the signal samples and means (27) of comparing, in operating mode, these stored value samples with value samples obtained in operating mode, and means (20, 25) of controlling a stopping of the motor of the rolling shutter when a difference between the value of the sample obtained in operating mode and the value of the stored sample is greater than a predetermined difference, wherein the means supplying the electrical signal representing the displacement of the rolling shutter comprise a pulley (13) on which is wound a flexible element (9) whose free

end is connected to the end of the rolling shutter (1) such that the unrolling of the rolling shutter causes the unrolling of the flexible element, an elastic means (14, 15) ensuring the rewinding of the flexible element on its pulley during the rolling of the



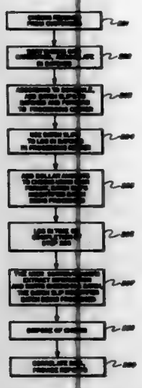
rolling shutter and a signal generator (18; 30) mechanically connected to a spindle of the pulley and supplying an electrical voltage representing the speed of rotation of the pulley, and wherein the logic processing unit (20) comprises means of sampling the electrical signal supplied by the signal generator.

5,198,975

APPARATUS AND METHOD FOR PROCESSING OF CHECK BATCHES IN BANKING OPERATIONS

Donna J. Baker, and Kerry S. Jones, both of Phoenix, Ariz., assignors to Valley National Bank, Phoenix, Ariz.

Filed Nov. 30, 1989, Ser. No. 444,009
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—406 20 Claims



1. A method of processing checks, said checks including associated deposit slips, said method comprising the steps of:

grouping the checks received at remote locations in batches according to one of a plurality of check characteristics;

coupling a preprinted batch slip with each batch, said batch slip including information encoded in MICR format and in bar code format, said encoded information including an identification of said remote location and a check characteristic;

periodically transmitting said batches to a processing station;

processing said checks in said batches;

entering information into a data processing system by apparatus responsive to said information encoded in said bar code format, said entering information being performed at a preselected juncture in said processing checks;

entering said information encoded in said MICR format in said data processing system by means of a MICR reader/sorter, said MICR reader/sorter extracting information from said checks; and

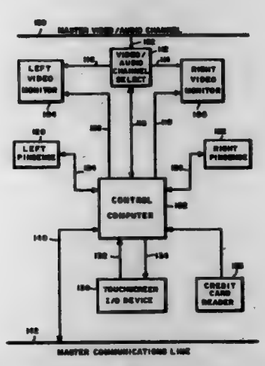
storing, in said data processing system, identifying information from said batch slip together with information related to said checks coupled to said batch slip.

5,198,976

MULTIFUNCTION INTERACTIVE AUTOMATIC BOWLING ALLEY SYSTEM UTILIZING A TOUCH SCREEN CONSOLE

Michael A. Form, Southborough; Gene L. Greystone, Boston, and Charles L. Hoesman, Cambridge, all of Mass., assignors to Computer Sport Systems, Inc., Cambridge, Mass.

Continuation of Ser. No. 470,963, Jan. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 267,341, Nov. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 849,806, Apr. 9, 1986, abandoned. This application Mar. 4, 1991, Ser. No. 664,550
Int. Cl.[5] A63D *5/04*
U.S. Cl. 364—410 16 Claims



1. An interactive bowling alley system for a bowling alley having a plurality of lanes with a patron area for each lane comprising:

a computer adapted to store information concerning selected bowling alley functions, said functions including a problem correction function and at least one of a refreshment ordering function, a scoring function, an entertainment function, and an announcement function;

a touch-screen device located at the patron area for at least selected ones of said lanes, the touch screen device including a video monitor;

means responsive to said computer for causing a menu of said selected functions to appear on each video monitor, a key area being provided on the monitor for each displayed menu item;

means responsive to the user touching the key areas corresponding to one of the menu items shown on a video monitor for causing the computer to provide to the monitor and to display thereon selected information concerning the function corresponding to the touched key area, said selected information including a menu of available options for the selected function, there being a key area provided on the monitor for each available option and there being key areas provided on the monitor for operation by a user in performing a selected function, the information provided to the user when the problem correction function is selected being a menu of potential bowling alley problems;

means responsive to a user touching a key area for an available option for providing additional available options on the function and for causing the selected available option to be performed if additional available options are not stored, action being initiated to correct a selected problem in response to the user touching the key area for the problem on the problem correction menu; and

means responsive to the user touching key areas in response to displayed instructions for causing the instruction to be performed;

whereby a user may easily perform the selected bowling alley functions without having prior computer knowledge or experience.

5,198,977

SYSTEM AND METHOD FOR LOCALIZATION OF FUNCTIONAL ACTIVITY IN THE HUMAN BRAIN

Jesse Salb, 10445 Wilshire Blvd., Los Angeles, Calif. 90024

Filed Nov. 27, 1990, Ser. No. 619,187
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—413.01 18 Claims

1. A system for determining anatomical localization of functional activity of a human brain during a neurosurgical procedure comprising:

a) illumination means for generating an illuminating light;

b) optical bandpass filter means disposed between the illumination means and the brain for enabling sequential illumination of an exposed surface of the brain with predetermined wavelengths of monochromatic light;

c) a video camera generating a video signal representing an image of the illuminated exposed surface of the brain;

d) video processing means coupled to the video camera for converting the generated video signal to a log signal which directly represents reflectance of said exposed brain surface;

e) image processing means coupled to said video processing means for digitizing and analyzing said log signal and for computing regional total hemoglobin concentration of said exposed brain surface;

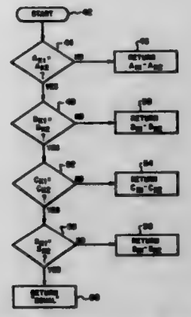
f) display means coupled to said image processing means for displaying an image representing the computed regional total hemoglobin concentration of said exposed brain surface.

5,198,978

SYSTEM FOR FACILITATING THE SORTING OF NATIONAL LANGUAGE KEYS IN A DATA PROCESSING SYSTEM

Denis Garneau, Toronto, Canada, and Wen-Hsin Sears, Fort Worth, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 458,044, Dec. 27, 1989, Pat. No. 5,070,456. This application Oct. 21, 1991, Ser. No. 779,692
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 6 Claims



1. A data processing system for facilitating the sorting of national language keys, said data processing system comprising:

means for assigning a selected alphabetic key value for each of said national language keys;

means for assigning a selected diacritic key value for each of said national language keys;

means for establishing a fixed length place value data frame for each of said national language keys, each of said fixed length place value data frames having a most significant digit, a least significant digit, a fixed portion of said fixed length place value data frame containing said selected alphabetic key value and a fixed portion of said fixed length place value data frame containing said selected diacritic key value; and

means for thereafter determining a sort precedence between any two selected national language keys by a comparison of the fixed length place value data frames associated with said two selected national language keys.

5,198,979

SEISMIC MIGRATION OF MULTIPROCESSOR COMPUTER

William D. Moorhead; Richard L. Gregg, both of Houston, and Donald M. Tolle, Sugar Land, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1989, Ser. No. 412,692
Int. Cl.[5] G01V *1/30*
U.S. Cl. 364—421 25 Claims

1. A method for processing seismic data on a multiprocessor computer having multiple interconnected processor nodes, comprising:

providing such a computer with appropriate input parameters and seismic data;

calculating processing parameters from some of said input parameters, said processing parameters including an output subpoint span;

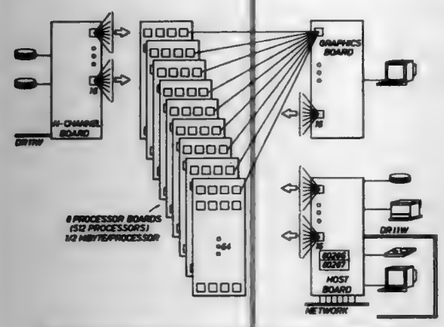
determining processing operators and a maximum size processing operator from some of said input parameters;

arranging a correspondence between a collection of said nodes and preselected output subpoints such that one or

more output subpoints are assigned to one node and the output subpoint span of the maximum size processing operator is less than the output subpoint span assigned to said collection of nodes;

providing such nodes with a processing program and processing parameters;

passing said seismic data as a linear sequence of input traces



through said collection of nodes in a continuous sequence; and

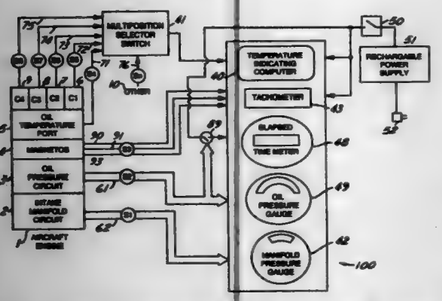
for each node of said collection of nodes and for each corresponding output subpoint assigned thereto generating an output trace for said corresponding output subpoint from those input traces whose subpoints fall within the input subpoint span of the processing operator corresponding to said corresponding output subpoint.

5,198,980

PORTABLE TESTING APPARATUS FOR AIRPLANE ENGINES

James D. Patrick, 23079 Forest Ln., Taylor, Mich. 48180

Filed Nov. 5, 1990, Ser. No. 609,474
Int. Cl.[5] G01M *15/00*
U.S. Cl. 364—424.03 **16 Claims**



13. A portable testing apparatus for monitoring the operating parameters of an aircraft reciprocating engine having cylinders, an intake manifold pressure circuit, magnetos, and oil flowing through an oil pressure circuit and through an oil temperature port, the portable testing apparatus comprising:

a plurality of sensors detachably attached to the cylinders and to the oil temperature port for sensing the temperature thereof;

a temperature indicating computer connected to said plurality of sensors;

a tachometer connected to the magnetos for measuring an operating speed of the engine; and

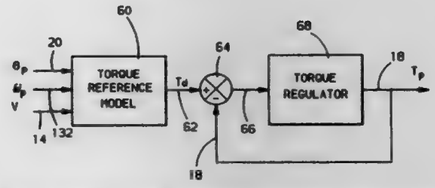
pressure sensing means in communication with the intake manifold and oil pressure circuits, the portable testing apparatus enabling operating parameters of the engine to be monitored when the engine is mounted in the aircraft.

5,198,981

CLOSED-LOOP TORQUE CONTROL FOR ELECTRIC POWER STEERING

Steven J. Collier-Hallman, Frankenmuth, and Julie A. Kleinau, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 9, 1990, Ser. No. 594,468
Int. Cl.[5] B62D *5/04*
U.S. Cl. 364—424.05 **19 Claims**



15. An apparatus for controlling an electric power steering system in a vehicle comprising:

means for measuring steering wheel angle and vehicle lateral acceleration;

means for developing a steering wheel velocity signal as a time differentiation of said measured steering wheel angle;

means for developing, in response to the measured steering wheel angle and vehicle lateral acceleration and in response to the steering wheel velocity signal, a steering torque command representative of a target operator exerted steering torque and for comparing the steering torque command to a measure of actual operator exerted steering torque and developing a torque error signal in response to the comparison; and

means for controlling an electric motor to apply torque assist to the vehicle steering system in response to the torque error signal, increasing said torque assist if the actual operator exerted steering torque is greater than the target operated exerted steering torque and decreasing said torque assist if the actual operator exerted steering torque is less than the target operator steering torque thereby to minimize the torque error signal and bring the actual operator exerted steering torque into substantial agreement with the target operator exerted steering torque.

5,198,982

AUTOMOTIVE VEHICLE CONTROL SYSTEM FOR PREDICTING ROAD FRICTION LEVEL

Kazumitsu Kobayashi, Gunma, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isezaki, Japan

Filed Dec. 19, 1990, Ser. No. 631,005
Claims priority, application Japan, Dec. 19, 1989, 1-329139
Int. Cl.[5] B60K *28/16*
U.S. Cl. 364—426.02 **20 Claims**

1. A traction control system for an automotive vehicle, comprising:

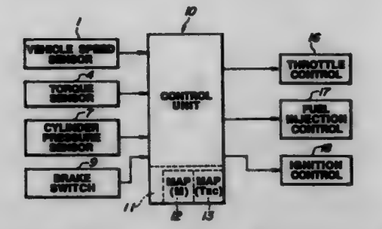
first means for adjusting a driving torque delivered to the driven wheels of the vehicle from an automotive internal combustion engine;

second means for detecting vehicular deceleration and acceleration and generating vehicular deceleration and acceleration indicative data;

third means for monitoring a torque transmitted between a road surface and said driven wheels, for generating transmitted torque magnitude indicative data;

fourth means for predicting road friction level on the basis of said vehicular deceleration and acceleration indicative data and said transmitted torque magnitude indicative data;

fifth means for deriving a torque criterion on the basis of said road friction level derived by said fourth means; and



sixth means, responsive to said transmitted torque magnitude indicative data greater than said torque criterion, for performing a control for said first means for adjusting the output torque of said engine and thereby adjusting said torque transmitted between said road surface and said driven wheels below said torque criterion.

5,198,983

METHOD AND APPARATUS FOR SEMI-AUTOMATED INSERTION OF CONDUCTORS INTO HARNESS CONNECTORS

Evan E. Blake; Paul F. Newman, both of Bedford, and Dale W. Springer, Hurst, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

PCT No. PCT/US90/03744, § 371 Date Jul. 9, 1990, § 102(e) Date Jul. 9, 1990
PCT Filed Jul. 9, 1990, Ser. No. 601,816
Int. Cl.[5] G06F *15/46*; B23P *19/04*
U.S. Cl. 364—468 **53 Claims**

1. A method of randomly installing predetermined components into designated locations in an assembly unit using a semi-automated component installation system which includes at least system controller means operatively connected to data input means, data output means and a light indicator means, said method comprising the steps of:

(a) receiving request for assembly unit code at the data output means from the system controller means;

(b) providing assembly unit code to the system controller means from the data input means;

(c) receiving confirmation of the assembly code at the data output means from the system controller means;

(d) loading assembly unit into a holding fixture;

(e) providing request for alignment of assembly unit to the system controller means from the data input means;

(f) receiving spot of light from light indicator means on the assembly unit to indicate the location of an indexing point for the assembly unit;

(g) moving assembly unit to position the predetermined indexing point on the assembly unit in alignment with the spot of light;

(h) providing information to the system controller means through the data input means confirming alignment of assembly unit completed;

(i) receiving request for a component identification code at the data output means from the system controller means;

(j) providing component identification code of a randomly selected component to the system controller means through the data input means;

(k) receiving confirmation of the component identification code at the data output means from the system controller means;

(l) receiving spot of light from the light indicator means on a designated location for said randomly selected component;

(m) installing said randomly selected component into said designated location;

(n) providing information to the system controller means through the data input means confirming that said randomly selected component has been installed; and

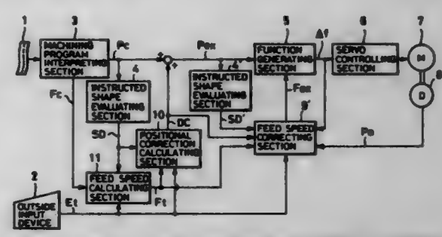
(o) repeating steps (i), (j), (k), (l), (m) and (n) until all predetermined components have been installed.

5,198,984

NUMERICAL CONTROL METHOD FOR CORRECTING MACHINE TOOL PATH ERRORS

Takahiro Yamaguchi, and Kenji Ito, both of Niwa, Japan, assignors to Okuma Corporation, Aichi, Japan

Continuation-in-part of Ser. No. 401,855, Aug. 31, 1989, abandoned. This application Oct. 3, 1991, Ser. No. 770,404
Claims priority, application Japan, Aug. 31, 1988, 63-217239
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—474.30 **4 Claims**



1. A numerical control method for controlling a machining path of a tool in accordance with a first machining path data denoting an instructed machining path from a machine program, a first feed speed data denoting an instructed feed speed from the machine program, and a first path error data denoting a prespecified tolerable path error, said method comprising the steps of:

determining a second feed speed data which causes a machining path error that is N times as large as that of the first path error data when the machining path of the tool is driven according to the first machining path data, N being determined in advance;

predicting an actual machining path of the tool according to the first machining path data and the second feed speed data;

determining a second path error data according to a difference between the predicted actual machining path and the first machining path data;

obtaining a first positional correction data by subtracting the first path error data from the second path error data;

calculating a second machining path data by adjusting the first machining path data by an amount corresponding to the first positional correction data in a direction opposing a direction in which a path error occurs;

calculating an amount of movement per unit of time in accordance with the second machining path data and the second feed speed data;

driving the machine tool according to the calculated amount of movement per unit of time; and,

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detecting an actual machining path of the driven machine tool, calculating an actual follow-up lag data between the detected actual machining path and the second machining path data, and correcting the second feed speed data according to the actual follow-up lag data and the first path error data.

5,198,985

APPARATUS FOR REMOVING ERRONEOUSLY INSERTED PARTS IN AUTOMATIC INSERTION MACHINE

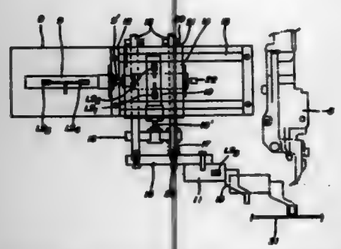
Yong C. Kwon, and Ha S. Baik, both of Kyungki, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 27, 1990, Ser. No. 618,634

Claims priority, application Rep. of Korea, Nov. 28, 1989, 17342/1989

Int. Cl.[5] G06F *15/20*; H05K *3/30*

U.S. Cl. 364—478 5 Claims



1. An apparatus for removing erroneously inserted parts for use in an automatic insertion machine, which apparatus comprises:

a finger driving cylinder for driving a finger for picking up an erroneously inserted part, said finger driving cylinder being provided with driving confirming means;

an ascending and descending cylinder for lifting up and lowering said finger, respectively, said ascending and descending cylinder being provided with means for confirming ascension and descention of said finger;

a forwardly and backwardly moving cylinder for moving said finger forward and backward, said forwardly and backwardly moving cylinder being provided with means for confirming forward and backward movement of said finger;

an erroneously inserted part removing member having a moving base wherein a part transferring chuck and a part inserting chuck are coupled together and said cylinders are coupled to said moving base for cooperative movement therewith;

a control member for controlling the operation of said erroneously inserted part removing member;

a power supply member; and

an operation and display member including a control panel.

5,198,986

CROSSTALK VERIFICATION DEVICE

Minoru Ikeda, and Tsuneaste Munakata, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1990, Ser. No. 582,106

Claims priority, application Japan, Dec. 22, 1989, 1-333901

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—489 29 Claims

1. A crosstalk verification device, comprising:

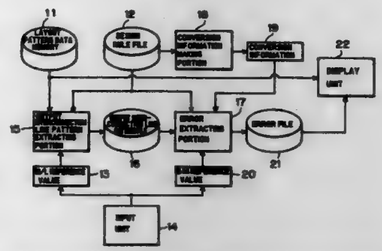
first providing means for providing layout pattern data defining a layout pattern to be verified;

second providing means for providing a design rule on said layout pattern to be verified;

first storing means for storing a first reference on a size of a transistor easily exerting an influence of crosstalk and a second reference on a size of a transistor easily influenced by crosstalk;

first extracting means coupled with said first and second providing means and said first storing means for extracting data on output interconnection line patterns of a first transistor satisfying said first reference and a second transistor satifying said second reference out of transistors in said layout pattern to be verified, from said layout pattern data, by processing said layout pattern data with said design rule and said first and second references referred;

second storing means for storing a third reference on an area



of an overlapping portion of output interconnection lines and a fourth reference on a length of a parallel portion of said output interconnection lines;

second extracting means coupled with said first extracting means and said second storing means for extracting as error portions said overlapping portion of an area exceeding said third reference and said parallel portion of a length exceeding said fourth reference between said output interconnection lines of said first and second transistors by processing said data on output interconnection patterns with said third and fourth references referred;

display means connected with said second extracting means for visually displaying said error portions.

5,198,987

WIRING-PATTERN-DETERMINATION SYSTEM

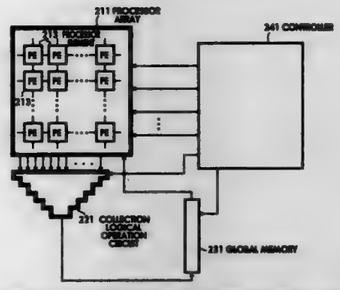
Tatsuya Shindo, Kawasaki, and Kaoru Kawamura, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 24, 1990, Ser. No. 602,863

Claims priority, application Japan, Oct. 24, 1989, 1-276379

Int. Cl.[5] G06F *15/60, 15/16*

U.S. Cl. 364—490 16 Claims



1. A wiring-pattern-determination system implemented by a computer including processors connected orthogonally to each other, each having a processor memory, comprising:

label setting means, implemented by the computer, for setting labels corresponding to each of the processors from a starting point to an ending point by performing a labeling operation utilizing a maze running and storing each of the labels in each processor memory;

reference point setting means, implemented by the computer, for setting a corner of a wiring pattern to be determined by setting said ending point as a reference point assigned with a label for a back-trace, performed by a collection logical operation circuit connected to the processors, of said maze running;

corner judging means, implemented by the computer, for determining a next corner of the wiring pattern as a next reference point based on the label assigned to the reference point by said reference point setting means;

termination judging means, implemented by the computer, for determining a termination of the back-trace when said starting point and the next corner determined by said corner judging means match; and

reference point revising means, implemented by the computer, for instructing said reference point setting means to set said next corner as a new reference point when said starting point and the next corner determined by said corner judging means mismatch.

5,198,988

METHOD OF DETERMINING OPTIMUM OPERATING CONDITIONS IN AN ELECTROCHEMICAL DETECTOR AND ELECTROCHEMICAL DETECTOR USING THE METHOD

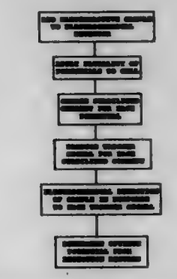
Thomas Dorr, and Clemens Linowski, both of Waldbronn, Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 16, 1990, Ser. No. 568,091

Claims priority, application European Pat. Off., Sep. 15, 1989, 8911 7071

Int. Cl.[5] G06F *15/20*; C25B *15/02, 15/08*

U.S. Cl. 364—497 8 Claims



1. In a method of determining optimum operating conditions in an electrochemical detector coupled to the outlet of the separation column of a liquid chromatograph for separating a sample to be analyzed into sample components to be detected, which comprises introducing liquid including an electroactive sample component to be detected into a electrochemical cell of the detector and applying a potential between the liquid in the cell and a working electrode, such that a current is created and stabilized at the working electrode, the steps of:

a) successively applying and adjusting a plurality of potentials in the cell with the values of said potentials corresponding to a sequence of discrete values ranging from an initial to final value,

b) stabilizing said current created at said working electrode with each adjustment of a new potential value, producing a trigger signal indicative of each stabilized current created, which trigger signal triggers the injection of said sample to be analyzed into said separation column, and electrochemically detecting the sample component to be detected in response to each said trigger signal, and

c) determining from each of said plurality of potentials the optimum operating potential to produce the measuring values with best signal-to-noise behavior for detection of the sample from the sample electrochemical detection results obtained according to step b).

5,198,989

SEWER FLOW MEASUREMENT CONTROL SYSTEM

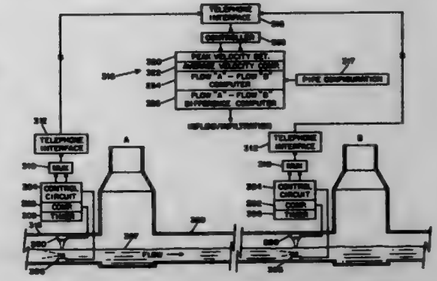
Alan M. Petroff, Huntsville, Ala., assignor to ADS Environmental Services, Inc., Huntsville, Ala.

Continuation-in-part of Ser. No. 440,582, Nov. 17, 1989, Pat. No. 5,020,374, and a continuation-in-part of Ser. No. 285,321, Dec. 13, 1988, Pat. No. 4,933,833, which is a division of Ser. No. 755,062, Jul. 15, 1985, Pat. No. 4,791,547, which is a division of Ser. No. 473,689, Mar. 9, 1983, Pat. No. 4,530,045, which is a continuation-in-part of Ser. No. 196,836, Sep. 23, 1980, Pat. No. 4,386,409. This application Jun. 13, 1990, Ser. No. 537,369

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] G01F *1/66*

U.S. Cl. 364—510 11 Claims



1. A first sewage flow monitoring system comprising:

first liquid height detection means for providing an indication of a wetted area of a sewage flow conduit of a discrete configuration; and

first velocity sensing means comprising:

sonic means including at least one transducer immersed in sewage flowing in said conduit and including emitting means for emitting a sonic signal generally along the direction of flow of sewage and detecting echo signals from objects flowing generally along the said direction of flow,

signal generating means responsive to said sonic means for providing output signals representative of Doppler signals detected by said sonic means,

multi-signal detection means for receiving the output signals and detecting the presence of a range of different Doppler signals therein,

discrimination means including means responsive to a maximum value in the range of different Doppler signals from the detection means for providing a selected output which is representative of average velocity of sewage flow through said conduit, and

flow computation means responsive to said discrimination means and said first liquid height detection means for indicating the volume of flow through said conduit.

5,198,990

COORDINATE MEASUREMENT AND INSPECTION METHODS AND APPARATUS

Farshad Farnan, Encino, and Valeria J. Gasio, Culver City, both of Calif., assignors to Panamation, Inc., Compton, Calif.

Filed Apr. 23, 1990, Ser. No. 512,477

Int. Cl.[5] G06F *15/46, 3/00*

U.S. Cl. 364—560 12 Claims

1. Apparatus for measuring an object comprising

(a) a frame assembly having a reference table for supporting the object,

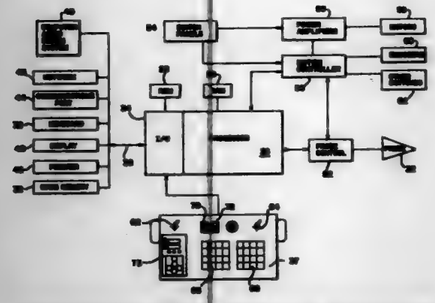
(b) a robotics unit secured to said frame assembly, said robotics unit having movable probe means, said probe means generating output signals when said probe means contacts the object, and

(c) machine control means for controlling said probe means, said machine control means having

(i) a processor means for processing said probe output signals, controlling said robotics unit and said machine control means, and analyzing data of the object instructions received from memory means,

(ii) first input means connected to said probe means for placing said probe output signals in said processor means,

(iii) second input means for programming and controlling said processor means,



(iv) first output means connected to said processor means for controlling the movement of said probe means,

(v) second output means for displaying information calculated in said processor means,

(vi) a program for operating said robotics unit in predetermined ways, said program being responsive to a memory containing a substantial number of instructions in a widely-used command syntax said instructions existing in a memory, and

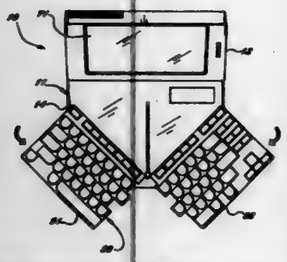
(vii) a part file containing said commands, whereby said part file is executed by the program embodied in the memory of the robotics unit without the use of either preprocessors and/or postprocessors.

5,198,991

PERSONAL COMPUTER WITH DISSOCIATED KEYBOARD

Richard F. Pellitt, Highland Beach, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 30, 1990, Ser. No. 621,668
Int. Cl.[5] G06F 1/00
U.S. Cl. 364—708 10 Claims



1. A personal computer comprising:

first and second housings each having a generally rectangular parallelepiped configuration with predetermined length, width and depth dimensions, said housings being joined for pivotal movement thereof one relative to the other about a housing axis parallel to the lengthwise dimensions thereof;

a display mounted in one of said housings for presenting to a user a visual display of information processed by the personal computer;

a central processor unit mounted in one of said housings for manipulating information and operatively connected with said display;

random access memory mounted in one of said housings for exchanging with said central processor unit information manipulated by said central processor unit and for storing information exchanged;

a direct memory access controller mounted in one of said housings and operatively associated with said central processor unit and said random access memory for controlling access to said random access memory;

a direct access storage device mounted in one of said housings for exchanging information with said central processor unit and said random access memory and operatively associated with said direct memory access controller;

a power supply mounted in one of said housings for supplying energy for the operation of said display, said central processing unit, said random access memory, said direct memory access controller, and said direct access storage device; and

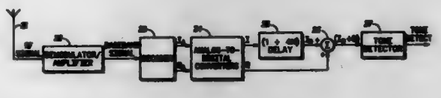
a keyboard assembly operatively associated with said housings and said central processing unit and comprising first and second keyboard portions each bearing manually engageable elements for entering characters and commands, said portions being operatively coupled together for pivotal movement one relative to the other about a keyboard axis and operatively coupled with one of said housings for sliding movement relative thereto between a position superposed on said coupled housing and a position partially displaced from said coupled housing and partially overlying a lengthwise side edge thereof.

5,198,992

METHOD AND APPARATUS FOR IMPROVING WIDEBAND DETECTION OF A TONE

Shawn McCaslin, 61 Simpson, Cedar Creek, Tex. 78612

Filed Apr. 6, 1992, Ser. No. 864,299
Int. Cl.[5] G06F 15/31
U.S. Cl. 364—724.09 10 Claims



4. An apparatus for wideband detection of a tone, comprising:

a first analog-to-digital converter having an input for receiving an analog in-phase signal, and an output for providing a digital in-phase signal;

a second analog-to-digital converter having an input for receiving an analog quadrature signal, and an output for providing a digital quadrature signal;

a delay element having an input coupled to said output of said first analog-to-digital converter, and an output for providing a delayed in-phase signal, said delay element delaying said in-phase signal by one plus an integer number times four sample periods to provide said delayed in-phase signal;

a summing device having a first input coupled to said output of said delay element, a second input coupled to said output of said second analog-to-digital converter, and an output; and

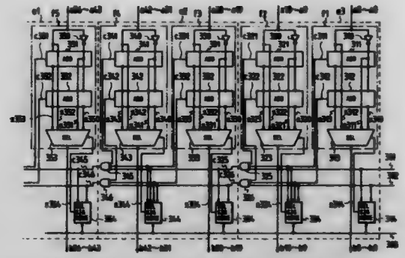
a tone detector having an input coupled to said output of said summing device, and an output for providing a tone detect signal.

5,198,993

ARITHMETIC DEVICE HAVING A PLURALITY OF PARTITIONED ADDERS

Yasuhiro Makakura, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 28, 1990, Ser. No. 619,635
Claims priority, application Japan, Dec. 4, 1989, 1-314758
Int. Cl.[5] G06F 7/50, 7/38
U.S. Cl. 364—788 5 Claims



1. An arithmetic device for executing an arithmetic operation on input data separated into a plurality of partitioned input data, the device comprising:

a plurality of partitioned adders receiving a plurality of partitioned input data respectively and each including a first adder element adding "1" to partitioned input data, an inverter inverting the partitioned input data, a second adder element adding "1" to output data from the inverter, and a data selector selecting one of the partitioned data, the output from the inverter, output data from the first adder element, and output data from the second adder element in response to a selection signal;

an n-th group defined by a (2n−1)-th partitioned adder and a 2n-th partitioned adder, where "n" denotes natural numbers between 1 and a given number equal to a total number of group;

the n-th group including the (2n−1)-th partitioned adder, the 2n-th partitioned adder, a positive group carry generating circuit, a negative group carry generating circuit, a first selection signal generating circuit, and a second selection signal generating circuit, wherein the positive group carry generating circuit generates a positive group carry output of the n-th group on the basis of a carry output from a first adder element in the (2n−1)-th partitioned adder, a carry output from a first adder element in the 2n-th partitioned adder, and a positive carry output from an (n−1)-th group, wherein the negative group carry generating circuit generates a negative group carry output of the n-th group on the basis of a carry output from a second adder element in the (2n−1)-th partitioned adder, a carry output from a second adder element in the 2n-th partitioned adder, and a negative carry output from the (n−1)-th group, wherein the first selection signal generating circuit generates a selection signal to a data selector in the (2n−1)-th partitioned adder on the basis of the positive carry output from the (n−1)-th group, the negative carry output from the (n−1)-th group, and a sign signal, and wherein the second selection signal generating circuit generates a selection signal to a data selector in the 2n-th partitioned adder on the basis of the positive carry output from the (n−1)-th group, the negative carry output from the (n−1)-th group, the sign signal, the carry output from the first adder element in the (2n−1)-th partitioned adder, and the carry output from the second adder element in the (2n−1)-th partitioned adder;

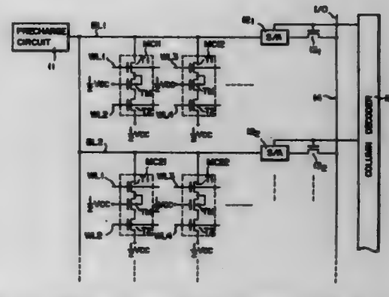
wherein bit lengths of the first and second adder elements in the (2n−1)-th partitioned adder and the 2n-th partitioned adder are chosen so that propagation gate stage numbers of positive and negative group carry outputs of the (n−1)-th group which are inputted into the positive and negative group carry generating circuits of the n-th group will be equal to propagation gate stage numbers of the carry outputs from the first and second adder elements in the (2n−1)-th partitioned adder and the 2n-th partitioned adder, and wherein partitioned sums outputted from data selectors in the respective groups compose a sum result output.

5,198,994

FERROELECTRIC MEMORY DEVICE

Kenji Natori, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 399,935, Aug. 29, 1989, abandoned.
This application Nov. 8, 1991, Ser. No. 789,538
Claims priority, application Japan, Aug. 31, 1988, 63-214910
Int. Cl.[5] G11C 11/22; H01L 29/34
U.S. Cl. 365—145 23 Claims



1. A nonvolatile semiconductor memory, having a reference-potential source, a first word line, a second word line, and a bit line, comprising an array of memory cells arranged in rows and columns, each memory cell comprising:

a first field-effect transistor including a ferroelectric insulation film, a gate coupled to the reference-potential source, a source, and a drain;

a second field-effect transistor including a gate coupled to the first word line, and a source-drain path having one end coupled to the source of the first field-effect transistor and another end; and

a third field-effect transistor including a gate coupled to the second word line, and a source-drain path having one end coupled to the drain of the first field effect transistor and another end,

wherein one of the other ends of the second and third field-effect transistors is coupled to the bit line and the other of the other ends of the second and third field-effect transistors is coupled to the reference-potential source.

5,198,995

TRENCH-CAPACITOR-ONE-TRANSISTOR STORAGE CELL AND ARRAY FOR DYNAMIC RANDOM ACCESS MEMORIES

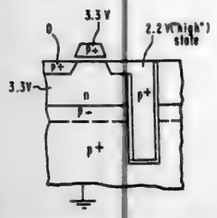
Robert H. Dennard, Peekskill, and Nicky C. Lu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1990, Ser. No. 605,892
Int. Cl.[5] G11C 11/34; H01L 29/78
U.S. Cl. 365—149 8 Claims

1. A dynamic random access memory cell array comprising:

a p-type doped substrate, the upper portion of said substrate being lightly doped and the lower portion being heavily

doped, said upper lightly doped portion being less conductive than said heavily doped lower portion,
a n-type doped well region disposed in said upper portion of said substrate,
means for applying a bias voltage to said well region,
means connected to said n-type doped well region for providing a positive voltage level of VDD above ground potential,
at least one storage means extending from the surface of said well region, through said well region and said upper substrate portion and into said highly conductive lower substrate portion, said storage means being electrically isolated from said well region and said upper and lower substrate portions,
at least one p-type MOS access transistor device having a gate electrode and further including a source region and a drain region disposed in said well region, said source and



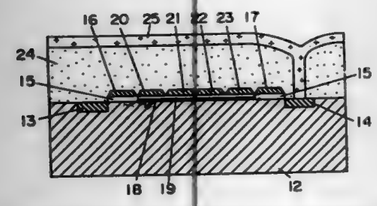
drain regions being heavily doped with first conductivity type impurities,
said access transistor having a threshold voltage of substantially zero or a value greater than zero,
at least one wordline, said wordline connected to said gate electrode of said access transistor, at least one bitline, said bitline connected to one of said access transistor source and drain regions disposed in said well region,
said wordline connected to said gate electrode of said access transistor having an unselected voltage value thereon of VDD which decreases to a low voltage value when said wordline is selected, and
said bitline having an initial signal level value thereon which is less than VDD and greater than said low voltage wordline value, wherein said initial signal level value on said bitline changes to a different level value in response to said wordline being selected, said different level of said bitline being lower in value than VDD.

5,198,996

SEMICONDUCTOR NON-VOLATILE MEMORY DEVICE

Makoto Kojima, Suita, and Takashi Takata, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Division of Ser. No. 353,331, May 16, 1989. This application Apr. 10, 1992, Ser. No. 866,877
Claims priority, application Japan, May 16, 1988, 63-118540
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—182 **7 Claims**



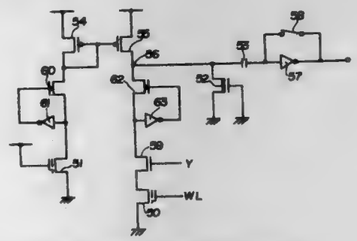
1. A semiconductor non-volatile memory comprising:
plural memory cell blocks arranged in matrix, in which each memory cell block is composed of:
source region and drain region of reverse conductive type formed on a semiconductor substrate of one conductive type,
plural data storage parts connected in series on said semiconductor substrate surface between said source region and drain region,
a separation gate formed between said source region and the data storage part at one end, and
a selection gate formed between said drain region and the data storage part at the other end,
bit lines commonly connected to each drain region of said plural memory cell blocks arranged in row direction,
control lines commonly connected to the gate electrodes of each separation gate, data storage part and selection gate of said plural memory cell blocks arranged in column direction, and
means for controlling the data read, erase, write or write disable in a specified data storage part of said plural memory cell blocks, by applying a specific voltage to said bit lines and control lines.

5,198,997

ULTRAVIOLET ERASABLE NONVOLATILE MEMORY WITH CURRENT MIRROR CIRCUIT TYPE SENSE AMPLIFIER

Hideki Arakawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 565,136, Aug. 10, 1990, abandoned. This application Jan. 8, 1992, Ser. No. 818,113
Claims priority, application Japan, Aug. 11, 1989, 1-208703
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **3 Claims**



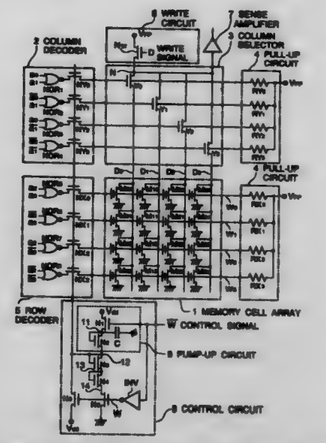
1. A nonvolatile memory device comprising:
a plurality of memory cells of a first conductivity type for storing data,
a reference cell having the same structure and the same first conductivity type as said memory cells,
a sense amplifier comprising a first MIS transistor of a second conductivity type, a second MIS transistor having the same structure and the same second conductivity type as said first MIS transistor, wherein said gate and drain electrodes of said first MIS transistor are connected to a first node and said gate electrode of said second MIS transistor is connected to said first node and said drain electrode of said second MIS transistor is connected to a second node, and said reference cell is connected between said first node and a ground node, and said memory cell is connected between said second node and ground note; and
a constant current source connected between said second node and ground node,
wherein the current drivability of said current source has an intermediate value between a value of the current drivability in an erased state and a value of the current drivability in a programmed state.

5,198,998

ERASABLE PROGRAMMABLE READ ONLY MEMORY

Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 729,557
Claims priority, application Japan, Jul. 13, 1990, 2-186042
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—185 **8 Claims**



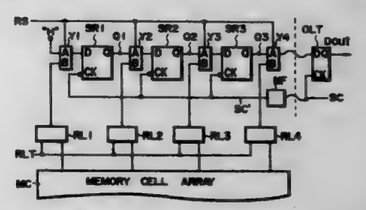
1. A read only semiconductor memory comprising:
a memory cell array including a number of floating-gate type erasable programmable memory cells arranged in the form of a matrix having a plurality of rows and a plurality of columns;
a plurality of column lines each connected to the memory cells in a corresponding column of the matrix of the memory cell array;
a plurality of row lines each connected to the memory cells in a corresponding row of the matrix of the memory cell array;
a column decoder having an input for receiving an address signal and a plurality of outputs each outputted through a transfer gate;
a column selector having a plurality of column selection gates, each of which is on-off controlled by a corresponding one of the outputs of the column decoder through a corresponding one of the transfer gates of the column decoder;
a first pull-up circuit for applying a high voltage to the outputs of the column decoder;
a row decoder having an input for receiving an address signal and a plurality of outputs each outputted through a transfer gate to a corresponding one of the row lines;
a second pull-up circuit for applying a high voltage to the outputs of the row decoder;
a write circuit for applying, when data is written to a selected memory cell in the memory cell array, a high voltage to a column line connected to the selected memory cell;
a sense amplifier connected to the column lines for reading data from a selected memory cell in the memory cell array;
each of the transfer gates of the column decoder and the transfer gates of the row decoder being formed of a non-depletion field effect transistor; and
a control circuit including a pump-up circuit and receiving a control signal for supplying a gate voltage signal to gates of all the non-depletion field effect transistors.

5,198,999

SERIAL INPUT/OUTPUT SEMICONDUCTOR MEMORY INCLUDING AN OUTPUT DATA LATCH CIRCUIT

Katsumi Abe, Yokohama; Kaoru Nakagawa, Kawasaki, and Hiroyuki Koinuma, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 405,884, Sep. 11, 1989, abandoned. This application Sep. 4, 1991, Ser. No. 754,170
Claims priority, application Japan, Sep. 12, 1988, 63-228060
Int. Cl.[5] G11C *19/00, 11/407, 11/413*
U.S. Cl. 365—189.05 **6 Claims**



1. A semiconductor memory having a clock input, comprising:
n selectors, each respectively having a plurality of data input terminals and a data output terminal, and outputting from its data output terminal, data input from one of said plurality of data input terminals in accordance with a state of a selection control signal;
(n−1) one-bit shift registers, each having a clock signal input terminal, one data signal input terminal, and an output terminal, said one-bit shift registers being alternately arranged with said n selectors such that a given one of said (n−1) one-bit shift registers receives, at its data signal input terminal, an output from a data output terminal of a selector connected to said data signal input terminal of said given one-bit shift register and supplies an output to a data input terminal (A) of a selector connected to an output terminal of said given one-bit shift register, and said (n−1) one-bit shift registers each being arranged to hold and output data received at its data signal input terminal in an immediately preceding clock input cycle and receive data input at its data signal input terminal when the clock input is set at a first state and to output data received in a second state of the clock input and invalidate data input to its data signal input terminal; and
an output data latch circuit, having a clock signal input terminal, and a data input terminal receiving an output selected by a last selector of said n selectors, for outputting data supplied to its data input terminal when the clock input is set in the first state, and holding the output data and invalidating data input to its data input terminal when the clock input is set in the second state, wherein a noise filter is inserted in a clock input supply path to said n one-bit shift registers, and said noise filter is not inserted in a clock input supply path to said output data latch circuit.

5,199,000

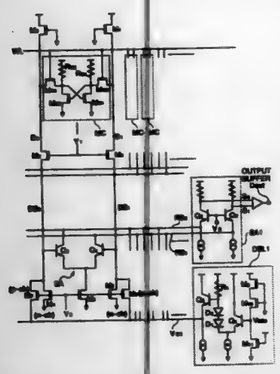
SEMICONDUCTOR MEMORY CIRCUIT HAVING SWITCHED VOLTAGE SUPPLY FOR DATA BUS LINES

Hiroyuki Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,836
Claims priority, application Japan, Mar. 27, 1990, 2-78112
Int. Cl.[5] G11C *11/413*
U.S. Cl. 365—189.09 **6 Claims**

1. A semiconductor memory circuit comprising a plurality of memory cells each connected to a corresponding word line and a corresponding pair of digit lines, said pair of digit lines being connected through a switch circuit to a corresponding pair of data bus lines, which are in turn connected to a sense amplifier, the semiconductor memory circuit also including a

voltage supply circuit composed of circuit elements having the same characteristics as that of circuit elements included in a circuit for determining a potential on said pair of data bus lines when said pair of digit lines and said pair of data bus lines are selected, said voltage supply circuit operating to generate, on the basis of the potential on said pair of data bus lines when said



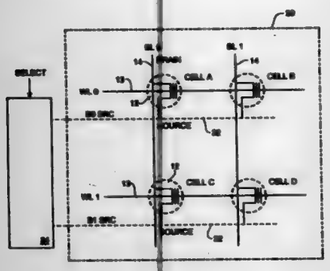
pair of digit lines and said pair of data bus lines are selected, a voltage to be applied to said pair of data bus lines when said pair of digit lines and said pair of data bus lines are not selected, the voltage generated by said voltage supply circuit being supplied to said pair of digit lines or said pair of data bus lines through another switch circuit which is turned on when said pair of digit lines and said pair of data bus lines are not selected.

5,199,001

ARCHITECTURE FOR ERASING VERY SMALL AREAS OF FLASH EPROMS

Jyh-Cherng J. Tzeng, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 29, 1990, Ser. No. 604,947
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—218 15 Claims



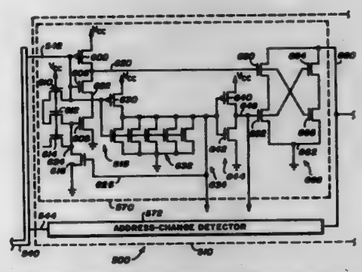
1. An erasable electrically programmable memory array for minimizing the amount of memory needed to be reprogrammed following erasure, said memory array comprising:
a plurality of transistors for storing digital information, said transistors aligned in rows and columns, each of said transistors having a gate terminal, a source terminal, and a drain terminal;
a plurality of bit lines each connected to the drain terminals of the transistors in each column of the memory array;
a first word line connected to the gate terminals of the transistors in a first row;
a first source conductor electrically connected to the source terminals of the transistors in the first row;
a second word line connected to the gate terminals of the transistors in a second row adjacent to the first row; and
a second source conductor electrically connected to the source terminals of the transistors in the second row, said second source conductor electrically insulated from the first conductor so that the second row may be electrically erased separately from the first row.

5,199,002

SRAM-ADDRESS-CHANGE-DETECTION CIRCUIT

Michael A. G. Ang, Santa Clara; Kevin W. Glass, Sunnyvale, and David J. Pilling, Los Altos Hills, all of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Oct. 1, 1990, Ser. No. 591,439
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—233.5 9 Claims



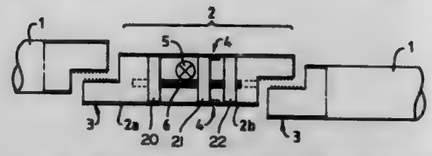
1. An address-change detector (570) having an input and an output, the address-change detector (570) comprising in combination:
a waveform generator (618) including,
a first transistor (600) having a gate connected (542) to the address-change detector (570) input and a channel including a first end connected to receive a power-supply potential and a second end,
a second transistor (606) having a gate connected to said first transistor (600) gate and a channel including a first end connected to said first transistor (600) channel second end and a second end,
a third transistor (608) having a gate and a channel including a first end connected to said second transistor (606) channel second end and a second end connected to receive a circuit-ground potential,
resistor means (610 and 612) including a first end connected to said second transistor (606) gate and a second end connected to said third transistor (608) gate, and
a fourth transistor (616) having a gate and a channel including a first end connected to said third transistor (608) gate and a second end connected to receive the circuit-ground potential;
first inverter means (634) having an input connected to said second transistor (606) gate and an output connected to said fourth transistor (616) gate;
second inverter means (644) having an input connected to said first inverter means (634) input and an output; and
gate means (658) having a pair of inputs including a first input connected to said first transistor (600) channel second end and a second input connected to said second inverter means (644) output and having an output connected (660) to the address-change detector (570) output.

5,199,003

METHOD AND APPARATUS FOR RELEASE OF A SEISMIC ARRAY, ESPECIALLY STREAMERS IN THE EVENT OF OVERLOADING

Einar Gjestrum, Baerums Verk, Norway, assignor to Geco A.S., Stavanger, Norway

Filed Nov. 29, 1991, Ser. No. 798,724
Claims priority, application Norway, Nov. 29, 1990, 905187
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—20 18 Claims



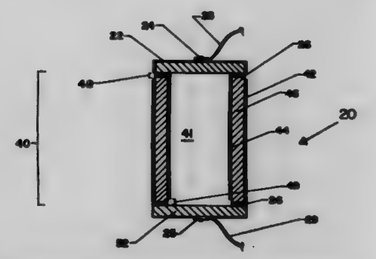
1. An apparatus for severing a cable towed behind a towing vessel in seismic surveys at sea comprising:
a plurality of cable lengths forming said cable;
connecting elements on ends of said cable lengths;
at least one severable cable connector comprising two severable sections normally held together at a severable joint thereon and having opposite connector ends for connecting with said connecting elements on two adjacent cable lengths;
a release mechanism on said at least one severable connector for normally holding said severable sections thereof together at said severable joint; and
loading sensor means on said at least one severable connector for sensing a load on said cable and operatively connected to said release mechanism for operating said release mechanism for severing said two sections of said at least one connector at said severable joint when an overload condition is sensed by said loading sensor, so that said adjacent cable lengths are separated only at said severable joint of said at least one connector due to said overload.

5,199,004

SEALED ACOUSTICAL ELEMENT USING CONDUCTIVE EPOXY

Patrick J. Monahan, Gales Ferry, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1992, Ser. No. 892,056
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—157 11 Claims



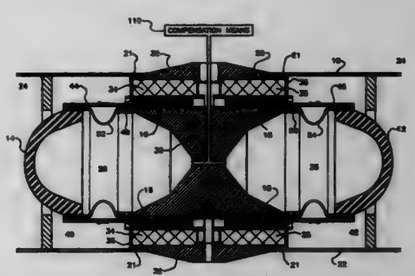
1. A sealed piezoelectric transducer comprising:
an electrically conductive end cap;
a metallic-based conductive epoxy, said conductive epoxy bonding to said end cap and being electrically connecting to said end cap;
a piezoelectric body having an enclosure, said piezoelectric body being connected at one end to said end cap and being electrically connected to said conductive epoxy, said piezoelectric body further including an inner means for conducting electric current, said inner means being electrically connected to said conductive epoxy, a piezoelectric material, aid material surrounding said inner means for conducting, an outer means for conducting electric current, said outer means surrounding said piezoelectric material and being insulated electrically for said end cap by an electrode gap located between said outer means for conducting and said end cap; and
a means for sealing the enclosure of said piezoelectric body, said means for sealing being connected at the other end of said piezoelectric body.

5,199,005

ELECTROMAGNETIC DRIVE ASSEMBLY FOR UNDER WATER SONAR TRANSDUCER

Gerard K. Forsberg, Lauderdale Lakes, Fla., assignor to Argotec, Inc., Ft. Lauderdale, Fla.

Filed Aug. 14, 1992, Ser. No. 929,233
Int. Cl.[5] H04R *9/00*
U.S. Cl. 367—175 5 Claims



1. In a sonar projector for underwater operation including:
piston means mounted for oscillatory movements to generate sound energy and arranged to have a side in communications with open sea water on the exterior of said projector when said projector is submerged therein;
electromagnetic means including inner and outer cylindrical pole pieces arranged concentrically relative to each other to define an annular gap therebetween, permanent magnet means disposed between said cylindrical pole pieces, and movable coil means arranged within said annular gap activated through said permanent magnet means and connected to drive said piston means;
compliant means comprising gas means on another side of said piston means opposite said side; and
compensation means for maintaining a pressure of said gas means equal to ambient hydrostatic pressure;
the improvement comprising:
that said permanent magnet means are formed in two coaxial members which are longitudinally juxtaposed, with each of said members comprising a plurality of permanent magnets radially poled in the same direction;
that the permanent magnets of one of coaxial members are radially poled oppositely to the permanent magnets of the other of said coaxial members; and
that said movable coil means are located within said annular gap radially adjacent said coaxial members.

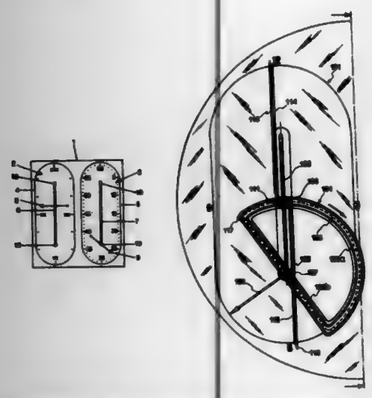
VOL 1148 ISS 5 MR 30 1993 UMI

5,199,006

SYSTEM FOR THE MOVEMENT OF THE HANDS OF A CLOCK OR WATCH

Carlo Ferrara, 40 Via G. di Collorado, I-00152 Roma RM, Italy

Filed Mar. 25, 1992, Ser. No. 857,158
Claims priority, application Italy, Mar. 27, 1991, 000201 A/91
Int. Cl.[5] G04B *19/00*; G04C *21/00*
U.S. Cl. 368—76 **8 Claims**



1. An analog type clock or watch having a scale of indicia showing time, said clock or watch comprising:

at least one hand;

a closed, non-circular path having a first and a second straight section, parallel to each other and joined respectively at their ends by corresponding semicircular portions;

said at least one hand slidably engaged in a slot centered on said closed, non-circular path;

means for moving said at least one hand in said slot and turning said at least one hand when it reaches an end of said slot;

wherein a free end of said hand follows said closed non-circular path, pointing in succession to marks indicating the time arranged on a dial of said clock or watch when said at least one hand is moved in said slot by said means for moving;

wherein said means for moving comprises a continuous, flexible transmission element positioned between a driver roller and a driven roller; a rod, fixed to the outer surface of said flexible element perpendicularly to its upper and lower edges, said rod having on an upper part a first section bent at a right angle, the length of said first section being equal to the radius of said rollers, and a second section extending perpendicularly from a free end of said first section, said second section being parallel to the axis of said rollers, and slidably engaged in said slot, and said at least one hand being fixed to a free end of said second section.

5,199,007

COMPACT WATCH DOG TIMER CIRCUIT

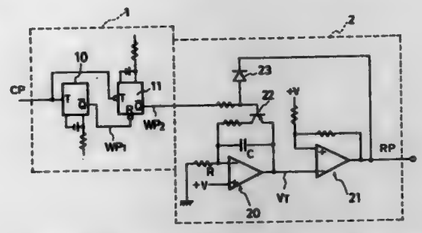
Masami Okano, Saitama, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Feb. 1, 1991, Ser. No. 648,910
Claims priority, application Japan, Feb. 8, 1990, 2-28905
Int. Cl.[5] G04F *8/00*; G06F *11/30*
U.S. Cl. 368—108 **4 Claims**

1. A compact watch dog timer circuit comprising:

a pulse period determining circuit for generating a timer reset pulse if a period of an input pulse from an external machine falls within a tolerance range or beyond an upper limit of said tolerance range and no timer reset pulse if said period falls below a lower limit of said tolerance range; and

a timer for generating a signal for restoring said external



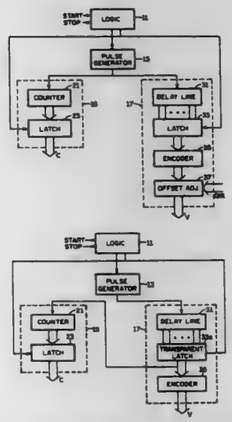
machine to a predetermined condition when no timer reset pulse is fed from said pulse period determining circuit within a timer period which is set corresponding to said tolerance range.

5,199,008

DEVICE FOR DIGITALLY MEASURING INTERVALS OF TIME

Walter L. Lockhart, and Benjamin M. Piepgrass, Jr., both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Mar. 14, 1990, Ser. No. 493,507
Int. Cl.[5] G04F *8/00*
U.S. Cl. 368—117 **12 Claims**



1. A device for measuring time by counting the number of occurrences of a pulse having a known period and any increment of said pulse between a random start signal and a random stop signal, comprising:

a logic unit for receiving a start signal and a stop signal, wherein said logic means generates a start control signal in response to said start signal to be communicated to a pulse generator and a stop control signal in response to said stop signal to be communicated to a counter latch and a delay latch;

a pulse generator for generating a periodic pulse signal, having a known period, said pulse generator being initialized by said start signal;

a digital counter for receiving said pulses, and for counting occurrences of said pulses;

a counter latch for receiving the output of said counter, and for capturing said output of said counter in response to said stop signal;

a tapped delay means for receiving said pulses, and for delaying each of said pulses, wherein the total delay of said delay means is no greater than the period of pulses from said pulse generator;

a delay latch for receiving the output of said delay means, wherein said latch has a number of bit positions that correspond to the number of taps of said delay means and wherein each bit position of said latch corresponds to said pulse such that an edge of said pulse tracks a lead bit;

a decoder means for converting an output pattern of said delay latch to a set of bits representing a portion of said pulse period; and

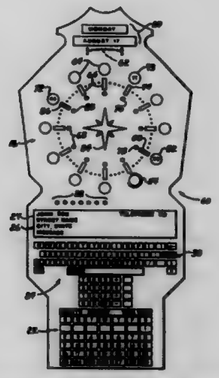
an offset adjustment means for adding a set of offset bits to the output of said decoder means, such that the output of said decoder means is zero at each new increment of said counter.

5,199,009

REMINDER CLOCK

Geno Svast, 2113 S. Gunderson Ave., Berwyn, Ill. 60402-2061

Filed Sep. 3, 1991, Ser. No. 753,877
Int. Cl.[5] G04C *19/02*; G04B *45/00*
U.S. Cl. 368—240 **11 Claims**



1. A reminder clock mounted to a wall or similar support structure for entering and storing reminder messages of events and appointments for subsequent recall, said reminder clock comprising:

clock means adapted for attachment to and suspension from a wall or similar support structure, said clock means including a plurality of first analog and first digital display means for displaying current time in hours and minutes, respectively, and a plurality of second analog and second digital display means for displaying the time in hours and minutes, respectively, of the time of recall of each of said reminder messages, wherein each analog display means represents an hour position on said clock means and each digital display means comprises a digital read-out disposed adjacent each of said analog display means, and wherein said first and second analog display means comprises a common set of first display elements disposed in a generally circular manner on said clock means, and wherein said first and second analog display means are color coded with said first analog display means having a first color and said second analog display means having a second color for respectively representing the current time in hours and the hour of recall of a reminder message, and wherein said first and second digital display means comprise a common set of second numeric display elements each disposed adjacent a respective one of said first display elements for respectively indicating the current time in minutes and the recall time of a reminder message in minutes, and wherein each of said first display elements is disposed at a respective hour indicating position on said clock means;

keyboard means disposed on said clock means for entering the reminder messages and the time for recall of each of said reminder messages;

controller means coupled to said clock means and to said keyboard means for processing said reminder messages and recall times associated therewith and for providing said recall times to said clock means;

memory means coupled to said controller means for storing said reminder messages for subsequent recall at said recall times by said controller means; and

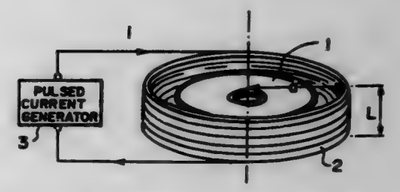
alphanumeric display means disposed on said clock means and coupled to said controller means for displaying said reminder messages read from said memory means by said controller means at a respective one of said recall times.

5,199,010

METHOD FOR INITIALIZING A MAGNETO-OPTICAL DISK USING A COIL AS A MEANS TO INITIALIZE THE DISK

Nobuyuki Adachi, and Naoshi Sugiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 8, 1989, Ser. No. 433,233
Claims priority, application Japan, Nov. 11, 1988, 63-284986
Int. Cl.[5] G11B *13/04, 11/12, 11/10*
U.S. Cl. 369—13 **5 Claims**



1. A method for initializing a magneto-optical disk, which comprises the steps of:

i) positioning at least one magneto-optical disk in a coil, wherein the coil length is shorter than the coil diameter, so that the direction of the thickness of said magneto-optical disk coincides with the axial direction of said coil, and

ii) applying a predetermined pulse current across said coil in order to generate a pulsed magnetic field having an instantaneous magnetic field.

5,199,011

APPARATUS FOR ATTENUATING OPTICAL CROSSTALK INDUCED COMPONENTS OF A FOCUS ERROR SIGNAL IN AN OPTICAL DISK DRIVE

James C. McDonald, Bellvue, and Gregory V. Hofer, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 466,165, Jan. 17, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,926
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—58 **3 Claims**

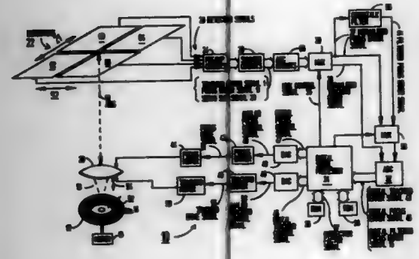
1. An optical disk drive having a focus servo system and a tracking servo system for controlling focus and tracking of said optical disk drive comprising:

detector means for generating detector signals in response to optical signals from an optical disk;

summing circuit means for generating a tracking error signal and a focus error signal from said detector signals;

crosstalk filter means for filtering said focus error signal to produce a filtered calibration focus error signal during a

calibration phase of said optical disk drive, said crosstalk filter means having a lower cutoff frequency greater than the inverse of the response time of said focus servo system;
means for generating a correction factor signal from said



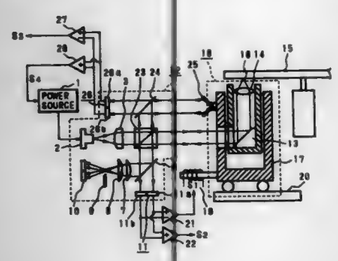
filtered calibration focus error signal as a function of said tracking error signal;
means for modifying said focus error signal by said correction factor signal to attenuate crosstalk induced components in said focus error signal.

5,199,012

APPARATUS FOR DETECTING POSITIONAL DEVIATION OF A MOVING STAGE IN A TWO-STAGE OPTICAL RECORDING/PRODUCING APPARATUS

Hitoshi Imai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 24, 1991, Ser. No. 690,682
Claims priority, application Japan, May 9, 1990, 2-120779
Int. Cl.[5] G11B 7/13
U.S. Cl. 369—44.41 24 Claims



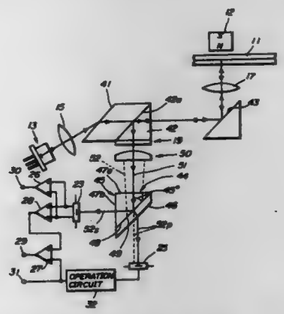
1. An apparatus for recording and reproducing data on an optical recording medium, the apparatus having a fixed stage and a moving stage capable of moving in a tracking direction parallel with the recording medium, said apparatus comprising:
a light source attached to said fixed stage for providing a beam of light;
means attached to the fixed stage for dividing the light from the light source into first and second beams;
an objective lens mounted on said moving stage;
said means for dividing light directing said first beam towards the objective lens, said objective lens condensing said first beam onto the recording medium which reflects said condensed beam;
first photodetecting means attached to said fixed stage and positioned for detecting the light reflected from said recording medium through said objective lens;
means for determining an amount of track divergence on the basis of the amount of light detected by the first photodetecting means;
a reflector attached to said moving stage;
said means for dividing light directing said second beam at said reflector in a direction substantially parallel to the tracking direction, said reflector reflecting at least a portion of the second beam;
second photodetecting means attached to said fixed stage and positioned for detecting light reflected by said reflector; and
means for determining an amount of deviation of said moving stage in a direction which is substantially orthogonal to the tracking direction on the basis of the amount of light detected by said second photodetecting means.

5,199,013

OPTICAL HEAD APPARATUS APPLICABLE TO OPTICAL DISC APPARATUS

Kenji Shimozawa, Sagamihara, Japan, assignor to TEAC Corporation, Japan

Continuation of Ser. No. 464,904, Jan. 16, 1990, abandoned. This application Feb. 25, 1992, Ser. No. 841,886
Claims priority, application Japan, Jan. 18, 1989, 1-3941[U]
Int. Cl.[5] G11B 7/12
U.S. Cl. 369—44.12 6 Claims



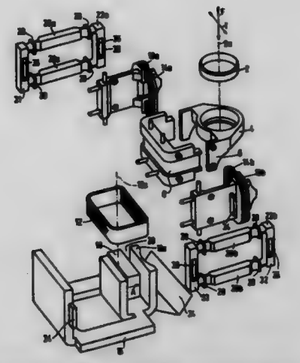
1. An optical head apparatus applicable to an optical disc apparatus having an optical disc on which information has been recorded, comprising:
a light source emitting a light beam; and
an optical system transmitting the light beam emitted from said light source onto a surface of the optical disc and transmitting a light beam reflected on the surface of the optical disc to a first optical detector to reproduce information recorded on the optical disc and to a second optical detector to detect focus error on a basis of astigmatic difference of an irradiated light beam, said optical system including a beam splitter splitting the light beam reflected by the surface of the optical disc into a first light beam traveling toward the first optical detector and a second light beam traveling toward the second optical detector, and a transparent member fixed to said beam splitter, through which said second light beam passes and causing astigmatic difference in said second light beam, so that said second light beam having the astigmatic difference is irradiated to said second optical detector.

5,199,014

TWO AXIS ELECTRO-OPTICAL SCANNING DEVICE HAVING ORTHOGONAL COILS SHARING ONE AIR GAP

Fredericus G. A. Homburg, and Bernardus J. Stinesen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1991, Ser. No. 662,044
Claims priority, application Netherlands, Jun. 29, 1990, 9001492
Int. Cl.[5] G11B 7/09
U.S. Cl. 369—44.15 18 Claims



1. An electro-optical scanning device comprising:
a movable lens having an optical axis, said lens being movable in a focussing direction to form at least one radiation spot on a surface to be scanned, and movable in a tracking direction oriented transversely of the focussing direction to follow a recording track in said surface,
a stationary section including a magnetic circuit and an air gap extending in a plane defined by said focussing direction and said tracking direction, and a movable section movable with respect to said stationary section, said movable section carrying said lens and comprising at least one focussing coil and at least one tracking coil for driving said lens, each of said coils extending into said air gap, characterized in that
the focussing coil has a coil axis extending parallel to said optical axis,
the air gap is situated between the optical axis and said coil axis,
the device includes a compliant mechanical suspension securing the movable section to the stationary section, and
said movable section extends in a direction oriented transversely of said plane defined by the focussing direction and the tracking direction, and has a mass center situated in or near the air gap.

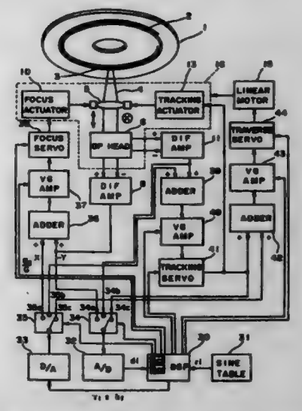
5,199,015

OPTICAL RECORDING/REPRODUCING DEVICE HAVING MEANS FOR ADJUSTING SERVO LOOP GAIN AND PHASE CHARACTERISTICS

Yasuaki Edahiro, Hirakata, and Katsuya Watanabe, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 18, 1991, Ser. No. 716,982
Claims priority, application Japan, Jun. 18, 1990, 2-159034
Int. Cl.[5] G11B 7/09
U.S. Cl. 369—44.25 19 Claims

1. An optical recording and playback device for irradiating a light beam spot on a track of a data carrying medium at a target condition, comprising:
servo error signal detection means for detecting a deviation of the light beam spot from the target condition and for generating a corresponding servo error signal;
servo control means defining a servo loop with said servo error signal detecting means for moving the light spot to and holding the light spot at the target condition;
reference signal generator for generating and applying a reference signal having a predetermined frequency to said servo loop;
complex amplitude detection means for detecting a complex amplitude at said predetermined frequency of the servo



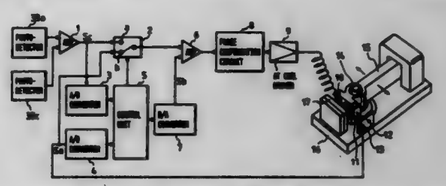
error signal generated by said servo error signal detection means when the reference signal is applied to the servo loop by said reference signal generator;
means for calculating a gain characteristics of the servo loop from the complex amplitude detected by the complex amplitude detection means and a complex amplitude at said predetermined frequency of the reference signal; and
an adjustment means for changing the gain characteristic of the servo loop when the gain characteristic calculated by said calculating means deviates from a desired gain characteristic.

5,199,016

METHOD AND APPARATUS FOR PROCESSING DATA

Satoshi Shikichi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,451
Claims priority, application Japan, Sep. 5, 1990, 2-233166
Int. Cl.[5] G11B 7/085
U.S. Cl. 369—44.28 12 Claims



1. A data processing apparatus for performing at least one of data recording on an optical recording medium and data reproduction from the optical recording medium, the optical recording medium having a plurality of data tracks and a plurality of tracking tracks, which are alternately formed to be parallel to each other, comprising:
beam radiation means for radiating a first light beam for performing at least one of the data recording onto one of the plurality of data tracks of the medium and data repro-

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duction from said one of the plurality of data tracks, and for radiating a second light beam onto one of the plurality of tracking tracks to detect a tracking error signal;

first moving means for moving the first and second light beams relative to the medium along a longitudinal direction of the data and tracking tracks;

second moving means for moving the first and second light beams relative to the medium in a direction perpendicular to the longitudinal direction of the data and tracking tracks;

means for detecting the tracking error signal from a beam obtained by reflection of the second light beam by the medium;

switching means for selectively supplying the tracking error signal to said second moving means;

means for supplying a moving signal to said second moving means to move the first and second light beams, respectively, to a data track different from said one data track and a tracking track different from said one tracking track; and

control means for monitoring the tracking error signal, for switching said switching means to supply the tracking error signal to said second moving means in a tracking mode for controlling said apparatus to trace a data track with the first light beam, and for switching said switching means not to supply the tracking error signal to said second moving means in a moving mode for moving the first light beam to a different data track, said control means being arranged to interrupt monitoring of the tracking error signal during a period for which the second light beam is passing on data tracks in the moving mode.

5,199,017

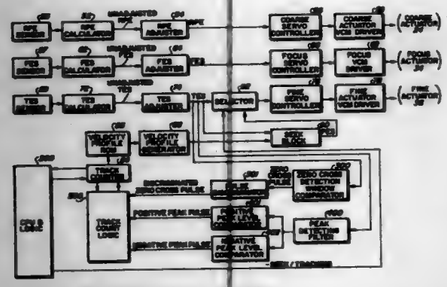
OPTICAL DISK DRIVE AND METHOD FOR COUNTING THE NUMBER OF TRACKS ON AN OPTICAL DISK

Naoyuki Kagami, Fujisawa; Hiroaki Kubo, Atsugi, and Keiichi Okada, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 11, 1991, Ser. No. 757,775

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.280 **10 Claims**



1. An optical disk drive comprising:

an optical head for projecting a laser beam onto the recording surface of an optical disk;

seek control means for moving said beam from a current track to a target track over the tracks;

tracking error signal generating means for generating a tracking error signal (TES) which indicates the deviation of said beam from the center of a track in the radial direction of the disk; and

track number counting means for counting, based on said TES, the number of tracks over which said optical head has moved, said track number counting means including a positive peak level comparator for generating a positive peak pulse when said TES is higher than a predetermined positive level, a negative peak level comparator, for generating a negative peak pulse when said TES is lower than a predetermined negative level, and a logic circuit for generating an output pulse when said positive peak pulse and said negative peak pulse have been alternately inputted thereto.

5,199,018

SYSTEM FOR INSERTING A SYNCHRONIZING PATTERN IN DIGITAL AUDIO DATA ON AN OPTICAL DISK

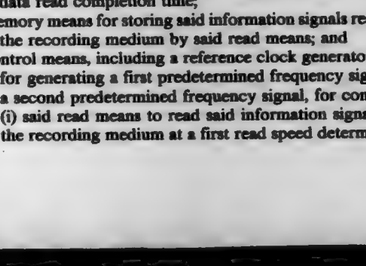
Dae Y. Kim, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Rep. of Korea

Filed Mar. 19, 1991, Ser. No. 671,492

Claims priority, application Rep. of Korea, Mar. 20, 1990, 3744/1990

Int. Cl.[5] H04N *5/76*; G11B *5/09*; H03K *17/00*

U.S. Cl. 369—59 **8 Claims**



1. A system for inserting a synchronizing pattern in digital audio data on an optical disk comprising:

an optical disk digital signal processor for signal-processing digital audio data on the optical disk read from a disk pickup to output a serial data, a beat clock, a sync signal, and a left and right clock;

a synchronizing pattern input control unit for generating the synchronizing pattern in accordance with a synchronizing pattern insert signal outputted from a microprocessor to control the serial data and the beat clock from said optical disk digital signal processor and indicate that inserting the synchronizing pattern has been completed; and

an optical disk ROM decoder for detecting 12 bytes of synchronizing pattern generated from said synchronizing pattern input control unit to decode the serial data and the beat clock.

5,199,019

DIGITAL SIGNAL INFORMATION REPRODUCTION APPARATUS ENABLING RECORDING MEDIUM SUBSITUTION DURING REPRODUCTION OF A PRIOR RECORDING MEDIUM

Asayuki Matsumura, and Masayoshi Nakamura, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 26, 1990, Ser. No. 543,543

Claims priority, application Japan, Jun. 30, 1989, 1-170201

Int. Cl.[5] H04N *5/76*; G11B *15/46*

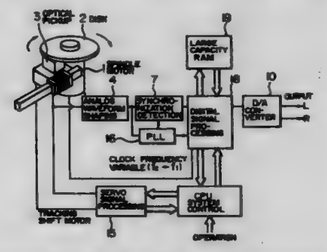
U.S. Cl. 369—60 **5 Claims**

1. An information reproduction apparatus, comprising:

read means for reading information signals from an information recording medium from a data read start time to a data read completion time;

memory means for storing said information signals read from the recording medium by said read means; and

control means, including a reference clock generator means for generating a first predetermined frequency signal and a second predetermined frequency signal, for controlling (i) said read means to read said information signals from the recording medium at a first read speed determined by said first predetermined frequency signal during a first predetermined time period from said data read start time to a data output start time at which information signals stored in said memory means are begun to be output therefrom, (ii) said memory means to store said information signals read at said first speed during said first predetermined time period, (iii) said read means to read said information signals from the recording medium at a second read speed which is lower than said first read speed and which is determined by said second predetermined frequency signal during a second predetermined time period from said data output start time to a data output



completion time at which output of information signals stored in said memory means is completed, and (iv) said memory means to store said information signals read at said second speed during said second predetermined time period, said data read completion time occurring before said data output completion time, said control means controlling output of said information signals stored in said memory means from said data output start time to said data output completion time, whereby information signals are still being output from said memory means after completion of reading of said information signals from the recording medium by said read means.

5,199,020

OPTICAL HEAD USING AN OPTICAL SCANNER

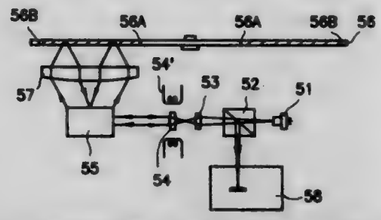
Young W. Kim; Seung T. Jung, both of Seoul, and Keun C. Kim, Kyonggi-Do, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyonggi-Do, Rep. of Korea

Filed Oct. 1, 1990, Ser. No. 591,092

Claims priority, application Rep. of Korea, Sep. 30, 1989, 89-14242

Int. Cl.[5] G11B *7/135*

U.S. Cl. 369—112 **5 Claims**



1. An optical head for reading information recorded in an annular region having a radially inner diameter and a radially outer diameter on a face of a disk which is arranged to rotate about the longitudinal axis of the annular region of the disk, said optical head comprising:

a laser beam generating means for providing a laser beam extending along a path;

a partial reflecting mirror interposed in said path for splitting said laser beam into a first portion continuing along said path and a diverted second portion;

a detecting member arranged to be illuminated by said diverted second portion of said laser beam;

a condensing lens interposed in said path for illumination by said first portion of said laser beam for condensing said first portion of said laser beam while passing through said condensing lens;

regulating lens means including a regulating lens interposed in said path for illumination by said first portion of said laser beam for correcting focusing error of said first portion of said laser beam on said annular region of said face of said disk; said regulating lens means further including focusing coil means for shifting said regulating means for correcting said focusing error;

an objective lens interposed in said path of said first portion of said laser beam, said objective lens being selected so as to permit said first portion of said laser beam, when shifted radially of said face of said disk to selectively illuminate all radial increments of said annular region;

an optical scanner interposed in said path of said first portion of said laser beam, between said objective lens and said regulating lens, for scanning said first portion of said laser beam selectively to cause said laser beam, when traveling through said objective lens towards said face of said disk, to illuminate a site at any radial increment of said annular region, and when reflected from said site, to travel back through said scanner, said regulating lens, and condensing lens, and to be diverted by said partial reflecting mirror so as to illuminate said defecting member; and

means operatively connecting said detecting member with said focusing coil means of said regulating lens means, for shifting said regulating lens in response to sensing of focusing error by said detecting member; said detecting member being arranged to provide an output signal which corresponds to reflections of said first portion of said laser beam from said site at a succession of moments in time;

said objective lens being fixedly set and having an aperture which collects substantially all laser beams scanned by said optical scanner;

said optical scanner having a scanning direction which is perpendicular to said longitudinal axis about which the disk is arranged to rotate;

said optical scanner having a scanning angle which is so large that scanned laser beams, after passing through said objective lens can irradiate the whole of said annular region of the disk; and

the optical detector being so arranged that the optical distance from the disk to said optical detector is substantially equal to the optical distance from the disk to said laser beam generating means.

5,199,021

METHOD OF ACCESS TO RECORDING MEDIUM, AND APPARATUS AND METHOD FOR PROCESSING INFORMATION

Katsunori Hatanaka, Yokohama; Osamu Takamatsu, Atsugi; Akihiko Yamano, Yokohama; Ryo Kuroda, Atsugi; Hiroyasu Nose, Zama, and Toshihiko Miyazaki, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1991, Ser. No. 685,643

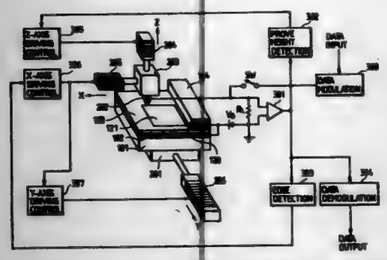
Claims priority, application Japan, Apr. 18, 1990, 2-104057

Int. Cl.[5] G11B *9/00*

U.S. Cl. 369—126 **24 Claims**

1. A method of access of a probe electrode to a recording medium having on the surface thereof an edge portion having a level difference larger than a recording recess-projection or having an electron state different from a recording electron

state: the method comprising steps of detecting the edge portion; causing the probe electrode to scan at a certain angle to



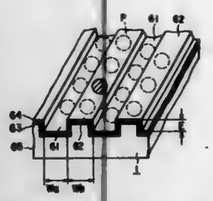
the edge portion; and moving the recording medium to a direction along the edge portion.

5,199,022

DISK HAVING DATA MEMORIZING PORTION INCLUDING LAND-SHAPED AND GROOVE-SHAPED AREAS, AND WRITING/READING APPARATUS FOR THE SAME

Katsumi Suzuki, Tokyo; Tsuneshi Yokota, Kawasaki, and Tomohisa Yoshimaru, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1991, Ser. No. 858,620
Claims priority, application Japan, Jun. 28, 1991, 3-183685
Int. Cl.[5] G11B *13/04*
U.S. Cl. 369—275.1 17 Claims



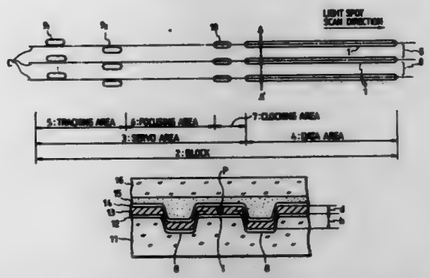
1. A magneto-optical data recording member comprising:
a transparent disk substrate; and
land-shaped areas and groove-shaped areas formed on the disk substrate in a spiral manner so as to be parallel with each other, and the groove-shaped areas formed to be stepped with respect to land-shaped area;
wherein each of the land-shaped and groove-shaped areas has, in a surface region thereof, a first magnetic, film for reading data and a second magnetic film for recording data, the first magnetic film having a predetermined Curie temperature and a predetermined magnetic coercive force, and the second magnetic film for recording data, formed on the first magnetic film, having a Curie temperature higher than the predetermined Curie temperature and a magnetic coercive force higher than the predetermined magnetic coercive force, and having a plurality of memory pits in series according to the information data to be recorded, thereby enabling to write data and to read data in each of the land-shaped and groove-shaped areas.

5,199,023

OPTICAL INFORMATION RECORDING MEDIUM WITH A SEPARATING PART BETWEEN INFORMATION TRACKS

Masakuni Yamamoto, Yamato, and Shigeto Kanda, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,863
Claims priority, application Japan, Dec. 27, 1988, 63-327946; Dec. 11, 1989, 1-318853
Int. Cl.[5] G11B *3/70, 5/85, 7/26*
U.S. Cl. 369—275.4 10 Claims



1. An optical information recording medium comprising:
a recording surface formed by a recording layer provided on a substrate, said recording surface comprising information tracks each divided into a plurality of blocks, each of which includes a data area for information recording and a servo area comprising prepits for tracking signal detection;
wherein said data area has a separating part the height of which is different from that of the information tracks and which is provided between information tracks adjacent to each other, and said servo area is not provided with said separating part; and
wherein the recording layer of the information tracks and the recording layer of the separating part are continuously formed, free from discontinuity, and the difference in height between the information tracks and the separating part is greater than or equal to the thickness of said recording layer.

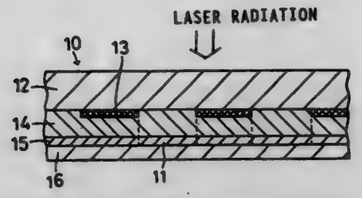
5,199,024

OPTICAL DATA STORAGE MEDIUM HAVING EMBEDDED TRACKING INFORMATION

Kazunari Taki, Nagoya; Hideo Maruyama, Kuwana; Riki Matsuda, Nagoya, and Yumiko Okushi, Hashima, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 3, 1990, Ser. No. 562,254
Claims priority, application Japan, Aug. 18, 1989, 1-213276
The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.
Int. Cl.[5] G11B *7/24*
U.S. Cl. 369—275.5 12 Claims

1. An optical data storage medium having at least one elongate recording track, comprising:
means for defining each of said at least one recording track; and
tracking guide means, disposed so as to at least partially define said each recording track, for providing tracking servo information to be optically read for alignment of a read/write beam with said each recording track, said tracking guide means being formed of a material which has a higher coefficient of light absorption than that of a



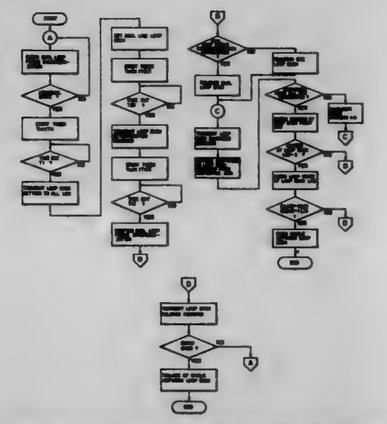
material of said means for defining each of said at least one elongate recording track.

5,199,025

LOOP BACK METHOD FOR LOOP TYPE LAN TRANSMISSION LINE

Makoto Miwa, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 16, 1991, Ser. No. 686,144
Claims priority, application Japan, Apr. 20, 1990, 2-105009; Apr. 20, 1990, 2-105010
Int. Cl.[5] H04J *1/16*
U.S. Cl. 370—16.1 8 Claims



8. A loop back method for a duplex loop-type LAN transmission system which comprises a plurality of local node units, at least one center node unit for supervising a loop back operation in said duplex loop-type LAN system and first and second transmission lines operating respectively as an active and a backup loop transmission line and having opposite signal transmission directions relative to each other, said plurality of local node units and said center node unit being interconnected serially through each of said first and second transmission lines, said method comprising:
(a) employing said center node unit to determine that a line failure exists in said first and second transmission lines by transmitting synchronous frame signals on said first and second transmission lines and by detecting, when said frame signals are returned to said center unit through said first and second transmission lines, an abnormality in synchronization of said frame signals, and if a said line failure is determined to exist, to send out through said first and second transmission lines a loop back setting command for instructing each of said local node units to form within itself a local unit loop back path between said first and second transmission lines;
(b) employing each of said local node units, upon their receipt of said loop back setting command through one of said first and second transmission lines, to form within itself a said local unit loop back path through which said loop back setting command received from one of said first and second transmission lines is returned to the other of said first and second transmission lines and to said center node unit, whereby said local unit loop back path of each of said local node units is connected across said first and second transmission lines and a next adjacent local node unit;
(c) employing each of said local node units to return, through its local unit loop back path, said loop back setting command to said center node unit during a predetermined time period;
(d) employing said center node unit to detect normal frame synchronization with respect to said loop back setting command which is returned thereto from each of said local node units during said predetermined time period;
(e) employing said center node unit to send out a loop back determination command through said first and second transmission lines for instructing each of said local node units to determine individually whether its local unit loop back path is to be maintained or released;
(f) employing each of said local node units, in response to their receipt of said loop back determination command from either said first transmission line and said second transmission line, to indicate to said center node unit whether the local node unit itself is receiving input signals on both said first transmission line and said second transmission line and whether frame synchronization exists on both said first transmission line and said second transmission line, and if so, to release its local unit loop back path and if not, to maintain its local unit loop back path, whereby a single loop is created which includes local loop back paths of two of said local node units that are adjacent to and on opposite sides of said line failure;
(g) employing said center node unit to send out a loop back diagnosis command over one of said first and second transmission lines for instructing each of said local node units to check frame synchronization of any signals being input thereto on both of said first and second transmission lines;
(h) employing each of said local node units, upon their receipt of said loop back diagnosis command, to send back to said center node unit said loop back diagnosis command having added thereto check result information indicating whether frame synchronization exists as to any signals input thereto on both of said first and second transmission lines; and
(i) employing said center node unit to determine, from said loop back diagnosis command having added thereto said check result information, a location of said line failure existing on said first and second transmission lines.

5,199,026

TOKEN RING WIRING CONCENTRATOR

Stephen R. Lund, Wake County, assignor to Memorex Telex N.V., Tulsa, Okla.

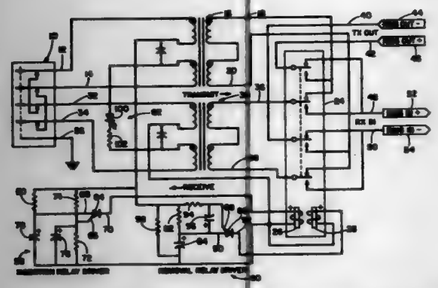
Filed Feb. 27, 1991, Ser. No. 662,723
Int. Cl.[5] H04Q *11/00*
U.S. Cl. 370—56 6 Claims

1. In a token ring network wiring concentrator providing a DC control signal to control insertion and removal of a work station, an improved concentrator lobe comprising:
a latching relay having a closed position in which communication is provided between a token ring network and a workstation and an open position in which such communication is severed;
an insertion relay driver circuit responsive to a token ring DC control signal providing a closing voltage signal to said latching relay when the DC control signal reaches a

preselected minimum level for a preselected minimum time;

a removal relay driver circuit responsive to a token ring DC control signal providing a removal voltage signal to said latching relay when the DC control falls below a preselected level for a preselected time; and

insertion indicator means responsive to a token ring DC control signal for providing indication of insertion of a



workstation in a token ring and simultaneously providing terminating resistance for the token ring DC control signal, and wherein said latching relay has a closing solenoid and an opening solenoid and wherein said closing voltage signal provided by said insertion relay driver circuit is in the form of a DC voltage pulse coupled to said closing solenoid, and wherein removal voltage signal provided by said removal relay driver circuit is in the form of a DC voltage pulse coupled to said opening solenoid.

5,199,027

COMMUNICATION SWITCHING SYSTEM

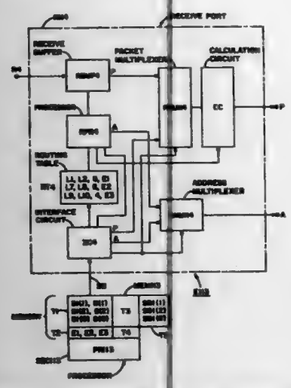
Peter I. A. Barri, Bonheiden, Belgium, assignor to Alcatel N.V., Amsterdam, Netherlands

PCT No. PCT/EP89/00281, § 371 Date Nov. 5, 1990, § 102(e) Date Nov. 5, 1990, PCT Pub. No. WO90/10984, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 14, 1989, Ser. No. 613,520

Int. Cl.[5] H04L *12/56*

U.S. Cl. 370—60 **17 Claims**



1. Communication switching system including a switching network (BSN) with at least one switching element (E113) having a plurality of input links (R4) and at least one output link (8), and processing means (PR113) for calculating the total bandwidth [B1(8)] used by virtual paths on said output link (8) from individual bandwidth values (LP) contained in path setup cells used for setting up said virtual paths, characterized in that said processing means (PR113) re-calculates said total bandwidth [SB(8)] at least from said individual bandwidth values contained in maintenance cells transmitted on said virtual paths and adjusts said calculated total bandwidth to correspond to said re-calculated total bandwidth.

5,199,028

ASYNCHRONOUS TIME DIVISION NETWORK

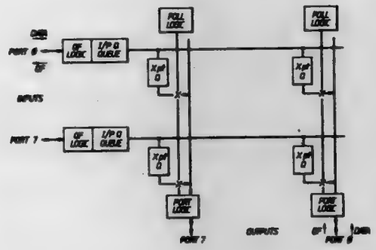
John S. Arnold, Northants, England, assignor to BEC Plessey Telecommunications Limited, Coventry, England

Filed Apr. 11, 1989, Ser. No. 336,158

Claims priority, application United Kingdom, Apr. 28, 1988, 8810094

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 **6 Claims**



1. An asynchronous time division network in which data is divided into fixed length packets which are transmitted by way of high rate bearers, the network comprising a switching matrix of switching nodes, the matrix having a plurality of input ports and a plurality of output ports, said plurality of output ports each being connected at one end of respective columns formed by the switching nodes and means is provided for routing each data packet from a respective one of the plurality of input ports to a defined one of the plurality of output ports by way of a plurality of the individually addressed switching nodes, each node being provided with queuing means and each queuing means in each column of the switching matrix being tested starting from a row after a last row transmitted from that column whereby priority is given to the first queuing means determined to hold more than one packet on testing.

5,199,029

CIRCUIT ARRANGEMENT FOR ESTABLISHING CONFERENCE CONNECTIONS

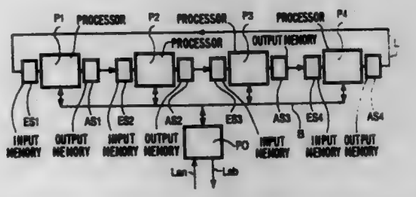
Peter Hessler, Erlangen; Manfred Schmidt, Salz, and Bernd Selbach, Eckental, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1990, Ser. No. 618,275

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939044

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—62 **6 Claims**



1. Circuit arrangement for establishing conference connections among a plurality of participant conference units linked to form a loop, comprising;

means responsive to sample values of signals of all the participant conference units in a conference for forming a sum codeword;

means for passing the sum codeword from one conference unit of the loop to the next;

updating means in each participant conference unit for updating the sum codeword by the use of the actual sample value and forming a conference signal from the sum codeword;

a programmed processor for taking over the function of one or more participant conference units;

interface circuit means coupled to the programmed processor for generating write and read commands by which the programmed processor is actuated for controlling the conference signal input and output;

means in each processor for writing each updated sum codeword into an input memory of the next processor;

means for transforming each updated sum codeword into a test word and overwriting the contents of the input memory of the next processor with the test word at a later instant, means in the next processor in the loop for reading the test word from this memory, comparing the sum codeword previously contained in this memory to the testword and produces an alarm signal depending upon the result of the comparison;

sequencing means for causing successive processors to perform the program items of updating the sum codeword and comparing the sum codeword to the test word in a time offset order.

5,199,030

DIGITAL SIGNAL TRANSMISSION DEVICE

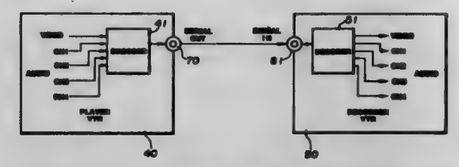
Mamoru Ueda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,568

Claims priority, application Japan, Sep. 11, 1990, 2-238932

Int. Cl.[5] H04J *3/02*

U.S. Cl. 370—68 **5 Claims**



1. Apparatus for changing channel identification data which normally accompany digital information signals transmitted serially between two devices via coaxial cable and which identify individual channels in which said digital information signals are respectively processed, said apparatus comprising: channel decoding means having an input coupled to receive said channel identification data and operable to decode said channel identification data for detecting the individual channel to which a digital information signal is to be supplied for processing; converting means coupled to the input of said channel decoding means for supplying channel identification data thereto; and conversion control means coupled to said converting means and selectively operable to control said conversion means to convert said channel identification data from the form thereof which accompanies a digital information signal and identifies a particular channel to a modified form that identifies a different channel to which said digital information signal is supplied for processing.

5,199,031

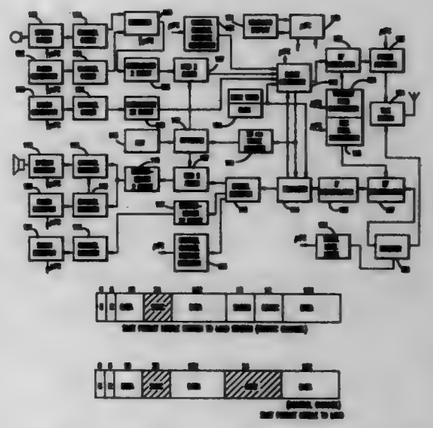
METHOD AND SYSTEM FOR UNIQUELY IDENTIFYING CONTROL CHANNEL TIME SLOTS

Jan E. Å S. Dahlin, Järfälla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 575,645, Aug. 31, 1990, abandoned. This application Feb. 28, 1991, Ser. No. 662,414

Int. Cl.[5] H04J *3/12*; **H04B** *7/212*; **H04Q** *7/00*

U.S. Cl. 370—110.1 **24 Claims**



1. A system for utilizing certain time slots of a radio channel frame as communication channels, each time slot capable of being used for transmitting message signals between a mobile station and a base station in a cellular telephone network, said system comprising:

message signal generating means for generating message signals to be transmitted in said time slots of said frame as a series of binary bits;

synchronization word generating means for generating time slot synchronization words which are associated with each of said time slots, each time slot including channel indication information for indicating whether a time slot is a first type of channel or a second type of channel;

frame producing means for producing a frame, which includes a plurality of said time slots, by allotting to each of said time slots a message signal and an associated synchronization word;

transmitting means for transmitting said frame;

receiving means for receiving said transmitted frame;

detecting means for detecting said channel indication information; and

determining means determining whether each of said time slots is to be utilized as a traffic channel or a control channel in response to detection of either said first type of channel or said second type of channel.

5,199,032

MICROCONTROLLER HAVING AN EPROM WITH A LOW VOLTAGE PROGRAM INHIBIT CIRCUIT

Robert W. Sparks, Tokyo, Japan; Gregory A. Racino, and Brian R. Gardner, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1990, Ser. No. 576,864

Int. Cl.[5] G06F *11/30*

U.S. Cl. 371—3 **10 Claims**

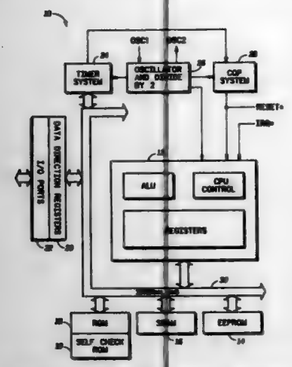
1. In a data processing system having a processor, an electrically alterable memory, and a communications bus for communicating therebetween, protection means included in said memory for inhibiting the alteration of said memory when a supply

voltage falls below a specified voltage level, said protection means comprising:

first means for providing a reference voltage;

second means coupled to said first means for comparing a second voltage generated from said supply voltage to said reference voltage, and for providing an output signal, said output signal having a first logic value when said second voltage is larger in magnitude than said reference voltage, and a second logic value when said second voltage is smaller in magnitude that said reference voltage;

third means coupled to said second means for supplying said second voltage to said second means, said third means operating to insure that when said supply voltage remains above the specified voltage level, said second voltage supplied to said second means is larger in magnitude than



said reference voltage, and when said supply voltage falls below the specified voltage level, said second voltage supplied to said second means is smaller in magnitude that said reference voltage; and

fourth means coupled to said second means for storing a plurality of control bits for controlling programming of said memory, said fourth means inhibiting the alteration of said memory when said output signal is said second logic value, without disabling said processor from accessing information stored in said memory during performance by said processor of other data processing operations, and enabling the programming of said memory when said output signal is said first logic value, said fourth means controlling programming of said memory by manipulating said control bits based upon the logic value of said output signal.

5,199,033

SOLID STATE MEMORY ARRAY USING ADDRESS BLOCK BIT SUBSTITUTION TO COMPENSATE FOR NON-FUNCTIONAL STORAGE CELLS

Bruce M. McGeoch, Cupertino, and Scott E. Richmond, San Jose, both of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed May 10, 1990, Ser. No. 521,575
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—10.1 **11 Claims**

1. A solid state memory array using address location substitution to compensate for non-functional storage cells of the array, comprising:

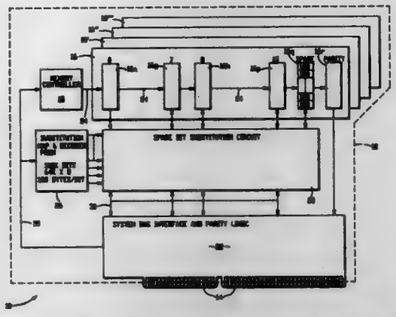
an address bus means for receiving memory location addresses from a source,

a bidirectional data bus means having L parallel data bit lines, wherein L has a value of at least 8, for transferring data values between the source and the memory array,

a plurality of partly defective VLSI memory array chips each containing at least one megabit of data storage capacity, each having defective memory cell locations, each being connected to the address bus means, and each providing m bit lines of data storage at each said memory location address, wherein m has a value between 1 and 4, each said memory array chip having a memory array chip bidirectional tri-state driver means connected between said m bit lines thereof and corresponding ones of said parallel data bit lines,

at least one VLSI substitution memory chip containing at least one megabyte of data storage capacity, being connected to the address bus means, and providing m bit lines of data storage at each said memory location address,

a substitution chip tri-state driver means connected between said m bit lines of said substitution memory chip and all of said parallel data bit lines,



programmable read only memory means connected to be addressed by said address bus means and programmed for putting out a binary coded value which has been coded to identify each said defective memory cell location of each said memory array chip,

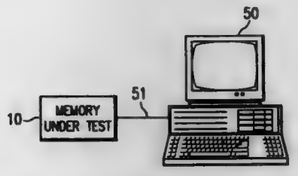
decoder means connected to receive and decode said binary coded value into tri-state driver control values and for applying said values to said substitution chip tri-state driver means and to one of said memory array chip bidirectional tri-state driver means so as to disable said memory array chip associated with said driver means when a said defective memory cell location thereof is addressed, and to enable said substitution memory chip at said location and connect it to the data bus means in place of said associated memory array chip.

5,199,034

APPARATUS AND METHOD FOR TESTING SEMICONDUCTORS FOR CELL TO BITLINE LEAKAGE

Ignatius Yeo, and Eileen W. L. Kam, both of Singapore, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1990, Ser. No. 636,817
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—21.2 **5 Claims**



1. A method for testing leakage between cells and bitlines in a memory, said memory having a plurality of columns arranged as bitlines and as bitline complements, each said column

connected to a cell in each row and wherein all of the cells of certain rows are connected to respective bitline columns and all of the cells of certain other rows are connected to respective complement bitline columns, said method comprising the steps of:

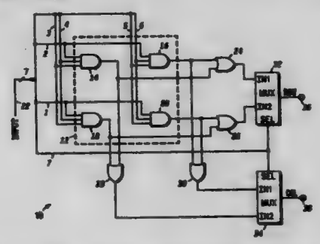
1) writing a background of data to all of said cells;
2) writing one of said bitline connected rows with the complement of said data;
3) reading said one bitline row for a period of time corresponding to the refresh time of said memory;
4) writing said one bitline row with said data;
5) reading the entire memory array to ascertain if any cell now contains any complementary data;
6) writing one of said complement bitline rows with said complement of said data;
7) reading said last-mentioned bitline row for a period of time corresponding to the refresh time of said memory;
8) writing said last-mentioned bitline row with said data;
9) reading the entire memory array to ascertain if any cell now contains any complementary data;
10) writing a background of complement data to all of said cells;
11) writing one of said bitline connected rows with said data;
12) reading said one bitline row for a period of time corresponding to the refresh time of said memory;
13) writing said one bitline row with said data complement;
14) reading the entire memory array to ascertain if any cell now contains any data which is not said data complement;
15) writing one of said complement bitline rows with said data;
16) reading said last-mentioned bitline row for a period of time corresponding to the refresh time of said memory;
17) writing said last-mentioned bitline row with said data complement; and
18) reading the entire memory array to ascertain if any cell now contains any data which is not said data complement.

5,199,035

LOGIC CIRCUIT FOR RELIABILITY AND YIELD ENHANCEMENT

David E. Lopez, and Tomas Colunga, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1990, Ser. No. 591,189
Int. Cl.[5] G06F *15/40, 11/00*
U.S. Cl. 371—68.1 **6 Claims**



1. In an integrated circuit, a logic circuit for testing a reliability of the integrated circuit, comprising:

an array circuit including a plurality of matrix arrays each having a plurality of inputs, said plurality of matrix arrays being positioned in a predetermined row and column of said array circuit and being responsive to a plurality of input signals applied thereto for providing a respective row and column output;

a parity circuit responsive to said row and column outputs of said plurality of matrix arrays for causing an output signal at an output of the logic circuit to be in a first logic state whenever said row outputs of said plurality of matrix arrays are logically different, or whenever said column outputs of said plurality of matrix arrays are logically different;

stimulus means coupled to said plurality of inputs of said plurality of matrix arrays for supplying said plurality of input signals to exhaustively stimulate each one of said plurality of matrix arrays with all possible logic combinations; and

verification means for verifying the operation of said parity circuit by stimulating said parity circuit with a predetermined logic sequence.

5,199,036

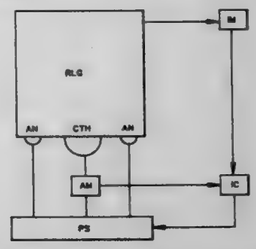
Patent Not Issued For This Number

5,199,037

EXTENDED LASER LIFE

Frederick Aronowitz, Laguna Niguel, and Frederick Vescial, Orange, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 24, 1991, Ser. No. 764,872
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—31 **20 Claims**



1. A method for extending a life of a laser by reducing a discharge current initially applied to the laser, comprising the steps of:

(a) measuring an intensity of a laser;

(b) comparing the intensity of the laser with a pre-established intensity service limit, below which the laser is in danger of falling; and

(c) increasing a discharge current applied to the laser when the intensity of the laser approaches the intensity service limit, until the intensity of the laser falls below the intensity service limit.

5,199,038

SEMICONDUCTOR LASER NOISE REDUCTION

Kerry J. Vahala, 328 Bridge St., San Gabriel, Calif. 91775, and Michael A. Newkirk, 707 Rockwood Rd., Pasadena, Calif. 91105

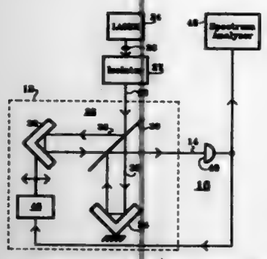
Continuation-in-part of Ser. No. 594,376, Oct. 9, 1990, abandoned. This application May 14, 1991, Ser. No. 699,518
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—33 **19 Claims**

1. A laser system for producing reduced amplitude noise output, comprising:

a detuned laser for providing detuned laser output, said detuned laser output having amplitude noise and phase noise, said amplitude noise being related to said phase noise by an inherent amplitude-phase coupled noise transfer function;

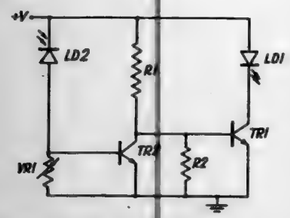
filter means for producing a filter output in response to a filter input, amplitudes of said filter input and said filter output being related to each other by a frequency dependent amplitude transfer function substantially inversely related to said inherent amplitude-phase coupled noise transfer function; and

means for coupling said detuned laser output to said filter input,



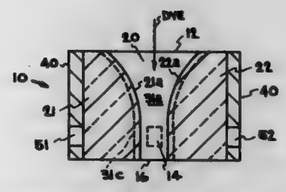
whereby phase noise in said detuned laser output is used to reduce amplitude noise in said filter output.

5,199,039
LASER DIODE SUPPLY CIRCUIT
Keith Raper, Aldershot, Great Britain, assignor to Imatronic Limited, Berkshire, England
PCT No. PCT/GB90/01119, § 371 Date Jul. 22, 1991, § 102(e) Date Jul. 22, 1991, PCT Pub. No. WO91/04595, PCT Pub. Date Apr. 4, 1991
PCT Filed Jul. 20, 1990, Ser. No. 721,606
Claims priority, application United Kingdom, Sep. 22, 1989, 8921483
Int. Cl.[5] H01S 3/00
U.S. Cl. 372—38 3 Claims



1. A laser diode supply circuit, comprising:
first and second voltage busses;
a laser diode, having an optical power output related to current flow therethrough, connected in a first series circuit path with collector and emitter terminals of a first transistor between said first and second voltage busses, there being substantially no resistance in said first series path between the first and second voltage busses;
a second transistor having collector and emitter terminals connected in a second series path with a collector load resistance between the first and second voltage busses;
means coupling said second series path with a base terminal of said first transistor;
a light sensitive device optically coupled with said laser diode and electrically connected with a resistance in a third series path between the first and second voltage busses; and
means coupling said third series path with a base terminal of said second transistor such that in operation a control voltage is applied to said base terminal which is a proportional part of the voltage difference between said first and second voltage busses, said proportional part being determined by the optical power output of said laser diode; and
wherein said second transistor is switched into conduction when control voltage exceeds an intrinsic threshold voltage value of said second transistor means to provide a feedback control of the current in said first series path and thereby to stabilize the optical power of said laser diode against a variation in voltage difference between said first and second voltage busses.

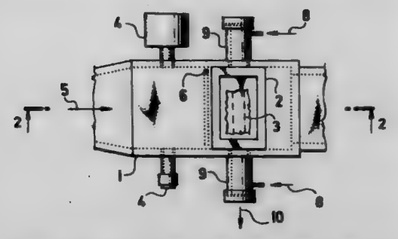
5,199,040
MONOLITHIC DYE LASER AMPLIFIER
Thomas C. Kakio, Ripon, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 30, 1991, Ser. No. 707,510
Int. Cl.[5] H01S 3/02
U.S. Cl. 372—54 5 Claims



1. A channel structure for a fluid dye laser amplifier and having a flow passage therethrough with an inlet and an outlet for flow of a laseable fluid therethrough, said flow passage having a lasing region between said inlet and outlet, said channel structure having a pumping beam axis transverse to the flow passage at said lasing region and a signal beam axis transverse to both said flow passage at said lasing region and said pump beam axis, said channel structure comprising:
a pair of opposed and spaced-apart first glass window pieces disposed on opposite sides of said lasing region and positioned for transmission therethrough of a beam projected along said pumping beam axis;
a pair of opposed and spaced-apart second window pieces disposed on opposite sides of said lasing region for transmission therethrough of a beam projected along said signal beam axis;
said pairs of first and second window pieces having opposed and inwardly facing surfaces contiguous to each other and forming said flow passage and being shaped so that the cross-sectional area of said flow passage decreases gradually from said inlet end of said passage to said lasing region therein;
each of said first window pieces having surfaces in abutment with surfaces of both of said second window pieces, said abutting surfaces being joined by a glue such that said pairs of first and second window pieces form a monolithic structure with said flow passage passing therethrough.

5,199,041
MODULATION OF OXYGEN-IODINE LASER
Josef Schmiedberger; Jaraslla Kodymová; Jiri Kovár; Otomar Spalek, and Pavel Treada, all of Prague, Czechoslovakia, assignors to Ceskoslovenská Akademie Ved, Prague, Czechoslovakia
Filed Jul. 12, 1991, Ser. No. 729,424
Claims priority, application Czechoslovakia, Aug. 13, 1990, 3967-90
Int. Cl.[5] H01S 3/09
U.S. Cl. 372—89 13 Claims

1. A method of modulating a continuously pumped chemical oxygen-iodine laser having a body containing an optical resonator and a laser active zone in the resonator where oxygen and iodine react to generate laser light, comprising:
generating a magnetic field of intensity up to 800 A.cm^{-1}, externally of the body, the magnetic field extending into the laser active zone, and varying the intensity of the magnetic field according to a selected timing for modulating an output power of laser light from the optical resonator according to the selected timing.

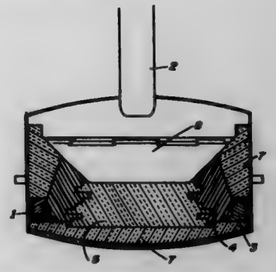


5,199,042
UNSTABLE LASER APPARATUS
Thomas Papetti, Huntsville, Ala.; Gregory A. Witt, Apopka, Fla.; Steven Stranch, Ellicott City, Md., and Ron Selleck, Winter Park, Fla., assignors to Litton Systems, Inc., Little Falls, N.J.
Filed Jan. 10, 1992, Ser. No. 818,834
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—95 7 Claims

1. An unstable laser with improved beam quality comprising:
a laser medium;
a pair of crossed Porro prism and reflectors positioned to form a resonator defining a light path through said laser medium;
beam expansion means located in said light path between said pair of crossed Porro prism end reflectors for magnifying said light beams passing therethrough in one direction to form an unstable laser resonator, said beam expansion means including a negative element having a negative spherical power;
a radially varying birefrigent member positioned in said light path between said crossed Porro prisms;
recollimation optic means for recollimation of said light beam for said beam expansion means in a second direction, said recollimating optic means includes a positive component having a net positive spherical power; and
polarizer means located in said light path for reflecting a portion of said light beam from said light path to form an output light beam, whereby a near diffraction limited output beam is accomplished with an unstable laser.

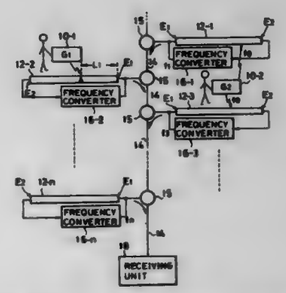
5,199,043
LINING FOR A DIRECT-CURRENT ELECTRIC ARC FURNACE
Dane Meredith, Brandon, Fla., assignor to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Dusseldorf, Fed. Rep. of Germany
Filed Aug. 9, 1991, Ser. No. 743,146
Int. Cl.[5] F27D 1/00
U.S. Cl. 373—72 9 Claims

2. A lining for an arc furnace configured to receive a melt, the arc furnace having ring shaped current conductor and an electrode extending into the arc furnace, with direct current passing between the ring shaped current conductor and the electrode, the lining comprising
a refractory and electrically insulative brick lining,
a plurality of graphite bricks annularly arranged to contact the ring shaped current conductor,
a plurality of electrically conductive refractory bricks positioned to contact the graphite bricks and the electrically insulative brick lining, the electrically conductive refractory bricks being concentrically arranged radially inward from the graphite bricks,



an electrically insulative monolithic ramming mass centrally positioned in direct physical contact with the melt and above the refractory and electrically insulative brick lining, the ramming mass accommodating the electrically conductive refractory bricks to define a jagged transition zone between the ramming mass and the electrically conductive refractory bricks, the transition zone also being defined by at least a portion of electrically conductive refractory and electrically insulative bricks.

5,199,044
SYSTEM FOR DETECTING POSITION OF OBJECT HAVING DATA CARRIER
Kunihiko Takeuchi, Kawasaki, and Masao Oba, Yokohama, both of Japan, assignors to Tokimec Inc., Tokyo, Japan
Filed May 13, 1991, Ser. No. 698,774
Claims priority, application Japan, May 22, 1990, 1-32322; May 22, 1990, 1-32323; May 22, 1990, 1-32324
Int. Cl.[5] H04L 27/30
U.S. Cl. 375—1 9 Claims



1. An object position detecting system comprising:
(A) a plurality of portable data carriers each having a unique pseudo random series assigned thereto corresponding to an ID code and each for generating a spread spectrum signal by modulating a carrier signal having a first frequency which is common to all of the portable data carriers by the unique pseudo random series assigned thereto;
(B) a plurality of leaky cables, two-dimensionally distributed and arranged throughout a building structure, each hav-

ing opposite first and second ends and a predetermined line length;

(C) a plurality of frequency converters, respectively connected to the first end of said plurality of leaky cables, each for frequency converting a spread spectrum signal generated by a portable data carrier and received by and transmitted within a leaky cable connected thereto into a frequency converted spread spectrum signal of one of a plurality of unique frequencies respectively assigned to said leaky cables;

(D) transmission cables commonly connected to an output of each of said frequency converters and to the second end of each of the leaky cables; and

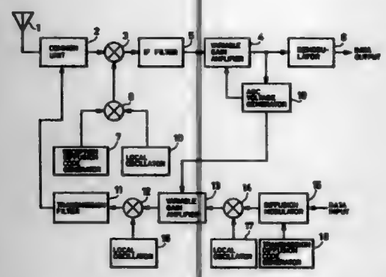
(E) a receiving unit, connected to said transmission cables, for calculating a position on one of said leaky cables where one of said portable data carriers is in close proximity and for discriminating said one of said portable data carriers based on at least one a correlation between a received spread spectrum signal and a received frequency converted spread spectrum signal and a correlation between a pseudo random series contained within the spread spectrum signals and the plurality of the unique pseudo random series assigned to the portable data carriers.

5,199,045

COMMUNICATION APPARATUS

Ichiro Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 552,463, Jul. 16, 1990, abandoned, which is a division of Ser. No. 203,084, Jun. 7, 1988, Pat. No. 4,958,359. This application Apr. 13, 1992, Ser. No. 866,271
Claims priority, application Japan, Jun. 9, 1987, 62-142155
Int. Cl.[5] H04L *27/30*; H04B *7/005*
U.S. Cl. 375—1 **32 Claims**



1. A communication apparatus comprising:

receiving means for receiving a signal including a signal from a partner station;

conversion means for converting the signal received by said receiving means in accordance with a diffusion code, wherein the diffusion code is determined in accordance with a diffusion code used in transmission by the partner station;

control signal generating means coupled to the conversion means for generating a control signal corresponding to an output level of said conversion means;

transmission means for transmitting data to the partner station; and

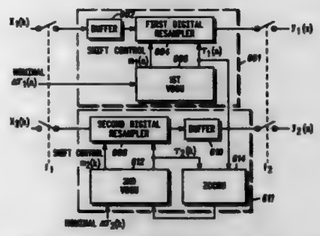
transmission control means coupled to the transmission means for controlling a transmission level of a signal output of said transmission means in accordance with the control signal generated by said control signal generating means.

5,199,046

FIRST AND SECOND DIGITAL RATE CONVERTER SYNCHRONIZATION DEVICE AND METHOD

Fuyun Ling, Jamaica Plain, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Sep. 9, 1991, Ser. No. 756,741
Int. Cl.[5] H04B *1/38*
U.S. Cl. 375—8 **27 Claims**



1. A digital synchronization device for at least partially synchronizing at least first and second digital rate converters (DRCs), the first DRC having an input of at least some first digital sequence samples $\{x_1(k)\}$ sampled at a first sampling rate and the second DRC having an input of at least some second digital sequence samples $\{y_2(n)\}$ related to the first digital sequence samples and sampled at a second sampling rate different from the first sampling rate, wherein:

the first DRC comprises at least:

a first buffer, operably coupled to receive the first digital sequence samples $\{x_1(k)\}$, for delaying and temporarily storing the first digital sequence samples $\{x_1(k)\}$;

a first digital resampler having at least a first delay unit, operably coupled to the first buffer, for shifting the first digital sequence samples into the first delay unit and for generating first output digital sequence samples $\{y_1(n)\}$ at substantially the second sampling rate utilizing a first selected sample timing in accordance with a first shift control signal $m_1(n)$ and a first desired normalized timing offset $\tau_1(n)$; and

a first variable delay generating unit having a normalized timing input $\Delta\tau_1(n)$, $\Delta\tau_1(n)$ being a first sampling time advance, and being operably coupled to the first digital resampler, for providing the first desired normalized timing offset $\tau_1(n)$ and for providing the first shift control signal $m_1(n)$ determined from a previous normalized timing offset $\tau_1(n-1)$; and

the second DRC comprises at least:

a second buffer, operably coupled to receive the second digital sequence samples $\{y_2(n)\}$ related to the first digital sequence samples $\{x_1(k)\}$, for at least delaying and temporarily storing the second digital sequence samples $\{y_2(n)\}$ and providing the delayed, temporarily stored samples to a second digital resampler;

a second digital resampler having at least a second delay unit, operably coupled to the second buffer and to a second variable delay generating unit, for shifting the second digital sequence samples into the second delay unit and for generating second output digital sequence samples $\{x_2(n)\}$ at substantially the first sampling rate utilizing a selected sample timing in accordance with a second desirable normalized timing offset $\tau_2(k)$, and a second shifting control signal $m_2(n)$ from the second variable delay generating unit,

the second variable delay generating unit having a normalized timing input $\Delta\tau_2(k)$, $\Delta\tau_2(k)$ being a second sampling time advance, and being operably coupled to the second digital resampler, for providing the second desired normalized timing offset $\tau_2(k)$ and for providing the second shift control signal $m_2(n)$ determined from a previous normalized timing offset $\tau_2(n-1)$, the second variable delay generating unit being operably coupled at least to the second digital resampler, for providing shift and timing information in accordance with a second sampling time advance $\Delta\tau_2(k)$,

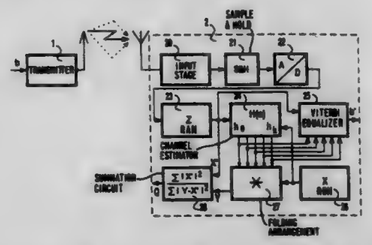
such that timing differences between the first digital sequence samples and the second output digital sequence samples are substantially detected and variations in the timing differences are substantially reduced.

5,199,047

RECEIVER FOR A DIGITAL TRANSMISSION SYSTEM

Wolfgang Koch, Heroldsberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1990, Ser. No. 604,734
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935436; Jan. 20, 1990, 4001592
Int. Cl.[5] H03H *7/40*; H04L *27/01*
U.S. Cl. 375—13 **17 Claims**



1. A receiver for data transmitted over a transmission channel in which data as transmitted contain a transmitted training data sequence (X), wherein the receiver comprises means for receiving data including data symbols (b') and a received training data sequence (X'), means for storing a copy of said transmitted training data sequence, and means for estimating a channel impulse response (H(0)) for said transmission channel based on said received training data sequence,

characterized in that said means for estimating comprises:

means for determining an estimated sequence (Y) based on the estimated channel impulse response and said copy of the transmitted training data sequence, and

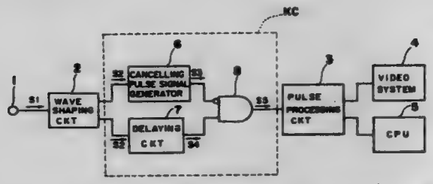
means for determining a degree of match of said estimated sequence with said received training data sequence.

5,199,048

NOISE CANCELER FOR KEYING PULSE IN CATV CONVERTER

Toshikazu Wakabayashi, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 27, 1991, Ser. No. 675,260
Claims priority, application Japan, Mar. 28, 1990, 2-80343
Int. Cl.[5] H03K *5/05*; H04B *1/12*
U.S. Cl. 375—104 **2 Claims**



1. A noise canceler for removing noise pulses from a keying signal defined by a plurality of keying pulses and noise pules, comprising:

a canceling pulse generating means for receiving the keying signal and for generating a canceling pulse signal having a canceling pulse upon each leading edge of each keying pulse and noise pulse of the keying signal, each canceling pulse having a pulse width of a first predetermined time period;

a delaying means for receiving the keying signal and for delaying each keying pulse and noise pulse of the keying signal by a second predetermined time period to generate a delayed keying signal; and,

a canceling means for receiving said delayed keying signal from said delaying means and said canceling pulse signal from said canceling pulse generating means, and for generating a noise canceled keying signal having a pulse corresponding to each received pulse of said delayed keying signal except during a time period in which a canceling pulse of said canceling pulse signal is also received;

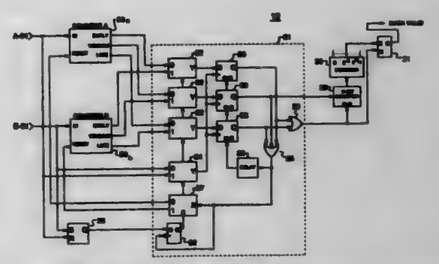
said canceling pulse generating means including (a) a leading edge detector for detecting a leading edge of each keying pulse and noise pulse of said keying signal, (b) a timer, coupled to said leading edge detector, for generating a clear signal after the lapse of said first predetermined time period from the detection of a leading edge by said leading edge detector, and (c) a latch circuit, coupled to said timer, for latching said keying signal to generate a first level signal at each keying pulse and noise pulse of said keying signal and for clearing in response to said clear signal from said timer to generate a second level signal, said first level signal corresponding to a canceling pulse.

5,199,049

CIRCUIT AND METHOD OF DIGITAL CARRIER DETECTION FOR BURST MODE COMMUNICATION SYSTEMS

William B. Wilson, Shillington, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1990, Ser. No. 515,293
Int. Cl.[5] H04B *1/10*
U.S. Cl. 375—104 **14 Claims**



1. A circuit disposed in an integrated circuit, for comparing an input signal to a first predetermined frequency, characterized by:

a first timing means for generating a first signal at a first predetermined time after a first polarity transition in an input signal; and,

first comparing means, responsive to the first and input signals, for determining if a second polarity transition in the input signal occurs before or after the first signal is asserted, the second polarity being opposite the first polarity;

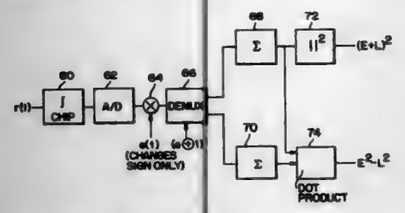
wherein the first predetermined time is substantially one-half the inverse of the first predetermined frequency and the first comparing means indicates to a first output that the frequency of the input signal is greater than or less than the first predetermined frequency.

VOL 1148 ISS 5 MR 30 1993 UMI

5,199,050
PSEUDORANDOM (PN) SIGNAL SYNCHRONIZATION CIRCUIT AND RELATED METHOD

Stuart T. Linsky, San Pedro, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 5, 1991, Ser. No. 681,039
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—115 **10 Claims**



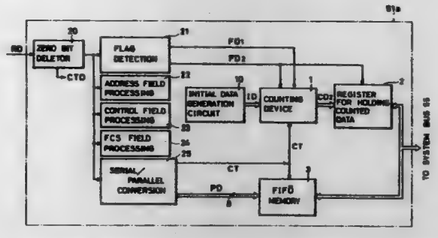
1. A circuit for generating signals for detecting and synchronizing with a received pseudorandom (PN) signal, the circuit comprising:
- a source of early and late reference PN signals spaced apart in time by one chip interval of the PN signal;
- a single digital multiplier, for multiplying successive values of the received signal and the early reference signal, to produce a product signal;
- a demultiplexer, for directing the product signal over first and second alternate paths; and
- accumulation means associated with each of the alternate paths, for accumulating the product signal in each path, over a selected signal burst period, to produce for each burst period a signal on the first alternate path equivalent to the sum of the early and late signals, and a signal on the second alternate path equivalent to the difference of the early and late signals;
- wherein the demultiplexer is controlled to select the first alternate path when the early and late reference signals have the same value, and to select the second alternate path when the early and late reference signal have different values;
- whereby the digital multiplier is time-shared by the first and second alternate paths, but without loss of data or degradation in performance.

5,199,051
DATA LENGTH DETECTION DEVICE FOR DETECTING LENGTH OF FRAME DATA DEFINED BY FLAGS

Takeo Nakabayashi, and Haruhisa Kondoh, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1991, Ser. No. 765,767
Claims priority, application Japan, Nov. 1, 1990, 2-296232
Int. Cl.[5] H04L *25/38*
U.S. Cl. 375—117 **8 Claims**

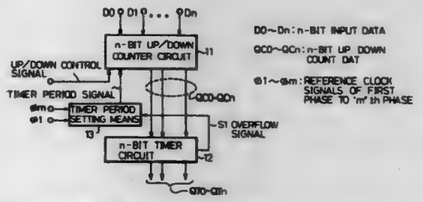
1. A data length detection device for detecting the data length of one frame data defined by a start flag and a stop flag, said frame data including a first data part having a predetermined data length, and a second data part having an arbitrary data length,
said device comprising:
- initial data generation means for generating initial data determined based on the predetermined data length of said first data part;
- flag detection means for receiving said frame data and detecting the start flag and the stop flag; and
- counting means responsive to said flag detection means for counting the data length of the second data part,
- said initial data generation means applying the initial data to said counting means prior to the counting operation of said counting means,
- said counting means starting the counting operation in response to the detection of the start flag and stopping the counting operation in response to the detection of the stop flag by said flag detection means.



5,199,052
RELOAD TIMER CIRCUIT

Atsushi Fujita, Hachioji, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 1, 1991, Ser. No. 723,890
Claims priority, application Japan, Jun. 29, 1990, 2-174284
Int. Cl.[5] H03K *23/56, 21/02*
U.S. Cl. 377—20 **18 Claims**



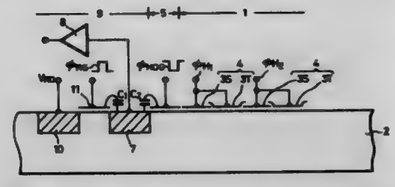
1. A reload timer circuit comprising:
- an n-bit counter circuit for receiving input data of n bits and providing count data of n bits based upon a counting operation thereof in response to a counter operation signal (S2);
- an n-bit timer circuit for receiving n-bit count data and providing timer data of n bits; and
- a timer period setting means for generating a timer period signal in response to an overflow signal of the n-bit timer data and providing the n-bit counter circuit with the timer period signal as a counting operation signal, said timer period signal controlling the period of each pulse of the n-bit timer circuit.

5,199,053
CHARGE TRANSFER DEVICE OUTPUT

Masahide Hirama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 10, 1992, Ser. No. 911,936
Claims priority, application Japan, Jul. 12, 1991, 3-172633; Jul. 12, 1991, 3-172634
Int. Cl.[5] G11C *19/28*; H01L *29/78*
U.S. Cl. 377—60 **15 Claims**

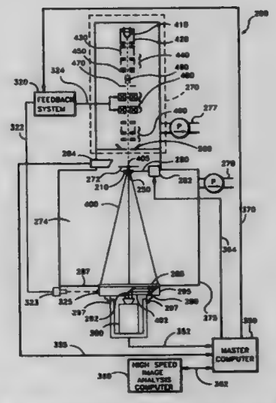
1. A charge transfer device formed on a semiconductor substrate comprising:
- a charge detecting section including an electrically floating diffusion region;
- a floating diffusion amplifier connected to said floating diffusion region, and a transistor responsive to a reset pulse voltage signal for resetting said floating diffusion region to a predetermined potential, said transistor comprising said floating diffusion region, a drain diffusion region formed in said substrate, a gate electrode connected to a source of said pule voltage signal, and a channel formed on said substrate, said channel extending between said floating diffusion region and said drain diffusion region; and
- a charge transfer means for transferring charges to said charge detecting section, said charge transfer means including a channel formed on said substrate, a plurality of gate electrodes insulated from said channel, and an output gate electrode formed on an end of said charge transfer means, said plurality of gate electrodes being responsive to a driving pulse voltage signal, wherein said driving pulse voltage signal having a specific phase so that a noise generated by a voltage shift of said driving pulse voltage signal overlaps on an output signal corresponding to a reset period.



5,199,054
METHOD AND APPARATUS FOR HIGH RESOLUTION INSPECTION OF ELECTRONIC ITEMS

John A. Adams, Escondido; Bruce D. Baker, Olivenhain; Kerry L. Brown, Temecula; Robert L. Corey; Brian L. Ganz, both of San Diego; David C. Reynolds, San Marcos; Edward W. Ross, Escondido; Gerald S. Russell, and Christopher S. Sexton, both of San Diego, all of Calif., assignors to Four Pi Systems Corporation, San Diego, Calif.

Filed Aug. 30, 1990, Ser. No. 575,550
Int. Cl.[5] H01J *35/08*
U.S. Cl. 378—21 **14 Claims**

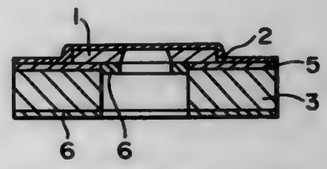


1. A high resolution laminography system comprising:
- a source of X-rays wherein said source of X-rays further comprises:
  - a source of electrons which generates an electron beam;
  - a deflector for steering said electron beam;
  - a target wherein X-rays are emitted from said target when said electron beam impinges upon said target, said target further comprising an imagable feature;
- an SEM detector for producing an SEM micrograph of said target imagable feature in response to illumination of said feature by said electron beam;
- an image analysis system for analyzing characteristics of said SEM micrograph image of said target imagable feature, and providing an output signal in response to said analysis; and
- a feedback system which receives said output signal from said image analysis system, processes said output signal and provides a control signal to said electron beam deflector; and
- a laminographic detector for producing a cross sectional image of a cutting plane of an object illuminated by said X-rays emitted by said target.

5,199,055
X-RAY LITHOGRAPHIC MASK BLANK WITH REINFORCEMENT

Hitoshi Noguchi; Yoshihiko Nagata; Megumi Kashida, and Yoshihiro Kubota, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1992, Ser. No. 908,330
Claims priority, application Japan, Aug. 5, 1991, 3-219207
Int. Cl.[5] G21K *5/00*
U.S. Cl. 378—35 **12 Claims**



7. A method for the preparation of an X-ray lithographic mask blank with reinforcement which compriaes the steps of:
- (A) forming a layer of silicon oxide on one surface of a silicon wafer or on the surface of a reinforcing member made from a silicon single crystal;
- (B) bringing the silicon wafer and the reinforcing member into contact with the layer of silicon oxide intervening therebetween;
- (C) heating the assembly of the silicon wafer and the reinforcing member made from a single crystal of silicon in contact with each other with an intervening layer of silicon oxide in vacuum or in an atmosphere of an inert gas so as to integrally bond the silicon wafer and the reinforcing member;
- (D) depositing a film of an X-ray permeable material on the surface of the silicon wafer reverse to the reinforcing member; and
- (E) etching the silicon wafer from the surface reverse to the deposited film in the area not bonded to the reinforcing member to expose the deposited film bare.

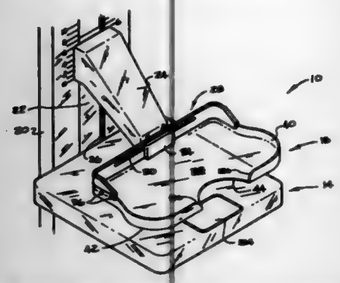
5,199,056
MAMMOGRAPHY COMPRESSION PADDLE

Carol J. Darrah, 8100 E. 22nd St. N., Wichita, Kans. 67226

Filed Nov. 28, 1989, Ser. No. 441,996
Int. Cl.[5] A61B *6/04*
U.S. Cl. 378—37 **6 Claims**

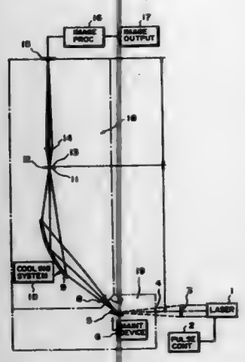
1. In a mammography system for patients with breast implants, apparatus for compressing and positioning the breast for penetrating radiation and image formation of internal tissue on X-ray film, the improvement comprising:
- a compression paddle means formed of transpareat, X-ray transmissive material which is substantially rectangular in shape with extended front corners, the paddle means including a planar bottom having sidewalls extending normally from the bottom surrounding the periphery thereof, an arcuate cutout means in the front edge of the

planar bottom shaped to substantially surround while not compressing the breast implant, the front corners of the



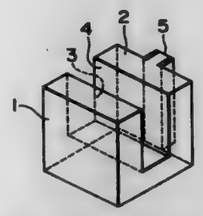
paddle extending outward from the arcuate cutout so that tissue laterally of the implant can be examined at the same time.

5,199,057
IMAGE FORMATION-TYPE SOFT X-RAY MICROSCOPIC APPARATUS
Yuichi Tamura; Hiroshi Nagata, both of Tokyo, and Katsumi Mizunoe, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 784,119, Oct. 30, 1991, abandoned, which is a continuation of Ser. No. 707,927, May 28, 1991, abandoned, which is a continuation of Ser. No. 562,326, Aug. 3, 1990, abandoned. This application Feb. 11, 1992, Ser. No. 833,918
Claims priority, application Japan, Aug. 9, 1989, 1-206563; Feb. 19, 1991, 3-24764; Feb. 21, 1991, 3-27403
Int. Cl.[5] G21K *7/60*
U.S. Cl. 378—43 **20 Claims**



1. An image formation-type soft X-ray microscopic apparatus comprising:
a pulse X-ray source for applying X-rays;
a single concave aspherical multilayer film condenser for reflecting the X-rays emitted from said pulse X-ray source so as to condense said X-rays on a sample;
a two-dimensional X-ray imaging sensor;
a phase zone plate objective optical system for forming an image of said sample on said two-dimensional X-ray imaging sensor by using said X-rays;
image processing means connected to said two-dimensional X-ray imaging sensor; and
output means connected to said image processing means for the purpose of outputting an image of said sample.

5,199,058
X-RAY MONOCHROMATOR AND SPECTRAL MEASUREMENT APPARATUS USING THE X-RAY MONOCHROMATOR
Katsuhiko Tani, Tokyo, and Eriko Chiba, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 17, 1991, Ser. No. 808,627
Claims priority, application Japan, Dec. 17, 1990, 2-411119; Feb. 18, 1991, 3-46143
Int. Cl.[5] G01T *1/36*
U.S. Cl. 378—82 **19 Claims**



1. An x-ray monochromator comprising a semiconductor perfect single crystal serving as a monochromator and a solid state detector for measuring and/or counting the incident x-ray photons of an x-ray beam which enters the semiconductor single crystal, said solid state detector being disposed integrally with said semiconductor perfect single crystal on a side opposite to an x-ray beam incident side thereof.

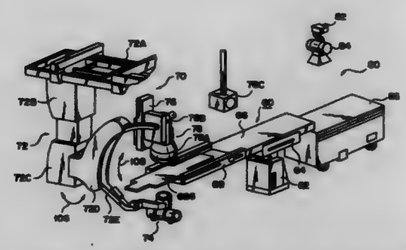
5,199,059
X-RAY TUBE ANODE WITH OXIDE COATING
Wolfgang Hohenauer, Kufstein, Austria, assignor to Schwarzkopf Technologies Corporation, New York, N.Y.
Filed Nov. 21, 1991, Ser. No. 795,760
Claims priority, application Austria, Nov. 22, 1990, 2367/90
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—144 **4 Claims**

1. An X-ray anode, in particular a rotary anode, of high thermal emissivity, said anode having a parent body made of a refractory metal or its alloys and a focal spot region or focal track region made of a refractory metal or its alloys, said anode having an oxide coating formed as a homogeneous, fused phase and deposited directly or via a base layer onto said parent body at least on parts of said anode surface outside said focal spot or focal track regions, wherein said coating comprises oxides of the metals Ti, Zr and Al, said oxide coating consisting essentially of 1–20% by weight of aluminum oxide, less than 20% by weight of titanium dioxide, and more than 60% by weight of zirconium oxide.

5,199,060
X-RAY PHOTOGRAPHING APPARATUS
Kunitaka Kato, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 4, 1991, Ser. No. 709,974
Claims priority, application Japan, Jun. 4, 1990, 2-144446
Int. Cl.[5] H05G *1/02*
U.S. Cl. 378—196 **16 Claims**

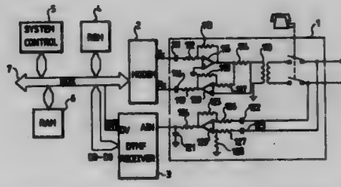
1. An x-ray photographing apparatus comprising:
an arm imaging system comprising:
an arm unit fixed on a ceiling,
an x-ray tube unit arranged in said arm unit, and
an x-ray image detecting unit arranged in said arm unit, and having a film changer for single-shot photography and divisional photography and a fluoroscopic system for fluoroscopy;
a collective photographic system arranged in tandem with said arm imaging system, and comprising:
an x-ray tube support arm fixed on said ceiling,

an x-ray tube supported on said x-ray tube support arm; and
an elongated film changer placed on a floor, which has an elongated film stored therein;
a catheter bed system arranged between said arm imaging system and said collective photographing system, and comprising:
a base arranged on the floor,
a frame fixed to an upper surface of said base,
an intermediate moving unit which is arranged on said frame and which can be horizontally moved on said frame, and



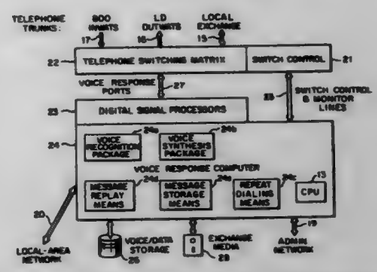
a top plate unit which is arranged on said intermediate moving unit and which can be horizontally moved on said intermediate moving unit;
a control unit for controlling a movement of said intermediate moving unit of said top plate unit, so as to move in accordance with one of following modes of, a normal movement mode for obtaining said fluoroscopic image and said x-ray film image, a stepping movement mode for divisional photography using said x-ray film, a whole body fluoroscopic image mode, and a collective photographing mode for collective photography using said elongated x-ray film.

5,199,061
COMMUNICATION METHOD AND EQUIPMENT FOR FREEZE-FRAME VIDEO PHONE
Do Young Kim, Daejeon, Rep. of Korea, assignor to Electronics and Telecommunications Research Institute and Korea Telecommunication Authority, Rep. of Korea
Continuation of Ser. No. 578,874, Sep. 6, 1990, abandoned. This application Jan. 16, 1992, Ser. No. 823,029
Claims priority, application Rep. of Korea, Sep. 6, 1989, 1989-12897
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—53 **1 Claim**



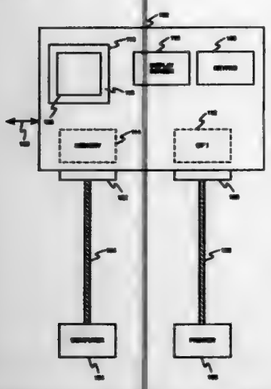
1. A method for sending and receiving freeze-frame video information, the method comprising:
a first step for sending a video control tone signal consisting of five dual tone multifrequency (DTMF) signals for forming three fields comprising a first field of two DTMF tones which contains a signal indicating a start of video data communication, a retransmission signal after deceleration of a transmission speed, and a signal indicating the transmission of video data, a second field of a DTMF tone which indicates said transmission speed, and a third field of two DTMF tones which contains information regarding color of the video data, size of the video data, and type of a character data;
a second step for receiving in one field among said three fields an Acknowledge ("ACK") signal or a Negative Acknowledge ("NAK") signal from a receiving side in response to said first step;
a third step for sending a plurality of binary "0" signals according to the transmission speed of said second field when said ACK signal of said second step has been received; and
a fourth step for sending the video data at the transmission speed when said ACK signal has been received in response to said third step, and for restarting from said first step after reducing the transmission speed sequentially from 9.6 kbps to 4.8 kbps and then to 2.4 kbps in case said NAK signal has been received after performing said third step.

5,199,062
TELEPHONE COMMUNICATIONS SYSTEM INCLUDING A DIGITAL TELEPHONE SWITCH, A VOICE RESPONSE UNIT AND A STORED PROGRAM SEQUENCE FOR CONTROLLING BOTH THE SWITCH AND THE VOICE RESPONSE UNIT
William F. Von Meister, Great Falls, and Mark Foster, Falls Church, both of Va., assignors to Phone Base Systems Inc., Vienna, Va.
Continuation of Ser. No. 639,739, Jan. 11, 1991, abandoned, which is a continuation of Ser. No. 147,102, Jan. 20, 1988, abandoned. This application Nov. 8, 1991, Ser. No. 789,398
Int. Cl.[5] H04M *3/50, 3/54, 3/56*; H04Q *11/04*
U.S. Cl. 379—67 **43 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 79 Pages)



31. A method of providing telephone communication services to a subscriber, comprising:
programming a common stored program sequence in accordance with instructions from the subscriber;
upon receipt of a call from the subscriber, producing audio messages according to a stored user script;
accepting audio user commands from the subscriber in response to said audio messages;
processing said accepted commands; and
directly controlling, using said common stored program sequence, both a telephone switch and an audio response unit responsive to said processed commands such that, based on said audio user commands and said common stored program sequence, the received call is switched to an outgoing line directed to a number other than that which the subscriber originally dialed.

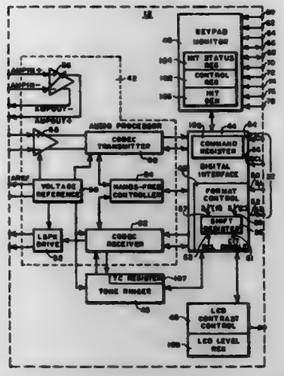
5,199,063
AUTOMATICALLY GENERATING TELEPHONE DIRECTORY LABELS FOR FACSIMILE DEVICES
Michael D. Erickson, and Richard L. Kochis, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 1, 1991, Ser. No. 649,516
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—100 13 Claims



1. A facsimile device used with an external printer, for facsimile device having programmable autodial capabilities, for automatically generating a legible telephone directory label, said facsimile device comprising:
(1) a window for displaying said telephone directory label;
(2) memory means for storing autodial information, said autodial information including names;
(3) a port for connecting said external printer; and
(4) means for automatically generating said telephone directory label compatible in size and format for display in said window, by sending commands and said autodial information to said external printer through said port.

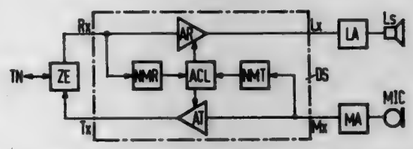
5,199,064
FULLY-INTEGRATED TELEPHONE UNIT
Dale E. Gulick; Herbert Chen, and Alan F. Headrickson, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Dec. 3, 1990, Ser. No. 589,327
Int. Cl.[5] H04M *1/60*
U.S. Cl. 379—387 9 Claims

1. An integrated circuit forming a hands-free telephone unit for use in a digital telephone network and in association with an external keypad having a plurality of depressible key switches, an external microprocessor, an external microphone, and an external speaker, said integrated circuit comprising:
keypad monitoring means arranged to be coupled to said external keypad for providing digital key code signals corresponding to the depression of said depressible key switches;
audio processing means arranged to be coupled to said external microphone for converting outgoing analog voltages from said microphone representative of human speech to outgoing digital signals representative of said human speech and arranged for converting incoming digital signals from said network representative of human speech to incoming analog voltages representative of human speech and arranged to be coupled to said external speaker for providing said speaker with said incoming analog voltages; and
digital interface means coupled to said audio processing means and said keypad monitoring means and arranged to be coupled to said digital network and said external microprocessor for conveying said incoming digital signals from said network to said audio processing means, said outgoing digital signals to said network, and said digital key code signals to said microprocessor,



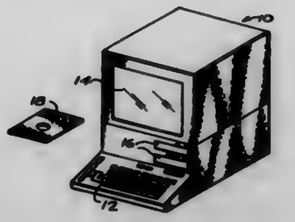
said digital interface means being arranged to be coupled to said network and said microprocessor by a serial bus, and wherein said digital interface means is arranged to convert parallel-bits of data to outgoing serial-bits of data and serial-bits of data to incoming parallel-bits of data.

5,199,065
METHOD FOR AUTOMATIC SPEECH DIRECTION REVERSAL, AND CIRCUIT CONFIGURATION FOR PERFORMING THE METHOD
Andreas von Zitzewitz, Maitenbeth, and Siegmund Redl, Wolnzach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Oct. 18, 1990, Ser. No. 599,657
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 3934769
Int. Cl.[5] H04M *1/60*
U.S. Cl. 379—389 19 Claims



17. Circuit configuration for automatic speech direction reversal, comprising a loudspeaker; a controllable reception attenuator having an input receiving a reception signal and an output supplying a signal to said loudspeaker for triggering said loudspeaker; a microphone supplying a microphone signal; a controllable transmission attenuator having an input receiving the microphone signal and an output supplying a transmission signal; two signal/noise detectors, one of said signal/noise detectors receiving one of the reception and loudspeaker signals, and the other of said signal/noise detectors receiving one of the microphone and transmission signals; and a control logic connected downstream of said signal/noise detectors and upstream of said reception and transmission attenuators for controlling said reception and transmission attenuators.

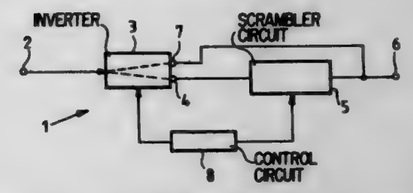
5,199,066
METHOD AND APPARATUS FOR PROTECTING SOFTWARE
Andrew J. Logan, Gladwyne, Pa., assignor to Special Effects Software, Inc., Philadelphia, Pa.
Filed Apr. 18, 1989, Ser. No. 339,760
Int. Cl.[5] H04L *9/00, 9/32*
U.S. Cl. 380—4 20 Claims



15. A system for protecting a software program recorded within a storage medium for use with, or transmission to, computer or processor based hardware, the system comprising:
means for inputting a hardware code uniquely associated with the particular hardware with which the software is to be employed;
means for inputting a first software code uniquely associated with the particular embodiment of the software being employed;
computer means for performing a first predetermined operation upon the hardware code and the first software code to produce a first intermediate code;
means for inputting a unique activation code for the particular embodiment of the software being employed, the activation code being received from a software supplier;
computer means for performing a second predetermined operation upon the first intermediate code and the activation code to produce a second intermediate code;
computer means for comparing the second intermediate code with a second software code uniquely associated with the particular embodiment of the software and stored at a hidden location within the software, the second software code not being ascertainable by the user; and
means for enabling the use of the software if the second intermediate code and the second software code are identical.

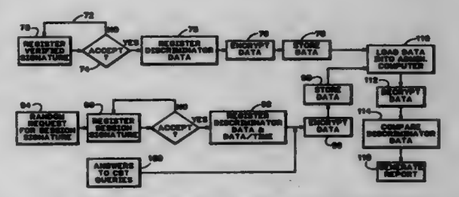
5,199,067
PROCESS FOR PROMOTION OF PAY TELEVISION BROADCASTS, AND DEVICE FOR USE OF THE PROCESS
Michel Leduc, Boersch; Joël Hamon, Lipsheim; Eric Diehl, Neudorf; Albert Dorner, Strasbourg, and Jacky Mahler, Niederbronn Les Bains, all of France, assignors to Laboratoire Europeen De Recherches Electroniques Avancees Societe En Nom Collectif, Courbevoie, France
Filed Dec. 10, 1990, Ser. No. 625,069
Claims priority, application France, Dec. 8, 1989, 89 16271
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—10 17 Claims

1. A process for promotion of pay television network broadcast, comprising the steps of:
providing a television broadcast signal;
scrambling said television signal to a predetermined level in order to emit a scrambled signal; and
controlling, independent of said viewer, said scrambling in order to provide a preprogrammed intermittent reduction



in the percentage of said broadcast signal rendered unintelligible.

5,199,068
COMPUTER-BASED TRAINING SYSTEM WITH STUDENT VERIFICATION
Robert R. Cox, Newberg, Oreg., assignor to Professional Achievement Systems, Inc., Portland, Oreg.
Filed Jan. 22, 1991, Ser. No. 643,912
Int. Cl.[5] H04K *1/00*; G07D *7/00*; G06K *9/00*
U.S. Cl. 380—23 31 Claims

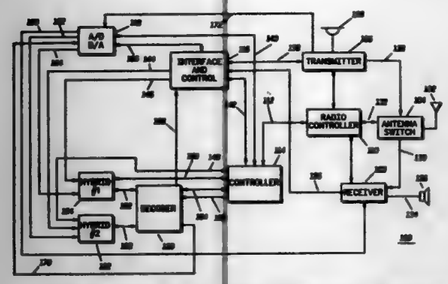


1. A signature verification system for use as part of a computer system to ascertain the identity of a user thereof, said verification system comprising:
(a) means for registering a machine-readable form a representation of said user's signature;
(b) means for requesting said user to register said signature at a random time during a session of computer operation;
(c) means for discerning by computer at least one discriminator datum of said signature;
(d) means for storing at least two said representations of signatures registered at different times and respectively corresponding discriminator data; and
(e) means for comparing discriminator data from two different signatures to determine whether the same person caused the respective signatures to be registered.

5,199,069
AUTOMATIC ENCRYPTION SELECTOR
Steven T. Barrett, Plantation, and Bruce D. Oberlies, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 25, 1991, Ser. No. 660,186
Int. Cl.[5] H04K *1/00, 9/00*; H04L *9/02*
U.S. Cl. 380—28 6 Claims

1. A radio capable of automatically selecting a proper algorithm from among a plurality of different algorithms, each having an associated key, for decrypting an encrypted signal which is received by the radio and one of the plurality of algorithms in the radio is designated to be a default algorithm, the radio comprising:
a. means for automatically decrypting the received encrypted signal with one of the plurality of different algorithms;
b. means for determining if the algorithm chosen to decrypt

the encrypted signal has properly decrypted the encrypted signal and selecting another algorithm from among the plurality of algorithims if the encrypted signal has not been properly decrypted: and



c. means for developing a control signal upon the proper decryption of the received encrypted signal in order to indicate correct decryption.

5,199,070

METHOD FOR GENERATING A PUBLIC KEY

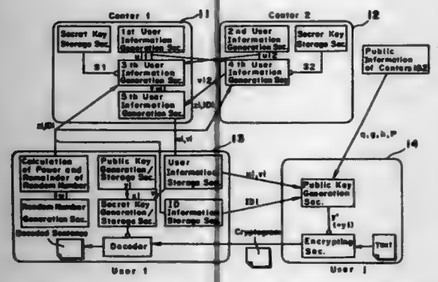
Natsume Matsuzaki, Misoo; Shunji Harada, and Makoto Tatebayashi, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1991, Ser. No. 809,134

Claims priority, application Japan, Dec. 18, 1990, 2-403058; Aug. 8, 1991, 3-199148; Sep. 6, 1991, 3-227125

Int. Cl.[5] H04L *9/30*

U.S. Cl. 380—30 **50 Claims**



1. A public key generation method having a first user bearing unique identification information, a second user bearing unique identification information, a user information issuing center, and a network which interconnects these, wherein the user information issuing center sets up both a public one-way function f and a public function h, the one-way function f being such a function that, when a first operation op1 and a second operation op2 and a third operation op3 and a fourth operation op4 are assumed to be binomial operation, respectively, and a and b are assumed to be data, respectively, the following equations hold:

$$f(op1\ (a,))=op2\ (f(a),\ b)$$

$$f(op3\ (a,))=op4\ (f(a),\ f(b)),$$

the public key generation method comprising:

a system setup step, wherein the user information issuing center sets up a secret key S, keeps it is secret, calculates, as the public key of the user information issuing center, an output value P of the one-way function f taking an input of the secret key S of the user information issuing center, and notifies the first and second users of the public one-way function f, the public function h and the public key P as public information of the user information issuing center;

a user information issuing step, wherein the first user sets up a secret key, calculates, as the public key of the first user, the output value of the one-way function f taking an input of the secret key, notifies the user information issuing center of the public key and the identification information of the first user, and requests issue of the user information of the first user; and wherein the user information issuing center authenticates the first user, generates a random number r, keeps it in secret, calculates the result u of the fourth operation taking inputs of both the output value of the one-way function f, which takes an input of the random number r, and the public key of the first user, inputs the result u and the identification information of the first user into the public function h, calculates the result of the first operation taking inputs of both the secret key S of the user information issuing center and the output value of the function h, calculates the result v of the third operation taking inputs of both the result of the first operation and the random number r, and issues, to the first user, the results u and v as the first user information and the second user information, respectively, of the first user; and

a public key generation step, wherein the first user sends to the second user the first user information u, the second user information v, and the identification information of the first user; the second user inputs the result u and the identification information of the first user into the public function h, calculates the result of the second operation taking inputs of both the public key P of the user information issuing center and the output of the function h; taken as the public key of the first user is the result of the fourth operation taking inputs of both the result of the fourth operation, which takes inputs of both the result of the second operation and the user information u, and the inverse number of the output value of the one-way function f taking an input of the second user information v in the fourth operation.

5,199,071

MODEM MODE MATCHING METHOD WITH PBX DIAL-IN

Kenichi Abe; Masumi Kaneuchi; Kenji Kurashina; Kenzou Kaji, and Kikuo Sumiyoshi, all of Tokyo, Japan, assignors to NTT Data Communications Systems Corporation; Oki Electric Co., Ltd. and Texas Instruments Japan Ltd., Tokyo, Japan

PCT No. PCT/JP89/00977, § 371 Date Jul. 10, 1990, § 102(e) Date Jul. 10, 1990, PCT Pub. No. WO90/03702, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 27, 1989, Ser. No. 476,449

Claims priority, application Japan, Sep. 27, 1988, 63-239785

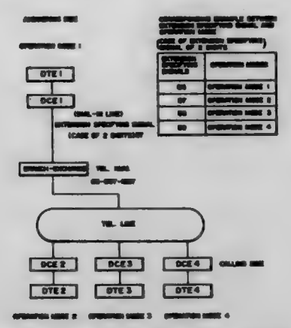
Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—98 **4 Claims**

1. A communication system comprising a modem connected to an analog telephone line using a direct inward dialing line and a digital terminal for sending data to said analog telephone line or for receiving data from said analog telephone line via said modem, wherein said communication system comprises:

said modem having means for detecting an extension instructing signal via said analog telephone line, means for providing said detected extension instructing signal to said digital terminal, means for repreaenting a plurality of operating modes, and a mode switching means for changing an operation mode in response to an operation mode instruction signal of an answering side digital terminal; and

said digital terminal having memory means for storing said corresponding relationship between said extension instructing signal and said operation mode of said modem, and an outputting means for outputting said operation mode instruction signal to said modem, whereby an operation mode corresponding to said extension instructing



signal provided via said modem is selected, and said modem is set to the selected operation mode.

5,199,072

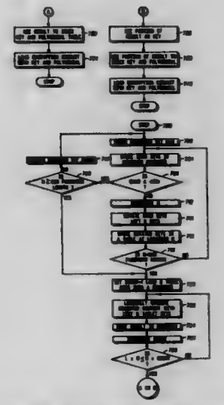
METHOD AND APPARATUS FOR RESTRICTING ACCESS WITHIN A WIRELESS LOCAL AREA NETWORK

Richard E. White, Cary, and Lee Hamilton, Jr., Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1992, Ser. No. 829,206

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—44 **20 Claims**



19. A wireless time division multiplexed Local Area Network (LAN) having distinct user groups, each user group having a unique password, at least one control module (CM) and a plurality of user modules (UM) which communicate by transmitting and receiving packets at time slots within a frame, said network comprising:

said at least one CM having:

means for receiving the user group password,

means, responsive to the password, for selecting a CM key and polynomial,

means, coupled to the CM, for encrypting at least a portion of a packet received by or transmitted from the CM via the selected key and polynomial, and

means, coupled to the encrypting means, for transmitting encrypted packets; and

at least one UM having:

means for receiving the user group password,

means, responsive to the password, for selecting a UM key and polynomial,

means, coupled to the UM, for receiving CM encrypted packets,

means, coupled to the packet receiving means for synchronizing UM operation to CM timing, and

means, coupled to the UM, for decrypting CM encrypted packets and encrypting UM transmitted packets via the UM selected key and polynomial,

such that the UM is permitted to communicate with the CM if the key and polynomial selected by the UM is identical to the key and polynomial selected by the CM.

5,199,073

KEY HASHING IN DATA PROCESSORS

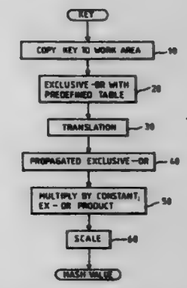
Jonathan A. Scott, Chandlers Ford, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1991, Ser. No. 773,389

Claims priority, application European Pat. Off., Oct. 30, 1990, 90311902.2

Int. Cl.[5] H04F *9/00*

U.S. Cl. 380—49 **20 Claims**



11. In a data processing system having a central processing unit (CPU), memory and a database, a computerized method for retrieving a data item stored in the database using a key stored in the memory, by calculating a hash value from the key comprising a plurality of digits, comprising the steps of:

(a) logically combining in the memory, by means of the CPU, each of said digits in said key with a corresponding digit from a first predefined table of digits stored int he memory using a first logical combination to produce a plurality of logically combined digits;

(b) overwriting in memory, by means of the CPU, each of said logically combined digits with a substitute digit obtained from a second predefined table of digits stored in the memory to produce a set of substituted digits, the location of the substitute digit in said second table being determined from the value of the digit to be replaced;

(c) dividing said set of substituted digits in memory, by means of the CPU, into at least three groups of digits;

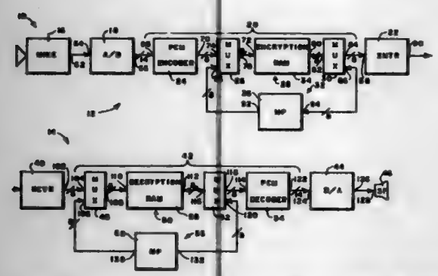
(d) logically combining two of said groups in memory, by means of the CPU, according to a second logical combination to produce a result word;

(e) overwriting in memory, by means of the CPU, said result word with the logical combination of said result word and a further group stored in the memory, according to a second logical combination;

(f) repeating step (e) until said second logical combination has been applied to each of said groups; and

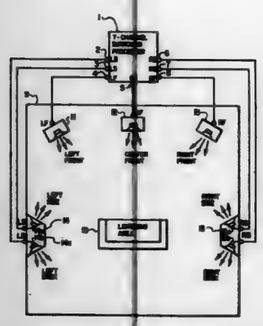
(g) retrieving the data item from the database using the result of step (f) to determine the location of the data item in the database.

5,199,074
ENCRYPTION SYSTEM
Allen B. Thor, Livingston, N.J., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Jan. 6, 1992, Ser. No. 817,150
Int. Cl.[5] H04L 9/06
U.S. Cl. 380—50 32 Claims



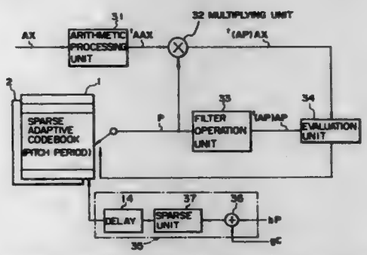
1. An encryption system for providing encrypted digital signal samples from digital signal samples to be encrypted, said system comprising:
memory means including a plurality of addressable memory locations for storing said encrypted digital signal samples, an address input for receiving said digital signal samples to be encrypted, and a data port for providing said encrypted digital signal samples responsive to said received digital signal samples; and
programming means for providing said memory means with said encrypted digital signal samples, said programming means including addressing means for storing each one of said encrypted digital signal samples at a predetermined unique memory location of said memory means,
said programming means comprising a microprocessor having an address output for providing memory means addresses for addressing said memory locations of said memory means and a data output coupled to said memory means data port for providing said memory means with said encrypted digital signal samples.

5,199,075
SURROUND SOUND LOUDSPEAKERS AND PROCESSOR
James W. Fosgate, 4750 E. 1200 South, Heber City, Utah 84032
Filed Nov. 14, 1991, Ser. No. 789,530
Int. Cl.[5] H04R 5/02
U.S. Cl. 381—24 15 Claims



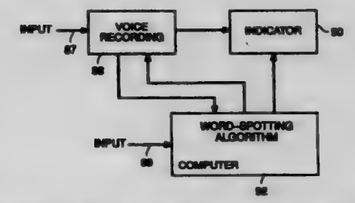
1. Apparatus for multichannel reproduction of sound in a listening area utilizing a surround sound processor adapted to produce at least left and right front, left and right rear, and left and right side output signals, said apparatus comprising:
loudspeakers located relative to the listening area at left and right front, and left and right side positions;
said left and right front loudspeakers receiving the corresponding one of said left and right front output signals from said surround sound processor;
said left and right side loudspeakers each being a dual loudspeaker comprising two independent drivers, one facing toward the front of the listening area and another facing toward the rear of the listening area, said front-facing driver of said left or right side loudspeakers receiving the corresponding one of said left or right side output signals, and said rear-facing driver receiving the corresponding one of said left or right rear output signals from said surround sound processor;
said left and right side loudspeakers having a dipole radiation pattern whenever said side and rear output signals are applied in antiphase to said forward-facing and rearward-facing drivers respectively, and a hemispherical omnidirectional pattern whenever said side and rear signals are applied to the respective drivers in phase.

5,199,076
SPEECH CODING AND DECODING SYSTEM
Tomohiko Taniguchi, Kawasaki, Japan; Mark A. Johnson, Cambridge, Mass.; Hideaki Kurihara, Kawasaki, Japan; Yoshinori Tanaka, Kawasaki, Japan, and Yasuji Ohta, Kawasaki, Japan, assignors to Fujitsu Limited, Japan
Filed Sep. 18, 1991, Ser. No. 761,048
Claims priority, application Japan, Sep. 18, 1990, 2-248484
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—36 11 Claims



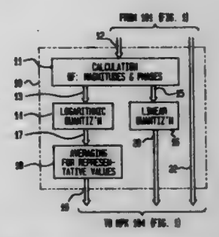
1. A speech coding and decoding system which includes coder and decoder sides, the coder side including an adaptive codebook for storing a plurality of pitch prediction residual vectors (P) and a stochastic codebook for storing a plurality of code vectors (C) comprises of white noise, whereby use is made of indexes having an optimum pitch prediction residual vector (bP) and optimum code vector (gC) (b and g gains) closest to a perceptually weighted input speech signal vector (AX) to code an input speech signal, and the decoder side reproducing the input speech signal in accordance with the code,
wherein the adaptive codebook comprises a sparse adaptive codebook for storing a plurality of sparse pitch prediction residual vectors (P), and
wherein the coder side comprises:
first means for receiving the perceptually weighted input speech signal vector and for arithmetically processing a time-reversing perceptual weighted input speech signal ('AAX) from the perceptually weighted input speech signal vector (AX);
second means for receiving as a first input the time-reversing perceptual weighted input speech signal output from the first means, and for receiving as a second input the plurality of sparse pitch prediction residual vectors (P) successively output from the sparse adaptive codebook, and for multiplying the two inputs producing a correlation value ('AP)AX);
third means for receiving the pitch prediction residual vectors and for determining autocorrelation value ('(AP)AP) of a vector (AP) being a perceptual weighting reproduction of the plurality of pitch prediction residual vectors; and
fourth means for receiving the correlation value from the second means and the autocorrelation value from the third means, and for determining an optimum pitch prediction residual vector and an optimum code vector.

5,199,077
WORDSPOTTING FOR VOICE EDITING AND INDEXING
Lynn D. Wilcox, Portola Valley, and Marcia A. Bush, Belmont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Sep. 19, 1991, Ser. No. 762,290
Int. Cl.[5] G10L 5/06, 5/00
U.S. Cl. 381—43 19 Claims



1. A wordspotting method for determining the location of a word in recorded continuous voice-speech using a single spoken version of the word as a keyword, comprising:
(a) creating a first hidden Markov model (HMM) representing features of the voice that recorded the speech,
(b) providing the keyword,
(c) creating a second hidden Markov model (HMM) representing features of the keyword to be spotted, said first and second HMMs comprising a sequence of states each having an output representative of an acoustic unit and transition probabilities to succeeding states and having a normalized forward probability for each state and having an endstate for the keyword,
(d) using the first and second HMMs, scanning through the recorded speech computing the normalized forward probability for each state searching for a peak in the a posteriori probability of the endstate of the keyword thus hypothesizing that the end time of a keyword has been found,
(e) if a peak is found in step (d), stopping the scanning and backtracking through the recorded speech to the most probable hypothesized keyword beginning time while computing a score for that hypothesized keyword, where the score represents a measure of how well the second HMM representing background speech fits the hypothesized keyword beginning and end times relative to how well the first HMM fits the said beginning and end times,
(f) indicating the keyword has been spotted in the recorded speech when the score computed in step (e) exceeds a pre-set value.

5,199,078
METHOD AND APPARATUS OF DATA REDUCTION FOR DIGITAL AUDIO SIGNALS AND OF APPROXIMATED RECOVERY OF THE DIGITAL AUDIO SIGNALS FROM REDUCED DATA
Reinhold Orgmeister, Berlin, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Mar. 6, 1990, Ser. No. 489,261
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1989, 3907551
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—47 8 Claims

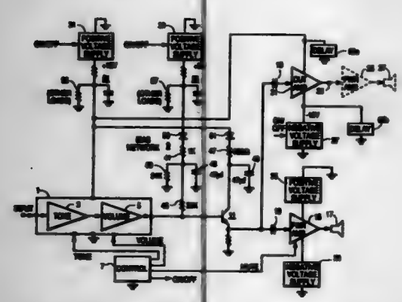


1. A method of data reduction of a digital audio signal for recording or transmission and for approximated recovery of the digital audio signal after recording or transmission, wherein preliminary steps for data reduction include overlapping windowing followed by fast Fourier transformation to produce spectral values and final steps of approximated recovery include inverse fast Fourier transformation and inverse overlapping windowing, while intermediate steps immediately preceding and immediately following recording or transmission are respectively multiplexing and demultiplexing operations, said fast Fourier transformation steps respectively producing and requiring scaling factors, characterized in that said method further comprises the steps of:
converting said spectral values into spectrally differentiated magnitude values and corresponding phase values:
logarithmically quantizing said magnitude values;
linearly quantizing said phase values;
grouping and averaging spectrally adjacent quantized magnitude values at least for magnitudes in an upper spectral range extending to the upper spectral extremity of said spectral values to produce representative magnitude values;
multiplexing ungrouped values of said quantized magnitude values, said representative magnitude values, said quantized phase values and also said scaling factors produced by said fast Fourier transformation step, for transmission or recording as a reduced data audio signal.

5,199,079
SUPPLY VOLTAGE RESPONSIVE AUDIBLE TRANSIENT (POP) SUPPRESSION ARRANGEMENT
Mark R. Anderson, Indianapolis, and John A. Andrews, Greenwood, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed May 21, 1991, Ser. No. 703,107
Int. Cl.[5] H04B 15/00
U.S. Cl. 381—94 16 Claims

1. In an audio channel for processing an audio signal, apparatus comprising:
means for amplifying said audio signal;
means for selectively providing a supply voltage;
means for storing a voltage related to said supply voltage;
means for coupling said stored voltage to said audio signal amplifying means as an operating voltage; and
means for selectively coupling said supply voltage providing means to said voltage storing means when said supply voltage is provided and selectively decoupling said supply

voltage providing means from said voltage storing means when said supply voltage is removed so that said operating voltage for said audio signal amplifying means is temporarily maintained by said storing means after said supply voltage is initially removed.

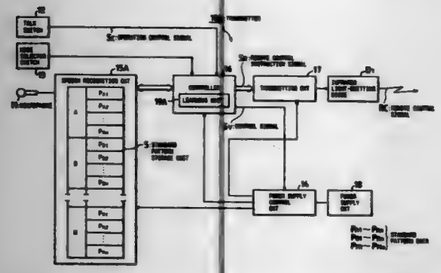


5,199,080

VOICE-OPERATED REMOTE CONTROL SYSTEM

Toshiyuki Kimura, and Kazuo Yabe, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,706
Claims priority, application Japan, Dec. 29, 1989, 1-341629
Int. Cl.[5] H03G *3/20*
U.S. Cl. 381—110 5 Claims



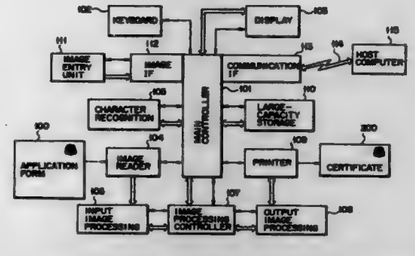
1. A voice-operated remote control system comprising:
a microphone for converting a spoken voice command into an electric signal;
storage means for storing for said voice command a plurality of sets of different standard pattern data, each set of different standard pattern data being independently representative of said voice command as spoken by at least one speaker;
speech recognition means for converting the electric signal into pattern data and for comparing the pattern data with the plurality of sets of different standard pattern data to recognize one of the sets of the different standard pattern data as corresponding to the spoken voice command; and
transmitting means for generating and transmitting a remote control signal based on the recognized spoken voice command.

5,199,081

SYSTEM FOR RECORDING AN IMAGE HAVING A FACIAL IMAGE AND ID INFORMATION

Tutomu Saito, Yokohama, and Akito Iwamoto, Kamakura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1990, Ser. No. 627,757
Claims priority, application Japan, Dec. 15, 1989, 1-323928; Oct. 24, 1990, 2-287464
Int. Cl.[5] G06K *9/34, 9/42, 9/20, 5/00*
U.S. Cl. 382—2 4 Claims



1. A system for recording an image having a facial image and ID information in a predetermined recording format, comprising:
a form having a format which includes an area for the facial image, an area for a monochrome image constituting a part of the ID information, an area for a character image constituting the other part of the ID information, reference marks for specifying reference coordinates of at least two of said facial image area, said monochrome image area, and said character image area and identification marks for identifying the format;
image reading means for reading the images on the form to output image signals from said areas;
processing means for identifying the format of said form based on said identification marks, and for processing the image signals of said areas output from said image reading means to fit said recording format, in according with the specified reference coordinates and the identified format of said form; and
recording means, responsive to image signals processed by said processing means, for recording the facial image, the monochrome image and the character image.

5,199,082

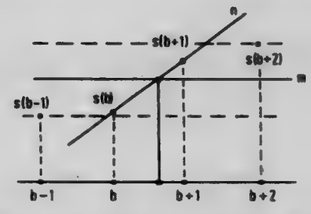
METHOD OF DETECTING AN AMPLITUDE TRANSIENT IN A FIELD OF ELEMENTS HAVING A MULTIVALENT AMPLITUDE DISTRIBUTION, DEVICE SUITABLE FOR PERFORMING THE METHOD, AND VIDEO SYSTEM INCLUDING THE DEVICE

Willem J. Venema, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 581,500, Sep. 11, 1990, abandoned. This application Nov. 1, 1991, Ser. No. 798,251
Claims priority, application Netherlands, Sep. 11, 1989, 8902257
Int. Cl.[5] G06K *9/48*
U.S. Cl. 382—22 14 Claims

1. A method of detecting and localizing an amplitude transient by searching along a search curve directed through a field of regularly spaced apart signal elements with a multivalent amplitude distribution, said method comprising:
obtaining amplitude values of successive arrays of said signal elements selected by respective successive positions of a window onto said field advanced along said search curve, each array including three signal elements arranged along a line;

detecting the occurrence of an amplitude transient along said line; and
determining the location of said amplitude transient along



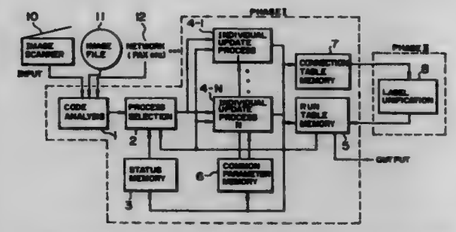
said line by interpolating to a fraction, less than ½, of the spacing between adjoining signal elements along said line as a function of the amplitude values of each of said three signal elements.

5,199,083

IMAGE DATA PROCESSING METHOD AND SYSTEM FOR GIVING IDENTIFICATION LABELS TO AREAS OF CONNECTED BLACK PICTURE ELEMENTS

Haruo Takeda, Palo Alto, Calif., assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1991, Ser. No. 736,050
Claims priority, application Japan, Jul. 30, 1990, 2-199293
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—26 14 Claims



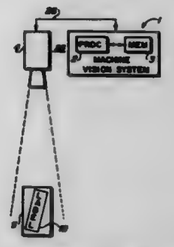
1. An image data processing method for giving area identification labels to individual image areas included in image data wherein each image area is composed of consecutive picture elements having a same color with each other, the method comprising:
a step of analyzing image data compressed by modified READ coding in units of one code word and updating contents of first table means for storing, for a plurality of runs each said run being composed of at least one consecutive picture element having said same color as objects of labeling, a relationship between run data indicative of a position of each run in the image data and a value of a provisional label given to that run, and contents of second table means for storing a relationship between provisional labels to be later unified so as to have a same value, the updating being made each time the image data is analyzed in units of one code word, on the basis of one of predetermined processing rules selected in accordance with a kind of code word analyzed; and
a step of correcting the value of the provisional label for each run stored in said first table means on the basis of the contents of said second table means.

5,199,084

APPARATUS AND METHOD FOR LOCATING CHARACTERS ON A LABEL

Gregory T. Kishi, and Michael P. McIntosh, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1991, Ser. No. 745,651
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—48 18 Claims



9. A robotic vision system for reading coded data on a label, the label being attached to an article for identifying said article, wherein the time required to reach each one of the coded data on the label is reduced by accurately predicting the location of each one of the coded data on the label thereby reducing a size of each coded data search window, said robotic vision system comprising:
a processor;
a memory coupled to said processor;
a camera coupled to said processor;
wherein said processor comprises:
means for searching a first image window for identifying a first object, the first object being a top portion of the label;
means for searching a second image window for identifying a second object, the second object being a bottom portion of the label;
means for determining a first reference position on the first object and a second reference position on the second object;
means for predicting a first coded data window location for placing a first coded data window, the location being relative to the first and second reference positions;
means for reading a first coded data; and
means for searching the first and second image windows for third and fourth objects, respectively, if the processor failed to identify the first or second objects, or if the processor failed to read the first coded data.

5,199,085

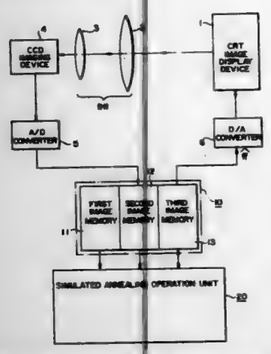
APPARATUS FOR RESTORING ORIGINAL IMAGE FROM DEGRADED IMAGE

Nagaaki Ohyama, Kawasaki, and Toshiaki Wada, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1991, Ser. No. 671,495
Claims priority, application Japan, Mar. 28, 1990, 2-79717
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—54 5 Claims

1. An image restoration apparatus comprising:
an image display means for displaying an image estimated as a nondegraded original image;
lens system means for focusing the estimated image displayed on said image display means, said lens system means in a restoration mode including a correction lens system for adjusting a focusing characteristic;
image input means for receiving image information of said estimated image by photographing the estimated image displayed on the image display means by use of said lens system means;
comparing means for comparing the input image information received by said image input means with degraded

image information prepared beforehand to obtain a difference therebetween; and



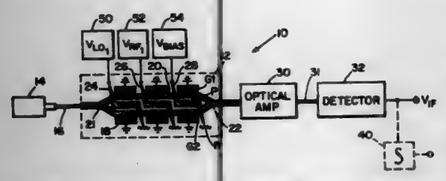
restoring means for performing restoration of an original image by changing the estimated image by using a random number of the basis of the difference obtained by said comparing means.

5,199,086

ELECTRO-OPTIC SYSTEM

Leonard M. Johnson, Carlisle; Warren K. Hutchinson, Dracut, and Alexander Sonnenschein, Weston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 17, 1991, Ser. No. 642,516
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—2 **41 Claims**



1. An electro-optic mixer for mixing at least two electrical signals to obtain voltage product terms of said electrical signals comprising:

a) an electro-optic intensity modulator in which the optical output is light transmission which varies non-linearly in accordance with the voltages of the electrical signals applied to it;

b) a source of light coupled to said modulator;

c) electrode means for applying electrical signals to said modulator;

d) bias means for setting the operating point of said modulator where the light transmission versus electrical signal voltage transfer function is comprised of even-order non-linearities: and

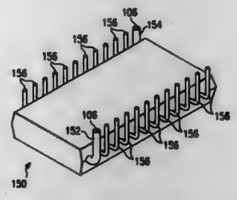
e) an optical detector for receiving the optical output of the modulator to provide an electrical output signal containing the desired product terms.

5,199,087

OPTOELECTRONIC INTEGRATED CIRCUIT FOR TRANSMITTING OPTICAL AND ELECTRICAL SIGNALS AND METHOD OF FORMING SAME

Gary A. Frazier, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1991, Ser. No. 816,505
Int. Cl.[5] G02B *6/12*; H01L *21/70, 27/02*; C03B *11/08*
U.S. Cl. 385—14 **34 Claims**



1. An optoelectronic integrated circuit, comprising:

an integrated circuit chip;

a package having a cavity therein for receiving and encapsulating said chip; and

a plurality of optically transmissive filaments having first ends coupled with said chip and second ends opposite said first ends positioned outside said package, said second ends insertable into a socketed circuit board for transmitting optical signals

a plurality of pins extending from said package and each including a conductor, a plurality of electrically conductive lead wires connected to said chip and coupled with said respective ones of said conductors, said conductors aligned with respective ones of said filaments for transmitting optical and electrical signals to said circuit board.

15. A method of optically connecting a fiber optic filament to an optically active device in an optoelectronic integrated circuit chip, comprising the steps of:

melting an end of the filament to form a spherical lens;

forming a silicon dioxide layer over the optically active device;

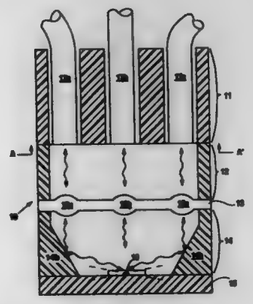
fusing the spherical lens to the layer to form an optical connection between the optically active device and the filament.

5,199,088

FIBER OPTIC SWITCH WITH SPATIAL LIGHT MODULATOR DEVICE

Gregory A. Magel, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1991, Ser. No. 815,454
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—18 **21 Claims**



1. A switch for optical fibers, comprising:

an optical fiber holder layer for holding the ends of two outer fibers and one middle fiber parallel to each other;

a lens layer having a lens associated with each of said ends, for coupling light to and from said ends;

a spacer layer for separating said fiber holder layer and said lens layer at a predetermined distance from each other and above a tilting mirror;

a grazing mirror layer beneath said lens layer and above said spatial light modulator device layer, having a grazing mirror associated with each of said outer fibers, for directing light to or from said outer fibers at a predetermined grazing incidence angle;

a tilting mirror capable of being moved to a tilt angle in either of two directions with respect to a horizontal plane, wherein said horizontal plane is defined by a normal axis of said middle fiber, wherein said tilting mirror directs light to and from said outer fibers when in said tilted positions; and

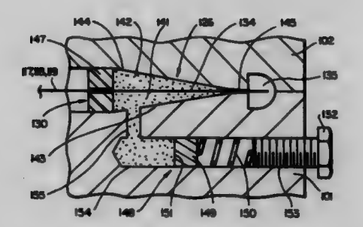
an electrode circuit for controlling the position of said tilting mirror.

5,199,089

STRAINED DISTRIBUTED OPTICAL FIBER COMMUNICATION SYSTEM

Bruce D. Campbell, Portola Valley; Joseph Zacker, Foster City, and James E. Jervis, Atherton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 513,526, Apr. 19, 1990, Pat. No. 5,109,445, which is a continuation-in-part of Ser. No. 265,735, Nov. 1, 1988, Pat. No. 4,983,008, which is a continuation-in-part of Ser. No. 87,957, Aug. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 899,368, Aug. 22, 1986, abandoned, and a continuation-in-part of Ser. No. 899,363, Aug. 22, 1986, abandoned. This application Jan. 24, 1992, Ser. No. 825,234
The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 **3 Claims**



1. A distribution system for interconnecting a plurality of stations and at least one central office or remote extension thereof for communicating information therebetween, comprising:

a plurality of stations;

means for interconnecting the stations and the central office or remote extension thereof, the interconnecting means including at least one optical fiber comprising a glass core surrounded by a glass cladding surrounded by a protective coating in contact with the cladding, the coating being substantially transparent to light guided by the core used to represent the information and having an index of refraction so as to allow light coupling at a bend, the fiber having a predetermined proof stress strength;

at least one optical tap disposed on the optical fiber and in communication with the plurality of stations, the at least one tap including bending means for maintaining a bend in the fiber of a radius sufficiently small so as to enable either light injection into or light withdrawal from the core of the optical fiber by passing the light being injected or detected through a side of the fiber cladding and coating at an unbroken intermittent section of the fiber, the fiber bend having a maximum radius of curvature sufficiently small so as to impose a maximum static stress on the fiber glass in excess of one-half the fiber proof stress, the bending means maintaining the maximum stress on the fiber whenever light is being transmitted on the fiber regardless of whether one or more telephones associated with the tap is in operation or is operational;

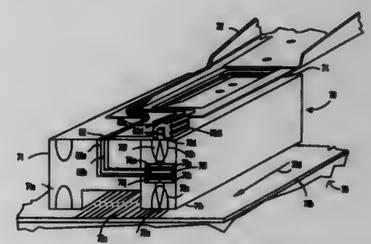
at least one means for enclosing the at least one tap and bend associated therewith so as to provide a water-tight seal for the at least one tap capable of keeping water located outside the enclosing means from entering an interior thereof and contacting the at least one tap and associated bend.

5,199,090

FLYING MAGNETOOPTICAL READ/WRITE HEAD EMPLOYING AN OPTICAL INTEGRATED CIRCUIT WAVEGUIDE

Bernard W. Bell, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 6, 1992, Ser. No. 847,553
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—33 **20 Claims**



1. A magnetooptic read/write head for magnetically recording on a magnetooptic media or for reading magnetic recordings thereon, comprising:

a slider body having a surface adapted to be disposed adjacent the surface of said magnetooptic media;

a waveguide structure on said slider, said waveguide structure having opposite ends, one of said opposite ends of said waveguide structure being disposed adjacent said surface of said slider;

a light source on said slider coupled to said waveguide structure adjacent the other of said opposite ends of said waveguide structure;

detector means having light sensitive means coupled to said waveguide structure for sensing light in said waveguide structure;

a magnetic circuit, having at least two poles, each pole having an end, said magnetic circuit being disposed on said slider with the end of one pole overlying said one of said opposite ends of said waveguide structure, the other of said two poles being disposed on said slider removed from said one pole and said one of said opposite ends of said waveguide structure and having the end of said other of said two poles adjacent said first surface of said slider, the ends of said poles adapted to confront and form airgaps with the surface of said magnetooptic media; and

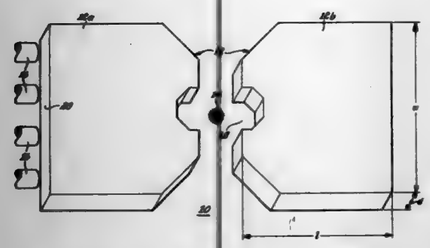
coil means electromagnetically coupled to said magnetic circuit for producing a magnetic field adapted to link said magnetooptic media across said airgaps.

VOL 1148 ISS 5 MR 30 1993 UMI

5,199,091
ARRANGEMENT AND A METHOD FOR COUPLING A LIGHT SOURCE TO A LIGHT GUIDE USING A SOLID OPTICAL COUPLER

John M. Davenport, Lyndhurst, Ohio; William W. Finch, Ann Arbor, Mich.; Richard L. Hausler, Pepper Pike, Ohio; John L. Henkes, Latham, N.Y., and Kenneth S. King, Willoughby Hills, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1991, Ser. No. 806,381
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—39 18 Claims



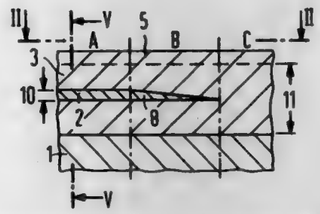
1. An arrangement for coupling light from a light source to a light transmitting arrangement comprising:
a solid optical coupler element constructed of a material having a high transmittance value in the visible region;
said solid optical coupler element being construction in a shape such that the length and width of a first surface are substantially greater than the depth of said solid optical coupler element; said width being effective in controlling the spread of light exiting an aperture formed in said optical coupler, and said length being effective in the dissipation of thermal energy between the light source and said aperture;
said aperture being formed in said optical coupler element so as to allow light to be communicated through said optical coupler element to said light transmitting arrangement;
a bore formed in said solid optical element and being sized such that said light source fits therein in a contacting relation to an inner surface surrounding said bore; and
wherein said inner surface surrounding said bore is optically smooth such that light from said light source is transmitted into said solid optical element thereby.

5,199,092
OPTOELECTRONIC DEVICE FOR COUPLING BETWEEN DIFFERENT DIMENSIONED WAVEGUIDES

Bernhard Stegmueller, Augsburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 31, 1992, Ser. No. 828,551
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1991, 4103929
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—50 15 Claims

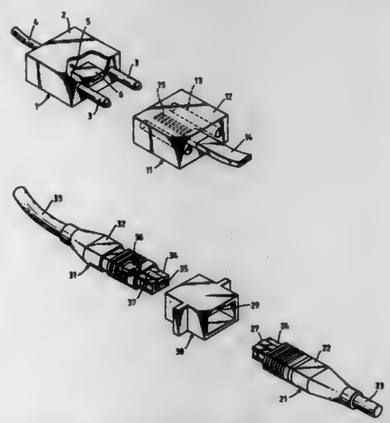
1. An optoelectronic device comprising a waveguide having first means for a narrow wave guidance in the lateral direction and second means for a broad wave guidance in the lateral direction, said first means and said second means being arranged to extend parallel to one another and being superimposed at least along a longitudinally directed portion of the waveguide, the second means comprising a broad ridge fashioned in a broad waveguide layer and said first means comprising a narrow waveguide having a higher refractive index being embedded in the material of the broad waveguide layer, one of said first and second means being continually reduced in thickness in the transversal direction along a section of the longitudinally directed portion so that a narrow wave guidance occurs adjoining one side of said section in the longitudinal direction and a broad wave guidance occurs adjoining the other side of said section in the longitudinal direction.



5,199,093
MULTI-PART OPTICAL FIBRE CONNECTORS

Philip C. Longhurst, Bunbury, England, assignor to Bicc plc., United Kingdom

Continuation of Ser. No. 700,477, May 15, 1991, abandoned. This application Mar. 30, 1992, Ser. No. 863,496
Claims priority, application United Kingdom, May 22, 1990, 9011424
Int. Cl.[5] G02B 6/36
U.S. Cl. 385—88 11 Claims

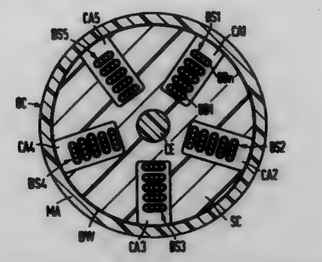


1. For use in a multi-part optical fibre connector, an optical fibre connector-part comprising a body of moulded plastics material having two oppositely disposed ends, at least one of which ends is adapted to make a plug and socket connection with an end of another optical fibre connector-part; and at least one optical conductor which is disposed within and extends between said two oppositely disposed ends of the body and which has permanently optically connected therein at least one discrete passive integrated optical chip for effecting at lest one passive fibre optic function, at least one permanent optical connection between the optical conductor and said optical chip being wholly encapsulated within the moulded plastics material of the body so that an optical signal is accurately transmittable between the optical conductor and said optical chip.

5,199,094
METHOD AND APPARATUS FOR MANUFACTURING AN OPTICAL CABLE

Reiner Schneider, Eberadorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 9, 1991, Ser. No. 803,562
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1990, 4041274
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—100 9 Claims

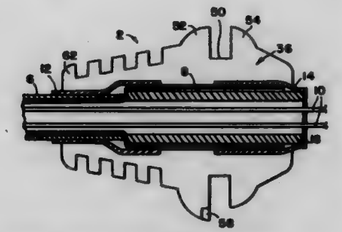


1. In a method for manufacturing an optical cable, which method includes providing a plurality of light waveguide supply reels, forming a group of light waveguides as a combined form of a band, and subsequently subjecting the band to a cabling process, the improvements comprising changing the torsion on the light waveguides by creating a pre-torsion on the light waveguides during the formation of the band by an overhead haul off of the light waveguides from each of the light waveguide supply reels, said pre-torsion being in a direction opposite to the direction of the torsion created during a cabling process of the band into a cable so that the resultant torsion on the light waveguides in the finished cable are diminished.

5,199,095
FIBEROPTIC CABLE FEEDTHROUGH FASTENER AND METHOD FOR FORMING SAME

Roger Iapicco, Little Ferry, N.J., assignor to Computer Crafts, Inc., Hawthorne, N.J.

Continuation-in-part of Ser. No. 696,238, May 6, 1991. This application Mar. 12, 1992, Ser. No. 849,749
Int. Cl.[5] G02B 6/36
U.S. Cl. 385—100 43 Claims

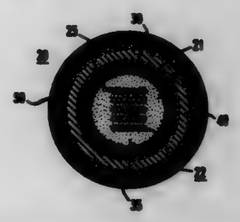


28. A feedthrough fastener comprised of:
(A) a PVC mold formed by an injection molding process, said PVC mold being configured with
(i) a fastening path conforming in size, shape and width to a preexisting aperture in a housing, and
(ii) a first protrusion positioned on one side of said fastening path and a second protrusion positioned on the opposing side of said fastening path, each of said first and second protrusions extending above said fastening path, said PVC mold encapsulating a cable, heat shrink tubing and protective tubing assembly, and having captured exposed aramid fibers from said assembly as said PVC mold cooled, and said PVC mold not extending beyond the outer end of the protective tubing of said assembly,
(B) a cable, heat shrink tubing and protective tubing assembly comprising
(i) a fiberoptic cable having an outer jacket surrounding a strength member of aramid fibers which in turn surrounds one or more buffered fibers wherein said jacket has been stripped from said cable at a fastening point and wherein said strength member has been stripped off the cable at a point beyond the fastening point,
(ii) a protective tubing positioned about the buffered fibers, said protective tubing abutting the end of said jacket and said protective tubing having said strength member positioned about its exterior, said protective tubing being heat resistant and capable of withstanding a compression force of 700 p.s.i. and said protective tubing having a wall with an inner diameter no greater than the outer diameter of said jacket and an outer diameter no less than the inner diameter of said jacket,
(iii) a first section of heat shrink tubing secured about the cable jacket and the protective tubing,
(iv) a second section of heat shrink tubing secured about the protective tubing such that said strength member is secured in place between said second section of heat shrink tubing and said protective tubing, and
(v) a gap of exposed strength member situated between said first section of heat shrink tubing and said second section of heat shrink tubing.

5,199,096
STEAM-RESISTANT CABLE SUCH AS STEAM-RESISTANT OPTICAL FIBER CABLE

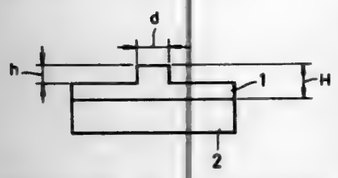
Krishnaswamy Kathiresan, 2544 Morgan Lake Dr., Marietta, Ga. 30066; Andrew J. Panuska, 5936 Islandview Dr., Buford, Ga. 30518, and Manuel R. Santana, 2175 River Cliff Ct., Roswell, Ga. 30076

Filed Oct. 30, 1991, Ser. No. 785,602
Int. Cl.[5] G02B 5/14, 6/44
U.S. Cl. 385—109 25 Claims



1. A steam-resistant cable, said cable comprising
a core comprising at least one transmission medium;
a first tubular member in which is disposed said core and which comprises a plastic material which resists degradation when exposed to relatively high temperatures;
a second tubular member which is disposed about said first tubular member, which has a sealed seam and which comprises a metallic material having a relatively low chemical or electrochemical reactivity; and
a jacket comprising a plastic material and being disposed about said second tubular member.

5,199,097
LIGHT WAVELENGTH SHIFTER
Kichiro Shinokura, and Tetsuro Endo, both of Tendo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 26, 1991, Ser. No. 765,734
Claims priority, application Japan, Oct. 18, 1990, 2-279957
Int. Cl.[5] G02B 6/00; G02F 1/37
U.S. Cl. 385—122 2 Claims

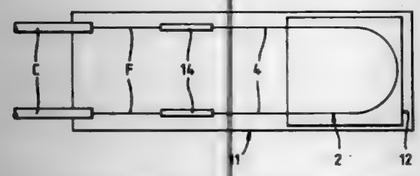


1. A light wavelength shifter device comprising:
an optical waveguide type light wavelength shifter element which comprises a core of a nonlinear optical crystal having a varying rate of refractive index with respect to temperature higher than 1×10^{-4}/° C., and a cladding in contact with the core so that a primary incident light on the core can be shifted to a second harmonic wave having a wavelength of half the wavelength of said primary incident light; and
a thermoelectric element in contact with said optical waveguide type light wavelength shifter element.

5,199,098
MOISTURE RESISTANT OPTICAL FIBER COATINGS WITH IMPROVED STABILITY
Kelly J. Nolan, Beaver Dams; Emily M. Squires, Painted Post, both of N.Y., and Eric H. Urrati, Wilmington, N.C., assignors to Corning Incorporated, Corning, N.Y.
Filed Oct. 9, 1991, Ser. No. 773,525
Int. Cl.[5] G02B 6/10
U.S. Cl. 385—128 4 Claims

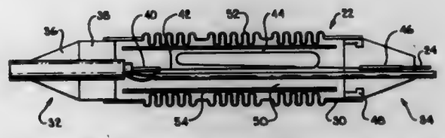
1. A coated optical fiber exhibiting improved moisture resistance which includes a glass optical fiber disposed within a cured polymer coating, characterized in that the cured polymer coating comprises a phosphite stabilizing agent in combination with a cured polyurethane-acrylate polymer, the urethane groups in the cured polymer being the reaction product of an aliphatic isocyanate and a predominantly saturated, predominantly nonpolar aliphatic diol.

5,199,099
OPTICAL CABLE SPLICE CASSETTE DEVICE AND METHOD USING SAME
David Dalgoutte, Ormskirk, England, assignor to BICC Public Limited Company, London, England
Filed Mar. 6, 1992, Ser. No. 847,335
Claims priority, application United Kingdom, Mar. 14, 1991, 9105435
Int. Cl.[5] G02B 6/40; B65D 1/34
U.S. Cl. 385—135 9 Claims



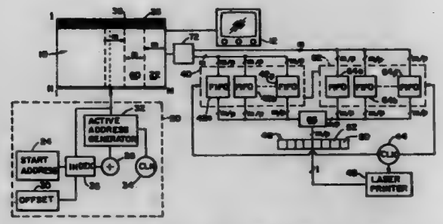
1. A method of effecting an optical connection between an optical fibre of one optical cable and an optical fibre of another optical cable, which method comprises:
(i) mounting in a cassette a preformed component comprising a housing and at least one discrete optical conductor which is so disposed in the housing that opposite end parts of the conductor, each of which end parts consists of at least one length of optical fibre, protrude from the housing at an acute angle to one another lying in the range 0° to 90° and that at least a part of an optical signal entering said discrete optical conductor along one of its protruding lengths of optical fibre will pass along a discrete optical path and said part of the optical signal will leave said optical conductor along another of its protruding lengths of optical fibre;
(ii) splicing one of the protruding lengths of optical fibre of the optical conductor of said preformed component to one of said two optical fibres to be optically connected and splicing another of said protruding lengths of optical fibre of said optical conductor to the other of said two optical fibres;
(iii) providing mechanical protection for each optical fibre splice; and
(iv) so mounting the protected optical fibre splices in said cassette that the protected optical fibre splices are spaced from said preformed component, at least one of the group consisting of the preformed component and the protected optical fibre splices being so detachably mounted in said cassette that the distance between the protected optical fibre splices and the preformed component can be reduced.

5,199,100
WET END TERMINATION FOR TOWED CABLE
Steven J. Maas, Simi Valley; A. Douglas Meyer, West Hills, and John F. Cappi, Canoga Park, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Filed Feb. 21, 1992, Ser. No. 838,893
Int. Cl.[5] G02B 6/00, 6/36
U.S. Cl. 385—139 11 Claims



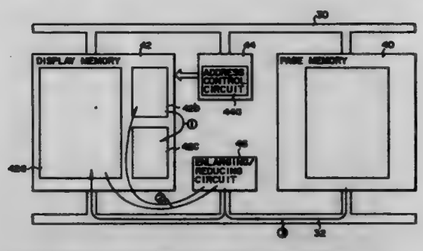
1. Apparatus for joining one end of a cable of the type that includes an elongated outer jacket that surrounds a first conductor to at least one sensor of the type that includes a second conductor, said apparatus comprising, in combustion:
a) a splice for joining said conductors;
b) said first conductor comprising a segment whereby the length of said first conductor exceeds the unstressed length of said outer jacket;
c) a front piece fixed to the outer jacket of said cable;
d) a rear end piece in spaced relationship to said front piece, said rear end piece enclosing said splice;
f) opposed ends of a wall being fixed to said front piece and said rear end piece to define a chamber; and
e) said segment being located within said chamber.

5,199,101
ON THE FLY IMAGE ROTATION SYSTEM FOR HIGH-SPEED PRINTERS
Daniel V. Cusick, Chesterland; Michael A. Chenera, Willoughby Hills, and Raymond G. Molnar, Boston Heights, all of Ohio, assignors to Bell & Howell Publication Systems Company, Wooster, Ohio
Filed Oct. 3, 1990, Ser. No. 592,186
Int. Cl.[5] G06K 15/00
U.S. Cl. 395—115 18 Claims



1. A system for concurrently displaying of M×N pixel images from raster image data read out in a raster direction and printing the read out raster image data transversely to the raster direction, the system comprising:
an M×N image memory means from which rows of image data are read out and displayed in the raster direction;
first and second FIFO memory means for alternately receiving m×N columns of the read out image data;
an addressing means for causing m×N columns of image data read out from the M×N image memory means to be supplied alternately to the first and second FIFO memory means;
a serializing means for alternately serializing the m×N columns of data from the first and second FIFO memory means and feeding the serialized data to a printer, where m is a plural integer that is equal to or less than M/2.

5,199,102
IMAGE PROCESSING APPARATUS HAVING MULTIPLE DISPLAY AREAS FOR EDITING
Hiroshi Sakuragi, Agee, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 428,621, Oct. 30, 1989, abandoned.
This application Feb. 28, 1992, Ser. No. 841,763
Claims priority, application Japan, Oct. 31, 1988, 63-275639
Int. Cl.[5] G06F 15/62
U.S. Cl. 395—139 1 Claim



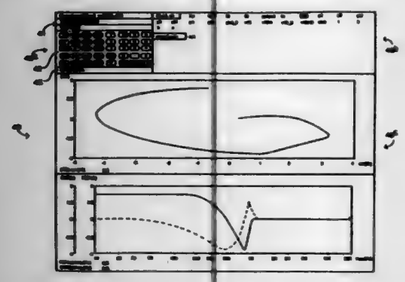
1. An image processing apparatus, comprising:
first memory means for storing at least three distinct images;
second memory means for storing at least three distinct retrieval information used for identifying each of the distinct images stored in the first memory means;
means for inputting retrieval information to the second memory means.
means for outputting from the first memory means an image that is identified by the inputted retrieval information that corresponds to one of the retrieval information stored in the second memory means;
page memory means for temporarily storing the identified image which is output from the first memory means;
means for displaying images, the display means including a square entirely display region having first and second rectangular display areas and a third rectangular display area that is wider than either the first or second rectangular display areas, the first, second and third rectangular display areas being arranged in the square entirety display region, with a longer side of the third rectangular display area being parallel to longer sides of the first and second display areas;
display memory means for temporarily storing images which are to be displayed on the display means, said display memory means including contents of first, second and third storage areas having storage capacities corresponding to the first, second and third rectangular display areas, respectively, the display memory means being connected to the display means and page memory means;
magnifying means for magnifying images which are to be displayed on the display means, the magnifying means including means for magnifying the image temporarily stored in the page memory means with a magnification corresponding to the storage capacity of the third storage area, means for magnifying an image stored as the contents of the third storage area, upon detection of such image, with a magnification corresponding to the storage capacity of the second storage area, and means for magnifying an image stored as the contents of the second storage area, upon detection of such image, with a magnification corresponding to the storage capacity of the first storage area;
transferring means for transferring the image magnified to the third storage area capacity from the page memory means to the contents of the third storage area, for transferring the image the third storage area to the contents of the second storage area, and for transferring the image magnified to the first storage area capacity from the contents of the second storage area to the contents of the first storage area; and
means for simultaneously displaying the contents of the first, second and third storage areas on the first, second and third rectangular display areas, respectively.

5,199,103
VECTOR CALCULATOR APPARATUS FOR GRAPHIC WAVEFORM MANIPULATION
David W. Smith, Forest Grove, and Scott A. Majdecki, Newberg, both of Oreg., assignors to Analogy, Inc., Beaverton, Oreg.
Division of Ser. No. 19,418, Feb. 26, 1987, Pat. No. 5,046,024.
This application Apr. 23, 1991, Ser. No. 689,953
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] G06F 15/20
U.S. Cl. 395—140 4 Claims

1. In a computer system, means for processing one or more selected vector arrays by operating thereon by vector operators to produce a vector result, said means comprising:
means for simulating the appearance and operation of a plural key calculator pad by creating a display window within the computer system, the display window resembling a calculator, with selected ones of the keys in the pad

being associated in the system with different vector operators;

means for inputting one or more selected vector arrays; and



user-operable means associated with such keys for processing such vector arrays.

5,199,104

ELECTRONIC ORGANIZER WITH ELECTRONIC BOOK MARKER

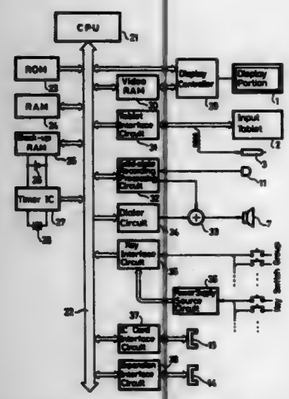
Tomoaki Hirayama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,258

Claims priority, application Japan, Dec. 15, 1988, 63-316838; Dec. 27, 1988, 63-330138

Int. Cl.[5] G06F *15/20*

U.S. Cl. 395—145 5 Claims



1. An electronic organizer, comprising:

computer control means for controlling and organizing data, the data being organized as pages in a book;

input means coupled to the computer control means for entering data into the electronic organizer;

memory means coupled to the computer control means for storing said data;

display means coupled to the control means and the memory means for displaying at least one page of data; and

an exclusively dedicated operating key operatively coupled to the computer control means for placing and removing at least one electronic bookmark on a page of data so that the page of data so marked can be immediately accessed by actuation of said key.

5,199,105

UNIVERSAL ASYNCHRONOUS RECEIVER/TRANSMITTER

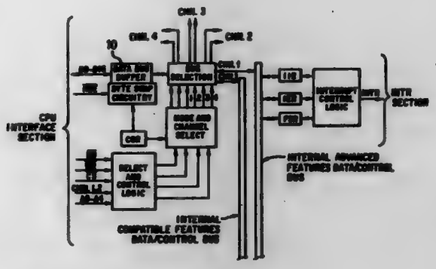
Martin S. Michael, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 244,920, Sep. 14, 1988, Pat. No. 5,140,679.

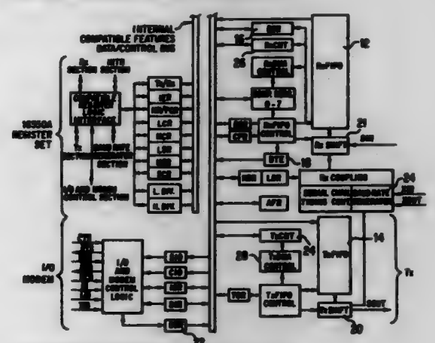
This application Aug. 15, 1991, Ser. No. 745,613

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—275 13 Claims



UART BLOCK DIAGRAM (1 SERIAL CHANNEL SHOWN)



UART BLOCK DIAGRAM (1 SERIAL CHANNEL SHOWN)

1. A data processing system comprising:

(a) a data processing system having a direct memory access unit associated therewith for transferring data characters from a system memory of the data processing system to a data communications device utilizing the direct memory access unit;

(b) a data communications device comprising

(i) transmitter memory means having storage locations for a plurality of data characters received by the data communications device from the system memory;

(ii) means for determining whether the transmitter memory means is empty;

(iii) means for establishing a count of the number of data characters that are to be transferred from the system memory to the data communications device utilizing the direct memory access unit;

(iv) means for enabling the direct memory access unit for direct transfer of the number of data characters from the system memory to the data communications device; and

(v) means for transferring the number of data characters to the data communications device utilizing the direct memory access unit.

5,199,106

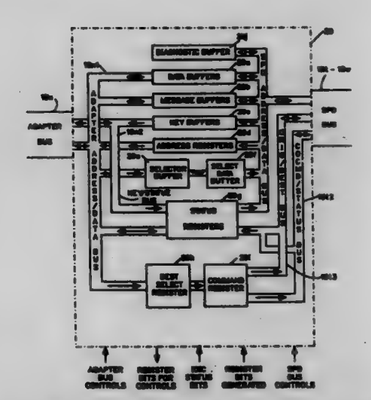
INPUT OUTPUT INTERFACE CONTROLLER CONNECTING A SYNCHRONOUS BUS TO AN ASYNCHRONOUS BUS AND METHODS FOR PERFORMING OPERATIONS ON THE BUS

Donall G. Bourke, Boca Raton; Douglas R. Chisholm, Delray Beach, both of Fla.; Gregory D. Float, Vestal, N.Y.; Richard A. Kelley, Coral Springs, Fla.; Roy Y. Liu; Carl A. Malmquist, both of Vestal, N.Y.; John M. Nelson, Apalachin, N.Y.; Charles B. Perkins, Jr., Endicott, N.Y.; Richard L. Place, Vestal, N.Y.; Hartmut R. Schwermer, Stuttgart, Fed. Rep. of Germany, and John D. Wilson, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 452,779, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 909,431, Sep. 19, 1986, abandoned. This application Aug. 15, 1990, Ser. No. 568,530

Int. Cl.[5] G06F *13/16*

U.S. Cl. 395—275 11 Claims



1. In a device for attachment to an asynchronous bus (10*f*) of the type having a plurality of attached users, said asynchronous bus (10*f*) also having an Address/Data bus (10*f*1), an Origin/Destination bus (10*f*3), a Command/Status bus (10*f*2) and a Control Line group (10*f*4), said device having a primary functional section and a bus interface section (12) for joining said asynchronous bus (10*f*) to said primary functional section, said bus interface section (12) being disposed to operate in either a master mode for presenting data to said asynchronous bus (10*f*) or a slave mode for accepting data from said asynchronous bus (10*f*), said bus interface section (12) comprising:

master control unit means (40*a*) connected to said asynchronous bus (10*f*) for requesting control of said asynchronous bus (10*f*) and for issuing data to said asynchronous bus (10*f*) in response to acquiring said control during said master mode of operation;

slave control unit means (40*b*) connected to said asynchronous bus (10*f*) for accepting and responding to data received from said asynchronous bus (10*f*) during said slave mode of operation;

data buffer means (20*a*) connected to said Address/Data bus (10*f*1) for storing data received from said Address/Data bus (10*f*1) during said slave mode of operation;

message buffer means (20*b*) connected to said Address/Data bus (10*f*1) for storing data for presentation to said Address/Data bus (10*f*1) during said master mode of operation; and

command register means (20*f*) attached to said Origin/Destination bus (10*f*3) and said Command/Status bus (10*f*2) for storing data for presentation to said Origin/Destination bus (10*f*3) and Command/Status bus (10*f*2) during said master mode of operation.

5,199,107

CONTROLLER FOR EFFECTING A SERIAL DATA COMMUNICATION AND SYSTEM INCLUDING THE SAME

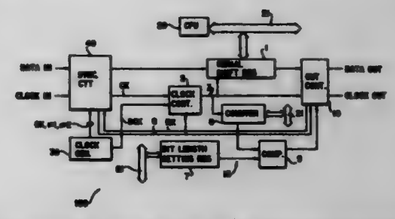
Yukihiro Ozawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 17, 1990, Ser. No. 583,280

Claims priority, application Japan, Sep. 19, 1989, 1-242675

Int. Cl.[5] G06F *13/42*

U.S. Cl. 395—325 27 Claims



1. A controller provided in a receiving side of a serial data communication system and receiving serial data from a transmitting side thereof, the controller comprising:

a memory means connected to an internal bus, for serially storing data of a predetermined bit length of the serial data communication;

a bit length setting means for arbitrarily setting a bit length of data to be received from the memory means;

a synchronization means, operatively connected to the memory means and responsive to a) serial data from the transmitting side, b) a first clock and c) a second clock, said synchronization means for synchronizing the serial data with the first clock when the serial data communication is carried out, and for synchronizing the serial data with the second clock when the serial data communication is not carried out; and

a communication control means, operatively connected to the synchronization means, said communication control means a) for counting the first clock, b) when a counted value of the first clock is within a value defined by said arbitrarily set bit length, for indicating a first duration in which the controller is permitted to effect the serial data communication, and c) when the counted value is out of the value defined by the arbitrarily set bit length, for indicating a second duration in which the controller is inhibited to effect the serial data communication,

wherein when the first duration is indicated by said communication control means, data of said arbitrarily set bit length is taken out of the serial data stored in the memory means and received in the internal bus, and when the second duration is indicated by said communication control means, receiving the serial data by the internal bus in inhibited.

5,199,108

SHORT RANGE RADIO INFORMATION SYSTEM

Richard E. Morgan, Richardson, and Nolan D. Self, Duncanville, both of Tex., assignors to Electronic Communications, Inc., Garland, Tex.

Filed Dec. 30, 1988, Ser. No. 292,494

Int. Cl.[5] H04B *7/14*

U.S. Cl. 455—18 5 Claims

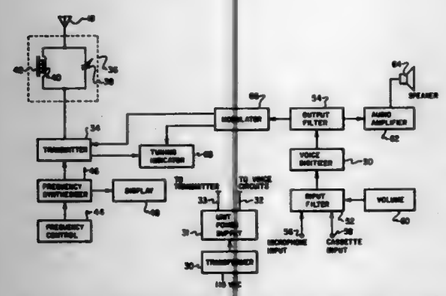
1. A low power AM band broadcast station, comprising:

an antenna;

a transmitter;

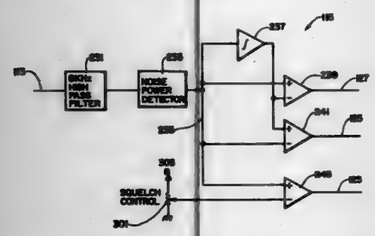
a tuning circuit coupled to said antenna and to said transmitter, wherein said tuning circuit has an inductor and a capacitor in parallel, wherein said tuning circuit matches the impedance of the transmitter with that of the antenna,

and wherein the inductor is formed on a high magnetic permeability element to form a high-Q inductor;
means coupled to said transmitter for controlling the frequency of a transmitted carrier signal;
a modulator coupled to said transmitter for modulating the carrier signal in response to an applied electrical signal representing audio information;
means for accepting an audio signal and converting it to a corresponding electrical signal;



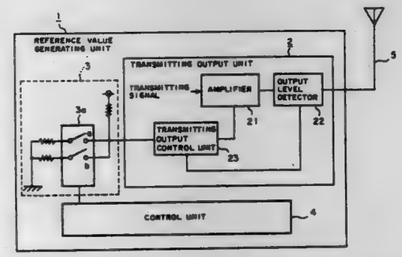
an A to D converter coupled to said accepting means for converting the electrical signal into digital form;
a memory for storing the digital form of the electrical signal;
a D to A converter coupled to said memory and to said modulator for converting the digital form to a second electrical signal and applying it to said modulator; and
control means coupled to said memory and to said D to A converter for repeatedly reading the digital form of the electrical signal from said memory.

5,199,109
MULTI CHANNEL SCANNING RECEIVER WITH IMPROVED SIGNAL STRENGTH DETECTING CIRCUITRY
William Baker, Indianapolis, Ind., assignor to Uniden, Ft. Worth, Tex.
Filed Oct. 26, 1989, Ser. No. 426,768
Int. Cl.[5] H04B *1/16*
U.S. Cl. 455—161.2 **13 Claims**



8. A radio receiver for receiving radio broadcast signals over a plurality of channels, said radio receiver comprising:
means for sensing the presence or absence of a signal on a radio channel;
means, including an integrator, for determining the trend over time of the signal strength of a radio channel, said integrator holding the past signal strengths of the radio channel;
means for sending a signal from said sensing means to said means for determining the trend over time indicating the presence or absence of a signal; and
means functionally connected to said trend determining means for generating, as a result of the determination of said trend over time, a first signal indicative of signal strength increasing with time, a second signal indicative of signal strength decreasing with time, and a third signal indicative of signal strength above a selected threshold.

5,199,110
TRANSMITTING POWER CONTROL CIRCUIT
Keigo Adachi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1990, Ser. No. 573,966
Claims priority, application Japan, Jun. 8, 1990, 2-150554
Int. Cl.[5] H01Q *11/12*; H04B *1/04*
U.S. Cl. 455—126 **2 Claims**

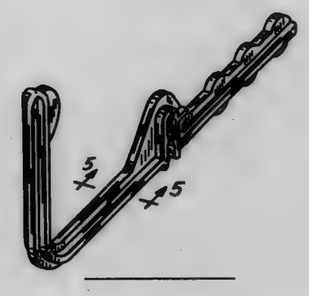


1. In a transmitting power control circuit of the type having an output level detector which detects transmitting output level and outputs a detected level signal depending on such transmitting output level, and a transmitting output control unit which controls said transmitting output level to a predetermined level in a specified range on the basis of said detected level signal and an output reference value specifying said predetermined level, a transmitting power control circuit comprising:
a reference value generating unit which generates output reference values corresponding to different higher and lower transmitting output levels within said specified range, and
a control unit connected to said reference value generating unit for applying to said reference value generating unit an instruction to output the output reference value corresponding to the higher transmitting output level in the case where said transmitting signal is data signal, and an instruction to output the output reference value corresponding to the lower transmitting output level in the case where said transmitting signal is voice signal.

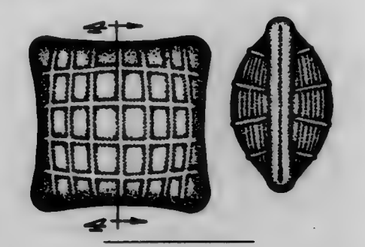
DESIGNS

MARCH 30, 1993

334,273
HANDLE STICK FOR A CONFECTIONARY PRODUCT
Dennis Kupperman, Glenview, Ill., assignor to RB Toy Development Co., Skokie, Ill.
Filed Jan. 14, 1991, Ser. No. 640,847
Term of patent 14 years
U.S. Cl. D1—105

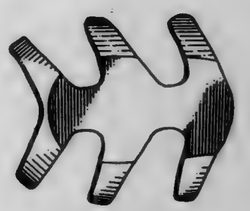


334,274
FOOD PRODUCT PIECE
Dean W. Creighton, Albertville, and John D. Efstathiou, Plymouth, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Dec. 17, 1990, Ser. No. 628,760
Term of patent 14 years
U.S. Cl. D1—128



334,275
SHOE FOR MARINE AND ATHLETIC ACTIVITIES
Harry Miller, 416 Commonwealth Ave., #220, Boston, Mass. 02215, and Rosalba L. Mische, 12 Maple St. Extension, Hopkinton, Mass. 01748
Filed Mar. 11, 1991, Ser. No. 668,412
Term of patent 14 years
U.S. Cl. D2—265

334,276
ELEMENT OF A SHOE SHOLE
Craig L. Feller, and John S. Earle, both of Tigard, Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Division of Ser. No. 647,637, Jan. 13, 1991, Pat. No. Des. 326,351. This application Jan. 24, 1992, Ser. No. 826,177
Term of patent 14 years
U.S. Cl. 82—314

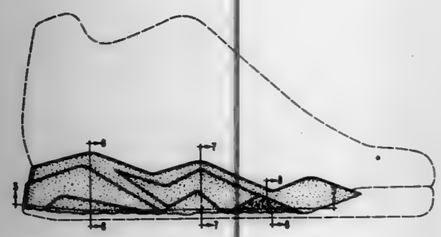


334,277
SHOE UPPER
Tracy Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1992, Ser. No. 875,721
Term of patent 14 years
U.S. Cl. D2—314

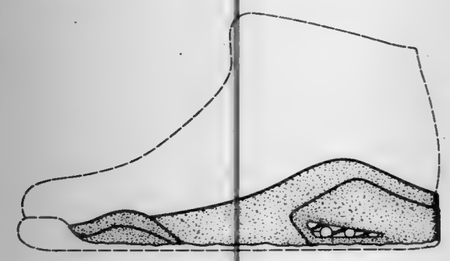
334,278
SHOE MIDSOLE PERIPHERY
Pamela S. Greese, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 4, 1992, Ser. No. 877,776
Term of patent 14 years
U.S. Cl. D2—314

VOL 1148 ISS 5 MR 30 1993 UMI

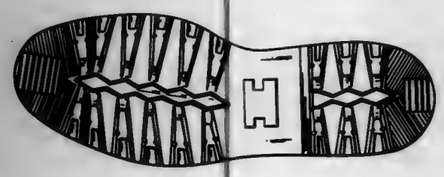
334,279
SHOE SOLE PERIPHERY
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 12, 1992, Ser. No. 881,832
Term of patent 14 years
U.S. Cl. D2—314



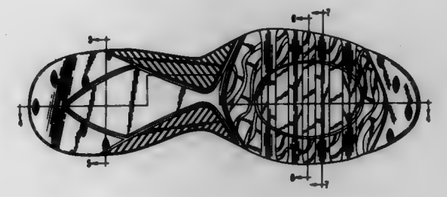
334,280
SHOE MIDSOLE PERIPHERY
Tracy L. Teague, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 12, 1992, Ser. No. 881,835
Term of patent 14 years
U.S. Cl. D2—314



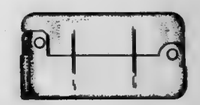
334,281
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H.H. Brown Shoe Company, Inc., Greenwich, Conn.
Filed Jan. 30, 1991, Ser. No. 648,394
Term of patent 14 years
U.S. Cl. D2—320

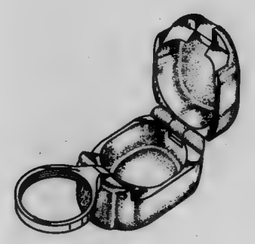


334,282
OUTSOLE BOTTOM
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 1, 1992, Ser. No. 877,065
Term of patent 14 years
U.S. Cl. D2—320

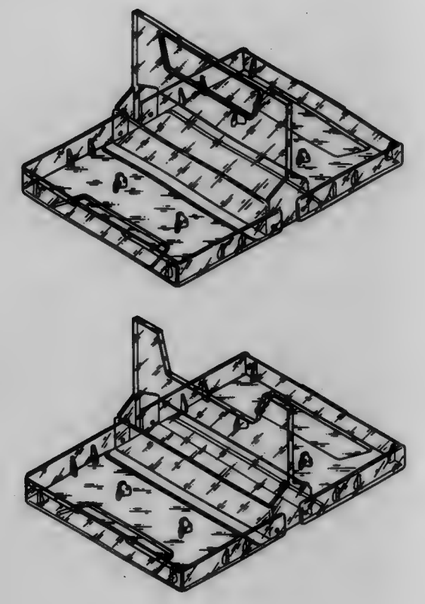


334,283
FOLDING LENS CASE
John J. Schroth, Doylestown, Pa., assignor to Edmund Scientific Company, Barrington, N.J.
Filed Jul. 1, 1991, Ser. No. 723,645
Term of patent 14 years
U.S. Cl. D3—33

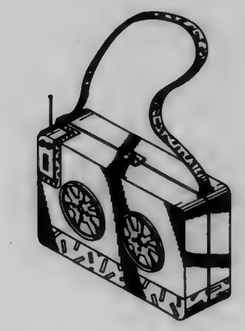




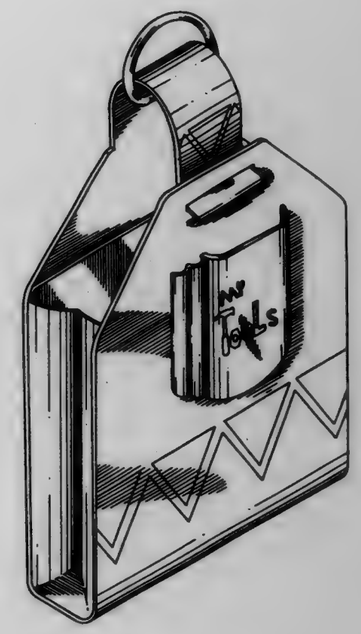
334,284
CASE FOR AUDIO TAPE CASSETTES
Kazuhisa Horikiri, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 17, 1991, Ser. No. 716,231
Term of patent 14 years
U.S. Cl. D3—35



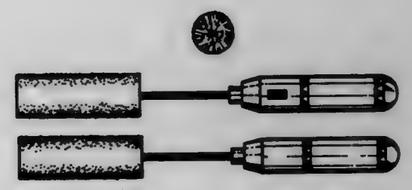
334,285
COMBINED RADIO AND POCKET BOOK COVER
Preston L. Wilson, 707 W. Queen St., Hampton, Va. 23669-3948
Filed Aug. 8, 1990, Ser. No. 564,300
Term of patent 14 years
U.S. Cl. D3—43



334,286
PERSONALIZED TOOL SET HOLDER
Ruth-Kay M. Keene, 82 Gillander Ave., Auburn, Me. 04210
Filed Jan. 8, 1991, Ser. No. 638,660
Term of patent 14 years
U.S. Cl. D3—105

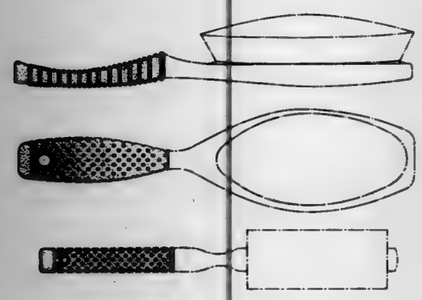


334,287
POWER DRIVEN BOTTLE BRUSH
Dan Ingles, 6289 Rattle Run, St. Clair, Mich. 48079
Filed Nov. 13, 1991, Ser. No. 791,614
Term of patent 14 years
U.S. Cl. D4—102

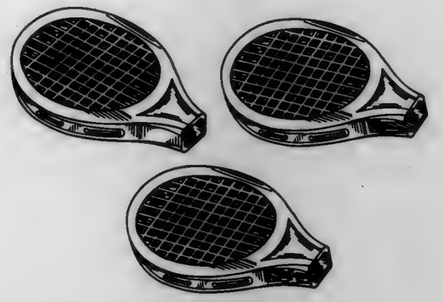


334,288
TOOTHBRUSH
Uli Witzig-Jaggi, Wolfhausen, Switzerland, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Filed Mar. 25, 1991, Ser. No. 675,598
Claims priority, application Benelux, Sep. 24, 1990, DM/017682
Term of patent 14 years
U.S. Cl. D4—104

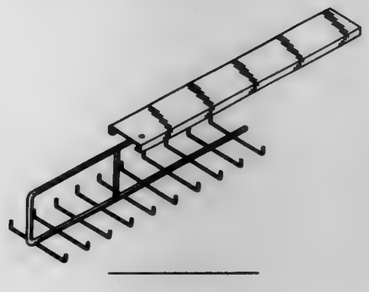
334,289
BRUSH HANDLE
Gerald J. Rubin, El Paso, Tex., assignor to Helen of Troy Corporation, El Paso, Tex.
Filed Jan. 30, 1990, Ser. No. 472,479
Term of patent 14 years
U.S. Cl. D4—138



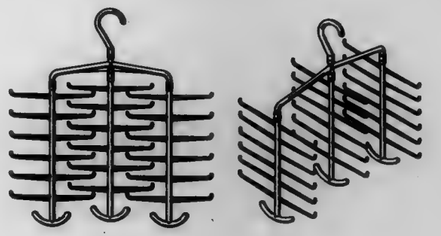
334,290
TOOTHBRUSH COVER
John K. Gruberg, Clovis, Calif., assignor to Tooth Toy, Inc., Clovis, Calif.
Filed Mar. 26, 1990, Ser. No. 498,600
Term of patent 14 years
U.S. Cl. D4—199



334,291
COMBINED TIE AND BELT RACK
Howard W. Rooke, South Perth, Australia, assignor to Homecourt Holdings Pty. Ltd., Australia
Filed Apr. 26, 1989, Ser. No. 343,246
Term of patent 14 years
U.S. Cl. D6—317



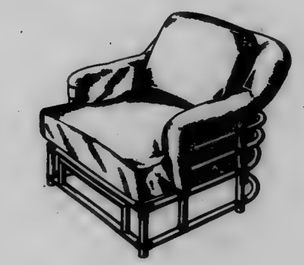
334,292
SWIVEL RACK
Richard Klein, Overland Park, Kans., and Chris Sersiev, Kansas City, Mo., assignors to Lynk, Inc., Shawnee Mission, Kans.
Filed Nov. 25, 1991, Ser. No. 797,336
Term of patent 14 years
U.S. Cl. D6—317



334,293
CHAIR
Ward Bennett, One West 72nd St., New York, N.Y. 10023
Filed Sep. 5, 1990, Ser. No. 577,619
Term of patent 14 years
U.S. Cl. D6—366

334,294
RECLINER ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex SARL, Oyonnax, France
Filed Oct. 17, 1990, Ser. No. 599,241
Claims priority, application Int'l Pat. Institute, Apr. 17, 1990, DMA/001223
Term of patent 14 years
U.S. Cl. D6—367

334,295
CHAIR
John B. Wisner, New York, N.Y., assignor to Ficks Reed Company, Cincinnati, Ohio
Filed Nov. 21, 1990, Ser. No. 617,066
Term of patent 14 years
U.S. Cl. D6—369



334,296
CHAIR
John Hutton, New York, N.Y., assignor to Douglas Furniture, New York, N.Y.
Filed Dec. 27, 1989, Ser. No. 457,544
Term of patent 14 years
U.S. Cl. D6—374

334,297
CHAIR
Rory S. Rehmert, Birmingham, Ala., assignor to Winston Furniture Company, Inc., Birmingham, Ala.
Continuation-in-part of Ser. No. 446,723, Dec. 5, 1989. This application Jan. 29, 1990, Ser. No. 545,966
Term of patent 14 years
U.S. Cl. D6—376

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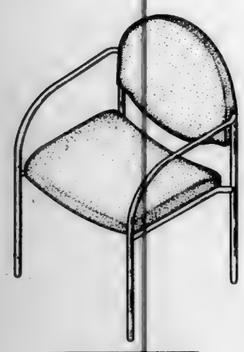
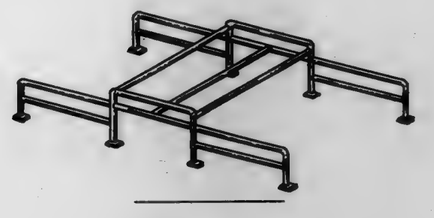
334,298
CHAIR
James Pantaleucos, Ontario, Canada, assignor to Nightingale Inc., Mississauga, Canada
Filed Jul. 19, 1989, Ser. No. 382,952
Claims priority, application Canada, Feb. 8, 1989, 08-02-89-6
Term of patent 14 years
U.S. Cl. D6—379



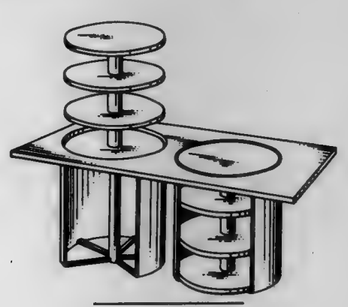
334,299
CHAIR
Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 22, 1990, Ser. No. 600,973
Term of patent 14 years
U.S. Cl. D6—379

334,300
SECTIONAL SOFA
Andrew C. Gibson, Greensboro, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Oct. 10, 1990, Ser. No. 595,167
Term of patent 14 years
U.S. Cl. D6—381

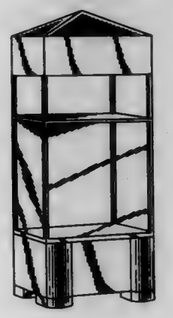
334,301
SHOPPING CART HOLDER
Robert S. Buckley, P.O. Box 246, Keene, N.H. 03431
Filed Jan. 10, 1992, Ser. No. 818,973
Term of patent 14 years
U.S. Cl. D6—462



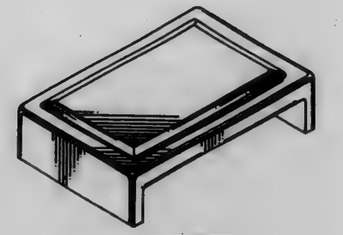
334,302
CAROUSEL CABINET
Ulla Lindeberg, Landåvägen 2, 440 06 Gråbo, Sweden
Filed Jul. 9, 1990, Ser. No. 549,702
Term of patent 14 years
U.S. Cl. D6—431



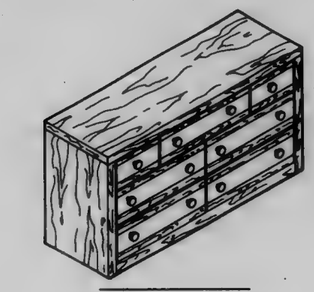
334,303
DISPLAY CART
John Costello, and Michael Arney, both of Boston, Mass., assignors to Dunkin' Donuts Incorporated, Randolph, Mass.
Filed May 15, 1990, Ser. No. 523,465
Term of patent 14 years
U.S. Cl. D6—436



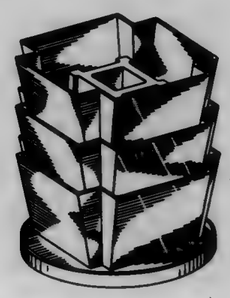
334,304
TELEVISION STAND
Michael G. Gilman, 7175 Scenic Creek Pl., Fairfax, Va. 22039
Filed Dec. 27, 1990, Ser. No. 634,320
Term of patent 14 years
U.S. Cl. D6—449



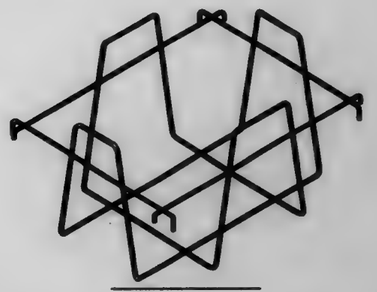
334,305
DRESSER
Carol B. Wheeless, and Harold Van Ambert, both of High Point, N.C., assignors to Ladd Furniture, Inc., High Point, N.C.
Filed Jan. 3, 1992, Ser. No. 816,932
Term of patent 14 years
U.S. Cl. D6—445



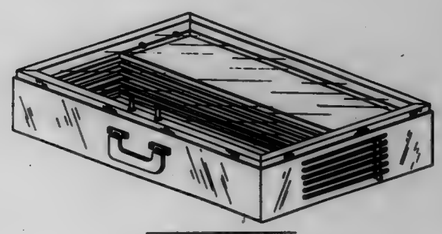
334,306
ROTARY COMPARTMENTED ORGANIZER
John D. Breen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 4, 1991, Ser. No. 637,501
Term of patent 14 years
U.S. Cl. D6—455



334,307
NEWSPAPER BASKET
Norman C. Lee, Reidsville, N.C., assignor to Zarn, Inc., Reidsville, N.C.
Filed May 20, 1991, Ser. No. 703,127
Term of patent 14 years
U.S. Cl. D6—462

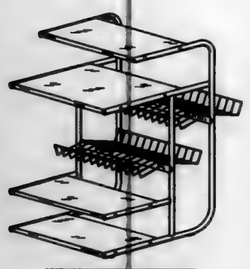


334,308
PORTABLE MULTI-SHELVED SHOWCASE
Ernest A. Verina, P.O. Box 2090, Westport, Conn. 06880
Filed Sep. 24, 1990, Ser. No. 586,714
Term of patent 14 years
U.S. Cl. D6—470

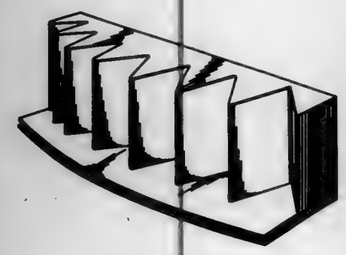


334,309
SHELVING UNIT
Margie E. Stricker, Rte. 1, Box 90, Midway Rd., Barnesville, Ga. 30204
Filed Apr. 4, 1990, Ser. No. 507,065
Term of patent 14 years
U.S. Cl. D6—474

334,310
PRINTER TABLE
Yong Y. Keong, Kuala Lumpur, Malaysia, assignor to Artwright Marketing SDN BHD, Jalan Kuchai Lama, Malaysia
Filed Jan. 16, 1991, Ser. No. 642,272
Claims priority, application United Kingdom, Jul. 17, 1990, 2008327
Term of patent 14 years
U.S. Cl. D6—474

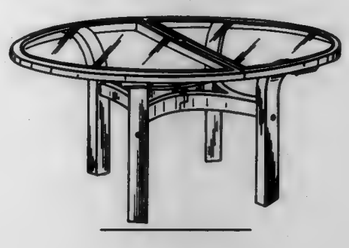


334,311
MERCHANDISE DISPLAY RACK
Hal D. Sandy, 4937 Glendale Rd., Shawnee Mission, Kans. 66205
Filed Mar. 11, 1991, Ser. No. 667,089
Term of patent 14 years
U.S. Cl. D6—467

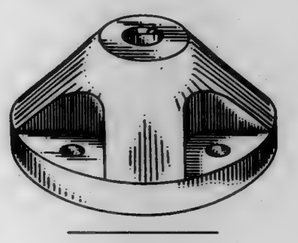


334,312
TABLE
Al Glass, 3286 M St., NW., Washington, D.C. 20007
Filed Mar. 29, 1990, Ser. No. 501,200
Term of patent 14 years
U.S. Cl. D6—484

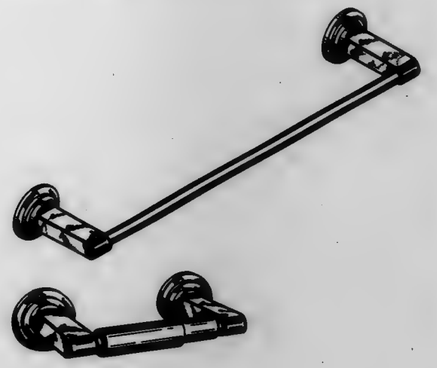
334,313
TABLE
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex SARL, Oyonnax, France
Filed Nov. 5, 1990, Ser. No. 609,216
Claims priority, application World Int. Prop. O., Jun. 21, 1990, DMA/001260
Term of patent 14 years
U.S. Cl. D6—487



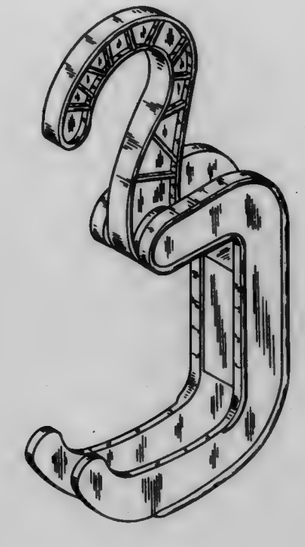
334,314
BASE FOR A POST
Richard M. Milton, Austin, Tex., assignor to Flasher Equipment Co., Inc., San Antonio, Tex.
Filed Jan. 14, 1991, Ser. No. 641,098
Term of patent 14 years
U.S. Cl. D6—495



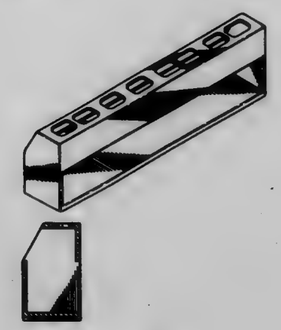
334,315
WALL MOUNTABLE SUPPORT
Alan D. Bengtson, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 11, 1991, Ser. No. 639,953
Term of patent 14 years
U.S. Cl. D6—524



334,316
HANGER FOR A SCUBA REGULATOR
Brace B. Daniel, 199 Usher Dr., Madison, Ala. 35758
Filed Jul. 9, 1990, Ser. No. 549,709
Term of patent 14 years
U.S. Cl. D6—552

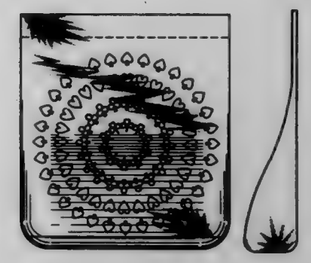


334,317
HOLDER FOR KITCHEN UTENSILS
Shun So, Kowloon, Hong Kong, assignor to Ki Mee Metal & Plastic Factory Limited, Hong Kong
Filed Sep. 24, 1990, Ser. No. 587,211
Claims priority, application United Kingdom, Apr. 2, 1990, 2005843
Term of patent 14 years
U.S. Cl. D6—567



334,318
SEAT CUSHION
Edward K. Choe, San Francisco, Calif., assignor to Rolliture Corporation, San Francisco, Calif.
Filed Apr. 3, 1990, Ser. No. 504,752
Term of patent 14 years
U.S. Cl. D6—601

334,319
TOP SHEET
Deborah K. Nation, 13 Mahan La. N.E., Rydal, Ga. 30171
Filed Oct. 18, 1990, Ser. No. 599,382
Term of patent 14 years
U.S. Cl. D6—603



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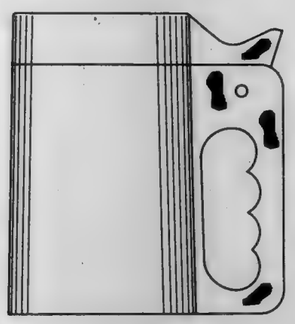
334,320
MULTIPLE MICROWAVE OVEN ASSEMBLY
Lawrence Van Tol, and Linda Van Tol, both of 5266 Samson Ave., Boise, Id. 83704
Filed Aug. 14, 1989, Ser. No. 393,752
Term of patent 14 years
U.S. Cl. D7—351

334,321
TULIP GLASS
James Falzorano, Melrose, Mass., assignor to Comet Products, Inc., Chelmsford, Mass.
Filed Dec. 19, 1990, Ser. No. 629,973
Term of patent 14 years
U.S. Cl. D7—527

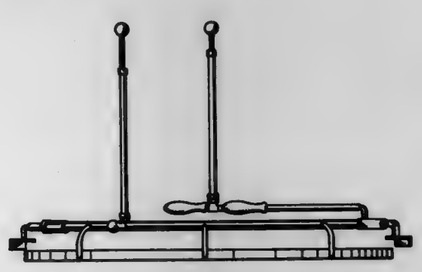
334,322
MUG
Eddy I. C. Huang, Gaithersburg, Md., assignor to H.I.C. International, Inc., Gaithersburg, Md.
Filed Jul. 26, 1990, Ser. No. 558,185
Term of patent 14 years
U.S. Cl. D7—536

334,323
TRAY
Frank W. Rohrbeck, Chicago, Ill., assignor to Reynolds Metals Company, Richmond, Va.
Filed Jun. 11, 1990, Ser. No. 536,267
Term of patent 14 years
U.S. Cl. D7—552

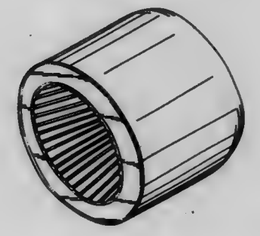
334,324
INSULATED CAN COOLER
Michael B. Pierce, Orono, Minn., assignor to Co-Rect Products, Inc., Minneapolis, Minn.
Filed May 9, 1991, Ser. No. 697,456
Term of patent 14 years
U.S. Cl. D7—605



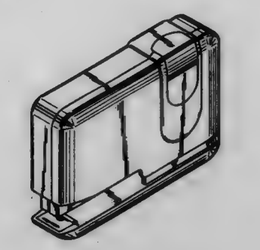
334,325
TONGS FOR ARCHED PAVING STONES
Niels I. Ingvorsen, Lombjergparken 3, Roskilde, Denmark 4000
Filed Aug. 2, 1989, Ser. No. 389,117
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1989, 8902244[U]
Term of patent 14 years
U.S. Cl. D8—14



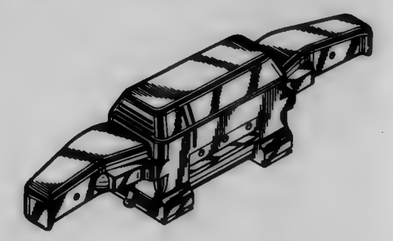
334,326
BOTTLE TOP REMOVER
Alan G. Detling, 2918 E. Pratt St., Baltimore, Md. 21224
Filed Jul. 17, 1991, Ser. No. 731,862
Term of patent 14 years
U.S. Cl. D8—40



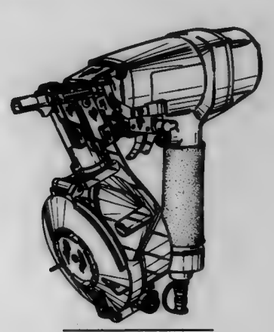
334,327
STAPLER
Junji Hiromori, Tokyo, Japan, assignor to Hiromori, Inc., Tokyo, Japan
Filed Nov. 1, 1990, Ser. No. 608,182
Claims priority, application United Kingdom, May 4, 1990, 2006608/90
Term of patent 14 years
U.S. Cl. D8—50



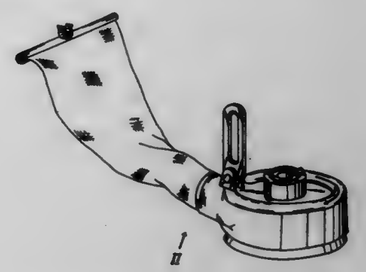
334,328
POWER CONTOUR PLANE
Stephen E. Sharpe, Dannatt House, 81 Brigg Road, Barton-upon-Humber, South Humberside DN18 5DX; Richard Sharpe, Witbank, Elm Lane Goxhill, Barrow-upon-Humber, South Humberside, and Garry Brewin, 27 Beck Hill, Barton-upon-Humber, South Humberside, all of England
Filed Sep. 7, 1990, Ser. No. 578,836
Claims priority, application United Kingdom, Mar. 7, 1990, 2005225/90
Term of patent 14 years
U.S. Cl. D8—61



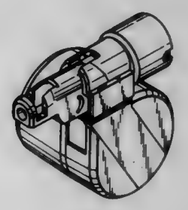
334,329
PORTABLE PNEUMATIC NAILER
Yasunori Ogawa, Mito; Kunio Yamamoto, and Kaoru Ichikawa, both of Katsuta, all of Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan
Filed Mar. 13, 1991, Ser. No. 669,304
Claims priority, application Japan, Sep. 21, 1990, 2-31798
Term of patent 14 years
U.S. Cl. D8—68



334,330
DUST COLLECTOR FOR A GRINDER
Horst Moshammer, Rheinstr. 27, 5414 Vallendar, Fed. Rep. of Germany
Filed Jan. 25, 1991, Ser. No. 646,053
Term of patent 14 years
U.S. Cl. D8—70



334,331
ATTACHMENT FOR PORTABLE ELECTRIC DRIVER
Naoki Kikuchi, Tokyo, Japan, assignor to Ryobi Ltd., Hiroshima, Japan
Filed Mar. 22, 1991, Ser. No. 674,061
Claims priority, application Japan, Oct. 3, 1990, 2-33508
Term of patent 14 years
U.S. Cl. D8—70



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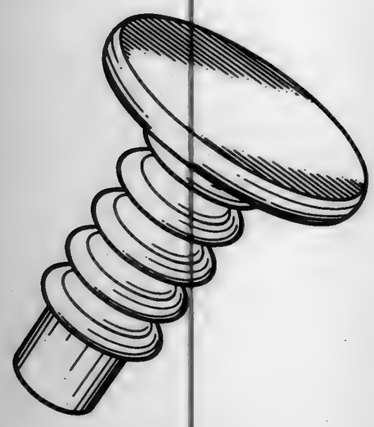
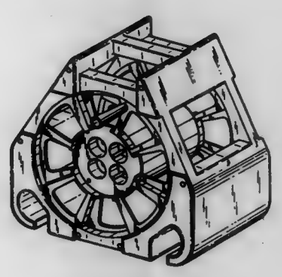
334,332
TOOL HANDLE
Herbert W. J. Massey, 124 B Grace Road, Tauranga, New Zealand
Filed Jul. 25, 1989, Ser. No. 384,522
Claims priority, application New Zealand, Jan. 25, 1989, 22398
Term of patent 14 years
U.S. Cl. D8—107

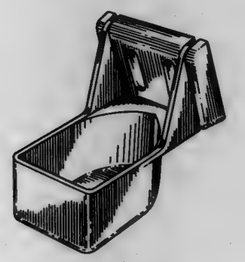


334,333
GROUND SUPPORT STAKE FOR IRRIGATION TUBING
Hans D. Christen, La Verne, and Howard E. Thornton, Glendora, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Jun. 24, 1991, Ser. No. 719,608
Term of patent 14 years
U.S. Cl. D8—356

334,334
EXTENSION CORD REEL
Patrice Jarry, Le Vau de José, France, assignor to Legrand, Limoges, France
Filed Jun. 13, 1991, Ser. No. 714,752
Claims priority, application France, Dec. 18, 1990, 907891
Term of patent 14 years
U.S. Cl. D8—359



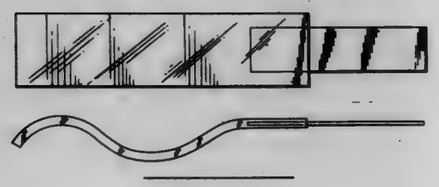
334,335
TRANSDUCER MOUNTING BRACKET
Stephen G. Boucher, Amherst; Robert M. Cullen, Hudson; Maurice P. Lagace, Peterborough, and Andrew L. Noyes, Bedford, all of N.H., assignors to Airmar Technology Corp., Milford, N.H.
Filed Aug. 16, 1991, Ser. No. 746,518
Term of patent 14 years
U.S. Cl. D8—373



334,336
SCREW FOR REPLACING THE MALE COMPONENT OF A SNAP FASTENER
Joseph L. Terreis, 111 S. Bolmar St., West Chester, Pa. 19382, and Christopher J. Terreis, 1324 Central Ave., Ocean City, N.J. 08226
Filed Mar. 23, 1990, Ser. No. 498,925
Term of patent 14 years
U.S. Cl. D8—387

334,337
WIRE BINDER
Takayoshi Ito, and Takashi Hayakawa, both of Utsunomiya, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan
Filed Aug. 13, 1990, Ser. No. 565,842
Claims priority, application Japan, Mar. 6, 1990, 2-7274
Term of patent 14 years
U.S. Cl. D8—396

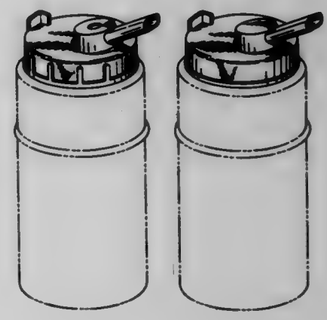
334,338
VIBRATION DAMPENING WINDOW CLIP
Thomas E. Dances, 5570 N. Teath St., No. 102, Fresno, Calif. 93710
Filed May 21, 1990, Ser. No. 527,156
Term of patent 14 years
U.S. Cl. D8—400



334,339
BOTTLE
Georges Legaie, Coye la Foret, France, assignor to Applications Commercials et Technique des Emballages, Coyle la Foret, France
Filed Jul. 29, 1991, Ser. No. 736,802
Claims priority, application France, Jan. 29, 1991, 910.561
Term of patent 14 years
U.S. Cl. D9—316

334,340
FLEXIBLE BAG
A. Francis Parrish, and John G. Geri, both of 1250 Palisades Circle, Pensacola, Fla. 32504
Filed Dec. 17, 1990, Ser. No. 626,703
Term of patent 14 years
U.S. Cl. D9—305

334,341
BOTTLE LID
Jerrold G. Brown; Phillip W. Hamilton, and W. Henry Kahl, all of Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 4, 1991, Ser. No. 637,885
Term of patent 14 years
U.S. Cl. D9—447



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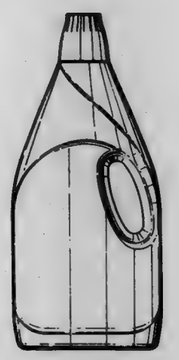
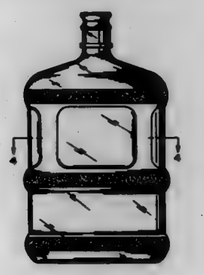
334,342
BOTTLE
Jerry H. Thompson, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed May 3, 1990, Ser. No. 519,361
Term of patent 14 years
U.S. Cl. D9—502

334,343
BOTTLE
Stuart M. Leslie, 708 8th Ave., Apt. 2R, Brooklyn, N.Y. 11215, and Mario A. Petrone, 9033 Walnut Ave., Franklin Park, Ill. 60131
Filed Sep. 16, 1991, Ser. No. 760,214
Term of patent 14 years
U.S. Cl. D9—523

334,344
COMBINED BOTTLE AND CAP
Ulrich Reif, Duesseldorf, Fed. Rep. of Germany, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Nov. 20, 1991, Ser. No. 798,403
Claims priority, application United Kingdom, May 31, 1991, 2015038
Term of patent 14 years
U.S. Cl. D9—531



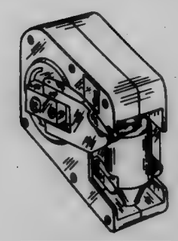
334,345
BOTTLE
Harold B. Wright, Centerville, Ohio, assignor to Johnson Enterprises, Inc., Rockford, Ill.
Filed Dec. 18, 1990, Ser. No. 629,362
Term of patent 14 years
U.S. Cl. D9—553



334,346
WRISTWATCH
Joseph D. Vogel, 623 Shadow Creek La., Norcross, Ga. 30093
Filed Oct. 17, 1989, Ser. No. 422,435
Term of patent 14 years
U.S. Cl. D10—33

334,347
DIGITAL POCKET WATCH
Richard J. White, 300 Palmcrest Rd., North Syracuse, N.Y. 13212
Filed Aug. 17, 1990, Ser. No. 568,694
Term of patent 14 years
U.S. Cl. D10—37

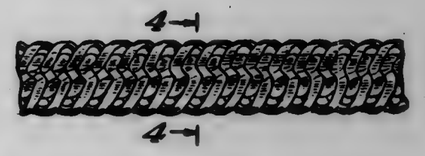
334,348
PLUMB BOB
Richard A. Doyle, 54 E. Kidder St., Portland, Me. 04103
Filed Mar. 19, 1990, Ser. No. 495,837
Term of patent 14 years
U.S. Cl. D10—65



334,349
FLASHING SIGNAL FOR HOME EMERGENCY ALARM SYSTEM
Anthony Maini, 9350 Long Meadow Ct., Fenton, Mich. 48430-8739
Filed Apr. 17, 1990, Ser. No. 510,419
Term of patent 14 years
U.S. Cl. D10—114

334,350
BELL
Sen T. Wang, No. 18, Pinghe I St., Pinghe Li, Changhua city, Taiwan
Filed Aug. 13, 1991, Ser. No. 744,217
Term of patent 14 years
U.S. Cl. D10—116

334,351
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A., Zeno, Italy
Filed Jun. 14, 1990, Ser. No. 538,175
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—13



334,352
ORNAMENTAL CHAIN
Pasquale Bichi, Arezzo, Italy, assignor to MGZ S.p.A., Zeno, Italy
Filed Jun. 14, 1990, Ser. No. 538,171
Claims priority, application Italy, Dec. 19, 1989, 11776/89[U]
Term of patent 14 years
U.S. Cl. D11—15

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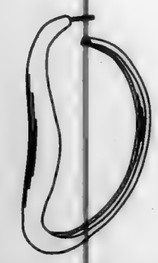
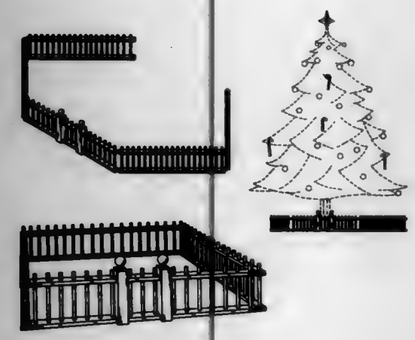
334,353
EARRING
Marcia Lorberfeld, 500 E. 77th St., Apartment 532, New York, N.Y. 10021
Filed May 10, 1990, Ser. No. 521,585
Term of patent 14 years
U.S. Cl. D11—78



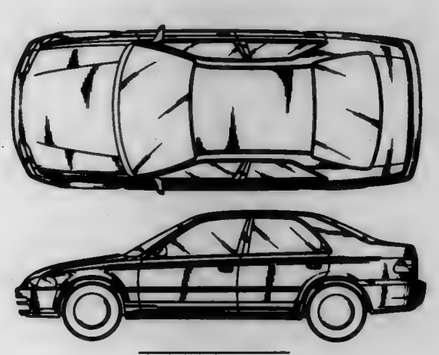
334,354
PHOTO IDENTIFICATION LOCKET
John J. McNally, Jr., Warwick, R.I., assignor to Textron Inc., Providence, R.I.
Filed Mar. 5, 1991, Ser. No. 664,999
Term of patent 14 years
U.S. Cl. D11—81

334,355
FENCE FOR ORNAMENTAL TREES
Roberta R. Moody, 69 Ohio Rd., Lake Worth, Fla. 33467
Filed Feb. 11, 1991, Ser. No. 654,368
Term of patent 14 years
U.S. Cl. D11—125



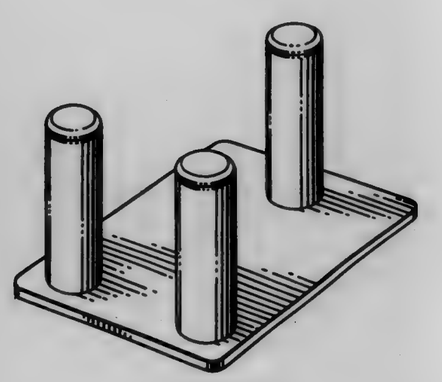
334,356
PLANTER
Candelario Lomeli, P.O. Box 1536, Lockeford, Calif. 95237
Filed Apr. 23, 1991, Ser. No. 690,794
Term of patent 14 years
U.S. Cl. D11—149

334,357
AUTOMOBILE
Kohichi Hirata, Niiza, and Hiroyuki Kawase, Nerima, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 16, 1991, Ser. No. 701,978
Claims priority, application Japan, Nov. 19, 1990, 2-38615
Term of patent 14 years
U.S. Cl. D12—92

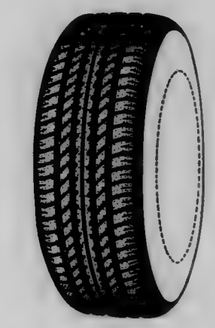


334,358
MOTOR HOME FRONT PANEL UNIT EXTERIOR SURFACE
Patrick P. Treadway, Ontario, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.
Filed Feb. 5, 1991, Ser. No. 650,656
Term of patent 14 years
U.S. Cl. D12—100

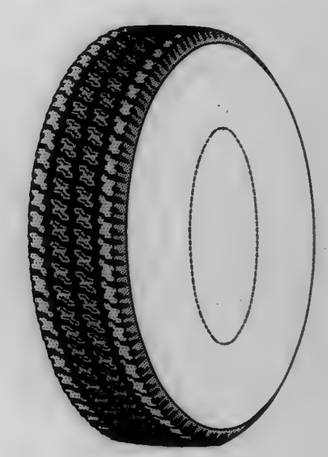
334,359
BICYCLE STAND
John T. Welcher, Jr., and Maren E. Welcher, both of 9106 Sherlock La., Garden Grove, Calif. 92641
Filed Jun. 24, 1991, Ser. No. 721,205
Term of patent 14 years
U.S. Cl. D12—115



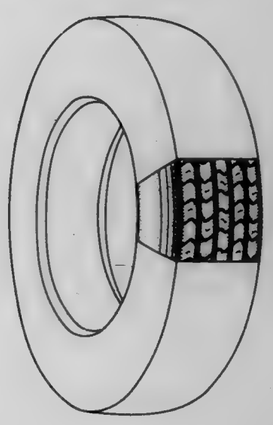
334,360
TIRE TREAD AND BUTTRESS
Maurice Graas, Reichlange, and Hendrikus J. L. M. De Wit, Colmar-Berg, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 5, 1990, Ser. No. 608,963
Term of patent 14 years
U.S. Cl. D12—146



334,361
PNEUMATIC TIRE TREAD AND BUTTRESS
Bernhard Croissant, Bastogne, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sep. 4, 1990, Ser. No. 576,898
Term of patent 14 years
U.S. Cl. D12—147



334,362
TIRE
James E. Stone, Travelers Rest, and David A. Weston, Taylors, both of S.C., assignors to Michelin Recherche et Technique, Switzerland
Filed Mar. 25, 1991, Ser. No. 674,046
Term of patent 14 years
U.S. Cl. D12—147



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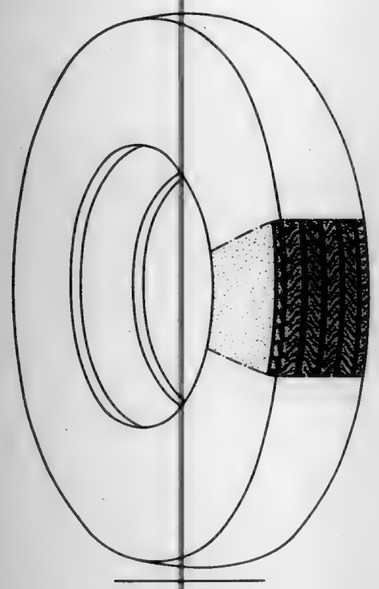
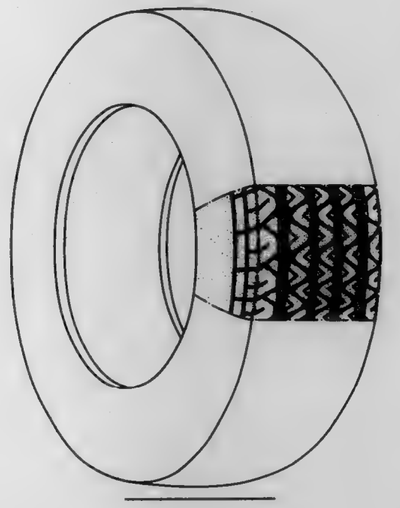
334,363
TIRE
Philippe Grenie, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Jun. 25, 1991, Ser. No. 721,211
Term of patent 14 years
U.S. Cl. D12—147

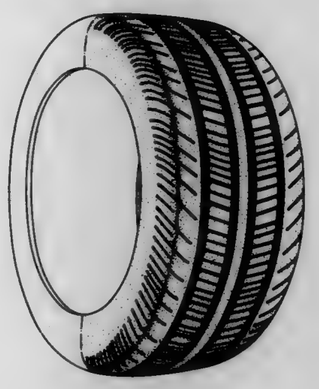


334,365
TIRE
Gary D. Enterline, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Aug. 19, 1991, Ser. No. 747,241
Term of patent 14 years
U.S. Cl. D12—147

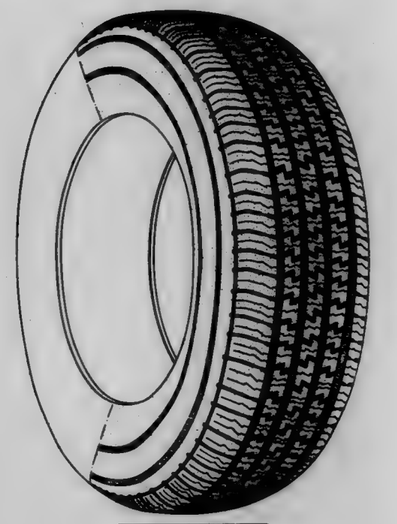


334,364
TIRE TREAD AND BUTTRESS
Bruno Maitre, Hesperange, and Maurice Grass, Reichlange, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 8, 1991, Ser. No. 742,651
Claims priority, application Benelux, Feb. 22, 1991, 66313-00
Term of patent 14 years
U.S. Cl. D12—147

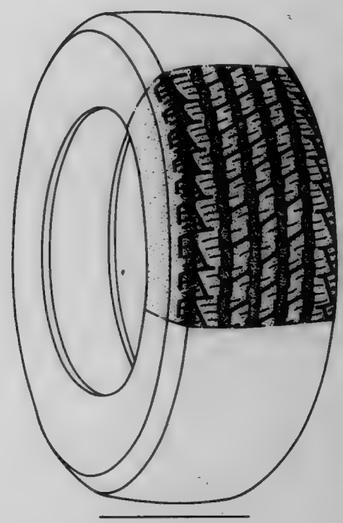
334,366
TIRE
W. Christopher Baker, Greenville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Sep. 4, 1991, Ser. No. 754,725
Term of patent 14 years
U.S. Cl. D12—147



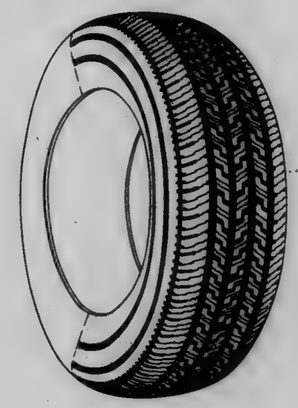
334,367
TIRE
Timothy A. White, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Sep. 19, 1991, Ser. No. 762,212
Term of patent 14 years
U.S. Cl. D12—147



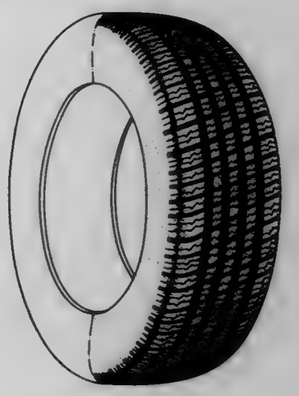
334,369
TIRE
Damon L. Christenbury, Greenville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Continuation-in-part of Ser. No. 650,643, Feb. 5, 1991, abandoned. This application Oct. 4, 1991, Ser. No. 771,231
Term of patent 14 years
U.S. Cl. D12—147



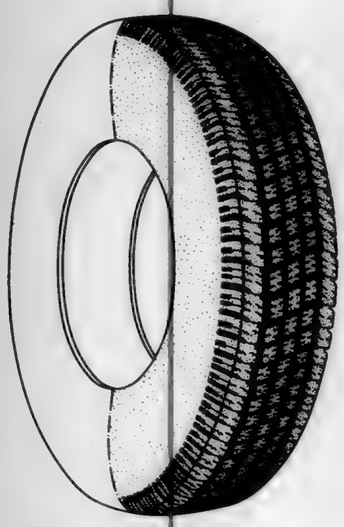
334,368
TIRE
Timothy A. White, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Sep. 19, 1991, Ser. No. 762,218
Term of patent 14 years
U.S. Cl. D12—147



334,370
TIRE
Timothy A. White, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Oct. 4, 1991, Ser. No. 771,250
Term of patent 14 years
U.S. Cl. D12—147

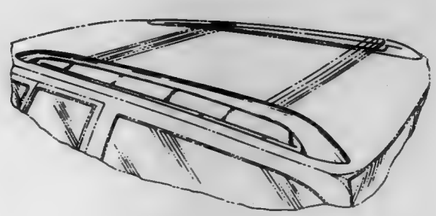


334,371
TIRE
Emory E. Hodges, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Oct. 7, 1991, Ser. No. 772,047
Term of patent 14 years
U.S. Cl. D12—147

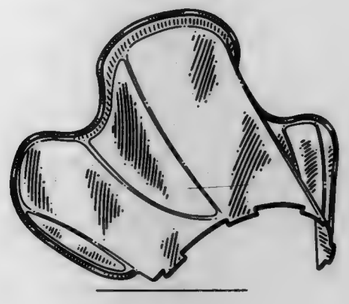


334,372
TIRE
Philippe Grenie, Greer, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Nov. 15, 1991, Ser. No. 792,755
Term of patent 14 years
U.S. Cl. D12—147

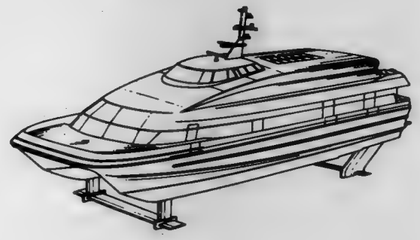
334,373
VEHICLE LUGGAGE CARRIER SIDE RAIL
John S. Cacheran, Lake Orion, Mich., assignor to John A. Bott, Grosse Pointe Farms, Mich.
Filed Apr. 19, 1991, Ser. No. 687,539
Term of patent 14 years
U.S. Cl. D12—157



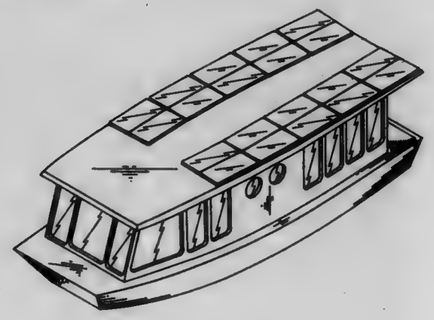
334,374
SNOWMOBILE WINDSHIELD
Miklos D. Hornai, Brooklyn, Mich., assignor to Arctco, Inc., Thief River Falls, Minn.
Filed Mar. 12, 1990, Ser. No. 491,634
Term of patent 14 years
U.S. Cl. D12—182



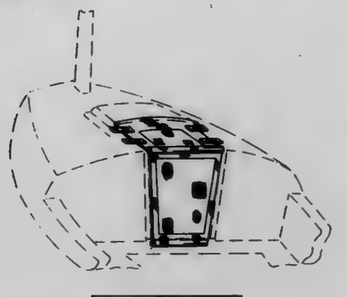
334,375
VESSEL
Ellev Instanes, Omastrand, Norway, assignor to Kvaerner Fjellstrand, Omastrand, Norway
Filed Dec. 11, 1991, Ser. No. 805,883
Claims priority, application Norway, Jun. 11, 1991, D910455
Term of patent 14 years
U.S. Cl. D12—309



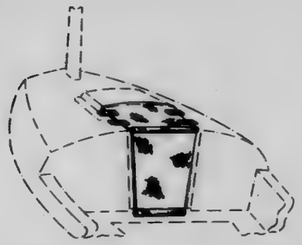
334,376
HOUSE BOAT
George McNeir, 5413 Hounds Ear Pl., Raleigh, N.C. 27606
Filed Feb. 21, 1991, Ser. No. 658,566
Term of patent 14 years
U.S. Cl. D12—315



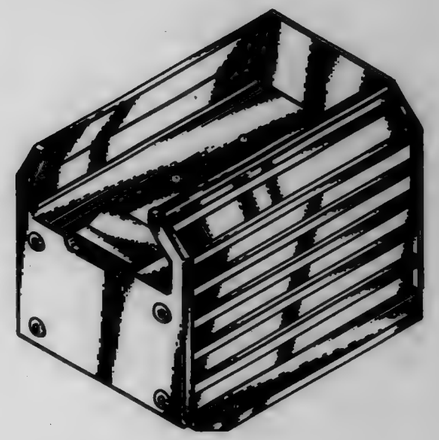
334,377
CLOSURE SCREEN FOR A COMPANIONWAY OF A BOAT
Marilyn S. Riddles, and Steven W. Riddles, both of Rte. 1, Box 59B, Edmond, Okla. 73034
Filed Oct. 4, 1991, Ser. No. 771,778
Term of patent 14 years
U.S. Cl. D12—317



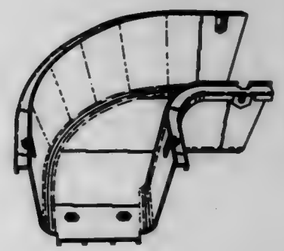
334,378
CLOSURE FOR A COMPANIONWAY OF A BOAT
Marilyn S. Riddles, and Steven W. Riddles, both of Rte. 1, Box 59B, Edmond, Okla. 73034
Filed Oct. 4, 1991, Ser. No. 771,937
Term of patent 14 years
U.S. Cl. D12—317



334,379
CHARGING UNIT FOR A BATTERY POWERED DEVICE
Raymond L. Sharrah, Collegeville, and Charles W. Craft, Lansdale, both of Pa., assignors to Streamlight, Inc., Norristown, Pa.
Filed Oct. 25, 1991, Ser. No. 782,508
Term of patent 14 years
U.S. Cl. D13—108



334,380
GUIDING TROUGH, 90° HORIZONTAL ELBOW FOR OPTICAL FIBERS
Roy Hesseberger, Eagan, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.
Filed Jul. 31, 1989, Ser. No. 387,892
The portion of the term of this patent subsequent to Jul. 14, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—155



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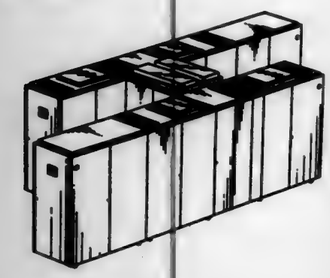
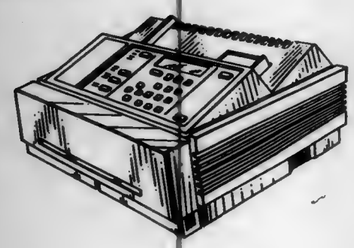
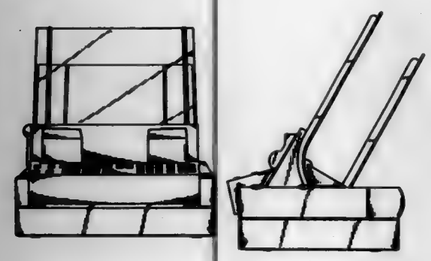
334,381
FLOOR STANDING MAINFRAME COMPUTER
Robert V. Jones, R.D. 1, Box 120, Woodstock Ridge Rd., Woodstock, N.Y. 12498; Susan S. Moffatt, 648 Pumpkin La., Clinton Corners, N.Y. 12514, and John D. Swansey, P.O. Box 6117, Kingston, N.Y. 12401
Filed Sep. 4, 1990, Ser. No. 578,103
Term of patent 14 years
U.S. Cl. D14—102



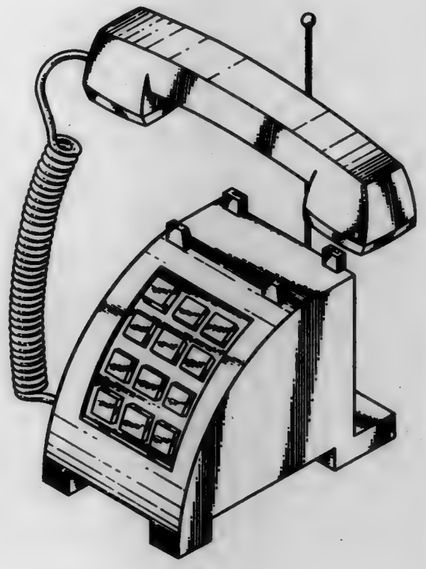
334,382
FACSIMILE MACHINE
James C. Dow, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 5, 1991, Ser. No. 652,894
Term of patent 14 years
U.S. Cl. D14—118



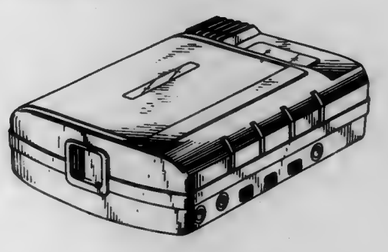
334,383
FACSIMILE TRANSCEIVER
Hatto Grosse, Esslingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Sep. 4, 1991, Ser. No. 754,566
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1991, M 91 01 991.5
Term of patent 14 years
U.S. Cl. D14—118



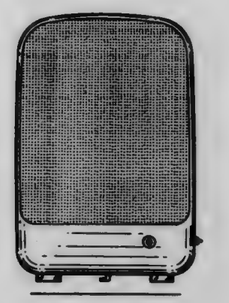
334,384
TELEPHONE
Carl Nye, P.O. Box 175, Cottonwood, Ariz. 86326
Filed Apr. 30, 1992, Ser. No. 876,215
Term of patent 14 years
U.S. Cl. D14—149



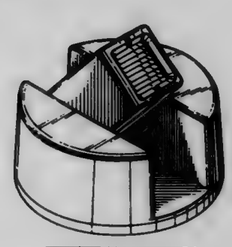
334,385
TAPE RECORDER
Hiroshi Imai, and Amane Mori, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 5, 1991, Ser. No. 740,215
Claims priority, application Japan, Feb. 5, 1991, 3-2824
Term of patent 14 years
U.S. Cl. D14—165



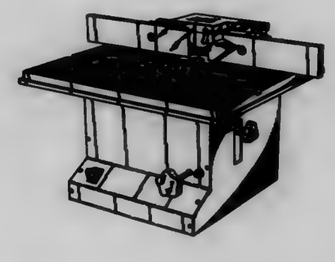
334,386
COMBINED SPEAKER AND AMPLIFIER
Akira Yamazaki, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 31, 1990, Ser. No. 560,331
Claims priority, application Japan, Feb. 15, 1990, 2-4681
Term of patent 14 years
U.S. Cl. D14—210



334,387
COMBINED MICROPHONE WITH HOLDER
John Bostock, Bozing, and Kevin Ryan, Camberley, both of England, assignors to Technotrend Limited, Hampshire, England
Filed Jun. 11, 1991, Ser. No. 714,073
Term of patent 14 years
U.S. Cl. D14—227

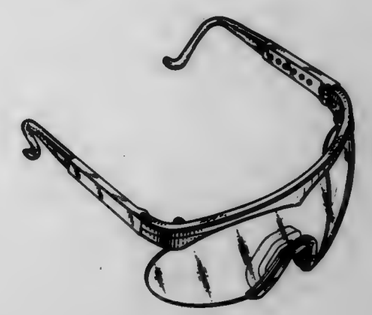


334,388
COMBINATION BENCH ROUTER AND SHAPER
Barry D. Wixey, Pittsburgh, and Kenneth Kepton, Verona; both of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.
Filed Oct. 16, 1990, Ser. No. 595,892
Term of patent 14 years
U.S. Cl. D15—131



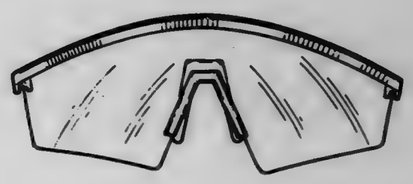
339-701 O.G.-93-23

334,389
SUNGLASSES
Maurice Bollé, Codex, France, assignor to Etablissement Bollé S.N.C., Codex, France
Filed Mar. 17, 1989, Ser. No. 325,342
Term of patent 14 years
U.S. Cl. D16—102



334,390
SUNGLASSES
Simon M. Conway, Lima, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sep. 3, 1991, Ser. No. 754,110
Term of patent 14 years
U.S. Cl. D16—112

334,391
SUNGLASSES
Ken Wilson, 10943 Wheatlands Rd., Santee, Calif. 92071
Filed Mar. 30, 1992, Ser. No. 859,555
Term of patent 14 years
U.S. Cl. D16—123



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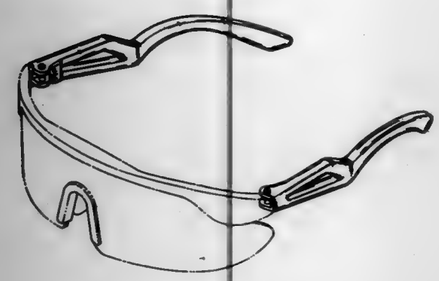
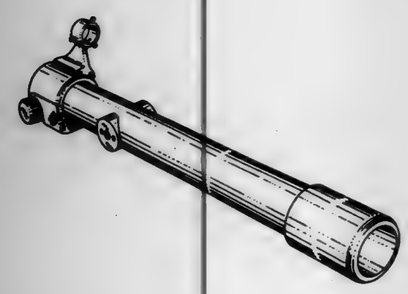
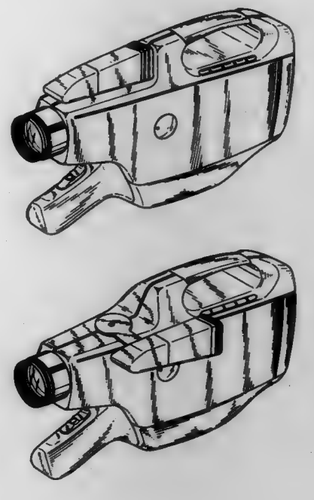
334,392
PAIR OF TEMPLES FOR SPECTACLES
Tony Lei, 40, Lane 142, Chung Shani Rd., Tainan City, Taiwan
Filed Dec. 20, 1990, Ser. No. 633,437
Term of patent 14 years
U.S. Cl. D16—127



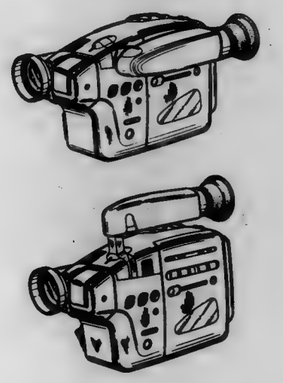
334,393
TELESCOPE
Sidney D. Moore, Claremont, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed May 30, 1990, Ser. No. 530,949
Term of patent 14 years
U.S. Cl. D16—132



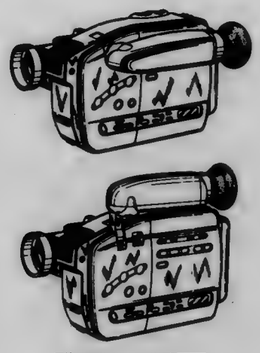
334,394
VIDEO CAMERA WITH VIDEO TAPE RECORDER
Yoshinobu Kitakaze, Ehime, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 25, 1991, Ser. No. 721,364
Claims priority, application Japan, Dec. 27, 1990, 2-44019
Term of patent 14 years
U.S. Cl. D16—202



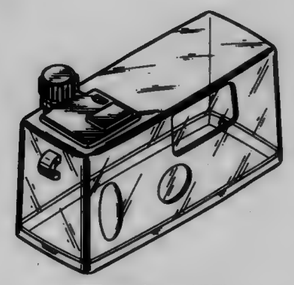
334,395
VIEDO CAMERA WITH VIDEO TAPE RECORDER
Koya Kurokawa, Ehime, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 5, 1991, Ser. No. 727,792
Claims priority, application Japan, Jan. 9, 1991, 3-219
Term of patent 14 years
U.S. Cl. D16—202



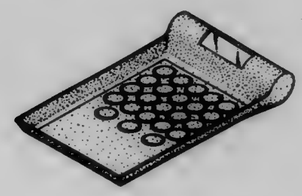
334,396
VIDEO CAMERA WITH VIDEO TAPE RECORDER
Masakazu Mori, and Koya Kurokawa, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 2, 1991, Ser. No. 740,201
Claims priority, application Japan, Feb. 8, 1991, 3-3218
Term of patent 14 years
U.S. Cl. D16—202



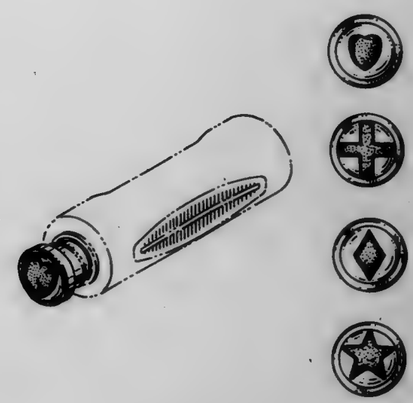
334,397
WATERPROOF CASE FOR A CAMERA
Atsuo Kohno, and Takeomi Kurin, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 10, 1990, Ser. No. 565,420
Term of patent 14 years
U.S. Cl. D16—204



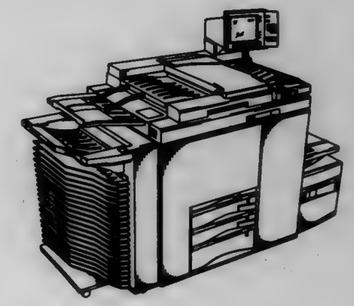
334,398
CALCULATOR
Gretchen M. Conard, 500 Sequoia, San Anselmo, Calif. 94906
Filed Sep. 19, 1991, Ser. No. 763,407
Term of patent 14 years
U.S. Cl. D18—7



334,399
INK DAUBER
William F. Ziegler, 1064 E. 29th St., Hialeah, Fla. 33013
Filed May 15, 1990, Ser. No. 523,645
Term of patent 14 years
U.S. Cl. D18—15



334,400
COPIER WITH DOCUMENT HANDLER
Mark S. Peake, West Henrietta; Robert E. Kalvitis, Fairport; Clark, III: William T., West Henrietta, all of N.Y.; Mariand Chow, Oceanside, Calif.; Hideyuki Matsubara, and Hideji Kobashi, both of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.
Filed Sep. 27, 1991, Ser. No. 766,156
Term of patent 14 years
U.S. Cl. D18—39



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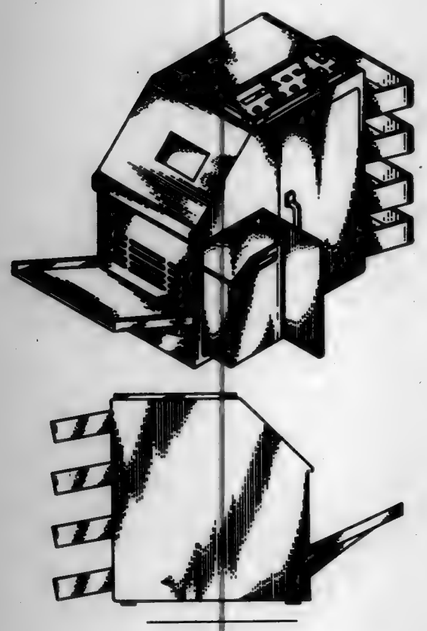
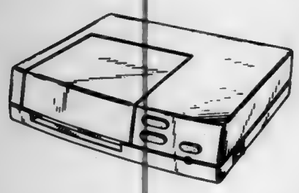
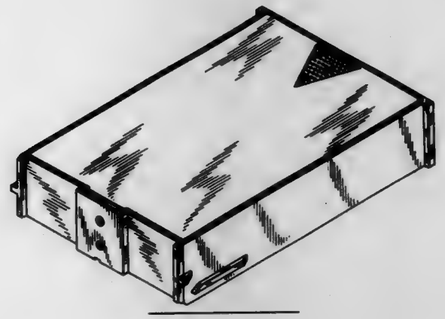
334,401
COMPUTER PAPER COLLATOR
Jeanette Mitchell, 166 Sea Pines, Daytona Beach, Fla. 32014
Filed Feb. 28, 1990, Ser. No. 486,180
Term of patent 14 years
U.S. Cl. D18—48



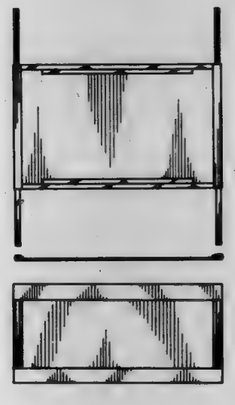
334,402
VIDEO PRINTER
Nobuki Matsumoto, Miura, and Keizi Tsuda, Takarazuka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 5, 1991, Ser. No. 710,312
Claims priority, application Japan, Dec. 5, 1990, 2-40742
Term of patent 14 years
U.S. Cl. D18—50



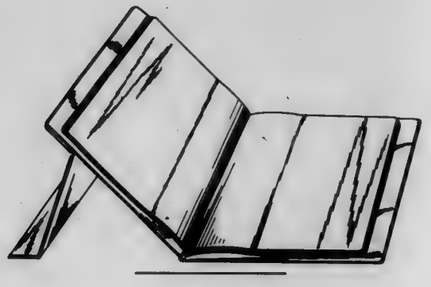
334,403
INK CARTRIDGE FOR PRINTER
Kazuhisa Kawakami, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed May 1, 1990, Ser. No. 517,900
Claims priority, application Japan, Nov. 1, 1989, 1-40020
The portion of the term of this patent subsequent to Oct. 20, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—56



334,404
ADJUSTABLE PROTECTIVE BOOK COVER
Michael J. Ostrowski, 91 Old Toll Rd., West Barnstable, Mass. 02668
Continuation-in-part of Ser. No. 588,271, Sep. 26, 1990, Pat. No. 5,056,663, and Ser. No. 552,794, Jul. 16, 1990, abandoned. This application Nov. 1, 1990, Ser. No. 607,484
Term of patent 14 years
U.S. Cl. D19—26



334,405
COMBINED ALBUM AND SUPPORT THEREFOR
Dominique Prat, Neuilly sur Seine, France, assignor to Fabrications Prat/Europa, Paris, France
Filed Dec. 13, 1990, Ser. No. 626,866
Claims priority, application France, Aug. 3, 1990, 90 5038
Term of patent 14 years
U.S. Cl. D19—26

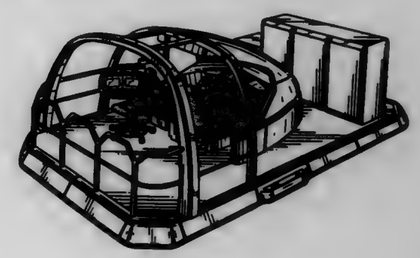


334,406
LOTTO CARD MARKER
Michael A. Celender, 4805 Yew St., Pittsburgh, Pa. 15224
Filed Nov. 6, 1991, Ser. No. 789,144
Term of patent 14 years
U.S. Cl. D19—43

334,407
AUTOMATIC PENCIL
Tor Petterson, 31248 Palos Verdes Dr. West, Palos Verdes, Calif. 90274
Filed May 24, 1988, Ser. No. 197,908
Term of patent 14 years
U.S. Cl. D19—49

334,408
WRITING INSTRUMENT CLIP
Shun Takemura, Pacific Palisades, Calif., assignor to Itoya of America, Ltd., Torrance, Calif.
Filed Feb. 20, 1991, Ser. No. 657,398
Term of patent 14 years
U.S. Cl. D19—56

334,409
AIRCRAFT SIMULATOR
Stephen J. Harper, Balsall Common, United Kingdom, assignor to Rediffusion Simulation Limited, Sussex, United Kingdom
Filed Feb. 28, 1991, Ser. No. 661,374
Claims priority, application United Kingdom, Aug. 31, 1990, 2009359
Term of patent 14 years
U.S. Cl. D19—63



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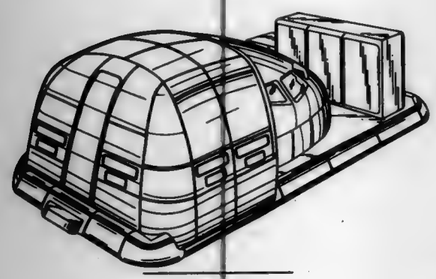
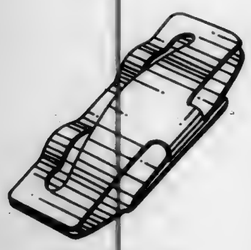
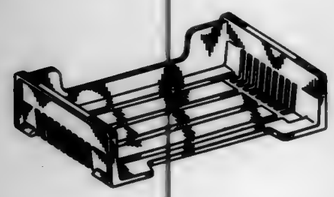
334,410
AIRCRAFT SIMULATOR
Stephen J. Harper, Balsall Common, United Kingdom, assignor to Rediffusion Simulation Limited, Sussex, United Kingdom
Filed Feb. 28, 1991, Ser. No. 662,084
Claims priority, application United Kingdom, Aug. 31, 1990, 2009361
Term of patent 14 years
U.S. Cl. D19—63



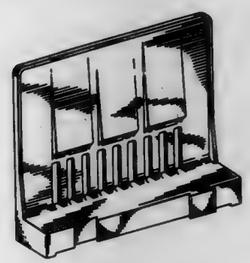
334,411
SPRING CLIP
Akitada Kuroda, Aichi, Japan, assignor to LEC Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 1, 1991, Ser. No. 738,749
Term of patent 14 years
U.S. Cl. D19—65



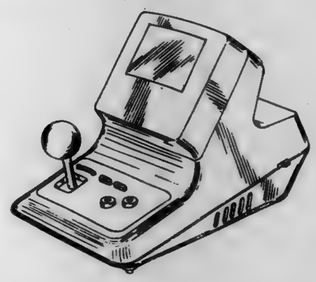
334,412
LETTER TRAY
David L. Feer, Medina, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 22, 1990, Ser. No. 600,974
Term of patent 14 years
U.S. Cl. D19—92



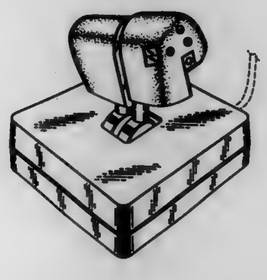
334,413
VERTICAL FILE MODULE
David L. Feer, Medina, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 22, 1990, Ser. No. 600,975
Term of patent 14 years
U.S. Cl. D19—99



334,414
ELECTRONIC GAME HOUSING
Kazumi Kitaue, Irumagun Saitama, Japan, assignor to Konami Co., Ltd., Japan
Filed Oct. 24, 1991, Ser. No. 781,960
Term of patent 14 years
U.S. Cl. D21—13

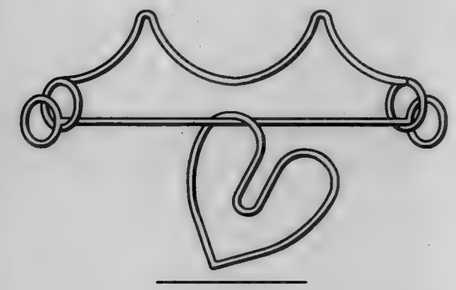


334,415
VIDEO GAME CONTROLLER
Robert L. Carter, Lake Oswego, Oreg.; Gary L. Moffett, Vancouver, Wash., and Frank M. Bouton, Beaverton, Oreg., assignors to Thrustmaster, Inc., Tigard, Oreg.
Continuation-in-part of Ser. No. 598,338, Oct. 16, 1990, Pat. No. D. 330,230. This application Aug. 14, 1992, Ser. No. 930,344
Term of patent 14 years
U.S. Cl. D21—48

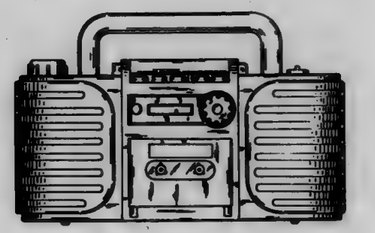


334,416
PIVOTAL SEGMENT
Richard Zawitz, 365 Moncada Way, San Francisco, Calif. 94127
Filed May 28, 1991, Ser. No. 706,085
Term of patent 14 years
U.S. Cl. D21—108

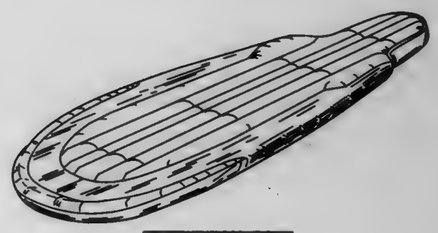
334,417
WIRE PUZZLE
Paul Wood, P.O. Box 483, Bodega Bay, Calif. 94923
Filed Nov. 13, 1989, Ser. No. 435,572
Term of patent 14 years
U.S. Cl. D21—106



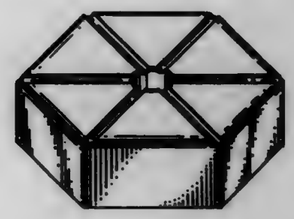
334,418
TOY CASSETTE PLAYER
Kin O. Woo, 303, On Hop House, Tze On Est., Kowloon, Hong Kong
Filed Feb. 6, 1990, Ser. No. 476,006
Claims priority, application United Kingdom, Aug. 18, 1989, 2000481
Term of patent 14 years
U.S. Cl. D21—112



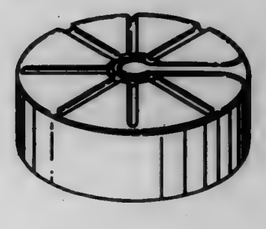
334,419
SURF BOARD
Steven Klein, 1324 St. George Dr., San Dimas, Calif. 91773
Filed Feb. 19, 1991, Ser. No. 657,556
Term of patent 14 years
U.S. Cl. D21—228



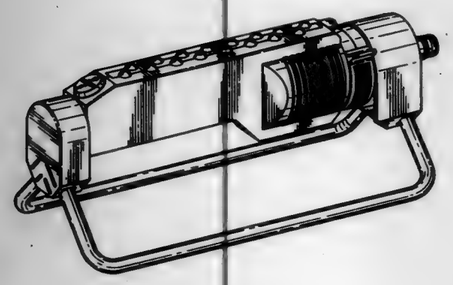
334,420
CHEMICAL DETERGENT BLOCK
Elizabeth J. Gladfelter, Falcon Heights; Tina O. Outlaw, Inver Grove Heights; James L. Copeland; Rhonda K. Schulz, both of Burnsville; Daniel K. Bocke, Eagan, and Jeff W. Petersen, Minnetonka, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.
Filed May 14, 1991, Ser. No. 699,946
Term of patent 14 years
U.S. Cl. D23—207



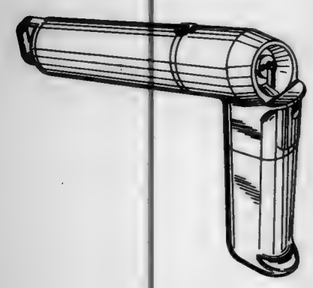
334,421
CHEMICAL DETERGENT BLOCK
Elizabeth J. Gladfelter, Falcon Heights; Tina O. Outlaw, Inver Grove Heights; James L. Copeland; Rhonda K. Schulz, both of Burnsville; Daniel K. Bocke, Eagan, and Jeff W. Petersen, Minnetonka, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.
Filed May 14, 1991, Ser. No. 699,947
Term of patent 14 years
U.S. Cl. D23—207



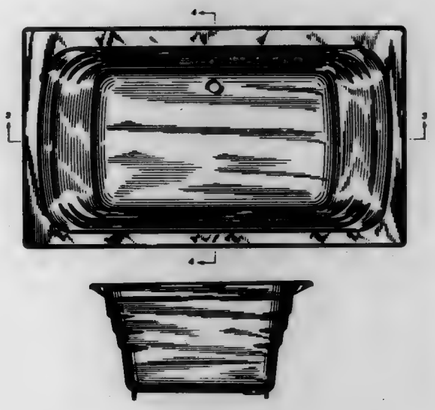
334,422
SPRINKLER
Franco Clivio, Zürich, Switzerland, assignor to Gardena Kress- + Kastner GmbH, Fed. Rep. of Germany
Filed Aug. 23, 1989, Ser. No. 397,565
The portion of the term of this patent subsequent to Mar. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—216



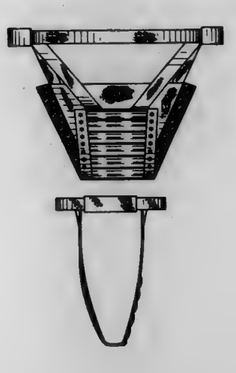
334,423
AEROSOL PUMP GUN
Scott W. Demarest, Caledonia, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 17, 1990, Ser. No. 600,348
Term of patent 14 years
U.S. Cl. D23—226



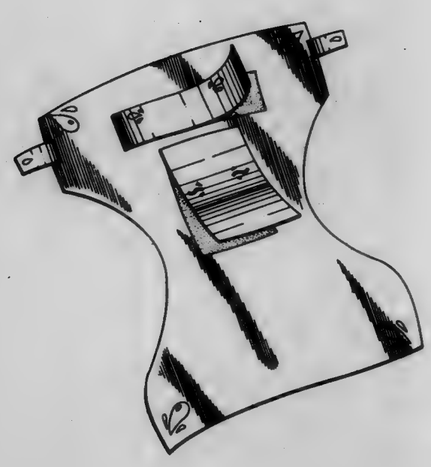
334,424
BATHTUB
David J. O'Connell, Sturgeon Bay, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 11, 1991, Ser. No. 641,013
Term of patent 14 years
U.S. Cl. D23—280



334,425
DISPOSABLE WASTE GARMENT
Naomi A. Rose, 109 East Mason Ave., Alexandria, Va. 22301
Filed Jul. 20, 1990, Ser. No. 554,828
Term of patent 14 years
U.S. Cl. D24—125

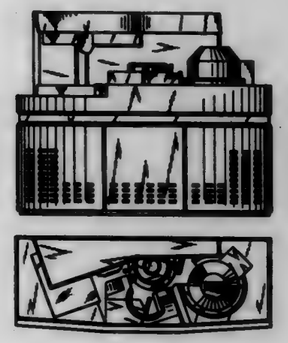


334,426
COMBINED DIAPER AND WIPE ATTACHMENT
Lloyd R. Meis, Rte. 2 Box 176, Neligh, Nebr. 68756
Filed Dec. 20, 1990, Ser. No. 630,959
Term of patent 14 years
U.S. Cl. D24—126



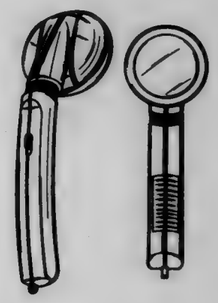
334,427
CONTAINER FOR HOLDING, CLEANING, AND DISINFECTING TOOTHBRUSHES
Frank J. Palazzolo, 20211 Van Antwerp, Harper Woods, Mich. 48225, and Joel L. Stone, 1317 LakePointe Rd., Grosse Pointe Park, Mich. 48230
Continuation-in-part of Ser. No. 272,869, Nov. 18, 1988, abandoned. This application Jun. 14, 1991, Ser. No. 716,375
Term of patent 14 years
U.S. Cl. D24—176

334,428
AUTOMATED ANALYTICAL ANALYZER
George L. Horton, Englewood, N.J.; Michael Pantaleoni, Ossining, N.Y.; Eric Anderson, Bergenfield, N.J., and Thomas A. Bonagur, Burnt Hills, N.Y., assignors to TriTech Partners, Tarrytown, N.Y.
Filed Jul. 24, 1989, Ser. No. 384,512
Term of patent 14 years
U.S. Cl. D24—186



334,429
ELBOW EXTENSION SLEEVE
Helen J. Diamuko, P.O. Box 2323 Pillow Hill, West Helena, Ark. 72390
Continuation-in-part of Ser. No. 132,579, Dec. 14, 1987, abandoned. This application Dec. 7, 1990, Ser. No. 624,284
Term of patent 14 years
U.S. Cl. D24—190

334,430
VIBRATORY MASSAGER
Paul Tsou, 3th Fl., 39, Tehhsing E. Rd., Taipei, Taiwan
Filed Oct. 31, 1990, Ser. No. 607,079
Term of patent 14 years
U.S. Cl. D24—215



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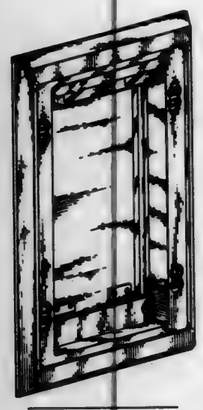
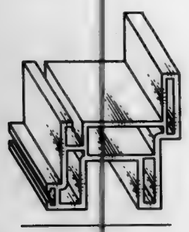
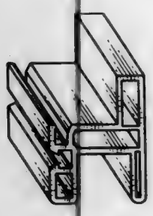
334,431
COMBINED PET DOOR FRAME AND FLAP
George N. Davlantes, 21457 Iglesia Dr., Woodland Hills, Calif. 91364
Filed Feb. 22, 1991, Ser. No. 661,083
Term of patent 14 years
U.S. Cl. D25—60



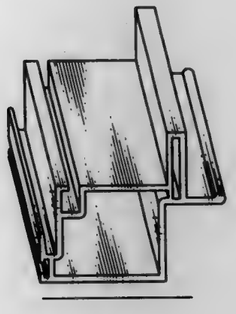
334,432
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,092
Term of patent 14 years
U.S. Cl. D25—124



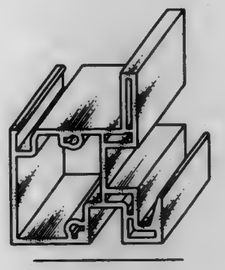
334,433
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,097
Term of patent 14 years
U.S. Cl. D25—124



334,434
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,584
Term of patent 14 years
U.S. Cl. D25—124



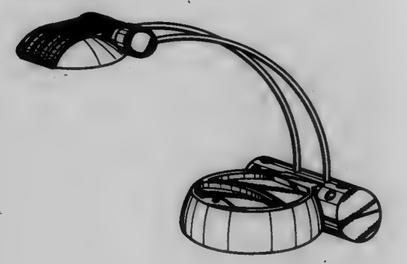
334,435
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 673,585
Term of patent 14 years
U.S. Cl. D25—124



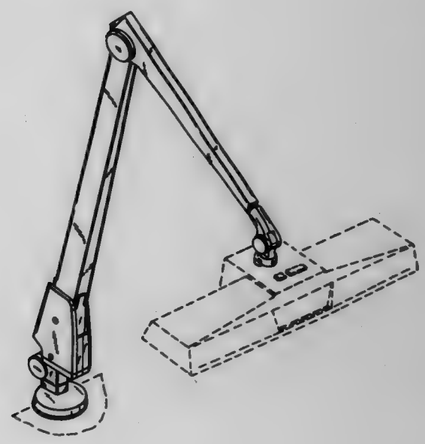
334,436
WINDOW COMPONENT EXTRUSION
Douglas L. Cole, Seattle, Wash., assignor to Mikron Industries, Kent, Wash.
Filed Mar. 20, 1991, Ser. No. 672,627
Term of patent 14 years
U.S. Cl. D25—125

334,437
FLUORESCENT LANTERN
Tit W. Poon, Chain Wan, Hong Kong, assignor to Flying Dragon Development Ltd., Chai Wan, Hong Kong
Filed Jan. 10, 1991, Ser. No. 639,000
Claims priority, application United Kingdom, Jul. 11, 1990, 2008191
Term of patent 14 years
U.S. Cl. D26—42

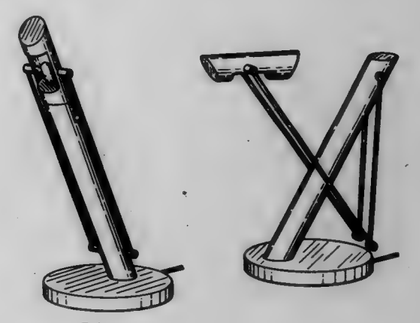
334,438
ADJUSTABLE TABLE LAMP
Long-Far Kua, Taipei, Taiwan, assignor to Steve Chen, Taipei, Taiwan
Filed May 6, 1991, Ser. No. 695,762
Term of patent 14 years
U.S. Cl. D26—63



334,439
ARTICULATED ARM FOR A TASK LIGHT
Carl X. Meyer, Grantwood Village; Louis O. Vitt, St. Louis; David P. Burchell, Valley Park, and James A. Schmid, St. Louis, all of Mo., assignors to Dazor Manufacturing Corporation, St. Louis, Mo.
Filed Oct. 12, 1990, Ser. No. 596,842
Term of patent 14 years
U.S. Cl. D26—65



334,440
ADJUSTABLE LAMP
Ken Goldner, 145 E. 16 St., Apt. 2P, New York, N.Y. 10003
Filed Aug. 6, 1991, Ser. No. 745,084
Term of patent 14 years
U.S. Cl. D26—65



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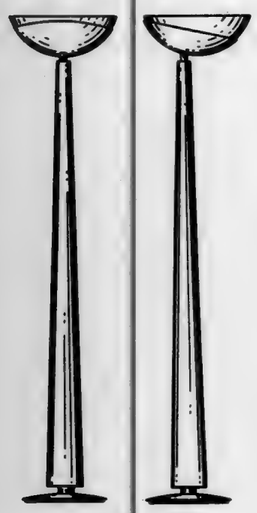
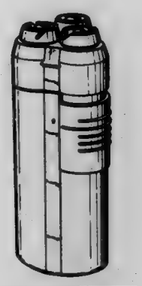
334,441
FLOOR LAMP
Pierluigi Nicolin, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Feb. 4, 1991, Ser. No. 655,513
Term of patent 14 years
U.S. Cl. D26—106

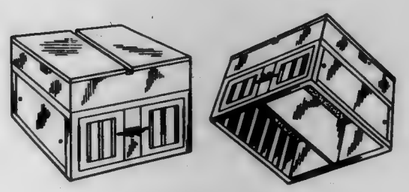


334,442
FLOOR LAMP
Leslie A. Meck, Blandon; N. Peter Pettersson, Bernville; John Lehn, Reading, and Michael J. Becker, Lansdale, all of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Jun. 4, 1991, Ser. No. 710,297
Term of patent 14 years
U.S. Cl. D26—111

334,443
DRY SHAVER
Dieter Rams, Kronberg, and Peter Eckart, Frankfurt, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Mar. 21, 1991, Ser. No. 673,218
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1990, 9006407
Term of patent 14 years
U.S. Cl. D28—50

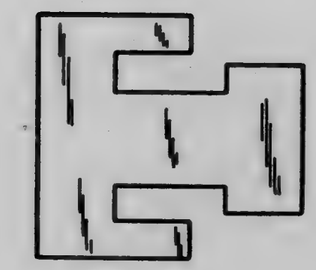


334,444
COMBINED DOG TRANSPORTATION BOX AND STORAGE CONTAINER
Steven S. Darby, P.O. Box 73, Anderson, S.C. 29622
Filed Jan. 7, 1991, Ser. No. 637,742
Term of patent 14 years
U.S. Cl. D30—108

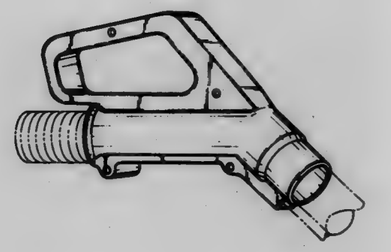


334,445
HOUSE FOR CATS
Kami Kiani, 1456 Lancaster, Memphis, Tenn. 38116
Filed May 13, 1991, Ser. No. 699,780
Term of patent 14 years
U.S. Cl. D30—108

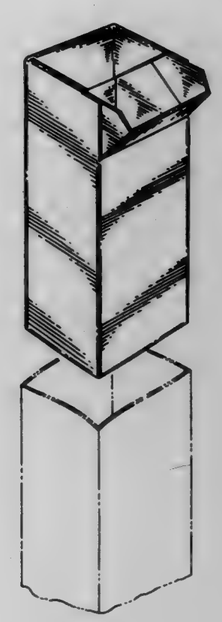
334,446
DOG TOY
Michael J. Mercer, 6010 W. Calumet Rd., Milwaukee, Wis. 53223
Filed Dec. 23, 1991, Ser. No. 817,102
Term of patent 14 years
U.S. Cl. D30—160



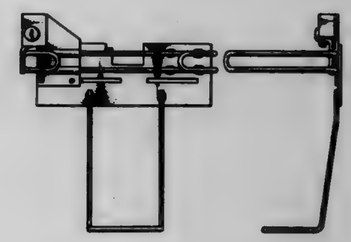
334,447
VACUUM CLEANER HANDLE
Dean R. Rohn, Cadillac, Mich., assignor to Rexair, Inc., Troy, Mich.
Filed Jan. 22, 1990, Ser. No. 468,823
Term of patent 14 years
U.S. Cl. D32—34



334,448
TRASH BAG SUPPORT
John M. Fish, 1910 Larkdale Dr., Glenview, Ill. 60025
Filed May 14, 1991, Ser. No. 699,560
Term of patent 14 years
U.S. Cl. D34—5



334,449
SHARPS COLLECTION CONTAINER HOLDER
Rodolfo Gaba, and Bruno J. Ramirez, both of Simi Valley, Calif., assignors to Devon Industries, Inc., Chatsworth, Calif.
Filed Jan. 4, 1991, Ser. No. 641,575
Term of patent 14 years
U.S. Cl. D34—6



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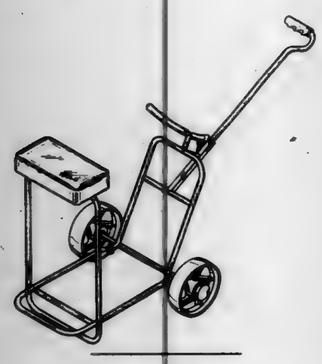
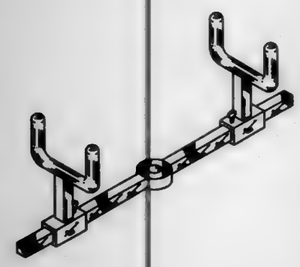
334,450
RECEPTACLE LID
Antonio R. Reguz, 46011 Cleveland Avenue, Chilliwack, British Columbia, Canada V2P 2U8
Filed Dec. 10, 1990, Ser. No. 625,592
Claims priority, application Canada, Jun. 8, 1990, 08-06-90-11
Term of patent 14 years
U.S. Cl. D34—11

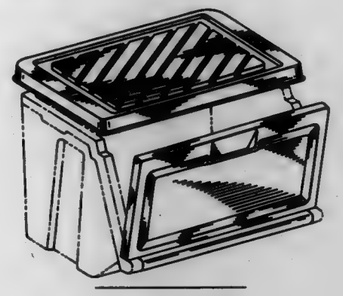
334,451
GOLF PULL-CART
Ian C. Lindeman, Lyneham Act, Australia, assignor to Pratt Golfing Equipment, Inc., Houston, Tex.
Filed Jul. 23, 1991, Ser. No. 734,587
Term of patent 14 years
U.S. Cl. D34—15



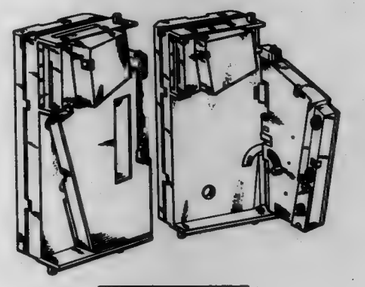
334,452
AUTOMOBILE JACK ATTACHMENT
Stacy L. Duncan, Rte. 1, Box 313, Michigan City, Miss. 38647
Filed Apr. 1, 1991, Ser. No. 677,849
Term of patent 14 years
U.S. Cl. D34—31



334,453
LID AND DOOR UNIT FOR STORAGE CONTAINER
Peter A. Koloski, Columbus, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 13, 1991, Ser. No. 654,908
Term of patent 14 years
U.S. Cl. D34—40

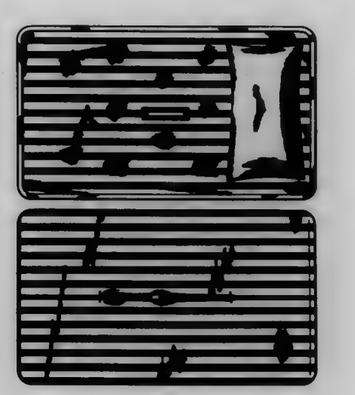


334,454
COIN SELECTOR
Jesus E. Ibarrola, Pamplona Navarra, Spain, assignor to Azkoyen Industrial, S.A., Peralta Navarra, Spain
Filed Jan. 2, 1991, Ser. No. 636,937
Claims priority, application Spain, Aug. 3, 1990, 122791
Term of patent 14 years
U.S. Cl. D99—34



334,455
BABY BOTTLE BANK
Ralph M. Dworman, and Nancy S. Dworman, both of Worcester, Mass., assignors to Ralphco, Inc., West Boylston, Mass.
Filed Aug. 27, 1990, Ser. No. 573,667
Term of patent 14 years
U.S. Cl. D99—37

334,456
NOVELTY BANK
Richard C. Levy, P.O. Box 34828, Bethesda, Md. 20827, and Peter Franason, 14225 Secluded La., Gaithersburg, Md. 20878
Filed May 16, 1991, Ser. No. 701,966
Term of patent 14 years
U.S. Cl. D99—37



334,457
AUTOPSY HEAD DRAPE
James H. Becker, Topeka, Kans., assignor to Marketing International, Inc., Topeka, Kans.
Filed Apr. 29, 1991, Ser. No. 692,510
Term of patent 14 years
U.S. Cl. D99—99

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LIST OF PATENTEES

TO WHOM

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Kubo, Masahiro; and Ohtsubo, Yasuo, to Kabushiki Kaisha Toshiba. Magnetic disk device including a slider provided with a solid protecting layer which determines the distance between a magnetic gap and a magnetic disk recording device. 5,198,934, Cl. 360-104.000.

Kubota, Hiroshi, to Sharp Kabushiki Kaisha. Variable density ink-jet dot printer. 5,198,833, Cl. 346-1.100.

Kubota, Hitoshi: *See*—
Anezaki, Takashi; Kubota, Hitoshi; and Yamane, Manabu, 5,198,876, Cl. 356-375.000.

Kubota, Ryuichi: *See*—
Ohta, Tohru; Daimaru, Akimasa; Ichikawa, Masao; Fujishiro, Hideyuki; Kubota, Ryuichi; Nakamura, Takeyoshi; Harada, Hisayoshi; Koshitani, Hirotaka; Suzuki, Tatsuya; and Hoshino, Teruo, 5,198,167, Cl. 264-86.000.

Kubota, Yoichi: *See*—
Ishizuka, Ko; Nishimura, Tetsuharu; Kubota, Yoichi; Tsukiji, Masaaki; and Ishii, Satoshi, 5,198,873, Cl. 356-356.000.

Kubota, Yoshihiro: *See*—
Noguchi, Hitoshi; Nagata, Yoshihiko; Kashida, Meguru; and Kubota, Yoshihiro, 5,199,055, Cl. 378-35.000.

Kucharski, John G.: *See*—
Roinestad, Gerald C.; Straight, Michael R.; and Kucharski, John G., 5,197,591, Cl. 198-803.010.

Kudashov, Nikolai V.: *See*—
Fedorov, Svyatoslav N.; Kozin, Mikhail P.; Kudashov, Nikolai V.; and Sakharov, Jury I., 5,197,473, Cl. 128-645.000.

Kudo, Hirotsugu, to NEC Corporation. Matrix switch apparatus with a diagnosis circuit having stand-by ports and reduced size matrix switching elements. 5,198,808, Cl. 340-825.800.

Kuhn, Uwe: *See*—
Kiesele, Herbert; Kuhn, Uwe; and Haupt, Stephan, 5,198,092, Cl. 204-402.000.

Kuhner, Karl: *See*—
Scheiber, Friedrich; Bier, Waldemar; Sonnleitner, Hermann; Kuhner, Karl; and Lommel, Albrecht, 5,197,929, Cl. 475-160.000.

Kukio, Thomas C., to United States of America, Energy. Monolithic dye laser amplifier. 5,199,040, Cl. 372-54.000.

Kukreja, Jagmohan S.: *See*—
Nayak, Ashok B.; and Kukreja, Jagmohan S., 5,198,947, Cl. 360-109.000.

Kullik, Gotz: *See*—
Falb, Wolfgang; Gippert, Karl-Ludwig; Heim, Ulrich; Holscher, Uvo; Kinke, Siegfried; Kullik, Gotz; Loser, Ralf-Ernst; and Maurer, Christoph, 5,197,462, Cl. 128-203.140.

Kumano, Mikio; and Kondoh, Shigeyuki, to Nippondenso Co., Ltd. Variable discharge high pressure pump. 5,197,438, Cl. 123-506.000.

Kumazaki, Toshimi: *See*—
Mishima, Kyoichi; Kumazaki, Toshimi; and Kawashima, Masahiko, 5,197,928, Cl. 474-263.000.

Kumazawa, Tsutomu: *See*—
Ueda, Hiroshi; Yoshida, Yoshio; Inoue, Hiroshi; Kaneda, Toshikazu; Moriya, Toshiaki; and Kumazawa, Tsutomu, 5,198,508, Cl. 525-454.000.

Kume, Taketsugu, to Suzuki Kabushiki Kaisha. Secondary air supply system for engine unit. 5,197,282, Cl. 60-307.000.

Kumobayashi, Hidenori: *See*—
Noyori, Ryoji; Kitamura, Masato; Sayo, Noboru; Kumobayashi, Hidenori; and Giles, Martin F., 5,198,562, Cl. 556-23.000.

Kunimoto, Yukitaka, to Kabushiki Kaisha CSK. System for detecting punched holes of magnetic cards. 5,198,646, Cl. 235-449.000.

Kunkel, Wulf B.: *See*—
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Kunze, Norbert; and Weber, Georg, to U.S. Philips Corporation. Magnetic-tape-cassette apparatus comprising a deck for magnetic-tape cassettes (reversing mechanism). 5,198,943, Cl. 360-96.300.

Kunze, Norbert, to U.S. Philips Corporation. Magnetic-tape-cassette apparatus comprising a manually operable cassette drive. 5,198,954, Cl. 360-137.000.

Kurakake, Tadakazu, to Kabushiki Kaisha Toshiba. High precision single focus collimator and method for manufacturing high precision single focus collimator. 5,198,680, Cl. 250-505.100.

Kuranuki, Kenji; Taniguchi, Masayuki; Yamamoto, Hiromichi; and Nakajima, Shuroo, to Matsushita Electric Industrial Co., Ltd. Solid electrolytic capacitor and method for making same. 5,198,967, Cl. 361-523.000.

Kurashina, Kenji: *See*—
Abe, Kenichi; Kaneuchi, Masumi; Kurashina, Kenji; Kaji, Kenzou; and Sumiyoshi, Kikuo, 5,199,071, Cl. 379-98.000.

Kuratate, Tomoaki; Koden, Mitsuhiro; and Funada, Fumiaki, to Sharp Kabushiki Kaisha. Ferroelectric liquid crystal composition. 5,198,151, Cl. 252-299.660.

Kureha Kagaku Kogyo K.K.: *See*—
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Kuribara, Masaru: *See*—
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Kurimura, Masaaki: *See*—
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Kuroda, Masami; Amano, Masayo; and Furusho, Noboru, to Fuji Electric Co., Ltd. Bisazo photoconductor for electrophotography. 5,198,318, Cl. 430-58.000.

Kuroda, Ryo: *See*—
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Kurosawa, Yuichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Head drive mechanism using non-axial lead screw imparted motion. 5,198,946, Cl. 360-105.000.

Kurosawa, Yuji, to Canon Kabushiki Kaisha. Image communication apparatus and method with selection of magnification transmission mode and setting minimum transmission time. 5,198,908, Cl. 358-409.000.

Kurtin, Stephen. Method for replicating solvent-sensitive images. 5,198,060, Cl. 156-230.000.

Kusakabe, Hiromi, to Kabushiki Kaisha Toshiba. Custom integrated circuit composed of a combination of analog circuit cells designed to operate in current mode. 5,198,781, Cl. 330-257.000.

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Kuznar, Ronald J., to General Electric Company. Squeeze film damper seal ring. 5,197,807, Cl. 384-99.000.

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Kwasnick, Robert F.; Possin, George E.; Holden, David E.; and Sais, Richard J., to General Electric Company. Thin film transistor structure with improved source/drain contacts. 5,198,694, Cl. 257-766.000.

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Kyber, Manfred; Schmidt, Wolfgang; and Thiele, Ulrich, to Zimmer Aktiengesellschaft. Process for continuous polycondensation of terephthalic acid and 1,4-bis(hydroxymethyl)cyclohexane. 5,198,530, Cl. 528-279.000.

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Kyushu Hitachi Maxell, Ltd.: *See*—
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Lacy, Rodney G. Card holder jacket. 5,197,387, Cl. 101-368.000.

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Lang, Gerard; Maignan, Jean; Restle, Serge; and Shroot, Braham, to L'Oreal. Benzonorbornene derivatives, processes for their preparation and medicinal and cosmetic compositions containing them. 5,198,567, Cl. 560-56.000.

Lang, Hans-Walter; and Wenger, Josef, to Kaltenbach & Voigt GmbH & Co. Work-bench with a safety device. 5,197,835, Cl. 409-134.000.

Lang, Victor H., to Semborg Recrob, Corp. Interactive animated charater immediately after the title. 5,198,893, Cl. 358-93.000.

Lanser, Michael L.; VanderVeen, Steven E.; and Becker, David J., to Prince Corporation. Visor with extendable panel. 5,197,777, Cl. 296-97.800.

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Leary, Craig W.; and Scanlon, Christopher M., to United States Surgical Corporation. Suture retainer. 5,197,597, Cl. 206-63.300.

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Lee, Fei P.; Koblish, Theodore R.; and Halvorsen, Robert M., to Fuel Systems Textron Inc. Variable area combustor air swirler. 5,197,290, Cl. 60-748.000.

Lee, Guo-ahuh J.; Garces, Juan M.; Meima, Garmt R.; and van der Aalst, Matheus J. M., to Dow Chemical Company, The. Alkylation of aromatic compounds. 5,198,595, Cl. 585-467.000.

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Leung, Ka-Ngo; Kunkel, Wulf B.; and Walther, Steven R., to United States of America, Energy. Production of N^+ ions from a multicusp ion beam apparatus. 5,198,677, Cl. 250-424.000.

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Levy, Edward K.; D'Agostini Mark; Latkovic, Damir; and Parkinson, James W., to Electric Power Research Institute. Separation of pyrite from coal in a fluidized bed. 5,197,398, Cl. 110-347.000.

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Sakonju, Kazutaka; and Hori, Eisaku, to Jidosha Denki Kogyo Kabushiki Kaisha. Constant-speed cruising control system for vehicles. 5,197,563, Cl. 180-176.000.

Sakuragi, Hiroshi, to Kabushiki Kaisha Toshiba. Image processing apparatus having multiple display areas for editing. 5,199,102, Cl. 395-139.000.

Sakurai, Kaoru; Murakami, Harunori; Iijima, Hiroshi; Maeda, Masaru; and Matsuda, Koji, to Nippon Sheet Glass Co., Ltd. Reception system for a motor vehicle. 5,198,825, Cl. 343-713.000.

Sakurai, Toshiharu: *See*—
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Salas, Margarita: *See*—
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Salb, Jesse. System and method for localization of functional activity in the human brain. 5,198,977, Cl. 364-413.010.

Salin, Jarl-Gunnar, to Ekono Oy. Process for drying timber. 5,197,201, Cl. 34-16.500.

Salituro, Gino M.: *See*—
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Sallwasser, Alan: *See*—
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Salomon, Bernd; and Orthmann, Reinhard, to Licentia Patent-Verwaltungs-GmbH. Multiple-surface sensor control for a traveling wave motor. 5,198,714, Cl. 310-323.000.

Salomon, Mary F., to Lubrizol Corporation, The. Antioxidant products. 5,198,132, Cl. 252-48.200.

Salomon, Mary F.: *See*—
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Salomon S. A.: *See*—
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Sampson, Gary: *See*—
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Samson, Richard D.; McKinney, James M.; and Russell, John, to Graniteville Company. Insect repellent tent fabric. 5,198,287, Cl. 428-248.000.

Samsonite Corporation: *See*—
Van Hooreweder, Godwin, 5,197,578, Cl. 190-18.00A.

Samsung Electron Devices Co., Ltd.: *See*—
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Samsung Electronics Co., Ltd.: *See*—
Kim, Chun-dong, 5,198,916, Cl. 359-15.000.
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Sohn, Myung D.; and Ro, Kyeng H., 5,197,299, Cl. 62-262.000.

Samueli, Henry; and Brackert, Ralph H., to PairGain Technologies, Inc. Oversampled digital-to-analog converter for multilevel data transmission. 5,198,818, Cl. 341-144.000.

San Luis Tank Piping Construction Co. Inc.: *See*—
Todd, Lorin R.; and Noorafshani, Siavash, 5,197,513, Cl. 137-592.000.

Sanabria, Jose: *See*—
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Sanchez, Jose R., to Pitney Bowes Inc. Mailing machine cut tape dispensing apparatus. 5,197,629, Cl. 221-15.000.

Sanchez, Martha L. See-through storage container. 5,197,661, Cl. 229-162.000.

Sanden Corporation: *See*—
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Sanders, Allen C.: *See*—
Aulick, Rodney O.; Beach, Bradley L.; Elbert, Donald L.; Franey, Terence E.; Feeman, James F.; Olson, John M.; Sanders, Allen C.; and Vollmer, Robert L., 5,198,022, Cl. 106-22.00K.

Sanders Saws, Inc.: *See*—
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Sanderson, Barbara J. S.: *See*—
Henner, William D.; Comstick, Kenine E.; Sanderson, Barbara J. S.; and Claflin, Virginia J., 5,198,337, Cl. 435-6.000.

Sandoz Ltd.: *See*—
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Sankyo Chemical Co., Ltd.: *See*—
Tani, Naoyuki; and Yoshida, Kusutaro, 5,198,064, Cl. 156-289.000.

Sano, Eiichi; Asa, Masahito; and Nakajima, Masayuki, to Tokimec, Inc. Waveguide for dividing and combining microwaves. 5,198,787, Cl. 333-128.000.

Sano, Yoshio: *See*—
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Sanofi: *See*—
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Sanshin Kogyo Kabushiki Kaisha: *See*—
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Sansom, Matthias R.; and Ellingson, Richard L., to MegaDyne Medical Products, Inc. Composite electrosurgical medical instrument. 5,197,962, Cl. 606-45.000.

Santana, Manuel R.: *See*—
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Santi, John, to Briggs & Stratton Corporation. Crankpin bearing for connecting rod of internal combustion engine. 5,197,425, Cl. 123-197.300.

Sanyo-Denki Kabushikigaisha: *See*—
Tada, Kinya; Kurimura, Masaaki; Yano, Mutsumi; Mieno, Eiichiro; Sekiguchi, Wataru; Nakagawa, Junzo; and Akazawa, Takanori, 5,198,315, Cl. 429-209.000.

Sanyo-Ekuseru Kabushikigaisha: *See*—
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Sanyo Electric Co., Ltd.: *See*—
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Sapozhnikov, Gregory: *See*—
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Sasaki, Hidemi, to Fuji Photo Film Co., Ltd. Combined universal head and grip. 5,197,702, Cl. 248-178.000.

Sasaki, Isamu; and Yoshioka, Takeya, to Nippon Suisan Kaisha, Ltd. Method of manufacturing a fibrous fish or shellfish neriseihin product. 5,198,261, Cl. 426-643.000.

Sasaki, Naoto: *See*—
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Sato, Hiroshi: *See*—
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Sato, Yasuhito: *See*—
Takahashi, Hideki; Takeuchi, Eiichi; Shimizu, Shigeru; Yamamoto, Tadao; Inoue, Hideaki; Sato, Yasuhito; Nakayama, Kenji; Honda, Toshiro; and Asako, Kenichiro, 5,198,839, Cl. 346-155.000.

Sato, Yoshimitsu: *See*—
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Sato, Yoshio: *See*—
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Savage, David W.: *See*—
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Savall, Vincent; and Gaudin, Marie-Pierre, to Degremont. Assembly for removing water for washing filters. 5,198,108, Cl. 210-265.000.

Saville, Eric J.; Hunt, Raymond S., Jr.; and Dunn, William R., to Pneu-Draulics, Inc. Aircraft waste system drain valve. 5,197,515, Cl. 137-613.000.

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Hashimoto, Masashi; and Kwon, Oh-Kyong, 5,198,699, Cl. 307-270.000.
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Robbins, John; and Boston, Ricky L., 5,197,271, Cl. 51-163.100.
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Ito, Kazumasa; Makino, Toshio; Ohbayashi, Masaki; Koike, Shoji; and Yoshida, Jun-ichi, 5,197,460, Cl. 128-66.000.

Yoshida, Keiichi: *See*—
Kikuchi, Hiroshi; Maeyama, Ken-ichi; and Yoshida, Keiichi, 5,198,355, Cl. 435-232.000.

Yoshida Kogyo K.K.: *See*—
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Okada, Yozo; Kando, Akiyoshi; and Kuse, Kazuki, 5,197,686, Cl. 242-55.300.
Yamakita, Yoshimichi, 5,197,306, Cl. 68-5.00D.

Yoshida, Kusutaro: *See*—
Tani, Naoyuki; and Yoshida, Kusutaro, 5,198,064, Cl. 156-289.000.

Yoshida, Masato; Yokoyama, Takanao; Nanba, Muneyoshi; Kato, Yoshihiko; Iida, Kazumasa; and Miyamoto, Katsuhiko, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Method for detecting fuel blending ratio. 5,197,451, Cl. 123-696.000.

Yoshida, Mitsuhiro: *See*—
Kobayashi, Takaichi; and Yoshida, Mitsuhiro, 5,198,966, Cl. 361-395.000.

Yoshida, Tohru: *See*—
Sugano, Toshio; Nagaoka, Kohji; Tsukui, Seiichiro; Wakashima, Yoshiaki; Tanimoto, Michio; Watanabe, Masayuki; Sakaguchi, Suguru; Nishi, Kunihiko; Kaneda, Aizo; Serizawa, Kohji; Honda, Michiharu; Yoshida, Tohru; Komaru, Takeshi; and Nakamura, Atsushi, 5,198,888, Cl. 257-686.000.

Yoshida, Yoshio: *See*—
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Yoshida, Yutaka: *See*—
Tsuchiya, Kazuhiro; and Yoshida, Yutaka, 5,198,688, Cl. 257-144.000.

Yoshii, Yasuharu; Misono, Shinji; and Ue, Hitoshi, to Tokai Carbon Co., Ltd. Carbon black for tire tread rubber. 5,198,205, Cl. 423-445.000.

Yoshimaru, Tomohisa: *See*—
Suzuki, Katsumi; Yokota, Tsuneshi; and Yoshimaru, Tomohisa, 5,199,022, Cl. 369-275.100.

Yoshimura, Kimitaka, to Kabushiki Kaisha Toshiba. Double heterotype semiconductor laser device. 5,198,686, Cl. 257-94.000.

Yoshino, Kazuhiko, to Sharp Kabushiki Kaisha. Process for fabricating a semiconductor device. 5,198,373, Cl. 437-31.000.

Yoshioka, Takeya: *See*—
Sasaki, Isamu; and Yoshioka, Takeya, 5,198,261, Cl. 426-643.000.

Yoshioka, Toshihiro: *See*—
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Yoshizawa, Tetsuo; Tarayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, to Canon Kabushiki Kaisha. Electric circuit device having an electric coanecting member and electric circuit components. 5,197,892, Cl. 439-91.000.

You, Chin-San. Method of making golf club of plastic composite material. 5,198,058, Cl. 156-173.000.

Young, Ross: *See*—
Ovshinsky, Stanford R.; Young, Ross; Van der Leeden, Gerard; and Chao, Benjamin S., 5,198,414, Cl. 501-1.000.

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Yu, Yuan-Fu: *See*—
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Yue, Der C.: *See*—
Shie, Jin S.; Horng, Jiann C.; Tone, Kwang S.; Tao, Kuang C.; Hsieh, Yann T.; Chiou, Shou C.; and Yue, Der C., 5,198,803, Cl. 340-782.000.

Yuen, Po-Ling. Rotating bead stringing apparatus. 5,197,175, Cl. 29-241.000.

Yumoto, Hideaki, to Tlv Co., Ltd. Thermally-actuated steam trap. 5,197,669, Cl. 236-58.000.

Yung, Chu K.: *See*—
Taylor, John A.; Phillips, Duncan A. S.; Yung, Chu K.; and Ellis, Gerard, 5,197,992, Cl. 8-549.000.

Yung-Kuk, Jo; Yong In, Jo; and Chang Sun, Yang, to SKC Limited. Method of making magneto-optical recording medium. 5,198,087, Cl. 204-192.300.

Yutani, Yuji: *See*—
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, 5,198,136, Cl. 252-54.000.

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Zajac, Eugeniusz: *See*—
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Zaklady Chemiczne "Blachownia": *See*—
Kiedik, Maciej; Kolt, Jozef; Marsaycki, Jerzy; Zajac, Eugeniusz; Bek, Teodor; Swiderski, Zbigniew; Rzodeczko, Anna; Mroz, Jerzy; and Olkowska, Janina, 5,198,591, Cl. 568-727.000.

Zambon Group S.p.A.: *See*—
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Zebco Corporation: *See*—
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Zepp, Charles M.; Wald, Stephen A.; and Dodds, David R., to Separacor, Inc. Compounds useful in enzymatic resolution systems and their preparation. 5,198,568, Cl. 560-60.000.

Zeria Pharmaceutical Co., Ltd.: *See*—
Ogura, Kuniyoshi; Aotsuka, Tomoji; Torizuka, Motoki; Soeda, Mitsuo; Tanaka, Yoshiaki; Kato, Hisayoshi; Miura, Naoyoshi; Nakata, Noaki; Morita, Hikaru; and Okubo, Akihiro, 5,198,450, Cl. 514-326.000.

Zexel Corporation: *See*—
Nagasaka, Yoshikiyo; Sugita, Takashi; and Ishikawa, Tadaaki, 5,197,538, Cl. 165-144.000.
Okano, Masami, 5,199,007, Cl. 368-108.000.

Zhang, Daozheng; and Liang, Nian R., to Zhang, Daozheng; Liang, Nian R.; and Beijing Stone Office Equipment Technology Co. Ltd. Method and system for inputting simplified form and/or original complex form of Chinese character. 5,197,810, Cl. 400-110.000.

Zhang, Yunchang; and Cannon, James C., to Puritan-Bennett Corporation. Chemical oxygen generator. 5,198,147, Cl. 252-187.310.

Zhang, Zuoying L.: *See*—
MacDonald, Noel C.; and Zhang, Zuoying L., 5,198,390, Cl. 437-203.000.

Zhou, Jingshi; and Fochtman, David J., to Amway Corporation. Conditioning shampoo. 5,198,209, Cl. 424-71.000.

Zibilich, Anthony M., Jr.; Chaisson, Garron J.; and Beam, Mancel C., to Shell Offshore Inc. Seismic cable deployment apparatus. 5,197,716, Cl. 254-134.3SC.

Zijsling, Djurre H., to Shell Internationale Research Maatschappij B.V. The Netherlands. Rotary drill bit for drilling through sticky formations. 5,197,554, Cl. 175-393.000.

Zilber, Steven A. Manual cassette system for overhead projection transparencies. 5,198,846, Cl. 353-113.000.

Zimmer Aktiengesellschaft: *See*—
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Zimmerman, Erich: *See*—
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Zimmermann, Peter H.; and McDonald, Paul A., to Loral Infrared & Imaging Systems, Inc. Method for fabricating buttable epitaxial infrared detector arrays by dimensionally controlled cleaving of single crystal substrates. 5,198,069, Cl. 156-600.000.

Zingher, Arthur R.: *See*—
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Ziu, Christopher G., to Double Containment Systems. Centering support assembly for double containment pipe systems. 5,197,518, Cl. 138-113.000.

Zlydnikov, Dmitry M.: *See*—
Trofimov, Fedor A.; Tsyshkova, Nina G.; Bogdanova, Nadezhda S.; Nikolaeva, Irina S.; Zotova, Svetlana A.; Sakhaschik, Zinaida M.; Padeiskaya, Elena N.; Fomina, Alla N.; Svirina, Evgenia A.; Zlydnikov, Dmitry M.; Kubar, Olga I.; Shvetsova, Evgenia G.; Kutchak, Svetlana N.; Peters, Valentina V.; Bryantseva, Elena A.; Konoplyannikov, Anatoly G.; Surinov, Boris P.; Yadrovskaya, Vera A.; Safonova, Ljudmila S.; Karpova, Nina A.; Savina, Elena P.; Savinova, Ljudmila A.; Grinev, Alexei N., deceased; and Pershin, Grigory N., deceased, 5,198,552, Cl. 548-492.000.

Zmek, William P.: *See*—
Shen, Gon Y.; Zmek, William P.; and Shu, Ker L., 5,198,653, Cl. 250-201.900.

Zoche, Michael. Radial internal combustion engine. 5,197,416, Cl. 123-55.00A.

Zolton, Gregory P., II: *See*—
Dankovic, Richard A.; Zolton, Gregory P., II; Bushkill, John F.; and Slimak, Louis S., 5,198,635, Cl. 219-121.460.

Zona, Mauro; and Bettinardi, Marco, to Comau S.p.A.. Articulated robot with two forearms. 5,197,346, Cl. 74-479.000.

Zorzi, Claudio; Tonel, Valerio; and De Bortoli, Giuseppe, to Nordica S.p.A. Lever structure particularly for ski boots. 5,197,165, Cl. 24-68.0SK.

Zotova, Svetlana A.: *See*—
Trofimov, Fedor A.; Tsyshkova, Nina G.; Bogdanova, Nadezhda S.; Nikolaeva, Irina S.; Zotova, Svetlana A.; Sakhaschik, Zinaida M.; Padeiskaya, Elena N.; Fomina, Alla N.; Svirina, Evgenia A.; Zlydnikov, Dmitry M.; Kubar, Olga I.; Shvetsova, Evgenia G.; Kutchak, Svetlana N.; Peters, Valentina V.; Bryantseva, Elena A.; Konoplyannikov, Anatoly G.; Surinov, Boris P.; Yadrovskaya, Vera A.; Safonova, Ljudmila S.; Karpova, Nina A.; Savina, Elena P.; Savinova, Ljudmila A.; Grinev, Alexei N., deceased; and Pershin, Grigory N., deceased, 5,198,552, Cl. 548-492.000.

Zucker, Joseph: *See*—
Campbell, Bruce D.; Zucker, Joseph; and Jervis, James E., 5,199,089, Cl. 385-24.000.

Zuerner, Edwin C.; Patzelt, Robert A.; and Foster, Norman, to Nortru, Inc. Composition for the treatment of overspray in paint spray booths containing secondary alcohol esters and surfactants. 5,198,143, Cl. 252-170.000.

Zugates, Thomas B.: *See*—
Coudriet, Lawrence A.; and Zugates, Thomas B., 5,198,125, Cl. 210-803.000.

Zukowski, Stanislaw L.: *See*—
Berman, Andrew B.; Bruchman, William C.; and Zukowski, Stanislaw L., 5,197,983, Cl. 623-13.000.

Zullig, Charles J.: *See*—
Rines, Steven P.; and Zullig, Charles J., 5,198,558, Cl. 552-108.000.

Zurek, Thomas F.: *See*—
Khalil, Omar S.; Hanna, Charles F.; and Zurek, Thomas F., 5,198,368, Cl. 436-518.000.

Zuzich, Anne H.: *See*—
Blytas, George C.; Frank, Harry; and Zuzich, Anne H., 5,198,532, Cl. 528-421.000.

Zyman, Alexandre; Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Lipid compounds derived from sphingosines, process for preparing these and their applications, in particular in cosmetics and in the pharmacy of skin conditions. 5,198,470, Cl. 514-785.000.

501 Pronav International, Inc.: *See*—
Burrell, Gary L.; Kao, Min H.; and Shumaker, Paul K., 5,198,831, Cl. 343-895.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MARCH, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

British Telecommunications public limited company: *See*—
Johnston, Robert D., Re. 34,205, Cl. 364-724.190.

Elston, Sidney B., III: *See*—
Nelson, Joey L.; Elston, Sidney B., III; Tseng, Wu-Yang; and Hemsworth, Martin C., Re. 34,207, Cl. 416-226.000.

General Electric Company: *See*—
Nelson, Joey L.; Elston, Sidney B., III; Tseng, Wu-Yang; and Hemsworth, Martin C., Re. 34,207, Cl. 416-226.000.

Hemsworth, Martin C.: *See*—
Nelson, Joey L.; Elston, Sidney B., III; Tseng, Wu-Yang; and Hemsworth, Martin C., Re. 34,207, Cl. 416-226.000.

Johnson Service Company: *See*—
Kautz, Thomas O., Re. 34,202, Cl. 137-14.000.

Johnston, Robert D., to British Telecommunications public limited company. Adaptive recognizing device. Re. 34,205, Cl. 364-724.190.

Kautz, Thomas O., to Johnson Service Company. Dual mode pneumatic control system. Re. 34,202, Cl. 137-14.000.

McGarraugh, Clifford B. Variable speed transmission. Re. 34,209, Cl. 475-89.000.

Nelson, Joey L.; Elston, Sidney B., III; Tseng, Wu-Yang; and Hemsworth, Martin C., to General Electric Company. Counterrotating aircraft propulsor blades. Re. 34,207, Cl. 416-226.000.

Northern Telecom Limited: *See*—
Sayar, Babak, Re. 34,206, Cl. 375-20.000.

Palazzo, David T. Double wall storage tank and method of making same. Re. 34,208, Cl. 220-445.000.

Sayar, Babak, to Northern Telecom Limited. Method and apparatus for timing recovery. Re. 34,206, Cl. 375-20.000.

Shaw, Laurence J. Swinging bob toy. Re. 34,208, Cl. 446-75.000.

Takada, Juichiro. Pressure regulation device for vehicle safety air bag. Re. 34,204, Cl. 280-739.000.

Tseng, Wu-Yang: *See*—
Nelson, Joey L.; Elston, Sidney B., III; Tseng, Wu-Yang; and Hemsworth, Martin C., Re. 34,207, Cl. 416-226.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

B.E.L-Tronics Limited: *See*—
Martinson, Glen, B1 4,952,936, Cl. 342-20.000.

El Gamel, Abbas, to SiArc. BiCMOS logic circuit for ASIC application. B1 5,068,548, 3-30-93, Cl. 307-446.000.

Halpert, David E.: *See*—
Walsh, Brian F.; and Halpert, David E., B1 4,437,122, Cl. 358-166.000.

Heffron, Allan J., to Ingersoll CM Systems, Incorporated. Monotonic cutting machine. B1 4,790,698, 3-30-93, Cl. 409-200.000.

Hemstreet, Harold S., to Hemstreet, Harold S. Method and apparatus for identifying letters, characters, symbols and the like. B1 3,713,099, 3-30-93, Cl. 382-34.000.

Hirai, Toshio: *See*—
Inoue, Sigeo; Uchiyama, Tetsuo; Hirai, Toshio; and Niihara, Koichi, B1 4,746,635, Cl. 501-89.000.

Ingersoll CM Systems, Incorporated: *See*—
Heffron, Allan J., B1 4,790,698, Cl. 409-200.000.

Inoue, Sigeo; Uchiyama, Tetsuo; Hirai, Toshio; and Niihara, Koichi, to Kabushiki Kaisha Riken; Hirai, Toshio; and Niihara, Koichi. High strength and high hardness alumina-zirconia-silicon carbide sintered ceramic composite and its manufacturing process. B1 4,746,635, 3-30-93, Cl. 501-89.000.

Kabushiki Kaisha Riken: *See*—
Inoue, Sigeo; Uchiyama, Tetsuo; Hirai, Toshio; and Niihara, Koichi, B1 4,746,635, Cl. 501-89.000.

Lee, Jung-Jae, to Samsung Electronics Co., Ltd. Idling rotation mechanism used in the housing of a video cassette tape recorder. B1 5,034,830, 3-30-93, Cl. 360-85.000.

Lieberman, Walter G., to Tol-O-Matic, Inc. Pressure cylinder. B1 4,545,290, 3-30-93, Cl. 92-88.000.

Martinson, Glen, to B.E.L-Tronics Limited. Multiband radar detector having plural local oscillators. B1 4,952,936, 3-30-93, Cl. 342-20.000.

Mizukane, Masahiro: *See*—
Suzuki, Shigemi; and Mizukane, Masahiro, B1 4,512,616, Cl. 384-42.000.

Niihara, Koichi: *See*—
Inoue, Sigeo; Uchiyama, Tetsuo; Hirai, Toshio; and Niihara, Koichi, B1 4,746,635, Cl. 501-89.000.

Price, Reese. Automobile burglar alarm. B1 4,740,775, 3-30-93, Cl. 340-429.000.

Samsung Electronics Co., Ltd.: *See*—
Lee, Jung-Jae, B1 5,034,830, Cl. 360-85.000.

SiArc: *See*—
El Gamel, Abbas, B1 5,068,548, Cl. 307-446.000.

Suzuki, Shigemi; and Mizukane, Masahiro, to Toto Ltd. Sliding guide. B1 4,512,616, 3-30-93, Cl. 384-42.000.

Tol-O-Matic, Inc.: *See*—
Lieberman, Walter G., B1 4,545,290, Cl. 92-88.000.

Toto Ltd.: *See*—
Suzuki, Shigemi; and Mizukane, Masahiro, B1 4,512,616, Cl. 384-42.000.

Uchiyama, Tetsuo: *See*—
Inoue, Sigeo; Uchiyama, Tetsuo; Hirai, Toshio; and Niihara, Koichi, B1 4,746,635, Cl. 501-89.000.

Walsh, Brian F.; and Halpert, David E., to Xerox Corporation. Low resolution raster images. B1 4,437,122, 3-30-93, Cl. 358-166.000.

Xerox Corporation: *See*—
Walsh, Brian F.; and Halpert, David E., B1 4,437,122, Cl. 358-166.000.

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Henneberger, Roy, 334,380, Cl. D13-155.000.

Airmar Technology Corp.: *See*—
Boucher, Stephen G.; Cullen, Robert M.; Lagace, Maurice P.; and Noyes, Andrew L., 334,335, Cl. D8-373.000.

Anderson, Eric: *See*—
Horton, George L.; Pantaleoni, Michael; Anderson, Eric; and Bonagur, Thomas A., 334,428, Cl. D24-186.000.

Applications Commercials et Technique des Emballages: *See*—
Legaie, Georges, 334,339, Cl. D9-316.000.

Arctco, Inc.: *See*—
Hornsi, Miklos D., 334,374, Cl. D12-182.000.

Arney, Michael: *See*—
Costello, John; and Arney, Michael, 334,303, Cl. D6-436.000.

Artemide S.p.A.: *See*—
Nicolin, Pierluigi, 334,441, Cl. D26-106.000.

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Artwright Marketing SDN BHD: *See*—
Keong, Yong Y., 334,310, Cl. D6-474.000.
Avia Group International, Inc.: *See*—
Feller, Craig L.; and Earle, John S., 334,276, Cl. 82-314.000.
Azkoyen Industrial, S.A.: *See*—
Ibarrola, Jesus E., 334,454, Cl. D99-34.000.
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Baldwin Hardware Corporation: *See*—
Meck, Leslie A.; Pettersson, N. Peter; Lehn, John; and Becker, Michael J., 334,442, Cl. D26-111.000.
Bausch & Lomb Incorporated: *See*—
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Becker, Michael J.: *See*—
Meck, Leslie A.; Pettersson, N. Peter; Lehn, John; and Becker, Michael J., 334,442, Cl. D26-111.000.
Bengtson, Alan D., to Kohler Co. Wall mountable support. 334,315, 3-30-93, Cl. D6-524.000.
Bennett, Ward. Chair. 334,293, 3-30-93, Cl. D6-366.000.
Bichi, Pasquale, to MGZ S.p.A. Ornamental chain. 334,351, 3-30-93, Cl. D11-13.000.
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Boche, Daniel K.: *See*—
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Gladfelter, Elizabeth J.; Outlaw, Tina O.; Copeland, James L.; Schulz, Rhonda K.; Boche, Daniel K.; and Peterson, Jeff W., 334,421, Cl. D23-207.000.
Bolle, Maurice, to Establissement Bolle S.N.C. Sunglasses. 334,389, 3-30-93, Cl. D16-102.000.
Bonagur, Thomas A.: *See*—
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Bostock, John; and Ryan, Kevin, to Technotrend Limited. Combined microphone with holder. 334,387, 3-30-93, Cl. D14-227.000.
Bott, John A.: *See*—
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Boucher, Stephen G.; Cullen, Robert M.; Lagace, Maurice P.; and Noyes, Andrew L., to Airmar Technology Corp. Transducer mounting bracket. 334,335, 3-30-93, Cl. D8-373.000.
Bouton, Frank M.: *See*—
Carter, Robert L.; Moffett, Gary L.; and Bouton, Frank M., 334,415, Cl. D21-48.000.
Braun Aktiengesellschaft: *See*—
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Breen, John D., to Rubbermaid Incorporated. Rotary compartmented organizer. 334,306, 3-30-93, Cl. D6-455.000.
Brewin, Garry: *See*—
Sharpe, Stephen E.; Sharpe, Richard; and Brewin, Garry, 334,328, Cl. D8-61.000.
Brown, Jerrold G.; Hamilton, Phillip W.; and Kahl, W. Henry, to Rubbermaid Incorporated. Bottle lid. 334,341, 3-30-93, Cl. D9-447.000.
Buckley, Robert S. Shopping cart holder. 334,301, 3-30-93, Cl. D6-462.000.
Burchell, David P.: *See*—
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Celander, Michael A. Lotto card marker. 334,406, 3-30-93, Cl. D19-43.000.
Chee, Edward K., to Rolliture Corporation. Seat cushion. 334,318, 3-30-93, Cl. D6-601.000.
Chen, Steve: *See*—
Kua, Long-Far, 334,438, Cl. D26-63.000.
Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See*—
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357 5,197,378
446 5,197,379
580 5,197,380

CLASS 101
72 5,197,382
91 5,197,383
123 5,197,384
177 5,197,385
213 5,197,386
368 5,197,387
474 5,197,388

CLASS 103
293 5,198,611
5,198,612
313 5,198,613
401 5,198,614
476 5,198,615
501 5,198,616

CLASS 104
9 5,197,389
284 5,197,391

CLASS 108
3 5,197,392
149.1 5,197,390

CLASS 106
22 K 5,198,022
22 R 5,198,023
28 R 5,198,024
429 5,198,025
430 5,198,026
692 5,198,027

CLASS 108
10 5,197,393
44 5,197,381
50 5,197,394
56.1 5,197,395
56.3 5,197,396

CLASS 110
281 5,197,397
345 5,197,399
347 5,197,398

CLASS 112
122.3 5,197,400

CLASS 114
39.1 5,197,401
39.2 5,197,402
90 5,197,403
267 5,197,404
344 5,197,405
363 5,197,406

CLASS 116
86 5,197,407
173 5,197,408

CLASS 118
62 5,198,028
303 5,198,029
411 5,198,030
505 5,198,031
718 5,198,032
5,198,033
725 5,198,034

CLASS 119
5 5,197,409
28.5 5,197,411
99 5,197,412
106 5,197,413
5,197,414
114 5,197,410

CLASS 122
17 5,197,415

CLASS 123
41.54 5,197,440
48 C 5,197,432
52 MB 5,197,433
55 A 5,197,416
73 C 5,197,417
5,197,418
90.130 5,197,419
90.15 5,197,420
90.17 5,197,421
182.1 5,197,422
195 A 5,197,423
196 S 5,197,424
197.3 5,197,425
198 E 5,197,426
198 R 5,197,427
296 5,197,428
357 5,197,429
421 5,197,430
423 5,197,431
433 5,197,434
456 5,197,435
5,197,436
5,197,437
467 5,197,441
502 5,197,438
506 5,197,439
514 5,197,443
5,197,444
520 5,197,442
538 5,197,446
557 5,197,447
620 5,197,448
622 5,197,449
685 5,197,450
696 5,197,451

CLASS 124
57 5,197,452

CLASS 125
15 5,197,453

CLASS 126
9 R 5,197,454
25 B 5,197,455
350 R 5,197,456

CLASS 127
67 5,198,035

CLASS 128
7 5,197,457
66 5,197,458
5,197,459
5,197,460
118.1 5,197,461
203.14 5,197,462
207.14 5,197,463
5,197,464
207.29 5,197,465
399 5,197,466
419 PG 5,197,467
5,197,468
419 R 5,197,469
634 5,197,470
640 5,197,471
644 5,197,472
645 5,197,473
653.5 5,197,474
660.01 5,197,475
660.03 5,197,476
661.08 5,197,477
681 5,197,478
696 5,197,479
697 5,197,480
719 5,197,481
749 5,197,482
5,197,483
754 5,197,484
758 5,197,485
772 5,197,486
776 5,197,487
782 5,197,488
5,197,489
5,197,490
786 5,197,491
846 5,197,492
853 5,197,493

CLASS 131
298 5,197,494
328 5,197,495

CLASS 132
200 5,197,496
218 5,197,497
325 5,197,498

CLASS 134
6 5,198,036
22.11 5,198,037
95.2 5,197,499
142 5,197,500

CLASS 136
66 5,197,501
69 5,197,502
88 5,197,503
102 5,197,504
5,197,505
118 5,197,506

CLASS 137
1 5,197,507
5,197,508
13 5,197,509
14 Re.34,202
216.2 5,197,510
360 5,197,511
375 5,197,512

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592 5,197,513
597 5,197,514
613 5,197,515
625.62 5,197,516
813 5,197,517

CLASS 138

113 5,197,518

CLASS 139

1 C 5,197,520
1 R 5,197,521
91 5,197,522

CLASS 141

206 5,197,523

CLASS 144

342 5,197,524

CLASS 148

11 5,198,038
194 5,198,039
304 5,198,040
402 5,198,041
403 5,198,042
512 5,198,043
514 5,198,044
552 5,198,045

CLASS 149

61 5,198,046

CLASS 150

102 5,197,525

CLASS 152

209 R 5,198,047
210 5,198,048
5,198,049
517 5,198,050
524 5,198,051

CLASS 156

45 5,198,052
64 5,198,053
5,198,054
66 5,198,055
73.1 5,198,056
83 5,198,057
173 5,198,058
230 5,198,059
5,198,060
234 5,198,061
245 5,198,062
282 5,198,063
289 5,198,064
315 5,198,065
538 5,198,066
5,198,067
542 5,198,068
600 5,198,069
612 5,198,070
625 5,198,071
627 5,198,072
659.1 5,198,073

CLASS 160

84.1 5,197,526

CLASS 162

15 5,198,074
19 5,198,075

CLASS 164

45 5,197,527
97 5,197,528
113 5,197,529
119 5,197,530
122.1 5,197,531
137 5,197,532
446 5,197,533
467 5,197,534
468 5,197,535
476 5,197,536

CLASS 165

32 5,197,537
144 5,197,538
172 5,197,539

CLASS 166

55.8 5,197,540
67 5,197,541
122 5,197,542
250 5,197,543
294 5,197,544
372 5,197,545
382 5,197,546
387 5,197,547

CLASS 169

11 5,197,548

CLASS 171

17 5,197,549
58 5,197,550

CLASS 172

42 5,197,551
264 5,197,552

CLASS 174

65 R 5,198,617
67 5,198,618
74 A 5,198,619
74 R 5,198,620
128.1 5,198,621
143 5,198,622

CLASS 175

57 5,197,553
393 5,197,554
431 5,197,555
432 5,197,556

CLASS 177

210 R 5,197,557

CLASS 178

19 5,198,623

CLASS 180

8.2 5,197,558
65.1 5,197,559
69.21 5,197,560
79.3 5,197,561
169 5,197,562
176 5,197,563
179 5,197,564
248 5,197,565
249 5,197,566

CLASS 181

166 5,198,624
248 5,198,625
291 5,198,626

CLASS 184

1.5 5,197,567
7.4 5,197,568
55.1 5,197,569

CLASS 187

16 5,197,570
74 5,197,571

CLASS 188

67 5,197,573
71.6 5,197,574
72.9 5,197,575
159 5,197,576
265 5,197,577

CLASS 190

18 A 5,197,578
0.062 5,197,581
1.37 5,197,582
35 5,197,583

CLASS 194

217 5,197,588
248 5,197,589

CLASS 198

300 5,197,590
380 5,197,584
384 5,197,585
462 5,197,586
497 5,197,587
803.01 5,197,591
830 5,197,592
851 5,197,593

CLASS 200

120.011 5,197,660

CLASS 203

50 B 5,198,627
61.47 5,198,628
61.54 5,198,629
83 P 5,198,631
83 R 5,198,632
144 AP 5,198,630
318 5,197,594
572 5,197,604

CLASS 202

202 5,198,076

CLASS 204

60 5,198,077

CLASS 205

70 5,198,078
98 5,198,079
101 5,198,080
105 R 5,198,081
130 5,198,082
149 5,198,083
157.47 5,198,084
182.4 5,198,085
5,198,086
192.3 5,198,087
196 5,198,088
240 5,198,089
298.11 5,198,090
299 R 5,198,091
402 5,198,092
406 5,198,093
430 5,198,094

CLASS 205

138 5,198,095
210 5,198,096

CLASS 206

0.6 5,197,595
6.1 5,197,596
63.3 5,197,597
141 5,197,598
232 5,197,599
444 5,197,600
511 5,197,601
514 5,197,602
570 5,197,603
582 5,197,605
594 5,197,606

CLASS 208

39 5,198,101
79 5,198,097
85 5,198,098
89 5,198,099
5,198,100
310 Z 5,198,102
431 5,198,103

CLASS 209

586 5,197,607

CLASS 210

149 5,198,104
151 5,198,105
222 5,198,106
232 5,198,107
265 5,198,108
321.75 5,198,109
321.79 5,198,110
408 5,198,111
490 5,198,112
608 5,198,113
610 5,198,114
634 5,198,115
636 5,198,116
638 5,198,117
5,198,118
654 5,198,119
659 5,198,120
689 5,198,121
748 5,198,122
791 5,198,123
792 5,198,124
803 5,198,125

CLASS 211

50 5,197,608
57.1 5,197,609
59.2 5,197,610
5,197,611
74 5,197,612
133 5,197,613
181 5,197,614

CLASS 212

185 5,197,615

CLASS 215

220 5,197,616
221 5,197,617
232 5,197,618
256 5,197,619
307 5,197,620
331 5,197,621

CLASS 219

89 5,198,633
121.43 5,198,634
121.46 5,198,635
121.68 5,198,636
121.69 5,198,637
209 5,198,638
219 5,198,639
530 5,198,640
544 5,198,641

CLASS 220

89.2 5,197,622
212 5,197,623
254 5,197,624
418 5,197,625
445 Re.34,203
507 5,197,626
571 5,197,627
589 5,197,628

CLASS 221

15 5,197,629
37 5,197,630
52 5,197,631
197 5,197,632

CLASS 222

14 5,197,633
109 5,197,634
137 5,197,635
190 5,197,636
207 5,197,637
212 5,197,638
606 5,198,126

CLASS 223

88 5,197,639

CLASS 224

30 A 5,197,640
42.021 5,197,641
310 5,197,642

CLASS 225

93 5,197,643

CLASS 226

118 5,197,644
154 5,197,645

CLASS 227

8 5,197,646
126 5,197,647
179 5,197,648
5,197,649

CLASS 228

6.2 5,197,650
44.7 5,197,651
5,197,652
116 5,197,653
124 5,197,654
254 5,197,655

CLASS 229

40 5,197,656
5,197,657
93 5,197,658
117.01 5,197,659
162 5,197,661
244 5,197,662
303 5,197,663

CLASS 235

375 5,198,642
382 5,198,643
383 5,198,644
441 5,198,645
449 5,198,646
5,198,647
462 5,198,648
5,198,649
472 5,198,650
5,198,651
492 5,198,652

CLASS 236

11 5,197,664
26 D 5,197,665
46 R 5,197,666
49.3 5,197,667
51 5,197,668
58 5,197,669
78 D 5,197,670
92 C 5,197,671

CLASS 239

1 5,197,672
102.1 5,197,673
408 5,197,674
585.2 5,197,675
690 5,197,676

CLASS 241

5 5,197,677
21 5,197,678
36 5,197,679
57 5,197,680
65 5,197,681
101.7 5,197,682
189.1 5,197,683
283 5,197,684

CLASS 242

1.1 R 5,197,685
55.3 5,197,686
67.1 R 5,197,687
78.8 5,197,688
118.7 5,197,689
244 5,197,690

CLASS 244

3.13 5,197,691
54 5,197,692
110 B 5,197,693
5,197,694
129.1 5,197,695
145 5,197,696
197 5,197,697

CLASS 248

60 5,197,698
118 5,197,699
125 5,197,700
166 5,197,701
178 5,197,702
225.1 5,197,703
292.1 5,197,704
316.7 5,197,705
499 5,197,706
638 5,197,707

CLASS 249

92 5,198,127

CLASS 250

201.9 5,198,653
208.1 5,198,654
208.10 5,198,655
214 A 5,198,658
5,198,660
214 LS 5,198,656
214 VT 5,198,657
214.1 5,198,659
221 5,198,661
227.18 5,198,662
231.1 5,198,663
239 5,198,664
282 5,198,665
294 5,198,666
306 5,198,667
310 5,198,668
328 5,198,670
352 5,198,671
370.11 5,198,673
376.01 5,198,672
396 ML 5,198,674
397 5,198,675
5,198,676
424 5,198,677
455.11 5,198,678
484.1 5,198,679
505.1 5,198,680

CLASS 251

8 5,197,708
129.15 5,197,709
5,197,710
152 5,197,711
335.3 5,197,712

CLASS 252

32.7 E 5,198,129
5,198,130
47.5 5,198,131
48.2 5,198,132
49.9 5,198,133
50 5,198,134
52 A 5,198,135
54 5,198,136
62.54 5,198,137
5,198,138
68 5,198,139
90 5,198,140
142 5,198,141
163 5,198,142
170 5,198,143
174.11 5,198,144
174.14 5,198,145
182.24 5,198,146
187.31 5,198,147
299.01 5,198,148
299.61 5,198,149
5,198,150
299.66 5,198,151
389.31 5,198,152
500 5,198,153
514 5,198,154
628 5,198,128

CLASS 254

29 R 5,197,713
126 5,197,714
134.3 SC 5,197,716
134.4 5,197,715

CLASS 256

59 5,197,717

CLASS 257

20 5,198,879
21 5,198,682
67 5,198,683
79 5,198,684
82 5,198,685
94 5,198,686
137 5,198,687
144 5,198,688
197 5,198,689
200 5,198,690
219 5,198,881
316 5,198,691
591 5,198,692
676 5,198,883
678 5,198,889
686 5,198,888
701 5,198,885
720 5,198,693
727 5,198,886
760 5,198,884
766 5,198,694
773 5,198,695

CLASS 261

18.1 5,198,155
87 5,198,156

CLASS 264

9 5,198,157
22 5,198,158
5,198,159
28 5,198,160
40.5 5,198,161
49 5,198,162
51 5,198,163
58 5,198,164
65 5,198,165
73 5,198,166
86 5,198,167
132 5,198,168
137 5,198,169
141 5,198,170
211.23 5,198,171
219 5,198,172
257 5,198,173
512 5,198,174
5,198,175
522 5,198,176
572 5,198,177

CLASS 266

50 5,198,178
217 5,198,179
225 5,198,180

CLASS 267

119 5,197,718

CLASS 269

40 5,197,719
48.1 5,197,720
315 5,197,721

CLASS 270

32 5,197,722

CLASS 271

3 5,197,723
3.1 5,197,724
110 5,197,726
183 5,197,727
220 5,197,728
248 5,197,729

CLASS 273

73 C 5,197,731
80 C 5,197,733
84 R 5,197,734
138 R 5,197,735
142 R 5,197,736
169 5,197,737
176 FA 5,197,738
187 B 5,197,739
235 R 5,197,740
237 5,197,741
239 5,197,742
378 5,197,743
396 5,197,744
420 5,197,745
735 5,197,732

CLASS 277

144 5,197,746
235 B 5,197,747

CLASS 279

4.12 5,197,748
147 5,197,749

CLASS 280

11.2 5,197,572
250.1 5,197,750
426 5,197,751
610 5,197,752
642 5,197,753
655 5,197,754
690 5,197,755
728 5,197,756
734 5,197,757
736 5,197,759
739 Re.34,204
741 5,197,758
814 5,197,760

CLASS 281

15.1 5,197,761
43 5,197,762

CLASS 283

76 5,197,763
81 5,197,764
93 5,197,765

CLASS 285

14 5,197,766
39 5,197,767
105 5,197,768
212 5,197,769
353 5,197,770

CLASS 290

327.2 5,198,669
577 5,198,681

CLASS 292

45 5,197,771

CLASS 294

57 5,197,772
86.18 5,197,773

CLASS 296

24.1 5,197,774
37.12 5,197,775
65.1 5,197,776
97.8 5,197,777
136 5,197,778
220 5,197,779

CLASS 297

284.7 5,197,780
323 5,197,781

CLASS 298

23 M 5,197,782

CLASS 299

17 5,197,783
37 5,197,784

CLASS 301

63.1 5,197,785
124.1 5,197,786

CLASS 303

10 5,197,787
100 5,197,788

CLASS 307

10.1 5,198,696
31 5,198,697
64 5,198,698
270 5,198,699
273 5,198,700
296.3 5,198,701
326 5,198,702
350 5,198,703
446 5,198,704
B1 5,068,548
465 5,198,705
5,198,706
475 5,198,707
480 5,198,708
5,198,709
520 5,198,710

CLASS 310

12 5,198,711
242 5,198,712
316 5,198,713
323 5,198,714
328 5,198,715
349 5,198,716

CLASS 312

223.2 5,197,789
329 5,197,790
348.1 5,197,791

CLASS 313

17 5,198,717
359.1 5,198,718
414 5,198,719
446 5,198,720
503 5,198,721
623 5,198,722
634 5,198,723

CLASS 315

111.21 5,198,724
111.41 5,198,725
224 5,198,726
291 5,198,727
307 5,198,728
370 5,198,729
376 5,198,730
388 5,198,731

CLASS 318

116 5,198,732
254 5,198,733
369 5,198,734
565 5,198,735
568.10 5,198,736
568.11 5,198,737
652 5,198,738
661 5,198,739
687 5,198,740
696 5,198,741
803 5,198,742

CLASS 320

31 5,198,743

CLASS 322

33 5,198,744
58 5,198,745

CLASS 323

207 5,198,746
303 5,198,747

CLASS 324

71.1 5,198,749
76.35 5,198,748
76.47 5,198,750
141 5,198,751
158 F 5,198,752
5,198,753
5,198,754
158 P 5,198,755
5,198,756
158 R 5,198,757
5,198,758
5,198,759
5,198,760
207.12 5,198,761
207.21 5,198,762
207.23 5,198,763
207.26 5,198,764
227 5,198,765
300 5,198,766
301 5,198,767
318 5,198,768
5,198,769
367 5,198,770
438 5,198,771
463 5,198,772
464 5,198,773
468 5,198,774
544 5,198,775
639 5,198,776
671 5,198,777
718 5,198,778

CLASS 328

14 5,198,779
32 H 5,198,795

CLASS 330

254 5,198,780
257 5,198,781
277 5,198,782

CLASS 331

66 5,198,783
117 R 5,198,784

CLASS 332

109 5,198,785

CLASS 333

26 5,198,786
128 5,198,787
207 5,198,788

CLASS 335

132 5,198,789

CLASS 336

83 5,198,790

CLASS 337

31 5,198,791
251 5,198,792

CLASS 338

172 5,198,793
195 5,198,794

CLASS 340

310 A 5,198,796
425.5 5,198,797
429 B1 4,740,775
539 5,198,798
552 5,198,799
573 5,198,800
589 5,198,801
709 5,198,802
782 5,198,803
799 5,198,804
825.06 5,198,805
825.160 5,198,809
825.31 5,198,806
825.54 5,198,807
825.8 5,198,808
870.13 5,198,810
905 5,198,811
975 5,198,812

CLASS 341

59 5,198,813
118 5,198,814
133 5,198,815
137 5,198,816
143 5,198,817
144 5,198,818

CLASS 342

20 B1 4,952,936
26 5,198,819
165 5,198,820
360 5,198,821
424 5,198,822
429 5,198,823

CLASS 343

700 MS 5,198,824
713 5,198,825
726 5,198,826
761 5,198,827
776 5,198,828
878 5,198,829
882 5,198,830
895 5,198,831
915 5,198,832

CLASS 346

1.1 5,198,833
5,198,834
5,198,843
76 PH 5,198,835
5,198,836
108 5,198,837
5,198,838
155 5,198,839
5,198,840
157 5,198,841
159 5,198,842

CLASS 351

161 5,198,844
221 5,198,845

CLASS 353

113 5,198,846

CLASS 354

195.12 5,198,847
320 5,198,848
410 5,198,849
412 5,198,850
5,198,851
413 5,198,854
414 5,198,855
430 5,198,856

CLASS 355

53 5,198,857
202 5,198,858
204 5,198,859
211 5,198,852
244 5,198,853
246 5,198,860
5,198,861
259 5,198,862
274 5,198,863
5,198,864
326 5,198,865
5,198,866

CLASS 356

125 5,198,867
142 5,198,868
243 5,198,869
311 5,198,870
318 5,198,871
352 5,198,872
356 5,198,873
358 5,198,874
369 5,198,875
375 5,198,876
5,198,877
394 5,198,878

CLASS 357

37 5,198,882
214 5,198,880

CLASS 358

29 5,198,890
31 5,198,891
41 5,198,892
51 5,198,897
75 5,198,898
86 5,198,899
93 5,198,893
98 5,198,894
103 5,198,895
105 5,198,896
136 5,198,900
5,198,901
166 B1 4,437,122
183 5,198,902
186 5,198,903
198 5,198,904
213.11 5,198,905
213.17 5,198,906
296 5,198,907
409 5,198,908
412 5,198,909
456 5,198,910

CLASS 359

3 5,198,911
5,198,912
7 5,198,913
8 5,198,914
10 5,198,915
15 5,198,916
76 5,198,917
172 5,198,918
216 5,198,919
245 5,198,920
248 5,198,921
290 5,198,922
324 5,198,923
350 5,198,924
356 5,198,925
5,198,926
385 5,198,927
465 5,198,928
513 5,198,929
583 5,198,930
660 5,198,931
694 5,198,932
698 5,198,935
831 5,198,936
844 5,198,937
864 5,198,938
889 5,198,939

CLASS 360

9.1 5,198,940
33.1 5,198,941
78.04 5,198,942
83 B1 5,034,830
96.3 5,198,943
99.06 5,198,933
5,198,944
104 5,198,934
5,198,945
105 5,198,946
109 5,198,947
124 5,198,948
126 5,198,949
5,198,950
132 5,198,951
5,198,952
5,198,953
137 5,198,954

CLASS 361

18 5,198,957
42 5,198,955
106 5,198,956
119 5,198,958
149 5,198,959
150 5,198,960
380 5,198,961
5,198,962
383 5,198,887
386 5,198,963
5,198,964
5,198,965
395 5,198,966
523 5,198,967
529 5,198,968

CLASS 362

31 5,197,792
32 5,197,793
66 5,197,794
72 5,197,795
202 5,197,796
219 5,197,797
235 5,197,798
420 5,197,799

CLASS 363

17 5,198,969
37 5,198,970
71 5,198,971
138 5,198,972

CLASS 364

167.01 5,198,973
5,198,974
406 5,198,975
410 5,198,976
413.01 5,198,977
419 5,198,978
421 5,198,979
424.03 5,198,980
424.05 5,198,981
426.02 5,198,982
468 5,198,983
474.30 5,198,984
478 5,198,985
489 5,198,986
490 5,198,987
497 5,198,988
510 5,198,989
560 5,198,990
708 5,198,991
724.09 5,198,992
724.19 Re.34,205
788 5,198,993

CLASS 365

145 5,198,994
149 5,198,995
182 5,198,996
185 5,198,997
5,198,998
189.05 5,198,999
189.09 5,199,000
218 5,199,001
233.5 5,199,002

CLASS 366

136 5,197,800
167 5,197,801
217 5,197,802
309 5,197,803

CLASS 367

20 5,199,003
157 5,199,004
175 5,199,005

CLASS 368

76 5,199,006
108 5,199,007
117 5,199,008
240 5,199,009

CLASS 369

13 5,199,010
44.12 5,199,013
44.15 5,199,014
44.25 5,199,015
44.28 5,199,016
44.280 5,199,017
44.41 5,199,012
58 5,199,011
59 5,199,018
60 5,199,019
112 5,199,020
126 5,199,021
275.1 5,199,022
275.4 5,199,023
275.5 5,199,024

CLASS 370

16.1 5,199,025
56 5,199,026
60 5,199,027
5,199,028
62 5,199,029
68 5,199,030
110.1 5,199,031

CLASS 371

3 5,199,032
10.1 5,199,033
21.2 5,199,034
68.1 5,199,035

CLASS 372

31 5,199,037
33 5,199,038
38 5,199,039
54 5,199,040
89 5,199,041
95 5,199,042

CLASS 373

72 5,199,043

CLASS 374

185 5,197,804
208 5,197,805

CLASS 375

1 5,199,044
5,199,045
8 5,199,046
13 5,199,047
20 Re.34,206
104 5,199,048
5,199,049
115 5,199,050
117 5,199,051

CLASS 376

132 5,198,181
260 5,198,182
272 5,198,183
283 5,198,184
399 5,198,185
435 5,198,186

CLASS 377

20 5,199,052
60 5,199,053

CLASS 378

21 5,199,054
35 5,199,055
37 5,199,056
43 5,199,057
82 5,199,058
144 5,199,059
196 5,199,060

CLASS 379

53 5,199,061
67 5,199,062
98 5,199,071
100 5,199,063
387 5,199,064
389 5,199,065

CLASS 380

4 5,199,066
10 5,199,067
23 5,199,068
28 5,199,069
30 5,199,070
44 5,199,072
49 5,199,073
50 5,199,074

CLASS 381

24 5,199,075
36 5,199,076
43 5,199,077
47 5,199,078
94 5,199,079
110 5,199,080

CLASS 382

2 5,199,081
22 5,199,082
26 5,199,083
34 B1 3,713,099
48 5,199,084
54 5,199,085

CLASS 384

1 5,197,806
42 B1 4,512,616
99 5,197,807
493 5,197,808
617 5,197,809

CLASS 385

2 5,199,086
14 5,199,087
18 5,199,088
24 5,199,089
33 5,199,090
39 5,199,091
50 5,199,092
88 5,199,093
100 5,199,094
5,199,095
5,199,096
109 5,199,097
122 5,199,098
128 5,199,099
135 5,199,100
139 5,199,101

CLASS 395

115 5,199,102
139 5,199,103
140 5,199,104
145 5,199,105
275 5,199,106
5,199,107
325 5,199,108

CLASS 400

110 5,197,810
489 5,197,811
635 5,197,812
697.1 5,197,813

CLASS 401

78 5,197,814
202 5,197,815

CLASS 403

24 5,197,816
93 5,197,817
217 5,197,818

CLASS 406

13 5,197,819
128 5,197,820

CLASS 408

68 5,197,821
73 5,197,822
128 5,197,823
5,197,824
206 5,197,825
224 5,197,826
229 5,197,827
269 5,197,828
282 5,197,829

CLASS 407

42 5,197,830
114 5,197,831

CLASS 408

222 5,197,832
226 5,197,833

CLASS 409

131 5,197,834
134 5,197,835
200 5,197,836
B1 4,790,698
249 5,197,837

CLASS 411

43 5,197,838
340 5,197,839
433 5,197,840
522 5,197,841

CLASS 412

39 5,197,842

CLASS 414

140.8 5,197,843
331 5,197,844
339 5,197,845
731 5,197,846
752 5,197,847
786 5,197,848
788 5,197,849

CLASS 415

53.1 5,197,850
58.5 5,197,851
115 5,197,852
5,197,853
119 5,197,854
167 5,197,855
209.3 5,197,856

CLASS 416

204 A 5,197,857
226 Re.34,207

CLASS 417

14 5,197,858
19 5,197,859
34 5,197,860
42 5,197,861
53 5,197,862
68 5,197,863
218 5,197,864
420 5,197,865
472 5,197,866
571 5,197,867

CLASS 418

55.5 5,197,868
77 5,197,869

CLASS 419

35 5,198,187
45 5,198,188

CLASS 420

555 5,198,189
582 5,198,190

CLASS 422

68.1 5,198,192
100 5,198,193
144 5,198,194
199 5,198,195
219 5,198,196
256 5,198,197
264 5,198,198

CLASS 423

88 5,198,199
131 5,198,200
235 5,198,201
303 5,198,202
385 5,198,204
445 5,198,205
522 5,198,206
647 5,198,207
718 5,198,203

CLASS 424

1.1 5,198,208
71 5,198,209
78.03 5,198,210
78.31 5,198,211
85.5 5,198,212
85.8 5,198,213
5,198,420
92 5,198,214
5,198,215
94.2 5,198,216
195.1 5,198,217
401 5,198,218
405 5,198,219
426 5,198,220
434 5,198,221
438 5,198,222
449 5,198,223
450 5,198,224
5,198,225
457 5,198,226
463 5,198,227
469 5,198,228
473 5,198,229
525 5,198,230
713 5,198,231

CLASS 425

2 5,198,232
6 5,198,233
28.1 5,198,234
62 5,198,235
80.1 5,198,236
113 5,198,237
130 5,198,238
133.1 5,198,239
145 5,198,240
149 5,198,241
150 5,198,242
230 5,198,243
383 5,198,244
385 5,198,245
432 5,198,246
503 5,198,247
522 5,198,248
589 5,198,249

CLASS 426

2 5,198,250
5 5,198,251
53 5,198,252
83 5,198,253
102 5,198,254
241 5,198,255
250 5,198,256
282 5,198,257
384 5,198,258
435 5,198,259
643 5,198,261

CLASS 427

96 5,198,264
126.2 5,198,265
5,198,266
162 5,198,267
190 5,198,268
226 5,198,269
230 5,198,270
244 5,198,271
251 5,198,272
437 5,198,273
527 5,198,262
577 5,198,263

CLASS 428

5 5,198,274
43 5,198,275
5,198,276
92 5,198,277
95 5,198,278
99 5,198,279
102 5,198,280
5,198,281
114 5,198,282
195 5,198,283
5,198,284
216 5,198,285
246 5,198,286
248 5,198,287
253 5,198,288
263 5,198,290
286 5,198,289
288 5,198,291
290 5,198,292
5,198,293
300 5,198,294
323 5,198,295
336 5,198,296
5,198,297
5,198,298
340 5,198,299
354 5,198,300
355 5,198,301
375 5,198,302
437 5,198,304
463 5,198,303
5,198,305
481 5,198,306
589 5,198,307
608 5,198,308
667 5,198,309

CLASS 429

17 5,198,310
20 5,198,311
26 5,198,312
94 5,198,313
174 5,198,314
209 5,198,315

CLASS 430

32 5,198,316
58 5,198,317
5,198,318
96 5,198,319
110 5,198,320
138 5,198,321
189 5,198,322
191 5,198,323
265 5,198,324
283 5,198,325
296 5,198,326
363 5,198,327
5,198,328
523 5,198,329
538 5,198,330
569 5,198,331
588 5,198,332
597 5,198,333

CLASS 431

5,197,870
5,197,871
5,197,872

CLASS 433

9 5,197,873
74 5,197,874
80 5,197,875
116 5,197,876
153 5,197,877
158 5,197,878
159 5,197,879
5,197,880
173 5,197,881
215 5,197,882

CLASS 434

167 5,197,883
178 5,197,884
236 5,197,885
365 5,197,886

CLASS 435

2 5,198,334
4 5,198,335
5,198,336
6 5,198,337
5,198,338
7.2 5,198,339
7.8 5,198,340
42 5,198,341
69.1 5,198,342
5,198,343
5,198,344
5,198,346
5,198,347
5,198,348
5,198,541
69.4 5,198,542
69.6 5,198,349
91 5,198,350
99 5,198,351
101 5,198,352
188 5,198,353
199 5,198,354
232 5,198,355
240.2 5,198,356
240.26 5,198,357
252.1 5,198,358
252.3 5,198,359
5,198,360
252.33 5,198,361
254 5,198,362
277 5,198,363

CLASS 436

57 5,198,364
66 5,198,365
86 5,198,366
518 5,198,367
5,198,368
534 5,198,369

CLASS 437

3 5,198,370
11 5,198,371
31 5,198,372
5,198,373
5,198,374
5,198,375
32 5,198,376
40 5,198,377
41 5,198,378
5,198,379
43 5,198,380
5,198,381
46 5,198,382
47 5,198,383
5,198,384
51 5,198,385
52 5,198,386
101 5,198,387
173 5,198,388
190 5,198,389
203 5,198,390
218 5,198,391
241 5,198,392

CLASS 439

60 5,197,887
67 5,197,888
76 5,197,889
77 5,197,890
83 5,197,891
91 5,197,892
101 5,197,893
159 5,197,894
194 5,197,895
247 5,197,896
263 5,197,897
271 5,197,898
5,197,899
352 5,197,900
5,197,901
492 5,197,902
564 5,197,903
581 5,197,904
737 5,197,905
787 5,197,906
810 5,197,907
825 5,197,908

CLASS 440

2 5,197,909
89 5,197,910

CLASS 441

10 5,197,911
133 5,197,912

CLASS 446

75 Re.34,208
156 5,197,913

CLASS 452

32 5,197,914
31 5,197,915
125 5,197,916
131 5,197,917
171 5,197,918

CLASS 453

10 5,197,919

CLASS 454

228 5,197,920
254 5,197,921

CLASS 455

18 5,199,108
69.1 5,198,345
126 5,199,110
161.2 5,199,109

CLASS 462

2 5,197,922

CLASS 472

13 5,197,923
116 5,197,924
118 5,197,730
5,197,925
5,197,926

CLASS 474

80 5,197,927
263 5,197,928

CLASS 475

89 Re.34,209
160 5,197,929
168 5,197,930

CLASS 482

74 5,197,931
79 5,197,932
101 5,197,933
123 5,197,934

CLASS 492

7 5,197,174

CLASS 493

85 5,197,935
88 5,197,936
167 5,197,937
373 5,197,938

CLASS 494

53 5,197,939

CLASS 501

1 5,198,414
65 5,198,393
89 B1 4,746,635
98 5,198,394
136 5,198,395
138 5,198,396

CLASS 502

43 5,198,397
56 5,198,398
111 5,198,399
113 5,198,400
155 5,198,401
167 5,198,402
204 5,198,403
230 5,198,404
300 5,198,405

CLASS 503

207 5,198,406
226 5,198,407
227 5,198,408
5,198,409
5,198,410

CLASS 504

225 5,198,013
5,198,014
344 5,198,012

CLASS 505

1 5,198,411
5,198,412
5,198,413

CLASS 507

103 5,198,415
136 5,198,416

CLASS 514

2 5,198,417
8 5,198,418
11 5,198,419
11 5,198,421
12 5,198,422
5,198,423
13 5,198,424
14 5,198,425
19 5,198,426
26 5,198,427
54 5,198,428
58 5,198,429
5,198,430
63 5,198,431
182 5,198,432
212 5,198,433
215 5,198,434
216 5,198,435
221 5,198,436
224.5 5,198,437
235.8 5,198,438
236.2 5,198,439
241 5,198,440
249 5,198,441
5,198,442
252 5,198,443
269 5,198,444
5,198,445
277 5,198,446
304 5,198,447
312 5,198,448
317 5,198,449
326 5,198,450
330 5,198,451
357 5,198,452
367 5,198,453
369 5,198,454
372 5,198,455
383 5,198,456
392 5,198,457
397 5,198,458
5,198,459
410 5,198,460
411 5,198,461
432 5,198,462
450 5,198,463
5,198,464
474 5,198,465
496 5,198,011
517 5,198,466
553 5,198,467
558 5,198,468
777 5,198,469
785 5,198,470

CLASS 521

46.5 5,198,471
63 5,198,472
99 5,198,473
112 5,198,474

CLASS 522

31 5,198,476

CLASS 523

106 5,198,477
145 5,198,478
214 5,198,479
500 5,198,480

CLASS 524

9 5,198,481
94 5,198,482
100 5,198,483
108 5,198,484
243 5,198,485
302 5,198,486
403 5,198,487
404 5,198,488
439 5,198,489
443 5,198,490
449 5,198,491
501 5,198,492

CLASS 525

54.1 5,198,493
71 5,198,494
5,198,495
93 5,198,496
108 5,198,497
125 5,198,498
201 5,198,499
244 5,198,500
266 5,198,501
276 5,198,502
288 5,198,503
301 5,198,504
326.2 5,198,505
332.2 5,198,531
333.8 5,198,506
432 5,198,507
454 5,198,508
523 5,198,509
531 5,198,510

CLASS 526

113 5,198,511
130 5,198,512
242 5,198,513
259 5,198,514
262 5,198,515
5,198,516
313 5,198,517

CLASS 528

12 5,198,518
28 5,198,519
33 5,198,520
61 5,198,522
85 5,198,523
87 5,198,524
048 5,198,521
171 5,198,525
183 5,198,526
198 5,198,527
272 5,198,528
5,198,529
279 5,198,530
421 5,198,532

CLASS 530

313 5,198,533
350 5,198,535
381 5,198,534
405 5,198,536
406 5,198,537
417 5,198,538

CLASS 536

23.2 5,198,543
25.3 5,198,540
26.26 5,198,539

CLASS 540

310 5,198,544

CLASS 544

133 5,198,545
198 5,198,546
258 5,198,547

CLASS 546

136 5,198,548
345 5,198,549

CLASS 548

177 5,198,550
435 5,198,551
492 5,198,552
504 5,198,553

CLASS 549

237 5,198,554
242 5,198,555
448 5,198,556
513 5,198,557

CLASS 552

108 5,198,558

CLASS 554

35 5,198,559

CLASS 556

12 5,198,560
13 5,198,561
23 5,198,562
57 5,198,563
137 5,198,564
420 5,198,565

CLASS 560

13 5,198,566
56 5,198,567
60 5,198,568
5,198,569
61 5,198,570
70 5,198,571
86 5,198,572
204 5,198,573
224 5,198,574

CLASS 562

410 5,198,575
493 5,198,576
522 5,198,577
532 5,198,578
535 5,198,579
542 5,198,580
546 5,198,581

CLASS 564

52 5,198,582
158 5,198,583
289 5,198,584
343 5,198,585
356 5,198,586
374 5,198,587

CLASS 568

442 5,198,588
454 5,198,589
619 5,198,598
697 5,198,590
727 5,198,591
885 5,198,592

CLASS 570

177 5,198,593

CLASS 585

467 5,198,594
5,198,595
500 5,198,596
654 5,198,597

CLASS 600

9 5,197,940
27 5,197,941

CLASS 602

5 5,197,942
5,197,943
27 5,197,944
49 5,197,945

CLASS 604

22 5,197,946
28 5,197,947
5,197,950
30 5,197,948
35 5,197,949
93 5,197,951
96 5,197,952
110 5,197,953
5,197,954
167 5,197,955
171 5,197,956
352 5,197,957
361 5,197,958
385.1 5,197,959
385.2 5,197,960

CLASS 606

1 5,197,961
45 5,197,962
46 5,197,963
48 5,197,964
54 5,197,965
69 5,197,966
79 5,197,967
115 5,197,968
133 5,197,969
158 5,197,970
192 5,197,971
201 5,197,972
214 5,197,973
235 5,197,974
238 5,197,975

CLASS 623

1 5,197,976
5,197,977
5,197,978
2 5,197,979
5,197,980
6 5,197,981
9 5,197,982
13 5,197,983
14 5,197,984
16 5,197,985
20 5,197,986
5,197,987
23 5,197,988
5,197,989
5,197,990

CLASS 800

200 5,198,599

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CLASSIFICATION OF DESIGNS

D1—	105	334,273		455	334,306		387	334,336			334,366		204	334,397		186	334,428
	128	334,274		462	334,301		396	334,337			334,367	D18—	7	334,398		190	334,429
D2—	265	334,275			334,307		400	334,338			334,368		15	334,399		215	334,430
	314	334,277		467	334,311	D9—	305	334,340			334,369		39	334,400	D25—	60	334,431
		334,278		470	334,308		316	334,339			334,370		48	334,401		124	334,432
		334,279		474	334,309		447	334,341			334,371		50	334,402			334,433
		334,280			334,310		502	334,342			334,372		56	334,403			334,434
	320	334,281		484	334,312		523	334,343		157	334,373	D19—	26	334,404			334,435
		334,282		487	334,313		531	334,344		182	334,374			334,405		125	334,436
D3—	33	334,283		495	334,314		553	334,345		309	334,375		43	334,406	D26—	42	334,437
	35	334,284		524	334,315	82—	314	334,276		315	334,376		49	334,407		63	334,438
	43	334,285		552	334,316	D10—	33	334,346		317	334,377		56	334,408		65	334,439
	105	334,286		567	334,317		37	334,347			334,378		63	334,409			334,440
D4—	102	334,287		601	334,318		65	334,348	D13—	108	334,379			334,410		106	334,441
	104	334,288		603	334,319		114	334,349		155	334,380		65	334,411		111	334,442
	138	334,289	D7—	351	334,320		116	334,350	D14—	102	334,381		92	334,412	D28—	50	334,443
	199	334,290		527	334,321	D11—	13	334,351		118	334,382		99	334,413	D30—	108	334,444
D6—	317	334,291		536	334,322		15	334,352			334,383	D21—	13	334,414			334,445
		334,292		552	334,323		78	334,353		149	334,384		48	334,415		160	334,446
	366	334,293		605	334,324		81	334,354		165	334,385		106	334,417	D32—	34	334,447
	367	334,294	D8—	14	334,325		125	334,355		210	334,386		108	334,416	D34—	5	334,448
	369	334,295		40	334,326		149	334,356		227	334,387		112	334,418		6	334,449
	374	334,296		50	334,327	D12—	92	334,357	D15—	131	334,388		228	334,419		11	334,450
	376	334,297		61	334,328		100	334,358	D16—	102	334,389	D23—	207	334,420		15	334,451
	379	334,298		68	334,329		115	334,359		112	334,390			334,421		31	334,452
		334,299		70	334,330		146	334,360		123	334,391		216	334,422		40	334,453
	381	334,300			334,331		147	334,361		127	334,392		226	334,423	D99—	34	334,454
	431	334,302		107	334,332			334,362		132	334,393		280	334,424		37	334,455
	436	334,303		356	334,333			334,363		202	334,394	D24—	125	334,425			334,456
	445	334,305		359	334,334			334,364			334,395		126	334,426		99	334,457
	449	334,304		373	334,335			334,365			334,396		176	334,427			

CLASSIFICATION OF PLANTS

P.—	34.1	8,187	38.1	8,188		8,189	69.2	8,190	87.12	8,192	87.3	8,191

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PATENTS

01 :	5,197,279	5,197,343	5,197,900	5,198,644	5,198,084	5,197,220
	5,197,359	5,197,353	5,197,916	5,198,657	5,198,103	5,197,227
	5,197,381	5,197,362	5,197,920	5,198,661	5,198,176	5,197,301
	5,197,415	5,197,376	5,197,927	5,198,665	5,198,201	5,197,307
	5,197,768	5,197,377	5,197,931	5,198,671	5,198,263	5,197,404
	5,197,823	5,197,401	5,197,941	5,198,677	5,198,275	5,197,484
	5,198,547	5,197,402	5,197,948	5,198,682	5,198,313	5,197,489
	5,198,989	5,197,410	5,197,949	5,198,691	5,198,772	5,197,492
	5,199,042	5,197,443	5,197,958	5,198,703	5,198,805	5,197,639
02 :	5,197,150	5,197,455	5,197,978	5,198,705	5,198,820	5,197,691
	5,197,447	5,197,459	5,197,979	5,198,706	5,198,877	5,197,696
04 :	5,197,407	5,197,504	5,197,999	5,198,715	5,198,893	5,197,763
	5,197,609	5,197,509	5,198,008	5,198,725	5,199,011	5,197,819
	5,197,618	5,197,510	5,198,021	5,198,753	5,199,063	5,197,887
	5,197,731	5,197,513	5,198,023	5,198,756	5,199,090	5,197,889
	5,197,755	5,197,515	5,198,038	5,198,760	09 : 5,197,179	5,197,908
	5,197,796	5,197,559	5,198,060	5,198,811	5,197,208	5,197,953
	5,197,798	5,197,589	5,198,071	5,198,817	5,197,225	5,197,972
	5,197,832	5,197,600	5,198,072	5,198,818	5,197,239	5,197,974
	5,197,878	5,197,603	5,198,089	5,198,827	5,197,463	5,198,104
	5,197,961	5,197,623	5,198,090	5,198,834	5,197,533	5,198,106
	5,197,983	5,197,636	5,198,091	5,198,867	5,197,597	5,198,181
	5,198,291	5,197,638	5,198,109	5,198,869	5,197,622	5,198,187
	5,198,623	5,197,644	5,198,116	5,198,914	5,197,630	5,198,254
	5,198,701	5,197,678	5,198,188	5,198,918	5,197,642	5,198,264
	5,198,764	5,197,693	5,198,204	5,198,919	5,197,754	5,198,385
	5,198,944	5,197,699	5,198,217	5,198,924	5,197,814	5,198,528
	5,198,957	5,197,700	5,198,223	5,198,926	5,197,855	5,198,774
	5,198,963	5,197,701	5,198,229	5,198,928	5,197,859	5,198,832
	5,198,975	5,197,707	5,198,266	5,198,947	5,197,863	5,198,844
	5,199,035	5,197,713	5,198,298	5,198,952	5,197,922	5,198,920
	5,199,084	5,197,732	5,198,340	5,198,962	5,197,970	5,198,991
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06 :	Re.34,208	5,197,742	5,198,365	5,198,990	5,198,009	5,199,043
	5,197,152	5,197,749	5,198,380	5,199,001	5,198,035	5,199,069
	5,197,158	5,197,760	5,198,381	5,199,002	5,198,050	5,199,106
	5,197,178	5,197,762	5,198,404	5,199,033	5,198,218	13 : 5,197,195
	5,197,183	5,197,774	5,198,411	5,199,037	5,198,306	5,197,314
	5,197,184	5,197,786	5,198,412	5,199,038	5,198,545	5,197,367
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	5,197,223	5,197,803	5,198,487	5,199,050	5,198,653	5,197,493
	5,197,241	5,197,812	5,198,492	5,199,054	5,198,670	5,197,500
	5,197,245	5,197,818	5,198,519	5,199,077	5,198,927	5,197,598
	5,197,248	5,197,821	5,198,526	5,199,083	5,199,004	5,197,606
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	5,197,253	5,197,844	5,198,602	5,199,100	5,197,659	5,197,626
	5,197,269	5,197,854	5,198,606	5,199,105	5,198,085	5,197,876
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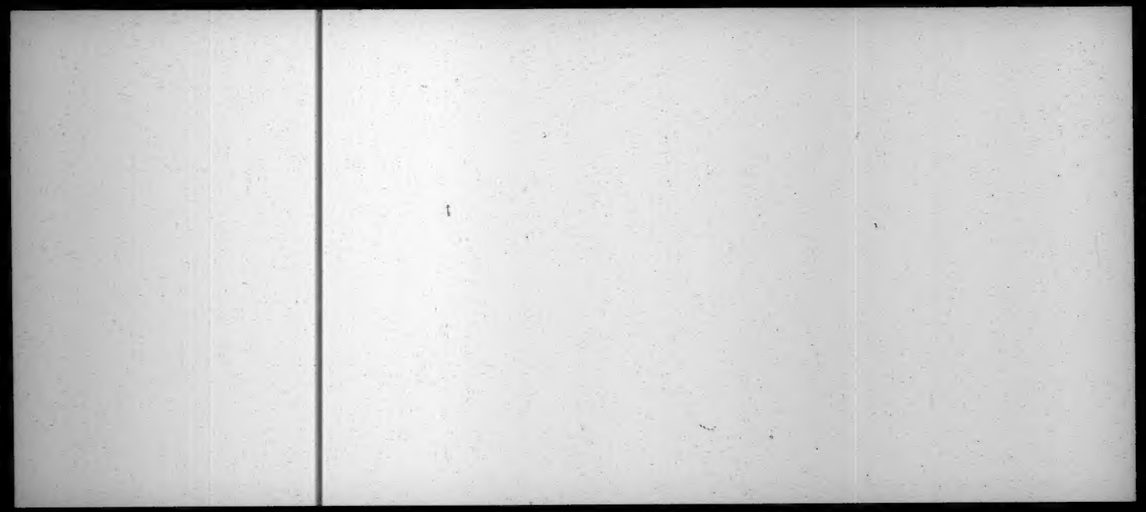

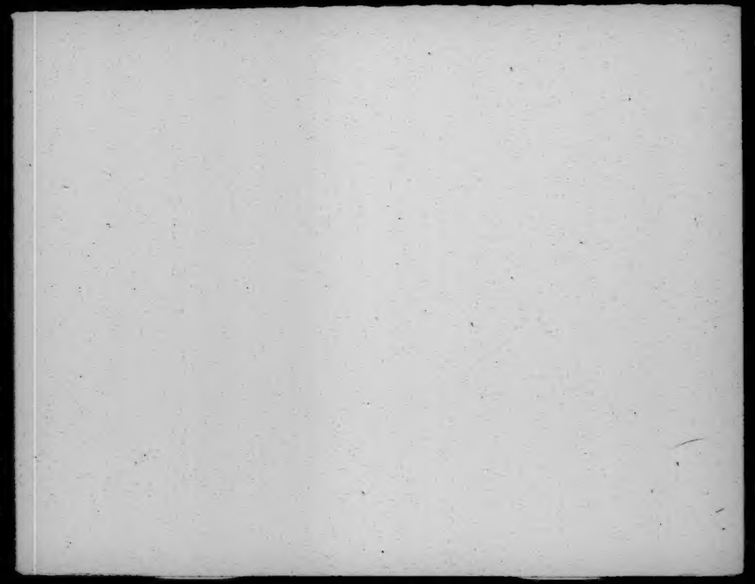

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